Long Island Shellfish Restoration Program: Origins and purpose

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How did we get here?

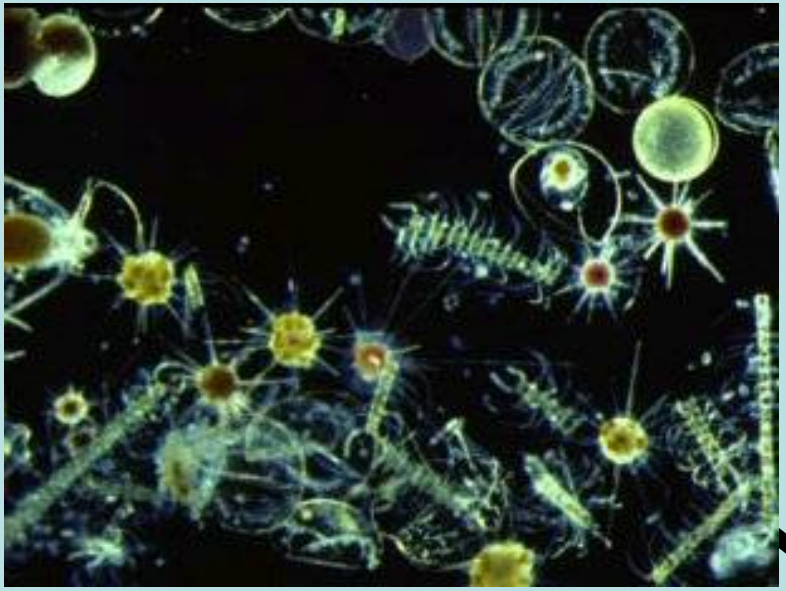
A 5-Point

$10.4 million shellfish restoration

project all across Long Island...

Great South Bay, May 2017

Why Bivalves?



Clearing plankton from the water column is a primary ecosystem service of bivalves.

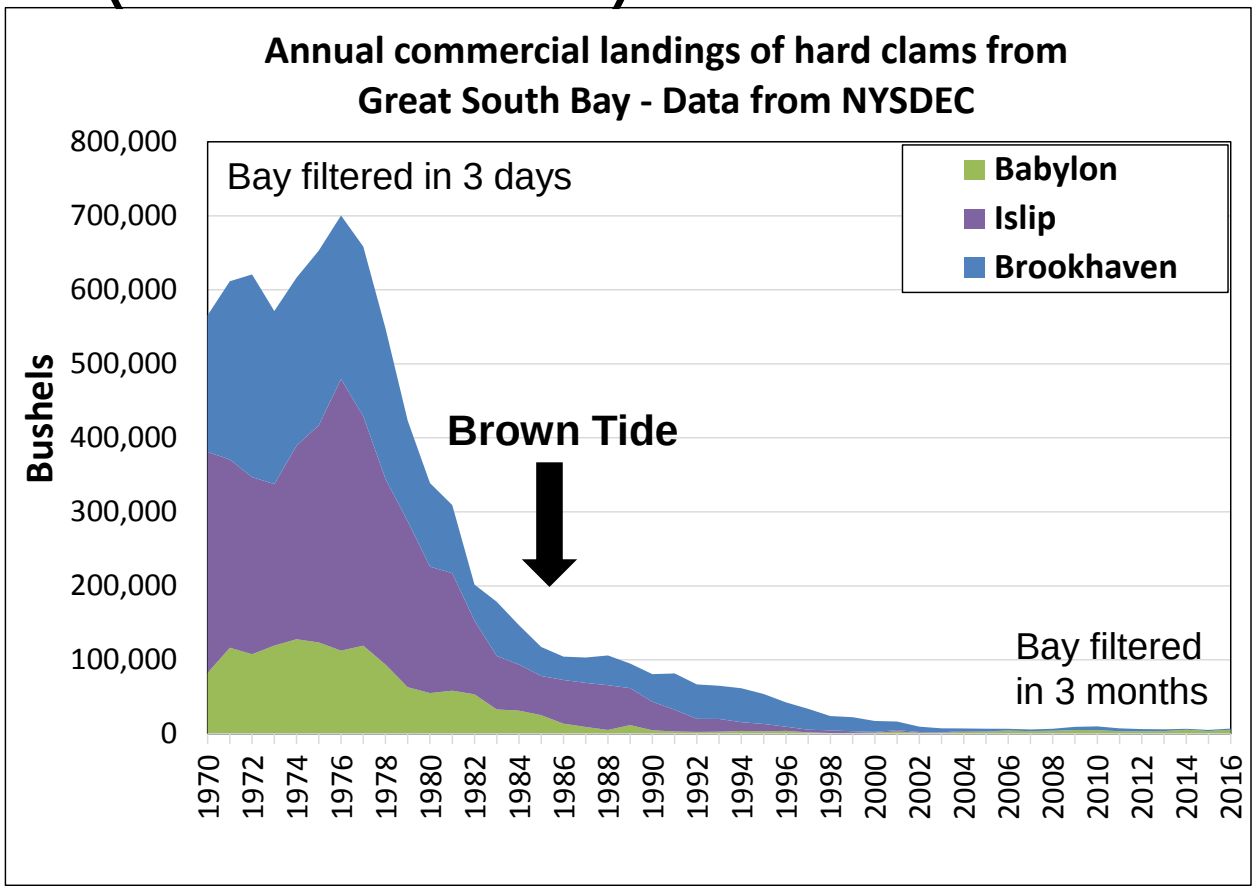
Bivalves are ‘Ecosystem Engineers’

Bivalves are filter feeders, and when in large numbers can:

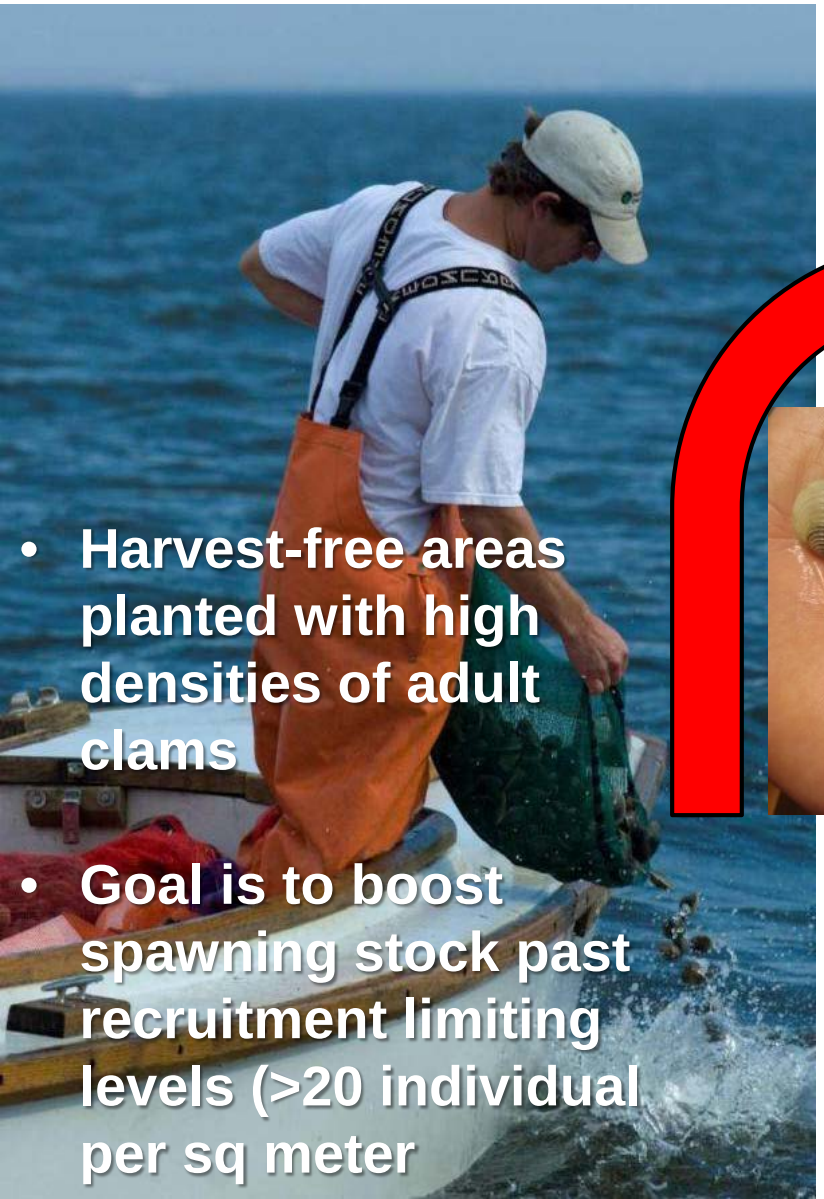
- Control phytoplankton abundance
- Reduce harmful algal blooms
- Improve water clarity

