

CLIMATE CHANGE AND THE NEWS
Climate Change in the Great Lakes

September 19, 2014
WBEZ | Navy Pier
Chicago, IL

Resources List

All links retrieved on 09/04/2014 unless otherwise noted.

Session 1: Introduction to Climate Science

The Physical Basis for Climate Science

Intergovernmental Panel on Climate Change Fifth Assessment Report.

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/>

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

National Aeronautics and Space Administration (NASA). Climate change: How do we know?
<http://climate.nasa.gov/evidence>

National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center. State of the Climate. <http://www.ncdc.noaa.gov/sotc/>

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

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, February 27) The Basics of Climate Change.
<http://royalsociety.org/policy/projects/climate-evidence-causes/basics-of-climate-change/>

Weather Underground. Evidence of Climate Change.
<http://www.wunderground.com/climate/evidence.asp?MR=1>

Great Lakes Regional Climate Drivers

Huff, A., and A. Thomas. (2014) *Lake Superior Climate Change Impacts and Adaptation*. Prepared for the Lake Superior Lakewide Action and Management Plan – Superior Work Group.

<http://www.epa.gov/greatlakes/lakesuperior/lake-superior-climate-change-impacts-report-201401.pdf>

U.S. Environmental Protection Agency (EPA). Climate Impacts in the Midwest.
<http://www.epa.gov/climatechange/impacts-adaptation/midwest.html>

Winkler, J.A., J.A. Andresen, J.L. Hatfield, D. Bidwell, D., and D. Brown (Eds.). (2014) *Climate Change in the Midwest: A Synthesis Report for the National Climate Assessment*. Washington, DC: Island Press.

http://www.cakex.org/sites/default/files/documents/NCA_Midwest_Report.pdf

Effects of Climate Change on Extreme Weather Events

- Bradbury, J., and C. DeConcini. (2012) *The connection between climate change and recent extreme weather events* (Fact Sheet). World Resources Institute.
http://www.wri.org/sites/default/files/pdf/connection_between_climate_change_and_extreme_weather.pdf
- Coumou, D., and S. Rahmstorf. (2012) A decade of weather extremes. *Nature Climate Change* 2: 491-96.
DOI: [10.1038/nclimate1452](https://doi.org/10.1038/nclimate1452)
- 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)
- Freedman, A. (2014, January 6) Polar Vortex in U.S. May be Example of Global Warming. Climate Central.
<http://www.climatecentral.org/news/polar-vortex-in-u.s.-may-be-valid-example-of-global-warming-16927>
- 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://dx.doi.org/10.1146/annurev-environ-060809-100145>
- Trenberth, K., J. Meehl, J. Masters, R. Somerville, H. Cutting, S. Chung, and S. Hassol. (2011) Current extreme weather and climate change. *Climate Communication Science and Outreach*.
<http://www.climatecommunication.org/wp-content/uploads/2011/09/Extreme-Weather-and-Climate-Change.pdf>
- U.S. Department of Energy. (2013) U.S. energy sector vulnerabilities to climate change and extreme weather.
<http://energy.gov/sites/prod/files/2013/07/f2/20130716-Energy%20Sector%20Vulnerabilities%20Report.pdf>
- U.S. Department of Transportation. (2012, December) Climate Change and Extreme Weather Vulnerability Assessment Framework.
http://www.fhwa.dot.gov/environment/climate_change/adaptation/publications_and_tools/vulnerability_assessment_framework/fhwahep13005.pdf
- 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)
- The White House YouTube Channel. (2014, January 8) The Polar Vortex explained in 2 minutes.
<http://www.youtube.com/watch?v=5eDTzV6a9F4>
- Wuebbles, D. J., K. Kunkel, M. Wehner, and Z. Zobel, (2014) Severe weather in the United States under a changing climate. *EOS* 95:149-150. <http://dx.doi.org/10.1002/2014EO180001>

Extreme Weather and the Great Lakes Region

- Hayhoe, K., J. VanDorn, D.J. Wuebbles, K.A. Cherkauer, and S. Vavrus. (2010) Regional climate change projections for Chicago and the Great Lakes. *Journal of Great Lakes Research* 36:7-21.
http://climateknowledge.org/figures/Rood_Climate_Change_AOSS480_Documents/Hayhoe_Projections_Chicago_Great_Lakes_JGreatLakesRes_2010.pdf
- Hayhoe, K., M. Robson, J. Rogula, M. Aufhammer, N. Miller, J. VanDorn, and D. Wuebbles. (2010) An integrated framework for quantifying and valuing climate change impacts on urban energy and infrastructure: A Chicago case study. *Journal of Great Lakes Research* 36:94-105.
<http://www.sciencedirect.com/science/article/pii/S0380133010000547>
- Liu, J.P., J.A. Curry, H. Wang, M. Song, and R.M. Horton. (2012) Impact of declining Arctic sea ice on winter snowfall. *Proceedings of the National Academy of Sciences*. 109(17):6781-6783.
<http://www.pnas.org/content/109/11/4074>

