

Alabama: Overview

Everything in the main manual and the skill guides applies in Alabama exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Alabama go deeper on laws, local resources, and the data behind the risks named here.

April 27, 2011: the deadliest day in Alabama's tornado history

Georgia's page on this site covers the April 2011 Super Outbreak's Ringgold-Apison tornado; Alabama absorbed far more of that outbreak's total damage than any other state. On April 27, 2011 alone, 62 tornadoes touched down across Alabama, including the Tuscaloosa-Birmingham EF4, which killed 64 people along an 80.7-mile path, and the Hackleburg EF5, one of only four EF5-rated tornadoes in the entire outbreak. Alabama's statewide death toll from the outbreak exceeded 230, more than any other state affected. See the Risks page for the full data.

Hurricane Ivan: a direct hit on the Alabama Gulf Coast

Alabama's coastline carries real hurricane risk independent of its tornado exposure. Hurricane Ivan made its first U.S. landfall near Gulf Shores, Alabama on September 16, 2004, as a Category 3 storm with sustained winds over 120 mph and a storm surge of 10-15 feet along the coast into Mobile Bay.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Alabama: tornado season preparedness, a safe room, a weather radio, and a practiced shelter plan, deserves the highest priority this manual gives it anywhere, Alabama's death toll from a single day in 2011 makes the stakes concrete, and Gulf Coast households need hurricane evacuation and storm surge planning on top of that.

Sources

- April 27, 2011 Alabama tornado outbreak death toll and individual tornado data: PMC/NIH mortality study; Wikipedia, sourced to NWS

- Hurricane Ivan landfall, winds, and storm surge: NHC Tropical Cyclone Report; NOAA NCEI

BY STATE › ALABAMA

Alabama: Laws & Legal Considerations

Rainwater harvesting: a private property right, essentially unregulated

Alabama treats rainwater harvesting as simply part of what a property owner is entitled to do with their own land, with no dedicated state regulatory framework at all.

Rule	Alabama
Source water	Rooftop or other catchment
Permit required	No; the state has no current regulations specifically governing rainwater harvesting
Permitted uses	Personal, non-potable use
Institutional support	Both Alabama A&M and Auburn University's Extension services publish guidance actively encouraging rainwater collection, with technical instructions

Where to find it: the Alabama Cooperative Extension System (aces.edu) publishes rainwater harvesting guidance for homeowners.

Water rights: riparian, with use restricted to riparian land

Alabama follows the riparian doctrine for surface water, allowing reasonable use but restricting where diverted water can actually be used.

Concept	How it works in Alabama
Who holds the right	Landowners whose property touches a water source
Governing principle	Reasonable use: a landowner may use any quantity of water from a source if the use itself is reasonable
Key restriction	Diverted water generally can't be used on non-riparian land, only on the property actually touching the water source, without a court order permitting an exception

Permitless carry since 2023, with active 2026 legislative pushback

Alabama has allowed permitless carry since January 1, 2023, but the policy isn’t without current political contest.

Requirement	Detail
Standard	Permitless ("constitutional") carry since January 1, 2023
Minimum age	18
Optional permit	Available in 1-year, 5-year, and lifetime versions; no training required to obtain one

This is a live legislative issue, not settled history

As of early 2026, a bill (SB267) has been introduced in the Alabama Legislature that would require a permit to carry a pistol in a vehicle or on one’s person, with criminal penalties for violating that requirement, effectively reversing permitless carry. As of this writing, it remains a proposed bill, not enacted law, and permitless carry is still in effect. Confirm current status before relying on this page if you’re reading it well after 2026.

Sources

- Alabama rainwater harvesting rules and Extension guidance: LawShun; Landifyr
- Alabama riparian water rights: Alabama Farmers Federation; University of Alabama School of Law
- Alabama permitless carry status and 2026 SB267: Fox News; Alabama Legislature SB267

BY STATE › ALABAMA

Alabama: Local Resources

AEMA and Ready Alabama

The Alabama Emergency Management Agency runs public preparedness outreach through Ready Alabama, focused on building a household emergency kit and general disaster awareness, in partnership with the national Ready.gov campaign.

Where to find it: servealabama.gov/ready-alabama-1.

Alabama Extension: run jointly by two universities, unlike most states covered on this site

The Alabama Cooperative Extension System is unusual among the states covered here: it’s operated jointly by Alabama A&M University and Auburn University rather than a single land-grant institution.

- **Alabama Extension Master Gardener Program:** a 14-week course providing 50 hours of classroom and hands-on training, followed by 50 volunteer hours within 12 months to certify (10 of which must be worked on the Master Gardener Helpline specifically), then 25 volunteer hours and 10 continuing-education hours annually to maintain it.

Where to find it: mg.aces.edu lists local Master Gardener associations.

CERT: county-run, coordinated through AEMA

Alabama’s CERT programs are organized at the county level, Tuscaloosa County and Jefferson County among the active examples, following the standard FEMA curriculum.

Typical time commitment

Alabama CERT training typically runs 18-21 hours total, often delivered as one evening session a week over about two months.

Where to find it: ema.alabama.gov/preparedness; search “[your county] CERT” for a local program.

Sources

- AEMA Ready Alabama campaign: Serve Alabama
- Alabama Extension Master Gardener Program structure and requirements: Alabama Cooperative Extension System
- Alabama CERT program structure and county examples: Tuscaloosa County EMA; Jefferson County EMA

BY STATE › ALABAMA

Alabama: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

April 27, 2011: Alabama’s deadliest tornado day on record

Metric	Figure
Alabama deaths, full outbreak	230+
Alabama injuries	~2,200
Tornadoes in Alabama	69 (62 on April 27 alone)
Tuscaloosa-Birmingham tornado: rating/path/deaths	EF4, 80.7 mi, 64 deaths (44 Tuscaloosa, 20 Birmingham), 1,500+ injuries
Hackleburg-Phil Campbell tornado: rating/path/deaths	EF5, 102 mi across 5 counties, 71 deaths, 145+ injuries, the deadliest single tornado in Alabama history
Cordova tornadoes: deaths/injuries	13 deaths, 54 injuries (struck twice, EF3 then EF4)
National ranking	Alabama suffered more deaths than any other state in the largest tornado outbreak in U.S. history

Why this outbreak still matters for comparison across the site

Georgia’s page on this site covers the same April 2011 outbreak through its Ringgold-Apison EF4, one tornado among the outbreak’s hundreds. Alabama’s toll wasn’t from one storm, it was from dozens of tornadoes striking across the state in a single day, including 2 of the outbreak’s 4 EF5-rated tornadoes (Hackleburg-Phil Campbell and Rainsville); the other 2 EF5s, Philadelphia and Smithville, struck Mississippi. Alabama’s share of the outbreak’s total death toll was larger than any other affected state’s.

Hurricane Ivan (2004): a direct hit on Gulf Shores

Metric	Figure
Landfall location and date	Near Gulf Shores, AL, September 16, 2004
Landfall strength	Category 3, 120+ mph sustained winds
Storm surge (Destin, FL to Mobile Bay, AL)	10-15 ft
Total U.S. deaths (full storm lifecycle)	57
Total U.S. damage	~\$14-27 billion (estimates vary by source and dollar-year adjustment)

What these two have in common

Alabama’s tornado risk and its Gulf Coast hurricane risk are both severe by national standards but strike on very different timescales, tornadoes with minutes of warning, hurricanes with days, which is part of why this manual treats a practiced, fast shelter response and a longer-lead evacuation plan as two genuinely separate skills rather than one general “severe weather” plan.

Sources

- April 27, 2011 Alabama tornado outbreak data: PMC/NIH mortality study; Wikipedia, sourced to NWS
- Hurricane Ivan landfall, damage, and death toll: NHC Tropical Cyclone Report; Florida Tech

Alaska: Overview

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The 1964 Good Friday earthquake: the most powerful ever recorded in North America

On March 27, 1964, a magnitude 9.2 earthquake struck Alaska, the most powerful earthquake ever recorded in North America and the second most powerful recorded anywhere since modern seismography began. The shaking lasted four and a half minutes and deformed more than 200,000 square kilometers of terrain. Fifteen people died in the earthquake itself, and 124 more died in the tsunamis it triggered along the Alaska, Oregon, and California coastlines, including a wave that reached 220 feet at Shoup Bay. See the Risks page for the full data.

October 2025 Typhoon Halong remnants: a very recent, still-unfolding disaster

In October 2025, the remnants of Typhoon Halong slammed into Alaska's Yukon-Kuskokwim Delta with hurricane-force winds and coastal flooding that reached up to 60 miles inland, an area hundreds of miles from the nearest road system. Homes floated off their foundations with families still inside, utility poles snapped, and the storm triggered one of the largest airlift evacuations in Alaska's history. This page treats it as a live, recent event rather than settled history; recovery and even relocation decisions for affected villages were still ongoing as of early 2026. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification, but Alaska adds a structural constraint most of this manual doesn't otherwise address: roughly 60% of Alaska's 285 communities have no state-registered fire department, and many rural communities are reachable only by plane or boat, weather permitting. That means the assumption running through most of this manual, that professional emergency responders will

eventually arrive, holds far less reliably here than almost anywhere else covered on this site. Self-sufficiency and community-level mutual aid aren't just Tier 3-4 aspirations in remote Alaska; they're closer to a baseline necessity.

Sources

- 1964 Good Friday earthquake data: Wikipedia; NOAA NCEI
- October 2025 Typhoon Halong remnant flooding data: NOAA NESDIS; NPR
- Alaska's remote-community emergency infrastructure gaps: Governing

BY STATE › ALASKA

Alaska: Laws & Legal Considerations

Water rights: a dual riparian/appropriative system under one statute

Alaska’s 1966 Water Use Act recognizes both riparian and appropriative water rights within a single statutory framework, rather than choosing one doctrine or layering them ad hoc the way some other states covered on this site do.

Concept	How it works in Alaska
Governing law	Alaska Water Use Act (1966)
Recognized doctrines	Both riparian rights (land adjacent to water) and appropriative rights (water for a designated purpose) are recognized under the same act
Priority	Rights are prioritized by the date first put to beneficial use, with senior users getting primary access during a shortage
Process	Apply to the Division of Mining, Land, and Water; a permit may lead to a certificate of appropriation once beneficial use is established and permit conditions are met

Where to find it: the Alaska Division of Mining, Land, and Water (dnr.alaska.gov/mlw/water/rights) administers water rights.

No dedicated rainwater harvesting statute found

Search of Alaska statutes and agency guidance didn’t surface a rainwater-harvesting-specific rule distinct from the general water rights framework above. Typical small-scale residential catchment for non-potable use is unlikely to trigger the formal appropriation process, but confirm with the Division of Mining, Land, and Water for anything beyond casual collection, especially for potable use given Alaska’s remote water-quality concerns.

Permitless carry since 2003, one of the longest-standing on this site

Alaska has recognized permitless concealed carry since 2003, longer than nearly every other permitless state covered on this site, most of which adopted their laws between 2010 and 2023.

Requirement	Detail
Standard	Permitless carry, concealed or open, for anyone 21+ legally eligible to possess a firearm (Alaska Statute §11.61.220)
Optional permit	Remains available for reciprocity, or to bypass a background check on additional firearm purchases
Notable prohibited locations	K-12 schools and grounds (narrow exceptions), courthouses/courtrooms, childcare facilities, domestic violence/sexual assault shelters, and bars (limited restaurant exceptions)

Sources

- Alaska water rights and the 1966 Water Use Act: Alaska DNR; ISER
- Alaska permitless carry (2003) and prohibited locations: Alien Gear Holsters; Giffords Law Center

[BY STATE](#) › [ALASKA](#)

Alaska: Local Resources

Alaska Division of Homeland Security and Emergency Management (DHS&EM)

DHS&EM, formed in 2004, protects Alaskans and their property from terrorism and all other hazards and coordinates rapid recovery from disasters statewide.

Where to find it: ready.alaska.gov.

UAF Cooperative Extension: Master Gardener Program

University of Alaska Fairbanks Cooperative Extension Service runs the same category of program as every other state covered on this site, with a distinctive exam-first structure.

- **Alaska Master Gardener Program:** trainees must first pass a comprehensive knowledge exam, then complete 40 hours of volunteer service within 12 months to become certified. Maintaining certification afterward requires 20 volunteer hours and 10 hours of continuing education annually.

Where to find it: uaf.edu/ces/garden/mastergardeners.

CERT: a dedicated statewide administrator role

Alaska's CERT program is coordinated through DHS&EM's Outreach Branch, which includes a specifically designated CERT State Administrator role, a level of centralized coordination worth noting given how many other rural, low-population states covered on this site instead rely on a fully county-by-county model.

Centralized coordination, but still a vast geography to cover

Having a single statewide CERT administrator doesn't mean every Alaska community has an active team, especially in the remote, road-inaccessible villages this state's overview page discusses. Residents should still confirm local availability directly with DHS&EM.

Where to find it: ready.alaska.gov/Preparedness/Meet_the_Team.

Sources

- Alaska DHS&EM structure and mission: Wikipedia
- UAF Master Gardener Program requirements: University of Alaska Fairbanks
- Alaska CERT statewide coordination: Alaska DHS&EM

BY STATE › ALASKA

Alaska: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 1964 Good Friday earthquake

Metric	Figure
Date	March 27, 1964
Magnitude	9.2 (some sources cite 9.2-9.3), the most powerful earthquake ever recorded in North America
Duration of shaking	4 minutes, 38 seconds
Area of tectonic deformation	200,000+ sq km
Deaths, earthquake itself	15
Deaths, resulting tsunamis (AK/OR/CA)	124 (12 in Crescent City, CA alone)
Maximum tsunami run-up	220 ft, Shoup Bay, Alaska
Damage (1964 / 2013-adjusted)	\$500 million / ~\$3.75 billion

A tsunami risk that reached three states

This earthquake’s death toll wasn’t confined to Alaska: the tsunamis it generated killed people as far away as Crescent City, California. It’s a clear demonstration that a single Pacific-coast seismic event can have consequences hundreds or thousands of miles from the epicenter, not just locally.

October 2025 Typhoon Halong remnant flooding

Metric	Figure
Landfall	October 12, 2025, Yukon-Kuskokwim Delta, Western Alaska
Flood extent inland	Up to 60 mi
Residents displaced	1,000+
Confirmed deaths	1, with 2 family members still missing at time of reporting
Notable damage	Homes swept off foundations (some occupied at the time), snapped utility poles, uprooted village boardwalks, numerous diesel/oil spills, graves washed away, a year's stockpiled subsistence food (fish, berries) ruined
Evacuation scale	One of the largest airlift evacuations in Alaska history

Still an open, unresolved situation

As of early 2026, affected villages were still weighing whether to relocate entirely rather than rebuild in place. Treat the specific figures above as a snapshot of an ongoing recovery, not a closed historical event, and expect them to be updated as the situation develops further.

Sources

- 1964 Good Friday earthquake data: Wikipedia; NOAA NCEI
- October 2025 Typhoon Halong remnant flooding data: NOAA NESDIS; NPR; Anchorage Daily News

Arizona: Overview

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Extreme heat: an ongoing, worsening annual crisis

Phoenix and the rest of Maricopa County record a heat-related death toll every single year, tracked in unusual detail by the county's own public health department. 2023 set a record with 645 heat-related deaths; 2024 saw the first year-over-year decline in a decade, 602 deaths, despite being the hottest summer on record. During one 44-day stretch in the summer of 2024, at least one heat-related death occurred in Maricopa County every single day. See the Risks page for the full breakdown.

The Colorado River: Arizona takes the deepest cuts

Arizona's water supply is directly tied to the Colorado River, and under the river's current tiered shortage system, Arizona absorbs the largest mandatory reductions of any state sharing it. The river has operated under Tier 1 Shortage conditions in 2022, 2024, 2025, and 2026, cutting roughly 512,000 acre-feet from Arizona's allocation each year, and the 2007 operating guidelines governing the whole system expire at the end of 2026, with steeper cuts already planned for 2027. This isn't a single event, it's a standing, worsening supply constraint that shapes water policy statewide.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Arizona: heat safety (hydration, shade, checking on elderly or outdoor-working neighbors) needs to be a genuine year-round Tier 1 priority for a large part of the year, not an occasional summer concern, and this manual's water storage and conservation guidance carries real weight in a state whose primary water source is already under mandatory federal cuts.

Sources

- Maricopa County heat-related death figures: Maricopa County Department of Public Health; NBC News
- Colorado River Tier 1 Shortage and Arizona's allocation cuts: Central Arizona Project; Arizona Department of Water Resources

Arizona: Laws & Legal Considerations

Rainwater harvesting: legal statewide, and required for some development in Tucson

Arizona places no state-level restriction on residential rainwater harvesting, and the state actively incentivizes it with a tax credit, but the more remarkable legal fact here is local, not statewide.

Rule	Arizona
Source water	Rooftop or other catchment
Permit required	No, for typical residential rain barrels and cisterns
Permitted uses	Non-potable: irrigation, landscaping
Residential state tax credit	25% of installation cost, up to \$1,000, for a qualifying water conservation system
Agricultural state tax credit	Up to 75% of installation cost, for systems used for agricultural purposes

Tucson's ordinance was the first of its kind in the nation

In 2008, Tucson adopted Ordinance 10597, taking effect in 2010, requiring all new commercial development to submit a rainwater harvesting plan showing that at least 50% of the site’s yearly landscape water budget will come from harvested rainwater. It was the first ordinance of its kind in the country. Enforcement has been inconsistent over the years, according to local reporting, but the requirement itself remains on the books and is a genuinely distinctive local law not found in any other state covered on this site.

Where to find it: the Arizona Department of Revenue (azdor.gov) administers the state tax credit; Tucson’s Unified Development Code, Section 4-01, covers that city’s commercial requirement specifically.

Water law: two entirely separate systems for surface water and groundwater

Arizona’s surface water follows the same prior appropriation doctrine as Utah, Oregon, and Washington, but its groundwater is governed by a completely separate, more modern regulatory framework that most other states covered on this site don’t have.

Water type	Governing framework
Surface water	Prior appropriation ("first in time, first in right")
Groundwater, inside an Active Management Area	Groundwater Management Act of 1980: mandatory conservation, a 100-year assured water supply requirement for new development, and a legal goal of "safe-yield" (withdrawals balanced against recharge)
Groundwater, outside an Active Management Area	Comparatively few restrictions

Why this matters for most Arizonans specifically

There are 8 Active Management Areas statewide (including Phoenix and Tucson), and more than 75% of Arizona’s population lives inside one. The 1980 Act’s safe-yield goal for AMAs had a target date of January 1, 2025, now passed; whether that goal has actually been met varies significantly by AMA, and it’s worth checking current status with the Arizona Department of Water Resources rather than assuming the target was achieved statewide.

Where to find it: the Arizona Department of Water Resources (azwater.gov) administers both systems and publishes current AMA status.

Permitless carry since 2010, well ahead of most states covered on this site

Arizona has allowed permitless concealed carry since 2010, considerably earlier than Texas, Florida, Ohio, and Georgia, which adopted similar policies between 2021 and 2022.

Requirement	Detail
Standard	Permitless ("constitutional") carry, open or concealed, since 2010
Minimum age	21
Optional Concealed Weapons Permit (CWP)	\$60, shall-issue through the Department of Public Safety, requires an in-person training class (no fully online option)
Why get the optional permit anyway	Recognized in 37+ states for reciprocity; exempts the holder from the federal 1,000-foot school zone restriction; skips the point-of-sale NICS background check at licensed dealers

Sources

- Arizona rainwater harvesting rules and state tax credit: Arizona Department of Revenue
- Tucson's commercial rainwater harvesting ordinance: Arizona Daily Star; University of Arizona Water Resources Research Center
- Arizona Groundwater Management Act and Active Management Areas: Arizona Department of Water Resources; Audubon
- Arizona permitless carry and optional CWP: Arizona Department of Public Safety; ArizonaShooting.org

Arizona: Local Resources

DEMA: no single branded consumer campaign found, similar to Virginia's approach

The Arizona Department of Emergency and Military Affairs (DEMA), through its Division of Emergency Management, coordinates the state's all-hazard preparedness, response, recovery, and mitigation efforts. As with Virginia, this research didn't turn up one specific named public-facing household campaign (like "Ready Ohio" or "ReadyNJ"); DEMA's public presence centers more on training coordination and partner programs than a single branded consumer push.

Where to find it: dema.az.gov/emergency-management/preparedness.

University of Arizona Cooperative Extension: Arizona's version of the other states' land-grant Extension programs

The University of Arizona's Cooperative Extension runs the same category of program as every other state covered on this site, partnering with all 15 Arizona counties.

- **Master Gardener Program:** courses typically run 20 weeks, followed by additional volunteer training; specific hour requirements and schedules vary by county.

Where to find it: extension.arizona.edu lists Master Gardener programs by county, including Maricopa and Pima.

CERT: coordinated through DEMA's Training Branch

Arizona's CERT training is coordinated through DEMA's Training Branch, funded through Department of Homeland Security grants, with actual course delivery happening locally.

How to actually find a class

DEMA's Training Branch can be reached directly at 602-464-6225 or training@azdema.gov for current CERT course information, in addition to the standard approach of searching "[your county] CERT" for a program near you.

Where to find it: dema.az.gov/emergency-management/preparedness/training-branch.

Sources

- DEMA Division of Emergency Management and preparedness structure: DEMA
- University of Arizona Master Gardener Program: UA Cooperative Extension
- Arizona CERT training coordination: DEMA Training Branch

BY STATE › ARIZONA

Arizona: Risks & Trends

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Maricopa County heat deaths: a tracked, worsening annual toll

Metric	Figure
2023 heat-related deaths	645 (record high, 52% above the prior record)
2024 heat-related deaths	602 (first year-over-year decline in a decade, despite the hottest summer on record)
Longest daily-death streak (2024)	44 consecutive days (June 18-July 31) with at least one heat death every day
Deaths during that streak	355
Share of 2023 deaths aged 50+	~2 in 3
Share of 2023 deaths that were men	~3 in 4
Share of 2024 deaths that occurred outdoors	77%

Why 2024's decline doesn't mean the risk eased

2024 was Phoenix’s hottest summer on record, yet heat deaths fell for the first time in a decade, most likely reflecting expanded heat-relief efforts (cooling centers, outreach) rather than milder conditions. Both facts are true at once: the underlying heat exposure kept getting worse, and the death toll dropped anyway, a genuine public-health success story layered on top of a still-worsening climate trend.

The Colorado River shortage: Arizona’s deepest cuts of any state on the river

Metric	Figure
Current shortage tier	Tier 1 (in effect 2022, 2024, 2025, 2026)
Arizona's annual Tier 1 reduction	512,000 acre-feet
Share of Central Arizona Project's normal supply	~30%
Share of Arizona's total Colorado River supply	~18%
Share of Arizona's total water supply (all sources)	Just under 8%
Additional Lower Basin cuts starting 2027	1.25 million acre-feet
Current operating guidelines expire	End of 2026

Arizona’s Central Arizona Project water right sits junior to other states’ Colorado River allocations under the interstate agreements governing the river, which is why Arizona absorbs the largest share of cuts under the tiered shortage system even though its total allocation is smaller than California’s. The 2007 interim operating guidelines that have governed cuts since then expire at the end of 2026, and negotiations over what replaces them will directly determine how much deeper Arizona’s cuts go after that.

What these two have in common

Both of Arizona’s defining risks get worse the longer the underlying trend continues, and neither has a single fixed end date. Extreme heat and water scarcity reinforce each other in a practical sense too: less water available for landscaping and cooling infrastructure makes heat exposure harder to manage, which is part of why this manual treats water storage, heat safety, and general Tier 1-2 self-sufficiency as connected priorities rather than separate concerns here specifically.

Sources

- Maricopa County heat-related death data: Maricopa County Department of Public Health; azfamily.com; NBC News

- Colorado River Tier 1 Shortage and Arizona-specific cuts: Central Arizona Project; Arizona Department of Water Resources

Arkansas: Overview

Everything in the main manual and the skill guides applies in Arkansas exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Arkansas go deeper on laws, local resources, and the data behind the risks named here.

The 2014 Mayflower-Vilonia tornado

On April 27, 2014, an EF4 tornado with winds up to 190 mph tracked more than 41 miles through central Arkansas, from Mayflower through Vilonia, killing 16 people and injuring 193. One of the deaths occurred inside an above-ground storm shelter, believed to be the first known fatality of its kind, a detail that matters directly for how this manual's shelter guidance should be read: a shelter reduces risk, it does not eliminate it, and placement and anchoring still matter. See the Risks page for the full data.

The Guy-Greenbrier earthquake swarm: a hazard this manual hasn't covered yet

Between 2010 and 2011, a stretch of central Arkansas near the towns of Guy and Greenbrier experienced over 14,000 earthquakes, most too small to feel, but including a magnitude 4.7 event, the largest instrumentally recorded in the area. This wasn't ordinary natural seismicity: researchers linked the swarm to underground disposal of wastewater from nearby natural gas drilling, and the earthquakes largely stopped within months after the state shut the injection wells down. Every other seismic risk covered elsewhere on this site, from California's San Andreas system to the New Madrid Seismic Zone under the central Mississippi Valley, is naturally occurring. Arkansas's swarm is a reminder that some seismic risk is driven by ongoing industrial activity nearby, and can, in principle, be turned off rather than merely endured. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Arkansas: this manual's storm-shelter guidance should be read alongside the Mayflower-Vilonia shelter fatality, not as a reason to skip a shelter but as a reason to take its construction and anchoring seriously, and residents in the Guy-

Greenbrier area or near other active injection-well zones have a genuine reason to track local seismic activity that residents elsewhere in the state do not.

Sources

- 2014 Mayflower-Vilonia tornado track, winds, deaths, and injuries: Wikipedia; KARK
- Guy-Greenbrier earthquake swarm cause and scale: Wikipedia; CNN

Arkansas: Laws & Legal Considerations

Rainwater harvesting: unrestricted for non-potable use

Arkansas places no state-level restriction on collecting rainwater in a barrel or cistern for garden or other non-potable use.

Rule	Arkansas
Source water	Rooftop or other catchment
Permit required	No, at the state level, for basic residential collection
Permitted uses	Non-potable; the state's onsite non-potable reuse guideline also covers uses like water closet and urinal flushing
Technical requirements for reuse systems	Filtration, a debris excluder, and an automatic first-flush diverter

Where to find it: the University of Arkansas Division of Agriculture (uaex.uada.edu) publishes homeowner guidance.

Water rights: pure riparian doctrine

Arkansas water law is built on riparian doctrine: the right to use water belongs to landowners whose property touches the source, and all riparian users must share limited supply proportionally rather than on a first-come basis.

Concept	How it works in Arkansas
Basic rule	Riparian landowners may use the water they need from an adjacent source, but must scale back if the source can't meet every riparian user's needs
Registration threshold	Diverting more than 325,900 gallons (1 acre-foot) in a calendar year requires registering with the Arkansas Natural Resources Division
Groundwater	Governed separately, with its own conservation and registration rules administered by the same division

Where to find it: the Arkansas Natural Resources Division (formerly the Arkansas Natural Resources Commission) administers water rights registration.

Permitless carry since 2013, clarified in 2023

Arkansas has recognized permitless carry since August 16, 2013, with a 2023 law change removing lingering ambiguity about whether carrying itself, not just possessing, a handgun without a permit was fully protected.

Requirement	Detail
Standard	Permitless carry, open or concealed, for anyone 18+ legally eligible to possess a firearm
2023 clarification	SB480, signed February 3, 2023, confirmed the right to carry concealed without a license
Optional license	A Concealed Handgun Carry License remains available, minimum age 21 (18 for active military and veterans), requiring a state-approved 5-hour course with live fire, for \$100
Why get the optional license anyway	Reciprocity in states that don't recognize Arkansas's permitless standard for out-of-state residents

A live legislative issue, not settled history

Arkansas’s induced-seismicity moratorium described on the Risks page was a regulatory action by the Arkansas Oil and Gas Commission, not a permanent statute. Regulatory posture toward wastewater injection near populated areas can shift with drilling activity and state administration; residents near active or former injection-well zones should check the Commission’s current rules rather than assume 2011’s moratorium area still applies unchanged.

Sources

- Arkansas rainwater harvesting guidance: University of Arkansas Division of Agriculture; EPA
- Arkansas riparian water law and registration threshold: National Agricultural Law Center; University of Arkansas Extension
- Arkansas permitless carry (2013 statute; SB480, 2023): Protect With Bear
- Arkansas Oil and Gas Commission moratorium, 2011: Wikipedia

Arkansas: Local Resources

ADEM: county-judge-coordinated, not centrally run

The Arkansas Division of Emergency Management, under the Department of Public Safety, coordinates the state's all-hazards preparedness program, but day-to-day emergency management in Arkansas runs through county judges and local emergency management coordinators in all 75 counties rather than a single statewide office handling response directly.

Where to find it: adem.arkansas.gov lists county-level contacts and current CERT grant programs.

University of Arkansas Division of Agriculture Extension: Master Gardener Program

The University of Arkansas's Extension arm runs the same category of program as every other state covered on this site, though its footprint is notably wide for a state Arkansas's size.

- **Arkansas Master Gardener Program:** active in 67 of the state's 75 counties since 1988. A 40-hour horticulture course covering annuals, perennials, shrubs, fruits, and vegetables, followed by ongoing volunteer service to remain active.

Where to find it: uaex.uada.edu/yard-garden/master-gardeners lists county programs and how to apply.

CERT: concentrated in the state's most populous counties

Arkansas's CERT programs are organized locally rather than through one statewide standard, active in Pulaski County (Little Rock), Benton and Washington counties (Northwest Arkansas), Sebastian County (Fort Smith), Craighead County (Jonesboro), and other jurisdictions. Training is free and typically runs eight sessions.

Coverage varies by county

Unlike states covered elsewhere on this site with a single statewide CERT curriculum body, Arkansas's CERT programs are organized county by county. Residents outside the counties listed above should check with ADEM directly for the nearest active team, since coverage does not yet reach all 75 counties.

Where to find it: adem.arkansas.gov/aem/grants-funding/cert.

Sources

- ADEM structure and county coordination: Arkansas Department of Public Safety
- Arkansas Master Gardener Program history and county coverage: University of Arkansas Division of Agriculture
- Arkansas CERT county programs: New World Survival

BY STATE › ARKANSAS

Arkansas: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 2014 Mayflower-Vilonia tornado

Metric	Figure
Date	April 27, 2014
Rating	EF4
Peak winds	190 mph
Path length	41.10 mi
Maximum path width	1,320 yards
Duration	56 minutes
Deaths	16, including one inside an above-ground storm shelter
Injuries	193
Damage	\$223.45 million (2014 USD)
Communities hit	Paron, Mayflower, Lake Conway, Vilonia, El Paso

The above-ground shelter fatality

One of the 16 deaths occurred inside an above-ground storm shelter, believed to be the first documented fatality of its kind in a tornado. It doesn't mean above-ground shelters are unsafe as a category; it means a shelter's protection depends on its specific construction, anchoring, and placement relative to the tornado's actual path and debris field, not on the fact that it is labeled a shelter.

The Guy-Greenbrier earthquake swarm: induced, not natural

Metric	Figure
Active period	July 2010 - October 2011
Earthquakes detected	14,604 (magnitude -1.5 to 2.9 for the vast majority)
Largest recorded event	Magnitude 4.7, night of February 27, 2011
Suspected cause	Wastewater disposal wells associated with Fayetteville Shale natural gas drilling, injecting near the Guy-Greenbrier fault
Disposal wells in the area, 2009-2011	6
Regulatory response	Arkansas Oil and Gas Commission moratorium on new disposal wells in the area, adopted unanimously July 27, 2011
Outcome after wells shut down	Seismicity dropped off within about three months

A hazard that can be turned off

Every other seismic risk on this site, including the New Madrid Seismic Zone covered on Illinois, Missouri, and Tennessee’s pages, is naturally occurring and cannot be switched off by a regulatory order. The Guy-Greenbrier swarm is the exception: once the disposal wells linked to it stopped operating, the earthquakes largely stopped within months. That doesn’t make the risk zero for residents near other active injection sites, but it does mean tracking well permits and Commission actions is a genuinely actionable step in a way that tracking natural fault stress is not.

Sources

- 2014 Mayflower-Vilonia tornado data: Wikipedia; KARK
- Guy-Greenbrier earthquake swarm data and moratorium: Wikipedia; CNN

California: Overview

Everything in the main manual and the skill guides applies in California exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under California go deeper on laws, local resources, and the data behind the risks named here.

Earthquake risk that sits directly under the state's two biggest population centers

California's earthquake risk isn't a single fault the way the Wasatch Fault or Cascadia are; it's a dense network of faults, the San Andreas foremost among them, running through or near nearly every major population center in the state. The USGS-led Uniform California Earthquake Rupture Forecast (UCERF3) puts the 30-year probability of at least one magnitude 6.7+ earthquake at 60% for the Los Angeles region and 72% for the San Francisco Bay Area, counting all faults capable of producing one in each area, not just the San Andreas itself.

The USGS's own ShakeOut planning scenario, built around a magnitude 7.8 rupture of the southern San Andreas, projects roughly 1,800 deaths, 50,000 injuries, and more than \$200 billion in losses, with the strongest shaking funneled directly into the Los Angeles basin. Unlike a single-fault risk, this is a standing, structural feature of living almost anywhere in urban California, not a coastal-only or regional concern.

Wildfire risk that's no longer a future projection

The January 2025 Southern California firestorm, the Palisades and Eaton fires chief among 14 separate destructive fires that month, killed 31 people, burned more than 57,000 acres, and destroyed or damaged over 18,000 structures across the Los Angeles metropolitan area and San Diego County. The Palisades Fire alone is the most destructive fire in the city of Los Angeles's history. A separate epidemiological study estimated the total mortality impact, counting indirect deaths from smoke exposure and disrupted medical care, at closer to 440; that figure is a statistical estimate, not a confirmed count, and the two numbers measure genuinely different things, direct versus total attributable mortality, not a correction of one by the other.

A third, slower-moving stressor: water

California's chronic water stress, drought cycles, an aging reservoir and aqueduct system, and a water-rights system genuinely more complicated than most other states', shapes long-term planning here in a way that doesn't have a single dramatic case study the way earthquake and fire do, but affects far more of the state, far more continuously. See the Laws page for how California's water-rights system actually works.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in California: earthquake preparedness (Tier 1's basic supply kit, Tier 2's extended self-sufficiency) matters across nearly the entire state's urban population, not a specific fault corridor, and wildfire evacuation planning needs to account for the kind of fast-moving, wind-driven fire behavior the January 2025 fires demonstrated, hours of warning at most, sometimes less.

Sources

- USGS / UCERF3, 30-year earthquake probability for Los Angeles and San Francisco Bay regions: USGS
- USGS ShakeOut Scenario, magnitude 7.8 southern San Andreas planning scenario: shakeout.org
- January 2025 Southern California wildfires, confirmed death toll, acreage, and structure loss; Palisades Fire specific figures: Wikipedia, sourced to contemporary reporting

California: Laws & Legal Considerations

Rainwater harvesting: simple rooftop rule, like Oregon’s

California’s Rainwater Capture Act of 2012 (Water Code §10574) does the same job Oregon’s rooftop exemption does: collecting rainwater from a building’s roof for later use on the same property doesn’t require a state water-right permit at all.

Rule	California
Source water	Rooftop catchment specifically
Permit required	No, for residential/commercial/governmental rooftop systems used on-site
Permitted uses	Non-potable uses; check local code for anything plumbed indoors
Underlying statute	Water Code §10574, via the Rainwater Capture Act of 2012

The practical rule is nearly identical to Oregon’s: a rain barrel or cistern fed by your own roof, used on your own property, for non-potable purposes, doesn’t need state permission. This is meaningfully simpler than Utah’s tiered registration system.

Water rights: the one genuinely different legal system among the states covered so far

Utah and Oregon both use pure prior-appropriation water law. California uses a hybrid of two systems at once, and which one applies to a given water source changes the analysis entirely.

System	Who holds it	Key feature
Riparian rights	Owners of land bordering a water source	Shared equally among riparian landowners; not lost through nonuse; senior to appropriative rights in a shortage
Appropriative rights	Anyone, land ownership not required	"First in time, first in right" priority; can be lost after 5 years of nonuse if not transferred

Why this matters more than it might seem

In a genuine water shortage, riparian rights holders get water before appropriative rights holders do, regardless of who has the older claim, then appropriative rights are honored in strict priority order among themselves. This two-tier structure doesn’t exist in Utah or Oregon’s pure appropriative systems, and it’s the reason California water litigation is often more complex than in neighboring states.

Where to find it: the State Water Resources Control Board (waterboards.ca.gov) administers water rights statewide; for anything beyond basic rooftop rainwater capture, a water rights attorney or the Board directly is worth consulting given the system’s real complexity.

Concealed carry: a system that changed fundamentally in 2022, and is still moving

California’s concealed carry law looked completely different before 2022. Following the U.S. Supreme Court’s *NYSRPA v. Bruen* decision, California was forced to drop its old “may issue” system, which let local authorities deny a permit at their discretion even to qualified applicants, in favor of an objective “shall issue” standard.

Requirement	Detail
Standard	Shall-issue: if you meet the statutory criteria, the issuing authority must issue
Minimum age	21
Training, new applicants	Minimum 16 hours, including firearm safety, state law, 1 hour of mental health awareness, and live-fire qualification
Training, renewals	Minimum 8 hours
Governing statute	Penal Code §§26150–26155, §26202

The 'sensitive places' list is genuinely unsettled

SB 2 (effective January 2024) created an extensive list of locations where CCW holders cannot carry even with a valid permit, including parks, playgrounds, places of worship, bars, stadiums, museums, libraries, and public transit. Multiple federal court challenges have resulted in injunctions blocking parts of this list, and the situation was still actively being litigated as of this writing. Don’t treat any single source, including this one, as the final word on where carry is currently permitted; check current status before relying on it.

Defensible space: the most detailed rule of any state covered so far

Under Public Resources Code §4291, anyone who owns, leases, controls, or maintains a structure in a State Responsibility Area must maintain up to 100 feet of defensible space around it, structured into three distinct zones.

Zone	Distance from structure	Requirement
Zone 0	0–5 ft	Ember-resistant: non-combustible ground surfaces, no dead vegetation, no combustible fencing attached to the home
Zone 1	5–30 ft	Reduced fuel load, spaced/maintained vegetation
Zone 2	30–100 ft (or to the property line)	Reduced fuel load, standard defensible space practices

Zone 0 specifics are still being finalized

Zone 0 doesn’t require bare dirt; hardscape (pavers, gravel, concrete), non-combustible fencing, and well-maintained fire-resistant plants are all allowed, the requirement is that materials within 5 feet of the structure be non-combustible or ember-resistant, not that the area be empty. As of this writing, some Zone 0 implementation details remain subject to state rulemaking; confirm current requirements with CAL FIRE or your local fire authority before treating any specific checklist as final.

Where to find it: CAL FIRE publishes the official defensible space guidance at fire.ca.gov/dspace.

Sources

- California Water Code §10574 and the Rainwater Capture Act of 2012: California Legislative Information
- California’s hybrid riparian/appropriative water rights system: Union of Concerned Scientists; El Dorado Irrigation District
- California concealed carry law post-*Bruen*, Penal Code §§26150–26155/§26202, SB 2 sensitive places litigation status: USCCA
- Public Resources Code §4291 and Zone 0 defensible space requirements: FindLaw; Ember Pro

California: Local Resources

Cal OES and Listos California

California's Governor's Office of Emergency Services (Cal OES) runs the state's preparedness campaign under the name Listos California, the direct analog to Be Ready Utah and Oregon's Be 2 Weeks Ready. It's specifically built to reach populations that generic preparedness campaigns often miss.

A specific focus most other states' campaigns don't emphasize

Listos California has invested more than \$100 million in community preparedness since 2019, delivered through a network of community-based organizations, Tribal governments, and CERT programs, with material specifically designed for low-income households, people with disabilities, language barriers, older adults, and residents of high-risk disaster areas, rather than a single one-size-fits-all campaign.

Where to find it: listoscalifornia.org publishes readiness guides in multiple languages alongside the standard English materials.

UC ANR Cooperative Extension: California's version of USU/OSU Extension

The University of California's Division of Agriculture and Natural Resources runs the same category of program Utah's USU Extension and Oregon's OSU Extension do, administered through county-level Cooperative Extension offices.

- **UC Master Gardener Program:** active in more than 52 California counties, requiring roughly 50+ hours of training in plant science, soils, irrigation, pest management, and related topics before volunteers begin community outreach, comparable in scope to Utah's and Oregon's Master Gardener programs.

Where to find it: ucanr.edu lists every county program; availability, cost, and schedule vary by county, the same pattern as Utah's and Oregon's Extension programs.

CERT: one of the largest programs in the country

Los Angeles alone runs one of the largest, most established CERT programs in the United States, and it's entirely free.

What LA's program actually looks like

The Los Angeles Fire Department's CERT program is free to anyone 18 or older, delivered as 17.5 hours of training over seven weekly sessions, covering fire safety, light search and rescue, team organization, and disaster medical operations, the standard FEMA-approved curriculum. Classes run continuously throughout the year across locations citywide. Los Angeles County runs its own parallel CERT network beyond the city limits through the County Fire Department and individual city partnerships.

Where to find it: within the city of Los Angeles, contact the LAFD CERT Unit directly at 213-202-3136 (lafd.org); for Los Angeles County outside city limits, see ready.lacounty.gov/cert. Other California counties and cities run their own independent programs; search “[your city] CERT training” if you're elsewhere in the state.

Sources

- Cal OES / Listos California preparedness campaign and funding: Listos California; Cal OES News
- UC ANR Master Gardener Program structure and county availability: UC ANR
- Los Angeles Fire Department CERT program details: LAFD
- Los Angeles County CERT network: Ready LA County

BY STATE › CALIFORNIA

California: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Earthquake probability: UCERF3 and the ShakeOut scenario

Metric	Figure	Source
30-yr chance of M6.7+, Los Angeles region	60%	USGS / UCERF3
30-yr chance of M6.7+, San Francisco Bay region	72%	USGS / UCERF3
30-yr chance of M7.0+, Los Angeles region	46%	USGS / UCERF3
30-yr chance of M7.0+, San Francisco Bay region	51%	USGS / UCERF3
ShakeOut planning scenario magnitude	M7.8, southern San Andreas	USGS
Projected deaths, ShakeOut scenario	~1,800	USGS
Projected injuries, ShakeOut scenario	~50,000	USGS
Projected economic losses, ShakeOut scenario	>\$200 billion	USGS

Why the LA and Bay Area numbers differ, and what 'UCERF3' actually covers

These percentages count every fault capable of producing that magnitude in each region, not just the San Andreas alone, which is why the Bay Area’s figure is higher despite the San Andreas itself running directly through Los Angeles’s broader region too: the Bay Area’s fault network (San Andreas, Hayward, Calaveras, and others) produces a higher combined probability across all sources considered together.

The January 2025 Southern California firestorm

Metric	Figure
Confirmed deaths, all fires combined	31
Separately estimated total mortality (direct + indirect, one epidemiological study)	~440
Total acres burned, all fires	~57,500
Structures destroyed or damaged, all fires	18,189+
Palisades Fire: deaths / acres / structures	12 / 23,448 / 7,854 destroyed or damaged
Eaton Fire: deaths / acres / structures	18 / 14,021 / 10,491 destroyed or damaged

The 31-versus-440 gap is not a data error

The 31 figure is the confirmed direct death toll, people who died from the fires themselves. The roughly 440 figure comes from a separate epidemiological study estimating total attributable mortality, deaths from smoke exposure, disrupted medical care, and other indirect effects layered on top of the direct toll, not a revision or correction of the confirmed count. Both numbers are real and both are useful, but they measure different things, and citing one without the other’s context risks a misleading impression either way.

Two things stand out from the fire-by-fire breakdown: the Eaton Fire killed more people despite burning fewer acres than the Palisades Fire, and the Palisades Fire, while smaller in structures lost than Eaton, is specifically the most destructive fire in the city of Los Angeles’s own history, a distinct record from the county- or state-wide totals.

What these two have in common

Both of California’s defining risks share a structural feature this manual’s own framing is built around: they’re not single, bounded events with a clear before-and-after, they’re standing conditions of living in the state’s major population centers. A magnitude 6.7+ earthquake in the Bay Area or LA region isn’t a remote possibility on a 500-year timescale, it’s a better-than-even chance within 30 years by the state’s own modeling; a wind-driven wildfire capable of the January 2025 event’s speed and scale isn’t confined to remote wildland, it reached deep into dense Los Angeles neighborhoods with hours of warning at most.

Sources

- UCERF3 earthquake probability figures: USGS
- USGS ShakeOut Scenario projections: shakeout.org
- January 2025 Southern California wildfires, confirmed and estimated death tolls, acreage, and structure loss, overall and by individual fire: Wikipedia, sourced to contemporary reporting

Colorado: Overview

Everything in the main manual and the skill guides applies in Colorado exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Colorado go deeper on laws, local resources, and the data behind the risks named here.

The Marshall Fire: a winter grassfire, not a summer forest fire

On December 30, 2021, a fast-moving grass fire driven by extreme winds tore through the suburban Boulder County communities of Louisville and Superior, destroying 1,084 structures, nearly all of them homes, and causing more than \$2 billion in damage in a matter of hours. It remains the most destructive wildfire in Colorado history by structures lost, and it happened in winter, with the fire feeding on dry grassland after an unusually wet spring followed by an extremely dry fall, not the deep summer forest fire most people associate with Western wildfire risk. See the Risks page for the full data.

Avalanches: a standing, leading risk, not a single event

Colorado has led the nation in avalanche deaths for decades, and by a wide margin: 287 fatalities between 1950 and 2023, nearly double second-place Alaska's total. This isn't a single disaster, it's an ongoing, structural risk driven by the sheer volume of backcountry recreation in Colorado's mountains combined with the state's notoriously unstable, thin continental snowpack.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Colorado: wildfire evacuation planning matters year-round in grassland and wildland-urban-interface areas, not just during the conventional summer fire season, and anyone who recreates in Colorado's backcountry during winter should treat avalanche safety training and equipment (a beacon, probe, and shovel, and the knowledge to use them) as essential gear, not optional.

Sources

- Marshall Fire deaths, structures destroyed, and damage: Wikipedia, sourced to Boulder County; Colorado Sun
- Colorado avalanche death statistics: Colorado Avalanche Information Center; SnowBrains

Colorado: Laws & Legal Considerations

Rainwater harvesting: legal only recently, and still restricted for some properties

Every other state covered on this site treats rainwater as essentially unclaimed until you catch it. Colorado is the exception: under strict prior appropriation, rainwater has historically been treated as already legally spoken for.

Rule	Colorado
Underlying legal theory	Under prior appropriation, rainwater is considered tributary water that senior water rights holders are already entitled to; collecting it could interfere with their allocation
Standard residential rain barrels	Legal since a 2016 law, for single-family homes or buildings with 4 or fewer units, collecting from a rooftop for outdoor, non-potable use
Rural properties on an exempt well	Rainwater harvesting is legal only with a Precipitation Collection System Permit from the Colorado Division of Water Resources, under a 2009 law (SB 09-080)
Larger or commercial systems	Generally require an augmentation plan or other water court approval to avoid interfering with senior water rights

Why Colorado is a genuine outlier among every state covered on this site

In every other state covered here, the question is simply whether a permit is needed, not whether the underlying activity is legal at all. Colorado rainwater harvesting was effectively illegal for ordinary residents until relatively recently, specifically because the state’s water law treats every drop as already allocated to someone. The 2016 rain barrel law and 2009 rural exempt-well law were targeted exceptions carved out of that default rule, not a general legalization.

Where to find it: the Colorado Division of Water Resources (dwr.colorado.gov) administers rainwater collection rules and permits.

Water rights: prior appropriation, the doctrine’s original home

Colorado is where the American prior appropriation doctrine was established in the 19th century, during the mining and agricultural booms, and its waterways are frequently over-appropriated today.

Concept	How it works in Colorado
Governing principle	"First in time, first in right": the oldest water right on a given source has priority over newer rights
Practical effect	Many Colorado waterways are already fully allocated among existing right holders, which is exactly why new uses, including rainwater collection, can require special legal accommodation

Where to find it: the Colorado Division of Water Resources administers water rights statewide; Colorado’s water courts adjudicate disputes and augmentation plans.

Concealed carry: training requirement increased in 2025

Colorado requires a Concealed Handgun Permit, and its training requirement recently increased.

Requirement	Detail
Standard	Shall-issue through the county Sheriff's office
Minimum age	21
Training required (since July 1, 2025)	8 hours, including a live-fire exercise and a written competency exam
Renewal	A 2-hour refresher course including 50 rounds of live fire and a written test

Sources

- Colorado rainwater harvesting law history and current rules: Blue Barrel Systems; Colorado Division of Water Resources
- Colorado prior appropriation doctrine: Colorado State Engineer’s Office
- Colorado concealed handgun permit training requirements: HB24-1174; Have Gun Will Train Colorado

[BY STATE](#) › COLORADO

Colorado: Local Resources

DHSEM and READYColorado

The Colorado Division of Homeland Security and Emergency Management runs public preparedness outreach through READYColorado, which started in 2004 as a Denver Urban Area Security Initiative project before moving under direct state management in 2011.

Where to find it: dhsem.colorado.gov/info-center/readycolorado.

CSU Extension: Colorado's version of the other states' land-grant Extension programs

Colorado State University Extension runs the same category of program as every other state covered on this site.

- **Colorado Master Gardener Program:** 60 hours of core training ("Green School," delivered online with live review sessions and in-person labs, November through March), requiring at least 80% class completion and a passing score of 70%+ on the final exam, then a minimum of 50 volunteer hours in the apprentice year (or 60 hours over a 2-year option) to certify, followed by 24 volunteer hours and 12 continuing-education hours annually.

Where to find it: extension.colostate.edu lists the program by county.

CERT: full training plus shorter alternative tracks

Colorado's CERT program, coordinated through DHSEM, offers something most other states covered on this site don't: shorter, more condensed alternatives for people who want some preparedness training without the full time commitment.

Colorado's tiered training options

Alongside full CERT training, Colorado offers “Be Ready” and “Take Part” programs, shorter, more condensed courses covering core preparedness skills for residents who can’t commit to the complete CERT curriculum.

Where to find it: dhsem.colorado.gov for statewide CERT coordination; search “[your county] CERT” for a local team.

Sources

- READYColorado history and campaign structure: DHSEM
- Colorado Master Gardener Program training and certification requirements: CSU Extension; Colorado Master Gardener Handbook
- Colorado CERT program structure, including Be Ready and Take Part tracks: Colorado Emergency Management

BY STATE › COLORADO

Colorado: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Marshall Fire (2021): Colorado’s most destructive wildfire on record

Metric	Figure
Date	December 30, 2021
Deaths	2
Burn injuries	8
Acres burned	6,026
Structures destroyed	1,084 (97% residential)
Structures destroyed by community	550 Louisville / 378 Superior / 156 unincorporated Boulder County
Damage	\$2 billion+
People evacuated	37,500+

Why this fire is a genuine outlier

The Marshall Fire happened in December, driven by hurricane-force winds following an unusually wet spring that grew heavy grass, then an extremely dry fall that cured it into fuel. It’s a fundamentally different mechanism from the deep-forest, summer wildfires covered elsewhere on this site, a fast-moving grass fire that reached suburban neighborhoods with almost no warning, driven by wind rather than drought-dried timber.

Avalanche deaths: a decades-long national lead

Metric	Figure
Colorado avalanche deaths, 1950-2023	287
National ranking	1st, nearly double 2nd-place Alaska
Colorado deaths, last 12 winter seasons	62 (from 54 fatal avalanches)
National average deaths per year, last 12 seasons	~22

Colorado’s lead isn’t just about how many people recreate in its backcountry, it’s also about the terrain itself: the state’s relatively thin, dry continental snowpack is notoriously unstable, and weather events can leave lingering instability for weeks, longer than the faster stabilization typical in other snow climates.

What these two have in common

The Marshall Fire and Colorado’s avalanche toll both demonstrate that Colorado’s mountain and grassland terrain carries year-round risk in different forms: wind-driven grass fire risk in the shoulder seasons and winter, and snowpack instability throughout the backcountry ski and recreation season. Neither risk fits neatly into the conventional “fire season” or “storm season” framing that applies in most other states covered on this site.

Sources

- Marshall Fire death toll, structures destroyed, and damage: Wikipedia, sourced to Boulder County; Colorado Sun
- Colorado avalanche death statistics: Colorado Avalanche Information Center; SnowBrains

Connecticut: Overview

Everything in the main manual and the skill guides applies in Connecticut exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Connecticut go deeper on laws, local resources, and the data behind the risks named here.

The 1938 Hurricane: catastrophic, and almost entirely unforecast

Before modern hurricane forecasting existed, a major hurricane struck southern New England on September 21, 1938, with almost no advance warning. It killed an estimated 564-682 people across the region, and the Connecticut River crested at 35.4 feet in Hartford, nearly 20 feet above flood stage. Property losses reached \$306 million in 1938 dollars, roughly \$4.7 billion today. See the Risks page for the full data.

Tropical Storm Isaias: the modern grid vulnerability

More than 80 years later, a far weaker storm exposed a different kind of vulnerability. Tropical Storm Isaias struck Connecticut on August 4, 2020, with winds around 70 mph, nowhere near hurricane strength, but still knocked out power to more than 757,700 customers at its peak, one of the largest outage events in the state's modern history. The comparison matters: Connecticut's power grid can be brought to its knees by a storm far weaker than the one that devastated the region in 1938.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Connecticut: households need real hurricane and coastal flood planning for the kind of storm the region can clearly still experience, and this manual's backup power guidance carries extra weight here specifically, Connecticut's grid has proven vulnerable to storms considerably weaker than a hurricane.

Sources

- 1938 Hurricane deaths, Connecticut River crest, and damage: Connecticut History (CTHumanities); NOAA Climate.gov
- Tropical Storm Isaias Connecticut outages and death: CT Public; NBC Connecticut

Connecticut: Laws & Legal Considerations

Rainwater harvesting: legal for outdoor and indoor non-potable use

Connecticut permits rainwater collection for both outdoor and indoor non-potable applications, with simple systems falling outside the building code entirely.

Rule	Connecticut
Source water	Rooftop or other catchment
Simple outdoor systems	A basic downspout-to-rain-barrel or cistern setup for outdoor use isn't covered by the Connecticut Building Code at all
Indoor non-potable use	Governed by Section 1303, Nonpotable Rainwater Collection and Distribution Systems
Permitted uses	Outdoor use and indoor non-potable use (not drinking)

Where to find it: Connecticut’s official watershed and stormwater management plan incorporates rainwater harvesting without requiring a separate water rights permit for typical systems.

