

Maine Center for Research in STEM Education (RiSE Center) 2024



Selected Key Impacts from FY24

Basic and Applied STEM Education Research Within & Across Disciplines:

11 refereed papers published or in press;
22 new or continuing grants or contracts funded;
\$38.5 million in new or continuing grant funding

Community Partnerships and Innovative Collaborations at All Educational Levels

Supporting 112 teachers and their 4758 students statewide with year-long, high quality instructional resources through the Materials Warehouse;
Supporting 36 STEM courses, 40 faculty, 154 undergraduate learning assistants, and 5989 undergraduate students through the Faculty Course Modification Incentive Grant – Maine Learning Assistant Program

STEM Teacher Preparation and Ongoing Professional Learning

621 professional learning participants
95 graduate student credit hours

RiSE Mission Statement

To advance the research and practice of teaching and learning in science, technology, engineering, & mathematics – the STEM disciplines



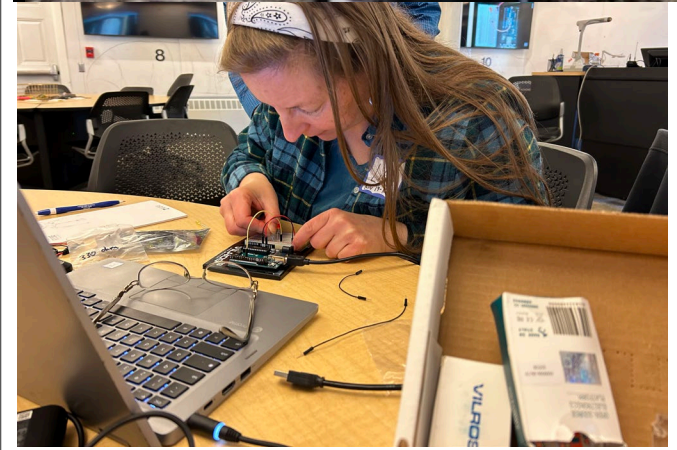
MST students celebrate 2024 graduation & end of spring semester in Estabrooke

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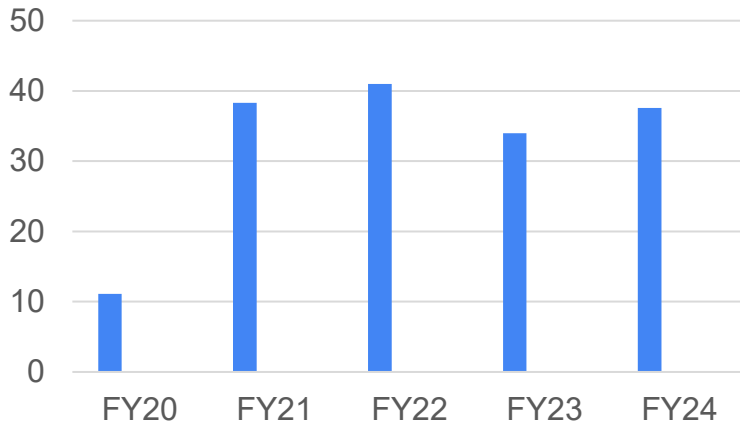
Vision

The RiSE Center seeks to make UMaine a place known for outstanding basic and applied research in teaching and learning in the STEM disciplines. This vision includes studies of effective practices to deepen student understanding and engage all students. RiSE members work to integrate education research into STEM teaching and learning at all levels with RiSE providing support for STEM educators to adopt research-supported, evidence-guided practices. Experiences of undergraduate and graduate students, professional staff, postdocs, faculty, teachers, and other partners are interwoven through research-practice partnerships to foster innovative collaborations and sustain statewide professional communities. This model supports our vision of improving STEM education in Maine and beyond. These improvements and partnerships are part of a vision to contribute to Maine communities' workforce development, sustainability, and vitality in meaningful ways.



Financials

RiSE Grant Involvement (New and Continuing Awards) in Millions of Dollars



FY21-FY24 include \$26.6 million awarded to EPSCoR Maine-eDNA (Award #1849227, involving McKay, Speers, Stetzer, and Holt) and INSPIRES (Award #1920908, involving Lindsay, McKay, Peterson, Siddons, and Van der Eb).

