



# Restoring Coastal Habitat in the Heart of New York City

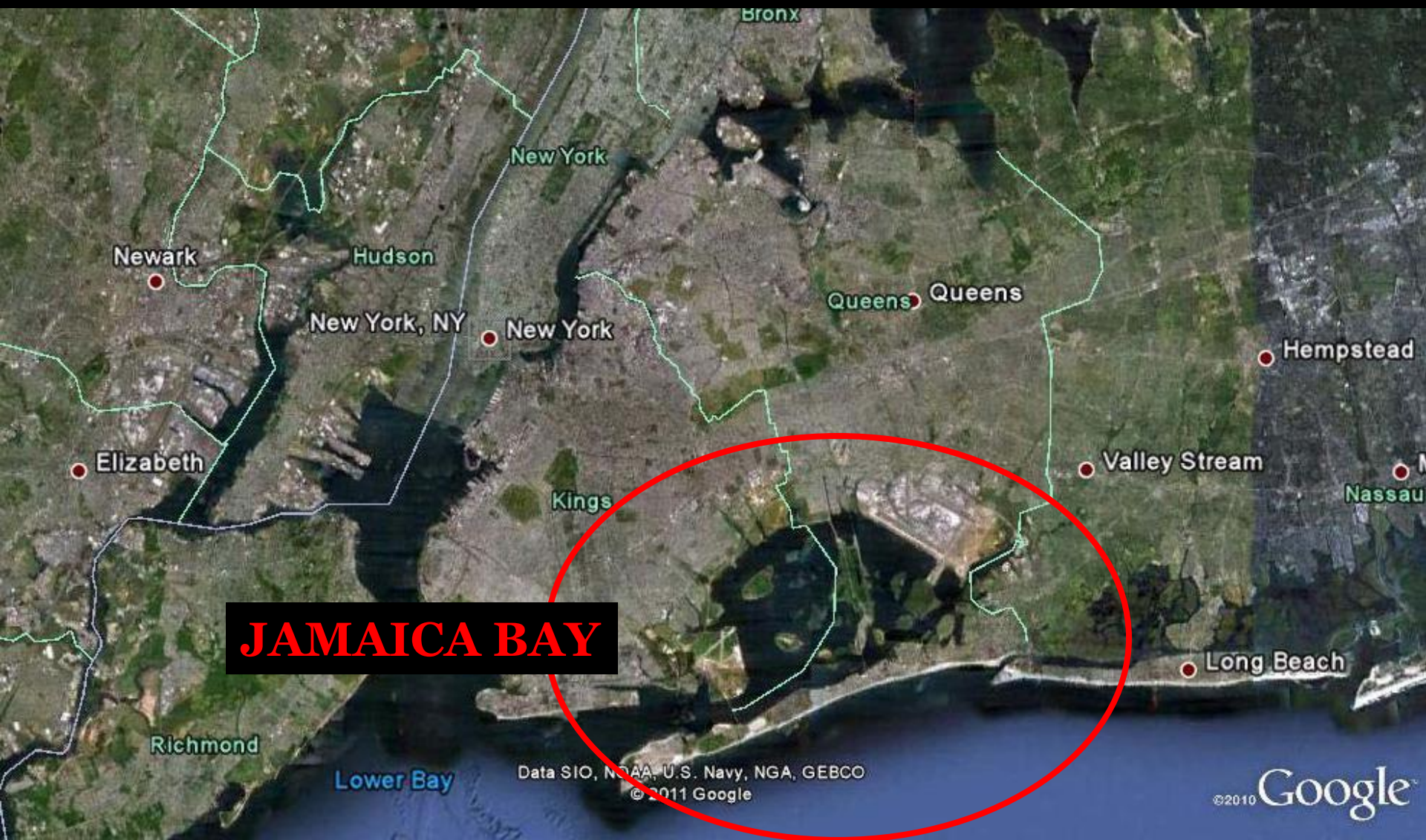
Terry Doss  
Biohabitats, Inc.

John McLaughlin  
New York City Environmental Protection

4<sup>th</sup> National Conference on Ecosystem Restoration  
Restoring the NY Harbor Estuary  
August 2, 2011



