METCALF INSTITUTE FOR MARINE & ENVIRONMENTAL REPORTING

Peter B. Lord Seminars on the Environment

Adapting to Climate Change: Planning for an Uncertain and Expensive Future

November 30, 2012
Coastal Institute Hazard Seminar Room
University of Rhode Island Graduate School of Oceanography
Narragansett, R.I.

Resources

Climate Change Impacts

See detailed list of resources on climate change impacts developed by Metcalf Institute for the October 12, 2012 Peter B. Lord Seminar on the Environment, Climate Change Impacts in Southern New England.
http://metcalfinstitute.org/wp-content/uploads/2012/05/Metcalf-Resources-PBL-Seminar-10.12.12.pdf

Douglas, E. and Fairbank, C. (2011). Is Precipitation in Northern New England Becoming More Extreme? Statistical Analysis of Extreme Rainfall in Massachusetts, New Hampshire, and Maine and Updated Estimates of the 100-Year Storm. *J. Hydrol. Eng.*, 16(3), 203–217.
http://ascelibrary.org/action/showAbstract?page=203&volume=16&issue=3&journalCode=jhyeff

Hayhoe, K., et al. (2008). Regional climate change projections for the Northeast USA. *Mitigation and Adaption Strategies for Global Change*, 13(5): 425-436.
http://www.springerlink.com/content/v75n741366031j20/export-citation/

National Academy of Sciences. Climate Modeling 101. National Academy of Sciences.
http://nas-sites.org/climatemodeling/index.php

Potsdam Institute for Climate Impact Research and Climate Analytics. (2012, November). Turn Down the Heat: Why a 4°C Warmer World Must be Avoided. The World Bank.
http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centrigrade_warmer_world_must_be_avoided.pdf

The Nature Conservancy. ClimateWizard. The Nature Conservancy, University of Washington, and The University of Southern Mississippi. http://www.climatewizard.org/
A user-friendly source of climate projections. "With ClimateWizard you can view historic temperature and rainfall maps for anywhere in the world, view state-of-the-art future predictions of temperature and rainfall around the world, and view and download climate change maps in a few easy steps."

Titus, J.G. and Anderson, K.E. (2009, January). Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region. U.S. Climate Change Science Program. Synthesis and Assessment Product 4.1.
http://www.climatescience.gov/Library/sap/sap4-1/final-report/sap4-1-final-report-all.pdf

U.S. House of Representatives Natural Resources Committee Democrats. (2012, October 25). The *New* New England: How Climate Change Jeopardizes the Northeast's Economy and Environment.
http://www.climateaccess.org/sites/default/files/NRDems_The%20New%20New%20England.pdf

Ecosystem-Based Adaptation

Clark, S., et al. (2012). Ecosystem-based Adaptation to Climate Change: A Cost-Benefit Analysis.
http://www.bren.ucsb.edu/research/2012Group_Projects/documents/adaptation_report.pdf

Jones, H.P., Hole, D.G. and Zavaleta, E.S. (2012, June 26). Harnessing nature to help people adapt to climate change. *Nature Climate Change* 2, 504-509.
http://www.nature.com/nclimate/journal/v2/n7/abs/nclimate1463.html

OCRM. (2012, February). Voluntary Step-by-Step Guide for Considering Potential Climate Change Effects on Coastal and Estuarine Land Conservation Projects. NOAA.
http://coastalmanagement.noaa.gov/resources/docs/guidecelpapp.pdf

Puckett, C. (2012, September 26). Salt Marshes May Slow Climate Warming. USGS. Retrieved on 11/21/12 from http://www.usgs.gov/blogs/features/usgs_top_story/salt-marshes-may-slow-climate-warming-for-a-while/

Shepard, C.C., Crain, C.M. and Beck, M.W. (2011). The Protective Role of Coastal Marshes: A Systematic Review and Meta-analysis. *pLoS ONE*, 6(11).
http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0027374

Singh, K., Walters, B.B. and Ollerhead, J. (2007). Climate Change, Sea-Level Rise and the Case for Salt Marsh Restoration in the Bay of Fundy, Canada. *Environments Journal* 35(2).
http://www.environmentsjournal.ca/index.php/ejis/article/view/14267/11259

Comprehensive Planning and Development Standards

American Planning Association. (2011). Policy Guide on Planning and Climate Change.
www.planning.org/policy/guides/pdf/climatechange.pdf

Center for Climate and Energy Solutions. State Adaptation Plans
http://www.c2es.org/us-states-regions/policy-maps/adaptation

Coastal Resilience. http://coastalresilience.org
"Coastal Resilience aims to provide tools and information to better inform decision-making with a primary goal of identifying vulnerable human and natural communities and enabling adaptation solutions, emphasizing the important role of ecosystems."

