



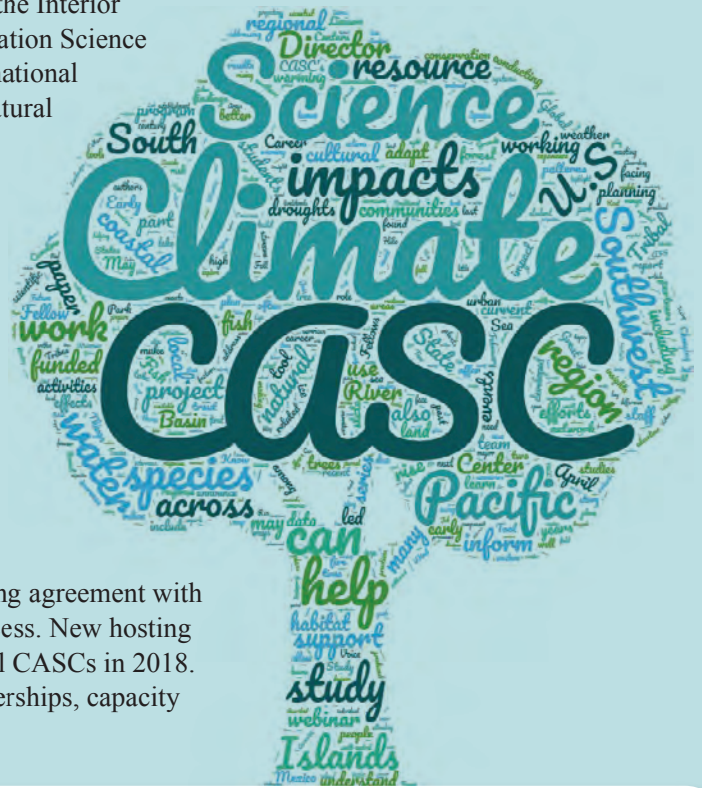
Climate Adaptation Science Centers— Annual Report for **2018**

By Elda Varela Minder

2018 marked the 10-year anniversary of the establishment of the U.S. Geological Survey (USGS) National Climate Change and Wildlife Science Center! With the passage of the fiscal year 2018 budget on March 23, 2018, our program name was changed from the National Climate Change and Wildlife Science Center to the National Climate Adaptation Science Center (NCASC). The eight regional Department of the Interior (DOI) Climate Science Centers were renamed Climate Adaptation Science Centers (CASCs). The name changes more clearly align the national and regional centers and emphasize their focus on meeting natural resource adaptation needs. Although the program has a new name, [our mission has not changed](#). We are still hard at work delivering science to help fish, wildlife, water, land, and people adapt to a changing climate.

During the past 10 years, the NCASC and the eight regional CASCs funded over 425 science projects and built a network of research partners, resource management stakeholders, interdisciplinary staff, fellows, and early career researchers. In celebration of our work and accomplishments over the last 10 years, the NCASC began a monthly web post series on “[10 Things You May Not Know](#)” about topics our science has focused on, including drought, glaciers, and wildfire.

Additionally, CASCs that had completed their initial hosting agreement with the USGS underwent a formal review and recompetition process. New hosting agreements were awarded to the Southwest and North Central CASCs in 2018. Read on to learn more about the CASCs’ great science, partnerships, capacity building, and more from 2018.



2018 Snapshot



More than
\$9.5 million toward new and continued research projects



More than
180 new publications



More than
93 new datasets

More than
60 new projects



Science Publications

In fiscal year 2018, the CASCs funded more than 60 new projects to help address management needs and questions important to the regions associated with these projects. Visit our [website](#) to learn more about our science projects and the products they develop.

Examining the Inclusion of Nonhuman Impacts of Water Shortage in Drought Plans

An NCASC-supported study examined drought plans in the upper Missouri River Basin of southwestern Montana to determine whether these plans incorporate nonhuman impacts of drought (such as impacts to fish, wildlife, water quality, and forests). The authors found that ecosystems are rarely accounted for, except through the narrow lens of impacts to fish as measured by water temperature and streamflow. They concluded that a more comprehensive analysis of factors that influence water availability and drought risks, to both ecosystems and people, could lead to more effective drought plans.

Learn more at <https://www.usgs.gov/center-news/new-paper-examines-inclusion-non-human-impacts-water-shortage-drought-plans>



Bear Trap Canyon, Montana. Credit: public domain.



Researcher holding a tree-ring cross section. Credit: Molly Tankersley, Alaska CASC.

Between the Lines: Tree Rings Reveal Avalanche History

To Alaska CASC researchers, the Eaglecrest Ski Area in Juneau, Alaska, represents a vast source of information about the avalanche events that have occurred there over the past 5, 10, or even 100 years. The researchers are scouting field sites for an upcoming historic avalanche reconstruction project that will use dendrochronology (the science of dating changes in the environment through tree-ring analysis) as a method for dating historic large-magnitude avalanche events. The historic avalanche data will be critical for assessing the effects of climate change on future avalanche hazards in the Juneau area.

