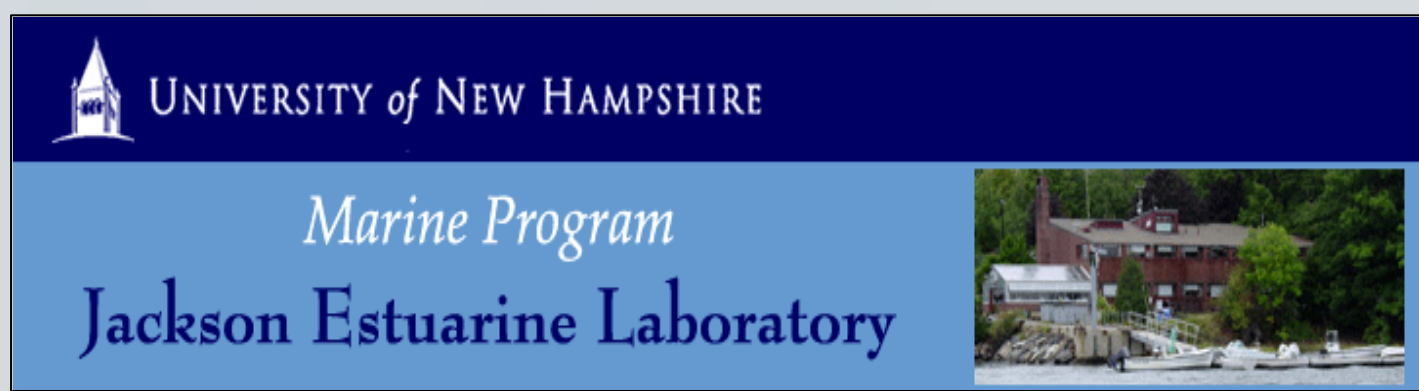


# SCALING-UP THE OYSTER RESTORATION RESEARCH PARTNERSHIP (ORRP) IN THE HUDSON RIVER/NY HARBOR SYSTEM: PHASE 2 (2012-2015) AT SOUNDVIEW PARK, BRONX, NY

