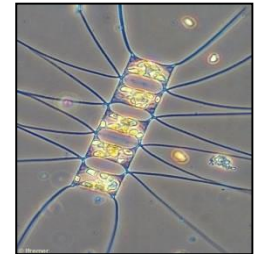
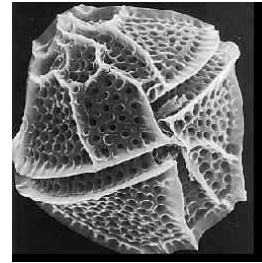


## *2.5 Storm impacts on coastal ecosystem and fisheries*

Participants : Christopher J. Gobler, Jackie Collier, Anne McElroy, Robert Cerrato, Brad Peterson, Jake Thickman



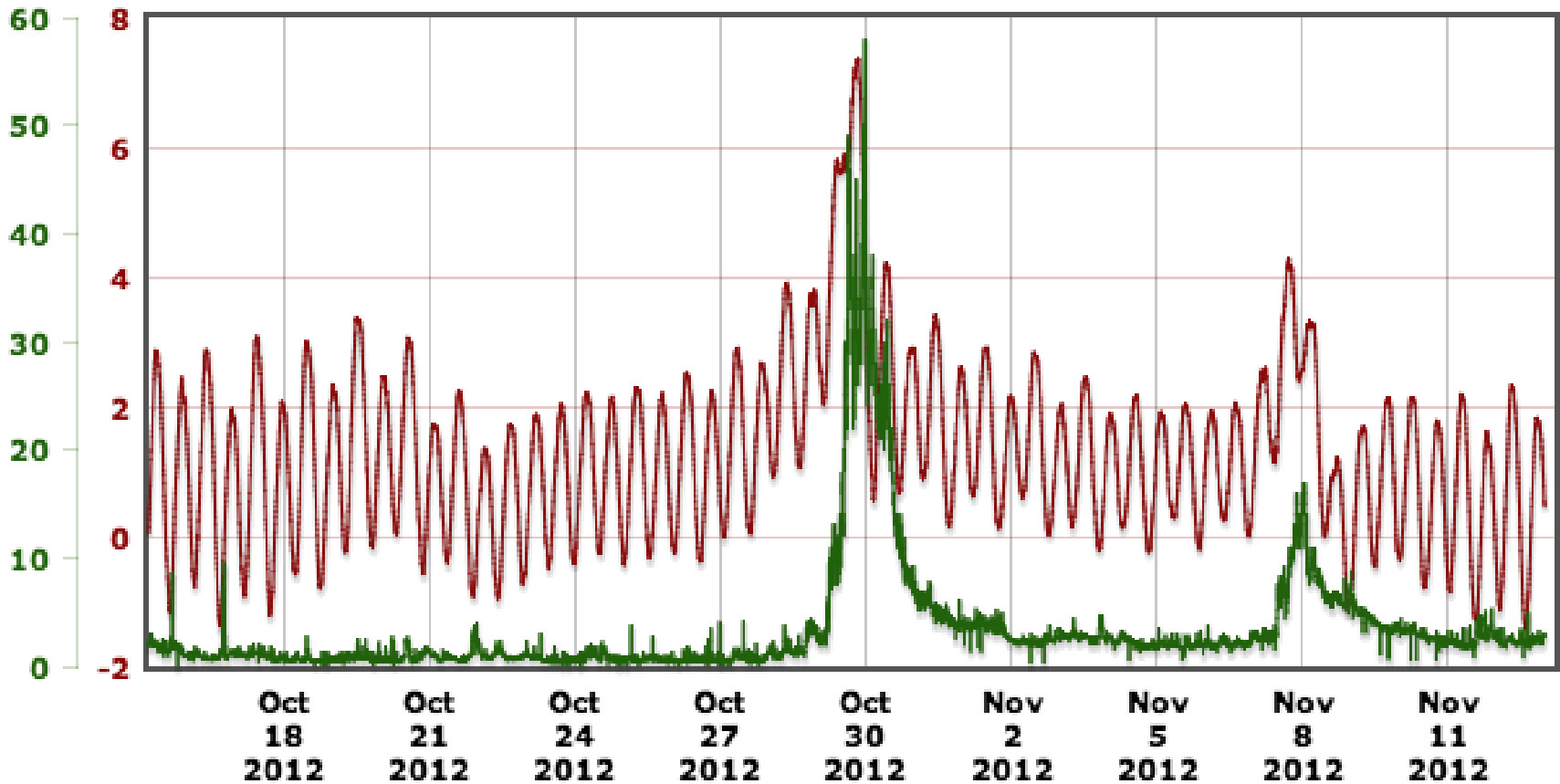
# Approach

- Assess the effect of Sandy and other storms on food webs and coastal water quality
- Contrast the seagrass condition at three permanent transects along a depth gradient in proximity of the breach from 2007-2012 to that of 2013.
- Assess how changes in crab populations due to storms may impact fisheries and food webs in NY estuaries.

# What are the acute impacts of storms on coastal waters?

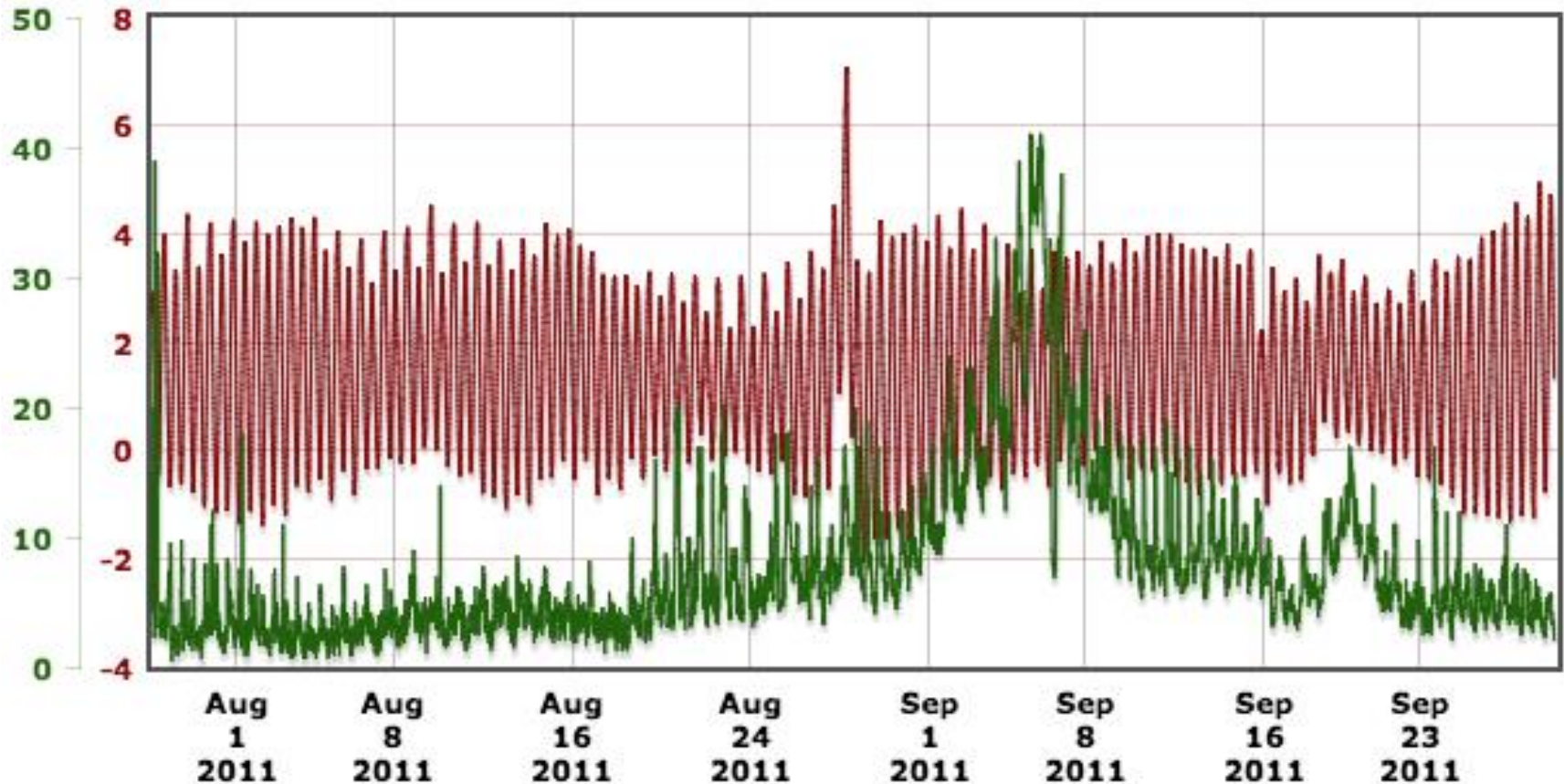


# Turbidity, Peconic Estuary, Hurricane Sandy (observed in multiple regions)



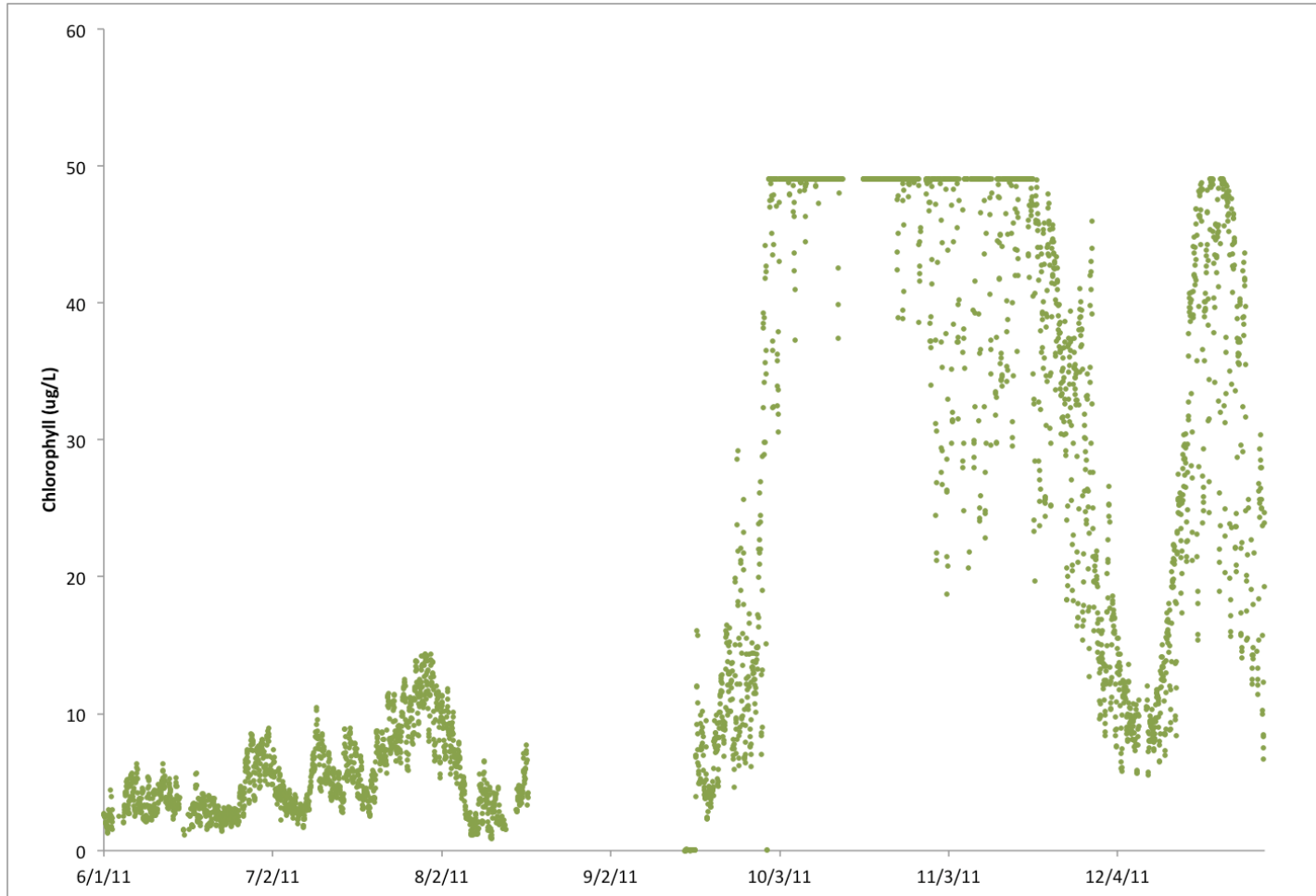
USGS station 01310740 at Orient Harbor turbidity (FNU) and elevation (NGVD 1929)

