# Introducing the Science Center for Marine Fisheries (SCeMFiS)

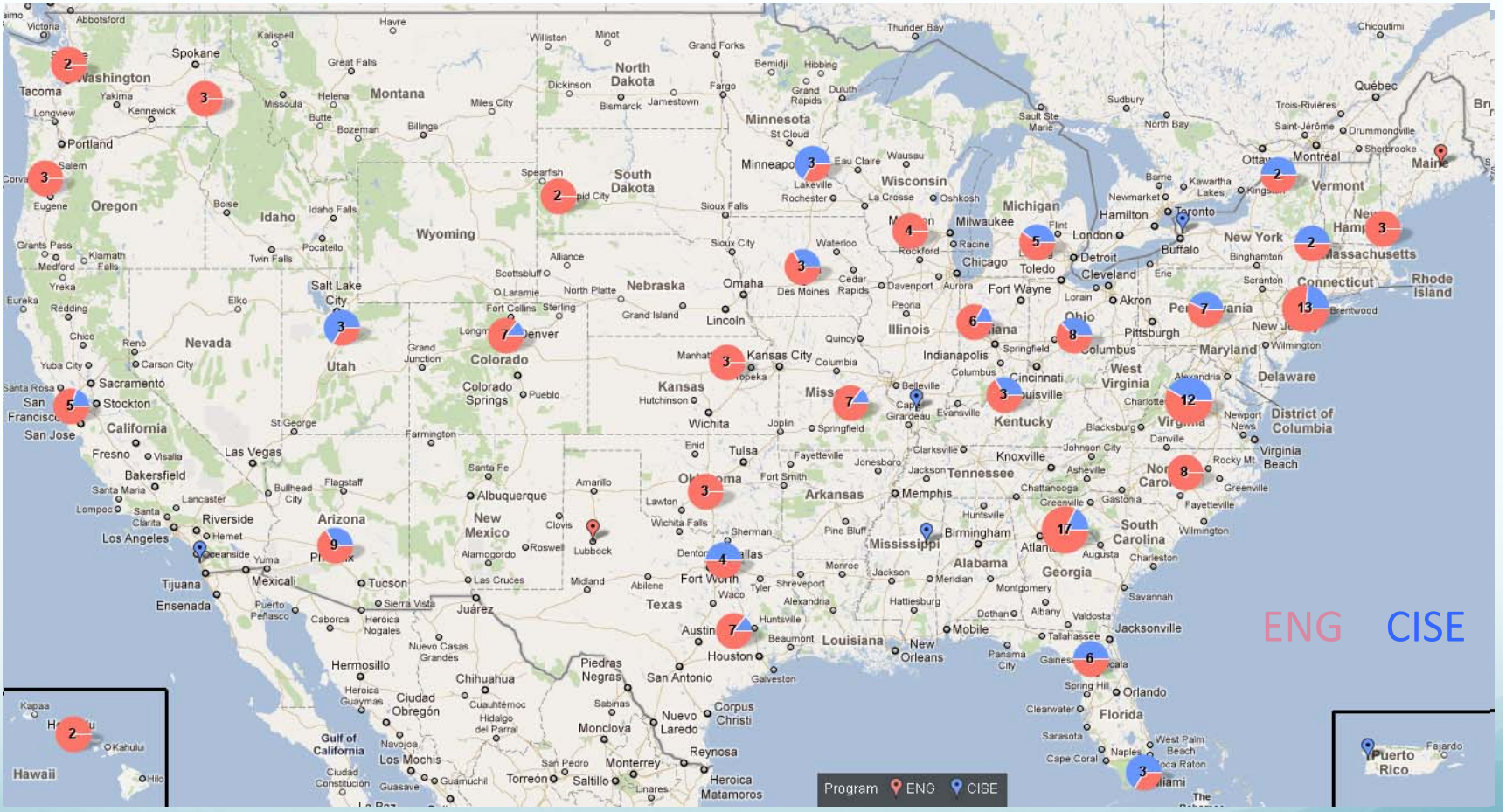
- SCeMFiS is a National Science Foundation Industry/University Cooperative Research Center (I/UCRC)
- University partners:

  University of Southern Mississippi
  Virginia Institute of Marine Science
- Center/USM Site Director: Eric Powell
- VIMS Site Director: Roger Mann
- www.scemfis.org

*Science & Industry Working Together for Sustainable Fisheries*

# Industry/University Cooperative Research Centers

## Academic-Industry partnerships meeting industry sector research needs




>62 Centers
>172 I/UCRC Sites

Plus Participating International Sites

Over 760 Member Organizations (2010)

# Why are I/UCRCs Unique?

An I/UCRC

⇨ is Industry Partner driven

⇨ operates under Industry Partner oversight

⇨ provides products directly to Industry Partners

⇨ distributes products to support Industry Partners' needs

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# What is an “Industry Partner”?

