

Reprint From: California Sea Grant's News Blog "Our Ocean"

(From: <http://caseagrantnews.org/2013/09/06/1-2-million-awarded-to-10-new-delta-science-fellows/>)



Priyanka Sharma, an authority on Titan's dune fields, is one of 10 new Delta Science Fellows. Credit: Caltech

On behalf of the Delta Science Program, California Sea Grant has awarded 10 Delta Science Fellowships to support research on key topics related to water issues and ecosystem health in the San Francisco Bay-Delta.

The fellowship recipients include eight University of California postdoctoral researchers and doctoral graduate students, and two postdoctoral researchers with the California Institute of Technology.

"We are very grateful to the agencies that have come together to support the 2013 fellows program," said Peter Goodwin, the Delta Science Program's lead scientist.

"The challenge of reconciling the coequal goals of ecosystem sustainability and water supply reliability attracts gifted young scientists from around the world," Goodwin, an internationally recognized authority on ecosystem restoration, said.

Indeed this is true, as this year's class draws on talent from around the world, including graduates from Delhi University, University of Southampton, University of British Columbia, Peking University and, of course, the University of California.



Qingfang Wu, an environmental engineer, recovers a drifter in the San Francisco Bay. Credit: Berkeley

But, more exciting than the program’s growing international dimensions are the cutting-edge technologies that will be applied to Bay-Delta issues. Who would guess that studies of Saturn’s largest moon, Titan; human genome mapping, or smart phone apps would have any bearing on targeted Bay-Delta research questions. Yet, they do, and it’s quite intriguing how and why.

Fellowship recipient **Priyanka Sharma**, a post-doc at Caltech, explained that dune fields on Titan have many unexpected similarities to the sand dunes in the sub-Saharan desert, in terms of their shape and the processes that formed them.

For her Delta Science Project, she will apply techniques she developed to analyze Titan’s surface roughness to monitor very small deformations and movements at and around levees in the delta.

“I am still analyzing the same kinds of NASA radar data,” Sharma explained. It’s just that this radar data will be of Earth, not Titan. “The goal is to understand what causes levee instability and seepage.”

Recipient **Kenneth Jeffries**, a post-doc at UC Davis, will be studying the potential impacts of climate change on native and non-native fishes and hopes to develop biomarkers of thermal stress. Such could help scientists and managers evaluate habitat quality for fishes.



Floating robots equipped with GPS-enabled smart phones drift in the Sacramento River at Walnut Grove.
Credit: Berkeley

“My research will characterize the effects of water temperature on the expression of 44,000 genes in longfin smelt and inland silverside,” Jeffries explained. “This type of research would not even have been possible a decade ago, before advances in genomics.”

Yet another new fellow, **Qingfang Wu**, a post-doc at Berkeley, will deploy a newly developed fleet of “smart drifters” into the Liberty Island wetland. These portable, floating robots track and monitor water quality using smart phone technologies.

“The use of cell phone technologies for environmental monitoring is enabling us to reveal features of river flows that have been previously un-observable,” said UC Berkeley professor Alexandre Bayen, Wu’s academic mentor on the project. “It’s super exciting.”

This year’s post-doctoral research fellowship recipients are:



Erin Bray, a UCSB postdoc, conducts field work in the San Joaquin River. Credit: UCSB

Erin Bray, UC Santa Barbara, who will study gravel bars in rivers to identify what features facilitate groundwater exchanges that create good Chinook salmon spawning habitat

Cedric Fichot, California Institute of Technology, who will use hyperspectral remote-sensing reflectance data to map and study the dynamics of methylmercury in the Bay-Delta

Priyanka Sharma, California Institute of Technology, who will use synthetic aperture radar data to monitor levee conditions and subsidence in the Delta.

Kenneth Jeffries, UC Davis, who will determine thermal tolerances of longfin smelt and inland silverside and develop biomarkers of thermal stress using new genomics technology

Elizabeth Wells, UC Davis, who will investigate effects of climate change on survival, growth, and feeding rate of the invasive overbite and invasive Asian clams

Anna Sturrock, UC Berkeley, who will examine links between the early life histories of Central Valley Chinook salmon and their chances of surviving to adulthood

Qingfang Wu, UC Berkeley, who will deploy a fleet of floating robots into the Liberty Island wetland to study how water currents and wetland geomorphology affect phytoplankton abundances and transport



Rachel Wigginton, a UC Davis graduate student, holds a Suisun song sparrow at Rush Ranch. Credit: H. Spautz

The graduate student fellowship recipients are:

Ali Shafiee, UCLA, who will study the seismic response of peaty organic soils beneath delta levees to improve seismic hazard assessments

Katherine Smith, UC Davis, who will study the basic ecology of the endangered salt marsh harvest mouse to better protect and enhance habitat for it and other species

Rachel Wigginton, UC Davis, who will examine the effects of perennial pepper weed on tidal marsh ecosystems and look for strategies to stop the noxious weed's spread

Including this year's class, the Delta Science Program has funded 68 fellowships, totaling more than \$9 million. The award package for 2013 fellowship class is worth about \$1.27 million, and includes generous support from NASA's Jet Propulsion Laboratory, U.S. Fish and Wildlife Service and California Department of Water Resources.

California Sea Grant administers the fellowships on behalf of the Delta Science Program, which is part of the Delta Stewardship Council.

[Read more about the research of our Delta Science Fellows.](#)