Water rights: riparian and littoral doctrine combined

Connecticut recognizes both riparian rights (for landowners along rivers and streams) and littoral rights (for landowners along the coast), both grounded in reasonable use.

Concept	How it works in Connecticut
Riparian rights	Landowners along a river or stream may make reasonable use of the water touching their property
Littoral rights	Landowners along coastal waters have reasonable access rights specific to that coastal frontage
Larger alterations	No alteration of a watercourse or wetland is allowed without a DEEP permit

Where to find it: the Connecticut Department of Energy and Environmental Protection (DEEP) administers water rights and watercourse alteration permits.

Concealed carry: technically may-issue, functioning closer to shall-issue since 2022

Connecticut’s pistol permit system remains legally “may-issue,” but its practical operation changed meaningfully after the Supreme Court’s 2022 Bruen decision.

Requirement	Detail
Standard	Technically may-issue, but courts have required issuing authorities to apply objective, documented criteria rather than open-ended discretion since Bruen, functioning closer to shall-issue in practice
Minimum age	21
Process	A local permit from your town's police department or first selectman first, then a State Permit to Carry Pistols and Revolvers; roughly 8 weeks
Training required	A course meeting or exceeding the NRA Basic Pistol Course standard, including live-fire instruction (some basic NRA safety-only courses don't qualify)
Cost	\$70 for the state permit
Reciprocity	Connecticut does not recognize concealed carry permits issued by any other state

Where this sits relative to other states covered so far

Connecticut’s non-recognition of any other state’s permit matches New Jersey’s position, the most restrictive on that specific point covered on this site. Combined with the two-step local-then-state permit process and mandatory live-fire training, Connecticut’s overall system remains among the most demanding covered here, even though it no longer operates as a purely discretionary “proper cause” system the way it did before 2022.

Sources

- Connecticut rainwater harvesting rules: WTNH
- Connecticut riparian and littoral water rights: American Whitewater
- Connecticut pistol permit process and post-Bruen status: CT DESPP; Connecticut Gun Laws

[BY STATE](#) › CONNECTICUT

Connecticut: Local Resources

DEMHS and CT Prepares

The Connecticut Division of Emergency Management and Homeland Security runs the CT Prepares app, providing emergency alerts and preparedness information directly to residents.

Where to find it: portal.ct.gov/demhs.

UConn Extension: Connecticut's version of the other states' land-grant Extension programs

The University of Connecticut's Extension runs the same category of program as every other state covered on this site, with one of the more demanding training requirements seen so far.

A heavier classroom-hour commitment than most states

UConn's Master Gardener core training requires 96 hours of classroom instruction, second only to Washington's 120-hour program among the states covered on this site, followed by 60 hours of supervised volunteer service.

Where to find it: mastergardener.uconn.edu lists county Extension centers.

CERT: coordinated through DEMHS, with ongoing team education

Connecticut runs roughly 100 active Citizen Corps teams statewide (CERT, Medical Reserve Corps, and Fire Corps combined), representing about 4,250 active members, coordinated through DEMHS.

Ongoing training beyond the basic course

DEMHS runs “Connecticut CERT Connect” (CT3), a bi-monthly webinar series that gives already-certified CERT members continuing education on evolving preparedness topics, a form of ongoing team development not mentioned on every other state’s page.

Where to find it: portal.ct.gov/demhs; search “[your town] CERT” for a specific local team, such as Bethel’s.

Sources

- DEMHS and CT Prepares app: CT.gov DEMHS
- UConn Extension Master Gardener Program hours: UConn Extension
- Connecticut CERT program scale and CT3 webinar series: CT.gov DEMHS Citizen Corps

BY STATE › CONNECTICUT

Connecticut: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 1938 Hurricane: nearly unforecast, catastrophic

Metric	Figure
Southern New England deaths	564-682 (estimates vary by source; some accounts range as high as 800)
Injuries	1,700+
Homes/buildings destroyed	8,900
Homes/buildings damaged	15,000+ (more than 57,000 homes damaged or destroyed across the broader region)
Boats destroyed	2,600+
Connecticut River crest at Hartford	35.4 ft (19.4 ft above flood stage)
Power/telephone line miles downed	20,000
Damage (1938 dollars / 2024-adjusted)	\$306 million / ~\$4.7 billion

Why the death toll varies so much across sources

Because this storm predates modern hurricane forecasting and a coordinated national reporting system, contemporary and historical death-toll estimates vary meaningfully, from the low 500s to as high as 800 across the wider Southern New England region depending on the source and what geographic area is counted.

Tropical Storm Isaias (2020): a weak storm, a major grid failure

Metric	Figure
Landfall date	August 4, 2020
Peak winds	~70 mph
Peak power outages	757,700 customers
Connecticut deaths	1 (struck by a falling tree)
National ranking (informal)	One of the largest power outage events in Connecticut's modern history, alongside the October 2011 snowstorm, Hurricane Sandy, and Tropical Storm Irene

What these two have in common

The 1938 Hurricane and Tropical Storm Isaias, 82 years apart, demonstrate a consistent vulnerability: Connecticut’s infrastructure, first its coastal defenses and inland flood control, more recently its electrical grid, has repeatedly proven less resilient than storm severity alone would predict. A storm well short of hurricane strength still produced one of the state’s largest modern outage events, a useful data point for anyone assuming only a “real” hurricane poses genuine risk here.

Sources

- 1938 Hurricane deaths, damage, and Connecticut River crest: Connecticut History (CTHumanities); WeatherWorks
- Tropical Storm Isaias Connecticut outage and death data: CT Public; NBC Connecticut

Delaware: Overview

Everything in the main manual and the skill guides applies in Delaware exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Delaware go deeper on laws, local resources, and the data behind the risks named here.

The Ash Wednesday Storm of 1962: a storm that wouldn't leave

Between March 5 and 9, 1962, an unusually slow-moving nor'easter parked itself off the mid-Atlantic coast and refused to move on, flooding Delaware's coastline across five separate high tides over three days rather than the single tidal surge a typical storm produces. An estimated 6,000 people along the Delaware coast ended up in emergency shelters, and the storm killed 40 people across six affected states. See the Risks page for the full data.

Sea level rise: Delaware's coast at nearly twice the global rate

Delaware is uniquely exposed among the states covered on this site: low elevation, flat terrain, and ongoing land subsidence combine so that sea levels along its coast are rising at roughly twice the global average, and tidal flooding has already increased 260% since 2000. Current projections put the state on track to lose 11% of its total land mass to beach erosion at current rates, and some coastal properties already facing repeated tidal flooding are projected to see that risk expand significantly within the next decade. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Delaware: a slow-moving coastal storm can produce repeated flooding across several tide cycles rather than one surge, so this manual's flood-evacuation guidance should account for a multi-day event, not just a single high-water moment, and coastal Delaware households face one of the more severe standing sea-level-rise trajectories covered on this site, a genuine long-term planning consideration beyond any single storm.

Sources

- Ash Wednesday Storm of 1962 data: Wikipedia; National Park Service

- Delaware sea level rise and erosion data: Sea Level Rise; Delaware DNREC

Delaware: Laws & Legal Considerations

Rainwater harvesting: legal, sponsored, and formally recognized as stormwater management

Delaware treats rainwater harvesting as a genuine stormwater management tool, not just a permitted hobby.

Rule	Delaware
Source water	Rooftop or other catchment
Permit required	No water rights permit needed
Governing standards	Delaware Administrative Code Title 7 §5101-11.0 (Post Construction BMP Standards) and the 2018 State Plumbing Code (referencing 2015 IPC §1303)
State posture	Sponsors incentive programs encouraging rainwater harvesting as sustainable stormwater management

Where to find it: the Delaware Department of Natural Resources and Environmental Control (dnrec.delaware.gov).

Water rights: riparian rights blended with natural-flow doctrine

Delaware’s water law combines ordinary riparian rights with the natural-flow doctrine, shaped by centuries of accumulated water law plus more recent coastal-protection legislation and a federal interstate program managing the Delaware River.

Concept	How it works in Delaware
Basic rule	Riparian use must be reasonable, judged by comparing the proposed use against other riparian landowners' uses and any interference with downstream users
Interstate layer	The Delaware River is separately managed under a federal interstate compact given the river's shared multi-state significance

Where to find it: the Delaware Department of Natural Resources and Environmental Control administers state water regulation.

Concealed carry: a court-issued, may-issue license

Delaware requires a Concealed Deadly Weapon License (CDWL), issued by the Superior Court on a may-issue basis, though in practice most qualified applicants are approved.

Requirement	Detail
Standard	May-issue CDWL, issued by the Superior Court
Public notice requirement	Applicants must publish intent to apply in a local newspaper at least 10 days before filing
Other requirements	Firearm training course, five references, and a background check
License validity	3 years initial, 5 years on renewal
2026 status	No permitless-carry legislation has been enacted

A public-notice step unlike any other state covered here

Delaware’s requirement to publish intent to apply for a carry license in a local newspaper before filing is a genuinely distinctive procedural step, not seen on any other state’s page on this site. It doesn’t change the underlying approval odds for qualified applicants, but it is a real, publicly visible part of the process.

Sources

- Delaware rainwater harvesting rules and stormwater standards: NTO Tank
- Delaware riparian and natural-flow water law: SSRN, James R. May
- Delaware CDWL requirements: Delaware Department of Justice; Alien Gear Holsters

Delaware: Local Resources

Delaware Emergency Management Agency (DEMA)

DEMA is the lead state agency coordinating emergency preparedness, training, response, recovery, and mitigation to protect lives and Delaware's economic base.

Where to find it: dema.delaware.gov.

University of Delaware/Delaware State University: Master Gardener Program

Delaware's Master Gardener program is a genuine cross-institution partnership, jointly run through both of the state's land-grant universities rather than a single school's Extension arm.

- **Delaware Master Gardener Program:** training delivered by Cooperative Extension Specialists and Agents from both the University of Delaware and Delaware State University, plus green-industry experts and experienced Master Gardeners, covering plant ID, soils, integrated pest management, and program design.

Where to find it: udel.edu/canr/cooperative-extension/master-gardeners.

CERT: relaunched statewide in September 2025

DEMA relaunched its free Community Emergency Response Team initiative in September 2025, timed to National Preparedness Month. Participants receive classroom instruction in preparedness and disaster response plus hands-on activities and simulations, preparing them to provide basic support in the critical window before first responders arrive.

A recently relaunched program

Because Delaware's CERT initiative was specifically relaunched in September 2025, availability and specific class schedules may still be expanding. Check DEMA's current training page for the latest session offerings rather than assuming a long-established, stable schedule.

Where to find it: dema.delaware.gov/preparedness/training.

Sources

- DEMA structure and mission: Delaware Emergency Management Agency
- Delaware CERT relaunch, September 2025: State of Delaware News
- Delaware Master Gardener Program structure: University of Delaware

BY STATE › DELAWARE

Delaware: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Ash Wednesday Storm of 1962

Metric	Figure
Dates	March 5-9, 1962
Duration parked off coast	3 days, across 5 separate high tides
Deaths (6-state total)	40
Injuries (6-state total)	1,000+
Delaware residents sheltered	~6,000, per contemporary newspaper estimate
Damage (6-state total)	Hundreds of millions of dollars (1962 dollars)

Why five high tides mattered more than one big surge

A typical coastal storm floods an area once and recedes. The Ash Wednesday Storm’s defining feature was that it barely moved for three days, so the same coastal areas flooded again and again across five separate high-tide cycles, compounding damage that a single surge, even a larger one, might not have caused.

Sea level rise: a standing risk projected to reshape the coastline

Metric	Figure
Current rate vs. global average	~2x the global average rate of sea level rise
Rise over the past century	Up to 15 in, per tide gauge records
Increase in tidal flooding since 2000	260%
Mid-century projection	1-1.5 additional feet of sea level rise
2100 projection (high-emissions scenario)	4-6 additional feet
Projected land mass loss to erosion	~11% of the state's total land, at current erosion rates of 3+ ft/year
At-risk properties, Bethany Beach	676 today, projected 814 by 2033
At-risk properties, South Bethany	534 today, projected 855 within 15 years

One of the most severe standing coastal risks on the site

Every coastal state covered on this site faces some degree of sea level rise, but Delaware’s combination of low elevation, flat terrain, and active land subsidence makes its rate of change, roughly double the global average, and its projected land loss among the most severe documented here. This isn’t a single event with a date attached; it’s a compounding, ongoing condition that raises the baseline risk for every future coastal storm.

Sources

- Ash Wednesday Storm of 1962 data: Wikipedia; National Park Service
- Delaware sea level rise and erosion projections: Sea Level Rise; Delaware DNREC; Climate Central

Florida: Overview

Everything in the main manual and the skill guides applies in Florida exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Florida go deeper on laws, local resources, and the data behind the risks named here.

The most hurricane-exposed state in the country

Of the 292 hurricanes that have made landfall in the United States since 1851, roughly 120, more than 41%, have hit Florida, more than double the next closest state. Hurricane Ian, which struck southwest Florida in September 2022, is the reference case for this manual: a Category 4 landfall whose storm surge, not its wind, caused the large majority of direct deaths, and whose \$112 billion damage total made it the costliest hurricane in Florida history. See the Risks page for the full data, including why different sources report meaningfully different death tolls for the same storm.

A slower-moving risk: sea level rise along a coastline most Floridians live on

Sea level around Miami has risen roughly 6 inches over the 1985-2016 period and is projected by the U.S. Army Corps of Engineers' high scenario to rise another 6 inches in half that time, by the early 2040s. NOAA's own national projection puts 10-12 inches of coastal sea level rise by 2050. Unlike a hurricane, this isn't a single event with a before-and-after; it's a standing condition that raises the baseline for every future storm surge and high-tide flood on top of it, and it affects the state's most densely populated coastal counties continuously, not episodically.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Florida: hurricane season planning, an evacuation plan, a way to secure the home, a plan for extended power loss, needs to be a standing part of Tier 1-2 preparation for essentially the entire state, not a regional concern, and households in low-lying coastal areas should treat storm surge risk as distinct from, and often more dangerous than, wind risk when deciding whether to evacuate.

Sources

- Florida's share of U.S. hurricane landfalls since 1851: Universal Property
- Hurricane Ian death toll and damage figures: Wikipedia, sourced to NHC and Florida Medical Examiners Commission
- Miami-area sea level rise history and projection: Southeast Florida Regional Climate Compact
- NOAA national coastal sea level rise projection through 2050: NOAA Sea Level Rise and Coastal Flooding Impacts

Florida: Laws & Legal Considerations

Rainwater harvesting: no state permit for typical residential use

Florida law doesn’t broadly restrict collecting rainwater on your own property, and the state actively frames it as a way to reduce demand on municipal supply.

Rule	Florida
Source water	Rooftop or other on-property catchment
Permit required	No, for typical residential barrels/cisterns
Permitted uses	Non-potable: irrigation, vehicle washing, toilet flushing, pool filling
Underlying statutes	Florida Statutes §373 (water resources) and §373.62 (rainwater/graywater use)

Local rules can be stricter than the state's

Counties and municipalities can and do add their own requirements on top of the state baseline, covering things like roof material, drainage impact, and system size. Miami-Dade County, for example, requires a site plan review for any system holding more than 1,000 gallons. Check your specific county or city before installing anything beyond a basic rain barrel.

Where to find it: the Florida Department of Environmental Protection (floridadep.gov) administers state water law; your county’s building or environmental resources department handles local permitting questions.

Water rights: purely riparian, unlike Utah, Oregon, or Texas

Utah, Oregon, and Texas’s surface water all run on some form of prior appropriation (“first in time, first in right”). Florida doesn’t use that system at all for its lakes, rivers, and streams; it uses riparian rights instead, a fundamentally different logic tied to owning land that touches the water, not to who claimed it first.

Concept	How it works in Florida
Who holds the right	Owners of land bordering a natural watercourse (a lake, river, or stream)
Governing principle	"Reasonable use": each riparian owner may use a reasonable share of the water, without unreasonably interfering with other riparian owners' same right
How rights transfer	Appurtenant to the land itself; they transfer automatically with the property, not held or lost independently
State's role	Holds title to submerged sovereign lands in trust for the public; riparian rights are qualified by this public trust doctrine, not absolute

Why this is a genuinely different system, not just different terminology

Under prior appropriation, a senior water right holder can, in a real shortage, take their full allotment before a junior right holder gets any water at all, regardless of whether the junior holder also borders the water source. Under Florida’s riparian system, every riparian landowner on a shared water body is entitled to a reasonable share simultaneously; there’s no seniority ranking among them. This is a structurally different way of allocating scarce water, not a regional variation on the same idea.

Where to find it: the Florida Water Resources Act (Chapter 373, Florida Statutes) and Florida’s five Water Management Districts administer permitting for larger consumptive uses beyond ordinary riparian rights; see floridadep.gov/water for district contacts.

Permitless carry since 2023, in the country’s most populous permitless-carry state

Florida joined the permitless carry group in 2023, becoming, alongside Texas, one of the two states covered here where most adults can carry a concealed handgun without a license at all.

Requirement	Detail
Standard	Permitless concealed carry for handguns since July 2023 (HB 543); the state-issued Concealed Weapon License (CWL) remains available and is administered by the Department of Agriculture and Consumer Services
Minimum age, permitless carry	21, with exceptions for active-duty military and honorably discharged veterans
Minimum age, CWL	18, following a 2026 state appellate ruling (Eubanks v. Florida) striking down the prior 21-and-over requirement specifically for the licensed pathway
Disqualifiers	Felony conviction; certain violent misdemeanor convictions within the past 3 years; chronic substance abuse or involuntary mental health commitment history

Why the CWL still matters even though it's no longer required

A Florida CWL provides reciprocity in states that don’t recognize Florida’s permitless carry but do recognize its license, skips the federal firearm-purchase waiting period, and serves as a form of ID. It’s optional for carrying within Florida itself, but far from redundant for anyone who travels.

Sources

- Florida rainwater harvesting rules and Miami-Dade local threshold: LegalClarity; Florida Statutes §373.62
- Florida riparian water rights and the reasonable use doctrine: Barnes Walker; State Regs Today
- Florida permitless carry (HB 543, 2023) and CWL eligibility: FDACS; Eubanks v. Florida ruling on 18-20 year old CWL applicants: Protect With Bear

Florida: Local Resources

FDEM: two dedicated preparedness campaigns a year

The Florida Division of Emergency Management runs public outreach at two fixed points on the calendar: Florida Hurricane Preparedness Week (the first full week of May, ahead of hurricane season) and Florida Preparedness Month (September, the traditional peak of hurricane activity). Both center on the same three-part framework.

FDEM's own three-part framework

Know Your Risk (understand your specific hazards, including whether your address sits in a storm surge evacuation zone), Make a Plan (a household-specific plan accounting for children, pets, and seniors), and Build a Kit (enough non-perishable food, water, medicine, and supplies for at least 7 days per person, longer than the 3-day minimum some other states' campaigns cite).

Where to find it: floridadisaster.org is FDEM's central hub, including an address-lookup tool for evacuation zones.

UF/IFAS Extension: Florida's version of USU/OSU/UC ANR/Texas A&M AgriLife Extension

The University of Florida's Institute of Food and Agricultural Sciences runs the same category of program as every other state's land-grant Extension service covered on this site, delivered through county Extension offices statewide.

- **Florida Master Gardener Program:** requires 50+ hours of initial training (exact hours vary by county) followed by a University of Florida/IFAS exam, then 75 volunteer hours and 10 continuing-education hours in the first year to earn full certification, a heavier ongoing commitment than some other states' Master Gardener programs.

Where to find it: sfyl.ifas.ufl.edu lists the Master Gardener program by county; contact your local UF/IFAS Extension office directly for the current schedule and cost.

CERT: county-based, with active statewide coordination

Florida's CERT programs originate at the county level, the same decentralized structure as Texas's, but with more active statewide coordination layered on top: Volunteer Florida administers CERT funding in partnership with FEMA and FDEM, and the Florida CERT Association runs an annual statewide conference connecting individual county teams.

What this means in practice

Some counties run more than one CERT program. Rather than one single statewide entry point, start with Volunteer Florida's CERT page, which is built specifically to route you to the right local program, or search "[your county] CERT" directly if you already know your county.

Where to find it: volunteerflorida.org/cert; the Florida CERT Association at flacertassociation.org lists member teams statewide.

Sources

- FDEM Hurricane Preparedness Week and Florida Preparedness Month campaigns: Florida Disaster
- UF/IFAS Florida Master Gardener Program requirements: UF/IFAS; Seminole County Extension
- Florida CERT program structure and statewide coordination: Volunteer Florida; Florida CERT Association

BY STATE › FLORIDA

Florida: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Ian (2022): the costliest hurricane in Florida history

Metric	Figure	Source
NHC-classified direct deaths, all U.S. (all in Florida)	66	NHC tropical cyclone report
Direct deaths from storm surge specifically	41 (36 in Lee County alone)	NHC tropical cyclone report
Florida Medical Examiners Commission total attributed deaths	149	FL Medical Examiners Commission, Feb. 2023
Total damage (NOAA estimate)	\$112 billion	NOAA
Florida-specific damage	\$109.5 billion	NOAA
Landfall strength	Category 4, 150 mph sustained winds, Cayo Costa Island	NHC
Storm surge height	10-15 ft	NHC

Why '66' and '149' are both correct, and neither is wrong

The NHC’s official tropical cyclone report uses a strict meteorological classification for “direct” deaths, ones caused by the storm’s physical forces themselves (surge, wind, freshwater flooding), which puts the U.S. total at 66, all in Florida. The Florida Medical Examiners Commission’s count of 149 uses a broader “attributed to the hurricane” standard that includes indirect deaths in the storm’s aftermath, lack of medical care, carbon monoxide poisoning from generators, and similar causes. Both counts come from credible official sources; they answer different questions rather than disagreeing about the same one. A small number of additional deaths (Cuba, North Carolina, Virginia) bring some all-location totals as high as 161.

Storm surge, not wind, did the most damage to human life: two-thirds of the NHC’s direct death count came from surge alone, concentrated overwhelmingly in Lee County, which sat directly in Ian’s path when it made landfall as a Category 4.

The slower-moving risk underneath: sea level rise

Metric	Figure	Source
Miami-area sea level rise, 1985-2016	~6 in	Southeast Florida Regional Climate Compact
Projected additional rise, Miami area, by early 2040s	~6 in more (U.S. Army Corps high scenario)	Southeast Florida Regional Climate Compact
NOAA national coastal sea level rise projection through 2050	10-12 in	NOAA

Unlike Hurricane Ian, sea level rise doesn’t produce a single dramatic event with a clear before-and-after. Its effect is cumulative: every future storm surge and every routine high tide starts from a higher baseline than the one before it, which is why South Florida’s high-tide “sunny day” flooding has become measurably more frequent even in years without a major hurricane.

What these have in common

Florida’s two defining risks operate on completely different timescales but reinforce each other: a higher sea level baseline means a hurricane of Ian’s exact strength would push storm surge further inland and to a greater height

today than it did in 2022, and the gap will keep widening as the underlying sea level keeps rising, regardless of any single storm's track.

Sources

- Hurricane Ian NHC-classified direct death toll and storm surge data: NHC tropical cyclone report, via WUSF
- Hurricane Ian broader death toll and damage figures: Wikipedia, sourced to Florida Medical Examiners Commission and NOAA
- Southeast Florida sea level rise history and projection: Southeast Florida Regional Climate Compact
- NOAA national coastal sea level rise projection: NOAA Sea Level Rise and Coastal Flooding Impacts

Georgia: Overview

Everything in the main manual and the skill guides applies in Georgia exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Georgia go deeper on laws, local resources, and the data behind the risks named here.

Tornado risk that reaches into the city, not just rural counties

Georgia sits at the edge of the Southeast's tornado risk zone, and unlike the more rural devastation typical of Midwest tornado outbreaks, Georgia has seen a tornado strike directly through the heart of a major downtown. On March 14, 2008, an EF2 tornado tore through downtown Atlanta itself, damaging the CNN Center and the Georgia Dome, the 13th costliest tornado in U.S. history. Three years later, the April 27, 2011 Ringgold-Apison tornado, part of the largest tornado outbreak ever recorded, killed 24 people in Georgia, the deadliest single tornado to hit the state during that outbreak. See the Risks page for the full data on both.

Water supply: a slower crisis with a legal fight attached

Georgia's other defining risk isn't a single dramatic event, it's water scarcity, made worse by the fact that Atlanta's main water source, Lake Lanier, is shared across state lines. Georgia, Alabama, and Florida spent more than three decades in litigation, the "Tri-State Water Wars," over how much water Georgia's reservoirs can hold back from downstream states. During the severe 2007 drought, Lake Lanier fell to its lowest level since the lake was built in the 1950s, and the Atlanta area came within roughly 35 days of exhausting its water supply. See the Laws page for the interstate legal dispute and the Risks page for the drought data itself.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Georgia: tornado preparedness (a safe room, a weather radio, a practiced shelter plan) matters even in dense urban areas, not just rural ones, and this manual's water storage and conservation guidance carries extra weight here, Georgia has already come close to a genuine regional water emergency once, and the underlying interstate dispute over the water supply hasn't been permanently resolved.

Sources

- 2008 Atlanta tornado damage and ranking: Wikipedia, sourced to NWS
- 2011 Ringgold-Apison tornado deaths and damage: Wikipedia, sourced to NWS
- Tri-State Water Wars background: Atlanta Regional Commission; Southern Environmental Law Center
- 2007-2008 Georgia drought and Lake Lanier levels: Circle of Blue

Georgia: Laws & Legal Considerations

Rainwater harvesting: legal with specific codified technical standards

Georgia liberalized its rainwater harvesting rules substantially under the 2010 Georgia Rainwater Harvesting Act, and unlike most states covered on this site, the technical requirements for a system are written directly into the state plumbing code.

Rule	Georgia
Source water	Rooftop catchment
Permit required	No, for typical residential barrels/cisterns; larger systems require a permit
Permitted uses	Non-potable outdoor uses: irrigation, and per the plumbing code, fire protection; drinking water is not permitted
Reservoir standard	Must be an approved, closed vessel built from durable, nonabsorbent, corrosion-resistant material
Filtration	Water must pass through an approved filter system before distribution
Underlying statute	Georgia Rainwater Harvesting Act (2010), codified in the Georgia State Minimum Standard Plumbing Code

Where to find it: the University of Georgia Cooperative Extension (extension.uga.edu) publishes homeowner guidance; check with your county for any additional local ordinances.

Water rights: ordinary riparian rules, overshadowed by a genuine interstate war

Within Georgia, water rights follow the same general riparian reasonable-use framework common across the Southeast. But the legal story that actually matters for anyone relying on metro Atlanta’s water supply isn’t intrastate riparian law, it’s a three-decade interstate legal fight.

The Tri-State Water Wars, briefly

Since 1990, Georgia, Alabama, and Florida have litigated how much water Georgia can hold back in Lake Lanier and other reservoirs on the Apalachicola-Chattahoochee-Flint and Alabama-Coosa-Tallapoosa river systems, water Atlanta depends on for drinking supply, versus how much must flow downstream for Alabama’s and Florida’s own water needs, including endangered species protections in Florida’s Apalachicola Bay. As of recent rulings, litigation between the states in the ACF basin has paused for the first time since 1989, though related appeals remain active. This is not a settled, permanent resolution; the underlying tension between Atlanta’s growing water demand and downstream states’ needs hasn’t gone away.

Where to find it: the Georgia Environmental Protection Division (epd.georgia.gov) administers state water permitting; the Atlanta Regional Commission (atlantaregional.org) tracks the interstate dispute’s current status.

Permitless carry since 2022

Georgia is the fifth permitless-carry state covered on this site, joining Utah, Texas, Florida, and Ohio.

Requirement	Detail
Standard	Permitless ("constitutional") carry, concealed or open, since April 12, 2022 (Senate Bill 319)
Minimum age	21
Disqualifiers	Any state or federal bar on firearm possession
Optional Georgia Weapons Carry License	Still available and useful for reciprocity in states that require a permit from Georgia residents

Permitless doesn't mean unrestricted

Dropping the license requirement didn’t remove location restrictions. Carrying in a legally banned location, schools and certain government buildings among them, remains a criminal offense regardless of whether the carrier has a license.

Sources

- Georgia rainwater harvesting rules and technical standards: Georgia Water Tanks; Georgia Plumbing Code, Chapter 15
- Tri-State Water Wars background and current litigation status: Atlanta Regional Commission; Southern Environmental Law Center
- Georgia permitless carry (SB 319, 2022): Georgia Criminal Defense; Protect With Bear

Georgia: Local Resources

GEMA/HS and Ready Georgia

The Georgia Emergency Management and Homeland Security Agency runs public preparedness outreach through the Ready Georgia campaign, covering the standard core steps, an emergency plan, a supply kit, and staying informed, alongside year-round emergency management training for professionals and volunteers.

Where to find it: gema.georgia.gov/plan-prepare/ready-georgia.

UGA Cooperative Extension: Georgia's version of the other states' land-grant Extension programs

The University of Georgia Cooperative Extension runs the same category of program as every other state covered on this site, through county-based offices statewide.

- **Georgia Master Gardener Extension Volunteer Program:** requires a minimum of 50 hours of core horticultural and risk-management training, followed by 50 hours of volunteer service within the first year to earn certification, then 10 continuing-education hours annually to maintain it.

Where to find it: extension.uga.edu lists the program by county.

CERT: Atlanta's own program plus independent county chapters

Atlanta runs its own city-specific CERT program, the Atlanta Community Emergency Response Team (ACERT), through Atlanta Fire Rescue, alongside independent chapters in surrounding metro counties.

What's available where

ACERT's Basic Training is a free 7-week course open to City of Atlanta community members, covering the standard FEMA curriculum. Outside the city, Fulton, Cobb, and Henry counties, among others, run their own separate CERT chapters through their local emergency management offices, a similar decentralized-with-a-flagship-city pattern to the one seen in a few other states covered on this site.

Where to find it: within Atlanta, Atlanta Fire Rescue. Elsewhere in metro Atlanta or the rest of the state, search “[your county] CERT” or check with your county’s emergency management office.

Sources

- GEMA/HS Ready Georgia campaign: GEMA/HS
- UGA Master Gardener Extension Volunteer Program requirements: UGA Extension
- Atlanta and metro-area CERT program structure: Atlanta Fire Rescue; Fulton County

BY STATE › GEORGIA

Georgia: Risks & Trends

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The 2008 Atlanta tornado: a rare direct hit on a major downtown

Metric	Figure
Peak rating	EF2
Deaths, full March 14-15, 2008 outbreak	3 (1 in Atlanta)
Injuries, full outbreak	53
Damage, Atlanta tornado alone	~\$500 million
National ranking	13th costliest tornado in U.S. history
Notable structures damaged	CNN Center, Georgia Dome

Most damaging tornadoes strike rural or suburban terrain; this one tracked directly through downtown Atlanta’s dense high-rise core, a genuinely unusual event that demonstrated urban tornado risk isn’t purely theoretical.

The 2011 Ringgold-Apison tornado: the deadliest of the largest outbreak on record

Metric	Figure
Peak rating	EF4
Georgia deaths	24 (including 1 indirect)
Ringgold deaths alone	9
Injuries	335
Economic losses (2024 dollars)	\$88 million+

Part of the largest tornado outbreak ever recorded

This tornado struck on April 27, 2011, during the April 14-16 and 25-28, 2011 tornado outbreak sequence, the largest tornado outbreak in recorded history across the southeastern and midwestern U.S. It was the single deadliest tornado to hit Georgia during that sequence.

The 2007-2008 drought: Atlanta approaches “Day Zero”

Metric	Figure
2007 drought severity ranking	Second driest year on record for the region
Share of the region in "exceptional" drought by year end	1/3+
Lake Lanier water level drop	~20 ft below normal, lowest since the lake's construction in the 1950s
Estimated water supply remaining at worst point	~35 days
Counties under Drought Level 4 (total outdoor watering ban)	64
Mandatory reduction ordered from winter-use baseline	10%

Unlike the two tornadoes above, this wasn't a single dramatic event with a clear before-and-after, it was a slow-building supply crisis that took months to reach its worst point and became the direct trigger for the interstate legal fight covered on the Laws page. Georgia has had 13 long-term severe droughts over the past 325 years, with droughts lasting three or more years occurring roughly once every 40 years on average, making this a recurring risk rather than a one-time event.

What these have in common

Georgia's tornado risk and its water supply risk operate on completely different timescales, minutes of warning for a tornado, months of accumulating deficit for a drought, but both demonstrate the same practical point: a risk doesn't need to be exotic to be serious. Ordinary severe weather and ordinary water-supply management, stressed hard enough, both produced genuine crises here within the last two decades.

Sources

- 2008 Atlanta tornado damage and ranking: Wikipedia, sourced to NWS; 2008 Atlanta tornado outbreak
- 2011 Ringgold-Apison tornado deaths, injuries, and damage: Wikipedia, sourced to NWS
- 2007-2008 Georgia drought and Lake Lanier water level data: Circle of Blue; Georgia drought history

Hawaii: Overview

Everything in the main manual and the skill guides applies in Hawaii exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Hawaii go deeper on laws, local resources, and the data behind the risks named here.

The 2023 Lahaina wildfire: the deadliest U.S. wildfire in over a century

On August 8, 2023, wind-driven fires fueled by dry invasive grasses tore through the historic town of Lahaina on Maui, killing at least 100-102 people and destroying more than 2,200 structures, roughly 81% of the town. It became the deadliest U.S. wildfire in more than 100 years and Hawaii's second-costliest disaster on record, behind only Hurricane Iniki in 1992. Unlike California and Oregon's forest-fire case studies, Lahaina's fire moved through a dense historic town built largely of wood, with limited evacuation routes, a combination that turned a fast-moving grass fire into a mass-casualty event. See the Risks page for the full data.

The 2018 Kilauea eruption: a hazard type new to this site

Beginning May 3, 2018, Kilauea's lower East Rift Zone erupted for months, sending lava flows across the Puna District that destroyed 723 structures, cut 50 kilometers of public roads, and forced roughly 3,000 residents to evacuate. This is the first volcanic hazard covered anywhere on this site, and it behaves differently from every other disaster type covered here: lava flows are slow enough that death tolls are typically low, but they permanently and irreversibly destroy everything in their path, land included, in a way a flood or fire's damaged structures can still be rebuilt on. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Hawaii: evacuation planning matters even more than usual given how few routes exist off many parts of the islands, as Lahaina's fire demonstrated tragically, and residents on the Big Island near active rift zones face a genuinely different kind of long-term risk, permanent land loss, that this manual's disaster-recovery guidance doesn't fully address since most other hazards covered leave the underlying land intact.

Sources

- 2023 Lahaina wildfire data: Britannica; CNN
- 2018 Kilauea lower Puna eruption data: Wikipedia; USGS

BY STATE › HAWAII

Hawaii: Laws & Legal Considerations

Rainwater catchment: unrestricted, and a primary water source for tens of thousands

Hawaii doesn’t just permit rainwater catchment, it’s a genuinely mainstream primary water source on the islands, not a supplemental backup.

Rule	Hawaii
Source water	Rooftop catchment
Permit required for small systems	No, for exterior systems used for outdoor irrigation up to 360 gallons storage
Larger/domestic systems	Owned and operated by the homeowner; not regulated by the Department of Health or any other agency
Scale of use	An estimated 30,000-60,000 residents statewide rely on rain catchment for their water needs (2016-2020 estimates)

Where to find it: the Hawaii Department of Health Safe Drinking Water Branch (health.hawaii.gov/sdwb/raincatchment) publishes safety guidance for domestic catchment systems.

A live 2026 legislative push

HB1728 HD1, active as of 2026, would require all Hawaii counties to allow rainwater catchment installation statewide, closing gaps in current county-by-county zoning that still restrict it in some areas. This is a pending bill, not enacted law; confirm current status if reading this later.

Concealed carry: shall-issue only since 2022, after decades as effectively no-issue

Hawaii’s transition to shall-issue concealed carry is one of the most dramatic legal shifts covered on this site.

Requirement	Detail
Pre-2022 status	Nominally 'may-issue' but functioned in practice as effectively no-issue for decades
2022 change	The Supreme Court's Bruen decision (June 2022) forced Hawaii to become genuinely shall-issue: the issuing authority must grant a permit if the applicant meets all legal requirements
Issuing authority	County Chief of Police
Firearm acquisition (separate from carry)	Minimum age 21, a permit-to-acquire required for each purchase, fingerprinting and background check, plus a 14-day waiting period
2026 development	A Supreme Court ruling (Wolford v. Lopez) held that a permit holder may carry onto publicly accessible private property unless the owner affirmatively posts a 'no firearms' sign or tells the carrier to leave

The most dramatic legal shift on the site

No other state covered here went from a decades-long, effectively no-issue system to shall-issue this abruptly. Hawaii’s carry law today looks nothing like it did before 2022, which is worth keeping in mind since older sources describing Hawaii’s gun laws may no longer reflect the current, post-Bruen legal reality.

Sources

- Hawaii rainwater catchment rules and usage scale: Hawaii Department of Health; Grassroot Institute of Hawaii
- Hawaii’s shift to shall-issue concealed carry post-Bruen: USCCA
- Wolford v. Lopez (2026) and carry on private property: Wikipedia; Hawaii News Now

[BY STATE](#) › [HAWAII](#)

Hawaii: Local Resources

Hawaii Emergency Management Agency (HI-EMA)

HI-EMA, headquartered inside Diamond Head Crater, serves as the coordinating agency across Hawaii's four county emergency management agencies and as the state's official Warning Point, managing the full disaster lifecycle from mitigation through recovery.

Where to find it: dod.hawaii.gov/hiema.

University of Hawaii: Master Gardener Program

University of Hawaii Cooperative Extension Service runs the same category of program as every other state covered on this site, active since 1982.

- **University of Hawaii Master Gardener Program:** nationally recognized certification training in horticultural education and sustainable practices, run by University Educators, Specialists, and Researchers, with volunteers extending outreach efforts to the general public and community groups.

Where to find it: ctahr.hawaii.edu/uhtm lists island-specific chapters.

CERT: county-run, with Honolulu's program the largest

CERT training in Hawaii runs through each county's own emergency management department. Honolulu's Department of Emergency Management offers free CERT classes across multiple required sessions to reach full certification, the largest program among the four counties given Oahu's population.

Four counties, four separate programs

Unlike a single statewide CERT curriculum, Hawaii's CERT training is organized independently by each of its four county emergency management departments (Honolulu, Maui, Hawaii, and Kauai counties). Residents should check with their own county's department for the current schedule and requirements.

Where to find it: dod.hawaii.gov/hiema/emergency-response-training-sign-up lists current training opportunities statewide.

Sources

- HI-EMA structure and mission: Hawaii Emergency Management Agency
- University of Hawaii Master Gardener Program history: University of Hawaii CTAHR
- Hawaii county CERT programs: Hawaii Emergency Management Agency

BY STATE › HAWAII

Hawaii: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 2023 Lahaina wildfire

Metric	Figure
Date ignited	August 8, 2023
Deaths	100-102 (sources vary slightly as the final count was confirmed)
Structures destroyed	2,200+, roughly 81% of Lahaina
Total damage	\$5.5 billion
Insured losses	\$3.4 billion
Historical ranking	Deadliest U.S. wildfire in over a century; Hawaii's second-costliest disaster on record after Hurricane Iniki (1992)

Why this fire was so much deadlier than a comparable mainland wildfire

Lahaina’s fire moved through a dense historic town, much of it wood-frame construction, with a limited number of roads out and high winds from a passing hurricane offshore accelerating the spread. California and Oregon’s wildfire case studies on this site mostly describe fires moving through forested or suburban terrain with more evacuation options; Lahaina’s combination of density, construction materials, and route scarcity is a materially different risk profile.

The 2018 Kilauea lower Puna eruption

Metric	Figure
Eruption start	May 3, 2018
Land inundated	32.4 sq km in the Puna District
Structures destroyed	723
Roads cut	50 km of public roads, including two major highways
Residents evacuated	~3,000
Injuries	24
Property damage	~\$800 million (2018 USD)
Notable infrastructure loss	Puna Geothermal Venture, ~25% of the Big Island's electricity supply, shut down and later damaged by lava

A hazard that doesn't behave like the others on this site

Lava flows move slowly enough that Kilauea’s 2018 eruption caused zero direct deaths despite destroying hundreds of homes, but the land itself, not just the structures on it, is often permanently lost or buried. Every other disaster covered on this site leaves land that can eventually be rebuilt on; volcanic hazard is the exception.

Sources

- 2023 Lahaina wildfire data: Britannica; CNN
- 2018 Kilauea lower Puna eruption data: Wikipedia; USGS

Idaho: Overview

Everything in the main manual and the skill guides applies in Idaho exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Idaho go deeper on laws, local resources, and the data behind the risks named here.

The 1910 Big Burn: the fire that shaped a century of American fire policy

Over three days in August 1910, a wind-driven firestorm burned 3 million acres across northern Idaho and western Montana, killing 87 people, 78 of them firefighters. It remains one of the deadliest wildfires in U.S. history, and its aftermath reshaped how the country fights fire: the young U.S. Forest Service, created only five years earlier, used the disaster to justify an aggressive nationwide “put every fire out” policy that dominated American wildfire management for most of the 20th century, a policy later understood to have made forests denser and future fires worse. See the Risks page for the full data.

The 1976 Teton Dam failure: catastrophic on its first fill

On June 5, 1976, the newly built Teton Dam failed catastrophically during the very first filling of its reservoir, releasing more than one million cubic feet of water per second and draining the entire reservoir within six hours. The flood devastated the towns of Sugar City, Rexburg, and Wilford downstream, killing 11 people, destroying 733 homes and 250 businesses, and causing damage estimated at \$400 million to \$2 billion depending on how total losses are calculated. It remains one of the costliest dam failures in U.S. history. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Idaho: wildfire risk here has a documented history of overwhelming even a well-organized firefighting response, so defensible space and evacuation planning matter as much as in California or Oregon, and the Teton Dam failure is a reminder that even brand-new infrastructure can fail catastrophically and without much warning, worth keeping in mind for any household downstream of a dam.

Sources

- 1910 Big Burn data: Britannica; Forest History Society
- 1976 Teton Dam failure data: Association of State Dam Safety Officials; Idaho Office of Emergency Management

BY STATE › IDAHO

Idaho: Laws & Legal Considerations

Rainwater harvesting: unrestricted

Idaho places no permit requirement or volume limit on residential rainwater harvesting.

Rule	Idaho
Source water	Rooftop or other catchment
Permit required	No
Volume limit	None at the state level
Permitted uses	Non-potable, typically irrigation and similar uses

Where to find it: the Idaho Department of Water Resources (idwr.idaho.gov) administers water law generally.

Water rights: prior appropriation with a distinctive conjunctive-management layer

Idaho has followed prior appropriation since the Idaho Territorial Legislature adopted it in 1881, later written into the state constitution. What makes Idaho’s system distinctive is how it treats the connection between the Snake River and the aquifer beneath it.

Concept	How it works in Idaho
Basic rule	The earliest-dated beneficial use of a water source holds first claim during a shortage
Conjunctive management	The Eastern Snake Plain Aquifer is hydraulically connected to the Snake River itself, so state regulators administer surface water and groundwater rights as one integrated system when groundwater pumping affects senior surface rights
Priority order	Because surface-water delivery systems predate groundwater pumping in most of the state, surface water users generally hold seniority over groundwater users

Permitless carry from age 18

Idaho has allowed permitless concealed carry since 2019, joining Arkansas, Indiana, Louisiana, and Mississippi as one of the permitless-carry states covered on this site with an 18, not 21, minimum age.

Requirement	Detail
Standard	Permitless carry, concealed, for any U.S. citizen 18+ legally eligible to possess a firearm
2019 change	Idaho Code §18-3302E lowered the permitless age from 21 to 18, effective July 1, 2019
2020 expansion	HB 516 removed the residency requirement and the inside/outside city-limits distinction, extending permitless carry statewide to all eligible U.S. citizens and active-duty military, effective July 1, 2020
Optional license	Remains available through county sheriffs for reciprocity in states that don't recognize Idaho's permitless standard

Idaho's own internal consistency

Idaho’s 18-year-old permitless-carry threshold matches its own age for open carry and long-gun purchases, a single consistent age across all three, which isn’t true of every state covered on this site (Tennessee, for example, sets 21 for its general permitless standard but carves out 18 specifically for active-duty or honorably discharged military).

Sources

- Idaho rainwater harvesting rules: Texas Real Food
- Idaho prior appropriation and conjunctive management: Idaho Legal Services Authority; Idaho State University Digital Atlas
- Idaho permitless carry (2019 age change; HB 516, 2020): Boise Gun Club

[BY STATE](#) › [IDAHO](#)

Idaho: Local Resources

Idaho Office of Emergency Management (IOEM)

IOEM coordinates the state's preparedness programs, including National Preparedness Month outreach and statewide earthquake drills built around the "Drop, Cover, and Hold" standard, with participation from K-12 schools, colleges, businesses, and government agencies.

Where to find it: ioem.idaho.gov.

University of Idaho Extension: Master Gardener Program

University of Idaho Extension runs the same category of program as every other state covered on this site.

- **Idaho Master Gardener Program:** a federal-standard minimum of 40 hours of classroom training plus 40 hours of volunteer service to become certified, though specific fees, schedules, and service requirements vary by county.

Where to find it: uidaho.edu/extension/horticulture/master-gardener lists county programs and course schedules.

CERT: statewide coordination with a notable youth program

IOEM serves as Idaho's statewide CERT coordinator, supporting CERT teams in neighborhoods, workplaces, and schools. Idaho's program is distinguished by an explicit youth-CERT emphasis, including a CERT curriculum built into a Meridian charter high school and a dedicated Teen CERT Ready Camp run with Southwest District Health, a level of youth-specific investment not seen on other states' pages covered so far.

Where to find it: ioem.idaho.gov/about/administration-outreach/community-preparedness.

Sources

- IOEM preparedness programs: Idaho Office of Emergency Management
- Idaho Master Gardener Program requirements: University of Idaho

- Idaho CERT and youth CERT programs: Idaho Office of Emergency Management

BY STATE › IDAHO

Idaho: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 1910 Big Burn

Metric	Figure
Dates	August 20-23, 1910
Area burned	~3 million acres across northern Idaho and western Montana
Deaths	87 total, 78 of them firefighters
Peak winds	Up to 70 mph, driving separate fires into one massive firestorm
Firefighters deployed	~4,000 civilian firefighters plus ~4,000 U.S. Army troops
Long-term policy effect	Prompted the U.S. Forest Service's aggressive nationwide fire-suppression policy for most of the 20th century

A policy legacy worth understanding

The Big Burn’s aftermath led directly to a “put every fire out immediately” national policy. That policy is now understood to have allowed forests to grow denser with unburned fuel over decades, contributing to the larger, more intense wildfires seen across the Western U.S. in recent years, including the fires covered on California and Oregon’s pages. The 1910 fire didn’t just kill 87 people; it shaped the wildfire risk every Western state faces today.

The 1976 Teton Dam failure

Metric	Figure
Date	June 5, 1976, during the reservoir's first filling
Peak flow released	1,000,000+ cubic feet per second
Time to fully drain the reservoir	~6 hours
Deaths	11
Homes destroyed	733 (3,000+ more damaged)
Businesses destroyed	250
Livestock lost	13,000-20,000
Damage estimate	\$400 million (initial Bureau of Reclamation estimate) to \$2 billion (broader total-loss estimates)
Towns most affected	Sugar City, Rexburg, Wilford

Why the damage figures vary so widely

The \$400 million figure reflects an early, narrower federal liability estimate; the \$2 billion figure reflects broader total economic loss across the flooded region. Both numbers appear regularly in sources on this event; presenting the range rather than picking one keeps faith with what the underlying estimates actually measure.

Sources

- 1910 Big Burn data: Britannica; Forest History Society
- 1976 Teton Dam failure data: Association of State Dam Safety Officials; Idaho Office of Emergency Management

Illinois: Overview

Everything in the main manual and the skill guides applies in Illinois exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Illinois go deeper on laws, local resources, and the data behind the risks named here.

Tornadoes: the deadliest single tornado in U.S. history passed through here

The Tri-State Tornado of March 18, 1925, remains the deadliest tornado in recorded U.S. history, and Illinois bore the overwhelming majority of it: 588 of the storm's 695 total deaths were in Illinois, more than 100 of them in the town of Murphysboro alone. That event is a century old, but the risk isn't historical: the November 17, 2013 outbreak, 77 tornadoes across the state in a single day, killed 8 people and caused \$1.6 billion in damage, the deadliest and costliest November tornado outbreak in Illinois history. See the Risks page for the full data on both.

Earthquake risk from a fault system most people don't associate with the Midwest

Southern Illinois sits at the northern edge of the New Madrid Seismic Zone, a major fault system running through the central Mississippi Valley. The USGS puts the 50-year chance of a magnitude 6 or larger earthquake in the zone at 25-40%, and communities in Illinois's southernmost counties, Cairo, Carbondale, and Harrisburg among them, carry meaningfully elevated risk compared to the rest of the state.

Extreme cold: a record that still stands

In January 2019, a polar vortex event pushed Illinois to its coldest recorded temperature ever, -38°F in Mt. Carroll, and killed 3 people in Chicago alone as part of a Midwest-wide death toll of at least 21. Illinois hospitals treated 144 people for cold-related injuries in a single three-day stretch.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Illinois: tornado season planning (a safe room or basement, a NOAA weather radio, a practiced shelter plan) matters statewide, not just in a narrow "Tornado Alley" corridor; households in the state's southernmost counties should treat earthquake preparedness as a real consideration, not an afterthought; and extended extreme-cold planning, backup heat, insulated pipes, a plan that doesn't depend on the power grid staying up, deserves the same weight winter storm planning gets in states further north.

Sources

- 1925 Tri-State Tornado Illinois deaths and Murphysboro impact: Wikipedia, sourced to NWS and contemporary records
- November 17, 2013 Illinois tornado outbreak: Wikipedia, sourced to NWS
- New Madrid Seismic Zone earthquake probability and Illinois county risk: Illinois Emergency Management Agency; USGS
- January 2019 polar vortex Illinois temperature record and death toll: ABC7 Chicago; Chicago Sun-Times

Illinois: Laws & Legal Considerations

Rainwater harvesting: legal under the state plumbing code

Illinois doesn’t have a dedicated rainwater harvesting statute the way some other states do; instead, harvesting systems fall under the state’s general plumbing regulation framework.

Rule	Illinois
Source water	Rooftop catchment
Permit required	Governed by the Illinois Plumbing Code (administered by the Illinois Department of Public Health); check local amendments
Permitted uses	Non-potable: irrigation, toilet flushing, laundry
Potable use	Not regulated as legal or illegal; the state hasn't written treatment standards for drinking harvested rainwater, so it's simply not addressed
Underlying statute	Plumbing-Rainwater Systems provisions (SB0038) built into the Illinois Plumbing Code

Where to find it: the Illinois Department of Public Health (dph.illinois.gov) administers the state plumbing code; check with your municipal building department for any local amendments before installing a system.

Water rights: riparian, with a Great Lakes wrinkle none of the other states have

Illinois uses the same riparian reasonable-use doctrine as Florida, New York, and Pennsylvania for its rivers and streams, but it’s the first state covered on this site that also borders a Great Lake, which adds an entirely separate legal layer.

Water source	Governing framework
Rivers and streams	Common-law riparian reasonable use; domestic needs must be satisfied before any "artificial" use is allowed
Lake Michigan diversions	Governed by U.S. Supreme Court decrees, the Illinois Level of Lake Michigan Act, and the Great Lakes Compact

Illinois has a genuinely unusual legal status under the Great Lakes Compact

The Great Lakes Compact generally restricts diversions of Great Lakes water outside the basin, but Illinois already had a Supreme Court-authorized diversion (through the Chicago Sanitary and Ship Canal, dating back over a century) before the Compact existed. As a result, Illinois isn’t subject to certain Compact provisions on new or increased Great Lakes withdrawals that do apply to the seven other Great Lakes states, a legal quirk specific to Illinois’s history with Lake Michigan.

Where to find it: the Illinois Department of Natural Resources handles state water regulation generally; Lake Michigan-specific diversion questions run through the Illinois State Water Survey.

Firearm ownership itself requires a license here, before concealed carry even enters the picture

Every other state covered on this site regulates concealed carry directly, permitless, shall-issue, or a demanding license process, but none of them require a separate license just to own a firearm at all. Illinois does.

Requirement	Detail
Firearm Owner's Identification (FOID) Card	Required to possess any firearm or ammunition in Illinois at all; \$10, valid 10 years, issued by Illinois State Police
Concealed Carry License (CCL)	A separate license required on top of a valid FOID card; requires 16 hours of training through an ISP-approved instructor; \$150, valid 5 years
Minimum age, FOID	21, or under 21 with a parent/guardian's written consent

Why this two-tier structure matters

In every other state covered so far, the question is simply how hard it is to carry a gun concealed. In Illinois, there's a prior question: a FOID card is required to own a gun at all, kept at home, unloaded, for any purpose, before concealed carry is even relevant. This two-license structure is unique among the states covered on this site.

Sources

- Illinois rainwater harvesting regulation under the Plumbing Code: Illinois Plumbing Authority; LegalClarity
- Illinois riparian water rights and reasonable use doctrine: NOAA/Mississippi-Alabama Sea Grant Legal Program
- Illinois's Great Lakes Compact status and Lake Michigan diversion history: Great Lakes Compact, Wikipedia
- Illinois FOID card and Concealed Carry License requirements: Giffords Law Center; Illinois State Police FOID FAQ

Illinois: Local Resources

IEMA and Ready Illinois

The Illinois Emergency Management Agency runs public preparedness outreach through the Ready Illinois website, a “one-stop shop” for building an emergency plan and a supply kit, with a different preparedness topic highlighted each month throughout the year.

Reach since launch

Ready Illinois has been active since 2007, and IEMA reports more than half a million people have used the site for disaster preparedness information in that time.

Where to find it: ready.illinois.gov.

University of Illinois Extension: Illinois’s version of the other states’ land-grant Extension programs

University of Illinois Extension runs the same category of program as every other state covered on this site, through county-based offices statewide.

- **Illinois Master Gardener Program:** requires more than 60 hours of initial training from Extension Educators and State Specialists, followed by 40 volunteer hours to earn certification, then 20 volunteer hours and 10 continuing-education hours annually to maintain it, a heavier initial training load than most other states’ programs covered so far.

Where to find it: extension.illinois.edu/mg lists the program by county, with both in-person and online training options in many areas.

Chicago CERT: federally funded, run directly by the city

Chicago’s CERT program is managed directly by the city’s Office of Emergency Management and Communications (OEMC), with the Chicago Fire Department and Chicago Police Department providing instruction, similar in

structure to New York City's city-run model.

What Chicago's program looks like

Training runs at least four times a year, roughly 27 hours of classroom instruction plus 3 hours of hands-on practical skills, and it's free, funded through a federal Department of Homeland Security grant. Graduates continue with monthly sessions covering CPR, Stop the Bleed, and other ongoing skills.

