CALFED BAY-DELTA PROGRAM Media Advisory

650 Capitol Mall, 5th Floor Sacramento, CA 95814 PHONE 916.445.5511 FAX 916.445.7297 www.calwater.ca.gov

Contact: Jeanie Esajian, 916/445-0464 or 916/275-6802
Keith Coolidge, 916/445-0092

Reporter's Tip Sheet
2006 CALFED Science Conference

Highlights for Monday, October 23, 2006

Plenary Session -- Rooms 311-315

9:10 a.m.
The Art – and Science – of Policy Making in the Delta
Mike Chrisman
Secretary for Resources
California
Secretary Chrisman will set the tone for the conference by offering an overview of policy issues in the Delta and discussing the current direction policymakers are taking in resolving Delta issues.

9:55 a.m.
Bridging the Gap between Science, the Press and Public: How Can We Better Tell Our Story?
Patricia A. Conrad
Department of Pathology, Microbiology and Immunology
School of Veterinary Medicine
University of California, Davis
This Aldo Leopold Leadership Training Program fellow will discuss the responsibility scientists have to translate the results of their research for the public and policy makers both directly and through the media. The presenter will use her own experience with a major environmental story: the near-extinction of one of California's most charismatic creatures -- the Southern sea otter. After being hunted to near extinction for their fur in the 1800s, this subspecies became federally protected in 1977. Despite this protection, sea otter abundance in California continued to be at a low level due to continuing infectious parasitic diseases. The mystery surrounding these deaths attracted national and international media attention. Ultimately, Dr. Conrad testified before the Legislature and the Governor signed AB 2485 to provide research into sea otter deaths.

10:40 a.m.
New Orleans and Hurricane Katrina: Lessons for California's Levees
Raymond B. Seed
Civil and Environmental Engineering
University of California at Berkeley
The recent flooding and devastation of the greater New Orleans region during hurricane Katrina represented the most costly peace-time failure of an engineered system in North American history. Extensive investigations and analyses have been performed by several major teams in the wake of this disaster, and some very important lessons have been learned. Many of these

have very direct and urgent applications to California's levee systems and flood risk exposure. Lessons include the importance of proper evaluation of risk and hazard; so that appropriate decisions can be made regarding the levels of expense and effort that should be directed towards prevention of catastrophe, and the levels of post-disaster response capability that should be maintained as well. The lessons from New Orleans were learned at tremendous cost. Hopefully, these can now be used to prevent similar catastrophe here in California.

11:05 a.m.
POD: Pelagic Organism Decline or Price of Development?
Ronald T. Kneib
University of Georgia Marine Institute
Understanding the factors and mechanisms driving changes in desirable pelagic assemblages that are dependent on the estuarine ecosystem and human-dominated watershed of the upper San Francisco Bay is a focal component of the CAFED Bay-Delta Science Program. Pelagic organism decline (POD), together with human-induced changes in other biotic assemblages and water resources, have been well documented in this system at multiple temporal and spatial scales. Balancing the collective needs and wants of an expanding human population with respect to the distribution and use of water resources will continue to be a persistent global challenge for resource managers into the foreseeable future.

11:30 a.m.
The Promise of Microarrays and Proteomics Approaches to Assess Endocrine Disruption in Fish
Nancy D. Denslow
Department of Physiological Sciences
University of Florida
Endocrine disrupting chemicals (EDCs) negatively impact reproduction in wildlife through both sex-hormone receptor dependent and independent pathways, along the hypothalamic-pituitary-gonadal (HPG) axis. Traditionally there have been no encompassing approaches to assess the effects of chronic exposure to low concentrations of pollutants, identify multiple effects caused by single chemicals, provide insight into the effects of chemical mixtures or multiple stressors, and finally, to meet the challenge of translating molecular data into population and ecosystem level impacts. Traditional approaches identify impacted environments, normally focusing on a single mechanism of action, but often lack sufficient data to bring together a cohesive understanding of how an impacted environment causes adverse effects.