Examples of Efficiencies that Enhance Quality

- *Providing MST students as graduate assistants to other STEM-related programs*
- *Combining similar courses with School of Teaching and Learning*
- *Supplying materials for science teaching methods courses from the Materials Warehouse*
- *Developing teacher leader capacity to co-design and co-lead RiSE professional learning experiences for teachers*

Noteworthy Financial Information

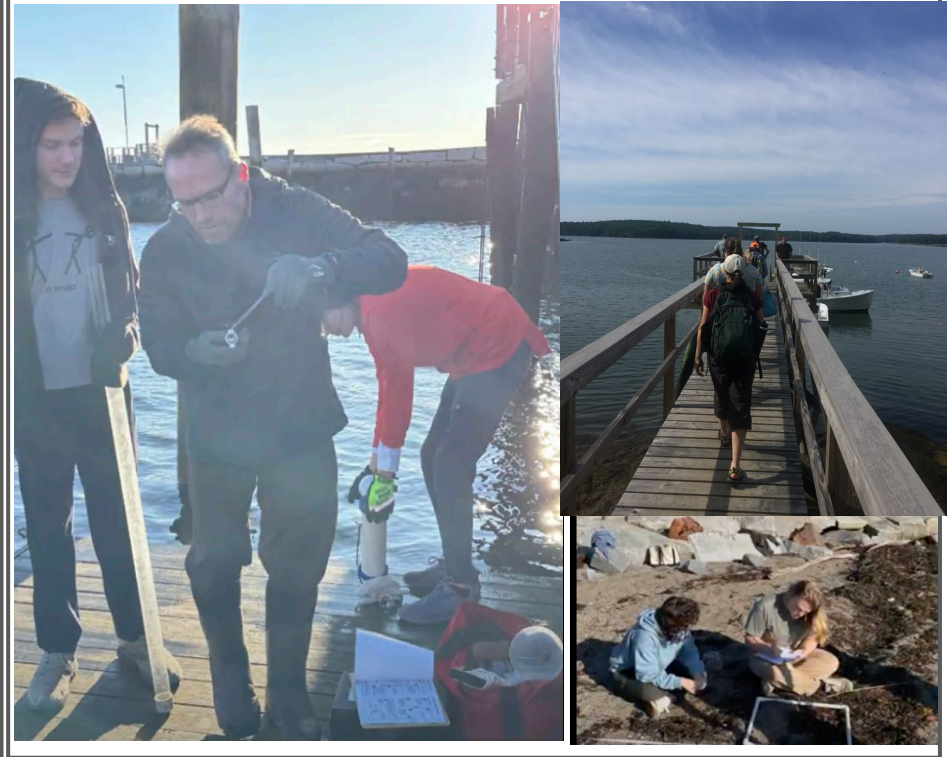
- *RiSE combined E&G and MEIF budgets, corrected for inflation, total ~37% of what they were in FY05.*
- *RiSE has raised over \$1 million from individual donations and private foundations during the last decade coming through the University of Maine Foundation.*

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Impact Stories

1. In 2021, teachers from the Belfast area (RSU 71) approached the RiSE Center about submitting an NSF ITEST grant with them to partner in bringing more technology use and research by students into their new Marine Institute. This meeting led to the creation of Coastal Tracers, “A Model Program to Engage Students in Authentic, Technology-Infused Coastal Research and Monitoring: Building Student Data Literacy and Career Competency through Partnership”, a 4-year, \$1.35 million award. This program has grown to include 20 teachers from coastal Maine communities, all the way from Kittery to Lubec. The link below illustrates recent news coverage.



https://www.foxbangor.com/news/local/a-collaboration-between-umaine-and-belfast-hs-students-test-their-underwater-sea-glider/article_501a4718-2548-11ef-a7f0-0b53faffe192.html

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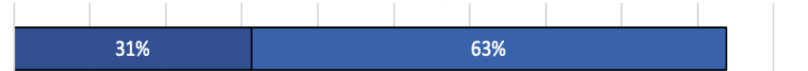


Impact Stories (cont.) FIG-MLA Program

2. The RiSE Center hired and prepared 154 undergrads as Maine Learning Assistants in FY24. They experienced these very strong positive impacts. Creation of such valuable work for students, recruiting some to be teachers, and introducing them to STEM education research are noteworthy program impacts.