NSF considers an “Industry” Partner to be any:

- Private company
- Publicly-traded company
- Trade organization
- Non-profit group
- Government agency (federal, state, or local)

# Why are I/UCRCs Unique?

**No other program receiving federal support permits full industry ownership of the science agenda**

*And added benefits include:*

- ✓ Leveraging of federal support
- ✓Financial resources permit research too costly for one partner
- ✓Indirect cost limit is 10%!

# What is the Mission of SCeMFiS?

SCeMFiS utilizes academic and commercial and recreational fisheries resources to address urgent scientific problems limiting sustainable fisheries

SCeMFiS seeks to simultaneously achieve sustainability in both fish and shellfish stocks and fish and shellfish fisheries

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# How Does SCeMFiS Work?

SCeMFiS Industry Partners form the Industry Advisory Board (IAB)

The IAB operates as the Board of Directors for SCeMFiS

Each participating partner has voting representation on the Board in proportion to that partner's financial commitment

The IAB plans and approves the science agenda and evaluates the performance of participating researchers

Funding is provided by IAB membership fees with additional support from NSF

# Who Has Joined SCeMFiS?

**Full members**

- National Fisheries Institute - Clam Committee
- National Fisheries Institute - Scientific Monitoring Committee
- National Marine Fisheries Service - Northeast Fisheries Science Center

**Associate members**

- Atlantic Capes Fisheries, Inc.
- Garden State Seafood Association
- LaMonica Fine Foods
- Lunds Fisheries Incorporated
- Surfside Seafood Products

**Ex officio members**

- Chair, MAFMC SSC

# What is the Status of SCeMFiS?

- SCeMFiS was funded in April 2013 for a 5-Year period with the potential for an additional 10-Year renewal
- The IAB first met in June 2013
- At the June meeting, the IAB designated its Chair as Tom Alspach and its Vice-Chair as Jeff Kaelin
- The IAB met for a second time in October 2013 and adopted bylaws for its operation
- Funding of projects began in June 2013 -- the science agenda was expanded at the April 2014 IAB meeting

# How is the SCeMFiS Science Program Constructed?

SCeMFiS uses a wide range of science expertise:

- University of Southern Mississippi
- Virginia Institute of Marine Sciences
- University of Washington
- Cornell University
- Consultants from the U.S. and Canada

