

# Colorado River Basin Water Year 2005 Outlook

Summary of a NOAA Briefing November 9, 2004

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NOAA and its climate services partners sponsored a briefing for water managers, decision makers, and planning groups in the Intermountain West region on November 9, 2004. The briefing provided an assessment of current and projected climate conditions and water availability impacting the Lower and Upper Colorado River Basins. NOAA scientists described various forecast tools available for seasonal climate and hydrologic prediction, and presented operational forecasts and outlooks. The outlook briefing was held in Salt Lake City, UT co-hosted by the NOAA Colorado Basin River Forecast Center (CBRFC) and U.S. Bureau of Reclamation (USBR) Upper Colorado Region Area Office. Over 80 people attended, including representatives of more than a dozen water resource management

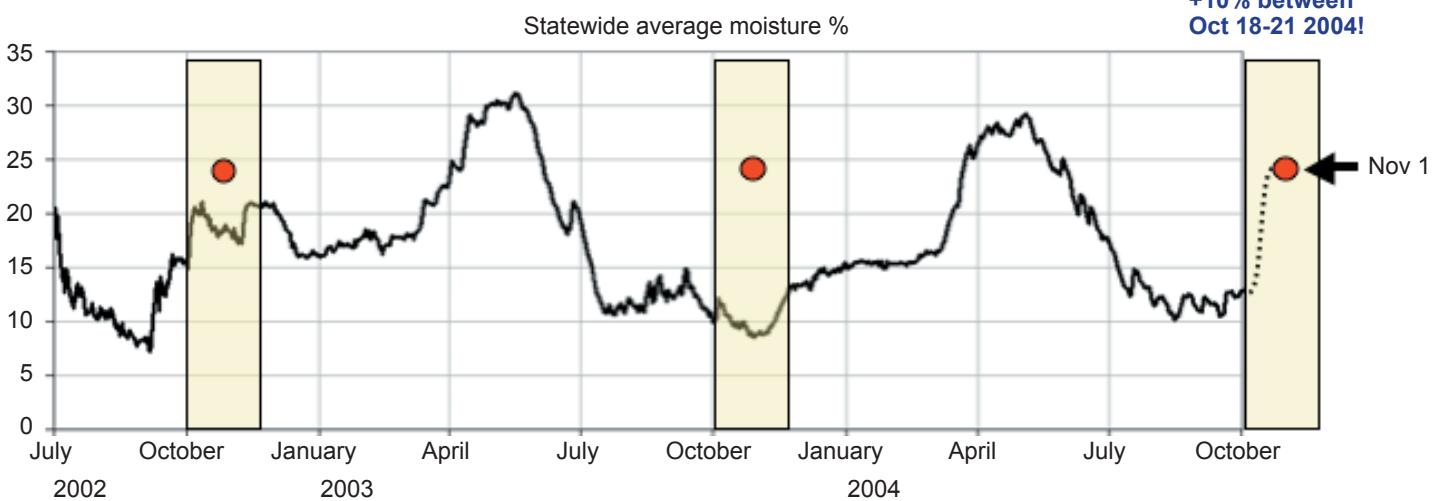
organizations, several USBR offices, and several universities.

## Key points of the briefing

- Soil moisture conditions in the Colorado River Basin (CRB) are considerably higher than in the fall in the past several years (Figure 11a).
- There is a weak El Niño in progress in the Pacific, not as strong as those in 1997-98 or 1982-1983, and with less pronounced effects anticipated. The center of warming directly impacting the atmosphere is located in the western Pacific, in contrast with the more canonical or typical El Niños, in which the center of warming exists in the eastern Pacific (the Niño 3.4 area).
- The long-term impact of the current El Niño on precipitation in the CRB is uncertain and highly dependent on how conditions in the equatorial Pacific evolve over the next few months.
- The early outlook for Lake Powell April-July 2005 inflows is 6.7 million acre-feet (MAF) and was updated in early December to 7.3 MAF compared to an average of 7.9 MAF (Figure 11b).
- In the short term, atmospheric circulation has shifted from the dominant winter pattern of the last few years characterized by a persistent high pressure anomaly over much of the western U.S. that was blocking moisture and storms from bringing needed drought relief. This year, however, the atmosphere



**State of Utah NRCS Soil Moisture 2002-2004 (70 sites)**



**Figure 12a.** Utah statewide average soil moisture percentage for July 2002 – October 2004. Note that the soil moisture for October 2004 is higher than in October 2002 and 2003 and is closer to the soil moisture in the spring runoff season. This data comes from the Utah office of the Natural Resources Conservation Service.

has been much more conducive to the production of winter storms in the CRB.

