

# Climate Change Vulnerability Assessment Resources

## Publications

### Vulnerability Assessment Frameworks and Guidance

Intergovernmental Panel on Climate Change (IPCC). 2005. *Guidance Notes for Lead Authors of the IPCC Fourth Assessment Report on Addressing Uncertainties*.

Intergovernmental Panel on Climate Change, Geneva. <http://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf>.

National Research Council (NRC). 2009. *Informing Decisions in a Changing Climate*. Panel on Strategies and Methods for Climate-Related Decision Support, Committee on the Human Dimensions of Global Change. Division of Behavioral and Social Sciences and Education. National Academies Press, Washington, D.C. [http://www.nap.edu/openbook.php?record\\_id=12626&page=R1](http://www.nap.edu/openbook.php?record_id=12626&page=R1).

Olmos, S. 2001. *Vulnerability and Adaptation to Climate Change: Concepts, Issues, Assessment Methods*. Climate Change Knowledge Network, International Institute for Sustainable Development, Winnipeg. [http://www.cckn.net/pdf/va\\_foundation\\_final.pdf](http://www.cckn.net/pdf/va_foundation_final.pdf). United Nations Framework Convention on Climate Change (UNFCCC). 2008. *Compendium on Methods and Tools to Evaluate Impacts of, Vulnerability and Adaptation to, Climate Change*. UNFCCC, Bonn, Germany. <http://unfccc.int/>

[adaptation/nairobi\\_work\\_programme/knowledge\\_resources\\_and\\_publications/items/2674.php](http://adaptation/nairobi_work_programme/knowledge_resources_and_publications/items/2674.php).

U.S. Environmental Protection Agency (EPA). 2009. *A Framework for Categorizing the Relative Vulnerability of Threatened and Endangered Species to Climate Change*. EPA/600/R-09/011. National Center for Environmental Assessment, Washington, D.C. <http://www.epa.gov/ncea>.

U.S. Global Change Research Program (USGCRP). 2009. *Global Climate Change Impacts in the United States*. A report of the USGCRP. USGCRP, Washington, D.C. <http://www.globalchange.gov/usimpacts/>.

Williams, S.E., L.P. Shoo, J.L. Isaac, A.A. Hoffmann, and G. Langham. 2008. Towards an integrated framework for assessing the vulnerability of species to climate change. *PloS Biology* 6: 2621–2626. <http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.0060325>.

### General Climate Change Adaptation Principles and Planning

Association of Fish and Wildlife Agencies (AFWA). 2009. *Voluntary Guidance for States to Incorporate Climate Change into State Wildlife Action Plans and Other Management Plans*. AFWA, Washington, D.C. [http://www.fishwildlife.org/pdfs/ClimateChangeGuidance%20Document\\_Final\\_reduced%20size.pdf](http://www.fishwildlife.org/pdfs/ClimateChangeGuidance%20Document_Final_reduced%20size.pdf).

Glick, P., A. Staudt, and B. Stein. 2009. *A New Era for Conservation: Review of Climate Change Adaptation Literature*. National Wildlife Federation, Washington, D.C. [http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2009/~media/PDFs/GlobalWarming/Reports/ClimateChangeAdaptationLiteratureReview.ashx](http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2009/~/media/PDFs/GlobalWarming/Reports/ClimateChangeAdaptationLiteratureReview.ashx).

Groves, C., M. Anderson, C. Enquist, E. Girvetz, T. Sandwith, L. Schwarz, and R. Shaw. 2010. *Climate Change and Conservation: A Primer for Assessing Impacts and Advancing Ecosystem-based Adaptation in The Nature Conservancy*. The Nature Conservancy, Arlington, VA. <http://conserveonline.org/workspaces/climateadaptation/documents/a-primer-for-assessing-impacts/view.html>.

Heller, N.E., and E.S. Zavaleta. 2009. Biodiversity management in the face of climate change: A review of 22 years of recommendations. *Biological Conservation* 142: 14–32. <http://www.lagunadesantarosa.org/knowledgebase/sites/default/files/Heller%20and%20Zavaleta%202009.pdf>.

Lawler, J.J. 2009. Climate change adaptation strategies for resource management and conservation planning. *Annals of the New York Academy of Sciences* 1162: 79–98. [http://training.fws.gov/branchsites/lkm/climate\\_change/june\\_09/cc-adaptreview.pdf](http://training.fws.gov/branchsites/lkm/climate_change/june_09/cc-adaptreview.pdf).

Mawdsley, J.R., R. O'Malley, and D.S. Ojima. 2009. A review of climate-change adaptation strategies for wildlife management and biodiversity conservation. *Conservation Biology* 23: 1080–1089.

<http://ceses.washington.edu/cig/outreach/seminarfiles/2009seminars/Mawdsley-et-2009.pdf>.

