

New York State & Nassau County Host

LONG ISLAND RESILIENCY & CLEAN WATER INFRASTRUCTURE MEETING

May 12, Noon - 4 p.m.

Nassau County Legislative Chambers
1550 Franklin Avenue, Mineola, New York

Meeting Agenda

Welcome Noon – 1 p.m.

- **Peter Scully**, NYSDEC Regional Director
- **Joseph Martens**, NYSDEC Commissioner
- **Edward Mangano**, Nassau County Executive
- **U.S. Congressman Peter King**
- **Jamie Rubin**, Director, Governor's Office of Storm Recovery
- **Matthew Driscoll**, President and CEO, NYS Environmental Facilities Corporation

Invited Speaker Presentations 1 p.m. – 2 p.m.

- **Dr. Lawrence Swanson**, Associate Dean, School of Marine and Atmospheric Sciences, SUNY Stony Brook
- **Peter H. Glus, P.E.**, Vice President, Arcadis
- **Shila Shah-Gavnoudias, P.E.**, Commissioner, Nassau County Department of Public Works
- **Dr. Mari Bortman and Carl LoBue**, Marine Research Scientists, The Nature Conservancy

Break 2 p.m. – 2:15 p.m.

Invited Speaker Presentations 2:15 p.m. – 4 p.m.

- **Kevin S. Law**, President and Chief Executive Officer, Long Island Association
- **Adrienne Esposito**, Executive Director, Citizens Campaign for the Environment
- **Richard O'Kane**, President, Nassau-Suffolk Building Trades Council
- **Jack Schnirman**, City Manager, City of Long Beach
- **Eric Alexander**, Executive Director, Vision Long Island
- **Robert Weltner**, President, Operation SPLASH

New York State and Nassau County Host Long Island Resiliency & Clean Water Infrastructure Meeting

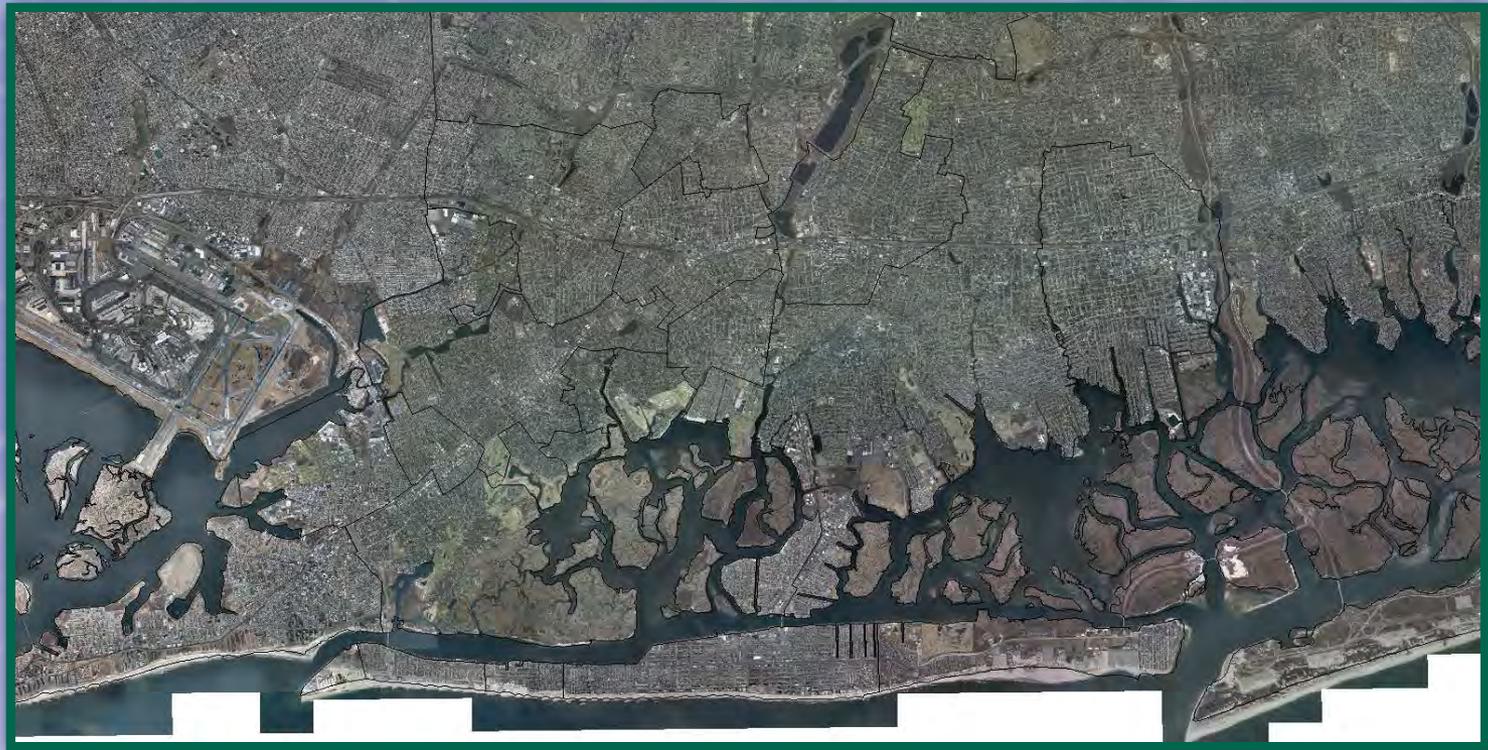
Joe Martens, Commissioner
May 12, 2014



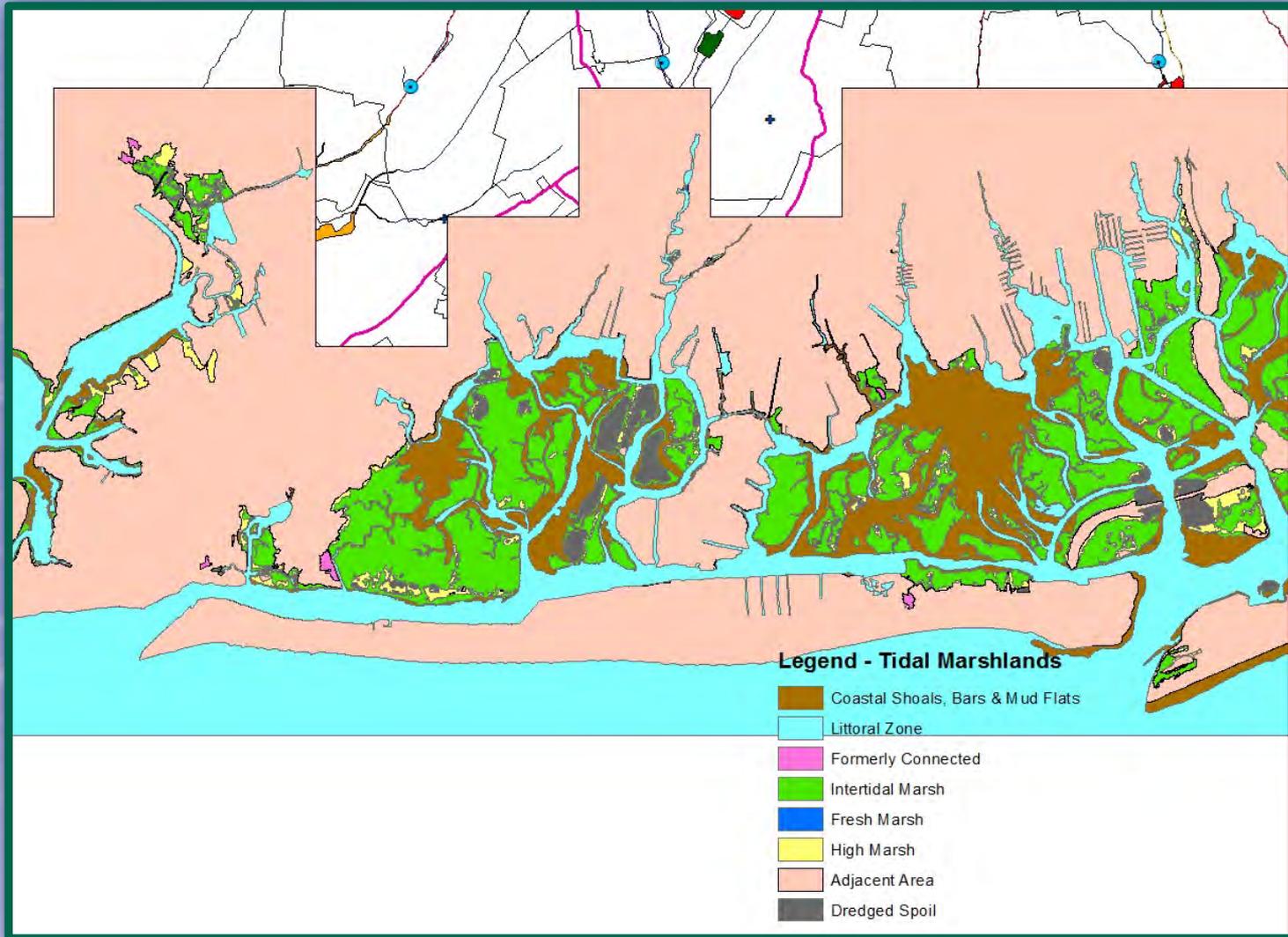
New York State
Governor Andrew M. Cuomo

The Western Bays – Resiliency Matters

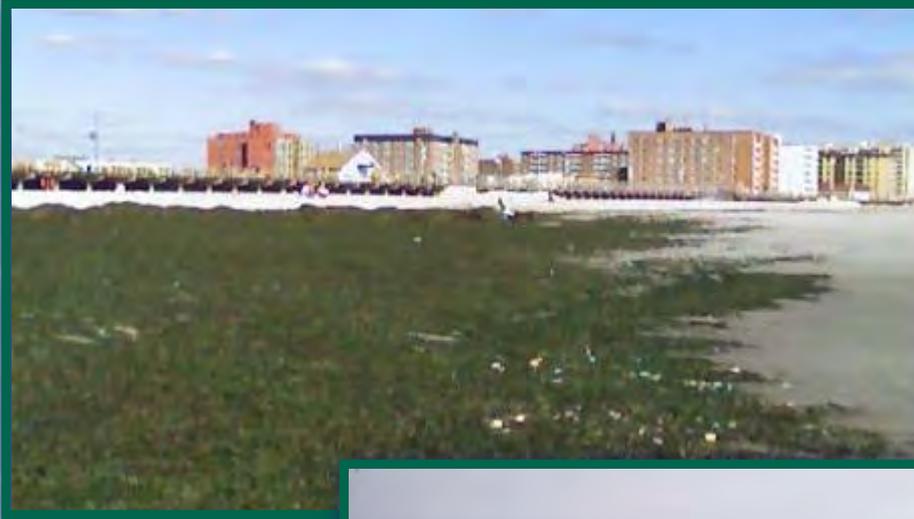
Marshlands of the Western Bays (May 12, 2014)



Marshlands of the Western Bays



Where the Sea Lettuce Goes....



Where Sea Lettuce Was Concentrated on August 26, 2008



Marshland Erosion



Hurricane Sandy Bay Park STP Damage



-  Basement and Tunnel Flooding due to Surcharged Storm and Plant Drain Systems
-  3 - 7 foot Tidal Surcharge above ground Elevation

FEMA Recovery Scope



Discharge From Bay Park After Hurricane Sandy



Photo courtesy of Doug Kuntz



What Resiliency Looks Like

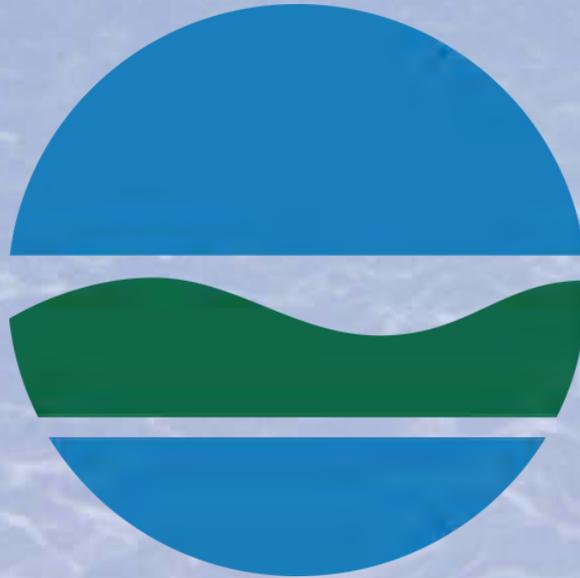


Making Long Island More Resilient and Improving Clean Water Infrastructure

Here Today to Find Ways to:

- Mitigate the Existing Problems of the Western Bays
- Prevent Marshland Loss to Ensure and Improve the Resiliency of this Important Ecosystem





How to submit comments:

- Written comments at all three meetings or by email: **liwaterquality@gw.dec.state.ny.us**.
- Verbally during the evening portion of the May 28 meeting

Impaired Uses and Poor Water Quality in West Bay: Causes and Consequences

**R. Lawrence Swanson
School of Marine and Atmospheric Sciences
Stony Brook University
May 12, 2014**



Stony Brook University
*School of Marine and
Atmospheric Sciences*

Support provided by

Battelle

New York State Department of
Environmental Conservation

New York State Department of State

New York State Resiliency Institute for
Storms & Emergencies (NYS RISE)

Town of Hempstead

US Geological Survey

Contributors to this Report

Investigators

- Henry Bokuniewicz
- Bruce Brownawell
- Kirk Cochran
- Charles Flagg
- Roger Flood
- Mike Frisk
- Chris Gobler
- Anne McElroy
- Larry Swanson
- Robert Wilson

Students

- Cassie Bauer
- Anne Cooper Doherty
- Ryan Wallace
- Kaitlin Willig
- Dongming Yang

Collaborators

- Jim Browne, ToH
- Tom Doheny, ToH (ret.)
- Scotty's Marina and Fishing

Impaired waters – those where designated uses are not fully supported

West Bay and Middle Bay

- **closed to shellfishing**
- **eutrophic**

Cause of Eutrophication

An aerial photograph of a small, elongated island covered in dense green vegetation, surrounded by clear blue water. The island is the central focus of the image, with the water extending to the edges of the frame.

