***Results—***

**Oyster shell growth is similar in reduced, ambient or elevated alkalinity conditions**

Looking into **the independent role of total alkalinity**…on average, when oysters only experience variability in [TA] but little salinity change (single stressor), to what extent does lowering and elevating [TA] (at ambient salinity) influence net oyster growth (~ X umol kg-1)

* They didn’t see a strong effect of pH at ambient salinity; we didn’t see a strong effect of TA (and subsequently omega) at ambient salinity.
* Grew more with more food relative to oysters in flow through system.
* Under similar, ambient TA conditions, average growth was higher under lower salinity
* (suggests operating at a biological maximum/limited by something other than carbonate stress overall)

**Oysters’ shell growth in lower salinity was higher when coupled higher TA**

Now considering alkalinity change from a frequent source that also changes salinity (multiple stressor); for example, DI (hurricane/rainwater), diluted [TA], maintained [TA]; **to what extent does [TA] influence net growth during acclimation to low S conditions**

* In salinity reductions prepared with DI, we saw significantly lower net growth than in oysters exposed to lower salinity and a higher alkalinity.
* In our case, low S interacting with TA produced a higher influence than either change alone.
* They found that their low S (and low TA) treatment was stronger than any of the high pCO2 treatments (with ambient S). YES this is similar to our pH/TA treatments.
* When coupled with high pco2 (low pH), low S (and low TA) had a greater impact on physio and shell properties than each factor alone in their study; we did show declined shell growth in low S and low TA treatments however, our treatments spanned across the threshold of omega = 1, indicating that oysters were able to maintain similar, albeit depressed growth.

**Incremental growth rate was high following exposure (0-18 dps), then reduced following (18-36 dps)**

* Patterns that saw overall (net) were similar to what we saw in the first two weeks following exposure; this means that the overall pattern was dominated by the oysters initial response to conditions (1/2 half vs 2/d half)
* We saw benefits of high TA on incremental growth in low salinity conditions within the first two weeks, suggesting that oysters were able to optimize on their preferred condition quickly (effect was apparent by two weeks)
* In contrast, we did not see an effect of elevated TA until after 2.5 weeks in ambient salinity. Even so, the overall effect size of the second half of growth is minimal compared to first half.
* We saw a similar pattern between S and TA growth in both stages, with TA having a stronger effect in the later time period.
* We saw different patterns between TA and shell growth in the two growth phases; with the effect of TA not showing up until later, and even so, being minimal
* The mechanisms driving the decline in growth rate in the latter half of the experimented were not tested. We suspect that a number of the following may be interacting to lower growth rates in oysters: (1) the seawater was transitioning from upwelling to rainy season (cite), meaning oysters were biologically downregulating activity naturally during this period; (2) oyster growth per shell area declined with size in the latter half, a trend that differed from the slope = 0 in the beginning; (3) oysters found the experimental conditions unsuitable (for whatever reason) and downregulated activity overall. We did not alter their feeding or water change regime and are not necessarily interested in the within treatment shift through time. But rather, whether patterns among treatments remain across time.

**Differences in condition index are driven by changes in shell growth and not by differences in soft tissue mass—**

* No effect of TA or S (or pH/Omega) on soft tissue mass overall;
* However, oysters were fed enough that they increased CI relative to those fed less often and grown in the ambient flowthrough seawater.
* This indicates we had animals that could increase energy storage (were not in physiological stress) and that quick changes to their environments didn’t have a significant negative impact to their energy stores.