Wang, S.-Y., L. Hippias, R.R. Gillies, and J-H Yoon. (2014) Probable causes of the abnormal ridge accompanying the 2013–2014 California drought: ENSO precursor and anthropogenic warming footprint. *Geophysical Research Letters* 41(9):3220-3226.

<http://onlinelibrary.wiley.com/doi/10.1002/2014GL059748/abstract>

Dr. Jeff Masters, Weather Underground. (2014, April) Comments on the above article: *California Drought/Polar Vortex/ Jet Stream Pattern Linked to Global Warming*.

<http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=2665>

Session 2: Climate Change Effects Upon Great Lakes Water Resources

What to Expect for Great Lakes Water Resources in Next 20-100 years?

Angel, J.R., and K.E. Kunkel. (2010) The response of Great Lakes water levels to future climate scenarios with an emphasis on Lake Michigan-Huron. *Journal of Great Lakes Research* 36(S2):51–58.

<http://www.sciencedirect.com/science/article/pii/S0380133009001853>

Gronewold, A.D., V. Fortin, B. Lofgren, A. Clites, C.A. Stow, and F. Quinn (2013) Coasts, water levels, and climate change: A Great Lakes perspective. *Climatic Change* 120(4):697–711.

<http://www.glerl.noaa.gov/pubs/fulltext/2013/20130021.pdf>

Gronewold, A.D., and C.A. Stow. (2014) Water loss from the Great Lakes. *Science* 343(6175):1084–1085.

<http://www.glerl.noaa.gov/pubs/fulltext/2014/20140013.pdf>

Gronewold, A.D., and C.A. Stow. (2014) Unprecedented seasonal water level dynamics on one of the earth's largest lakes. *Bulletin of the American Meteorological Society* 95(1):15–17.

<http://www.glerl.noaa.gov/pubs/fulltext/2014/20140011.pdf>

Millerd, F. (2011) The potential impact of climate change on Great Lakes international shipping. *Climatic Change* 104(3-4):629-652.

<http://link.springer.com/article/10.1007/s10584-010-9872-z>

Wang, J., X. Bai, H. Hu, A. Clites, M. Colton, and B. Lofgren. (2012) Temporal and spatial variability of Great Lakes ice cover, 1973–2010. *Journal of Climate* 25:1318-1329.

<http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1513&context=usdeptcommercepub>

Water Quality; How to Achieve Clean Water in Era of Increased Stormwater Runoff?

Climate and Water Quality Project. Assessing the effects of climate-change-induced extreme events on water quality and ecology in the Great Lakes.

<http://www.miseagrant.umich.edu/nsf/>

Great Lakes Water Quality Board. (2003, August) *Climate Change and Water Quality in the Great Lakes Basin: Report of the Great Lakes Water Quality Board to the International Joint Commission*. 217 p.

<http://www.ijc.org/files/publications/C210.pdf>

Michalak, A. et al. (2013) Record-setting algal bloom in Lake Erie caused by agricultural and meteorological trends consistent with expected future conditions. *Proceedings of the National Academy of Sciences*. DOI: 10.1073/pnas.1216006110.

<http://www.pnas.org/content/early/2013/03/28/1216006110.full.pdf+html>

Tong, S.T.Y., A.J. Liu, and J.A. Goodrich. (2007) Climate change impacts on nutrient and sediment loads in a Midwestern agricultural watershed. *Journal of Environmental Informatics* 91(1):18-28.

<http://www.iseis.org/jei/pdfstart.asp?no=200700084>

Session 3: Great Lakes Ecosystem Impacts of Climate Change

Fisheries and Aquatic Invasive Species

Cline T.J., V. Bennington, and J.F. Kitchell. (2013) Climate change expands the spatial extent and duration of preferred thermal habitat for Lake Superior fishes. *PLoS ONE* 8(4): e62279.

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0062279>

Ficke, A.D., C.A. Myrick, and L.J. Hansen. (2007, November) Potential impacts of global climate change on freshwater fisheries. *Reviews in Fish Biology and Fisheries* 17(4): 581-613.

<http://changingclimate.osu.edu/assets/pubs/ficke-2007.pdf>

Mulvaney, K.K. 2013. Understanding information needs and pathways for the incorporation of climate change into Great Lakes fisheries management. Dissertation. Purdue University, West Lafayette, Indiana.

