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Advancing Knowledge on Night smelt/*Spirinchus starksi* populations in Humboldt & Del Norte counties

Sarah Moreau

Cal Poly Humboldt, Sarah.Moreau@humboldt.edu

Z. Zenobia

Cal Poly Humboldt, tgz1@humboldt.edu

Jose R. Marin Jarrin

Cal Poly Humboldt, jrm261@humboldt.edu

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Advancing Knowledge on night smelt/*Spirinchus starksi* populations in Humboldt & Del Norte counties

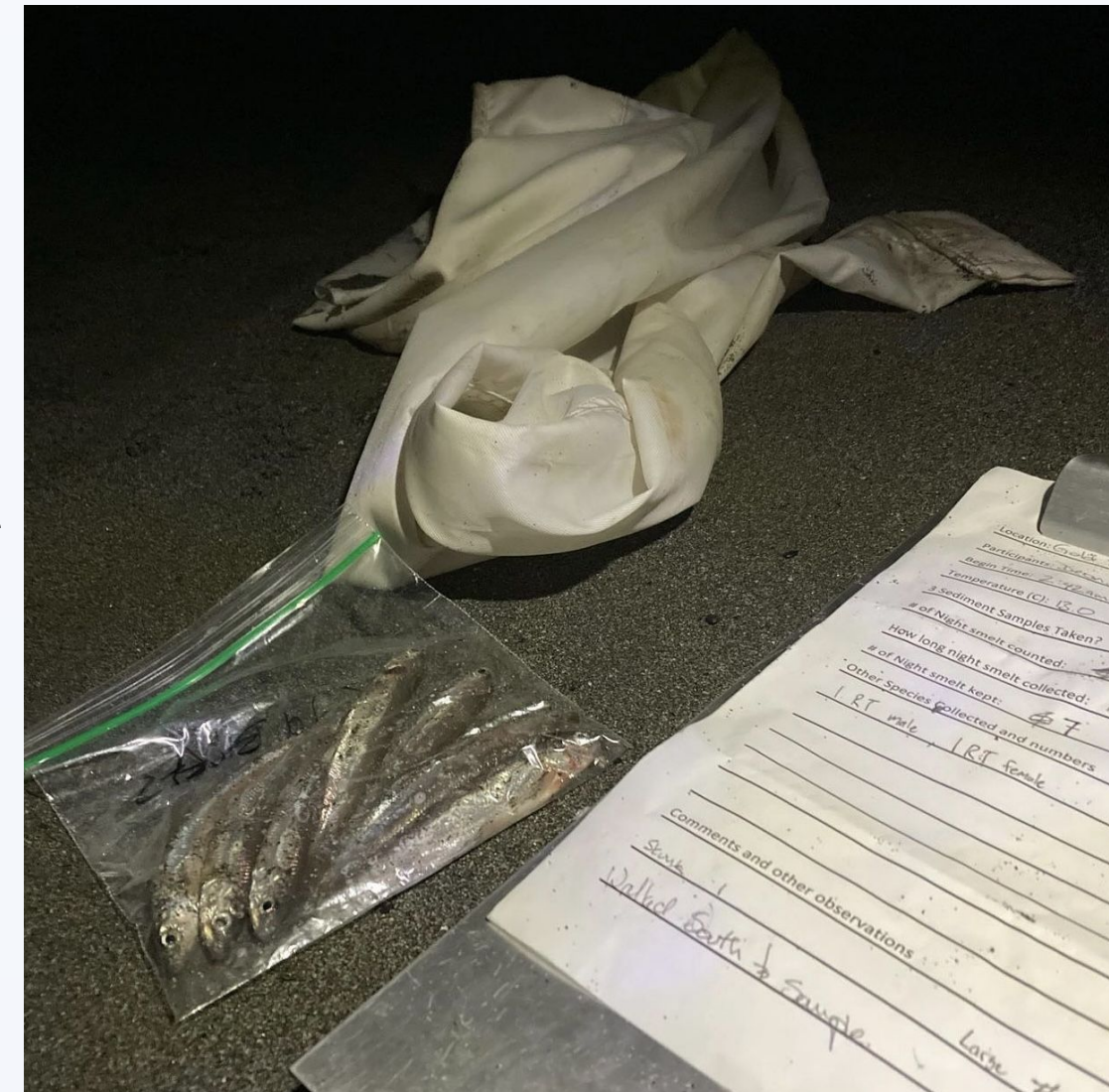
Sarah Moreau, Z Zenobia, Jose R. Marin Jarrin

