SOUTH CENTRAL CLIMATE SCIENCE CENTER

2013 Annual Report

March 1, 2013 - February 28, 2014

This year's highlights:

- Began evaluation of global and down-scaled climate projections for the region
- Initiated CSC-related, multi-institution research projects funded by NSF and USDA
- Hosted a research planning workshop and a climate communications workshop
- Conducted five workshops to engage with Tribes and drafted a Tribal Engagement Plan

SOUTH CENTRAL
CLIMATE SCIENCE CENTER

Helping to solve real problems in a variable and changing climate

The South Central Climate Science Center is one of eight regional Climate Science Centers that are managed by the U.S. Geological Survey (USGS). Established in 2012, the South Central Climate Science Center is a research collaboration between the USGS, University of Oklahoma, Texas Tech University, Chickasaw Nation, Choctaw Nation of Oklahoma, Oklahoma State University, Louisiana State University, and the Geophysical Fluid Dynamics Laboratory of the National Oceanic and Atmospheric Administration. The South Central Climate Science Center collaborates with a wide range of Landscape Conservation Cooperatives, tribes, state and Federal agencies, universities, and non-governmental organizations.

Our research

The USGS Climate Science Centers are working across regions of the United States to develop and bring critical science results to managers and stakeholders concerning impacts of climate variability, trends, and extremes with the goal of developing strategies to minimize economic, sociological, and ecological consequences. Priority science activities include measurement, modeling, and decision support that are related to the impacts of climate on natural and cultural resources.

Our region

Water, energy, agriculture, native peoples, and rapidly growing metropolitan areas intersect with a highly variable and changing climate to frame many of the risks, challenges, and opportunities for natural and cultural resources in the south-central United States. National parks, scenic waterways, tribal and trust lands, and other protected areas are prevalent across the region. Spatial and temporal changes in the south-central climate are linked to changes in biodiversity; key wildlife habitats; wetlands quality and extent; stream sedimentation and flow; range and density of heritage and invasive species; cultural and natural landscapes; water quality; pathogen outbreaks; and health of ecosystem services. Changes in the region also result from other stressors; hence responses to climate change must be examined in combination with land cover/use change, habitat fragmentation, increasing population, pollution, invasive species, increasing demand for natural resources, and other stressors.

The south-central U.S. encompasses 20 ecoregions, resulting from a significant gradient in annual average precipitation, from 60 inches in coastal areas to 6 inches in the deserts.

Overview

The South Central Climate Science Center (SC-CSC) was funded by the U.S. Geological Survey on March 1, 2012. This University of Oklahoma-led Consortium includes Texas Tech, Oklahoma State, and Louisiana State universities, Chickasaw Nation, Choctaw Nation of Oklahoma, and NOAA's Geophysical Fluid Dynamics Lab. During 2013, we focused on building regional capacity by connecting researchers and pursuing large, inter-institutional funding opportunities.

First South Central CSC Assistant Director

The SC-CSC welcomed Dr. Mike Langston (right) as our new Assistant Director. Dr. Langston has a B.S. in Wildlife Ecology from Oklahoma State University, an M.S. in Ecology from the University of Central Florida, and a Doctorate in Environmental Science (emphasis in water policy) also from OSU.

Dr. Langston most recently served as the Assistant Director of the Oklahoma Water Resources Research Institute from 2004 until 2014. Prior to that, he worked for 14 years with an environmental research and consulting firm in Florida where most of his research focused on treating wastewater using wetlands, wetland's ecology, and the ecology of threatened or endangered species.

Since returning to Oklahoma in 2000, his research interests and experience have included developing protocols for involving stakeholders in watershed management decisions, water policy development, and the nexus of water and energy development. Dr. Langston was instrumental in putting together and moderating many of the stakeholder meetings conducted during the development of the recent Oklahoma Comprehensive Water Plan.

Co-located Great Plains LCC Coordinator

Dr. Nicole Athearn (left) was selected by the US Fish and Wildlife Service as the Coordinator of the Great Plains Landscape Conservation Cooperative; a position now hosted at the SC-CSC's main office space in Norman, Oklahoma. Dr. Athearn previously led a team in implementing a Strategic Habitat Conservation approach to the FWS's conservation and restoration activities in the Klamath River watershed, including a structured process to select surrogate species for addressing watershed-scale conservation needs.

