

Natural Disaster Risk Profiles presents an outline of the data center consequences expected from specific types of severe weather.

Please also refer to the *Natural Disasters Risk Locations Map* that graphically indicates degrees of vulnerability by type of disaster and data center location within the U.S.

Tornado

On site—For data centers in or near the storm path, expect disruption and minor to severe infrastructure damage

- Advance warning of tornado potential but no site specific warning
- Employees remain at site
- Duration is brief although intense
- Roofs and outside equipment (satellite dishes, cooling towers, etc.) damaged or destroyed
- Potential damage to building structure

Off site—For data centers in or near the storm path, expect disruption and minor to severe infrastructure damage

- Loss of local utility and communications, especially if not buried
- Quick restoration of localized damage

Hurricane

On site—For data centers in or near the storm path, expect disruption and minor to severe infrastructure damage

- Significant advance warning
- Duration is hours to a few days
- Employees may require evacuation from site
- Post-storm security may be required
- Emergency supplies needed for at least several days operation
- Roofs and outside equipment damaged or destroyed
- Potential damage to building structure from flying debris

Off site—Expect severe region-wide damage to public infrastructure, utilities, and communications

- Loss of local utility and communications, especially if not buried
- Repair of regional damage may require days, weeks, or longer for massive reconstruction of electric power transmission or distribution facilities
- Potential for lasting off-site public infrastructure damage

Earthquake

On site—Expect catastrophic damage and disruption to data centers near the epicenter and infrastructure damage to data centers further away

- No warning
- Brief duration with the threat of continued aftershocks
- Employees may be unable to leave site
- Emergency supplies, food, and water needed for at least several days operation
- Building structural damage
- Toppling of unbraced computer hardware and site infrastructure equipment including collapse of raised floor

• Broken glass, light fixtures, and other breakables

Off site—Expect severe region-wide damage to public infrastructure, utilities, and communications

- Site may be isolated for an extended period
- Highways and bridges may be damaged or destroyed preventing movement of diesel fuel and other operating supplies required for continued operation
- Power and communications may sustain extensive damage requiring days, weeks, or longer to repair.

Ice Storm/Blizzard

On site—Expect some disruption or failure of data center if outside equipment is not designed to survive severe ice and snow accumulation

- Several day warning generally expected
- Storm or multiple storms may last several days with accumulative effects
- Employees may be unable to leave or enter the site
- Emergency supplies, food, and water needed for at least several days operation
- Ice damage to structure and outside equipment
- Roof failure from excessive snow load
- Potential freezing of pipes

Off site—Expect severe region-wide damage to public infrastructure, utilities, and communications

- Loss of overhead power and/or communication lines over large areas may require days, weeks, or longer to repair
- Roads dangerous or impassible

Thunderstorm/Lightning

On site—Expect disruption ranging from disaster to no impact depending on distance to lightning strike and proper operation of surge suppression, UPS, and engine-generator systems

- Special sensors can provide minutes of storm approach warning
- Duration is brief but may recur daily during thunderstorm season
- Frequent UPS battery discharges shorten remaining battery life
- Extended power interruption if utility service is overhead or radial and a nearby lightning strike causes protective devices to open
- Possible flooding and roof leakage

Off site—Expect frequent momentary public utility disruptions from lightning strikes hitting the electric power transmission grid

- Momentary undervoltages can affect hundreds of square miles
- Fires started by lightning can destroy public infrastructure located in rural areas

Flood

On site—Expect catastrophic damage and disruption to data centers in severe flood areas or with infrastructure systems below grade

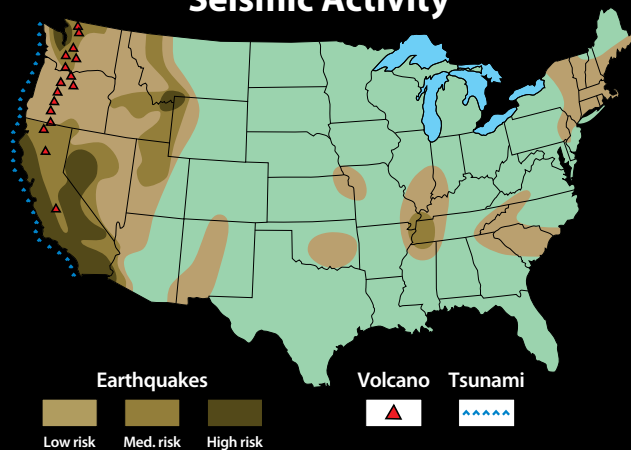
- Several day warning generally expected
- Employees may be unable to leave site
- Emergency supplies, food, and water needed for at least several days operation
- Site infrastructure damage requiring days to weeks to repair

Off site—Expect severe region-wide damage to public infrastructure, utilities, and communications