Where to find it: within Chicago, chicago.gov/CERT. Elsewhere in Illinois, CERT programs are organized locally; search “[your county] CERT” or check with your county's emergency management office.

Sources

- IEMA Ready Illinois campaign structure and reach: Ready Illinois; Illinois Emergency Management Agency
- Illinois Master Gardener Program training and certification requirements: Illinois Extension
- Chicago CERT program structure and training hours: City of Chicago

BY STATE › ILLINOIS

Illinois: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Tri-State Tornado (1925): the deadliest tornado in U.S. history

Metric	Figure
Illinois deaths	588 of 695 total across IL/IN/MO
Murphysboro, IL deaths alone	100+
Total three-state injuries	2,027
Total path length	219 mi
Forward speed through Murphysboro	62 mph
Peak rating	F5
Total duration	3 hr 45 min

Illinois absorbed the overwhelming majority of this storm’s death toll, and its combination of an unusually long, unusually fast-moving path is part of why: at 62 mph forward speed, there was far less warning time than a typical tornado allows, even by 1925 standards before modern radar existed.

The November 17, 2013 outbreak: the same risk, modern data

Metric	Figure
Total tornadoes statewide, single day	77
Illinois deaths	8
Injuries	190+
Damage	~\$1.6 billion
Strongest tornadoes	Two rated EF4, together responsible for 5 of the 8 deaths

Why this is the relevant modern comparison, not just a historical footnote

Nearly 90 years separate these two events, but they demonstrate the same underlying risk: Illinois can produce large, multi-tornado outbreaks in a single day. The 2013 outbreak is the deadliest and costliest November tornado event in Illinois history specifically, showing this risk isn’t confined to the traditional spring tornado season either.

The New Madrid Seismic Zone: a standing probabilistic risk

Metric	Figure
50-year chance of a repeat of the 1811-12 earthquake sequence	7-10%
50-year chance of a magnitude 6+ earthquake in the zone	25-40%
100-year chance of a damaging earthquake in Cairo, IL	50-75%
Risk level for Springfield, Champaign, and the Chicago area	5-25%

Unlike the tornado risk above, this is a standing, probabilistic condition rather than a single documented event, the same kind of framing this site uses for California’s UCERF3 figures and Oregon’s Cascadia probability. Southern Illinois carries meaningfully more of this risk than the rest of the state.

The January 2019 polar vortex: a record that still stands

Metric	Figure
Coldest temperature ever recorded in Illinois (Mt. Carroll)	-38°F
Chicago deaths	3
Midwest-wide deaths	21+
Illinois hospital treatments for cold injury, single 3-day window	144

What these have in common

Illinois carries three structurally different hazard mechanisms, wind, seismic, and extreme cold, none of them hypothetical: the state holds the record for the deadliest tornado in American history, sits within meaningful reach of a major fault system, and set its own all-time cold record within the last decade. A household’s specific exposure depends heavily on where in the state they are, southern counties carry more earthquake risk, the whole state carries real tornado risk, and extreme cold is a statewide concern every winter.

Sources

- 1925 Tri-State Tornado Illinois death toll, path, and speed: Wikipedia, sourced to NWS and contemporary records
- November 17, 2013 Illinois tornado outbreak death toll and damage: Wikipedia, sourced to NWS
- New Madrid Seismic Zone earthquake probability and Illinois-specific risk: Illinois Emergency Management Agency; USGS
- January 2019 polar vortex Illinois record cold and death toll: ABC7 Chicago; Chicago Sun-Times

Indiana: Overview

Everything in the main manual and the skill guides applies in Indiana exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Indiana go deeper on laws, local resources, and the data behind the risks named here.

The Palm Sunday Outbreak: the deadliest tornado event in Indiana history

On April 11, 1965, 10 tornadoes tore through Indiana in a matter of hours as part of a six-state outbreak, killing 137 people and injuring more than 1,200, the deadliest tornado outbreak in the state's recorded history. The broader outbreak, 47 tornadoes across six states, ranks as the fourth deadliest in U.S. history and directly led to major improvements in severe weather warning systems nationwide. See the Risks page for the full data.

August 2026: a flood record that stood for 113 years, broken

In August 2026, a 1-in-1,000-year rainfall event, more than 11 inches in roughly 32 hours in parts of the state, sent the White River at Anderson to a crest of 24.9 feet, breaking the record set during the Great Flood of 1913. At least 7 people were confirmed dead, and the flooding arrived alongside a derecho that knocked out power to more than 1 million customers regionally. Because this event is recent, some figures may still be updating as recovery continues; the numbers on the Risks page reflect what was confirmed as of this writing.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Indiana: tornado season planning (a safe room, a weather radio, a practiced shelter plan) matters statewide given the Palm Sunday Outbreak's scale, and households near the White River corridor or other flood-prone waterways should treat "it hasn't flooded like that before" as no longer a reliable assumption, a century-old record fell in a single storm.

Sources

- 1965 Palm Sunday tornado outbreak Indiana deaths and injuries: Wikipedia, sourced to NWS; National Weather Service

- August 2026 Indiana floods, rainfall, deaths, and the White River record crest: Wikipedia, sourced to contemporary reporting

Indiana: Laws & Legal Considerations

Rainwater harvesting: unrestricted below a specific volume threshold

Indiana places no state-level restriction on residential rainwater harvesting up to a defined annual volume, a cleaner numeric threshold than most states covered on this site use.

Rule	Indiana
Source water	Rooftop or other catchment
Permit required	No, for systems collecting up to 100,000 gallons annually
Above that threshold	Typically requires a DNR permit
Permitted uses	Non-potable: irrigation and similar uses
Downstream impact	If a system could measurably reduce downstream flow or affect neighboring properties, the DNR may require additional documentation regardless of volume

Where to find it: the Indiana Department of Natural Resources (in.gov/dnr) administers permits above the threshold.

Water rights: standard riparian doctrine

Indiana follows the same general riparian rights framework as most Midwestern and Eastern states covered on this site.

Concept	How it works in Indiana
Who holds the right	Landowners adjacent to a natural water source
Governing principle	Reasonable use, without unreasonably diminishing flow or quality for other riparian owners
Larger uses	Reviewed by the DNR when downstream or neighboring impact is a realistic concern

Where to find it: the Indiana Department of Natural Resources administers water rights and permitting.

Permitless carry, with a genuinely free optional license

Indiana adopted permitless carry in 2022, and unlike every other permitless state covered on this site, it went a step further by eliminating the state fee for its optional license entirely rather than just keeping it low.

Requirement	Detail
Standard	Permitless ("constitutional") carry, open or concealed, for anyone 18+ legally eligible to possess a firearm
Optional License to Carry Handgun (LTCH)	No state fee at all for a 5-year or lifetime license (fingerprinting fees may still apply locally)
Why get the optional license anyway	Useful for reciprocity in states that require a permit from Indiana residents

A genuinely different posture from every other permitless state covered so far

Arizona’s optional permit costs \$60, Ohio’s optional permit costs \$67; Indiana’s costs nothing at the state level. This is a small but real distinction: Indiana isn’t just permitless, it’s also removed the financial barrier to the optional license most other permitless states still charge for.

Sources

- Indiana rainwater harvesting rules and DNR permit threshold: Indiana Hub; Rain Harvest Pro
- Indiana permitless carry and free optional LTCH: Keffer Hirschauer LLP; USA Gun Shop

[BY STATE](#) › [INDIANA](#)

Indiana: Local Resources

IDHS and Get Prepared

The Indiana Department of Homeland Security runs public preparedness outreach through its Get Prepared campaign, with a dedicated e-newsletter and content specifically organized around hazards common in Indiana, tornadoes, floods, and snowstorms among them.

Where to find it: in.gov/dhs/get-prepared.

Purdue Extension: Indiana's version of the other states' land-grant Extension programs

Purdue University's Cooperative Extension Service runs the same category of program as every other state covered on this site, through local county Extension offices.

- **Purdue Extension Master Gardener Program:** a 14-16 week in-person Basic Training course (one 3-hour class weekly), a passing score of at least 70% on an exam, and 40 hours of volunteer service to become certified, then 12 volunteer hours and 6 continuing-education hours annually to stay active.

Where to find it: extension.purdue.edu lists the program by county.

CERT: coordinated through IDHS

Indiana's CERT program trains neighborhood, workplace, and school teams in basic disaster response skills, coordinated through the state Department of Homeland Security's training division.

Where to actually find a team

IDHS's Training and Certifications page is the statewide starting point; from there, local availability varies by county and city the same way it does in most other states covered on this site.

Where to find it: in.gov/dhs/training.

Sources

- IDHS Get Prepared campaign: Indiana DHS
- Purdue Extension Master Gardener Program requirements: Purdue Extension; Purdue Master Gardener Program Policy Guide
- Indiana CERT program and IDHS training coordination: Indiana DHS

BY STATE › INDIANA

Indiana: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Palm Sunday Outbreak (1965): Indiana’s deadliest tornado event

Metric	Figure
Indiana tornadoes	10
Indiana deaths	137
Indiana injuries	1,200+
Six-state outbreak total tornadoes	47 (55 confirmed across some counts)
Six-state outbreak total deaths	271
National ranking	4th deadliest tornado outbreak in U.S. history
Damage (1965 dollars, all states)	~\$250 million

The outbreak’s severity, including 18 tornadoes rated F4, was a direct catalyst for major improvements to the national severe weather warning system in the years that followed.

August 2026 floods: a 113-year-old record broken

Metric	Figure
Start date	August 11, 2026
Peak rainfall (New Castle, ~32 hrs)	11+ in, a 1-in-1,000-year event
Indiana deaths	7+
White River crest at Anderson	24.9 ft, exceeding the 1913 record
Regional power outages (from the accompanying derecho)	1 million+ customers
Indiana peak outages	~300,000
Delaware County evacuations (as of Aug. 15)	350+

This is a recent, still-developing event

Because this flooding happened in the weeks before this page was written, some figures, particularly the final death toll and total damage estimate, may still be updating as recovery continues. The numbers above reflect what was confirmed in contemporary reporting at the time of writing; check current sources for the latest confirmed totals.

What these two have in common

The Palm Sunday Outbreak and the August 2026 floods, separated by more than 60 years, both demonstrate the same practical point about Indiana specifically: the state’s worst-case severe weather events aren’t confined to memory. A record set in 1913 held for over a century before a single storm broke it, and Indiana’s deadliest tornado outbreak remains the deadliest on record six decades later, not because nothing worse has threatened since, but because both events represent genuinely extreme tails of Indiana’s ordinary severe weather patterns.

Sources

- 1965 Palm Sunday tornado outbreak Indiana deaths and national ranking: Wikipedia, sourced to NWS; Fox59

- August 2026 Indiana floods, rainfall, and White River crest data: Wikipedia, sourced to contemporary reporting

Iowa: Overview

Everything in the main manual and the skill guides applies in Iowa exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Iowa go deeper on laws, local resources, and the data behind the risks named here.

The 2008 flood: a record crest, and no deaths

In June 2008, the Cedar River crested at 31.12 feet in Cedar Rapids, more than 11 feet above the previous record, flooding 10 square miles of the city and displacing more than 18,000 residents. Statewide, the flooding caused \$10 billion in damage across 16 counties, yet no deaths were directly attributed to it, a genuine credit to warning and evacuation systems given the flood's unprecedented scale. See the Risks page for the full data.

The 2020 derecho: the costliest thunderstorm event on record

Twelve years later, Cedar Rapids took a direct hit from a completely different kind of disaster. On August 10, 2020, a derecho, essentially an inland hurricane of straight-line thunderstorm winds, produced gusts up to 140 mph in the Cedar Rapids area, damaging nearly every building across 75 square miles of the city and destroying an estimated 676,000 trees, roughly 70% of its tree canopy. The storm caused \$11.2 billion in damage nationally, the costliest thunderstorm event ever recorded in the United States, and killed 4 people in Iowa.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Iowa: river flood risk deserves the same seriousness this manual gives coastal flood risk elsewhere, Cedar Rapids's 2008 experience shows how quickly a "record" flood level can be redefined, and this manual's backup power and debris-clearing guidance carries extra weight given how long derecho-related outages can last, more than 1 million customers lost power in 2020, some for over two weeks.

Sources

- 2008 Cedar Rapids flood crest, displacement, and statewide damage: City of Cedar Rapids

- 2020 Iowa derecho winds, deaths, and damage: Wikipedia, sourced to NWS; Washington Post

BY STATE › IOWA

Iowa: Laws & Legal Considerations

Rainwater harvesting: no state-level restrictions

Iowa places no state regulation on residential rainwater harvesting and actively encourages the practice.

Rule	Iowa
Source water	Rooftop or other catchment
Permit required	No, at the state level
Permitted uses	Non-potable: irrigation and similar uses
Local variation	Municipal building and plumbing codes and zoning laws may still apply

Where to find it: the Iowa Department of Natural Resources (iowadnr.gov) publishes general water conservation guidance.

Water rights: “modified riparian,” a genuinely distinct label from other states covered here

Iowa’s water law is often described specifically as “modified riparian,” a hybrid combining elements of appropriation and riparian doctrine under a single beneficial-use framework, distinct in its own terminology from Oklahoma’s explicitly dual riparian/prior-appropriation system covered elsewhere on this site.

Concept	How it works in Iowa
Ownership	All waters are "public waters and public wealth" of Iowa citizens under state law adopted in 1957
Governing standard	Beneficial use: water must be put to beneficial use, waste or unreasonable use is prohibited, and conservation is required
Permit threshold	Withdrawals exceeding 25,000 gallons/day from a stream or aquifer require an Iowa DNR permit

Where to find it: the Iowa Department of Natural Resources administers water withdrawal permits.

Permitless carry since 2021

Iowa adopted permitless carry effective July 1, 2021.

Requirement	Detail
Standard	Permitless carry, open or concealed, for anyone 21+ legally eligible to possess a firearm
Optional permits	A Permit to Acquire Pistols and Revolvers and a Nonprofessional Permit to Carry Weapons remain available through the county sheriff
Why get an optional permit anyway	Reciprocity while traveling to states requiring a permit from Iowa residents; can help avoid delays from a NICS background check hold when purchasing from a licensed dealer

Sources

- Iowa rainwater harvesting rules: Survival Sullivan
- Iowa’s modified riparian water law and 25,000-gallon permit threshold: Iowa DNR
- Iowa permitless carry (HF 756, 2021): Iowa DPS; Giffords Law Center

[BY STATE](#) › [IOWA](#)

Iowa: Local Resources

HSEMD and Ready Iowa

The Iowa Department of Homeland Security and Emergency Management, active since 1965, runs public preparedness outreach through Ready Iowa, built around four steps: be aware, make a plan, build a kit, and get involved.

Where to find it: ready.iowa.gov.

Iowa State University Extension: Iowa's version of the other states' land-grant Extension programs

Iowa State University Extension and Outreach runs the same category of program as every other state covered on this site.

- **Iowa Master Gardener Program:** 40 hours of initial training (webcast, in-person, and hands-on formats), followed by 40 hours of volunteer service to become an active Master Gardener, then 20 volunteer hours and 10 continuing-education hours annually to maintain it. A non-volunteer "Iowa Home Gardener" track is also available for those who just want the education.

Where to find it: extension.iastate.edu/mastergardener lists the program by county.

CERT: standardized statewide through the Iowa Disaster Human Resource Council

Iowa's CERT training follows standards set jointly by the Iowa Disaster Human Resource Council's CERT Support Committee and HSEMD, giving the state a more centrally coordinated instructor and curriculum standard than some fully county-by-county models covered on this site.

Where to find it: iavoad.org/resources/cert-guides; search "[your county] CERT" for a local team.

Sources

- Ready Iowa campaign and HSEMD history: Ready Iowa
- Iowa State Extension Master Gardener Program requirements: Iowa State University Extension
- Iowa CERT program standardization: Iowa Disaster Human Resource Council

BY STATE › IOWA

Iowa: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 2008 flood: Cedar Rapids’s record crest

Metric	Figure
Cedar River crest at Cedar Rapids	31.12 ft (previous record: ~20 ft)
Area of Cedar Rapids flooded	10 sq mi (14% of the city)
Cedar Rapids residents displaced	18,000+
Statewide residents displaced (16 counties)	38,043
Homes flooded (Cedar Rapids)	~6,000 (1,300 later demolished)
City facilities damaged	310
Statewide damage	\$10 billion
Deaths	0

The 2020 derecho: the costliest thunderstorm event on record

Metric	Figure
Date	August 10, 2020
Path length	~700-770 mi (South Dakota to Ohio)
Peak winds (Cedar Rapids area)	140 mph
Iowa deaths	4
National damage total	\$11.2 billion, the costliest thunderstorm event on record in the U.S.
Cedar Rapids area damaged	~75 sq mi, nearly every building
Cedar Rapids trees lost	~676,000 (~70% of the tree canopy)
Iowa farmland destroyed	~6 million acres (~20% of the state's farmland)
People in the overall damage footprint	20 million+
Peak power outages	1 million+ customers, some for 2+ weeks

What these two have in common

Separated by 12 years, the 2008 flood and the 2020 derecho both struck Cedar Rapids specifically with force well beyond anything the city’s existing infrastructure and expectations were built for, one redefining the city’s flood-crest record by more than 11 feet, the other flattening the majority of its urban tree canopy in a matter of hours. Together they demonstrate that a single Midwest city can face both catastrophic water risk and catastrophic wind risk within the span of a little over a decade.

Sources

- 2008 Cedar Rapids flood statistics: City of Cedar Rapids
- 2020 Midwest derecho data: Wikipedia, sourced to NWS; Washington Post

Kansas: Overview

Everything in the main manual and the skill guides applies in Kansas exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Kansas go deeper on laws, local resources, and the data behind the risks named here.

The 2007 Greensburg tornado: a town erased in minutes

On the night of May 4, 2007, an EF5 tornado, the first ever rated under the newly implemented Enhanced Fujita Scale, struck the town of Greensburg with winds near 205 mph and a path 1.7 miles wide. It destroyed 95% of the town, killing 12 people. Greensburg's rebuilding effort afterward, centered on green/sustainable construction, became a widely studied model, but that's a story for after the disaster; this manual's concern is the 65 minutes the tornado was on the ground. See the Risks page for the full data.

The Ogallala Aquifer: a slow-moving version of the Dust Bowl's cause

Western Kansas sits over the Ogallala Aquifer, the primary water source that let the Great Plains recover from the 1930s Dust Bowl through irrigation. That aquifer is now being drawn down faster than it recharges, with some estimates projecting it could be roughly 70% depleted within 50 years. Paleoclimatic data shows a Dust-Bowl-severity drought hits western Kansas three to four times a century on its own; layering a depleted aquifer on top of the next one is a materially different, and worse, version of the same underlying risk. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Kansas: tornado risk here can be genuinely total, not partial, as Greensburg's 95% destruction figure shows, so shelter planning and a go-bag ready to grab matter as much as anywhere covered on this site; and if you're in the western part of the state relying on groundwater, water rights and long-term supply planning deserve real attention now rather than being a someday problem.

Sources

- 2007 Greensburg tornado data: Wikipedia; Fox Weather
- Ogallala Aquifer depletion and Dust Bowl recurrence risk: Kansas Reflector; Yale E360

BY STATE › KANSAS

Kansas: Laws & Legal Considerations

Rainwater harvesting: unrestricted for domestic use up to a specific threshold

The Kansas Water Appropriation Act specifically protects the right to harvest rainwater for domestic purposes, with a defined scope for what counts as domestic use.

Rule	Kansas
Source water	Rooftop or other catchment
Permit required for domestic use	No, if within the domestic-use definition
Domestic-use definition	Household use, watering livestock on pasture, or watering up to 2 acres of lawn and garden
Beyond that threshold	A Department of Agriculture permit may be required, and any storage large enough to affect downstream flow is subordinate to existing water rights

Where to find it: the Kansas Department of Agriculture, Division of Water Resources (agriculture.ks.gov) publishes water law basics.

Water rights: prior appropriation, the same family as Utah’s

Kansas is a prior-appropriation state: the state owns all water, and use rights are granted on a “first in time, first in right” basis, the same doctrine already covered for Utah, Oregon, Washington, and Arizona’s surface water.

Concept	How it works in Kansas
Basic rule	Earliest-dated water right holders have first claim during a shortage
Groundwater	Governed under the same appropriation framework as surface water, notably relevant given the Ogallala Aquifer's decline in western Kansas
Administration	Kansas Department of Agriculture, Division of Water Resources

Where to find it: the Division of Water Resources administers appropriation permits.

Permitless carry since 2015, with a distinctive 18-20 provisional tier

Kansas has recognized permitless carry for adults 21 and older since July 1, 2015.

Requirement	Detail
Standard (21+)	Permitless carry, concealed, for anyone 21+ legally eligible to possess a firearm
18-20 year olds	Not covered by the permitless standard; may obtain a provisional License to Carry Concealed Handgun with approved training instead
Optional license (21+)	Remains available for reciprocity in states that don't recognize Kansas's permitless standard

A two-tier system, not a single age line

Most permitless-carry states covered on this site draw one age line and stop. Kansas instead gives 18-20-year-olds a real, if more involved, path to concealed carry through the provisional license rather than simply excluding them until 21, a structural difference from a state that would just require the standard optional permit at a younger age.

Sources

- Kansas rainwater harvesting rules: Survival Sullivan; GMD 4 Kansas Water Law Summary
- Kansas prior appropriation water law: Kansas Department of Agriculture
- Kansas permitless carry (2015) and 18-20 provisional license: Alien Gear Holsters; Protect With Bear

Kansas: Local Resources

Kansas Division of Emergency Management (KDEM)

KDEM's Training Section provides training and support to each county's own emergency management staff and state emergency-support-function partners, helping every county build and sustain its own local training program rather than running response centrally.

Where to find it: kansastag.gov/498/Training, under the Kansas Adjutant General's Department.

K-State Research and Extension: Master Gardener Program

K-State Research and Extension runs the same category of program as every other state covered on this site.

- **Kansas Extension Master Gardener Program:** 40 to 50 hours of horticulture instruction traded for ongoing volunteer time, active in 73 of Kansas's 105 counties. In 2021 alone, Kansas Master Gardener volunteers logged more than 91,000 hours, valued at over \$2.6 million.

Where to find it: hnr.k-state.edu lists participating counties.

CERT: organized county by county

Kansas's CERT programs run through individual county emergency management offices, including active programs in Douglas, Johnson, Sedgwick, and Riley counties among others, each teaching the standard fire safety, light search and rescue, team organization, and disaster medical curriculum.

No single statewide CERT brand

Unlike states covered elsewhere on this site with one centrally branded CERT program, Kansas's CERT training is delivered independently by each county's emergency management office. Residents should check with their own county's office for the nearest active team and its schedule.

Where to find it: search “[your county] Kansas CERT” or check your county’s emergency management webpage directly.

Sources

- KDEM training and county support structure: Kansas Adjutant General’s Department
- Kansas Extension Master Gardener Program scale and county coverage: K-State Research and Extension
- Kansas county-level CERT programs: Douglas County; Sedgwick County

BY STATE › KANSAS

Kansas: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 2007 Greensburg tornado

Metric	Figure
Date	May 4, 2007
Rating	EF5, the first tornado ever rated under the newly implemented Enhanced Fujita Scale
Peak winds	~205 mph
Maximum width	1.7 mi
Duration on the ground	65 minutes
Deaths	11-12 (sources vary slightly)
Injuries	63
Town destroyed	95% of Greensburg (961 homes/businesses destroyed, 216 with major damage, 307 with minor damage)
Damage	\$250 million

A near-total loss, not a partial one

Most tornado case studies on this site describe severe but partial destruction across a city or county. Greensburg is the clearest example on the site of a near-total loss: 95% of an entire town of 1,400 people gone in about an hour. It’s the scenario this manual’s go-bag and shelter guidance is built for at its most literal.

The Ogallala Aquifer: the standing risk behind the next Dust Bowl

Metric	Figure
Historical Dust Bowl frequency, western Kansas	A Dust-Bowl-severity drought occurs roughly 3-4 times per century on its own, per paleoclimatic data
Projected Ogallala Aquifer depletion	Some estimates project ~70% depletion within 50 years
Trend direction	Water levels are mostly in decline from Kansas southward
Compounding factors cited by researchers	Historic drought, aquifer depletion, climate change, and existing farm-program incentives, acting together

A slow risk, not an event

Unlike Greensburg’s tornado, the Ogallala Aquifer’s decline has no single date attached to it. It’s a standing condition, the same category as California’s water stress or Arizona’s Colorado River shortage covered elsewhere on this site, that raises the odds of a future acute drought event compounding on top of an already-reduced water supply, rather than a disaster with a start and end date of its own.

Sources

- 2007 Greensburg tornado data: Wikipedia; Fox Weather
- Ogallala Aquifer depletion projections and Dust Bowl recurrence data: Kansas Reflector; Yale E360

Kentucky: Overview

Everything in the main manual and the skill guides applies in Kentucky exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Kentucky go deeper on laws, local resources, and the data behind the risks named here.

December 2021: the deadliest tornado in Kentucky history

On the night of December 10, 2021, a high-end EF4 tornado tracked 165.7 miles across western Kentucky, an unusually long and unusually late-season path, killing 57 people and becoming both the deadliest tornado in Kentucky's recorded history and the deadliest anywhere in the U.S. during the month of December. Mayfield took the worst of it: the storm collapsed the Mayfield Consumer Products candle factory and devastated the downtown business district, with 24 deaths in the county alone. See the Risks page for the full data.

July 2022: catastrophic flash flooding in the Appalachian hollows

Seven months later, a fundamentally different disaster struck the opposite end of the state. Slow-moving "training" thunderstorms dumped 14-16 inches of rain on parts of eastern Kentucky over a few days in late July 2022, and the region's narrow hollows and steep terrain turned that rain into flash floods with almost no warning. The flooding killed at least 43 people, damaged or destroyed nearly 9,000 homes, and required more than 600 helicopter rescues.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Kentucky: tornado preparedness matters even outside the traditional spring season, the 2021 outbreak struck in December, and households in eastern Kentucky's hollows and narrow valleys need a real flash flood evacuation plan given how quickly water can rise in that terrain, regardless of whether a location has flooded before.

Sources

- December 2021 Western Kentucky tornado deaths, path, and Mayfield impact: Wikipedia, sourced to NWS

- July 2022 Eastern Kentucky floods deaths, rainfall, and damage: NWS Jackson, KY; CNN

BY STATE › KENTUCKY

Kentucky: Laws & Legal Considerations

Rainwater harvesting: legally the landowner’s own water

Kentucky’s approach to rainwater is unusually explicit for a state without a dedicated harvesting statute: it’s addressed directly through the state’s definition of diffused surface water.

Rule	Kentucky
Source water	Rooftop or other catchment
Legal status	"Diffused surface water which flows vagrantly over the surface of the ground shall not be regarded as public water, and the owner of the land on which such water falls or flows shall have the right to its use" (KRS 151.120)
Permit required	No, for typical residential non-potable systems
Permitted uses	Irrigation, gardening, livestock, outdoor cleaning
Potable use	Only if it meets specific quality requirements set by the local health department

Where to find it: the Kentucky Division of Water administers water rights and any larger withdrawal permitting.

Water rights: riparian, with a statutory permit system for larger withdrawals

Kentucky follows the riparian reasonable-use doctrine, layered with a statutory permitting system for larger uses.

Concept	How it works in Kentucky
Who holds the right	Landowners whose property abuts a watercourse
Governing principle	Reasonable use, without unreasonably interfering with other riparian owners' access
Larger withdrawals	Require a permit under Kentucky's statutory water withdrawal permitting system

Where to find it: the Kentucky Division of Water administers withdrawal permits.

Concealed carry: permitless since 2019, with a brand-new 2026 change for younger adults

Kentucky has allowed permitless carry since July 1, 2019, and a significant change specifically affecting 18-to-20-year-olds took effect in mid-2026.

Requirement	Detail
Standard	Permitless ("constitutional") carry, open or concealed, for anyone 21+ legally eligible to possess a firearm
Optional CCDW license	Requires a state-approved firearms training course; useful for reciprocity in states that don't recognize Kentucky's permitless carry
New provisional license for 18-20 year olds	Effective July 15, 2026 (HB312, enacted via veto override on April 14, 2026), 18-to-20-year-olds can obtain a provisional license meeting the same training and background-check standards as the standard license, automatically converting to a full license at 21

A very recent change worth double-checking

This provisional license program only took effect in mid-2026, shortly before this page was written. If you’re an 18-to-20-year-old Kentucky resident, confirm current application details directly with Kentucky State Police rather than relying solely on secondary sources, since a newly implemented program’s practical details can shift in its first months.

Sources

- Kentucky rainwater harvesting and diffused surface water statute (KRS 151.120): The Land Geek
- Kentucky riparian water rights and withdrawal permitting: Texas Real Food

- Kentucky permitless carry and 2026 provisional license law (HB312): Kentucky State Police CCDW; Gunvera

[BY STATE](#) › [KENTUCKY](#)

Kentucky: Local Resources

KYEM and Ready for Anything

Kentucky Emergency Management runs public preparedness outreach under the “Ready for Anything” name, centered on building a family emergency plan with a designated meeting place and clear communication procedures.

Where to find it: kyem.ky.gov/plan-prepare.

University of Kentucky Extension: Kentucky’s version of the other states’ land-grant Extension programs

The University of Kentucky’s Cooperative Extension runs the same category of program as every other state covered on this site, marking 50 years in Kentucky as of 2023.

- **Kentucky Extension Master Gardener Program:** 40 hours of volunteer service to earn initial certification, then 20 hours annually to maintain it, with more than 1,100 active Master Gardener volunteers statewide.

Where to find it: kyemg.wordpress.com lists the program by county Extension office.

CERT: county-run, including Lexington’s own branded program

Kentucky’s CERT programs are organized at the county level, with Lexington running its own specifically branded version.

A distinctive local program

Lexington’s CERT effort operates under the “Be Ready Lexington” name, one of the more distinctly branded local CERT programs covered on this site, alongside county programs like Daviess County’s.

Where to find it: bereadylexington.com/cert in Lexington; search “[your county] CERT” elsewhere in the state.

Sources

- KYEM Ready for Anything campaign: Kentucky Emergency Management
- Kentucky Extension Master Gardener Program scale and requirements: UK College of Agriculture
- Kentucky CERT program examples: Be Ready Lexington; Daviess County

BY STATE › KENTUCKY

Kentucky: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Western Kentucky tornado (December 2021)

Metric	Figure
Kentucky deaths	57
Kentucky injuries	515+
Peak rating	EF4
Path length	165.7 mi
Maximum width	2,600 yd (~1.5 mi)
Peak winds	190 mph
Graves County (Mayfield) deaths	24
National ranking	Deadliest tornado in Kentucky history; deadliest U.S. tornado during the month of December

A single tornado within a larger outbreak

This tornado was part of a broader outbreak that also struck Arkansas, Illinois, and Tennessee the same night, causing more than 90 deaths and \$3.9 billion in damage across all affected states combined. The Kentucky-specific figures above cover the Western Kentucky tornado itself, not the full multi-state outbreak total.

The Eastern Kentucky floods (July 2022)

Metric	Figure
Deaths	43-45 (rose over subsequent months as some victims later died from flood-related health complications)
Homes damaged or destroyed	~9,000
Damage estimate	\$450-950 million
Peak rainfall over a few days	14-16 in
Rainfall intensity at times	4+ in/hour
Helicopter rescues	600+
Counties declared federal disaster areas	13

The flooding was driven by “training” storms, slow-moving thunderstorm cells that repeatedly crossed the same ground rather than moving through quickly, concentrating extreme rainfall totals over a small area. Eastern Kentucky’s narrow hollows and steep terrain then turned that rainfall into fast-rising flash floods with very little warning time.

What these two have in common

Separated by seven months and hundreds of miles, the Western Kentucky tornado and the Eastern Kentucky floods demonstrate that severe weather risk in this state isn’t confined to one region or one season: a record-setting tornado struck in December, historically outside peak tornado season, and a historic flood struck a region not traditionally associated with the state’s most severe flooding.

Sources

- December 2021 Western Kentucky tornado data: Wikipedia, sourced to NWS; Tornado outbreak of December 10-11, 2021
- July 2022 Eastern Kentucky floods data: NWS Jackson, KY; CNN

Louisiana: Overview

Everything in the main manual and the skill guides applies in Louisiana exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Louisiana go deeper on laws, local resources, and the data behind the risks named here.

Hurricane Katrina: an engineering failure as much as a storm

Hurricane Katrina struck the Gulf Coast on August 29, 2005, and while the storm itself was severe, most of New Orleans's catastrophic flooding came from a different cause: levees and floodwalls failed in more than 50 locations around the city, built on weak soils with pilings driven too shallow, several failing below their own design height. The flooding submerged 80% of New Orleans and 95% of neighboring St. Bernard Parish. More than 1,390 people died, total damage reached roughly \$125 billion, and roughly 400,000 residents never returned to the city permanently. See the Risks page for the full data.

Coastal land loss: a standing crisis, not a single event

Louisiana's other defining risk isn't a storm at all, it's the ongoing loss of the coastline itself. The state holds more than 45% of the intertidal wetlands in the lower 48 states, yet accounts for more than 90% of the nation's total coastal wetland loss. Between 1932 and 2000 alone, an estimated 1.2 million acres of Louisiana's coastal wetlands disappeared, and another 448,000 acres are projected to be lost by 2050. This is a genuinely different kind of risk from a hurricane, permanent, cumulative, and directly connected to how much storm surge protection the coastline can still provide.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Louisiana: hurricane evacuation planning needs to account for the reality that levee and floodwall protection, even where it exists, isn't guaranteed to hold, and coastal and near-coastal households should understand that the wetlands that once buffered storm surge are disappearing, meaning the same storm today can push further inland than an equivalent storm decades ago.

Sources

- Hurricane Katrina deaths, levee failures, and damage: History.com; The Data Center
- Louisiana coastal wetland loss statistics: USGS; Restore or Retreat

Louisiana: Laws & Legal Considerations

Rainwater harvesting: broadly permitted statewide

Louisiana law permits collecting rainwater for any legal purpose, with comparatively light state-level regulation.

Rule	Louisiana
Source water	Rooftop or other catchment
Permitted uses	Any legal purpose, provided the collection system doesn't interfere with other water rights holders
Permit required	No general state permit for typical residential systems
Local variation	Parish-level rules vary; some parishes have tighter restrictions, others few or none

Where to find it: your parish government for any local rules; the Louisiana Department of Environmental Quality for broader water conservation guidance.

Water rights: the only civil-law legal system in the United States

Every other state covered on this site operates under the English common law tradition. Louisiana is the sole exception, its entire legal system, not just water law, descends from French and Spanish civil law, most directly the Napoleonic Code.

Concept	How it works in Louisiana
Governing framework	The Louisiana Civil Code, not common-law precedent, is the primary source of property and water law
Riparian owners' rights	A riparian landowner may make reasonable use of adjacent surface water, and may extend that same access to a non-riparian owner for agricultural or aquacultural purposes within the state
Practical effect	Louisiana's outcome looks similar to common-law riparian reasonable use in other states, but it's derived from a genuinely different legal tradition and codified civil provisions rather than case law

Why this distinction matters beyond water law

Louisiana’s civil law heritage affects far more than water rights, it shapes contract law, property law, and inheritance law throughout the state in ways that can surprise people used to how the other 49 states’ common-law systems work. Water rights specifically have historically generated relatively little litigation in Louisiana, reflecting the state’s traditional water abundance, but the underlying legal framework is worth understanding on its own terms rather than assuming it works exactly like a “normal” riparian state.

Where to find it: Louisiana Revised Statutes Title 9 (Civil Code-Ancillaries) codifies riparian rights specifically.

Permitless carry since July 2024

Louisiana adopted permitless carry in July 2024, one of the more recent states to do so, with a notable age gap between the permitless standard and its optional permit.

Requirement	Detail
Standard	Permitless carry, concealed or open, for anyone 18+ legally eligible to possess a firearm, residents and non-residents alike
Optional Concealed Handgun Permit (CHP)	Requires being 21+; \$125 fee, valid 5 years, \$62.50 renewal (start 90 days before expiration)
Why get the optional CHP anyway	Reciprocity in roughly 37 other states that don't recognize Louisiana's permitless carry; also satisfies the federal Gun-Free School Zones Act exemption near K-12 schools, the same gap noted on Arizona's and Tennessee's pages

Sources

- Louisiana rainwater harvesting rules: Survival Sullivan
- Louisiana’s civil law water rights framework: Louisiana Revised Statutes Title 9, §9:1102.1; Water Rights and Water Policy in Louisiana
- Louisiana permitless carry and optional CHP: Alien Gear Holsters; Protect With Bear

Louisiana: Local Resources

GOHSEP

The Governor's Office of Homeland Security and Emergency Preparedness coordinates Louisiana's statewide emergency management, preparedness, response, and recovery efforts, with a natural emphasis on hurricane readiness given the state's coastal exposure.

Where to find it: gohsep.la.gov.

LSU AgCenter: Louisiana's version of the other states' land-grant Extension programs

The LSU AgCenter runs the same category of program as every other state covered on this site, organized at the parish level, Louisiana's equivalent of counties.

- **Louisiana Master Gardener Program:** a 40-hour training course, a passing exam score, and a 40-hour volunteer internship to become certified, delivered through 29 individual parish-level programs.

Where to find it: lsuagcenter.com lists the program by parish.

CERT: coordinated through GOHSEP at the parish level

Louisiana's CERT programs are coordinated through GOHSEP, with training delivered locally by parish-level emergency management offices.

Terminology note

Louisiana uses "parish" where every other state covered on this site uses "county," a holdover from the state's civil law and French colonial history. Searching "[your parish] CERT" is the equivalent of the "[your county] CERT" search suggested on other states' pages.

Where to find it: gohsep.la.gov for statewide coordination; your parish's emergency management office for local training schedules.

Sources

- GOHSEP structure and mission: GOHSEP
- LSU AgCenter Master Gardener Program requirements and parish reach: LSU AgCenter

BY STATE › LOUISIANA

Louisiana: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Katrina (2005)

Metric	Figure
Total deaths (most sources)	1,390+
Total deaths (some Louisiana-specific counts)	1,500+
Total damage	~\$125 billion
Levee/floodwall failure locations	50+
Share of New Orleans flooded	80%
Share of St. Bernard Parish flooded	95%
Residents who never returned permanently	~400,000
Leading causes of death	Drowning (~40%), injury/trauma (~25%), heart conditions (~11%)

Why the death toll figure varies

Different sources count deaths across different geographic scopes and time windows, some limited to direct storm/flood deaths in the immediate aftermath, others including a broader count of Louisiana residents whose deaths were ultimately attributed to the disaster over a longer period. Both figures are credible; they answer slightly different questions about scope and timeframe, not a factual dispute.

Coastal land loss: an ongoing, standing crisis

Metric	Figure
Share of lower-48 intertidal wetlands in Louisiana	>45%
Share of the nation's total coastal wetland loss occurring in Louisiana	>90%
Acres lost, 1932-2000	~1.2 million
Additional acres projected lost by 2050	~448,000
Historical average loss rate, 1985-2010	16.6 sq mi/year
Current average loss rate	10.9 sq mi/year (6,944 acres/year)

The 'football field an hour' statistic, precisely

The widely repeated claim that Louisiana loses “a football field of land every hour” is accurate as a 25-year average specifically for 1985-2010, not as a description of a constant, ongoing rate happening in real time today. Louisiana has never lost land at a literal steady hourly clip; the rate varies significantly year to year depending on storms and other factors, and the current average (10.9 sq mi/year) is meaningfully lower than the 1985-2010 average (16.6 sq mi/year). The land loss is real and severe either way, but the specific “every hour” framing describes a historical average, not a live rate.

What these two have in common

Hurricane Katrina and Louisiana’s coastal land loss are connected in a direct, physical way: the coastal wetlands that have been disappearing for decades once provided a natural buffer against storm surge, meaning the same category of storm pushes further inland and does more damage today than it would have when more of that buffer still existed.

Sources

- Hurricane Katrina death toll, levee failures, and damage: History.com; The Data Center; Britannica
- Louisiana coastal land loss statistics and the football-field rate: USGS; WWL-TV Verify; Restore or Retreat

[BY STATE](#) › [MAINE](#)

Maine: Overview

Everything in the main manual and the skill guides applies in Maine exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Maine go deeper on laws, local resources, and the data behind the risks named here.

The Ice Storm of 1998: identified as Maine's worst natural disaster

Between January 5 and 9, 1998, waves of freezing rain coated Maine in up to 3 inches of ice, knocking out power to roughly 900,000 residents at some point during the days-long storm and damaging an estimated 17 million acres of forest. A later study identified it as the worst natural disaster in Maine's history, and all 16 of the state's counties were declared federal disaster areas. See the Risks page for the full data.

The January 2024 coastal storms: a new all-time record, twice in one week

On January 10 and again on January 13, 2024, two severe coastal storms struck Maine back to back, driving wind gusts of 60-80 mph and aligning storm surge with the month's highest astronomical tide. The Portland tide gauge, with continuous records dating back to 1912, recorded a water level of 14.57 feet on January 13, breaking the previous all-time record of 14.17 feet set during the Blizzard of 1978. Historic structures on the waterfront, including 200-year-old fishing shacks at Fisherman's Point, were destroyed. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Maine: this manual's extended-power-outage guidance carries real weight given the 1998 ice storm's scale, and coastal households should treat "record" flood levels as something that can be broken again soon, not a fixed ceiling, given that Maine set a new all-time coastal water-level record in January 2024, just 46 years after the previous record was set.

Sources

- Ice Storm of 1998 data: WGME; Center Square

- January 2024 Maine coastal storm data: WGME; Bangor Daily News

Maine: Laws & Legal Considerations

Rainwater harvesting: no state law either way

Maine is unusual among the states covered on this site in having no state-level law specifically addressing rainwater harvesting at all, neither permitting it explicitly nor restricting it.

Rule	Maine
Source water	Rooftop or other catchment
State-level permit or restriction	None; the practice falls outside any specific state statute
What still applies	General water rights and health codes, plus any local county or municipal ordinances that may separately address it

Where to find it: check with your local municipality, since Maine’s silence at the state level means local rules, where they exist, control.

Water rights: riparian reasonable-use

Maine’s early water law follows riparian doctrine: landowners along a water body may make reasonable use of its natural flow, though they don’t own the water itself.

Concept	How it works in Maine
Basic rule	Riparian owners have a right to the reasonable use of a stream's natural flow, without substantially interfering with other users' rights
Ownership	Riparian owners don't own the water itself, only the right to reasonable use of it

Where to find it: the Maine Legislature’s water law materials and the Department of Environmental Protection.

Permitless carry from age 21, with a pending bill to lower it

Maine has allowed permitless concealed carry since 2015.

Requirement	Detail
Standard	Permitless carry, concealed, for anyone 21+ legally eligible to possess a firearm
Military exception	18+ active-duty, National Guard, or honorably discharged veterans may carry concealed without a permit
Under 21, non-military	May still carry concealed with a Maine Permit to Carry Concealed Handguns, or a recognized out-of-state permit
Optional permit (21+)	Remains available, shall-issue, mainly for reciprocity while traveling

A pending bill, not current law

LD 424, introduced by state Rep. Alicia Collins, would lower Maine’s general permitless-carry age from 21 to 18 to match the state’s legal adult age for voting and military enlistment. As of early 2026 this has not been enacted; confirm current status if reading this later.

Sources

- Maine’s lack of state-level rainwater harvesting regulation: Survival Sullivan; Rain Harvest Pro
- Maine riparian water law: Texas Real Food
- Maine permitless carry, military exception, and pending LD 424: Alien Gear Holsters; Maine State Police

[BY STATE](#) › [MAINE](#)

Maine: Local Resources

Maine Emergency Management Agency (MEMA)

MEMA, part of the Department of Defense, Veterans, and Emergency Management, provides training in partnership with FEMA for government officials, emergency services personnel, business representatives, and community volunteers.

Where to find it: maine.gov/mema.

UMaine Extension: Master Gardener Volunteer Program

University of Maine Cooperative Extension runs the same category of program as every other state covered on this site, with a fully online structure.

- **UMaine Extension Master Gardener Volunteer Program:** an 18-week online course (late October through late March) requiring 4-5 hours per week, followed by a 40-hour hands-on volunteer internship. Certified volunteers then contribute at least 20 hours annually. The course costs \$400, with sliding-scale options at \$200 and \$100.

Where to find it: extension.umaine.edu/gardening/master-gardeners.

CERT: statewide base training plus specialty academies

Maine's CERT program trains teams in basic disaster response skills, fire safety, light search and rescue, team organization, and disaster medical operations, then offers periodic CERT Academy weekend sessions for specialty training beyond the basics, a structure not every state covered on this site offers.

Where to find it: maine.gov/mema/community-preparedness/cert.

Sources

- MEMA structure and training programs: Maine Emergency Management Agency

- UMaine Extension Master Gardener Volunteer Program requirements: University of Maine Cooperative Extension
- Maine CERT program and specialty academies: Maine Emergency Management Agency

BY STATE › MAINE

Maine: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Ice Storm of 1998

Metric	Figure
Dates	January 5-9, 1998
Ice accumulation	Up to 3 in
Deaths	5-8 (sources vary)
Peak power outages	~900,000 Mainers affected at some point during the storm
Forest acreage damaged	~17 million acres
State cost	\$320 million
Natural resource losses (separate estimate)	\$1 billion+
Federal disaster declaration	All 16 Maine counties
Historical ranking	Identified by a later study as the worst natural disaster in Maine's history

Why the death count varies

Sources report Maine deaths from this storm anywhere from 5 to 8, largely because the causes were indirect and varied: carbon monoxide poisoning from improperly used generators, hypothermia in an unheated home, a fall on a dark staircase, and a structural collapse under ice weight. These aren’t always counted the same way across different official tallies, which is why the range is presented rather than one number.

The January 2024 coastal storms

Metric	Figure
Dates	January 10 and January 13, 2024 (two separate storms)
Wind gusts	60-80 mph
Portland record water level, Jan 13	14.57 ft, a new all-time record
Previous record	14.17 ft, set during the Blizzard of 1978
Portland gauge record history	Continuous since 1912
Notable losses	Historic fishing shacks at Fisherman's Point, some with 200-year-old timbers, destroyed at Willard Beach

A record broken after 46 years, not a century

The previous Portland record stood since 1978, 46 years before it was broken. That’s a meaningfully shorter interval than “once in a lifetime” framing usually implies, and it’s a useful data point for any coastal Maine household treating past record floods as a fixed ceiling rather than a number that can be exceeded again within a single adult’s lifetime.

Sources

- Ice Storm of 1998 data: WGME; Center Square
- January 2024 Maine coastal storm data: WGME; Bangor Daily News

Maryland: Overview

Everything in the main manual and the skill guides applies in Maryland exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Maryland go deeper on laws, local resources, and the data behind the risks named here.

The Key Bridge collapse: a hazard mechanism new to this site

At 1:25 AM on March 26, 2024, the container ship Dali lost electrical power twice within seconds of each other while leaving Baltimore Harbor, and struck a support pier of the Francis Scott Key Bridge. The bridge's central span collapsed almost immediately, killing 6 construction workers who were on it at the time. This is a genuinely different infrastructure failure than any covered elsewhere on this site, not an internal system failure like Michigan's dam collapses or Ohio's derailment, but a catastrophic external strike against critical infrastructure, and a reminder that bridges and similar structures carry a specific collision risk that most household preparedness planning doesn't normally consider. See the Risks page for the full data.

The Chesapeake Bay: land that's actually disappearing

Maryland's other defining risk isn't a single event, it's an ongoing loss of land itself. More than 500 islands have already vanished from the Chesapeake Bay, Holland Island's last standing house collapsed into the water in 2010, and Smith Island has lost roughly 3,300 of its original acres over the past 150 years, with only about 900 acres still habitable. Sea level in the Bay is rising at roughly twice the global average rate. This is a genuinely different framing from the sea-level-rise coverage on Florida's, Virginia's, and New York's pages, those focus on flood-day increases and infrastructure risk; Maryland's Chesapeake communities are losing the land itself.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Maryland: households near major shipping channels and critical bridges should be aware that infrastructure collapse from a vessel strike, while rare, is a real category of disaster with almost no warning time, and residents of Chesapeake Bay island and shoreline communities face a genuinely different kind of long-term planning question than storm preparedness alone, whether the land itself will still be habitable within a normal planning horizon.

Sources

- Francis Scott Key Bridge collapse details, cause, and deaths: Wikipedia, sourced to NTSB and contemporary reporting; NTSB
- Chesapeake Bay island loss and sea level rise rate: Chesapeake Bay Program; Chesapeake Climate Action Network

Maryland: Laws & Legal Considerations

Rainwater harvesting: legal and codified in the state plumbing code

Maryland treats rainwater harvesting as a defined, regulated category within its building code rather than leaving it to general water law.

Rule	Maryland
Source water	Rooftop or other catchment
Permit required	No, for typical residential non-potable systems
Permitted uses	Non-potable: toilet flushing and similar uses
Underlying code	2018 Maryland Plumbing Code, Chapter 13 (Nonpotable Water Systems), §1303 (Non-Potable Rainwater Collection and Distribution Systems)

Where to find it: Maryland’s water conservation guidance (mde.maryland.gov) recommends non-potable rainwater use as part of standard conservation practice.

Water rights: riparian, with a real interstate dispute in its history

Maryland follows ordinary riparian rights doctrine for its waterways, but its most consequential water-law episode wasn’t about ordinary reasonable use, it was a genuine interstate fight with Virginia over the Potomac River that reached the U.S. Supreme Court.

Concept	How it works in Maryland
Who holds the right	Landowners with property abutting a body of water
What riparian rights include	Access to the water, building a pier or dock, and reasonable use without transforming the water itself

Virginia v. Maryland (2003)

Maryland and Virginia disputed Virginia’s right to withdraw water from the Potomac River and build structures into it, a conflict rooted in a 1785 compact between the two states. The U.S. Supreme Court ruled in Virginia’s favor in 2003, confirming Virginia’s riparian rights on the river didn’t require Maryland’s permission. It’s a useful reminder that water rights disputes aren’t always between individual landowners, sometimes they’re between entire states.

Where to find it: the Maryland Department of the Environment administers state water rights and permitting.

Concealed carry: a two-license sequence, not a single application

Maryland requires a Wear and Carry Permit, but unlike most states covered on this site, getting one requires first holding a separate, distinct license.

Requirement	Detail
Prerequisite	A Handgun Qualification License (HQL) is required before applying for the Wear and Carry Permit; the HQL has its own training, fingerprinting, and background check
Standard	Shall-issue since the 2022 Bruen decision
Minimum age	21 (18 for active-duty military)
Training required	16 hours, including live-fire practice and demonstrated proficiency
Cost	\$125 non-refundable application fee, on top of the separate HQL cost

Why this sequential structure is genuinely different from Illinois's

Illinois also requires two licenses (a FOID card, then a separate CCL), but a FOID card is required just to own a gun at all. Maryland’s HQL is specifically a prerequisite step toward carrying, layered directly beneath the Wear and Carry Permit itself, a different structural relationship between the two licenses.

Sources

- Maryland rainwater harvesting rules under the Plumbing Code: Maryland water conservation guidance

- Virginia v. Maryland Supreme Court case: Wikipedia
- Maryland Wear and Carry Permit and HQL requirements: Maryland State Police; Alien Gear Holsters

Maryland: Local Resources

MDEM and MdReady

The Maryland Department of Emergency Management (formerly known as MEMA, the acronym still appears in some older materials) coordinates statewide preparedness, mitigation, response, and recovery. Its main public-facing tool is the MdReady app, which provides emergency notifications and preparedness information directly to residents' phones.

Where to find it: mdready.maryland.gov.

University of Maryland Extension: Maryland's version of the other states' land-grant Extension programs

University of Maryland Extension runs the same category of program as every other state covered on this site, active in 20 Maryland counties plus Baltimore City.

- **Master Gardener Program:** 50 hours of basic training, followed by 40 hours of volunteer service in the first year to certify, then 20 volunteer hours and 10 continuing-education hours annually to maintain it.

Where to find it: extension.umd.edu lists the program by county.

CERT: entirely county and municipal, no statewide MDEM-run program

Unlike some states covered on this site where CERT is coordinated directly by the state emergency management agency, Maryland's CERT programs are run entirely at the county or municipal level.

A representative example

Montgomery County runs an active CERT program alongside a "Ready Montgomery" seminar series specifically designed to educate residents on emergency preparedness, in partnership with local emergency management and fire/rescue services.

Where to find it: mdem.maryland.gov/pages/cert.aspx lists Maryland's CERT programs by jurisdiction.

Sources

- MDEM structure and MdReady app: Maryland Department of Emergency Management; MdReady
- University of Maryland Extension Master Gardener Program requirements and county reach: UMD Extension
- Maryland CERT program structure, county-level administration: MDEM; Montgomery County

BY STATE › MARYLAND

Maryland: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Francis Scott Key Bridge collapse (2024)

Metric	Figure
Date and time	1:25 AM, March 26, 2024
Deaths	6, all construction workers on the bridge at the time
Cause	The container ship Dali lost electrical power twice within seconds while leaving Baltimore Harbor, striking a bridge support pier
Ship size	~984 ft long, ~213 million lbs
Port of Baltimore closure	Channel fully reopened after 11 weeks
Daily cargo value affected	\$100-200 million
Jobs directly dependent on the port	~8,000

The collapse happened almost instantly once the ship struck the pier, there was essentially no meaningful warning time between the vessel losing power and the bridge coming down, which is part of why the 6 workers on the span had no realistic chance to evacuate.

The Chesapeake Bay: a slow, ongoing loss of land

Metric	Figure
Islands already lost to the Bay	500+
Holland Island's last house collapse	2010
Smith Island acres eroded over 150 years	~3,300
Smith Island acres still habitable	~900
Bay sea level rise rate vs. global average	~2x
Sea level rise at the Bay's mouth	~1.3 ft/century
Local rise rate (land subsidence + sea level)	4.6 mm/year (vs. 3.0 mm/year global average)

Why this isn't the same story as Florida's or Virginia's sea level rise pages

Those pages focus on flood-day frequency and infrastructure risk in major coastal cities. The Chesapeake Bay’s island communities face something more absolute: Holland Island once had over 350 residents, a church, a school, and a post office, and today it’s marsh poking through the water. Smith Island’s remaining population faces the real possibility that most of the island will be underwater by 2100. This is land loss, not just more frequent flooding of land that still exists.

What these two have in common

The Key Bridge collapse and the Chesapeake Bay’s island loss sit at opposite extremes of the same underlying point: Maryland’s infrastructure and geography both face genuine risk, one from a single catastrophic minute with almost no warning, the other from a slow-motion process measured in decades that’s just as certain to keep happening.

