Social Scientists in

Regional Fisheries Management

First Training and Coordination Workshop

HOSTED BY THE WESTERN PACIFIC FISHERY MANAGEMENT COUNCIL

DECEMBER 17-19, 2014

HONOLULU, HAWAII

Final Report

PREPARED FOR
THE EIGHT REGIONAL COUNCILS
COUNCIL COORDINATION COMMITTEE
WWW.FISHERYCOUNCILS.ORG

MAY 20, 2015

Report prepared by:

- **Dr. Christopher Hawkins,** Social Scientist

  Western Pacific Fishery Management Council

- **Ellary TuckerWilliams,** Contractor

  Western Pacific Fishery Management Council

- **Rachel Feeney, ABD,** Social Impact Analyst

  New England Fishery Management Council

In partnership with members of the SSRFM network.

Cover photo:

Standing (l to r): Kate Quigley, Mike Downs, Brett Wiedoff, José Montañez, Kitty Simonds, Craig Severance, Ava Lasseter, Sam Cunningham, Chris Hawkins, Ellary TuckerWilliams.

Seated: Rachel Feeney, Kari MacLauchlin, Anna Henry, Madeleine Hall-Arber, Cindy Grace-McCaskey.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Social Scientists in Regional Fisheries Management (SSRFM) is a group that formed in 2012 to address issues pertaining to social impact analysis in fishery management plan development. SSRFM includes staff from each Regional Fishery Management Council, academia, the private sector, and staff from the National Marine Fisheries Service.

In December 2014, SSRFM members met at the Western Pacific Regional Fishery Management Council office to discuss social science issues that are relevant to the work of the Councils; to understand and improve how the Councils address common directives (National Standards, etc.); and to engage in interregional collaboration to strengthen the role of social science in fishery management and policy.

The three-day meeting focused on describing the history and challenges of fisheries social science in each region; understanding how relevant federal requirements can best be addressed (e.g., National Standards 2, 4, 8, and 10; NEPA compliance; Executive Orders); sharing best practices learned through regional approaches to social impact assessment; and developing and using social indicators in fisheries management.

The discussions were broad, but a number of consensus statements were developed pertaining to social impact assessment, fishing communities, safety at sea assessment, Council-NMFS coordination, NEPA, and environmental justice. These can be found in Section 7 of this report, though some of the more important are listed here.

- Improve available data to conduct comprehensive social impact analyses of management alternatives. Regional work is necessary to develop sociocultural indictors by fishery and to collect these data regularly. NMFS financial support is needed for these efforts.
- Ensure that, at a minimum, elements described in National Standard 8 regulations (CFR 600.345) are addressed for relevant actions.
- Develop a process within each Council to define fishing communities, and collaborate with NMFS on profiling them.
- Improve and maintain engagement and cooperation between Council and regional NMFS staff to meet Council socioeconomic needs.
- Executive Order 12898. Clarify the determination of whether an action requires comprehensive assessment of environmental justice for minority and low-income populations.

1. SSRFM OVERVIEW

A fishery can be defined as a *socio-ecological* system that includes fish, harvesters, and the entire support industry, the long-term success of which starts with sustainable fish resources (Ditton 1997). As such, fisheries management must involve a certain focus on understanding and managing for the sociocultural and economic conditions of fishermen, their families, and the coastal communities associated with fisheries. In recognition of this, the National Marine Fisheries Service (NMFS) has, over the past few decades, hired a number of fisheries economists as well as a small cadre of sociocultural scientists to research the importance of fishery resources to fishermen and communities and assess the potential economic and sociocultural impacts that may stem from management alternatives (Abbott-Jamieson & Clay 2010). Their expertise became more important following passage of the Sustainable Fisheries Act (SFA) in 1996, which amended and reauthorized the Magnuson-Stevens Fishery Conservation and Management Act, adding National [Fishery Management] Standards, several of which pertain to the human dimensions of fishing.

The eight Regional Fishery Management Councils (Councils) have also developed their capacity to understand and manage the human dimensions of fisheries. Some of the Councils have hired full-time sociocultural social scientists, while others contract out sociocultural research and assessments.

At an October 2011 national meeting of the Council's Scientific and Statistical Committees in Williamsburg, VA, participants recommended the development of a cross-SSC social science group (MAFMC 2012). In early 2012, a staff-level group was formed to improve staff contributions to regional fisheries research and management. The group is now called "*Social Scientists in Regional Fisheries Management*" (SSRFM), and membership has grown to 18 individuals, including staff and contractors from each Council and most of the NMFS regions.

SSRFM provides a forum for participants to address the sociocultural issues in fisheries research and analyses pertaining to Social Impact Assessment (SIA), management plan development, compliance with the National Environmental Policy Act (NEPA) and the Executive Order on Environmental Justice,[1] and socioeconomic indicators of fishery conditions. In contrast to the NMFS Human Dimensions Team, SSRFM includes Council staff and focuses discussions on the sociocultural aspects of fisheries management. Since its formation, the SSRFM has met three or four times per year via conference call/webinar.

[1] Executive Order 12898 on Federal Actions to Address *ENVIRONMENTAL JUSTICE* in Minority Populations and Low-Income Populations

2. WORKSHOP OVERVIEW

In December 2014, the Western Pacific Regional Fishery Management Council (WPFMC) hosted the first face-to-face SSRFM workshop, providing members the opportunity to engage in substantive discussions regarding social science needs, practices, and emerging issues.

WORKSHOP GOALS

1. Discuss social science issues relevant to the work of the Councils;
2. Understand and improve how the Councils address common directives (National Standards, etc.); and
3. Engage in interregional collaboration to strengthen the role of social science in fishery management and policy.

The meeting focused on best practices for fishery social science and approaches to SIA, relevant federal requirements, social indicators; and predicted vs. actual social outcomes. Each attendee contributed presentations and/or facilitated discussions.

WORKSHOP ATTENDEES

- Sam Cunningham, North Pacific Fishery Management Council
- Dr. Mike Downs, AECOM
- Rachel Feeney, ABD, New England Fishery Management Council, *co-coordinator*
- Dr. Christopher Hawkins, Western Pacific Fishery Management Council, *co-coordinator*
- Dr. Cindy Grace-McCaskey, University of Hawaii/Pacific Island Fisheries Science Center
- Anna Henry, Northeast Fisheries Science Center (contractor, Integrated Statistics)
- Dr. Ava Lasseter, Gulf of Mexico Fishery Management Council
- Dr. Kari MacLauchlin, South Atlantic Fishery Management Council
- Dr. Madeleine Hall-Arber, MIT Sea Grant
- Dr. José Montañez, Mid-Atlantic Fishery Management Council
- Kate Quigley, Caribbean Fishery Management Council
- Dr. Craig Severance, University of Hawaii/WPFMC Science and Statistical Committee
- Brett Wiedoff, Pacific Fishery Management Council

Kitty Simonds, WPFMC Executive Director hosted the workshop and contractor Ellary TuckerWilliams provided logistical support. The workshop was a public meeting and a few economists from the PIFSC and stakeholders attended and contributed to discussions. Some SSRFM members did not attend, but contributed to shaping the agenda and this report, including: Trish Clay (NEFSC), Lisa Colburn (NEFSC), Jason Didden (MAFMC), Jennifer Gilden (PFMC), Ed Glazier (PIFSC), Mike Jepson (SERO), Dawn Kotowicz (PIFSC), Matthew McPherson (SEFSC), Christina Package-Ward (SERO), and David Witherell (NPFMC).

3. SOCIAL SCIENCE IN THE REGIONS

Workshop participants compared how social information has been collected and used in each Council, and discussed some of the greatest challenges to doing so.

3.1 NEW ENGLAND

3.1.1 HISTORY: Amendment 5 to the Northeast Multispecies FMP was perhaps the first in the nation to include a formal, if limited, Social Impact Assessment. At the behest of Dr. Peter Fricke, NMFS's first sociocultural scientist, the National Sea Grant Office encouraged MIT Sea Grant's anthropologist, Dr. Madeleine Hall-Arber, to provide the initial SIA in 1992, which was supplemented by Council staff member and Groundfish Coordinator Phil Haring, though a much more complete analysis was later published (Griffith & Dyer 1996). That experience prompted the need for more background information on fishing communities. Supported by NMFS's Marine Fisheries Initiative (MARFIN), the first community profiles were completed in 1999 (Hall-Arber et al. 2001), which helped inspire a nation-wide profiling effort by NMFS.