<http://docs.lib.purdue.edu/dissertations/AAI3592054/>

Mulvaney, K.K., C. J. Foley, T. O. Höök, E.C. McNie, and L.S. Prokopy. In press. Identifying useful climate change information needs of Great Lakes fishery managers. *Journal of Great Lakes Research*.

<http://www.sciencedirect.com/science/article/pii/S0380133014001439>

Rahel, F., and J. D. Olden. (2008) Assessing the effects of climate change on aquatic invasive species. *Conservation Biology* 22(3):521–533.

<http://www.uwyo.edu/frahel/pdfs/rahel-2008-1.pdf>

U.S. Environmental Protection Agency. Great Lakes Invasive Species.

<http://www.epa.gov/greatlakes/invasive/index.html>

Forests, Soils, and Terrestrial Invasive Species

Brandt, L. et al. (2014) *Central Hardwoods ecosystem vulnerability assessment and synthesis: a report from the Central Hardwoods Climate Change Response Framework project*. Gen. Tech. Rep. NRS-124. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 254 p.

(Note: This document reports the vulnerability of different habitats, characterized by tree types, to expected climate change.)

<http://www.treesearch.fs.fed.us/pubs/45430>

http://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs124.pdf

Dybas, C.L. 2009. Minnesota's Moose: Ghosts of the Northern Forest? *BioScience* 59(10):824-828.

<http://www.bioone.org/doi/abs/10.1525/bio.2009.59.10.3?journalCode=bisi>

Fisichelli, N.A., L. E. Frelich, P. B. Reich, and N. Eisenhauer. (2012) Linking direct and indirect pathways mediating earthworms, deer, and understory composition in Great Lakes forests. *Biological Invasions* DOI: 10.1007/s10530-012-0350-6.

<http://link.springer.com/article/10.1007/s10530-012-0350-6/fulltext.html>

Staudinger, M.D., et al. (2013) Biodiversity in a changing climate: a synthesis of current and projected trends in the US. *Frontiers in Ecology and the Environment* 11: 465–473. <http://dx.doi.org/10.1890/120272>

Swanston, C., et al. (2011) *Ecosystem vulnerability assessment and synthesis: a report from the Climate Change Response Framework Project in northern Wisconsin*. Gen. Tech. Rep. NRS-82. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 142 p.

(Note: This extensive document covers many climate change issues in Wisconsin, focusing on current and predicted ecological conditions.)

<http://www.treesearch.fs.fed.us/pubs/38255>

http://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs82.pdf

Swanston, C., and M. Janowiak (Eds.) (2012) *Forest adaptation resources: Climate change tools and approaches for land managers*. Gen. Tech. Rep. NRS-87. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 121 p.

(Note: This publication is a companion document, focusing on adaptation strategies.)

<http://www.treearch.fs.fed.us/pubs/40543>

http://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs87.pdf

Walther, G., et al. (2002, March) Ecological responses to recent climate change. *Nature* 416: 389-95.

<http://dx.doi.org/10.1038/416389a>

Session 4: Economic, Policy, and Health Impacts

Regional Water Policy

The Council of State Governments: Midwest. (2013) New policy priorities emerging in fight to protect Great Lakes: Rise in algae growth, low water levels and changing climate among concerns being raised in the region.

<http://www.csgmidwest.org/policyresearch/0813slmw.aspx>

Pie charts on Great Lakes water use, by jurisdiction.

<http://www.csgmidwest.org/policyresearch/documents/glwaterusebyjuris.pdf>

U.S. Environmental Protection Agency. Great Lakes Water Quality Agreement (Links can be found here to the 2012 Agreement itself and associated documents.)

<http://www.epa.gov/glnpo/glwqa/>

U.S. Environmental Protection Agency. Water Quality Trading

(A description of water quality trading program principles and policy.)

<http://water.epa.gov/type/watersheds/trading.cfm>

Effects on Agriculture

Baker, M.K., W.W. Kirk, J.M. Stein, and J.A. Andresen. (2005) Climatic trends and potato late blight risk in the upper Great Lakes region. *HortTechnology* 15(3):510-518.

<http://horttech.ashspublications.org/content/15/3/510.full.pdf>

U.S. Environmental Protection Agency. Agriculture and Food Supply.

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

Vermeulen, S.J., B.M. Campbell, and J.S.I. Ingram. (2012, November) Climate change and food systems. *Annual Review of Environment and Resources* 37: 195-222.

