

Chair's Summary Report
AFSC Economics and Social Science Research Program Review
July 17-21, 2017
Seattle, WA

Overview

The purpose of this chair's summary report is to identify key themes that emerged from the five individual reviews. The review team brought significant diversity in background and perspective to the review. Not surprisingly, each reviewer chose to emphasize somewhat different issues in their individual reviews. The five individual reports complement each other well, and provide a wide range of commentary for the AFSC to consider in defining the future of economic and social science research. As the individual comments are posted, I will not repeat every point made by the five reviewers. Where detail is appropriate, I have chosen to identify examples or concerns raised by two or more of the reviewers. I did not find any area of substantive disagreement among the five individual reports.

Six general themes emerged from the individual reports, and I will organize this chair's summary report around these themes:

1. Strong positive assessment of technical competence.
2. Overall scope of research appropriate for mission.
3. Need for strategic planning for research.
4. Recognition of tension in relationship of research to management agenda.
5. Data issues to consider as research agenda moves ahead.
6. Systemic issues in conduct of social science.

1. Strong positive assessment of technical competence.

The five reviews were consistently laudatory about the high level of technical expertise and professionalism within the Economic and Social Science Research Program (ESSRP.) A consistent theme in the reviews was that the ESSRP is a small but highly productive unit. The reviewers pointed to three strong indicators of this success: high rate of publication in peer reviewed journals; extensive collaboration with researchers from other Science Centers and from academic institutions; and leadership by ESSRP staff in professional organizations, conferences, and workshops. Some areas that were specifically highlighted by the reviewers were: spatial analysis of fishing activity; the work to integrate social science research and modelling into the science work of the Center, including stock assessment; and the care that is evident in the conduct of survey work.

2. Overall scope of research appropriate for mission.

The five reviews agreed that the scope of research being conducted within the ESSRP is broadly appropriate in terms of its relation to the NOAA mission. That scope is very broad, including: economic and social impact analysis of regulatory change; valuation of commercial, recreational, and non-consumptive uses of marine resources; analysis of how commercial and recreational harvesters respond to regulation; and how socioeconomic factors influence the behavior of those connected to the region's fisheries.

3. Need for strategic planning for research.

All five reviews identified the need for explicit strategic planning for ESSRP research. While the general scope of the research being conducted is very reasonable, the relatively small ESSRP unit undoubtedly faces more research questions than it can address. A plan is needed to prioritize research questions.

The reviewers did suggest some issues that a strategic prioritization should consider, beyond prioritizing the current research agenda. One broad area is related to uniquely Alaska/Arctic issues, including rural food security, the role of traditional and local knowledge in the AFSC research agenda, and the impact of Arctic climate change on marine-related activities in communities along the Bering Sea and Arctic Ocean. At least three of the reviewers recommended that steps be identified to insure strong integration of recently-hired sociocultural staff into the ESSRP and the broader Center science program. Some of the reviews also recommended research that applies the natural capital conceptualization to explore how management decisions determine the long-term value that society realizes from its marine resources.

The research prioritization should include research coordination with other Science Centers and with other potential research partners in academic institutions and within Alaska state government.

4. Recognition of tension in relationship of research to management agenda.

Those involved in the management process (from the Alaska Regional Office, the NPFMC, and the industry) clearly communicated that they would like the ESSRP research to feed more directly into the management process. Those comments indicated that SAFE reports are a key reference document for the management process, but that other ESSRP research is not seen as connected to the management process. There was an acknowledgement that ESSRP staff have made recent efforts to improve communication between the ESSRP and those directly involved in management.

The reviewers made four comments on this situation. First, there is an inherent tension in the allocation of research effort to immediate management issues versus longer run issues in fisheries management and in non-fisheries marine resource use. The answer is not to devote all ESSRP effort to immediate fisheries management issues, as these other areas are important. But second, a conscious strategy about how ESSRP will balance these competing demands would

help manage the inherent tension. This should be part of the research prioritization effort that was recommended in the previous point. Third, there may be ways to better structure communication of research to the management process. The SAFE documents seem to have become a compendium of data (albeit, data with interpretation) and as such have become very large. One suggestion was to augment the SAFE reports with online data delivery tools, such as data visualization and convenient data serving/data filtering tools. There are probably also ways to include more “evaluation” in SAFE documents. That might include sections that interpret the significance of recent research, both from the ESSRP and also from the broader published literature, for the management choices facing the Council. Another way to deliver policy-relevant synthesis of research from the ESSRP and from other sources might be through “research briefs” on important topics confronting the management process. Finally, the reviewers expressed optimism that the newly-created Social Science Plan Team would help address the perceived communication gap between the ESSRP and the management process.

5. Data issues to consider as research agenda moves ahead.

The terms of reference specifically sought comment on the adequacy of the data available to support socioeconomic research. In general, the ESSRP staff demonstrated a thorough understanding of data needs and are actively engaged in efforts to improve the data available to support both research and management. Most notably, the deficiencies in the available cost data are the result of constraints imposed by the existing management structure and the ESSRP is actively involved in trying to address these deficiencies.

The reviewers did identify two broad areas that will need more attention and resources in the future. First, while there has been some progress on the collection of socioeconomic data on crew and on processing employees, these areas clearly deserve more attention. Second, there is a very large gap between the data collected for commercial fisheries as compared to data collected about other uses of marine resources. There is essentially no data on recreational fishing other than charter boats. There did not seem to be an understanding of the adequacy of the data with respect to subsistence harvesting, which is collected by the Subsistence Division of the Alaska Department of Fish and Game. No mention was made of data related to non-consumptive uses of marine resources. These deficiencies are not unique to Alaska; there are great challenges in collecting data on recreational fishing, subsistence harvesting, and marine tourism. But just as Alaska is unique in its very large commercial fishing sector, Alaska is also unique in the high level of recreational fishing, in the importance of fish and marine mammals for subsistence and food security, and in the very high level of marine tourism.

6. Systemic issues in conduct of social science.

The reviews identified two sets of interrelated issues around the conduct of social science research. While the context for these issues is across the social sciences, there may be aspects that are specific to ESSRP and NOAA. The first set of issues involves replicability of social science research, which is gaining broad attention. There is growing agreement that social science researchers must take greater care to document research steps and to archive data and metadata. The issue of replicability raises unique problems when research uses confidential data, which is common for ESSRP research. A related issue is how NOAA will work with

outside researchers to allow research based upon confidential NOAA data. The second set of issues is about ethical considerations in the conduct of human subjects research. The expectations about prior review of ethical aspects of social science research are being heightened and codified. For academic institutions, this is almost universally achieved through Internal Review Boards (IRB.) There may also be extra-institutional review of some types of research, such as by the Alaska Area IRB. An increasing number of social science journals require evidence of IRB approval as part of the peer review process. While ESSRP staff seemed to view OMB Paperwork Reduction Act review as equivalent to IRB review, that process is not exactly equivalent. It may be time for researchers at federal research centers to revisit institutional review of social science research.

Reviewer 1 Observations and Recommendations

AFSC Economics and Human Dimensions Program Review

17-21 July, 2017

Overview

This is a report of observations and recommendations in response Economics and Social Sciences Research Program (ESSRP) review. The ESSRP is a small, but remarkable group of scientists. The work they are doing supports highly influential decisions for living marine resource stewardship and the livelihoods of the individuals and communities that rely on them. There is a high demand for scientific advice and products from their partners, constituents and stakeholders and their research has led to a noteworthy number of high quality publications.

It is no simple task to distill a program of this scope into a story that can be told in three days. The ESSRP is to be commended for the hard work they put into preparing for this review and gratitude goes to the AFSC for their hospitality over the course of the week.

TOR 1: Clear Goals and Objectives

Strategic Planning

The Alaska Fisheries Science Center (AFSC) has a strong commitment to strategic and tactical planning to guide funding and programmatic decisions as demonstrated by the ability to “sightline” their work plans through the full hierarchy of strategic plans and guidance down to the level of individual performance plans. The process is organized, well documented and laudable. One concern with the process is the issue of scale. According to the introductory presentation, the AFSC base budget hovers around \$63M. The base budget for the program is a little over \$1.5M, which is about 2.4% of the total base budget. It is not clear if the granularity of the Center-wide process for priority setting is fine-scaled enough to influence the inner workings of this program.

One thing is clear – the demand for science from the program by clients of their science (e.g., Regional Office, the North Pacific Fishery Management Council (NPFMC), industry, headquarters) by far outstrips the time and funding available to provide it. This puts a high premium on the program’s ability to set priorities to ensure their efforts yield the highest return on investment, regardless of whether it is via the priority-based resource allocation process or a process operating at a finer scale. Application of the overarching philosophy of the Center-wide priority-based resource allocation process is evident. One example of this within the program designation of travel by scientists to deliver science products and advice to the NPFMC as a “must pay.” Likewise, a high priority is placed on other work that is directly responsive to the mandates of the Magnuson-Stevens Reauthorization Act of 2006 (MSRA), such as the generation of Stock Assessment and Fishery Evaluation (SAFE) reports.

The area of work that may benefit from a stronger approach for priority setting is the research portfolio. Based on the review presentations and the list of publications, the

quality and relevance of work within ESSRP is excellent. A good deal of that work is funded via RFPs, which set the boundaries on subject matter. It could be beneficial to bring a heightened level of intentionality to proposal development in response to RFPs by establishing short- mid- and long-term research goals to address long-standing needs in the region and using proposals to incrementally chip away at accomplishing those goals. In this way, the work continues to be relevant but also is responsive and makes incremental progress toward the broader ESSRP and AFSC vision.

Observation: The ESSRP is responsive to the mandates established by the MSRA, even though the NPFMC and Regional Office perspective appears to be “more would be better.”

Observation: The priority-based resource allocation process may operate at a granularity level that is too coarse to guide decision making within the ESSRP.

Recommendation: Discuss and set short-, mid- and long-term goals that can be achieved through a more coordinated approach to extramurally-funded research.

Portfolio Balance

The classic tension from seeking the ideal balancing point for resources (time, funding) expended on operational science relative to research could be felt over the course of the review. Managers who rely on science advice and products that to address contemporary and often urgent questions are strong and vocal proponents of skewing the balancing point toward operational science. The agency views this work as a high priority but also values innovative research that strengthens the cutting edge of the discipline. This is borne out by the fact that publication rates are important performance metrics at the Science Center and individual scientist level. Finding the perfect blend of these two classes of work is a perennial challenge and requires consistent attention and tuning.

Observation: The classic tension in seeking ideal balancing point for resources (time, funding) expended on operational science relative to research exists.

Recommendation: Strategic planning for extramurally-funded research can help ensure that work is purpose driven and with longer-range goals in mind, even if the returns on investment aren't immediate.

Recommendation: Communications with stakeholders and science clients on the role and expectations for pipeline or fundamental research will likely not resolve, but can help manage the tension between the need for fundamental research and the demand for more operational science.

