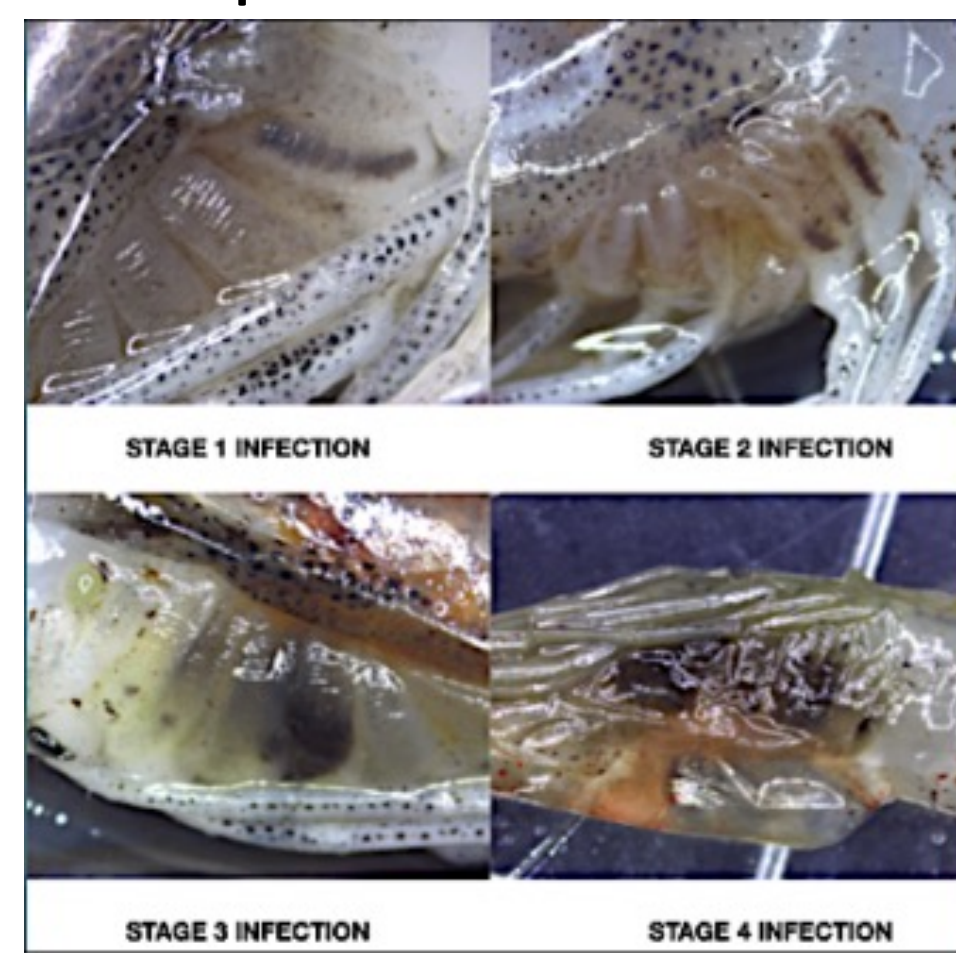


## INTRODUCTION

- Black Gill disease (sBG) is caused by a ciliate parasite, *H. lynni.*, which infects shrimp gills and can lead to necrosis and potentially death.
- sBG is found in the Southeast Atlantic and Gulf of Mexico where penaeid shrimp are commercially valuable.
- This study aims to investigate the prevalence of sBG on a week-to-week basis, and behavior and disease progression in differing salinities.
- Hypotheses: (1) the percentage of penaeid shrimp infected with sBG will increase June-July, and disease prevalence will be higher in areas of lower salinity. (2) Shrimp developing at higher salinity will have higher survival than shrimp at lower salinities.



