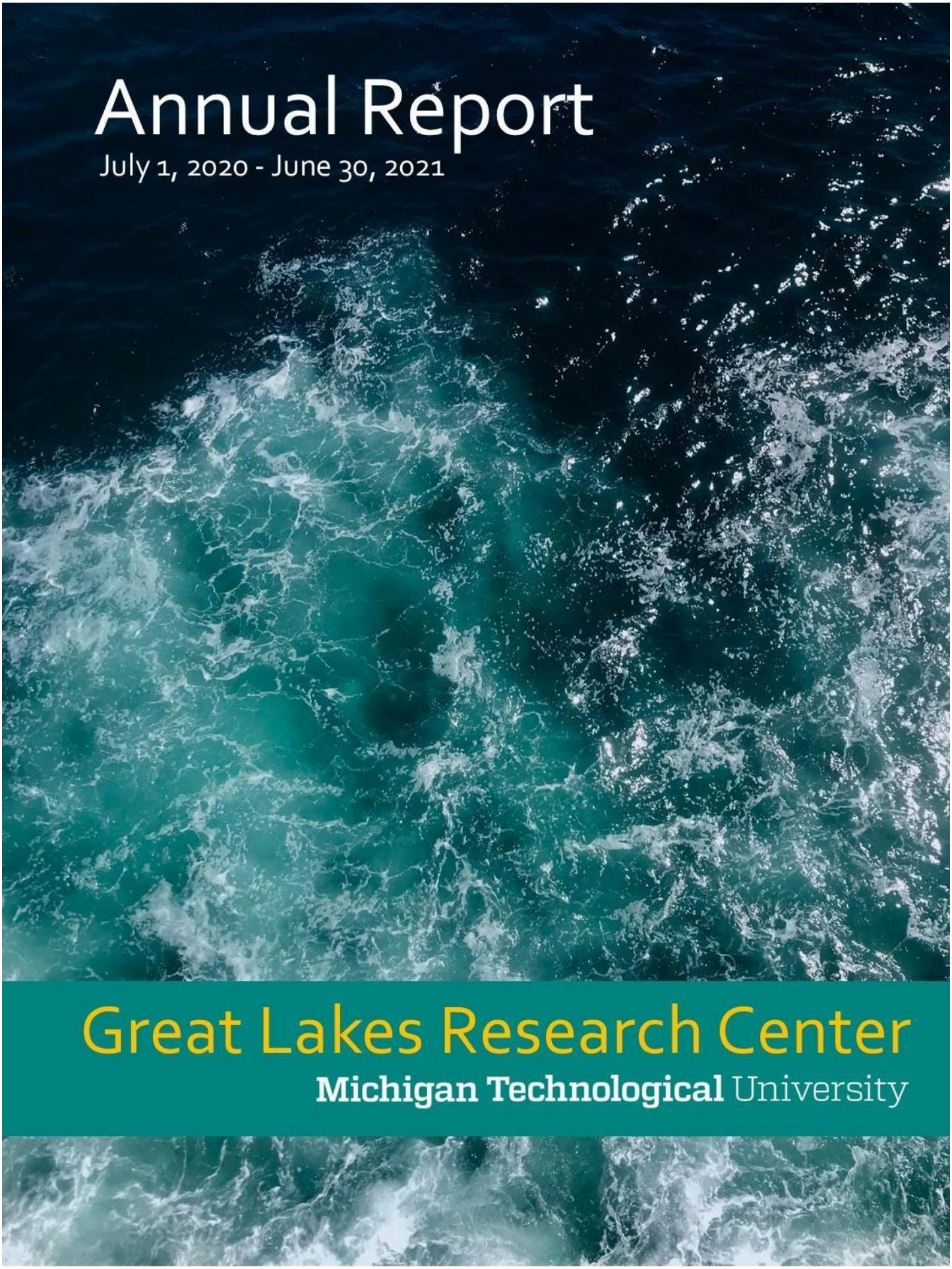


Annual Report

July 1, 2020 - June 30, 2021

Great Lakes Research Center

Michigan Technological University

FY21 Budget Summary

The Great Lakes Research Center (GLRC) Institute's budget summary for July 1, 2020 – June 30, 2021 (FY21) reflects the impacts of the COVID 19 pandemic on revenue and leadership's ability to minimize the effects through expenditure cost containment measures. Delays in the conduct of research resulted in less research expenditures and subsequently lower IRAD returns than projected.

The GLRC's payroll expenses (personnel) were less due to staff ability to direct charge to grants and contracts and higher use of nonproductive pay (holiday, University days off, personnel days, vacation and sick time). Other expenditures which include costs for catering, event sponsorship, travel, and guest speakers, were significantly reduced as most events were cancelled, postponed, or transitioned to on-line delivery.

Revenue	Budgeted	Actual	%
FY20 Budget Carryforward	$ 74,088	$ 74,088	100%
VPR Strategic Initiative Fund	$ 73,710	$ 60,611	82%
FY21 IRAD Returns	$ 611,678	$ 441,086	72%

Expenditures	Budgeted	Actual	%
Personnel	$ 537,385	$ 432,899	81%
Other	$ 222,091	$ 67,583	30%

Despite lower than budgeted FY21 IRAD returns, actual returns of $441,086 were 42.5% higher than the returns realized the previous year. This report shows sustained or increases in all metric reporting categories in FY21 which continue the GLRC's growth trends.

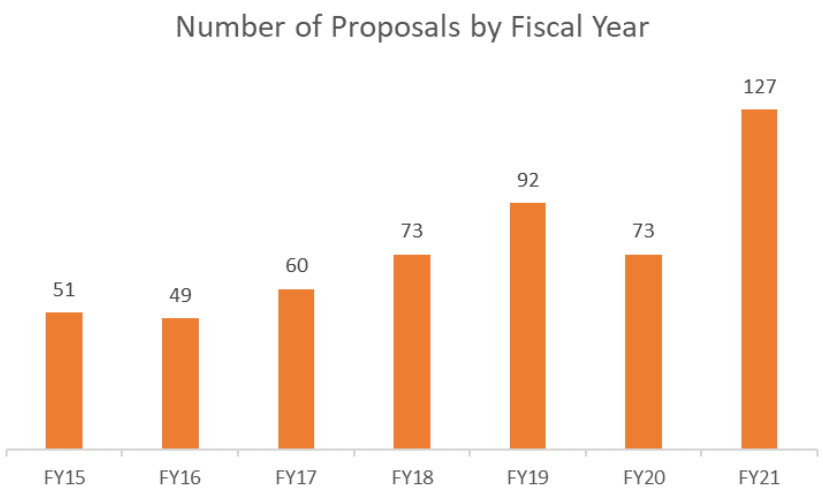
FY21 Research Highlights

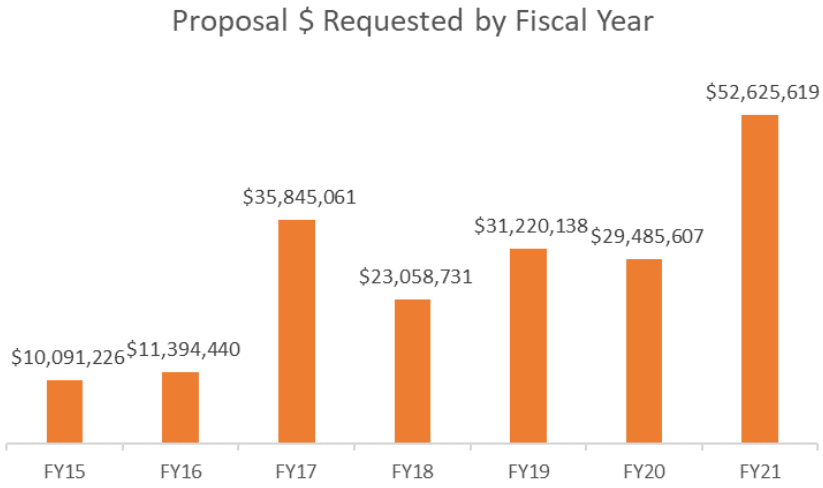
Proposals. GLRC affiliated researchers submitted 127 proposals in FY21, an increase of 35 more than any previous reporting period and with cumulative budget requests exceeding $52.6M. Seven proposals included requests greater than $1M. This number included a large, multidisciplinary, multi-organization proposal to the National Science Foundation at $18M led by Dr. Guy Meadows (GLRC).

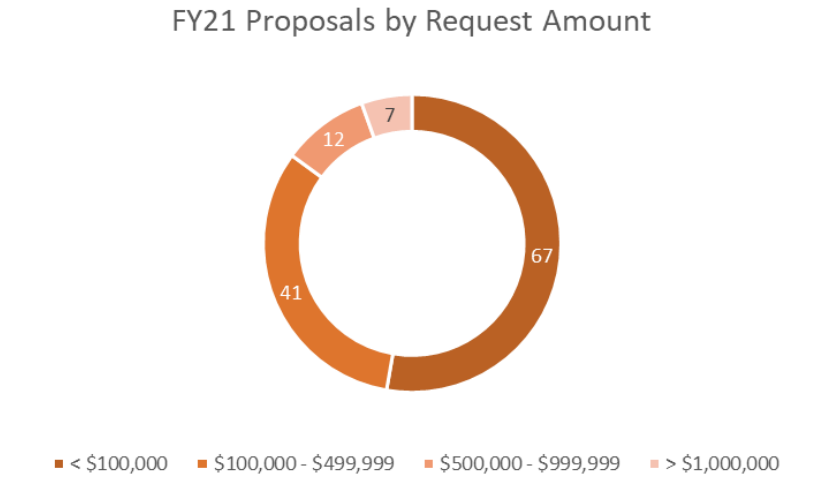
Awards. GLRC affiliated researchers were awarded 69 grants and contracts in FY21, an increase of 6 over any other previous reporting period. The cumulative value of the FY21 awarded grants and contracts exceeded $6.7M. This included one incrementally funded award greater than $1M led by Dr. Stephen Techtmann (BIO). During Q4, 47 faculty and staff from 14 units were engaged in active externally sponsored research affiliated with the GLRC.

