Effect of Storms on Ecosystem Processes: STURM Experiment

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MORGAN STATE UNIVERSITY

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Objectives

- How storms and oysters' biodeposits affect the ecosystem
- Storms:
  - Natural stressors
- Biodeposits:
  - Oyster feces and pseudofeces
- Resuspension of biodeposits
  - Lifts from bottom
  - Affects water quality
- Shear Stress
  - When resuspension occurs

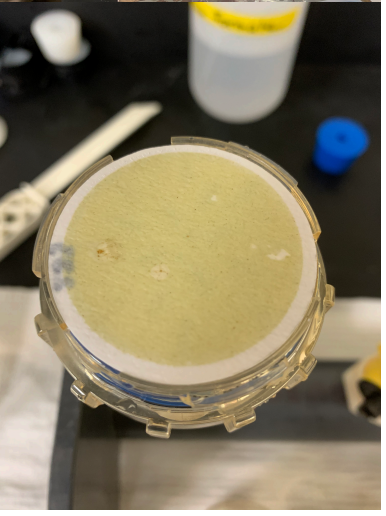
Methods: Daily

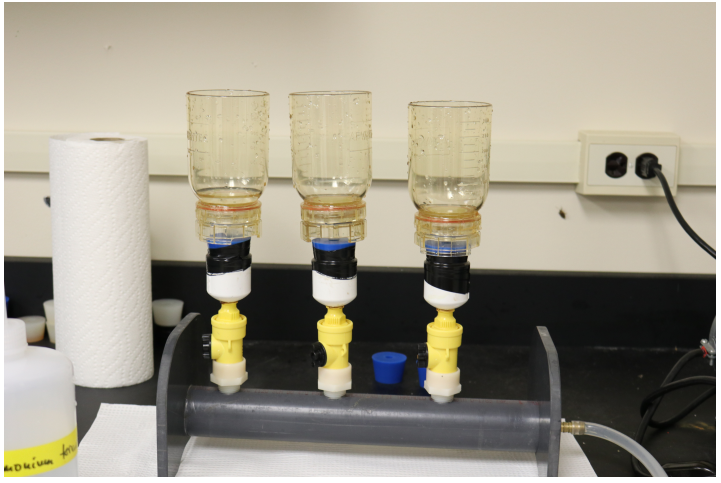
- Daily Measurements:
  - YSI Instrument for Dissolved Oxygen
  - Fluorometer
  - Secchi
- Daily and Automatic Measurements:
  - Temperature
  - Turbidity (OBS-3)
- Mixing System going 4h_on, 2h_off 24hrs a day for four weeks PLUS stepwise erosion during two storms
  - Daily 10% water exchange with filtered water
- Daily addition of 2,000 mL of biodeposits of oysters held at the dock

