

CLIMATE CHANGE AND THE NEWS  
**Planning for Sea Level Rise and Extreme Weather**

November 4, 2015

Rising Seas Summit | Boston Sheraton Hotel  
39 Dalton Street, Boston, MA

**Resources List**

**SUMMARIES OF CLIMATE CHANGE SCIENCE**

Intergovernmental Panel on Climate Change Fifth Assessment Report. <http://www.ipcc.ch/report/ar5/>  
Working Group I, The Physical Science Basis: <https://www.ipcc.ch/report/ar5/wg1/>  
Working Group II, Impacts, Adaptation, and Vulnerability: <https://www.ipcc.ch/report/ar5/wg2/>  
Working Group III, Mitigation of Climate Change: <https://www.ipcc.ch/report/ar5/wg3/>

Intergovernmental Panel on Climate Change. Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. <http://ipcc-wg2.gov/SREX/report/>

National Climate Assessment. <http://nca2014.globalchange.gov/>

NOAA National Climatic Data Center. Global Climate Change Indicators. <https://www.ncdc.noaa.gov/indicators/>

Romm, J. (2015) Climate Change: What Everyone Needs to Know. Oxford University Press 328 pp.

The Royal Society and U.S. National Academy of Sciences. (2014) Climate Change: Evidence and Causes. <https://royalsociety.org/policy/projects/climate-evidence-causes/>

The Royal Society. (2014) The Basics of Climate Change. <https://royalsociety.org/policy/projects/climate-evidence-causes/basics-of-climate-change/>

U.S. Environmental Protection Agency. Climate change indicators in the United States: weather and climate. <http://www.epa.gov/climatechange/science/indicators/weather-climate/index.html>

**EXTREME WEATHER SCIENCE RESOURCES**

Barnes, AghaKouchak, A., D. Feldman, M. Hoerling, T. Huxman, and J. Lund. (2015) Water and climate: Recognize anthropogenic drought. *Nature*, 524(7566). <http://bit.ly/1JmVe5X>

Allan, R.P., and B.J. Soden. (2008) Atmospheric warming and the amplification of precipitation extremes. *Science*, 321(5895): 1481-84. DOI: [10.1126/science.1160787](https://doi.org/10.1126/science.1160787)

E.A., L.M. Polvani, and A.H. Sobel. (2013) Model projections of atmospheric steering of Sandy-like superstorms. *Proc. Nat. Acad. Sci.*, DOI: [10.1073/pnas.1308732110](https://doi.org/10.1073/pnas.1308732110)

Bender, M.A., T.R. Knutson, R.E. Tuleya, J.J. Sirutis, G.A. Vecchi, S.T. Garner, and I.M. Held. (2010) Modeled impact of anthropogenic warming on the frequency of intense Atlantic hurricanes. *Science*, 327(5964): 454-58. DOI: [10.1126/science.1180568](https://doi.org/10.1126/science.1180568)

Bonfils, C., and B.D. Santer. (2011) Investigating the possibility of a human component in various Pacific decadal oscillation indices. *Climate Dynamics*, 37(7-8): 1457-68. DOI: [10.1007/s00382-010-0920-1](https://doi.org/10.1007/s00382-010-0920-1)

Bradbury, J., and C. DeConcini. (2012) The connection between climate change and recent extreme weather events. World Resources Institute (Fact Sheet). <http://bit.ly/1MFIpa1>

Center for Climate and Energy Solutions. Extreme heat and climate change. <http://bit.ly/1k8rjNv>  
Comment on this paper from Weather Underground: <http://bit.ly/1LQZMWD>

Coumou, D., and S. Rahmstorf. (2012) A decade of weather extremes. *Nature Climate Change*, 2: 491-96. <http://bit.ly/1dxS7gO>

De Sherbinin, A. (2014) Climate change hotspots mapping: what have we learned? *Climatic Change*, 123(1): 23-37. <http://link.springer.com/article/10.1007%2Fs10584-013-0900-7>

Emanuel, K. (2013) Downscaling CMIP5 climate models show increased tropical cyclone activity over the 21<sup>st</sup> century. *Proc. Nat. Acad. Sci.*, DOI: [10.1073/pnas.1301293110](https://doi.org/10.1073/pnas.1301293110)

Francis, J.A., and S.J. Vavrus. (2012) Evidence linking Arctic amplification to extreme weather in mid-latitudes. *Geophysical Research Letters*, 39(6): L06801. DOI: [10.1029/2012GL051000](https://doi.org/10.1029/2012GL051000)

Francis, J. and N. Skific. (2015) Evidence linking rapid Arctic warming to mid-latitude weather patterns. *Philosophical Transactions of the Royal Soc. A*, 373(2045). <http://bit.ly/1RKc8gt>

Holdren, J.P. (2014, February 28) Drought and global climate change: An analysis of statements by Roger Pielke, Jr. <http://1.usa.gov/1vb0Si8>

Knutson, T.R., et al. (2010) Tropical cyclones and climate change. *Nature Geoscience*, 3: 157-163. DOI: [10.1038/ngeo779](https://doi.org/10.1038/ngeo779)

Ogburn, S.P. (2013, September 6) Climate change exacerbates some extreme weather. *Scientific American*. <http://bit.ly/1Lwu7aU>

Schiermeler, Q. (2013, April 11) Climate change brings stormier weather to the US. *Nature*. <http://www.nature.com/news/climate-change-brings-stormier-weather-to-the-us-1.12763>

Trenberth, K., J. Meehl, J. Masters, R. Somerville, H. Cutting, S. Chung, and S. Hassol. (2011, September 7) Current extreme weather and climate change. Climate Communication Science and Outreach. <http://bit.ly/1OxTdc1>

