

# Delivering Climate Science About the Nation's Fish, Wildlife, and Ecosystems: The U.S. Geological Survey National Climate Change and Wildlife Science Center

Changes to the Earth's climate—temperature, precipitation, and other climate variables—pose significant challenges to our Nation's natural resources. Managers of land, water, and living resources require an understanding of the impacts of climate change—which exacerbate ongoing stresses such as habitat alteration and invasive species—in order to design effective response strategies. In 2008, Congress created the **National Climate Change and Wildlife Science Center (NCCWSC)** within the U.S. Geological Survey (USGS). The center was formed to address environmental challenges resulting from climate and land-use change and to provide natural resource managers with rigorous scientific information and effective tools for decision making. Located at the USGS National Headquarters in Reston, Virginia, the NCCWSC has established eight regional **Department of the Interior (DOI) Climate Science Centers (CSCs)** and has invested over \$93 million (through fiscal year 2013) in cutting-edge climate change research.

Partnering closely with natural resource managers and scientists ensures that NCCWSC-supported science is founded on stakeholder needs and that research products are accessible to users. On the basis of NCCWSC's commitment to science that is directly applicable to management decisions, the **mid-range science goals** of the NCCWSC are to

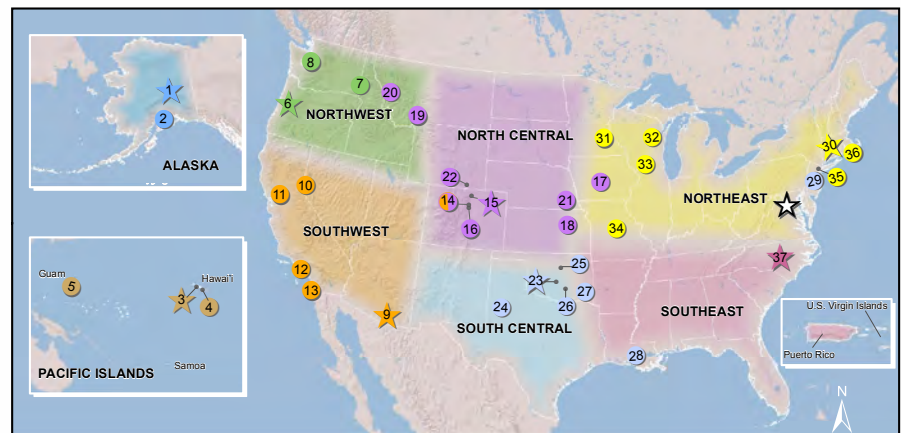
1. Assess and synthesize the current state of knowledge about climate and land-use change impacts on natural and cultural resources.
2. Perform vulnerability assessments of species and ecosystems.

3. Understand the ecological, social, and political impacts of climate and land-use change.
4. Understand the interactions between climate and the physical, biological, and chemical forces that influence the structure and functioning of ecosystems and the goods and services they provide.

The mission of the NCCWSC is to provide natural resource managers with the tools and information they need to develop and execute management strategies that address the impacts of climate and other concurrent global changes—such as biodiversity loss, land clearing, and urbanization—on fish and wildlife and their habitats. In support

of this mission, the NCCWSC aims to support **the infrastructure for collaborative, informed dialogue and decision making** through

1. Collaboration, communication, and translation of science results to managers, stakeholders, and the public interested in climate change activity.
2. Creation of a shared information and data management platform.
3. Education and training of a core of climate scientists that will provide expertise in the future.
4. Evaluation of the utility of the science produced by the NCCWSC/CSC enterprise.



Base from ESRI, 2009, Albers Equal Area Conic Projection, North American Datum of 1983

EXPLANATION			
	<b>National Climate Change and Wildlife Science Center</b>	<b>Northwest CSC</b>	<b>North Central CSC</b>
	<b>CSC lead institutions</b>	6. Oregon State University	14. University of Colorado
	<b>CSC institutions</b>	7. University of Idaho	15. Colorado State University
	<b>Alaska CSC</b>	8. University of Washington	16. Colorado School of Mines
	1. University of Alaska Fairbanks		17. Iowa State University
	2. University of Alaska Anchorage	<b>Southwest CSC</b>	18. Kansas State University
		9. University of Arizona	19. Montana State University
	<b>Pacific Islands CSC</b>	10. Desert Research Institute (Nevada)	20. University of Montana
	3. University of Hawai'i at Mānoa	11. University of California, Davis	21. University of Nebraska, Lincoln
	4. University of Hawai'i at Hilo	12. University of California, Los Angeles	22. University of Wyoming
	5. University of Guam	13. Scripps Institute of Oceanography	<b>South Central CSC</b>
		14. University of Colorado	23. University of Oklahoma
			24. Texas Tech University
			25. Oklahoma State University
			26. Chickasaw Nation
			27. Choctaw Nation of Oklahoma
			28. Louisiana State University
			29. NOAA Geophysical Fluid Dynamics Laboratory
			<b>Northeast CSC</b>
			30. University of Massachusetts, Amherst
			31. University of Minnesota
			32. College of Menominee Nation
			33. University of Wisconsin, Madison
			34. University of Missouri, Columbia
			35. Columbia University
			36. Marine Biological Laboratory
			<b>Southeast CSC</b>
			37. North Carolina State University