Dr. Athearn's focus is on integrating science with management decision making, often through the development and use of models as well as decision support and data management frameworks. She supports a collaborative approach to problem-solving and seeks to help bring relevance and focus to research to better address management information needs in support of greater conservation effectiveness. Co-locating Dr. Athearn at the SC-CSC main office strengthens ties between the SC-CSC and the LCCs in its region, brings direct stakeholder input to the research process, and increases the capability of the SC-CSC to produce actionable science.

Consortium Researchers and Students

To formalize the relationship with researchers conducting non USGS-funded yet CSC-relevant work in the region, the SC-CSC will begin an "Affiliate Program" in May 2014. Benefits of affiliate membership include notification of new requests for proposals, an invitation to the annual SC-CSC research workshop, and the ability to have new research or publications featured on the SC-CSC website and Facebook page.

Associated:	Faculty	Staff	Students
University of Oklahoma	11	6	5
Texas Tech University	14	4	4
Louisiana State University	12		5
Chickasaw Nation		2	
Choctaw Nation of Oklahoma		2	
Oklahoma State University	19	4	6
NOAA's GFDL*	--	--	--

* Unable to participate as a full consortium partner due to lack of funding from USGS.

South Central CSC Base Funding

During the first two grant years, the SC-CSC Consortium expended $1,159,082 of the budgeted amount of $1,390,868 (83.34%). Delays in the hiring of faculty, staff, and students resulted in departures from the budgeted expenditures for salary, fringe benefits, tuition, and the associated indirect costs. The Consortium has developed a plan to expend the remaining funding and submitted written commitments to USGS stating that there will be no remaining carryover by the end of the third grant year. As of February 28, 2014, only two of five funding agreement packages awarded to NOAA's GFDL by USGS since the inception of the SC-CSC have passed legal review and been put into effect.

Year 1 & 2:	Received	Expended	Percent Expended
University of Oklahoma	$627,746	$582,423	92.78%
Texas Tech University	$195,235	$195,235	100.00%
Louisiana State University	$153,298	$104,319*	68.05%
Chickasaw Nation	$217,610	$156,442*	71.89%
Choctaw Nation of Oklahoma	$0	$0	--
Oklahoma State University	$149,469	$73,219*	48.99%
NOAA's GFDL	$47,510**	$47,444**	99.86%

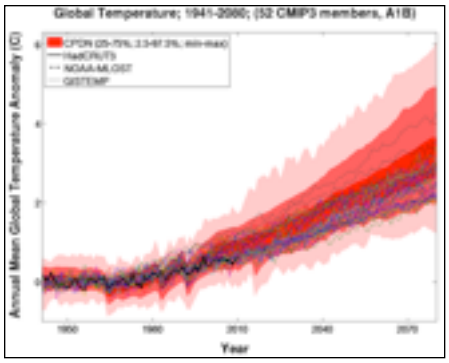
* Actual expenses through Jan 2014. Estimated expenses for Feb 2014.
** Year 1 only. USGS has not transferred Year 2 funding to GFDL.

Advisory Committee on Climate Change and Natural Resource Science

South Central CSC University Director and University of Oklahoma Vice President for Weather and Climate Programs, Dr. Berrien Moore, III, was appointed to a newly created federal advisory committee that provides guidance about the Interior Department's climate change adaptation science initiatives to Secretary Jewell. The Advisory Committee on Climate Change and Natural Resource Science advises the Secretary of the Interior about the USGS National Climate Change and Wildlife Science Center and the Department of Interior Climate Science Centers. Dr. Moore's alternate on the committee is Dr. Paul Risser, Chair and Chief Operating Officer of the University of Oklahoma University Research Cabinet and SC-CSC co-investigator.

