

Testing how the color of light used in traps affects the diversity and abundance of marine species caught

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Introduction

European Green Crab (*Carcinus maenas*) is an invasive species that has a negative impact on the local ecosystem and has few predators (Ens et al., 2022). They dig up eelgrass, which is important habitat for shellfish, local crab, and juvenile salmon (Ens et al., 2022). Green crabs are moving up the coast and one way to detect their arrival is by using light traps (Porter et al., 2008). Light attracts animals, including larval crab. Seeing what light color is most attractive to different species could help determine which color may attract green crab in the future. We are also interested in the diversity of species caught with our research. It is important data to have so we can monitor changes if green crab arrive in Hoonah.

Hypothesis

We predicted that blue light would attract more larval crab and more species because blue light travels further in the ocean than any other color. Some animals tend to go towards light in search of food (Dickey et al., 2011).

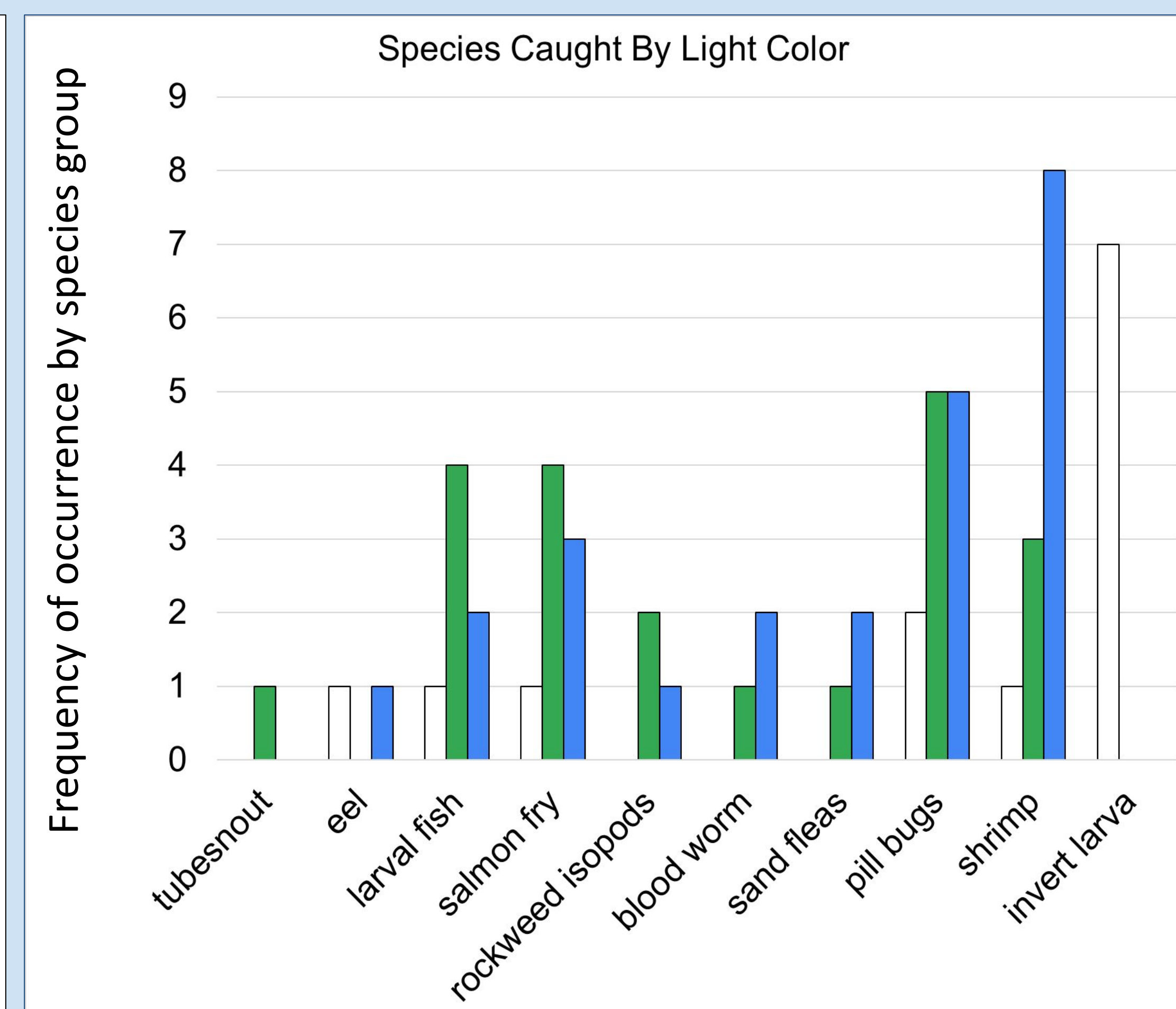
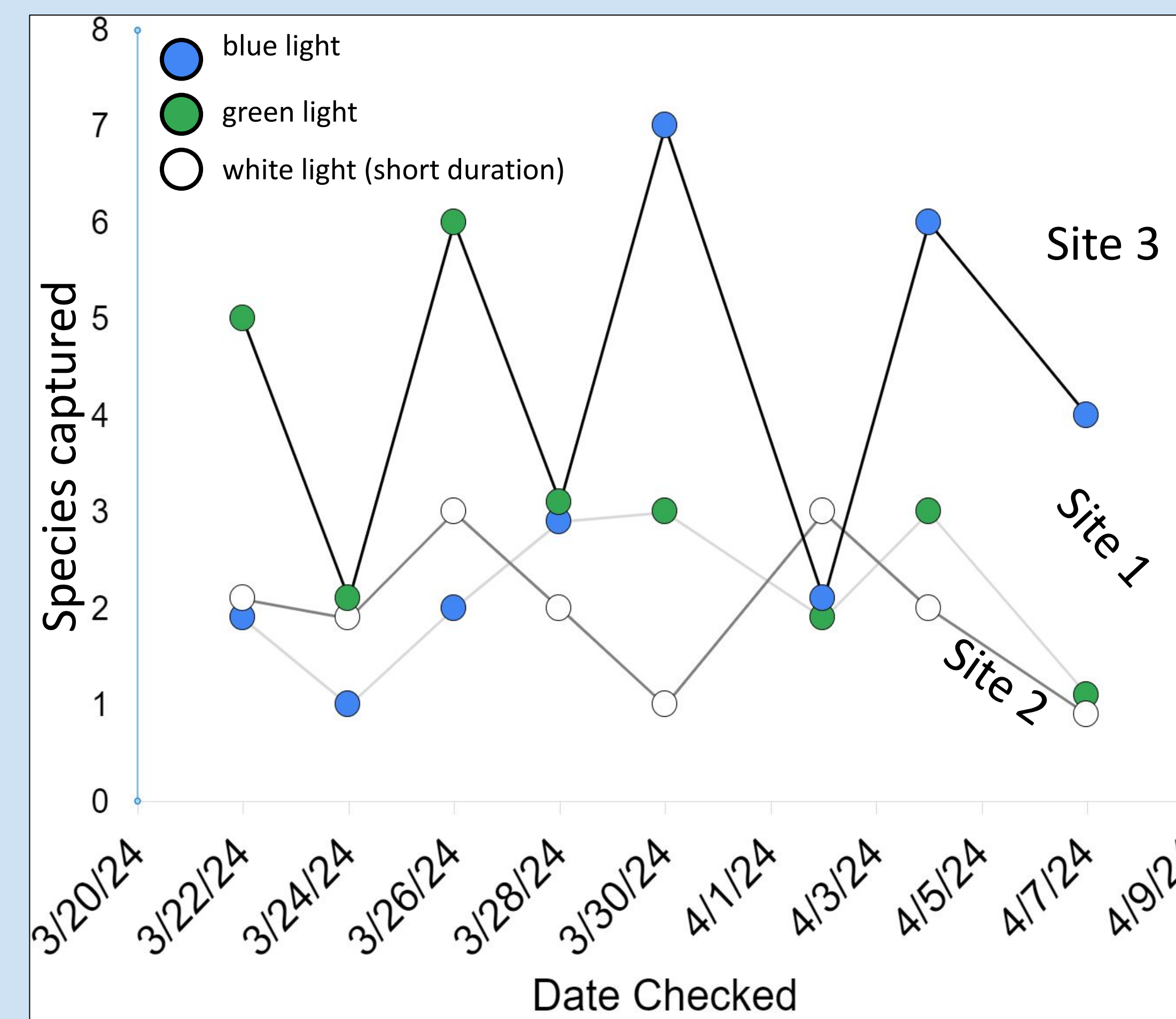
Methods



