LI Sound Futures Fund 2013 - Planning All Types and Water Quality Monitoring - Submit Final Programmatic Report (New Metrics)
Grantee Organization: Sacred Heart University, Inc.
Project Title: Restoration of Intertidal Habitat at Stratford Point (CT)

Project Period	9/30/2013 - 4/30/2015
Project Location Description (from Proposal)	Stratford Point, Lordship Peninsula of the Town of Stratford, CT.
Project Summary (from Proposal)	Construct a 3.5 acre intertidal marsh pilot living shoreline, collect data to assess the success of the pilot and produce a long term management plan to address coastal erosion at Stratford Point.
Summary of Accomplishments	We have constructed a pilot living shoreline at Stratford Point to assess the efficacy of this type of structure to protect coastal shorelines from storm-generated erosion. Sixty-four Pallet Reef Balls™ were installed on May 6-7th, 2014 in the intertidal zone along the low energy side of Stratford Point. Locally sourced Spartina alterniflora was planted throughout the summer landward of the reefballs to initiate establishment of a fringe marsh to provide additional wave attenuation. Abiotic and biotic data were collected across the summer, fall, and winter of 2014 and into the spring of 2015. Additional monitoring is ongoing and will continue for five years per requirements of the CT Certificate of Permission to install the pilot project. To date, the pilot project has been effective with respect to attenuating wave energy (30% reduction), enhancing sediment accretion behind the reef balls (6 cm), and serving as a substrate for colonization by marine organisms including oysters, barnacles, algae, sponges, clams, snails, and crabs. The S. alterniflora is actively growing and spreading via rhizomes. Additional S. alterniflora will be planted over the next month to supplement the existing fringe marsh.
Lessons Learned	It is clear that the Office of Long Island Sound Programs within the CTDEEP are more than willing to help facilitate permitting processes for living shoreline installations. It is of utmost importance to work with OLISP from day one of the project planning to identify potential pitfalls and obstacles to the long-term success of any installation. Living shoreline projects must be viewed in terms of a fluid mosaic of habitats that must interact harmoniously with each other. We highly recommend that as many if not all components of living shorelines be installed at the same time to facilitate synergistic interactions within the living shoreline components. While we were cautioned that results may not be visible for multiple years, the data we collected through careful monitoring do suggest that sediment accretion can occur fairly rapidly. Up to 15 cm of sediment has accreted landward of the Reef Balls within a year post installation. Integrating multiple stakeholders into the process of living shoreline installations is a key factor towards determining overall success. Governmental agencies, non-profit environmental groups, and universities can all contribute to the adaptive management of living shoreline projects. We highly recommend that any future installations comprise a group of relevant stakeholders to facilitate overall success.

Activities and Outcomes

Funding Strategy: Habitat Restoration
Activity / Outcome: LISFF - Land, wetland restoration - Acres restored
Description: Enter the number of acres restored
Required: Recommended
Acres restored - Current: 2.00
Acres restored - Grant Completion: 2.34
Notes:

Funding Strategy: Capacity, Outreach, Incentives
Activity / Outcome: LISFF - Outreach/ Education/ Technical Assistance - # websites, social media tools
Description: Enter the number of websites and other social media tools used to disseminate information about the project
Required: Recommended
websites, social media tools - Current: 0
websites, social media tools - Grant Completion: 1
Notes:

Funding Strategy: Capacity, Outreach, Incentives
Activity / Outcome: LISFF - Outreach/ Education/ Technical Assistance - # workshops, webinars, meetings
Description: Enter the number of workshops, webinars, and meetings held to address project activity
Required: Recommended
workshops, webinars, meetings - Current: 0
workshops, webinars, meetings - Grant Completion: 1
Notes:

Funding Strategy: Capacity, Outreach, Incentives
Activity / Outcome: LISFF - Outreach/ Education/ Technical Assistance - # gov’t entities participating
Description: Enter the number of municipalities or local governments participating in the project
Required: Recommended
gov't entities participating - Current: 0
gov't entities participating - Grant Completion: 4
Notes:

Funding Strategy: Planning, Research, Monitoring
Activity / Outcome: LISFF - Management or Governance Planning - # plans developed
Description: Enter the number of plans developed that had input from multiple stakeholders
Required: Recommended
plans developed - Current: 0.00
plans developed - Grant Completion: 1.00
Notes:

Funding Strategy: Capacity, Outreach, Incentives

Activity / Outcome: LISFF - Outreach/ Education/ Technical Assistance - # of schools participating
Description: Enter the number of elementary, middle, and high schools participating in the project
Required: Recommended
# of schools participating - Current: 1
# of schools participating - Grant Completion: 1
Notes:

Funding Strategy: Habitat Restoration
Activity / Outcome: LISFF - Beach habitat quality improvements - Miles restored
Description: Enter the number of miles restored
Required: Recommended
Miles restored - Current: 0.00
Miles restored - Grant Completion: 0.03
Notes:

The following pages contain the uploaded documents, in the order shown below, as provided by the grantee:

Photos - Jpeg
Photos - Jpeg
Photos - Jpeg
Photos - Jpeg
Photos - Jpeg
Photos - Jpeg
Photos - Jpeg
Final Report Narrative - Standard

The following uploads do not have the same headers and footers as the previous sections of this document in order to preserve the integrity of the actual files uploaded.

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.

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

We have constructed a pilot living shoreline at Stratford Point to assess the efficacy of this type of structure to protect coastal shorelines from storm-generated erosion. Sixty-four Pallet Reef Balls™ were installed on May 6-7th, 2014 in the intertidal zone along the low energy side of Stratford Point. Locally sourced *Spartina alterniflora* was planted throughout the summer landward of the reef balls to initiate establishment of a fringe marsh to provide additional wave attenuation. Abiotic and biotic data were collected across the summer, fall, and winter of 2014 and into the spring of 2015. Additional monitoring is ongoing and will continue for five years per requirements of the CT Certificate of Permission to install the pilot project. To date, the pilot project has been effective with respect to attenuating wave energy (30% reduction), enhancing sediment accretion behind the reef balls (6 cm), and serving as a substrate for colonization by marine organisms including oysters, barnacles, algae, sponges, clams, snails, and crabs. The *S. alterniflora* is actively growing and spreading via rhizomes. Additional *S. alterniflora* will be planted over the next month to supplement the existing fringe marsh.

2. Project Activities & Outcomes

Activities

- *Describe and quantify (using the approved metrics referenced in your grant agreement) the primary activities conducted during this grant.*
- *Briefly explain discrepancies between the activities conducted during the grant and the activities agreed upon in your grant agreement.*

Outcomes

- *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.*

Goal 1. Construct a small pilot living shoreline along the low energy side of Stratford Point.

The Living Shoreline project at Stratford Point is a collaborative effort between DuPont, Sacred Heart University, AECOM (formerly URS), and the Connecticut Audubon Society and National Audubon Connecticut. Construction of the artificial reef took place between May 2 and May 7, 2014 during low tide. The artificial reef is comprised of two staggered rows of 33 and 32 reef balls (65 reef balls total), each 4 feet in diameter at the base and 3 feet tall. The reef balls are constructed of cement with a fiberglass skeleton, and are hollow with multiple portals for water to pass through. The reef is located approximately 18 meters seaward of the Mean High Water (MHW) elevation, and oriented in a slightly convex shape with a north-northeast focal point, which is the direction from which the predominant waves approach the shore (Figures 1 and 2). The artificial reef is extends ~40 meters in length. To prevent scouring at the base of the reef , two to three inch median diameter gravel was placed to a depth of approximately four to six inches deep along the base of the reef to a linear extent of three feet both landward and seaward. *Spartina alterniflora* was also planted landward of the reef balls in the intertidal zone (Figure 3), and additional plantings are scheduled in the future to provide more cover and sediment stability. In total 0.028 miles of beach were restored along and additional 0.34 acres of intertidal fringe marsh bringing the total land restoration between the current grant and our past NFWF LISFF grant (2011 – Planning Grant) to 2.34 acres of beach, marsh, and coastal upland habitat that has been restored.