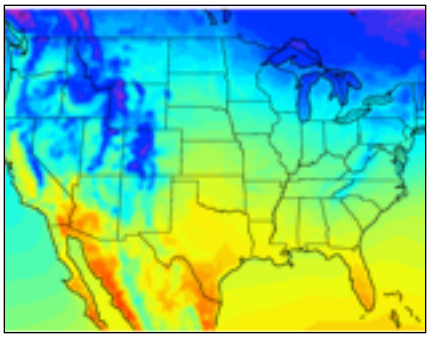
Global and Downscaled Climate Projections

Understanding Uncertainty in Global Climate Model Projections



Information on the uncertainties in projections of future climate change is vital for their effective use across a wide range of applications. Dr. Derek Rosendahl, a SC-CSC post-doctoral research associate, examined a multi-thousand member perturbed-physics ensemble of global climate model (GCM) simulations to better estimate model uncertainties in climate change projections for the globe and the North American region. Ensemble members were generated by the distributed computing project climateprediction.net at the University of Oxford, where thousands of simulations of the Hadley Centre HadCM3L model were run on PCs across the globe. Initial results demonstrate that this ensemble contains a significantly larger range of uncertainty in comparison to the CMIP3 and CMIP5 multi-model ensembles for global and North American regional temperature and precipitation across the 20th and 21st centuries. This work will now inform a full performance evaluation of GCMs across the historical past for the South-Central U.S region in order to better constrain future projections.

Evaluation of Statistical Downscaling Techniques



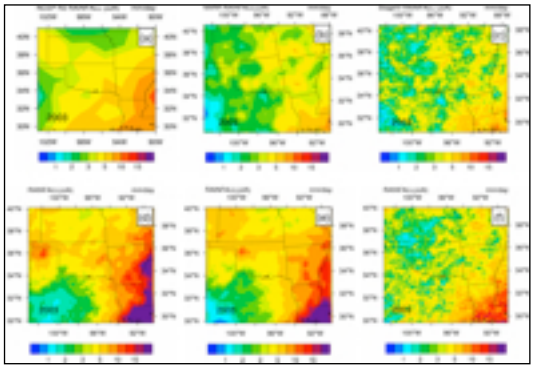
GCM results typically lack fine-scale detail and may contain biases that make it inappropriate to use the raw GCM output in studies of projected regional or local-scale climate impacts. Informed by observational data sets, statistical downscaling (SD) techniques are often applied to refine GCM output in an attempt to account for shortcomings in a GCM's simulation of local climate. It typically is assumed that the skill exhibited by a SD method during the historical period will be retained in the future even as the climate is changing - an untested assumption with potentially large implications for the quality of SD output used as input to climate impacts analyses. Dr. Carlos Gaitan, a SC-CSC post-doctoral research associate, is working with collaborators at NOAA's GFDL to test this assumption. Dr. Gaitan is working on a novel experimental design, known as a "Perfect Model" design, to compare the downscaled models' performance for both historical and future periods through the use of synthetic data.

Derived Downscaled Climate Projection Portal

Drs. Katharine Hayhoe and Anne Stoner of Texas Tech University created a web portal that allows visualization and downloading of future climate projections from a group of statistically downscaled GCMs in collaboration with USGS' Center for Integrated Data Analytics. The team used temperature and precipitation projections from these GCMs to calculate derivative climate indicators that measure the number of days that exceed certain thresholds. All derivative climate indicators in the portal were derived from a suite of atmospheric-oceanic GCM simulations from the CMIP3 archive using four scenarios from the IPCC Fourth Assessment Report. The user can control what is shown on the map and the plot window using an interactive toolbar.
The portal can be accessed at: http://cida.usgs.gov/climate/derivative/

Very High-Resolution Dynamic Downscaling of Regional Climate

In collaboration with the Center for Analysis and Prediction of Storms, the SC-CSC hired a Senior Visiting Scientist from Nanjing University, Dr. Xuguang Sun. Dr. Sun is working to successfully demonstrate the ability to run long-term (multi-year), convection-permitting simulations with improved projection over current, coarser resolution GCM runs. Seven years of model simulations were generated at 4-km grid spacing with several additional runs made at 25 km over a domain covering much of the Southern and Central Plains, Texas, and northern Mexico. Model output was compared against the driving reanalysis and gridded observational datasets, including Stage IV and PRISM precipitation during the experiment periods. Preliminary results have found significant improvement in using high-resolution dynamical downscaling to improve model representation of high-rainfall events. Furthermore, this work has permitted the relative performance comparison of various model parameter schemes when coarser resolution runs are required.

