Present and Historic Hydrodynamics and Sediment Dynamics of Jamaica Bay, NY

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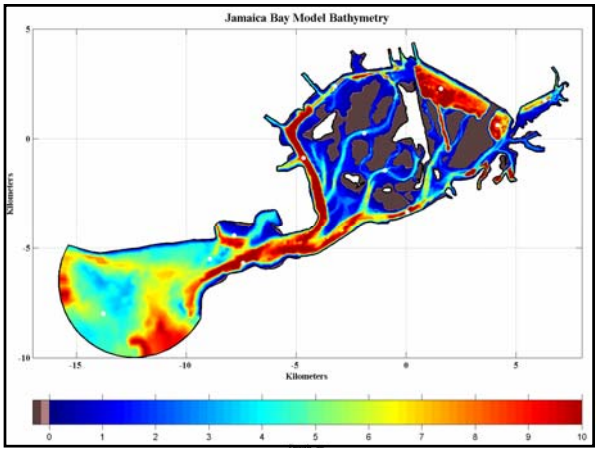
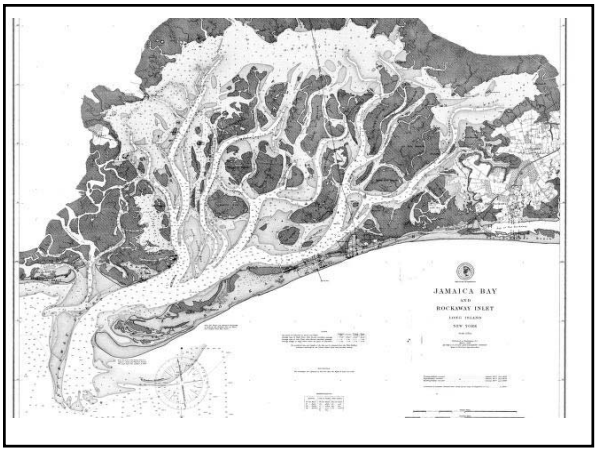
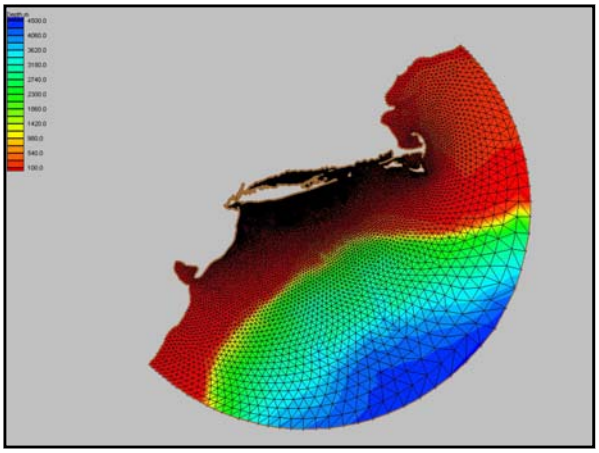
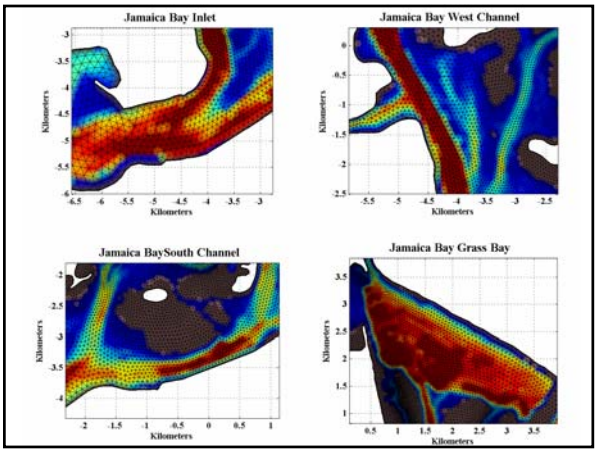
OBJECTIVES

