



Eelgrass (*Zostera marina*) Restoration in Jamaica Bay: Initial Site Selection and Potential for Success

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SEAGRASS.LI
LONG ISLAND'S SEAGRASS CONSERVATION WEBSITE

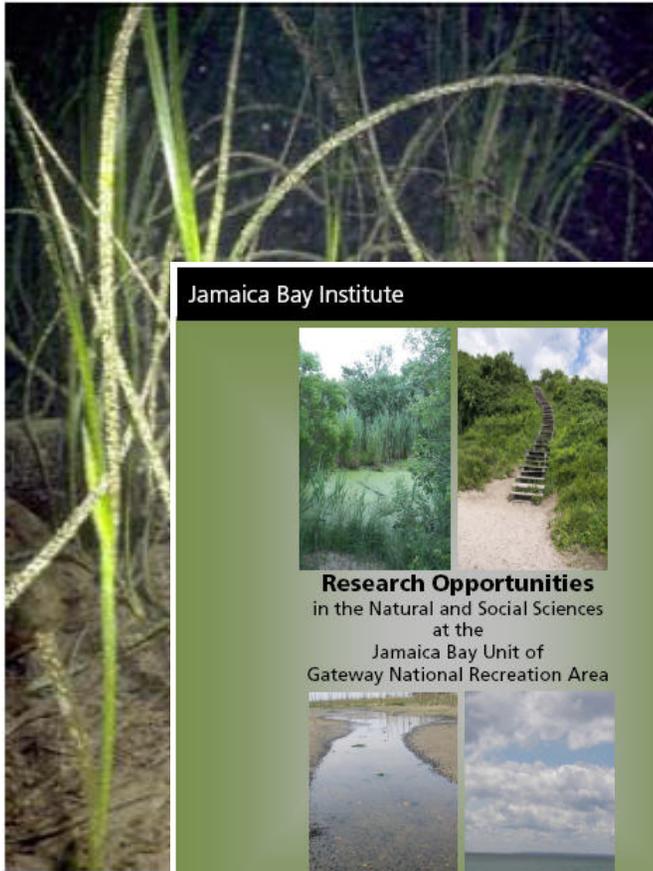
Alternate Title

Eelgrass (*Zostera marina*)
“PLANTING” in Jamaica Bay...

Using the term “restoration” implies that we know something about historic conditions for *Zostera* and unfortunately, in JB we don’t know much...

Was there ever Eelgrass in Jamaica Bay?

Eelgrass.



Eelgrass, *Zostera marina*, is not presently known in Jamaica Bay. In fact, it is not definitively known to have occurred there. But, given its historical and present-day distribution in similar Long Island region

Jamaica Bay Institute



Research Opportunities
in the Natural and Social Sciences
at the
Jamaica Bay Unit of
Gateway National Recreation Area



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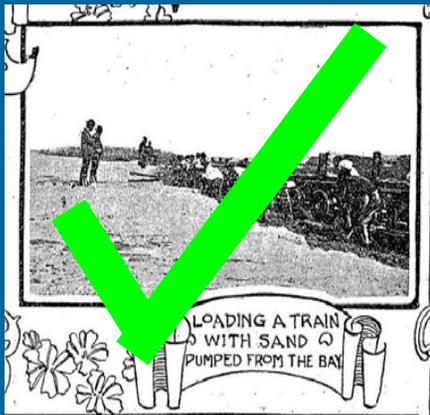
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What would constitute evidence of grass in Jamaica Bay?

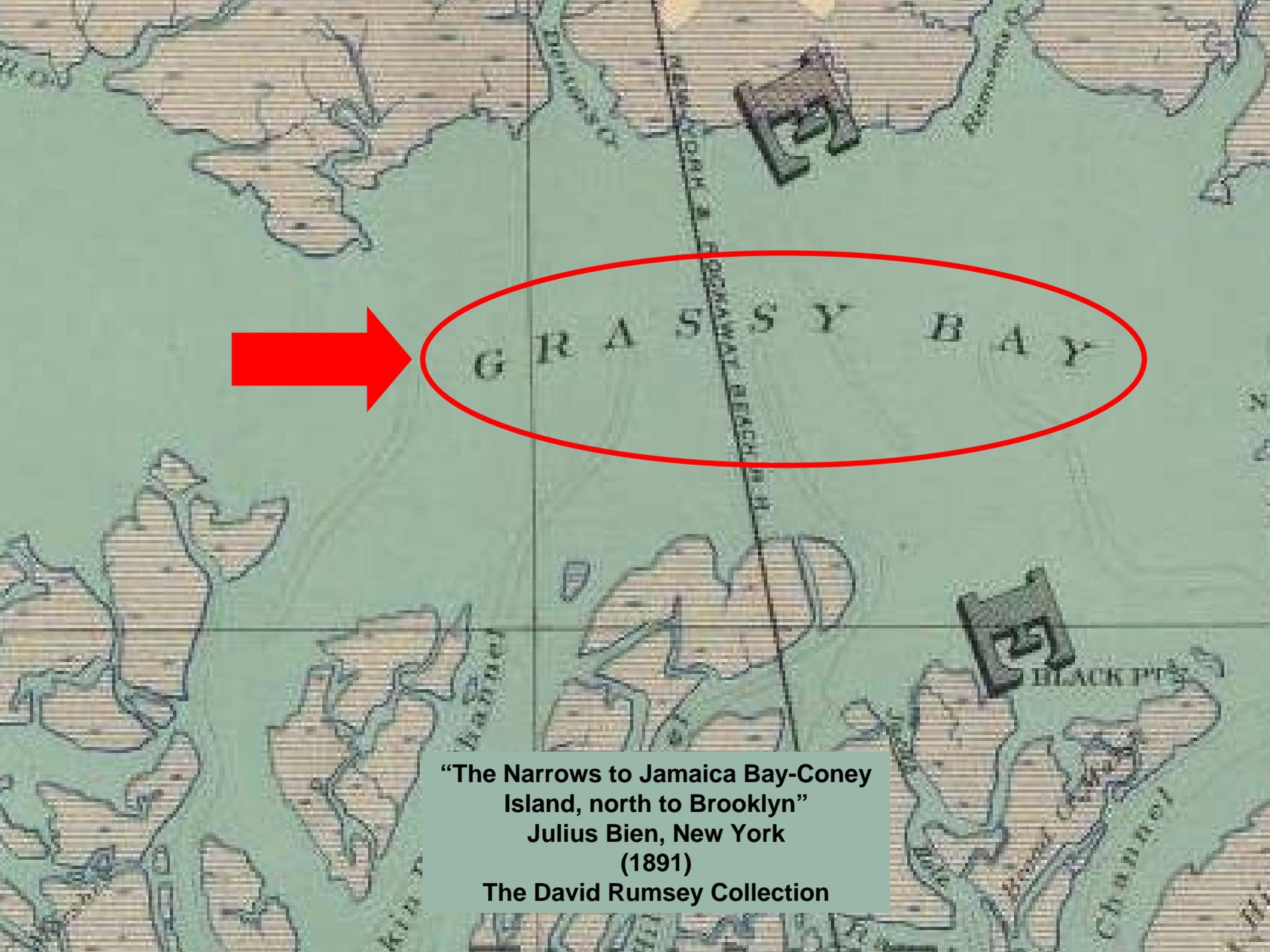


Scientific Observations
and Herbarium Samples

Evidence of seed coats in
sediment cores



Anecdotal reports in old
documents and maps



GRASSY BAY

**“The Narrows to Jamaica Bay-Coney Island, north to Brooklyn”
Julius Bien, New York
(1891)
The David Rumsey Collection**

JAMAICA BAY REGATTA

Only Four Boats Start in Catboat Class.
Two Motor-Launch
Classes.