# Chlorophyll, Western Bays, Hurricane Irene



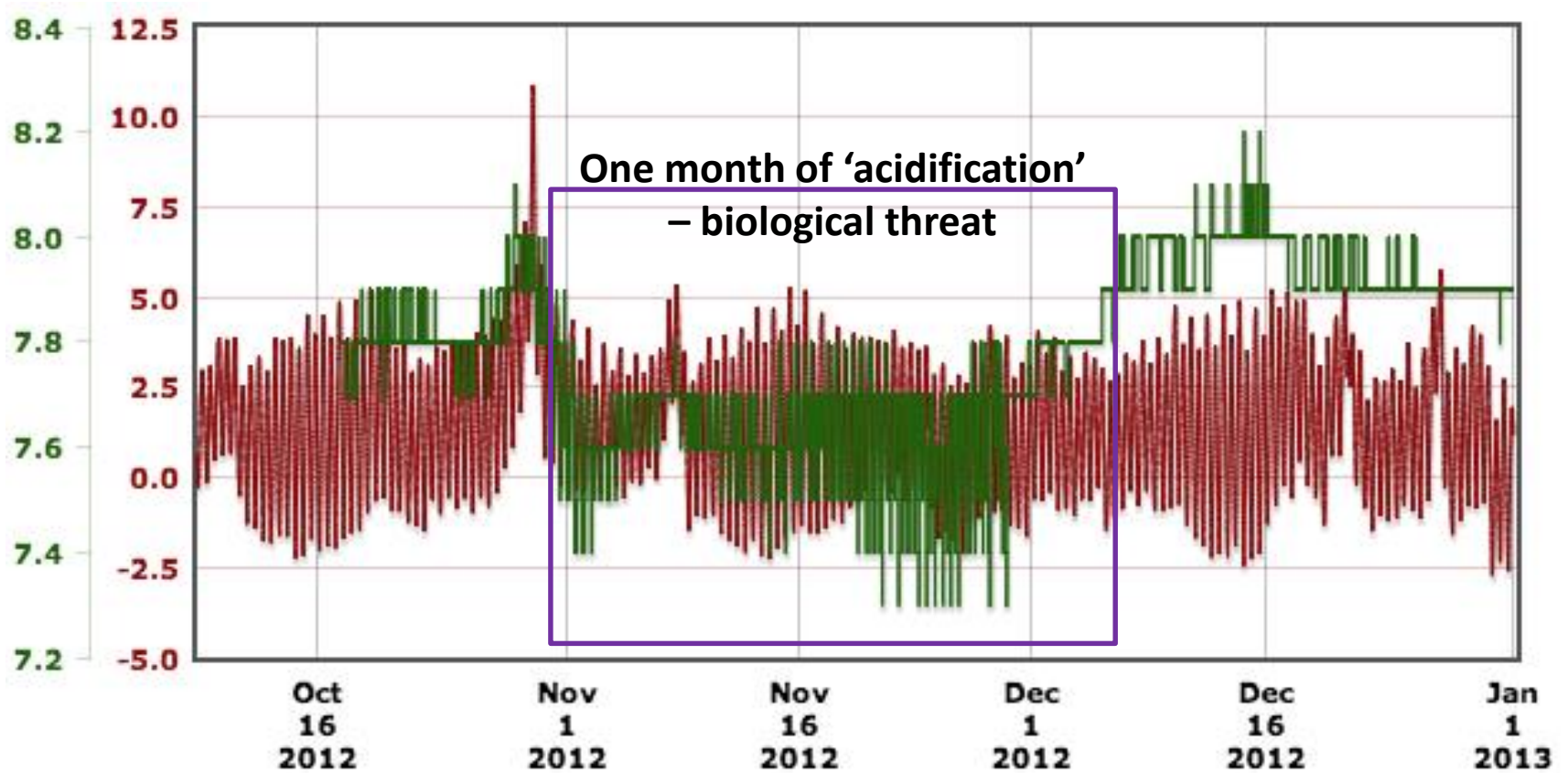
USGS station 01310740 at Reynolds Channel chlorophyll ( $\mu\text{g/L}$ ) and elevation (NGVD 1929)

# Chlorophyll, Great South Bay, Hurricane Irene



Chlorophyll readings from buoy GSB1 operated by the Great South Bay Project during the time period surrounding Hurricane Irene

# pH, Western Bays, Hurricane Sandy



# Assessing the response of the New York's south shore bays storm induced new inlets





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## Close the Breach

presented by [Peter Kohler](#)



It's encouraging that the state DEC has finally taken a first step to close a breach at Fire Island National Sea Shore.

For months, Suffolk Executive Steve Bellone, Congressman Tim Bishop and Sen. Charles Schumer have urged state and federal authorities to do so. This was the third breach that opened in the barrier beaches after Superstorm Sandy. The U.S. Army Corps of Engineers moved quickly to close two of them.

But officials took an understandable wait-and-see attitude toward the third, hoping that it might close on its own. It hasn't.

Environmentalists say that the breach has helped clear pollution from the bays. Perhaps. But inland communities say they've experienced flooding because of it.

Last week, Stony Brook Professor Charles Flagg dismissed that notion, blaming the flooding on a rash of severe ocean

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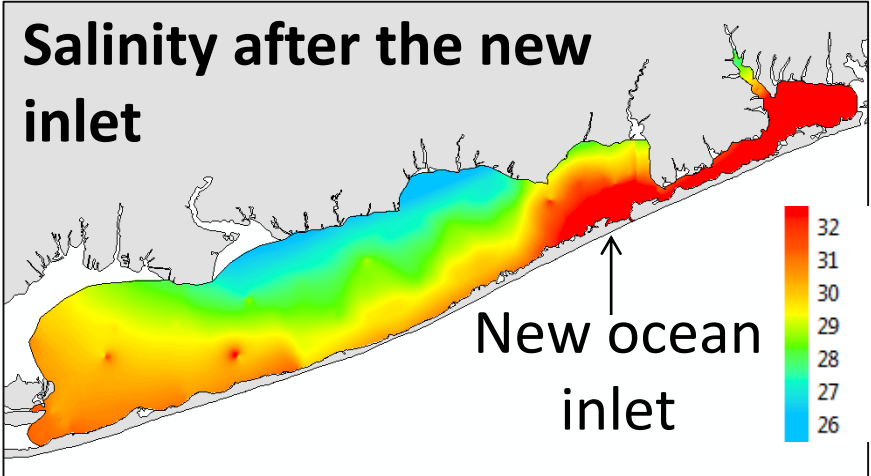
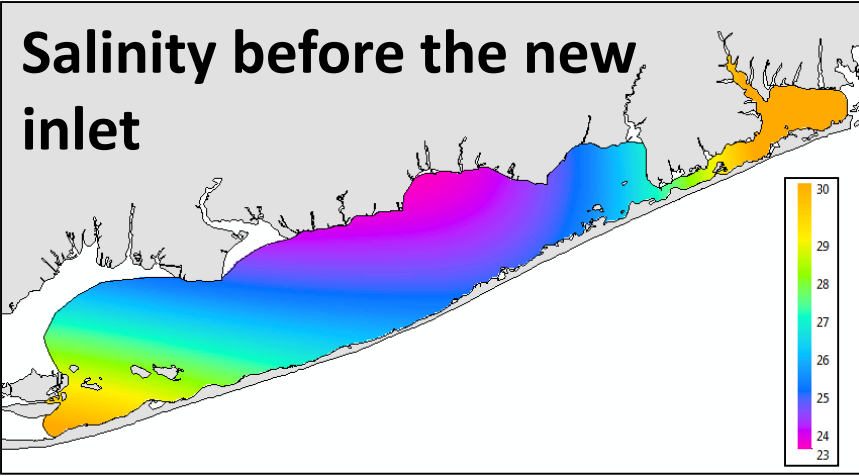
[Call or Write](#)

# Problems in New York estuaries associated with excessive nitrogen loading:

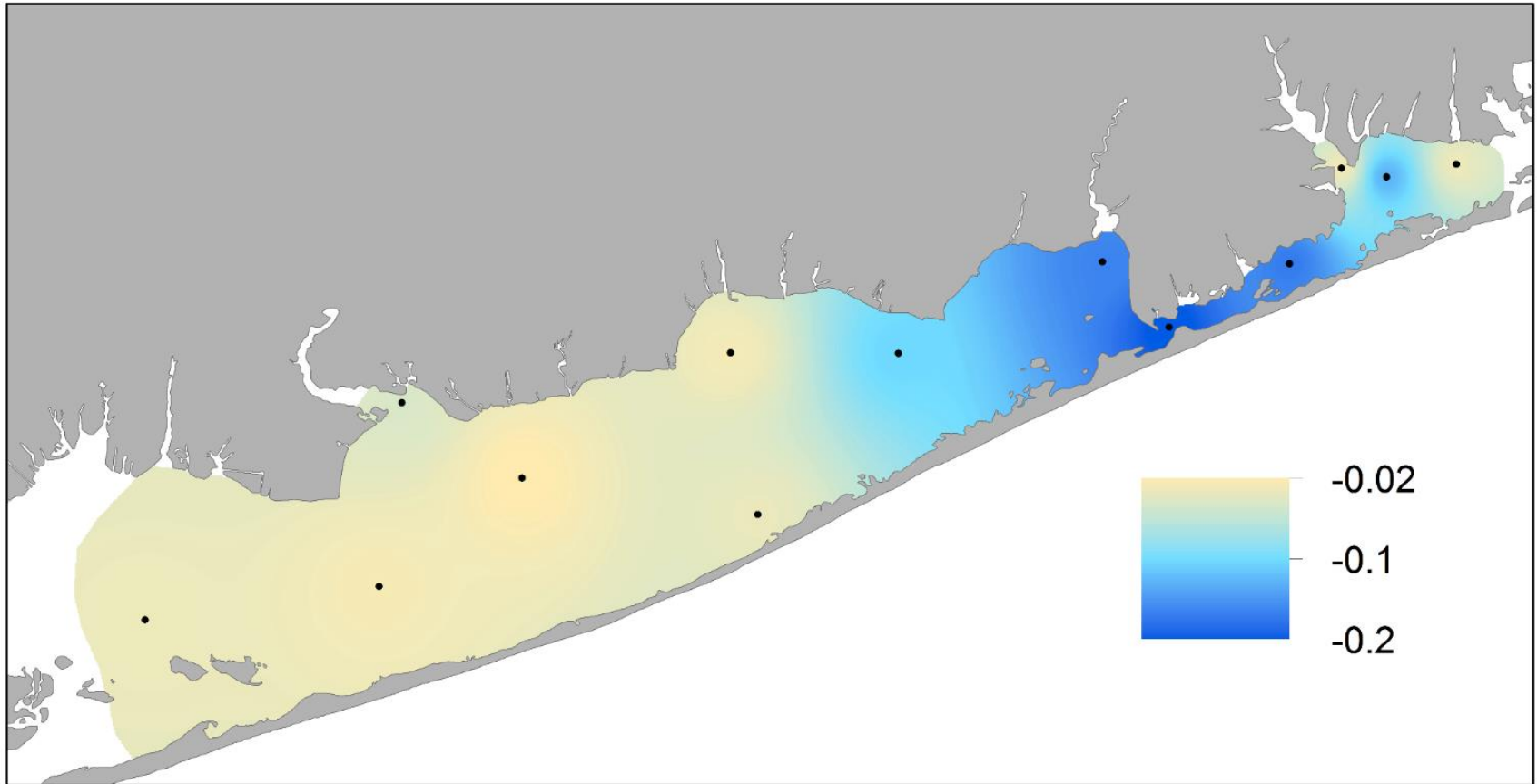
Algal blooms, turbid water, low oxygen loss of eelgrass, shellfish