## WEEKLY SAMPLING

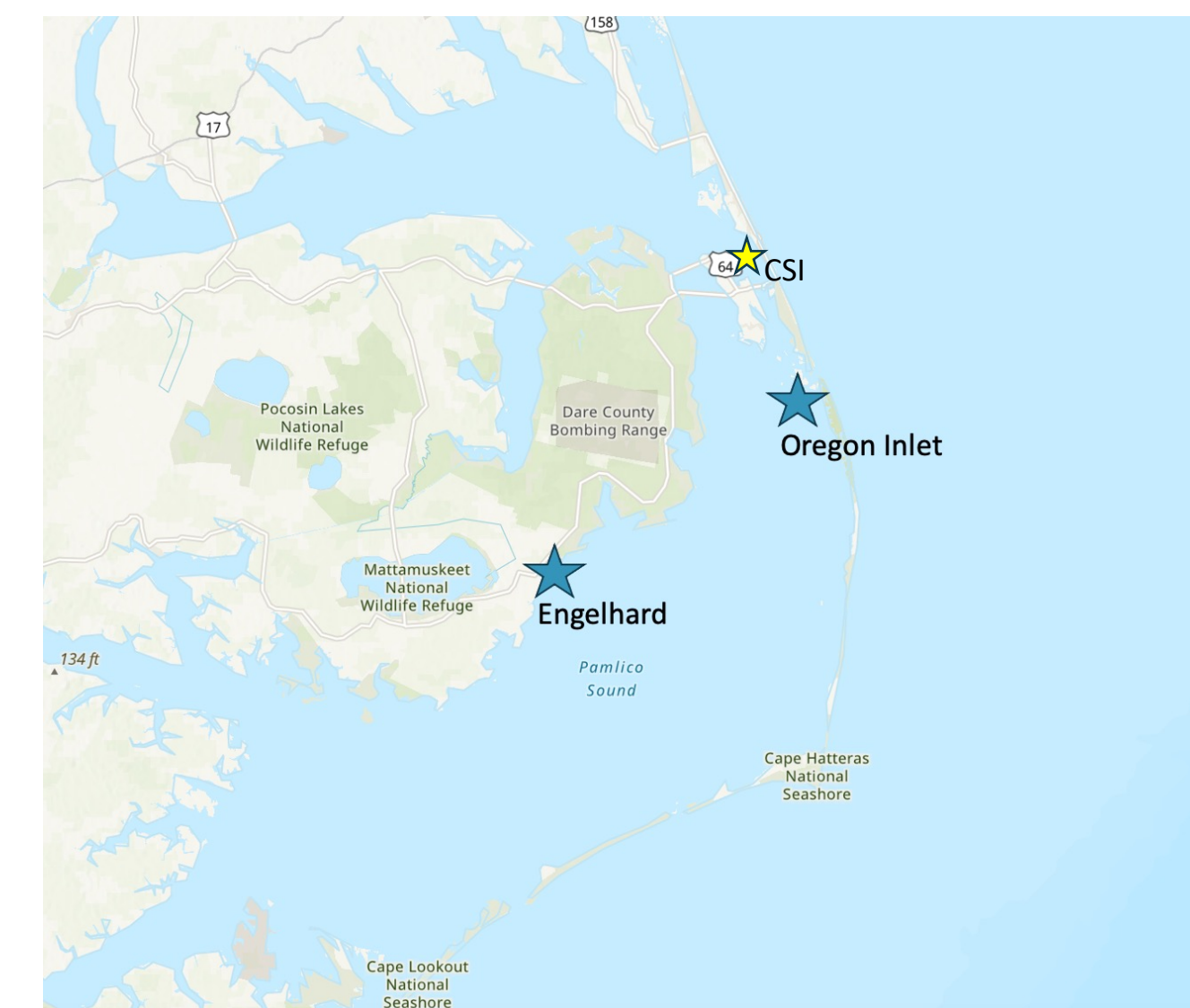
### Methods



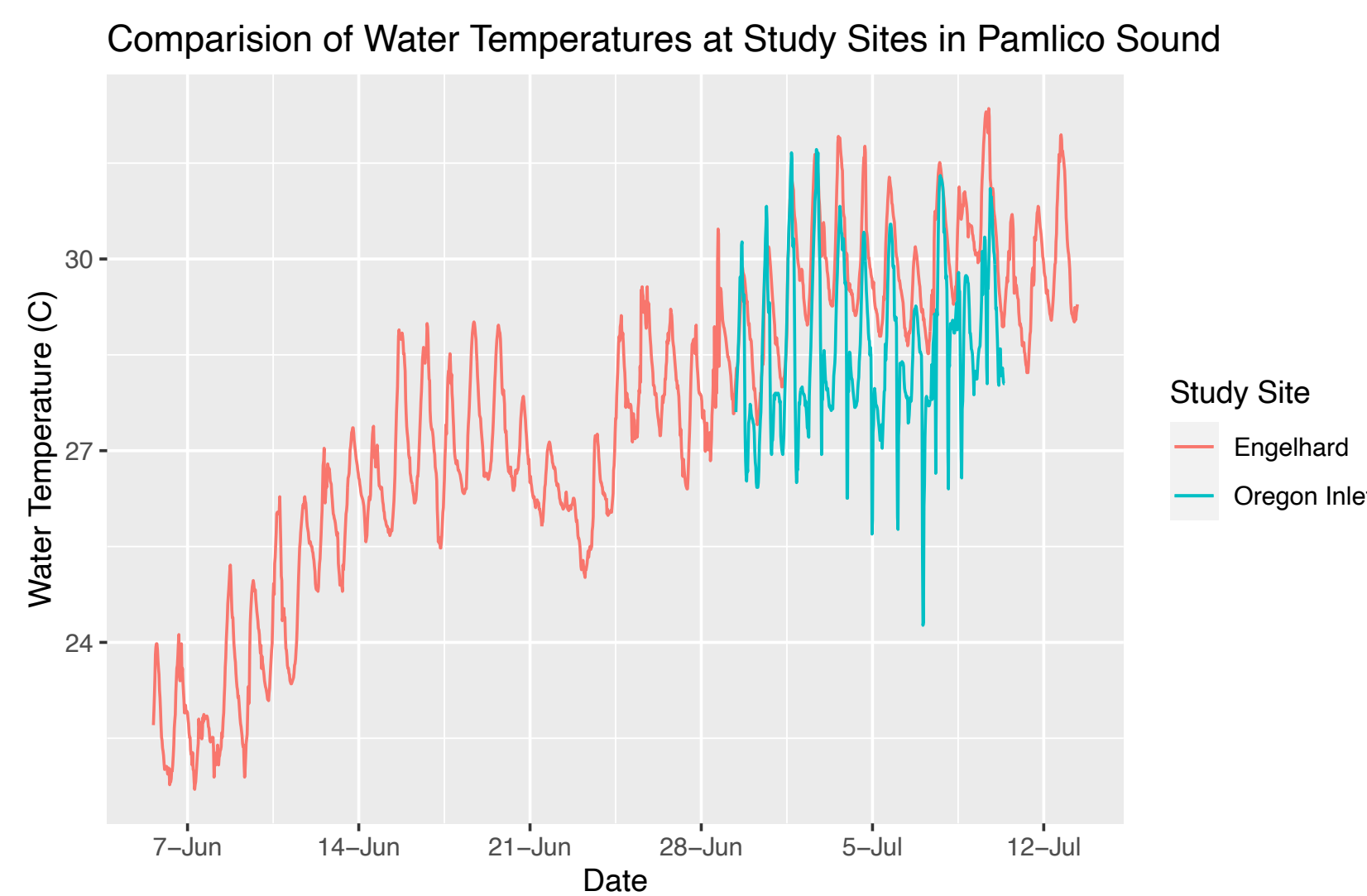
Shrimp collected weekly June-July from two regions in Pamlico Sound. Beach seines and dipnets used for collection.



Samples processed using microscopy to examine the gills for signs of sBG and classify the severity of infection from 0-4.

