

Comprehensive Socioeconomic Data Collection for Alaskan Fisheries: A Discussion and Suggestions

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Introduction

In November 2006, the Economic and Social Sciences Research Program (ESSRP) at the Alaska Fisheries Science Center (AFSC) coordinated a working group to address the North Pacific Fishery Management Council's (NPFMC) October 2006 motion to draft a comprehensive program for collecting revenue, ownership, employment, cost, and expenditure data in Alaskan fisheries.

Regional or community economic analysis of proposed fishery management policies is required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), National Environmental Policy Act (NEPA), and Executive Order 12866, and other applicable Federal laws. The goal of the working group was to propose a core set of data that is currently unavailable yet important for answering many of the questions raised when evaluating past and future management decisions, and conducting regulatory and legally mandated analyses.

The working group was comprised of individuals representing the National Marine Fisheries Service (NMFS), Alaska Department of Fish and Game (ADF&G), Commercial Fisheries Entry Commission (CFEC), NPFMC, NOAA GC, and Alaska Department of Commerce (ADOC). As with any working group, there were differences of opinion within the group. For this group, the differences were primarily over the level of detail that should be required in the data collection. However, all involved basically shared the same frustration over the lack of social and economic data and felt that we need to develop a comprehensive program. In an attempt to propose a feasible program and to decrease reporting burden, the suggestions included in this paper are typically consistent with the minimal level of detail/information requested by the group (some individuals or agencies requested that much more detailed information be collected). We will lay out these proposed data collection elements suggested by the working group later in the discussion paper. For now we will focus on the need for improving socioeconomic data collection in Alaskan fisheries.

The Need for Socioeconomic Information in Fisheries Management

Fisheries management focuses in large part on providing an environment that is conducive to healthy, productive fish stocks; a sustainable source of food, employment, and income; and resilient communities – which we will loosely refer to here as “net benefits.” Often times fishery managers are expected to choose among a range of policy choices that each lead to considerably different sizes and distributions of net benefits. If the distribution of the net benefits (i.e., the division of the pie) didn't matter, one would always choose the greatest net benefits (i.e., the biggest pie).

Unfortunately, fishery managers in Alaska consistently know neither the size of the different pies they are asked to choose among, nor the specifics of how each pie will be divided; at present we cannot calculate the net benefits generated within our fisheries and cannot accurately account for all the parties affected by fisheries management decisions. To improve our decision-making

capability we therefore need to improve (1) our ability to account for the relevant parties whose net benefits are affected by Alaskan fisheries; and (2) our knowledge of the elements that comprise each party's net benefits. By better encompassing the appropriate group of stakeholders for whom net benefits should be considered and improving the precision of calculated net benefits, we can provide fishery managers with a significantly heightened ability to evaluate the trade-offs associated with different policies and management actions.

Let us now discuss in turn the way in which one may improve items (1) and (2) above. For item (1), the October 2006 Council motion and SSC and AP minutes clearly express a need to consider not only the harvesting sector (for both catcher vessels *and* catcher-processors), but also the shoreside processors, motherships, crewmembers, and communities. Similarly, for item (2) the Council provides specific guidance on the additional components of net benefits that will need to be collected: revenue, ownership, employment, cost, and expenditure data. The SSC also asked for a detailed description of social data and the types of performance studies that could be developed from such data, while the AP adds a request for information on both crew and processing workers, the geographic distribution of expenditures, and how they contribute to the benefits and/or regulatory impacts on fishing communities.

It is important to note that one of the primary reasons we cannot currently conduct these analyses is that nearly all socioeconomic surveys of Alaskan fisheries to date have been conducted (with very little success) through voluntary reporting. There has been broad industry reluctance to provide these data, typically because of fear that the data would somehow be used against submitters (e.g., to levy enforcement penalties based on profits, or to show how much or how little money a sector or fleet is making in allocation disputes), used incorrectly, or disclosed to competitors or the public. These are reasonable concerns on the part of industry, but we believe there are solutions to these concerns that can be feasibly incorporated into the data collection program to overcome them. However, we feel it is important to emphasize that voluntary economic data collection is not a viable option in Alaska. Dozens of surveys of various lengths and level of detail have been developed by NMFS and other researchers for nearly every sector, yet the information we need is still unavailable. For the most part the only industry cooperation has been with private contractors who were working on behalf of the harvesters or processors (often bringing the accuracy of the data into question because of the underlying incentives). Only recently in the BSAI crab and the Amendment 80 rationalization programs has socioeconomic data collection been mandated, and it is only in these fisheries where we will be able to conduct truly satisfactory economic analyses. It is therefore our opinion that only with a comprehensive mandatory data collection program can we provide the accurate information required for the analyses requested by decision makers for the various Alaskan fisheries.

The task of the working group was to evaluate the existing data collection programs and to make specific suggestions for improving the information content in the aforementioned categories of interest. For some of these categories data are almost entirely unavailable, whereas in other categories we merely will note slight or potential deficiencies in the currently available data to address particular questions.

In the next section we provide a detailed discussion of the specific types of information that could be collected to address common management questions, along with suggestions regarding what should or could be collected. The subsequent sections discuss approaches for collecting data, identifying data collection frames (census versus sampling) and the relevant populations and reporting entities, data confidentiality, and the linkages between economic and social analyses. We also include brief discussions on the use of fish oil and the collection of cold-storage data, as per an SSC request in the October 2006, minutes.

Suggested Data Elements to be Collected

1. Cost Data

The greatest deficiency in our ability to estimate net benefits in Alaskan fisheries, or understand the effects of various management actions, is our ignorance of the costs incurred by harvesters and processors to harvest and process fish. Without an understanding of the magnitude of production costs, in the best case scenario (such as when only one action is occurring and is unambiguously beneficial to all parties) we can only postulate the direction in which net benefits are likely to change. However, in most instances different parties are affected in different ways, and we are unable to weigh the costs imposed and benefits created by a particular action.

For purposes of this discussion let us distinguish two types of economic costs: variable and fixed. Variable costs are goods or services whose costs are directly affected by the amount of fishing or processing that occurs. Three broad types of inputs that comprise variable costs are fuel/energy, labor, and “materials.” Although the materials used in harvesting are somewhat fishery specific, they usually include gear (such as line, nets, or pots), bait, and ice; standard processing materials include raw fish, product packaging, and additives.

Many of the management issues that arise have potential impacts not only to revenue, but also to variable costs of harvesters and processors. For example, how might a change in the total allowable catch affect the costs, and thus net benefits, arising in a fishery? Or what will be the cost of closing areas to fishing due to excessive bycatch, marine mammal concerns, or related issues? To address such questions, analysts must have some estimate of the variable costs associated with these closures, including costs incurred by vessels from having to travel to alternative locations and spend additional days at sea. Thus, knowledge of fuel costs (a large portion of vessels’ overall expenditures) is essential to respond to these and many other related questions.

Labor costs are also quite relevant to examining such questions, as they too comprise a large portion of vessel operating costs. Aside from serving as an indicator of how crew expenditures may contribute to local economies (discussed in a subsequent section), knowledge of the labor costs in harvesting and processing is important for assessing changes in production efficiency afforded by management actions aimed at achieving that end. For example, if a management change encourages vessel consolidation in overcapitalized fisheries, one may see a decrease in the number of vessels and crewmembers required to harvest the TAC. An ability to quantify the reduction in fuel and labor costs associated with landing that TAC would represent a large improvement over our current ability to quantify the effects generated by a management action. Similarly, if relaxed processing caps allowed a plant to achieve greater economies of scale, one could examine the way in which unit costs were reduced.

