Data and Monitoring Needs *for* Western Water Management

Data and Monitoring Needs

The Western States Water Council places a high priority on funding for vital federal water and climate data collection and analysis programs (position #345, adopted October 2012). Water is the lifeblood of the West. Managing water to meet the needs of our cities, farms, and the environment relies on federal hydroclimate monitoring networks and data collection programs. State and local water agencies depend on these programs for the information they use in making decisions to protect public health and safety and the environment.

Like the nation's water infrastructure, many of these networks are aging, and years of neglecting to invest in their hardware and software threaten information continuity critical for water management. Monitoring and data programs further need to be able to take advantage of the latest advances in technology, using tools including remote sensing or real-time data acquisition and transmission to improve capabilities such as flood or water supply forecasting.

Federal water and climate data and analysis programs cover all phases of the hydrologic cycle from monitoring conditions in the atmosphere to measuring water use on the ground. These programs also span across multiple agencies, including, NASA, NRCS, NOAA, NWS and USGS. Descriptions of the specific monitoring these agencies provide are included throughout this brochure:

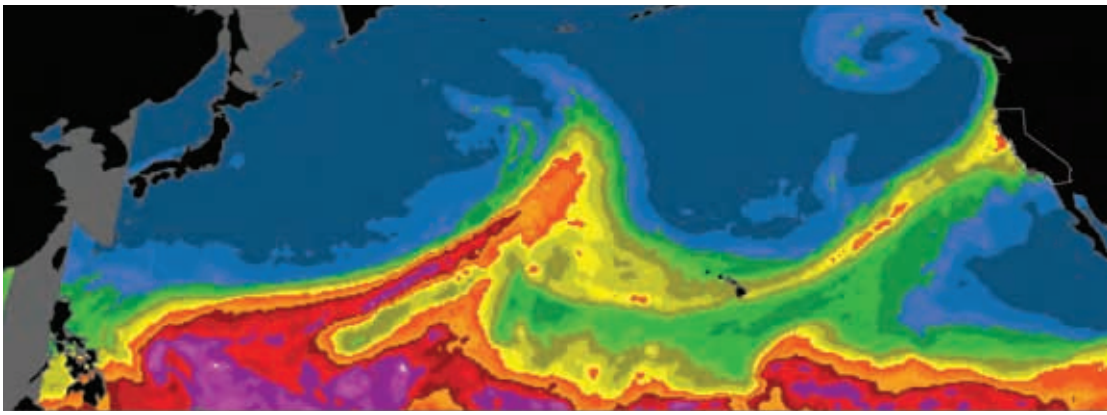
NASA National Aeronautics and Space Administration

NOAA National Oceanic and Atmospheric Administration

NRCS Natural Resources Conservation Service

NWS National Weather Service

USGS United States Geological Survey



Satellite image of atmospheric river reaching West Coast. Atmospheric river storms — storms fueled by concentrated streams of water vapor from the Pacific Ocean — are responsible for most episodes of major West Coast flooding. The HMT's efforts in California were responsible for identifying this storm type and its importance for flood management and water supplies. *NOAA figure*




NRCS

The National Water and Climate Center of the Natural Resources Conservation Service (NRCS) monitors snowpack conditions and has a limited network of soil moisture monitoring sites.

