

RESEARCH

Lake Superior National Estuarine Research Reserve

Staff

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 Deanna Erickson, Education Coordinator
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 Patrick Robinson, Co-Director, UWEX Environmental Resources Center
 Shon Schooler, Research Coordinator
 Erika Washburn, Reserve Manager

Background

The National Estuarine Research system (<https://coast.noaa.gov/nerrs/>) is a network of 28 Reserves which are administered by the U.S. Department of Commerce (<https://www.commerce.gov/>), National Oceanic and Atmospheric Administration (<https://www.noaa.gov/>) (NOAA) and promotes stewardship of the nation's estuaries through science and education using a system of protected areas. The Lake Superior Reserve System builds federal, state, and community partnerships and promotes management and stewardship of estuarine and coastal habitats through scientific understanding linked with public education through a combination of research, education and public outreach.

Lake Superior Reserve Mission and Goals

The Lake Superior Reserve works in partnership to improve the understanding of Lake Superior freshwater estuaries and coastal resources and to address the issues affecting them through an integrated program of research, education, outreach and stewardship.

- Goal 1 – Conduct applied research and monitoring to increase the understanding of Lake Superior freshwater estuaries and coastal ecosystems
- Goal 2 – Educate youth, students, community members, and visitors about Lake Superior freshwater estuaries and coastal resources and improve their ability to address coastal issues
- Goal 3 – Increase the ability of community leaders and other decision makers to address critical Lake Superior coastal management issues
- Goal 4 – Protect and enhance the ecological health of the St. Louis River Watershed and Lake Superior coastal habitats

Information

The Lake Superior National Estuarine Research Reserve (<https://lakesuperiorner.org/>) (Lake Superior Reserve) is the 28th Research Reserve in the NERR System and is the only NERR located in Wisconsin within NOAA's Lake Superior Biogeographical Region. Designated in October 2010, Lake Superior Reserve joins Old Woman Creek Reserve on Lake Erie as the second Great Lakes freshwater estuary in the NERR System. Lake Superior Reserve is situated on the most western tip of Lake Superior and contains examples of many of the types of habitats associated with the St. Louis River freshwater estuary and its watershed. The St. Louis River is the largest United States tributary to Lake Superior and flows 179 miles through a 3,634 square mile watershed. The lower

23 miles of the St. Louis River form the boundary between Wisconsin and Minnesota.

University of Wisconsin and Lake Superior Reserve

The Lake Superior Reserve is a state - federal partnership. The federal partner, NOAA, provides federal funds and guidance to the Reserve, while the state partner, University of Wisconsin, provides matching funds and is responsible for the management of the Reserve. Two entities within the University of Wisconsin System have strong ties to the Reserve. Federal funds enter the state through the University of Wisconsin-Extension (<https://www.wisconsin.edu/>) (UWEX), the State's designated lead agency for the Lake Superior Reserve, which is the only Reserve in the NERR system to be managed by the Extension arm of a University. The Lake Superior Reserve is housed within two buildings, owned by the University of Wisconsin-Superior (UW-Superior), on Barkers Island in Superior, Wisconsin. The administrative offices, laboratory, educational center, and Interpretive Visitors Center are located in these buildings which are part of UW-Superior campus. Lake Superior Reserve staff members are appointed through either UWEX or University of Wisconsin-Superior.

In addition to the Lake Superior Reserve facilities, the UW-Superior owns a 72-acre parcel of land within the Lake Superior Reserve boundaries that includes Dutchman Creek on the south shore of Lake Superior, which is named the Nelson Outdoor Laboratory.

Projects and Research

There are paid and volunteer student opportunities. Students majoring in natural and social science programs, arts and the humanities have opportunities to participate in research projects as student research or education assistants, work study, interns, or volunteers.

Areas of interest include: Natural Sciences, Chemistry, Economics, Business, Mathematics, Sociology and Anthropology, Physics, History, Psychology and Behavior Sciences, Engineering, Education, and Art.