Concurrent Sessions

2 p.m. Long-Term Challenges: Levees, Room 308
Characteristics of Earthquake Ground Shaking Hazard for Input into the Delta Risk Analysis
Ivan G. Wong
URS Corporation
The effects of earthquakes may be the most significant natural hazard that can impact the Delta levees. As part of the Delta Risk Management Strategy Project to evaluate the risk of failure of the Delta levees, probabilistic seismic hazard analyses (PSHA) will be performed to define plausible earthquake ground shaking events that will contribute to the risk of levee failure in the Delta. A working group will develop a composite representation of the informed technical

community as input into the PSHA. The PSHA methodology to be used in this study allows for the explicit consideration of epistemic uncertainties and inclusion of the range of possible interpretations of components in the seismic hazard model, including seismic source characterization and ground motion estimation.

2:40 p.m. Long-Term Challenges: Levees, Room 308
Levee Fragility
Said S. Salah-mars
URS Corporation
The Delta Risk Management Strategy (DRMS) will evaluate the risk of levee failure in the Sacramento-San Joaquin Delta and Suisun Marsh (the Delta) under present and foreseeable future events and conditions. There have been several levee failures leading to island inundations since construction of levees a century ago and these levee failures will be used to test/calibrate some of the numerical models. The levee fragility analysis is conducted to evaluate the probability of failure of levee reaches for each stressing event considered for all modes of failures that may occur during a given stressing event. Several levee failure modes were identified and they include: 1) through-seepage, under-seepage, static stability failures under normal "sunny weather" conditions, 2) through-seepage, under-seepage, wind wave induced erosion, overtopping, slope stability failure and sudden drawdown under flood conditions and 3) seismic-induced failures.

3:40 p.m. Long-Term Challenges: Levees, Room 308
Subsidence Mitigation and Sediment Accretion in a Restored Wetland on Twitchell Island, Sacramento-San Joaquin Delta, California
Roger Fujii
US Geological Survey
The stability of levees in the Sacramento-San Joaquin Delta is threatened by continued subsidence of Delta peat islands. Up to 6 meters of land-surface elevation has been lost, primarily due to oxidation of peat soils, since Delta marshes were first leveed and drained 150 years ago. Restoration of marshes on subsided peat islands halts peat oxidation and can result in recovery of land-surface elevation and accretion of new sediment. This study demonstrates that restoration of managed emergent marsh wetlands on subsided Delta peat islands can produce significant increases in land surface elevation, and is directly relevant to the CALFED objectives of improving levee system stability and restoring valuable marsh habitat in the Delta.

Highlights for Tuesday, October 24, 2006

Concurrent Sessions

8:30 a.m. Migrating Fish and Rivers: Sacramento River Ecological Flows I, Room 306
Overview of the Sacramento River Ecological Flow Study
Ryan A. Luster
Mike D. Roberts
The Nature Conservancy

Although active floodplain re-vegetation strategies have proven successful, a long-term conservation strategy for the Sacramento River involves restoring or replicating the natural river processes that create and maintain these dynamic ecosystems. The Sacramento River Ecological Flows Study strives to contribute to restoration planning for the Sacramento River by identifying flow characteristics required to drive process-based restoration of aquatic, bank, riparian and off-channel habitats. It is important to emphasize that this project does not aim to return the Sacramento River flow patterns to some unaltered historical conditions. Rather, the project encourages resource managers and stakeholders to examine ways to manage water to better support the habitats and species of the river while fulfilling water supply, water quality, and flood management objectives.

8:30 a.m. Science and Management: Pelagic Organism Decline I, Introduction, Room 315

Pelagic Organism Decline 2005-2006: Overview of Program and Progress

Ted R. Sommer

Department of Water Resources

Abundance indices calculated by the Interagency Ecological Program (IEP) show recent marked declines in four species of pelagic fish in the upper San Francisco Estuary: delta smelt, longfin smelt, young-of-the-year striped bass and threadfin shad. Although several species show evidence of long-term declines, the recent low levels were unexpected, given the relatively moderate winter-spring flow of the past several years. IEP Agency Directors have directed IEP staff to prepare and implement a series of studies to define and understand the nature of these declines. Since 2005, the overall approach sought to identify the most likely causes and assign priorities on the basis of where funds and resources could best be used. The pelagic organism decline is a major concern to the IEP, CALFED and all agencies concerned with water development and resource management in the San Francisco Estuary.

