Wreck Pond Feasibility Study
Project Update

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September 17, 2014

US Army Corps of Engineers
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Agenda

- Overall Status
- Data Collection
- H&H Modeling
- Sediment Estimation
- Upcoming Work

Status of Wreck Pond Feasibility Study

- Ongoing feasibility study to investigate potential ecosystem restoration and risk management solutions for the Wreck Pond watershed.
- Study will be completed at 100% Federal cost (Disaster Relief Appropriations Act of 2013)
- Data collection, modeling, engineering information, cost/benefit analysis.

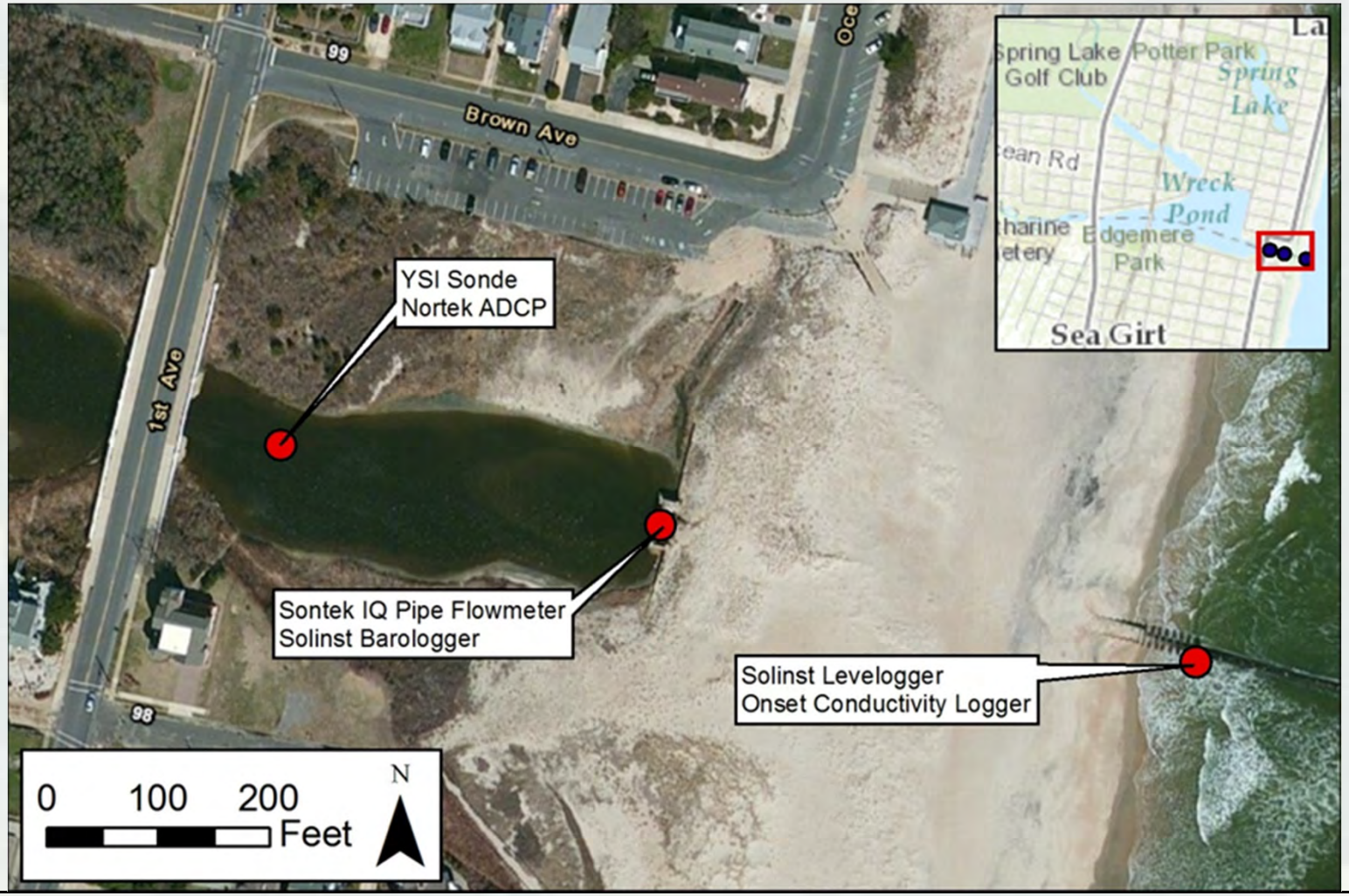
Study Area

Study Objectives

- Working with stakeholders to create plans that will meet study objectives.
  - Habitat restoration, reduce sedimentation, improve aquatic diversity and health, etc.
  - Coastal storm risk management.
- USACE team coordinating with the State of New Jersey, Wreck Pond Technical Advisory Committee, USFWS, etc.

Data Collection

Data Collection Period (May 29 –June 30, 2014)
Instrument Locations



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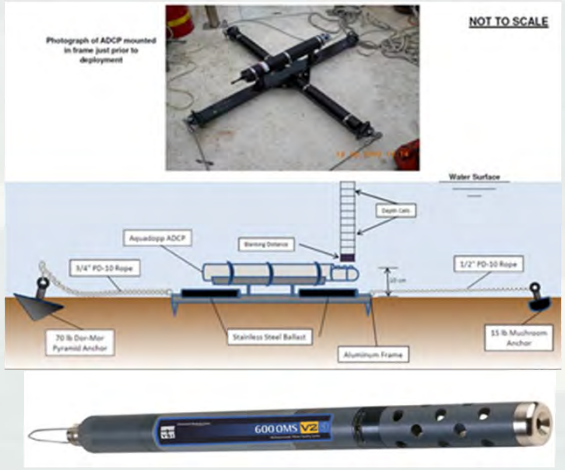
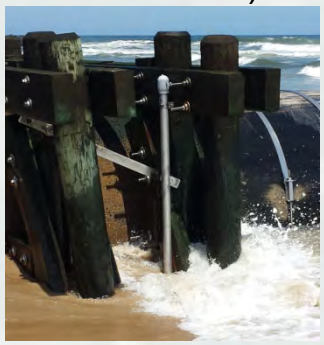
Data Collection

Instruments and Parameters

- **Wreck Pond**
  - YSI 600 Water Quality Sonde
    - Temperature, Conductivity, Dissolved Oxygen
  - Nortek Aquadopp ADCP
    - Level, temperature, current (speed and direction)



- **Outfall (Ocean Side)**
  - Solinst Levelogger Junior
    - Level
  - Onset Conductivity Logger
    - Conductivity



