

Introduction:

- Jakolof Bay is located across the bay from Homer, near the village of Seldovia (**Fig. 1**)
- Peterson Bay is located across the bay from Homer, near Halibut cove lagoon (**Fig. 1**)
- Rocky intertidal zones¹:
 - Exposed to high wave action
 - Vertical zonation
 - Upper organisms: tolerant of physiological conditions: freezing, heating, respiration, desiccation
 - Lower organisms: competition, predation
- Waves can "throw" rocks, harming or killing organisms²; Jakolof Bay is known for strong currents, suggesting more diversity at Peterson Bay³



Figure 1. Map depicting Peterson Bay (red circle) and Jakolof Bay (yellow circle).

Table 1. Water quality data from Jakolof and Peterson Bay. N/A is no data was collected. *Numbers are likely incorrect; meter may not have been calibrated.

Water Quality Tests	Jakolof Bay	Jakolof Bay	Peterson Bay
Collection site	North side of island	Docks	Otter Rock
Average salinity (ppt)	30	29	30.5
Average salinity (S.G.)	1.023	1.021	1.0235
Average pH	8.6	8.355	8.36
Average temperature (°C)	3.3	1.9	4.85
Conductivity (µS/cm)	328.5	328.5	N/A
Turbidity (NTU)	25.7	15.9	29.7
Dissolved oxygen (mg/L)*	N/A	N/A	122*
Dissolved oxygen (%)*	N/A	N/A	100*
Secchi depth (cm)	N/A	>47	N/A

Materials and Methods:

Materials

- 1m x 1m quadrat made of PVC pipe
- 30 transect tape
- Field Guide to Intertidal Species: Beachcomber's Guide to Intertidal Marine Invertebrates of South Coastal Alaska and Mac's Field Guide to Northwest Coastal Invertebrates
- Water quality probes for salinity, pH, temperature, conductivity, turbidity, and dissolved oxygen
- Secchi disk

Methods

- Biodiversity surveys were conducted at low tide
- A transect line ran the entire intertidal zone
- The 1m x 1m quadrat was rotated up and over the transect line from the lowest point to the highest
- Biodiversity within the quadrat was measured by percent cover for most species, while individual counts were made for visibly larger invertebrate species
- Water quality was collected at three different sites (north side of island, the docks, and Otter Rock) (**Table 1**)