An issue that came up more than once was the mis-match between the time it takes to receive and evaluate a management need, design a study to address it and deliver advice or products to address it. Managers described the challenges they face in “knowing what to ask for” and it is easy to see how difficult this can be with the long lead time required

when a new data collection would be needed to address the issue. Planning that brings managers and scientists together to identify long-lead studies and set out timelines for deliverables can help build a shared view of the priorities for these requirements, and develop a common understanding of the timeline to delivery for them.

The NPFMC and their constituents are highly adaptable and innovative. This creates a dynamic landscape for living marine resources stewardship and problem solving. It also creates the potential for managers to want to effect change faster than the science needed to support those changes can be conducted. This causes tension in the system. In many cases, this scenario is difficult to avoid – the science takes as long as it takes (finding the funding; study design; Paperwork Reduction Act (PRA) clearances; carrying out the work; analyzing and writing up the results; peer review). Good communication is critical to manage expectations and to avoid a scenario in which a management decision is implemented in a timeline that can't be supported by the science.

Recommendation: Strengthen the collaboration between managers and scientists in the planning process to ensure that the timelines for management decisions and scientific support to implement them are well understood.

TOR 2: Program Integration

A recurring theme in the discussions dealing with ESSRP integration with other programs was that integration is hard, takes time. Further, integration of human dimensions into ecosystem models is never easy, but always easier if done early in the development of the model rather than later.

Evidence of good program integration was the use of data to characterize the relative economic importance of the region's stocks for use as an input in the new Stock Assessment Prioritization Process. Output from the process will help make challenging decisions on the appropriate level of complexity and periodicity for stock assessments in a setting in which the demand outstrips the supply.

Examples of regional, national and international-scale collaborations through service on working groups and co-authored publications are strong. This level of cross pollination is good for the program and for the discipline is invaluable and should continue, provided it is properly balanced with competing demands.

The evolution toward ecosystem approaches to fisheries management will generate growing demands on the ESSRP. This type of modeling is computationally intensive and may require more horsepower that is currently available to be done efficiently.

Recommendation: Continue to invest in bioeconomic modeling to better understand human responses to marine ecosystem dynamics and to correctly interpret catch data in light of human behavior.

Recommendation: Continue to invest in synergies gained through regional, national and international collaborations on working groups and collaborative research, provided it is appropriately balanced with competing demands.

Recommendation: Continue work to understand the public's preferences and values for protected species stewardship via the non-market valuation research, especially as we evolve toward ecosystem approaches to fisheries management.

Recommendation: Explore availability of affordable High Performance Computing to bring higher efficiency to ecosystem modeling efforts.

TOR 3: Data Collections

The ESSRP functions in an extremely challenging environment for data collections. The geographic dispersion and isolation of their populations of interest is daunting. The group is commended for solutions they are found to overcoming some of these challenges.

If the presentation was understood correctly, the original Catcher/Processor survey form was 40 pages long and there is agreement that decisions on the ideal balance between thoroughness and simplicity should be revisited. It sounds like the Economic Data Report (EDR) has been modernized, but that legacy issues, linked to the original survey structure remain. The "life history" of the four EDR programs is different as they respond to the needs of different fishery management plans, but a careful study of them against one another to look for sensible conformities could strengthen them and improve their utility.

Recommendation: Study the four, mandatory EDRs to look for opportunities to streamline, modernize and standardize these collections.

Data collections, particularly economic and social collections, are tricky things. The benefits of informed decision making are highly desirable, but there is often resistance to providing the requisite data and information to realize those benefits. Roles and responsibilities of the Agency and NPFSC are often tightly interwoven in the goal for science-based stewardship. This comment is certainly not an attempt to redefine carefully negotiated roles in the region, but rather some general input for consideration. When it comes to data collections, a suggesting is to obtain the requirements (what is the goal or desired outcome) from the Council, and allow the ideal data collection design to meet that requirement to come from the scientists. The newly-established Social Science Plan Team may be the ideal vehicle for these discussions to take place.

Recommendation: Use the nascent Social Science Plan Team to ensure that the NPFMC's social science data requirements are correctly translated into data collection programs that are designed according to best scientific practices.

Recreational data collections are inherently challenging, but made even more so by the high level of diversity and geographic distribution of the sector. A citizen science approach may be one possible mechanism to reach these users. Properly characterizing the quality of self-reported data would be important, but incentives in accurate and timely reporting (e.g., better management decisions or a desire to capture their own input data for their use) can strengthen both the quality and timeliness of the data.

Recommendation: Explore the use of citizen science to help meet some of the recreational data needs of the region.

TOR 4: Appropriate Models and Tools

The program appears to be very intentional in the selection of their analytical methods and to be carrying out their work using best scientific practices. Per feedback above, a carefully balanced research portfolio, built from a refined strategic planning process can result in ensuring the ESSRP have an active role in advancing the cutting edge of the discipline in addition to conducting their work at that cutting edge.

Recommendation: Strongly concur with the decision to invest in converting FishSET from MATLAB to R to increase use and utility of the tools.

Recommendation: Continue to invest in the bioeconomic modeling and integrated research, (e.g., IEAs and climate change/climate vulnerability analyses).

TOR 5: Use and Utility of the Science

A hallmark product of the ESSRP is the SAFE Report. One report, *The Economic Status of the Groundfish Fisheries Off Alaska, 2015*, is 488 pages long and replete with narratives, tables and graphs that are invaluable to managers, scientists and the industry. It is great to see the invitation to report users to make suggestions for additional analyses and tables to make the report more useful. It is very easy to imagine the document becoming an even greater “Alaskan snowball” as other data treatments and products are developed in response to user input. The point of diminishing returns in decisions to add to a large report that reports on complex information like this can be a fuzzy one. The idea raised during the review of modernizing the report is a good one. Making the databases available (within the constraints of MSRA confidentiality provisions) and building tools that enable users to query or filter the data themselves should be a valuable investment of time and improve the utility of the product. That way, the report can focus on core treatments of the data and leaves one-off data treatments to the user via well-constructed user interface tools.

Recommendation: Strongly support investing the time to modernize the SAFE report to enable custom data visualizations and electronic access to the results.

NOAA's response to the Executive Order calling for Public Access to Research Results is well underway. A challenge in meeting the requirements of the policy and in meeting the demand for economic and social data by academic partners and other users are provisions in the MSRA, and scientific best practices, calling for the protection of confidential data. Contributing to the development of means of sharing data in ways that still meet confidentiality requirements would be a good investment.

Recommendation: Join national efforts that are exploring the means to share economic and social data in ways that still meet data confidentiality obligations.

Creating new products of high interest and value to the NPFMC, stakeholders and general public is a good thing. The creation of long-term, serial products should be based on a careful analysis of the ESSRP's commitment and ability to tend to the "care and feeding" of the product.

TOR 6: Best Available Science

The AFSC and ESSRP are to be commended for their commitment to scientific best practices and generating products and advice that adhere to the precept of best available science. National Standard Guidelines for MSRA implementation define and document peer review processes for science products and advice used in fishery management decisions by the Councils. It is important that products and advice coming from the ESSRP meet these standards. Discussions of this issue during the review indicated this is the case.

TOR 7: Communications

The quality of the presentations given at the review is a good indicator of the degree of communication skills possessed within the ESSRP. Good communication is crucial to the success of the program. This includes communication within the program (e.g., a shared understanding of short-, mid- and long-term research goals to enable collaborators to align their pursuits to them) among programs to promote strong, integrated science that embodies your commitment to ecosystem-based fisheries management. Strengthened communications between ESSRP scientist and managers will also bring a strong return on the investment.

The more the fishing industry and other users of your products and advice understand the discipline in general, your program goals and objectives and the projects you're working on the better it is for all. This is particularly true of the industry members who are providing responses to surveys as part of your data collection programs. It is recognized that this is a classic, "easier said than done." Constituents are profoundly and their baseline understanding of fisheries science and management is on a steep gradient. That said, any effort you invest in a more informed constituency will be a valuable one.

The notion of making complex information more accessible via data visualization tools or infographics is a good one. Meeting with constituents who attend Council meetings or giving presentations at association meetings are examples of ways to increase interactions efficiently.

Recommendation: Continue to explore innovative ways if increasing the quantity and quality of stakeholder outreach and engagement.

Recommendation: Strongly support studying NOAA Fisheries' new, standardized web format to ensure a well-planned transition of the AFSC's and ESSRP's web content.

Reviewer 2 Observations and Recommendations

AFSC Economics and Human Dimensions Program Review

17-21 July, 2017

1. Does the Center/ST have clear goals and objectives for an economic and sociocultural science program? Do the Center's/ST's Programs provide information to address the priority needs of the Regional Offices, other NOAA managers, Fishery Management Councils, Fisheries Management Commissions, and other stakeholders that require economic and human dimensions -related information to achieve their mission? Do the Center's/ST's Programs have a strategic research agenda that anticipates evolving and long-term economic and sociocultural science needs including research to support adapting to climate change and implementation of ecosystem-based fishery management?

The Center's Strategic Science Plan outlines three themes and 12 foci. The themes are: "*Theme 1: Monitor and assess fish, crab, and marine mammal populations, fisheries, marine ecosystems, and the associated communities that rely on these resources. Theme 2: Understand and forecast effects of climate change on marine ecosystems. Theme 3: Achieve organizational excellence in our administrative activities through innovation and the use of best practices.*"

Within this set of themes and foci the goals and objectives of the economic and sociocultural programs relate to (1) the support for NOAA Fisheries and the Management Council, conducting socioeconomic data collection and analysis for fish, crab and marine mammals including the spotlight species (Cook Inlet beluga whales); (2) Understanding the effects of climate change - which includes developing and implementing regional action plans, constructing integrated ecosystem assessments, and forecasting the effects of climate change on economies and communities, and (3) including the economics and social science program in the annual resource planning activities and administrative processes including the development of best practices and data management actions.

The FY2018 Priorities and Strategic Approach follow from the higher level objectives, although specific discussion of economic and social science components is included in this document. This document also outlines potential future budget constraints which may hinder longer term planning for research and staffing.

Response:

Yes. The goals are clear and the group is attempting to address the goals and objectives and address the relevant stakeholders.

Concerns / Questions / Comments:

- a. This is a relatively small group and there are a large number of goals with a great deal of scope within the goals / objectives. Are there targets or goals within the group associated with the allocation of effort across objectives? Is there a mechanism for alignment between individuals, groups and the overall objectives? What are the incentives for alignment with the various goals and objectives?

The alignment of each individual's research program with the goals of the Center and the ESSRP is a function of their individual workplans. But the incentives are not clear to me (perhaps they are internally). What are the incentives for more focused work on a specific EDR area versus interdisciplinary work on climate change? What are the incentives for publishing in higher quality journals versus field journals? What are the incentives (other than personal) for collaboration within the group or with academics? Are there plans or objectives for the appropriate "mix" of actions and activities for the group? The goals are very broad and could be relevant to a much larger group – so some rationalization for this small group may be useful.