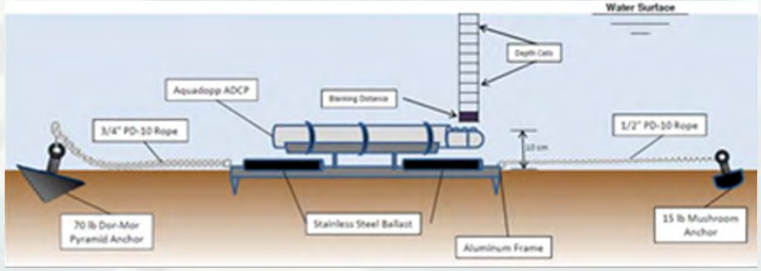
- **Outfall (Pond Side)**
  - SonTek IQ Pipe flow meter
    - Level, velocity, flow
  - Solinst Barologger
    - Barometric Pressure

Data Collection

Instruments and Parameters

- **Wreck Pond**
  - YSI 600 Water Quality Sonde
    - Temperature, Conductivity, Dissolved Oxygen
  - Nortek Aquadopp ADCP
    - Level, Temperature, Current (speed and direction)

ADCP Mounted to Frame



Data Collection

Instruments and Parameters

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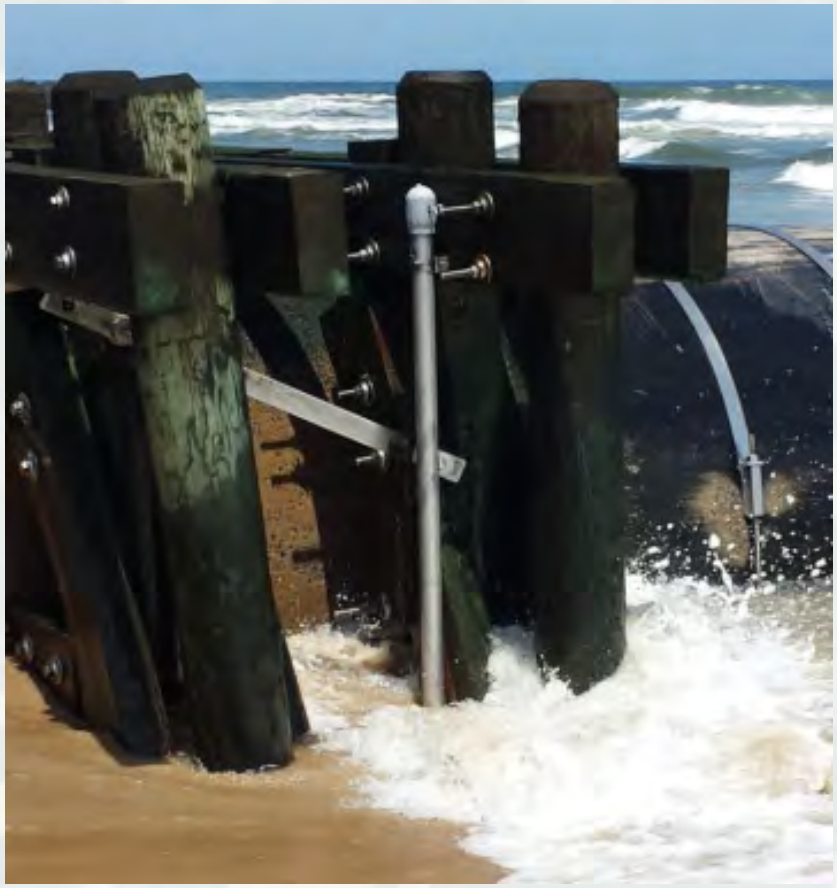

Data Collection

Instruments and Parameters

- **Outfall (Pond Side)**
  - SonTek IQ Pipe flow meter
    - Level, velocity, flow
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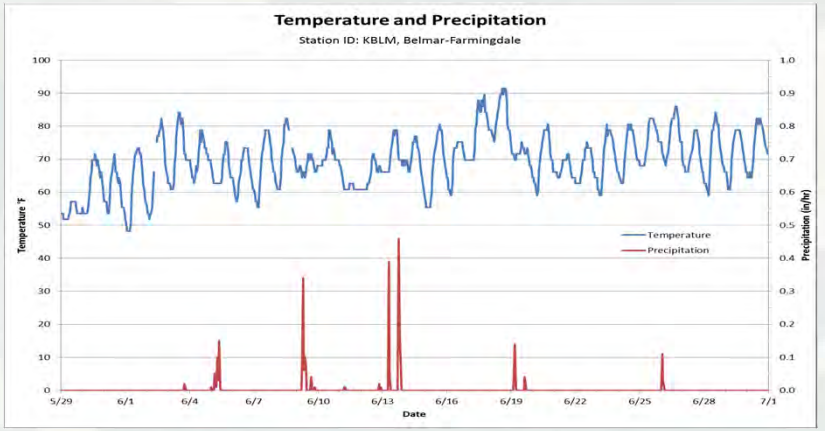
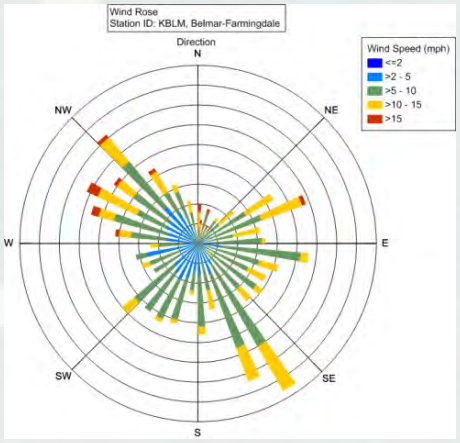
    - Barometric Pressure

Data Collection

Ancillary Data Collected

- Metrological data was retreved to the monitoring period Station KBLM (Monmouth Executive Airport)

