The Long Voyage to Including Sociocultural Analysis in NOAA's National Marine Fisheries Service

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Introduction

Today the National Marine Fisheries Service (NMFS) recognizes social science as one of the basic sciences supporting its mission. Planning documents routinely mention social science, recognizing that humans, their institutions, and their activities have profound effects on coastal and marine ecosystems and vice versa. This was not always the case. This paper describes the long voyage the agency has undertaken to develop its capacity to integrate social scientific analysis into its overall scientific analyses in support of its mission to manage, conserve, and protect living marine resources within the United States Exclusive Economic Zone.

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ABSTRACT—The United States has managed and analyzed its marine fisheries since 1871, and since 1970 via NOAA's National Marine Fisheries Service (NMFS). As the primary directive moved from aiding fishermen in expanding their operations emphasizing conservation, the government over time recognized that management involves influencing people not fish, and has hired social scientists to complement the biologists who assess fish populations. This change has not always been smooth. We use archival documents and oral histories to trace the development of sociocultural analytic capabilities within NMFS and describe future plans for growing the program. Four points are made. First, NMFS has created the best developed social science program in NOAA. Second, established institutions change slowly; achieving the social science presence in NMFS has taken over 25 years. Third, change needs visionaries and champions with both tenacity and opportunity. Fourth, social science data collection and research helps in making fishery management decisions, but they have also been useful in evaluating the impact and helping with the recovery from Hurricane Katrina. Good work finds other uses.

Before we begin our story, it is important to clarify what are the social sciences. The social sciences are the branches of science that study humans in relation to each other and the environment. This includes the study of society, its institutions and functions, its culture(s), and the relationships of individuals within and to society and the environment. The disciplines generally regarded to constitute the social sciences include anthropology, economics, human geography, political science, psychology, and sociology. Social scientists with the agency, like other applied social scientists, draw upon standard scientific methods.

Some sociocultural information was collected as early as the late 1880's by the United States Fish Commission (USFC), a NMFS antecedent agency. This information was usually in the form of notes made by biologists, oceanographers, and others with little or no thought to actually analyzing these data. Their notes often reflect their cultural biases and lack of social science background. A typical example follows:

> "The majority of our fishermen are native-born citizens of the United States, although in certain localities there are extensive communities of foreigners, clinging to the traditions of their fatherlands, and conspicuous in the regions where they dwell by reason of their peculiar customs and physiognomies" (Goode and Collins, 1887:6).

Acronym List

AFSC	Alaska Fisheries Science Center
AHE	Affected Human Environment
BCF	Bureau of Commercial Fisheries
BSF	Build Sustainable Fisheries
DEA	Data Envelopment Analysis
DOC	Department of Commerce
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
E.O.	Executive Order
FCZ	Fishery Conservation Zone
FCMA	Fishery Conservation and Management Act
FCP	Fishing Community Profiles
FEAT	Fisheries Ecosystem Analysis Tool
FIS	Fisheries Impact Statement
FMC	Financial Management Center
FMP	Fishery Management Plans
FR	Federal Register
IPA	Intergovernmental Personnel Act
LME	Large Marine Ecosystem
LMRCSC	Living Marine Resources Cooperative Science Center
LFK	Local Fisheries Knowledge
MFCMA	Magnuson Fishery Conservation and Management Act
MSA	Magnuson-Stevens Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOHIG	NOAA Oral History Interest Group
NOS	National Ocean Service
NS8	National Standard 8
NWFSC	Northwest Fisheries Science Center
OAR	Oceanic and Atmospheric Research
OSF	Office of Sustainable Fisheries
OTA	Office of Technology Assessment, Congress of the United States
PAIG	Preserve America Initiative Grant
PIFSC	Pacific Islands Fisheries Science Center
RFA	Regulatory Flexibility Act
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SFA	Sustainable Fisheries Act
SFFMO	State/Federal Fisheries Management Office
SIA	Social Impact Assessment
SWFSC	Southwest Fisheries Science Center
TEK	Traditional Ecological Knowledge
USBF	U.S. Bureau of Fisheries
USFC	United States Commission of Fish and Fisheries (U.S. Fish Commission)
VFF	Voices from the Fisheries

One kind of social scientist, an economist, has played a role in the agency for many years. During NMFS's Bureau of Commercial Fisheries period (1956–70), industry economists compiled economic information that was useful for the fishing industry. These pioneer economists were initially hired into jobs focused on identifying market trends and providing services to industry, analogous to staff fishery biologists of that period whose key function was searching for new fishery resources for fishing industry exploitation. Anthropologists and sociologists were absent from the agency's employee roster until 1974 (Hobart, 1995).[1]

The primacy of economists in NMFS social science hiring history has contributed to certain terminological confusions once other social scientists began to be hired after 2002. A distinction is often made between "economists" and "social scientists," with "social scientist" referring to all social scientists who are not economists. Recognition of this linguistic oddity has even led to the frequent usage of the phrase "non-economic social scientists." As a result, confusion sometimes exists over what or who is being referenced when the terms "social science" or "social scientists" are being used. Throughout this paper, the term social scientist includes anthropologists, economists, sociologists, and all other disciplines listed in the definition of social science above. The term "sociocultural analysis" is used to refer to the subset of research activities associated primarily with anthropologists and sociologists.

This overview focuses on the origins and development of NMFS' sociocultural analysis capability, addressing economists only when their advancements in the agency are linked with those of the sociocultural analysis staff. Further, while there is a broad literature on the marine fisheries anthropology and sociology of the United States and other nations, this review is largely restricted to work authored by agency social scientists, who are the primary focus of this article. Fisheries social science work that has been carried out in this country by social scientists outside the agency during the period covered here has often been funded by NOAA through Sea Grant and NMFS.

Before the Fishery Conservation and Management Act (FCMA)[2]

The National Marine Fisheries Service, NOAA, henceforth referred to as NMFS or the agency, is the contemporary descendant of the United States Commission of Fish and Fisheries (U.S. Fish Commission or USFC), established in 1871 to protect, study, and restore the nation's fish. The USFC became the U.S. Bureau of Fisheries (USBF) in 1903, moving into the U.S. Department of Commerce and Labor at the same time. Subsequently it was merged with the Agriculture Department's Biological Survey and moved into the Fish and Wildlife Service in the Department of Interior in 1940, only to be renamed again in 1956 by the new Fish and Wildlife Act[3] as the Bureau of Commercial Fisheries (BCF) and the Bureau of Sport Fisheries and Wildlife, which were housed in the Interior Department's new U.S. Fish and Wildlife Service. Federal responsibility for pinnipeds and cetaceans was also assigned to the BCF as part of the Act. Although its general charge included the notion of management, its only tools were persuasion, fish culture, or, in some cases, financial incentives (Hobart, 1995).[4] By 1957, the Bureau of Commercial Fisheries had, besides its headquarters, five regional organizations, several research laboratories, and a Hawaii office.[5]

In 1970, Executive Order (E.O.) 11564 established the National Oceanic and Atmospheric Administration (NOAA) and directed it to improve our understanding of the Nation's living marine resources, the environment in which they are found, and the interaction between the two. NOAA was placed within the Department of Commerce (DOC). The BCF was renamed the National Marine Fisheries Service (NMFS) and transferred to NOAA where it remains today. By 1971, NMFS had largely attained its current organizational structure (Hobart, 1995). The newly named and positioned NMFS has had less autonomy than the BCF. It must negotiate its budget requests through these additional bureaucratic levels and is subject to their discipline and policy emphases.

Stimulated by NOAA's broad mandate, NMFS began to rethink its mission, resulting in a reorientation from primarily providing service to the fishing indus-

[1]An example of the general orientation toward the Nation's living marine resources during this period is the 1954 Congressional passage of Public Law 466, known as the Saltonstall-Kennedy Act. Among other things, the Act set aside funds for fishery product and market research, as well as fisheries development (Hobart, 1995:25). The general view was that the oceans held unlimited living resources; the need was for development and further exploitation for both food and employment, and conservation and management were not statutorily allowed.

[2]The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA or MSA) was originally enacted as the Fishery Conservation and Management Act (FCMA) of 1976 (P.L. 94-265), and was subsequently amended or reauthorized in 1981, 1983, 1989, 1991, 1996, and 2006. Senator Magnuson's (R-WA) name was added to it in 1980 in honor of his sponsorship and active interest in its passage, after which it was commonly referred to as the MFCMA. Senator Ted Stevens' (R-AK) name was attached in 1996 because of his long-standing interest in and active support of fishery conservation and management. The 1996 reauthorization of the MFCMA was realized by passage of the Sustainable Fisheries Act (SFA) of 1996 (P.L. 104-297). It is current practice to use Magnuson-Stevens Act (MSA) to refer to the Act after 1996, including all subsequent reauthorizations. The authors use FCMA to refer to the Act between 1976 and 1980, MFCMA between 1981 and 1995, and MSA from 1996 to the present.

[3]http://www.fws.gov/laws/lawsdigest/FWACT.HTML (accessed 6 Mar. 2008)

[4]This overview is drawn from Hobart's 1995 publication, from interviews with current and former NMFS employees conducted during 2005–07, a review of various in-house documents including memos, directives, and e-mail traffic archived by some of the participants, and public documents. The Hobart publication provides a useful compendium of NMFS' institutional history, some of its most significant accomplishments, and enabling legislation.

[5]This discussion concerns itself only with those parts of NMFS that manage the Nation's marine fisheries. Some other parts of NMFS include the Office of Protected Resources (responsible for species protected by the Marine Mammal Protection Act, and some protected by the Endangered Species Act), and the Office of Habitat Protection, among others. See http://www.nmfs.noaa.gov/ (accessed 5 Mar. 2008) to learn more about how the agency is organized and its full range of responsibilities.

try towards becoming a natural resource conservation and management agency. This would have a profound effect on the agency's operations, transforming it into the only regulatory agency within NOAA. The transformation has been a very, very slow process.