Figure 1. Reef Ball arrangement at Stratford Point

Figure 2. Installation of Reef Balls


Figure 3. Newly planted *Spartina*

Goal 2. Collect and analyze abiotic and biotic data to assess the success of the pilot living shoreline

<u>Biotic Assessment</u>

<u>Invertebrate and algal recruitment to reef balls</u>- Over the course of the project we assessed macroalgal and invertebrate recruitment to the reef balls. Thirty Reef Balls were randomly selected for assessment of invertebrate and macroalgal recruitment using a random number generator. Limited recruitment occurred over the summer of 2014. The late spring installation did not allow for the seasonal barnacle set which was evident on two test reef balls placed in the area in February 2014. However, this spring (2015) barnacles did settle on the reef balls and we are monitoring survivorship and growth. During the second week of November, 2014, 27 reef balls were surveyed with a focus on oyster spat. Results from the surveys tallied 841 individual oyster spat (average 22 oysters per reef ball), 348 periwinkles, 1560 barnacles, 19

mud snails, and 25 slipper shells. Surveys were also completed to check each reef ball for 1) the presence of spat on exterior, 2) presence of spat on interior surface, 3) presence of spat on shell or substrate in the bottom of the reef ball. All 65 reef balls were found to have spat on the exterior surface. Fifty four reef balls had spat present on the interior wall and 50 reef balls were found with spat present on or in the bottom substrate. All 65 reef balls were resurveyed in April 2015. Individual spat, dead or living, were tallied to help determine an over-winter survival rate. This survey resulted in 1,146 total spat counted. 184 of these were deemed living while 962 had large shell openings and were considered dead. Based on our previous data we approximate that there was a 10% survival rate over the winter. There was limited algal growth on the reef balls over the summer of 2014. Only 6% of the reef ball surface on average was covered by*Cladophora spp*.

<u>Nekton monitoring -</u> Nekton were surveyed on 24 July and 29 July 2014. 20-m beach seines were conducted during both flood and ebb tides in the same tidal cycle. Maximum water depth was 1.5 m during surveying. Seines were repeated on the seaward and landward sides of the reef balls, in a reference area at Stratford Point adjacent to the reef balls, and at Milford Point. Each location was seined three times per survey. The dominant species captured around the reef balls was *Menidia menidia* (Atlantic silverside) with the exception of a few *Fundulus heteroclitus* (Mummichog) and *Fundulus diaphanous* (Banded killifish). There was no significant difference between nektonic communities between the reef balls and adjacent control site or reference site.

<u>*Spartina alterniflora* density and growth</u> – We planted a total area of 130 m^2 with *Spartina*. Surveying was completed on 31 July 2014. Due to the complexity of the *Spartina* planting layout at Stratford Point, seven transects were run parallel to shore on the landward side of the reef with five $0.25m^2$ quadrats randomly sampled per quadrat. The five tallest stems within each quadrat were measured for height with a meter stick. Shoot density was counted by touch and only included stems entirely located within the quadrat. The average stem height for all plantings at Stratford Point was 52 cm. Average shoot density was 12 shoots per $0.25m^2$. Additional plantings are scheduled for early June 2015.

<u>Invertebrate diversity and abundance -</u> Invertebrate diversity was analyzed by comparing historical density data with the field data collected in the summer of 2014. Four, 50 m transect lines were run parallel to shore with 2 located on the seaward side and 2 on the landward. Three pits were excavated and sieved along each transect. Sampling points were determined using a random number generator. Numbers coincided with the meter marks on a field tape. A 0.25 m^2 quadrat was placed over the center of the tape and the edges of the pit were marked with a shovel. Each pit was dug to a depth of 20 cm. Sediment was collected in buckets then sieved using a 1 cm screen. Macroinvertebrates were identified to the nearest genus/species. *Mya arenia* (Softshell clam) decreased from $8.2/0.25m^2$ in 2012 to $7.1/0.25m^2$ in 2014. On average, *Mytilus edulis* density increased from 2012 to 2014. Green crabs (*Carcinus maenus*), not present in 2011, were present in 2014. There was also an increase in Asian shore crabs (*Hemigrapsus sanguineus*) and rough periwinkles (*Littorina saxatilis*). Polychaete abundance and diversity increased from 2011 to 2014. There was a two fold increase in *Nereis virens* (Common clam worm) and *Glycera* sp (bloodworms). Abundance of the *Ilyanassa obsoleta* (Eastern mud snail) remained relatively constant over the sampling period. Overall there was an increase in species richness from 2011 to 2014.