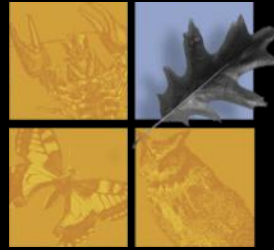
# Location



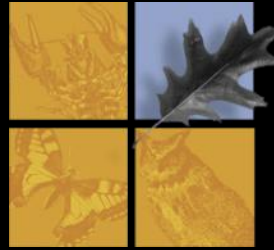
**JAMAICA BAY**



# Urban Habitat

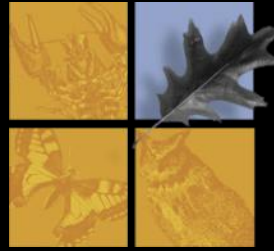


# Eroding Marshes





# Water Quality

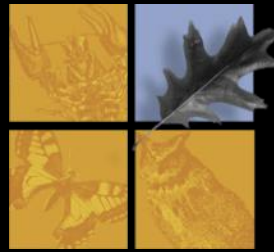


**Treated discharges into the Bay from the WPCPs account for:**

**95% of the nitrogen**

**95% of the phosphorous**

**80% of the carbon**



# Ecological Pilot Projects



**Oyster Restoration**

**Eelgrass Restoration**

**Wave Attenuators for slowing Marsh