

Science Program Current Research Projects

Topic Area
Delta Smelt

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
1	SCI-06-C02-106	Modeling the Delta Smelt Population of the San Francisco Estuary	The proposed project will develop, test, and apply three classes of computer models for delta smelt: particle-tracking models, an individual-based model, and matrix projection models. These models have very different spatial and temporal scales, and different objectives.	California State University, San Francisco	Kimmerer, Wim	\$997,027	01-Apr-06	31-Mar-09	Culberson
2	SCI-05-C101	The Application of Otolith Geochemistry to Determine Stock Structure, Survival and the Relative Impact of Water Exports on the Threatened Delta Smelt (Sea Grant Fellows)	In this project, a scientist will analyze otolith geochemical signatures in adult fish (otoliths are bony structures in a fish's ear) to identify those larval nursery habitats contributing most to the adult population. They will also examine whether adult survival rates correlate with fast growth rates.	University of California, Davis	Hobbs, James	\$228,750	01-Sep-05	31-Aug-08	Machula
Sum						<u>\$1,225,777</u>			

Ecosystem Water and Sediment Quality

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
3	SCI-05-C11-122	Biomass and Toxicology of A New Established Bloom of the Cyanobacteria Microcystis Aeruginosa and its Potential Impact on Beneficial Use in the Sacramento-San Joaquin Delta	This hypothesis-based research program will focus on learning about the potential impact of this new large-colonial toxic cyanobacterium on beneficial use in the Delta through three tasks. Task 1: Literature review and database. Task 2: Field study of Microcystis biomass, toxicity, food web transfer and historical data analysis. Task 3: Fish bioassay.	California Department of Water Resources	Lehman, Peggy W.	\$500,000	01-Jun-06	30-Jun-08	Culberson

Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
4 SCI-05-C100	Modeling Nutrient and Organic Carbon Loads and Sources in Central Valley Watersheds: Taking Existing Monitoring Data to the Next Stage (Sea Grant Fellows)	The objective of this research is to use existing data and computer models to quantify the fluxes, sources and controls of nitrate, phosphate, and organic carbon throughout the Sacramento and San Joaquin river systems. Some of the specific research questions to be addressed include: 1) What are relative contributions of various land-based sources of dissolved organic carbon and nutrients? 2) How can the ability to predict sources and fluxes of nutrients be improved? 3) How will changes in climate, population growth and increased water demand influence water quality? Findings will be used to improve water quality for ecosystems as well as public health.	California State University, Humboldt	Harrison, John	\$228,750	01-Sep-05	31-Aug-08	Podger
Sum					\$728,750			

Estuary Foodweb Productivity

Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
5 SCI-06-C13-332	Phytoplankton Communities in the San Francisco Estuary: Monitoring and Management Using A Submersible Spectrofluorometer	The objective of this grant is to evaluate a new submersible spectrofluorometer, the bbe FluoroProbe, for phytoplankton monitoring and management in the San Francisco Estuary. Secondly, this project seeks to investigate high-frequency patterns in spatial phytoplankton group distributions among Delta habitats and along gradients from the productive southern Delta to the unproductive northern Delta and the increasingly saline western Delta and northern San Francisco Bay. A third aim of this project is to investigate high-frequency temporal phytoplankton patterns at fixed stations in contrasting Delta and Bay regions.	California Department of Water Resources	Mueller-Solger, Anke	\$159,158	15-Mar-06	15-Mar-08	Culberson
6 SCI-05-C12-107	Foodweb Support for the Threatened Delta Smelt and Other Estuarine Fishes in Suisun Bay and the Western Sacramento-San Joaquin Delta	Foodweb support for the threatened delta smelt, and potential mechanisms underlying relationships of abundance or survival of some fish to freshwater flow.	California State University, San Francisco	Kimmerer, Wim	\$1,170,000	01-Jan-06	31-Dec-08	Lougee
Sum					\$1,329,158			

Future Change

Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
7 SCI-05-G01-84	CASCADE: Computational Assessments of Scenarios of Change for the Delta Ecosystem	The purpose of this project is to develop and apply a model-based approach of ecological forecasting to project future states of the Delta ecosystem under prescribed scenarios of change, and to communicate the outcomes of those scenarios to resources managers facing the daunting challenge of meeting CBDA goals in a continually changing world.	U.S. Geological Survey	Cloern, James	\$1,662,870	01-Jan-06	28-Feb-09	Shouse
Sum					\$1,662,870			