Wallace, J.M., I.M. Held, D.W.J. Thompson, K.E. Trenberth, and J.E. Walsh. (2013). Global warming and winter weather. *Science*. 343(6172): 729-730. DOI: [10.1126/science.343.6172.729](https://doi.org/10.1126/science.343.6172.729)

## SEA LEVEL RISE & COASTAL FLOODING SCIENCE RESOURCES

Crow, C. (2010) Establishing vertical control & geospatial infrastructure for monitoring sea level rise. National Geodetic Survey. <http://www.edc.uri.edu/monumentation/Resources/CACOKickOff/Crow.pdf>

Geological Society of America. (2012, November 1) Why seas are rising ahead of predictions. GSA Press Release No. 12-82. <http://geosociety.org/news/pr/12-82.htm>

Geophysical Fluid Dynamics Laboratory. Hurricanes and Climate Change.  
<http://www.gfdl.noaa.gov/hurricanes-and-climate-change>

Geological Society of America. (2012, November 1) Why seas are rising ahead of predictions. GSA Press Release No. 12-82. <http://geosociety.org/news/pr/12-82.htm>

Holland, D. and D. Holland (2015, October 19) On the rocks: The challenges of predicting sea level rise. *Eos*, 96, doi:10.1029/2015EO036667. <http://bit.ly/1N0tV4O>

Joughin, I., B.E. Smith, B. Medley. (2014) Marine ice sheet collapse potentially under way for the Thwaites Glacier Basin, West Antarctica. *Science*, 344(6185): 735-38. DOI: [10.1126/science.1249055](https://doi.org/10.1126/science.1249055)

Kemp, A.C., and B.P. Horton. (2013) Contribution of relative sea-level rise to historical hurricane flooding in New York City. *Journal of Quaternary Science*, 28(6): 537-41. DOI: [10.1002/jqs.2653](https://doi.org/10.1002/jqs.2653)

Lin, N., K. Emanuel, M. Oppenheimer, and E. Vanmarcke. (2012) Physically based assessment of hurricane surge threat under climate change. *Nature Climate Change*, 2(6): 462-467.  
<http://www.nature.com/nclimate/journal/v2/n6/abs/nclimate1389.html>

Meehl, G.A., et al. (2012) Relative outcomes of climate change mitigation related to global temperature versus sea-level rise. *Nature Climate Change*, 2(8): 576-580.  
<http://www.nature.com/nclimate/journal/v2/n8/full/nclimate1529.html>

Najjar, R.G., et al. (2010) Potential climate change impacts on the Chesapeake Bay. *Estuarine, Coastal and Shelf Science*, 86(1): 1-20. DOI: <http://dx.doi.org/10.1016/j.ecss.2009.09.026>

Nicholls, R.J. and A. Cazenave. (2010) Sea-Level Rise and Its Impact on Coastal Zones. *Science*, 328: 1517-1520. <http://www.sciencemag.org/content/328/5985/1517.abstract>

Sallenger, A.H., K.S. Doran, and P.A. Howd. (2012) Hotspot of accelerated sea-level rise on the Atlantic coast of North America. *Nature Climate Change*, 2(12), 884-888.  
<http://www.nature.com/nclimate/journal/v2/n12/full/nclimate1597.html>

Strauss, B.H., S. Kulp and A. Levermann. (2015) Carbon choices determine US cities committed to futures below sea level. *Proc. National Academy of Sciences*, DOI: [10.1073/pnas.1511186112](https://doi.org/10.1073/pnas.1511186112).

Strauss, B.H., R. Ziemiński, J.L. Weiss, and J.T. Overpeck, (2012) Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States. *Environmental Research Letters*, 7(1): 014033. <http://iopscience.iop.org/1748-9326/7/1/014033>

## **PUBLIC OPINION OF CLIMATE CHANGE AND ADAPTATION**

Howe, P., Boudet, H. Maibach, E., and Leiserowitz, A. (2014) “Mapping the Shadow of Experience of Extreme Weather Events.” *Climatic Change* 127 (2): 381–89. DOI: [10.1007/s10584-014-1253-6](https://doi.org/10.1007/s10584-014-1253-6).

Leiserowitz, A., E. Maibach, C. Roser-Renouf, G. Feinberg, S. Rosenthal, J. Marlon, and P. Howe. (2014) *Extreme Weather and Climate Change in the American Mind, November 2013*. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication. <http://bit.ly/1Pw4nNA>

Yale Project on Climate Change Communication, Climate Change in the American Mind  
“This project 1) investigates, explains, and tracks public understanding of the causes, consequences, and solutions to climate change, support for climate policies, and the current barriers to action, and 2) designs and tests new strategies to engage the public in climate science and solutions.” <http://bit.ly/1baWxRj>

