



## Understanding disaster resiliency factors for broadband deployments

### References and sources

- Adams, P., Steeves, J., Ashe, B., Firth, J., & Rabb, B. (2014). *Climate risk study for telecommunications and data center services: report prepared for the General Services Administration*. Riverside Technology, inc.  
<https://sftool.gov/Content/attachments/GSA%20Climate%20Risks%20Study%20for%20Telecommunications%20and%20Data%20Center%20Services%20-%20FINAL%20October%202014.pdf>
- Anderson, S., Barford, C., & Barford, P. (2020, October). Five alarms: Assessing the vulnerability of us cellular communication infrastructure to wildfires. In *Proceedings of the ACM Internet Measurement Conference*, 162-175, Virtual Event, USA.  
[https://pages.cs.wisc.edu/~pb/wildfires\\_final.pdf](https://pages.cs.wisc.edu/~pb/wildfires_final.pdf)
- AP News. (2019, October 29). *California fires: State utility PG&E says nearly 1.1 million people remain without electricity*. Firstpost.  
<https://www.firstpost.com/world/california-fires-state-utility-pg-nearly-1-1-million-people-remain-without-electricity-7571651.html>
- AP News. (2020, July 17). *Utility's power lines caused huge 2019 California wildfire*.  
<https://apnews.com/general-news-3d35a822b32a447b665281d0bb2e8fd2>
- AT&T. (n.d.). *Network disaster recovery*.  
<https://about.att.com/pages/disaster-recovery/network-recovery>
- Beale, M. (2020, August 26). *Wildfire evacuation alert 'utterly failed'*. Daily Democrat.  
<https://www.dailydemocrat.com/2020/08/26/some-yolo-county-residents-say-wildfire-evacuation-alert-system-utterly-failed/>
- Benzow, A., Fikri, K., Kim, J., & Newman, D. (n.d.). *Advancing economic development in persistent-poverty communities*.  
<https://eig.org/wp-content/uploads/2023/06/EIG-Persistent-Poverty-Report.pdf>
- Bittle, J. (2023, February 23). *The American climate migration has already begun*. *The Guardian*.  
<https://www.theguardian.com/commentisfree/2023/feb/23/us-climate-crisis-housing-migration-natural-disasters>



- Brookings (2022, October 22). *Why the federal government needs to step up their efforts to close the rural broadband divide*.  
<https://www.brookings.edu/articles/why-the-federal-government-needs-to-step-up-their-efforts-to-close-the-rural-broadband-divide/>
- Comes, T., & Van de Walle, B. A. (2014). Measuring disaster resilience: The impact of hurricane sandy on critical infrastructure systems. *Information Systems for Crisis Response and Management*, 11(May), 195-204.  
[http://idl.iscram.org/files/comes/2014/408\\_Comes+VanDeWalle2014.pdf](http://idl.iscram.org/files/comes/2014/408_Comes+VanDeWalle2014.pdf)
- Cybersecurity and Infrastructure Security Agency. (2018, November 29). *DHS ECD Public Safety Communications Network Resiliency Self-Assessment Guidebook*.  
[https://www.cisa.gov/sites/default/files/publications/DHS%2520ECD%2520Public%2520Safety%2520Communications%2520Network%2520Resiliency%2520Self-Assessment%2520Guidebook\\_11.29.18%2520-%2520FINAL.pdf](https://www.cisa.gov/sites/default/files/publications/DHS%2520ECD%2520Public%2520Safety%2520Communications%2520Network%2520Resiliency%2520Self-Assessment%2520Guidebook_11.29.18%2520-%2520FINAL.pdf)
- Federal Communications Commission. (2018, August 24). *Report on the 2017 Atlantic Hurricane Season's Impact on Communications* (17-344).  
<https://www.fcc.gov/document/2017-atlantic-hurricane-season-report-impact-communications>
- Feld, H., April, J., Pickering, M., Schwartzman, A. J., Stewart, C. E., Davis, D., Getachew, Y., Falcon, E., Bloxom, Q., Wood, M., Goodman, P., Means, D., Mitchell, C., FitzGerald, T., Wein, O., Siefer, A., Panetteri, A., National Hispanic Media Coalition, Stager, J., ... Banks, C. (2019, December 4). *Network Resiliency Letter House*. National Consumer Law Center.  
<https://www.nclc.org/wp-content/uploads/2022/08/Network-Resiliency-letter-to-house-2019.pdf>
- Gibbs, L. I., & Holloway, C. F., (2013, May). *Hurricane Sandy After Action*. New York City Government.  
[https://www.nyc.gov/assets/em/downloads/pdf/hurricane\\_sandy\\_aar.pdf](https://www.nyc.gov/assets/em/downloads/pdf/hurricane_sandy_aar.pdf)
- Government Accountability Office. (2021). *Telecommunications: FCC Assisted in Hurricane Maria Network Restoration, but a Clarified Disaster Response Role and Enhanced Communication Are Needed*. <https://www.gao.gov/assets/gao-21-297.pdf>
- InformIT. (2012, November 9). *Hurricane Sandy and Widespread Telecom Outages: How Poor Disaster Recovery Measures Made the Aftermath Even Worse*.  
<https://www.informit.com/articles/article.aspx?p=1983305>