River Channel and Floodplain

Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
8 SCI-03-C109	An Investigation of Floodplain Habitat For California's Native Fish Species (Sea Grant Fellows)	Jeff Opperman recently wrote a draft report for CALFED, in which the general principles of floodplain geomorphology, hydrology, and ecology for the Central Valley were reviewed. A second document will review the historical extent and losses of floodplains, describe restoration approaches in the valley and elsewhere and discuss potential implications of climate change on floodplain hydrology and ecology. The scientist and collaborators have developed a technique for identifying floodplains inundated by ecologically important flows and have used the technique to document the rarity of this type of habitat in California. More recently, the scientist has been studying growth rates of juvenile chinook raised in either floodplain or riverine habitats of the Consumes River Preserve. Results show that fish grown in floodplains grow faster than those raised in the river. Subsequent analyses will compare the mercury content of these fish.	University of California, Davis	Opperman, Jeff	\$235,950	01-Jul-03	30-Nov-06	Machula

Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager	
9	SCI-05-C106	Long-term Geomorphic Effects of Dams on Rivers in the Central Valley of California: A Comprehensive and Comparative Approach (Sea Grant Fellows)	The goal of this project is to compare the effects of dams on 16 major tributaries in the Central Valley. The scientist will study changes in magnitude and frequency of geomorphic processes associated with dams and document how differences in dam operation and design influence these changes.	University of California, Berkeley	Minear, J. Toby	\$107,679.00	01-Sep-05	31-Aug-08	Podger
10	SCI-05-C07-295	How Abiotic Processes, Biotic Processes, and Their Interactions Sustain Habitat Characteristics and Functions in River Channels and Their Floodplains: An Investigation of the Response of A Gravel-Bed Reach of the Merced River to Restoration.	How do abiotic and biotic processes in a restored, simplified channel-floodplain system interact to develop the conditions that favor a set of native and endangered species of plants and animals?	University of California, Santa Barbara	Dunne, Thomas	\$1,400,000	01-Jun-06	31-May-09	Lougee

Sum **\$1,743,629**

Non-native Invasive Species

Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager	
11	SCI-05-C103	Determining the Factors Controlling Site Invasibility to Lepidium Latifolium (Sea Grant Fellows)	Perennial pepperweed (<i>Lepidium latifolium</i>) is a noxious weed that grows in the San Francisco Bay-Delta system. To prevent its spread and otherwise improve the management of this potentially destructive non-native plant, scientists will use remote sensing to map the plant's distribution and identify environmental factors (e.g., temperature, precipitation, wind, stream flow and soil salinity) that may influence its growth and reproduction. Statistical analyses of this data will make it possible to generate maps showing areas most vulnerable to infestation. This information can serve as an early detection system for subsequent eradication programs and assist in efforts to protect native habitats from encroaching invasive plants.	University of California, Davis	Andrew, Margaret	\$111,750	01-Sep-05	31-Aug-08	Shouse

Sum **\$111,750**

Riparian Habitat

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
12	SCI-05-C102	Restoring Non-Equilibrium Riparian Communities in Disturbance-Altered Ecosystems: Implications for River Management and Climate Change (Sea Grant Fellows)	In this project, scientists will examine the consequences of water operations on cottonwood population structure and life-history characteristics. In particular, they will test three hypotheses: 1) Fremont cottonwood populations are declining throughout the Central Valley because of habitat loss and inappropriate hydrology 2) Tree growth and stand condition are largely determined by sufficient water, the availability of which varies with climate, location and severity of hydrologic alteration 3) Cottonwood physiological function varies with water availability. Findings from this project will assist in restoring riparian habitats in an ecosystem continuously stressed by human activity.	University of California, Berkeley	Stella, John	\$228,750	01-Sep-05	31-Aug-08	Hastings
13	SCI-05-C105	Addressing Stakeholder Concerns: Pests and Pest Control in the Sacramento River Conservation Area (Sea Grant Fellows)	In the Sacramento River valley, some farmers have expressed concerns about the potential for restored riparian forests to increase the numbers of agricultural pests. To quantify the degree to which these concerns are valid, researchers will examine the quantities and distribution of serious agricultural pests—weeds, insects and mammals—and document their movement from restored riparian areas to farm lands. They will also study similar questions for enemies of pests, the idea being that farm yields might actually benefit from the presence of restored habitats, if these habitats become refuges for pest enemies. Scientists will share findings with farmers and other stakeholders in the region to better ground public perception of the costs and benefits of restoration.	University of California, Santa Cruz	Langridge, Suzanne	\$129,239	01-Sep-05	31-Aug-08	Shouse
Sum						<u>\$357,989</u>			