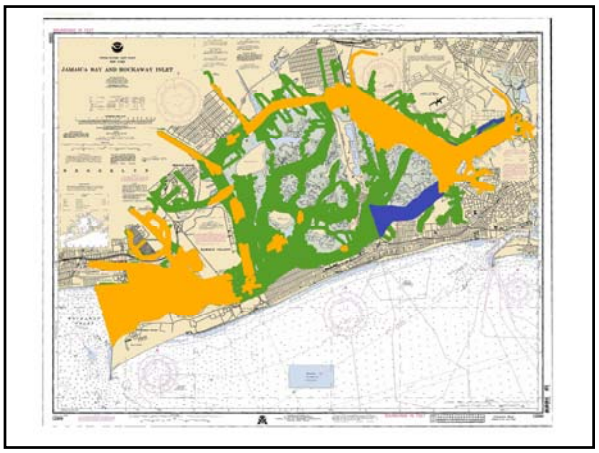
- **Determine the system's hydrodynamics relative to pre- and post-anthropogenic alterations.**
- **Develop a high-resolution 3D hydrodynamic model for Jamaica Bay for tidal and estuarine circulation and which can describe the transport of both coarse grain and fine grain suspended sediment.**
- **Quantify the changes in tidal hydrodynamics (tidal range, tidal currents, tidal asymmetry), residual estuarine circulation, sediment transport patterns, and basin residence time patterns associated with historical changes in Jamaica Bay bathymetry and morphology.**
- **Historical changes in basin bathymetry and morphology include changes in inlet channel length and cross section. They include also changes in bathymetry and morphology within the interior of the basin and very significant changes in the extent of shoreline hardening.**
- **The hydrodynamic response to these changes includes changes in tidal asymmetry with associated changes in sediment transport patterns.**