Department of Fisheries Biology and Biology, Cal Poly Humboldt



Introduction

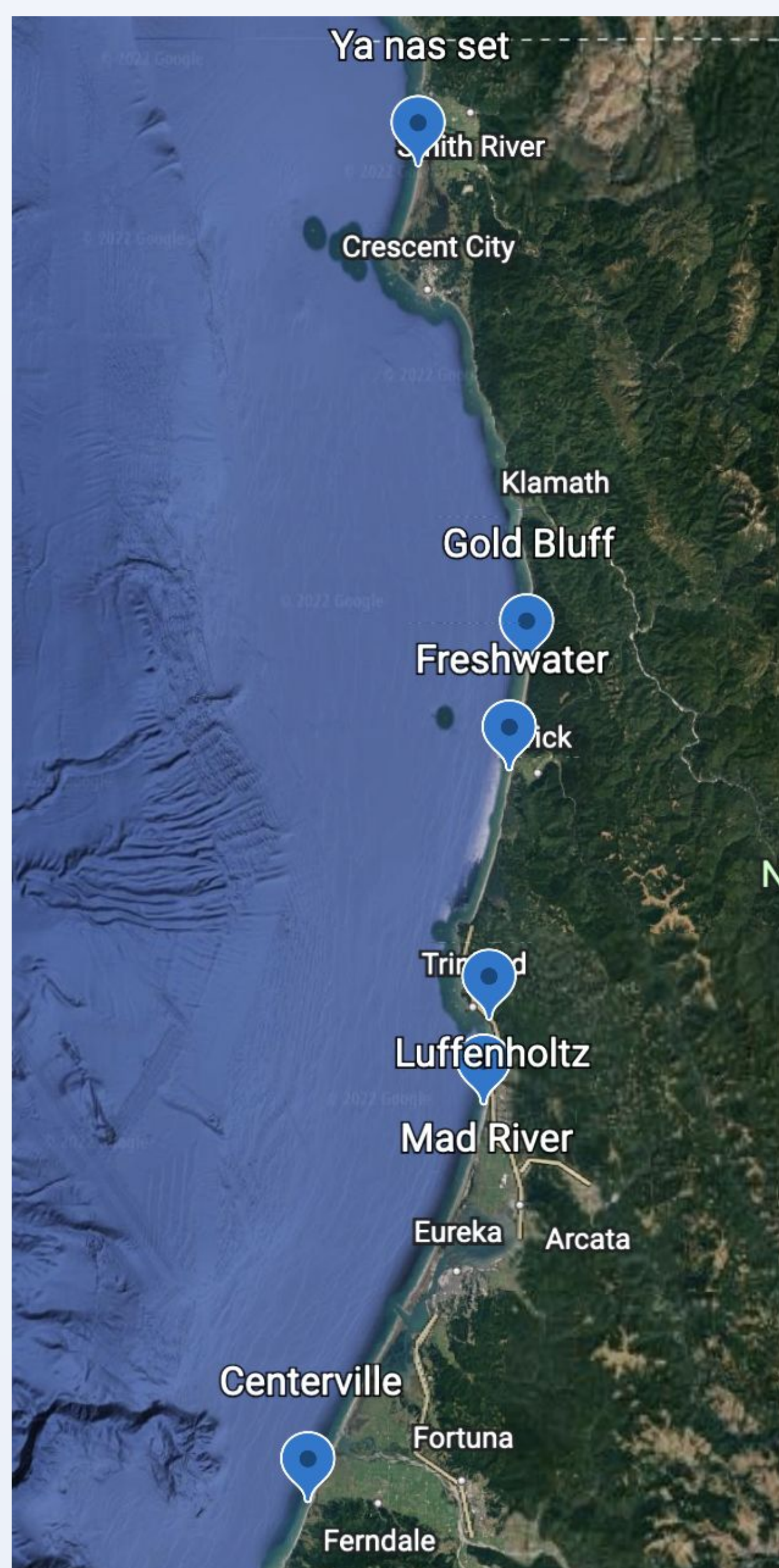
- Northern California coastline is valuable ecosystem for many fish species
- Night smelt (*Spirinchus starksi*) is common in sandy beach surf zones and are commercially, culturally and ecologically important