Dick Schaefer, a marine fisheries biologist who had moved to NMFS from his position as Director of New York's Fisheries Laboratory in June 1972, is a key figure in the first agency sociocultural analysis staff hires during this transitional period. Schaefer's knowledge of state marine fisheries and his contacts made him the logical choice for head of the then recently created State/Federal Fisheries Management Office (SFFMO). Many Federal fisheries staff had no state experience and, according to Schaefer, often "… had the attitude that the states would just bow to them, which made it hard for me to maintain my relations with state staff."[6]

Driven by the Law of the Sea Treaty negotiations and extended jurisdiction policy development discussions begun in 1973, the original FCMA was in process of being drafted. Schaefer was also assigned to the agency team working with Congress to draft the original FCMA. This meant that he knew both the details of the impending legislation and what it implied for how the agency's mission would be reconstituted once the legislation was signed into law. The key concept that initially informed management was maximum sustainable yield (MSY).[7] As Schaefer commented, he knew "… then we would manage people—fish don't listen to you." He also reported that "when we adopted optimum yield[8], that equaled economists."[6]

Schaefer was given six professional positions to staff his new office. He hired some biologists, a lawyer, a staff man, and an economist without much difficulty. He knew he also wanted another kind of social scientist, though in his words, he "knew nothing about social scientists."[6] He began by looking at academics. He found the first anthropologist, James M. Acheson, through the SFFMO's work on lobster. Acheson (1972) had also published a widely read and distributed article on lobstermen's territories in *Natural History* that gave him a lot of credibility. Acheson, then at the University of Maine-Orono, was hired by NMFS in 1974, but he made it clear he was primarily interested in gaining the experience and did not think he would become permanent. This was acceptable because Schaefer was looking for someone who could help jumpstart the new program, recognizing that such a person might not be the same person who would be happy staffing it in the long term. Acheson stayed 16 months. He combined a strong background in economics and anthropology with lobster fishery experience, and he was already publishing his first papers on Maine lobstermen's territorial system (Acheson 1972, 1975a).[6, 9]

Although Schaefer recognized the potential usefulness of sociocultural analysts for managing marine fisheries, many agency staff did not. According to Schaefer, the NOAA Assistant Administrator for Fisheries at the time, Robert W. Schoning, was outraged when he found out about the plans to hire Acheson, nearly firing Schaefer over it. Schaefer was forced to write a 3-page defense of his actions before he was allowed to proceed. Schaefer remembers comments like "What the hell we've got social scientists for?" or "We're running a welfare system for social scientists!" as typical expressions of the views of many staff marine science professionals at the time. What economists could contribute was clearer to most agency staff because they had already been a part of the agency for several years, while "the other social scientists" were unprecedented. According to Schaefer, another widely shared staff view held that what the fishermen[10] thought did not matter, because the FCMA was now the law and they would have to obey it without regard to their personal views. For this reason, it made no sense to waste limited resources on sociocultural analysis staff.[6]

The next hurdle involved finding a niche for Acheson. Schaefer recalls that Acheson's first assignments involved reviewing draft Fishery Management Plans (FMP's). Acheson remembers that "… they thought I could comment on any fisheries management plan—even in fisheries where there were no social science data. I did my best to disabuse them of this idea, and stressed repeatedly the need for solid socio-cultural information on fisheries and fishing communities."[6, 11]

At the time little was known about fishermen or about the social and economic importance of fishing to particular communities, nor was much known about the importance of fishing

[6]Notes from interview with Dick Schaefer, Fisheries Biologist, retired, NMFS-HQ, Silver Spring, Md., conducted by Susan Abbott-Jamieson in his home, Bethesda, Md., 6 June 2005. Contact her at NOAA/National Marine Fisheries Service, Office of Science and Technology, 1315 East West Hwy., Silver Spring, MD 20910.

[7]"Maximum Sustainable Yield (MSY) is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions." (1997 NOAA Fisheries Strategic Plan, http://www.nmfs.noaa.gov/om2/glossary.html (accessed 5 Mar. 2008)).

[8]MSA, Sec. 3(33) The term "optimum," with respect to the yield from a fishery, means the amount of fish which—(A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery. http://www.nmfs.noaa.gov/msa2005/docs/MSA_amended_msa%20_20070112_FINAL.pdf (accessed 6 Mar. 2008).

[9]Interview with James M. Acheson, Professor, Department of Anthropology, University of Maine-Orono, conducted by Susan Abbott-Jamieson in his home, Bangor, Maine, 13 Feb. 2005, available in the Society for Applied Anthropology Collection, Louis B. Nunn Center for Oral History, Special Collections Library, University of Kentucky Libraries, Lexington, Ky.

[10]We will refer to "fishermen" rather than "fishers," as most U.S. men and women who fish commercially prefer this designation. A "fisher" they note is actually a member of the weasel family *Mustelidae*, a marten (*Martes pennanti*).

[11]Letter 22 June 2009 from James M. Acheson, Dept. of Anthropology, University of Maine, Orono, Maine. Contact S. Abbott-Jamieson at NOAA, National Marine Fisheries Service, Office of Science and Technology, 1315 East West Hwy., Silver Spring, MD 20910.

to specific regions of the country. U.S. Census data on occupations was not particularly helpful for several reasons. First, the fishing occupation is not tied to particular places in the way most census defined occupations are. Most fishermen do a variety of different things in different places throughout an annual cycle. At the time little was known about these patterns, which greatly complicated efforts to manage fisheries. Other difficulties are created by the way the U.S. Census aggregates the occupational information it does collect; fishermen are combined with forestry and agriculture. Finally, most fishermen are self-employed, and the occupational area of the self-employed is not identified by the U.S. Census.

Looking for something that was less routine and boring, Schaefer encouraged Acheson to start doing some "quick and dirty" research involving interviewing fishermen to find out what their attitudes were toward management; this information was helpful with management issues at the time. In the meantime, Acheson had reached the conclusion that he could make an important contribution by helping NMFS understand what social scientists could do for fisheries management. He wrote "Fisheries Management in Social Context" (1975b). Although it drew on examples from Acheson's research carried out prior to working for NMFS, it was aimed at NMFS staff.[6, 11]

The new FCMA raised many implementation issues. The U.S. Congress Office of Technology Assessment Oceans Program was asked to prepare a report assessing them. As part of this effort, Acheson spent considerable time researching and writing a working paper (Acheson, 1977) that discussed the types of social science data that would be needed to successfully implement the FCMA.[11] The complete OTA report, Establishing a 200-Mile Fisheries Zone (OTA Oceans Program, 1977), appeared after Acheson had left the agency.

Acheson recalled that he also worked with the New England states on the SFFMO efforts to harmonize state lobster management by adopting three fundamental rules—a uniform minimum 3.5 inch carapace size limit, protection of gravid females, and a law/rule that lobsters must be sold whole, not in parts. This effort failed.[12]

Acheson was offered a permanent position but returned to his position at the University of Maine at Orono in August 1975.

After the FCMA

Amid mounting public concern and increasingly outspoken calls to keep foreigners from fishing U.S. national waters, the first Fishery Conservation and Management Act (FCMA) was passed in 1976 (P.L. 94-265). As Hobart stated, it was "… the first real step toward comprehensive management of marine fisheries … (It) … set up eight regional Fishery Management Councils[13] to manage the Nation's fisheries within the newly created 200-mile Fishery Conservation Zone (FCZ[14])" (Hobart, 1995:38).

Schaefer replaced Acheson with Michael Orbach in 1976. Orbach became the NMFS social anthropologist in what was by then the Office of Fisheries Conservation and Management. During his time with NMFS, he also served as an advisor on social science to NOAA's Office of Sea Grant.[15] Orbach's service (1976–79) coincided with NMFS' transformation under the FCMA. This transformation required staff to begin regulating individuals (and their firms) whom they regarded as old friends, and whose businesses they had been supporting through agency research and other service activities. Many chose to retire rather than make this painful transition.[6]

Periods of organizational transformation offer opportunities to make significant contributions. Orbach's background in economics, anthropology, and policy enabled him to participate in diverse areas and contribute widely.[16] His book "Hunters,

[12]James M. Acheson interview, 13 Feb. 2005. Acheson further expanded on his account of this event saying "The NMFS and the representatives of many state agencies were in favor of uniform laws to simplify regulations and to aid enforcement efforts. Maine was for this law because it already had such laws on its books. Moreover, Vinal Look, the (Maine's) Commissioner of the DMR (Dep. of Mar. Resour.) supported a uniform size measure for all states since Maine lobsters were being cut out of the chicken market (i.e. very small lobster) by lobsters from southern New England states which had a lower minimum size limit. Officers of the NMFS tried to persuade all states to adopt minimum size measures. We failed because of opposition to the 3 3/16 inch minimum size rule in states with a lower size limit. These states had long had a monopoly on the market for small lobsters, and raising the minimum size limit would mean sharing the "chicken market" with other states with higher measures (e.g. Maine) (personal commun., 10 Mar. 2010). See also Acheson (2000:160).

[13]The Councils are quasi Federal entities with an office and a support staff with NOAA funding, whose members are responsible for developing FMP's. There are one to three Councils for each NMFS region and Council members include a set appointed by the Governors of the states or territories within the region (representatives from industry including the commercial harvest and recreational sectors, non-governmental organizations (NGO's), and other interested citizens), the NMFS Regional Office Director, a Coast Guard representative, and State fishery managers within the region. Councils also appoint committees of outside experts to advise them on the state of fish stocks and economic and sociocultural dimensions of each fishery that they manage. These experts or others provide impact assessments for proposed management options. See http://www.nmfs.noaa.gov/councils/ (accessed 5 Mar. 2008).

[14]The FCZ is now most commonly referred to as the Exclusive Economic Zone (EEZ). The EEZ is the area between three and 200 nautical miles (n.mi.) seaward of the 48 contiguous states, Alaska, Hawaii, and US-affiliated islands except off Texas, the Florida Gulf Coast, and Puerto Rico where the EEZ extends 9-200 n.mi. It is composed of at least eight large marine ecosystems. Details can be found in NMFS (2007:3).

[15]Sea Grant is currently under the NOAA Office of Oceanic and Atmospheric Research (OAR); it has never been part of NMFS. M. Orbach and L. King. 1979. The social sciences in the Sea Grant Program. Rep. Sea Grant Assoc. Exec. Comm., Wash., D.C., is a product of this work.

[16]Examples of Orbach's work during this period include M. Orbach (Editor). 1977. Report of the national workshop on the concept of optimum yield in fisheries management. U.S. Dep. Commer.; Cato, J. C., H. L. Nix, M. Orbach, and K. Roberts. 1978. Social and economic aspects of fisheries management, Charleston, S.C., S. Atl. Fish. Manage. Coun., 37 p.; Orbach, M., and V. Harper. 1979. United States fishery systems and social science: an annotated bibliography and directory of researchers. U.S. Dep. Commer; and Bockstoce, J., M. M. R. Freeman, W. S. Laughlin, R. K. Nelson, M. Orbach, R. Petersen, J. G. Taylor, R. Worl, and W. Anendale. 1979. Report of the panel to consider cultural aspects of aboriginal whaling in north Alaska. Rep. presented to the Tech. Committee of the Int. Whal. Commission by the Panel Meeting of Experts on Aboriginal/Subsistence Whaling, Seattle, Wash., 5–9 Feb. 1979 (unpubl.), 40 p. [Paper avail. from the Office of the IWC].

