Investigation of the salinity tolerance of invasive and native coastal crayfish in South Carolina, USA

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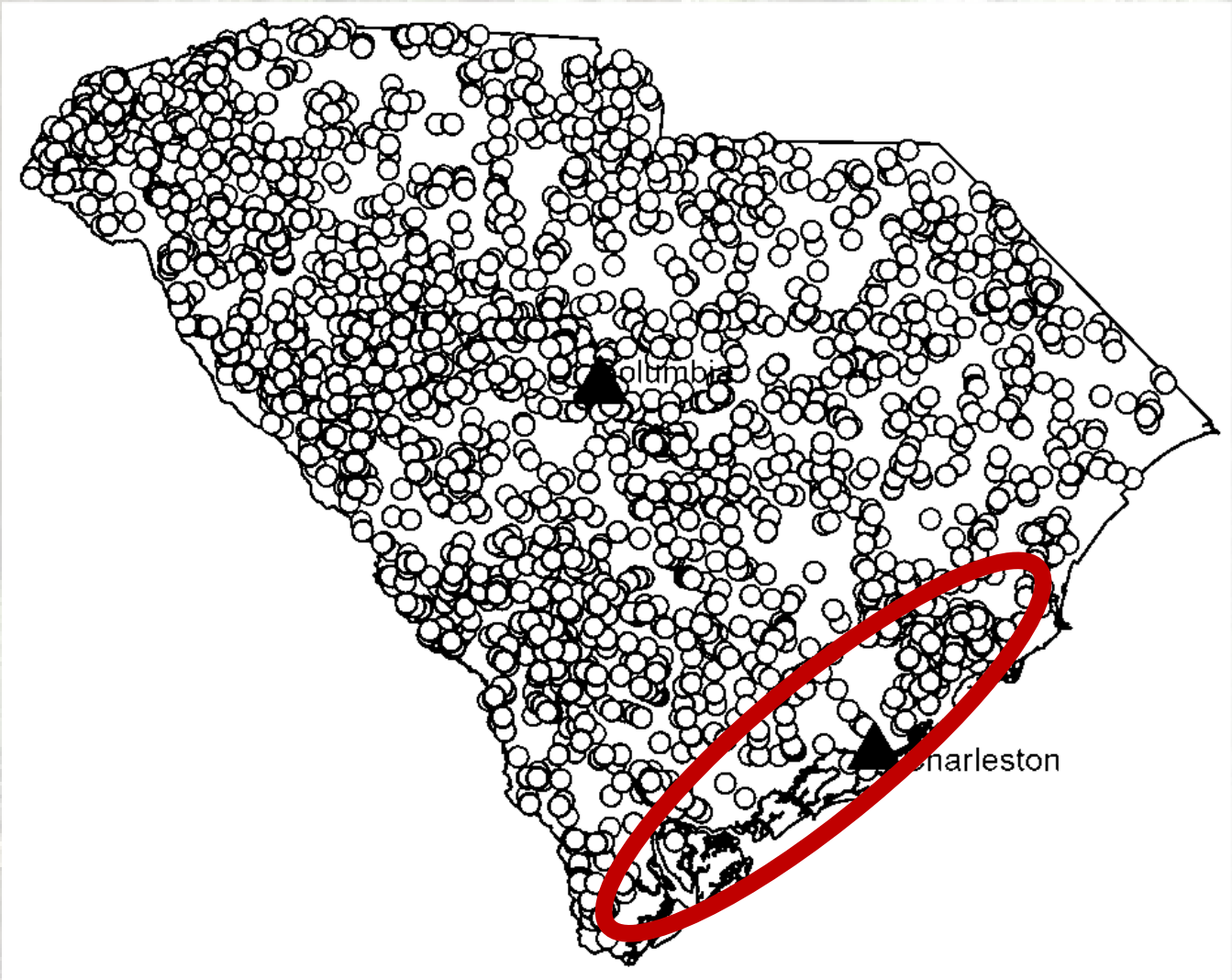
DNR

