

**All Science Program Research Projects Affected by Bond Freeze
January 2009**

P.I. Last Name	P.I. First Name	Title	PSP/Fellow Year	Award Amount	Short Project Description	Repercussions of Bond Freeze
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Science Program Fellows

Barnett-Johnson	Rachel	Linking Freshwater Sources of California Chinook Salmon to Their Ocean Distribution Using Physical and Natural Tags of Origin	2009 Fellow	\$164,765	The CALFED Fellow's preliminary findings suggest that young salmon exhibit a spatial population structure in the ocean, until about age three. Continuing analyses, integrating multiple fish markers, will look closely at the degree to which different salmon populations mix at sea and get at the question- How can fishermen harvest abundant salmon populations without driving at-risk salmon species to extinction?	Not yet impacted as the project is proposed to begin in June 2009.
Brander	Susanne	Endocrine Disruption in the Delta: Confirming Sites' Known Estrogenicity with Outplants, Histology and Choriogenin Level Measurements	2008 Fellow	\$129,124	In parallel with an ongoing CALFED study of feminization in salmon in the Delta, this project will use the ubiquitous inland silverside fish (<i>Menidia beryllina</i>) as an indicator of endocrine disruptor contamination. By comparing the effects of endocrine disrupting compounds on silversides, salmon and Delta smelt, the CALFED Fellow seeks to identify specific chemicals causing the most harm to target species. She will also conduct "outplanting" experiments to compare the effects of contamination between sites to laboratory controls, part of an effort to understand the biochemical mechanisms of sublethal toxicity—how toxins are absorbed and how they affect fish physiology.	1) no funding for supplies or travel from CALFED project so field project planned for spring and summer will be delayed; 2) no funds to cover tuition & fees for Spring which is due in March 09 and will have to cover from personal savings or take out a loan; 3) TA positions may be alternative source of funding but are very limited at the Bodega Marine Laboratory (2 hours away from UCD campus)- taking TA positions on campus will add considerable time and personal travel expense and result in delay in PhD completion.
Buck	Kristen	Copper-binding Organic Ligands in the San Francisco Bay Estuary: Evaluating Current and Future Likelihood of Copper Toxicity Events in a Perturbed Ecosystem	2009 Fellow	\$121,500	The CALFED Fellow will determine the chemical speciation and toxicity of dissolved copper in San Francisco Bay and its watershed, including Suisun Bay, Suisun Slough, Carquinez Strait, and Sacramento and San Joaquin Rivers. She will then determine relative contributions of copper-binding organic ligands from Sacramento and San Joaquin Rivers, Suisun Slough and Sulphur Springs Creek, among others. These freshwater data will be used to compare urban and marsh runoff. The fellow's goal is to be able to predict how changes in water management and land-use practices might affect copper-binding ligand sources, copper bioavailability and copper toxicity in the Bay-Delta.	1) Inability to ship samples taken in late November for analysis, rendering the samples useless; 2) strain on postdoctoral career (abrupt halt of research project, funding, and publications); 3) strain on research advisor's budget; 4) will soon have to commit to alternate funding and other research projects and may not be able to return to this project.
Chang	Andrew	Effects of Freshwater Flow and Population Connectivity on Benthic Community Dynamics in the San Francisco Estuary	2009 Fellow	\$165,000	In efforts to improve native oyster restoration and to better understand the spread of non-native mussels, the CALFED Fellow will lead field surveys to monitor changes in abundances and size classes of <i>Ostrea</i> and <i>Mytilus</i> spp. at 12 sites in brackish waters of the Bay-Delta. Trace elemental fingerprinting will be used to determine natal regions of newly settled juveniles throughout the San Francisco Estuary. Toward the end of the project, the fellow will conduct laboratory experiments to further investigate and quantify the stress effects of low salinity on mollusk heart rate, reproduction and survival.	Not yet impacted as the project is proposed to begin in May 2009.

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Clemento	Anthony	Validation of a New Method for Population Assessment of Pacific Salmonids Using Genetic Markers	2006 Fellow	\$129,375	The CALFED Fellow is attempting to develop a new method for tracing the parentage of Central Valley chinook. If successful, this virtual-tagging method would yield a powerful tool—one significantly better than current coded wire tags—for monitoring the effects of hatchery practices, water policy, climate change and fisheries management on salmonid populations.	1) loss of stipend so out of paycheck until at least mid-Feb (when advisor may be able to secure alternative funding) or possibly beyond; 2) equipment funds and stipend critical for moving beyond initial lab work phase; 3) if advisor can't secure alternate funds, will probably be forced to drop out of school and look for job; 4) the significant amount of research already accomplished will likely languish.
Das	Tapash	Investigating the Frequency and Magnitude of Floods in the Sacramento-San Joaquin Valleys Under Changing Climate	2009 Fellow	\$123,269	In this computer-modeling project, the fellow will investigate the potential effects of climate change on extreme precipitation and flooding in the Sacramento-San Joaquin Valley. Some of the questions to be addressed: (1) To what extent do simulated flood statistics mirror historical observations? (2) How and why do extreme events of simulated streamflows change under current climate change scenarios? (3) How does uncertainty in computer model simulations affect extreme event statistics?	1) under strong financial crisis as fellowship stipend was only salary; 2) loss of momentum in research after obtaining large dataset to analyze from floods perspective; 3) tremendous loss to my research career and CALFED research project.
Feinstein	Laura	Frequency, Distribution, and Ecological Impact of Cryptic Hybrid Invaders: Management Tools for Eradication of Invasive Spartina	2009 Fellow	\$88,785	The first goal of this project is to use micro-satellite markers and Bayesian statistical algorithms to develop a better DNA test for hybrids, including “cryptic hybrids” morphologically similar to the native. The fellow will then use this tool to: (1) determine the frequency and distribution of cryptic hybrids; (2) identify spatial and environmental variables that favor hybrid colonization; and (3) measure the ecological impact of cryptic hybrids. The cumulative benefit of this project will be to provide tools and information to managers that may help them weigh the cost-benefits of attempting to eradicate every cryptic hybrid in the region.	1) significant delayed progress in research due to TA time commitment and time writing and submitting grant proposals to seek alternative funding; 2) no funding for supplies (~\$1400) so may delay the experimental work until next year; 3) greenhouse space bill (\$500) will have to be paid out of pocket; 4) no funding secured for spring and summer quarters with questionable prospects of finding alternative support.
Fremier	Alexander E.	Modeling Physical Drivers and Age Structure of Cottonwood Forest Habitat: An Integrated System Approach	2008 Fellow	\$228,750	The ultimate goal of this project is to improve the long-term prospects for restoring and protecting one of the signature species of the Central Valley’s riparian ecosystem—the Fremont cottonwood. Toward this end, the CALFED Fellow will adapt a model of the physical processes driving river channel migration and cottonwood habitat creation along a 100-mile stretch of the Sacramento River from Red Bluff to Colusa. If the modeling effort is successful, it will be used to generate predictions of how cottonwood forests will fare in the future under various physical states, including different climate scenarios, flow regimes and floodplain sedimentation rates. The results could help identify high-value habitat and plan corridor-wide conservation efforts.	(Elizabeth Harper is the postdoc on this grant as Alex took a faculty position at UI and remains as co-research mentor)- 1) research mentor start up funds will run out in March; uncertainty of funding situation makes plan to find child care difficult thus cannot devote time to project; 2) if funding does not resume soon, stipends can't be paid and all the work that we have achieved in the last several months will be wasted; 3) postdoc will be forced to find a new position before analyses and manuscripts that we are working on will be completed and replacement of postdoc with similar skill level is very unlikely 4) start up account of the research mentor will be severely impacted with out retroactive reimbursement.

