



NOAA FISHERIES

Pacific Islands Fisheries Science Center

Background and PIFSC Response: Panel Reports of the Economics and Human Dimensions Program Review July 31 – August 3, 2017 Honolulu, Hawaii

The following provides an overview of the objectives of the Pacific Islands Fisheries Science Center (PIFSC) 2017 program review, summary of reviewer remarks, and the PIFSC response to the review panel reports. For the terms of references, background materials, presentations, and the panelists' reports, contact: pifsc.socioeconomics@noaa.gov.

Program Review: NOAA Fisheries constantly strives to improve the quality and timeliness of our science at each of the agency's six science centers and the headquarters Office of Science and Technology. A standardized five-year cycle of peer review and evaluation of our fundamental science programs at both the national and regional level help us to stay at the cutting edge of science and still meet the needs of our stakeholders. Each year of the cycle has a specific thematic focus. The 2017 focus was NOAA Fisheries' economics and human dimensions science programs. The reviews are conducted to:

- 1) Evaluate the quality, relevance, and performance of science and research conducted in NMFS Regional Science Centers (Centers) and associated laboratories
- 2) Strategically position the Centers and NMFS Office of Science and Technology (ST) in planning future science and research.

The objective for this review was to evaluate the human dimensions and economic science programs of the Centers/ST. These reviews assess the extent to which current science programs are focused on the priority information needs required to complete the NOAA Fisheries mission, assess the quality and effectiveness of these programs, and make recommendations for the future.

Panel: The PIFSC program review was held from July 31 to August 3, 2017 in Honolulu, Hawaii. The review panelists were respected members of the scientific community from across the country:

- Chair: Dr. Sherry Larkin (External Scientist - University of Florida)
- Dr. Ron Felthoven (NOAA Fisheries Scientist - Alaska Fisheries Science Center)
- Dr. Kirsten Oleson (External Scientist - University of Hawai'i)
- Dr. Melissa Poe (External Scientist - University of Washington Sea Grant)
- Dr. Christopher Hawkins (External Scientist - Coastlines Group LLC)

Overarching Questions for Reviewers and Research Themes: The review was intended to address seven overarching questions (as outlined in the Terms of Reference) in the context of eight thematic research areas engaged in by the PIFSC Economics and Human Dimensions (EHD) research program. The eight general research areas were:

1. Science Activity Planning and Prioritization
2. Economic and Human Dimensions Data Collection and Management
3. Human Dimensions and Community Research
4. Commercial Fisheries Economics
5. Noncommercial Fisheries Economics
6. Ecosystem Science
7. Support for Management
8. Communicating Science and Outreach

A summary of the general findings with respect to the Terms of Reference from the panel Chair's Summary Report is presented in Appendix 1. The overall conclusion from the Chair's Summary Report was stated as:

“The Economics and Human Dimensions (EHD) Team is strong and well-functioning, with clear leadership. Their aspirations were realistic and indicate that goals have been identified. The new project-focused organizational structure is noteworthy in that it provides an opportunity for social scientists to learn of projects early, and that alone could serve to generate more integrated research and break down disciplinary barriers. This is especially likely given that EHD staff look forward to participating in innovative multi-disciplinary approaches to research. Articulating a suite of research questions at the onset will be important to fostering collaboration, helping to balance needs for management, and ensuring the continued development of contributions to the scientific literature. Activities initiated by the new communications coordinator have already served to facilitate interactions among researchers, and utilizing this new position to help serve outreach and education objectives could provide scientists with more time for research. As plans for the new organizational structure are more fully developed and implemented, attention should be paid to the need for dedicated funding for social science research, and improved access to data to prevent delays in providing timely information to stakeholders. In terms of the new organizational structure, it will be important to continually assess and facilitate the efficiency processes and completion of joint objectives and tasks. Finally, the entire panel provided recommendations in the pages that follow that could prove helpful as the EHD team moves forward.”

Panel Member's Major Recurrent Observations and Recommendations: The panel members brought different perspectives and expertise, with recurrent observations and recommendations (numbered 1-19 below). Also included below is selected text from the Chair's report in italics [editorial additions denoted in brackets] and supporting text from individual panelists' recommendations marked with a, b, c, etc. The PIFSC response to each recommendation immediately follows, and is noted with the preface “PR-”. Recommendations that could involve a specific action from PIFSC are listed in a table following this section organized by recommendation, with the identified PIFSC response action as well as a proposed date of implementation.

1. All panelists felt [a need for] the Center [to] convey the importance of the EHD Program to the Center and to all other Center staff.

- a. Multiple compelling reasons were given why social science is important to reach a variety of goals or satisfy requirements, including National Standards, the Ocean Research Priorities Plan, EBFM [Ecosystem Based Fisheries Management], Climate RAPs [Regional Action Plans], NOAA Fisheries Priorities and Annual Guidance for 2017. It is curious, however, that social science is barely present in the PIFSC strategic science plan, and only once referred to (in the context of contributing to EBFM) in the annual guidance memo.
- b. It may be worth expending some effort to identify more specific goals in the both the PIFSC strategic science plan, and in the annual guidance memo, to conduct social science research in support of EBFM.
- c. From various comments throughout the review, it is clear that leadership (at both PIFSC, and perhaps nationally) needs to better understand the specific role of human dimensions science in fisheries management, and why it is important to invest in. This is particularly true as the Science Center moves towards more integrated assessments.
- d. In order to ensure that staff can focus on ESD goals and objectives, rather than ancillary goals defined by outside funding sources, as well as feel like equal partners in such Projects, [economics and] human dimensions staff should get funds from the PIFSC to the extent practicable. The key point here is that human dimensions scientists should feel equally valued and supported in multi-disciplinary work, and PIFSC financial support is a tangible way to demonstrate the importance of their inclusion.
- e. It is clear that team leader Justin Hospital has stewarded this group through a number of years of transition, culminating in the reorganization across the entire Science Center this past year. His articulated vision of integrated, innovative, and impactful science deserves leadership support.

PR-1. PIFSC leadership has championed implementation of Ecosystem Based Fisheries Management (EBFM) as a leading Center priority in FY2018 and has explicitly acknowledged the important role that socioeconomics must play to make progress towards this goal. PIFSC has recently rolled out a Science Council (SC) body that will serve under the direction of the PIFSC Director's Office to provide input and make recommendations on the Center's annual and long-term science priorities. A representative with expertise in economics and human dimensions will serve on the SC to ensure that socioeconomics is integrated in future Center research priorities.

Additionally, the SC will be tasked with contributing to the forthcoming revised PIFSC Science Plan, which should ensure that economics and human dimensions research are given equal footing with other disciplines within the Center.