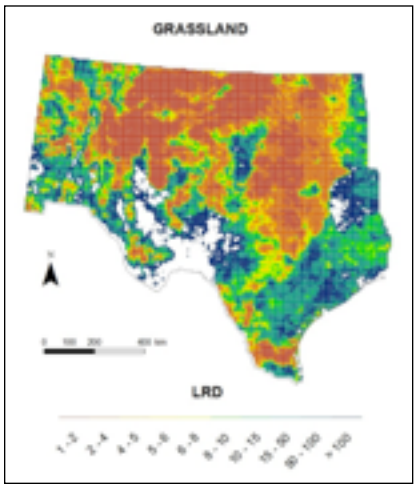


South Central Climate Science Center Research Projects

Tribal Perspectives on Changing Climate (PI-Smith, OU)

Under the guidance of Dr. Laurel Smith, Assistant Professor at the University of Oklahoma, Masters student Paulette Blanchard and Native media makers Filoteo Gómez Martínez and Jeffery Palmer traveled across Oklahoma and New Mexico to document the perspectives of Tribal citizens on the region's changing climate. Participants were interviewed by the team about their personal experiences with climate change and their understanding of and concerns about the unique impacts that Tribal peoples face. The team created *Listening for the Rain*; a short film that not only illustrates some of the environmental transformations distinguishing the diverse Tribal landscapes in our region, but also suggests some of the proactive solutions and ideas for addressing these issues that are currently being undertaken in Indian Country.
Listening for the Rain is available online at: http://vimeo.com/91082165

Terrestrial Connectivity and Land Use Change (PI-Baum, OSU)



Dr. Kristen Baum, Associate Professor at Oklahoma State University, and Dr. Elena Lopez Zozaya, post-doctoral scholar, evaluated terrestrial connectivity across the South Central United States in order to predict patterns of connectivity necessary to sustain wildlife populations and communities. They evaluated species which vary in habitat preferences, scales of habitat selection, and responses to the matrix (area between habitat patches). They also evaluated the implications of predicted land use change across the study area, including a focus on climate change and dominant land uses within the region. Their specific objectives include 1) Quantify terrestrial connectivity across the South Central United States, 2) Evaluate the effect of land use change (including climate change) on terrestrial connectivity, and 3) Develop a framework for applying terrestrial connectivity analyses to specific species given different levels of existing information. The project provides a framework for conducting large-scale, cross-taxa assessments of connectivity for identifying factors that contribute to biodiversity loss within the region.

Socio-ecological Assessment of Ecosystem Services (PI-Vaughn, OU)

Dr. Caryn Vaughn, Professor at the University of Oklahoma, and Dr. Antonio Castro, post-doctoral research associate at the Oklahoma Biological Survey, are using an ecosystem services framework to examine how different water management/environmental flow scenarios in the Kiamichi River watershed affect the delivery of ecosystem services, and thus contribute to the wellbeing of people living both in and outside the watershed. The Kiamichi River watershed in southeastern Oklahoma is at the center of intense conflict over water ownership and use. Missing from these disputes are the needs of the watershed's rich animal and plant life, including three federally endangered freshwater mussels. Drs. Vaughn and Castro's approach involves mapping the spatial delivery of a selection of watershed services, and then exploring the tradeoffs between their biophysical, socio-cultural and economic values. They can then examine the tradeoffs between different water management strategies and share their results with policy makers and managers.

Grant Funding

In January 2013, the USGS issued a request for proposals for FY13 science funding, resulting in nine funded proposals for the SC-CSC region (five Consortium-led and four USGS-led). The following Consortium-led grants were selected for funding by USGS through the annual supplemental research funding call for FY13:

Regional Graduate Student, Post-Doc, and Early Career Researcher Workshop
Renee McPherson (OU), PI – 1 year, $50,959

Very High-Resolution Dynamic Downscaling of Regional Climate
Ming Xue (OU), PI – 1 year, $23,938

Predicting Sky Island Forest Vulnerability to Climate Change: Fine Scale Climate Variability, Drought Tolerance, and Fire Response
Dylan Schwilk (TTU), PI – 2 years, $99,937

Impacts of Climate Change on Flows in the Red River Basin
Wayne Kellogg (Chickasaw Nation), PI –2 years, $291,580

Expanding a Standardized Framework for the Evaluation and Intercomparison of Statistically Downscaled Climate Projections
John Lanzante (GFDL), PI – 1 year, $124,393

* As of February 28, 2014, USGS has not transferred funds for GFDL's portion of this project ($67,650).

