

RREV Academic Innovation Sustainability Template

This template provides an outline of the components required of a RREV Innovative Pilot Sustainability Plan. The information in this template will serve as the basis for requests for schools/districts to proceed with an individually designed RREV Pilot Sustainability Plan.

Section 1: Define the Primary Sustainability Need

Sustainability for your pilot innovation can be described in three different levels of impact which we will define below.

Maintain – Least amount of contextual change. You are basically working with the same group of students and teachers to solidify the potential impact of your pilot and gather enough data to consider the pilot’s potential in new contexts.

Spread – Innovation or reform implemented in greater numbers of **similar grade level classrooms** and includes the activities, structures, materials, and underlying beliefs, norms, and pedagogical principles associated with the change strategy. –Coburn, 2003

Scale - Innovation or reform is implemented in greater numbers of **diverse grade level classrooms and schools** and includes the activities, structures, materials, and underlying beliefs, norms, and pedagogical principles associated with the change strategy.

- A. In the table below, select the level of impact and describe the pilot-identified student needs / problems that your plan will continue to address for both the 2023/2024 school year and for the next 3-5 years.

2023 / 2024 School Year

Identify: **MAINTAIN / SPREAD** / SCALE

Define sustainability need(s):

We have identified two major areas of needed spread:

BEYOND THE CLASSROOM: Internships for all students and access to the ocean.

The goal of the Marine Institute is to increase student awareness of Marine-Related Careers. SPREADING The student experience beyond the classroom: Internships and Career experiences for every student in Marine Studies. In the 2022-23 school year, we were able to collect baseline data regarding student awareness of marine-related careers, and expose them to aquaculture and general marine related career opportunities. We recognize the power of a student career “hands-on” experience, such as an internship with local businesses or an individual.

We find that even with being a coastal community, very few of our students have ever ventured near or onto the waters of Penobscot Bay or beyond. The vast majority of our student population know little of or have practical experience with very few things marine-related, including potential careers. Program Element Description- In order for students to truly explore the marine world, we need to get them out onto (or into, or working with) the water! They need access to physically be on it, in it, and working with it, literally getting their feet wet. This needs to be done in an organized, efficient and safe manner. We see variations of floating classrooms (including a moored observation platform, a work boat, a variety of solo sensor platforms and multiple individual watercraft). These floating classrooms would provide student access to Penobscot Bay for hands-on, place based, experiential learning.

3-5 year plan

Identify: MAINTAIN / SPREAD / SCALE

Define sustainability need(s):

The goal of the 3-5 years is celebrating our successes and maintaining the positions that are supporting the ongoing work: Extended Learning Coordinator and a CTE Satellite Program.

The need to give students access to a curriculum that connects them to their ocean community, marine related careers, and access to marine studies in an interdisciplinary approach is an ongoing student need that will continue to inform the Marine Institute's goals, programs, and growth. Because of our demonstrated success in increasing numbers of engaged students in the exposure and engagement with marine studies, we envision maintaining our current progress of continuing to address the need for workforce awareness and future career possibilities, while at the same time spreading the concept of a floating classroom for learning and possible career connections, as well as opening the Marine Institute programming up to other local high schools.

- B. Identify which additional students would be impacted, targeted, or supported as a result of your sustainability plan.

Review and describe the evidence (quantitative and qualitative data and research) that demonstrates the impact your pilot had on the original student populations and describe how this data informs your choice to Maintain / Spread / Scale.

Use data that will provide evidence your innovation supports the target student population. This may include the performance of various groups of students (e.g., students in rural locales, students from low socio-economic conditions, students with disabilities, students who are EIs, students at risk for dropping out, student who are homeless) with regard to academic achievement, graduation rates, social emotional and mental wellness, economic data, and/or workforce participation.

With the implementation of the CTE, students from other Waldo County High Schools will also have access to both educational curriculum and hands-on learning on the bay that they would otherwise not have access to.

With the addition of water access, other disciplines within Belfast Area High School could partner with the Marine Institute; outdoor leadership classes could include sea kayaking, ocean navigation and cold water safety, English courses such as "Sea Stories" could experience place-based learning with journaling on the floating platform, art students can participate in pencil sketching and journaling sea-scapes in person rather than from a screen. Continued offerings of certifications, a key concept in the Marine Institute pilot, will provide an advantage in hiring and admissions to post-secondary institutions. Any students interested in obtaining or exploring kayaking skills, water navigation, hydrographical studies, water safety, marine biology and/or marine engine/watercraft maintenance and repair would continue to be welcomed into the Marine Institute, and possibly invited to pursue a Marine Institute Endorsement. This would appeal to a wide-range of students with mechanical engineering interests, scientific enquiry, facilities and equipment management, and general people skills development.