Sources

- Francis Scott Key Bridge collapse details: Wikipedia, sourced to NTSB and contemporary reporting
- Chesapeake Bay island loss and sea level rise data: Chesapeake Bay Program; Newsweek

Massachusetts: Overview

Everything in the main manual and the skill guides applies in Massachusetts exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Massachusetts go deeper on laws, local resources, and the data behind the risks named here.

The Worcester tornado: the deadliest in New England history

On June 9, 1953, an F4 tornado tore through Worcester and surrounding towns, staying on the ground for 78 minutes across 48 miles, killing 94 people and leaving roughly 10,000 homeless. It remains the deadliest tornado ever recorded in New England, a region most people don't associate with serious tornado risk at all. See the Risks page for the full data.

The Blizzard of 1978: a three-day siege that shut down the state

Twenty-five years later, a very different kind of storm defined Massachusetts's severe-weather history: a nor'easter that dropped 27.1 inches of snow on Boston over nearly 33 hours, killed 54 people statewide, and left roughly 10,000 residents in emergency shelters after more than 2,500 homes were effectively destroyed. Massachusetts was functionally shut down for the better part of a week.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Massachusetts: households need a real severe-weather plan that covers both ends of the spectrum, a practiced tornado shelter plan for summer thunderstorm season and genuine multi-day winter-storm self-sufficiency (heat, food, water, and a plan that doesn't assume roads will be passable) for nor'easter season, rather than treating either as the state's "main" risk to the exclusion of the other.

Sources

- 1953 Worcester tornado deaths, path, and damage: Wikipedia, sourced to NWS; Blue Hill Observatory

- 1978 Blizzard deaths, snowfall, and damage: Wikipedia, sourced to NWS and contemporary reporting; New England Historical Society

Massachusetts: Laws & Legal Considerations

Rainwater harvesting: legal and encouraged

Massachusetts places no meaningful state-level restriction on residential rainwater harvesting for non-potable use, and actively promotes it as part of its water conservation policy.

Rule	Massachusetts
Source water	Rooftop or other catchment
Permit required	No, for typical residential non-potable systems
Permitted uses	Non-potable: irrigation, and graywater-style reuse where applicable
Larger withdrawals	Governed separately under the Water Management Act, not the rainwater rules

Where to find it: the Massachusetts Department of Environmental Protection (mass.gov/dep) publishes water conservation guidance.

Water rights: riparian reasonable use, with a state permit layer for larger withdrawals

Massachusetts follows the standard riparian reasonable-use doctrine, but pairs it with a more active state permitting system than several other riparian states covered on this site.

Concept	How it works in Massachusetts
Who holds the right	Owners of land bordering a natural watercourse
Governing principle	Reasonable use, weighed against the purpose, economic and social value, and potential harm to other riparian owners
Larger withdrawals	The Water Management Act requires a permit for significant water withdrawals
Smaller groundwater withdrawals	A 2014 amendment to the Act created a separate, lighter-touch permitting program specifically for small groundwater withdrawals

Where to find it: the Massachusetts Department of Environmental Protection administers Water Management Act permits.

Concealed carry: a License to Carry with a discretionary suitability standard

Massachusetts requires a License to Carry Firearms (LTC), and its licensing authorities apply a “suitability” determination that gives them real discretion, a meaningfully different structure from the purely objective shall-issue systems covered on most other states’ pages.

Requirement	Detail
Standard	The local licensing authority must determine the applicant is a "suitable person," on top of meeting the objective statutory criteria
Training required	A Massachusetts-certified Basic Firearms Safety course
Process	Background check, fingerprinting, and an in-person interview
Cost	\$100, non-refundable (no charge for renewal at age 70+)
Training update	New firearms safety course requirements, including a live-fire component, take effect for applications submitted on or after April 2, 2026

Where this sits relative to the other states covered so far

The explicit “suitable person” discretionary standard puts Massachusetts’s LTC process closer to New York’s and New Jersey’s end of the spectrum than to the shall-issue systems in states like Pennsylvania or North Carolina, though all of these states’ discretionary standards have been narrowed somewhat by post-*Bruen* federal court rulings. Confirm current status with your local licensing authority rather than assuming full discretion still applies unchanged.

Sources

- Massachusetts rainwater harvesting and Water Management Act: LegalClarity; State Regs Today
- Massachusetts LTC requirements and 2026 training changes: Alien Gear Holsters; MW Peterson Law

[BY STATE](#) › [MASSACHUSETTS](#)

Massachusetts: Local Resources

MEMA and Ready Massachusetts

The Massachusetts Emergency Management Agency runs public outreach through the Ready Massachusetts (#ReadyMA) campaign, built around four core messages: stay informed and sign up for alerts, make a plan, build a kit, and get involved in community preparedness. Materials are available in seven languages.

Where to find it: mass.gov/ready.

Master Gardeners: the one state covered here where this isn't run through Extension

Every other state covered on this site runs its Master Gardener program through the official state land-grant Extension service. Massachusetts is the exception.

What actually happened here

UMass Extension's own Master Gardener program ended in 1989 due to funding cuts. Rather than disappearing, a group of program graduates organized independently and kept it going, and regional volunteer associations, the Western Massachusetts Master Gardener Association among them, now run Master Gardener training and certification across the state outside the university system entirely. Hours and structure vary by regional association, typically in the 40-75 hour range for both training and first-year volunteer service.

Where to find it: search "[your region] Master Gardener Association" (for example, the Western Massachusetts or Cape Cod associations) for a program near you; UMass still offers a separate Horticulture Certificate Program through its University Without Walls, a related but distinct credential.

CERT: one of the largest networks covered on this site

Massachusetts has more than 160 registered CERT teams statewide, coordinated by MEMA, which also runs a “CERT Rodeo” event to give volunteers hands-on practice and connect teams across the state.

Where to find it: mass.gov/mema lists CERT program information; search “[your city/town] CERT” for a specific local team.

Sources

- MEMA Ready Massachusetts campaign structure: [Mass.gov](https://mass.gov); MEMA preparedness toolkit
- Massachusetts Master Gardener program history and current independent structure: Western Massachusetts Master Gardener Association
- Massachusetts CERT program scale and MEMA’s CERT Rodeo: [Mass.gov](https://mass.gov)

Massachusetts: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Worcester tornado (1953): the deadliest in New England history

Metric	Figure
Deaths	94
Injuries	1,288
Peak rating	F4
Path length	48 mi
Time on the ground	78 min
Buildings damaged or destroyed	~4,000
People left homeless	~10,000
Damage (1953 dollars / 2023-adjusted)	\$52.2 million / ~\$590 million

The tornado’s most concentrated toll came in a single minute: 60 of its 94 deaths occurred within Worcester itself as the storm clipped the northern part of Lake Quinsigamond on its way toward Shrewsbury.

The Blizzard of 1978: a three-day siege

Metric	Figure
Massachusetts deaths	54
Northeast-wide deaths	~100
Injuries (Northeast-wide)	~4,500
Boston snowfall total	27.1 in
Storm duration	32 hrs, 40 min
Massachusetts damage (1978 dollars / 2025-adjusted)	\$500 million / ~\$2.57 billion
Homes effectively destroyed	2,500+
People sheltered	~10,000

Why the death toll was so high for a snowstorm

Many of the blizzard’s deaths came from causes specific to a prolonged, disorienting storm rather than the cold alone: some victims were electrocuted by downed power lines, others became lost or trapped in snowbanks near their own vehicles and weren’t found for weeks. This is part of why this manual treats winter storm planning as more than just staying warm, visibility, downed-line awareness, and not attempting to travel matter just as much.

What these two have in common

Separated by 25 years, the Worcester tornado and the Blizzard of 1978 demonstrate that Massachusetts carries two of the most severe possible expressions of ordinary New England weather, an early-summer thunderstorm that produced the region’s deadliest tornado on record, and a routine winter nor’easter pattern that, under the right conditions, became one of the most catastrophic storms the Northeast has ever recorded.

Sources

- 1953 Worcester tornado death toll, path, and damage: Wikipedia, sourced to NWS; Blue Hill Observatory

- 1978 Blizzard death toll, snowfall, and damage: Wikipedia, sourced to NWS and contemporary reporting; New England Historical Society

Michigan: Overview

Everything in the main manual and the skill guides applies in Michigan exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Michigan go deeper on laws, local resources, and the data behind the risks named here.

The Flint water crisis: when the water system itself is the hazard

In April 2014, the city of Flint switched its municipal water source from Detroit's system to the Flint River as a cost-saving measure. The river water corroded aging lead pipes, and roughly 100,000 residents were exposed to elevated lead levels before the city switched back to Detroit water 18 months later. A concurrent Legionnaires' disease outbreak, traced to the same water switch, killed at least 12 people. This is the second infrastructure-failure disaster covered on this site, after Ohio's East Palestine derailment, and it's the clearest illustration yet of why this manual treats water storage and testing as a real household priority, not a hypothetical one. See the Risks page for the full data.

The 2020 Midland dam failures: when aging infrastructure fails at once

On May 19, 2020, after days of heavy rain, the privately-owned Edenville Dam failed, and the sudden surge overwhelmed the downstream Sanford Dam within hours, both structures giving way on the same evening. Roughly 11,000 people evacuated with as little as 18 hours' warning; officials estimate that decision saved 10 to 20 lives. No deaths resulted, a genuinely fortunate outcome given the scale of the failure, but the event is a stark example of how quickly a flood risk can escalate when the infrastructure holding water back gives out.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Michigan: household water storage and a working water filter or purification method matter here specifically because Michigan has already had a real, sustained municipal water failure, and anyone living downstream of an aging dam, and Michigan has hundreds of them built decades ago, should treat evacuation-readiness as a genuine, not theoretical, plan.

Sources

- Flint water crisis timeline and health impact: Wikipedia, sourced to CDC and Michigan state records; NRDC
- Edenville and Sanford Dam failures: USGS; Mackinac Center

BY STATE › MICHIGAN

Michigan: Laws & Legal Considerations

Rainwater harvesting: legal and actively encouraged

Michigan places no state-level restriction on residential rainwater harvesting, and state law specifically encourages it as a cost-efficient practice.

Rule	Michigan
Source water	Rooftop or other catchment
Permit required	No, for typical residential outdoor systems; indoor non-potable systems fall under the Michigan Plumbing Code and require permits
Permitted uses	Non-potable: irrigation, and per Plumbing Code Appendix A, certain indoor non-potable fixtures with a permitted system
Potable use	Not addressed; the plumbing code requires potable water for drinking, bathing, and cooking fixtures, with no treatment or certification pathway for harvested rainwater
Underlying framework	Cost Effective Governmental Energy Use Act; 2018 Michigan Plumbing Code, Appendix A (Non-Potable Water Systems)

A local incentive worth knowing about

Washtenaw County offers a credit for installing a rain barrel or cistern, similar in spirit to Philadelphia’s rainwater subsidy program covered on Pennsylvania’s page, though smaller in scale. Check with your own county or municipality for similar local programs.

Where to find it: the Michigan Department of Environment, Great Lakes, and Energy (michigan.gov/egle) for state guidance; your local municipality for specific plumbing permit requirements.

Water rights: riparian rules that change depending on which shoreline you’re on

Michigan borders four of the five Great Lakes, more than any other state, and its riparian law reflects that: the rules that apply to an inland lake or stream are meaningfully different from the rules that apply to actual Great Lakes shoreline.

Water body type	How riparian rights work
Inland lakes and streams	Standard riparian doctrine: landowners bordering the water have reasonable-use rights, similar to most states covered on this site
The four bordering Great Lakes	Many standard riparian rules don't apply the same way; bottomlands ownership and shoreline rights follow a distinct legal framework specific to Great Lakes frontage

Michigan's Great Lakes Compact status, a contrast with Illinois

Michigan is a full member of the Great Lakes-St. Lawrence River Basin Water Resources Compact (2008), which treats groundwater and surface water in the Basin as one connected system and prohibits diversions outside it. This is a meaningfully different position from Illinois, which is exempt from certain Compact diversion provisions because of its pre-existing Chicago Sanitary and Ship Canal diversion; Michigan has no equivalent historical exemption.

Where to find it: the Michigan Lakes and Streams Association (mymlsa.org) publishes plain-language guidance distinguishing inland riparian rights from Great Lakes shoreline rights.

Concealed carry: shall-issue with a live-fire training requirement

Michigan requires a Concealed Pistol License (CPL) to carry concealed, issued at the county level, with a more demanding training component than some other shall-issue states covered on this site.

Requirement	Detail
Standard	Shall-issue: the county clerk must issue a CPL to any applicant meeting statutory requirements
Minimum age	21
Residency	Michigan resident for at least 6 months prior to application
Training required	8 hours total: at least 5 hours classroom (Michigan firearm law, safe handling/storage, use of deadly force, pistol fundamentals) plus at least 3 hours live-fire, firing a minimum of 30 rounds
Cost	\$100 state application fee, paid to the county clerk
Processing	Fingerprinting within 45 days of application; license issued or denied within 45 days of classifiable fingerprints

Sources

- Michigan rainwater harvesting rules and plumbing code requirements: LegalClarity; WKFR
- Michigan riparian rights on inland waters versus the Great Lakes: Michigan Lakes and Streams Association
- Great Lakes Compact membership and provisions: Great Lakes Compact, Wikipedia
- Michigan CPL requirements: Michigan State Police; CCW Hub

[BY STATE](#) › MICHIGAN

Michigan: Local Resources

Michigan State Police and MIREADY

The Michigan State Police Emergency Management and Homeland Security Division runs public preparedness outreach through MIREADY, alongside a newer “Know Your Plan. Be Alert.” campaign specifically focused on getting residents signed up for local emergency alerts.

Where to find it: michigan.gov/miready.

MSU Extension: Michigan’s version of the other states’ land-grant Extension programs, delivered mostly online

Michigan State University Extension runs the same category of program as every other state covered on this site, but its Master Gardener path is structured differently from most: the core educational component is a 10-week online course rather than an in-person classroom series.

How Michigan's program differs from most other states' Master Gardener paths

The Foundations of Gardening course is fee-based, offered twice a year, and combines self-paced learning with weekly live sessions. After completing it, participants become eligible to join the volunteer program, and 40 hours of volunteer service within 12 months completes certification. This online-first structure is a genuine departure from the classroom-hours model most other states covered on this site use.

Where to find it: canr.msu.edu/master_gardener_volunteer_program.

CERT: Detroit’s own program plus county chapters statewide

Detroit runs its own CERT program directly through the city’s Homeland Security & Emergency Management department, alongside independent chapters in counties across the state.

What's available where

Detroit's CERT program runs free, quarterly 4-day training sessions, requiring all four sessions for certification. Outside the city, Monroe, Oakland, and Grand Traverse counties, along with cities like Ferndale and Dearborn Heights, run their own separate CERT chapters, the same decentralized-with-a-flagship-city pattern seen in a few other states covered on this site.

Where to find it: within Detroit, detroitmi.gov/dhsem. Elsewhere in Michigan, search “[your county] CERT” or check with your county’s emergency management office.

Sources

- Michigan State Police MIREADY and alert-sign-up campaigns: Michigan.gov MIREADY; MSP Newsroom
- MSU Extension Master Gardener Program structure: MSU Extension
- Detroit and county CERT program structure: City of Detroit; Oakland County

BY STATE › MICHIGAN

Michigan: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Flint water crisis (2014-2015): a municipal water system as the hazard

Metric	Figure
Water source switched to Flint River	April 25, 2014
Switched back to Detroit water	October 16, 2015
Total residents exposed to elevated lead	~100,000
Children exposed to high lead levels	6,000-12,000
Legionnaires' disease cases, Genesee County	87, June 2014-November 2015
Legionnaires' disease deaths	12 confirmed (some later counts include 2 additional deaths, for 14 total)
State of emergency declared	December 15, 2015 (city); January 5, 2016 (state); January 16, 2016 (federal)

Why the death-toll figure varies slightly, and why that's not a red flag

The 12-death figure is the most commonly cited confirmed Legionnaires’ toll tied directly to the water switch; some later accounts include 2 additional deaths bringing the total to 14. This is the same kind of death-count evolution this site has flagged for other disasters (Winter Storm Uri, the 2021 Oregon heat dome), not a sign of unreliable reporting, just how mortality investigations for a slow-developing public health crisis typically resolve over time.

The crisis wasn’t caused by a natural event at all: switching the water source to save money, without adding required corrosion-control treatment, let the more corrosive river water leach lead directly from aging pipes into

tens of thousands of homes for a year and a half before the switch was reversed.

The Edenville and Sanford dam failures (2020): aging infrastructure, sudden failure

Metric	Figure
Date	May 19, 2020
Rainfall, Midland County (3 days prior)	4.7 in
Rainfall, Gladwin County (3 days prior)	up to 8 in
People evacuated	~11,000
Warning time before evacuation	~18 hours
Homes/buildings damaged	2,500+
Damage estimate	~\$200 million
Deaths	0
Estimated lives saved by early evacuation	10-20

The Edenville Dam’s earthen embankment failed first, washing away a 900-foot section, and the resulting surge overwhelmed the downstream Sanford Dam within hours, a cascading failure of two separate structures on the same evening. Both dams were privately owned and had a documented history of safety concerns before the failure.

What these two have in common

Neither of Michigan’s defining modern disasters was a hurricane, earthquake, or wildfire, both were failures of built infrastructure that Michigan residents had every reason to assume was safe: a water system and a set of aging dams. That’s a genuinely different risk character from most other states covered on this site, and it’s a direct argument for why household-level water storage, filtration, and evacuation planning matter even when the immediate cause of a disaster isn’t the weather.

Sources

- Flint water crisis timeline, exposure figures, and Legionnaires' disease death toll: Wikipedia, sourced to CDC and Michigan state records; NRDC
- Edenville and Sanford dam failure data: USGS; Mackinac Center

Minnesota: Overview

Everything in the main manual and the skill guides applies in Minnesota exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Minnesota go deeper on laws, local resources, and the data behind the risks named here.

The 1997 Red River flood: catastrophic damage, zero deaths

In April 1997, the Red River of the North crested at 54 feet in Grand Forks, 5 feet above the National Weather Service's own worst-case estimate, flooding East Grand Forks, Minnesota and neighboring Grand Forks, North Dakota so completely that all but eight homes in East Grand Forks were damaged. More than 50,000 people evacuated, and total damage reached \$3.5-3.6 billion, at the time the eighth-costliest flood in U.S. history. Despite the scale, no deaths resulted, a genuine success story for early warning and evacuation that stands in useful contrast to disasters elsewhere on this site where warning time or evacuation execution fell short. See the Risks page for the full data.

The 1991 Halloween Blizzard: a storm that broke its own category

On October 31, 1991, a blizzard dropped 28.4 inches of snow on the Twin Cities and 36.9 inches on Duluth, still the largest single-storm snowfall total in Minnesota history more than three decades later. The storm killed roughly 20-22 people and arrived astonishingly early in the season, an unusual combination of scale and timing that caught much of the state unprepared for a storm of that magnitude in October.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Minnesota: households along the Red River Valley and other flood-prone waterways should take early evacuation orders seriously, 1997 shows how effective that response can be, and winter storm preparedness needs to start before the conventional winter season does, the Halloween Blizzard demonstrates that Minnesota's worst snowstorms don't wait for a calendar date.

Sources

- 1997 Red River flood damage, crest height, and evacuation figures: Wikipedia, sourced to NWS; Grand Forks County Historical Society
- 1991 Halloween Blizzard snowfall and death toll: MNopedia; Minnesota DNR

Minnesota: Laws & Legal Considerations

Rainwater harvesting: legal and encouraged, but with a real approval step

Minnesota’s Department of Natural Resources actively encourages rainwater harvesting as a conservation practice, but the actual installation process is more involved than the simple permit-free rule most other states covered on this site use.

Rule	Minnesota
Source water	Roof surfaces made of hard, impervious material specifically
Permitted uses	Non-potable
Installation requirement	Commissioner approval is required to install, build, change, or fix a rainwater-catching system
Underlying rule	Minn. Stat. §4714.1602.7.4

Why this is a meaningfully different process than most states covered so far

Most states covered on this site let a resident install a basic rooftop rain barrel with no state involvement at all. Minnesota’s commissioner-approval requirement is a genuine, if modest, additional step, worth planning for before assuming a simple rain barrel needs no state-level sign-off.

Where to find it: the Minnesota Department of Natural Resources (dnr.state.mn.us) administers approval and general water law guidance.

Water rights: riparian, comparatively permissive next to Western states

Minnesota follows the common-law riparian doctrine, limited by reasonable use, the same broad family as most Midwestern and Eastern states covered on this site.

Concept	How it works in Minnesota
Who holds the right	Owners of land riparian to a water source
Governing principle	Reasonable use for domestic, agricultural, and manufacturing purposes

Where to find it: the Minnesota DNR administers water rights and appropriation permits statewide.

Permit to Carry: required, unlike some neighboring states

Minnesota requires an actual Permit to Carry, a meaningful contrast with neighboring states like Indiana and Ohio’s permitless systems covered elsewhere on this site.

Requirement	Detail
Standard	A Permit to Carry is required to carry a handgun in public at all, concealed or not
Minimum age	21
Training required	Certified handgun safety training within one year of application or renewal
Issuing authority	The county sheriff where the applicant resides (nonresidents may apply to any Minnesota county)
Cost and validity	\$100 initial fee (capped by law), \$75 renewal, valid 5 years
Processing time	Up to 30 days

One practical benefit of holding the permit

A Minnesota Permit to Carry holder doesn’t need a separate Permit to Purchase when buying a firearm, the carry permit itself satisfies that requirement.

Sources

- Minnesota rainwater harvesting rules and commissioner approval requirement: Rain Harvest Pro; AllowedHere
- Minnesota riparian water rights: State Regs Today
- Minnesota Permit to Carry requirements: Minnesota Dept. of Public Safety; Minnesota Gun Owners Caucus

Minnesota: Local Resources

HSEM: no single branded consumer campaign, organized by audience instead

The Minnesota Division of Homeland Security and Emergency Management, formed in 2003 by merging the state's emergency management and homeland security offices, organizes its public-facing preparedness content by audience rather than under one branded campaign name, similar to the approach on Virginia's and Arizona's pages.

Where the content actually lives

HSEM's preparedness section is split into distinct personal and family, community, and business preparedness pages, each with its own tailored guidance, rather than a single unified household checklist.

Where to find it: dps.mn.gov/divisions/hsem/programs/prep.

University of Minnesota Extension: Minnesota's version of the other states' land-grant Extension programs

UMN Extension runs the same category of program as every other state covered on this site.

- **Master Gardener Volunteer Program:** a required Core Course plus 50 hours of public horticulture education and outreach in the first year (the internship year runs January-December, with applications due October 1), then at least 25 volunteer hours and 5-12 continuing-education hours annually (varying by county) to maintain certification.

Where to find it: extension.umn.edu lists the program by county.

CERT: supported through HSEM and FEMA local sponsor partnerships

Minnesota's CERT program operates year-round through local sponsor partners, with HSEM and FEMA providing support, covering preparedness activities, event assistance, and disaster site deployment when needed.

Where to find it: dps.mn.gov/divisions/hsem/programs lists current CERT and community preparedness programs.

Sources

- HSEM structure and preparedness program organization: Minnesota Dept. of Public Safety
- UMN Extension Master Gardener Program requirements: UMN Extension
- Minnesota CERT program structure: League of Minnesota Cities

BY STATE › MINNESOTA

Minnesota: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 1997 Red River flood: a disaster with no fatalities

Metric	Figure
Deaths	0
Total damage (Red River region)	\$3.5 billion
Damage in the immediate Grand Forks/East Grand Forks area	\$3.6 billion
Crest height at Grand Forks	54 ft (5 ft above the NWS's own worst-case estimate)
People evacuated	50,000+
East Grand Forks homes damaged	All but 8
Floodwater extent inland	3+ mi
National ranking at the time	8th costliest flood in U.S. history

Why zero deaths from a flood this severe is worth highlighting

A flood that exceeded the National Weather Service’s own worst-case crest prediction by 5 feet, flooded nearly every home in an entire city, and forced 50,000 people to evacuate could easily have been fatal on a large scale. That it wasn’t reflects effective advance warning and evacuation execution, a useful contrast to some other disasters covered on this site where warning time or evacuation compliance fell short.

The 1991 Halloween Blizzard: still Minnesota’s snowfall record-holder

Metric	Figure
Date	October 31-November 1, 1991
Twin Cities snowfall total	28.4 in
Duluth snowfall total	36.9 in, still the largest single-storm total in Minnesota history
Deaths	~20-22
Injuries	100+
Damage	~\$11.7 million
Peak wind gusts	60 mph
Temperature drop	Into the teens, with the Twin Cities airport hitting -3°F, the earliest sub-zero reading on record at the time
Duluth continuous snowfall duration	72 hours straight

The storm still holds Minnesota’s records for both highest single-storm snowfall total and highest 24-hour snowfall total, more than three decades on, a useful reminder that record-setting weather events don’t automatically get surpassed just because time passes.

What these two have in common

The Red River flood and the Halloween Blizzard demonstrate opposite outcomes from Minnesota’s severe weather extremes, one a catastrophic-scale disaster handled well enough to avoid fatalities, the other a storm whose sheer unexpectedness, both in scale and timing, contributed directly to its death toll. Both argue for the same practical lesson: take official warnings seriously regardless of the calendar or how unlikely a worst-case scenario seems.

Sources

- 1997 Red River flood damage, crest, and evacuation data: Wikipedia, sourced to NWS; NWS flood assessment

- 1991 Halloween Blizzard snowfall, deaths, and records: MNopedia; Minnesota DNR

Mississippi: Overview

Everything in the main manual and the skill guides applies in Mississippi exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Mississippi go deeper on laws, local resources, and the data behind the risks named here.

Hurricane Katrina (2005): the Gulf Coast's story, not New Orleans's

Louisiana's page on this site covers Hurricane Katrina through the lens of the levee and floodwall failures that flooded New Orleans, an engineering failure as much as a storm. Mississippi's Katrina is a genuinely different disaster mechanism: the storm made its second landfall right at the Louisiana-Mississippi state line, and the Mississippi Gulf Coast took a direct hit from the highest storm surge ever recorded in U.S. history at the time, more than 27 feet in spots, that reached six to twelve miles inland. There was no levee to fail; the surge simply erased entire waterfront communities. See the Risks page for the full data.

The 2011 Smithville tornado: the other EF5 from Alabama's outbreak

Alabama's page on this site covers the April 27, 2011 Super Outbreak through its two Alabama-based EF5s, Hackleburg-Phil Campbell and Rainsville, while noting that the outbreak's other two EF5s, Philadelphia and Smithville, struck Mississippi that same day. This page picks up that thread: the Smithville tornado tore through the small town of Smithville with 205 mph winds, destroying the large majority of the town's buildings in minutes. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Mississippi: a Gulf Coast location needs the same storm-surge evacuation seriousness this manual gives coastal Louisiana and Florida, since Mississippi's own coast has already recorded the nation's highest measured surge, and Mississippi's tornado risk is genuinely severe enough to have produced one of only four EF5-rated tornadoes in the single largest outbreak in U.S. history.

Sources

- Hurricane Katrina Mississippi Gulf Coast surge, deaths, and destruction: Britannica; WLOX
- 2011 Smithville tornado data: Wikipedia; Tornado Talk

Mississippi: Laws & Legal Considerations

Rainwater harvesting: actively encouraged, not just permitted

Mississippi places no state-level restriction on residential rainwater harvesting, and the state’s own Department of Environmental Quality promotes rain barrel use as part of its stormwater management guidance.

Rule	Mississippi
Source water	Rooftop or other catchment
Permit required	No, at the state level
Permitted uses	Non-potable: irrigation and similar uses
State posture	Actively promoted by MDEQ's stormwater guidance, not merely tolerated

Where to find it: the Mississippi Department of Environmental Quality (mdeq.ms.gov) publishes stormwater and rain barrel guidance.

Water rights: riparian with a drought-triggered proportional rule

Mississippi water law is built on riparian doctrine: landowners adjacent to a water source may make reasonable use of it, and natural uses like drinking water, livestock, and garden irrigation are generally treated as reasonable by default.

Concept	How it works in Mississippi
Basic rule	Riparian landowners may use any quantity of water so long as it doesn't interfere with other riparian landowners' rights
Drought rule	During drought conditions, extraction can be restricted so all riparian owners share the reduced flow proportionally to their stream-bank ownership
Gulf Coast riparian rights	Separately defined by statute (Miss. Code §49-15-9) given the coast's tidal and littoral geography

Permitless carry since 2016

Mississippi has recognized permitless carry since July 1, 2016.

Requirement	Detail
Standard	Permitless carry, open or concealed, for anyone 18+ legally eligible to possess a firearm
Optional permits	A shall-issue Firearms Permit and an Enhanced Firearms Permit remain available, the latter extending access to a few additional sensitive locations
Why get an optional permit anyway	Reciprocity while traveling to states that don't recognize Mississippi's permitless standard for its own residents

Same April 2011 outbreak, a different state's page

Mississippi’s Smithville tornado struck the same day as the Hackleburg-Phil Campbell and Rainsville EF5s covered on Alabama’s page, part of the same nationwide Super Outbreak. This page doesn’t restate that outbreak’s full national data; see Alabama’s Risks page for the broader event context.

Sources

- Mississippi rainwater harvesting posture: Mississippi Department of Environmental Quality
- Mississippi riparian water law and drought-sharing rule: Texas Real Food; Justia, Miss. Code §49-15-9
- Mississippi permitless carry (2016) and optional permits: GunCarrier

Mississippi: Local Resources

MEMA: Mississippi Emergency Management Agency

MEMA coordinates the state's all-hazards emergency management program, including an extensive training catalog for state and local emergency managers, public officials, volunteer relief organizations, and related professionals.

Where to find it: msema.org.

Mississippi State University Extension Service: Master Gardener Program

MSU Extension runs the same category of program as every other state covered on this site.

- **Mississippi Master Gardener Program:** 40 hours of initial educational training, followed by 40 hours of volunteer service within one year to become certified. After the first year, maintaining certification requires 20 volunteer hours and 12 continuing-education hours annually.

Where to find it: extension.msstate.edu/community/leadership/master-gardener lists county chapters.

CERT: a joint MSU Extension and MEMA program

Mississippi's CERT program is delivered through a partnership between MSU Extension and MEMA, giving it a more centrally coordinated structure than the fully county-by-county CERT models covered on some other states' pages, while still operating under CERT's standard DHS policy that teams do not self-deploy.

Where to find it: extension.msstate.edu/community/disaster-preparedness/cert.

Sources

- MEMA structure and training programs: Mississippi Emergency Management Agency
- Mississippi Master Gardener Program requirements: Mississippi State University Extension Service

- Mississippi CERT program structure: Mississippi State University Extension Service

Mississippi: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Katrina (2005): the Mississippi Gulf Coast

Metric	Figure
Landfall	Second landfall near the LA/MS state line, August 29, 2005
Storm surge, Biloxi/Gulfport area	26-28 ft above normal tide, the highest measured in U.S. history at the time
Surge penetration inland	6-12 mi along bays and rivers
Mississippi deaths	231-238 (sources vary on the exact figure)
Structures destroyed, beachfront Biloxi/Gulfport/Long Beach/Pass Christian	~90% of all structures between the beach and the railroad
National damage total	\$125 billion (all affected states)

Why Mississippi's Katrina looks different from Louisiana's

Louisiana’s page on this site covers Katrina as a levee and floodwall engineering failure that flooded New Orleans over days. Mississippi’s coast had no comparable levee system to fail; the storm surge itself, among the highest ever measured in the country, simply overran entire waterfront towns directly. Same storm, two structurally different disasters.

The 2011 Smithville tornado: the other Mississippi EF5

Metric	Figure
Date	April 27, 2011
Rating	EF5
Peak winds	205 mph
Maximum width	3/4 mi
Deaths	23 total along the path, 16 in Smithville itself
Injuries	137
Structures destroyed/damaged in Smithville	117 destroyed, 50 damaged
Damage	\$14.4 million (2011 USD, Smithville-area figure)

The same outbreak Alabama's page covers

The Smithville tornado struck the same day as Alabama’s Hackleburg-Phil Campbell and Rainsville EF5s, all part of the April 2011 Super Outbreak, the largest tornado outbreak in U.S. history. Mississippi’s Philadelphia tornado was the outbreak’s fourth EF5; see Alabama’s Risks page for the outbreak’s full national context rather than repeating it here.

Sources

- Hurricane Katrina Mississippi Gulf Coast data: Britannica; WLOX
- 2011 Smithville tornado data: Wikipedia; Tornado Talk

Missouri: Overview

Everything in the main manual and the skill guides applies in Missouri exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Missouri go deeper on laws, local resources, and the data behind the risks named here.

Joplin: the deadliest U.S. tornado since modern record-keeping began

On May 22, 2011, an EF5 tornado tore a 22-mile path through Joplin, cutting a six-mile stretch of destruction directly through a densely populated part of the city with winds exceeding 200 mph. It killed 158 people, the deadliest single tornado in the United States since official record-keeping began in 1950, and caused roughly \$3 billion in damage, the costliest tornado on record. See the Risks page for the full data.

New Madrid: the town, and the fault zone, share a name for a reason

Illinois's and Tennessee's pages on this site both cover the New Madrid Seismic Zone from their own state's exposure. Missouri is where the name comes from: the town of New Madrid itself was largely destroyed during the 1811-1812 earthquake sequence, and the zone's epicenters sit within or near Missouri's own borders. This page doesn't repeat the probability figures already covered on those two states' pages; the underlying risk and data are the same regional hazard.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Missouri: tornado season preparation (a safe room, a weather radio, a practiced shelter plan) deserves the same weight here that this manual gives it anywhere in Tornado Alley, Joplin demonstrates the outer edge of what's actually possible, and southeastern Missouri counties near the New Madrid zone should treat earthquake preparedness as a real, not abstract, consideration.

Sources

- Joplin tornado death toll, path, and damage: Wikipedia, sourced to NWS; NIST

- New Madrid earthquake sequence and the town's destruction: USGS; Missouri Encyclopedia

BY STATE › MISSOURI

Missouri: Laws & Legal Considerations

Rainwater harvesting: explicitly protected for both non-potable and potable use

Missouri is one of the more permissive states covered on this site, with a specific statute protecting the right to collect rainwater for either purpose.

Rule	Missouri
Source water	Rooftop or other catchment
Permit required	No, for small-scale residential systems (typically under 100,000 gallons of storage)
Non-potable use	Legal and unrestricted
Potable use	Also legally protected, though appropriate treatment is still required to make it safe to drink
Underlying statute	RSMo §640.648, effective August 28, 2018

Why rainwater harvesting doesn't conflict with Missouri's water rights system

Because Missouri is a riparian state rather than a prior-appropriation state, collecting rainwater on your own property doesn't compete with anyone else's claim to a water source the way it might in a Western prior-appropriation state. This is part of why Missouri's rules are comparatively simple.

Where to find it: the Missouri Department of Natural Resources (dnr.mo.gov) oversees permits for larger systems.

Water rights: riparian, with a brand-new restriction on exporting water out of state

Missouri follows standard riparian reasonable-use doctrine, but a 2025 law added a genuinely new wrinkle: a specific restriction on sending Missouri's water to other states.

Concept	How it works in Missouri
Who holds the right	Landowners touching or lying above a water source
Nature of the right	Access and reasonable use, not ownership of the water itself
Water exports	A law passed in 2025 restricts exporting Missouri water to other states, reflecting a broader push by the legislature to treat water as a resource worth actively protecting rather than just regulating locally

Where to find it: the Missouri Department of Natural Resources administers water resource regulation statewide.

Permitless carry since January 2017, at a distinctive age of 19

Missouri has allowed permitless concealed carry longer than most other permitless states covered on this site, and its minimum age sits between the two thresholds used elsewhere.

Requirement	Detail
Standard	Permitless ("constitutional") carry since January 2017
Minimum age	19 (18 with qualifying military service)
Optional Concealed Carry Permit (CCP)	Available in Standard (5-year), Extended (10 or 25-year), and Lifetime versions; recognized in roughly 36 other states
Local nuance	Municipalities can still require a valid CCP to open carry within city limits, even though concealed carry itself needs no permit statewide

Age 19, an outlier of its own kind

Most permitless-carry states covered on this site set the age floor at 21, and a distinct cluster (Arkansas, Idaho, Indiana, Louisiana, Mississippi, Montana, New Hampshire, North Dakota, South Carolina, South Dakota, and West Virginia as of 2026) set it at 18. Missouri’s 19-year minimum doesn’t match either group, a genuinely distinct threshold rather than the lowest one on the site.

Sources

- Missouri rainwater harvesting statute and potable-use protection: RSMo §640.648; Watershed Committee of the Ozarks
- Missouri's 2025 water export restriction: Missouri Independent
- Missouri permitless carry, minimum age, and optional CCP: Protect With Bear; USA Gun Shop

Missouri: Local Resources

SEMA and Ready in 3

The Missouri State Emergency Management Agency, together with the American Red Cross and the state's homeland security office, runs public preparedness outreach under the Ready in 3 name, built around three core preparedness steps rather than a longer checklist.

Where to find it: health.mo.gov/emergencies/readyin3.

MU Extension: Missouri's version of the other states' land-grant Extension programs

The University of Missouri Extension runs the same category of program as every other state covered on this site, with a notably lighter training requirement than most.

- **MU Extension Master Gardener Program:** a 30-hour classroom Core Course, followed by 30 hours of volunteer service in approved MU Extension activities to certify.

Where to find it: extension.missouri.edu lists the program by county.

CERT: regionally organized, with a formal association covering the St. Louis metro area

Missouri's CERT programs are organized at the city and county level, with the St. Louis region standing out for its level of coordination: more than a dozen individual municipal CERT teams (St. Charles City, St. Charles County, Cottleville, Dardenne Prairie, Lake Saint Louis, O'Fallon, Weldon Spring, Wentzville, and others) operate under the umbrella of the St. Louis Regional CERT Association.

Federal funding structure worth knowing about

The Kansas City and St. Louis metro regions are both Urban Areas Security Initiative (UASI) jurisdictions, meaning their CERT and broader emergency preparedness councils receive direct federal funding, a step beyond the state-and-local-only funding model in less urbanized parts of Missouri.

Where to find it: within St. Louis, contact CEMA at 314-444-5466 or CERT@stlouis-mo.gov; within Kansas City, contact the city's Office of Emergency Management directly; elsewhere, search "[your county] CERT."

Sources

- SEMA and Ready in 3 campaign: Missouri Dept. of Health and Senior Services
- MU Extension Master Gardener Program requirements: MU Extension
- Missouri CERT program structure and St. Louis Regional CERT Association: City of St. Louis; Eureka Fire Protection District

BY STATE › MISSOURI

Missouri: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Joplin tornado (2011): the deadliest since modern record-keeping began

Metric	Figure
Peak rating	EF5
Deaths	158 (some counts up to 161 including additional indirect deaths)
Injuries	1,000+
Total path length	22.1 mi
Length of path through dense Joplin	~6 mi
Peak winds	>200 mph
Damage	~\$3 billion, the costliest tornado on record
Business structures damaged	553
Residential structures damaged	~7,500 (3,000+ heavily damaged or destroyed)
National ranking	Deadliest single U.S. tornado since modern record-keeping began in 1950; 7th deadliest in all of U.S. history

Joplin surpassed the June 1953 Flint, Michigan tornado, which had held the modern-era record at 116 deaths, by a wide margin, and its combination of maximum-width, maximum-intensity winds passing directly through a dense urban area is part of why it remains the reference case for EF5 tornado risk in a populated area.

New Madrid: where the earthquakes that named the zone actually happened

Metric	Figure
First major earthquake	M~7.5, December 16, 1811
Second major earthquake	M~7.3, January 23, 1812
Third major earthquake	M~7.5, February 7, 1812
Impact on the town of New Madrid	Largely destroyed; residents were still camped in open fields when the final quake struck

Why current probability figures aren't repeated here

Illinois’s and Tennessee’s pages on this site already cover the New Madrid Seismic Zone’s current earthquake probability data (the same USGS figures apply regardless of which state within the zone is asking) and their own state-specific exposure. Missouri’s distinguishing fact isn’t a different probability number, it’s that the zone’s namesake and historical epicenter sit within the state itself.

Sources

- Joplin tornado death toll, path, and damage: Wikipedia, sourced to NWS; NIST
- New Madrid earthquake sequence details: USGS; Missouri Encyclopedia

Montana: Overview

Everything in the main manual and the skill guides applies in Montana exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Montana go deeper on laws, local resources, and the data behind the risks named here.

The 1959 Hebgen Lake earthquake: the deadliest quake in Montana history

On the night of August 17, 1959, a magnitude 7.3 earthquake struck near West Yellowstone, triggering a massive landslide in the Madison Canyon that swept roughly 50 million cubic yards of rock and debris down the mountainside. The slide dammed the Madison River overnight, creating what's now called Earthquake Lake. It remains the deadliest and most severe earthquake on record in Montana and the broader Intermountain West, killing 28 people, most of them campers at a full campground buried by the slide. See the Risks page for the full data.

The 2017 Lolo Peak fire: a major modern wildfire season case study

Montana's 2017 wildfire season was one of its worst in decades, and the Lolo Peak fire, burning nearly 54,000 acres across the Lolo and Bitterroot National Forests, was among its most significant single fires, killing one firefighter, destroying two homes, and forcing more than 3,000 evacuations. The nearby Rice Ridge fire that same season burned even more acreage, together illustrating how quickly a Montana fire season can escalate from routine lightning starts to megafire conditions. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Montana: seismic risk here is real and historically severe, not a hazard limited to the West Coast, and this manual's evacuation and go-bag guidance applies just as directly to a fast-escalating summer wildfire season as it does to California or Oregon's fire risk.

Sources

- 1959 Hebgen Lake earthquake data: USGS; Wikipedia
- 2017 Lolo Peak fire data: Wikipedia; Northern Rockies Fire Science Network

Montana: Laws & Legal Considerations

Rainwater harvesting: unrestricted

Montana places no permit requirement on residential rainwater harvesting for typical household use.

Rule	Montana
Source water	Rooftop or other catchment
Permit required	No, for typical residential collection
Permitted uses	Non-potable, typically irrigation and similar uses

Where to find it: the Montana Department of Natural Resources and Conservation (dnrc.mt.gov) administers water rights generally.

Water rights: prior appropriation, written directly into the state constitution

Montana follows prior appropriation, the same “first in time, first in right” doctrine as Utah, Oregon, Washington, Arizona, Kansas, and New Mexico, with two features worth calling out specifically.

Concept	How it works in Montana
Basic rule	The earliest-dated appropriator holds first claim during a shortage; owning land along water doesn't itself grant a right to use it
'Use it or lose it'	A water right must be actively put to beneficial use to remain valid, a specific enforcement mechanism named explicitly in Montana law
Constitutional guarantee	Montana's water rights framework is written directly into Article IX, Section 3 of the state constitution, not left to statute alone

Where to find it: the Montana Department of Natural Resources and Conservation administers appropriation permits and the statewide water-right recording system.

Permitless carry since 2021

Montana has recognized full constitutional carry since House Bill 102 took effect February 18, 2021.

Requirement	Detail
Standard	Permitless carry, concealed, for any resident or visitor 18+ legally eligible to possess a firearm, in most locations
Applies to visitors too	Non-residents passing through Montana are covered by the same permitless standard as residents
Still applies	Prohibited-location rules, federal law overlays (e.g., federal buildings, national parks' specific restrictions), and reciprocity considerations when traveling elsewhere

Sources

- Montana rainwater harvesting and water rights administration: Montana DNRC
- Montana prior appropriation, “use it or lose it,” and constitutional guarantee: MSU Extension; University of Montana
- Montana permitless carry (HB 102, 2021): LegalClarity

Montana: Local Resources

Montana Disaster and Emergency Services (DES)

Montana DES coordinates statewide emergency planning and response, working through county-level DES offices (Cascade County, Yellowstone County, and others) that handle local implementation, training, and CERT delivery.

Where to find it: your county's DES office, or the state Department of Military Affairs's Disaster and Emergency Services Division.

MSU Extension: Master Gardener Program

Montana State University Extension runs the same category of program as every other state covered on this site, in a notably compact format.

- **Montana Master Gardener Program:** an 8-10 week course, shorter than the 40+ hour classroom standard seen on many other states' pages, followed by an open-book exam and a 20-hour volunteer commitment.

Where to find it: montana.edu/extension/mastergardener lists county-level classes.

CERT: county-run, with active programs in Cascade, Missoula, and Fergus counties

Montana's CERT programs are organized independently at the county level rather than through one statewide curriculum. Cascade County and Missoula County both run established CERT programs, and Fergus County has more recently moved to add its own, a free eight-unit course typically delivered over about three days covering first aid, disaster psychology, fire safety, and utility controls.

Coverage varies significantly by county

Not every Montana county has an active CERT program yet. Given the state's large geography and low population density outside a handful of counties, residents should check directly with their county's DES office for the nearest active team rather than assuming coverage.

Where to find it: search “[your county] Montana CERT” or check your county DES office’s website directly.

Sources

- Montana DES structure: Cascade County; Yellowstone County
- Montana Master Gardener Program requirements: Montana State University
- Montana county CERT programs: KPAX; Missoula CERT

BY STATE › MONTANA

Montana: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 1959 Hebgen Lake earthquake

Metric	Figure
Date	August 17, 1959, 11:37 PM MST
Magnitude	7.3
Epicenter	~6.5 mi WNW of West Yellowstone, MT
Landslide volume	~50 million cubic yards of rock and debris
Deaths	28, most at Rock Creek campground, buried by the slide
Bodies never recovered	19, presumed buried beneath the slide debris
New feature created	Earthquake Lake ('Quake Lake'), formed when the slide dammed the Madison River
Historical ranking	Deadliest and most severe earthquake on record in Montana and the Intermountain West

A dam that formed in a single night

Earthquake Lake didn't exist before August 17, 1959; a landslide triggered by the quake dammed the Madison River in a matter of minutes. It's a striking reminder that seismic events can reshape a landscape's water features permanently and immediately, not just damage buildings.

The 2017 Lolo Peak fire

Metric	Figure
Start date	July 15, 2017
Cause	Lightning
Area burned	53,902 acres
Deaths	1 (firefighter Brent Witham)
Injuries	1 non-fatal
Homes destroyed	2
Residences threatened	1,150
People evacuated	3,000+
Damage	\$34.6 million

Part of a broader, worse season

The Rice Ridge fire, burning the same summer northeast of Seeley Lake, grew from 40,000 to over 100,000 acres in a single week in September 2017 and became the nation’s top wildfire priority at the time, ultimately burning 155,900 acres. Lolo Peak wasn’t an isolated event; it was one part of one of Montana’s worst wildfire seasons in decades.

Sources

- 1959 Hebgen Lake earthquake data: USGS; Wikipedia
- 2017 Lolo Peak and Rice Ridge fire data: Wikipedia; Wikipedia

Nebraska: Overview

Everything in the main manual and the skill guides applies in Nebraska exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Nebraska go deeper on laws, local resources, and the data behind the risks named here.

The 2014 Pilger twin tornadoes: a hazard type new to the site

On June 16, 2014, the small town of Pilger, population under 350, took a direct hit from two tornadoes on the ground side by side at the same time, an EF4 and an EF2, a genuinely rare configuration. The larger tornado alone destroyed 75% of the town, including its entire business district, and the event killed two people and injured 20. This is the first tornado case study on this site involving simultaneous parallel tornadoes rather than one storm or a sequence of separate ones. See the Risks page for the full data.

The March 2019 bomb cyclone flood: one of the costliest inland floods on record

A rapid-intensification “bomb cyclone” in March 2019 combined record snowmelt with heavy rain on ground still frozen from an exceptionally cold February, sending a wall of water and ice through Nebraska’s river systems. The ice-choked Niobrara River burst through and destroyed the Spencer Dam entirely, and three-fourths of Nebraska’s 93 counties declared a state of emergency. NOAA estimated the total multi-state damage at \$10.8 billion, one of the costliest inland flood events ever recorded in the U.S. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual’s Tier structure and the skill guides apply without modification. What’s different in Nebraska: tornado shelter planning needs to account for the real possibility of more than one tornado on the ground in the same area at once, not just sequential storms, and this manual’s dam-failure and river-flood guidance carries extra weight given that an entire dam here failed under conditions many residents hadn’t planned around, ice-choked rivers in late winter, not the more commonly anticipated spring or summer flood pattern.

Sources

- 2014 Pilger tornado data: Wikipedia; Omaha World-Herald
- March 2019 Nebraska bomb cyclone flood data: Weather.com; NPR

Nebraska: Laws & Legal Considerations

Rainwater harvesting: legal and actively promoted

Nebraska law and its own universities actively promote rainwater harvesting for outdoor, domestic use.

Rule	Nebraska
Source water	Rooftop or other catchment
Permit required	No, at the state level, for outdoor domestic use
Governing provision	Section P2912, Nonpotable Rainwater Collection and Distribution Systems
State posture	Actively encouraged, including by University of Nebraska Extension itself

Where to find it: University of Nebraska’s Water Center (water.unl.edu) publishes water use guidance.

Water rights: a genuine dual system, surface and groundwater governed separately

Nebraska is one of a small number of states covered on this site with two entirely distinct legal frameworks for surface water and groundwater, rather than one doctrine covering both or a hybrid blend.

Water type	Governing doctrine in Nebraska
Surface water	Prior appropriation ('first in time, first in right'), the same family as Utah/Oregon/Kansas/New Mexico
Groundwater	Correlative rights: all landowners share access to groundwater beneath their property, limited to reasonable use that doesn't harm neighboring rights
Local management	23 Natural Resources Districts (NRDs) manage groundwater regionally, a structure unique among the states covered on this site

Where to find it: the Nebraska Department of Natural Resources and the relevant local Natural Resources District.

Permitless carry since September 2023

Nebraska became the 27th constitutional-carry state when LB 77 took effect in September 2023.

Requirement	Detail
Standard	Permitless carry, concealed, for anyone 21+ legally eligible to possess a firearm
ID requirement	Must carry valid government-issued ID while carrying
Disclosure requirement	Must immediately disclose to law enforcement or emergency personnel that you're carrying, upon contact
Optional permit	Remains available through State Patrol for reciprocity in states that don't recognize Nebraska's permitless standard
Handgun purchase note	A handgun certificate or concealed carry permit is still required to purchase a handgun, even in a private sale, separate from the carry question itself

A live 2026 legislative debate

LB 1237, introduced in 2026, would standardize “gun-free” designations for the State Capitol and its surrounding grounds. This is a pending proposal, not enacted law; confirm current status if reading this later.

Sources

- Nebraska rainwater harvesting rules: Salt & Prepper
- Nebraska’s dual water rights system: University of Nebraska College of Law; Midwest Ag Law
- Nebraska permitless carry (LB 77, 2023) and handgun-purchase certificate requirement: Protect With Bear; 88 Tactical

Nebraska: Local Resources

NEMA: Nebraska Emergency Management Agency

NEMA operates under Nebraska's Military Department and coordinates statewide emergency planning, training, and public outreach, including its own Citizen Corps community-outreach program.

Where to find it: nema.nebraska.gov.

Nebraska Extension: Master Gardener Volunteer Program

University of Nebraska-Lincoln Extension runs the same category of program as every other state covered on this site, in place since 1976.

- **Nebraska Extension Master Gardener Volunteer Program:** 40 hours of initial education plus a 70%-or-higher open-book test to become a Trainee, then 40 hours of volunteer activity to become a full Volunteer. Classes run twice yearly, starting in late January and October, through local county extension offices.

Where to find it: mastergardener.unl.edu lists training sites by county.

CERT through NEMA

Nebraska's CERT program is delivered through NEMA and trains volunteers in fire safety, light search and rescue, team organization, and disaster medical operations, free of charge to anyone with a personal or professional interest in disaster readiness.

Where to find it: nema.nebraska.gov/citizen-corps.

Sources

- NEMA structure and Citizen Corps program: Nebraska Emergency Management Agency
- Nebraska Extension Master Gardener Volunteer Program requirements: University of Nebraska-Lincoln

- Nebraska CERT training: Nebraska Emergency Management Agency

BY STATE › NEBRASKA

Nebraska: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 2014 Pilger twin tornadoes

Metric	Figure
Date	June 16, 2014
Configuration	Two tornadoes on the ground simultaneously, side by side
Larger tornado rating/winds	EF4, 166-200 mph
Smaller tornado rating	EF2
Deaths	2
Injuries	20
Pilger destroyed	75% of the town, including 100% of its business district
Pilger population at the time	Under 350

A hazard configuration new to the site

Every other tornado case study on this site involves one tornado, or a sequence of separate tornadoes across a wider outbreak. Pilger’s twin tornadoes were genuinely simultaneous and side by side, a rare enough configuration that it drew national attention specifically for that reason, not just its damage total.

The March 2019 bomb cyclone flood

Metric	Figure
Trigger	Rapid-intensification 'bomb cyclone' (Winter Storm Ulmer), March 13, 2019
Mechanism	Record snowmelt plus heavy rain on ground still frozen from exceptional cold
Deaths (NE + IA)	3
Nebraska homes affected	7,000+
Nebraska damage	\$2.7 billion
Total multi-state damage	\$10.8 billion, one of the costliest inland flood events on record in the U.S.
Counties declaring emergency	~70 of Nebraska's 93 counties (three-fourths)
Notable infrastructure failure	Spencer Dam destroyed on the ice-choked Niobrara River

A dam failure most residents weren't planning around

Spencer Dam’s failure happened in mid-March, driven by ice jams and snowmelt rather than the summer thunderstorm flooding many households plan for. It’s a reminder that river and dam risk in Nebraska isn’t confined to one season.

Sources

- 2014 Pilger tornado data: Wikipedia; Omaha World-Herald
- March 2019 Nebraska bomb cyclone flood data: Weather.com; NPR

[BY STATE](#) › [NEVADA](#)

Nevada: Overview

Everything in the main manual and the skill guides applies in Nevada exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Nevada go deeper on laws, local resources, and the data behind the risks named here.

Las Vegas heat: a death toll rising fast in the opposite direction from Phoenix's

Clark County recorded 526 heat-related deaths in 2024, up from 294 the year before, a 78% increase in a single year, during the same period Maricopa County, Arizona's own heat death count was actually declining. The 2024 summer was the hottest on record in Las Vegas, with 112 days above 100°F, breaking a record set in 1947, and a peak temperature of 120°F on July 7. See the Risks page for the full comparison with Arizona's own heat-death data.