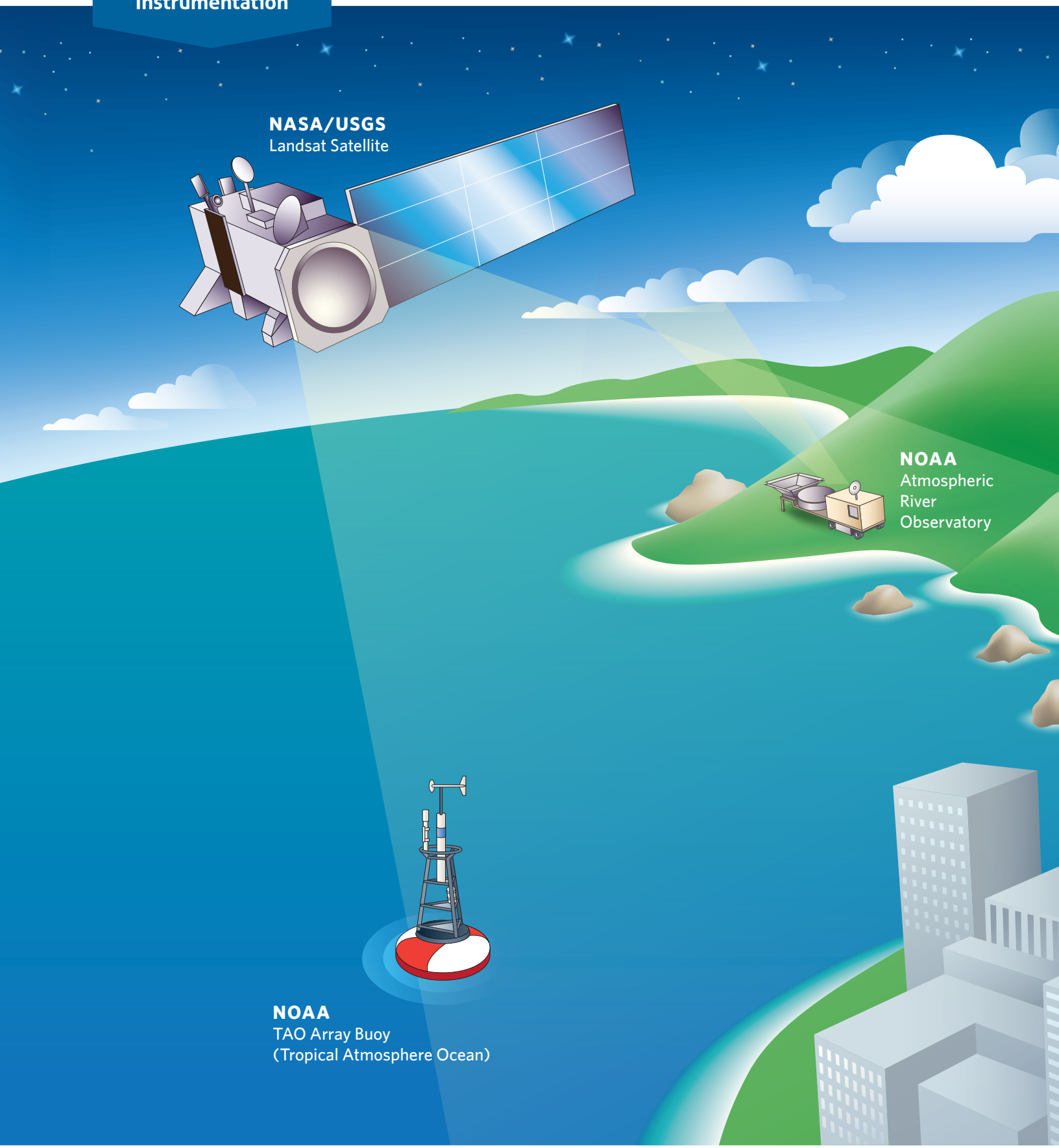


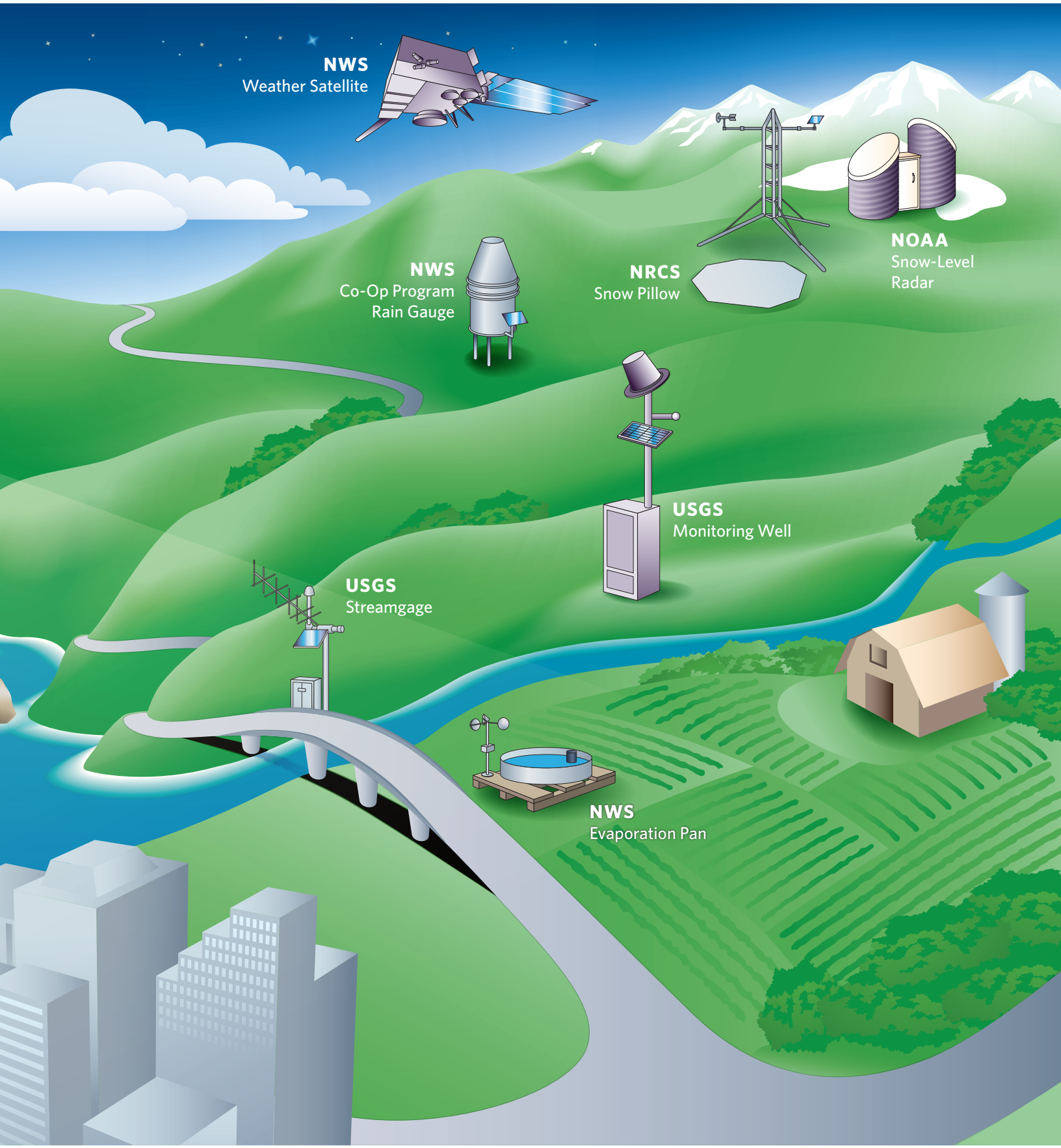


NOAA/NWS

The Hydrometeorology Testbed (HMT) program in the National Oceanic and Atmospheric Administration's (NOAA's) Climate Program Office provides research-level monitoring and forecasting for extreme precipitation, while the **Weather Forecast Offices and River Forecast Centers in NOAA's National Weather Service (NWS)** produce operational weather and streamflow forecasts.