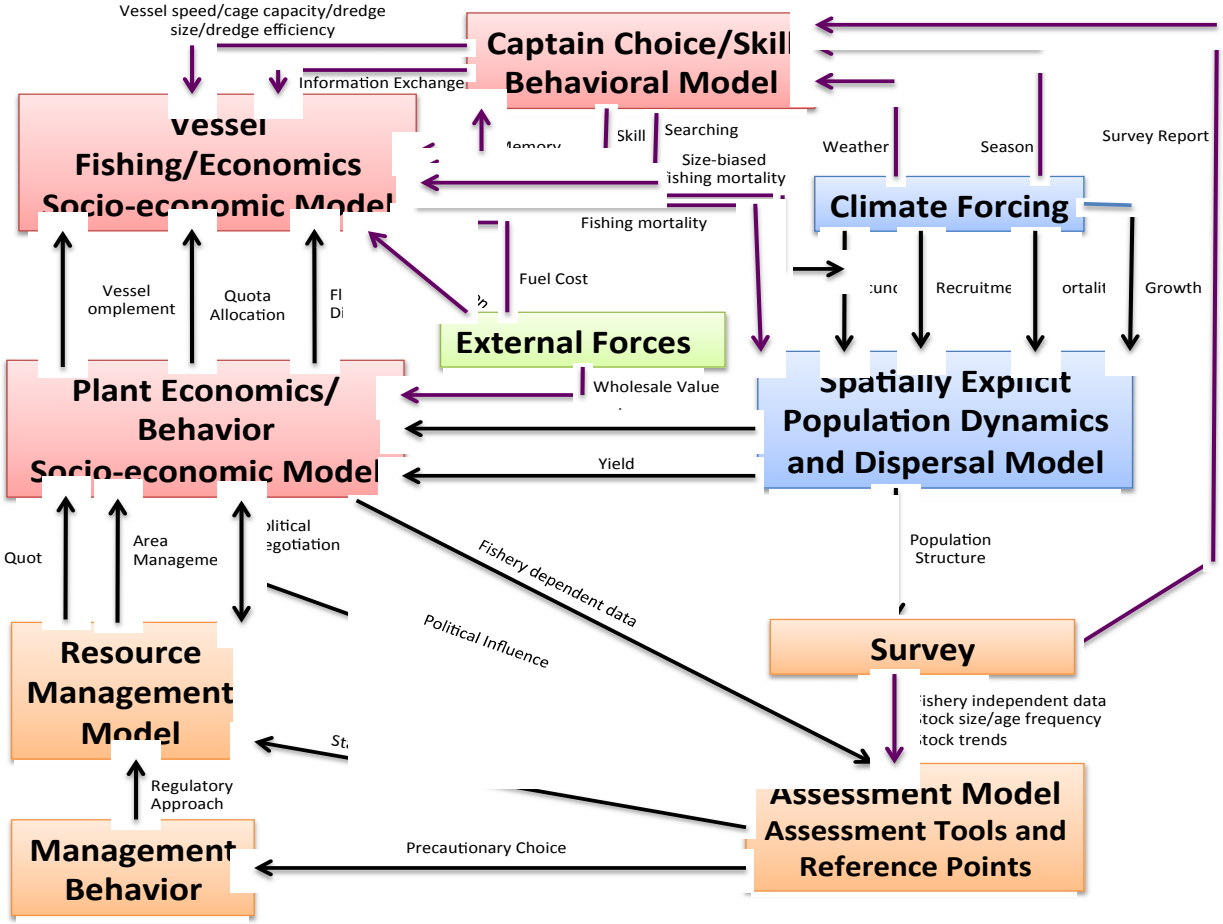
SCeMFiS funds targeted research and national teams:

- Fisheries Stock Assessment Team
- Marine Mammal Assessment Team

# The 2014 Science Agenda for SCeMFiS – Targeted Research

## Evaluation of the Influence of Surfclam Productivity Changes on the Fishery

*SCeMFiS will use a Management Strategy Evaluation model (SEFES) to examine the influence of changes in recruitment and mortality on fishery performance*

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# The 2014 Science Agenda for SCeMFiS – Targeted Research

Ocean quahogs recruitment and life history dynamics

And

Improvements in reference point formulation to reduce uncertainty in stock status

*SCeMFiS is obtaining additional age-at-length information for ocean quahogs to support the development of improved reference points for this long-lived species. SCeMFiS will use these and other data to develop Fmsy reference point options based, for the first time, on population dynamics information for this species.*

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# The 2014 Science Agenda for SCeMFiS – Targeted Research

## Juvenile Survey for Surfclams and Ocean Quahogs

*SCeMFiS will construct a new survey dredge to permit improved capture of small clams. This new dredge was tested during the August survey and performed beyond expectations*

## Breakage in Surfclams and Ocean Quahogs During Survey

*SCeMFiS will develop regression relationships permitting length to be estimated from measures of thickness taken from broken clams during survey so that the entire length frequency of the catch can be recorded*