- However, little to no information on their biology, nor the effects of abiotic factors.
- To fill in these knowledge gaps, we sampled night smelt in Humboldt and Del Norte counties during 2021

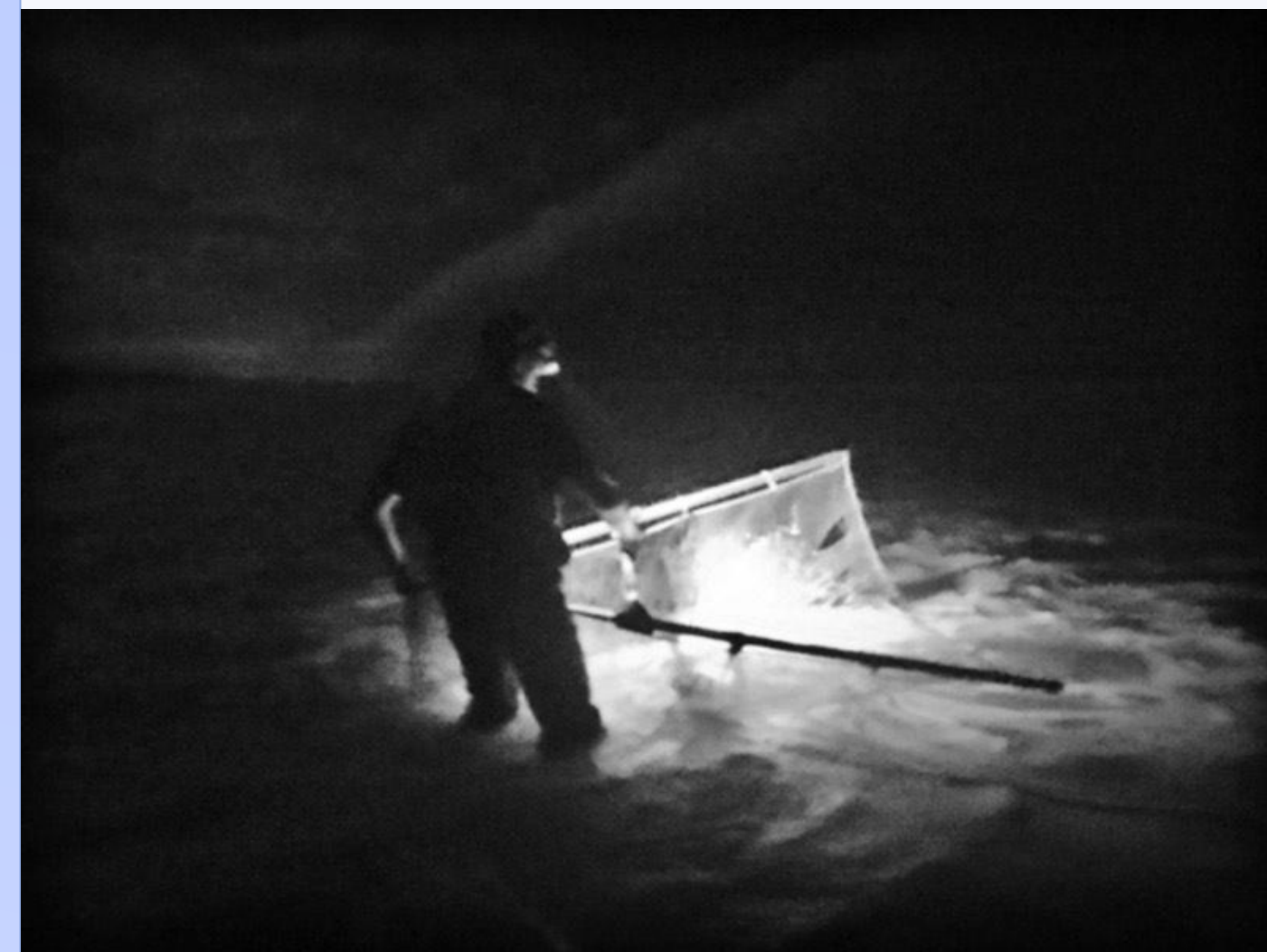
Sampling Sites

- Six beaches sampled in Humboldt and Del Norte counties
- Each site sampled once per month from March through September 2021
- Sampling at night for one hour on outgoing tide



