

Title: Drinking water, waste water and climate change

Speaker: Ming Li

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Abstract:

The United Nations recognizes access to water and sanitation as a human right, fundamental to health, dignity, and prosperity. Climate change is threatening this basic human right, not only in developing countries but also in developed countries. About two-thirds of the global drinking water supply comes from surface waters, including tidal rivers such as the Tagus River. Salt contamination of drinking water intakes in tidal rivers has made headline news worldwide in recent years. For example, the U.S. Army Corps of Engineers had to barge freshwater to water treatment facilities in New Orleans to dilute the salinity content to levels safe for drinking in fall 2023. Salt contamination of drinking water also occurred in the Chao Phraya River where residents in Bangkok were urged to shower less to conserve water. The 2022 summer drought in Europe led to record low flows in the Rhine River and triggered emergency water conservation measures in the Netherlands. Prolonged drought and rapid sea-level rise in a changing climate create an increasingly perilous condition for extreme saltwater intrusion, leading to large spikes in salt levels at water intakes. In this talk I will provide an overview of this emerging global issue. I will also discuss the connection between waste water and climate change. Waste water treatment plants (WWTPs) are recognized as one of the largest of greenhouse gas emitters and contributed to about 2% of global greenhouse gas emissions. They are being explored to deliver ocean alkalinity enhancement that seeks to sequester carbon into the ocean and limit global warming to less than 2° C by the end of the 21st century. I will compare two approaches that seek to reduce the carbon emissions from the WWTPs and promote carbon sink into the ocean.

Biography:

Dr. Ming Li is a Professor at the University of Maryland Center for Environmental Science, U.S.A. He obtained his B.Eng from Hohai University, China and D.Phil from the University of Oxford, U.K. Dr. Li's research spans several areas in physical oceanography, including estuarine and coastal dynamics, sea level rise, and storm surge. He is also actively engaged in interdisciplinary research to address pressing environmental problems such as hypoxia, ocean acidification, and harmful algal blooms. He has published over 120 peer-reviewed papers. He is a Specialty Chief Editor at Frontiers in Marine Science, an Associate Editor at Continental Shelf Research, and an Academic Editor at PLOS Climate. A major focus of Dr. Li's research is the regional impact of climate change and extreme weather events on coastal systems. He has been leading large multi-institutional research projects on hypoxia and harmful algal blooms. He has recently established a National Research Coordination Network to advance interdisciplinary research for building resilient communities and infrastructure in estuaries and bays and is leading a global synthesis of salt contamination of drinking water supplies in tidal rivers. Dr. Li is a Fulbright US scholar visiting Portuguese Institute for Sea and Atmosphere.