UC SANTA BARBARA

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Bren Professor Shares Major Award

The Ohio River Basin Water Quality Trading Project, a science-based approach to reducing nutrient loading in the Ohio River, has been awarded the 2015 United States Water Prize from the U.S. Water Alliance. UC Santa Barbara's Arturo Keller, a professor in the Bren School of Environmental Science & Management, has been a key contributor to the project, which was recognized for outstanding achievement in advancing sustainable solutions to national water challenges. For the project, Keller performed science that was used to establish the maximum daily nutrient loads for the river and contributed to determining the initial price for the credits to ensure the project's economic viability.

The project, developed by the Electric Power Research Institute (EPRI), established a maximum daily load for such nutrients as nitrogen and phosphorus, as well as a system of tradable credits. Authorized entities in Indiana, Ohio and Kentucky can receive credits for decreasing their nutrient releases more than required and can sell the credits to other entities that are unable to reduce their releases to acceptable levels. This is the first interstate trading program of its kind, allowing for water-quality credits generated in one state to be applied in another.

Excess nutrients targeted by the project — much of which results from agricultural runoff water, treated wastewater plant effluent and electric power companies — cause a variety of negative ecological effects in aquatic habitats, including excess algal growth and oxygen depletion. Waterways that are devoid of oxygen become dead zones where fish and many other organisms cannot survive. A pilot trading period that lasted from 2013 through 2015 is expected to keep 30,000 pounds of

phosphorus and 66,000 pounds of nitrogen by the end of 2015 — the equivalent of nearly 3,000 50-pound bags of fertilizer — out of the Ohio River.

“Our major contribution to the science has been to establish trading ratios that take into account the characteristics of the rivers and their tributaries, the geographical proximity of buyers and sellers and a safety margin to ensure that the credit trading benefits the environment while the parties benefit from lower costs of compliance,” Keller said. “It has been exciting to see this project go from theoretical concept to implementation and to be recognized along with the entire team that is working with EPRI.”

EPRI has conducted research on environmental markets for more than a decade and initiated the Ohio River Basin Water Quality Trading Project in 2009 to test the viability of market-based approaches for achieving water-quality goals for nitrogen and phosphorus. The project has built a comprehensive science-based approach for designing and developing markets for nutrient-reduction credits.

A nonprofit organization, EPRI conducts research and development relating to the generation, delivery and use of electricity for the benefit of the public. It brings together EPRI scientists and engineers as well as experts from academia and industry to help address challenges in electricity, including reliability, efficiency, affordability, health, safety and the environment.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.