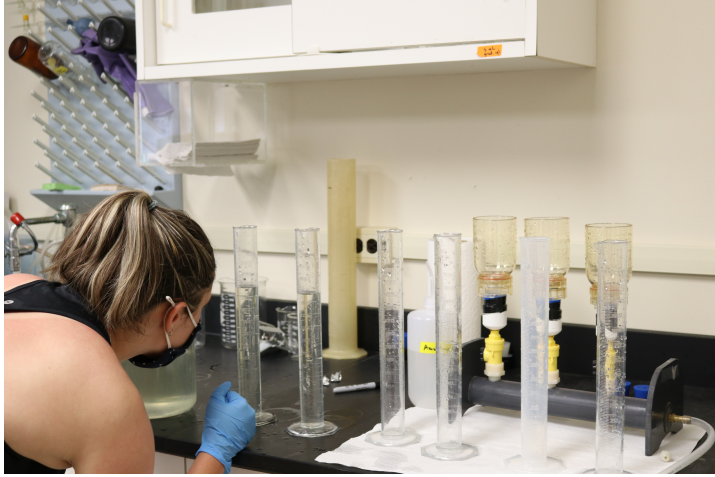
Methods: Sampling Days

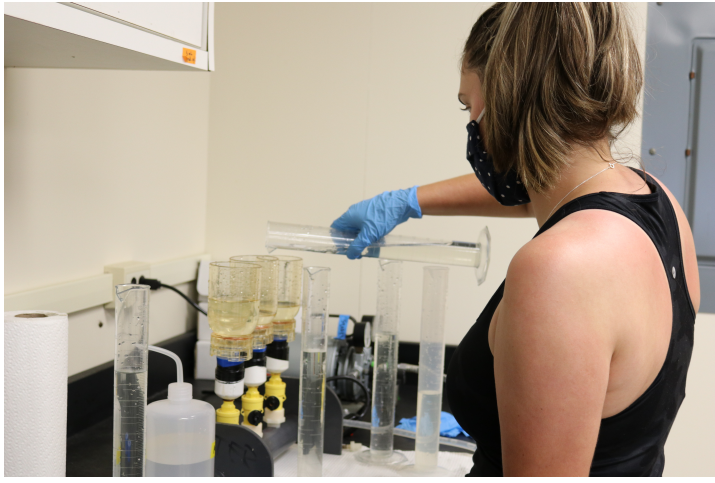
- Use of a sampling stick
  - Homemade instrument with pvc and tubes tied to it with zip ties to intake water
- Filtered total suspended solids (TSS)
  - Also called “seston”
  - Using prepared filters

Each of us doing our assigned jobs on sampling day







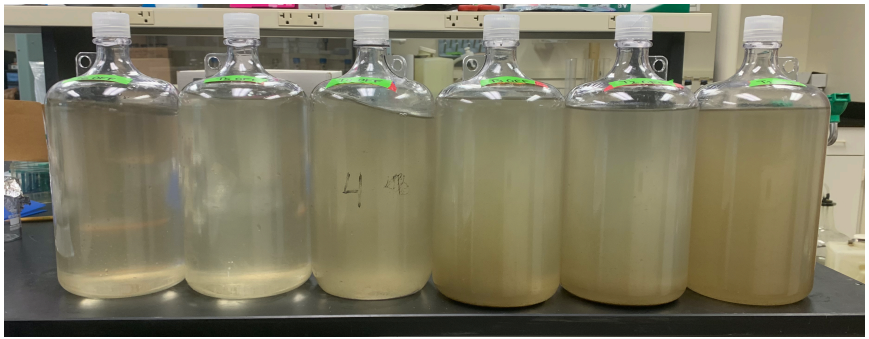


Filtration Process

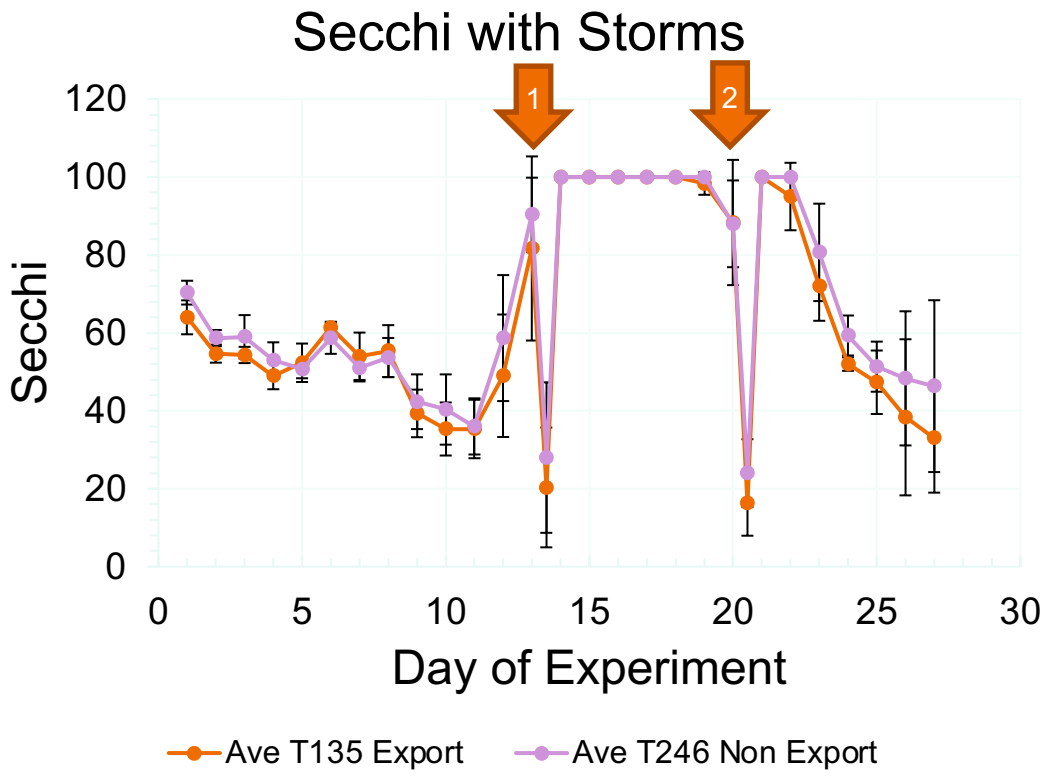
End of filtration process...

