RECLAMATION Managing Water in the West

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The Knowledge Stream
Research Update

How Do We Determine Reliable and Relevant Climate Projections for Planning?

Reclamation's diverse set of planning and management situations requires a flexible framework for judging climate projections applicability across our collection of adaptation decisions

Bottom Line

Approaching the question from the dual perspectives of information relevance and reliability can narrow the problem and ease the judgment of how climate projections may inform decisions.

Better, Faster, Cheaper

This information resource will support information reliability across a wide variety of situations—reducing planning and assessment costs for Reclamation and partners. The framework for merging reliability and relevance considerations will focus on study scoping and potentially lead to streamlined processes for planning and decisionmaking.

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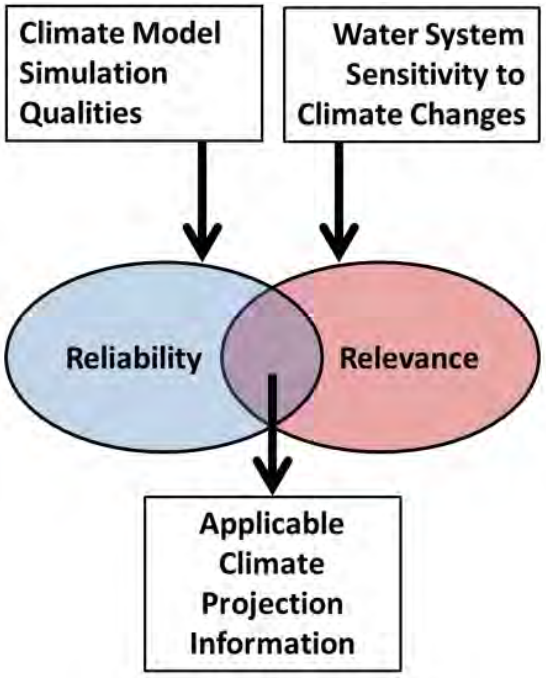
Collaborators

- **Reclamation's Mid-Pacific Region**
- **USACE**
- **NOAA**
- **University of Colorado**

Problem

Driven by recent trends in administration priorities, Reclamation is increasingly compelled to mainstream climate change considerations into its broad spectrum of mission activities. A common challenge facing planners and study teams across these activities is judging which aspects of climate projection information are relevant, reliable, and, therefore, applicable to their decisions, which may be very diverse (e.g., developing long-term water and environmental management criteria, informing investments in climate-resilient infrastructure, supporting efforts in river restoration and species recovery).

Reclamation, in collaboration with researchers and study partners from around the Western United States (U.S.), has made significant progress in developing the technical methods required to evaluate water supply and demands and assess system vulnerability under projected future climate conditions. As we pivot from vulnerability assessments to adaptation action and investment, managers will require sharper understanding of which aspects of climate are *relevant* to a given system or management context and which aspects of climate projection information are *reliable* enough given climate model uncertainties in order to determine which aspects of climate change information are *applicable* to a given decision context.



Conceptual framework for identifying climate projection information applicable to an individual planning or decisionmaking situation.

Solution

Reclamation is partnering with the National Oceanic and Atmospheric Administration (NOAA), U.S. Army Corps of Engineers (USACE), and the University of Colorado's Cooperative Institute for Research in Environmental Sciences to develop a framework for assessing the relevance, reliability, and applicability of climate projection information to individual planning and decisionmaking situations. Relevance and reliability are evaluated separately, and then considered jointly to inform judgments of applicability.

- Relevance is based on analyses of how the given water management situation is sensitive to different types of climate changes. The goal is to identify the

