**Supplementary material for:**

*Geographically aware estimates of remotely sensed water properties for Chesapeake Bay*

Table 1: Number of measurements, programs, and stations in the observational dataset.

| variable | n_measures | n_programs | n_stations |
|---|---|---|---|
| SST (C) | 103015 | 20 | 334 |
| SSS (psu) | 62116 | 20 | 316 |
| turbidity (NTU) | 53191 | 15 | 153 |

Table 2: Distribution of values in the observational dataset.

| variable | 0.0 | 0.05 | 0.5 | 0.95 | 1.0 |
|---|---|---|---|---|---|
| SSS (psu) | 0 | 0.1 | 11.48 | 22.25 | 32.7 |
| SST (C) | -1.75 | 4.07 | 19.9 | 29.37 | 50 |
| turbidity (NTU) | 0 | 1 | 5.8 | 36.34 | 3742.34 |

Table 3: Random Forest tuning results.

| variable | n_estimators | min_samples_leaf | max_features | max_depth |
|---|---|---|---|---|
| salinity | 1810 | 5 | auto | 20 |
| turbidity | 1050 | 5 | sqrt | 50 |
| temperature | 1430 | 5 | sqrt | 100 |

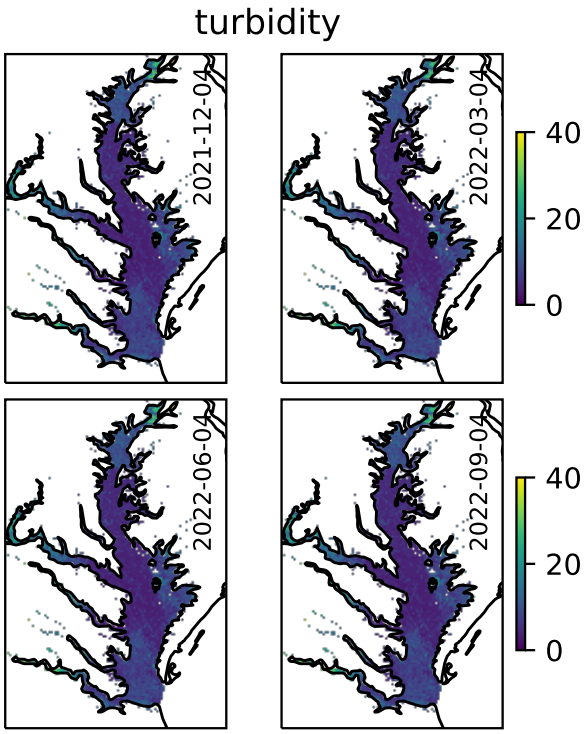


Figure 1: Seasonal Random Forest prediction results for turbidity.

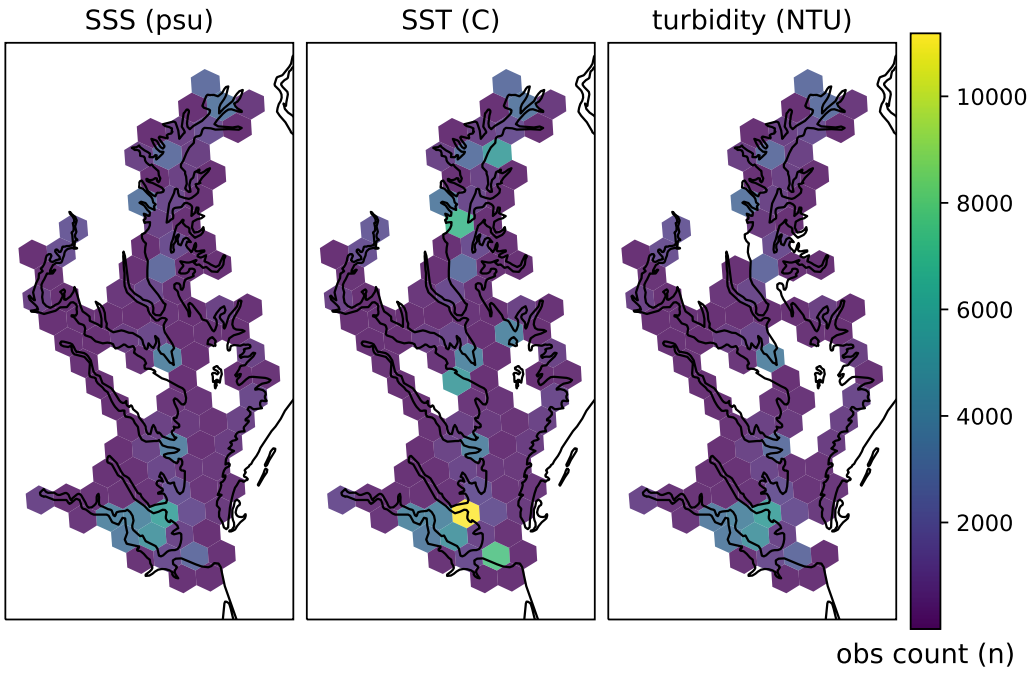


Figure 2: Locations of observational data.

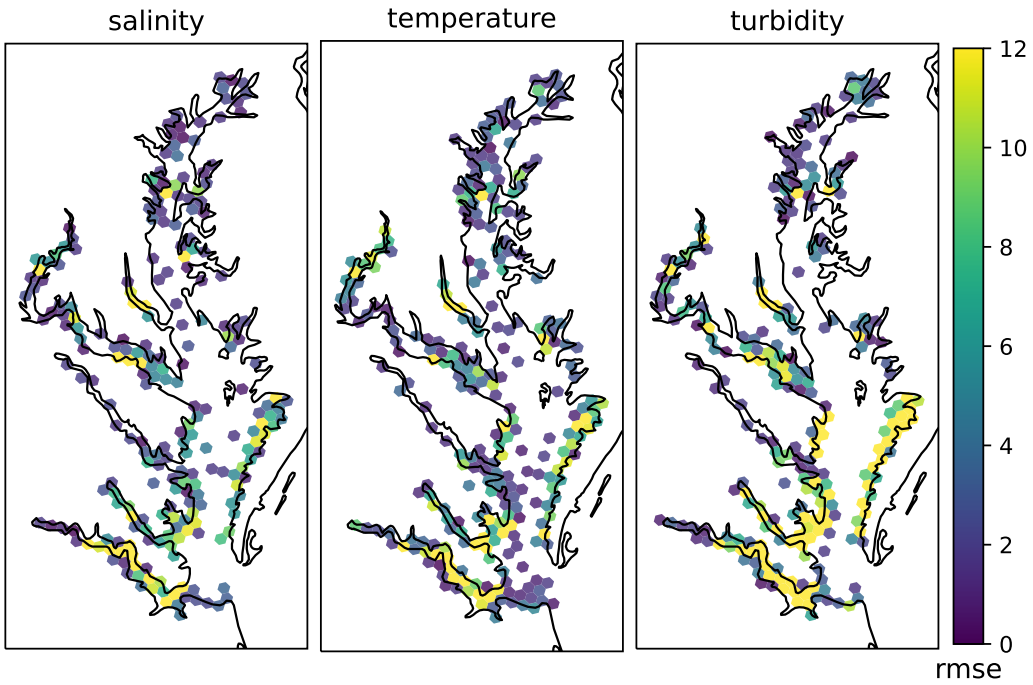


Figure 3: Map of model validation errors.