Methods: Storm Days

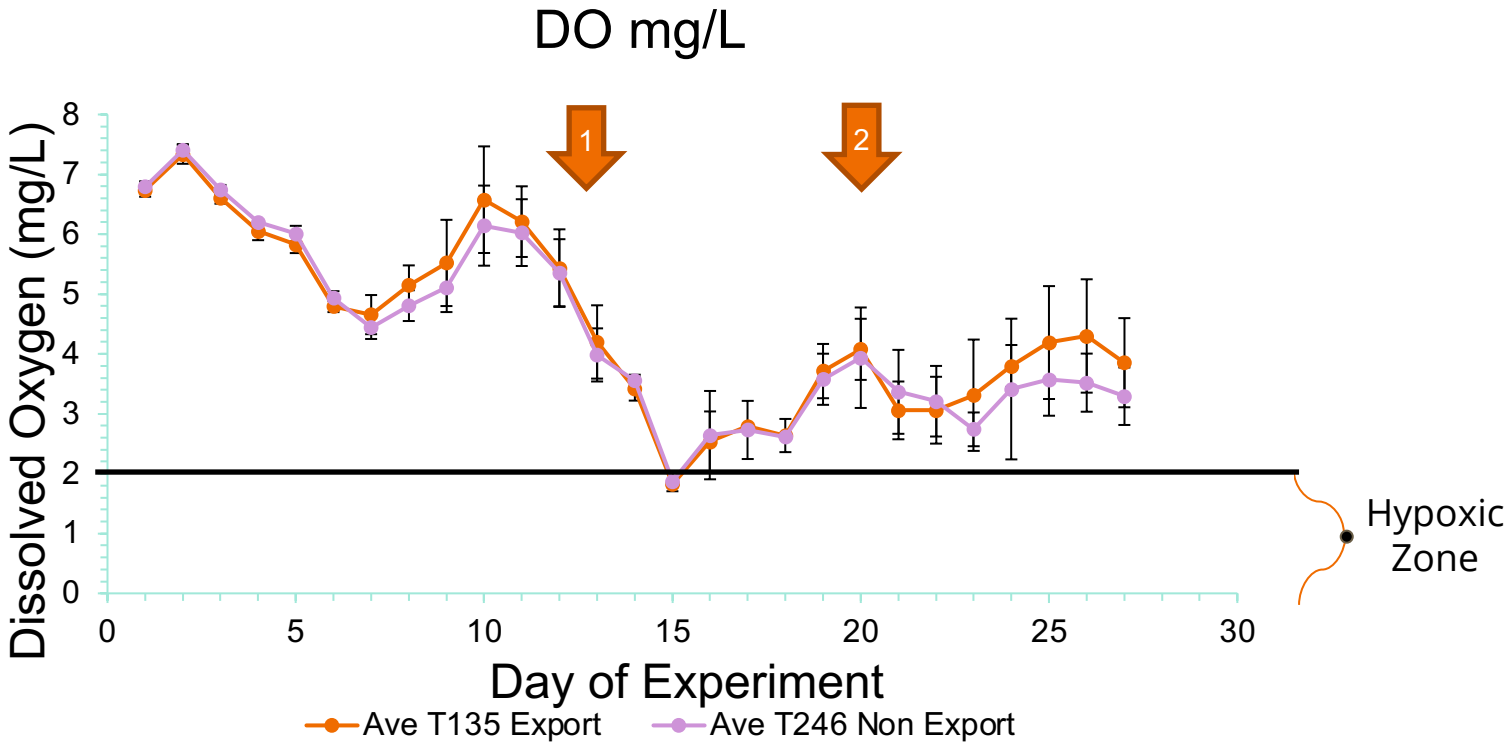
- Daily measurements at beginning
- Dissolved oxygen measured every 30 minutes
  - With the increase of shear stress
- Water sample taken at end
- Exported 50% of water out of 3 tanks (1,3,&5)
  - Filled with raw sea water afterwards



