PROPOSED IMPLEMENTATION OF A FISHING VESSEL REGISTRATION AND FISHERIES INFORMATION SYSTEM

REPORT TO CONGRESS

Submitted to

The Committee on Resources
of the House of Representatives

And

The Committee on Commerce, Science, and Transportation
of the Senate

***PREPARED BY*:**

National Marine Fisheries Service
National Oceanic and Atmospheric
Administration
U. S. Department of Commerce

Foreword

Section 401 of the Magnuson-Stevens Act requires the Secretary of Commerce (Secretary) to transmit a recommended proposal for implementation of a national fishing vessel registration and fisheries information system (System). This plan is required to coordinate regional efforts to collect and disseminate data and to integrate the vessel registration and fisheries information systems on a national basis.

The National Marine Fisheries Service (NMFS) consulted with many major stakeholders in the creation of this report. Information, ideas, concepts and concerns were gathered through a series of presentations and meetings with stakeholders, and a 60-day public comment period, using a "discussion draft" paper and "Draft Report to Congress" to highlight critical issues and options. These stakeholders included NMFS organizational units, the U.S. Coast Guard, Regional Fishery Management Councils, state fishery organizations, Interstate Marine Fisheries Commissions, members of the commercial and recreational fishing and boating industry, and members of marine advisory and environmental groups. NMFS has tried to reconcile the different views and comments of the various stakeholders in this implementation plan.

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

The National Marine Fisheries Service (NMFS), fishery management councils, and states rely on fishery data to make decisions regarding the stewardship of the Nation's living marine resources. Citizens of the United States also rely on fishery statistics to make decisions regarding their participation, investment in, and use of commercial and recreational fisheries. In addition, fishery statistics can be used to measure how effectively governmental agencies are meeting stewardship goals and objectives. The quality of resource stewardship decisions and the predictability of the outcomes are strongly dependent on the quality of the data being used.

Given the increasing complexity of fisheries management, the current state of fisheries statistics needs to be greatly improved. Despite some regional successes, it is clear that the current overall approach to collecting and managing fisheries information needs to be re-thought, revised, and reworked. The quality and completeness of fishery data are often inadequate. Data are often not accessible in an appropriate form or a timely manner. Methods for data collection and management are frequently burdensome and inefficient. These drawbacks result in the inability to answer some of the most basic questions regarding the state of the Nation's fisheries, such as: How many vessels and people participate in various fisheries? Do our policy decisions improve the economic and biological sustainability of our fisheries - by how much? How are different people (harvesters, consumers, coastal residents, non-consumptive users) affected by these stewardship decisions? An ability to answer these kinds of questions is essential to sound resource stewardship. Simply put, to manage fisheries at local, state, regional, or national levels requires a much better fisheries information system than the one in place.

To address these shortcomings, the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act required NMFS to "develop recommendations for implementation of a standardized fishing vessel registration and information management system" to improve the state of our fisheries statistics programs. This Report to Congress provides the recommendations for implementation of this "System."

The benefits of such a system would be seen on several levels. At the most basic level, answers to fishery performance questions similar to those above would be immediately available. The ability to evaluate the status of all managed fish stocks would be enhanced. Scientists working with fishery data would be freed of the inordinate amount of time now spent on searching for, cleaning, checking, and reconciling data prior to use. Fishery participants would have an enhanced ability to make decisions on their participation and production. The entire system would be more efficient in the collection of data and the delivery of useful information to those who need it. Just as a business requires data on raw materials, inventory, cash flow, employees, product quality, and capital investments to be successful, this fisheries statistics system is designed to deliver the analogous decision-making information to those who manage and depend on the Nation's living marine resources for their livelihood, food or recreation.

The Magnuson-Stevens Act required that the system be implemented on a regional basis. Since several major regional information systems already exist or are being planned, NMFS recommends creating a system that improves, expands and integrates ongoing regional activities under a nation-wide "umbrella."

As specified in the Magnuson-Stevens Act, the system will have two main components. The first component, the Vessel Registration System (VRS) will enable fisheries managers to uniquely identify every US vessel engaged in commercial and recreational for-hire fishing. To implement the VRS component of the system, NMFS recommends utilizing a system already being developed by the U.S. Coast Guard (Coast Guard). The Vessel Information System (VIS), includes nearly all of the information needed for the VRS and is based on combining data from the Coast Guard vessel documentation and

state vessel numbering files into one Coast Guard database. A pilot implementation of the VIS, with data from two states and the Coast Guard, is now online and undergoing testing. State participation in the VIS is currently voluntary. However, an expansion of this system to require coastal states and territories to participate would fulfill the requirements for a VRS as set forth in the Magnuson-Stevens Act in the least costly and least burdensome manner. The modifications to the Coast Guard VIS that would allow it to serve as the VRS include:

- Requiring that coastal states and territories participate in the VIS
- The placement of a Hull Identification Number (HIN) on all undocumented vessels participating in commercial or charter fishing that did not have one upon manufacture
- Creation of a "charter fishing" endorsement and principal use category

A new separate system to include recreational vessels in the VRS is not recommended. However, since pleasure craft are already in the VIS, conditionally including them in the VRS is recommended. The recommendation is contingent on there being no additional costs or burdens to participants or the state numbering agencies to include VIS pleasure craft in the VRS. Otherwise, the net benefits of inclusion would no longer outweigh the costs.

The VRS design requirement includes obtaining the identity of the owner and operator of each fishing vessel at the time of registration, but vessel operator data changes frequently over time. Several resource management agencies, regional statistics planning groups and industry members suggested that tracking vessel performance over time without information regarding the operator, and in some cases the crew, was insufficient to meet their needs. During development of the VRS proposal, it became clear that better data on fishermen, in addition to fishing vessels, was an important design criterion for many stakeholders. While many federal and state permitting and licensing programs contain information on vessel operators, there is no universally accepted means to identify fishermen across fisheries or states. More frequently than not, fishery performance data are not linked to the operator. While various regional statistics planning efforts have identified this issue for resolution, there has yet to be a consensus on how to do this. NMFS proposes that the regional statistics bodies be asked to continue to investigate the development of a regional operator identifier that would be included as part of the catch information.

The second component, the Fisheries Information System (FIS), will be implemented by integrating and expanding on the current regional fisheries cooperative statistics activities. Some of these regional activities are well developed, while others are in the early stages of implementation. Present control and management of these regional programs will remain local. The FIS will simply link and harmonize the data from these programs to each other to form a virtual national system. FIS implementation details are addressed under three major areas: Data Collection; Information Management; and Institutional Arrangements. Under the recommended FIS, regional detail data would continue to be collected locally with minor adjustments in content, coverage, and quality control as required to meet both the Act's requirements and regional requirements. Access to data will be controlled regionally to ensure a balance in the need for access to data with the confidentiality constraints under which they were collected. Routine summaries of detailed data will be made available for the most frequent uses of data. Reciprocity agreements to satisfy multiple state and federal data submission and user access requirements are recommended. Adoption of common codes or creation of bridges between coding systems is recommended.

Using the unique vessel identifier from the VRS/VIS as a link, the FIS will associate with each vessel a record of its fishing activities, including landings, fishing location, gear used, time periods of fishing, and other data recorded in the regional data collection systems. In addition, data in the VRS/FIS system will be available as necessary to assist in the issuance of permits and for other systems requiring vessel and ownership data so that an applicant will not have to submit identifying information more than once.

Resolution of issues arising among the states, the marine fisheries commissions, and federal agencies (including NMFS) concerning the development of agreements, policies, regulations, and laws to collect and share information, or concerning budgets and planning for cooperative development of the System, will be jointly resolved by the System partners. Statistical committees and work groups, plus an annual statistics meeting of all System partners, are proposed for bringing together the relevant parties. These groups would:

- Facilitate coordination of data sharing among states, regions and NMFS, where such outcomes support fisheries stewardship; and
- Facilitate consensual formulation of regional and national policies concerning data collection and management.

The plan relies on existing regional statistics, industry advisory and marine fisheries policy groups to facilitate solutions rather than the creation of new entities.

Section 401(a)(5) of the Magnuson-Stevens Act requires that the Report to Congress provide for "funding (subject to appropriations) to assist appropriate state, regional or tribal entities and marine fisheries commissions" for implementing activities associated with this Report. The total cost for the nation-wide VRS/FIS system is projected to be $51.9 million. This is the total incremental cost of implementing the system over and above current funding levels, and was derived through an extensive consultative process with the states, Regional Fishery Management Councils, and Marine Fisheries Commissions. Overall, $43.1 million are for data collection, integration and harmonization, $7.2 million for information technology and management and $1.7 million for institutional infrastructure costs. Eighty percent of these costs are annually recurring, with full implementation phased in over a period of 5-7 years. The totals include $23.7 million to fix or redesign data collection programs to fill gaps in current needs, including state-level commercial trip ticket systems, $3.4 million for data quality and data integration improvements, $6.8 million for economic and socio-cultural data collection, and $1.7 million for improvements in state/federal information management communication and computer technology.

Three legislative/regulatory considerations associated with VRS/FIS implementation are recommended: 1) implement a fisheries statistics confidentiality sunset provision of 10 years coincident with the next Magnuson-Stevens Act reauthorization; 2) create a temporary VRS/FIS System liaison office within the Office of Management and Budget to obtain any Paperwork Reduction Act approvals coincident with VRS/FIS implementation in a comprehensive and expedited manner; and 3) strike prohibitions on collecting economic and financial fisheries statistics data in the Magnuson-Stevens Act coincident with its next reauthorization.

2 INTRODUCTION

2.1 Purpose of this Report

This report is written in response to a requirement in Title IV, Section 401 of the Magnuson-Stevens Fishery Conservation and Management Act ("Magnuson-Stevens Act") entitled "Fishery Monitoring and Research: Registration and Information Management" (see Appendix 7.2).

Section 401 of the Magnuson-Stevens Act requires the Secretary of Commerce to deliver to Congress, in collaboration with key stakeholders, a proposal for implementing a nationwide fishing vessel registration system and information collection system (System). The Magnuson-Stevens Act requires that the System include and integrate all fisheries information required under all applicable federal statutory and regulatory requirements, including but not limited to the Magnuson-Stevens Act, the Marine Mammal Protection Act, and, with the permission of a state, any marine resource law implemented by that state.

The contents of this document present a recommended approach to achieving the Magnuson-Stevens Act's requirements. This approach involves collaboration among the Secretaries of Commerce and Transportation, NOAA's National Marine Fisheries Service, and appropriate state, regional, and tribal entities including the marine fisheries commissions and the regional fishery management councils.

2.2 Report Structure

This report is presented in seven sections and appendices, building from the overall context and framework of the Implementation Plan to the specific actions that are suggested for system design, development, and implementation. The document is organized in the following manner:

- Section 1, **EXECUTIVE SUMMARY**, is a brief synopsis of the major issues and recommendations.
- Section 2, **INTRODUCTION**, describes the purpose of the report and its organization and terminology.
- Section 3, **PLANNING ELEMENTS AND SYSTEM IMPLEMENTATION**, defines the objectives and scope of the system, outlines the overall concept, and focuses on implementation hurdles, and legislative considerations. .
- Section 4, **FISHING VESSEL REGISTRATION SYSTEM (VRS)**, outlines in more detail the proposed approach to implement the national commercial/charter fishing vessel registration component of the system.
- Section 5, **FISHERIES INFORMATION SYSTEM (FIS)**, outlines in more detail the proposed approach to implement the FIS component, including national and regional implementation considerations.
- Section 6, **FUNDING RECOMMENDATIONS**, outlines in more detail the proposed funding requirements.
- Section 7, **APPENDICES**. Includes the regional FIS implementation details, the text of Section 401 of the Magnuson-Stevens Act, and a table of current federal reporting requirements.

Nomenclature
The following definitions and specifications are provided for clarification:

"Operator." As used in this report is the vessel master.

Use of the term "region." This report uses the term "region" to identify five major EEZ areas of the United States: the Atlantic region (Maine through Florida), the Gulf region (Florida through Texas and

the Caribbean Territories), the Western Pacific region (Hawaii, western Pacific territories), the Pacific region (Washington, Oregon, and California), and Alaska region. References to organizational units of NOAA's National Marine Fisheries Service (Alaska Region, Northwest Region, Southwest Region, Southeast Region and Northeast Region) use the convention "NMFS region."

"System." The use of the capitalized word, System, refers to the combination of the recommended VRS and FIS components.

Vessel Registration System (VRS) and Fisheries Information System (FIS). Section 401 refers to the need for two major components of an integrated system. VRS will be used as the acronym defining the system component for fishing vessel registration for commercial and charter fishing vessels. FIS will be used as the acronym defining the fisheries information component of the system. The FIS represents a broad, umbrella concept encompassing a wide range regional and national data collection, data management, and partnership activities. The VRS, while sufficiently complex to be presented separately, is an integral component of the FIS.

3 NATIONAL OVERVIEW

3.1 System Concept

Section 401 of the Magnuson-Stevens Act states that "the Secretary shall, in cooperation with the Secretary of the department in which the Coast Guard is operating, the States, the Councils, and Marine Fisheries Commissions, develop recommendations for implementation of a standardized fishing vessel registration and information management system on a regional basis." The following outlines the context in which this implementation plan was developed.

Fisheries statistics and information are essential to fisheries management. The ability to formulate, implement and monitor good stewardship policies relies on a credible source of data about the resources themselves and the people who use or benefit from them. NMFS and states collect fishery data to support strategic goals of building sustainable fisheries, ensuring the recovery and conservation of protected species, and protecting and restoring living marine resource habitat. Most of the federal responsibilities are carried out in partnerships with the councils, coastal states, and tribes.

Good stewardship requires knowledge about the resource itself as well as information about who the participants are, and how public policy affects people, communities, and industries. Having adequate information to manage fisheries begins with the basics of who, what, when, where, why and how: who is fishing (e.g., fishermen demographics and the community they represent), what are they fishing for (e.g., target species, market characteristics, bycatch), when do they fish (daily, multi-day trips, seasonally), where do they fish (e.g., state, federal or international waters), why do they fish (e.g., revenue maximizers, lifestyle, recreation), and how do they fish (e.g., what gear and fishing practices are used). Knowledge about the human side of fisheries allows us to better understand the consequences of different fishery policy decisions, and in concept is no different than the business principle of having information about one's raw materials, production process and customers.

What is the current condition of the state and federal knowledge base used for public policy development and implementation? State and federal systems are not up to the task. Improvements in quality, completeness, timeliness, and accessibility to data would lead to a better understanding of the impacts of management decisions, lessening the risk of unintended results. The methods for collection and management are frequently burdensome and inefficient. These state and federal statistics deficiencies result in the inability to answer basic questions associated with fishery management policy choices, such as: How many vessels and people would be affected by management decisions in various fisheries? Do state and federal policy decisions improve the economic and biological sustainability of our fisheries - by how much? How are different people (harvesters, consumers, coastal residents, non-consumptive users) affected by these stewardship decisions? An ability to answer these kinds of questions is essential to sound resource stewardship.

Many state and federal statistics programs lack resources necessary to support high quality science. Programs lack coverage with respect to geography, time or fishery; data are missing relative to specific kinds of elements, particularly economic and socio-cultural information; databases include data which are of insufficient or of unknown quality; analysts suffer from poor timeliness of data collection and delivery; and inefficient, ineffective and insecure technologies are too common in state and federal data collection, data access and data archiving systems.

With fisheries worth more than $40 billion to the U.S economy and tens of thousands of jobs at stake, it is the consensus of the stakeholders who participated in developing this Report that more and better state and federal data are needed to steward these fisheries resources. Thus, this implementation plan's intent

is to recommend a set of state, regional, federal, and tribal principles and actions which will improve the completeness, quality, timeliness and availability of state and federal fishery statistics essential for resource stewardship.

Improved knowledge about the performance of our recreational and commercial fisheries will lead to better management decisions, more accurate and defensible analyses, and better access to and improved consistency in statistics reported back to the fishing industry itself, Congress, Fishery Management Councils, and the public. Implementation of this plan will bring numerous benefits. As examples:

- NMFS staff and others engaged in analysis of fishery issues through the fishery management councils will be more productive, as the availability of better quality data allows them to focus on analyzing and using the data, rather than locating and obtaining data and performing code transformations and quality editing to create a useable data set.
- Disagreements over different policy ideas can be argued on the relative merits of the policies rather than focusing on the shortcomings of the data and analyses as is common today.
- The industry will benefit two ways:
  - From a reduced reporting burden as unnecessary duplication in fishery data collection programs is eliminated, and/or technologically inefficient or cumbersome reporting requirements are improved.
  - From having an improved base of data from which to make business and investment decisions.
- The public will benefit from better information about the performance of state and federal agency stewardship through an enhanced ability to track the outcomes of policies on fisheries -- what kind of return on investment is the public getting through its commitment of tax dollars to fisheries management?
- Agencies involved in the collection and use of fishery statistics will benefit from the more effective use of their existing statistics budgets and personnel, and the creation of a consensus plan to obtain long term funding for data collection and data management improvements.

The System concepts presented herein are not intended to replace or duplicate existing data collection and management planning efforts. Rather they are designed to complement them by providing a common thread among programs to take advantage of opportunities in technology, economies of scale, efficiencies in re-use of survey and information management experiences, and to develop a unified context for assessing how to pay for these activities. Consultation with States, Fishery Management Councils, and Marine Fisheries Commissions was an important principle of this process. These are NMFS partners in the collection and use of fishery dependent statistics. Their role extends beyond defining and implementation of this concept, to assessing how well the program meets needs in the future. The creation of this plan was based on NMFS and its partners building on existing infrastructure wherever possible and working together to propose new ways to fund and implement new solutions where needed.

Further guidance that helped shape the scope of this Report was found in the July 1997 Senate Appropriation Committee for Commerce, Science, and Transportation FY98 NMFS Budget Appropriation report: "…There are several commercial fishery information network programs being conducted currently, as well as recreational fishery information programs. These networks have been funded on a regional basis. The Committee is concerned about the accuracy and effectiveness of these data collection efforts, and expects NMFS to create an umbrella program to coordinate the techniques used to gather and disseminate data on a national basis while continuing to take into account the unique characteristics of regional commercial and recreational fisheries." In creating the System, NMFS has created an "umbrella program" which fulfills this expectation.

What existing regional programs are included under this umbrella? Along the eastern seaboard, the Atlantic Coastal Cooperative Statistics Program (ACCSP) has developed detailed plans to implement a

coordinated data collection program. This program is in response to the Atlantic Coastal Fishery Cooperative Management Act of 1994 (Public Law 103-206). In the Gulf of Mexico, programs have been in place since the early 1990s that coordinate the data collection activities for commercial and recreational fishing in the Gulf. Initially, these programs, the Commercial Fisheries Information Network (ComFIN) and the Recreational Fisheries Information Network (RecFIN), included the states of North Carolina, South Carolina, Georgia and Florida, as well as the five Gulf states, Puerto Rico, and the U.S. Virgin Islands. Many of the fundamental goals, objectives and technical aspects of these programs were adopted for the ACCSP, which now includes the four South Atlantic states. Together the ACCSP and ComFIN/RecFIN cover 18 of the 23 coastal United States plus Puerto Rico and the U.S. Virgin Islands. On the Pacific coast, the Pacific Fisheries Information Network (PacFIN) has been operational for nearly two decades and coordinates the database for fisheries data collected by the states of California, Oregon and Washington. Most recently, the Alaska Fisheries Information Network (AKFIN) has taken the lead to establish coordinated data collection and data processing activities between Alaska and NMFS. In the Western Pacific, data collection activities for Hawaii, Guam, American Samoa and the Commonwealth of the Northern Marianas are coordinated by NMFS and the Western Pacific Fisheries Information Network (WPacFIN). The System's design integrates the features of ongoing data collection and data processing/storage activities from these regional programs throughout the maritime jurisdiction of the U.S.

3.2 System Objectives

Section 401 of the Magnuson-Stevens Act (Appendix 7.2) identifies broad objectives for the system. The objectives have been used to develop the following framework for system planning, design, and development:

I. Create an ability to identify and track fishing vessel and fisherman performance through time, regardless of changes in vessel ownership, location, or fishing activity. This requires:
   - A. Establishment of unique identifier for all commercial and charter fishing vessels operating in U.S. waters
   - B. An ability to link individual vessels with the fishing activity (landings) associated with that vessel, throughout its geographic range
   - C. An ability to associate vessel owners, operators and crew data with the fishing activity/history (landings) associated with that vessel
   - D. An ability to identify and enumerate individual fishermen (captains, crew), vessel owners, and comparable data from fish dealers and primary processors

II. Reduce burden on fishermen and other industry participants that contribute or collect fisheries data, through:
   - A. Reduction in the number of different reporting forms and paperwork required by federal and state fisheries management agencies
   - B. Elimination of duplicative data collection and reporting systems
   - C. Reduction in the average amount of time required by fishermen to comply with mandatory and voluntary harvest reporting systems
   - E. Implementation of technology to aid in the collection, management, and dissemination of fisheries information
   - F. Establish inter-governmental reciprocity in the satisfaction of data collection requirements

III. Integrate and coordinate fisheries information management systems across regions (recognizing the unique characteristics of regional fisheries), through:
   - A. Improved timeliness in entering, editing and accessing trip and summary fisheries information at the regional level

B. Improved capability in summarizing and reporting fishery performance information (harvest, participation, etc.) by fishery, region and nationally
C. Access for industry/public to regional and national summary information
D. Satisfying consumers of fisheries information with products generated by the System

IV. Establish stakeholder partnership agreements and funding arrangements that clearly define roles, responsibilities, and expected outcomes, as measured by:
A. Cooperative agreements and/or memoranda of understanding executed by all System partners, including appropriate state agencies, federal agencies, tribal entities, marine fisheries commissions, and regional fishery management councils
B. Clear, specific, and detailed operations plans
C. Institutional arrangement to integrate regional data efforts

V. Establish regional and/or nationwide standards of measurement, quality assurance/quality control, nomenclature, and format for data collection, submission, and sharing, as measured by:
A. Reduction in number of coding systems, measurement units; adoption of data standards
B. Improved capability to summarize regional information to produce national fishery performance summaries, including accurate inventories of participation (employment) and vessels, exclusive of duplication
C. Knowledge of data quality strengths/weaknesses
D. Validation/auditing of self-reported data

VI. Collect a minimum suite or "core" set of biological, economic and socio-cultural data for every fishery, including elements from these sectors:
A. Harvesting
B. Processing
C. Wholesale/retail
D. Manufacturing
E. Consumer

3.3 System Data Model

As specified in the Magnuson-Stevens Act, the System will have two main components. The first component, the Vessel Registration System (VRS) will enable fisheries managers to uniquely identify every US vessel engaged in commercial fishing. Using this unique identification as a link, the Fisheries Information System (FIS) will record each vessel's fishing activities, including fishing location, gear used, time periods of fishing, harvest, and other biological data on the catch. In addition, data in the VRS/FIS System will be available as necessary for linking with permitting and quota systems.