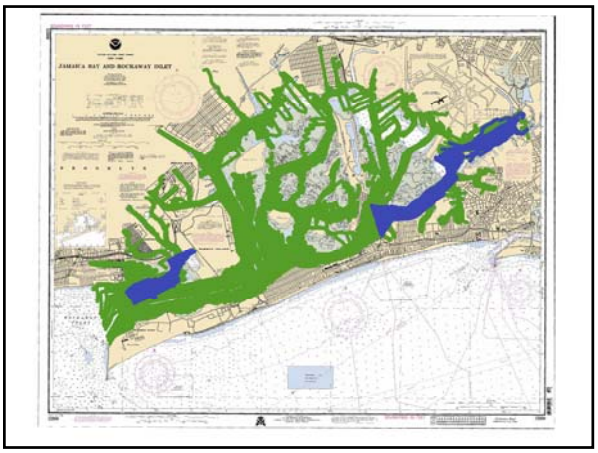


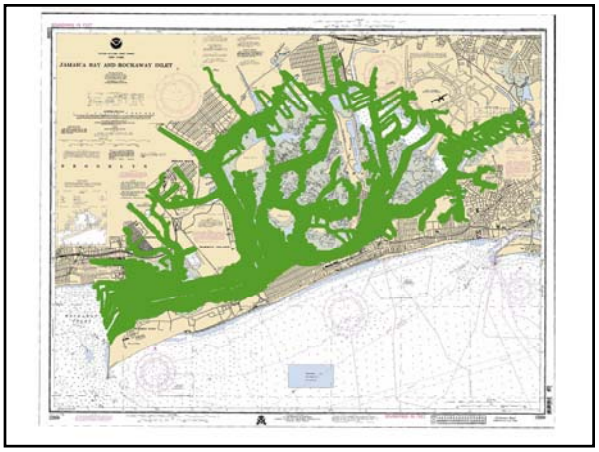


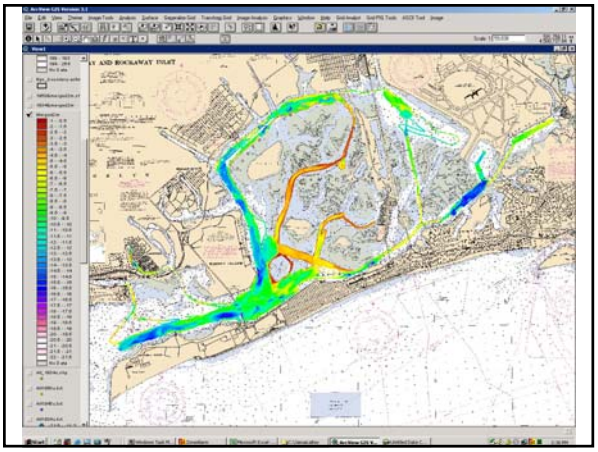


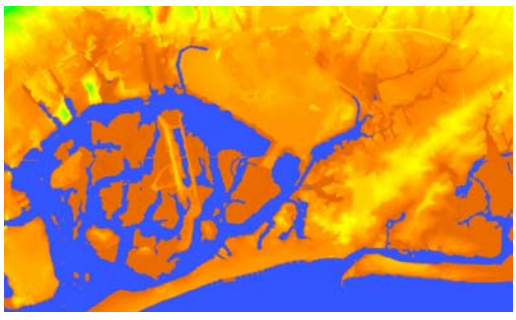


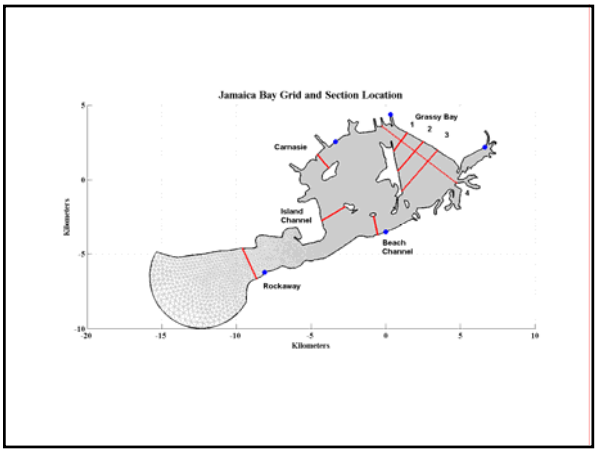


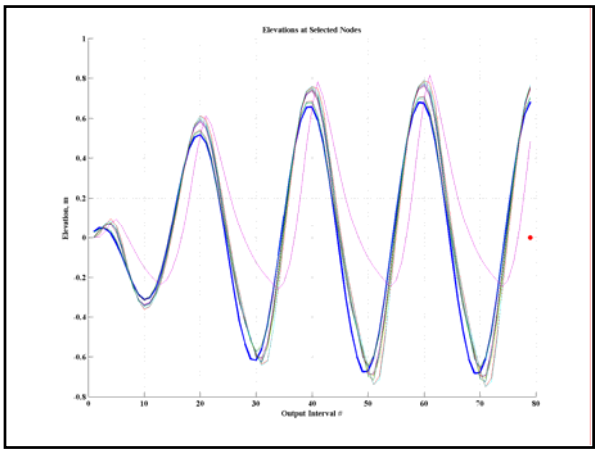


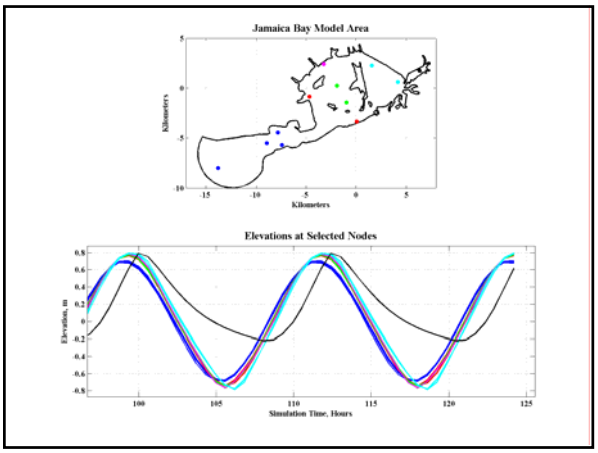


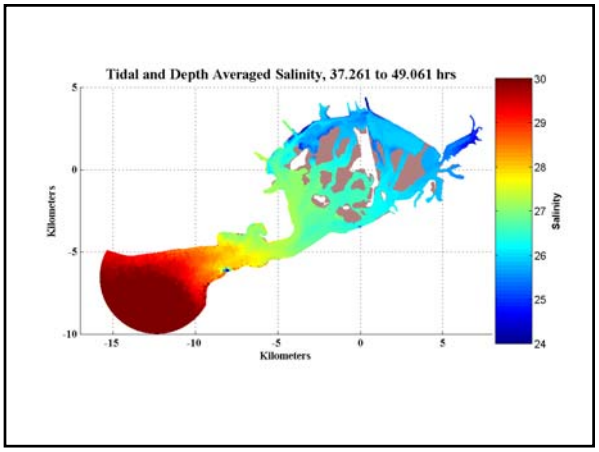


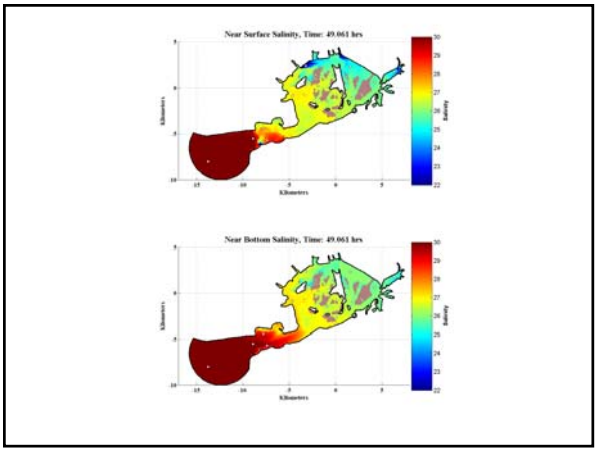


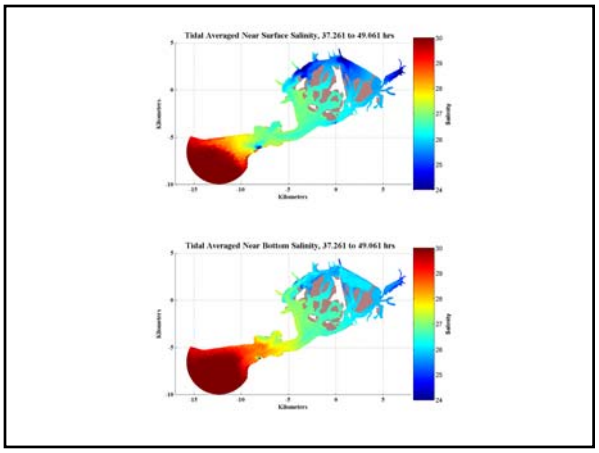