9:30 a.m. Water and Sediment Quality: Mercury I, Room 314

Methyl Mercury Concentrations and Load in the Central Valley

Chris G. Foe

Central Valley Regional Water Quality Control Board

The Sacramento and San Joaquin watersheds were the largest source of methyl mercury to the Estuary (62%). Follow-up monitoring was conducted at 26-sites with flow gauges (March 2003-September 2005) and methyl mercury loads estimated. Important findings for the Sacramento are that Shasta, Oroville and Folsom Reservoirs discharged 65% of the water but only 20% of the methyl mercury at Freeport (Delta boundary). The Sacramento River at Colusa (43%), Feather River (24%), Colusa Basin Drain (10%) and American Rivers (8%) are the main source of methyl mercury to the Delta. Important findings for the San Joaquin are that Mud Slough contributed 49% of the methyl mercury at Vernalis (Delta boundary) but only 9% of the flow. A positive relationship was observed in both rivers between the sum of upstream loads and the load discharged to the Delta.

1:10 p.m. Science and Management: Pelagic Organism Decline III, Food Web and Invasive Species Effects, Room 315

Foodweb Support for the Threatened Delta Smelt: Subtle Interactions may be a Cause of the Pelagic Organism Decline

Wim Kimmerer
Romberg Tiburon Center
San Francisco State University

A collaborative research program is underway to characterize the foodweb of the low salinity zone (LSZ) of the northern San Francisco Estuary. Recent evidence indicates that several species of estuarine fish, including delta smelt, may be food limited, suggesting a link between their declines and changes at lower trophic levels. These changes include a recent decline in abundance of the copepod Pseudodiaptomus forbesi, important food for young fishes in and landward of the LSZ during late spring and summer. The CALFED Science Program funded an interdisciplinary study of the pelagic foodweb of the upper estuary, which provides food to delta smelt and other fishes. The principal goal is to understand the principal sources of energy to this rather anomalous foodweb and how that energy makes its way into the copepods eaten by the fish.

1:50 p.m. Science and Management: Pelagic Organism Decline III, Food Web and Invasive Species Effects, Room 315

Zooplankton Trends, Habitat, and Diets in the Upper San Francisco Estuary

Anke B. Mueller-Solger
Department of Water Resources

One hypothesis to explain the recent declines in several pelagic fish species centers on increased food limitation due to changes in the zooplankton community. Most zooplankton species experienced at least some degree of long term decline in regions of the upper estuary, often in concert with new species introductions. In recent years, calanoid copepods have reached especially low densities in large Suisun Marsh sloughs and Suisun Bay, while remaining relatively stable elsewhere and showing some increases in the southern Delta. This presentation addresses long- and short term changes in the zooplankton community potentially related to pelagic fish declines in the upper San Francisco estuary and offers recommendations for increasing the densities of these organisms.

2:10 p.m. Long-Term Challenges: Aquatic Invasive Species III, Room 308

Northern Pike Containment System at the Outlet of Lake Davis on Big Grizzly Creek

James L. Newcomb
Department of Water Resources

The Department of Water Resources has designed a containment system to prevent northern pike from passing through the Lake Davis outlet and moving downstream into Big Grizzly Creek and into the Feather and Sacramento River system, where it could flow into the Delta, causing severe environmental and economic damage. Northern pike are a non-native invasive fish species that aggressively feeds on other fish. Despite major efforts to eradicate them, the northern pike population continues to grow. Discharge from the Lake Davis outlet will flow through any of six to eight "strainers" that remove all material 1.0 mm or larger before discharging into Big Grizzly Creek. The 1.0 mm strainer openings catch northern pike eggs and larvae in addition to adult fish. After passing through the strainer system, the pike-free water is released into Big Grizzly

Creek.