Excess nitrogen

Limited flushing

Consequences of Eutrophication

- **Excessive growth of *Ulva***
habitat impingement, transient hypoxia, toxic to fish larvae, recreation limitation, odors, disposal costs
- **10-year TN concentrations exceed 0.45 mg/L at 11 of 15 stations**
- **Sediments enriched in organic carbon**
- **Harmful algal blooms of *Heterosigma akashiwo* and *Peridinium spp.***

Discharge and Nitrogen Loading to West Bay

	Flow gal x 10 ⁶ /y	TN ton/y
Lawrence WPCP ¹	442	30
Greater Atlantic Beach WPCP ²	182	11
Long Beach WPCP ³	1788	157
Bay Park WPCP ⁴	18,177	2247
Pines Brook ⁵ (mean of 1992-1996)	814	5.8
East Meadow Brook ⁵ (mean of 1992-1996)	2996	5.5
Groundwater, Sewer District II ⁵		
Shallow	5670	91
Deep	2600	2
Total	32,669	2549.3

¹ Quarterly data (November, February, May, August) 2008-2011.

² Spot data, Summer 2012.

³ Monthly flow data and quarterly nitrogen data, December 2010-August 2012.

⁴ Monthly data, 2010-2011

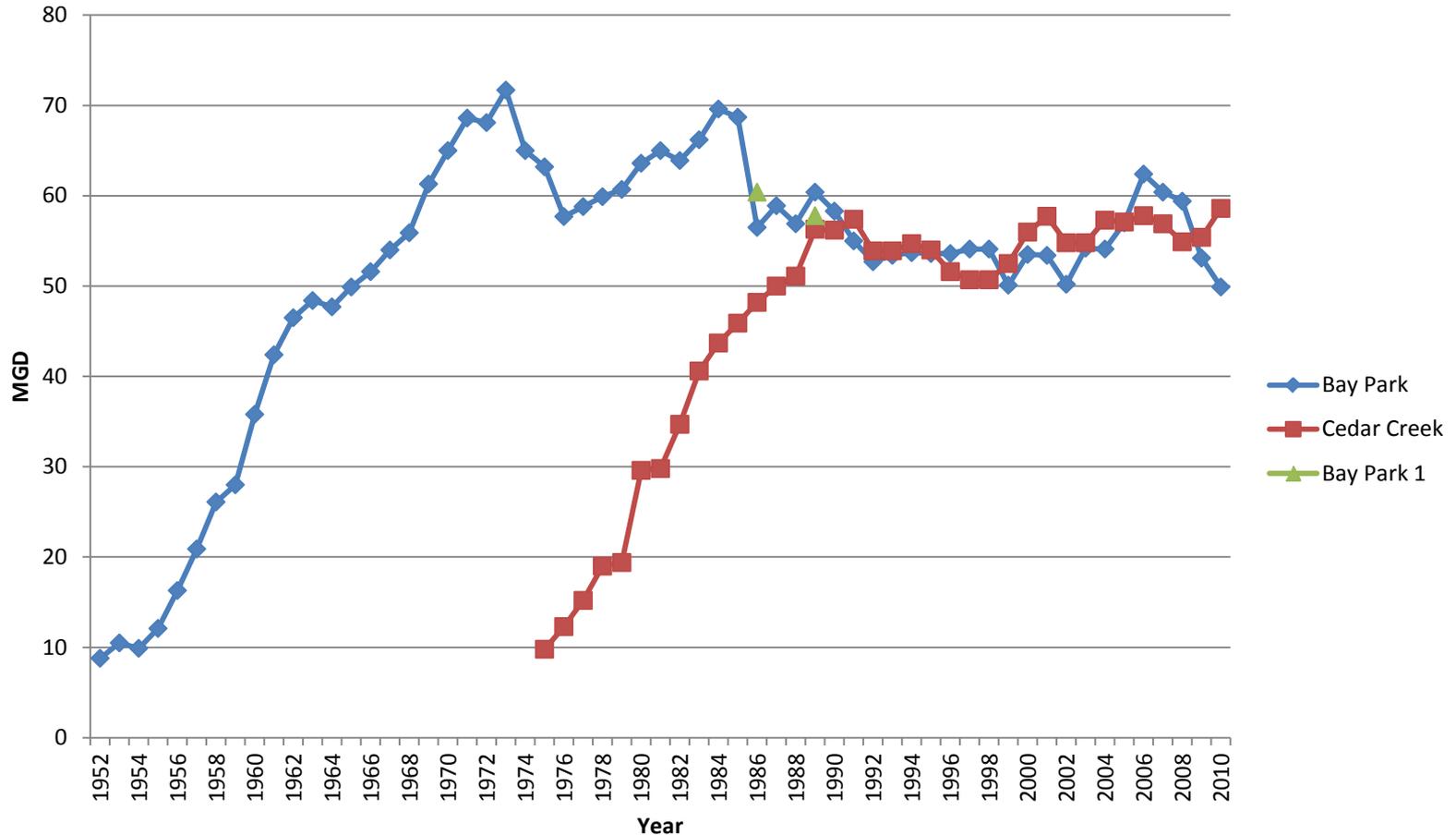
⁵ Monti, J. and M.P. Scorca. 2003. Trends in Nitrogen Concentration and Nitrogen Loads Entering the South Shore Estuary Reserve from Streams and Ground-Water Discharge in Nassau and Suffolk Counties, Long Island, New York 1952-97. U.S. Geological Survey, Water Resources Investigations Report 02-4255. Corum, NY. 36 pp.