Collapse of hard clam populations in South Shore bays

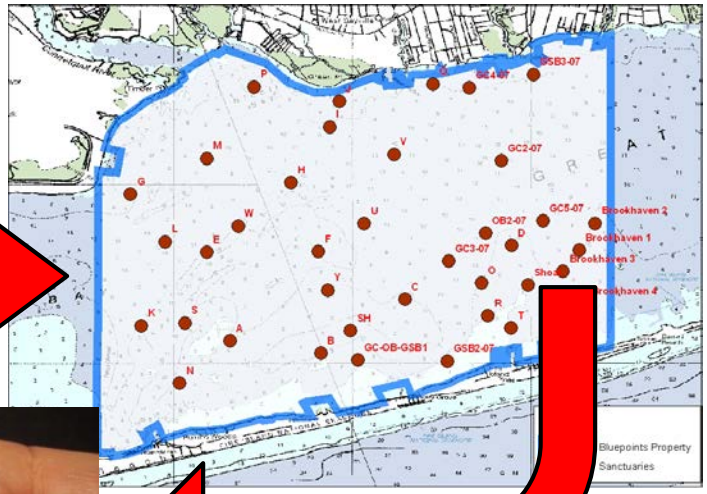
- **Hard clam populations were decimated by overfishing, and recurring brown tide blooms since the mid-1980s have impeded their recovery.**
- **Populations are now recruitment limited (Kraeuter et al. 2005)**



Hard Clam Spawner Sanctuaries

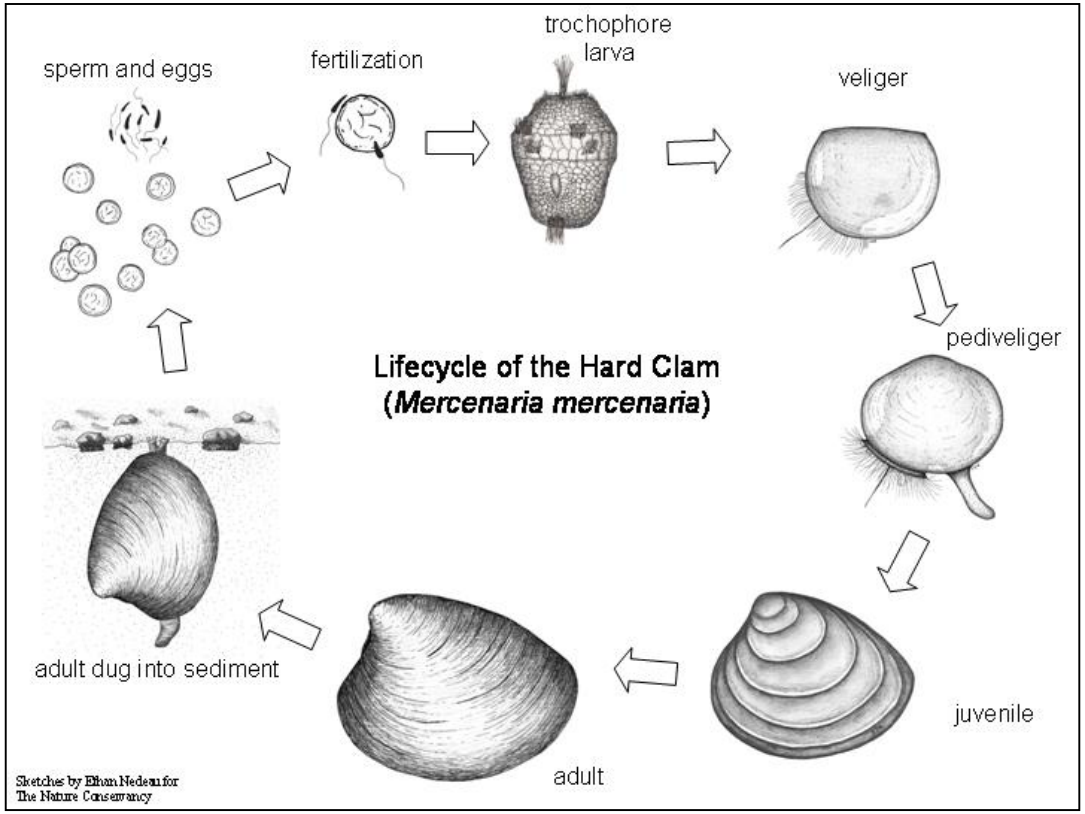


- Harvest-free areas planted with high densities of adult clams
- Goal is to boost spawning stock past recruitment limiting levels (>20 individual per sq meter



Intermediate Steps to Successful Restoration

Survival, Growth, & Retention of larvae

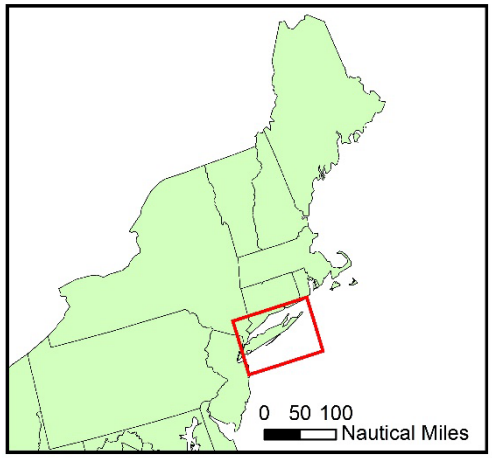


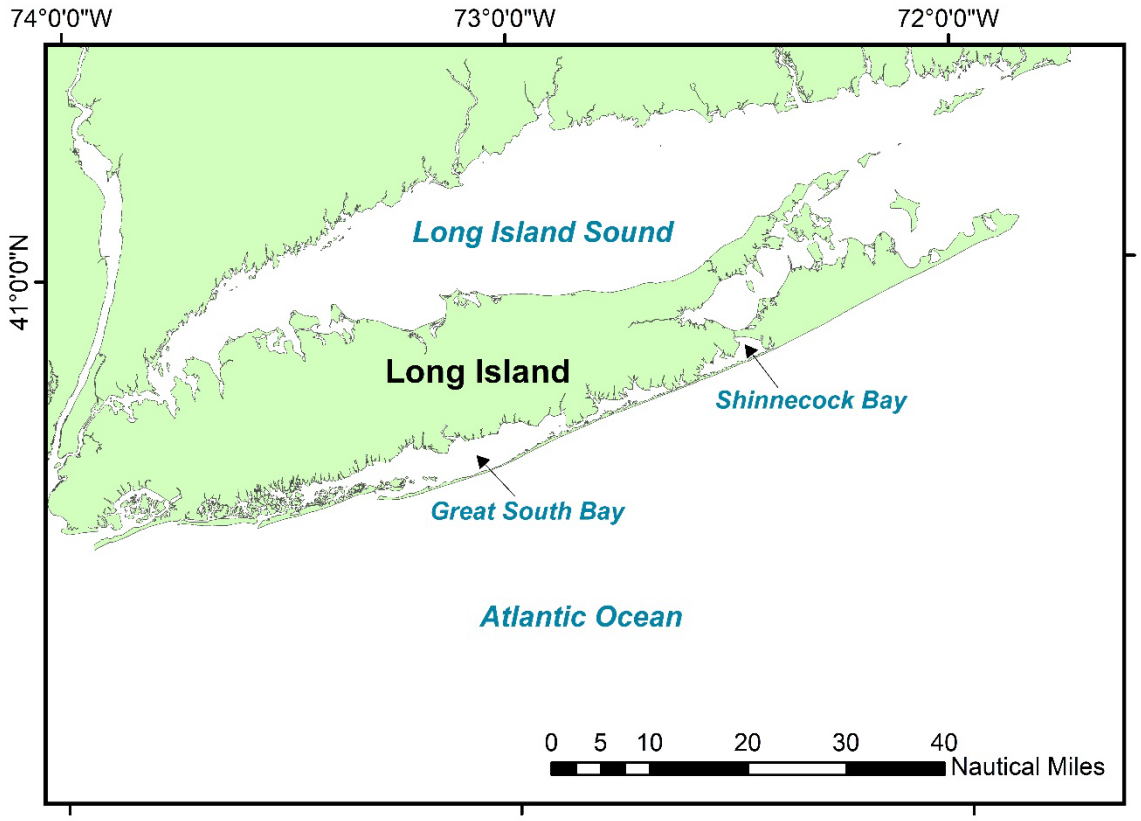
Recruitment

Survival & Growth of Juveniles

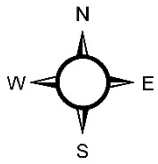
Condition & Spawning

Hard Clam Restoration in South Shore Estuaries in Long Island, NY





Stony Brook University



Coordinate System: NAD 1983 UTM Zone 18N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Author: Peter Larios

SHINNECOCK BAY
RESTORATION PROGRAM

Since 2010, oyster and clam restoration have been major components of Stony Brook University's Shinnecock Bay Restoration Program