## MANAGING RISKS OF SEA LEVEL RISE, EXTREME WEATHER, AND RELATED FLOODING

- Adger, W.N., T.P. Hughes, C. Folke, S.R. Carpenter, and J. Rockstrom. (2005, August) Social-ecological resilience to coastal disasters. *Science*, 309(5737): 1036-39. DOI: [10.1126/science.1112122](https://doi.org/10.1126/science.1112122)
- Beddington, J., et al. (2012, March) Achieving food security in the face of climate change. Commission on Sustainable Agriculture and Climate Change (final report). <http://bit.ly/1LQZZZT>
- Cutter, S.L., and M.L. Zoback. (2013) Improving the nation's resilience to disasters. *Eos, Transactions American Geophysical Union*, 94(9): 89. DOI: [10.1002/2013EO090007](https://doi.org/10.1002/2013EO090007)
- Hunt, A., and P. Watkiss. (2011) Climate change impacts and adaptation in cities: a review of the literature. *Climatic Change* 104:13-49. <http://link.springer.com/article/10.1007/s10584-010-9975-6>
- Kirshen, P., S. Merrill, P. Slovisky, and N. Richardson. (2012) Simplified method for scenario-based risk assessment adaptation planning in the coastal zone. *Climatic Change*. 113(3-4): 919-931. <http://link.springer.com/article/10.1007%2Fs10584-011-0379-z#page-1>
- Kousky, C. (2014) Managing shoreline retreat: a US perspective. *Climatic Change*, 124(1-2): 9-20. <http://link.springer.com/article/10.1007/s10584-014-1106-3>
- Lazo, J.K., M. Lawson, P.H. Larsen, and D.M. Waldman. (2011) U.S. economic sensitivity to weather variability. *Bulletin of the American Meteorological Society*, 92: 709-20. DOI: <http://dx.doi.org/10.1175/2011BAMS2928.1>
- Maloney, M.C. and B.L. Preston. (2014) A geospatial dataset for U.S. hurricane storm surge and sea level rise vulnerability: Development and case study applications. *Climate Risk Management*, 2:26-41. [doi:10.1016/j.crm.2014.02.004](https://doi.org/10.1016/j.crm.2014.02.004)
- Matonse, A.H., D.C. Pierson, A. Frei, M.S. Zion, A. Anandhi, E. Schneiderman, and B. Wright. (2013) Investigating the impact of climate change on New York City's primary water supply. *Climatic Change*, 116(3-4): 437-56. DOI: [10.1007/s10584-012-0515-4](https://doi.org/10.1007/s10584-012-0515-4)
- Martinich, J., J.E. Neumann, L. Ludwig, and L. Jantarasami. (2012) Risks of sea level rise to disadvantaged communities in the United States. Mitigation and Adaptation Strategies for Global Change. <http://link.springer.com/article/10.1007%2Fs11027-011-9356-0>
- Meehl, G.A., et al. (2012) Relative outcomes of climate change mitigation related to global temperature versus sea-level rise. *Nature Climate Change*, 2(8): 576-580. <http://www.nature.com/nclimate/journal/v2/n8/full/nclimate1529.html>
- Morss, R.E., O.V. Wilhelmi, G.A. Meehl, and L. Dilling. (2011) Improving societal outcomes of extreme weather in a changing climate: an integrated perspective. *Annual Review of Environment and Resources*, 36: 1-25. <http://bit.ly/1HqMGgE>
- Newmark, R. L., et al. (2012) Energy sector vulnerability to climate change: adaptation options to increase resilience. *American Geophysical Union*. <http://adsabs.harvard.edu/abs/2012AGUFMGC12B..04N>
- Olcott, C., and E. Penn. (2013) Adaptive Planning for Flooding and Coastal Change in Virginia: Legal and Policy Issues for Local Government. Virginia Coastal Policy Clinic. <http://law.wm.edu/academics/programs/jd/electives/clinics/vacoastal/docs/adaptive%20planning%20conference%20documents/finalreport.pdf>

Policy Lab. (2014, February 14) Science for Disaster Risk Reduction – An Academic Exercise? The Royal Society. <http://royalsociety.org/events/2014/02/Science-for-DRR/>

Rodriguez, A.B., et al. (2014) Oyster reefs can outpace sea level rise. *Nature Climate Change*, 4:493-497. DOI: 10.1038/nclimate2216 <http://bit.ly/1GGHO0d>

Smithers, J., and B. Smit. (1997) Human adaptation to climatic variability and change. *Global Environmental Change*, 7(2): 129-46. DOI: [http://dx.doi.org/10.1016/S0959-3780\(97\)00003-4](http://dx.doi.org/10.1016/S0959-3780(97)00003-4)

Tompkins, E.L., and W.N. Adger. (2004) Does adaptive management of natural resources enhance resilience to climate change? *Ecology and Society*, 9(2): 10. <http://bit.ly/1Pkw24V>

Tulou. C. (2009) Resilient Coasts: A Blueprint for Action. The Heinz Center, Washington DC. <https://www.travelers.com/about-us/docs/ResilientCoastsBlueprint.pdf>

U.S. Department of Energy. (2013) U.S. energy sector vulnerabilities to climate change and extreme weather. <http://1.usa.gov/1NKuUrj>

U.S. Department of Transportation. (2012, December) *Climate Change and Extreme Weather Vulnerability Assessment Framework*. <http://1.usa.gov/1OxThZd>

U.S. Government Accountability Office. (2015, October 13) Federal Supply Chains: Opportunities to Improve the Management of Climate-Related Risks. GAO-16-32: Published: Oct 13, 2015. Publicly Released: Oct 27, 2015. <http://www.gao.gov/products/GAO-16-32>

U.S. Government Accountability Office. Extreme Weather Events: Limiting Federal Fiscal Exposure and Increasing the Nation's Resilience. <http://www.gao.gov/assets/670/660861.pdf>

Wagner, M., N. Chhetri, and M. Sturm. (2014) Adaptive capacity in light of Hurricane Sandy: the need for policy engagement. *Applied Geography*, 50: 15-23. DOI: <http://dx.doi.org/10.1016/j.apgeog.2014.01.009>

## **PLANNING & RESPONSE EFFORTS RELATED TO SEA LEVEL RISE, EXTREME WEATHER, AND RELATED FLOODING**

The Bay Institute. The Horizontal Levee.

“The Horizontal Levee, The Bay Institute’s groundbreaking study about the economic value of tidal marshes, demonstrates conclusively that nature performs critical functions for society. During the current era of sea level rise, the forgotten marshlands of San Francisco Bay have become a critical adaptation tool.” <http://bay.org/bay-restoration/the-horizontal-levee>

Becker, A.H., et al. (2013, October) A note on climate change adaptation for seaports: a challenge for global ports, a challenge for global society. *Climatic Change*, 120(4): 683-95. DOI: [10.1007/s10584-013-0843-z](http://dx.doi.org/10.1007/s10584-013-0843-z)

Bierbaum, R., et al. (2013) A comprehensive review of climate adaptation in the United States: more than before, but less than needed. *Mitigation and Adaptation Strategies for Global Change* 18:361-406.