Today, regional capacity has grown to include a Social Sciences Branch (SSB) at the Northeast Fisheries Science Center (NEFSC), with five sociocultural scientists, including contractor Anna Henry. The first Social Impact Analyst, Rachel Feeney, was hired at the New England Fishery Management Council (NEFMC) in 2012. Many Plan Development Teams now have a sociocultural expert (or two in the case of groundfish) working to develop SIAs, and the Scientific and Statistical Committee (SSC) has three economists, a geographer, and a social scientist.

3.1.2 CHALLENGES: It remains difficult to continuously update fishing community data, which hinders monitoring the fisheries' complexity and dynamics. Managing to minimize negative social impacts is also complicated by NMFS's legal interpretation that National Standard 1 trumps the other nine national standards. FMP development would benefit from having sociocultural expertise on each PDT. There is a growing awareness among managers of the benefits of sociocultural analysis, but few know how the data may be usefully applied, particularly if the data are qualitative rather than quantitative. It is important for the sociocultural scientists to demonstrate the value of considering the social impacts, so that managers will be able to ask appropriate questions and apply the data offered.

Due to typically short windows of time between when the Council finalizes alternatives and takes final action, SIAs are typically brief and qualitative. The short timelines also limit the coordination with complementary economic and biological impact analyses, as well as SIAs for other actions that are completed simultaneously. Furthermore, these short time horizons, and the extent of the Council's responsibilities, limits the time managers have to read the prepared SIAs. This can lead to relying solely on public comment and personal knowledge of the fisheries (Feeney 2013).

3.2 MID-ATLANTIC

3.2.1 HISTORY: The Mid-Atlantic Council (MAFMC) relies on contractors and the NEFSC for much of the work on SIAs, never having employed sociocultural expertise in-house. Dr. José Montañez is the Council's third economist. Community descriptions, before 1994, were simplistic, but the MAFMC then contracted a characterization of principal ports involved with several of its fisheries to accurately describe the people and communities involved in the region's fisheries, as part of the MSA requirements for FMPs (McCay et al. 1993). That same year, McCay wrote the socioeconomic impacts of management strategies for black sea bass and scup, using fishery participant interviews, including their perspectives on the alternatives. In 2000, McCay et al. updated the port profiles for all but one of the states that have representatives on the MAFMC. They included descriptive information on the recreational fisheries, as well as other activities and land use issues in the ports, and these profiles were used for the next ten years with updates as needed.

3.2.2 CHALLENGES: MAFMC prioritized revisiting allocations and the impacts of changing allocations over time (e.g., in the scup fishery), though it is difficult to determine fairness and equity. Dr. Montañez has advocated for having sociocultural scientists involved with any potential reallocation amendment for the fishery. The only social scientists on the SSC are economists. Additional analysis is needed of the potential impacts to ports and communities, beyond fishery-wide impacts on landings and revenues. There is also some difficulty in having SIAs include impacts to all stakeholders.

Climate change is a big challenge, as the water temperature changes in the region are some of the largest in the world and are affecting some species' center of abundance or distribution. The MAFMC prioritized understanding how fishermen and processing centers could be potentially impacted by climate change. Because of climate change effects, the allocation of quotas may need to be realigned to reflect where the species are caught. This, however, would require analyses of the impacts on fishermen and processing centers of such reallocation. However, management moves too slowly when faced with critical and time-sensitive issues (e.g., dynamics of climate change).

A potential solution to the time crunch (that is not unique to the MAFMC) could be creating a baseline SIA that is revised every five to seven years as needed. This could save a lot of time in the SIA writing process by not starting from scratch every time. There would be necessary changes and fine-tuning, but it could drastically decrease the amount of time spent on writing SIAs. Additionally, the MAFMC needs to check the accuracy of the predicted SIA impacts or FMP objectives as management programs progress.

3.3 SOUTH ATLANTIC

3.3.1 HISTORY: The South Atlantic Fishery Management Council (SAFMC) has contracted social scientists in the past to assist with SIAs, including Dr. James Acheson, Dr. Michael Orbach and Dr. Peter Fricke. In 1994, they hired the first permanent sociocultural social scientist on staff of any Council and have had three on staff in succession, including Dr. Jepson who is now on staff at SERO, Dr. Kathy Kitner, and presently Dr. Kari MacLauchlin. The two sociocultural scientists at SERO address the needs of all three councils in the region. Dr. MacLauchlin has worked for the SAFMC as a fisheries social scientist for four years, and writes the social effects sections of action documents along with fulfilling responsibilities in outreach and social media.

3.3.2 CHALLENGES: There are a multitude of small-scale fishermen that target more than one species, in an approach known as "portfolio fishing." There can be a domino effect when a fishery closes as fishermen switch to other accessible species, but the impacts are hard to anticipate when it is unclear how and when the fishermen will switch fisheries.

The hot topics in the South Atlantic include red snapper, allocations, the visioning project, catch shares (individual and groups), marine protected areas, vessel monitoring systems, protected resources, and habitat/ecosystem-based management. The largest FMP is the snapper grouper, which incorporates 60 species. The more controversial management often involves fisheries which have a large recreational component. The recreational fishing community is large in the South Atlantic, and there is limited data on angler fishing behavior and landings. Recreational fishermen are hesitant to give data on their fishing locations, gear, etc.

Additionally, the SAFMC is working on a visioning project to revise and identify management goals for the snapper grouper fishery. Fishermen organized 27 port meetings throughout the region where the stakeholders were able to speak out and provide invaluable information regarding their specific fisheries, which staff was able to provide to the Council.

As in the other regions, staff time is limited and creates challenges in providing SIAs. Dr. MacLauchlin suggests that attention needs to be given to end users such as restaurants, fish houses, and tourism businesses associated with local fishing operations. Overall, the main challenges include workload, planning and timing. Fewer simultaneous amendments and more time to spend on one SIA at a time could improve the quality of the SIAs.

3.4 CARIBBEAN

3.4.1 HISTORY: The Caribbean Fishery Management Council (CFMC) has no sociocultural scientists on the SSC at this time. There are three NMFS SERO staff members focused exclusively on the Caribbean. The region also receives assistance from SERO and SEFSC social scientists. The SERO social scientists are split between three regions. Kate Quigley is a contracted economist of the CFMC.

3.4.2 CHALLENGES: There are four FMPs in place to manage 177 fish species, and an additional 121 fish species in the original FMUs. There are ACLs designated for these species or species groups for each island/island group and landings data are collected by species or species group, but there is limited landings data collection by species. Currently, the CFMC, the SEFSC and SERO are working with Puerto Rico and the Territory of the Virgin Islands to improve data collection at the species level and the rate at which landings data become available, but it is not on a real-time basis yet.

There are four amendments currently under CFMC development and consideration. One very significant amendment considers transitioning to island-based FMPs from Caribbean-wide FMPs. This change responds to very specific constituent concerns: the fishermen within each area felt their fisheries differed significantly with respect to species, gears, habitats, etc. These differences warrant separate management programs, and there are aspects of stock structure that may be different among islands (e.g., St. Croix fish will not share juvenile/adult distribution with any of the other two islands). The multi-species and multi-gear nature of the small-scale fisheries in the U.S. Caribbean being addressed on these island-based FMPs are challenging to SIAs, since the development of the fisheries, the species preference, and market demands are claimed to be different among the three areas.

Another amendment concerns development of consistent regulations for closed areas in Puerto Rico. The shared jurisdictions of the seasonally closed areas with different sets of regulations are a "nightmare" of social impacts – different gears and seasons create reporting and enforcement problems. A third amendment concerns changing the timing of seasonal closures when an ACL is exceeded. For this amendment, Quigley developed a model that could help determine when it would be best to have a fishery closure (depending on the objective, see Section 5.3.3), while still maximizing revenue and taking culturally important events into account. A fourth amendment/options paper will begin development of a federal permit system. This would greatly assist social scientists in identifying those most reliant on US Caribbean EEZ fisheries. All of these amendments require social impacts assessments, albeit there is no systematic data collection system on social impacts.