Existing Conditions for the Western Bays

Three Sewage Treatment Plant Discharges in Reynolds Channel

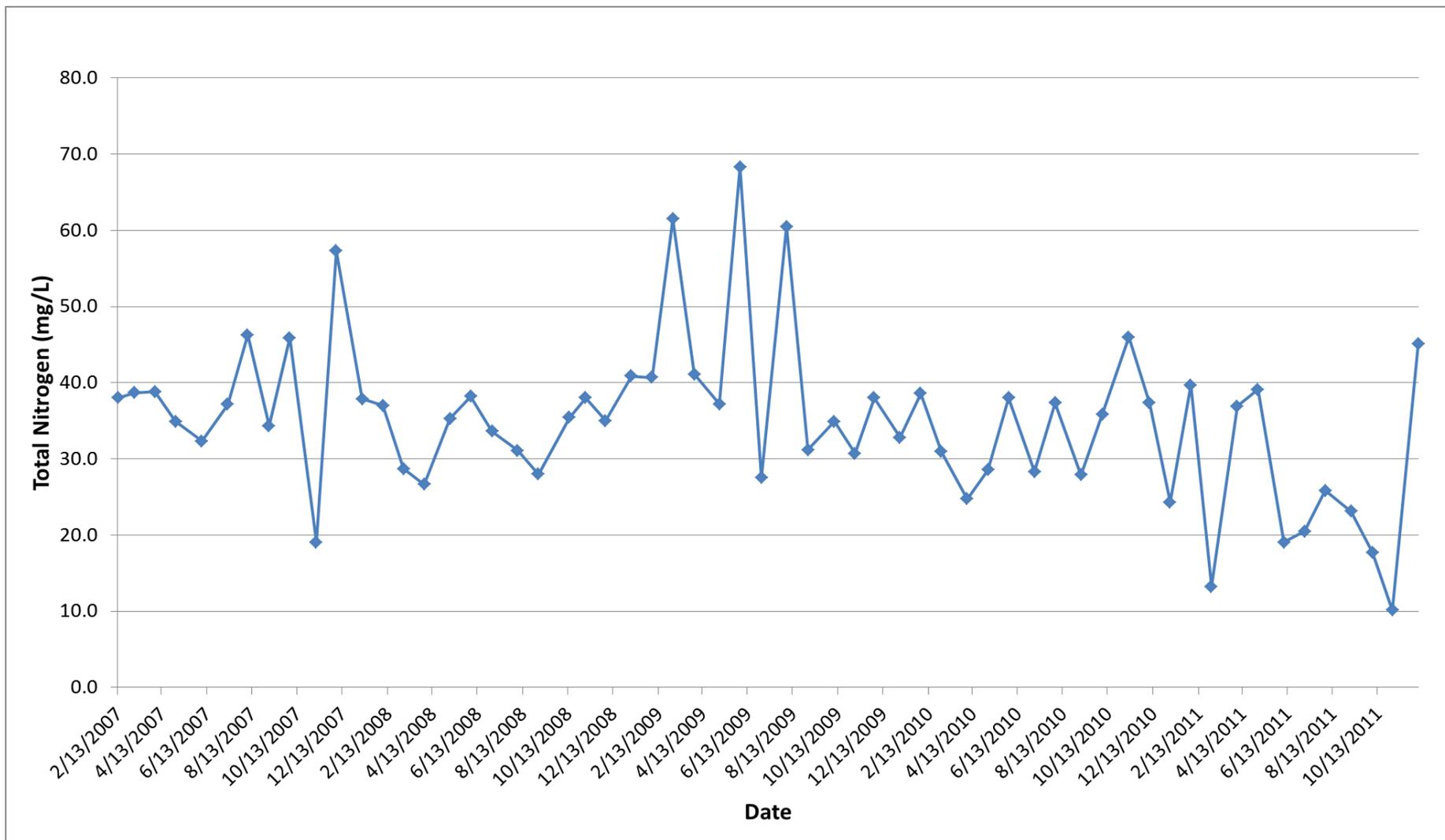


Annual Daily Averaged Discharge at Bay Park and Cedar Creek WPCP 1952-2010

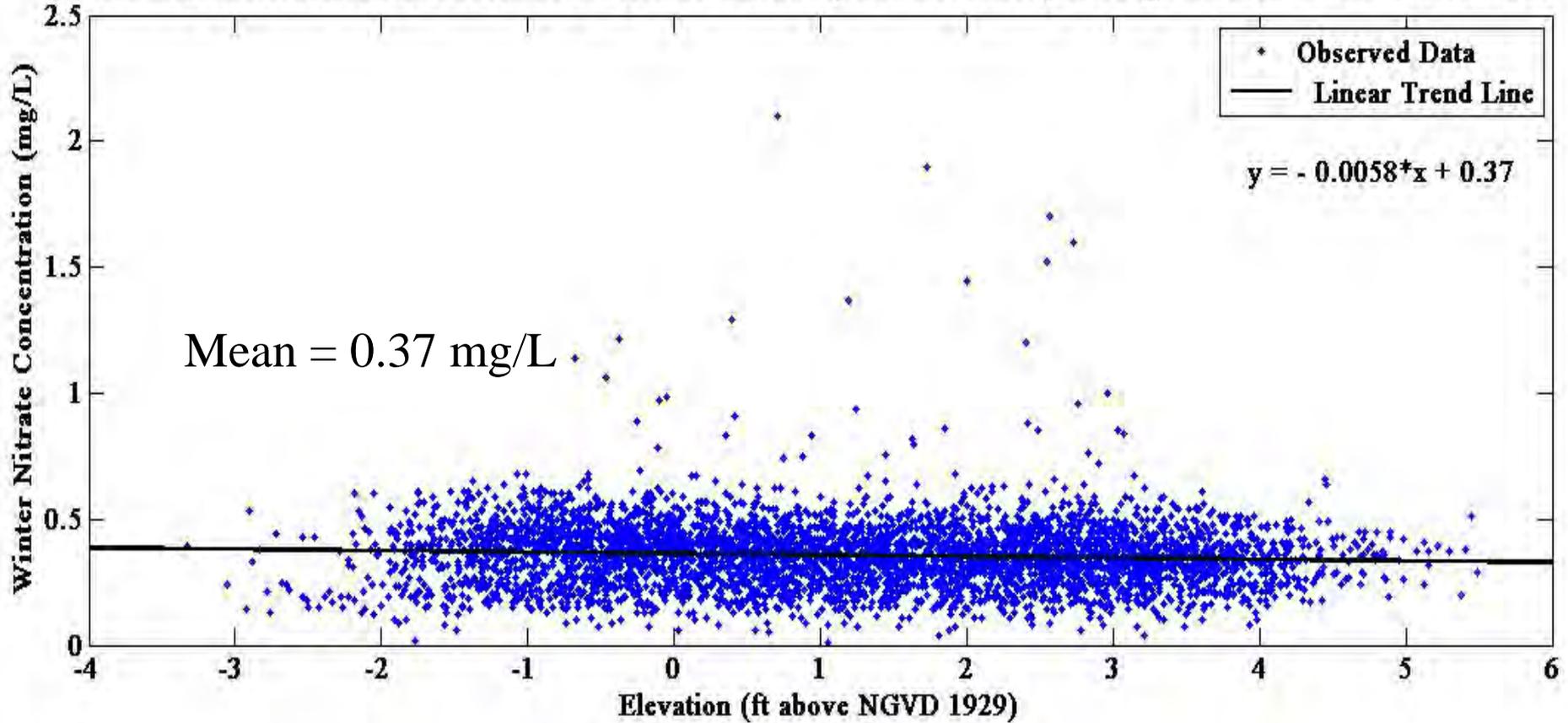


**Annual daily averaged discharge at Bay Park and Cedar Creek
WPCP 1952-2010.**

Total Nitrogen- Effluent Bay Park STP 2007-2011

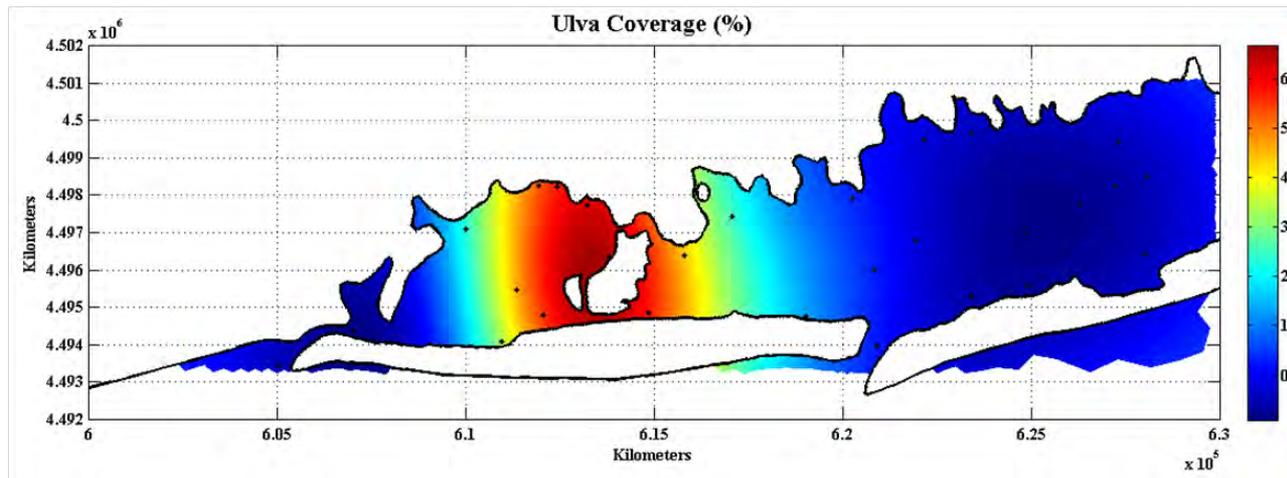
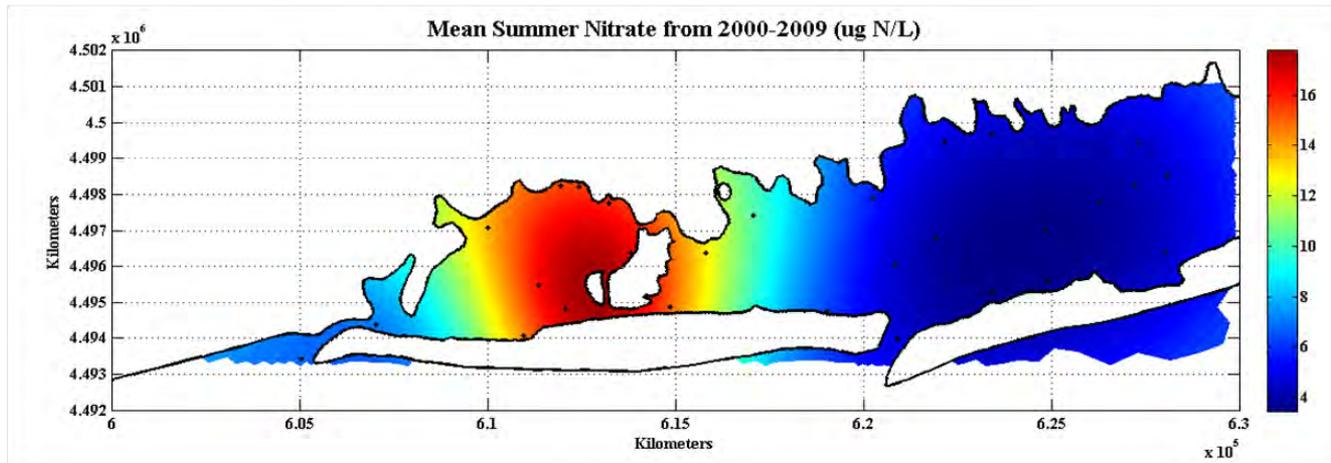


Nitrate Concentration vs Elevation in Winter Months (October-March) at Hog Island Channel Data Station



Nitrate concentration vs. elevation in winter months (October-March) at Hog Island Channel Data Station. (Data from US Geological Survey.)

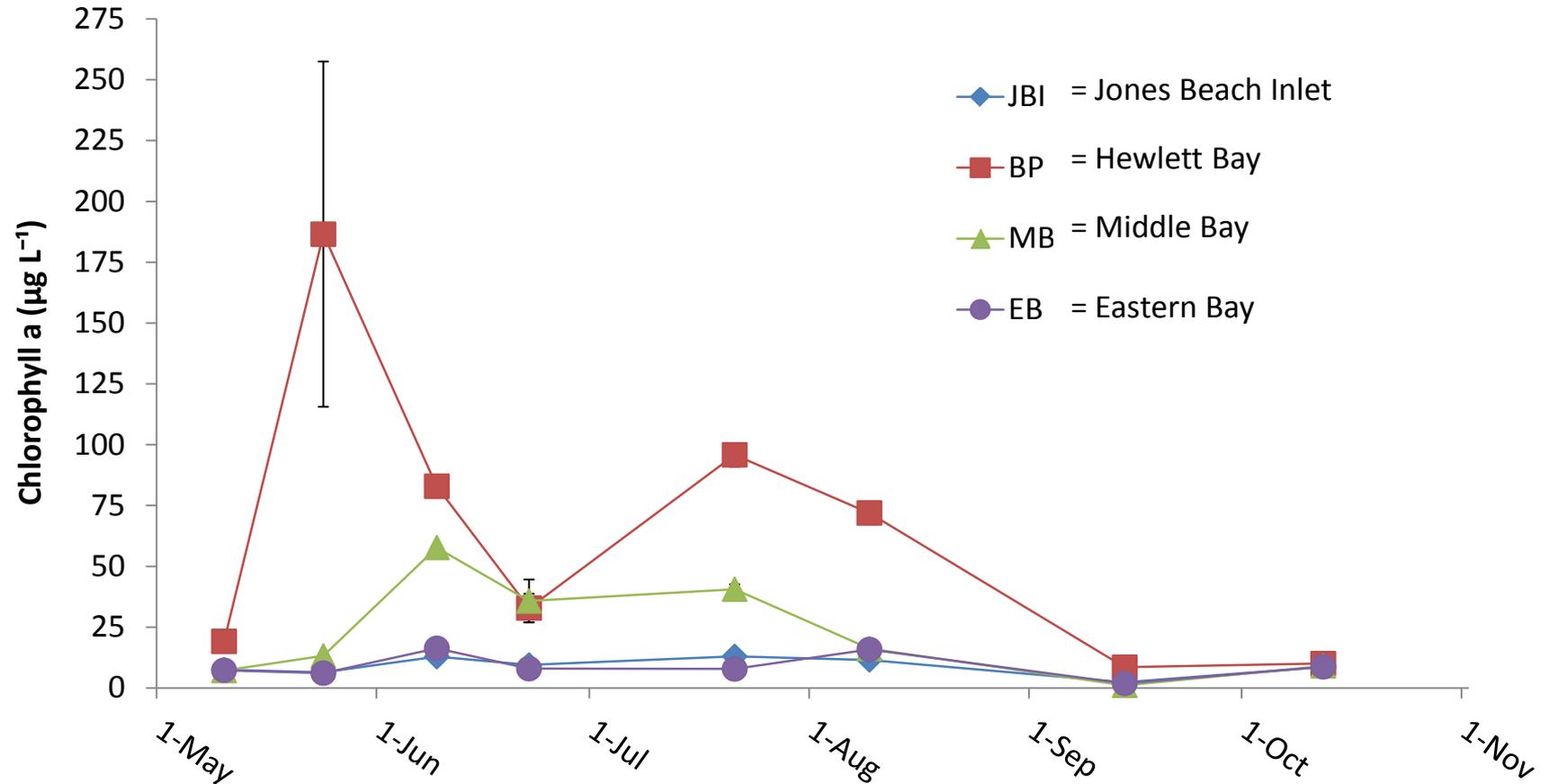
Comparison between *Ulva* growth and surface nitrate concentrations



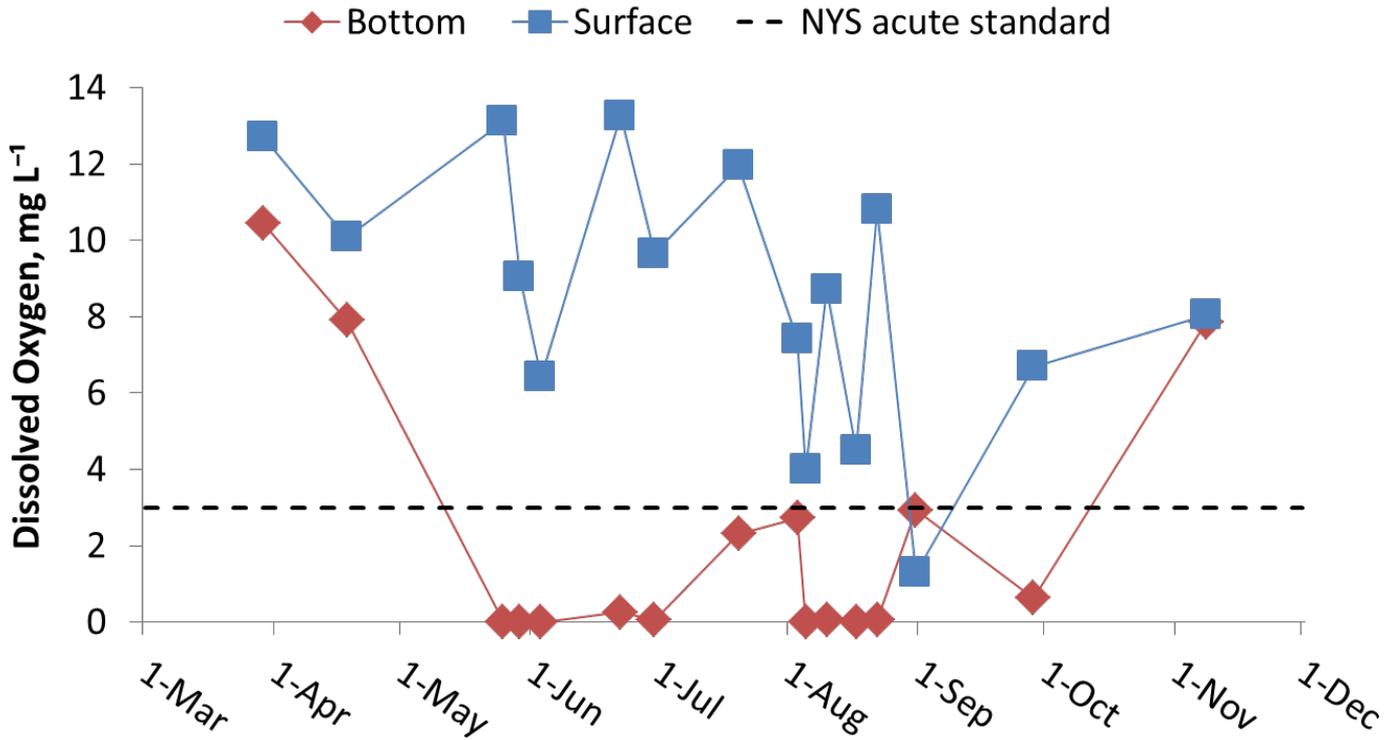
Comparison between *Ulva* growth and surface nitrate concentrations.

Phytoplankton Biomass

Hewlett Bay, and to a lesser extent, Middle Bay experience massive phytoplankton blooms during summer.

