Updates on Barnegat Bay Monitoring Project

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NJDEP
NJWMC Meeting
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Barnegat Bay Water Quality Monitoring Program: Objectives

- Determine type and extent of water quality impairments
- Develop models for use in directing water quality restoration or TMDL development
- Based on pollutant load responses, identify water quality or loading targets for nutrients or other pollutants

Updates

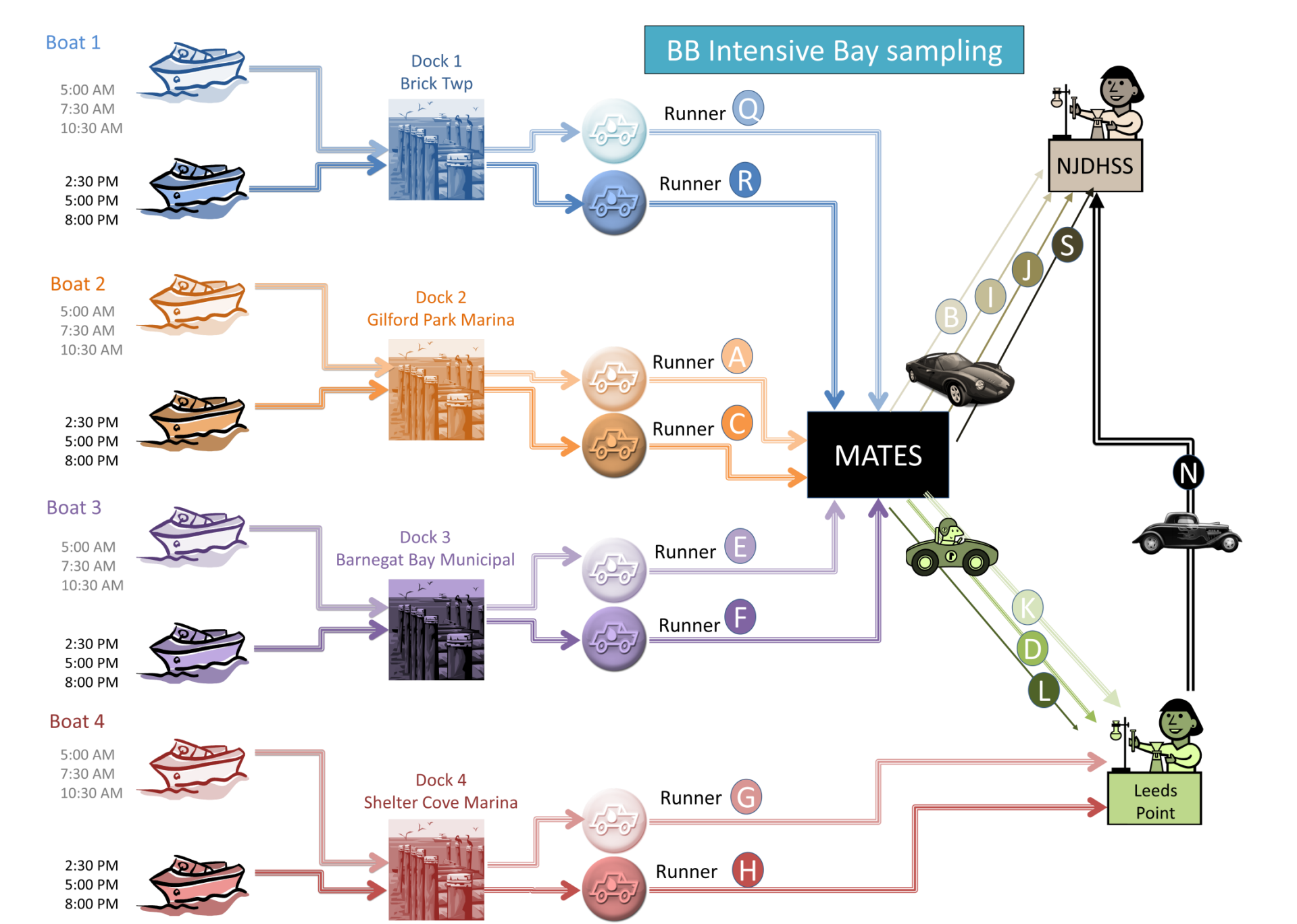
- Intensive sampling
- HOBO deployment
- Air deposition monitoring station
- Buoys
- Other BB projects funded by WM&S

Intensive Sampling

- Two 4-days Events (July 23 – 26 and August 13 – 16)
- 27 sampling locations
- 13 sampling teams
- 75 people per day
- Over 140 NJDEP staff involved
- 4332 total samples

Intensive Sampling (cont.)

- Bay
  - 15 Sampling Locations
  - 8 days (4 July- 4 August)
  - 6 samples a day
  - 5 dock locations
  - 6 boats
  - 6 sampling teams (at least 2 people)
  - 25 Runner routes and runners per day (including AM and PM)


BB Intensive Bay sampling
Boat 1
5:00 AM
7:30 AM
10:30 AM
2:30 PM
5:00 PM
8:00 PM
Dock 1
Brick Twp
Runner Q
Runner R
Boat 2
5:00 AM
7:30 AM
10:30 AM
2:30 PM
5:00 PM
8:00 PM
Dock 2
Gilford Park Marina
Runner A
Runner C
Boat 3
5:00 AM
7:30 AM
10:30 AM
2:30 PM
5:00 PM
8:00 PM
Dock 3
Barnegat Bay Municipal
Runner E
Runner F
Boat 4
5:00 AM
7:30 AM
10:30 AM
2:30 PM
5:00 PM
8:00 PM
Dock 4
Shelter Cove Marina
Runner G
Runner H
MATES
NJDHSS
B
I
J
S
N
K
D
L
Leeds
Point

Intensive Sampling (cont.)

- Tributaries
  - 12 Sampling locations
  - 4 days (2 July-2 August)
  - 2 samples a day
  - 12 sampling locations with continuous data
  - 7 sampling teams
  - 4 runner routes and runners per day

BB Intensive Tributary Sampling

BT01
North Branch
Metedeconk River
on Rt. 88, Brick Twp

BT02
South Branch
Metedeconk River
On Chambers Bridge Rd
Lakewood Twp.

BT04
Wrangle Brook
Near South Toms River

BT03
Toms River
In Park near Toms River

BT05
Jakes Branch
On Rt 619, Beachwood Boro

BT06
Ceder Creek
At Rt 9, Lacey Twp.