# Effect of new inlet in Great South Bay on salinity

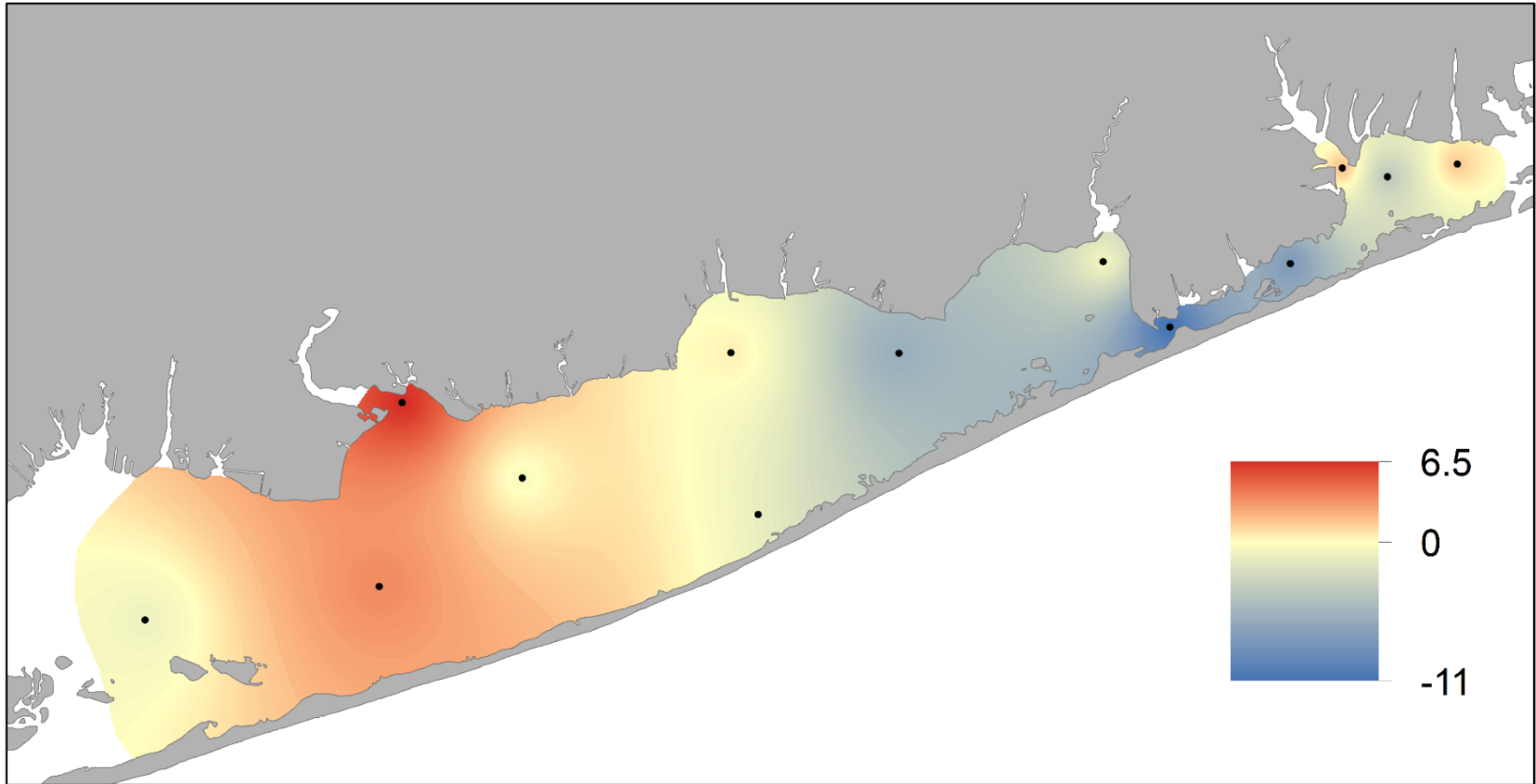


# Decrease in total nitrogen (mg/L)



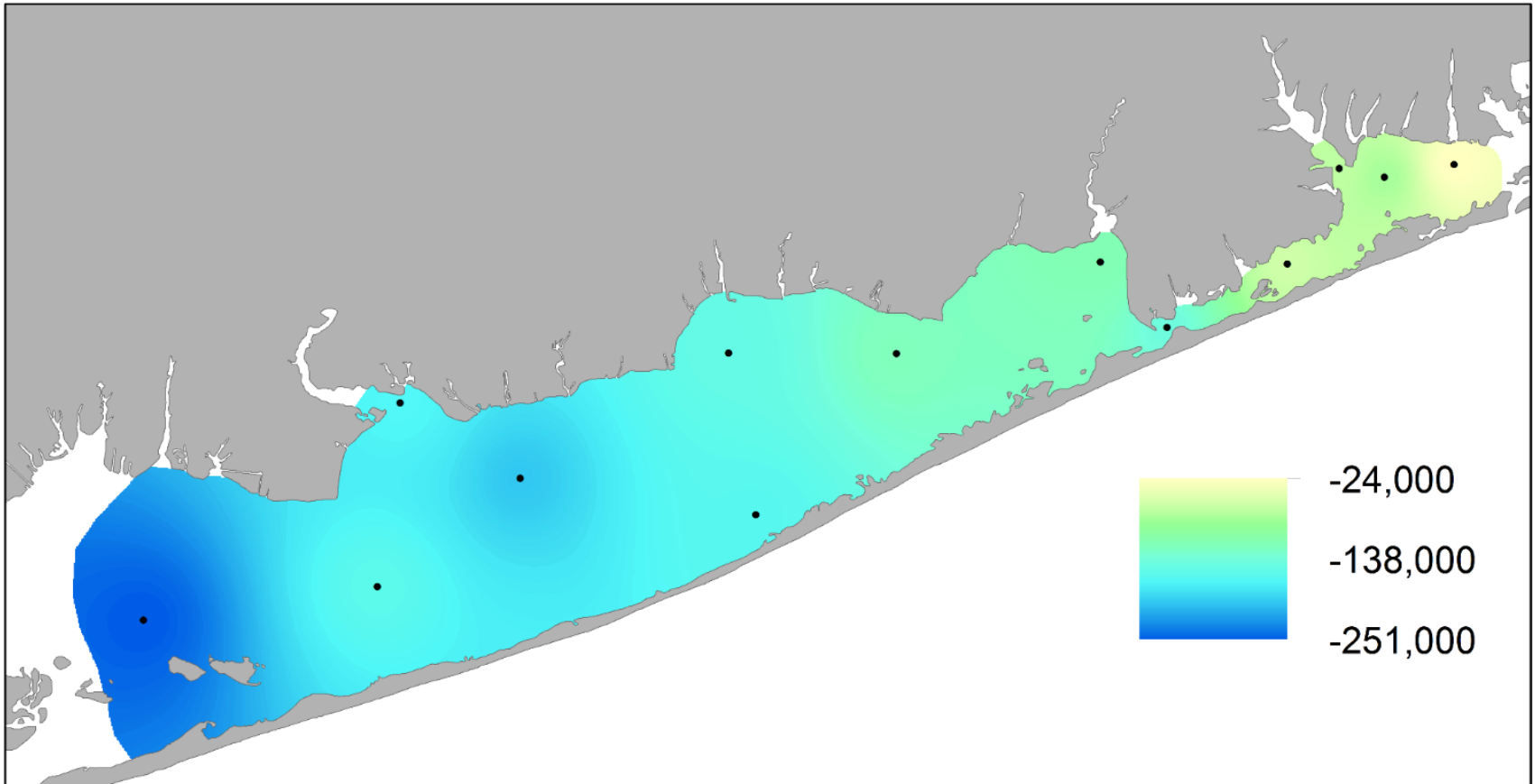
Post- and pre-New Inlet

# Changes in algae ( $\mu\text{g/L}$ )



Post- and pre-New Inlet

