

Update on the Ecosystem and Socioeconomic Profile (ESP) in the Alaska groundfish and crab fishery management plans

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Executive Summary

The ESP is a standardized framework that facilitates the integration of ecosystem and socioeconomic factors within the stock assessment process and acts as a proving ground for operational use in management advice. The NPFMC Plan Teams and SSC have designated the ESPs as the on-ramp for next generation stock assessments and as such they provide the necessary tools for implementing the ecosystem approach to fisheries management. We provide responses to the comments from the SSC and Plan Teams since the 2018 September ESP update. We also include summaries on the ESP workshops, improving ESP data accessibility, and the ESP annual cycle and associated documentation. The ESPs pave a clear path toward building next generation stock assessments and increase communication and collaboration across the ecosystem, socioeconomic, and stock assessment communities at the AFSC and many other agencies, stakeholders, and the public.

Introduction

Despite large strides in the realm of ecosystem-based science, the gap remains between conducting ecosystem research and integrating within the stock assessment process. There are three general disciplines within the Council process: stock assessment, ecosystem/economic assessment, and fisheries management. When considering the interactions of these three disciplines, fisheries management is fed information through the stock-specific stock assessment and fishery evaluation (SAFE) reports, and the comprehensive ecosystem status and economics reports (ESRs). However, there is no clear pathway to translating the underlying data in the ESRs to a stock-specific situation.

We have developed a new standardized framework termed the Ecosystem and Socioeconomic Profile or ESP for operationalizing the integration of ecosystem and socioeconomic factors within the NOAA Fisheries' stock assessment system (Shotwell et al., *In Review*). The approach builds on the century long legacy of qualitative reviews, conceptual modeling, and retrospective studies focused on detecting mechanisms underlying ecosystem responses to improve stock assessments (for examples in the last 30 years see, Megrey et al., 1996; Bailey et al., 1996; Chambers et al., 1997; Rupp et al., 2012; Catalan et al., 2019; Szuwalski et al., 2014). With the end goal of transitioning to ecosystem-linked assessments (Tommasi et al., 2017; Karp et al., 2019), they are specifically designed to prevent inclusion of process linkage in the decision making process before it has been tested and vetted through the scientific review process. The ESPs are a standardized framework for presenting and communicating the emerging evidence linking ecosystem processes to stock assessments. Completing the loop between the three disciplines allows for building a proactive strategy to be prepared for extraordinary change. The North Pacific Fishery Management Council (NPFMC or Council) has recommended ESPs be developed for priority stocks in the Alaska groundfish and crab fishery management plans.

The ESP process begins with a focused effort to understand the data availability for each stock and identify priority stocks for producing ESPs. The next step in the process requires grading a set of stock metrics in order to identify the vulnerabilities and potential life history bottlenecks for the stock. This leads to defining indicators and analyzing trends appropriate to the data availability for the stock. The process is completed with a standardized reporting template that is concise and conveys the potential of the leading indicators for use in the stock assessment. The ESP report is included as an appendix to the specific stock assessment chapter in the SAFE report and, where applicable, replaces the existing

ecosystem considerations section of the stock assessment chapter. Ecosystem and socioeconomic considerations are provided in the ESP report, and relevant elements of that report are linked to the harvest recommendations sections of the SAFE. The concept of the ESPs began in 2014 and have since developed in a phased approach within the annual fisheries management cycle (Shotwell, 2018). ESPs have been produced annually for Alaska sablefish since 2017 (Shotwell et al., 2017, 2018, 2019b) and two new stocks were added in 2019, Gulf of Alaska walleye pollock and Saint Matthew blue king crab (Shotwell et al., 2019a, Fedewa et al., 2019).

As the ESPs have gained momentum in the past several years, the coordination and communication of their production has increased dramatically. It became vital that a clear and efficient development plan should be in place to create and continue the ESPs for the Alaska groundfish and crab stocks. In response to these concerns, we proposed a series of three workshops to develop and implement the ESPs at the Alaska Fisheries Science Center (AFSC) from 2019 through 2021. Organized across the themes of data availability, modeling applications, and providing advice, these three workshops were funded through the Regional Work Plan process at the AFSC and administered by the Office of Science and Technology. The workshops will help bridge the gap between the ecosystem, socioeconomic, and stock assessment communities at the AFSC by encouraging cooperation and communication amongst a wide variety of programs toward the common goal of implementing ecosystem based fisheries management. The results of the workshops will create guidelines that detail the ESP process tailor fit to the ecosystem and socioeconomic research conducted at the AFSC.

SSC and Plan Team Comments on the ESPs

In this section, we list SSC or Plan Team comments and recommendations related to the ESPs since the 2018 September ESP document (Shotwell, 2018) and provide brief responses relating to progress on new developments of the ESPs that are further detailed in the following section. The first set of comments relates to Plan Team or SSC recommendations to producing the ESPs, while the remaining comments relate to avenues for ESP improvement.