BT07
North Branch Forked River
On Parker Ave, Forked River

BT08
Middle Branch Forked River
Off Rt. 9, Lacey Twp.

BT09
South Brank Forked River
Off Rt. 9, Forked River

BT10
Oyster Creek
Off Rt. 9, Lacey Twp

BT11
Mill Creek
Off Bay Ave., Manahawkin

BT12
Westecunk Creek
Railroad Ave., West Creek

FREC

BOD/CBOD
Silica

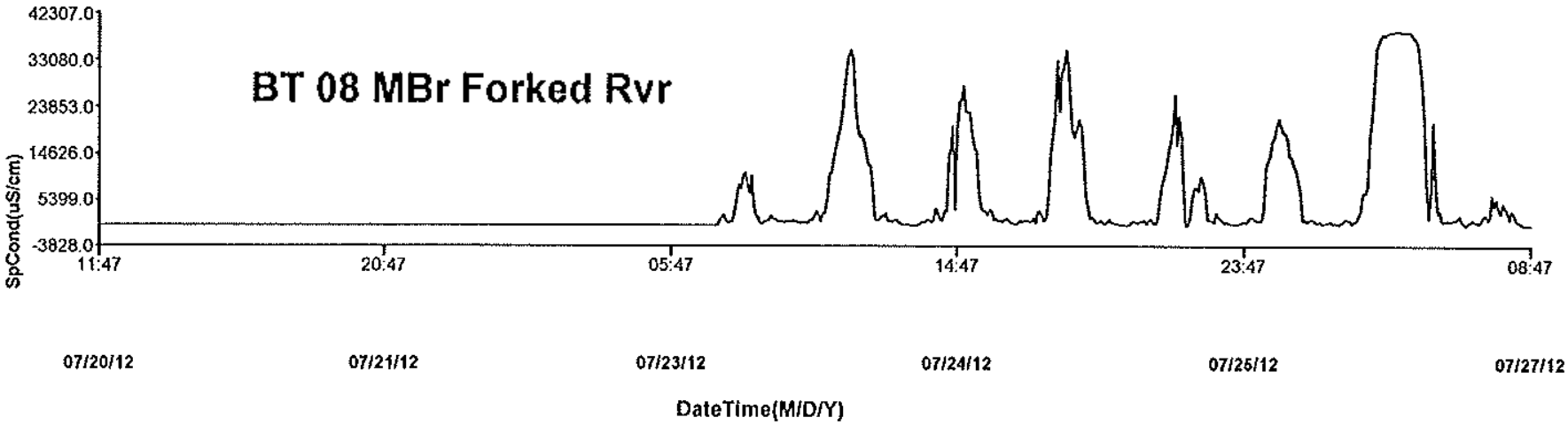
NJDHSS

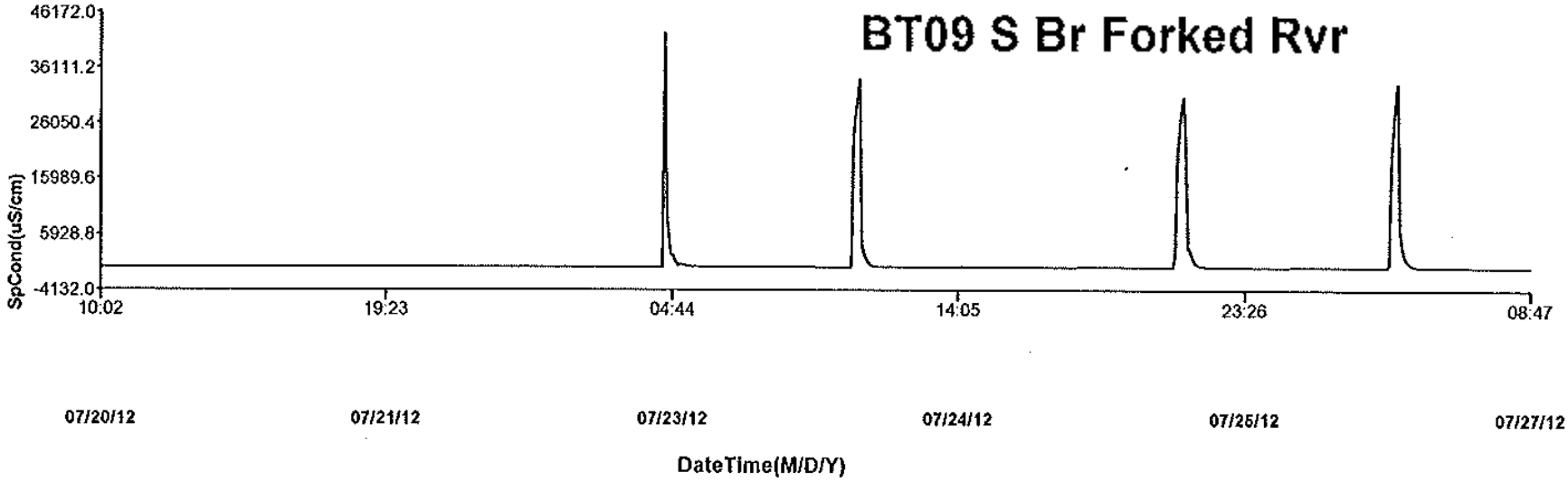
Nutrients
Carbon
Alkalinity
TSS
Turbidity
Chlorophyll a