Reno: real earthquake risk most people don't expect from Nevada

Nevada's northwestern corner sits within the Walker Lane Belt, a major tectonic shear zone, and the Reno-Carson City-Tahoe corridor carries a 60-75% chance of a damaging magnitude 6+ earthquake within 30 miles of any point in the corridor over the next 50 years, according to regional seismic hazard assessments, comparable to or exceeding some of the earthquake probability figures covered on California's page. The Mount Rose and Pyramid Lake fault zones near Reno are both capable of producing earthquakes above magnitude 7.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Nevada: heat safety needs to be a genuine year-round Tier 1 priority in the southern part of the state, on the same level this manual gives it in Arizona, and Reno-area households should treat earthquake preparedness, secured furniture, a practiced drop-cover-hold plan, water and supplies independent of undamaged infrastructure, as a real priority despite Nevada's reputation as simply a desert state.

Sources

- Clark County heat-related death statistics: Las Vegas Sun; Southern Nevada Health District
- Reno-area seismic hazard and fault data: Nevada Bureau of Mines and Geology; ShakeOut Nevada

BY STATE › NEVADA

Nevada: Laws & Legal Considerations

Rainwater harvesting: recently relaxed from a near-total historical restriction

Like Colorado, Nevada’s strict prior appropriation doctrine historically treated rainwater as already claimed water, making collection illegal without a state water right permit until relatively recent legislative changes.

Rule	Nevada
Historical rule	Collecting rainwater required a water right permit from the State Engineer, with no exception for ordinary residential use
2011 change (AB138)	Legalized capturing rooftop rainwater from a single-family dwelling for non-potable domestic use without a water right, plus wildlife guzzler collection, provided no conflict with existing water rights
2017 change (NB74)	Allowed rainwater collected under a granted water right to be exempt from the "use it or lose it" forfeiture doctrine, with some conditions still attached

A genuine parallel to Colorado, covered elsewhere on this site

Nevada and Colorado are the two states covered on this site where rainwater harvesting was historically treated as illegal by default under strict prior appropriation, rather than simply permitted or lightly regulated. Both states have since carved out targeted residential exceptions rather than fully legalizing the practice outright.

Where to find it: the Nevada Division of Water Resources (water.nv.gov) administers water rights and rainwater exceptions.

Water rights: prior appropriation for both surface water and groundwater

Nevada applies prior appropriation doctrine comprehensively, to groundwater as well as surface water, a more thorough application of the doctrine than some other prior-appropriation states covered on this site.

Concept	How it works in Nevada
Governing principle	"First in time, first in right" for both surface water and groundwater
Administering authority	The State Engineer, within the Division of Water Resources
Recent development	A 2024 "superbasin" ruling addressed how groundwater rights are managed across combined, interconnected basins, an evolving area of Nevada water law

Where to find it: the Nevada Division of Water Resources administers all water rights statewide.

Concealed carry: shall-issue, not permitless

Unlike neighboring Arizona and Utah, Nevada has not adopted permitless carry.

Requirement	Detail
Standard	A Concealed Firearm Permit (CFP) is required to carry concealed at all; carrying without one is a felony, not a misdemeanor
Minimum age	21
Training required	At least 8 hours, including both classroom instruction and live-fire range time
Issuing authority	The sheriff of the applicant's county (non-residents may apply through any Nevada county sheriff)
Validity	5 years, valid statewide

Sources

- Nevada rainwater harvesting law history and AB138/NB74 changes: State legislative water law overview
- Nevada prior appropriation and 2024 superbasin ruling: Nevada Water Rights; Natural Resources Law Network
- Nevada Concealed Firearm Permit requirements: LVMPD; Alien Gear Holsters

Nevada: Local Resources

Nevada OEM

The Nevada Office of Emergency Management/Homeland Security runs the state's preparedness portfolio without one single branded consumer campaign name, similar to the approach on a few other states' pages covered on this site.

A notably longer self-sufficiency target

Nevada OEM frames household preparedness around planning for 30 days of self-sufficiency, longer than the 72-hour to 2-week targets most other states' campaigns cite, a meaningful difference worth building toward specifically if you're following Nevada's own guidance rather than a generic national standard.

Where to find it: oem.nv.gov.

University of Nevada, Reno Extension: Nevada's version of the other states' land-grant Extension programs

UNR Extension runs the same category of program as every other state covered on this site, with a distinctive two-course prerequisite structure.

- **Master Gardeners of Nevada:** requires completing the Home Horticulture Certificate Program first (\$275), then the Master Gardener Training Program itself (\$25), an interview, background check, and volunteer paperwork. The internship year requires 15 continuing-education hours and 35 volunteer hours; ongoing certification requires 10 continuing-education hours and 20 volunteer hours annually.

Where to find it: extension.unr.edu/master-gardeners lists county programs, including Clark and Douglas counties.

CERT: Southern Nevada's program, open to residents as young as 16

Southern Nevada CERT, covering the Las Vegas Valley, is free and open to residents starting at age 16, younger than the 18+ minimum most other states' CERT programs covered on this site use.

Where to find it: lasvegasnevada.gov; northern Nevada residents can check with their county emergency management office for a local program.

Sources

- Nevada OEM preparedness portfolio and 30-day framing: Nevada OEM
- UNR Extension Master Gardener Program structure and requirements: UNR Extension
- Southern Nevada CERT program and minimum age: City of Las Vegas

BY STATE › NEVADA

Nevada: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Clark County heat deaths: rising fast while Phoenix’s fall

Metric	Figure
2023 heat-related deaths	294
2024 heat-related deaths	526 (preliminary; historically these figures are later revised upward as investigations conclude)
Year-over-year increase	~78%
Days above 100°F, 2024	112, breaking the previous record of 100 days set in 1947
Peak temperature (July 7, 2024)	120°F
July 2024 average temperature vs. normal	+6.7°F

A direct comparison worth making explicit

Clark County’s 526 reported 2024 heat deaths remain below Maricopa County, Arizona’s 602 for the same year, figures covered on Arizona’s page, but the two counties’ trajectories are moving in opposite directions: Maricopa’s toll fell from a record 645 in 2023 to 602 in 2024, while Clark County’s rose 78% over the same one-year span, from 294 to 526. If both trends continued, Las Vegas’s heat death toll could approach or exceed Phoenix’s within a few years, though that’s a projection, not a confirmed figure.

Reno-area earthquake probability: a standing risk

Metric	Figure
50-year chance of a damaging M6+ earthquake within 30 mi of the Reno-Carson City-Tahoe corridor	60-75%
30-year chance of M6.7+ within 100 km of Reno	~30%
Largest credible earthquake, Mount Rose Fault Zone (8 km from downtown Reno)	M7.0
Largest credible earthquake, Pyramid Lake Fault	M7.5
Historical significant earthquakes	1860 Reno (M6.5); 1868/1869 Virginia City (M6.0/M6.4); 1887 Carson City (M6.5); 1914 Reno (M6.4); 2008 Reno (M5.1)

Reno sits within the Walker Lane Belt, a major tectonic shear zone accommodating 15-25% of the total relative movement between the Pacific and North American plates, which is why this specific corridor carries earthquake probability figures more typical of California than of the broader Great Basin region Nevada is usually associated with.

What these two have in common

Las Vegas’s heat risk and Reno’s earthquake risk are geographically opposite ends of the state and mechanically unrelated, but both illustrate the same point about Nevada specifically: its dominant public image, a dry desert state, undersells two genuinely severe risks that don’t fit that image, extreme urban heat mortality and significant seismic hazard.

Sources

- Clark County heat death statistics: Las Vegas Sun; KTNV
- Reno-area seismic hazard data: Nevada Bureau of Mines and Geology; ShakeOut Nevada

New Hampshire: Overview

Everything in the main manual and the skill guides applies in New Hampshire exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under New Hampshire go deeper on laws, local resources, and the data behind the risks named here.

The Great Hurricane of 1938: often called New Hampshire's worst disaster

On September 21, 1938, a hurricane that struck New England with almost no warning, this was decades before organized hurricane forecasting, is widely considered the worst natural disaster in New Hampshire's history. Connecticut's page on this site covers the storm's broader Southern New England death toll (564-682 across the region); in New Hampshire specifically, 13 people died, and the storm's winds reached a stunning 163 mph atop Mount Washington, destroying the Cog Railway's trestle. Peterborough alone lost 10 bridges. See the Risks page for the full data.

The December 2008 ice storm: the most damaging storm in the state's grid history

On December 11-12, 2008, freezing rain coated New Hampshire in ice heavy enough that utilities at the time called it the most damaging storm ever recorded on the state's power grid. More than 400,000 customers lost power, some for as long as two weeks, and 780 utility poles and 1,300 transformers were destroyed outright. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in New Hampshire: this manual's extended-outage guidance is directly relevant here given the 2008 ice storm's two-week restoration timeline for some customers, and coastal and mountain wind exposure, as Mount Washington's 1938 reading shows, can be extreme even in a state most people don't associate with hurricane risk.

Sources

- 1938 Hurricane New Hampshire data: New England Historical Society; Wikipedia
- December 2008 ice storm data: Wikipedia; Union Leader

BY STATE › NEW HAMPSHIRE

New Hampshire: Laws & Legal Considerations

Rainwater harvesting: unrestricted and actively promoted

New Hampshire places no restriction on outdoor rainwater harvesting and actively promotes it through a dedicated state program.

Rule	New Hampshire
Source water	Rooftop or other catchment
Permit required	No, for outdoor applications
State program	'Soak Up the Rain,' run by the Department of Environmental Services, promotes rain barrels and similar water conservation practices

Where to find it: the New Hampshire Department of Environmental Services (des.nh.gov) runs Soak Up the Rain.

Water rights: reasonable-use riparian doctrine, under real strain

New Hampshire follows the reasonable-use version of riparian rights inherited from English common law: a landowner may use adjacent water so long as it doesn’t unreasonably interfere with another owner’s use, regardless of which use came first.

Concept	How it works in New Hampshire
Basic rule	Riparian landowners may make reasonable use of adjacent water; conflicts are resolved by reasonableness, not by priority date
Groundwater	Separately addressed under the state's Groundwater Protection Act
Known strain	Legal commentary has flagged that population growth and declining freshwater availability may eventually require modifying the reasonable-use system or introducing some form of allocation, though no such change has been enacted

Where to find it: the New Hampshire Department of Environmental Services administers groundwater rights.

Permitless carry since 2017

New Hampshire has recognized permitless (constitutional) carry since February 2017.

Requirement	Detail
Standard	Permitless carry, open or concealed, for anyone 18+ legally eligible to possess a firearm
Optional License to Carry (LTC)	Still issued to residents and non-residents on request, unchanged by the 2017 law, mainly useful for reciprocity while traveling

A real, if not yet resolved, water-law tension

New Hampshire’s water law hasn’t hit a crisis point the way some Western prior-appropriation states covered on this site have, but legal commentary has specifically flagged reasonable-use riparian doctrine as potentially inadequate for a state with rising population and finite freshwater. Worth watching, not yet an active constraint.

Sources

- New Hampshire rainwater harvesting and Soak Up the Rain: NH Department of Environmental Services; NTO Tank
- New Hampshire reasonable-use riparian water law: Texas Real Food; McLane Middleton
- New Hampshire permitless carry (2017): USA Gun Shop

[BY STATE](#) › [NEW HAMPSHIRE](#)

New Hampshire: Local Resources

New Hampshire Division of Homeland Security and Emergency Management (HSEM)

HSEM oversees statewide planning, preparation, response, recovery, and mitigation for all emergencies and disasters, from hurricanes and floods to severe winter storms and human-caused incidents.

Where to find it: hsem.dos.nh.gov.

UNH Extension: Master Gardener Program

University of New Hampshire Extension runs the same category of program as every other state covered on this site, active since 1993.

- **New Hampshire Master Gardener Volunteer Program:** trains volunteers in gardening, plants, soil, and insects, who then bring that education to their communities through projects and public presentations.

Where to find it: extension.unh.edu lists upcoming training sessions.

CERT: independent town-level teams under HSEM

New Hampshire's CERT program is supported by HSEM, the NH State Citizen Corps Council, and individual towns, but delivered through independently organized town teams rather than one centralized curriculum body. Goffstown's team, formed in 2003, is the longest continuously operating CERT team in the state; other active teams include Merrimack, Bedford, Plaistow, and Nashua.

Town by town, not statewide

Like several other states covered on this site, New Hampshire's CERT coverage depends on whether your specific town has organized a team. Residents should check with their town's emergency management office directly rather than assuming statewide coverage.

Where to find it: hsem.dos.nh.gov, or search “[your town] NH CERT.”

Sources

- HSEM structure and mission: New Hampshire Division of Homeland Security and Emergency Management
- UNH Master Gardener Program history: University of New Hampshire Extension
- New Hampshire town-level CERT programs: CERT-LA; Goffstown, NH

New Hampshire: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Great Hurricane of 1938

Metric	Figure
Date	September 21, 1938
New Hampshire deaths	13
Southern New England regional deaths	564-682 (see Connecticut's page for the full regional breakdown)
Peak wind, Mount Washington	163 mph, destroying the Cog Railway's trestle
Peterborough bridges destroyed	10
Regional damage (1938 dollars / 2024-adjusted)	\$306 million / ~\$4.7 billion

Why this is still called New Hampshire's worst disaster

This storm struck New England with almost no advance warning, decades before organized hurricane forecasting existed. That near-total surprise, more than the storm’s raw intensity alone, is why it’s remembered as uniquely catastrophic: nobody had the chance to prepare the way modern forecasting now allows for a storm of similar strength.

The December 2008 ice storm

Metric	Figure
Dates	December 11-12, 2008
Customers without power	400,000+
Longest restoration time	Up to 2 weeks for some customers
Utility poles destroyed	780
Transformers destroyed	1,300
Schools closed	450+
Deaths	4
Injuries	100+
Historical ranking	Called the most damaging storm in the state's power-grid history by utilities at the time

An outage duration worth planning around

Two weeks without power is a genuinely long outage, well past what a typical household’s stored supplies or a small generator’s fuel reserve is built for. This is the clearest New England example on the site of why this manual’s extended-outage guidance, not just its short-term outage guidance, matters even in a state without hurricane-force coastal risk.

Sources

- 1938 Hurricane New Hampshire data: New England Historical Society; Wikipedia
- December 2008 ice storm data: Wikipedia; Union Leader

New Jersey: Overview

Everything in the main manual and the skill guides applies in New Jersey exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under New Jersey go deeper on laws, local resources, and the data behind the risks named here.

Hurricane Sandy: the actual landfall, not just the surge

New York's page on this site covers Sandy's storm surge into New York Harbor; New Jersey's story is different, this is where the storm actually came ashore, near Brigantine in Atlantic County, on October 29, 2012, with 80 mph sustained winds. The Jersey Shore took the brunt of it directly: storm surge reached 4-9 feet in Raritan Bay and a record 8.9 feet at Sandy Hook, and 346,000 homes across the state were damaged or destroyed. See the Risks page for the full data.

A chronic, distributed risk: the most Superfund sites of any state

New Jersey's dense industrial history along its highway corridors left it with more federal Superfund sites, contaminated locations serious enough for direct EPA-led cleanup, than any other state in the country: 115 active sites still in some stage of investigation or remediation, with another 37 already cleaned up and removed from the list. Unlike a hurricane, this isn't a single event with a clear before-and-after, it's a standing, geographically distributed legacy risk that shapes where contamination concerns are worth checking before assuming a property or area is clean.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in New Jersey: coastal and shore-area households need real hurricane evacuation and storm surge planning, this state has already absorbed a direct hurricane landfall, and anyone buying property or doing renovation work, especially in older industrial or urban areas, benefits from checking EPA and NJDEP contamination records for the specific site, not just the general neighborhood.

Sources

- Hurricane Sandy New Jersey landfall, storm surge, and housing damage: Wikipedia, sourced to NOAA and NJ state records
- New Jersey Superfund site count: NJDEP; EPA Superfund Sites in Reuse

New Jersey: Laws & Legal Considerations

Rainwater harvesting: legal, with almost no state-level rules at all

New Jersey takes a hands-off approach at the state level, most of the practical regulation that exists happens at the county or municipal level instead.

Rule	New Jersey
Source water	Rooftop or other catchment
Permit required	No, for small-scale non-potable systems like standard rain barrels
Permitted uses	Non-potable: irrigation, toilet flushing
Potable use	Not permitted unless the system meets stringent state health standards
Local variation	Counties and municipalities may add their own zoning, size, or installation-code requirements

Where to find it: the New Jersey Department of Environmental Protection (dep.nj.gov) for state guidance; your local municipality for any additional zoning or code requirements.

Water rights: riparian, plus a distinctive requirement for tidal waterfront

New Jersey follows ordinary riparian reasonable-use doctrine for its waterways, but its coastal geography adds a wrinkle most inland states don't need: a specific state grant requirement for building on or using land that was historically underwater.

Concept	How it works in New Jersey
Inland riparian rights	Standard reasonable-use doctrine; rights are appurtenant to the adjoining land and can't be sold separately from it
Tidal waters and tidelands	Held under the public trust doctrine; land seaward of the mean high water line is generally reserved for public use
Riparian grants	A specific state grant from the NJDEP is required to build structures like piers or bulkheads on formerly tidal land, or otherwise claim rights to it

Why this matters more in New Jersey than most states covered so far

A lot of New Jersey’s current shoreline, especially around the Jersey Shore and Raritan Bay, sits on land that was once tidal and has since been filled or built up. Anyone buying waterfront property here specifically needs to check whether a riparian grant already exists or is required, a step that isn’t part of ordinary real estate due diligence in most inland states.

Where to find it: the NJDEP’s Bureau of Tidelands Management administers riparian grants.

Concealed carry: the most restrictive system covered on this site

New Jersey became a shall-issue state only after the Supreme Court’s 2022 *Bruen* decision forced it to drop its old discretionary standard, and the state responded with one of the most demanding permit processes and broadest carry restrictions covered anywhere on this site.

Requirement	Detail
Standard	Shall-issue since 2022, but with roughly 25 categories of legally off-limits locations added within days by Chapter 131
Minimum age	21
Character requirement	"Good moral character" standard with four personal references required
Training required	16 hours, including live-fire qualification with a state-approved instructor
Cost	\$200 application fee
Purchase limit	One handgun per 30 days, each requiring a separate Permit to Purchase
Magazine capacity	Capped at 10 rounds

A restriction New York's CCIA doesn't have

New Jersey recognizes no other state’s concealed carry permit at all, full stop. New York’s CCIA, restrictive as it is, still participates in some reciprocity; New Jersey does not. Open carry is also strictly prohibited statewide. Combined with the ~25 sensitive-location categories, this makes New Jersey’s system the most restrictive covered on this site so far.

Sources

- New Jersey rainwater harvesting rules: LegalClarity
- New Jersey riparian rights and tidal grant requirements: NJDEP Riparian Buffer guidance; Wolf Commercial Real Estate
- New Jersey concealed carry permit requirements, Chapter 131, and reciprocity status: USA Carry; GunLawMap

New Jersey: Local Resources

NJOEM and ReadyNJ

The New Jersey Office of Emergency Management runs public preparedness outreach through ReadyNJ, working with federal, state, and local partners on all-hazards planning, natural and manmade alike, a framing that fits New Jersey's dual hurricane-and-industrial risk profile particularly well.

Where to find it: nj.gov/njoem.

Rutgers Cooperative Extension: New Jersey's version of the other states' land-grant Extension programs

Rutgers Cooperative Extension runs the same category of program as every other state covered on this site, through county offices statewide.

- **Rutgers Master Gardener Program:** initial volunteer service requirements vary by county, generally in the 60-70 hour range (Somerset and Burlington counties require 60 hours, Essex County 70), plus prescribed training and an exam, followed by roughly 25 volunteer hours and 10 continuing-education hours annually to maintain certification.

Where to find it: extension.rutgers.edu/master-gardeners lists the program by county.

CERT: the largest program in the country

New Jersey doesn't just have a CERT program, it has the largest one in the United States.

Scale

New Jersey's CERT program counts roughly 12,000 volunteers statewide, more than any other state, coordinated through NJOEM alongside individual county and municipal teams. NJOEM has also equipped CERT volunteers with specialized utility trailers, a level of resourcing that goes beyond the basic training-only model seen in some other states.

Where to find it: nj.gov/njoem for the statewide program; search “[your county] CERT” for a local team.

Sources

- NJOEM and ReadyNJ campaign structure: NJOEM
- Rutgers Master Gardener Program county-level requirements: RCE of Somerset County; RCE of Burlington County
- New Jersey’s CERT program scale: NJEMA

BY STATE › NEW JERSEY

New Jersey: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Sandy (2012): where the storm actually came ashore

Metric	Figure
Landfall location and time	Near Brigantine, Atlantic County, ~6:30 PM EDT, October 29, 2012
Landfall winds	80 mph sustained
Total New Jersey deaths	38
Direct deaths	12
Indirect deaths from power-outage-related causes (hypothermia, CO poisoning, fires, oxygen deprivation)	13+
Storm surge, Raritan Bay	4-9 ft
Storm surge, Sandy Hook	8.9 ft, a record
Homes damaged or destroyed statewide	346,000
Homes/businesses destroyed or significantly damaged	~30,000
Households that lost power	2.7 million
Economic damage estimate	\$30 billion (initial); \$36.8 billion (Governor Christie's later repair-cost estimate)

Why the death toll doesn't cleanly split into two round numbers

The 12 direct and 13-plus indirect figures don’t sum to the full 38-death total; the remainder reflects other storm-related causes beyond the specific power-outage categories tracked separately (hypothermia, carbon monoxide poisoning, and fire deaths among them). This is presented as reported rather than forced into a tidier breakdown that the underlying data doesn’t actually support.

Unlike New York, where Sandy’s damage came from storm surge pushed into a harbor, New Jersey took the storm’s actual landfall directly on its coastline, which is part of why the Jersey Shore specifically saw some of the most concentrated physical destruction of the entire storm.

Superfund sites: a standing, statewide legacy risk

Metric	Figure
Active National Priorities List sites	115
Sites cleaned up and removed from the list	37
National ranking	Most of any state

This risk doesn’t work like a storm: there’s no single date or event, just a large number of specific, mapped locations, mostly tied to the state’s dense industrial history along its highway corridors, still in some stage of investigation or cleanup. It’s a genuinely different category from every weather-driven risk covered elsewhere on this site: chronic, geographically specific, and something a household can actually check for a given address rather than just plan a general response to.

What these two have in common

Sandy and the Superfund legacy operate on opposite timescales, one a single catastrophic week, the other a decades-long standing condition, but both illustrate the same thing about New Jersey specifically: its extreme population density and industrial development mean that when something goes wrong here, whether a hurricane or a contaminated site, it tends to affect more people, more directly, than the same event would in a less densely built state.

Sources

- Hurricane Sandy New Jersey deaths, landfall, and damage figures: Wikipedia, sourced to NOAA and NJ state records
- New Jersey Superfund site counts: NJDEP; EPA

New Mexico: Overview

Everything in the main manual and the skill guides applies in New Mexico exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under New Mexico go deeper on laws, local resources, and the data behind the risks named here.

The 2022 Hermits Peak/Calf Canyon fire: a government-started disaster

In April 2022, a U.S. Forest Service controlled burn escaped its boundaries in high winds and merged with a second fire to become the largest wildfire in New Mexico's recorded history, burning 341,471 acres across San Miguel, Mora, and Taos counties before it was fully contained in August. Like Ohio's East Palestine train derailment covered on this site, this is a disaster with an identifiable human and institutional cause, not a purely natural event, and Congress ultimately allocated nearly \$4 billion to compensate victims because the government itself was responsible for the ignition. See the Risks page for the full data.

The Rio Grande Compact: a 13-year interstate water fight, just settled

New Mexico shares the Rio Grande with Texas and Colorado under a 1938 interstate compact, and Texas sued New Mexico in 2013 alleging that New Mexico's groundwater pumping was siphoning off water the compact promised to Texas. That lawsuit ran for 13 years before the U.S. Supreme Court approved a settlement in May 2026, splitting irrigation water 57-43 in New Mexico's favor while requiring New Mexico to cut its annual groundwater use by 18,200 acre-feet over the next decade. This is a live example of exactly the kind of interstate water conflict Georgia's page covers for the ACF/ACT river basins, resolved just months before this page was written. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in New Mexico: wildfire risk here isn't limited to naturally ignited fires, so the same defensible-space and evacuation planning this manual recommends for California and Oregon applies just as much to a fire that starts from a government-managed burn; and if your household relies on groundwater in the Rio Grande basin, the newly mandated pumping cuts are worth tracking directly rather than assuming water availability stays as it has been.

Sources

- 2022 Hermits Peak/Calf Canyon fire data: Wikipedia; NRCS
- Rio Grande Compact settlement, May 2026: Source NM; Office of the Governor

BY STATE › NEW MEXICO

New Mexico: Laws & Legal Considerations

Rainwater harvesting: encouraged, but never a legal water right

New Mexico’s Office of the State Engineer actively encourages residential and commercial rainwater harvesting for on-site irrigation and domestic use, but the water law framework underneath it has a real limit most other states covered on this site don’t share.

Rule	New Mexico
Source water	Rooftop or other catchment
Permit required for typical residential use	No, for landscape irrigation
Permit required for large-scale collection/storage	Yes, under the prior-appropriation permitting system
Key limit	Harvested rainwater cannot be used to establish a legal water right, and may not be repurposed for uses beyond on-site irrigation/domestic use

Where to find it: the New Mexico Office of the State Engineer (ose.nm.gov) publishes rainwater harvesting guidance.

Water rights: prior appropriation since 1891

New Mexico’s water law has been built on prior appropriation since an 1891 territorial Supreme Court decision, the same “first in time, first in right” doctrine already covered for Utah, Oregon, Washington, Arizona, and Kansas.

Concept	How it works in New Mexico
Basic rule	The earliest-dated beneficial use of a given water source holds first claim during a shortage
Interstate obligations	New Mexico's Rio Grande allocation is governed by the 1938 Rio Grande Compact with Texas and Colorado, recently the subject of a 13-year Supreme Court lawsuit settled May 2026
New groundwater obligation	The 2026 settlement requires New Mexico to cut annual Rio Grande basin groundwater pumping by 18,200 acre-feet over 10 years, half within 5 years

Where to find it: the New Mexico Office of the State Engineer administers water rights and appropriation permits.

Concealed carry: shall-issue with mandatory training, not permitless

Unlike the several permitless-carry states already covered on this site, New Mexico requires a Concealed Handgun License to carry a loaded, concealed handgun in public.

Requirement	Detail
Standard	Shall-issue license required, issued by the NM Department of Public Safety
Minimum age	21
Residency	New Mexico residency required (non-resident permits limited to active-duty military and their dependents stationed in-state)
Training	15 hours mandatory, including live-fire qualification
License validity	4 years (2 years for a first-time license)

A live legal obligation, not just history

The 2026 Rio Grande settlement’s groundwater cuts are a new, binding legal obligation on New Mexico going forward, not a resolved historical dispute. Households relying on groundwater in the affected basin should watch for how the state implements the required reductions over the next decade.

Sources

- New Mexico rainwater harvesting rules and limits: NM Office of the State Engineer; Ink Stain

- New Mexico prior appropriation water law: Utton Center, UNM
- Rio Grande Compact settlement, May 2026: Source NM
- New Mexico concealed carry license requirements: Alien Gear Holsters; Giffords Law Center

[BY STATE](#) › [NEW MEXICO](#)

New Mexico: Local Resources

NMDHSEM: Department of Homeland Security and Emergency Management

DHSEM is New Mexico's central agency for mitigating hazards, preparing for emergencies, and coordinating disaster recovery statewide, including recovery coordination for the 2022 Hermits Peak/Calf Canyon fire.

Where to find it: dhsem.nm.gov.

NMSU Extension: Master Gardener Program

New Mexico State University's Cooperative Extension Service runs the same category of program as every other state covered on this site.

- **NMSU Extension Master Gardener Program:** active since 1981, beginning in Albuquerque. County chapters teach fundamentals of horticultural and biological land management, and trained volunteers assist their local Extension office with research-based gardening information for residents.

Where to find it: mastergardeners.nmsu.edu lists chapters by county.

CERT through DHSEM's Citizen Corps

New Mexico's Community Emergency Response Team program runs through DHSEM's Citizen Corps initiative, providing residents training and tools for disaster response and community resilience.

Where to find it: dhsem.nm.gov/preparedness/cert.

Sources

- NMDHSEM structure and mission: New Mexico Department of Homeland Security and Emergency Management
- NMSU Extension Master Gardener Program history: New Mexico State University

- New Mexico CERT program: NMDHSEM

BY STATE › NEW MEXICO

New Mexico: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 2022 Hermits Peak/Calf Canyon fire

Metric	Figure
Cause	A U.S. Forest Service controlled burn that escaped its boundaries in high winds, April 6, 2022
Area burned	341,471 acres, San Miguel, Mora, and Taos counties
Containment date	August 21, 2022
Deaths	4
Non-fatal injuries	3
Structures destroyed/damaged	903+ destroyed (several hundred homes), 85 damaged
People evacuated	27,000+
Federal compensation allocated	~\$4 billion (Congress/President Biden)
Claims paid as of July 2024	5,633 claims totaling \$926.7 million

The government caused this one

Most wildfires covered on this site, California’s and Oregon’s included, are naturally or accidentally ignited. Hermits Peak/Calf Canyon started as a federal agency’s own controlled burn, which is why Congress took the unusual step of directly funding victim compensation rather than routing recovery through standard disaster-relief channels. It’s the same “identifiable institutional cause” pattern as Ohio’s East Palestine derailment, applied to wildfire instead of an industrial accident.

The Rio Grande Compact settlement: 13 years, resolved in 2026

Metric	Figure
Original compact	1938 Rio Grande Compact, governing water sharing among Texas, New Mexico, and Colorado
Lawsuit filed	2013, Texas v. New Mexico, alleging NM groundwater pumping violated the compact
Potential damages alleged	Up to \$1 billion
Supreme Court approval of settlement	May 2026
Irrigation water split under settlement	57% New Mexico / 43% Texas
Required NM groundwater cut	18,200 acre-feet/year reduction over 10 years, half within 5 years

A live obligation going forward, not a closed case

The settlement ends 13 years of litigation, but it starts a new decade-long compliance clock for New Mexico’s groundwater users in the Rio Grande basin. This is worth distinguishing from a purely historical event: the actual water-availability effects of the mandated cuts are still ahead, not behind.

Sources

- 2022 Hermits Peak/Calf Canyon fire data: Wikipedia; NRCS
- Rio Grande Compact settlement, May 2026: Source NM; Office of the Governor

New York: Overview

Everything in the main manual and the skill guides applies in New York exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under New York go deeper on laws, local resources, and the data behind the risks named here.

Coastal storm surge: Hurricane Sandy

Hurricane Sandy, which made landfall near Atlantic City in October 2012 but drove its worst surge into New York Harbor and lower Manhattan, killed 48 people statewide and caused an estimated \$19 billion in damage to New York City alone. Subway tunnels flooded, the power grid in lower Manhattan went dark for days, and 90% of the direct deaths were drowning, most within three days of landfall. See the Risks page for the full breakdown.

Inland flash flooding: the remnants of Hurricane Ida

Not every major flood risk in New York comes from the coast. In September 2021, the post-tropical remnants of Hurricane Ida dropped a record 3.15 inches of rain in a single hour on New York City, overwhelming a sewer system built to handle roughly half that rate, and killed 13 people in the city, 11 of them in basement apartments, many of them unregulated units outside the 100-year floodplain entirely. This is a genuinely different hazard mechanism from Sandy's storm surge: sudden, inland, and concentrated in exactly the kind of housing this manual's Tier 1 shelter guidance assumes is safe.

Lake-effect snow: the Buffalo blizzard

Western New York carries a hazard the rest of the state doesn't: lake-effect blizzards driven by Lake Erie. Winter Storm Elliott, over Christmas weekend 2022, dropped more than 56 inches of snow on parts of the Buffalo area in five days, with wind gusts to 79 mph and snowdrifts up to 15 feet, killing 47 people statewide, most of them in Erie County, the deadliest storm in the region's recorded history, surpassing the infamous Blizzard of 1977.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in New York: coastal and low-lying households need Sandy-style storm surge evacuation planning, urban and inland households, especially anyone in a basement-level unit, need to take flash flood warnings seriously regardless of official floodplain maps, and households in the western part of the state need a genuine plan for being snowed in for days at a time, not just an afternoon.

Sources

- Hurricane Sandy New York deaths and damage: CDC MMWR; Wikipedia, sourced to contemporary reporting
- Hurricane Ida NYC deaths, rainfall record, and basement apartment toll: ABC News; NYC Health Department
- Winter Storm Elliott New York death toll and snowfall totals: Wikipedia, sourced to contemporary reporting

BY STATE › NEW YORK

New York: Laws & Legal Considerations

Rainwater harvesting: legal, encouraged, with a wrinkle none of the other states have

New York doesn’t just permit rainwater collection, state guidance actively teaches it. But it’s the first state covered on this site with a specific roof-material restriction written into the guidance itself.

Rule	New York
Source water	Rooftop catchment
Permit required	No, for typical residential systems; check local plumbing code for anything plumbed indoors
Roof material restriction	Cannot harvest from tar-and-gravel, asbestos shingle, or treated cedar shake roofs, or from any roof with lead-containing metal flashing
Permitted uses	Non-potable: irrigation, toilet flushing

Why the roof material matters here specifically

The restriction exists because those specific roofing materials can leach contaminants, including lead, directly into water that’s about to be stored and used, even for non-potable purposes. It’s a genuinely useful check to make before setting up a system: confirm what your own roof is actually made of, not just whether collecting from it is legal in the abstract.

Where to find it: the New York State Department of Environmental Conservation (dec.ny.gov) publishes rainwater harvesting guidance; check with your local building department for any additional municipal rules.

Water rights: riparian, the same family as Florida’s system

New York uses a regulated riparian system for its lakes, rivers, and streams, the same broad family as Florida’s, built around land ownership rather than who claimed the water first.

Concept	How it works in New York
Who holds the right	Owners of land bordering a watercourse (riparian) or lake (littoral)
Governing principle	Reasonable use: a landowner's use can't unreasonably interfere with other riparian owners' use of the same shared water
DEC's role	Article 15 of the Environmental Conservation Law requires a DEC permit to alter a watercourse or wetland, or for larger water withdrawals, beyond ordinary riparian use

Where to find it: the DEC’s Division of Water (dec.ny.gov/environmental-protection/water) handles permitting for anything beyond basic riparian use.

Concealed carry: the most restrictive system covered on this site so far

Every other state covered in this section, Utah, Texas, and Florida, lets most adults carry a concealed handgun without any license at all. New York is the opposite: even after the Supreme Court’s 2022 *Bruen* decision forced the state to drop its old discretionary “proper cause” standard, New York responded with the Concealed Carry Improvement Act, one of the most demanding licensing processes in the country.

Requirement	Detail
Standard	May-issue converted to a "good moral character" standard: character references, an in-person interview, and a background investigation are all required, not just a records check
Required training	18 hours total: 16 hours of classroom instruction plus 2 hours of live-fire qualification, through a DCJS-approved instructor, plus a written test requiring 80% or better
Sensitive locations	An extensive list of places where carry is banned even with a valid license: schools, parks, places of worship, bars, Times Square, public transit, and many others
Governing statute	The Concealed Carry Improvement Act (CCIA), signed July 1, 2022

This is still an actively litigated area of law

Multiple provisions of the CCIA have faced federal court challenges since 2022; most of the sensitive-locations framework has survived so far, including the Supreme Court declining to review key challenges, but this remains one of the more legally contested gun laws in the country. Don’t treat any single source, including this one, as the final word on current status; confirm before relying on it.

Sources

- New York rainwater harvesting rules and roof material restrictions: is-this-legal.com; AllowedHere
- New York riparian water rights and DEC Article 15 permitting: Pace University Elisabeth Haub School of Law; NYS DEC
- New York Concealed Carry Improvement Act, training requirements, and sensitive locations: New York Criminal Attorney Blog; Alien Gear Holsters

New York: Local Resources

The Citizen Preparedness Corps: a genuinely large state-run program

New York's Division of Homeland Security and Emergency Services runs the Citizen Preparedness Corps, a free training program open to any resident, delivered online in English plus 12 other languages. This is a notably larger, more institutionalized state preparedness effort than most of the other states covered on this site.

Scale and reach

As of this writing, more than 437,000 people have completed the Citizen Preparedness Corps course. The 13-language availability (including Arabic, Bengali, Chinese, Haitian Creole, Korean, Russian, Spanish, and others) specifically targets New York's large immigrant and limited-English-proficiency population, a similar equity-focused design choice to California's Listos California campaign.

Where to find it: dhses.ny.gov hosts registration and course access.

Ready New York: the NYC-specific companion campaign

Within New York City specifically, NYC Emergency Management runs its own parallel campaign, Ready New York, covering the same core steps (emergency plan, meeting place, home supplies, a Go Bag) but tailored to city-specific hazards, including guidance on basement apartment flood risk directly informed by the Hurricane Ida deaths covered on the Risks page.

Where to find it: nyc.gov/em.

Cornell Cooperative Extension: New York's version of USU/OSU/UC ANR/AgriLife/UF IFAS

Cornell Cooperative Extension runs the same category of land-grant Extension program as every other state covered on this site, administered county by county since 1975.

- **Extension Master Gardener Volunteer Program:** requires a minimum of 55 hours of coursework plus a required Action Project and 60 hours of volunteer service to earn certification. Not every New York county has the resources to run a program, so availability varies more than in some other states.

Where to find it: gardening.cals.cornell.edu lists participating counties; contact your local CCE office to confirm whether it runs a Master Gardener program.

CERT: a large city-run program plus independent county teams

Unlike most of the other states covered so far, New York City runs its CERT program directly through NYC Emergency Management, with instructors from the FDNY and NYPD Auxiliary Unit, rather than leaving it entirely to independent local chapters.

What NYC's program looks like

Basic training runs three times a year as an 11-session cycle, open to any NYC resident or anyone who works in the city, covering fire safety, light search and rescue, disaster medical operations, and traffic control, with a one-year volunteer commitment expected after graduation.

Where to find it: within NYC, nyc.gov/cert. Outside the city, several counties, Westchester and Nassau among them, run their own independent CERT programs; search “[your county] CERT” if you’re elsewhere in the state.

Sources

- New York State Citizen Preparedness Corps scale and language availability: Governor Hochul press release; NYS DHSES
- Ready New York campaign: NYC Emergency Management
- Cornell Cooperative Extension Master Gardener Volunteer Program requirements: Cornell Garden-Based Learning
- NYC CERT program structure and training cycle: NYC Emergency Management

BY STATE › NEW YORK

New York: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Sandy (2012): coastal storm surge

Metric	Figure
New York State deaths	48
Direct New York City deaths	43
Share of direct deaths caused by drowning	90%, most within 3 days of landfall
New York City area flooded	51 sq mi
New York City damage estimate	~\$19 billion
Homes severely damaged (5 boroughs)	~2,000
Homes moderately damaged (5 boroughs)	~15,000

Sandy’s death toll came almost entirely from storm surge, not wind, the same pattern later seen in Hurricane Ian’s Florida landfall a decade later. Nearly 2 million people lost power at some point during the storm.

Hurricane Ida remnants (2021): inland flash flooding

Metric	Figure
New York City deaths	13
Deaths in basement apartments specifically	11
Share of deaths that were drowning in unregulated basement units	71%
Peak one-hour rainfall (NYC record)	3.15 in
City sewer system's typical one-hour capacity	~1.75 in

Why this is a structurally different risk from Sandy, not a smaller version of it

Sandy was a coastal storm surge event: predictable direction, tied to a specific coastline, with days of advance warning. Ida’s NYC flooding was an inland flash flood driven by rainfall rate overwhelming fixed sewer infrastructure, capable of striking anywhere in the city with far less lead time, and it killed people specifically in housing, unregulated basement apartments outside the mapped 100-year floodplain, that official flood-risk tools didn’t flag as dangerous at all.

Winter Storm Elliott (2022): the Buffalo blizzard

Metric	Figure
New York State deaths	47
Erie County deaths	39+
Peak snowfall (Snyder, NY)	56.5 in
Buffalo airport snowfall total	51.9 in
Peak wind gust (Lackawanna, NY)	79 mph
Maximum snowdrift height	up to 15 ft

This was the deadliest storm in the Buffalo area’s recorded history, surpassing the region’s previous benchmark, the Blizzard of 1977. Unlike Sandy or Ida, this risk is geographically concentrated: it’s specifically a western New York, Lake Erie lake-effect phenomenon, not a statewide one.

What these three have in common

New York's geography produces three genuinely distinct disaster mechanisms rather than one dominant hazard type: a coastal metro area exposed to storm surge, dense inland housing stock vulnerable to flash flooding regardless of official floodplain maps, and a Great Lakes region exposed to some of the most intense lake-effect snowfall in the country. A household's actual risk profile in New York depends heavily on which of these three geographies they live in, more so than in most other states covered on this site.

Sources

- Hurricane Sandy New York death toll and damage figures: CDC MMWR; Wikipedia, sourced to contemporary reporting
- Hurricane Ida NYC death toll, basement apartment statistics, and rainfall record: ABC News; NYC Health Department
- Winter Storm Elliott New York death toll, snowfall, and wind data: Wikipedia, sourced to contemporary reporting

North Carolina: Overview

Everything in the main manual and the skill guides applies in North Carolina exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under North Carolina go deeper on laws, local resources, and the data behind the risks named here.

Hurricane Helene: catastrophic flooding hundreds of miles from the coast

Hurricane Helene made landfall on Florida's Gulf Coast on September 27, 2024, but its most catastrophic effects happened far inland, in the mountains of western North Carolina. Helene's remnants dropped 20-30 inches of rain across the Blue Ridge in a matter of days, and the French Broad and Swannanoa rivers in Asheville rose to levels not seen since a 1916 flood, breaking that century-old record by roughly 5 feet. The storm killed 107 people in North Carolina, roughly half of all deaths Helene caused across six states, making it the deadliest hurricane in modern North Carolina history and the costliest disaster of any kind the state has recorded. This site's Case for Preparedness page covers Helene as a national case study; see the Risks page here for the full North Carolina-specific data.

When the water system itself is the casualty

One detail from Helene is worth calling out specifically: the flooding didn't just damage homes, it severed the pipes connecting Asheville's water treatment plants to the city itself, leaving large parts of the city without safe drinking water for weeks. This is a useful, concrete illustration of why this manual treats water storage and purification as a Tier 1 priority even for households who assume municipal water is a given, sometimes the infrastructure itself is what fails.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in North Carolina: households in the western mountains, not just the coastal counties most people associate with hurricane risk, need a real flash flood and water-system-failure plan, and the state's coastal counties still carry the more conventional storm surge and wind risk on top of that.

Sources

- Hurricane Helene North Carolina death toll and damage: Wikipedia, sourced to NHC and NC state officials; this site's Case for Preparedness
- Asheville water system damage and river level records: WRAL

North Carolina: Laws & Legal Considerations

Rainwater harvesting: legal, and local governments can’t ban it outright

North Carolina liberalized its rainwater harvesting rules substantially, and state law goes further than simple permission, it explicitly bars local governments from prohibiting the practice.

Rule	North Carolina
Source water	Rooftop or other catchment
Permit required	No, for residential systems under 5,000 gallons
Permitted uses	Non-potable: toilet flushing, laundry, irrigation; must be a system entirely separate from the municipal water supply
Legal protection from local bans	N.C. General Statute §143-138 bars any local building code from prohibiting cistern use for non-potable purposes
HOA rules	HOAs may regulate appearance (matching siding color, screening) but cannot use aesthetic rules to effectively ban a system

Where to find it: the N.C. Department of Environmental Quality (deq.nc.gov) publishes rainwater harvesting guidance; larger or non-residential systems fall under the state Building Code Council’s Appendix C-1 requirements.

Water rights: riparian reasonable use, with roots in an 1868 state case

North Carolina follows the same riparian reasonable-use doctrine common across the Southeast, tracing back to a specific 19th-century state Supreme Court case.

Concept	How it works in North Carolina
Who holds the right	Owners of land adjacent to a natural watercourse
Governing principle	Reasonable use: a riparian owner may use water for domestic, agricultural, and industrial purposes, but not in a way that unreasonably interferes with other riparian owners
Foundational case	Willcox v. Whisnant (1868), which established the reasonable-use framework still applied today

Where to find it: the UNC School of Government (sog.unc.edu) publishes guidance on North Carolina water law for local governments and property owners.

Concealed carry: shall-issue with mandatory training, administered at the county level

North Carolina requires a permit to carry concealed, and unlike Pennsylvania’s no-training shall-issue system, it requires state-approved firearms training before a sheriff will issue one.

Requirement	Detail
Standard	Shall-issue: a county Sheriff issues a Concealed Handgun Permit (CHP) to any applicant who meets the statutory criteria
Minimum age	21
Residency	North Carolina resident for at least 30 days (or military permanently posted in the state)
Training required	A state-approved firearms training course, unlike Pennsylvania's no-training system
Duty to inform	A CHP holder must inform a law enforcement officer they're carrying upon initial contact

Where this sits relative to the other states covered so far

North Carolina is the first state on this site to pair a shall-issue standard with a real training requirement administered directly at the county level, a meaningfully different combination from Pennsylvania’s no-training shall-issue system, California’s state-administered 16-hour course, and the permitless systems in Utah, Texas, Florida, Ohio, and Georgia.

Sources

- North Carolina rainwater harvesting law, SB 163, and NCGS §143-138: LegalAtlas; LegalClarity
- North Carolina riparian water rights and Willcox v. Whisnant: State Regs Today
- North Carolina Concealed Handgun Permit requirements: Alien Gear Holsters; Protect With Bear

[BY STATE](#) › [NORTH CAROLINA](#)

North Carolina: Local Resources

NCEM and ReadyNC

North Carolina Emergency Management, part of the Department of Public Safety, runs public preparedness outreach through the ReadyNC campaign.

A feature worth knowing about specifically

ReadyNC directly tracks coastal evacuation zones and provides a lookup tool, a genuinely useful feature given how central hurricane evacuation planning is to the state's coastal risk profile, on top of its standard household plan and supply kit guidance.

Where to find it: readync.gov.

NC State Extension: North Carolina's version of the other states' land-grant Extension programs

NC State Extension runs the same category of program as every other state covered on this site, through Cooperative Extension Centers in every county.

- **Extension Master Gardener Volunteer Program:** 40 hours of basic training in home horticulture, followed by 40 hours of volunteer service to earn certification, then 20 volunteer hours and 12 continuing-education hours annually to maintain it.

Where to find it: emgv.ces.ncsu.edu lists the program by county.

CERT: run directly by NCEM, statewide

Unlike the fully decentralized county-by-county model seen in some other states, North Carolina's CERT program is administered directly by NCEM at the state level, with ReadyNC serving as the central information and training hub, similar in spirit to Ohio's hybrid model.

Where to find it: readync.gov/get-involved/cert.

Sources

- NCEM and ReadyNC campaign features: ReadyNC
- NC State Extension Master Gardener Volunteer Program requirements: NC State Extension
- North Carolina statewide CERT program administration: ReadyNC

North Carolina: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Helene (2024): the deadliest hurricane in modern North Carolina history

Metric	Figure
Total North Carolina deaths	107-108
Direct deaths (NHC classification)	86
Indirect deaths (NHC classification)	21
North Carolina damage estimate	\$59.6 billion, costliest disaster in state history
Total damage, all affected states	\$78.7 billion
Rainfall over the mountains	20-30 in
French Broad/Swannanoa river levels in Asheville	~5 ft above the previous 1916 record
Landfall strength (Florida)	Category 4, 140 mph

Direct versus indirect deaths, the same distinction this site applies consistently

The NHC’s own classification splits Helene’s North Carolina toll into 86 direct deaths (drowning, structural collapse, and similar causes tied directly to the storm’s physical effects) and 21 indirect deaths (causes like lack of medical care or accidents during cleanup, in the storm’s aftermath). Both are part of the same official 107-108 total; this isn’t a case of two competing counts, just a breakdown by cause, the same kind of distinction this site applies to Hurricane Ian’s Florida death toll.

Why the damage concentrated in the mountains, not the coast

Helene made its actual landfall on Florida's Gulf Coast, more than 500 miles from Asheville, but the storm's remnant moisture met the Blue Ridge Mountains' steep terrain days later, the same fundamental mechanism behind Pennsylvania's Hurricane Agnes and Ida flooding, a tropical system's rainfall colliding with mountainous or hilly terrain far from where it made landfall. Roughly half of all deaths Helene caused across the six states it touched happened in North Carolina alone, and the flooding was severe enough to break a flood-level record set in 1916.

What this means

Helene is the clearest single illustration on this site of a pattern that also appears in Pennsylvania and, less dramatically, Texas: hurricane risk isn't confined to the coastline a storm actually crosses. North Carolina's mountain counties, hundreds of miles inland and with no history of hurricane landfall, absorbed the deadliest and costliest disaster in the state's modern history from a storm that never came near them directly.

Sources

- Hurricane Helene North Carolina death toll (direct/indirect) and damage figures: Wikipedia, sourced to NHC and NC state officials; NHC tropical cyclone report
- Asheville-specific river level records and water system damage: WRAL
- This site's own Hurricane Helene case study: Case for Preparedness

North Dakota: Overview

Everything in the main manual and the skill guides applies in North Dakota exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under North Dakota go deeper on laws, local resources, and the data behind the risks named here.

The 1997 Red River flood: Grand Forks's own story

Minnesota's page on this site covers the 1997 Red River flood's broader regional numbers, a \$3.5 billion disaster largely without direct fatalities thanks to a massive evacuation. Grand Forks, North Dakota, sits at the center of that same flood with a story distinctly its own: the Red River crested at 54 feet, well past the National Weather Service's 49-foot worst-case estimate, forcing Mayor Pat Owens to order more than 50,000 people out of the city. In the middle of that evacuation, a major fire broke out downtown and burned through 11 buildings and 60 apartment units before firefighters could reach it through the floodwater. Recovery required removing entire neighborhoods permanently to build a new \$409 million federal levee system. See the Risks page for the full data.

The Blizzard of 1966: widely considered North Dakota's worst storm

Over March 2-4, 1966, a blizzard parked over North Dakota for three days, driving winds up to 70 mph into mountainous snow drifts across the state. It's often identified as the worst recorded storm in North Dakota history specifically because of how long it lingered, killing at least 18 people in the state and surrounding region along with thousands of livestock. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in North Dakota: a flood evacuation can create its own secondary emergencies, as Grand Forks's downtown fire during the 1997 flood shows, so this manual's guidance about not assuming firefighting response will be available or fast during a major flood applies directly here, and extreme, multi-day blizzard risk is a genuine, historically severe hazard in its own right, not just a routine winter inconvenience.

Sources

- 1997 Red River flood, Grand Forks-specific data: Wikipedia; City of Grand Forks
- Blizzard of 1966 data: State Historical Society of North Dakota; All That's Interesting

BY STATE › NORTH DAKOTA

North Dakota: Laws & Legal Considerations

Rainwater harvesting: legal for outdoor domestic use

North Dakota permits rainwater harvesting for outdoor, domestic use without a state water rights permit, though larger-scale use crosses into permit territory.

Rule	North Dakota
Source water	Rooftop or other catchment
Permit required for typical domestic/outdoor use	No
Permit threshold	Irrigation of more than 5 acres, or industrial/municipal/rural water-system use, may require a water rights permit
Structure/tank permits	A building permit may still be required for structures or underground tanks, separate from the water rights question

Where to find it: the North Dakota Department of Water Resources (dwr.nd.gov).

Water rights: prior appropriation, with domestic use generally exempt

North Dakota follows prior appropriation, the same “first in time, first in right” doctrine as Utah, Montana, Kansas, and several other states covered on this site.

Concept	How it works in North Dakota
Basic rule	The earliest-dated appropriator holds first claim during a shortage
Ownership	All waters within the state belong to the public and are subject to appropriation for beneficial use (N.D. Century Code §61-01-01)
Domestic and farm use	Generally doesn't require a permit, though obtaining one voluntarily can help establish a documented water right

Where to find it: the North Dakota Department of Water Resources administers appropriation permits.

Permitless carry since 2017

North Dakota has recognized constitutional carry since House Bill 1169 took effect August 1, 2017.

Requirement	Detail
Standard	Permitless carry, concealed, for anyone 18+ (resident or non-resident) with a valid driver's license or state ID, legally eligible to possess a firearm
Disclosure requirement	Anyone carrying under the permitless standard must inform any officer who makes contact (e.g., during a traffic stop) that they're carrying, or they're in violation of state law
Optional permit	Remains available for reciprocity purposes

Sources

- North Dakota rainwater harvesting rules: Primal Survivor
- North Dakota prior appropriation water law: North Dakota Century Code §61-01-01; North Dakota Department of Water Resources
- North Dakota permitless carry (HB 1169, 2017) and disclosure duty: USSCA

North Dakota: Local Resources

North Dakota Department of Emergency Services (NDDDES)

NDDDES coordinates statewide emergency planning, response, recovery, and mitigation, drawing directly on the state's history of severe flooding and blizzards.

Where to find it: North Dakota Department of Emergency Services.

NDSU Extension: Master Gardener Program

North Dakota State University Extension runs the same category of program as every other state covered on this site.

- **NDSU Extension Master Gardener Program:** a 40-hour horticultural core course, followed by 48 hours of volunteer service over a two-year period to become certified. Maintaining certification afterward requires 20 volunteer hours and 10 continuing-education hours annually. Available through a limited number of participating counties (26 as of recent cycles), with a program fee of \$225.

Where to find it: ndsu.edu/agriculture/extension/programs/master-gardener lists participating counties.

Not every county participates every cycle

NDSU's Master Gardener Program accepts a limited number of applicants across a specific list of participating counties each cycle, not a fixed statewide roster. Check the current year's list before assuming your county is included.

CERT

North Dakota's CERT training follows the standard FEMA curriculum, delivered through local emergency management offices in coordination with NDDDES.

Where to find it: your local county emergency management office, or NDDDES directly.

Sources

- NDSU Extension Master Gardener Program requirements and participating counties: NDSU Agriculture

BY STATE › NORTH DAKOTA

North Dakota: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Grand Forks and the 1997 Red River flood

Metric	Figure
Grand Forks crest	54 ft, well above the NWS's 49 ft worst-case estimate
People evacuated from Grand Forks	50,000+
Floodwater inland reach	3+ mi past the river's normal banks
Downtown fire during the flood	11 buildings and 60 apartment units burned before firefighters could reach the blaze
Post-flood levee system cost	\$409 million (federally funded)
Regional total damage (Red River basin)	\$3.5 billion (see Minnesota's page for the full regional breakdown)

A fire the flood itself made worse

Grand Forks’s downtown fire broke out in the middle of the evacuation, and floodwater actively slowed firefighters’ ability to reach it, letting it consume 11 buildings before being contained. It’s a clear example of how one disaster can directly disable the response capacity needed for a second, simultaneous emergency.

