HEP Oyster Subcommittee Meeting
March 27, 2019
Oyster Project Updates

Ryan Morrison (BOP)-BOP Soundview Park Oyster Project

- Led by BOP and funded by NYSDEC ($1.375 M over 4 years)
- Partners include NY/NJ Baykeeper, Hudson River Foundation, and Bronx River Alliance
- Goals of Project:
  - Construct new oyster reef habitat out of loose shell and gabions
  - Quantify ecosystem services
  - Engage community
- Project will be 5 acres total and consist of:
  - 250 gabions
  - 25 million live oysters
  - 1,400 cy loose shell
- Oct 2018-Sediment and benthic surveys completed
- July 2018-Phase 1: installation (as long as permits are in hand)
- Monthly monitoring will start in August

Jim Lodge (HRF)-Tappan Zee Bridge

- Pilot Study-3-year (2015-2017) pilot study funded by the NYS Thruway Authority.
  - Oyster research conducted by the Hudson River Foundation in partnership with the University of New Hampshire and the NY Harbor Foundation
  - Monitoring data suggests that oyster recruitment, growth and survival can be expected at three identified site locations
  - Consistent recruitment and survival of oysters at Site 8, where salinity and dissolved oxygen were well below levels considered optimal for eastern oyster growth and survival
- Mitigation Project
  - NYS Thruway Authority funded the ~ 6 acre oyster mitigation project.
  - TZB pilot study use to design and site the project.
  - Project is 6 acres in total with 3 sites consisting of 440 gabions and 900 reef balls

Hannah Davis (SCAPE) and Danielle Bissett (BOP)-Living Breakwaters Project

- Project Update
  - 100% Design is finished
  - Construction will begin June 2019 and finish by 2021-pending permits
  - Permit has been submitted and is under review
  - Construction will go out to bid

    - Project goals: reduce risk (erosion and storm waves); enhance ecosystem services (near-shore and shoreline), foster social resilience (education, stewardship, public access)
    - Ecological design consists of traditional breakwater and reef streets to increase complexity and habitat
- Overview of Proposed Oyster Installations:
    - Armor Unit: Shell + Mesh Treatment
    - Armor Unit: Disk Treatment
    - Loose Shell Installation (spat-on-shell and blank shell)
    - In-Situ Trials -tenting
    - Gabion Installation
- Preliminary Research Goals/Monitoring: survival, growth, density/clustering, reproduction, Bivalve Larvae Identification System, recruitment, ecosystem services, broodstock Comparison
- Permits are pending

Michael McCann (TNC) -TNC Oyster Report: Restoring Oysters to Urban Waters

- Report summarizes the history of oysters in NY/NJ Harbor. Reviews past and present efforts to bring oysters back to these waters and involve communities in the process. Aimed at restoration practitioners, researchers, advocates, policy makers, funders, fundraisers, educators, and students.

Katie Mosher (BOP)-Head of Bay Oyster Project

- Partners: NYC Department of Environmental Protection; BOP; HRF; Dr. Ray Grizzle, UNH; Cornell Cooperative Extension; HDR Inc.
- Donor reef (35K adult oysters) installed Sept. 2016
- Four receiver reefs (approx. 1 acre, 700 cy clam, 180 cy porcelain, 100 cy oyster) installed Oct. 2016
- Supplemented donor reef with 9k adults in Oct. 2017
- Placed oysters on bottom in Mar 2019
- Models demonstrated ideal conditions for oyster growth and recruitment: salinity, temp., DO, slower tidal dispersion rate; limitations: lack of substrate and larval supply.
- Objectives: assess water quality and ecological benefits; provide info on: effectiveness of water quality & ecological benefits, effectiveness of "attractive nuisance" safeguards, and what is required to restore a significant habitat
- Tasks: hydrodynamic profiling; sediment type survey; bathymetric profiling; oyster monitoring-growth and mortality, oyster condition index, disease testing, sex ratios/reproductive Stages
- Findings:
    - Island Creek oysters avg increased ~10mm (very big to start).

    - Merry Oysters increased ~20mm
    - 2017: post-spawn adults and good balance between male and female. Dermo was highest at HOB (of BOP sites). MSX not detected.
    - No recruitment found on spat collectors (HRF). Observed three recruits on Donor Reef in 2018/19.
    - Plankton tows were conducted from 6/27/18 - 9/06/2018 (HRF) and analyzed (Hare Lab) for presence/absence of C. virginica DNA. Positive results suggest that at least some larvae growing and persisting in Jamaica Bay for over a week.
- Data from the trays and info provided by the divers in 2018 confirm the reefs were providing substantial habitat for fish, invertebrates, and seaweeds (Grizzle)
- BOP & NY Harbor School contributions: professional diving, aquaculture, vessel operations, Alumni Crew, Marine Systems, Technology Interns
- Summer 2019 monitoring: Bivalve Larvae Identification System (BLIS); baseline data: adults on reefs, spat surveys on reefs, analysis and report writing

Meredith Comi (NY/NJ Baykeeper)-NWSE Living Shoreline

- Deployed 120 oyster castles set with oyster spat at the Living Shoreline site, bringing the total number of oyster castles at the site to 500
- Castles are arranged into pyramids consisting of 30 castles each
- Pyramids are spaced 10 feet apart and modeled after the placement of Wave Attenuation Devices (WADS)
- A total of 1.5 million larvae were added to the setting tanks in 2018
- Monitoring:
    - Performed via SCUBA and by examining oyster castles brought to the surface.
    - Photos taken during all phases of the project for documentation.
    - GPS points taken at each oyster pyramid and sediment trap, and during shoreline monitoring
    - Oyster Growth and Mortality: Good growth; high mortality due to oyster drills.
    - Reef Biodiversity: Fish trap treatments consisting of replicates of oysters/oyster shells and empty traps were deployed at the project site and left to soak for 48 hours. Monitoring showed the usual trends-more species present in the cages that contained habitat. Juvenile fish species were also present, indicating that fish species are using the living shoreline as a breeding and nursery area.
    - Water Quality: Water quality measurements were taken both in the aquaculture tanks and in the field using a YSI Pro DSS handheld meter.
    - Shoreline monitoring in partnership with Biohabitats, Inc. to characterize the biotic and non-biotic features of the intertidal zone and identify any apparent trends influencing the site.
    - Reef Integrity: Observations showed little or no movement of the oyster castles, even with several severe storms.
    - Deployed 50 sediment traps to assess the efficacy of the breakwater's ability to slow down water and wave energy, allowing sediment to settle out and increasing

sedimentation on the shoreward side. Sediment from the traps are baked, weighed, and sieved for grain size.

- Summer 2019: Expand LS with oyster castles set with juvenile oysters; monitor for oyster growth and survivorship; monitor for biodiversity; monitor for natural recruitment; disease testing; shoreline monitoring; sedimentation monitoring

Lisa Baron (USACOE)-Hudson Raritan Estuary Ecosystem Recommended Sites

- Oyster Restoration Recommended Sites-recommended for funding to advance the projects to the pre-construction engineering and design phase.
    - NWS Earle
    - Head of Bay
    - Bush Terminal
- NWSE Advanced first
- Feasibility Report due June 2019