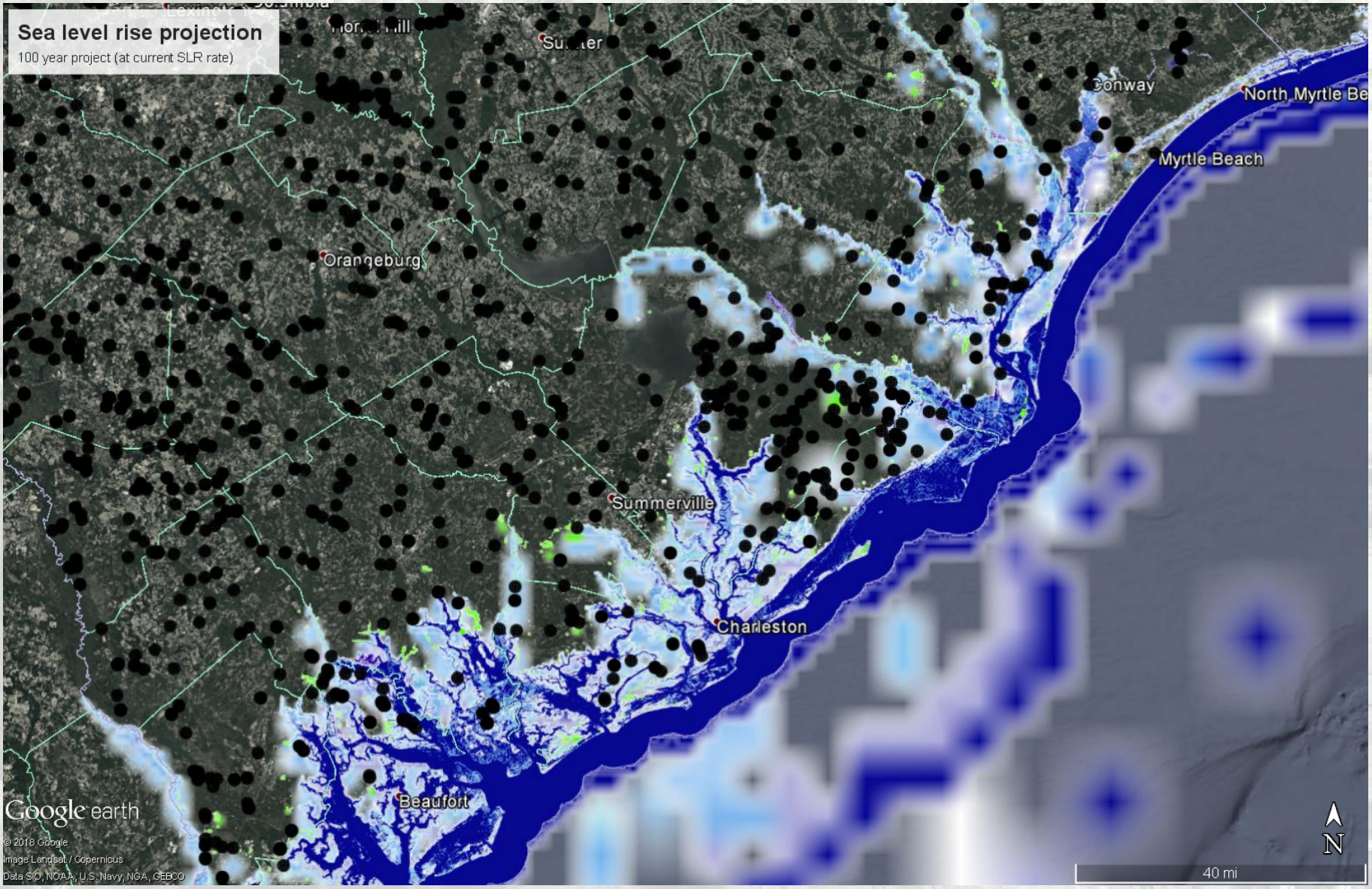
Crayfish in South Carolina