# Decreases in toxic brown tide (cells/mL)

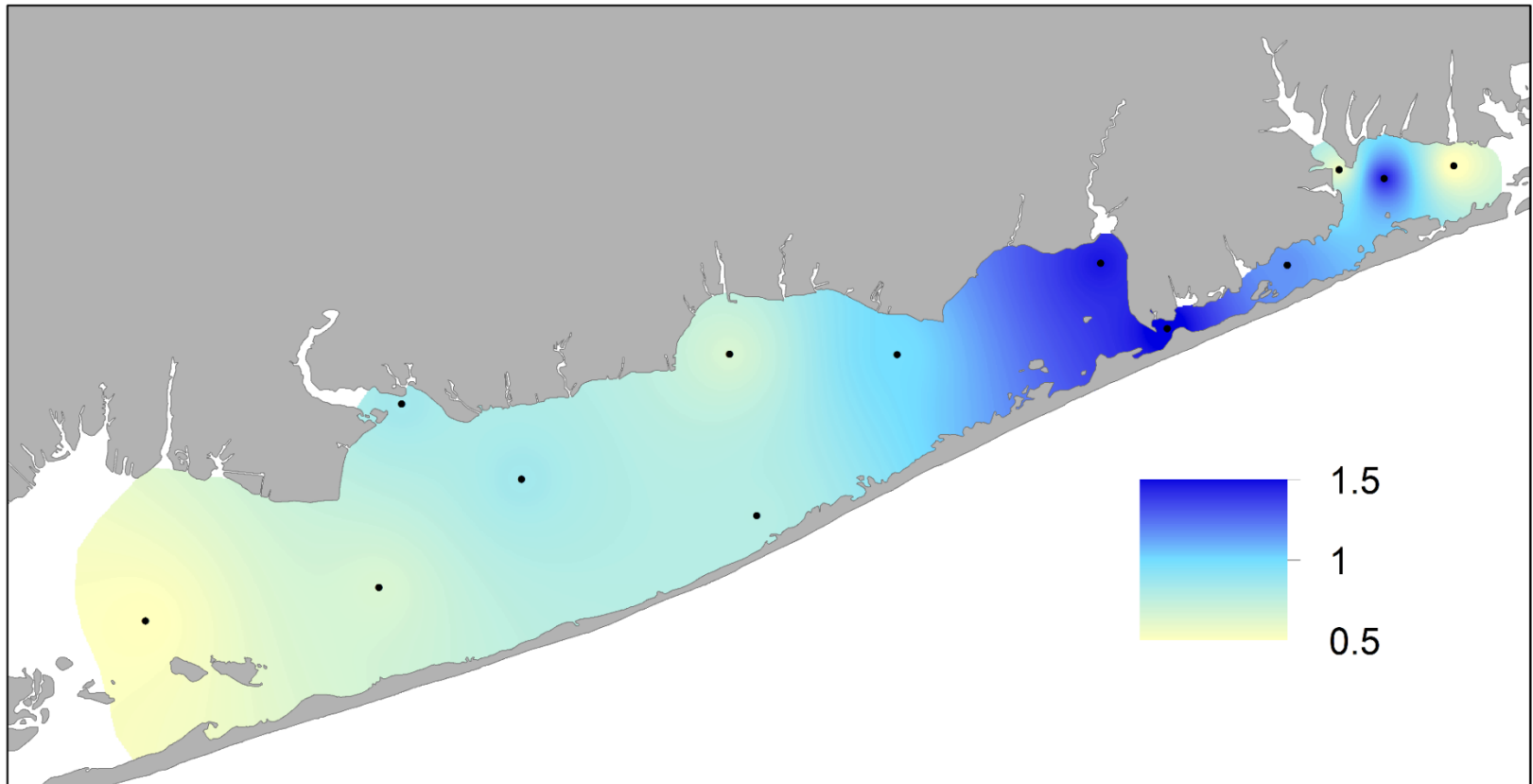


Post- and pre-New Inlet

***Light in the darkness:*** New Inlet in Great South Bay



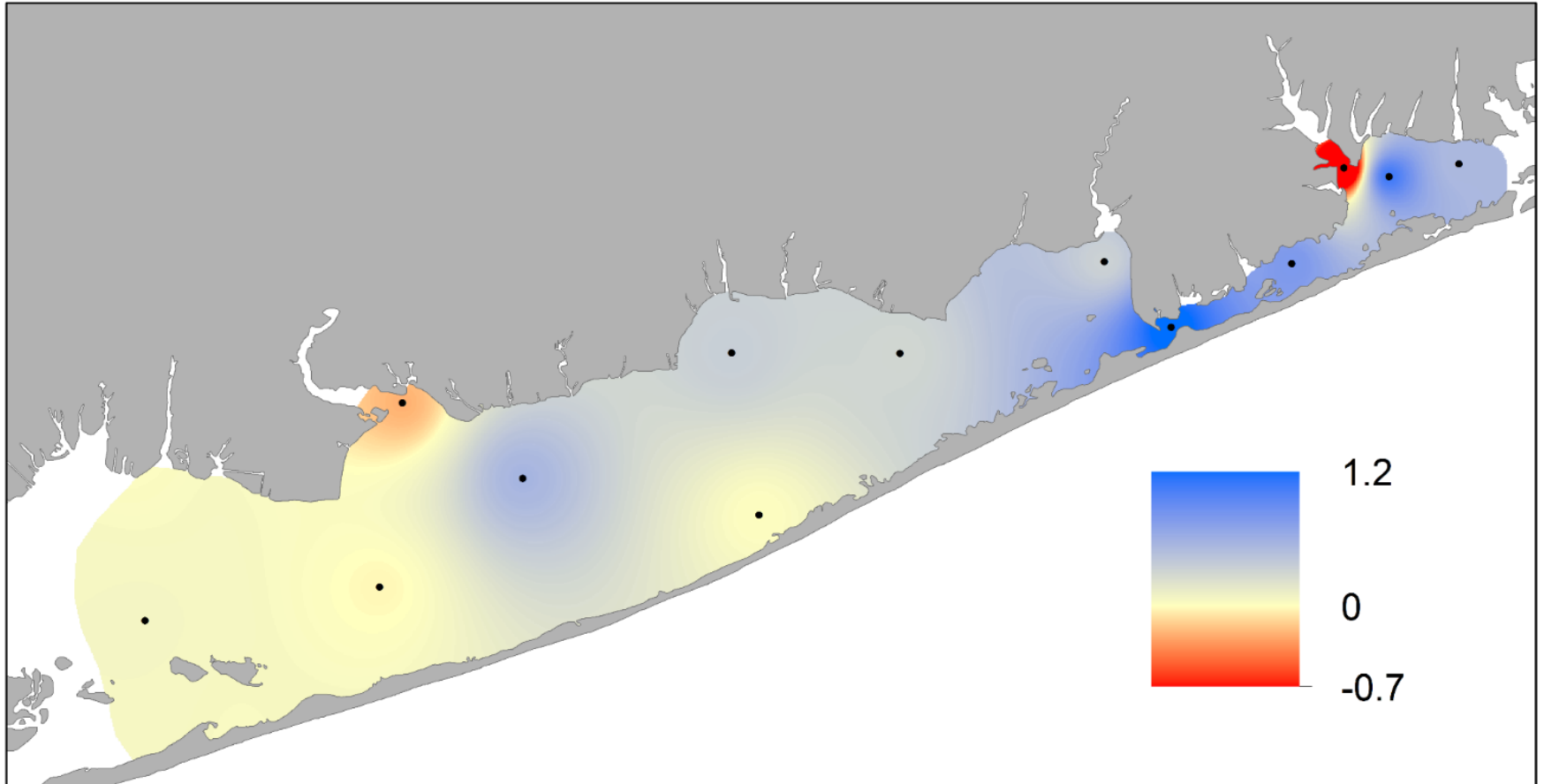
# Increase in water clarity (meters of visibility)



