

## **The U.S. National Integrated Drought Information System (NIDIS)**

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In general, NOAA's climate programs provide the nation with services and information to improve management of climate sensitive sectors, such as energy, agriculture, water, and living marine resources, through observations, analyses and predictions, decision support tools, and sustained user interaction. Our services include assessments and predictions of climate change and variability on timescales ranging from weeks to decades for a variety of phenomena, including drought. In this testimony I will highlight: (1) present drought-related adaptation measures being undertaken in the water sector across the U.S., and (2) the role of the NIDIS in improving our capacity for responding to drought.

As is widely acknowledged, drought is not a purely physical phenomenon, but is an interplay between water availability and the needs of humans and the environment. Drought is slow in onset, and its effects, such as impacts on energy (including hydropower), tourism, and commodity markets, can continue to be felt long after an event is over.

As outlined in Public Law 109-430, NIDIS is envisioned to serve as an early warning information system for managing drought-related risks in the 21st century. Impetus for information services to support federal, state and local responses has risen from ongoing concerns over water security and scarcity in the Southwest since 1999, in the Southeast since early 2007, along with declining water levels in the three largest Great Lakes since 1986.

A great deal of progress has been made since the NIDIS program was established in December 2006. A national interagency and interstate program implementation team has been established. The web-based Drought Portal, launched in November 2007, now provides comprehensive national level information derived from several Federal agencies and states on emerging and ongoing drought conditions. NOAA and NIDIS are accelerating improvements of NOAA's

operational climate forecast and application products tailored to watersheds and local scales (where reliable).

NIDIS works through numerous federal agencies, tribes, state and local governments, the National Drought Mitigation Center in Nebraska, emergency managers and state climatologists, to obtain drought information and incorporate this information into early warning systems. As such there is significant leveraging of existing observing system infrastructure, data, and products to provide data streams at the level of detail needed for decision making; at watershed (such as for the Colorado Basin), and the regional scales (such as the Southeast: TN, GA, AL, FL). Emerging needs for early warning system development, such as gaps in monitoring snow cover and snowmelt, soil moisture, stream gauge networks, in these locations, are being identified and prioritized within NIDIS activities led by interagency regional teams.

Data and predictions are, by themselves, insufficient to ensure adaptation (and flexibility) in the water resources sector. A hallmark of NIDIS is the provision of decision support tools and training coupled with the ability for users to report local conditions back to the Portal. Near-term activities include tailoring of the Drought Portal to add locally specific data and information at the watershed and county level.

Water managers are already explicitly considering how to incorporate the potential effects of a changing climate into specific designs. For example, in southern California MWD, Seattle, and in Las Vegas Nevada, adaptive management measures include water conservation, efficiency requirements, reclamation, conjunctive use of surface and groundwater and desalination of brackish water. The barriers to implementing adaptation measures include the inability of some natural systems to adapt at the rate of combined demographic pressures and climate, understanding and

quantifying water demands, and impediments to the flow of timely and reliable knowledge and information relevant for decision makers. Climate information services designed to support adaptation, of which NIDIS is an example, will be important in coping with current and future climate extremes and their effects on water resources regardless of how that change is derived.

Over the next five years NIDIS will continue to close the gap between what is available, and what is needed, for proactive drought risk reduction. For example, as part of their drought management, municipalities and state agencies will have improved climate information and forecasts at key entry points for allocating domestic and industrial water usage. Water resource managers will have access to more detailed information on low flow conditions when balancing irrigation and hydropower with the needs of wildlife and flows to support coastal economies. Farmers will be better positioned to make decisions on which crops to plant, and when to plant them. Emergency declarations can better reach out to those communities in need of assistance with improved information on the areal extent and severity of developing droughts.

While per capita water use is declining in some parts of the country, trends in demand, observational records and climate projections provide abundant evidence that our freshwater resources are vulnerable. Priorities for drought early warning information and decision support tools to prepare our nation for these

challenges requires a mixed portfolio of approaches, including:

- Enhancing coordinated networks of systematic observations of key elements of human, ecological and physical systems including monitoring groundwater and vegetation stress; and actively engaging communities and states in monitoring, preparedness, and planning.
- Promoting drought plans that maintain state sovereignty but respond to the needs of shared watersheds; In particular strengthening and expanding water conservation and efficiency programs within these plans; and developing transboundary monitoring and early warning information for our internationally-shared watersheds with our neighbours to the North and the South.
- Developing drought impacts assessment tools that include the costs and benefits of various adaptations and changing water demands.
- Developing usable drought management triggers for specific planning thresholds and scenarios in agriculture, water, energy, health, environment, and coastal zones.

The challenges of managing water supplies to meet social, economic, and environmental needs requires matching what we know with what we do. NIDIS offers the nation a mechanism to achieve this service requirement by providing a basis for integrating drought monitoring, research, and information for decision support.