Fig 1. Location traps were deployed in Hoonah Harbor marked with Site 1, 2 and 3.
Fig 2. Students displaying light trap before deployment.
Fig 3. Eel (*Pholis laeta*) caught in trap collection chamber.

- Traps were built using models from Swinomish Indian Tribal Community
- Traps were deployed with white, green and blue LED lights and checked every 48-72 hours at three different locations within Hoonah harbor.
- Sampling started on 3/22/24 and ended 4/7/24.
- For the first four times traps were checked, blue light was used at site one and green light was used at site three. For the last four times traps were checked green, light was used at site one and blue light was used at site three.
- Samples were taken out of the traps. Species were identified using "[Common seashore animals of SE Alaska](#)" field guide by Aaron Baldwin
- Samples were returned to the water after identification.
- Batteries for lights were replaced if lights were dim or off.

Results



- Site 3 brought in more species than any other site. Also, at site 3 we had an up-and-down pattern of species caught.
- Site had a big impact on number of species caught, it is not clear what impact light may have based on the data we collected.
- Pill bugs and shrimp were caught most frequently in the traps. No crab larvae were caught in the traps.
- White light at site 2 attracted the most insect ("invert") larvae.
- Note: The white light would turn off before recovery and the green/blue lights sometimes appeared dim after the second deployment in a row.

Discussion

We observed that location had more of an impact on the number of species caught than the color of light used. It is possible the trap at site 3 caught more species because is closer to the breakwater, so there was an increase flow of water through that area. We were not able to test our hypothesis in relation to crab larvae, because none were caught. We will redeploy the traps in the summer when more crab larvae are present. We built these traps as an early indication measure for green crab, and the modifications we made were a success. One issue we ran into was the batteries draining over the deployment time, so the lights were dim when we checked the traps. The dim light did not seem to catch fewer species.

References:

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