



## Directions

1. The San Simeon site is about a quarter of a mile south of the community of San Simeon. To reach it, turn off Highway 1 at the Sea Breeze Inn on Vista del Mar, the southern-most road in the community. Drive to the end of Vista del Mar where it meets Balboa. There is a public access trail from this intersection across a vacant lot to the beach. Once on the sandy beach, walk south until you reach a sloping rock platform that rises above the sand.
2. There are no restrooms at or near this site.

## Sampling Procedures

Three procedures are used at the San Simeon site:  
 1) Vertical transect 2) Total organism counts in a permanent area, 3) Size measurements in a permanent area.

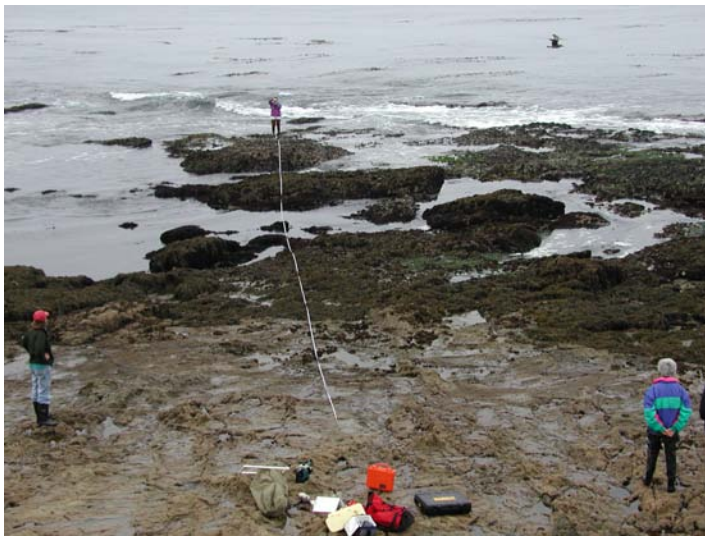


Figure 2. The San Simeon site from shore showing the vertical transect.



Figure 1. The San Simeon site is at the south end of the town of San Simeon, CA.

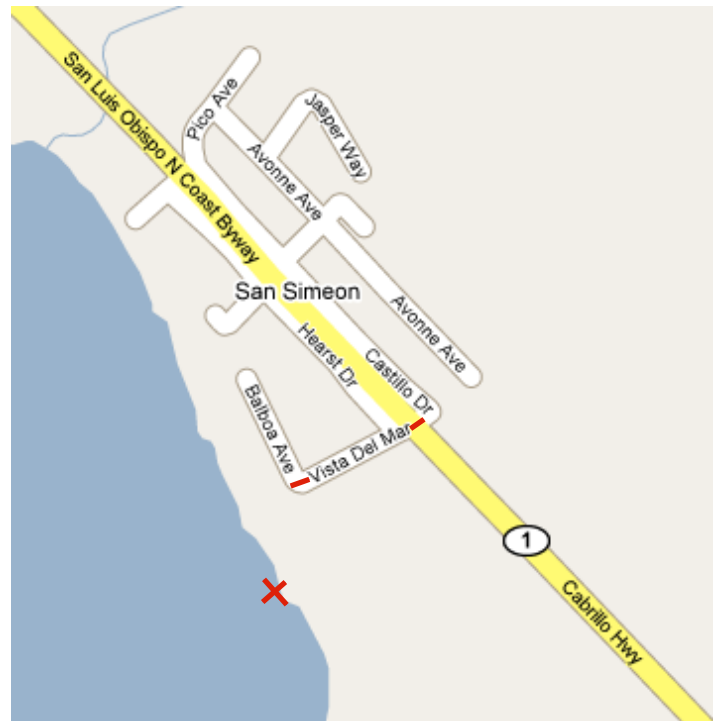


Figure 3. The San Simeon site is across an empty lot and down the trail to the beach.

## Vertical Transect

The vertical transect is marked with 4 stainless steel eyebolts cemented into the rock. The 0m bolt for the vertical transect is close to the center of the platform in the nearly bare rock at the base of the cliff. The others are at 16m, 36.35m, and 42m. The GPS locations of 4 of the eyebolts are: N 35° 36.250' W 121° 08.522' (0m), N 35° 36.242' W 121° 08.521' (16m), N 35° 36.234' W 121° 08.519' (36.35m), and N 35° 36.228' W 121° 08.517' (42m). The transect ends further across the platform, at 48m, next to a small tidepool filled with coralline algae and sea urchins.

1. Center the quadrats over the transect tape at: 0m, 4m, 8m, 12m, 16.1m, 20m, 24m, 28m, 31.5m, 36.35m, 42m, and 46m.
2. Record the species abundance within each quadrat as instructed on the data sheet. For algae, only the square(s) that contain the holdfast should be recorded. Count only live organisms, this may require some close investigation.