Monitoring Instrumentation



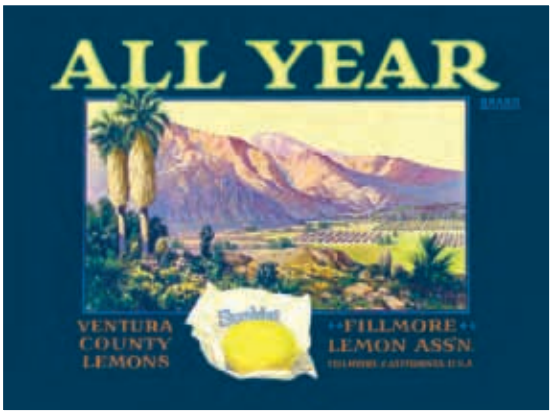

NWS
Weather Satellite
NOAA
Snow-Level
Radar
NWS
Co-Op Program
Rain Gauge
NRCS
Snow Pillow
USGS
Monitoring Well
USGS
Streamgage
NWS
Evaporation Pan

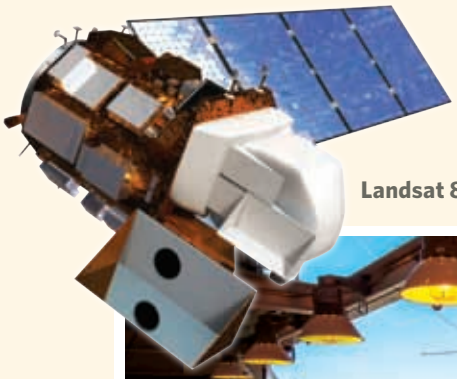
Western states use information from the federal data programs for purposes such as:

- Flood fighting and making emergency management decisions
- Drought response and management
- Operating water supply and flood control projects
- Water supply planning
- Administering water rights and allocating water among competing uses
- Protecting in-stream water uses
- Complying with federal water quality and environmental requirements

Adequate and consistent federal funding is needed to maintain, restore, modernize, and upgrade these data programs not only to avoid loss or further erosion of critical information and data, but also to address incorporation of new technological capabilities and improve efficiencies of data collection and dissemination.

Continuity of important long-term historical records such as USGS streamflow data must be maintained and capabilities of aging historical observing networks such as the NWS cooperative observer program (important for monitoring spatial variability of precipitation) must be appropriately preserved. Important data gaps remain to be filled. For example, the Council has supported (position #332, adopted June 2011) development of an improved observing system for extreme precipitation events in the West, a system that would rely on monitoring programs of multiple federal agencies including NOAA, USGS and NRCS.





Landsat 8

Landsat Data Continuity Mission Ready for Launch

NASA/USGS

The National Aeronautics and Space Administration (NASA) and USGS Landsat program delivers thermal imaging data that can be used for estimating water use by crops and native vegetation; Landsat and other NASA missions enable estimation of evapotranspiration for irrigation scheduling for agricultural and urban landscape.

USGS

The U.S. Geological Survey (USGS) Cooperative Streamgaging Program and National Streamflow Information Program measure lake and reservoir levels and flow in rivers and streams, and USGS groundwater data programs monitor water levels in wells.

The United States should accurately assess the quantity and quality of its water resources, should accurately measure how water is used, and should know how water supply and use change over time.

Many effective programs are underway to measure aspects of our water resources. However, simply stated, quantitative knowledge of U.S. water supply is currently inadequate.

The United States should measure water resources more strategically and efficiently. A robust process for measuring the quantity and quality of the Nation's water resources requires a systems approach. Surface water, groundwater, rainfall, and snowpack all represent quantities of water to be assessed and managed – from the perspectives of quantity, quality, timing, and location.

Without an adequate assessment of water supplies on a watershed or aquifer basis, optimal water management cannot be achieved. Improved knowledge of the size and distribution of the water supply and how it changes over time will allow more efficient and equitable allocation of this precious resource and will minimize overallocation of limited supplies.

National Science and Technology Council
Subcommittee on Water Availability and Quality (SWAQ)

A Strategy for Federal Science and Technology to Support Water Availability and Quality in the United States
September 2007

(801) 685-2555
www.westernstateswater.org