LADCO | LAKE MICHIGAN AIR DIRECTORS CONSORTIUM

LADCO Summer 2026 Internship

The Lake Michigan Air Directors Consortium (LADCO) is hiring a summer intern to investigate patterns in air pollution concentrations across the city of Chicago. The intern will analyze data from a dense network of low-cost sensors in the city and explore spatial patterns and the drivers of these patterns. This project will involve both examination of the scientific literature and new analysis of environmental datasets.

Applications are due on March 20 @ 5:00 Central

Project Description

Air pollution can adversely impact human health and contribute to premature mortality. Significant work at the federal, state, and local levels over the last few decades has resulted in large reductions in air pollution around the country, including in Midwestern cities. However, urban and lakeshore areas in Chicago and other Midwestern cities continue to experience persistent ground level ozone and fine particulate matter ($PM_{2.5}$) pollution episodes. Developing effective strategies to further improve air quality requires increased understanding of the sources and distribution of air pollution in our cities. Recent innovations in high spatial and temporal resolution observational platforms offer the potential to bridge the gap between emission sources and ambient concentrations.

Open Air Chicago is the densest network of low-cost air quality sensors in the country. This network was deployed by the City of Chicago and the University of Illinois Chicago in summer 2025. Sensors measure nitrogen dioxide (NO_2, a precursor to both ozone and $PM_{2.5}$) and $PM_{2.5}$ concentrations across the city with devices that are less than 1.5 km apart at sub-hourly time scales. The availability of air quality data at this high spatial and temporal resolution allows investigation of fine-scale variations in concentrations within the city, including identification of pollution hotspots. Such hotspots may be particularly dangerous if located in communities that are already subject to environmental health disparities. This analysis in turn should improve our understanding of emissions sources in the city, which can increase our understanding of the sources of pollution and help improve computer models of air pollution.

The summer 2026 LADCO intern will analyze the data from the Open Air Chicago network to investigate temporal and spatial trends in NO_2 and/or $PM_{2.5}$ around the city, in collaboration with the Open Air Chicago team. This analysis may involve application of statistical tools, such as cluster analysis, to investigate spatial variations in pollutant concentrations around the city. The intern may also use statistical tools to explore variations in measured pollutant

concentrations based on land use and proximity to emissions sources such as highways or industry. The intern will compare the sensor data with data from the more sparse but higher quality regulatory monitoring networks.

The objectives of the project are to (1) identify spatial patterns in concentrations of NO_2 and/or $PM_{2.5}$ across Chicago, including any hotspots, (2) explore how these spatial patterns change over the year, and (3) investigate the origins of concentration hotspots, including their connection to known and previously unknown emissions sources.

The final products of the internship will be a report describing the intern's analysis and findings, and a presentation to staff from LADCO, U.S. EPA, and LADCO member states.

Position Requirements

You must be a college or university student who will have completed at least your junior 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 Skills Desired:

- Familiarity with and ability to program in interpreted programming languages such as MATLAB, R, and Python.
- Access to online library databases (e.g., Web of Science) and electronic scientific journals.
- Experience in literature review of scientific papers and publications.
- Experience in research paper writing and presenting technical information to others.

Internship Details

- Term: 8 weeks in June – August 2026 (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

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Application

Applicants should submit the following materials via email to the LADCO office manager (heath@ladco.org) by March 20 @ 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 programming languages.
- 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.