Tuscarora became disabled by eel grass catching in her screw, and she withdrew. At that time she was in the lead by over one minute.

Brooklyn Daily Eagle, August 3, 1902
Brooklyn Public Library Collection (online)

If there was grass where was it?

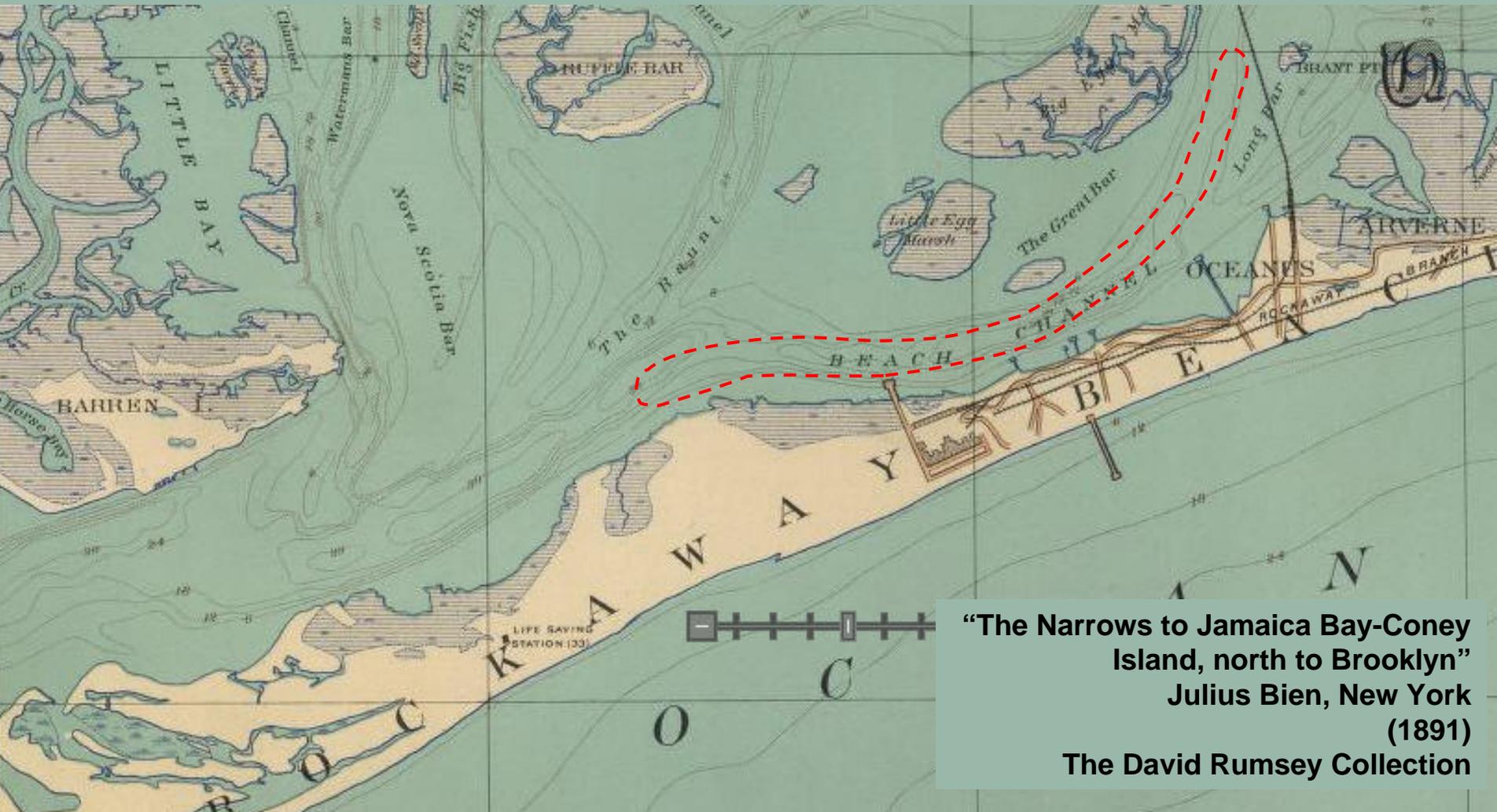
MATCH YACHT RACE ON JAMAICA BAY

The New York Times
August 19, 1901

**Lilly S. Wins the Inter-Club Event
for Catboats.**

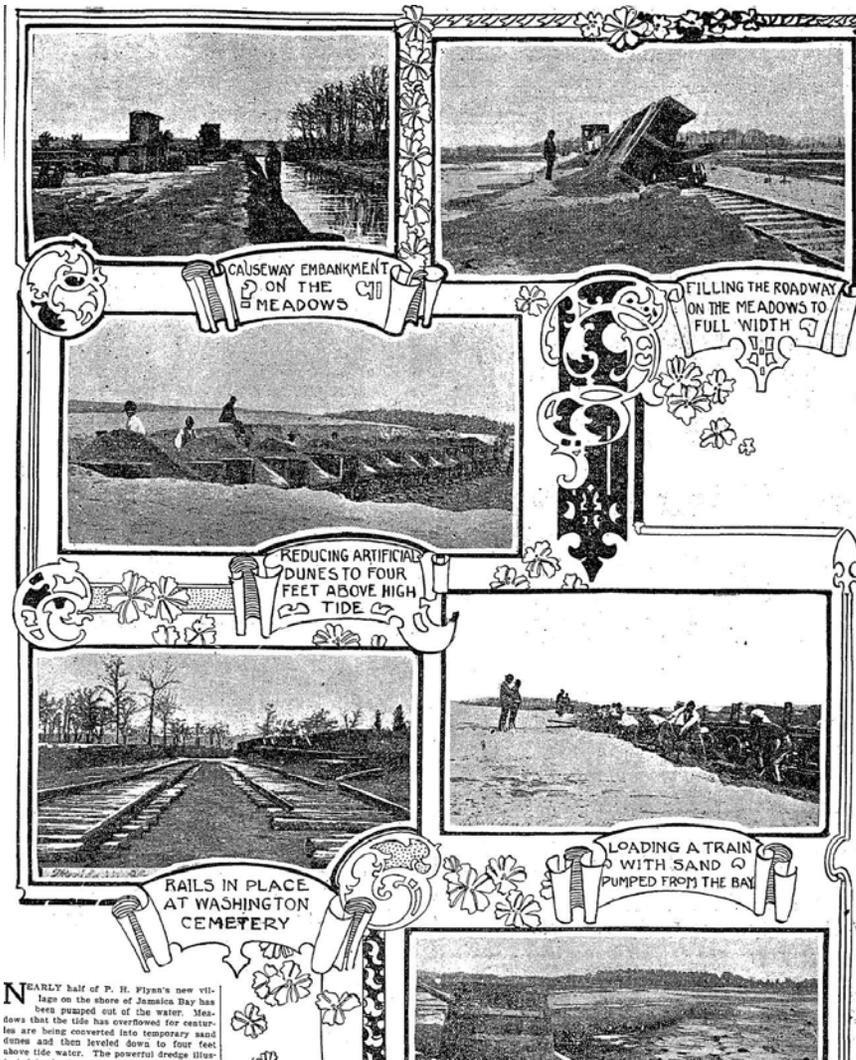
The course was from a float off the Jamaica Bay Yacht Club here at Hollands Station to and around the Spar Buoy off Block House Point, to and around a stakeboat off Broad Channel Drawbridge. The distance was five miles, and the contending craft covered the circuit twice.