The Blizzard of 1966

Metric	Figure
Dates	March 2-4, 1966
Duration	3 days
Peak winds	Up to 70 mph
Deaths (ND and surrounding region)	18+
Livestock losses	Thousands
Historical ranking	Widely considered the worst recorded storm in North Dakota history

Duration, not just intensity, made this the worst on record

The 1966 blizzard is remembered as North Dakota’s worst storm largely because of how long it persisted, three full days of sustained high winds and heavy snow, rather than any single moment of extreme intensity. A shorter, more intense storm might have produced less cumulative damage than this one’s sheer duration did.

Sources

- 1997 Red River flood, Grand Forks-specific data: Wikipedia; City of Grand Forks
- Blizzard of 1966 data: State Historical Society of North Dakota; All That’s Interesting

Ohio: Overview

Everything in the main manual and the skill guides applies in Ohio exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Ohio go deeper on laws, local resources, and the data behind the risks named here.

The Xenia tornado: one of the deadliest in U.S. history

On April 3, 1974, an F5 tornado tore through Xenia, Ohio during the 1974 Super Outbreak, at the time the largest tornado outbreak ever recorded, 148 tornadoes across 13 states in 24 hours. The Xenia tornado alone killed 32 people and destroyed or damaged roughly half the town's buildings. Statewide, the outbreak killed 39 Ohioans, injured 2,000, and destroyed 7,000 homes. See the Risks page for the full data.

East Palestine: a hazard this manual's framework already covers, from a different cause

In February 2023, a Norfolk Southern freight train carrying hazardous chemicals derailed in East Palestine, Ohio, near the Pennsylvania border. Several tank cars, including ones carrying vinyl chloride, ruptured, and officials conducted a controversial controlled burn days later. This is the first industrial/hazmat disaster covered in this section of the site, every other state's case studies so far have been natural hazards, and it's a useful reminder that this manual's shelter-in-place, evacuation, and go-bag guidance applies just as directly to a chemical release as to a hurricane or earthquake.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Ohio: tornado season preparation (a safe room, a weather radio, a practiced shelter plan) matters across the state, and households anywhere near a major rail line, which in Ohio's industrial corridors is a meaningful number of people, benefit from the same evacuation-kit and shelter-in-place planning this manual already recommends for other hazards, just triggered by a different kind of warning.

Sources

- 1974 Xenia tornado and Super Outbreak Ohio-wide figures: Wikipedia, sourced to NWS and NCEI; NOAA NCEI
- East Palestine train derailment details: EPA; NPR

BY STATE › OHIO

Ohio: Laws & Legal Considerations

Rainwater harvesting: the first state covered here that allows potable use

Every other state covered on this site restricts collected rainwater to non-potable use only. Ohio is different: under specific conditions, it’s legal to drink it.

Rule	Ohio
Source water	Rooftop or other catchment
Non-potable use	Legal, generally without a permit for typical residential systems
Potable use	Legal as a "private water system" under Ohio Revised Code §3701.344 if it serves fewer than 15 connections and doesn't regularly serve 25+ people at least 60 days a year
Collection volume	Ohio DNR allows collection up to 10,000 gallons without additional approval
Permits	Required from local authority or the Ohio Department of Health before starting collection; requirements vary by locality

Potable use still means treatment, not just a bigger tank

The legal pathway to drinking harvested rainwater exists, but it requires the water to be treated to private-water-system standards under Ohio Administrative Code 3701-28-12, not simply collected and consumed. This is a meaningfully higher bar than the non-potable systems covered on every other state’s laws page so far.

Where to find it: the Ohio Department of Health (odh.ohio.gov) administers private water system rules; check with your county or city building department for local permit requirements.

Water rights: riparian reasonable use, with an explicit constitutional protection

Ohio follows the same riparian reasonable-use doctrine as most of the states covered on this site, but it’s the first one where that protection is written directly into the state constitution rather than resting on case law alone.

Concept	How it works in Ohio
Surface water	Riparian owners have a property interest in the reasonable use of water in an adjacent lake or watercourse
Groundwater	A property owner has a property interest in the reasonable use of groundwater beneath their own land, explicitly protected under Ohio Constitution Article I, §19b
Limits	Reasonable use only; groundwater may be used on the overlying tract but can't be transported to a different, non-overlying tract

Where to find it: Ohio State University’s Agricultural & Resource Law Program (farmoffice.osu.edu) publishes a plain-language guide to Ohio water rights for property owners.

Permitless carry, with an optional license for reciprocity

Ohio eliminated its permit requirement for concealed carry in June 2022, joining Utah, Texas, and Florida among the permitless-carry states covered on this site.

Requirement	Detail
Standard	Permitless ("constitutional") carry: any adult 21+ who can legally possess a firearm may carry concealed with no permit
Optional Concealed Handgun License (CHL)	Available for reciprocity in states that require a permit from Ohio residents; requires 8 hours of firearms safety training
Cost and validity of optional CHL	\$67 for Ohio residents of 5+ years (plus an FBI background-check fee for newer residents), valid 5 years

Sources

- Ohio rainwater harvesting rules, potable-use pathway, and collection limits: Enlight Inc.; Ohio Revised Code §3701.344

- Ohio riparian water rights and constitutional groundwater protection: Ohio Constitution Article I §19b; OSU Agricultural & Resource Law Program
- Ohio permitless carry and optional CHL requirements: Protect With Bear; CCW Hub

BY STATE › OHIO

Ohio: Local Resources

Ohio EMA and Ready Ohio

The Ohio Emergency Management Agency runs public outreach through the Ready Ohio campaign, most visibly during National Preparedness Month each September, covering the same core steps as most other states’ campaigns: know your local hazards, build a communications plan, store important documents safely, and sign up for emergency alerts.

Where to find it: ready.ohio.gov.

Ohio State University Extension: Ohio’s version of the other states’ land-grant Extension programs

Ohio State University Extension runs the same category of program as every other state covered on this site, and its Master Gardener Volunteer program is one of the larger, more established ones covered so far.

Scale

More than 3,000 active Master Gardener Volunteers serve across more than 62 Ohio counties, with 618 new volunteers trained in 2024 alone. Certification requires 50 hours of initial training plus 50 hours of volunteer service within the first year, then 20 volunteer hours and 10 continuing-education hours annually to maintain it. An online option, Buckeye Gardener Online, is also available.

Where to find it: mastergardener.osu.edu lists the program by county.

Ohio CERT: a genuine hybrid model

Unlike states covered so far where CERT is either fully decentralized (Texas, Florida) or run directly by one dominant city (New York City, Chicago), Ohio runs an actual statewide program, Ohio CERT, coordinated by Ohio EMA, with active county-level teams operating underneath it, Franklin County (Columbus), Cuyahoga County (Cleveland), and Summit County (Akron) among the established examples.

How the layers fit together

Ohio EMA sets statewide CERT program standards and provides coordination and resources, while individual counties run their own teams and training schedules, in Cuyahoga County's case, explicitly organized as independent teams with the county emergency management office acting as a resource hub rather than a direct operator.

Where to find it: ema.ohio.gov for the statewide program; search “[your county] CERT” for a local team.

Sources

- Ohio EMA Ready Ohio campaign: Ready Ohio
- Ohio State University Extension Master Gardener Volunteer Program scale and requirements: OSU Master Gardener Volunteers; MGV Policy Statement
- Ohio CERT statewide and county program structure: Ohio EMA; Cuyahoga County

BY STATE › OHIO

Ohio: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Xenia tornado (1974): one of the deadliest single tornadoes on record

Metric	Figure
Xenia deaths	32
Ohio-wide deaths, full outbreak	39
Ohio-wide injuries	2,000
Ohio-wide homes destroyed	7,000
Xenia buildings damaged or destroyed	~1,400, roughly half the town
Damage estimate (1974 dollars, inflation-adjusted)	\$250 million (\$1.63 billion in 2025 dollars)
Peak rating	F5

The Xenia tornado struck during the 1974 Super Outbreak, at the time the largest tornado outbreak ever recorded: 148 tornadoes across 13 states in 24 hours. Xenia’s tornado was the single deadliest of that entire outbreak, and the event became a major driver of subsequent improvements to tornado warning systems nationwide.

East Palestine (2023): a still-unfolding hazmat disaster

Metric	Figure
Total cars derailed	38
Cars carrying hazardous materials	11 (20 cars total contained hazardous cargo per some counts)
Key chemicals involved	Vinyl chloride, ethylene glycol, ethylhexyl acrylate, butyl acrylate, isobutylene
Initial evacuation radius	~1 mile
NTSB-identified root cause	Overheating wheel bearing

Why there's no clean death-toll or damage-total figure here, unlike this site's other case studies

Unlike a hurricane or tornado, East Palestine didn’t produce an acute, countable death toll or a settled damage estimate; its consequences are long-tail and still being studied. Independent investigations found toxic chemicals lingering in buildings for months after the derailment, and as of two years later, residents’ health concerns and chemical monitoring were still ongoing news, not a closed case. This manual’s standard is to report what’s actually confirmed rather than manufacture a false sense of resolution, and for this event, “still under investigation, years later” is itself the honest answer.

What these two have in common

Xenia and East Palestine are structurally opposite kinds of disaster, one an instant, visible, countable catastrophe, the other a slow-motion, still-unresolved one, but both demonstrate the same practical lesson this manual is built around: a real evacuation plan and a real go-bag don’t care whether the trigger is a funnel cloud on radar or a derailment alert from the county emergency system. The warning looks different; the preparation doesn’t.

Sources

- 1974 Xenia tornado and Super Outbreak figures: Wikipedia, sourced to NWS and NCEI; NOAA NCEI
- East Palestine train derailment details and NTSB findings: EPA; The Conversation; NPR, two-year follow-up

Oklahoma: Overview

Everything in the main manual and the skill guides applies in Oklahoma exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Oklahoma go deeper on laws, local resources, and the data behind the risks named here.

Moore, Oklahoma: struck by two EF5 tornadoes, 14 years apart

On May 3, 1999, an F5 tornado tore through Bridge Creek, Newcastle, and Moore, and mobile Doppler radar recorded winds as high as 321 mph inside it, the highest wind speed ever measured on Earth. The storm killed 36 people directly and caused roughly \$1 billion in damage. Fourteen years later, on May 20, 2013, another EF5 tornado struck the same city of Moore directly, killing 24 people, including 7 children sheltering at Plaza Towers Elementary School when a wall collapsed. See the Risks page for the full data on both.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Oklahoma: a genuine, practiced tornado shelter plan, an underground storm shelter or a specifically identified interior room, isn't optional preparedness here, it's a response to documented, repeated, top-of-scale tornado risk in the same communities. Moore's experience shows that being hit by history's most extreme tornado doesn't make a location safe from the next one.

Sources

- 1999 Bridge Creek-Moore tornado wind speed record, deaths, and damage: Wikipedia, sourced to NWS and NSSL; NOAA NSSL
- 2013 Moore tornado deaths, Plaza Towers Elementary, and damage: NIST; Fox Weather

Oklahoma: Laws & Legal Considerations

Rainwater harvesting: no dedicated state statute, generally unrestricted

Oklahoma doesn’t have a specific law addressing residential rainwater harvesting one way or the other, which in practice means typical small-scale collection isn’t regulated.

Rule	Oklahoma
Source water	Rooftop or other catchment
Permit required	No dedicated state requirement for typical residential rain barrels
Permitted uses	Non-potable: irrigation and similar uses
Larger surface water storage	Damming a stream to collect water is generally a "reasonable use" under riparian doctrine, unless it blocks natural flow or interferes with other riparian owners

Where to find it: the Oklahoma Water Resources Board (oklahoma.gov/owrb) administers water rights and larger permitting.

Water rights: a genuine dual system, unlike most states covered on this site

Oklahoma sits at a geographic and legal crossroads, combining elements of the riparian doctrine common in Eastern states with the prior appropriation doctrine typical of the West.

Water use	Governing doctrine in Oklahoma
Domestic use by a riparian landowner	Riparian rights, running with the land, not lost through nonuse
Most other surface water uses	Prior appropriation ("first in time, first in right"), requiring intent to use, physical diversion, and beneficial use within a reasonable time

Why this hybrid exists

Oklahoma’s location between the historically water-rich East and the arid West left it with a legal system that draws from both traditions rather than adopting one exclusively. Since 1963, new water rights claims based purely on riparian land ownership have been phased out in favor of the appropriation system for most uses beyond basic domestic needs, meaning Oklahoma has shifted increasingly toward the Western model over time while retaining riparian protection for domestic use specifically.

Where to find it: the Oklahoma Water Resources Board administers both systems.

Permitless carry since 2019, with a 2026 bill proposing a lower age floor

Oklahoma has allowed permitless carry since 2019, and a bill under consideration in 2026 would extend eligibility further.

Requirement	Detail
Standard	Permitless carry, open or concealed, for anyone 21+ legally eligible to possess a firearm
Optional Self-Defense Act (SDA) License	8-hour safety and law course with live-fire qualification through an OSBI-certified instructor; \$100 for 5 years, \$200 for 10 years
Proposed 2026 change	Senate Bill 1698 would extend permitless carry and transport eligibility to anyone 18 or older, removing the current military-service exception requirement for that age group

Confirm current status

As of this writing, SB 1698 is proposed legislation, not enacted law; the 21-year minimum for permitless carry remains in effect unless and until it passes. Check current status before relying on an 18-year floor.

Sources

- Oklahoma water rights dual system: Oklahoma State University Extension; League of Women Voters Tulsa
- Oklahoma permitless carry and SDA license: Oklahoma OSBI; Protect With Bear

[BY STATE](#) › [OKLAHOMA](#)

Oklahoma: Local Resources

Oklahoma Emergency Management (OEM)

OEM coordinates the state's preparedness, response, recovery, and mitigation programs, without a single named consumer-facing campaign the way some other states covered on this site have.

A distinctive program for younger residents

Since 2019, Oklahoma has run a Youth Preparedness Council in partnership with local emergency managers, tribes, volunteer agencies, and FEMA Region 6, specifically designed to build emergency preparedness knowledge and leadership skills in young Oklahomans, a program not seen on any other state's page covered so far.

Where to find it: oklahoma.gov/oem/programs-and-services.html.

OSU Extension: Oklahoma's version of the other states' land-grant Extension programs

Oklahoma State University Extension runs the same category of program as every other state covered on this site.

- **Oklahoma Master Gardener Program:** classroom training coordinated by local county Extension offices, followed by 60 hours of certification service (48 hours at the Master Gardener help desk, 12 hours in the Demonstration and Teaching Garden), then 20 volunteer hours and 10 continuing-education hours annually to maintain it.

Where to find it: extension.okstate.edu lists the program by county.

CERT: including Moore's own program

Oklahoma's CERT programs are organized locally, and the City of Moore, itself the site of two EF5 tornadoes, runs its own Community Emergency Response Training program directly.

Where to find it: oklahoma.gov/homeland-security/training/cert for statewide information; the City of Moore (cityofmoore.com) for its own program specifically.

Sources

- Oklahoma Emergency Management programs and Youth Preparedness Council: Oklahoma.gov OEM
- OSU Extension Master Gardener Program requirements: OSU Extension
- Oklahoma CERT program and City of Moore's own program: Oklahoma.gov; City of Moore

BY STATE › OKLAHOMA

Oklahoma: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Bridge Creek-Moore tornado (1999): the highest wind speed ever recorded on Earth

Metric	Figure
Peak rating	F5
Peak measured wind speed	321 mph $\pm$ 20 mph (revised upward from an initial 1999 measurement of 301 mph in a 2021 reanalysis)
Measurement method	Mobile Doppler radar (Doppler on Wheels), University of Oklahoma
Direct deaths	36
Indirect deaths	5
Injuries	583
Path length	38 mi
Duration	1 hr 25 min
Damage (1999 dollars / 2025-adjusted)	\$1 billion / ~\$1.9 billion

Why the record wind speed figure changed

The originally reported 301 mph measurement was revised to 321 mph following a 2021 scientific reanalysis of the original radar data, with a stated margin of error of $\pm$ 20 mph either way. This still stands as the highest wind speed ever measured inside a tornado, or anywhere on Earth, by direct instrumentation.

The Moore tornado (2013): the same city, an EF5 again

Metric	Figure
Peak rating	EF5
Deaths	24 (7 children at Plaza Towers Elementary)
Injuries	377
Peak width	~0.5 mi
Peak winds	~200 mph
Buildings damaged or destroyed	~2,400, including two elementary schools and Moore's only hospital
Damage estimate	\$2-3.5 billion (estimates varied widely in the weeks after the event)

Nine of the tornado’s deaths, beyond the 7 at Plaza Towers, occurred in eight different homes within a quarter mile of the school, concentrated in the same immediate area.

What these two have in common

The two Moore tornadoes, separated by 14 years, demonstrate that Oklahoma’s most extreme tornado risk isn’t randomly distributed, certain corridors within Tornado Alley, Moore among them, have now been struck by top-of-scale tornadoes more than once within a single generation. That history is a direct argument for permanent storm shelter infrastructure rather than treating a single close call as reason enough to feel safe going forward.

Sources

- 1999 Bridge Creek-Moore tornado wind speed, deaths, and damage: Wikipedia, sourced to NWS and NSSL; NOAA NSSL
- 2013 Moore tornado deaths, damage, and Plaza Towers Elementary data: NIST; Insurance Journal

Oregon: Overview

Everything in the main manual and the skill guides, the physical techniques, the federal agencies, the underlying science, applies in Oregon exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Oregon go deeper on laws, local resources, and the data behind the risks named here.

The one risk that shapes everything else: the Cascadia Subduction Zone

Oregon's coast sits directly above a fault line capable of producing one of the largest earthquakes possible on Earth, and it is overdue by historical standards. The Cascadia Subduction Zone last ruptured on January 26, 1700, in a magnitude-9.0 event that dropped the coastline several feet and sent a tsunami across the Pacific to Japan, where it was recorded in written records with no known local earthquake. Subduction zone earthquakes of this scale recur on average every 400 to 600 years, though the historical interval has ranged from as little as 200 years to as long as 1,000.

The current risk estimates, per Oregon's own Department of Emergency Management and DOGAMI (the state's Department of Geology and Mineral Industries): roughly a 37% chance of a magnitude 7.1+ rupture somewhere on the zone in the next 50 years, and a 10–15% chance specifically of a full-margin magnitude-9.0+ event in that same window, per USGS estimates. A full-margin rupture would generate a tsunami up to 100 feet high along parts of the Oregon coast, arriving in as little as 15 to 20 minutes, before any official warning could realistically reach people in the inundation zone.

This is the reason Oregon's own emergency management agency built its household preparedness campaign around two weeks of self-sufficiency, not the 72-hour standard used in most of the country: a Cascadia event is expected to leave transportation routes, communication networks, and water and power service unusable for that long or longer across a wide swath of the state, not just the coast.

Wildfire is no longer a coastal-forest abstraction

The 2020 Labor Day fires burned roughly 1 million acres in a single week, destroyed more than 4,000 homes, and killed at least 9 people, driven by an unusual east wind event that pushed fire out of the Cascades and into populated valley towns that don't typically think of themselves as fire country. It remains the state's most

destructive wildfire event on record and reset how Oregon's own fire agencies plan for wind-driven fire risk statewide, not just in the traditionally fire-prone areas east of the Cascades.

Extreme heat is a real, recent mass-casualty event here, not a hypothetical

The Pacific Northwest heat dome of late June 2021 pushed Portland to 116°F, a temperature the city had never recorded before by nearly 10 degrees. Confirmed death counts varied as investigations concluded, from an initial 83 confirmed hyperthermia deaths statewide by late July 2021 to a final tally cited at 116 in later reporting; Multnomah County alone confirmed 72 heat deaths from that single event. Most victims were older adults living alone without air conditioning, a real, specific, identifiable vulnerability rather than a generic risk category.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What changes in Oregon: the two-week planning horizon (already the manual's own Tier 1 target) is not a conservative buffer here, it's the state's own emergency management agency's explicit minimum, because Cascadia is the specific scenario that horizon is built around. See the Laws and Resources pages for what's actually different about executing on that plan in Oregon specifically.

Sources

- Oregon Department of Emergency Management, Cascadia Subduction Zone hazard information: oregon.gov/oem
- USGS, earthquake probabilities and hazards in the U.S. Pacific Northwest: usgs.gov
- Oregon Department of Emergency Management, "Be 2 Weeks Ready" campaign rationale: oregon.gov/oem
- 2020 Labor Day fires acreage, home losses, and death toll: Oregon Forest Resources Institute; Wikipedia, sourced to contemporary reporting
- 2021 Pacific Northwest heat dome death toll (evolving across sources as investigations concluded) and Portland's record temperature: OPB; Multnomah County; State of Oregon Initial After-Action Review

Oregon: Laws & Legal Considerations

Several of this site’s skill guides describe Utah-specific legal processes, most directly the Legal Rainwater Harvesting in Utah guide. None of that content applies here without modification. This page covers the Oregon-specific rules that matter most for the skills already covered elsewhere on this site.

Rainwater harvesting: simpler than Utah’s, with one hard restriction

Oregon’s rule is more permissive than Utah’s registration system in one sense (no registration or paperwork requirement for a basic rooftop system) and more restrictive in another (a hard limit on *where* the water can come from).

Rule	Oregon	How it differs from Utah
Source water	Only rooftop catchment, water diverted directly from an artificial impervious surface into a tank or cistern	Utah has no equivalent source restriction beyond the storage-volume tiers
Registration	None required for a typical residential system	Utah requires free registration once storage exceeds 200 gallons
Storage limit	No specific state-imposed volume cap for rooftop systems	Utah caps registered storage at 2,500 gallons before a full water right is needed
Ground/standing water	Cannot be collected at all under this exemption once it has touched the ground	Not a distinction Utah's rule makes

The reason for the rooftop-only rule: Oregon water law treats all water in the state as public, subject to the prior-appropriation permit system, unless a specific exemption applies. The exemption for rainwater applies specifically to water captured directly off an artificial impervious surface (a roof) before it ever reaches the ground or a natural watercourse; water that has already hit the ground is legally indistinguishable from any other surface water and falls back under the full water-rights permit system.

Indoor use needs more than a rain barrel

Using harvested rainwater for outdoor, non-potable purposes (irrigation, washing) has no special requirements beyond the rooftop-source rule. Indoor use, including something as simple as flushing a toilet with it, requires a code-compliant system with backflow prevention to keep it from ever contaminating the potable water supply; check with your city or county building department before plumbing harvested rainwater into any indoor fixture.

Where to find it: OSU Extension publishes a free, Oregon-specific guide (EM 9448, “Rainwater Harvesting in Tanks or Cisterns: Oregon Regulations”) covering both the legal rules and basic system design; contact your local Oregon Water Resources Department (OWRD) watermaster office for anything beyond a basic residential system.

Water rights: prior appropriation, same doctrine as Utah, different agency

Oregon and Utah both use prior-appropriation water law (“first in time, first in right”), the standard doctrine across the western United States, so the underlying logic in the rainwater guide’s discussion of water rights transfers directly. What doesn’t transfer is the agency and the specific process: Oregon’s water rights are administered by the Oregon Water Resources Department (OWRD), not Utah’s Division of Water Rights, and any well, diversion, or water use beyond the rainwater exemption above needs a permit through OWRD specifically.

Defensible space is now a state-level requirement in mapped wildfire hazard areas

Oregon’s State Fire Marshal has established minimum defensible space requirements (ORS 476.392) for property in areas identified on the state’s wildfire hazard map as wildland-urban interface. Where it applies, the property owner must maintain a buffer around all buildings and decks that’s free of combustible vegetation and stored combustible materials (firewood, lumber) within the defined space, based on the International Wildland-Urban Interface Code.

Check your specific property, don't assume

Whether this applies to a given property depends on where it falls on the state’s wildfire hazard map, which local governments can adopt and, in some cases, expand on. Contact your county or the Oregon State Fire Marshal’s office directly to check a specific address, and check with your local fire department for separate, locality-specific burn permit rules before any outdoor burning; these are set locally, not by a single statewide permit.

Where to find it: the Oregon State Fire Marshal publishes a free defensible space checklist covering the specific buffer-zone requirements: oregon.gov/osfm.

Concealed carry: a permit state, unlike Utah’s permitless-carry-for-residents approach

Oregon requires a Concealed Handgun License (CHL) to carry concealed, issued by the county sheriff where the applicant resides, under ORS 166.291–166.292.

Requirement	Detail
Minimum age	21
Competency requirement	A certified safety course including in-person instruction and a live-fire component, or equivalent through organized shooting competition or military experience
Background check	Fingerprint-based, run through Oregon State Police and FBI records; sheriff has 45 days to issue or deny
Cost	Roughly \$115 for a new application, \$75 to renew
Validity	4 years
Reciprocity	Oregon does not recognize any other state's concealed carry permit

This is a real, practical difference from Utah for anyone relocating or splitting time between the two states: a Utah permit carries no weight in Oregon, and vice versa, since Oregon doesn’t extend reciprocity to any other state’s license.

Sources

- OSU Extension, “Rainwater Harvesting in Tanks or Cisterns: Oregon Regulations” (EM 9448): extension.oregonstate.edu
- Oregon Water Resources Department, water rights and prior appropriation: oregon.gov/owrd
- Oregon State Fire Marshal, defensible space requirements and ORS 476.392: oregon.gov/osfm; Oregon Law, ORS 476.392
- Oregon Concealed Handgun License requirements, ORS 166.291–166.292: USCCA Oregon gun law summary

Oregon: Local Resources

The skill guides and addenda on this site point to Utah-specific programs throughout, USU Extension, Be Ready Utah, Utah CERT chapters. Oregon has its own direct equivalents for nearly all of them.

Oregon Department of Emergency Management: “Be 2 Weeks Ready”

Oregon’s own household preparedness campaign, the direct analog to Be Ready Utah, is built explicitly around the same two-week horizon this site’s own manual uses as its Tier 1 target, and for the same underlying reason: a Cascadia Subduction Zone earthquake is expected to leave much of the state’s infrastructure unusable for two weeks or longer, well past the 72-hour standard used in most other states’ campaigns.

Why this matters more here than the name suggests

Oregon adopted the two-week standard specifically because the 72-hour guidance common elsewhere doesn’t reflect what a full Cascadia rupture would actually do to transportation, communication, water, and power infrastructure across a wide part of the state, not just the coast. See the overview page for the hazard data behind this.

Where to find it: oregon.gov/oem publishes the full checklist and planning guidance free.

OSU Extension Service: the direct analog to USU Extension

Oregon State University’s Extension Service runs the same category of skill-building programs this site’s addenda repeatedly point to for Utah, USU Extension, just administered by a different land-grant university.

- **Master Gardener Program:** volunteer training in sustainable gardening and food production, run through county Extension offices across the state, the same structure as Utah’s Master Gardener program.
- **Master Food Preserver Program:** over 40 years running, trains and certifies volunteers in safe home food preservation (canning, drying, fermenting); after the core training, volunteers complete 20–40 hours of community service annually teaching others, the same “learn it, then teach it” progression the Water & Food addendum’s Stage 3–4 content describes for Utah’s Master Food Preserver program.

Where to find it: extension.oregonstate.edu; both programs are run through individual county Extension offices, so availability, cost, and schedule vary by county, the same pattern as Utah's USU Extension programs.

CERT: more than 50 active chapters statewide

Community Emergency Response Team training is free through most local programs and follows the same national curriculum described in the Understanding START Triage guide, disaster medical operations, light search and rescue, team organization, fire safety.

Real, concrete examples of what free actually looks like here

Tualatin CERT runs a free 7-week Basic CERT course twice a year for residents and people working in the city. Milwaukie and Clackamas County run free classes twice yearly, taught by FEMA-certified local trainers, over three 8-hour Saturday sessions (24 hours total). Benton County's course is free with volunteering afterward optional, not required.

Where to find it: the state maintains a directory of all active CERT programs at oregon.gov/oem; email community.preparedness@oem.oregon.gov if your specific area isn't listed or you want to help start a program.

Sources

- Oregon Department of Emergency Management, "Be 2 Weeks Ready" campaign: oregon.gov/oem
- OSU Extension Service, Master Gardener and Master Food Preserver programs: extension.oregonstate.edu; Master Food Preserver Program
- Oregon Department of Emergency Management, CERT program directory: oregon.gov/oem
- Local CERT program details (Tualatin, Milwaukie/Clackamas County, Benton County): city and county program pages

BY STATE › OREGON

Oregon: Risks & Trends

This page is Oregon’s equivalent of the trend-line data behind the Case for Preparedness document’s Utah sections, sized to one state rather than the full national/global picture that document covers. Same standard: every figure below is independently sourced, and figures that vary across sources are noted as such rather than resolved to a single number that looks more precise than the underlying data actually is.

The Cascadia Subduction Zone

Metric	Figure	Source
Chance of M7.1+ rupture, next 50 years	~37%	Oregon DOGAMI / Oregon Dept. of Emergency Management
Chance of full-margin M9.0+ rupture, next 50 years	10–15%	USGS
Last full rupture	January 26, 1700 (M9.0, confirmed via Japanese tsunami records)	USGS, DOGAMI
Typical recurrence interval	400–600 years (range: 200–1,000)	DOGAMI
Projected tsunami height, worst-case coastal areas	Up to 100 ft	Oregon Dept. of Emergency Management
Estimated tsunami arrival time after rupture	15–20 minutes	Oregon Dept. of Emergency Management

The probability figures above describe two different thresholds, not a contradiction: a 37% chance covers any rupture of magnitude 7.1 or greater anywhere on the zone (which could mean a partial rupture affecting only part of the coast), while the 10–15% figure covers specifically a full-margin magnitude-9+ event, the “Big One” scenario that produces the 100-foot tsunami projection and the multi-week infrastructure loss Oregon’s own two-week preparedness standard is built around.

The 2020 Labor Day fires

Metric	Figure
Acres burned	~1.0–1.1 million (figures vary slightly by source)
Homes destroyed	4,000+
Deaths	At least 9 (some sources report up to 11)
Timeframe	Most destruction occurred within a single 72-hour period over Labor Day weekend

What made this event different from Oregon's typical fire season wasn't just scale, it was location: an unusual east wind event pushed fire out of the Cascades and into populated valley towns (Detroit, Blue River, Phoenix, Talent) that hadn't historically planned around wind-driven fire risk the way areas east of the Cascades do. It remains the benchmark event Oregon's fire agencies plan against for wind-driven, structure-loss fire risk statewide.

The 2021 heat dome

Metric	Figure
Portland's peak temperature	116°F, a new all-time record by nearly 10°F
Confirmed hyperthermia deaths, statewide, as of July 26, 2021	83 (State of Oregon Initial After-Action Review)
Statewide death toll cited in later reporting	116
Multnomah County deaths from the event	72, nearly all within a single five-day stretch in June 2021
Demographic pattern	Most victims were older adults living alone without air conditioning

Why the death count moved over time

The gap between the 83-death count in the state's own late-July after-action review and the 116 figure cited in later reporting isn't a data error; it reflects medical examiners finalizing individual investigations and toxicology reports over the following weeks, the same pattern the Case for Preparedness document notes for other disasters' initial-versus-final damage and casualty figures.

What these three have in common

Each of these is the kind of event this manual's Tier 1–2 framing exists for: a sudden onset, a multi-day to multi-week disruption to normal services, and a real, documented history of catching people without the specific preparation that would have mattered most, water and food independence for the Cascadia scenario, defensible space and an evacuation plan for wildfire, a cooling plan and a way to check on isolated older neighbors for extreme heat. None of them are hypothetical for Oregon; all three have already happened in the last five years.

Sources

- Cascadia Subduction Zone probability figures, recurrence interval, and tsunami projections: Oregon Dept. of Emergency Management; USGS
- 2020 Labor Day fires acreage, structure loss, and death toll: Oregon Forest Resources Institute; Wikipedia, sourced to contemporary reporting
- 2021 heat dome temperature record and evolving death toll: OPB; Multnomah County; State of Oregon Initial After-Action Review (June 2021 Excessive Heat Event)

Pennsylvania: Overview

Everything in the main manual and the skill guides applies in Pennsylvania exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Pennsylvania go deeper on laws, local resources, and the data behind the risks named here.

A landlocked state, but not a hurricane-free one

Pennsylvania doesn't take direct hurricane landfalls, it's nowhere near the coast, but that doesn't make it immune to hurricanes. A weakening tropical system's remnant moisture can still dump enormous rainfall on the state's river basins in a matter of hours, and Pennsylvania's hilly terrain and dense network of rivers turn that rain into flash flooding fast. Hurricane Agnes did exactly that in June 1972, killing 50 people in Pennsylvania and causing \$2.3 billion in damage, the governor at the time called it, without qualification, the worst disaster in Pennsylvania's history. The mechanism repeated on a smaller scale in September 2021, when the remnants of Hurricane Ida pushed Philadelphia's Schuylkill River to heights not seen in over 150 years.

What makes this risk easy to underestimate

Because Pennsylvania isn't in any conventional hurricane risk zone, it's easy to treat hurricane season as somebody else's problem. The data says otherwise: the state's worst disaster on record was a hurricane's remnants, not an earthquake, wildfire, or blizzard, and it happened specifically because a weakened tropical system stalled over the state's river basins rather than passing through quickly. See the Risks page for the full comparison between 1972 and 2021.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Pennsylvania: households anywhere near a river, not just the obvious floodplain, should treat remnant tropical moisture as a real flash flood risk during hurricane season (June through November), and this is true statewide, not just in coastal-adjacent counties the way it is in most other states covered on this site.

Sources

- Hurricane Agnes deaths, damage, and evacuation figures in Pennsylvania: Wikipedia, sourced to NOAA and contemporary reporting; Fox Weather
- Hurricane Ida remnants' Pennsylvania rainfall and Schuylkill River crest: USGS; NPR

Pennsylvania: Laws & Legal Considerations

Rainwater harvesting: permitted statewide, subsidized in Philadelphia

Pennsylvania places no state-level restriction on collecting rainwater for non-potable use, and Philadelphia specifically goes further than any other city covered on this site by directly funding it.

Rule	Pennsylvania
Source water	Rooftop or other on-property catchment
Permit required	No, for typical residential non-potable use
Permitted uses	Non-potable: irrigation, washing; drinking untreated collected rainwater is not permitted
Underlying framework	No specific state harvesting statute; governed under the broader Pennsylvania Storm Water Management Act of 1978 (Act 167), which sets the stormwater-management framework counties and municipalities build local ordinances on

Philadelphia will give you a rain barrel

The Philadelphia Water Department runs free workshops and gives away free rain barrels to residents, and the city offers stormwater grants and low-interest loans for larger nature-based stormwater projects on non-residential properties. This is a genuinely different posture from every other state covered so far, direct public funding for the exact behavior this manual’s water chapter already recommends, not just an absence of restriction.

Where to find it: the Philadelphia Water Department (water.phila.gov) for city-specific programs; the Pennsylvania Department of Environmental Protection (dep.pa.gov) for statewide stormwater policy.

Water rights: riparian, same family as Florida and New York, with an explicit priority rule

Pennsylvania uses the same broad riparian reasonable-use doctrine as Florida and New York, but its case law spells out an explicit priority order that those two states’ pages didn’t need to cover.

Concept	How it works in Pennsylvania
Who holds the right	Riparian owners: landowners bordering a watercourse
Governing principle	Reasonable use: some reduction in flow is allowed as long as other riparian users aren't unreasonably harmed; "reasonable" depends on stream size, use type, withdrawal amount, and other users' circumstances
Nature of the right	Usufructuary: a right to use the water, not to own it outright
Priority in a conflict	Domestic use (drinking, bathing, livestock, laundry) is explicitly given top priority over all other uses when riparian users conflict
Prohibited uses	Selling or wasting water, and diverting it to non-riparian land, are both treated as unreasonable regardless of amount

Where to find it: the Pennsylvania DEP’s Bureau of Safe Drinking Water handles larger water allocation questions; Penn State Extension (extension.psu.edu) publishes a plain-language overview of riparian rights for property owners.

Concealed carry: shall-issue, and the simplest process covered here so far

Pennsylvania requires a license to carry concealed, unlike Utah, Texas, and Florida’s permitless systems, but its process is the least demanding shall-issue system covered on this site, notably simpler than California’s or New York’s.

Requirement	Detail
Standard	Shall-issue: the county Sheriff must issue a License to Carry Firearms (LTCF) to any applicant who meets the statutory criteria
Training required	None; Pennsylvania is one of the few shall-issue states with no mandatory training or live-fire component at all
Minimum age	21
Cost and validity	\$20, valid for 5 years
Processing time	Up to 45 days by law

Where Pennsylvania sits on the spectrum

Across the six states covered so far, this section runs from fully permitless (Utah, Texas, Florida) through Pennsylvania’s no-training shall-issue system, to California’s shall-issue system with a mandatory 16-hour course, to New York’s much more demanding “good moral character” standard with an 18-hour requirement and an active interview and background investigation. Pennsylvania sits closer to the permitless end than either California or New York.

Sources

- Pennsylvania rainwater harvesting rules and Philadelphia incentive programs: Pennsylvania-State.blog; Philadelphia Water Department; Act 167 framework: StormwaterPA
- Pennsylvania riparian water rights, reasonable use, and domestic-use priority: Penn State Extension; MPL Law Firm
- Pennsylvania License to Carry Firearms requirements: CCW Hub; Alien Gear Holsters

Pennsylvania: Local Resources

PEMA and ReadyPA

The Pennsylvania Emergency Management Agency runs public preparedness outreach under the ReadyPA campaign, built on the national Ready.gov framework from DHS and the Ad Council but adapted with Pennsylvania-specific content.

ReadyPA's three-part framework

Be Informed (know your specific local hazards and how to get emergency alerts), Be Prepared (build a kit and a household plan), and Be Involved (volunteer, including through your local CERT team or Citizen Corps). ReadyPA is supported jointly by PEMA, Citizen Corps of Pennsylvania, and the state Department of Health.

Where to find it: pa.gov/agencies/ready.

Penn State Extension: Pennsylvania's version of USU/OSU/UC ANR/AgriLife/UF IFAS/Cornell CCE

Penn State Extension runs the same category of land-grant Extension program as every other state covered on this site.

- **Master Gardener Program:** 40 hours of basic training (many counties run it as a 20-week evening program, October through March), an 80%-or-better score on midterm and final exams, then 50 hours of volunteer service within the first year to earn certification, followed by 20 volunteer hours and 10 continuing-education hours annually to maintain it.

Where to find it: extension.psu.edu lists the program by county.

CERT: county-run, with PEMA offering a direct connection

Like most states covered on this site outside of a few large single-city programs, Pennsylvania's CERT teams are organized at the county level, Allegheny County (Pittsburgh), Chester County, and Montgomery County among the active examples, each with its own schedule and application process.

A shortcut worth knowing about

Rather than searching independently, Pennsylvania residents can contact PEMA directly and ask to be connected to their local CERT team, a small but genuinely useful coordination service that not every state covered here offers explicitly.

Where to find it: pa.gov/services/ready for the PEMA connection point; Pittsburgh and Chester County for two active county-level examples.

Sources

- PEMA and ReadyPA campaign structure: Ready PA; ReadyPA newsletter/background
- Penn State Extension Master Gardener Program training and certification requirements: Penn State Extension
- Pennsylvania CERT program structure and PEMA's local connection service: [PA.gov](https://pa.gov); Allegheny County

BY STATE › PENNSYLVANIA

Pennsylvania: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Agnes (1972): the worst disaster in Pennsylvania’s recorded history

Metric	Figure
Pennsylvania deaths	50
Pennsylvania damage (1972 dollars)	\$2.3 billion
People evacuated statewide	100,000+
People left homeless statewide	220,000+
Homes and businesses damaged or destroyed	68,000 homes / 3,000+ businesses
U.S.-wide deaths (for comparison)	119

Why Pennsylvania's share of this disaster was so disproportionate

Agnes made its actual landfall on the Florida Panhandle and had weakened to a tropical depression by the time it reached Pennsylvania, but it stalled over the state’s river basins for days, dumping enormous rainfall on already-saturated ground. Pennsylvania’s share of the storm’s total U.S. damage was larger than every other affected state combined; then-Governor Milton Shapp called it, without qualification, the worst disaster in Pennsylvania’s history. The lesson isn’t about hurricane category or landfall strength, it’s about a weakened system’s rainfall meeting a river basin’s terrain.

Hurricane Ida remnants (2021): the same mechanism, half a century later

Metric	Figure
Pennsylvania deaths	5+
Rainfall, eastern/south-central PA	5-10 in, most within about 6 hours
Schuylkill River crest in Philadelphia	Highest level in more than 150 years
Pennsylvania damage estimate	\$117 million+

Ida’s Pennsylvania toll was far smaller than Agnes’s in absolute terms, but the mechanism was identical: a tropical system, by then a post-tropical remnant, dropped its rainfall over a short window directly onto a Pennsylvania river basin, and the Schuylkill responded by rising to a height the city hadn’t seen in a century and a half.

What these two have in common

Separated by 49 years, Agnes and Ida demonstrate the same structural risk: Pennsylvania doesn’t need a hurricane to make landfall on its own soil to suffer a landmark flood disaster, it only needs a weakening tropical system to stall its rain over the right river basin. That’s a very different risk profile from every coastal state covered on this site, and it means hurricane season matters in Pennsylvania even though no hurricane has ever technically made landfall there.

Sources

- Hurricane Agnes Pennsylvania death toll, damage, and evacuation figures: Wikipedia, sourced to NOAA and contemporary reporting; Fox Weather; Susquehanna River Basin Commission
- Hurricane Ida remnants’ Pennsylvania deaths, rainfall, and Schuylkill River crest: USGS; NPR

Puerto Rico: Overview

Everything in the main manual and the skill guides applies in Puerto Rico exactly as written. What's different here is the specific hazard profile and a legal framework that runs on civil law, not the English common law every state's page on this site is built on, which changes water rights and several other legal questions in ways worth understanding before assuming a state-page answer transfers over. This page is the starting point; the other three pages under Puerto Rico go deeper on laws, local resources, and the data behind the risks named here.

Hurricane Maria: the longest blackout in U.S. history

Hurricane Maria made landfall near Yabucoa on September 20, 2017, as a high-end Category 4 storm with sustained winds of 155 mph. The island's power grid didn't come back for 328 days, nearly 11 months, the longest blackout in U.S. history and the second-largest in world history; the last home reconnected was in rural Ponce. The human toll took over a year to actually settle: Puerto Rico's government initially reported 64 deaths, but a government-commissioned George Washington University study released in August 2018 put excess mortality at 2,975 in the months after landfall, the figure the territorial government then formally adopted, while an independent Harvard study estimated as many as 4,645 using a different methodology. Total damage ran approximately \$90 billion, almost entirely borne by Puerto Rico itself, and a month after landfall roughly 29% of the island, close to a million people, still had no running water. See the Risks page for the full data.

The grid never really recovered, and it's still failing island-wide

The power system that took 328 days to rebuild after Maria hasn't stabilized since. On December 31, 2024, a failed line at the Costa Sur plant cascaded into an island-wide failure that cut power to roughly 1.2 of Puerto Rico's 1.47 million customers. On April 16, 2025, a single transmission line brought down by overgrown vegetation, a line that had already failed 23 separate times in the prior year, took out power for 1.4 million customers and water service for over 400,000 more as a direct knock-on effect. The utility's own 2023 reliability numbers explain why: PREPA/LUMA's distribution grid averaged roughly 1,022 outage-minutes per customer per year against 4.7 separate outage events, three to six times worse than typical mainland utilities on both measures, while the utility's operator has fallen well short of its own contracted improvement targets. PREPA itself remains in unresolved federal bankruptcy proceedings as of this writing. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification, but Tier 3, "no more fuel deliveries, no grid to return to," isn't the distant edge case here that it is in most of this manual's coverage area: it's the documented, lived experience of a large share of Puerto Rico's population for the better part of a year after Maria, and island-wide outages have recurred since on a multi-month cycle rather than a multi-decade one. Households here have a real reason to treat Tier 3 energy and water planning as a near-term possibility, not a remote contingency. Puerto Rico also experienced a serious earthquake sequence in January 2020 (a magnitude 6.4 mainshock left thousands displaced and damaged a power plant supplying over a quarter of the island's electricity), a reminder that the grid's fragility isn't only a hurricane problem. And because Puerto Rico's legal system runs on civil law rather than the common-law framework every state page on this site assumes, the Laws page below is worth reading even for household preparedness questions (like water rights) that seem purely practical rather than legal.

Sources

- Hurricane Maria landfall, wind speed, and grid restoration timeline: Wikipedia; NPR
- Maria death toll (GWU excess-mortality study): George Washington University
- Maria death toll (Harvard independent estimate): New England Journal of Medicine
- Maria damage cost and water-service disruption: Wikipedia
- December 2024 island-wide outage: CBS News
- April 2025 island-wide outage: U.S. News
- PREPA/LUMA reliability statistics: POWER Magazine; LUMA Q4 report
- January 2020 earthquake sequence: Wikipedia

BY STATE › PUERTO RICO

Puerto Rico: Laws & Legal Considerations

Rainwater harvesting: legal, code-recognized, and, on paper, government-mandated

Rainwater harvesting is legal in Puerto Rico for both non-potable and potable use, common enough that cisterns are sold at local hardware stores, and it’s directly written into the building and plumbing codes rather than left as an unaddressed gray area.

Rule	Puerto Rico
Source water	Rooftop or other catchment, for non-potable or potable use
Governing code	Puerto Rico Plumbing Code, Chapter 13 ("Nonpotable Water Systems", §1301); Puerto Rico Building Code, Chapter 29 (§P2901.1)
Distribution marking	Code requires purple piping to identify rainwater, graywater, and reclaimed-water lines
2024 public policy	Law 91-2024 establishes rainwater harvesting as public policy and requires government agencies themselves to collect rainwater to reduce consumption

A 2024 law with compliance still in question

Law 91-2024 requires Puerto Rico’s own government agencies to collect rainwater, not just permits it for households. As of an August 2025 investigative report, compliance with that mandate was largely unverified, and legislators had filed a resolution to investigate why it hadn’t been implemented. The underlying legal right to harvest rainwater as a household isn’t in question; whether the government is actually following its own 2024 mandate is a separate, still-open question.

Water rights: public domain under civil law, not riparian rights

Puerto Rico’s water law starts from a fundamentally different premise than any state covered on this site: water isn’t privately owned alongside the land it touches.

Concept	How it works in Puerto Rico
Basic framework	Puerto Rico Civil Code, Title 31, Subtitle 2, Part IV ("Waters"), Chapter 153 §1311: rainwater, streams, and most surface and ground water belong to the public domain of the Commonwealth, held in trust for the population
Comprehensive statute	Act No. 136 of June 3, 1976, the Puerto Rico Water Resources Act, governs development and use, prioritizing domestic and human consumption above other uses
Administering agency	Department of Natural and Environmental Resources (DRNA), which issues permits and franchises for water development
Retail utility	PRASA (Puerto Rico Aqueduct and Sewer Authority, "AAA" in Spanish), created in 1945, serves roughly 97% of the population with water and 59% with sewer

Not riparian rights, and a live constitutional question about reliability

Every state’s water-law page on this site describes some form of riparian or prior-appropriation doctrine, private rights tied to land ownership or use history. Puerto Rico’s civil-code framework starts from the opposite premise: the water itself belongs to the public, held in trust, not to whoever owns the adjacent land. Separately, and directly relevant to a preparedness plan: a federal court ruled in October 2025 that PRASA’s failure to reliably provide water violates constitutional rights, a live legal finding about the same utility most households depend on for their primary water supply.

Concealed carry: a 2019 reform moved Puerto Rico from restrictive may-issue to shall-issue

Puerto Rico’s Act No. 168 of 2019, the “Puerto Rico Weapons Act of 2020,” took effect January 1, 2020, converting the territory from a may-issue system, where a license reportedly cost around \$1,500 and was rarely granted to an ordinary applicant, to shall-issue.

Requirement	Detail
Standard	Shall-issue since Act No. 168 (2019), effective January 1, 2020
License structure	A single unified license covers both firearm possession and carry, rather than two separate licenses
Processing	The Puerto Rico Police Bureau must approve or deny an application within 30 days if statutory criteria are met
Minimum age / requirements	21+; background and criminal-record check; fingerprints; a certified firearms training course leading to a required Use and Management Certificate
Cost	\$200 license fee (5-year term); \$100 renewal
Still restrictive relative to mainland shall-issue states	No open carry; mandatory firearm registration remains in place

A 2019 reform, not a response to Bruen

Act 168 took effect in January 2020, more than two years before the U.S. Supreme Court’s 2022 Bruen decision reshaped concealed carry law nationally. Puerto Rico’s shift to shall-issue was a local legislative reform, not a court-driven response, worth getting right since the timing is easy to mix up with the broader post-Bruen wave of changes in other jurisdictions.

Sources

- Puerto Rico rainwater harvesting code and Law 91-2024: Plenitud PR; NotiCel
- Puerto Rico Civil Code water provisions: Justia
- Puerto Rico Water Resources Act (Act 136 of 1976): FAO Lex
- PRASA structure and service coverage: AAFAF
- October 2025 federal court ruling on PRASA water reliability: Circle of Blue
- Act No. 168 of 2019 (Puerto Rico Weapons Act of 2020): Official text; Buckeye Firearms Association; Wikipedia

[BY STATE](#) › [PUERTO RICO](#)

Puerto Rico: Local Resources

Negociado para el Manejo de Emergencias y Administración de Desastres (NMEAD)

NMEAD, the Puerto Rico Emergency Management Bureau, leads territorial emergency management and disaster response under the Department of Public Safety. The agency in its current form dates to a 2023 reorganization law that restructured the prior Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (AEMEAD) into NMEAD.

Use the Department of Public Safety mirror if NMEAD's own site won't load

NMEAD's own domain has had an expired SSL certificate; browsers may refuse to load it or show a security warning. The Department of Public Safety hosts a working mirror page with the same agency information if that happens.

Where to find it: dsp.pr.gov (NMEAD page).

CERT: active island-wide through NMEAD

NMEAD runs an active Community Emergency Response Team program, training volunteers in disaster preparedness, fire safety, light search and rescue, team organization, and disaster medical operations, the same core CERT curriculum used across the states, adapted to the island's own hazard profile.

University of Puerto Rico: Agricultural Extension Service Master Gardener Program

UPR-Mayagüez, Puerto Rico's land-grant institution, runs an Extension Master Gardener program through its Agricultural Extension Service, developed with financial and technical assistance from the U.S. Forest Service's International Institute of Tropical Forestry.

- **Extension Master Gardener Program:** a 12-module curriculum taught by agronomists from Extension Service regions across the island, including the municipal islands of Culebra and Vieques, covering plant anatomy, pathology, entomology, soils, community-garden management, wildlife management, and sustainable gardening practices, with field trips to sites like the Río Piedras Botanical Garden and El Yunque National Forest.

Where to find it: the UPR-Mayagüez Agricultural Extension Service, Box 787, Río Grande, PR 00745; (787) 887-2275; mgppr@uprm.edu.

Sources

- NMEAD structure, mission, and 2023 reorganization: DSP Puerto Rico; Microjuris
- NMEAD CERT program: NMEAD
- UPR Extension Master Gardener Program structure: USDA Forest Service

BY STATE › PUERTO RICO

Puerto Rico: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Maria (2017)

Metric	Figure
Landfall	September 20, 2017, near Yabucoa, high-end Category 4, 155 mph sustained winds
Grid restoration	328 days (nearly 11 months) to full restoration; longest blackout in U.S. history
Death toll	64 (initial official count); 2,975 (GWU excess-mortality study, later adopted as PR's official figure); up to 4,645 (independent Harvard estimate, wide confidence interval)
Damage	~\$90 billion, almost entirely borne by Puerto Rico
Housing	Estimates range from ~166,000 to ~472,000 residential units destroyed or majorly damaged, depending on source and criteria
Water access, 1 month out	~29% of the island, roughly 1 million people, still without running water

Three different death tolls, and why that's not a red flag

A death toll that changes by a factor of 45 (64 to 2,975) sounds like a cover-up; it’s actually a methodology difference. The initial 64 counted only deaths directly, immediately attributable to the storm itself. The GWU and Harvard studies instead measured excess mortality, how many more people died in the months after Maria than would have died in a normal period, capturing deaths from lost medical care, heat, and infrastructure failure that a direct-cause count misses entirely. Puerto Rico’s government formally adopted the GWU figure (2,975) as its official toll; the Harvard estimate runs higher because it used a different survey methodology with a wider uncertainty range. All three numbers are real; they’re answering different questions.

The grid since Maria: recurring island-wide failures, not a one-time crisis

Metric	Figure
December 31, 2024 outage	~1.2 of 1.47 million customers (82%) lost power in a cascading failure originating at the Costa Sur plant; ~98% restored within a day
April 16, 2025 outage	1.4 million customers lost power; over 400,000 also lost water service; traced to a single transmission line that had already failed 23 times in the prior year
Distribution SAIDI, 2023	~1,022 outage-minutes per customer per year
Distribution SAIFI, 2023	~4.7 outage events per customer per year
Comparison to mainland utilities	Roughly 3-6x more outage-minutes and 2-3x more interruptions than typical mainland utilities cited for comparison
Generation availability	On average, only about 53% of total generation capacity available at any given time

Still in bankruptcy, still unresolved

PREPA remains in unresolved Title III federal bankruptcy proceedings as of this writing, the last major case of its kind still open. The utility’s operator has also fallen well short of its own contracted reliability-improvement targets. None of this is a settled, recovering situation; it’s an ongoing one, worth checking for current status rather than assuming it’s been resolved by the time you’re reading this.

The January 2020 earthquake sequence

Metric	Figure
Mainshock	January 7, 2020, magnitude 6.4, epicenter near Guayanilla in southwestern Puerto Rico
Deaths/injuries	At least 1 confirmed initially, rising to a commonly cited total of 4 dead and 9 injured across the sequence
Damage	~\$3.1 billion
Displacement	8,000+ homeless island-wide within a week; roughly 40,000 people camping outside their homes in Ponce alone
Emergency shelter response	28 government shelters across 14 municipalities, plus 5 tent cities with a combined capacity of ~3,200
Power infrastructure	A power plant supplying more than a quarter of the island's electricity was badly damaged, with repairs estimated to take a year or more

Sources

- Hurricane Maria landfall, wind speed, and grid restoration: Wikipedia; NPR
- Maria death toll, GWU study: George Washington University
- Maria death toll, Harvard estimate: New England Journal of Medicine
- Maria damage, housing, and water-access figures: Wikipedia; Wikipedia
- December 2024 outage: CBS News
- April 2025 outage: U.S. News
- PREPA/LUMA reliability statistics and bankruptcy status: POWER Magazine; LUMA Q4 report; PR Oversight Board
- January 2020 earthquake sequence: Wikipedia

Rhode Island: Overview

Everything in the main manual and the skill guides applies in Rhode Island exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Rhode Island go deeper on laws, local resources, and the data behind the risks named here.

