Cooperative Research in the Northeast:
A Strategic Direction for 2010-2014

On behalf of National Marine Fisheries Service, Northeast Fisheries Science Center

Gulf of Maine Research Institute
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ACKNOWLEDGMENTS

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Our deepest gratitude is toward the cooperative research community of the Northeast – the dedicated fishermen, scientists, managers and members of environmental organizations who contributed their time and expertise. The recommendations in this report were shaped by the cooperative research community's insight and collective experience without which this project would not have been possible. Thank you!

Funding for this project was provided by the National Marine Fisheries Service (NOAA Fisheries Service), Northeast Cooperative Research Program (NCRP). Initiated in 1999, the goals of this program are to enhance the data upon which fishery management decisions are made as well as to improve communication and collaboration among commercial fishery participants, scientists, and fishery managers. NOAA Fisheries Service works in close collaboration with the New England Fishery Management Council's Research Steering Committee and the Mid-Atlantic Council's Research Set-Aside Committee to set research priorities to meet management information needs.

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Background

NOAA Fisheries has engaged in funding cooperative research in the Northeast Region through two key programs. The Cooperative Research Partners Program (CRPP) began in 1999 with the mission to formalize and expand collaborative research among New England's commercial groundfish industry, scientists and managers. The goal of cooperative research is to enhance the data upon which fishery management decisions are made as well as to improve communication and collaboration among partners. In addition to CRPP, the Research Set-Aside (RSA) programs established by the Mid-Atlantic and New England Fishery Management Councils (Councils) have provided a mechanism to fund cooperative research and compensate vessel owners through the sale of fish harvested under a research quota. Together, the CRPP and RSA programs are administered through the Northeast Cooperative Research Program (NCRP) at the Northeast Fisheries Science Center (NEFSC). This funding has provided a significant opportunity for NOAA Fisheries to develop collaborative relationships with the fishing industry and has served as a mechanism to build trust and understanding among the various players in the fisheries community and management agencies.

The NCRP works in close collaboration with the New England and Mid-Atlantic Councils in setting research priorities to meet management and fishing industry needs. In early 2009, the NEFSC launched a strategic planning process to help better inform NOAA's Regional leadership as it plans for the NCRP for the next 3-5 years. This document is a result of these efforts. This Cooperative Research Strategic Plan is meant to complement the research priorities that have been set by the Councils by further refining the list of research projects and to identify a focused subset particularly appropriate and suited for industry involvement.

Northeast Cooperative Research Program - Core Objectives:

- Foster coordination, cooperation, communication and mutual respect among scientists, managers, and industry; and
- Enhance the data upon which fishery management decisions are made.

Strategic Planning Objectives:

- To define a clear set of strategic cooperative research priorities to inform the evolution of NOAA Fisheries' Northeast Cooperative Research Program from 2010-2014.

Outcomes:

- Restructure cooperative research program administration, implementation, and current processes that support and direct cooperative research (structure).
- Define a clear set of cross-cutting themes and specific fishery – species priorities for the Northeast Cooperative Research Program for 2010-2014.

A Brief Overview of the Process

A Cooperative Research Coordinating Committee was formed to guide the strategic planning process and serve as a mechanism to improve communication and joint research planning among NOAA Fisheries, the Councils and the Atlantic States Marine Fisheries Commission. The Committee reviewed an initial set of cooperative research priorities developed by the Councils, including input from New England Fishery Management Council's Research Steering Committee, Mid-Atlantic Fishery Management Council's Research Set-Aside Committee, and their respective Scientific and Statistical Committees (SSCs). Broad stakeholder comments were received during 5 facilitated public meetings[1], and the resulting prioritized cooperative research strategy was presented to the Northeast Region Coordinating Council (NRCC[2]).

Cooperative research has had a significant impact in the northeast over the past ten years. The collaborative research priorities respond to the management needs and research gaps identified by Committee members and involved stakeholders. It is also important to acknowledge that ongoing discussions, particularly with engaged stakeholders and managers will provide an opportunity to maintain this as an evolving plan.