In May 2013, the USGS issued a request for proposals for FY14 science funding. The SC-CSC Consortium submitted multiple Statements of Interest, resulting in seven invitations to submit full proposals. Final decisions for this supplemental research funding call have not been announced.

Utilizing the collaborative infrastructure created by the SC-CSC Consortium, additional proposals were developed and submitted to other agencies, including the U.S. Department of Defense, the National Oceanic and Atmospheric Administration, and the National Science Foundation.

Selected funded SC-CSC related grants include the following:

Facilitating adaptive management under conditions of rapid drought onset using the GOES-based evaporative stress index
Mark Shafer (OU), co-PI – 2 years, $149,350 from the National Oceanic and Atmospheric Administration

Understanding the Ecology of Lesser Prairie-Chickens in Conservation Reserve Program Dominated Landscapes with Implications toward Lesser Prairie-Chicken Management in Texas
Blake Grisham (TTU), PI – 1 year, $103,000 from National Resource Conservation Service

Climate Change Impacts at Department of Defense Installations
Katharine Hayhoe (TTU), co-PI – 2 years, $1,060,272 from the U.S. Department of Defense

Assessment of the geochemical signals in corals from Veracruz Mexico for reconstructing environmental conditions in the southwest Gulf of Mexico
Kristine DeLong (LSU), PI – 1 year, $136,827 from the Louisiana State Board of Regents

Climate Training for Native American Tribes
April Taylor (Chickasaw Nation), co-PI – 1 year, $99,599 from the National Oceanic and Atmospheric Administration

2013 Tribal Climate Change Adaptation Learning Project
April Taylor (Chickasaw Nation), co-PI – 1 year, $146,992 from the Bureau of Indian Affairs

Selected SC-CSC related grants in review include the following:

Integrated Social and Natural Systems Approach for Sustainability of the Arbuckle-Simpson Watershed
Renee McPherson (OU), PI – 5 years, $3,914,070 from the National Science Foundation

Development and Application of Convection-Permitting Ensemble Regional Climate Simulations for Downscaled Decadal Projections of Precipitation and Other High Impact Climatological Variables
Ming Xue (OU), PI – 5 years, $2,685,436 from National Science Foundation

Water Sustainability and Climate of the Southern High Plains
Katharine Hayhoe (TTU), co-PI – 4 years, $3,000,000 from National Science Foundation

Assessing the Dynamics of Poverty Traps and Mangrove Ecosystem Services in Coastal Tanzania
Victor Rivera-Monroy (LSU), co-PI – 1 year, $117,954 from the National Science Foundation

Water and Climate GIS Training for Native American Tribes
April Taylor (Chickasaw Nation), co-PI – 1 year, $21,000 from the U.S. Geological Survey, Bureau of Reclamation

Leveraging South Central CSC Resources

Adapting Socio-ecological Systems to Increased Climate Variability

In this five-year project, Oklahoma Experimental Program to Stimulate Competitive Research is advancing our understanding of how socio-ecological systems can adapt sustainably to increased climate variability caused by a changing climate. This knowledge will be used to empower managers to effectively adapt socio-ecological systems to climate variability and educate Oklahomans about the expected consequences of regional environmental change. Complex human, climate, and natural resource systems are being examined through the use of three interlinked research focus areas. These are: a socio-ecological observatory network; a socio-ecological forecasting system, and a decision support system. Each of the three components is linked with feedback loops, providing integration among the constituent parts.

This project received $20,000,000 in funding from the National Science Foundation and $4,000,000 in funding from the Oklahoma State Regents for Higher Education. The major participants in this project are: Oklahoma State University, the University of Oklahoma, the Samuel Roberts Noble Foundation, and the University of Tulsa. The project also involves additional collaborations with Langston University, a historically black university that serves 3,000 students, four tribal colleges, state and federal agencies/ laboratories, and K-12 schools.