- b. The current make-up of the group is largely economists, with a mix of on-going and contractor members on the team. Those with most experience are also economists. This suggests that care must be taken in mentoring the new social science researchers on the team and integrating them into the processes and system. The social science group could easily be "marginalized" as there are few researchers, their data collection processes are not as well aligned with processes like the collection of material for the SAFEs, and their research methods are more diverse (a mixture of quantitative and qualitative methods). The group is also quite dependent on ST funding for staff and research – what are the implications of this for staffing and research programs? One of the advantages of agency based research is the opportunity to take on long term data collection and research projects, but this is affected by shorter term vulnerable funding.
- c. One area that appears to be lacking in terms of alignment between objectives and workplans is the role of traditional knowledge in informing science and policy. There is discussion of traditional knowledge (in various forms) but there does not seem to be a systematic plan for such information. That is not unusual – most resource management agencies continue to struggle with this issue – but given the Alaskan context, and the relevance of traditional knowledge in adapting to climate change this seems to be a particularly important topic.
- d. The integration of climate change into some of the research areas seemed to be lacking (e.g. recreational fishery economics, protected species economics). It would be worth ensuring that the integration of climate change is not only addressed in the multidisciplinary modelling projects, but also incorporated to the extent possible within the more "traditional" projects. The Center's programs clearly incorporate economic and social science research into their broader objectives associated with climate change and ecosystem based fisheries management within the interdisciplinary programs. The inclusion of economics (primarily) into programs like ACLIM and BSIERP, and the IEA and EBFM efforts are excellent and there seems to be a genuine enthusiasm for such integration across the disciplines and individuals. If this momentum continues the region will be very well positioned for understanding the effects of climate change and constructing policy options and support for adaptation that may be necessary.

But this raises another challenge, related to (a) above, associated with the allocation of effort by the group over the range of activities that could be included in such a program. How much is allocated to understanding the effects of climate change relative to efforts supporting fisheries research?

- e. A comment on a very focused topic, relevant to organizational excellence and administration, is the issue of human research ethics and institutional review boards. This is likely a NOAA wide topic and not specific to AFSC, but the issue may have more importance in the AFSC than other centers. A great deal of survey research (quantitative and qualitative) is conducted in the center. This involves firms, recreationists, general public samples, and indigenous people. Issues of confidentiality, data access, and other items were discussed within the sessions. It is surprising (at least to me) that there does not appear to be a human research ethics review process (other than OMB approval in some cases – which is different). Such processes are increasingly being required before submission to journals. In principle such processes are intended to support good practice and to protect researchers and participants from unintended consequences of research. In the long term it may be wise to consider such processes within the context of long term economic and social science research.

2. Are the Center’s economic and sociocultural programs appropriately integrated with each other and with other science activities within the Center including, but not limited to, fishery and marine mammal stock assessments, ecosystem and multispecies ecological modeling, fishery observer programs, resource and environmental surveys, the Auke Bay Laboratory, and the Kodiak Laboratory? Are research efforts integrated, where relevant, with efforts at the regional offices and headquarters?

Response:

The degree of integration is very impressive. In terms of integration within the economic and sociocultural groups there is evidence of collaboration (co-authorship, etc.) among the economists (bringing different skills and experience to specific projects) and between economists and social scientists. The latter is particularly impressive given the difficulties in “language” and approach between economists and other social scientists. The interaction between economists is also quite impressive. The link between the regional economic impact analysis and fisheries or recreational economics is noteworthy. These types of linkages are critical to achieving the objectives of the Center and it seems that this interaction is occurring, rather than having “silos” of activity.

Concerns / Questions / Comments:

- a. There may be additional opportunities within the group. I notice that there is some work on-going in the economics area on intrahousehold analysis or household dynamics, and there are efforts in the social science team to examine gender impacts of climate change and other policies. This could be a fruitful area for collaboration.
- b. There also appear to be strong links between the social and economic researchers and those working in ecology, fisheries and other natural science areas. There is some work linking with the region and there is integration between the Center’s social scientists and those in other centers. There is clearly a “norm” of integrated research in this group – which takes a great deal of time to establish.
- c. I will take this opportunity to comment on the productivity of the members of the ESSRP and their contributions to knowledge as well as policy analysis. First, the group is very productive relative to social scientists in similar fields in research positions or academia. While there is variation within the group, publication rates are quite high (in some cases up to 8 – 10 refereed papers in a year) and there is a very nice portfolio of refereed papers, technical publications, and

other publications. There is also a nice mix of papers in economics field journals and fisheries / coastal / marine interdisciplinary journals. I also examined the citation rates of several of the members of the team and they are generally very good (relative to others at this stage of career and position). H-indexes vary but are as high as 11 (on Scopus – a very conservative metric). I feel this should be recognized. The group is publishing research that is making a contribution to their disciplines. The aspect that I do not know is how this level of publication, and the portfolio of publications, is handled within the annual review process and incentive mechanisms. Is it clear to individuals how these aspects of their work are being evaluated and included in the annual review process and promotions process?

- d. While the group is very productive it is not easy for members to participate in conferences or interactions with the “parent disciplines” of economics or fields of economics (environmental and resource economics). Researchers have limited resources for travel to conferences in these areas, and seem to be going to more “fisheries” related conferences rather than economics or social science conferences. If there is any way to support linkages to the parent disciplines this would be useful.
- e. The productivity of the group, and the diversity of the areas that each individual works in, is impressive but also raises questions about sustainability of the level of effort that is being expended. Members of this group are active in very focused research projects, multidisciplinary teams, and leadership activities, and producing at high levels. Can this level of activity be continued, especially given the likely decline in budgets? Some discussion of prioritization may have to arise.
- f. It would be useful to recognize the areas in which this group appears to be leaders in the agency. Spatial analysis of fishery behavior, valuation of protected species, and the linkages between commercial / recreational fisheries and economic activity (impact analysis) are examples of areas where this group provides leadership to the agency overall.

3. Is the status of data collection related to commercial fisheries, recreational fisheries, subsistence fisheries, fishing participants, and communities adequate to fulfill economic and sociocultural science research needs? Has the Center/ST developed strategies to obtain, manage, and make data accessible? Are there barriers that impede data collection and access to data held by other entities (e.g. states, commissions, other federal agencies, etc.) that could be used to support the Center/ST’s research, and how can these barriers be overcome?

Response:

Yes. Overall the effort and care put into data collection is outstanding. A very high level of care and attention to detail is put into data collection efforts across the various groups.

Concerns / Questions / Comments:

- a. There is access to very high quality and important data on commercial fisheries. There are concerns about the lack of complete cost data (extending cost data beyond fuel and labor). Hopefully that can be addressed in the future as a more complete set of data on costs would help inform a number of analyses including productivity analysis and measures of comprehensive wealth associated with the stocks. Such information would also help in comparisons across regions.

- b. Recreational fishing data, while very good relative to other recreational fishing databases, are still probably lacking in terms of data required to address such questions as the response to climate change or a full investigation of the opportunities under the Halibut Catch Sharing Plan. This is not a problem specific to this Center but is a more general problem, although it seems to be exacerbated by the fact that MRIP does not extend to Alaska. This means that ad hoc surveys are implemented approximately every five years – which is probably not sufficient to inform the research questions that arise. Given budget concerns one also wonders whether such data collection efforts will occur in the future – without champions these efforts will not occur. There is on-going research into other methods for collecting recreational activity data, including fishing, using smartphones and other electronic approaches – this may be worth staying informed about. There may also be a need to collect different types of data to fully address questions like the opportunities under the CSP or climate change, such as increased collection of duration, seasonality and timing of trips. Is there an opportunity for more inter-regional discussion of issues around recreational fishing data?
- c. It is not clear what the status of subsistence data or traditional knowledge information are and how systematically they are collected. It would also be useful to know the extent to which these data could be integrated into the recreational data for a more comprehensive analysis of effort, activity and economic welfare.
- d. Data on communities have been collected and are easily accessed (community snapshots) and these may facilitate analysis of issues such as the distributional impacts of policy changes or climate change. With new social science staff on board these types of analyses may be worth considering.
- e. There appears to be some tension on data and access issues. It is understandable that some of these data are highly confidential and it has taken some time to build the trust to allow for such data collection. Many data sets are limited to use by individuals in the organization and not to external collaborators. A very clear information policy around data access and use will be helpful in avoiding misunderstandings. However not all data are subject to such restrictions and some data have been accessed via FOIA. This is also somewhat concerning if there are confidentiality issues surrounding such data sets. Overall, some additional clarity on data access by external partners / individuals would be useful.

4. Are the Centers/ST using appropriate models and research tools to analyze data and provide management advice? Are they developing and using methods and models that contribute to the evaluation and exploration of ecosystem based fisheries management and other emerging issues? Are their barriers to adapting to address emerging issues?

Response:

Overall my response is “yes” – but I will elaborate in a few areas on some issues and opportunities.

Concerns / Questions / Comments:

- a. Data Collection Methods:

Survey research: A great deal of the research is based on surveys – whether this is fishery costs and revenues, recreational fishing activity, measures of passive use values, or subsistence use. Overall the methods of survey research being implemented are first rate. I was very impressed with the attention to detail, the adoption of best practices, and the continuing effort to improve survey research practice. This group is highly skilled in survey research and there are spillovers within the group and outside of the group that provide benefits. It's somewhat nice to see a group of economists with such skills and interest in survey research, questionnaire design, and related activities. It's also worth noting that there are relatively few rewards in some areas of the literature (e.g. recreation valuation) for carefully design questionnaires and careful survey practice, as there is relatively little discussion in journals articles about the survey process. But given the need for high quality data collection, especially in cases like passive use valuation, this care and attention should be rewarded.

Even though there is a great deal of attention paid to questionnaire design and survey processes, the group should nevertheless continue to update their approaches with best practices. I was pleased to hear that there will be an effort to assess the extent to which the group's stated preference data collection approaches match with those outlined in new guidelines for stated preference research and other guidelines documents. There are some areas where constant updating of approaches is necessary;

- In passive use valuation (protected species issues primarily) addressing issues of consequentiality and the importance of single binary discrete choice questions for valuation will be necessary,
- The passive use value research on protected species would also benefit from additional consideration of the “extent of the market” issue. There are no easy solutions to this topic, but it plays a more significant role in benefits assessment than almost any of the more technical issues surrounding valuation. ,
- There will be on-going debate about the validity and reliability of stated preference methods, especially passive use valuation measures. Given the importance of these measures for recovery planning and processes such as IEAs, there is a need for NOAA researchers to be aware of the state of the art for research in this area and aware of the on-going debates (including those arising from the BP NRDA analyses). There could also be better (or more obvious to readers like me) linkages between the recovery plan strategies, costs of recovery, and the valuation analyses. It may already be the case but integration between those conducting the valuation exercises, the recovery plans, and the analysis of the impacts of recovery actions on fisheries, would be beneficial.
- In stated preference methods used for recreation valuation and modeling, recognition of the challenges associated with strategic behavior in the context of these “private goods” is necessary,
- In the design of recreation surveys the need to better understand the response to climate change may need a re-consideration of stated preference questions along the lines of trip timing, duration, or other aspects that may arise as anglers responding to changing temperature and precipitation regimes.