**Figure 1.** Map showing the locations of the Department of the Interior Climate Science Centers (CSC) and their university-led consortia.

## Regional Partnerships and Meeting Local Needs: NCCWSC, CSCs, and Landscape Conservation Cooperatives

CSCs are a key element for ensuring the delivery of useful science and data products to resource managers. Regional CSCs are hosted by universities, many with multiple partners (fig. 1) with substantial capacity to conduct climate change research and leverage existing resource management partnerships. Since fiscal year 2010, the NCCWSC has established eight DOI CSCs at host universities in **Alaska** (University of Alaska, Fairbanks), the **Southeast United States** (North Carolina State University), the **Northwest United States** (Oregon State University), the **Southwest United States** (University of Arizona, Tucson), the **North Central United States** (Colorado State University, Fort Collins), the **Northeast United States** (University of Massachusetts, Amherst), the **South Central United States** (University of Oklahoma), and the **Pacific Islands** (University of Hawai‘i, Mānoa).

Since their establishment, the CSCs have managed and supported local, regional, and landscape scale **research projects**, while the NCCWSC has focused on addressing broader national and multiregion climate science priorities. Each CSC is advised by a Stakeholder Advisory Committee (SAC) composed of Federal, State, and Tribal representatives that help identify annual and long-term science priorities based on the needs of the region. A national advisory committee, the Advisory Committee on Climate Change and Natural Resource Science (ACCCNRS), was established in May 2013 to advise the Secretary of the Interior about the NCCWSC and DOI CSCs. ACCCNRS has 25 members from DOI, other Federal agencies, State and local governments, Tribal nations and partners, the nongovernmental community, academia, and the private sector. The committee is guided by the ACCCNRS **charter**.

**DOI Landscape Conservation Cooperatives (LCCs)** are primary partners and clients of CSCs. LCCs are a network of public-private

partnerships that provide applied conservation science to inform integrated resource management actions addressing climate change and other stressors at a landscape level. CSCs prioritize delivery of fundamental research, data products, and decision-support tools to meet the needs of the LCCs and other resource managers within their respective regions. Together, NCCWSC, CSCs, and LCCs form the cornerstones of DOI’s integrated approach to climate change science and adaptation.

## NCCWSC – Science Across the Nation

- In 2012, NCCWSC research staff contributed to the technical report entitled “**Impacts of Climate Change on Biodiversity, Ecosystems, and Ecosystem Services**” and a series of companion manuscripts published in a special issue of “**Frontiers in Ecology and the Environment**.” This technical report, in addition to other supporting articles and books, provides a foundation for the corresponding chapters of the U.S. Global Change Research Program’s **Third U.S. National Climate Assessment**, which is scheduled to be released in 2014.



**Walleye (*Sander vitreus*) (Eric Engbretson, U.S. Fish and Wildlife Service).**

- In cooperation with scientists from the University of Wisconsin-Madison, the NCCWSC supports the “Climate Change and Resilience of Sport Fisheries in Lakes” project in which researchers are assessing climate driven trends in cool- and warm-water sport fish by studying interactions between walleye and bass populations in the Upper Midwest lakes. Resulting tools are intended for use by management agencies to evaluate potential impacts of climatic change on sport fisheries.
- The NCCWSC sponsors a national **webinar series** highlighting the research findings of projects funded by the NCCWSC and CSCs. This series is co-sponsored with the U.S. Fish and Wildlife Service’s National Conservation Training Center and features talks highlighting climate impacts and corresponding management issues.
- NCCWSC staff is working to create a searchable public database on climate change vulnerability assessments. By creating a central location for researchers and managers to locate information on current and past vulnerability assessments, research redundancy may be reduced, collaboration increased, and the utility of the information shared beyond the region in which the information originated.

## For Further Information

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