Resilience and Vulnerability of Beef Cattle Production in the Southern Great Plains under Changing Climate, Land Use and Markets

The overall goal of this project is twofold: (1) to better understand vulnerability and enhance the resilience of beef-grazing systems in a world of increased climate variability, dynamic land-use, and fluctuating agricultural and energy markets through diversified forage sources, improved grazing management, multiple marketing options, strategic drought planning, and improved decision support systems for evaluation of alternative options; and (2) to safeguard and strengthen ecosystem services of rangelands and croplands in the region.

This project uses an interdisciplinary and community-based participatory approach to organize research, education and extension activities. The team is developing a community-based extension/education program to engage beef cattle ranchers and farmers in the process of research design, implementation and delivery. A functional network of monitoring sites at multiple spatial scales that represent gradients of climate, water, land use, and beef cattle production systems in the region is in development and will be combined with geospatial technology, biogeochemical models, hydrological models, and in-situ data to estimate, monitor, and forecast carbon, nitrogen, and water dynamics in the region. The project will finally develop best management practices and technology that would reduce C, N, and water footprints, carry out life cycle analysis, and develop enterprise-specific decision support tools that will assist beef cattle producers and farmers to make risk-based management and decision-making.

This project received $9,567,330 from the U.S. Department of Agriculture's Agriculture and Food Research Initiative. The major participants in this project are Kansas State University, Oklahoma State University, the University of Oklahoma, USDA's Grazinglands Research Lab, the Samuel Roberts Noble Foundation, and Tarleton State University.

Second South Central CSC Research Workshop

On October 28-29, 2013, the SC-CSC held its second research workshop, hosted at the National Weather Center in Norman, OK. The workshop featured a keynote address by Dr. David Karoly (right), Professor at the University of Melbourne and IPCC Working Group 2 lead author, on "Attribution of Extreme Climate Events: Some recent examples from Australia."

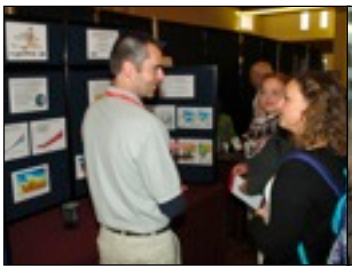
The workshop provided an opportunity to build consensus between SC-CSC members and key partners on short and long term research questions for the region and to identify potential teams to lead efforts in these areas. Over 100 participants attended from the SC-CSC Consortium, as well as from private, Federal, state, Tribal, or non-CSC university entities. The three breakout session topics were: drought; extreme weather events; and sustainability. Seven project ideas were presented during the wrap-up session at the conclusion of the workshop.

Climate Communications Workshop

On February 6-7, 2014, a workshop hosted by Drs. Dennis Patterson and Katharine Hayhoe of Texas Tech University and Dr. Riley Dunlap of Oklahoma State University entitled: "Building CSC Expertise in Understanding the Social and Communication Impacts of Climate Change" was held at the Trinity River Audubon Center in south Dallas. National experts in climate communication, climate visualization, public opinion, policy, and public affairs were invited from across the country and from the other CSCs. The panel of experts engaged workshop attendees in a series of interactive discussions that explored how to narrow the gap between science and public policy by addressing the communication aspects and human impacts of climate change.

General Public Outreach

Members of the SC-CSC University of Oklahoma main office educated the general public through displaying posters and booths at events such as the Sam Noble Museum's Science in Action Day, the University of Oklahoma's GIS Day (below left), and the Oklahoma Climatological Survey's Meteorology Summer Camp (below center-left), and hosting meetings of and presenting to stakeholder groups such as the City of Norman's Chamber of Commerce (below center-right). Dr. Katharine Hayhoe of Texas Tech University (below right) participated in the USFWS' "ClimateChangeLIVE" broadcast for high schoolers and served as a science advisor for AAAS' "What We Know" initiative. Dr. Tom Arsuffi of Texas Tech University writes and presents "Texas Water Symposium"; an on-going series for broadcast on Texas Public Radio covering a variety of water and climate topics and hosting a panel to illustrate the complexity of providing water for Texans in this century.

