Development of a Cooperative State/Federal Fisheries Independent Sampling Program

Part I: Program Design

Introduction

Development and assessment of fisheries management strategies rely heavily on data collected on the species or resource in question. The lack of sufficient or appropriate data can result in misleading conclusions and improper management decisions. The amount of data necessary to properly manage a species is often very extensive. Compounded over all managed species, data requirements are extremely high. No single fishery management agency in the northeast region has the fiscal, personnel, or physical capability to meet the objectives of existing state, interstate, and federal fishery management plans currently in place, nor those planned for the future.

To overcome the problems of insufficient funding and other resources, two or more agencies often combine resources and share responsibilities to conduct a survey that the individual agencies might not have been able to accomplish on their own. Benefits of cooperative sampling efforts include more cost efficient and time efficient sampling, the ability to sample over a larger geographic area or longer period of time, and more consistent sampling protocols within that area or time.

Cooperative programs are currently used on the Atlantic coast to collect both fishery dependent and fishery independent data. The Atlantic Coastal Cooperative Statistics Program (ACCSP) has recently been implemented to collect catch, effort, and other information from commercial and recreational fisheries from Maine to Florida. Fishery independent data are collected from North Carolina south as part of the Southeast Area Monitoring and Assessment Program (SEAMAP), which also includes the Gulf of Mexico and the Caribbean. SEAMAP provides a platform for the collection and use of fishery independent data, including coordination of existing programs, development of new programs where necessary, and dissemination of data.

Currently, there is no large scale cooperative effort to collect fisheries independent data in near shore ocean waters north of North Carolina. Proper management of our fisheries resources requires extensive fisheries independent data from this area. A cooperative state/federal program in the northeast region, similar to SEAMAP, would permit the development of cooperative fisheries independent data collection programs. Agencies could combine resources to conduct large scale, interjurisdictional fisheries independent research activities.

In 1997, the Commission's Management and Science Committee (MSC) identified several areas of concern with existing fisheries independent sampling programs, including:

- **Large areas of Atlantic coastal waters (less than 90 feet) are not covered, or receive less than adequate coverage. The two primary areas that are not covered are the Gulf of Maine (outside of Massachusetts state waters) and much of the mid-Atlantic Bight;**

- **Little coordination of surveys exists among the state and federal agencies, in terms**

of geographic and temporal coverage, sampling design, and survey procedures; and

- **There is uncertainty as to the continued availability of currently utilized survey vessels.**

In October 1997, the Commission passed a resolution (Appendix I-1) to develop a cooperative fisheries independent data collection program, in cooperation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. In June 1998, a workshop was held to begin the design and development of such a program. Details were added to the program during workgroup meetings in late 1998 and early 1999. This document presents recommendations for the mission, goals, objectives, and operational protocols of the Northeast Area Monitoring and Assessment Program (NEAMAP).

Mission

The mission of NEAMAP is to provide an integrated and cooperative state/federal program to facilitate collection and dissemination of fishery-independent information for use by government agencies, the fishing industry (commercial and recreational), researchers, and others requesting such information. To meet the needs of fishery management and fish stock assessment, NEAMAP provides the framework for collection and use of fishery independent data. This includes coordination of existing programs, development and implementation of new programs where necessary, and dissemination of the data collected. NEAMAP will serve to coordinate fisheries independent data collection and data management among states in the northeast region, as well as between NEAMAP and other existing regional programs (*e.g.* SEAMAP, ACCSP). The intent of the program is not to change existing programs, but to coordinate and standardize procedures and improve data accessibility.

All data collection programs developed through NEAMAP will be strictly fishery independent. The Atlantic Coastal Cooperative Statistics Program (ACCSP) was designed to coordinate the collection of both fisheries dependent and fisheries independent data. ACCSP has, however, deferred the development of a fisheries independent data module in order to focus on implementation of the fisheries dependent portion of the program. SEAMAP - South Atlantic surveys collect fishery independent data from North Carolina to Florida. Surveys developed under NEAMAP will collect fishery independent data north of Cape Hatteras, North Carolina. Coordination of these three programs will ensure comprehensive collection of both fishery dependent and fishery independent data along the entire Atlantic coast.