Our pilot saw an increase in students with First Aid CPR in our school community. We also saw a number of students obtain Scuba certification and other credentials such as Fishing Vessel Drill Conductor. Marine Studies students have also gone on to further educational or career opportunities in the marine world including higher education, working on the water, going into business on their own and other entrepreneurial efforts.

The potential number of students who could access the Marine Institute expands from 510 (BAHS) to include 123 students from Searsport High School and 338 from Mt. View High School. The number of students that we could potentially access therefore doubles.

Section 2: Data Informed Sustainability

A. Provide the Logic Model your school used to implement your Pilot

<p>RREV financial resources and coaching</p> <p>NSF Grant partnership with UMaine</p> <p>Belfast teachers and staff</p> <p>Field gear, aquaponics, technology related equipment and software.</p> <p>Kelp Farm</p> <p>3D printers, drones and environmental sensors</p>	<p>Hire an ELO coordinator</p> <p>Examine and adjust the schedule to allow for appropriate staff in the program.</p> <p>Site-visits to organization with similar programs.</p> <p>Facilities expansion including a kelp nursery and research wet lab.</p> <p>Summer PD with consultants to develop place-based science and career courses.</p> <p>Secure community partners</p> <p>Purchase gear and equipment for outside of the classroom experiences on the water.</p> <p>Create a framework for an internship program.</p> <p>Curriculum development to explore additions such as Maritime Art, technical drawing, sea kayaking.</p>	<p>Use of the local community as an extension of the classroom.</p> <p>More authentic field-based learning experiences.</p> <p>Maximize teacher involvement in institute courses as a result of the schedule adjustment.</p> <p>Internship structure and process supports students within the Marine Institute as well as students outside the institute.</p> <p>Community partners are available to receive student interns.</p> <p>Graduation pathway focused on marine and maritime issues.</p>	<p>Increased student confidence applying STEM skills and using technology.</p> <p>Students at all levels have the opportunity to explore STEM related interests.</p> <p>Students are involved in conducting scientific research and immersive field experiences.</p> <p>Students explore marine diesel technology.</p> <p>Students have opportunities to earn certifications and credentials of value.</p> <p>Student build a long term data set of the Penobscot Bay.</p>	<p>Student and community ocean literacy increases.</p> <p>A school-wide structure exists to support student driven learning based on their interests.</p> <p>More students learning matches student interests.</p> <p>Student learning thrives with more hands-on, collaborative, and project-based work.</p> <p>Students become invested global citizens as they connect the classroom experience to global concerns.</p>	<p>Extended learning opportunities in the community result in greater student engagement.</p> <p>Students are prepared for future skilled jobs through community partner internships.</p> <p>More students consider a variety of possible career and education opportunities that exist for them after high school.</p> <p>Students have a greater understanding of the ocean's influence on them and their influence on the ocean.</p> <p>Relevant learning experiences increase academic growth as student learning becomes more self-directed.</p>
<p>Explore additional credit based opportunities based on student interest and need.</p> <p>Chemistry and Physics lab courses become physics and chemistry of the ocean.</p> <p>Collaboration with the City Climate Crisis Committee.</p>	<p>Existing community partnerships are enhanced and at least one new partnership is developed.</p> <p>3 new place-based courses (2 science and 1 humanities) are developed.</p> <p>12 students a year complete an internship.</p>	<p>Students see their learning as authentic and contributing to their community through public presentation, shared data collection, harvesting kelp to use as fertilizer and potentially as a food source in the future.</p>		<p>As students become more involved and engaged citizens of the community, they are informed thinkers who make good real-life decisions with a positive attitude.</p>	

B. Describe the data you collected about your innovation pilot outcomes that will be used to inform and shape your plan to MAINTAIN / SPREAD / SCALE

At the end of the 2022-23 academic year we facilitated a survey to our Marine Institute and Marine Studies students in order to determine if we had increased student knowledge of Marine based careers in Penobscot Bay. Our end of the year survey results show us that in order to continue to SPREAD the certification and credentialing aspect of the Pilot we need to ensure that we are providing in-class (or in-school) opportunities for students to earn these. We initially collected data regarding the students' understanding of careers in the Marine Industry. 72% of students who responded to the survey in the fall indicated that they had learned about a career related to Marine Science from the Marine Studies course.