The Hurricane of 1938: downtown Providence under 13 feet of water

On September 21, 1938, a hurricane that struck with almost no warning devastated Rhode Island. Connecticut and New Hampshire's pages on this site cover the storm's broader Southern New England death toll; in Rhode Island specifically, an estimated 229 people died. Providence recorded sustained winds of 100 mph, gusting to 125, and a storm surge rushed into the harbor and submerged downtown Providence under more than 13 feet of water. Narragansett Bay took the worst of the surge, 12-15 feet, destroying most coastal homes, marinas, and yacht clubs, and in Jamestown, seven children died when their school bus was blown into Mackerel Cove. See the Risks page for the full data.

The March 2010 floods: the worst in 200-plus years

Over three days in late March 2010, Rhode Island received nearly 16 inches of rain, a rainfall total classified as a 1-in-100-year event, producing what officials called the worst flooding the state had seen in more than two centuries. The Pawtuxet River crested 13 feet above flood stage, and the Warwick and Rhode Island malls sat partially submerged for days. Remarkably, the flooding itself caused no direct deaths, though one indirect traffic fatality occurred during the storm. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Rhode Island: coastal storm surge here has a documented history of submerging an entire downtown, not just low-lying edges, so evacuation planning for Providence and Narragansett Bay communities should account for that scale, and the 2010 flood shows that a state this size can absorb a historic, multi-day rain event with strong emergency response and still avoid a mass-casualty outcome, a genuine success story worth noting alongside the manual's warning-and-evacuation guidance.

Sources

- Hurricane of 1938 Rhode Island data: What's Going On In Rhode Island; Small State Big History
- March 2010 Rhode Island flood data: WPRI; ecoRI News

Rhode Island: Laws & Legal Considerations

Rainwater harvesting: legal, encouraged, and subsidized

Rhode Island doesn’t just permit rainwater harvesting, it offers a direct tax incentive for installing a cistern, a step beyond Pennsylvania’s Philadelphia-specific rain-barrel subsidies covered elsewhere on this site.

Rule	Rhode Island
Source water	Rooftop or other catchment
Permit required	No, at the state level
State incentive	10% income tax credit, up to \$1,000, for installing a cistern to collect rainwater for home or business use (RIGL §44-30-28)

Where to find it: the Rhode Island Division of Taxation administers the cistern tax credit.

Water rights: riparian reasonable-use

Rhode Island follows riparian doctrine: property owners may use water from a source on or adjacent to their land, limited by the reasonable-use standard when that use would interfere with downstream owners.

Concept	How it works in Rhode Island
Basic rule	A riparian landowner may reasonably use adjacent water so long as it doesn't unreasonably interfere with other riparian landowners downstream
How reasonableness is judged	By comparing the proposed use against other riparian landowners' own uses of the same source

Where to find it: the Rhode Island Department of Environmental Management administers water-related regulation.

Concealed carry: one of the most restrictive and inconsistent systems covered on this site

Rhode Island runs a genuinely unusual hybrid: two separate issuing authorities with two different standards, producing inconsistent access depending on which one an applicant goes through.

Path	Standard
Local police chief/sheriff	Shall-issue: must grant a permit to anyone 21+ who is a citizen or legal resident, passes a background check, completes mandatory safety training, and undergoes a mental health evaluation
Attorney General	May-issue: requires a 'proper showing of need,' interpreted strictly in practice, generally limited to a documented specific threat, a security-related job, or former law enforcement status

Two paths to the same permit, two very different odds

Because Rhode Island lets both local authorities and the Attorney General issue carry permits under different legal standards, two applicants with identical backgrounds can face very different odds of approval depending purely on which office they apply through. No other state covered on this site splits carry-permit authority this way.

Sources

- Rhode Island rainwater harvesting tax credit: NTO Tank
- Rhode Island riparian reasonable-use water law: Wikipedia
- Rhode Island’s hybrid shall-issue/may-issue carry system: Rhode Island Attorney General’s Office; D’Ellison Law

[BY STATE](#) › RHODE ISLAND

Rhode Island: Local Resources

Rhode Island Emergency Management Agency (RIEMA)

RIEMA provides technical assistance and support directly to municipalities and qualified non-governmental organizations building disaster response capability, covering planning, organization, equipment, training, and exercises.

Where to find it: riema.ri.gov.

URI Extension: Master Gardener Program

University of Rhode Island Cooperative Extension runs the same category of program as every other state covered on this site, active since 1977.

- **URI Master Gardener Program:** after completing core training, participants become “Interns,” then must complete 50 hours of volunteer service on an approved project to earn full “URI Extension Master Gardener” certification.

Where to find it: web.uri.edu/coopext/programs/mgp.

CERT: RIEMA-supported, municipality by municipality

Rhode Island’s CERT program is delivered through RIEMA’s direct technical assistance to individual municipalities, covering disaster preparedness, fire suppression, medical operations, light search and rescue, team organization, and disaster simulation exercises.

Support from the state, delivery at the local level

RIEMA’s role is to help each municipality build and maintain its own trained CERT cadre, not to run one single statewide team. Coverage still depends on whether your specific municipality has built out its program with that support.

Where to find it: riema.ri.gov, or your municipality's emergency management office.

Sources

- RIEMA structure and CERT support model: Rhode Island Emergency Management Agency
- URI Master Gardener Program history and requirements: University of Rhode Island

BY STATE › RHODE ISLAND

Rhode Island: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Hurricane of 1938

Metric	Figure
Date	September 21, 1938
Rhode Island deaths	~229 (estimate)
Providence sustained winds/gusts	100 mph sustained, gusting to 125 mph
Providence storm surge	13+ ft, submerging downtown
Narragansett Bay storm surge	12-15 ft, destroying most coastal homes, marinas, and yacht clubs
Notable single loss	7 children killed in Jamestown when their school bus was blown into Mackerel Cove
Power outage duration	Several weeks in some areas

A regional storm, a state-specific toll

Connecticut’s and New Hampshire’s pages on this site cover this same storm’s broader 564-682 Southern New England death toll. Rhode Island’s ~229 estimate is this state’s specific share of that regional total, not a separate event.

The March 2010 floods

Metric	Figure
Dates	Late March 2010, over 3 days
Rainfall	~16 in
Statistical classification	1-in-100-year rainfall event
Pawtuxet River crest	13 ft above flood stage, 20.79 ft total
Deaths	0 direct; 1 indirect (a traffic fatality during the storm)
Disaster assistance applications	26,000+ Rhode Islanders
Federal disaster assistance	\$79 million
Historical ranking	The worst flooding the state had experienced in more than 200 years

A historic flood without a mass-casualty outcome

Unlike many of the acute disasters covered on this site, Rhode Island's 2010 flood caused zero direct deaths despite being officially the worst flood in over two centuries. That combination, historic severity without a matching death toll, is a genuine credit to the state's warning and response systems, in the same category as Minnesota's 1997 flood and Iowa's 2008 flood covered elsewhere on this site.

Sources

- Hurricane of 1938 Rhode Island data: What's Going On In Rhode Island; Small State Big History
- March 2010 Rhode Island flood data: WPRI; ecoRI News

South Carolina: Overview

Everything in the main manual and the skill guides applies in South Carolina exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under South Carolina go deeper on laws, local resources, and the data behind the risks named here.

Hurricane Hugo: record storm tides on the East Coast

Hurricane Hugo made landfall just north of Charleston at Sullivan's Island around midnight on September 22, 1989, as a Category 4 storm with winds of 135-140 mph. It killed 35 people in South Carolina and caused \$7 billion in damage, and the storm surge at McClellanville reached more than 20 feet, the highest storm tides ever recorded along the East Coast up to that point. See the Risks page for the full data.

The 2015 floods: a statistical 1-in-1,000-year rainfall event

In October 2015, a slow-moving storm system dropped rainfall so extreme that several areas of the state, Columbia among them, met the statistical threshold for a 1-in-1,000-year event, with Columbia recording 17 inches of rain in just 17 hours on its wettest day on record. The flooding killed 19 people, nearly 50 dams failed or were breached statewide, and emergency crews conducted more than 1,500 water rescues.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in South Carolina: coastal households need real hurricane evacuation planning that accounts for storm surge specifically, not just wind, and households anywhere near a dam or in a floodplain should know that a "1,000-year" rainfall statistic describes probability, not a guarantee of infrequency, South Carolina has already experienced one.

Sources

- Hurricane Hugo deaths, damage, and storm surge: National Weather Service; National Academies Press

- 2015 South Carolina floods, rainfall, and death toll: NOAA Climate.gov; NWS Service Assessment

South Carolina: Laws & Legal Considerations

Rainwater harvesting: legal, with a specific storage cap

South Carolina permits rainwater harvesting under its Water Resources Act, with a defined numeric storage limit for typical residential systems, unlike the volume-agnostic rules in many other states covered on this site.

Rule	South Carolina
Source water	Above-ground rooftop surfaces
Permitted uses	Non-potable: irrigation, lawn care, vehicle washing
Storage cap	2,500 gallons for a single-family residence, unless a local municipality adopts a stricter ordinance
Underlying statute	South Carolina Water Resources Act

Where to find it: the South Carolina Department of Health and Environmental Control (now part of the state’s reorganized environmental agencies) publishes rooftop collection guidance; check local ordinances for any stricter caps.

Water rights: standard riparian doctrine

South Carolina follows the traditional riparian rights system derived from English common law, the same general framework as most Southeastern states covered on this site.

Concept	How it works in South Carolina
Who holds the right	Landowners along a river or stream
Governing principle	Reasonable use of water bordering or flowing through the property

Where to find it: the South Carolina Department of Environmental Services (formerly DHEC’s environmental functions) administers water rights and larger withdrawal permits.

Permitless carry since March 2024, at age 18

South Carolina became a permitless-carry state effective March 7, 2024, one of the more recent states to adopt the policy, and set its minimum age at 18 rather than 21.

Requirement	Detail
Standard	Permitless carry, open or concealed, effective March 7, 2024
Minimum age	18
Optional Concealed Weapons Permit (CWP)	8 hours of state-approved training, \$50 fee through SLED, valid 5 years, \$50 renewal
Why get the optional CWP anyway	Useful for reciprocity in states that require a permit from South Carolina residents

An age threshold worth noting

South Carolina’s 18-year permitless carry age matches Missouri’s low end (19, or 18 with military service) more closely than the 21-year floor most other permitless states covered on this site use.

Sources

- South Carolina rainwater harvesting rules and storage cap: CityRuleLookup; AllowedHere
- South Carolina riparian water rights: University of South Carolina Law Review
- South Carolina permitless carry and optional CWP: Attorney Truslow; USA Gun Shop

[BY STATE](#) › [SOUTH CAROLINA](#)

South Carolina: Local Resources

SCEMD, Know Your Zone, and the SC Emergency Manager app

The South Carolina Emergency Management Division runs a specifically named hurricane evacuation campaign, Know Your Zone, alongside a general-purpose mobile app for preparedness and real-time updates during an emergency.

Why Know Your Zone matters specifically here

Given South Carolina's direct hurricane exposure, this campaign is built around a genuinely practical action: identifying your specific coastal evacuation zone and route in advance, rather than waiting to figure it out during an actual storm.

Where to find it: scemd.org/prepare; the SC Emergency Manager app is available for iPhone and Android.

Clemson Extension: South Carolina's version of the other states' land-grant Extension programs

Clemson University's Cooperative Extension runs the same category of program as every other state covered on this site.

- **South Carolina Master Gardener Program:** at least 40 hours of intensive, practical horticultural training through the Master Gardener Volunteer Training Course.

Where to find it: clemson.edu/extension/mg lists the program by county, including an online class option.

CERT: coordinated through SCEMD

South Carolina's CERT programs are coordinated through the state Emergency Management Division.

Where to find it: scemd.org/em-professionals/cert-programs-in-sc.

Sources

- SCEMD Know Your Zone campaign and SC Emergency Manager app: SCEMD; SC Living
- Clemson Extension Master Gardener Program requirements: Clemson University
- South Carolina CERT program coordination: SCEMD

BY STATE › SOUTH CAROLINA

South Carolina: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Hugo (1989): record storm tides on the East Coast

Metric	Figure
Landfall strength	Category 4, 135-140 mph
South Carolina deaths	35 (13 direct, 22 indirect, including deaths from candle-caused house fires)
Damage	\$7 billion
Homes completely destroyed	9,302 (more than half mobile homes)
Homes with major damage	26,772
Charleston peninsula sustained winds/gusts	87 mph / up to 107 mph
Storm surge at McClellanville	20+ ft, the highest East Coast storm tide recorded to that point

The 2015 floods: a 1-in-1,000-year rainfall event

Metric	Figure
Deaths	19 (9 in Richland County/Columbia)
Peak rainfall (Columbia, 17 hours)	17 in, wettest day on record
Peak rainfall, some areas	~30 in
Dams failed or breached	~50
Water rescues	1,500+
Roads/bridges closed	500+
Residents displaced	20,000+

Why the damage estimate for this event varies so widely across sources

South Carolina-specific damage estimates for the 2015 floods range from roughly \$1.5 billion to as high as \$12 billion depending on the source and what’s counted (direct property damage alone versus broader economic impact). Separately, USGS’s own post-event analysis found no clear evidence that streamflow itself reached 1,000-year-event levels at monitored gauges, even though the rainfall total met that threshold in several locations, rainfall probability and streamflow/flood discharge are related but distinct measurements, and they didn’t move in lockstep during this event.

What these two have in common

Hurricane Hugo and the 2015 floods, 26 years apart, both produced record-setting numbers by different measures, storm surge height and rainfall statistical rarity respectively, and both demonstrate that South Carolina’s combination of coastal exposure and inland river/dam infrastructure creates two genuinely distinct paths to catastrophic flooding.

Sources

- Hurricane Hugo death toll, damage, and storm surge data: National Weather Service; National Academies Press

- 2015 South Carolina floods rainfall, deaths, and infrastructure impact: NOAA Climate.gov; NWS Service Assessment
- USGS analysis of 2015 flood discharge vs. rainfall rarity: USGS

South Dakota: Overview

Everything in the main manual and the skill guides applies in South Dakota exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under South Dakota go deeper on laws, local resources, and the data behind the risks named here.

The 1972 Black Hills flood: rainfall plus a dam failure

On the night of June 9-10, 1972, nearly 15 inches of rain fell in about six hours near Nemo in the Black Hills, overwhelming Rapid Creek and other waterways. Canyon Lake Dam, clogged with debris from the flooding, failed outright late that evening, sending a wall of water through Rapid City. The combination, extreme rainfall on top of a dam failure, made this the most detrimental flood in South Dakota's history and one of the deadliest floods in U.S. history, killing 238 people. See the Risks page for the full data.

The 2015 Delmont tornado: a small town hit directly

On May 10, 2015, an EF2 tornado tracked more than 16 miles through southeastern South Dakota and struck the small town of Delmont directly, severely damaging or destroying 44 houses and leaving the entire town without power and water for two days. It's a useful modern case study precisely because of its scale: a single tornado can disable an entire small town's basic utilities for days even without producing a large death toll. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in South Dakota: this manual's guidance about not relying on a single point of infrastructure failure, like a dam, applies directly given Rapid City's history, and Delmont's two-day utility outage after a single tornado is a reminder that a small town's entire infrastructure can be knocked out at once in a way a larger city's redundancy might partially absorb.

Sources

- 1972 Black Hills flood data: Wikipedia; National Weather Service
- 2015 Delmont tornado data: South Dakota Magazine; South Dakota Response

South Dakota: Laws & Legal Considerations

Rainwater harvesting: unrestricted

South Dakota places no permit requirement on residential rainwater harvesting for typical household use.

Rule	South Dakota
Source water	Rooftop or other catchment
Permit required	No, for typical residential collection
Permitted uses	Non-potable, typically irrigation and similar uses

Where to find it: the South Dakota Department of Agriculture and Natural Resources (danr.sd.gov) administers water rights generally.

Water rights: a genuine hybrid, riparian priority for domestic use, prior appropriation for everything else

South Dakota is a hybrid state, combining both systems rather than choosing one, and the split is defined by use type rather than geography.

Use type	Governing doctrine in South Dakota
Small domestic use	Riparian-style priority: individual domestic water use takes preference over other uses without needing an appropriation filing
All other uses (irrigation, industrial, municipal, etc.)	Prior appropriation, 'first in time, first in right,' with priority set by the date an application is filed
Ownership	All water within the state belongs to the people of South Dakota; the right to use it is acquired by appropriation as provided by law

Where to find it: the South Dakota Department of Agriculture and Natural Resources administers appropriation permits.

Permitless carry since 2019

South Dakota has recognized constitutional carry since July 2019.

Requirement	Detail
Standard	Permitless carry, concealed, for anyone 18+ legally eligible to possess a firearm, regardless of state of residence
Optional permit	Remains available to residents and some non-residents for reciprocity while traveling

A genuinely different structure from a single-doctrine state

Most states covered on this site pick one water-rights doctrine and apply it across the board. South Dakota’s split by use type, rather than by water source or region, means the same river can be governed by two different legal standards depending on what the water is being used for.

Sources

- South Dakota rainwater harvesting and water rights administration: South Dakota DANR
- South Dakota’s hybrid riparian/prior-appropriation water law: Texas Real Food; South Dakota DENR
- South Dakota permitless carry (2019): USSCA

South Dakota: Local Resources

South Dakota Office of Emergency Management

The Office of Emergency Management protects residents and property from natural, man-made, and technological disasters across the full cycle of preparedness, response, recovery, and mitigation.

Where to find it: South Dakota Department of Public Safety.

SDSU Extension: Master Gardener Volunteer Program

South Dakota State University Extension runs the same category of program as every other state covered on this site.

- **SDSU Extension Master Gardener Volunteer Program:** develops gardening enthusiasts into research-based volunteer educators; maintaining certification requires 20 hours of service and 10 hours of continuing training annually.

Where to find it: extension.sdstate.edu.

CERT: Pennington County's program covers Rapid City and several neighboring counties

Pennington County, home to Rapid City and the site of the 1972 Black Hills flood, runs one of South Dakota's most established CERT programs: a 7-week course (6 weeks of instruction plus a week-7 simulated exercise), open to adults and teens 15+, twice yearly. Residents of neighboring Custer, Lawrence, Meade, and Fall River counties are also welcome to attend.

A regional hub, not full statewide coverage

Pennington County's CERT program extends its reach to several neighboring counties, a genuinely regional model, but residents elsewhere in South Dakota should still check for a closer program rather than assuming Pennington County's classes are the only option or cover the whole state.

Where to find it: pennco.org/cert.

Sources

- South Dakota Office of Emergency Management mission: South Dakota Department of Public Safety
- SDSU Extension Master Gardener Volunteer Program requirements: South Dakota State University Extension
- Pennington County CERT program structure: Pennington County, SD

South Dakota: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The 1972 Black Hills flood

Metric	Figure
Date	June 9-10, 1972
Rainfall near Nemo	~15 in in ~6 hours
Rainfall over 60 sq mi area	10+ in
Trigger	Canyon Lake Dam, clogged with debris, failed late on June 9
Deaths	238
Injuries	3,057
Homes destroyed	1,335+
Automobiles destroyed	5,000+
Damage (1972 / 2025-adjusted)	\$160 million / ~\$1.23 billion
Historical ranking	The most detrimental flood in South Dakota history and one of the deadliest floods in U.S. history

Rainfall alone didn't cause this; the dam failure did too

Extreme rainfall created the conditions, but the dam failure amplified the disaster into one of the deadliest floods in U.S. history. It's a reminder that a piece of infrastructure meant to manage water can itself become the point of catastrophic failure once conditions exceed its design.

The 2015 Delmont tornado

Metric	Figure
Date	May 10, 2015
Rating	EF2
Peak winds	130 mph
Path width	400 yards
Path length	16+ mi
Injuries	9
Homes severely damaged/destroyed	44 (12 more damaged)
Power/water outage duration, entire town	2 days
Fire department	Destroyed, with hazardous debris scattered through town

Small-town scale, total impact

Delmont’s tornado didn’t approach the death toll of the 1972 flood, but it knocked out an entire town’s power and water for two full days and destroyed the local fire department that would normally respond to exactly this kind of emergency. In a small town, a single storm can disable the whole local response infrastructure at once.

Sources

- 1972 Black Hills flood data: Wikipedia; National Weather Service
- 2015 Delmont tornado data: South Dakota Magazine; South Dakota Response

Tennessee: Overview

Everything in the main manual and the skill guides applies in Tennessee exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Tennessee go deeper on laws, local resources, and the data behind the risks named here.

Memphis: the major city most directly exposed to the New Madrid Seismic Zone

Illinois's page on this site covers the New Madrid Seismic Zone through its southern counties, like Cairo, which sit geographically close to the zone but have small populations. Memphis is a different scale of exposure entirely: a metro area of more than a million people sitting inside the same seismic zone, with aging, often unreinforced infrastructure and a documented soil liquefaction risk along the Mississippi and Wolf Rivers that would make ground shaking substantially worse downtown. See the Risks page for the full data.

The Great Smoky Mountains: wildfire risk in a place most people don't expect it

In November 2016, the Chimney Tops 2 Fire started in the Great Smoky Mountains National Park and, five days later, spread directly into Gatlinburg, killing 14 people and becoming the deadliest wildfire in the eastern United States since the 1940s. This is a genuinely different wildfire context from California's or Oregon's dry, western forest fires, dense Appalachian hardwood terrain, high humidity most of the year, and a fire season most residents didn't think applied to them until it did.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Tennessee: Memphis-area households should treat earthquake preparedness (secured furniture, a practiced drop-cover-hold plan, water and supplies that don't depend on undamaged infrastructure) as a real Tier 1-2 priority, not an abstraction, and households in or near the Smokies and other forested East Tennessee terrain should keep a wildfire evacuation plan even without living in a state typically associated with fire risk.

Sources

- Memphis and New Madrid Seismic Zone risk factors: USGS Memphis Earthquake Hazard Mapping Project; USGS New Madrid Seismic Zone
- Chimney Tops 2 Fire and Gatlinburg wildfire deaths and damage: Wildfire Today; WATE

Tennessee: Laws & Legal Considerations

Rainwater harvesting: no volume limits, no permit, anywhere in the state

Tennessee is among the most permissive states covered on this site for rainwater harvesting, with no state-level cap on how much a resident can collect.

Rule	Tennessee
Source water	Rooftop or other catchment
Permit required	No, at the state level, for any volume
Equipment/inspection requirements	None imposed by the state
Potable use	Requires treatment; not permitted for drinking without it
Local requirements	Municipalities may impose their own codes; check locally

Chattanooga pays you back

The City of Chattanooga reimburses residents for the cost of installing rain barrels and other stormwater management features, a local incentive similar in spirit to Philadelphia’s rainwater subsidy program covered on Pennsylvania’s page.

Where to find it: the Tennessee Department of Environment and Conservation (tn.gov/environment) for state guidance; your municipality for local incentive programs.

Water rights: riparian reasonable use, with domestic needs prioritized even over downstream impact

Tennessee follows the same broad riparian reasonable-use family as most Southeastern states covered on this site, with one specific priority rule worth knowing.

Concept	How it works in Tennessee
Who holds the right	Landowners bordering a natural watercourse, with equal rights among riparian owners
Governing principle	Reasonable use: each riparian owner may use water for domestic, agricultural, or manufacturing purposes without materially diminishing the flow available to others
Domestic/natural use priority	Water needed for drinking, cooking, bathing, and watering essential livestock can generally be taken in full, even if it measurably affects downstream users
Regulatory trend	Tennessee has moved toward "regulated riparianism," adding state statutes and agency oversight on top of the older common-law framework

Where to find it: the Tennessee Department of Environment and Conservation administers water resource regulation statewide.

Permitless carry since 2021, with a two-tier optional permit system

Tennessee has allowed permitless concealed and open carry since 2021, and unlike most other permitless states covered on this site, it offers two distinct optional permits rather than one.

Requirement	Detail
Standard	Permitless carry, open or concealed, for anyone 21+ (18+ for active-duty or honorably discharged military) legally eligible to possess a firearm
Enhanced Handgun Carry Permit (EHCP)	Requires training; provides the broadest reciprocity with other states
Concealed Handgun Carry Permit (CHCP)	Fewer requirements than the EHCP, but recognized in fewer states
Federal school zone exemption	Constitutional carry alone does not satisfy the federal Gun-Free School Zones Act exemption; an EHCP or CHCP is required to legally carry within 1,000 feet of a K-12 school

Why the school zone detail matters in practice

This is the same kind of federal-versus-state gap noted on Arizona’s page: Tennessee’s own law doesn’t require a permit to carry, but federal law still restricts carrying near K-12 schools unless the carrier holds one of Tennessee’s two permit types specifically. Relying on permitless carry alone near a school risks a federal violation even where state law imposes no requirement at all.

Sources

- Tennessee rainwater harvesting rules and Chattanooga's reimbursement program: PerfectWater; Primal Survivor
- Tennessee riparian water rights and domestic-use priority: Tennessee Land Development Services; State Regs Today
- Tennessee permitless carry, EHCP/CHCP, and federal school zone exemption: Protect With Bear; Rent Awareness

[BY STATE](#) › [TENNESSEE](#)

Tennessee: Local Resources

TEMA and ReadyTN

The Tennessee Emergency Management Agency runs public preparedness outreach under the ReadyTN name, most visibly during National Preparedness Month each September, with a “Ready to Recover” framing that pairs preparation with resilience after a disaster, not just readiness beforehand.

A program not seen on any other state's page so far

ReadyTN Faith is a dedicated statewide initiative specifically helping houses of worship prepare for, respond to, and recover from emergencies and disasters, a targeted outreach effort to a specific community type that’s genuinely distinctive among the states covered on this site.

Where to find it: tn.gov/tema/prepare.

UT Extension: Tennessee’s version of the other states’ land-grant Extension programs

The University of Tennessee Extension runs the same category of program as every other state covered on this site.

- **Tennessee Extension Master Gardener Program:** 40 hours of horticultural training plus 40 hours of volunteer community service to certify, delivered through almost 40 local groups statewide with more than 2,250 active volunteers.

Where to find it: mastergardener.tennessee.edu lists local groups.

CERT: county-run, with programs in both major metro areas

Tennessee’s CERT programs are organized locally, with active training in both Memphis/Shelby County and Nashville/Davidson County, plus dozens of smaller county programs across the state.

What's typical

Shelby County's program (jointly run by the county Emergency Management Agency and City of Memphis Office of Emergency Management) is a 16-hour course over two Saturdays. Statewide, most Tennessee CERT programs run a roughly 20-hour basic course, free to participants, covering fire prevention/suppression, head-to-toe medical assessment, and light search and rescue.

Where to find it: tn.gov/volunteer-tennessee lists participating counties; Nashville and Memphis residents can also contact their city's Office of Emergency Management directly.

Sources

- TEMA ReadyTN and ReadyTN Faith campaigns: TEMA; The Mountain Press
- Tennessee Extension Master Gardener Program scale and requirements: UT Master Gardener Program
- Tennessee CERT program structure statewide and in Shelby County: Volunteer Tennessee; Shelby County

BY STATE › TENNESSEE

Tennessee: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Memphis and the New Madrid Seismic Zone

Metric	Figure
Memphis metro population directly exposed	1,000,000+
50-year probability of a magnitude 6.0+ earthquake in the zone	25-40%
Regional population across the 8-state highest-risk zone	~11-12 million
Key vulnerability factor	Aging, often unreinforced buildings, including some schools and fire/police stations
Secondary hazard	Soil liquefaction along the Mississippi and Wolf Rivers through downtown Memphis

Why Memphis carries more consequence than Illinois's exposure, covered elsewhere on this site

Illinois’s page covers this same fault system from southern Illinois counties like Cairo, which sit close to the zone geographically but have small populations, Cairo’s is under 2,000. Memphis is a genuinely different scale of exposure: a metro area of more than a million people combined with aging, often unreinforced infrastructure and riverside liquefaction risk. What makes Memphis’s exposure so consequential is how many people and how much vulnerable infrastructure sit inside the zone, not a claim that the zone’s own seismic probability is higher there than elsewhere along it.

The Chimney Tops 2 Fire (2016): the deadliest eastern U.S. wildfire since

the 1940s

Metric	Figure
Start date and location	November 23, 2016, Chimney Tops Trail, Great Smoky Mountains National Park
Date it reached Gatlinburg	5 days later, November 28
Deaths	14
Injuries	200+
People evacuated	~14,000
Acres burned	~17,136
Structures damaged or destroyed	~2,460
Insurance claims	Approaching \$1 billion

What made this fire unusual wasn’t just its scale, it’s that it happened in a place with none of the typical Western wildfire signals: dense Appalachian hardwood forest, generally high humidity, and a town built up right against national park land with limited expectation that fire would ever reach it directly.

What these two have in common

Memphis’s earthquake exposure and Gatlinburg’s wildfire history share a structural theme this site returns to often: both risks are real and well-documented, but neither fits the stereotype most residents associate with their region. Tennessee isn’t conventionally thought of as earthquake country or wildfire country, and both risks are exactly the kind that get underprepared for as a result.

Sources

- Memphis and New Madrid Seismic Zone risk data: USGS Memphis Earthquake Hazard Mapping Project; Missouri DNR
- Chimney Tops 2 Fire deaths, damage, and timeline: Wildfire Today; The Voss Law Firm

[BY STATE](#) › [TEXAS](#)

Texas: Overview

Everything in the main manual and the skill guides applies in Texas exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Texas go deeper on laws, local resources, and the data behind the risks named here.

Hurricanes and the Gulf Coast

Texas has more than 350 miles of Gulf Coast, and every hurricane season carries a real chance of landfall somewhere along it. Hurricane Harvey, which struck the Houston area in August 2017, is the reference case: it stalled over southeast Texas for days, dropping rainfall totals as high as 60.58 inches near Nederland, the highest storm-total rainfall ever recorded in the continental United States, flooding more than 300,000 structures and causing an estimated \$125 billion in damage. Harvey was a flood disaster more than a wind disaster, a distinction that matters for how you prepare: wind-rated construction doesn't protect against a storm that simply refuses to move.

A grid that has already failed once, statewide

Texas runs its own electrical grid, managed by ERCOT and largely isolated from the two interconnected grids covering the rest of the continental U.S. That isolation was central to Winter Storm Uri in February 2021, when a deep cold snap outside the grid's typical planning range triggered cascading power plant failures and left millions without power, some for days, in freezing temperatures. The manual's Case for Preparedness page covers Uri in detail as a national case study; the short version for Texas specifically is that it's the state where it happened, and the grid structure that made it possible hasn't fundamentally changed.

Flash flooding: the Hill Country's defining hazard

The Texas Hill Country, including Kerr County and the areas around the Guadalupe River, sits in a region meteorologists sometimes call "flash flood alley," where thin soil over rock, steep terrain, and Gulf moisture combine to produce some of the fastest-rising floodwaters in the country. The July 2025 Central Texas floods, when a mesoscale storm system dropped roughly four months' worth of rain in a few hours, killed at least 136 people, the deadliest inland flooding disaster in the U.S. since 1976. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Texas: households on or near the Gulf Coast need hurricane-specific evacuation and flood planning in addition to the manual's general Tier 1-2 supply guidance, households anywhere on the ERCOT grid should treat extended winter power loss as a real, not hypothetical, scenario, and anyone in flash-flood-prone terrain, the Hill Country especially, should treat "move to higher ground immediately" as a standing instruction for any period of sustained heavy rain, not something to decide in the moment.

Sources

- Hurricane Harvey rainfall totals, damage estimate, and structures flooded: NOAA NESDIS; Wikipedia, sourced to NHC and contemporary reporting
- ERCOT grid isolation and Winter Storm Uri: see this site's Case for Preparedness
- July 2025 Central Texas floods, death toll and meteorological cause: Wikipedia, sourced to contemporary reporting

BY STATE › TEXAS

Texas: Laws & Legal Considerations

Rainwater harvesting: actively encouraged, not just permitted

Where Utah, Oregon, and California each carve out a narrow rooftop exemption from a broader permit system, Texas goes further: the state actively incentivizes rainwater collection.

Rule	Texas
Source water	Rooftop or other catchment; no state permit required for collection or on-site use
Sales tax	Exempt: equipment, labor, and materials for a rainwater harvesting system are exempt from state sales tax
Property tax	Local option: taxing units may exempt part or all of the assessed value added by an approved rainwater harvesting system
HOA restrictions	Barred: a homeowners association cannot prohibit a rainwater harvesting system
Underlying statutes	Tax Code §151.355 (sales tax); Tax Code §11.32 (property tax); Property Code §202.007 (HOA protection)

How to actually claim the sales tax exemption

It isn't automatic at checkout. The purchaser fills out Texas Comptroller Form 01-339 (the sales tax exemption certificate) and gives it to the supplier at time of purchase, covering rain barrels, cisterns, tanks, gutters and diverters routed into a collection system, roof washers, and filtration screens.

Where to find it: the Texas Water Development Board maintains rainwater harvesting guidance at twdb.texas.gov.

Water rights: a genuinely distinct third system

Utah and Oregon use pure prior-appropriation law for their water. California splits surface water between riparian and appropriative rights. Texas does something different again: it treats groundwater and surface water as two

entirely separate legal regimes, governed by different rules and, in the case of groundwater, largely different logic than any other state covered so far.

Water type	Governing rule	Key feature
Groundwater	Rule of capture	A landowner may pump essentially unlimited water from beneath their own land, regardless of the effect on a neighbor's well or the water table, subject only to local Groundwater Conservation District rules where one exists
Surface water	Prior appropriation	State-owned; "first in time, first in right" permits issued and administered by TCEQ, the same underlying doctrine as Utah's and Oregon's systems

Rule of capture is not the same as 'no rules at all'

The rule dates to a 1904 Texas Supreme Court ruling and remains the default, but it isn’t absolute in practice: roughly 177 counties fall under a local Groundwater Conservation District with permitting and pumping-limit authority, and regional Groundwater Management Areas set longer-term availability targets. Whether a given well is meaningfully regulated depends entirely on which district, if any, covers that specific property.

Where to find it: the Texas Commission on Environmental Quality (tceq.texas.gov) administers surface water rights; check the Texas Water Development Board’s district map for groundwater regulation in a specific county.

Permitless carry since 2021

Texas is one of the states, alongside Utah, that allows most adults to carry a handgun, openly or concealed, without any permit at all.

Requirement	Detail
Standard	Permitless ("constitutional") carry for handguns; a License to Carry remains available and is useful for reciprocity when traveling to other states
Minimum age	21, with narrower exceptions for 18-20-year-olds following a 2025 federal court ruling and for active-duty military 18 and older
Disqualifiers	Federal or state firearm prohibition; certain misdemeanor convictions within the past 5 years; active criminal street gang membership
Governing statute	House Bill 1927 (2021), effective September 1, 2021

Permitless carry applies to handguns only

HB 1927 changed the default rule for handguns specifically; it didn’t alter separate state and federal rules governing rifles, short-barreled firearms, or carry in specifically restricted locations (schools, courts, polling places, and others). A License to Carry still matters for anyone who travels regularly to a state that recognizes Texas LTC reciprocity but not permitless carry itself.

Sources

- Texas rainwater harvesting sales and property tax exemptions, HOA protection: Texas Tax Code §151.355; Texas Water Development Board
- Texas groundwater rule of capture and Groundwater Conservation Districts: Texas Water Resources Institute; Texas Living Waters Project
- Texas surface water prior appropriation and TCEQ administration: Texas Policy Foundation
- Texas permitless carry, HB 1927, age requirements: Versus Texas; federal court ruling on 18-20 year olds: NPR

Texas: Local Resources

TDEM: the state agency, and a large open training catalog

The Texas Division of Emergency Management coordinates state and local emergency response and runs public preparedness outreach under the banner “Prepare Today For A Safer Tomorrow.” Its most useful feature for an individual household is scale: TDEM’s training arm maintains a catalog of more than 1,000 courses, most free, covering everything from basic disaster preparedness to specialized response skills, open to the public as well as emergency responders.

Where TDEM's training actually lives

Course registration runs through [PreparingTexas.org](https://preparingtexas.org) rather than TDEM’s main site. Not everything in the catalog is aimed at ordinary households, much of it targets responders and local officials, but the all-hazards preparedness sections are open to anyone and free to attend.

Where to find it: preparingtexas.org for training and course registration; tdem.texas.gov for general preparedness guidance and current alerts.

Texas A&M AgriLife Extension: the state’s version of USU/OSU/UC ANR Extension

Texas A&M AgriLife Extension runs the same category of program Utah’s USU Extension, Oregon’s OSU Extension, and California’s UC ANR do, delivered through county-level offices across all 254 Texas counties.

- **Texas Master Gardener Program:** administered county by county, with initial training ranging from roughly 35 to 72+ hours depending on the county, covering soils, water conservation, pest management, vegetable and fruit production, and related topics, followed by a volunteer service commitment to earn certification.

Where to find it: agrilifeextension.tamu.edu lists every county office; the specific hours, cost, and schedule for Master Gardener training vary by county, the same pattern as every other state’s Extension program covered on this site.

CERT: real, but genuinely decentralized

Unlike Los Angeles's single large citywide program, Texas doesn't run CERT through one dominant statewide or metro-wide system. Instead, dozens of individual cities and counties, Fort Worth, Burleson, and Houston among them, run their own independent CERT chapters, each following the same FEMA-approved curriculum but with its own schedule, cost (usually free), and application process.

What this means in practice

There's no single statewide CERT hub to check first. The most reliable path is searching "[your city or county] CERT" directly, or contacting TDEM's training office at training@tdem.texas.gov or 512-377-0011 if a direct local search doesn't turn up a program near you.

Sources

- TDEM preparedness mission, public outreach, and training catalog scale: TDEM; TDEM training registration
- Texas A&M AgriLife Extension Master Gardener Program structure and county variation: Texas A&M AgriLife Extension; Fort Bend County AgriLife
- Local CERT program examples and structure: Fort Worth CERT; Burleson, TX

BY STATE › TEXAS

Texas: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hurricane Harvey (2017): the wettest tropical cyclone on record in the U.S.

Metric	Figure
Direct deaths, Texas	89
Additional indirect deaths in the following months	35
Peak rainfall total (Nederland, TX)	60.58 in, a U.S. record
People who experienced 30+ inches of rainfall	~7 million
Structures flooded	300,000+
Estimated total damage	~\$125 billion (2017 USD)

Harvey’s defining characteristic wasn’t wind speed, it made landfall as a Category 4 but weakened quickly. The damage came from the storm stalling over southeast Texas for days, turning a normal hurricane’s hours-long rain event into one that lasted the better part of a week over the same ground.

The July 2025 Central Texas floods: deadliest U.S. inland flood since 1976

Metric	Figure
Total confirmed deaths, all counties	136+
Kerr County deaths	117
Camp Mystic deaths (campers and counselors)	~27
Peak rainfall in a few hours	20.33 in, roughly four months' typical rainfall
AccuWeather preliminary total economic loss estimate	\$18-22 billion

Why the damage figures vary so much across sources

Wikipedia’s infobox-style figure for this event (roughly \$1.1 billion) reflects a narrower, more immediately confirmable category, direct infrastructure and insured-loss estimates available soon after the event. AccuWeather’s \$18-22 billion is a broader preliminary total-economic-loss estimate, covering business disruption, tourism loss, and long-term health costs alongside direct property damage. Both figures come from real methodologies measuring different things; neither is a rounding error of the other, and the wide range on the AccuWeather figure itself reflects that it was issued while the disaster was still unfolding.

The mechanism matters as much as the rainfall total: a mesoscale convective system pushed tropical moisture over the Hill Country’s thin soil and steep terrain, the same regional combination behind the area’s informal name, “flash flood alley,” and the Guadalupe River rose dozens of feet in under an hour in several towns.

A third standing risk: the ERCOT grid

Texas’s electrical grid is deliberately isolated from the two interconnected grids covering the rest of the continental United States, a structure that avoids most federal interstate regulation but also means Texas can’t easily import power from neighboring states during a shortfall. Winter Storm Uri in February 2021 demonstrated the consequence directly: see this site’s Case for Preparedness page for the full data on that event, 210 confirmed deaths statewide and roughly \$195 billion in property damage, mostly from cold exposure and frozen or burst water pipes during days of grid failure.

What these have in common

All three of Texas's defining risks, hurricane flooding, flash flooding, and grid failure, share the same practical lesson: none of them are rare, remote-probability events on the scale this manual otherwise treats as background risk. Texas has a named Atlantic hurricane season every single year, the Hill Country's flash-flood geography doesn't change, and the ERCOT grid's structural isolation is a standing design choice, not something fixed after 2021.

Sources

- Hurricane Harvey death toll, rainfall records, and damage estimate: NOAA NESDIS; National Hurricane Center tropical cyclone report
- July 2025 Central Texas floods, death toll by county, Camp Mystic, and meteorological cause: Wikipedia, sourced to contemporary reporting
- AccuWeather preliminary total economic loss estimate: AccuWeather
- Winter Storm Uri death toll and damage: this site's Case for Preparedness

Utah: Overview

Every other page in this section describes what changes about a skill or a law once you leave Utah. This page is different, because there's nothing to translate: the manual's 13 chapters, its addenda, and its skill guides already are Utah's edition, written for the Wasatch Front specifically, not adapted from a generic template afterward.

Why Utah has a page here at all

If you found this page by browsing the By State list, that's a reasonable question. The other 49 states each needed dedicated content because this site's core material assumes Utah. Utah's own "state page" is really the rest of this site: the Manual, the Addenda, the Skill Guides, and the Case for Preparedness document. This page and its three sub-pages exist so the list itself doesn't look incomplete, and so there's one place that routes you to where the real depth already lives.

The hazard profile in one place

The full, sourced case for why this matters here specifically lives in the Case for Preparedness document. The short version: a Wasatch Fault earthquake isn't a hypothetical (93% chance of magnitude 5+ in the next 50 years, a modeled 2,000+ fatalities from a magnitude-7.0 event on the segment beneath Salt Lake City), the Great Salt Lake is a slow-moving public-health and economic crisis for the 2.5 million people living along the Wasatch Front, and the 2026 Cottonwood Fire showed how a wildfire here becomes a flood risk for months afterward, not just a fire risk during the burn. The Risks page in this section pulls those figures together in one place, sized the same way every other state's risks page is.

What's actually different about this page's siblings

The Laws, Resources, and Risks pages under Utah don't describe deltas the way, say, Oregon's or Texas's do, they describe the baseline every other state's pages are written as a delta from. Utah's rainwater harvesting rule, its concealed carry law, Be Ready Utah, USU Extension, and Utah's county-run CERT programs are all already referenced throughout the main manual, addenda, and skill guides; these three pages just collect that reference material in the same By State format as every other state, for anyone who lands here first.

Where to actually go next

- **New to this site entirely?** Start with Ready, Set, Ready, a 10-minute assessment and a map for using everything else here.
- **Want the how-to?** Skill Guides covers all 13 categories, plus Utah-specific sub-skills like Legal Rainwater Harvesting in Utah.
- **Want the full reference?** The Manual and The Addenda are the complete Tier 1–4 curriculum, written for here.
- **Want the “why”?** The Case for Preparedness is the full, sourced case, Utah sections included.

Utah: Laws & Legal Considerations

Every other state’s laws page in this section describes how that state’s rules differ from Utah’s. This page describes Utah’s rules directly, the same ones already covered in more depth elsewhere on this site, collected here so this page follows the same format as the other 49.

Rainwater harvesting: two tiers, one free

Storage amount	What's required
Up to 200 gallons (2 covered containers, 100 gallons each, max)	Nothing. No registration, no paperwork.
Up to 2,500 gallons total, on one parcel	Free registration with the Utah Division of Water Rights
More than 2,500 gallons, or water for other parcels	A full water right, a separate and more involved process

This is covered in full, step-by-step detail in the Legal Rainwater Harvesting in Utah skill guide: how to register, where collection and use are limited to the same parcel where the water is captured, and how to build a system that doesn’t create a mosquito problem in the process.

Where to find it: waterrights.utah.gov/forms/rainwater.asp for registration; the skill guide above for everything else.

Water rights: prior appropriation

Utah uses prior-appropriation water law (“first in time, first in right”), the standard doctrine across the western United States. Every other prior-appropriation state’s laws page on this site, Oregon’s, Washington’s, Arizona’s, and others, describes its own version of this same doctrine as a variant of Utah’s; Utah’s own water rights are administered by the Utah Division of Water Rights, the same office that handles rainwater harvesting registration above.

A slow-moving consequence of this system

The Great Salt Lake and the broader Colorado River system that Utah shares an allocation in are both covered in depth in the Case for Preparedness document; the legal mechanism behind both is this same prior-appropriation system, now under real strain from decades of upstream diversion and a shrinking mountain snowpack.

Concealed carry: permitless since 2021

Utah has been a permitless-carry state since House Bill 60 took effect on May 5, 2021, signed by Governor Spencer Cox. Any person 21 or older who may lawfully possess a firearm can carry concealed in public without a permit.

Item	Detail
Minimum age (permitless)	21
Optional Concealed Firearm Permit	Still issued, mainly for reciprocity when carrying in other states; available at 21, or 18 for a provisional permit
Effective date	May 5, 2021 (HB 60)

Utah is one of 28 permitless-carry states covered across this section, not the first to adopt one (Arizona’s dates to 2010, for instance) but the state every other page in this section is written relative to, since this site’s core audience is here. National Patterns lays out how the age minimums and adoption timelines compare across all 28.

Sources

- Utah Division of Water Rights, rainwater harvesting registration: waterrights.utah.gov
- Utah HB 60 (2021), concealed carry amendments: le.utah.gov; coverage via Legal Heat
- Utah concealed firearm permit ages and reciprocity purpose: Utah Bureau of Criminal Identification

Utah: Local Resources

Every other state's resources page in this section introduces its own agencies and programs as "the direct analog to Be Ready Utah, USU Extension, and Utah's CERT network." This page is the source those comparisons point back to.

Be Ready Utah

The state's own household preparedness campaign, published by the Utah Division of Emergency Management, and the source of the two-week household self-sufficiency target this manual's own Tier 1 aligns with. It's referenced throughout the manual and addenda: winter storm and power outage guidance, pet evacuation checklists, and access-and-functional-needs planning built around the CMIST framework.

Where to find it: beready.utah.gov.

USU Extension: Master Gardener and other skill-building programs

Utah State University Extension runs the land-grant-university skill-building programs referenced throughout the addenda, most directly the Master Gardener program covered as Stage 3–4 content in the Water & Food addendum.

What the training actually involves

USU's Master Gardener program runs roughly 13 weeks of classroom and hands-on instruction (about 40 hours total), taught by USU Extension specialists and faculty, offered at 13 locations across the state. Certification requires completing the course and returning a minimum of 40 hours of volunteer service afterward, the same "learn it, then teach it" progression this site describes for other states' equivalent programs.

Where to find it: extension.usu.edu/mastergardener; individual county Extension offices handle registration and scheduling.

CERT: county-run, not a single statewide program

Community Emergency Response Team training in Utah is organized at the county level, not through one statewide office, the same decentralized structure this site's Texas and Florida pages describe for their own states. The Sanitation & Medical chapter already points to county-run CERT training as a faster path to Tier 4 (community-level readiness) than building an equivalent skill-sharing network from scratch.

Where to find it: contact your own county's emergency management office directly; Salt Lake County, Utah County, and Davis County each run their own regularly scheduled CERT courses along the Wasatch Front.

Sources

- Be Ready Utah: beready.utah.gov
- USU Extension Master Gardener Program: extension.usu.edu/mastergardener; Master Gardener Policy Manual
- County-run CERT programs, Wasatch Front: individual county emergency management offices

BY STATE › UTAH

Utah: Risks & Trends

This page collects the same rigor and sourcing standard used throughout this section, applied to the state the rest of the site’s data already lives in: the Case for Preparedness document. Nothing below is new; it’s the Utah-specific figures from that document, gathered into the same format as every other state’s risks page.

The Wasatch Fault

Metric	Figure	Source
Chance of M5.0+ quake, next 50 years	93%	Working Group on Utah Earthquake Probabilities (UGS/USGS, 2016)
Chance of M6.0+ quake, next 50 years	57%	Working Group on Utah Earthquake Probabilities
Chance of M6.75+ quake, next 50 years	43%	Working Group on Utah Earthquake Probabilities
Population within 15 miles of the fault	~85% of Utah's population, infrastructure, and economy	Working Group on Utah Earthquake Probabilities
Modeled fatalities, M7.0 event on the Salt Lake City segment	2,000–2,750	Earthquake Engineering Research Institute (Utah Chapter) / Utah Geological Survey, FEMA HAZUS methodology, 2015
Modeled buildings destroyed outright	~55,400	Same HAZUS model
Modeled short-term direct economic loss	\$33.2 billion	Same HAZUS model

The probability and consequence figures above come from two separate studies, not one: the 93% (and related) probabilities are a forecast of how likely an earthquake of a given size is; the fatality and damage figures are a separate model of what a specific magnitude-7.0 event would do if it happened on the segment running beneath Salt Lake City specifically, the most populated part of the fault. See the full write-up for how the two studies fit together and what drives the projected death toll (largely unreinforced masonry buildings).

The 2020 Magna earthquake: a preview, not the event itself

Metric	Figure
Magnitude	5.7
Deaths or serious injuries	0
Damage	\$629 million
Households/businesses without power	~50,000
Aftershocks	2,500+

Why nobody died

The quake hit at 7:09 a.m. on March 18, 2020, when Utah schools had just gone remote for COVID-19. A junior high school damaged badly enough to be declared a total loss would have had students inside on any normal school day. Utah’s own state seismologists have said Magna was ordinary background seismicity, a data point inside the Wasatch Fault forecast above, not evidence the larger risk has been released. Full write-up: Case for Preparedness.

The Great Salt Lake

Metric	Figure
Wasatch Front residents exposed to lakebed dust	2.5 million+
Water lost from the lake annually	~2 million acre-feet
Lowest recorded level	October 2022 (2025 water year: third-lowest on record)
Additional annual inflow needed to restore a healthy level by 2055	800,000 acre-feet, sustained

Exposed lakebed contains arsenic, lead, and other heavy metals, linked by researchers to respiratory and cardiovascular health effects for the population living along the Wasatch Front. Full write-up: Case for Preparedness.

The 2026 Cottonwood Fire and the flood that followed it

Metric	Figure
Acres burned	97,464 (Utah's 6th-largest wildfire on record)
Structures destroyed	150+
Homes hit by the resulting flood, three weeks later	~200
Rainfall that triggered the flood	1.5+ inches in 45 minutes, onto the fresh burn scar

A debris flow off the burned mountainside tore out sections of State Route 153, shut down Interstate 15 for hours, and contaminated Beaver City’s municipal water supply. The fire and the flood were declared a single state of emergency, because a burned mountainside doesn’t stop being a hazard once the flames are out, it becomes a flood risk for months afterward instead. Full write-up: Case for Preparedness.

The mechanism behind both water crises: a shrinking, earlier-melting snowpack

Utah has no major river system of its own; both the Great Salt Lake and the state’s own share of the Colorado River system depend on mountain snowpack melting on a predictable schedule. That schedule is shifting: Utah’s peak mountain snowpack has declined 16% since 1979, and the date of peak snowpack now arrives about 9 days earlier than it used to, per NOAA and the Utah Climate Center at Utah State University. The same mechanism shows up at two different scales: the Great Salt Lake locally, and Lake Powell and Lake Mead at the river-basin scale Utah shares an allocation in alongside six other states.

Sources

- Wasatch Fault earthquake probabilities: Working Group on Utah Earthquake Probabilities (Utah Geological Survey / USGS, 2016)
- Magnitude-7.0 Salt Lake City segment loss modeling: Earthquake Engineering Research Institute, Utah Chapter, with Utah Geological Survey, using FEMA’s HAZUS methodology (2015)
- 2020 Magna earthquake damage and outage figures: Utah Geological Survey; contemporary reporting
- Great Salt Lake water level, health, and inflow-restoration figures: Utah Division of Water Resources; Great Salt Lake Strike Team
- 2026 Cottonwood Fire acreage, structures, and flood impact: Utah Division of Forestry, Fire and State Lands; Governor Spencer Cox’s state of emergency declaration

- Utah snowpack decline and peak-timing shift: NOAA; Utah Climate Center, Utah State University
- Full narrative and additional context for every figure above: Case for Preparedness

Vermont: Overview

Everything in the main manual and the skill guides applies in Vermont exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Vermont go deeper on laws, local resources, and the data behind the risks named here.

Tropical Storm Irene (2011): Vermont's worst disaster since 1927

On August 28, 2011, Tropical Storm Irene dumped up to 11 inches of rain across Vermont, no longer a hurricane by the time it arrived, but still catastrophic. Officials called it the state's worst natural disaster since 1927, and it killed 6 people, destroyed or damaged over 2,400 roads, 800 homes and businesses, and 300 bridges including historic covered bridges, and cut off a dozen towns and villages entirely, some reachable only by helicopter delivering food and emergency supplies. See the Risks page for the full data.

July 2023: the same river system, a new record just 12 years later

Less than a dozen years after Irene, Vermont experienced flooding its own governor called "historic and catastrophic." The Winooski River at Montpelier crested at 21.35 feet, more than two feet above the crest Irene produced, downtown Montpelier under water again, this time second only to the legendary 1927 flood in the state's records. Unlike Irene, this flooding came from a slow, days-long rain event rather than a named storm, a reminder that the storm doesn't need a hurricane's name attached to produce a record-breaking result. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Vermont: this manual's guidance about towns being cut off entirely during a flood, not just individual homes flooding, applies directly here given Irene's helicopter resupply of isolated communities, and Vermont households should treat "record flood level" the way Maine's page frames it, a number that can be broken again within just over a decade, not a stable historical ceiling.

Sources

- Tropical Storm Irene Vermont data: Vermont Business Magazine; National Weather Service
- July 2023 Vermont flood data: Wikipedia; National Weather Service

Vermont: Laws & Legal Considerations

Rainwater harvesting: legal outdoors, with a specific labeling requirement

Vermont permits rainwater harvesting for outdoor use without a permit, under standards adopted from the 2018 International Plumbing Code.

Rule	Vermont
Source water	Rooftop or other catchment
Permit required for rain barrels/aboveground cisterns	No, for outdoor use
Governing code	2018 International Plumbing Code, §1303
Labeling requirement	Any conveyance piping must be marked 'CAUTION: NONPOTABLE WATER - DO NOT DRINK'
Large withdrawals	Require a permit from the Vermont Agency of Natural Resources, even on your own property

Where to find it: the Vermont Agency of Natural Resources (anr.vermont.gov).

Water rights: riparian reasonable-use

Vermont follows riparian doctrine: landowners whose property touches a natural body of water may make reasonable use of it, with reasonableness the only real limit on that right.

Concept	How it works in Vermont
Basic rule	A riparian landowner may make reasonable use of adjacent water, limited only by the reasonableness standard
Projects affecting water resources	May require approval from the riparian landowner or the Agency of Natural Resources, depending on the project

Where to find it: the Vermont Agency of Natural Resources administers water-related permitting.