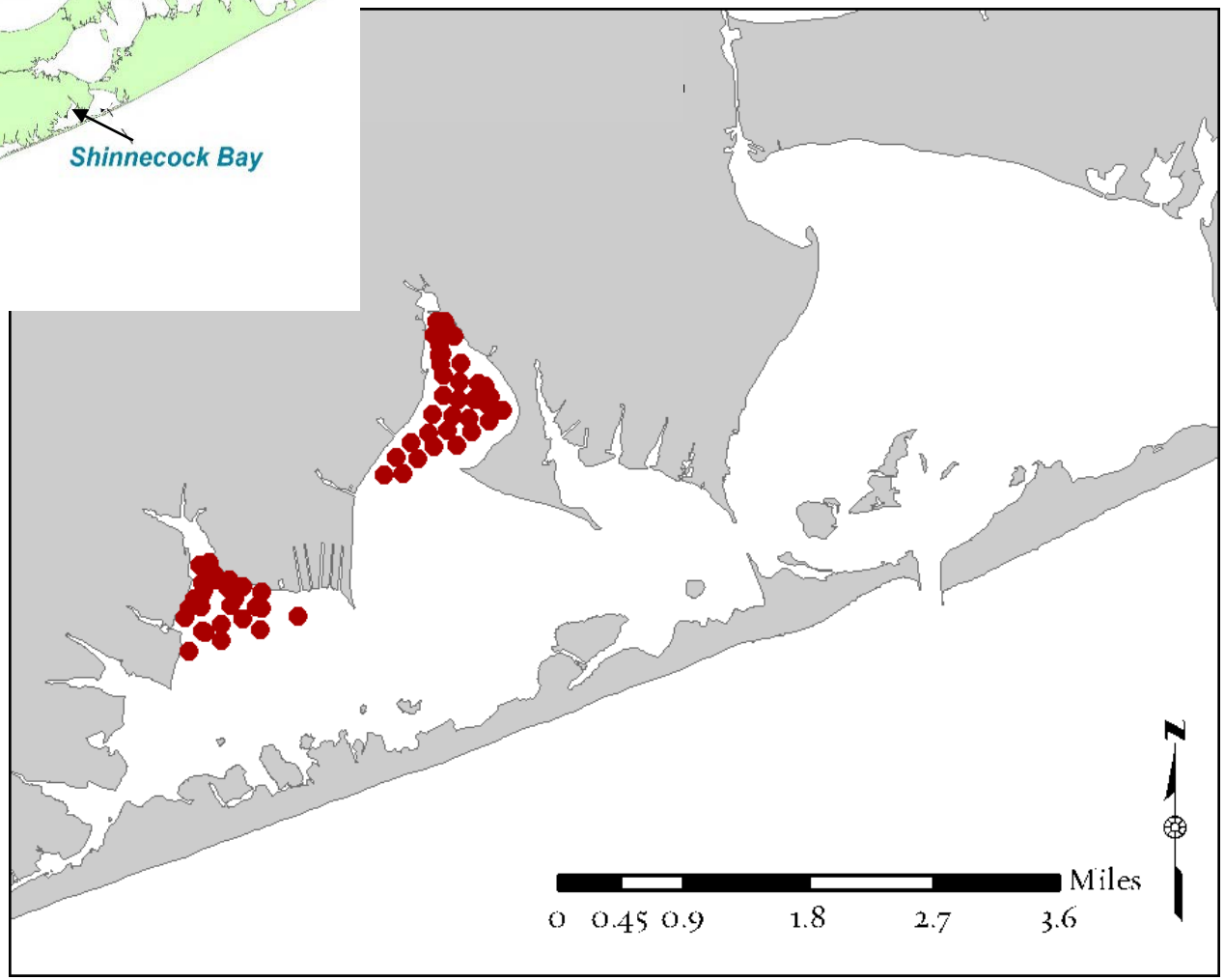



Shinnecock Bay

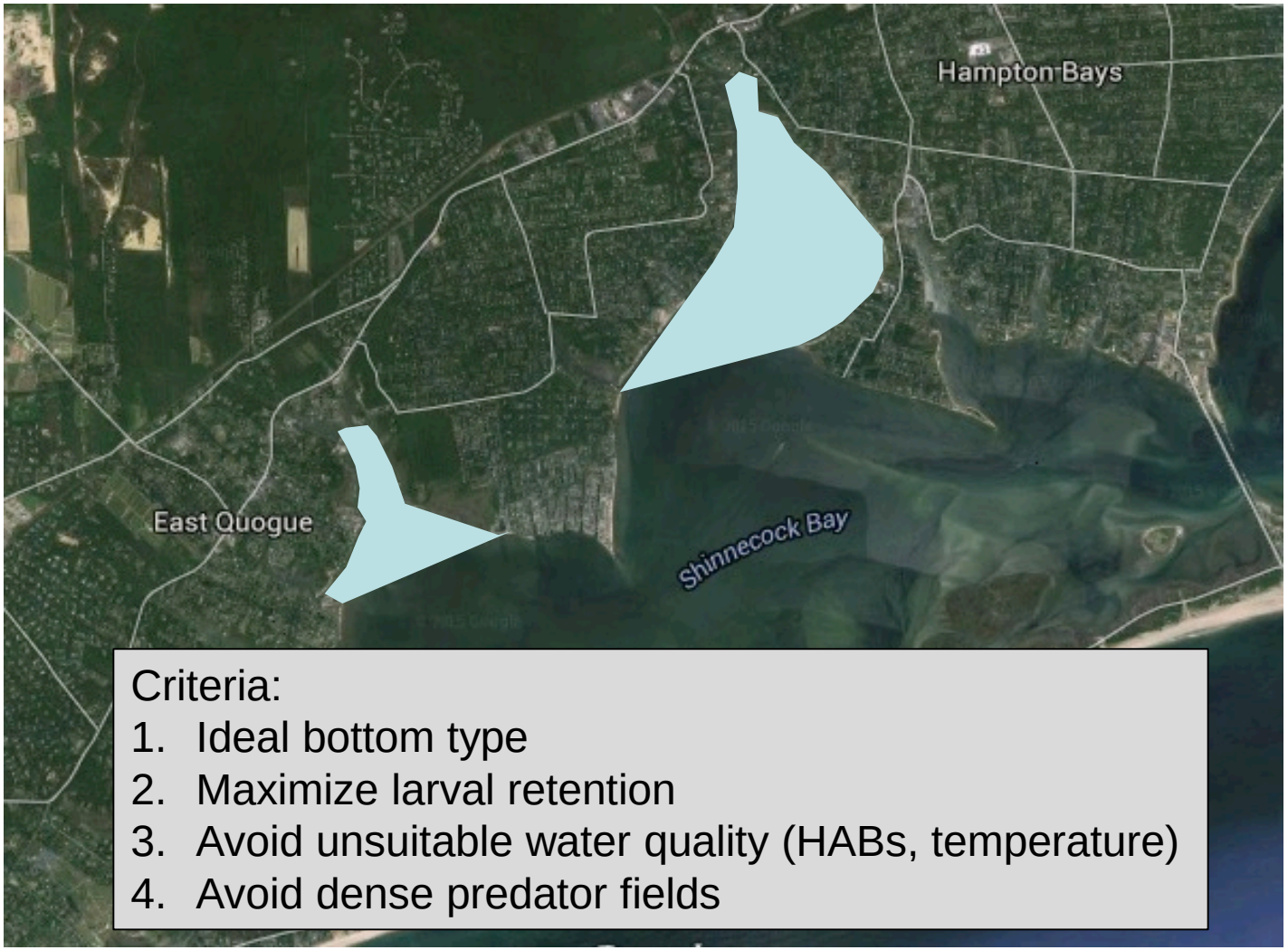
Since 2012, Stony Brook University has planted three million clams to 57 sites in western Shinnecock Bay