National Research Council (NRC). 2010. *Adapting to the Impacts of Climate Change*. America's Climate Choices: Panel on Adapting to the Impacts of Climate Change. National Academies Press, Washington, D.C. <http://americasclimatechoices.org/paneladaptation.shtml>.

U.S. Climate Change Science Program (U.S. CCSP). 2008. *Preliminary Review of Adaptation Options for Climate-sensitive Ecosystems and Resources*. A report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. S.H. Julius and J.M. West (eds.); J.S. Baron et al. (authors). U.S. EPA, Washington, D.C. <http://downloads.climate-science.gov/sap/sap4-4/sap4-4-final-report-all.pdf>.

West, J.M., S.H. Julius, P. Kareiva, C. Enquist, J.J. Lawler, B. Petersen, A.E. Johnson, and M.R. Shaw. 2009. U.S. natural resources and climate change: Concepts and approaches for management adaptation. *Environmental Management* 44: 1001–1021. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2791483/pdf/267\\_2009\\_Article\\_9345.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2791483/pdf/267_2009_Article_9345.pdf).

Williams, B.K., R.C. Szaro, and C.D. Shapiro. 2007. *Adaptive Management: The U.S. Department of the Interior Technical Guide*. Adaptive Management Working Group, U.S. Department of the Interior, Washington, D.C. <http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf>.

## Web-Based Tools

Bioclimatic metrics: WorldClim,  
<http://www.worldclim.org/>.

Climate Adaptation Knowledge  
Environment (CAKE):  
<http://www.cakex.org/>

ClimateWizard:  
[http://www.climatewizard.org](http://www.climatewizard.org/).

Compendium of conceptual ecological  
response models:  
[http://www.fileheap.com/software/  
conceptual\\_data\\_model.html](http://www.fileheap.com/software/conceptual_data_model.html).

Drought indices and hydrologic models:  
[http://drought.unl.edu/whatis/indices.  
htm](http://drought.unl.edu/whatis/indices.htm); Variable Infiltration Capacity model,  
[http://www.hydro.washington.edu/  
Lettenmaier/Models/VIC/](http://www.hydro.washington.edu/Lettenmaier/Models/VIC/).

Ecological models: The Regional Hydro-  
Ecologic Simulation System (RHESsys),  
[http://fiesta.bren.ucsb.edu/~rhessys/  
setup/downloads/downloads.html](http://fiesta.bren.ucsb.edu/~rhessys/setup/downloads/downloads.html); PnET,  
[http://www.pnet.sr.unh.edu/download.  
html](http://www.pnet.sr.unh.edu/download.html); the CENTURY model, [http://nrel.  
colostate.edu/projects/century5/](http://nrel.colostate.edu/projects/century5/).

Expert opinion ecological response models:  
Bayesian Analysis Toolkit,  
<http://www.mppmu.mpg.de/bat/>; Treeage  
Pro, [http://www.treeage.com/products/  
index.html](http://www.treeage.com/products/index.html); Delphi Decision Aid, [http://  
armstrong.wharton.upenn.edu/delphi2/](http://armstrong.wharton.upenn.edu/delphi2/).

GAP Program models: [http://www.nbio.  
gov/portal/server.pt/community/maps\\_  
and\\_data/1850/species\\_modeling/7000](http://www.nbio.gov/portal/server.pt/community/maps_and_data/1850/species_modeling/7000).

Landscape model: PATCH,  
[http://www.epa.gov/wed/pages/  
news/03June/schumaker.htm](http://www.epa.gov/wed/pages/news/03June/schumaker.htm).

NatureServe Climate Change  
Vulnerability Index:  
[http://www.natureserve.org/  
prodServices/climatechange/  
ClimateChange.jsp](http://www.natureserve.org/prodServices/climatechange/ClimateChange.jsp).

Niche and occupancy ecological  
response models:  
GARP, [http://www.nhm.ku.edu/  
desktopgarp](http://www.nhm.ku.edu/desktopgarp); Maxent, [http://www.  
cs.princeton.edu/~schapire/maxent/](http://www.cs.princeton.edu/~schapire/maxent/);  
Regression Trees and Random Forests,  
[http://rattle.togaware.com/rattle-  
download.html](http://rattle.togaware.com/rattle-download.html); Bioclim, [http://software.  
informer.com/getfree-bioclim-download-  
software/](http://software.informer.com/getfree-bioclim-download-software/).

NOAA Coastal Climate Adaptation:  
[http://collaborate.csc.noaa.gov/  
climateadaptation/default.aspx](http://collaborate.csc.noaa.gov/climateadaptation/default.aspx)

USDA Forest Service Climate Change  
Resource Center:  
<http://www.fs.fed.us/ccrc/>.



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