<http://dx.doi.org/10.1146/annurev-environ-020411-130608>

Walthall, C.L., et al. (2012) *Climate Change and Agriculture in the United States: Effects and Adaptation*. USDA Technical Bulletin 1935. Washington, DC. 186 pages.

[http://www.usda.gov/oc/climate_change/effects_2012/CC%20and%20Agriculture%20Report%20\(02-04-2013\)b.pdf](http://www.usda.gov/oc/climate_change/effects_2012/CC%20and%20Agriculture%20Report%20(02-04-2013)b.pdf)

Winkler, J.A., J.A. Andresen, G. Guentchev, and R.D. Kriegel. (2002) Possible impacts of projected temperature change on commercial fruit production in the Great Lakes region. *Journal of Great Lakes Research* 28(4):608–625.

<http://www.sciencedirect.com/science/article/pii/S0380133002706096>

Public Health

Chicago chapter of Physicians for Social Responsibility. Cook County Climate Change and Public Health Action Plan. <http://www.chicagoprs.org/PDFs/climatechangepublichealthplancookcounty.pdf>

Holloway, T, S.N. Spak, D. Barker, M. Bretl, C. Moberg, K. Hayhoe, J. Van Dorn, and D. Wuebbles. (2008) Change in ozone air pollution over Chicago associated with global climate change. *Journal of Geophysical Research: Atmospheres* 113(D22). DOI: 10.1029/2007JD009775. <http://onlinelibrary.wiley.com/doi/10.1029/2007JD009775/full>

Lin, J.-T., D.J. Wuebbles, H.-C. Huang, Z. Tao, M. Caughey, X.-Z. Liang, J.-H. Zhu, and T. Holloway. (2010) Potential Effects of Climate and Emissions Changes on Surface Ozone in the Chicago Area. *Journal of Great Lakes Research* 36(sp2):59-64. <http://www.bioone.org/doi/abs/10.1016/j.jglr.2009.09.004>

McMichael, A.J., R.E. Woodruff, and S. Hales. (2006) Climate change and human health: present and future risks. *The Lancet* 367(9513):11-17. [http://dx.doi.org/10.1016/S0140-6736\(06\)68079-3](http://dx.doi.org/10.1016/S0140-6736(06)68079-3)

Patz, J.A., D. Campbell-Lendrum, T. Holloway, and J.A. Foley. (2005, November) Impact of regional climate change on human health. *Nature* 438:310-17. <http://www.nature.com/nature/journal/v438/n7066/full/nature04188.html>

Rogers, D.J., and S.E. Randolph. (2000, September 8). The Global Spread of Malaria in a Future, Warmer World. *Science* 289:1763-1766. <http://www.sciencemag.org/content/289/5485/1763.full>

Stone Jr., B., A.C. Mednick, T. Holloway, and S.N. Spak. (2007) Is Compact Growth Good for Air Quality? *Journal of the American Planning Association* 73(4):404-418. http://www.tandfonline.com/doi/abs/10.1080/01944360708978521#.U_utv0g6gtE

U.S. Environmental Protection Agency. Climate Change Impacts on Human Health. <http://www.epa.gov/climatechange/impacts-adaptation/health.html>

Yu, W.W., K. Mengersen, X. Wang, X. Ye, Y. Guo, X. Pan, and S. Tong. (2012) Daily average temperature and mortality among the elderly: a meta-analysis and systematic review of epidemiological evidence. *International Journal of Biometeorology* 56(4): 569-581. <http://www.springerlink.com/content/t8h7601434455986/>

Climate Change Adaptation

Bergeron, D., G. Clark, F. Lichtkoppler, and J. Lucente. Preparing Coastal Communities and Businesses for Climate Change: Duluth, MN and Toledo, OH: Focus Group Results. (A product of a May 2008 grant to the Great Lakes Sea Grant Network, NOAA Great Lakes Environmental Research Laboratory, and the Cooperative Institute for Limnology and Ecosystem Research.) <http://climategreatlakes.com/wp-content/uploads/2013/10/16-Final-Report-Focus-Group-Survey-Work.pdf>

Council of Great Lakes Industries. (2014, June 25) *Great Lakes Industries: The Business of Resilience*. PowerPoint presentation, Adaptation in the Great Lakes Region Conference, University of Michigan, Ann Arbor, MI. http://graham.umich.edu/media/files/6_25_Sirvient_CGLI-Adaptation%20Conference-Great%20Lakes%20Industries%20The%20Business%20of%20Resilience-6252014%20%281%29.pdf

Dinse, K., J. Read, and D. Scavia. 2009. *Preparing for Climate Change in the Great Lakes Region*. [MICHU 09-103] Ann Arbor, MI: Michigan Sea Grant. http://www.miseagrant.umich.edu/downloads/climate/Climate_Workshop_Report.pdf