There are several economic and social concerns/challenges in the region. Recreational fishing is often not subject to a great deal of regulation or enforcement interventions, and this has short-term and long-term economic and social impacts when the ACL is exceeded and fisheries need to be closed. Diving safety is a concern, in that divers may not be following diving safety guidelines and using the appropriate diving equipment for the depths they are fishing. Inconsistencies between state and federal regulations cause confusion for fishermen and make enforcement more difficult, which can have long-term negative economic and social impacts. The CFMC often relies on public comment for information about up to date economic, social, and cultural effects. Due to a limited number of social scientists in the region, biologists have often conducted social science research. A good portion of the fishing effort is for subsistence purposes, but to what degree is unknown. Most of the islands have not fully recovered from the 2008 economic recession. Therefore, not only has subsistence fishing likely increased, but local

people are not buying as much fish as they had previously. Because fishing is based on market demand, there may have been a decrease in landings for some species.

The SEFSC collects socioeconomic data through a fishermen census conducted every 5-6 years. Within the Caribbean, if a recently proposed federal permits amendment is implemented, the SERO could collect better data on fishermen fishing in federal waters.

The USVI (St. Thomas, St. John and St. Croix) contains highly dependent communities that are likely vulnerable and not highly resilient due to limited alternate employment. The USVI depends on fish for protein, especially when employment declines (unemployment is currently high on St. Croix). Government employees and other salaried citizens in the USVI purchase local fish, but it is less affordable for other residents to do so. The fish market is largely locals. The cruise ship tourists that frequent St. Thomas do not typically buy local fish, but instead tend to eat on the ships.

3.5 GULF OF MEXICO

3.5.1 HISTORY: Dr. Ava Lasseter is the first sociocultural social scientist at the Gulf of Mexico Fishery Management Council (GMFMC). She works as staff lead on amendments addressing socioeconomic issues and also completes the SIAs for other Council actions. Prior to hiring Dr. Lasseter, the GMFMC had other staff write the SIAs or contracted them out to social scientists. The GMFMC was the first Council to convene a socioeconomic advisory panel that reviewed fishery management plans, provided advice on the social and economic impact assessments within management plans, and prioritized social science research for MARFIN and other grant programs. Later, this panel became the Socioeconomic Scientific and Statistical Committee (SESSC). The GMFMC is currently reorganizing its SSCs by increasing the number of social scientists on the standing SSC, and creating a smaller Special SESSC, which will be convened upon request by the Council to review socioeconomic-specific issues.

3.5.2 CHALLENGES: The primary social issue for the GMFMC is allocating ACLs among user groups. In the past year, the GMFMC has considered allocating a single species, red snapper, 1) between two sectors, 2) among components within a sector, and 3) among member States of the Council. Although national guidelines do not exist for determining fairness and equity, analytical frameworks in the social science literature could serve as the foundation for developing guidelines for defining and assessing fairness and equity (e.g., political ecology). Other primarily social issues in the region, and for which red snapper is a prime example, include conflict between the commercial and recreational sectors, inconsistent state and federal water regulations, and the disparate extent of territorial waters among the Gulf states (9 miles for Texas and Florida; 3 miles for Louisiana, Mississippi, and Alabama).

As recognition of the need for social scientists in fishery management continues to grow, a challenge remains in helping non-social science colleagues better understand how social science contributions can improve fishery management. Similar to the generation when economists

strived for a position at the management table among biologists (Abbott-Jamieson & Clay 2010), part of the job of Council social scientists is to help inform our colleagues on how our theories, concepts, and methodological approaches, while different, complement existing approaches and analyses in fisheries management.

3.6 PACIFIC

3.6.1 HISTORY: Sociocultural science has not played a large role in fisheries management in the Pacific Fishery Management Council (PFMC) region. Prior to 1990, much of the information was provided anecdotally through public testimony, and mainly focused on salmon issues. The PFMC hired one sociocultural social scientist in the early 1990s who in 2005 developed a publication on social science in the region (Gilden 2005). In 2003, the Northwest Fisheries Science Center (NWFSC) hired their first sociocultural scientist, and now has three on the Human Dimensions Team within the Conservation Biology Division. The NWFSC program examines the impact of West Coast fishing on communities and regional economies, including how fishery management decisions affect communities and environmental conditions. Today, anecdotal and public testimony to the PFMC continues to provide valuable information, and the fishing industry is represented on PFMC advisory bodies. These bodies provide insight regarding negative and positive impacts of proposed fishery management measures. The PFMC does not have sociocultural scientists on its SSC or other scientific teams, but could create such positions if it sees the utility of sociocultural data in the decision-making process.

In 2010, sociocultural issues became more prominent in decision making when the industry, states, and the PFMC developed and implemented the shoreside Individual Fishing Quota (IFQ) program for groundfish fisheries, the first catch share program for the west coast. The Environmental Impact Statement (EIS) included a comprehensive look at dependence, engagement, vulnerability, and resilience of west coast fishing communities. Program implementation included a mandatory economic data collection program. Recently, the NWFSC used the data to measure social and cultural changes in the groundfish fishing industry and related communities (Russell et al. 2014). Currently, a paper is being written on the “greying of the fleet” that looks closely at generations of fishing communities and the issue of future family members not taking over family fishing businesses (Russell, in prep).

3.6.2 CHALLENGES: Current challenges related to social science include understanding how social science information is best communicated to and used by the PFMC; determining information needs for the PFMC to understand an issue and make decisions accordingly; determining the scope of social issues related to management decisions, and incorporating proprietary information into the decision-making process. Social science is used to support fishery management decisions; however, providing this information to the PFMC in a timely and effective way is challenging. The NWFSC plans to update profiles created in 2007, to give each community a resilience score summarizing the community’s ability to adjust to other fisheries as regulations change (Norman et al. 2007). This tool will provide the PFMC information about port use, fishery diversity (participation in multiple fisheries), and how economically dependent a

community may be on the fishing industry. The reliance score will help identify which ports would be most heavily impacted by fishery management actions. This will generate a more "real time" model for the PFMC and provide information on how communities may be impacted by fishery management decisions prior to full SIA development.

3.7 NORTH PACIFIC

3.7.1 HISTORY: The North Pacific Fishery Management Council (NPFMC) typically contracts out sociocultural analyses for major actions that require an EIS and a stand-alone SIA. When an SIA is completed, it is cross-referenced and its conclusions are summarized in the Regulatory Impact Review (RIR). Dr. Mike Downs has been particularly involved in this work, dating back to 1990. While NPFMC does not employ a staff member with an anthropological background, it does include fishery analysts with backgrounds in geography and economics. Staff economists write RIRs for regulatory and FMP amendment packages. The NPFMC has a small number of geographically defined FMPs that have undergone many amendments (around 100 each for the Gulf of Alaska and the Bering Sea/Aleutian Islands groundfish fisheries). For minor actions that are not anticipated to involve extensive social impacts or that require only an Environmental Assessment and an RIR, as opposed to a full EIS, staff typically addresses social impacts within the RIR chapter.

NPFMC has developed a large number of quota based ("catch share") fisheries, relative to other regions, and has recently focused on management measures to reduce the bycatch of "prohibited species" – such as Pacific halibut and Chinook (king) salmon – which cannot be retained in directed groundfish fisheries. These major actions develop slowly, through an iterative process of defining management alternatives and assessing fishery and community impacts. Measures that constrain fishing opportunities or that redistribute the social and economic benefits of fishing privileges receive a great deal of attention from NPFMC and its stakeholders. Whether written as a stand-alone document or incorporated into the RIR, SIAs often make use of community profiles that NPFMC and its contractors produce periodically. These profiles are published separately and may be cited in NEPA documents, but are sometimes included in the analysis itself. NPFMC staff often draws on personal communication with industry and community representatives when analyzing the potential management impacts on fishery-dependent communities.

