



Economics & Human Dimensions Program Review

Office of Science & Technology Summary and Response – January 2018

Introduction

The NOAA Fisheries Economics & Human Dimensions Program has been developed by NMFS to improve the economic and sociocultural information underpinning the management of commercial and recreational fisheries, protected species and marine ecosystems. In 2017, NOAA Fisheries (NMFS) undertook a review of its Economic & Human Dimensions Program (Program). This Program Review was the focus of the fifth and final year of a five-year series the agency initiated in 2013 to systematically peer review key science programs conducted at each of the six Science Centers and the Office of Science & Technology (ST).

On September 26 – 28, 2017, ST convened a panel of experts (Panel) to evaluate its program. The objective of the review was to evaluate the quality, relevance, and performance of the ST program, based on the following overarching questions from the Terms of Reference ([click here](#) for the complete TOR and related materials):

1. Does NMFS have clear goals and objectives for its economic and sociocultural science program? Are the ST economic and human dimensions focus areas appropriate to advance economic and sociocultural research that will meet NMFS's needs?
2. Is ST focused on the priority information needs required to fulfill the NMFS mission?
3. Are the methods and models being developed contributing to (or will they contribute to) the advancement of conservation and management approaches such as integrated ecosystem assessments (IEAs), ecosystem based fisheries management, and other emerging issues?
4. Are ST economic and sociocultural programs appropriately integrated with other relevant programs? Are research efforts integrated with efforts at the Centers, regional offices and headquarters offices?
5. Does ST use the best tools to appropriately communicate research results to various managers, partners, stakeholders and the public?

ST staff provided the Panel with presentations covering ST's economics and human dimensions programs, background material for more in-depth information, and time during the review for detailed discussions with ST management and staff.

Acknowledgements

ST thanks the Panel, who devoted a significant amount of time to prepare for and participate in this review. Their preparation showed - their insightful observations and helpful recommendations provided valuable feedback on how our Economics & Human Dimensions program is performing relative to our stated goals and objectives and how it can improve that performance. The panelists for this review were:

Dr. John Whitehead – Chair, Appalachian State University
Dr. James Sanchirico, University of California, Davis
Richard B. Robins, Jr. – Retired, Mid-Atlantic Fishery Management Council Chairman
Emily Menashes, NOAA Fisheries Office of Sustainable Fisheries
Dr. Theresa L. Goedeke – National Ocean Service, National Centers for Coastal Ocean Science

Finally, we would like to express our appreciation to the ST staff for their contributions, insights, and candor during this 3-day review. Several comments in the panelists' reports emphasized the high quality of work being accomplished by ST's small, entrepreneurial staff. The outcome of this review is a testament to their commitment and dedication to this program and their colleagues in the field.

Overarching Remarks

The Panel found that ST has made a positive and significant contribution to the NMFS mission. The Chair's summary and the individual reports reinforce and validate the mission, direction and activities implemented by ST's economics and human dimensions program while also offering recommendations for improvements that ST will address in the coming years. The reviewers noted that the ST approach to the agency's Economics & Human Dimensions Program has led to a "*world-renown research program that is pushing the frontier in fishery economics, recreational economics, nonmarket valuation and human dimensions research,*" despite resource limitations. This encouraging review will motivate ST staff and leadership to continue to pursue excellence in all aspects of the agency's economics and human dimensions science programs.

Response to Recommendations and Other Observations

1. Goals and Objectives

While the Panel noted that the ST Program has clear goals and objectives, it observed that the program would benefit operationally by developing a strategic plan. The Panel cited the enhanced ability to bring the more nascent components of the Program, e.g., Human Dimensions and ecosystem service valuation (ESV) research, to bear on decision-making as a potential benefit of a well-articulated plan.

Recommendation 1.1 The Panel suggested ST should undertake formal strategic planning. They recommended that the planning process should evaluate what processes and approaches are working well and focus efforts on improving any processes that inhibit priorities (including Council priorities) from being met. In addition, the Panel noted that ST should provide a leadership and coordinating role as the Center programs undertake their own strategic planning.

Response: ST agrees with the full sweep of the Panel's strategic planning recommendations and will undertake strategic planning in FY18. As recommended by the Panel, the draft plan will address allocation and efficiency, ecosystem based fishery management (EBFM), Integrated Ecosystem Assessments (IEAs), and other suggestions provided by the Panel. In addition, ST will convene conference calls with the regional leads to facilitate their regional planning processes and ensure alignment with national goals. As part of the strategic planning process, Centers will identify major gaps and the Centers' highest priority hiring needs. The strategic plan will also establish a short-term plan for working group meetings.