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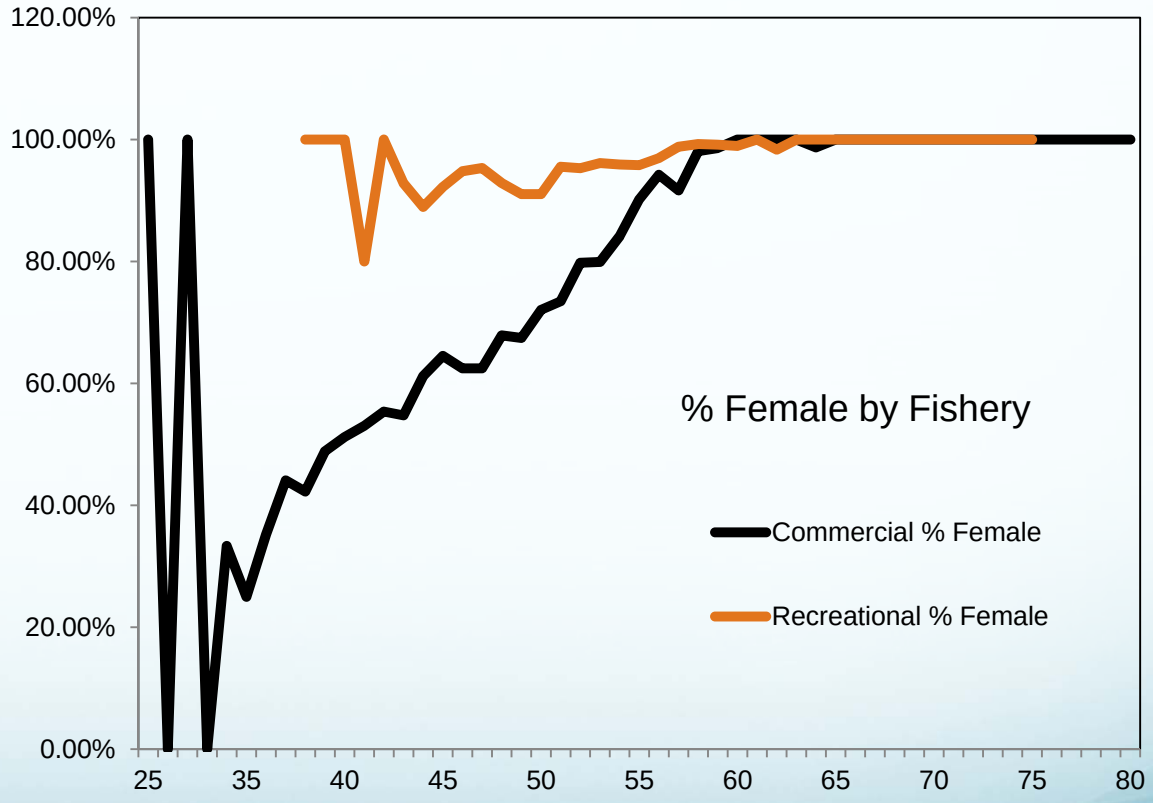
# The 2014 Science Agenda for SCeMFiS – Targeted Research

## Sex-specific population assessment modeling of summer flounder

*SCeMFiS is developing the first sex-specific fisheries model for summer flounder. This model will incorporate known variations in growth, mortality, and fishery selectivity by sex.*

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# The 2014 Science Agenda for SCeMFiS – Assessment Teams

Independent advisory team (IAT) for marine mammal assessments

Paula Moreno (GCRL), André Punt (Univ. Washington)

Randall Reeves (Okapi Wildlife Assoc.), John Brandon (Greeneridge Sciences)

*Background:*

- *Potential Biological Removal (PBR) is used to evaluate the level of bycatch posed by each fishery on marine mammal stocks*
- *PBR relies on estimating various parameters, which often are set to default values or may have considerable uncertainty*
- *All else being equal, this leads to a decrease in PBR, which may result in measures to reduce bycatch*

*IAT assembled in early 2014 to:*


- *Engage in the annual stock review process for the Atlantic region*
- *Promote robust approaches by maximizing the use of available data and reducing uncertainty*
- *Provide recommendations to SCeMFiS´s science agenda identifying research priorities*

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# The 2014 Science Agenda for SCeMFiS – Assessment Teams

## Stock assessment team

Jean Jacques Maguire, Steve Cadrin, Robert Leaf

*In 2014/2015, the SCeMFiS stock assessment team will support the benchmark assessment for scup using the latest available data, information from fishermen with practical knowledge of stock status, and information available from ongoing research programs, combined with models formulated specifically to evaluate the status of the stock and the reference point options with respect to the biological performance of the stock.*

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# Why Join SCeMFiS?

- ⇨SCeMFiS is Industry Partner driven and operates under Industry Partner oversight
- ⇨No other program receiving federal support permits full industry ownership of the science agenda
- ⇨Combining financial resources permits research too costly for one partner
- ⇨SCeMFiS accesses academic expertise throughout the U.S. and internationally
- ⇨Indirect cost limit is 10%!

