



# Great Lakes HABs Collaboratory

Linking Science and Management to Reduce Harmful Algal Blooms

**HABs State of the Science Webinar series: HABs Blooms Sources & Toxicity  
Tuesday August 16, 2016, 11:00 am-12:00 p.m. (EDT)**

## **Q/A follow-up**

*(This document will be updated as answers will be available)*

**Question for Kevin Czajkowski University of Toledo- I understand how you can map new tile drains, but can you map older (most) historically installed tile drains?**

*I did not show images that depict how we identify tile lines. We do it by the soil color. The area above the tile lines is dryer and tends to be lighter in color. Tile lines can be best detected a few days after a heavy rain. In some fields, we can see several different tile orientations and we know that the tiles were put in at different times. We also have blueprints of tile installation and some fields show different tiles as well that cross each other. The crossing tile (the older ones may be at a greater depth) show that there are old tiles that are still working in fields. Farmers have told me that when clay tiles were installed, they were put in the short length of the fields while now with the plastic tile, they are generally put in the long way. That makes for the crossing tile.*

**Question for Fasong Yuan Cleveland State University- What is the linkage between Pb and P in sediment?**

*Pb was initially used as an age marker since the deposition history of this metal is well documented in Lake Erie. We derived the age model from Pb-210 data through a linear regression equation (Yuan et al. 2014). This age model is supported by our Cs-137 data and the existing Pb records from eastern and central basins (Azcue et al. 1996; Graney et al. 1995). Also, Pb can be used as a tracer to indicate the transport and settlement of suspended sediments from the western basin to the Sandusky basin. There is no direct linkage between Pb and P. But eutrophication caused by increased P inputs from sewer and agricultural runoffs can promote phytoplankton activity or biological productivity and affects the transfer and cycling of Pb in the lake.*

**Question for Fasong Yuan Cleveland State University- Doesn't P migrate up and down in the sediment, making it difficult to interpret historical timing of changes from sediment cores?**

*Post-deposition migration is always a concern for this type of study. But many records from this lake and others suggest that the degree of P migration may be minimal so that the Sandusky sediment TP record may be used to indicate historic changes in the internal P loading. Although we are currently at the early stage of the project, our initial results from sequential extractions did support this interpretation as a fairly amount of P is bound with Fe, Al, and Ca in the sediments, which are relatively stable after deposition.*

*References:*

*Azcue JM, Rosa F, Mudroch A. (1996) Distribution of major and trace elements in sediments and pore water of Lake Erie. Journal of Great Lakes Research 22:389-402.*

*Graney JR, Halliday AN, Keeler GJ, Nriagu JO, Robbins JA, Norton SA. (1995) Isotopic record of lead pollution in lake sediments from the northeastern United States. Geochimica et Cosmochimica Acta 59:1715-1728.*

*Yuan F, Depew R, Soltis-Muth C. (2014) Ecosystem regime change inferred from the distribution of trace metals in Lake Erie sediments. Sci Rep 4:1-7.*