Great Lakes Coastal Resilience. Great Lakes Coastal Resilience Planning Guide. <http://greatlakesresilience.org/>

Gregg, R.M., K.M. Feifel, J.M. Kershner, and J.L. Hitt. (2012) *The State of Climate Change Adaptation in the Great Lakes Region*. EcoAdapt, Bainbridge Island, WA.

http://ecoadapt.org/data/library-documents/EcoAdapt_GreatLakesAdaptation.pdf

The Nature Conservancy. Climate Change in the Great Lakes Region: Adapting Conservation Efforts for a Sustainable Future.

<http://www.nature.org/ourinitiatives/regions/northamerica/areas/greatlakes/explore/adapting-to-climate-change-in-the-great-lakes.xml>

Wagner, R. (2012, September 10). Adapting Environmental Justice: In the Age of Climate Change, Environmental Justice Demands a Combined Adaption-Mitigation Response. *The Arizona Journal of Environmental Law and Policy*, a student-run publication of the University of Arizona.

<http://www.ajelp.com/articles/adapting-environmental-justice-in-the-age-of-climate-change-environmental-justice-demands-a-combined-adaption-mitigation-response/>

General Resources

Climate Impacts and Adaptation in the Midwest

(A concise summary of major changes in temperature, rainfall, etc. that the Midwest region can expect under continuing climactic change, and example responses already in being implemented.)

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

Dietz, T., and D. Bidwell (Eds.) (2011) *Climate Change in the Great Lakes Region: Navigating an Uncertain Future*. Michigan State University Press. 278 p. [Available at amazon.com](#)

The Great Lakes: An Environmental Atlas and Resource Book. (Third edition, 1995). Jointly produced by: Government of Canada & United States Environmental Protection Agency.

(A six-chapter online book covering topics ranging from history and policy to geology and ecology—essentially a Great Lakes primer.)

<http://www.epa.gov/glnpo/atlas/index.html>

Great Lakes Climate, developed by the Ohio Sea Grant College Program

(A repository of information, news, and links, including the Changing Climate Webinar Series hosted by Ohio State University and partners.)

<http://climategreatlakes.com/>

Kling, G.W. et al. (2013) *Confronting Climate Change in the Great Lakes Region*, Union of Concerned Scientists & Ecological Society of America. 92 p.

(In addition to the full report, an executive summary [updated in 2005], regional summaries [U.S. states and Ontario], and topic summaries are also available at the link below.)

<http://www.ucsusa.org/greatlakes/glchallengereport.html>

Lynn, K., K. MacKendrick, and E.M. Donoghue. (2011) *Social vulnerability and climate change: synthesis of literature*. Gen. Tech. Rep. PNW-GTR-838. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 70 p.

http://www.fs.fed.us/pnw/pubs/pnw_gtr838.pdf

Michigan: State of the Great Lakes 2013, prepared by the Office of the Great Lakes, Michigan Department of Environmental Quality for the office of the Governor.

(A document summarizing a wide range of topics, authored by a variety of experts.)

http://www.michigan.gov/documents/deq/State_of_the_Great_Lakes_2013_opt_442885_7.pdf

Weather Underground Blog.

(Dr. Jeff Masters is a co-founder of Weather Underground and writes blog entries sharing the most up-to-date information on the current state and impacts of the climate and extreme weather events around the world.)

<http://www.wunderground.com/blog/JeffMasters/show.html>

Journalism Resources

Techniques for Reporting on Climate Change

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>

Selected Climate Change Coverage

Anonymous. (2014, June 19) MN develops first-of-its-kind stormwater management program using trees over pipes. *WaterWorld Magazine*.

<http://www.waterworld.com/articles/2014/06/minnesota-develops-new-option-for-property-owners-municipalities-to-save-thousands-by-installing-trees-for-stormwater-management.html>

Corley, C. (2014, May 21) Why those tiny microbeads in soap may pose problem for Great Lakes. NPR.

<http://www.npr.org/2014/05/21/313157701/why-those-tiny-microbeads-in-soap-may-pose-problem-for-great-lakes>

Egan, D. (2014, July 26) How invasive species changed the Great Lakes forever. *Journal Sentinel*, Milwaukee, WI.

(The first in a four-part series called “A Watershed Moment.”)