<http://dx.doi.org/10.1007/s11027-012-9423-1>

Canada-Caribbean Coastal Climate Adaptation Strategies (C-Change). <http://www.coastalchange.ca/>

Carmin, J., N. Nadkarni, and C. Rhie. (2012) Progress and challenges in urban climate adaption panning: results of a global survey. MIT, Cambridge, MA.

<http://web.mit.edu/jcarmin/www/urbanadapt/Urban%20Adaptation%20Report%20FINAL.pdf>

GAO. (2013, April 12). Climate Change: Future Federal Adaptation Efforts Could Better Support Local Infrastructure Decision Makers. GAO-13-242, April 12. <http://www.gao.gov/products/GAO-13-242>

Georgetown Climate Center. State and Local Adaptation Plans. <http://www.georgetownclimate.org/node/3324?page=1>

Hinkel, J., et al. (2014) Coastal flood damage and adaptation costs under 21<sup>st</sup> century sea-level rise. *Proc. Nat. Acad. Sci.* DOI: 10.1073/pnas.1222469111 <http://www.pnas.org/content/early/2014/01/29/1222469111.abstract>

Hodges, T. (2011) Flooded bus barns and buckled rails: public transportation and climate change adaptation. FTA Report No. 0001. Federal Transit Administration, U.S. Department of Transportation, Washington, D.C. [http://www.fta.dot.gov/documents/FTA\\_0001\\_-\\_Flooded\\_Bus\\_Barns\\_and\\_Buckled\\_Rails.pdf](http://www.fta.dot.gov/documents/FTA_0001_-_Flooded_Bus_Barns_and_Buckled_Rails.pdf)

King, D., et al. (2013) Planning, building and insuring: Adaptation of built environment to climate change induced increased intensity of natural hazards. *National Climate Change Adaptation Research Facility*. <http://bit.ly/1KrzgxM>

Kirshen, P., K. Knee, and M. Ruth. (2008) Climate change and coastal flooding in Metro Boston: impacts and adaptation strategies. *Climatic Change*. 90(4): 453-473. <http://link.springer.com/article/10.1007%2Fs10584-008-9398-9#page-1>

Leggett, J.A. (2015, February 23) Climate change adaptation by Federal agencies: An analysis of plans and issues for Congress. Congressional Research Service. <http://bit.ly/1C5tW2N>

Maloney, M.C. and B.L. Preston. (2014) A geospatial dataset for U.S. hurricane storm surge and sea level rise vulnerability: Development and case study applications. *Climate Risk Management*, 2:26-41. [doi:10.1016/j.crm.2014.02.004](http://doi:10.1016/j.crm.2014.02.004)

MetEd. (2015, August) Geospatial Infrastructure for Coastal Communities: Informing Adaptation to Sea Level Rise. Comet. <http://bit.ly/1NKuZew>

National Oceanic and Atmospheric Administration/Environmental Protection Agency. (2013) Case study of Virginia tidewater area, water resource strategies and information needs in response to extreme weather/climate events. <http://1.usa.gov/1LQqYZ>

New York City Panel on Climate Change. (2010) Climate change adaptation in New York City: building a risk management response. *Annals of the New York Academy of Sciences*, 1196: 1-354. <http://onlinelibrary.wiley.com/doi/10.1111/nyas.2010.1196.issue-1/issuetoc>

Ng, A., and J.-P. Rodrigue. (2013) Climate change and the adaptation of transport infrastructure. In *The Geography of Transport Systems*, 3<sup>rd</sup> edition. Routledge: New York, NY. <http://people.hofstra.edu/geotrans/eng/ch8en/appl8en/ch8a3en.html>

PopTech. Climate Resilience Lab Resources.

The CRLR is “exploring innovation at the intersection of community resilience, climate change, and the empowerment of girls and women.” [http://poptech.org/climate\\_lab\\_resources](http://poptech.org/climate_lab_resources)

Temmerman, S., et al. (2013) Ecosystem-based coastal defense in the face of global change. *Nature*, 504: 79-83. doi: [10.1038/nature12859](http://doi:10.1038/nature12859)

Tillmann, P. and D. Siemann. (2011) Climate change effects and adaptation approaches in marine and coastal ecosystems of the North Pacific Landscape Conservation Cooperative Region: a compilation of scientific literature (phase I draft final report). National Wildlife Federation. <http://bit.ly/1jEYMBc>

Tol, R.S.J., R.J.T Klein, and R.J. Nicholls. (2008) Towards Successful Adaptation to Sea-Level Rise along Europe's Coasts. *Journal of Coastal Research*, 24(2): 432-442. <http://www.bioone.org/doi/abs/10.2112/07A-0016.1>

Tollefson, J. (2013, February) New York vs. the sea. *Nature*, 494: 162-4. <http://www.seagrant.sunysb.edu/media/sandy12/NatureMagazine-Sandy021413.pdf>

Tompkins, C.F. (2013) Coastal communities in Virginia lead the way on climate change. World Resources Institute. <http://www.wri.org/blog/coastal-communities-virginia-lead-way-local-climate-action>

United Nations Framework Convention on Climate Change. Least Developed Countries National Adaptation Plans. <http://bit.ly/1G8pZxK>

Watts, R.G. (2013) Engineering response to climate change. CRC Press: Boca Raton, FL. <http://bit.ly/1hHG5Cy>