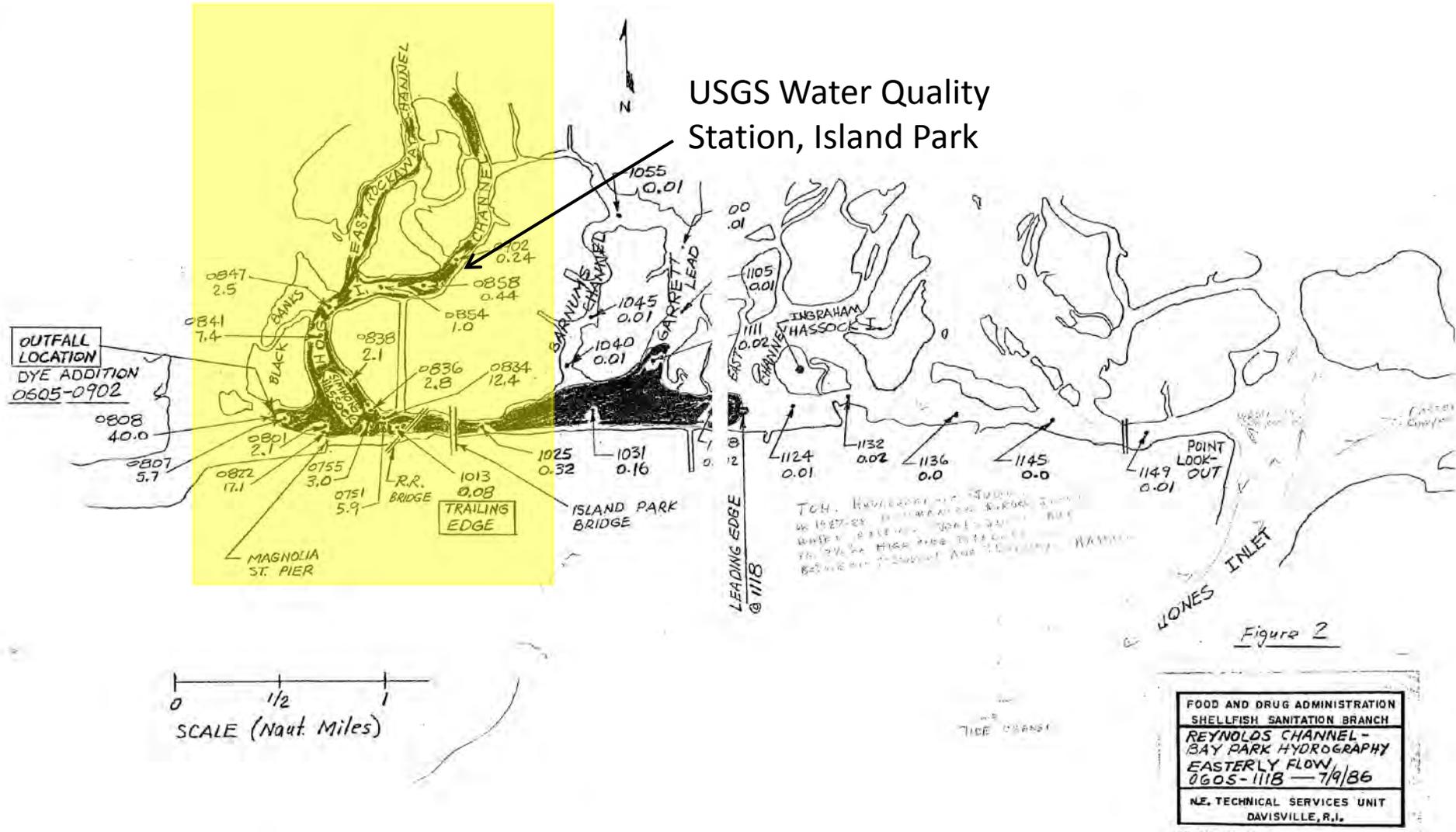


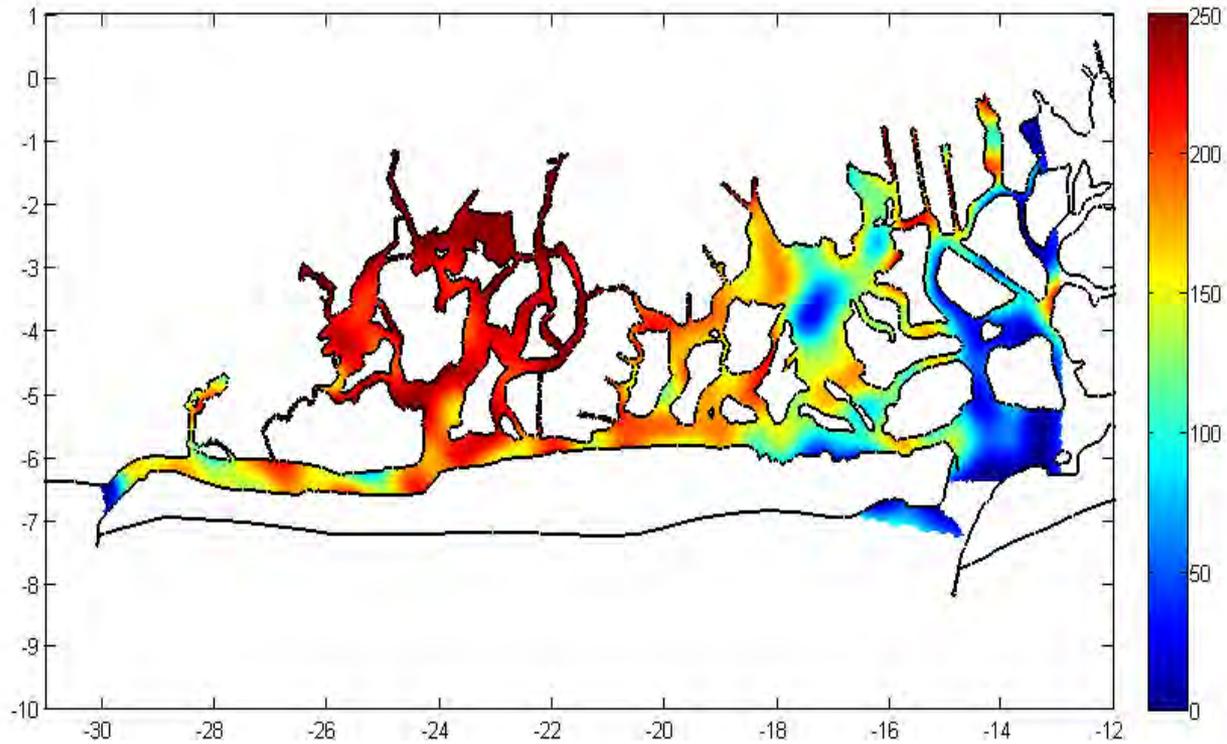
2011 Hewlett Bay



Dissolved oxygen concentrations (mg O₂/L) as a function of time in Hewlett Bay.

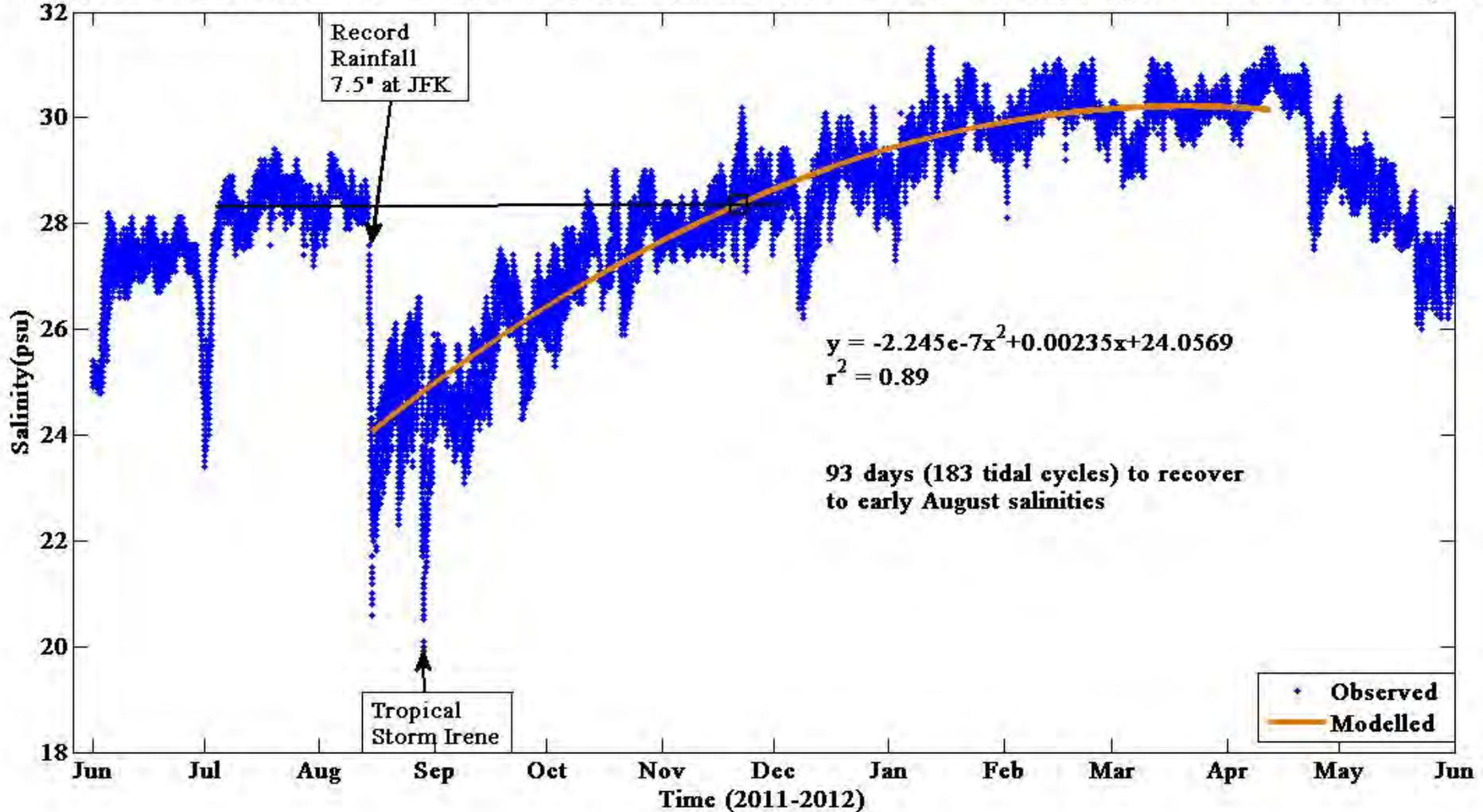
Dye Distribution Released from Bay Park Outfall





**Residence times of particles in West and Middle Bays.
Color bar is time in hours.**

June 1, 2011 to May 30, 2012 Salinity at Hog Island Channel, Island Park, Showing August 2011 Severe Salinity Drop



Data from US Geological Survey

Bay Park Sewage Treatment Plant Flooding from Superstorm Sandy



Bay Park STP Flood Zones

Courtesy of the Nassau County Department of Public Works

- Basement and Tunnel Flooding due to Surcharged Storm and Plant Drain Systems
- 3 - 7 foot Tidal Surge above ground Elevation

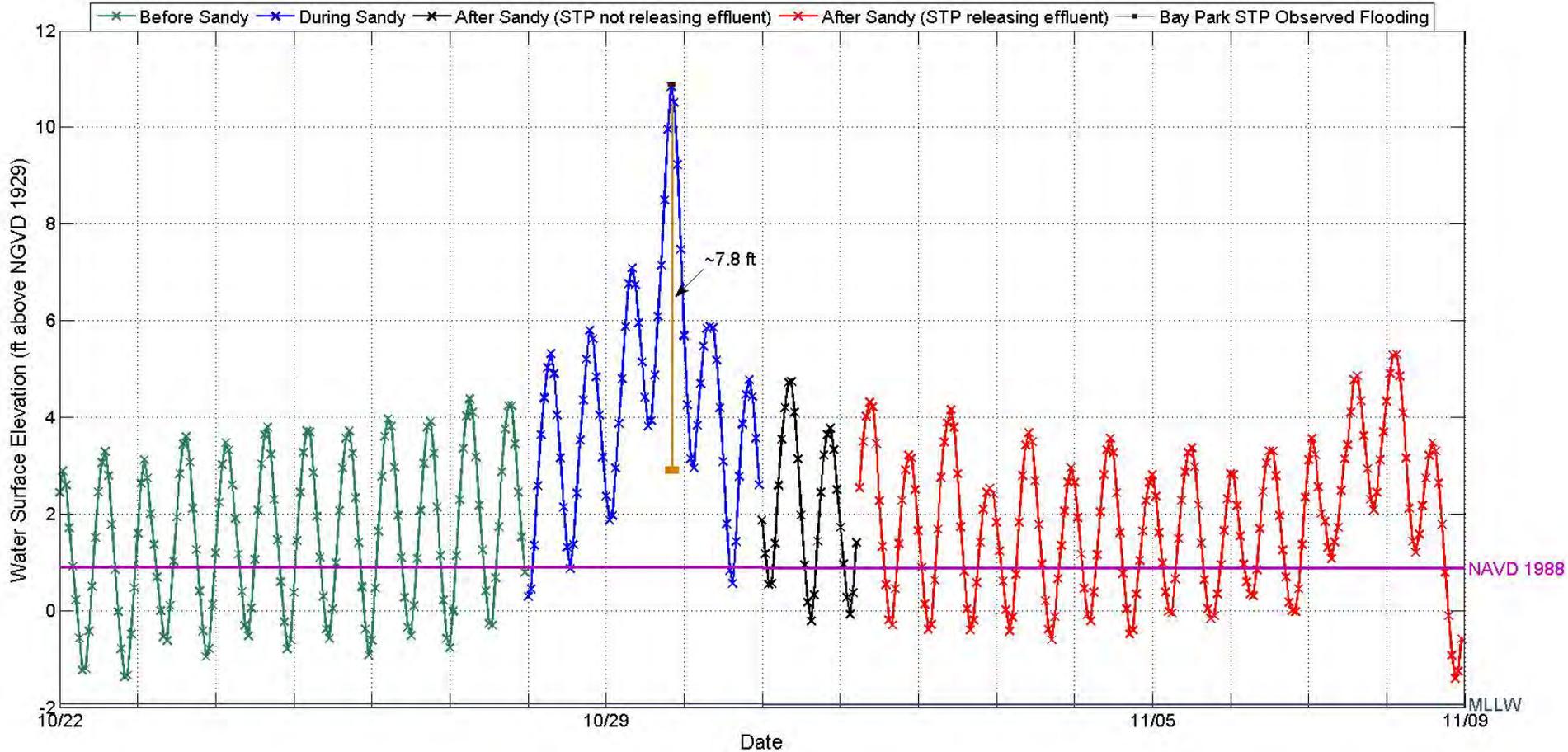


Courtesy of Nassau County Department of Public Works



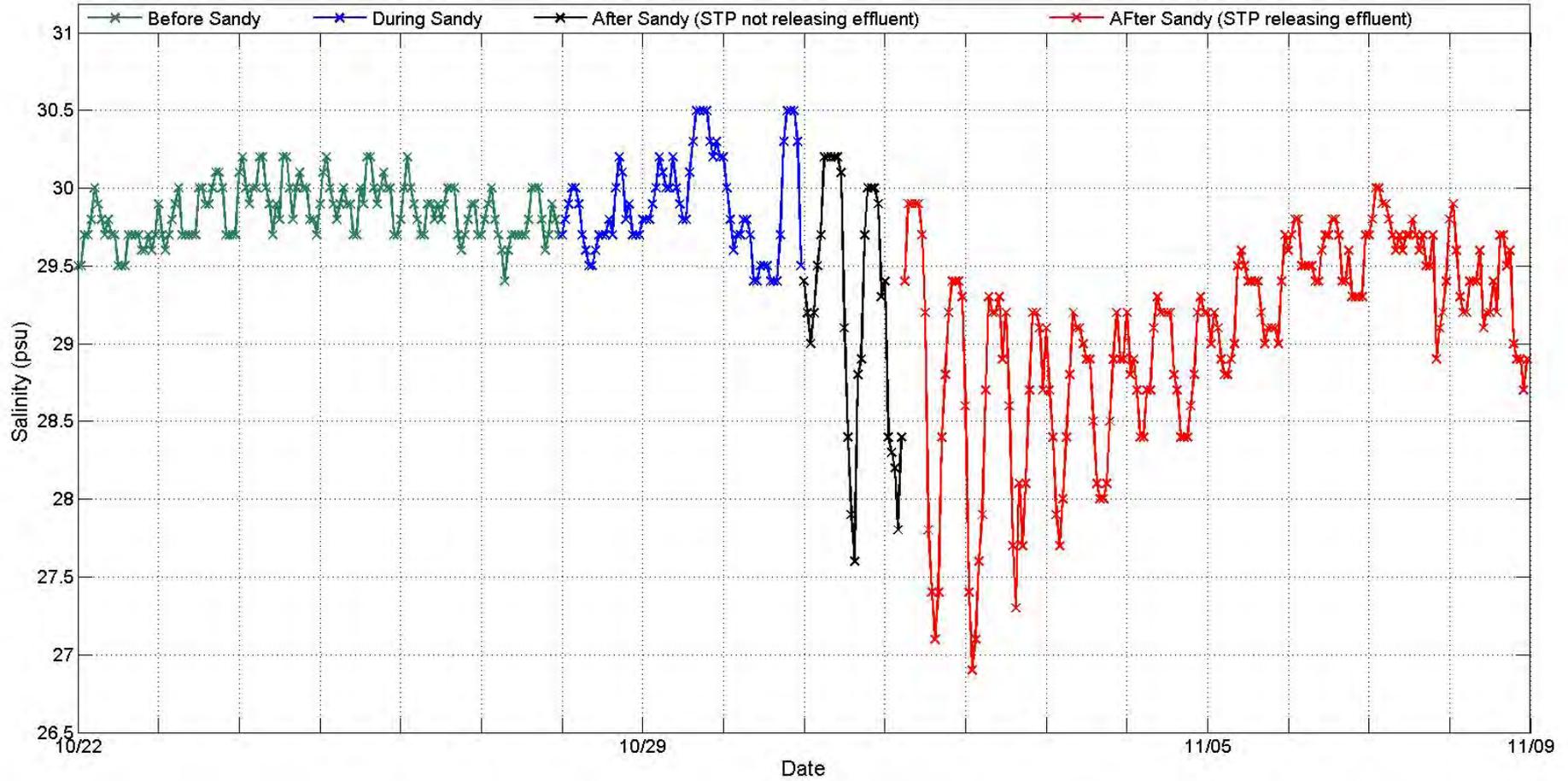
Courtesy of Nassau County Department of Public Works

Water Surface Elevation and Surge at Hog Island Channel USGS Station Around Superstorm Sandy