One final comment on data: there was relatively little discussion on the use of experiments or results of pilots. Almost all of the economic analysis uses structural models (except for the stated preference

analysis which relied on the randomization within experimental designs for identification). In understanding responses to policy change, pilots and experiments can be very informative, especially when conducted in a formal program evaluation context. Analysis of the Halibut CSP, GAF, and related options, for example, would be fertile ground for pilots / experiments with formal program evaluation. There is some interesting use of quasi-experimental methods within the group (e.g. Haynie and Reimer work on costs of SSL spatial closures). This is important and timely work and such approaches should be encouraged within the group. While it was refreshing to spend time with economists and almost never hear the words “identification strategy” the group should be encouraged to employ experimental or quasi-experimental methods where relevant. The use of structural models for policy analysis is warranted and necessary but keeping an eye on opportunities for experimentation is worthwhile. This may also be very relevant to the social science components of the program. I have less awareness of the opportunities on that front.

b. Models:

This group uses state of the art models within economics and in interdisciplinary approaches. In some cases these are modified to be able to provide practical policy advice, but overall they are well developed and implemented. Notable examples are FishSET – which is a very impressive linkage between econometric models of behavior and spatial information. Similarly, the models constructed for recreational fishing and the potential for incorporation into BLAST illustrates high quality modeling and integration into platforms that provide decision support for policy analysis. What’s also impressive is that the researchers recognize that the model platforms aren’t always the best ones to address the questions at hand. An example is the RUM (random utility model) backbone within FishSET that, while very useful, is not always used by the researchers – when the problem requires a different type of analysis.

A couple of possible extensions may be worth considering: First, both the recreational and spatial commercial fishing models that rely on RUM models may not be the best for addressing issues of frequency, duration, temporal substitution, and related topics that will be important in analysis of climate change and linkage to fish stocks. Abbott and Fenichel’s (Can. J. Fish. Aquat. Sci. 2013) and Fenichel et al’s (Fish and Fisheries, 2013) work using Kuhn-Tucker models is quite convincing in terms of the potential for these models to provide better links to fisheries (from a recreational context). They are not straightforward models, but some investment may be worthwhile. Second (and admittedly a stretch) – attempts to incorporate more “behavioral economic” aspects into the modeling may be useful. The role of habits, or the large impact of small transactions costs, or other findings that suggest deviations from standard economic models are probably at play in commercial and recreational fisheries, and in valuation in general. While viewing the presentation on FishSET I continued to think about other models / advances that could be employed to provide a better behavioral representation of location decisions (temporal dimensions, interdependence between agents, etc.)

An overall area that may be something to put on the long term research agenda is a more comprehensive examination of natural capital, comprehensive wealth, and productivity. One of the goals of the Center is the assessment of the “sustainability” of economies and communities, and natural capital measures or measures of comprehensive wealth are potentially very useful in such cases. There has not been much success in capturing marine resources in wealth accounts, yet this could be a very informative long term well-being metric. Similarly, the analysis of productivity, as the basis for economic

growth, could also be very informative. The relationship between productivity and natural capital, and its fundamental role in economies such as that in Alaska, would seem to be a key way to assess economic well-being. The work of Abbott and Fenichel (J. Assoc. Env. Res. Econ, 2014;) and Yun et al (PNAS, 2017, 6439-44) would be useful at a more “local” level, while broader wealth accounting approaches and productivity analyses would be useful at the regional and national level.

5. Is the Center’s/ST’s social and economic information being used in living marine resource management advice? Are the existing mechanisms sufficient for ensuring this information is used appropriately? Are there barriers to the uptake of science provided by the Center and what steps can be taken to overcome these?

Response:

Yes – the social and economic information appears to be valued in the science communities within the Center and beyond. However, there is clearly a tension between some players on the Council, region and industry and the ESSRP products and analyses. The feedback from the council staff (informal notes) and comments during the session illustrate these areas of tension. This is not unusual for a group such as this, tasked with conducting publishable research and yet informing a policy process or process with short timelines. I provide some discussion below on the issue of the social science plan team. There may be some opportunities for this group to address such challenges. But in general this is a common issue in cases like this – especially with economic / social science research and the time required for data collection, and the research questions that are relevant to the disciplines.

6. Is the Center providing the Best Available Science? Are the Center/ST’s economic and sociocultural research products adequately peer-reviewed? Are the appropriate processes being used to ensure that scientific products meet professional standards and are of high caliber? How could a social science plan team provide additional peer-review or improve the quality and appropriateness of economic and human dimensions research provided to the NPFMC and AKRO?

Response:

As mentioned above, as a group the ESSRP publishes high quality peer-reviewed papers in very good journals that are relevant to their fields and the research topics. There appears to be a norm for good quality publication in solid outlets. That suggests that the peer review process, and perhaps more importantly the internal norms for publication quality, are functioning well. This has spillovers to the technical memoranda and related non-refereed journal materials.

I do not believe that a social science planning team will provide significant additional benefit if it is tasked with additional peer-review. There appears to be sufficient effort involved in internal and external review and the norms of research quality are high. The SSPT may be able to play a significant role in the communication of research problems and the communications of research results, in a timeline fashion, between the stakeholders. Stakeholders identified challenges in knowing about project process, RFPs, and interpretation of results. The SSPT can help with this by identifying such gaps early and facilitating processes for the exchange of information between researchers and stakeholders. The

SSPT can also help inform the research team of emerging questions or policy issues and identify future research topics. Perhaps most importantly, the SSPT can be a conduit for the discussion of interim research results. In cases where there is a difference in timelines between the research teams and stakeholders, groups like the SSPT can help address these concerns. However, the SSPT must be active. Members must buy-in to the processes and their roles for communication and dissemination.

The council staff feedback, and related feedback during the presentations, highlights both the benefits of successful communications efforts between researchers and the stakeholders, and concerns that there is not enough interaction and explanation of research projects and findings. The statement from the Regional office that they could not answer the question of what research is needed for their analysis is worrisome. But it illustrates the need for communications, relationship building, and awareness building. Again this is not unusual in such cases, but efforts to include short presentations, summaries, or other communications products to stakeholders would be beneficial. Non-technical summaries may be useful, as long as they were presented in a readable fashion perhaps as a “newsletter” or in some other consolidated format. But while summaries and publications are helpful, there is a need for on-going relationship building and in-person communications. This is challenging given tight budgets and often a lack of time, but on-going long term investments in relationships with stakeholders is important. The group must avoid being captured, which is always a concern in such cases, but mechanisms for personal contact or representation should be explored.

7. Does the Center’s/ST’s program use the best tools to appropriately communicate research results to various managers, partners, stakeholders and the public?

Response:

Overall the communications tools seem appropriate. The SAFE reports and other descriptive material appear to be very well received. This is the advantage of long term products that have come to be expected and relied upon. Descriptive material is very useful as background for stakeholders and typically does not take specialized knowledge of research methods to interpret. Results from research projects, such as more detailed economic analyses or nonmarket valuation, are a different story and typically require more careful presentation and context development. There may be opportunities for the presentation of decision support tool outcomes or clear responses to policy questions as methods of communications in these cases.

Reviewer 3 Observations and Recommendations

AFSC Economics and Human Dimensions Program Review

17-21 July, 2017

Report to AFSC on its human dimensions social science program

July 26, 2017

Preface

I have been asked to address seven issues described in detail in the terms of reference. In summary these issues are: (1) whether the goals and objectives of the Economics and Social Science Research program (ESSRP) of the Alaska Fisheries Science Center (Center) are clear; (2) whether the ESSRP research is adequately integrated with other Center science and with NOAA Fisheries' national and Alaska Regional Office (Region) efforts; (3) whether data collection is adequate to meet research needs; (4) whether ESSRP is using appropriate models and research tools; (5) whether ESSRP products are being used for management; (6) whether ESSRP is providing best available science; (7) efficacy of ESSRP communication efforts.

The panel received two days of briefings on the different ESSRP research projects. This is an exciting program of rigorous, often cutting edge, science investigating a wide range of economic and anthropological questions of relevance to a large number of clients. I was impressed by the range and quality of the overall research effort.

ESSRP clients include Regional and North Pacific Fishery Management Council (Council) managers as a special case (management support is a core function). They also include Center scientists in other fields, managers and scientists in other parts of NOAA Fisheries around the country, State of Alaska fisheries managers, state and local community representatives, and a wide range of people with interests in fisheries issues. Important classes of clients are not yet in management positions, but will be 5 to 10, or 20, years from now, and will need scientific products that have long gestation periods.

To a first approximation, NOAA Fisheries social scientists in Alaska are specialized between policy analysts in the Region and the Council, and scientific researchers located in the ESSRP. The line between these functions is fuzzy. ESSRP scientists participate in and support policy analysis, while Regional and Council analysts will sometimes participate with ESSRP scientists in research efforts. Many of my comments will address communication back and forth across this fuzzy line.

1.0 Economic and sociocultural goals and objective

The presentations made it clear that ESSRP is busy and productive, conducting a wide range of research, producing products exploring many issues, and oriented to a wide variety of clients.

While strategic planning at the Center level was discussed in the presentations, and the Center's Strategic Plan was one of the background documents, less time was spent on strategic planning within ESSRP. It was not clear that the ESSRP has a strategic plan, or there is an explicit frame of

reference within ESSRP for systematically developing all the products desirable for supporting fisheries management.

1.1. Templates for strategic planning for social science

ESSRP needs to think explicitly and systematically about the research needed for management.

Benefit-cost analysis (BCA) and regional impact modeling offer organizing ideas that can be used to define economic research needs and priorities. BCA provides a set of analytical categories, and can be used to identify and prioritize gaps in data collection and modeling. Regional impact modeling, addressing a different set of issues, provides a complementary set of analytical categories. Periodic formal review of the ESSRP research program through these lenses would be a helpful way to identify research topics that aren't being addressed.

Statutory guidance documents, such as that for carrying out environmental justice analysis under NEPA, or the NOAA Fisheries Social Impact Analysis guidelines, may provide structures or checklists that can be consulted to ensure the full suite of management's analytical needs in anthropology are being met.

If these, or similar templates, are not being explicitly used in ESSRP as organizing principles for research efforts, I recommend that they be introduced for general guidance of those efforts.