Learn more at <https://www.usgs.gov/center-news/between-lines-tree-rings-reveal-avalanche-history>

Evaluating Adaptive Management Options for Black Ash Forests in the Face of Emerald Ash Borer Invasion

The arrival and spread of emerald ash borer (EAB) across the western Great Lakes region has shifted considerable focus toward developing silvicultural strategies that minimize the effects of this invasive insect on the structure and functioning of black ash wetlands. Research efforts supported by the Northeast CASC were carried out in north-central Minnesota, Michigan, and Wisconsin to evaluate the potential for using regeneration harvests in conjunction with planting of replacement species to sustain forested wetland habitats after EAB infestations. Researchers reviewed the results from these recent experiences in managing black ash for resilience to EAB, provided insights gained on the ecological functioning of these forests, and described the unique, foundational role played by black ash.

Learn more at <https://doi.org/10.3390/f9060348>



Emerald ash borer. Credit: James Zablotny, U.S. Forest Service.

Complex Old-Growth Forests May Protect Some Bird Species in a Warming Climate

Old forests that contain large trees and a diversity of tree sizes and species may offer refuge to some types of birds facing threats in a warming climate. After studying 13 bird species that have been tracked annually in the USGS North American Breeding Bird Survey, Northwest CASC-supported researchers in the College of Forestry at Oregon State University reported that certain bird species that are sensitive to rising temperatures during the breeding season are likely to benefit from old-growth forest, providing support for conserving these forests.

Learn more at <https://www.usgs.gov/center-news/complex-old-growth-forests-may-protect-some-bird-species-a-warming-climate>



Wilson's Warbler. Credit: Tom Koerner, U.S. Fish and Wildlife Service.



'Ohi'a lehua (*Metrosideros polymorpha*). Credit: Alan Cressler, USGS.

Hawaiian Endemic Plants are Vulnerable to Climate Shifts

Because Hawai'i's native plant life is highly endemic, meaning plants that can be found only in Hawai'i, it is vulnerable to habitat loss that can result from changes in climate and encroachment of nonnative or invasive species. Shifting temperature and rainfall patterns in the Hawaiian Islands are expected to continue to change, leading managers at Hawai'i Volcanoes National Park to ask how these changes might affect plant distributions. Scientists supported by the Pacific Islands CASC described research seeking to answer this question.

Learn more at <https://www.usgs.gov/center-news/hawaiian-endemic-plants-are-vulnerable-climate-shifts-new-study-suggests>

Lack of Water is Key Stressor for Urban Trees

A study from the Southeast CASC found that urban trees can survive increased heat and insect pests fairly well, unless they are thirsty. Insufficient water not only harms trees but allows other problems to have a substantial effect on trees in urban environments. If the trees had adequate water, however, researchers found that higher temperatures could actually have a positive effect on tree growth. Additionally, scale insects had little or no adverse effect if the trees were not water stressed.

Learn more at <https://www.usgs.gov/center-news/lack-water-key-stressor-urban-trees>



Red maple branch infested with gloomy scale. Credit: Adam Dale, North Carolina State University.

Adapt, Move, or Die: How Biodiversity Reacted to Past Climate Change

Plants and animals react to environmental changes by adapting, migrating, or going extinct. A Southwest CASC-supported paper, authored by an international group of scientists, reviews current knowledge on climate change and biodiversity. The study showed that local adaptation to new conditions seems to have played a key role in the way species survived in the past; however, adaptation happens slowly over a long period of time. The findings point to radical changes in future biodiversity because of climate change.

Learn more at <https://www.usgs.gov/center-news/adapt-move-or-die-how-biodiversity-reacted-past-climate-change>



American pika. Credit: public domain.



Mangrove habitat at J.N. "Ding" Darling National Wildlife Refuge in Florida. Credit: Karen Leggett, U.S. Fish and Wildlife Service.

Global Change Impacts and Conservation Opportunities for Mangrove Forests

Mangrove forests are fragile systems that provide fish and wildlife habitat, improve water quality, reduce coastal erosion, minimize flooding impacts, and sequester carbon. With support from the South Central and Southeast CASCs, researchers in Louisiana examined the effects of global change, including climate change, land conservation, and sea-level rise, on mangrove forests along the Gulf of Mexico. The researchers described restoration and conservation strategies that can make these forests more resilient to change.