Leeds Pt

8:00 AM delivery processed by 12:00 PM and transported to labs at 2:00 PM

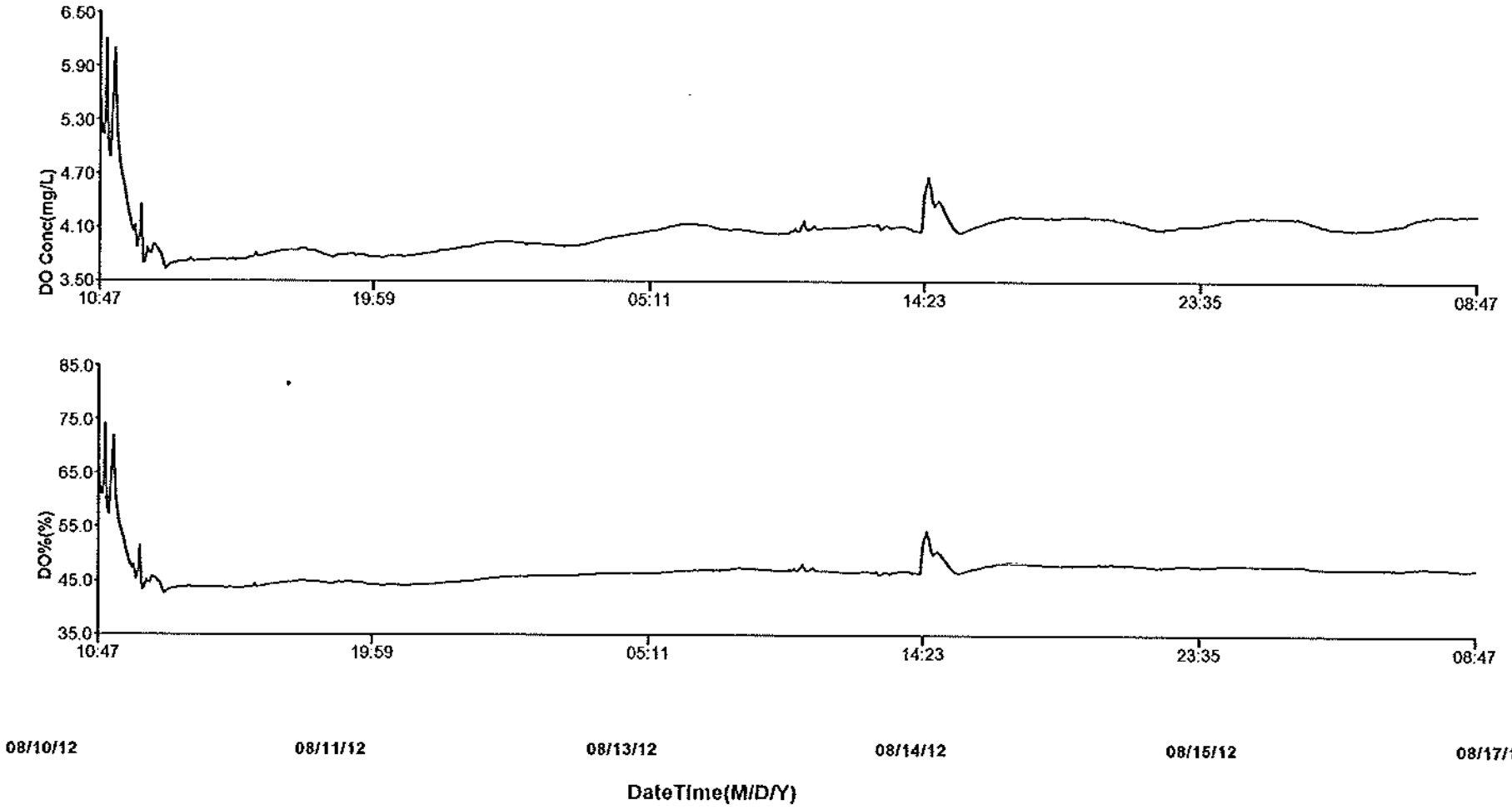
7:00 PM delivery processed by 11:00 PM and stored at Leeds Point Lab overnight. Transported to DHSS lab at 11:00 AM the next morning with bay samples.





