Effect of Decomposing Fish in Prolonging Red Tide Events

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Florida Red Tide Mitigation & Technology Development Initiative

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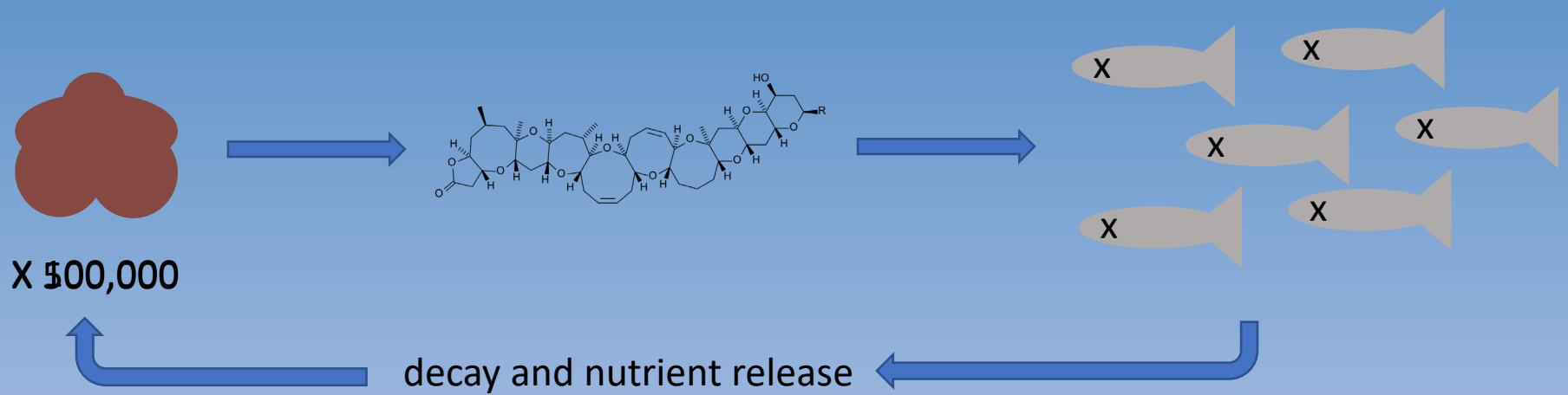

Is fish removal and composting a viable option to mitigate *Karenia brevis* blooms?

The Study:

1

Better quantify the nutrient inputs to red tide from fish kills in southwest Florida;

2

Conduct a cost/benefit analysis of fish removal as a mitigation tool;

3

Evaluate composting and use of a compost accelerator compound to repurpose the dead fish as fertilizer for local stakeholder use.

