

Nassau County North Shore Bays Surface Water Modeling

- Objectives: Tidal and residual circulation, flushing and residence time
- Model used is 3D EPA hydrodynamic and water quality model EFDC
- Model grids developed with grid generator associated with EFDC using NYDEC coastline shape file and National Ocean Service (NOS) bathymetry data
- Model forced by water level and T,S on open boundaries as well as surface and ground water inflows

Model Grids Developed For Each Bay

Shading Indicates Grid Quality

Legend

- Grid5
- LongIsland_Coast_Revised_FWS
- Grid4
- Spline4
- Grid7
- Spline7
- Spline6
- Spline5
- Spline3
- Grid6
- Spline2
- Spline1



7.157 Kilometers

Title

Legend

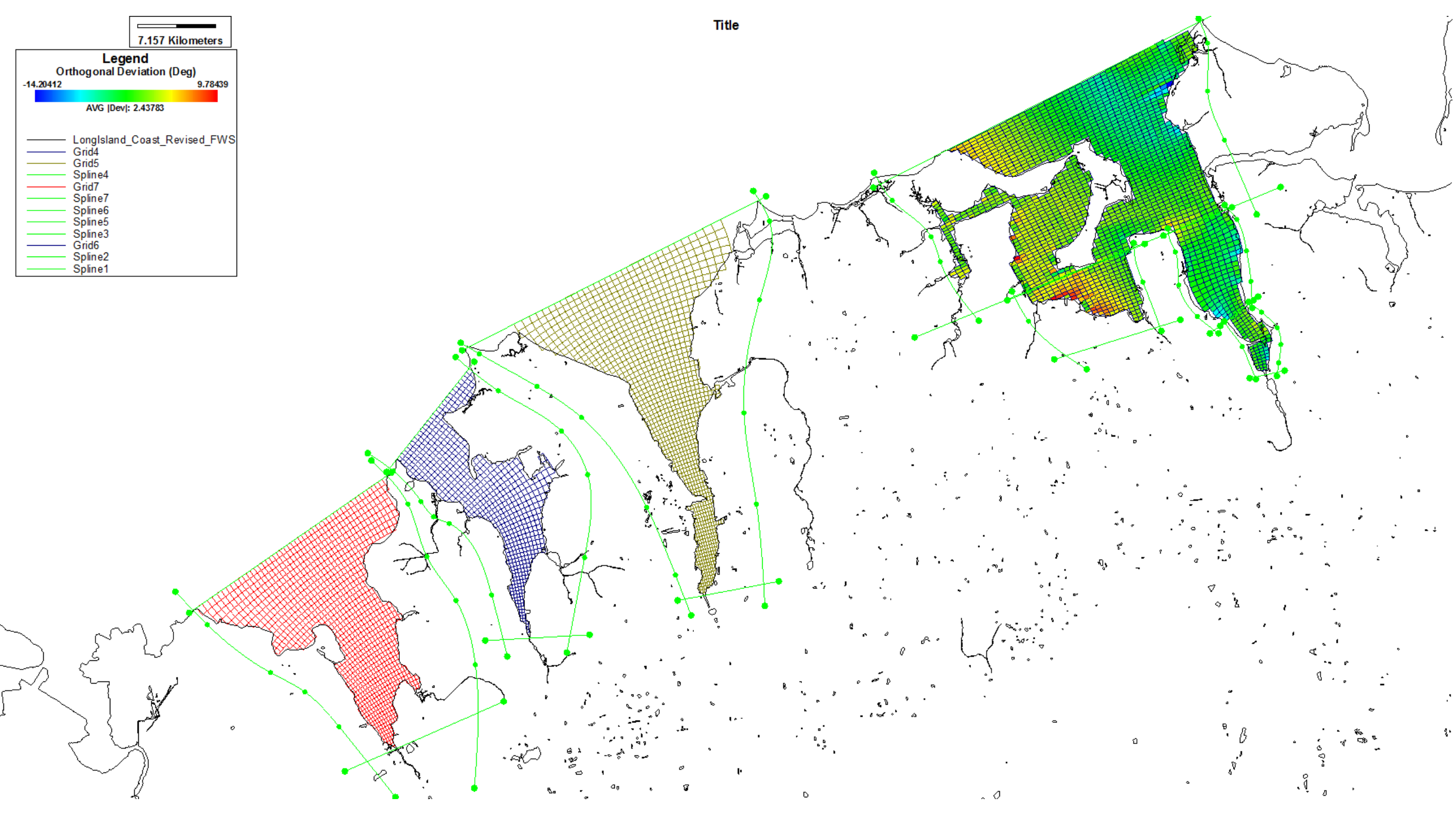
Orthogonal Deviation (Deg)

-14.20412

9.78439

AVG |Dev|: 2.43783

- LongIsland-Coast-Revised-FWS
- Grid4
- Grid5
- Spline4
- Grid7
- Spline7
- Spline6
- Spline5
- Spline3
- Grid6
- Spline2
- Spline1



Title

7.157 Kilometers

Legend

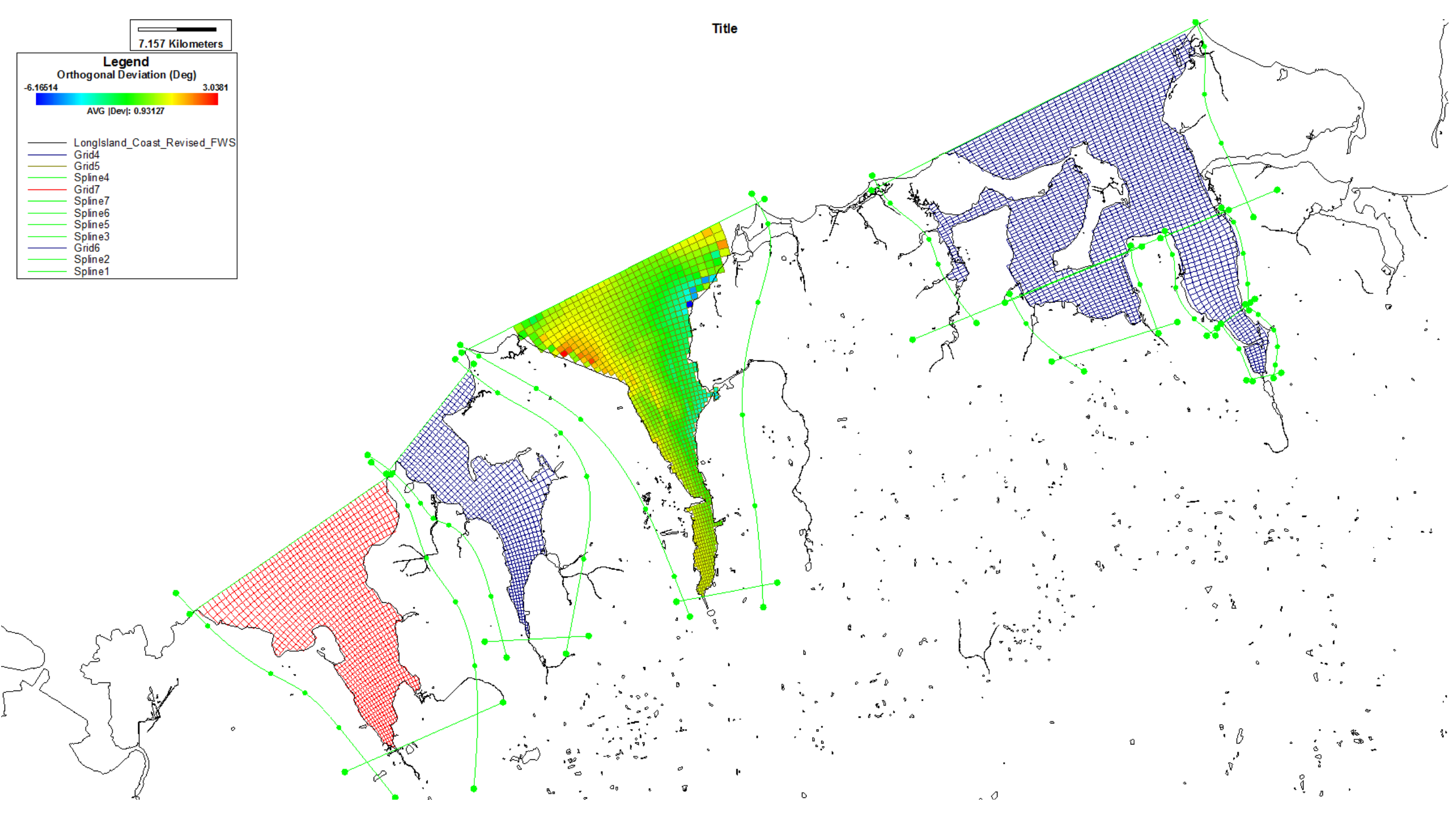
Orthogonal Deviation (Deg)

-6.16514

3.0381

AVG |Dev|: 0.93127

- LongIsland_Coast_Revised_FWS
- Grid4
- Grid5
- Spline4
- Grid7
- Spline7
- Spline6
- Spline5
- Spline3
- Grid6
- Spline2
- Spline1