*Science & Industry Working Together for Sustainable Fisheries*

# How do you join SCeMFiS?

- Tiered Industry Partner financial support
  - Full partner: $50,000 ⇒ 2 IAB votes
  - Associate partner: $25,000 ⇒ 1 IAB vote
  - Federal agencies join using an IAA
- National Science Foundation Commitment: $150,000
  - Duration of 5 years ($750,000)
  - Renewal up to 10 additional years possible
  - 2014 additional commitment of $20,000 in REU support

*Science & Industry Working Together for Sustainable Fisheries*

For more information contact
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at the
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eric.n.powell@usm.edu

Roger Mann
at the
Virginia Institute of Marine Science
rmann@vims.edu

www.scemfis.org

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Science, Service, Stewardship

# Research Set Asides (RSA)

NOAA FISHERIES SERVICE

*Ryan Silva*
*Cooperative Research Liaison*
*Sustainable Fisheries Division, Greater Atlantic Region*

NOAA FISHERIES SERVICE

# Discussion Summary

Program overview – What are they, how do they work?

Program implementation and administration

Program summaries – Scallop, Monkfish, Herring

Program focus – Mid-Atlantic RSA

NOAA FISHERIES SERVICE

# RSA Overview – RESEARCH

Supporting science and management needs for program species

Applied science

Cooperative research

- Diverse expertise
- Engagement and cooperation

A Federal grant program

NOAA FISHERIES SERVICE

# RSA Overview – HARVEST

(the 2nd part of the equation)

Funding research, compensating vessels

Dedicated compensation fishing vs joint research/harvest

Funding stability

Exemptions to facilitate compensation fishing

NOAA FISHERIES SERVICE

# RSA Overview – HARVEST

Compensation fishing oversight

- Vessel sanction checks
- Reporting requirements
- Monitoring and validation
- Enforcement

Role of the grant recipient

NOAA FISHERIES SERVICE

# Implementation… it takes a village

Fishery Management Councils: Specifications, priorities, project review

NOAA Fisheries:

- Grants
  - Solicitation, technical and management review, project selection, and oversight.
- Permitting, compensation fishing oversight
- Enforcement

State partners:

- Permitting, compensation fishing oversight
- Quota monitoring

SMAST Fishermen's Steering Committee

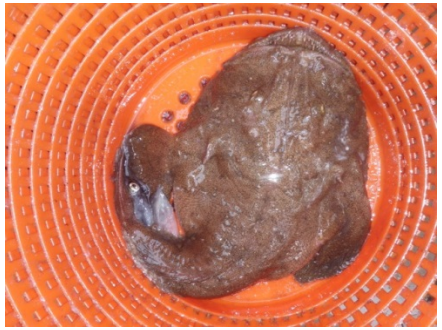
Grantee and partners: Research and compensation fishing

RESULTS (all parties)

NOAA FISHERIES SERVICE

# RSA Overview - Program differences

- Science and management needs
- Stability of the RSA value
- Effort controls
- Fishery and fleet dynamics



NOAA FISHERIES SERVICE

# Program summary - Scallop RSA

Background:

- Multiple actions, starting in 1999 with Framework 11
- Currently 1.25 million lb annual set-aside
- Approximately 15 awards per year, $15m total value, $3m research value

Current research focus: Surveys, bycatch reduction, biology, habitat

Compensation fishing: Possession limits, additional access area trips

Status: 2015/2016 solicitation closes Nov. 12

NOAA FISHERIES SERVICE

# Program summary - Monkfish RSA

Background:

- Amendment 2 (2005)
- 500 Monkfish RSA DAS
- Two projects, $3m total value, $600k research value

Current research focus: tagging, age/growth, genetics, bycatch

Compensation fishing: Possession limit exemptions, additional DAS

Status: 2 multi-year projects, through 2015

NOAA FISHERIES SERVICE

# Program summary - Herring RSA

Background:

- Amendment 1 (2007)
- Up to 3 percent from each management area
- One project, approximately $1m total value, $300k research value

Current research focus: portside sampling, river herring/shad avoidance

Compensation fishing: Federal area quota closures, seasonal closures

Status: One project funded through 2015.