Learn more at <https://doi.org/10.1016/j.ecss.2018.09.006>

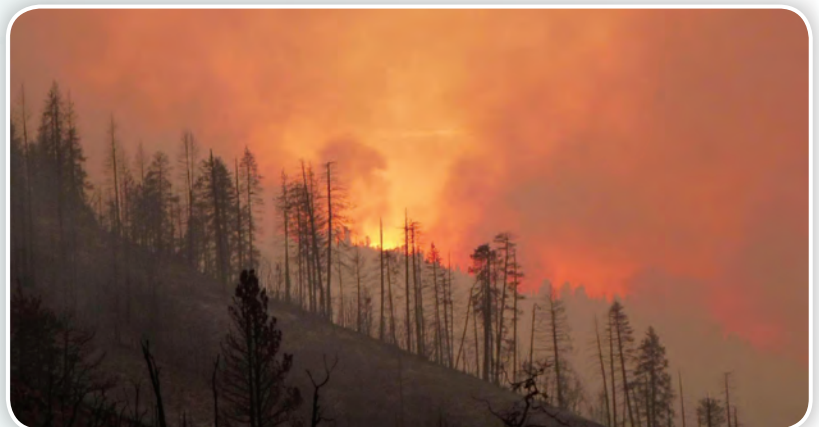
Science You Can Use

CASC-supported researchers work closely with stakeholders to create science that can be used by the management community in broadly accessible formats. These efforts were described by Federal and university researchers from the Southwest CASC who explained a process for engaging decision makers by outlining [how ecologists transform research into change](#). CASC researchers also share their science and network activities with the broader scientific community through participation in national science meetings such as the [American Fisheries Society \(AFS\) Annual Meeting](#), the [American Geophysical Union Fall Meeting](#), and the [Ecological Society of America Annual Meeting](#). What's more, several CASCs participated in and supported regional Association of Fish and Wildlife Agencies meetings to engage State, Provincial, and Territorial fish and wildlife agencies in North America. Additionally, the NCASC hosted a networkwide [fish and game webinar series](#) to highlight CASC-supported science research and products.

USGS Fire Science Making a Difference

Researchers from the CASCs and the USGS are part of the large cadre of Federal, university, and other researchers committed to science that not only supports the immediate needs of managers during wildfires but also helps managers determine the most effective strategies to lessen wildfire risks. This research informs managers' approach to addressing rising wildfire risks to save lives, property, wildlands, and money.

Learn more at <https://www.usgs.gov/news/usgs-fire-it-s-not-a-matter-if-it-s-a-matter-more-fire-science-data-please>



Sierra National Forest, California. Credit: U.S. Forest Service.

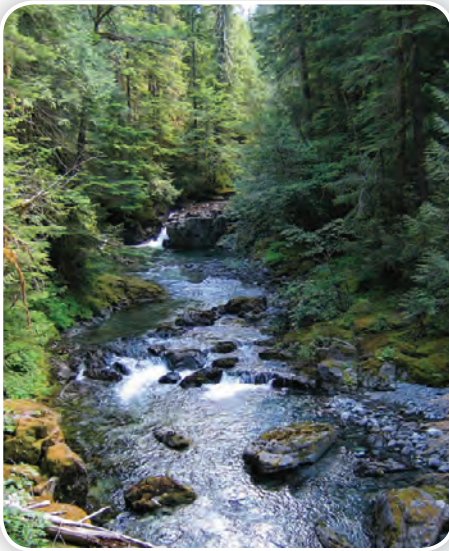
A New Way to Offer Alaskans Local Climate Change Information

A team from the Alaska CASC at the University of Alaska Fairbanks created a web-based tool that allows communities in Alaska and western Canada to see how climate change could affect the regions where they live. The tool transforms temperature and precipitation predictions from global climate models into detailed information about potential future conditions on a local scale.

Learn more at <https://www.usgs.gov/center-news/new-tool-offers-local-climate-change-information>



Nellie Juan Glacier, Alaska. Credit: Jeremy Littell, USGS.



New Guide for Monitoring Stream Temperature

An NCASC- and Northwest CASC-supported research ecologist co-authored guidance for a stream temperature monitoring protocol that can easily be implemented by nonspecialist (nonaquatic) staff. Measuring stream temperature can help identify locations where restoration actions are needed, provide insight about how and why temperatures change over time, and help anticipate the consequences of these changes for water quality and species distributions.

Learn more at <https://www.usgs.gov/center-news/new-guide-monitoring-stream-temperature>

Forested stream. Credit: U.S. Forest Service.

EDDI, a New Drought Index, Provides Early Warning of Flash Droughts

A team of climate scientists working in collaboration with the North Central CASC and the National Oceanic and Atmospheric Administration Physical Sciences Division took part in building a new tool—the Evaporative Demand Drought Index (EDDI)—that can improve understanding of drought as it occurs. EDDI was developed exclusively to monitor atmospheric evaporative demand, also described as atmospheric “thirst.” EDDI provides early warning for rapidly evolving flash droughts and indicates the persistence of ongoing drought.

Learn more at <https://www.usgs.gov/center-news/eddi-a-new-drought-index-provides-early-warning-flash-droughts>



Drought conditions in Wyoming. Credit: Jerrod Wheeler, USGS.



Marsh mangrove habitat. Credit: Mike Osland, USGS.

Coastal Resilience Through Natural Infrastructure

Northeast CASC researchers, in collaboration with Landscape Conservation Cooperatives (LCCs), published a synthesis of information related to four coastal habitats—tidal marshes, beaches and barrier islands, mangrove forests, and biogenic reefs. They compared the benefits, opportunities, and challenges of natural infrastructure (such as vegetative shorelines) in comparison to grey (such as sea walls and levees) and hybrid (grey and natural) approaches in each habitat. Study results related to using living shoreline techniques and incorporating ecological thresholds into coastal protection and restoration actions are available through the [Massachusetts Climate Action Tool](#).

