

# Civil and Environmental Engineering at the University of Houston and Rice University present...

## Sustaining Water Availability in Rural Communities: Expanding Use of Poor Quality Waters



### The 2017 Kappe Lecturer

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Donovan Maddox Distinguished Engineering Chair

Professor of Chemical Engineering

Professor of Civil, Environmental and Construction Engineering

**Friday, November 17, 2017**

**2:45PM-3:45PM**

**Classroom Business Building (CBB) Room 122**

### Abstract

Water is critical, not only to meet personal water needs, but to support a healthy economy and to meet the challenges of food for an ever-growing world population. Increased climate variability and conflicting demands for water requires us to fundamentally rethink how we should manage our limited groundwater and surface water resources so that energy production and economic vitality does not come at the cost of potable water availability, food security and environmental quality. Much of the recent research has focused on securing water for large urban centers. While the challenges facing large urban centers are significant, these communities typically have much greater resources to address their problems than small communities and rural areas where water security challenges are equally serious. Particularly challenging is water for agriculture and agricultural communities that receive important but limited economic benefits from water and therefore are hard pressed to support expensive solutions. Further stressing rural and agricultural water sources in some areas is intensive water use for energy development such as oil and gas production. Water systems in rural and small urban communities are also less resilient to both human and natural factors. These issues will be explored using the example of the southern high plains emphasizing cost-effective solutions for the water challenges facing rural and agricultural areas and to support water-intensive industry in such areas. The primary focus will be on taking advantage of poor quality water including saline and brackish waters to supplement conventional water resources. Energy production, and the extraction of petroleum and other minerals, use enormous amounts of water but much of this demand could be met with poor quality waters including brackish groundwater and produced water. Brackish waters could also be employed for agriculture and agricultural communities to extend conventional water resources. Cost-effective approaches for use of these waters will be explored and challenges to their implementation identified. More effective exploitation of these poor quality waters can protect potable and near-potable waters for human consumption and food production and help sustain rural and agricultural communities.

### Bio

Dr. Danny D. Reible is the Donovan Maddox Distinguished Engineering Chair at Texas Tech University. He was previously the Bettie Margaret Smith Chair of Environmental Health Engineering in the Department of Civil, Architectural and Environmental Engineering and the Director of the Center for Research in Water Resources at the University of Texas in Austin. Dr. Reible holds a Ph.D. in Chemical Engineering from the California Institute of Technology, and is a Board Certified Environmental Engineer, a Professional Engineer (Louisiana), and was elected to the National Academy of Engineering in 2005 for the “development of widely used approaches for the management of contaminated sediments”. His research is focused on the fate, transport, and management of contaminants in the environment and the sustainable management of water resources. The research has been applied to the management of a number of large contaminated sites including sites such as Portland Harbor, OR, Hudson River, NY, and the Fox River, WI. Dr. Reible has authored or edited six books and more than 150 journal articles and book chapters.

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