Fall, 2023 data

Helped me feel connected to a group of like-minded peers



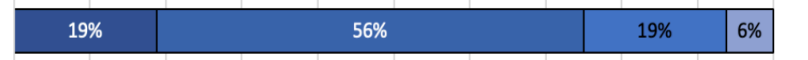
Will be useful to me after I leave UMaine



Made me more confident in pursuing a STEM career



Helped me feel like I belonged to a community



Caused me to reflect on my own teaching and learning



Made me think differently about teaching and learning



Valuable to my professional development



0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Percent Respondents

Strongly Agree Agree Neither Agree nor Disagree Disagree Strongly Disagree

[Impact Stories \(cont.\) The RiSE Materials Warehouse](#)

3. In August 2023, a long-term sub at Houlton High School was switched from teaching 8th grade to 9th grade at the last minute, and he reached out to the RiSE Materials Warehouse for help. RiSE was able to provide him with a semester-long, teacher-vetted set of instructional resources aligned with the learning targets that he needed to teach. The high school has asked to use the materials again next year. He was very appreciative of RiSE being able to help him in a pinch and respond quickly. This response impacted 1 teacher and 70 students in FY24 and will continue to impact 9th graders each year that the high school continues to use the resources. In addition to high quality resources, the Materials Warehouse provides economy of scale, making these materials available conveniently to schools. RiSE faculty, staff, and teacher leaders also offer targeted teacher professional learning to support teachers new to these resources. The Materials Warehouse saves teachers from spending time and money shopping for materials for hands-on science lessons.



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Awards and Recognition of RiSE Faculty and Students



Ally Ryan was named the 2024 Outstanding Graduate from the MST Program. She became excited about teaching as an undergraduate when she worked as a Maine Learning Assistant, and has earned secondary life sciences certification through the MST Program. She has accepted a teaching position at Boothbay Region High School, where she will be teaching biology, anatomy and physiology, and marine sciences. She has been selected as a RiSE Teaching Fellow, and she is also going to be part of Coastal Tracers, using project-based learning supported by that program in her marine science course.



MacKenzie Stetzer, Associate Professor of Physics and RiSE Associate Faculty Member, was awarded the 2024 College of Liberal Arts and Sciences Teaching and Advising Award. Stetzer joined the faculty at UMaine as part of the Maine Physical Sciences Curriculum Partnership, where he began his work on the Faculty Course Modification Incentive Grant – Maine Learning Assistant Program, which he continues to co-lead. In this role, he shares his knowledge of research-based teaching. He serves on the RiSE Executive Committee and advises MST and Physics doctoral students.

Franziska Peterson, Assistant Professor of Mathematics Education, was awarded the Maine STEM Partnership (MSP) Annual Award for Excellence in recognition of her leadership and outstanding contributions to the MSP research-practice partnership. This award recognizes two members of the MSP community each year who exhibit and promote commitment to the values, vision, and goals of the MSP community, which include promoting equity, empowerment, and excellence in STEM education informed by



research-guided best practices. She is shown here with her MST thesis advisee, Madeline Dougherty, a 2024 graduate who used the MST Program to transition from a military career training helicopter pilots to one as a physics teacher.

Goals for Next Year

1. Increase grant proposal submissions to \$5.5 million (from \$1.9 million in FY24)
2. Recruit at least 8 new MST and STEM Education Ph.D. students to start between January 2025 – September 2025. (FY24 total was 4)
3. Review and update key performance indicators
4. Work with administration to develop long-term faculty hiring plan that supports RiSE research

Supporting R1

- RiSE faculty were part of \$38.5 million in new and continuing grants during FY24.
- RiSE faculty teach courses and serve as dissertation committee chairs for all students in the STEM Education Ph.D. Program (3 students in FY24) and in discipline-based Ph.D. programs in their academic home units (4 Physics Ph.D.).
- Investment in RiSE research and its application to improve STEM teaching and learning (PreK-12 & undergraduate) provide the educational foundation for more Maine students to pursue doctoral studies.

Top 3 Achievements this Year

1. Contributing high quality work to \$38.5 million in new and continuing grants.
2. Supporting 36 courses in the FIG-MLA Program in spite of an ~10% budget cut. (In FY23, 28 courses were supported.) This program generates revenue through improved student retention.
3. Providing professional learning to 621 educators statewide. (In FY23, 259 participants were supported.)

Supplemental Documents:

Listing of all Center/Institute Faculty (Joint, Associate & External Assoc)

Name	Academic Dept	Type (Joint, Assoc, Ext)
Amar, Francois	CHY	Associate Faculty (Emeritus as of 12/31/2023)
Batuski, David	PHY	Associate Faculty
Bruce, Mitchell	CHY	Associate Faculty
Dimmel, Justin	EHD	Associate Faculty
Emanetoglu, Nuri	ECE	Associate Faculty
Fairman, Janet	EHD	Associate Faculty
Falconer, Heather	ENG	Associate Faculty

Supplemental Documents (cont.)