Provided by Chris Kunz

BT05 Jakes Br



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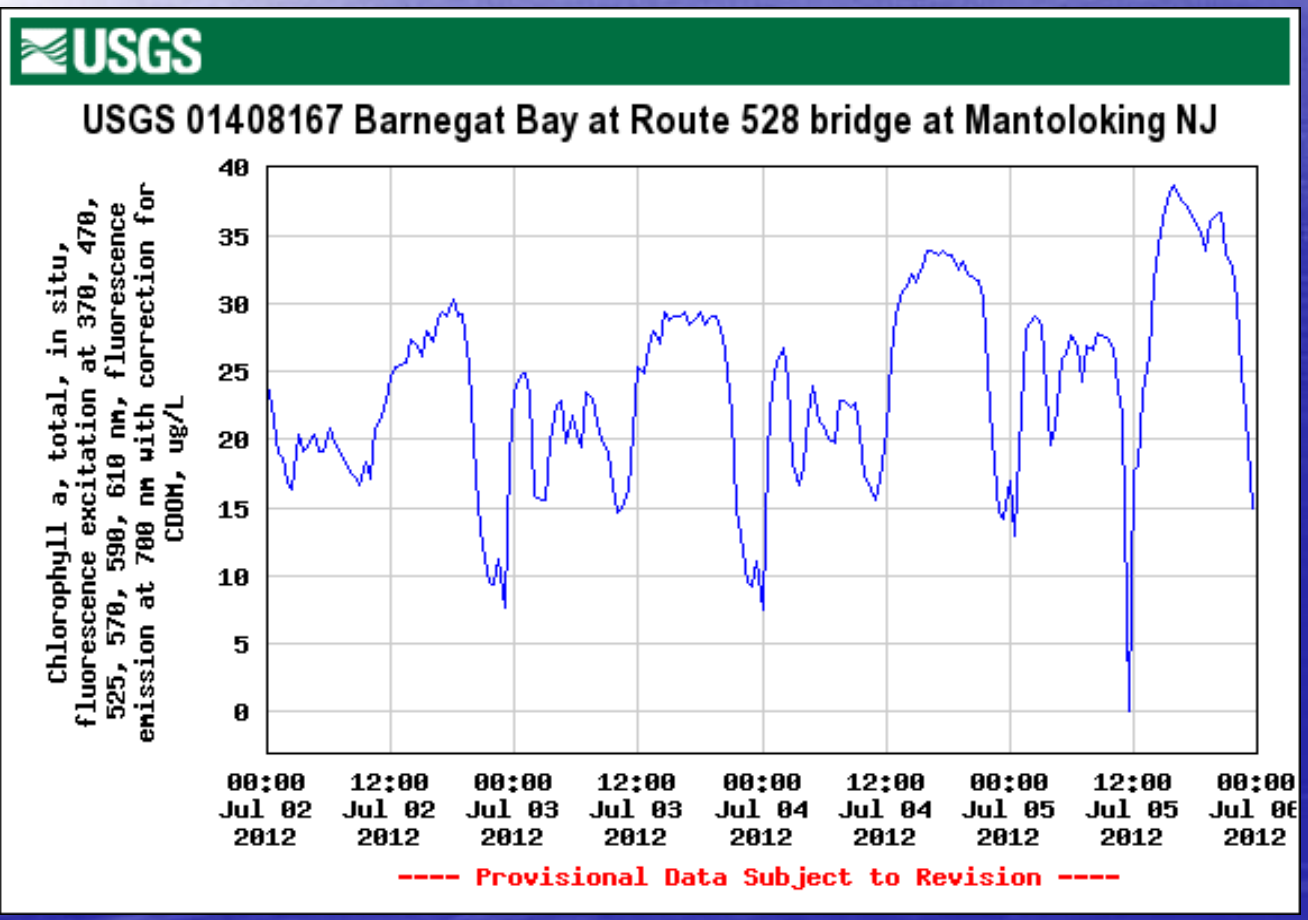
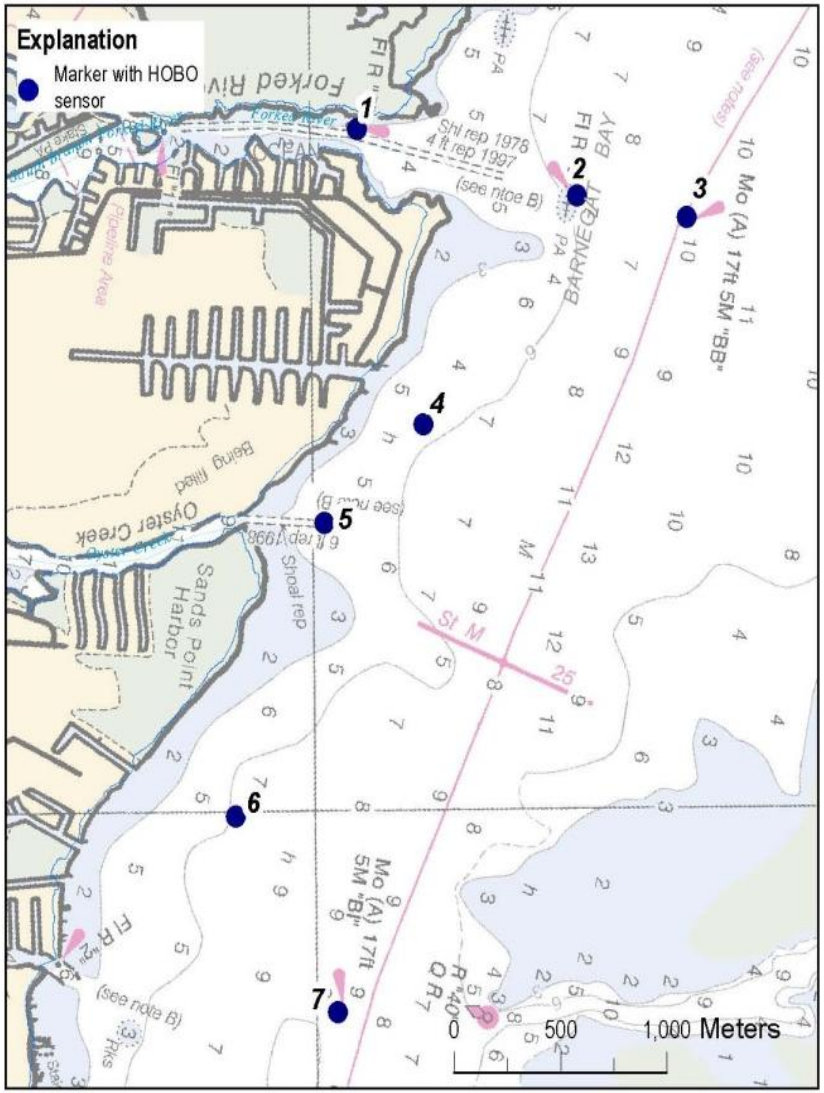
Diurnal Swing



- Data collected during the intensive event will catch the daily variation, which will be critical for the successful calibration of the model.