Stony Brook University
School *of* Marine and
Atmospheric Sciences

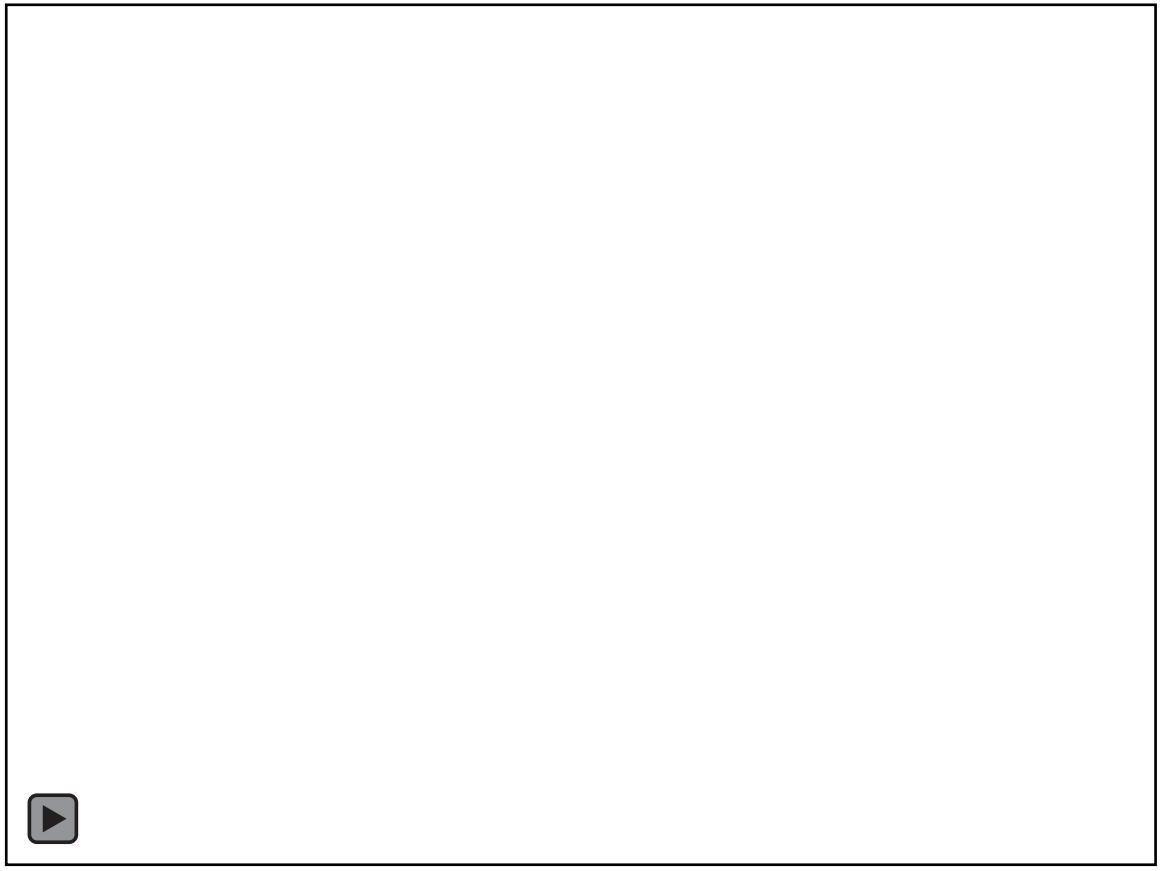
SHINNECOCK BAY
RESTORATION PROGRAM



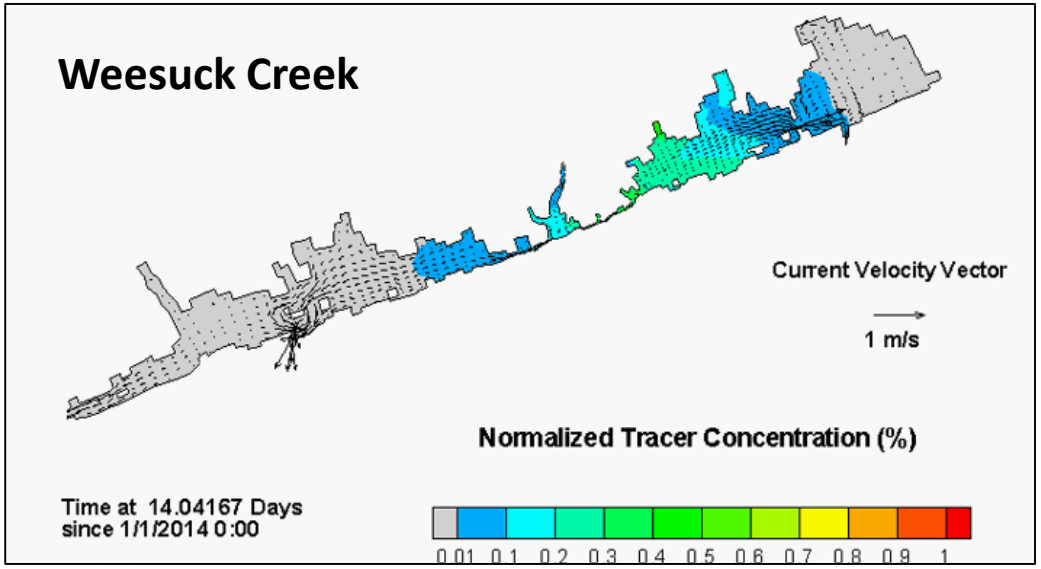
Hard clam spawner sanctuaries in Shinnecock Bay