Comments related to Producing ESPs

“Three SSC members attended a workshop on Ecosystem Socio-economic Profiles (ESPs) in May 2019. The SSC was pleased to learn of the progress on the ESP and its connections to the risk table. In addition, the Bering Sea FEP and Crab Plan Team reports highlighted the range of approaches currently in development. During the October 2017 SSC meeting the SSC requested stock-specific ecosystem status (i.e., “OK-ness”) and “inference of impending decline” specific to groundfish stock assessments. Given that the risk table and ESP are clearly in development and are likely to evolve in important ways, the SSC suspends its requests for “OK-ness” and “inference of impending decline” for individual stock authors of all assessments. The combined efforts of developing ESPs for key species, the planned fall and spring meetings of the Ecosystem Status Report team to assess ecosystem change, and the development of risk tables should provide the information needed to inform the NPFMC of relevant ecosystem change. The SSC appreciates the responsiveness of the authors and the Plan Teams to previous requests. The SSC would like to see how these new processes and products develop to determine if they are able to provide the type of information needed to provide an early detection of ecosystem change. In addition, risk tables only need to be produced for groundfish assessments that are in a “full” year in the cycle. For now, ESPs may be developed for crabs, but risk tables will not be requested until after the groundfish model has become more refined.” (SSC, June 2019, pg. 1-2)

In response to this recommendation, ESPs along with Ecosystem Status Reports (ESRs), the Preview of Ecosystem and Economic Considerations (PEEC) meeting, and the risk tables are the primary avenues for determining stock-specific ecosystem status and conducting evaluations of indicators of severe impending

decline. As the ESPs develop for more stocks the coordination between these efforts will be important to maintain consistency in response and avoid redundancy.

“The SSC supports plans for further ESP development and evaluation. These efforts should enhance the future utility of indicators in stock assessments, including evaluations of uncertainty. ESPs are a commitment to a process, not a static product. As such, consideration should be given to the regularity (and timing) of reviews and revisions. Moreover, this effort should not stop with ecosystem indicators, but continue until ecosystem information is formally incorporated into SAFEs to achieve the goal of ecosystem-based fisheries management (EBFM). In that light, the SSC acknowledges the thoughtful consideration that is going into defining the varying needs and uses of socioeconomic data in ESPs, ESRs, and SAFE documents. The SSC is well aware of the challenges involved in trying to close the EBFM loop. Tough decisions lay ahead about how exactly to do this.” (SSC, June 2020, pgs. 3-4)

We are very thankful for the continued support and advice from the SSC and Plan Teams regarding the ESPs. The planned September 2020 one-day ESP Discussion workshop will have an agenda item to review and provide feedback on the annual ESP cycle. We hope to streamline the review process and reporting templates to help with increasing efficiency in producing the annual ESPs. Additionally, ESP facilitators and ESR editors are now coordinating indicator contributions between the ESPs, ESRs and Economic SAFE to avoid redundancy in the various products.

Comments related to Improving ESPs

“The following items were noted in discussion and the Teams recommended that they be referred to at the planned workshops for consideration, coordination, and development:

- *Spatial footprint of different areas shown for data purposes on the webpages.*
- *Continued coordination with ESR and ESP development.*
- *Incorporating ROMS output into this framework in coordination with existing national initiatives and delivery of these outputs.*
- *ACLIM project coordination on projection modeling trends and defining appropriate time frames.*
- *Upcoming discussion papers on skipper surveys and ongoing socio-economic work.*
- *Continue to keep ecosystem information in context for individual stock assessment authors to query and keep the larger ecosystem context in mind in developing these.*
- *Continue to coordinate the myriad of individual efforts for ESR, ESP, and ongoing economic work.”*

(Joint Groundfish Plan Team, September 2018, pgs. 10-11)

“The SSC supports the PT list of development avenues for the Ecosystem and Socioeconomic Profile (ESP) process and encourages continued work on these efforts. The SSC looks forward to the planned ESP workshops and hopes there may be some level of SSC participation.” (SSC, October 2018, pg. 12)

A summary of the 2019 and 2020 workshops is included in the following section. Additionally the agendas for these workshops are included in an appendix to this report for reference (Appendix A for 2019, and Appendix B for 2020). Several members of the Plan Teams and SSC were in attendance at these two workshops and will continue to be included in future workshops and discussion sessions. We greatly appreciate their time in attending the workshops and the valuable feedback they provided. Regarding the specific bullets of the Plan Team recommendations: 1) webpages are in development to summarize the ESPs and associated data sources are referenced in the reports and links provided to show maps of the survey spatial footprint where available, 2) coordination between the ESP facilitators, stock assessment authors, and the ESR editors is currently occurring along the lines of indicator development and location of contributions, 3&4) ROMS and ACLIM project summaries and output were presented at

2020 ESP Workshop and currently being incorporated into several ESPs, 5) socioeconomic indicators are becoming more fully developed and organized in the ESPs and this topic will be an agenda item at the one-day discussion workshop, 6&7) ESP teams have an assigned ESP editor and Economic SAFE editor to increase coordination efforts between the various products and avoid redundancy.

“[Within the ACLIM Report]... The SSC suggests that the most appropriate ‘on-ramp’ for long-term strategic advice emerging from ACLIM analyses is through the climate Action Module of the Bering Sea Fishery Ecosystem Plan (FEP). Other ‘on-ramps’ for this information are provided through Ecosystem Status Reports (ESRs) and through Ecosystem and Socioeconomic Profiles (ESPs) that are being developed for individual stocks.” (SSC, April 2019, pg. 2)

Recent results suggest that climate change and ocean acidification may pose substantial threats to the long-term production of several key commercially fished stocks (Punt et al., 2014; Holsman et al., 2019). ACLIM output is currently being prepared for the Eastern Bering Sea Pacific cod ESPs and will also be included in the GOA Pollock and GOA Pacific Cod ESP when the GOA CEATTLE model is reviewed and published. We also anticipate that this information will be included in the BSAI and GOA arrowtooth flounder ESPs when they are developed.