Figure 3-1: Overview of the fishing vessel registration and fisheries information system

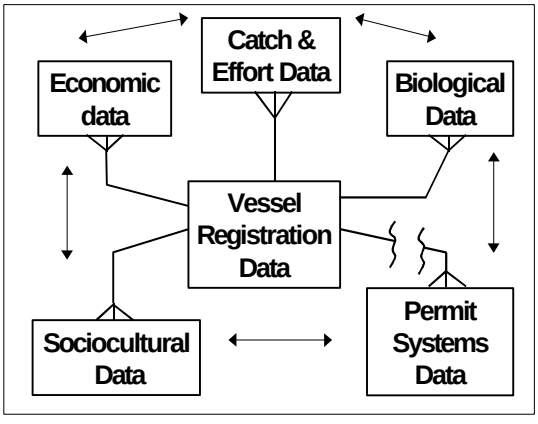


Figure 3-1 shows an overview data model for the System. The box labeled "vessel registration data" contains the VRS information. This information is the key to the System, providing the necessary links between the other entities shown in the Figure. For example, the VRS information will allow an economist analyzing information on fixed and variable costs of fishing (data in the box labeled "economic data") to link to information on the fishing effort and resulting catch (data in the box labeled

"catch and effort data"). Similarly, the VRS would allow multiple permitting systems (not part of the System per se) to be reconciled to evaluate overlap of permits across fisheries. More details of the entities in Figure 3-1 are provided in Sections 4 and 5.

3.4 System Scope

For the purposes of this report, as specified in the Act, the System includes information on commercial and recreational fisheries, commercial and recreational for-hire (charter and headboat) fishing vessels, all species of fish and shellfish that are either currently under state, tribal, or federal management or might be in the future, fishery-dependent data or any information resulting directly from fishing (e.g. harvest data, observer data, biological samples of the catch), processing, economic, socio-cultural, and trade information.

Thus, the System covers a broad range of fishery dependent information. Section 401 of the Magnuson-Stevens Act describes minimum fisheries performance information that the System should provide, including the number of vessels in the fishery, season, area, gear, effort, and other information required under subsection 303(a)(5) or requested by a Council under section 402.

Subsection 303(a)(5) refers to commercial, recreational and charter fishing data required to be submitted to the Secretary under a fishery management plan. These data may include, but are not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight, area, time of fishing, number of hauls, estimated and actual processing capacity.

Section 402 refers to all additional information collections which a Council determines would be beneficial for developing, implementing, or revising a fishery management plan or for determining whether a fishery is in need of management.

In addition to the minimum requirements specified in Subsection 401(c), Section 401 requires the vessel registration and fishery information system to standardize registration and information systems required by the Magnuson-Stevens Act, the Marine Mammal Protection Act, and any other marine resource law implemented by the Secretary. Examples of such laws or agreements include the Endangered Species Act and the High Seas Fisheries Compliance Act. Appendix 7.3 summarizes the data elements required to be included in the scope of the System based on an evaluation of the record keeping and reporting requirements of the 39 fishery management plans, the Marine Mammal Protection Act, and NMFS' international convention or treaty obligations for data collection.

The Magnuson-Stevens Act also indicates that relevant State marine resource conservation (primarily focused on "inshore" marine and estuarine fisheries) laws may be included in the system with the State's permission. In many cases state-collected data already form the basis of the current holdings in regional data systems for both inshore and offshore species.

3.5 System Implementation

3.5.1 Institutional Arrangements

In the process leading up to this report, four options were developed that described different institutional arrangements for carrying out the VRS/FIS program. These options differed in the lead organization that was to undertake the responsibility for the coordination of implementing major decisions concerning the design, development, planning, and execution of the VRS/FIS systems:

Option A: States

Option B: Marine Fisheries Commissions
Option C: NMFS
Option D: Shared: states, councils, commissions, NMFS, tribes, territories, and island governments

Option D is the final recommendation. In reviewing these options, it was hard to develop an institutional arrangement that: 1) was inclusive of all interested parties; 2) did not unnecessarily duplicate existing planning and coordination groups and responsibilities, or 3) did not create a large bureaucratic institution that would hinder rather than help support decision and planning processes.

In addition, many of the System implementation actions will not require a nation-wide process that includes all the System partner's participation (e.g., NMFS, industry, Councils, the states, commissions, tribes, and island governments). The majority of steps may only require working with a subset of these institutions. For example:

- The collection of data from tuna vessels in the Pacific does not require the involvement of the Atlantic States Marine Fisheries Commission or its member states, but may require several state, federal and international institutions in the Western Pacific, Pacific, and perhaps even Alaska regions, to communicate and coordinate plans and work together.
- The development/improvement of the transmission of data from Massachusetts-based fisheries to a regional database does not require the involvement of the Northwest Indian Fisheries Commission or the State of Washington, but may require several state and federal institutions along the Atlantic coast to communicate and coordinate plans and work together.

Despite such regional decision making there is still, however, a need to reach agreements among all of the System partners on the specific implementation of the "umbrella" principles outlined in this Report, such as details on what data should be available from any region for summarization, or how access to data between regions should be controlled. There are also strong financial and technical reasons to share information among all regions on common problems, such as solutions to regional data quality and reporting problems, or adopting innovative data collection and management technologies being employed by other regions.

Comments received on institutional arrangements from the draft Report included suggestions that proposed a single lead organization, an all-inclusive membership organization, or a totally separate new statistics oversight institution. The concept proposed in the draft Report of a "Secretariat" was generally misinterpreted to vest decision making and policy making authority within NMFS for the System. This was incorrect. The intent was literally for the NMFS to provide secretarial support (administrative duties, maintaining records, organizing meetings and workgroups, facilitating communications) for the System partners since NMFS already has existing nation-wide authority and experience to coordinate with all the appropriate existing institutions. NMFS proposed role was also to assist in the creation of policy committees and technical workgroups, comprised of System partners, which would be necessary for implementation of the VRS/FIS systems and principles.

Rather than continue to focus on the meaning of "Secretariat," it is recommended instead that NMFS continue its current support and coordination role in a partnership with all of the existing state, federal, international and industry institutions. Thus, all System partners will be responsible for improving communications, providing forums to resolve technical and inter-governmental policy problems, guiding the development of cooperative agreements, policies, regulations and laws to collect and share information, guiding coordinated planning of budgets, and facilitating cooperative database development and management.

The existing regional governing bodies will stand as a virtual organization, analogous to the virtual database concept of the FIS, rather than create a new standing or separate national entity. To promote coordination and communication, an annual fisheries statistics meeting of the System partners, organized with the help of regional statistics bodies, is proposed. The purpose of the annual meeting would include bringing together the relevant state, industry and organizational bodies in a common forum to make plans, discuss programs and issues, and recommend actions for local/regional consideration and potential adoption. Funding to support the annual meeting is part of the recommended budget item for institutional arrangements.

3.5.2 Legislative/Regulatory Considerations

The Magnuson-Stevens Act SFA 401 Report to Congress requires "…(3) recommendations for any such additional legislation as the Secretary considers necessary or desirable to implement the proposed system." This section presents a discussion and recommendations regarding confidentiality policies, the Paperwork Reduction Act, and the Magnuson-Stevens Act prohibition of the collection of "economic data."

3.5.2.1 Confidentiality Policies

The fishing industry (i.e., fishermen, dealers, processors) is responsible for generating most of the raw harvest data used in the System, and is thus very sensitive to the handling of any proprietary or confidential business information. Generally, competitive business practices create the need for industry to closely guard its business information. However, this need must be balanced with the needs of resource managers to have access to the types of information required for responsible stewardship and management of these common property resources. The implementation of well-conceived data access standards, policies and regulations are designed to ensure that business confidentiality is maintained, and thus inspire confidence among suppliers of data

The foundation of the FIS is based on the use, enhancement and integration of existing data collection programs, information management systems and infrastructure. Part of this infrastructure is the existing set of policies on data confidentiality. The Magnuson-Stevens Act contains very powerful statutory authority to prevent the release of data submitted to the Secretary for purposes other than fishery conservation and management. Magnuson-Stevens Act confidentiality regulations codified at 50 CFR part 600 govern use and access to data. Any person in violation of these regulations shall be liable to the United States and may be subject to civil penalties, not to exceed $100,000 for each violation and/or criminal prosecution.

With the regional programs, such as AKFIN, PACFIN, COMFIN, RECFIN, and ACCSP, authorized users of Magnuson-Stevens Act data are subject to the same regulations and penalty schedule. In addition there are state statutes and regulations on confidentiality guiding the use of and dissemination of fishery data. Therefore, there is a substantial institutional foundation on which to prescribe confidentiality standards for the overall System being proposed. Thus, the System will rely on existing protections of confidentiality embodied in its component regional programs.

One issue of concern is where existing state statutes prohibit any access or use of confidential data collected under state authority except for specified uses within the state. Rather than conditioning access to users under some general guidelines that states have discretion to implement, the statutes specify the circumstances and users, which in the case of this System may create problems with reciprocity. Rather than resolve this issue though federal legislation, it is the consensus of the stakeholders to work on individual solutions between respective partners.

Within the Magnuson-Stevens Act confidentiality authority, there is one issue deserving consideration. Once a data element is labeled confidential under the Act, it remains so in perpetuity without any sunset provision. Long after a data element has any sensitivity for business purposes, the federal government must continue to maintain its confidential nature. In most circumstances the data in question are of a fishery performance nature, not a proprietary practice or trade secret. However, under the Act the quantity of landings of an individual fisherman will remain confidential even after the business or the individual has ceased to exist. The resultant impact on the information management system is one of high cost and technological complexity because separate computer files and procedures are needed to maintain confidential and non-confidential data sets. As time passes, the benefits of maintaining confidentiality diminish. Thus, it is recommended that a confidentiality sunset provision of 10 years be considered coincident with the next Magnuson-Stevens reauthorization.

3.5.2.2 Paperwork Reduction Act requirements

The implementation of the System will have many implications on approvals of federal information collections under the Paperwork Reduction Act (PRA) (44 USC 3501-3520). Any federally sponsored information collection requires approval by the Office of Management and Budget to demonstrate its practical utility. New collections of information being proposed to implement the VRS and FIS components will require this approval, while several existing approved collections will need to be modified. Both increases and decreases in burden are expected as a result of the System implementation. Moreover, under the reciprocity principle of the System, federal versus state "sponsorship" of a data collection effort becomes clouded. While many stakeholders consulted during the preparation of this Report suggested a legislative exemption from the PRA be obtained, such an action may be unnecessary if Congress certifies to OMB the practical utility of the data contained in the System, and requests OMB work cooperatively on obtaining approval for entire classes of data collection that may be necessary to implement the System. There will be adequate justification to demonstrate the practical utility of the federally sponsored collections associated with System implementation. However, because of the size, complexity and unique state/federal/tribal nature of the proposed System, the recommendation is to have a temporary VRS/FIS System liaison office established within OMB to address these approvals in a comprehensive and expedited manner. This OMB Liaison office would work with NMFS and other System partners on developing the expedited and comprehensive approvals of the System components.

3.5.2.3 Magnuson-Stevens Act "Economic" Data

Many sections within the Magnuson-Stevens Act require actions or analyses that rely on economic data, from National Standard 8 on economic impacts on fishing communities, to Fisheries Research, to understanding the economic relationships of US fish processors. Despite this, and the overwhelming need for data and analyses on the economic impacts of fisheries regulations under other applicable laws and Executive Orders, the Magnuson-Stevens Act limits the collection of certain classes of information that are needed to fulfill these statutory and regulatory requirements. Within the Magnuson-Steven Act, section 303(b)(7) authorizes the collection of data from fish processors who first receive fish, but expressly excludes economic data. In section 402(a), Councils are authorized to request additional information from the Secretary, except for "information that would disclose proprietary or confidential commercial or financial information regarding fishing operations or fish processing operations." These limits exist even though there are powerful confidentiality procedures and Magnuson-Stevens Act regulations in place that protect the proprietary or confidential nature of any data submitted to the Secretary.

This is a serious constraint on the Systems reciprocity principle. States and other System partners have authorities to collect, protect and exchange non-confidential summary data, but the Secretary cannot even collect such data even if the Secretary is the most logical and cost efficient entity. Moreover, this constraint is inconsistent with the new National Standard 8 requiring an assessment of the impact of

conservation requirements on sustained participation of such communities and minimizing adverse economic impacts. In addition, the Regulatory Flexibility Act and related applicable law requires an economic analysis of regulations that is problematic because of the prohibition on collecting economic and financial data necessary to conduct the analyses. Based on the discussion of the extensive confidentiality protections in place in Section 3.5.2.1, there appears little risk in allowing the collection of these data for fishery management and conservation purposes, especially since the subsequent analyses using such data are required by law. Therefore, it is recommended that the referenced prohibitions on collecting economic and financial data be struck from the Magnuson-Stevens Act coincident with its next reauthorization.

4 FISHING VESSEL REGISTRATION SYSTEM (VRS)

4.1 Introduction

Section 401 of the Magnuson-Stevens Fishery Conservation and Management Act requests recommendations for implementation of a standardized fishing vessel registration system (VRS), and specifies certain data elements that must be collected in the system. Although various registration, permitting, and tracking activities are performed by the Coast Guard, NMFS and the individual states, no single program exists to standardize or share these data among states to comprise a national system.

The intent of the VRS is to develop a vessel universe within which current and historical information on ownership, operators, and vessel performance can be tracked. The key to the proposed VRS is the unique identifier provided by the Coast Guard Vessel Identification System (VIS) described below. Using this unique identifier as a link, the FIS will record each vessel's fishing activities, including fishing location, gear used, time periods of fishing, harvest, and other biological data on the catch.

As specified in the Magnuson-Stevens Act (16 USC 1881(d)) the recommended VRS is not to be considered as a permit or license for the purpose of revoking, suspending, denying or imposing any other conditions or restrictions. This restriction, however, does not prohibit the use of the VRS as a reference database for the issuance of permits and licenses. Utilizing the VRS, NMFS and states may access the information maintained in the VRS to reduce the amount of duplicative information that is required in the issuance of licenses or permits.

4.2 U.S. Coast Guard Vessel Identification System

The preferred option for a national VRS is to utilize the Vessel Identification System currently under development by the U.S. Coast Guard. This recommendation leverages significant federal and state money already spent on developing that system. The VIS, as described at 33 CFR part 187, is a compilation of existing Coast Guard documentation and state vessel numbering systems. Under the current planning, users will be able to access information about state-numbered and Coast Guard documented vessels. Participating state and federal agencies will connect to a central database to share easily accessible, up-to-date and accurate vessel information.

The Coast Guard VIS requirements for vessel information will meet many of the requirements set forth by the Magnuson-Stevens Act. Based on discussions with the Coast Guard, NMFS estimates that the cost of building onto the VIS is considerably less than tasking NMFS, an agency that does not currently number or document vessels, with this responsibility. The VIS requires participating states to collect the following information: vessel name (if available), state's certificate of number or Coast Guard official number, hull identification number (HIN), name of each owner, address of principal owner or business, make of vessel or name of builder, length of vessel, type of vessel, construction material, propulsion type, fuel type, and vessel use.

Current Coast Guard implementation calls for voluntary state participation in the VIS. Participation in the VIS must be made mandatory to meet the purposes of the VRS. Section 401(a)(8) of the Magnuson-Stevens Act limits the VRS coverage "…to states within the geographic area of authority of the Councils…" or 28 states and territories. However, only if all the states and territories participated in the VIS would the resulting data base provide the critical "universe" of information sought by the Magnuson-Stevens Act. This would avoid the complications and missing data that will arise when a vessel registered in an inland state participates in a coastal fishery. NMFS recommends that Congress at a

minimum require the 28 states and territories under Council authority to participate in the VIS, and to consider the inclusion of the remaining inland states.

4.3 Vessel Identification

As the sole vessel numbering authority in the United States (as delegated by the Secretary of Transportation), the Coast Guard documents all commercial vessels equaling five net tons or more. This documentation process provides a unique, "Coast Guard Official Number" for each vessel regardless of its string of ownership and location(s) of operation. This system currently records more than 200,000 vessels, approximately 30,000 of which are commercial fishing vessels.

The Coast Guard delegates numbering authority to the states and territories for all undocumented vessels. Currently all states and territories except Alaska number undocumented vessels with what is generally referred to as a certificate of number. Vessels are typically numbered through state vessel numbering and titling systems that are operated through that state's natural resource management agency, taxing/revenue agency, or motor vehicle registration agency. If a vessel changes ownership or relocates to another state, a new State certificate of number will be assigned. Due to the distributed nature of these documentation systems, vessels less than five net tons cannot be positively tracked throughout their operating range and ownership history.

The Magnuson-Stevens Act specifically requires fisheries performance information at the vessel level. NMFS and the states collect harvest information using various methods of identification. These may include the use of a vessel's Coast Guard official number, a state's certificate of number, a marine plate number, an individual's license, or a vessel or individual's permit. These methods were historically set up to meet the needs of the individual collecting agency or to resolve problems identifying individual vessels over time.

Most if not all these data collections, on an annual basis, can be linked to the individual harvesting vessel but with difficulty. Because state numbered vessels may not carry a unique identifier, NMFS is unable to verify over time the fishery performance or ownership history on a majority of fishing vessels. For any VRS implementation scenario to meet the Magnuson-Stevens Act's requirements, a unique identifier is required. NMFS recommends the placement of a Hull Identification Number (HIN) on all undocumented vessels participating in commercial or charter fishing**.** NMFS also recommends that catch and performance data collected by the states and NMFS be linked to a vessel's HIN, if undocumented, or the Coast Guard's official number, if documented.

4.3.1 Hull Identification Number (HIN)

Commercial vessels five net tons or greater are documented with the "Coast Guard Official Number", and all undocumented vessels less than five net tons are identified by the state certificate of number, which may or may not be linked with a HIN. As a result, there is no primary key with which to identify all vessels. A mandatory HIN would fill the critical documentation gap among commercial vessels less than five net tons.

Similar to the Vehicle Identification Number on an automobile, the HIN is a permanent identifier and would allow linking to fishery data to be collected in the Fisheries Information System (FIS). Currently, only manufacturers and importers of recreational vessels are required to assign HINs (33 CFR part 181 subpart C). The current HIN is a unique 12 character alphanumeric identifier which consists of the manufacturer identification code (three characters), the boat's serial number (five characters), the month and year of certification or manufacture (two characters), and the model year (two characters). The Coast Guard is currently considering expansion of the HIN. Under current regulations, vessels without a HIN

may obtain one from the Coast Guard's Recreational Boating Product Assurance Branch or a state's numbering and titling agency.

4.4 Owner and Operator

The Magnuson-Stevens Act requires the VRS to maintain the name and address of the owner or operator or both if possible. Existing VIS requirements will capture the name of each owner and the principal place of residence or mailing address of at least one of the owners or place of business of an owner that is not an individual.

Many vessels are operated not by the owner but an individual having no financial interest in the vessel. As pointed out in the consultative process, the historical performance of an operator is as critical as the historical characteristics and fishing power of a vessel. In light of trends in fisheries regulations, operators should be able to establish and verify their catch history in a fisheries information system. The capture of operator information is not appropriate for the VIS since the operator of a vessel could change as frequently as every fishing trip. The nature of fishing allows a vessel to be operated by numerous individuals over time. Thus, it would not be feasible to maintain current and accurate operator information in the VIS.

Although not appropriate for the VIS, operator information is often captured through existing state and NMFS data collection authorities. Most states and NMFS already license or issue permits to operators to participate in certain fisheries or use certain gear. This information is proposed to be a required data element in the capturing of a fishery catch and/or landings event (e.g., trip ticket, dealer weighout, logbook). The operator information may than be linked to the vessel of record , thereby establishing an operator catch history for that fishery or gear.

What is still lacking, however, is an ability to match an operator's landings from multiple states or fisheries when they are using different operator permits and licenses. A consensus could not be reached on an inter-regional or inter-fishery operator identifier. For example, the simplest form of identification would be the use of the operator's social security number, but under the Privacy Act, 5 USC 552(a), this can not be required except by statutory authority. It is recommended that the regional statistics bodies continue to investigate the creation of unique regional operator identifiers that would be captured as part of the catch information. For example, it may be possible that the regional statistics authorities could decide to maintain bridge tables between all the operator license and permit authority files.

4.5 Vessel Characteristics

A vessel's characteristics are important when determining the performance of a vessel. The VIS requirements will capture many of these elements. Specifically the VIS will collect the type of vessel (open, cabin, house, or other), manufacturer, year built, construction material (wood, fiberglass, metal, plastic, or other), propulsion (inboard, outboard, inboard-outboard, sail, or other), fuel (gasoline, diesel, or other) and length. Many of these characteristics can be used to determine the fishing power of a vessel. NMFS, and many states, specifically use the length of a vessel to determine access to certain fisheries.

4.5.1 Gross Tonnage and Capacity

Congress specifically requested that the VRS include the measurements for gross tonnage[1]. The Coast Guard calculates both gross and net tonnage for documented vessels. The states do not capture these measurements in their numbering system; thus, they are not included in the VIS. The tonnage measurement has proven to be of little practical value in measuring the fishing size of a vessel. As an example, a tuna purse seiner, with a 1200-ton capacity, will have a gross tonnage of 1,049 and a net tonnage of 492.

NMFS also researched the Congressional requirement to collect "capacity" as a VRS data element. Neither the Coast Guard nor the states collect this measurement. It was assumed that the intent of Congress was to develop a measurement for the fish holding capability of a vessel. Although a capacity measurement, in cubic feet, for vessels that have a designated storage area is possible, it may not accurately measure the fish holding capability of a vessel. Taking the previous example of a 1200-ton purse seiner, it has been shown that the capacity may vary on the order of 10 percent. This variance can be attributed to the size of the harvested fish. Also, many of the state numbered vessels are of an open-deck design without a specified area for storage. Vessels in this category include the crab, oyster, clam, and lobster fisheries. These type of vessels normally hold the harvest in baskets, totes, and sacks placed upon the open deck. Other historical methods to impute capacity included measuring a vessel's mean harvest or the maximum historical catch delivered, but these methods suffer from self-reporting biases or are often constrained by management quotas or trip limits.

NMFS, however, recognizes the importance in ascertaining the carrying capacity of a vessel. In April 1998 NMFS hosted a United Nations' Food and Agriculture Organization technical workshop on developing a measurement for capacity. According to the Working Group, capacity can be measured as a flow of product (harvest) that results from a stock of capital invested in a fishery to harvest fish. Since capacity is equivalent to harvest levels, it is also a function of stock size at a point in time when the capital is employed to harvest fish. Using production theory, capacity is a multi-dimensional concept. That is, the length, gross or net tonnage, beam, electronics, and horsepower of a vessel as well as the fuel, bait, quantity and type of gear used determine the capacity of the vessel to harvest fish. Other than length and tonnage, these parameters are recommended to be captured by the FIS system rather than the VRS. Total capacity of a fleet of vessels is the sum of the capacities of each individual vessel in the fishery.

However, the capital invested in a vessel (as captured by data in the VRS and FIS) will harvest different levels of fish depending upon the relative abundance of fish in each fishery. As a result, each vessel and the fleet has a potential capacity, an actual capacity, and a target capacity. Potential capacity is the level of harvest that would occur for a given level of capital investment if stock abundance was not a constraint on abundance. If a vessel could operate year round on a stock of fish of infinite size, the resulting level of harvest would be that vessel's potential capacity.

Actual capacity is the level of harvest that occurs for a given capital investment level where stock size is a constraint at a point in time. That is, the vessel has the capacity to harvest more fish than exist in the fishery. Actual capacity can also be affected by the size of the fishing fleet. As more vessels enter the fishery, fewer fish are available to be harvested by any particular boat. This stock affect is particularly problematic in common property fisheries managed as open access resources.

