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National Dialogue on Decentralization of Water Infrastructure: Optimizing the Size & Scale of Water Services & Urban Water Management

Racine, Wisconsin

A diverse group of water experts convened to further understanding about the neet and pathway to optimizing the structure and scale of urban water services and management systems.

In March of 2014 Biohabitats' president, Keith Bowers, was invited to engage with other leaders in water and related sectors to explore the potential for distributed water infrastructure systems to be integrated with, or substituted for, more traditional water infrastructure, with a focus on right-sizing the structure and scale of systems and services to optimize water, energy and sanitation management, while achieving long-term sustainability and resilience. Held in Racine, Wisconsin at the Johnson Foundation at Wingspread, the event was assembled by the Water Environment Federation and the Patel College of Global Sustainability, University of South Florida.

The diverse group of experts selected for this national dialogue represented the perspectives of end users and operators (utilities), designers, equipment manufacturers, academics, water associations/research foundations, citizen advocates, and regulators/code enforcers. The group included those who had successfully implemented decentralized approaches in urban areas, those that were considering it, and those who may have been skeptical. Together, they examined the barriers, opportunities, and needs related to the role that distributed infrastructure can play in our nation's long-term water and sanitation security. Key themes of the dialogue included:

- delineating the critical barriers to decentralization;
- understanding the success stories and how the barriers have been overcome;
- understanding the current state of technological approaches and next-generation solutions;
- identifying unanticipated consequences (e.g. concentrates, impacts on utilities, etc.);
- financing options for decentralized infrastructure;
- using decentralization as a means to integrated resource management;
- using decentralization as an element of more resilient

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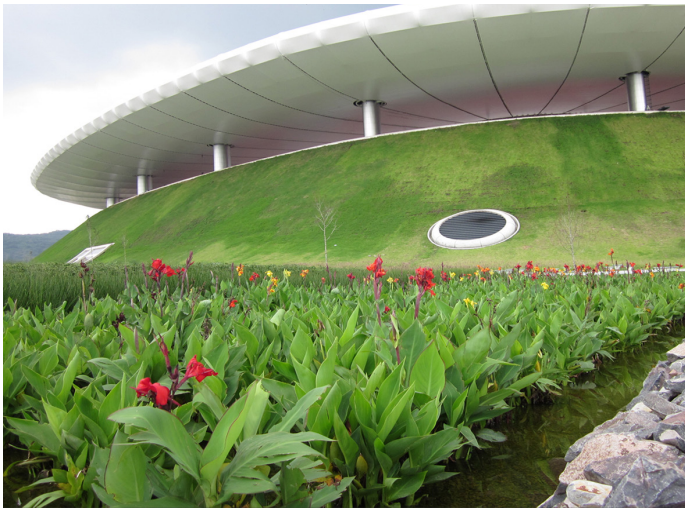
water infrastructure;

- assessing the applicability of decentralized systems in existing infrastructure versus "greenfield" sites;
- transitioning from centralized to decentralized infrastructure and the optimization to "right-sized" systems; and
- gaining institutional and regulatory acceptance of decentralized solutions.

The two plus days of dialogue, debate, and discussion led to the publishing of "Optimizing the Structure and Scale of Urban Water Infrastructure: Integrated Distributed Systems." As a result of this report, along with over six years of intensive, solution-oriented work on U.S. freshwater issues, The Johnson Foundation at Wingspread is concluding its Charting New Waters initiative. Through convening hundreds of experts representing different sectors and perspectives, they have amplified important ideas and innovations that can make a difference. Their final report, "Navigating to New Shores; Siezing the Future for Sustainable and Resilient U.S. Freshwater Resources," synthesizes insights from the full arc of Charting New Waters and is meant to provide a platform for leaders as they continue to address water resource and infrastructure challenges.



Constructed wetlands for natural wastewater treatment: Omnilife Stadium in Guadalajara, Jalisco, Mexico (right) and Sidwell Friends School in Washington, DC (below)

RELATED LINKS AND PUBLICATIONS—

Navigating to New Shores; Seizing the Future for Sustainable and Resilient U.S. Freshwater Resources

Additional Workshop Information

Centralized water infrastructure has served communities and urban areas in the developed world for many decades, providing clean drinking water and wastewater treatment to protect public health and the environment. As populations and environmental standards have increased, water infrastructure has expanded to meet growing needs. In urban settings water services are now almost synonymous with large-scale, centralized infrastructure. In U.S. cities and towns the increased demand driven by population growth and industrial needs has been accommodated by expanding centralized systems with longer distribution networks, longer collection systems, and larger pipes. This approach permits skilled, centralized management and provides for financial and institutional economies of scale. Centralization is further supported by traditional engineering curricula, which promote "conventional" treatment and design.

But centralization has its tradeoffs: higher energy demands for long-distance transport; maintenance demands; disruption of the water cycle including large-scale transfer of freshwater resources to estuarine and saline environments; and more. Today, a combination of forces is driving the water sector to take a closer look at decentralized approaches and whether these could be integrated with, or substituted for, more traditional water infrastructure as an alternative, and potentially more sustainable, path forward. Some of these forces include:

- Increased water scarcity promoting interest in water reuse and "fit-for-purpose" water;
- Potential for energy recovery from wastewater;
- Desire for energy savings from reduced transport of water and wastewater;
- Need to provide adaptability and resiliency in infrastructure systems;
- Challenges in accessing capital for large-scale projects;
- Improvements in technology for distributed infrastructure; and
- A desire to reduce large-scale transfer of freshwater to offshore water bodies.

The approval and integration of decentralized approaches faces several barriers. These hurdles can include: integrating centralized management with distributed infrastructure; regulatory permitting and/or code barriers; a lack of institutional acceptance; perception that decentralization drives sprawling development; and public resistance to decentralization.

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RELATED LINKS AND PUBLICATIONS—

Optimizing the Structure and Scale of Urban Water Infrastructure: Integrated Distributed Systems

Navigating to New Shores: Seizing the Future for Sustainable and Resilient U.S. Freshwater Resources