“Overall, the human dimensions section would benefit from a series of maps that show the relationships between the various geographic units discussed and the location of communities within those geographies (and the larger ecosystem geographies). It would also be beneficial to clarify the relationship between the type of human dimensions data that are contained in ESRs, ESPs, SAFEs, the Economic SAFE, and the apparently new and to-be-defined documents that will contain the fishing community information that was removed from the current version of the Economic SAFE. This would provide clarity and consistency in meeting the data needs to address social and community focused management obligations under National Standard 2 and National Standard 8 while avoiding redundancy of effort.” (SSC, December 2019, pg. 7-8)

We plan to have an agenda topic in the one-day ESP Discussion Workshop on clarifying the socioeconomic aspects of the ESPs and the relationship of this information with the other human dimensions information contained in the ESRs and the Economic SAFE. We anticipate that following the discussion we will have a better understanding of what indicators should be in each product to meet the obligations of NS2 and NS8 and avoid redundancy.

“Regarding ESPs in general, the SSC recommends development of a method to aggregate indices into a score that could be estimated over time and compared to stock history. One potential pathway forward may be to normalize and use an unweighted sum of all the indicators where all time series overlap, or just assign +1 or -1 to each indicator so that a neutral environment would be zero.” (SSC, February 2020, pg. 7)

We provided a presentation on a scoring option for the indicator suite in the ESP Model Workshop in March 2020. The score used a simple +1, 0, and -1 assignment to the indicator based on whether the current year was above, within, or below 1 standard deviation from the mean for the time series. We used sablefish and GOA pollock as case studies and calculated this score historically for the past 15 years. We also evaluated the score timeline trajectory with respect to the general ecosystem and socioeconomic considerations provided in the ESP documents. We plan to provide this score in both the partial and full ESPs for this year and hope for feedback on the method.

ESP Developments

In this section, we provide additional information on several projects regarding the development of the ESPs and report progress in each of the main topics.

ESP Workshops

The first of the ESP workshops was conducted in May 2019 and successfully met the anticipated goals of the workshop which were to 1) introduce the ESP process and products through new data-rich and data-limited examples (pollock and crab), 2) generate a data list to be operationally available for producing ESPs (100 plus datasets), 3) discuss and list priority stock assessments for producing ESPs, 4) foster communication and collaboration between programs for contributing to the ESPs, and 5) outline a workshop report and prepare for producing a technical memorandum. Approximately 70 participants were in attendance either in-person or remotely from AFSC staff as well as representatives from the North Pacific Fisheries Management Council (NPFMC), Alaska Regional Office (AKRO), Alaska Department of Fish & Game (ADF&G), Northwest Fisheries Science Center, Southwest Fisheries Science Center, NMFS Office of Science and Technology, Pacific Marine Environmental Laboratory, National Environmental Satellite, Data, and Information Service, industry representatives, universities, and non-governmental organizations.

The second of the three planned ESP workshops was conducted in March 2020. This workshop focused on modeling applications for use in the ESPs and the anticipated goals of the workshop were to 1) review the ESP framework, current and new priority ESPs, data accessibility for ESPs, and recommendations regarding improving ESPs, 2) discuss and generate guidelines for ESP modeling applications from simple indicator development and analysis to advanced multi-species, climate-enhanced models, 3) foster communication and collaboration between programs and discuss the process for ESP contributions, timeline, and avenues for improvement, and 4) review the 1st workshop report, outline 2nd workshop report, and prepare both for producing a technical memorandum series. The workshop had been scheduled for an in-person conference, but due to COVID-19 virus concerns we opted to hold an almost entirely remote workshop with two small groups in Juneau, Alaska and Seattle, Washington to host the presentations. Approximately 100 participants were in attendance mirroring the diversity of the first workshop participation. We achieved nearly all of the planned workshop objectives using remote workshop tools such as WebEx large capacity conferencing, shared google products, and live polling applications. Discussion sessions were limited due to the nature of remote conferencing; however, a follow up one-day workshop is scheduled for September 2020. We plan to generate model application guidelines for ESPs and conduct several dedicated discussion sessions on topics selected by a survey of the workshops participants.

The final ESP workshop is anticipated to occur in spring of 2021 and will focus on short-term forecasting applications for the ESPs, finalizing the reporting frameworks, and identification of diagnostic criteria necessary for transitioning from a qualitative data summary to ecosystem-linked assessments. Primary objectives of this third workshop may be to 1) update on current ESPs and recommendations, 2) discuss and generate guidelines for the use of mechanisms identified and tested in the ESP and what diagnostic thresholds should be passed for the mechanisms to be transitioned for use in the assessment, short-term forecasts and other applications, 3) discuss and generate guidelines for diagnostic thresholds for consideration potential ecosystem links as potential qualitative evidence in risk assessments (note the goal is that the proposed link passes diagnostic testing in 3 and can be formally used in the stock assessment and decision tables), 4) discuss and provide templates for ESP reporting (full, executive summary, and rapid communication) for various users, and 5) review technical memorandum drafts and the draft workshop manuscript. Final planned products for the ESP workshops include three proceedings technical memorandums, a manuscript summarizing the resulting guidelines by workshop theme and overall recommendations of the three workshops, and an ESP webpage on the NMFS website that reviews the

ESP process and provides links to ESP templates, code, and examples at the AFSC for potential application at other science centers.