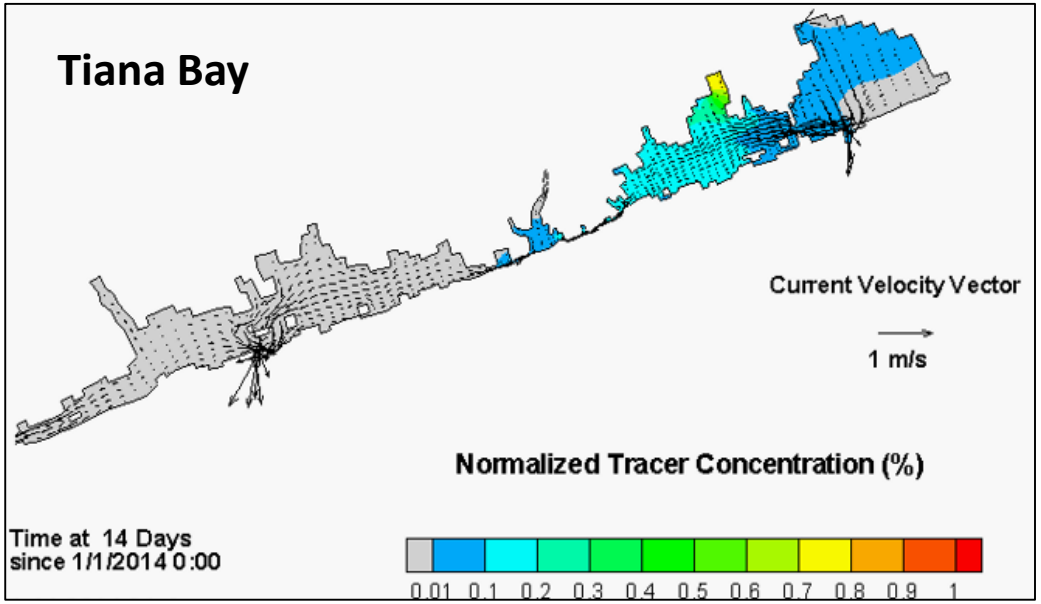


Transport and retention of larvae within the estuary

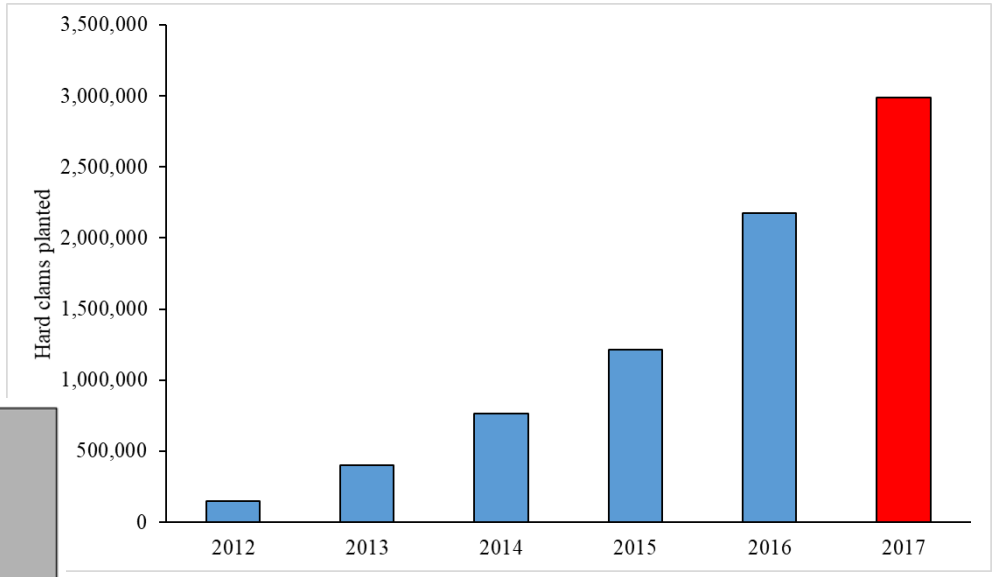


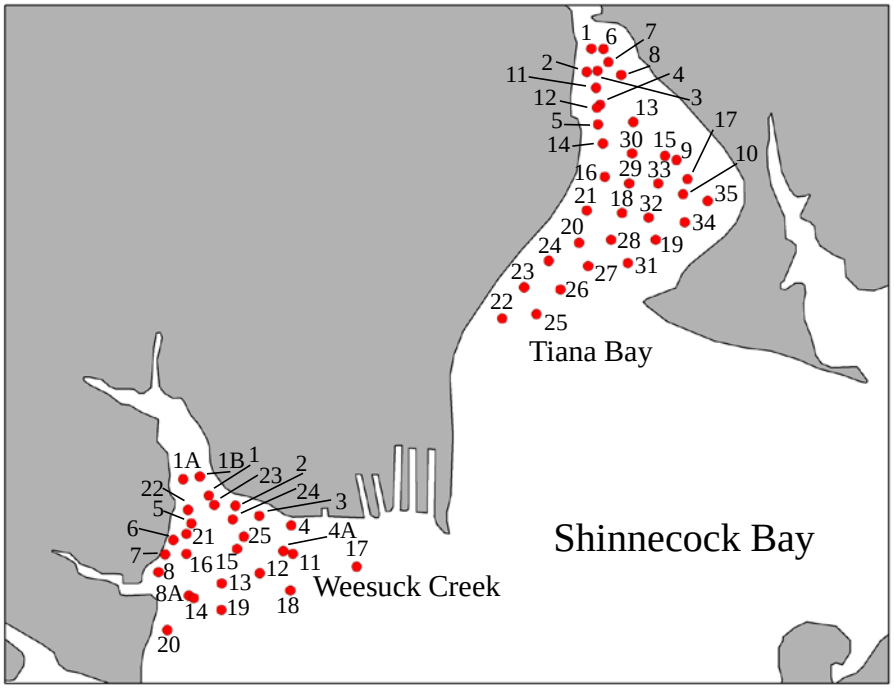
Hydrodynamic models indicate larvae produced from spawner sanctuaries are retained within the estuary



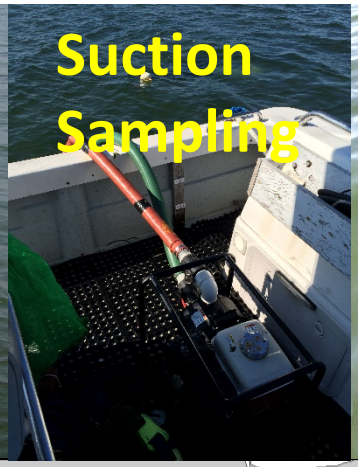


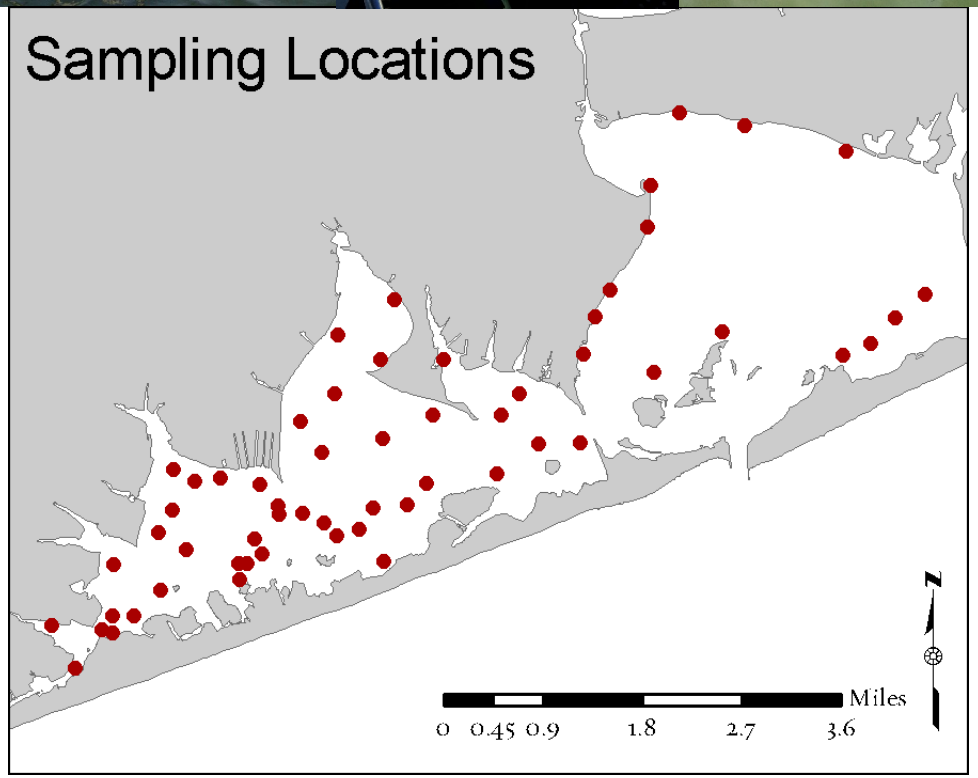
3 million clams planted to date across over 60 sites





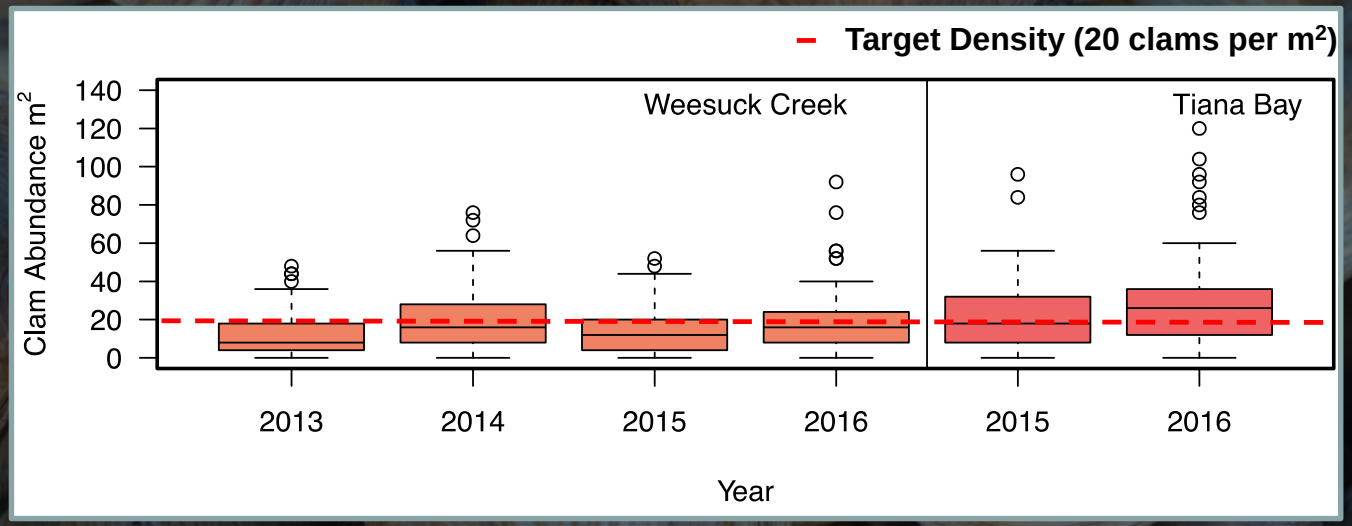
Clam Abundance Sampling – Shinnecock Bay