NOAA FISHERIES SERVICE

# Program summary - Mid-Atlantic RSA

Background:

- Summer flounder, scup, black sea bass, squid, mackerel, butterfish, bluefish, spiny dogfish, tilefish
- Framework 1 (2001) (primarily)
- Up to 3 percent of allowable landings
- 2-3 projects per year
- Approximately $1.5m research

Current research focus: Surveys.

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# Mid-Atlantic RSA – Compensation fishing

Exemptions: Federal quota closures and possession limits, state exemptions

Species value, RSA usage

Vessel participation:

- Federal and state-only permitted vessels
- Commercial and charter/party vessels
- Geographic distribution

NOAA FISHERIES SERVICE

# Mid-Atlantic RSA - challenges

Compliance and enforcement

Quota monitoring:

- State quotas

Research products

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# Mid-Atlantic RSA - Status

Program review and program adjustments

Council/commission vote to suspend

Council review going forward

NOAA FISHERIES SERVICE

# Concluding remarks

Supporting science and management

Supporting cooperative research

The need for effective oversight

NOAA FISHERIES SERVICE

# Questions?

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(978) 281-9326

cheryl.corbett@noaa.gov
(508) 495-2070

Photo credits

- Coonamaessett Farm Foundation
- Cornell Cooperative Extension
- University of Massachusetts, Dartmouth (SMAST)
- University of Rhode Island
- Virginia Institute of Marine Science

# NEAMAP Mid-Atlantic/Southern New England Nearshore Trawl Survey

***Tales from a Non-Traditional Funding Mechanism***
***** Mid-Atlantic Multispecies RSA *****

**Jim Gartland / VIMS**
**October 2014**

# NEAMAP M-A/SNE Trawl Survey

***RSA Funding History***

- **50% of funding in 2008 (50% ASMFC & NEFSC CRP)**
- **100% of funding in 2009 & 2010**
- **80% of funding in 2011 & 2012 (20% CFRF)**
- **100% of funding in 2013 & 2014**

# NEAMAP M-A/SNE Trawl Survey

## ***RSA Funding Mechanism/Timing***

- **Spring 2013 – Submit proposal w 2014 allocation requests & "price guesses"**
- **Fall 2013 – Award decisions announced**
- **Dec 2013 – Quota requests negotiated w NERO/NEFSC**
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## *2014 RSA Allocation*

| SPECIES | ALLOCATION (LBS) |
|---|---|
| Black Sea Bass | 51,686 |
| Bluefish | 99,800 |
| Butterfish | 99,000 |
| Longfin Squid | 1,400,000 |
| Scup | 690,000 |
| Spiny Dogfish | 250,000 |
| Summer Flounder | 487,825 |
| **Total** | **3,078,311** |

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# Mid-Atlantic Multispecies RSA Program

## ***Positives / Advantages***

- **Supports research that otherwise would not occur due to a lack of available funds**
- **Connects scientific and fishing (comm. & for-hire rec.) communities**
- **Insulated from fluctuations in the Federal budget**
- **Generated expected funds 85% of the time (although nerve-wracking, it works)**

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## ***Negatives / Disadvantages***

- **Timing of grants cycle leaves ~1yr between allocation request / price guess to price realization at auction**
- **Timing of specification setting has resulted in some missed harvest opportunities**
- **Payments typically arrive in last quarter – Institute fronts >70% of the cost of operations**
- **Sometimes the money doesn't come (2009)**
- **Original program intent & large-project funding somewhat at odds**

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# Mid-Atlantic Multispecies RSA Program

***Misconception #1***

## Mid-Atlantic RSA Quota MUST Be Auctioned

FALSE!

# Mid-Atlantic Multispecies RSA Program

***Misconception #2***

## The Auction Process Inhibits Cooperative / Collaborative Research

FALSE!

# Mid-Atlantic Multispecies FSA Program

***Misconception #3***

## Some Individuals Who Have Successfully Bid on Quota at Auction Have Cheated by Underreporting Landings

TRUE!

# Mid-Atlantic Multispecies RSA Program

***Misconception #3***

**Some Individuals Who Have Successfully Bid on Quota at Auction Have Cheated by Underreporting Landings, So Elimination of the Program Will Eliminate Cheating**

FALSE!