ESP Data

During the 2019 ESP Data Workshop, we collected metadata on approximately 100 datasets that were currently available for contributing to the ESPs. This list has continued to expand as we increased participation in the 2020 ESP Model Workshop. Unfortunately, many of these datasets are not readily accessible and exist on a large variety of platforms and repositories. It is clear that a streamlined data management system is needed to support seamless integration between these different data sources. Currently the Alaska Fisheries Information Network (AKFIN) program provides centralized processing and distribution of survey and fishery data to stock assessment authors within a flexible data management system. Views set up in this system can be accessed through filters in a dashboard environment or through a back-end direct query. The majority of stock assessment authors utilize this system to access data for creating their stock assessment model input files. We plan to use this system to increase visibility and access to many of the ecosystem and socioeconomic datasets identified in the ESP workshops.

To jump start this project, we utilized foregone travel funding from the March 2020 ESP Model Workshop to initiate an ESP page on the current stock assessment dashboard managed by AKFIN. Additionally, we submitted a proposal to the FY2021 Fisheries Information System to develop a web-based application tool for uploading diverse ecosystem and socioeconomic data or views to AKFIN and make it available through the dashboard or direct query. This will be an opt-in process with authorization and continued input from data providers. We plan to demo the initial ESP dashboard page at the one-day discussion workshop and solicit group feedback for development of the dashboard and uploading tool. We hope that this expanded data access system will function as a one-stop shop for initializing next generation stock assessments.

ESP Documents

The workshops combined with recommendations from the Plan Teams and SSC have resulted in creating an annual cycle for preparing and producing the ESPs reports. An ESP is typically initiated in the fall and winter during the annual stock assessment cycle. The ESP facilitator and/or the stock assessment author then identifies an ESP team to conduct and update the ESP. This team meets regularly throughout the following spring and summer to solicit contributions for the ESP and generate the report. The ESP is then presented to the groundfish and crab Plan Teams for review (May for crab ESPs and September for groundfish ESPs). Once approved the ESP report is then completed and included as an appendix in the final SAFE report (September for crab stocks and November for groundfish stocks). Additionally, for groundfish, the ESP facilitator, ESR editors, and stock assessment author meet prior to the final SAFE report submission deadline to discuss how results of the ESP and ESR may be utilized and referenced within the main SAFE report.

The first or initial ESP document is considered a full document. The reporting template includes four main sections: 1) justification and data sources, 2) metrics assessment, 3) indicators assessment, and 4) recommendations. The justification section includes a summary of the national initiatives and stock assessment classification as described and recommended in the Next Generation Stock Assessment Improvement Plan (Chapter 8, Lynch et al., 2018). The metrics assessment includes an initial review of common metrics collected across a wide range of stocks combined with an evaluation of ecosystem and socioeconomic process studies to identify life history bottlenecks, ecological vulnerability, mechanistic linkages, fishery performance, economics, and community engagement. The indicators assessment begins with a review of any historical manuscripts of integrating ecosystem and socioeconomic indicators into the stock assessment. This is followed by the indicator time series suite that serves as proxies for critical processes identified in the metrics section. The indicators suite is monitored within the ESP through

potentially three main stages that include statistical analysis suited to the data availability of the stock. The output of the statistical analysis may be used as an early warning system and provided as a summary in the final recommendations section. Data gaps and future research priorities are also provided. A full document is scheduled for EBS Pacific cod, GOA Pacific cod, and Bristol Bay red king crab in 2020.

The partial ESP document is an executive summary version of the full document and follows the template for SAFE partial assessments. Any changes in the metric and indicator data or monitoring analysis are provided in a summary of changes section. This is followed by a brief summary of results to include new literature on metrics or indicators, the most recent metric and indicator trends, and an updated summary of recommendations. Generally, a partial ESP document is conducted following a full ESP document as recommended by the Plan Team. This will occur for Alaska sablefish, GOA pollock, and St Matthew blue king crab in 2020.

A rapid one-page communication template is under development for the ESPs and will be provided in tandem with a one-page summary of the SAFE results. An example of this two-page communication has been developed for sablefish (e.g., Shotwell et al., 2018, Lynch et al., 2018 in Appendix B). Automation of the two-page template is currently under development. Additional planned manuscripts on the ESPs include an introduction to the ESP process and product (Shotwell et al., *In Review*), a two part investigation on specialized products from the Gulf of Alaska Integrated Ecosystem Research Program for use in the ESPs, three ESP workshop technical memorandums, and a final overview manuscript on the benefits of structured workshops for developing and implementing the ESPs in the Alaska region.

Summary and Conclusions

The ESP is a framework for identifying ecosystem linkages that improve stock assessments using structured statistical evaluation of the performance of ecosystem-linked assessments and a communication platform for reporting results. The results of the ESPs are available through several different reporting formats to effectively communicate with the scientific community, stakeholders, and the public. Closing this communication gap is a research priority of nearly all strategic documents (e.g., Lynch et al., 2018).

