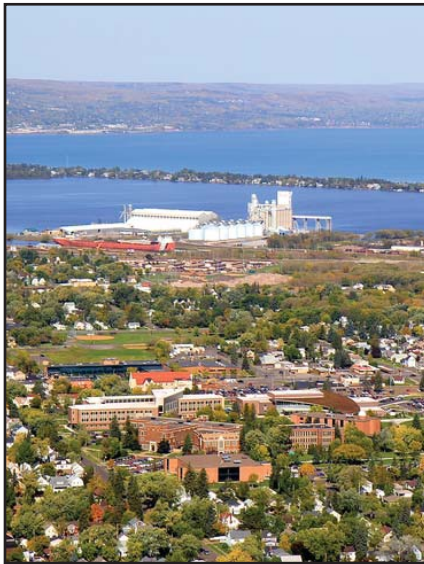


Research Initiatives FY 2016



UW-Superior overview

The University of Wisconsin-Superior is a gem of higher education located on the western tip of Lake Superior in the northwestern corner of the state. It is the only bachelor's- and master's-degree-granting institution in the northern third of Wisconsin. With the support of a skilled, dedicated faculty and staff, 2,600 students explore a wealth of knowledge and opportunity through more than 30 undergraduate majors, eight graduate programs, one specialist program and six online degree programs.

UW-Superior is home to the largest percentage of international undergraduate students in the UW System after UW-Madison with 146 international students from 38 countries.

- Graduates of UW-Superior succeed, with 95 percent getting a job in their field or continuing their education upon graduation.
- Students in Academic Service-Learning courses provide 19,800 hours of community service each year through internships and service projects.
- UW-Superior provides extensive support to the nearly 46 percent of its population who are first-generation college students. It delivers programs to recruit, support and graduate underrepresented minority students, playing a vital role in the region and the UW System.

LEFT: North-facing aerial view of the UW-Superior campus, foreground, with St. Louis Bay and Lake Superior in background. ABOVE: Students walk from Yellowjacket Union to Swenson Hall.

By the Numbers

2,589

Total students enrolled

134

Graduate students enrolled

\$4 million

Dollars in federal research annually

- Innovative programs such as Transportation and Logistics Management, Art Therapy, and the Individually Designed major provide students unique areas of study and allow the campus to draw students from across the country.

Partnerships with federal agencies

Federal dollars are put to work at UW-Superior to support a wide reach of environmental and maritime research. During the past five years, UW-Superior was awarded significant research dollars through grants and cooperative agreements with federal agencies. Examples include:

- **Maritime Administration (MARAD) Cooperative Agreement - \$800,000 to \$1,000,000** annually to establish the feasibility of converting maritime vessels to liquid natural gas. Funds were awarded to the Great Lakes Maritime Research Institute.
- **Great Ships Initiative - \$1,258,120** to evaluate ballast treatment technologies that can minimize the potential introduction of exotic species, such as zebra mussels, ruffe, and goby, by commercial ships. The project will pave the way for effective and defensible aquatic invasive species prevention policies for the Great Lakes by producing robust, practicable methods, and first results on the risk/release relationship for worst-case Great Lakes aquatic invaders. Funds were awarded by MARAD and the Great Lakes Restoration Initiative through the Northeast-Midwest Institute to the Lake Superior Research Institute.
- **US Environmental Protection Agency (EPA) Great Lakes Restoration Initiative - \$971,714** to monitor the condition of the nearshore zone in the Lake Superior basin in Northwestern Wisconsin. The project established more than 75 stations to monitor the condition of coastal wetlands, tributaries and nearshore waters. The coastal stations include 17 coastal wetlands monitoring stations, 34 tributary stream stations and 32 nearshore stations. Funds were awarded to the Lake Superior Research Institute.
- **Wisconsin Sea Grant Omnibus Program - \$94,712** to combine data from prior vegetation studies in the Lake Superior estuary and create a synthesized dataset of wetland vegetation. The digital dataset will be used to inform management decisions and judge future changes in the estuary.