Seamen, and Entrepreneurs" appeared in 1977 giving him credibility (Orbach, 1977a). Orbach was recognized as a leading expert in distant water fishing at a time when there was growing interest in that topic. He had contacts with the biggest U.S. distant water fleet. He also shared his experience in Federal employment with other anthropologists in a *Practicing Anthropology* publication entitled "Federal Employment" (Orbach, 1977b), and later explained NMFS itself to social scientists (Cicin-Sain and Orbach, 1986). Orbach stayed until 1979, when he, like Acheson, left for academia, assuming the Associate Directorship of the Center for Coastal Marine Studies at the University of California-Santa Cruz. Orbach was a new kind of applied anthropologist, someone who sought to have a policy impact with his work. Although he left NMFS for an academic appointment, he has continued to involve himself in applied work throughout his career.

With the FCMA in place and the new Fisheries Management Councils (Councils) up and running, NMFS' bureaucratic structures established and given responsibility for carrying out FCMA mandates, and initial policies developed—the agency was well into the implementation stage. This meant that work was becoming more routine; the excitement of establishing a new regulatory apparatus and its associated policies was passing away. The first FMP's were starting to arrive at NMFS from the new Councils.

Anthropologist Raoul Andersen was hired in 1979 to replace Orbach who left in August of that year; it was the same position but the job had largely evolved from research and policy creation to policy implementation, regulatory work, and other miscellanea, including liaison with Sea Grant. According to Andersen "My principal task … was to develop policy recommendations for the [FCMA] … Being the only 'social anthropologist' on staff, it was necessary to 'cherry pick' those issues to which one could reasonably expect to contribute." Andersen remained only six months, returning to Memorial University in Newfoundland, Canada in early 1980.[17,18]

Peter Fricke, trained as a sociologist but also having a Masters Degree in Public Policy, began working with NMFS in January 1981 in the Office of Fisheries Management, reporting to its Director, Roland Smith.[19] The position was a reformulation of the Andersen position. Between 1981 and 1984 Fricke worked two months each year with NMFS under the terms of an Intergovernmental Personnel Act (IPA)[20] agreement with East Carolina University. Fricke described his position at the time in this way:

> "When I arrived I was doing policy work almost entirely. I was doing some SIA [Social Impact Assessment] work. For two days a month I was the Sea Grant social science person … I would come up to their offices in Bethesda … [I] got to know other persons in other Sea Grant programs that I didn't know … [I] got to working on other projects."[18]

In 1984, NMFS offered him a full time position in the Office of Sustainable Fisheries (OSF), and he accepted. Except for 1993 when anthropologist John Wingard moved from the USDA to work with Fricke, he remained the only sociocultural analyst on the NMFS Headquarters staff until greater funding was obtained in 2001.

Fricke continued to work for the Director of OSF until 1994, when a reorganization of OSF resulted in the creation of a new Regulatory and Analytical Services Division. He joined a diverse group of specialists working on policy issues, including management of fisheries; providing advice on policy as requested by officials up to the Secretary of Commerce; reviewing all FMP's developed by the Councils—recommending approval or not—and overseeing regulatory activities related to implementation of FMP's once they were approved.[21] Fricke's role in recommending approval/disapproval of FMP's involved reviewing each Affected Human Environment section (AHE) and SIA within the National Environmental Policy Act (NEPA[22]) mandated Environmental Impact Statement (EIS) of each FMP for adequacy of sociocultural content and analysis.[18]

During these early days of the MFCMA, sociocultural data necessary for analyzing the impacts of regulations were often nonexistent, at least in the required formats or geographic coverage. Under these circumstances, something

[17]Raoul Andersen, Honorary Research Professor, Dep. of Anthropology, Memorial Univ., Newfoundland and Labrador, Canada, personal commun., 12 Sept. 2005.

[18]Interview with Peter Fricke, Social Anthropologist, NMFS-HQ, Office of Sustainable Fisheries, Silver Spring, Md., conducted by Susan Abbott-Jamieson at NMFS, 27 Apr. 2005, available in the Society for Applied Anthropology Collection, Louis B. Nunn Center for Oral History, Special Collections Library, University of Kentucky Libraries, Lexington, Ky.

[19]NMFS has changed the names of its headquarters offices and office divisions over the years, although their functions have remained broadly similar. On the management side, the progression has been from Office of Fishery Management through the Office of Conservation and Management, to today's Office of Sustainable Fisheries. On the science side, the progression has been from Office of Research and Environment to Office of Science and Technology. NMFS structural separation in the field is described in footnote 21.

[20]Intergovernmental Personnel Act of 1970 (Public Law 91-648), Revised Intergovernmental Personnel Act (IPA) mobility program regulations (5 CFR part 334), effective 29 May 1997, allow Federal agencies to operate in a more efficient and productive manner. Online at http://www.opm.gov/programs/ipa/Mobility.asp (accessed 8 Mar. 2010).

[21]The agency has separated regulatory activities and functions from research since 1976–77. This separation of functions is seen in the creation of separate Regional Offices and Fisheries Science Centers in each NMFS region. The Regional Offices concern themselves with fisheries management, dealing directly with the Councils who send regional FMP's to the Regional Office for vetting before they are forwarded up through the bureaucratic hierarchy to the Secretary of Commerce who actually approves them. The Science Centers conduct research, compile and analyze data, issue reports, and so forth. They provide scientific information in support of the agency's mission. This dichotomy is also seen within headquarters, where the management-related positions held by anthropologists through Fricke were not until later balanced by research-related hires in the Office of Science and Technology.

[22]National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, Jan. 1, 1970, 83 Stat. 852) as amended by P.L. 94-52, July 3, 1975, 89 Stat. 258, and P.L. 94-83, 9 Aug. 1975, 89 Stat. 424). http://ceq.eh.doe.gov/nepa/regs/nepa/nepaeqia.htm (accessed 6 Mar. 2008).

like the phrase "No data available" would be written in the relevant EIS and FMP sections, and the Secretary of Commerce would still approve the plan. This was considered to fulfill the MFCMA National Standard 2 requirement for use of "best available data."

Fricke was also involved in outreach activities throughout this period. A newsletter directed at Regional Office and Science Center directors and deputy directors was developed by agency economists addressing issues like how to cope with the requirement for best available data, identifying nonagency economists and other social scientists doing relevant work, pointing to upcoming meetings that were relevant, and discussing ideas. After 1985, Fricke began sending out his own newsletter, From the Anthropologist's Desk, as a way to let people know that sociocultural data existed. He pointed out that when calls began to pick up, he transferred the newsletter to the sociologist John Maiolo, who was then on the staff of the South Atlantic Fisheries Management Council. Fricke conducted several workshops in different regions on how to include social science information in an FMP and EIS. All these activities were carried out in an effort to educate agency and Council staff about both economic and sociocultural aspects of fisheries management and to improve their willingness to use these data to prosecute the agency's mission.[18]

Fricke observed that agency budgets were tight throughout this period[23], with the result that it was often easier to not gather data on the grounds that if one didn't gather it, one didn't have to put it in the document. This situation began to change in the early 1990's after a series of memos, sent to the Science Centers beginning in 1989, pointed out that NEPA issues had to be addressed in FMP's. Fricke had prepared informal guidance to Councils (under the Office Director's signature) on proper conduct of SIA's as early as 1985, but in 1989 these were made official agency policy and incorporated into the Operational Guidelines[24] (Fricke, personal commun. 31 Mar. 2008). Fricke was also part of an inter-agency effort to establish protocols for SIA (ICGP, 1994; 2003). Then in 1991, a Fishery Impact Statement (FIS[25]) requirement was put into Sec.303(a)9 of the MFCMA. These helped set the stage for future improvements in staffing.[18]

A Difficult Voyage to Gaining Support

The social sciences finally gained enough traction to establish themselves as a recognized program within NMFS by the end of the 1990's. The effort was driven by the work of a few dedicated staff social scientists who had a clear vision of what a NMFS social science program could contribute, and the sheer doggedness to see the process through to the end. They were helped along the way by occasional legislative changes, the effect of successful lawsuits against the agency won on the basis of inadequate social and economic impact analysis (Gade et al., 2002:25–26, 29–32; Olson, 2005), some top level administrators who were beginning to appreciate the need for social science as a part of NMFS, and a Congress that was finally willing to authorize new funding for social science because they were being pressured by constituents involved in marine fisheries.

The decade-long push to achieve recognition and funding was carried out on two fronts from within NMFS. Some activities were pursued from the management side of the house by Peter Fricke, while another set were pursued from the scientific research side of the house by Mark Holliday (Chief of the Fisheries Statistics and Economics Division, Office of Science and Technology) and his team. While all these activities served to heighten visibility of social science's presence, they were not always coordinated across the divide and were sometimes in competition. The efforts arising from the scientific research side were the ones that finally achieved the new program funding that resulted in additional staff and new data collection funds.

Table 1 summarizes the significant events leading to the new program. There is not space here to examine the table in detail, so we will highlight only two activity streams—the 1996 reauthorization of the MFCMA, and Mark Holliday's (a Ph.D. originally hired as a statistician but broadly trained in economics, marine biology, and policy), and economist Amy Gautam's long, determined, successful campaign to gain social science program funding through the Department of Commerce process.

MFCMA reauthorization is on a 5-year cycle (Table 1, Legislative and Legal Actions column). The 1996 reauthorization was accomplished by passage of the Sustainable Fisheries Act (SFA)[26], which amended the MFCMA and resulted in the MSA (see footnote 2 for more detail). The parts of the SFA that provided a new legal impetus for the future development of agency social science have been described in many places.[27] They included a new provision defining entities called "fishing communities" [see MSA Section 3(17)]; the term was also included in the newly created Standard 8 [Section 301(a)(8)], and

[23]NOAA's marine and coastal sciences budgets remained flat under the Reagan Administration, 1981–88, and improved only slightly in the first Bush Administration 1989–92. See Collins (1994) and Alcock (2001) on this point. Although Presidential requests for NOAA's budget increased overall during this time, the budgets for what Congressman Unsoeld called the "wet" side of the agency—Oceans, Coasts, and NMFS— were starved, dropping from 46% of the total NOAA budget to a mere 22% in the FY 1989 budget request round (Unsoeld, 1993).

[24]The current version can be found at https://reefshark.nmfs.noaa.gov/f/pds/publicsite/documents/procedures/01-111-02.pdf (accessed 31 Mar. 2008).

[25]In practice, the FIS and EIS are generally the same document, as many of the requirements are the same or overlap.

[26]See http://www.nmfs.noaa.gov/sfa/augstup.htm (accessed 5 Mar. 2008) for a full description. The Office of Sustainable Fisheries website provides detailed information on all legislation and directives that set the frame for NMFS' activities. See http://www.nmfs.noaa.gov/legislation.htm (accessed 5 Mar. 2008).