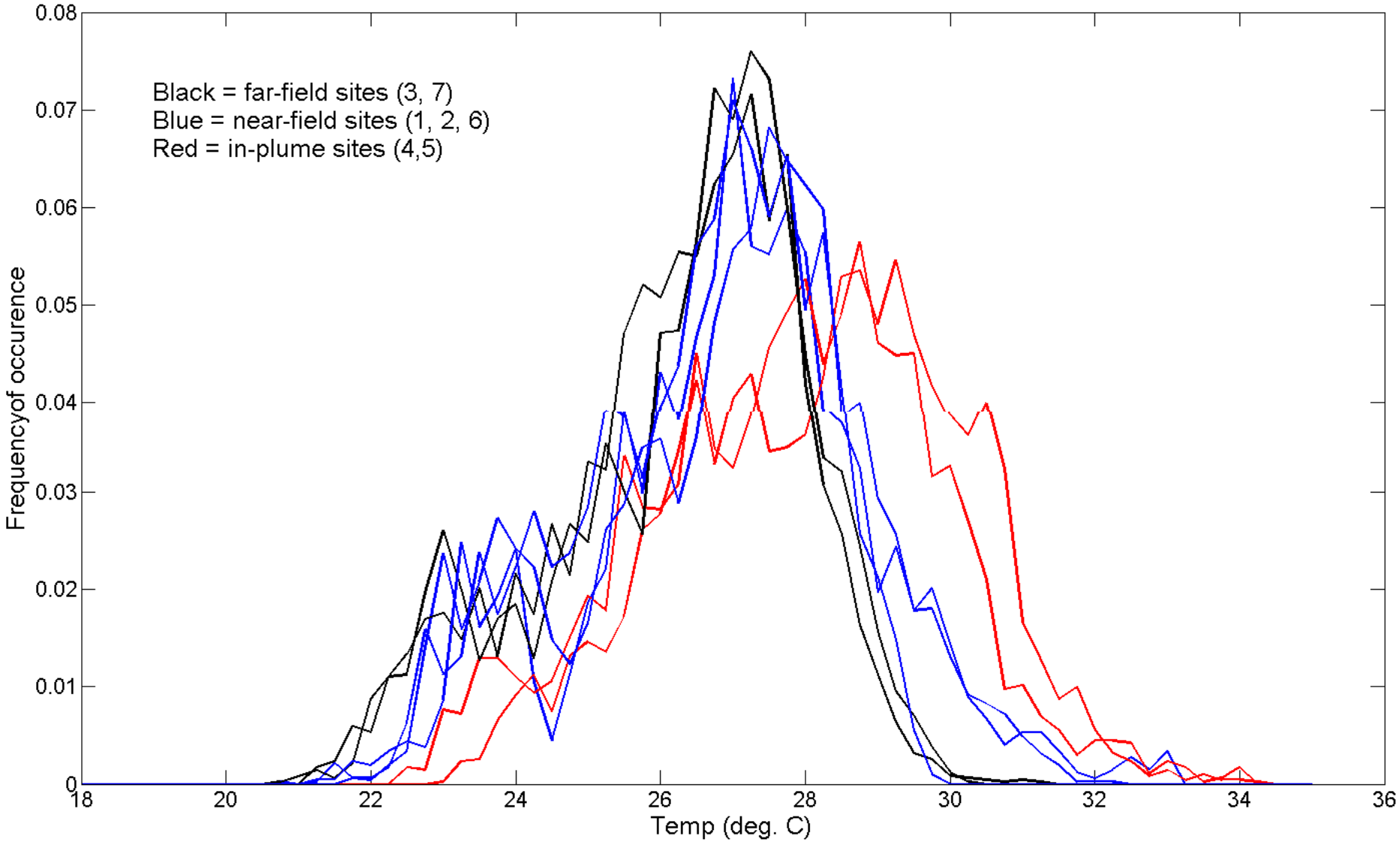
HOBO Deployment

- 7 locations along the thermal plume
  - Surface temp
  - Temp and conductivity (Station 2 and 5)
  - Surface and bottom (station 5)
- Two deployments over the summer



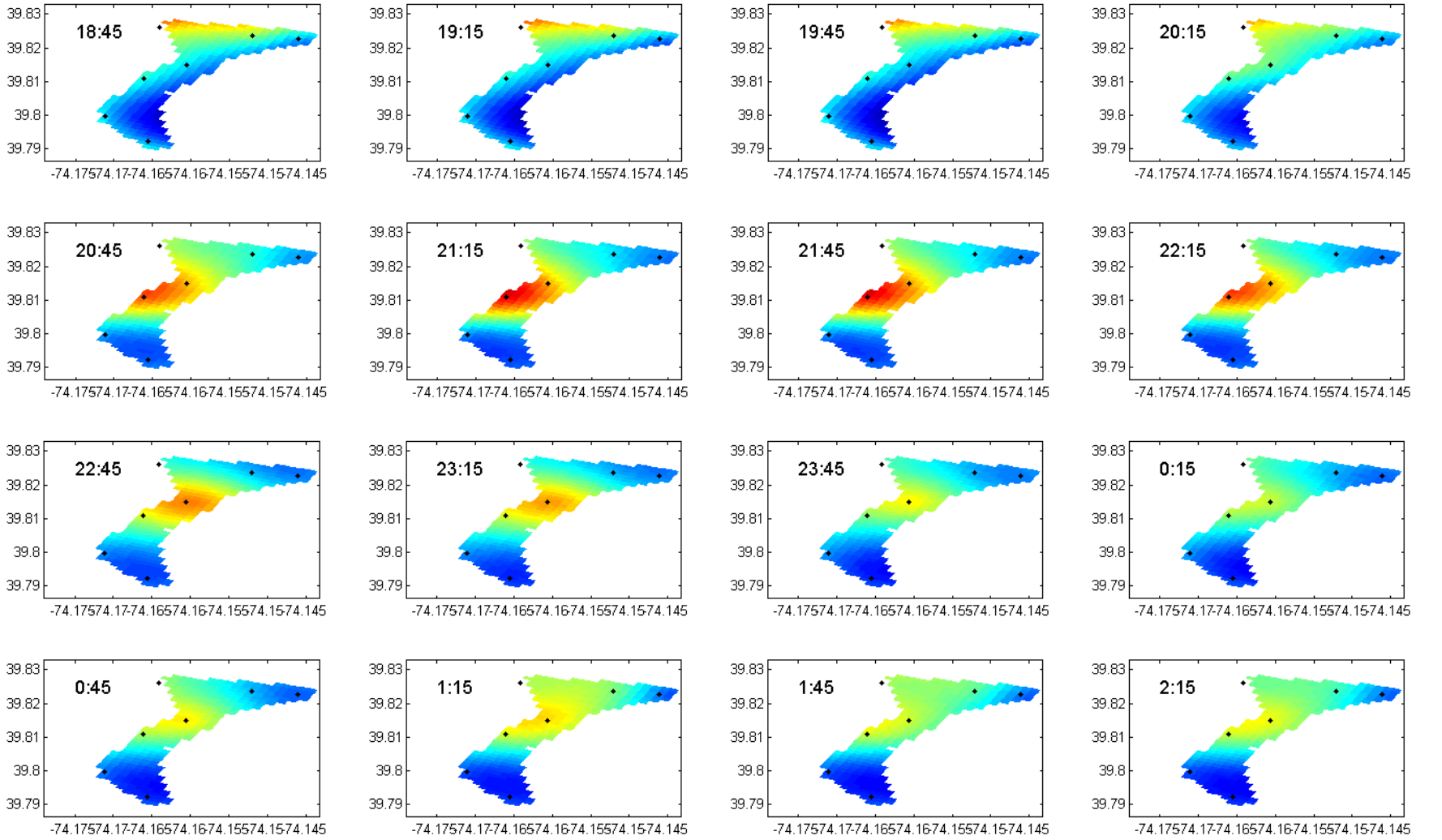
Hobo temperature sensors in the vicinity of Oyster Creek, BB-LEH estuary.