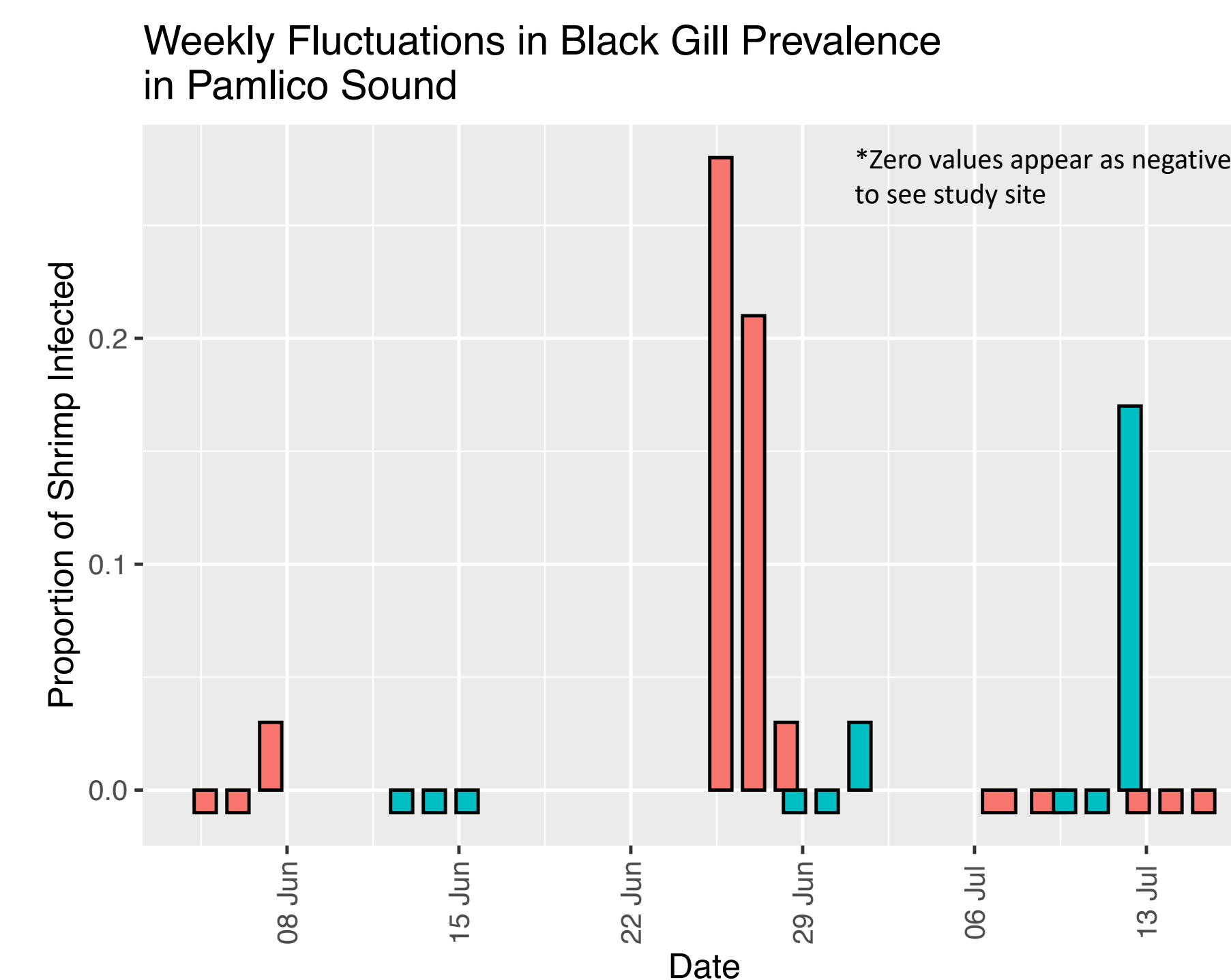


Map of sampling sites in Pamlico Sound, NC.



Water temperatures were collected throughout the day using a temperature logger at both sites. Oregon Inlet is typically cooler and has larger fluctuations due to its proximity to the ocean.

