

Piloting Utility Modeling Applications for Climate Change **(PUMA)**

PUMA is a collaborative venture bringing together Water Utility Climate Alliance (WUCA) members, Regional Integrated Sciences and Assessments (RISA) leaders, and selected representatives of the climate science and applications communities, to:

- Identify state-of-the-art climate modeling tools and techniques for use by a select group of Water Utility Climate Alliance members committed to conducting and technically prepared to conduct climate change impacts assessments for their systems.
- Frame the value proposition of these climate modeling tools by articulating the uncertainties embedded in modeling results, as well as how to best use downscaled and other climate modeling data in planning.
- Acquire climate projection data utilizing the identified modeling tools in a form and scale that can be used by utility hydrologic models to generate watershed and/or urban runoff information to be utilized in impacts assessment, water planning processes, and decision making.
- Build a national RISA collaboration and enhance regional RISA connections by engaging RISA experts from the NW, Cal-Neva, SE, and NE RISA programs in the project, corresponding to the regions for the subject utilities.
- Inform developing conversations between climate science users and providers regarding how existing research meets or does not meet the needs of the adaptation community, how future investment in research might better serve society, and the nature of climate services needed on the ground in communities facing adaptation challenges.

Project timeframe: 2010 -- 2012

Piloting Utility Modeling Applications Project Leaders

Water Utility Climate Alliance

The Water Utility Climate Alliance (WUCA) is dedicated to providing leadership and collaboration on climate change issues affecting drinking water utilities by improving research, developing adaptation strategies and creating mitigation approaches to reduce greenhouse gas emissions.

WUCA members deliver drinking water to over 43 million Americans and include the Central Arizona Project, Denver Water, the Metropolitan Water District of Southern California, New York City Department of Environmental Protection, Portland Water Bureau, San Diego County Water Authority, San Francisco Public Utilities Commission (Chair), Seattle Public Utilities, Southern Nevada Water Authority, and Tampa Bay Water.

Five utilities are pilots engaged in various levels of assessment as part of the PUMA project: Tampa Bay Water, Seattle Public Utilities, San Francisco PUC, New York City DEP, and Portland Water Bureau.

San Francisco Public Utilities Commission
David Behar, Climate Program Director

New York City Department of Environmental Protection
Alan Cohn, Climate Change Manager

Seattle Public Utilities
Paul Fleming, Manager, Climate & Sustainability Group

Tampa Bay Water
Alison Adams, Ph.D., P.E., Source Rotation and Environmental Protection Manager

Portland Water Bureau
Lorna Stickel, Water Resources Planning Manager

Regional Integrated Sciences and Assessments (RISA) program

The Regional Integrated Sciences and Assessments (RISA) program supports research that addresses complex climate sensitive issues of concern to decision-makers and policy planners at a regional level. The RISA research team members are primarily based at universities though some of the team members are based at government research facilities, non-profit organizations or private sector entities. Traditionally the research has focused on the fisheries, water, wildfire, and agriculture sectors. Established by NOAA in the mid-1990s, RISA projects point the way toward a new paradigm of stakeholder-driven climate sciences that directly address society's needs and concerns.

Climate Decision Support Consortium (Northwest RISA)
Philip Mote, Director, Oregon Climate Change Research Institute

California-Nevada Applications Project (California-Nevada RISA)
Dan Cayan, Researcher, Scripps Institution of Oceanography

Southeast Climate Consortium (Southeast RISA)

Wendy Graham, Director, University of Florida Water Institute

Consortium for Climate Risk in the Urban Northeast (Northeast RISA)

Radley Horton, Associate Research Scientist, Columbia University

The Modeling Advisory Committee

A Modeling Advisory Committee (MAC), created by invitation, is composed of

- 1) climate researchers that have extensive experience working with GCMs and conducting downscaling studies,
- 2) “bridge people” that have a track record of facilitating collaboration between the research community and the water sector, and
- 3) practitioners with experience executing similar analyses.

The primary function of the MAC will be to: learn from subject utilities about their needs, tools, scales of interest, and goals related to impacts assessment; to subsequently identify, in collaboration with the utilities, the best climate modeling tools to meet those needs; and to help build connections between the utilities and the selected tools in service of the project.

Because modeling tools have been widely used in assessing water supply impacts, this task will be focused on identifying the best tools in the current generation of models.

Because modeling of potential climate change effects on stormwater management is a relatively new application, the MAC will first consider whether modeling tools even exist that have the skill needed to produce meaningful output for use by stormwater managers.

Phil Duffy

Chief Scientist, Climate Central

Joseph Barsugli

Research Scientist, CIRES and Western Water Assessment

Mike Dettinger

Research Hydrologist, U.S. Geological Survey/Scripps Institution of Oceanography

Tom Johnson

Physical Scientist, Office of Research and Development, Global Change Research Program, U.S. EPA

Ed Maurer

Associate Professor, Civil Engineering Santa Clara University

Linda Mearns

Senior Scientist, National Center for Atmospheric Research

Levi Brekke

Principal Technical Specialist, Water Resources Planning & Operations Support Group, U.S. Bureau of Reclamation

John Abatzaglou

Assistant Professor, University of Idaho

Claudia Tebaldi

Research Scientist, Climate Central

Project Workshops

The project includes plans for two workshops:

Workshop #1 objectives (held in San Francisco, December 1-3, 2010)

1. Presentations from subject utilities regarding needs, tools, scales of interest and goals related to impacts assessment.
2. Discussion and recommendation of climate modeling tools available that best meet subject utility needs and how to utilize data from those tools. Initiation of work or advancement of existing work in collaboration with regional RISA programs in assessing impacts utilizing selected tools .

Prior to the workshop, written materials were distributed to provide background on items 1 and 2 above.

Workshop #2 objectives (Location and dates TBD)

1. Presentations of findings and lessons learned from climate modeling tools
2. Presentations of findings and lessons learned from utility impacts assessment downstream modeling.

Prior to the workshop, written materials will be distributed to provide background on items 1 and 2 above.

Project Update (December, 2010):

In advance of the first project workshop, each community in the project has produced knowledge for use by all participants.

- ⇒ Utilities produced concise “Utility Briefing Papers” describing their systems, planning tools, and assessment objectives.
- ⇒ Modeling Advisory Committee (MAC) members answered a 10-question survey providing their views on climate modeling tools, downscaling techniques, and “actionable science.”
- ⇒ For the RISA program, the Climate Decision Support Consortium produced an overview white paper on climate modeling, “An Inventory of Approaches to Climate Modeling and Downscaling.”

These products were distributed to project leaders in advance of a 2.5 day workshop held in San Francisco December 1-3, 2010. At this workshop, progress was made toward each of the project goals and assessment collaborations between utilities and RISA leaders, with the assistance of MAC members, were established or advanced. Individual assessments are now proceeding regionally, with goals for completion set for 2011.