Courtesy of Vince DePaul of USGS



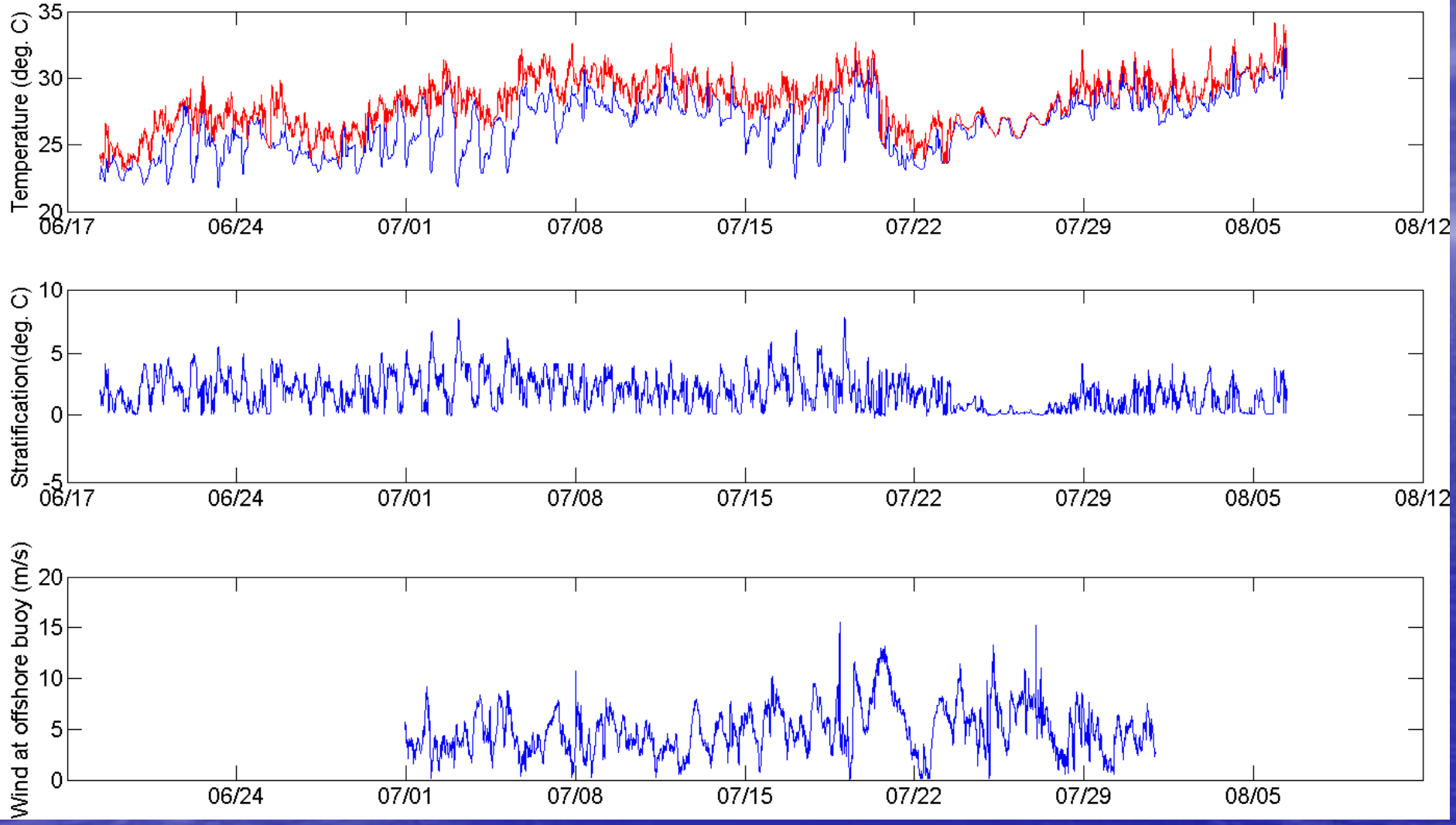
Histograms of temperature from seven surface Hobo sensors.

Courtesy of Neil Ganju of USGS



Time-series map of surface temperature in deg. C on day of maximum temperature at station BB5 (August 5-6, 2012). Black points are station locations. Data appear to be from flood-to-ebb-to-flood.