Erosion**

**Algal Turf Scrubber**

**Ribbed Mussel Water Filtering**

**Ulva Harvesting**

# Oyster Pilot Project



**GERRITSEN CREEK**

**DUBOS POINT**

Canarsie Pol

Rulers Bar Hassock

Grass Hassock

Fishkill Hassocks

Yellow Bar Hassock

Winhole Hassock

Sails Point Hassock

Ruffle Bar

Barren Island













12/02/2010



07/13/2011







# Oyster Monitoring

**Salinity**

**Temperature**

**Dissolved Oxygen**

**Turbidity**

**Chlorophyll**

**Current Speed**

**Oyster Count**

**Oyster Density**

**Percent Dead**

**Oyster Size Frequency**

**Oyster Growth (change in size)**

**Sediment Accumulation**

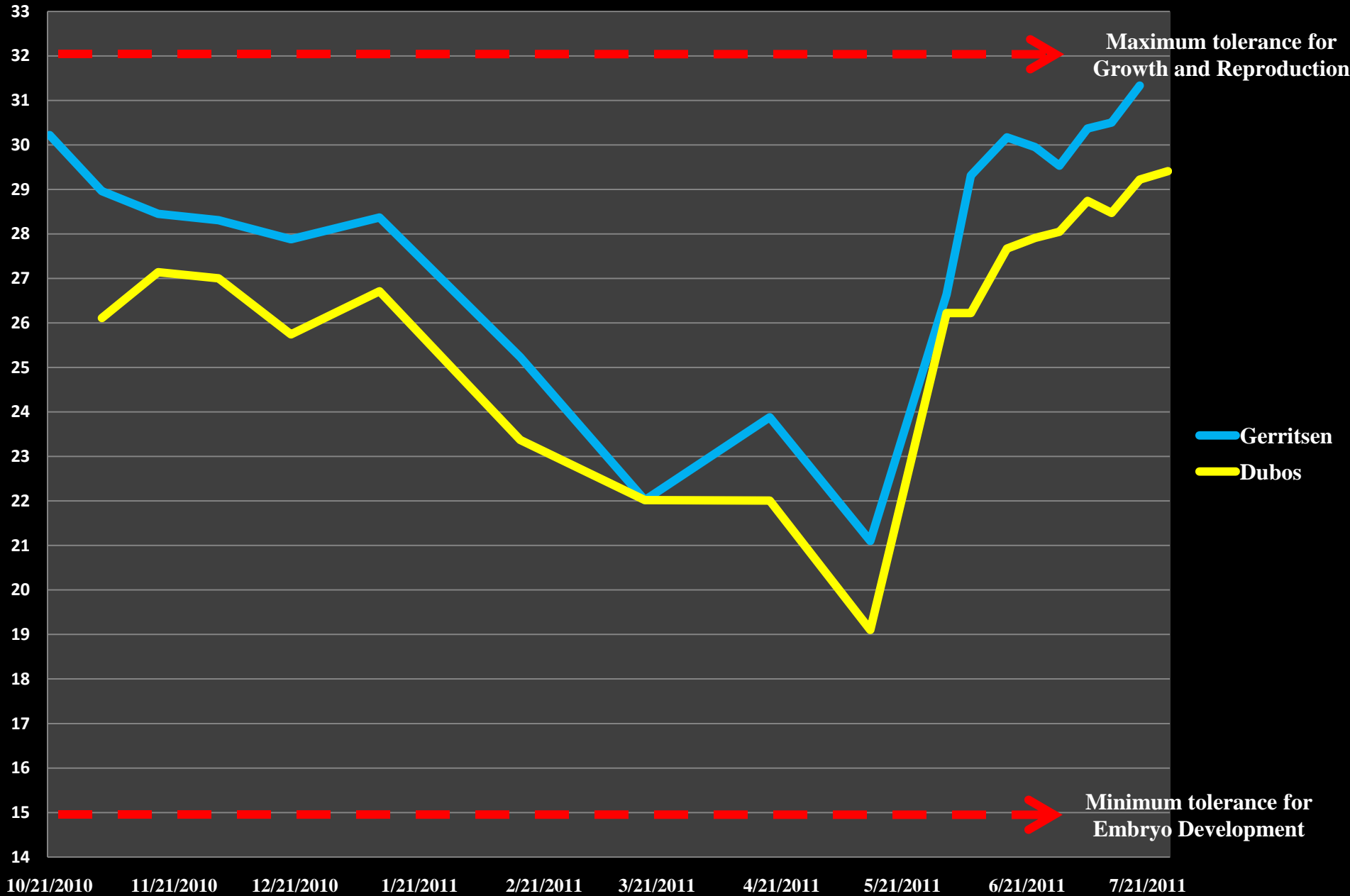
**Predator Observations**

**Disease Testing**

**Recruitment**

# Water Quality Observations - Salinity

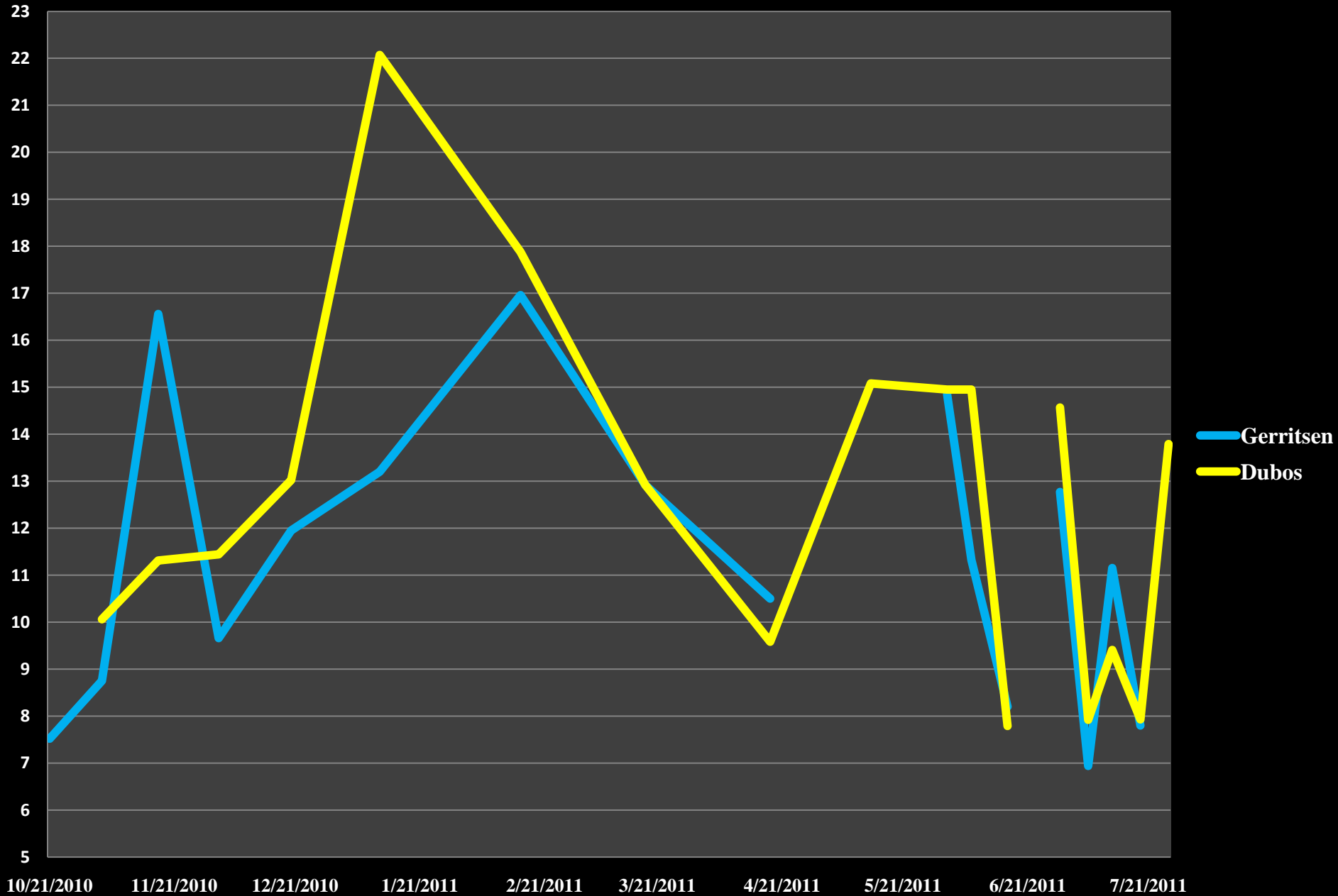
## October 2010 - July 2011





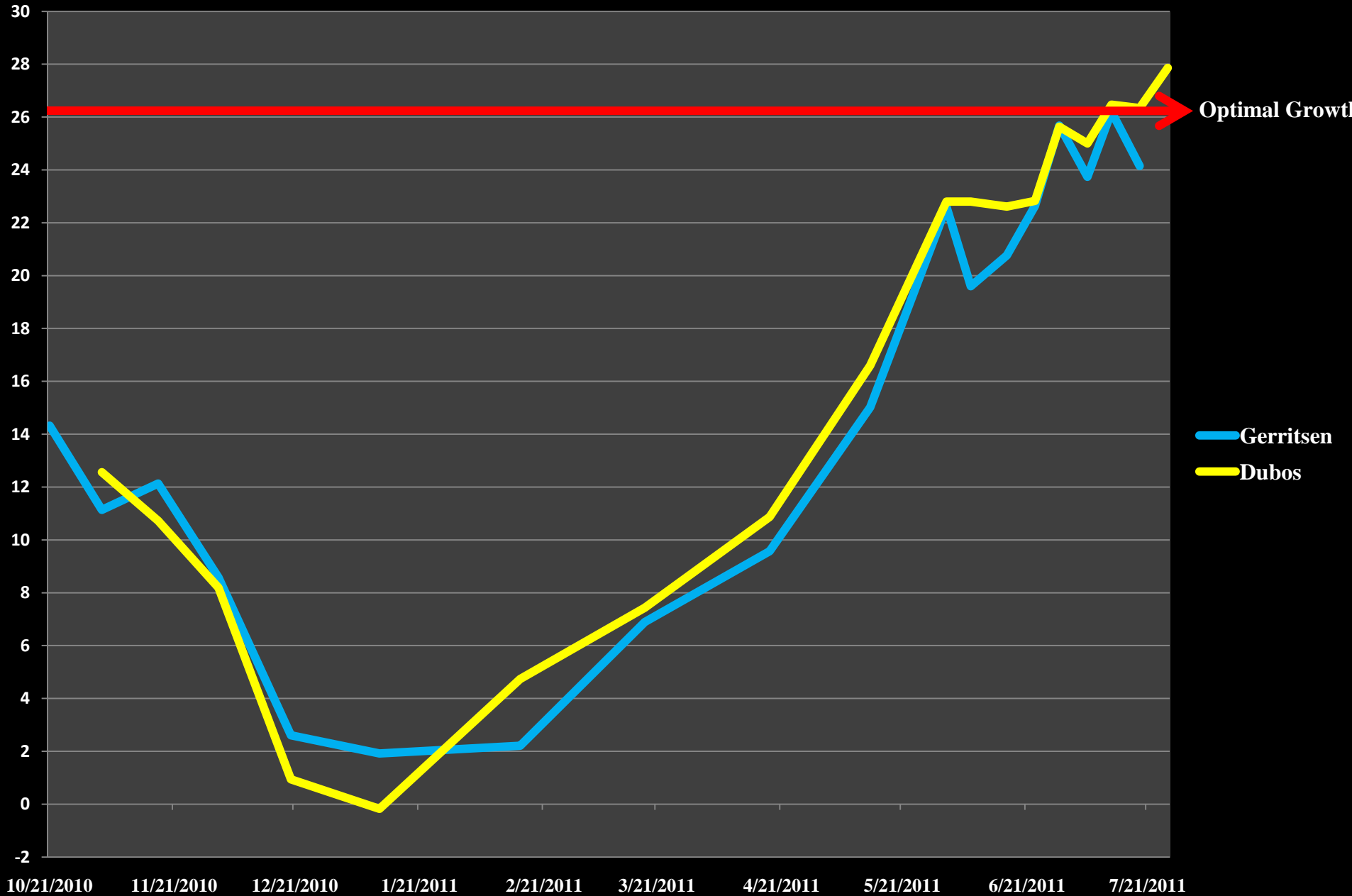
# Water Quality Observations - Dissolved Oxygen

## October 2010 - July 2011



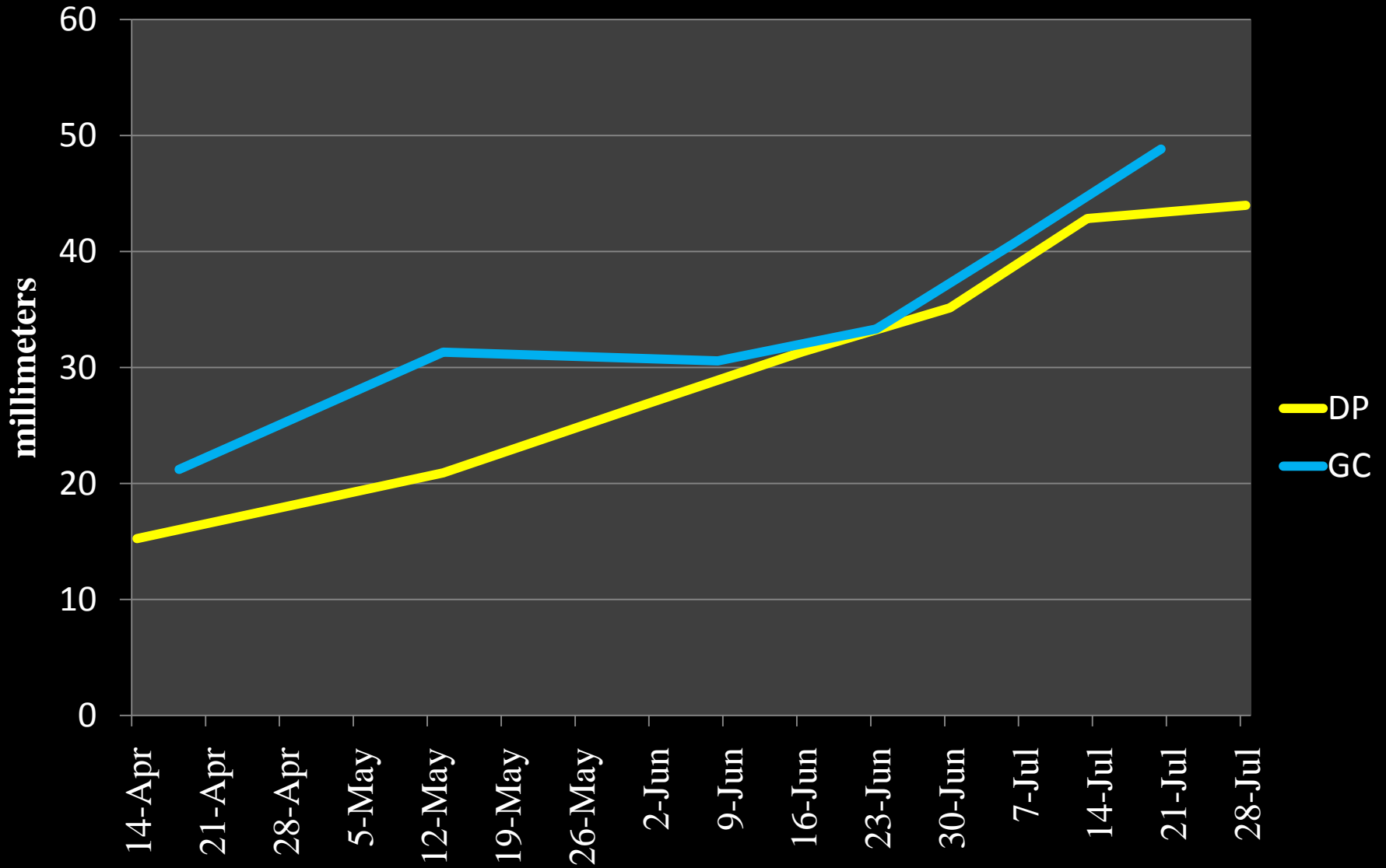
# Water Quality Observations - Temperature

