

W A T E R R E S O U R C E S

# IMPACT

September 2006 | Volume 8 | Number 5

**DECISION SUPPORT  
FOR ADAPTING TO  
CLIMATE CHANGE**

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## DECISION SUPPORT FOR ADAPTING TO CLIMATE CHANGE

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Climate has a profound influence on the quantity, quality, and timing of water resources available to support human needs. The impacts of climate change on water and watershed systems may present significant additional risk associated with the provision of safe, reliable water supplies, compliance with water quality regulations, and the protection of aquatic ecosystems. Coping with climate change will require tools and information that allow water and watershed managers to explicitly address the implications of climate variability and change in their decision making process. This issue of *Water Resources IMPACT* presents a series of articles addressing the need for, and examples of recently developed approaches for providing decision support to guide adaptation to climate change.

### INTRODUCTION

- 4 Decision Support for Adapting to Climate Change**  
*Thomas Johnson and John Furlow*

### FEATURE ARTICLES

- 5 "The Future Ain't What It Used To Be:" Climate Change and Water Resources Management**  
*John Furlow ([jfurlow@usaid.gov](mailto:jfurlow@usaid.gov))*

Infrastructure and management systems designed to deal with climatic variability are often based on the assumption that hydrologic variables do not change over time. However, several examples show that this assumption is not always valid and can lead to costly planning and design flaws. Consideration of climatic change can lead to better, more resilient design.

- 8 Elements of Effective Decision Support for Water Resource Management Under a Changing Climate**  
*Christopher R. Pyke ([pyke.chris@epa.gov](mailto:pyke.chris@epa.gov)) and Roger S. Pulwarty*

Effective decision support requires more than just software and hydrologic models. It requires an enabling environment for incorporating decision support as a part of an organization's learning process. Effective applications of decision support address these issues early and often, and, these considerations can make the difference between meaningful decision support and unrealized expectations for decision makers, information providers, and stakeholders.

- 11 Converting Research into Action: A Framework for Identifying Opportunities to Provide Practical Decision Support for Climate Change Adaptation**  
*J. Randall Freed ([rfreed@icfi.com](mailto:rfreed@icfi.com)) and Frances Sussman*

Despite the likelihood of significant impacts of climate change and variability, information on future climate conditions is rarely integrated into water resource decision making. This paper provides practical advice on how researchers can best assist water resource managers in adapting to future climate change.

- 15 Sensitivity Analysis as a Guide for Assessing and Managing the Impacts of Climate Change on Water Resources**  
*Thomas Johnson ([johnson.thomas@epa.gov](mailto:johnson.thomas@epa.gov)) and John Kittle, Jr.*

Water and watershed managers can assess their exposure to climate-related risks by understanding the hydrologic sensitivity of key management goals to a wide range of plausible climatic conditions and events. This understanding can also guide the development of management strategies to reduce the likelihood of future harm. New computational tools make such analyses easier by automating modeling tasks and providing easier access to relevant information.

- 18 Implications of Climate Warming on Local Water Management in the South Fork of the American River, California**  
*David Yates ([Yates@ucar.edu](mailto:Yates@ucar.edu)), David Purkey, Melissa Gunter, and Elizabeth Mansfield*

Regional climate change could have profound impacts on drinking water utilities such as the El Dorado Irrigation District of Northern California. A new water planning tool, the Water Evaluation and Planning Decision Support System, shows how shifts in the timing of snowmelt, along with strict environmental requirements and customer needs will challenge future water needs.

- 22 A New Approach to Reducing the Vulnerability of Water Supplies to Climate Change in the U.S.-Mexico Border Area**  
*William A. Nitze ([wnitze@gridpoint.com](mailto:wnitze@gridpoint.com))*

Climate change will make existing water management challenges in the U.S.-Mexico border region more severe. A new approach based on the creation of a watershed-by-watershed, bottom-up planning process led by the existing bi-national institutions responsible for water is necessary to meet those challenges and reduce the vulnerability of water supplies to climate change in the U.S.-Mexico border area.

W A T E R R E S O U R C E S

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Cover Photo: The Niger River during the rainy season at Niamey, Niger.

Photo by John Furlow, USAID, Washington, D.C.



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**A Note From the Editor-In-Chief ...** With this issue, we are pleased to welcome a new columnist to the pages of *IMPACT*. Eric Fitch has joined Clay Landry and agreed to put on a different hat – as a regular columnist – to bring ideas, opinions, and a variety of points of view to us in each issue of *IMPACT*. Look for Clay and Eric to be with us on a regular basis. As always, they look forward to your opinions as well. Do not hesitate to contact us with your responses to articles and their opinion columns (see "Feedback" on pg. 12).

## Scheduled Topics for Future Issues ...

**NOVEMBER 2006**

**GLOBAL WATER FUTURES**

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**JANUARY 2007**

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**MARCH 2007**

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**JULY 2007**

**INSTREAM FLOWS**

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