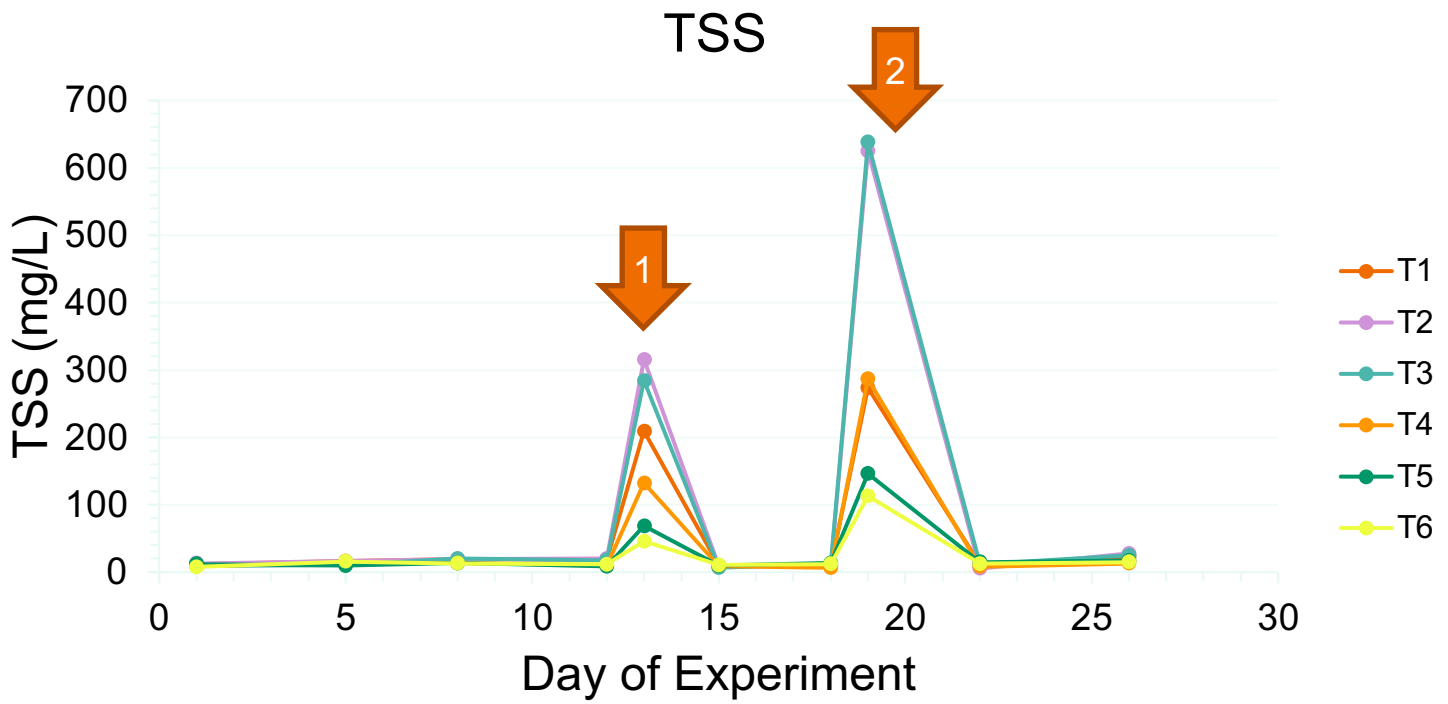
Results: Secchi over experiment



