Crabs Pinch-Perfect Habitats: What are crabs like in the Salish Sea?

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Oceanography 101

Research Question & Background

Crab species have a range of physical/behavioral adaptions that vary depending on the characteristics of the beach environments they live in. The difference between the deep ocean all the way to the rocky shores. "Crabs are fascinating creatures with a rich history of evolutionary adaptions. Their ability to thrive in diverse environments, from the deep ocean to dandy beaches and rocky shores, makes them one of the most successful groups of crustaceans. Understanding crab adaption not only sheds light on their survival strategies but also offers insights into evolutionary biology and environmental science." (Aridilles, 2025). Our question was, how do the characteristics of crabs vary across different beach environments?

Methods

Materials & Location

The materials we used were a ruler, a hollow square (55cm x 55cm), a camera, and a packet of marine life species. We went to Birch Bay together on 5/22/25, to Marine Park on 5/1/25, and to Fossil Beach on 5/3/25.

Procedure

We walked down near the coastline, and we looked for a good location in the intertidal zone, where we expected to see crabs. We measured a small square to look for crabs in. In our small square we started to move around rocks and quickly the crabs started moving around. One person would hold the crab in their palm or a shell, and the other would measure and write down what color and size the crab was. Then process would repeat.

Key Learnings

The Salish Seashore is home to many different types and sizes of crabs.

Some of the most common are Dungeness crab (up to 10 in.), hairy shore crab (1.9 in.), helmet crab (4 in.), kelp crab (4.3 in.), purple shore crab (2.2 in.), and red rock crab (7.8 in.). (WDFW, 2023) Many species spend time in the intertidal zone, between low and high tide. This is a particularly interesting area for marine and plant life, because the species must survive in air and water, light and darkness, with conditions changing throughout the day, month, and year.

Crabs are adapted to their local habitats.

Each beach that we visited had different characteristics in terms of landscape and the other marine and plant life present. In Birch Bay, the beach was large rocks and the crabs lived along with barnacles, snails, and eelgrass. In Fossil Beach, there was more sedimentation as the beach was mixed sand and small rocks, with smooth algae along the shore. In Marine Park, the beach was sandy and crabs were found near eelgrass and brown algae, snails and starfish.

Each beach also had a predominant color of crab. At Marine Park we found red and purple crabs; at Fossil Beach we found mostly green crabs; and at Birch Bay we found dark green crabs along with many other colors and spotting patterns. The biggest crabs were at Marine Park and the smallest crabs in Birch Bay (see figure, *Crab Sizes by Beach*). We conclude that crabs are adapted to their immediately local habitat for the food, and water conditions where they thrive.

Where to find the crabs.

All the crab species like to live/hide under rocks by the shore, as a survival mechanism to avoid being eaten by predators and bigger crabs. But the adult crabs live in the water because it's safer for them because they are better equipped to survive, and they don't have other crabs out to get them.

Report potential invasive crabs.

At Fossil Beach, we found many green crabs and initially thought they were invasive European green crabs. We reported them to the Washington Department of Fish and Wildlife through the online reporting form for invasive species, and found out they were hairy green crabs. This is why WDFW advises to not kill crabs.

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