Remote Sensing of Turbidity in the Salt-Marsh Water Bodies of Georgia

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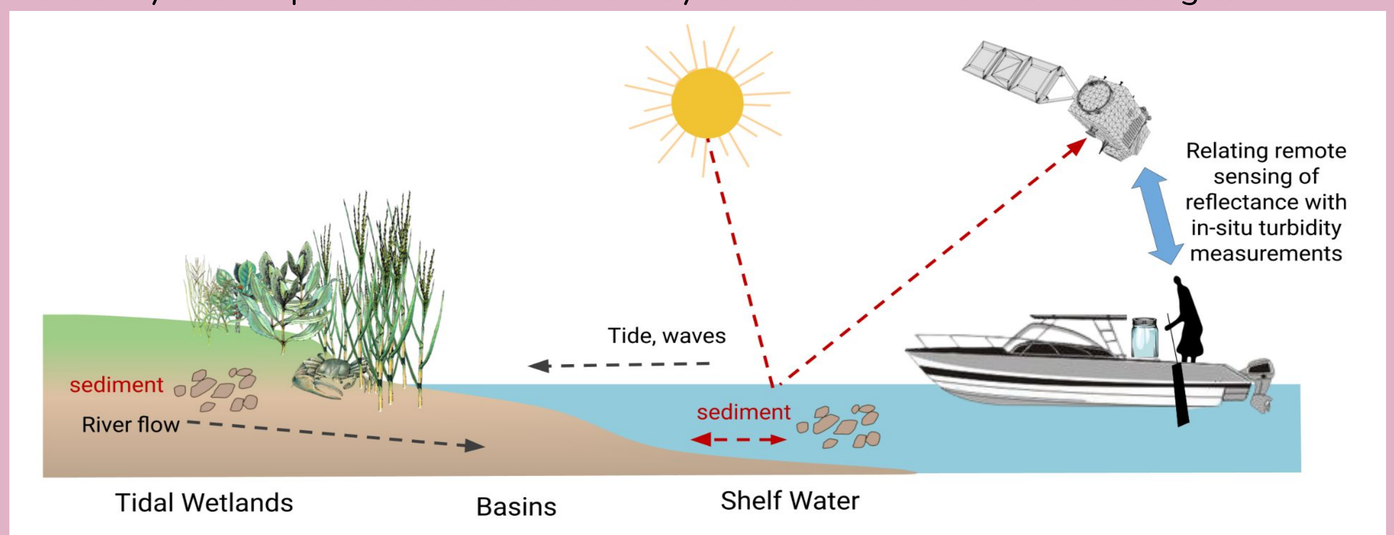
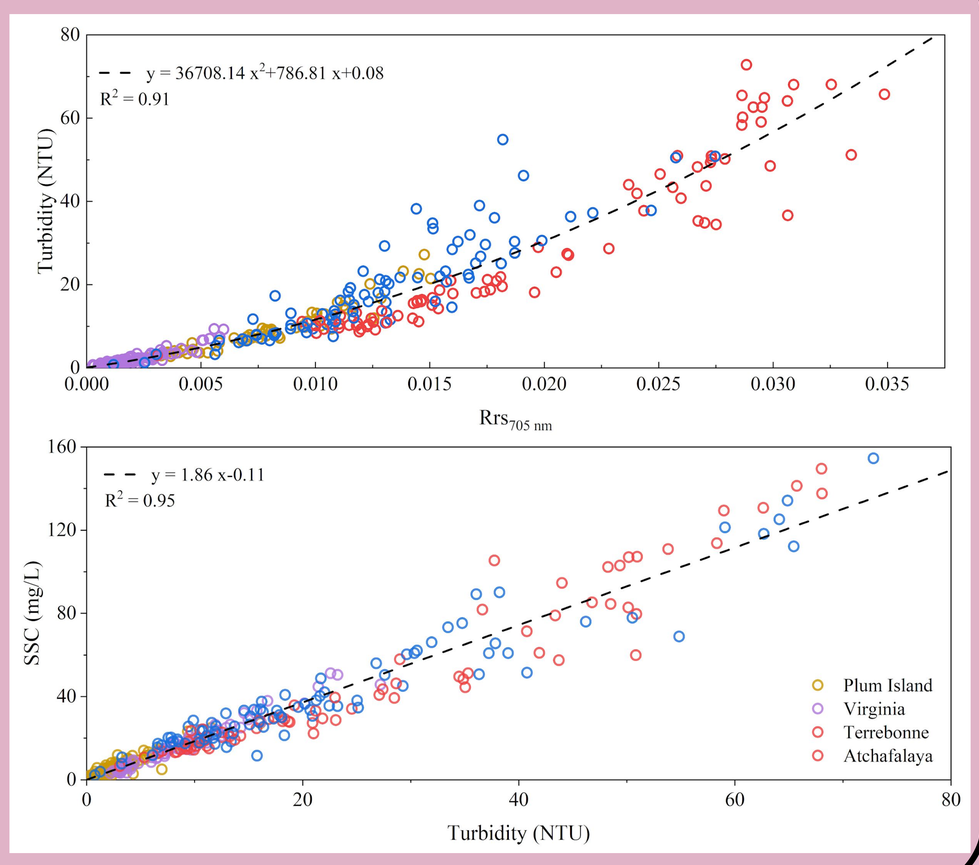
Introduction

