

Marine Ecology – Intertidal Field Trip

The purpose of this field trip is to acquaint you with (1) the community of species inhabiting the rocky intertidal of central California, (2) how species differ in their distribution and abundance in relation to tidal height, and (3) common methods that ecologists use to quantify the cover and density of benthic species.

In class, we will discuss how patterns of vertical distribution of species in the rocky intertidal has stimulated a tremendous amount of very influential ecological research. This field trip will get you out into that system to see these patterns first hand.

How: People will **work in groups**, one recording data while the other identifies species being sampled. Estimates of abundance can be recorded in two ways, (1) percent cover and (2) density (number of individuals per unit area). Organisms that are difficult to distinguish individuals or too numerous to count (e.g., algae, encrusting animals like sponges, 100's of small barnacles) are usually enumerated by their **percent cover** (how much of the area sampled is covered by that species). Animals or plants whose individuals are readily distinguished and countable are counted within a specified area (quadrat) to estimate **density**. Percent cover is typically measured by recording the organism that lies beneath a uniformly or randomly determined location; this is referred to as the **point intercept** method. This can be done at pre-determined uniform or random distances along the length of a transect line, or at intersections of line strung across a quadrat. We will estimate species abundance across the gradient from high to low intertidal using all three of these approaches.

To quantify and describe the patterns of abundance of species along a gradient from high intertidal to low intertidal, we will first extend a 50 m tape along the shore at the high intertidal. This will be our "**baseline**", from which, and perpendicular to, we will extend 5-6 meter tapes from the high intertidal down to the low intertidal. Two groups will work along each of these tapes collecting data using each of three methods (point intercept along the transect, point intercept within a quadrat, and density within a quadrat):

- 1. Point intercept along the transect** – Using the data sheet specific for sampling the transect line, you simply record the distance along the transect and the code for the species that each point lies over. Distance is not pre-determined on the data sheet because we have to apportion samples evenly along the length of the transect, and we don't know the length of our transects until we actually extend them from high to low intertidal.

2. **Point intercept within a quadrat** – Quadrats will be placed at even intervals down the length of each of the transects extending from high to low intertidal. Place each quadrat adjacent to the meter tape such that the upper (inshore) corner lies at the pre-determined point along the transect and the quadrat lies along the west side of the transect tape. Then, using the quadrat data sheet, record within each of the 16 rows for each quadrat (e.g., 1:1 through 1:16), the code of the species and the number of times it is found beneath each of the 16 intersections of line strung across the quadrat. There are 16 rows per quadrat on the data sheet in case you encountered 16 different species beneath the 16 points within a quadrat (this is very unlikely, so you'll probably fill in only a few of these rows for each quadrat).
3. **Density** – Using the same quadrat data sheet, count the number of individuals within the quadrat and record the number and species code within the rows (e.g., 1:1 through 1:16) not used for percent cover.

To determine the tidal height at uniform distances along each of the transects, we'll use marked poles for sighting the height of each spot relative to the height of the tide. We'll know the tide height by recording the time and looking at a tide book or some computer program that estimates it for us.

STUDENTS BRING:

- (1) field journal,
- (2) pencils
- (3) clip board
- (4) handout with species codes
- (4) old shoes, boots or thick wet suit booties (feet will get wet) and a pair to change afterwards.

WE NEED TO BRING: data sheets, tide height laser gizmo, meter tapes, quadrats, clipboards