

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON
ANNUAL STATE OF THE CALIFORNIA CURRENT ECOSYSTEM REPORT

The Scientific and Statistical Committee (SSC) received a presentation by Drs. Chris Harvey (Northwest Fisheries Science Center) and Toby Garfield (Southwest Fisheries Science Center) on the Annual State of California Current Ecosystem Report to the Council. The report is a concise source of information on patterns of climate forcing on the California Current ecosystem and the biological response of ecosystem components, including fish stocks and fisheries. The report is an important contribution to the Council process that provides an ecosystem perspective on West Coast fish stocks, fisheries, and coastal communities. The SSC appreciates the California Current Integrated Ecosystem Assessment (CCIEA) team's responsiveness to suggestions by the Council and SSC on the previous year's report, and those arising from the comprehensive indicator review completed by the Council and its advisory bodies last year.

This year's annual ecosystem report indicates that there has been a return to more normal oceanographic conditions. The biological responses to the marine heat wave are lagged relative to oceanographic conditions, and the impacts on Council-managed stocks are ongoing. Although some of the effects of the climate "stress test" on the ecosystem were successfully anticipated, others were unexpected, such as the high numbers of juvenile rockfish that were detected in the juvenile rockfish survey and in anecdotal observations. Recruitment success of these year classes will not be known with any certainty until they start showing up in groundfish surveys and in the fishery in 3-5 years.

The SSC emphasizes that interpretation of many of the indicators in the report requires an understanding of the uncertainty and natural variability that is associated with the indicator. Without that context, there is a risk of overconfidence in the predictive power of the indicators. For example, the plots showing abundance and trends in regional forage availability and salmon escapement do not currently show the uncertainty associated with the points, so it is difficult to know whether the patterns are meaningful. In addition, they can understate the severity of depletion when the recent mean abundance is low and variability is high (for example, compare results for sardine and anchovy in Fig. 4.2.2 in Agenda Item F.1.a, NMFS Report 1 with Fig. G2 on page S20 of Agenda Item F.1.a, NMFS Report 2). Interpretation of indicators also requires that the broader context of the indicator be considered. For example, the interpretation of indices for California sea lions should take into account the current population size and whether the sea lion population has reached carrying capacity.

The SSC discussed with the CCIEA team which components in the Integrated Ecosystem Assessment (IEA) were appropriate for technical review at a joint meeting with the SSC Ecosystem Subcommittee (SSCES) scheduled for September 13-14 during the September 2017 Council meeting in Boise. A preliminary list of topics relative to the annual ecosystem report include:

- new habitat indicators, particularly those based on salmon life cycle stages;
- use of time series models to smooth the indices and separate signal from noise;
- definition and identification of biologically meaningful thresholds in indicators for risk assessment.

Additional topics that are not presently included in the annual ecosystem report, but may benefit from SSCES review include:

- an initial management strategy evaluation based on current assessment assumptions that includes an environmental driver of sablefish recruitment;
- models of fishery participation choices under a variable climate.

This meeting will be most useful if the primary analysts conducting the work being reviewed attend the meeting.

PFMC
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