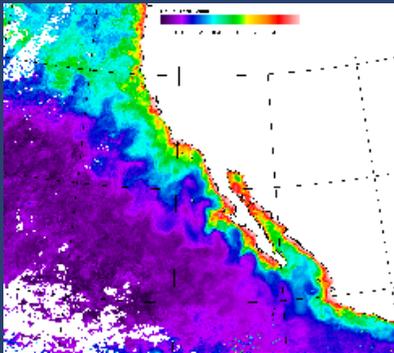




NOAA FISHERIES SERVICE

Southwest Fisheries
Science Center



Fisheries Resources Division

The Fisheries Resources Division develops the scientific foundation for the conservation and management of marine resources in the California Current and Pan-Pacific Pelagic Ecosystems. We serve the public and contribute information to management organizations and the scientific community.

Fisheries Oceanography Program

The primary goal of the Fisheries Oceanography Program is to contribute to the understanding of the effects of climate change and climate variability on California fisheries, with a primary focus on pelagic fisheries and forage species.

Program Members



L-R: Ed Weber (staff), Susie Jacobson (staff), Sara Aubery (contractor), Sam McClatchie (Program Leader), Karen Nieto (NRC post-doc).

Primary Activities

We produce multidisciplinary analyses to inform ecosystem based management, using long-term datasets from the CalCOFI program. We evaluate and develop indices to facilitate incorporation of environmental variability into stock assessments. We produce new tools to access the CalCOFI databases (IchthyoDB web interface), and to create statistical and graphical analyses (rcalcofi analysis package). We serve data requests from the larger community and produce web-based summaries of cruise results. We also strive to add value to the CalCOFI sample time series by reprocessing archived survey samples and data using new technology (Zooscan) and new capabilities (characterization of mesoscale features from remote sensing data).

Ecosystem state:

Summaries of the state of the California Current provide important background for ecosystem based management. In addition, long-term trends in key variables affecting habitats, such as hypoxic levels of oxygen have produced valuable information from the 60-year CalCOFI time series.

Sardine spawning habitat:

Spawning habitat is thought to mediate climatic effects on small pelagic fish. Our group developed predictive models of spawning habitat of sardine and anchovy. We also showed how spatial variability affects these relationships and provided insight into environmental variables that can be used to predict the probability of finding sardine and anchovy eggs.

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Fisheries Oceanography

Primary Activities, Cont.

Evaluating environmental indices:

Stock-recruit-environment indices needs to be re-evaluated in the light of new data. We have reassessed the stock-recruit and temperature-recruitment relationships underpinning the Scripps Pier temperature index for sardine assessment. Work is now focused on developing a replacement for the existing environmental index.

New tools:

In collaboration with Scripps Institution of Oceanography we developed a new web-based interface for previewing, selecting and downloading the CalCOFI ichthyoplankton data. We also developed a package in the R statistical language to facilitate analyses with CalCOFI data. The package uses the spatial capabilities of the language to facilitate working with CalCOFI data in different coordinate systems. We are now applying the Zooscan plankton imaging technology to add value to the enormous archive of CalCOFI plankton samples. Zooscan will permit us to quantify the density of larval fish predators and the size structure of larval fish prey. The additional information on predators and prey from the CalCOFI surveys will enhance our understanding of mortality and survival of key commercial fish species.

Significant Program Citations

McClatchie, S., Goericke, R. Rich Cosgrove, R. and Vetter, R. 2010. Oxygen in the Southern California Bight: multidecadal trends and implications for demersal fisheries. *Geophysical Research Letters* 37, L19602, doi:10.1029/2010GL044497.

McClatchie, S., Goericke, R., Auad, G. and Hill, K. 2010. Re-assessing the temperature index for Pacific sardine (*Sardinops sagax*) stock assessment. *Canadian Journal of Fisheries and Aquatic Sciences*, 67: 1782-1790.

Weber, E.D. and McClatchie, S. 2010. Predictive models of Northern Anchovy *Engraulis mordax* and Pacific Sardine *Sardinops sagax* spawning habitat in the California Current. *Marine Ecology Progress Series*, 406: 251-263.

McClatchie, S., Goericke, R., Charter, and 29 other authors (2009). The state of the California Current, spring 2008-2009: Cold conditions drive regional differences in coastal production. *CalCOFI Reports*, 50: 14-42.

Weber, E.D. and McClatchie, S. 2009. rcalcofi: Analysis and visualization of CalCOFI Data in R. *CalCOFI Reports*, 50: 178-186