Target capacity corresponds to the capital investment needed to harvest a given level of fish. If the biological target was a stock size that corresponded to the yield that occurs at maximum sustainable yield (MSY), then target capacity would correspond to the level of capital investment in a fishery where actual capacity is equal to the potential capacity that is needed to harvest the fishery resource at MSY. That is,

[1] A nautical measurement for merchant vessels, a ton is expressed in units of 100 cubic feet. Historically this equaled the amount of space required to hold 252 wine gallons or a "tun."

just enough capital has been invested in the fishery to generate a harvest level that corresponds to yield at MSY; i.e. excess capacity does not exist.

4.5.2 Length

NMFS proposes the use of "length" as the form of measurement to be used in the VRS**.** Already collected by the Coast Guard and the states, length is a required element of the VIS. However, the definition of length may be inconsistent between the NMFS, Coast Guard, and state databases. This inconsistency is a result of the many ways in which a vessel may be measured.

There are two recognized methods to measure a vessel based on its length.

Simplified Measurement:

> Vessels less than 79 feet, the determination for "overall length" is defined by Coast Guard as: "the horizontal distance between the outboard side of the foremost part of the stem and the outboard side of the aftermost part of the stern, excluding rudders, outboard motor brackets, and other similar fittings and attachments."

Convention Measurement:

> Vessels 79 feet or greater are normally measured using the "Convention System" (46 U.S.C. 143) defined as "either 96 percent of the length on a waterline at 85 percent of the least molded depth measured from the top of the flat keel or the length from the fore side of the stem to the axis of the rudder stock on that waterline, whichever is greater. In vessels designed with a rake of keel, this length is measured on a waterline parallel to the design waterline."

The essential difference between the two measurements for length is that owners, for vessels less than 79 feet, normally report the simplified measurement to the Coast Guard or the responsible state agency. A vessel 79 feet or greater is measured by a certified agent of the Coast Guard.

NMFS utilizes the "simplified" form of measurement for the enforcement of management plan requirements. This has caused some confusion in that the measurement for length as documented by the Coast Guard or states may vary significantly from the reported or measured length used for fishery management plans.

NMFS, the states, and Coast Guard, working with vessel owners, should reconcile the measurements of the affected vessels. Once normalized, NMFS should rely solely on the length reported in the VIS. This necessary step places the burden of proof for accurate measurements on the vessel owner.

4.5.3 Number of Fishermen

During the consultative process the number of crew onboard a vessel was identified as a desired VRS data element. At this time there is no accurate method to determine total fisherman participation. This element is important for determining employment statistics as well as computing measures of fishing power. Many data requests are received from the public, Congress, and even the Coast Guard for total and fishery-specific participation.

However, the number of passengers and/or crew on a fishing vessel changes from season to season or fishery to fishery. Collection of this information as part of the VRS vessel documentation and/or registration renewal system may suffice for computing average full and part time crew size, but is too imprecise a method where trip by trip crew data are necessary for an analysis. In such cases capturing the crew size on a trip basis as part of the FIS is more appropriate.

4.6 Operational Use of Vessel

The Coast Guard and states require an owner to designate the primary operational use of a vessel, also referred to as the vessel's "endorsement" or "principal use" respectively. The VIS will capture the following endorsements: pleasure, rent or lease, demonstration, commercial passenger, commercial fishing, and other commercial. If all states participated in the VIS, it would generate a database of approximately 12 million vessels. Fisheries users of the VIS only need to query the database for vessels with a commercial fishing endorsement. Thus, it is critical that all U.S. vessels engaged in commercial fishing operations maintain such an endorsement.

Current Coast Guard regulations (46 CFR part 67) require U.S. flagged vessels that commercially fish in the navigable waters of the U.S. or within the Exclusive Economic Zone (EEZ) to maintain a fishery endorsement. The regulations allow vessels operating on the high seas to maintain a "coastwise" endorsement. Queries of the VIS database for commercial fishing vessels would miss those vessels using a coastwise endorsement.

NMFS recommends that all vessels that participate in commercial fishing activities (harvesting vessel, fish processing vessels, and fish tenders) within the navigable waters of the U.S. or within the EEZ maintain a fishery endorsement**.** For those vessels that operate outside the EEZ a "fishery (limited)" endorsement is recommended. This type of endorsement is already employed for the coastwise endorsement. Since commercial vessels may maintain more than one endorsement, these recommendations would not prevent a secondary coastwise endorsement to remain in effect.

The Magnuson-Stevens Act specifically requires that charter fishing vessels be included within the registration system. The Magnuson-Stevens Act defines the term charter fishing to mean fishing from a vessel carrying a passenger for hire (as defined in 46 USC 2101(21a)) who is engaged in recreational fishing. A vessel for charter would most likely maintain a coastwise endorsement pursuant to Coast Guard regulations. Once again this would make a query of the VIS database for fishing vessels meaningless since there are many forms of coastwise-endorsed vessels**.** It is recommended that the Coast Guard and states adopt a specific endorsement for "charter fishing." Due to current state vessel numbering requirements it may take upwards of 3 years for the states to comply. In the interim, NMFS and some regional statistics bodies are in the process of developing a list of "for hire" vessels for sampling purposes and will be providing such information to the System.

4.7 Integration with Catch Data

The Magnuson-Stevens Act requires the VRS to capture information on the species caught, gear type, geographic area of operation, and season. These data are more appropriately collected through the FIS based on actual performance data, rather than being based on intent at the time of vessel registration. The essential element of the VRS is the identifying link to a vessel's FIS catch and performance data collected by the states and NMFS. As previously described, the proposed link between the VRS and the catch information is the HIN or official number. Although utilizing the HIN or official number systems when first recording catch information would be most efficient, it is not mandatory. States and NMFS utilize many forms of identification when recording data. The critical step would be to link these existing systems to the HIN or official number. This method would ensure the integrity and continuity of the data in the databases.

4.8 Incorporation of Recreational Fishing Vessels

Section 401(g) of the Magnuson-Stevens Act requires a recommendation on the need to include recreational fishing vessels in the System. The "pleasure craft" endorsement in the VIS includes all craft

considered recreational fishing vessels. Since these vessels are already in the VIS, their inclusion in a VIS-based VRS would be cost-effective.

However, there are two factors that detract from the utility of including recreational vessels in the VRS: 1) the lack of a specific endorsement for "recreational fishing" makes the data base less useful for sampling and statistical purposes; and 2) there is no proposed link of a recreational HIN to a FIS data collection system. Thus, there is no basis by which to capture and maintain data on specific recreational trips by craft. Differentiating pleasure craft as recreational fishing craft will always be problematic. The burden of adding a separate "recreational fishing" principal use category to state numbering systems would be costly and ineffective because the intended use of a pleasure craft for fishing can change, not only from year to year but from trip to trip.

Creation of a new independent system just to capture the universe of recreational vessels in a VRS would be cost-prohibitive. After consultation with the various stakeholders, a new separate system to include recreational vessels in the VRS is not recommended. However, since pleasure craft are already in the VIS, conditionally including them in the VRS is recommended. The recommendation is contingent on there being no additional costs or burdens to participants or the state numbering agencies to include VIS pleasure craft in the VRS. Otherwise, the net benefits of inclusion would no longer outweigh the costs.

5 FISHERIES INFORMATION SYSTEM (FIS)

5.1 Conceptual Model of Proposed FIS

The FIS provides a context for the design, development, and implementation of data collection and information management systems for fishery-dependent statistics, nationwide. The FIS "belongs" to no single organization; rather, it represents numerous coastal, regional and national partnerships.

A set of design principles has been articulated to guide the development of the FIS framework. These general principles apply to the FIS regardless of the region of implementation. The principles also provide the basis for a shared understanding of the FIS. Universal stakeholder consensus on the following principles provides a context and foundation for future systems planning, design, and development.

FIS Design Principles

- **Utilize existing programs, systems, and infrastructure investment to the extent possible**
  - Integrate information under existing fishery management plans to avoid duplication
  - Integrate VRS and FIS to produce vessel and fishery performance information (such as vessel identification, owner information, vessel capacity, vessel tonnage, identification of fisheries in which each vessel participates, number of vessels participating in each fishery, time period and location of catch, gear types used, etc.)
  - Avoid duplication of existing state, federal, tribal systems by synthesizing state/federal data reporting/access systems into a single, integrated system, where possible
  - Utilize information collected from existing systems
  - Reduce redundancy in data collection systems
  - Utilize cooperative agreements, where possible, to formalize partnerships among data collectors, managers, and users
  - Develop and include procedures to ensure confidentiality of information
  - Build on existing and emerging data collection programs
- **Establish regional (and/or national) standards of measurement and quality**
  - Establish standardized units of measurement and nomenclature, where possible
  - Establish standard coding systems, where possible, or build logical bridges or translations between separate coding systems, where necessary.
  - Establish reasonable minimum data quality standards
  - Establish standard (minimum critical) data elements
  - Minimize number of coding systems
  - Develop processes to ensure the timely release of information to the public
- **Reduce reporting burden on providers of fishery information**
  - Minimize paperwork required for fishing industry participants to comply with reporting requirements
  - Require no fisherman to complete more than one logbook for any particular trip
  - Coordinate state/federal data collection efforts to minimize duplicative reporting
  - Minimize other costs and burdens on those reporting fisheries data
  - Establish standard formats and processes for collection and submission of fishery information

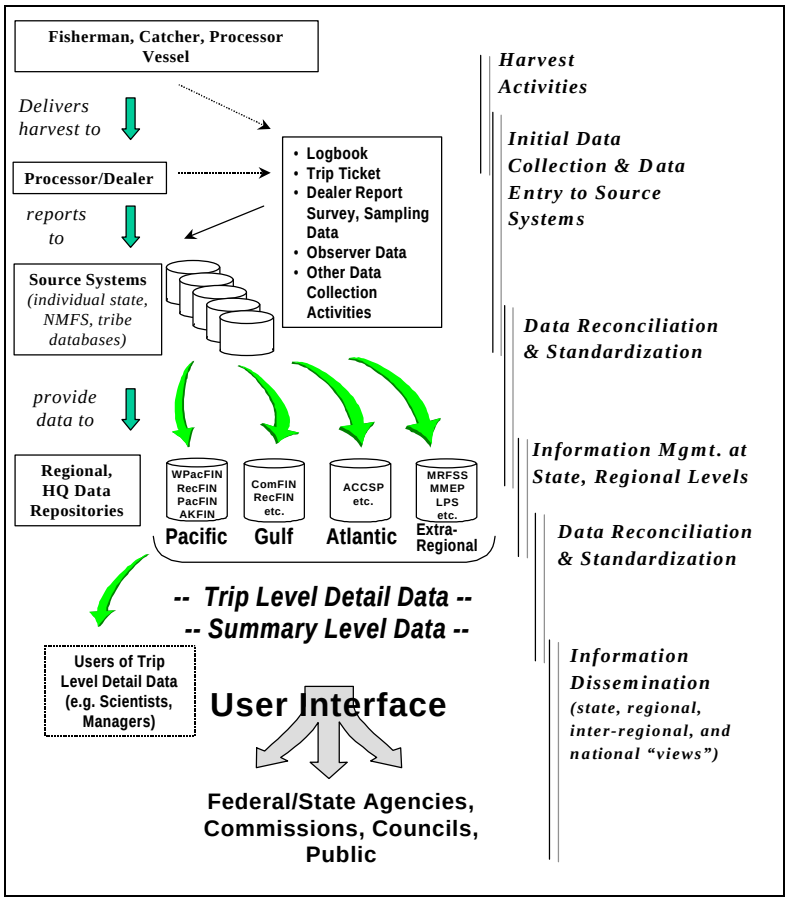
It is important to understand that the proposed FIS model described herein is not a radical departure from the structure and content of existing regional systems. Planning for the FIS largely assumes that most of the existing systems will remain the same or will be modified somewhat to create the necessary intra-

regional and national linkages. Some inefficient systems may require consolidation. The purpose of this project is not to replace existing data systems that are successful, but to build and improve upon them.

In this way, the FIS becomes a source of regional and national fisheries data, where users of summary-level data within or across regions have access to fisheries information of consistent quality. These customers would consist of fishery management council and commission staff, fisheries scientists/managers in the public, private, non-profit, and academic sectors, and members of the general public, fishing and related industries.

Figure 5-1 represents the conceptual model of the FIS, depicting information flows from various (state/federal) sources, through data management systems and repositories at the state, regional and national levels, culminating in distribution of raw data and value-added information to the community of end-users.

Figure 5-1: FIS Conceptual Model



Harvest activities generate catch and effort data contained in trip reports, logbooks, or other reporting forms. This **initial data collection** either takes place at the state, regional, or federal levels and results in the entry of data into source information systems such as that of a state resource management agency or NMFS.

The first **data reconciliation and standardization** process would occur as trip-level ("detail") data are extracted from the source state or federal systems into regional data repositories in the Atlantic, Gulf, Western Pacific, Pacific and Alaska areas. Generally, data collection standards are to be developed at the regional level. However, there may be opportunities to develop national standards for certain data elements, coding systems, or units of measurement. The higher the level that standardized coding systems can be agreed upon, the fewer data translation and interpretation issues need to be addressed. Each region would maintain its own central repository of trip-level and summary data, serving as the **state/regional information management system** (e.g. PacFIN, AKFIN, ACCSP).

The second **data reconciliation and standardization** process would occur as summary data are extracted from the regional repositories, reconciled and summarized to develop national or inter-regional views. This concept would provide consistency by harmonizing regional differences, and would provide data to users in a consistent, understandable way.

One consequence of the reconciliation and summarization processes will be the ability to provide information on the performance and status and trends of our inter-regional and national fisheries and the

vessels and people operating in those fisheries. The government's role in producing information on this important component of the U.S. economy is long-standing. The ability to enumerate total U.S. commercial and recreational harvests by species/gear/area, direct and indirect employment and fishery participation, the number of vessels fishing in U.S. waters and landing in U.S. ports, the total wholesale and retail and revenues generated by these landings, the imports and exports of fishery products, and other important statistics provides fishery scientists, fishery managers, and economists the basic raw material for their analysis and reporting responsibilities.

Information dissemination and access to detail-level and summary-level information provides the real value of the FIS. An effective end-user interface is critical to the success of the System. Through this interface, information flows out of the system into the hands of the user community. The information can range from very general summaries by members of the public to detailed data used by scientists and fishery managers.

5.1.1 FIS Information Content and Data Models

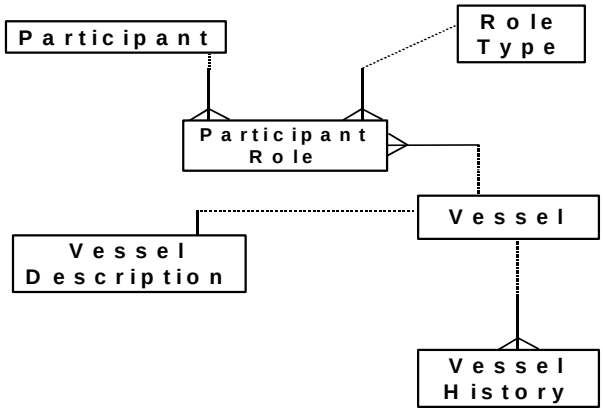
Another method to describe the FIS is to identify the information systems or databases that comprise the FIS. This answers the question of "what's in" and "what's out." By identifying the federal and state fisheries data collections (and their resulting databases), a shared understanding of what information systems fall under the FIS "umbrella" will emerge. Once these systems have been identified it becomes easier for FIS participants/stakeholders to evaluate what, if any, changes would be necessary to integrate (harmonize) data collection systems and to link these databases for more effective information sharing.

The broad categories of information included in the FIS were shown in Figure 3-1. This information includes data on catch and effort, economic and socio-cultural data, and biological data. These subsystems will be linked by common fields in the VRS database. This section describes in more detail the data models of some specific subsystems, and gives examples of the data elements to be included.

Data Models

Figures 5-2 through 5-8 are sample data models that show the major areas of information in the VRS and FIS and their relationship to each other. These data models are all components of the conceptual model in Figure 5-1. A data model is used to identify and describe the relationships among the specific data elements that ought to comprise an information system. Data models help to visualize information needs, or what information should be contained in the FIS, whether at the national or regional level. It is important to note that the data model is strictly a logical representation of the information requirements. The model does not depict where data physically exists or who owns it. Rather, it consists of a number of important data objects that are proposed elements of VRS and FIS. The rectangular boxes in the Figures represent these objects, called data entities. An entity is simply something about which information needs to be stored. The entity represents all instances of a particular kind of data. In a physical sense, this is akin to records in a file.

Figure 5-2: Sample Vessel Registration Data Model



The lines connecting the entities are called data relationships. A relationship documents the fact that certain types of information are associated with other types of information. An example is that a vessel would have an associated vessel description. Therefore, in Figure 5-2, the entity **Vessel** has a relationship connecting it to the **Vessel Description** entity. Relationships are bi-directional and can be read in either direction. Reading in the other direction indicates that a **Vessel Description** is associated with a **Vessel**. Figures 5-2 through 5-8 are data models for the initial data collection and data entry layer of the conceptual model. Table 5-1 contains the major FIS data entities and their description.

Figure 5-3: Sample Permit Management Data Model

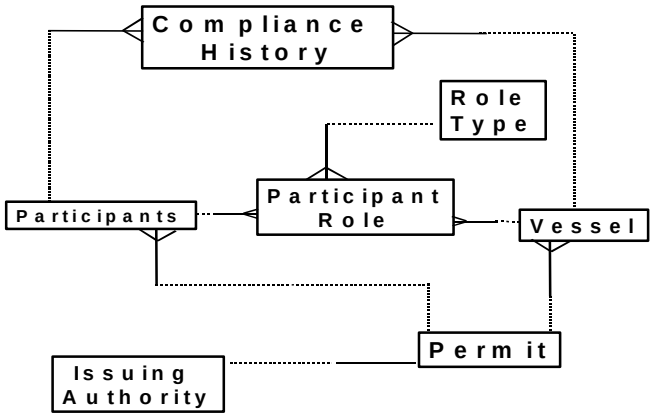


Figure 5-4: Sample Catch & Effort Data Model

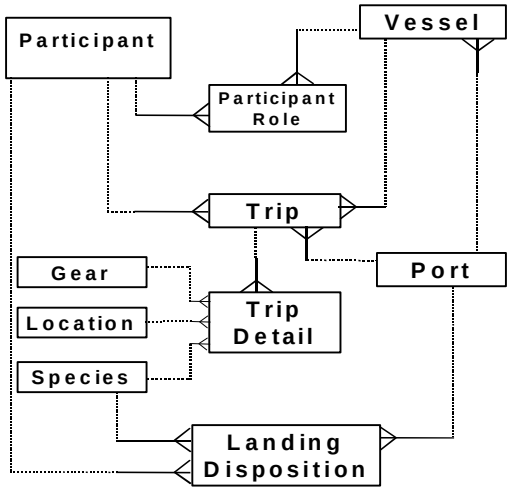


Figure 5-5: Sample Biological Data Model

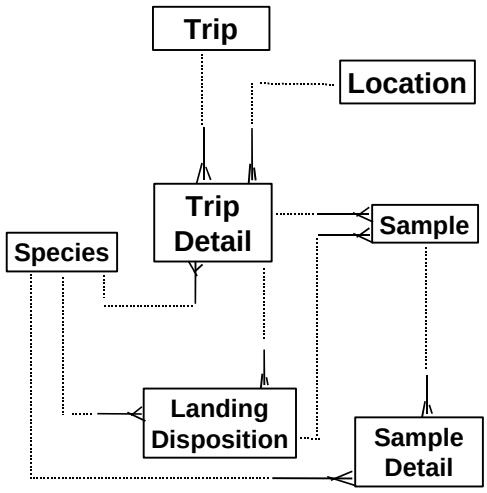


Figure 5-6: Sample Recreational Sociocultural & Economic Data Model

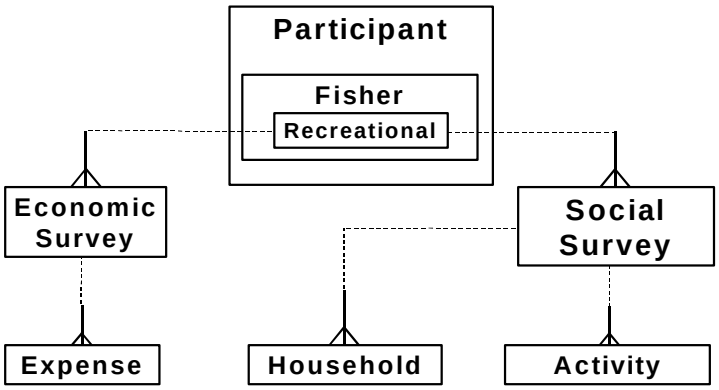


Figure 5-7: Sample Commercial Dealer Sociocultural & Economic Data Model

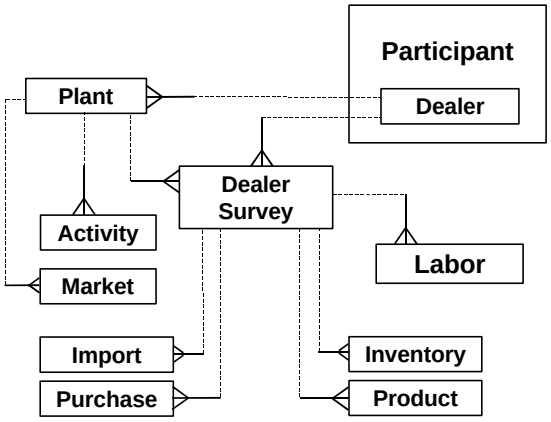


Figure 5-8: Sample Commercial Harvester Sociocultural & Economic Data Model

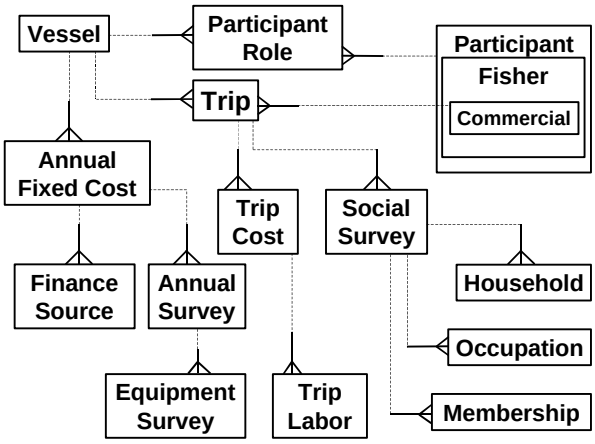


Table 5-1: Representative Data Entity Descriptions

The following are some of the major data entities and descriptions of the representative system.