## Results

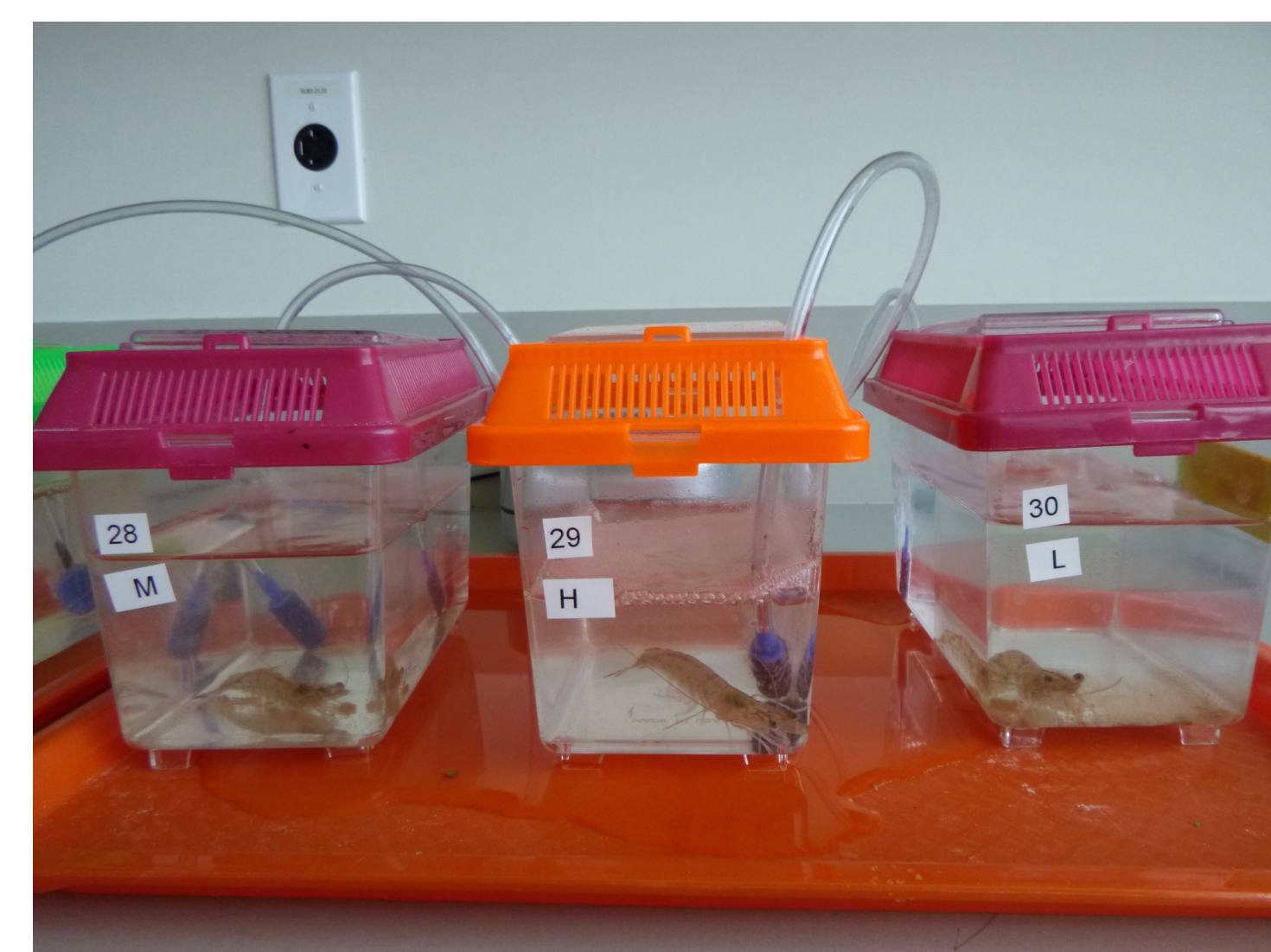


\*Zero values appear as negative to see study site

Infection rates of sBG showed weekly fluctuations. Rates were usually higher at Engelhard, however there was no significant difference in prevalence between the two sites (t-stat=0.75, p=0.46).

