

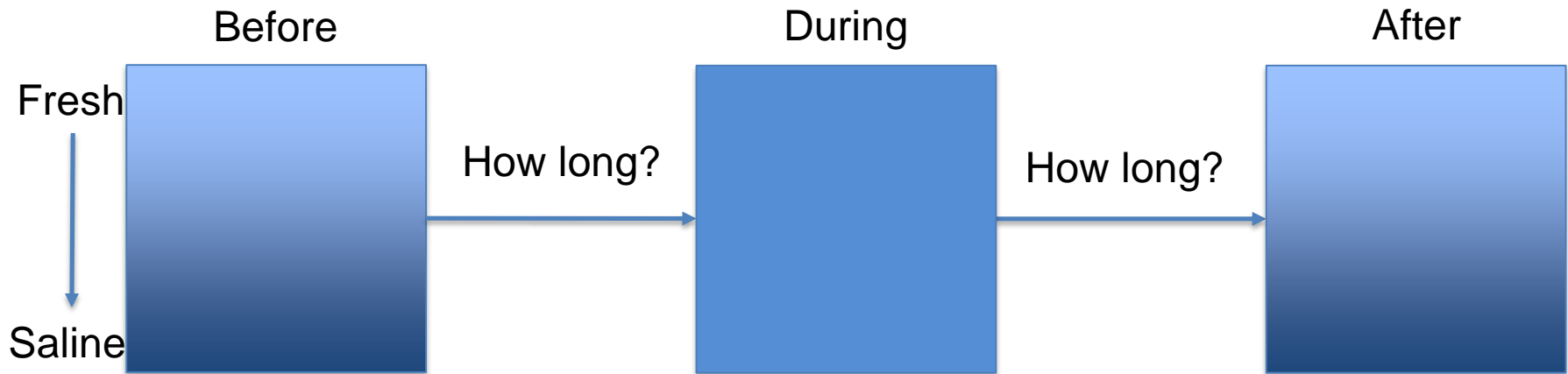
Impact of storm events on density stratification in the Pamlico and Albemarle Estuarine System

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Casey Dietrich (Advisor)



Purpose

- Main Goals:
 - How do storm events alter the stratification?
 - How quickly does the mixing of the system occur?
 - How long does it take to re-stratify?