2. *The EHD [Economics and Human Dimensions] Program has identified projects, including data needs, tasks and methods. However, the vision would be strengthened with the development of a strategic long-run agenda. Strategic planning could involve identifying the research questions and hypotheses currently being investigated to systematically catalogue and evaluate the appropriate mix of research to conduct, an audit of ongoing projects with respect to planned contributions to the science (conceptual, theoretical, applied, etc.) and planned publication outlets. The Strengths, Opportunities, Aspirations, and Restraints presented to the panel by the EHD Program lead – many of which mimic those noted by panelists – should also be consulted.*

- a. Internal efforts to identify their strengths, opportunities, aspirations and restraints were accurate, insightful and indicate effective leadership of the social science team moving forward.
- b. It does not appear that the Socioeconomic Program has a strategic annual or two-year plan that describes the origin of its intended research, the clients those data will serve, the rationale for proposing it, the methods and analysis to be used, and the staff that will effort the projects.
- c. The Program should conduct an internal audit of its research enterprise to ensure that, where applicable, researchers are developing conceptual and theoretical foundations for their work prior to conducting it.

PR-2. The PIFSC EHD research program last outlined a strategic research agenda in 2012. Since then, the program has undergone significant staffing, leadership, and organizational transitions. Given recent growth in staff and expertise, coupled with new EBFM research priorities, we agree that the time is right to assess and define a strategic research agenda for future EHD research, including the identification of strengths, opportunities, aspirations and restraints. Key opportunities to chart this path are apparent during the coming year, both internally, but also more broadly as we explore the future role of socioeconomics in the Ecosystem Sciences Division (ESD). During 2018, ESD will work to establish long-run research priorities and work to understand how they connect with NOAA and PIFSC priorities, Federal mandates, and stakeholder needs. As stated in PR-1, the PIFSC Science Council will also outline long term science plans at the Center-level in the coming year.

3. *There was a general sense that better communication may be needed with the Council to convey the priority research areas that are relevant to their management timeline. It may be good to share the current research agenda early on, including the hypotheses to be tested, such that stakeholders are aware of the nature of the results, the timing of the results and the uncertainty of the outcome.*

- a. The Program should engage management staff in a structured conversation about needs and staff capacity to address those needs. It may be advisable to have this meeting annually, given staff turnover in the Program and the Regional Office. The Socioeconomic Program would be well-served to periodically engage typical data users regarding their information needs, data availability, and staff capacity to address those needs.
- b. It would be helpful to the Regional Office to have a summary of the expertise and current projects of each staff.
- c. Improved communication with partners (such as the Council) could help with timeliness of science for management needs and expectations; it may also help scientists and managers anticipate future needs to drive research within adequate time frames.
- d. The use of new models (e.g., ecosystem models such as Atlantis) are going to require increased communication both internally and externally; know what the information needs are, and how information is incorporated and used should be understood by all such that demands on time and expected results are known (need to avoid surprises by model limitations at end; no model is a panacea).

PR-3. We agree that additional efforts at communication with regional stakeholders would further awareness of the breadth, function, and utility of PIFSC's EHD research program. Quarterly meetings have been ongoing with PIRO's Sustainable Fisheries Division for the past 12 months, but there are opportunities to better engage with other Divisions at the Regional Office. The PIFSC EHD research team intends to develop a "Social Science 101" program to roll out to our regional stakeholders. We hope to implement this program by the spring of 2018. We intend to structure this innovative program with input from stakeholders to ensure we can maximize impact

and efficiency. The focus will be to highlight: (i) our discipline and the types of questions we ask and answer; (ii) staff expertise and interests; (iii) program data collections and products, as well as constraints (e.g. timeframe of OMB approvals, data collection methodologies and analysis, etc.); and (iv) to facilitate a discussion of stakeholders' needs, which in some cases may be informed by our presentation. Through this activity we hope to foster more frequent and improved communication, explore collaborative opportunities, and to ensure our skills are utilized and stakeholder needs are met. Additionally, PIFSC EHD research program staff currently sit on many regional scientific advisory committees (Scientific and Statistical Committee, Plan Teams, Social Science Planning Committee) which provide a valuable forum for communicating with stakeholders on program research progress and planning.

4. The time horizon for decision making is often shorter than the time horizon for completion and review of the supporting analysis. Delays in the acquisition of the most recent data needed for timely analysis contribute to this barrier. Communicate research studies at onset and while in development since stakeholders can provide valuable feedback on hypotheses that can foster acceptance of subsequent results.

- a. The management timescale and research timescale are not well aligned, as is the case in all regions. While the Program can rightly call almost all of its data products "management-responsive," those products are sometimes provided too late to inform management decision-making.
- b. Stakeholders expressed a lack of need for and appreciation of retrospective studies (versus predictive modeling); however, retrospective studies are the pillar of adaptive management as they provide the opportunity to learn from past actions.
- c. The individuals from the Council and PIRO who attended seemed to be relatively pleased with the nature and quantity of the support they receive, but expressed a common complaint about the timing of studies and how they fit in with the Council process/calendar. In particular, they said that retrospective policy analyses that are published after rulemaking aren't useful for them. They also expressed a preference for simpler or more easily explained analyses or models. This finding is common among regions across the US.

PR-4. We acknowledge the challenge of aligning scientific research timelines with management decision needs. It is the hope that steps outlined in recommendations PR-2 and PR-3 will alleviate some traditional challenges. Additional mechanisms to improve the timeliness of providing scientific advice are described below in Recommendations 9 and 14.

5. As the integrated Ecosystem Sciences Division [ESD] develops, the plan for how research will progress within this new framework should be developed; focusing on deliverables is a necessary but not sufficient condition or fostering joint research. At this time, the leadership has engaged in extensive internal planning and careful facilitation to design and anticipate integration, but implementation details and an ongoing commitment to assessment (and adaptive management) will determine success. To help foster the development of effective integrated ecosystem research; all panelists felt that the Center consider dedicating funds to the socioeconomic components of ecosystem studies to (1) ensure multi-disciplinary collaborations, and to (2) convey the importance of the Economics and Human Dimensions Program to the Center and to Center staff. Panel members offered valuable advice and suggestions to inform implementation.

- a. It is important that the PIFSC institutionalize multi-disciplinary ecosystem research at the Center level as a core activity and provide programmatic funds to support it within the ESD.
- b. I envision interdisciplinary project teams, where natural and social scientists engage early in the project design: defining the problem, identifying the conceptual frameworks, developing hypotheses, designing a data strategy, interpreting data, etc.
- c. Several panelists offered ideas to help generate interest in integrated work such as: requiring biophysical and socioeconomic to be addressed in each proposal or paper; holding monthly brown bag research proposals; and using the Kennedy and Thomas Model for mapping out areas of interest.
- d. It is often the case that social scientists are brought into interdisciplinary collaborations at later stages, after problems have been defined and research designs made. Project leaders are encouraged to engage EHD scientists at early stages. With that said, there is also a risk that the small staff may be spread thin in meeting existing social and economic science requests AND new interdisciplinary collaborations. Scientists and supervisors need to keep this possibility in mind. Furthermore, social sciences are multiple and diverse with a variety of methodologies and expertise. Not all human dimensions questions can be addressed interchangeably by an individual trained in one of the social science disciplines.