Wilby, R.L. and R. Keenan. (2012) Adapting to flood risk under climate change. *Prog in Phys Oc.*, 36: 348-378. DOI: [10.1177/0309133312438908](https://doi.org/10.1177/0309133312438908)

Zimmerman, R., and C. Faris. (2011) Climate change mitigation and adaptation in North American cities. *Current Opinion in Environmental Sustainability* 3(3):181-187. <http://www.sciencedirect.com/science/article/pii/S1877343510001430>

## JOURNALISM RESOURCES

Bagley, K. (2015, March 18) FEMA to states: No climate planning, no money. *Inside Climate News*. <http://bit.ly/1BQBvrw>

Bulla, L. (2014, July 10) "Cities and businesses prepare for the threat climate change poses to water." *The Guardian*, New York, NY. <http://bit.ly/1mjCV7Z>

Evans-Brown, S. (2015, October 27) "Sea Level Rise: A bipartisan problem that's not making waves in the NH primary." New Hampshire Public Radio. <http://bit.ly/1Wqabh2>

Flechas, J. and J. Staletovich. (2015, October 3) "Miami Beach's battle to stem rising tides." *The Miami Herald*. <http://hrlid.us/1OMhuLF>

Gillis, J. (2014, January 13) Tide gauges needed for research are often victims of storms. *The New York Times*. <http://nyti.ms/1dT3zU2>

Gillis, J. and N. Fleur (2015, September 23) Global Companies Joining Climate Change Efforts. *The New York Times*. <http://nyti.ms/1MIDNRC>

Glass, D. (2014, May 27) The future of evacuations in the climate change era. *CityLab*. <http://www.citylab.com/cityfixer/2014/05/the-future-of-evacuations-in-the-climate-change-era/371584/>

Goodell, J. (2013, June 20) Goodbye, Miami: Why the city of Miami is doomed to drown. *Rolling Stone*. <http://www.rollingstone.com/politics/news/why-the-city-of-miami-is-doomed-to-drown-20130620>

- ICTMN staff. (2014, July 16) “Obama allocates \$10 million for tribal climate change adaptation.” *Indian Country Today Media Network*, Verona, NY. <http://bit.ly/1t6fMGM>
- Jaffe, E. (2013, May 2). “Why Sewage Plants Are Especially Vulnerable to Climate Change.” *Atlantic Cities*. <http://bit.ly/1GU5oqA>
- Katz, C. (2015, February 9) As extreme weather increases, a push for advanced forecasts. *Yale Environment 360*. <http://bit.ly/1vA8Mb6>
- Klinenberg, E. (2013, January 7) Adaptation: How can cities be “climate-proofed?”. *The New Yorker*, pp. 32-37. <http://www.newyorker.com/magazine/2013/01/07/adaptation-2>
- Kwon, D. (2015, October 1) “Are Europeans Better Than Americans at Forecasting Storms?” *Scientific American*. <http://bit.ly/1Pfb46c>
- Lascher, B. (2014, January 20) The next generation of infrastructure: Building for hotter, wetter, stormier cities. *Next City*. <http://nextcity.org/forefront/view/the-next-generation-of-infrastructure>
- Marshall, B. (2013, February 21) “New research: Louisiana coast faces highest rate of sea-level rise worldwide.” *The Lens*. <http://bit.ly/1JUMKFp>
- Masters, J. (2013, August 5) Hurricanes and climate change: Huge dangers, huge unknowns. *Weather Underground*. <http://www.wunderground.com/blog/JeffMasters/hurricanes-and-climate-change-huge-dangers-huge-unknowns>
- Mayfield, D. (2015, October 29) Norfolk, pushed by sea level rise, rethinking the future of the city. *The Virginian-Pilot*. <http://hamptonroads.com/2015/10/norfolk-pushed-sealevel-rise-rethinking-future-city>
- McNeill, R., D.J. Nelson, and D. Wilson. (2014, September 4) Water’s Edge: The Crisis of Rising Sea Levels. A Reuters Series. <http://reut.rs/1nWM4Ai>
- Oakes, B. (2013, August 23) As climate changes, urban planners help cities adapt. *WBUR*. <http://www.wbur.org/2012/08/23/cities-adapt-climate-change>
- Perry, F. (2015, February 27) “Boston plans for an underwater future.” *The Guardian*. <http://www.theguardian.com/cities/2015/feb/27/boston-flooding-underwater-future-climate-change>
- Plumer, B. (2014, May 22) Should we try to fight rising sea levels – or abandon the coasts? *Vox*. <http://www.vox.com/2014/5/22/5735144/rising-sea-levels-abandoning-the-coasts>
- Porter, E. (2013, May 14) For Insurers, No Doubts on Climate Change. *The New York Times*. <http://nyti.ms/1Fas2jQ>
- Samenow, J. (2015, April 7) Funding for promising hurricane forecast improvement program slashed. *The Washington Post*. <http://wapo.st/1NS2uq8>
- Schwab, J. (2015, August/September) “A Rising Tide of Engagement: The Professionals Lean in on Climate Change.” *American Planning Association*.  
<https://www.planning.org/planning/open/2015/risingtide.htm>  
<https://www.planning.org/planning/2015/aug/nextbigone.htm>  
<https://www.planning.org/planning/2015/aug/highertide.htm>



van der Linden, S.L., A.A. Leiserowitz, G.D. Feinberg, and E.W. Maibach.(2014) How to communicate the scientific consensus on climate change: plain facts, pie charts or metaphors? *Climatic Change*. DOI: 10.1007/s10584-014-1190-4.