The Alaska Fisheries Science Center (AFSC) has recently undertaken several social science survey efforts in Alaskan fishing communities. These projects are intended to serve either as an evaluation tool for previously implemented management programs, or as baselines for the future review of programs that could change the dynamics of socially and economically significant fisheries. AFSC is working with the NPMFC and NMFS staff to better integrate its research priorities with management needs; the Council has made time in its agenda to review survey results and provide feedback, as well as direction for future study.

3.7.2 CHALLENGES: The portrayal of complex social science data as a key challenge, noting that concise presentation is essential when informing decision-makers. Dr. Mike Downs related his recent experience in administering an AFSC social science survey in GOA fishing communities, which generated a great deal of useful information, but also underscored the necessity of close communication with the Council on research timing and objectives relative to ongoing Council processes prior to working in the field. In the future, clear messaging to stakeholders about the specific intended use of survey information from both the Council side and the researcher side will be a priority, as the researchers found that some survey participants viewed the survey questions as a reflection of the NPFMC's intended direction for future management action.

3.8 WESTERN PACIFIC

3.8.1 HISTORY: Fish and fishing are closely intertwined with the cultural histories of American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and Hawaii. As one chief in American Samoa has said, "fish is culture!" In the past, much of the fishing effort was conducted to supply fish for ceremonies and high status individuals, and some of the islands had culturally-prescribed rules for using, sharing, and distributing fish. Despite enormous social change (e.g., the Mariana Islands are now Hispanicized and Catholicized), certain fishing practices and species, such as the palolo worm in American Samoa, are still culturally important.

Social science activities in the Western Pacific date to standard fisheries economics research in the late 1970s. Sociocultural research began in earnest in the early 1990s. The Pacific Islands Fisheries Science Center (PIFSC) has had a Human Dimensions Research Program (HDRP) in the Socioeconomic Division for about a decade. The HDRP currently consists of three sociocultural-focused social scientists; one NMFS FTE and two staff affiliated with the NOAA/University of Hawaii Joint Institute for Marine and Atmospheric Research (JIMAR). Dr. Cindy Grace-McCaskey, who attended the workshop, is a JIMAR employee and PIFSC relies heavily on JIMAR for much of the social and economic work it conducts.

The WPFMC has a good track record of advocating and using social science, though Dr. Severance noted at times some Council and SSC members have disregarded or minimized sociocultural information, or have conflated social science data with the more general sociopolitical considerations inherent to all management decisions. The first Council economist was hired in the early 1980s, and by the end of the decade, the Council had contributed to a series of recommendations for social science research in the newly-created Pelagic Fisheries Research Program. By the mid-1990s, the Council had established a social science subcommittee within its SSC and a Cultural and Social Science Research Plan (1994). In the early 2000s, the Council created a Social Science Research Group and quickly transitioned that to a formal Council committee (Social Science Research Committee – now the Social Science Planning Committee). Cultural anthropologist Dr. Craig Severance (SSC member) has been chair of the committee from its beginning.

In 2010, the NMFS Pacific Islands Regional Office Sustainable Fisheries Division hired its first social scientist, via JIMAR. Dr. Christopher Hawkins spent four years in the position before joining the Council staff in early 2014. Although Dr. Hawkins is the first official staff member focused on sociocultural issues at the WPFMC, the Council did employ a socioeconomist (Marsha Hamilton) during much of the 2000s and has utilized a variety of academic and consultant expertise over the years.

3.8.2 CHALLENGES: The Western Pacific is similar to the Caribbean: the indigenous island peoples have strong and historical ties to the nearshore and open ocean, the two areas have similar habitats and species, and have some of the same management challenges (e.g., a relative dearth of comprehensive social and biophysical fisheries data).

There are several major social science-associated challenges in the region. Largely absent are regularly-collected valid, reliable, and representative social data that can inform policy analysis. Basic information about the numbers of noncommercial and commercial fishermen across most of the region's fisheries is needed. Much of the social science work that has been done has been not been linear or repeated. Since the region is spread across much of the Pacific and includes several distinct cultural groups (e.g., Samoans and Hawaiians), there has never been enough capacity, especially at the jurisdictional level, to assess island community connections to and dependence upon fishery resources in the different island areas. Unlike most areas in the U.S., it is often difficult to categorize individuals as commercial or noncommercial fishermen in certain fisheries. With easy access to marine resources and both formal and informal markets, many otherwise noncommercial fishermen sell some portion of their catch from time to time. Though this sale is rarely profitable, the act of selling even a single fish has been interpreted to be commercial fishing. From a modern management perspective, this presents a challenge, since managers are promulgating rules for groups that may not exist, and it is difficult to establish a commercial harvest amount for a fishery that has significant, but not well-quantified, noncommercial catch.

Minor challenges include ensuring social science expertise is brought in early in the analytical process and maintaining timely and effective communication and collaboration between the WPFMC and the PIFSC in terms of needed and planned social science research.

4. ADDRESSING FEDERAL REQUIREMENTS

The Magnuson-Stevens Fishery Conservation and Management Act and the National Environmental Policy Act are the primary laws that shape FMP development. The workshop discussed these mandates as they pertain to sociocultural aspects of the Council process. Workshop time constraints limited the MSFCMA discussions to just a few of the National Standards (NS), though the importance of all National Standards and sections such as 303A9 and 303B6 were noted.

4.1 NATIONAL STANDARD 2 – DATA QUALITY

National Standard 2 requires the use of best available science in fisheries management, and SSRFM discussed how to ensure this standard is met for SIAs. It has been the experience of SSRFM members that SIAs do not receive much scrutiny in amendment document review processes. Because of a lack of feedback, it is difficult to determine if SIAs are of sufficient quality. NMFS has rarely been sued over the quality of socioeconomic analyses, which may explain why these analyses receive scant review. It is also unclear to SSRFM who is responsible for deeming whether SIAs meet NS 2. A well-defined chain of review would help analysts seek early input and counsel on data quality while developing a SIA.

One question that arose was if and how public comment should be used in SIAs or other analytical documents, since this information is not necessarily collected systematically and thus may not be representative. The consensus was that, so long as the source and limitations are identified, it is acceptable to use public comment. When doing so, it is helpful to understand and relay the extent to which this input might represent the perspectives of relevant groups or communities.

4.2 NATIONAL STANDARD 4 – NO DISCRIMINATION OR EXCESSIVE SHARES

National Standard 4 requires, in part, that management not discriminate between residents of different states, and that no individual or entity be able to acquire an excessive share of fishing privileges. SSRFM felt that guidance on what is considered discrimination is lacking, but would greatly benefit SIAs. NMFS has created guidance for how to define excessive shares economically, in terms of market power, for Limited Access Privilege Programs (Anderson & Holliday 2007). The bar that defines market power in a quantitative sense is quite high, and would only be reached in fishery allocations under the rarest of circumstances. Sociocultural considerations of what may be excessive are broader. NMFS guidance states that Councils can define “excessive shares” based on the achievement of the goals and objectives for a particular action, but there is little guidance for how sociocultural analysts should approach that work. SSRFM also discussed how Councils struggle with what may be considered excessive for non-LAPP fisheries and with the balance between consolidation and retention of historical participation in a fishery. The primary social impacts of consolidation have been documented in the literature (e.g., Brandt & Ding 2008; Carothers et al. 2010; Copes & Charles 2004; Olson 2011), drawing on social theory is likely to help. SSRFM noted that management actions that define which types of vessels can fish in a particular fishery or at a given time or location may have *de facto* allocative effects.

4.3 NATIONAL STANDARD 8 – COMMUNITIES

National Standard 8 requires managers to consider the importance of fishing resources to fishing communities to help sustain participation and minimize adverse consequences to these

communities. NS8 applies to communities "substantially" engaged in or dependent on fisheries, yet this term lacks a clear definition.

SSRFM discussed criteria for identifying substantially engaged fishing communities. It was recommended that pounds landed should be used with caution, especially when comparing between species; value per pound is usually more appropriate. SSRFM also discussed whether there should be standard criteria for what constitutes a fishing community within a FMP, across all FMPs of a Council, or nationally. There was mixed support for national standardization, as several members were concerned about losing regional flexibility and considerations. There was a consensus that: 1) Councils should develop working groups to examine and recommend the most applicable criteria, and 2) each fishery or FMP should have a set of relevant fishing communities defined that can be consistently used across all FMP actions and performance reports.