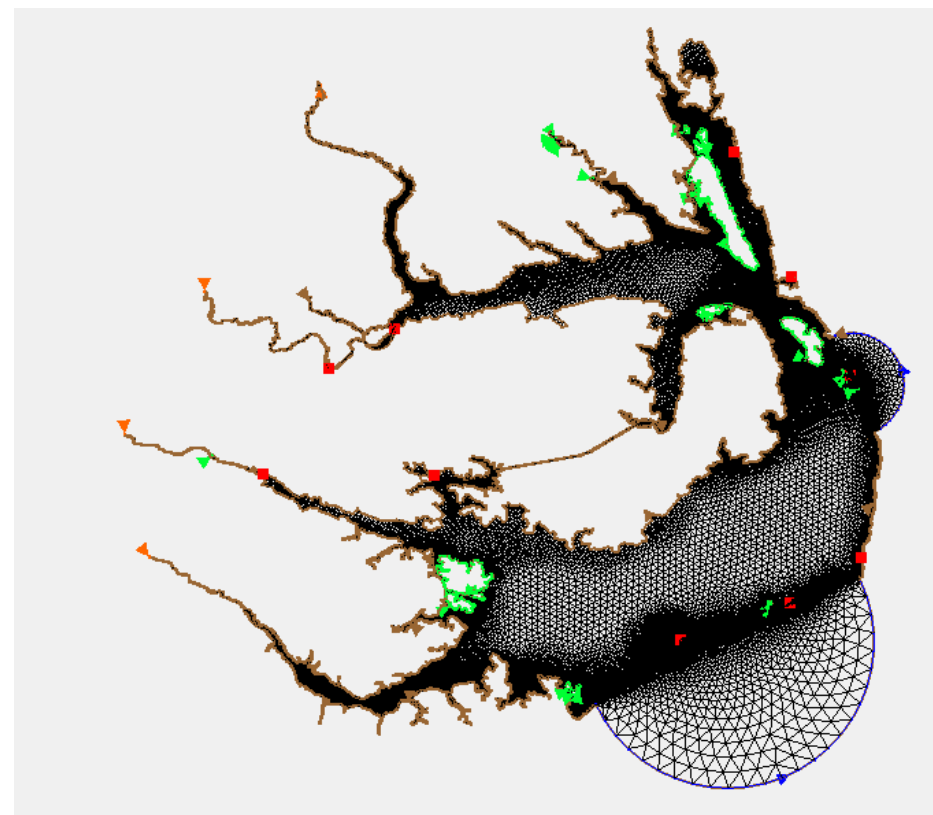
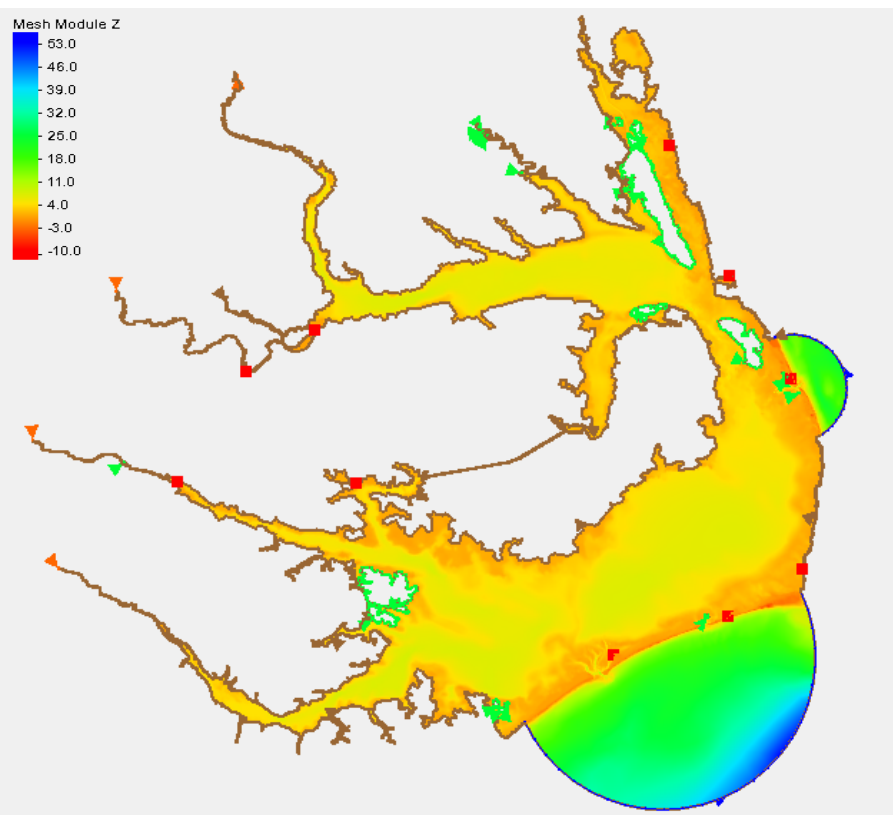
Study area and Importance