## SALINITY EXPERIMENT

### Methods

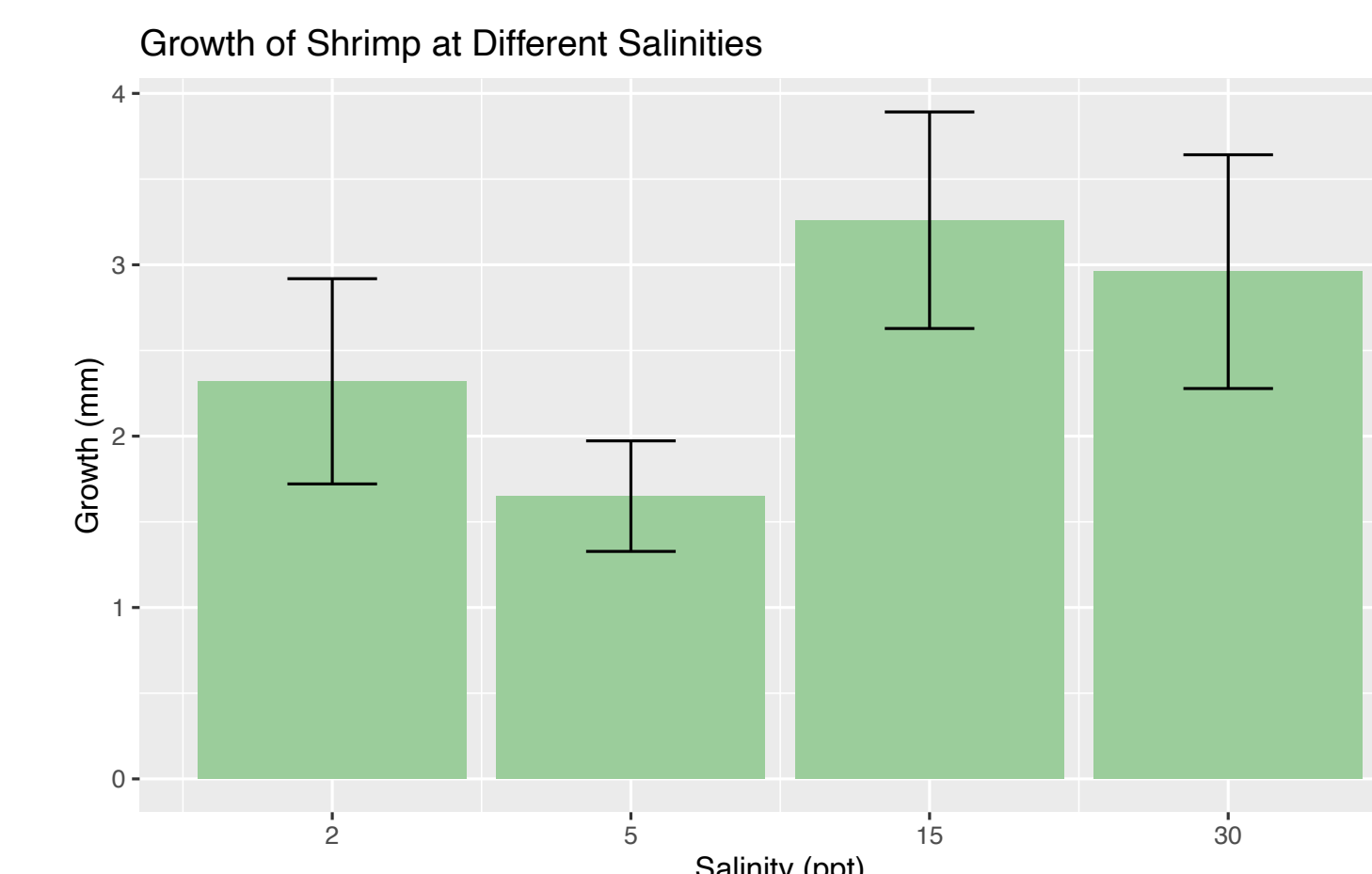


Live shrimp (N=40) were collected from Engelhard and put in individual tanks with different salinities (2ppt, 5ppt, 15ppt, or 30ppt).