[27]This overview relies heavily on the June 2003 NMFS report Implementing the Sustainable Fisheries Act, p. 24–26 (http://www.nmfs.noaa.gov/sfa/SFA-Report-FINAL7_1.pdf (accessed 5 Mar. 2008)) which provides a succinct review of agency efforts to implement SFA communities provisions.

Table 1.—Some Events in the development of the sociocultural analysis capacity in the social science program, NOAA's National Marine Fisheries Service.

Year	Staff Hired	Legislation and Legal Actions	Legislation Implementation
<1991	Beginning in 1975, Acheson, Orbach, Andersen, and Fricke hired in succession in precursor office to Sustainable Fisheries (OSF). Fricke moves to NMFS fulltime 1984. Only sociocultural analyst in NMFS.	Passed in 1974, NEPA requires EIS's, includes Affected Human Environment; 1977–97 10 lawsuits against NMFS on all bases—8 won, 2 lost.	
1991		MFCMA reauthorized. Fishery Impact Statement (FIS) requirement added to Sec.303(a) 9.	
1992	Mark Holliday, only economist in HQ/Fisheries Statistics and Economics on science side of agency, hires Amy Gautam, economist, part-time, in his office. Patricia Clay, 1-3 yr term hire, Northeast Science Center (NEFSC) in November		
1993	John D. Wingard, OSF, hired. Works with Fricke.		
1994	Gautam, full-time.	Preliminary work begins on next MFCMA reauthorization.	
1995	Clay's hire made permanent.	MFCMA reauthorization work continues.	
1996	Wingard leaves for USDA, then academic position. Not replaced.	MFCMA reauthorized by P.L. 104-297, SFA, now referred to as MSA. Includes National Standard 8 & other language defining fishing communities, requiring need to take into account importance of fisheries resources to fishing communities, other language helpful to social science.	Policy Implementation Group (PIG) staffed to oversee implementation of MSA re-authorization changes; Fricke and Richard Surdi from HQ/SF lead at NMFS level; Clay chairs Working Group to write NS8 Implementation Guidelines.
1997		Regulatory Flexibility Act (5 USC 601-612)-based lawsuits begin at 2 per year, once judicial review added in 1996; 1997–2001 10 NEPA-based lawsuits—6 lost and 4 won.	
1998		NMFS/ST drafts reauthorization suggestions on revising NS8.	
1999	Clay goes part-time. Northeast decides to hire second sociocultural analyst.	ST NS8 suggestions rejected by NMFS MSA Re-authorization Committee.	ST begins formal coordination attempt with SF re. parallel efforts in pushing a social science agenda.

Program Budget	Internal Directives, Memos, Activities, Program Building Activities	Research and Data Collection
	Beginning in 1989, directives sent to regions that must start doing NEPA EIS's, including Affected Human Environment. 1985, guidance prepared by Fricke; incorporated into Operational Guidelines 1989. Fricke works to build awareness within agency that sociocultural data exist for AHE analysis. Conduct of SIA's becomes official agency policy. Fricke reviews all AHE, SIA within NEPA EIS's for adequate sociocultural content/analysis.	
No budget line earmarked for social science staff, data collection, or research. Small number economists in HQ and in Science Centers/Regional Offices.		
Holliday arguing for social science projects, program to support agency mission goals. Most are economics survey projects.	AA Roland Schmitten memo officially stating "no data" not acceptable as best available data for SIA's.	
Holliday continues arguing for social science projects, program to support agency mission goals.	All regions tasked to write Social Science Plans; Clay writes Northeast plan and assists most other Regions; none funded.	
Holliday made Lead for NOAA Build Sustainable Fisheries (BSF) Goal Team; Gautam as staff economist assigned to social science capacity development. Clay on temp assignment to NOAA HQ Office of Policy and Strategic Planning—writes draft memo for Susan Fruchter intended for NOAA leadership with copies to NMFS leadership, which would describe the minimal social science strategy needed to address then politically sensitive issues of social and economic impacts of fisheries management; as draft memo vetted up the line, stimulates discussion. Fruchter decides it has raised agency management awareness and advanced internal debate, and no need to push further. Fricke and Holliday discuss NOAA Strategic Plan and its BSF component. Clay meets with AA Schmitten on social science in the agency and then provides follow up document for his use at upcoming Executive Board meeting.	First national Social Science Plan created from regional plans; not funded.	
Holliday & Gautam continue to push for funding; some progress at NMFS level.	NMFS Draft Strategic Plan circulates at regional level for comments; teams are organized around various objectives and formal revisions are suggested but few social science revisions are adopted.	Atlantic States Marine Fisheries Commission (ASMFC) begins to develop sociocultural data collection guidelines with help from NMFS, i.e. Clay and Fricke, and academic social scientists.
Holliday & Gautam continue to push; some progress at NOAA level.	Gulf Council decides to support 1994 Southeast Regional Social Science Plan. In December, Draft Strategic Plan for Fisheries Research circulates internally for comments at the Regional level—not all social science groups are tasked for comments; there is confusion over whether it is a plan to fulfill the NOAA Strategic Plan or a plan to fulfill SFA requirements; Clay tasked at HQ level to add social and economic language to Draft NMFS Fisheries Strategic Research Plan.	
Holliday & Gautam continue to push for funding. Gautam visits each Science Center & Regional Office; interviews each Lead Economist about needs to meet mission goals; Social Science Research Plan prepared. Holliday and Gautam begin vetting Plan to agency. Established initial FTE targets at 30 anthropologists/sociologists and 110 economists; data collection $5.5M, research $3.1M. Clay brought in to help. NMFS AA William Fox supportive; Marine Fisheries Advisory Committee (MAFAC) involved. Department of Commerce and Government Accounting Office convinced. New funding included in FY99 budget request. OSF proposes social science policy and the research plan to AA Rolland Schmitten based on 1994 regional plans compiled into a national plan, but no funds are attached so NMFS Science Board (Directors of regional Science Centers & HQ-ST) not interested (also not interested because proposal doesn't come from science side). New money for social science program achieved in FY99 Budget -$1M.	First draft NMFS Strategic Research Plan goes out for public comment. CENR (Committee on Environment and Natural Resources of the White House Office of Science and Technology Policy's National Science and Technoloy Council) sustainable ecosystem initiative is based on submissions from the NOAA strategic planning teams for the '00 budget. The social and economic theme has about $4M, of which $2.75 were from the Build Sustainable Fisheries (BSF) team.	

continued

Table 1.—(continued) Some Events in the development of the sociocultural analysis capacity in the social science program, NOAA's National Marine Fisheries Service.

Year	Staff Hired	Legislation and Legal Actions	Legislation Implementation
2000	Julie Olson hired, NEFSC, with reprogrammed funds.	Preliminary work begins on MSA reauthorization.	
2001	S. Abbott-Jamieson, HQ/ST, Sr. Social Scientist; Jennifer Sepez, AFSC hired with NS8 funds in December.	Preliminary work continues on MSA reauthorization.	
2002	Stewart Allen, SWFSC; Karma Norman, NWFSC, hired with NS8 funds; Palma Ingles, SERO hired with reprogrammed funds; NEPA staff hired in all Regions.	Work continues on the MSA reauthorization. ST comments on 2 specific re-authorization bills: Gilchrist and Tauzin.	
2003	Lisa Colburn, Patricia Pinto da Silva, NEFSC; Brent Stoffle, SEFSC hired.	Work continues on the MSA re-authorization.	
2004	Suzanne Russell, NWFSC, hired with reprogrammed funds.	Work continues on the MSA reauthorization.	
2005		Work continues on the MSA reauthorization.	
2006			
2007		Latest MSA re-authorization includes new requirements related to social and economic research.	
2008			
2009	Amber Himes, AFSC, hired with reprogrammed funds. Palma Ingles leaves the SERO to work for U.S. Fish & Wildlife, Alaska. Michael Jepson hired, SERO.		
2010	SWFSC preparing to advertise for a social scientist; SERO to replace Ingles.		

added to Section 303(a)(9) on fishery impact statements, Section 303(b)(6)(E) on limited access, Section 304(e)(4) on rebuilding programs, Section 312(a) on disaster relief, and included in the new "community sustainability plan" required in Section 303A(3)(A) for implementation of limited access privilege programs.

The MSA defines a fishing community as "a community which is substantially dependent on or substantially engaged in the harvest or processing of a fishery to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." National Standard 8 states that "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such com-