In developing community social vulnerability indicators, a distinction between two facets of fishing dependence has been outlined, fishing "engagement" and "reliance" (Jepson & Colburn 2013). These facets provide a closer look at the complexity of fishing dependence, to understand the impacts within larger communities of the social and economic influence that come with the number of vessels and many support industries that provide essential services to a large fleet, while at the same time allow for the relative importance a smaller fleet and less infrastructure may have on smaller communities. For those communities that are highly engaged, impacts from regulatory change may be diffuse but affect a large number of people. A highly reliant community may see impacts that are more acute and affect a small group more intensely.

Other NS8 issues arose. Social scientists could help managers understand how to use community profiles, though NMFS guidance would be helpful. Some fishing communities are more dynamic than others, and profiling often does not keep pace with the rate of change. NMFS guidance (2007) states that "communities" are geographically based (e.g., towns), yet fisheries are peopled with recreational, commercial, subsistence or other communities of interest that cross-cut geographic places. It is unclear if and how potential impacts to these groups can be considered in management, while still complying with the MSA and NMFS guidance.

4.4 NATIONAL STANDARD 10 – SAFETY

National Standard 10 requires that safety at sea be considered when developing regulations. Management measures can have both direct and indirect effects on human safety. Actions that alter the timing or location of fisheries might unintentionally cause fishermen to operate in less safe conditions (e.g., poor weather, farther from shore). Managers should be aware of and consider social factors that influence the need to fish at a certain time of year. For example, fishermen in some regions experience greater pressure to fish prior to Lent or other cultural events, during which fish products are in high demand. Management actions that reduce fishing

opportunities around these times limit options for meeting demand while operating in the safest possible manner.

SSRFM agreed that NS10 is often inadequately covered in SIAs. The group supported addressing safety in each SIA, to the extent necessary and practicable. The U.S. Coast Guard maintains a database that is useful to this end, tracking catastrophic events and mortalities. However, the data do not capture smaller incidents well, since many small-boat and nonfatal incidents go unreported. Incident data does not always identify the specific fishery in which a vessel was operating at the time of the event. Requests for fishery-specific data are possible, but fulfillment can take a long time and might not fit with a Council's schedule. The National Institute for Occupations Safety and Health (NIOSH) can assist in data pulls for use in SIAs, but encourages cross-checks with NMFS fishery data to verify which fishery a vessel was fishing under at the time of an incident. SSRFM suggests that a data field be added to the USCG databases to facilitate this.

NIOSH is developing a standard set of safety-related questions that could be addressed in SIAs, which workshop participants reviewed. These questions seek to identify the safety issues that are inherent to each fishery, and provide a method for the identification of the indirect, non-obvious safety impacts of management. Over time, analysts can develop a standard description of the safety issues for consideration in each fishery, such as vessel characteristics, timing and location of fishing, seasonal weather challenges, and other external factors that limit fishermen's choice in when and how they prosecute the fishery. Those descriptions can be included in all relevant NEPA documents, and will promote the conscious consideration of management's effect on human safety. The literature is also of value, at least generally, since it can highlight fishing vessel accident trends by size and fishery (e.g., Marvasti 2014).

4.5 NATIONAL ENVIRONMENTAL POLICY ACT

The SIA contains the social analyses required by NEPA in considering effects on the human environment - "the natural and physical environment and the relationship of people with that environment" (40 CFR 1508.14; IOCGP 1994). Although NEPA is intended to be a national policy, workshop participants noted that the Council regions are receiving inconsistent participation and feedback from regional NEPA coordinators on SIAs. In some regions, NEPA coordinators are involved in the early stages of EA/EIS preparation, while in other regions, the NEPA coordinator does not get involved until the final stages. The criteria for determining whether an amendment requires an EIS or an EA also vary among Council regions. Some regions consider environmental justice analysis to be required under Executive Order 12898, while others do not. Also, workshop participants expressed concern for the often contradictory and inconsistent applications of the NEPA process across the regions, feeling that the process is overly political. Regional NEPA coordinators may insist on their individual interpretation of NEPA guidelines, despite contradictory guidance from national NEPA coordinators and official NEPA guidelines (Bass et al. 2001). For example, "significant" is an important term in NEPA analyses, but despite

official guidance on its use (Bass, et al. 2001), regional NEPA coordinators have been inconsistent in their reviews as to when and how the term may be used appropriately.

To address such inconsistencies, workshop participants suggested that a national NEPA coordinator be available as a NEPA consultant for Council staff, to assist with staff's efforts to comply with NEPA and ensure that the application of NEPA guidelines are as consistent as possible. Regional NEPA coordinators work for the regional NMFS offices, not for the Councils, an arrangement that does not require cooperation with Council staff. Another suggestion is for Council staff to receive additional NEPA training from headquarters, thereby enabling compliance with NEPA requirements to be accomplished at the Council level.

On the other hand, participants recognize the differences among the regions and the need to have NEPA expertise that overlaps with knowledge of local fisheries. Unfortunately, some NEPA coordinators seem uninformed or unprepared during preliminary planning meetings. Participants agree that it should be a goal to involve the NEPA coordinator as participant and reviewer as early as possible in the EIS development process. This would help educate NEPA coordinators on the fisheries for which they evaluate NEPA analyses.

In general, participants embrace the underlying intent of NEPA, especially the requirements to integrate social science into an interdisciplinary analytical approach, consider regulatory impacts on the human environment, and to involve the public in planning and decision making. However, participants have found the NEPA regional process to be unnecessarily bureaucratic and inflexible. Rather than focusing on improving procedural compliance, workshop participants from all regions shared a frustration with a perceived lack of cooperation on the part of regional NEPA coordinators.

5. SOCIAL IMPACT ASSESSMENTS

The key contribution of sociocultural expertise in the Council process is to assess potential social impacts stemming from fishery management alternatives, documented in SIAs. Accordingly, workshop participants discussed methods, indicators, data analysis, and writing techniques, as well as identified how well SIAs have predicted impacts.

5.1 REGIONAL APPROACHES TO SIA

Staff from each region provided an overview of their basic process to assess the potential social impacts of management actions and incorporate them into the action document, some of which is detailed in earlier sections of this report. The North Pacific has stand-alone SIAs appended to EISs or other environmental review/decision documents that are particularly consequential or contentious. Otherwise, SIAs are embedded in several sections of the action document, or in the Regulatory Impact Review document. In some cases, economic and social analyses are combined for concision and readability into a "human communities" section.

Because most documents require a quicker turnaround than is ideal for comprehensive impacts analysis, the output tends to be more broad-brush than what would be considered ideal, particularly according to the NMFS guidelines for SIA writing (NMFS 2007). Sometimes, the fishing community profiles developed by the regional fisheries science centers are helpful, but they often do not contain information that is detailed enough to be directly applicable to an action. SSRFM discussed the potential for bias in SIAs. For example, SIAs can disproportionally focus on impacts to certain communities or focus on issues or communities that analysts know best or view as important.

There is no consistency among the Councils in terms of the review process for social analyses prior to transmittal to NMFS. In some regions, the SSC and Advisory Panel play a role, but this practice is not wide-spread. SIAs can be improved when the analysts knows how SIAs get reviewed, if the information is useful for decision making purposes, and receives feedback on the analysis.

5.2 HUMAN RESOURCES

Social science capacity among managers has typically been limited, leaving Council and NMFS staff responsible for spearheading considerations of NS8 and other social science issues, as well as prioritizing social information needs. In recent years, several of the Councils have hired staff with social science and research expertise, as have a couple of the NMFS regional offices. SSRFM discussed the need for more social science capacity in the management process, across all Council regions. As an intermediate solution, staff resources could be leveraged with interns (e.g., the NOAA Hollings Scholar program), academicians, fishing community researchers, Sea Grant agents, and university cooperative extension units. However, experienced social scientists should supervise the work.