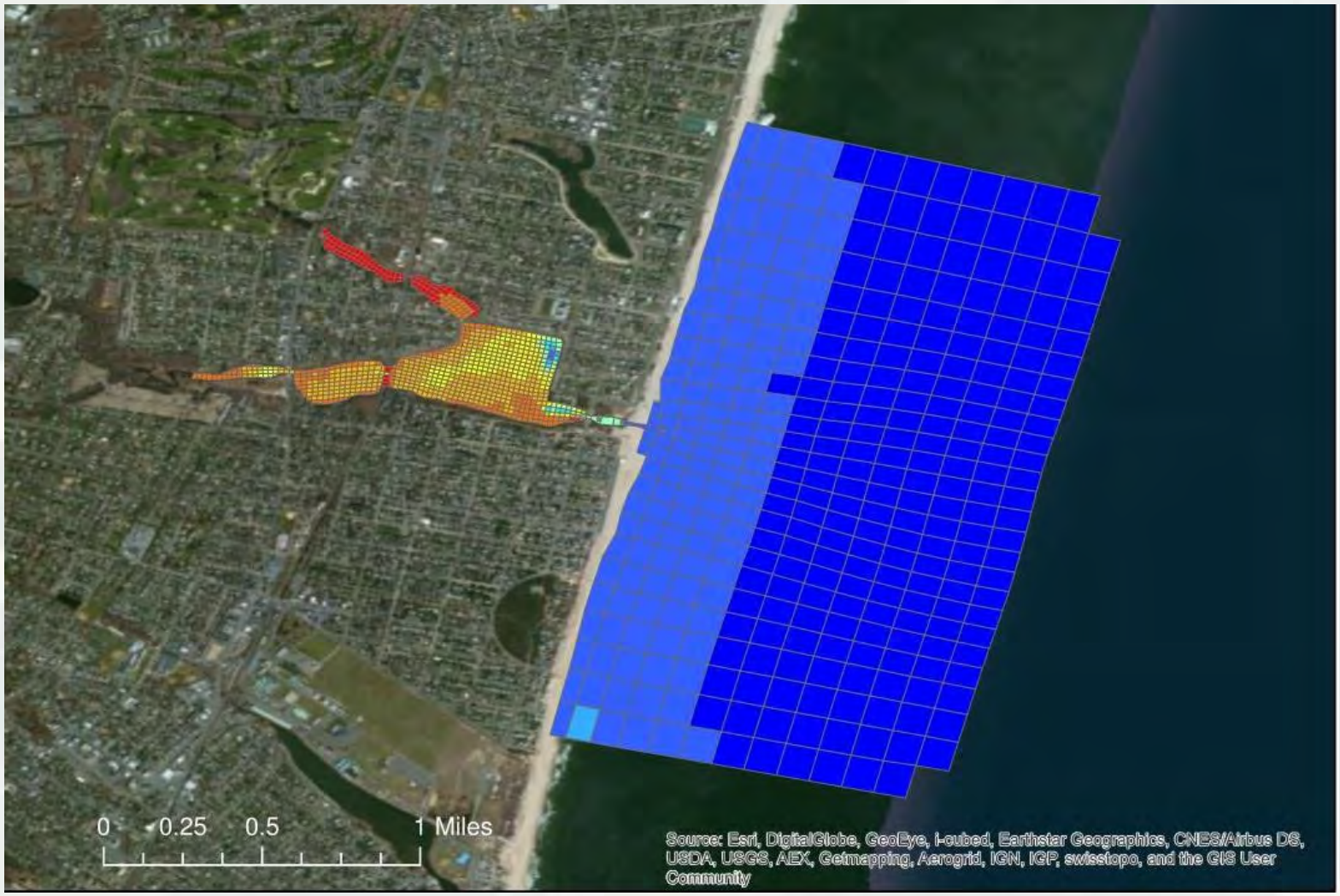


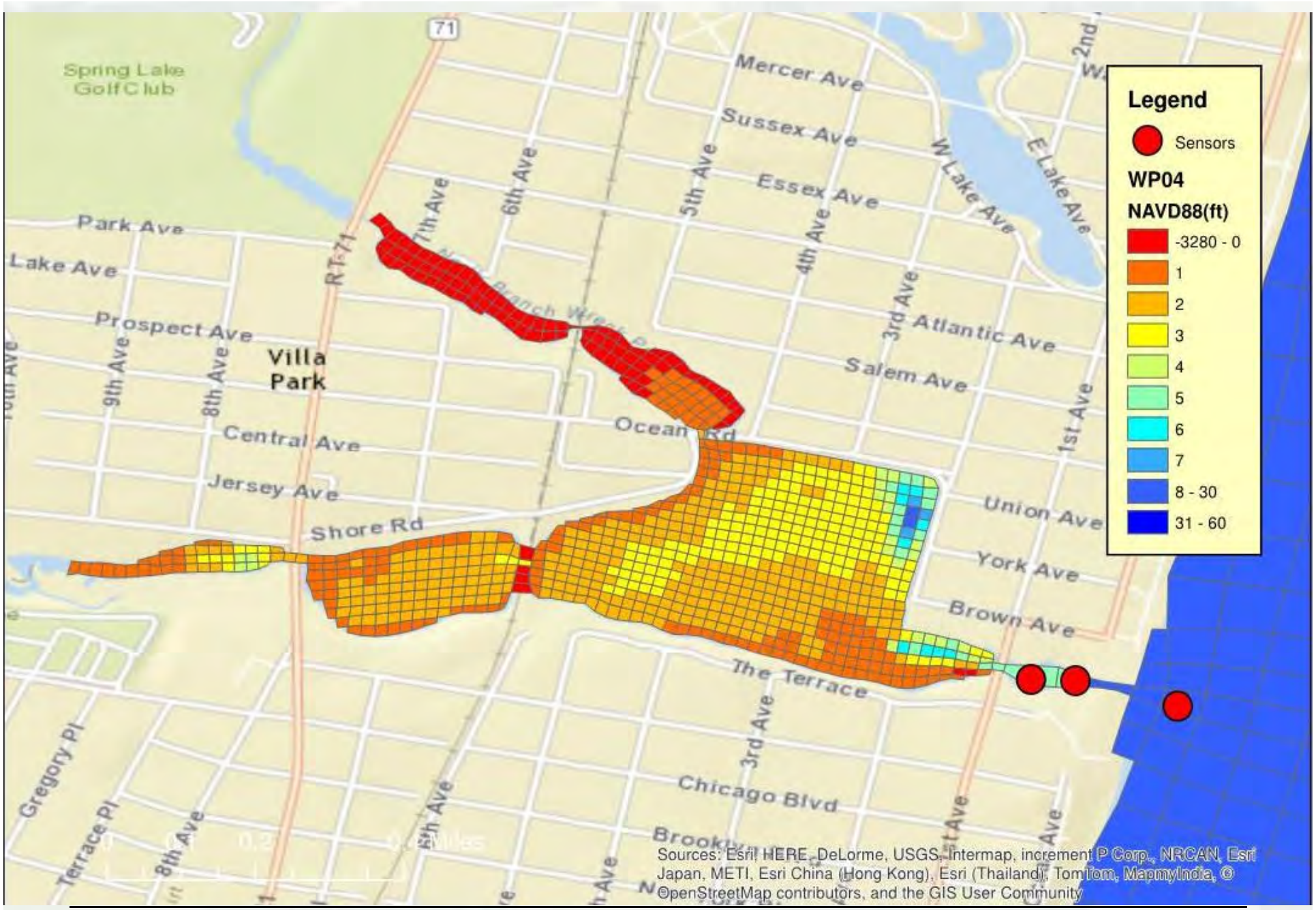


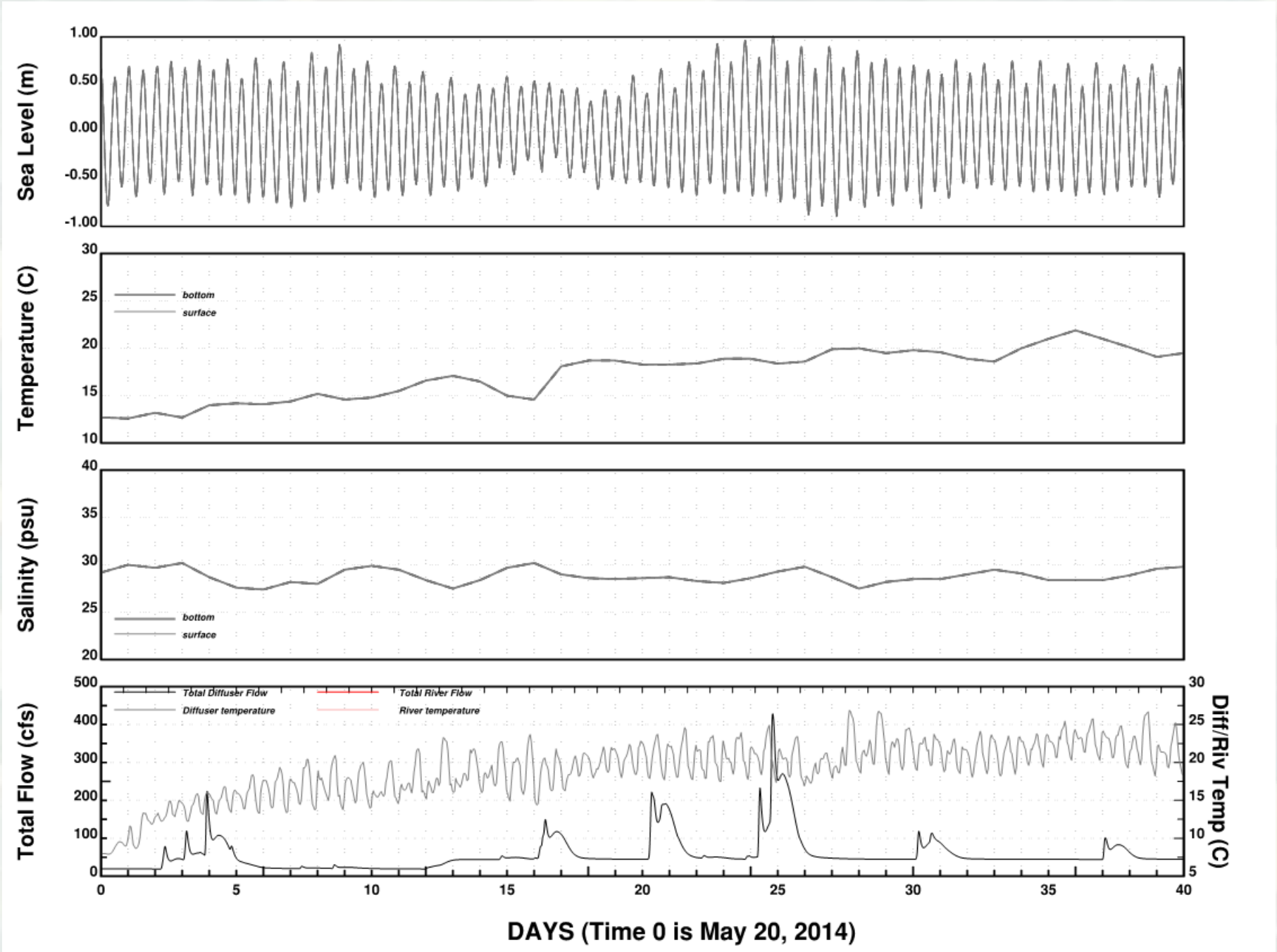
Summary

- Data recorded during the period of May 29, 2014 to June 30, 2014 will provide the data needed to develop and calibrate the Wreck Pond Hydrodynamic model.
- Meteorological data from station KBLM will be used to provide rainfall data for a hydrologic model of the Wreck Pond watershed for the estimation of storm flow to the Wreck Pond complex.
- Water level data from the ocean outfall will be used to develop the boundary condition to the hydrodynamic model of Wreck Pond.
- Flow data from the outfall structure will be used to aid in the development and calibration of rating curves of the outfall.
- Hydrodynamic and water quality data collected in Wreck Pond will be used to calibrate the Wreck Pond Model.

