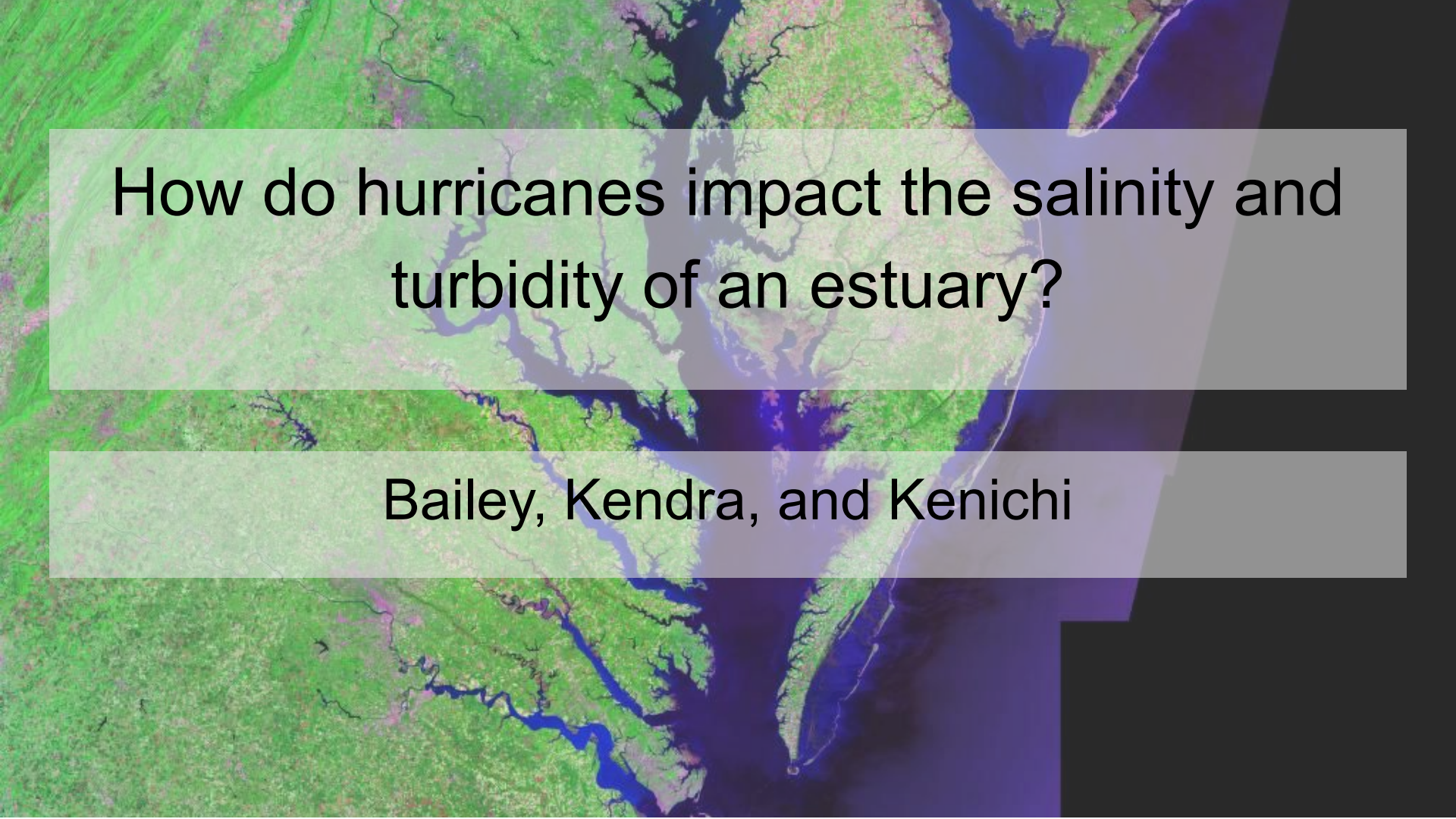


How do hurricanes impact the salinity and turbidity of an estuary?

