

CHAIR'S SUMMARY

Report on Program Review of Economics and Human Dimensions Program

Pacific Islands Fishery Science Center

NOAA Inouye Regional Center

Honolulu, HI

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Review Panel Members

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

Purpose and Objectives of the Review

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 ST in planning future science and research.

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

Background and General Overview of Meeting

The review of the PIFSC Economics and Human Dimensions (EHD) Program began with an overview of the NMFS review process and the economics and human dimensions research being conducted at the national level. These presentations were followed by an introduction to the science programs at the PIFSC, including the economics and human dimensions research currently underway. The science programs have recently been restructured but, as we learned later, full implementation of the restructure will not begin until October.

The activities of the center were presented to the review panel during 24 presentations organized under seven themes. Comprehensive background documents on staff, organizational structure, recent products and the like were available via a website prior to the review. Lead researchers summarized historic, current and future activities related to each theme. Every session ended

with a discussion panel of scientists and stakeholders, and an opportunity for the public to ask questions. 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 Science (ES) Division; a re-organization that will allow for improved collaborations among disciplinary scientists with the goal of providing more effective information to both the Pacific Islands Regional Office and the Western Pacific Fisheries Management Council, in addition to helping communicate the science to the public.

Observations and Recommendations: Terms of Reference

In relation to the Terms of Reference and Overarching Questions, the following observations and corresponding recommendations were made:

Question 1: Goals and Objectives

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

The unit 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 2015 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 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 ingratiated 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 seek to adopt, modify and use information from those efforts (e.g., decision tools being developed and expanded by OST). 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. 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 EIA 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. Beyond these efforts it is unclear if staff are motivated or have the expertise to conduct more sophisticated and fundamental research upon which to base recommendations.

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 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.

Panel Member's Major Recurrent Observations and Recommendations

The themes are those as presented to the panel during the review, not those listed in the Report Templates. An "Other" category was added to capture overarching observations and recommendations. Since some panelists used the Templates, information by Theme does not match across reports in this document. The following observations and recommendations are a summary, not a consensus. In addition to the summary below, and detail provided by each panelist, 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.

Theme I: Data Collection and Data Management

Observations

- Staff repeatedly mentioned a lack of time and money to travel to establish contacts to collect information and data due to the size of the region; building trust and having local contacts are perceived as being critical to collecting valid data.
- Access to data for program needs is hampered by the current platform that relies on queries prioritized in a seemingly ad hoc manner. Delays in receiving data have negatively affected efficiency of the EHD Program and their ability to supply the information they are charged with providing.

- Several panelists noted issues with OMB approval to change questionnaires.
- Many ongoing data collection programs are continuing to produce valuable information for stakeholders but are not research projects in the sense that they are serving to help test hypotheses and answer pre-defined questions.
- 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).
- The EHD Program complies with the NOAA’s Data Access and Public Access to Research Results (PARR).

Recommendations to Address Issues

- 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.
- 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. The Center could look toward other regions on the development of a relational database, and even automation of the generation of SAFE reports.
- Identification of research questions and associated testable hypotheses during the initial planning of a new report, including an outline for associated peer-reviewed publications, could help to identify additional data gaps.
- Opportunities for using new technological approaches for collecting data were 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.
- Leadership needs to prioritize scientists time spent on communication and outreach for educational purposes and, if desired, the research of effective communication. It is not clear if either of these activities are components of the overall charge to the EHD program.
- One discussion panelist recommended the possibility of using non-disclosure agreements to allow data access to collaborators; perhaps consider whether this is possible.

Theme II: Human Dimensions and Communities

Observations

- 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. 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.

- EHD scientists have sought complementary secondary data to augment information needs (e.g., from the Nutrition Assistance Program); this is an excellent and innovative strategy.
- The “cost and earnings” reports are well-received, and include more information than costs and earnings; this additional information may be missed by stakeholders given the historic title.
- Some panelists felt that the Fishing Community Profiles could be better understood by EHD scientists in order to help refine the information included.
- At one point, an EHD scientist indicated the expectation that all EHD Program staff should have a broad skill set to address every social science issue; however, this is certainly not the case with respect to biological specializations.