Members of the Cooperative Research Coordinating Committee included the following:

- Frank Almeida, Deputy Science and Research Director, NEFSC
- Fred Serchuk, Senior Science Advisor, NEFSC
- George Darcy, Assistant Regional Administrator, Northeast Regional Office
- Chris Kellogg, Deputy Director, New England Fishery Management Council
- Pat Fiorelli, Public Affairs Officer/Fishery Analyst, New England Fishery Management Council
- Rich Seagraves, Fishery Management Specialist, Mid-Atlantic Fishery Management Council
- Clayton Heaton, Fishery Management Specialist, Mid-Atlantic Fishery Management Council
- Bob Beal, Director, Interstate Fisheries Management Program, ASMFC
- John Hoey (ex officio), Director, Cooperative Research Program, NEFSC
- Earl Meredith (ex officio), Research Fishery Biologist, Cooperative Research Program, NEFSC

[1] Stakeholder meetings were held in Galloway, NJ (MAFMC), Narragansett, RI, Waltham, MA (NEFMC), Portland, ME and at the Maine Fishermen's Forum in Rockland, ME.

[2] The NRCC meets twice a year to discuss regional coordination/planning issues among the NMFS, New England and Mid-Atlantic Councils and Atlantic States Marine Fisheries Commission among the leadership of these organizations.

Lessons Learned in Cooperative Research

After nearly a decade of experience administering a range of cooperative research projects throughout the Northeast region, the Committee identified a list of important lessons learned that are useful to reflect upon as the NCRP moves forward over the next 3-5 years.

Frequent Dialogue: First and foremost, frequent dialogue among cooperative research partners is essential for success, smooth operations, and overall program efficiency.

Responsiveness to Management: Projects that are responsive to management and research priorities and can provide technically reviewed results to managers and the public are preferred.

Early and Regular Collaboration: Communication and partnerships with NMFS scientists and technical people on Council Plan Development Teams throughout the project make the results most useful to management.

Cooperative Agreements and Networks: Formal cooperative agreements and network arrangements provide greater opportunities to leverage infrastructure and specialized knowledge. These arrangements include formally established processes that encourage inter-agency, institutional, and university collaboration to enhance research, economic efficiency, and responsiveness.

Sharing Products Regionally: Broad regional capacity building is enhanced if some of the products that have been developed or purchased are made available to other collaborators during subsequent projects (e.g. electronic scales can be shared, the NEFSC survey database supports industry-based survey data, the NEFSC mark-recapture project management system supports several species tagging initiatives).

Peer Review of Results: Peer review of cooperative research results is essential prior to consideration by Fishery Management Councils. The NEFSC and Northeast Consortium have developed a process to conduct technical reviews of final projects. Review comments are provided to the principal investigator for response. Final reports, review comments and responses are provided to the Council and ASMFC Committees who, in turn, recommend further action for the full Council or PDT to consider.

Project Data Procedures: Project data must be submitted, reviewed and archived in a timely manner to be most useful to the scientific and management process. Data accessibility and archiving is required by Federal law if the Councils and NMFS are to use that data to promulgate or justify regulations, stock assessments, and analyses of management alternatives. Data, sampling designs, sampling protocols, and QA/QC procedures must be documented.

Annual Meeting: Providing an annual opportunity for dialogue among cooperative research partners is essential for success, coordination, collaboration and overall program efficiency.

Recommendations for Cooperative Research Principles

1. Focus limited funds on research to support management priorities

Collaborative research with industry in the Northeast has been funded through a variety of mechanisms (NMFS funding, earmarks, and RSAs). Not all research lends itself to support through these funding mechanisms (e.g. long-term monitoring) and there are limits to the funds currently available. While the Committee did not want to limit the scope of cooperative research funding to research solely focused on short-term management issues for the region, the practical realities of current limited funding require a re-evaluation of the cooperative research administration and broad mandate. The Committee and involved stakeholders recommended a more focused set of research priorities with specific species issues identified.

The core purpose of NOAA's cooperative research funding should be focused on research to support fishery management efforts in the federal arenas (including joint interstate/federal plans). This is not meant to prohibit supporting research that focuses primarily on fisheries in state waters, but the research has to be relevant to federal fisheries priorities. Indeed, many fishermen involved in the RSA process voiced strong opinions that the RSA resources should be targeted on solving key management issues for the fishery. While a clear objective of this strategic planning process is to ensure we have a tighter link with the management process, it is clearly recognized that we do not want to discourage participation, innovation, or creativity that will allow us to be responsive in an ever changing biological and regulatory environment.