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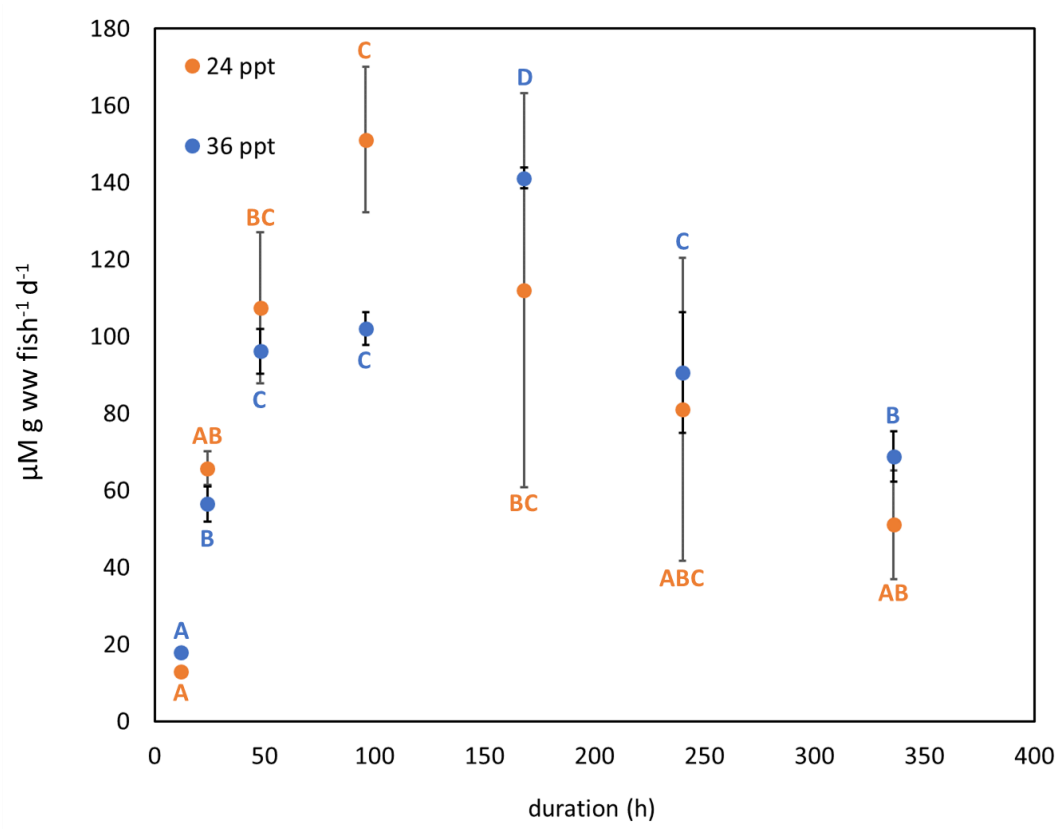
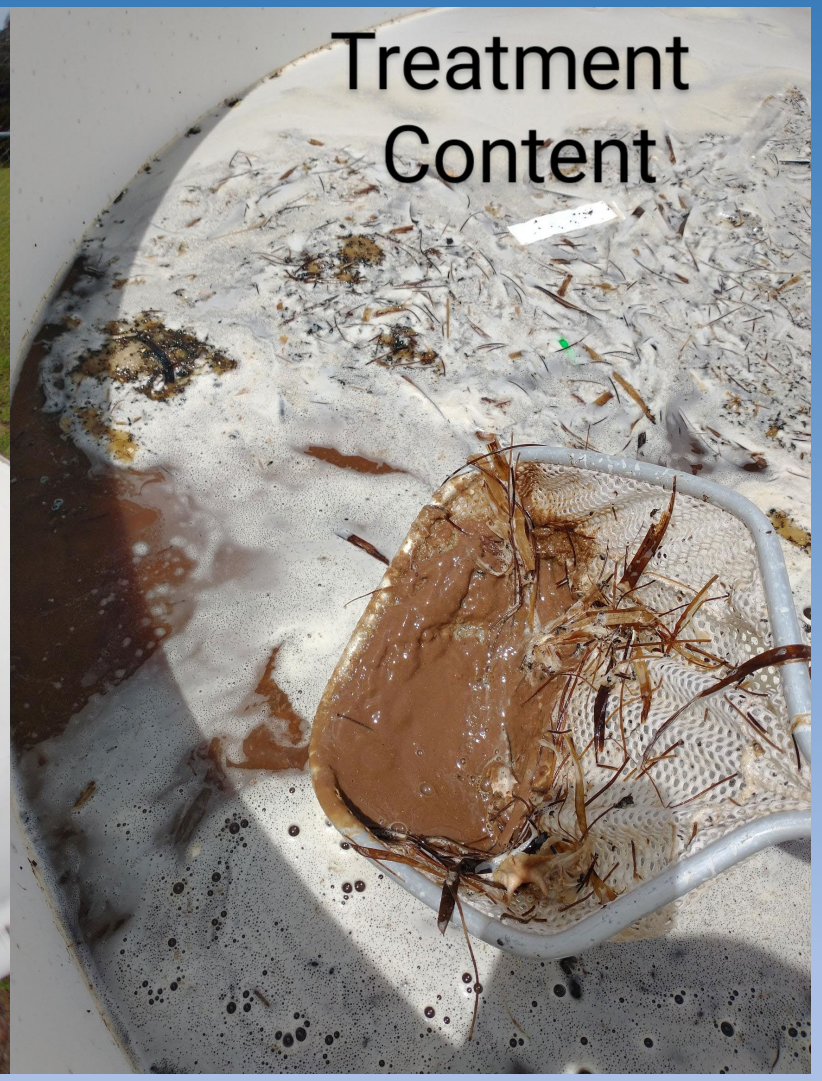


- Ammonium release rates over 14 days (336 hours) for the two salinity treatments (24 and 36) from the fall fish decay experiment.