Recommendation 1.2 The Panel noted that across the Centers and in ST, the number of economists greatly exceeded the number of social scientists, which could inhibit integration of human dimensions across the enterprise. Funding permitting, the Panel recommended ST hire a social scientist and should also address social science capacity shortfalls in the Centers.

Response: ST agrees that there is a social science capacity shortfall in the Centers. However, none of the Programs are right-sized for any discipline and *if funds were available for new hires*, it is unclear whether a

social scientist would be the priority hire in all regions. The planning exercise outlined above will provide improved clarity on hiring priorities in each region.

The lack of a social scientist in ST is a problem that has been managed by having the ST Division Chief serve as the ST representative to the Human Dimensions Program. While this solution has had some benefits (including requiring the Division Chief to better understand these disciplines), the costs now likely outweigh any potential benefits. ST has hired Dr. Lisa Colburn, a social scientist from the Northeast Fisheries Science Center, on a part-time basis (50/50 split with the NEFSC). Lisa is co-lead on the Community and Social Vulnerability Indicators decision support tool and thus already has a national perspective on the agency's Human Dimensions Program.

2. Addressing Priority Needs

Overall, the Panel found that ST has been highly effective at advancing the agency's work and research with limited resources. The Panel also noted that ST leadership and scientists play critical integration, facilitation, and supporting roles with respect to the regional Center programs. In particular, the Panel noted that ST has done an outstanding job of sustaining and expanding ST and Center data collections and ensuring this information is provided/served to users (constituents, managers, researchers, etc.).

While the Panel identified key strengths of the ST program, they also identified a number of actions that could be undertaken to improve the ST program and the national program. The Panel's main recommendations in this area focused on improving models and expanding decision support tools on key management issues such as allocation and some innovative ideas for meeting these needs. The Panel also provided suggestions to increase the uptake of information.

Recommendation 2.1 The Panel recommended that the ST strategic plan specifically address efficiency and quota allocation, including establishing commercial and recreational fishing working groups to discuss methods and steps towards implementation.

Response: The strategic planning process will explicitly address allocation and efficiency. In addition, ST will ask Centers to submit Work Plans for addressing their upcoming allocation needs. These Work Plans will be jointly reviewed and funded by ST and SF. As part of this planning process, ST and the regional leads will participate in an SF ARA meeting (date TBD) to help guide planning.

ST will also task the standing recreational fisheries economics working group and a sub-group of commercial fisheries economists in FY18 to look at potential improvements to our current modeling approaches. ST will convene workshops (dates TBD) to enhance knowledge sharing, innovations.

Recommendation 2.2 While the Panel acknowledged that ST's long term strategy of expanding decision support tools (e.g., BLAST and FishSET) was the correct path, it suggested ST also consider the development of short-term strategies to meet management needs. These suggestions included economic performance measures for non-catch share fisheries and the use of meta analyses to create "rules of thumb" that would inform management actions for both commercial and recreational fisheries. The Panel also suggested the development of recreational demand models to update the recreational fishing meta analysis estimates.

Response: ST agrees that economic performance measures are important baseline information and should be available for all commercial fisheries and not just the catch share fisheries. ST, in conjunction with the Centers, began routinely producing economic performance measures for selected non-catch share fisheries in FY13. While there is some potential to expand fishery coverage – and ST will pursue this direction – without additional resources at the Centers to produce these estimates it is unlikely that there will be a major expansion.

The use of meta analyses is an innovative suggestion. ST will explore the feasibility of conducting these types of analyses. ST has some concerns about the efficacy of general rules of thumb approaches given that fisheries are very disparate from region to region but will scope out these issues in conjunction with the Centers.

Recommendation 2.3 To enhance the national uptake of research innovation, including analytical development and decision support tools, the Panel recommended that ST hold periodic workshops, conference calls, and webinars for NMFS and Council staff.

Response: ST generally convenes 2-3 national workshops per year. Most of these workshops are discipline- or research-focus area specific, e.g., participation at the Human Dimensions Program Workshop, held roughly every two years, is generally limited to the social scientists, albeit that has been changing over time with three economists attending the 2017 workshop. The 2016 climate workshop was an exception and included economists and social scientists from all research areas.