The in-person workshop forum of the 2019 ESP Data Workshop was a successful collaboration between scientists from very diverse programs. The swath of programs represented was quite unprecedented in our recent history and feedback from the participants was overwhelmingly encouraging. Also, despite the largely remote participation of the 2020 ESP Model Workshop, the groundwork laid by the first workshop continued to inspire engagement and the remote option actually increased overall participation. Group discussion was limited and may continue to be a challenge if we cannot meet in-person in the future. But the participants remain very engaged and we hope to provide both in-person and large capacity conferencing and live polling in the future. The group interaction and coordination cannot be understated in the path toward implementing the ecosystem approach to fisheries management. By increasing the communication potential between scientists, we create an atmosphere that is inclusive and supportive. Improving data accessibility and visibility through data management systems like AKFIN will help continue the relationships developed in the workshop and allow for further innovation and progress. We hope to continue this collaboration and sense of community beyond the 2021 workshop by partnering the ESP workshop with other collaborative efforts such as the PEEC workshop and/or the Recruitment Processes Alliance workshop.

Decisions resulting from the ESP reports occur along the main categories of risk, rebuilding, and readiness. The summary considerations of the ESPs have mainly been used in a contextual manner to identify additional uncertainty not accounted for in the operational stock assessment model. This information is often included in the risk table of the groundfish SAFEs and may result in or prevent an

additional buffer from the maximum recommended quota (e.g. Alaska sablefish and GOA pollock). ESPs are also used for helping define productivity regimes in developing rebuilding plans (e.g., St Matthew blue king crab). Finally, the metrics and indicators of the ESP highlight the life history bottlenecks for a stock and provide an early warning system for extreme change. Together these elements allow for more informed decisions and increase the readiness of our stock assessment enterprise.

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Appendix 1A

Ecosystem and Socioeconomic Profile (ESP) Data Workshop 5/29/2019 – 5/31/2019, Traynor Room

Location Details:

Traynor Room 2076, Building 4, 2nd Floor - Sand Point, Seattle, Washington

Webex Details:

Meeting password for all three days: esp123!

Day 1: Meeting number: 902 608 587, Teleconference #: 1-888-456-5038, Participant Passcode: 8480290 <https://noaanmfs-meets.webex.com/noaanmfs-meets/j.php?MTID=m7b1faf6b2a042c563e305c4dec587aa0>

Day 2: Meeting number: 906 897 501, Teleconference #: 1-888-456-5038, Participant Passcode: 8480290 <https://noaanmfs-meets.webex.com/noaanmfs-meets/j.php?MTID=m590338b961681516c0b45bb2058071f3>

Day 3: Meeting number: 908 900 710, Teleconference #: 1-888-456-5038, Participant Passcode: 8480290 <https://noaanmfs-meets.webex.com/noaanmfs-meets/j.php?MTID=mcad1fd0d98ffaabcf9a8df787dcd2335>

Workshop Materials:

Links to workshop materials: [ESP Workshop Proposal](#), [Presentation Guidelines](#), [ESP Data List](#), workshop presentations, workshop minutes, draft workshop report

Workshop Goals:

Primary goals to accomplish at this workshop:

- Introduce the ESP process and products through new data-rich and data-limited examples
- Generate a list of metrics and indicators to be operationally available for producing ESPs (includes description, database location, contacts, and production timing)
- Generate a list of priority stock assessments for producing ESPs (potentially includes timeline)
- Foster communication and collaboration between programs and identify new metrics or indicators for the ESPs
- Outline a workshop report and prepare for producing a technical memorandum

Agenda:

In the following agenda, guideline times are listed for each topic. The values in parentheses following the topic title are the estimated time for presentation followed by time for questions and/or discussion relating to the topic (e.g., (5/5) means five minutes presenting, five minutes questions/discussion).

Day 1 Morning 5/29/2019, 9 am start - ESP Overview

- 09:00 - 09:15 Overview of ESP Workshop proposal, goals – Kalei Shotwell, Sandra Lowe (10/5)
 1. Introductions, review agenda, workshop materials
 2. Review rapporteur/time manager list

- 09:15 - 09:45 ESP Process, Products, and Framework – Kalei Shotwell, Kristan Blackhart (15/15)
 1. Stock Assessment Classification and justification for producing an ESP
 2. ESP reporting framework, metrics/indicators definitions, recommendations
- 09:45 - 10:30 Information flow between ESPs, ESRs, and Council recommendations on OFL and ABC – Martin Dorn (15/30)
- 10:30 - 10:45 Break (15 minutes)
- 10:45 - 11:15 Review of Sablefish ESP – Dana Hanselman (20/10)
- 11:15 - 12:00 Question/Discussion session on ESP framework, information flow, sablefish ESP
- 12:00 - 13:30 Lunch (1.5 hours)

Day 1 Afternoon 5/29/2019, 5 pm end - ESP Examples

- 13:30 - 15:30 Step-by-Step GOA Pollock ESP – Team Dorn (2 hours)
 1. Process summary and draft ESP pollock report – Kalei Shotwell (5/5)
 2. Metrics and mechanisms – Alison Deary (10/5)
 3. Ecosystem indicators – Lauren Rogers (10/5)
 4. Economic performance report and socioeconomic indicators – Ben Fissel (10/5)
 5. Assessment, recommendations, and management applications – Martin Dorn (15/5)
 6. Question/Discussion session on data-rich ESPs (45 minutes)
- 15:30 - 15:45 Break (15 minutes)
- 15:45 - 16:45 Step-by-Step Saint Matthew Island Blue King Crab ESP – Erin Fedewa (1 hour)
 1. Process summary and draft ESP crab report – Kalei Shotwell (5/5)
 2. Metrics and indicators – Erin Fedewa and Brian Garber-Yonts (10/5)
 3. Assessment, Recommendations, and Management Applications – Erin Fedewa (10/5)
 4. Question/Discussion session on data-limited ESPs (20 minutes)
- 16:45 - 17:00 Question/Discussion session on data-rich versus data-limited ESP examples