Methods & Materials

- Sampled night smelt with A-frame
- Measured salinity and temperature with hand-held sensor
- Collected 3 sediment samples to estimate sand grain size



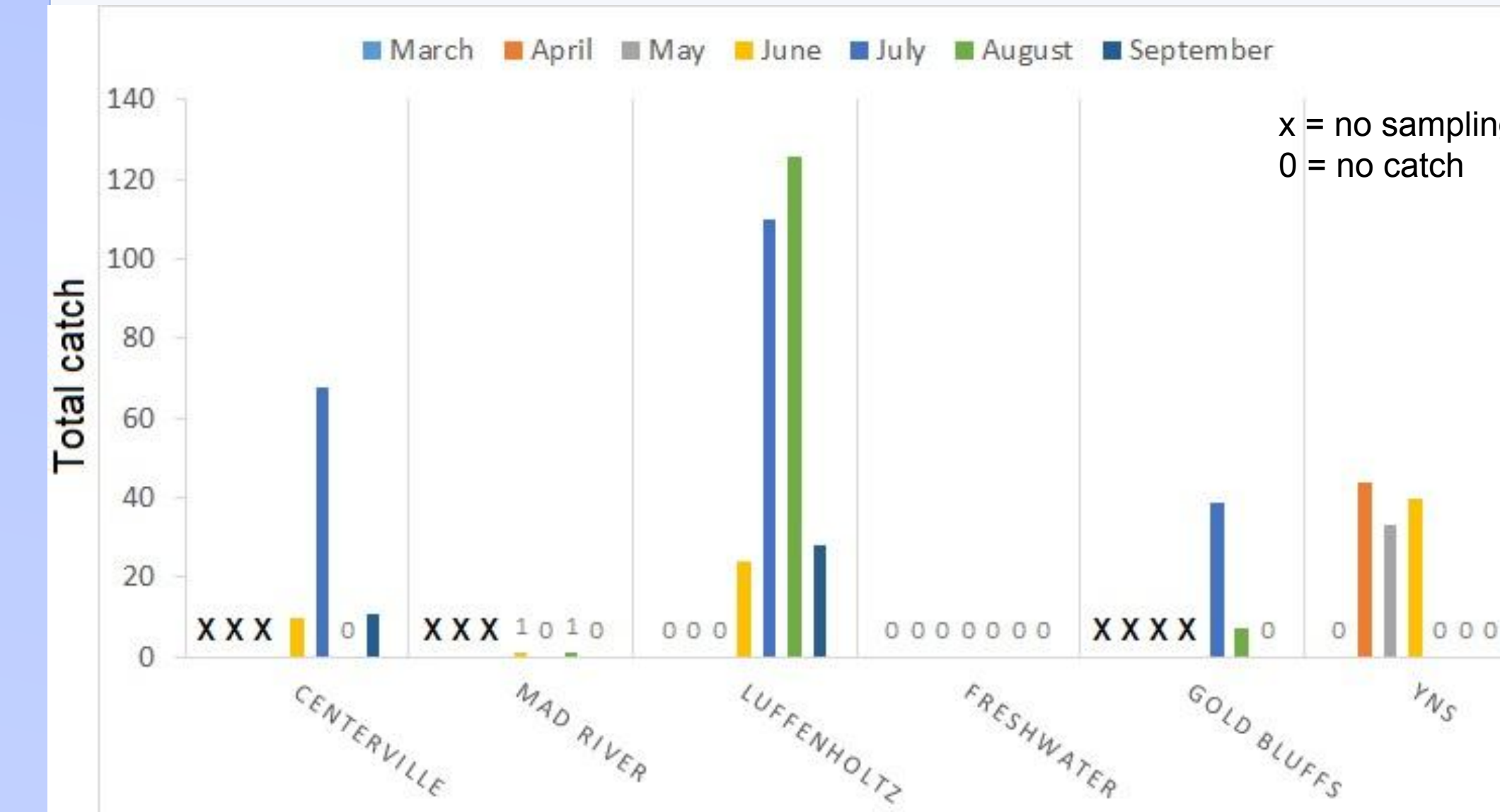
Lab Analysis

- Estimated catch per unit effort as number of fish per angler per hour
- Downloaded wave height from National Data Buoy Center
- Set of sieves to measure sediment grain size
- Excel & R for statistical analysis, multiple regression analysis