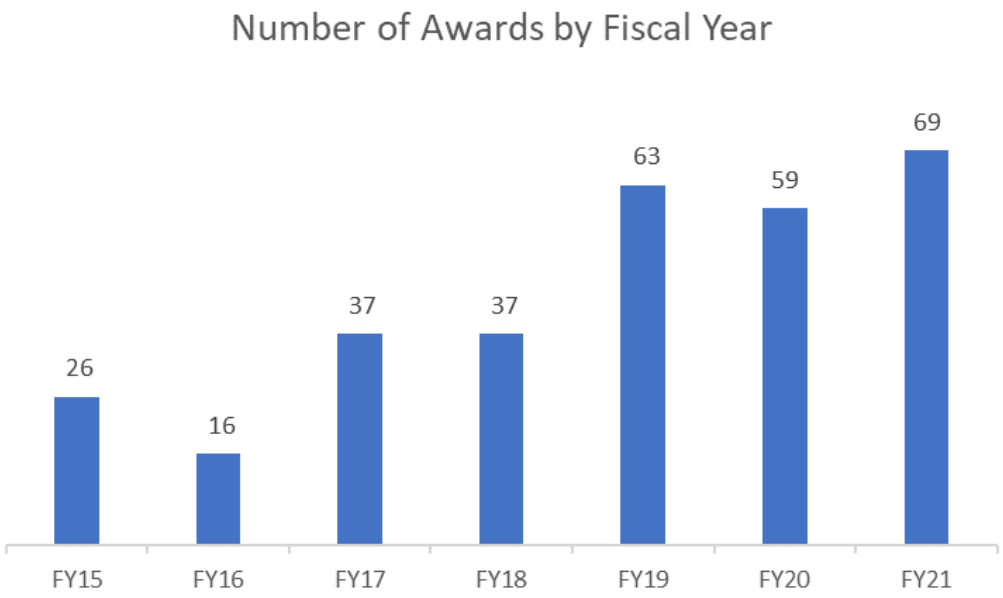
Active Projects and Research Expenditures. At the close of FY21 Q4, there were 103 active research projects affiliated with the GLRC during FY21 resulting in $5.9M in research expenditures and $441,086 in IRAD returns supporting the GLRC's financial sustainability and strategic growth.

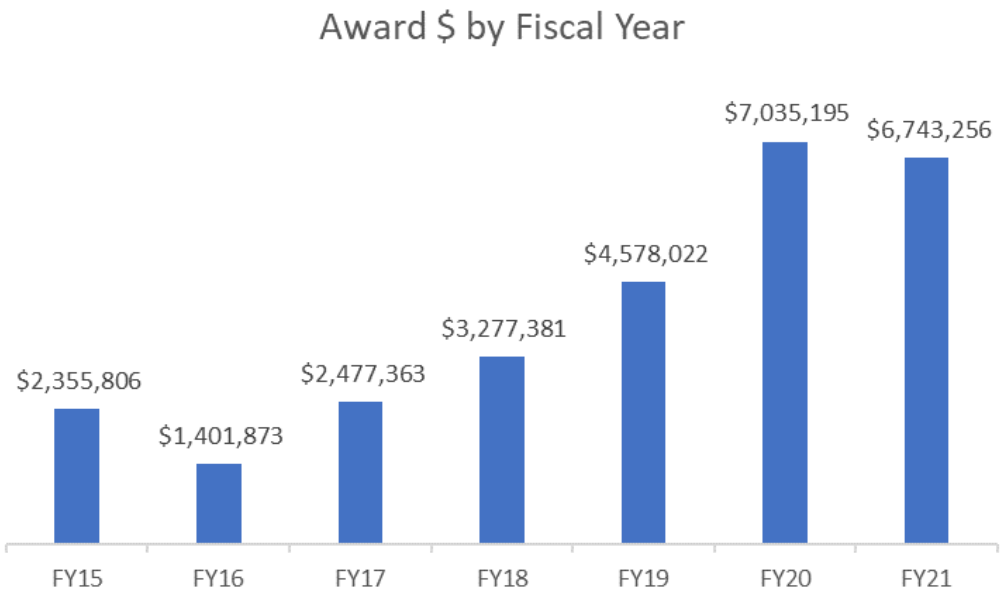
Proposal, award, active project, research expenditures and IRAD return trends for FY15-FY21 (actual) are charted on pages 2-5. A listing of (unofficial) proposals submitted, and awards received, during FY21 is included in this report (pages 12-29).

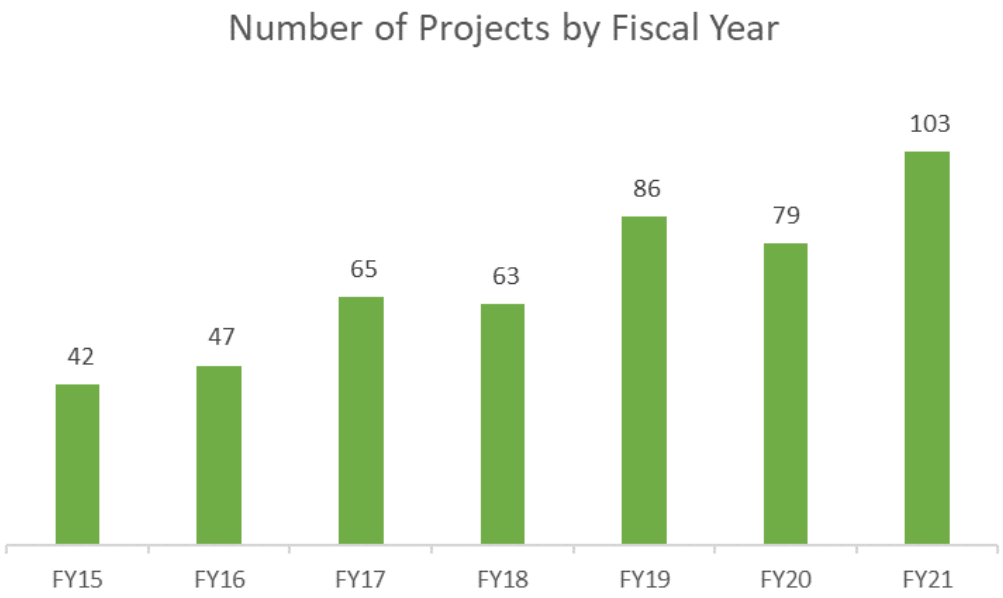

Number of Proposals by Fiscal Year
51
49
60
73
92
73
127
FY15
FY16
FY17
FY18
FY19
FY20
FY21

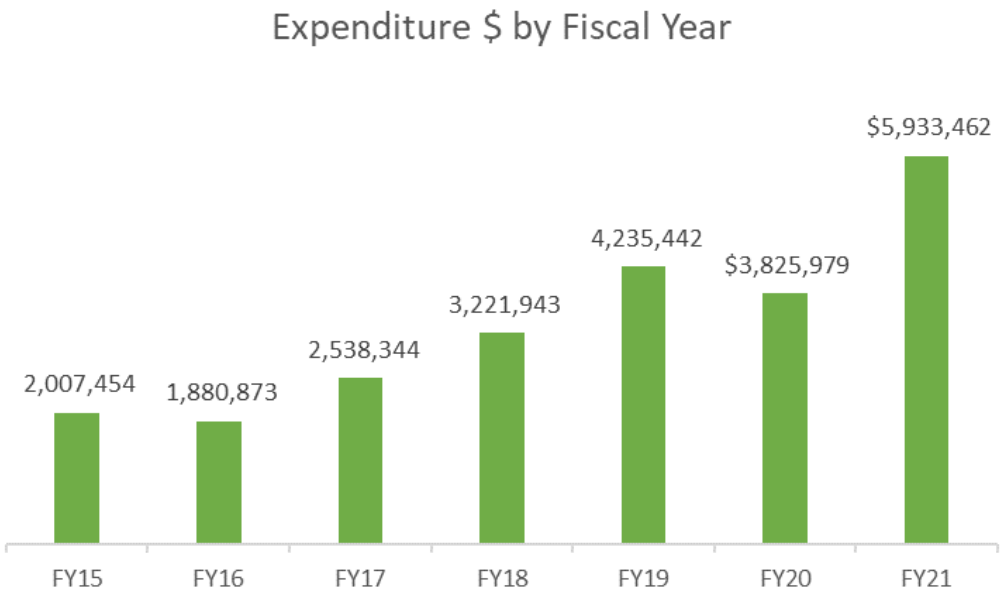

Proposal $ Requested by Fiscal Year
$10,091,226
$11,394,440
$35,845,061
$23,058,731
$31,220,138
$29,485,607
$52,625,619
FY15
FY16
FY17
FY18
FY19
FY20
FY21