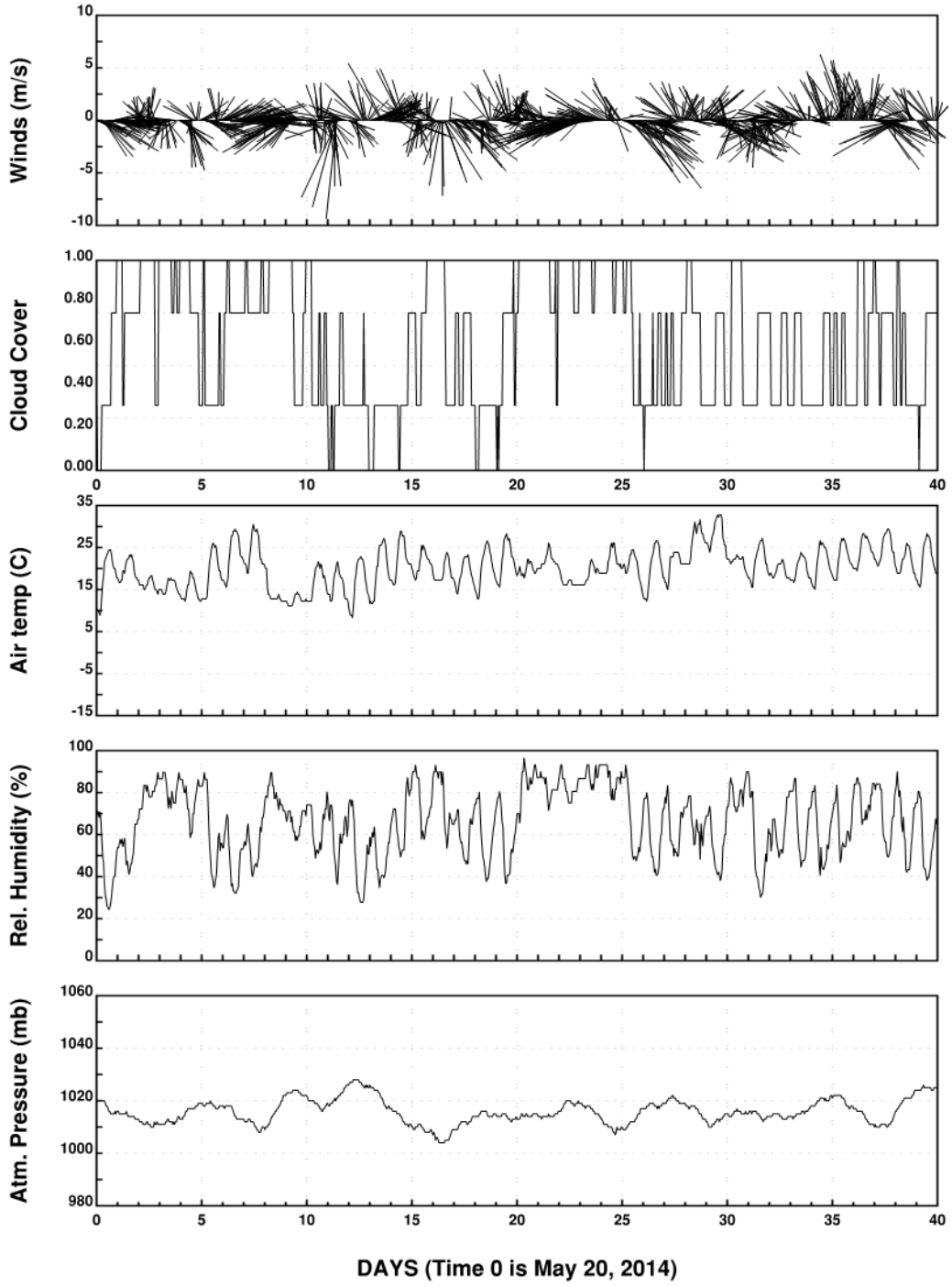
Development of Hydrodynamic Model of Wreck Pond




Legend
Sensors
WP04
NAVD88(ft)
-3280 - 0
1
2
3
4
5
6
7
8 - 30
31 - 60
Spring Lake Golf Club
Villa Park
Mercer Ave
Sussex Ave
Essex Ave
Park Ave
Lake Ave
Prospect Ave
Central Ave
Jersey Ave
Shore Rd
Ocean Rd
Salem Ave
Atlantic Ave
Union Ave
York Ave
Brown Ave
The Terrace
Chicago Blvd
Gregory Pl
Terrace Pl
RT-71
W Lake Ave
E Lake Ave
1st Ave
2nd
3rd Ave
4th Ave
5th Ave
6th Ave
7th Ave
8th Ave
9th Ave
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community


Sea Level (m)
1.00
0.50
0.00
-0.50
-1.00
Temperature (C)
30
25
20
15
10
bottom
surface
Salinity (psu)
40
35
30
25
20
bottom
surface
Total Flow (cfs)
500
400
300
200
100
0
Total Diffuser Flow
Diffuser temperature
Total River Flow
River temperature
Diff/Riv Temp (C)
30
25
20
15
10
5
0
5
10
15
20
25
30
35
40
DAYS (Time 0 is May 20, 2014)