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Ger	Kernal Ali	Trophic Impacts of Microcystis on Crustacean Zooplankton Community of the Delta	2009 Fellow	\$164,931	Scientists now wonder whether toxic cyanobacteria blooms in the Delta (of the species <i>Microcystis aeruginosa</i>) might be changing the base of the pelagic food web enough to contribute to the decline in the region's pelagic fishes. Of particular interest in this project is to examine how the toxic blue-green algae might be affecting copepods, a main food for several fishes, including the endangered Delta smelt. In this project, the fellow will use recent advances in genetic markers to calibrate a PCR-based method for tracking in-situ ingestion of Microcystis by zooplankton.	1) risk of not being issued a visa, which would prevent the postdoc from returning to US to conduct research (US Embassy Officer may refuse to issue visa on basis of uncertain funding); 2) significant delays, if not cancellation of project if funding is not resumed.
Harrison	John	Modeling Nutrient and Organic Carbon Loads and Sources in Central Valley Watersheds: Taking Existing Monitoring Data to the Next Stage	2005 Fellow	\$228,750	What are the relative contributions of various land-based sources of dissolved inorganic nitrogen and dissolved organic carbon to the Sacramento and San Joaquin River systems? How are river nitrogen and carbon concentrations, loads and sources likely to change as a function of climate, population growth, water demand, and land-use change in the next few decades? This project seeks to improve understanding of the links between land use, climate, and surface water quality. Findings will be used to improve water quality for ecosystems as well as public health.	(Daniel Sobota is the postdoc on this grant as John took a faculty position at WSU serving as research mentor on project)- 1) research mentor start up funds will run out in Feb 09 and if funding is not resumed, postdoc won't be paid and research will grind to halt and much, if not all, of the effort expended to date will be lost; 2) only 10 months remain on the project which is in the synthesis and writing stage with 3 papers in various stages of production, including one that has been accepted to a prestigious journal, pending revisions; 3) if funding not reinstated within a month, the postdoc will almost certainly leave and publication of papers will be delayed or prevented altogether.
Heady	Walter	Effects of Water Temperature, Streamflow and Flood Availability on the Growth, Survival and Movement of Central Valley Juvenile Steelhead (<i>Oncorhynchus mykiss</i>) with Implications for Water Management	2005 Fellow	\$129,375	Through field studies, laboratory experiments and computer modeling, researchers are investigating factors affecting the growth, survival and movement of federally protected juvenile steelhead in parts of the Central Valley. This project focuses on links between water operations and biological resources. Findings will clarify questions regarding the impacts of water diversions and the Delta Cross Channel on juvenile steelhead trout.	

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Hughes	Sarah	Environmental Water: Developing Indicators and Identifying Opportunities	2008 Fellow	\$114,063	This project examines the policies and practices that influence how water is used in the Bay-Delta. Specifically, the CALFED Fellow is comparing urban water management policies in San Francisco and Sacramento, as they relate to the goals of CALFED's Environmental Water Account project- a conservation oriented project to help protect at-risk fish species by maintaining sufficient water for them. One anticipated outcome of this project is improved awareness, coordination and communication between cities and the Environmental Water Account.	1) will need alternative sources of support for Spring quarter which starts in March, most likely consider TA work or scholarship which will delay progress on research and degree; 2) causing me to question whether I should be focusing the research on California and the Bay-Delta to the extent that was planned because of my connections with CALFED- prior to stop work order, in the process of acquiring data and finalizing dissertation proposal and now it will be much longer before I have the data needed to begin analysis and advance to candidacy; 3) as fall back, began looking elsewhere for research support which could lessen the relevance of my findings to state policy makers.
Kiparsky	Michael	Climate Change and In-Stream Flows: Methods for Application of Risk Analysis to Modeling of Environmental Water Supplies	2009 Fellow	\$98,750	The fellow will interview water managers in the Stanislaus, Tuolumne and Merced River basins, for their perceptions of the future supply of water for environmental, agricultural and urban uses. The interview data will be combined with output from a hydrological model to compare the risks of different water management strategies.	1) weaken the chances that I can successfully complete my PhD, certainly as proposed in the fellowship; 2) without tuition and financial support, not able to complete this research; 3) I face difficult decisions about how and whether I will be able to continue towards completion of this research.
Lang	Susan	Investigating the Lower Trophic Levels of the Suisun Bay Food Web: a Biomarker-Specific Isotope Approach	2008 Fellow	\$215,759	This project is based on the premise that the isotopic composition of compounds unique to a wide range of primary producers will allow the CALFED Fellow to identify sources of organic carbon supporting zooplankton in Suisun Bay. For instance, the isotopes of chlorophyll may distinguish phytoplankton growing in the Sacramento River from those in the San Francisco Estuary, while "old" radiocarbon signatures would suggest an input from terrestrial carbon. If the novel biomarkers are effective, they will provide insights into the consequences of various water management options of relevance to pelagic species.	1) all progress on this project has halted and planned February sampling trip cancelled; 2) most important season for this project is the spring and for the Spring 2009 season to be a success, sampling decisions must be directed by the data gained from past trips; analyses are very labor intensive and without sufficient time to perform them before the spring sampling season, I will have lost a full year; 3) my inability to apply the methods developed to the samples collected will quickly impact my job prospects; 4) stipend is currently being supported by department at SIO but if stop work order continues, I will be forced to find alternative employment and under that scenario, it is questionable if I will be able to return to the CALFED project.
Langridge	Suzanne	Addressing Stakeholder Concerns: Pests and Pest Control in the Sacramento River Conservation Area	2005 Fellow	\$129,375	This project examines the question of how restoring riparian habitats affects nearby farmers by studying birds at orchards and nearby restored areas along the Sacramento River. Because healthier native habitats could elevate abundances of pest enemies or serve as refuges for them, the CALFED Fellow will also measure the abundance and movement patterns of pest enemies. Once the results are finalized, the fellow will share findings with farmers and other stakeholders.	Unable to conduct final interviews, fieldwork, and presentations to local farmers and at national conferences.