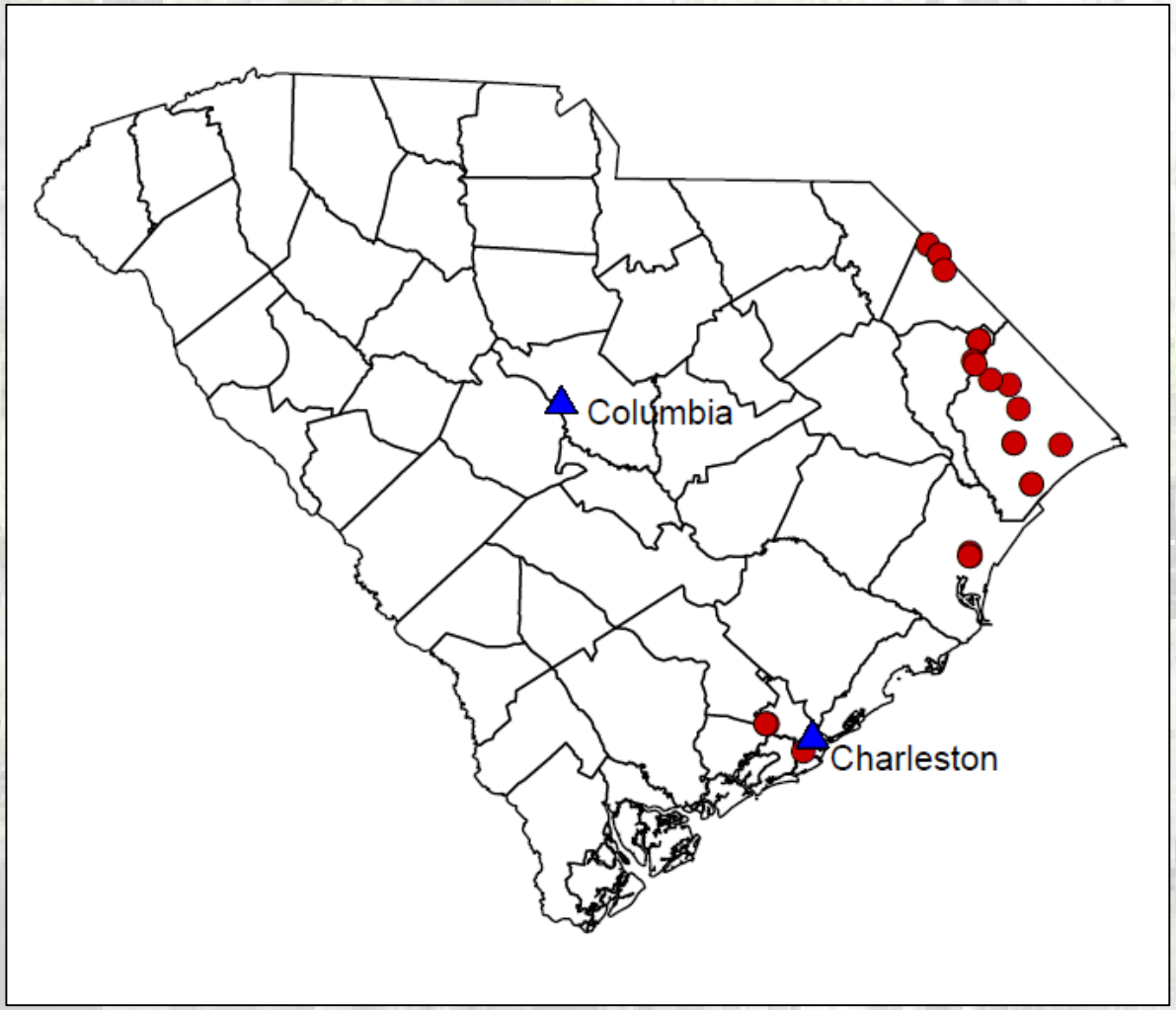
Data: updated from Eversole & Foltz 2015