Meteorological Data



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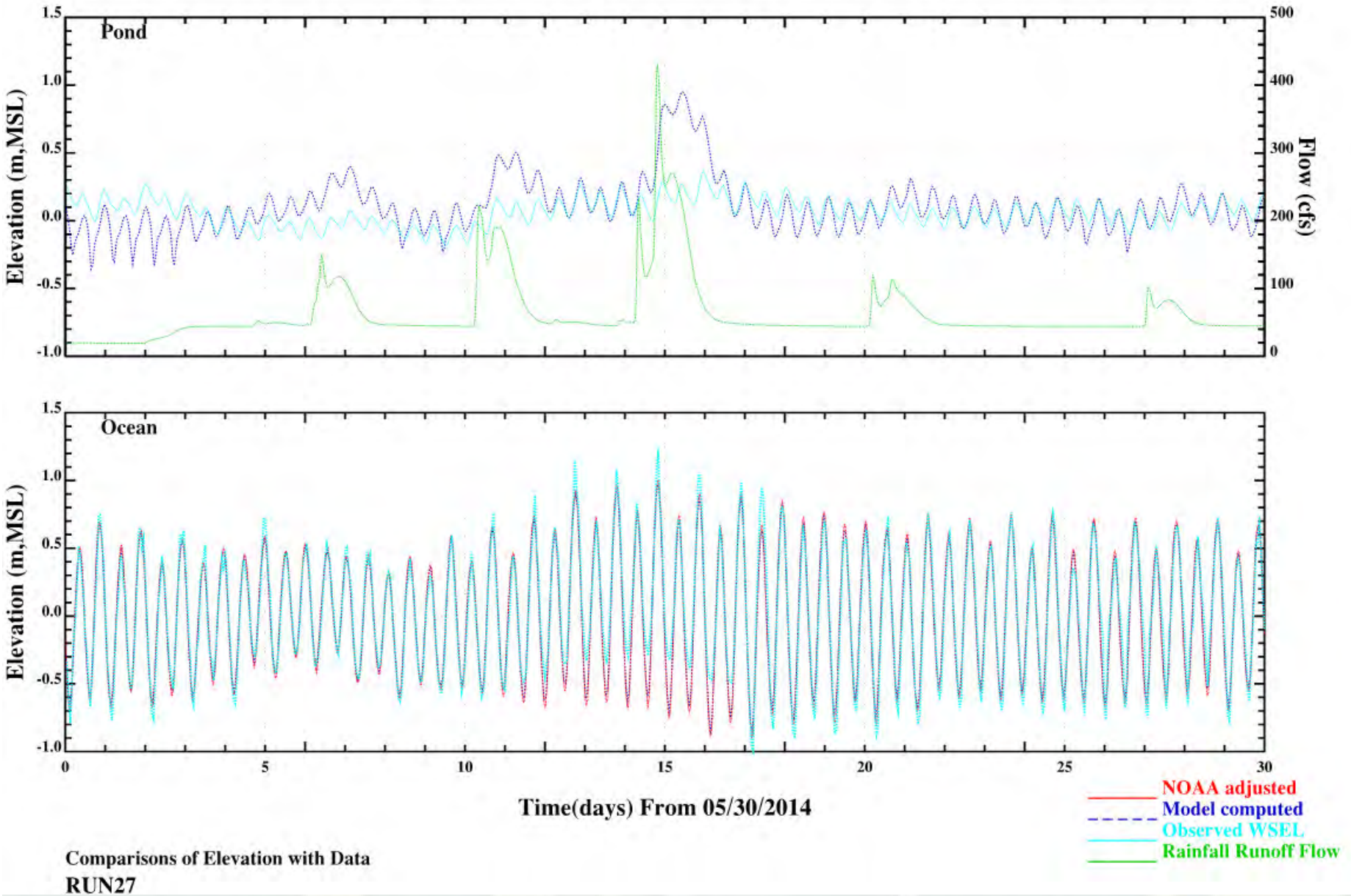
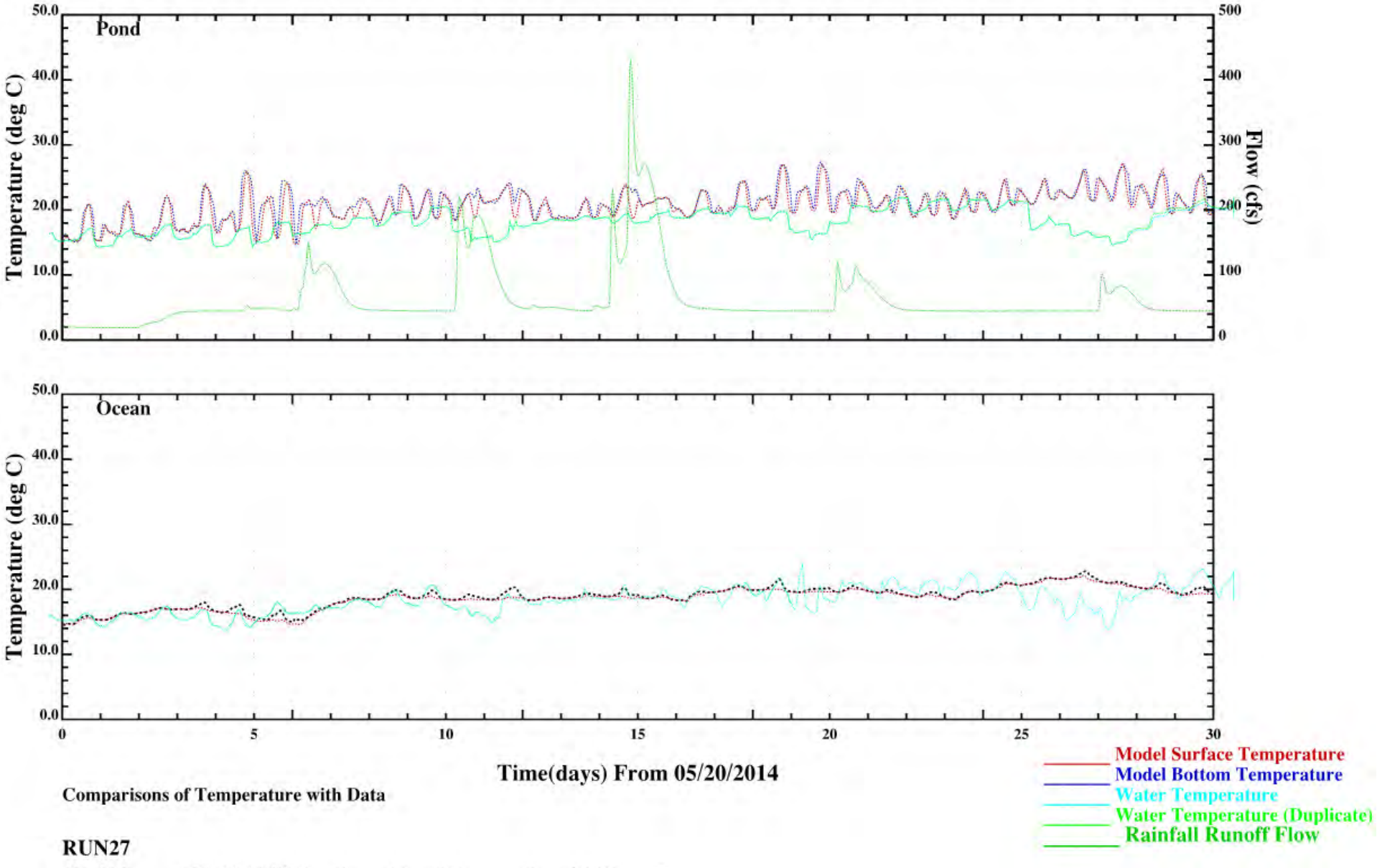