1.2 Take advantage of new Social Science Plan Team

In June, the Council created a new Social Science Plan Team (SSPT). The team, which includes representatives of key management agencies, as well as the Council's SSC and the ESSRP, is,

... established to improve the quality and application of social science data that informs management decision-making and program evaluation. The SSPT is constituted of representatives who will strategize medium- and long-term improvements in data collection and analytical methodology, allowing the NPFMC to better meet its own program objectives as well as LAPP review requirements defined in the Magnuson-Stevens Act and recommended in NMFS guidelines. The SSPT will identify data needs, make recommendations regarding research priorities, and advise analysts in efforts to improve analytical frameworks when possible. The SSPT will support the collection and aggregation of social science data in a manner that cuts across Fishery Management Plans and specific management programs within the North Pacific region. (Social Science Planning Team Proposed Purpose and Organization. Council Executive Director's Report. June 2017.)

The committee is new and its mode of operation will take time to work out. However, with its broad membership of regional managers and analysts, with its emphasis on the medium- and long-term strategic thinking, and with its mission to make recommendations with respect to research priorities, it offers promising potential for research coordination.

ESSRP should participate enthusiastically in the new plan team, supporting attendance by its scientists, briefing the team on its ongoing research, creating an internal mechanism to incorporate SSPT recommendations into its research program, and keeping the SSPT current on its response to the team's recommendations.

The Center and the ESSRP are both involved in the development of important research products that will require years, perhaps decades in some cases, to become routine management tools. ESSRP work participation in ecosystem and climate change modeling is work of this sort. This work reflects a long-term perspective in the Center and that perspective will be an important input into SSPT deliberations.

1.3 Make use of the EA/RIR/IRFA template in ESSRP planning

When analyzing regulations, policy analysts constantly come up against analytical limits imposed by lack of data or appropriate models. It would be desirable for the Council and Region to institutionalize and regularize the flow of this information about research needs to the ESSRP allowing it to incorporate information about these limits into its strategic planning as they are recognized by policy analysts.

The standard document presenting the analysis of a regulatory action is the Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA). This document meets the statutory requirements for regulatory analysis. In recent years an EA/RIR/IRFA template has been developed to act as a "checklist" and guide for completing an EA/RIR/IRFA.

The methodology section in this template might be modified to ask analysts to explicitly identify data or analytical tools that would have made it possible to prepare a more complete analysis in a timely manner. This section should be updated to reflect SSC comments about data or models that might have improved the quality of the analysis. Analysts could be asked to forward this section to ESSRP when the analysis is completed.

2.0 Integration of ESSRP research with other Center science

ESSRP social scientists work closely with other scientists in the AFSC. This was clearly apparent during the presentations. Examples include (a) ESSRP staff participation on the BSAI and GOA Groundfish Plan Teams, and on the Crab Plan Team; (b) ESSRP cooperation with ecological scientists in developing ecosystem models; (c) ESSRP cooperation with other scientists in developing models to project the impacts of climate change on Alaska fisheries and on the Alaska regional economy.

ESSRP scientists are also active in cooperative research efforts at the national level inside NOAA Fisheries. The development of the FISHSet spatial modeling toolset is an example. ESSRP scientists hold a number of leadership positions in national and international working groups and associations. ESSRP staff is also working with Regional and Council staff on joint projects. For example, there is an ongoing effort to develop easy to use versions of a multi-region impact model in cooperation with Alaskan staff.

2.1 Continue and expand interface with Region or Council staff when undertaking new projects

ESSRP scientists should make sure they contact Regional and Council staff when undertaking new research efforts, particularly survey efforts, in Alaska. Local staff appreciate being kept up to date on relevant research efforts, may have valuable local knowledge, and can help scientists network with persons outside the agency who may also appreciate being kept up to date on the research and who may be able to provide local knowledge.

2.2 Consider stationing social scientists in NOAA scientific or regional offices in Anchorage or Juneau.

For the same advantages discussed under 2.1.

3.0 Adequacy of data collection

ESSRP receives data from administrative sources, through the ongoing commercial fisheries Economic Data Reporting (EDR) program, through its interviews and surveys to collect information on fishery communities, through survey research to collect information about sport fisheries and non-use values for ecosystem elements, such as the Steller sea lions and the Cook Inlet Beluga whales, through collection of oral histories, for example, of Alaska Native Women, and in other ways.

3.1 ESSRP needs to collect more cost information

ESSRP collection of cost data is inadequate. During the presentations, a representative of the NOAA Fisheries Office of Science & Technology (S&T) provided a summary figure showing the percentage of fisheries with cost collections in each region. It is a rare year in which a region collects cost data from all fisheries, but regional collections have been gradually increasing through time. The Alaska Region, however, is well behind all other regions in the extent of its cost data collections.

Cost data is absolutely necessary to make it possible to analyze the different impacts of policy alternatives on fishery rents and on revenue flows to labor and capital. It is also needed to evaluate how the regional impacts of fishing activity change as policy alternatives change. In the absence of cost data, analysts must fall back on the use of gross revenue measures, and all parties are aware of the limitations of those as welfare measures.

The lack of cost data is not a situation that ESSRP can solve on its own. Collection of cost data in Alaska has been started in response to action taken by the Council as it sought to monitor new Limited Access Privilege Programs (LAPPs). Because of this, future development will likely require Council action.

The best local model for data collection appears to be the program carried out in the Amendment 80 fleet. It would be desirable to extend similar data collections to other fisheries as well. The "census" model used in the Amendment 80 fleet might not be appropriate to all fisheries; in some a periodic survey of a sample of operations might suffice. Regulations governing EDR collections should be more general, and less specific, in describing the cost

information that may be collected.

3.2 ESSRP needs to collect more systematic information on crew and processing workers

Fishing and processing jobs, their characteristics, and the characteristics of the people who fill them, are an outstandingly important concern for fisheries managers. The collection of data on fishing and processing labor supply and markets is thus very important. How many people work in the fishing and fish processing industries? What are the daily, weekly and seasonal patterns of work? Who are the workers, what is their race and ethnicity, where do they live? What are workers' opportunity costs of working in fishing or processing? How are they compensated, how do share systems vary across fisheries and through time as conditions change?

Some data is available from State of Alaska crew vessel licenses, fish tickets, and Alaska Department of Labor unemployment insurance records. More is being developed through EDR collections, although this apparently varies quite a bit across collections. The most complete survey data may have been collected in the Gulf of Alaska trawl survey one or two years ago. Labor compensation data will be forthcoming from the current regional impact survey of southwest Alaska.

However, these collections do not comprise a systematic effort to paint a picture of the Alaska fishing labor market. ESSRP should plan to focus economic and anthropology resources on efforts to pull together what is being collected, and to fill in gaps, so as to paint this picture and to create analytical tools that could be used in analysis of management proposals.

3.3 Disaggregated information on prices

Information on ex-vessel and first wholesale prices is highly aggregated with respect to space and time. However, many management actions of interest move fishing effort within areas and time periods within which prices can vary. These actions can be difficult to analyze, and conclusions often depend on information collected from key informants on the spur of the moments.

Since much price information is created from administrative data collected on an annual basis, or for large management areas, it is not clear that a completely satisfactory quantitative solution is possible. Price differences within an area or time period may also change as market supplies of substitutes increase and decrease, or consumer preferences evolve.

It might be useful to undertake a survey or interview process to systematically collect information about industry perceptions of price variation, as a starting point.

4.0 Are models and tools appropriately adapted to management needs?

ESSRP is creating a wide range of models and tools appropriate to management. ESSRP is also forward looking, cooperating with physical scientists in the Center and elsewhere to lay the groundwork for ecological and climate related tools that will be used by future managers. Perhaps the SAFE documents and associated web based archives are among the most useful current tools. However, other ESSRP tools and research have been used to inform management,

including the suite of regional impact models.

4.1 Need for price flexibility and elasticity estimates

Management actions will often change the volume of fish that may be harvested. Annual stock specifications will have similar impacts. Policy analysts don't currently have the tools to evaluate the price impacts of these changes. Meta-analysis of demand for whitefish and/or crab may be a useful first step to provide information that could be used to address these issues.

4.2 Consumer surplus

Change in consumer surplus can be an important component of a benefit-cost analysis when fish are consumed in domestic markets. Tools for evaluation are not available to policy analysts in the Alaska Region. Again, meta-analysis of market studies may be a cost-effective way to begin to make progress on this issue.

4.3 Issue briefs

Policy analysts face many social science issues in the course of carrying out an analysis. Often analysts have little economic or anthropological training. Products that provide brief guidance on how to address an issue, guidance that has been vetted by the Council SSC, may often facilitate the preparation of an analysis.

Such an issue brief could include a researched description of the issue of concern, provide boilerplate summary language that might be included in an EA/RIR/IRFA, could act as an online reference for more detailed information should the EA/RIR/IRFA reader want it, could explain how the issue might arise in different types of analytical document (EIS, EA, RIR, or IRFA), and could show how available data or models could be used to analyze the issue. Briefs should include worked examples, applying available information to typical questions. These could be drawn from existing analyses, or hypothetical examples.

I will discuss this topic again in recommendation 5.3, when I address ways to improve policy analyst pick-up of ESSRP human dimensions products. However, here I am suggesting ESSRP products that would be based on literature reviews, limited original research, and careful, systematic thinking about issues may come up in policy analysis. This class of issue briefs would be new content, not directly derivative of more sophisticated ESSRP research.

Many topics could be addressed in this way. The price impacts and consumer surplus issues discussed under recommendations 4.1 and 4.2 are examples. An issue brief on the taxes Alaska imposes on raw fish or its fisheries landings tax, looking at the way the tax program works, how the revenues flow through the state, and how to conduct analysis of tax issues in different kinds of analytical documents would be useful.

It would be desirable for S&T to consider RFP proposals for these types of relatively simple, but useful, briefs.

4.4 Cost, labor, and price variation models

Policy analysts and managers need more sophisticated models of vessel costs and net returns, labor markets, and of spatial and temporal price variation. These are implied in recommendations 3.1, 3.2, and 3.3 above and aren't further discussed here.

5.0 Are ESSRP products being used for management?

AFSC Strategic Plan Focus 1.2, "Support NOAA Fisheries and NPFMC analyses and International Obligations" is one of its two identified "core" activities. (Alaska Fisheries Science Center. Strategic Science Plan. Page 5.)

ESSRP products are being used for these purposes. The Groundfish and Crab Economic SAFE documents improve annually, and are widely used. ESSRP scientists contribute to analyses as well, either advising on how to use their work or drafting portions of documents. ESSRP publications are cited in analytical documents.

However, during the presentations to the panel, representatives of Region and the Council staffs, and a former Council economist, expressed concerns or frustrations with the extent to which ESSRP products were being utilized.