Current EHD capacity is well balanced, but there may be Division needs to bring in specialized capacities depending on projects.

PR-5. We recognize that while significant progress has been made in the reorganization of the Ecosystem Sciences Division, considerable work remains in working toward implementation of the ESD vision. We thank the panelists for their valuable suggestions on how ESD could ensure meaningful social science contributions and collaborations. Since the Program Review, the Ecosystem Sciences Division (ESD) has developed an approach to define interdisciplinary project-based work plans and identify priority PIFSC-funded Projects and externally-funded Initiatives. An interdisciplinary ESD Brown Bag series has been in place throughout the Division integration process, and continues to evolve. Economics and Human Dimensions Data Initiatives are explicitly recognized by ESD, although center-funded Projects are lacking (core economics and human dimension components of Projects are primarily supported by external funding sources). Ongoing efforts are in place to monitor the success of this initial year of ESD implementation and a programmatic evaluation of the project-based work structure and processes will take place in mid-2018.

6. The unit has made the decision to restructure in order to integrate [multi-] disciplinary research; an implicit goal in the reorganization is to increase linkages between traditional biophysical ecosystem research and social science information to be able to identify and address the impacts on human systems. Integrated goals and objectives are likely forthcoming under the new reorganization, but prioritization will be necessary.

- a. Clearly communicating what can and cannot be done to resource managers and Center leadership may provide the motivation to help expand or support the scope of the program and its focus, should expectations differ among the parties. The lack of social scientists at the Council, and only one economist at PIRO suggests that nearly all the PIFSC's social science resources could be devoted to such endeavors, which is why the Program should identify priorities and make sure the Council and PIRO understand what their staff is doing when they are not supporting them, as well as why that work it is important and how it fits into the overall PIFSC plans.
- b. The team is highly qualified, and as it begins to articulate and implement its vision, it should integrate across the broader division. The team, understandably, has been focused on completing on-going, legacy research. The team should take time to step back and assess whether all of these are worthwhile, and to see if there are any gaps (e.g., gender issues in fisheries never once came up in the discussions).
- c. The geographic range under the purview of the PIFSC is vast. As such, the range of potential study areas or populations is also vast. This necessitates significant planning and organization to ensure that various public groups feel included, that information gathering is rotated among spatial and temporal frames (since not all can be monitored simultaneously). Prioritizing which research to conduct does not appear to be obvious in this region.
- d. A recommendation surrounds the general feeling that the new reorganization could lead to priority overload (i.e., everything is priority, therefore nothing is). The mechanism discussed for ensuring collaboration across the socioeconomic group and the rest of the ecosystem division was to "cc Justin" – but this won't be tenable long-term. The team needs to think of processes for deciding what to do/prioritize.
- e. This is a great team going great places. As year unfolds under new structure, the team should continuously check in on the research priorities. There are lots of opportunities for innovative research that will place PIFSC at the national forefront of socioeconomic and human dimensions research. This is an exciting time for the team.
- f. Consider the development of a strategy to systematically assess what is the appropriate effort for generating needed routine information versus investing in new or extended areas of research.

PR-6. Prioritization is a key focus for PIFSC during FY2018, both in terms of resources and research. As previously stated, the PIFSC has recently rolled out a Science Council body that will serve under the direction of the PIFSC Director's Office to provide input and make recommendations on the Center's annual and long-term science priorities. PIFSC is also refining the Annual Guidance Memorandum (AGM) process in an effort to outline Center priority activities to staff in a timelier manner. At the Division level, during FY2018 ESD staff will work collectively to define and implement activities to promote organizational and scientific goals that will result in strategies to identify and rank interdisciplinary research activity priorities. At the regional level, multiple PIFSC EHD research staff will be collaborating to refine the Council

Social Science Research Priorities. Lastly, internal strategic planning and outreach activities, as defined in recommendations PR-2 and PR-3 will help inform EHD research program staff activity prioritization.

7. *Some panel members conveyed concern that the staff time may be insufficient to meet future programmatic needs, especially given the integration into a larger division that is likely to involve increased demands for both research and coordination. While EHD capacity is well balanced, if new initiatives involving multidisciplinary research arise, staff may get stretched thin in meeting [traditional] social science analysis requests.*

- a. Given the size of the region and the number of distinct projects underway and planned, and the level of commitment the Program is putting into SAFE Report production; Plan Team work; SSPC meetings, etc., it would seem that at least one more social scientist position should be created in the Program.
- b. Despite now operating at a fuller capacity, PIFSC has the smallest EHD program of the NOAA Fisheries Science Centers, which is set within the largest marine area in the public trust managed by NOAA.
- c. The EHD, PIFSC and NMFS ST leadership should seek ways to stabilize and retain the recently built diverse skilled labor force.
- b. Attention should be paid to whether any additional capacity is required regarding qualitative and quantitative theory, methodological, and analytical skills give the type of research the Program is planning to conduct in the coming years.
- e. The social science staff should think about what capabilities are most important to increase or to drop depending on Center priorities, or funding changes, or in what areas these changes are likely to occur. Agreement on these directions may make it easier to realign staff with priorities should funding not allow the full desired portfolio to continue or to be enriched.

PR-7. The PIFSC EHD research program staffing levels and research capacity has grown significantly in the past 12 months, but remains the smallest program within NMFS. PIFSC is down one federal social scientist from past staffing levels (FY2010-FY2011), and an additional federal position would increase long-term continuity and reduce temporary funding requirements. An important consideration in future staffing decisions is the challenge of retaining staff on temporary funds, both in terms of career advancement, but also the recurring funding requirements needed to support staff and the inherent challenge of aligning deliverables for short-term funding with emerging management needs. Strategic planning activities outlined in recommendation PR-2 would further elucidate targeted research expertise needs in any future hiring opportunities, be them federal or contract staff.

8. *Nearly all panel members paid particular attention to the role of temporary funds in supporting EHD research activities. The need for external funding to support future integrations was reiterated; if integration is dependent on external funding, then multidisciplinary ingratiated research must not be a priority. Seed funding could help to initiate collaboration. Panel members suggested that the funds to conduct data collection in support of EHD analyses may not be as great as believed, and should be considered in comparison to funds spent on research cruises for biophysical data; both types of data need to be sufficient to generate meaningful information for management from a coupled ecosystem model.*

- a. The EHD program makes good use of and depends disproportionately on leveraged temporary funds and non-permanent staff to overcome this concern. However, such an approach also creates inherent vulnerabilities in accomplishing work, maintaining trusted relationships with stakeholders this is necessary to carry out relevant social and economic research, and creating long-term cohesion internally and regionally.
- b. The Program has a high reliance on temporary funds, which in addition to implications for staff stability over time, also come with overhead considerations.
- c. It should be noted that in comparison, it is extremely costly to run research cruises to conduct biophysical surveys. The Program and PIFSC should explore ways to address this issue.
- d. Consider developing a budget for desired data collection efforts; yes, data collection is expensive, but any data collection is expensive and only by generating a budget of additional costs can the center director make an informed decision about where to invest additional funds. Showing how the resulting data will (i) answer questions important to fishery managers and (ii) answer well-defined research questions (in support of management decisions or that could advance the science) would strengthen the proposal.