Adjourn for day and decompress at Magnuson Cafe & Brewery, 62nd Avenue Northeast (5-7 pm)

Day 2 Morning 5/30/2019, 9 am start - Metrics and Indicators

- 09:00 - 09:15 Recap, Introduction to Metrics and Indicators – Kalei Shotwell, Lisa Eisner (10/5)
 1. Guidelines for program presentations
 2. Review draft ESP Data List of metrics and indicators
 3. Accessibility to metric/indicator data, example webpage, data server
- 09:15 - 09:35 How to use the Economic SAFE for ESPs – Ben Fissel, Sarah Wise (15/5)
- 09:35 - 09:55 How to use the Ecosystem Status Reports for ESPs – Elizabeth Siddon (15/5)
- 09:55 - 10:10 Climate Model and IBM Applications – Buck Stockhausen (10/5)
- 10:10 - 10:25 Break (15 minutes)
- 10:25 - 12:10 AFSC Metrics and Indicators – AFSC Program Representatives
 1. Pacific Marine Environmental Laboratory – Phyllis Stabeno (10/5)
 2. Recruitment Processes Program – Alison Deary, Lauren Rogers (10/5)
 3. Ecosystem Monitoring and Assessment – Jamal Moss, Ellen Yasumiishi (10/5)
 4. Recruitment, Energetics, and Coastal Assessment – Rob Suryan, Mandy Lindeberg (10/5)
 5. Fisheries Behavioral Ecology – Ben Laurel (10/5)
 6. Midwater Assessment and Conservation Engineering – Kresimir Williams (10/5)
 7. Shellfish Assessment Program – Erin Fedewa (10/5)
- 12:10 - 13:30 Lunch (1.25 hours)

Day 2 Afternoon 5/30/2019, 5 pm end - Metrics and Indicators (cont.)

- 13:30 - 15:15 AFSC Metrics and Indicators – AFSC Program Representatives
 1. Groundfish Assessment Program – Duane Stevenson (10/5)
 2. Age and Growth Program – Beth Matta (10/5)
 3. Resource Ecology and Ecosystem Modeling – Kirstin Holsman (10/5)
 4. Fisheries Monitoring and Analysis – Craig Faunce (10/5)
 5. Status of Stocks and Multispecies Assessment – Jim Ianelli (10/5)
 6. Marine Ecology and Stock Assessment – Chris Lunsford (10/5)
 7. Economic and Social Sciences Research – Steve Kasperski (10/5)
- 15:15 - 15:30 Break (15 minutes)
- 15:30 - 15:45 Alaska Seabird Data – Bill Sydeman (10/5)
- 15:45 - 16:00 Alaska Regional Office, Sustainable Fisheries Division – Anne Marie Eich (10/5)
- 16:00 - 16:15 Alaska Department of Fish & Game – Ben Williams, Kally Spalinger (10/5)
- 16:15 - 16:30 International Pacific Halibut Commission – Ian Stewart (10/5)
- 16:30 - 17:00 Question/Discussion session on metrics and indicators

Adjourn for day and enjoy happy hour, TBA (possibly Ravenna Brewing Co, weather dependent, 5-7 pm)

Day 3 Morning 5/31/2019, 9 am start

- 09:00 - 09:10 Recap, Introduction to Metric/Indicator Development – Kalei Shotwell (5/5)
- 09:10 - 09:25 Spatial Model Derived Metrics/Indicators – Jim Thorson (10/5)
- 09:25 - 09:40 Essential Fish Habitat Metrics/Indicators – Jodi Pirtle (10/5)
- 09:40 - 09:55 Reproductive Metrics – Susanne Mcdermott (10/5)
- 09:55 - 10:10 Remote Sensing Applications – Jordan Watson (10/5)
- 10:10 - 10:30 Question/Discussion session on developing metrics/indicators for ESPs
- 10:30 - 10:45 Break (15 minutes)
- 10:45 - 11:45 Priority Stock Assessments for ESPs – Kalei Shotwell, Sandra Lowe, Chris Lunsford
 1. Review draft ESP Priority Stock List from Stock Assessment Classification (10/5)
 2. Question/Discussion session on priority ESPs (45 minutes)
- 11:45 - 12:00 Main Workshop Wrap-up – Kalei Shotwell
 1. Timeline for finalizing ESP Data List, ESP Priority Stock List, workshop report
 2. Next ESP Workshop theme and preliminary dates
- 12:00 - 13:30 Lunch (1.5 hours) – ESP Workshop Team, rapporteurs (all are welcome)

Day 3 Afternoon 5/31/2019, 5 pm end

ESP Workshop Team and rapporteurs will reconvene to collect notes, structure report, and set timelines. All are welcome to join.