Bailey, Kendra, and Kenichi

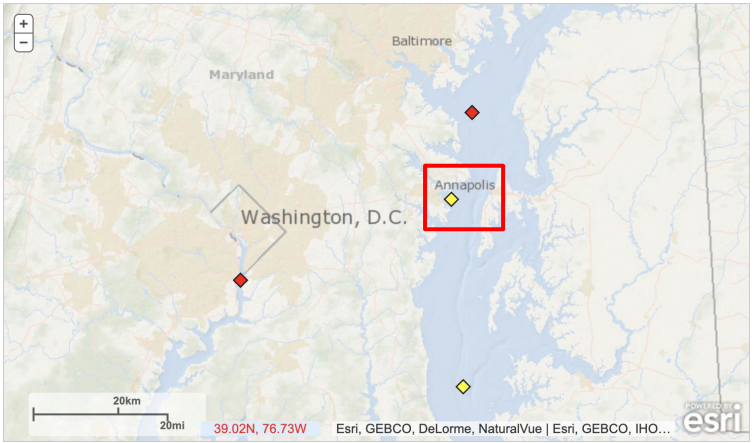
Background

- Storms temporarily alter the physical characteristics of an estuary
  - Freshwater runoff
  - Turbulent waters
- Case study of Hurricane Irene took place in August 28, 2011 in Chesapeake Bay

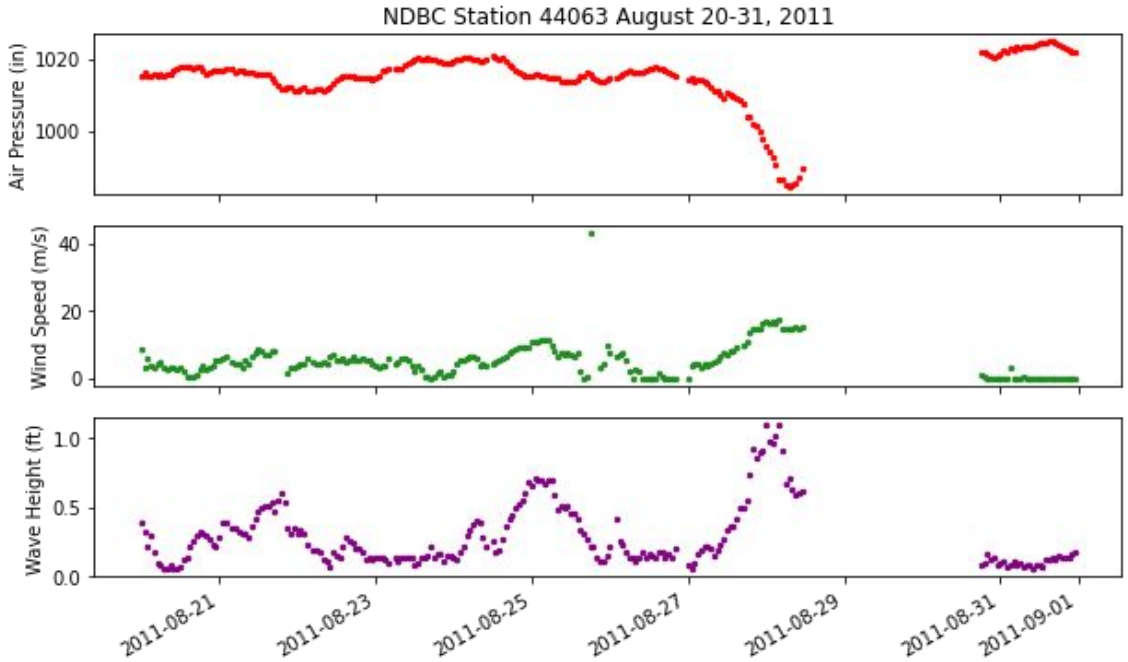
britannica.com chesapeakebay.net

The datasets and variables

- Buoy 44063 - located in the Chesapeake Bay right off the coast of Annapolis, MD
- Meteorological variables as indicators of storm presence:
  - Wind speed
  - Wave height
  - Air pressure
- Ocean data for physical characteristics of the estuary
  - Salinity
  - Turbidity