2:10 p.m. Water and Sediment Quality: Mercury III, Room 314

Biosentinel Mercury Monitoring in Support of Restoration Management across the Bay-Delta Watershed

Darell Slotton
UC Davis

The Fish Monitoring Program began in 2005 is a central component of the CALFED Bay-Delta Program's mercury strategy, tracking relative methylmercury exposure and providing feedback to restoration and remediation managers. One key component of this program is the collection and analysis of appropriate small fish and invertebrate bio-sentinel organisms throughout the Bay-Delta watershed. Sampling is particularly focused on large wetland restoration regions and their potential to alter methylmercury exposure. Additional index sampling tracks background regional, inter-annual and seasonal trends. Collections in 2005 confirmed highest mercury bioaccumulation in certain tributary regions, with most of the Delta proper considerably lower. Particularly notable for elevated inland silverside mercury were the Yolo Bypass, the Cosumnes River and Mud Slough draining the Kesterson region.

3:10 p.m. Science and Management: Pelagic Organism Decline IV, Operations and Flow Effects, Room 315

***Multi-Decade Habitat Trends: Patterns and Mechanisms for Three Fishes in the* San Francisco Estuary**

Matt Nobriga
Department of Water Resources

Quantification of physical and chemical factors that influence habitat suitability provides a useful tool for the evaluation of fish population dynamics. We examined a 36-year record (1967-2004) of midwater trawl sampling and concurrent water quality sampling to evaluate habitat trends for delta smelt (Hypomesus transpacificus), striped bass (Morone saxatilis), and threadfin shad (Dorosoma petenense) in the San Francisco Estuary. Generalized additive modeling revealed that two water quality variables -- Secchi depth and specific conductance -- were important predictors of fish occurrence. Indices of habitat quality derived from the modeling predictions exhibited significant long-term declines for each species, and the most dramatic changes were located in the southeastern and western regions of the estuary.

3:30 p.m. Science and Management: Pelagic Organism Decline IV, Operations and Flow Effects, Room 315

Hydrodynamic Influences on Historical Patterns in Delta Smelt Salvage

Peter E. Smith
US Geological Survey

In 2005, the Interagency Ecological Program working group investigating the Pelagic Organism Decline (POD) in the Sacramento-San Joaquin Delta discovered that the winter salvage of adult delta smelt at the south Delta fish facilities was especially high during 2000 through 2004. We extended the POD group's salvage data analyses further back in time and analyzed possible hydrodynamic mechanisms that might help explain the historical patterns in delta smelt salvage since the general numerical decline of the species in the early 1980s. We found that the average monthly combined flow in Old and Middle Rivers near Bacon Island predicts the monthly total

(federal and state) salvage for the juvenile and adult stages of delta smelt more accurately than the average monthly export flow.

4:30 p.m. Science and Management: Pelagic Organism Decline IV, Operations and Flow Effects, Room 315

POD 2007 Study Plan: "Are we there yet?"

Chuck S. Armor

California Department of Fish and Game

The Pelagic Organism Decline (POD) work planned for 2007 is based on an extension and refinement of the work started in 2006, recommendations from the CALFED peer review panel and information gaps identified by the narrative models developed in 2006. Refinement of the narrative models has focused on food web changes and the use of habitat as a conceptual way to bring much of the information together and to link the two narratives. The Pelagic Organism Decline (POD) effort is part of the Interagency Ecological Program (IEP). The IEP is an integral part of the CALFED Science program. POD investigations are of critical importance to water and resource managers in the San Francisco Estuary.

Highlights for Wednesday, October 25, 2006

Concurrent Sessions

9:30 a.m. Long-Term Challenges: Climate Change I, CALFED's Climate Setting, Room 308

A Decade of Phytoplankton Increase in San Francisco Bay: Response to Climate Trends (or Something Else)?

James E. Cloern

US Geological Survey

The puzzles of phytoplankton increase in San Francisco Bay and zooplankton-fish declines in the Delta illustrate the unusual complexity of estuarine ecosystems whose biological communities are responsive to interacting atmospheric, coastal-ocean, trans-oceanic and watershed processes. Climate-induced variability of estuarine communities is best understood in a broad ecosystem context that includes all these processes of change. Sustainability of species and communities in the San Francisco Bay-Delta requires an ecosystem-scale understanding of the processes of biological change, including interactions between climatic variability and human disturbances.