Jacob, K. Maxemchuk, N., Deodatis, G., Morla, A., Schlossberg, E., Paung, I., Lopeman, M., Horton, R., Bader, D., Leichenko, R., Vancura, P., & Klein, Y. (2011).

Telecommunications. *ClimAD*.

<https://nescaum-dataservices-assets.s3.amazonaws.com/nyclimatescience.org/ClimAID-Telecommunications.pdf>

Kwasinski, A. (2012). Hurricane sandy effects on communication systems. *The University of Texas at Austin, Tech. Rep. PR-AK-0112-2012*.

<http://users.ece.utexas.edu/~kwasinski/preliminary%20telecom%20report%20v3%20comp.pdf>

Lee, N. T., Seddon, J., Tanner, B., & Lai, S. (2022). *Why the federal government needs to step up efforts to close the rural broadband divide, Report# 1 of the Rural Broadband Equity Project*. Brookings.

<https://www.brookings.edu/articles/why-the-federal-government-needs-to-step-up-their-efforts-to-close-the-rural-broadband-divide/>

Leon, B. (2022, June 10). *Telecommunication operators and natural disasters*. Orange Silicon Valley.

<https://siliconvalley.orange.com/en/news/telecommunication-operators-and-natural-disasters/>

Marek, S. (2021, March 24). *Jeffries analyst says rural broadband market is ripe for investment*. Fierce Telecom.

<https://www.fiercetelecom.com/operators/jeffries-analyst-says-rural-broadband-market-ripe-for-investment>

Microsoft. (2023). *Microsoft Airband Initiative | Microsoft CSR*.

<https://www.microsoft.com/en-us/corporate-responsibility/airband-initiative>

Microsoft. (2021, March 12). *'We brought the sea to the servers': How Project Natick is keeping datacenters cool and green*. Microsoft News Center.

<https://news.microsoft.com/source/features/innovation/datacenter-liquid-cooling/#:~:text=%27We%20brought%20the%20sea%20to%20the%20servers%27&text=Instead%20of%20an%20engineered%20fluid,seawater%20through%20the%20sealed%20tube.>

Miller, L. (2019, November 5). *California suffered widespread cellphone outages during fires. A big earthquake would be much worse*. Los Angeles News.

<https://www.latimes.com/california/story/2019-11-05/mass-cellphone-outages-during-blackouts-and-fires-are-a-grim-preview-of-life-after-a-major-earthquake>



New York City Government. (n.d.). Sandy and Its Impacts.