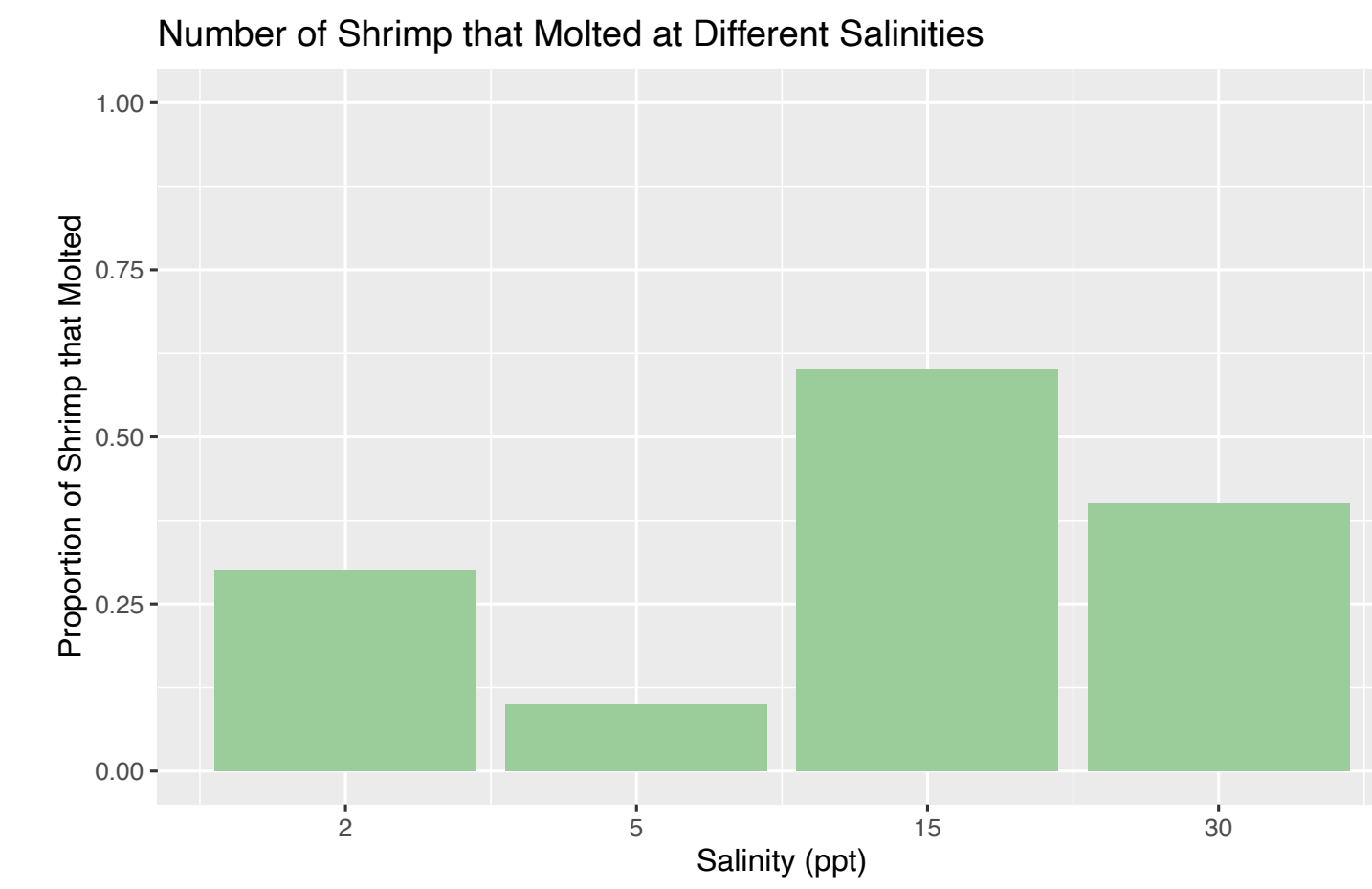


Behavioral data such as activity level, molting, and eating habits was collected daily.