The list below includes additional data collected about participation and successful completion of certifications and credentials. This will be used to set realistic goals for spreading to more students.

29 students participated in the SCUBA discovery day
14 received first aid, CPR, AED credential
17 received the US Coast Guard Fishing Vessel Drill Conductor Training certification
2 received their Basic Open Water scuba certification
4 received lifeguard certification

- C. List new data that you will need to collect to further inform and shape your plan to MAINTAIN / SPREAD / SCALE

In order to apply to be a satellite CTE program, we need to survey the students at the Region 7 high schools about their interest in aquaculture. This will be a huge data point for the Marine Institute. We will also include questions collecting information about students' awareness of careers in the marine industry, so that we may begin to track the impact on the overall goal of the Marine Institute: The goal of the Marine Institute is to increase student awareness of Marine-Related Careers. This fall (October, 2024) students at Belfast Area High School, Searsport District High School and Mt. View High School will be asked to complete a short survey about their interest in and knowledge about Careers in Aquaculture. In order for the DOE to provide funding for an aquaculture CTE program, there has to be demonstrated interest among the student body in the sending schools.

Section 3: What is the intended impact of your sustainability plan

- A. Describe the goals/milestones of your sustainability plan.

Consider how your plan will continue to meet the needs of the identified target student population(s) and describe changes in policy, practice, or structures necessary to MAINTAIN / SPREAD / SCALE your innovation.

2023 / 2024 School Year

During the 2023 / 2024 school year we will continue to determine what kinds of tools and resources are most needed for the Marine Institute to succeed here at BAHS as well as if it is to "Spread and Scale" to students beyond our initial target population.

In the 23-24 school year, we will require that each student involved in the Marine Institute complete at least one specially designed career experience, job shadow or internship. In order to facilitate this, our Marine Studies class will incorporate an internship requirement as part of the curriculum. Our 23-24 schedule has been modified to allow for student release time, during the school day, for this to happen. Belfast Area High School is fortunate that we employ an Extended Learning Opportunity Coordinator whose responsibility will be to match our students with marine-related internships and job shadows. He will work directly with the students in this program to provide these individual experiences.

Getting students in, out onto, or working with the water takes our program to a higher level of engagement. We know that many students in our school have not been able to explore the marine world that is right here on our doorstep. A floating classroom would enable various ways for students to learn and engage whether it be with a moored floating classroom complete with long-term ecological and meteorological data collection, various watercraft such as a workboat and kayaks for students to easily and safely obtain access to the water for data collection, oceanographic observations, maintenance of established sensor systems and other water-borne opportunities.

A Moored Floating Platform (designed, constructed and maintained by students that will be ADA compliant) for testing/collecting/measuring marine data, a Marine Weather Station, multiple Collection platforms from around the harbor and bay for our sensors in addition to the stationary dock. This would enable us to provide long-term data collection and comparative analysis with other data collections including other schools in our district or other districts around the bay, as well as provide a platform for streaming current data to monitors around the school in real-time.

The use of multiple Individual watercraft would enable students to be able to quickly access the moored and floating platforms, record data, make observations, check on aquaculture kelp farm progress, and perform maintenance and upkeep on projects, in addition to taking water samples from different depths for analysis. To work with the water, we need testing equipment such as sensors and trawls for data collection and management of said weather and marine data.

Research Classroom/Vessel: We will include students in the design and building process in collaboration with a local boatbuilder. This would include site visits during the construction and outfitting stages, with small boat building career applications. The goal is to have students research, design, and help build a boat which will serve their intended goals as a “floating classroom” as well as introduce them to possible marine construction careers. Further, students will be part of the process with learning proper boat maintenance, registration, storage, launching/retrieval and winterizing procedures. As with all aspects of the Marine Institute, compliance with ADA accessibility requirements will be met and prioritized.

If we are going to be able to “spread”, we need to be able to be on the water with students collecting data, tending our sea farm, and not having to rely on outside of school volunteers to provide us access to the water. More opportunities for testing of the water in the bay- which supports our highly effective instructional strategies- using data with students.

3 – 5 Year Plan

Our goal is to build sustainable systems for the Belfast Marine Institute that will allow the program to survive and thrive despite changes in leadership at both the district and school staff level. We want to explore the idea of sustaining such a program through a shared commitment from the school district as well as the larger community. We would also like to create a consortium model of learning where students from other mid-coast schools and island communities are able to take advantage of the BMI programming in a cooperative, collegial kind of shared experience.