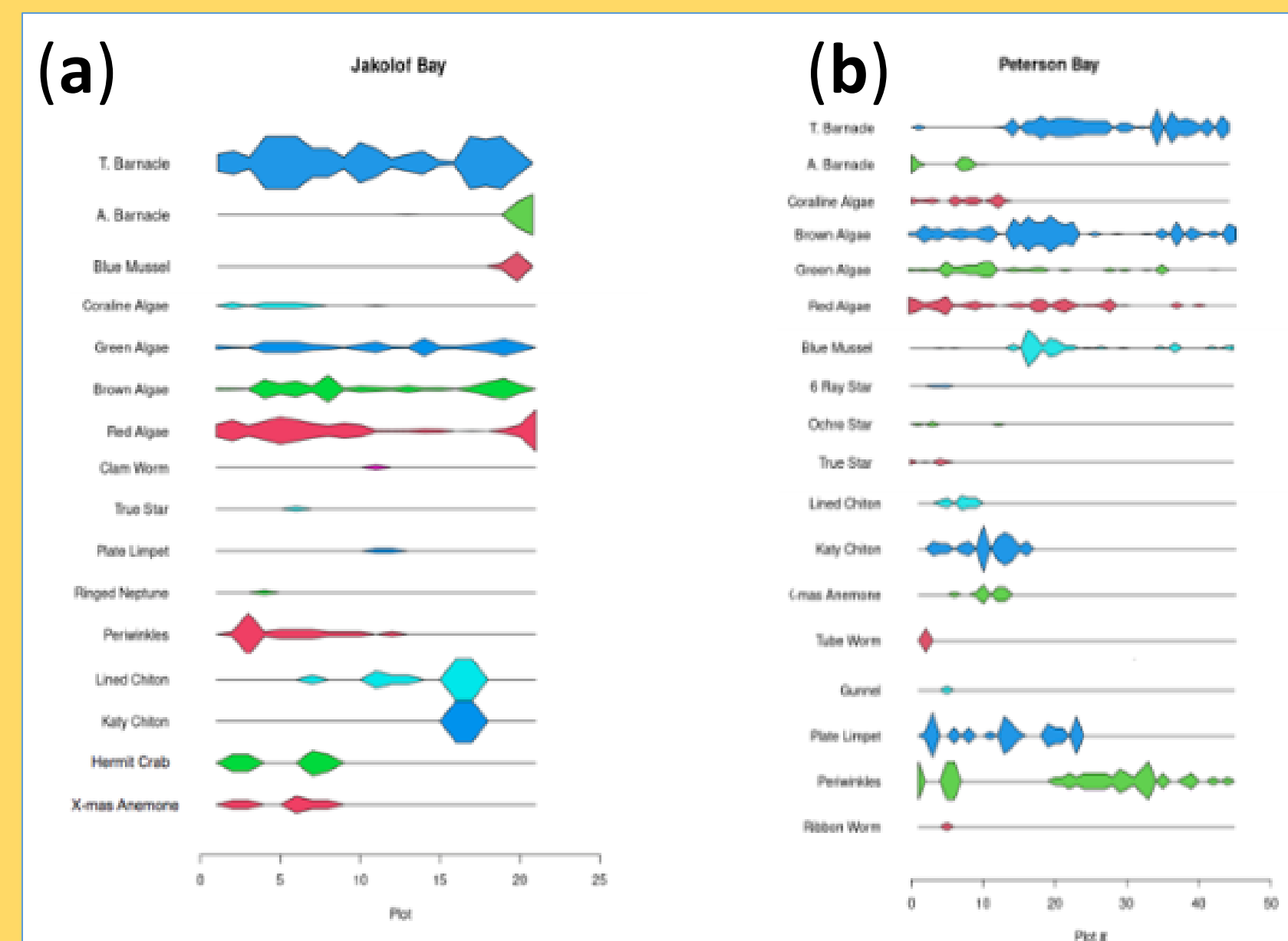


Figure 2. Kite diagram showing the percent cover of intertidal zone species in (a) Jakolof Bay and (b) Peterson Bay. Plot numbers are in order from the low tide to the high tide. The width of the kite indicates increasing species cover.

Results:

- Species diversity: 16 in Jakolof, 18 in Peterson
- Jakolof: red algae, green algae, brown algae, coralline algae, blue mussel, acorn barnacle, thatched barnacle, periwinkle snail, ringed Neptune, true star, clam worm, katy chiton, lined chiton, plate limpet, red hairy hermit crab, Christmas anemone (**Figure 2a**)
- Peterson: red algae, green algae, brown algae, coralline algae, blue mussel, acorn barnacle, thatched barnacle, periwinkle snail, true star, little six rayed star, ochre star, tube worm, ribbon worm, katy chiton, lined chiton, plate limpet, Christmas anemone, and gunnel fish (**Figure 2b**)
- Species such as hermit crab, periwinkle snail, Christmas anemone, and sea stars observed lower in the intertidal zone (**Fig. 3a and d**)
- Species such as barnacles and blue mussels observed higher in intertidal zone (**Fig. 3b, c, e, and f**)
- More species diversity and abundance closer to shoreline and lower in the intertidal zone
- More starfish observed at Peterson

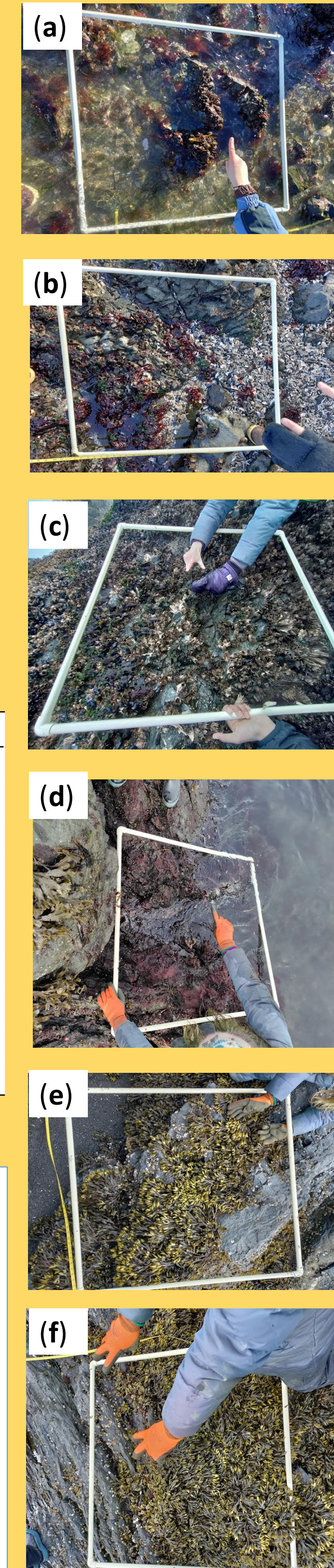


Figure 3. Three transects from Jakolof Bay showing plot 1 (a), plot 11 (b), and plot 21 (c), and 3 transects from Peterson Bay showing plot 1 (d), plot 22 (e), and plot 45 (f).