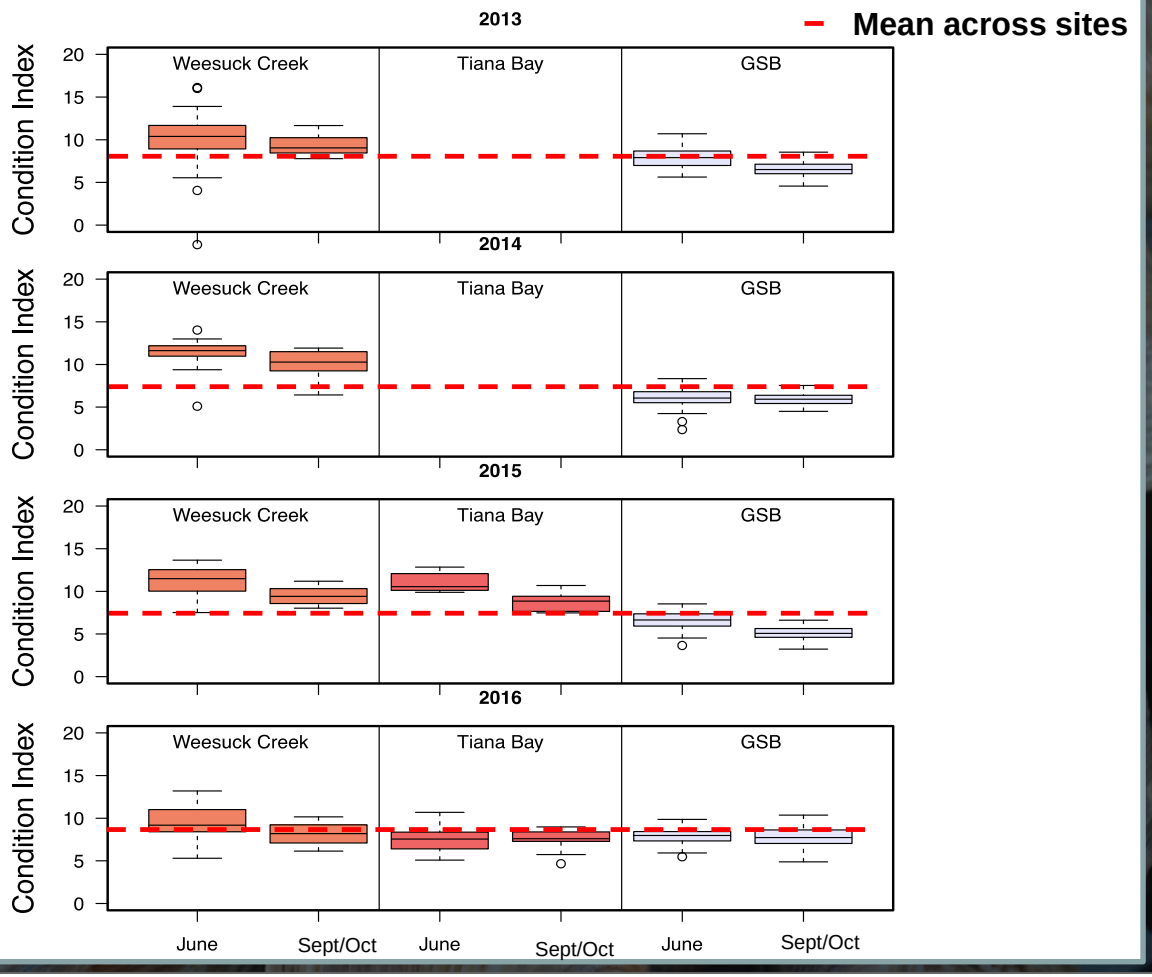


- **57 sample locations across SB**
- **Most sampling in western SB**

Clam abundance remains high in planted sanctuaries

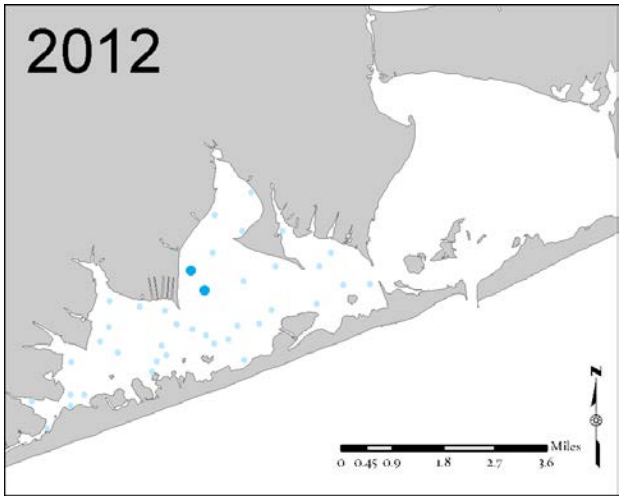


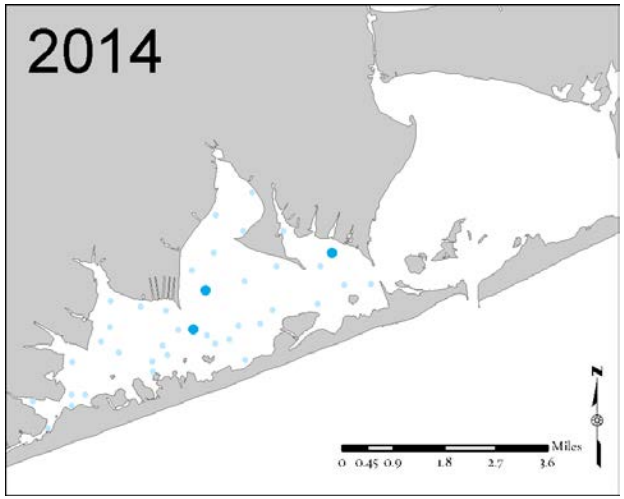
Clams in sanctuaries have high gonadal conditions, exceeding GSB

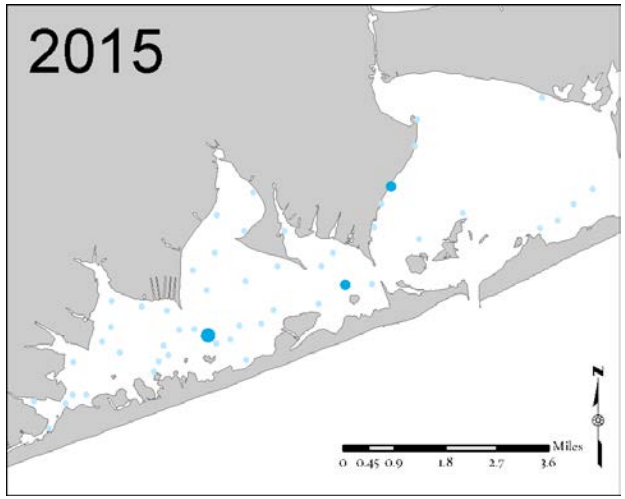


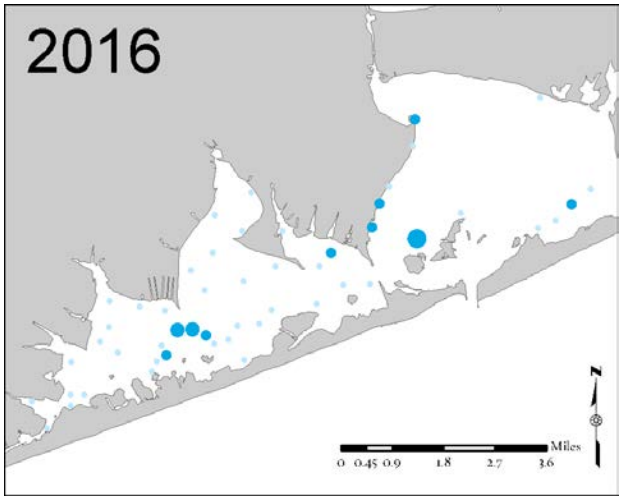
Juvenile Hard Clam Abundance Shinnecock Bay 2012-2017

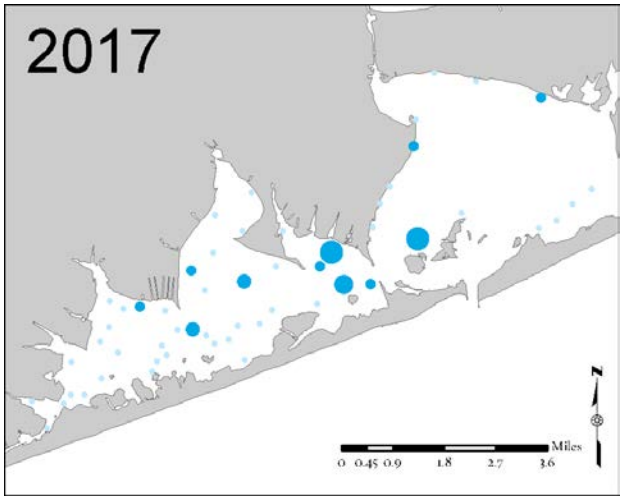
- **Progressive increases in juvenile abundance in 2016 and 2017**