Public Education

National Estuarine Research Reserves serve as "living classrooms" for educators, students and the public in general. Research Reserves take a local approach in advancing freshwater estuary literacy and generating meaningful experiences for all kinds of people interested in learning about, protecting and restoring estuaries. Reserves provide adult audiences with training on coastal issues of concern in their local communities; offer classes for K-12 students; support teachers through professional development programs in coastal and estuary education; and provide public education events.

Contact Information

Lake Superior National Estuarine Research Reserve

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Lake Superior Research Institute (LSRI)

Staff

Kelly Beaster, Researcher I
 Amy Eliot, Associate Director
 Kimberly Eller, Researcher I
 Lana Fanberg, Researcher I

Steve Gebhard, Researcher I
 Roberta Grube, Financial Specialist II
 Dr. Jeremy Hartsock, Researcher II
 Mikayla Haynes, Researcher I
 Dr. Jen Maki, Researcher III
 Samantha McClung, Research Specialist
 Michael Nagel, Research Specialist
 Desiree Niewinski, Research Specialist
 Christine Polkinghorne, Scientist I
 Heidi Saillard, Researcher III
 Dr. Kurt Schmude, Scientist III
 Reed Schwarting, Researcher I
 Gerald Shepard, Researcher I
 Ardeen Stoll, Research Administrator
 Dr. Matt TenEyck, Director

History

Founded in 1967 and approved by the Board of Regents in 1969, the Lake Superior Research Institute (<https://www.uwsuper.edu/academics/research-and-innovation/lake-superior-research-institute/>) (LSRI) is the applied environmental research and related public outreach unit of UW-Superior. Supported almost entirely by extramural funding, the Institute's mission is to conduct environmental research and provide services that directly benefit the people, industries, and natural resources of the Upper Midwest, the Great Lakes Region, and beyond; provide non-traditional learning and applied research opportunities for undergraduate students; and foster environmental education and outreach in the Twin Ports and surrounding communities. Faculty and academic staff associated with the Institute possess training in biology, chemistry, aquatic ecology, ecological modeling, environmental education, geology, microbiology, plant ecology, statistical analysis, taxonomy, and toxicology.

LSRI has received more than 711 grants and contracts to date with a combined extramural budget of more than \$74.8 million. More than 153 federal, state, and local agencies have supported LSRI.

Projects and Research

LSRI is well equipped and staffed to conduct environmental research and monitoring. Facilities include analytical chemistry laboratories, culture rooms for fish and invertebrates, toxicity testing systems, a microbiology laboratory, and a taxonomy laboratory. LSRI scientists have extensive experience conducting field sampling on Lake Superior, inland lakes, wetlands, and streams.

Recent research activities include studies on the occurrence and control of exotic species in the Great Lakes, effects of chemicals on aquatic organisms and ecosystems, biological evaluations of contaminated sediments in the Great Lakes, monitoring and assessing environmental parameters in Lake Superior coastal wetlands, streams, and nearshore areas, monitoring water and air quality of the Lake Superior region, analysis of trace levels of organic and inorganic pollutants, and determination of mercury levels in Great Lakes' fish.

In addition to research, the Institute is active in the publication of results. Papers are presented at scientific meetings and published in professional journals. LSRI scientists have written and published six toxicity research data books that have a worldwide distribution.

Public Education

LSRI has been involved with several public environmental education programs, including the National Science Foundation's Young Scholars program, American Indian Science and Engineering Society Workshop

for teachers, Wisconsin Water Action Volunteer program, Bird Studies Canada volunteer Marsh Monitoring program and a collaborative effort with the University of Illinois Urbana/Champaign called Envirovet. In 2023, LSRI will be unveiling new public education programs for its newly commissioned Superior Floating Classroom. LSRI will host boat trips for general audiences as well as K-12 education and Rhode Scholars.

Student Research Opportunities

LSRI has employed over 800 undergraduate students and provided research experience for countless other students at the University of Wisconsin-Superior. Many of the students who have participated in research projects have gone on to pursue post-graduate education and/or careers in the sciences. Many students majoring in the sciences at UW-Superior participate in environmentally oriented research projects under the direction of faculty and staff from the LSRI. Student participation occurs during the school year through part-time jobs as student research assistants and during the summer through full-time jobs as student research assistants or student research interns. In this way, students gain valuable research experience and earn money to help finance their education.