Maintaining and repairing a fishing vessel or processing plant (the “capital stock”) can also be a significant expense to a fisher or processor. It is outlays on “fixed costs” such as these (and other investments in new equipment) that individuals often struggle to recoup during the year through the volume of their fishing and processing activities. Thus, many of the measures and models used to evaluate economic performance require some measure of the capital stock and information on how this stock has changed over time (through repairs or investments and depreciation).

For vessels the capital stock may be proxied by the value of the vessel and equipment onboard, or more commonly, by vessel characteristics (such as length, tonnage, or horsepower). However, it is unlikely that such crude measures will perfectly characterize the underlying productive capital

stock – especially in an era in which technological advancements play such a large role in a vessel’s ability to target and harvest fish (e.g., sonar, route tracers, global positioning systems, and onboard computers). It can be even more difficult to quantify the capital stock for plants, as the size of the plant will rarely be an accurate representation of the processing, freezing and storage equipment within it. Similarly, the value of the plant may reflect other assets on site, such as worker accommodations (boarding facilities, cafeterias, etc.). Even with these interpretational difficulties, the fixed costs such as insuring, repairing, maintaining, or improving one’s capital is a costly undertaking that should be tracked to adequately account for the economic returns of a fishing or processing operation.

Given all the different costs associated with operating a vessel or plant, and the burden associated with reporting the information, a natural question to ask is “for which costs does one really need to account?” In order to get a rough estimate of financial stability or economic returns of a fleet or processing sector it is important to account for the major costs and revenues associated with harvesting or processing, respectively. In many cases, however, the financial well-being of an entity (attributable to their overall seafood industry endeavors) will be determined by more than one vessel or plant – it is the cumulative effect of all their fishing-related operations¹. We bring up this point here (and again in the ownership section of this paper) to illustrate that it may not be possible to calculate the “profit” made by a fishing vessel or plant even if one accounts for all of the costs and revenues. There are likely to be costs of doing business (offices, staff, accountants, etc.) that are spread among all the operations in a company that cannot be tied to a vessel or plant. Thus, even if one accounts for every single variable cost associated with harvesting or processing, and requests comprehensive financial statements and data on ownership, the accuracy of measured “profits” is likely to be illusory. Thus, we believe such a goal is not realistic and the costs to all involved would likely be prohibitive.

In our opinion, the most prudent approach to a broad data collection effort may therefore be to account for the primary costs incurred by a plant or vessel (rather than formulating an exhaustive list) and to examine how these costs and the plant or vessel revenues change over time or in response to a management action. Such analyses will in many cases allow the Council to address the questions for which they seek answers, and to get a reasonable estimate of change in net benefits generated by plants or vessels arising out of a management action. Exact estimates of the profit earned by a vessel or plant will not be possible with this approach, but for most questions such precision is not necessary.

Suggestion:

We suggest the following set of cost data (or input data that relates to costs) be collected annually, by fishery (where possible), for plants and vessels: 1) Vessels: permit and harvesting (including CDQ) quota costs and royalties paid; crew earnings; costs of insurance, gear and line, bait, fuel, food and provisions for crew, moorage and gear storage; improvements in vessel, gear, and equipment; repair and maintenance; and vessel overhead. 2) Plants: permit and processor quota costs and royalties paid; number of processing positions; total man-hours devoted to processing; labor costs; annual sales volume and value (with grade details) for each processed product; and the cost of packaging materials, insurance, storage, fuel/electricity, improvements in plant, repair and maintenance, salaries to foremen and plant managers, and other plant overhead.

¹ As we discuss in other parts of this paper, ownership data are required to pull together the various pieces for an “overall” view of an owner and how he/she has been affected.

2. Revenue Data

In contrast to cost data, revenue data are currently available at both the ex-vessel and first-wholesale level. However, while we are concerned about potentially duplicative data requests, both sources are subject to limitations that should be noted and potentially remedied.

The ex-vessel revenue collected through fish tickets at the time of landing does not include the adjustments and bonuses that are often paid to fishers at a later date. For this reason, fish tickets tend to underestimate the revenue received by vessels. The CFEC does use data from the Commercial Operators Annual Report (COAR) to update the revenue information reported in fish tickets, but the corrections are based upon annual revenue totals, and thus may not be used to identify price differentials within the season that reflect roe bonuses or other types of post-fish ticket adjustments. Additionally, in programs with a variety of share types, shortcomings in identifying revenues by share type may exist (i.e., in BSAI crab we don't have A share/B share/C share/CDQ revenue separated). Therefore, there may be benefits from augmenting the existing data collection program to better account for seasonal price differences, or from explicitly requesting a complete revenue data profile in the new comprehensive data collection program.

One shortcoming of the first-wholesale data is that many products produced in Alaskan fisheries are differentiated by grade. Prices can differ substantially, for example, for different grades of surimi or roe. In order to differentiate price changes from changes in product quality (which often arise from changes in fishery management such as rationalization) one needs to account for the various product grades and relevant prices (this same concern exists for ex-vessel records, but to a lesser extent).

In addition, the processing revenue data are recorded at an annual level and therefore do not provide any indication of the way in which prices fluctuated within the season. Inability to observe the way in which prices fluctuate throughout the year prohibits analysis of the processors' decisions concerning species and product forms in response either to changing market conditions or to a management action that would change the temporal distribution of catch. We also should consider whether we need to distinguish sales to affiliates from non-affiliates.

An additional limitation on revenue data is that there are sources of income that affect an operator's ability to remain financially viable, such as chartering or tendering, for which we do not currently account. Another potentially large and important source of income is royalties associated with the sale or lease of limited access privileges (e.g., CDQ, IFQ, and IPQ). Any comprehensive data collection program that seeks to understand the benefits generated within a fishery should account for both a firm's sales revenues and royalties. Similarly, if one is seeking to compute the overall revenue stream accruing to the owner of a vessel or plant during a year, one should account for all alternative sources of income. To fully account for revenues from sales or lease of quota shares requires that all quota holders report. Since not all quota holders are vessel or plant owners, data collection efforts must include quota holders not included in vessel- or plant-level data collection.

Suggestion: The workgroup recommended that because of the shortcomings of existing revenue data collection, and the alternative sources of income other than ex-vessel sales, revenue data be included in a comprehensive data collection program. For Vessels and Quota Holders: Ex-vessel sales revenue should include post-season adjustments and bonuses in order to better reflect true market prices. The grade of delivered fish, where applicable, should be included in order to differentiate grade-specific prices. In fisheries with CDQs or IFQs, revenues from the sale and/or lease of quota should also be included (by share type). The Council may also wish to track revenues from tendering and chartering in fisheries where such activities are thought to comprise

a significant portion of vessels' annual income and may need to be considered when analyzing the effects of other fishery management actions. For processing plants: First wholesale sales revenue should be reported by species, product, and grade or size (where applicable) to facilitate a clearer understanding of observed prices and to help analysts better understand changes in processing strategies.

3. Employment Data

Some of the most important questions pertaining to the impacts of a particular fisheries management action involve the way in which the number of jobs, jobs in a particular location, or the income received by such employees, will be affected. Wage and salary data are collected from fish processors on a monthly basis, producing data that are sufficient for analyzing variations in income and employment in the processing sector. Employment data for the harvesting sector, however, is a critical data gap; because harvesting crew members are considered independent contractors, Alaska Department of Labor (ADOL) does not require employers to provide income and employment information for these individuals. The result of this information gap is an inability to accurately quantify the number of harvesting jobs in a sector or fishery, predict how the number of jobs may change in response to a management action, and specify the communities in which the impacts will be most heavily concentrated.