Some frustrations are caused by mismatches between research and the specific policy problems that need to be addressed, and other frustrations are caused by difficulties communicating research results in a way that can be used for policy analysis.

Scientific work, for publication in professional journals, has to look at questions that can be answered. This requires a very specific data collection and analysis exercise, and the results, while shedding some light on policy questions, may not be a perfect match to those questions, and may be difficult or impossible to apply. Moreover, research and policy time frames vary, and it can be difficult to formulate a useful research question several years in advance of knowing the specific forms the policy questions will take.

ESSRP is one of several related agencies, and improvements in applying ESSRP research to current management problems requires actions taken in several agencies. These actions should not depend on individual commitments to change behavior, but should be incorporated into the institutional framework of policy making.

The following suggestions propose changes that might facilitate the use of ESSRP products in evaluation of management actions, and promote an ongoing flow of information about analytical needs to ESSRP.

5.1 Make use of the Council Social Science Plan Team

This will provide a forum for ongoing interaction between ESSRP scientists and Regional and Council policy analysts, particularly with respect to medium- and long-term planning and prioritization. Discussed at greater length under Recommendation 1.2.

5.2 Staff outreach and networking

ESSRP scientists have been traveling to Alaska to brief policy analysts, regulation writers, and managers at the Council and the Region on their work. This creates a useful two-way flow of information, and contributes to networking by ESSRP, Council, and Regional staff. The personal relationships developed through networking should contribute to more productivity going forward.

I recommend that the Center continue to provide funding for these efforts, and that Council and Regional managers encourage relevant staff to go to these workshops and seminars as a part of their continuing education.

Staff outreach is a two-way street. Policy analysts who are familiar with the topical distribution of research responsibilities among ESSRP staff are better placed to make phone calls to find out if ESSRP staff members have work products or expertise relevant to a policy question.

Recommendations 2.1 and 2.2 on touching base with Council and Alaska staff when beginning new research efforts, and possibly stationing a staffer in Juneau or Anchorage, are also relevant here.

5.3 Issue briefs

I discussed issue briefs under Recommendation 4.3 above. That discussion dealt with creation of issue briefs that were not created as a part of other, more sophisticated, ESSRP research.

ESSRP should consider supplementing technical memoranda reporting on its research, and publication of research in peer-reviewed journals, with the preparation of similar issue briefs. These should explain the research clearly in terms a layperson can understand, and include all the elements of an issue brief that were discussed above.

ESSRP should consider including requesting funding for issue brief preparation as part of its research funding proposals to S&T. ESSRP staff should cooperate with Council and Regional staff in preparing these briefs. Issue briefs should be submitted to the Council SSC for review before being posted for use.

While issue briefs might be useful in communicating research results to policy analysis staff and the public, the need to prepare an issue brief may also help ESSRP scientists think about ultimate management uses very early in the research process.

6.0 Is the Center producing the best available science?

ESSRP science is high quality. Economists and social scientists appear to be careful and rigorous, to be using state of the art methods, and to be constantly engaged in pushing the envelope on their research agendas. They publish frequently in peer-reviewed journals in marine, environmental, and resource economics. Scientists are active in national and international working groups in their fields and are often placed in leadership organizations in these groups. It was exciting to listen to the presentations given the panel on ESSRP science.

6.1 Publication metrics for future economics human dimensions evaluations

It would have been helpful to have publication metrics such as numbers of publications in refereed journals, and numbers of citations to ESSRP refereed publications to compare across science centers. Development of comparable metrics is a more appropriate task for S&T than for the individual centers, although individual centers would be tasked to provide lists of articles published by their economists and social scientists.

6.2 Promote replicability

ESSRP should review its guidelines for conducting research, and for documenting and archiving research materials when projects are completed, to ensure scientists are using best practices with respect to the potential for accurately replicating research results.

Practices should include use of transparent scripts written in languages such as R to clean and do preliminary manipulation of data (rather than spreadsheets), and archiving of scripts as well as raw data.

Requirements to protect the confidentiality of many data sets will naturally limit the potential for outside replication of analysis, and these arrangements must ensure the security and privacy of confidential data.

This recommendation is not in reaction to specific problems identified during the panel presentations. It is brought up because replicability has become an issue in economics and other social sciences in recent years.

7.0 How is the Center communicating its products?

ESSRP communicates the results of its work to the public and to staffers in other agencies in many ways. It publicizes its results through technical memoranda and publications in refereed journals; it maintains a web site providing online access to many of its data sets and other products. Each year it produces Groundfish and Crab Economic SAFE documents combining a wide range of statistical and other data, and does presentations on these to the Council and its SSC. (Parenthetically, Council and Region staff using these SAFE documents speak highly of them and their annual improvements.)

The following recommendations focus on one communications issue: improving ESSRP-Region-Council staff communications.

7.1 Issue briefs

I have discussed issue briefs above (under recommendation 5.3).

7.2 Visits, networking, locating ESSRP staff in Alaska

This has been discussed under Recommendations 2.1 and 2.2.

7.3 Personal email circulars summarizing research efforts

In some instances, ESSRP staff distribute periodic email briefings on their research work. Policy staff has expressed appreciation for those efforts.

Such staff emails could point to planned future work, discuss on going work, summarize completed work and perhaps its applicability to policy problems, and provide lists of recent publication.

**Reviewer 4 comments for
Program Review of Economic and Social Sciences Research Program
at the Alaska Fisheries Science Center (AFSC)**

**July 17-21, 2017
Seattle. WA**

Comment on review process

I left the review feeling that my ability to make constructive comment on the socioeconomic programs at AFSC was somewhat limited by how information was presented. I would recommend that future reviews include more organized background material, including information on budgets and resources together with CV's and time commitments for all researchers (both regular staff and contractors.) Considering the heavy reliance on Office of Science and Technology funding, it would also have been beneficial to get a better sense of agency-wide research strategies.

Responses to 7 overarching questions

1. *Does the Center/ST have clear goals and objectives for an economic and sociocultural science program? Do the Center's/ST's Programs provide information to address the priority needs of the Regional Offices, other NOAA managers, Fishery Management Councils, Fisheries Management Commissions, and other stakeholders that require economic and human dimensions-related information to achieve their mission? Do the Center's/ST's Programs have a strategic research agenda that anticipates evolving and long-term economic and sociocultural science needs including research to support adapting to climate change and implementation of ecosystem-based fishery management?*

--The materials presented in the review did not present a well-articulated strategic direction for the Center's economic and human dimension research. Rather, the process for determining economic and human dimension research was presented as a bottom-up process where individual researchers propose research programs that senior managers react to. This is not to criticize the scope of research proposed by the research team. That work is largely tied to agency missions and broadly covers relevant research areas. However, the available research resources are limited and a strategic vision is required to pick among competing projects that may all be relevant to agency mission, but of varying importance.

-There are obvious competing interests for emphasis in the Center's socioeconomic research. The most significant question is the degree to which research should be tied to the current fisheries management environment. Participants in the NPFMC process, including Alaska

Regional Office, the Council and its staff, industry, and non-fishing industry interests, clearly would like the socioeconomic research agenda to be more directly tied to the management agenda. On the other hand, socioeconomic research should not be limited to issues on the current fisheries management agenda. It is an important role of research to anticipate what could (or should) be on the management agenda in the future. And NOAA has responsibilities for marine resources beyond commercial and recreational fisheries that the socioeconomic research agenda should address. Rather than some *ad hoc* juggling of this tension between short-run management needs and broader resource management needs, it would seem to make sense to consciously decide how this balance will be struck.

--The socioeconomic staff are not the only researchers doing work on the marine environment. AFSC staff have comparative advantages (such as access to confidential data) and comparative disadvantages (such as political sensitivities about some socioeconomic research) that need to be considered when deciding what research should be emphasized by NOAA and what might be left for others.

--As discussed in the next question, it does seem appropriate to have a coordinated national research agenda for socioeconomic research within the agency.

-A significant strategic question is the role that NOAA will assume in research on traditional fishing and marine mammal harvesting in Alaska. Several factors complicate this strategic question. First, the most important traditional fishery is salmon, and that is a state responsibility. Second, traditional harvests of marine mammals are within federal authority. The changes in sea ice are dramatically impacting traditional harvest patterns for species such as walrus, seal, and polar bear. These sea ice condition changes are raising important questions for another NOAA agency, the National Weather Service. This might be reason to consider joint research with NWS. Third, there is a very large amount of academic research on food security in rural Alaska, and it may be that this is not an area of comparative advantage for NMFS. Again, it deserves conscious strategic direction.

--I will address the question of strategic emphasis in other areas under question 4 and 6.

2. *Are the Center's economic and sociocultural programs appropriately integrated with each other and with other science activities within the Center including, but not limited to, fishery and marine mammal stock assessments, ecosystem and multispecies ecological modeling, fishery observer programs, resource and environmental surveys, the Auke Bay Laboratory, and the Kodiak Laboratory? Are research efforts integrated, where relevant, with efforts at the regional offices and headquarters?*

--Interestingly, the seven questions do not ask if the economics and human dimension work is appropriately integrated with work by other researchers, both at other NOAA science centers, in other government agencies, and in the academy. There is potentially a large benefit to the AFSC and NOAA by better coordination of AFSC socioeconomic research with these other agencies and academic institutions.

--The Office of Science and Technology seems to be treated as a "competitive funding agency" that relies heavily on the research direction defined by individual Centers. Since S&T provides about 2/3 of the funding for the Economics and Human Dimension program for AFSC, it seems logical for S&T to have a more explicit role in coordinating research among the centers. For example, it seems appropriate for S&T to coordinate the approach to stated preference work on endangered marine mammals across the Centers. (S&T does implicitly coordinate some parts of the research agenda. For example, the work on evaluation of catch share programs across the nation has resulted in reports that pool the research of the Centers.)

3. *Is the status of data collection related to commercial fisheries, recreational fisheries, subsistence fisheries, fishing participants, and communities adequate to fulfill economic and sociocultural science research needs? Has the Center/ST developed strategies to obtain, manage, and make data accessible? Are there barriers that impede data collection and access to data held by other entities (e.g. states, commissions, other federal agencies, etc.) that could be used to support the Center/ST's research, and how can these barriers be overcome?*

--Center staff are obviously very aware of the limitations of available cost data, in particular. Comments from the public and Alaska Regional Office staff endorsed the perspective that this is a significant issue. Those comments also endorsed the Center perspective that this is the result of regulatory challenges and not the result of insufficient attention to this question by Center staff.

--I think that the Center staff may be slightly overconfident about their knowledge of socioeconomic data in Alaska. I would suggest that Center staff explore opportunities to expand collaboration with state agencies beyond ADF&G, and in particular explore the ability to track Alaska residents using Permanent Fund Dividend data. And while Center staff understand the serious limitation of ACS and Census data, there may be opportunities to work with non-fisheries social scientists in Alaska to understand how to work around some of these limitations.