Post- and pre-New Inlet



# Increase in dissolved oxygen (mg/L)

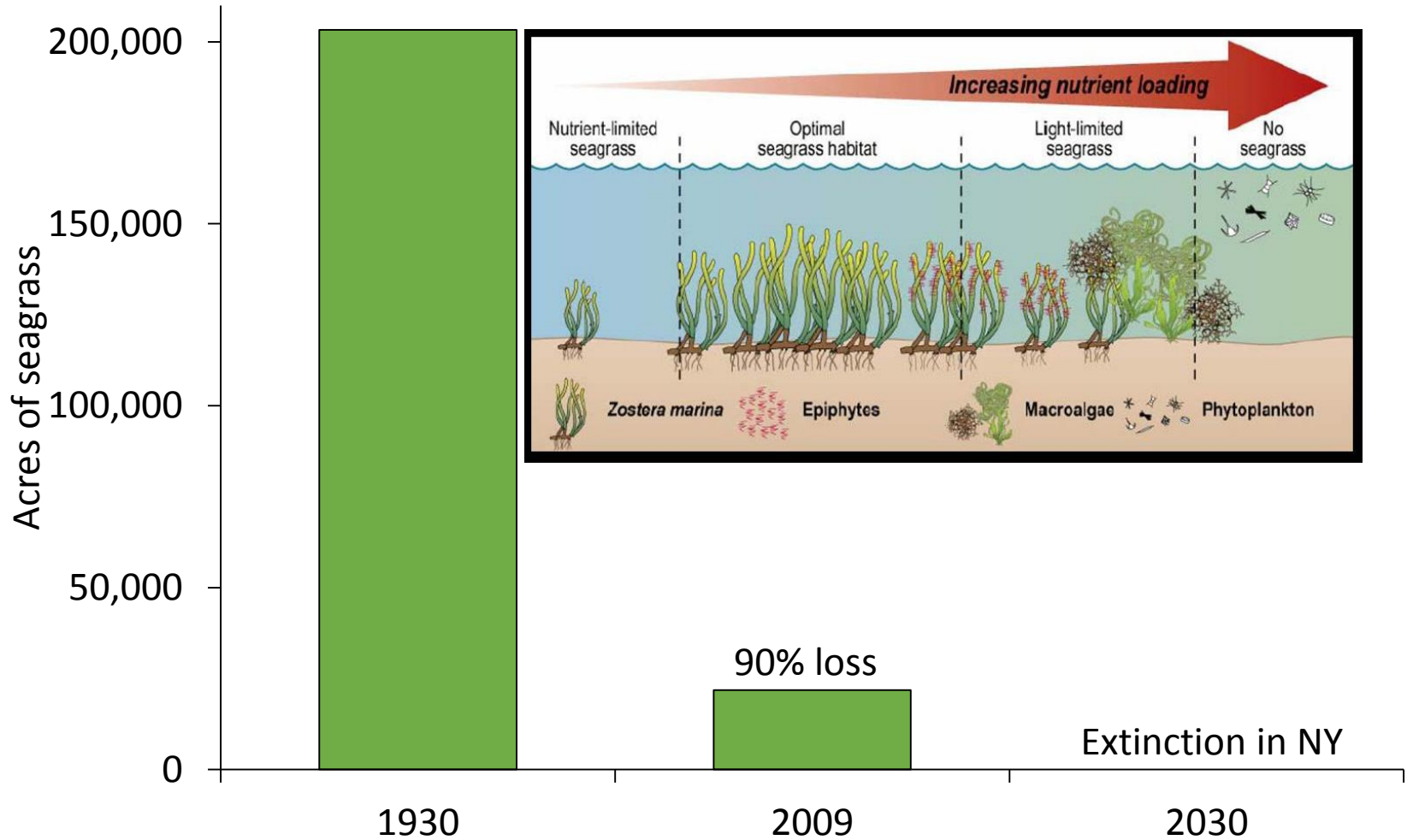


Post- and pre-New Inlet

# Eelgrass: Critical benthic habitat



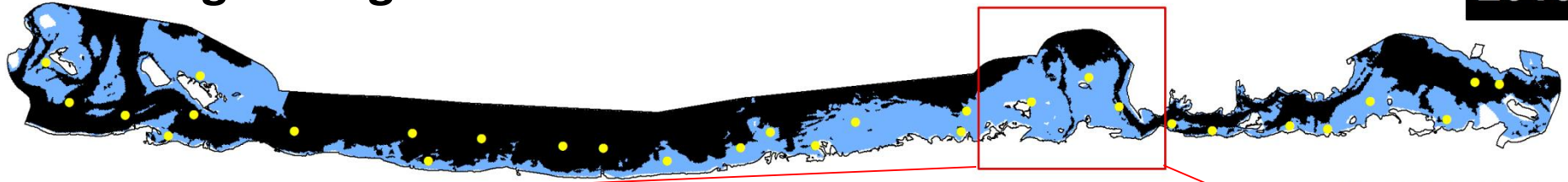
# NYS seagrass, 1930 - 2030



NYSDEC Seagrass Taskforce Final Report, 2010; Suffolk County assessment, 2014

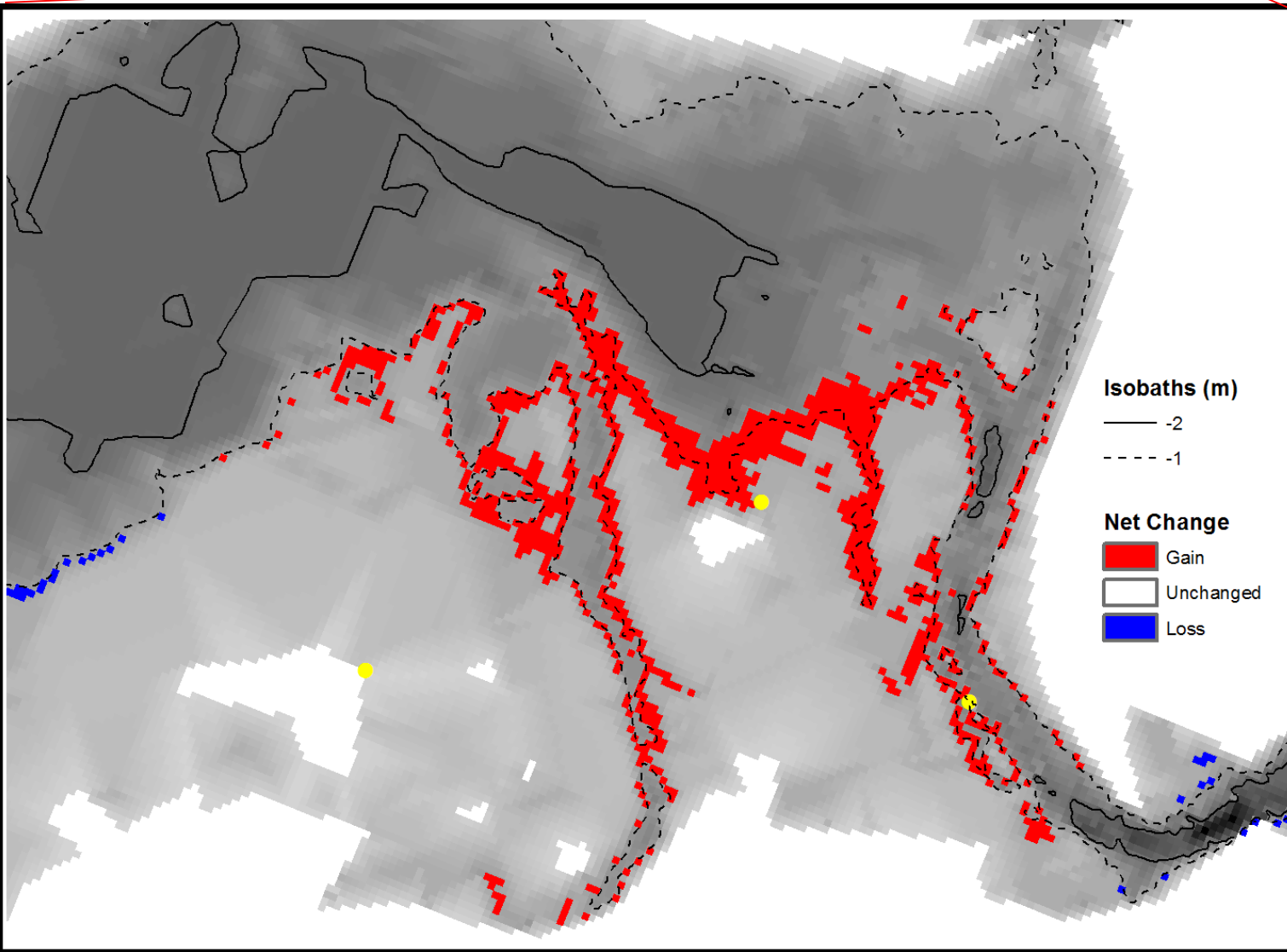
# Changes in light levels around New Inlet

2013



Percent Surface Irradiance

- < 22%
- > 22%



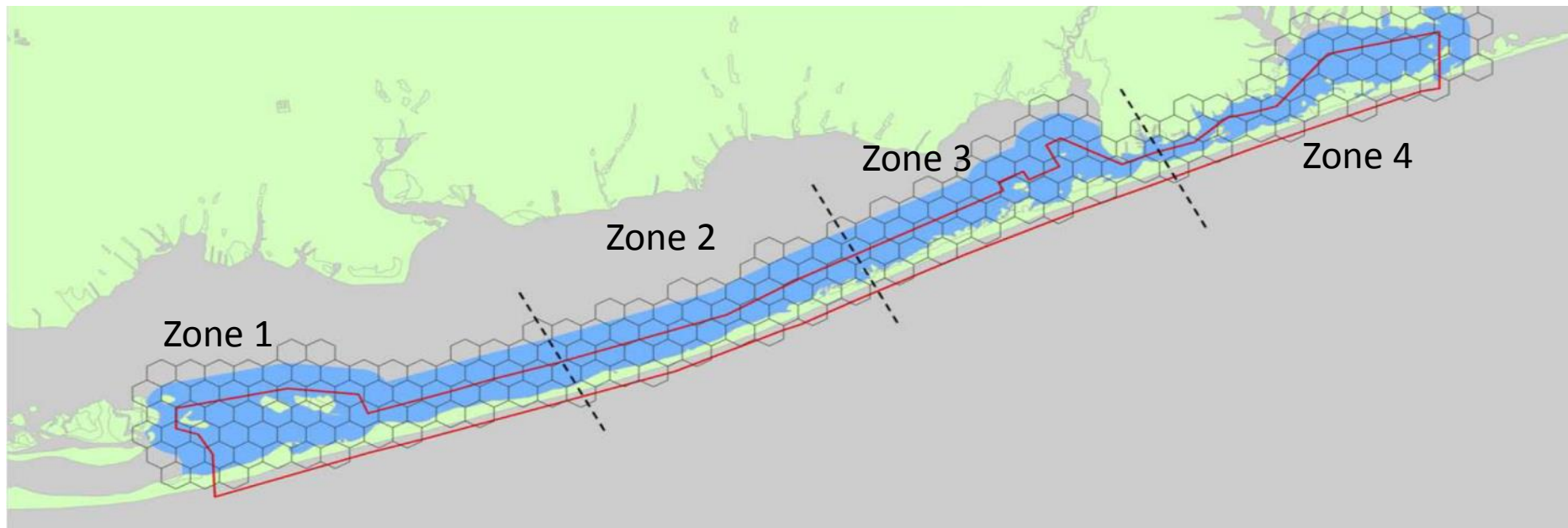
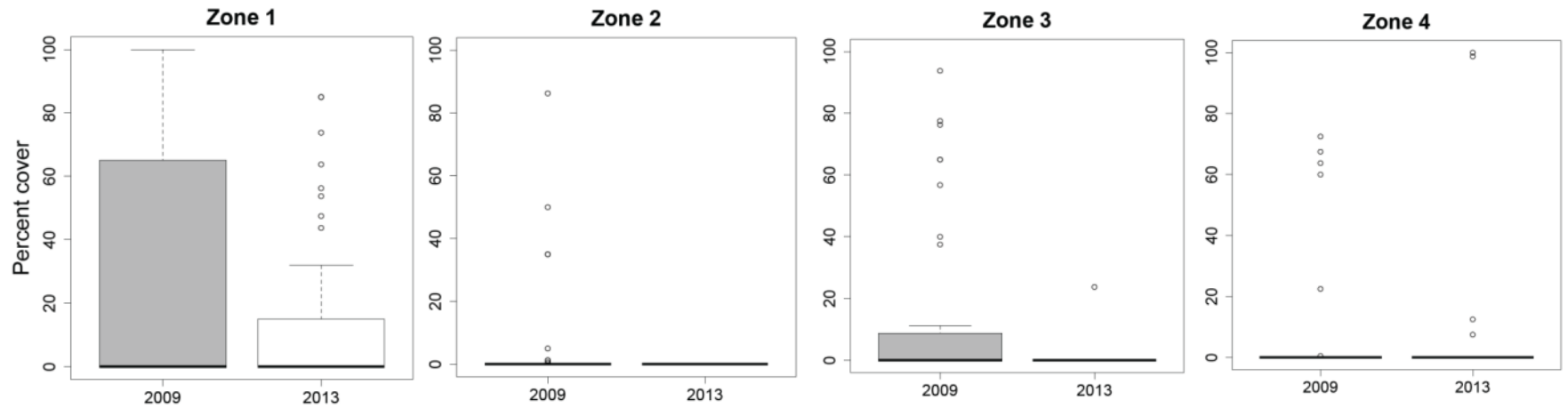
Isobaths (m)

