



Natural Disaster Risk Profiles for Data Centers

Natural disasters have caused many "corporate heart attacks" as data centers throughout the country have lost their life-support systems. Yet, virtually all these unexpected downtime events could have and should have been avoided. For data centers without appropriate Site Uptime® safeguards, each natural disaster can cause disruptions and infrastructure damage ranging from costly to catastrophic.

The following *Natural Disaster Risk Profiles* present an outline of the data center consequences expected from specific types of severe weather. ComputerSite Engineering also offers a *Natural Disaster Risk Profile Map* that graphically indicates degrees of vulnerability by type of disaster and data center location.

Tornado

On-site. For data centers in or near the tornado's 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. Expect severe localized damage to public infrastructure, utilities, and communications

- 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 (satellite dishes, cooling towers, etc.) 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 farther away

- No warning
- Brief duration with 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 impassable

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
- Highways and bridges may be damaged 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