

WATER RESOURCE DECISION-MAKING NEEDS REGARDING CLIMATE CHANGE: A PRELIMINARY SUMMARY

Views of water resource decision-makers about their needs for information from climate change science and modeling are summarized in three recent reports. According to these reports (see sources below), decision-making needs include three categories: information needed from climate science and models, information needed from continuing observing systems, and needs for supportive institutional structures.

Information needed from climate science and modeling

- climate scenarios to provide information about a range of climate possible futures – including seasonal and mid-term (e.g., 20 years out) changes in water supply and extreme events (extremes are often stronger drivers than means, and reliability standards are related to extreme events) – in part to provide support for moving away from stationarity assumptions
- downscaled forecasts at scales useful for water resource management (watershed and/or regional scale) of (a) climate-induced changes in hydrology, including runoff as well as precipitation (including seasonal timing and storm-related short-term events); (b) high-resolution climate forcing data including precipitation, temperature, humidity, wind, and solar radiation, depending on the hydrologic model being used; (c) soil moisture, including high elevations; and (d) water temperature -- all of this related to water resource conditions ranging from drought to flooding at a variety of time scales from daily to seasonal, annual, and longer trends departing from historic variability – issues include best practices in downscaling, confidence levels, and formatting amenable to incorporation in water resource management models
- forecasts of ENSO, PDO, etc. patterns to inform planning for reservoir rule curves and operating guidelines
- “one-stop shopping” site for available model outputs, sensitive to differences in spatial and temporal scales
- projections of land use/land cover change and other landscape changes, including fire and insect infestations and urban drainage

- providing daily/hourly climate data sets (e.g. temperature and precipitation) to incorporate in water demand forecasting and to help in analyzing projections of extreme events
- projections of how changes in population and climate will impact water use, combining climate model projections with utility population and water demand forecasts
- treating uncertainties with respect to accurate quantification of future impacts
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Information needed from observing systems

- maintaining historical federal government water system data collection systems, such as snowpack/snowmelt and stream gages: sustained data sets, filling some data gaps (e.g., groundwater), and improving data accessibility (including proprietary issues): e.g., data clearinghouses? tools that automatically download data and clip them to a particular location?
- change detection, especially for developing adaptation strategies

Needs for supportive institutional structures

- structured long-term processes for exchanging information, e.g., regarding GCM runs
- intermediary structure to get practitioner input regarding research questions
- improved linkages between scientists and practitioners: e.g., data base of scientific expertise so that practitioners can identify experts as needed and data base of research being funded to find out what is going and to identify potential partners
- impact information related to drivers of water system impacts other than climate change, such as shifts in projected population migration patterns that might be associated with climate change impacts
- opportunities to interact about how to translate data and projections into “best assumptions” about changes in water supplies, reflecting local knowledge as well as model outputs

Sources:

Proceedings of the Western Governors' Association/Western States Water Council/California Department of Water Resources: May 2007, "Climate Change Research Needs Workshop"

Report, CCSP/Western Governors' Association/Western States Water Council, "Water Managers Roundtable, NOAA, Boulder, CO, March 18, 2008"

Water Utility Climate Alliance, Comments on the Summary of Revised Research Plan for the US Climate Change Science Program, February 16, 2008