Jamaica Bay Grid and Section Location
Grassy Bay
1
2
3
Carnasie
Island Channel
Beach Channel
Rockaway
Kilometers
Kilometers
5
0
-5
-10
-20
-15
-10
-5
0
5
10

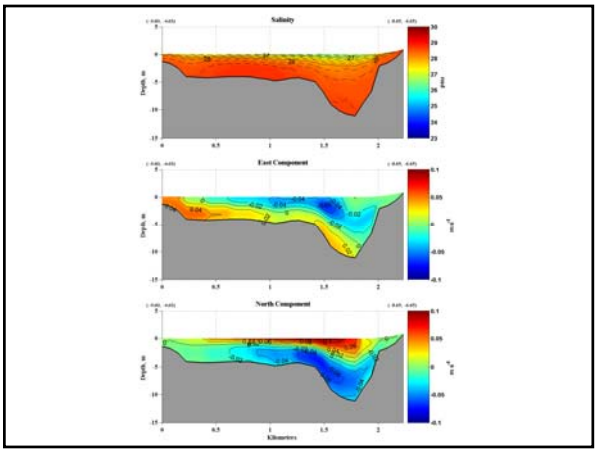

Elevations at Selected Nodes
Elevation, m
Output Interval #

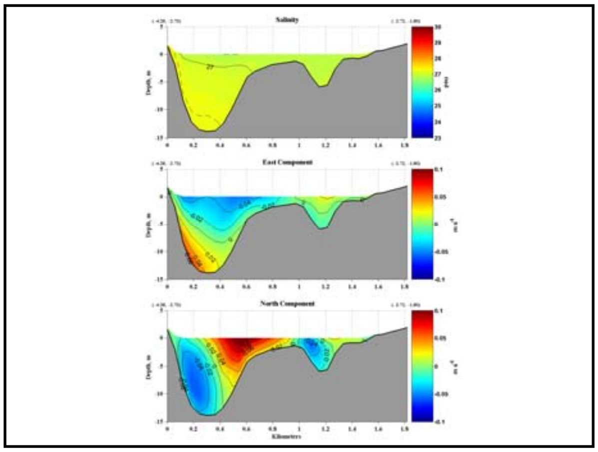

Jamaica Bay Model Area
Kilometers
Kilometers
Elevations at Selected Nodes
Elevation, m
Simulation Time, Hours