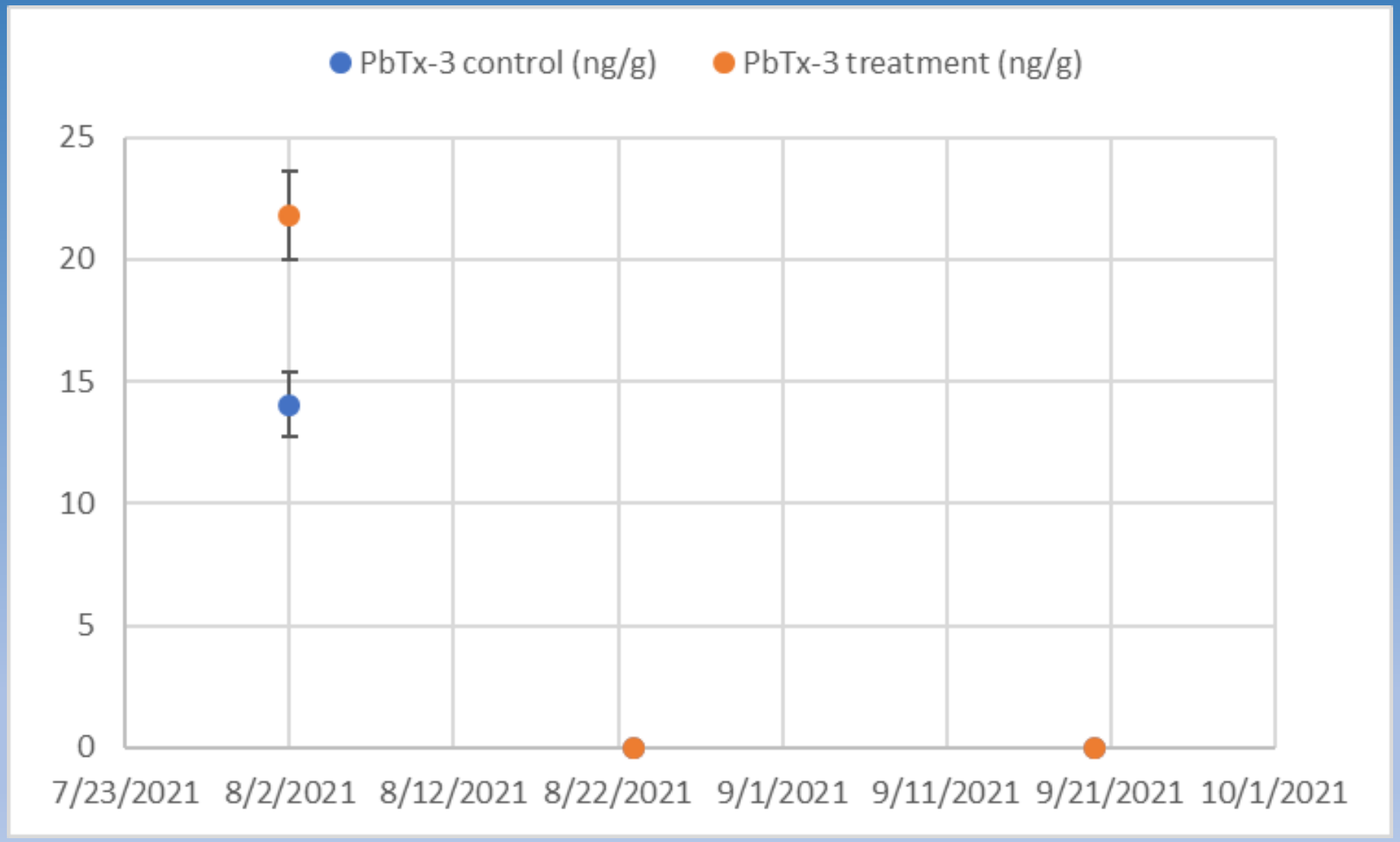
Economic Analysis Summary

- Counties lost ~$6 million per month when red tide was present (>100,000 cells L^{-1})
- Counties spent ~$1,600 to $6,000 per ton for fish carcass clean-up
- Appears to be economically feasible to remove fish IF such removal can mitigate (i.e., reduce) red tide intensity

- What can we do with the dead fish?



NPK analysis: Treatment material end product was 74% nitrogen, <10% phosphate and 6% potash (by weight).


PbTx-3 control (ng/g)
PbTx-3 treatment (ng/g)
25
20
15
10
5
0
7/23/2021
8/2/2021
8/12/2021
8/22/2021
9/1/2021
9/11/2021
9/21/2021
10/1/2021

Summary and Next Steps

Fish are major source of ammonium;

Removing fish MAY remove a major nutrient source, mitigating red tide;

Fish removal appears to be economically feasible;

Composting creates a nitrogen-rich, toxin-free product

- Organic fertilizer?
- “Nitrogen neutral”

Next steps are to:

- Examine actual nutrient (and red tide) reductions associated with fish removal in the field;
- Examine feasibility of large-scale fish composting and utilization as local fertilizer resource

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