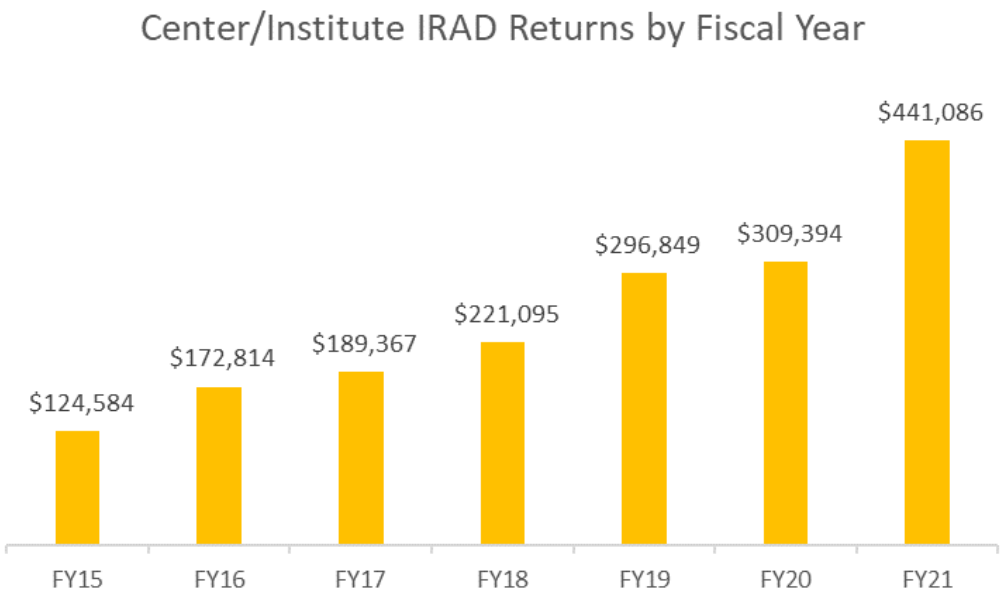

FY21 Proposals by Request Amount
67
41
12
7
< $100,000
$100,000 - $499,999
$500,000 - $999,999
> $1,000,000


Number of Awards by Fiscal Year
26
16
37
37
63
59
69
FY15
FY16
FY17
FY18
FY19
FY20
FY21


Award $ by Fiscal Year
$2,355,806
$1,401,873
$2,477,363
$3,277,381
$4,578,022
$7,035,195
$6,743,256
FY15
FY16
FY17
FY18
FY19
FY20
FY21


Number of Projects by Fiscal Year
42
47
65
63
86
79
103
FY15
FY16
FY17
FY18
FY19
FY20
FY21


Expenditure $ by Fiscal Year
2,007,454
1,880,873
2,538,344
3,221,943
4,235,442
$3,825,979
$5,933,462
FY15
FY16
FY17
FY18
FY19
FY20
FY21



FY21 Staffing Highlights

The GLRC hired seven staff to support a growing research portfolio and offer more services to researchers, including three postdoctoral fellows Drs. James Junker, Daniel Trepal and Longhuan Zhu (mentored by Dr. Jill Olin (BIO), Dr. Don Lafreniere (SS), and Dr. Pengfei Xue (CEGE)); a geoheritage research scientist (Dr. Erika Vye); a research/electrical engineer (Mr. Erik Kocher); captain and marine logistics coordinator (Mr. Jason Swain); and, an administrative coordinator (Ms. Alexandra Holmstrom). The GLRC's payroll roster grew to 49 staff, research employees, and hourly students during the spring semester of FY21.

FY21 Programming Highlights

Student Seed Research Grants

Six students were awarded GLRC Student Research Grants in FY21, for a total of $4,479 in funding. Four student projects contributed to $1,052,019 in funded research awards at Michigan Tech. One student applied for an NSF Graduate Research Fellowship that was not awarded, but received favorable reviews.

- Carleigh Lenard, a BS student in the Civil, Environmental, and Geospatial Engineering department, advised by Dr. John Lenters (GLRC), was awarded $750. Her research contributed to a proposal submitted to the Great Lakes Observing System (GLOS) entitled, "An expanded Spotter buoy network on the Upper Great Lakes in support of recreational boating, shipping, and ferry line operations" and was awarded $70,924 in funding.

- Xing Zhou, a PhD student in the Civil, Environmental, and Geospatial Engineering department, advised by Dr. Pengfei Xue (CEGE), was awarded $750. His research contributed to a proposal submitted to the United States Geological Survey (USGS), entitled "Understanding and forecasting potential recruitment of Lake Michigan fishes by modeling growth and survival of larval stages with coupled climate, biophysical, and bioenergetics models", and was awarded $85,008 in funding. In addition, a year two proposal for this research has been submitted.
- Miraj Bhakta Kayastha, a MS student in the Civil, Environmental, and Geospatial Engineering department, advised by Dr. Pengfei Xue (CEGE), was awarded $750. His research contributed to a proposal submitted to the Argonne National Laboratory (DOE passthrough from Pacific Northwest National Lab), entitled, "Coupled Great Lakes-Atmosphere Model Development", and was awarded $450,005 in funding.
- Benjamin Mohrhardt, a MS student in the Civil, Environmental, and Geospatial Engineering department, advised by Dr. Daisuke Minakata (CEGE), was awarded $750. His research contributed to a proposal submitted to the National Science Foundation (NSF), entitled "MRI: Acquisition of 500 MHz Nuclear Magnetic Resonance Spectrometer for Research and Education Infrastructure Enhancement at Michigan Technological University and Upper Peninsula", and was awarded $446,082 in funding.
- Tyler LaMahieu, a BS student in the Civil, Environmental, and Geospatial Engineering department, advised by Dr. Cory McDonald (CEGE), submitted a proposal entitled, "Heavy Metal Accumulation in Wild Rice and Health Implications for Human Consumption", and was awarded $729 in funding. This research contributed to Tyler's NSF Graduate Research Fellowship submission, which reviewed well, but was not funded.
- Bradley Baas, a MS student in the Mechanical Engineering-Engineering Mechanics department, advised by Dr. Guy Meadows (GLRC), submitted a proposal entitled, "Development of a Machine-Plant Interface for Extracting Invasive Aquatic Plants", and was awarded $750 in funding. Proposal submission forthcoming.

Partnerships and Memberships

- The GLRC continued to support the establishment of a National Marine Sanctuary in the Keweenaw Peninsula. The Keweenaw Lake Superior National Marine Sanctuary (NOAA) nomination document is in progress. This partnership activity is being led by Dr. Erika Vye (GLRC).
- Michigan Tech and the Great Lakes Research Center are the Houghton Hub of the Lake Superior Living Labs Network (LSLLN). LSLLN is a collaborative network fostering interdisciplinary and place-based research, learning and community engagement. The LSLLN partnership is being led by Dr. Erika Vye (GLRC).
- The GLRC was engaged in the management of the Great Lakes Evaporation Network (GLEN) with colleagues at the Environment and Climate Change Canada and CU-Boulder, as well as a collaborative project with Northern Michigan University to support and maintain the GLEN monitoring site at Granite Island (near Marquette). GLEN collaboration is being led by Dr. John Lenters (GLRC).

- The GLRC continued its membership in the Undersea Technology Innovation Consortium (UTIC), which provides opportunities for researchers to propose on limited Navy Other Transactional Authority (OTA) projects through the Naval Undersea Warfare Center at Newport. The UTIC partnership is being led by GLRC Director, Dr. Andrew Barnard (MEEM).
- The GLRC supported Michigan Tech's memberships in the National Marine Association of Laboratories (NAML), the University-National Oceanographic Laboratory System (UNOLS), and the Marine Technological Society (MTS). These memberships provide opportunities to promote Michigan Tech's capabilities, identify collaboration and networking possibilities, obtain information on efforts to increase federal funding for Great Lakes and coastal ocean research, and expand the sphere of influence of the GLRC staff by assuming influential and leadership roles within these organizations. These memberships are stewarded by a number of GLRC staff, including Dr. Guy Meadows.
- Due to continued growth of the GLRC's University Indigenous Community Partnership Program, Dr. Erika Vye was hired to work with Dr. Valoree Gagnon, Director, in continued program growth. This partnership continues to benefit Michigan Tech and Indigenous partners, as well as our local community, through outreach, research activities, and collaborative proposal submissions. For this reporting period, four awards ($108,604) and four subawards ($43,393) have been received from Indigenous Peoples' sponsors; with six proposal submissions totaling $317,731.
- The GLRC established a MOU with Michigan State University in FY19 to house a Michigan Sea Grant Extension (MSGE) educator in the Western Upper Peninsula. Dr. Lauren Jescovitch (MSU) was hired and located in Houghton, MI at the GLRC to help advance the MSU Extension and MSGE missions in the region and to facilitate greater collaboration and partnership across programs and organizations.
- In FY21, GLRC signed an MOU with Northwestern Michigan College (NMC) to work together towards joint research, teaching, and outreach opportunities. Researchers at Michigan Tech and NMC have submitted several collaborative proposals in FY21 and were awarded their first collaborative proposal from the Great Lakes Observing System (GLOS) led by Dr. John Lenters (GLRC).

Strategic Activities

- The GLRC is committed to Diversity, Equity, Inclusion, and a Sense of Belonging for everyone as part of the Michigan Tech CommUNITY. The GLRC supported Indigenous Peoples' Day, the Michigan Tech/IPEC Justice in Transition seminar, partnered with KBIC for World Water Day events and sponsored research, and initiated a Web Accessibility Assessment with help from students in the Scientific & Technical Communications program.
- The GLRC administrative team began streamlining the proposal development process, creating a repository for facilities and equipment descriptions, a style guide for proposal development, and revised proposal development dashboard and timeline templates. These tools will allow the GLRC admin team to more efficiently support proposal development.