Sea level rise in SC

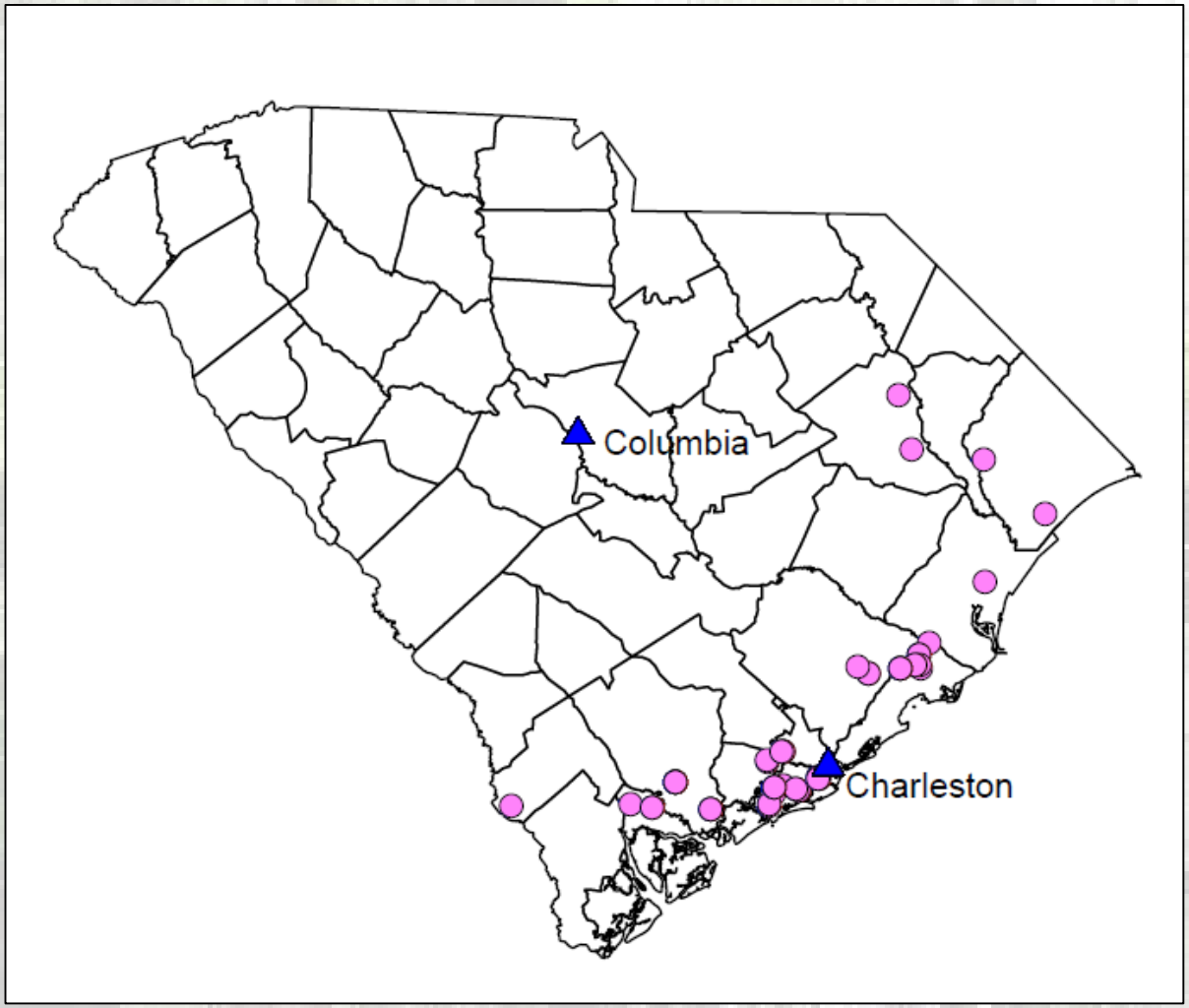
Sea level rise in SC