<http://www.jsonline.com/news/wisconsin/how-invasive-species-changed-the-great-lakes-forever-b99297128z1-267010971.html>

Gillis, J. (2014, May 30) A price tag on carbon as a climate rescue plan. *The New York Times*, New York, NY.

http://www.nytimes.com/2014/05/30/science/a-price-tag-on-carbon-as-a-climate-rescue-plan.html?hp&_r=5

Great Lakes Echo - A regional environmental news service, powered by Michigan State University's Knight Center for Environmental Journalism.

<http://greatlakesecho.org/>

Great Lakes Now – Collection of stories from Detroit Public TV.

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

Henry, T. (2013, July 14) Great Lakes ‘ground zero’ for water needs. *The Blade*, Toledo, OH.

<http://www.toledoblade.com/local/2013/07/14/Great-Lakes-ground-zero-for-water-needs.html>

Kick, C. (2014, May 12). Federal climate change report says food, ag production could be in jeopardy. *Farm and Dairy*, Salem, OH.

<http://www.farmanddairy.com/news/federal-climate-change-report-says-food-ag-production-jeopardy/189745.html>

Marion, D.F. (2010, July 19). Lake Superior, a huge natural climate change gauge, is running a fever. *The New York Times*, New York, NY.

<http://www.nytimes.com/cwire/2010/07/19/19climawire-lake-superior-a-huge-natural-climate-change-83371.html>

O'Dell, M. Sustainable Chicago. ChicagoStories.org.
<http://chicagostories.org/sustainability/>

Surrusco, M. (2014, January) Workshop on Design Thinking for Climate Resilience. *AdaptNY: Your Voice in New York's Climate Change Adaptation Debate*. (Part of a project of the CUNY Graduate School of Journalism, in Partnership with Gotham Gazette & DocumentCloud.)
<http://www.adaptny.org/2014/02/20/workshop-adaptnydesign-live-event/>

Wheeler, T. (2014, August 6) Lake Erie not alone in suffering from harmful algae. *The Baltimore Sun*, Baltimore, MD.
<http://www.baltimoresun.com/features/green/blog/bal-lake-eries-water-woes-strike-home-20140805,0,4294130.story>

Tools and Databases

Climate Change Indicators in the United States.
(Various tabs offer a range of data visualization tools in addition to those pertaining to the Great Lakes, linked below, that demonstrate changes in lake surface temperature, ice levels, etc. evident from long-term datasets.)

<http://www.epa.gov/climatechange/science/indicators/ecosystems/great-lakes.html>
<http://www.epa.gov/climatechange/science/indicators/snow-ice/lake-ice.html>

GLAA-C. Socioeconomics and Climate Change in the Great Lakes Region.
(An interactive mapping tool that displays how climate change may impact local economies, infrastructure, and vulnerable populations around the Great Lakes.)
<http://graham.umich.edu/glaac/great-lakes-atlas>

Great Lakes Observing System.
(An interactive tool for mapping near-realtime and archived observations of lake conditions, water levels, wave heights, air and water temperatures, etc.)
<http://glos.us/>

Harmful Algal Blooms.
(A project to monitor, explain, and forecast algal blooms, operated by the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory.)
<http://www.glerl.noaa.gov/res/waterQuality/?targetTab=habs>

The project's most recent bulletin can be found here:

http://www2.nccos.noaa.gov/coast/lakeerie/bulletin/bulletin_current.pdf

Lakewide Management Plans.
(Lake-by-lake management plans for the Great Lakes, with links to various lake-specific topics of concern.)
<http://www.epa.gov/greatlakes/lamp/index.html>

Michigan Tech Research Institute Harmful Algal Bloom Mapping.
This joint project of MTRI, GLOS, and Great Lakes Restoration produces maps of harmful algal blooms (HABs) and related water quality and public health concerns. Their website also features a list of other Great Lakes data sources.
<http://apache.mtri.org/wordpress/habsmapping/>

National Center for Water Quality Research
Based at Heidelberg University in Ohio, the NCWQR monitors surface and groundwater chemistry and biology in the Great Lakes region and beyond.
<http://www.heidelberg.edu/academiclife/distinctive/ncwqr>

NOAA National Climatic Data Center.

NCDC is world's largest provider of weather and climate data. <http://www.ncdc.noaa.gov/data-access>

NCDC Participates in Bilateral Great Lakes Water Quality Agreement

<http://www.ncdc.noaa.gov/news/ncdc-participates-bilateral-great-lakes-water-quality-agreement>

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>

Sustaining Lakes in a Changing Environment (SLICE)

This project of Minnesota's Department of Natural Resources is an effort to monitor biological and chemical changes in a representative sample of lakes throughout Minnesota.