- 13:30 - 14:00 Collect notes from rapporteurs and time managers on Google Drive
- 14:00 - 15:30 Structure Workshop Report – ESP Workshop Team
 1. Finalize draft ESP Data List, ESP Stock List for report, determine future use
 2. Ensure contacts for producing metrics/indicators
 3. Identify avenues for programs to help with priority ESPs
 4. Draft report outline and set timeline for report production
- 15:30 - 16:30 Outstanding Questions/Discussion

Adjourn and see you at the next ESP workshop!!!

Action Items:

- ESP Data List of metrics and indicators
 - Contacts for products to be updated annually
 - Protocol for uploading data
- ESP Priority Stock List
 - Draft priority stock list based on Stock Assessment Classification results
 - Identify avenues for helping stock assessment authors with ESPs and the potential schedule of production for long and short-form templates
- ESP Workshop Report
 - Framework, Sablefish, GOA Pollock, BSAI Crab ESP summaries
 - Metric/Indicator by program summaries
 - Metric/Indicator development summaries
 - Priority ESP Stock Assessments
 - Table 1: ESP Data List of metric/Indicator with Contacts
 - Table 2: ESP Stock List, Schedule
- ESP Workshop Summary Presentations
 - PEEC Workshop – June 6th, 2019
 - Joint Groundfish Plan Team – September 16-20, 2019
 - Possibly October Council (SSC) – September 30 - October 4, 2019

Next Workshop Timing:

ESP Modeling Workshop, Sand Point, Seattle, Washington, Spring 2020

Appendix 1B

Ecosystem and Socioeconomic Profile (ESP) Model Workshop 3/10/2020 – 3/12/2020, Royce/Traynor Room

Location Details:

Royce Room 131 (Library), Ted Stevens Marine Research Institute, 17109 Pt Lena Loop Rd, Juneau, AK
Remote Site: Traynor Room 2076, Building 4, 2nd Floor - 7600 Sand Point Way NE, Seattle, WA

Webex Details:

Meeting password: ESP123

Meeting number: 906 830 321

Meeting passcode: 8480290

Join by Phone: 1 888-456-5038

Meeting Link: <https://noaanmfs-meets.webex.com/noaanmfs-meets/j.php?MTID=m7743bde7004c13f1a8a615a9e6c1042d>

Workshop Materials:

Links to workshop materials: [ESP Workshop Proposal](#), [ESP Data List](#), [2019 ESP Data Workshop Materials](#), [ESP Discussion Worksheet](#), ESP Workshop Survey, workshop minutes, draft workshop report

Workshop Goals:

Primary goals to accomplish at this workshop:

- Review ESP framework, current and new priority ESPs, data accessibility for ESPs, and Council recommendations regarding improving ESPs and use in management decisions
- Discuss and generate guidelines for ESP modeling applications from simple indicator development and analysis to advanced multi-species, climate-enhanced models
- Foster communication and collaboration between programs and discuss the process for ESP contributions, timeline, and avenues for improvement
- Review 1st workshop report, outline 2nd workshop report, and prepare both for producing technical memorandum series

Agenda:

In the following agenda, guideline times are listed for each topic. The values in parentheses following the topic title are the estimated time for presentation followed by time for questions and/or discussion relating to the topic (e.g., (5/5) means five minutes presenting, five minutes questions/discussion).

Day 1 Afternoon 3/10/2020, 12 pm start (Alaska Daylight Time)- ESP Update

- **12:00 - 12:15** Review of ESP Workshop proposal, goals – Kalei Shotwell (10/5)
 1. Introductions, review agenda, workshop materials, workshop survey
 2. Review rapporteur/time manager list, discussion and polling sessions
- **12:15 - 12:30** ESP Review, Update, Council Feedback – Kalei Shotwell (10/5)

1. Short review of ESP process, standard products, and reporting frameworks
2. Review on PT/SSC recommendations, coordinating timeline, teams, needs
- **12:30 - 13:30** ESP Team Updates – Kalei Shotwell, Erin Fedewa, Olav Ormseth (45/15)
 1. Sablefish, GOA Pollock, Pacific Cod ESPs: executive summaries, full documents, production timeline, Plan Team/SSC recommendations
 2. Crab ESPs: executive summary, priority ESPs, timeline, recommendations
 3. Data limited ESPs: description, alternate uses, considerations
- **13:30 - 14:00** Discussion/Polling Session – Cindy Tribuzio
 1. What are the standards for including indicators in an ESP (e.g., mechanism documentation, proxy information)?
 2. To what extent do we transform the assessment through the ESP (e.g., everything not directly used for harvest recommendations, method testing)?
- **14:00 - 14:25** Break (25 minutes)
- **14:25 - 15:00** Data Accessibility for ESPs – Jordan Watson, Kalei Shotwell (20/15)
- **15:00 - 15:30** Ecosystem/Economics Status Reports and ESP Workflow – Bridget Ferris, Ben Fissel, Ebett Siddon (20/10)

Adjourn for the day and please fill out the ESP survey!