Given the scale and importance of the seafood industry in many Alaskan communities, generating greater than half of total employment in some communities, improving the understanding of employment effects of Council management decisions is a priority component of a comprehensive economic data collection program. The need for this information is especially acute in situations where management changes are likely to cause considerable consolidation or contraction of the industry (e.g., BSAI crab). An understanding of both the magnitude and rate of consolidation is important for devising effective and appropriate management actions if the degree of consolidation is inconsistent with the desired program goals.

The Southwest Alaska Municipal Conference (SWAMC) recently organized a workshop of Federal, state, and local government agencies and other community stakeholders (including most of the members of the AFSC working group convened for this discussion paper) to address the needs for harvesting sector employment information and potential approaches to collect these data. In addition to analysis of income and employment impacts of fishery management decisions, the SWAMC report (Northern Economics Inc., 2007; attached as Appendix X) identifies other important needs for harvesting employment data. Perhaps most notable is the lack of documented history of crew member participation in fisheries. Whereas data collected through CFEC document the historical participation of harvesting vessels and processing plants in Alaskan fisheries and have provided the basis for distribution of limited access privileges to these vessel and plant owners, no such documentation exists for harvesting crews. This asymmetry presents a barrier to incorporating crew members into limited access privilege distribution programs on a similar basis with owners. Another significant concern raised by SWAMC is the effect that poor information on harvesting employment at the community level has on documenting community economic structure. This impedes the ability of communities to develop comprehensive plans and compete against communities with better employment data for important economic development resources in the form of grants and Federal trade adjustments. In addition, recent amendments to the MSA require communities that participate in future limited access programs to submit a community sustainability plan to the Council.

Existing Employment Data Collection Programs

Information on harvesting crew members and processing employees can be divided into two principal components: 1) income and employment information associated with harvesting and processing activities, by fishery, location, and other strata, and 2) demographic information on individuals who are employed in commercial fisheries. Details regarding the data elements collected and the data collection frames are discussed below.

Income and employment

As noted above, ADOL collects monthly employment data and uses quarterly earnings data to compute monthly earnings estimates for processor employees. However, monthly employment represents a count of jobs as opposed to individual workers. It is not an unduplicated count of the number of individuals because workers holding more than one job or who change jobs during the measuring timeframe (the pay period that includes the 12th of the month) may be reported by more than one employer. For these reasons, the data may not be representative of the number of individuals typically employed (especially if there are peaks or troughs in processing volume during the month due to seasonal fisheries). In addition, monthly earnings data may include remuneration for work done in previous time periods since date of payment rather than date of service is the determining factor.

Annual data collected from processors in the BSAI Crab economic data report (EDR) include average number of crab processing positions, total man-hours, and total processing labor payment reported by fishery, and total salary and number of other plant employees not included in processing labor². The Amendment 80 economic data collection for the H&G factory trawlers, which has not yet been formally approved, is more narrowly focused on monitoring vessel costs and earnings. It records costs of processing and other labor, annual average and total number of employees in processing, harvesting, and other activities, and average length of workday for processing employees. These figures are not broken out by fishery.

By contrast, very little primary data are available from direct monitoring of harvesting crew income and employment (except in BSAI crab and the pending Amendment 80 fishery economic data reporting programs). ADOL does provide useful labor and income estimates on an ongoing basis, but these are constructed using internal rules of thumb about crew size and crew shares and are not based on direct observation. The BSAI Crab EDR for catcher vessels directly elicits the total payment to captain and crew, and total number of paid crew members, by fishery. In addition to share payment information, catcher vessel owners are also required to report expenses that are deducted or directly charged to crew members (thus allowing us to better understand the share system and how it may change with the advent of CDQ or IFQ), and are required to record the ADF&G commercial crew license number or CFEC gear operator permit number and residence for all paid crew (including captain). As noted above the draft Amendment 80 EDR collects data on average and total number of harvesting employees during the reporting year, and total cost of non-processing labor. These figures are not broken out by fishery and no crew license information is collected.

Employee demographics

Demographic information about individuals employed in Alaskan fisheries is currently collected through a variety of state and Federal agency reporting requirements. Wage and employment data reported by processing plants includes SSN for each individual covered by unemployment

² Feedback from processing sector EDR submitters indicate that they approximate by-fishery figures by converting annual hours attributed to processing catch from a given fishery into number of FTEs. While this is an approximation, it provides somewhat greater detail than the figures collected by ADOL.

insurance. Demographic information from the Permanent Fund registry is used by ADOL³ to conduct demographic and community level analyses of processing plant income and employment changes within Alaska. These data or analyses do not address implications of processing employment of non-residents. BSAI Crab EDR reporting includes information on processing employees' residence, including city for Alaskan residents and state or country for non-Alaskan residents. It should be noted that feedback from processing sector EDR submitters indicates that the information they report in the EDRs is often incomplete – for many employees, they do not have access to complete residency information. Aside from the difficulty associated with collecting and reporting this information for potentially hundreds of employees, there are also potential accuracy problems with interpreting employees' actual residence from their reported mailing addresses.

The sources for most information currently collected on individuals employed in the harvesting sector are ADF&G commercial crew license and CFEC Commercial Fishing Permit (also known as gear operator permit) databases. These data are collected from all individuals who participate in the commercial harvesting of marine resources in Alaskan waters. For the purpose of commercial crew licensing, anyone who participates either directly or indirectly in harvesting is defined as harvesting crew; this includes technicians, engineers, cooks and others who may not operate fishing gear, but support the operation of the vessel for the purpose of harvesting. Individuals employed solely for on-board processing are not included in this definition. Data collected annually from crew license and operator permit applicants include name, social security number (SSN), mailing address, physical address, Alaska residency status, US Citizenship status, and birth date. With the exception of nationality and education, the data elements collected in the license and permit databases include all demographic information identified by the working group as necessary for socioeconomic analyses.

Alternatives for comprehensive employment and demographic monitoring

A comprehensive system for monitoring employment in Alaska fisheries must integrate both participation and demographic information and include both harvesting and processing sectors. In the existing data collection programs reviewed above, demographic information is self-reported by the individuals working in the industry, either through industry-specific data collection or through data-sharing with other agencies and leveraging data collected for other purposes. In contrast, information on participation and earnings are reported through monitoring at the workplace, e.g. through plant- and vessel-based reporting. This is an effective structure that distributes reporting burden to entities most able to provide the relevant information, and one that should be preserved in a comprehensive monitoring effort. An additional objective in designing the data collection programs is to minimize the total reporting burden by avoiding duplicative data submission. To some extent, achieving this objective will require coordinating with other agencies to modify and leverage existing data collection programs.

As the preceding discussion indicates, the principal gap in employment and income data is in the harvesting sector. The most detailed information on crew employment and earnings is currently collected only in the EDRs used by the BSAI crab and Amendment 80 fleets. Crew counts are being collected in the fisheries covered by the new eLandings system, which is currently mandatory for the crab fisheries and will be so for groundfish in 2008. While the level of detail at which to collect harvesting labor data across the other fisheries under Council jurisdiction

³ Employer wage and salary reports and the Permanent Fund registry are linked using employee social security numbers. Due to the sensitivity of SSN data, ADOL will not release disaggregated data to other agencies.

depends on the analytical and management questions to be addressed, experience suggests that this information will most efficiently be provided through mandatory vessel-level reporting.

Harvesting sector employment and participation can be most accurately monitored across all fisheries if vessel-level participation for individual crew members is indexed by a unique individual crew member identifier. One alternative would be to require vessel-level reports to provide social security numbers for all individuals contributing harvesting labor to the vessel. SSN could then be used to associate participation data from multiple vessels and over multiple years to construct individual crew member histories and track patterns of employment between fisheries.

