

## Density of Giant Kelp

**Overview:** One of the main strengths of the long term ecological research program is that it allows us to evaluate changes in the ecological community against the background of natural long-term variability. This long-term context is particularly important when we seek to distinguish between changes caused by natural processes and those caused by human activities. SBC LTER has undertaken long-term measurements of the abundance of reef algae, invertebrates and fish within permanent transects at 11 kelp forest sites in the Santa Barbara Channel. These data represent one of the core research activities of SBC LTER and they provide a relatively comprehensive description of community structure and dynamics of kelp forest communities within our study region.

**Experimental design:** Time-series data on the abundance of ~250 species of algae, invertebrates and fish are collected each summer on replicate 40m x 2m permanent transects ( $n = 2$  to 8 transects per site) at 9 mainland and 2 Santa Cruz Island reefs that have historically supported giant kelp forests. Data collection began in the summer of 2000 and continues annually to provide information on community structure, population dynamics and species change.

**Methods:** The density of giant kelp > 1 m tall is recorded in four contiguous 20 m x 1m swaths that run parallel and adjacent to each 40 m transect (Figure 1). Each plant with at least half of its holdfast located within the sampling area is counted and the number of fronds > 1 m tall on each plant is recorded. The greatest diameter of the holdfast for each adult plant (holdfast > 20 cm) is also recorded.

**Figure 1.** Schematic diagram showing the position of the four 20 m x 1 m swaths relative to the 40 m transect.