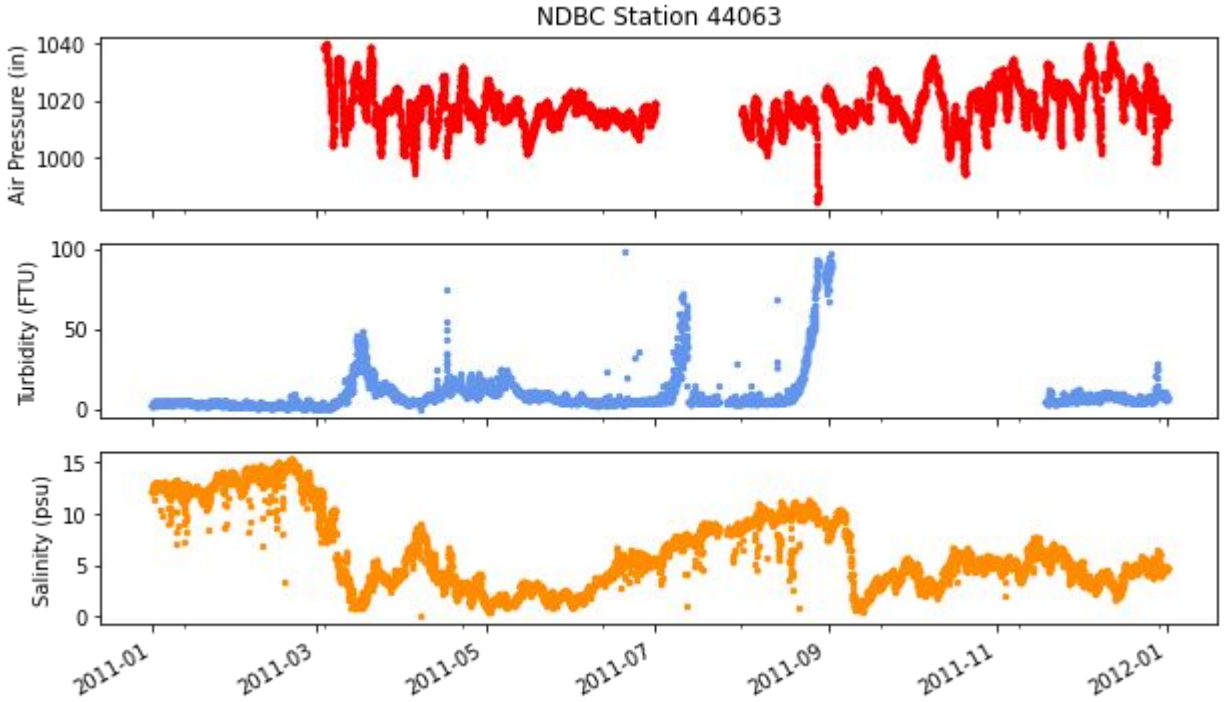


Low air pressure reinforces the fact that Hurricane Irene was present, which cause high wind speeds and waves