Learn more at <http://necsc.umass.edu/news/new-publication-coastal-resilience-through-natural-infrastructure>

USGS-Led Study Could Help Pacific Wetlands Adapt to Sea-Level Rise

A study sponsored by the Northwest and Southwest CASCs introduced an innovative tool to help resource managers protect Pacific coastal wetlands from rising sea levels and provide insight into a range of futures for Pacific tidal wetlands. Study results indicate that the magnitude of marsh elevation lost will vary by site and rate of sea-level rise. The findings also show that even the lowest predicted rates of sea-level rise could cause significant losses of Pacific tidal wetlands by the end of the century. Losses were projected to be highest in the latter part of the 21st century and under the highest rates of sea-level rise.

Learn more at <https://www.usgs.gov/center-news/new-usgs-led-study-could-help-pacific-wetlands-adapt-sea-level-rise>



Great white egret at Seal Beach National Wildlife Refuge, California. Credit: Kat Powelson, U.S. Fish and Wildlife Service.



Pacific Northwest Biochar Atlas: Case Studies, Tools, and More

Growing research suggests that biochars (soil components that are produced by partially combusting organic waste material and are used to improve plant growth and health) can provide “win-win-win” solutions to sustain rural livelihoods, preserve natural ecosystems, and adapt to climate variability. The Pacific Northwest Biochar Atlas, funded in part by the Northwest CASC, provides case studies, tools, and more to assist regional users and producers of biochar.

Learn more at <http://www.pnwbiochar.org/>

Biochar study plots. Credit: U.S. Department of Agriculture.

Global Database on Historic Fossil Records Supports Global Change Research

The Director of the Southwest CASC and co-authors described the role and purpose of the Neotoma Paleocology Database, which supports interdisciplinary global change research by consolidating many types of data on taxon and community diversity, distributions, and dynamics during the large environmental changes of the past. The community-curated database draws together fossil pollen, vertebrate, plant-macrofossil, ostracod, diatom, insect, and other paleoecological data.

Learn more at <https://doi.org/10.1017/qua.2017.105>



Honey bee. Credit: Sarah Scott, USGS.



Puerto Rican coastline. Credit: U.S. Fish and Wildlife Service.

Downscaled Climate Change Projections Produced for Puerto Rico and the U.S. Virgin Islands

A Southeast CASC-funded project produced high-resolution climate scenarios for Puerto Rico and the U.S. Virgin Islands by using the Weather Research and Forecasting (WRF) model. The WRF model was used to generate downscaled regional projections of future climate conditions for the mid-21st century to assist decision makers with adaptation activities within Puerto Rico and the U.S. Virgin Islands. Model output parameters were chosen in consultation with local scientists and natural resource managers.

Learn more at <https://statesummaries.ncics.org/pr>

Capacity Building

The CASC network continues to support research, education, and training opportunities that enable young and early career scientists and managers to better understand the impacts of a changing climate on fish and wildlife resources.

Early Career Experts Essential for Planetary Sustainability

An NCASC researcher and colleagues evaluated how intergenerational partnerships and interdisciplinary collaboration can enable early career experts to contribute to a sustainable future, particularly through intergovernmental organizations. The researchers found that strong institutional cultures that promote intergenerational learning and involvement cultivate emerging leaders and sustainable decision making for the future.

Learn more at <https://doi.org/10.1016/j.cosust.2018.02.004>



Attendees of the 2016 National Climate Adaptation Science Center National Student and Early Career Training. Credit: Toni Klemm, University of Oklahoma.



Measuring Rio Grande cutthroat trout. Credit: Abigail Lynch, USGS.

Student Spotlight: Cutthroat Trout Conservation

In New Mexico, nonnative brown trout are the most widespread invasive trout species, and they can tolerate a broader range of water temperatures than native Rio Grande cutthroat trout. Brown trout are also larger and stronger than cutthroat trout. A New Mexico State University graduate student is conducting NCASC-supported research to explore strategies to conserve Rio Grande cutthroat trout populations facing a changing environment.

Learn more at <https://www.usgs.gov/center-news/nmsu-graduate-student-researches-cutthroat-trout-decline>

Student Research Identifies Areas Where Evolution Could Rescue Animals Threatened by Climate Change

A former Southeast CASC-supported research fellow, who is now with the Northeast CASC, and an international team have identified areas that could foster rapid “evolutionary rescue” of species particularly vulnerable to climate change. Together they mapped “polymorphic zones” for eight color-changing species, including hares, weasels, and the Arctic fox. In polymorphic zones, brown- and white-coated individuals coexist in winter, making these areas primed to promote rapid evolution toward coats remaining brown in winter instead of changing to white as climate changes and winters become shorter.

Learn more at <https://www.usgs.gov/center-news/research-identifies-areas-where-evolution-could-rescue-animals-threatened-climate-change>



Snowshoe hare in Denali National Park and Preserve, Alaska. Credit: Tim Rains, National Park Service.

Student Research Explores How Beavers Can Reduce Climate Change Impacts on Watersheds

A Northwest CASC fellow partnered with the Tulalip Tribes of Washington State to conduct research on how beaver activity in northwestern U.S. mountain streams could help to reduce the impacts of climate change on watersheds. As ecosystem engineers, beavers have the capacity to not only protect existing ecosystem functions but also to buffer against future changes and habitat alterations. This research focused on the use of beaver reintroduction as an adaptation strategy to address impacts of climate change on streamflow and temperature. The Tulalip Tribes plan to use the findings of this research to initiate and monitor beaver reintroduction within priority areas.