Program Budget	Internal Directives, Memos, Activities, Program Building Activities	Research and Data Collection
FY2000 $1M- referred to as the NS8 funds.		
FY2001 $1M-NS8 funds. Pays salaries of most new sociocultural analyst hires.	Clay begins planning national workshop on technical guidance for National Standard 8; OSF holds training workshops for the Councils and Regions on implementation of new SIA and Regulatory Flexibility Act/Regulatory Impact Review guidance.	New hires begin to establish national and regional Sociocultural Analysis Programs. Data collection to identify MSA fishing communities in Gulf Region begun by Mike Travis, SERO economist, with contractor.
FY2002 $1M-N8 funds. HQ/Office of Science and Technology, Sr. Soc. Scientist, administers distribution of NS8 data collection & research funds of ~$250K through annual internal competitive process based on proposals submitted.	National workshop on NS8 technical guidance held. A mix of NMFS, other federal agency, academic, and private sector social scientists participate. First draft of Sociocultural Practitioner's Manual completed, circulated for comment. Purpose to clarify MSA Operational Guidelines, provide practical advice. NOAA Fisheries Handbook for New Non-Economist Social Scientists written to help new hires. NOAA Fisheries listing added to American Anthropological Association Guide, Government Agencies section.	New regional hires start identifying data collection priorities, research needs. Ingles, SERO, begins oversight of Gulf community profiling contracts. AFSC community profiling efforts begin. Funds passed to other regions with sociocultural analysis staff in place to oversee contracts. U.S. Caribbean communities added.
FY2003 $1M-NS8 funds. $163K passed to regions. Social Science Review Panel reports to NOAA Science Advisory Board and cites HQ/Office of Science and Technology work as proactive (Fricke notes that no regional or other HQ input was provided to the Panel). Performance Measures established; tied to completion of data collection for community profiles of locations with fishing and fishing-related activity. Performance Measures require completion of the first round of profiling for all regions by end of FY08.	NMFS Southwest Region split into two regions: Southwest (CA only) and Pacific Islands Region (HI and Pacific Territories, HQ in Honolulu). Allen goes with the PI Region. Southwest only region now with no sociocultural analyst staff. National and regional program development continues. Regional anthropologists/sociologists attend national workshop on research methods in May. Opportunity for regional staff to meet each other. Second draft of Sociocultural Practitioner's Manual completed and circulated for comment. Indicators and methodology for identifying MSA fishing communities needs further work. Practitioner's Manual put on hold until these this issue can be resolved. Local Fisheries Knowledge (LFK) Project started in Maine	All except SW now actively working on community profiling work for their regions. Local Fisheries Knowledge Pilot Project started in Maine. LFK Database created.
FY2004 $1M; one-time money increases total research money available for FY04 to ~$340K for regions.	Working Group appointed to make recommendations on indicators and analysis methodology for identifying NS8 communities. Social Science SIA Conceptual Model Workshop held; work begun on conceptual model.	Regional staff continue to expand regional data collection programs. Additional funds this FY permit expansion of data collection into all regions. NWFSC and AFSC collaborate with SW to complete community profile data collection for Pacific Coast to include subset of CA communities that fish in AK with WA and OR communities.
FY2005 $1M; ~$250K passed to regions. One time money $300K provided for Hurricane Katrina damage assessment to Gulf of Mexico fishing community fishing infrastructure.		Data collection continues. Regional staff continue to develop national and regional Sociocultural Analysis Programs. Alaska Profiles completed. Profiles for Gulf and South Atlantic Management Council areas of Southeast Region completed.
FY2006 $1M; $260K passed to regions.	LFK Project ends.	Data collection continues. Regional staff continue to develop national and regional Sociocultural Analysis Programs.
FY2007 $1M; $324K passed to regions.	NMFS Voices from the Fisheries Database Project begins.	West Coast and North Pacific profiles completed; Preliminary assessment completed of the impacts of Hurricane Katrina on Gulf of Mexico fishing communities.
FY2008 $1M; $273K passed to regions.	NOAA Oral History Interest Group (NOHIG) formed.	Profiles completed for Northeast and Western Pacific Regions, and Southeast Region's Caribbean Management Council area.
FY 2009 $1M; $274K passed to regions.	NOAA Oral History Workshop held at NMFS HQ, Silver Spring.	Fishing communities of U.S., 2006 (NMFS, 2009a) published as part of new Economic and Sociocultural Status and Trend Series.
FY2010 $1M; $574K passed to regions.		

munities, and (B) to the extent practicable, minimize adverse economic impacts on such communities."

National Standard 8, soon known as the "Communities Standard" or "NS8," requires FMP's to take into account any potential effects on fishing communities— strengthening prior requirements under 303(a)(9) to examine economic impacts on "participants in the fisheries." Subsequent guidelines specified that the definition referred only to a geographic location or place[28] including its residents and businesses[29] (though communities of interest—such as gear groups or groups targeting a particular species, are still covered under 303(a)(9) and minorities and low income populations

[28]In the original legislative debate over fishing communities, both the House version emphasizing "local coastal communities" and the Senate version referencing "any place where vessel owners, operators, and crew or U.S. fish processors are based" were firmly place based (NOAA Office of General Counsel 1997:sec. 102). Online at http://www.nmfs.noaa.gov/sfa/sfaguide/ (accessed 18 Aug. 2009).

[29] *See next page.*

are further covered under E.O. 12898 on Environmental Justice[30]). Guidelines were written in 1998 by the NS8 Technical Working Group (chaired by Patricia M. Clay[31] of the NMFS Northeast Fisheries Science Center), vetted by Peter Fricke and Richard Surdi (OSF) as part of their duties in overseeing SFA implementation activities, and made official after public comment and subsequent revision.[32] NS8 became a factor in the subsequent development of the social science program; it was a new resource to reference in the arguments mounted to justify new funding to expand agency social science capability.

The MSA is not the only legislation governing fisheries management that has served to justify the development of a social science program. NEPA and the Regulatory Flexibility Act (RFA[33]) are two cases in point; however the MSA is the legislation most closely tied to the development of a sociocultural analysis capacity, the part of the social science program with which we are here concerned.

Referring again to Table 1, the main events in the effort to gain new funding for social science are listed in the Program Budget column. Holliday understood the issues facing the agency, and its social science data gaps. As Chief of the Fisheries Statistics and Economics Division, Office of Science and Technology, he was on the science side of the organization. This provided his initial platform for arguing for program funds. He put Gautam to work helping him after she joined his staff in 1992. Their efforts got a significant boost when Holliday was appointed Lead for the NOAA Build Sustainable Fisheries (BSF) Goal Team in 1993. As Gautam recalled:

> "… the empowerment … came when Mark became the head of what was called the Build Sustainable Fisheries Goal Team Initiative, to use today's kind of lingo for budgeting, … the agency was divided into three goal teams, and Build Sustainable Fisheries comprised one of them. It was about a $300M program, mostly NMFS, but also some NOS[34] and OAR programs … it's a subset of the Ecosystem Goal Team today …"[35]

The scope of Gautam's work expanded.

> "… as staff for him (Holliday), I was working on developing the social science initiative, now not just on behalf of our own little program and using our money, but for the purpose of the agency as a whole."[35]

Their initial arguments pushed the need to start including economics before management decisions were made. Later they added sociocultural analyses. They tried to explain that "economics and social sciences have a role to play in a pre-decisional way; it's not information that is best used to justify decisions that have already been made; that there is actually a value to contribute to this decision-making before it's been done." They argued the usefulness of these data in the management process as a whole, and therefore the need to collect the necessary data, do the research, and carry out the required analyses. They also argued for staff positions so they would have in-house expertise familiar with fisheries management issues to both oversee contracted data collection and research, and to conduct data collection and research of their own.[35]

They first began pursuing funding on an individual project basis. According to Gautam, they initially felt they would succeed by making plausible arguments for low funding levels (ca. $500,000) for specific data collection projects tied to immediate needs, budget requests for which staff who were not social scientists might more easily see the benefit. Clay arrived at NMFS Headquarters just prior to this (while maintaining her affiliation with the Northeast Fisheries Science Center) and became a resource for sociocultural advice and language crafting for these projects. Some projects proposed at this time were a national survey of employment in fisheries, as no good count of the number of fishermen existed, and a processor survey, as little was known of the costs, earnings, and other data on processors that are needed in judging impacts of regulations.[35]

The next step was the creation of a Social Sciences Research Plan that could be used to justify an actual program, rather than simply discrete projects. In order to write detailed and accurate proposals, in 1998 Gautam visited "almost every FMC (Financial Management Center), each of the (Science) Centers, the Regional Offices, and conducted interviews with each of the Lead Economists … and said 'what do we need to be at a 100% capability to fully satisfy our mission needs?'" She explored both staffing levels and qualifications, and data collection activities.[35]

The survey of regional staff indicated a need for 96 additional positions, 70 economists and 26 sociologists or anthropologists, divided between management and research. It was further noted that before full staffing could be effectively undertaken, more core data needs would have to be met. One factor that was noted over and over in her interviews was the new requirements that

[29]"… dependence, engagement, and sustained participation are not measured solely in terms of the percent of fishing activity in relation to the entire economic base of the community; there are other social, cultural, and economic assessments specifically focused on the harvesting, processing, and fishery-support industries." (63 Fed. Reg. 24211, 24223 (1 May 1998)).

[30]This is Executive Order 12898 (59 FR 7629 (1994)), "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."

[31]At this same time Clay was working to establish international guidelines for proper sociocultural data collection though collaboration with the FAO (Clay, 1998a).

[32]http://www.nmfs.noaa.gov/sfa/SFA-Report-FINAL7_1.pdf (accessed 5 Mar. 2008).

[33]The Regulatory Flexibility Act was originally passed in 1980 (P. L. 96-354). The Act was amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (P.L. 104-121).

[34]NOS stands for National Ocean Service; OAR, Office of Oceanic and Atmospheric Research.

[35]Interview with Amy Gautam, Economist, NMFS HQ, Office of Science and Technology, Silver Spring, M., conducted by Susan Abbott-Jamieson at NMFS, 2 May 2005, available in the Society for Applied Anthropology Collection, Louis B. Nunn Center for Oral History, Special Collections Library, University of Kentucky Libraries, Lexington, Ky.

NS8 would entail, and the need for anthropologists and sociologists to handle them. NS8 was thus an important driver in the regional assessments of needs for sociocultural analysis staff.

Once written, the Social Sciences Research Plan was the document which ultimately secured funding and allowed for a real social science program. The process, however, took four years. It was often tedious and frustrating. It required Holliday, Gautam, and Clay making their argument over and over again within a prescribed budgetary process. According to Gautam:

> "We made presentations, we wrote documents, we wrote facts, we wrote Q & A's; it would just seem like we would grind through the same types of information in many different formats, and … present it to many different people...I think that … is what finally got to me in the long run, was just sort of the burn out of defending this same program over and over and over again … with [only] marginal increases in the program."[35]

Funding was finally achieved in the FY2001 budget; $1M was allocated for NS8 activities. These funds, now referred to as the "NS8 Funds," are the foundation for financing the new sociocultural analysis section of the social science program. They fund six of the current program staff, and provide funds for data collection and any workshops, research, or other efforts that help develop the program at the national level.

At this time, NMFS was also writing a five-year Strategic Research Plan for the agency overall. As initially written it was largely biological, and negative responses to this began to come in during the public comment period. In 1997–98 Clay reviewed the NMFS Draft Strategic Research Plan at the request of William Fox (then NOAA Assistant Administrator for Fisheries) and John Everett (Chief, Division of Research) and was then asked to work on the next draft of the plan. She gathered input from the economists and then provided comments on, and suggested revisions to the plan, for strengthening both the social and economic focus. This was another critical moment because the sections created through this process became part of the standard table of contents for subsequent Strategic Research Plans.

The Current Social Science Program

NMFS's current mission is the "stewardship of living marine resources through science-based conservation and management and the promotion of healthy ecosystems" (NMFS, 2007:1). The agency's responsibility extends throughout the United States EEZ.[14] The social science program focuses on developing data resources and research that support this mission. Social science data collection and research are now integrated into NMFS's strategic planning process.

The drivers behind tactical decisions about what data to collect and which research projects to support lie in legislative mandates like the MSA (previously described in detail), various Executive Orders, and NMFS policy. The NMFS Strategic Plan for Fisheries Research issued in August 2007 (NMFS, 2007:30–32) provides an overview of current emphases in sociocultural and economic data collection and research. It also lists regional sociocultural and economic research accomplishments and priorities for FY 2007–12.

Another threshold in achieving full recognition and integration at the NOAA level was reached in 2005 when economic and sociocultural observational systems were included for the first time as a part of the NOAA observational systems.[36] This meant that sociocultural and economic data needs would now have higher visibility throughout NOAA.