- e. One immediate recommendation for long-term planning would be to pursue strategies to convert current temporary funds supporting contractors to permanent money. If this isn't possible for all funds, perhaps the most critical positions should be identified to convert one-by-one.

PR-8. PIFSC recognizes the significance and value of ensuring stable funding for Center research programs. Social science is particularly sensitive to temporary funding as successful research is often predicated on community support, trust, and cultural awareness, which is fostered by consistent staff who can build relationships. Additionally, PIFSC social science staff spend a considerable amount of time each year developing research proposals to solicit funds from diverse funding sources, which takes valuable time away from research activities and reduces our responsiveness to time-sensitive emerging management needs. The ability to develop mature research lines and to realize strategic plans is compromised with staff turnover. PIFSC will work to institutionalize permanent funding for core economics and human dimensions research activities.

9. Consider asking NMFS ST to prioritize expansion of one of its decision tools into the PI region; for example, FishSET could be valuable for examining new monument areas. Additionally, automated technologies have improved efficiencies in the development of reports [SAFE] in other regions, which could be consulted.

- a. Bringing decision support tools from other regions (e.g., FishSET, BLAST) could facilitate scientific analysis and advice for management.
- b. Leadership of the social science unit should be commended for actively seeking out the use of decision tools being developed by NMFS ST.
- c. Continue engagement with NMFS ST regarding the application of decision support tools that would be most useful to the Pacific Islands region (e.g., BLAST, FishSET, and QUEST).

PR-9. PIFSC has been in frequent communication with regional collaborators to bring existing decision support tools to the Pacific Islands Region. Specifically, the Fisheries Spatial Econometric Toolbox (FishSET) offers a valuable framework to assess spatial management regimes which are of interest given regional fishery management issues. Recent PIFSC staff hires bring valuable expertise that should allow us to begin to implement some of these tools and bring them into the management arena. It is likely that these tools will greatly improve the timeliness of scientific advice to inform regional management.

10. Staff are diligent about ensuring all results are summarized into tech memos immediately upon completion, which are reviewed and published internally. Research has been published in peer-reviewed outlets appropriate for an organization that is charged with supporting management. The high proportion of grey/white papers could indicate a future increase in peer-reviewed literature as the research life cycle is completed. An increase in the number of collaborations with academics (faculty and graduate students) and increased participation in professional conferences, some of which were discussed during the review, could also help to increase peer reviewed research as studies are vetted and improved by academic colleagues. Performance Plans could also include requirements or incentives for staff to remain current in their discipline in order to ensure research is reviewed by peers.

- a. Keep it up with diversity and creativity in public documents! Lots of great science communication work. One area where the EHD scientists could improve is to increase the publication of peer-reviewed science.
- b. The Program is striking a nice balance between scholarly work, management support, and public engagement. The scientific output of the group is appreciable, but the proportion of peer-reviewed papers to internal reports and grey and white papers could be increased by following through on some of those reports.
- c. Overall output of this group is impressive for its size. From my perspective, relative to other NMFS Socioeconomic programs across the country, there appears to be a larger portion of internal reports, administrative reports, or technical memoranda relative to peer-reviewed publications. It is unclear to me whether this balance was intentional, perhaps in order to get information to the public more quickly or in a manner that is more easily digestible, or because the report content does not have sufficient complexity to be deemed as a contribution to the literature.

PR-10. Contributions to the scientific literature are a core function of PIFSC research programs. The EHD research program has worked hard to generate a balanced portfolio of research products. Low staffing levels in recent years has placed emphasis on maintaining core economic data collection programs, the outputs of which are less conducive to academic journal outlets. However, with an influx of new staff with diverse expertise and advanced research methods, we agree with the panel's assessment to renew focus on peer-review publications. To facilitate movement in this direction, all FY2018 EHD federal staff performance plans now mandate a requirement to demonstrate annual progress towards peer-review publications. Similarly, the newly integrated Ecosystem Sciences Division should afford increased collaborative and publication opportunities for EHD research staff.

11. *Several diverse and novel communication products were showcased, and the EHD Program has begun branding distinct data collection efforts. The products were high quality, appealing and effective and the branding could be extended to summaries of results to increase impact. The EHD Program has consistently generated a very good portfolio of well-designed outreach products appropriate to the intended audience.*

- a. The PIFSC ESD Socioeconomic Program is well-led and produces quality data across a range of social and economic science disciplines. It communicates these data in products that are innovative and well received by managers and the public.
- b. The team presented an impressive array of outreach materials, gray literature, and publications. The interactive data displays are wonderful, and should be enhanced (with the leadership and support of the communications and data teams, not the economic analysts/human dimensions team!).
- c. The new newsroom – led by a new communications lead – is innovative and seems to have potential to foster cross-PIFSC work.

PR-11. The Center appreciates the panel's comments about the quality and diversity of the science communication forums and outreach products developed by EHD research staff and we will ensure that these products are maintained moving forward. The new Center Communications Coordinator will play a vital role in helping to advance and enrich future Center research products.

12. *Continued and expanded collaborations with academics could help to both increase the scientific rigor (e.g., peer-reviewed publications) and capacity to address the needs of management (which is an issue given the PI [Pacific Islands] region is the largest but has the fewest FTE [Full Time Employees]).*

- a. It appears that the Program is relying heavily on a few select academics, especially in economics. The Program should strengthen its network of human dimensions academic collaborators.
- b. EHD scientists could be well served by increased collaboration with university academics, to both elevate science rigor and to better meet capacity needs. The EHD has existing collaborative efforts with the University of Hawaii (UH), particularly students, but could benefit from identifying faculty research collaborators both at UH, and other academic institutions around the Pacific. Collaborations with scholars in diverse social science disciplines, as well as across disciplines, could also further the Division's goals of increased integration of social-ecological systems research (e.g., through incorporating socioeconomic efforts with oceanographic time series, climate-society vulnerability modeling, etc.).
- c. The geographic range covered by the PIFSC is an inherent challenge for researchers that rely on qualitative data collection or have the need to better understand their communities before initiating a research project; short of new resources to foster direct interaction, perhaps the development of a network of researchers could be established (additional academics and/or private consultants to facilitate introductions in remote regions).
- d. The need to have PIFSC human dimensions researchers develop long-term and meaningful connections with communities, stakeholders, and leaders should be addressed. The fact that the team is largely non-Federal hampers this, as does the funding situation. One recommendation is to enhance collaborations with regional universities.
- e. Collaborative partnerships (e.g., Habitat Blue Print) have helped to increase community knowledge, fill socioeconomic data gaps, and expand EHD activities into under-served areas of the PI region.

PR-12. We agree that there are numerous opportunities to increase collaboration within ESD, NMFS, external partners, and, as the panel suggests – academia. These collaborations are essential to support our science, and offer important opportunities to leverage expertise and resources.