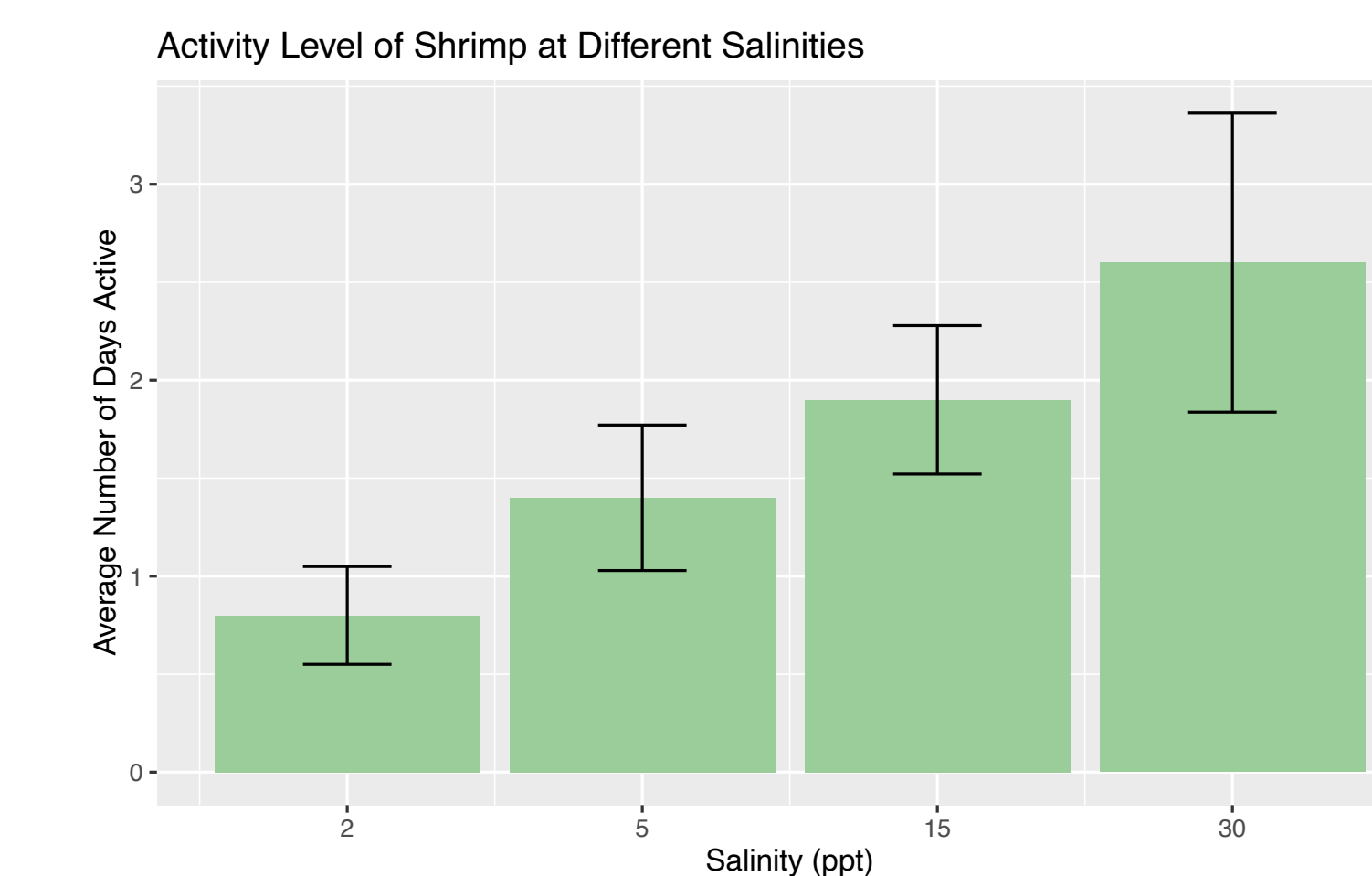
## Results



The amount that shrimp grew from the start to end of the experiment differed among salinities, although it was not a significant amount (F=1.54, p=0.22).



The number of shrimp that molted varied in each salinity group. Also, shrimp ate significantly less during their molting period (p=0.0001).



The activity level of shrimp increased with salinity; however, it was not significant (F=2.52, p=0.074).

## CONCLUSIONS

- Weekly sampling did not show a steady increase of sBG, instead prevalence fluctuated over time. Also, prevalence was patchy across sampling areas within estuaries.
- Engelhard had a higher mean rate of infection and more severe stages: 55% were stage 1 or 2, 36% stage 3, and 9% stage 4. All infected shrimp from Oregon Inlet were stage 1.
- No experimental shrimp were infected. However, activity and growth were reduced at low salinities (although non-significant). The only mortalities to occur (N=2) were at the lowest salinity.
- Results suggest greater stress at low salinity, which could lead to more severe sBG impacts.
- Future study should include frequent sampling with adequate spatial coverage to better understand the parasite-host relationship.