Listing of all Center/Institute Faculty (Joint, Associate & External Assoc)

Name	Academic Dept	Type (Joint, Assoc, Ext)
Farooq, Saima	PHY	Associate Faculty
Ferrini-Mundy, Joan	MAT	Associate Faculty
Franzosa, Robert D	MAT	Associate Faculty, Emeritus
Gerbi, Christopher	ERS	Associate Faculty
Hufnagel, Elizabeth	EHD	Associate Faculty
Lindsay, Sara	SMS	Associate Faculty
McKay, Susan	PHY	Director, Associate Faculty
Pandiscio, Eric	EHD	Associate Faculty

Supplemental Documents (cont.).

Listing of all Center/Institute Faculty (Joint, Associate & External Assoc)

Name	Academic Dept	Type (Joint, Assoc, Ext)
Peterson, Franziska	MAT	Joint appointed
Schauffler, Molly	ERS	Associate Faculty
Speer, Natasha	MAT	Joint appointed
Stetzer, MacKenzie	PHY	Associate Faculty
Thompson, John	PHY	Associate Faculty

Listing of New and Continuing External Funding Generated
Awards/Contracts for Report FY24

Name	Admin Dept	% Effort	Sponsor \$	Indirect \$	Award ID
Batuski, David	PHY	10%	\$6,000		Maine Space Grant
Dimmel, Justin	COEHD	30%	\$779,254		1822800
Dimmel, Justin	COEHD	100%	\$345,574		2145517
Dimmel, Justin	COEHD	100%	\$49,217		201900215
Emanetoglu, Nuri	ECE	100%	\$430,897		1851998

Listing of New and Continuing External Funding Generated
Awards/Contracts for Report FY24 (cont.)

Name	Admin Dept	% Effort	Sponsor \$	Indirect \$	Award ID
Emanetoglu, Nuri	ECE	15%	\$392,430	\$117,378	DE- SC002119 81
Emanetoglu, Nuri	ECE	10%	\$1,072,93 0		DE- SC002119 81
Emanetoglu, Nuri	ECE	50%	\$484,923	\$38,678	2024169
Fairman, Janet	MEPRI	100%	\$125,000	\$17,241	2022704
Fairman, Janet	MEPRI	30%	\$86,400		1T32GM13 2006-01

Listing of New and Continuing External Funding Generated
Awards/Contracts for Report FY24 (cont.)

Name	Admin Dept	% Effort	Sponsor \$	Indirect \$	Award ID
Lindsay, Sara McKay, Susan Peterson, Franziska Siddons, Christina Van der Eb, Marina	CRSF	6%	\$6,600.00 0		1920908
Lindsay, Sara	SMS	4%	\$600,322		
Lindsay, Sara	SMS	5%	\$2,496,11 3	\$173,203	2023463

Listing of New and Continuing External Funding Generated
Awards/Contracts for Report FY24 (cont.)

Name	Admin Dept	% Effort	Sponsor \$	Indirect \$	Award ID
McKay, Susan (PI)	RiSE	100%	\$84,680	\$26,680	GMRI subaward from NOAA
McKay, Susan (PI, 55%) Lindsay, Sara (Co-PI, 15%) Peterson, Franziska (Co- PI, 15%) Van der Eb, Marina (Co-PI, 15%)	RiSE	100%	\$1,350,00 0	\$387,582	2148520

Listing of New and Continuing External Funding Generated
Awards/Contracts for Report FY24 (cont.)

Name	Admin Dept	% Effort	Sponsor \$	Indirect \$	Award ID
McKay, Susan (3%) Speer, Natasha (2%) Stetzer, MacKenzie (2%)	EPSCoR	7%	\$20,000,0 00		1849227

Listing of New and Continuing External Funding Generated
Awards/Contracts for Report FY24 (cont.)

Name	Admin Dept	% Effort	Sponsor \$	Indirect \$	Award ID
McKay, Susan (55%) Bruce, Mitchell (15%) Lindsay, Sara (15%) Onsrud, Harlan (15%)	RiSE	100%	\$1,250,000		1842359
Stetzer, MacKenzie	PHY	100%	\$362,761		2125998

Listing of New and Continuing External Funding Generated
Awards/Contracts for Report FY24 (cont.)

Name	Admin Dept	% Effort	Sponsor \$	Indirect \$	Award ID
Stetzer, MacKenzie (60%) Bruce, Mitchell (40%)	PHY	100%	\$470,673		2142416
Stetzer, MacKenzie	PHY	100%	\$863,239	\$254,650	1821300
Stetzer, MacKenzie	PHY	100%	\$144,771		2043996
Thompson, John	PHY	100%	\$544,290		1912087