- An initiative to update the GLRC Strategic Plan is underway. The initial step was to provide a State of the GLRC Update for Deans, Department Chairs, and University Leadership. Afterwards, a kickoff meeting was held with GLRC affiliated faculty and staff to review the original strategic plan, share the current state of the GLRC, and to solicit volunteers to assist with the initiative. Thirty-three volunteers provided input via focus group discussion and planning exercises. The focus group data has been consolidated and is being reviewed by GLRC leadership in preparation for a report-out on next steps in FY22.
- Marine autonomy development and adoption is a strategic initiative of the GLRC. The Marine Autonomy Research Site (MARS) is a 30-mile radius test area for autonomous surface and sub-surface vessels. MARS comprises the Keweenaw Peninsula's Portage Canal, Portage Lake Canal, Portage River, Lily Pond, Torch Lake, Portage Lake, and Lake Superior bays along the Keweenaw Peninsula. This diversity of waterways makes it a unique location for developing autonomous vessels and sensor platforms, and was an integral part of four proposal submissions and two new awards in FY21.
- The GLRC received $150,000 from Michigan Tech's Tech Forward Initiative to continue development of an autonomous surface vehicle. Nine additional autonomy focused proposals were developed totaling $2.1M and resulted in seven funded projects totaling $1.5M. These included multi-Institute submissions with the Michigan Tech Research Institute and the Institute for Computing and Cybersystems.
- The GLRC continued to support the Smart Ships Coalition (SSC), a multi-sector network to advance autonomous technology development and adoption in the US. In FY21, SSC membership grew to more than 50 organizations. Outreach efforts expanded globally to include representation with the Finland Maritime Working Group, the Canadian Forum for Maritime Autonomous Surface Ships, and the Michigan Maritime Working Group. These working groups are investigating opportunities for business development, testing and applications, policies and standards, and workforce development relating to smart and autonomous maritime mobility solutions. A proposal to EGLE's Michigan Great Lakes Protection Fund was developed for continued support and administration of the SSC group and workshop development in FY22.
- The GLRC began migrating to laptops with docking stations for staff computing. Laptops have been purchased for most new staff hired in FY21 to enable greater remote and field work. To maintain efficient computing resources for GLRC staff, a technology inventory was completed to identify aging equipment for incremental annual replacement.

Outreach

- The GLRC partnered with KBIC for a virtual World Water Day celebration held March 18-24, 2021. The theme was "Valuing Water". Activities included a panel event, a youth speaker, a three-minute thesis competition, art night and on-line community art show, and a Sustainability Film Series event. The College of Engineering hosted a special Husky

Bites session focused on water. The opening and closing ceremonies featured a Water Prayer and the Woodland Singers.

- The GLRC sponsored a virtual Lunch & Learn, for the GLRC membership and University research community, on February 19, 2021 which featured 12 new GLRC affiliated researchers talking about their background, research interests, and capabilities. Forty people attended the Zoom session.
- More than 600 freshwater researchers and others from the Great Lakes region and beyond met virtually May 17–21, 2021 for the 64th annual Conference on Great Lakes Research. "Bridging: Knowledges • Seven Generations • Land to Lake" was the theme for the conference, convened by the International Association for Great Lakes Research (IAGLR). Site chair was Dr. Noel Urban (CEGE), and program co-chairs were Drs. Judith Perlinger (CEGE) and Gordon Paterson (BIO). Nineteen Michigan Tech faculty and students gave talks at the conference.
- The 2021 Michigan Tech Education and Outreach Webinar Series, co-sponsored by the GLRC, Michigan Sea Grant and Michigan State University Extension, was hosted by Drs. Lauren Jescovitch (MSU) and Erika Vye (GLRC). Topics for the five sessions explored how to improve community relationships through education, outreach, and partnerships. This series was formed based upon feedback gathered from 17 participants in the GLRC Listening Session held on September 2, 2020.

Facility

- The GLRC began migrating to keyless room entry via card readers, accelerated by the Pandemic/COVID Laboratory operations. Seven new card readers were installed during FY21 which improved access timeframes and eliminated the keyholder management process for those spaces.
- A new autoclave and ice machine were installed for use by GLRC researchers.
- Facility improvements - 35 tickets were submitted for custodial and facility maintenance. The requests range from repairing wall damage to water leaks and cleaning requests. The floors were waxed and new rugs were installed on the first floor and in the elevator. A secure shredding event to reduce paper clutter is ongoing. Lab spill kits were decentralized for more specific laboratory needs and quicker response by laboratory occupants in the event of a spill. All these efforts were made to keep the GLRC facility in safe and excellent condition.

FY21 Performance by Division

The following table summarizes the GLRC Institute's overall performance in FY 21. The table reports the percentage of the total value of proposals, award, space, and IRAD generated by unit, for the reporting period. Individual unit detail is available to unit leadership upon request.

COLLEGE OF SCIENCES & ARTS					
Department/Organization	% SPACE	% IRAD	% PROPOSALS	% PROPOSALSb	% AWARDS
Biological Sciences	31.5%	11.7%	6.8%	10.6%	21.2%
Chemistry	3.8%	0.1%	0.1%	0.2%	1.1%
Social Sciences	2.7%	3.2%	2.7%	4.2%	6.1%
Cognitive & Learning Sciences	-	0.4%	0.0%	0.0%	0.0%

COLLEGE OF COMPUTING					
Department/Organization	% SPACE	% IRAD	% PROPOSALS	% PROPOSALSb	% AWARDS
College of Computing	-	0.4%	-	-	-
Computer Science	-	1.0%	1.1%	1.7%	7.0%
Applied Computing	-	0.4%	-	-	-

COLLEGE OF FOREST RESOURCES & ENVIRONMENTAL SCIENCE					
Department/Organization	% SPACE	% IRAD	% PROPOSALS	% PROPOSALSb	% AWARDS
College of Forest Resources & Environ. Sci.	-	0.4%	0.1%	0.1%	0.0%

COLLEGE OF ENGINEERING					
Department/Organization	% SPACE	% IRAD	% PROPOSALS	% PROPOSALSb	% AWARDS
Civil, Environmental, & Geospatial Eng.	22.2%	20.4%	15.0%	23.3%	6.5%
Mechanical Engineering	6.2%	9.1%	2.9%	4.6%	2.5%
Chemical Engineering	-	11.3%	1.2%	1.9%	1.3%
Electrical & Computer Eng.	4.2%	3.9%	0.6%	1.0%	-
Materials Science & Engineering	-	4.6%	-	-	-
Biomedical Engineering	-	-	0.7%	1.1%	5.8%
Geological & Mining Engineering & Sciences	-	-	3.5%	5.4%	0.0%

VICE PRESIDENT FOR RESEARCH, CENTERS & INSTITUTES					
Department/Organization	% SPACE	% IRAD	% PROPOSALS	% PROPOSALSb	% AWARDS
Great Lakes Research Center	21.3%	32.4%	50.6%	23.4%	24.9%
Michigan Tech Research Institute	-	-	8.5%	13.1%	23.4%
Vacant Space	8.1%	-	-	-	-

OTHER UNITS					
Department/Organization	% SPACE	% IRAD	% PROPOSALS	% PROPOSALSb	% AWARDS
Provost's Office	-	0.8%	6.1%	9.4%	0.0%

Note: The difference between %Proposals and %Proposals b is a recalculation of the percentage of total being reported after removing the multi-million-dollar proposal ($18M; GLRC led) from the total to show a more representative level of effort/contribution across the Institute's research affiliates.

FY22 Initiatives

The following highlights some key initiatives planned for FY22 to facilitate the GLRC's leadership among research Centers and Institutes, as a non-academic department, and in a collaborative approach to stewarding the facility.

1) Leadership Transition. Dr. Timothy Havens (College of Computing) will replace Dr. Andrew Barnard (MEEM) in January 2022 as the GLRC's next director.
2) Staffing. To continue to support a foundation for strategic growth, budget has been allocated for two new positions. A postdoctoral researcher will be hired to work under the mentorship of Dr. Amanda Gonczi (GLRC) in the areas of curriculum development and STEM education program evaluation, and a PhD level research scientist/engineer will be hired to expand capabilities in a strategic area of research growth/need and to support additional research capacity at the University.
3) Facility. Budget has been reserved to upgrade the GLRC's wireless internet throughout the facility. Once the initial investment is made, the University's IT division will provide annual maintenance and upgrades going forward at no additional cost to the Institute.
4) Outreach. Working with the University's Marketing and Communication division, a marketing and communication strategy plan will be developed and implemented. This includes creating a presence in social media to promote research, programs, scholarship, people, and science.
5) Strategic Planning. GLRC leadership will synthesize and report out on the outcomes of the GLRC's FY21 Strategic Planning activities including findings and changes to the organization's strategic direction to better support the research community, external partners, and the University.
6) Process Improvement. In FY22, GLRC will continue to document, review, and update processes towards incremental improvements in efficiency in operations. Continued improvements will allow the GLRC to provide better research support services to researchers and external partners and manage strategic growth.