— -2  
- - - -1

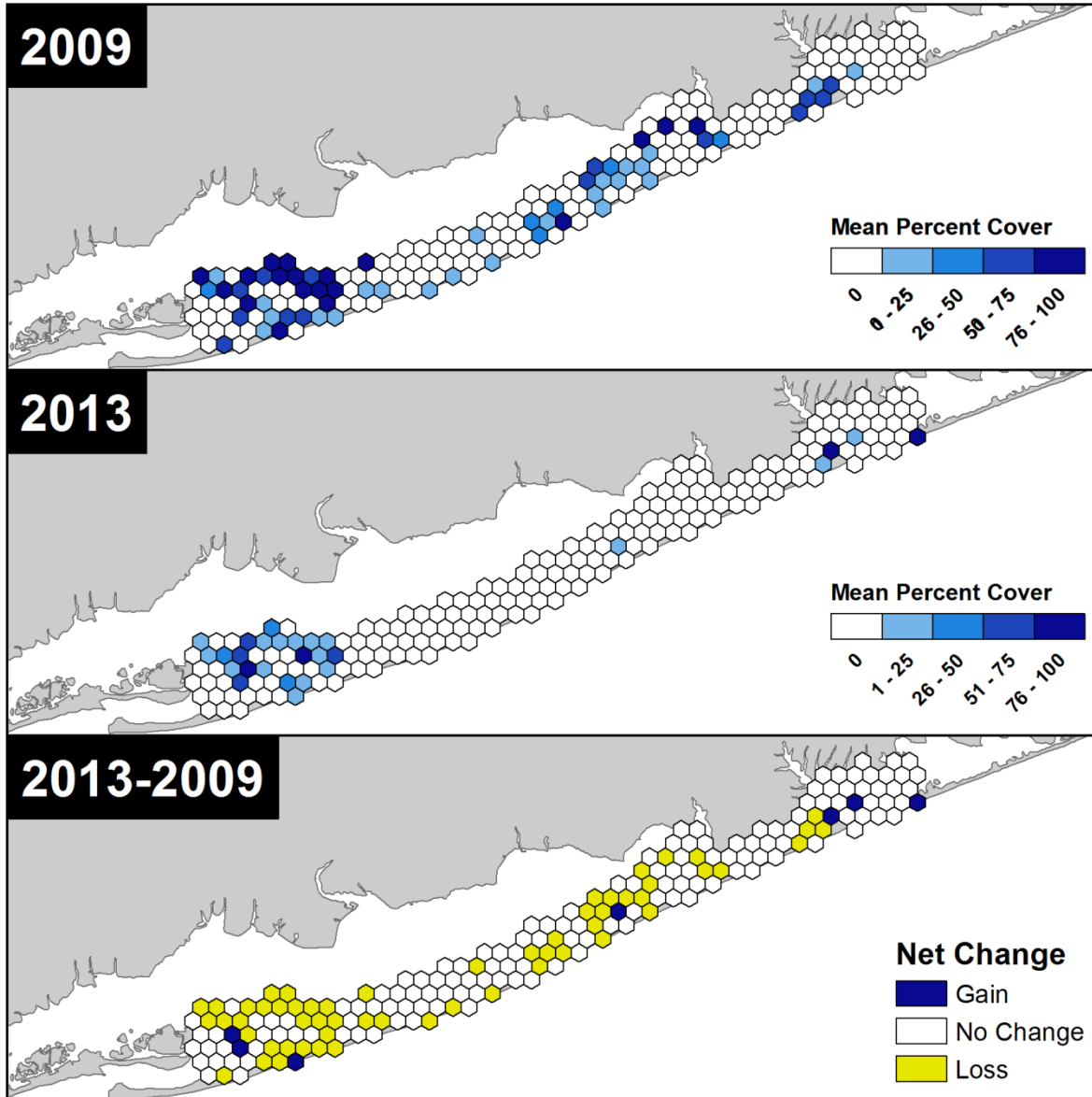
Net Change

Gain  
Unchanged  
Loss

# Eelgrass Coverage in Great South Bay



# Eelgrass coverage in GSB

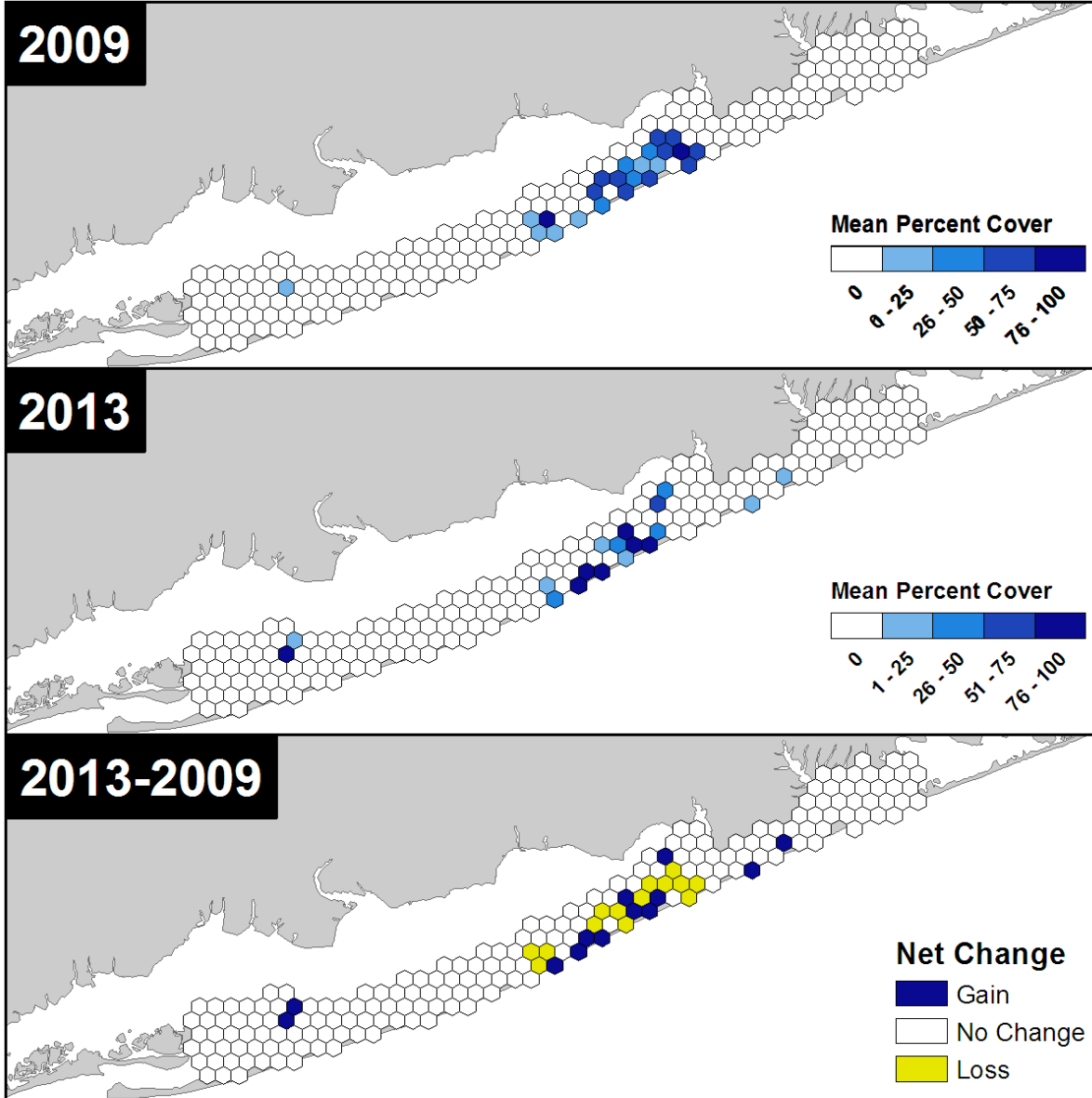


Eelgrass



Washover

# Ruppia coverage in GSB



*Ruppia* grass

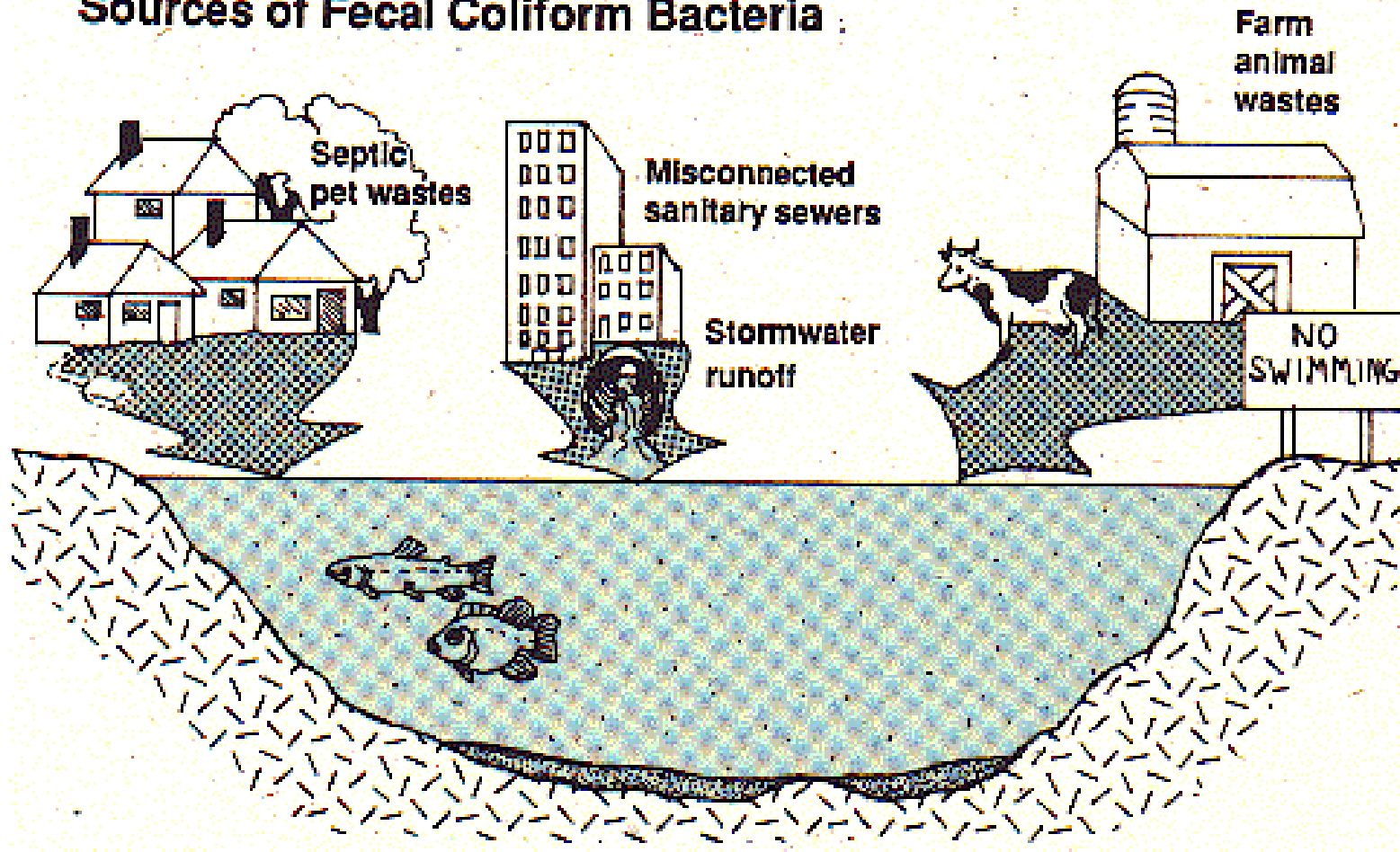
# Fish Abundance in eelgrass, 2014



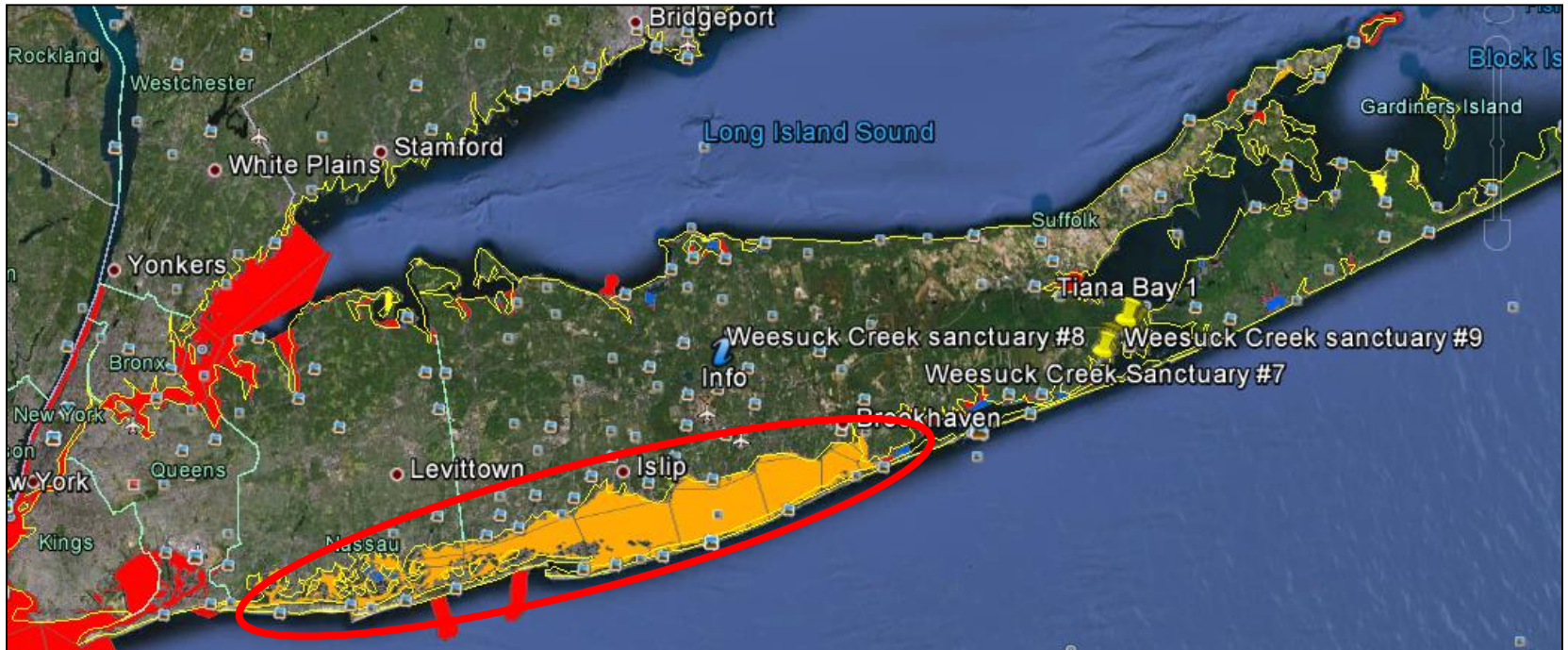