<u>Abiotic Assessment</u>

<u>Wave Energy</u> **-** Cera Diver pressure sensors (PS) were used to measure wave height. The pressure sensors took measurements every 0.5 seconds for approximately 6.5 hours. Attenuation of the pressure signal does occur in water and is dependent upon density, however this attenuation is essentially negligible at depths shallower than 5 m, so we assumed that the measurements made by the pressure sensor closely reflected wave height. Three pairs of pressure sensors were placed within the project area, with each pair having one pressure sensor located landward of the artificial reef, and one pressure sensor located seaward (Figure 4). All landward pressure sensors were placed along the same bathymetric elevation, as were the seaward pressure sensors respectively. Three pairs of pressure sensors were placed in the adjacent reference location at the same bathymetric elevation and positioned in a similar fashion to the experimental site. Individual pressure sensors were placed within PVC pipes approximately 8 inches long and 1 inch ID (inside diameter), and attached to poles using plastic zip-ties approximately 1 centimeter above the sediment surface. Preliminary results from a single storm event on 4/15/2015, indicated a statistically significant reduction in the relative change in significant wave height due to the presence of the artificial reef at the experimental site at Stratford Point, CT. The relative reduction in wave height was 29.1% (Figure 5).

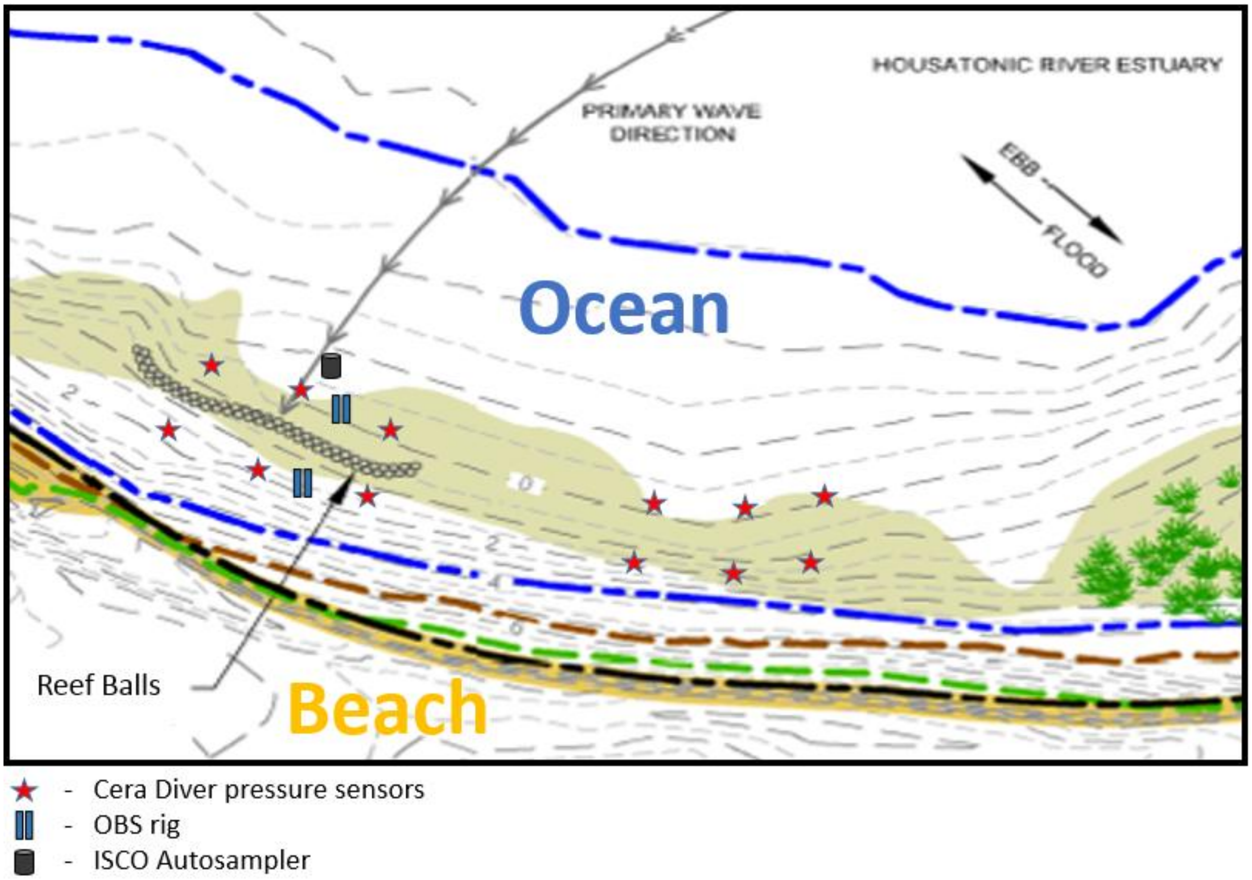

Figure 4. Map of the experimental site and reference site showing the location of the artificial reef, the bathymetry of the intertidal zone, the placement of pressure sensors and the primary direction of waves. Courtesy of URS

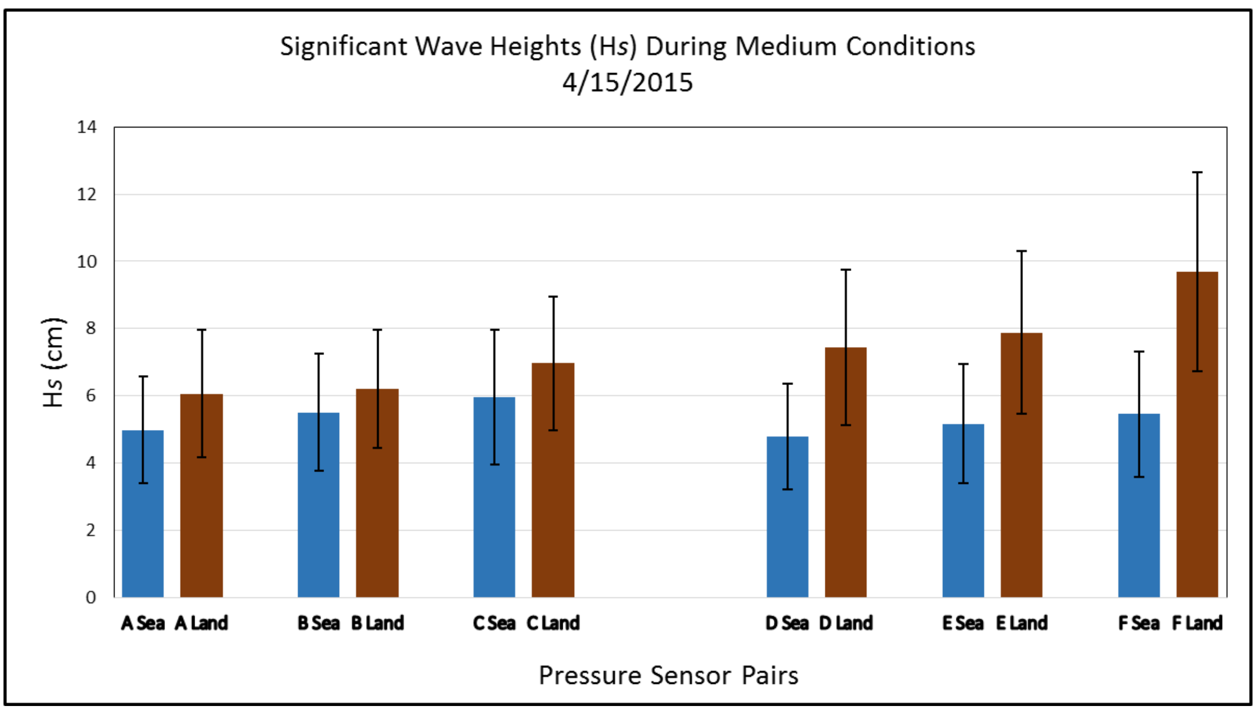

Figure 5. Graph showing calculated H*s* for each pressure sensor grouped in pairs from 4/15/2015. There is a statistically significant difference in ΔH*s* between the experimental site and the reference site. Independent t-test, $p = 0.004$, $t = -5.837$

