Money, Water, and Fish: Economics of Reconciliation

Ellen Hanak, Senior Policy Fellow, Public Policy Institute of California, hanak@ppic.org

Healthy watersheds are an important resource for the modern California economy, part of what makes the state a desirable place to live and work. Societal demand for these amenities is reflected in the adoption since the late 1960s of numerous state and federal environmental laws and regulations, over $34 billion in voter-approved state bonds supporting clean water and healthy watersheds, and numerous local investments devoted to environmental water efforts. Yet despite these endeavors, California has been fighting a losing battle to reverse declines in native aquatic ecosystems: the share of native fish species in reasonably secure condition fell from 38 to 19 percent between 1989 and 2010, and further deterioration is likely with climate change. Ecosystem reconciliation offers a hopeful alternative, because it shifts the focus from piecemeal regulation to improving overall ecosystem function. Reconciliation is also consistent with economic principles. At present, environmental management is often "siloed," with each agency and each project addressing particular issues in particular locations without an integrated vision of how these actions might contribute to overall improvement of ecological conditions. Coordinated approaches would be much more effective in protecting native species and would enable us to spend our dollars (and environmental water) more wisely.

Plenary Speaker Biography: Ellen Hanak is an economist and senior policy fellow at the Public Policy Institute of California (PPIC). Her career has focused on the economics of natural resource management and agricultural development. Since joining PPIC in 2001, she has built an influential, multi-disciplinary water policy research program involving scholars from across California. She has also held research positions with the French agricultural research system, the U.S. President's Council of Economic Advisors, the World Bank, and the Brookings Institution.

Tuesday, October 16, 2012: Room 308-313, Plenary Session – 9:10 AM

River Deltas: From Local Challenges to Global Syndrome

Charles J. Vörösmarty, Director, CUNY Environmental Crossroads Initiative

The world's coastlines are highly dynamic landforms, host to both terrestrial and aquatic lifeforms and distinctive ecosystems. Within the coastal zone, river deltas are among the most consequential of landforms and have played an essential role in human history, serving as cradles of civilization, testing grounds for early agriculture, and birthplace of hydraulic engineering. Today, deltas are home to a half-billion or more people. More than 200 million people are crowded into the Ganges, Nile, and Mekong deltas alone, and many of Asia's current or emerging megacities are located within deltas. As low-lying and low-relief plains, deltas are highly sensitive to even small changes in sea level and thus rightfully claim ground in the greenhouse warming debate. But the fragility of deltas is not solely a consequence of rising ocean waters. Many local human actions as well as upstream drainage basin management of landscapes and river systems are today defining the nature of river deltas. This presentation will offer evidence of an emerging global pattern of threat to the world's river delta systems, and explore the sources of this global syndrome. While threats to each delta are a unique combination of climate forcings; riverflow, sediment source and ocean energy regimes; biological communities; and, human engineering, there are certain commonalities. The ability to detect and act upon these threats remains a young science. The talk will conclude with a description of the intent and scope of a major new initiative on deltas—the International Year of Deltas (2013).

Plenary Speaker Biography: Charles J. Vörösmarty is a professor of civil engineering, a Distinguished Scientist with NOAA-Cooperative Remote Sensing Science and Technology Center and director of The City University of New York's Environmental Crossroads Initiative at The City College of New York. His research focuses on the development of computer models and geospatial data sets used in synthesis studies of the interactions among the water cycle, climate, biogeochemistry and anthropogenic activities. His studies are built around local, regional and continental to global-scale modeling of water balance, discharge, constituent fluxes in river systems and the analysis of the impacts of large-scale water engineering on the terrestrial water cycle.

Before he came to The City College of New York, he was a research full professor at the Institute for the Study of Earth, Oceans and Space at the University of New Hampshire, where he was founder and director of its Water Systems Analysis Group (http://www.wsag.unh.edu).

Tuesday, October 16, 2012: Room 308-313, Plenary Session – 9:40 AM

Present and Future Challenges for Estuaries: Towards Solutions

Marcia McNutt, Director, U.S. Geological Survey

Estuarine ecosystems across the Nation face many challenges to their environmental integrity. Estuaries such as the Chesapeake Bay, San Francisco Bay, and the Gulf of Mexico are each vastly changed and continue to change as the result of human actions — such as population growth; building levees, seawalls, and dams; land-based sources of pollution — and natural events like hurricanes and floods. In addition, these ecosystems face other human-induced natural challenges like climate change, sea level rise, and competition with non-native species. Improved understanding of the function and processes of estuarine natural systems helps inform decisions for adapting to sea level rise and preparing for increased storm events. The growing realization of the need to reconcile conflicting goals of human use while maintaining natural functioning of ecosystems has led to development of decision support tools that can help decision makers assess the trade-offs they must consider between natural ecosystems and how humans use them. The integrity of estuaries and the multiple challenges they face in three roughly analogous areas of the U.S. will be discussed with a final focus on the Bay-Delta area.