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Luengen	Allison	Mercury Interactions With Algae: Effects On Mercury Bioavailability in the San Francisco Bay Delta	2006 Fellow	\$191,439	This project seeks to identify the chemical parameters controlling mercury uptake in phytoplankton—the pathway by which mercury enters the aquatic food chain. The CALFED Fellow will investigate the hypothesis that phytoplankton are accidentally acquiring methyl mercury as they feed. The findings may help regulators identify ways to reduce the entry of mercury into the food chain.	1) I work with radioactive mercury, which is extremely expensive and difficult to obtain. It also has a short half-life. Every day that goes by without me being able to work on it causes the loss of valuable resources. If I let this mercury go to waste, it may be months before I can obtain a new supply, drastically slowing my research and causing the unnecessary loss of thousands of dollars of radioactive mercury; 2) if funding isn't resumed, there is the potential for my research to not get published. Not having this data published would be tremendous loss both for CALFED and my career; 3) this fellowship is my only source of support/income and I just received lay-off notice from UC Davis and if funding is not resumed will have to look for new job.
Matella	Mary K.	Scenarios for Restoring Ecologically Functional Floodplains and Providing Flood Control Services in the Sacramento-San Joaquin Delta	2009 Fellow	\$98,375	Employing existing climate change models for the Bay-Delta, the fellow will study the effects of predicted hydrological shifts on potential floodplain restoration sites. Also to be studied is the extent to which levee setbacks could increase the amount of available floodplain habitat and improve public safety from flooding. The findings will help managers develop a cost-efficient strategy for deciding which levees are most suited to setbacks, in terms of meeting ecological and public safety goals.	1) secured a last minute teaching assistant position to fund me this semester, as a result, my research has been shifted to the back burner at the moment.
Mioni	Cecile Elise	Environmental Controls on the Distribution of Harmful Algae and Their Toxins in San Francisco Bay, California	2009 Fellow	\$164,620	To better understand the distribution of harmful algae and environmental conditions controlling their toxin production, the fellow leading this project will examine three primary hypotheses: (1) future environmental changes will favor dinoflagellates in the South Bay and cyanobacteria in the delta, as opposed to diatoms, resulting in more frequent blooms of these species; (2) increases in available light to delta waters, due to reductions in turbidity, will lower or otherwise alter nutrient inputs, resulting in enhanced toxicity of harmful algae; (3) changing environmental conditions in the bay during the last decade have and will continue to increase the intensities and frequencies of harmful algal blooms.	1) considerably slowed down my research project on the environmental controls on the distribution of harmful algae and their toxins in San Francisco Bay, CA; 2) loss of only funding support as it was my full time job but temporarily covered on reduced stipend by research mentor on different project; 3) pursuing CALFED research as a volunteer, traveling 500 miles with personal vehicle each month to collect samples in the Bay and Delta; 4) no longer able to purchase ELISA kits and I am concerned that when I have used all my materials, samples will accumulate without being processed.; 5) samples don't keep more than a couple of months and will be wasted; 6) presented my preliminary results to the ASLO ocean sciences meeting in Nice, France in January 2009 and have been awarded the ASLO Early Career Travel Award (\$1,000) to attend this conference and paid remaining costs with personal credit card.

