The Water Center is working to enhance freshwater research activities at the University of Michigan by fostering cross-disciplinary collaborations, encouraging new linkages to freshwater issues in research and courses, and providing more opportunities to study and learn about the Great Lakes and other large freshwater systems.

Through this funding effort, the Water Center is increasing U-M’s capacity to contribute solutions to the protection and restoration of freshwater systems.

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PROJECT SUMMARY
Similar to sea spray, freshwater ecosystems release lake spray. The action of breaking waves creates lake spray and releases particles into the air. Lake spray particles have the potential to impact climate and human health. For example, lake spray particles generated during toxic algal blooms are hypothesized to impact human health by exposure to toxins through inhalation. Few studies, however, have been conducted to assess the physical and chemical properties of freshwater lake spray.

This study involves collaboration between research groups in the Departments of Environmental Health Sciences and Chemistry to establish the capability to study freshwater lake spray particles using state-of-the-art measurement techniques at the University of Michigan. The project will develop a research approach for, and expertise in, the study of atmospheric impacts of freshwater ecosystems.

Methodology will be developed to generate lake spray particles in the laboratory using samples collected at 10 sites along the Michigan, including sites impacted by harmful algal blooms. The physical and chemical properties of the generated lake spray aerosol will be determined to identify specific “fingerprint” signatures. These signatures will allow future studies to isolate specific particles in coastal air to determine human health impacts on communities.

The methods and results developed as part of this project provide the required preparation for the project team’s proposed future atmospheric aerosol measurement efforts for which lake spray aerosol will be measured in-situ and compared to laboratory-generated lake spray aerosol. The project will provide preliminary data required for submission of a planned collaborative proposal for algal bloom water and air impact studies.

Sampling sites. National Data Buoy Center sites in cyan and Great Lakes Environmental Research Laboratory sites in red. A black circle in the marker indicates a site where a harmful algal bloom has been observed.