--Access to NMFS data continues to be seen as an issue for academic researchers. This concern goes back a long time, and the issues are deeper than the current socioeconomic staff or even a single science center. I think that it is fair to say that progress on some types of fisheries

research by economists have been significantly delayed in the past by data access issues. The Center is now working around the underlying confidentiality problems by engaging in collaborative research with both faculty and graduate students. The scope of the collaborations is very significant. Perhaps this is “as good as it gets.” But, as staff acknowledged, the significant delays in the process are still problematic for those developing funded research and for graduate students. At present, there is a very large investment required to learn about NMFS data and the conditions attached to its use. Without detailed knowledge of what data is available and the steps required to use the data, researchers and graduate students cannot write successful research proposals. And there remains a risk that research questions that are uncomfortable for the agency might be blocked by an inability to establish research collaborations. Better documentation of meta-data and clear guidelines for conditions of access would help address both sets of issues. Finally, I think that the pipeline of future fisheries economics and social science researchers will be unnecessarily restricted if that pipeline is largely determined by the personal connections of a small number of graduate supervisors to NMFS researchers.

4. *Are the Centers/ST using appropriate models and research tools to analyze data and provide management advice? Are they developing and using methods and models that contribute to the evaluation and exploration of ecosystem based fisheries management and other emerging issues? Are their barriers to adapting to address emerging issues?*

6. *Is the Center providing the Best Available Science? Are the Center/ST's economic and sociocultural research products adequately peer-reviewed? Are the appropriate processes being used to ensure that scientific products meet professional standards and are of high caliber? How could a social science plan team provide additional peer-review or improve the quality and appropriateness of economic and human dimensions research provided to the NPFMC and AKRO?*

I will address questions 4 and 6 together, as there is considerable overlap. In general, the staff have identified appropriate areas for research and are applying appropriate methodologies. Their work has resulted in an on-going series of peer-reviewed publications. I will not repeat that overall message for the specific research areas. Rather, let me focus on areas that merit special attention.

---I would single out the work on spatial modelling, with its specific emphasis on how harvesters respond to regulatory change, as being a significant strength of the research agenda. This research applies rigorous economic modelling and estimation to detailed data NMFS fishing location data. The work involves collaboration with both other Science Centers and academic researchers. I think that this work is making a significant contribution to the growing worldwide realization that regulation needs to anticipate, and not just respond to, the incentives that

regulations create for harvesters to change their fishing patterns. The Center staff are also using this area of strength to make significant contributions to ecosystem analysis and climate change. This is a very positive contribution to the ecosystem and climate change work.

--The initial steps towards integrating economic understanding of fishing behavior into how catch data is used in stock assessment are very interesting. Economists have understood the qualitative dimensions of this issue for at least 40 years, so it is encouraging to see significant interdisciplinary work here.

-- As discussed below, there may be an opportunity to use the SAFE reports as vehicles to bridge the perceived gap between Center research and its relevance to current fisheries management. It might also make sense to look for peer review beyond the SSC and related management processes. Getting the perspectives of those not directly involved in the management process might be one part of a strategy of including more “evaluation” in SAFEs.

--The research agenda for the non-economic work seemed unfocused relative to the economic research. This is perhaps due to the vacancy, until recently, in the sociology/cultural anthropology position.

--Notably absent is any research directed at non-consumptive users of the marine environment. Alaska has over 2 million visitors per year, almost entirely during a short summer season. This tourist industry is clearly among the four top “export” industries in Alaska (the other 3 being oil, federal spending, and fisheries.)

--I think that the Center has overlooked the potential importance of non-estimation economic science, including tools drawn from institutional economics and economic history. This is particularly true in catch share program evaluation, under which the center includes CDQs and fisheries coops. CDQs and coops are fundamental institutional innovations, and they warrant specific institutional analysis. Researchers at the Center have unique access to information on CDQs and on coops that, due to confidentiality, may be completely unavailable to other researchers. Staff presentations treated coops as basically a variation on individual quotas. The coordination within coops is fundamentally different from the individualized decision-making of individual quotas. Again, this seems to be an example of the worldview of the regulatory process (which does tend to lump coops with IQs) influencing the worldview of researchers.

--The review did not include any mention of research related to the Arctic. Late in the review process, it was explained that an AFSC request to fund a specific Arctic initiative had been declined. While this was undoubtedly unfortunate, the fact remains that change in the Arctic is accelerating. The impact of these changes on communities along the Bering Sea and Arctic Ocean are “front burner” issues in Alaska. Explicit decisions about the role of AFSC socioeconomic research with respect to the Arctic is required, whatever the funding environment.

I am not necessarily arguing that the AFSC socioeconomic program needs to redirect a large share of its resources towards Arctic issues. The issues are not primarily about federal fisheries exploitation (although changing sea ice is impacting marine mammal harvests), so this is not a research area that draws on the research strengths of existing staff. Rather than add staff in areas such as political science or law, it may well make sense for AFSC to defer to the State Department, the Department of Homeland Security, and the Department of Interior/Bureau of Indian Affairs or to the legal staff at NOAA. Academic research on the Arctic is also bludgeoning, with specific funding initiatives from agencies like NSF. But again, AFSC socioeconomic staff should at least be aware of the broader Arctic research environment and make conscious decisions about the appropriate level of AFSC involvement.

--It is important to remember that research is an inherently social enterprise, and that it is influenced by the social and political context. For government-based researchers, there is a risk that research questions will be influenced both directly by the regulatory agenda of the agency and indirectly by the world-view of participation in established regulatory patterns. For example, one Center researcher mentioned that the “elephant in the room” for halibut bycatch management is the opportunity to reduce total harvesting costs by allowing halibut IFQ to be harvested by the groundfish fleet. For economic researchers, this should not be an elephant in the room. The estimated economic benefits of economically rational management should be estimated and presented.

5. Is the Center's/ST's social and economic information being used in living marine resource management advice? Are the existing mechanisms sufficient for ensuring this information is used appropriately? Are there barriers to the uptake of science provided by the Center and what steps can be taken to overcome these?

--Information presented by the Alaska Regional Office, Council staff, and public comment indicated that (a) information in the SAFE documents is widely used and (b) the participants in the management process struggle to interpret the implications of other research AFSC socioeconomic outputs for management. This suggests a gap in communication of research results that should be addressed. At least three options present themselves. First, the SAFE could be expanded to be more than a compendium of data. As one staff person suggested, more “evaluation” could be included in the SAFE. For example, the implications of the growing work on decision-making by harvesters in response to regulation (including work at AFSC, at other Centers, and by academics) could be discussed in a section of the SAFE. A second alternative might be to author integrative research summaries that address that material. Such one-off integrative summaries might be useful to communicate with broader, public audiences. Third, Center staff could become more involved in drafting technical sections of RIRs, etc. This does occur at other Centers.

7. Does the Center's/ST's program use the best tools to appropriately communicate research results to various managers, partners, stakeholders and the public?

--The limitations of the communication of research with the management process were discussed under question 5.

--Only 1 public comment was made during this review, and that comment noted that the review was not widely advertised. Council staff made a similar comment about insufficient advertising of the review. This raised questions in my mind about the adequacy of communication about AFSC socioeconomic research to important constituencies. Given that the AFSC is in Seattle and its public constituencies are largely in Alaska, aggressive advance communication is required for the public to plan to participate in AFSC outreach activities.

Reviewer 5 Observations and Recommendations

AFSC Economics and Human Dimensions Program Review

17-21 July, 2017

Overall, I was very impressed with the ESSRP. The staff is highly competent and engaged in scientifically sound and interesting research on complex and useful fisheries, protected species, and ecosystem work. Below, I detail specific comments by TOR and, where appropriate, sub-TOR.

1a. Does the AFSC have clear goals and objectives for an economic and sociocultural science program?

The ESSRP aims to have world class science covering economic and sociocultural analyses that can also inform management. These goals and objectives are spelled out in the Center's Strategic Plan and AGM, and within individual work plans. However, there seems to be no ESSRP strategic planning or thinking. Research foci simply evolve, though the choices are good ones. However, there are other areas that could be addressed and insufficient staff to cover them all. The sociocultural contract staff, especially, have been without an FTE lead for over a year. The new hire should help to alleviate that, though she will, herself, need some time to get up to speed with the region and its needs,

That the work is world class is supported by both the number of peer-reviewed journal articles by ESSRP members and the number of major grants on which they are PIs or co-PIs. I was particularly impressed with the economic work on household welfare, recreation, and for the SAFE documents, as well as the work at the BCA level with DRCGE. On the sociocultural side, I was impressed with the work on catch shares and gender, the Alaska Community Survey reports, and the Bristol Bay oral histories of Native women fishermen. Overall, I was impressed with the level of inter- and multi-disciplinary work: on stock assessments, ecosystems, and climate change.

1b. Do the AFSC Programs provide information to address the priority needs of the Regional Offices, other NOAA managers, Fishery Management Councils, Fisheries Management Commissions, and other stakeholders that require economic and human dimensions-related information to achieve their mission?

The ESSRP seems to have a mixed relationship with the Regional Office (RO) and Council. On the one hand, several research projects have influenced management outcomes in a positive way. Though, the one member of the public present commented: "You're not making a decision for them, just providing consequences of their actions." This was echoed in the Baker & Marrinan presentation that stated: "Analyses must be neutral, support decision-making, AND comply with legal requirements." This line between science that supports management and management itself needs to be clear. On the other hand, Regional Office and Council staff feel their needs are not always met, and that the ESSRP personnel could be much clearer in their explanations of the science that is provided and do more keep

RO and Council staff apprised of the progress of grants and projects relevant to management. More work with the Communications team seems needed, for one thing. Doug DeMaster has begun joining the RO board meetings. However, more regular meetings of ESSRP, RO, and Council staff, just to touch base, would also be advisable.

There is, of course, an inherent tension in the roles of scientific researcher looking at topics that may be useful for understanding future situations and purveyor of research to the Council for use in current regulations. The ESSRP is making excellent progress in creating inter-disciplinary relationships within the AFSC and between the AFSC and academia that help to support world class research. Relationships with industry seem to vary, but clear effort is being made to reach out regularly to all stakeholders and to foster relationships that support both research and underlying data collection. Performance plans have 3 categories, one of which is Outreach. Staff are assigned specific outreach groups and report back to ESSRP colleagues quarterly on their contacts.

Not specifically a response to this question, but related, conducting more participatory research (where stakeholders, including industry, are involved jointly in planning, data collection, analysis, and write up) can lead to results more accepted by industry. This more inclusive method, rather than simply saying “FYI, here’s what I’m working on. Any quick thoughts,” can be a positive interaction. Perhaps such a process, initiated by the ESSRP, could lead to better constructed surveys that would be better received by industry. This might help bridge the gap between industry dictating survey construction or refusing to respond to them unless they are mandated in regulations, a practice which inhibits staff ability to update and revise surveys based on experience gained through implementation.