FY21 Proposals Submitted by Division and Department

College of Sciences and Arts

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
BIOLOGICAL SCIENCES - $3,601,569				
2007021P1	**Stephen M. Techtmann**	$725,941	National Science Foundation	CAREER:Carbon monoxide as a metabolic currency fueling syntrophic microbial growth in a anaerobic systems.
1912035P2	**Gordon Paterson** w/Brzeski	$56,968	Great Lakes Fishery Commission	An epigenetic assessment of stamp sand toxicity to salmonid eggs at Buffalo Reef Lake Superior
2011065P1	**Trista J. Vick-Majors**	$5,000	UNIVERSITY OF MICHIGAN-MICHIGAN SPACE GRANT CONSORTIUM	Shining a Light on Habitability: Biological and Organic Entrapment in Freshwater Ice
2101010PP	**Jill A. Olin**	$36,546	University of North Carolina	Linking saltmarsh function to flooding: does inundation contribute to the trophic support for blue crab and penaeid shrimp?
2101032P1	**W Charles Kerfoot**	$5,038	Michigan Dept of Natural Resources	Buffalo Reef: Particle Sieving Sizing and Counts (Beach Ponar Inventory)
2102063P1	**Rupali Datta**	$130,060	Stevens Institute of Technology	Green Remediation of Per- and Polyfluoroalkyl Substances (PFAS) in Soil and Water
2103007P1	**Stephen M. Techtmann** w/Meadows and Havens	$249,371	US Dept of Defense	Detection of underwater UXO using a multi-tiered approach integrating visual sonar and microbial biomarkers
2103052P1	**W Charles Kerfoot**	$41,269	Advanced Matrix-AEM Group JV LLC	Keweenaw Stamp Sands Geotechnical and Chemical Investigation
2104022P1	**Trista J. Vick-Majors** w/Kane	$611,024	National Science Foundation	DISPERSAL: Detecting Impacts of Slumping Permafrost through Ecological Research across Arctic Landscapes
2105005P1	**Jill A. Olin**	$76,000	National Academies of Sciences Engineering and Medicine	Tracking predator-prey interactions and food web responses in changing landscapes with implications for management
2105051P1	**Gordon Paterson** w/Junker, Olin, and Vick-Majors	$199,660	UNIVERSITY OF MICHIGAN-MICH SEA GRANT	A novel method for quantifying dreissenid veliger energetic contribution to Lake Huron zooplankton communities
2105035P1	**Rupali Datta**	$765,144	US Dept of Agriculture	PARTNERSHIP: Heterometallic Metal-Organic Nanohybrids for Controlled Pesticide Release: Photo-induced Dynamics and In Vivo Delivery Potential
2106063PP	**Rupali Datta** w/Rao	$699,548	US Dept of Housing and Urban Development	Lowering the Bioavailability in Residental Soils of Variable Physico-Chemical Properties using Sustatinable In-Situ Treatment Methods
CHEMISTRY - $62,695				
2001005P2	**Sarah A. Green**	$62,695	Colorado State University	RCH-UBE: Youth Environmental Alliance in Higher Education (YEAH)

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
SOCIAL SCIENCES - $1,411,678				
1905018P3	**Donald J. Lafreniere** w/Scarlett	$6,264	Université de Saint-Boniface	Three Centuries of Francophone Migration Across the North American Continent 1840-1940
2009062P1	**Donald J. Lafreniere** w/Trepal	$251,505	Michigan State University	Historical Environmental Neighborhood Risk Indicators (HENRI) for Chronic Disease Risk
2010088P1	**Donald J. Lafreniere** w/Lizzadro-McPherson	$2,002	Keweenaw Community Forest Company	KCFC GIS Enhancement
1905018P4	**Donald J. Lafreniere** w/Scarlett	$8,690	Université de Saint-Boniface	Three Centuries of Francophone Migration Across the North American Continent 1840-1940
2101024P1	**Richelle L. Winkler**	$39,736	Ohio State University	Spatio-Temporal Correlates of Renewable Energy Placement: Data for a Sustainable Energy Transition
2101067PP	**Chelsea L. Schelly** w/Sidortsov	$499,816	Alfred P Sloan Foundation	The renewable energy transition in pursuit of intergenerational energy justice and development of capabilities in post-mining and Tribal Nations communities
2102004P1	**Chelsea L. Schelly**	$298,833	National Science Foundation	EAGER: SAI: Socio-Technological Guided Enhancement of Power Infrastructure Resilience
2102057P1	**Roman V. Sidortsov** w/Pascaris	$15,000	CRDF Global	Development of state support mechanisms to promote agrovoltaics
1905018P5	**Donald J. Lafreniere** w/Scarlett	$8,232	Université de Saint-Boniface	Three Centuries of Francophone Migration Across the North American Continent 1840-1940
2105018P1	**Daniel J. Trepal** w/Lafreniere	$49,805	Wayne State University	The Hamtramck Historical Spatial Archaeology Project
2105029P1	**Donald J. Lafreniere** w/Trepal, Hiltunen, Rhodes, and Scarlett	$226,375	National Endowment for the Humanities	Rebooting Public Programming in Michigan's Copper Country with the Spatial Humanities
2105042P1	**Richelle L. Winkler**	$5,420	InvestUP	Pandemic Migration in Michigan's Upper Peninsula

College of Engineering

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
BIOMEDICAL ENGINEERING - $372,342				
2008036P1	**Smitha Malalur Nagaraja Rao** w/Gagnon	$372,342	National Science Foundation	REU Site: TECH SCEnE Technology Science and Community Engagement in Engineering
CHEMICAL ENGINEERING - $639,168				
1812050P3	**Lei Pan**	$162,480	Argonne National Laboratory	Investigation to Separate Lithium-ion Battery Active Cathode Materials via Froth Floatation
2105065P1	**Robert M. Handler**	$476,688	San Diego State University	C1-Intercept: Accelerating C1-Carbon Based Biotechnology to Advance Industrial Protein Innovations
CIVIL,ENVIRONMENTAL, AND GEOSPATIAL ENGINEERING - $7,920,088				
2006030P1	**Pengfei Xue**	$50,781	Argonne National Laboratory	Pengfei Xue Joint Appointment Argonne National Labs
2004010P2	**Pengfei Xue**	$95,228	US Dept of the Interior	Developing downscaled climate models to understand and forecast potential recruitment of Lake Michigan fishes
2008019P1	**Pengfei Xue**	$450,005	Argonne National Laboratory	COMPASS GLM
2008038P1	**Lloyd Tucker Wescoat** w/Gonczi and Chadde	$79,995	US Dept of Commerce	Lake Superior Stewardship Initiative: Expanding Meaningful Watershed Educational Experiences for Rural Schools (LSSI-ER)
2008039P1	**Noel R. Urban** w/Paterson	$404,989	National Science Foundation	REU-Site: Sustainability in the Great Lakes Region
2010077P1	**Cory P. McDonald**	$114,174	Iowa State University (of Science and Technology)	Sustainability of aquaculture intensification through a wastewater treatment and utilization lens
2001032P4	**Joan F. Schumaker Chadde**	$7,068	Copper Country Intermediate School District (CCISD)	MiSTEM Advisory Council-GLSI Consortium Grant
2001032P5	**Joan F. Schumaker Chadde**	$8,109	Copper Country Intermediate School District (CCISD)	Virtual Outdoor Learning Explorations
2011028P1	**Daisuke Minakata**	$398,511	National Science Foundation	Elucidation of the Fate of 1 4 Dioxane in Aqueous-phase Chemical Advanced Oxidation Process
2011077P1	**Pengfei Xue** w/Yang	$428,000	US Dept of Commerce	Using Deep Learning for Nonlinear Ensemble Aggregation to Improve WW3 Forecasts for Ice-bound Coasts
1603040P3	**David W. Watkins**	$31,400	National Science Foundation	INFEWS/T3: Reducing Household Food Energy and Water Consumption: A Quantitative Analysis of Interventions and Impacts of Conservation
2012008PP	**Daisuke Minakata** w/Ong, Brown, Mullins, and Pandey	$ -	US Dept of Energy	An Integrated Simulation of Next Generation Distributed Electrochemical Oxidation and Reduction Systems for Environmental Remediation and Energy Production
2012011P1	**Daisuke Minakata**	$332,524	National Science Foundation	Understanding and Predicting the Degradation Fate of Prioritized Per- and Poly-fluoroalkyl Substances in the Aqueous-phases Electrochemical Reduction Processes
1511023P2	**Joan F. Schumaker Chadde**	$13,200	Wayne State University	FACTs & Careers: A Scalable Place-based Educational Program at a Public Aquarium to Increase STEM Career Choices
2012016P1	**Joan F. Schumaker Chadde**	$7,670	BHK Child Development Board	Great Explorations STEM Clubs

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
CIVIL,ENVIRONMENTAL, AND GEOSPATIAL ENGINEERING - $7,920,088, continued				
2101005PP	**Daisuke Minakata** w/Lee, Watkins, Mullins, and Zhou	$1,998,388	National Science Foundation	EFRI DCheM Preliminary Proposal: Distributed Resource Recovery and Remediation of Per- and Polyfluoroalkyl Substances (DR3PFAS)
2101018P1	**Pengfei Xue**	$131,846	Florida International University	Using a multi-disciplinary method to examine demographical connectivity between the Dry Tortugas National Park and the Southeast United States spiny lobster stocks as well as among the Southeast United States and Caribbean spiny lobster stocks
2101027P1	**Pengfei Xue**	$25,000	University of Michigan	Using Ensemble-based data assimilation to improve hydrodynamic modeling Great Lakes
2102007P1	**Cory P. McDonald**	$3,971	Huron Mountain Wildlife Foundation Inc	Anthropogenic reactive nitrogen deposition to remote lakes in the upper Great Lakes region
2102016P1	**Lloyd Tucker Wescoat**	$14,449	Copper Country Intermediate School District (CCISD)	LSSI support for MiSTEM Advisory Council 2021-2022
2102016P2	**Lloyd Tucker Wescoat**	$14,510	Copper Country Intermediate School District (CCISD)	LSSI support for MiSTEM Network Region 16 - 2021
2102022P1	**Noel R. Urban** w/Perlinger	$100,662	Keweenaw Bay Indian Community	Assessment of risk from cumulative toxicity of chemical contaminants in Lake Superior fish to Keweenaw Bay Indian Community
2001032P6	**Joan F. Schumaker Chadde**	$8,030	Copper Country Intermediate School District (CCISD)	CCISD Task Order MiSTEM Advisory Council GLSI (Joan Chadde) 2021-22
2102061P1	**Judith Perlinger** w/Morrison, Minakata, Liu, and Slack	$1,999,356	National Science Foundation	NRT: Coastal Community Resilience Research and Training Experience (CO-CREATE)
2104034P1	**Noel R. Urban** w/Kerfoot	$81,649	Keweenaw Bay Indian Community	Biophysical Assessment of the Keweenaw Bay (Lake Superior) Coastline: A Long-Term Ecological Collaborative for Trial Resiliency Planning
2104042P1	**Noel R. Urban** w/Perlinger	$34,913	Michigan Dept of Environment Great Lakes and Energy	Data gap on responses of fish PCB content to remedial actions
2102016P3	**Lloyd Tucker Wescoat**	$8,308	Copper Country Intermediate School District (CCISD)	Fundraising Efforts for the Lake Superior Stewardship Initiative
2008019P2	**Pengfei Xue**	$387,445	Argonne National Laboratory	COMPASS GLM
2006030P2	**Pengfei Xue**	$6,080	Argonne National Laboratory	Pengfei Xue Joint Appointment Argonne National Labs - Project Supplement (15.5 months)
2105043P1	**Cory P. McDonald** w/Auer	$198,444	UNIVERSITY OF MICHIGAN-MICH SEA GRANT	Reevaluating phosphorus loading to Saginaw Bay: temporal dynamics and bioavailability
2105047P1	**Xinyu Ye** w/Auer and Xue	$199,975	UNIVERSITY OF MICHIGAN-MICH SEA GRANT	Addressing the Dual Challenge in Lake Huron: Balancing Phosphorus and Primary Production in Nearshore and Offshore Waters
2105050P1	**Emily Shaw** w/Urban	$50,000	University of Michigan	Quantifying Mixture Toxicity in Great Lakes Fishes
2104042P2	**Noel R. Urban** w/Perlinger	$35,522	Michigan Dept of Environment Great Lakes and Energy	Data gap on responses of fish PCB content to remedial actions
2106036P1	**Cory P. McDonald**	$199,886	National Science Foundation	ERI: Biomimetic Arrays of Small Impoundments for Nutrient Sequestration (BASINS)