Recent staff collaborations include the National Socio-Environment Synthesis Center (SESYNC), Pacific Islands Managed and Protected Areas Community (PIMPAC), North Pacific Marine Science Organization (PICES), National Center for Ecological Analysis and Synthesis Science for Nature and People Partnership (SNAPP) and National Academy of Sciences' Sackler Colloquium on the Science of Science Communication. PIFSC EHD staff will continue to be encouraged to build and broaden their research networks.

13. *Panel members felt that improved data storage, access and availability should all be part of a strategic plan – at the Center level – to improve efficiency. Access to secondary data for program needs is hampered by the current platform. Delays in receiving data have negatively affected efficiency of the Economics and Human Dimensions Program and their ability to supply the information they are charged with providing.*

- a. A recurring theme was a delay in getting data (both internally and for stakeholders). The protocol has not been well-defined and is considered vague and ad hoc by 'clients'; the development of a process that includes timelines, and communication of this process within the PIFSC could reduce the frustration at all levels.
- b. In addition to primary data produced by the EHD scientists, the program makes good use of secondary data from WPacFIN, logbooks, and other state and federal data resources (e.g., U.S. Census). However, there are some noteworthy challenges to accessing these data. For example, WPacFIN data requests are taking from two weeks to more than a month to be fulfilled and this slow turn-around has contributed in part to some concerns expressed by Council members about the unhelpful lag time in receiving data analyses for timely decision-making.
- c. It is highly recommended that innovative changes are made that facilitate data access. The system at PIFSC seems antiquated and cumbersome, and numerous times people said it stifled important and timely research. Secondly, the economists work on large datasets, but it should be the role of the science support group (see the new organization provided to reviewers) to organize and manage those data. There should be a mechanism for the data manager to collaborate with the economic analyst to design the best data solutions, but the onus should be on the technical team to deliver high quality data.
- d. We heard about the centralized system used to disseminate fisheries data to staff and it appears to be very effective as a bottleneck. While I appreciate the desire for consistency in published statistics and possibly control over, or a better understanding of, the way data are being used, this problem does not appear to this degree at other Science Centers. Resources should be put into modifying the system to allow scientists an analyst more access, while continuing to ensure data given to other stakeholders is sufficiently blind and not prone to misinterpretation.
- e. PIFSC should investigate approaches used in other regions for non-FIN staff to access and pull such data.

PR-13. The PIFSC recognizes the importance of timely and accurate data to support research and fisheries management. The PIFSC Annual Guidance Memorandum (AGM) is published annually to focus the Center's attention on specific programmatic areas. This year (FY2018) marks the establishment of a new Center goal to enhance our data management capabilities, entitled: *Enhance the management, accessibility and analysis capability of our data resources.* A specific action is that PIFSC is tasked to conduct internal workshops and audits of key PIFSC data streams to identify areas of strength, weakness, opportunities, and threats to help promote a culture of support, collaboration, and sharing within the PIFSC data management community and ensure integrity of our data. A longline data improvement workshop was held in September 2017 and EHD Program staff attended to ensure program needs were reflected in future improvements. These data improvements will be an ongoing Center-level activity during FY2018.

14. *Panel members spoke to support for embracing new technologies to facilitate data dissemination and data collection. A recent project to create user-friendly online visualization and data download tools for the public are excellent and should improve the efficiency of data availability and could help to show fishermen that their data is being used and appreciated (which could increase participation in future data collection efforts). Opportunities for using new technological approaches for collecting data were also discussed and should be investigated including the use of mobile devices (i.e., smart phone "apps"); the Center should, however, look for synergies with projects in other regions that may have already developed the platforms. The use of the new online visualizations and associated downloadable data should be monitored for usage and, if being used, the Center should consider whether to dedicate IT staff to maintain and perhaps expand.*

- a. Regional stakeholders expressed interest in data visualization tools to help communicate trends in fishing activity to communities.
- b. The recent ‘visualization’ project is an opportunity to use technology to show fishermen the use of survey results that could encourage continued cooperation.
- c. The data portals are awesome, and their reference in the SAFE reports very useful.
- d. New opportunities for data collection approaches were discussed in the review, including utilizing mobile devices (e.g., novel use of smart phone “apps”) that can be paperless, user-friendly and low-cost approaches to data collection, as well as proposed projects through internal RFPs and external funding.
- e. The “FishRules” application appears to be one that could be highly useful to the public (or particular subsets who may not be as informed about rules and regulations).

PR-14. The PIFSC released an online Hawaii Fishing Community Snapshot tool the week of the external review. During FY2018, the program intends to extend this tool to include data from at least one US territory, as data allows. Additional work is being conducted to build a pilot PIFSC data portal (a demo was available to the panel and public during the review) to provide public access to a select handful of PIFSC data streams (including SAFE report data) coupled with innovative data visualization applications. This PIFSC data portal will be rolled out during the spring of 2018 and should greatly improve the timeliness of reporting on our core economic data collection programs. Evaluation of usage and stakeholder feedback will determine if additional modules are developed in the future. Efforts to capitalize on existing data service frameworks (OceanWatch, PacIOOS, PIFSC ArcGIS Online Mapping Tools, etc.) will continue with added attention on socioeconomic data applications. In considering new data collection technologies, PIFSC EHD staff is currently involved in a pilot project with the American Samoa Longline Observer Program to test digital data collection methods for ongoing economic data monitoring. Similarly, PIFSC staff secured stakeholder support from the State of Hawaii to implement a regional module on a popular fishing regulations smartphone app, which could also be used as a medium for innovative survey outreach, sample design, and participation. However, PIFSC have submitted multiple unsuccessful funding proposals for development of this app in the past 12 months, but will continue to explore new technologies and potential funding sources.

15. *The number of early career [and new] staff [to the EHD research program] with experience in conducting collaborative ecosystem research has great potential to ensure that the future reorganization will be successful. Information was not presented on the Program or Center’s strategy/policy for having scientists engage in the profession.*

- a. Very little information was provided about attendance at professional academic conferences, and these are good venues to promote the exchange of scientific approaches and ideas. It’s encouraged that EHD are supported to attend these conferences.
- b. The early career staff should be afforded the opportunity to engage in professional development activities that will both provide for job satisfaction and bolster the credibility of their research
- c. Part of communicating results, but also designing innovation research and keeping current on the academic research, comes from presenting at academic conferences. Team members should be given incentives to publish, and encouraged to attend conferences.

PR-15. PIFSC remains committed to developing staff and affording professional development opportunities where participation aligns with Center and Division mission and research priorities. In FY2018, all EHD federal staff Performance Plans outline specific conference attendance for the year to ensure that opportunities are available, and to balance priorities as new opportunities arise during any given year. Similarly, new individual Work Plan requirements rolled out for ESD contract staff include a professional development section for staff to identify conference attendance and other employee development opportunities. PIFSC encourages all staff to develop and maintain an individual development plan to help chart a successful career path.