[https://www.nyc.gov/html/sirr/downloads/pdf/final\\_report/Ch\\_1\\_SandyImpacts\\_FINAL\\_singles.pdf](https://www.nyc.gov/html/sirr/downloads/pdf/final_report/Ch_1_SandyImpacts_FINAL_singles.pdf)

National Rural Education Association. (2020, October 13). Broadband connectivity is key to successful learning.

<https://www.nrea.net/broadband-connectivity-is-key-to-successful-learning>

NOAA (2023, January 10). 2022 U.S. billion-dollar weather and climate disasters in historical context.

<https://www.climate.gov/news-features/blogs/2022-us-billion-dollar-weather-and-climate-disasters-historical-context#:~:text=The%20number%20and%20cost%20of%20weather%20and%20climate%20disasters%20is.lead%20to%20billion%20dollar%20disasters>

Orange Silicon Valley. (2020, September 10). Telecommunication operators and natural disasters.

<https://siliconvalley.orange.com/en/news/telecommunication-operators-and-natural-disasters/>

Penn Live. (2012, November 16). *Restoring power to Hurricane Sandy victims takes days to weeks; 'it's hard, grueling work'*.

[https://www.pennlive.com/midstate/2012/11/restoring\\_power\\_to\\_hurricane\\_s.html#:~:text=After%20Sandy%2C%20New%20York%20utilities,West%20Virginia%20in%2010%20days.](https://www.pennlive.com/midstate/2012/11/restoring_power_to_hurricane_s.html#:~:text=After%20Sandy%2C%20New%20York%20utilities,West%20Virginia%20in%2010%20days.)

Poon, L. (2023, January 13). *Where Internet Connection Costs More in the US*. Bloomberg.

<https://www.bloomberg.com/news/articles/2023-01-13/mapping-where-americans-pay-less-for-internet>

Reardon, M. (2017, September 3). *How the wireless carriers fared during Hurricane Harvey*.

CNET. <https://www.cnet.com/tech/mobile/hurricane-harvey-phone-service/>

Reardon, M. (2013, February 5). *FCC holds first hearing on Sandy communications failures*.

CNET. <https://www.cnet.com/tech/tech-industry/fcc-holds-first-hearing-on-sandy-communications-failures/>

Reardon, M. (2012, October 30). *FCC on Sandy: Cell service likely to get worse before it gets better*.

<https://www.cnet.com/tech/mobile/fcc-on-sandy-cell-service-likely-to-get-worse-before-it-gets-better/>



- Rosenzweig, C., Solecki, W., DeGaetano, A., Hassol, S., Grabhorn, P., O'Grady, M., Bader, D., Comstock, F., Hammer, S. A., Horton, R., Jacob, K., Kinney, P. L., Klein, Y., Leichenko, R., Major, D. C., McDonald, A., Ostfeld, R. S., Panero, M., Parshall, L., ... Patrick, L. (2011). *Responding to climate change in New York State: Synthesis report*. New York State Energy Research and Development Authority.  
<https://nescaum-dataservices-assets.s3.amazonaws.com/nyclimatescience.org/ClimAID-synthesis-report.pdf>
- Sandhu, H. S., & Raja, S. (2019). *No Broken Link: The Vulnerability of Telecommunication Infrastructure to Natural Hazards*. World Bank.  
<https://openknowledge.worldbank.org/server/api/core/bitstreams/c833c1b9-5e6c-5480-8b21-9bb2bb192cfa/content>
- Stern, J. (2012, November 2). *Verizon and AT&T Deploy Trucks to Help Sandy Victims Recharge*. ABC News.  
<https://abcnews.go.com/Technology/verizon-att-deploy-trucks-sandy-victims-recharge/story?id=17620839>
- Zahn, M. (2022, September 22). *Puerto Rico's power grid is struggling 5 years after Hurricane Maria. Here's why*. ABC News.  
<https://abcnews.go.com/Technology/puerto-ricos-power-grid-struggling-years-hurricane-maria/story?id=90151141#:~:text=It%20took%20328%20days%2C%20or,even%20before%20Maria%2C%20said%20Sanzillo>