# Allegations of Summer Flounder Underreporting Pre-Dates RSA Program

## *From 2001 Roundtable on Summer Flounder Management*

TOP FLOUNDER FISHERY MANAGEMENT CHALLENGES:
SURVEY RESULTS FROM APPROXIMATELY *HALF* OF PARTICIPANTS

As you know, we undertook a brief, informal e-mail survey to elicit participants' views on the five most pressing challenges facing the summer flounder fishery. We received 21 responses, thus heard from about half of the participants.

Most of the issues nominated fell into five main categories. The main areas of concern identified by respondents are:

- Goals
- Targets, data, science
- Allocation
- Management, compliance
- Governance

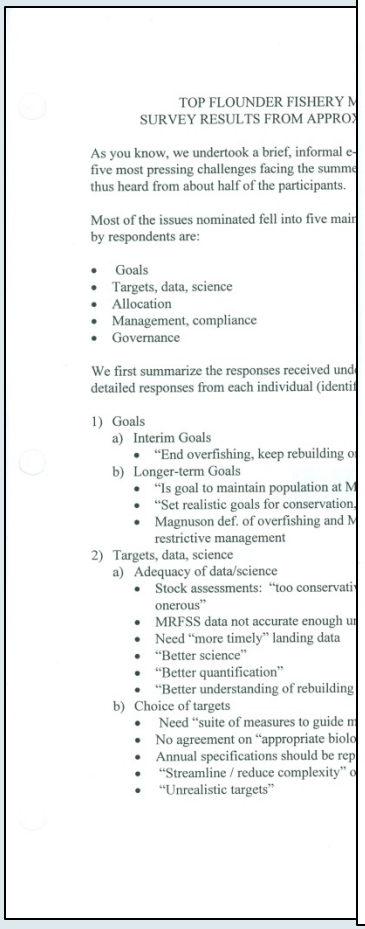
We first summarize the responses received under each category, and follow with a listing of the detailed responses from each individual (identified only by sector).

1) Goals
   a) Interim Goals
      - "End overfishing, keep rebuilding on track"
   b) Longer-term Goals
      - "Is goal to maintain population at MSY, greatest economic benefit, public access?"
      - "Set realistic goals for conservation, equity, allocation"
      - Magnuson def. of overfishing and MSY lead to public misunderstanding, overly restrictive management
2) Targets, data, science
   a) Adequacy of data/science
      - Stock assessments: "too conservative", "not timely", "imprecise", "impossibly onerous"
      - MRFSS data not accurate enough unless better funded
      - Need "more timely" landing data
      - "Better science"
      - "Better quantification"
      - "Better understanding of rebuilding target"
   b) Choice of targets
      - Need "suite of measures to guide management", not just TAC
      - No agreement on "appropriate biological targets"
      - Annual specifications should be replaced with multi-year targets
      - "Streamline / reduce complexity" of regulatory measures
      - "Unrealistic targets"

3) Allocation
   a) Allocation among states and regions
      - "inequitable and unfair"
      - commercial state-by state quota leads to "reduced efficiency, increased discards"
   b) Allocation between recreational/commercial
      - "determined from a time when recreational fisheries were depressed"
      - "split in late '60s was 85/15"
4) Management, compliance
   - Recreational overages "out of control", "jeopardizes management process"
   - Recreational conservation equivalency "defacto reallocation"
   - Improve "timeliness" of regulations
   - Manager's have not accepted recommendations of monitoring committee
   - Need ways to "improve estimates of regulatory discards and eliminate discards"
   - "Assess and reduce bycatch"
   - "Black market landings and sales"
5) Governance
   - "Management relegated to courts"
   - "Unequal state representation" in management process
   - Need "cooperative process to ensure that state limits complement, rather than undermine, federal"
   - "Conflicts between Atlantic Coastal Act and Magnuson Stevens"
   - "Consistency and coordination among NMFS, ASFMC, and MAFMC"
   - "Can we learn from our mistakes" and turn summer flounder into a model for others?