Title

7.157 Kilometers

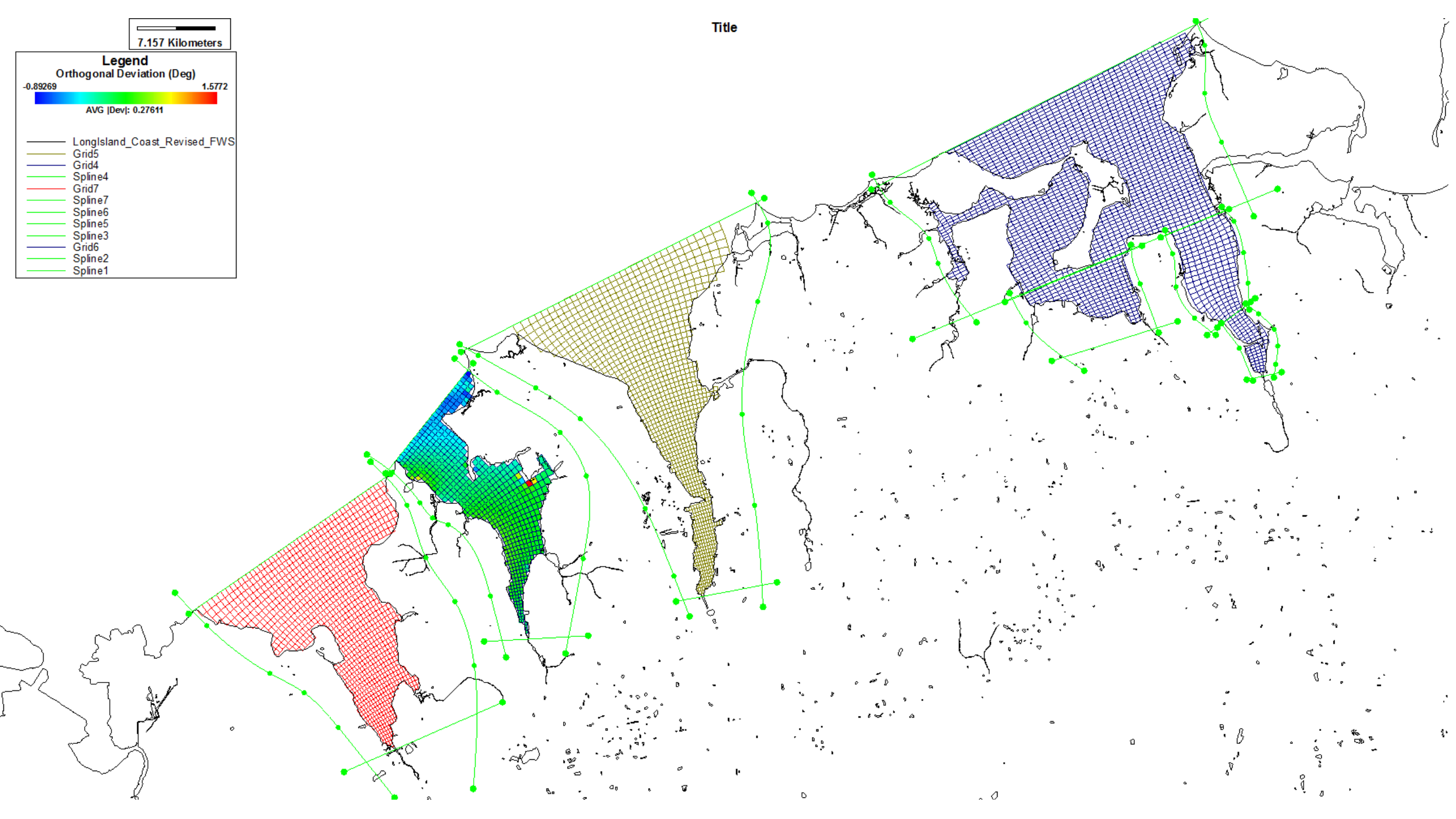
Legend

Orthogonal Deviation (Deg)

-0.89269 1.5772

AVG |Dev|: 0.27611

- LongIsland_Coast_Revised_FWS
- Grid5
- Grid4
- Spline4
- Grid7
- Spline7
- Spline6
- Spline5
- Spline3
- Grid6
- Spline2
- Spline1



Title

7.157 Kilometers

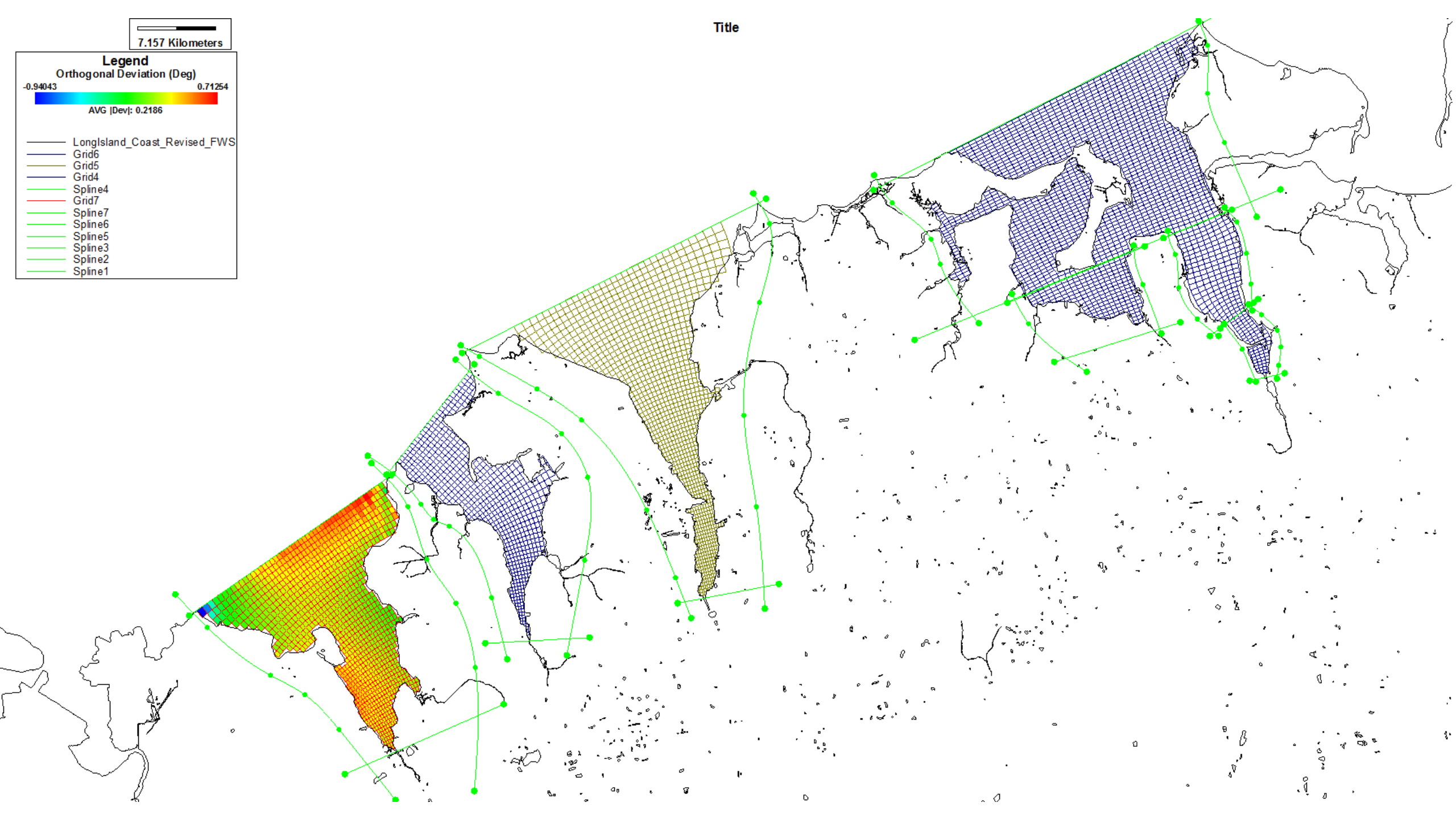
Legend

Orthogonal Deviation (Deg)

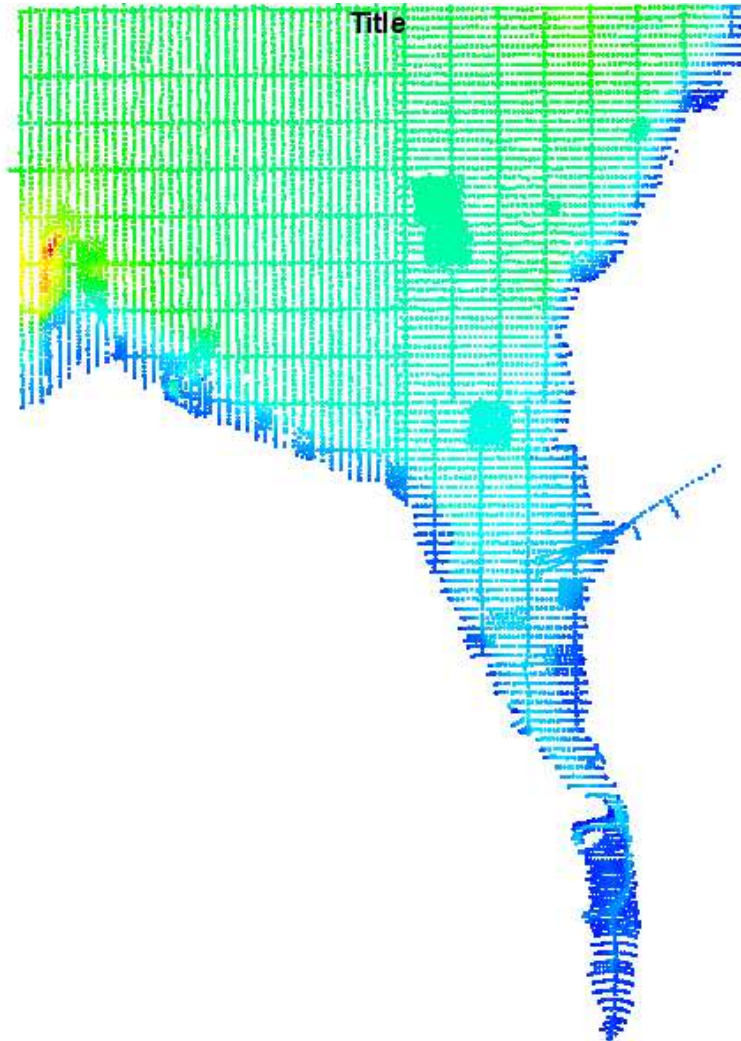
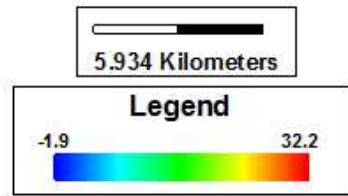
-0.94043 0.71254

AVG |Dev|: 0.2186

- LongIsland_Coast_Revised_FWS
- Grid6
- Grid5
- Grid4
- Spline4
- Grid7
- Spline7
- Spline6
- Spline5
- Spline3
- Spline2
- Spline1



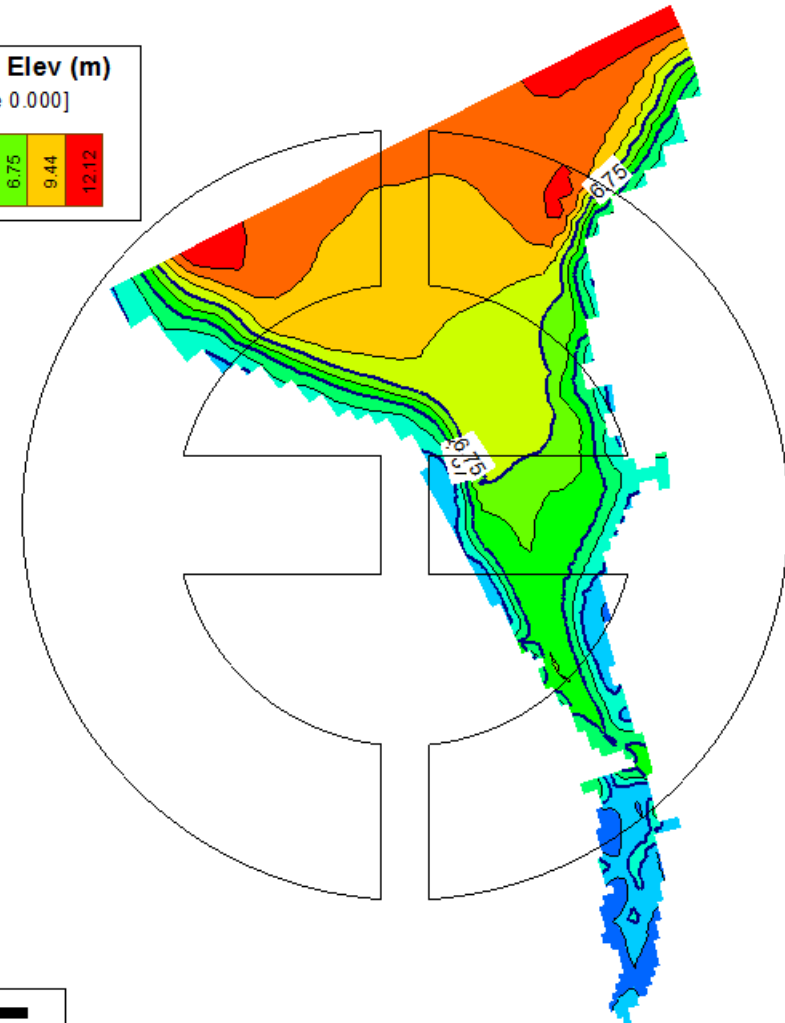
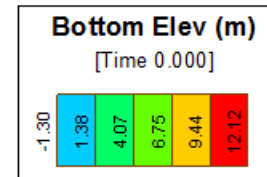
Hempstead Bay NOS Bathymetry Used For Model Grid