Suspended Solids and Turbidity - Water turbidity and suspended solids concentration was measured using two submersible Campbell Scientific Optical Back-Scatter sensors (OBS500). The OBS500 uses both backscatter (high turbidity measurements) and sidescatter (low turbidity measurements) sensors to measure changes in suspended solids. Sensors were attached to the landward most poll approximately 3.5cm above the sediment bed and oriented to face landward, away from the predominant flow of water. The sensors were placed in close proximity to a Cera Diver pressure sensor pair, with one sensor landward of the artificial reef, and one seaward. The data derived from the sensors was stored in a Campbell Scientific CR200X Datalogger that was placed in a water-resistant pelican case and mounted on a platform approximately 10 feet above the sediment. OBS500 sensors were factory calibrated and periodically tested in the laboratory for accuracy. Analysis of these data is ongoing. The inability to have an OBS500 sensor pair in both the experimental and reference site for the same storm event is unfortunate, and repeated measurements changing the location of the OBS500 sensor pairs among pairs within the experimental site, and between the experimental site and reference site will be necessary to derive any statistically significant information about the effect of the artificial reef on suspended solids concentration.

Specific Metrics

Metric	Original	Proposed	Completed
LISFF - Outreach/ Education/ Technical Assistance - # gov't entities participating	**0**	**4**	**6**
LISFF - Outreach/ Education/ Technical Assistance - # of schools participating	**1**	**1**	**1**
LISFF - Outreach/ Education/ Technical Assistance - # websites, social media tools	**0**	**1**	**1**
LISFF - Outreach/ Education/ Technical Assistance - # workshops, webinars, meetings	**0**	**1**	**4**
LISFF - Beach habitat quality improvements - Miles restored	**0**	**0.028**	**0.028**
LISFF - Land, wetland restoration - Acres restored	**2 (2011 LISFF Planning Grant)**	**.34**	**2.34**
LISFF - Management or Governance Planning - # plans developed	**0**	**1**	**1**

Metric Description

LISFF - Outreach/ Education/ Technical Assistance - # gov't entities participating

Planning, implementation, and monitoring of the pilot living shoreline included the participation of the following government agencies: CTDEEP, Office of Long Island Sound Programs; CT Department of Agriculture, Bureau of Aquaculture; US Army Corps, Environmental Protection Agency, Town of Stratford, and Housatonic River Estuary Commission. In addition, Audubon Connecticut and National Audubon Connecticut participated in the planning and implementation of this project.

LISFF - Outreach/ Education/ Technical Assistance - # of schools participating

Sacred Heart University was the primary institution associated with this project. A total of 14 graduate students in the Environmental Science and Management Professional Science Masters program were involved in this pilot project. A total of 12 undergraduate students were involved in this project. In addition, six K-12 schools participated in various aspects of the project (educational outreach, site visits).

LISFF - Outreach/ Education/ Technical Assistance - # websites, social media tools

This project has been featured on the websites of Sacred Heart University and Connecticut Audubon. Additional educational outreach has taken place through twitters, blogs, and RSS feeds associated with these two organizations.