HUDSON RIVER FOUNDATION  
for Science & Environmental Research



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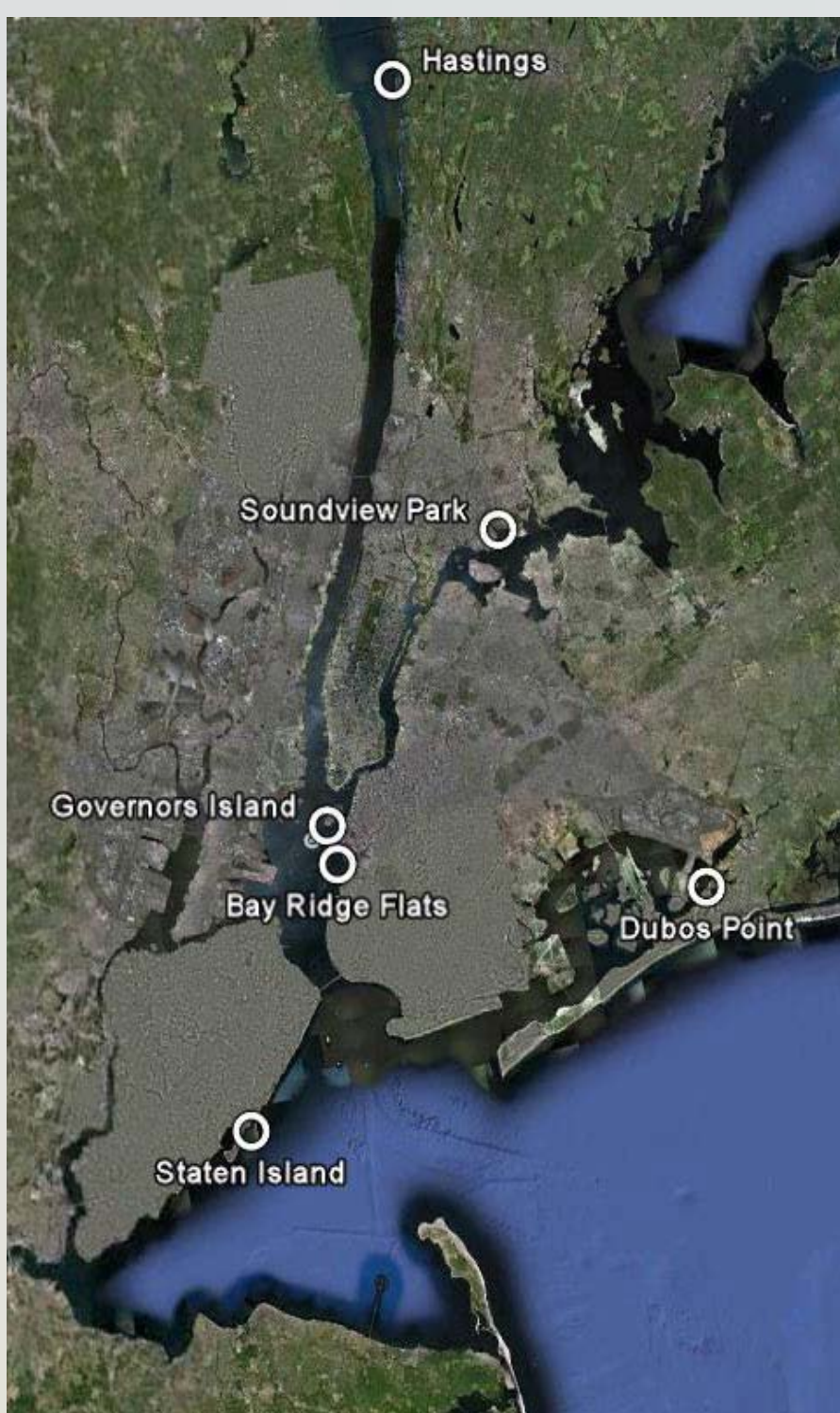
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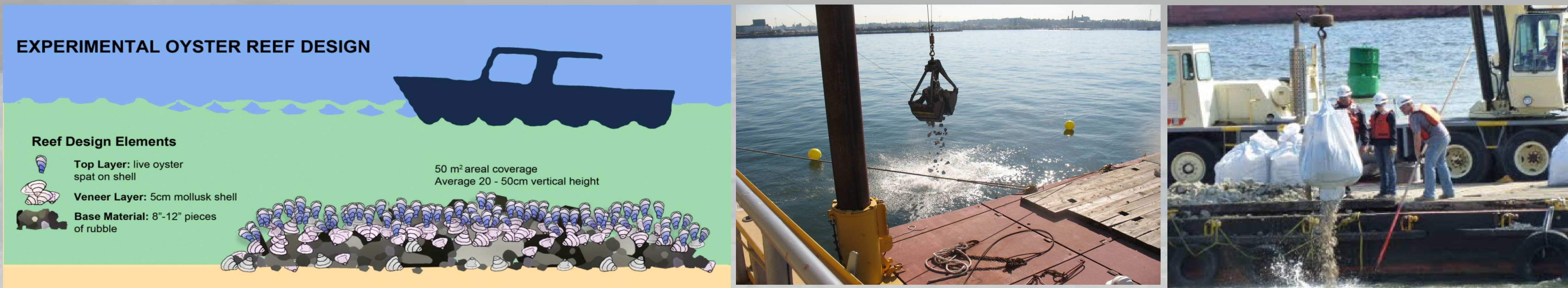
## Oyster Restoration Research Partnership

In 2009, the Hudson River Foundation, New York/New Jersey Baykeeper, US Army Corps of Engineers, University of New Hampshire, and more than 20 other partners began working together on an Oyster Restoration Research Partnership (ORRP) to begin to restore native eastern oyster (*Crassostrea virginica*) populations in the New York Harbor region. The regional Comprehensive Restoration Plan (CRP) set a long-term goal of 2,000 acres of established reef habitat by 2050, with the overall aim of restoring the eastern oyster to its historic ecological role in the region. Thus, the focus of the Plan is on ecosystem services provided by oyster reefs rather than human harvest and consumption.