An alternative to using SSN as the common identifier for vessel-level crew participation data is commercial crew license and gear operator permit numbers. As noted, these have the advantage of being associated with a nearly-sufficient and readily available source of demographic information for analysis of harvesting employment at the regional or community level. While the CFEC process for gear operator permit registration provides a persistent, unique identifier for permit holders, the ADF&G process for issuing commercial crew licenses would require significant changes that are beyond Council or NMFS jurisdiction to implement. The SWAMC report identifies a range of options for amending the administration of the crew licensing program to address the need for a permanent license number as well as improve the accuracy and reliability of the data collected. The full range of options is beyond the scope of this discussion paper, and decisions regarding if and how to proceed with any changes in the licensing system are within the jurisdiction of ADF&G. However, given the importance of improving harvesting employment information to local and state government in Alaska, the potential benefits of limited modifications such as permanent license numbers appear to be significant. As an additional alternative, all individuals wishing to participate in Federal fisheries could be required to register with NMFS Alaska region and receive a permanent Federal crew license. This would avoid reliance on SSN, which is problematic for reasons associated with identity theft concerns and Federal records management, and could be implemented independent of other agency cooperation.

Limiting reporting to fisheries under Federal jurisdiction will provide data largely sufficient for analysis of employment and income effects directly resulting from Council decision-making. It should be noted that omission of non-federally managed fisheries in Alaska leaves data gaps for some of the broader fisheries employment issues identified by SWAMC. Although it lies beyond Federal jurisdiction to mandate, one alternative identified in the SWAMC report is worth noting. The report proposes integrating crew member participation monitoring into the Interagency Electronic Reporting System (IERS)/e-Landings system to monitor crew participation at the fish-ticket level ("Path 4" in the SWAMC report). This would provide the highest resolution data on crew member participation in harvesting activities in both state and Federal fisheries, and would provide data directly comparable with that used to develop vessel histories. This system, however, would not provide data on the payments made to captains and crew for harvesting activities, non-harvesting labor (e.g. gear maintenance, tendering), and other labor payment details. Collection of these data would still require annual or seasonal reporting at the vessel level across all fisheries under state and Federal jurisdiction.

Suggestions:

1. Identify the potential to work cooperatively with ADF&G to make the commercial crew licensing process more amenable to the development of an electronic database containing permanent individual identifiers. This would include
2. Implement vessel-level reporting requirements for harvesting labor participation and income similar to that included in the BSAI Crab EDR. As described in the Cost Data section above, vessel-level reporting must include costs of labor inputs. Employment specific variables should include individual-specific identifiers (SSN, crew license number, gear operator permits number, or other). In fisheries where the nature of compensation is likely to change as a result of rationalization, the Council may also wish to request information on share percentages and deductions. EDRs for harvesting vessels should indicate the fisheries in which individual crew members worked to permit development of crew participation histories in individual fisheries. If suggestion 1 is successful, no further demographic information beyond individual crew member identifiers should be reported at the vessel level to reduce reporting burden.
3. Implement plant-level reporting on processing labor income and employment. Variables to collect would include total man-hours of processing labor employed at the plant, average number of hours worked by processing line employees, and total labor payments for processing workers. Fishery-specific data are preferred to annual totals for fisheries where such information could be collected accurately. Due to the large number of processing employees at many plants and the difficulty of collecting demographic information about individual employees from plant managers, we recommend that information such as residency of processing employees not be recorded, or at most, be recorded only for "local" employees. If however, the Council wishes to track residence information or processing employees on a basis similar to that proposed above for harvesting sector employees, a significantly larger reporting burden will be imposed on processors due to the large number of employees for whom they will need to account. This data could be collected by the processing plant management or provided by processing plant employees through an additional data collection instrument.

4. Expenditures in Coastal Communities

Although many of the regulations governing fisheries pertain to harvesters and processors, these entities are closely tied to the communities in which they operate and their employees reside, and to the businesses that facilitate their activities. Thus, in evaluating the impacts of an action, analysts must often look beyond the immediate impacts on harvesters and processors to gauge the likely overall impact on the local economy (direct fishing and processing, and support businesses) as a whole. In particular, National Standard 8 (MSA Section 301[a][8]) explicitly requires that, to the extent practicable, fishery management actions minimize economic impacts on fishing communities. To satisfy these mandates and inform policymakers and the public of the likely regional economic impacts associated with fishery management policies and actions, economists need appropriate economic models and data. Although a suite of regional economic models for analysis of fisheries exist, reliable data on fisheries-related economic sectors necessary to implement the models is either unavailable or unreliable. The absence and/or deficiencies of these data have severely limited development of viable regional economic models for fisheries.

Regardless of the model employed, much of the data required for regional economic analysis of fisheries reside within IMPLAN (IMPact analysis for PLANning). However it is not advisable to use unrevised IMPLAN data for analyzing fishery industries in the U.S. for several reasons.

First, IMPLAN applies national-level production relationships to regional industries, including fisheries. While this assumption may not be problematic for many regional industries, use of average production relationships may not accurately depict regional harvesting and processing technologies. Therefore, to correctly specify industry production functions, it is necessary to obtain primary data on harvesting and processing sector expenditures through economic surveys. In addition, since much of the intermediate inputs used by harvesting vessels engaged in fishing in Alaska waters are imported or purchased from various different locations, detailed information on vessel expenditures by location is also needed. If economic impacts are calculated assuming that all these goods and services are supplied by local businesses, regional impacts will be significantly overestimated. Only those expenditures made within the study region will generate positive economic impacts for the region.

Second, the employment and earnings of many crew members in the commercial fishing sector are not included in the IMPLAN data because IMPLAN is based on state unemployment insurance program data which excludes “uncovered” employees such as contractors, the self-employed, and casual or part-time workers (i.e., typical crew members). Thus, IMPLAN understates employment in the commercial fishing sectors. Therefore, (as discussed in the previous section) it is necessary to collect or estimate the employment and labor earnings information for the harvesting vessels. Processing sector data is also problematic stemming from the nature of the industry. Geographical separation between processing plants and company headquarters often leads to confusion as to the actual location of reported employment. In estimating the employment for harvesting and processing sectors, it is also necessary to identify the residence of crew members and processing workers to estimate the leakage of labor income outside of Alaska. Some labor income will stay in the region, since nonresident workers may spend some of their income there. However, most of nonresidents’ labor income will likely leave the region. The Alaska Department of Labor and Workforce Development (ADOL) regularly estimates nonresident employment and labor earnings for over 100 industries and state and local governments, but the estimates of employment and labor earnings for the harvesting industry are not reliable (as the non-resident analysis definitions mandated by the U.S. Bureau of Labor Statistics include only workers covered by unemployment insurance, which will bias the numbers downward for contractors such as harvesting crew). The analogous estimates for the seafood processing (food manufacturing) sector are much more reliable, although the issue of whether employment figures representing only one pay period during the month are truly representative remains open.

Finally, fishery sector data in IMPLAN are highly aggregated; there is only one harvesting sector and one processing sector in IMPLAN. Typical fishery management actions involve changes in the harvest of certain species and/or changes in catch by certain types of vessels. Therefore, models using aggregate data cannot estimate the potential impacts of fishery management actions on individual harvesting and processing sectors. To estimate these types of impacts, the IMPLAN commercial harvesting sector must be disaggregated into subsectors by species and vessel types. This requires the aforementioned expenditure (intermediate inputs), employment, and labor income data to be collected in a disaggregated manner by species- and vessel-type.