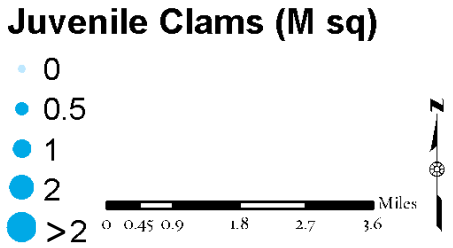






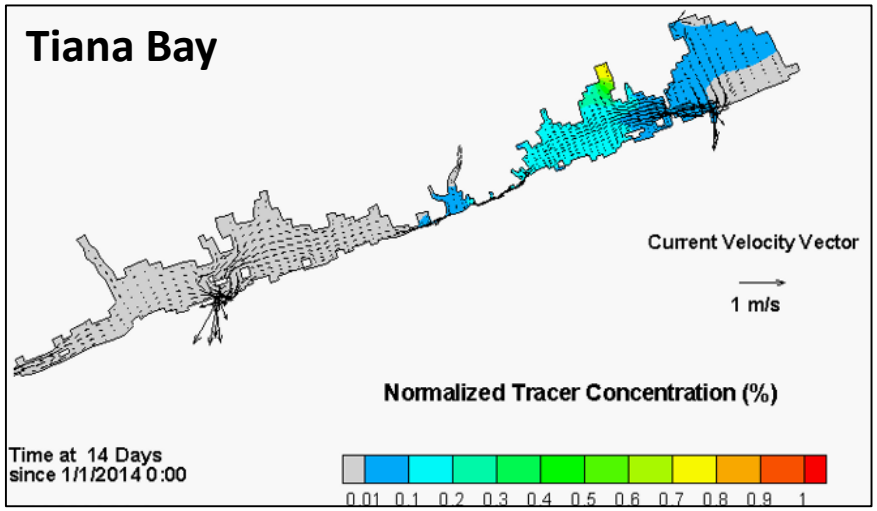


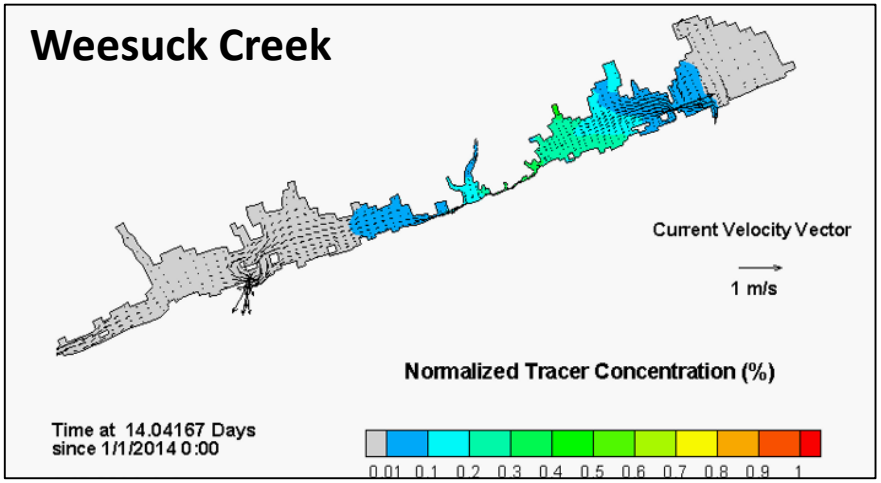


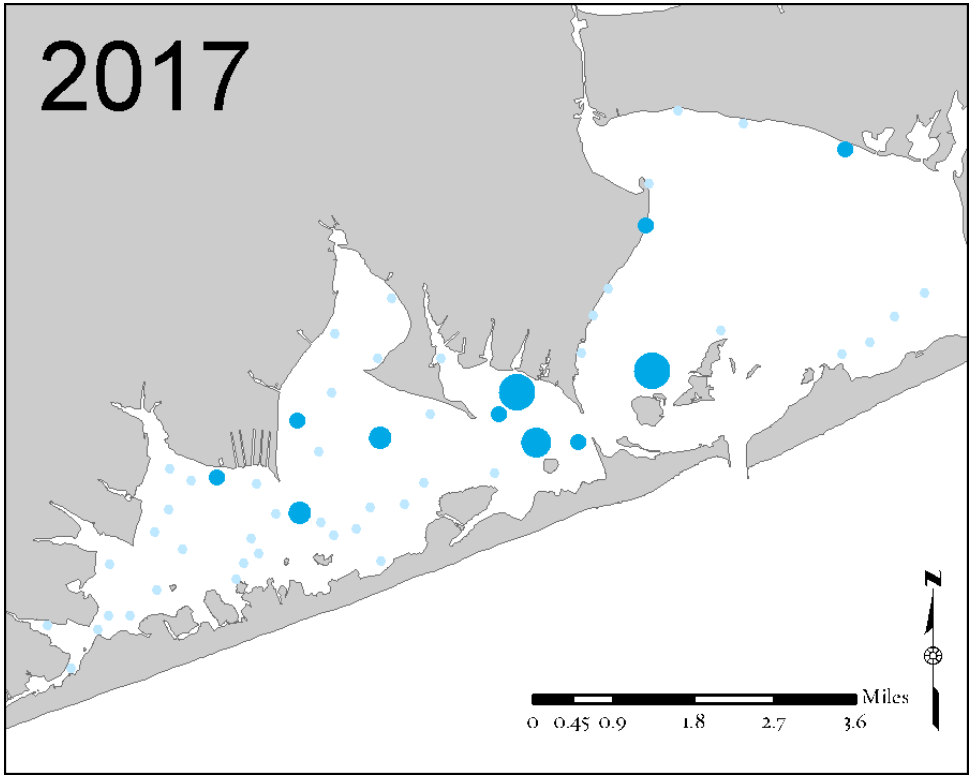


Larval Transport & Recruitment: Shinnecock Bay

- **Most recruitment observed east of the spawner sanctuaries, as predicted by the hydrodynamic models**



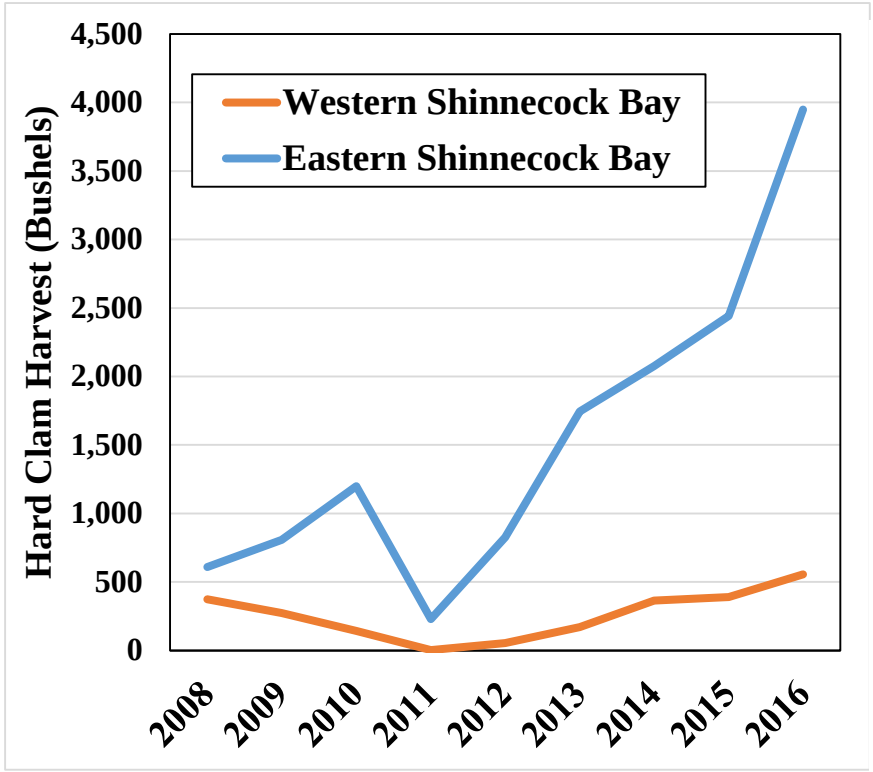




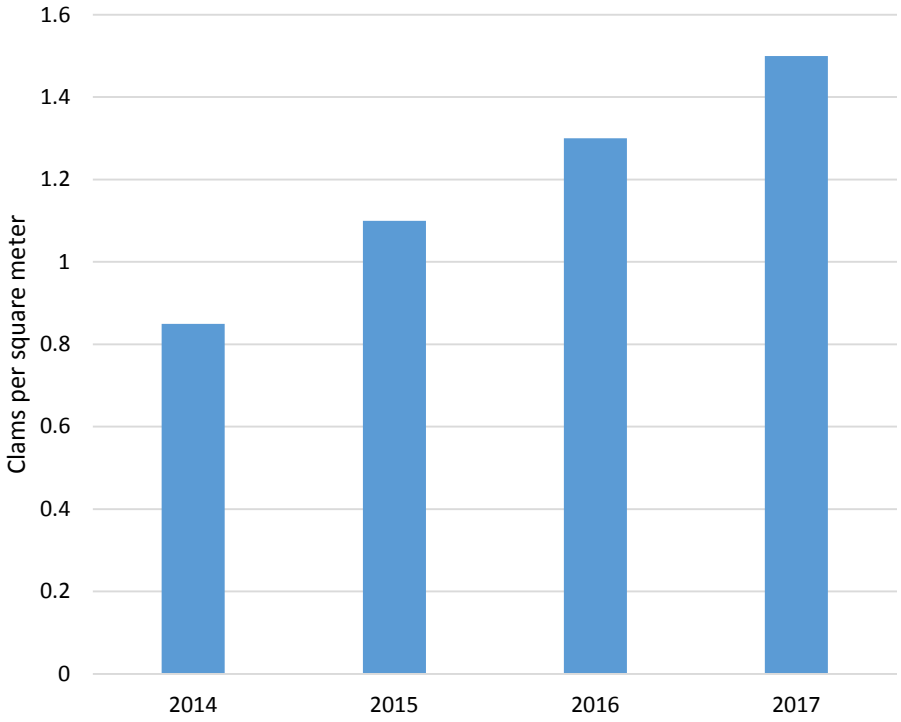
Growth & Survival of Recruits: Shinnecock Bay

- 400 - 500% increase in hard clam landings since start of restoration in 2012
- Doubling of abundance of adult clams in western Shinnecock Bay