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Parker	Alex	Heterotrophic bacteria and the foodweb of the low salinity zone and salt marsh habitats of the San Francisco estuary	2006 Fellow	\$152,500	There has been a sharp decline in phytoplankton abundance in the low-salinity zone of the San Francisco Estuary, and this has likely increased the relative importance of bacterial carbon as a food source for higher trophic levels. This project will compare phytoplankton and bacteria production and their respective roles in supporting the local food web. The CALFED Fellow will map the spatial and temporal patterns in phytoplankton and bacteria activity and abundance, and investigate factors influencing these patterns in restored vs. natural salt marshes.	
Perry	Russell	Estimating Route-Specific Survival and Distribution of Juvenile Salmonids Migrating Through the Sacramento-San Joaquin River Delta	2006 Fellow	\$129,365	A model developed for studying salmon on the Columbia River will be adapted to compute survival statistics for juvenile salmon migrating through the various river networks flowing into the Sacramento-San Joaquin Delta. The probability of a fish surviving passage through a specific dam or channel and more significantly, the proportion of a population subject to each route-specific survival rate, will be estimated. This information will allow the researcher to quantitatively assess the impact of water exports on juvenile salmon and the proportion of a population subject to lower survival rates for a given management decision.	1) received "emergency" RA ship through the UW School of Aquatic and Fishery Sciences for the Winter Quarter; 2) if the suspension doesn't get lifted by mid-March, will not be able to secure another "emergency" research assistantship and the future and likelihood of securing other funding are definitely uncertain.
Sandstrom	Phillip	Sacramento River Steelhead Trout: An Assessment of Behavioral Differences and Contributions of Hatchery and Wild Stocks	2009 Fellow	\$98,750	The CALFED Fellow will study the movements and behavioral differences of wild and hatchery-born Sacramento River steelhead trout. Both adults and juveniles of this endangered species will be acoustically tagged and tracked using the extensive, existing array developed for the California Fish Tracking Consortium. In the first phase, the movement patterns of fish will be characterized. The fellow will then characterize the behavioral differences in wild and hatchery fish. The goal is to complete a model capable of estimating the contributions of wild and hatchery adults and juveniles, based on fish success rates and environmental conditions.	1) One of the biggest impacts will be the increased difficulty to tag wild fish. Permit to complete this work was exceedingly difficult to obtain. In addition the time window in which wild juvenile and adult steelhead trout are available to us is very narrow and we already have acoustic tags in hand for juvenile steelhead trout. Batteries in these tags run down over the course of time. It is also of equal importance to purchase and deploy tags on wild steelhead adults in the same year to complete an age based model for wild fish. The wild steelhead population in the upper Sacramento River is very low and furthermore there are approximately 100 wild individuals remaining in Battle Creek (proposed source of fish) above Coleman National Fish Hatchery; 2) no longer have funding to cover my graduate school tuition or graduate student researcher salary; 3) the late notice of the stop work order makes it difficult to find other funding sources as many of the other opportunities available earlier in the year have passed

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Schile	Lisa	Tidal Wetland Vegetation Response to Climate Change in the SF Bay Delta	2008 Fellow	\$125,750	<p>The CALFED Fellow will map the current distribution of dominant plant species (e.g., California cordgrass, tule, bulrush, pickleweed and cattails) from the oceanic environment at the Golden Gate Bridge to the freshwater Delta.</p> <p>She will also conduct transplant and greenhouse experiments to establish plant tolerances to salinity and inundation. After these experiments are done, she and other CALFED-funded researchers will use GIS analyses to spatially model the predicted vegetation patterns in the estuary under different future climate scenarios. Her findings will have implications for land-use decisions and restoration planning.</p>	<p>1) now have to work 20 hours a week on a NSF-funded grant that is completely unrelated to my research in order to have funding to attend school; 2) work suspension order came in the midst of planning my field and greenhouse experiments that were set to begin in February- they comprise the majority of my dissertation research and necessitate at least two years of monitoring; now prohibited from conducting this time-sensitive research, and I need to initiate my experiments before spring plant growth occurs; 3) unless funding is reinstated by March, I will lose an entire field season's worth of data and will likely be unable to complete my research, despite its relevance to California and CALFED.</p>
Schroeter	Robert E.	Temporal and Spatial Patterns in Abundance and Production in Pelagic Organisms in the Low Salinity Zone (Suisun Marsh, Bay and Delta) of the San Francisco Estuary with Insight into Trophic Position and Impacts of Alien Invasive Species	2006 Fellow	\$200,625	<p>The aquatic community in Suisun Marsh will be compared to that in habitats in adjacent waterways to determine why there has been such a decline in marsh aquatic life. A first step in the research will be to compile existing data on aquatic life and use the larger dataset to begin to look for patterns linking fish and invertebrate abundances with environmental conditions. The CALFED Fellow will also examine potential consequences of invasive gelatinous zooplankton on native zooplankton and how this might influence primary productivity.</p>	<p>1) will delay the completion of year 1 tasks (i.e. first three papers); 2) have no funding, so have taken a part time job at the local college (Cal Poly) to try to make ends meet; 3) financially, the work suspension has hit particularly hard, since I just finished my dissertation and hadn't been paid for the first 9 months of 2008; 4) just received my official layoff packet from UCD; looking for permanent employment at the local colleges and if I find a position, I must admit it will hard to go back to the post-doc status.</p>
Seavy	Nathaniel	Measuring and Predicting the Success of Riparian Restoration for Wildlife Populations: Accommodating Uncertainty and Complexity	2006 Fellow	\$228,750	<p>Restoring riparian habitats has the potential to benefit songbirds. This project will determine the level of restoration needed to ensure songbird habitats. Models of riparian bird population dynamics will be used to predict whether or not a given restoration project will provide functional bird habitat. This information will be used to identify factors essential for re-creating bird habitats. This will hopefully lead to restoration strategies that will protect songbirds today and in the face of future climatic change.</p>	<p>1) I have not been paid to work on my fellowship work since late December which had the immediate impact of placing me in a position of financial hardship; 2) I have submitted 5 manuscripts for publication representing a significant investment of resources- on my behalf, but also my collaborators. Two of these have been accepted for publication (one in Ecological Applications and the other in Ecological Restoration) and require final revision before publication. The journals have deadlines for this work, and the stop work order jeopardizes my ability to meet these deadlines; 3) it has become difficult for me to maintain participation with collaborating partners and is reducing the impact that my fellowship has on assisting with riparian restoration activities in the Central Valley; 4) given the financial hardship, I cannot continue to work without funding beyond the end of January. I need to look for other funding opportunities.</p>

