The California Current Ecosystem (CCE) Long Term Ecological Research (LTER) site is an interdisciplinary group of scientists, students, and educators that is working to understand and communicate the effects of long term climate variability on the California Current pelagic ecosystem. The CCE site became part of the U.S. National Science Foundation-supported Long-Term Ecological Research network in 2004. CCE is based at the Scripps Institution of Oceanography/University of California, San Diego, but currently includes partners at four other institutions (Duke University, Georgia Institute of Technology, Point Reyes Bird Observatory Conservation Science, and the Southwest Fisheries Science Center/National Marine Fisheries Service). The CCE site welcomes scientific collaborations with visitors and researchers located elsewhere.

CCE research also is integrated with Education programs for local schools and Outreach efforts to convey research findings to a broader public audience.

The CCE LTER research site centers on 193,000 square km of the coastal ocean, extending along the California coastline from San Diego north to San Luis Obispo and westward over 500 km. The ocean sampling grid builds on the CalCOFI (California Cooperative Oceanic Fisheries Investigations) sampling lines, currently consisting of 6 tracks extending from the nearshore environment into more offshore ocean conditions. CalCOFI has sampled the California Current System for nearly 60 years, providing a vitally important baseline against which long term changes in ocean ecosystems can be measured.

For more information please contact:
http://ccelter.sio.ucsd.edu

California Current Ecosystem LTER site
Scripps Institution of Oceanography
Integrative Oceanography Division
University of California, San Diego
9500 Gilman Drive
La Jolla, CA 92093-0218
phone: 858-534-1547

For more information about the LTER Network, see:
http://www.lternet.edu

Merged
SeaWiFs/MODIS-Aqua
satellite ocean color
image illustrating
elevated
phytoplankton
concentrations along
the U.S. west coast
and Baja California
that are characteristic
of coastal upwelling.
(Phytoplankton
biomass ranges from
red [high] to magenta
[low]). Black in the
offshore indicates
clouds. Data from
NASA, image
produced by M.
Kahru, Scripps
Institution of
Oceanography.
**Central Research Questions**

- What are the mechanisms leading to different ecosystem states in a coastal pelagic ecosystem?
- What is the interplay between changing ocean climate, community structure, and ecosystem function?

**Mathematical Modeling** is an integral part of this research. Models help test our level of understanding and eventually make ecosystem forecasts. CCE scientists are developing different types of models, including:

- Bio-physical models that couple interactions in the pelagic food web to computer simulations of 4-D ocean circulation
- Nonlinear time-series models
- Control volume property fluxes

Representing the ocean environment as a ‘control volume’ helps to understand fluxes of nutrients and organisms into and out of the boundaries of the study site.

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**Long-term measurements**, together with experiments and numerical ocean models, permit researchers to go beyond simple correlations to understand the complex nonlinear dynamics underlying ecosystem variability.

**CCE measurement programs** include:
- Four augmented CalCOFI cruises each year, on a regular grid of 66 sampling stations
- Experimental process cruises, to assess key biological rates and interactions
- Satellite remote sensing
- Benthic time series measurements
- Nearshore measurements from the Scripps pier and Dana Point (in cooperation with the Ocean Institute)
- Spray ocean glider surveys

**Student research** is an integral part of the CCE LTER site. There are opportunities for students to pursue their PhD research and for undergraduates to participate in research experiences at CCE.

**CCE’s Education and Outreach** fosters partnerships that bridge research science and formal/informal learning environments. An outreach coordinator promotes inquiry-based science and encourages community involvement.

**Information Management:** The CCE LTER team is building an information management system as part of an informatics environment that serves as a digital hub for the site. Please visit: [http://ccelter.sio.ucsd.edu](http://ccelter.sio.ucsd.edu)