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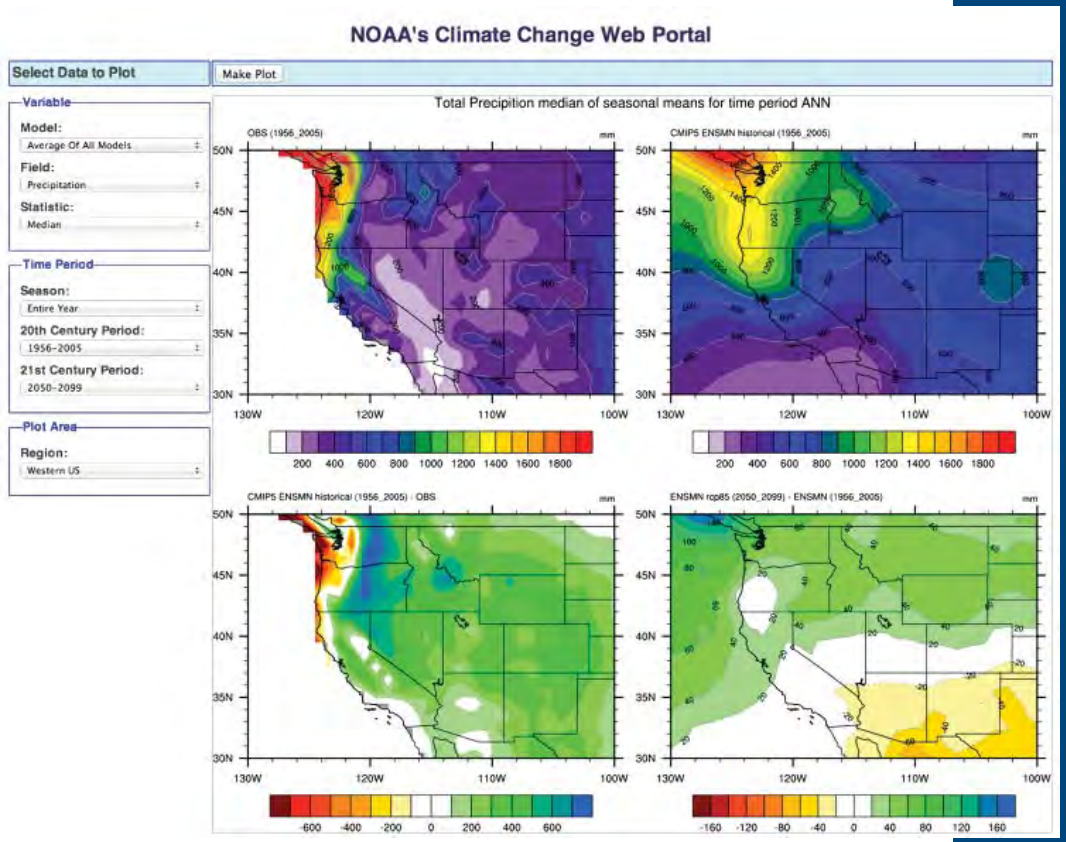
most critical and relevant types of change, which may vary by climate variable, time scales from annual to daily, space scales from region to local catchment, and climate statistic (e.g., averages, variability, and extremes). The study team is demonstrating the relevance analysis using the California Sacramento-San Joaquin Basins as a case study region, evaluating how various measures of Reclamation, State and local reservoir systems performances are sensitive to different types of climate change.

- Reliability is based on evaluation of climate models that provide future projection information, focusing on their skill in simulating historical climate. If climate models are found to simulate a given climate aspect reliably (e.g., models are found to accurately reproduce observed 20th century conditions) this supports judgment that the models can project future changes in that climate aspect. As Reclamation's mission activities depend on many climate aspects, this skill evaluation is being conducted across a large suite of climate variables and statistics. The team is building the reliability information resource to have global coverage so that it can flexibly serve any planning and assessment situation considered by USACE or Reclamation. Results from this evaluation are being packaged for distribution through a free and easy-access web portal.

"Outcomes from the scoping pilot are expected to inform opportunities to refine this framework, ease scoping processes, and enhance planning and decisionmaking under future climate uncertainty"

Levi Brekke
Water and Climate Research Coordinator



Climate model evaluation portal developed by NOAA partners to facilitate evaluation of climate model reliability (www.esrl.noaa.gov/psd/ipcc/cmip5/ccwp.html).

Future Plans

The study team plans to have a beta version of the reliability web portal online by early 2014. Shortly thereafter, the study team plans to collaborate with Reclamation's Mid-Pacific Region and host a mock scoping pilot where relevance and reliability information are merged to inform applicability judgments. Participants will include technical representatives and planning process experts familiar with leading feasibility studies and other planning assessments. Participants will be tasked with judging information applicability for a given mock study based on dual consideration of relevance and reliability, results from the Central Valley Project's reservoir systems' relevance analysis, and information from the reliability web portal.