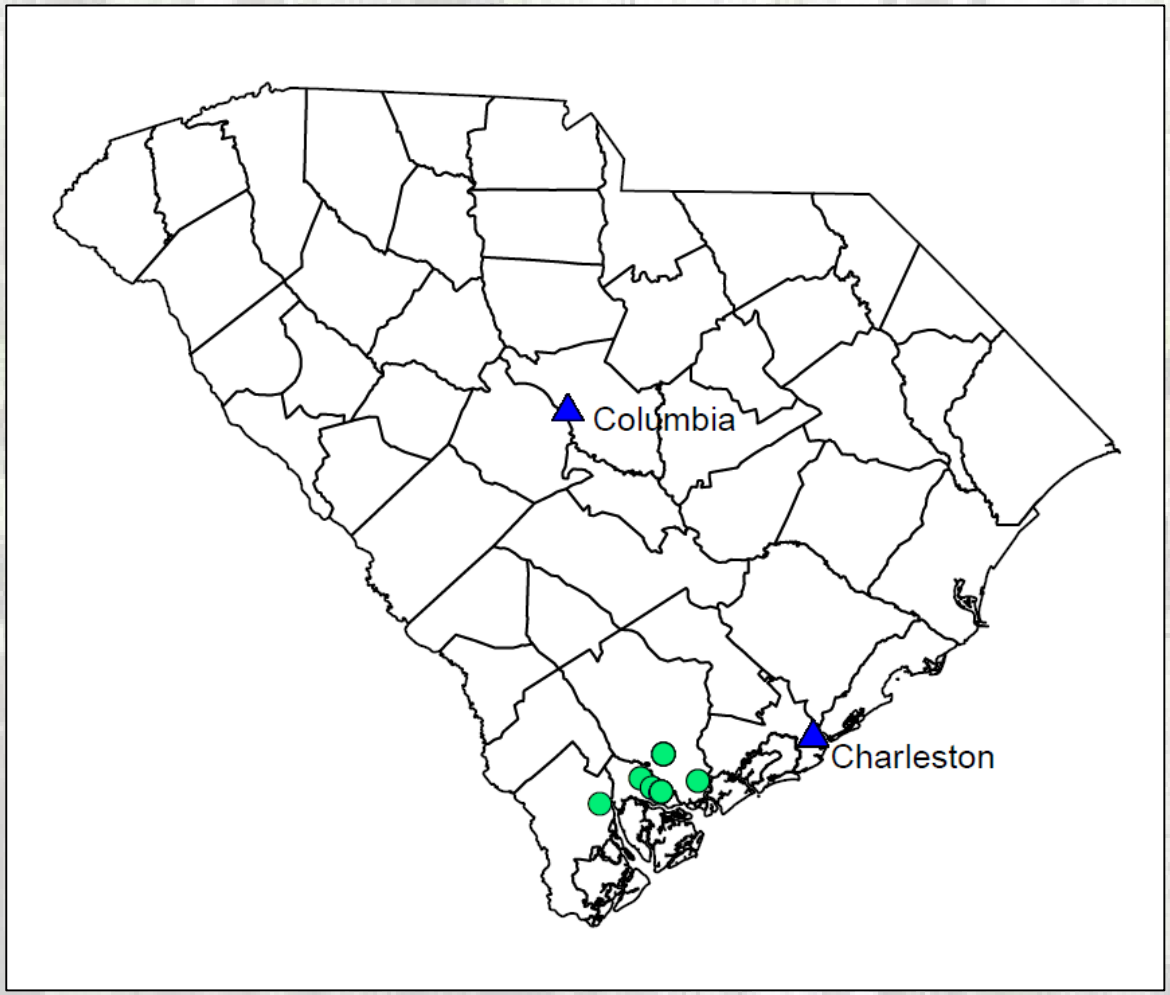
Procambarus clarkii (Invasive red swamp crayfish)



