

Y1Q2 Progress Report

Assessing the risks of lithium pollution on estuarine fishes

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i. Summary: There was limited progress on project goals over the reporting period, primarily because the reporting period included both the Thanksgiving fall break and Christmas break. That being said, this slow period was anticipated in our timeline and project goals are proceeding as anticipated. The period in question was primarily spent getting new staff acquainted with the project and techniques, improving animal production capacity in the lab, and implementing our field sampling program.

ii. Staffing and Procurement: As mentioned in the Y1Q2 report, I re-worked the budget to change the postdoc position to a technician, graduate student and summer undergraduate students. This was done because a suitable postdoc candidate did not emerge during my recruiting efforts and I did not want to jeopardize the project timeline. Suitable candidates have been identified for all positions, and the technician and undergraduate students are in place and currently working on the project. The graduate student is being actively recruited for a fall 2024 start date, which aligns with the redesigned budget.

Project procurement is largely complete outside of project consumables. The major source of procurement over the reporting period related to the sheepshead minnow spawning brood stock. While we had hoped it was sufficiently established as of the Y1Q1 report, our spawning efforts were resulting in slightly less than the 240 embryos required for a complete embryo survival test. We therefore added 200 more individuals to the stock, which is now producing at a sufficient level.

iii. Toxicity Testing: Definitive toxicity testing in sheepshead minnow is now underway, with the first test being a developmental toxicity assay in 0 ppt water (i.e. dechlorinated Port Aransas tap water). We are also beginning a behavioral toxicity test at 0 ppt freshwater in sheepshead minnow, with the dose response curve being based on preliminary range finder EC50 concentrations. Test completion for developmental toxicity is expected the first week of February while behavioral testing will likely be complete in March.

Note that the two other marine study species, the southern flounder and red drum, will begin testing when spawns become available. Southern flounder spawning has just begun and thus we will first perform a salinity tolerance curve in embryos to assess the efficacy of testing embryos at multiple salinities. If effective, we will immediately begin developmental toxicity trials. If embryo survival is poor in the test design then we will instead use the originally planned 96 h

larval tests. Note that we are already rearing southern flounder larvae. Red drum spawning is cycling up, and the Texas Parks and Wildlife hatchery becomes active in April, so it is likely that red drum testing will mostly occur over the late spring and summer periods.

iv. Analytical Testing and Field Sampling: Field sampling has begun as of mid-November with the first sampling site being Chocolate Bay. Data are as yet unavailable, but analytic testing will be completed by mid-February. Sampling at the other three sites will take place early in Y1Q3. As a matter of interest, we were able to obtain chemistry data for water treatment facility effluent in Corpus Christi, and lithium levels exceeded human health-based reference concentrations by 2 to 3-fold.



Figure 1: Proposed field sampling sites for the determination of lithium input into Matagorda Bay. Note that the reference site is intended as a non-effluent input site for the purposes of background values.

v. Complications and Anticipated Changes: We have no complications to report from Y1Q2.