

March 3, 2023

LADCO Summer 2023 Internship

The Lake Michigan Air Directors Consortium (LADCO) is hiring a summer intern to help develop conceptual models for fine particulate matter pollution within the Great Lakes region. This project will involve both examination of the scientific literature and new analysis of environmental datasets.

Applications are due on March 24 @ 5:00 Central.

Project Description

Fine particulate matter (PM_{2.5}) is emitted from a wide range of sources, including vehicles, smokestacks, and fires, and also forms in the atmosphere through reactions of other pollutants. PM_{2.5} pollution consists of a complex mix of chemical components that vary over time and space. Long- and short-term exposure to PM_{2.5} can trigger a variety of health problems, including heart attacks, asthma attacks, and premature death. PM_{2.5} is one of six common air pollutants identified in the Clean Air Act as “criteria air pollutants” and regulated by the U.S. Environmental Protection Agency (EPA) via the National Ambient Air Quality Standards (NAAQS) program. EPA recently proposed to lower the level of the annual PM_{2.5} NAAQS, which is anticipated to cause several areas in the Great Lakes states to be out of attainment with the NAAQS. LADCO will work with its member states to reduce PM_{2.5} concentrations in the region to attain these standards.

The emissions of many of the chemicals that form PM_{2.5} have decreased dramatically in the last few decades, and primary emissions of the pollutant have changed as well. As a result, the chemistry of PM_{2.5} formation has likely changed over time such that findings from studies conducted years ago may no longer be relevant. LADCO will benefit from a review of more recent research on the current chemical conditions and drivers of PM_{2.5} across the Great Lakes region.

The LADCO summer 2023 intern will refine and describe conceptual models for PM_{2.5} formation in different areas of the Great Lakes region. These models will describe the conditions under which high levels of PM_{2.5} occur in the area, including the meteorology of high-PM_{2.5} days during different seasons, the chemical composition of that PM_{2.5} and the relative importance of local versus transported sources of PM_{2.5}. To do this, the intern will:

- Review, catalog, and summarize existing resources, including scientific publications, policy documents, and existing LADCO analyses, to describe what is already known about PM_{2.5} formation in these areas.
- Analyze air quality and meteorological data for the areas to further develop the conceptual models. Analyses will likely focus on long-term monitoring data for PM_{2.5}, PM_{2.5} precursors, and meteorology at sites around the region.

The final products for the internship will be a technical resource library and a document describing the conceptual models for the different areas. The resource library will be a bibliography of literature

sources that describe studies conducted on PM_{2.5} composition and dynamics in the Great Lakes region within the past decade. The document will form the basis of a website LADCO will develop describing the conceptual models in the different areas. The intern will also give an oral presentation of their work to staff from LADCO and LADCO member states.

Position Requirements

You must be a college or university student who will have completed their sophomore, junior or senior year or be enrolled in graduate school. If you are not a U.S. citizen, you must have a valid and current student or work visa. Preference will be given to students majoring in a scientific field (including but not limited to atmospheric science, environmental science, biology, chemistry, engineering, geology, mathematics, meteorology, and physics). Students should have completed some environmental course work. Additional requirements:

- Familiarity with and ability to program in R
- Access to online library databases (e.g., Web of Science) and electronic scientific journals
- Experience reading and using information from scientific publications
- Experience analyzing and interpreting complex datasets, ideally focused on environmental data

Internship Details

- Term: 8 weeks in June – August 2023 (exact timing is negotiable)
- Hours: 20-30 per week
- Location: Virtual
- Stipend: \$3,000 paid in two installments
- The intern will work remotely under the supervision of the LADCO Data Scientist

Application

Applicants should submit the following materials via email to the LADCO office manager (heath@ladco.org) by March 24 @ 5:00 Central.

- Cover letter that includes a 1-page statement describing your interest in the internship and your qualifications for the position. This statement should describe your experience reading and applying information from the scientific literature, analyzing environmental data or other complex datasets, and using R.
- A resume or CV that includes your full contact information, and describes your academic background, GPA, course work, academic honors or awards, and any relevant research or work experience.

- Two reference letters. Letters should address your academic abilities, accomplishments, work habits, potential as a researcher, and ability to participate in and benefit from an internship program in air quality science. Recommendations generally come from your professors or supervisors. Please include your reference letters with your application.

About LADCO:

LADCO is an air quality research and planning organization located in Chicago. We work with state, local, and tribal air agencies in the Great Lakes region to fulfill their commitments under federal clean air regulations to improve air quality in the region. The LADCO region includes Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin.

LADCO provides equal employment opportunities to all employees and applicants for employment and prohibits discrimination and harassment of any type without regard to race, color, religion, age, sex, national origin, disability status, genetics, protected veteran status, sexual orientation, gender identity or expression, or any other characteristic protected by federal, state or local laws.