In the context of NEAMAP, fishery independent data are defined as those data which are obtained without direct reliance on activities of commercial or recreational fishermen. Data may be taken from such non-industry activities as trawl surveys for bottom fish and aircraft surveys for schooling fish. Fishery independent data are essential to management because information derived from fishermen (fishery dependent data) can be significantly influenced by varying economic conditions, changes in statutes and policies governing marine fisheries management, changes in vessel and gear design, discard patterns, willingness of fishermen to provide accurate

data, and changes in fishing strategies and practices that can not necessarily be measured.

NEAMAP does not propose a change in the basic pattern of regional fisheries research activities, but does maintain that a coordination of survey activities will yield non-duplicative data that can be incorporated into one or several regional fishery independent databases. Tracking and coordinating these activities will identify additional areas where fishery independent assessment activities are required to provide a complete, systematic database for northeastern resources. Specific purposes of NEAMAP are to:

- maximize the effective capability of fishery independent and associated survey activities to satisfy data and information needs of living marine resource management and research organizations in the region;

- optimize coordination and deployment of sampling platforms used in the region, including research and charter vessels, aircraft, submersibles, and satellites, in an effort to obtain regional, synoptic surveys;

- maximize the usefulness of fishery independent and associated survey data through documented sampling and data collection activities and through documented and regionally accessible computerized databases;

- promote coordination among data collection, processing, management, and analysis activities emphasizing those specifically concerned with living marine resource management and habitat protection;

- document long- and short-term requirements for fishery independent data necessary to meet current and future critical management and research needs, and establish compatible and consistent databases for holistic ecosystem and predictive modeling applications, and;

- provide a forum for coordination of other fishery related activities.

The overall approach of NEAMAP emphasizes the collection of fishery independent data to fill specific short-term and long-term management needs. Development of individual surveys will be both proactive and reactive; surveys will be designed to meet general fishery management needs as well as those mandated by statute for compliance with a particular fishery management plan. NEAMAP activities will also address issues that are important to the commercial and recreational fishing sectors. The first priority of NEAMAP will be development and continued implementation of a near shore trawl survey (See Part II of this document), but other types of surveys under NEAMAP might include surveys proposed in fishery management plans and the peer review process, and surveys that are required for compliance with a FMP. Examples of these types of surveys include:

- Juvenile seine surveys

- Spawning and egg count surveys
- Tagging studies, and
- Estuarine trawl surveys

There has been no priority given to development of surveys other than the proposed near shore trawl survey.

Data collection and management procedures for individual surveys will be coordinated among participating agencies in order to enhance the usefulness of the data, minimize costs, and increase the accessibility of information to fishery managers, administrators, and researchers. NEAMAP will build on, and coordinate with, current activities such as SEAMAP, ACCSP, and individual data collection activities, to develop optimum resource sampling and assessment capabilities.

Goals and Objectives

Goal 1: Cooperatively plan, evaluate, and administer fisheries independent data collection programs, including a state/federal near shore trawl survey and other NEAMAP-sponsored activities.

Objectives:

1. Develop an annual operations plan consistent with budget and operational constraints;

2. Develop an annual budget allocation plan which considers program needs, annual operations plans, and participant capabilities;

3. Sponsor meetings to cooperatively plan and evaluate activities;

4. Sponsor special workshops and symposia to help evaluate or plan sampling strategies, designs, or methods;

5. Establish working groups, as needed, under the auspices of the NEAMAP committees with appropriate expertise, to assist in planning and evaluating NEAMAP activities;

6. Conduct annual internal reviews of program activities;

7. Conduct periodic coordinated external reviews of specific management, administrative, and technical elements of the program;

8. Coordinate and document NEAMAP activities, and disseminate programmatic information.

Goal 2: Establish a coordinated, long-term, fisheries independent data collection program of Atlantic coast living marine resources from Cape Hatteras to Maine for the purpose of resource and habitat assessment and management.