Salmon

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
14	SCI-03-C62	Molecular Genetic Tools for Restoration and Monitoring California's Threatened Spring Run Chinook Salmon.	Describes the cloning and characterization of seven microsatellite loci from fathead minnow. In a sample of 48 fish from a captive population, polymorphism at these loci ranged from 4 to 11 alleles with expected heterozygosities ranging from 0.59 to 0.82. These loci will be extremely useful to researchers currently studying the ecotoxicology, behavior and population genetics of this species.	Oregon State University	Banks, Michael	\$293,448	01-Apr-03	31-Dec-06	Machula
	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
15	SCI-06-G06-299	Review of Four Juvenile Salmon Coded Wire Tag Experiments Conducted in the Delta	The purpose is to review four Delta juvenile salmon survival programs conducted by the Stockton USFWS office.	U.S. Fish and Wildlife Service	Brandes, Patricia	\$83,100	01-Sep-06	01-Dec-07	Shouse
16	SCI-05-C10-179	Chinook Salmon Rearing in the San Francisco Bay-Delta System: Identification of Geochemical Markers to Determine Delta Use	The purpose of this project is to focus our effort on developing geochemical markers to determine the timing and duration of Delta and Bay use. We will focus on Delta use because the role of the Delta in salmonid rearing is a major question in Central Valley ecosystem and water management, and because we expect the salinity gradient to provide a ready reference for migration from Chipps Island to the Golden Gate. But we will include samples collected between the Delta and the ocean to provide a complete picture of the geochemical markers in the system. To the extent possible, we will identify geochemical markers that identify sub-regions of the Delta.	University of California, Berkeley	Ingram, Lynn	\$197,689	01-Jan-06	01-Jan-08	Hastings

Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
17 SCI-05-C99	Development of A Simulation Model of Juvenile Salmon Movement in the Sacramento-San Joaquin Delta (Sea Grant Fellows)	By combining a hydrodynamic model of particle transport with a biological model of fish behavior, scientists will attempt to simulate the responses of juvenile salmon to changes in reservoir release rates, pumping rates, operations of the Delta Cross-Channel gates and other processes that can influence water flows. The broad idea is to understand how water operations influence migration patterns of juvenile salmon and to use this information to protect as many salmon as possible from potentially harmful water policies. To validate the model, output from multiple simulations will be compared to real observations. These comparisons will allow scientists to identify model hypotheses that best replicate observed patterns of fish movement. The final product will be a tool that scientists can use to compare the effects of various water management options on fish migration patterns. Results will be shared with CALFED managers and others interested in salmon and wildlife conservation.	California State University, Humboldt	Dodd, Annjanette	\$200,125	05-Sep-05	31-Aug-08	Culberson
18 SCI-05-G09-318	Are 'Apparent' Sex Reversed Chinook Salmon A Symptom of Genotoxicity?	Will use hypotheses driven approach to reduce uncertainty regarding the negative impact that apparent sex-reversed individuals have on populations of this at-risk species. 1. Is the apparent sex-reversed phenotype observed in fall-run Chinook salmon due to a Y-to X-chromosome/autosome translocation? 2. Is the apparent sex-reversed phenotype observed in fall-run Chinook salmon due to a Y-chromosome that has had the sex determining region deleted or inactivated? Does the Y-chromosome specific marker exhibit the same pattern of inheritance as two other male-specific markers, and the growth hormone pseudogene, in a controlled mating between an apparent XY-female and a genetically normal male.	University of California, Davis	May, Bernie	\$143,735	26-Sep-05	31-Dec-08	Shouse

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
19	SCI-06-C08-313	Survival And Migratory Pattern Of Central Valley Juvenile Salmonids	Grantee will determine the survival and movement patterns of late-fall Chinook salmon smolts and steelhead smolts as they migrate from the upper Sacramento River, down the mainstream, through the San Francisco Estuary, and into the ocean.	University of California, Davis	Klimley, Peter	\$1,500,000	01-Mar-06	31-Jan-09	Machula
20	SCI-05-C05-214	A Statistical Model of Central Valley Chinook Incorporating Uncertainty	The project purpose is to develop a statistical modeling approach to the two Central Valley Chinook Salmon species-at-risk that incorporates mortality in all phases of salmon life history, and includes the effects of uncertainty in assessing population status, guiding future research, and making management decisions.	University of California, Davis	Botsford, Louis W.	\$679,631	01-Mar-06	01-Mar-09	Podger
21	SCI-06-C04-111	Identifying the Causes of Feminization of Chinook Salmon in the Sacramento and San Joaquin River System	Identify the agents responsible for feminization of salmon in waters that discharge to the San Francisco-San Joaquin Delta.	University of California, Berkeley	Sedlak, David	\$1,167,149	01-Jan-06	31-Dec-09	Machula
Sum						<u>\$4,264,877</u>			