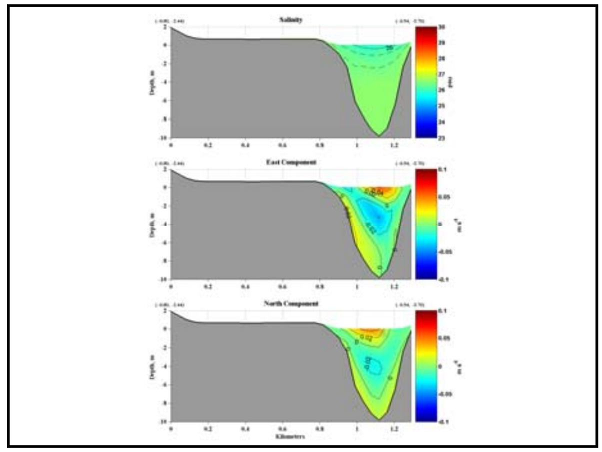

Tidal and Depth Averaged Salinity, 37.261 to 49.061 hrs
Kilometers
Kilometers
Salinity

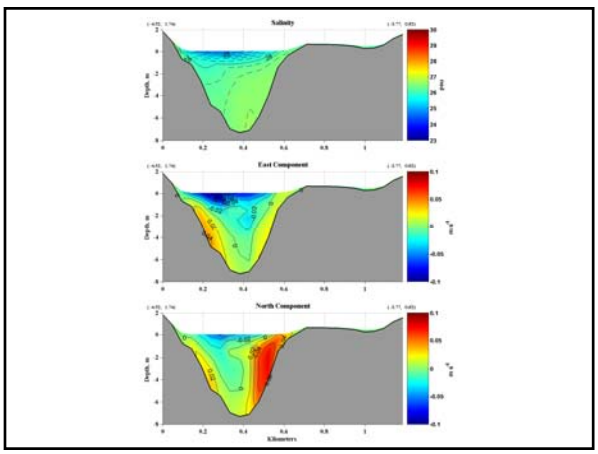

Near Surface Salinity, Time: 49.061 hrs
Near Bottom Salinity, Time: 49.061 hrs

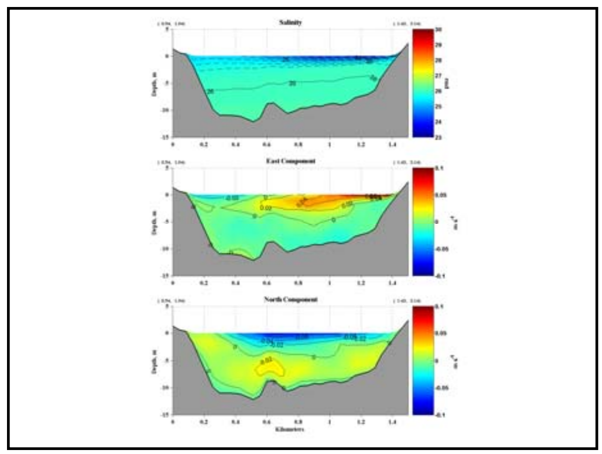

Tidal Averaged Near Surface Salinity, 37.261 to 49.061 hrs
Tidal Averaged Near Bottom Salinity, 37.261 to 49.061 hrs