## October 2010 - July 2011



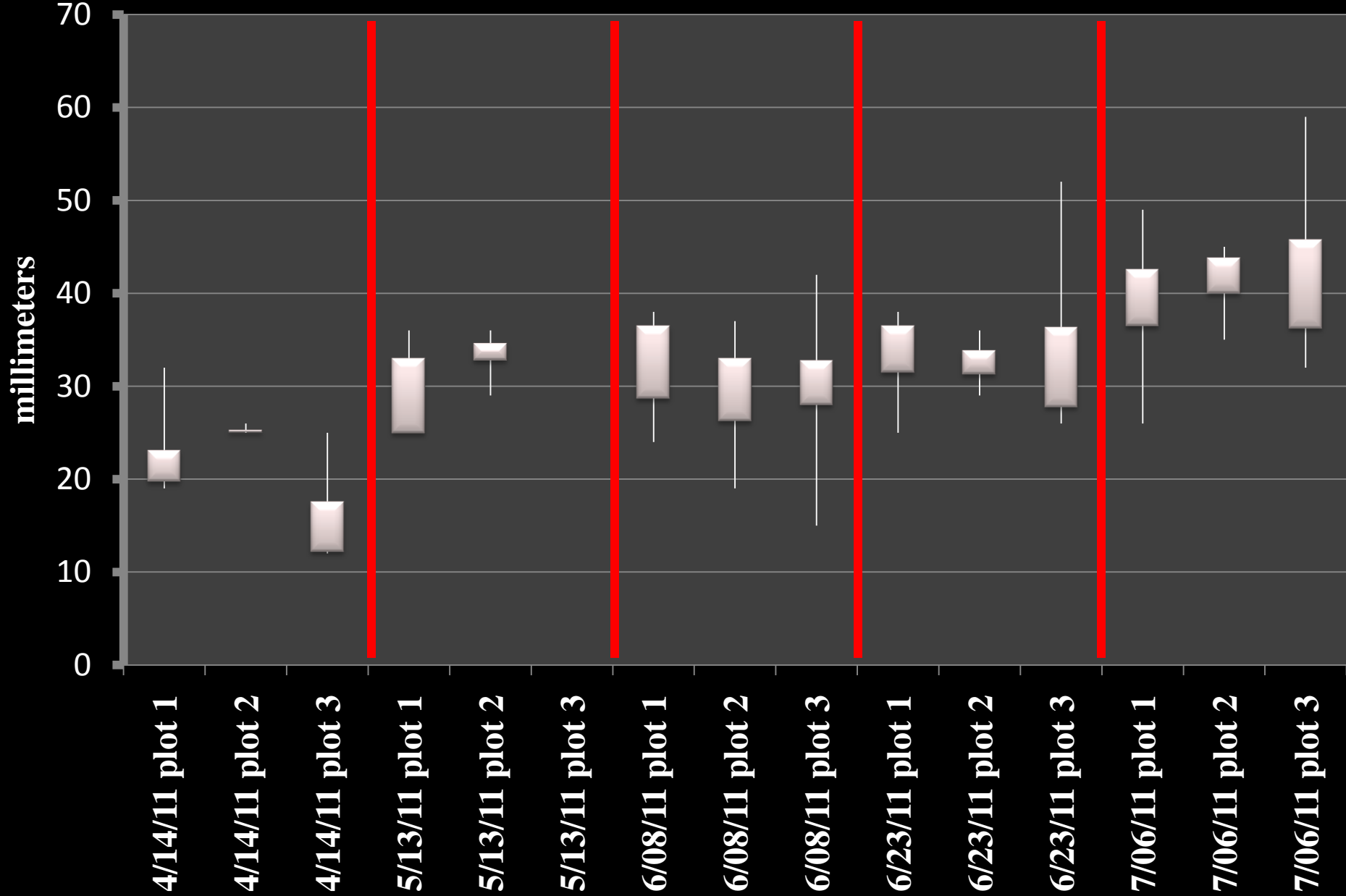


# Oyster Growth Rate April – July 2011

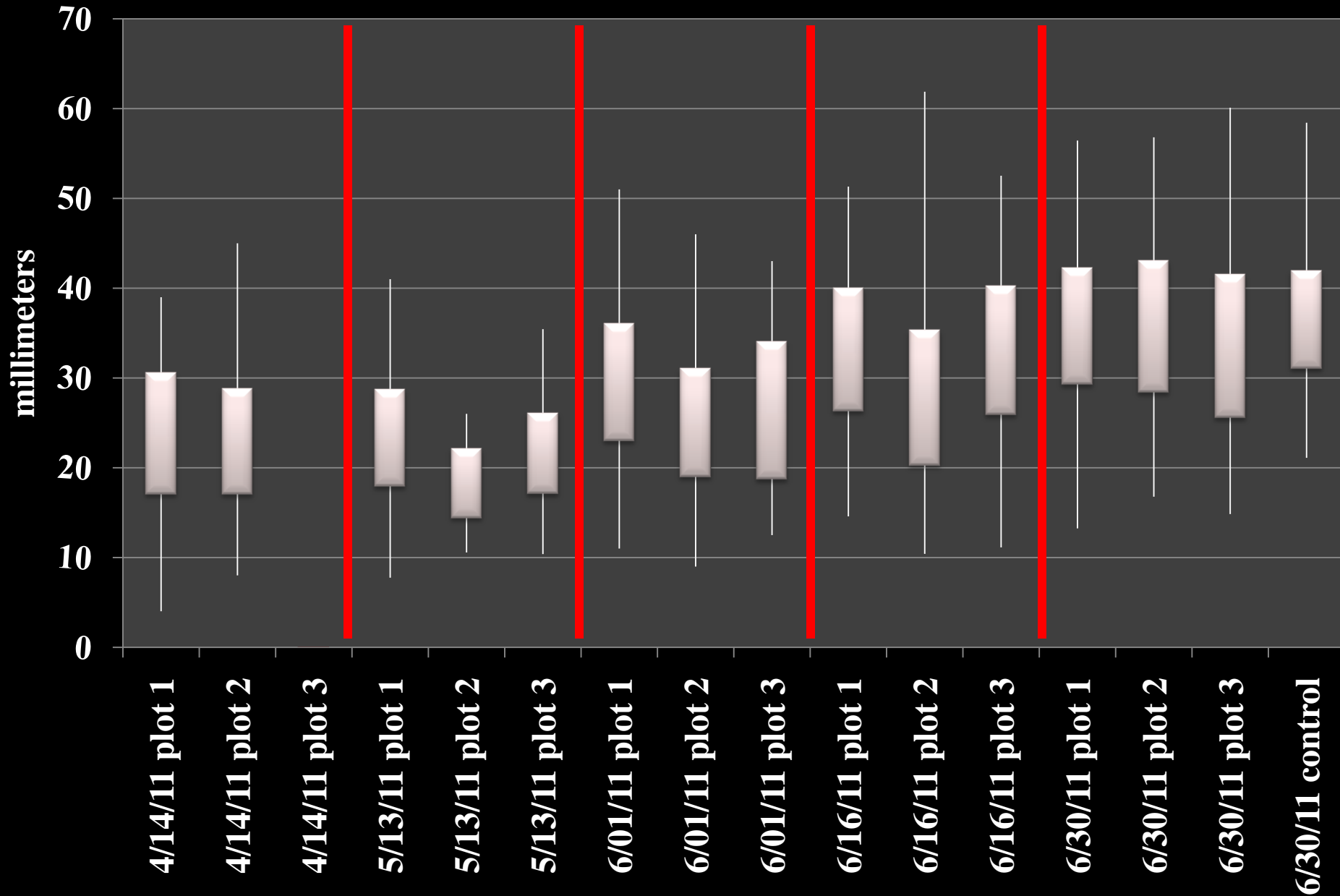


# Gerritsen Creek

## Observed Oyster Size Frequency



# Dubos Point Observed Oyster Size Frequency







# Oysters – Summary & Next Steps

## **WATER QUALITY:**

**Temp ranges: 0 – 27 C**

**Salinity: 19 – 31 ppt**

**DO: 7 – 22 milligrams/liter**

**pH: 6.7 – 8.9**

## **AS OF JULY 2010 --**

**Average Oyster Size: ~ 