Procambarus troglodytes (Eastern swamp crayfish)



Procambarus lunzi (Hammock island crayfish)



Research Objective

- **Determine the salinity tolerance of *P. clarkii*, *P. troglodytes*, and *P. lunzi***
  - **Predict response to salinization of habitats**

P. clarkii and P. troglodytes: Sample collection

- Collected crayfish from freshwater wetlands in Wadmalaw and Georgetown, SC

P. clarkii and P. troglodytes: Experimental trials

- 0, 6, 12, 18, 24, 30 psu treatments
- 4 crayfish per tank, 4 tanks per treatment
- 7 day trials
- Mean % survival

P. clarkii and P. troglodytes: Results

Procambarus clarkii

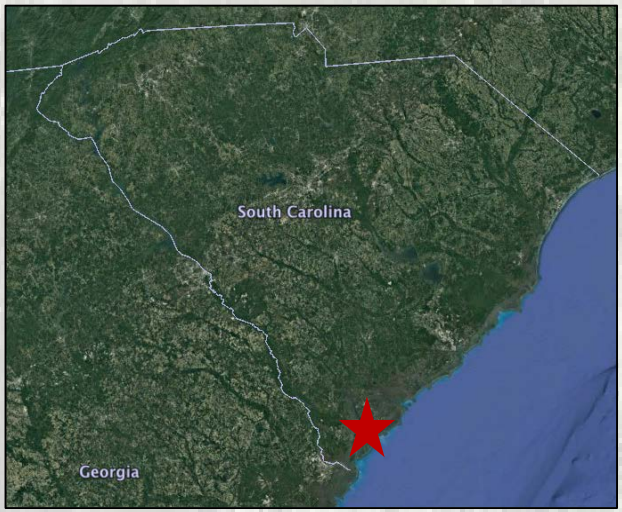
Salinity (psu)	Survival (%)
0	100
6	100
12	100
18	100
24	100
30	56.3 (± 6.3)

Procambarus troglodytes

Salinity (psu)	Survival (%)
0	100
6	100
12	100
18	100
24	100
30	62.5 (± 16.1)

P. lunzi: Field sampling

- Collected from South Williman Island
- Salinity ranged from 0.7 to 7.0 psu



P. lunzi: Experimental Trial 1

- 0 & 30 psu treatments
- 4 crayfish per tank, 4 tanks per treatment

Salinity (psu)	Survival (%)
0	100
30	18.75 (± 6.25)