In addition to these data requirements occurring from deficiencies of IMPLAN data, other important data must be obtained. Even if the total capital income of (or the profit earned by) vessel owners could be estimated, the leakage of capital income out of Alaska cannot be estimated accurately with currently available ownership data. To estimate the leakage of capital income, it is necessary to identify the place of residence of the owners of harvesting vessels and processing facilities. Since many of the harvesting vessels operating off Alaska are owned by

residents of Washington and Oregon, and many processing facilities are owned multi-nationally, it is likely that most of the capital income earned by these vessels will leave Alaska.

If the above-mentioned data are made available it will be possible to generate the following types of analyses for fishery-dependent boroughs (census areas), regions, the state of Alaska, and the lower 48 states:

- (a) Estimates of the contribution of each fishery to each fishery-dependent borough and census area, each region, and the state of Alaska, by examining direct, indirect, and induced effects of the seafood industry.⁴
- (b) Estimates of the static and dynamic (i.e., current and future) impacts of fishery management actions on fishery-dependent boroughs and census areas, regions, and the state.⁵

Unfortunately, our experience in attempting to gather information on fuel, bait, repair and maintenance, and capital improvement expenditures in the BSAI crab fisheries has shown us that significant hurdles exist in accurately accounting for the location of expenses. First, the invoices used by the individuals filling out economic data surveys to track the location of purchases often reflect the location of the business owner's billing office (e.g., Seattle) rather than the point of sale (e.g., Dutch Harbor). Problems such as these often arise because the skipper or other individuals that made purchases (and are familiar with the locations where they buy fuel or food) are not the parties that fill out the economic surveys; typically accountants or other company employees perform such duties using available financial records. Getting accurate location-specific purchase data thus requires a degree of coordination and communication that may not be feasible or likely to be undertaken by those filling out economic surveys. Second, industry members have conveyed that it is time consuming and very cumbersome to account for the location of all of their purchases. We tend to agree that it is not realistic to expect businesses to report every expenditure and the place in which it occurred. However, we recognize that of all the socioeconomic information desired by various stakeholders, the link to Alaskan communities is perhaps the most requested.

The solution to this problem is not entirely clear. Perhaps an alternative approach could be undertaken in which the communities themselves help to provide such information. For example, a business could ask their customers to report the vessel ID during purchases, which could then be used in conjunction with sales data and our landings data to examine which vessels or fisheries are most closely linked to the support industries (a simpler though less precise option is for businesses to ask for the fishery in which the supplies will be used). One could then monitor the changes in sales/support revenue generated by a fishery over time. The problem with this approach is that we do not have the authority to compel businesses or communities to provide this information. Additionally, purchases often apply to multiple fisheries. While it may be in their collective interest to do so, at the individual level it may be seen as an annoyance or rejected so as to not annoy customers concerned over privacy. It is also possible that customers may appreciate

⁴ These types of analysis can be conducted using models such as an input-output (IO) model or a social accounting matrix (SAM) model.

⁵ Specifically, it is possible to estimate the impacts on major regional economic variables including (i) employment and labor earnings (by harvesting and processing subsectors and by residency), (ii) capital income and its leakage (by harvesting and processing subsectors), (iii) similar variables in the other industries (non-fishery industries), (iv) household income by household type, (v) government expenditure and revenue, and (vi) welfare changes for households. These types of analyses can be conducted by a computable general equilibrium (CGE) model.

efforts to document the importance of their purchases, but it is difficult to know which sentiment will generally prevail. In addition, the regional economic impacts calculated with such an approach may still mischaracterize the full impacts of a fishery without supporting information on employment, labor earnings, and residency (for the reasons given above). Because of the complicated nature of compiling this information, and the broad-based support we've observed for its collection, it may be desirable to form a group to further investigate community-based data collection and the extent to which it would be supported by local businesses or municipalities.

Suggestion: The level of fisher and processor burden, and complications associated with recording the location of all purchases, in conjunction with the limited jurisdiction of NOAA and the NPFMC in obligating communities to report information pertaining to fishery expenditures and support services, suggests that neither harvesters and processors nor the communities will be able to shoulder the full data-reporting needs. Therefore, a collaborative approach could prove the most fruitful; the communities dependent upon or engaged in fishing or processing should work with industry and the management agencies to devise a plan for documenting the way in which fisheries and communities are interrelated. Where possible, fishers and processors should be compelled to provide basic (but limited, fishery-specific) information on labor expenditures, as well as the city or port in which they purchased a majority of their fuel and supplies, and had major work performed on the vessel. The data elicited in the EDRs by plants and vessels could then be used in conjunction with the community data to examine fishery-specific management questions, and possibly serve as a check on the accuracy of the voluntarily submitted community data (in terms of the quantity or value of support services claimed to be provided in an area).

5. Community Data

Socioeconomic analyses of fisheries and fishery management policies include analyses of impacts on communities. Communities often participate in the public aspects of policy-making, and National Standard 8 of the MSA ensures that community impacts will be considered. There are some data available for community-level impact analyses (landings, fishing permits, vessel ownership, Census data, and infrastructure) but there are four major areas in which the available data are inadequate. These are industry cost structure, fisheries labor (crew and processing workers), vessel-port connections, and community services. The first three are discussed in other sections of this document. Given how important these parameters are in determining actual affects of regulatory action on individual communities, the lack of information is a real handicap to analysts.

Suggestions for the collection of cost and labor/employment and vessel-port connections are included elsewhere. Any mandatory data collections as suggested above will likely include adequate data to apply to community-level analyses. It should be noted that although these data are not collected *from* communities, by including community information they provide the basis of analysis *of* communities. For community-level analyses to be accurate and useful, information collected must have reliable data on home community connections (residence, headquarters, etc.) and working community connections (ports of call, processing work locations, etc.).

For connections between vessels and ports and support sector services, however, it has been suggested that communities themselves might be a better source of information. This presents an interesting possibility along with a number of concerns. Primarily, it is not likely that Council has the authority to compel mandatory data collection from communities. However, communities may have more of an incentive to participate in data collection than industry, making a voluntary survey more viable.

Whether mandatory or voluntary, it would be a large undertaking with hundreds of communities, including many outside of Alaska that have working connections to Alaska fisheries. One major problem that would need to be confronted is the issue of who represents the community and could answer the survey. In Alaska, communities are complicated multi-jurisdictional places with city and tribal governments having political representation functions, regional and village corporations having resource stewardship functions, and quasi-governmental non-profit agencies providing many social services. In a recent request for feedback from communities in Alaska by the Alaska Fisheries Science Center, 296 organizations were contacted as representatives of 136 communities. About 15% responded, representing 44 communities (Package and Sepez 2005). Unlike vessel owners and permit holders, there is no consolidated source for the correct contact information for community entities and simply assembling the mailing list is a major undertaking. Nonetheless, it could be accomplished, especially given clear guidance on which types of communities and community representatives to contact.

Suggestions for data to be collected from communities (whether mandatory or voluntary) have been offered by a number of participants (analysts, agencies, and the AP) and include the following topics:

- Number of functional slips per vessel size
- Number of vessels by type (length class, gear type) of commercial fishing vessels homeported⁶
- Number of days and vessels by type (length class, gear type) of commercial fishing vessels using slips per season
- Notable changes of harbor and slip uses from previous patterns (narrative)
- Number and types of services available in port (fuel, groceries, parts, repairs, non-food supplies, entertainment, cleaning, shipping, etc.)
- Number of fisheries (or marine) specific support businesses (bait, net-mending, boat repair, tackle)
- Fishing festivals held in the community
- Fish tax dependent services or scholarships

Much of the community data regarding vessels and use of services would be collected with a finer resolution in vessel surveys as part of the suggested mandatory program than could be collected from communities. Of the remaining information, specific information about fisheries support businesses may be the most valuable to analysts.