16. The panel offered numerous suggestions to inform the future PIFSC Human Dimensions research portfolio, a select list of priority topics is listed below. *[Identify] timely and critically important question[s] that, if addressed from a methodological perspective, ha[ve] the potential to contribute to the peer-reviewed literature, serve as an example within NOAA, and can help to identify data gaps to guide future investments in data collection. This line of research should be pursued for maximum impact.*

- a. The Program is well-poised to lead a joint Program effort that develops consensus for categorizing noncommercial fishermen based on single or multivariable attributes, such as income, income minus expenses, primary motivation, and pounds sold/year. Such an investigation would be expected to yield data and inform future studies of noncommercial fisheries economics at PIFSC.
- b. The expanded definition [of non-commercial and cultural fishing] being operationalized through this team at the PIFSC stands to serve as a model for other regions. This is an opportunity to contribute to the science of managing fisheries in the U.S., especially in regions where commercial fisheries are not the dominate use of the resource (or are declining).
- c. There seem to be ample opportunities here to do innovative human dimensions and/or non-market valuation work that could directly inform management and the true, total value of fisheries to society.
- d. Perceived need for more focus on extended cultural values studies on post-harvest distribution and “fish flow” into the ways that fish get distributed.
- e. Although it is difficult to quantify and incorporate cultural values in these models, efforts should be undertaken to better explore how to do it appropriately. It sounds as if there are plans to do this and I would strongly support this work as a way to move beyond the simple economic and catch values typically used in an IEA. Staff desires to include human feedback loops into the biophysical systems is also to be commended and should be pursued.
- f. The Program is in a good position to help the Regional Office and Council refine a Social Impact Assessment template for use in producing SIA in the region.
- g. The Program should engage Council staff in a discussion about whether to initiate a re-examination and Options Paper regarding fishing community identification.
- h. The Program should focus more attention on elucidating what outcomes communities’ desire from improved natural ecosystem condition. It is these attributes (increased household income; increased participation in the ocean economy, etc.) that should be parameterized.
- i. The Region’s ACL specification process requires a consideration of social and economic information specific to non-fishing interests. This unique requirement provides the Program with a highly justifiable (i.e., management relevant) reason for conducting sociocultural and economic research throughout the PIR. It is unclear why the Program has not elected to build proposals around collecting data region-wide around the necessity of improving SEEM assessments for ACL specification.
- j. Understanding, collecting, and utilizing traditional ecological knowledge should be identified as a priority for this group.
- k. The development of oral histories and bio-cultural indicators for fishing in new monument areas are novel in the generation of spatially explicit cultural values (such as ‘cultural keystone species’) that can be used in ecosystem modeling.
- l. Gender issues in fisheries never once came up in the discussions

PR-16. We thank the panel for the many valuable ideas offered to help advance the PIFSC human dimensions and fishing community research portfolio. Of note, the research themes of noncommercial fishing classification, considerations of cultural fishing, and incorporation of traditional ecological knowledge are all active areas for EHD research staff during FY2018. EHD staff also possess specific expertise with gender issues in fisheries, and regional research applications are being explored. Additional suggestions offered by panel members align well with regional priorities and will be shared with the Council Social Science Planning Committee at our next meeting in June 2018, where the goal is to develop revised regional social science research priorities. These topics will also be considered as we develop our strategic research plan.

17. The EHD [Economics and Human Dimensions] Program has identified projects, including data needs, tasks and methods to address both climate change and ecosystem-based fishery management. The EHD Program is well-positioned to examine fishing community responses to projections of effects and play a key role in addressing the social aspects associated with climate change, which is inherently an anthropocentric issue.

- a. Regarding Climate Change Research: Climate change is inherently a social problem. The ESD is well positioned now to undertake research that examines fishing community responses to projections of climate change effects on MUS [Management Unit Species].
- b. the EHD science program needs to continue to work on climate change impacts (not only on biophysical dimensions, but also social vulnerabilities and adaptive capacity in fishing communities).

PR-17. We agree that ESD is well positioned to advance the science of social vulnerabilities and adaptive capacity for Pacific Island communities in the context of climate change. EHD research

staff have contributed to the drafting of the Pacific Islands Climate Regional Action Plan and participated in a recent Regional Climate Symposium to identify climate science needs. Ongoing field research in FY2018 is exploring social adaptive capacity in Pacific Island communities. Using output from the forthcoming Pacific Islands Vulnerability Assessment we will be able to apply our community social vulnerability indicators to describe potential fishing community impacts from fish species vulnerabilities to climate change.

18. *Many ongoing data collection programs are continuing to produce valuable information for stakeholders. Supplementary studies/surveys (systematic and opportunistic) also have good participation rates, and there is much anticipation over the recent data collection projects and those planned for more remote locations next year (including additional oral histories).*

- a. Arguably the bread and butter enterprise of the group, data collection on commercial fisheries provides crucial information for the national economic assessment indicators.
- b. For a program of this size, this Program collects a considerable amount of data on fisheries operating costs.
- c. The fact that the ‘earnings’ information has been expanded to include broader socioeconomic information to better match the unique characteristics of the fisheries speaks to the value-added approach held by current staff. These efforts were acknowledged by stakeholders through specific examples of how the social science staff provides timely evidence-based information and explanations of fishery outcomes, which indicates the social sciences team is cognizant and responsive to the core of their mission.
- d. Consistency and success at collecting these data benefit from outreach efforts and strong community support, which are reinforced by the E&HD scientists’ proactive efforts to disseminate research results to participants (e.g., vessel owners), communities, and other stakeholders (e.g., the Council and public) in accessible formats. The greatest success in data collection has been realized in the Hawaiian Islands, but more emphasis needs to be placed on on-going data collection efforts in the other territories and remote areas where important data gaps remain (e.g., Guam, American Samoa, and CNMI).
- e. Current opportunities to expand data collection exist, for example through Observer Program “add-ons,” and E&HD scientists have made good use of the inclusion of a few economic questions. To the extent possible, some thought towards new priority human dimensions question “add-ons” should be given by PIFSC and other research leaders to possibly include in the Observer Program data collection process.

PR-18. The Center appreciates the panel’s comments about the success of existing data collection programs and acknowledging the level of community support for PIFSC socioeconomic research. We agree with the assessment that the program should not become complacent and must continue to strive for new ways add value to our data collections. A socioeconomic survey of fishers on Guam and the CNMI will be fielded in 2018 to improve our understanding of economics and community attributes for the Marianas archipelago. EHD research staff submitted proposals in FY2018 to explore the feasibility of developing an ongoing regional socioeconomic survey that can provide more valuable community insights, on par with the ongoing economic data collection programs maintained by EHD research staff and regular collection of biological and physical data.