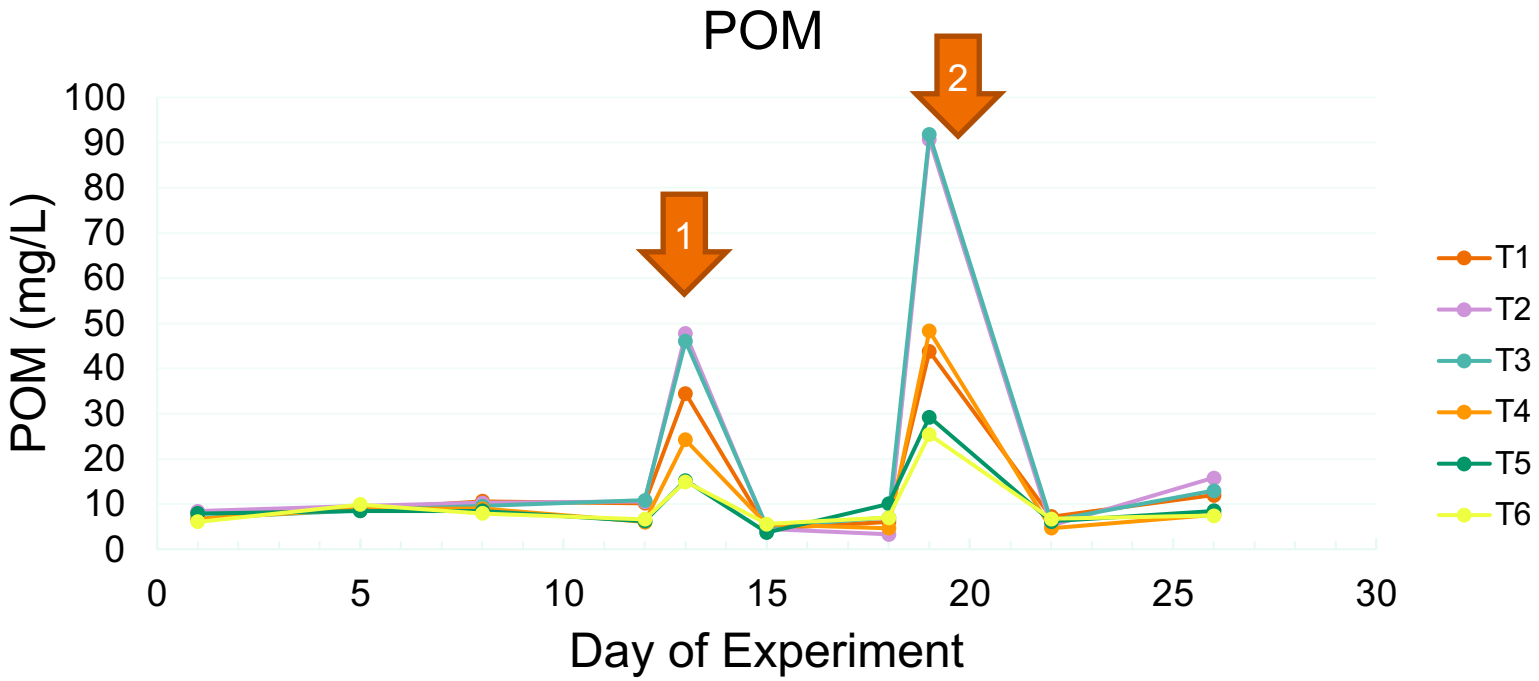
Results: Dissolved Oxygen over experiment