Georgetown Climate Center. State and Local Adaptation Plans
Compilation of plans from around the U.S. including short descriptions and links.
http://www.georgetownclimate.org/adaptation/state-and-local-plans?page=3

Horsley, S.W. Climate change and its effects on wetland migration, septic systems, and other structures – adaptation strategies. Presentation by S.W. Horsley of Horsley Witten Group, Inc. http://bit.ly/X0HJD9

Morsch, A. and R. Bartlett. (2011). Policy Brief: State strategies to plan for and adapt to climate change. Nicholas Institue for Environmental Policy Solutions, Duke University, NI PB 11-08.
http://nicholasinstitute.duke.edu/climate/adaptation/state-strategies-to-plan-for-and-adapt-to-climate-change/at_download/paper

NOAA, EPA, and Sea Grant College Programs. (2011, August). Achieving Hazard-Resilient Coastal & Waterfront Smart Growth. http://coastalsmartgrowth.noaa.gov/resilience.html

Floodplain Management

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

Burnett, M. Demystifying the Demons of Floodplain Management. http://rifloods.wordpress.com/
Effective summary of the National Flood Insurance Program (NFIP) process, from the Floodplain Management Program and the RI Emergency Management Agency.

FEMA. FEMA Map Service Center. http://msc.fema.gov/
A comprehensive website of FEMA Flood Maps, Flood Studies, and other useful tools.

FEMA. (2012, November 16). Hurricane Sandy Impact Analysis [Map], Retrieved November 19, 2012 from http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=307dd522499d4a44a33d7296a5da5ea0

National Flood Insurance Program. http://www.floodsmart.gov/floodsmart/

National Hydrologic Warning Council. http://www.hydrologicwarning.org/
"The National Hydrologic Warning Council (*NHWC*), with membership across the United States and around the world, is a non-profit organization dedicated to assisting emergency and environmental management officials by providing expert advice on the use of real-time, high quality hydrologic information from automated remote data systems, with the goals of protecting lives, property, and the environment."

NOAA. (2012, November 7). Aerial Photos of Hurricane Sandy Damage from NOAA's National Geodetic Survey. http://oceanservice.noaa.gov/news/weeklynews/nov12/ngs-sandy-imagery.html
"Through National Oceanic and Atmospheric Administration's (NOAA) National Geodetic Survey (NGS) website, emergency responders and members of the public can now view a map of the region and click on an icon to view a thumbnail or high-definition image of a specific area. Images are now available for some of the Northeast's hardest-hit areas, including: Atlantic City, NJ., Seaside Heights, N.J., Ocean City, Md., and parts of Delaware. The top priorities of NGS aerial imagery are to support safe navigation and capture damage to coastal areas caused by a storm. Priorities are centered on major ports and waterways supporting the Marine Transportation System; known or projected severe impacts to coastlines and critical infrastructure, and areas of severe flooding impacting coastal communities."

RIFMA. Rhode Island Flood Mitigation Association. http://www.riflood.org/#!

StormSmart Coasts. http://stormsmartcoasts.org/
A valuable resource for coastal decision makers seeking to gather the best information on how to protect their coastal communities from weather and climate hazards. Currently available for New Hampshire, Massachusetts, Rhode Island, Texas, Louisiana, Mississippi, Alabama, and Florida. Soon to be available for Maine, Connecticut, and Delaware.

Infrastructure Improvements

AASHTO. American Association of State Highway and Transportation Officials.
http://www.transportation.org/Pages/default.aspx

ASCE. Hurricane Storm Surge and Infrastructure.
http://ascelibrary.org/page/jwped5/hurricanestormsurgeandinfrastructure
A compilation of publications by the American Society of Civil Engineers (ASCE) on hurricane storm surge, effects on infrastructure, modeling and research, and lessons learned from previous storms in relation to the effects of Hurricane Sandy.

