

COASTAL PELAGIC FISHERIES ADVISORY SUBPANEL REPORT ON THE
CALIFORNIA CURRENT ECOSYSTEM (CCE) AND INTEGRATED ECOSYSTEM
ASSESSMENT (IEA) REPORT AND SCIENCE REVIEW TOPICS

In a joint webinar on March 1 with the Coastal Pelagic Species Management Team (CPSMT), the Coastal Pelagics Species Advisory Subpanel (CPSAS) heard a summary by Dr. Toby Garfield on the California Current Ecosystem Integrated Ecosystem Assessment (CCIEA) Report. The subpanel also reviewed the document (Agenda Item E.1.a, IEA Team Report 1, March 2019). The CPSAS thanks Dr. Garfield for his review and compliments the IEA Team for its illuminating report. Overall the IEA contained more detail than in past years, and we appreciate the team's efforts. The CPSAS offers the following comments on specific report sections:

Section 3.3 (Hypoxia and Ocean Acidification). This is a welcome addition to the report. Indicators as well as impacts will likely differ between regions, so we suggest that future reports maintain the three-region structure, i.e. the northern, central, and southern CCE's, with breaks as noted at Cape Mendocino and Point Conception.

Section 3.4 (Harmful Algal Blooms [HABs]). This section noted that toxic HABs of *Pseudo-nitzschia* frequently coincide with warming events in the CCE. The IEA report commented that in 2018 the low levels of domoic acid (DA) detected in Washington did not trigger fishery closures. Unfortunately, California was not so lucky, as spiny lobster and rock crab fisheries in the southern CCE did suffer DA advisories, resulting in closure restrictions in certain areas around the northern Channel Islands. In the recent past, the entire west coast Dungeness crab fishery has been impacted by similar events.

It would be helpful if future IEA reports could also include more HABs and DA information from the entire west coast, but in particular the central and southern CCE. This is critical to the above-mentioned fisheries.

Section 4.1 (Copepod Biomass Anomalies and Krill Size). This section reported on biological indicators based on information collected largely in the northern CCE. While it is encouraging to note improving foraging conditions for pelagic fisheries in this region, we suggest that future IEA reports also include comparable indicator species from the central and southern CCE.

Section 4.2 (Regional Forage Availability). The CPSAS appreciates the effort to describe forage availability by sub-region. We especially value that the IEA noted an increasing abundance of both juvenile and adult anchovy in the central and southern CCE, as well as increasing presence of young of the year (YOY) and adult sardine. We also highlight Appendix G.3 (Southern CC Forage) that reports on the ongoing increase in abundance of anchovy and market squid.

The new cluster analysis figures are useful to gain an overview of relative abundance of key species over time. We note that Southern CCE forage indicators are based on California Cooperative Oceanic Fisheries Investigations surveys, which are conducted primarily offshore and do not measure the abundance of CPS and squid that fishermen have observed in nearshore waters.

Section 4.6 (Marine Mammals). The IEA reported that sea lion pup births and growth rates showed significant improvement over 2016. However, the IEA did not include findings indicating that California sea lions have reached optimum sustainable population (OSP), and may have attained or exceeded carrying capacity. We recommend that this information be included in the IEA. CPSAS fishery representatives suggest that California sea lions should not be considered as a biological indicator of ecosystem state changes unless the negative characteristics of a population at, or over carrying capacity (i.e. increased disease and juvenile mortality, and reduced population growth) also are acknowledged.

Section 5 (Human Activities). The CPSAS appreciates the IEA's inclusion of the human element and socio-economics in the report. We again suggest that in future reports, all sections of the IEA, including human activities and socioeconomic discussions, maintain the northern, central, and southern CCE structure. This will enable direct comparison of oceanographic, biological and social-economic impacts over time.

The IEA Appendix (K.1, page S.29) noted declines in California fisheries to historically low levels in recent years. The closure of the sardine fishery will continue to impact CPS fisheries across the West Coast, particularly in California (i.e. the central CCE and southern CCE).

Section 6.1 (Social Vulnerability). The IEA assessed coastal community social vulnerability indices (CSVI), but the report does not include information to assess the vulnerability and commercial fishing reliance of some key ports in California (e.g. San Pedro, Terminal Island), where CPS have represented as much as 99 percent of total commercial fishery landings. The report also lumped San Pedro and Terminal Island into the broad category Los Angeles, which likely dampened the socio-economic impact felt by those ports. California fishery representatives on the CPSAS suggest that future IEAs need to strengthen the data to assess the importance of CPS to fishing communities, particularly in California.

Section 6.2 (Fleet Diversity Indices). The IEA report noted a continuing declining trend in diversification of revenue, notably in the California fleet (IEA 6.2, page 20). The CPSAS suggests that the IEA investigate the impact of current regulatory constraints on fleet diversification and the ability of fishermen and processors to maintain viable opportunities yearlong, and particularly in the face of climate change.

Section 7.1 (Summary of Recent Conditions). The report notes that the CCE appears to be in a slow transition away from the warm, relatively unproductive conditions of 2014-2016, but this begs the question: transition to what? There are no definitive signs one way or the other. We agree this underscores the importance of continued careful monitoring and improved modeling, analyzing, and communicating.

Section 7.2 (Forecasts and Predictions for 2019) The CPSAS appreciates the IEA's inclusion of a series of short-term forecasting tools such as J-SCOPE, which provides predictions regarding ocean conditions off the Pacific Northwest and can help improve our understanding of habitat quality for pelagic species.

The CPSAS compliments the IEA team for striving to improve the report and suggests the inclusion of more data relevant to California (e.g. DA advisories, regional socio-economic impacts). We ask the team to keep in mind the high spatial and temporal variability among regions when identifying early warning signals and ecosystem thresholds. As reported in the IEA, the CCE is a widely diverse ecosystem, one size definitely does not fit all.

Thank you for consideration of these comments.

PFMC
3/7/2019*