40 mm**

**Live Oysters on bed: ~500**

**Oysters on reef balls: ~600**

## **NEXT STEPS –**

**reproduction**

**recruitment**

**disease**



# Eelgrass Pilot Project



Canarsie Pol

Rulers Bar Hassock

Grass Hassock

Fishkill Hassocks

Yellow Bar Hassock

Winhole Hassock

Sails Point Hassock

Ruffle Bar

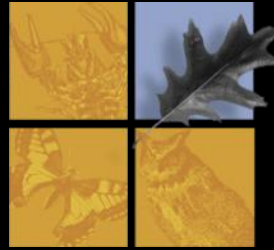
Barren Island

**KINGS  
COLLEGE  
WEST**

**KINGSBOROUGH  
COLLEGE EAST**

**BREEZY POINT**

# Eelgrass Timeline



**1<sup>ST</sup> PLANTING – APRIL /MAY 2010**

**Three sites**

**Weekly monitoring**

**By August 2010, no plants**

**NOVEMBER 2011 – FALL PLANTING**

**2<sup>ND</sup> SPRING PLANTING – APRIL 2011**

**Three sites**

**Weekly monitoring**



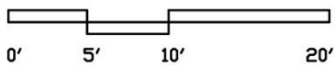
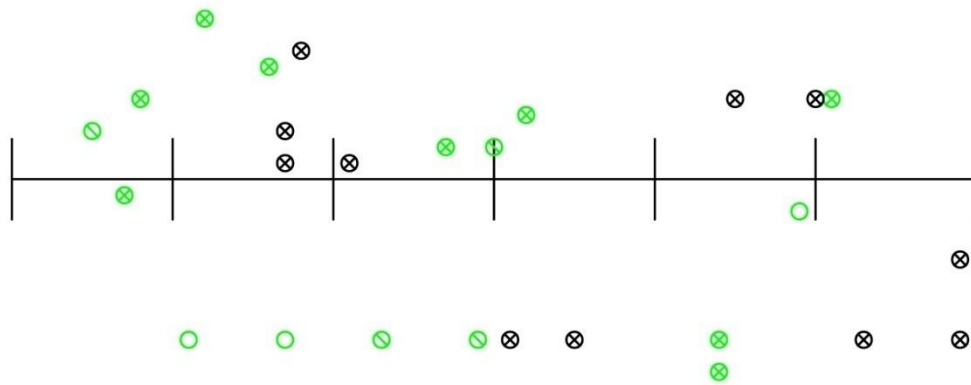


**Note:**

**Plots marked in  
black were not  
found**

**OR**

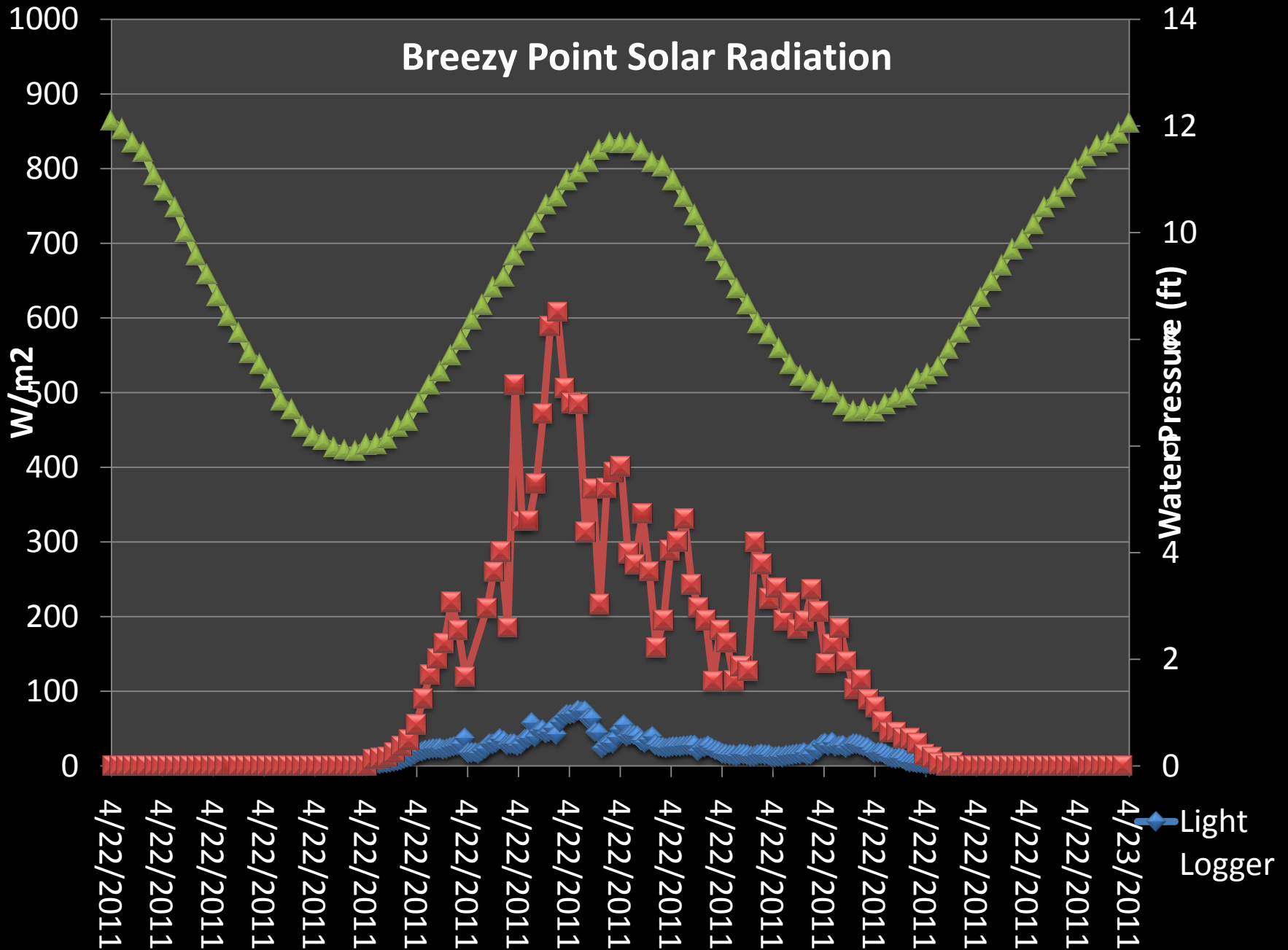
**found having no  
shoots at this  
monitoring event.**