Recommendations to Address Issues

- Consider renaming the “Cost and Earnings” reports to better convey additional content.
- Ensure that the Fishing Community Profiles adhere to CFR 600.345 and EHD scientists are aware of the guidelines.
- Center and EHD Program leadership could recognize the distinct social science expertise on staff and highlight the complementarities in order to better assess coverage, identify gaps, and efficiently develop teams within the ES Division.
- There was some discussion on the variability in types of indicators that are meaningful for different communities, and what are being used seem to exclude measures used in other regions, so some ground-truthing may be in order.

Theme III: Commercial Fisheries Economics

Observations

- The EHD Program is known for their comprehensive and excellent work involving the Hawaiian longline fishery.
- There are several ongoing/recurring data collection efforts and good ongoing reports; only the timeliness (addressed elsewhere in this report) was stated as an issue.
- 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.

Recommendations to Address Issues

- The team could consider expanding its focus to smaller islands and potentially other culturally important fisheries, most notably understanding the dynamics in American Samoa.
- It might be good idea 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 results and the uncertainty of the outcome.

Theme IV: Noncommercial Fisheries Economics

Observations

- Traditionally, this theme would focus on “recreational” fisheries; however, harvesters in the Pacific Islands region are often not merely fishing for entertainment or even to feed themselves. As such, the concept of “mixed motivation” fishing, while not a surprising characteristic, complicates the analyses.

- Due to the diversity of non-market uses, such as cultural practices and community events, surveying is complicated by the lack of a sampling frame.
- Sampling frames are problematic so the degree of coverage or whether samples are representative is unclear.
- EHD scientists have used innovative opportunities to gather information from vessel operators through Hawaii’s DBOR Vessel Registry. This is an excellent example of collaboration and adding value to existing data collection programs.

Recommendations to Address Issues

- How to enumerate “noncommercial” fisheries is a timely and critically important question that, if addressed from a methodological perspective, has 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.
- Efforts to ensure that the data is representative should continue by improving the sampling frame.
- Continue to pursue novel collaborative opportunities for research in this area:
 - Consider whether additional questions could be added to the DBOR Vessel Registry to answer critical research questions.
 - Efforts to communicate results of past data collection efforts should be continued in an attempt to strengthen community support and interest, which in turn could improve response rates.
 - Increased focus on the charter fleet, such as through examining the spatial overlap of fishing revenue for personal income with the community social vulnerability indicators, could yield vulnerability across charter boat owners.

Theme V: Communicating Science and Outreach

Observations

- This theme focused on communications to lay audiences, with the exception of a couple scientific posters from historic research.
- 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.
- EHD scientists have published fewer than four peer-reviewed publications per year on average in total, which indicates a relatively low level of communicating to peers but could be caused by external factors such as being understaffed.
- The new communications coordinator has already made some positive impacts in terms of both internal and external communications.

Recommendations to Address Issues

- Center and EHD leadership should be mindful of the role of a science center in communications (i.e., educate/inform vs. influence). Social scientists often have knowledge of concepts and tools that can help in developing more effective messaging,

but doing so might not best serve the Center (e.g., peer-reviewed publications vs. fact sheets for example). Discussions about distinct and collaborative roles of the scientists and communications coordinator are warranted.

- Information was not presented on the Program or Center's strategy/policy for having scientists engage in the profession; however, presentations at conferences (for example) are effective means for exchanging scientific information and ensuring ideas will serve as a contribution to the respective disciplines (i.e., peer reviewed literature).
- For the charter fishery in particular, and in all work broadly, sufficient information on uncertainty should be used to determine whether differences are statistically significant. Including and comparing confidence intervals is one way to do this, which is an improvement upon subjective comparisons of medians or means.
- The new communications coordinator appeared unfamiliar with what the EHD scientists do, and confused what they do with citizen science. The Center should allow for that position to learn about the activities of the scientists in order to help foster collaborations (much like the Newsroom idea).