Objectives:

1. Conduct routine surveys and special studies, as needed, of regional resources and their environments;

2. Coordinate data collection activities with ongoing surveys and data collection programs, including possible cooperative programs with industry;

3. Collect data on species composition, biomass, relative abundance, distribution, and seasonality of living marine resources;

4. Record biological information to include size, age, sex, and reproductive condition for target species;

5. Identify and monitor essential fish habitat;

6. Collect environmental data coincident with living marine resource monitoring activities;

7. Archive and provide biological specimens/samples to cooperating agencies and other investigators upon request, subject to certain limitations (time, space, funding);

8. Maintain the ASMFC's fishery independent program database and update as appropriate.

Goal 3: Operate the NEAMAP data management system for efficient management and timely dissemination of fishery independent data and information.

Objectives:

1. Design, implement, and maintain a NEAMAP data management support system that can be used to assess and monitor selected living marine resources and associated environmental and habitat factors;

2. Establish data handling and processing protocols for all NEAMAP data;

3. Compile and maintain a computerized directory of NEAMAP monitoring activities, including data summaries and inventories by gear, species, species

group, and geographic area;

4. Identify and describe existing non-NEAMAP databases and activities that are of value to fishery independent assessments of regional living marine resources, and coordinate and integrate these, where possible, with the NEAMAP database;

5. Coordinate data management activities with ACCSP and other existing programs, including common use of codes and formats.

Goal 4: Establish a comprehensive outreach program to secure funding and educate constituents on the actions, results, and benefits of the NEAMAP.

Objectives:

1. Develop an outreach package for Congress and other potential funding sources to secure long-term stable funding;

2. Develop methods to educate industry and the public about fishery independent sampling and data, including aspects such as the need for and benefits of fishery independent sampling, how the data are collected, and how the data are used;

3. Develop promotional materials that detail how NEAMAP data supports fisheries management and natural resource stewardship, citing specific examples where appropriate;

4. Develop reports of survey results and NEAMAP accomplishments for distribution;

5. Encourage public and industry assistance and support in NEAMAP sampling activities.

Program Structure and Organization

The program would consider as partners, all Atlantic coast states from Maine to North Carolina, (including Pennsylvania), the National Marine Fisheries Service, the Mid-Atlantic Fishery Management Council, the New England Fishery Management Council, the U.S. Fish and Wildlife Service, the Potomac River Fisheries Commission, and the District of Columbia.

Participants in the program would include all program partners plus SEAMAP, ACCSP, the Environmental Protection Agency, and others (such as universities) where necessary.

Four options were considered for the program committee structure. Two options

included a northeast only model, and two others considered integration of NEAMAP and SEAMAP to form a coastwide program. A range of committee membership options were considered, including representation from a subset of partners or full partner representation, and using existing committees or developing new committees. The preferred option for initial implementation is shown in the table below.

NEAMAP Committee Structure	
Executive	NEAMAP Board (all partners)
Middle Management / Operations	Operations Committee (all partners)
Technical	Separate committees for individual surveys
Advisory	Existing Commission committees
Administrative	ASMFC

This option was chosen for initial implementation of the program structure with the caveat that SEAMAP be strongly involved. It was also recommended that the benefits of combining SEAMAP and NEAMAP to form a single Atlantic coast program be evaluated as a possible long-term goal.

The NEAMAP Board will serve as the executive level committee for the program. The Board will oversee the design and implementation of the NEAMAP, establish policy to guide program and partner participation, and serve as the final decision making authority for the Program.

The Operations Committee will be responsible for recommending program priorities, funding criteria, research possibilities, and other items as requested by the NEAMAP Board. The Operations Committee will be the vehicle for coordination of Technical Committee input into the program, and will provide recommendations to the Board. The Operations Committee will present Advisory Committee, Technical Committee, and Operations Committee recommendations to the NEAMAP Board.