The first staff hires with NS8 funds occurred in late 2001 when the Alaska Science Center in Seattle hired Jennifer Sepez as Staff Anthropologist, and the Office of Science and Technology in NMFS headquarters hired Susan Abbott-Jamieson as Senior Social Scientist (Table 1, Staff Hired column). Abbott-Jamieson's role in the newly created position is to help guide the development of the social science program by providing national coordination and advice, organizing workshops, developing ties with academics with expertise in fisheries social science, and educating agency staff and others about the new program.

The role of the regional staff anthropologists and sociologists is to develop their region's sociocultural data collection and research program in line with national guidance, while also identifying and addressing any regionally specific characteristics, issues, or data requirements. In every case except the Northeast Region, the NS8 new hires were somewhat isolated, being the only social scientists, apart from economists, in their respective science center or regional office. This has meant that each had to develop a niche within their particular part of the agency on their own except for help they received from staff economists in their region. In most cases their immediate supervisors are the Lead Economist for their particular location.

In an effort to speed this process, Abbott-Jamieson wrote a "NOAA Fisheries Handbook for New Non-Economist Social Scientists," which was made available online, and early on held regular conference calls in which all the new social scientists participated, so that they could become acquainted, share information, and begin planning their regional programs. The "old hands," Peter Fricke and Patricia Clay, were particularly helpful in orienting the new hires, including Abbott-Jamieson.

By 2003 there was at least one sociocultural staffer in each NMFS region. That year, however, the Southwest Region (which included Hawaii and the Pacific Territories) split into two regions—the Southwest and the new Pacific Islands. Stewart Allen, the sociocultural hire in the Southwest, went with the Pacific Islands Region, leaving the

[36]Other NOAA observational systems include those designed to collect measurements of the ocean, atmosphere, and biological measurements needed to estimate fisheries resources.

Southwest without a sociocultural analyst (Abbott-Jamieson and Clay, 2004). The Northwest Fisheries Science Center and nonagency anthropologists under contract carried out some Southwest Region sociocultural data collection between 2004 and 2009. The SWFSC is now planning to hire a full time sociocultural analyst in 2010.

Building Fishing Community Profiles (FCP) for NMFS's Regions

Research activities within NMFS are separated into sub-types. One is "data collection," which involves bringing together information that has been compiled by others that can be used to support the agency's mission, e.g. U.S. Census data. Activities that involve generating new primary data are referred to as "research" for purposes of deciding how to use available funds. Referring once again to Table 1, the Research and Data Collection column provides a succinct overview by region. Once adequate data were compiled in a region, the first task that had to be completed was the creation of a series of profiles of fishing communities typical of and important to that region (Abbott-Jamieson and Clay, 2005). A subset of these may eventually be designated as official MSA fishing communities by the regional Council's for the purposes of NS8 and other MSA provisions.

Though some regions had already begun community profiling early on, e.g. the Faces of the Fishery produced through a NOAA co-operative agreement with the North Pacific Fishery Management Council beginning in the early 1990's (NPFMC[37]), and various grants and contracts let through the Northeast Fisheries Science Center and the Mid-Atlantic Fishery Management Council, once the NS8 funds were available it became feasible for all regions to attempt coordinated profiling that would allow comparisons both within and between regions. Further, a workshop held by Clay and Abbott-Jamieson in April of 2002 brought together NMFS, Sea Grant, and academic researchers to discuss what would constitute effective indicators for MSA fishing community status, and dependence or engagement under NS8, as well as to rate the feasibility of collecting the necessary data. The workshop set in motion discussions among NMFS's growing number of staff anthropologists and sociologists about the best design of data for the new fishing community profiles.

The long history of cross-cultural comparative research in anthropology and the Human Relations Area Files provided an intellectual model for planning the FCP's (Ford, 1967; Ember and Ember, 1998:651–652). Another came from the community ethnographies and descriptions that already existed for some U.S. fishing communities, for example Acheson (1980, 1988), Poggie and Pollnac (1981), Orbach (1977a), Ellis (1986), Edic (1996), and Durrenberger (1996). Another group of fishing community profiles had been prepared at the request of NMFS's social scientists and/or Council's as background material for preparation of fishery management plans. Examples include profiles by McCay and Cieri (2000), Griffith and Dyer[38]; Hall-Arber, et al.[39]; Jacob et al.[40]

We realized we needed basic descriptive information on a large set of local communities within each of six different geographically delimited regions of the United States and its territories. We did not know in advance how many communities should be profiled, but we did appreciate that there would likely be hundreds of them. We also recognized that both time and budget limitations meant we had to use secondary data sources, and we had to limit the length of these initial community profiles. This forced us to identify the categories of information that would not only be available to us, but that would also be useful to those who had to prepare future fisheries social impact assessments.

Since that workshop, the indicators and methodology for identifying MSA fishing communities relative to NS8 were further developed as part of a draft Sociocultural Practitioners' Manual (now undergoing final revisions), providing a national template for selecting fishing communities for further data collection. Profiles are now complete for 819 unique fishing communities or locations with fishing-related activities (some communities were profiled by more than one region due to overlapping fisheries), distributed across 23 coastal states and five territories.

These new FCP's, often called short-form profiles following Jennifer Sepez's practice with the Alaska profiles, were planned to be five to eight pages and largely based on archival data. Previous descriptive accounts of fishing communities and ports were 30–60 pages in length and based on months of ethnographic work. These are now called long-form FCP's. While some long-form profiles will still be undertaken, the shorter versions are more cost-effective and allow for at least a basic description of a much larger set of communities than would be possible with standard ethnographic techniques.

NMFS's social scientists are also developing regional databases to accompany the descriptive fishing community profiles. These databases will combine data from publicly available sources (e.g. U.S. Census), with fisheries dependent data (e.g. landings data) at the community level to support comparative analysis of fishing communities tied to different fisheries within regions for social impact assessments when FMP's are being amended. Because fisheries dependent data cannot always be made available to the public at the

[37]North Pacific Fishery Management Council (NPFMC). 1994. Faces of the fisheries (series of community and regional profiles). 9 vols. NPFMC-NOAA Cooperative Agreement #94-47FC0003. Anchorage, Alaska, 981 p.

[38]Griffith, D., and C. Dyer. 1996. An appraisal of the social and cultural aspects of the multispecies groundfish fishery in New England and the Mid-Atlantic regions. Aguirre International. NOAA Contract No. 50-DGNF-5-00008, 140 p.

[39]Hall-Arber, M., C. Dyer, J. Poggie, J. McNally, R. Gagne, and Human Ecology Associates. 2001. New England's Fishing Communities. Rev. ver. final rep. NE MARFIN grant #NA87FF0547. Online at http://seagrant.mit.edu/cmss/marfin/index.html (accessed 27 May 2010).

[40]Jacob, S., M. Jepson, C. Pomeroy, D. Mulkey, C. Adams, and S. Smith. 2002. Identifying fishing dependent communities: Development and confirmation of a protocol. A MARFIN Proj. and Rep. to the NMFS SEFC. Online at http://www.st.nmfs.noaa.gov/st1/econ/cia/FLFishingComm-MARFINReport.pdf (accessed 27 May 2010).

community level due to laws protecting the identity of individual firms, community level analyses of some of these data will be for internal use only.

All regions have completed the initial round of the short-form profiles. Completed profiles are published as NOAA/NMFS Technical Memos and made available to the public online.[41] Completion of an initial set of community profiles for the Nation was made official NMFS policy through the creation of a Performance Measure which required their completion by the end of fiscal year 2008 (i.e. 30 September 2008).

The baseline community profiles and their associated databases, which will be updated every three to five years, will serve as the port profiles required in every EIS/FIS undertaken when a regulation is proposed, as required by NEPA and the MSA. They will also provide a starting point for SIA's, making their conduct more efficient. As updates accumulate, they will also provide trend data which can be used in SIA's. Within and between regional analyses are becoming possible now that all the regional databases are compiled.

To assure the validity of these profiles based largely on secondary data, various methods of ground truthing the profiles have been undertaken in different regions with good results. Alaska selected 136 communities for short-form profiles, using quantitative data and Data Envelopment Analysis (DEA, a nonparametric, multidimensional model that allows for the comparison of entities across multiple indicators without requiring the researcher to arbitrarily assign weights, as the model does this internally) (Sepez et al., 2005; also see Sepez et al., 2006, 2007a). As a ground truthing method, Alaska has completed long-form profiles based on field work in eight major Federal fishing ports (Downs[42, 43]).

The Northwest Region, similar to Alaska, initially chose communities to profile using quantitative indicators and DEA. They have since conducted site visits to selected communities within the set chosen for profiling, "based on regional and community size considerations and to represent as much diversity as possible among visited communities" (Norman et al., 2007:14). Site visits are also underway in communities identified as important to tourism (Russell and Schneidler[44]). Long-form profiles are being prepared for nine fishing communities.[45] In the Southeast Region an initial report (Jepson et al., 2007) concentrated on archival data. Current profiles included rapid assessment site visits to all Gulf of Mexico states, and thus incorporated an element of ground truthing at the outset. A more intensive study of factors affecting the decline in fisheries participation in one coastal county each in the South Atlantic States of Georgia and North Carolina also included site visits and ethnographic interviews (Blount[46]). Profiles for the Caribbean Region were also conducted by the Southeast Region; these involved ethnographic work and are all long form profiles (Griffith et al., 2007; Impact Assessment, Inc., 2007b; and Stoffle et al., 2009; Stoffle[47]).

The Northeast Region chose communities to profile based on a set of quantitative indicators. Applying multivariate statistics (principal component analyses of census and fisheries data and cluster analyses of component scores derived from the principal component analyses) resulted in groups which were clearly differentiated not only with regard to the initial quantitative data, but also with regard to additional information added in the course of creating the profiles—a fact confirmed by further multivariate analyses. Site visits have so far been conducted to a representative sample of communities in five clusters in five states to provide a relatively robust test to ground truth the accuracy of the multivariate model (Smith et al.[48]).