Courtesy of Neil Ganju of USGS

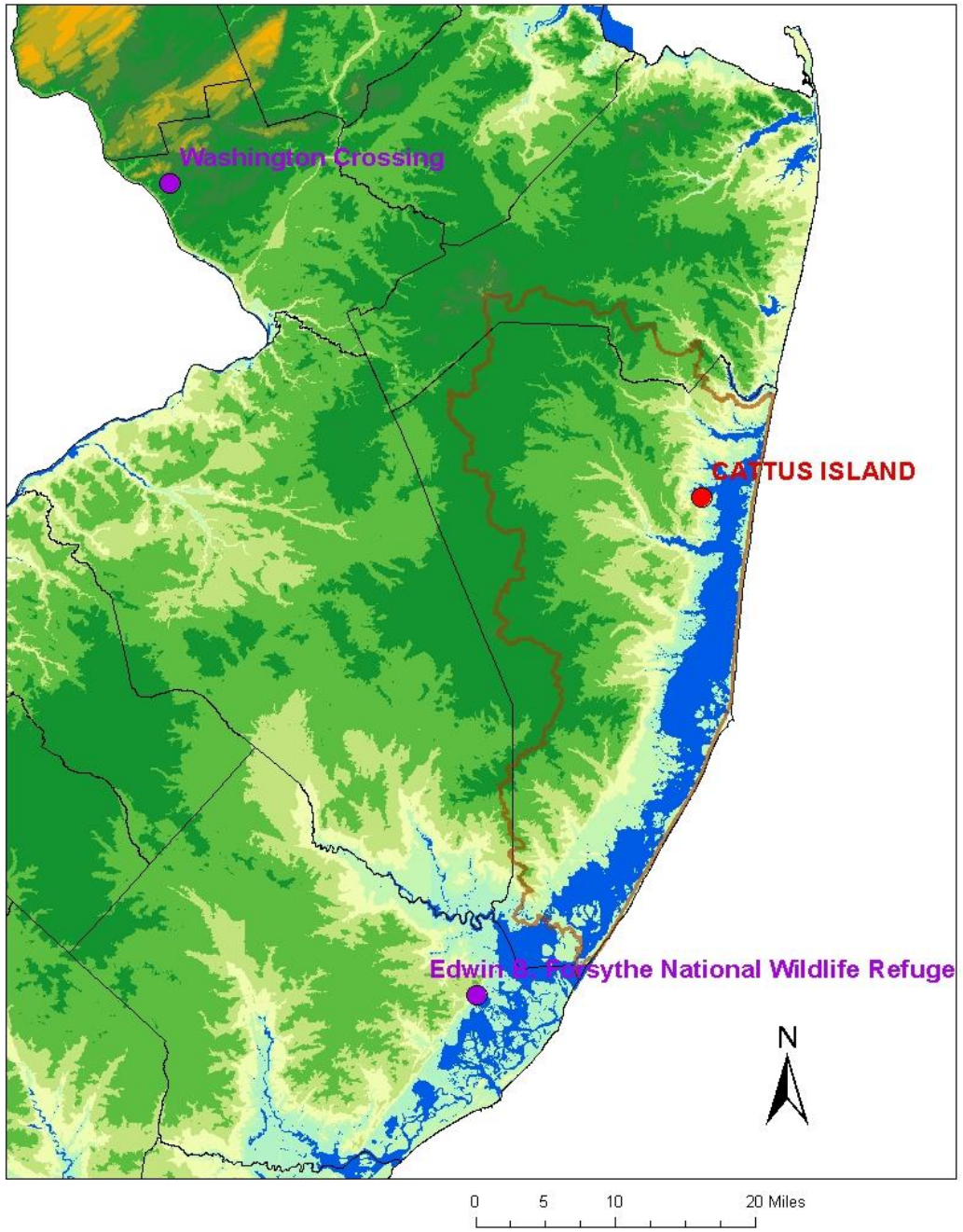


Temperature at Station 5 top (red) and bottom (blue), vertical temperature stratification (middle tile) and wind speed at buoy 44065. Wind events starting before 7/22 appear to have mixed water column

Courtesy of Neil Ganju of USGS

New Air Deposition Monitoring Station

- Cattus Island County Park
- Wet Deposition Monitoring Station
- Provide a better estimation of loading from the air deposition

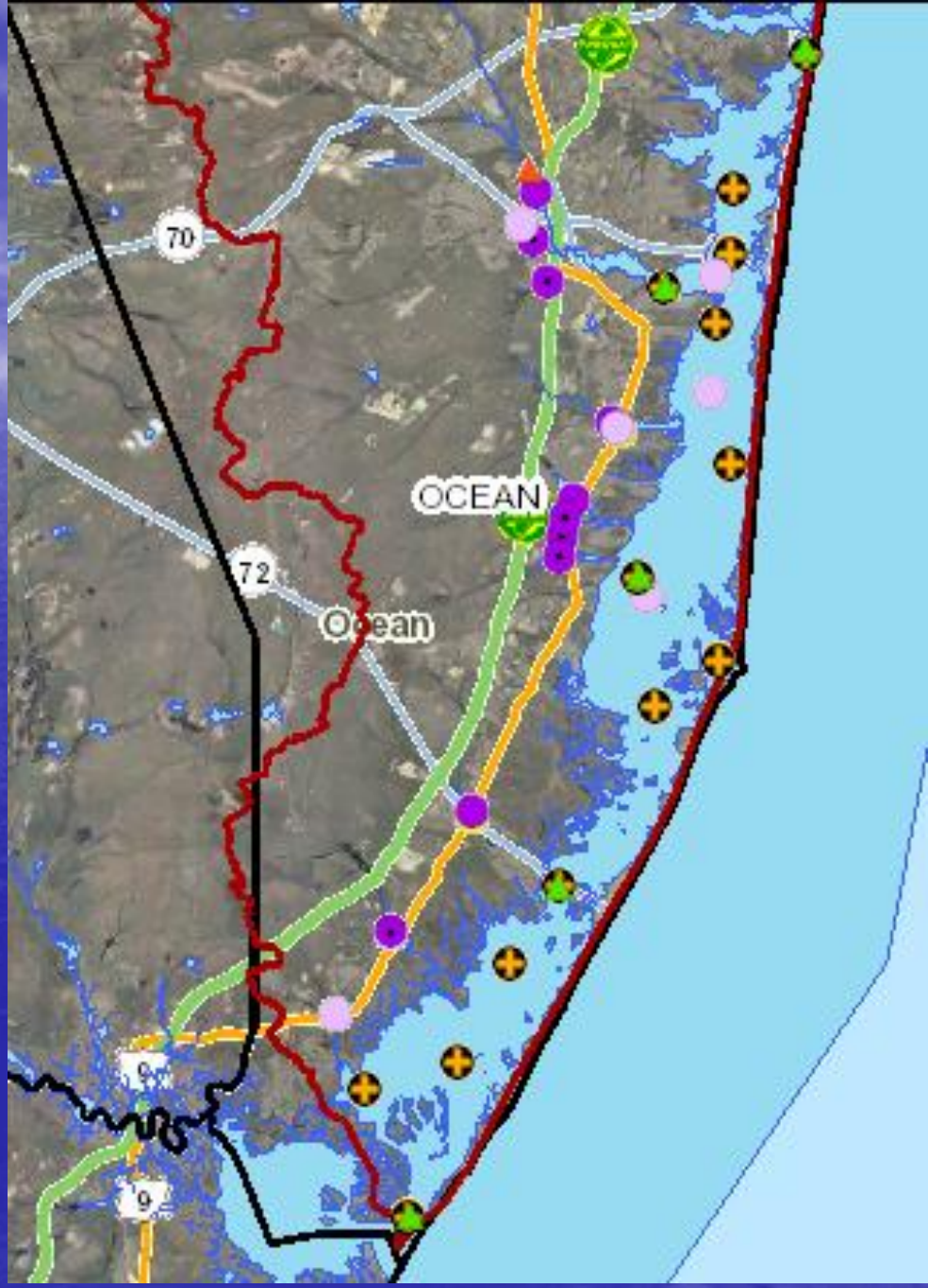



SILVER BAY
SEAWALL
CATTUS ISLAND
CATTUS ISLAND COUNTY PARK
Crossarm Creek
Applegate Cove
Applegate Creek
Cattus Island
N
0
0.175
0.35
0.7 Miles