Social scientists at NMFS headquarters have discussed the possibility of encouraging NMFS Science Centers to collect information about fisheries infrastructure for all fishing communities (as seen in the Gulf Coast fishing community profiles available at <http://sero.nmfs.noaa.gov/economics/economics.htm>). The preferred method for collecting this data is direct observation. However, with the expense of traveling to Alaskan communities by air, the collection method for Alaska would likely vary by community (mostly by telephone). Alternatively, much of the information could potentially be collected or reported by harbormasters or port administrators. These individuals are typically municipal employees and responding to NMFS requests for these data would be largely consistent with job duties.

⁶ It should be noted that the data on “homeport” available from vessel registration files do not reflect the vessels’ actual use of ports. In fact, it does not even necessarily reflect a place the vessel has ever been, as the registrant is free to list whatever location they like. We have not found this data to be useful in community-level impact analyses.

Suggestion: Most data relevant to community-level expenditures will be more accurate and detailed if it is collected from fisheries participants, rather than from communities. The workgroup does, however, suggest that supplemental information be collected through voluntary harbormaster surveys, or field work by NMFS researchers, based on the categories listed above..

6. Ownership Data

Many of the economic performance measures that are computed using the cost, revenue, and employment data discussed in this paper focus on the production process at the level of the vessel or plant. Examples include measures of capacity utilization, productivity, and various notions of efficiency. Focusing on the production process at the level of the vessel or plant allows the analyst to identify the link between inputs used to catch or process fish and the quantity of fish or product forms obtained, respectively. Characterizing this link, and how it changes, is a key part in assessing the changes in economic performance that arise in response to management actions. However, because the production activities of one vessel or plant may be only one component of a firm's overall business structure, instances arise in which the firm (which may own one or more vessels, plants, or both) is the natural unit of observation. As such, understanding the ownership structure of firms and the vessel, plant, and access privilege assets they hold can be important to analysis of fixed and firm-level operating costs of ownership entities and distribution of revenues accruing from the use of these assets.

An additional need for ownership information is in regulatory flexibility analyses (RFA) conducted by NMFS regional staff, which requires analysts to assign "small" or "large" entity status for those potentially affected by regulatory changes. This assignment process can require that information on subsidiary corporate ownerships be collected up through parent owners to identify large integrated entities. However, small status designation is unlikely to be assigned to entities with multiple tiers of subsidiary ownership, and a complete record is unlikely to be necessary for RFA requirements.

Ownership structure in the fishing industry is complex, with individual and corporate owners organized into a hierarchical system with varying degrees of vertical and horizontal integration and affiliation. Firms, vessels, and plants under common ownership can exist as independent subsidiaries or be closely associated through common management structures. Further, individuals can hold ownership shares or other controlling interests in multiple entities holding fishery assets. Given the fluidity of this "system", with assets being bought and sold and affiliations forming and dissolving continuously, it is unlikely that a tractable, verifiable system for monitoring ownership can fully capture all of the relevant information desirable for analysis. However, some limited objectives can be achieved with existing data sources supplemented with additional information provided by vessel, plant and permit owners in the context of comprehensive data collection.

The three most detailed sets of information currently collected on ownership include (1) Restricted Access Management (RAM) records for enforcement of use caps, which limit share holdings, in limited access fisheries that are evaluated "individually and collectively"; (2) the USCG vessel documentation system, required for vessels over five net tons; and (3) data collected under American Fisheries Act (AFA) by the US Maritime Administration (MARAD) for enforcement of foreign ownership restrictions on vessels over 100 feet in length. These requirements apply to floating processors as well as harvesting vessels. USCG Vessel documentation requires identification of all individual owners by name and SSN or tax id. MARAD documentation is more stringent, requiring individual identification and legal residence

information of all shareholders in corporations owning vessels required to report under AFA. RAM requires reporting by all non-individual (i.e., corporate) owners of harvesting or processing quota, including a unique company identification number, company name, unique owner identification, owner name, effective date of share ownership, and share percent owned. In addition, for the rationalized BSAI crab fishery, affiliation information is required for all non-individual owners of harvesting or processing quota shares, identifying all individuals with 10% or greater ownership or control. Note that “individual owner”, under the definition employed by RAM, includes both individual persons and corporations. The information collected by RAM is maintained as a registry of current ownership information. It is not reported by owners on a regular basis, but is required to be up-to-date. As such, it does not currently function as a database that can be matched to historical data collected through vessel or plant level data collection.

Suggestions: The principal impediment to incorporating ownership information into socioeconomic analyses is not a lack of data, but rather limitations on data accuracy and completeness given the dynamic and complex nature of ownership structures. That is, sufficient secondary data exists to satisfy the need for ownership information, but it must be obtained and organized into a useful database to support analysis. This will likely be a time-consuming and difficult task. Suggestions for proceeding are as follows:

1. Ownership information for vessels is largely complete under USCG and MARAD reporting requirements. Despite past reluctance to share this information, discussions with both agencies have indicated that data-sharing agreements either exist or can be developed subject to standard non-disclosure agreements. One suggestion is to complete data sharing agreements and obtain all available vessel ownership data from these sources.
2. Vessel level reporting requirement should include USCG Documentation number.
3. The number of processing plants is sufficiently small that the processing sector data could be surveyed through a mandatory requirement to provide ownership information with minimal effort.
4. Collection of data on ownership of access privilege assets by RAM should be reorganized as a historical database, with regular reporting and the potential to identify ownership changes over a period of time. This could be achieved by periodic (annually or quarterly) archiving of the registry database.

7. Data for Social Impact Analyses

As with community impact analysis data, social impact information is probably best collected using the other mandatory data collection programs suggested in this document, rather than as a separate endeavor. Information useful for social impact analysis is most often demographic (describing individual characteristics such as age, gender, race/ethnicity, nationality (citizenship), residency, income, and education). When available, this information is used to understand the distributional impacts of policies in terms of these socially salient characteristics, or to refine predictions about how sub-groups may be affected by or react to changes based on other known characteristics of the sub-group. More detailed social information (e.g., household size, composition, and other characteristics) necessary for social impact analysis is best obtained ethnographically and it should be noted that mandatory social data collection will not be able to replace the in-situ research that takes place in preparation for specific policy decisions.

The United States Census Bureau has specific guidelines on how to collect information on race/ethnicity that must be followed by Federal agencies. Census methods should also be followed for other data categories to make the information comparable.

Suggestion: The following demographic characteristics are those typically utilized to conduct satisfactory social impact analyses: age, gender, race/ethnicity, nationality (citizenship), residency, income, and education. Such information is most easily collected through licensing processes that require individuals to describe themselves in order to be eligible to work or receive other benefits. The information can also be obtained from individuals' employers, although industry has expressed concern over the time requirements and sensitive nature of providing these data.

Confidentiality of Data Collected Under the Proposed Program

This paper has recommended mandatory reporting of detailed personal and proprietary information by a variety of entities operating in Alaskan fisheries. These data meet the definition of confidential information under a number of Federal statutes as summarized in NOAA Administrative Order (NAO) 216-100. This NAO provides the principal guidance to NOAA personnel on protection of confidential data, including definitions, policies, operational responsibilities and procedures, penalties, and statutory authorities, and is provided as Appendix B to this paper. The NAO specifies conditions for authorization for access to confidential data by Federal, Council, and state employees and contractors. Any individual who receives access to confidential data must sign an agreement of nondisclosure, violation of which is punishable by dismissal, fines and imprisonment as set forth in the NAO.