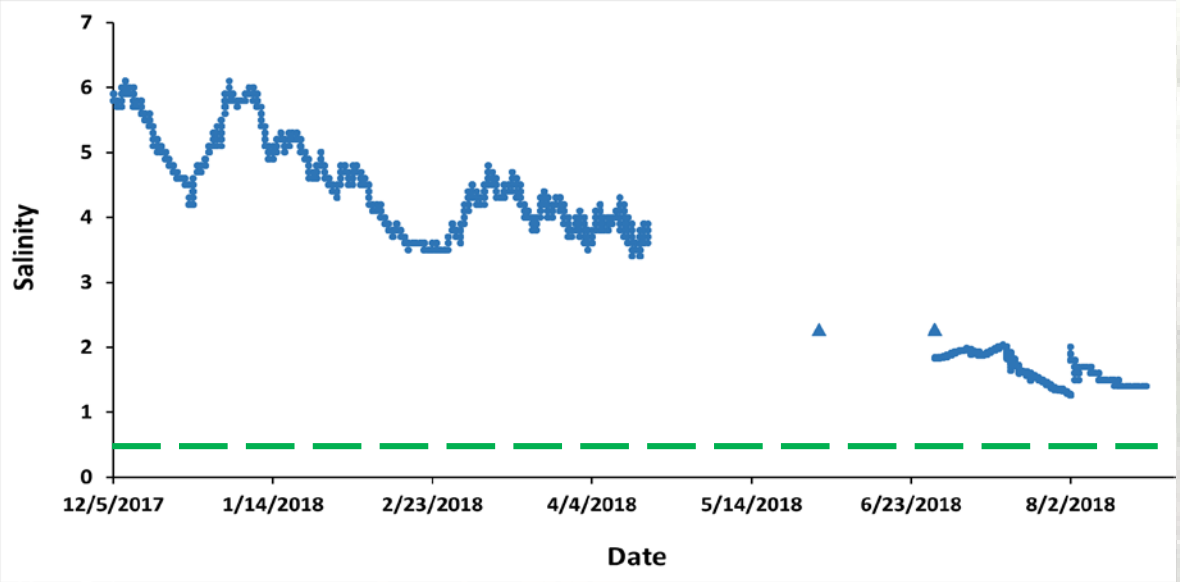
P. lunzi: Experimental Trial 2

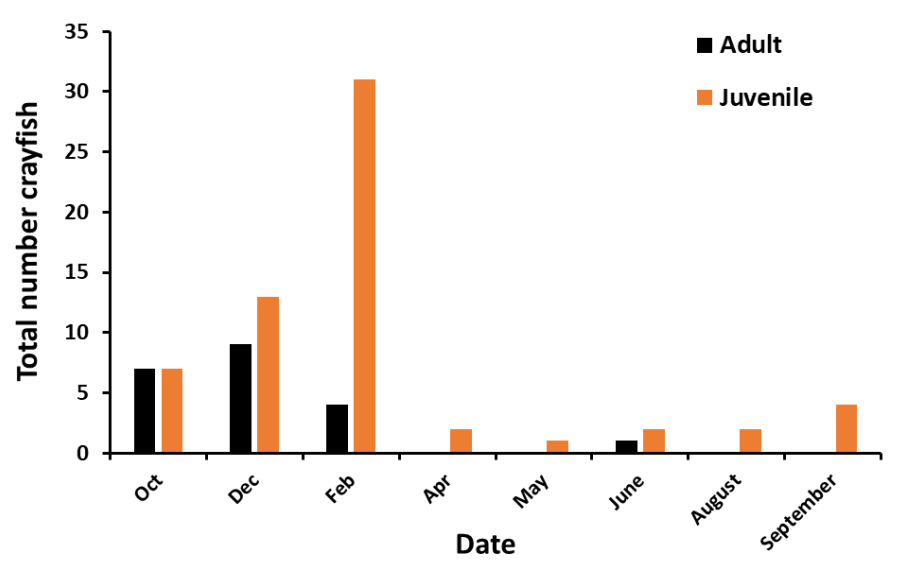
- Crayfish previously stressed from high-salinity habitat conditions?
- 0 psu treatment crayfish from Trial 1 kept in 0 psu
  - Fed every other day for 2 weeks
- 0 & 30 psu treatments
- 4 crayfish per tank, 2 tanks per treatment
- 7 day trial

Salinity (psu)	Survival (%)
0	100
30	87.5 (± 8.8)

Salinity and *P. lunzi* abundance on North Williman Island

Salinity and *P. lunzi* abundance on North Williman Island





Conclusions

- Experimental data show high survival at high salinities over 7 days
- Chronic high salinity recorded on Williman Island
  - Potential saltwater inundation from Hurricane Irma
- Low abundance of *P. lunzi* on North Williman Island
- Chronic exposure to higher salinities may have negative effects on *P. lunzi*

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