1c. Do the AFSC Programs have a strategic research agenda that anticipates evolving and long-term economic and sociocultural science needs, including research to support adapting to climate change and implementation of ecosystem-based fishery management?

The ESSRP and the AFSC have a clear planning and prioritization process for annual activities through the AFSC Strategic Plan and the national and AFSC AGM. However, there is no clear ESSRP-level strategic planning process, no sense of where the program itself is heading. Adding in regular discussions with the RO and Council about upcoming medium- and long-term needs would facilitate such forward planning and improve relations with these bodies, as well as allow longer-term research to better mesh with the shorter timelines of individual regulatory processes.

Both climate change and ecosystem-based fishery management are current and long-term research topics that are being conducted in coordination with other AFSC scientists and academic scientists. These include projects supported by money from NSF and NCEAS and intellectual support through membership and leadership roles by ESSRP staff in NMFS, ICES, and PICES IEA groups. There is certainly also a feedback process between IEA group participation and the projects. It is not clear how well apprised the Council and RO are of the ongoing status of these projects and findings that might be of interest to them.

No real mention was made of specific TLK/TEK projects or how they might be linked to ecosystem, climate, or management-related research. The oral histories of Native women may include some TLK

and I know there was some TLK research associated with BSIERP, though it was not conducted by ESSRP sociocultural staff.

2a. Are the AFSC's economic and sociocultural programs appropriately integrated with each other and with other science activities within the AFSC including, but not limited to, fishery and marine mammal stock assessments, ecosystem and multispecies ecological modeling, fishery observer programs, resource and environmental surveys, the Auke Bay Laboratory, and the Kodiak Laboratory?

There is a fair amount of integration of economic and sociocultural research within ecosystems and climate projects. And I was particularly encouraged by the way the socio-economic model is being linked to the biophysical model with advance planning, rather than as an add-on at the end where it is almost always difficult to create good linkages in terms of scale. The use of economics in stock assessment is long overdue and unique in this integrated way in NMFS regions, as far as I am aware. The plan to move the inclusion of economics from the comment to the modeling phase is particularly exciting. A next step would be to include sociocultural input. And the fact that the OA work is being cited in both stock assessment and economics journals is impressive.

It was not always clear, however, to what degree AFSC sociocultural staff were involved in these external projects – as opposed to academics. I think here of BSIERP, for example, where the oral history work is conducted by Henry Huntington (Pew Charitable Trusts' Arctic Conservation Science Team). Further, I don't recall any specific projects involving AFSC staff only where economic and sociocultural staff work together. Perhaps the Alaska Community Survey? There is one sociocultural contractor at the Auke Bay Lab, but no ESSRP staff at other labs – as far as I was able to ascertain.

2b. Are research efforts integrated, where relevant, with efforts at the regional offices and headquarters?

As noted above, under 1b., the Regional Office clearly felt that the ESSRP does not sufficiently respond to their needs for analysis. This is an area that needs to be carefully thought through. Unlike the Northeast and Southeast, in Alaska (and all other regions) the Science Center does not provide EIS analyses for the Council. This frees staff for more long-term research, which is good. Care should be taken not to change this balance without serious forethought. Perhaps the RO needs more staff to supply EIS analyses, rather than the ESSRP increasing their involvement. At a minimum, AFSC and RO leadership and the leadership of the associated socio-economic groups should have more regular meetings (annual or every 6mos) wherein RO staff could indicate medium- and long-term issues (say, 1-5 years) they see coming up in the Council. This would allow some lead time for research studies on management-relevant topics. The list of current research prioritization and planning efforts on slide 11 of the Baker-Marrinan presentation does not list any formal AFSC/RO or AFSC/Council staff planning meetings.

The fact that the RO will begin to score and rank all activities plans and that the AFSC Science Director will now attend the weekly board meeting of RO are, however, steps in the right direction. Still, the fact that Marrinan, a Council staffer, only found out about this review two days in advance – and through Baker from the RO, is highly problematic. Did the Center not reach out to the RO or the Council (staff

and members)? The new Social Science Plan Team (upon which all manner of roles seem to be being placed) might also undertake a discussion of this in conjunction with both AFSC and RO staff and leadership.

Finally, the Alaska Community Survey is also a source of at least some information on management issues and practices of concern to communities themselves (Q32 and Q33). It is not clear, however, that these answers are being examined for integration into research planning, as opposed to simply being analyzed statistically for the report.

3a. Is the status of data collection related to commercial fisheries, recreational fisheries, subsistence fisheries, fishing participants, and communities adequate to fulfill economic and sociocultural science research needs?

Data collection sufficiency varies between economic and sociocultural data, and economic data - especially - seem more in the control of the Council and industry than is appropriate for good science. Available social (Community Social Vulnerability, that includes fisheries indices, and Community Climate Vulnerability) and the currently largely economic Fishery Performance indicators are the result of multi-year and ongoing development processes. The AFSC seems to have these well in hand. Qualitative or quantitative indicators for more complex concepts like sense of place and cultural identity need yet to be developed. Other research needs are fulfilled to various degrees, depending on the topic and fishery. Commercial economic needs are under-met in comparison with all other regions. Recreational economic needs seem well met, though I feel less able to judge there. However, the reasons behind common responses in economic surveys (commercial and recreational) are often sociocultural. Consistent use of open-ended questions associated with surveys or a subset of ethnographic interviews can help to elucidate these reasons.

The degree to which sociocultural data needs are met is a bit unclear. The Alaska Community Survey is conducted regularly, to the AFSC's credit. This survey has been conducted in 2011, 2012, and 2014. It is apparently on a 2-5 year schedule; 2-3 years would be more appropriate. Yet, only two out of 13 data collections listed on the ESSRP site is social in nature. This should be more balanced and include some more detailed sociocultural surveys by fishery. Other topical commercial fisheries work can be conducted via small-scale studies like the oral histories of native women fishermen and the gender and catch share studies, both of which gathered data that are useful as is, as well as capable of being explored more broadly in surveys now that some baseline issues have been identified.

Sociocultural research on protected species, however, including marine mammals and halibut (less protected than marine mammals) is lacking. Similarly, sociocultural research on recreational fishing needs development. I would also recommend further developing a joint economic and sociocultural program on food networks. The only related projects presented were being viewed through a trade rather than a food security lens. There are apparently two food security projects in process that were not presented. Food projects more generally could include the referenced need for investigations into the differences between subsistence, personal use, and sport fishing, as well as looking at the broader area of commercial landings and tracking what happens from "dock to plate."

Socio-economic studies related to habitat is another area where research is needed. This should include TLK studies of shoreside and offshore habitat. Also missing is work on crew and processing employees.

There are ecosystem studies underway, but the extent to which these include research targeting ecosystem services is unclear. Reviewers also learned belatedly that a natural capital project is being undertaken. In all of the areas discussed in this and the previous paragraph, TLK of both Native peoples and longtime non-Native residents would be helpful in understanding the longer term and current status.

Adding these new areas of research would likely require hiring additional ESSRP staff, especially sociocultural staff but also economic. The fact that an additional sociocultural staff hire is already planned is encouraging. In these difficult budget times, the AFSC might consider reprogramming a few natural science positions to social science – as they open up. This would help to create better balance between the number of social science and natural science staff.

3b. Has the AFSC developed strategies to obtain, manage, and make data accessible?

The AFSC is complying with PARR procedures and investigating issues regarding uploading scripts for pulling data. I found the ESSRP *Data Collection Projects* page very well structured and useful for both researchers and the public. Like all other NMFS Science Centers, the AFSC Socio-economic Assessment group is quite dependent on one-year money from S&T. This makes it difficult to hire students, or even to some extent contractors, and to plan multi-year studies. The AFSC ESSRP has been able to participate in multi-PI grants from NCEAS and NSF that help with the one-year-money issue. But it is still problematic.

3c. Are there barriers that impede data collection and access to data held by other entities (e.g. states, commissions, other federal agencies, etc.) that could be used to support the AFSC's research, and how can these barriers be overcome?

The AFSC has data-sharing agreements with the state of Alaska and the Pacific States Marine Fisheries Commission. The degree of data sharing with the IPHC and, especially, Tribal Governments and the Marine Mammal Commission was unclear.

4a. Are the AFSCs/ST using appropriate models and research tools to analyze data and provide management advice?

I am impressed with the quality of the models and the research on model accuracy and precision for commercial and recreational economic models. Sociocultural analyses are less model-driven, though the social network analyses based on Alaska Community Survey data are well done.

4b. Are they developing and using methods and models that contribute to the evaluation and exploration of ecosystem based fisheries management and other emerging issues?

ESSRP researchers are involved in inter-disciplinary research using newly developed conceptual models and/or the creation of links between socioeconomic (primarily economic) and bio-physical models.

4c. Are there barriers to adapting to address emerging issues?

Staff is likely insufficient for all emerging issues. See 3a.

5. Is the AFSC's social and economic information being used in living marine resource management advice? Are the existing mechanisms sufficient for ensuring this information is used appropriately? Are there barriers to the uptake of science provided by the AFSC and what steps can be taken to overcome these?

See discussion under 2b.

6a. Is the AFSC providing the Best Available Science? Are the AFSC's economic and sociocultural research products adequately peer-reviewed? Are the appropriate processes being used to ensure that scientific products meet professional standards and are of high caliber?

The science provided by ESSRP (and collaborating AFSC staff from other groups) is impressive in its quality. Publications are adequately peer-reviewed, both internally and externally. Other scientific products, such as models, are subject to excellent review of appropriate construction and analysis (such as CIE reviews). Data collection instruments are likewise analyzed with respect to the specific questions and the degree to which data received are of high enough quality and appropriate type to be used in required analyses. This use of metadata is to be lauded.

6b. How could a Social Science Plan Team provide additional peer-review or improve the quality and appropriateness of economic and human dimensions research provided to the NPFMC and AKRO?

I suggested above (under 2b) that the SSPT might help to coordinate among the Science Center, the RO, and the Council – especially with regard to medium- to long-term planning. This body could also be a place in which to discuss issues of trans-disciplinary integration, as they arise. It should not be used as a peer-review

7. Does the AFSC use the best tools to appropriately communicate research results to various managers, partners, stakeholders and the public?

I was impressed by the available outreach assistance available through the communications staff. While it seems the ESSRP has worked with Communications, more and earlier contact between social scientists and this group would be advisable. This could include advice on already popular products such as the SAFE reports. I was also struck by the comment that the only format of the SAFE reports available is a PDF of each entire document, making it hard to tell what sections are most used. I would suggest making the document available both as a single PDF and as separate chapters. At least a test of this might indicate if specific chapters are popular as stand-alone products. Online versions could also allow for page view counts.