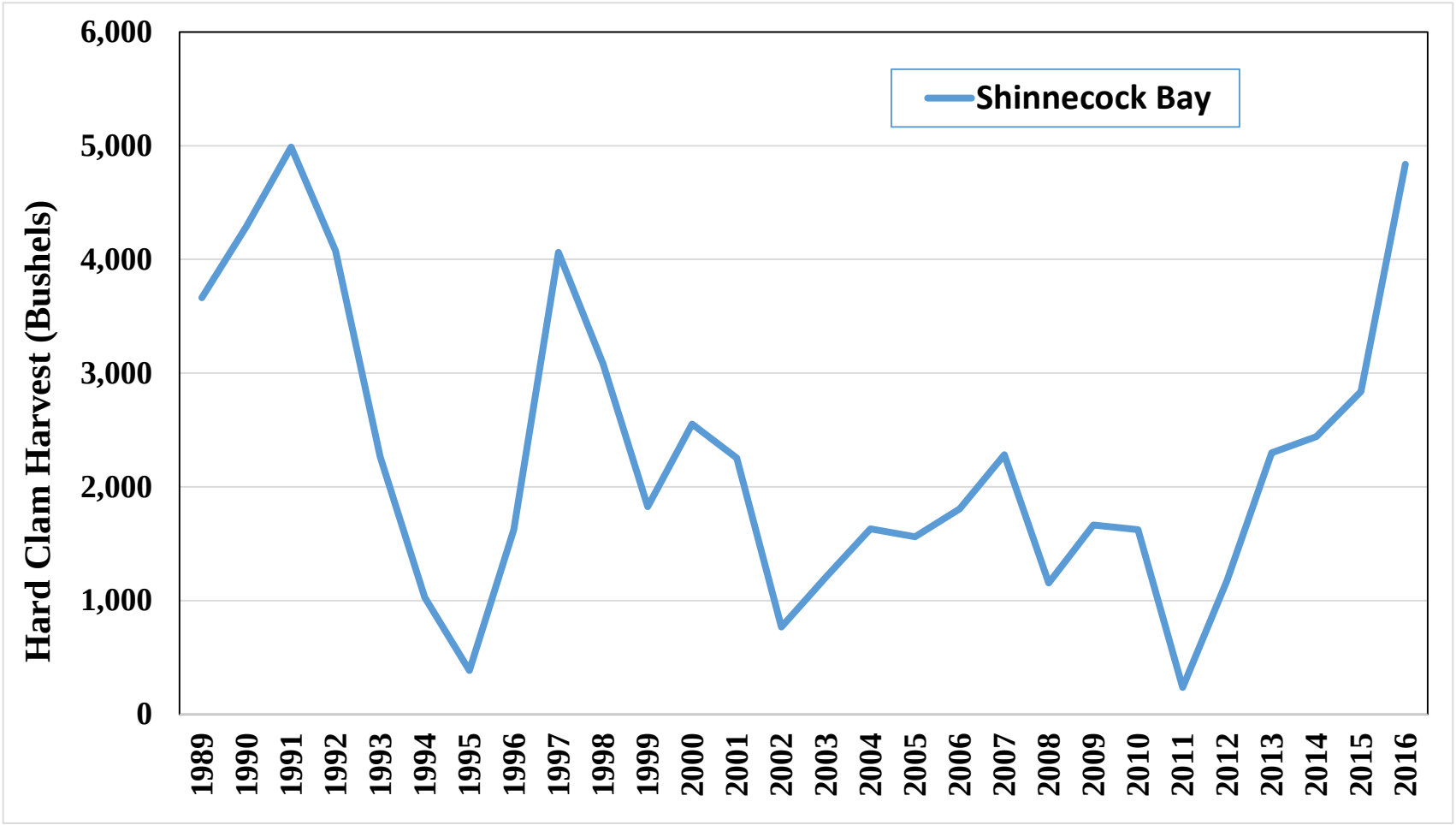
Shinnecock Bay hard clam landings data (NYS DEC)



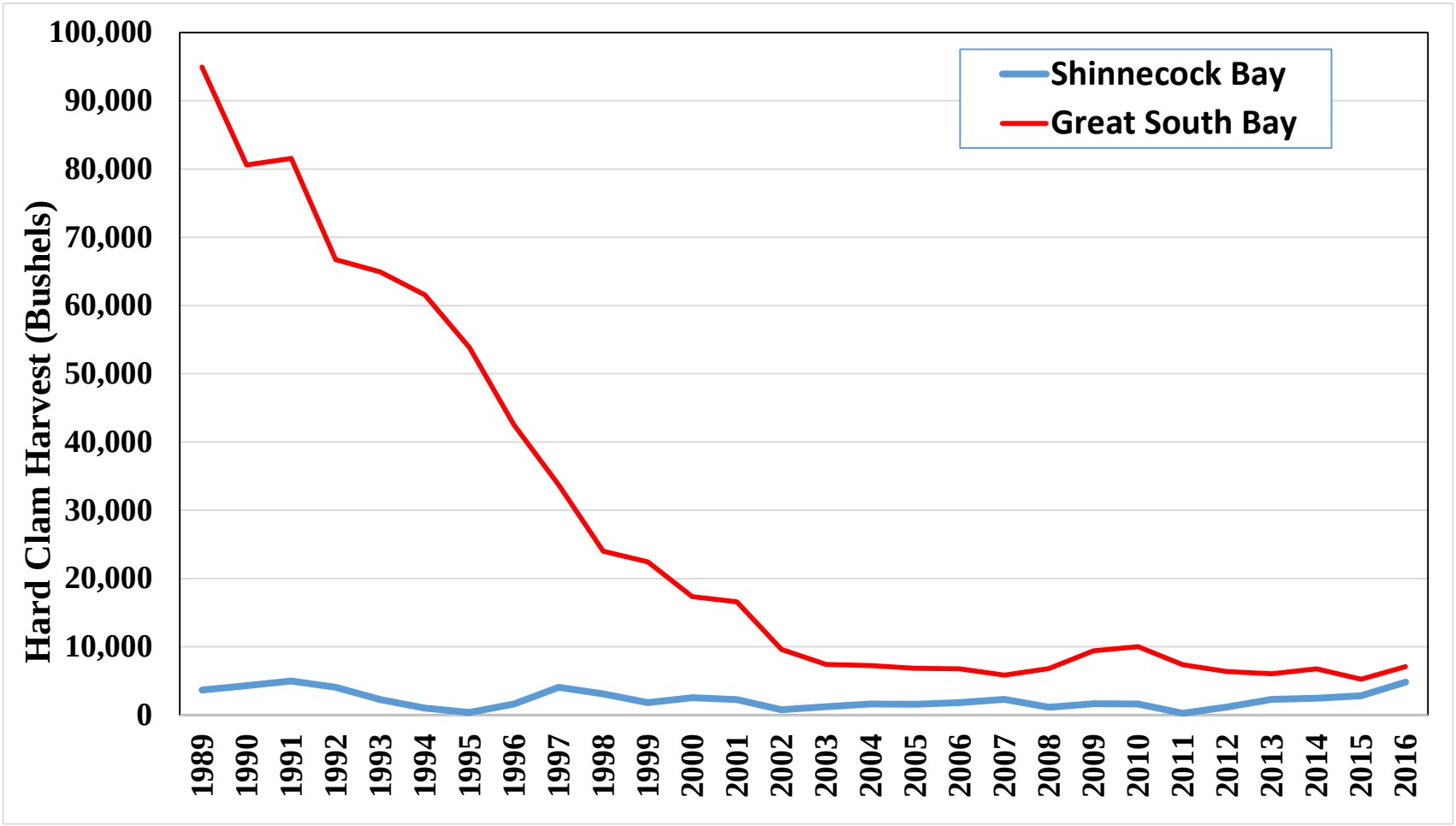
Adult abundance (clams >30 mm m^{-2}) Diver Benthic Sampling, western Shinnecock



Largest hard clam harvest in Shinnecock Bay in 25 years; 2017 likely higher



2017 landings of Shinnecock Bay likely to exceed Great South Bay



Creation of the Long Island Shellfish Restoration Project

May 2017

September 2017

Parameters for new spawner sanctuaries

1. Regions in need of enhanced filtration, improved water clarity / quality
2. Ideal bottom type; avoid hard bottoms and highly sulfidic muds
3. Maximize larval retention
4. Avoid unsuitable water quality (HABs, temperatures >30°C)
5. Avoid dense predator fields
6. Stock bivalves to a density that will ***filter the water column in three days or less.***
7. Sites of consensus for Governor's office and NYSDEC

1. ESTABLISH 5 NEW SHELLFISH SANCTUARY SITES

The plan will establish five new shellfish sanctuary sites at strategically-identified locations in Nassau and Suffolk counties...

4. LAUNCH THE SHELLFISH RESTORATION COUNCIL

SoMAS
School of Marine and Atmospheric Sciences
STONY BROOK UNIVERSITY

Cornell University
Cooperative Extension
of Suffolk County

BILLION OYSTER PROJECT
An initiative of the
NEW YORK HARBOR FOUNDATION

In order to monitor our progress,
we are forming the Shellfish Restoration Council
to be led by SUNY Stony Brook, Cornell Cooperative
Extension of Suffolk County and Billion Oyster Project.