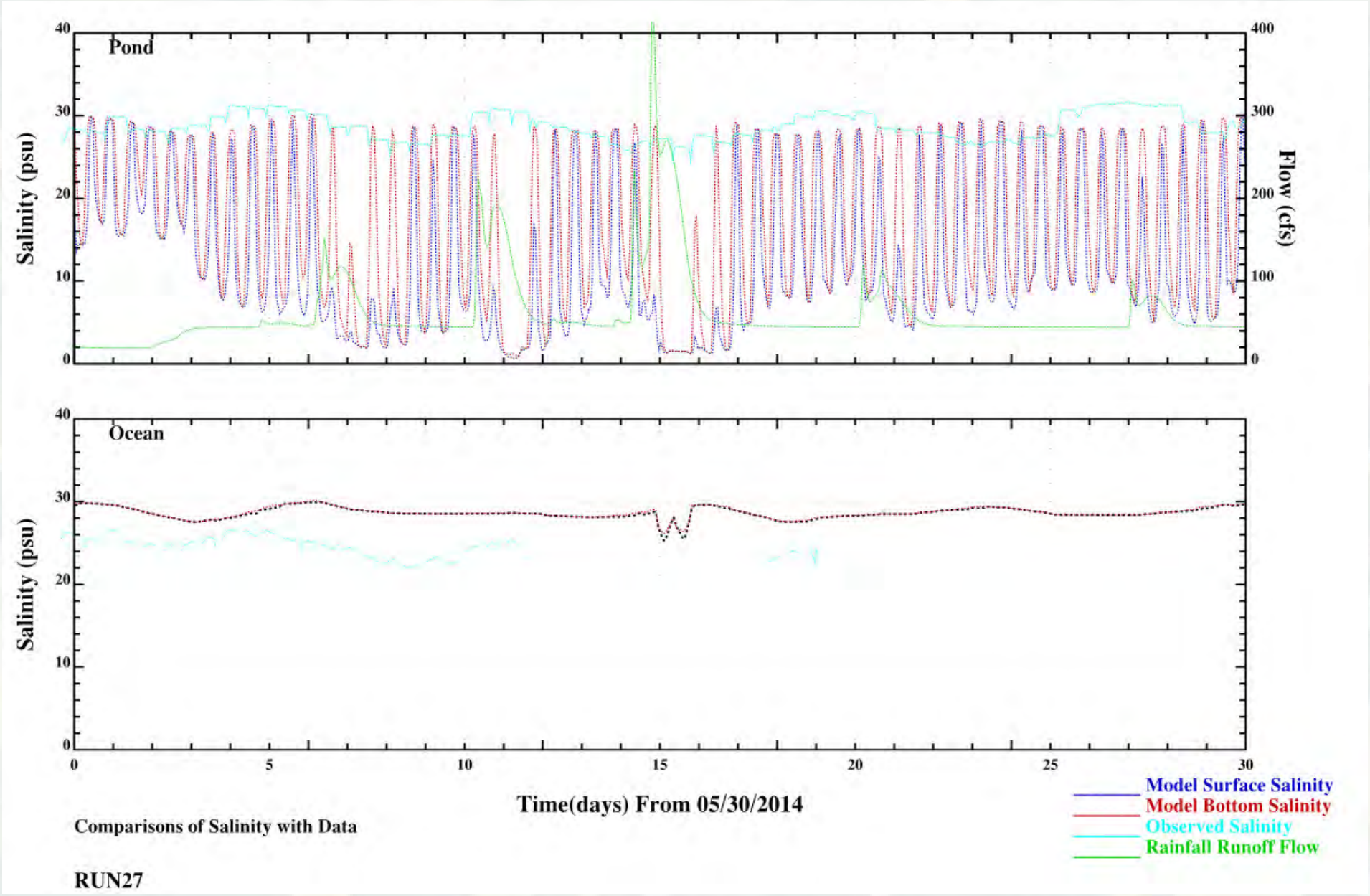
Comparisons of Elevation with Data

RUN27



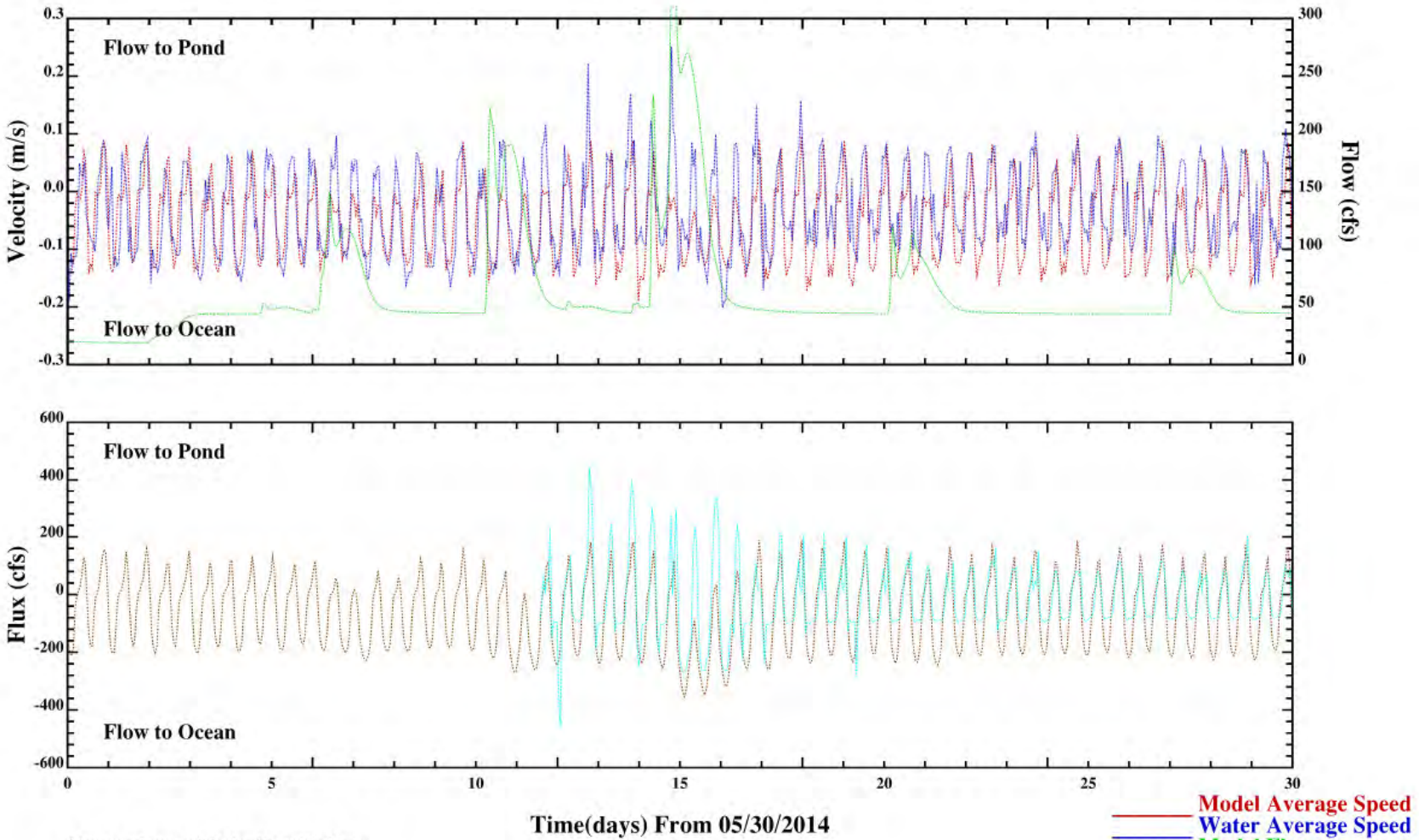
Comparisons of Temperature with Data

RUN27



Comparisons of Salinity with Data

RUN27



Comparisons of Velocity with Data

RUN27

38x99 Repeat RUN20 (SENS8) with combined Mommouth and JFK met data

Plot Location: /holly1/usac0010/HYDRO/PLOTS/VELO
Run Location: RUNS//holly1/usac0010/HYDRO/RUNS/RUN27
DATE: 9/12/2014 TIME: 10: 6: 0

