Long Island Sound Futures Fund 2009 - Large Grants - Submit Final Programmatic Report (Activities)
Grantee Organization: Friends of Outer Island, Inc.
Project Title: Outer Island Marine Environmental Education and Research Center (CT)

Project Period	09/08/2009 - 10/01/2010
Award Amount	$34,975.68
Matching Contributions	$94,000.00
Project Location Description (from Proposal)	Outer Island, the furthest offshore of the Thimble Island chain in Branford, CT.
Project Summary (from Proposal)	Build a revitalized educational center on Outer Island. A marine lab, learning stations, and a classroom pavilion will provide hands-on learning and research opportunities about the Long Island Sound.
Summary of Accomplishments	The timber frame pavilion has been constructed as an outdoor classroom and activity space. The remodelled cottage has as new roof, new windows and doors and laboratory storage, workstations and equipment has been installed.
Lessons Learned	Island work is often problematic due to logistics and weather. Volunteers are the key to our success.

Conservation Activities	Marine environmental education for Middle school students
Progress Measures	# of participants in activity
Value at Grant Completion	350 students
Conservation Activities	Trained docents working at Outer Island Refuge 2010
Progress Measures	# of volunteers engaged in project
Value at Grant Completion	40
Conservation Activities	Trained teachers to operate environmental field trips to OI at 2 workshops
Progress Measures	Other Activity Metric (# of teachers trained to lead field trips)
Value at Grant Completion	8
Conservation Activities	Log book record of visits June 2010-Oct2010
Progress Measures	Other Activity Metric (# of visitors)
Value at Grant Completion	720
Conservation Activities conferences and meetings nces	Present information about the educational facilities at Outer Island at
Progress Measures	Other Activity Metric (# of public presentations)
Value at Grant Completion	5
Conservation Activities	Set up hands-on stations with activities for students/visitors
Progress Measures	Other Activity Metric (# of learning stations with activities)
Value at Grant Completion	3
Conservation Activities	Constructed and equipped marine lab with storage and technology
Progress Measures technology)	Other Activity Metric (# equipped marine labs with lab desks and
Value at Grant Completion	1 lab for 24 participants
Conservation Activities	Construct an open classroom educational pavilion
Progress Measures educational open classroom)	Other Activity Metric (Square feet of useable teaching space in an
Value at Grant Completion	523.6 sq. ft.
Conservation Activities	Increase in stewardship
Progress Measures Island)	Other Activity Metric (% increase in membership in The Friends of Outer
Value at Grant Completion	20%
Conservation Activities	Population count in three intertidal locations on the rocky shore by students
Progress Measures square meter)	Other Activity Metric (# of invasive crabs Hemigrapsus sanguineus per

Value at Grant Completion	50 crabs per square meter


CLASS INSTRUCTION
AT THE REFUGE


Students enter
population data on laptop

Final Programmatic Report Narrative

Instructions: Save this document on your computer and complete the narrative in the format provided. The final narrative should not exceed ten (10) pages; do not delete the text provided below. Once complete, upload this document into the on-line final programmatic report task as instructed.

In four to five sentences, provide a brief summary of the project's key accomplishments and outcomes that were observed or measured.

1. Summary of Accomplishments

We completed the educational center on Outer Island as outlined in our proposal. Both the marine lab and the outdoor pavilion, (Phase 2 and Phase 3) the two major goals of our grant, are finished and operational. The completed project came in on budget with $35K from this present grant plus the $94 K from the Community Foundation of Greater New Haven and the hundreds of donations of goods and services from the local businesses and the Friends of Outer Island volunteers. A contractor, a teacher and a technology professional were the leaders at no cost to the project. The 300 square foot cottage was renovated into a 24 participant working lab complete with installed storage cabinets, lab tables with stools, and a sink. The new replacement windows and doors secured the interior from the harsh elements on the island. The lab is supplied with equipment for microscope studies, water analysis, a rolling cart for observational materials and technology for use by used by visitors. A large monitor with an attached laptop computer is mounted on the wall for large group viewing. The lab's sliding doors open to the new timber framed pavilion, a large shelter for both teaching and interpretive events. This covered structure provides protection from the sun and rain while the open framed architecture invites beautiful views of the Sound. The key outcome: to create a useable teaching facility where both students and adults can learn about Long Island Sound has been reached.

2. Project Activities & Outcomes

Activities

Primary Activities:

1. Environmental Education Center- The marine lab was completed and the educational pavilion was built. Both buildings are completely operational.