Entity	Description
Compliance History	The history of compliance actions taken on an INDUSTRY MEMBER or VESSEL and a description of the disposition or outcome of the action.
Gear	Equipment used for the purpose of catching fish or other living fisheries resource.
Participant	A person or organization conducting, or requesting to conduct a business activity (owners, agents, fishermen, dealers, processors, etc.) involving marine fisheries resources.
Issuing Authority	The authority responsible for granting permits and licenses.
Landing Disposition	The record of the disposition of all landings. This includes fish landed and sold, discarded, and used for personal consumption.
Location	A geographic position which identifies where a fishing activity occurs.
Occupation	Stated occupation of members of a household.
Participant Role	The identification of the ways in which an industry member is involved with marine fisheries
Permit	The approval to perform a marine fisheries business activity regulated by State or Federal authorities.
Plant	A plant that processes fishery products.
Port	A harbor town or city that serves as an embarkation point for fishing trips or discharge point for landings.
Role Type	The identification of the various roles a PARTICIPANT may play in the fishing industry.
Sample	The identification of a subset of a catch used for biological and statistical analysis.
Sample Detail	The description of the specific biological and statistical elements collected on an individual fish or other marine organism within a sample.
Species	The biological classification of a marine organism including both common and scientific name.
Trip	Any effort with a specific start and end date undertaken for the purpose of catching fish. A trip may be shore or vessel based.
Trip Cost	The variable cost of TRIP.
Trip Detail	The specific details about a TRIP; including time fished, gear used, location, and species quantity caught.
Vessel	The unique identification of a boat or watercraft.
Vessel Description	The characteristics of a VESSEL including length, breadth, gross and net tonnage, and vessel capacity.
Vessel History	The history of VESSEL name changes.

5.1.2 FIS Concept of Operation and Design Principles

The basic framework of the FIS has three elements: information management architecture, data collection integration, and institutional arrangements.

The first element describes the database design and structure. The degree of database centralization/distribution will be largely determined by this factor, as will the basic tables and their relationships. The underlying data model (map of data elements and their relationships) for the FIS will be virtually the same regardless of the degree of centralization/distribution.

The second element describes the level to which we will integrate and harmonize the data collection programs. Integration/harmonization will be accomplished by some combination of standardized forms, data definitions, coding standards, data collection standards, or translation tables.

The third element specifies the institutional arrangements (e.g. decision-making entities and processes) that will be implemented to make the system work. In basic terms, this means identifying the parties responsible for data collection, management and quality control. Regardless of the arrangements, all parties involved must cooperate and coordinate their efforts.

This sub-section further defines the FIS by describing: (1) a concept of operation, and (2) specific overarching design principles.

5.1.2.1 Information Management Architecture

A nationwide view of summary-level data implemented in regional data "warehouses" is the likely model for a nationwide FIS. This concept provides a single, complete view of the data, provides consistency by eliminating regional data differences, and provides data to users in a consistent, understandable way. Each site would provide "local" access and serve the unique needs of data users from their respective regions, while at the same time providing regional summary data for users requiring a national summary or view. Mirrored sites could provide for system security and flexibility (providing redundancy in case of network failure and off-site system backups), and ease of access (reducing traffic at any one site).

To provide for the efficient delivery of information, an end-user interface would be developed that consists of data query and analysis tools that allow for standard and ad-hoc queries, and provide advanced data manipulation capabilities (such as drill down, multi-dimensional analysis, etc.). Users would access the data through various means including direct network access, modem, and Internet to support a wide range of users. Internet web interfaces could also be developed for the posting of routine and/or special reports, metadata, or other information that would be of use to the public.

The design principles associated with the Information Management Architecture factor are presented and described below:

5.1.2.1.1 Data Flow Protocols/Policies

If state, regional, and national systems are to be integrated, there must be a shared understanding of how information will flow from sources to repositories to the ultimate users. Protocols must be established to guide the various data collection programs in establishing data collection and transmission, measurement, quality and coding standards. These protocols and information management policies include performance standards for timeliness of data submissions at various levels of summarization, disaster recovery and security management plans, configuration management, referential integrity assurance plans, and mechanisms for data validation and "cleaning." One also should expect on-line documentation of these protocols and policies. Additionally, there will be opportunities for standardizing software or specific applications to leverage an existing technology base.

5.1.2.1.2 Data Delivery/Dissemination

Various data dissemination technologies must be evaluated to determine the best mix of technologies to support potentially diverse end-users. The effectiveness by which data delivery can be controlled by authorized users will help determine the overall success of the system. To this end, flexible data access tools need to be provided to support the variety of users. In addition to the tools, a number of data delivery methods (e.g. internet web based deployment) will also need to be evaluated.

5.1.2.1.3 Infrastructure

The FIS infrastructure consists of all the physical components that will comprise the system. These components include the hardware platforms, communications, storage devices, database, operating software, and application software. The design of this infrastructure will have a significant impact on the overall costs of the FIS. The physical location of the components, as well as issues regarding connectivity, security, and access contributes to this issue. Additionally, the ability to use existing infrastructure, especially in terms of hardware and communications, can result in reduced development costs for the FIS. The detailed design of the FIS needs to result in key decisions regarding infrastructure at the national and regional levels.

5.1.2.1.4 FIS Data Models/Relationships

FIS data models need to be developed to present a conceptual view of the required FIS information. The data models combine related data elements into entities and define a unique identifier for each entity. The models further describe the relationship between entities (i.e. how one entity is associated with another). The importance of these models is that they provide a picture of FIS information requirements that represent user data needs. The models therefore act as a baseline against which current systems can be evaluated. The gap between current systems data and the FIS models indicate where improvements in data collection systems are needed.

5.1.2.2 Data Collection Integration

Generally, data collection standards should be developed at the regional level. However, there may be opportunities to develop national standards for certain data elements, coding systems, or units of measurement. The higher the level that standardized coding systems can be achieved, the fewer translation issues need to be addressed in the information management arena. Adoption of national standards that are either too cumbersome or not responsive to regional information needs would not be a logical path to follow.

The data reconciliation and standardization process pulls summary data from each regional repository based on some pre-determined criteria. These criteria will include identification of the specific data needed for the FIS as well as a designated time period. Typically, the extracts will access only new data or data that has changed since the previous extraction. The reconciliation process would involve taking summary data from the regions and harmonizing it for easy use. This implies that common standards are in place for the national summary level data. This standard may or may not also be adopted by one or more of the regions, as described above. Once reconciliation is complete, a national repository of integrated summary data will exist. The final form of the summaries that will be created will depend on the end-user reporting requirements.

The design principles associated with the Data Collection Integration factor are presented and described below*:*

5.1.2.2.1 FIS Content

The scope of the FIS data collection program should include all fishery-dependent data collection programs for all living marine resources. This scope is necessary to have an effective, non-duplicative FIS while capturing adequate data to ensure responsible management of all living marine resources.

"All living marine resources" includes commercial and recreational fisheries currently covered by the Sustainable Fisheries Act, the Marine Mammal Protection Act, and other acts (see Appendix 7.3). It might also include:

- species that are not inter-jurisdictional and are managed by individual states (shellfish and some crustaceans), subject to voluntary state participation in the FIS;
- internationally managed species (e.g., tuna managed by NMFS and ICCAT);
- species subject to authorities other than fishing statutes (marine mammal and endangered species bycatch, and non-consumptive uses of living marine resources);
- fisheries managed under interstate fishery management plans

The types of data collected include the usual fisheries-dependent statistics on landings, harvest, catch, effort, participation, as well as biological data, economic data, and socio-cultural data. These statistics are necessary to monitor impacts of fisheries and develop appropriate management measures. Biological data (e.g. lengths, weights, and biological samples such as scales and otoliths) are increasingly critical for stock assessments and often can be integrated with collection of catch and effort data. Economic data include, but are not limited to, commercial cost-earnings studies, processed products and cold storage studies, and recreational valuation and impact studies. Socio-cultural data include, but are not limited to, data on fishing communities and households, patterns of fishery activity and decision-making, and the industry and community understandings and beliefs about fishery management regimes. These economic and socio-cultural data are necessary for proper allocation and management of the resource for the maximum benefit to the States and the nation. At a minimum, the data required under the numerous Fishery Management Plans (FMPs) are to be included. The following are typical of the data types to be included in the FIS:

- Commercial harvest by species, gear, area
- Recreational harvest by species, mode, area
- Trade data
- Processed products data
- Coast Guard Vessel Information System (VIS) data
- Marine Mammal Protection Act Permit data
- High Seas Fishing Compliance Act Permit data
- Capital construction vessel files
- ITQ databases
- Cost and earnings data

5.1.2.2.2 Data Forms

Another opportunity for regional coordination is in the area of design and deployment of data collection forms. Asking for the same or similar information in the same or similar ways ought to be the goal to present a consistent approach from the data providers' (harvester/dealer/processor) perspective. This data collection model reflects all partners working

together to develop the most efficient and consistent data collection methods and forms (and paperless technologies where forms can be digitized). "Modular" logbooks would consist of a base portion (fisherman/vessel information) and fishery-specific modules (species, catch, effort, etc.). Ultimately, this will minimize redundancy and overlap in data collection systems (especially state and federal systems), thus minimizing the likelihood that any individual data provider would be asked for the same information twice (or more).

5.1.2.2.3 Quality Assurance/Quality Control (QA/QC)

Quality assurance and control procedures need to be established in the FIS to help ensure the validity and integrity of FIS data. Data standards and procedures should be designed and developed to provide a common basis for FIS data quality. These procedures might be applied at several points in the data flow, beginning at the point of collection and ending with the final distribution of the data to end-users. Checks on the completeness and accuracy of the data, validation of self-reported data, and verification of the database integrity could all be included as quality control procedures.

Quality standards need to be established for coding, error rates, missing data, and statistical validity. Coding standards can be established at either the national or regional level, depending on the data collection process. Maximum allowable rates for coding errors and missing values should be established for important data. Data from surveys should adhere to certain minimum standards of statistical validity and, at the very least, statistical procedures used to produce estimates need to be properly documented.

Regardless of the specific data capture technologies or data collection systems, in general, data quality standards and quality assurance systems are best implemented at the regional level. Data element standards must be agreed upon so that there are commonly held data element definitions. A data resource directory (DRD) should be developed so all partners understand the basic characteristics of the data. Metadata should be maintained so data users have the information they need to interpret data elements and the data itself.

5.1.2.2.4 Data Dictionary/Metadata

The subject areas of information and the specific data elements (data dictionary) that will comprise the FIS need to be identified and described. Metadata describing the data dictionary elements will be based on the QA/QC standards and procedures developed for the data. The completion of the FIS data dictionary and associated data quality standards will provide the basis for evaluating current data collection methods and systems. The extent to which current collection systems can provide the required data will determine in large part the scope and complexity of the FIS development effort.

5.1.2.2.5 Coding Standards

Regional coding standards should be developed for certain elements (e.g., species, gear, fishing area, etc.). All entities feeding data to the FIS would be encouraged to use established coding systems. While building bridge or translation tables to accommodate multiple coding systems is possible, the gains of using defined standards can be significant, especially in regional data retrieval exercises. In cases where a state elects to use the FIS as its state data repository, adherence to regional standards would be mandatory. Where possible, regional coding standards ought to be devised in the context of national coding standards. Ultimately, similar gains are to be reaped when regional data, nationwide, are combined and summarized for users of national summaries.

5.1.2.2.6 Technology Adoption

As scenarios are developed to satisfy the standards for a nationwide FIS, new opportunities and technologies that support the achievement of the FIS vision and goals should be simultaneously evaluated. Once there is a shared understanding of the specific processes and information flows that are needed, data collection and data dissemination technologies can be identified that support those processes. These technology elements might be crosscutting in that there are potential applications of technology across all components of a VRS and FIS. If mandatory trip-level reporting for each state is agreed upon, for example, there might be a strong case for the development of uniform electronic logbooks for trip data. Likewise, establishing unique identifiers for commercial fishing vessels nationwide may make possible a state-federal "one-stop shopping" system for fishery permits and licenses.

These processes and technologies are an important element of the FIS vision so a process will be designed to identify and evaluate candidate technologies and evaluate them according to specific criteria. Examples of the kinds of technologies that might be considered include, but are not limited to, electronic logbooks, electronic clipboards or other data capture devices, interactive voice response for permitting and catch reporting, computer assisted recording and transmission, fax-based data reporting, OCR/bar code and other technology-based data entry systems, and Vessel Monitoring System (VMS) technologies.

5.1.2.2.7 Non-Duplicative Participation Estimates

Answers to relatively simple questions about the number of fishermen operating regionally or nationally or the number of commercial fishing vessels operating in the U. S. are surprisingly difficult to find. An underlying principle of the FIS should be the establishment of unique identifiers of all commercial fishing vessels as part of a nationwide fishing vessel registration system. This registry (VRS) would track and enumerate vessels, exclusive of duplication and link vessel data with harvest data, producing reasonable estimates of fishery performance and employment.

6 FUNDING RECOMMENDATIONS

Section 401(a)(5) of the Magnuson-Stevens Act states that the Report to Congress shall include recommendations for "funding (subject to appropriations) to assist appropriate state, regional or tribal entities and marine fisheries commissions" for implementing activities associated with this Report. This section provides these recommendations by detailing the estimated incremental costs of implementing the System, over and above current state and federal funding levels. This section outlines a matrix of high-level implementation activities by geographic region, followed by a discussion of the content and cost estimate of each phase.

The cost estimates in Table 6.1 are the recommended funding levels above current state or federal funding levels to assist System implementation. However, at the request of the Atlantic Coast Cooperative Statistics Program's Operations Committee, the Atlantic costs now represent the total amount of new funds required for total ACCSP implementation, regardless of state or federal origin. The concern, raised during the 60 day public comment period, was that the ACCSP did not want the total cost of ACCSP implementation to be under-reported. The ACCSP Operations Committee does acknowledge that not all the costs of the collaborative state-federal ACCSP implementation will necessarily be funded by federal appropriations. This change to the budget in the draft Report increases the total cost in the table for the Atlantic coast by $8.3 million.

Table 6-1: Regional Implementation Costs ($ million)

Region (1)	Data Collection & Integration	Information Technology & Architecture	Institutional Arrangements	Regional Total
NMFS	**6.200**	**2.375**	**0.200**	**8.775**
Atlantic	**21.030**	**1.275**	**0.600**	**22.905**
Gulf	**6.860**	**0.750**	**0.150**	**7.760**
Pacific	**4.940**	**1.550**	**0.150**	**6.640**
Western Pacific	**4.060**	**1.250**	**0.550**	**5.860**
Total	**43.090**	**7.200**	**1.650**	**51.940**

(1) Nationwide or inter-regional programs have been pro-rated across geographic regions. Derived from regional VRS/FIS implementation plans in Appendix 7.1.

The cost estimates in Table 6-2 were derived through discussions with the regional statistics bodies who helped develop the technical content of this Report, and are based on the differences between current funding levels by state and/or region and the projected level needed to fulfill the data collection, information management and institutional objectives of the VRS/FIS. Not all these funds are needed or desired in year one. Implementation of the entire System is likely to occur over five or more years because of the magnitude of the effort. The majority of the costs, however, will be recurring once the System is implemented. Using the criteria of what activities would have the most profound positive change from the status quo and which activities are considered building blocks for future efforts, the following activities were determined to have the highest priority for funding in the initial two years of program implementation:

Year 1 = $9.7 million
Data base integration ($1.8M)
Wide Area Network ($1.6M)
1st half Social/Economic data collection ($3.4M)
Electronic reporting ($2.1M)
1st half Institutional arrangements ($0.8M)

Year 2 = $9.7M + $15.27M = $24.97M
Missing recreational data ($1.2M)
VIS implementation ($3.0M)
1st half commercial trip ticket system ($6.87M)
2nd half Social/Economic data collection ($3.4M)
2nd half Institutional arrangements ($0.8M)

However, because the creation of the System is based on a complicated transition from many separate existing programs to a harmonized System, the exact sequencing of specific events and their relation to detailed budgets and time frames has yet to take place. The stakeholders and regional statistics bodies which contributed to the Report have indicated they will work to develop detailed operating budgets and implementation schedules from these first approximations if the high-level principles, roles and processes proposed in the Report are approved by Congress.

To support an evaluation of the budget implications of these high-level principles and processes, this supplement links the target principles and the processes identified in the Report and the level of funding necessary for their implementation. For example, Sections 3 through 5 of the Report lay out the specific goals and objectives of the VRS/FIS and summarize what is envisioned by VRS/FIS implementation. The System seeks data for each fishing trip, intending to capture detailed data about the inputs creating the fishing trip (e.g., vessel, gear, fishermen, operator costs, fishing effort), as well as details of the transactions resulting from the trip (i.e., first sale, processing, marketing, trade, consumption/usage). The System includes all species under federal or state stewardship, as summarized in the data models shown in Figures 5-2 through 5-8 and Section 7.3. These data have to meet or exceed the minimum data quality standards that will be derived for the System. Once collected and audited, the VRS/FIS information management component has to store and deliver the data and its derivatives to a range of users quickly, reliably and accurately. For each of these high-level activities, this budget supplement estimates the cost of implementation.

There is a considerable gap between the desired attributes of the System and the current state of our regional information systems as described in detail in Section 7.1. The gap is not consistent across regions. Some regions are much closer to the ideal than others, with the number of fisheries and states within a region, geography, historical precedent, and budget success greatly influencing a region's "System readiness."

This Report outlines three major areas where funding needs to be applied: 1) Data Collection and Integration; 2) Information Management Architecture, and 3) Institutional Arrangements. The Report has identified specific targets and processes for System implementation in these three areas, and each of the regional implementation plans in Section 7.1 describe the regional gaps and strategies to meet these targets. Each strategy has a budget implication. For example, in some regions entirely new data collections would have to be initiated to collect "missing data" such as the social and economic data targeted by the System. In some regions, existing collection systems would only have to be enhanced to meet the "minimum data quality or timeliness standard" of the System.

The following sections describe the funding recommendations, summarized in Table 6-2, to assist System implementation in data collection, information management and infrastructure at the federal level and within the Atlantic, Gulf, Pacific and Alaska, and Western Pacific regions. Within the three areas, several major categories are defined below that summarize the activities comprising the budget estimates.

VRS/FIS System Definitions/Description

Data Collection and Integration

- Commercial fisheries data collection programs: the collection of trip-level detail of core data elements including fishing catch, landings, and effort, whether by trip ticket, logbook or some combination of dealer and harvester records. Includes expansion of reporting systems to adequately sample species, fishery coverage, geography and season.

- Recreational fisheries data collection programs: the collection of trip-level detail of core data elements including fishing catch, landings, effort and participation from saltwater anglers. Includes expansion of data collection to regions not currently covered, increase in sample size to improve precision and accuracy of estimates, and specialized studies for localized, unique and/or rare event fisheries.
- Social/economic data collection programs: the collection of economic and social science data on prices, employment, costs/expenditures, revenues, and allied community, demographic and social science data.
- Fisheries observer programs: the development of standard fishery observer protocols and practices and the initiation of additional observer days by region.
- Biological sampling programs: the statistical design and implementation of biological sampling programs for commercial and recreational fisheries of high priority for stock assessment purposes.

Information Technology/Architecture

Telecommunications/Wide Area Network systems : the design and implementation of a communications network and software applications for access/reporting among System partners, including the fishing industry and general public, for the secure and efficient collection, compilation, access and exchange of data and information.

- Data quality assurance/quality control: the derivation and execution of standard protocols and practices for data quality assurance for the entire life cycle of data (from data collection to data archiving).
- Technology/electronic reporting: research, prototyping and implementation of technology-based data collection/entry applications for commercial and recreational permits, landings and related data capture activities to improve efficiency and reduce industry burden.
- Data base integration/harmonization: design and creation of information systems that efficiently bridge current islands of information through the application of relational data base, client/server, data warehouse and related information system principles, hardware and software.

Institutional arrangements

- The implementation of effective staffing and program management solutions to ensure communication, coordination and performance management of the System's components.

6.1 Data Collection and Integration ($43.09 million)

6.1.1 Commercial fisheries data collection programs ($15.42 million)

Vessel Information System: ($1.68 million) - - Included in the draft Report was a recommended $25 thousand per state for implementation of the U.S. Coast Guard VIS. For 23 coastal states and five territories the total cost was estimated at $700 thousand, and a proportion of this amount was included in the total commercial fisheries data budget estimates by region. Based on supplementary information from the U.S. Coast Guard and public comments received during the 60 day comment period, this estimate is being revised. Recent experience by the U.S. Coast Guard and its contractors in converting existing state numbering systems into the VIS standard, including software for continual updating of the initial conversion, results in a revised cost estimate per state of $60 thousand. This by itself would increase the recommended VIS budget level by $980 thousand to a total of $1.68 million. Also as a result of public comments, described in detail in VIS section 4.2, it is recommended that full funding of all 50 states for conversion to the VIS be considered by Congress, rather than just the 28 coastal states

and territories under the scope of the VRS/FIS System. The marginal cost of including the additional states would be $920 thousand, with total VIS implementation then totaling $2.6 million. The benefits outlined by proponents of funding the inclusion of all 50 states in the VIS appear to outweigh the costs. However, it is beyond the scope of the charge to the Secretary to formally recommend funding the use of the VIS beyond the 23 coastal states and five territories, hence the total of $1.68 million given here.

Federal level: ($2.0 million) - - The objectives sought by this activity are to reduce government reporting burdens on industry, and to measure and quantify the resulting sampling and reporting uncertainty in our information systems. Currently many federal commercial statistics logbook programs assume they are obtaining a census or 100 percent enumeration of all commercial fishing activity, when in fact for a variety of reasons they are receiving a sample. To meet the VRS/FIS objectives for commercial fisheries, it is critical that data collection techniques reject this census assumption, assume the data collection programs have the properties of statistical sampling surveys, and structure the design, sample size and resulting estimation accordingly. To understand the population characteristics of fishermen submitting logbooks requires knowledge of the population of all permitted fishermen. Knowing this would provide statisticians better information upon which to develop sampling frames and execute statistical surveys. To this end, current data collection and data management systems for federal fishery permitting programs will be redesigned and linked to each other and U.S. Coast Guard documentation and VIS databases. The resulting unified federal permitting system would provide a form of end-to-end electronic commerce for permit applicants, promote more effective reciprocity with state permitting systems, initiate critical electronic links to the VRS/VIS and the FIS databases, and allow the development of statistical sampling frames for logbook implementation or analysis.

Atlantic Region: ($5.04 million) - - The Atlantic Coast Cooperative Statistics Program is estimating that a baseline trip level catch and effort system along the Atlantic coast from Maine to Florida will cost approximately $7 million in total, with $4.2 million in new funds necessary. All catch and effort data will be collected at the trip level with resolution for each gear and area (water body) combination. Data will be collected either using a one-ticket system (fishermen or dealer only reporting) or a two-ticket dual reporting system (combination of fisherman reports and dealer reports). This approach recognizes the special consideration needed for large-volume (as defined by number of trips) fisheries such as lobster where large numbers of small trips reported by both fishermen and dealer would overwhelm the system. Costs obtained from the ACCSP per state for a trip ticket system is estimated at: $600 thousand for large states (MA, NC, FL, VA); $300 thousand for medium states (ME, NY, SC, GA); and $100 thousand for small states (CT, DE, MD, NH, NJ, RI) for a total of $4.2 million. The VIS in the Atlantic region would cost $840 thousand.