# What were the post-Sandy trends in pathogenic bacteria in coastal waters?

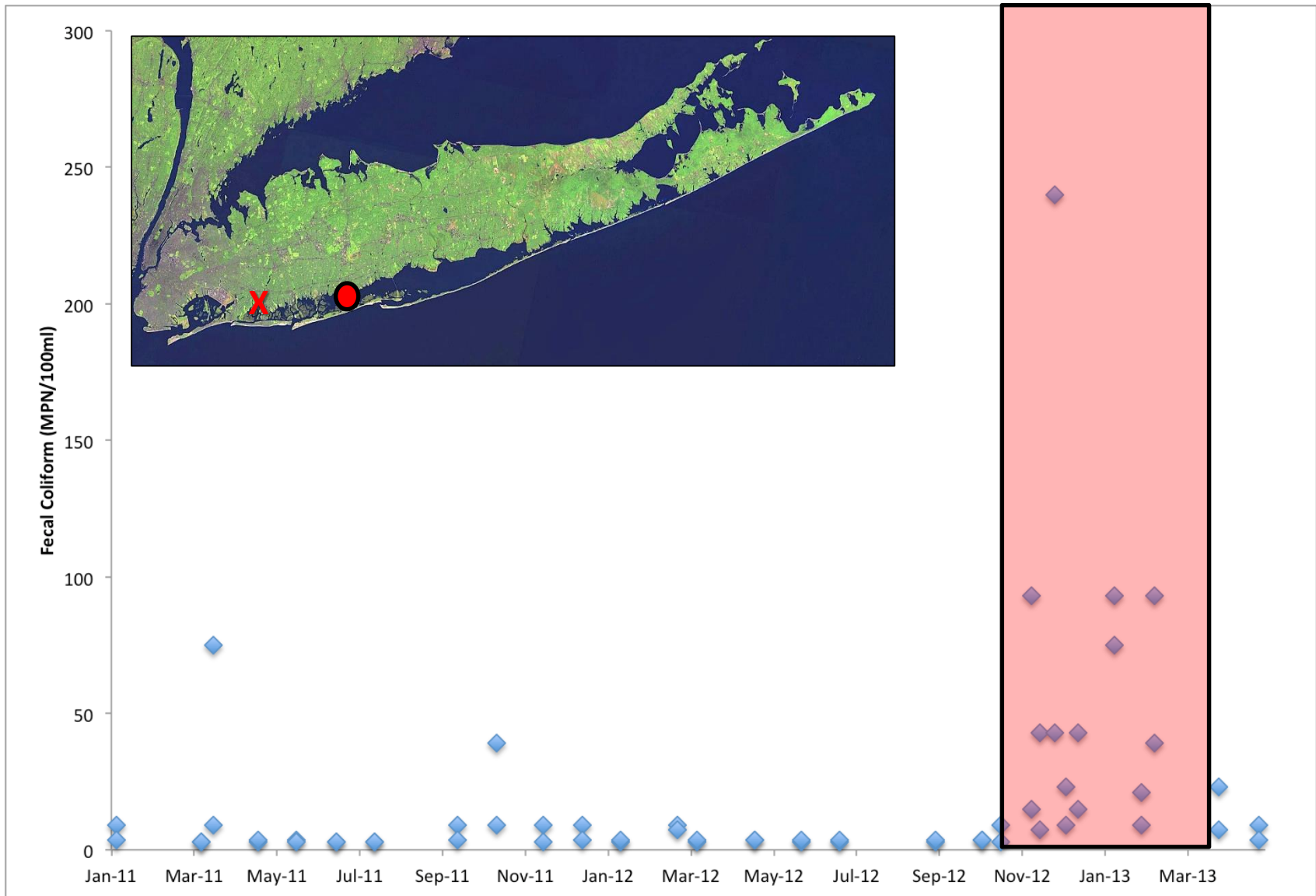
## Sources of Fecal Coliform Bacteria :



# Emergency shellfish bed closure, October 29 – December 16 2012. Why?

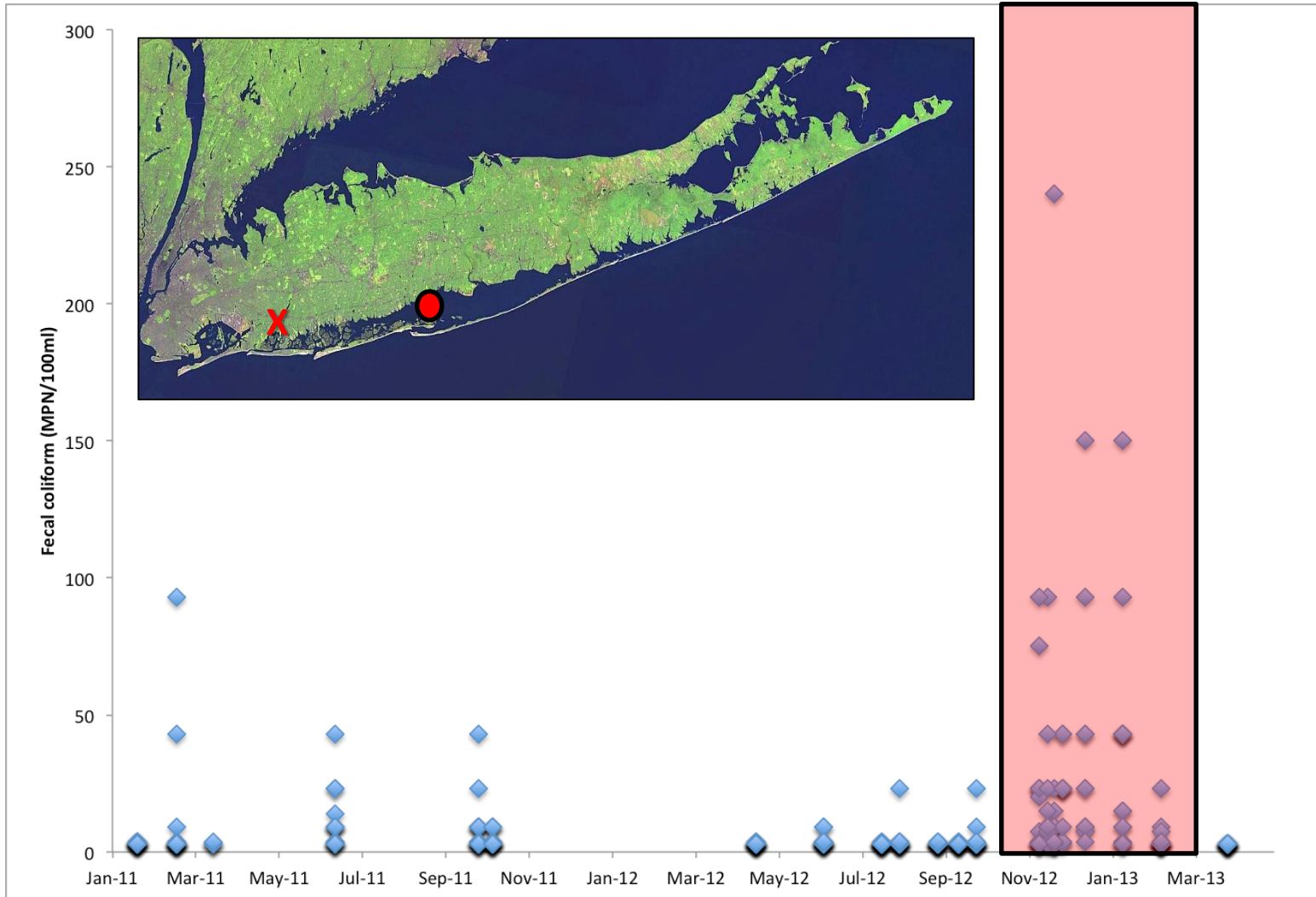


# Fecal Coliform, South Oyster Bay



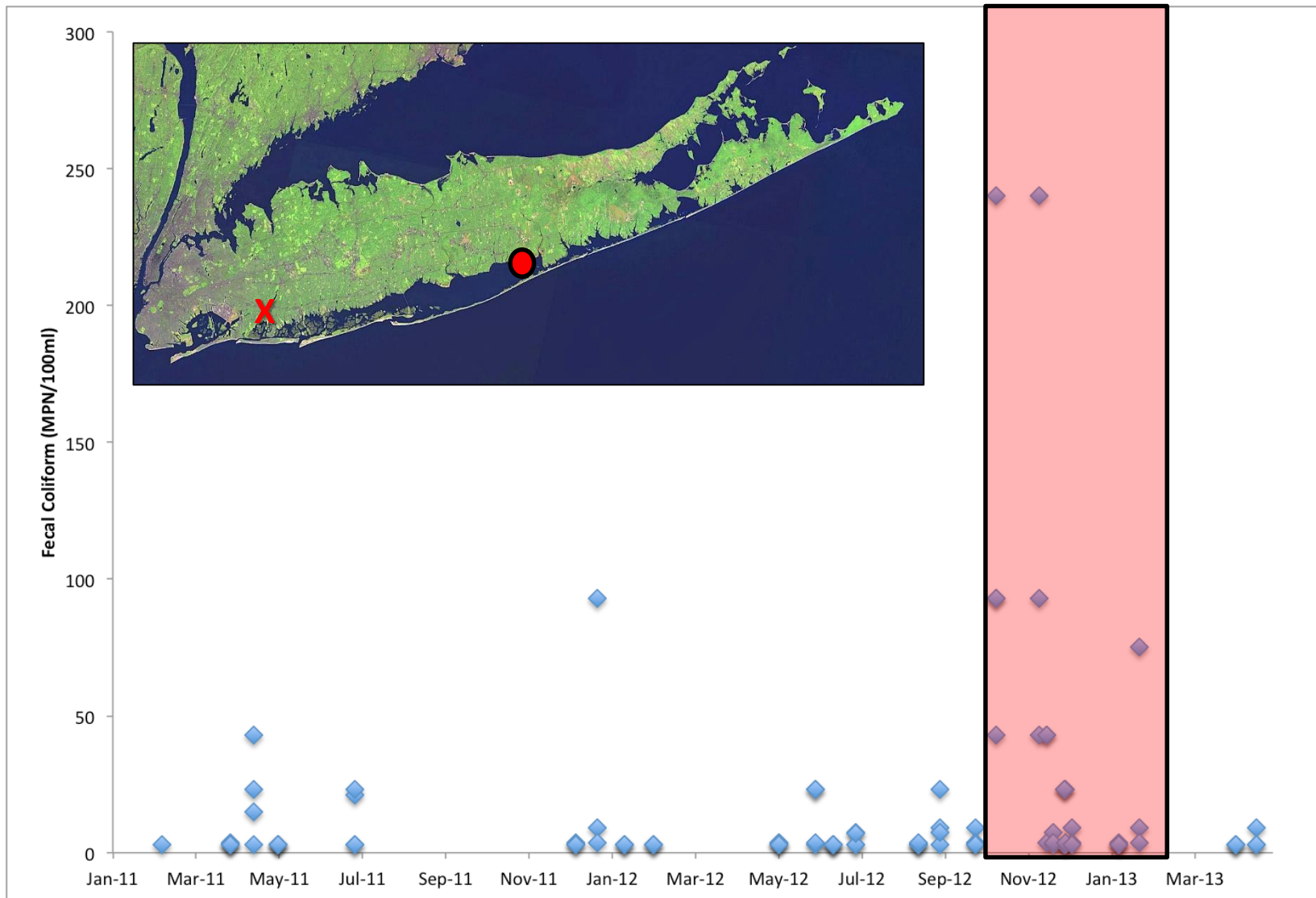
NYSDEC fecal coliform readings from sites in region 2 (South Oyster Bay) uncertified for shellfish harvest. Sampling sites L and M included.