http://www.ctaudubon.org/2013/11/innovative-living-shoreline-will-help-improve-bird-habitat-at-stratford-point/#sthash.oIeA5hYN.dpbs
http://www.ctaudubon.org/2014/05/an-innovative-living-shoreline-reef-is-in-place-at-stratford-point/#sthash.o3gbSk0K.dpbs
http://allhabitat.com/project-gallery/stratford-point-dune-restoration-reef-ball-construction/
http://longislandsoundstudy.net/2015/02/artificial-reefs/

http://longislandsoundstudy.net/2014/08/planting-a-tidal-wetland/
http://reefinnovations.com/projects/us-north-east/connecticut/
http://www.sacredheart.edu/aboutshu/news/newsstories/2014/may/unique-installation-to-be-completed-as-part-of-stratford-point-restoration-project.html
http://www.fhiplan.com/e-newsletter/spring2015/repair-environment.html

LISFF - Outreach/ Education/ Technical Assistance - # workshops, webinars, meetings: 1
This project has been presented at four scientific conferences. In addition the project and results will be presented at the UConn Climate Adaptation Academy's second workshop on Living shorelines on June 24 at Avery Point.

LISFF - Beach habitat quality improvements - Miles restored: 0.028
A total of 0.028 miles of beach were improved by this project. Erosion of this section of coastline has declined due to the abatement of wave energy by the reef balls.
LISFF - Land, wetland restoration - Acres restored: 2.34
Our previous NFWF grant restored two acres of coastal upland. This grant restored an additional 0.34 acres of coastal fringe marsh.

LISFF - Management or Governance Planning - # plans developed: 1
A monitoring plan has been produced to guide the adaptive management of the pilot project over the next five years in cooperation with the CTDEEP, Office of Long Island Sound Programs; CT Department of Agriculture, Bureau of Aquaculture; US Army Corps, Environmental Protection Agency, Town of Stratford, and Housatonic River Estuary Commission as a condition of the Certificate of Permission to install the reef balls in the intertidal zone of the low energy side of Stratford Point.

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?

1. Obtaining permits – The process of obtaining permits to install living shoreline projects in CT utilizing structures in the intertidal zone can be arduous and time consuming. However, it is clear that the personnel of the Office of Long Island Sound Programs within the Connecticut Department of Energy and Environmental Protection are more than willing to help facilitate the permitting process. It is of utmost importance to work with OLISP from day one of the project planning to identify potential pitfalls and obstacles to the long-term success of any installation. It is clear that OLISP and the CTDEEP are taking these types of projects seriously as they provide invaluable data pertaining to the long term protection of Connecticut's coastline.

2. Order of living shoreline restoration projects – Living shoreline projects must be viewed in terms of a fluid mosaic of habitats that must interact harmoniously with each other. Installation of protective dunes without the intertidal components (reefs and fringe marshes) could result in total failure due to a lack of wave attenuation in the intertidal zone. Installing fringe marshes without dunes or artificial reefs can result in the immediate loss of the fringe marsh due to a lack of wave attenuation and a potential "re-"supply of sediments from the backshore area. We highly recommend that as many if not all components of living shorelines be installed at the same time to facilitate synergistic interactions within the living shoreline components or at least the artificial reef structure be installed first before the other habitats to decrease orbital velocity of incoming waves and increase sediment deposition.

3. Monitoring – While we were cautioned that results may not be visible for multiple years, the data we collected through careful monitoring do suggest that sediment accretion can occur fairly rapidly. Up to 15 cm of sediment has accreted landward of the Reef Balls within a year post installation. These results for such a small pilot project suggest that larger installations will result in significant sediment accretion within short time periods. The reef balls have been successful with regards to abating wave energy and increasing sediment deposition. Monitoring must continue over the long term to determine how the reef balls will enhance habitat for marine organisms within the intertidal zone.

4. Collaboration – Integrating multiple stakeholders into the process of living shoreline installations is a key factor towards determining overall success. Governmental agencies, non-profit environmental groups, and universities can all contribute to the adaptive management of living shoreline projects. We highly recommend that any future installations comprise a group of relevant stakeholders to facilitate overall success.

4. Dissemination
Briefly identify any dissemination of lessons learned or other project results to external audiences, such as the public or other conservation organizations.

Oral and Poster Presentations:
2015 – Mattei, J. An example of a living shoreline installment at Stratford Point: Lessons learned after one year. Invited talk for Climate Adaptation Academy sponsored by CT Sea Grant, Living Shoreline Workshop II. UCONN, Avery Point, CT.