2. Cooperative approach in the Northeast has proven successful and should be fostered

It was clear to the Coordinating Committee and throughout the public stakeholder process that the regional scientists (academic and NMFS) and fishermen have benefitted greatly from the various sources of cooperative research funds made available during the last 10 years. A recent assessment of the impacts of cooperative research in the Northeast Region shows an impressive amount of financial benefits and creation of scientific capacity realized through several cooperative research programs (http://www.northeastconsortium.org). Particularly within New England, there is an established community of scientists, fishermen and managers that have been involved in cooperative research to varying degrees. Many fishermen have designed business plans that include a portion of their income from research funding. This income stream has become even more critical as the groundfish fishery has continued to contract.

The loss of Congressional funding to the Northeast Consortium (NEC) has had a profound impact, reducing the financial capacity that exists to support a large group of researchers, students, and indus-

try members who have worked on a broad array of projects, including state fishery issues, ecosystem, and short-term innovation projects. These cooperative research needs may appear less relevant to the immediate management needs in the region, but they provide critical data and there is a deep concern that they will not be supported through other NOAA funds. Many state fisheries research projects have been funded by NEC. As these funds have been eliminated, this has put additional pressure on NCRP funds to support critical near-shore fisheries issues (i.e. lobster trap surveys). NCRP has supported critical projects such as e-molt and the industry-based surveys, but this leaves little funding for other initiatives.

A decade of cooperative research has documented the advantages of using fishermen as partners and fishing vessels as platforms, including more efficient use of funds, enhanced communications, greater trust, and more meaningful ecological input by the industry into project design and the interpretation of results. NOAA has an opportunity to support collaborative research with the fishing industry beyond the Northeast Cooperative Research Program to gain fishermen's insight and leverage a network of vessels with experience and the capacity to collect data in support of ecosystem based management. A cooperative approach to research does not have to be limited to the projects that are funded through NCRP or RSA and this approach should be promoted throughout NMFS.

Recommendations:

1. Seek funding from other parts of NOAA to support core needs (NEAMAP and Inshore Surveys).
2. Support continued funding of broad cooperative research programs (e.g., Northeast Consortium, Southern New England Cooperative Research Initiative, etc.) that partner with NCRP and provide a source for cooperative research with industry that may have longer-term benefits for fisheries management.
3. Leverage cooperative research infrastructure and expertise by encouraging use within other parts of NOAA.

General Recommendations for NOAA's Northeast Cooperative Research Program

Restructure the Northeast Cooperative Research Program to improve performance, efficiency, and adaptability.

Lessons have been learned and there is a consensus that programmatic changes are necessary to improve leveraging of limited resources, build greater trust and collaboration between involved institutions and constituents, and establish institutional arrangements that are more flexible, dynamic, and responsive to management.

The current model of annual competitions resulting in grants and contracts does not serve the program well. While NCRP has funded many important projects, additional integration and cohesion within the program is necessary. In addition, the current procurement methods limit flexibility and constrain direct NMFS scientific involvement in the design and execution of research projects, especially those using a grants process, such as the RSA programs. Cooperative research projects that include meaningful and regular input by NMFS scientists, especially those involved on a Plan Development Team, have the greatest chance for successfully integrating the information into the management process upon project completion and peer review. Under the Northeast Consortium framework, NMFS scientists can propose to work with a fishing industry partner on a project. However, this may be restricted under current request for proposals (RFP) or broad agency announcement (BAA)

policy and procedures used by the NCRP. A new approach that is based on network structures and systems, with NEFSC as a core node, may be more efficient and allow broader integration of NMFS scientists into collaborative research with industry and academic partners.

Problems Addressed:

- Need for more coordination across institutions and agency divisions,
- Expansion of direct NMFS scientific involvement with research,
- Improved methods to obtain support and services from external partners, and
- Better communications and outreach.

Restructure the Northeast Cooperative Research Program to improve performance, efficiency, and adaptability.