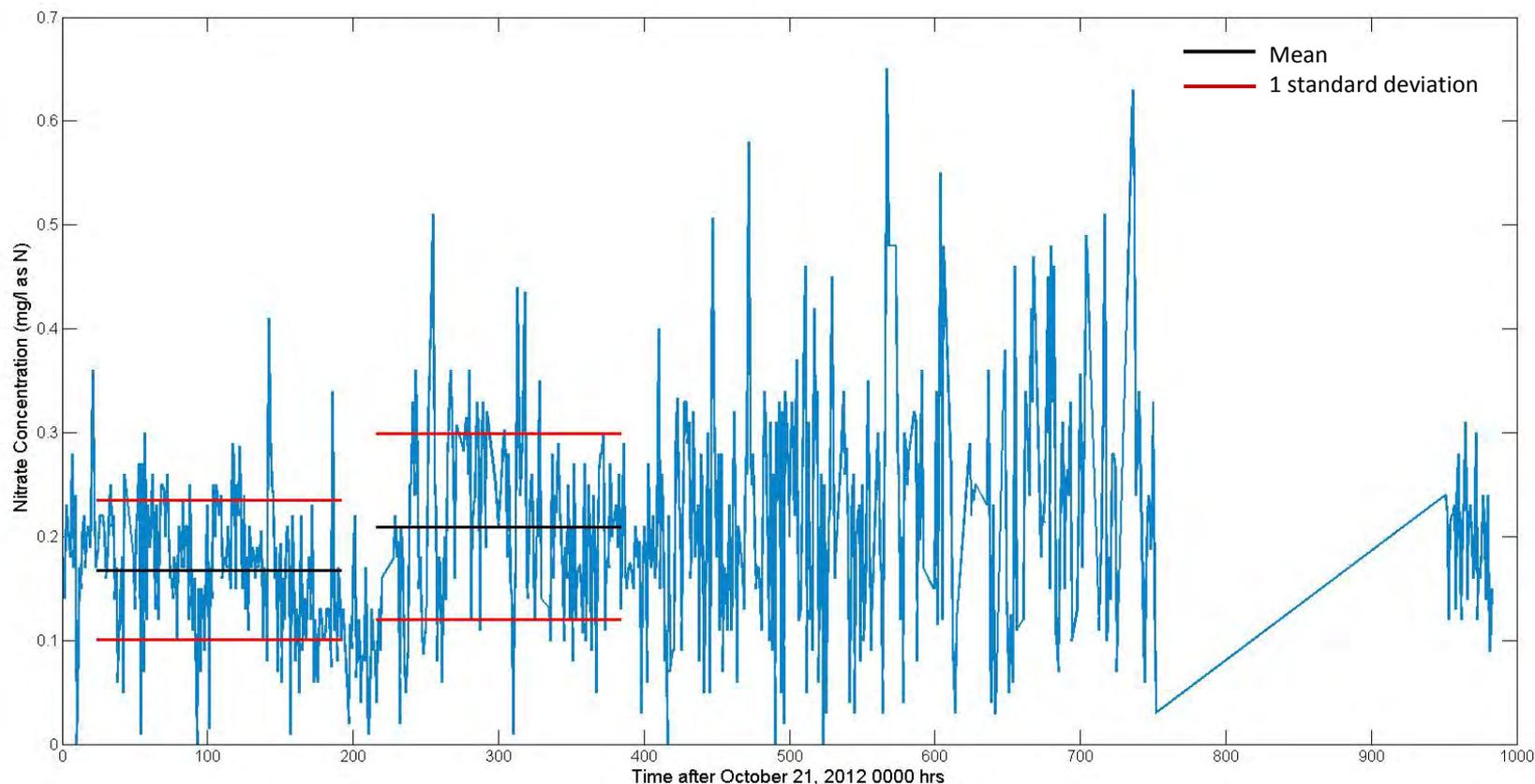


Bay Park Sewage Treatment Plant Sandy Timeline	Date
Bay Park STP goes offline. From this point, no raw sewage entered the plant and no raw or partially treated sewage left the plant.	Oct 29, 2012 2200
Raw sewage was pumped to 3 waterways (Grand Canal, Parsonage Creek, and Mill River) to help relieve collection system.	Oct 30, 2012 – Nov 1, 2012
Wastewater “stacked-up” in the collection system and eventually overflowed at lower elevations (e.g., manholes).	Oct 29, 2012 2200 – Nov 1, 2012 0600
STP comes back online.	Nov 1, 2012 0600
Effluent is pumped alternately via the main outfall in Reynolds Channel and the auxiliary outfall in Mill River at low tide and large head plus high volume flow, respectively.	Nov 1, 2012
Influent pumping/Raw sewage pumps.	
Effluent is treated at reduced levels of secondary treatment.	
Effluent is no longer released via the auxiliary outfall at high tide.	Nov 24, 2012
SPDES permit compliance achieved	Dec 13, 2012

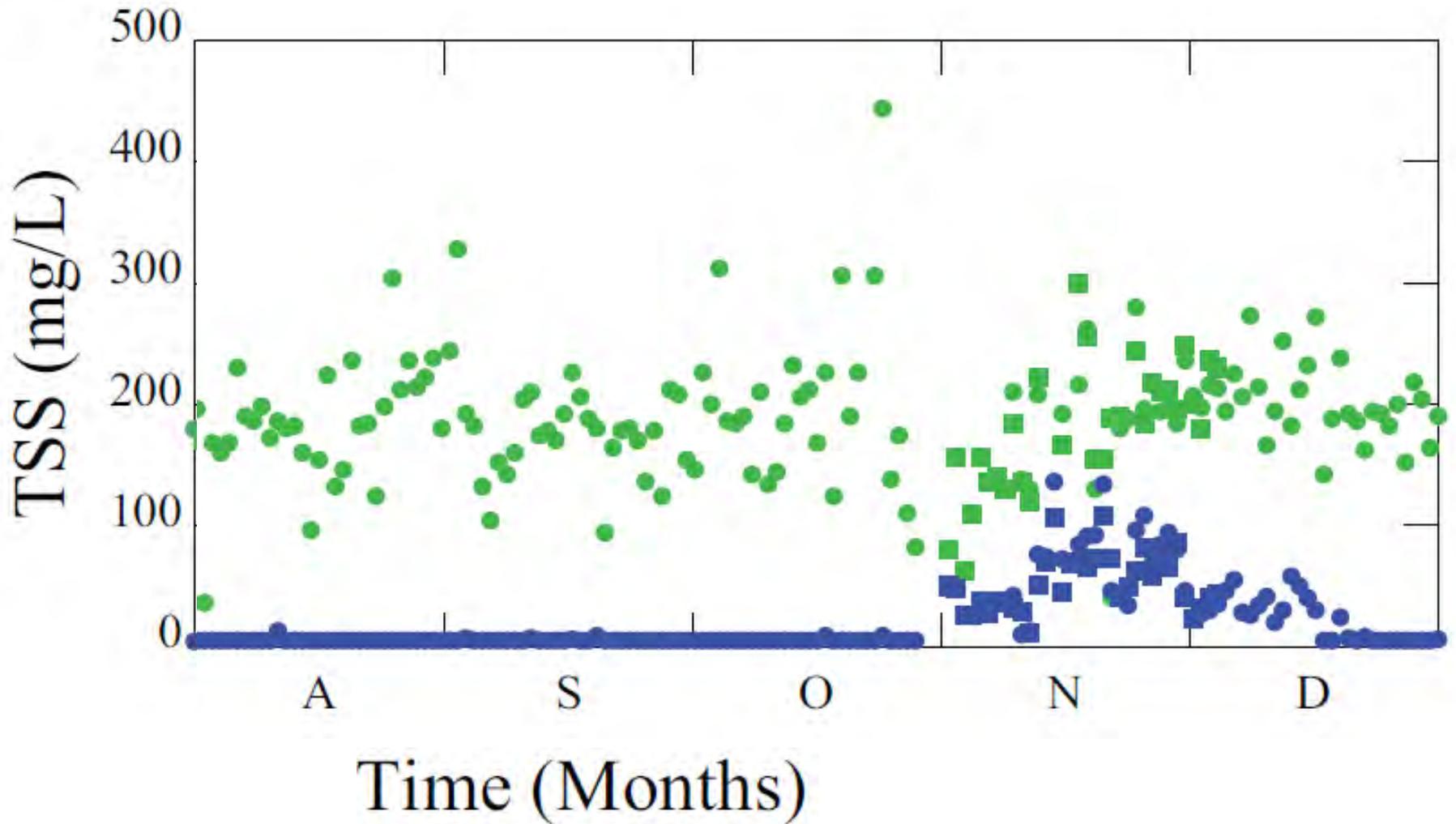
Salinity at Hog Island Channel USGS Station Around Superstorm Sandy



Range of Nitrate Concentrations Before and After Superstorm Sandy (1 standard deviation)

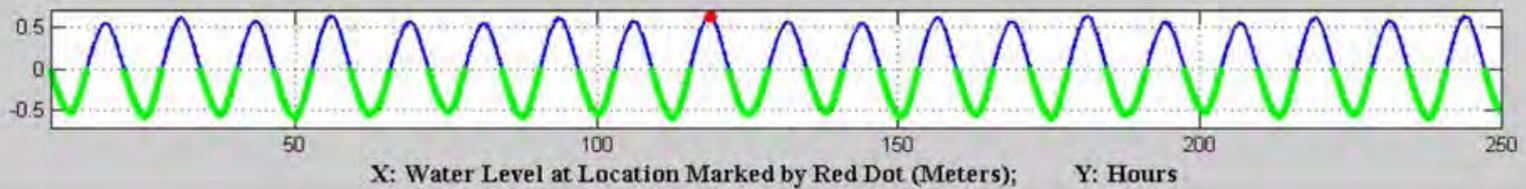
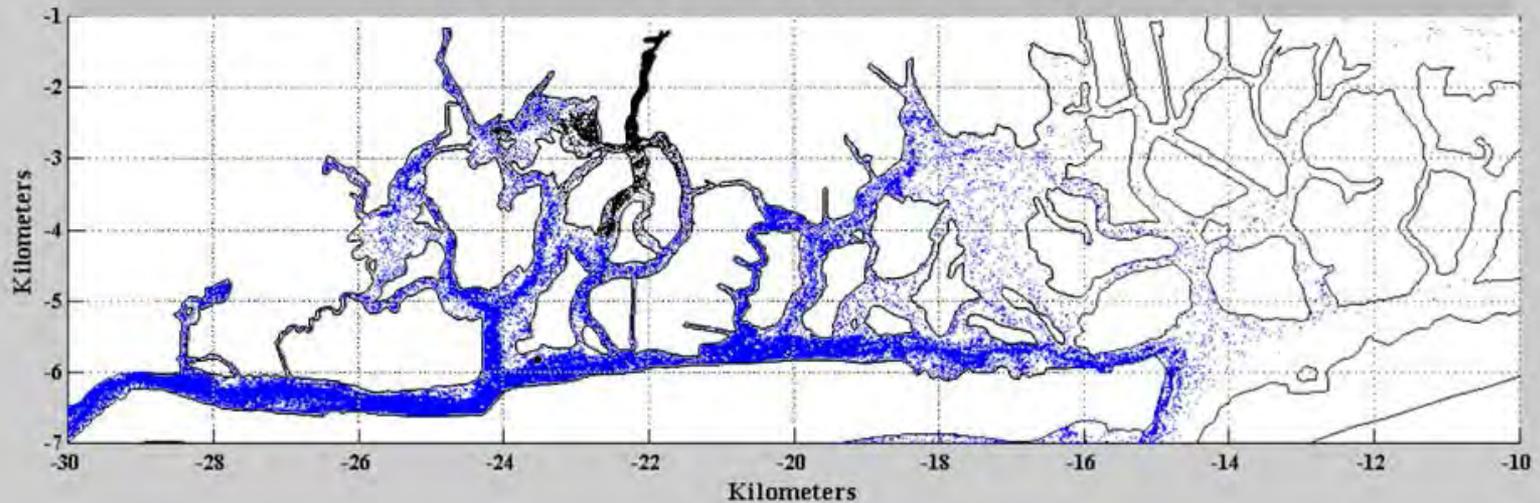


Bay Park STP Effluent Water Quality (2012)

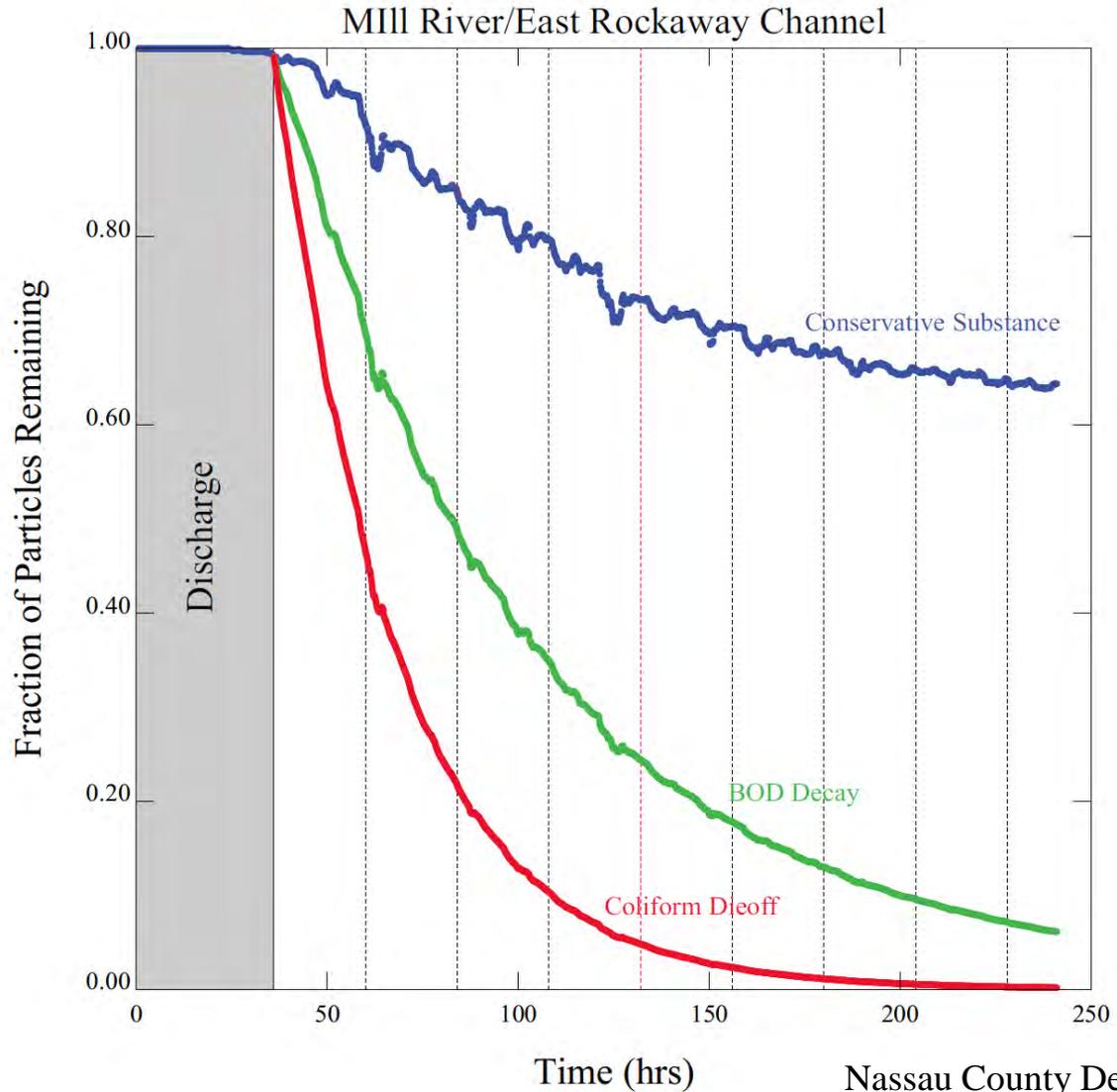


● / ■ - Influent EQS/H2M
● / ■ - Effluent EQS/H2M

Mixing Pattern after Approximately 5 Days



Flushing Analysis Using Particle Tracking in East Rockaway Channel: SUNY Modeling Analysis



To enhance resiliency and reduce impaired uses within West Bay

- construct an ocean outfall
- implement tertiary treatment at the Bay Park STP
- recycle a portion of the tertiary treated sewage to groundwater

Next Steps – Phase II of NYS RISE? Risk Assessment

- Undertake a thorough evaluation of the environmental conditions in and around the Cedar Creek and Bergen Point ocean outfalls.

