iFAST: The International Forum on Advanced Environmental Sciences and Technology

A series of distinguished seminars by eminent scientists

8 p.m. CDT, 9 p.m. EDT, Wednesday, May 10, 2023
1 a.m. GMT, 9 a.m. China, Thursday, May 11, 2023

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David Sedlak is the Plato Malozemoff Professor in the Department of Civil & Environmental Engineering at University of California at Berkeley, where he is the director of the Berkeley Water Center. Sedlak is a member of the National Academy of Engineering and recipient of numerous awards, including the Paul Busch Award for Innovation in Applied Water Quality Research and the Clarke Prize for Excellence in Water Research. He is also the author of the 2015 book *Water 4.0: The Past, Present and Future of the World's Most Vital Resource* and the forthcoming book *Water for All: Global Solutions for a Changing Climate*.

Opportunities for Researchers to Help Solve the Coming Water Crises

As the cumulative effects of population pressure, increasing wealth and a changing climate intersect with water policies and investments that fail to consider impacts on human health and the natural environment, the world will experience more severe water crises. To provide transformative solutions that are likely to be adopted, research and development is needed that employs the latest technologies, embraces systems-level thinking and considers the way in which new technologies diffuse into practice. The recent movement toward closed-loop municipal water systems being pioneered in water-stressed places like Southern California and Singapore provide an example of the ways in which research and development can support new solutions to coping with water scarcity. In the future, the focus of research and development in urban systems is likely to shift from centralized treatment to premise-scale water recycling systems that offer new opportunities to optimize water use, energy efficiency and resource recovery. Opportunities also will arise from decreases in the costs of established desalination technologies, like reverse osmosis. Innovation is needed to manage the brine produced by desalination and to develop more flexible separation methods. If researchers can identify cost-effective approaches for handling desalination brines or minimizing their production, crises related to water scarcity, soil salinization and the degradation of ecosystems could be prevented. The successful development and deployment of such approaches will require collaborations among scientists, engineers and policy experts to connect fundamental research with actions that will alter the way that the world obtains, treats and uses water.

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