2015 - Zemba, Anthony, J. Mattei, M. Beekey. Urban Estuaries: In need of Remediation, Restoration and Conservation. Oral presentation, Society of Wetland Scientists annual meeting (June 1), Providence, RI.

2015 - Mattei, Jennifer, M. Beekey, J. Rapaglia, L. Steele and A. Zemba. Urban Estuaries: In need of Remediation, Restoration and Conservation (Part 2). Oral presentation, Society of Wetland Scientists annual meeting (June 1), Providence, RI.

2015 – Mattei, J., Beekey, M., Rapaglia, J., and Steele L. Urban Estuaries: In Need of Remediation, Restoration and Conservation. New England Estuarine Research Society-Annual meeting, Bristol, RI April 2015.

2015 –Dolan, A. Rapaglia, J., Mattei, J., Beekey, M., and Steele, L. Wave Dissipation and Sediment Transport: A Living Shoreline Pilot Project. New England Estuarine Research Society-Annual meeting, Bristol, RI April 2015.

2014 - Dolan Andrew, J. Rapaglia, M. Beekey, L. Steel and J. Mattei. Shoreline Remediation by Sedimentation at Stratford Point, CT: Using Reef Balls for Wave Energy Reduction as part of a Living Shoreline Protection Strategy. *(Note: This poster won "Best Graduate Student poster presentation" at 24th Biennial Meeting of The Coastal Society and the National Summit on Coastal and Estuarine Restoration)*

2014 - Buckhout Brett, A. Beekey, J. Mattei, J. Rapaglia, L. Steele. Initial recruitment of macro-algal and invertebrate species on an artificial reef in Long Island Sound, Stratford Point, CT. 24th Biennial Meeting of The Coastal Society and the National Summit on Coastal and Estuarine Restoration, Washington, D. C.

2014 - Ray Courtney, A. Beekey, J. Rapaglia, L. Steele, J. Mattei. Comparison of lead concentrations in the sediments and biota of Stratford Point before and after restoration at the mouth of the Housatonic River, CT. 24th Biennial Meeting of The Coastal Society and the National Summit on Coastal and Estuarine Restoration, Washington, D. C.

2014 - Jackie Jahn. An assessment of marsh sediment and lead dynamics prior to installation of an oyster reef at Stratford Point, (Master's thesis).

Reef Installation Project in the News:

http://wshu.org/post/experiment-stopping-erosion-stratford-reef-balls

http://www.nbcconnecticut.com/news/local/Concrete-Reef-Balls-to-Save-Shoreline-231641101.html

http://www.ctpost.com/printpromotion/article/Reef-Balls-may-stop-erosion-5458055.php (front page article)

http://longislandsoundstudy.net/2014/08/planting-a-tidal-wetland/

https://www.youtube.com/watch?v=Qv0fTFt0SKA

http://www.ctpost.com/local/article/Artificial-reef-planned-for-Stratford-Point-4970691.php http://ctmirror.org/2014/05/14/success-not-guaranteed-for-unique-stratford-reef-project/

http://www.stratfordstar.com/15208/audubon-to-build-reef-at-stratford-point/

http://www.windcheckmagazine.com/seas_of_change_the_restoration_of_ecosystem_services_at_stratford_point

http://coastalnewstoday.com/connecticut-reef-balls-latest-try-at-restoring-marsh/

http://patch.com/connecticut/fairfield/59k-grant-funds-stratford-point-living-shoreline-installation-of-reef-balls-fairfield

http://www.myrecordjournal.com/news/state/3162869-129/reef-balls-seen-as-new-buffer-on-shoreline.html

http://www.connecticutsaltwaterfishing.com/2013/12/still-more-details-about-stratford.html

http://www.pressherald.com/2013/12/16/human_engineering_aims_to_restore__living_shoreline__/

5. Project Documents
Include in your final programmatic report, via the Uploads section of this task, the following:

- 2-10 representative photos from the project. Photos need to have a minimum resolution of 300 dpi and must be accompanied with a legend or caption describing the file name and content of the photos;
- 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.*


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