THE “JAMAICA BAY REGATTA” (1890’s TO 1900’s)



**“The Narrows to Jamaica Bay-Coney
Island, north to Brooklyn”
Julius Bien, New York
(1891)
The David Rumsey Collection**

“P.H. Flynn’s Nassau Beach and Causeway” aka the Broad Channel roadbed



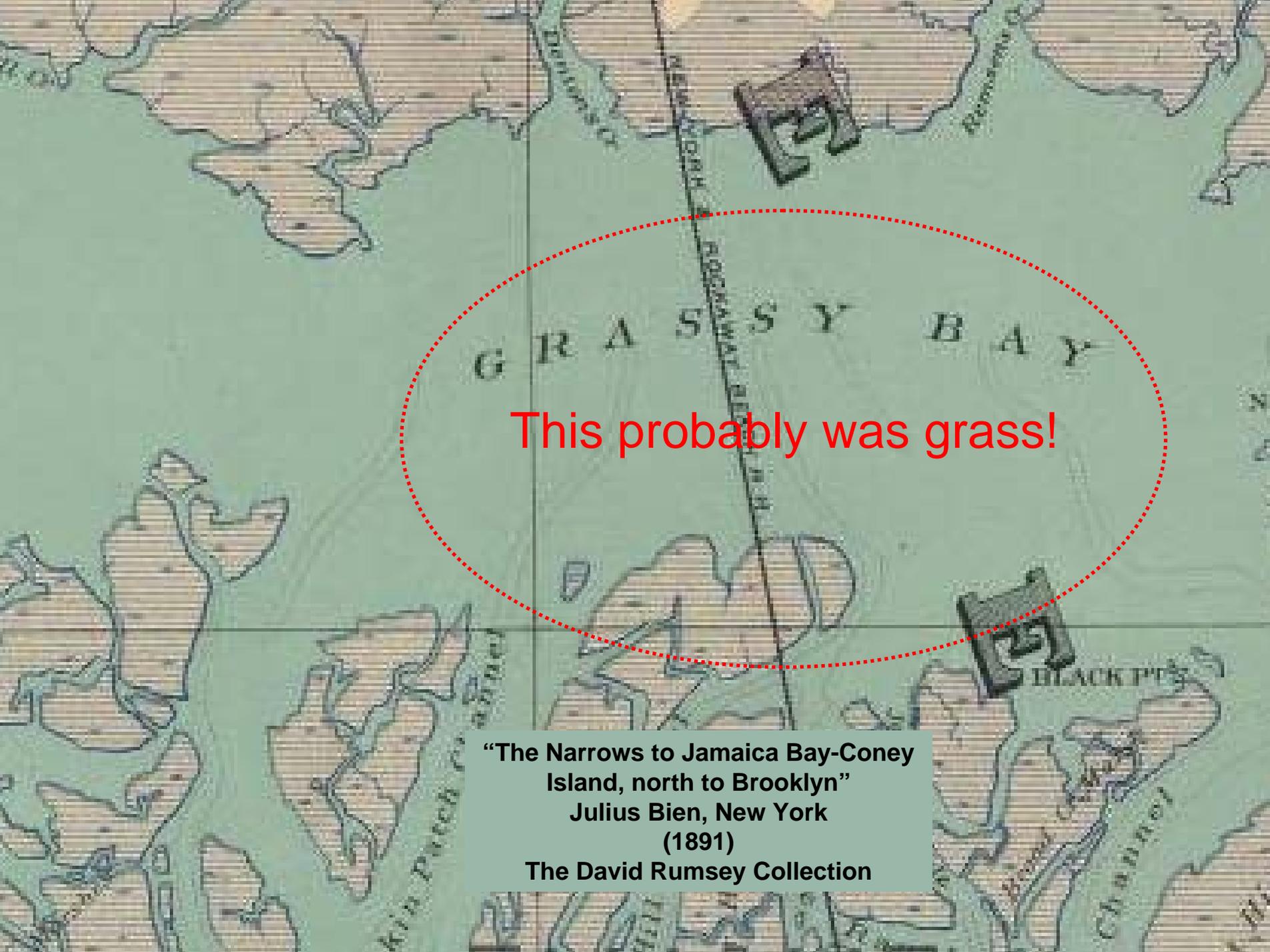
Briefly stated, Mr. Flynn is pumping a village site out of the water and creating a valuable water front for it by the same operations. An enormous steam pump and dredge anchored in a channel it has cut for itself through the eel grass and sand of the shallow waters along the shore are raising about eighteen thousand cubic yards of solid matter each twenty-four hours and pumping it through a twelve inch pipe with about five times the volume of water to whatever distance inland may be required. The solids that flow from this pipe settle rapidly, the heavier particles near the place of delivery and the lighter at

“It has cut...through the eel grass and sand of the shallow waters along the shore...”

Proof of existence and reason for decline...all in one!

Brooklyn Daily Eagle, May 13, 1900
(Brooklyn Public Library Collection, online)





GRASSY BAY

This probably was grass!

**“The Narrows to Jamaica Bay-Coney Island, north to Brooklyn”
Julius Bien, New York
(1891)
The David Rumsey Collection**

The Project

I first became involved with eelgrass work in JB after being invited by Jim Lodge to a meeting (July 2007) at the Hudson River Foundation.

During this meeting I agreed to look into the possibility of attempting some test plantings and I was given John McLaughlin's name. I contacted John and he was very interested in initiating a project.