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Stella	John	Restoring Non-Equilibrium Riparian Communities in Disturbance-Altered Ecosystems: Implications for River Management and Climate Change	2005 Fellow	\$228,750	The Fremont cottonwood is an abundant and important part of Central Valley riparian forests, as it stabilizes riverbanks, fixes carbon, produces woody debris and creates complex floodplain habitat for fish and wildlife. This project examines ecological factors influencing cottonwood forest health, growth and sustainability. Findings will assist in restoring forests in an ecosystem that is constantly being stressed by human activity.	(Maya Hayden is the predoc on this grant as John Stella took a faculty position at SUNY and is working with John Battles, the research mentor to collaborate on this project which complements the other CALFED Fellowship project)- 1) the research mentor cannot maintain his end of a productive collaboration as he is scrambling to afford the upcoming field season (Maya's stipend, one undergraduate field assistant and travel); 2) the focus of the collaboration will be exclusively ecology and no longer geomorphology which not only leveraged resources but makes for better science (for examples, the sediment analysis done by Piegay's group and shared with us is essential since successful establishment of riparian tree species is very sensitive to the depth and texture of the sediments). In fact sedimentation rate and texture are critical elements in our conceptual model of riparian forest dynamics. Piegay gets tree age estimates by a leading dendroecology lab in North America and we get sediment analyses done by a leading riverine geomorphology lab in Europe.
Street	Joseph	Reconstructing Climate Variability, Acidity, and Water Availability in the Sacramento-San Joaquin Watershed Based on Isotopic Evidence in Sediments from Swamp Lake Yosemite	2009 Fellow	\$87,058	The CALFED Fellow will produce a 19,000-year timeline of rainfall and water availability in the Sierra Nevada and Sacramento-San Joaquin watershed, based on isotope analyses of organic material in a sediment core from Swamp Lake, in northwestern Yosemite National Park. A primary focus will be to examine decadal, multi-decadal and centennial climate patterns. Another key goal is to study the climate regime during the mid-Holocene (about 3,500 to 8,000 years before present), when other evidence suggests that the mid-Holocene climate was warmer and dryer. The fellow will also examine the climate record during the last glacial maximum (18,000 to 20,000 years ago) and the glacial termination (10,000 to 15,000 years ago). The findings, besides furthering basic understanding of California's paleoclimate, will provide insights into the state's future climate and water budget challenges.	1) certainly slowed my progress towards finishing my degree- in exchange of tuition and stipend support from the department I must serve as a TA or lab curator each quarter that the department is supporting me. I don't mind working for my keep, but there is no getting around the fact that this is a significant time commitment and reduces the amount of time that I can spend on my research and with my family (new father of twins). I had specifically sought outside fellowship support to avoid this situation; 2) at the moment any costs I incur in my research must be paid for from other sources (my advisors' "rainy day" funds); 3) I am in the fourth year of my graduate studies, and I don't have the option of stopping work on the project previously funded by my CALFED fellowship if I want to finish my degree in a timely manner.
Sullivan	Lindsay	Prey Selection of Larval and Juvenile Planktivorous Fish in the San Francisco Estuary	2006 Fellow	\$152,500	Laboratory feeding experiments will be conducted to study prey selection in larval and juvenile delta smelt, striped bass and longfin smelt and its relation to light and turbidity levels. Results will be compared to analyses of gut contents of respective fishes- the traditional method for inferring prey selection. The findings, it is hoped, will shed light on the causes of declines in the abundances of plankton-eating fishes in the San Francisco Estuary.	1) research is on hold; 2) plans to collaborate with Susan Lang, another CALFED Postdoc to examine the transfer of nutrients from prey to smelt is on hold; 3) the lab I work in is funded by several other CALFED projects. Due to the stop work order, our lab has had to cut down on personnel. The technicians in our lab have a very specific skill set that would make it extremely difficult to replace them. The cost of hiring and training new technicians will set all our projects back considerably.

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Ulrich	Patrick	Pilot-Scale Evaluation of an Iron Sediment Amendment for Control of Mercury Methylation in Tidal Wetlands	2009 Fellow	\$93,333	Building on previous research led by the CALFED Fellow's research mentor, this project will examine a potential method for decreasing methyl mercury releases from restored wetlands. In particular, the fellow will evaluate the efficacy of using an iron sediment amendment to control net methyl mercury production in tidal wetlands of the Bay-Delta. Preliminary experiments have shown, compellingly, that high iron doses can decrease methyl mercury concentrations ten-fold. If the same holds in the field, iron amendments could offer a technique for reducing methyl mercury contamination during wetland restoration.	1) has prevented my current stipend level from being supplemented as described in my fellowship budget. However, if this situation is not resolved by June 1, I will have no funds available to cover my stipend (or my university fees for the fall semester); 2) to cover my research expenses, we are stretching an extension of a previous grant that will run out on June 30. After this, I will be relying on the Fellowship to cover all of my research expenses; 3) preventing me from registering for/attending the International Mercury Conference that will be held in China in June where my abstract was accepted for an oral presentation. Should the stop work order last for a few months, it will be too late to make the necessary arrangements to attend and present at the conference; 4) biggest impacts of the stop work order is that we passed up on opportunities to apply for other sources of funding for my research since we thought the Fellowship was secured for the next two years.
Weiskel	Heidi	Nutrients and Benthic Invasion Dynamics in SF Bay	2008 Fellow	\$107,812	The CALFED Fellow will lead one of the first efforts to examine the potentially critical relationship between nutrient pollution in the Bay-Delta and aquatic invasive species dynamics. A second, related topic is to understand the effects of biotic disturbances, in particular the effects of burrowing by the invasive Atlantic mud snail (<i>Ilyanassa obsoleta</i>) on benthic communities.	1) do not know at this time what my 2008 data will show, as I can only afford to analyze a subset of the response variables and process a subset of samples (For example, I cannot run my carbon: nitrogen or stable isotope analyses, both of which may be critical to the story my data suggest). If the data are unclear or insufficient, I have no funds to draw upon to conduct another field season; 2) the 2009 field season with another invasive snail species will be impossible to conduct without CALFED funds ; 3) I face being unable to graduate with my PhD from the UC Davis. In summary, the stop work order seriously compromises my current dissertation research and jeopardizes my future career goals.
Whitcraft	Christine	Role of Exotics as Ecosystem Engineers Affecting Estuarine Food Webs in Suisun Marsh	2006 Fellow	\$123,285	The CALFED Fellow will test the hypothesis that invasive estuarine plants, by affecting the biodiversity of microalgae and invertebrate communities, change local food web dynamics. In particular, the project will document key functional differences in areas of Suisun Marsh invaded by <i>Arundo donax</i> (giant reed), <i>Lepidium latifolium</i> (perennial pepperweed) and <i>Phragmites australis</i> (common reed). What is learned will be used to develop eradication strategies in highly disturbed wetland habitats, where there may be several rare species or other factors complicating restoration options.	(Two predocs were being supported through Jan 09 by remainder of this grant as Christine took a faculty position at CSULB and serves as the research mentor to the two predocs)- 1) the research mentor had to let both predocs go- they were unable to find other jobs on such short notice and for the short time period of one month; 2) research mentor unable to buy any supplies on this grant and using start-up money (which is declining quickly as a result); 3) funds needed to support two predocs through spring semester.