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Grid Statistics Indicating Resolution

Oyster Bay

Valid Cell Records:	1844
Valid Cell Area-ha:	3213.75(m ²)
Valid Cell Min DX:	65.4(m)
Valid Cell Avg DX:	100.25(m)
Valid Cell Max DX:	158.27(m)
Valid Cell Min DY:	98.98(m)
Valid Cell Avg DY:	173.65(m)
Valid Cell Max DY:	224.82(m)

Hempstead Bay

Valid Cell Records:	1056
Valid Cell Area-ha:	1901.47(m ²)
Valid Cell Min DX:	83.82(m)
Valid Cell Avg DX:	133.33(m)
Valid Cell Max DX:	251.04(m)
Valid Cell Min DY:	56.66(m)
Valid Cell Avg DY:	124.82(m)
Valid Cell Max DY:	292.66(m)

Manhasset Bay

Valid Cell Records:	578
Valid Cell Area-ha:	880.04(m ²)
Valid Cell Min DX:	80.27(m)
Valid Cell Avg DX:	130.92(m)
Valid Cell Max DX:	206.46(m)
Valid Cell Min DY:	68.04(m)
Valid Cell Avg DY:	113.62(m)
Valid Cell Max DY:	176.73(m)

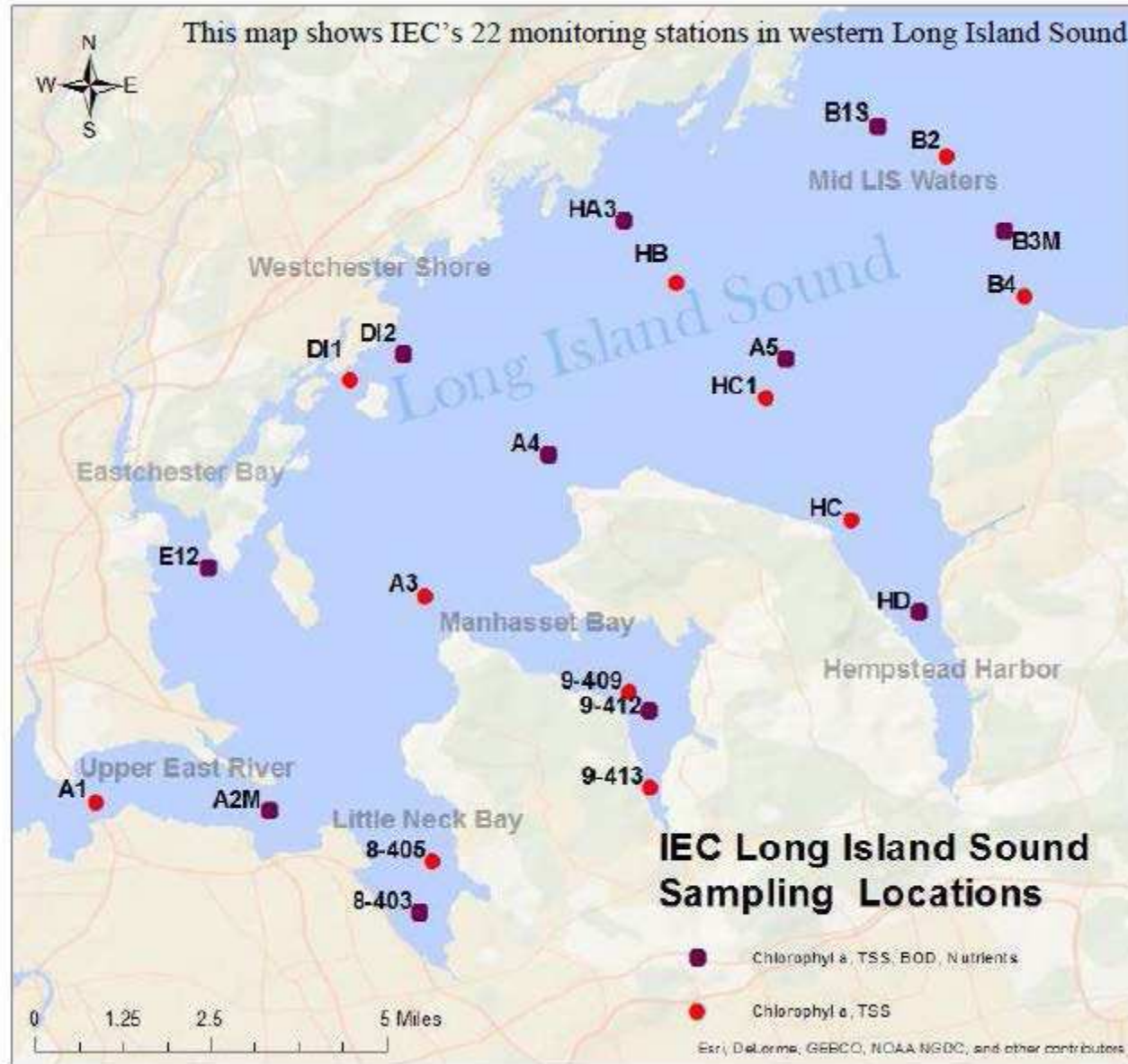
Little Neck Bay

Valid Cell Records:	1031
Valid Cell Area-ha:	1659.63(m ²)
Valid Cell Min DX:	95.28(m)
Valid Cell Avg DX:	144.98(m)
Valid Cell Max DX:	255.02(m)
Valid Cell Min DY:	70.23(m)
Valid Cell Avg DY:	107.76(m)
Valid Cell Max DY:	184.49(m)

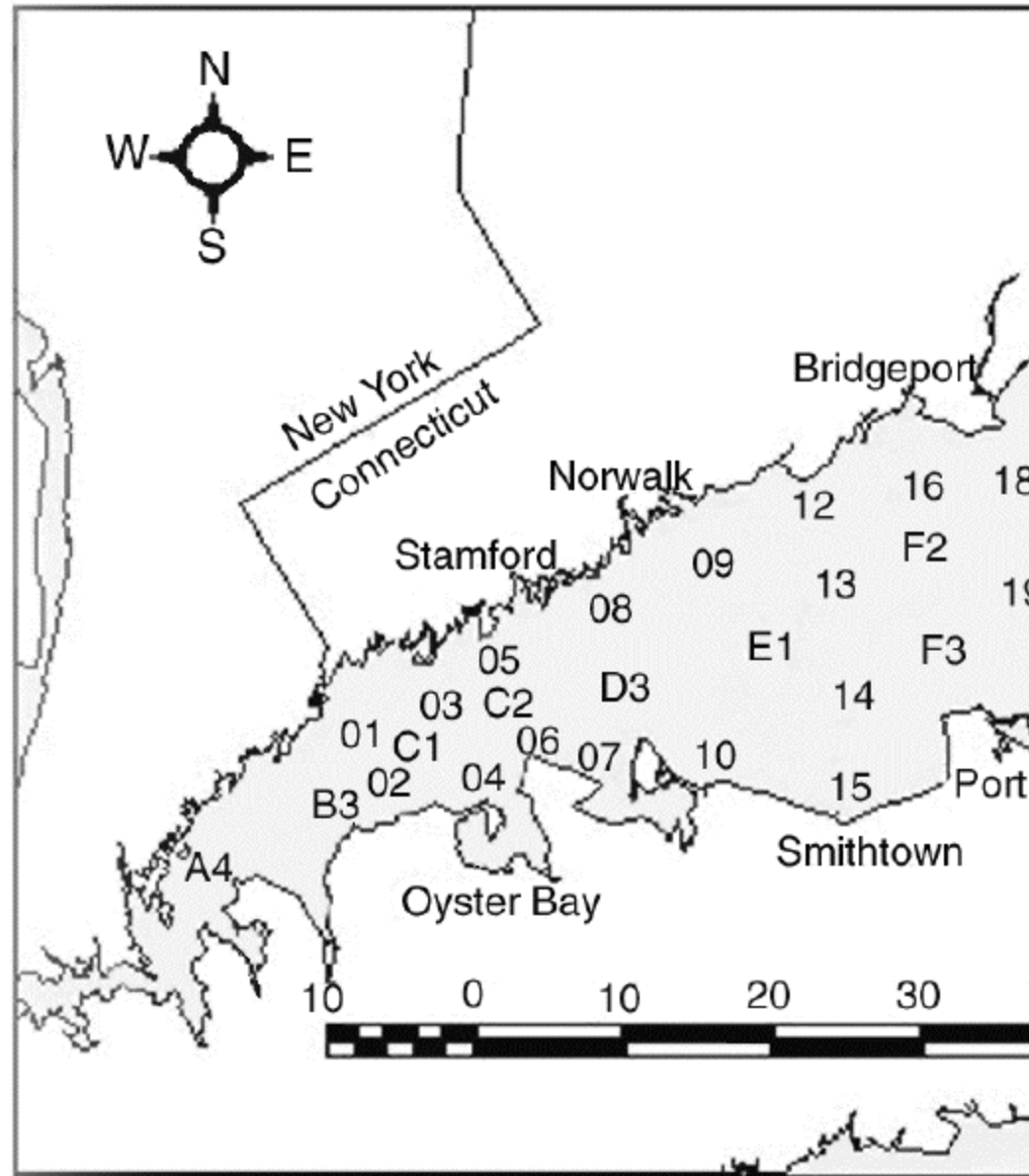
Data Available for Model Development

- IEC, CTDEEP, NYDEP, NOS, USGS
- Stevens archived Long Island Sound reanalysis data
<http://colossus.dl.stevens-tech.edu/thredds/catalog.html>