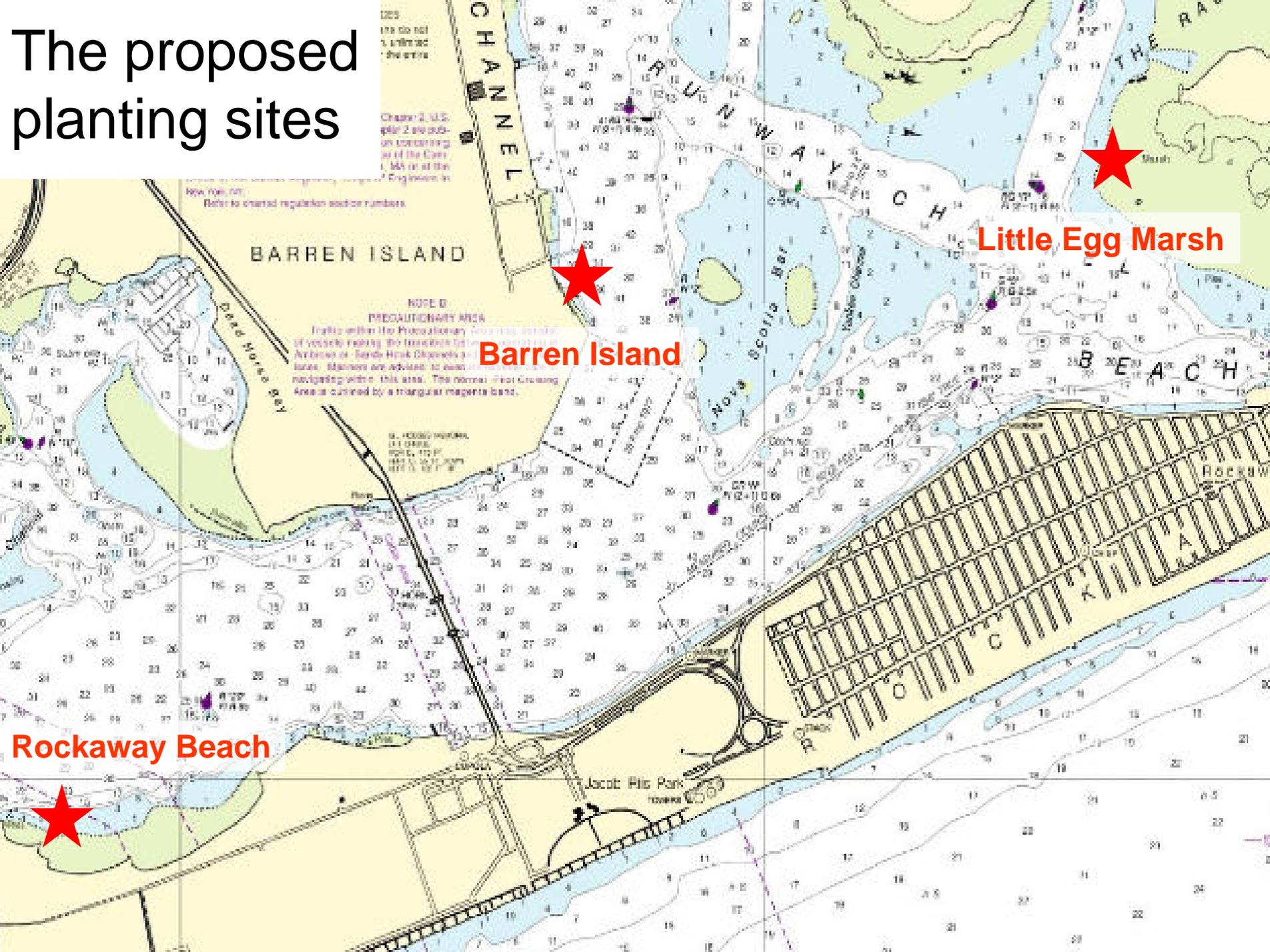
After this, I subsequently had conversations with Steve Zahn with the NYSDEC and Doug Adamo and George Frame from Parks to work out permitting details.

Permits were received on during winter of 2007/2008.

Field work began in June 2008.

The first plantings are planned for November 2008.

The proposed planting sites



How were these sites selected?

Over the last decade we have had a major paradigm shift with regard to site selection. Whereas we used to focus on creeks and harbors with fine sediments we now work almost exclusively in sands and gravels in higher energy sites.

Scouting for planting sites began with a review of recent aerial photos looking for sandy flats.

This was followed by an aerial recon using a helicopter and a visit to each site (NYCDEP vessel).