Plenary Speaker Biography: Marcia McNutt grew up in Minneapolis, Minnesota. She received a bachelor's in Physics from Colorado College, Phi Beta Kappa, Summa Cum Laude, and a doctorate in Earth Sciences from Scripps Institution of Oceanography. Dr. McNutt previously served as professor of Geophysics at Massachusetts Institute of Technology and as President and Chief Executive Officer of the Monterey Bay Aquarium Research Institute (MBARI), in Moss Landing, CA. Dr. McNutt has sailed as chief scientist on numerous oceanographic research voyages and published more than 100 peer-reviewed scientific articles. Her research has primarily focused on processes that lead to volcanic eruptions and formation of mountain belts far from the edges of the tectonic plates, and therefore are not explained by the plate tectonic paradigm. In 2009 she became director of the United States Geological Survey, where her responsibilities include leading the Nation's largest water, Earth, biological science and civilian mapping agency in its mission to provide the scientific data that enable decision makers to create sound policies for resource management and reducing vulnerability to natural hazards. She is a member of the National Academy of Sciences, the American Philosophical Society, and the American Academy of Arts and Sciences. The American Geophysical Union awarded her the Macelwane Medal in 1988 for research accomplishments by a young scientist and the Maurice Ewing Medal in 2007 for her significant contributions to deep-sea exploration. The Coast Guard awarded her their Meritorious Service Medal, the second highest honor open to civilians, for her efforts during the Deepwater Horizon oil spill. She holds honorary degrees from Colorado College, the University of Minnesota, Monmouth University, and the Colorado School of Mines. Her husband, Ian Young, is a sea captain. She has three daughters: Meredith and Dana work for a high tech company in Silicon Valley, and Ashley is in law school.

Tuesday, October 16, 2012: Room 308-313, Plenary Session – 10:50 AM

Scientific Discovery and the Co-Equal Goals of Water Reliability and Ecosystem Recovery

Peter Goodwin, Lead Scientist, Delta Science Program, peter.goodwin@deltacouncil.ca.gov

Knowledge discovery is occurring at an ever-increasing rate and the smartest generation in history is in the process of graduating from college. Another rapidly expanding trend is the deluge of data that has been well documented in the past five years. There are numerous challenges associated with our inability to adequately store or analyze data streams from different sources. But the potential benefits from mining diverse data, the ability of multi-disciplinary modeling to unravel complexity and conducting syntheses to improve holistic understanding are huge. Some lessons learned from 'Big' Science where diverse groups of scientists have clustered around vexing problems will be described from the perspective of how this could help build the science community working on developing an understanding of the Bay-Delta system from the tributary watersheds to the ocean. What scientific infrastructure could we begin to put in place today that will help the next generation of scientists address the challenges surrounding the co-equal goals of water resource reliability and protecting, restoring and enhancing the Delta ecosystem?

Plenary Speaker Biography: As Lead Scientist, Dr. Peter Goodwin works with the Delta Science Program staff, the Delta Independent Science board, agency scientists, and the scientific community at large to promote and coordinate the use of peer-reviewed science throughout the Delta Stewardship Council. Peter is the DeVlieg Presidential Professor in Ecohydraulics and professor of civil engineering at the University of Idaho and is the founding director of the Center for Ecohydraulics Research. His research includes modeling flows, sediment transport, and river channel evolution, quantifying the effects of restoration and understanding fish behavior in response to managed flows. He is a former CALFED Independent Science Board member and also serves as the scientific advisor for several government agencies addressing river and wetland management issues. He is also the director of Idaho's Experimental Program to Stimulate Competitive Research (EPSCoR), a federal-state partnership intended to build research infrastructure and encourage collaboration in states historically having received a low amount of federal research funding. He earned his Ph.D. from UC Berkeley in 1986.

Tuesday, October 16, 2012: Room 308-313, Plenary Session – 11:20 AM