Student research opportunities exist primarily in conjunction with research projects funded by state and federal agencies. The types of opportunities vary according to expertise of staff and availability of funds within those areas.

McNair Scholars Program

Staff

Dr. Marcia S. Francis, Director
 Ms. Michelle Vinoski, Academic Coordinator
 Ms. Debra Provost, Program Assistant

History

The Ronald E. McNair Postbaccalaureate Achievement Program (<https://www.uwsuper.edu/academics/academic-support/mcnair-scholars-program/>) (McNair Scholars Program) is a graduate school preparation program. It prepares low-income, first-generation college students and students from groups under-represented in graduate education for doctoral study. Qualifying university students who demonstrate academic ability can apply to the McNair Program as sophomores, juniors or seniors.

Students take part in an extensive graduate school preparation program which consists of monthly workshops and individual meetings, GRE preparation, and mentoring by faculty mentors. As juniors and seniors, they conduct research similar to what they would produce as graduate students and participate in a summer research internship. In the fall of the year students formally present their research projects at a campus-wide research symposium at National McNair Research Conferences and other conferences within their field of study.

Projects and Research

The McNair Scholars Program began providing services to students nationally in the 1989-1990 academic year. The University of Wisconsin-Superior received funding through the U.S. Department of Education for the Ronald E. McNair Post-Baccalaureate Achievement Program (<https://www2.ed.gov/programs/triomcnair/>) beginning October 1, 1999. The McNair Scholars Program at UW-Superior has worked with over 200 students on research projects across all academic disciplines.

Student Research Opportunities

Applications are due in late October each year. Students in all majors are welcome to apply. View more information on qualifications and for applications (<https://www.uwsuper.edu/academics/academic-support/mcnair-scholars-program/>).

Center for Undergraduate Research, Scholarship and Creative Activity (URSCA)

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Staff

Julie O'Leary, Director

History

While undergraduate research, scholarship and creative activity (URSCA) has long been established on campus, the Center for Undergraduate Research, Scholarship and Creative Activity (<https://www.uwsuper.edu/academics/research-and-innovation/undergraduate-research/>) was established in 2014 to promote, recognize and support URSCA in all academic disciplines. The Center provides support, resources, and opportunities for students, faculty and staff. The Center is located on the 3rd floor of Swenson Hall.

Projects

The Center administers the Summer Undergraduate Research Program (<https://www.uwsuper.edu/academics/research-and-innovation/undergraduate-research/>), organizes a campus undergraduate research celebration day annually, coordinates student participation in UW-System sponsored URSCA activities and events, assists students and staff in accessing regional, state and national opportunities, and serves as a resource for faculty and students.

Transportation & Logistics Research Center

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Staff

Mei Cao, Professor, Director
Daniel Rust, Associate Professor
Cassandra Roemhildt, Administrative Manager

History

The Transportation and Logistics Research Center (<https://www.uwsuper.edu/academics/research-and-innovation/transportation-and-logistics-research-center/>) was founded in 1999 with a mission to provide applied transportation, logistics and supply chain research, education, and advisory services that benefit the region's economy. The Transportation and Logistics Research Center is continually active in

transportation and logistics research projects. The faculty and academic staff associated with the center have training in economics, accounting, geography, statistics, transportation, logistics, and various other business disciplines. Since its founding in 1999, the center has received more than \$11 million in grants and endowments. The Transportation and Logistics Research Center is part of the School of Business and Economics and is located in Old Main 135.

The mission of the TLRC is to provide applied transportation and logistics research, education, and advisory services that advance the economy of the region.

Through its strategic goals (as listed below) the center works to promote and enhance its mission:

- Be actively involved in applied research projects that enhance the region's transportation and logistics systems.
- Develop and distribute informational publications and presentations to the academic community and general public.
- Establish continuing education courses in transportation and logistics to improve the economic effectiveness and safety of the region's transportation systems.
- Accept recommendations from the advisory board of professionals to continuously improve the center's service to the university and the community. The Transportation and Logistics Advisory Board is composed of representatives from key sectors of the transportation and logistics industry and are uniquely able to assist in creating excellence in education.
- Initiate distinguished speaker series to provide university and community opportunities to learn from and meet leaders in the field.
- Organize seminars and workshops that expose the region to new ideas and highlight opportunities.