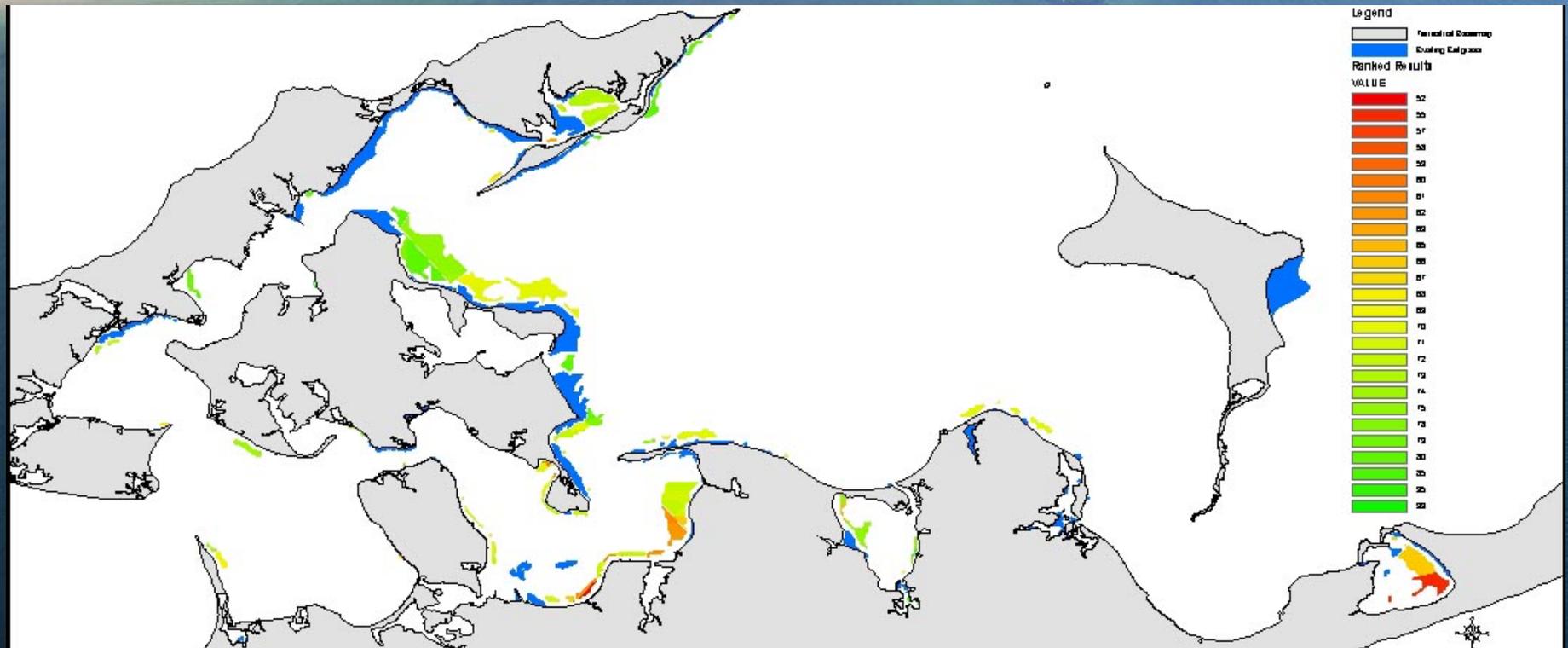


Typical Transplant Model Parameters

<u>Exclusive</u>	<u>Ranked</u>	<u>Score</u>
Historical Eelgrass (1930)	Kd	0-15
Existing Eelgrass (2001)	Temp	0-20
(100m buffer)	Phos	0-10
Water Depth (1.25-3.25m)	NOx	0-10
NOx (≤ 0.029 ppm)	Macroalgae	0 or 10
Phosphorous (≤ 0.071 ppm)	DEC closure	0 or 20
Temperature (≤ 27.1 C)	Sediment	0-5
Kd (≤ 0.75)	Fetch	
Mooring Fields	(<2km/2-4km NW)	0-10
Shoreline Hardening (15m buffer)		Total 100
Nuisance Phytoplankton		