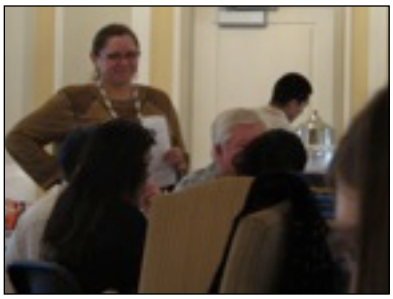


Tribal Engagement Plan

The SC-CSC's Tribal Engagement Plan describes how we will engage and facilitate partnerships with the 68 federally recognized Tribes within our region. The Tribal Engagement Plan emphasizes the collaborative nature of science and outlines concrete steps that the SC-CSC intends to take, such as including Tribal leaders in an advisory capacity, offering trainings for Tribal staff, and engaging with Tribal educators. In addition, the Tribal Engagement Plan details a strategy for ensuring that researchers engage with Tribes in culturally appropriate ways. The SC-CSC's Tribal Engagement Plan is the first of its kind and provides a template upon which other CSCs and LCCs can build.

Intertribal workshops

With the support of the SC-CSC and the Southern Climate Impacts Planning Program (SCIPP), five Intertribal Workshops on Climate Variability and Change took place in summer 2013 (four in OK and one in NM) under the leadership of Dr. Laurel Smith, Assistant Professor at the University of Oklahoma (OU) with the help of colleagues from OU, Chickasaw Nation, and USGS. These one-day events introduced over 60 Tribal representatives to the SC-CSC, the Landscape Conservation Cooperatives that service its region, and a couple of drought history tools that help communities understand and plan for drought, one of the most costly conditions characterizing the climate of the Southern Plains. At the heart of this project is the research of Paulette Blanchard (above), who is a graduate of Haskell Indian Nations University, a Masters student in OU's Department of Geography and Environmental Sustainability, and a member of the Absentee-Shawnee Tribe of Indians.



American Indian / Alaska Native Climate Change Working Group

On March 28-29, 2013, the CSC hosted the spring meeting of the American Indian / Alaska Native Climate Change Working Group (AIANCCWG) at the National Weather Center. The AIANCCWG builds linkages between a variety of partners in order to ensure that tribal peoples have the expertise within their own communities to make decisions related to issues such as energy, climate, and society. A key goal is fostering the interests and abilities of students of indigenous descent by providing them a venue in which to present their work and interact with a broader research community. The CSC-hosted meeting was the first time that an AIANCCWG event was held at a research university, and over 90 participants representing 11 tribes attended. The meeting featured keynote speakers such as Dr. Henrietta Mann (Cheyenne and Arapaho, above) and Dr. Suzanne van Cooten (Chickasaw).

Tribal outreach

April Taylor, the tribal liaison for the SC-CSC, attended and presented at meetings such as the Five Civilized Tribes Inter-Tribal Council, the Eight Northern Indian Pueblos Council, and the Tribal Environmental Coalition of Oklahoma. Additional education and outreach was performed through the Chickasaw Nation Native Explorers Program, the Norman Public Schools' Native American Science Club, the OU Chapter of the American Indian Science and Engineering Society, the Chickasaw Nation Environmental Health and Safety Expo and the Choctaw Nation Labor Day Festival (above).

Selected publications

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Challenges During 2013

The ability for the SC-CSC's consortium to carry out our overall research objectives as outlined in the hosting agreement was hampered by the failure of USGS to transfer base funding to consortium institution NOAA's GFDL for the second grant year. In total, as of February 28, 2014, GFDL has not received $132,238 in funding from USGS for three elements (year two of the hosting agreement and two individual research proposals). This failure has greatly limited the ability of the consortium to work on topics related to evaluation of climate projections and threatens the inclusion of GFDL in the consortium as a full partner.

Activities Planned for 2014

- Continue to strategically develop large-scale inter-institutional and inter-disciplinary regional proposals to establish a broader funding base;
- Evaluate global climate model projections across the region, evaluate statistical downscaling methods, and develop best practices for impacts researchers and resource managers on how to apply the output from these data sources;
- Support tribal engagement across the region, including hosting grant writing workshops and Climate 101 classes and pursuing funding opportunities in collaboration with tribal partners;
- Link students across the region by leading a 3-week undergraduate summer internship for underrepresented minorities and a week-long workshop for graduate students and early career researchers; and
- Establish data management best practices and begin to develop a central data portal.

Visit our website at http://southcentralclimate.org/

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