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
ELECTRICAL AND COMPUTER ENGINEERING - $329,639				
2103053P1	**Lan (Emily) Zhang** w/Barnard	$329,639	National Science Foundation	Collaborative Research: CPS: Medium: Sensing Tracking and Data Transmission under Ice for Autonomous Pipeline Leak Detection
GEOLOGICAL AND MINING ENGINEERING AND SCIENCES - $1,821,711				
2012002P1	**Snehamoy Chatterjee** w/McDonald, Urban, and Xue	$821,779	National Aeronautics & Space Administration	Uncertainty minimization of spatio-temporal variability of partial pressure of CO2 in coastal water: A data assimilation approach integrating in-situ measurement hydrodynamic model and remote sensing data
2006061P2	**Thomas Oommen** w/Meadows, Kueber Watkins, and Havens	$999,932	National Science Foundation	SCC-CIVIC-FA Track B: Helping Rural Counties to Enhance Flooding and Coastal Disaster Resilience and Adaptation
MECHANICAL ENGINEERING-ENGINEERING MECHANICS - $1,549,373				
2008031P1	**Andrew Barnard**	$50,809	Paul S Veneklasen Research Foundation	Development of a methodology for low-frequency sound measurement for field tests
2010110P1	**Gordon G. Parker** w/Barnard, Meadows, and Havens	$448,932	US Dept of Defense	DD-05 A Machine Learning Approach for Autonomous Maneuvering and Targeting Using Vessel-Based Distributed Sensor Platforms
1811070P3	**Andrew Barnard** w/Malladi	$60,000	Caterpillar Inc	Caterpillar Hydraulic Fluid Borne Sound
2012010P1	**Andrew Barnard**	$45,000	Great Lakes Sound and Vibration	Dual Use CNT application
2002002P2	**Andrew Barnard** w/Gonczi, Brown, Havens, and Cai	$250,000	US Dept of Defense	Continuation: Defending the Nation's Digital Frontier: Cybersecurity Training for Tomorrow's Officers
2103044P1	**Ana Dyreson** w/Schelly, Brown, Kelly, and Liu	$149,955	National Science Foundation	FW-HTF-P: Preparing workers in energy supply chains for equitable provision of energy services under climate-driven extremes: case study in the Upper Midwest
2105013P1	**Andrew Barnard** w/Anderson and Lenters	$60,000	University of Michigan	Lake Superior Environmental Monitoring Systems
2105052P1	**Andrew Barnard** w/Paterson, Olin, and Havens	$285,195	Purdue University	NSF Convergence Accelerator Track E: Networked Autonomous Systems for Surface-Denied Observations
2106029P1	**Ana Dyreson**	$199,482	National Science Foundation	ERI: Structural uncertainty characterization for climate-informed electricity planning

College of Computing

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
COMPUTER SCIENCE - $586,608				
2003058P2	**Charles R. Wallace** w/Barnard and Havens	$76,610	ARiA	Redesign and Implementation of USds-Proxy Language
2102054P1	**Charles R. Wallace** w/Barnard, Ureel, and Havens	$509,998	ARiA	Redesign and Implementation of USDS Proxy Language-Phase II

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
GREAT LAKES RESEARCH CENTER - $26,625,609				
2007014P1	**Guy A. Meadows** w/Meadows	$150,000	Michigan Dept of Environment Great Lakes and Energy	Completion of the Operational Installation of High Frequency Radar in the Straits of Mackinac
2007029P1	**Amanda L. Gonczi**	$491,074	Spencer Foundation	Promoting Leadership and Equity to Advance STEM Education (PLEASE)
2007051P1	**Amanda L. Gonczi**	$127,984	Northern Virginia Community College	CYBER TEAM: Engaging Teachers and Students in Cybersecurity Instruction
2008015P1	**John Lenters**	$2,000	Superior Watershed Partnership	Assembly and testing of TIDAS-900 Lake Superior weather buoy
1503062P3	**John Lenters**	$3,656	Great Lakes Observing System (GLOS)	Implementation of a Regionally Distributed Observing Network to Support Critical Stakeholder Needs 2016-2021 GLOS RA Cooperative Agreement - Supplement
2008015P2	**John Lenters**	$2,000	Superior Watershed Partnership	Assembly and testing of TIDAS-900 Lake Superior weather buoy
2009009P1	**Jill A. Olin**	$14,765	State of South Dakota	Using otolith microchemistry to evaluate the contribution of stocked age-0 Walleye to the fishery in Lake Oahe South Dakota
1807018P3	**Guy A. Meadows** w/Meadows	$80,002	Great Lakes Observing System (GLOS)	High Frequency Radar for the Straits of Mackinac Michigan
2009061P1	**Daniel J. Trepal** w/Lafreniere	$148,891	National Endowment for the Humanities	The Rise of an American Industrial City: A Spatial-Archaeological Perspective from Hamtramck MI
2001047P2	**Jamey H. Anderson**	$4,803	University of California	Recovery of an Experimental Buoy - 2020
2007043P1	**Travis M. White**	$30,000	Michigan Economic Development Corporation	Shift Environmental OceanSled Testing Grant
2010028P1	**Amanda L. Gonczi** w/Huntoon	$2,592,784	National Science Foundation	Teacher Learning and Curriculum Implementation in the age of NGSS (TLC NGSS)
2010034P1	**Erika C. Vye** w/Gonczi and Wescoat	$1,092,900	Michigan State University	Large-scale CoPe: Fostering Resilient Coastal Communities in the Great Lakes Region through Citizen Science Community Engagement and Collaborative Interdisciplinary Research
2010038P1	**Guy A. Meadows**	$119,136	University of Michigan	Machine Learning for Automated Detection of Shipwreck Sites from Large Area Robotic Surveys
2010049P1	**Jamey H. Anderson**	$974	Keweenaw Bay Indian Community	ROV Water Intake Survey
2010072P1	**Valoree S. Gagnon** w/Lenters	$646,123	University of Minnesota	Large-scale CoPe: Water Level Dynamics and Socio-Ecological Systems in the Coastal Great Lakes Hub
2010107P1	**Guy A. Meadows** w/Fiss, Brown, and Xue	$18,676,768	National Science Foundation	Large-scale CoPe: A Prediction Intervention Education and Research (PIER) Hub for Reducing Drownings in the Great Lakes Region
2010112P1	**Jamey H. Anderson**	$610	Keweenaw Convention and Visitors Bureau	Vessel Support
2011020P1	**John Lenters**	$44,965	University of Wisconsin	High-impact Observations for Enhancing Great Lakes Snowfall Forecasting
2011103P1	**Amanda L. Gonczi**	$76,658	University of Nebraska	Collaborative Research: Teacher Leadership: Investigating the Persistence and Trajectories of Master Teachers