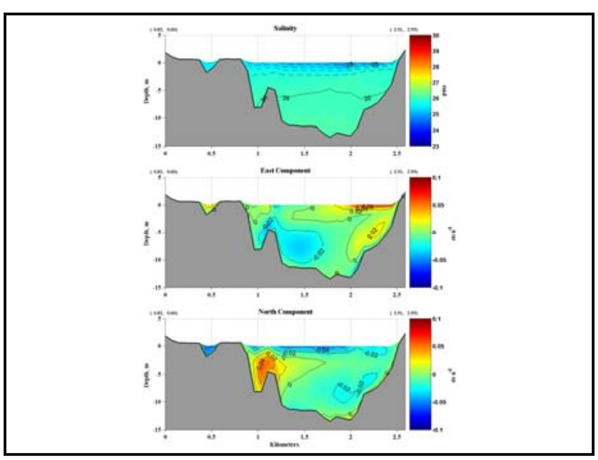

Salinity
East Component
North Component

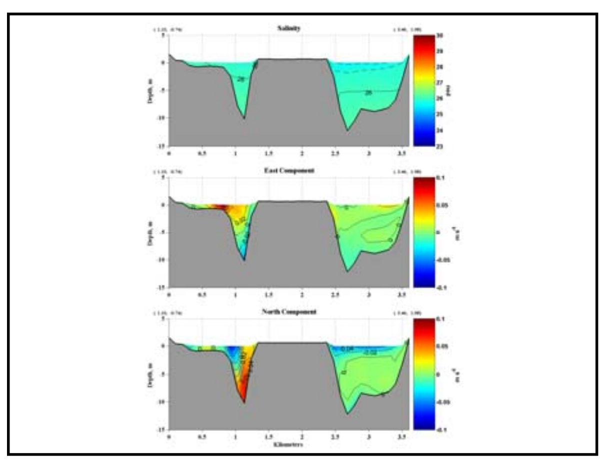

Salinity
East Component
North Component
Kilometers

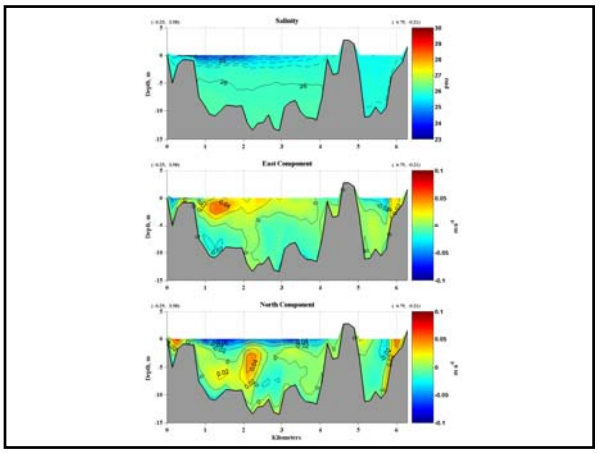

Salinity
East Component
North Component
Kilometers

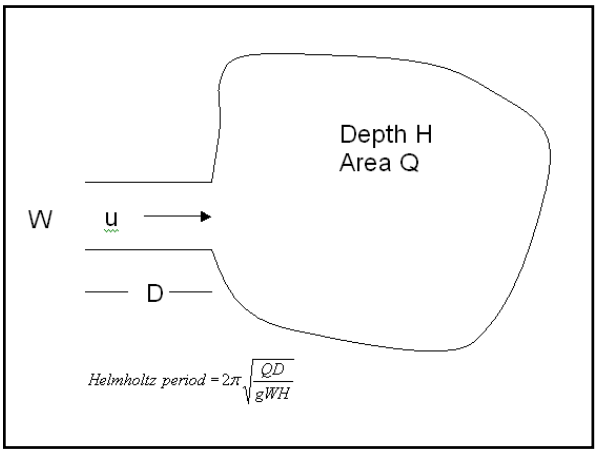

Salinity
East Component
North Component
Kilometers

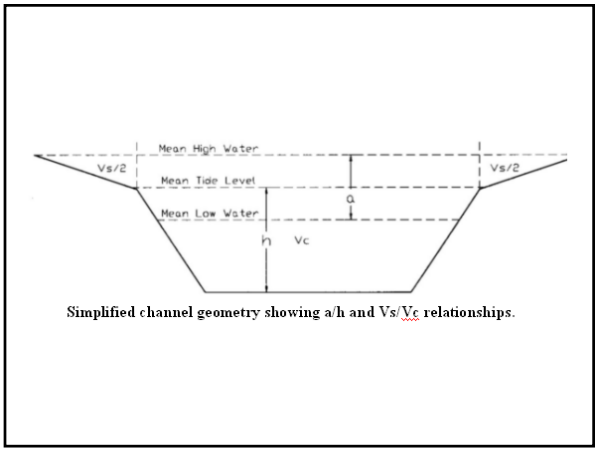

Salinity