Although the NAO 216-100 provides managers with working-level guidance, it falls under the umbrella of NOAA's regulatory provisions. Regulatory provisions controlling NOAA data confidentiality are found at 50 CFR Sec. 600.405 et seq. These provisions direct how NOAA collects, maintains, and provides access to proprietary and confidential commercial or financial fisheries data. In addition to describing data storage safeguards, these regulations establish the process and standards data managers use in determining whether to grant a request for access. The regulations also describe the government agencies and individuals to whom access is authorized.

Collection, maintenance and protection of confidential data are routinely conducted by NMFS, and procedures for preventing disclosure are well-established. However, due to the highly detailed nature of the personal and financial data proposed for this collection, additional concerns have been raised by the Council and members of the industry. In particular, the Council motion directing the economic data collection for BSAI crab fisheries included specific direction to staff to develop controls on access to the data, rules for aggregation of data for release to the public, penalties for release of confidential data, and penalties for unauthorized use in addition to those set forth in federal law. In addition, congressional authorization for the BSAI crab EDR included provisions requiring collection and custody of the data by a third party (Pacific States Marine Fisheries Commission) and removal of any personal or business identifying information from data records prior to conveyance to NMFS. At the December 2006 meeting, the Council issued an additional motion, directing staff to develop protocols for Council review to address rules for aggregation to maintain data confidentiality and assess the quality of the data to ensure accuracy of data collected in the crab EDR. A discussion paper outlining the process for developing these standards is attached (Appendix C), and will be presented to Council at the March/April 2007 meeting.

Suggestion: Since the data collection discussed above is similar in nature and subject to the same concerns as the crab EDR data, it is expected that the data handling protocols to be developed for crab data would also apply to these new data, in addition to the requirements under NAO 216-100. Council will have the opportunity to review these protocols as they are developed.

Linkage Between Economic Analysis and Social Analysis

Obviously the economic impacts associated with a management action are going to have social repercussions as well. A reduction in income or jobs will lower the standard of living of affected parties and impact their mental and physical well-being. Such losses will affect the ability of a family to provide adequate levels of food, shelter, or medical care. Different types of impacts will affect different segments of the community, such as lower income families, non-citizen vessel owners, or Native Alaskans. The degree and duration of these impacts on the community or sub-group will depend in part upon the number of alternative employment opportunities. It is important to note, however, that changes in fishery management can also impact the social structure of a community in ways unrelated to economic impacts, such as with subsistence opportunities, cultural practices, migration, etc.

The close relationship between social and economic analysis can be seen in the data collection recommendations, which often use the same vehicles (e.g., vessel owner surveys). The differences are in the questions asked and the units observed. Economic analyses will tend to focus on the vessel or plant as the unit of analysis, while social analyses will tend to focus on communities or socially recognized sub-groups of individuals (e.g., young fishers or female processing workers). Economic surveys ask questions that shed light on the net benefits or distribution of costs and benefits among industry sub-sectors, as measured in monetary terms. Social analyses will ask questions to focus on social groups and non-economic impacts as well as the distribution of economic impacts among socially salient groups.

Approaches to Data Collection: Reporting Entities and Collection Frames

One issue that must be considered when designing a data collection program is whether to collect information from all fishery participants, including vessel owners, quota holders, processors, community representatives, and others, or limit collection to one or more of these populations. All of these populations would be included in one or more component of the comprehensive data collection program outlined above. A second fundamental issue to resolve is whether to collect data from all entities within a population (i.e. census) or to sample a subset of the population. The choice over the approach depends in part on the type of questions one wishes to examine, the precision required, and the desired limit on the cost and public burden of collecting the data.

When the goal is to examine the average or a “representative” vessel or plant, a sampling approach may be preferred because it is more cost effective than a census. If the number of plants or vessels in the fishery of interest is large enough, one can use random sampling to develop a data set with a mean and variance that is representative of the underlying population with a known margin of error. This type of data collection is particularly well-suited to situations where one’s goal is to estimate parameters such as the average daily costs of fuel, labor, or bait for a fishery. One can then conduct analyses based on the average vessel and, depending on the degree of homogeneity in the fleet, get ballpark estimates for the impact of a management action. There may also be populations of interest (e.g., onshore processors, offshore catcher-processors) that are too small to “randomly” sample in order to get a desired level of precision, thus eliminating sampling as a viable option.

For other questions, however, a census may be preferable to a sampling approach. For example, a census allows one to examine the way in which all parties (not just the average vessel) have been affected by a management action. In situations where different parties may be affected differentially it may be particularly important to account for the entire range of impacts. Retrospective policy analyses, in which one examines the economic performance of an entity over time and attempts to isolate the effect of a policy action, are much more difficult to conduct with sample data and the results may be suspect. For these reasons, the data obtained through a census are likely to have a greater number of potential applications and support more information-intensive inquiries. Although the overall cost and time burden of a census is greater, one avoids making people or fleets feel “singled out” and may contribute to a sense of fairness (or shared vulnerability) in that all parties have the same responsibilities and requirements, and thus could contribute further (aside from increased observations) to the quality of the data.

One other way to frame the decision over a sample versus a census is in terms of the potential benefits of the information obtained relative to costs of collecting data. In smaller, lower value fisheries the potential benefits and costs of management actions are likely to be less than larger, more valuable fisheries. Accordingly, the benefits obtained from additional socioeconomic information to improve such decisions are likely to be greater when more is at stake. Therefore, it may be prudent to make the amount of resources that go into data collection commensurate with the size or value of the fishery, much like what is done with the stock assessment efforts.

A Brief Note on Fish Oil and Biodiesel

The SSC has asked us to collect data on the use of fish oil as a commercial fuel and we have included this discussion to describe our impression of the way in which this information may be used.

Unalaska/Dutch Harbor annually generates over three million gallons of fish oil as a byproduct of their fish processing activities. Unfortunately, this oil has had a relatively low commercial value and the cost of transporting it to existing markets for use as a bio-fuel appears to be prohibitive in many situations. However, large seafood processing facilities in Western and South Central Alaska have utilized fish oil as a fuel in boilers for many years. Two years ago a seafood processor, the Unalaska Dutch Harbor-based UniSea, Inc., rendered byproducts from the Alaskan walleye pollock fishery into oil for processing into biodiesel by Pacific Biodiesel, Inc. in Hawaii.

Given these advances, and the continued interest in locally produced, petroleum-free sources of fuel, it is likely that the use of fish oil for such purposes will increase over time. It therefore seems prudent to account for the use of fish oil by processing plants or vessels if it will be used to supplement their purchase of traditional petroleum-based fuel. That is, if we see the volume of fuel purchased by an entity drop markedly over time while fishing or processing activity remains relatively stable, we would incorrectly attribute these changes to increased fuel efficiency (rather than use of an alternative fuel source). Similarly, there may be significant capital expenditures undertaken by an entity to facilitate its use of fish oil as a fuel source, and these costs should be accounted for to properly understand the potential benefits or cost reductions from utilizing processing byproducts to fuel their activities.

Comments on Cold Storage Holding Data

NMFS collected and published data on monthly and annual cold storage holdings for a variety of fish and shellfish species for more than 50 years. The goal of these reports was to provide a

service to the fishing industry to aid business decisions for purchases, sales, and pricing. The reports also served as a tool to economic modelers; only by knowing both the changes in inventory and levels of production (which we do track consistently) do we know the true supply of a product on the market, which when combined with consumption and price data allows us to model the relationship between supply, demand, and prices. Thus, without inventory data, any market models that attempt to characterize the relationship between observed prices and (incorrect) quantities are likely to generate spurious results.