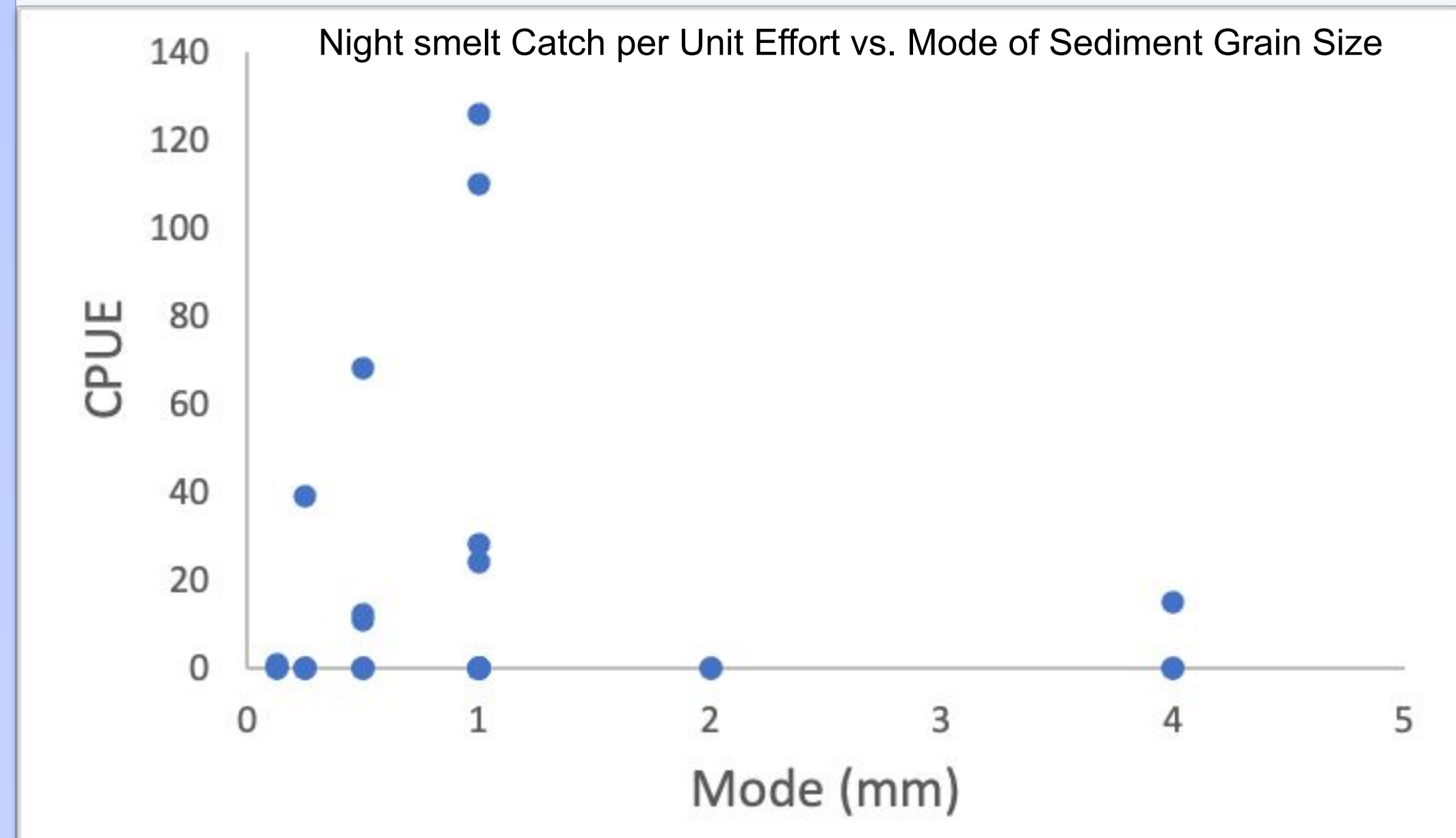