Dr. Richard Stewart (right) and his Transportation and Logistics class tour a Great Lakes freighter.

1
of 28 Transportation and Logistics Management programs in the U.S. **certified by the American Society of Transportation and Logistics**

2
Rank among UW schools in percentage of undergraduate international students

- **National Oceanic and Atmospheric Administration (NOAA), Bay Watershed Education Training Program (BWET) - \$229,300** to support the Rivers2Lake Program, an education and research program of the Lake Superior National Estuarine Research Reserve (LSNERR) that uses the Lake Superior watershed as a living classroom. The project increases Great Lakes literacy for both educators and students. Hands-on research experiences are provided to emerging, K-12 student scientists. Activities included more than 1,700 student contact hours and more than 600 professional development contact hours in the first half of the 2014-15 academic year.



Deanna Erickson shows Duluth and Superior area teachers how to test water quality as part of the Reserve’s River2Lake program.

Research centers and institutes

The Lake Superior Research Institute

The Lake Superior Research Institute (LSRI) was created in 1967 to conduct environmental research, provide environmental education and disseminate public information about the Great Lakes Region. Major research efforts are focused on biological monitoring (sampling, identification and analysis) of aquatic communities and wetland vegetation, ballast water treatment research, invasive species monitoring, toxicity testing and evaluation of contaminants of fish. Research efforts are focused on the Great Lakes and inland water bodies of the Upper Midwest.

Primary sponsors include the Northeast-Midwest Institute, a private, non-profit corporation located in Washington, D.C.; the Great Lakes Protection Fund; the U.S. Environmental Protection Agency; the Wisconsin Department of Natural Resources; Douglas County; private foundations and tribal entities. Numerous UW-Superior students have participated in the Institute’s research projects as student research assistants, interns and, upon graduation, as employees. Environmental outreach efforts include K-12 education, adult workshops, lake associations and involvement of UW-Superior undergraduates.

The Great Lakes Maritime Research Institute

The Great Lakes Maritime Research Institute is a consortium led by the University of Wisconsin-Superior and the University of Minnesota Duluth with 11 affiliate universities in the Great Lakes region including UW-Green Bay and UW-Madison. The Institute is dedicated to developing and improving economically and environmentally sustainable maritime

4

Number of world-class research centers

14:1

Student: faculty ratio

95

Percentage of graduates who enter the workforce or continue their education

commerce on the Great Lakes through applied research. The United States Maritime Administration designated the Great Lakes Maritime Research Institute (GLMRI) as a National Maritime Enhancement Institute in June of 2005, one year after its inception. GLMRI's research conducts, in a public-private partnership, research that develops and improves economically and environmentally sustainable maritime commerce on the Great Lakes. Current research topics include the conversion to Great Lakes vessels and other modes of transportation to using less costly, more environmentally friendly, North American natural gas as their primary fuel. GLMRI's federal and private partners include the US Maritime Administration (MARAD); the St. Lawrence Seaway Administration; Research Information and Technology Administration (RITA); Committee on Transportation and Infrastructure (CMTS); the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers and more than 200 partnerships with industries. Dr. Richard Stewart of UW-Superior is Co-Director of the Institute and serves on the newly created Environmental Protection Agency's Great Lakes Advisory Board.

Transportation and Logistics Research Center

UW-Superior is the home of the Transportation and Logistics Research Center. The Center's mission **is to provide applied transportation, and logistics research, education, and advisory services that advance the economy of the region.** The center's research educates and trains the future and existing transportation and supply chain workforce. The Center's research aims to reduce shipping and transportation costs through improved transportation and logistics for regional business such as: logging, mining, paper, trucking, rail, air, pipeline and marine industries. The Center has generated more than \$11 million in public-private partnership research funds over the past 14 years. UW-Superior's Transportation and Logistics Research Center is a partner university of the UW-Madison Center for Freight Infrastructure and Education (CFIRE) and was awarded full membership in the Council of University Transportation Centers (CUTC) in January 2014.