Nassau County Ocean Outfall Resiliency & Sustainability

*Presented by:
Commissioner Shila Shah-Gavnoudias &
Peter Glus, ARCADIS/Hazen & Sawyer JV*

May 12, 2014



Meeting Agenda

- Vision Overview
- Vision Elements
- Present Value Comparison
- Funding Approach
- Next Steps

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Existing Conditions for the Western Bays

Three Sewage Treatment Plant Discharges in Reynolds Channel



Proposed Resiliency Plan for the Western Bays

No STP Discharges in Reynolds Channel

Region-wide Resiliency

Legend:

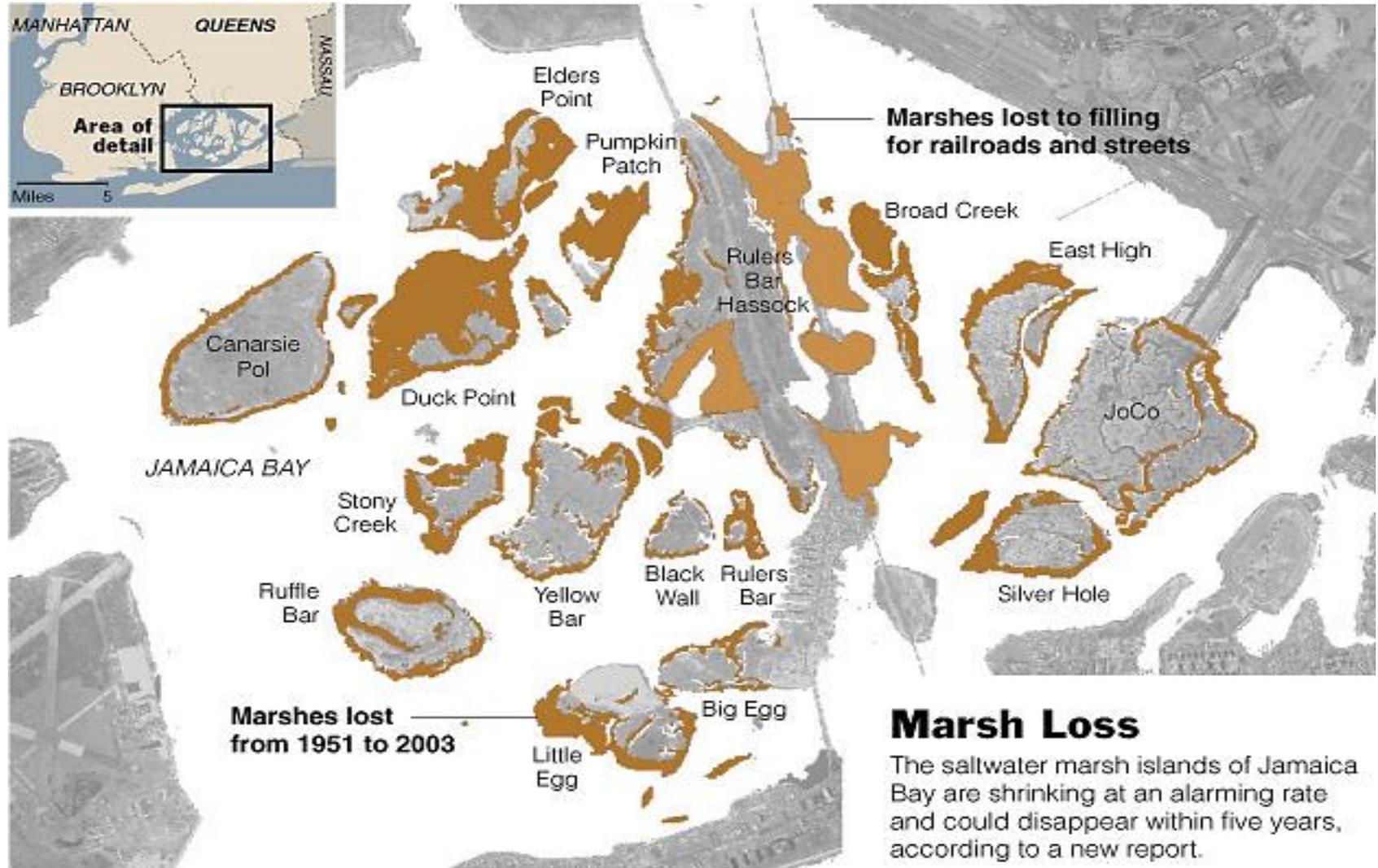
- Proposed Force Main
- Proposed Ocean Outfall



Benefits of the Vision

- Regionalizing the three treatment plants into one “storm-hardened” facility significantly improves the resiliency of the region and protects the communities in Southern Nassau
- Removing three wastewater discharges from Reynolds Channel removes more than three-fourths of the Nitrogen loading into the Western Bays
- This regionalized Vision is less expensive than maintaining existing conditions

A comparison to Jamaica Bay



Source: Jamaica Bay Watershed Advisory Committee

The New York Times

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Proposed Resiliency Plan for the Western Bays

No STP Discharges in Reynolds Channel

Region-wide Resiliency

Legend:

- Proposed Force Main
- Proposed Ocean Outfall



Proposed Conversion of Long Beach STP

Approx. 5 Acres Reclaimed for Development

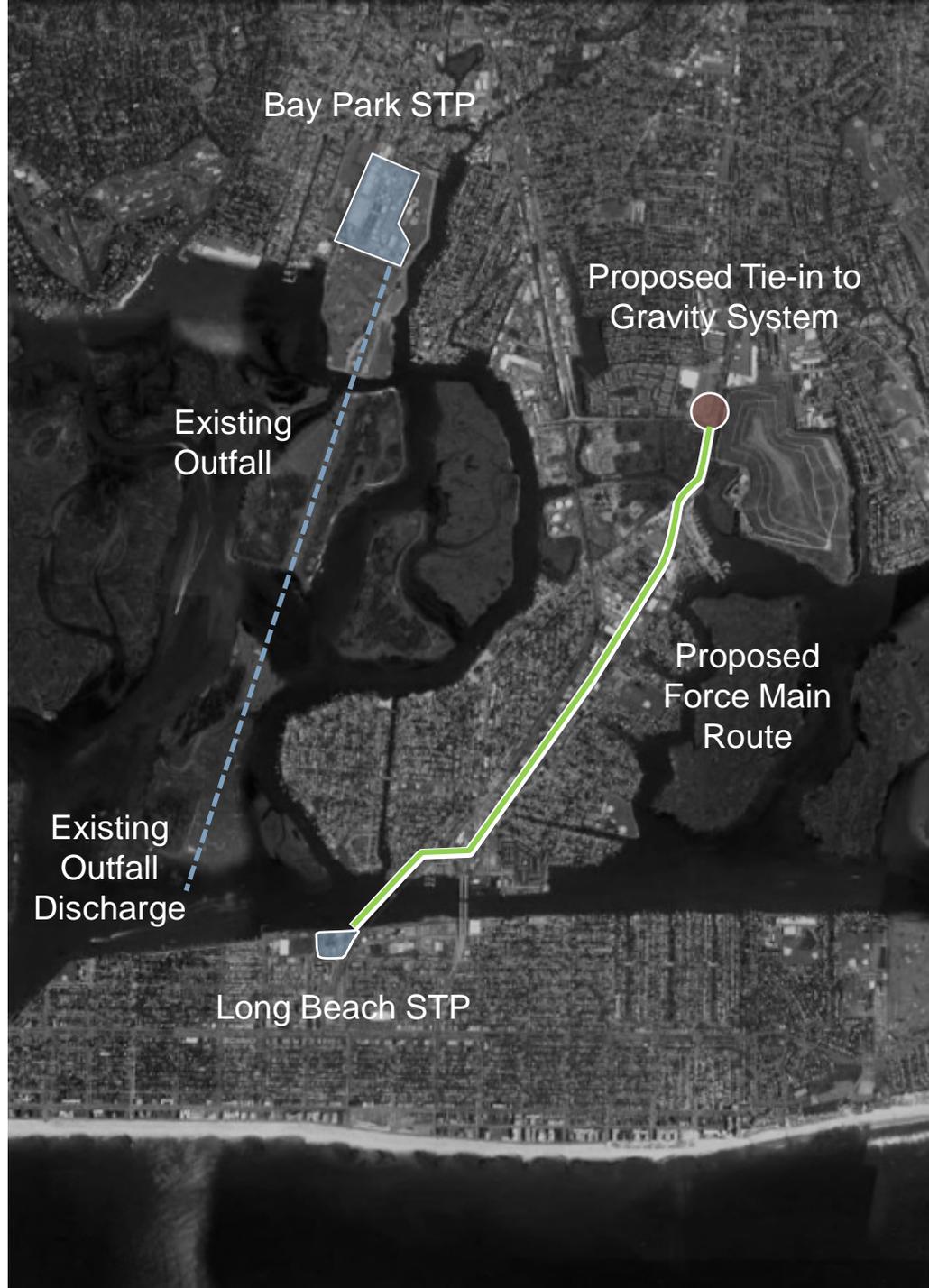
Reclaimed Area

New Pump
Station Footprint



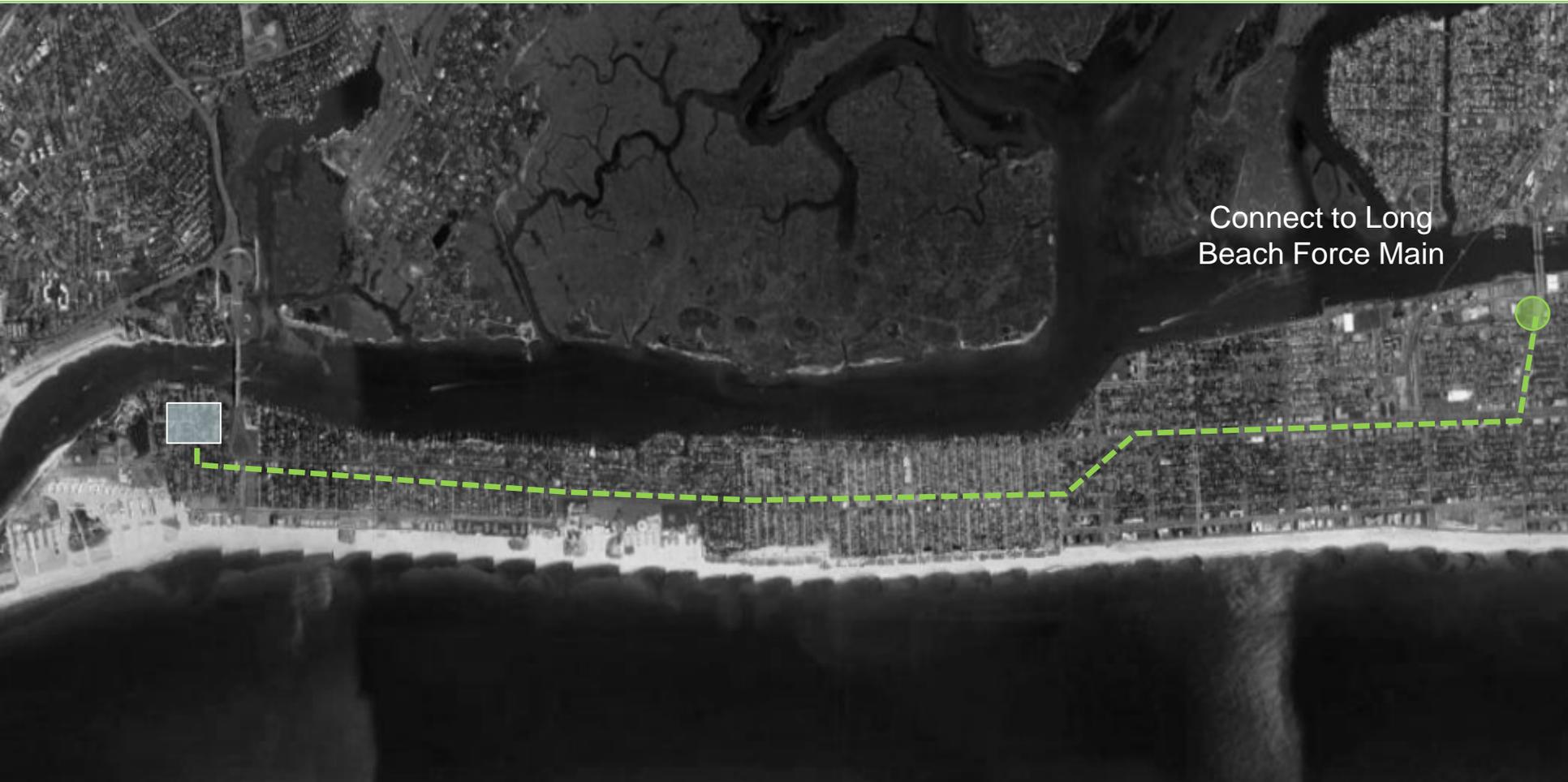
Proposed Force Main Route

1. Double 24-inch crossing in Reynolds Channel
2. Single 24-inch force main along Austin Blvd in Island Park
3. Double 24-inch crossing in Barnum Island Channel
4. Connection to Long Beach Road Interceptor in Oceanside