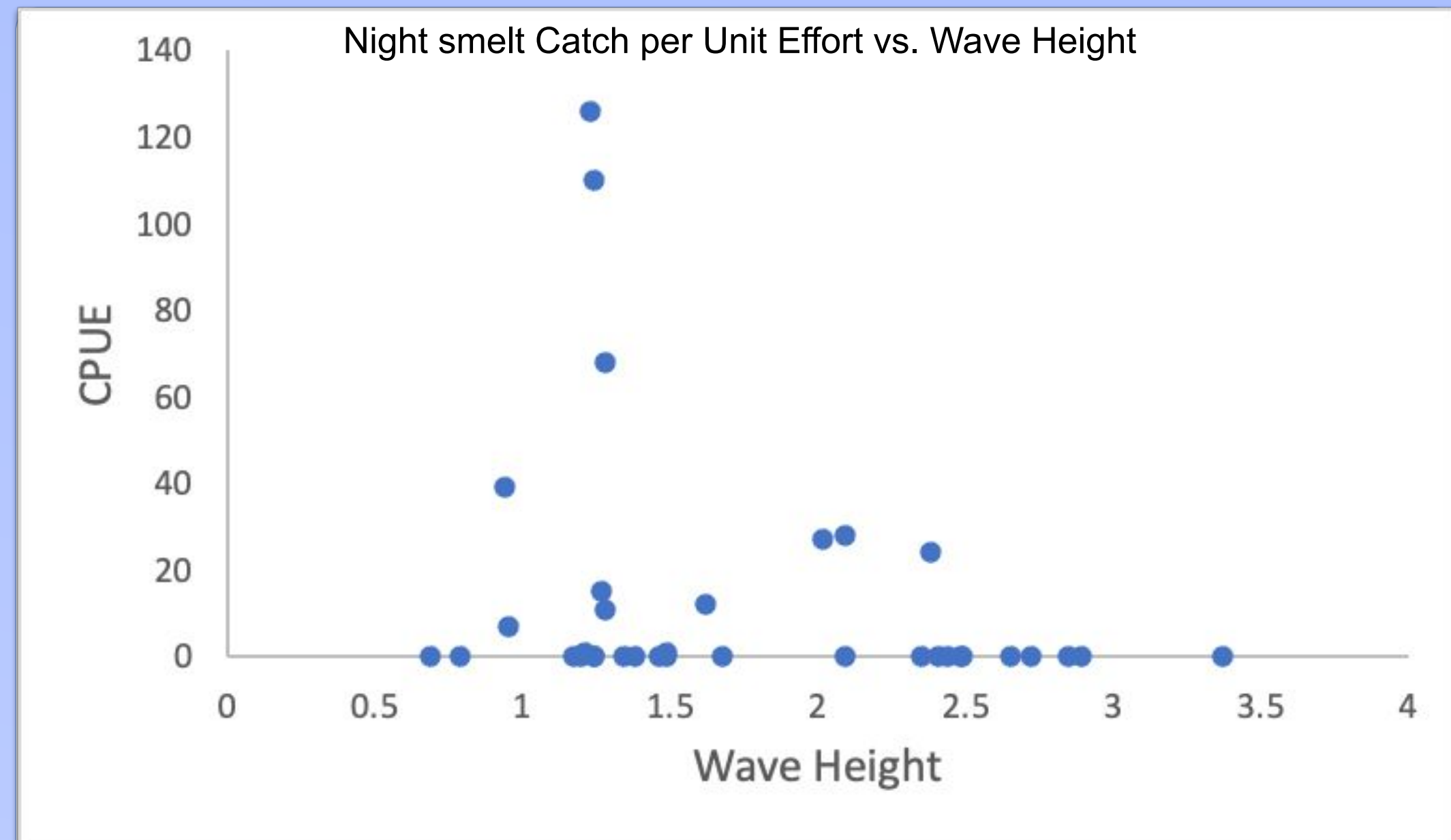
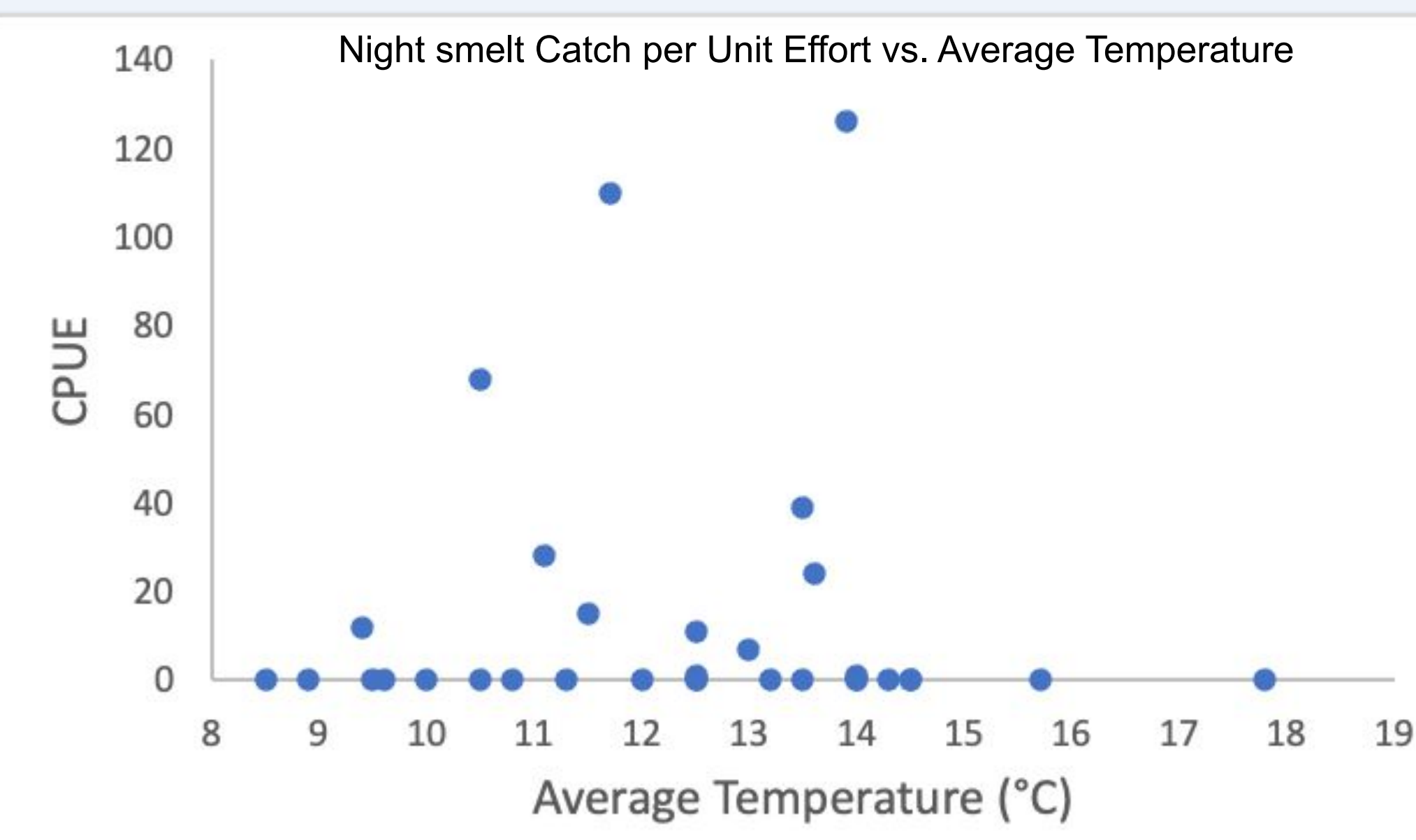