Discussion:

Greater Species Diversity at Peterson Bay

- Could be due to more protected zone; less storm impact
- Could be associated with warmer temperatures
- Could be associated with salinity or water chemistry

Observations include:

- Slightly more elevated salinity at Peterson
- Higher water temperature at Peterson
- Higher average pH at Jakolof sites
- More surveys at Peterson

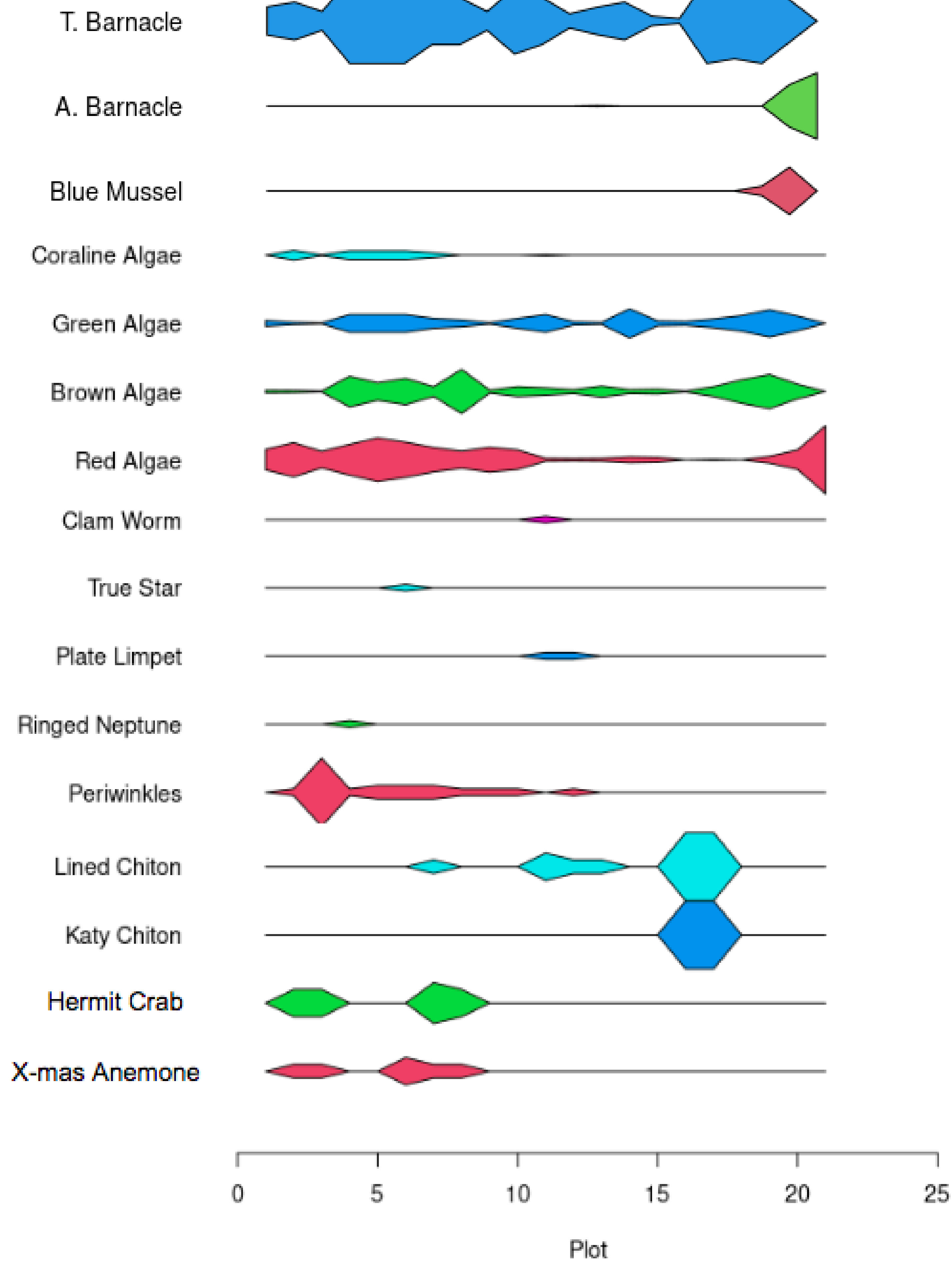
Sites varied:

- Transect at Peterson longer than Jakolof
- More species diversity caused longer transect
- Higher transect zone in Peterson had seagrass, barnacles, snails, and more
- Higher transect in Jakolof had more bare spots, rock, less biodiversity

Comparing the two sites, Peterson Bay had greater species abundance than Jakolof Bay (**Fig. 2 and 3**)

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Jakolof Bay



Peterson Bay