Learn more at <https://nwcasc.uw.edu/science/project/targeting-beaver-reintroductions-to-address-climate-impacts/>



Beaver. Credit: Jim Eklund, National Park Service.



Makapu'u Point, Hawai'i.
Credit: Bradley Romine, University of Hawai'i.

Pacific Islands CASC Graduate Student Earns International Recognition

A graduate student at the University of Hawai'i (UH) at Hilo was recognized with one of four Excellent Awards from the Institute of Mathematics for Industry at Kyushu University, Japan, for a poster presentation at the Forum "Math-for-Industry" conference held at UH Mānoa. This Pacific Islands CASC-funded work was developed out of the Manager Climate Corps program at UH Hilo. The research aimed to quantify past and present shoreline change rates along three geologically diverse coastal stretches by comparing historical images with newly acquired unmanned aerial system imagery. The student compared the results with sea-level rise projections to estimate future effects to coastlines. The results are being used by Hawai'i County in coastal management and adaptation decision making.

Learn more at http://pi-casc.soest.hawaii.edu/news/2017_10_30_RoseHart_IMIAward.pdf

Online Climate Change Impacts Course Informs Resource Managers About Planning for the Future

The South Central CASC designed a course titled "Managing for a Changing Climate" to help resource managers understand the components of the climate system and what is causing the system to change. Course participants learn about the impacts of a changing climate and how various groups are adapting to these changes. The 60 videos associated with this course can be accessed for free on the [South Central CASC YouTube channel](#).

Learn more at <https://www.sciencebase.gov/catalog/item/551aa76ee4b0323842783721>

Tribes and Indigenous Communities

The CASCs work with Tribes and indigenous communities to better understand their specific vulnerabilities to climate change and build their capacity for adapting to these impacts. To strengthen the CASCs' work with Tribes and indigenous communities, the DOI's Bureau of Indian Affairs has placed Tribal Resilience Liaisons at the CASCs. These Tribal Resilience Liaisons conduct and support research projects, outreach events (such as cultural festivals), training workshops, stakeholder meetings, youth internships, and other coordination activities.

Learn more at <https://www.usgs.gov/land-resources/climate-adaptation-science-centers/native-communities>



Puyallup Tribe canoe paddlers, volunteers, and members of the U.S. Air National Guard carry a heavy wooden dugout canoe across mudflats on the Puget Sound, Washington. Credit: Chas Jones, Affiliated Tribes of Northwest Indians, Northwest CASC.

Micro-Drought at the Wind River Indian Reservation

In 2015, the Wind River Indian Reservation in Wyoming experienced micro-drought conditions—harmful water shortages that occurred despite an overall wetter-than-normal status. Researchers supported by the North Central CASC described the processes that led to the 2015 micro-drought, providing insights to help guide drought assessments and preparedness at local scales.

Learn more at <https://doi.org/10.1016/j.crm.2017.09.004>



Wind River Indian Reservation, Wyoming. Credit: public domain.



Map showing tribes within the Northeast Indigenous Climate Resilience Network. Credit: Northeast Indigenous Climate Resilience Network.

Supporting Relationships Between Tribes and Climate Science

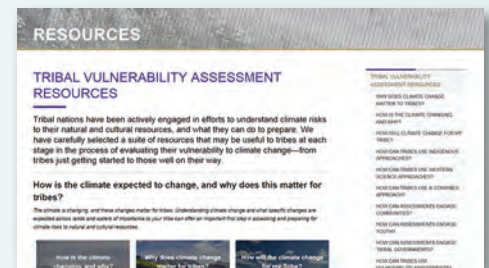
Indigenous peoples and Tribal communities from the Great Lakes and St. Lawrence region in eastern Canada are threatened by the uncertainty of changing environmental trends, such as shifting lake levels and patterns of precipitation. A Northeast CASC-funded project, led by a member of the College of Menominee Nation, developed climate scenario planning activities with these Tribes.

Learn more at <https://necsc.umass.edu/indigenous-peoples-and-tribal-partners/?g=2.66596458.558602336.1545235192-1418087687.1544548669>

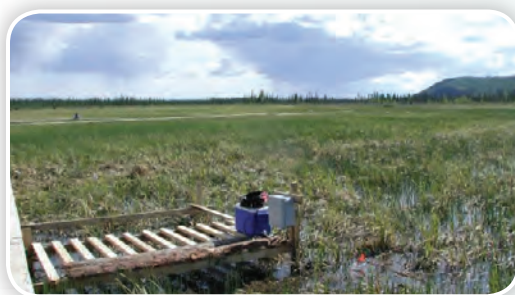
New Tribal Vulnerability Resources for Northwest and Great Basin Tribes

Through a project supported by the Northwest CASC, the University of Washington Climate Impacts Group released a suite of resources designed to help Northwest and Great Basin Tribes assess climate risks to natural and cultural resources. The Tribal Climate Tool provides interactive maps, graphs, and reports summarizing projected changes in climate for the Northwest and Great Basin regions. Additionally, the Tribal Climate Technical Support Desk offers rapid response to queries about the vulnerability assessment process.