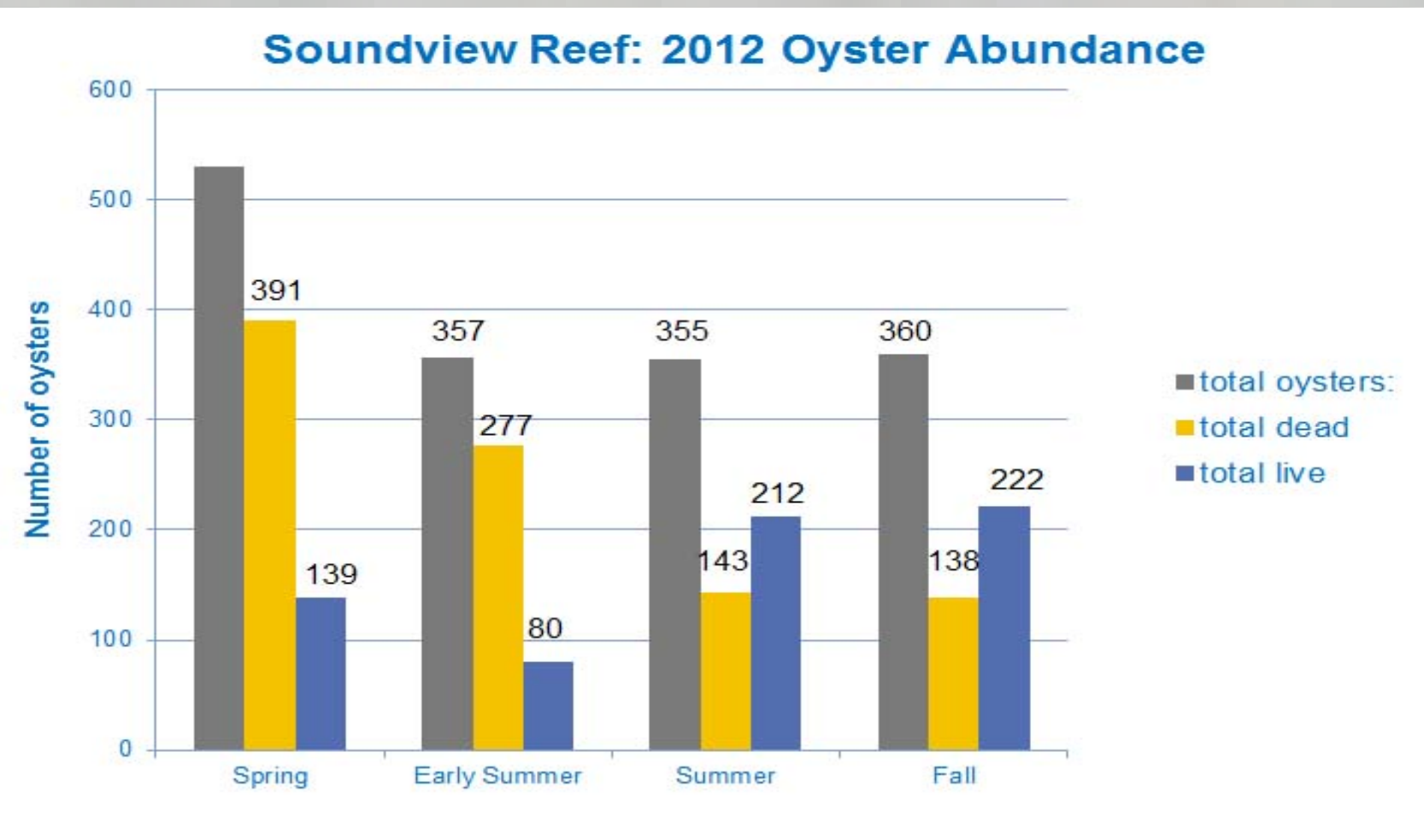
