

I. STATE OF THE CALIFORNIA CURRENT ANNUAL REPORT

NOAA's Integrated Ecosystem Assessment team has produced a second State of the California Current Ecosystem report, following past Council guidance on indicators and report content. The purpose of this report is to bring ecosystem information for the California Current Large Marine Ecosystem (CCLME) into the Council process in a succinct, straightforward format to (help) the council consider ecosystem variability in decision-making. This report includes a synthesis of 22 key environmental, biological and socio-economic indicators in the California Current Large Marine Ecosystem.

Many of the indicators that measure environmental variability (e.g., Pacific Decadal Oscillation, upwelling anomaly, dissolved oxygen) and ecological integrity (e.g., copepod species richness, salmon abundance, groundfish stock status) may be found in other reports or online; the goal of this report is to present trends in physical and biological components of the ecosystem - alongside fisheries, ecosystem impacts from other human activities, and socioeconomic factors of the California Current large marine ecosystem.

We modified the 2014 report in response to Council comments and requests. This includes adding new indicators for ocean acidification (aragonite saturation), forage fish (fish community structure), and socioeconomic conditions (subsistence practices among commercial fisheries) and modifying fisheries' landings (summarized by region and price) to better (elucidate) shifts among West coast fisheries. We also provide supplementary background materials, by section, for most of the indicators.

Some of the indicators in this report with differing trends between 2012 and 2013 conditions:

- Strong cumulative upwelling occurred during 2012 for southern and central California and during 2013 for the whole coast, indicating higher productivity.
- Survey catches indicate that Northern anchovy abundance is reduced along much of the coast recently; however, a number of other forage fishes have responded positively to productive conditions.
- In response to the poor condition of sea lion pups at rookeries and a high level of strandings, NMFS declared an Unusual Mortality Event (UME) of California sea lion pups in March 2013

II. IEA PHASE II REPORT 2013

[The California Current Integrated Ecosystem Assessment Phase II Report](#) is a web-based, interactive report that synthesizes status, trends, and risks facing the U.S. West Coast marine ecosystem. This is a peer-reviewed report of 2011-2012 research based on contributions of the California Current Integrated Ecosystem Assessment Team authors and affiliates - 57 authors and 15 affiliations. This interactive report is an evolving product – it will be

The IEA is organized around three questions:

- What is the [status and trends of key indicators of ecosystem health](#) in the U.S. West Coast marine ecosystem?
- What is the [status and trends of drivers and pressures](#) affecting the health of the U.S. West Coast marine ecosystem?
- How might potential [future management options](#) influence the health of the U.S. West Coast marine ecosystem?

- [Link](#) to latest California Current IEA Report
- NOAA's National IEA California Current [Home page](#)
- IEA Overview [Video](#)

updated annually and builds on previous technical background (Levin et al 2009, Levin and Schwing (eds.) 2011), and is completed as part of NOAA's National IEA program. In addition to the report and related publications, we also produced an IEA video in 2013, which includes members of the IEA team and the Pacific Fishery Management Council – go here to [view](#) video.

III. IEA CURRENT WORK – 2013-2014

Conceptual models

We are in the process of developing graphical conceptual models to directly identify the linkages between bio-physical (e.g., upwelling, chlorophyll, copepods, salmon) and societal (e.g., cultural, economic) components across the ecosystem. These models act as a framework for quantifying the links between system components as well as communicating linkages to managers.

Social Science

One of our focus areas in 2013 and 2014 on the California Current IEA is human dimensions, specifically to identify measures that reflect vulnerability of fishing communities and measures of human wellbeing

- *Subsistence and Informal Economic Practices among Commercial Fisheries:* We summarized the volume of fish and shellfish kept for personal use from commercial vessels, by both tribal and non-tribal participants in Washington and California between 1990 and 2010. This work is described in the 2014 State of the California Current report.
- *Community vulnerability:* We analyzed demographic, geographic, quality of life and fisheries-specific data for 2,529 coastal communities across the West coast, and are deriving indicators of community vulnerability (e.g., coastal poverty). Such indicators of wellbeing, paired with fishing metrics can illuminate connections to the marine environment, and may provide a way to integrate the socioeconomic dimension into research and management approaches.

Habitat

Habitat was added to the CCIEA in 2013 and we have completed the initial phase of work necessary to understand habitat health in the context of the CCLME. We have defined key California Current LME habitats (freshwater, estuary/nearshore, pelagic and seafloor), developed a working list of potential indicators for habitat quantity, quality and relate pressures, and have designed an overarching spatial habitat framework for the West coast.

Management Scenarios

We continue to test the implications of management decisions under alternate future conditions in the California Current. In IEA 3, we have added additional analyses for scenarios related to climate change and shipping, in addition to fishing. Models developed in 2013 (IEA 3) include:

- Climate change effects on salmon in fresh and salt water, groundfish, and pelagic species.
- Management scenario testing to identify robust, multi-sector management approaches under climate change
- Predictions of ocean acidification risk for calcifiers (shelled) species and corals
- Shipping and ship strikes of marine mammals

We received a request from the SSC to review *Atlantis* in June of 2014, so we are preparing for that. Next year, we will include scenarios in which we tackle a single question with multiple models, to increase our ability to quantitatively estimate uncertainties, and to distill results into more concise summaries (based on reviewer feedback).