Shallow Water and Marsh Habitat

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
22	SCI-03-C23	Fishes, Invertebrates, Primary Production and Nutrients in Tidal Wetlands of the San Francisco Estuary: Effects of Wetland Restoration State (Age). IRWM Integrated Regional Wetland Monitoring Pilot Project.	The purpose of this project is to determine how best to monitor and measure ecological changes associated with tidal wetland restoration projects being implemented by CALFED and other public entities in the North Bay and Delta.	California State University, San Francisco	Bollens, Steve	\$1,309,318	01-Jan-03	31-Dec-06	Culberson
23	SCI-05-C24	Integrated Regional Wetland Monitoring Pilot Project (Primary Agreement)	The purpose of this project is to determine how best to monitor and measure ecological changes associated with tidal wetland restoration projects being implemented by CALFED and other public entities in the North Bay and Delta. The CALFED Science Program has recognized that fishes and invertebrates were essential to components of tidal wetland systems, and that a team of investigators should be formed and charged with evaluating how best to monitor these taxa in restored and natural wetlands to answer the question of how CALFED's restoration projects are affecting ecosystem changes.	California State University, San Francisco	Siegel, Stuart	\$2,449,847	01-Jan-03	31-Dec-06	Culberson
Sum						<u>\$3,759,165</u>			

Splittail

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
24	SCI-03-C17	Population Genetics of Splittail	The purpose of this study is to characterize the genetic variation within and among splittail samples from different regions of the San Francisco estuary and the Napa Rivers.	University of California, Davis	May, Bernie	\$256,544	01-Dec-02	30-Nov-06	Culberson
Sum						<u>\$256,544</u>			

Steelhead

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
25	SCI-05-C104	Effects of Water Temperature, Streamflow and Flood Availability on the Growth, Survival and Movement of Central Valley Juvenile Steelhead with Implications for Water Management (Sea Grant Fellows)	This project thus focuses on two priority topics for CALFED: 1) the links between water operations and biological resources and 2) ecological processes and their relationship to water management and key species. It is anticipated that what is learned will help with government goals of doubling populations of naturally produced salmonids, restoring altered habitats and providing water flows to protect early stages of steelhead. Findings will also help in understanding environmental ramifications of water diversions and the Delta Cross Channel on juvenile steelhead trout.	University of California, Santa Cruz	Heady, Walter	\$129,375	01-Sep-05	31-Aug-08	Culberson
26	SCI-06-C03-140	Life History Variation in Steelhead Trout and the Implications for Water Management	This project will focus on determining the environmental conditions that underlie the three pathways available to steelhead in their first year. Prior studies on juvenile salmonids have demonstrated the influence of growth and lipid accumulation, interacting with genetic factors, on timing of life history transitions. Fast growth is typically associated with smoltification and emigration at age 1. The overall hypothesis is that water flow levels and the temporal pattern of water delivery have a major impact on growth opportunity and life history expression in age-0 steelhead. Alteration of water flow patterns potentially disrupts the natural adaptive responses of juvenile steelhead, resulting in reduced survival as fish make crucial mistakes in selected life history trajectories.	University of California, Santa Cruz	Mangel, Marc	\$1,014,596	01-Feb-06	01-Jan-09	Culberson
Sum						<u>\$1,143,971</u>			

Subsidence

	Project Number	Title	Purpose	Recipient Organization	P.I. or Author	Amount Approved	Start Date	End Date	Science Contract Manager
27	SCI-05-C30	Rates and Evolution of Peat Accretion (RE-PEAT) in the Sacramento-San Joaquin Delta, California	The purpose of this project is to determine the vertical accretion rate of peat through time in the Delta, and also to estimate the carbon balance of the Delta in light of the on-going land-surface subsidence in the region.	U.S. Geological Survey	Drexler, Judy	\$1,436,946	01-Jul-04	30-Jun-07	Podger

Sum **\$1,436,946**
Grand Total **\$18,021,426**