<http://www.dnr.state.mn.us/fisheries/slice/index.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. Environmental Protection Agency. How's My Waterway? <http://watersgeo.epa.gov/mywaterway/>

("Learn the condition of local streams, lakes and other waters anywhere in the US... quickly and in plain language. See if your local waterway was checked for pollution, what was found, and what is being done. The source of this information is a US Environmental Protection Agency (EPA) database of State water quality monitoring reports provided under the Clean Water Act.")

What's my Carbon Footprint? Powered by the Center for Climate and Energy Solutions.

(One example—there are many online—of an interactive carbon footprint calculator.)

<http://carbonfootprint.c2es.org/>

Relevant Organizations

Alliance for the Great Lakes (based in Chicago, IL).

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

Canadian Environmental Law Association

See their collection of materials concerning implementation and review of the Great Lakes Water Quality Agreement here <http://www.cela.ca/collections/water/great-lakes-water-quality-agreement>

Center for Earth and Environmental Science, Indiana University & Purdue University.

(An organization focused on research, environmental science education, and community engagement.)

<http://cees.iupui.edu/>

Detroit Climate Action Collaborative

(An environmental justice advocacy group.)

<http://www.dwej.org/do/dcac/>

Environmental Law and Policy Center (Chicago, IL).

(An advocacy group composed of public interest attorneys, environmental businesspeople, public policy advocates and communications specialists, with a science advisory council.)

<http://elpc.org/>

Global Lake Ecological Observatory Network.

(An organization supported by the U.S. National Science Foundation and Gordon & Betty Moore Chamberlain Foundation, interpreting and sharing high-resolution sensor data on global lake conditions.)

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

Great Lakes Adaptation Assessment for Cities (GLAA-C) & Great Lakes Integrated Sciences + Assessments (GLISA).

(Organizations supported by the University of Michigan and Michigan State University that work to help Great Lakes cities adapt to climate change.)

<http://graham.umich.edu/glaac>

<http://glisa.umich.edu>

Great Lakes Coalition.

(A non-profit corporation advocating for private landowners on the coasts of the Great Lakes.)

<http://www.iglc.org/about.shtml>

Great Lakes Commission.

(An agency established in 1955 by the Great Lakes Basin Compact, fostering collaboration between eight U.S. states and two Canadian provinces for management of the Great Lakes.)

<http://glc.org>

Great Lakes Basin Compact.

(A copy of the legislation may be found below.)

<http://glc.org/files/main/GreatLakesBasinCompact.pdf>

The Great Lakes Fishery Trust.

(A funding organization established in 1996, the result of a legal settlement aimed to compensate Michigan residents for fish losses caused by a hydroelectric plant. The organization “provides funding to nonprofit organizations, educational institutions, and government agencies to enhance, protect, and rehabilitate Great Lakes fishery resources.”)

<http://glft.org/>

The Great Lakes Indian Fish and Wildlife Commission.

(A group representing eleven Ojibwe tribes in Minnesota, Wisconsin, and Michigan. It offers “natural resource management expertise, conservation enforcement, legal and policy analysis, and public information services.”)

<http://glifwc.org/index.html>

Great Lakes Information Network (GLIN).

(A collection of news stories, resources, and agency links.)

<http://www.great-lakes.net/envt/refs/cchange.html>

Great Lakes Restoration Initiative.

(A collaboration of multiple U.S. federal agencies with goals ranging from pollution prevention and remediation to invasive species management.)

<http://greatlakesrestoration.us>

Great Lakes-St. Lawrence River Basin Water Resources Council (Compact Council).

(An agency established in 2008 by the Great Lakes-St. Lawrence River Basin Water Resources Compact; more information on the legislation can be found in the lower link.)

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

<http://www.cglg.org/projects/water/compactimplementation.asp>

Healing Our Waters-Great Lakes Coalition (based in Michigan).

(An advocacy consortium formed in 2004 and composed of 115 environmental, conservation, and outdoor recreation organizations, zoos, aquariums and museums.)

<http://healthylakes.org/about/>

Michigan Climate Coalition.

<http://miclimatecoalition.org/index.html>

Toronto and Region Conservation Authority

<http://trca.on.ca/>

See their page on adaptation strategies and resources for Toronto: <http://trca.on.ca/the-living-city/climate-change/addressing-climate-change/adaptation-strategies.dot>

Tribes and Climate Change. Great Lakes Tribes: Fond du Lac Band of Lake Superior Chippewa.

<http://www4.nau.edu/tribalclimatechange/tribes/greatlakes.asp>

USDA, Northern Institute of Applied Climate Science. Northwoods Climate Change Response Framework.

<http://www.nrs.fs.fed.us/niacs/climate/northwoods/>

Great Lakes States Sea Grant Offices

Illinois-Indiana Sea Grant.