IEC



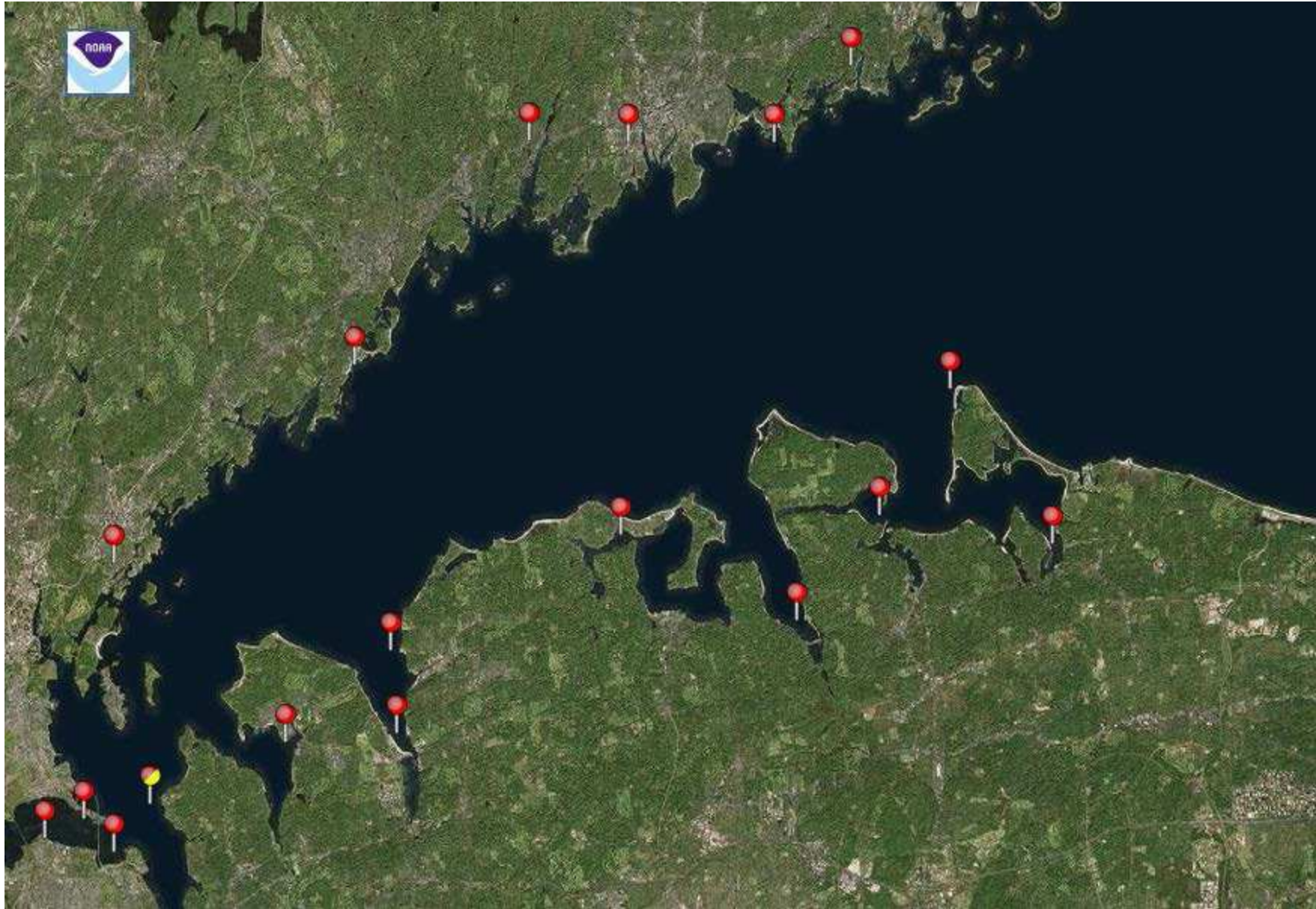
CTDEEP



NYDEP



NOS



USGS


USGS
 science for a changing world



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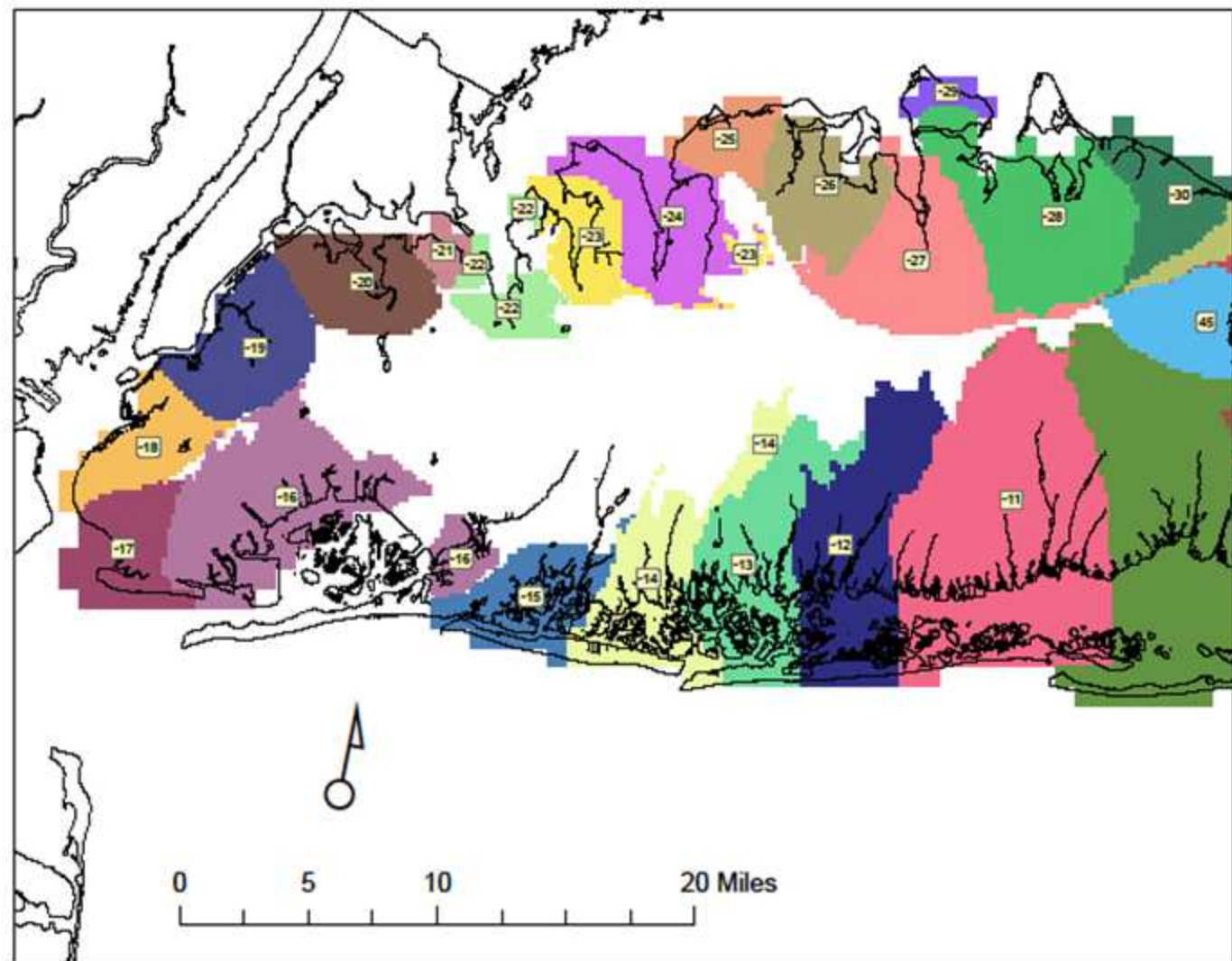
National Water Information System: Mapper

Help
 Info



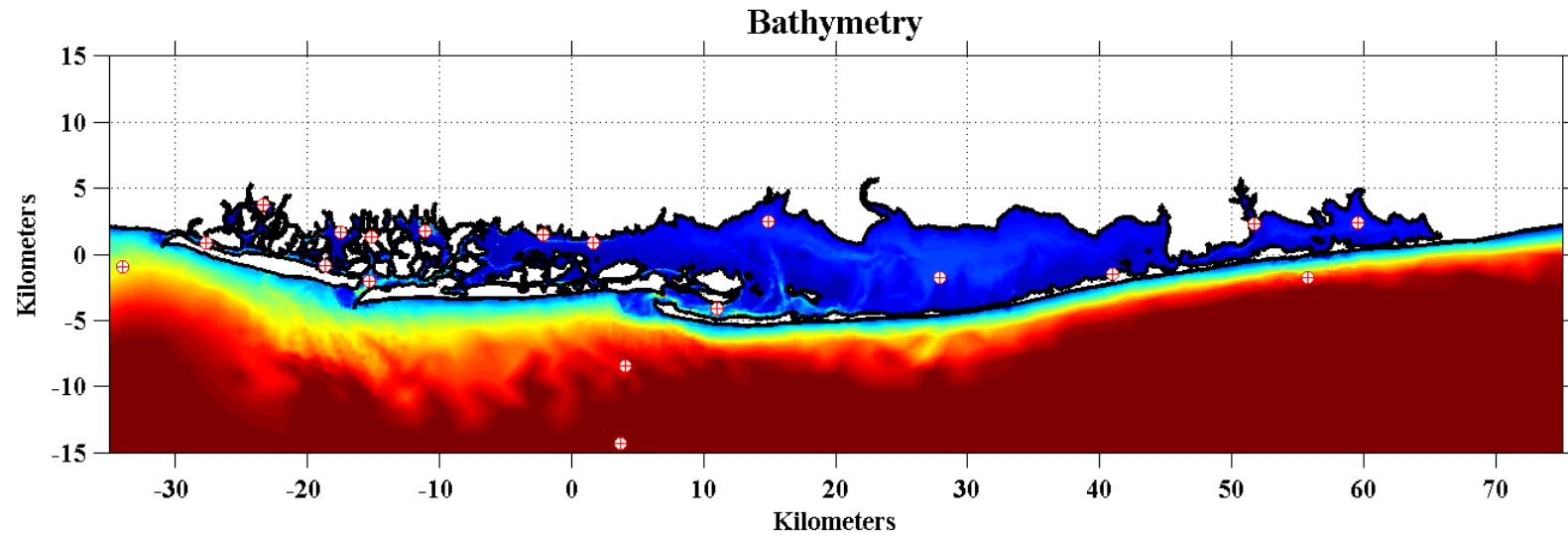
The screenshot displays the USGS National Water Information System (NWIS) Mapper interface. At the top, there is a header with the USGS logo and tagline 'science for a changing world' on the left, a background image of a river scene in the center, and navigation links 'USGS Home', 'Contact USGS', and 'Search USGS' on the right. Below the header is a blue bar with the title 'National Water Information System: Mapper' and 'Help' and 'Info' buttons. The main area shows a map of the New York City region, including Long Island Sound, the Hudson River, and various urban areas like New Rochelle, Port Washington, and Syosset. The map is overlaid with a network of roads and water features. A scale bar at the bottom left indicates distances in miles (0, 2, 4). A small inset map at the bottom right shows the location of the main map area within the state of New York.