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Winder	Monika	Plankton Dynamics in the Sacramento-San Joaquin Delta: Long-term Trends and Trophic Interactions	2009 Fellow	\$164,797	This project makes use of a 33-year record of plankton taxonomy in the Bay-Delta to study long-term trends, patterns and interactions among the region's phytoplankton and zooplankton. A variety of statistical and modeling techniques will be used to address several important topics of relevance to the observed decline in pelagic organisms, the first three of which are to: (1) describe spatial and temporal trends in zooplankton, the major food source for native fish species; (2) describe linkages between phytoplankton biomass and zooplankton production; (3) determine how changes in phytoplankton and zooplankton functional groups relate to biotic interactions and environmental changes.	1) sudden stop forced me to drop my Delta work and look for alternative funding; 2) shift my work temporarily to a different project; 3) the uncertainty of the funding situation and sudden shift to a different project does not allow me to plan for quantitative approaches I was going to take, meet with mentors and collaborators to discuss different approaches, and plan projects for the field season; 4) projects that could have been done this spring/summer need to be postponed to a later time or next year. Ultimately, the work I proposed – the historical analyses of field samples where the state invested a lot of money to collect this type of data sets – can not be completed in the time frame proposed and at the end will take more time and cost more money.
Woodley	Christa	The Impacts of Global Climate Change on Delta Fishes: Predicting Fish Abundance, Distribution and Community Changes	2006 Fellow	\$191,875	Global warming is predicted to reduce rainfall, raise sea level and enhance evaporation in the San Francisco Bay-Delta region. This project looks at what this may mean for native and invasive fish species in the region in terms of their distribution, foraging opportunities, growth and reproduction. The CALFED Fellow is studying the physiological response of select species of fish to various scenarios of future climatic conditions. This research complements CALFED's Computational Assessments of Scenarios of Change for the Delta Ecosystem project, the objective of which is to understand how the regional ecosystem might respond to a few plausible scenarios of climate change.	1) was in the process of getting Pacific Northwest National Laboratory to arrange the legal/paper work for transfer of postdoc to WA. The loss of funding hinders the continuation of the research and even my professional position at PNNL. PNNL's policy requires that I have funding to use their resources which means I am not allowed to work on the resulting publications and/or white papers at work, use their software, pc's. I lost the ability to travel/present my first year results at a meeting without this funding. I no longer have any library access to finish writing the year end report. I do not have any resources to continue to work on future funding as a springboard for another project. Without the funding at UCD, I have lost resource access there as well as from library access to software and soon email. In short, I lost the ability to conduct research and complete the requested tasks, thus my professional growth has been greatly hindered.

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Science Program Research Grants						
Brandes	Pat	Estimating Juvenile Chinook Salmon Spring and Winter Run Abundance at Chipps Island	2006 PSP	\$483,903	This study will estimate the abundance of winter- and spring- run Chinook salmon juvenile production leaving the Delta and compare it to other model estimates. This information is fundamental to achieving two goals: 1) identifying trends and patterns of populations and system response to a changing environment and 2) using discretionary environmental water supplies more effectively for at-risk species.	Processing of collected samples has halted as well and the analysis of that data. The contract will need to be extended to complete the work.
Castillo	Gonzalo	Pilot Mark-Recapture Study to Estimate Delta Smelt Pre-screen Loss and Salvage Efficiency	2006 PSP	\$669,995	The purpose of this study is to determine whether it is feasible to quantify entrainment losses of juvenile and adult delta smelt due to water exports. This information is critical to better understanding the movement of Delta smelt in the system.	The 2009 adult and juvenile delta smelt mark and recapture studies represent the culmination of a three-year planning effort by multiple agencies and the UCD delta smelt culture facility (FCCL). Thousands of endangered delta smelt have been cultured specifically for this study and marked adults are ready for release in February. The planned January release has already been missed. For juvenile mark-recapture experiments to take place this spring as planned, UC Davis FCCL will need confirmation of available funding by February 6, 2009. Without funding, this important work that has been repeatedly emphasized and discussed by the EWA Technical Review Team, the Programmatic IEP Delta smelt Review and the Central Valley Fish Facilities Team, cannot take place. Also, UC Davis technical staff will have to be laid off. Due to the planning difficulties (permits, contracting, training) and staff attrition it is no longer possible that this work could be conducted next year. Further, substantial IEP matching funds may be irrevocably lost.
Castillo	Gonzalo	Pilot Mark-Recapture Study II: transgenerational marking of cultured fish	N/A	\$80,000	This study is an addition to the original mark-recapture study by Dr. Castillo. The purpose of this additional study is to ensure that, in the unlikely event the cultured smelt of the original experiment produce progeny that survive, these progeny are chemically tagged. This tag will allow operators of the export pumps to distinguish wild fish from cultured fish so they will not result in false counts that trigger pumping curtailments.	As a new and unforeseen condition, DWR will allow adult releases in Clifton Court Forebay only if these adults have received additional transgenerational markers. Additional funding is needed for marking and otolith analysis. Otherwise adult releases that are still possible in February cannot proceed.
Drexler	Judy	Peat Accretion (RePeat)	2007 PSP	\$1,720,009	The goal of this project is to define and quantify processes affecting rates of peat and sediment accretion during both pre-settlement and post-settlement periods. This information is crucial for choosing the best potential sites for subsidence mitigation and predicting likely rates of peat and sediment accretion through time.	Research samples will degrade over time; Cores will become useless if too much time passes; Unable to continue work beyond this month; Information to increase understanding salinity in the Delta will be unavailable.