<http://link.springer.com/article/10.1007/s10584-014-1190-4>

Walsh, B. (2013, October 1) The hard math of flood insurance in a warming world. *Time*

<http://science.time.com/2013/10/01/the-hard-math-of-flood-insurance-in-a-warming-world/>

Walton, B. (2015, October 19) The growth of the water beat. *Circle of blue*. <http://bit.ly/1Kma5ea>

Ward, B. (2008) Communicating on Climate Change: An Essential Resource for Journalists, Scientists, and Educators. Metcalf Institute, University of Rhode Island, Narragansett, RI.

<http://metcalfinstitute.org/resources/communicating-on-climate-change/>

Weeks, J. (2013, February 22) Coastal Development. *The CQ Researcher*, 23(8): 181-204.

<http://bit.ly/1P6CBZN>

Weiser, M (2015, August/September) “Water Warrior: When the next flood comes, Roseville, California, will be ready.” American Planning Association.

<https://www.planning.org/planning/open/2015/waterwarrior.htm>

## RELEVANT TOOLS & DATABASES

Adaptation Learning Mechanism. <http://www.adaptationlearning.net/about>

Works to provide a common global platform for climate change adaptation strategies.

Canada Profile: <http://www.adaptationlearning.net/country-profiles/ca>

Philippines Profile: <http://www.adaptationlearning.net/country-profiles/ph>

U.S.A. Profile: <http://www.adaptationlearning.net/country-profiles/us>

Climate Adaptation Databases

Compiled by the University of Colorado <http://wwa.colorado.edu/resources/adaptation/>

Disaster Safety. <https://www.disastersafety.org/fortified-main/>

The “Fortified” program identifies ways to retrofit and build to reduce potential damage from storms.

High Impact Weather Project. <http://bit.ly/1RKapbc>

This project aims to “promote cooperative international research to achieve a dramatic increase in resilience to high impact weather, worldwide, through improving forecasts for timescales of minutes to two weeks and enhancing their communication and utility in social, economic and environmental applications.”

National Integrated Drought Information System (NIDIS).

NIDIS developed the U.S. Drought Portal ([www.drought.gov/drought](http://www.drought.gov/drought)) to provide early warning about emerging and anticipated droughts.

Sign up for weekly alerts from the U.S. Drought Monitor at <http://droughtmonitor.unl.edu/>

The Nature Conservancy. Climate Wizard.

An interactive online data visualization tool, for examining projected temperature and rainfall changes under IPCC emission scenarios. <http://www.climatewizard.org>

NASA. Global Climate Change Vital Signs of the Planet: Sea Level

Features charts showing sea level from coastal tide gauges since 1870.

<http://climate.nasa.gov/vital-signs/sea-level/>

New York City Panel on Climate Change. (2013) Climate risk information 2013: observations, climate change projections, and maps.

[http://www.nyc.gov/html/planyc2030/downloads/pdf/npcc\\_climate\\_risk\\_information\\_2013\\_report.pdf](http://www.nyc.gov/html/planyc2030/downloads/pdf/npcc_climate_risk_information_2013_report.pdf)

NOAA Coastal Services Center. OpenNSPECT.

An open-source tool for simulating erosion and pollution from surface water runoff, under different land use and climate change scenarios. Note that the website provides examples of the tool's use by various projects; however, it is a downloadable program, rather than an interactive online interface.

<http://www.csc.noaa.gov/digitalcoast/tools/openspect>

NOAA. State of the Coast. This site compiles data, maps, and other resources about a variety of coastal issues, including climate change, ecosystems, economy, and communities.

<http://stateofthecoast.noaa.gov/>

Surging Seas: A Project of Climate Central. <http://sealevel.climatecentral.org/>

The Surging Seas Risk Finder is “an interactive searchable data toolkit that shows populations, infrastructure, and assets exposed to coastal flooding aggravated by sea level rise. The Risk Finder...assesses exposure of over 100 infrastructure and other elements to allow users to explore vulnerability from zip code through city, county and state levels.”

U.S. Climate Change Policy Action at the State Level.

List compiled by the Center for Climate and Energy Solutions provides links to climate change legislation, statewide climate change commissions, and climate action plans around the U.S. The list is not exhaustive, but provides a good starting point for additional information.

[http://www.c2es.org/what\\_s\\_being\\_done/in\\_the\\_states/state\\_legislation.cfm](http://www.c2es.org/what_s_being_done/in_the_states/state_legislation.cfm)

U.S. Climate Resistance Toolkit.

A product of Climate.gov, this site “provides resources and a framework for understanding and addressing the climate issues that impact people and their communities.”

<http://toolkit.climate.gov/>

U.S. Environmental Protection Agency. Federal and EPA Adaptation Plans.

Lists a variety of U.S. adaptation plans developed by the EPA and across agencies.

<http://www.epa.gov/climatechange/impacts-adaptation/fed-programs.html>

U.S. Geological Survey Climate Projection Portal.

Another interactive online data visualization tool, capable of mapping temperature, rainfall and growing season length under IPCC emission scenarios. <http://cida.usgs.gov/climate/derivative/>

U.S. Geological Survey. Science in Your Backyard. <http://www.usgs.gov/state/>

Real-time data on stream flow, flooding, drought conditions, and groundwater available for each state.

U.S. Geological Survey. Sea-level Rise Hazards and Decision Support.

[http://woodshole.er.usgs.gov/project-pages/sea-level-rise\\_hazards/](http://woodshole.er.usgs.gov/project-pages/sea-level-rise_hazards/)

Yale Climate Opinion Maps (YCOM)

“This tool allows users to visualize and explore differences in public opinion about global warming in the United States in unprecedented geographic detail.

<http://environment.yale.edu/climate-communication/article/yale-climate-opinion-maps/>

## RELEVANT ORGANIZATIONS

Association of Climate Change Officers <http://www.accoonline.org/>

Association of State Floodplain Managers <http://www.floods.org/>

Climate Action Business Association <http://cabaus.org/>

Working to “help solve the climate crisis by organizing local small business leaders to be more effective advocates for climate change mitigation and adaptation within our communities, at the business, local, state, regional, national and international levels.”