USGS

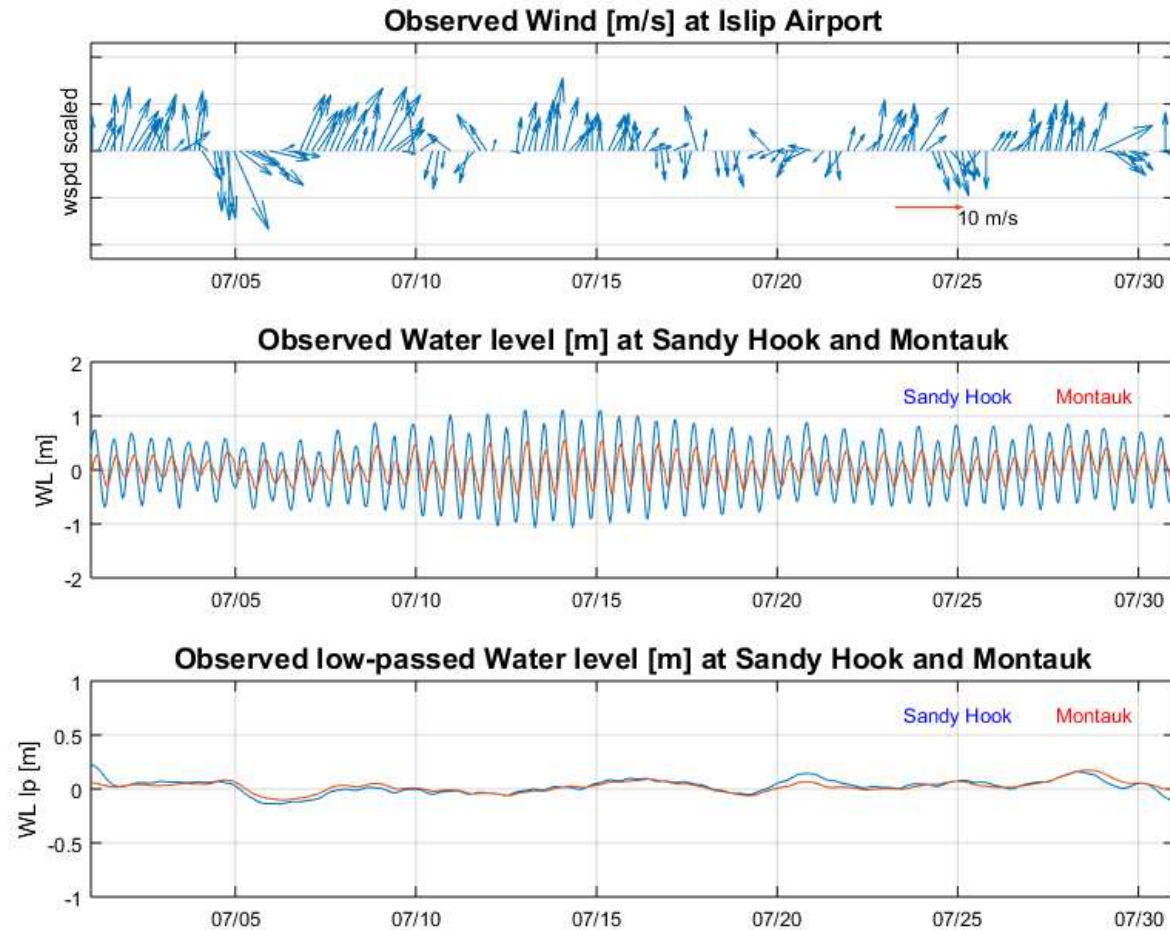


Great South Bay Flushing Times

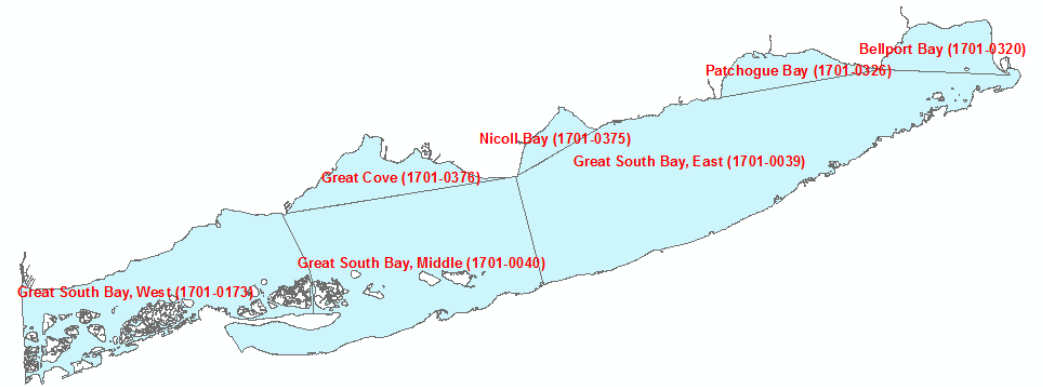
FVCOM Grid for Long Island's South Shore



Forcing July 2014

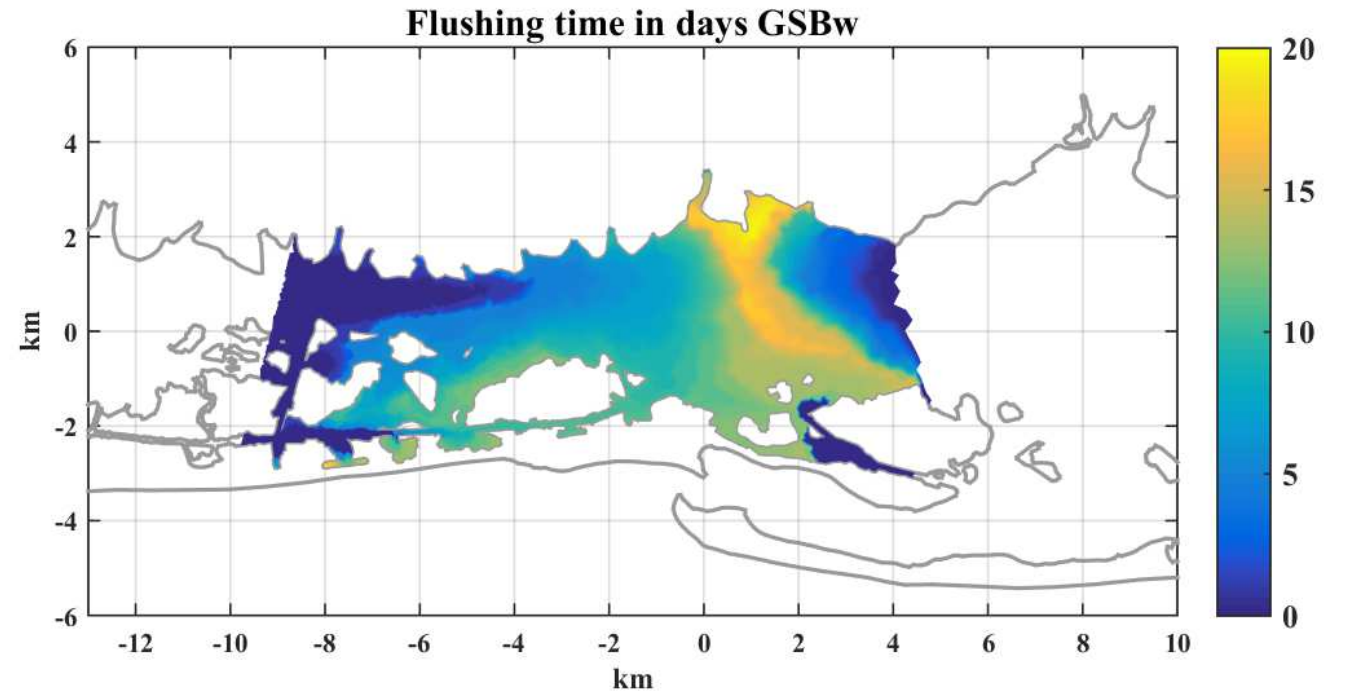
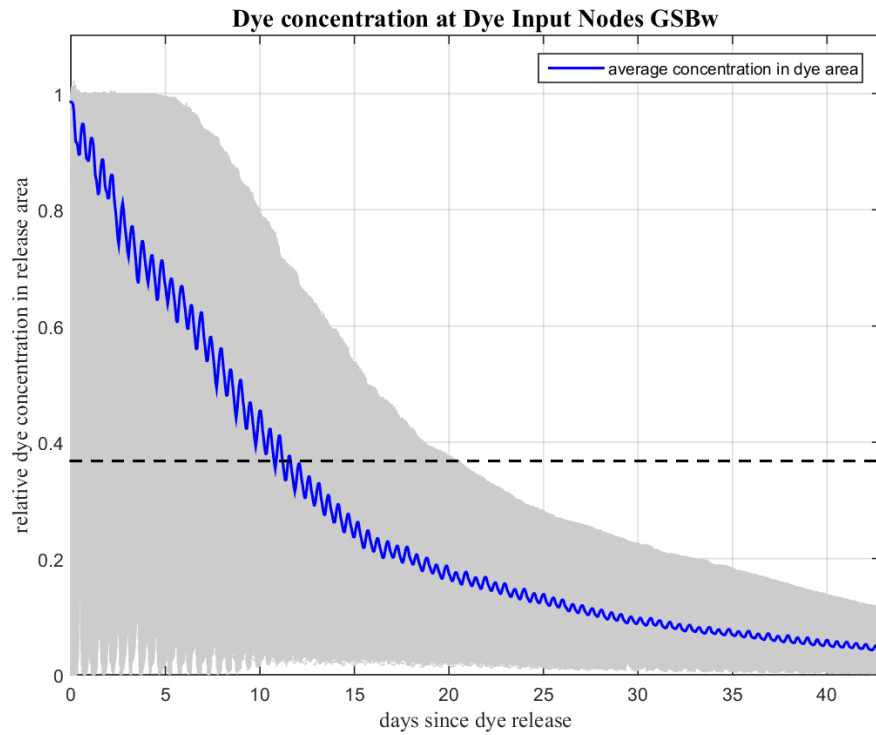


