



How will climate change impact telecommunications & data center companies?

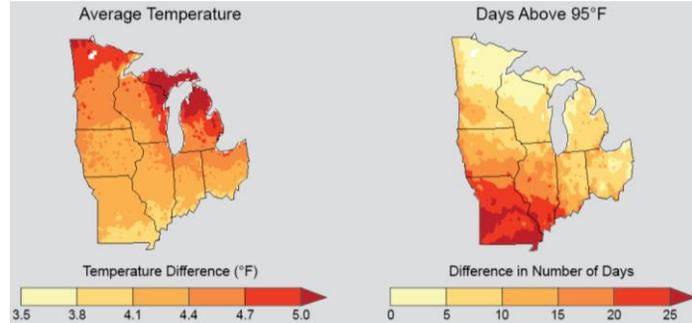
Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin

From extreme storms to incremental changes, telecommunications and data center companies are already feeling the impact of a changing climate. These impacts threaten to disrupt their supply chains and operations as well as cause costly damage to assets and infrastructure of companies in both sectors. This fact sheet offers some first steps toward increasing companies' resilience to climate change in the Midwest.

midwest

Climate is changing and impacts on telecoms and data centers are already being felt. Hurricane Sandy showed the devastating impact of extreme weather on telecoms (see case study below).

In the Midwest, temperatures are already rising, and extreme rainfall events and flooding have increased during the last century. In 2011, 11 of the 14 US weather-related disasters with damages of more than \$1 billion affected the Midwest.



Hot days will be hotter, and more frequent, in the Midwest by 2041. These maps show the projected increases in annual average temperatures by mid-century (2041-2070) as compared to averages for the period between 1971-2000, as well as annual projected increases in the number of the hottest days (days over 95°F) (NCA 2014).

The Midwest is particularly vulnerable due to its energy-intensive economy. Hotter temperatures increase cooling demands, stressing energy systems. Midwest cities are also characterized by aging infrastructure which is vulnerable to flooding, heat waves, and severe ice and snow storms; expected to increase in severity and frequency.

case study

In the summer of 2008, the state of Iowa suffered from a series of severe storms that produced heavy rainfall and tornadoes, which resulted in widespread flooding. Telecom services were among the critical infrastructure that suffered costly damage as a result of the flooding. Disruptions like this around the country are spurring major data center and telecoms companies like Verizon to build resilience and ensure that they avoid outages, customer complaints, and financial losses next time extreme weather hits. To see what Verizon is doing to increase its resilience, visit: <http://www.verizonwireless.com/aboutus/commitment/emergency-preparedness.html>

global companies need resilient supply chains



The supply chains supporting telecoms and data centers are complex and face a wide range of potential impacts from climate change. Complexity means that climate impacts to one part of the supply chain in one region of the world can have consequences for other parts of the supply chain in other regions. Companies need to look for climate risks in each tier of their supply chain.

- Business Environment
- Policy/regulation
- External telecommunications network
- Customer expectations

Climate risks for telecommunications and data centers

midwest

climate factors	potential impacts
Increases in maximum temperature	<ul style="list-style-type: none">Higher frequency, duration, and intensity of heat waves create additional burdens on keeping equipment cool in data exchanges and base stations, resulting in increased failure ratesIncreases in temperature can stress telecoms equipment and infrastructure, reducing life spansIncreased energy demand during heat waves can result in power outages, which can affect the delivery of telecom services and increase the cost of energy supply in an already energy-intensive economy
Increased precipitation	<ul style="list-style-type: none">Particularly around the Great Lakes, increases the risk of flooding of low-lying and underground infrastructure and facilities and the risk of erosion/flood damage to transport structures, potentially exposing cables
Increased frequency of extreme events	<ul style="list-style-type: none">Increases the risk of disruption to the electricity supply on which telecoms and data centers relyReduced capacity to handle increased demand for services, especially during a major snow/ice storm.

determine adaptive capacity

Use this checklist to start assessing how resilient your business is to less predictable weather and a changing climate.

- ✓ What backups and contingencies do you have in place to protect vital assets or operations?
- ✓ What financial options do you have in place that allow you to rebound from disruptions or change?
- ✓ How have past disruptions or extreme events impacted your business?
- ✓ Do critical tiers of your supply chain have redundancies in place to serve as backups?
- ✓ What are your business planning time frames?
- ✓ What shared infrastructure do you have?
- ✓ What is the rate of technological development and infrastructure lifespans? Shorter lifespans provide flexibility to respond quickly to changes in climate.

assess response strategies

There are many ways to build resilience. Here are some initial responses to consider.

- *Relocate or fortify* critical telecom assets such as terminals, cell towers, power facilities, or central offices out of existing and future floodplains, as well as out of coastal areas threatened by sea level rise or storm surges.
- *Move equipment out of basements or ground floors in areas at risk of flooding*, or put them on rolling carts.
- *Decouple communication infrastructure from the electric grid* where possible, for example with microgrids.
- *Identify resilient energy synergies*. Energy efficiency strategies not only reduce emissions but also lower your dependency on the electricity grid, which can suffer due to increased energy demand during heat waves and storm damage.

learn more

The full report, *Climate Risks Study for Telecommunications and Data Center Services*, is available at www.sftool.gov

The National Climate Assessment has more figures and details about climate change in your region at nca2014.globalchange.gov

Questions? Please email adaptation@gsa.gov or visit www.gsa.gov/climateadaptation

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References

- Adams, P. et al. (2014). "Climate Risks Study for Telecommunications and Data Center Services." Prepared for GSA by Riverside and Acclimatise.
- Horrocks, L. et al. (2010) "Adapting the ICT Sector to the Impacts of Climate Change – Final Report," Defra contract number RMP5604. Defra: London.
- Jacob, K. et al. (2011) "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change." ClimAID.
- NCA (2014). National Climate Assessment, 3rd edition. US Global Change Research Program.
- Ospina, A et al. (2014). "Resilient Pathways: the adaptation of the ICT sector to climate change." International Telecommunication Union (ITU): Geneva.
- Rosenzweig, C., et al. (Eds.). "Adaptation in New York State," NYSERDA, 363-396
- Willows, R. and Connell, R. (Eds.) (2003) "Climate adaptation: Risk, uncertainty and decision-making." UKCIP Technical Report. UKCIP: Oxford.