- **Salt marshes:** critical ecosystems protecting coastlines threatened by rising sea level
- Sediment budgets in salt-marsh waters are critical to understand salt-marsh resilience
- **Turbidity**: an optical proxy for suspended sediment concentration (SSC)
- **Objective**: Use optical remote sensing (Sentinel-2 MSI) to assess turbidity spatio-temporal variability and help understand sediment dynamics in salt-marshes of Georgia.

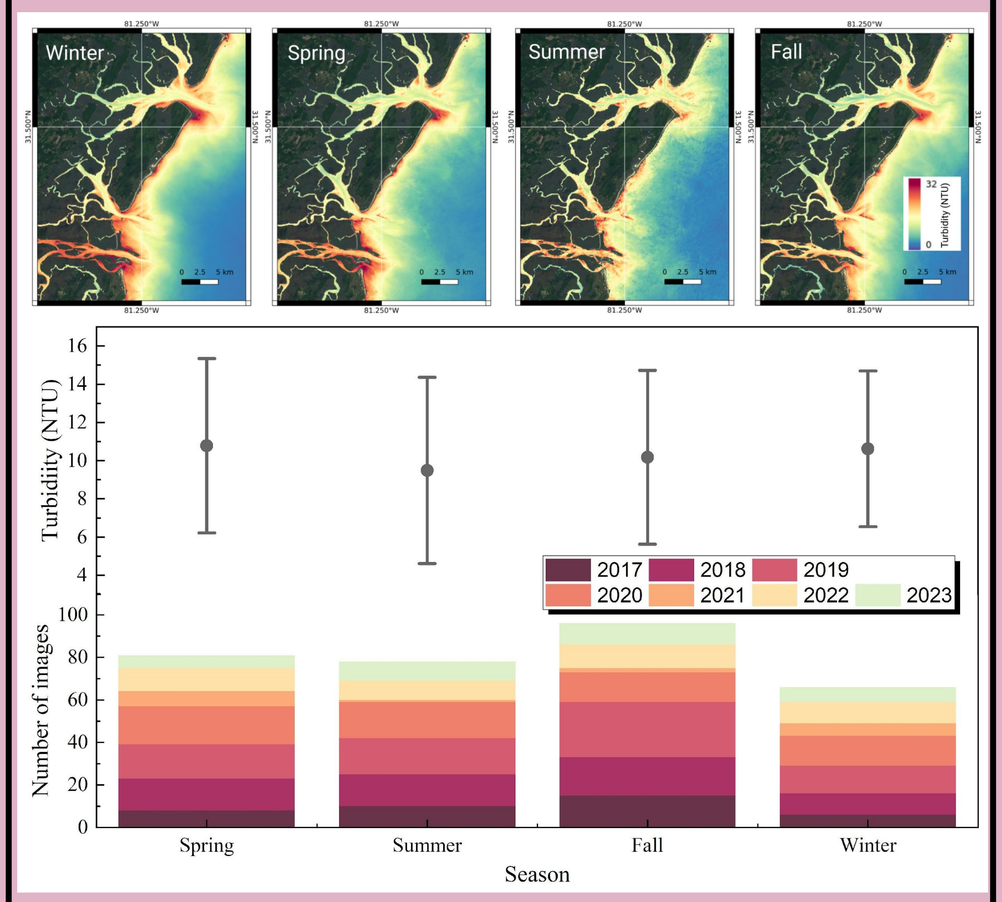


Methods

- Using ***in-situ*** measurements to develop the algorithm for estimating turbidity through **remote sensing**.
- The remote sensing reflectance of the water at 705 nm (near-infrared) is a good proxy for turbidity in the water, facilitating its detection from satellite.
- Turbidity is an excellent proxy for the suspended sediment concentration (SSC) in the salt-marsh waters.