Overview Results

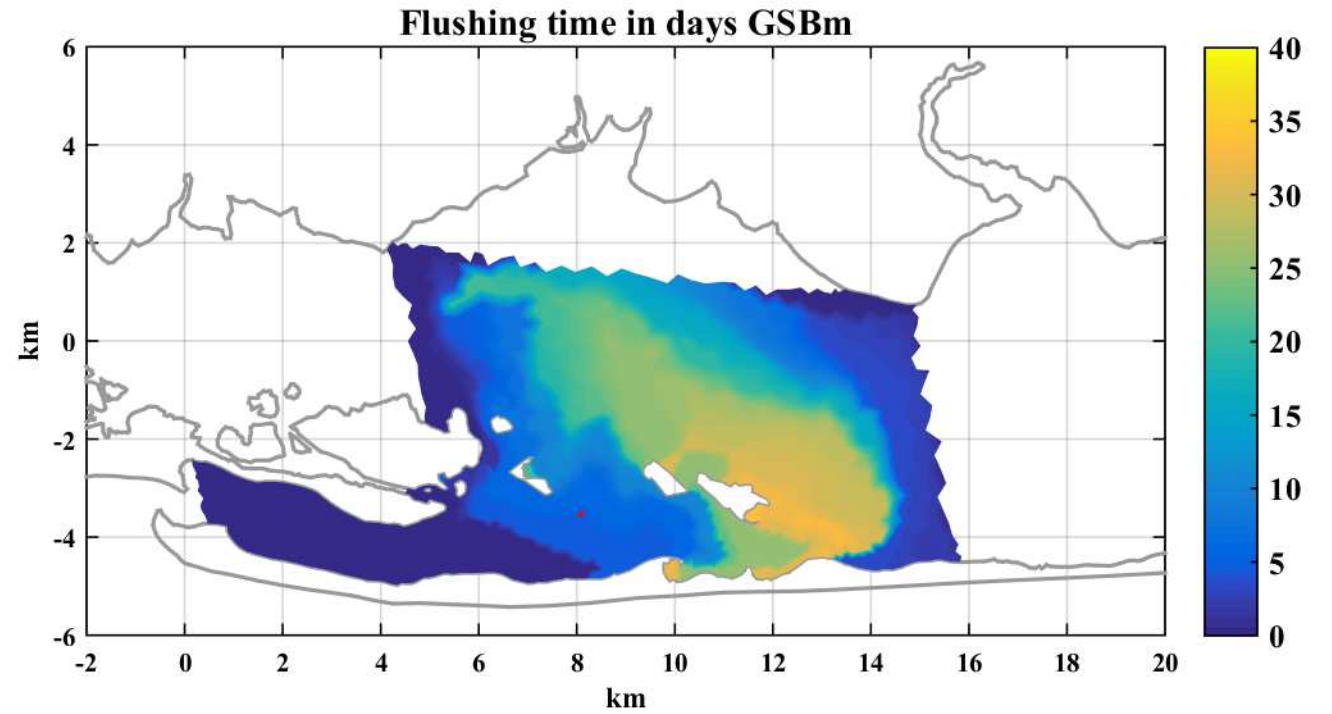
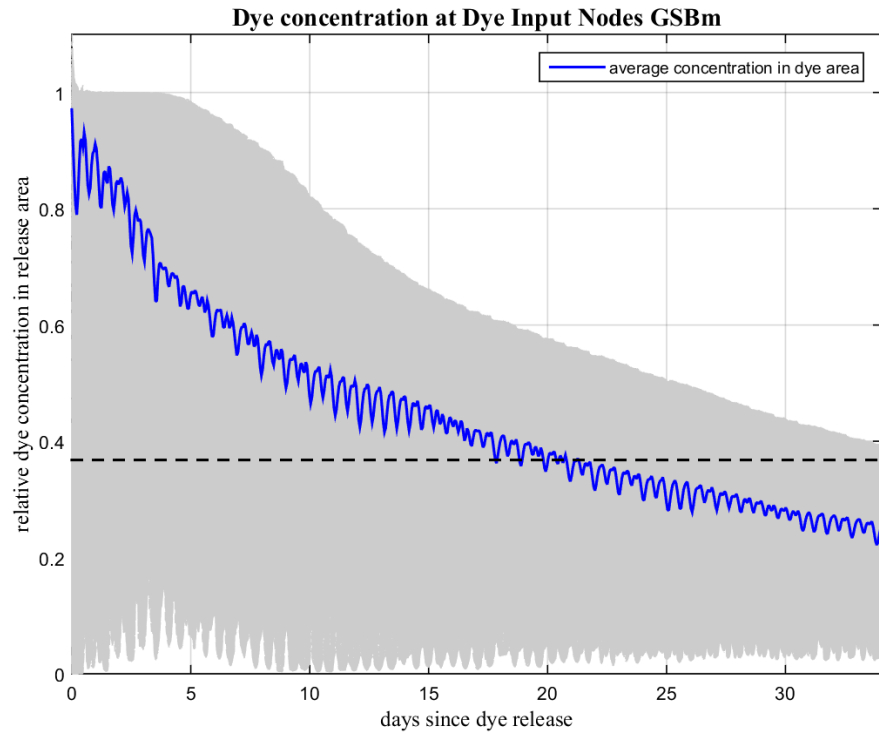


Name	PWL Number	No of dyed nodes	Dyed Area [km ²]	Mean Volume [m3*10 ⁶]	average flushing time [days]
GSB West	0173	8726	45	71	12
Great Cove	0376	746	14	28	6
GSB Mid	0040	3518	69	169	20
Nicoll Bay	0375	217	4	8	3
GSB East	0039	5526	106	226	53
Patchogue Bay	0326	353	8	15	4
Bellport Bay	0320	972	10	16	4

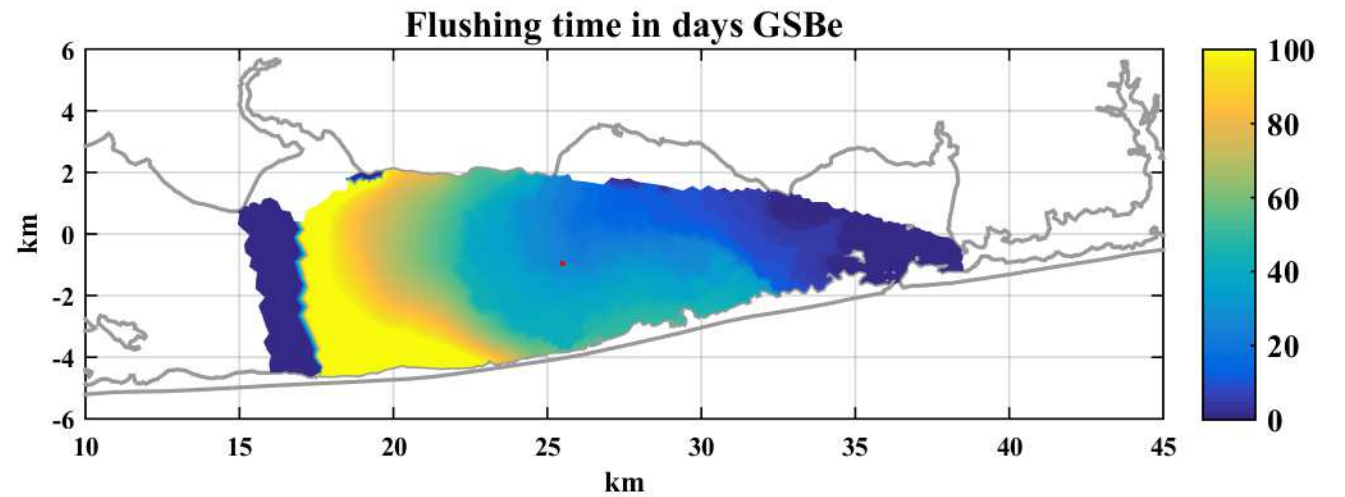
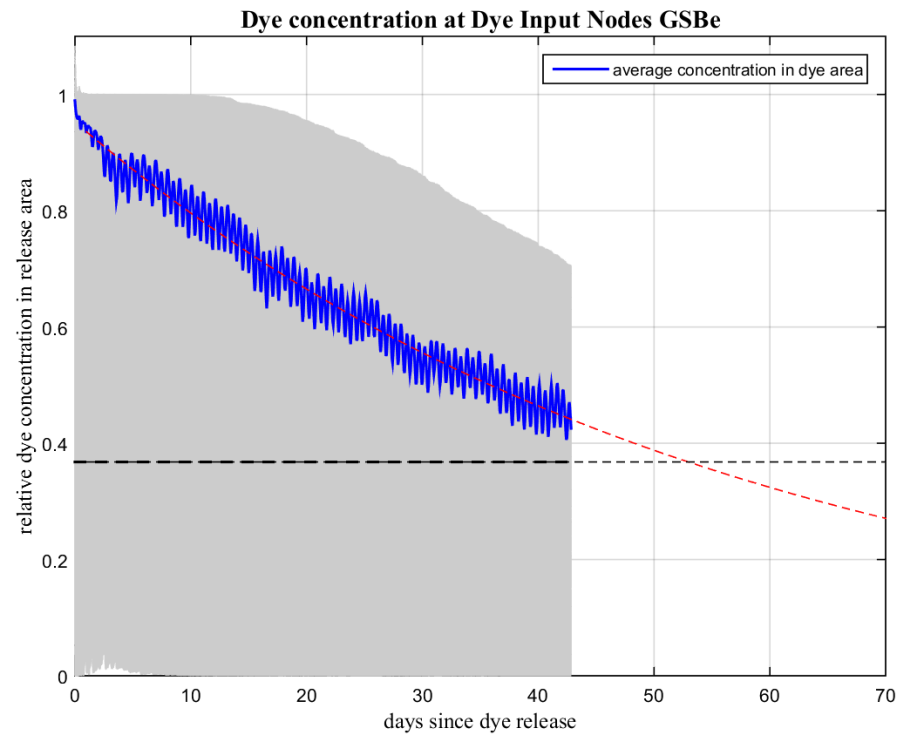
Great South Bay West (1701-0173)