Permitless carry since 1777, the original constitutional carry state

Vermont has never required a permit to carry a concealed handgun, at any point in its history, a distinction no other state covered on this site can claim.

Requirement	Detail
Standard	Permitless carry, open or concealed, for residents and non-residents alike who can legally possess a firearm
Constitutional basis	Article 16 of the Vermont Constitution, adopted in 1777, predating the U.S. Constitution's Second Amendment
Permits issued	None; Vermont has never operated a carry-permit system to opt into

Not just an early adopter, the original

Every other permitless-carry state covered on this site adopted the standard within the last few decades, most since 2010. Vermont never had a permit requirement to repeal in the first place, making it structurally different from a state that switched to permitless carry rather than one that simply never left it.

Sources

- Vermont rainwater harvesting rules: Primal Survivor
- Vermont riparian water law: LegalFix
- Vermont’s 1777 constitutional carry provision: FirearmSelect

Vermont: Local Resources

Vermont Emergency Management (VEM)

VEM coordinates statewide emergency planning, training, and CERT program support across Vermont's towns and cities.

Where to find it: vem.vermont.gov.

UVM Extension: Master Gardener Program

University of Vermont Extension runs the same category of program as every other state covered on this site.

- **UVM Extension Master Gardener Program:** an application and background check are required, followed by a course each winter/spring (January-May) covering botany, soil fertility, and landscape design, then 40 hours of volunteer service to earn certification. Cost is \$400 for Vermont residents, \$550 for out-of-state.

Where to find it: uvm.edu/extension/mastergardener.

CERT: state-supported training, but independently run teams since 2020

Vermont's CERT Basic Training is a 20-hour classroom and hands-on course covering emergency traffic control, fire safety assistance, light search and rescue, and disaster medical assistance. Since February 1, 2020, individual CERT teams have operated as independent nonprofits rather than units managed directly by VEM for activation, insurance, equipment, and reimbursement, a structural change that lets teams fundraise and apply for grants on their own.

A genuinely different organizational model

Most states covered on this site run CERT either through a single state agency, county offices, or city departments. Vermont's 2020 shift to independent team nonprofits is a structurally distinct model: VEM still supports training, but day-to-day team operation and funding now sit with each team itself.

Where to find it: vem.vermont.gov/programs/cert.

Sources

- VEM CERT program structure and 2020 change: Vermont Emergency Management
- UVM Extension Master Gardener Program requirements: University of Vermont

BY STATE › VERMONT

Vermont: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Tropical Storm Irene (2011)

Metric	Figure
Date	August 28, 2011
Rainfall	Up to 11 in
Vermont deaths	6
Roads damaged/destroyed	2,400+
Homes/businesses destroyed	800
Bridges damaged/destroyed	300 (including historic covered bridges)
Power outages	117,000
Communities cut off entirely	13, resupplied by helicopter
Vermont damage	\$733 million
National damage total (all of Irene)	\$14.3 billion, the sixth-costliest hurricane in U.S. history
Historical ranking	Vermont's worst natural disaster since the 1927 flood

The July 2023 floods

Metric	Figure
Dates	July 9-12, 2023
Rainfall statewide	3-9 in over 48 hours
Highest single total	9.20 in, Calais, Washington County
Deaths	2
Damage	\$600 million+
Winooski River crest at Montpelier	21.35 ft, 2+ ft above Irene's crest at the same location
Historical ranking	Second only to the 1927 flood's 27.10 ft crest at Montpelier

A record broken in barely a decade, without a hurricane's name attached

Irene’s flooding came from a named tropical storm; the July 2023 flood came from an ordinary, if extreme, multi-day rain event with no storm name at all, yet it broke Irene’s own river-crest record at Montpelier by more than two feet. This is the same “recent record, not distant history” pattern flagged on Maine’s page (a 46-year gap there), except Vermont’s gap between record floods was under 12 years.

Sources

- Tropical Storm Irene Vermont data: Vermont Business Magazine; National Weather Service
- July 2023 Vermont flood data: Wikipedia; National Weather Service

[BY STATE](#) › VIRGINIA

Virginia: Overview

Everything in the main manual and the skill guides applies in Virginia exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Virginia go deeper on laws, local resources, and the data behind the risks named here.

Hampton Roads: the fastest-rising coastline on the East Coast

The Hampton Roads region in southeast Virginia, home to Norfolk, Virginia Beach, and the world's largest naval base, has the highest relative sea level rise rate anywhere on the U.S. East Coast. Norfolk's own flood-day count has risen 325% since 1960, from 1.7 days of tidal flooding a year to 7.3, and the city now ranks as the second most vulnerable community to coastal flooding in the entire country, behind only New Orleans. See the Risks page for the full projections.

The 2012 derecho: a hazard type new to this site

A derecho is a long-lived, fast-moving line of severe thunderstorms capable of hurricane-force winds over a huge area, and Virginia took a direct hit from one of the most destructive on record on June 29, 2012. The storm traveled roughly 700 miles in 12 hours, and Dominion Energy still ranks it as the third-worst storm to hit Virginia, causing the largest non-hurricane power outage in the state's history. This is a genuinely different hazard mechanism from the hurricanes, earthquakes, and tornadoes covered elsewhere on this site, a severe wind event that arrives with far less warning than a hurricane and covers far more ground than a tornado. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Virginia: coastal and Hampton Roads-area households need real, standing flood planning that accounts for a rising baseline, not just occasional storm surge, and this manual's backup-power guidance (Chapter on Fire/Generator Safety) carries extra weight here given how long derecho-related outages have already lasted in Virginia.

Sources

- Hampton Roads and Norfolk sea level rise and flood-day data: ASCE Journal of Infrastructure Systems; Union of Concerned Scientists
- 2012 derecho path, deaths, and Virginia power outage impact: NWS Heritage; NOAA Service Assessment

BY STATE › VIRGINIA

Virginia: Laws & Legal Considerations

Rainwater harvesting: the most developed regulatory framework covered on this site

Virginia is the only state covered here with a full, dedicated administrative code chapter specifically governing rainwater harvesting systems, including potable use, effective October 2024.

Rule	Virginia
Source water	Rooftop or other catchment
Non-potable use	No permit required for rain barrels up to 100 gallons; larger non-potable systems generally unregulated by the state
Approved non-potable uses	Toilets, urinals, mechanical equipment, hose connections, vehicle washing, lawn maintenance, service sinks
Potable use ("Tier 4 end use")	Requires a written construction permit from the Virginia Department of Health commissioner before installation, alteration, or rehabilitation
Underlying framework	Code of Virginia §32.1-248.2; 12VAC5-635 Rainwater Harvesting System Regulations, effective October 21, 2024

Why Virginia's system stands out

Ohio was the first state covered on this site to allow potable rainwater use at all; Virginia goes further, with an actual tiered permit system and a dedicated regulatory chapter specifically for it, rather than folding rainwater into a general private-water-system rule. This reflects a more deliberate state-level effort to make potable harvesting a real, regulated option rather than an edge case.

Where to find it: the Virginia Department of Health (vdh.virginia.gov) administers the permit program.

Water rights: riparian, with a specific numeric diversion cap

Virginia’s riparian law is the ordinary reasonable-use doctrine, but it’s paired with an explicit percentage limit that most other states covered on this site don’t state as a hard number.

Concept	How it works in Virginia
Surface water	Riparian owners may withdraw water for use on their own riparian property; water can't be exported to non-riparian land
Diversion cap	No more than 50% of streamflow may be diverted for a single property without a state permit
Groundwater	Governed separately under the Virginia Ground Water Management Act (1992); no permit required for withdrawals under 300,000 gallons/month in a designated groundwater management area

Where to find it: the Virginia Department of Environmental Quality administers surface water and groundwater withdrawal permits.

Concealed carry: shall-issue, with a notably flexible competency option

Virginia requires a Concealed Handgun Permit (CHP), issued through the circuit court in the applicant’s county, with a competency requirement that can be satisfied in an unusually flexible way.

Requirement	Detail
Standard	Shall-issue: the circuit court of the applicant's county or city issues the CHP
Minimum age	21
Competency demonstration	Can be satisfied by a hunter education/safety course, an NRA Basic Pistol course, or several other approved methods, not just a dedicated concealed-carry class
Cost and validity	~\$50 state fee, valid 5 years, \$50 renewal
Processing time	Up to 45 days after a complete application

An unusual competency pathway

Letting a hunter education or hunter safety course satisfy the concealed carry competency requirement is a genuinely different approach from the dedicated firearms-training courses required in most other states covered on this site, useful to know if you already hold a hunter safety certification from Virginia or another state.

Sources

- Virginia rainwater harvesting regulations and permit tiers: Virginia Department of Health; 12VAC5-635
- Virginia riparian rights, diversion caps, and groundwater law: University of Richmond Law Review; Waterfront Property Law
- Virginia CHP requirements and competency options: Alien Gear Holsters; Giffords Law Center

Virginia: Local Resources

VDEM: no single branded consumer campaign, but real operational tools

Unlike most other states covered on this site, the Virginia Department of Emergency Management doesn't run one single named public-facing campaign like "Ready Ohio" or "ReadyNJ." Instead, VDEM operates 24/7 and provides direct tools, most notably the Virginia Flood Monitoring System, alongside its Partners in Preparedness program, which works with local governments and community organizations on outreach.

Where the branded campaigns actually live

Local jurisdictions fill the branding gap: Virginia Beach runs its own "ReadyVB" public education campaign, for instance. If you're looking for consumer-facing preparedness content, check both VDEM's statewide "Prepare" portal and your specific city or county's own emergency management page.

Where to find it: vaemergency.gov/prepare.

Virginia Cooperative Extension: Virginia's version of the other states' land-grant Extension programs

Virginia Tech's Cooperative Extension runs the same category of program as every other state covered on this site, with one of the larger volunteer bases seen so far.

- **Virginia Master Gardener Program:** more than 5,000 active volunteers statewide; typically 50 hours of initial training and 50 hours of volunteer service to certify (some counties, like Prince William, require 70+ training hours), then 20 volunteer hours and 8 continuing-education hours annually to maintain it.

Where to find it: ext.vt.edu/lawn-garden/master-gardener.html lists the program by county.

CERT: county-run across the state

Virginia's CERT programs are organized at the county level, similar to Texas's and Florida's decentralized model, with active chapters in Arlington, Fairfax, Chesterfield, and many other counties.

What's typical

Chesterfield County's program is representative: a free 24-hour course open to residents 18 and older, covering the standard FEMA curriculum, with a certificate and volunteer opportunities on completion.

Where to find it: search “[your county] CERT” or check VDEM’s Communities page (vdem.virginia.gov/prepare/communities) for a local program.

Sources

- VDEM operations, Partners in Preparedness, and flood monitoring tools: VDEM
- Virginia Beach’s ReadyVB campaign: City of Virginia Beach
- Virginia Master Gardener Program scale and requirements: Virginia Cooperative Extension
- Virginia county CERT program examples: Chesterfield County; Fairfax County

BY STATE › VIRGINIA

Virginia: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Hampton Roads sea level rise: the fastest on the East Coast

Metric	Figure
Sea level rise, past century	~1.5 ft
Recent rate (past 5 years)	~5.6 mm/year
Norfolk flood-day increase since 1960	325% (1.7 days/year to 7.3 days/year)
National vulnerability ranking (coastal flooding)	2nd most vulnerable U.S. community, behind only New Orleans
Projected major roadway flooding at high tide by 2100 (intermediate scenario)	~10%
Projected major roadway flooding at 99% tide by 2100	~15%
Projected roadway flooding under a 100-year storm surge by 2100	65%+

Why this region specifically

Hampton Roads combines several compounding factors beyond global sea level rise alone: land subsidence, the coastline’s specific geometry, and the interaction of rainfall, river flow, and tidal and groundwater levels all push water higher here than a simple ocean-rise number alone would predict. This is the same kind of “standing condition, not a single event” risk covered for California’s water stress and Florida’s own sea level rise section, but Hampton Roads currently has the highest measured rate on the entire East Coast.

The 2012 derecho: a fast-moving wind event, not a hurricane or tornado

Metric	Figure
Date	June 29, 2012
Path	~700 mi, Indiana to the Mid-Atlantic in ~12 hours
Forward speed	~60 mph
Peak winds	Common gusts over 60 mph; numerous reports over 80 mph; isolated pockets over 100 mph
Virginia deaths	6 (of 13 total direct deaths across all affected states)
Customers without power (Dominion Energy service area)	1 million+
Regional customers without power (all affected states)	4 million+
Longest outages	Over a week for some Virginia customers
Ranking	Third-worst storm in Virginia history, per Dominion Energy; largest non-hurricane power outage in state history

A regional heat toll on top of the direct deaths

An additional 34 deaths across the broader affected region were attributed to extreme heat in the days after the derecho, a consequence of the storm knocking out power and air conditioning during a summer heat wave. That figure covers the full multi-state affected area, not Virginia alone, so it’s reported here as regional context rather than a Virginia-specific count.

What these two have in common

Hampton Roads’s flooding and the 2012 derecho sit at opposite ends of the same spectrum this site keeps returning to: one is a slow-building, statistically certain trend with no single date attached, the other was a specific storm that arrived with almost no warning and reshaped the state’s power-outage record in a single night. Both argue for the same practical response: real backup power planning and a flood plan that doesn’t wait for an official “climate emergency” declaration to start mattering.

Sources

- Hampton Roads and Norfolk sea level rise and flood projections: ASCE Journal of Infrastructure Systems; Union of Concerned Scientists
- 2012 derecho path, deaths, and Virginia-specific power outage data: NWS Heritage; NOAA Service Assessment

Washington: Overview

Everything in the main manual and the skill guides applies in Washington exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Washington go deeper on laws, local resources, and the data behind the risks named here.

Mount Rainier: the real danger is mud, not lava

Mount Rainier is an active volcano, but its most dangerous hazard to human life isn't an eruption, it's a lahar, a fast-moving slurry of volcanic debris, ice melt, and water that can rush down a river valley even without an eruption triggering it. More than 150,000 people live in Mount Rainier's lahar hazard zones, concentrated in Puyallup, Sumner, and Orting, and scientists estimate a lahar could reach Orting in as little as 30 minutes from origin, faster than many people could realistically evacuate on foot without early warning. See the Risks page for the full data.

The Oso landslide: the deadliest in U.S. history

On March 22, 2014, a hillside above the small community of Oso, about 55 miles northeast of Seattle, collapsed after weeks of unusually heavy rain, sending roughly 18 million tons of debris across the valley floor at highway speed. The slide killed 43 people and destroyed 49 homes, and it remains the deadliest landslide recorded in U.S. history. Neither this nor Mount Rainier's lahar risk has an equivalent case study anywhere else on this site.

Washington's share of the same fault system covered in Oregon

Washington sits on the same Cascadia Subduction Zone covered in depth on Oregon's page, and the earthquake and tsunami risk described there applies to Washington's own coast and Puget Sound region as well; that page's data isn't repeated here to avoid duplicating the same figures twice.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Washington: households in Mount Rainier's mapped lahar zones need a specific, practiced, fast evacuation plan, not a general one, since warning time can be measured in minutes rather than hours, and anyone living below a steep slope after a period of unusually heavy or prolonged rain should treat landslide risk as a real, not remote, possibility.

Sources

- Mount Rainier lahar hazard zone population and arrival-time estimates: Washington DNR; USGS
- Oso landslide death toll, scale, and cause: USGS; KOMO News

Washington: Laws & Legal Considerations

Rainwater harvesting: permit-free, with a specific structural condition

Washington’s Department of Ecology has determined that state law can reasonably be interpreted not to require a water right permit for on-site rooftop rainwater collection and use, but that interpretation comes with a specific condition most other states covered on this site don’t have.

Rule	Washington
Source water	Rooftop or "guzzler" catchment
Permit required	No, for on-site storage and use of rooftop-collected rainwater under the Department of Ecology's current interpretation
Structural requirement	Must come from a fixed structure whose primary purpose is something other than collecting rainwater, a purpose-built collection structure doesn't qualify
Use requirement	Rainwater must be used on the same property where it's collected
In-home/potable use	Regulated as surface water under the Surface Water Treatment Rule; requires local building department approval

This interpretation could change locally

If the Department of Ecology finds that rainwater collection in a specific area is measurably affecting existing water rights there, local restrictions on new systems could follow. This is a live administrative policy, not a fixed statute, so it’s worth checking current status for your specific area before assuming the general rule still applies unchanged.

Where to find it: the Washington State Department of Ecology (ecology.wa.gov) publishes current guidance.

Water rights: prior appropriation, the same doctrine as Utah and Oregon

Washington has used the prior appropriation doctrine since 1917, the same “first in time, first in right” system covered on Utah’s and Oregon’s pages.

Concept	How it works in Washington
Ownership	Water is a public resource owned by the people of Washington, managed by the Department of Ecology
Priority	The earlier of an application's filing date or the date water was first put to beneficial use establishes seniority
In a shortage	Junior water right holders are cut back first, potentially losing their entire allocation before senior holders lose any

Where to find it: the Washington State Department of Ecology administers water right permits and claims statewide.

Concealed carry: shall-issue with no training requirement

Washington requires a Concealed Pistol License (CPL) to carry concealed, but unlike the state’s stricter reputation on other firearm policy (a 10-day waiting period and an assault weapons ban among them), the CPL itself requires no training course at all.

Requirement	Detail
Standard	Shall-issue: the local police chief (incorporated areas) or county sheriff (unincorporated areas) must issue a CPL to any non-disqualified applicant
Minimum age	21
Training required	None, for the CPL itself
Common disqualifiers	Firearm possession ineligibility under state law, outstanding warrants, active felony bond conditions, a CPL revoked in the past, court-ordered firearm forfeiture within the past year
Non-resident applicants	May face a 60-day wait if applying with an out-of-state driver's license or ID

A genuine contrast within Washington's own gun law framework

Washington pairs a no-training CPL with some of the stricter firearm purchase rules covered on this site (a waiting period and magazine/assault weapon restrictions), a different combination from every other state covered so far, where the concealed carry permit itself tends to track the state's overall restrictiveness more closely.

Sources

- Washington rainwater collection interpretation and conditions: Washington Department of Ecology
- Washington prior appropriation water law: WSU Extension; RE Sources
- Washington CPL requirements: Washington State Department of Licensing; Alien Gear Holsters

Washington: Local Resources

Washington EMD and “2 Weeks Ready”

The Washington Emergency Management Division runs public outreach under a “2 Weeks Ready” campaign, near-identical in name and framing to Oregon’s “Be 2 Weeks Ready” covered on that state’s page, a genuine regional consistency between the two Pacific Northwest states rather than a coincidence, both build household preparedness guidance around the same two-week self-sufficiency target.

Where to find it: mil.wa.gov/preparedness.

WSU Extension: the most extensive initial training of any state covered on this site

Washington State University Extension runs the same category of land-grant program as every other state covered here, but its Master Gardener core curriculum requires meaningfully more upfront training than any other state’s program on this site.

Why the hours are so much higher here

WSU’s Master Gardener core training, delivered through the Washington Green School online program, runs 120 hours, roughly double or triple the 40-60 hour range typical of most other states covered on this site. First-year volunteer service requirements still vary by county, generally 40-60 hours, and certified volunteers maintain status with 25 hours of service and 10 hours of continuing education annually.

Where to find it: mastergardener.wsu.edu lists the program by county.

CERT: local teams, coordinated statewide through Serve Washington

Washington’s CERT programs are organized at the county and city level, Snohomish County, King County (including the CERT Eastside Coalition, a group of Eastside King County teams sharing resources), SeaTac, and Kitsap County among the active examples, with Serve Washington providing statewide credentialing support.

Where to find it: servewashington.wa.gov for statewide credentialing information; search “[your county] CERT” for a local team.

Sources

- Washington EMD “2 Weeks Ready” campaign: Washington Military Department
- WSU Master Gardener Program training hours and structure: WSU Master Gardener Program; WSU Green School
- Washington CERT program structure and statewide coordination: Serve Washington; CERT Eastside Coalition

BY STATE › WASHINGTON

Washington: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

Mount Rainier: a standing lahar risk, not a single event

Metric	Figure
Total population at risk from lahar impacts	150,000+
Residents in the primary lahar-hazard zone	~48,640
Employees in the primary lahar-hazard zone	~29,414
Most-exposed communities	Puyallup, Sumner, Orting
Estimated lahar arrival time at Orting	As little as 30 minutes
Historical frequency of major lahars	Every 500-1,000 years, with smaller flows more often

Why lahars don't require an eruption

A lahar can form from a flank collapse or major landslide on the volcano’s slopes even without any eruption occurring, driven by the volcano’s own weak, hydrothermally altered rock combined with its glacial ice. This is why lahar hazard maps and evacuation planning exist independently of any active eruption warning, the risk is standing, not conditional on volcanic activity picking up first.

The Oso landslide (2014): the deadliest in U.S. history

Metric	Figure
Date	March 22, 2014
Deaths	43
Homes destroyed	49
Debris volume	~18 million tons
Debris speed	~40 mph
Debris field size	~1 sq mi, up to 80 ft deep in places
Preceding rainfall (Feb-Mar 2014)	150-200% of the long-term average
National ranking	Deadliest landslide in recorded U.S. history

The slide struck the small community of Oso, about 55 miles northeast of Seattle, burying a neighborhood along the North Fork Stillaguamish River after weeks of unusually heavy rain saturated the hillside above it. Victims ranged from 4 months to 91 years old.

What these two have in common

Mount Rainier’s lahar zones and the slope above Oso share the same underlying lesson: some of Washington’s most dangerous terrain doesn’t look dangerous day to day. A lahar zone is a river valley that looks like any other until the volcano’s slopes give way; the hillside above Oso looked stable for generations until an unusually wet winter changed that. Both risks reward knowing the specific, mapped hazard zone for wherever you live, rather than assuming a place is safe just because nothing has happened there recently.

Sources

- Mount Rainier lahar hazard zone population, exposure, and arrival-time data: Washington DNR; USGS
- Oso landslide death toll, scale, and rainfall data: USGS; Fox Weather

[BY STATE](#) › [WASHINGTON, D.C.](#)

Washington, D.C.: Overview

Everything in the main manual and the skill guides applies in Washington, D.C. exactly as written. What's different here is the specific hazard profile and the district's unusual legal status, a federal district with no state legislature, its own emergency management agency, and gun and water law shaped by that status rather than by a typical state code. This page is the starting point; the other three pages under D.C. go deeper on laws, local resources, and the data behind the risks named here.

The August 2011 Virginia earthquake: damage nobody expected in a city that isn't supposed to have earthquakes

A magnitude 5.8 earthquake centered near Mineral, Virginia, roughly 83 miles southwest of the district, shook Washington on August 23, 2011. D.C. isn't considered an earthquake-prone city, and that's exactly what made the damage instructive: the Washington Monument sustained more than 150 cracks, some deep enough to let daylight through, and closed for 32 months before reopening in May 2014 after a \$15 million repair, split between \$7.5 million in federal funds and a matching \$7.5 million donation. The Washington National Cathedral came off worse: three of its four central-tower corner spires were severely damaged, along with cracked flying buttresses and destroyed masonry, at an estimated \$34 million in damage that ordinary insurance didn't cover, since it doesn't cover earthquake damage. Restoration has run in phases since, funded entirely by private donations, with the Cathedral's own projection putting full completion around 2029, eighteen years after the quake. See the Risks page for the full data.

The June 2012 derecho: one storm, a multi-day outage, and a heat wave that turned it dangerous

A line of hurricane-force straight-line winds, gusting past 87 mph in the Baltimore-Washington corridor, tore through the region on the evening of June 29, 2012, with almost no advance warning: derechos develop fast and don't carry the days of lead time a hurricane does. Roughly 68,000 D.C. customers lost power, part of a multi-state outage that topped a million customers regionally, and utilities weren't back to 90% restoration in the district until days later. The timing made it worse than a typical summer outage: a heat wave settled in immediately behind the storm, with D.C.'s daily high staying at or above 95°F for over a week and peaking at 105°F on July 7, air conditioning down across much of the city the entire time. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in D.C.: this manual's Energy & Heat chapter assumes a heat wave and a power outage are separate risks that sometimes overlap; the 2012 derecho is a documented case of them arriving together with no warning, which is the harder planning case, not the easier one. And the 2011 earthquake is a reminder that this manual's Security & Shelter structural-safety guidance isn't just for households in an obviously seismic state: D.C.'s older masonry rowhouses and monuments weren't built to a seismic code, because nobody expected to need one, and the actual damage shows that mattered.

Sources

- 2011 Virginia earthquake, epicenter and magnitude: USGS
- Washington Monument closure and repair cost: National Park Service; TIME
- Washington National Cathedral damage and ongoing restoration: Washington National Cathedral; Washington Post
- June 2012 derecho wind speeds and regional impact: NWS service assessment; Wikipedia
- D.C.-area outage figures and heat wave data: NOAA/NWS; Energy.gov

BY STATE › WASHINGTON, D.C.

Washington, D.C.: Laws & Legal Considerations

Rainwater harvesting: legal, and directly discounted off your water bill

The District treats a rain barrel or cistern as green stormwater infrastructure worth paying you to install, not just a permitted hobby.

Rule	Washington, D.C.
Source water	Rooftop or other catchment
Permit required	No permit needed for a standard rain barrel or cistern
Incentive program	RiverSmart Rewards: up to 55% off the DC Stormwater Fee and up to 20% off the Clean Rivers Impervious Area Charge, both billed through DC Water, for qualifying green infrastructure installed after May 1, 2009
Direct rebate	Separate rain barrel rebate: \$2 per gallon of capacity (50-gallon minimum, screened inlet required) plus up to \$150 toward installation

Where to find it: the D.C. Department of Energy and Environment (doee.dc.gov).

Water rights: no riparian doctrine, because there’s effectively one water system

Unlike a state, D.C. doesn’t have a body of riparian or prior-appropriation case law governing private water use, because there’s almost nothing for such a doctrine to apply to: nearly the entire district is served by a single retail utility rather than private wells or diversions.

Concept	How it works in D.C.
Basic framework	No documented general riparian-rights doctrine distinct from a narrow statutory permit scheme
Waterfront construction	D.C. Code §47-2711 requires a permit and fee for filling, dredging, or building structures (like a wharf) along the Potomac or Anacostia, a construction rule, not a water-allocation doctrine
Retail supply	DC Water (D.C. Water and Sewer Authority), an independent authority established in 1996, is the sole retail water and sewer utility
Interstate layer	The Potomac River is coordinated through the Interstate Commission on the Potomac River Basin (ICPRB), a non-regulatory body with D.C., Maryland, Virginia, Pennsylvania, West Virginia, and federal commissioners, created by a 1940 interstate compact

Where to find it: DC Water administers retail service; the ICPRB coordinates the interstate river basin.

Concealed carry: shall-issue since 2017, but D.C. honors no other jurisdiction’s permit

D.C.’s concealed carry law changed fundamentally in 2017, but it remains an island in one specific way: it doesn’t reciprocate with anyone.

Requirement	Detail
Standard	Shall-issue since Wrenn v. District of Columbia (D.C. Cir. 2017) struck down the prior good-reason/special-need requirement
Minimum age	21
Training	16-hour firearms training course covering District and federal firearms law, self-defense law, and marksmanship, plus 2 hours of live-fire range training with an MPD-certified instructor
Renewal	4-hour refresher course plus range requalification (70% accuracy required); license valid 2 years
Reciprocity	None: D.C. does not recognize a concealed carry license issued by any other state or jurisdiction

No reciprocity, in either direction, with any state

Every state covered on this site's By State section has some concealed carry framework, and most recognize at least a handful of other states' permits. D.C. recognizes none. A valid permit from any of the 50 states doesn't authorize carrying in the District, and a D.C. license doesn't carry weight elsewhere either; anyone who might carry both in D.C. and while traveling needs to treat the two as entirely separate legal questions, not one credential that travels.

Sources

- Wrenn v. District of Columbia and D.C.'s shift to shall-issue: Wikipedia
- D.C. concealed carry eligibility requirements: Metropolitan Police Department
- D.C. concealed carry training hours, fees, and renewal requirements: Scrofano Law
- D.C.'s lack of reciprocity with other states: USCCA; NRA-ILA
- RiverSmart Rewards and rain barrel rebate program: D.C. Department of Energy and Environment; DOEE Rain Barrel Rebates
- D.C. Code §47-2711 waterfront permit requirement: D.C. Code
- DC Water structure: Wikipedia
- Interstate Commission on the Potomac River Basin: ICPRB

BY STATE › WASHINGTON, D.C.

Washington, D.C.: Local Resources

Homeland Security and Emergency Management Agency (HSEMA)

HSEMA leads planning and coordination for the district's homeland security and emergency management: it operates D.C.'s Emergency Operations Center, the DC Fusion Center, the Business Emergency Management Operations Center, the AlertDC public alert system, and regional interoperable-communications coordination with Maryland and Virginia.

Where to find it: hsema.dc.gov.

CERT: run by Serve DC, in partnership with HSEMA

D.C.'s Community Emergency Response Team program isn't run directly by HSEMA; it's administered by Serve DC, the Mayor's Office on Volunteerism and Partnerships, working in partnership with HSEMA. Training is free and open to anyone who lives, works, or regularly spends time in the district, and requires completing FEMA's IS-100 and IS-700 online courses, a D.C. background check, and a practical exam.

Two different agencies, one program

If you go looking for D.C.'s CERT program on HSEMA's own site and can't find a dedicated CERT page, that's why: sign-up and program administration run through Serve DC, not HSEMA directly, even though HSEMA is a genuine partner in it.

Where to find it: servedc.galaxydigital.com/dc-cert, or email dc.cert@dc.gov.

University of the District of Columbia: Master Gardener Program

UDC, the district's land-grant university, runs a Master Gardener Program through its Center for Urban Agriculture, Gardening and Education, part of the College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES).

- **UDC Master Gardener Program:** 48 hours of basic training (a 16-week course, mostly weeknight sessions plus four Saturdays) plus 40 hours of required hands-on volunteer service, with a final exam requiring a 75% pass rate. Certified Master Gardeners maintain their status with 20 volunteer hours and 10 continuing-education hours a year. Open to any D.C. resident 18 or older; the \$300 course fee has financial assistance available, and applications are reviewed by ward to keep participation citywide across all 8 wards.

Where to find it: udc.edu/causes/land-grant/center-for-urban-agriculture-gardening-education/master-gardener-program.

Sources

- HSEMA structure and functions: Homeland Security and Emergency Management Agency
- D.C. CERT program administration and requirements: Serve DC
- UDC Master Gardener Program structure and eligibility: University of the District of Columbia; DC Master Gardener

BY STATE › WASHINGTON, D.C.

Washington, D.C.: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The August 2011 Virginia earthquake

Metric	Figure
Date	August 23, 2011
Magnitude / epicenter	M5.8, near Mineral, VA, ~83 miles from D.C.
Washington Monument cracks	150+, some deep enough to let daylight through
Washington Monument closure	32 months (Aug. 2011 - May 12, 2014)
Washington Monument repair cost	\$15 million (\$7.5M federal funds, \$7.5M matching donation)
National Cathedral damage estimate	~\$34-38 million (sources vary; not covered by insurance)
National Cathedral restoration timeline	Ongoing since 2011; full completion projected around 2029

A damage bill that isn't finished almost 15 years later

The National Cathedral’s own restoration page still projects final completion around 2029, eighteen years after the quake. Three of the four central-tower corner spires were severely damaged, along with cracked flying buttresses and destroyed masonry, none of it covered by ordinary insurance, since earthquake damage isn’t a standard policy inclusion. A single quake most of the region felt as a strong jolt, not a catastrophe, still produced a repair timeline measured in decades.

The June 2012 derecho

Metric	Figure
Date	June 29, 2012 (evening)
Peak wind gusts	87+ mph in the Baltimore-Washington corridor
D.C. customers without power	~68,000 (district-proper figure; regional total across DC-MD-VA exceeded 1 million)
Restoration timeline	80-85% restored regionally by the following Tuesday; up to 8-10 days in worst-hit spots
Heat wave that followed	Daily high at or above 95°F for over a week; peaked at 105°F on July 7, 2012
Confirmed D.C. death	1 (electrocution while checking storm damage from a fallen tree)
Regional damage estimate	~\$2.9 billion (multi-state total, no separate D.C.-only figure available)

Two different numbers for 'how many lost power,' and why

Sources describing this storm cite very different outage numbers because they’re describing different areas: roughly 68,000 customers in the District of Columbia itself, versus regional reporting of “more than a million” across the combined DC-Maryland-Virginia metro area. Both are accurate; they’re just answering a different question about scope. The district’s own retail customer base is small relative to its suburbs, so a D.C.-only figure will always look modest next to a metro-wide one.

Sources

- 2011 Virginia earthquake epicenter and magnitude: USGS
- Washington Monument closure and repair cost: National Park Service; TIME
- Washington National Cathedral damage and restoration timeline: Washington National Cathedral; Washington Post
- June 2012 derecho wind speeds: NWS service assessment; Wikipedia
- D.C.-area outage figures, restoration timeline, and heat wave data: NOAA/NWS; Energy.gov

West Virginia: Overview

Everything in the main manual and the skill guides applies in West Virginia exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under West Virginia go deeper on laws, local resources, and the data behind the risks named here.

The June 2016 flood: a thousand-year rainfall in under 12 hours

On June 23, 2016, torrential rain dropped 8 to 10 inches across Greenbrier County in less than half a day, a rainfall total meteorologists later classified as a once-in-1,000-year event. The town of White Sulphur Springs took the worst of it, where Howard's Creek turned into a torrent that swept homes off their foundations. The flood killed 23 people statewide, most in Greenbrier County, and destroyed more than 1,500 homes and businesses. See the Risks page for the full data.

The 2014 Elk River chemical spill: a contamination disaster, not a storm

On January 9, 2014, up to 10,000 gallons of an industrial coal-cleaning chemical leaked from a storage tank into the Elk River in Charleston, just 1.5 miles upstream of the drinking-water intake serving 300,000 people. The contamination overwhelmed the water treatment plant's ability to filter it out, and residents across the region were told not to use their tap water for any purpose, drinking, cooking, or bathing, for five days. This is a genuinely different kind of disaster from a flood or storm: no property was physically destroyed, but an entire metro area's water supply became unusable with almost no warning. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in West Virginia: this manual's stored-water guidance isn't just for after a storm knocks out utilities, the Elk River spill shows that a water supply can become unsafe to use even while the taps keep running, and flash-flood risk in narrow Appalachian valleys like Greenbrier County's can produce rainfall totals well beyond what most households plan around.

Sources

- June 2016 West Virginia flood data: NOAA Climate.gov; e-WV: The West Virginia Encyclopedia
- 2014 Elk River chemical spill data: Wikipedia; West Virginia Watch

West Virginia: Laws & Legal Considerations

Rainwater harvesting: encouraged with state incentive programs

West Virginia doesn’t just permit rainwater harvesting, it offers incentives and assistance programs for using alternative water sources like rain barrels and cisterns.

Rule	West Virginia
Source water	Rooftop or other catchment
Permit required	No, at the state level
Permitted uses	Non-potable: irrigation and similar uses
State posture	Active incentive and assistance programs for alternative water sources, not just tolerance

Where to find it: the West Virginia Department of Environmental Protection (dep.wv.gov) publishes water use guidance.

Water rights: riparian reasonable-use, with real state regulation layered on top

West Virginia courts have long applied the reasonable-use version of riparian doctrine: each landowner along a water source may make reasonable use of it to meet natural needs, with disputes resolved case by case rather than by strict priority dates.

Concept	How it works in West Virginia
Basic rule	Riparian landowners may make reasonable use of adjacent water for natural needs; conflicts are resolved under the reasonable-use standard
Not purely unregulated	West Virginia layers specific state regulations on particular water uses, administered by the Department of Environmental Protection, rather than leaving riparian rights entirely to case law

Where to find it: the West Virginia Department of Environmental Protection administers water use regulation.

Permitless carry from age 18, as of June 2026

West Virginia has recognized constitutional carry since May 2016, but the minimum age changed very recently.

Requirement	Detail
Standard	Permitless carry, concealed, for anyone 18+ who is a U.S. citizen or legal resident and not otherwise prohibited from possessing a firearm
Original 2016 standard	Permitless carry for adults 21+; 18-20 year olds needed a provisional license and a handgun safety course
2026 change	HB 4106, signed April 1, 2026, took effect June 12, 2026, dropping the age to 18 and eliminating the separate provisional-license track entirely

A change only months old at time of writing

West Virginia’s 18+ permitless standard took effect June 12, 2026, just weeks before this page was written. If reading this well after that date, it’s worth confirming the law hasn’t been amended further, since a change this recent is still fresh enough that follow-up legislative activity is plausible.

Sources

- West Virginia rainwater harvesting incentives: State Regs Today
- West Virginia riparian reasonable-use water law: Texas Real Food; WVU Law Review
- West Virginia permitless carry age change (HB 4106, 2026): Concealed Carry Inc.; USA Carry

[BY STATE](#) › [WEST VIRGINIA](#)

West Virginia: Local Resources

West Virginia Emergency Management (WV EMD)

WV EMD's Preparedness and Response Section coordinates statewide emergency planning and training, working alongside county-level Departments of Homeland Security and Emergency Management (DHSEM).

Where to find it: emd.wv.gov.

WVU Extension: Master Gardener Program

West Virginia University Extension runs the same category of program as every other state covered on this site, with a notably structured online format.

- **WVU Extension Master Gardener Program:** an 18-session online training program covering 54 hours of instruction (botany, plant propagation, entomology, pesticides and pest management, plant disease, soil science), followed by 40 hours of volunteer service for initial certification.

Where to find it: extension.wvu.edu/lawn-gardening-pests/master-gardener-program.

CERT: county-run under DHSEM, statewide standard curriculum

West Virginia's CERT program operates through county-level DHSEM offices under WV EMD's umbrella and FEMA's national CERT curriculum, covering disaster preparedness, fire safety, disaster medical operations, light search and rescue, and related skills. The course is free and open to the public age 18 and older.

Where to find it: emd.wv.gov/Preparedness/Training, or your county's DHSEM office directly.

Sources

- WV EMD structure and preparedness programs: West Virginia Emergency Management
- WVU Extension Master Gardener Program requirements: West Virginia University

- West Virginia CERT program structure: Jefferson County Commission

BY STATE › WEST VIRGINIA

West Virginia: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The June 2016 flood

Metric	Figure
Date	June 23, 2016
Rainfall, Greenbrier County	8-10 in in under 12 hours, classified as a once-in-1,000-year event
Deaths	23 statewide, 15 in Greenbrier County alone
Hardest-hit community	White Sulphur Springs, where Howard's Creek destroyed entire neighborhoods
Homes/businesses destroyed	1,500+
Homes/businesses significantly damaged	2,500+
Highway/bridge losses	~\$53 million

What 'once-in-1,000-year' actually means

A 1,000-year rainfall event doesn't mean it happens once every thousand years on a schedule; it means the recorded rainfall total had roughly a 0.1% chance of occurring in any given year based on historical data. That statistical framing doesn't make the flood less real, but it does explain why so much of Greenbrier County's infrastructure wasn't built to handle it.

The 2014 Elk River chemical spill

Metric	Figure
Date	January 9, 2014
Chemical released	Crude MCHM (4-methylcyclohexanemethanol), a coal-cleaning flotation reagent
Volume	Up to 10,000 gallons
Distance to drinking-water intake	1.5 mi upstream of Charleston's intake
People affected	~300,000, across the greater Charleston area
'Do Not Use' order duration	5 days
Health complaints reported over 2 weeks	584 cases of nausea/diarrhea/skin irritation, 369 directly attributed to MCHM

A different disaster shape entirely

Nothing was destroyed in the Elk River spill the way a flood or tornado destroys property. The disaster was that an entire metro area’s tap water became unsafe with almost no advance warning, for reasons invisible to anyone just turning on a faucet. It’s the clearest example on this site of why stored water matters even when the power stays on and the roof stays intact.

Sources

- June 2016 West Virginia flood data: NOAA Climate.gov; e-WV: The West Virginia Encyclopedia
- 2014 Elk River chemical spill data: Wikipedia; West Virginia Watch

Wisconsin: Overview

Everything in the main manual and the skill guides applies in Wisconsin exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Wisconsin go deeper on laws, local resources, and the data behind the risks named here.

The Peshtigo Fire: the deadliest wildfire in American history, largely forgotten

On October 8, 1871, a firestorm swept through Peshtigo, Wisconsin, and the surrounding countryside, killing at least 1,152 people, the deadliest wildfire in recorded U.S. history, far deadlier than California's January 2025 firestorm covered elsewhere on this site. It happened on the exact same night as the Great Chicago Fire, 260 miles south, and has been overshadowed by it in public memory ever since despite killing several times as many people. See the Risks page for the full data.

The 1984 Barneveld tornado: Wisconsin's first F5 in 26 years

Modern Wisconsin still carries real tornado risk: on June 8, 1984, an F5 tornado struck Barneveld, killing 13 people and causing \$40 million in damage, the state's first F5-rated tornado since a deadly 1958 outbreak in the Chippewa Valley. Wisconsin's tornado risk is real but episodic, long gaps between the most violent tornadoes rather than a constant, low-level threat.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Wisconsin: wildfire risk isn't confined to the arid West, Peshtigo demonstrates that a fast-moving firestorm can happen in forested Midwest terrain under the right drought and wind conditions, and tornado preparedness deserves real weight even in a state that doesn't experience violent tornadoes every year, since the ones that do occur here can be catastrophic.

Sources

- Peshtigo Fire death toll and historical context: History.com; National Weather Service
- 1984 Barneveld F5 tornado deaths and damage: Wikipedia, sourced to NWS

Wisconsin: Laws & Legal Considerations

Rainwater harvesting: legal, with a detailed plumbing code framework

Wisconsin permits rainwater harvesting statewide and has built a more detailed plumbing-code framework around it than many states covered on this site.

Rule	Wisconsin
Source water	Rooftop or other catchment
Permit required	No, for typical residential outdoor non-potable systems
Permitted uses	Non-potable: irrigation, landscaping, and toilet flushing where plumbed per code
Indoor plumbing	The state plumbing code specifies exactly what's allowed depending on how collected water enters household plumbing
Local variation	Municipalities, counties, and utility districts may adopt stricter rules; check local zoning and building codes

Where to find it: the Wisconsin Department of Safety and Professional Services administers the state plumbing code.

Water rights: standard riparian doctrine

Wisconsin follows the same general riparian reasonable-use framework as most states in this region.

Concept	How it works in Wisconsin
Who holds the right	Owners of land bordering a river, stream, or lake
Governing principle	Reasonable use for irrigation, recreation, and domestic consumption, without excessively infringing on other riparian owners or altering the water's natural flow

Where to find it: the University of Wisconsin’s water law guidance publications, available through UW-Extension, explain the doctrine in plain language for property owners.

Concealed carry: an actual license required, unlike most Midwest peers covered on this site

Wisconsin is shall-issue but not permitless, a genuine departure from the pattern in Illinois, Indiana, Ohio, and Missouri, all covered elsewhere on this site with either permitless carry or a two-tier ownership/carry license system.

Requirement	Detail
Standard	Shall-issue: Wisconsin DOJ must issue a license to any qualified applicant who completes the requirements
Minimum age	21
Training required	A firearms safety training course
Validity	5 years, with a background check at renewal
Vehicle carry	A license is specifically required to carry a loaded handgun within reach while in a vehicle, even though open carry itself doesn't require one for those 18+

A real outlier in this region

Ohio, Indiana, and Missouri have all moved to permitless carry, and Illinois requires a FOID card plus a separate CCL to carry at all. Wisconsin instead requires an actual carry license, with no permitless alternative, closer in structure to Pennsylvania’s or North Carolina’s shall-issue systems than to its immediate Midwest neighbors.

Sources

- Wisconsin rainwater harvesting and plumbing code framework: LegalClarity
- Wisconsin riparian water rights: UW-Extension Water Law Guide
- Wisconsin concealed carry license requirements: Wisconsin DOJ; Alien Gear Holsters

[BY STATE](#) › [WISCONSIN](#)

Wisconsin: Local Resources

Wisconsin Emergency Management and ReadyWisconsin

Wisconsin Emergency Management, part of the Department of Military Affairs, runs public preparedness outreach through ReadyWisconsin, aligned with the national Ready.gov framework.

Where to find it: readywisconsin.wi.gov.

UW-Madison Division of Extension: Wisconsin's version of the other states' land-grant Extension programs, recently restructured

The University of Wisconsin's Division of Extension runs the same category of program as every other state covered on this site, and recently changed its onboarding structure.

A newer, online-first entry point

As of 2026, the path to becoming a Wisconsin Master Gardener starts with an annual fall online course, "Growing and Caring for Plants in Wisconsin: Foundations in Gardening," followed by a winter Master Gardener Onboarding course (up to 5 years allowed between the two). Full certification requires 36 hours of training plus a passing exam score, then 24 hours of volunteer service annually, along with 10 hours of continuing education, to maintain it.

Where to find it: mastergardener.extension.wisc.edu lists the program and county associations.

CERT: supported through ReadyWisconsin

Wisconsin's CERT program follows the same nationwide FEMA model in place since 1993, with ReadyWisconsin serving as the state's central information point for getting involved locally.

Where to find it: readywisconsin.wi.gov/be-informed/be-involved.

Sources

- ReadyWisconsin campaign and CERT program information: ReadyWisconsin; Wisconsin Emergency Management
- UW-Madison Master Gardener Program restructured onboarding and requirements: UW-Madison Division of Extension

BY STATE › WISCONSIN

Wisconsin: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Peshtigo Fire (1871): the deadliest wildfire in recorded U.S. history

Metric	Figure
Date	October 8, 1871
Verified deaths	1,152
Acres burned	1.2-1.5 million
National/world ranking	Deadliest wildfire in recorded U.S. history

Why the true death toll is likely higher than the verified count

The fire destroyed town records for the affected area, and many victims lived on remote farmsteads or logging camps that were never formally documented in the first place, their settlements, and their bodies, were burned beyond identification. The 1,152 figure is the verified count; some historians believe the true toll was meaningfully higher, though it can't be confirmed with surviving records.

The fire is believed to have started from a brush fire, possibly set by railroad workers clearing land, though no definitive cause was ever established. It struck the same night as the Great Chicago Fire, which killed far fewer people but received far more attention then and since.

The Barneveld tornado (1984): Wisconsin’s first F5 since 1958

Metric	Figure
Date	June 8, 1984
Peak rating	F5
Deaths	13
Injuries	322
Damage (Wisconsin)	~\$40 million
Context	Part of a 46-tornado outbreak; Wisconsin's first F5 since the 1958 Chippewa Valley outbreak, which killed 27 people statewide including 19 in a single F5 near Colfax

What these two have in common

Separated by 113 years, the Peshtigo Fire and the Barneveld tornado both demonstrate that Wisconsin’s most severe weather events are genuinely rare but genuinely catastrophic when they occur, long quiet intervals punctuated by events far outside what residents typically expect from the state’s usual climate.

Sources

- Peshtigo Fire death toll and historical details: [History.com](#); National Weather Service
- 1984 Barneveld F5 tornado and 1958 Chippewa Valley outbreak data: Wikipedia, sourced to NWS

Wyoming: Overview

Everything in the main manual and the skill guides applies in Wyoming exactly as written. What's different here is the specific hazard profile and the state, local, and legal context around it. This page is the starting point; the other three pages under Wyoming go deeper on laws, local resources, and the data behind the risks named here.

The Yellowstone Caldera: an extremely low-probability, extremely high-consequence risk

Wyoming shares the Yellowstone region with Montana and Idaho, both already covered on this site through the 1959 Hebgen Lake earthquake and 1976 Teton Dam failure respectively, but Yellowstone's own supervolcano deserves its own treatment. The annual probability of another caldera-forming eruption is approximately 1 in 730,000, roughly comparable to the odds of a large asteroid striking Earth, and the USGS reports no current indication that a major eruption is approaching. If one ever did occur, the areas of Wyoming, Montana, and Idaho closest to the caldera would face pyroclastic flows, while falling ash would affect a much wider area of the country. This isn't a risk to lose sleep over day to day, but it's a genuinely different category of hazard from anything else covered on this site: vanishingly unlikely, but catastrophic if it ever happened. See the Risks page for the full data.

The Blizzard of 1949: Wyoming's worst storm on record

Starting January 2, 1949, a blizzard with winds of 65-80 mph dumped 20-30 inches of snow on Cheyenne within days, the first of what became two months of repeated snow and bitter cold across the state. It killed 12 people in Wyoming and required a rescue effort involving at least 10 state and federal agencies, from the U.S. Army to the National Park Service. See the Risks page for the full data.

What this means for how you use the rest of this manual

The manual's Tier structure and the skill guides apply without modification. What's different in Wyoming: extreme, sustained winter weather is a genuinely severe and historically proven risk here, not just an inconvenience, so this manual's extended-outage and vehicle-emergency-kit guidance matters as much as anywhere covered on this site, and while the Yellowstone Caldera isn't a near-term planning concern, it's worth

understanding why it's mentioned at all: even an essentially negligible-probability hazard is worth a paragraph when the consequences would be regional or national in scale.

Sources

- Yellowstone Caldera eruption probability and consequences: USGS; Popular Science
- Blizzard of 1949 data: WyoHistory.org; Cowboy State Daily

Wyoming: Laws & Legal Considerations

Rainwater harvesting: unregulated at small residential scale

Wyoming has no statute specifically addressing residential rainwater harvesting, but small-scale rooftop-to-barrel collection is widely practiced without a permit.

Rule	Wyoming
Source water	Rooftop or other catchment
Small-scale residential use	Widely practiced without a permit, though no specific statute explicitly authorizes it
Larger systems	May require a formal water appropriation permit through the State Engineer's Office if downstream water rights could be affected

Where to find it: the Wyoming State Engineer’s Office administers water appropriation permits.

Water rights: the first state to constitutionalize prior appropriation

Wyoming didn’t just adopt prior appropriation, it was the first state to write the doctrine directly into its constitution, at statehood in 1890.

Concept	How it works in Wyoming
Basic rule	'First in time is first in right': the earliest-dated beneficial use holds priority during a shortage
Constitutional basis	Wyoming Constitution, Article 8, which declares the water of all natural streams, springs, lakes, and other still-water collections to be state property
Historical significance	Wyoming's 1890 constitutionalization of prior appropriation predates and influenced how several other Western states, including some covered elsewhere on this site, later structured their own water law

Where to find it: the Wyoming State Engineer’s Office administers appropriation and adjudication.

Concealed carry: permitless at 21+, with a new 2026 permit option for 18-20 year-olds

Wyoming’s constitutional (permitless) carry standard remains set at 21, but a 2026 law opened a new path for younger adults.

Standard	Detail
Permitless carry	21+ only, for anyone legally eligible to possess a firearm
18-20 year-olds	As of HB 96, effective July 1, 2026, may now apply for and hold a physical concealed carry permit, a path that didn't exist for this age group before

A new option, not a lowered permitless age

Wyoming’s 2026 change doesn’t lower the permitless-carry age itself, it opens the previously 21+-only optional permit to 18-20 year-olds for the first time. That’s a narrower change than several other states’ recent age adjustments covered on this site (Idaho and West Virginia both lowered their actual permitless threshold), worth distinguishing carefully since the practical effect is different.

Sources

- Wyoming rainwater harvesting practice: LegalClarity
- Wyoming’s constitutional prior appropriation doctrine (1890): Wyoming Water Development Commission; Wyoming Legal Authority
- Wyoming’s 2026 concealed carry permit age change (HB 96): Wyoming News

Wyoming: Local Resources

Wyoming Office of Homeland Security (WOHS)

WOHS provides programs for statewide emergency response, search and rescue, and hazard mitigation across Wyoming.

Where to find it: hls.wyo.gov.

University of Wyoming Extension: Master Gardener Program

University of Wyoming Extension runs the same category of program as every other state covered on this site.

- **University of Wyoming Master Gardener Program:** a minimum of 40 hours of science-based horticulture training, connecting participants across the state with volunteer service opportunities suited to Wyoming's specific growing environment.

Where to find it: uwyo.edu/mastergardener.

CERT: county-run, with Teton County's program among the most established

Wyoming's CERT programs run through individual county emergency management offices, including established teams in Laramie, Teton, Albany, and Uinta counties. Teton County's program, home to Yellowstone and Grand Teton National Parks, has trained volunteers since 2006 through a free 32-hour course.

A long-running program in a high-visibility location

Teton County's CERT program has operated since 2006, longer than many county-level programs covered on other states' pages, likely reflecting the county's high visitor traffic and proximity to Yellowstone's unique hazard profile discussed on this state's overview page.

Where to find it: tetoncountywy.gov, or your own county's emergency management office.

Sources

- Wyoming Office of Homeland Security programs: NRD.gov
- University of Wyoming Master Gardener Program requirements: University of Wyoming
- Teton County CERT program history: Teton County, WY

BY STATE › WYOMING

Wyoming: Risks & Trends

Same standard as every other page on this site: every figure below is independently sourced, and figures that vary across sources, or measure genuinely different things, are flagged as such rather than collapsed into one number that looks more precise than the underlying data actually supports.

The Yellowstone Caldera

Metric	Figure
Annual probability of a caldera-forming eruption	~1 in 730,000 (~0.00014%)
Comparable risk	Roughly similar to the odds of a large (1 km) asteroid striking Earth
Current magma chamber state	5-15% molten material, not a solid pool of ready-to-erupt lava
Current USGS assessment	No indication that a major eruption is approaching
Regional impact if it occurred	Pyroclastic flows affecting the nearest parts of WY, MT, and ID; falling ash affecting a much broader area of the country

Why this is worth a page at all, given the odds

A 1-in-730,000 annual probability is genuinely negligible for day-to-day planning purposes, and nothing here should be read as suggesting otherwise. It’s included because the site’s standard is to name every hazard with real regional-to-national consequence potential, however unlikely, and to give readers the actual numbers rather than either alarmist framing or silence.

The Blizzard of 1949

Metric	Figure
Start date	January 2, 1949
Peak winds	65-80 mph
Cheyenne snowfall, initial surge	20-30 in within days
Total event duration	~2 months of repeated snow and bitter cold following the initial storm
Deaths	12 (Wyoming)
Rescue effort	10+ state and federal agencies involved, including the U.S. Army and National Park Service
Historical ranking	Widely considered the worst winter storm in Wyoming's recorded history

A storm, then a season, not a single event

The Blizzard of 1949’s initial multi-day storm was followed by roughly two more months of repeated snow and extreme cold across Wyoming. Its reputation as the state’s worst storm reflects that extended pattern, not just the opening blizzard’s snowfall total.

Sources

- Yellowstone Caldera eruption probability and consequences: USGS; Popular Science
- Blizzard of 1949 data: WyoHistory.org; Cowboy State Daily