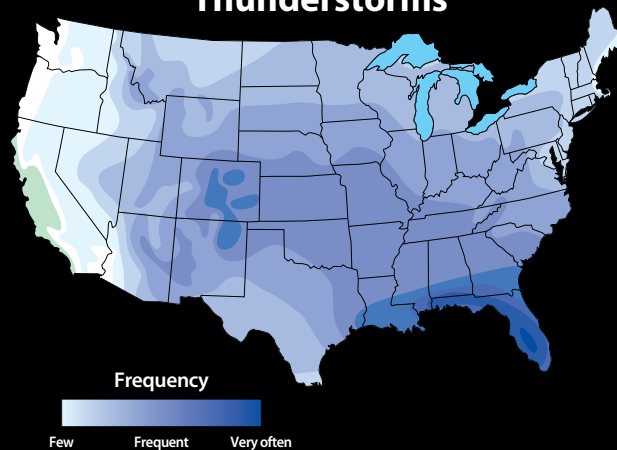
- Site may be isolated for an extended period
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- Power and communications may sustain extensive damage requiring days, weeks, or longer to repair

Natural Disaster Risk Locations

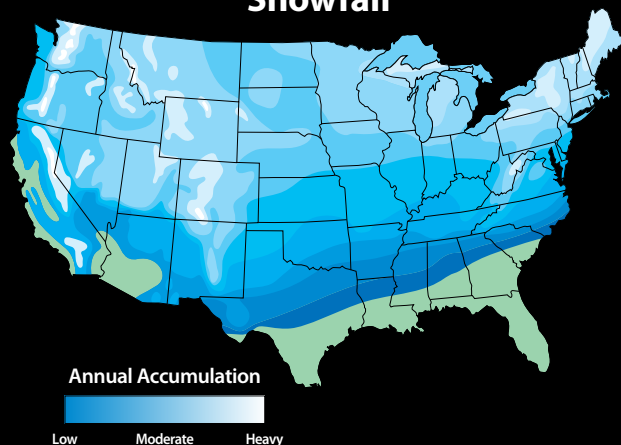
Seismic Activity



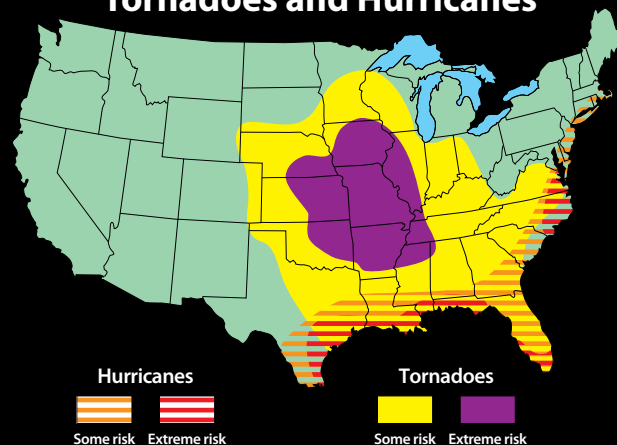
Thunderstorms



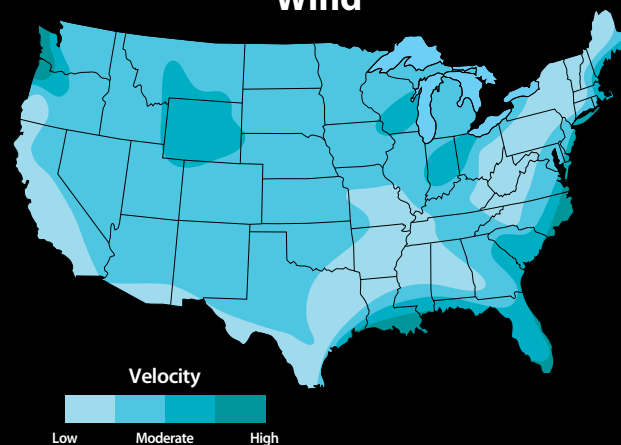
Snowfall



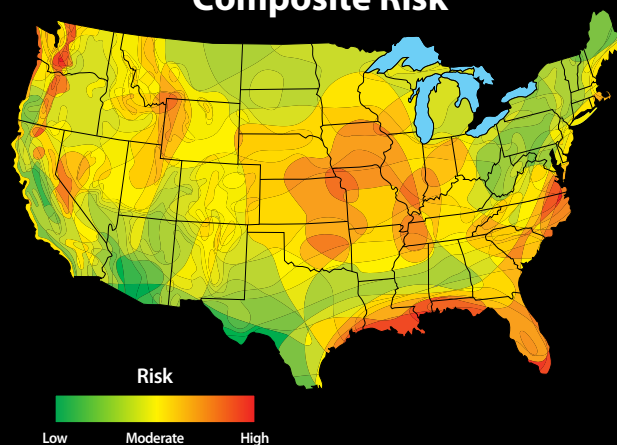
Tornadoes and Hurricanes



Wind



Composite Risk



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