2. Visits to Outer Island- Public access increased. The renovated facility was visited in the summer and fall of 2010 (upon completion of the facility) by 350 students and 740 adults, an increase of 30% over the previous year. The requests for use in 2011 have increased by 50%.

Discrepancies in our primary activities:

One discrepancy of importance in our project was the timing of the construction. The dates were moved forward by six months, from the fall of 2009 to the spring of 2010. Most of this discrepancy was caused by the nature of doing construction on an island. Severe weather and the logistics of hauling all of the materials by barge to the offshore location caused the delay. In addition, it took longer to achieve the permits and necessary coordination between the USFWS, the contractors and the Friends of Outer Island volunteer staff. However, it must be noted that by June of 2010, the project moved quickly and all parties worked in concert.

Another discrepancy was budgetary in the laboratory. More money was needed for the built-in storage cabinetry and less for the lab desks. However, in the end there was a balance and the lab functions well and is visually pleasing. (See attached photos). The actual layout of the lab was changed slightly to allow for greater participant numbers. The lab can seat 24 students at lab tables.

- Describe and quantify progress towards achieving the project outcomes described in your grant agreement. (Quantify using the approved metrics referenced in your grant agreement or by using more relevant metrics not included in the application.)
- Briefly explain discrepancies between what actually happened compared to what was anticipated to happen. Provide any further information (such as unexpected outcomes) important for understanding project activities and outcome results.

Outcomes

1. Stewardship and Interest- Membership and participation in the Friends of Outer Island have increased by 20%. The Friends opened the island for visitors every weekend (weather permitting) from June through early October 2010, which was an increase of three weekends over the previous year. Six new docents were trained and took turns working on the island. In general, there was an immeasurable feeling of accomplishments from all of the volunteers in their stewardship of Outer Island upon the completion of the new facility.
Increased interest - The Friends of Outer Island website was revamped and has become an important tool in reaching the public about events and the mission on Outer Island.

2. School and university study and research of the LIS ecosystem- Middle school students during twelve field trips to Outer Island in May, September and October of 2010 researched the invasive Asian shore crab population. This study is a continuation of a ten-year population count started in 2000. The students counted over 6000 crabs and analyzed the data to show that the crab population increased in 2010 over previous years. (Please see the website crabscount.com). Although the data was collected by teens, the result is significant because of the large number of events in the statistical analysis. This student research on the crabs increases our understanding of the role non-indigenous species have in the Long Island Sound ecosystem. The CT State University visited the island for field trips and academic projects, but it is not known if a significant research investigation was completed during the time-line of this grant.

3. Survey- Students during field trips measured water quality and became familiar with the properties that indicate the health of LISound. Students' understanding of the Long Island Sound ecosystem was measured before and after their field visits by a questionaire. An increase of 30% in understanding and context was seen.

4. Learning Stations/Activities – We set up the materials and methods for three activities relating to understanding the Long Island Sound ecosystem. The first station was about water quality. Dissolved oxygen, salinity, and temperature of the Sound are measured at different locations and compared. The protocols for this learning station are complete and work well with the school children during their field trips.

Second, we set up an activity to observe and measure the invasive shore crabs and to search for the crabs' food supply with nets and seine. Students learned about the invasive crab *Hemigrapsus sanguineus* by participating in a hands-on population count. The participants measure the crabs' carapace width and mass in the lab and enter the data in the computer. The data is displayed on the large monitor for all to see. The invasive crab data can be seen on the website – www.CrabsCount.com. Equipment such as scales and a laptop, purchased through this grant, have been invaluable. Microscopes are set up on lab desks for students to view plankton and small invertebrates that are found in the water. Books about marine organisms have been placed in the marine lab and are used by students.

Third station in the lab was installing interpretive material about Long Island Sound on the large screen monitor in "kiosk" style. We are fortunate to have a CD created by Dr. Vince Breslin that introduces the natural and geologic history of Outer Island and Long Island Sound.

A rolling cart with non-living marine species has been set-up in the lab for hands-on explorations. However a full operational live marine touch tank has not been installed because of the budget. Hopefully, this will become a reality as money allows.
Both the water analysis and the crab observations activities will be extended to the visiting public beginning in June 2011 as soon as the docents of the Friends of Outer Island are trained (May 24 is the first training day). The docents

will show the visitors how to measure and consequently understand the importance of oxygen in the Sound; they will also introduce the visiting public to the problem of invasives through hands-on observations of the Asian shore crab.

5. Professional development -Two professional workshops were offered, one in the public school and one on Outer Island; eight teachers were trained.