Theme VI: Ecosystem Science

Observations

- The Center appears to genuinely desire to integrate the biophysical and socioeconomic aspects of fisheries and has taken enormous strides over the past two years to create the organizational structure to facilitate this change.
- It was more difficult to assess the level of integration given that: the program reviews for the two broad areas (biophysical and socioeconomic) were conducted in succession; that the new organization structure has not been finalized; and staff from the biophysical sciences were not present.
- The number of early career staff with experience in conducting collaborative ecosystem research have great potential to ensure that the future reorganization will be successful.
- It will be important to recognize that 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 disciplines.
- While EHD capacity is well balanced, if new initiatives involving multidisciplinary research arise, staff may get stretched thin in meeting social science analysis requests.
- Panelists observed that hoping to foster integration by means of cc'ing leadership will likely result in missed opportunities. In addition, a passive approach also puts all the *burden on the social sciences leadership to initiate and/or request collaboration.*

Recommendations to Address Issues

- To help foster the development of effective integrated ecosystem research:
 - All panelists felt that the Center consider dedicating funding to the socioeconomic components of ecosystem studies to (1) ensure multi-disciplinary collaborations and (2) convey the importance of the EHD Program to the Center and to all other Center staff.
 - Two great opportunities were to demonstrate integration were presented (Atlantic and IEA); however, it is not clear if resources are necessary for them to succeed as interdisciplinary projects (e.g., which EHD scientists are leading in the

integration efforts?). Seed funding, such as to address the first point, could help by initiating the collaboration up front versus in parallel or subsequently.

- Several panelists offered ideas to help generate interest in integrated work such as: requiring biophysical and socioeconomics 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 (Reviewer 1, page 20).
- One panelist suggested that all proposals be required to consider both the biophysical and socioeconomic implications of a study, which could lead to more diverse teams.

Theme VII: Support for Management

Observations

- The EHD Program conducts practical and regional analysis in support of management, more so than any other region. And with the smallest staff to analyze fisheries in the largest geographic region.
- Some panel members found it challenging to identify the needs of management with respect to EHD information and, therefore, it was a challenge to assess the relevance of the science as directed. Stakeholder experiences and discussions clearly conveyed that the Program is delivering useful information, but the approach was a bit ad hoc.
- The management and research timescales are not well coordinated such that some results are too late to inform decision making.

Recommendations to Address Issues

- In cases where research results are finalized too late to provide input for the intended regulatory action being considered, staff should be encouraged to show the effectiveness or success of past decisions; promoting the usefulness of such research under an adaptive management perspective could help justify the importance of research.
- Consider asking OST to prioritize expansion of one of its decision tools into the PI region, for example, FishSET could be valuable for examining new monument areas.
- The annual SAFE reports have the potential to be an important tool for management and should be continued; however, automated technologies have improved efficiencies in the development of these reports in other regions, which could be consulted.

Other: Overarching Issues

Observations

- Strategic planning could involve identifying the research questions and hypotheses currently being investigated; it was often not clear how much of the research described was associated with hypotheses or underlying research questions that built on, or would contribute to, the scientific literature.
- The Center Director's presentation did not include the social and ecological effects of climate change although there is an effort underway to address such issues. 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.

- Past collaborations with a few academics (most notably PingSun Leung) have proved very fruitful.
- The EHD Program lead (Justin Hospital) has done a fantastic job, however, he could be getting stretched thin.

Recommendations to Address Issues

- As staff expertise grows and disciplinary capacities diversify within the EHD Program, it could be good timing to agree on a group/program name. It would also be helpful to the regional office to have a summary of the expertise and current projects of each staff in terms of NMFS' Research Areas.
- 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.
- 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 is warranted.
- The movement toward a project-driven work portfolio (vs. program-driven) affords the opportunity to remove disciplinary silos within the newly integrated ES Division.
- 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 region is the largest but has the fewest FTE).
- Prioritizing time spent on research versus management for the EHD lead should be discussed (especially given the increased management that will be required to help with a successful transition to the new organizational structure).

Conclusions

The 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 the early career faculty are looking 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.