The Lake Superior National Estuarine Research Reserve

The Lake Superior National Estuarine Research Reserve (LSNERR) is part of a system of 28 Reserves nation-wide and is only one of two Reserves in the Great Lakes. Established in 2010 by NOAA, the state of Wisconsin and other public and private agencies, it represents the expression of decades-long efforts to understand and preserve the St. Louis River Estuary. The Lake Superior NERR seeks to improve the understanding of Lake



(2012 file photo) Biology student Cody Closson works on a summer project with Lake Superior Research Institute, which hires about 10 undergraduate students a year to assist in research.

127

Number of students hired by the Lake Superior Research Institute over the past decade

23rd

National ranking on U.S. News' Best Online Bachelors' Programs list -- highest in the UW System, region and state of Wisconsin.

Superior freshwater estuaries and coastal resources and to address the issues affecting them through an integrated program of research, education, outreach and stewardship. Research interests are focused on freshwater resources and the uniqueness of the Lake Superior ecosystem, making LSNERR attractive for scientists of many disciplines. Current research priorities include long-term water quality monitoring, impacts of climate change, invasive species, restoration as well as the human and community dimensions related to these and other topics within the St. Louis River watershed. (<http://lsnerr.uwex.edu/Research/Docs/LSNERR-ResearchStrategicPlan8-9-12.pdf>).

Education and outreach programs are dedicated to advancing freshwater estuary literacy and generating meaningful experiences for all people, making the LSNERR a community asset and destination for students, researchers, natural resource managers, and visitors. A bayside laboratory was completed in winter 2013, and planning for an interpretive center is underway.



Aerial view of the St. Louis River's Pokegama Bay, part of the Lake Superior National Estuarine Research Reserve.

Undergraduate research for economic development

UW-Superior supports STEM education by providing its students with hands-on experience in solving challenges through research, giving them a competitive advantage in finding and generating high-paying jobs for economic development in the region. The Lake Superior Research Institute hires between 10 and 15 students each year. The Transportation and Logistics Research Center offers two to three research opportunities for each student, ranging from industry-based internships to hands-on research. The Lake Superior National Estuarine Research Reserve (LSNERR) also supports undergraduate research by mentoring around 10 undergraduate research assistants each year and engaging more than a hundred K-12 student scientists with hands-on, age-appropriate research activities.

On campus, a large majority of academic programs are incorporating undergraduate research, scholarship or creative activity into the curriculum. Eighty percent of the faculty and staff responding to a campus-wide survey reported including undergraduate research, scholarship and creative activity in their curriculum or faculty-supported summer research offerings in 2012.

Throughout the past year, efforts to promote undergraduate research at UW-Superior have taken center stage. In 2014, UW-Superior established



5

Number of consecutive years G.I. Jobs Magazine has recognized UW-Superior as a Military Friendly School

2014

Year Outdoor Magazine named Duluth "Best Outdoor Town"

and staffed a Center for Undergraduate Research, Scholarly and Creative Activities (URSCA) through a UW System Institutional Change Grant. The Center is working with faculty and staff to increase undergraduate research opportunities across all disciplines in the liberal arts. Activities include matching student interests to research opportunities, and identifying research partnerships and opportunities within the community. The Center is increasing the ability of faculty to integrate undergraduate research, scholarship and creative activity throughout their curricula by providing professional development opportunities, promoting best practices, and providing internal grants that advance high-level URSCA opportunities for students. URSCA opportunities at UW-Superior include: research assistantships, summer undergraduate research fellowships, a campus-wide showcase of undergraduate scholarship, and opportunities for students to travel to present their work at professional meetings and other events.

Educational Best Practices: UW-Superior is deeply dedicated to creating excellence in teaching and learning and fostering liberal arts learning outcomes for each student. Its recognized, best-practice teaching strategies include mentored undergraduate research, academic service learning, global awareness, first-year experience, senior-year experience (capstones) and writing across the curriculum.