6. Teen involvement- Students were offered opportunities to join the Junior Friends Group. A Face book Page was created where students wrote about their experiences on Outer Island. (See Face book *Outer Island Field Trips*)

7. Off-Site lectures - Four off-site presentations were given by Friends of Outer Island Board Members: two at the The Connecticut Conference on Natural Resources in Storrs, CT and one each at the National Science Teachers Conference in Philadelphia and the Marine Educator's Conference in Norwalk, CT.

8. Information for the public – A brochure explaining the history and mission of the Friends of Outer Island was planned and written. The brochure with a printing of 750 copies will be distributed to visitors beginning in June 2011.

9. An opening event was held in August of 2010. Staff from the US Fish and Wildlife Service, the CT Department of Environmental Protection, the State University and the Friends of Outer Island and other local guests toured Outer Island and saw first hand the educational facility on Outer Island. Thirty guests arrived by kayak and thirty guests by ferry. Rick Potvin, Manager of the McKinney National Wildlife Refuge and Prof. Jeremiah Jarret of the CT State University presented ideas for the future that would increase research and education on Outer Island

Briefly explain discrepancies between the activities conducted during the grant and the activities agreed upon in your grant agreement.

Discrepancies:

University Involvement: University students from the Connecticut State University visited Outer Island for field studies and research, but it is unknown if any publications resulted from these visits.

Web Page: We had planned to add a counter in 2010 to our Friends of Outer Island Web Page as an indicator of interest in Outer Island. Unfortunately, the counter was added beyond the timeframe of this grant. Thus we have no data for this report on the number of visits to our website.

Information about LIS for the public: Our brochure took us longer than anticipated to edit and our costs were greater than the original budget. The brochure is complete and the distribution is in effect for 2011 season.

Dissolved Oxygen: The protocols for using the dissolved oxygen meter were more complicated than stated in the proposal. Teachers who had been trained with the use of the Dissolved Oxygen (DO) meter were successful in teaching students about the DO measurements and its value to the health of LI Sound. But the weekend docents need lots of training and practice in order to introduce the importance of DO in the Sound. The plan is to incorporate hands-on training for the docents this summer so that the meter will be in full use. At that point the Dissolved Oxygen protocols will be available for use by visitors.

Touch table: We originally thought we could install a live touch tank, but found out the plumbing and installation cost much more than we could afford. A simple display of non-living organisms is the replacement for the touch tank.

Unexpected Positive Outcomes: The volunteer hours that were given to construct the educational facility were beyond all expectations. Carpenters and skilled craftsmen donated over 250 hours, while others have donated 200 hours towards development of educational and interpretive programs. These citizens believe that the restoration of Outer Island will have an effect in educating the public about Long Island Sound. The pride in building the new educational facility binds many folks to the mission of caring for the LI Sound environment by improving the facilities on Outer Island.

Long Term
We look forward to an increase in visitation and interpretation on Outer Island. The management of educational visits and research at OI will be a continued partnership between the CT State University and the USFWS with the Friends of Outer Island acting as docents and stewards. The State University is managing school field trips to the refuge and has reorganized visiting procedures to take advantage of the new facility. The Friends of Outer Island are instituting an interpretive birding program at Outer Island and the USFWS will be hosting interpretive events. These programs are feasible now with the new educational center in operation. All of the equipment purchased through the grant will be used in the future for research and education. For storage, the lockable cabinets secure the instruments and materials safely.

The Branford, CT public schools has incorporated standards-based field investigations on Outer Island into the 8th grade science curriculum which is evolving into a model for other schools. The students at the Walsh Intermediate School in Branford continue to investigate the invasive Japanese shore crab, *Hemigrapsus sanguineus*, at Outer Island and to study the properties of LI Sound, notably the dissolved oxygen and salinity values. The teachers noted this fall that with the new facility, the field trips went smoother and were more productive than in the past with no defined teaching space.

An informational brochure produced from the grant funds is a source of Long Island Sound and Refuge information for local cruise boaters and kayakers. With the modern educational facilities and interesting information, more of these casual visitors will explore Outer Island and become stewards in protection of LI Sound.

3. Lessons Learned
Describe the key lessons learned from this project, such as the least and most effective conservation practices or notable aspects of the project's methods, monitoring, or results. How could other conservation organizations adapt their projects to build upon some of these key lessons about what worked best and what did not?

Lessons Learned: Since this project was primarily a construction project on an island refuge, the key lessons learned is that planning and organization are paramount and even then, problems arise and execution is often slow. Working with a split between government agencies, hired contractors, the University and skilled volunteers require incredible organization and a great deal of time.