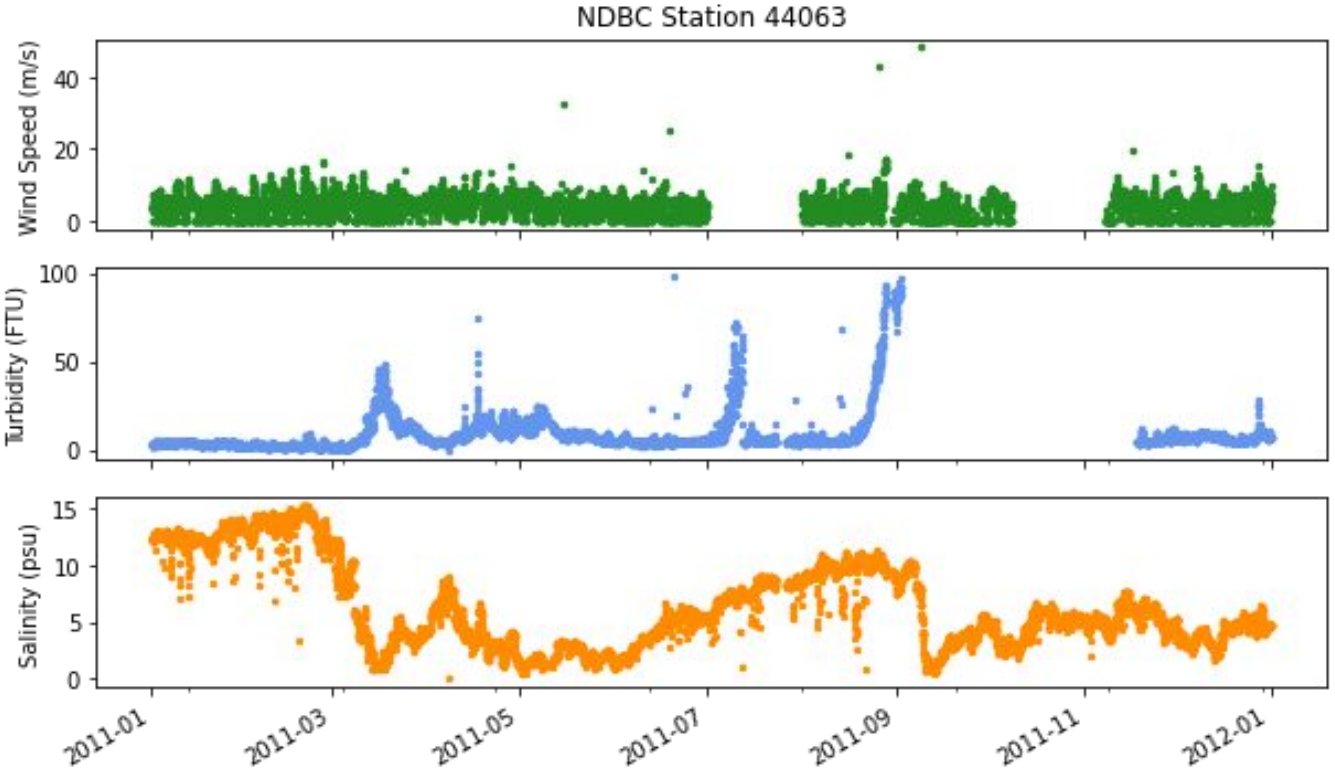


Low air pressure coincides with high turbidity and low salinity throughout the year