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
GREAT LAKES RESEARCH CENTER - $26,625,609, continued				
1812079P3	**Guy A. Meadows** w/Lafreniere and Williams	$74,706	Michigan Dept of Environment Great Lakes and Energy	Year Five of the Coastal Geophysical Properties and Resiliency Strategy
1812079P4	**Guy A. Meadows** w/Lafreniere and Williams	$60,017	Michigan Dept of Environment Great Lakes and Energy	Year Five of the Coastal Geophysical Properties and Resiliency Strategy
2101026P1	**Valoree S. Gagnon** w/Vye	$46,362	Keweenaw Bay Indian Community	Climate Resiliency Plan and amendment of the Integrated Resource Management Plan
2102009P1	**Jason Swain** w/Barnard	$6,017	University of Rhode Island	MARS Support for University of Rhode Island Autonomous Vessel Under Ice Testing
2102010P1	**Amanda L. Gonczi** w/Bettin, Ott, and Cai	$294,344	National Science Foundation	Ready to Teach CS: A High School Certification Program to Elevate Computer Science Through Teacher Leadership
2102039P1	**Erika C. Vye**	$2,881	Copper Country Intermediate School District (CCISD)	STEAM Outdoor Field Explorations Collection
2103001P1	**Erika C. Vye**	$1,200	Michigan State University	Creating Inclusive Excellence Grants - MSU
2103006P1	**Erika C. Vye** w/Meadows and Lenters	$147,322	Great Lakes Observing System (GLOS)	An Under-ice Coastal Observator: Vital Year-Round Measurements on the World's Largest Lake
2103010P1	**John Lenters** w/Barnard and Vye	$148,824	Great Lakes Observing System (GLOS)	An expanded Spotter buoy network on the Upper Great Lakes in support of recreational boating shipping and ferry line operations
2103017P1	**Travis M. White** w/Anderson and Hollingsworth	$99,156	Great Lakes Observing System (GLOS)	SEAMAP - Shallow-water Environmental Assessment and Multibeam Autonomous Platform
2103005P1	**Guy A. Meadows** w/Vye, Lenters, Meadows, and Williams	$47,207	Great Lakes Observing System (GLOS)	A Straits of Mackinac Public Outreach Kiosk for High Frequency Radar and Numerical Flow Predictions
2103050P1	**Jamey H. Anderson**	$82,500	University of California	Deployment and Recovery of an Experiment Buoy - 2021
2103010P2	**John Lenters** w/Barnard and Vye	$70,924	Great Lakes Observing System (GLOS)	An expanded Spotter buoy network on the Upper Great Lakes in support of recreational boating shipping and ferry line operations
2104047P1	**Amanda L. Gonczi**	$99,866	Northern Virginia Community College	Super PL: Building a Supervisor Professional Learning Model to Improve Internship Outcomes
2104051P1	**Ryan A. Williams** w/Bos and Oommen	$599,803	US Dept of Defense	Robotic platform soil and terrain characterization for close to real time GO/NOGO maps
2105058P1	**Erika C. Vye** w/Gonczi, Lafreniere, and Gagnon	$296,686	National Science Foundation	EAGER: Geoheritage and Two-Eyed Seeing - Advances in Interdisciplinary Earth Science Research Learning and Inclusion through Shared Ways of Knowing
2106015P1	**Jamey H. Anderson**	$5,609	University of Michigan	Fieldwork Support Services
2106024P1	**Erika C. Vye** w/Trepal and Lenters	$99,864	Great Lakes Observing System (GLOS)	Human Centered Design for Smart Great Lakes and the Coastal Climate Signal
2106035P1	**Erika C. Vye** w/Wescoat	$38,112	Native American Heritage Fund	Fostering Local Literacy through Experiential Place-based Education Resources
2106081P1	**Amanda L. Gonczi**	$98,116	University of Virginia	Supporting STEM Identity Development and Racal Equity for Black Girls and Mothers through Community-Based Critical Literacy STEM Education

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
MICHIGAN TECH RESEARCH INSTITUTE - $4,461,269				
2007019P1	**Laura L. Bourgeau-Chavez** w/Battaglia, Sayers, Xue, and Shuchman	$1,448,328	National Aeronautics & Space Administration	Quantifying Great Lakes aquatic ecosystem vulnerability to climate change by integrating systems models and remote sensing
2101006P1	**Colin N. Brooks** w/Anderson, Kueber Watkins	$349,926	Genex Systems LLC	Real-Time Monitoring and Modeling of Scour - Phase II
2101006P2	**Colin N. Brooks** w/Anderson, Kueber Watkins	$319,950	Genex Systems LLC	Real-Time Monitoring and Modeling of Scour - Phase II
2102041P1	**Colin N. Brooks** w/Anderson, Billmire, and Xue	$579,336	Ontario Power Generation	Implementing the Darlington Advanced Algae Warning System (D-AAWS): Phase 2
2103008P1	**Colin N. Brooks** w/Weinstein, Anderson, Billmire, and Xue	$531,901	Ontario Power Generation	Enabling the Pickering Advanced Algae Warning System to Reach Operational Status: A Phase 2.5 Project
2104053P1	**Colin N. Brooks** w/Bourgeau-Chavez, Sayers, and Xue	$373,209	University of the Virgin Islands	Climate Change and the Effects of Golden Tides on Caribbean Coastal Sustainability - Multiscale Predictions for an Emerging Biocomplex Problem
2102041P2	**Colin N. Brooks** w/Anderson, Billmire, and Xue	$858,619	Ontario Power Generation	Implementing the Darlington Advanced Algae Warning System (D-AAWS): Phase 2

College of Forest Resources and Environmental Science

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
COLLEGE OF FOREST RESOURCES AND ENVIRONMENTAL SCIENCE - $49,972				
2011041P1	**Fengjing Liu** w/Gierke	$49,972	Keweenaw Bay Indian Community	Study on Stream Temperature Controls at Menge Creek Falls River and Silver River Catchments

Provost's Office

Proposal Number	PI Name (w/Co-PI)	Request Amount	Sponsor	Proposal Title
PROVOST OFFICE - $3,193,898				
2101022P1	**Jacqueline E. Huntoon** w/Semones and Tubman	$194,259	Michigan Dept of Education	Mi-STAR Consortium 2020-2022
2104045P1	**Jacqueline E. Huntoon** w/Gonczi, Bluth, Semones, and Tubman	$2,999,639	US Dept of Defense	STEM Education Apprenticeships for Success (SEAS)

FY21 Awards Received by Division and Department

College of Sciences and Arts

Proposal Number	PI Name (w/Co-PI)	Award Period	Awarded Amount	Sponsor	Proposal Title
BIOLOGICAL SCIENCES - $1,306,634					
1911040P1	**Amy M. Marcarelli**	09/20-08/23	$67,325	Baylor University	Aquatic N2- Fixation Research Coordination Network (ANF-RCN)
1909087P2	**Stephen M. Techtmann** w/Shonnard, Pearce, and Ong	09/20-11/21	$1,113,228	US Dept of Defense	BioPROTEIN - Biological Plastic Reuse by Olefin and Ester Transforming Engineered Isolates and Natural Consortia
1812021P2	**Casey J. Huckins**	10/19-09/21	$74,774	Michigan Dept of Natural Resources	Salmon Trout River Restoration and Coaster Brook Trout Confirmation
2101032P1	**W Charles Kerfoot**	02/21-08/21	$5,038	Michigan Dept of Natural Resources	Buffalo Reef: Particle Sieving Sizing and Counts (Beach Ponar Inventory)
2011065P1	**Trista J. Vick-Majors**	05/21-06/22	$5,000	UNIVERSITY OF MICHIGAN-MICHIGAN SPACE GRANT CONSORTIUM	Shining a Light on Habitability: Biological and Organic Entrapment in Freshwater Ice
2103052P1	**W Charles Kerfoot**	04/21-09/21	$41,269	Advanced Matrix-AEM Group JV LLC	Keweenaw Stamp Sands Geotechnical and Chemical Investigation
CHEMISTRY - $65,663					
1907044P19-1	**Lynn Mazzoleni**	09/19-11/19	$2,968	University of New Orleans	Various Sponsor: User Support for Ultrahigh Resolution Orbitrap Elite Mass Spectormetry Analyses of Groundwater Samples
2001005P2	**Sarah A. Green**	08/20-07/25	$62,695	Colorado State University	RCH-UBE: Youth Environmental Alliance in Higher Education (YEAH)
SOCIAL SCIENCES - $378,015					
1902025P1	**Richelle L. Winkler**	04/20-03/21	$8,075	University of Wisconsin	Generating & Archiving County-Level Migration Data for Health Research and Planning
2001026P1	**Donald J. Lafreniere** w/Trepal, Kitalong, Pastel, and Scarlett	09/20-08/23	$324,310	National Endowment for the Humanities	Advancing Deep Mapping Infrastructure for Community-Driven Spatial Humanities: The Keweenaw Time Traveler
1905018P3	**Donald J. Lafreniere** w/Scarlett	04/19-03/26	$6,264	Université de Saint-Boniface	Three Centuries of Francophone Migration Across the North American Continent 1840-1940
2010088P1	**Donald J. Lafreniere** w/Lizzadro-McPherson	10/20-12/21	$2,002	Keweenaw Community Forest Company	KCFC GIS Enhancement
1905018P4	**Donald J. Lafreniere** w/Scarlett	04/19-03/26	$8,690	Université de Saint-Boniface	Three Centuries of Francophone Migration Across the North American Continent 1840-1940
1903041P2	**Sarah F. Scarlett** w/Lafreniere and Hiltunen	01/20-12/21	$5,346	Council on Library and Information Resources	Emergency Relief Fund (Michigan Miners at Home and Work)
1905018P5	**Donald J. Lafreniere** w/Scarlett	04/19-03/26	$8,232	Université de Saint-Boniface	Three Centuries of Francophone Migration Across the North American Continent 1840-1940
1902025P1	**Richelle L. Winkler**	04/20-03/22	$9,676	University of Wisconsin	Generating & Archiving County-Level Migration Data for Health Research and Planning
2105042P1	**Richelle L. Winkler**	05/21-11/21	$5,420	InvestUP	Pandemic Migration in Michigan's Upper Peninsula