Recommendations:

- **Formalize and permanently establish the Northeast Cooperative Research Coordinating Committee.** This presents a good opportunity, at the Deputies level, to assist and help ensure program responsiveness, coordination, and relevance.
- **Enhance internal administrative capacity** and efficiency by identifying cooperative research staffing that will fully support scientific and administrative needs for program networks identified below. This includes an expansion of the pool of technical reviewers of research proposals at the beginning of the proposal review process.
- **Revise acquisition methods and structure** to improve administration and management of cooperative research.
    - **More fully utilize alternative acquisition processes** that include grants, cooperative agreements, and contracts or consider other models.
    - **Establish multi-year cooperative agreements** that allow flexibility and greater involvement of NMFS scientists and managers.
    - **Create networked organizations** (through competitions), that are more fully integrated with NEFSC systems (data and stock assessments). Use Memoranda of Agreement among organizations with theme related expertise (such as a conservation engineering network). This should facilitate more efficient funding and the ability to select the most highly qualified partners for specific tasks and tap directly into their strengths. Networks can expand and contract as needs and priorities change.
- **Consider broader programmatic regulatory permitting and NEPA/Protected Resources review processes.** The recent study fleet programmatic EFP is an example. This would require more detailed planning for specific research activities in the near future, but could reduce the administrative burden and enhance both oversight and accountability.
- **Develop and implement a coherent outreach and education strategy** over the next year that increases regular interaction among NMFS scientists and stakeholders and makes industry and the general public more aware of the results of cooperative research activities.

Recommended Research Themes for the Next 3-5 Years

THEME I: Support development and implementation of innovative monitoring tools and pilot programs to address critical data gaps as the industry moves to new management regimes.

Major transitional events are affecting fisheries management and science in the northeast. Management is transitioning to programs requiring significant changes in fleet and vessel monitoring requirements (sectors, annual catch limits (ACL), accountability measures (AM), limited access privilege programs (LAPP), dedicated access privilege programs (DAPP), etc). Many scientists who are directly involved in management issues expressed concern that the science is lagging behind management decisions because monitoring programs have not kept up. The current data management systems will not suffice for some fisheries management programs based on annual catch limits for all fisheries. A move toward hard total allowable catch (TAC) limits within fisheries will also require better estimates of discards. The current emphasis on reporting landings more accurately in real time and in greater spatial and temporal resolution is too narrowly focused. ACL and AM mandates will necessitate greater monitoring and accounting of discards. This may be the driving force of closing fisheries as quotas are reached. As the fishing industry considers new approaches such as sector management in the groundfish fishery, there is concern that they will not have the tools needed to support a more community-based form of management. There are key research and development areas that the NCRP should support during this transition.

In addition, fishery-independent monitoring programs are transitioning (e.g. the NOAA Ship *Henry B. Bigelow*) and expanding (e.g. the NEAMAP and ME-NH inshore surveys), while recent assessments have identified new species priorities and data gaps. A decade of experience with cooperative research has demonstrated that these activities can complement core NMFS research activities and support the evaluation and implementation of various management options.

It should also be noted that many stakeholders expressed concern that the data required to move toward a more ecosystem-based approach to management was also lacking. As the management structure moves toward this approach in the future, there will need to be additional resources focused on addressing data gaps.

A. Fishery-dependent monitoring and reporting tools:

Management options required by the reauthorized Magnuson Act and under consideration in the Northeast Region will be less effective without addressing the need for improved fishery-dependent data and discards. The biggest industry liability will be discards under ACLs. More detailed haul based data will allow for more precise estimates of discards, and with quick turnaround will allow industry to use dynamic area management to reduce interactions. The electronic fisheries logbook data recording system (FLDRS) developed and pilot tested under the Study Fleet program has the capacity to expand to serve these needs.

There is a need to work toward establishing an integrated network for industry dependent reporting (centered on study fleet developments) that will provide real time, high spatial and temporal resolution data on fishing effort and catch to support fishery communications and information exchange for 'sector' or community self-management oriented programs. Additionally, the data networks would provide additional avenues for the collection of ecosystem data and oceanography oriented information capitalizing on fishermen's traditional knowledge. This initiative could provide structure and support for the development of new and emerging management methods such as LAPPs and DAPPs.

Problems Addressed:

- Need to support timely and accurate fishery dependent reporting for ACL, AM, LAPPS, DAPPS, etc., and
- Need for more accurate and precise estimation of discards.

THEME I: Support development and implementation of innovative monitoring tools and pilot programs to address critical data gaps as the industry moves to new management regimes.