Bathymetric Survey Results

SURVEY STATISTICS

REACH: A
Size of Lake: 1.5 Acres
Volume of Sediment: 6,067 cubic yards

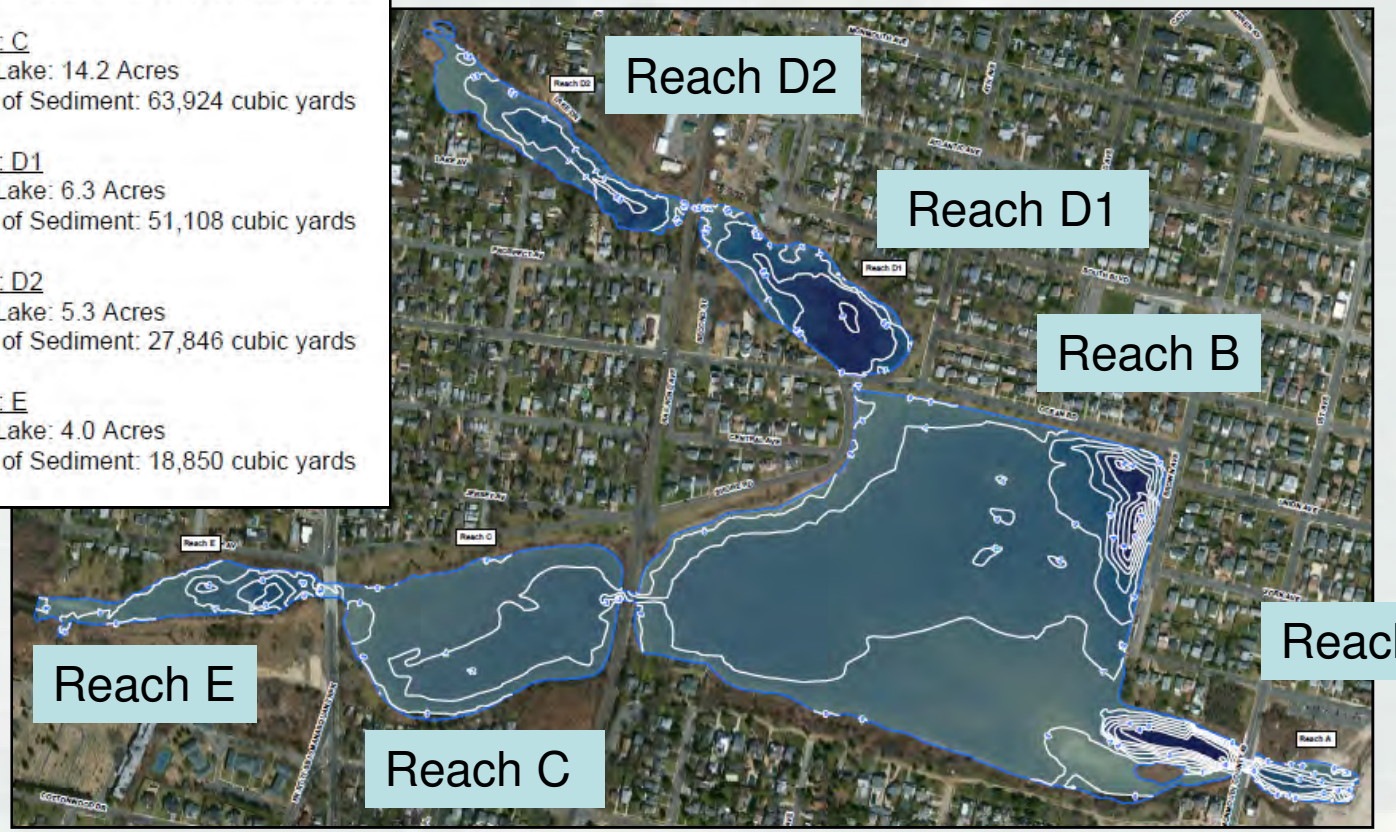
REACH: B
Size of Lake: 57.7 Acres
Volume of Sediment: 407,453 cubic yards

REACH: C
Size of Lake: 14.2 Acres
Volume of Sediment: 63,924 cubic yards

REACH: D1
Size of Lake: 6.3 Acres
Volume of Sediment: 51,108 cubic yards

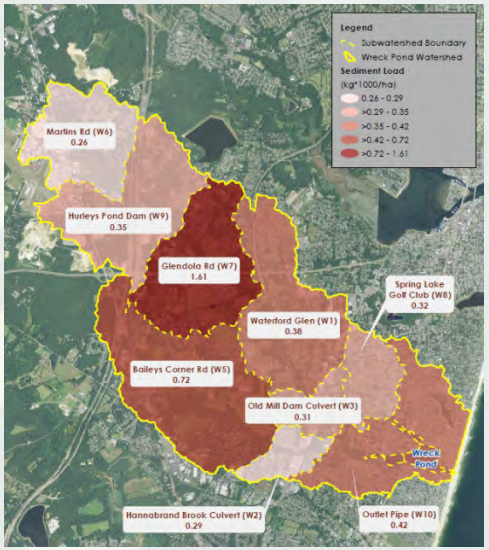
REACH: D2
Size of Lake: 5.3 Acres
Volume of Sediment: 27,846 cubic yards

REACH: E
Size of Lake: 4.0 Acres
Volume of Sediment: 18,850 cubic yards



Sediment from Watershed

Wreck Pond - Annual Pollutant Loading					
Subwatershed	Area (ac)	Total Sediment	Streambank Sediment	Total Nitrogen	Total Phosphorus
		(lbsx1000)	(lbsx1000)	(lbs)	(lbs)
1	1,181	400	136	6,948	507
2	262	67	26	1,313	117
3	296	82	23	1,773	158
5	1,707	1,093	235	10,962	912
6	815	188	56	3,927	291
7	1,104	1,583	202	9,689	1,144
8	412	118	29	2,485	226
9	1,156	364	172	5,808	463
10	1,030	390	103	7,102	683
Aggregate	7,958	5,853	2,919	50,063	4,426



Upcoming Work

- Late 2014: NEPA Scoping meeting
- Summer 2015: Public release of draft feasibility report and environmental assessment (NEPA document)
- Mid-2017: USACE approval of plan
- USACE Project Manager: Jen Thalhauser

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