



## Measuring Catalina's Ocean

Santa Catalina's ocean is dynamic. Climate change, population change and legislative change all affect the island we love in ways we do not understand. For Catalina is a unique place, unlike any other of the Channel Islands. This difference is produced by the weather and current patterns as well as proximity to the mainland. Santa Catalina has its Catalina Eddy and sits within a vortex driven by the California Current. This swirling current isolates Catalina somewhat from both the mainland and the other islands. For instance, nutrients that are plentiful along the Northern Channel Islands do not have clear access to our island and the local waters may not be as well flushed as those surrounding the other islands. Easy access also brings civilization to Catalina in a manner that far exceeds that found elsewhere. These, and other factors, make Catalina unique.

Understanding the island's present and future ecology requires long-term data measurements and its subsequent analysis. Surprisingly, little has been measured at the island. Although substantial facilities exist at Two Harbors, these are mostly educational in nature and there are no long-term data-collecting efforts now. One difficulty to gathering such data is that the island is somewhat inconvenient. Getting researchers there (and back) is more than a day's work, and the logistics of doing so add considerably to research costs.

To solve this problem, the Catalina Marine Society will acquire data over significant periods of time using volunteers. We plan to measure at a minimum salinity, chlorophyll, pH, and dissolved oxygen at specific depths near the island. These quantities permit us to tell where the water comes from, where the phytoplankton reside, the acidity of Catalina water and how much so-necessary oxygen is available to marine fauna. We hope to obtain sufficiently dense records to compare to similar data collected in Los Angeles Harbor (by the Southern California Marine Institute), Point Loma (Scripps Institution of Oceanography) and off the Santa Barbara coast (University of California, Santa Barbara), as well as understand the physical processes operating around the island and develop expectations for what climate change and ocean acidification will bring. The new

data will also supplement what we have previously collected at a single depth near Two Harbors.

For example, the increasing flow of carbon dioxide into the atmosphere will most assuredly make the ocean more acidic. Will this be harmful to Catalina's scallops, clams and mussels, lessening their ability to generate shells? Knowing the natural variation in acidity will inform us. For the range of natural changes in pH that shellfish experience now influences how well adapted to acidification they are likely to be. As another example, regions of low oxygen have been found with increasing frequency off the Oregon Coast. Do these occur off Catalina? If so, when, where, how and what is their effect on wildlife? Only a measurement program will tell us.

We hope to answer these questions and many more with data collected by volunteer boaters and technicians. We have developed protocols to make the work straight forward and not onerous. But it does require a repeated presence offshore Santa Catalina Island that volunteers are uniquely suited to provide.