Learn more at <https://www.usgs.gov/center-news/new-resources-support-tribes-preparing-climate-change>



Screenshot from the University of Washington Climate Impacts Group website.



Bonanza Creek, Alaska. Credit: Mark P. Waldrop, USGS.

Local Climate Information for Tribal Communities

To prepare for rapid climate changes occurring across the State, Alaska Native communities need high-resolution information about the effects they might face locally. Alaska CASC researchers and their Tribal Liaison developed and shared information on climate change effects at several workshops and meetings with Tribal communities across the State. Additionally, Alaska CASC researchers and the Northwest Boreal LCC worked with local Tribes to publish a paper on indigenous citizen science research and launched a [map-based search tool](#) to help local managers locate science about their region.

Learn more at <https://doi.org/10.5334/cstp.123>

Climate 101 Workshop

The South Central CASC held a workshop titled “Climate 101” at the Southwestern Indian Polytechnic Institute as part of the National Tribal Geographic Information System Conference. The training covered basic climate science, the process of vulnerability assessments, and potential funding opportunities for those interested in pursuing climate adaptation. The training, which was originally intended for 20 participants, was expanded to accommodate nearly 40 participants because of high demand.

Partnerships

Effective identification of and response to the challenges of climate change require close collaboration between managers and scientists. Ongoing partnerships with Federal agencies, Tribes, State and local governments, nongovernmental organizations, and the public guide our research priorities and activities.

Southeast CASC Working to Improve the Use of Climate Science in U.S. Fish and Wildlife Service Species Status Assessments

In 2018, the Southeast CASC Deputy Director and a Southeast CASC research ecologist participated in the annual summit of the Species Status Assessment (SSA) Framework Implementation Team. They presented on how to support the improved use of climate science and climate model projections by U.S. Fish & Wildlife Service (USFWS) species biologists and SSA teams. The USFWS can use this information to inform a range of decisions under the Endangered Species Act. The Southeast and Northeast CASCs are planning for pilot projects in 2019 that can provide dedicated scientific and technical analyses to support SSA efforts in the Eastern United States.

Learn more at <https://globalchange.ncsu.edu/southeast-casc-scientists-improving-use-of-climate-science-in-species-status-assessments/>



Eastern indigo snake.
Credit: public domain.



USGS Researchers Help Find Solutions to Fisheries Challenges at Fishackathon

NCASC fish biologists participated in a Fishackathon in 2018. The Fishackathon event brings together thousands of concerned designers, developers, and subject matter experts to build practical technical solutions to endemic fisheries problems. Fishackathon events present fisheries challenges to teams who have expert mentors to help hone their ideas into projects that will solve real-life problems.

Learn more at https://www.uma.es/media/files/Fishackathon_2018_Challenge_Statements_.pdf

Regional Climate Response Collaboratives: Multi-Institutional Support for Climate Resilience

How do regional, multi-institutional collaborations benefit climate science? North Central CASC researchers outlined how a regional collaborative program formed in the Rocky Mountain west and northern plains region is working to support climate resilience. They shared lessons learned, discussed the conditions that fostered successful collaboration, and suggested mechanisms for overcoming potential barriers.

Learn more at <https://doi.org/10.1175/BAMS-D-17-0183.1>



Glacier National Park. Credit: Greg Pederson, USGS.



Maple syrup tapping. Credit: public domain.

Impacts of Climate Change on Sugar Maple and Maple Sugaring

The Northeast CASC brought together researchers and collaborators from State and Federal agencies, Tribes, and private industry from around the region for a special series at the annual Forest Ecosystem Monitoring Cooperative conference. The session addressed the impacts of climate change on sugar maple distribution, syrup quality, and tapping timing.

Learn more at <https://blogs.umass.edu/acernet/video/>

A Path to Actionable Climate Science: Perspectives from the Field

The Northwest CASC explored its unique role and experience in pursuing science that is coproduced (collaboratively created by scientists, decisionmakers, and other stakeholders with the intention of making the science useable in practice) and actionable (decision-relevant). The authors identified the most significant challenges and possible solutions for the Northwest CASC and others using these approaches.

Learn more at <https://doi.org/10.1007/s00267-017-0960-y>

Whitebark pine. Credit: Diane Renkin, National Park Service.



Waipi'o Valley, Hawai'i. Credit: Alan Cressler, USGS.

Using Coproduction to Facilitate Climate Change Adaptation on Hawai'i Island

Pacific Islands CASC-supported scientists report on their progress toward developing the Manager Climate Corps (MCC), a new knowledge coproduction program that involves managers and UH Hilo faculty, staff, and graduate students. This program builds upon existing local relationships between researchers and managers to develop science that addresses climate change and local ecosystem management needs.