Technical Committees will be assigned to develop technical details of individual surveys and perform relevant tasks assigned by the Operations Committee and the NEAMAP Board. The Technical Committees will report back directly to the Operations Committee.

The Advisory Committee used will be existing ASMFC Advisory Committees for individual species, the Commission Advisory Board, or a combination of both, depending on the issue. Advisors will have the opportunity to comment on NEAMAP activities and make recommendations to the NEAMAP Board regarding those activities.

The NEAMAP Board and Operations Committee will be comprised of one representative

from each Program partner. Technical Committee makeup will vary depending on the function of each specific committee. Each committee will elect a chairman and vice-chairman to oversee the committee actions. The chairman will serve a two-year term. At the conclusion of the chairman's two-year term, the vice-chairman will become chairman, and the committee will elect a new vice-chairman.

All committees shall reach decisions by consensus, if possible. If consensus is not possible, the NEAMAP Board will reach a final decision by vote, with each partner agency casting one vote. If consensus is not possible at any other committee level, the committee shall identify the options and present the benefits and drawbacks to each option. These options will be forwarded to the next higher committee level for review and development of a recommendation.

Staff support and other administrative functions will be provided by the ASMFC.

Data Management

Specific data management protocols have not been discussed at this time. General discussion has focused on the set up and location of the database. The preferred long-term alternative is the development of a single, centralized database. However, several issues that must be considered before a centralized database is developed are discussed below.

- Database structure - If all the data is to be located in a single database, a common data structure must be developed that is applicable to all types of fisheries independent data.

- Data management responsibilities - Data responsibilities must be established and adhered to. Responsibilities include data entry, data editing, transferring data to the central database, distribution of reports, etc. Responsibilities must be developed for each survey individually and for the entire database.

- Location of the database - The actual location of the data is unimportant as long as the data are readily accessible to all users. One suggestion is to locate the database in the same location as the ACCSP database. The ACCSP database allows data querying through a web-based application.

Eventually, the database should include data from existing surveys. Each survey would be responsible for their own data entry and editing, but finalized data would be converted to a standardized format and sent to the centralized database. Stock assessment biologists could then access data from multiple surveys in a single location. There are, however, several issues that must be addressed before existing data are located in a central database.

1. Who are the end users and what are they using the data for? - There is concern that fisheries independent data are very easily misinterpreted, and therefore may be used improperly. Steps must be taken to minimize the misinterpretation of the

data. For example, it was suggested that detailed metadata about survey procedures and events be included with the data (changes in gear configuration, weather events, vessel change, etc)

2. Increased communication among different agencies and the development of standardized editing procedures - Increasing communication among agencies will allow the sharing of ideas and methods for data entry and auditing procedures. Standard data editing protocols must be developed. All surveys will be required to follow these protocols before submitting data to a central database. Until standard protocols are developed, some alternatives include annual meetings of data managers and perhaps a national/international list serve or email database for people to pose questions to others in the field.

3. Staff time - Many agencies expressed the concern that they were much too busy to even consider working on converting their data to a common format, even with help from the central database data manager. It would require additional staff, but that staff would also have to be very familiar with the survey data to be able to understand all the different nuances of the data.

Data handling and storage procedures should be one of the highest priorities of the committee tasked with addressing data management. Specific protocols for data entry, quality assurance, data transfer, and data storage should be developed and adopted by all program partners before any data from existing surveys are moved into a NEAMAP database. These protocols should be established before data collection begins on any newly developed NEAMAP survey. Development of these practices will require significant coordination between the researchers and data management personnel.

Documentation

The technical committee for each survey managed under the program is required to document survey structure and protocols. Documentation should include, but not be limited to, the goals and objectives of the survey, survey sampling design and sampling protocols, data management protocols, quality assurance and control protocols, coordination with existing surveys, and types and sources of metadata. These documents will be developed before the survey is implemented and will be updated as necessary.