Proposed Connections from Greater Atlantic Beach

- Flow from Greater Atlantic Beach divert Along Long Beach in 20-inch Sewer Pipe to Long Beach Force Main



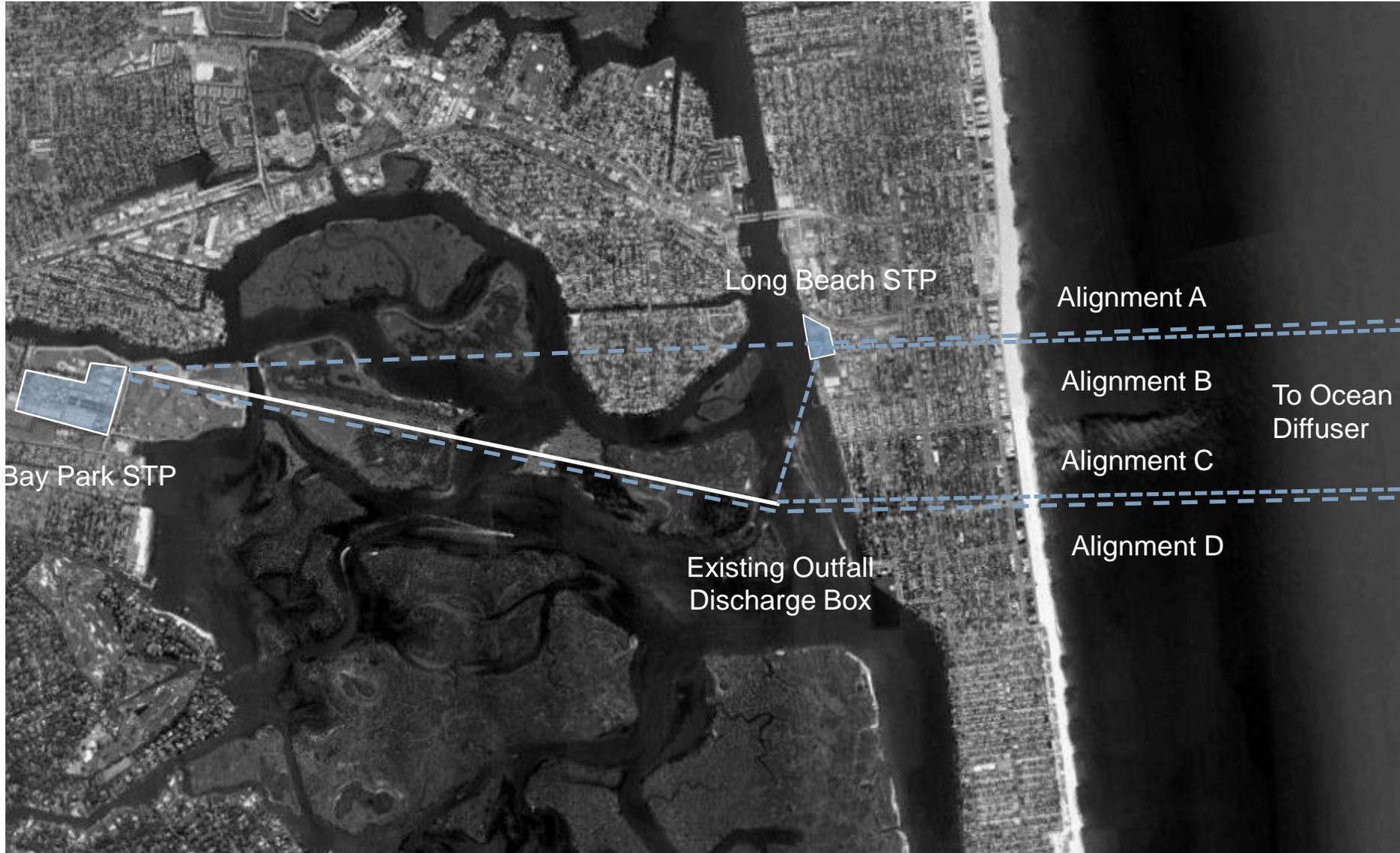
Proposed Connections from Point Lookout (Program Alternative)

Connect to existing
20-inch trunk sewer at
Nassau Lane near
Island Park Train
Station

Modified Regent
Drive Pump
Station



Proposed New Ocean Outfall Alignments



Tunnel Boring Machine



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Bay Park STP Modeling Results

Level	Prescribed Treatment configuration	Total Nitrogen Limit of Technology	Bay Park Cost	
1	Conventional Activated Sludge	20 mg/L	n/a	
2	3 Stage BNR	8 mg/L	\$130M	<i>What the County <u>wants</u> to do Combined with the Outfall</i>
3	5 Stage BNR + Denite Filtration	<4 mg/L	\$400M	<i>What the County <u>will have</u> to do with No Outfall</i>
4	5 Stage BNR + Denite Filtration + MF/RO	< 2 mg/L	\$800M	

25-Yr Present Value Comparison

Facility	Existing Conditions (Baseline)	Proposed Regionalization
Bay Park STP	\$ 1,244,860,000	\$ 1,306,530,000
Long Beach WPCP	\$ 300,330,000	\$ 60,170,000
GAWRD	\$ 93,550,000	\$ 35,560,000
Subtotal	\$ 1,638,740,000	\$ 1,402,260,000

Meeting Agenda

- Introductions and Goals
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- **Funding Approach**
- Next Steps

Potential Funding Source

Primary Source

- FEMA Public Assistance

Secondary Source

- HUD / CBDG-DR
- NYS Storm Mitigation Loan Program

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Next Steps

Continue collaboration with Federal, NYS, and County officials to discuss, scope, and fund the vision!

Thank You





Carl LoBue Marci Bortman

My Name is Carl LoBue, I am Sr. Marine Scientist at The Nature Conservancy on Long island, I am a representative of the South Shore Estuary Reserve Council and the Western Bays Coalition.

Thank DEC Commissioner Martens, Governor Cuomo, for the invitation to present at today's hearing. Thank our congressional delegation for working hard for the Sandy appropriation, thank the agency staff who traveled to LI. Thank the engineers and staff that have been keeping STP going in its tattered condition.

Citizens in the audience don't get paid to participate as they are doing today. Many have dedicated a tremendous amount of time in community planning and reconstruction, especially since Sandy. There are several NY Rising CRZ co-chairs and members in the audience – I have also seen them participating in the Rebuild-By-Design meetings. The reason that a water quality hearing attracts those involved in NY Rising is because making their coastal communities more resilient is their charge, and restoring water quality is an essential part of that charge.



In addition to a legacy of largely unplanned sprawl, both Nassau and Suffolk Counties are plagued with aging, failing, and inadequate waste water treatment. The consequences of this have become obvious.

Decades of investments in scientific research, have led to a better understand of the causes of what is happening to our coastal ecosystems, and are allowing us to reasonably predict what will continue to happen if we don't take action and change trajectories.

Degradation of Long Island's waters threatens the future viability and resiliency of our communities. Fortunately, the upside is there are proven solutions and if we work together we can actually reverse the degradation of our waters.

As Dr. Marci Bortman mentioned previously, we have issues Island wide - But for the purposes of this presentation I want to focus on Southern Nassau County – a place that is familiar to me because in addition to leading restoration efforts in Great South Bay and being a Councilor of the SSER since 2003, I also grew up in Nassau Shore's Massapequa, a Sandy impacted community where my parents and their neighbors are still working to recover



People like me, who chose to live in bayside communities, do so because there are attributes of coastal communities that we value, that have benefits and provide unique lifestyle and business opportunities.

Long Island's waterways are one of the most important and unique natural assets we have. The numbers don't lie, there are 97,000 boats registered in Nassau and Suffolk Counties, not including canoes, kayaks, paddleboards and such. A 2003 study showed we spend over 1 Billion dollars on pleasure boating annually. But Long Island's boaters today not only have to keep track of high tide and low tide, they need to keep track of brown tide, rust tide, red tide, and green tide – combine that with \$5/Gal gas and the cost-benefit of boating changes.

It's unavoidable to notice that the costs and risks of living and working in Long Island's coastal communities are going up – Sandy made that abundantly clear and increasing insurance premiums will be driving it home. But at the same time, the unique attributes that we value about our waterside communities are declining. This is bad, this is unsustainable.

If a company had this balance sheet, the smart business minds in the room would have already sold – but it's not a stock, it's our home, and much of this balance sheet is within our ability to control.



Sandy was certainly a wake-up call. I'm sure many of you have seen these images of raw and partially treated sewage flowing from the Bay Park STP outfall after Sandy.

We knew we had a problem before Sandy, many of us had been meeting about it for over a decade right here in this building. A lot of resources had gone into studying the problems in the western Bays and identifying solutions.

But Sandy drove things home, it reminded us that we can all work together to achieve big things.

Look at the proximity of this sewage outfall to densely populated communities in Barnum, Island Park, and Long Beach. - If this sewage treatment plant failure happened in August instead of October 29th – there would have been a serious human health crisis coinciding with of all the other problems we had at the time.



By the end of this presentation – it is my hope to get across to all of you that the way we are treating and discharging sewage in South West Nassau is jeopardizing our future by devaluing the County’s natural assets in ways that are decreasing the social and economic resilience of our coastal communities

In addition, something many of us were unaware of prior to some recent scientific findings. Nitrogen pollution from sewage is also decreasing the structural resilience of our coastal communities –

For those of you wondering – this is Magnolia fishing pier – and this is where over 50MGD of sewage discharges.



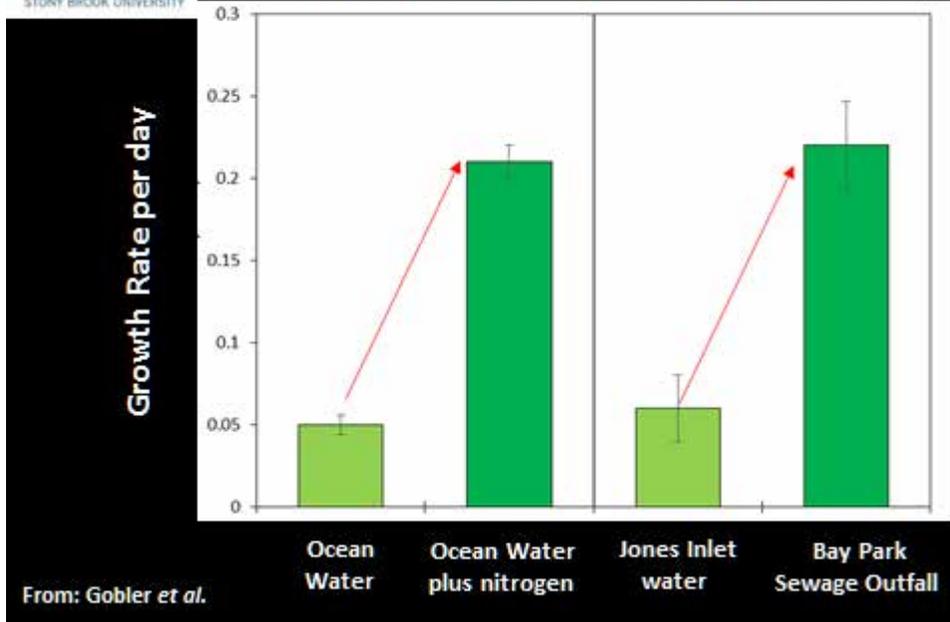
This is my nephew Dylan. One of my favorite things to do is boogie board with my niece and nephews –

My sister lives in Baldwin. Nickerson Beach is beautiful town beach, close to her house, waves break good. It's a wonderful asset to the people in Hempstead.

However my sister won't go there anymore. Instead she'll drive all the way to Babylon and go to Gilgo – which is not ideal because she has to wait till late in the afternoon, when it's colder and there is only a hour of or two of sunlight left. Alternatively she will go all the way to her in-laws in West Hampton Beach.

The reason? She won't go in the water at her own town beach because of all the seaweed, the little isopods that crawl on the seaweed, and the smell.

Growth of *Ulva* from Western Bays



Seaweed = *Ulva* or Sea Lettuce

Its gets on the ocean beaches because we've turned the bay into an *Ulva* incubator by fueling it with high volumes of treated sewage that is loaded with reactive nitrogen.

Explain chart from Stony Brook University research showing that the *Ulva* growth is caused by the nitrogen in the sewage discharged into western Bays -

News media regularly reports on it as a problem, but they often incorrectly identify it as something caused by wind and currents. Yes winds and currents wash it up on the ocean beaches – but the reason it is there in the first place is from the sewage discharged into the Bay.

Dumpsters of *Ulva*



Newsday 2013

Every summer for the past July several years this has been on TV, Last July CBS news was interviewing people that said their not coming back anymore because it has gotten so unpleasant. It is now so bad that the town is using bucket loaders twice per day to fill dumpsters of this stuff.

<http://newyork.cbslocal.com/2013/07/31/disgusting-seaweed-spoils-beach-at-port-lookout-1-i/>

Ulva at Pt Lookout



Newsday 2013

But even with daily cleaning, this is what the ocean beach at Pt Lookout was like at the height of beach season. This is why my sister drives far away to go to the beach.

She lives and pays taxes in Hempstead – but she's not realizing the full value of this community asset – nor is the town, which is spending money to clean it daily and it's still unappealing

They are not the only ones losing out - Pt Lookout deli, Marvel Ice Cream, and many other businesses are losing customers when residents and tourists choose to spend their time and money somewhere else.

Decaying *Ulva* at Jones Inlet



This is a view of decaying *Ulva* along the backside of Jones Inlet. It gets feet thick and extends hundreds of feet, It stinks of rotten eggs, it breeds insects.

My friend Gerry lives near here and says there are many times where his family simply cannot sit outside in their own yard because of the smell of hydrogen sulfide from decaying *Ulva*.

You don't have to be a realtor to realize that smell is not a positive selling feature.

I've heard Assemblyman Wiesenberg of Long Beach talk how this discolors the exterior house paint of his constituents. I had to look this up how this happens— but it's true. So if you plan to paint your house to make it more attractive to sellers, act quick before the color is stained by the hydrogen sulfide gas coming from the decaying *Ulva*.

