



# Center for Integrated Marine Technologies

## Wind to Whales Program

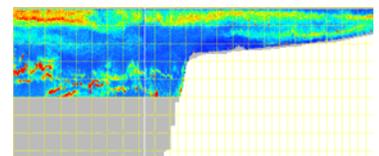
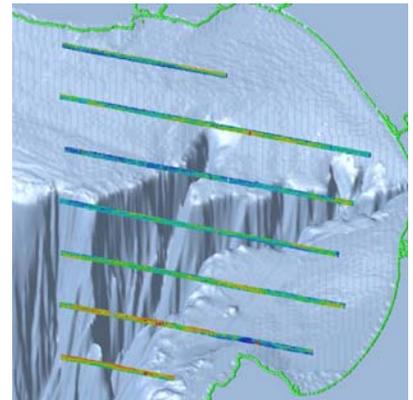
### Mission:

The Center for Integrated Marine Technologies' (CIMT) mission is to create a coastal ocean observing and forecasting system that provides a scientific basis for the management and conservation of Monterey Bay, and serves as a model for all of California's coastal marine resources and the U.S. Integrated Ocean Observing System (IOOS).

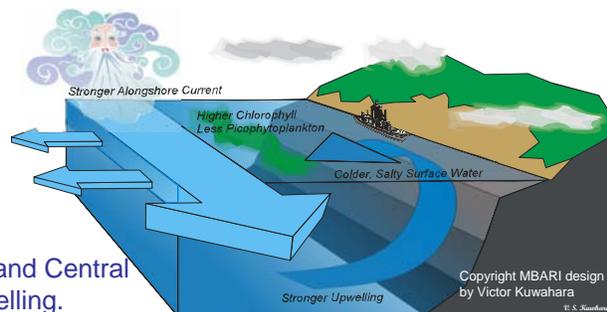
Specifically, CIMT's coastal ocean monitoring program links new technologies and data across disciplines of marine science to address key questions for the management and conservation of California coastal marine resources. These technologies are being used to investigate the critical linkages among:

- Physical forcing mechanisms,
- The availability of critical nutrients,
- The distribution, abundance and species composition of phytoplankton and zooplankton, and
- The distribution, abundance and species composition of top-level consumers including fish, seabirds, marine mammals and sea turtles.

This comprehensive interdisciplinary approach will serve as a model for integrated coastal ocean observing systems and establish the scientific basis for the effective monitoring and management of coastal fisheries and protected resources, especially those of the Monterey Bay.



Monterey Canyon with ship-survey track lines showing zooplankton backscatter.



Monterey Bay and Central California Upwelling.

### Activities:

#### •Monitoring Program

Create an interdisciplinary team to identify the needs and technological solutions to understanding Monterey Bay's upwelling ecosystem

#### •Develop New Technologies

Develop new sensors to fill important gaps in understanding the coupling between physical and biological processes in the coastal upwelling ecosystem

#### •Integration of Data

Integrate data across platforms (mooring, ship-based, satellite) and across temporal and spatial scales

#### •Data Dissemination

Develop a coordinated software system for the acquisition, organization, visualization, archiving and access of physical, biological, and chemical coastal marine data sets

#### •Outreach

Develop strong linkages between the CIMT researchers and product end-users



**Vision:**

The Center for Integrated Marine Technologies' vision is to understand the relationship between the physical dynamics and productivity, from wind to whales, of California's coastal ocean.

**Integration of existing and new technologies:**

•The CIMT is simultaneously collecting data via moorings, shipboard surveys, apex predator tagging and tracking, and satellite, aircraft, and land-based remote sensing.

•Data integration provides new insights to the complex interactions among climatic events, riverine input of iron, and wind-driven coastal upwelling of nutrients to phytoplankton production, the distribution and abundance of animals from zooplankton to fish, seabirds, marine mammals and sea turtles.

•This approach provides the ability to develop predictive models of how marine resources respond to variability in coastal dynamics.

**Partner Institutions:**



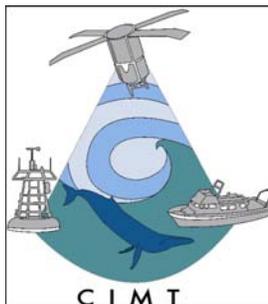
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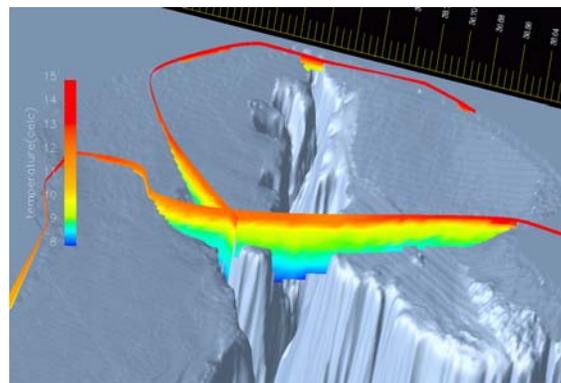
NATIONAL MARINE SANCTUARIES  
MONTEREY BAY

JPL



**Approach:**

- Use the Monterey Bay NMS as a regional model
- Review current coastal upwelling monitoring programs
- Determine data gaps
- Develop new instrumentation to fill gaps
- Archive and integrate new and old data sets across networks and programs
- Develop user-friendly data access and visualization interfaces
- Determine the processes underlying coastal dynamics
- Develop predictive models



Elephant seal tracks with temperature measurements

For more information contact:

[cimt@pmc.ucsc.edu](mailto:cimt@pmc.ucsc.edu)

or visit:

<http://cimt.ucsc.edu>