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Dugdale	Richard	Do Low Phytoplankton Growth Rates Signal the "Bad" Habitat Conditions in Suisun Bay Driving the Pelagic Organism Decline?	2006 and 2007 PSP's	\$838,377	The purpose of this research is the study of anomalous low phytoplankton productivity in Suisun Bay by comparing Suisun Bay phytoplankton growth and nutrient uptake rates (e.g. NH4) with those in Central San Francisco Bay, the Delta and the Sacramento and San Joaquin Rivers. This research is critical because of the recent declines in pelagic fishes in the upper SF Estuary and the need to understand the underlying causes resulted in the formation of a Pelagic Organism Decline.	Technicians and researchers will need to be laid off. Field seasons would be missed that are critical for data gathering for the project. Data already gathered is not being analyzed or published. Additional understanding is not being obtained on this important water quality work and the pelagic organism decline.
Dunne	Thomas	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.	2004 and 2007 PSP's	\$1,550,000	The focus of this project is on how river restoration affects the abundance and distribution of salmonid and non-salmonid fishes at critical life stages. The proposal involves intensive field surveys of hydraulics, sedimentation processes, channel change, habitat conditions, invertebrate and fish communities and their interactions. This project is important because it will help us better understand how conservation and restoration interventions influence biological resources in California rivers and be directly useful for restoration design and other river management.	An interdisciplinary team including 19 personnel have stopped work on one of the most ambitious habitat restoration investments in the basin. Matching funds will be lost. Work on increasing understanding of how physical and biological processes interact in gravel-bed rivers will be halted. It would take more than a year to re-establish a team to continue the work.
Guerin	Marianne	The Consequences of Operational Decisions on Water Quality: Reconciling Delta Smelt, Salmon, and Human Needs	2006 PSP	\$116,927	The goals of this project are: to assess the consequences of actions taken to protect threatened or endangered Chinook salmon species relative to other upstream and in-Delta water management actions that have changed seasonal salinity in the Delta, thus reducing the ability of delta smelt to survive as a species; and, to investigate with modeling scenarios the potential to ameliorate this trade-off with specific operational actions. This research is necessary because it integrates water supply and management decisions with the need to maintain or improve ecosystem quality for the delta smelt and the winter-run Chinook salmon.	In the absence of the results from this research, there may be water management actions conducted for one species that will irreparably harm the other.
Hendrix	Noble	A Statistical Model of Central Valley Chinook Incorporating Uncertainty	2004 PSP	\$679,631	This research supports the accelerated development of critical and urgent information on Chinook salmon modeling for future decision-making efforts for the Delta. This information is important because it produces a scientifically robust and unbiased assessment of Chinook salmon populations.	A portion of this project is funded by federal sources so the work can continue for a short time while the freeze is in place.

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Ingram	Lynn	Chinook Salmon Rearing in the SF Bay-Delta System: Identification of Geochemical Markers to Determine Delta Use	2004 and 2007 PSP's	\$425,781	The focus of this project is on developing geochemical markers to determine the timing and duration of Delta and Bay use by salmon. This study is important because it will help scientists gain knowledge on juvenile behavior and adult spawning success.	
Kimmerer	Wim	Modeling the Delta Smelt Population of the San Francisco Estuary	2004 PSP	\$997,027	Individual-based and particle-tracking informed model exercise examining population behavior of Delta smelt under different modeling scenarios.	Data is not being analyzed, written up or published. Knowledge of the Delta Smelt will be partial, piecemeal and incomplete.
Kimmerer	Wim	Foodweb Support for the Delta Smelt	2004 and 2007 PSP's	\$1,469,872	The research project is aimed at understanding and possibly improving the foodweb supporting delta smelt and other estuarine species. This research is important because: 1) will increase foodweb support for the threatened delta smelt and 2) identify potential mechanisms underlying relationships of abundance or survival of some fish to freshwater flow.	Loss of skilled technicians would devastate the operation of the research lab. Hiring and training new staff would take a year or more. One million dollars of data is not being analyzed, written up or published. Knowledge of the Delta foodweb will be partial, piecemeal and incomplete.
Klimley	Peter	Survival and Migratory Pattern of Central Valley Juvenile Salmonids	2004 and 2007 PSP's	\$1,756,535	The study will determine the survival and movement patterns of late-fall Chinook salmon smolts and steelhead smolts as they migrate downstream. This information is important to better understand how salmon move through the system.	A 7-member research team will be dismantled and fish will not be tagged and released to complete the study. A gap in data will result in an unbalanced experimental design and we will not better understand the reach-specific survival of salmon as they migrate downstream to the ocean. The results were being monitored by the Pacific Management Council for use in their assessments of the viability of salmon stocks.
Kueltz	Dietmar	Quantitative Indicators and Life History Implications of Environmental Stress on Sturgeon (2006 PSP)	2006 PSP	\$700,000	This proposal seeks to analyze the effects of the pollutants on the overall fitness of different life stages of the green and white sturgeon. The research will significantly enhance our understanding of stressors on sturgeon and allow further development of life history models.	
Lehman	Peggy W	Biomass and Toxicology of a Newly Established Bloom of the Cyanobacteria Microcystis Aeruginosa and its Potential Impact on Beneficial Use in the Sacramento-San Joaquin Delta	2004 PSP	\$500,000	Monitoring and simple analysis of the extent of this cyanobacteria in the Delta, and preliminary exploration of the impacts of cystins on drinking water quality, and human and wildlife health.	Two staff have been lost; Reports cannot be written that would provide valuable information on Microcystis in the Delta.