The working group tasked with developing the program design has recommended that a formal agreement be developed before implementation of NEAMAP. The formal agreement will be used to confirm commitment of all partners towards the goal of cooperative fisheries independent sampling. Two options have been proposed for the development of a formal agreement.

1. The first option is to develop a completely new agreement to be approved and signed by all NEAMAP partners. This option will require much effort on the part

of the partners, and will be time consuming to finalize.

2. The second option is for all Commission partners to reaffirm their commitment to the fisheries independent portion of the ACCSP Memorandum of Understanding (MOU). The ACCSP Coordinating Council, however, would be overburdened at this point in time if they were also required to assist in the development of NEAMAP. The program structure outlined in the **Program Structure and Organization** section will therefore be used to develop and oversee NEAMAP. In the future, NEAMAP may come under the auspices of ACCSP for the collection of fisheries independent data, but it is not recommended at this time.

Action will be taken on this issue during the initial NEAMAP Board meeting.

Other documentation that will be required include a long-term (multi-year) strategic plan and a one year operations plan to be updated annually.

Funding

Securing long-term funding support for this program through Congressional allocations should be the top priority of the NEAMAP program during the initial years of the program. It must be noted that, under the current structure, NEAMAP is seeking funding and support that is completely separate from funding for existing cooperative programs, such as SEAMAP and ACCSP. If funding is granted only through an existing program, this program will not be implemented. In the future, however, if SEAMAP and NEAMAP are combined into a single program, funding priorities will be re-evaluated.

The total annual funding requirement for NEAMAP is not known, and will be dependent on the types and extent of the surveys included in the program. The top research priority for NEAMAP is the proposed near shore trawl survey. A preliminary budget requirement for the proposed trawl survey is included in the Near Shore Trawl Survey Design document. All other research activities will be funded subsequent to sufficient allocation for the trawl survey. Funding requirements for subsequent studies will be included in the respective survey design documents.

Appendix I-1

Resolution for the Development of Coordinated Fisheries Independent Sampling Programs

WHEREAS shared authority and jurisdiction for management of many fish stocks by state and federal fishery management agencies promote the use of cooperative fisheries data collection programs to ensure all agencies collect information in the most efficient manner, and have access to the best scientific data available; and,

WHEREAS the collection of fishery independent data is critical to produce relevant and scientifically valid stock assessments used to develop and amend state, federal, and interstate fishery management plans; and,

WHEREAS there are a variety of fishery independent sampling methods used by state and federal marine fisheries agencies and universities, such as trawl surveys, seine surveys, gill net surveys, and acoustic surveys, which provide essential data for assessing the status of marine fisheries; and,

WHEREAS current fishery independent data collection programs are largely not coordinated among state and federal agencies, and university programs, in terms of geographic and temporal coverage, sampling design, and survey procedures; and,

WHEREAS there are large areas of Atlantic coastal waters that are not sampled, or receive less than adequate coverage by the current fishery independent data collection programs; and,

WHEREAS there is uncertainty as to the continued availability of presently utilized vessels;

NOW THEREFORE BE IT RESOLVED that the Atlantic States Marine Fisheries Commission and its member states, in cooperation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, will facilitate the development of a coordinated fisheries independent sampling program along the Atlantic coast; and,

BE IT FURTHER RESOLVED that this coordinated program will expand on existing surveys, and develop new surveys to fill gaps in sampling, to ensure consistent and comprehensive data for use in state, federal, and interjurisdictional fisheries management; and,

BE IT FURTHER RESOLVED that the design of this program will include the development of a funding initiative to achieve the goals set forth in this program; and,

BE IT FURTHER RESOLVED that data from such a coordinated fisheries independent sampling program will ultimately be coordinated with the Atlantic Coastal Cooperative Statistics Program, and data from such a program will be used in conjunction with fisheries dependent data to develop fishery management plans using the most scientifically valid data available.