Western Pacific Region: ($1.88 million) - - Section 7.1.3.3 characterized the commercial data collection program in the Western Pacific as suffering from serious data gaps among some species and sectors, as well as from occasional sampling errors. There is no region-wide computerized dealer reporting system, and region-wide creel surveys lack sufficient funding to collect enough samples to ensure accurate estimates. To remedy these shortcomings, the Western Pacific Fisheries Information System (West PacFIN) partners propose enhancing the fisheries monitoring programs by modifying their programs to meet the VRS/FIS target for commercial fisheries. To support the System design and implementation, of the $1.88 million, $240 thousand would support the VIS, $250 thousand would support four new

Guam Department of Commerce	$70K
Guam Division of Agriculture and Wildlife	$270K
Commonwealth of Northern Marianas Islands Division of Fish and Wildlife	$310K
American Samoa Department of Marine and Wildlife Resources	$250K
Hawaii Division of Aquatic Resources	$490K

statistician/data specialist FTEs in NMFS for the program design and management, and $1.39 million would be allocated for the collection of commercial data as follows:

Pacific Region: ($1.74 million) - - The present commercial fisheries data collection programs in California, Oregon Washington and Alaska have longstanding fish trip ticket systems. Thus, relative to the other regions, the Pacific region needs are fairly modest to satisfy many of the VRS/FIS targets. The most critical commercial fisheries statistics change needed to implement the System is for the PSMFC, States and NMFS to jointly establish a centralized repository/system of logbook data with the necessary linkages to biological sampling (via port-agent or observer programs) and with associated vessel fish tickets. This would enable users to link the details of specific trips, such as gear used, fishing effort and other trip parameters required by the FIS, back to the trip ticket. Unlike trip tickets implemented more recently on the Atlantic coast, these fishing trip data elements are not captured by the trip ticket system itself on the Pacific coast. This level of funding would also support the inclusion of freshwater and aquaculture production data for the member states within AKFIN and PacFIN. A total of $240 thousand would be used for the VIS, with the balance apportioned between the states as they decide.

Gulf Region: ($4.76 million) - - Currently a combination of state and federal agents collect summarized data from fishermen and/or dealers (see table 7.3). For commercial fishing, the goal is to collect the minimum System data for every trip (or sales transaction) that occurs, i.e. to establish a trip ticket program (or its equivalent) for all partners in the Gulf region. Only Florida collects trip-level detail, although Louisiana has initiated a pilot test project to begin a trip ticket program in January 1999. Based on data analyzed by Texas, it is estimated that initiation of a trip ticket system for a Gulf state will cost up to $1.35 million per state, with an annual recurring cost of about $1.1 million. Given the relative geographic size and number of ports to be covered, the total cost for four states from Alabama through Texas is estimated at $4.4 million. Creating equivalent systems in Puerto Rico and the U.S. Virgin Islands is estimated equivalent to the small and medium state costs derived for ACCSP or $400 thousand. The VIS cost would be $360 thousand.

6.1.2 Recreational fishery data collection programs: ($8.29 million)

The recreational fishery data collection program to satisfy the System requirements has a distinct advantage over the commercial fisheries programs. Since 1979, NMFS has sponsored an annual marine recreational fishery statistics survey (MRFSS) program across the Nation. Depending on funding level, bimonthly estimates of catch and effort by species, state, mode and area of fishing, as well as estimates of angler participation, have been estimated for the Atlantic, Gulf, Pacific, Western Pacific, and Caribbean areas. Implementation of a uniform statistically designed methodology across states and years has resulted in a significant time series of data for fisheries stewardship. With the exception of Alaska, all coastal states have either participated in the conduct of the survey or provided support to the program to provide answers to state recreational data needs. Alaska has traditionally relied on its own state survey of recreational fishing, and many other states also conduct complementary surveys to the MRFSS to complete their needs. Currently almost $4.0 million nationwide in federal funds are used to support the MRFSS. To meet the needs of precision, timeliness and coverage needed by the states, an additional $8.29 million is needed for MRFSS and non-MRFSS programs as follows:

Federal Level: ($200 thousand) - - Extension of the MRFSS into new geographic areas, rare event species add-ons, and the integration of state and federal data collection programs into a harmonized system requires additional survey staff. Two senior survey statisticians and an operations researcher would provide the scientific expertise needed to ensure data were unbiased and comparable between regions and programs, including design of survey instruments, optimization of the sample frame and sample allocation, and the calculation of variances and other survey statistics associated with sample surveys.

Atlantic Region: ($5.89 million) - -The Atlantic Coast Cooperative Statistics Program (ACCSP) has recommended tripling the MRFSS sample sizes from Maine through Florida. This would provide many benefits, from improving the precision of all species estimates to capturing data for previously "rare event" species that because of season or clustered areas of fishing effort are missed at historical sample sizes. These funds would also support surveys of recreational shell fishing (e.g., blue crab fisheries in Chesapeake Bay), specialized surveys of angler participation (estimated at $20 thousand/state), coast-wide surveys of the for-hire sector (charter and headboat fisheries), and targeted special surveys for species of particular concern for stock assessment (e.g., summer flounder and bluefish) where the recreational component of fishing mortality is significant. These costs are in addition to the $5.5 million in federal and state funds currently being expended on recreational statistics programs in the Atlantic region.

Western Pacific Region: ($1.0 million) - - Recreational fisheries data programs need significant improvement in Hawaii and the western Pacific islands. From 1979-1981, NMFS conducted the MRFSS in these areas but insufficient funds since 1982 caused this region to be dropped from the program. In this region, recreational and subsistence fishing are sometimes difficult to differentiate. In addition, in Hawaii recreational fishing is a significant tourism attraction as well as a source of fresh fish for commercial markets when, by custom, the catch caught by anglers is frequently sold into commercial markets by the operators of charter fishing vessels. Funding would be used to design and implement a recreational fisheries statistics program in coordination with WPacFin, the Western Pacific Fishery Management Council and the NMFS Honolulu lab and MRFSS staff. This would fill a major gap in recreational fishery performance data for this region and conform to the target requirements of the FIS.

Pacific Region: ($1.0 million) - - The PSMFC has played a significant role in the conduct of the MRFSS in California, Oregon and Washington since 1979. In addition, each state has fishery or area-specific data collection programs for some part of its recreational fishery. Increasingly, the Pacific Regional Fishery Management Council is recommending policies on the sometimes contentious allocation of resources among commercial and recreational fishermen, and NMFS and state stock assessment biologists are tasked with providing assessment advice for species that have a large recreational component. For these reasons the increase in funding sought will be used to increase sample sizes and coverage of the MRFSS in Washington, Oregon and California that will result in more accurate and precise estimates, and to fill geographic gaps in angler surveys especially for in-river fisheries where little or no data currently exist.

Gulf Region: ($200 thousand) - - Table 7.3 summarizes the data collection programs in the Gulf of Mexico, and lists the MRFSS and the recreational survey conducted by the Texas Parks and Wildlife Department as the major programs. In 1992, NMFS implemented a major data initiative that resulted in a doubling of the MRFSS sample size for the entire Southeast area. Thus, the current state and federal recreational fisheries statistics programs in the Gulf come very close to meeting the requirements of the FIS.

However, in the Caribbean, NMFS conducted the MRFSS in Puerto Rico and the U.S. Virgin Islands in 1979, and again in 1981, but has not collected data there in more than 15 years because of budget shortages. The circumstances faced by the Caribbean Fishery Management Council for reef fish are similar in many respects to the recreational data circumstances found in the Western Pacific — a mixture of angler tourism, subsistence and commercial sale of angler catch. The proposed $200 thousand in funding would re-start a systematic collection of recreational data in the islands as NMFS, the Council and the island governments collaboratively design and implement a statistically based survey.

6.1.3 Social and economic data collection: ($6.775 million)

Throughout the VRS/FIS Report to Congress there is a recurrent theme of missing data in the areas of economics and other social sciences. This is especially evident in examining the base of information available to the Regional Councils to evaluate the benefits and costs of alternative management options, and the information base available to the Secretary of Commerce to analyze and implement fishery regulations. The major uses of such data are to fulfill federal statutory, regulatory and Executive Order requirements to better understand the economic and social impacts of fisheries decisions.

These requirements are presented separately from commercial and recreational catch data to emphasize their importance and the fact that such data are generally unavailable relative to commercial and recreational biological information. This does not mean that the collection methodologies and implementation plans are proposed to be separate, stand-alone actions. In many cases the most efficient and effective means to obtain such data are in parallel with the traditional biological data collection systems. Collecting these data in tandem permits the linking of the inputs of production (fishing effort gear, costs of fishing) and the outputs of fishing (catches, revenues), which are the important parameters in understanding the dynamics of fisheries and their regulations. In *Our living oceans: the economic status of the US fishing industry* (NMFS, 1996), Tables 2-1 to 2-5 outlined the data needs and economic information needed by sector. These data were used as a starting point for identifying the economic requirements of the VRS/FIS. The cost of filling these economic data matrices and other social science data needs of the System is described below.

Federal level: ($4.0 million) - - Funds will be used to initiate collection of core social and economic data elements from recreational and commercial fishermen and processors engaged in federally managed fisheries, and fisheries managed under joint state-federal jurisdiction. Initial databases would include: 1) improved coverage and frequency of exvessel, wholesale and retail prices, 2) vessel and processor employment data (including demographics), and 3) vessel operating costs and earnings information. These are required inputs to estimate supply and demand functions for fishery products and to establish economic performance measures/indicators of capitalization. Some of these elements will be captured in continuous collection systems (such as prices) while other will be collected in periodic or specialized surveys. The major initiatives include the collection of regional recreational economic data ($1.5 million/year) to estimate the economic value of recreationally important fisheries; $1.25 million for initiation of systematic commercial cost and earnings data collections in five regions at $250 thousand each per year; and $1.0 million per year to collect social and demographic data for development of fishing community profiles to model how communities will be affected by fishery management regulations. These efforts directly address the federal data needs to satisfy Regulatory Flexibility Act and Social Impact Assessment requirements. In addition, the funding will support the collection of data needed to estimate current fleet capacity, and subsequently track changes in capacity as a result of policy actions (such as vessel buyouts, shifts to individual quota allocations, etc).

Atlantic Region: ($500 thousand) - - The ACCSP has identified $100 thousand for recreational and $500 thousand in commercial baseline social and economic data for their program. (The $100 thousand recreational component is covered in the Federal level funding described above since the primary data collection program is the federal MRFSS.) The kinds of data elements to be captured are similar to those described for the federal level. However, these funds would be targeted at inshore or state fisheries, whereas the federal funds would be targeted at fisheries that occur predominantly in the Exclusive Economic Zone.

Western Pacific Region: ($275 thousand) - - The gaps in economic and socio-cultural information for the Western Pacific require $175 thousand for one FTE and contract data collection for missing economic data, and $100 thousand for socio-cultural information. As previously described, the distinctions in this region between commercial versus subsistence fisheries become very blurred, especially in the Western Pacific islands, so directed economic and anthropological studies are proposed

to differentiate the behavior of fishermen in different fisheries, and assess the impacts of regulations on fishermen and communities.

Pacific Region: ($1.0 million) - - These funds would be used to expand RecFIN and PacFIN to include economic and socio-cultural data and information that meets the VRS/FIS target. To better fulfill the Magnuson-Stevens Act and other statutory requirements, a long-term coast-wide economic and social science data plan has been developed by the Pacific Fishery Management Council and a similar effort is in progress in Alaska. These systems will routinely collect data and information concerning commercial fisheries, recreational fisheries, communities, and habitat and will be capable of integrating this information with other data systems, while not being burdensome on the industry. To accomplish this it will be necessary to increase industry outreach and provide greater opportunities for industry/community involvement in the design and implementation of data and information systems and technologies. The preferred approach is to develop an economic fisheries information network (EcFIN) under the PSMFC umbrella. An oversight committee will be created to coordinate existing and future economic and social science data collection efforts and for integrating such information into AKFin, PacFIN and RecFIN. This network would also be a repository of economic and socio-cultural data on geographically defined fisheries dependent communities.

Gulf Region: ($1.0 million) - - Recreational and commercial economic and social science data collection systems are lacking in every Gulf state and in the Caribbean. In the Southeast region, economic data collection will focus on commercial shrimp, spiny lobster, king mackerel and stone crab fisheries and recreational fisheries throughout the Gulf. The Caribbean Fishery Management Council has very little economic and social science data to assist in the formulation of fishery management policies. The proposed collection of economic performance data to meet the VRS/FIS minimum standard is necessary to support the Magnuson-Stevens Act and regulatory requirements for analyses of the relative impacts of various Gulf fishery management plans on fishermen, and ultimately on the fish stocks themselves. In addition, the data and analyses allow for tracking of economic performance of vessels and fisheries over time, providing indicators of economic health of the industry, and enabling the Councils, states and NMFS to measure progress on its resource stewardship objectives.

6.1.4 Observer programs: ($7.86 million)

There is no separate increase in federal level funding proposed. Rather, an apportionment of observer system funding has been made to each region.

Atlantic Region: ($5.6 million) - - The ACCSP has proposed significant increases in observer days to capture more catch-related information that is only available at-sea (e.g., incidental catch of fish, marine mammals, sea birds; oceanographic observations related to catch; biological attributes and species composition of discarded catch) and expand the current program into the southeast. Based on current costs of approximately $700/observer day, the ACCSP proposal would result in an additional 8,000 observer days.

Western Pacific Region: ($755 thousand) - -This funding would result in the deployment of an observer corps of 16 FTEs to fisheries managed by the Western Pacific Fishery Management Council.

Pacific Region: ($1.0 million) - - Additional observer data for Alaska and the Pacific Northwest are needed to better identify areas of effort and catch and to stratify fishery samples by depth. This information is needed for stock assessments and monitoring total harvest. For example, the Pacific Groundfish Management Team needs to be able to predict the effects of alternative management measures on total removals (landings and discards) from the fishery. Discards may be regulation-induced (as under trip limits) or market induced — both types of discard need to be quantified. Development of

methods, programs, or analytical tools to provide such information is a high priority. Alternative methods of estimating discard rates need to be validated against accurate observations made by observers. Note: The Oregon Trawl Commission in cooperation with Oregon Department of Fish and Wildlife has started an observer program pilot project and NMFS Northwest Fisheries Science Center will be collaborating on the design and analysis of the Oregon observer program.

Gulf Region: ($500 thousand) - - The proposed budget is for the design and implementation of an expanded at-sea observer program for improving incidental catch data of finfish, marine mammals and other protected species, such as sea turtles. Many fishery management issues in the Gulf involve policy decisions that must balance directed catch and bycatch activities. For example, resolving conflicts between rebuilding schedules for over fished red snapper stocks and finfish bycatch in the shrimp trawl fishery requires more significant observer coverage for biological and fishery compliance purposes.

6.1.5 Biological sampling: ($4.75 million)

Biological sampling of the commercial and recreational harvest is a key ingredient to the conduct of stock assessments and a broader understanding of the biological characteristics of fisheries**.** Age data play a crucial role in stock assessments, yet some of the aging techniques routinely employed suffer from inadequate temporal and spatial samples for individual species. Improper aging results in unreliable stock assessment data. Validation studies are important to assure that the basic data used in stock assessments are accurate. In each region, state and federal stock assessment biologists have evaluated the key recreational and commercial fisheries where biological sampling needs improvement. The budget proposed will improve the quantity of data available, as well as provide for increased standardization of data collection and analysis of the resulting information by developing consensus on techniques, data standards, and quality control procedures.

Atlantic Region: ($4.0 million) - - There are many interjurisdictional species managed along the Atlantic coast that have significant recreational components. Obtaining more precise estimates of population using age-based stock assessment techniques requires good data on size composition of the catch. Presently there are very few programs collecting biological samples (e.g., scales, otoliths, size frequencies) of the recreational catch. Much of the sampling effort of the commercial catch is not distributed throughout the range and season of the fishery. The ACCSP partners have proposed biological sampling programs across states, months and gears for species such as bluefish, summer flounder, weakfish and striped bass, and to strengthen programs for other species such as cod and other flounders.

Western Pacific Region: ($150 thousand) - - Biological samples obtained from WPacFIN partners for species included in the Western Pacific Pelagics, Bottomfish and Seamount and Crustaceans FMPs are needed to improve the quantity and quality of data used in stock assessments.

Pacific Region: ($200 thousand) - - Age composition data are critical for precise stock assessments with stock synthesis and other assessment models. Collection and analyses of coast-wide age structure data from research surveys and commercial fishing need to be expanded for whiting, rockfish, lingcod, and flatfish. There are species and areas in which the collection of age data is very incomplete (e.g., sablefish dressed at sea and rockfish taken by non-trawl gear). Previous sablefish age sampling programs have not been extensive enough to allow examination of age composition by area, season and gear type. Failure to account for these components of sablefish catch can lead to biased results and erroneous conclusions. There is a particular need to collect otoliths of sablefish caught in the non-trawl fishery, much of which is headed and gutted prior to unloading. The high percentage of dressed fish in some gear/area strata severely compromises age composition estimates. At-sea collections are needed to gather the necessary data for some species.

Gulf Region: ($400 thousand) - - Similar to the Atlantic Region, there are many species managed along the Gulf coast (e.g., mackerels, reef fish) that have significant recreational components. To obtain more precise estimates of population using age-based stock assessment techniques requires good data on size composition of the catch. The current state/federal cooperative Gulf trip interview program cannot meet the need for collecting biological samples (e.g., scales, otoliths, size frequencies). Much of the sampling of the commercial catch is not distributed throughout the range and season of the fishery. Furthermore, many of species of interest have large recreational components that target on different sizes than the commercial fisheries which are not presently sampled. This funding would implement statistically designed biological sampling programs for the commercial and recreational species of interest. The highest priority species for biological sampling are: king mackerel, Spanish mackerel, and red snapper.

6.2 Information technology/architecture ($7.20 million)

The following section provides cost estimates for the four information technology components of the VRS/FIS:

Communications Networks/Computer infrastructure: The VRS/FIS is designed to link existing state and federal data programs across time and space. Thus, the telecommunications and computer infrastructure to enable these links is critical to the System's success. Secure and efficient transfer of data among providers and users of data will be impossible without an investment in hardware and software technologies.

Data quality assurance/quality control: High speed transfer of data which is of unknown or poor quality serves no one, so the VRS/FIS system also requires investments in data quality assurance and quality control procedures, including establishment of standards and protocols to measure, document and improve data quality.

Technology/electronic reporting: One way to improve data quality and reduce burden on providers and users of data is the application of innovative technology. The development and implementation of electronic reporting had widespread appeal among VRS/FIS partners.

Data base integration/harmonization: Access to and archiving of the contents of the System will require the integration of numerous state and federal data bases, which in the VRS/FIS model is a regional detail/central summary architecture that can be satisfied by virtual data base networks and/or data warehouses.

6.2.1 Communication Networks/Computer infrastructure: ($1.7 million)

The creation of a fisheries information communications network and supporting computer infrastructure will permit the System to provide secure, efficient access, sharing and use of fishery data. Lack of standards and the absence of configuration management have been impediments to past data transfer and sharing. Taking advantage of existing NMFS/regional systems and planned architecture is proposed to lower initial and recurring costs for the System due to economies of scale and adaptive re-use of plans and computer code.

These computer infrastructure costs on the Atlantic coast will cost $900K. The ACCSP has initiated a prototype information management system using NMFS Northeast region data and Florida trip ticket data. Full implementation will require a communications backbone. The plan is to integrate NMFS and all the ACCSP partners into a common communications network to ensure a contiguous, consistent and standardized architecture. The architecture of the ACCSP component will provide access between all

NMFS facilities and one nodal facility at each of the states, three Councils, three interstate commissions and the U.S. Fish and Wildlife Service. The intent is to provide the band-width and security of a virtual private network dedicated for State-Federal fisheries-related information.

Similarly, $200 thousand would be used to extend the network and supporting infrastructure to the Gulf coast and Caribbean partners, and another $450 thousand to link the Western Pacific region into the system. The Pacific coast states are already part of this infrastructure as a result of the foresight of the PacFIN and AKFIN networks, but would require annual maintenance and support costs of $150 thousand to link to the System.

Design principles and architectural planning is underway to various degrees in each region and will be assessed prior to actual implementation. Standards may include: TCP/IP transport protocols; routers at each facility, as well as modems for out-of-band configuration and testing; microcomputers and servers with appropriate network cards and TCP/IP software; network hubs. Software will likely include support of Telnet, FTP, and other Internet protocol supported capabilities. A WEB-enabled relational database management system (e.g., ORACLE w/SQL*Net or equivalent) with GUI forms, reports and OLAP application software tools will be expected. A network management system will be needed for network management and monitoring.

6.2.2 Data quality assurance/quality control: ($1.575 million)

The objective of this element is to establish and implement criteria and processes for evaluation of data quality and data quality standards (validation, quality control, and quality assurance). A key objective of the System is the establishment of standards of data quality and quality assurance/control of fisheries statistics databases. Funds would be used to: 1) research and adopt nationwide data quality standards, including utilization of university, other federal agency and private research contractors familiar with large scale data quality issues; 2) establish nationwide data quality control groups that will provide continuous oversight and peer review of both data collection and data quality processes; 3) research, design, and implement independent validation methods for self-reported statistics systems (e.g., logbooks) to measure and document the biases and accuracy of such data; and 4) create on-line metadata files for System statistical information within the data bases to improve availability of documentation on quality aspects of our information, and inform users accessing data through the regional data centers.

Regional implementation of these standards will rely on existing regional statistical bodies such as ACCSP or PacFIN to initiate regional data quality teams and peer review processes. Methodological research on validation techniques for self-reported data, workshops on deriving variances and other statistical properties, and development and sharing of data entry and auditing software code are expected outcomes. For example, in the Atlantic region, Section 7.1.1.2 of the Report cited that regional coding standards will be developed for certain data elements (e.g., species codes, gear codes). All entities feeding data to the regional repository would be required to map their data to established coding systems. Also, bridge tables will be required for legacy/historical data. In cases where states are using the FIS as the data repository for their detailed state data, adoption of the regional standards would be mandatory. Wherever possible, regional coding standards will be devised in the context of national coding standards to realize the gains in efficiency when accessing inter-regional or nation wide summaries. Sections 7.1.2 through 7.1.5 discuss implementation of comparable initiatives for the Gulf, Pacific, Western Pacific and Alaska regions.

6.2.3 Technology/electronic reporting: ($2.125 million)

Funds would be used to research and adopt strategies for application of new technologies to improve efficiency of data collection/entry, reduction in data collection redundancy, and reduction of burden on industry in compliance with federally mandated data collection systems. NMFS and several states have

been exploring and prototyping on a small scale the feasibility of using modern technologies for the acquisition, entry and quality control of statistical information from fishermen. The System envisions full scale implementation of the most successful prototypes in selected fisheries. Data entry technologies that are currently being evaluated include PC-pen based field recording devices, fax-based data entry systems from processors/dealers to NMFS or state computers; Optical Character, Optical Mark and bar code readers of paper forms and voice actuated recording devices to capture data. This funding is targeting existing paper-based trip tickets (primarily on the west coast) and federal paper-based logbooks (see Sections 6.1.4.3 and 6.3) for conversion to electronic reporting. The funding for implementation of new trip ticket systems on the Atlantic and Gulf coasts in section 6.1.1.3 and 6.1.1.6 includes development of electronic reporting as part of the design costs of those systems.

6.2.4 Data base integration/harmonization: ($1.80 million)

The "umbrella" concept of building links among existing regional statistics systems, rather than creating an entirely new separate "national" system, has been a fundamental principle of the System design. The FIS conceptual model shown in Figure 5-1 describes how source data are reconciled into regional repositories, and further reconciled across regional repositories into inter-regional and nationwide summary information. There are several technical paths to achieve this functionality, but each requires solutions be developed for: computer security, system access, network administration, confidentiality, server technology, relational database design, and end-user data manipulation tools.