10:50 a.m. Migrating Fish and Rivers: Central Valley Salmonids II, Room 306

Salmon Conservation in a Changing Climate

Peter M. Miller

UC Berkeley

Climate change poses a significant new threat to biodiversity in general, and to Pacific Salmon in particular, that differs in important ways from other threats. Current planning approaches are either founded on the assumption of a static climate or they employ complex, multi-variable models that aren't easily adapted to the evaluation of potential management responses. Neither approach can be easily integrated into an adaptation planning framework. As a result, conservation planners are going to have to develop new approaches that facilitate effective

planning in a much more dynamic environment. The climate sensitivity response (CSR) framework addresses this problem by providing a reliable and practicable methodology for assessing key vulnerabilities and adaptive response options.

10:50 a.m. Long-Term Challenges: Climate Change II, CALFED's Climatic Future, Room 308

Projected Sea Level Rise along the California Coast and in the Bay/Delta

Daniel R. Cayan
Scripps Institution of Oceanography
UC San Diego

Hourly sea levels during the 21st Century along the California coast and in San Francisco Bay and Delta have been modeled based on tides, simulated climates and global sea-level trends. The simulated occurrence of extreme sea levels escalates sharply as mean sea level rises. The confluence of low barometric pressures and large waves from storms substantially increases the likelihood of high, damaging sea levels along the coast. Sea level variations caused by tides, weather and climate fluctuations are also transmitted into San Francisco Bay, Delta, and the lower reaches of the Sacramento River so that, when the low pressures and waves are part of winter storms that flood the Sacramento/San Joaquin Delta, the potential for inundation or damage to levees and other structures increases even more. Sea level rise could have detrimental effects on water quality and Delta levees and wetlands.

11:10 a.m. Long-Term Challenges: Climate Change II, CALFED's Climatic Future, Room 308

Projecting Inundation Due to Sea Level Rise in the San Francisco Bay and Delta

Noah Knowles
US Geological Survey

A projected sea level rise of 20-80 cm over the coming century will cause new areas surrounding the San Francisco Bay and Delta to be inundated, with a wide variety of ecological and socioeconomic consequences. Available elevation and land-use data are used to characterize the areas at greatest risk of inundation. The projected inundated areas are primarily inter-tidal. The dominant inundated land-use types are wetlands adjacent to the Bay and areas that are presently croplands around the Delta periphery. The effects of sea level rise would also combine with projected higher flood stages due to reduced snow pack and with continued land subsidence to significantly increase the risks of levee failure in and around the Delta.

11:30 a.m. Long-Term Challenges: Climate Change II, CALFED's Climatic Future, Room 308

Warm Storms in a Warmer World and Floods from the Sierra Nevada

Michael D. Dettinger
US Geological Survey

Warm winter storms can have dire consequences of flooding from the Sierra Nevada that ultimately impact upland rivers, reservoirs, Central Valley rivers and the Bay-Delta estuary. Analyses of the historical distributions of such storms and the temperatures, precipitation and ultimately runoff that they cause indicate that the most dangerous storms impinge on the Sierra Nevada within fairly narrow ranges of wind directions and distinct atmospheric circulation patterns. Analyses of the frequencies and intensities of these wind, circulation, and temperature patterns in recent climate-change projections for Central California will be presented. The results

support a discussion and mapping of areas with greatest potentials for major flood-frequency changes in the Sierra Nevada. CALFED's objectives of levee stabilization, ecosystem restoration and water supply and quality protection are all threatened on a regular basis by floods and flood damage.