Carter, N.T. (2012, October 31). Federal Involvement in Flood Response and Flood Infrastructure Repair: Storm Sandy Recovery. *CRS Report for Congress.* Congressional Research Service.
http://www.fas.org/sgp/crs/homesec/R42803.pdf

EPA. Transportation Impacts and Adaptation.
http://www.epa.gov/climatechange/impacts-adaptation/transportation.html

Fears, D. and Eilperin, J. (2012, November 4). Coastal cities seek protections against superstorms. *The Washington Post.* Retrieved on November 19, 2012 from http://www.washingtonpost.com/national/health-science/coastal-cities-seek-protections-against-superstorms/2012/11/04/5a1751dc-2520-11e2-ac85-e669876c6a24_story.html

GrowSmart Rhode Island. http://growsmartri.org

Kirk, R.S. (2012, November 1). Emergency Relief Program: Federal-Aid Highway Assistance for Disaster-Damaged roads and Bridges. *CRS Report for Congress*. Congressional Research Service. http://www.fas.org/sgp/crs/homesec/R42804.pdf

Neumann, J. (2009, December). Adaptation to Climate Change: Revisiting Infrastructure Norms, Issue Brief 09-15. Resources for the Future. http://www.rff.org/rff/documents/RFF-IB-09-15.pdf

Rhode Island Coalition for Transportation Choices. http://www.rictc.org/

The Royal Academy of Engineers. (2011, February). Infrastructure, Engineering and Climate Change Adaption – ensuring services in an uncertain future. *Engineering the Future*. http://www.raeng.org.uk/news/publications/list/reports/Engineering_the_future_2011.pdf

Planning for/Responding to Risk

National Sea Grant College Program. Focus Team: Hazard Resilient Coastal Communities. *NOAA*. http://www.seagrant.noaa.gov/focus/hrcc_page.html

Poyar, K.A. and Beller-Simms, N. (2010, July). Early Responses to Climate Change: An Analysis of Seven U.S. State and Local Climate Adaptation Planning Initiatives. American Meteorological Society. *Weather, Climate & Society*, 2, 237-248.

Tibbetts, J.H. (2012). No worries? The new science of risk and choice. South Carolina Sea Grant Consortium. Coastal Heritage, 26(4). http://www.scseagrant.org/Content/?cid=593

Adaptation, General

Climate Adaptation Knowledge Exchange. http://www.cakex.org

Climate Change Connecticut. Connecticut Adaptation Resource Toolkit. http://ctclimatechange.com/index.php/towns/art-adaptation-resource-tool-kit-home-page/

FWS. (2010, February 18). AGENDA: Adapting to Climate Change in the Mid-Atlantic. Working Agenda for March 23-25, 2010. A Working Agenda published for the Adapting to Climate Change in the Mid-Atlantic workshop hosted in Cambridge, Maryland on March 23-25, 2010 with a primary target audience of managers of federal, state, and private lands and resources in the Mid-Atlantic United States. The workshop was focused on topics such as techniques used to assess climate change impacts on ecosystems in the Mid-Atlantic United States and collaborative efforts in addressing common climate adaption issues. http://www.fws.gov/northeast/climatechange/conference/pdf/MidAtlantic_ClimateConference_Agenda_021809_Draft.pdf

Georgetown Climate Center. Resources for Adaptation Action. Georgetown University. http://www.georgetownclimate.org/node/4025

Massachusetts Climate Change Adaptation Advisory Committee. (2011). Massachusetts Climate Change Adaptation Report, September 2011. www.mass.gov/eea/docs/eea/.../eea-climate-adaptation-report.pdf

Rhode Island Climate Change Commission. (2012, November). Adapting to Climate Change in the Ocean State: A Starting Point. *2012 Progress Report*. http://www.rilin.state.ri.us/Reports/Climate%20Change%20Commission%20Prog%20Report%20Final%2011%2015%2012%20final%202.pdf

Roberts, T., et al. (2010, February). Summary: Preliminary Assessment of Rhode Island's Vulnerability to Climate Change and its Options for Adaptation Action. Brown University Center for Environmental Studies. http://www.cakex.org/sites/default/files/Rhode%20Island%20Climate%20Change%20Adaptation.pdf