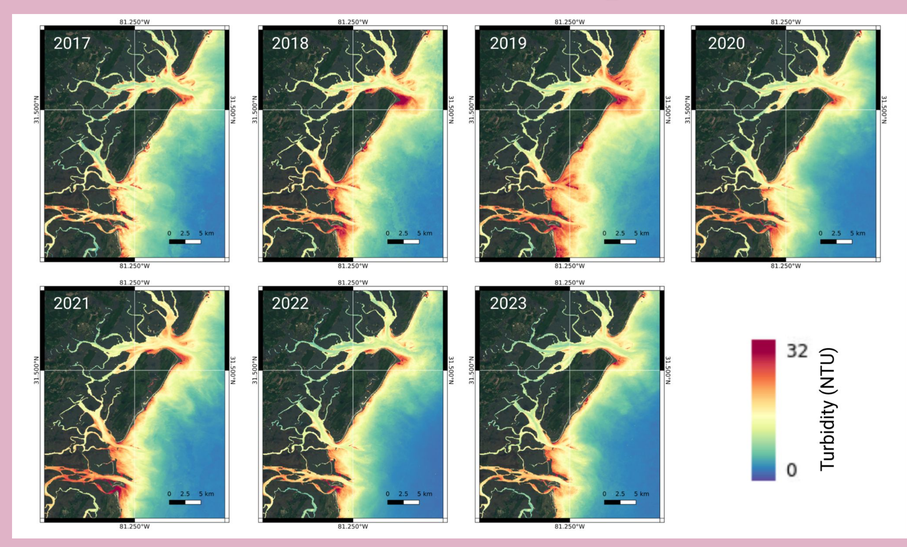


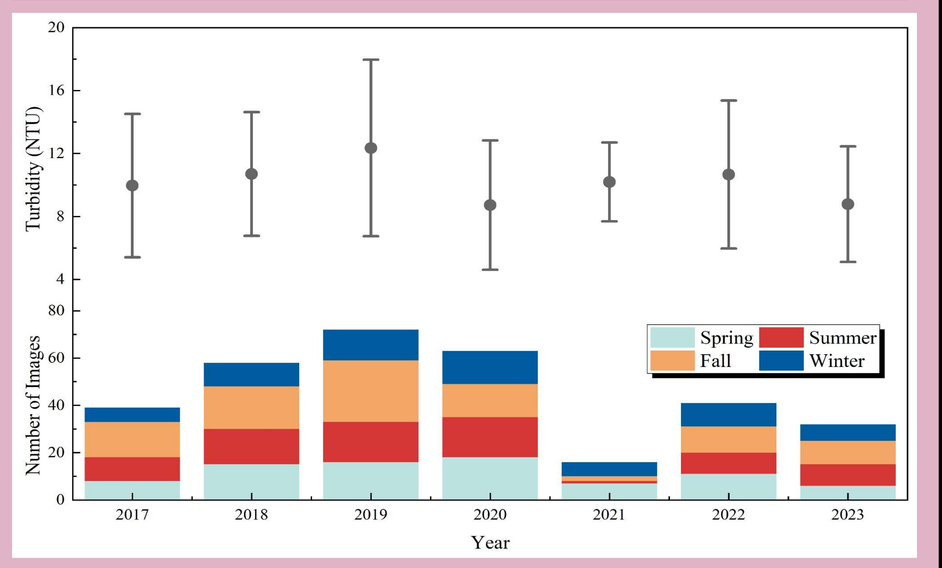
Seasonal Variation in Georgia



- Seasonal turbidity variations were detected but were small.
- Highest turbidity in winter and lowest in Summer.

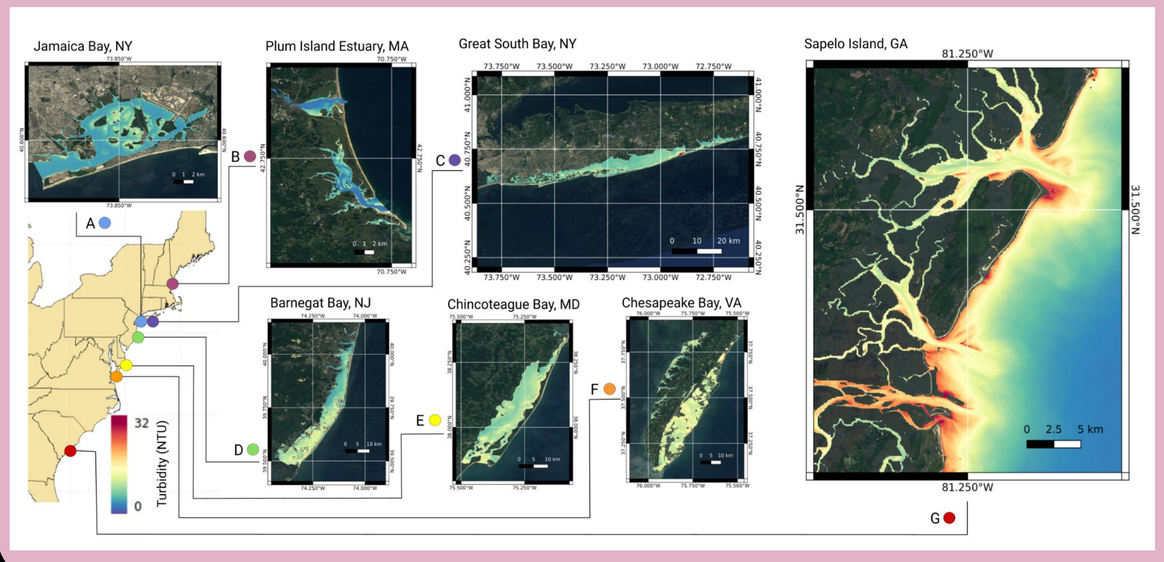
Annual Trend in Georgia





- Interannual variability in turbidity was detected
- Significant difference in image availability from year to year (reason remains unclear).

Turbidity Gradient Along the US East Coast



Salt-marsh waters in Georgia tend to have higher average turbidity and SSC than salt-marsh waters located further north.

Acknowledgements

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Conclusions

- High-resolution optical remote sensing (Sentinel-2 images) facilitated an assessment of the spatio-temporal variability of turbidity in the saltmarsh water bodies of Georgia.
- Overall, the analysis revealed some subtle seasonal and moderate interannual variability in turbidity in these waters.
- Part of this interannual variability could be attributable to biases in image availability between years.
- Future work will try to understand the drivers of that variability.