11:30 a.m. Water and Sediment Quality: Pyrethroids, Laboratory Methods & Environmental Effects II, Room 314

An Overview of Effects of Pyrethroid Insecticides on Fish

Inge B. Werner

UC Davis

This paper will present information on the effects of pyrethroids alone and in combination with other stressors on an economically important fish species resident in the Sacramento and San Joaquin River watersheds and delta. Pyrethroids have recently been identified as a pollution problem in sediments of the watershed. Due to their hydrophobic properties, pyrethroids rapidly sequester to particles and organic matter, and it is generally assumed that dissolved concentrations in the water column are too low to cause acutely toxic effects in fish. However, there is concern that these pesticides may be having deleterious sublethal effects at environmentally relevant doses. This presentation will give an overview of known toxic effects of pyrethroids in fish, as well as present recent data on age-specific toxicity and on sublethal effects in Chinook salmon.

1:10 p.m. Climate Change III: DWR/USBR Responses to Climate Change, Room 308

California Climate Change – A Historical Perspective

Michael L. Anderson

Department of Water Resources

CALFED planners are exploring options to expand water supplies and efficient water use through an array of projects and management proposals. Planning analysis requires understanding of potential future climate conditions and how those conditions affect option viability. To this end, it is beneficial to have a historical perspective of observed changes to provide perspective on potential climate change impacts for Central Valley headwater runoff. Observed trends and fluctuations in precipitation, temperature, and runoff over the past 100 years are presented as point of reference to discuss potential future changes over the next century as depicted by climate simulation models. Potential impacts indicated by climate model simulations are then assessed. The implications of the observed trends and expected future changes in storm runoff and snowmelt will be explored. These findings relate to CALFED's objectives of water supply and reliability.

1:50 p.m. Climate Change III: DWR/USBR Responses to Climate Change, Room 308

Preliminary Climate Change Impacts Assessment for the Sacramento-San Joaquin Delta

Jamie D. Anderson

Department of Water Resources

Potential Delta impacts of projected sea level rise include threats of higher water levels to levees and degradation of water quality due to increased saltwater intrusion. Changes in precipitation and runoff were examined for four climate change scenarios. The CalSim-II operations model was used to simulate changes in State Water Project and Central Valley Project operations for the climate change scenarios for both present and one foot sea level rise conditions. Effects of climate change on Delta inflows and exports were examined. Preliminary assessment of potential

climate change impacts on Delta water quality focused on compliance with municipal standards for chlorides. Effects of a one foot sea level rise on the potential to overtop selected Delta levees were also examined. These results are relevant to the CALFED objectives of water quality, water supply reliability, and levee system integrity.

3:10 p.m. Long-Term Options for the Delta: Scientific Insights and Management Approaches, Room 308

Bringing Science Beyond the Peripheral Canal

Jay Lund
UC Davis

This presentation will report on an interdisciplinary effort to bring the most recent ecological, geomorphologic, economic, hydrodynamic and engineering thought and ideas on the Delta together to develop a range of promising approaches to Delta water management. Findings will include a review of paradigm shifts in scientific understanding of the Delta's ecosystems, geomorphologic response, hydrodynamics and economic activity. The presentation would reflect a serious, albeit finite, effort of a team of experienced scientists and technical scholars with long involvement and experience with the Delta and California water problems to come to some interim conclusions and suggestions on the Delta's situation and some promising solutions.

3:10 p.m. Water and Sediment Quality: Managing Contaminated Sediments, Room 314

The Good, the Bad and the Muddy: Creating Wetlands using Dredged Sediments: Lessons Learned form the First Three Years of Operation at the Montezuma Wetlands Project, Suisun Marsh

Roger D. Leventhal
FarWest Restoration Engineering

The Montezuma Wetlands Project (MWP) is the largest dredged sediments beneficial reuse project operating on the West Coast. Since late 2003, the MWP has been placing dredged sediment to restore a mixture of tidal and seasonal wetlands in what is now subsided habitat in Suisun Marsh. The completed project will restore approximately 1,800 acres of habitat in this critical region of San Francisco Bay. This talk will focus on the critical design elements of the project with a particular focus on the "lessons learned" and adaptive management measures implemented during the first three years of operations. A summary of monitoring data will be presented. To date, approximately two million cubic yards of dredged sediments have been successfully placed at the site and project goals and objectives are being met, but some lessons have been learned along the way.

###