U.S. EPA. Adaptation Efforts: New England States. http://www.epa.gov/region1/eco/energy/adaptation-efforts-ne.html

Contacts

FEMA Region 1 (New England) Mitigation Office Directory
http://www.fema.gov/region-i-mitigation-contact

New England Water Environment Association. (2012). Officer & Committee Directory.
http://www.newea.org/LinkClick.aspx?fileticket=jK80WTorcas%3D&tabid=244&mid=805

State Emergency Management Agencies

Connecticut -- http://www.ct.gov/demhs/site/default.asp

Massachusetts -- http://www.mass.gov/eopss/agencies/mema/

Rhode Island -- http://www.riema.ri.gov/prevention/floods/

State Floodplain Management Contacts

Association of State Floodplain Managers Directory
http://www.floods.org/index.asp?menuID=274&firstlevelmenuID=185&siteID=1

Connecticut – https://hazards.fema.gov/contacts/statecontacts/contacts.asp?page=CT
Diane Ikfovic, diane.ifkovic@ct.gov, 860-424-3537

Massachusetts – https://hazards.fema.gov/contacts/statecontacts/contacts.asp?page=MA
Richard Zingarelli, richard.zingarelli@state.ma.us, 617-626-1406

Rhode Island – https://hazards.fema.gov/contacts/statecontacts/contacts.asp?page=RI
Michelle Burnett, michelle.f.burnett@us.army.mil, 401-462-7048

Additional Resources Retrieved from SEJ-TIPSHEET: SEJ WatchDog of 14 NOVEMBER 2012.
http://www.sej.org/publications/tipsheet/overview

"Superstorm Sandy was a wake-up call on many levels–especially as a lesson on the need to be prepared for disasters. SEJ's Reporting Tools library, http://www.sej.org/library/reporting-tools/overview, may help you prepare for covering environmental disasters. But here are a few more that may come in handy.

- EPA's National On-Scene Coordinator Phone Book is a listing of crisis responders within the agency -- often those focused on Superfund hazardous waste incidents -- in many cases including 24-hour numbers. Ignore EPA's press office, who are rarely helpful, and will tell you to go through them, and call the On-Scene Coordinator anyway. http://www.epaosc.org/main/oscdir.aspx

- WISER, the National Institutes of Health's Wireless Information System for Emergency Responders, is a mobile app you can run on your smart phone (iPhone, Android, or Blackberry). It is a quick entry to TOXNET's Hazardous Substances Data Bank, including support for radiological and biological agents. Starting point: http://1.usa.gov/TJqLnF

- Some of the biggest impacts of Sandy were on sewer and water infrastructure. The Water Environment Federation has published many guides related to disasters affecting public drinking water and sewage treatment plants http://bit.ly/QdS9NX

- EPA has collected Risk Management Plans for some major hazmat-handling facilities that could kill tens or hundreds of thousands of people in a catastrophe -- but makes it hard for reporters to access the information. To find one near you, start here http://www.epa.gov/oem/content/rmp/ It's a good thing OMB Watch's Right-To-Know Network has compiled the verboten information in easy-to-access form http://www.rtknet.org/db/rmp

- If you really want to prepare for chasing hazmat trucks, you may want to download and install CAMEO http://www.epa.gov/oem/content/cameo/index.htm on your 4G-tethered laptop or tablet. It's the same system most hazmat trucks carry onboard -- to tell them what chemical risks they face and what vulnerable sites (nursing homes? schools?) may be nearby.

- Another key resource is the Dart Center for Journalism & Trauma http://dartcenter.org/topic/disaster, which includes help on covering natural disasters in all their facets, including mental health. Further resources are available from the International News Safety Institute <http://www.newssafety.org/>.

- The International Center for Journalists also offers help. Check out "Disaster and Crisis Coverage," by Deborah Potter and Sherry Ricchiardi http://www.icfj.org/resources/disaster-and-crisis-coverage>; and "Journalism and Trauma," by Deborah Potter and Sherry Ricchiardi http://www.icfj.org/resources/journalism-and-trauma

- SEJ's Reporting Tools library http://www.sej.org/library/reporting-tools/overview> includes toolboxes on floods, tsunamis, earthquakes, oil spills, hurricanes, wildfires, and more."