Peconic Estuary Parameters

GIS Planting Suitability Index Model Results



Rockaway Beach Site



JUN 18 2008

Point Biv



Little Egg Marsh Site

New York

J a m a i c a B a y



JUN 18 2008



Barren Island Site



Long Island



JUN 18 2008



Comparing Sites

Rockaway Beach



Little Egg Marsh



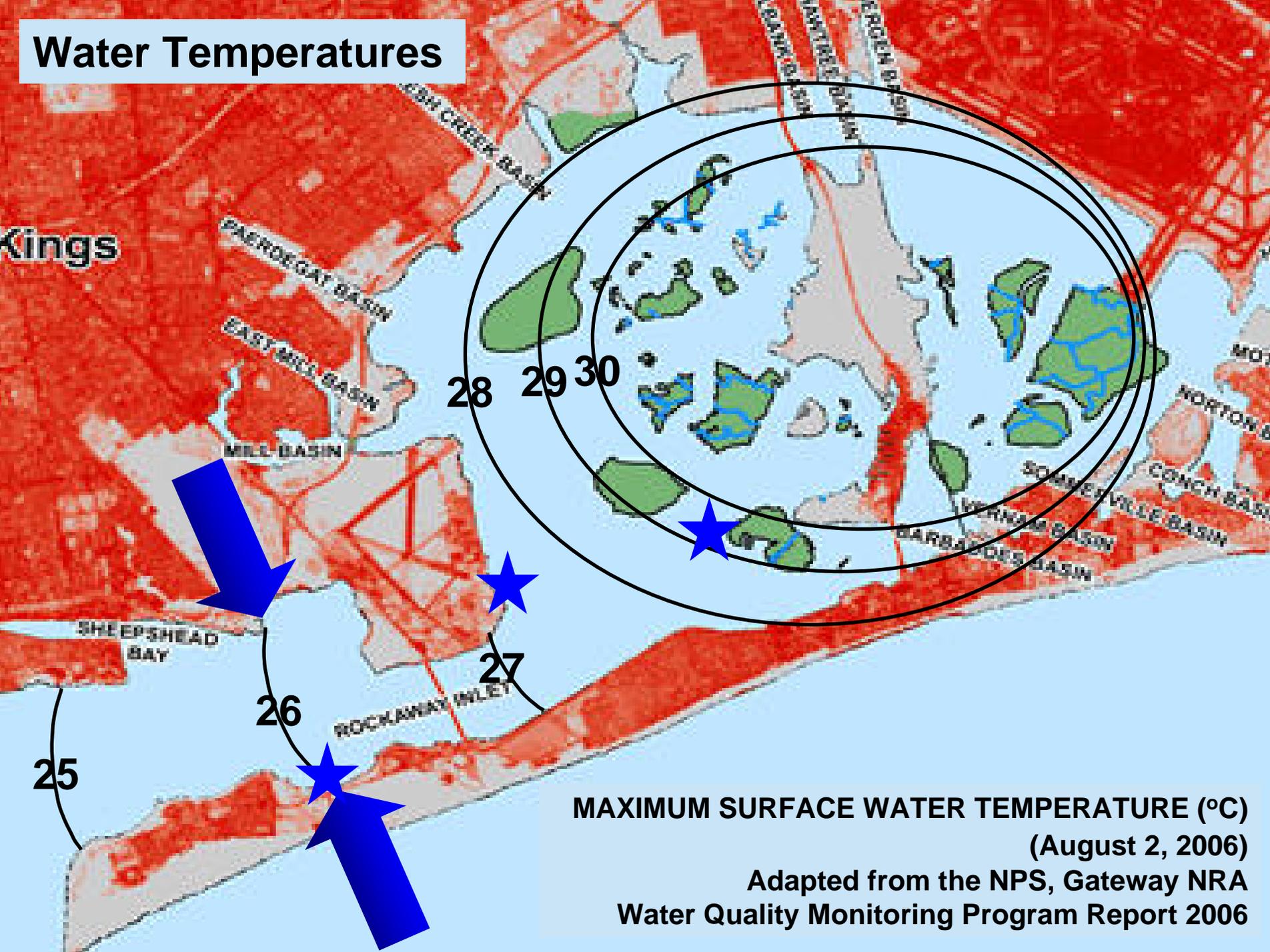
Barren Island



**Declining
Water Quality**



Water Temperatures

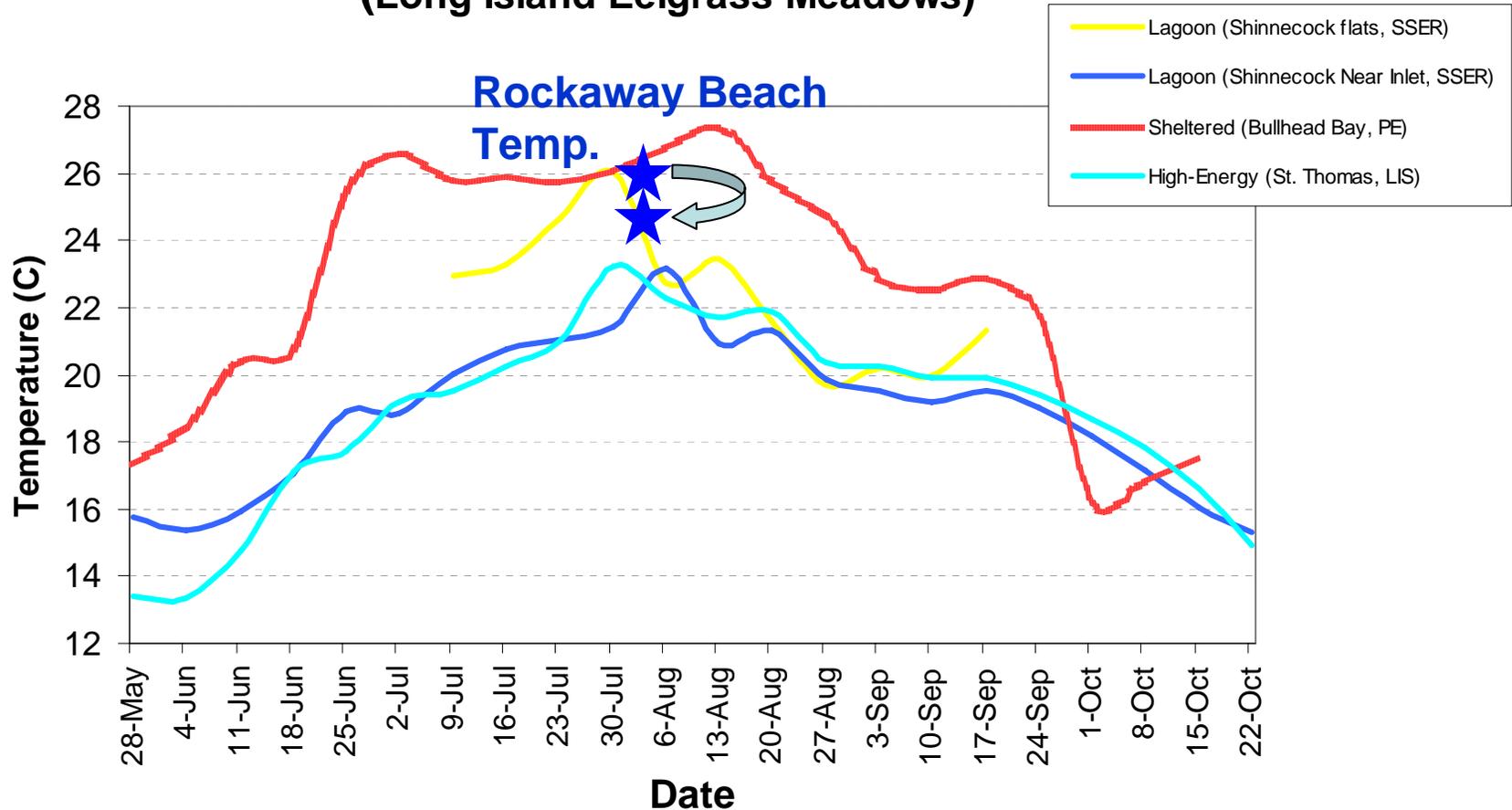


MAXIMUM SURFACE WATER TEMPERATURE (°C)
(August 2, 2006)

Adapted from the NPS, Gateway NRA
Water Quality Monitoring Program Report 2006

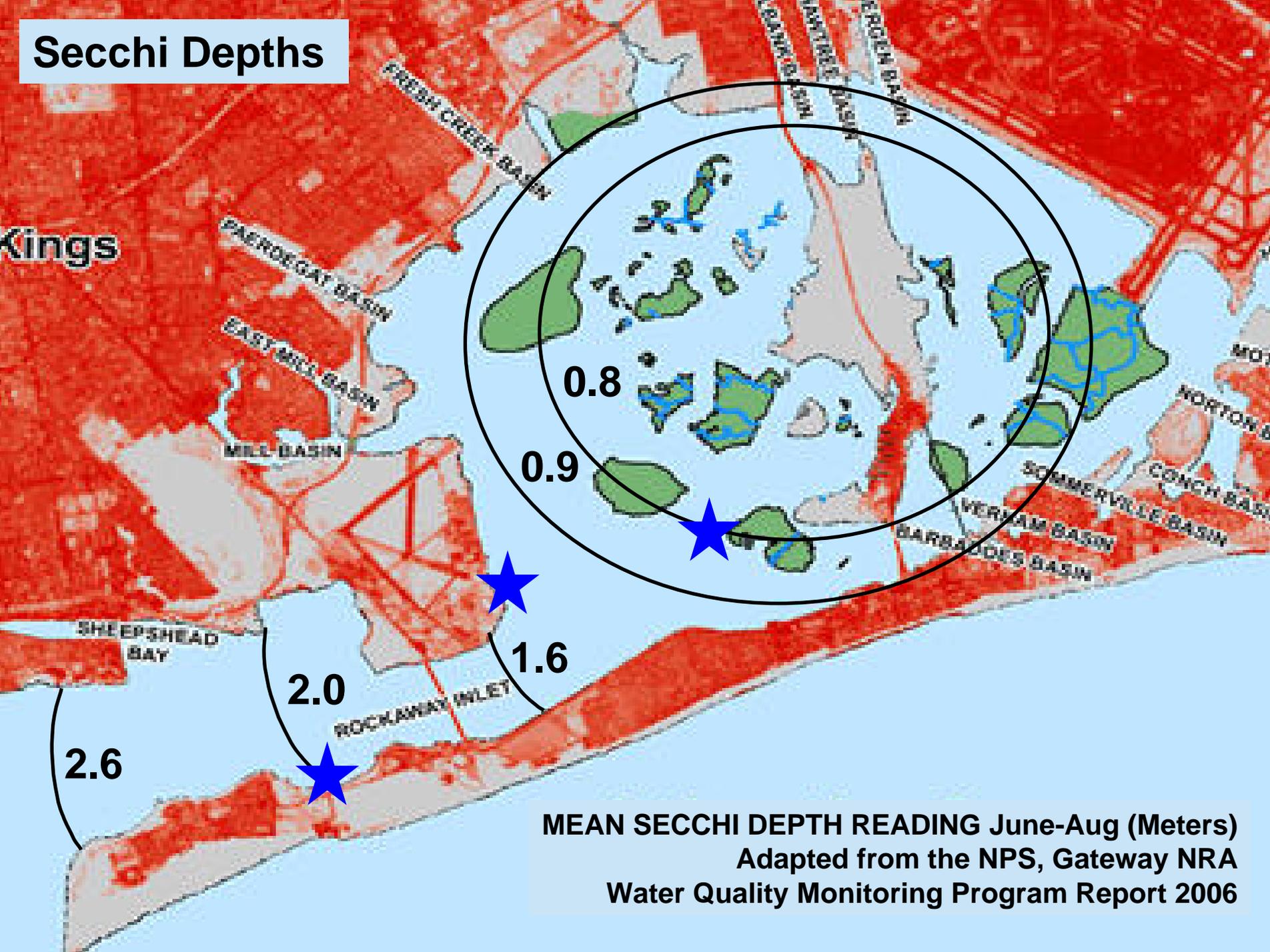
Comparing Temperatures

Weekly Average Water Temperatures (2006)
(Long Island Eelgrass Meadows)