Participation by the industry in providing monthly reports to NMFS was always voluntary. Unfortunately, cooperation between industry and NMFS steadily declined, evidently reflecting contraction and privatization in this industry sector, and NMFS staff grew increasingly concerned about the reliability and utility of the data summaries. Outreach and educational efforts, in cooperation with industry associations, did not improve reporting compliance.

Because NMFS leadership no longer felt it could support the reliability of the cold storage holdings summaries in terms of their utility for guiding business decisions, the agency discontinued the collection and publication of cold storage holdings after December 31, 2002.

As an example of the type of inconsistencies observed, an increasingly greater percentage of the month-facility-species product records included carryover estimates from the previous monthly report, and many facility time series were several months in arrears. NMFS staff believed that the declining trend in reporting by industry was so pervasive that the accuracy and utility of the cold storage reports no longer supported practical business decisions.

In response to an inquiry by Dr. John Vondruska, a NOAA economist, Dr. Mark Holliday explained his decision to eliminate the cold-storage program:

John V.,

I have read your thoughtful comments and appreciate your concerns and interests. As Chief of the Fisheries Statistics and Economics Division, I recommended this action, not John Hoey, after a long and thoughtful analysis of the program and implications for continuance or cessation, and consultation with persons I felt were the appropriate parties. I understand probably as well as anybody in NMFS the need for economic data and the intricacies of utilizing best available data and data paucity when it comes to economic analyses. There have been many attempts and ideas tried by me personally and by my staff and others to save the cold storage program and they have not met with success. My job also includes advising management when it is inadvisable to continue a program that has great risk to the subsequent quality and content of analyses and policies based on severely biased and incomplete data. This is only more critical today under the requirements of the Data Quality Act. I agree we need these kinds of data, but this voluntary collection and its permutations (privatizing, contracting out, regional indices, etc) is not the vehicle to accomplish this need, and after 20 years familiarity with managing the cold storage program I am confident in my conviction and suggestion. You're certainly free to solicit comments on your point of view as that is one of the purposes of the listserve, and I hope the time and energy expended is useful.

Regards,

Mark Holliday

However, leaders in seafood market modeling at the University of Alaska, Fairbanks (UAF) have since asserted that a lack of inventory data has essentially eliminated their ability to model the

market relationships they seek to understand. In a letter to NMFS leadership, researchers from the UAF note that while the data may have had problems, it evidently exhibited a fair degree of accuracy (in terms of properly reflecting net increases/decreases) as confirmed by model results using the data:

“Moreover, while we acknowledge that concerns about data quality may have validity, we note that past fishery models that relied on collected cold storage holdings data have conformed to economic theory and proved successful at capturing past changes in prices and inventories and at predicting future prices. That is, models based on collected inventory data have performed well and could not have done so if the inventory data were spurious; directional movements in inventories have been accurately reflected in the reported data.”

We have also included the text from a letter written by Dr. Criddle to Dr. Mark Holliday of NOAA:

Dear Dr. Holliday,

I am a member of the North Pacific Fishery Management Council's Scientific and Statistical Committee and a direct and indirect consumer of the data series provided by your office. I would like to add my voice to others that have expressed concern over the discontinuance of the cold storage holdings data. I appreciate the conundrum that is presented by the deterioration and lack of verifiability associated with the voluntarily reported inventory data. I have watched in frustration as the rigor of quantitative economic analyses of management action have deteriorated over my 11-year tenure on the SSC, a deterioration that has arisen from an ever increasing reluctance of industry to provide basic data. We have approached the point where the level of analysis possible with available data is so rudimentary that compliance with EO 12866 is often questionable. The loss of inventory data coupled with the lack of cost data and the lack of transactions-level price data is crippling.

As an example, I would like to call your attention to the question of assessing the likely consequences of alternative approaches to fisheries rationalization. The question of who gained and who lost as a result of the Alaska halibut-sablefish IFQ program has been the subject of analysis by NOAA-Fisheries, the OMB, a National Research Council committee, and numerous individual researchers. The question has remained unsettled because of the lack of ex-ante analysis and questions about the interplay of ex-vessel, wholesale, and consumer markets for halibut. Dr. Mark Herrmann and I have recently completed a 3-year project for Alaska Sea Grant wherein we make substantial progress at isolating the effects of IFQs from changes in halibut abundance, inventories, and trade. Our results suggest that the gains from IFQs have not been as great as some have claimed nor their adverse impact on processing as dire as some others have claimed. We could not have made these advances without the inventory data. Changes in inventories were important in the transition from open access to IVQs in British Columbia and IFQs in Alaska. Some of the initial estimates of the benefits of IVQs in British Columbia were inflated by a failure to consider changes in inventories. Similarly, some of the losses perceived by processors following implementation of IFQs in Alaska are more properly attributed to offloading of excess inventories that had been built up in response to incorrectly anticipated changes in halibut catch limits. Without a consistent set of inventory data, we would not have been able to separate the effects of IVQ and IFQ program implementation from the effects of changes in product form and changes in catch limits.

Uncertainty about the consequences of the halibut-sablefish IFQ program provided an excuse

for the suggestion of the controversial two-pie allocation scheme for the Alaska crab fisheries. The RIR prepared for the crab rationalization decision does not include an econometric model of supply and demand, but instead includes a qualitative discussion of the possible consequences of the alternative actions, a discussion based to a considerable degree on speculation about the consequences of the halibut-sablefish IFQ program. Without careful development of an econometric model that accounts for supply, trade, demand, and inventories, it will not be possible to look back at the implementation of the Alaska crab rationalization program and answer the basic questions of who gained, who lost, and by how much and we can expect future actions to be justified based on speculation, rumors, and myths about the consequences of 2-pie crab rationalization. Management action should not be justified by fairy tales and fish stories told by interested parties.

I understand the difficult position that you are in; it cannot be easy deciding when bad data is worse than no data at all. My colleagues on the NPFMC SSC have strongly endorsed mandatory data collection on the economic side to complement mandatory data collection on the biological and ecological side. I will work with my colleagues to reaffirm that suggestion and to strongly encourage the NPFMC to support our suggestion.

Sincerely,

Keith R. Criddle

It is clear that there are complicated issues that must be overcome to develop a satisfactory system for collecting this information. It appears that the industry was not receiving the utility from the reports that NMFS assumed would assure compliance with the voluntary system. To date we have not heard complaints from industry about the elimination of the cold-storage database, but economists focused on modeling and understanding complex market relationships are concerned that much of the market information they have provided in the past, which has benefited industry, cannot be accurately provided without the inventory data.

We have attempted to make NMFS leadership in Silver Spring aware of the potential problems associated with a lack of inventory data. However, we have been unable to garner support to revive the old program or develop a new one. We have not yet held discussions with industry to gauge their willingness to participate in the former program or a modified inventory data collection program (or whether there are other sources of inventory data they utilize), but ultimately it seems that we will need to identify a supportive base who demands this information in order to move forward. One potential reason for a lack of requests for inventory data since the discontinuation of the program could be an inability of the public/industry to recognize that market predictions and models do hinge critically on this information. Perhaps if an effort to raise support for this data collection focused on the end products that could be developed with inventory data it would have a greater chance of being adopted. We suggest that interested parties form a unified "working group" to formulate a strategy for obtaining the data needed for market models; this group may command more attention from the government and industry partners that will need to be brought into the process.

REFERENCES CITED

Package, Christina and Sepez, Jennifer. 2005. Community Feedback: Who Represents a Community? Paper presented at the Society for Applied Anthropology Meetings, April 9, 2005, Santa Fe, New Mexico.

Northern Economics, Inc. 2007. "Improving Seafood Harvesting Labor." Report prepared for the Southwest Alaska Municipal Conference (SWAMC).