5.3 DATA COLLECTION AND ANALYSIS METHODS

SIAs analyze anticipated impacts of proposed actions compared to existing regulations. SSRFM discussed methods for collecting and analyzing the data used in SIAs. Ideally, the analysis should include consideration of potential cumulative impacts of the proposed actions relative to the possible long-term effects of no action. Although lack of data typically limits strict adherence to NMFS SIA guidelines (NMFS 2007), considerations in the National Standard 8 implementing regulation (50 CFR 600.345) must still be addressed.

Conducting SIAs come with a few common constraints: rules regarding confidentiality, the dynamic environment (environmental, regulatory and social), and unquantifiable or unpredictable impacts, sometimes due to cumulative impacts. Impacts are not necessarily all about economics. Ethnography and fieldwork can be helpful in identifying sociocultural impacts. When there are insufficient resources (e.g., financial, time) to conduct research in the entire pertinent area, use of quantitative data can set the stage, and data subsets can be selected for in-depth analysis. Phone interviews can supplement in-person research to groundtruth data.

Community profiles are snapshots of communities in time and their level of detail vary by region, but include demographic, fishery, and social indicators that allow for a determination of what type of fishing is most important to a community. Profiles are systematic, but are difficult to keep updated and their pertinence to specific management actions is limited. Updates could just focus on key communities that may have experienced the most change. SSRFM agreed that there needs to be regional consensus regarding how often profiles need to be updated. NMFS has embarked on a program to develop community snapshots that may be updated annually. They currently have snapshots in the NE, SE and Alaska. They will be developed for the West Coast and likely Hawaii.

Ethnography is important in understanding fisheries, and potential impacts from fishery management changes, within a community context. While initially resource intensive, social scientists spending time in fishing communities with participants from the various directly engaged sectors (e.g., fishing vessel owners, vessel crew members, processing managers, processing crew) as well as support service business owners and local community leaders, among others, can inform the analysis. This aids in conveying the interconnectedness of locally present fishery sectors, the role of the fishery in the local economy, and the potential impacts of a proposed management action within the socioeconomic/cultural context of communities. This type of work pays dividends down the road, facilitating data collection for future analysis through efficiencies gained with greater background knowledge and improved personal connections with individuals who are key informants. A good example of this type of work is the ethnographic effort that went into the Bering Sea/Aleutian Islands crab rationalization SIA, which has proven useful for a number of subsequent North Pacific analyses.

Anecdotal data and information from public comment can be helpful (see Section 4.1). Collecting data at advisory panel meetings may be a systematic way of collecting data on knowledge, attitudes, and perceptions. Broad social impacts and existence values should be taken into consideration and written about when applicable.

Interviews of former fishermen may reveal why individuals change fisheries or leave fishing altogether. In some cases, age and/or family support such as an employed wife affect what decision is made. It is not uncommon to hear people say, “We want our community to be viable.” Viable, however, means different things to different people and different communities. In some cases, viable means making money; in other cases, it means that more jobs are available and that the tradition of fishing can be passed down to the next generation. Understanding the values and goals of individuals and communities is important for SIAs.

5.4 SOCIAL INDICATORS AND FISHERY PERFORMANCE MEASURES

Indicators of social change in fisheries and their communities are important in examining human dimensions in a comparable and quantifiable method, but are under-utilized. Indicators can be specific to FMP objectives and can be used to track progress toward meeting those objectives. They can also be generic and geared towards understanding how a fishery or fishing community

is evolving over time. Either way, such indicators can greatly inform SIAs and fishery performance reports.

5.4.1 ESTABLISHING METRICS. The Social Sciences Branch at the NEFSC initiated a process in 2009 to identify socio-economic performance measures for fisheries in the Northeast region, motivated by the need to evaluate catch share programs, particularly groundfish sectors. The purpose was to capture the experience of fishery participants and understand what it means for a fishery to "perform" successfully. Five performance measures were identified: financial viability, distributional outcomes, well-being, stewardship of marine resources, and governance (Clay et al. 2010). Existing data were insufficient to track these performance measures, particularly for social outcomes, so new data collection efforts have been implemented, including a vessel annual cost survey and two socioeconomic surveys (an intercept survey for fishing crew and an online/mail survey for vessel owners). The socioeconomic surveys were administered in 2012 and 2013. The initial versions of the surveys were lengthy, which may have depressed response rates. Future versions will be shorter, focused on core socioeconomic data gaps and conducted on a regular basis to enable long-term monitoring. Timing of supplementary data collection needs to be frequent enough to track trends but avoid interview/survey fatigue. Some of the results have been included in Council actions and technical reports (e.g., Henry & Olson 2015).

Social indicators of fishing community vulnerability and resilience have been developed by NMFS and will be completed for all regions in 2015. Using existing secondary data to construct quantitative indices that provide an objective measure of the social condition of communities and their fishing dependence, the indicators provide a snapshot of current vulnerabilities and fishing dependence and will help predict how community vulnerability may change over time in response to changes in fisheries management (Jepson & Colburn 2013). The indicators are available on-line,[2] including a mapping tool to easily compare communities. These indicators have been used in some SIAs and will be used nationally as a metric for evaluating the impact of catch share programs on communities. Work is ongoing to develop a time series of community indicators as well as fishery-specific indicators for all regions. SSRFM feels that these indicators provide general insight on communities, but more work could be done to help the effort be applicable to management.

5.4.2 GROUNDTRUTHING RESULTS. To establish the external validity of the social indicators, all regions either have or will groundtruth the quantitatively derived results. Groundtruthing has been completed in the Northeast and Gulf regions, where over 500 ethnographic interviews were conducted in 19 communities (Pollnac et al. 2013). Additional groundtruthing has been completed in the South Atlantic, where 345 interviews were conducted in 21 communities (Griffith et al. 2014). In the South Atlantic and Gulf Coast regions,

[2] http://www.st.nmfs.noaa.gov/humandimensions/social-indicators.

groundtruthing has found a high degree of agreement between the quantitative and qualitative results for the social vulnerability indices, similar to the results found in earlier exploratory research (Jacob et al. 2012). For the Northeast, results for the gentrification indices were mixed due to the presence of gentrification facets in some communities not captured by the indices. Additional indices are underdevelopment to fill this gap. The fishing dependence groundtruthing results show a stronger correlation with commercial fishing than recreational fishing, because respondents generally just associated the former with the concept of "fishing community." In the South Atlantic, the quantitative and groundtruthed results have a little over 70% agreement, with large urban areas showing the most discrepancies. Overall, the groundtruthing results in all regions suggest that the quantitative social indicators are reflective of the conditions in communities for describing community dependence on fishing and social and gentrification pressure vulnerabilities.

5.4.3 OPERATING IN THE ABSENCE OF INDICATORS. SSRFM discussed the challenges when there is a lack of regularly collected, standardized indicator data, and focused on an example from the U.S. Caribbean.

There is no standardized assessment of dependence, resilience, or vulnerability for the U.S. Caribbean federal fisheries, other than a census of fishermen in Puerto Rico and USVI, which contains some fishing dependence indicators. The SEFSC collects this data every 5-6 years from all known fishermen in Puerto Rico (e.g., Matos-Caraballo & Agar 2011) and the U.S. Virgin Islands (USVI) (Kojis & Quinn 2012). The data include demographics by coastal region/island (e.g., number of fishermen, number of captains and "helpers", age, race, education level, years of fishing experience), fishing income and other fishing dependence indicators, marketing information, vessel characteristics, amount of fishing gear and equipment, ranking of the importance of different gear and species groups targeted and perceptions of the biological and socioeconomic condition of the fishery. While valuable, the data are not specific to federal fisheries, since the lack of a federal fishing permit system in the U.S. Caribbean hampers identification of the population of fishermen fishing in federal waters.[3]

The lack of standardized socioeconomic data for the federal fisheries hampers determination of timing seasonal closure accountability measures (AMs) to minimize negative socioeconomic impacts. SERO annually provides data to the CFMC to evaluate if ACLs for each species/species group were exceeded. An ACL overage in the average of the three latest years of available data, triggers an ACL reduction equivalent to the overage, implemented through a time closure. NMFS estimates how many days a closure is needed based on historical landings. The closure currently ends on December 31 and goes back for the number of days needed. This, however, can conflict with end of year fish sales that are very important in the USVI (i.e., Christmas holiday).

