2013 Class of Science Fellows

Postdoctoral Fellow	Topic	Lead Institution	Community Mentor	Funding Agency	Funding Amount	Project Status	Findings	Management Implications
Erin Bray	Studied gravel bars in rivers to identify what features facilitate groundwater exchanges that create good Chinook salmon spawning habitat.	UC Santa Barbara	USBR	DSC/DSP	$153,400.00	Completed	Research resulted in a new model that can be used to predict river temperatures and their response to streamflow management. About half of the incoming solar radiation lies in a spectral range where absorption is independent of depth, providing a new explanation as to why dam releases of cool water may have limited influence to downstream temperatures.	These results provide a more detailed understanding of how and by what mechanisms the river water gets so hot. Water managers may consider using this new model to evaluate the effectiveness of flow releases in modifying high water temperatures. The Delta Science Fellow is currently engaged in conversations with the U.S. Bureau of Reclamation, who may use the model developed here within the framework of its own existing model called SRH-2D.
Cedric Fichot	Used hyperspectral remote-sensing reflectance data to map, and study the dynamics of methylmercury in the Bay-Delta.	JPL (Jet Propulsion Laboratory)	USGS	JPL	$169,376.00	Completed	Airborne imaging was used to derive high-resolution distributions of turbidity, dissolved organic carbon (DOC) concentration, and chlorophyll-a concentration in a wetlands region. A high resolution depiction of methylmercury concentration in surface waters was identified for the study area.	The benefit of the developed technology is that it can greatly expand the spatial coverage of traditional boat and station-based approaches used for water quality monitoring. High-resolution imaging of large areas can help inform management and policy development by facilitating the detection and sources of pollution, and providing data to help assess the impacts of wetland restoration and climate change.
Ken Jeffries	Determined the thermal tolerances of longfin and Delta smelt and inland silverside and develop biomarkers of thermal stress using new genomics technology.	UC Davis	DWR	DSC/DSP	$147,000.00	Completed	This was the first study to characterize the effects of exposure to high water temperature in longfin smelt. At environmentally-relevant temperatures, longfin smelt show a cellular response consistent with temperature stress. The longfin smelt was shown to be relatively more sensitive to increases in temperature.	Effects of water temperature on longfin smelt can be used to determine when water temperatures become stressful for these fish in the Delta, informing management decisions. Using RNA-sequencing technology, we now have sequence information for thousands of longfin smelt genes, which can be used for follow up studies on the effects of environmental stress on this species.
Priyanka Sharma	Used synthetic aperture radar data to monitor levee conditions and subsidence in the Delta.	JPL (Jet Propulsion Laboratory)	DWR	JPL	$139,096.00	Expected completion: 3/31/16	(In progress): This project uses data from a NASA instrument to track levee stability in the Delta by monitoring very small deformations and movements at and around levees in the Delta.	(In progress): Results will help determine underlying processes affecting levee subsidence and movement. Such information would be of great use to water and land management programs in the region.
Anna Sturrock	Examined links between the early life histories of Central Valley Chinook salmon and their chances of surviving to adulthood.	UC Berkeley	DFW	DSC/DSP	$135,500.00	Expected completion: 3/31/16	(In progress): Chinook salmon abundance, size and lifecycle vary primarily as a function of water flow. In wetter years, early migrating fry represented the most abundant type of the juvenile population, while in drier years outmigrants (migrating to the ocean) tended to be fewer but larger.	(In progress): Results of salmon survival and success as a function of flow can influence hatchery management practices.
Quinfang Wu	Deployed a fleet of floating robots ("smart drifters") into the Liberty Island wetland to study water currents and wetland geomorphology.	UC Berkeley	USGS	USFWS DSC/DSP	$177,363.00	Expected completion: 7/31/16	(In progress): Developed and customized hardware and software for smart drifters (floating robots to study water currents and phytoplankton). The functionality of the drifters has been enhanced to meet special requirements in studying the wetland ecosystem, in particular the flow and landscapes near the Liberty Island in the Delta.	(In progress): Findings may help identify wetland designs that would be most effective at creating habitats to support the fish food web.

2013 Class of Science Fellows

Doctoral Fellow	Topic	Lead Institution	Community Mentor	Funding Agency	Funding Amount	Project Status	Findings	Management Implications
Ali Shafiee	Studied the seismic response of peaty organic soils beneath Delta levees to improve seismic hazard assessments.	UCLA	Curt Schmutte, Consultant	DWR	$94,427.00	Expected completion: 04/15/16	(In progress): This project will examine how peaty soils settle during and post-earthquake. These soils underlie many of the region's earthen levees and their deformation potential is an important factor in seismic hazard assessment.	(In progress): Findings will further refine and improve seismic hazard assessment within the geologic context of the delta.
Katherine Smith	Studied the basic ecology of the endangered salt marsh harvest mouse to better protect and enhance habitat for the mouse as well as for the other species that utilize the same habitat.	UC Davis	DFW	USFWS	$116,705.00	Completed	Results improve our understanding of the diet, demography, life history, and ecology of the salt marsh harvest mouse (SMHM), and how the recent drought affects the SMHM population. SMHM are not necessarily preferring to eat the foods that have historically been considered their primary food source, mainly pickleweed. Preliminary results show a strong preference for several of the plants that waterfowl managers encourage in their wetlands.	This research project investigated effects of waterfowl management, and correlations between populations of waterfowl and SMHM in managed wetlands.
Rachel Wigginton	Examined the effects of perennial pepper weed on tidal marsh ecosystems and look for strategies to stop the noxious weed's spread.	UC Davis	USDA	DSC/DSP	$92,200.00	In Progress	(In progress): This project will explore the ecological role and impact of a highly aggressive, non-native plant in the mustard family, known as perennial pepper weed. Experiments will seek to quantify the weed's impact on carbon storage, marsh plant productivity, and food webs at sites with different salinity exposures.	(In progress): Findings may provide important insights into cost-effective control strategies for the weed and their implications for marsh restoration.

Total amount funded: $1,225,067.00