Secchi Depths

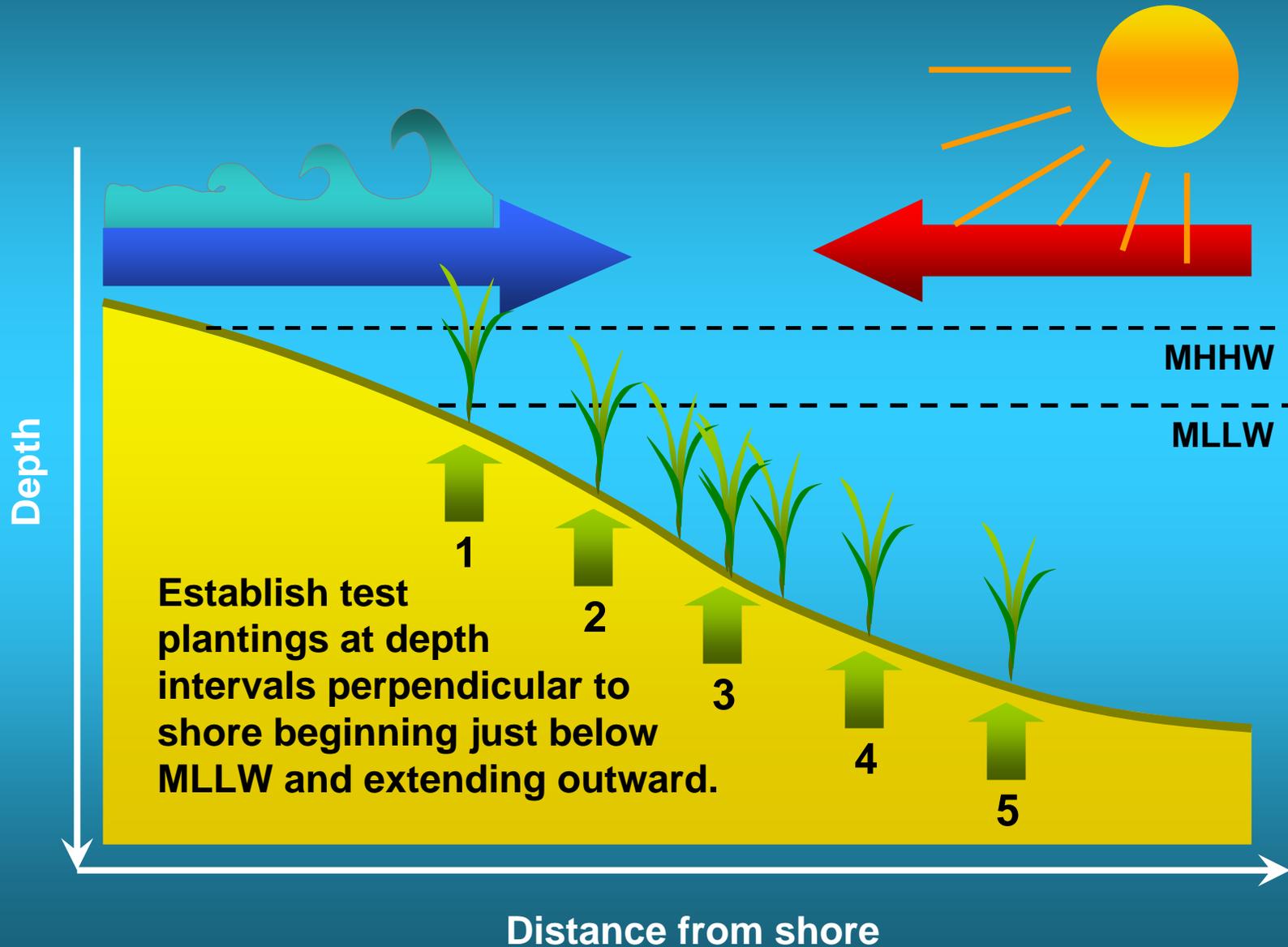
Kings



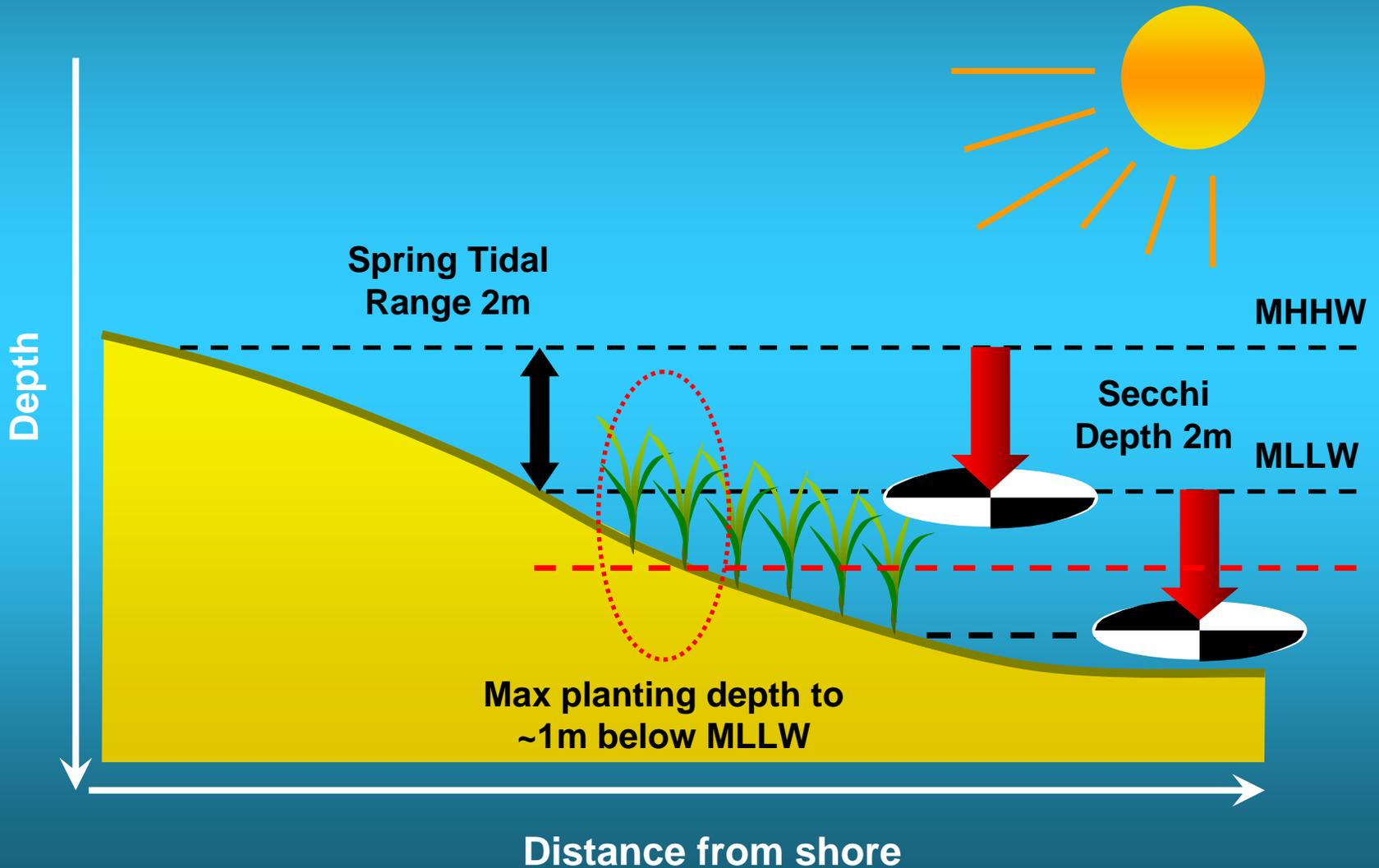
MEAN SECCHI DEPTH READING June-Aug (Meters)
Adapted from the NPS, Gateway NRA
Water Quality Monitoring Program Report 2006



How will we plant?



