DEPARTMENT OF CIVIL AND ARCHITECTURAL ENGINEERING AND CONSTRUCTION MANAGEMENT
COLLEGE OF ENGINEERING AND APPLIED SCIENCE

RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: February 8, 2026

PROJECT TITLE: Project Title: Field Measurements of Aerosolized Algal Bloom Toxins from Lake Erie in Lakeshore Areas: Occurrence, Concentration, and Cytotoxicity

Physical Requirement :
Must be able to lift 30 lbs

Project's Technical Skills Requirement :
must be able to drive a SUV for 5 hours a day

Project's Available Positions : 1

Tianren Wu, Ph.D.
Department of Civil and Architectural
Engineering and Construction Management
College of Engineering and Applied Science
798 Rhoads Hall
Cincinnati, OH 45221
wutr@ucmail.uc.edu

Project Description

The goal of this study is to characterize the occurrence and abundance of aerosolized harmful algal bloom (HAB) toxins from Lake Erie in lakeshore areas in Ohio through field measurements and to study the associated cytotoxicity.

Inland freshwater bodies like Lake Erie are increasingly recognized as major reservoirs of HABs that generate potent toxins, yet the aerosolization and inhalation exposure pathway remains largely unexplored. While waterborne exposure via ingestion and dermal contact dominates monitoring and regulation, emerging evidence suggests that HAB toxins may become airborne via lake spray aerosols (LSA) and pose respiratory and systemic health risks. However, far less attention has been given to inhalation exposure route, despite its potential for prolonged and widespread impact.

In this project, the undergraduate research student will contribute to the field sampling and chemical analysis of HAB-laden airborne particles in the lakeshore region of Lake Erie. The student will travel frequently to field sites for sampling.

The student will gain in-depth knowledge and hands-on experience of air quality analysis, aerosol science, field measurements, and analytical chemistry.