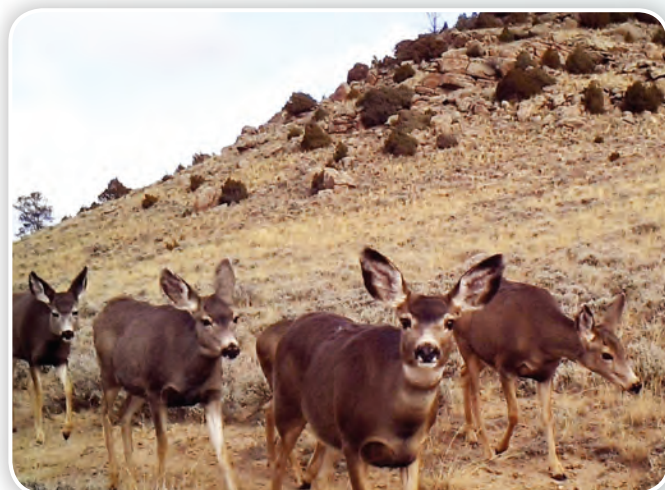
Learn more at <https://www.usgs.gov/center-news/using-coproduction-facilitate-climate-change-adaptation-hawai-i-island>

Listening Sessions Hosted by the South Central CASC

The South Central CASC conducted several listening sessions in 2018 to gather input from State, Federal, nongovernmental, and Tribal organizations that manage natural and cultural resources in the South Central region (New Mexico, Texas, Oklahoma, and Louisiana). During the sessions, the South Central CASC provided stakeholders with information on the CASC network and its mission and highlighted high-resolution climate projections. The South Central CASC heard from stakeholders about science needs in the region and discussed how South Central CASC science could be incorporated into planning efforts.



New Mexico vista. Credit: Abigail Lynch, USGS.



Mule deer in Wyoming. Credit: Matthew Kauffman, USGS.

Aiding Resource Managers with a Wildlife Health Initiative

Scientific information on changing environmental conditions and emerging and intensifying fish and wildlife diseases is limited. To help provide State and Federal resource managers with science to inform management and facilitate adaptation to change, the Northeast CASC is leading an effort among the national and regional CASCs to identify priority research themes and management opportunities that can prepare resource managers for new and more intense disease effects on fish and wildlife. The Northeast CASC is working with the USGS National Wildlife Health Center to convene an advisory committee, lead a synthesis of the best available science, and lead a national workshop of resource managers and experts in fish and wildlife disease and changing environmental conditions.

Learn more at <https://necsc.umass.edu/projects/synthesis-current-and-future-risks-climate-change-wildlife-health-and-identification>

Researcher and Center Achievements and Awards

The CASCs have a talented and dedicated group of personnel and researchers. In recognition of this excellence, numerous individuals and Centers are periodically acknowledged for their contributions. Congratulations to all of our recognized scientists, and thank you to all of the CASC personnel who continue to make our work possible!



USGS NCASC fish biologist Abigail Lynch.

NCASC Fish Biologist Receives the American Fisheries Society Emerging Leaders Mentorship Award

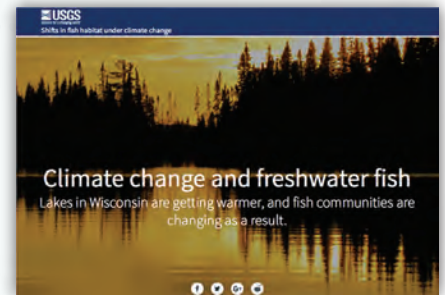
The AFS Emerging Leaders Mentorship Award Program was established to develop future leaders of the Society, and the fisheries profession as a whole, by providing selected candidates an opportunity to participate for 1 year in activities of the AFS Governing Board. NCASC fish biologist Abigail Lynch received the award for her work on sustainable inland fisheries and her community outreach and education efforts.

Learn more at <https://fisheries.org/about/awards-recognition/call-for-award-nominations/emerging-leaders-mentorship-award/>

Northeast CASC Project Receives USGS Shoemaker Award

The Northeast CASC-funded decision-support tool and interactive website “Shifts in Fish Habitat Under Climate Change” won a prestigious USGS award, the Shoemaker Award for External Communications Excellence. The Shoemaker Communications Awards were established to recognize extraordinary examples of communicating and translating complex scientific concepts and discoveries into words and pictures that capture the interest and imagination of the American public or increase knowledge and understanding among USGS employees about the USGS’s mission.

Learn more at <https://www.umass.edu/necsc/news/climate-change-and-freshwater-fish-product-wins-usgs-communications-excellence-award>



Screenshot from the “Shifts in Fish Habitat Under Climate Change” website.



Renee McPherson, University Director for the South Central CASC.

South Central CASC University Director Receives the American Meteorological Society Charles E. Anderson Award

The American Meteorological Society Charles E. Anderson Award is given to individuals who exemplify “extraordinary, sustained efforts to broaden participation of traditionally underrepresented individuals in STEM [science, technology, engineering, and mathematics] research and education, particularly women and Native Americans.” South Central CASC University Director Dr. Renee McPherson has done this throughout her career by working to create opportunities for students, researchers, and other staff from underrepresented minorities.