Projects and Research

The Transportation and Logistics Research Center is continually active in transportation and logistics research projects. The faculty and academic staff associated with the center have training in economics, accounting, geography, statistics, transportation, logistics, and various other business disciplines. Since its opening in 1999, the center has received more than \$8 million in grants and endowments.

The Transportation and Logistics Research Center partners with many different local and national organizations on research projects, seminars, outreach, and education. Examples of these companies and organizations include:

CN Railroad (<https://www.cn.ca/en/>)

Key Lakes, Inc. (<https://usw5000.org/key-lakes-inc/>)

BNSF Railroad (<http://www.bnsf.com/>)

Halvor Lines, Inc. (<https://www.halvorlines.com/>)

Duluth Seaway Port Authority (<https://duluthport.com/>)

Dart Transit (<http://www.dart.net/>)

Metropolitan Interstate Council (<https://dsmic.org/>)

Transportation Research Forum (<https://trforum.org/>)

Wisconsin Department of Transportation (<https://wisconsindot.gov/Pages/home.aspx>)

Minnesota Department of Transportation (<http://www.dot.state.mn.us/>)

Duluth-Superior Transportation Association (<http://www.duluthsuperiortransportation.com/>)

Duluth-Superior Maritime Club (<https://duluthport.com/community/maritime-activity/>)

Council of Supply Chain Management Professionals - Twin Cities and North East Wisconsin Roundtables (<https://cscmp.org/>)

Intermodal Association of North America (<https://www.intermodal.org/>)

Women in Trucking Association (<https://www.womenintrucking.org/>)

U.S. Department of Transportation (<https://www.transportation.gov/>)

U.S. Environmental Protection Agency (<https://www.epa.gov/>)

U.S. Army Corps of Engineers (<https://www.usa.gov/federal-agencies/u-s-army-corps-of-engineers/>)

U.S. Coast Guard (<https://www.gocoastguard.com/>)

The Transportation and Logistics Research Center is an active member of the following research organizations.

Great Lakes Maritime Research Institute (GLMRI)

GLMRI (<http://www.glmri.org/>) represents a consortium of the University of Wisconsin-Superior Transportation and Logistics Research Center and the University of Minnesota, Duluth Swenson College of Science and Engineering (<https://scse.d.umn.edu/>) and Labovitz School of Business and Economics (<https://lsbe.d.umn.edu/>).

The director of the Transportation and Logistics Research Center also serves as a co-director of the GLMRI.

To learn about the latest research efforts in marine transportation, logistics, economics, engineering, environmental planning, and port management, visit <http://www.glmri.org/>.

Wisconsin Space Grant Consortium

UW-Superior is a member of the Wisconsin Space Grant Consortium (<https://spacegrant.carthage.edu/>) (WSGC). The University's T&L Research Center hosted the 17th annual meeting in 2007 and the 28th annual meeting in 2016. UW-Superior has been awarded student scholarships and grants for research and outreach.

Council of University Transportation Centers (CUTC)

UW-Superior's Transportation and Logistics Research Center is a member of CUTC (<https://mycutc.org/>). Collectively, council members have advanced the state of the art in all modes and disciplines of transportation. In doing so, they have made significant and lasting contributions to the nation's mobility, economy, and defense. In 2014 council's membership consisted of 97 of the nation's leading university-based transportation research centers. Membership in the council is limited to any organized center, institute, division, unit, or specifically identifiable organization devoted to transportation research, education and technology transfer that is an integral part of a university or four-year college.

Student Research Opportunities

The Transportation and Logistics Research Center (<https://www.uwsuper.edu/academics/research-and-innovation/transportation-and-logistics-research-center/>) offers the opportunity to qualified students looking to become involved in undergraduate research. Student

research opportunities vary each semester depending on the number of ongoing projects. Opportunities include part-time jobs, student research assistantships, fellowships and internships to help students gain valuable research experience, and further their education goals.