East Component
North Component
Kilometers


Salinity
East Component
North Component
Kilometers

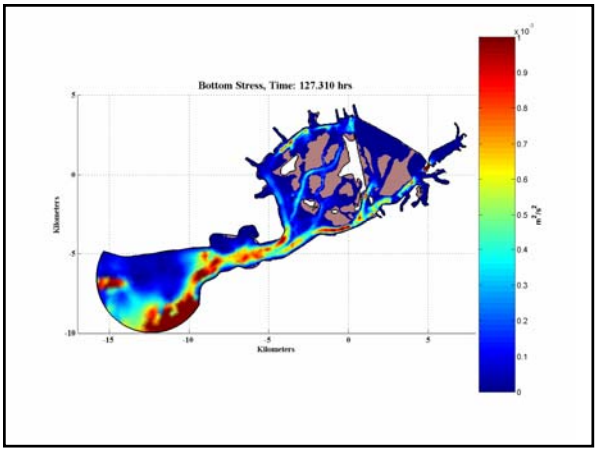

Salinity
East Component
North Component
Kilometers

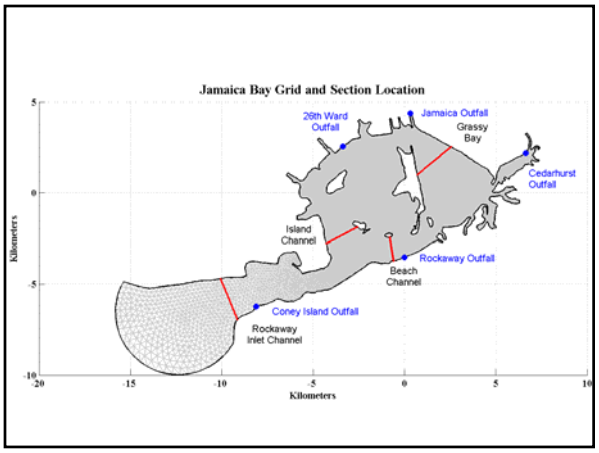


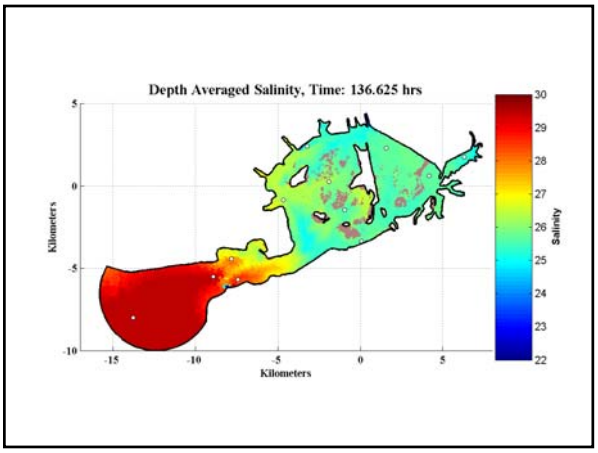


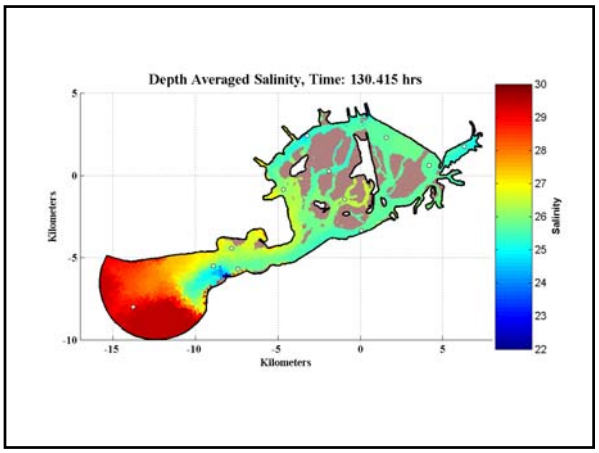


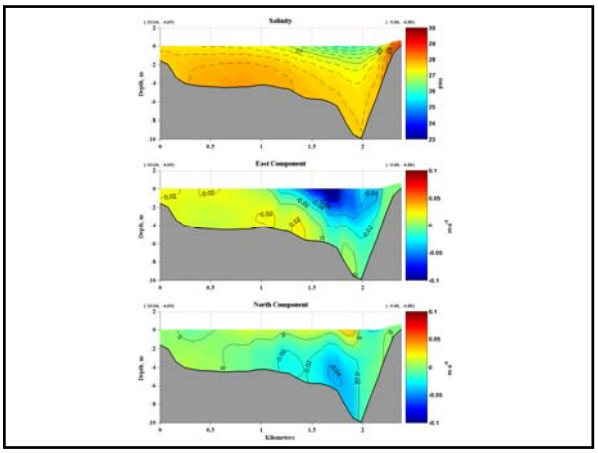
Simplified channel geometry showing a/h and Vs/Vc relationships.

