Ecological Sanitation in Urine Diverting (UD) Mode to: Conserve Water and Energy, Recover Nutrients, and Reduce Estrogen Pollution

Speaker:

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Issue Covered:

Elevated concentrations of estrogens in natural waters pose a significant threat to public health and aquatic ecosystems. Both natural and synthetic estrogens, ubiquitous in wastewater effluents and receiving waters, have been shown to affect the endocrine systems of humans and aquatic life. The effects vary from cancer to sex reversals at levels as low as parts per trillion in sensitive organisms. Separation of urine which constitutes only about 1% of domestic sewage and contains nearly all of the excreted estrogens, potentially offers an energy-efficient way to contain and then treat these chemicals. Urine diverting toilets (UDT) can be employed to separate urine at the source. By installing a UDT, a family in the USA can realize an estimated savings of $101/y in energy, water, and nutrients and a decrease of 100 kg greenhouse gas emissions. To remove 99% of estrogenicity in discharged waters would require approximately 12 kWh/p-y using continuous electrodialysis followed by ozonation (O3) of source separated urine. To achieve the same results by adding O3 treatment after activated sludge at existing municipal wastewater treatment plants would require 23 kWh/p-y. In addition to the environmental and economic benefits, this talk will also cover the results of a UDT acceptability study conducted in Hawaii.