Learn more at <https://www.usgs.gov/center-news/south-central-casc-university-director-renee-mcpherson-receives-ams-charles-e-anderson>

Southeast CASC Project Recognized with DOI Environmental Achievement Award

The Southeast CASC project “Protecting Cultural Resources in the Face of Climate Change” received honorable mention for the DOI Environmental Achievement Award under the “Cultural Resources Protection” category, which recognizes efforts to promote and protect cultural resources to showcase the Department’s stewardship of its extensive cultural resources, including archaeological sites, historic buildings and sites, cultural and historic landscapes, and Tribal trusts.

Learn more at <https://www.usgs.gov/center-news/southeast-casc-project-recognized-doi-environmental-achievement-award>



Cape Lookout National Seashore, North Carolina. Credit: Erin Seekamp, North Carolina State University.

Beyond the Science

Beyond delivering science to address stakeholder-defined priority climate needs, CASC researchers also contribute to other diverse initiatives, such as science leadership, women in science, and science communication. These activities also strengthen and add to the research community.

A Voice for All: Cultivating Leadership, Diversity, and Inclusivity in Academia

After seeing how the “Leadership Workshop for Early Career Women in Science” motivated participants and the broader University of Alaska (UA) Fairbanks community in unexpected ways, workshop co-organizer and Alaska CASC Program Coordinator Jane Wolken co-organized a workshop titled “Mindful Leadership: Creating a Diverse and Inclusive UA.” Wolken reflected on her experience in a post for the American Geophysical Union blog “The Plainspoken Scientist,” writing “Following both workshops I asked myself, can individuals or small groups of people make a difference? YES.”

Learn more at <https://www.usgs.gov/center-news/a-voice-all-part-i-cultivating-leadership-diversity-and-inclusivity-academia>



Participants of the workshop “Mindful Leadership: Creating a Diverse and Inclusive UA.” Credit: Heather McFarland, University of Alaska Fairbanks.



Compilation of photographs from the USGS science moms.

A Snapshot of Women of the U.S. Geological Survey in STEM and Related Careers

A publication celebrating the careers and achievements of women in the USGS from the very first—Florence Bascom, hired in 1896—to today. The report highlights the roles and experiences of some of the women who have been pathfinders as scientists, cartographers, editors, and professional support staff at the USGS. It includes spotlights on Northeast CASC research ecologist Toni Lyn Morelli and former Northeast CASC Director Mary Ratnaswamy.

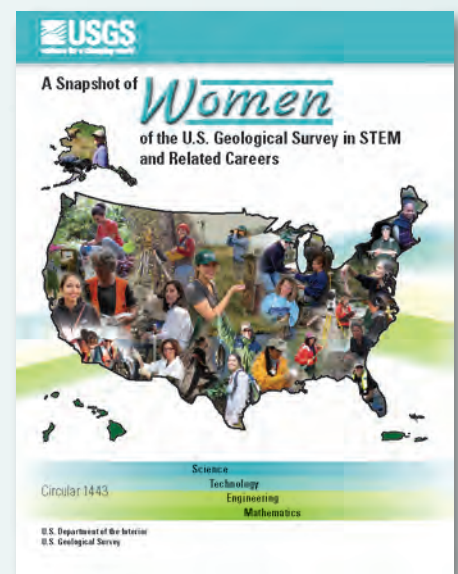
Learn more at <https://doi.org/10.3133/cir1443>

Cover of the “A Snapshot of Women of the U.S. Geological Survey in STEM and Related Careers” report.

Science Moms: Navigating Work and Life

In celebration of Women’s History Month in March 2018, the Early Career Climate Forum and the Fisheries Blog joined forces to highlight the personal stories of female researchers in these scientific networks by showcasing perspectives from the NCASC and the CASCs. They spotlight 4 female scientists who are active researchers and moms.

Learn more at <https://eccforum.org/how-achieve-work-life-balance-stories-success-csc-science-moms>



Pacific Islands CASC Place-Based Projects Highlighted in “Voice of the Sea” Episode

Three place-based research projects funded by the Pacific Islands CASC were highlighted in an episode of the University of Hawai‘i Sea Grant College Program-produced science program “Voice of the Sea.” In the episode “Adapting Culture to Climate Change,” the program explores how researchers from UH Hilo work with cultural practitioners and community members to understand and adapt to effects of climate change while promoting traditional practices and community connections.

Learn more at <https://www.usgs.gov/center-news/voice-sea-highlights-pi-casc-newest-episodes>



A frame from the “Voice of the Sea” episode.

South Central CASC Researcher Appears in the Documentary “The Underwater Forest”

South Central CASC researcher Dr. Kristine DeLong of Louisiana State University was asked to appear in a documentary on an ancient cypress forest in the Gulf of Mexico. The documentary, which was produced by This is Alabama, describes the discovery and exploration of an ancient cypress forest. The forest dates back to a time when sea levels were 400 feet lower than they are today and can provide researchers with paleoclimate data from 60,000 years ago.

Learn more at <https://www.youtube.com/watch?v=PKm0eRfFFfo>



A frame from the documentary “The Underwater Forest.”

Cypress swamp at Big Lake National Wildlife Refuge, Arkansas.
Credit: Jeremy Bennett, U.S. Fish and Wildlife Service.

Learn more about the NCASC and the CASCs at <https://www.usgs.gov/land-resources/climate-adaptation-science-centers>