

## Lead Scientist's Report

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**Summary:** This report covers four items: 1) Possible "megadrought" for the Western United States, 2) Fall Midwater Trawl (FMWT) results for delta smelt and other POD species, 3) summary of the first snow survey of 2014 and 4) new infestation of quagga mussels in California.

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### **Possible 'Megadrought' Experienced by the Western United States**

At the Fall Annual Meeting of the American Geophysical Union in December 2013 paleoclimatologist Dr. Edward Cook, director of the Tree Ring Laboratory at Columbia University's Lamont-Doherty Earth Observatory, gave a talk on megadroughts. Megadroughts are defined as a drought lasting 20 or more years. Dr. Cook suggested that parts of the western United States may be in the midst of a megadrought that began in 2000. Tree ring data show that decades-long droughts predate recent buildup of greenhouse gases in the atmosphere and appear to be associated with warmer climate conditions. Dr. Toby Ault of Cornell University indicated in a subsequent presentation the chances of a decade-long drought in the U.S. this century would be about 45 percent, and a multi-decade-long drought less than 10 percent. Several online news sources and the Associated Press publicized the presentations in the days following the conference.

### **The Fall Midwater Trawl Results**

On December 17, 2013 the California Department of Fish and Wildlife completed its 2013 Fall Midwater Trawl sampling season. Low abundance indices were reported for all pelagic species. The 2013 age-0 striped bass index is 70 (tied third lowest in FMWT history). The longfin smelt index (184) and the threadfin shad indices were the eighth and fifth lowest in FMWT history, respectively. The delta smelt (18) and American shad (309) indices were the second lowest index in FMWT history. The FMWT delta smelt index is used in determining the incidental take limit, which affects exports of water from the Delta.

### **First Snow Survey of 2014**

The Department of Water Resources released the findings of its first snow survey on January 3, 2014. Statewide snowpack water content measured about 20 percent of average for this time of year, which is only 7 percent of the average peak snowpack (April 1). This ties the record low for first survey snowpack set in 2012.

**Quagga Mussels Invade Piru Reservoir**

On December 18, 2013, the invasive quagga mussel was discovered in Piru Reservoir in Ventura County. Mandatory boat quarantines have been implemented for neighboring lakes, Cachuma and Casitas, to prevent their further spread. This represents the first time quagga mussels have been found in a Southern California water body that was not fed by the Colorado River.

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