The current ACCSP is working on a computer system prototype that is evaluating and choosing solutions to these technical questions for the Atlantic coast, with a proposed completion date of the prototype in early 1999. Section 7.1.1.1 contains a list of the actions and strategy underway for ACCSP database design and implementation. The ACCSP conceptual architecture consists of three layers: 1) an operational layer comprised of the disparate systems maintained by the ACCSP partners that for the data sources for the ACCSP system; 2) a reconciled layer containing standardized or common ACCSP data, derived from the minimum critical core data elements taken from the operational layer and transformed into a consistent format and content; and 3) an informational layer consisting of information (source data further summarized or processed) repositories and data manipulation tools that support end-user data reporting and analysis requirements.

The System proposes adoption of this three layer architecture to reconcile the regional systems under an inter-regional/national umbrella. For example, the operational layer of the System would be comprised of the nationally-disparate regional data systems (e.g., PacFIN, ACCSP, ComFIN); the reconciled layer would contain standardized inter-regional data; the information layer would contain centralized summary data with data tools to create reports, tables and graphs of information.

Moreover, a region that does not have an existing regional architecture is strongly encouraged to consider adoption of this three layer architecture approach for its own regional design. The funding for this element is to apply the database integration activities underway in ACCSP to other regions, including the design of the relational data bases linkages underlying the data collection systems identified in Tables 7-1, 7-3, 7-4, 7-5 and 7-6.

6.3 Institutional arrangements: ($1.65 million)

Successful implementation of the VRS/FIS will require an extensive collaboration process among the data providers, data managers and data users at the state and federal level. The institutional arrangements proposed in Section 3.5.1 require the formation of technical and policy committees and/or working groups to be responsible for the coordination and implementation of the System. The proposed funding will support additional regional staffing and/or contractor support in the areas of technical/statistical

design, program coordination, and database management, as well as support the meeting, travel and workshop logistics of the various committees and workgroups that will be created. The funds would be allocated as follows: $600 thousand for the Atlantic region; $550 thousand for the Western Pacific region; $200 thousand for NMFS; and $150 thousand each for the Pacific and Gulf regions.

Table 6-2: Estimated Costs of Proposed Implementation of Vessel Registration and Fisheries Information Management System by Major Activity and Region ($ millions)

Data Collection and Integration

Region	Commercial	Recreational (1)	Social/ Economic	Observers	Biological Sampling	Row Total
NMFS	2.000	0.200	4.000	(2)	(2)	6.200
Atlantic	5.040	5.890	0.500	5.600	4.000	21.030
Gulf	4.760	0.200	1.000	0.500	0.400	6.860
Pacific	1.740	1.000	1.000	1.000	0.200	4.940
W. Pacific	1.880	1.000	0.275	0.755	0.150	4.060
Total	15.420	8.290	6.775	7.855	4.750	43.090

(1) Additions to the NMFS MRFSS are apportioned in this table to regions as follows: $1M WPacific; $2.6M Atlantic; $1M Pacific; $0.2K Caribbean

(2) NMFS funding has been pro rated to regions.

Information Technology and Architecture

Region	Communication & Computers	QA/QC	Electronic Rpt/ Techology	Database Integration	Row Total
NMFS	0.000	0.375	1.000	1.000	2.375
Atlantic	0.900	0.375	(3)	(4)	1.275
Gulf	0.200	0.375	(3)	0.175	0.750
Pacific	0.150	0.250	1.000	0.150	1.550
W. Pacific	0.450	0.200	0.125	0.475	1.250
Total	1.700	1.575	2.125	1.800	7.200

(3) Atlantic and Gulf costs for electronic reporting are included in commercial data collection estimate.

(4) Atlantic data base integration costs are included in commercial data collection estimate.

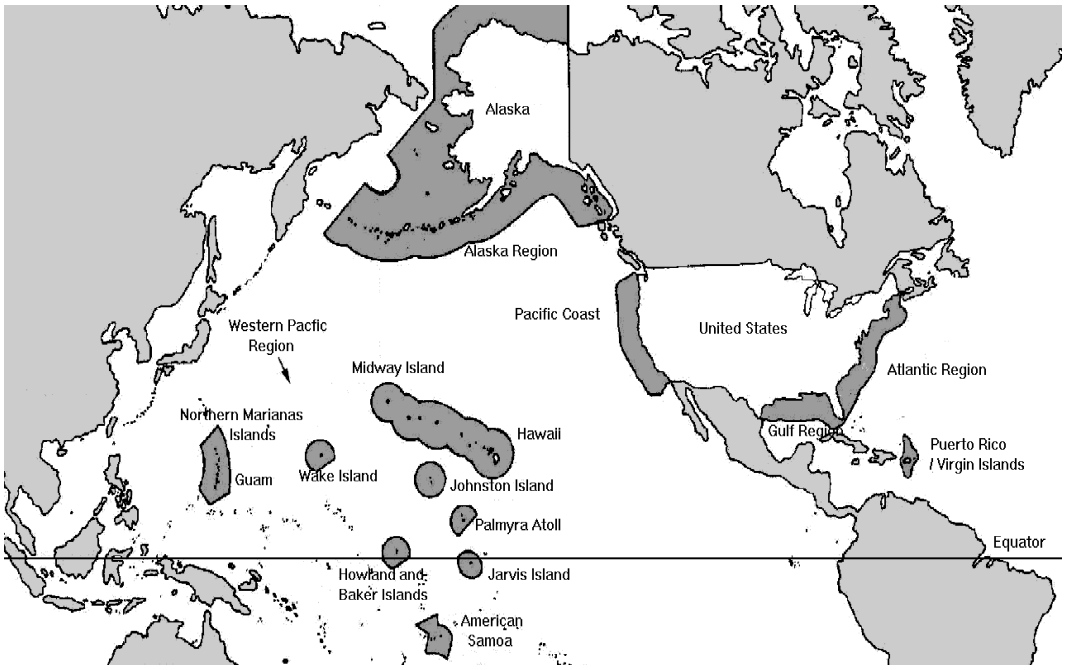
Region	Institutional Arrangements
NMFS	0.200
Atlantic	0.600
Gulf	0.150
Pacific	0.150
W. Pacific	0.550
Total	1.650

7 APPENDICES

7.1 Regional Implementation: Considerations, Implications and Consequences

The previous description of the FIS has focused on broad objectives and design characteristics. Translation of this conceptual view to a "regional" view is the next step. This answers the question of how the FIS conceptual design is implemented in each region. For the purposes of the FIS, there are five regional components to the FIS, each covering a wide geographic area. Figure 7.1 shows the Exclusive Economic Zone (EEZ) of the United States and the corresponding five regions of the FIS.

Figure 7-1. Exclusive Economic Zone (EEZ) of the United States (dark shade), with FIS geographic regions.



The following discussion, for each region (Atlantic, Gulf, Pacific Coast, West Pacific, Alaska, and "Extra-Regional"), is organized according to the three basic factors that make up the FIS framework: Information Management Architecture, Data Collection Integration, and Institutional Arrangements. Described for each factor is the current situation, a proposed regional-level model that considers regional "uniqueness" but conforms to the umbrella FIS concept, and a description of the gap between the current and proposed states and basic strategies to bridge that gap.

7.1.1 Atlantic Region: Atlantic Coastal States

The Atlantic Region FIS comprises the coastal entities from Maine to Florida and includes all state and federal data collection and information management programs within the FIS umbrella. Table 7-1 summarizes the state and federal information systems that might be considered under the Atlantic FIS umbrella.

As described in Section 3.1, the Atlantic Coastal Cooperative Statistics Program (ACCSP), comprised of all of the state, federal, and industry partners with a stake in this program, is in the midst of a very robust statistics planning effort. The result of the ACCSP's planning activities will serve as the FIS model for the Atlantic region.

7.1.1.1 Atlantic Region: Information Management Architecture

Current Situation

The current situation can be characterized as follows:

- Due to historical NMFS program structure, the regions have maintained separate data collection and information management programs.
- Some states maintain their own trip level detail on state-owned and state-managed systems.
- Federal reporting systems (e.g. logbooks, dealer reporting, and information management systems) are managed by the NMFS NE and SE regions.
- All states feed their data to NMFS offices monthly or annually.
- Not all states contribute trip-level detail data to NMFS.
- In order to obtain Atlantic region summary-level data within a current year, ad hoc queries must be run on multiple federal and state databases in the Northeast and Southeast.
- All states cannot currently access the NMFS Wide Area Network.
- Numerous coding and measurement standards have evolved independently over time.

Table 7-1: Data Collection Systems of the Atlantic Region Fishery

Information System	Responsible Agency
Commercial Fisheries – Dealer Data Entry	NMFS-NERO
Commercial Fisheries – Vessel Logs Data Entry	NMFS-NERO
Commercial Fisheries – Vessel Trip Audit	NMFS-NERO/NEFSC
Commercial Fisheries Database System	NMFS-NEFSC
Quota Entry Reporting System	NMFS-NERO
Surf Clam and Ocean Quahog Landings/Quota Monitoring	NMFS-NEFSC
Marine Ecosystem Database	NMFS-NEFSC
NE Data Dictionary and Directory	NMFS-NEFSC
NE Observer Program	NMFS-NEFSC
Vessel/Dealer Owner, Operator, Species Permitting	NMFS-NERO
ABT Daily Landing/Monitoring	HMS/NERO
Surf Clam and Ocean Quahog ITQ	NMFS-NER

Proposed Model

The ACCSP partners have collaborated to develop an information management model that capitalizes on existing mission, organizational structure, and technology base (computer hardware, software and telecommunications.) The proposed model incorporates the following important design principles:

General Technical and Functional Elements

- The selection of a central summary/regional detail implies that all regional trip-level detail and Atlantic coast summary level data will be accessible to all state and federal partners on one or more servers. Summarized data from this regional repository would be provided to a central entity to meet the central (or national) summary level information needs.
- Consistent data management protocols (e.g. computer security and system access, network administration, confidentiality) will be developed and implemented, system-wide.

- Standards of data quality (e.g. timeliness, accuracy, and estimates of precision) will be established and implemented, system-wide.
- Standards of data definitions, codes, and units of measurement will be established and implemented, system-wide.
- Technology solutions that support these principles and that reduce reporting burden on the industry will be identified, developed, and implemented where appropriate.

Architecture Elements (Final decisions on these issues will be determined by the ACCSP process)

- The Atlantic FIS will rely on two new independent servers as warehouses of regional detail data from federal and state sources.
- The servers will be sized and configured so that all state and federal data could be contained on either site and so that both sites could serve as "mirror" sites. As mirror sites, security, backup, and flexibility benefits would be realized. The servers would provide the sole or a replicate repository of data for an individual state. Some states may use the servers as their primary data repository if no state resources are to be invested in new infrastructure within that state.
- The servers might be located in NMFS facilities in the NMFS Northeast Region at Woods Hole and in the NMFS Southeast Region in Miami. These locations are advantageous because they already house database management operations and have established the physical facility requirements such as secured power and air conditioned space to support the server equipment. In addition, location of the servers within NMFS affords the benefit of the expertise of NMFS database management and information technology staff.
- Servers could alternatively be located in state facilities.
- The physical environment would require secured and power conditioned space.
- The servers would need to be connected to each other (and to source systems) by a high-speed WAN. The expansion of the NMFS WAN to all other state and federal partners could serve as the backbone of the nationwide FIS. The WAN would serve as a conduit of data to the FIS in addition to providing access to and dissemination of the holdings of the FIS at various levels of security to different users depending upon their access privileges.
- Configuration management (server technology, operating systems, and relational database management systems) must be designed and implemented. Since much of the federal and state fisheries data already is on NMFS or NMFS-compatible systems (albeit in some cases summary rather that trip-level detail) the marginal costs of expanding this existing system should be less that creating an entire new architecture.
- Design and development of initial transitional and relational bridge tables and system architecture might be contracted to a private sector firm.
- Maintenance and improvement of the system would be the responsibility of the newly hired on-site ACCSP staff – possibly two in Woods Hole and one in Miami. While an operational role for the ACCSP is a departure from historical practice there is a successful precedent on the Pacific coast for such a role. Since there are no hiring restrictions for the ASMFC, the new positions could be hired by the ASMFC to fill the data administration and applications management responsibilities.

The gap between the current situation and the proposed ACCSP model is significant. Recognizing that much more detailed information will be available (via the ACCSP planning process) over the next several months, the following actions are proposed as a change strategy, many of which have either been planned or are currently being implemented.

- **Verify ACCSP requirements and objectives**
  - Identify System Components
  - Define Functional Requirements
  - Define Technical Requirements
  - Develop Data Model
  - Develop Process Model
  - Identify Program Standards
  - Perform Infrastructure Survey
- **Design ACCSP System**
  - Evaluate Architecture Options
  - Evaluate Supporting Technology
  - Revise Data Model
  - Revise Process Model
  - Design Operational Procedures
  - Select System Design
  - Recommend Preferred Design
  - Approve System Design
  - Evaluate Current Infrastructure
- **Design Technical Architecture**
  - Design Physical Database
  - Design Hardware Infrastructure
  - Design Software Components
  - Select Implementation Tools
  - Acquire System Components
  - Develop Acquisition Plan
  - Procure System Components
  - Develop Implementation Strategy
- **Develop ACCSP Prototypes [FL trip ticket and NE (dealer reporting and logbook) programs]**
  - Define Prototype Scope
  - Establish Technical Infrastructure
  - Install Hardware
  - Install Software
  - Install Communications
  - Develop Prototype Database
  - Develop Prototype Software
  - Transition ACCSP Prototype
  - Test ACCSP Prototype
  - Review Prototype
- **Transition to Operation**
  - Expand Technical Infrastructure
  - Develop Production Database
  - Develop Production Software
  - Accept Production System

7.1.1.2 Atlantic Region: Data Collection Integration

Current Situation

The following attributes or characteristics can summarize the current situation:

- A combination of state agents and federal agents collect data from fishermen and/or dealers.
- Various logbook, dealer report and trip ticket data collection programs have evolved independently over time in response to specific fishery management planning.
- Trip level detail is not collected for some important fisheries.
- Over time, some data collection systems have become duplicative and/or redundant; overlaps exist in the kinds of data collected by separate entities from the same sources (i.e. fishermen and dealers)
- Data collection programs at state level have been traditionally funded with federal grant and contract funds, and with state funds from licensing and other revenue sources.
- Multiple data element and coding standards have evolved over time; even within a NMFS region there are numerous examples of multiple coding systems for the same parameter (e.g. species, gear, water body); including the state standards adds additional complexity and variety.

Proposed Model

Standard, harmonized, and integrated state and federal data collection systems will support the establishment of the Atlantic FIS infrastructure described above. The proposed data collection model results from agreement by ACCSP partners on the following policies, principles, and objectives:

- Establishment of a core set of data elements ("minimum data elements") that must be collected for all fisheries by all partners for all commercial and recreational fisheries.
- All catch and effort data will be collected at the trip level with resolution for each gear and area (water body) combination.
- Implementation of data collection processes for large-volume (as defined by number of trips) fisheries requires special consideration.
- Data will be collected either using a one-ticket system (fishermen or dealer reporting only) or a two-ticket dual reporting system (combination of fisherman reports and dealer reports).
- All landings will be reported by the state in which the fish were landed.
- All protected species interactions will be reported (Note: no decision has been made regarding mandatory or voluntary reporting).
- A recreational participant-sampling frame to monitor the recreational fishery will be developed (in the long term).
- A research program designed to improve current recreational fisheries monitoring programs will be developed (short- to medium-term).
- Sampling programs for the collection of discard data will be developed.
- Biological data collection programs will be expanded and improved.
- Collection of economic and sociocultural data targeting recreational fishermen, commercial fishermen, and dealers is proposed. (Frequency of collection of base and follow-up sets of information under consideration)
- Fishermen/dealer reports of daily trip data are to be submitted to source system during the following month
- Data standards and definitions will be contained in a data resource directory (DRD) so all partners understand the basic characteristics of the data. Metadata should be maintained so data users have the information they need to interpret data elements and the data and information content.
- Regional coding standards will be developed for certain elements (e.g., species codes, gear codes). All entities feeding data to the regional repository would be required to use established coding systems. While building bridge tables to accommodate multiple coding systems is certainly an alternative approach, the efficiency gains of up-front agreement on definite standards are significant, especially in regional data retrieval exercises. Also, bridge tables may be required for

legacy/historical data. In cases where states are using the FIS as their state data repository, adherence to regional standards would be mandatory. Where possible, regional coding standards ought to be devised in the context of national coding standards. Ultimately, similar gains are to be reaped when regional data, nationwide, are combined and summarized for users of national/central summaries.

- Any individual fisherman or dealer would only be required to report catch/landing on one system (dealer report or trip ticket); Improved efficiency in collecting data; burden reduction; use of pre-coded reported forms implemented to the extent possible. ACCSP planning has focused on the potential for regional coordination in the design and deployment of standard data collection forms. Asking for the same or similar information in the same or similar ways ought to be the goal in order to present a consistent approach from the data providers' (harvester/dealer/processor) perspective. This data collection model reflects all partners working together to develop the most efficient and consistent data collection methods and forms (and technologies where forms can be digitized in some way). "Modular" logbooks might consist of a base portion (fisherman/vessel information) and fishery-specific modules (species, catch, effort, etc.). Ultimately, NMFS will be able to minimize redundancy and overlap in data collection systems (especially state and federal systems), thus minimizing the likelihood that any individual data provider would be asked for the same information twice (or more).
- Innovative technologies for data collection, analysis, and information dissemination should be employed to support ACCSP vision.

Gap Analysis/Change Strategy

The gap between the current situation and the proposed model is significant. There are no systems currently in place that provide the degree of data collection integration that are required by the FIS. Systems planning activities currently being undertaken by the ACCSP are in the process of specifying desired coding standards, data quality standards, and possible data collection technologies. Although much more information will be available over the next several months, the following tentative actions are proposed as change strategies:

- Analyze actual extent of data collection redundancy/overlap (what, where, how much, etc.); use this analysis to define roles and responsibilities of partners and industry in collecting and contributing data, respectively.
- Determine responsibilities for collecting the data to ensure principles of reporting only to one entity in each geographical area.
- Continue ACCSP data collection planning processes through Commercial and Recreational Technical Committees, Forms Committee, Data Standards Committee, etc.

7.1.1.3 Atlantic Region: Institutional Arrangements

Current Situation

The current situation can be characterized by the following attributes:

- Responsibility is spread over wide range of agencies and organizations; NMFS has a Magnuson-Stevens Act mandate to collect of fishery data and information nationwide; states are responsible for fisheries in their jurisdiction and in cooperation with other states for inter-jurisdictional fisheries. (ACFCMA, Inter-jurisdictional Fishery Management Plans, etc.)
- There is a long history of state-federal cooperation in data collection and management.
- Historically, planning activities were shared by all cooperating parties but until commencement of ACCSP little forward momentum on Atlantic coast has occurred; there has been no real leadership buy-in to system-wide improvements until relatively recently.

- The structure and processes of the ACCSP currently involve various levels of stakeholders in a statistics program, i.e. technical computer analysts, policy makers, and industry.

Proposed Model

It is proposed that the partner institutions jointly share responsibility and accountability for program planning and management. Although it may be premature to suggest the details of institutional arrangements, considering the early stage of ACCSP planning, several basic principles are proposed at this time:

Table 7-2: Roles and Responsibilities of Atlantic FIS Partners

PARTNERS	DATA COLLECTION	ONGOING PLANNING	INFORMATION MANAGEMENT	COORDINATION
NMFS	**X**	**X**	**X**	**X**
Councils	**X**	**X**		**X**
ASMFC/ ACCSP		**X**	**X**	**X**
States	**X**	**X**	**State by state basis**	**X**
Industry	**X**	**X**		**X**

- The ACCSP infrastructure will facilitate a partnership of states, the federal government, and industry representatives.
- All decisions will be made by consensus; all partners need to be able to abide by the consensus decision.
- The Coordinating Council will continue to serve as the "leadership team" and is comprised of high level executives of partner institutions; they will set policy and direction for the ACCSP.
- An ACCSP Leader/Manager (probably a new hire) would serve as an independent program manager perhaps reporting to the ACCSP Coordinating Council. This manager could be hired by the ASMFC and funded as part of the base ACCSP budget. A technical coordinator (especially if multiple server sites) and three database managers (as described above) and an administrative support person would round out the ACCSP "paid" staff. This staff would serve program maintenance and system support roles on behalf of partners.
- Roles and responsibilities of the ACCSP partners are depicted in Table 7-2.
- The ACCSP Coordinating Council obtains industry input through the Advisory Committee prior to consideration of issues.
- ACCSP Operations Committee should continue to provide day-to-day oversight and guidance to the development and implementation of the Atlantic Coast FIS.

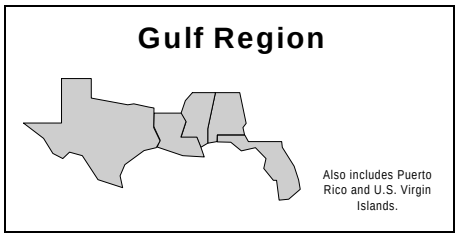
Gap Analysis/Change Strategy

The following activities are suggested in order to implement the new collaborative model of the Atlantic FIS:

- Implement processes and systems to ensure that ACCSP model fits with national principles and standards.
- Identify the concrete, specific measureable results that the ACCSP strives to achieve.
- Develop requirements and processes for creating budgets and allocating resources.
- Identify, describe, and prioritize potential funding sources
- Develop institutional processes and schedules to ensure progress toward fulfillment of ACCSP vision.
- Develop policies and mechanisms to ensure partners' compliance with ACCSP model.
- Develop strategies for continuous process and operational improvements.
- Integrate activities of NMFS' Core Statistics Program to ensure NMFS' movement toward ACCSP model.

7.1.2 Gulf Region: Gulf of Mexico and Caribbean

The Gulf Region FIS is comprised of the Gulf states, from Texas to Florida and the Caribbean islands of Puerto Rico and the U.S. Virgin Islands. Please note that references to "Gulf" and "Gulf Region" include the Caribbean territories.



Two planning systems and operational components, ComFIN and RecFIN (FIN), have long been the focal point for fisheries statistics data collection and information management planning in the southeast U.S. The planning efforts have included the Gulf states, Caribbean territories, and the Atlantic coastal states from North Carolina to Florida. Many of the FIN program principles were used as seeds for the initialization of the ACCSP described in the previous section of this discussion draft. The FIN programs and the ACCSP have collaborated over the last several years to assure that they are working towards a common end. ComFIN and RecFIN program managers and participants are involved in ACCSP development and have generally agreed with the ACCSP design objectives and principles. The following sections describe the current status of FIN planning in the Gulf.

7.1.2.1 Gulf Region: Information Management Architecture

Current Situation

The current situation can be characterized by the following:

- Landings data collected by the states are entered and processed by the same state on computers/systems maintained by them.
- Some states collect, or are in the process of initiating programs to collect, data for every trip/transaction at a licensed seafood dealer.
- Data that are collected by NMFS are entered and processed by NMFS on computers/system maintained at the SEFSC in Miami.
- All states provide monthly summary data to the NMFS/SE in Miami and these data are stored in a regional database, which can be accessed by any partner via dial-in modem or the internet. States do not currently have access to the NMFS wide area network.
- Summary data for the entire region are not maintained as a separate database, Such summaries are available with the use of software available on the NMFS/SE computer.
- Some states have their own coding and measurement systems; however, all data that are provided to the NMFS/SE for the regional databases are reconciled into a single set of codes.

Proposed Model

In the Gulf of Mexico region the FIS will be implemented through the Fisheries Information Network (FIN). The partners in the Gulf (ComFIN and RecFIN) have not explicitly addressed an information management model at this time. Through cooperation and coordination between the FIN and the ACCSP, technical and functional elements will be standardized or compatible.