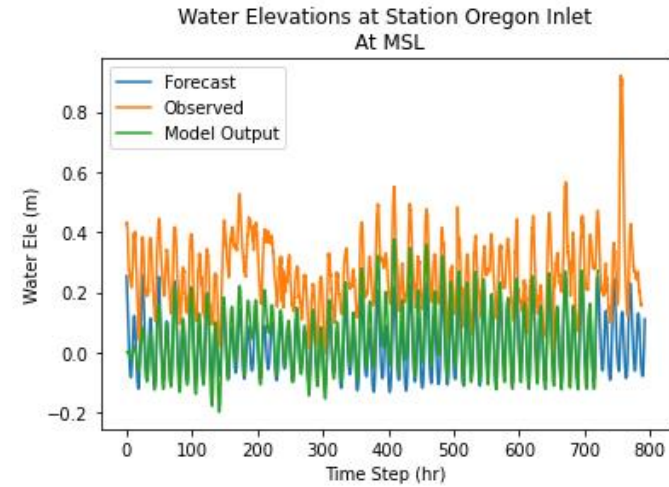
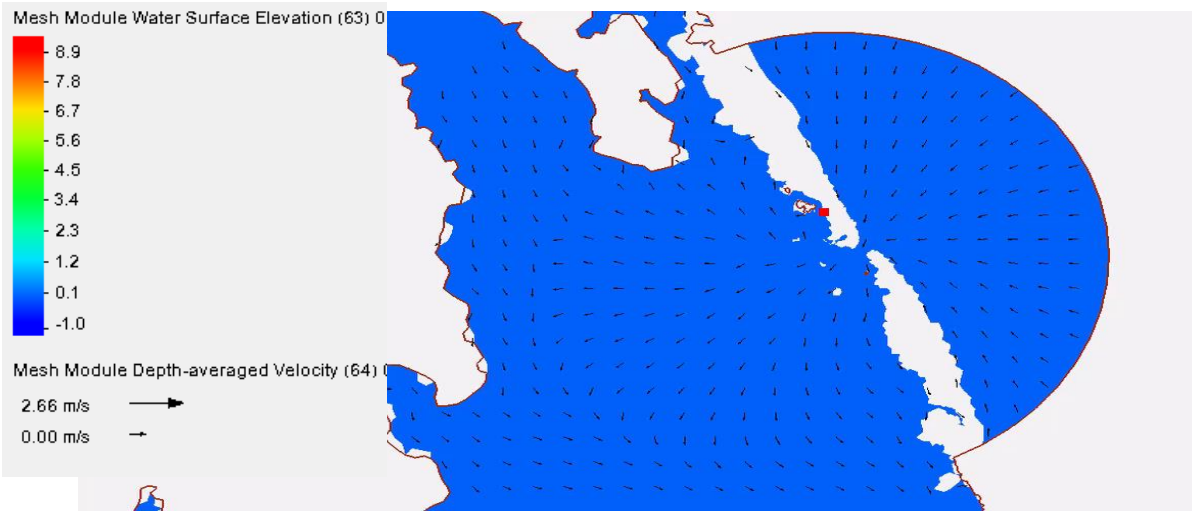
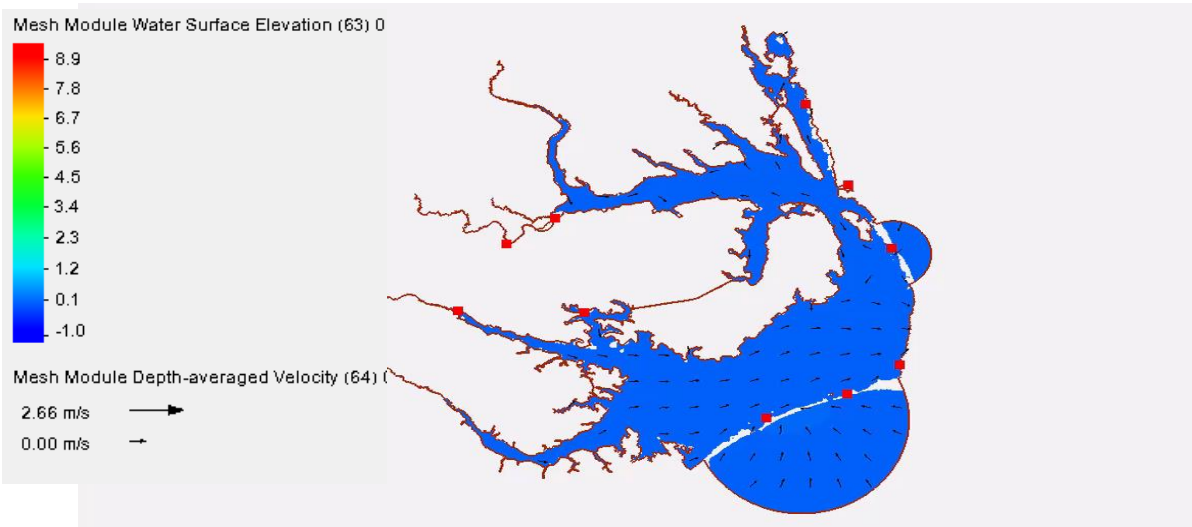
Cherry Grove Beach, SC
Experts offer explanation for dead fish found near Cherry Grove Beach

<https://www.wmbfnews.com/2020/09/17/experts-offer-explanation-dead-fish-found-near-cherry-grove-beach/>