Future Federal Partnerships and Investment: The UW-Superior's faculty and academic programs are poised to develop a number of strategic partnerships with federal government agencies on opportunities for advancing STEM, teacher preparation, earth and biological sciences, economics and humanities, to name a few. Opportunities for federal funding well-suited for the campus exist through the United States Departments of Agriculture, Education, Energy and Interior as well as the National Science Foundation and the National Endowment for the Humanities.

Regional economic partnerships

The Northern Center for Community and Economic Development focuses on applied research and education in northern Wisconsin. It works with and through the county-based Community Resource Development Educators of UW-Extension to provide local and regional economic data as a service to the community. As a regional center, it also works directly with multi-county and statewide organizations and agencies on issues of specific importance to Northern Wisconsin. By fostering partnerships and collaborations it leverages resources for shared outcomes in workforce and economic development.

Regional Business: UW-Superior is honored to participate in the annual [Regional Economic Indicators Forum](#) through key faculty in the Department of Business and Economics. The forums represent an unprecedented effort to identify key indicators of economic growth and business oppor-



TOP: Undergraduate Augustin Tegaboue Tchouassi adjusts a freeze dryer unit for his research on anti-viral properties of highbush cranberry fruit. **MIDDLE:** Undergraduate Joe Ripley has worked as student Monitoring Technician for the Lake Superior NERR for over two years. He also received a Summer Undergraduate Research Fellowship to carry out an extension of the NERR's regular water quality monitoring that will further understanding of the aquatic ecosystem.

tunities in northeastern Minnesota and northwestern Wisconsin. Data collected from three universities in the region are analyzed for use by business and government leaders to help spur the region's collaboration and economic growth.

Wisconsin's Small Business Development Center (SBDC) at UW-Superior is supported by the U.S. Small Business Administration (SBA) with matching funds from UW-Extension. The Center provides one-on-one business advising, resource referral and business education programs for entrepreneurs and existing small business owners. Covering an eight-county region, the program serves as a catalyst for economic growth for nearly 200,000 residents. The SBDC conducts training programs in business plan development and financial essentials. It is a founder and facilitator of the Twin Ports Inventors & Entrepreneurs' Club and the Superior PeerSpectives CEO Roundtable for Douglas County business leaders.

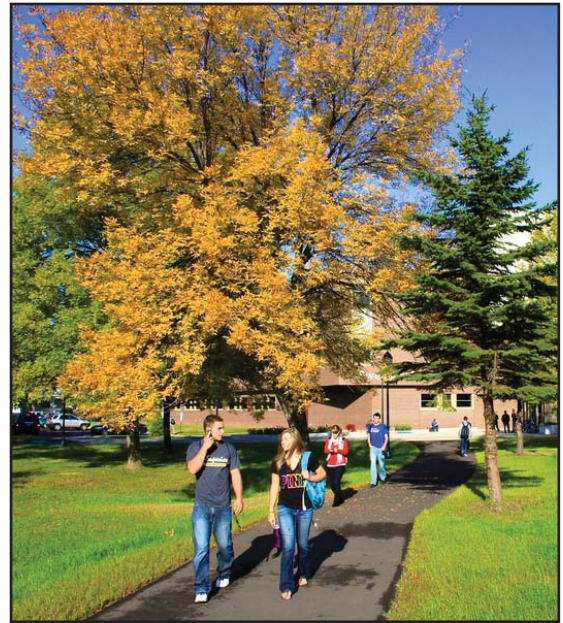
UW-Superior's **Center for Continuing Education** partners with government, business, foundations, non-profit organizations, and K-12 schools with an array of learning options. By providing opportunities for education and collaboration, the Center creates positive community and economic impacts by focusing on the areas of leadership, nonprofit administration, professional development, and health education. Certificates are offered in the areas as diverse as human resources, transportation and logistics, ethical leadership, mediation and conflict resolution, and the paralegal profession.