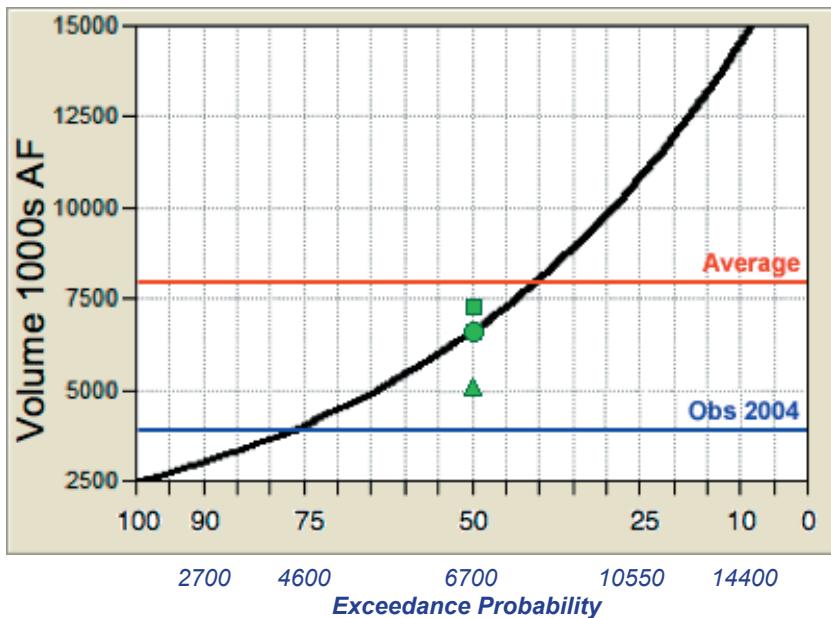
- The observed trend towards higher temperatures across much of the Western U.S., and in the CRB, may be the most certain information available about the upcoming year. Projections for the current warming trend to continue represents a potentially big challenge for water management in the CRB.
- Forecast skill for the next few seasons to a year is primarily based on the El Niño/Southern Oscillation; while there is interest by researchers in other indices such as the Atlantic Multi-decadal Oscillation (AMO) and Pacific Decadal Oscillation (PDO), there is no convincing demonstration of skill based on any index but ENSO.

- NOAA is developing new, spatially coherent climate divisions to more accurately describe, monitor, and potentially forecast sub-basin variations in climate variability.

Forecasters must combine many factors and indices in order to determine the spring and summer water supplies for the western U.S., and as these indices change, the forecast may change as well. According to the NOAA Colorado Basin River Forecast Center, the primary drivers of the water supply forecast at this time of year are antecedent fall flow; soil moisture surplus or deficit; and snowpack. Snowpack for the winter is highly uncertain and it is sensitive to details of the El Niño event, specifically the strength and the spatial pattern of the sea surface warming. Currently, there is considerable uncertainty

regarding the strength and spatial pattern for this event, which lowers the confidence in a prediction of a wet water year for the Upper and Lower Colorado Basins that forecasters would typically expect from an El Niño. However, the odds favor some overall improvement in the Basin this season based on early trends and the developing El Niño.

**Dr. Andrea Ray** is a research scientist at the NOAA Climate Diagnostics Center. Her recent work includes studying the interaction of climate variability and reservoir management and other studies of climate and society interactions.



#### Forecasts of Most Probable made on ...

- December 13, 2004 (7300)
- November 3, 2004 (6700)
- August 18, 2004 (5100)

**Figure 12b.** Colorado Basin River Forecast Center (CBRFC) Extended Streamflow Prediction (ESP) Forecast for Lake Powell April-July 2005 volume. The red line shows the average inflows (7.9 MAF), the blue line shows the observed inflows in water year 2004 (3.6 MAF). The black curve shows exceedance probabilities for inflows, which were calculated on November 3, 2004. The most probable inflows (50% exceedance) forecast on that date was 6.7 MAF. However, that value was revised up to 7.3 MAF in December due to favorable soil moisture and precipitation.

For more information on streamflow forecasts, visit the CBRFC web site, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov), and go to 'Water Supply Forecasts'.

#### On the Web

Agenda, meeting summary, and complete presentations are available at: <http://www.cdc.noaa.gov/news/crbob>.