4. Dissemination

Briefly identify any dissemination of lessons learned or other project results to external audiences, such as the public or other conservation organizations.
Four off-site presentations were given by Friends of Outer Island Board Members: two at The Connecticut Conference on Natural Resources in and one each at the National Science Teachers Conference in Philadelphia and the Marine Educator's Conference. At the CT Conference on Natural Resources, Lynn Dorsey, the President of the Friends of Outer Island, presented an overview of the Outer Island facility and its use as a resource to learn about Long Island Sound. At the same conference, Beth Taylor and Ginny Baltay presented the research on the invasive Asian shore crab population which had been collected on Outer Island.

5. Project Documents
1. The local newspaper, *The Sound*, ran a lead story in May 2010 about the efforts to revitalize Outer Island. http://www.theday.com/article/20100520/NWS10/305209768/-1/zip06details&town=Branford&template=zip06art

2. CCNR 2011 - 5th Connecticut Conference on Natural Resources
http://clear.uconn.edu/ccnr2011/abstracts/baltay_oral.pdf

Abstract V.Baltay and E. Taylor
The *Crabs Count* project is a population study of the non-indigenous crab *Hemigrapsus sanguineus* by middle school students at Outer Island. This small black crab that invaded the rocky shoreline of the Northeast Atlantic coast is an ideal species for student investigations because of its size, visibility and abundance. Young teens become excited when they overturn rocks and find dozens of small crabs underneath.

3. Website for Friends of Outer Island: www.friendsofouterisland.org
This website contains photos and information about the new educational center at Outer Island.

4. Website for data on the invasive Asian shore crab; maintained by the student research of the Walsh Intermediate School of Branford, CT: www.crabscount.com

5. Brochure - Pages 1-2 of 8 folded pages:

Outer Island

P.O. Box 305 Branford, CT 06405
friendsofouterisland@refugeassociation.org
Web: friendsofouterisland.org

Mission

- **Preserve the natural resources of Outer Island**
- **Provide environmental education and wildlife dependent recreation**
- **Assist with maintenance and improvement of island facilities**

Outer Island
Jewel of the Thimbles

Longitude 72.760375 W
Latitude 41.242041 N

Outer Island is a five-acre unit of the **Stewart B. McKinney Wildlife Refuge** and under the management of the **United States Fish and Wildlife Services**.

Outer Island is the southernmost island in the **Thimble Island** chain off the coast of **Stony Creek** in **Branford, Connecticut.**

Topography and Geology

Much of coastal **New England** was formed during the **first advance** of the **Laurentide Glacier**, which was estimated to be over **75,000 years ago**. There have been **three advances and recessions** of the ice sheet- each moving the glacier further to the south before receding.

Outer Island, along with the rest of the Thimble Islands, was formed during the last advance of the Laurentide Glacier, which covered most of Canada and northern United States. The maximum advance of the ice sheet reached Long Island approximately 20,000 years ago. The thickness of the Laurentide ice sheet exceeded over 6,000 feet. Its weight was so great that it depressed the Earth's crust by as much as 2,300 feet, and so much water was deposited on the land in the form of ice and snow that elevations changed dramatically.

The Laurentide ice flow reached out to the continental shelf which was not, at that time, covered by water. It was at this point that the glacier deposited a number of terminal moraines. These moraines formed the topography of Long Island, Block Island, Nantucket, Martha's Vineyard and Cape Cod.

It was only after the last recession of the Laurentide Glacier that these landforms became islands.

Outer Island is comprised of **pink granite which sits upon the bedrock hills** that extend out of the water. **Glacial erratics** (boulders left by the retreat of the ice sheet) may be seen on Outer Island as well as many of the Thimble Islands.

History

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

The **Mattabesic** Native Americans came from a single village on the **Connecticut River** near **Middletown, Connecticut**. In the summer months, many of the Mattabesic traveled south to the area around Stony Creek

- 2-10 representative photos from the project. Photos need to have a minimum resolution of 300 dpi;
- report publications, GIS data, brochures, videos, outreach tools, press releases, media coverage;
- any project deliverables per the terms of your grant agreement.

POSTING OF FINAL REPORT: *This report and attached project documents may be shared by the Foundation and any Funding Source for the Project via their respective websites. In the event that the Recipient intends to claim that its final report or project documents contains material that does not have to be posted on such websites because it is*

protected from disclosure by statutory or regulatory provisions, the Recipient shall clearly mark all such potentially protected materials as "PROTECTED" and provide an explanation and complete citation to the statutory or regulatory source for such protection.