



## Directions

This site is located in the Coal Oil Point Reserve (COPR) on the western campus of U.C. Santa Barbara in Goleta, Santa Barbara County. Groups must obtain a permit from the COPR in advance. To get to the site, take the Storke Road exit from the 101 Freeway. Turn towards the ocean and continue on Storke for approximately 1 mile to a light at a junction with El Colegio. If you have a West Campus parking pass (obtained from COPR with your permit), continue straight through this light and proceed for 0.8 miles past the Devereaux Slough to the gate. Enter and park on the bluff top. The site is immediately below the top of the point. There are trails down to the beach in either direction.

If you do not have a West Campus parking pass, you will need to park in the western end of the community of Isla Vista and walk approximately 0.5 miles to the point either on the blufftop trail or along the beach (Figure 2). To reach the parking area, turn left at the junction with El Colegio from Storke and then take your next right, at Camino Corto. Drive 5 blocks to Del Playa. Turn right and drive for two blocks, and park along the row of trees. A trail leads out to the point and COPR.

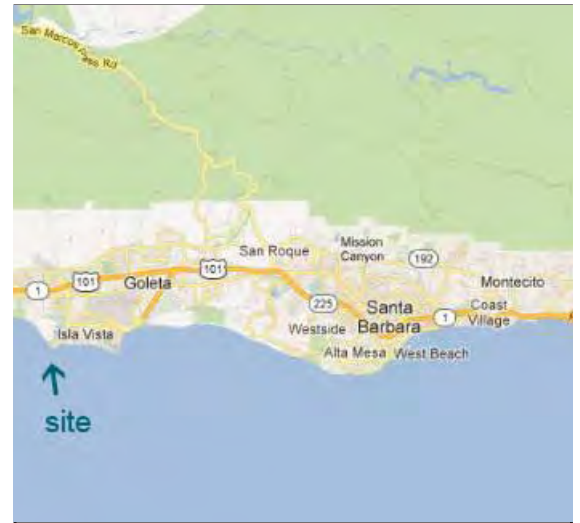


Figure 1: Location of Coal Oil Point.

## Sampling procedures

Coal Oil Point experiences a lot of sand build-up during the summer months. Often this sand may cover some or most of the sampling area. To locate the area, you will need a 50 meter tape and start from higher in the intertidal than at other locations. Locations of sampling areas and procedures are outlined below. Three sampling methods are used at Coal Oil Point for monitoring. This will allow some flexibility due to conditions and sand levels:

- 1) Vertical transect,
- 2) Random quadrats
- 3) Total organism counts (ochre sea stars)

### 1. Vertical Transect and Random Quadrats

From the SE corner of the isolated large rock in the upper sand beach below the corner of the point, run a tape out 13 meters at approx. 165 degrees to a low boulder with an epoxy mark and bolt. Note: this rock may be buried in sand. From this location, run a tape out 50 meters due south 180 degrees. From 41 to 47 meters the tape will cross over a surge channel and then include some higher reef for mussel habitat.

The reef is low and affected by sand accumulation. Also, a westerly swell of more than 3' may prevent sampling, depending on the tide level.



Figure 2: Location of COP parking area at west end of Isla Vista and monitoring site.



## 1. Vertical transect

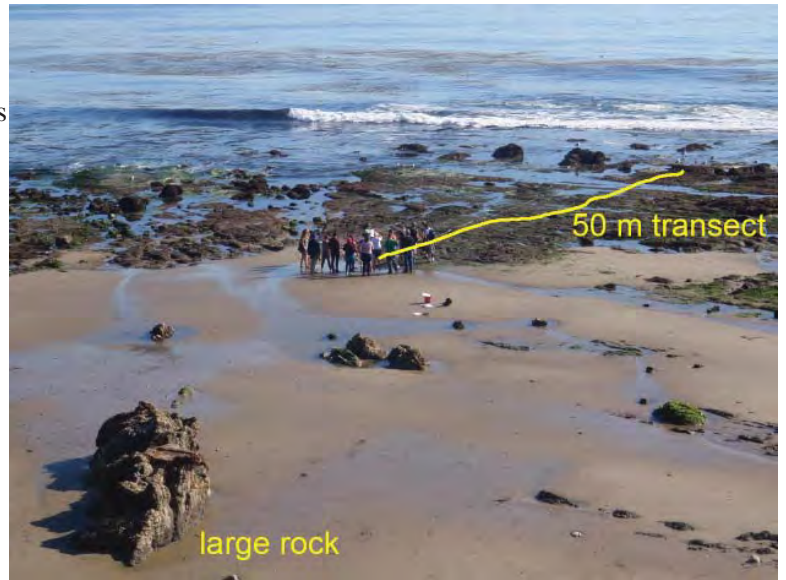
To sample the vertical transect, place a quadrat centered on the transect tape every 5 meters, beginning at 5 meters and ending at 50 meters. Record the quadrat counts on the data sheet.

## 2. Random Quadrats

To sample the permanent plot within which random quadrat counts are taken, lay out the transect as outlined above. Survey 20 random quadrats total.

- Using the random number table, choose a number between 00.0 and 50.0. Locate this number along tape.
- Choose a second random number between 0.0 and 10.0. This number indicates how far from the base transect line you will place your quadrat. Use the third random number table to decide whether your location will be east or west of the base transect. Lay down a second transect tape, perpendicular to the first, to find this location. If the location is off the edge of the reef, covered in sand or in a surge channel try the opposing side of the tape.
- Center the quadrat over the second meter tape.
- Record species abundance within the quadrats as directed on the "Random Quadrat Data Sheet."
- Count only live organisms and algae attached within the quadrat.
- Complete 20 quadrats

Note: In some cases, the random numbers will place the quadrat in a deep pool. When this happens, place the quadrat on a level area as close to the designated coordinates as possible.



**Figure 3.** View from bluff top. Location of large rock, reef and start of transect.



**Figure 4.** Transect and view of cliff in background. Quadrats are placed randomly and along the vertical transect, depending on method in use.





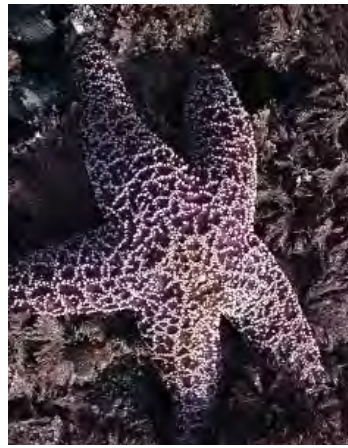
**Figure 5.** The sea star plot covers much of the exposed rocky reef (approximately 100 meters of shoreline) and is centered on the transect.

### 3. Total Organism Counts

#### *Ochre sea stars*

Ochre sea stars are surveyed on the flat rocky reef on either side of the permanent transect. This large rectangular area covers about 100 meters of shore line (see Figure 5). Search sides of boulders, raised areas and tidal channels (Figure 6).

- Use cones, tapes or backpacks to mark the boundaries of the area
- Systematically search the whole area in teams of 2 or 3, moving back and forth in successive swaths about the width of your outstretched arms.
- Record what you see, as you go. • Record ochre sea stars as “orange” or “purple/brown” (see Fig. 7).
- When counts are finished, record the length of the count, in minutes, on the data sheet. Each count should last approximately 20 minutes.



**Figure 7:** Count all ochre sea stars found within the permanent area. Record individuals as “orange” or “purple/brown”.



**Figure 6.** Ochre stars are often in mussel zone or in pools and channels.



# LiMPETS Monitoring Site: Coal Oil Point