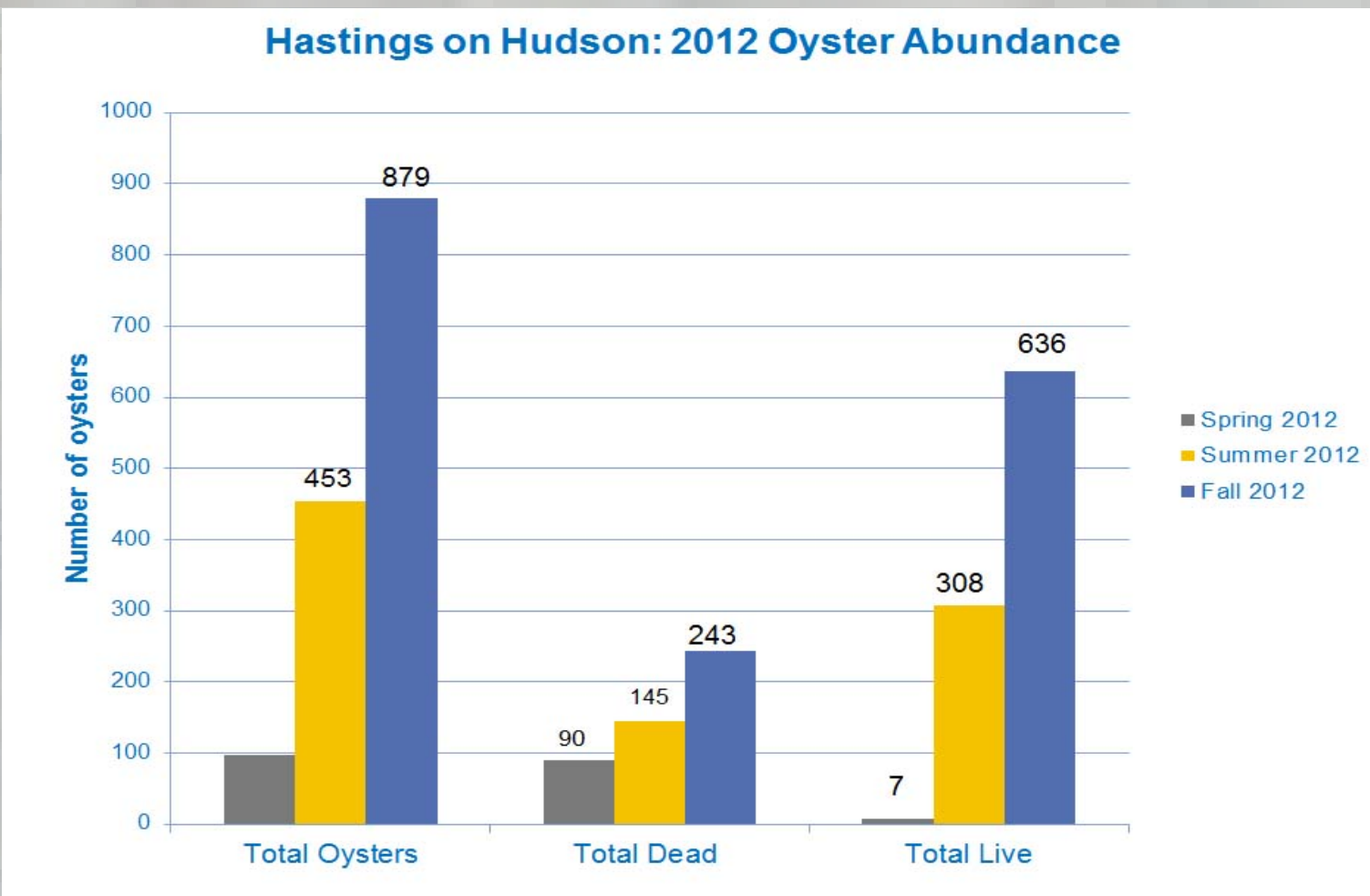
