

08-07

Project Title: Integrating Indicators: Co-variation, Periodicity and Amplitude of Key Biological Signals from Central Oregon and Northern California

Principal Investigators: William Sydeman, Alec MacCall, Kyra Mills (Farallon Inst. Advanced Ecosystem Research [FI]), Frank Schwing & Steven Bograd (SWFSC/ERD), and Chet Grosch (Old Dominion University), Julie Thayer (FI)

Goals: (1) to develop interpretable multivariate ecological indicators that reflect the complex bio-physical interactions which drive variability in key fish and wildlife populations for inclusion in developing CCLME IEA efforts, and (2) assess the co-variation in periodicities and amplitude (i.e., cross-species “signals”) in key time series datasets.

Approach: We will integrate key Oregon and northern California biological time series using EOF/CEOF, Spectral, and Wavelet analysis (as possible).

Work Completed: Due to delays in funding transaction, we are a bit behind on this project. To date, we have examined spectra of time series of copepod abundance and diversity, coho salmon survival, seabird reproductive success, and timing, and upwelling indices at 36°, 39°, and 42°N. Remarkably, most series show strong variability at the 12-14 year period. The complexity of this analysis is substantial. To obtain appropriate spectra, the annual signal must be removed, and then the series is de-trended. We have also integrated values of the NPI, NOI, SOI, MEI, and PDO with these biological measurements.

Applications: Analyses will be included in next versions of the California Current Integrated Ecosystem Assessment (IEA). The first version, Module 1, on select indicators is available (see below, Sydeman and Elliott 2008). The second version, Module 2, on trends and variability of select indicators, is under internal NOAA-NMFS and Farallon Inst. review (Sydeman and Thompson 2009).

Publications/Presentations/Webpages: Sydeman and Elliott (2008) is available online (www.faralloninstitute.org). Sydeman and Thompson (2009) should be available online within 1-2 months (by 30 September 2009). Bograd and Sydeman (in prep.) have contributed information to the PICES North Pacific Ecosystem Status Report.