Day 2 Morning 3/11/2020, 8:30 am start (Alaska Daylight Time) - Modeling Applications for ESPs

- **08:30 - 08:40** Recap, Introduction to Models for ESPs – Kalei Shotwell (5/5)
 1. Structure for model presentations
 2. Review discussion and polling sessions
- **08:40 - 09:05** Oceanographic Models – Kelly Kearney, Darren Pilcher (15/10)
- **09:05 - 09:30** Individual Based Models – Esther Goldstein, William Stockhausen (15/10)
- **09:30 - 09:55** Food Web Models – Kerim Aydin, Jon Reum (15/10)
- **09:55 - 10:20** Break (25 minutes, potential polling session)
- **10:20 - 10:45** Species Distribution Models, Part 1 – Lewis Barnett, Jim Thorson (15/10)
- **10:45 - 11:10** Species Distribution Models, Part 2 – Ned Laman, Jodi Pirtle (15/10)
- **11:10 - 11:35** Metrics Applications – Ben Laurel, Susanne McDermott, Rob Suryan (15/10)
- **11:35 - 12:45** Lunch (~1.25 hours)

Day 2 Afternoon 3/11/2020, 3:30 pm end (AKDT) - Modeling Applications for ESPs (cont.)

- **12:45 - 13:15** Ecosystem Indicator Applications – Lauren Rogers, Ellen Yasumiishi (20/10)
- **13:15 - 13:40** Discussion/Polling Session – Jim Thorson
 1. What are the criteria to add or remove metrics/indicators for use in an ESP?
 2. How do we measure and report skill-testing of a potential indicator in an ESP?
- **13:40 - 14:00** Break (20 minutes)
- **14:00 - 14:20** SEASAW: Past, Present and Future – Alan Haynie (15/5)
- **14:20 - 14:50** A Conceptual Model for social and economic indicators – Ben Fissel (25/5)
- **14:50 - 15:05** Sablefish Case Study: Fleet Performance Indicator – Marysia Szymkowiak (10/5)
- **15:05 - 15:30** Discussion Session – Steve Kasperski
 1. What kind of advice should social and economic indicators provide?
 2. How can we weave social and economic considerations in the ESP paradigm?

Adjourn for the day and please fill out the ESP survey!

Day 3 Morning 3/12/2020, 9 am start (Alaska Daylight Time) - Modeling Applications within ESPs

- **09:00 - 09:10** Recap, Introduction to Models within ESPs – Kalei Shotwell (5/5)
 1. Review ESP indicator analysis framework stages for ESPs
 2. Review discussion sessions and trigger questions
- **09:10 - 09:35** Simple Indicator Scores – Kalei Shotwell, Martin Dorn (15/10)
- **09:35 - 10:00** Indicator Importance Methods – Curry Cunningham (15/10)
- **10:00 - 10:15** Break (15 minutes)
- **10:15 - 10:45** Enhanced Stock Assessment Models – Meaghan Bryan, Carey McGilliard (20/10)
- **10:45 - 11:10** Climate-enhanced Multi-species Models – Kirstin Holsman (15/10)
- **11:10 - 11:35** Multi-area Models – Kari Fenske, Dana Hanselman, Nick Tolimieri (15/10)
- **11:35 - 12:00** Discussion session – Chris Lunsford
 1. What model performance metrics do we provide in the ESPs?
 2. How do these metrics translate to advice for the SAFE?
- **12:00 - 13:30** Lunch (1.5 hour)

Day 3 Afternoon 3/12/2020, 3 pm end (AKDT) - Review Tech Memo

- **13:30 - 14:00** Discussion/Polling Session Review – Discussion Session Leads (30)
 1. Present summary conclusions of discussion/polling sessions
 2. Review workshop survey preliminary results
- **14:00 - 14:30** Draft ESP Workshop Tech Memo, Manuscript – ESP Workshop Team (30)
 1. Review outline for Tech Memos of each workshop
 2. Review outline for ESP Workshop Manuscript
- **14:30 - 14:45** Main Workshop Wrap-up – Kalei Shotwell
 1. Timeline for summary presentations, progress report, Tech Memos, Manuscript
 2. Mini-meet Workshop Review and Discussion, Monday September 14, 2020
 3. Next ESP Workshop theme and discuss preliminary dates
- **14:45 - 15:00** Break (15 minutes) and **End main workshop**

ESP Workshop Team and rapporteurs will reconvene to collect notes and discuss action items for the next workshop preparation. All are welcome to join.

- **15:00 - 15:15** Collect notes/summary from rapporteurs/presenters on Google Drive
- **15:15 - 15:30** Workshop Actions – ESP Workshop Team
 1. Writing assignments for workshop notes
 2. Timeline for completion of workshop Tech Memo (1, 2, 3 or combo)
 3. Discuss ESP Teams and facilitation
 4. Discuss Advice workshop and preparation

Adjourn and see you at the next ESP workshop!!!

Action Items:

- ESP Modeling Synopsis and Guidelines
 - Accounting of modeling applications for use in ESPs
 - Guidelines for testing indicators and model output within ESPs
- ESP Discussion Review
 - Pre-workshop survey on participant expectations

- Discussion wrap-up session conclusions
- ESP Workshop Report
 - ESP Update and Team Reports
 - Model Guidelines for ESPs
 - Workshop Survey
 - Discussion Review
 - Table 1: Testing criteria for indicators
 - Table 2: Performance metrics for model output
- ESP Workshop Summary Presentations
 - PEEC Workshop – May, 2020
 - Possibly June Council – June, 2020
 - Joint Groundfish Plan Team – September 2020

Next Workshop Timing:

ESP Advice Workshop, Sand Point, Seattle, Washington, Spring 2021