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Lehman	Peggy	Using FlowCam Technology to Measure High Frequency Spatial and Temporal Variation in Phytoplankton and Zooplankton Monitoring Programs	2006 PSP	\$150,000	Deployment and testing of camera-based technique for counting and assessing plankton populations in the Delta, with implications for mandated monitoring programs.	This project will lose a skilled technician and numerous students and the initial sampling that is imperative to the rest of the project. Given all the field data gathering and data analysis, loss of a year of sampling will delay the project a year or more.
Mangel	Marc	Life History Variation in Steelhead Trout and the Implications for Water Management	2004 and 2007 PSP's	\$1,209,216	Exploration of the ways in which different stream hydrology and temperature can affect the growth and maturation of steelhead trout. Model examination of how various streamflow management regimes may affect trout population dynamics region-wide.	One technician has been laid off; Two post docs have also been let go. Important information about steelhead trout will not be available.
May	Bernie	Predicting the Effects of Invasive Hydrozoa (Jellyfish) on Pelagic Organisms Under Changing Salinity and Temperature Regimes	2006 PSP	\$430,870	This research seeks to investigate the potential effects of jellyfish, a devastating invader of some ecosystems, on the SFE ecosystem, to determine the key factors allowing successful establishment and spread of these species, and to predict future effects and spread of the invasions. This information is critical in understanding the basic biology of pelagic organisms and their possible negative effect on the SFE ecosystem.	One of the main researchers will be working just a short while more.
Messer	Dean	Analysis of Archived Samples to Assess Patterns of Historic Invasive Bivalve Biomass	2006 PSP	\$219,822	These analyses will provide information regarding the effect of bivalves in restored habitat by assessing patterns of invasive bivalve biomass. This research is important because these bivalves are invasive and dominant in the upper San Francisco Bay-Delta system, which are considered to be a major sink of primary productivity in the system.	The research team has been moved to other projects. Data will not be available for use and analyses will not be completed or presented to the public.
Messer	Dean	Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay-Delta to Guide Risk Assessment for Sensitive Species	2006 PSP	\$395,700	The objective of this project is to quantify spatially and temporally pesticide loadings to the Sacramento River, San Joaquin River, and Bay-Delta estuary to improve decision making and optimize resource spending. This research is needed information about pesticide peak loadings, which will assist those researchers trying to determine if contaminants were contributing to the decline of pelagic organisms in the delta.	Work on this project has stopped. Critical water quality information on fate and transport of agricultural chemicals and emerging pesticides will not be collected or analyzed. Support for BMPs and future monitoring will not be provided nor will critical water quality information regarding at-risk species in the Delta.

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Mueller-Solger	Anke	Phytoplankton communities in the San Francisco Estuary: monitoring and management using a submersible spectrofluorometer	2004 PSP	\$159,158	The primary objective of this project is to evaluate a new submersible spectrofluorometer, the bbe FluoroProbe, for phytoplankton monitoring and management in the SFE. Secondly, this project seeks to investigate high-frequency patterns in spatial phytoplankton group distributions among Delta habitats and along gradients from the western Delta and northern San Francisco Bay. A third aim is to investigate high-frequency temporal phytoplankton patterns at fixed stations in contrasting Delta and Bay regions. This information will help make recommendations for improved phytoplankton monitoring and management in the upper SFE, including recommendations for a monitoring and rapid early-warning strategy for harmful algal bloom occurrences.	This project was joined with the project led by Richard Dugdale through the 2007 supplemental PSP. It will be similarly affected: Field seasons would be missed that are critical for data gathering for the project. Data already gathered is not being analyzed or published. Additional understanding is not being obtained on this important water quality work and the pelagic organism decline.
Parker	Thomas	Climate Change Impacts to San Francisco Bay-Delta Wetlands: Links to Pelagic Food Webs and Predictive Responses Based on Landscape Modeling	2006 PSP	\$646,848	The project focuses are: 1) evaluating the potential impacts of climate change on SF Bay-Delta tidal wetlands, 2) improving our understanding of the linkage between these wetlands and the pelagic food web, especially fish populations, and 3) using this information to make predictions about potential effects of climate change on the Bay-Delta system. This information is important because wetlands are the most vulnerable habitats in California under a variety of climate change scenarios.	This project will lose a skilled technician and numerous students and the initial sampling that is imperative to the rest of the project. Given all the field data gathering and data analysis, loss of a year of sampling will delay the project a year or more and result in large amounts of unpublishable data. Without this work significant insight will be lost into wetland decomposition dynamics and links between wetlands and pelagic systems, in the context of climate change.
Sedlak	David	Identifying the Causes of Feminization of Chinook Salmon in the Sacramento and San Joaquin River Systems	2004 PSP	\$1,167,141	The main purpose of this research project is to identify the agents responsible for feminization of salmon in waters that discharge to the San Francisco-San Joaquin Delta. This research is important because there is currently no information regarding the contaminants responsible for the feminization in salmon; there is only supporting information for other fish species.	Samples are waiting to be analyzed; May not be able to keep staff if the delay is a number of months; Progress on identification of the chemicals that could be responsible for endocrine disruption signals would be lost.
Stacey	Mark T.	A Calibration-Free Approach to Modeling Delta Flows and Transport	2006 PSP	\$390,869	Using a novel approach for simulating gross flow and transport in the Delta, with an anticipation that the method could be applied to unknown (future) conditions and be reasonably accurate without the need for calibration to (nonexistent) data.	Work on the model has stopped and students will be laid off. Unsure if they'll be able to start up again with the same team. Lost dollars due to time to retrain staff.
Stacey	Mark T.	The Transport and Dispersion of Rafting Vegetation in the Sacramento-San Joaquin Delta	2006 PSP	\$200,975	The research is focused on developing a thorough, mechanistic understanding of how rafting vegetation, such as hyacinths or egeria, is transported in the Sacramento-San Joaquin Delta. This research will be useful for future invasions, particularly because rafts of vegetation are known to be important transport mechanisms for many marine species.	Students will be laid off. Unsure if they'll be able to start up again with the same team. Lost dollars due to time to retrain staff.

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Torres	Raymond	A Non-Point Source of Contaminants to the Estuarine Food Web	2006 PSP	\$790,000	The goals of this research are to quantify the process of contaminant concentration and resuspension of shallow and intertidal cohesive sediments at sites along the salinity gradient from Prospect Island to San Pablo Bay. This research is important because it helps to understand the pathways by which contaminants are assimilated, which is essential to appropriately manage habitat areas.	An international post-doc will need to be released after a few months.