

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON
FISHERY ECOSYSTEM PLAN COORDINATED ECOSYSTEM INDICATOR REVIEW
INITIATIVE

Dr. Martin Dorn, Chair of the SSC Ecosystem Subcommittee (SSCES), presented a summary of the Joint SSCES and California Current Integrated Ecosystem Assessment (CCIEA) Team meeting to review ecosystem indicators that was held September 12th and 13th 2016. The purpose of the joint meeting was 1) to conduct a technical review of proposed indicators and methods for the next CCIEA annual report, 2) to review risk assessments for the California Current ecosystem, and 3) to review ongoing work to evaluate environmental drivers of sablefish recruitment. The SSCES will provide a full report of the meeting to the CCIEA team. The SSC highlights the following recommendations.

The SSCES reviewed the use of Multivariate Autoregressive State Space Models (MARSS) models in the development of CCIEA time series indicators. The SSC notes that these models have not yet been used in a CCIEA report, but in the future it may be appropriate to use these models to combine time series and to quantify observational error in some of the indices. The SSCES will provide additional guidance to the IEA indicators team on which indices may benefit most from MARSS modeling.

The physical and biological indicators underlying the salmon "stoplight" indicators included in recent CCIEA reports were reviewed. The SSC finds that these indicators, taken collectively, provide a useful qualitative guide to the present state of the ocean environment when Columbia River salmon smolts, especially fall Chinook, enter the ocean. This is not a quantitative forecasting tool nor has its applicability to other stocks been reviewed. Promising directions for future research include the development of similar indices for different stocks (or species), such as a salmon stock in the southern part of the California Current, and testing hypotheses for the mechanisms underlying relationships between indicators and stocks of interest.

The Coastal Community Vulnerability Indices for the CCIEA provide useful human dimension indicators. The SSC continues to support the general approach used to assess community vulnerability and recommends that it be further developed to provide information about other human dimension aspects within the CCIEA. The SSC recommends looking at whether significant tribal catch data were missed when calculating indices of fishery dependence and whether this problem could be resolved by acquiring data from the tribes. The SSC further notes the need for the development of indicators that measure community dependence on ecosystem services other than commercial fisheries, in particular recreational fisheries.

For habitat indicators, the SSC recommends that the development of spatially-resolved habitat indicators for multiple life cycle stages of salmon be prioritized. The snow water equivalent trend representing riverine habitat quality, which was presented in the March 2016 ecosystem report, is an important start, but the SSC recommends that this analysis be done at a more finely resolved spatial scale than the proposed coastwide scale. Indicators for the quality of estuarine/nearshore and off-shore habitat for salmon need to be developed. The SSC identified

salmon habitat indicators as a priority because of the vulnerability of salmon stocks (especially those listed under the ESA) to climate change, and because of the greater availability of information on salmon habitats.

The SSC recognizes the potential contribution that the risk assessment approaches used in the CCIEA can make to our understanding of ecosystem level processes and their implications for fisheries management. The SSC supports CCIEA efforts to integrate ecological, social and economic risks within a risk assessment framework. The SSC recommends that additional consideration be given to risk assessments that have an ecosystem or FMP focus rather than a species focus to increase the relevance of CCIEA risk assessments to Council deliberations.

An update on ongoing work to evaluate environmental factors affecting sablefish recruitment was presented to the SSCES. Progress has been made on a preliminary model for relating environmental variables (derived from a Regional Ocean Modelling Systems (ROMS) model) to sablefish recruitment. The SSCES recommended technical refinements to the preliminary model to the modeling team and the SSC anticipates reviewing a revised model of sablefish recruitment at the March 2017 Council meeting. The SSC encourages continuing the collaborative work with Alaska Fisheries Science Center and Canadian scientists to evaluate the stock structure of sablefish. Research into aspects such as stock structure and extending the temporal coverage of the ROMS model are likely to require additional time beyond March 2017.

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