Rockaway Beach Site Example



Expected Results

THE GOOD NEWS:

The Rockaway site looks promising and is similar in sediment type and water quality to other sites where we have had some success.

One major complicating factor could be bioturbation from crabs.

Chances of success: GOOD TO VERY GOOD

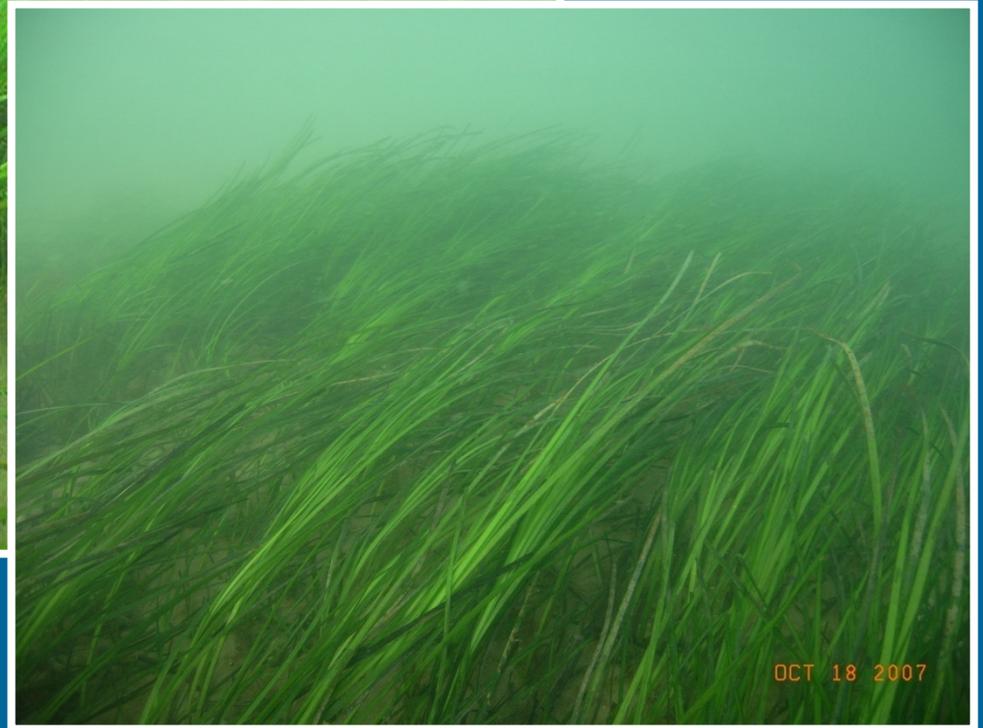
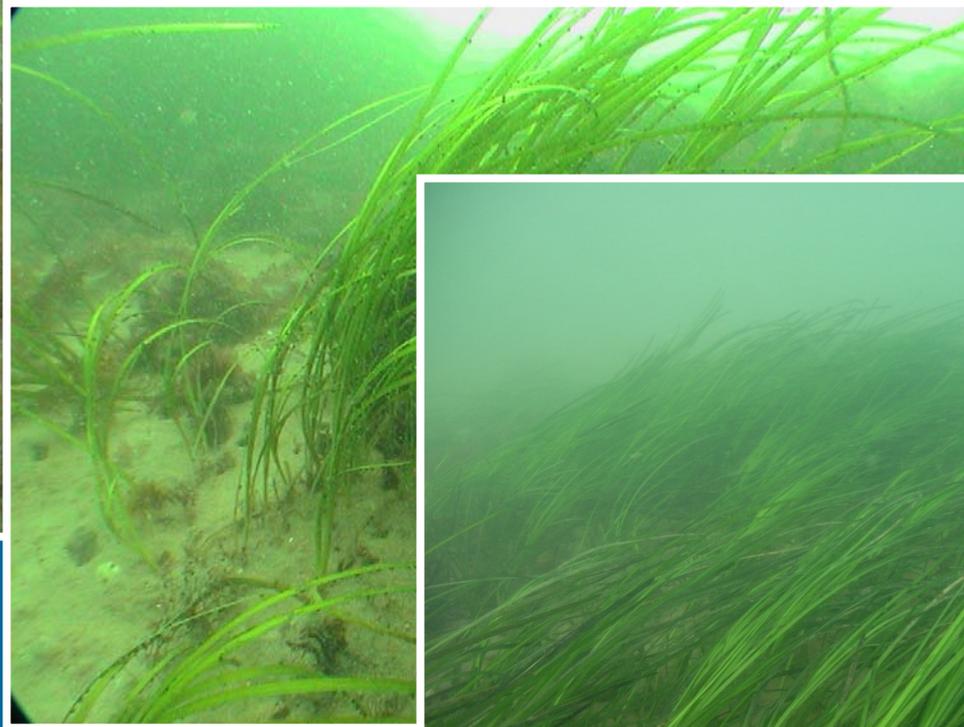
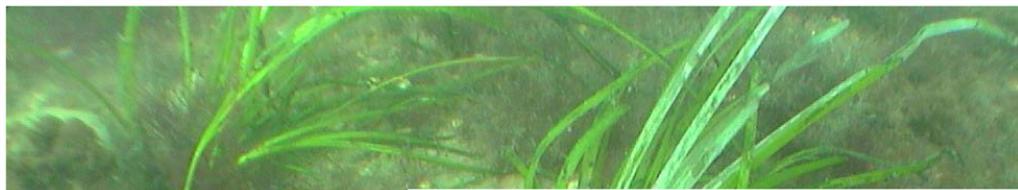
THE BAD NEWS:

The Barren Island and Little Egg Marsh sites have few redeeming qualities except for sediment type.

Temperature and lack of light appear to be major limiting factors.

Chances of success: POOR

Can we be successful?



Conclusions

It is essential to conduct test plantings prior to undertaking any large-scale planting efforts.

Lessons learned from this work will have practical application to any future efforts in the bay.

If nothing else, we will learn something about the potential of Jamaica Bay to support this species.

For more information on our work
please visit:

www.SeagrassLI.org



View Our
Newsletter

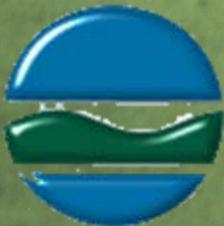


Check Out
Our Blog



Thank You!

HRF



- **Jim Lodge, Hudson River Foundation**
- **John McLaughlin, NYCDEP**
- **Steve Zahn, NYSDEC**
- **Doug Adamo and George Frame, National Park Service**

OCT 18 2007