We have an aging population in Nassau. Many, like my parents, moved here before this was an issue. I find myself asking - what part of this will be appealing to the next generation that our parents hope to sell their homes to?



Marshes are natural assets that help protect coastal properties from waves and erosion.

Nowhere in NYS are such densely populated coastal properties as protected by expansive salt marsh islands as in Southern Nassau County.

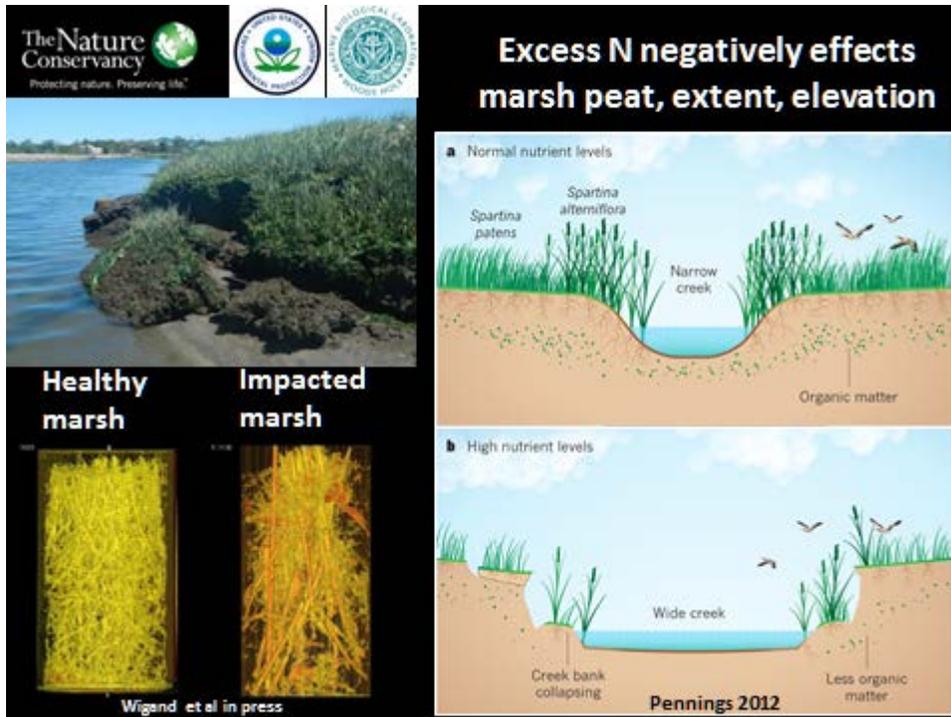
Sea Level rise is a very real threat to these coastal properties – The good news is that marshes can actually keep up with sea level rise if they are trapping sediments, have room to grow, and have good water quality.



The Nature Conservancy's coastal scientist Dr. Nicole Maher, along with others, has been studying if, how, and where Long Island's marshes are keeping pace with sea level rise. They do this with a network of monitoring stations like the one shown on the left.

The marsh core on the right shows how a white layer of feldspar allows researchers to determine if the changes in marsh elevation are a result of new sediment accumulation (on top of the white layer), or changes in roots or below ground processes (below white layer).

This marsh in the photo is located near the center of a 2,000 acre nature preserve on Shelter Island – and it is doing just fine and keeping pace with sea level rise.



But it turns out, somewhat unexpectedly, that excess nitrogen in the water negatively effects marsh condition.

Throughout history, every so often there is a pivotal scientific finding that makes people think... “of course – that totally makes sense – why didn’t I discover that.”

When I was in college I learned that marshes were an inexhaustible sink for nutrients. We learned that basically we could keep adding nitrogen to marshes and they would suck it all up and turn it into plants.

But in 2012, after over a decade of experimenting to see how well salt marshes could remove excess nitrogen in the water, a research team in Woods Hole lead by Linda Deegan published a peer reviewed study in October 2012 showing that nitrogen in water, over time, actually degrades salt marshes.

As a result of this work we’ve come to learn that water quality is at least as important as sediment supply, in some cases more important, for keeping marshes viable!

Cartoons on right illustrate the effect of elevated N on the physical composition of wetlands.

After a few years they were surprised to see their treatment area cracking and slumping!

This is because of the effects that elevated N has on marsh plants and marsh peat:

Excessive dissolved nitrogen in the water changes the way the plants grow. They allocate growth above vs belowground. This is similar to what happens if you overwater and fertilize

your garden, it looks great until a thunderstorm comes and knocks all the plants down because they don't have deep roots.

It turns out the extra nitrogen also increases decomposition and reduces the storage of organic matter in the marsh peat; essentially changes the "stickiness" of marsh peat itself so that there is increased fracturing and calving over time causing marsh loss or erosion from the edges.

Top left – photo western Hempstead Bay - where common to see marsh edges calving like melting glaciers

Lower left - CT scans of marsh peat from one healthy/stable marsh and one fracturing/disappearing marsh on LI.

These changes in the marsh peat affect both the aerial extent of marshes as well as their elevation relative to sea level– so these changes impact ALL of the ecosystem services that are a function of marsh size and elevation as well as the future viability of the marsh itself.

Wigand et al 2014: Below the disappearing marshes of an urban estuary: Historic nitrogen trends and soil structure

Collapsing Marshes



R. Weltner 2013

All you need to do is go out in the western bays at low tide and you can see this happening.

It's so obvious that over the years these observations have triggered a lot of conversations about boat wakes and speed limits –

It's not totally unrelated to boat wakes, but as you can imagine – without deep dense network of roots and rhizomes, and with more slippery marsh peat, the marshes are much more susceptible to any wave action.



Marshes protect our developed shorelines from wave energy and erosion every day. The reason is that the marshes, particularly these marsh islands, block the fetch, which is the distance wind blows over water.

Two Octobers ago, I was asked collect some samples of the western marshes and Rob and Tommy from Operation Splash agreed to take me out on their Carolina skiff. When I got up that morning it was Gail force winds. I thought, there is absolutely no way we can get around the bay in a skiff, because where I'm used to working in central Great South Bay, where there are no marsh islands, it would be so rough I would not have been able to pull out of the boat basin, no less get to all the places we needed to go. But I drove to Long Beach anyway because these guys re-arranged their work schedules to get me out and I didn't want to be the one to cancel.

Turns out, even though it was cold, the water was incredibly calm, because the marsh islands block the waves from basically every direction.

As a consequence, the way people have developed the coastline is very different here in Nassau than it is in central Great South Bay where there are no Marsh Islands.

As an example I'm going to zoom in on Barnum Island

Many coastal properties will be more vulnerable as marshes degrade



Here on Barnum Island, just like many places along the south shore bays of Nassau County, coastal properties are built right at the water's edge. There are finger docks and piers jutting right into the bay. We don't have bay-front development like this in places like central Great South Bay where there are no marsh islands.



This image is a regular breezy fall day in eastern GSB – The kind of day Bill Korbell might call “lovely.”

If not for those marsh Islands – this breezy but otherwise lovely day would smash up every boat tied to those finger piers on Barnum Island – it would rip up planks, wipe out floating docks, and pound damaging wave spray against people’s homes.

I’m not talking about a superstorm, a hurricane, or even a nor’easter – just a regular breezy day would cause that much damage – because we didn’t build in this area with wind waves in mind.



It might make people feel better to know we are not alone

There is a global imbalance of reactive nitrogen that stems from our ability to pull inert nitrogen gas from the air and turn it into fertilizer. This process, named for Dr.s Haber and Bosch won them both the Nobel Prize, without it we would not be able to feed all the people in the world.

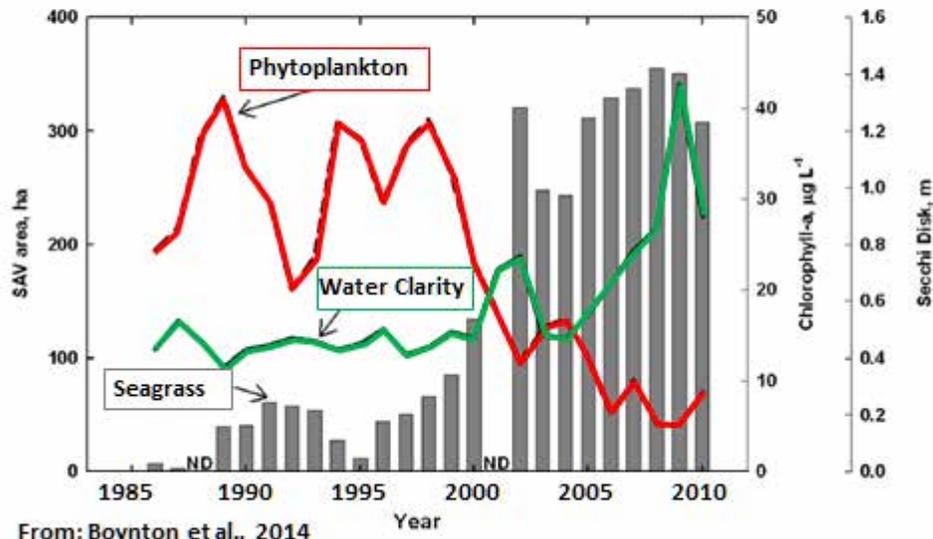
In areas with high densities of people, human waste water is typically the major source of the pollution, in agricultural areas it's often from excessive use of fertilizers as well as waste from livestock. Many of you have probably heard of nitrogen problems in Chesapeake Bay and Gulf of Mexico and have heard about the connection to farming practices.

The red and yellow dots on this chart are all the coastal areas impacted by nitrogen pollution

But the green dots show where we are actually making progress to reverse these problems.

http://www.nola.com/environment/index.ssf/2014/02/tulane_to_announce_1_million_d.html

Mattawoman Creek Recovery



Places like Tampa Bay, Boston Harbor, even right here in LI Sound are making significant progress in reducing the impacts of nitrogen pollution. A scientific study on a place called Mattawoman Creek came out just last month, and so I decided I would walk you through an example of the kinds of things that can be expected from a recovering system.

In case you don't know, Mattawoman Creek is a tributary to the Potomac River, part of the Chesapeake Bay watershed.

IN this example, improvements in waste water treatment in the mid 1990's resulted in decreases in phytoplankton blooms, increases in water clarity, and increases in rooted vascular plants, similar to our eelgrass, these are the plants that are beneficial and highly valued by fish and wildlife.

A sound proposal



As we have seen in the previous presentations, lot of people have been working hard on solutions, and there is a very sound and reasonable proposal out there to fortify the plant compound, consolidate districts of Cedarhurst, Lawrence, Long Beach, and Atlantic Beach, relocate the outfall to the ocean, modernize many

aspects of the aging plant, including incorporation of advanced treatment to remove nitrogen and Ultra-Violet Light as opposed to Chlorine as a disinfectant.

There are many people in this room whose lives were permanently impacted by Sandy.

Because of that, we set a high bar in terms of projects that should be prioritized for Sandy funding.

This is the way I and many others view this project.

- 1) It's an investment in essential infrastructure that, after the consolidations, 600,000 people will depend on every day. No, more than every day. Every time we turn on a faucet, flush the toilet, turn on the dishwasher or washing machine. That in itself is pretty darn good.
 - 2) It's an investment in our community, our economy. Benefits both small and large businesses. Improves our quality of life, AND our environment. How many times does one project hit all those points.
 - 3) Then comes the science that shows that failure to act further jeopardizes the structural resilience of the salt marshes that protect our coastal communities. I'm sure many of you have noticed that the Rebuild By Design teams are proposing building new wetlands to protect our communities. But if we don't do this project we can't even protect the wetlands we have now, no less create new ones and expect them to be self-sustaining.
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The goal is to fix the problems, not relocate them. It's the responsibility of EPA and DEC to protect all waterbodies, which is why the agencies are correctly calling for advanced treatment along with relocation of the outfall.

The call for a 8mg/l nitrogen removal and common sense and cost effective treatment measures such as Ultra Violet disinfecting as opposed to Chlorination are will work to improve the conditions at our ocean beaches rather than degrade them.

Reducing the bay's propensity as an *Ulva* incubator will improve conditions on the ocean beaches, and restoring the estuary as a regional significant producer of fish is also good for our ocean resources and regional fisheries.

An ocean outfall does not preclude waste water engineers from implementing innovative resource recovery technology at a new modern Bay Park STP. To the contrary, having a safe and reliable way to treat and discharge sewage at the same rate is coming in is what enables us to explore resource recovery and re-use options.

The volume of effluent that flows through this plant each day is enormous. Any resource recovery or re-use could occur for only a portion of the effluent which would go through a side stream treatment.

There are experts advancing this innovation like this around the world and over time we should continue to invest in incentives to recover resources from sewage treatment plants all around New York State.

Don't forget about plumbing



As a closing point I want to emphasize that our waste water treatment system is more than just the treatment plant, we should not forget about plumbing that transports raw sewage to the treatment plant. Some of which is old and past its lifespan.

I mentioned earlier that my parents live in a Sandy Impacted neighborhood.

During reconstruction, one of their neighbors was informed that they had a compromised sewer lateral. This is the pipe that carries raw sewage from the home to the sewer main under the street. The home owners thought this was more Sandy damage – but the contractor informed them that this was not caused by Sandy. This pipe had been failing long before Sandy, probably for years. But with Long Island's sandy soils and a canal right across the street, the raw sewage it never came up in their yard, rather it just flowed underground into the canal. They were not required to inspect the Sewer Lateral so they never knew that not only was this a problem for what's called – exfiltration – basically untreated sewage going straight in the ground and surface waters – this house is right across the street from a canal – but non-water tight sewer mains and sewer laterals are also contributing to what's called infiltration – which is when ground water gets into the pipes and floods a surge of volume to the Sewage Treatment Plant when it rains or the tides are very high. These I&I surges compromise the ability of our engineers to properly treat sewage before it is discharged. Ask any engineer you know and they will tell you that we simply can't have reliable sewage treatment operations if we get an extra 20MGD of water flowing to the plant whenever it rains or there is a storm surge.

Lack of inspection and maintenance of private sewer laterals and onsite septic systems is a common theme and something that requires programmatic and regulatory changes that should accompany the proposed engineering projects in both counties. And don't forget about maintaining the integrity of the public sewer pipes as well.



Thank you very much for the invitation to be here today, and for all of your efforts in bringing Long Island's water resources management into the 21st century.

I and the rest of my colleagues at TNC will gladly try to address any questions that you may have, as well as provide any assistance we can in developing recommendations of the Governors Taskforce.