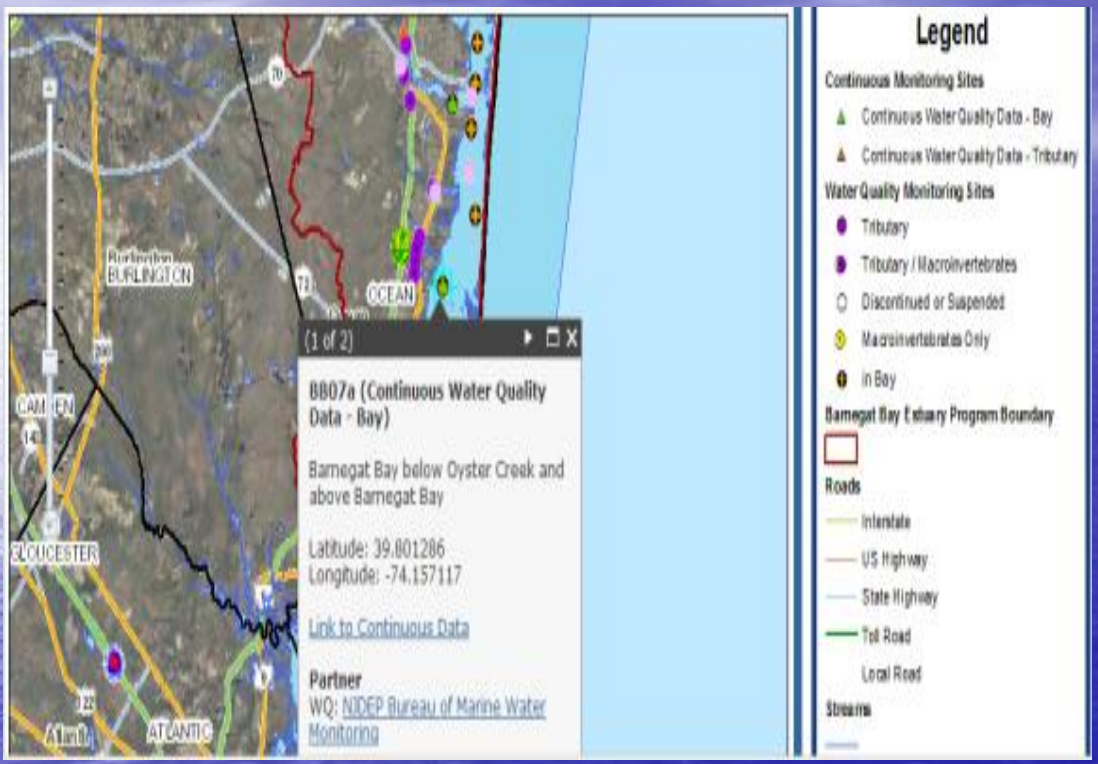

NO CARS BEYOND THIS POINT

Buoys

- 4 buoys (BB04a, BB07a, BB10 and Bb14)
- 5/22/12 and 7/19/12
- Temp, SpCond, Salinity, DO, DO%, pH, Turbidity and Chl-a



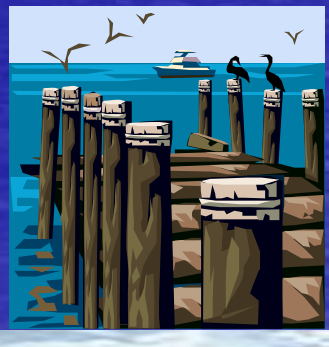
http://www.nj.gov/dep/barnegatbay/bbmapviewer.htm



Station	TIMESTAMP	TempC	SpCond_mS	Sal	DO_%	DO_mgL	PH	Turb_Plus	Chl_ugL
BB07a	5/22/2012 13:16	18.84	40.2	25.74	100.6	8.03	8.04	1	4.9
BB07a	5/22/2012 13:31	19.26	40.1	25.66	98.4	7.8	8.01	0.8	5.4
BB07a	5/22/2012 13:46	19.38	40.19	25.73	97.3	7.69	8.01	0.8	4.4
BB07a	5/22/2012 14:01	20.06	39.74	25.4	95.5	7.47	7.96	0.7	4.8
BB07a	5/22/2012 14:16	19.88	40.06	25.63	96.2	7.54	7.97	0.8	4.1
BB07a	5/22/2012 14:31	19.89	40.14	25.69	96.5	7.56	7.98	0.7	3.9
BB07a	5/22/2012 14:46	19.96	40.13	25.68	96.2	7.52	7.98	0.8	3.8
BB07a	5/22/2012 15:01	20.6	39.66	25.34	95.9	7.42	7.93	1	3.4
BB07a	5/22/2012 15:16	20.19	40.03	25.61	96.4	7.51	7.97	0.8	4.1
BB07a	5/22/2012 15:31	20.72	39.61	25.31	95.6	7.38	7.94	1	4.2
BB07a	5/22/2012 15:46	20.89	39.77	25.42	94.1	7.24	7.95	1	4.8
BB07a	5/22/2012 16:01	21.02	39.82	25.45	97.1	7.46	7.97	0.8	4.1
BB07a	5/22/2012 16:16	19.15	41.05	26.34	100.2	7.93	8.07	0.8	4.2
BB07a	5/22/2012 16:31	19.82	40.49	25.94	101.4	7.94	8.02	0.8	3.6
BB07a	5/22/2012 16:46	19.04	41.07	26.36	99.4	7.88	8.06	0.8	4.2
BB07a	5/22/2012 17:01	20.14	40.47	25.92	95.4	7.42	7.98	0.6	4
BB07a	5/22/2012 17:16	19.5	40.89	26.22	93.4	7.34	7.99	0.6	3.8
BB07a	5/22/2012 17:31	19.72	40.73	26.11	92.9	7.28	7.98	0.5	3.2

Other Projects

- **Sediment Toxicity Assessment**
  - Tim Reilly of USGS
  - Sample collection was completed on 9/11/12
  - Lab analysis is on-going
    - 28-day sediment toxicity
    - Currently-used pesticides
    - Legacy pesticides, metal, PAHs and PCBs
    - pH, conductivity and grain size analysis
- **Determination of Benthic Nutrient and Oxygen Fluxes from the sediment**
  - Vincent DePaul, Timothy Wilson and Jacob Gibs of USGS
  - Field measurement and sampling collection are on-going
  - SOD and nutrient flux measurement
  - Phase 1 2012 and Phase 2 2013



Upcoming

- **Ambient Sampling**
  - Reduced frequency, twice per month from October to December 2012
  - Scope of sampling for 2013 to be determined soon
  - Chl-a analysis is added to the samples from the tributary stations
- **Two additional sediment-related monitoring projects**
  - Continuous Suspended Solid Concentration from Acoustical Flow Data
  - Sediment resuspension analysis
- **LIDAR fly over to finish the bathymetry**


Barnegat Bay Website:
www.state.nj.us/dep/barnegatbay/
(including Interactive Map for monitoring data)
THANK YOU !