With the removal of the travel cap, ST will be re-instituting its biennial national conference of economists and social scientists. In addition, ST will also be convening a Bycatch Workshop in FY19; participants will include commercial fisheries economists, recreational fisheries economists and protected resource economists. Funding permitting, ST will also fund travel to the 2018 NMFS Stock Assessment Workshop. (See also 5.4 for information on support provided to externally-sponsored workshops such as ICES, PICES and MSEAS).

The ST Quantitative Ecology and Socioeconomics Training (QUEST) program supports educating and training the next generation of **ecosystem scientists, stock assessment scientists, and economists**. The QUEST webinar series, which is open to the public, includes a number of presentations by university and NOAA Fisheries economists and social scientists. This approach has proven to be a useful way to disseminate information on research innovations. Under its planning process, ST can consider a more strategic use of this series.

Recommendation 2.4 To enhance the proliferation of decision support across regions, the Panel recommended that ST develop best practice manuals that would include tool maintenance and updates and would also outline plans for training users.

Response: ST has supported training for the Social Indicators Toolbox for both Council and NMFS staff. In addition, a Best Practices Manual for conducting Social Impact Assessments (SIAs), which covers both the Social Indicator Toolbox and the Community Snapshots, is nearing completion. ST plans to conduct additional trainings when this manual is available. training these individuals on these tools makes sense since SIAs are often conducted by NEPA policy analysts and Council staff.

ST could also provide training on both FishSET and BLAST. Given, however, that these decision support tools can only be run by highly trained economists and not the layman, the training would require a two-track approach: a) training for econometricians; and b) training policy analysts at the NMFS Regional Offices and at the Councils that lack the econometric background on the appropriate applications of these models. The Mid-Atlantic and New England Council's Scientific and Statistical Committee review of the Northeast BLAST model could provide a useful blueprint for a Council/Regional Office/industry training. In addition, the internal BLAST workshop for NMFS staff in Tampa that ST funded as part of the kick-off of the Gulf BLAST meeting could serve as model for future expansions of the BLAST model.

Lastly, providing guidance on the maintenance needs of these models will be useful and illuminating for both Center and ST staff.

Recommendation 2.5 The Panel identified understanding human relationships with key protected species as a useful research area for ST to pursue.

Response: ST and the Centers have conducted relevant research in this area, with some very innovative research emerging from PIFSC in the past year. ST has discussed presenting this information to the PR Board to identify good candidate projects that could be undertaken in FY19.

Recommendation 2.6 The Panel recommended that ST explore the disconnect between its role in developing ecosystem service valuation methods and their application in management. The Panel encourages ST to work to ensure that these values are included in the policy process.

Response: Before responding directly to this recommendation, it is important to clarify that ecosystem service values determined through revealed preferences methods are routinely used in management. The Panel is referring to stated preference methods that economists may use when a good is not traded in a market or the existing data cannot be used to address the management issue.

ST agrees wholeheartedly with the spirit of this comment and both ST and the Centers have highly qualified staff to conduct these types of studies. There are, however, multiple – and potentially reinforcing – barriers to including this information in management decisions, some of which are beyond ST’s immediate influence. For example, because of the controversy surrounding stated preference valuation, the Office of Management and Budget (OMB) review of these surveys (required under the Paperwork Reduction Act) is necessarily quite rigorous, resulting in some surveys not being approved. In addition, in the past, the OMB OIRA has not always allowed the use of non-market valuation estimates to be used in regulatory impact assessments and thus even if the information exists, it may not be used for decisional purposes. These uncertainties inhibit research and may also discourage managers from attempting to use this information in a regulatory action.

This said, ST can work directly on trying to overcome any internal barriers. The ST Ecosystem Service Valuation Working Group will survey PR staff and managers to better understand why ecosystem service values are not being used in management.

3. Emerging Needs

The Panel identified a broad suite of “emerging needs,” including climate assessments, EBFM, ecosystem service valuation, and habitat economic research. It also identified the new challenge posed from the new MRIP estimation methodology that may significantly change catch estimates for some species, noting the import this may have in quota allocation discussions. The Panel offered a suite of recommendations for moving forward on each topic, noting potential linkages but also observed that the relationships between IEAs, ESV, EBFM and management strategy evaluations (MSEs) is not always clear.

Recommendation 3.1 The Panel recommended ST conduct workshops or capacity building effort to evaluate allocations in anticipation of the new MRIP catch estimates.