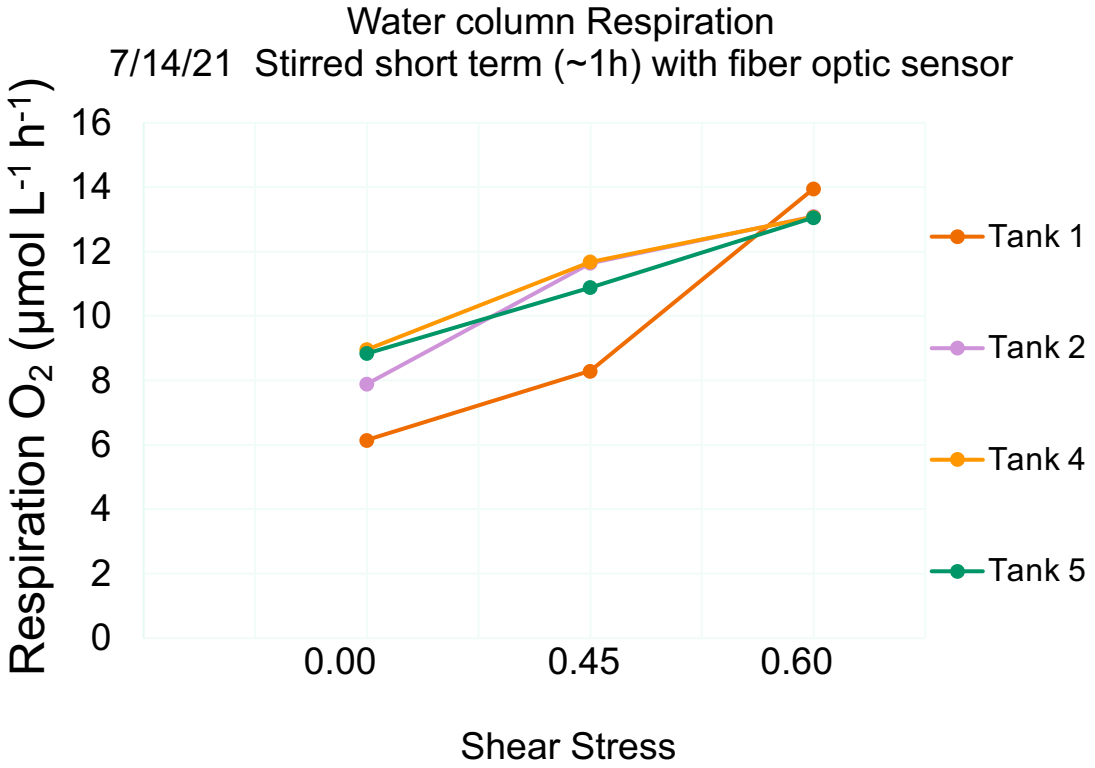
Results: Seston (TSS) over experiment



Results: POM over experiment



Results: Respiration and Shear Stress



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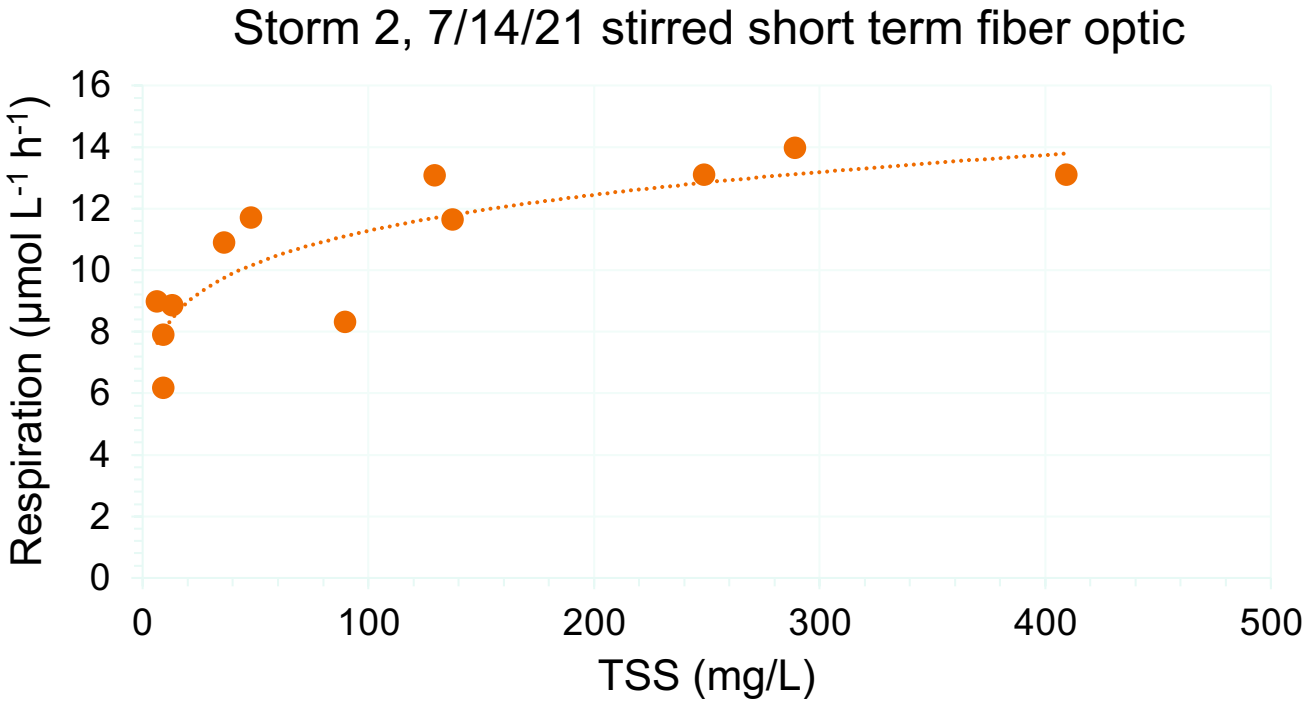
Results: Respiration and TSS



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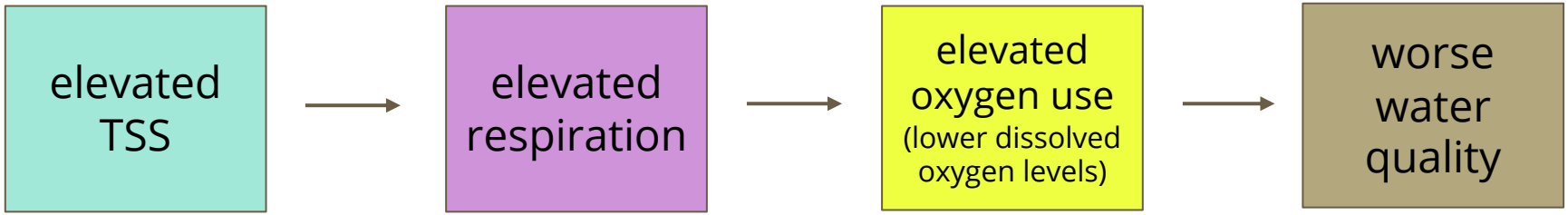
Research Findings and Implications



Effect on nutrients???

Conclusion and Future Analysis

- In conclusion....
  - Additional biodeposits affected resuspension
    - More seston and POM (particulate organic matter)
  - Respiration elevated as shear stress increased during storms

- Future analysis...
  - More information with nutrients, chlorophyll a in the sediment, and much more has yet to be analyzed...









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Acknowledgements...

Thank you!
Any questions?

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