<u>General Technical and Functional Elements</u>

- Each state will maintain their own trip-level data and will provide those data to a regional database.
- Protocols for maintaining confidentiality of data will be developed and agreed to through the FIN.

- Consistent data management protocols (e.g. computer security and system access, network administration, confidentiality) will be developed and implemented gulf-wide.
- Standards of data quality (e.g. timeliness, accuracy, estimates of precision, etc.) will be developed and implemented gulf-wide.
- Where necessary, data definitions, codes and units of measurements will be agreed upon and such standards will be implemented or the necessary reconciliation made (likely in the form of bridge tables).
- Technology solutions that support these principles and that reduce reporting burden on the industry will be identified, developed and implemented where appropriate.

Specific Architecture Elements

- The Gulf portion of the FIS will have one independent server as a regional repository of the trip-level detail data.
- The NMFS WAN would be expanded to serve all of the states (partners) in the Gulf region and would serve as the backbone of the Gulf FIS.
- Configuration management (server technology, operating systems, and relational database management systems) will be developed and implemented jointly through the FIN.
- Expand existing personnel to staff and maintain the regional (summary) database and state/federal wide area network within the region.

Gap Analysis/Change Strategy
The gaps between the current situation and the proposed FIS for the Gulf are considerable. The following are the major situations that need to be improved, changed or added.

- Provide funding or hardware/software for the purchase and implementation of a server for each partner. Provide staff and/or training to maintain/operate the server.
- Provide access to the NMFS WAN for each partner. Provide staff and/or training to maintain/operate access to the WAN.
- Continue work through the FIN to design and implement the technical architecture for the regional system.

7.1.2.2 Gulf Region: Data Collection Integration

Current Situation
The following attributes or characteristics can summarize the current situation for the data collection programs in the Gulf region:

- A combination of state agents and federal agents collect data from fishermen and/or dealers.
- The data collection methods (port agents, logbooks, dealer reporting, etc.) have evolved independently over time and often in response to specific fishery management needs.
- Only Florida collects trip-level detail, although Louisiana has initiated a pilot test project to begin a trip ticket program in January 1999.
- Data collection programs run by the states are partially funded by Federal grants.
- Multiple data element definitions and coding systems have evolved over time; however, any differences are reconciled as the data are submitted to the regional database.

Proposed Model

The components of the data collection FIS in the Gulf region are as follows.

- A standardized set of data elements has been established that, at a minimum, will be collected for each fishing trip transaction, when fish are unloaded and sold: i.e. a commercial fishing trip, and each angler interview for recreational fishing.
- For commercial fishing, the goal is to collect the minimum data for every trip (or sales transaction) that occurs, i.e. to establish a total universe of commercial fishing.
- Although the minimum data will include some information on fishing effort and location, the universe of commercial fishing trips will be used to develop sampling programs to provide detailed data on (1) size frequencies for target species, (2) hard-part and tissue samples for aging analysis for age-length keys, (3) fishing effort and location when the trip does not provide sufficient detail, and (4) at-sea (observer) sampling program(s) to collect data on protected species/marine mammal interactions and discards of unwanted catch.

Table 7-3: Data Collection Systems of the Gulf of Mexico Regional Fishery

Information System	Responsible Agency
Shrimp Statistics	NMFS
Commercial Landings	Combined: States & NMFS
Biological Data (length frequency, aging)	Combined: States & NMFS
Logbook Data (Catch/Effort)	NMFS
Recreational Statistics (Florida through Louisiana)	NMFS
Recreational Statistics (Texas)	Texas/NMFS
Vessel Inventory	Combined: States & NMFS
Vessel/Gear Permits/Licenses	States & NMFS, individually

- Enhance the existing programs that collect recreational fishery statistics.
- A research program designed to improve current recreational fisheries monitoring program has been developed.
- Data collection program, which will be independent of trip ticket programs, will be developed for economic and sociocultural data from both commercial and recreation harvester and the associated infrastructure for these industries.
- Standards for timeliness and data quality will be modified where necessary.
- Data definitions, coding systems will be contained in a data resource directory so all partners and users understand the data. Metadata will be maintained so data users have the information they need to interpret data elements and the data and information content.

Innovative technologies for data collection, analyses, and information dissemination will be employed to support the FIS in the Gulf.

Gap Analysis/Change Strategy

The gap between the current situation and the proposed model is considerable. There are no systems currently in place that provide the degree of data collection integration that is required by the FIS. The following tentative actions are proposed as change strategies:

- Implement trip ticket programs for all partners in Gulf region.
- Continue data collection planning processes through ComFIN and RecFIN.

- Design and implement at-sea observer program for marine mammals and other protected species.
- Continue to develop quality control and quality assurance policies and standards.
- Develop data collection programs (selection criteria, survey instruments, etc.) to collect economic and sociocultural data. Continue to work closely with ACCSP to design/implement similar and consistent programs between the two regions.
- Continue to develop and expand the existing biological/bioprofile data collection program.

7.1.2.3 Gulf Region: Institutional Arrangements

Current Situation

The current situation can be characterized by the following attributes:

- Responsibility is spread among state and federal agencies.
- A long history of state-federal cooperation, including formal cooperative agreements, exists for both data collection and information/data management.
- The FIN has been administered and coordinated since its inception by the GSMFC.
- Although data collection and processing activities have been shared cooperatively between the NMFS and the states, the extent of the cooperation has increased significantly since the formal implementation of ComFIN and RecFIN.
- In comparison to the structure of the ACCSP, ComFIN and RecFIN (Gulf) lack a senior level body to decide on policy and resource allocation issues.
- ComFIN and RecFIN (Gulf) have just begun to obtain industry input to their data collection and processing processes.

Proposed Model

It is proposed that the partner institutions jointly share responsibility and accountability for program planning and management in the Gulf region. The following principles are proposed to shape this responsibility:

- The institutional infrastructure consists of a partnership of states, the federal government (NMFS), the Gulf States Marine Fisheries Commission, the Gulf of Mexico Fishery Management Council and industry.
- A senior level body makes policy and resource allocation decisions.
- A proposed breakdown of the roles and responsibilities are presented in Table 7-3.

Gap Analysis/Change Strategy

The following activities are suggested in order to implement the proposed FIS model for the Gulf region.

- Continue planning and implementation of data collection, data quality standards, and information management systems that has been initiated through ComFIN and RecFIN.
- Decide on procedures to establish a policy-setting body and create this oversight body.
- Provide funding to hire and train personnel to staff and maintain the Gulf data system

7.1.3 Western Pacific Region: Hawaii and Western Pacific Territories

The Western Pacific Region FIS is comprised of all state and federal fishery data collection and information management programs in Hawaii, Guam, the Commonwealth of the Northern Marianas Islands, and American Samoa.

7.1.3.1 Western Pacific Region: Information Management Architecture

Current Situation

The fishery information needs for federal fishery management in this region are served by the Western Pacific Fisheries Information Network (WPacFIN), which receives data from NMFS, the State of Hawaii, and the other island governments. The WPacFIN data are maintained by NMFS personnel and resources at the Honolulu Laboratory of the Southwest Fisheries Science Center.

The following attributes or characteristics can summarize the current situation:

Information Management Entities in the Western Pacific Region
American Samoa Department of Marine & Wildlife Resources
Commonwealth of the Northern Marianas Islands Division of Fish & Wildlife
Guam Department of Commerce
Guam Division of Acquatic & Wildlife Resources
Hawaii Division of Acquatic Resources
NMFS Honolulu Laboratory
NMFS Pacific Area Office
Western Pacific Fishery Management Council

- There is considerable separation among Western Pacific data collection and information programs.
- American Samoa, Guam, CNMI and Hawaii maintain separate and distinct systems.
- Data sharing is performed either monthly or quarterly via floppy disk/U.S. Mail and occasionally via modem connection between computers.
- Shared data among the member entities is mostly at the detail-level.
- Some prepared summary-level data; queries or report generators must be run on one or multiple databases in order to obtain specific summaries; typically performed by NMFS/Honolulu staff on an ad hoc basis.

Table 7-4 summarizes the specific state and federal information systems that might be considered under the Western Pacific FIS umbrella.

Table 7-4: Data Collection Systems of the Western Pacific Fishery

System	NMFS	American Samoa	Guam	CNMI*	Hawaii
Plan Team Report Generation	✓	✓	✓	✓	✓
Fisheries Statistics of the Western Pacific Production		✓	✓	✓	✓
Commercial Landings		✓	✓	✓	✓
Fisherman Reporting				✓	✓
Dealer Reporting		✓	✓	✓	✓
Boat-based “Creel” Surveys		✓	✓	✓	✓
Shoreline-based “Creel” Surveys		✓	✓	✓	✓
“Tuna” Transshipment		✓	✓	✓	✓
Vessel Inventory	✓	✓	✓	✓	✓
Tournament Sampling		✓	✓	✓	
Length/Size Sampling (Market, Vessel)	✓	✓	✓	✓	✓
Biological Sampling	✓	✓	✓	✓	
Permits & Licenses	✓	✓	✓	✓	✓
Imports and/or Exports			✓	✓	
HI Auction Monitoring	✓				✓
NWHI Lobster Logbooks	✓				
Longline Logbooks	✓				
Longline Permits	✓				

✓ = Existing System

***** = Commonwealth of Northern Marianas Islands

Proposed Model
The following suggests a form that capitalizes on existing mission, organizational structure, and technology base in the areas of computer hardware, software and telecommunications. The selection of a central summary / regional detail combination of the information technology factor in the Western Pacific implies all regional trip-level detail and Western Pacific summary level data will be accessible to authorized partners as needed. Data from this repository could be summarized and combined with other Pacific region data for regional and/or national summary views.

The Western Pacific FIS could utilize two independent servers as warehouses of regional detail data from federal and state sources. These new servers would be independent of other NMFS servers but could be maintained in existing NMFS facilities in Honolulu or in another suitable location. The servers would be sized and configured so that all state and federal data could be contained on either site and both sites could serve as "mirror" sites, where security, backup, and flexibility benefits would be realized. The servers would provide the sole or a replicate repository of data for each individual WPacFIN member. Some member entities might choose to use one of these servers as a "state" repository if no state or territorial resources are invested in new infrastructure.

The location of the servers in existing, secured and power-conditioned space is a clear advantage of using existing NMFS facilities.

Gap Analysis/Change Strategy
The gap between the current information management architecture and the proposed model is narrow. Each of the WPacFIN member entities collects and maintains its data. Because there currently is no significant real-time data need, regional data updates are transmitted to the WPacFIN either monthly or quarterly, depending on the particular system. WPacFIN is currently developing an internet web site which will facilitate more efficient data submission and sharing among entities. A central online query system that allows remote users to access specific data will be a component of this development.

To satisfy the needs of the FIS, WPacFIN should maintain its current detail-level functional data systems in each of its member agencies.

7.1.3.2 Western Pacific Region: Data Collection Integration

Current Situation
Unlike the Information Management structure of the WPacFIN, the Data Collection Integration component of the WPacFIN requires significant investment to meet FIS benchmarks. Like most fishery data collection programs, various systems within WPacFIN suffer from serious data gaps among some species and sectors, as well as occasional sampling errors. Symptomatic of most fisheries data systems, there is a perceived lack of confidence among various government and industry stakeholders.

The following attributes or characteristics can summarize the current situation:
- Commercial fishers/dealers report landings monthly to the state of Hawaii, which updates the WPacFIN monthly or quarterly.
- No computerized dealer reporting system region-wide.
- Twice-per-week sampling at Hawaii fish auction, where approximately 50% of commercial landings are sold.
- Region-wide creel surveys lack resources to ensure accurate sampling
- Invoice tracking system captures approximately 80% of commercial landings in Samoa
- Much of the data collection in some areas has been funded by U.S. Fish & Wildlife Service's Sportfish Restoration Program

- Data quality controls are not standardized across the region
- Core statistics standards are not uniformly established
- Database structures are not fully compatible at the user level (e.g. using standardized codes or cross reference tables)

Proposed Model

WPacFIN members have set numerous data collection and integration goals for its WPacFIN 2000 program. Many of these program goals seek to address inconsistencies, and to standardize them wherever possible. Additional funding is needed to accomplish these goals.

Any data collection systems proposed to support the Western Pacific FIS must meet the basic requirements identified by WPacFIN but also need to be flexible enough to gather information without imposing unreasonable burden on harvesters and dealers/processors.

To achieve optimal data collection/integration, certain planning decisions are recommended. The following key recommendations parallel many of the specific goals outlined in the WPacFIN 2000 program:

- Determine what additional data elements are required to support the conservation and stewardship missions of the Western Pacific Fishery Management Council, NMFS, and the member island governments.
- Standardize to the furthest extent practicable data formats, standards, and coding.
- Mandate and enforce efficient and non-burdensome reporting mechanisms to assure full compliance from commercial and recreational fishers.
- Utilize current technology to assist data collection and timely transfer. Where possible, confine commercial reporting burdens to a single, trip-level data submission.

Building upon the work that has already been accomplished in WPacFIN planning it is clear that a regional approach to data collection harmonization and integration is the best alternative. Allowing each partner to establish its own standards and trying to reconcile and "map" those differences using bridge tables is extremely inefficient and resource intensive. To contribute to the national needs, the WPacFIN Fisheries Data Coordinating Committee would collaborate with similar committees from other regions (Pacific, Gulf, Atlantic) to harmonize data collection integration and data quality/standards nationwide.

Gap Analysis/Change Strategy

The gap between the current situation and the proposed model is significant. There are no systems currently in place that provide the degree of data collection integration that is required by the FIS. Coding protocols in NMFS require standardization across facilities and regions. Planning activities currently underway by WPacFIN are in the process of specifying desired coding standards, data quality standards, and possible data collection technologies. The following tentative actions are proposed as change strategies:

- Analyze actual extent of data collection redundancy/overlap (what, where, how much, etc.)
- Continue planning processes in the WPacFIN 2000 Program
- Continue NMFS core statistics planning processes, especially in area of data quality and standard development, NMFS-wide.
- Establish a long-term, regional data quality assurance process (planning and maintenance).

7.1.3.3 Western Pacific Region: Institutional Arrangements

Current Situation

The following attributes or characteristics can summarize the current situation:

- Responsibility spread over wide range of agencies and organizations; NMFS has primary mandate for collection of fishery data and information, nationwide
- States and territories responsible for fisheries in their jurisdiction
- Long history of state-federal cooperation in data collection and management
- Much of the funding for island agency data collection has come from the U.S. Fish & Wildlife Service
- Funding for program personnel is provided by home agencies mostly via federal grant programs
- Planning for WPacFIN generated largely by WPacFIN Fisheries Data Coordinating Committee, comprised of fisheries management personnel from each of the member entities

Proposed Model

The proposed Institutional Accountability model for the FIS assumes shared responsibility among the program's partners. In the case of WPacFIN, this model has worked successfully in the past, and appears sufficient to support program goals for the foreseeable future.

Gap Analysis/Change Strategy

Due to the established nature of the WPacFIN and its obvious parallels to the proposed FIS Institutional Accountability model, little change is required. WPacFIN, however, must secure more funding for technology acquisition and staff to administer the system to the data collection standards envisioned in the overall FIS plan.

7.1.4 Pacific Coast Region: Washington, Oregon, California

The Pacific Coast Region FIS comprises the three states of California, Oregon, and Washington, and includes all state and federal data collection and information management programs within the FIS umbrella.

7.1.4.1 Pacific Coast Region: Information Management Architecture

Current Situation

The NMFS and the three states, working through the Pacific States Marine Fisheries Commission (PSMFC), have consolidated much of the fishery data and information used for managing fisheries into the Pacific Fisheries Information Network (PacFIN). The current situation is characterized as follows:

Table 7-5: Data Collection Systems of the Pacific Coast Regional Fishery

Information System	Responsible Agency
Fish Tickets/Ex-Vessel Prices	WDFW, ODFW, CDFG, Tribes
Weekly At-Sea Production Reports	NMFS-NWR
Domestic At-Sea Observer Data	NMFS AKFSC
Federal Fishery Permits	NMFS-NWR
Vessel Registration Systems	WDFW, ODFW, CDFG
Federal Limited Entry Data	NMFS-NWR
State Limited Entry Data	WDFW, ODFW, CDFG
Groundfish Trawl Logbooks	WDFW, ODFW, CDFG
Port Sampling Systems	WDFW, ODFW, CDFG
Recreational Data	WDFW, ODFW, CDFG
Regional Systems	PSMFC

- Regional data systems covering Pacific coast fisheries generally meet the recommended FIS scenario. These systems are the result of cooperation between the states, tribes, NMFS, Pacific Fishery Management Council, Pacific States Marine Fisheries Commission, other regional agencies, industry members and environmental groups.
- The Pacific States Marine Fisheries Commission aids all parties in developing data plans and provides central repository services for participating agencies. Data in this system is transmitted and accessed by jointly agreed rules and standards.
- Commercial fisheries data are submitted or updated weekly, biweekly, monthly or annually, depending on the agency and type of data. The states typically submit monthly data. Coast Guard documented vessel information is provided annually by NMFS. In addition to fish ticket data, logbook information is used to apportion Groundfish catch by area.
- The main source of regional recreational data is state activities. However, there is increasing merging of these state activities with the NMFS Marine Recreational Fisheries Statistics Survey (MRFSS). The PSMFC conducts the intercept component of the survey through a cooperative agreement (Pacific RecFIN). PSMFC also supplies and performs analysis of these data for the Pacific coastal states of Washington, Oregon and California.

Information Management Entities in the Pacific Coast Region FIS
California Department of Fish and Game
Oregon Department of Fish and Wildlife
Washington Department of Fish and Game
Tribes
Pacific Fishery Management Council
Pacific States Marine Fisheries Commission
NMFS Northwest Region
NMFS Southwest Region

- PSMFC performs statistical analysis and presentation of recreational fisheries data on the Pacific coast. RecFIN is currently integrating various recreational fisheries information, including other data collected by the states and PSMFC, into this database as well as designing and implementing internet access to the data through form queries. NMFS personnel in the Southwest and Northwest Regions, the Pacific Fishery Management Council and personnel located in various other agencies and individuals nationwide access this data.

Proposed Model

The current system is adequate, but may need expansion to meet FIS system goals. There is also an increasing need to develop architecture that builds on the existing PSMFC coordinated systems and develop better connectivity between the commercial, recreational, and habitat databases. In addition, a central repository of state logbook information is needed, along with the necessary architecture to connect information on biological samples to the associated vessel's logbooks and fish tickets. The development of an electronic logbook will also influence future architectural needs.

Gaps/Strategies

- Use a blend of PSMFC's Pacific Coast Data and RecFIN Committees to assess region's architecture and information management needs.
- Provide NMFS, states, PSMFC, and tribes with necessary resources to develop fully integrated GIS systems.
- Provide PSMFC with the necessary resources to integrate PacFIN and RecFIN information architectures.

7.1.4.2 Pacific Coast Region: Data Collection Integration

Current Situation

There are two major data collection and management systems on the Pacific coast: (1) Pacific Fisheries Information Network (PacFIN) and (2) Recreational Fisheries Information Network (RecFIN). Although these networks emphasize data on Pacific groundfish and salmon, they also include data/information on other marine species. Other major sources of data and information about Pacific coast fisheries include state logbooks, federal at-sea reporting requirements, port-agents, and observers.

Under PSMFC guidance, agreement among the states and federal agencies has already been reached over minimum data elements, coding standards, and access rules. These committees are also responsible for the standardization of reporting forms, data quality standards and quality assurance. Because the region's systems are pointed at regional, state, and tribal fish management needs, sometimes data are not summarized in a manner that quickly aids national summary needs. In these instances, once national summary needs have been identified, efforts are undertaken to develop the necessary summary tables or necessary "bridge" tables to convert regional code systems to national code systems.

The main problem areas can be characterized by the following:

- lack of data entry resources
- quality assurance and integration among different data bases
- need to develop a centralized repository for logbooks and for integrating habitat related information
- lack of a comprehensive observer program

Proposed Model

The proposed model is to build upon the current state/federal/tribal arrangements chiefly through the existing PSMFC structure, where there is an overall oversight or "super" committee to achieve integration among the major databases and for establishing overall quality assurance standards. There

would be linkages between these committees and any national committees formed to address these same issues. All of these arrangements should be modified to provide formal processes for industry involvement in data collection and management.

Two specific proposals might be:

1. Provide states, tribes, NMFS, PSMFC, and PFMC with sufficient resources for data entry, quality control and quality assurance efforts.
2. Expand RecFIN and PacFIN to include economic and socio-economic data and information.

To better fulfill the Magnuson-Stevens Act and other statutory requirements, a long-term coast-wide economic data system that includes Alaska needs to be developed. This system should routinely collect data and information concerning commercial fisheries, recreational fisheries, communities, and habitat and is capable of integrating this information with other data systems while not being burdensome on the industry.

One additional area of improvement is to find ways to increase industry outreach and provide greater opportunities for industry/community involvement in the design and implementation of data and information systems and technologies. The Pacific groundfish industry has approached the PFMC family and NMFS with the following concepts:

- Develop catch/effort history from records provided key skippers/boats in major ports to develop abundance trends that can be compared with research surveys. If promising, establish a program that ties in observers, dock interviews, informal information exchanges, and gear standardization.
- Create a small group of fishermen and state/federal logbook experts to solicit, evaluate, and make recommendations to improve fishery logbooks.
- Expand the current industry observer program, perhaps by allowing fish that are now discarded as incidental or bycatch to be landed and sold with funds going to support future research.
- Develop process to engage fishermen and processors in the collection of biological samples.

Gap Analysis/Change Strategy
(Note: Some of the processes discussed below may already be underway.)

- PSMFC initiates a workshop, in association with states, tribes, PFMC, NMFS and other federal agencies, to develop a coordinated long-term plan for regional data collection and integration efforts.
- PSMFC, States and NMFS jointly establish a centralized repository logbook system with the necessary linkages to biological sampling via port-agent or observer programs and with associated vessel fish tickets.
- Expand PacFIN to include freshwater and aquaculture production.
- RecFIN identify geographic gaps in angler surveys, especially for in-river fisheries.
- Fund development of electronic data logbook demonstration project and cooperative NMFS-state-industry fishery dependent research programs.
- PFMC, on behalf of the entire region, develop formal processes to ensure industry involvement of the design and implementation of fishery information systems as well as providing the industry with sufficient instructions and understanding of current and future reporting requirements.
- Initiate funding requests, mainly through federal processes, that assure that states, tribes, NMFS, PSMFC, and PFMC have the necessary resources to carry out quality control and quality assurance tasks.

- Expand the federal observer program run by the NMFS-AFSC to bolster observer resources dedicated solely to Pacific coast needs.
- Develop an economic fisheries information network (EcFIN) under the PSMFC umbrella, complete with an oversight committee for purposes of coordinating existing and future economic and sociocultural data collection efforts and for integrating such information into PacFIN and RecFIN. This network would also be a repository of economic and sociocultural data on geographically defined fisheries dependent communities--data that needs to be collected and developed appropriately.

7.1.4.3 Pacific Coast Region: Institutional Arrangements

Current Situation

Currently there is a high degree of cooperation and acceptance of data-related responsibilities associated with Pacific coast fisheries. The various committees of PSMFC reflect broad membership by participating groups that in turn reflect strong institutional relationships between tribes, states, regional and joint-state commissions, councils, NMFS and other federal agencies. The PFMC processes also provide another source of oversight and recommendations concerning strengths and weaknesses of the majority of the region's fishery information management systems.