Climate Impacts Group, University of Washington

Interdisciplinary research group studying the impacts of natural climate variability and global climate change. <http://cses.washington.edu/cig/>

CoastAdapt

Project financed in part by the European Union to help coastal communities in the North Atlantic adapt to climate change. <http://coastadapt.org/>

Coastal Resilience Center, University of North Carolina, Chapel Hill

Launched in 2015 with a five-year grant from the Department of Homeland Security, the Center and its 22 partners across the U.S. conduct research to address challenges associated with growing coastal vulnerability. <http://coastalhazardscenter.org/coastal-resilience-center-july-2015/>

Coastal Resources Center, University of Rhode Island Graduate School of Oceanography

This group of researchers and faculty work within the U.S. and in developing nations around the world to build sustainable coastal communities, bridging economic, environmental, and social justice objectives.

<http://www.crc.uri.edu/>

ecoAdapt

Founded to offer support, training, and assistance to make planning and management less vulnerable by providing support for climate change adaptation. <http://www.ecoadapt.org/>

Climate Adaptation Knowledge Exchange (CAKE) is a “community website for people working to manage natural and built environments in the face of climate change,” featuring case studies and a directory of adaptation professionals around the U.S.

Federal Emergency Management Agency National Flood Insurance Program

This site contains information on the NFIP, flood hazard mapping, the Community Rating System, and much more. <http://www.fema.gov/national-flood-insurance-program>

FloodRISE: Resilient Infrastructure and Sustainable Environments

A University of California Irvine research project that aims to promote coastal resilience to flooding in Southern California. <http://floodrise.uci.edu/>

George Mason University Center for Climate Change Communication

Uses “social science research methods...to find ways of effectively engaging the public and policy makers in the problem, and in considering and enacting solutions.”

<http://www.climatechangecommunication.org/>

Georgetown Climate Center. State and Local Adaptation Plans.

A directory of climate adaptation plans from across the U.S.

<http://www.georgetownclimate.org/node/3324?page=1>

#### Gulf Coast Center for Evacuation and Transportation Resiliency

A joint effort of Louisiana State University and the University of New Orleans, the Center conducts research and outreach on issues affecting transportation under emergency conditions.

<http://www.evaccenter.lsu.edu/>

#### Infrastructure and Climate Network

“A network of over 50 academics, students, and practitioners who are dedicated to accelerating climate science and engineering research in the Northeastern United States.” <http://theicnet.org/>

#### Institute for Sustainable Communities

A non-profit dedicated to providing “tools and skills...to inspire active citizenship, protect the environment, and take on climate change.” <http://www.iscvt.org/>

#### Local Environmental Observer Network

“Tribal professionals who apply traditional knowledge, western science and technology to document unusual plants and wildlife, extreme weather, erosion, flooding, droughts, wildfire and other events that can threaten food security, water security and community health.”

<http://www.anthc.org/chs/ces/climate/leo/>

NAACP Environmental and Climate Justice Program <http://www.naacp.org/programs/entry/climate-justice>

#### National Hazard Mitigation Association

<http://nhma.info/>

#### New Climate Economy

A project of The Global Commission on the Economy and Climate, this “new international initiative to analyze and communicate the economic benefits and costs of acting on climate change.”

<http://newclimateeconomy.net/>

#### Northeast Climate Science Center

A consortium of universities, research groups, and government agencies part of a “federal network of eight Climate Science Centers created to provide scientific information, tools, and techniques that managers and other parties interested in land, water, wildlife and cultural resources can use to anticipate, monitor, and adapt to climate change.” <https://necsc.umass.edu>

#### Pacific Northwest Tribal Climate Change Network

This network “fosters communication between tribes, agencies, and other entities about climate change policies, programs, and research needs pertaining to tribes and climate change.”

<http://tribalclimate.uoregon.edu/network/>

#### Penn State Center for Solutions to Weather and Climate Risk

A research group with a mission “to advance the science of exploiting environmental opportunities and understanding environmental impacts to manage risk.” <http://solutions2wxrisk.psu.edu>

#### Re:focus

A group of “social entrepreneurs” who “design integrated resilient infrastructure systems—including water, waste, and energy projects—and develop new public-private partnerships to align public funds and leverage private investment for vulnerable communities around the world.

<http://www.refocuspartners.com/>

#### Resilient America

Aims to help communities and the nation build resilience to extreme events in order to save lives and reduce the physical and economic costs of disasters.

<http://sites.nationalacademies.org/PGA/ResilientAmerica/index.htm>

#### Resilient City

An open non-profit network with the mission to develop creative, practical, and implementable planning and design strategies. <http://www.resilientcity.org/>

#### Rhode Island Shoreline Change Special Area Management Plan (SAMP)

Otherwise known as the “Beach SAMP,” this is a nationally innovative, multi-stakeholder effort to develop coastal regulations to help Rhode Islanders prepare for sea level rise, stronger and more frequent coastal storms, and coastal erosion. <http://www.beachsamp.org/>

#### San Diego Climate Collaborative

“A network for public agencies serving the San Diego region to share expertise, leverage resources, and advance...solutions to facilitate climate change planning.” <http://sdclimatecollaborative.org/>

#### Sea Grant (National Sea Grant College Program)

An excellent source for research and educational materials related to coastal science. All coastal states (including the Great Lakes) have a Sea Grant office. Find your state office here

<http://seagrant.noaa.gov/WhereWeWork/SeaGrantPrograms.aspx>

#### SheSource, Women’s Media Center

An “online braintrust of female experts on diverse topics designed to serve journalists, producers and bookers.” <http://www.shesource.org/>

#### USDA Regional Climate Hubs

Regional networks across the U.S. that “deliver information to farmers, ranchers and forest landowners to help them adapt to climate change and weather variability.”