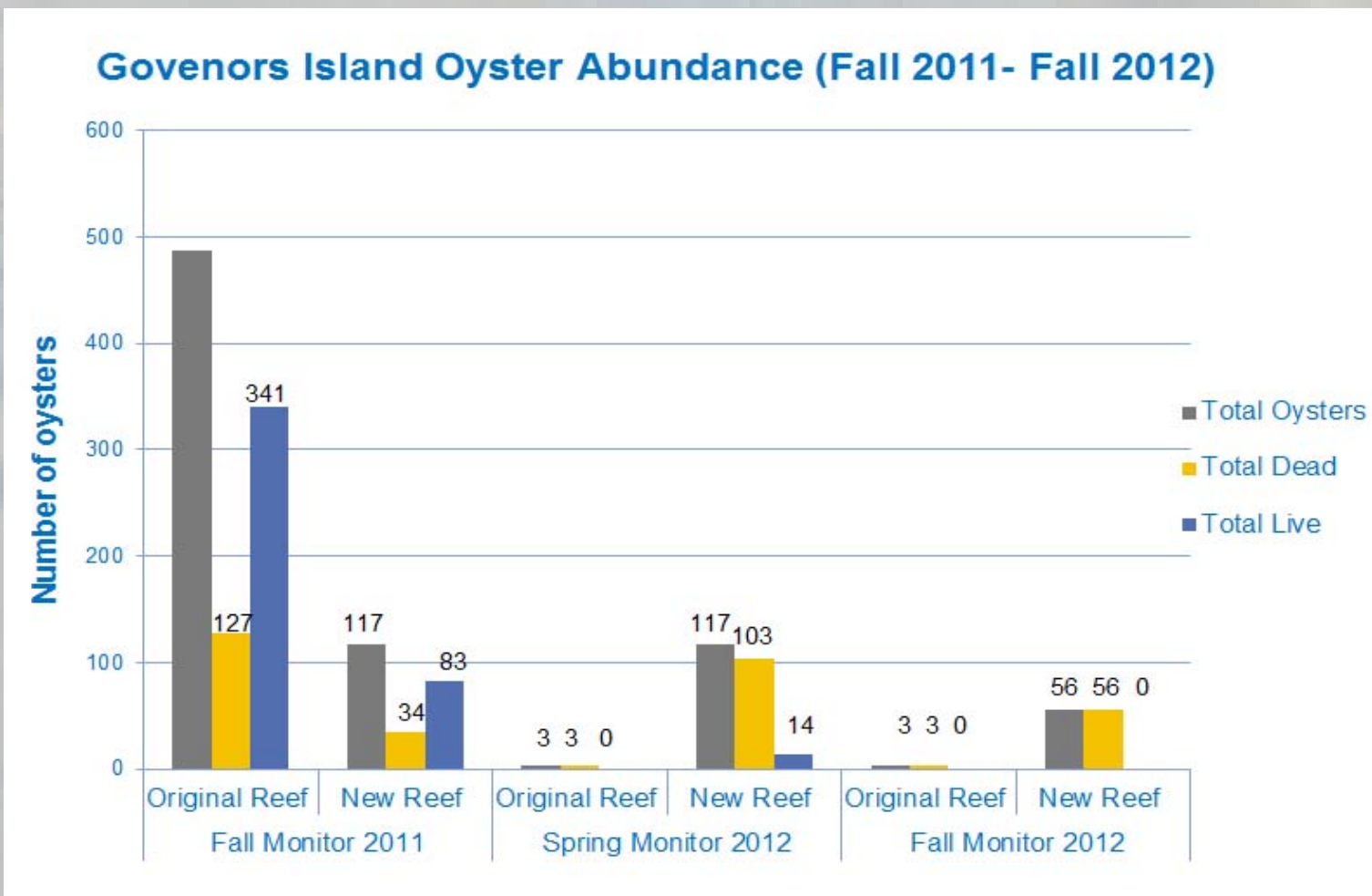