# Fecal Coliform, Babylon



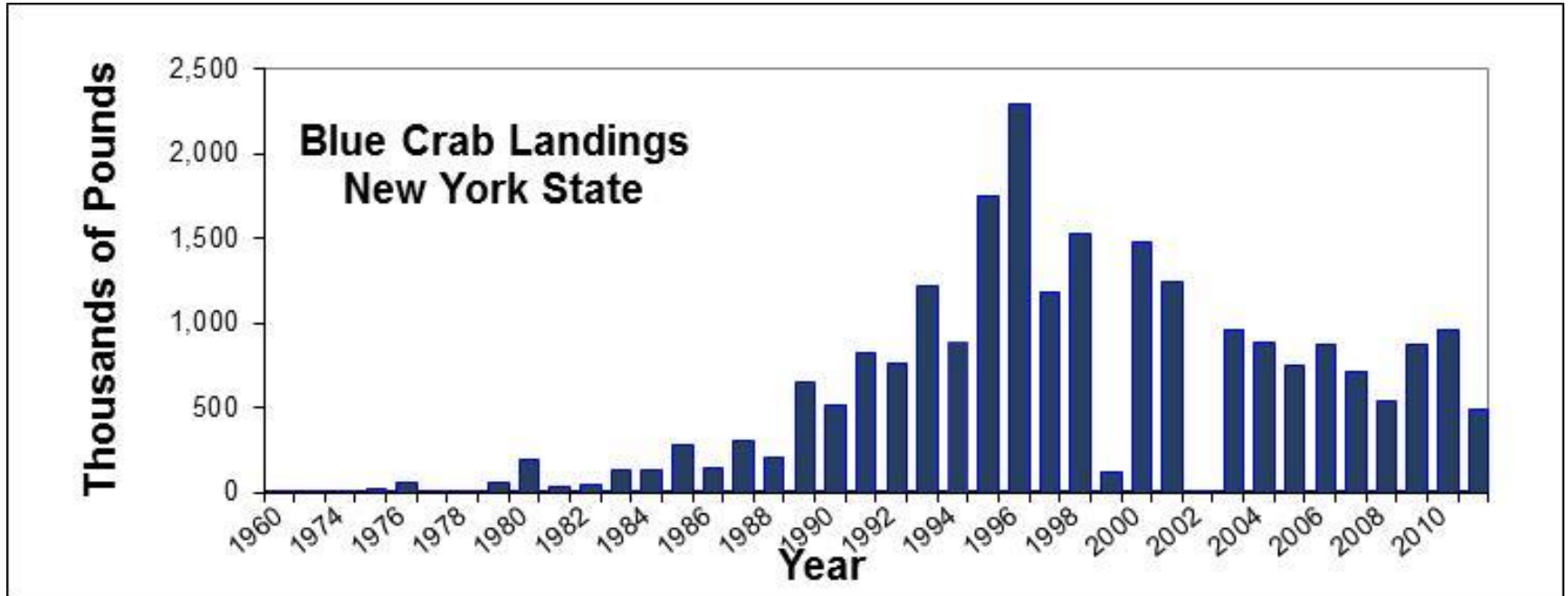
NYSDEC fecal coliform readings from sites in region 3 (Great South Bay, Babylon) certified for shellfish harvest. Sampling sites 11.1, 12, 13, 15, 19, 20, 20.2, 22, 34.2, 4.1, 40, 41, 45, 5, 54, 59.2, and 6 included.

# Fecal Coliform, Bellport



NYSDEC fecal coliform readings from sites in region 7 (Bellport Bay) certified for shellfish harvest. Sampling sites 4, 8A, 8B and 8C included.

# Blue Crabs in New York waters



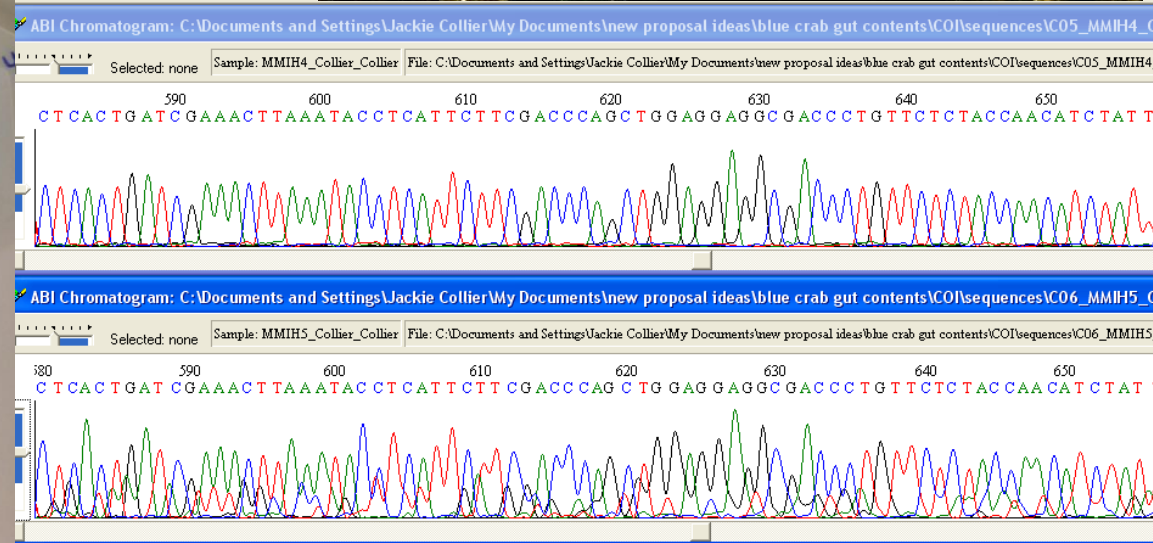
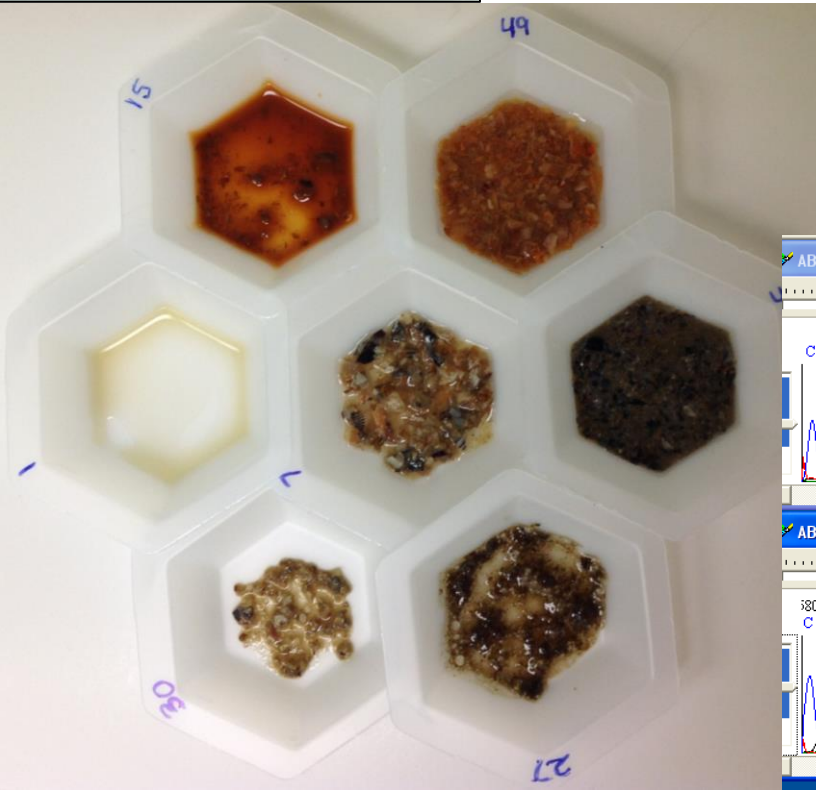
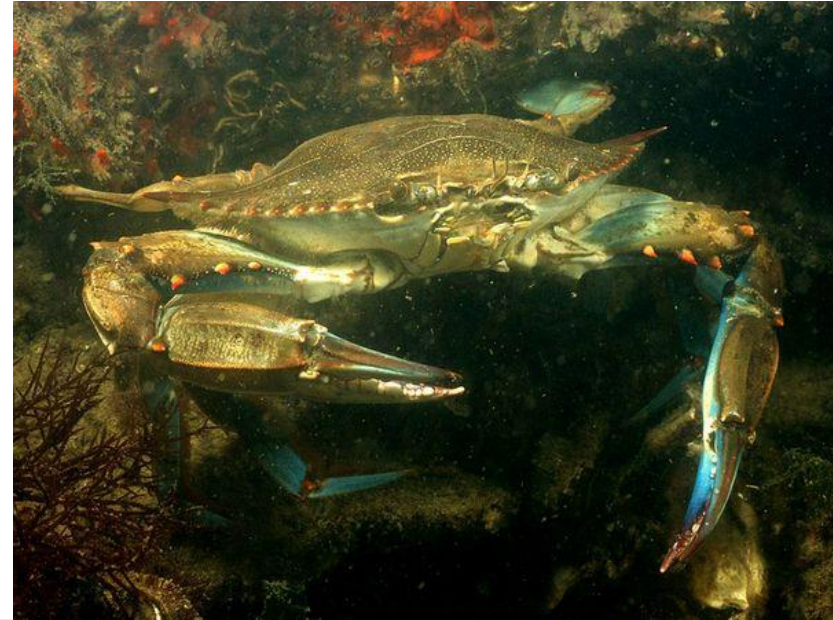
- Emerging fishery in NYS

*How do Blue Crabs affect NY ecosystems and other fisheries in the post-Sandy era?*

**Project team:**

**Jackie Collier, Bob Cerrato, Anne McElroy**

# How do Blue Crabs affect NY ecosystems and other fisheries in the post-Sandy era?



# Conclusions

- Major coastal storms cause immediate changes in algal blooms, turbidity, and, indirectly, acidification.
- New inlets make NY's coastal waters saltier, cooler, clearer, and lower in nitrogen and harmful algae.
- Seagrasses were initially buried by Sandy, but are showing signs of recovering enhancing fish populations.
- Sandy created serious waste water problems in NY far away from Bay Park and, in some cases, far away from any sewage treatment plant.