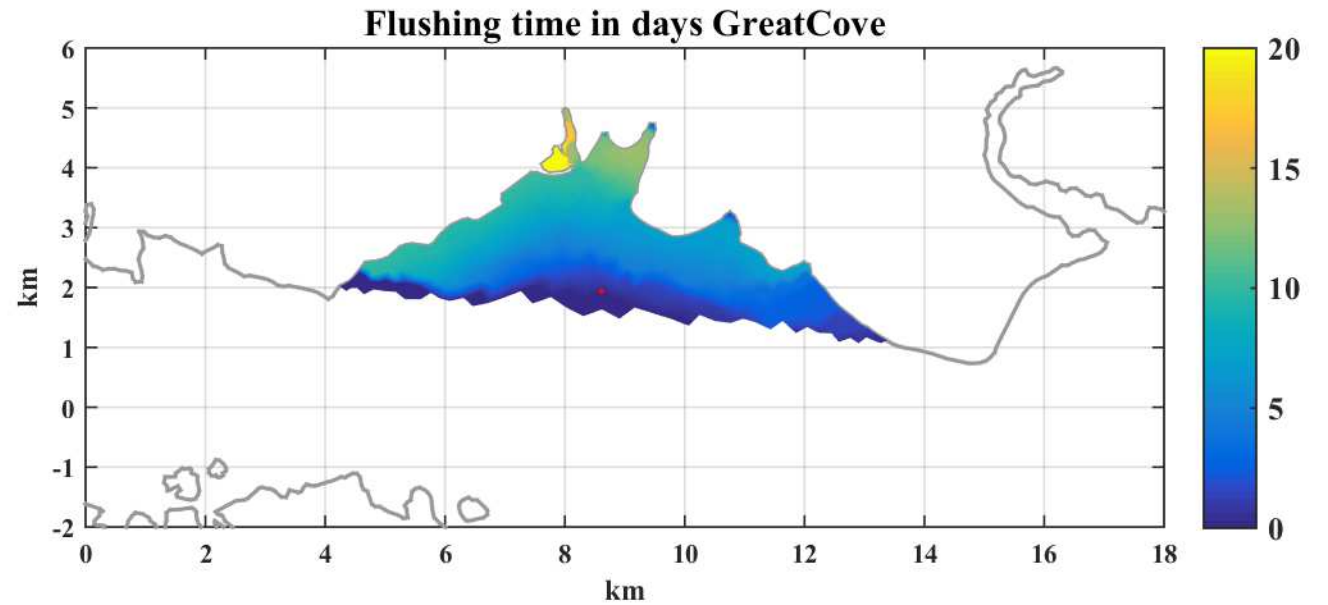
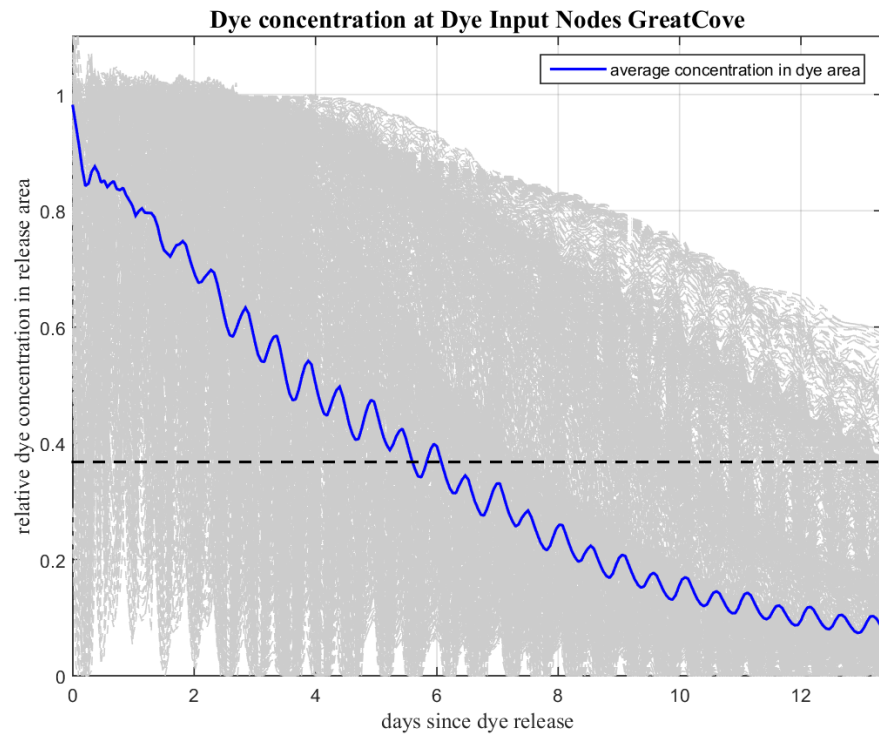
Great South Bay Middle (1701-0040)



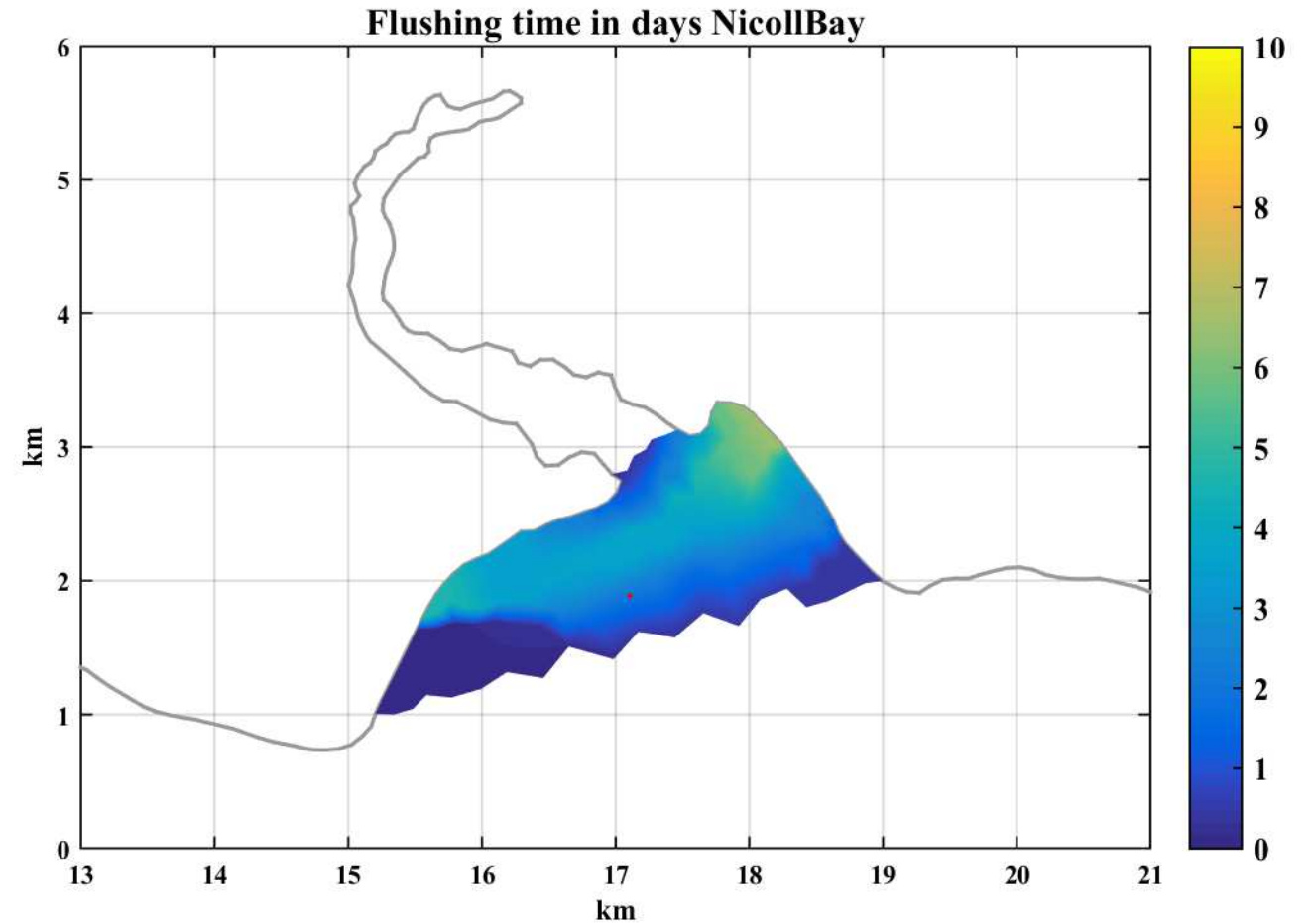
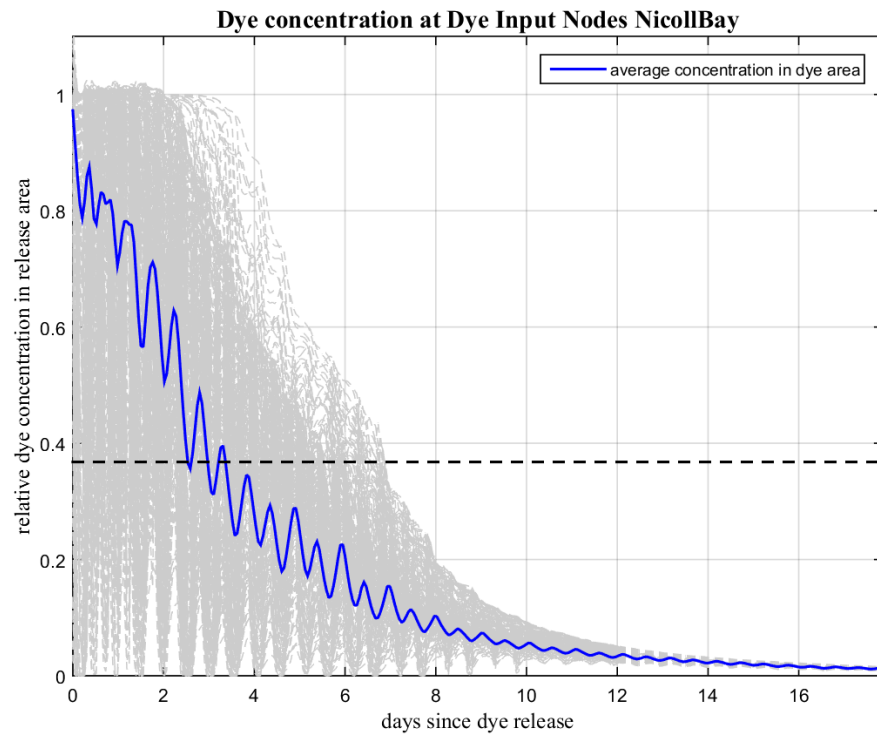
Great South Bay East (1701-0039)