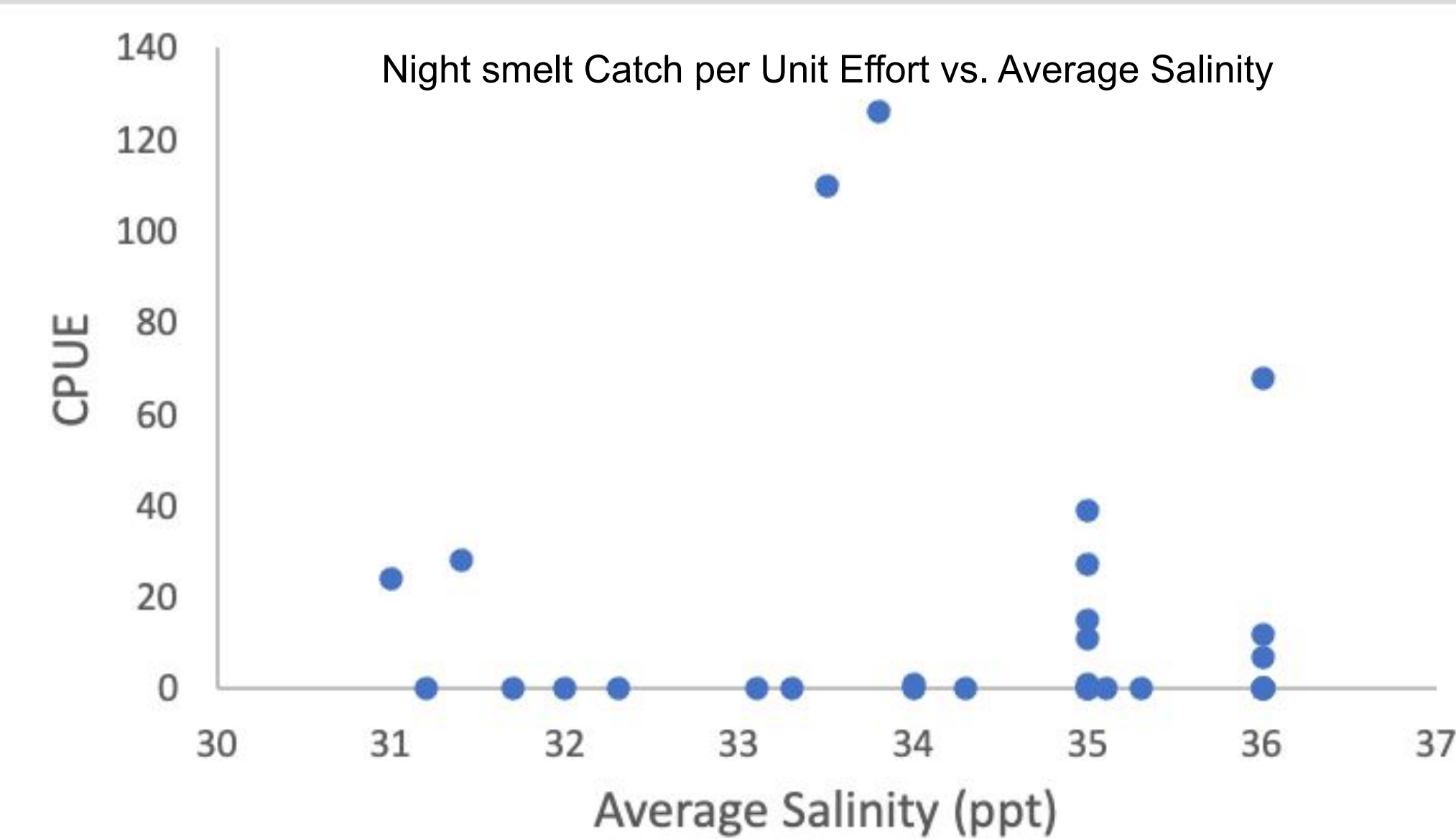