A. Fishery-dependent monitoring and reporting tools - *Recommendations:*

- **Establish an integrated network for fishery-dependent reporting.** Foster the development of real-time management systems and communication networks to minimize discards through a focused program to transfer technology of new fishery-dependent monitoring and reporting tools (extension of Study Fleet program).
- **Conduct studies and analyze new information on discards** in collaboration with the NEFSC Observer Program's at-sea independent observers, vessel captains, and other data collectors (e.g. Study Fleet technicians); including evaluating sub-sampling protocols of catch and extrapolation methods to the trip, sector and/or fishery level.

B. Industry-based surveys and data gaps:

Different stakeholders (scientists, managers, and fishermen) have different research interests. Scientists may have longer-term and theoretical interests, whereas managers and fishermen are likely more interested in shorter term results that address perceived management needs. Stakeholders will have different preferences for investments relative to basic research (biological sampling), technology development (survey tools, sensing and IT systems, new fishing gears, alternative management programs), and education and technology transfer.

The NCRP has made large investments in industry-based surveys (e.g. cod and yellowtail). More recently, as other funds have become less available, NCRP funds have been used to support critical near-shore fisheries surveys such as NEAMAP and the ME-NH Inshore Trawl Survey. It is important that these long-term survey efforts be transitioned to other funding sources. Cooperative research funds are best used to develop pilot surveys to fill in gaps in species-specific information. Two examples of this approach are the need for a ventless trap survey for scup and sea bass as well as a fixed gear hard-bottom survey in the Gulf of Maine.

Problem Addressed:

- Improve fishery independent survey coverage, especially for specific areas where trawl surveys are not possible.

THEME I: Support development and implementation of innovative monitoring tools and pilot programs to address critical data gaps as the industry moves to new management regimes.

B. Industry-based surveys and data gaps - *Recommendations:*

- **Formalize a standardized industry data management system to support survey programs** (such as used by NEAMAP, Maine/New Hampshire, NEFSC, and MA-DMF). This system should be designed to facilitate the flow of information into the science and management arenas, as well as to disseminate survey results back to industry.
- **Fund pilot surveys** to address critical data gaps in scup, black sea bass, and the Gulf of Maine.
- **Collect species-specific biological samples** to answer emerging questions about population responses to ecosystem change.

Recommended Research Themes for the Next 3-5 Years

THEME II: Develop a comprehensive conservation engineering program to achieve regional coordination and technology transfer with industry.

There have been significant cooperative research program investments in the development of selective fishing gear. Though many projects have been conducted, very little coordination and integration among these projects have occurred. There is no centralized and standardized data repository and archive system. There have been some successes in developing effective gear to separate target from non-target species, but other projects have not provided favorable results. Greater industry advisory capacity and integration with gear technologists would optimize success rates of conservation engineering projects. The fishing industry adds the greatest value in conservation engineering related projects. A more cohesive structure and program to guide conservation engineering is needed within the NCRP.

By establishing a network, scientists and industry leaders can be identified and resources can be leveraged (financial, infrastructure, and expertise). This approach would be a 'proof-of-concept' and, if successful, other programs could be considered that would focus on cross-cutting thematic research such as socioeconomic research.

Problems Addressed:

- Lack of integration and coordination within the conservation engineering community experts,
- Untapped expertise of the fishing industry to guide design of gear projects,
- Lack of transfer of new gear solutions once designs have been approved through the management system, and
- Need for more oversight and regular guidance so experiments can be adjusted and/or halted if not reaching their objectives.

THEME II: Develop a comprehensive conservation engineering program to achieve regional coordination and technology transfer with industry.

Recommendations:

- Establish collaborative networks for conservation engineering in the region through a focused approach (through RFP).
- Establish a conservation engineering node at the NEFSC to leverage cooperative research capacity to support conservation engineering (standardized field operations, data capture systems, archiving capacity, statistical design and analytical advice).
- Establish an industry conservation engineering panel to guide gear research programs (a conservation engineering 'think tank').
- Provide extension services and financial support to increase adoption of more selective fishing gear and broaden use of new gear designs.
- Leverage Sea Grant program involvement where appropriate in gear research and technology transfer

Research Priorities Identified by the Mid-Atlantic and New England Fishery Management Councils

The Committee reviewed the list of research projects based on the Mid-Atlantic Council's 2009-2014 Research Plan and the New England Council's Research Priorities and Data Needs (2009-2013), to prioritize research appropriate for a cooperative approach utilizing fishermen's knowledge, expertise, and fishing vessels. Council lists were further discussed by the Cooperative Research Coordinating Committee, Council research committees, and public stakeholders. A subset of the Council's research and information priorities, those most appropriate for Cooperative Research, are listed in order of priority.

