



Environmental Engineering *Seminar Series*

Friday, April 11th, 2014

**McDonnell Douglas Auditorium
(MDEA)**

1:30PM-2:20PM

Radiocarbon Dating of Wastewater and its Implications for the Carbon Footprint of Wastewater Treatment

The methods the Intergovernmental Panel on Climate Change (IPCC) recommends for estimating greenhouse gas emissions from wastewater treatment plants (WWTPs) are based on the assumption that all carbon in the treatment process is biogenic (IPCC, 2006). In other words, carbon in wastewater is assumed to originate in crops, undergo conversion to CO₂ during the treatment process, and be taken up by new crops. For this reason, CO₂ emissions from wastewater treatment facilities are not included in global greenhouse gas inventories. The presence of ancient, or "fossil" carbon (for example, carbon derived from petrochemical sources) in both municipal and industrial wastewater suggests that emissions from wastewater treatment are underestimated. Since municipal wastewater contains personal care products and detergents derived from petrochemical feedstock, fossil carbon is likely to be present in significant amounts in most WWTPs. Radiocarbon dating provides a precise estimation of the relative prevalence of modern vs. "old," or ¹⁴C depleted, carbon in a sample. I will present research conducted in UC Irvine's Keck Carbon Cycle Accelerator Mass Spectrometer facility that uses radiocarbon dating to probe the carbon footprint of domestic and industrial wastewater treatment.



Speaker Bio

Alice Robinson completed her Bachelor's degree in Biology and Physics at the University of North Carolina, Chapel Hill, and she is currently a PhD student at UCI. She also works as a process engineer at BKT United in Anaheim, CA.