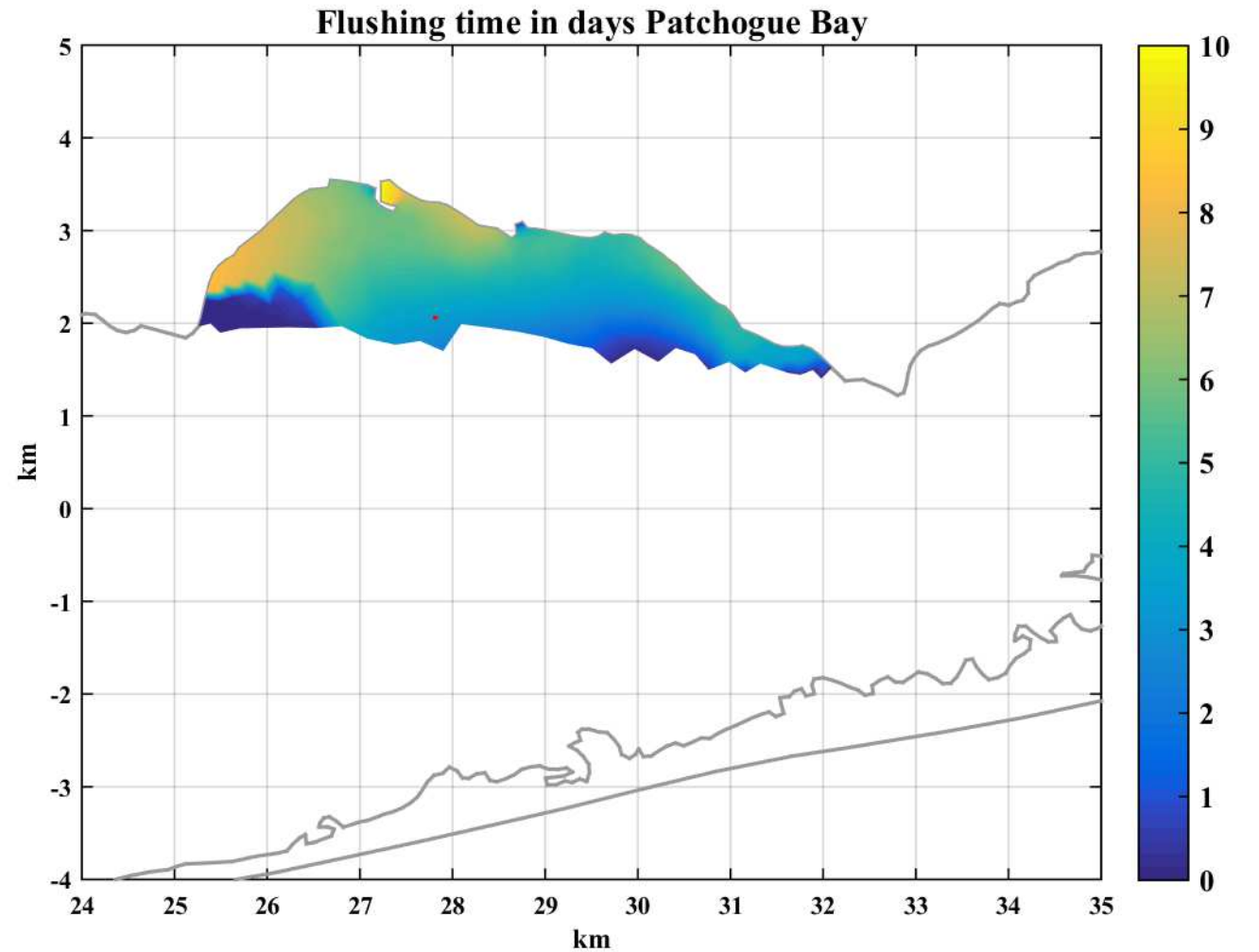
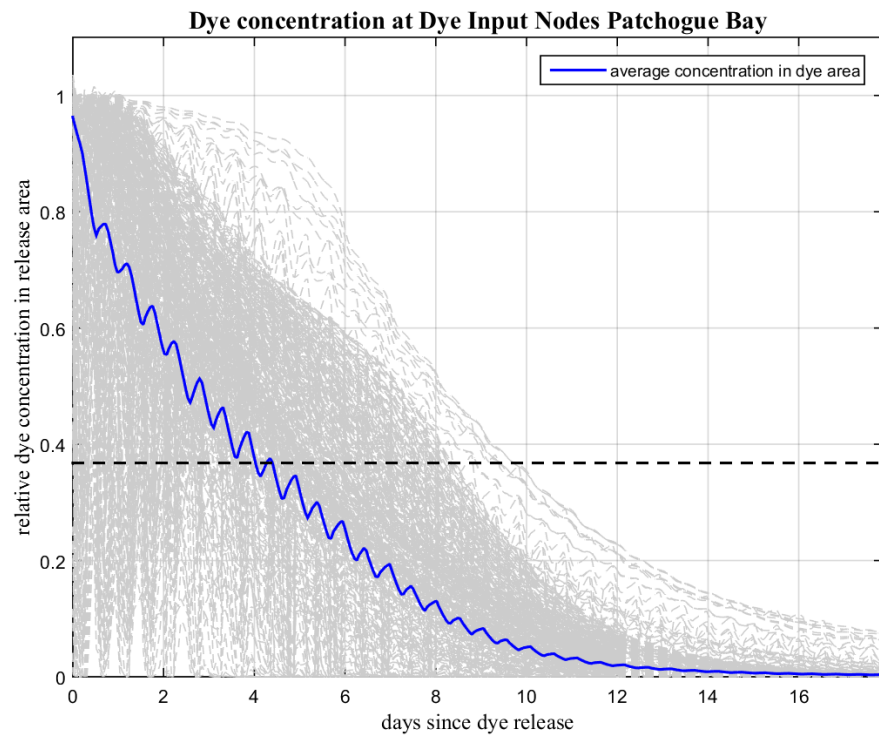
Great Cove (1701-0376)



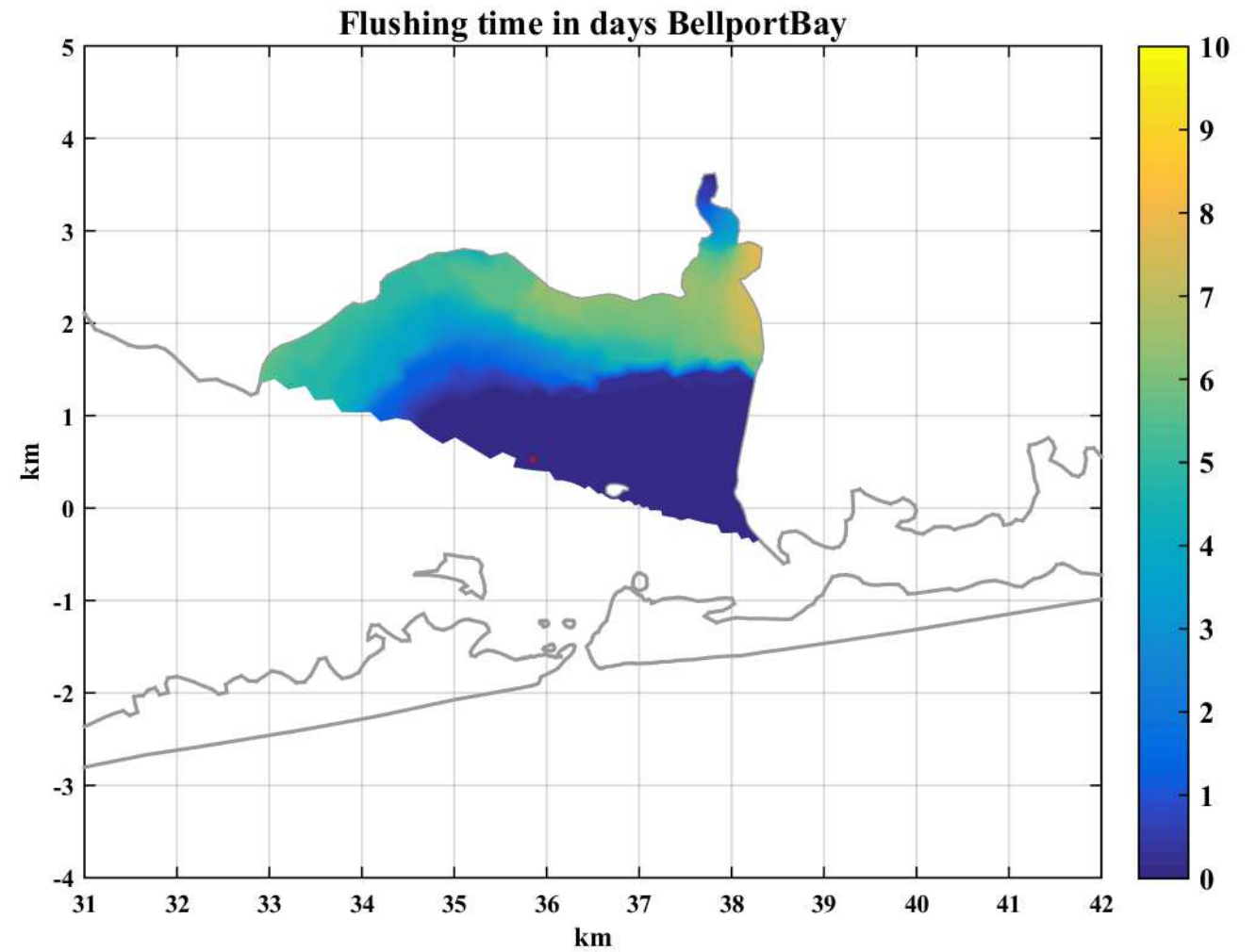
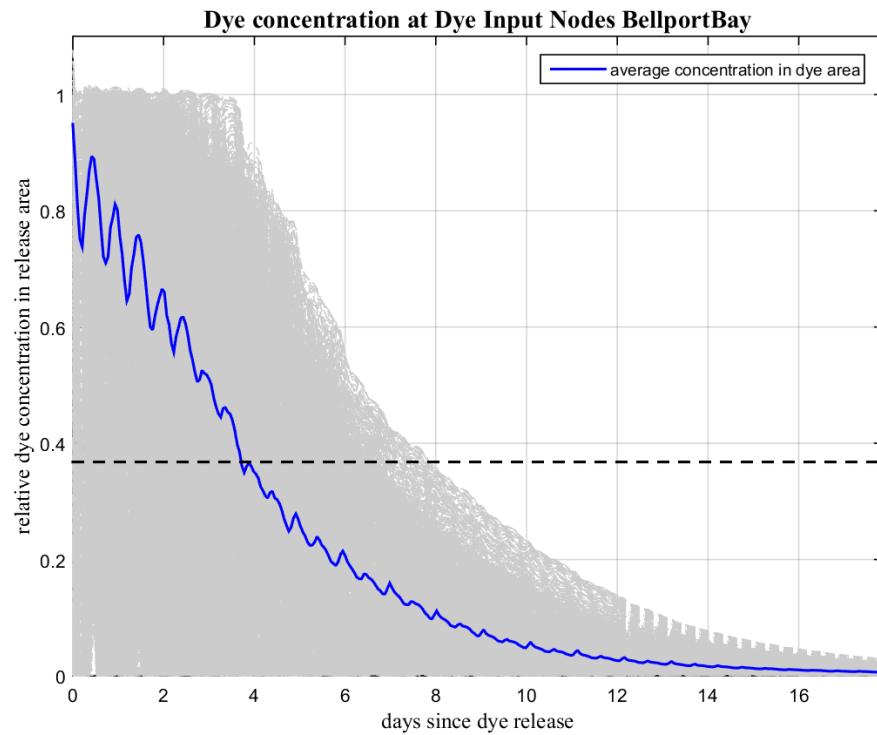
Nicoll Bay (1701-0375)



Patchogue Bay (1701-0326)



Bellport Bay (1701-0320)



Hempstead Bay, West