[3] If a recently proposed federal permits amendment is implemented, there could be better estimation of effects to fishermen fishing in U.S. Caribbean federal waters resulting from changes in federal regulations.

The CFMC is developing an amendment that would avoid AM closures during periods of high market demand. Historical landings, largely influenced by market demand, fluctuate over the year. There are high landings due to increased demand during festivals, Lent (Holy Week in particular), and Christmas and sometimes before elections. Regularly collected indicator data could be useful in identifying areas and times of high dependence, degree of resilience and vulnerability.

In the absence of this data, an alternative strategy was devised by CFMC staff economist, Kate Quigley, who created a model that examines closure timing options relative to potential negative economic and social impacts. The model examines potential revenue loss and closure duration, incorporating the fluctuating economic value of specific species/species groups over a typical year and important social and cultural events that influence market demand. District advisory panels of commercial and recreational fishermen as well as non-profit representatives contributed information regarding the sociocultural aspects, indicating periods of high demand and need for fish. Commercial fish houses in Puerto Rico were also visited and informal conversations conducted that supplemented sociocultural, landings and ex-vessel value data in the model. Final landings data are typically delayed in reaching management by about 18 months, so the model cannot be used on a real-time basis.

The model allows identification of preferred closure timings in comparison to the status quo. The CFMC can narrow down the various options to a small number of closure alternatives. The model facilitates stakeholder discussion of closure options and the interactions and trade-offs between the closure length, economic losses/gains and sociocultural events. District Advisory Panels and the CFMC have been very supportive of the model as a way to incorporate information from different disciplines, especially sociocultural information, to enable decision-making. Future indicator data can be incorporated into the model and improve estimates of socioeconomic effects of the timing of seasonal closures.

5.5 DATA GAPS

When it comes to human dimensions data, there are a number of gaps, and many of these are common to the different Council regions.

- There are large data gaps for the island territories and commonwealths, due to lack of funds for research, broad fishery participation, and infrequent Council and staff travel to these communities.
- Landings and participation data are missing or incomplete for at least some fisheries in all regions, more so in regions lacking noncommercial fishing licenses.
- To understand broader social impacts, it is important to understand the ties between shore-side support services and the fisheries, but there has been scant research on shore-side support services.
- There is little data on knowledge, attitudes, and perceptions.

- Some Councils and NMFS science centers have not developed socioeconomic data streams that can populate Stock Assessment and Fishery Evaluation (SAFE) reports and other similar reports.
- There has been little systematic attention paid to the value of marine resources to local tourism and the cultural contributions of commercial fishing to ports.

5.6 COUNCIL PROCESS

SSRFM noted several process issues that affect the work and contribution of social scientists. The following are common to almost all Councils:

- Everyone involved in an action should be aware that, if social and economic information is needed to select preferred alternatives, then the staff or a contract social scientist must be involved as early in the process as possible.
- Council members and others may not read an SIA, or selectively read the parts that interest them. Potential solutions include:
    - Brief the Council early in the process on the anticipated methods and contents, to solicit their views of important topics to cover.
    - Have the SIA as a stand-alone appendix rather than embedded throughout the amendment document.
    - Combine the economic and social impacts into a section of impacts to "human communities."
- Freedom and flexibility to be in the field discussing issues and obtaining stakeholder feedback would greatly improve the role and expertise of a Council social scientist.
- Recognition of the value of social science information among Councils and Council staff is crucial to improving social science in each region.

5.7 SUGGESTIONS FOR IMPROVED SIAS

- Ensure that, at a minimum, elements described in National Standard 8 regulations (CFR 600.345) are addressed for relevant actions.
- Tradeoff/multi-criteria analysis needs to be incorporated in assessments where appropriate.
- Impacts to episodic fishery participants are important and need to be considered.
- Past analyses can be an excellent source of data.
- To avoid data confidentiality issues, which are growing due to industry consolidation, report averages and proportions, rather than exact numbers, supplemented with publicly available information.
- When appropriate, map/display demographic and participation data.
- Connections *between* communities may be important to understand.

6. SIAS IN RETROSPECT

To improve future SIAs, SSRFM discussed the importance of understanding how well SIAs predict actual fishery impacts. An example of a retrospective analysis was considered in detail. Hall-Arber et al. (2014) looked at SIAs developed for the Atlantic herring FMP to determine if the SIAs correctly anticipated impacts. Five community researchers, an economist, an anthropologist, and a variety of students reviewed SIAs and NMFS data from the initial Atlantic Herring FMP in 1999 through Amendment 4 in 2011, and interviewed stakeholders. Despite fairly minimal changes in management regulations and a fishery that is not overfished, impacts were identified. Some were correctly anticipated by the initial SIAs. The SIAs, however, failed to recognize the sheer variety and number of fishery stakeholders, the diversity of their interests even within categories of stakeholders (e.g., within herring businesses, support services, observers, managers and scientists), distributional impacts, and ecosystem impacts. Furthermore, there were a variety of unanticipated and unintended consequences (e.g., closure of the last herring cannery in Maine). There were cascading effects of lower catch limits on processing plants, plus a number of sociocultural impacts.

Beyond this example, SIAs and subsequent analysis suggest that the more resilient or sustainable businesses are companies that have long histories in their communities and/or are less specialized, thus more flexible. To date, management techniques do not typically facilitate flexibility. There are a multitude of potential unintended consequences. The actions may not linearly lead to improvement in the fisheries.

7. KEY CONCLUSIONS AND CONSENSUS STATEMENTS

Key conclusions and consensus statements for improving the collection and use of social science data in fisheries management are as follows. Ideas in bold considered by SSRFM to be the most important. Some are more actionable by NMFS, by Councils, or by staff analysts as noted. These should be considered recommendations from topical experts rather than directives.

- Social Impact Assessments
    - **NMFS/Council: Improve available data to conduct comprehensive analyses of management alternatives. Regional work is necessary to develop sociocultural indictors by fishery and to collect these data regularly. NMFS financial support is needed for these efforts.**
    - **Staff: Ensure that, at a minimum, elements described in National Standard 8 regulations (CFR 600.345) are addressed for relevant actions.**
    - Staff: Early identify information needs that are especially unique to an action to allow time for data collection and analysis. Council staff plays a major role in this and must communicate with their social scientist (if the Council has one) or their regional science center.
    - Staff: Incorporate anecdotal information and public comments into SIAs, but with the caveat that these data may not be representative or generalizable.

    - Staff: Improve impacts analysis relative to National Standard 10.
        - Examine literature (e.g., reports, journal articles) and appropriate databases (e.g., USCG).
        - Address the checklist of questions being developed by NIOSH.
        - Include in the USCG database of safety incidents the fishery in which a vessel was operating at the time of an incident.
    - NMFS: Develop NMFS guidance on using community profiles in management.
    - NMFS: Improve review and evaluation of SIAs
        - Ensure that there is a NMFS review of SIAs and that it is conducted by social scientists.
        - Retrospectively evaluate SIAs to examine how well they predicted impacts, which will help improve future analyses.
- Defining Fishing Communities
    - **Council: Develop a process within each Council to define fishing communities.**
        - Each fishery or FMP should have a set of relevant communities defined that can be used across all FMP actions and performance reports.
        - Identify recreational, commercial, subsistence and other communities of interest within and between geographically-based fishing communities and use that information in policy analysis.
- Council-NMFS Coordination
    - **NMFS/Council: Improve and maintain engagement and cooperation between Council and regional NMFS staff to meet Council socioeconomic needs.**
        - Involve Council staff in planning science center projects.
        - Use Council staff expertise in scientific efforts.
    - All: Improve and maintain communication and cooperation between the NMFS Human Dimensions Team and SSRFM.
- Meeting Federal Mandates other than the MSFCMA
    - **NMFS: *Executive Order 12898.* Clarify the determination of whether an action requires comprehensive assessment** of environmental justice for **minority and low-income populations.**
    - NMFS: *NEPA.* Clarify the determination of when, and to what extent, social and economic considerations must be addressed as part of the NEPA process. Practices appear to differ according to regional interpretation provided by NEPA specialists and NOAA General Counsel. Improve understanding of social science among NEPA reviewers.