Results

- We collected 529 night smelt, with an average of 13 and a range of 0 to 126 fish per angler per hour



- Water temperature, salinity and wave height were on average 12.3 °C, 34.3 ppt, and 1.6 m and ranged from 8.5 - 17.8 °C, 31 - 36 ppt and 0.69-3.37 m, respectively
- The mode of sand grain size was on average 1 mm
- Night smelt were present earlier in YNS and later in Luffenholtz
- Fish abundance was not significantly different among beaches or months, and was not significantly correlated with temperature, salinity, wave height or sediment grain size (mode) ($p > 0.05$)



Conclusions and Discussion

- No significance among the beaches, months, temperatures, salinity, wave height, or sediment grain size (mode) - why?
 - Small sample sizes
 - Missing data, data not recorded
 - Many zeros, fish were often not caught
 - Abundances are influenced by other factors including biological variables such as potential prey or predators
- Why were catches so low?
 - Climate shifts in the last decade have lead to smaller populations and larger waves

References

- H.T. Harvey & Associates CDFW, California Commercial Beach, and Fishermen's Association. 2015. Collaborative Research on the Spawning Population of Night Smelt (*Spirinchus starksi*) in Humboldt and Del Norte Counties, California. H.T Harvey & Associates, HTH Project No. 3501-01, Arcata California. 25 pp.

Acknowledgments

Collaborators: Laucci R., McCovey S., Meyers K., Ray J., Van Pelt M.