19. *The on-site review was well-organized and benefited from the efforts of the Program Lead who provided reviewers with materials prior to the meeting and was responsive to queries from the review panel during the meeting. The PIFSC staff also provided a summary of all discussions that allowed for full participation of the all panel members in the discussions. The review panel appreciated the opportunity to provide feedback into the development of the new integrated Ecosystem Sciences Division (ESD).*

PR-19. The Center appreciates the hard work of Tanya Ochoa, PIFSC Information Technology Services staff (Chad Sugimoto, Courtney Shipp, and Timothy Lee), all presenters, and other support staff to successfully convene the 2017 PIFSC External Review program.

Summary of proposed PIFSC response actions to panel recommendations

Recommendation	Action(s)	Date(s)
Panel members wanted to see more explicit consideration of social science in PIFSC research priorities and planning (PR-1)	PIFSC Science Council will work to develop long term research goals and a revised PIFSC Science Plan will be mindful of EHD scientific contributions	September 2018
All panel members saw value in an Economics and Human Dimensions strategic research planning exercise (PR-2)	EHD staff will convene internal Economics and Human Dimensions Visioning Workshop Session	March 2018
	EHD short and long-term research plans to be integrated within broader Division research priorities to be defined in FY2018 ESD Implementation activities	June 2018
There was a recognized need for improved stakeholder engagement (PR-3)	Existing quarterly meetings with PIRO Sustainable Fisheries will continue, and steps will be made to broaden communication with other stakeholders both within and outside PIFSC	Ongoing FY2018
	A “Social Science 101” program will be developed and rolled out to regional stakeholders	April 2018
	Staff will be asked to make a more concerted effort to utilize scientific advisory committee forums to update stakeholders of research accomplishments and plans	March – October 2018
Panel members called attention to misalignment between research and management timelines (PR-4)	See recommendations 2, 3, 9, 14	Ongoing FY2018
Panel members offered suggestions related to successful social science integration and ESD implementation (PR-5)	ESD Implementation is an ongoing effort	Ongoing FY2018
	ESD organizational and scientific goals will be articulated with staff input	June 2018
	Programmatic Evaluation of ESD Integration and Implementation	June 2018
All panel members recognized the need for the EHD research program to have a clearer set of research priorities (PR-6)	Research priorities will be articulated at various scales in the coming year:	
	(i) Internal research prioritization based on staff expertise and interest	March 2018
	(ii) PIFSC FY2019 AGM	May 2018
	(iii) ESD scientific goals and priorities	June 2018
	(iv) Council Social Science Planning Committee (SSPC) research priorities	June 2018
Staff time may be insufficient to meet future programmatic needs (PR-7)	Hire an additional federal social scientist	December 2018

Recommendation	Action(s)	Date(s)
Pursue strategies to convert temporary funds to permanent money (PR-8)	Discussions are underway among NMFS leadership and PIFSC leadership on how to add funding stability for core actives (and to support EBFM implementation research)	Ongoing FY2018
Prioritize expansion of decision-support tools to Pacific Islands Region (PR-9)	Collaborations are underway to develop a regional application of the FishSET toolbox	August 2018
The panel would like to see a renewed focus on peer-review publications (PR-10)	FY2018 Federal Performance Plans include explicit peer review publication priority language	November 2017
Panel members felt that improved data storage, access and availability should all be a part of a strategic plan – at the Center level – to improve efficiency (PR-13)	FY2018 PIFSC AGM includes Data Management pillar to enhance Center data systems and processes	Ongoing FY2018
The panel was supportive of new technologies in both data visualization, dissemination, and collection (PR-14)	Roll out of PIFSC pilot Data Portal (online visualization tool)	March 2018
	Expand online Hawaii Community Snapshot Tool to American Samoa, Guam, and the CNMI, where feasible	August 2018
	Implement American Samoa pilot digital data collection project	August 2018
Staff should be afforded professional development opportunities (PR-15)	FY2018 federal Performance Plans and FY2018 non-federal individual Work Plans recognize professional development opportunities Individual Development Plans	November 2018 Ongoing FY2018
Program is encouraged to strengthen key human community research themes such as; categorizing non-commercial fishing; characterizing cultural fishing; and incorporating traditional ecological knowledge (PR-16)	Much work is already being accomplished in these themes, which will be considered in development of our strategic research agenda. Future work will expand as funding and logistical support permits.	Ongoing FY2018
The program needs to continue to work on climate change impacts, especially in context of social vulnerabilities and social adaptive capacity (PR-17)	Much work is already being accomplished in these themes, future work will expand as funding and logistical support permits.	Ongoing FY2018
EHD should maintain existing data collection programs, but should continue to look to add value (PR-18)	A socioeconomic fishing survey will be implemented on Guam and the CNMI in the coming year A regional assessment of National Coral Reef Monitoring Program socioeconomic monitoring data will be analyzed for synergies with existing data collection programs and assessed for potential improvements	October 2018 June 2018 – August 2019

Appendix A. General Findings on the Terms of Reference

This appendix presents the seven overarching Terms of Reference questions (in bold), and general findings from the panel chair's summary report (in italics).

Question 1: Goals and Objectives

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

The unit [PIFSC] has made the decision to restructure in order to integrate disciplinary research; an implicit goal in the reorganization is to increase linkages between traditional biophysical ecosystem research and social science information to be able to identify and address the impacts on human systems. Tasks are listed in the Guidance document but the Science Plan from 2013 is less specific. There appears to be objectives for the Supporting Fishing Communities work, which are good. Integrated goals and objectives are likely forthcoming under the new reorganization, but prioritization will be necessary given relatively low staff levels and high travel costs.

1b. Does the PIFSC Socioeconomics Program 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?

Yes, they do provide information, especially through participation in numerous committees and workgroups. Stakeholders identified a few additional types of information that would be appreciated if resources allow, but the first priority would be to improve the timeliness of routine quantitative information. Recent staff increases and an acknowledgement that a protocol for data requests and prioritization are likely to improve this situation.

1c. Does the PIFSC Socioeconomics Program 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 EHD [Economics and Human Dimensions] Program has identified projects, including data needs, tasks and methods to address both climate change and ecosystem-based fishery management. The projects and areas of interest are relatively broad and all-encompassing with respect to social science information due to the recent hire of early career faculty with diverse specializations; however, the vision would be strengthened with the development of a strategic long-run agenda that focuses on answering specific research questions through addressing well-defined objectives that are supplemented with hypotheses. Such an agenda would help integrate the priorities and knowledge of stakeholders and improve their understanding of new and complicated ecosystem modeling tools and metrics. Such an approach is also science-based since results are directly linked to objectives. Focusing on providing “valuable inputs”, “exploring”, “monitoring”, and “assessing” will generate interesting information, but runs the risk of not addressing any specific research objective.

Question 2: Integration

2a. Are PIFSC economic and sociocultural programs appropriately integrated with each other, with the Ecosystem Sciences Division, and with other science activities within the Center?

There are examples where researchers within the economics and human dimensions (social science) team are thinking of ways to integrate; cost and earnings data can be linked with sociocultural or Census information, and work on fishing community profiles affords an opportunity to link qualitative and quantitative information.