Proposed Model

The proposed model is the current model.

Gap Analysis/Change Strategy

No major gaps are evident, but major expansion of implementation is needed, e.g. economics, logbooks, observers, and comprehensive data integration.

7.1.5 Alaska Region

The State of Alaska is unique among the coastal states considering its significant fishery production and the tremendous contribution of its harvesting and processing industries (revenues and employment) to its economy. The Alaska Region FIS includes all state and federal data collection and information management programs within the FIS umbrella.

7.1.5.1 Alaska Region: Information Management Architecture

Several federal and state institutions are involved in fisheries data collection and management. Recent planning efforts have resulted in a formal partnership among these entities and the Pacific States Marine Fisheries Commission (PSMFC) for the design and development of the Alaska Fisheries Information Network (AKFIN).

Current Situation

Currently, information management responsibilities are distributed among the organizations sponsoring the various data collection programs. These organizations include:

- Alaska Department of Fish and Game
- National Marine Fisheries Service, and
- Alaska Commercial Fisheries Entry Commission.

In order to obtain harvest statistics, processor data, vessel licensing data, permit data, and other information used for fishery management, primary data customers (including the PSMFC and the North Pacific Fishery Management Council) must go to the individual data sources and agencies for the data.

Information Management Entities in the Alaska Region
Alaska Department of Fish & Game
Commercial Fisheries Entry Commission
North Pacific Fishery Management Council
NMFS Alaska Region
Pacific States Marine Fisheries Commission
Pacific Halibut Commission

These information systems are essentially independent of one another, each with individual data element, coding and quality standards. Increasing demands for Alaska groundfish data for fishery management purposes has meant increasing reporting burdens through weekly production reports from catcher-processor vessels and motherships, ADF&G trip tickets from catcher vessels delivering to shore-based processors, and observer information. There is a significant need for the agencies involved to develop systems that enable them to share information more efficiently and effectively to minimize industry reporting burden and duplicative or redundant data management systems.

The current data systems contain some redundant (and sometimes inconsistent) data that fishery analysts must resolve, increasing the amount of time required for analysis and impacting overall quality of these analyses. These data systems should be integrated to improve data quality and timeliness.

Proposed Model

A major initiative designed to address data system integration and consolidation and the coordination of information collection and management systems commenced in 1994. This initiative, known as the Alaska Fisheries Information Network (AKFIN) is sponsored by the PSMFC and provides the framework needed to consolidate collection, processing, analysis, and reporting of a variety of information essential to management of Alaska fisheries. The AKFIN partners consist of PSMFC, ADF&G, NMFS, and the

CFEC as primary participants. The North Pacific Fishery Management Council, although not a data provider, is a primary data customer of AKFIN. The AKFIN program is designed to:

- Implement and manage a coordinated relational data/information system encompassing State of Alaska and federal fisheries data for use by fishery managers, associated agencies, and the public.
- Provide data management consultation and technical advice to the North Pacific Fishery Management Council and participating agencies upon request.
- Assist agencies to improve the efficiency, effectiveness and timeliness of data acquisition and delivery with a minimum of duplication.
- Develop and implement data standards across agencies to facilitate the merging and distribution of fisheries data in AKFIN.

AKFIN will be designed to manage information on catch, effort, value, and participation for Alaska's groundfish fishery, crab fishery, salmon fishery, scallop fishery, and sablefish and halibut IFQ programs. The system is being designed to accept catch information from the primary data sources (NMFS and ADF&G) for the above fisheries (not including salmon initially) and stored in a relational database located in the AKFIN office in Juneau. The goal is to provide a central repository and access point of fisheries information for analysts and managers.

Gap Analysis/Change Strategy

In order to test the AKFIN system design, a prototype database is currently under construction that includes trip-level detail data for the groundfish fishery from 1994-96. These initial data sets will be primarily derived from NMFS and ADF&G data sets. Once the concept is tested and proven, it is likely that this database will be expanded to include crab and salmon data.

7.1.5.2 Alaska Region: Data Collection Integration

Current Situation

Currently, the Alaska Department of Fish and Game, the National Marine Fisheries Service, and the Commercial Fisheries Entry Commission share fisheries data collection and management responsibilities. Table 7-6 lists the data collection systems that currently form the basis for the AKFIN.

Table 7-6: Data Collection Systems of the Alaska Regional Fishery

Information System	Responsible Agency
Fish Tickets	ADF&G
Fish Tickets/Ex-Vessel Price Estimates	CFEC
Weekly Production Reports	NMFS AKRO
Weekly At-Sea Production Reports	NMFS AKRO
Foreign And Joint Venture Observer Data	NMFS AKFSC
Domestic Observer Data	NMFS AKFSC
Federal Fishery Permits	NMFS AKRO
AK Vessel Registration	CFEC, ADF&G
Commercial Operators Annual Reports	ADF&G
Intent To Operate Files	ADF&G
Bering Sea Crab And Scallop Observer Data	ADF&G
Vessel Documentation & Numbering	COAST GUARD
AK Fishery Permit Files	CFEC
Federal Processor Permits	NMFS AKRO
IFQ Registered Buyer Permits	NMFS AKRO
IFQ Holdings And IFQ Landings	NMFS AKRO
Vessel Moratorium Permits	NMFS AKRO

Groundfish is the primary fishery resource in Alaska's EEZ. Groundfish production reports are submitted by more than 200 at sea and shoreside processors directly to the NMFS (AKRO) in Juneau, by fax, on a weekly basis. Another 1,600 catcher vessels delivering their trip-by-trip catch to shore-based processors participate in the Alaska fish ticket reporting system. Federal funds are used to support this state-conducted trip ticket program. ADF&G also conducts data collection programs for other species,

particularly crabs, scallops, and salmon. Vessel registration and state fishery permit/ licensing systems are conducted by the CFEC.

Other federal fishery permit and fisheries information systems are operated by NMFS in direct response to requirements of NPFMC Fishery Management Plans and Sablefish and Halibut IFQ programs.

These data collection programs have evolved over time in response to specific fishery management needs at the federal and state levels. Most data collection systems were developed without the benefit of knowing about future system development so they tend to "stand alone" with respect to collection methodologies, technologies, and data element/coding/quality standards. In order for fishery analysts to effectively use data across computer platforms, data sources, agencies, or fisheries, it is necessary to create numerous translation and look-up tables to generate overall consistent views of information.

Proposed Model

The AKFIN system partners have recently decided to coordinate the development of data element standards and coding systems in concert with other Pacific area fisheries data. AKFIN will essentially adopt the PacFIN code sets for species, gear, and area, including some modifications in the PacFIN codes to accommodate unique Alaska requirements. The AKFIN institutional arrangements will be in place that allow continued collaboration among all of its partners to approach data collection issues and data standard/quality issues from an Alaska perspective in order to avoid the future development of stovepipe systems.

Although AKFIN has not been fully implemented, the system partners have discussed potential opportunities for developing new data collection systems that capitalize on new technologies and reduce overall industry burden and transaction/processing costs. For example, there is considerable interest in developing a single reporting instrument that combines the federal fax-based weekly groundfish production reports with the Alaska trip ticket system. Entering data directly on computers at processor sites and regularly transmitting this data to the AKFIN database is one option.

Gap Analysis/Change Strategy

Planning efforts have resulted in a fairly clear vision of the implementation strategy for AKFIN. High-level data models with entity relationships have been developed that describe the types of information to be included in AKFIN. The next step is to refine these models to include specific data elements, definitions, and relationships.

7.1.5.3 Alaska Region: Institutional Arrangements

Current Situation

Prior to the chartering of AKFIN, federal, state, and industry partners collaborated in information management and data collection activities. This arrangement, however, lacked the critical mass of resources to implement the best possible approach to establishing information management architecture, communications systems, and data collection system.

The following committees have been formed to provide the direction necessary for AKFIN planning, implementation and integration with other Pacific region programs:

- AKFIN Policy Committee: This committee is comprised of NMFS, ADF&G, CFEC, PSMFC, NPFMC and Industry representatives to shape high level policy, direction, and funding for the continuing development of AKFIN.

- AKFIN Steering Committee: The Steering committee is staffed by NMFS, ADF&G, PSMFC, NPFMC and Industry representatives. The focus is primarily on technical issues such as policy guidance, technical implementation, and priority-setting/resource allocation.
- AKFIN Technical Work Groups: Technical Work Groups are convened by the Steering Committee for technology, implementation and integration issues, and are staffed by appropriate representatives from the member entities.

Proposed Model

The current institutional arrangements supporting AKFIN include a partnership modeled after the PacFIN system, where state and federal agencies share the responsibilities for system design, development and implementation. The PSMFC is responsible for overall coordination, management, administrative support and funding through grant awards. NMFS is responsible for administering the AKFIN grant awards, will provide administrative support for computer and telecommunication networks, and will participate in planning and policy development. ADF&G will also contribute staff, funding, and planning/policy support.

Gap Analysis/Change Strategy

Since AKFIN is a "work-in-progress", the strategy here is to continue with the ongoing process.

7.1.6 Extra-Regional Information Systems

Most fisheries information systems and databases are somewhat easily attributed to one of the five "regions" described above. However, it should be recognized that some data collection and information management programs are managed with an inter-regional or national focus. For example, the Marine Recreational Fisheries Statistics Survey is a multi-regional program managed in the NMFS Office of Science and Technology at NMFS headquarters in Silver Spring. Although managed nationally, customers of these data are found throughout the fisheries management community of the United States. The development of an FIS should take into account data collection and information systems that span regional and/or coastal boundaries. Table 7-7 contains representative extra-regional systems.

Table 7-7: Extra-regional Data Collection Systems

Information System	Responsible NMFS Office
Marine Recreational Fisheries Statistics Survey	NMFS Office of Science and Technology
Large Pelagic Survey	NMFS Office of Sustainable Fisheries
Marine Mammal Exemption Permit Program	NMFS Office of Protected Resources
International, U.S. Trade	NMFS Office of Science and Technology

7.2 Section 401 of the Magnuson-Stevens Fishery Conservation and Management Act

SEC. 401. <<NOTE: 16 USC 1881.>> REGISTRATION AND INFORMATION MANAGEMENT.

(a) **Standardized Fishing Vessel Registration and Information Management System** --The Secretary shall, in cooperation with the Secretary of the department in which the Coast Guard is operating, the States, the Councils, and Marine Fisheries Commissions, develop recommendations for implementation of a standardized fishing vessel registration and information management system on a regional basis. The recommendations shall be developed after consultation with interested governmental and nongovernmental parties and shall—

(1) be designed to standardize the requirements of vessel registration and information collection systems required by this Act, the Marine Mammal Protection Act (16 U.S.C. 1361 et seq.), and any other marine resource law implemented by the Secretary, and, with the permission of a State, any marine resource law implemented by such State;

(2) integrate information collection programs under existing fishery management plans into a non-duplicative information collection and management system;

(3) avoid duplication of existing State, tribal, or Federal systems and shall utilize, to the maximum extent practicable, information collected from existing systems;

(4) provide for implementation of the system through cooperative agreements with appropriate State, regional, or tribal entities and Marine Fisheries Commissions;

(5) provide for funding (subject to appropriations) to assist appropriate State, regional, or tribal entities and Marine Fisheries Commissions in implementation;

(6) establish standardized units of measurement, nomenclature, and formats for the collection and submission of information;

(7) minimize the paperwork required for vessels registered under the system;

(8) include all species of fish within the geographic areas of authority of the Councils and all fishing vessels including charter fishing vessels, but excluding recreational fishing vessels;

(9) require United States fish processors, and fish dealers and other first ex-vessel purchasers of fish that are subject to the proposed system, to submit information (other than economic information) which may be necessary to meet the goals of the proposed system; and

(10) include procedures necessary to ensure—

(A) the confidentiality of information collected under this section in accordance with section 402(b); and

(B) the timely release or availability to the public of information collected under this section consistent with section 402(b).

(b) **Fishing Vessel Registration** --The proposed registration system should, at a minimum, obtain the following information for each fishing vessel--

(1) the name and official number or other identification, together with the name and address of the owner or operator or both;

(2) gross tonnage, vessel capacity, type and quantity of fishing gear, mode of operation (catcher, catcher processor, or other), and such other pertinent information with respect to vessel characteristics as the Secretary may require; and ``(3) identification (by species, gear type, geographic area of operations, and season) of the fisheries in which the fishing vessel participates.

(c) **Fishery Information** --The proposed information management system should, at a minimum, provide basic fisheries performance information for each fishery, including--

(1) the number of vessels participating in the fishery including charter fishing vessels;
(2) the time period in which the fishery occurs;
(3) the approximate geographic location or official reporting area where the fishery occurs;
(4) a description of fishing gear used in the fishery, including the amount and type of such gear and the appropriate unit of fishing effort; and
(5) other information required under subsection 303(a)(5) or requested by the Council under section 402.

(d) **Use of Registration** --Any registration recommended under this section shall not be considered a permit for the purposes of this Act, and the Secretary may not propose to revoke, suspend, deny, or impose any other conditions or restrictions on any such registration or the use of such registration under this Act.

(e) <<NOTE: Federal Register, publication>> **Public Comment** -- Within one year after the date of enactment of the Sustainable Fisheries Act, the Secretary shall publish in the Federal Register for a 60-day public comment period a proposal that would provide for implementation of a standardized fishing vessel registration and information collection system that meets the requirements of subsections (a) through (c). The proposal shall include--

(1) a description of the arrangements of the Secretary for consultation and cooperation with the department in which the Coast Guard is operating, the States, the Councils, Marine Fisheries Commissions, the fishing industry and other interested parties; and
(2) any proposed regulations or legislation necessary to implement the proposal.

(f) <<NOTE: Proposals.>> **Congressional Transmittal** --Within 60 days after the end of the comment period and after consideration of comments received under subsection (e), the Secretary shall transmit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Resources of the House of Representatives a recommended proposal for implementation of a national fishing vessel registration system that includes--

(1) any modifications made after comment and consultation;
(2) a proposed implementation schedule, including a schedule for the proposed cooperative agreements required under subsection (a)(4); and
(3) recommendations for any such additional legislation as the Secretary considers necessary or desirable to implement the proposed system.

(g) **Report to Congress** --Within 15 months after the date of enactment of the Sustainable Fisheries Act, the Secretary shall report to Congress on the need to include recreational fishing vessels into a national fishing vessel registration and information collection system. In preparing its report, the Secretary shall cooperate with the Secretary of the department in which the Coast Guard is operating, the States, the Councils, and Marine Fisheries Commissions, and consult with governmental and nongovernmental parties.

7.3 Federal Reporting Requirements

The following table outlines the reporting requirements for U.S. Fisheries, organized by authorizing legislation. For each major authorizing legislation, the associated regulations codified in 50 CFR are noted, along with a general description of the reporting requirement, a listing of the vessel-specific information, and a listing of the instruments used to collect the data. The last two columns list the responsible Fishery Management Council (FMC) or international agency, and the responsible NMFS region or office that collects or maintains the data.

Federal Reporting Requirements for U.S. Fisheries						
Authorizing Legislation/Treaty	**Regulations at 50 CFR**	**Description**	**Vessel Information Required**	**Fishery Reporting Instruments**	**Council/ Agency**	**NMFS Region**
Marine Mammal Protection Act (MMPA)						
MMPA	216.24	Taking and related acts incidental to commercial fishing operations in the eastern tropical Pacific yellowfin tuna purse seine fishery	Vessel certificate of inclusion	Gear inspection Mandatory observer program Log incidental takings		SW
MMPA	216.108	Requirements for monitoring and reporting under incidental harassment authorizations for Arctic waters		Observer program Monitoring reports		AK
MMPA	216.114	Monitoring and reporting requirements for taking of ringed seals incidental to on-ice seismic activities		Letter of Authorization, Annual report (location, effort, number of seals)		HQ
MMPA	216.145	Monitoring and reporting requirements for bottlenose and spotted dolphins incidental to oil/gas structure removals.		Observer program Activity report		SE
MMPA	216.155	Monitoring and reporting requirements for DOD conventional underwater weapon detonations.		Activity notification Observer program Monitoring Activity final report Letter of Authorization, annual report (date, action summary, death/injury results, monitoring results, takings info. as applicable, and pop. Assess. studies)		SW
MMPA	220.45	Report filing procedures for General Permits		Potential report filing requirements		HQ
MMPA	229.6	Authorization for commercial fisheries under the MMPA reporting procedures		Report filing subsequent to takings (vessel name and ID, name and address of owner or operator, catch data)		HQ
WHALING CONVENTIONS ACT, MMPA	230.8	Reporting by whaling captains.		Gear description Report of whaling activities (catch)		HQ

International						
Atlantic Tuna Convention Act (ATCA)	285.29	Dealer recordkeeping and reporting for Atlantic bluefin tuna dealer		Sales info (date, catch) Bi-weekly sales reports (date, catch, price, effort) Maintain copies of landing card and bi-weekly reports for 2 years.		HQ
ATCA	285.54	Vessel recordkeeping and reporting for Atlantic tunas (not bluefin)	Logbook	Catch report.		HQ,SE
ATCA	285.56	Dealer recordkeeping and reporting for Atlantic tunas (not bluefin)		Sales info (dealer specific info, catch, price) Bi-weekly sales reports Maintain copies of reports for 2 years.		HQ,SE
Tuna Convention Act	300.22	Vessel recordkeeping and reporting for Eastern Pacific tuna	Logbook	Inter-American Tropical Tuna Commission (IATTC) logbook	IATTC	SW
ATCA	300.25	Dealer recordkeeping and reporting for Pacific bluefin tuna		Bi-weekly import/export reports Maintain copies of bi-weekly reports for 2 years.		NE
South Pacific Tunas Act	300.34	Vessel recordkeeping and reporting for South Pacific tuna	Logbook	Forum Fisheries Agency (FFA) forms	FFA	SW
Pacific Salmon Treaty Act	300.93	Reporting requirements for Fraser River sockeye and pink salmon		Non-native fishermen req. to file WA state reports Native fishermen subject to tribal reporting		NW
Antarctic Marine Living Resources Convention Act (AMLRCA)	300.107	Vessel recordkeeping and reporting for Antarctic Marine Living Resources	Logbook	Commission for the Conservation of Antarctic Marine Living Resources reporting forms (CCAMLR)	CCAMLR	HQ
Treaty between the U.S. and Colombia	300.124	Vessel recordkeeping and reporting requirements for U.S. vessels fishing in Colombia Treaty waters	Arrival and departure reports	Catch and effort reports.		SE
Agreement between the U.S. and the Russian Federation	300.154	Vessel recordkeeping and reporting requirements for U.S. vessels fishing in Russian waters	Vessel permit abstraction report Vessel departure and return reports	Catch and effort reports Retain copies of all records for 1 year onboard the vessel (must make available for 2 additional years)		AK
Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)						
MSFCMA	600.507	Vessel recordkeeping and reporting requirements for foreign fishing in the U.S. Exclusive Economic Zone (EEZ)	Logbooks retained onboard 3 yrs	Catch and effort log reports	ALL FMC	ALL
MSFCMA	600.705	Relation to other laws for state responsibilities relating to data collection			ALL FMC	ALL
MSFCMA	600.715	General recordkeeping and reporting requirements for	As required by state or federal	As required by state or federal regulations	ALL FMC	ALL

		domestic fisheries	regulations			
MSFCMA	622.5	Vessel and dealer recordkeeping and reporting requirements for Caribbean, Gulf and South Atlantic fisheries (Coastal pelagics, reef fish, shrimp, South Atlantic snapper-grouper, South Atlantic golden crab, red drum, South Atlantic rock shrimp, coral or live rock, Caribbean spiny lobster, queen conch)	Trip reports	Catch and effort logbooks Dealer reports; must retain sales reports for 1 year after receipt	SOUTH ATLANTIC; GULF OF MEXICO; SOUTH ATLANTIC; CARIB.	SE
MSFCMA	628.4	Reporting requirements for bluefish	See 600.715	See 600.715	MID-ATLANTIC	NE
MSFCMA	630.5	Vessel and dealer recordkeeping and reporting requirements for Atlantic Swordfish fishery	Logbook of effort, catch, and composition	Catch and effort logbooks Dealer reports of sales amount, type and price	NMFS	SE
MSFCMA	640.5	Vessel and dealer recordkeeping and reporting requirements for Spiny lobster (GOM and S. Atlantic)	Reserved	Reserved	SOUTH ATLANTIC; GULF OF MEXICO	SE
MSFCMA	644.5	Recordkeeping and reporting requirements for Atlantic billfish tournaments (Sailfish, white marlin, blue marlin, longbill spearfish)		Fisher specific info (name, telephone number), vessel, catch data, environmental conditions	NEW ENGLAND; MID-ATLANTIC; SOUTH ATLANTIC; GULF OF MEXICO; CARIB.	SE
MSFCMA	648.7	Vessel and dealer recordkeeping and reporting requirements for Northeastern fisheries (Atlantic mackerel, squid, butterfish, Atlantic salmon, Atlantic sea scallops, Atlantic surf clam and ocean quahog, summer flounder, scup, black sea bass, northeast multispecies)	Fishing log; retain for 1 year onboard	Weekly and annual dealer reports of sales amount, type, locale and price; retain for 1 year after receipt	NEW ENGLAND; MID-ATLANTIC	NE
MSFCMA	654.5	Vessel and recordkeeping and reporting requirements for Gulf of Mexico stone crab fishery	Reserved	Reserved	GULF OF MEXICO	SE
MSFCMA	660.3	Vessel and dealer recordkeeping and reporting requirements for fisheries off the West coast and Western Pacific		State required records	PACIFIC; WESTERN PACIFIC	SW, NW
MSFCMA	660.14	Vessel and dealer recordkeeping and reporting requirements for Western Pacific fisheries (Pelagic, crustacean, precious corals)	Logbook for catch, effort and transshipment	Sales reports as well as catch and effort reports Packing and weighout slips Dealers must retain sales reports State required records	WESTERN PACIFIC	SW
MSFCMA	660.303	Vessel and dealer recordkeeping and reporting	State required records so long	State required records so long as NMFS has access	PACIFIC	NW

		requirements for West coast groundfish	as NMFS has access			
MSFCMA	660.404	Vessel and dealer recordkeeping and reporting requirements FOR West coast salmon	State and tribal required records so long as NMFS has access	State and tribal required records so long as NMFS has access	PACIFIC	NW, SW
MSFCMA	662.4	Vessel and dealer recordkeeping and reporting requirements for Northern anchovy	State required records so long as NMFS has access	State required records so long as NMFS has access	PACIFIC	SW
MSFCMA	674.3	Vessel and dealer recordkeeping and reporting requirements for high seas salmon off Alaska	State required records so long as NMFS has access	State required records so long as NMFS has access	NORTH PACIFIC	AK
MSFCMA	678.5	Vessel and dealer recordkeeping and reporting requirements for Atlantic sharks	Logbook	Weighout slips with catch and effort data	NMFS	SE
MSFCMA	679.5	Vessel and dealer recordkeeping and reporting requirements for fisheries in the EEZ off Alaska (Groundfish, king and Tanner crab, scallops, sablefish and halibut IFQ)	Logbooks (retained for 3 years after end of fishing year)	Catch and effort reports; including discard estimates, transfer reports	NORTH PACIFIC	AK