8. IDEAS FOR FUTURE SSRFM DISCUSSION

The following topics are additional social issues to pursue in future SSRFM discussion and projects.

1) How to balance NS1 requirements for biological protections with sociocultural and economic needs, which NMFS and the courts interpret to be secondary in importance.
2) The National Standard 4 requirement that management shall "not discriminate between residents of different states";
3) The National Standard 5 requirement that management shall "consider efficiency in the utilization of fishery resources";
4) Inclusion of stakeholders in the stock assessment process (both their data and as participants);
5) Consideration of the social impacts of climate change;
6) Consideration of the social impacts on shore-side support services in fishing communities (characterization and impacts analysis);
7) The axioms of ecological policy, as discussed by Lackey (2006);
8) Review of the catch share indicators website: Catchshareindicators.org;
9) Consideration of social and economic factors for uncertainty in the ACL setting process (e.g., SEEM process in the Western Pacific);
10) Formal and informal methods to collect industry input for SIA analysis, perhaps through working groups;
11) How to involve fishermen working groups from the beginning of FMP development and create a formal process for gathering fishermen's information, not just assume it will be forthcoming during public comment.
12) The bearing of Sections 303A9 and 303B6 of the MSFCMA on SIAs.

9. REFERENCES

Abbott-Jamieson S, Clay PM. 2010. The long voyage to including sociocultural analysis in NOAA's National Marine Fisheries Service. Marine Fisheries Review. 72(2): 14-33.

Anderson L, Holliday M. 2007. The Design and Use of Limited Access Privilege Programs. Silver Spring (MD): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-F/SPO-86. 165 p.

Bass RE, Herson AI, Bogdan KM. 2001. The NEPA Book: A step-by-step guide on how to comply with the National Environmental Policy Act. Point Arena (CA): Solano Press Books p.

Brandt S, Ding N. 2008. Impact of property rights on labor contracts in commercial fisheries. Ocean and Coastal Management. 51(11): 740-748.

Carothers C, Lew DK, Sepez J. 2010. Fishing rights and small communities: Alaska halibut IFQ transfer patterns. Ocean & Coastal Management. 53(9): 518-523.

Clay PM, da Silva PP, Kitts A. 2010. Defining social and economic performance measures for catch share systems in the Northeast U.S. IIFET 2010 Montpellier Proceedings.

Copes P, Charles A. 2004. Socioeconomics of Individual Transferable Quotas and community-based fishery management. Agricultural and Resource Economics Review. 33(2): 171-181.

Ditton RB. 1997. Choosing our words more carefully. Fisheries. 4(10): 4.

Feeney RG. 2013. Evaluating the use of social impact assessment in Northeast US federal fisheries management. Impact Assessment and Project Appraisal. 31(4): 271-279.

Gilden J. 2005. Social Science in the Pacific Fishery Management Council Process. Portland, OR: Pacific Fishery Management Council. 86 p.

Griffith DR, Dyer C. 1996. An Appraisal of the Social and Cultural Aspects of the Multispecies Groundfish Fishery in the New England and Mid-Atlantic Regions. Bethesda (MD): Aguirre International and the National Oceanic and Atmospheric Administration. 18 p.

Griffith DR, Stoffle B, Jepson M. 2014. Ground-Truthing Social Indicators of Fishing in North Carolina, South Carolina, Georgia, and east Florida Coastal Communities. Miami (FL) A report to the SEFSC.

Hall-Arber M, Brandt S, Chryssostomidis C. 2014. Socioeconomic Impacts of Herring Fisheries Management in the Northeast: Looking Back to Move Forward. Cambridge (MA): MIT Sea Grant College Program. 64 p.

Hall-Arber M, Dyer C, Poggie JJ, McNally J, Gagne R. 2001. New England's Fishing Communities. Cambridge (MA): MIT Sea Grant College Program. 431 p.

Henry A, Olson J. 2015. An overview of the survey on the socio-economic aspects of commercial fishing crew in the Northeast. Woods Hole (MA): USDo Commerce. NOAA Tech. Memo. NMFS NE 230. 42 p.

IOCGP. 1994. Guidelines and Principles for Social Impact Assessment Prepared by the Interorganizational Committee on Guidelines and Principles for Social Impact Assessment. U.S. Department of Commerce NOAA Tech Memo. 34 p.

Jacob S, Weeks P, Blount B, Jepson M. 2012. Development and evaluation of social indicators of vulnerability and resiliency for fishing communities in the Gulf of Mexico. Marine Policy. 26(10): 16-22.

Jepson M, Colburn LL. 2013. Development of Social Indicators of Fishing Community Vulnerability and Resiliance in the U.S. Southeast and Northeast Regions. Silver Spring (MD): U.S. Department of Commerce. NOAA Tech. Memo. NMFS-F/SPO-129. 64 p.

Kojis BL, Quinn NJ. 2012. Census of the Marine Commercial Fishers of the U. S. Virgin Islands. 138 p.

Lackey RT. 2006. Axioms of ecological policy. Fisheries. 316(6): 286-290.

MAFMC. 2012. Fourth National Meeting of the Regional Fishery Management Council's Science and Statistical Committees. R Seagraves, Collins K eds. Williamsburg (VA): Mid-Atlantic Fishery Management Council. 94 p.

Marvasti A. 2014. Crew Injuries and Fatalities, Employment Estimates, and Casualty Rates in the Gulf of Mexico Commercial Fisheries. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-656. 26 p.

Matos-Caraballo D, Agar JJ. 2011. Census of Active Commercial fishermen in Puerto Rico: 2008. Marine Fisheries Review. 73(1): 13-27.

McCay BJ, Blinkoff B, Blinkoff R, Bart D. 1993. Fishery Impact Management Project, Part 2 Phase 1 of report to the MAFMC. New Brunswick (NJ): R University. 179 p.

NMFS. 2007. Guidelines for Assessment of the Social Impact of Fishery Management Actions. In: NMFS Council Operational Guidelines - Fishery Management Process. Silver Spring (MD): National Oceanic and Atmospheric Administration. 39 p.

Norman KC, Sepez JA, H. L, Milne N, Package C, Russell S, Grant K, Peterson Lewis R, J. P, Springer E, et al. 2007. Community Profiles for West Coast and North Pacific Fisheries - Washington, Oregon, California, and Other U.S. States. Seattle (WA): U.S. Department of Commerce. NOAA Tech. Memo. NMFS-NWFSC-85. 602 p.

Olson J. 2011. Understanding and contextualizing social impacts from the privitization of fisheries: An overview. Ocean and Coastal Management. 54: 353-363.

Pollnac RB, Colburn LL, Jepson M, Seara T. 2013. Taxonomy of East Coast Fishing Communities in Terms of Vulnerability and Resilience. Narragansset (RI) A report to the NEFSC.

Russell SM, Sparks K, Arias-Arthur A, Varney A. 2014. The Pacific Groundfish Fishery Social Study - An Initial Theme Based Report. Seattle (WA): U.S. Department of Commerce. NWFSC Report 5. 78 p.

10. ACRONYMS

CDQ	Community Development Quota
CFMC	Caribbean Fishery Management Council
CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
EO	Executive Order
FMC	Fishery Management Council
GMFMC	Gulf of Mexico Fishery Management Council
IFQ	Individual Fishing Quota
MAFMC	Mid-Atlantic Fishery Management Council
MARFIN	Marine Fisheries Initiative
MIT	Massachusetts Institute of Technology
MSA	Magnuson-Stevens Act
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NPFMC	North Pacific Fishery Management Council
NMFS	National Marine Fisheries Service
NWFSC	Northwest Fisheries Science Center
NOAA	National Oceanic and Atmospheric Administration
NS	National Standard
PFMC	Pacific Fishery Management Council
SERO	Southeast Regional Office
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SSB	Social Sciences Branch
SSC	Science and Statistical Committee
SSRFM	Social Scientists in Regional Fisheries Management
WPFMC	Western Pacific Fishery Management Council