On 19 April 1999, NMFS approved identification of American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam as fishing communities (64 FR 19067-19069). On 7 April 2003 (68 FR 16754), and later affirmed on 5 August 2003 (68 FR 46112-46116), NMFS approved of the definition of each of the seven main inhabited Hawaiian Islands as a fishing community. NMFS recognized that an island-scale definition of fishing communities would be broad and perhaps overly-inclusive, but did not view that outcome as a problem, primarily

[41]Completed profiles can be found for the Alaska Regionathttp://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/CPU.php (accessed 5 Mar. 2008); for Northwest and Southwest Regions at http://www.nwfsc.noaa.gov/publications/displayinclude.cfm?incfile=technicalmemorandum2007.inc (accessed 5 Mar. 2008), then scroll to Norman, et al., 2007; and for Guam and American Samoa in the Pacific Islands Region at http://www.pifsc.noaa.gov/pubs/fmsdpub.php (accessed 25 Feb. 2010). The Southeast has multiple reports; go to http://sero.nmfs.noaa.gov/sf/SocialSciencePublications.htm (accessed 25 Feb. 2010) to download Gulf of Mexico and South Atlantic profiles, and to http://www.sefsc.noaa.gov/socialscience_memo.jsp (accessed 10 Mar. 2010) to access those for the U.S. Virgin Islands and Puerto Rico. Northeast profiles are available at http://www.nefsc.noaa.gov/read/socialsci/community_profiles/ (accessed 25 Feb. 2010).

[42]Downs, M. 2005. Comprehensive baseline commercial fishing community profiles: Unalaska, Akutan, King Cove, and Kodiak, Alaska. Final Rep. North Pac. Res. Board. NPRB project #318. Online at http://doc.nprb.org/web/03_prjs/r0318_final.pdf (accessed 18 Aug. 2009).

[43]Downs, M. 2008. Comprehensive baseline commercial fishing community engagement and dependency profiles: Adak, St. George, St. Paul, and Sand Point, Alaska. Final Rep. North Pac. Res. Board. NPRB project #640. Online at http://doc.nprb.org/web/06_prjs/640_final_vers2.pdf (accessed 18 Aug. 2009).

[44]Russell, S. M., and M. M. Schneidler. In prep. A profile of the people in the U.S. whale watching industry of the Greater Puget Sound, W. NOAA-NMFS Tech. Memo. NWFSC, 300 p.

[45]The nine communities include Neah Bay, Bellingham, Westport, Iwalco, Seattle, and Anacortes, Wash.; and Port Orford, Garibaldi, and Newport, Oreg.

[46]Blount, B. G. 2006. Factors affecting participation in marine fisheries: case studies in Georgia and North Carolina. NOAA Grant No: NA04NMF4330316. Rep. NMFS Southeast Region. Office. Online at http://sero.nmfs.noaa.gov/sf/socialsci/pdfs/NOAAFinalReport101506Blount.pdf (accessed 22 Apr. 2008).

[47]Two additional reports by B. Stoffle are available: 1) Profiling the St. Thomas fisheries and local stakeholders' perceptions of marine protected areas, and 2) Profiling the St. Croix fisheries and local stakeholders perceptions of marine protected areas. Both were prepared in 2006 for the NOAA Coral Reef Program and the USVI Department of Planning and Natural Resources. Contact Brent Stoffle, SEFSC, 75 Virginia Beach Dr., Miami, FL 33149.

[48]Smith, S. L., R. B. Pollnac, L. L. Colburn, and J. Olson. In prep. Classification of coastal communities reporting commercial fish landings in the Northeast Region: developing and testing a methodology.

because information at smaller scales for planning and policy development would be available in the future through ongoing PIFSC research activities. In summary, there are 10 fishing communities in the Western Pacific Region, and everyone in the region lives in a fishing community (Levine and Allen, 2009; Allen and Bartram[49]).

The fishing community profiles have already received widespread attention. The Gulf States profiles were finalized just prior to Hurricane Katrina in 2005 and were available as baseline data for assessing damages. Special monies were assigned to reprofile communities impacted by Katrina and write a special report (Impact Assessment, 2007a). Local, state, and Federal officials from multiple agencies and Congress all requested and utilized these data.

A new publication intended for the public, Fishing Communities of the United States, 2006 (NMFS, 2009a) presents descriptive demographic data on a subset of each coastal state's commercial fishing communities and ports, as well as some social indicator data for each state. This is the first volume in the new NMFS Economics and Sociocultural Status and Trends Series, and a companion to the Fisheries Economics of the U.S., 2006 (NMFS, 2009b). The Communities volume will appear next when 2010 U.S. Census data are made available, while the Economics volume appears annually. This volume is based in part on the regional FCP data.[50]

Other Data Collection and Research Programs

At NMFS Headquarters, a project on conceptual modeling for SIA has been completed (Pollnac et al., 2006[2008]). There had been exploratory work done earlier on the construction of SIA's for fisheries in the Northeast (Clay and Dolin, 1997; Clay and McGoodwin, 1997), although that work was not directly linked to this new effort. Headquarters social scientists invited twelve senior academic anthropologists, and five NMFS and Council social scientists who combined extensive experience in modeling, quantitative methods, marine fisheries SIA, and fisheries management in diverse regions to begin development of the model at a workshop held near Silver Spring, Md., in 2004.

The new conceptual model for fisheries SIA's developed by SIA workshop participants is more compatible with the approaches taken by fisheries biologists and economists when assessing potential effects of management actions. Well-being was selected as the dependent measure (Westwood, 2008; Smith and Clay, 2010). One might argue that changes in economic welfare, such as changes in income or wealth are adequate measures of well-being. Social scientists, however, have shown that fishing and interaction with marine resources is much more than solely an economic activity. The new model seeks to foster multi-disciplinary assessments and to increase the perceived usefulness of sociocultural data by fishery managers. The next step is to test the model by applying it to real world situations. A ground truthing of this model is currently underway in the Northeast Region.

Other research has also been undertaken. The concept of "fishing community," including the intersection of theoretical and legal definitions of fishing community has been examined (Clay and Olson, 2007), issues of defining and investigating vulnerability, resilience, and disaster assistance (Olson and Clay, 2001; Clay and Olson, 2008; Pinto da Silva and Hall-Arber, 2008; Tuler et al., 2008), and studies of population and demographic trends in fishing communities over time (Poole and Sepez, 2006a, 2006b; Sievanen and Sepez, 2007), as well other historical work (Sepez, et al., 2007b) and an examination of the role of fishing where it is largely isolated as the dominant human impact on coastal resources (Miller et al., 2007). The Northwest Region has a new project in progress to describe by species and gear the fishing communities identified in the community profiles.

The Southeast Region has conducted follow up studies of the impacts of Hurricane Katrina on fishing communities (Ingles and McIlvaine-Newsad, 2007; Ingles, 2008; Abbott-Jamieson and Ingles[51]). Since 2004 they have been monitoring representative communities of different fishing community types within the region.

Other work tries to fit traditional concepts of place to contemporary decision-making, or to understand the role of place in defining community relative to fishing regulations (Olson, 2005). In connecting people and practices to places, GIS has become an important tool (Olson, 2006; Pinto da Silva and Fulcher, 2006, 2007; Olson, 2010; cf. similar pre-GIS work (Clay, 1996a) to combine both internal and external data for community and SIA analyses). Current work is underway in the Pacific Region to develop an interactive GIS tool called the Fisheries Ecosystem Analysis Tool (FEAT).[52]

Many regions have inspected the role of anthropology in Federal fisheries management more generally (Colburn et al., 2006; Allen, 2007; Ingles and Sepez, 2007; Vaccaro and Norman, 2008). Multiple studies are ongoing of new collaborative management efforts (Pinto da Silva, 2006; Pinto da Silva and Kitts, 2006; Kitts et al., 2007; Pollard-Rountree et al., 2008). More broadly, other work, in conjunction with University of Rhode Island Sea Grant Program, has worked to flesh out the "socio-economics" and "governance" modules[53] of the Large Marine Ecosystem (LME) model (Sutinen et al., 2005).

[49]Allen, S. D., and P. Bartram. 2008. Guam as a fishing community. Pac. Is. Fish. Sci. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Pacific Islands Fish. Sci. Cent. Admin. Rep. H-08-01, 66 p. Online at http://www.pifsc.noaa.gov/adminrpts/2000-present/PIFSC_Admin_Rep_08-01.pdf (accessed 10 Mar. 2010).

[50]The Northeast has published some relevant trend data using permit and landings data but no information on fishermen or communities (Polland-Rountree et al., 1998).

[51]Abbott-Jamieson, S., and P. Ingles. In prep. Hurricane Katrina's path: initial devastation and partial recovery in Gulf of Mexico fishing communities' fishing infrastructure. NOAA, National Marine Fisheries Service, Office of Science and Technology, 1315 East West Hwy., Silver Spring, MD 20910.

[52]For more information about FEAT, contact Stewart Allen, PIFSC, 2570 Dole St., Honolulu, HI 96822.

[53]There are 5 modules total: productivity, fish/fisheries, pollution/ecosystem health, socio-economics, and governance (Duda and Sherman, 2002:811).

Another common theme is examining understudied populations such as women, crew, low-income groups, minorities, children, and the elderly (Pitchon and Norman[54]). A series of oral histories is underway of women in the fisheries (fishermen, wives, processing plant workers, and others) by researchers in the Northeast Region (Colburn and Clay, 2009; Colburn and Clay[55]). Analyses of crew experiences are ongoing (Carothers and Sepez, 2005; Allen and Gough, 2006a, 2006b, 2007a, 2007b) while earlier work compared captains and crew (Olson and Clay, 2001). Elsewhere environmental justice issues are targeted (Allen and Gough, 2006b; Tuler et al., 2008).

Other studies discuss questions of property (Clay, 1996a, 1996b) and equity (Clay, 1998b), monitor the sociocultural and economic effects of fishing regulations (Allen, 2007; re: earlier discussion of monitoring projects underway in the Southeast), discuss approaches to the development of MPA's (Griffith et al., 2007); analyze institutions associated with water quantity management to support salmon habitat in Puget Sound (Safford and Norman[56]), and look at humans in the ecosystem (Clay and Olson, 2008; Link et al.[57]).

Not all work examines commercial fishing and enterprises. Subsistence and recreational fishing are also part of the NMFS mandate. Subsistence studies have been undertaken of the Makah (Sepez, 2002, 2008; Etnier and Sepez, 2008), questions of defining what constitutes subsistence (Allen, 2009; Clay et al.[58]) and of the need to include subsistence issues in FMP's (Vaccarro and Sepez, 2003). Other related work explores methods for distinguishing subsistence users from recreational users in the broader regional population (Clay et al.[58]) and the implications of subsistence-type harvesting for recreational policy (Steinback et al., 2009). Recreational fishing catch and effort (Allen and Bartlett[59]) has been studied, as have the economic values of recreational fishing opportunities in Hawaii.[60] Marine tourism has been investigated in studies of swimming with dolphins (*Stenella longirostris*: Hawaiian stock) in Hawaii (Sepez[61]) and of the Puget Sound whale (*Orcinus orca*) watching industry (Russell and Schneidler[62]).

