The Catalina Marine Society's Continental Thermograph Array
Guide for Volunteer Site Managers
04/26/2011

Introduction

The Catalina Marine Society is deploying an array of marine temperature recording devices off the coast of the Los Angeles metropolitan coast. Data from the thermographs will be used to study the effects of Santa Ana winds on the ocean, the distribution of internal waves, upwellings, El Nino/La Nina temperature conditions and other phenomena. The data collections are intended to be long-duration experiments, lasting perhaps five years or more. Deploying and maintaining this array will require significant resources both to purchase the instrumentation and to deploy it. Much of these resources will be donated by volunteers who will act as site managers and this guide is intended to describe for them the procedure for choosing a collection site, deploying sensors and maintaining the data collection.

Instrumentation

The Catalina Marine Society will supply the sensors and associated mounting hardware. Typically these instruments will be thermographs produced by the Onset Computer Co. The CMS will perform QA and calibration procedures on the sensors before they are deployed and when they are retrieved. The mounting hardware is typically a long, metal sandscrew with carabiner clips that attach to the thermograph for quick setting and release.

Data collection sites

Precise data-collection sites are at the discretion of the site manager with the concurrence of the CMS. Sites will generally lie between Deer Creek near the Los Angeles County/Ventura County line and Laguna Beach in Orange County. Data-collection sites are a compromise between scientific value, safety, secrecy, ease of access, convenience and ease of recovery.

Sites with the most scientific value are those that experience Santa Ana winds, for example, the seaside mouths of mountain canyons. Dive sites adjacent to Malibu Road in Malibu are very likely to experience intense Santa Ana winds that flow down Malibu Canyon. Similarly, thermographs off Main Beach in the town of Laguna Beach can be expected to provide good Santa Ana data. Also sites adjacent to deep water will generally have much internal wave activity. Examples include Carrillo Beach and Point Dume in Malibu, Redondo Canyon off Veterans Park as well as sites off Palos Verdes.

The scientific value of the data is increased if multiple thermographs can be placed at a site covering a range of depths. This range should be between 30 and 100 ft. with thermographs nominally separated by 30ft in depth. The minimum deployment depth is considered to be 30 ft for the protection of the instrument during storms and large swell events. The number of thermographs available for deployment at a given site will depend on available resources.

Other site considerations are that they be interesting to the site manager and offer many diving opportunities regarding surf conditions, especially if shore entry is required. Sites that are frequented by divers are not the best locations as we know of instances when instruments have been removed by recreational divers.

Thermographs, once deployed, should be capable of easily being found without much searching. This is perhaps best ensured by placing the thermographs near readily-found seabed relief in well-known topography.

Deployment procedures

The site manager will notify the CMS approximately when he/she intends to deploy the sensors. The CMS will ready the instruments and have them set to launch near the expected time of deployment and deliver them to the site manager. During deployment, the site manager will record the following data:

1. Names of divers and contact information
2. Instrument number
3. Date
4. Location and coordinates
5. Time instrument hits water
6. Time instrument is fastened to bottom
7. Tide
8. Depth
9. Substrate
10. Distance to shore
11. Bathymetry (if possible, e.g., slope of bottom, presence of pinnacles, etc)

Photos of the shoreline, the deployed sensor and other interesting activity are desired though not required.

Retrieval Procedures

The first instrument should be replaced approximately after two months of recording data. Subsequent sensor swaps should be performed every 6 to 9 month. The retrieved sensor should be returned soon to the CMS for data readout, re-calibration and redeployment.

If the site manager expects not to continue diving the site, we request that he/she retrieves the thermograph and associated supporting structures for recycling in the Continental Thermograph Array program.