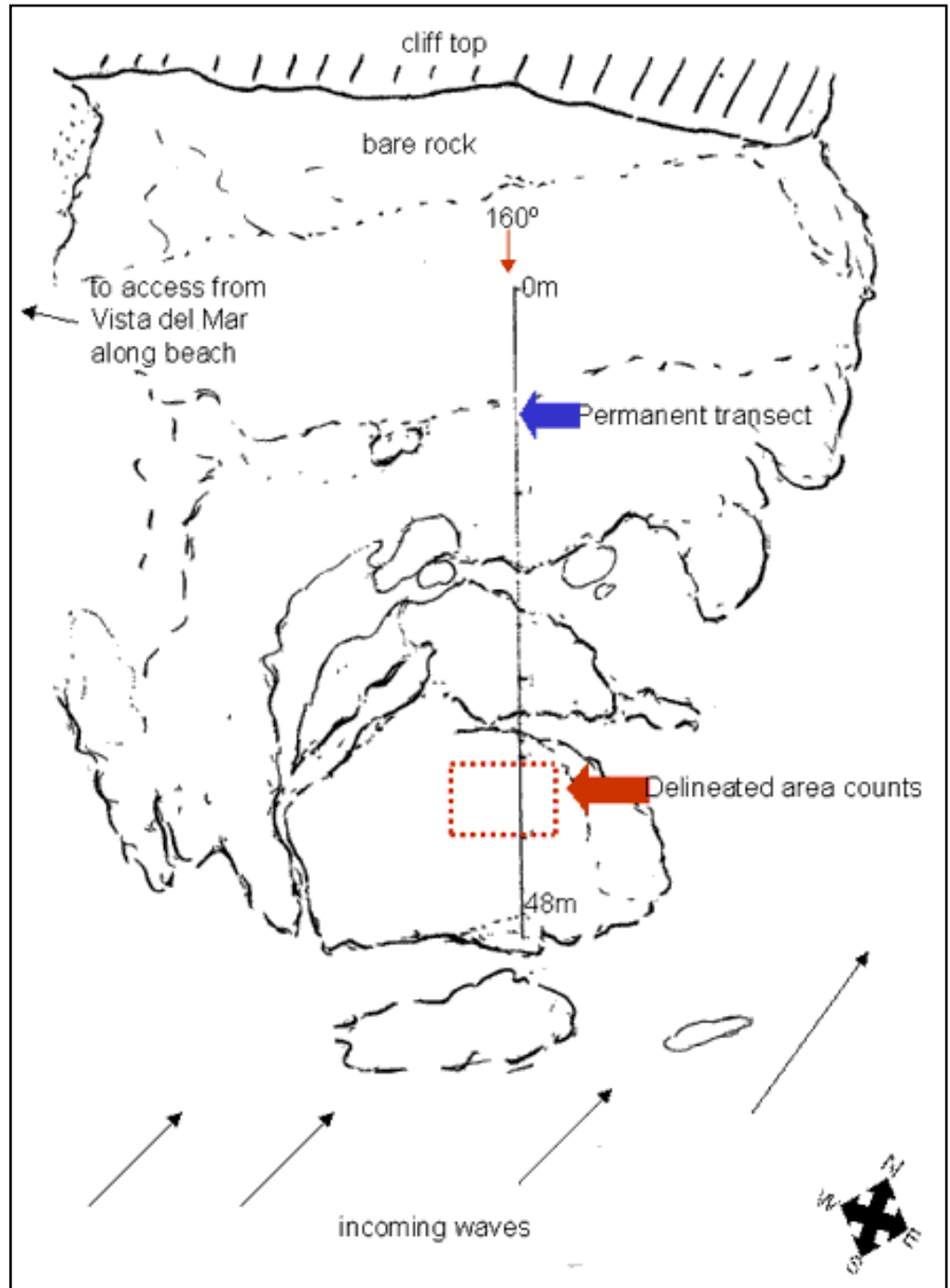


Figure 4: Hand drawn map of the monitoring area.

## Total Organism Counts and Size Measurements in a Permanent Area

Species counted are ochre sea stars and sea anemones. Teams of 2 or 3 students should tackle total organism counts for one species at a time. Systematically search the whole area by moving back and forth across it, searching successive swaths about the width of your outstretched arms.

We have delineated an area around the mussel bed, between the 36.35m and 42m eyebolts, where these animals are the most abundant. Stretch two transect tapes perpendicular across the vertical transects, one at the 36.35m eyebolt and the other at the 42m eyebolt, so that each extends 3 meters to the south and 7 meters to the north, see Figure 4. This will create a rectangle with an area of 56.5m<sup>2</sup> (5.65x10m), which is suitable for counting ochre sea stars, owl limpets, and large, solitary sea anemones.

1. Ochre sea stars (*Pisaster ochraceus*): Both sea star color phases (orange and brown/purple) are counted. The orange color phase will be easy to spot, while the purple/brown phase will require close inspection of cracks, overhangs, crevices and under algae.
2. Giant green (*Anthopleura xanthogrammica*) and sunburst (*Anthopleura sola*) sea anemones: Count anemones that are larger than 5 cm (or 2.5 inches) in diameter, and any that are large and solitary but closed. Many of the large anemones that are covered with water will be open, but those out of the water will mostly be closed and covered with rocks or bits of shells.



Figure 5. Giant green anemone (bottom left), ochre sea star (top middle), and sunburst anemone (bottom right).

## Size Measurements in a Permanent Area for Owl Limpets

Use the same area as for Total Organism Counts.

Smaller owl limpets (*Lottia gigantea*) are sometimes difficult to distinguish from other species of limpets, therefore we only count and measure owl limpets equal to and above 2.5 cm in shell length. The length of each limpet is measured with a ruler and recorded.



Figure 6. Closeup of an owl limpet (upper left). Patches of bare rock could indicate an owl limpet “farm”.