Model Development

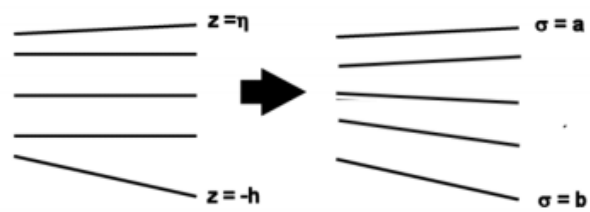


2D Model Results



3D Model

σ – coordinate system

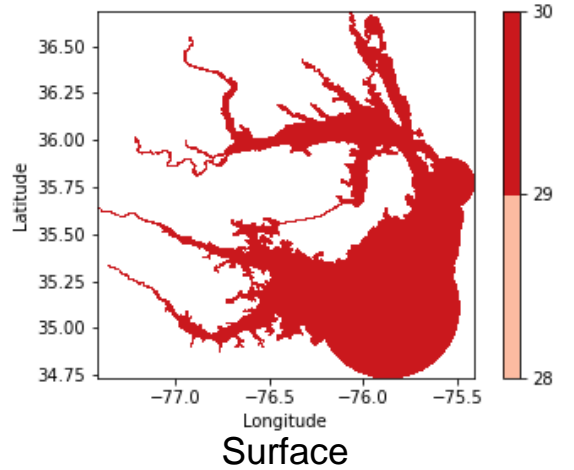


$$\sigma = a + \left(\frac{a-b}{H} \right) (z - \zeta)$$

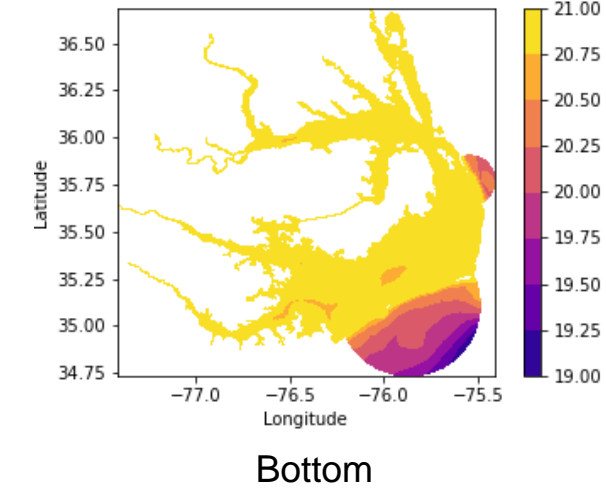
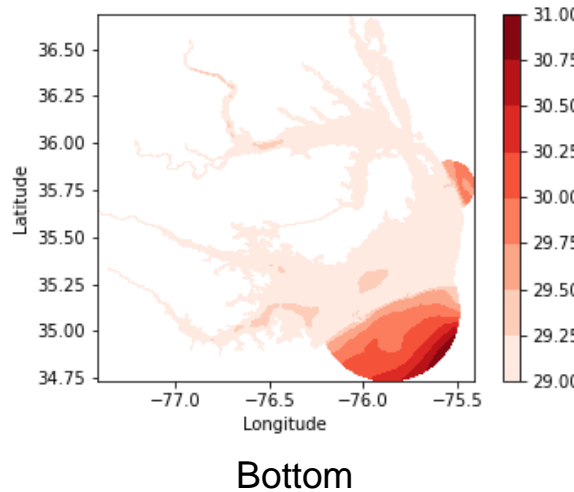
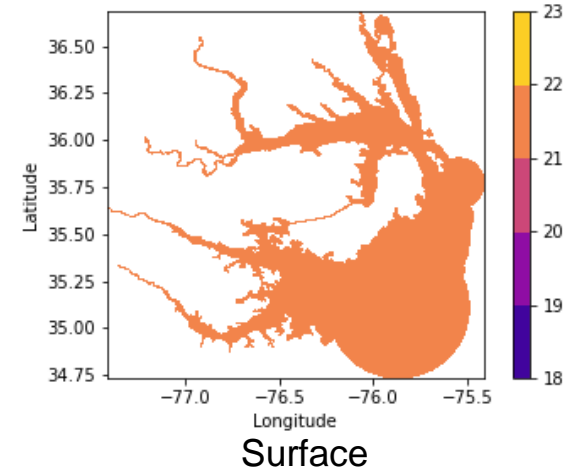
$$z = \left(\frac{\sigma - a}{a - b} \right) H + \zeta$$

Luettich, R., & Westerink, J. (2004, December 8). Formulation and Numerical Implementation of the 2D/3D ADCIRC Finite Element Model Version 44.XX. Retrieved October 20, 2020, from https://adcirc.org/files/2018/11/adcirc_theory_2004_12_08.pdf

Salinity

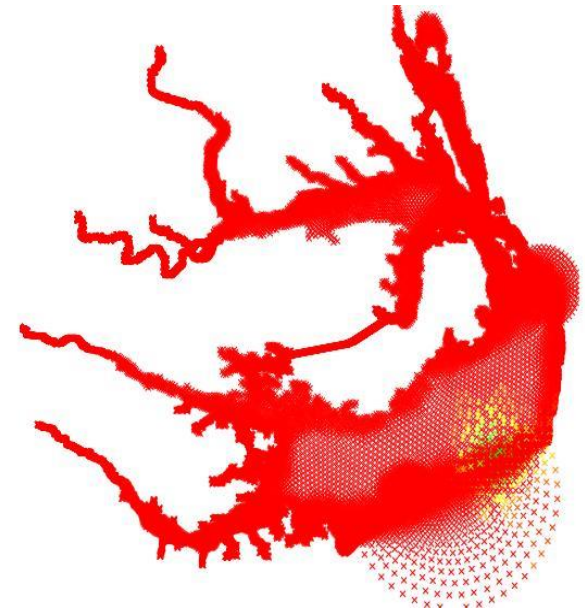


Temperature



Future Work

- Using observed values for salinity and temperature forcing
 - North Carolina Department of Environmental Quality
- Run storm event simulations



Distribution of observed temperature values.

Thank you!