

# IEH Undergraduate Intern Mentoring Opportunity

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Deadline: March 17, 2015

Selections Announced:

Name/Title/Institution(s) of senior mentor(s): Paul G. Tratnyek, Professor, OHSU

Name/Title/Institution(s) of frontline mentor(s): Chunhua Xu, Visiting Professor, Shandong University

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**Project Title:** Environmental Fate and Remediation of Toxic Metals

## Context for Project:

Toxic metals such as arsenic, chromate, lead, and copper are ubiquitous contaminants in developed waterways such as the Columbia River (CR). The fate and (bio)availability of these metals is controlled mainly by their interactions with sediments by adsorption and redox reactions. These reactions occur mainly on the surfaces of minerals, especially iron and manganese oxides. Understanding these reactions is essential to managing the health and ecological risks associated with toxic metals in the aquatic environment, especially highly contaminated areas like the Portland harbor.

## Project Description:

The intern will participate in research on the sequestration (removal by adsorption + reduction) of toxic metals by reducing materials found in harbor sediments such as magnetite, mackinawite, and metallic iron. They will help collect and prepare samples, expose the samples to contaminant metals, measure the resulting concentrations, help with ancillary characterization of the sediment materials (e.g., redox potential), and model the kinetics of sequestration. Methods that will be used may include spectroscopy, chromatography, and microscopy. We will try to coordinate with other CMOP investigator activities on common materials and methods.

## Proposed Outcomes/Broader Impact:

This work will contribute to better means of mitigating exposure (e.g., by remediation) and managing risk (e.g., by modeling bioavailability). The frontline mentor (Xu) is heavily involved in development of water reuse practices in China, and this connection will provide the intern with some exposure to issues related to international environmental technology transfer.

## Proposed timeline (within a 10 week span):

<i>Week</i>	<i>Activities</i>	<i>Deliverables</i>
1	Basic training on safety, lab protocols, analytical methods.	
2	Develop and validate analytical methods.	
3	Preliminary application of methods to contaminant degradation.	
4	Refine methods based on preliminary results.	
5	Synthesize and present interim results.	Presentation
6-9	Further application and refinement of the methodology.	
10	Synthesize and present final results.	Report

## Intern academic experience and skill-set should include:

Applicants should be majoring in chemistry, chemical engineering, environmental engineering, or a closely related field. Strong math and computer skills are also required.