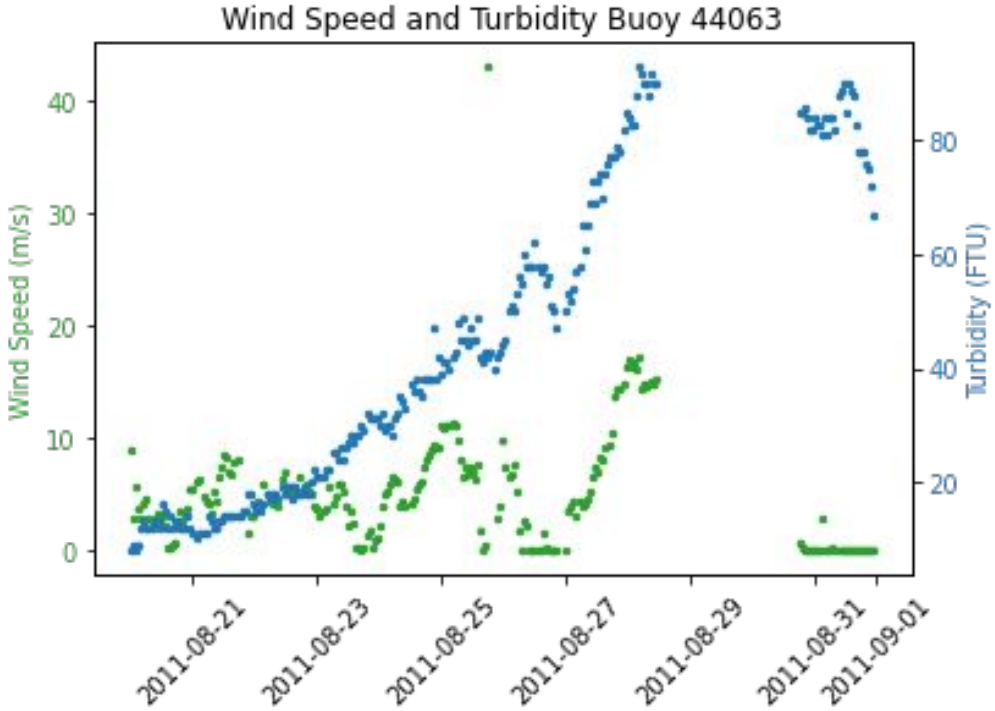
- Yearly data for 2011



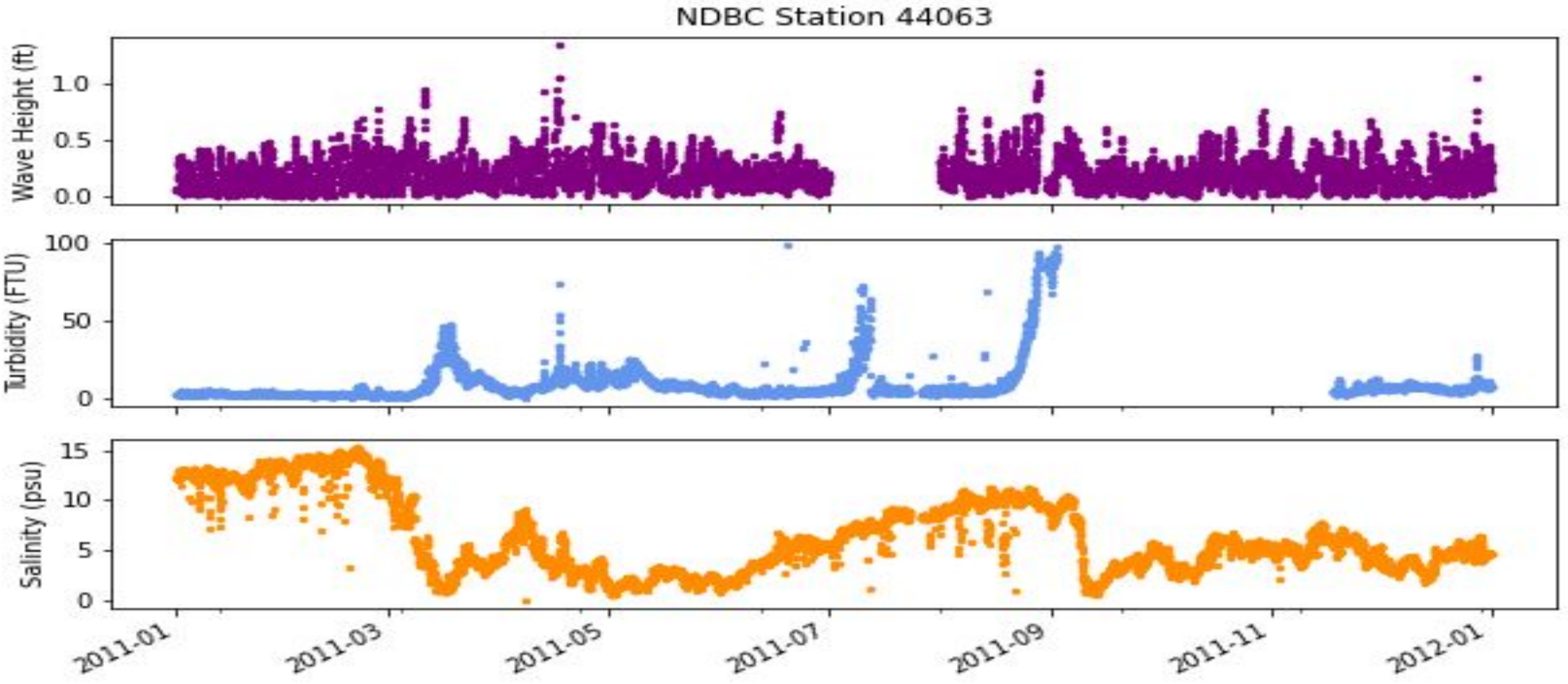
High wind speed, as a proxy for storms, coincides with high turbidity and low salinity