In the 24-25 school year, we will seek to have the ELO coordinator at least partially funded by the RSU 71 School District. Because this will be an important position in continuing the mission of the Marine Institute, the plan is to engage local businesses in sponsorship of the ELO position, as it has already been recognized as a valuable position and program to both BAHS and the City of Belfast. We believe that through both RSU 71, potential DOE continued funding, our ELO partners across Waldo County will continue to fund this incredibly important work.

Another facet in the 3-5 year plan includes the establishment and spreading of a CTE program involving multiple regional high schools with an aquaculture satellite program being housed at BAHS. This will allow for direct state funding for a teaching position and will allow students from BAHS, Mount View High School and Searsport District High School to participate in the Marine Institute. By aligning aquaculture standards across the Marine Studies curriculum, students will receive industry standard training and explore potential career opportunities.

B. UMaine GANTT Chart

Milestones	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24
Seed kelp and grow in aquarium/Wet Lab	█	█	█	█								
ELO Opportunities	█	█	█	█	█	█	█	█	█	█	█	█
Pursue CTE Programming	█	█	█	█	█	█	█	█	█	█	█	█
Purchase equipment and build floating platform	█	█	█	█								
Survey new Marine Institute Classes to collect baseline data			█			█						█
Access to Water for kelp check, place-based learning (kayaks, floating platform)				█	█	█	█	█	█	█	█	█
secure funding for ELO coordinator position in 24-25 budget					█	█	█	█	█	█	█	
Ordering construction of the work-boat (including student design, site visit for construction of wood and fiberglass project)		█	█		█	█	█	█	█			
RREV Team Visit					█				█	█		

Section 4: Identify Key Expenses and Necessary Resources

A. Describe budget expenditures and necessary resources required to MAINTAIN / SPREAD / SCALE your innovation through June 2024.

Essential Expenditures:

1. Materials for moored observation platform \$10,000
 - a. Wood and composite decking, mooring line, mooring,
 - b. Derrick/lifting equipment
 - c. Sensors/weather station gear
2. Workboat construction, outfitting and completion costs \$50,000
 - a. Construction
 - b. Engine/trailer
 - c. Marine hardware: anchor, rope, cleats, davits, mounts
 - d. Oceanographic mounts/trawl haulers
3. Solo and dual watercraft and appropriate kayak and safety equipment \$20,000
 - a. Kayaks (both dual and solo)

- b. PFDs/paddles/skirts/kayak gear
- c. Trailer/mount/Kayak rack
- 4. Testing equipment for oceanographic stations/data collection \$20,000
 - a. ROVs, oceanographic sensors and samplers
 - b. Salinity testers, dissolved O2, temperature gauges, secchi disks, Nansen bottles
 - c. Microscopes, Ph analyzers, fluorometers, current readers
 - d. Monitors, software for streaming data

Necessary Resources:

1. Continued administrative support (Which includes support for: flexible student schedules, new course offerings such as the English course “Sea Stories”, attention to the impact on graduation requirements, and policy changes that support the program)
2. UMaine RiSE Center (Research in Science Education) Partnership supporting data literacy and marine studies
3. ELO Coordinator
4. Marine Institute Planning team and Marine Institute Coordinator
5. Certification instructors
6. Kelp farm and Wet lab
7. Curriculum planning time and support for professional learning

- B. Describe budget expenditures and necessary resources required to MAINTAIN / SPREAD / SCALE your innovation BEYOND June 2024

Expenses could include staff time, materials, professional development activities, facilities, and other related expenses. This section does not need to include specific costs, but rather list out the different costs that should be considered to implement the innovation.

Essential Expenditures:

In addition to the RSU 71 funding to support the Marine Institute in the 24-25 school year and beyond, additional funds will need to be secured.

These costs will include:

- Marine Institute Coordinator stipend- \$3,000
- STEM lab materials - \$5,000
- Van transportation - \$2,000
- Maintenance of learning spaces that support the Marine Institute - \$5,000

Necessary Resources:

1. Continued administrative Support
2. RISE Center partnership
3. ELO Coordinator
4. Marine Institute Planning team and Marine Institute Coordinator
5. Certification instructors
6. Kelp farm and Wet lab
7. Curriculum planning time and support for professional learning
8. Trailer able work boat

9. Floating platform,
10. Solo and Dual Kayaks
11. Coordination with Mount View High School and Searsport School District
12. Outside funding for a CTE aquaculture program