Soil and Water Sciences Department  
Graduate Student Research Seminar

Speaker: Peng Gao  
Ph.D. Dissertation Degree Candidate

Advisors: Lena Q. Ma, Ph.D. and P. Chris Wilson, Ph.D.

Title: PAHs in Florida Urban Soils: From Sources to Exposures

Date: Wednesday, June 19, 2019

Time: 12:00 pm – 1:00 pm

Location: McCarty Hall A, Room 3177

Polycyclic aromatic hydrocarbons (PAHs) are ubiquitous organic contaminants, with soil being the accumulative sink. This study determined the concentrations, distributions, and sources of 16 USEPA priority PAHs and 6 emerging PAHs in urban soils of two large cities and four small cities in Florida. The average $\Sigma_{16}$-PAHs in urban soils of Clay county, Ocala, Pensacola, West Palm Beach, Orlando, and Tampa were 1821, 2748, 3115, 4055, 3227 and 4562 µg kg$^{-1}$, respectively. Based on benzo[a]pyrene equivalent (BaP-EQ), the 7 USEPA carcinogenic PAHs ($7c$PAHs) and 3 emerging carcinogenic PAHs ($3c$PAHs) in urban soils in Clay County averaged 223 and 3703, Ocala 319 and 4521, Pensacola 302 and 5423, West Palm Beach 449 and 5916, Orlando 452 and 7387, and Tampa 802 and 4943 µg kg$^{-1}$, respectively. Although $\Sigma_{7c}$PAHs in 75-89% of samples were lower than the Florida Soil Cleanup Target Levels (FSCTLs) for industrial sites at 700 µg kg$^{-1}$, $\Sigma_{3c}$PAHs were 6-18 times greater than $\Sigma_{7c}$PAHs. However, the oral bioaccessibility of PAHs based on n-butanol mild extraction in Orlando and Tampa urban soils were low, averaging 3.4–7.4%. Based on molecular diagnostic ratios and PMF model, major sources of soil PAHs in all cities were similar, mainly from pyrogenic sources including vehicle emissions, and biomass, coal and coke combustion. Based on ArcGIS mapping, PAHs concentrations in soils near commercial sites, business districts, and high traffic roads were higher. In short, it is important to consider the background concentrations of both legacy and emerging PAHs in urban soils as well as their bioaccessibility for soil remediation and human health risk assessment.

This seminar can be viewed live via this link: Peng Gao. Since this is a Zoom meeting, anyone viewing remotely will be able to ask questions at the end of the seminar. In addition, all seminars are archived for viewing on our SWSD Seminar Page.