

Lead Scientist's Report

Summary: This report presents four items, 1) highlights from the 22nd National Science Foundation (NSF) Experimental Program to Stimulate Competitive Research (EPSCoR) Conference, 2) an update on salmon returns, 3) a summary of the recent paper by Glibert et al. (2011) in *Reviews in Fisheries Science*, and 4) an overview and update on the current status of the El Niño (La Niña) Southern Oscillation (ENSO) phenomena.

22nd NSF EPSCoR Conference

The NSF EPSCoR Conference is an annual meeting presenting research and educational approaches that embody the EPSCoR ideals of being a testbed for new ideas and concepts with measurable outcomes. EPSCoR is an NSF program that invests in multi-institutional and interdisciplinary projects and provides physical, human and cyber (computer) infrastructure aimed at improving research competitiveness in 27 states and two territories. The three themes at this year's EPSCoR conference included Water and Environment, Workforce Development and Energy.

During the Water and Environment plenary session, Dr. Cliff Dahm gave a presentation titled, "Science, Policy, Planning and Competing Goals in River Management". He used the Delta Plan as an important example where science, planning, and policy development interface in substantive ways. Other Water and Environment plenary session presentations addressed topics such as the role of information technology in sustaining water systems, emerging technologies for research in water quality, and recent discoveries at the interface between land and water.

For more information about the conference please visit:

<http://www.certain.com/system/profile/web/index.cfm?PKwebID=0x2268429679&varPage=home>

Salmon Returns

Early data indicate that more fall-run Chinook salmon are returning to the Central Valley streams to spawn than in recent years. Each year salmon that survive numerous factors (e.g., predation, entrainment, harvest for consumption, ocean condition) return to streams in the Sacramento River and San Joaquin River basins to reproduce. In the Sacramento River Basin, Yuba River and Battle Creek fall-run Chinook returns to date are greater than the previous year's returns.

For example, during the first part of this year's Battle Creek fall-run salmon return, the number of returning fall-run salmon was 24,870 (as of 10/25/11), exceeding the number of fall-run salmon that returned each year for the past four years (the greatest of which was 22,763 salmon in 2007). In the San Joaquin River basin, fall-run salmon returns are also higher this year relative to recent years. On the Mokelumne River, observations of returning salmon to date by video monitoring total 10,944 salmon (as of 10/25/11), exceeding the total returns from 2010 (7,177 salmon). These increased returns on the Mokelumne River are associated, in part, with the closure of the Delta Cross Channel gates from October 4-14, 2011.

West Coast salmon returns outside of the Central Valley, such as in the Russian River Basin and Columbia River Basin, are also greater than in previous years. Although this year's

observed salmon returns to date appear lower than those observed in the early 2000's, Central Valley returns this fall look much more promising than in recent years.

Glibert et al. (2011) Paper in Reviews in Fisheries Science

A recently published paper by Patricia Glibert et al. (2011) explores the role of nutrient stoichiometry (varying nutrient ratios) on food quality and food webs in the San Francisco Estuary (Bay Delta). The paper uses 30 years of data to explore the relationship between changes in varying ratios of nutrients (nitrogen-to-phosphorous) and the composition of aquatic food webs in the Bay Delta ecosystem. Glibert et al. (2011) conclude that the composition of the Bay Delta's aquatic food web can be predicted by measured nutrient ratios. The paper suggests that changes in the availability of nutrients and the ratio of the nutrients to each other is the primary driver for observed changes in the Bay Delta's aquatic community composition over time. The paper infers that increases in nitrogen and reductions in phosphorous over time have led to changes in food web interactions that explain the Pelagic Organism Decline (POD). Glibert et al. (2011) conclude that restoring fish populations in the Bay Delta will require significant nitrogen reductions to restore historic nutrient ratios between nitrogen and phosphorus. The Glibert et al. (2011) paper presents one interpretation for explaining the POD that focuses upon the relationship between nutrients and aquatic food webs in the Bay-Delta. This paper will add to the debate of the role of nutrients in the health of the aquatic ecosystems of the Delta.

Reference

Glibert, P. M., D. Fullerton, J. M. Burkholder, J. C. Cornwell and T. M. Kana. 2011. Ecological stoichiometry, biogeochemical cycling, invasive species, and aquatic food webs: San Francisco Estuary and comparative systems. *Reviews in Fisheries Science* 19:4, 358-417.

To access the Glibert et al. (2011) paper please visit:

<http://www.tandfonline.com/doi/abs/10.1080/10641262.2011.611916#preview>

El Niño (La Niña) Southern Oscillation (ENSO) Phenomena

La Niña conditions are currently present in the tropical Pacific Ocean and are expected to strengthen and continue through the Northern Hemisphere again this winter. La Niña conditions are characterized by cooler than normal ocean waters in the eastern tropical Pacific and warmer than normal ocean waters in the western Pacific. Sea surface temperature, sea surface elevations, tropical winds, the distribution of clouds in the tropics, the direction and strength of ocean currents, and vertical temperature profiles are used to determine the status of the ENSO phenomena in the tropical Pacific.

La Niña conditions are well correlated with below normal precipitation and reduced water from snowmelt in Southern California and the southwestern U.S (including Texas). The effects of a large La Niña event on precipitation and river flows in Northern California are much less predictable because this region falls in the transition zone between generally wetter conditions in the Pacific Northwest and drier conditions in the southwestern U.S.

To access the latest ENSO information please visit:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/index.shtml

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