## THE CENTER FOR SCIENCE AND TECHNOLOGY POLICY RESEARCH

The Center for Science and Technology Policy Research (CSTPR) was initiated within the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado-Boulder in the summer of 2001 as a contribution both to the CIRES goal of "promoting science in service to society" and to the University's vision of establishing research and outreach across traditional academic boundaries.

CSTPR seeks to improve how science and technology policies address societal needs, through research, education and service.

The Center is a response to an increase in problem-focused research at the interfaces of environment, technology, and policy, and to the growing demand by public and private decision makers for "usable" scientific information. Our work is often aimed at understanding the choices that people and institutions make in pursuing goals under uncertainty, be it an uncertain future climate, uncertain outcomes of investments in science and technology, or the uncertain outcomes of a particular environmental policy. One of our goals is enlarging the range of choice considered by policy-makers, by analyzing options in areas such as energy technology, carbon management, science investments, and public lands and ecosystems management.

By linking integrative science with the needs of decision makers, science and technology policy research can serve a valuable role in helping the research community better focus its efforts on issues of importance to society, and decision makers can more effectively incorporate scientific and technological advances into their decision processes.

## THE COOPERATIVE INSTITUTE FOR RESEARCH IN ENVIRONMENTAL SCIENCES

The Cooperative Institute for Research in Environmental Sciences (CIRES) was established in 1967 to provide a setting for collaborative research and teaching in the wide-ranging disciplines of the environmental sciences. Its mission is to act as a national resource for multidisciplinary research and education in the environmental sciences by providing scientific leadership in basic and applied research relevant to environmental and earth sciences issues, by contributing scientific expertise and resources to environmental science educational programs, and by providing support to facilitate collaborations among scientists at the University of Colorado, the National Oceanic and Atmospheric Administration, and other institutions. CIRES is sponsored jointly by the University of Colorado at Boulder and the Environmental Research Laboratories of the National Oceanic and Atmospheric Administration.

## THE UNIVERSITY OF COLORADO AT BOULDER

Founded in 1876 in Boulder, CU is recognized as one of the outstanding public universities in the United States. As the flagship university of the state of Colorado, CU-Boulder is a dynamic community of scholars and learners situated on one of the most spectacular college campuses in the country. As one of 34 U.S. public institutions belonging to the prestigious Association of American Universities – and the only member in the Rocky Mountain region – CU has a proud tradition of academic excellence, with four Nobel laureates and more than 50 members of prestigious academic academies.

## NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

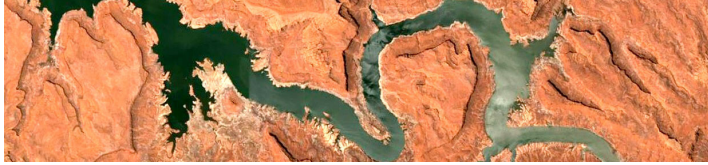
NOAA is an agency that enriches life through science. Their reach goes from the surface of the sun to the depths of the ocean floor as NOAA works to keep citizens informed of the changing environment around them. NOAA's mission is (1) to understand and predict changes in climate, weather, oceans, and coasts. (2) to share that knowledge and information with others, and (3) to conserve and manage coastal and marine ecosystems and resources.

## NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

NCAR is a federally funded research and development center devoted to service, research and education in the atmospheric and related sciences. NCAR's mission is to understand the behavior of the atmosphere and related physical, biological and social systems; to support, enhance and extend the capabilities of the university community and the broader scientific community – nationally and internationally; and to foster transfer of knowledge and technology for the betterment of life on Earth. The National Science Foundation is NCAR's primary sponsor, with significant additional support provided by other U.S. government agencies, other national governments and the private sector.