Education Partners - Delivering education to ever wider and more diverse constituencies is one of the ways UW-Superior builds economic strength in northwestern Wisconsin. Beginning in 2008, UW-Superior helped organize a new group, Northwest Wisconsin Educators for Regional Development (NorthWERD). The group exists to advance and consolidate this mission in areas served by eight educational institutions, including UW-Superior, Northland College, Wisconsin Indianhead Technical College, North Central Technical College, Lac Courte Oreilles Tribal and Community College, UW-Baron County and CESA 12. By leveraging the resources and strengths of each institution, NorthWERD is building a new capacity for education to address the needs of business, governments and organizations seeking a skilled workforce. UW-Superior is a founding member of the NorthWERD group. <http://www.northwerd.org>



Federally Funded Student Support Programs

- UW-Superior has a longstanding commitment to help underrepresented and disadvantaged students prepare for and succeed in higher education. Countless numbers of low-income, first-generation college



Students pass between classes on the University of Wisconsin-Superior campus.

40

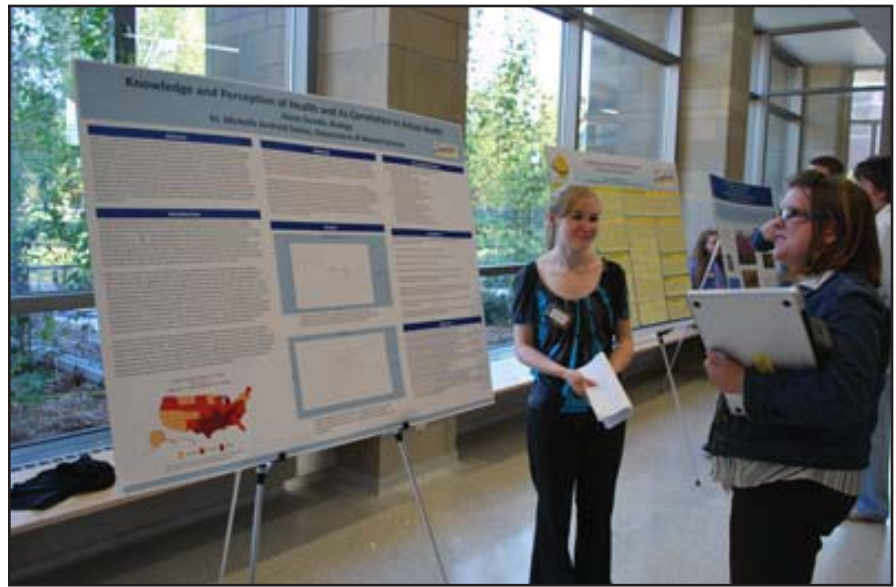
Percent of all UW-Superior students who take an academic service-learning course in a year

43

Number of countries represented in the student body

students and members of a traditionally underrepresented group have succeeded in higher education through federally funded TRiO programs.

- Over the past 16 years the McNair Post- Baccalaureate Achievement Program 116 students have completed undergraduate research/graduate school preparation program. It prepares students for research and graduate education and uses a STEM focus as designated by the Department of Education.
- At 35 years, the Student Support Services (SSS) provides personal, academic, and career-support services to hundreds of low-income and first-generation college students, as well as students with disabilities.
- The high school counterpart, Upward Bound has been the foundation for hundreds of high school students realize their goals of successfully pursuing a postsecondary education. It has also been at UW-Superior for 16 years.



LEFT: McNair scholar and biology student Alison Gondik describes her research at a poster session in Swenson Hall.



Winds of Change
Magazine 2014



Distinctions

- **COPLAC:** Member of the Council for Public Liberal Arts Colleges

- **Recognized by Winds of Change** magazine as a Native American friendly school for 4 years

- **President's Higher Education Community Service Honor Roll** four outreach, engagement, and community service