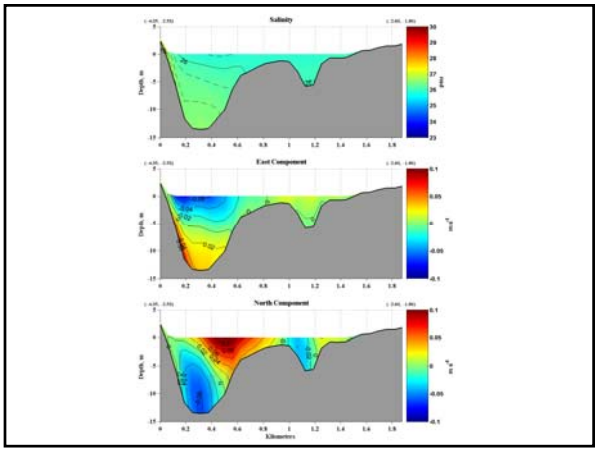


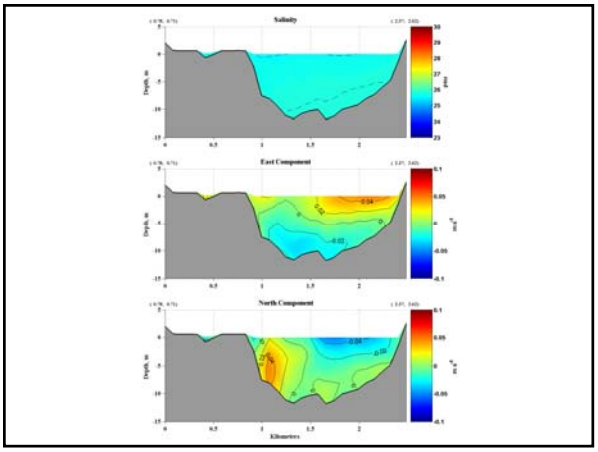


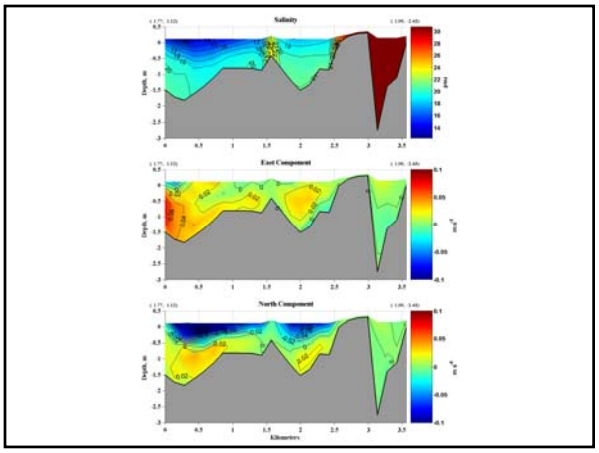


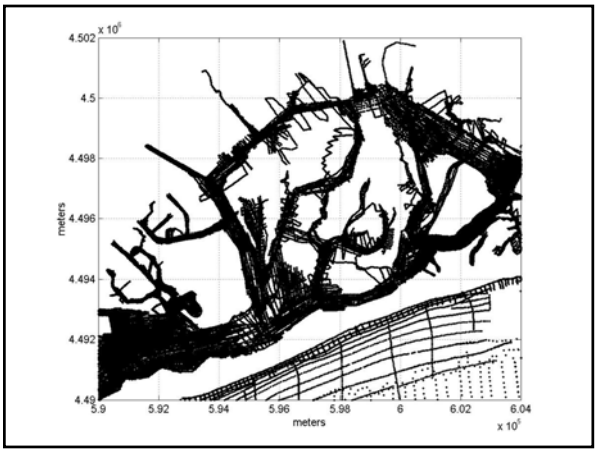

Depth Averaged Salinity, Time: 130.415 hrs
Kilometers
Kilometers
Salinity


Salinity
East Component
North Component


Salinity
East Component
North Component


Salinity
East Component
North Component


Salinity
East Component
North Component


meters
meters