

# Climate Adaptation Planning to Aid State, Municipal, Tribal, and Federal Governmental Decision Makers in Oklahoma

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## Abstract

The Oklahoma Climatological Survey (OCS) and the Southern Climate Impacts Planning Program (SCIPP) hosted a half-day meeting on planning for climate change, held at the National Weather Center in Norman, OK, on December 10, 2009. The goal of the meeting was to frame high-level needs for climate variability and climate change information and establish future directions for an integrated planning effort.

Using results from the December meeting, SCIPP and OCS developed a protocol to conduct a climate needs assessment for the state of Oklahoma. The protocol is being used to conduct semi-structured interviews with decision-makers across the state. SCIPP is gathering data pertaining to weather and climate-related issues that decision-makers are currently facing or anticipate that they will face in the future, as well as determining future research activities (e.g., needs, gaps, spatial and temporal resolutions) that would be beneficial to decision-makers. A large group follow-up workshop to the December 2009 meeting is planned for late Spring 2011.

## Objectives

### Initiating a Dialog

Much of Oklahoma's economy relies on oil, natural gas, agriculture, and water resources (e.g., tourism, public water supply, agriculture). Oklahomans generally are independent in spirit, preferring personal choice, community discussions, and the marketplace to help solve problems rather than the Federal government. Wise scientists who communicate with state officials, tribal nations, communities, and the general public understand that the first step to engaging Oklahoma's governmental, non-governmental, and private sector organizations in discussions about climate variability and change is to *listen*.

In late 2009, OCS and SCIPP scientists initiated a dialogue focused on climate change, its impacts, and adaptation planning for the state of Oklahoma. A half-day meeting was held at the University of Oklahoma with the following objectives:

- begin a dialogue to collaboratively and incrementally make Oklahoma communities more resilient to weather extremes;
- learn from participants about their concerns and needs for information;
- identify projects that can be done easily with existing resources; and
- identify long-term research needs that can be addressed through partnerships.

The meeting drew representatives from 17 state agencies, 10 Native American Tribes, 3 cities and 3 federal agencies. The meeting included an overview of Oklahoma's climate and projected changes under IPCC scenarios as well as a breakout session.

### Continuing the Dialog

In October 2010, SCIPP hired a full-time research assistant to help continue the dialog. In particular, this scientist would conduct the following activities:

- synthesize results of the break-out session and prepare a workshop summary report;
- host one or more follow-on workshops to share results from the workshop and expand participation to include other state and federal agencies, Native American tribes, community representatives, non-profit organizations, businesses and economic development coalitions, and advocacy groups;
- begin development of sectoral or issue-based stakeholder groups to examine need for climate information on a more in-depth basis; and
- host a series of town hall meetings across Oklahoma in which the SCIPP team would listen to individual citizens on how climate and extreme events impact them, how they perceive climate variability and change, and determine what they want to know, or products they would like developed.

## Assessment Activities



### December 2009 Kick-Off Meeting

On December 10, 2009, OCS and SCIPP hosted a half-day meeting on planning for climate change. During this "kick-off" meeting, OCS and SCIPP provided an overview of climate change and potential impacts on Oklahoma, and obtained substantial feedback from participants regarding how climate affects their organization and its mission. The feedback helped to define the needs for information, research, products, and training in Oklahoma. Meeting participants included representatives from state and federal agencies, municipal governments, tribes, and universities. In particular, almost one-third of the sovereign tribal nations that reside within Oklahoma participated in December's kick-off meeting.

Several issues emerged as important foci for the participants who attended the meeting and are listed in the table below. A couple of the participants mentioned that they do not have any long-term plans or are not allowed to discuss the implications of climate change in their plans.

