Biosolids as a Resource for Land Reclamation and Agriculture: Assessing the Fate of Persistent Organic Pollutants

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The University of Hong Kong

Abstract
Widespread degradation and scarcity of land and water resources are fostering the need to move from disposing to recovering used resources. At the same time as resources bottlenecks are increasing, there is also an increasing demand for water, food, and energy. The need to adapt to re-use and re-utilization in societal daily activities has never been greater. There is a need to understand and anticipate potential risks associated with resource re-utilization to optimize management and help in the synergies between water-energy-food. For the past 15 years our group at UMD, in cooperation with US federal laboratories and private industries, have evaluated the re-utilization of biosolids from human and animal waste in agriculture and land-reclamation. The group is located at the Chesapeake Bay Watershed, the largest estuarine and productive environments in the US, covering over 64,000 square miles and hosting over 18 million people. We have been concentrating in understanding benefits and potential risks associated with the utilization of biosolids for land reclamation and agriculture. Our group is focusing in addressing the fate of emerging toxic chemicals present in degraded soils and biosolids to assess their potential ecological impacts. We have conducted significant work in the development of analytical techniques for the analysis and quantification of these micro-pollutants and designed both field and laboratory experiments to further evaluate their fate and potential ecological impacts. Naturally occurring, heterogeneous dissolved organic matter (DOM) from a variety of origins has been shown to impact the general bioavailability and aqueous transport of hydrophobic contaminants and pesticides, by enhancing solubility from solid soil matrix. In this seminar I will present case studies on the fate of emerging toxic chemicals upon land application of biosolids and present a discussion on biosolids-DOM-EC interactions pertinent to the aqueous transport and bioavailability of emerging contaminants in the environment.

About the Speaker
Dr. Alba Torrents is a professor at the Department of Civil and Environmental Engineering, at the University of Maryland, with an expertise in applied environmental organic chemistry. She has more than 25 years of research assessing the fate and transport of organic pollutants in the environment and was the recipient of the NSF CAREER award. She has published over 90 journal papers and book chapters. For the past ten years, professor Torrents group have focus their research on assessing the fate of endocrine disruptor chemicals and looking at wastewater effluents as nutrient, water, and energy resources. Her group has developed highly sensitive and selective analytical techniques to isolate and quantify chemicals from diverse environmental matrices, from atmospheric air and rain to soil, water and biosolids. In their research they use a combination of field observations and studies with laboratory experiments coupled with state-of-the-art analytical techniques to discern phase transfer processes and transformations of organic pollutants in the environment. Her group is also part of a team evaluating the use of biosolids and compost for in-situ remediation at two superfunds sites.

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