For FY09, research priorities were identified as winter flounder and skate bycatch in groundfish fisheries and butterfish bycatch in the *Loligo* fishery – other species priorities are contingent on funds.

High priority research applicable to Cooperative Research: Mid-Atlantic

Summer Flounder

- Need significant increase in biological sampling (length, age, sex, maturity) for summer flounder catch (kept and discards) across fisheries at fine scales of resolution. Critical sex ratio stock productivity questions need to be addressed. Discard mortality issues remain contentious. Develop a SNE – Mid-Atlantic Industry-based flatfish survey to provide periodic samples and biomass estimates, alternating with the Monkfish survey.

Black Sea Bass and Scup

- A ventless trap sampling survey should be considered as a potential index of abundance. Fishery independent surveys for scup and black sea bass (unvented trap surveys) providing opportunities for additional conventional tagging and biological sampling.
- Study localized changes in sex ratio for black sea bass as a function of age, size, and exploitation rates that may affect reproduction patterns as male dominance and territorial ranges change.

Butterfish

- Further research on improving the precision of discard estimates for butterfish from all sources.

Loligo Squid & Butterfish

- Conduct gear research to reduce discards in the *Loligo* squid fishery.
- Mesh selectivity - *Loligo* retention and butterfish escapement (summer and winter).
- Test gear modifications (in addition to mesh size) in the *Loligo* squid fishery to reduce bycatch of butterfish and other species (Fishing Circle Mesh).
- Evaluate potential for dynamic area management to reduce butterfish-scup interactions
- Study mortality rates of *Loligo* squid that pass through trawl mesh.

Sea Turtle Bycatch in Mid-Atlantic Trawl Fisheries

- Develop turtle exclusion devices for trawl gear in the Mid-Atlantic.
- Explore opportunities to leverage work on sea turtle bycatch funded under other programs (NMFS BREP, Scallop RSA).

Mid-Atlantic Trawl Fishery – baseline economic survey of infrastructure investments

- Initiate survey to start developing industry cost estimates for fleet impacts of trawl gear modifications to address bycatch reduction.

High priority research applicable to Cooperative Research: New England

Groundfish

- Increase quantity and quality of data on discards and bycatch in the monkfish, groundfish (including small mesh) and skate fisheries. All gears.

Skates

- Identify fishing practices or gear modifications that may improve skate size and species selectivity. Reduce fishing mortality on skate stocks of concern.

Herring

- Bycatch monitoring.
- Increased sampling and stock identification research to address fishery conflicts

Sea Turtle Bycatch in Southern New England Fisheries

- Gear modifications or fishing practices that can reduce or eliminate turtle bycatch without unacceptable reductions in target catch. Leveraging opportunities exist.
- Bycatch monitoring of scallopers for turtles, yellowtail and other flounders.

Spatial-temporal Distributions

- Further investigations into stock definition, stock movements, mixing, and migration through tagging studies, DNA markers, morphological characteristics and other means for groundfish, skates, herring and silver hake (dogfish, wolfish).

Medium priority research applicable to Cooperative Research

Tilefish

- Hook selectivity study. Collect data on spatial distribution and population size structure.

Spiny Dogfish

- Conduct tagging and genetic studies of spiny dogfish in U.S. and Canadian waters to clarify current assumptions about stock structure.
- Investigate the distribution of spiny dogfish beyond the depth range of current NEFSC trawl surveys, possibly using experimental research or supplemental surveys.

Low priority research applicable to Cooperative Research

Ocean Quahog

- Conduct further work to determine the relationship between dredge efficiency, depth, substrate and clam density.

Atlantic Mackerel

- Develop pilot survey to search for old fish to test hypothesis of dome in commercial fishery selectivity.

Illex Squid

- Determine size and age-at-maturity and growth parameters for Illex squid.

Red Crab

- Examine red crab sex rations by depth and year, information on larval supply, transport, settlement and early juvenile distributions and abundance.

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