Developing a capability to monitor the impact of episodic corrosive water and hypoxic events on Southern California fisheries.

Principal Investigators: Sam McClatchie, David Demer, John Hyde, John Butler, Kevin Stierhoff and Russ Vetter
SWFSC, La Jolla, California

Retrospective analyses of CalCOFI datasets:
The search for changes in plankton correlated with increases in ocean acidification that might be revealed through analyses of the CalCOFI time series has only recently begun. Ohman et al. 2009 examined the calcareous pteropods, heteropods and foraminiferans in CalCOFI samples but concluded that there was no detectable diminution in the numbers of calcareous plankton, despite the measurable increase in acidity in the SCB. On the other hand, based on Empirical Orthogonal Function analyses the temporal changes in the abundance of components of the mesopelagic fish community appears to be related to trends in oxygen (Koslow et al. 2010). Mesopelagic fish larvae are ubiquitous in the CalCOFI samples. Virtually nothing is known about the spatial variability of time series of the mesopelagic community. We will examine these trends with multivariate statistics in relation to oxygen, acidity and temperature. Even simple analyses of the time series from the Santa Barbara Basin, which is a well-known area for hypoxia and low pH, have not been analyzed. Currently unpublished work presented at the 2010 CalCOFI acidification and hypoxia symposium showed there is a quantitative predictive relationship between pH, temperature and oxygen. We will apply this relationship to the hydrographic data set from CalCOFI and correlate the changes in the physical environment to potential shifts in the community structure of the mesopelagic ichthyoplankton. The data series are long enough and detailed enough that we should be able to use cross validation to improve our statistical models.

References