Planning Sector	Stakeholder Issues
<b>Agriculture</b>	Invasive species; crop tolerance; carbon sequestration
<b>Ecosystems</b>	Control of invasive Eastern red-cedar ( <i>Juniperus virginiana</i> )
<b>Emergency Response &amp; Preparedness</b>	Preparing and responding to floods, tornadoes, ice storms, and wildfires; checking on elderly adults after storms
<b>Energy</b>	Utility costs; fleet management; alternative energy (e.g., wind)
<b>Health</b>	Urban heat-island effects; heat stress; disease outbreaks
<b>K-12/Higher Education</b>	Standards, curriculum, and assessments
<b>Transportation</b>	Traffic patterns associated with population changes; alternative fuels (e.g., natural gas); aging infrastructure
<b>Water Resources</b>	Storm runoff; groundwater aquifer recharge; water rights; fire suppression



### State Government & University Participants:

Office of the Secretary of the Environment  
 Oklahoma Association of Conservation Districts  
 Oklahoma Biological Survey  
 Oklahoma Conservation Commission  
 Oklahoma Department of Agriculture, Food, and Forestry  
 Oklahoma Department of Education  
 Oklahoma Department of Emergency Management  
 Oklahoma Department of Transportation  
 Oklahoma Department of Wildlife Conservation  
 Oklahoma Geological Survey  
 Oklahoma Insurance Department  
 Oklahoma State Department of Health  
 Oklahoma State University - Experiment Station  
 Oklahoma State University - Extension Division  
 Oklahoma Water Resources Board  
 Oklahoma Wheat Commission  
 University of Oklahoma Health Sciences Center

### Tribal Government Participants:

Chickasaw Nation  
 Delaware Nation  
 Iowa Tribe  
 Kiowa Tribe  
 Muscogee (Creek) Nation  
 Osage Nation  
 Pawnee Nation  
 Seminole Nation  
 Seneca-Cayuga Tribe  
 United Keetoowah Band of Cherokee Indians

### Municipal Government Participants:

City of Enid, OK  
 City of Norman, OK  
 City of Oklahoma City, OK

### Federal Government Participants:

Federal Highway Administration - Oklahoma Division  
 United States Geological Survey

## Information Needs

While most of the participants in the assessment activities said that climate variability could and/or does impact their organization, some indicated that they do not necessarily have the proper information to make informed decisions. The participants discussed their water-, weather-, and climate-related needs, which were divided into three categories: data/resources, education, and modeling.

### Data/Resource Needs

<b>Data Portal:</b>	A free "one stop shop" for weather and climate information; a mechanism for sharing ideas; comprised of data from all state agencies; includes comprehensive datasets (e.g., temperatures, water quality, soil, unpermitted small emissions); with the ability to incorporate GIS maps
<b>Manpower:</b>	Assistance from other agencies to offset resource limitations
<b>Weather/Climate Data:</b>	Groundwater monitoring network (e.g. LIDAR); a more dense observing network
<b>Societal Data:</b>	Uninsured losses due to wildfires, flood, hail, tornadoes, etc.; data on individual/single family travel plans; integrate climate information with transportation planning processes

## Current and Future Work

Current efforts are being supported in part by a special project funded by the Regional Integrated Sciences and Assessments (RISA) program through SCIPP as part of the next U.S. National Assessment on climate change. As part of that project, climate information and planning needs in Oklahoma will be cross-compared to a similar needs assessment effort being conducted along a portion of the U.S. Gulf Coast (Texas, Louisiana, and Mississippi).

As a direct result of the kick-off meeting and follow-up assessments, OCS is drafting a report on climate and adaptation planning for Oklahoma. Elements of the document include an overview of Oklahoma climate (including weather extremes), current understanding of global climate change and projected impacts in the southern Great Plains, Oklahoma-specific impacts by sector (e.g., agriculture, transportation, water resources), and general guidelines for adaptation planning. A major emphasis of the document was to summarize IPCC, USGCRP, and other relevant resources in the context of decision makers who affect resources.

A climate needs assessment for the state of Oklahoma is underway. Semi-structured interviews are being conducted with representatives from federal, state, and city agencies. We anticipate that stakeholders from private industry and non-governmental organizations also will participate. The purpose of the assessment is to understand the weather and climate-related needs that can be met using existing resources of OCS, SCIPP, or other climate information sources, as well as the needs that will require additional research. The assessment is uncovering the current and anticipated weather and climate-related issues that Oklahoma stakeholders face now or will face in the future. It also looks at the spatial and temporal scales in which stakeholders make decisions. The results will be inform future climate research initiatives in Oklahoma and beyond, especially the climate modeling community. In addition to interviews, a large group workshop is planned for Spring 2011 that will continue the dialogue initiated at the December 2009 meeting. We anticipate that we will begin to work closely with several of the participating organizations to help address their needs.