Breezy Point  
07/26/11  
Total Plots: 16

|   |       |    |
|---|-------|----|
| □ | Good: | 03 |
| / | Fair: | 04 |
| X | Poor: | 09 |

# Breezy Point Solar Radiation





04/12/2011





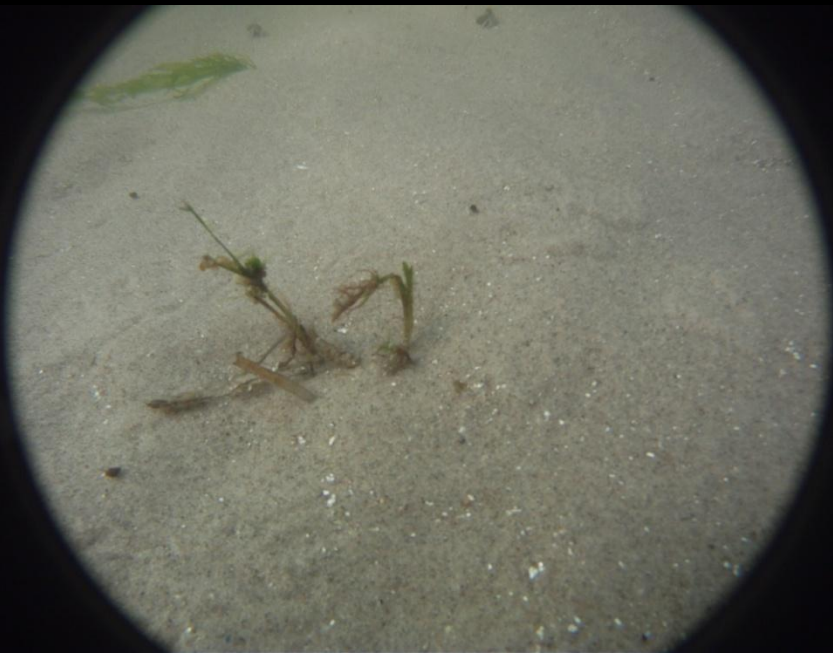
**28 JUNE 2011**



**11 JULY 2011**



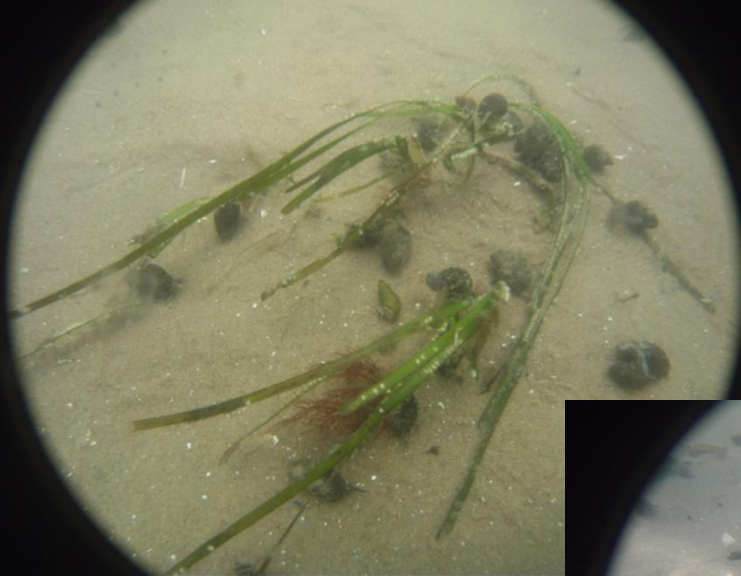
**19 JULY 2011**



**26 JULY 2011**







**28 June 2011**

**11 July 2011**



**5 July 2011**

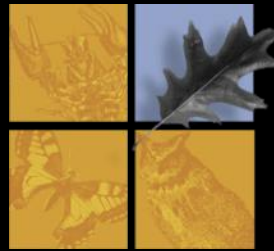


**19 July 2011**

**26 July 2011**







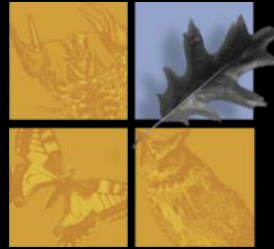
# Eelgrass – Summary & Next Steps

**POTENTIAL CAUSES –**  
**Sedimentation**  
**Water Quality**  
**Predation**

**NEXT STEPS –**  
**Large Fall Planting**  
**~8000 plants**



# Thank You



## **NYCDEP**

**John McLaughlin**  
**Bob Will**

## **DIVERS**

**Neal Stark**  
**Ed Decio**

## **NYSDEC**

**Steve Zahn**  
**Susan Maresca**

## **CORNELL COOPERATIVE EXTENSION**

**Gregg Rivara**  
**Chris Pickerell**

## **JOINT VENTURE TEAM –**

**HYDROQUAL/HDR, HAZEN & SAWYER and BIOHABITATS**  
**ER&M and MILLER MARINA**