[http://www.usda.gov/oce/climate\\_change/regional\\_hubs.htm](http://www.usda.gov/oce/climate_change/regional_hubs.htm)

#### Water Utility Climate Alliance

“Provides leadership in assessing and adapting to the potential effects of climate change through collaborative action. We seek to enhance the usefulness of climate science for the adaptation community and improve water management decision-making in the face of climate uncertainty.”

<http://www.wucaonline.org/html/>

#### weAdapt

“An online ‘open space’ on climate adaptation issues and synergies with mitigation which allows practitioners, researchers and policy makers to access credible, high quality information and to share experiences and lessons learnt.” <http://weadapt.org/>

### INDIVIDUAL SOURCES

Kristin Baja, Baltimore City Department of Planning, Office of Sustainability (municipal climate adaptation planning) <http://www.baltimoresustainability.org/about/staff>

Meghna Babbar-Sebens, Hydroinformatics Research Group, Oregon State University (engineering solutions for sustainable planning and climate adaptation, with a focus on water-based systems such as wetlands and stormwater)

<http://research.engr.oregonstate.edu/hydroinformatics/members>

Teresa Crean, Rhode Island Sea Grant and University of Rhode Island Coastal Resources Center. (municipal climate adaptation, community and regional planning, coastal management, stakeholder engagement)

[http://www.crc.uri.edu/contacts\\_page/teresa-crean/](http://www.crc.uri.edu/contacts_page/teresa-crean/)

Kerry Emanuel, Massachusetts Institute of Technology (hurricanes, hurricane forecasting, climate change effects on hurricanes) emanuel@mit.edu

<http://eaps4.mit.edu/faculty/Emanuel/>

Zach Ferdana, The Nature Conservancy. (building coastal climate resilience by restoring coastal habitats) zferdana@tnc.org

Grover Fugate, Rhode Island Coastal Resources Management Council. (coastal climate change impacts, sea level rise, storm surge, coastal management, climate adaptation)

<http://www.crmc.ri.gov/contact.html>

Isaac Ginis, University of Rhode Island Graduate School of Oceanography. (hurricane forecasting, hurricane formation, climate change effects on hurricanes) iginis@uri.edu

<http://web.uri.edu/coastalinstitute/meet/isaac-ginis/>

Lara Hansen, ecoAdapt (climate change adaptation, coastal climate change impacts, national perspective) lara@ecoadapt.org

[http://ecoadapt.org/team/\\_details/lara\\_hansen](http://ecoadapt.org/team/_details/lara_hansen)

Sean Hart, Bureau of Indian Affairs. (BIA and tribal support for climate change adaptation) sean.hart@bia.gov

<http://www.firststewards.org/sean-hart.html>

Nichole L. Hefty, Office of Sustainability, Miami-Dade Dept. of Regulatory and Economic Resources.

<http://www.miamidade.gov/planning/contact.asp>

John Hummel, Center for Integrated Resiliency Analyses, Argonne National Lab. (research on tools to enhance resiliency for disruptive events such as climate change and natural disasters)

<http://www.anl.gov/articles/argonne-announces-new-center-integrated-resiliency-analyses>

Alessandra Jerolleman. (effects of disasters on people as well as local hazard mitigation and adaptation)

[agazzo@gmail.com](mailto:agazzo@gmail.com) <http://jeo.com/2013/08/dr-alessandra-jerolleman-joins-jeo-consulting-group-inc/>

Jon Krosnick, Stanford University. (public opinion polling related to environmental issues, especially climate change)

<https://comm.stanford.edu/faculty-krosnick/>

Howard Kunreuther, University of Pennsylvania Wharton School of Business. (risk assessment, insurance sector's responses to climate change)

<http://opim.wharton.upenn.edu/risk/faculty/kunreuther.html>

Anthony Leiserowitz, Yale Project on Climate Change Communication. (public opinion polling on climate change and perception of risks)

<http://environment.yale.edu/profile/leiserowitz/>

Rebecca Lupes, Federal Highway Administration Sustainable Transport and Climate Change Team (climate change impacts on transportation infrastructure and adaptation responses)

[Rebecca.lupes@dot.gov](mailto:Rebecca.lupes@dot.gov)

Edward Maibach, George Mason University Center for Climate Change Communication (public opinion polling on climate change and adaptation)

<http://communication.gmu.edu/people/emaibach>

Jonathan Patz, Global Health Institute; University of Wisconsin-Madison. (public health impacts of climate change)

<http://www.sage.wisc.edu/people/patz/patz.html>

Jeff Payne, Acting Director, NOAA Office for Coastal Management (coastal climate change impacts and mitigation) <http://coastalmanagement.noaa.gov/backmatter/contacts.html>

Katie Skakel (expert on local adaptation, land use planning, floodplain management, climate action at local level & hazard mitigation) [kdskakel.nhma@gmail.com](mailto:kdskakel.nhma@gmail.com) <http://nhma.info/about/board-of-directors/skakel/>

Amy Snover, Climate Impacts Group, University of Washington (climate adaptation and decision-making, climate impacts, integrated assessment, stakeholder engagement)

<http://cses.washington.edu/db/personnel/>

Shalini Vajjhala, Founder and CEO of re:focus. (“social entrepreneurs with expertise in public policy and sustainable development. We design integrated resilient infrastructure systems—including water, waste, and energy projects—and develop new public-private partnerships to align public funds and leverage private investment for vulnerable communities around the world”)

<http://www.refocuspartners.com/about-us/>