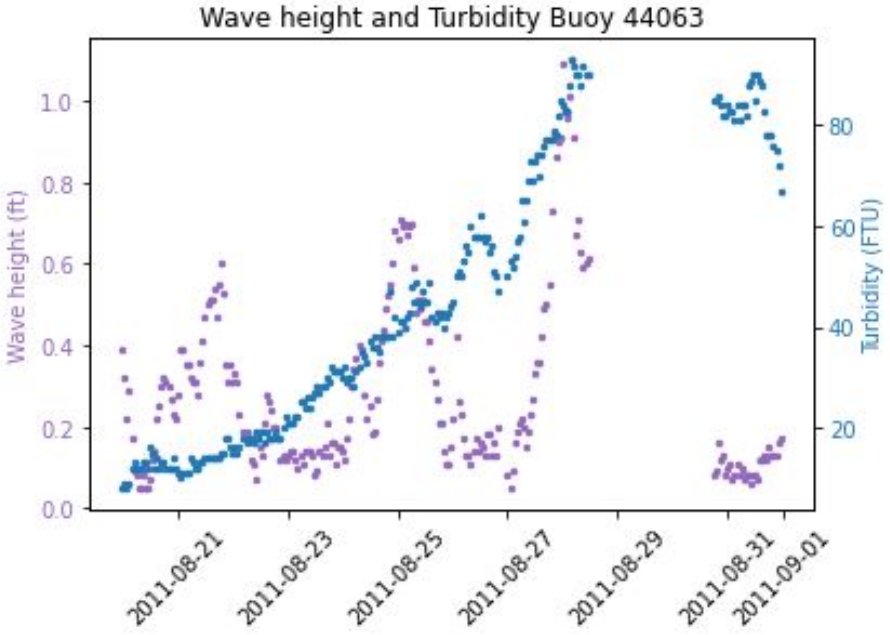
During Hurricane Irene, wind speed spiked. An increase in turbidity followed

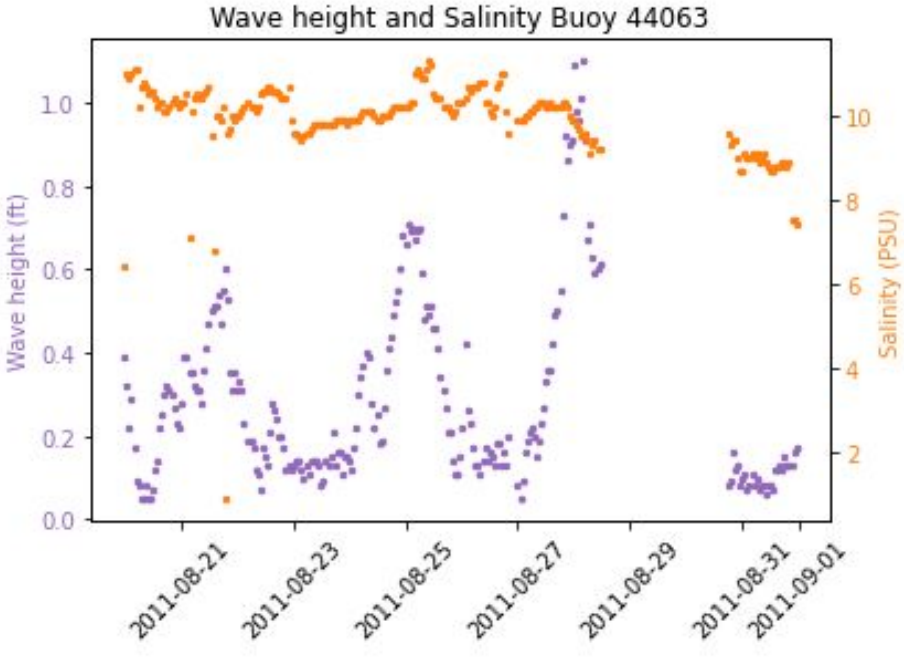


Wave height and turbidity spike at similar intervals, while salinity has a lagging inverse effect



As wave height peaks, turbidity also reaches a high. Salinity has a more slow response to the storm





Conclusions

- Salinity has a slower response than turbidity, and has a lagging effect
- Turbid waters take several days to settle after the hurricane passes
- Hurricanes most likely the cause of data loss :(

Future Work

- Add more variables to the analysis
- Look at more storm events
- Compare estuary system to open water
- Investigate how changes in salinity and turbidity impact organisms living there

Acknowledgements/Questions

- Special thanks to Sage Lichtenwalner, Chris Russoniello and Ed Dever
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