Response: See 1.1 and 2.1. In addition, ST will work closely with the MRIP transition team that is already in place. ST will also work closely with the SEFSC, NEFSC and SF to develop a work plan for meeting the modeling and assessment needs in these regions created by the pending release of new MRIP catch estimates for these regions. Recognizing that allocation challenges may result from the new MRIP estimates, the work plan will prioritize species caught by both commercial and recreational fisheries.

Recommendation 3.2 The Panel recommends that as the agency moves forward on the EBFM Roadmap, ST should consider research strategies that develop model pathways that will facilitate interim strategies for meeting EBFM needs. In particular, ST should develop research strategies to evaluate tradeoffs associated with harvest strategies for important forage fisheries. Also see 1.1.

Response: ST agrees with this recommendation, which is consistent with the EBFM Roadmap that acknowledges EBFM will be accomplished by building upon existing activities. ST will establish a working group to assess current models and decision support tools in terms of a) their ability to meet EBFM needs, and b) provide guidance on incremental improvements to existing approaches, and c) articulate the long-term modeling needs. The working group will explicitly consider the role of management strategy evaluations as well as regional IEA needs. ST will also address EBFM – and forage species – in its strategic plan (see 1.1).

Recommendations 3.3 As regional biological vulnerability to climate change assessments are developed in the remaining regions, ST should ensure that social vulnerability assessments of coastal fishing communities are also conducted.

Response: The Human Dimensions Program, led by ST, will incorporate the regional biological vulnerability to climate change assessments into the social vulnerability assessments. In addition, the program is currently pursuing multiple ways to make the oral histories more accessible, including a story map (a SERO project).

Recommendation 3.4 The Panel recommended that ST explore ways to link the Voices from the Fisheries oral histories projects with the social vulnerability assessments.

Response: ST is piloting a story map of oral histories with SERO to increase access to this resource for vulnerability assessments, social impact assessments, etc. In addition, ST will task the Community Social Vulnerability Indicator (CSVI) Working Group leads with exploring the feasibility of adding the oral histories to the CSVI mapping tool.

Recommendation 3.5 The Panel noted that one of the effects of warming oceans is shifting stocks and identified the need for more spatially explicit biological and economic data and models to support an adaptive management approach.

Response: ST will continue to support the development and propagation of FishSET, which has rich data visualization tools and spatial modeling tools, to other regions.

Recommendation 3.6 ST should provide leadership incorporating economic and human dimensions data and research into IEAs and in the development of MSE decision-support tools.

Response: ST will more actively engage the IEA and MSE staff to identify potential topics to emphasize in its FY19 internal funding proposal request. In addition, the working group established under 3.2 will explicitly address the role of MSEs under the EBFM framework.

Recommendation 3.7 ST should consider how the habitat economics program and non-market valuation could be meaningfully combined into an ecosystem service valuation research program.

Response: ST has funded the development of the West Coast Habitat Economics Research Plan with the intent that it will provide a blue print for a national plan. Given the focus of this comment on non-market valuation, the Ecosystem Service Valuation Working Group (ESVWG) will take up this issue in FY19.

4. Integration with Relevant Programs

The Panel found that the ST Economics & Human Dimensions Program is well integrated with the Centers' programs and with other ST programs but observed that the economics program and human dimensions program appear to be operating in parallel. The Panel's recommendations underscore the importance of increasing interdisciplinary research between these two fields.

Recommendation 4.1 ST should explore low-cost methods to bring together regional leads and science center staff on a regular basis to facilitate coordination and learning across programs.

Response: As identified in 2.1, ST and the regional leads will participate in an SF ARA meeting (date TBD) to help guide planning and will also meet in FY18 (dates TBD) as part of the strategic planning process. See 2.3 for additional information on staff workshops and 5.4 for information on externally-sponsored conferences.

Recommendation 4.2 Develop incentives to increase the integration of economic and human dimensions research in the Centers.

Response: ST will prioritize integrated economic and human dimensions research in its FY19 internal funding proposal request. To incentive this, ST will also discuss with regional leads changing the criteria to its Best Paper Awards to give more weight to research integrating economic and human dimensions research.

5. Communications

The Panel commended the ST Communications Team but noted that breakthroughs in research by Center staff is complex and warrants consideration.¹ More generally, they provided recommendations for improving communicating with managers. In addition, they recommended increasing communication among agency scientists as well as the broader research community, echoing earlier recommendations (see also 2.3).

Recommendation 5.1 ST should work with the communications and outreach team to develop strategies to communicate with managers and end users about data, models and information tools and how to appropriately and most effectively use and apply these products.

