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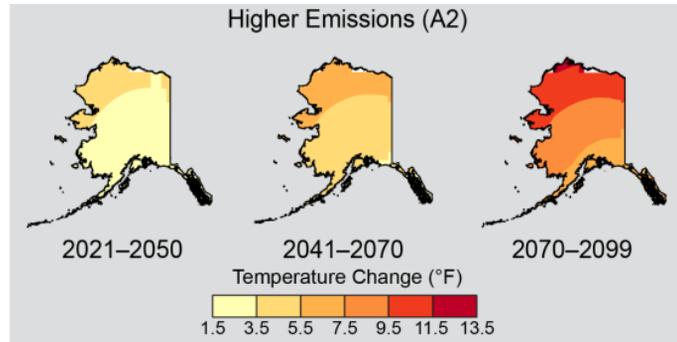
From extreme storms to incremental changes, telecommunications and data center companies are already feeling the impact of a changing climate. These impacts threaten to disrupt their supply chains and operations as well as cause costly damage to assets and infrastructure of companies in both sectors.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

The state of Alaska and surrounding waters

Alaska

Changing weather conditions can alter the business environment too, leading to increases in operating costs and rising customer dissatisfaction.

Alaska is already warming twice as fast as the rest of the country, bringing widespread impacts as spring snowmelt happens earlier, sea ice recedes, and glaciers retreat. Temperatures in Alaska are expected to continue to rise, posing challenges for business and society.

Higher Emissions (A2)

2021–2050   2041–2070   2070–2099

Temperature Change (°F)
1.5 3.5 5.5 7.5 9.5 11.5 13.5

Alaska will continue to warm rapidly
These maps show how average temperatures are expected to significantly increase across Alaska in the near and long term if greenhouse gas emissions continue at a high rate. These numbers are relative to temperatures in 1971-1999 (NCA 2014).

In Alaska, 80% of land is underlain by permafrost, which restricts water drainage and therefore strongly influences the design and maintenance of infrastructure. As permafrost thaws, much of this area is vulnerable to land subsidence, which not only destabilizes infrastructure but also leads to drier landscapes and more wildfires.

case study

During Hurricane Sandy, telecom companies on the Eastern seaboard witnessed first-hand that their infrastructure and operations were not able to cope with extreme weather. Flooding and storm surges caused power failures, and inadequate backup generators rendered many sites inoperable. The storm also caused significant physical damage, knocking out 25% of all cell towers in an area spread over the coasts of 10 states. The storm seriously impacted service provision just when customers needed it most. Now major telecoms companies like Sprint and Verizon are working 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

Telecom Provider
- **Transmission infrastructure** (above and below ground, including masts, antennae, switch boxes, aerials, wires and cables, and satellites)
- **Operations & maintenance**
- **Data centers**

Primary Inputs
- Electricity
- Water
- Tech hardware
- Software
- Materials sourcing
- Transportation

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

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.

Climate risks for telecommunications and data centers

Alaska

climate factors	potential impacts
Increases in maximum temperature	• Thawing permafrost, leading to drier or unstable landscapes and increases the incidence of fires, which poses a risk to infrastructure especially in rural or remote locations • Land subsidence and heave, due to thawing permafrost, can reduce the stability and cause settling of telecommunications infrastructure both above and below ground
Increased frequency of extreme events	• Increases the risk of damage to above-ground transmission infrastructure (masts, antennae, switch boxes, aerials, overhead wires, and cables), which are often final access connections to homes and businesses, and may negatively impact telecommunications service delivery • Increases risk of disruption to the electricity supply on which telecommunications and data centers rely
Sea level rise	• Increases in storm surges increase the risk of saline corrosion of coastal telecommunications infrastructure • Leads to erosion or inundation of coastal and underground infrastructure

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 what are 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.

- *Decouple communication infrastructure from the electric grid* where possible, for example, with microgrids.
- *Increase the operating thresholds of telecom infrastructure* to withstand the increased risk of groundwater flooding and subsidence, possibly exacerbated by increased temperatures and reduced summer rainfall.
- *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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