College of Engineering

Proposal Number	PI Name (w/Co-PI)	Award Period	Awarded Amount	Sponsor	Proposal Title
BIOMEDICAL ENGINEERING - $358,920					
2008036P1	**Smitha Malalur Nagaraja Rao** w/Gagnon	03/21-02/24	$358,920	National Science Foundation	REU Site: TECH SCEnE Technology Science and Community Engagement in Engineering
CHEMICAL ENGINEERING - $80,669					
1812050P3	**Lei Pan**	10/18-03/21	$25,000	Argonne National Laboratory	Investigation to Separate Lithium-ion Battery Active Cathode Materials via Froth Floatation
1905054P1	**Lei Pan**	10/19-03/23	$55,669	Virginia Polytechnic Institute and State University	Collecting Mine Dust Particles With Liquid-Coated Vibrating Meshes. Phase 2
CIVIL, ENVIRONMENTAL, AND GEOSPATIAL ENGINEERING - $402,279					
2006030P1	**Pengfei Xue**	08/20-08/22	$50,781	Argonne National Laboratory	Pengfei Xue Joint Appointment Argonne National Labs
1606010P2	**Pengfei Xue** w/Kulie	07/17-07/21	$58,494	National Aeronautics & Space Administration	Evaluating and Advancing the Representation of Lake-Atmosphere Interactions and Resulting Heavy Lake-Effect Snowstorms Across the Laurentian Great Lakes Basin Within the NASA-Unified Weather Research and Forecasting Model
2001032P4	**Joan F. Schumaker Chadde**	07/20-08/21	$7,068	Copper Country Intermediate School District (CCISD)	MiSTEM Advisory Council-GLSI Consortium Grant
2001032P5	**Joan F. Schumaker Chadde**	06/20-04/21	$8,109	Copper Country Intermediate School District (CCISD)	Virtual Outdoor Learning Explorations
1511023P2	**Joan F. Schumaker Chadde**	01/17-08/21	$13,200	Wayne State University	FACTs & Careers: A Scalable Place-based Educational Program at a Public Aquarium to Increase STEM Career Choices
2012016P1	**Joan F. Schumaker Chadde**	12/20-06/21	$7,670	BHK Child Development Board	Great Explorations STEM Clubs
1603040P3	**David W. Watkins**	10/16-09/22	$31,400	National Science Foundation	INFEWS/T3: Reducing Household Food Energy and Water Consumption: A Quantitative Analysis of Interventions and Impacts of Conservation
2102016P1	**Lloyd Tucker Wescoat**	01/21-08/22	$14,449	Copper Country Intermediate School District (CCISD)	LSSI support for MiSTEM Advisory Council 2021-2022
2102016P2	**Lloyd Tucker Wescoat**	01/21-09/21	$14,510	Copper Country Intermediate School District (CCISD)	LSSI support for MiSTEM Network Region 16 - 2021
2001032P6	**Joan F. Schumaker Chadde**	01/21-08/21	$8,030	Copper Country Intermediate School District (CCISD)	CCISD Task Order MiSTEM Advisory Council GLSI (Joan Chadde) 2021-22
2004010P2	**Pengfei Xue**	03/21-03/25	$95,228	US Dept of the Interior	Developing downscaled climate models to understand and forecast potential recruitment of Lake Michigan fishes
2101027P1	**Pengfei Xue**	07/21-06/22	$25,000	University of Michigan	Using Ensemble-based data assimilation to improve hydrodynamic modeling Great Lakes
2001056P1	**Noel R. Urban**	05/21-10/22	$49,981	Keweenaw Bay Indian Community	Identificatin of Toxic Substance in a Tribal Area of Concern Affecting Great Lakes Fish
2102007P1	**Cory P. McDonald**	05/21-04/22	$3,971	Huron Mountain Wildlife Foundation Inc	Anthropogenic reactive nitrogen deposition to remote lakes in the upper Great Lakes region
2102016P3	**Lloyd Tucker Wescoat**	01/21-12/22	$8,308	Copper Country Intermediate School District (CCISD)	Fundraising Efforts for the Lake Superior Stewardship Initiative
2006030P2	**Pengfei Xue**	05/21-07/21	$6,080	Argonne National Laboratory	Pengfei Xue Joint Appointment Argonne National Labs - Project Supplement (15.5 months)

Proposal Number	PI Name (w/Co-PI)	Award Period	Awarded Amount	Sponsor	Proposal Title
MECHANICAL ENGINEERING - ENGINEERING MECHANICS - $155,809					
2008031P1	**Andrew Barnard**	08/20-08/21	$50,809	Paul S Veneklasen Research Foundation	Development of a methodology for low-frequency sound measurement for field tests
1811070P3	**Andrew Barnard** w/Malladi	01/21-12/21	$60,000	Caterpillar Inc	Caterpillar Hydraulic Fluid Borne Sound
2012010P1	**Andrew Barnard**	11/20-05/21	$45,000	Great Lakes Sound and Vibration	Dual Use CNT application

College of Computing

Proposal Number	PI Name (w/Co-PI)	Award Period	Awarded Amount	Sponsor	Proposal Title
COMPUTER SCIENCE - $431,608					
2003058P2	**Charles R. Wallace** w/Barnard and Havens	07/20-01/21	$76,610	ARiA	Redesign and Implementation of USds-Proxy Language
2102054P1	**Charles R. Wallace** w/Barnard, Ureel, and Havens	03/21-02/23	$354,998	ARiA	Redesign and Implementation of USDS Proxy Language-Phase II

Proposal Number	PI Name (w/Co-PI)	Award Period	Awarded Amount	Sponsor	Proposal Title
GREAT LAKES RESEARCH CENTER - $1,535,369					
1909049P1	**Valoree S. Gagnon** w/Perlinger, Baird, and Urban	01/21-06/24	$749,801	National Science Foundation	CNH2-S: Convergence Research: Bridging knowledge systems and expertise for understanding the dynamics of a contaminated Tribal landscape system
1503062P3	**John Lenters**	09/20-10/21	$3,656	Great Lakes Observing System (GLOS)	Implementation of a Regionally Distributed Observing Network to Support Critical Stakeholder Needs 2016-2021 GLOS RA Cooperative Agreement - Supplement
2001047P1	**Jamey H. Anderson** w/Pinnow	08/20-09/20	$4,776	University of California	Deployment of an Experiment Buoy - 2020
2008015P1	**John Lenters**	08/20-09/20	$2,000	Superior Watershed Partnership	Assembly and testing of TIDAS-900 Lake Superior weather buoy
2008015P2	**John Lenters**	08/20-11/20	$2,000	Superior Watershed Partnership	Assembly and testing of TIDAS-900 Lake Superior weather buoy
2009009P1	**Jill A. Olin**	10/20-06/21	$14,765	State of South Dakota	Using otolith microchemistry to evaluate the contribution of stocked age-0 Walleye to the fishery in Lake Oahe South Dakota
1807072P1	**Amanda L. Gonczi** w/Handler	09/19-08/21	$83,151	University of Virginia	Strategies: Making Engineering Real (ME Real)
2010049P1	**Jamey H. Anderson**	10/20-11/20	$974	Keweenaw Bay Indian Community	ROV Water Intake Survey
2001047P2	**Jamey H. Anderson**	10/20-11/20	$4,803	University of California	Recovery of an Experimental Buoy - 2020
1503062P2	**John Lenters**	11/20-10/21	$50,000	Great Lakes Observing System (GLOS)	Implementation of a Regionally Distributed Observing Network to Support Critical Stakeholder Needs for 2016-2021
2010112P1	**Jamey H. Anderson**	10/20-10/20	$610	Keweenaw Convention and Visitors Bureau	Vessel Support
1807018P3	**Guy A. Meadows** w/Meadows	10/20-09/21	$80,002	Great Lakes Observing System (GLOS)	High Frequency Radar for the Straits of Mackinac Michigan
2007014P1	**Guy A. Meadows** w/Meadows	09/20-12/21	$150,000	Michigan Dept of Environment Great Lakes and Energy	Completion of the Operational Installation of High Frequency Radar in the Straits of Mackinac
2102039P1	**Erika C. Vye**	01/21-05/21	$2,881	Copper Country Intermediate School District (CCISD)	STEAM Outdoor Field Explorations Collection
2102009P1	**Jason Swain** w/Barnard	02/21-04/21	$6,017	University of Rhode Island	MARS Support for University of Rhode Island Autonomous Vessel Under Ice Testing
1812079P4	**Guy A. Meadows** w/Lafreniere and Williams	01/21-06/21	$60,017	Michigan Dept of Environment Great Lakes and Energy	Year Five of the Coastal Geophysical Properties and Resiliency Strategy
2006010P1	**Valoree S. Gagnon**	01/21-12/21	$11,287	Intertribal Agriculture Council	Build and Broaden Indegenous Agriculture and Food Sovereignty Symposium
1901008P1	**Guy A. Meadows** w/Xue	02/20-01/22	$100,000	UNIVERSITY OF MICHIGAN-MICH SEA GRANT	An Integrated Physical-Social-Community (PSC) Approach for Sustainable Shore Protection Beach Integrity and Bluff/Dune Stabilization Along Lake Michigan
2011103P1	**Amanda L. Gonczi**	12/20-04/22	$76,658	University of Nebraska	Collaborative Research: Teacher Leadership: Investigating the Persistence and Trajectories of Master Teachers
2101026P1	**Valoree S. Gagnon** w/Vye	03/21-10/22	$46,362	Keweenaw Bay Indian Community	Climate Resiliency Plan and amendment of the Integrated Resource Management Plan

Proposal Number	PI Name (w/Co-PI)	Award Period	Awarded Amount	Sponsor	Proposal Title
GREAT LAKES RESEARCH CENTER - $1,535,369, continued					
2103050P1	**Jamey H. Anderson**	04/21-06/21	$5,000	University of California	Deployment and Recovery of an Experiment Buoy - 2021
1903024P1	**Valoree S. Gagnon** w/Clark	02/20-01/22	$75,000	UNIVERSITY OF MICHIGAN-MICH SEA GRANT	Anishinaabe-Gikendaasowin Integrated Research in the Keweenaw Bay Indian Community for Stewardship and Governance Partnerships
2106015P1	**Jamey H. Anderson**	06/21-08/21	$5,609	University of Michigan	Fieldwork Support Services
MICHIGAN TECH RESEARCH INSTITUTE - $1,439,407 (Undisclosed)					
2002073P1	**Colin N. Brooks** w/Anderson, Kueber Watkins, and Dobson	06/20-12/20	$48,887	N/A	N/A
2102041P2	**Colin N. Brooks** w/Anderson, Billmire, and Xue	05/21-12/22	$858,619	N/A	N/A
2103008P1	**Colin N. Brooks** w/Weinstein, Anderson, Billmire, and Xue	04/21-03/22	$531,901	N/A	N/A