Response: This will be done in conjunction with 2.4.

Recommendation 5.2 Consider developing communications products that summarize how economic information is used in fishery management.

Response: ST will work with Center and Regional Offices as well as its communications program to develop communication product that summarize how economic information is used in fishery management as well as how it *could* be used in fishery management. See 2.4 for additional information.

Recommendation 5.3 Center scientist and council analysts would benefit from periodic workshops and conference calls to leverage innovations as they come online through a regional research project.

Response: See 2.3

Recommendation 5.4: ST could amplify research innovations through participation at AFS and ICES.

Response: ST wholly supports the spirit of this recommendation and notes that in recent years it has funded travel for researchers to participate in ICES, PICES and MSEAS, including funding a one-day workshop post MSEAS in 2017. Looking forward, ST will explicitly incorporate these activities into its FY19 planning.

¹ Note that the agency's established communication processes are not determined by ST; ST can, however, flag this issue for the NOAA Fisheries Communications Office.

Table 1. Summary of action items and schedules arising from the 2017 Office of Science & Technology Economics & Human Dimensions Program Review

	Action Items	
1	Goals & Objectives	
1.1/1.2 2.1/2.3 3.1/3.2	ST5 will draft a strategic plan in (Plan) FY18 that will address allocation and efficiency, EBFM, IEAs, and other suggestions incorporated herein. As part of the strategic planning process, Centers will identify major gaps and their highest priority hiring needs. The Plan will also establish a short-term plan for work group meetings.	FY18; Q4
1.2	ST5 has hired a social scientist on a part-time basis (50/50 split with NEFSC).	FY18, Q2
2	Address Priority Needs	
2.1	ST5 will have the Centers submit Work Plans addressing allocation needs as part of the ST5 FY19 Spend Plan. These Work Plans will be reviewed and funded jointly by ST5 and SF.	FY19; Q1
2.2	ST5 will explore the feasibility of conducting these types of meta-analyses.	FY19; Q4
2.3/5.3	As part of its strategic planning, ST5 will develop a short term plan for Work Group meetings. In FY19, ST5 will be convening a bycatch workshop composed of commercial, recreational and PR economists. With the travel cap lifted, ST5 will reinstitute its biennial meeting. ST5 will continue to make more use of the QUEST webinar series to disseminate information on innovative research.	FY18 and ongoing
2.4 / 5.1/5.2	In conjunction with the Centers, ST5 will develop Best Practices Manual for conducting Social Impact Assessments. ST5 will work with its communications and outreach team and the Centers to develop strategies to communicate with managers and end users about data, models and information tools and how to appropriately and most effectively use and apply these products.	FY18, Q4 for SIA manual; ongoing for other informational materials
2.5	ST5 will discuss emerging sociological work that focuses on human interactions with PR species with the PR Board to identify candidate projects that could potentially be undertaken in FY19.	FY19, Q4
2.6	The Ecosystem Service Valuation Working Group (ESVG) will survey PR staff and managers to understand why ecosystem value are not being used in management.	FY19, Q2
3	Emerging Needs (IEAs, EBFM, Climate)	
3.4	The Human Dimensions Program, led by ST, will integrate the biological climate vulnerability assessments (as they become available) into the community social vulnerability assessments. In addition, ST5 is piloting a project with SERO to use a story map to access those oral histories and in turn make it easier to identify which oral histories may have relevance for a Social Impact Assessment.	FY19, Q2 and then ongoing
3.5	ST5 will continue to support the development and expansion of FishSET, which has rich data visualization tools and spatial modeling tools, to other regions. (Note that this was not framed as a recommendation and may have been intended as an observation.)	Ongoing
3.6	ST5 will coordinate with IEA staff and EBFM program leads to identify potential topics to emphasize in its FY19 internal funding proposal request.	FY18, Q4
3.7	ST5 has funded the development of the West Coast Habitat Economics Research Plan with the intent that it will provide a blue print for a national plan. Given the focus of this comment on non-market valuation, the ESGV will take up this issue in FY19.	FY19

4	Integration with Relevant Programs	
4.1	ST5 will convene a meeting of the Center leads in FY18 (see also 2.3).	FY19, Q1
4.2	ST will use the FY19 internal funding proposal request to increase the integration of economics and human dimensions research.	FY19, Q1
5	Communication of status and accomplishments	
5.4	ST5 will continue to fund travel for researchers to present their work at ICES, PICES, AFS and other relevant interdisciplinary workshops.	Ongoing