Fostering integrated research among the social sciences team will be a necessary step in integrating with the non-social sciences. As the integrated Ecosystem Sciences Division develops, the plan for how research will progress within this new framework should be developed; focusing on deliverables is a necessary but not sufficient condition or fostering joint research. At this time, the leadership has engaged in extensive internal planning and careful facilitation to design and anticipate integration, but implementation details and an ongoing commitment to assessment (and adaptive management) will determine success. More importantly, the need for external funding to support future integrations was reiterated; if integration is dependent on external funding, then multidisciplinary integrated research must not be a priority.

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

The social sciences team is also clearly apprised of complementary efforts throughout NOAA Fisheries and seeks to adopt, modify and use information from those efforts (e.g., decision tools being developed and expanded by NMFS ST). In addition, staff are participating in workgroups where researchers from around the U.S. discuss methods to improve social science information. This participation has potential for the team to lead in NOAA's fishery management efforts for the benefit of both the regional office and headquarters.

Question 3: Data Collection

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

For established commercial fisheries the use of observer and logbook data is excellent, and the data collected is continually refined to improve the information received. Supplementary studies/surveys (systematic and opportunistic) also have good participation rates, and there is much anticipation over the recent data collection projects and those planned for more remote locations next year (including additional oral histories). New information is also being generated through new hires. Whether the information collected will be adequate for the newly integrated ecosystem projects, or long-run strategic research priorities that have yet to be identified is unknown. Resources will constrain additional data collection.

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

The social sciences team has recently released data in user friendly format, but is limited by the availability of a subset of the data. The team does not have direct access to the data, which are in an Access data base. Requests take 2-3 weeks. As a result, it is not clear if researchers really know what data their getting since they do not do the query. Automation of similar data has been implemented at other Centers (i.e., relational data bases), as such, modification of the platform should be considered. At this time, there does not appear to be a plan at the Center level to address ongoing data requests, and perceived delays, but there is an opportunity to revisit following the implementation of the new Ecosystem Sciences Division in October as researchers from all disciplines look to assess the availability of a range of data. As the amount of data collected voluntarily increases, it is important to continue to convey the utility of participating in the programs and have feedback to fishermen, so they do not get too fatigued.

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 PIFSC research, and how can these barriers be overcome?

The common barrier noted was with respect to data from the Western Pacific Fisheries Information Network [WPacFIN]. Although WPacFIN is a cooperative program involving an office at the PIFSC, the fisheries information compiled is often delayed since it is collected by agencies in American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, and Hawai'i. The team also noted challenges with the OMB process for tailoring surveys for unique uses of fish in their region.

Question 4: Methods

4a. Are PIFSC staff using appropriate models and research tools to analyze data and provide management advice?

Yes, standard and traditional tools are used, which helps foster confidence in results when presented for management.

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?

The IEA [Integrated Ecosystem Assessment] is a good example of moving in this direction. An Atlantis model is in development and the group is contributing to thinking of how this model needs to be adapted to the PI region. The work on indicators to qualitatively define ecosystem properties also could serve to contribute to the science of “web” based ecosystem models and efforts at framing questions for gathering data are in development. Advances on both fronts will position the Center well for considering future issues with implications to social science outcomes.

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

No explicit or intentional barriers exist; however, reorganization is a time of uncertainty. Changing culture and building new teams and relationships will require strong leadership. Early career staff have been trained in the importance of integrated research so perceived barriers will eventually fall. One idea may be for the establishment of a new joint project (versus the two current projects that were already adopted) with input from all researchers in the new ES [Ecosystem Science] Division; for example, a stakeholder suggested a project involving “fish flow.” Brainstorming about how to analyze the value chain from integrated perspective could impart ownership of the project on a wide-scale and set the stage for future projects.

Question 5: Use of Information

5a. Is PIFSC social and economic information being used in living marine resource management advice?

Yes, especially with respect to commercial fisheries; most notable is engagement of staff on Council and related subgroups charged with providing scientific opinion, analysis and advice on a continual basis. Several examples were provided by staff and corroborated by stakeholders.

5b. Are there existing mechanisms sufficient for ensuring this information is used appropriately?

Yes, mechanisms exist through regulatory mandates such as the 10 national standards in the Magnuson-Stevens Act, NEPA, and Executive Orders. Working groups of the WPFMC are also required to develop and evaluate reports with social science information.

5c. Are there barriers to the uptake of science provided by the Center and, if so, what steps can be taken to overcome them?

The time horizon for decision making is often shorter than the time horizon for completion and review of the supporting analysis. Delays in the acquisition of the most recent data needed for timely analysis contribute to this barrier. Stakeholders also expressed a lack of need for and appreciation of retrospective studies (versus predictive modeling); however, retrospective studies are the pillar of adaptive management as they provide the opportunity to learn from past actions.

Overall recommendations include:

- Develop a protocol that includes the process, criteria and timeline for both the submission and delivery of data requests and results of queries. Could also develop processes specific for standing requests from certain stakeholders.
- Communicate research studies at onset and while in development since stakeholders can provide valuable feedback on hypotheses that can foster acceptance of subsequent results.
- Invite graduate students working on Center-related research to council meetings and/or workgroups to facilitate communication of the science.

Question 6: Best Available Science

6a. Is the Center providing the Best Available Science?

Yes. There is no negligence in terms of failing to do the obvious study, nor are they ignoring completing the analysis of any obvious data. All data that is accessible is being studied. In addition, staff are using standard tools that are appropriate, accepted and expected.

6b. Are PIFSC economic and sociocultural research products adequately peer-reviewed?

Yes, technical memos are reviewed, and research has been published in peer-reviewed outlets appropriate for an organization that is charged with supporting management (e.g., Marine Policy). The high proportion of grey/white papers could indicate a future increase in peer-reviewed literature as the research life cycle is completed. The recent hire of early career researchers could also increase the average peer-reviewed journal article publication rate above four per year. An increase in the number of collaborations with academics (faculty and graduate students) and increased participation in professional conferences, some of which were discussed during the review, could also help to increase peer reviewed research as studies are vetted and improved by academic colleagues.

6c. Are the appropriate processes being used to ensure that scientific products meet professional standards and are of high caliber?

Yes, study outcomes are reviewed as soon as completed. Staff are diligent about ensuring all results are summarized into tech memos immediately upon completion, which are reviewed and published internally. Professional engagement is an additional mechanism to ensure research is science-based and valid and staff are attending such conferences and workgroups. Performance Plans could also include requirements or incentives for staff to remain current in their discipline in order to ensure research is reviewed by peers, but this was not discussed.

Question 7: Communication

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

The outreach is excellent (e.g., branding surveys). SAFE reports are developed using rudimentary approaches that could be modernized. The decision to invest in the development of a user-friendly internet data interface with visualization tools will be useful to a variety of audiences and (potentially) with the development of SAFE reports. The tool, which includes the ability to download spreadsheets, could also help in reducing data requests. The new communications coordinator is also implementing new strategies for both internal and external communication, and may provide an opportunity to allow the social science staff to focus on the research.