Estuarine metrics

Image UF/IFAS

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Estuarine metrics

Things we can measure that will help us understand the timing, quantity and duration of river flow that best supports ecosystem recovery in the Apalachicola Bay

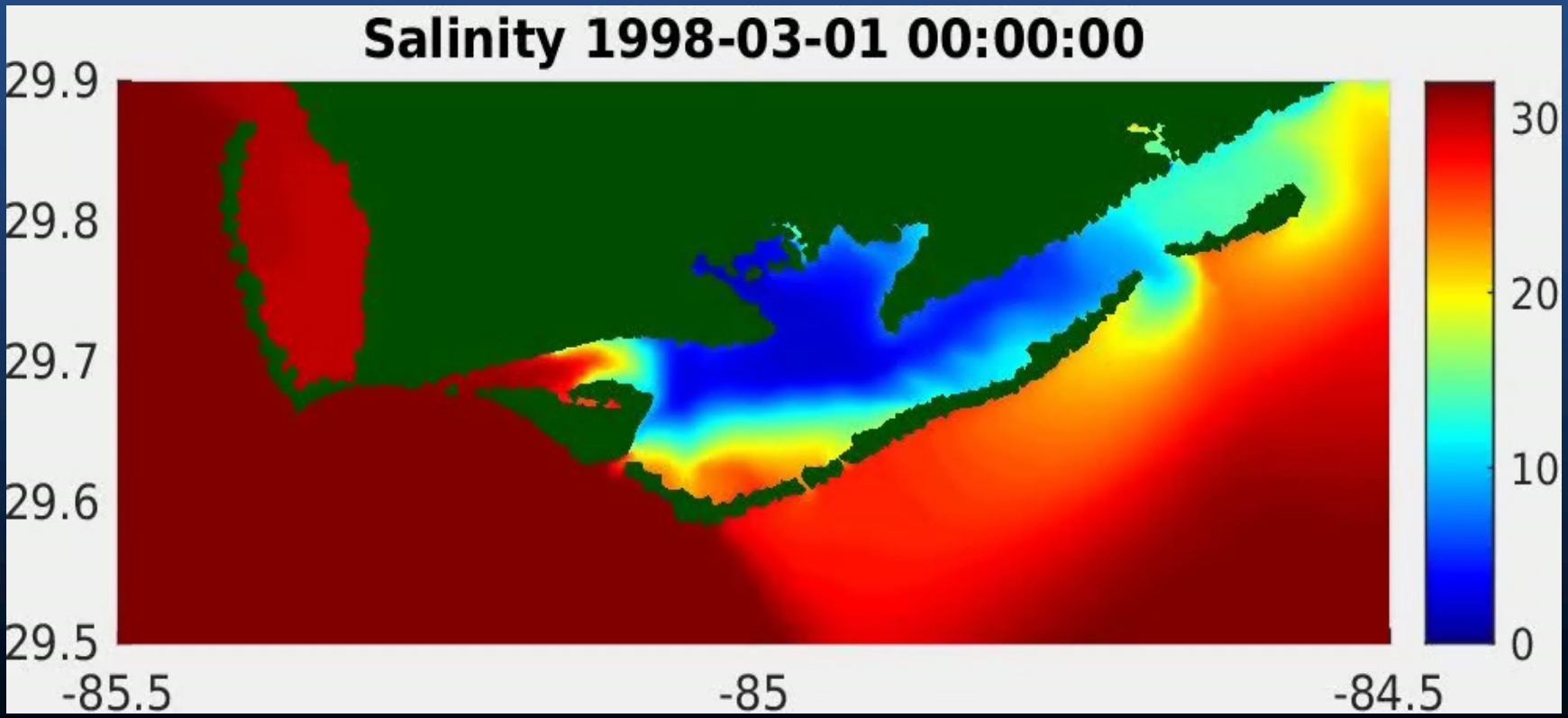
There are several different types of metrics

Environmental

Category	Associated Metrics
Environmental	For eastern oysters, the optimal range of salinities is 15-25 ppt and temperatures are 20-30°C. Use hydrodynamic models to estimate: • Spatial and temporal footprint of optimal salinity conditions under different flow regimes (and temperatures if possible). • Spatial and temporal footprint of unfavorable conditions (< 10 ppt, > 25 ppt) under different flow regimes. Use *in situ* instruments to validate and parameterize models to increase accuracy. Use ANERR data (current and historical) to hindcast environmental conditions (temp, salinity, oxygen, turbidity, pH, nutrients) relative to historical water flows.

Oysters do best at salinities around 15-25 ppt

So what we are looking for are flow regimes that give us the biggest footrprint for the longest time



Biological

Category	Associated Metrics
Biological - Oysters	Measurable biological responses may be ***immediate*** (e.g. mortality in response to extreme conditions), ***delayed*** (e.g. high mortality from predation/disease in response to extended high salinities) or ***sub-lethal*** (e.g. reduced growth in response to long-term suboptimal conditions). The following variables can be measured during monthly monitoring and results interpreted in the context of observed or modeled environmental conditions. Biological metrics include: • Mortality (boxes) – juveniles, sub-adults, adults. • Recruitment - river outflow can change current regime and environmental conditions, which influence larval survival, and dispersal. • Condition index – decreases under sub-optimal conditions. • Disease (Dermo) prevalence – increases in high salinity warm conditions. Primarily affects adults. • Reproductive status – can be impacted under long-term suboptimal conditions.

Ecological

Category	Associated Metrics
Ecological - Oysters	• Oyster population dynamics – number of live, dead and boxes for juvenile, sub-adult and adult oysters can identify size-related mortality events.
Ecological - Other Species	• Predator abundance (high salinities facilitate predators such as oyster drills, crown conch, stone crabs). • Occurrence of pests (boring sponge, blister worms) and parasites (flatworms). • Use FWC Fisheries independent monitoring data to assess distribution of fishes (and managed invertebrate species) relative to river flow and modeled/observed environmental data.

Others?

How do river flow scenarios change outcomes of:

- Predictive habitat models
- Larval dispersal models
- Ecological models
- Shell budgets

Question/comments?