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

Michigan Sea Grant.

<http://www.miseagrant.umich.edu/>

Minnesota Sea Grant.

<http://www.seagrant.umn.edu/>

Ohio Sea Grant College Program.

<http://www.ohioseagrant.osu.edu/>

University of Wisconsin Sea Grant Institute.

<http://www.seagrant.wisc.edu/home/>

Additional Sources of Note (i.e., individuals and specialists)

Jeff Andresen, Associate Professor of Geography, Michigan State University.

(Note: The below link will also lead you to an MSU Experts list for journalists.)

<http://msutoday.msu.edu/journalists/expert/jeffrey-andresen/>

Jon Allan, Director, Office of the Great Lakes, Michigan Department of Environmental Quality.

http://www.michigan.gov/deq/0,4561,7-135-3313_3677-287980--,00.html

(Note: The below link will lead you to a directory of the Office's entire staff.)

http://www.michigan.gov/documents/deq/deq-water-ogl-staff-nophotos_363495_7.pdf

Jay Austin, Associate Professor, Large Lakes Observatory, University of Minnesota Duluth.

<http://www.d.umn.edu/llo/people/jaustin.html>

Andy Buchsbaum, Regional Executive Director, National Wildlife Federation's Great Lakes Regional Center.

<http://www.nwf.org/news-and-magazines/media-center/faces-of-nwf/andy-buchsbaum.aspx>

Cameron Davis, Senior Advisor to the Administrator, Great Lakes National Program Office, U.S. Environmental Protection Agency.

<http://www2.epa.gov/aboutepa/about-great-lakes-national-program-office-glnpo>

Noah Hall, Wayne State University School of Law. <http://law.wayne.edu/profile/noah.hall/>

(water law, Great Lakes Compact)

Stephen Handler, Climate Change Specialist, USDA. <http://www.nrs.fs.fed.us/people/sdhandler>

Thomas Hook, Purdue University. <http://web.ics.purdue.edu/~thook/>

(fisheries ecology, effects of nutrient pollution)

Stuart Ludsin, The Ohio State University. <https://eeob.osu.edu/people/ludsin>
(Fisheries, water quality, human impacts on aquatic environments)

Anna Michalak, Stanford University. <http://globalecology.stanford.edu/labs/michalaklab/>
(water quality in Great Lakes related to climate change)

Michael Notaro, Associate scientist and associate director, Center for Climatic Research, University of Wisconsin. <http://experts.news.wisc.edu/experts/16>
(Note: The above webpage will also lead you to a directory called an “Experts Guide” at the University of Wisconsin-Madison, specifically designed to help journalists find relevant experts in a variety of fields.)

Catherine O'Reilly, Assistant Professor, Illinois State University.
<https://about.illinoisstate.edu/cmoreil/Pages/Research.aspx>

Lana Pollack, Chair of the U.S. Section, International Joint Commission.
http://www.ijc.org/en/United_States_Section
(Note: Contact information for U.S. and Canadian section staff, and Great Lakes regional staff, can be found at the link below.)
http://www.ijc.org/en/Contact_us

Don Scavia, Professor and Director of the Graham Environmental Sustainability Institute, University of Michigan.
<http://www.snre.umich.edu/profile/scavia>
(water quality, climate change in Great Lakes, resource management, ecological changes in Great Lakes food webs)

Mark Seeley, Extension Climatologist/Meteorologist, University of Minnesota.
<http://www.swac.umn.edu/People/MarkSeeley/>
(extreme weather, climate change)

Allison Steiner, University of Michigan.
<http://aoss.engin.umich.edu/people/alsteine>
(biosphere-atmosphere interactions, regional climate modeling, and chemistry-climate interactions)

Dave Ullrich, Executive Director, Great Lakes and St. Lawrence Cities Initiative.
(Note: The below link connects to the entire staff directory.)
<http://www.glslcities.org/about/staff.cfm>
(water policy)

U.S. Environmental Protection Agency. Great Lakes National Program Office Staff Directory.
<http://epa.gov/greatlakes/staff/index.html>

Specialists who have spoken at public seminars in Wisconsin as part of the “Climate Change in the Great Lakes Region: Starting a Public Discussion” series.
<http://seagrant.wisc.edu/climatechange/portals/0/shuter.pdf>

Upcoming Conferences of Note

Agriculture and Climate Change: Adapting Crops to Increased Uncertainty.
Amsterdam, The Netherlands, 15-17 February, 2015 (Organized by Elsevier.)
Abstract due date: 17 October 2014
<http://www.agricultureandclimatechange.com/>