Work has been done on both practical and theoretical issues that present serious challenges to meaningful incorporation of Traditional Ecological Knowledge (TEK) into FMP's (Sepez, 2005; Lazrus and Sepez, 2005), as well as the relationship between indigenous and scientific species naming (Sepez[63]). Social scientists in the Alaska and Pacific Islands Regions have been the most active in this area of research.

The Local Fisheries Knowledge (LFK) project[64], modeled on the Foxfire program in the Southern Appalachian Region[65], was begun in 2003 as an education and outreach project in two Maine high schools. Working with NMFS social scientists and education specialists from the Rural School and Community Trust[66], high school students conducted oral histories of local fishermen and used the information gained in the classroom for local purposes as well as providing transcriptions of the interviews for inclusion in a new agency oral history database (see Voices from the Fisheries, below; Abbott-Jamieson and Isé, 2004; Isé and Abbott-Jamieson, 2005; Abbott-Jamieson, 2007, 2010). Various local efforts have been spurred by this process, including the development of a local heritage center in one of the communities that participated in the LFK Project. This project has also inspired projects in other regions, funded through a variety of sources.

Meanwhile, NMFS is helping lead a coordination effort with other parts of NOAA, including the National Ocean Service (NOS), through establishment of the NOAA Oral History Interest Group (NOHIG). These researchers are also undertaking oral histories in communities in coastal areas, and are documenting the internal history of NOAA by recording the experiences of NOAA's scientists and managers. NOHIG provides a mechanism for sharing methodologies and protocols. We hope to foster the collection of more comparable information and gain from each others' experiences.

[54]Pitchon, A., and K. Norman. In prep. Pier fishing for consumption in Los Angeles county: an overview of demographics, behaviors, and associated risks, 39 p. Contact Karma Norman, NWFSC, 2725 Montlake Blvd., E., Seattle, WA 98112.

[55]Colburn, L. L., and P. M. Clay. In prep. Triangulation and multiple methods in social impact assessment research. Invited submission, J. of Ecol. Anthropol. One of the criteria for selecting persons for oral history interviews is the community taxonomy developed for the New England region described above.

[56]Safford, T., and K. Norman. In prep. Planning salmon recovery: applying sociological concepts to spawn new organizational insights. Submitted to Soc. Nat. Resourc., 27 p.

[57]Link, J. S., J. K. T. Brodziak (Editors) and J. K. T. Brodziak, D. D. Dow, S. F. Edwards, M. C. Fabrizio, M. J. Fogarty, D. Hart, J. W. Jossi, J. Kane, K. L. Lang, C. M Legault, J. S. Link, S. A. MacLean, D. G. Mountain, J. Olson, W. J. Overholtz, D. L. Palka, T. D. Smith (Contributors). 2002. Status of the Northeast U.S. continental shelf ecosystem: a report of the Northeast Fisheries Science Center's ecosystem status working group. Northeast Fish. Sci. Cent. Ref. Doc. 02-11. Online at http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0211/c1.pdf (accessed 1 Mar. 2010).

[58]Clay, P. M., S. Steinback, and K. Wallmo. In prep. Using the marine recreational fisheries statistics survey to estimate regional rates of subsistence fishing., 40 p.

[59]Allen, S. D., and N. Bartlett. 2008. Hawaii marine recreational fisheries survey. How analysis of raw data can benefit regional fisheries management and how catch estimates are developed: an example using 2003 data. Pac. Is. Fish. Sci. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Pacific Islands Fish. Sci. Cent. Admin. Rep. H-08-04, 44 p. Online at http://www.pifsc.noaa.gov/adminrpts/2000-present/PIFSC_Admin_Rep_08-04.pdf.(accessed 13 July 2010).

[60]Contact S. Allen, PIFSC, 2570 Dole Street, Honolulu, HI 96822.

[61]Sepez, J. 2007. Human interactions with spinner dolphins *(Stenella longirostris)* in the main Hawaiian Islands: description and analysis of activities of concern and management options. Rep. to the NMFS Pac. Is. Reg. Office, 50 p. Avail. upon request NMFS Pacific Islands Regional Office, Honolulu, HI.

[62]Russell, S. M., and M. M. Schneidler. In prep. A profile of the people in the U.S. whale watching industry of the Greater Puget Sound, W. NOAA-NMFS Tech. Memo. NWFSC, 300 p.

[63]Contact J. Sepez, AFSC, 7600 Sand Point Way N.E., Seattle, WA 98115, for information on this work.

[64]http://www.st.nmfs.noaa.gov/lfkproject/ (accessed 5 Mar. 2008).

[65]http://www.foxfire.org/ (accessed 5 Mar. 2008).

[66]For more information about the Rural School and Community Trust see http://www.ruraledu.org/ (accessed 3 Mar. 2010).

Social scientists Patricia Pinto da Silva (NEFSC) and Susan Abbott-Jamieson (NMFS-HQ), are leading a NOAA Preserve America Initiative Grant (PAIG[67]) and NMFS Office of Science and Technology funded effort called the Voices from the Fisheries (VFF[68]) project. In collaboration with partners outside NOAA, including academic and non-profit entities, existing marine fisheries oral history collections throughout the Northeast and other parts of the country are being identified for eventual upload or linkage to the redeveloped oral history database first developed for the LFK Project, now called the Voices from the Fisheries Database.[69] The VFF Database is now available to the public, substantially increasing the number of fisheries oral histories available on the web, while improving accessibility through a single portal for marine-focused oral histories collected by multiple researchers. Oral histories provide historical and cultural context and are a way of gaining in-depth information on groups and topics not often covered in broader efforts such as the community profiles. They also offer an opportunity for cooperative research and to improve trust and understanding between NMFS and those in the fisheries. A new Voices from the Fisheries Handbook (Bartch et al., 2009) providing detailed information for those contemplating beginning marine fisheries-oriented oral history projects is now available online.

To foster communication among all sociocultural analysts and economists in the agency Mark Holliday began, and subsequent division chiefs[70] have continued, holding biennial NMFS Social Science Workshops. Agency personnel and some academics, students and contractors working with them present current research. Council members and members of the various Marine Fisheries Commissions[71] are also invited. Some NMFS-staff-only sessions are included to allow for program meetings to coordinate future research and planning. These workshops have been a vital source of cross fertilization among both regions and disciplines.

The social science program has also made extensive use of both graduate and undergraduate students in every NMFS region. Some have been hired as paid interns to work on particular projects, while others have arrived as Knauss Fellows.[72] Some have held research assistantships awarded through their university but funded by research contracts or grants awarded to their faculty advisor to conduct social science research in support of the NMFS social science program. The Northeast and Southeast Regions have utilized their links to the NOAA-funded Living Marine Resources Cooperative Science Center (LMRCSC[73]) consortium, and others are utilizing other agency opportunities to fund mutually beneficial training opportunities for students in hopes of encouraging more students to pursue careers in some aspect of marine fisheries. Some of these programs target minority serving institutions.[74]

Conclusion

At least four points can be drawn from the story we have just told. First, within the NOAA family of line offices, NMFS has created the best developed sociocultural and economic analysis program. Currently about 85 social scientists and economists work for NOAA; about 85% of these work for NMFS. The program has been able to hire a cadre of well-trained, applied research-oriented social scientists from strong programs who have quickly established a notable publication record while working to develop data resources to underpin the research they do to support NMFS's fisheries management mission. Much still remains to be done. More staff and more data collection vehicles are needed, as is more money for research, before the program will be fully developed.

Second, achieving the current sociocultural analysis presence within NMFS has been a slow process. From FCMA passage to enhanced sociocultural social science funding in 2001 was 25 years. Established institutions like NMFS do not change quickly, and they usually do not change at a steady, measured pace, but rather by periods of increased opportunity that allow bigger steps to be taken. Passage of the initial FCMA in 1976, and the subsequent adoption of NS8 in 1996 were events that increased the opportunity for enhancing funding for developing social science within the agency.

Change needs visionaries and champions. This is the third point to be made. Dick Schaefer and Mark Holliday were the visionaries and champions in our story that not only recognized the need for broader agency social science capability, but were also able to acquire new resources that allowed them to hire new social science staff. They were able to achieve their purpose because of their positions within the agency and their

[67]For more on PAIG see http://preserveamerica.noaa.gov/grant.html (accessed 3 Mar. 2010).

[68]http://www.st.nmfs.noaa.gov/voicesfromthefisheries/ (accessed 3 Mar. 2010).

[69]To search the VFF Database, go to https://www.st.nmfs.noaa.gov/pls/apex/f?p=213:1:2340988936153950 (accessed 3 Mar. 2010).

[70]As of 21 Mar. 2004, economists and other social scientists have had their own separate Economic and Social Analysis Division within the NMFS Office of Science and Technology (http://www.ofa.noaa.gov/%7Eames/NOAA_Circs/nc2004/nc04-01.html; accessed 7 Mar. 2008). For more on this Division see http://www.st.nmfs.noaa.gov/st5/index.html (accessed 6 Mar. 2008).

[71]See http://www.nmfs.noaa.gov/commissions.htm (accessed 6 Mar. 2008) for background on these commissions.

[72]John A. Knauss Marine Policy Fellowship, National Sea Grant College Federal Fellows Program, established in 1979, provides a unique educational experience to students who have an interest in marine/ocean/Great Lakes resources and in the national policy decisions affecting those resources. It is open to all students enrolled in a graduate or professional program in a marine- or aquatic-related field at a U.S.-accredited institution of higher learning, and includes social scientists. The fellowship allows students to share their expertise with policy makers in Washington, D.C., and provides a first-hand look at how science is used in the policy arena and how decisions are made.

[73]See http://www.umes.edu/lmrcsc/ (accessed 25 June 2008) for a description of the LMRCSC.

[74]See http://www.education.noaa.gov/students.html (accessed 25 June 2008) for a list of NOAA undergraduate and graduate student fellowships and internships. Though atmospheric and ocean sciences predominate, social sciences are recognized as one of NOAA's basic sciences and social science students are selected for some of these awards.

unrelenting determination. Others like James Acheson, Michael Orbach, and Peter Fricke also made contributions to the process by presenting arguments to management through their publications and presentations, and through constantly pressing the message whenever opportunity presented itself. Peter Fricke was able to do this from within the agency over many years, and was also persistent in the quest to make this transformation come about.

Finally, social science data collection and research helps in making fishery management decisions, but in addition the data have been very useful for evaluating the impact and helping with recovery from Hurricane Katrina. The data resources that are now being assembled will also support future research designed to test theoretical propositions and methodological questions of broader interest to the social and related parts of the ecological natural resource sciences, and policy studies. Good work will find other uses.

In the past eight years, a foundation has been laid for the continued development of a significant body of social science work that supports management of the Nation's living marine resources—NMFS's core mission. NMFS can be proud of what it has created.

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