

CCE Moorings

*(Moored Climate, Carbon, Biogeochemical, and Ecosystem Observations
in the Southern California Current)*

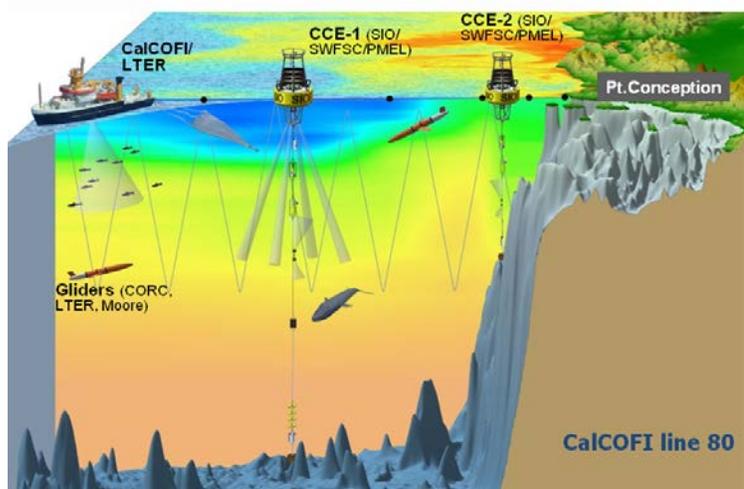
Uwe Send¹, Mark Ohman², David Demer³

^{1,2}Scripps Institution of Oceanography, La Jolla, CA

³NOAA Southwest Fisheries Science Center, La Jolla, CA

Project Summary

The California Current is a region of large ecological significance and known sensitivity to climate forcing. Climate processes, complex physical systems, carbon and nutrient chemistry, and ecosystem dynamics all interact to create a rich, societally important, and scientifically fascinating ocean environment off the west coast of the US. The California Current Ecosystem (CCE) mooring project is establishing a unique highly multidisciplinary timeseries of conditions in the southern California Current, to complement ship-board observations from CCE-LTER and CalCOFI, glider observations, and the flow and transport monitoring system that has been initiated under CORC, and to start building a comprehensive continuous real-time monitoring system for this region.



The two moorings now operating, called CCE-1 and CCE-2 are located in the offshore core and the coastal upwelling regime of the California Current system, respectively, along CalCOFI line 80, and measure

- **atmospheric conditions** ($x(\text{CO}_2)$, wind, temperature, humidity, precipitation, irradiance),
- **upper ocean conditions** (temperature, salinity, $p(\text{CO}_2)$, O_2 , pH, currents, point and integrated measures of phytoplankton chlorophyll content over the euphotic zone, and nitrate supply),
- **active-acoustic observations** of zooplankton and fish biomass.

Most of the data are telemetered in real-time and publicized via websites to other researchers and agencies.

The CCE moorings are intended to serve as an example and nucleus for enhanced autonomous observations of the California Current climate system, carbon cycle, ocean acidification processes, and ecosystem changes. It also represents a real step towards a recognized need in the sustained ocean observing system – techniques and implementations of observing infrastructure that addresses the societal challenges driving the climate, biogeochemical and ecosystem communities. This was clearly identified as a major need at the OceanObs09 conference in Venice. The highly collaborative merging of many new technologies and several funding sources

is a promising example of how to enable such observations in the future. CCE-1 and CCE-2 are probably the first sustained US sites which are aimed at filling this gap in the global ocean observing system.

The supported activities include operation of the two highly instrumented real-time moorings along CalCOFI line 80 and processing of the data. This includes construction of moorings, execution of cruises, servicing and calibration of sensors, upgrading of technology, and participation in ocean acidification research spanning the west coast.

The anticipated products and outcomes include:

- long records of the processes and variability in the physical, biogeochemical, and ecosystem conditions in the southern California Current
- data sets to develop and validate biogeochemical models
- integration of the data with other OA and ecosystem programs along the US west coast.

The users and applications include the carbon, OA, ecosystem, and fisheries research communities and agencies, modeling centers, and fisheries management programs. The data also complement and add value to the regular ecosystem and stock assessment ship surveys along the west coast.