CENTER & FOR SCIENCE & TECHNOLOGY POLICY RESEARCH

**Center for Science and Technology Policy Research**
**University of Colorado/CIRES**
**1333 Grandview Avenue**
**Campus Box 488**
**Boulder, CO 80309-0488**
**PH: 303-735-0451**
**FX: 303-735-1576**
**email: info@sciencepolicy.colorado.edu**
**http://sciencepolicy.colorado.edu**



# INTERACTIONS OF DROUGHT AND CLIMATE ADAPTATION (IDCA) FOR URBAN WATER

## University of Colorado
## CIRES Center for Science and Technology Policy Research


CENTER & FOR SCIENCE & TECHNOLOGY POLICY RESEARCH

CIRES

University of Colorado Boulder

NOAA

NCAR

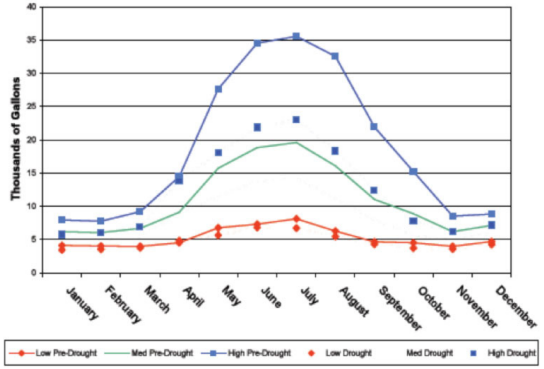
# Interactions of Drought and Climate Adaptation for Urban Water Project

## About IDCA

Drought events are already major concerns for urban water resource managers in many areas, and municipalities have responded in various ways to past droughts, enacting a variety of policies to cope with temporary reductions in water supply.

Demand-side policy measures have been effective in certain circumstances in lowering water consumption. While this can be seen as a positive trend, it has also led to concern about future flexibility due to "demand hardening," the notion that ongoing conservation programs may undermine managers' ability to call on short-term measures during a drought. **(See Figure 1)** Conversely, short-term drought response measures may potentially constrain the ability to respond to future climate change.

*Figure 1: Residents who already used much less water in normal conditions did not reduce their water use in drought conditions, leading to "demand hardening". (Kenney et al. 2008)*




Yet, there is little understanding of how such policies put in place to reduce short-term vulnerabilities to drought events will position municipalities to manage the impacts of longer-term climate change.

The Interactions of Drought and Climate Adaptation (IDCA) for Urban Water Project seeks to enhance understanding by examining the ways in which drought policies interact with both short-term drought and long-term climate change. Using a case-based approach, the project seeks to identify robust and practical strategies that will enhance the resilience of urban water systems across timescales.

IDCA for Urban Water is a 2-year project that is funded through the National Oceanographic and Atmospheric Administration's Sectoral Applications Research Program.

## Research

The IDCA for Urban Water Project will contribute to an understanding of drought and climate adaptation policy by answering the following questions:

- Do policies designed to respond to short-term drought events impact the ability of urban water managers to address risk at other timescales?
- Are adaptation measures effective across a variety of conditions, from short-term variability to long term-climate change?
- Will conservation measures employed in response to climate variability lead to "demand hardening" in which further reductions in use will be difficult to achieve?
- Does having greater flexibility in response options imply a greater or lesser degree of dependence on weather and climate information?

## Project Approach

IDCA for Urban Water team draws on combined expertise from the University of Colorado, the National Oceanographic and Atmospheric Administration, and the National Center for Atmospheric Research.

The project takes a four-step approach to addressing research questions:

1. **Establish an Advisory Working Group** to integrate practitioner consultation throughout all phases of the project.
2. **Identify Vulnerability Indicators** to evaluate the impact of water policy on long-term adaptive capacity in the urban water management sector.
3. **Develop Case Study Selection Criteria** to identify urban water systems that capture a range of decision making.
4. **Examine Past Drought Response** by conducting municipal level case studies to characterize past and current vulnerability to assess capacity to manage future climate risks.

## We want your feedback ...

The IDCA for Urban Water project seeks to learn from innovative practices in the urban water management sector. If you know of interesting examples of urban drought management and climate adaptation policies, we'd like to hear from you!

### Contact Information

Lisa Dilling, Ph.D.
Principal Investigator
Center for Science and Technology Policy Research
University of Colorado at Boulder
Email: ldilling@colorado.edu

For more information, please visit the IDCA for Urban Water website:
http://sciencepolicy.colorado.edu/research_areas/eap/index.html