## Progress from 2009 - 2012

Five experimental reefs were constructed in Sep-Oct 2010 by putting down a rock (6" Rip-Rap) base with a thin covering of dead surf clam shell (see schematic at lower left and photos below). This task was accomplished by the NY District US Army Corps of Engineers, using a spud barge with an on-board crane. Reef size averaged about 5m x 10m. The reef bases were "seeded" in Oct-Nov 2010 with oyster spat-on-shell (SOS) produced by remote setting in the aquaculture facilities of the New York Harbor School on Governors Island. ORRP partners seeded the reefs by manually spreading the SOS onto the rock/shell reef bases.



The constructed reefs were sampled during 2010-2012 to assess their development (oyster growth and survival, and natural recruitment). Of the five, only three showed good potential for long-term development and sustainability: Soundview, Hastings, and Governors Island. All three showed good growth of the SOS and some natural recruitment (see graphs below and poster by Ward et al.).



## Scaling up at Soundview

The rationale behind constructing small experimental reefs at multiple sites was twofold: to test the overall reef design, and to identify sites with the most potential for full-scale restoration efforts. A major design issue identified in Phase 1 was erosion and transport of the SOS off the reefs by waves and boat wakes. Overcoming this transport loss is critical for successfully restoring oyster reef habitat in the high energy and low natural recruitment environment typical of New York Harbor. Of all the Phase 1 study sites, Soundview had the best combination of natural recruitment, survival and growth. Thus, funds were sought and secured from the Wildlife Conservation Society and NOAA Lower Bronx River Partnership to construct a 1-acre reef in 2013.

## Reef Design

The first step in reef design was a bottom map of the restoration area. ORRP partners used a balloon mapping technique to capture very high resolution images of the study area (see images below). A photomosaic was constructed from the photos showing major bottom features, including the ORRP experimental reef, other rocky areas, and soft sediments. The imagery was ground-truthed by walking multiple transects across the area at low tide and sampling the bottom. The overall plan is to deposit cured surf clam shell (200 - 400 yd<sup>3</sup>) in areas with soft sediments (approximately half of the 1-acre restoration area) to result in a total of 1 acre of hard bottom (see lower right image). While the project will rely primarily on natural recruitment we will also supplement natural recruitment with aquaculture derived remotely set spat-on-shell using native broodstock from the wild population. The spat-on-shell will be grown out in 2'x2'x0.5' cages and allowed to grow together to form one solid "block". These blocks will be placed in various configurations within the project footprint to test different designs to limit erosion and transport off the reef.



## 2013 & the Future

Reef construction is planned for 2013, with shell deposition in early summer followed by spat-on-shell in the fall. Assessment of reef development and performance will begin immediately after construction and will continue through the Spring of 2015. ORRP partners are planning additional oyster restoration research studies at sites in: Wallabout Basin, NY; Governors Island, NY; Jamaica Bay, NY; and Raritan Bay, NJ.

**Additional Oyster Restoration Research Project Partners:** United States Army Corps of Engineers, The Port Authority of New York & New Jersey, The NY Harbor Foundation, The Trust for Governors Island, The New York - New Jersey Harbor Estuary Program, The New England Interstate Water Pollution Control Commission, New York City Department of Parks and Recreation Natural Resources Group, New York City Department of Environmental Protection, United States Environmental Protection Agency, New York State Department of Environmental Conservation - Hudson River Program, NOAA Restoration Center, Bay Ridge Flats Oyster Project, Rocking the Boat, and the Bronx River Alliance. A special thanks to Bart Chezar for his work on the Bay Ridge Flats reef, Mike Pretty and Tim LaFontaine from Army Corps of Engineers and the students from the Harbor School.