# Allega… Underrep…er …gram

***From 2001 Roundt…***



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# Mid-Atlantic Multispecies RSA Program

## *A Possible Way Forward*

- **Convene a group of M-A Council members, industry representatives, and enforcement officers – review enforcement & identify steps to inhibit cheating**
- **Build fee into permitting application process (EFP?) to fund enforcement**
- **Reinstate RSA Program for 2016 fishing year**
- **Others?**

# Northeast Fisheries Climate Vulnerability Assessment (NEVA): First Implementation of a National Methodology

Jon Hare, Wendy Morrison, Mark Nelson, Megan Stachura, Eric Teeters, Roger Griffis, Mike Alexander, Jamie Scott, Keirsten Curti, John Kocik, Larry Alade, Toni Chute, Lisa Milke, Sean Lucey, Tobey Curtis, Dan Kircheis, Cami McCandless, Eric Robillard, Dave Richardson, Rich Bell, Harvey Walsh, Conor McManus, and Katey Marancik

# Outline

1. Project goals, needs, and objectives
2. Vulnerability assessment methodology
3. Results
4. Next Steps

http://www.gmri.org/mini/index.asp?ID=59&p=177

# Need

*Climate Change* is a long-term change in part of the land-atmosphere-ocean system

*Already observing impacts* of climate change on variety fish stocks.

*Expected Changes:*

- Changes in stock *productivity* (Bell et al. 2014, NEFSC)
- Changes in *distribution* (Nye et al. 2009, Pinsky et al. 2013 )
- Changes in species *interactions* (Richardson et al. 2014)

# Need– What About a Quantitative Approach?

In NE, quantitative models have been completed for 5 species

(Atlantic cod, Atlantic croaker, Cusk, Atlantic salmon, River herring)

Math:

- 1-2 years per species
- 50+ species (NE only)
- = 50-100 years


http://3.bp.blogspot.com/_TNHOnYQjgYY/Sj5OKI52BkI/AAAAAAAAAEI/YUnjWm1hgAk/s1600-h/fish2.jpg

# Project Goal, and Objectives

Goal: To assess the vulnerability of commercially and recreationally exploited fish and shellfish species in the Northeast U.S. Continental Shelf Ecosystem (including NEFMC & MAFMC managed species)

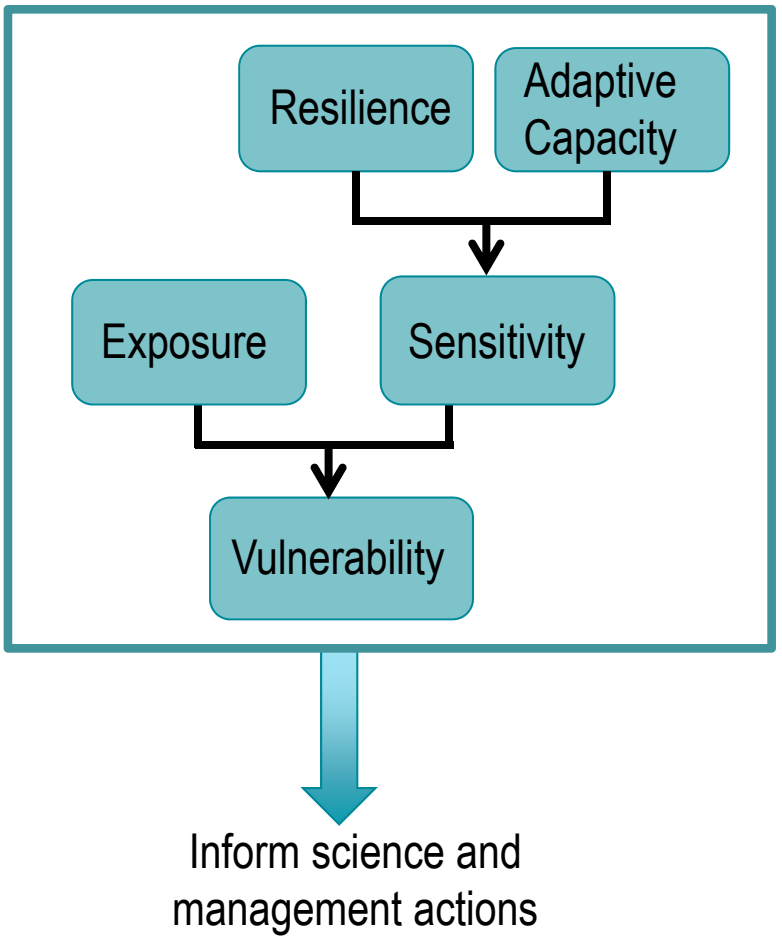
Objectives:

1. Develop relative vulnerability rank across species
2. Determine attributes/factors driving vulnerability rank
3. Identify data quality and data gaps

79 Species included
(most exploited fish and shellfish species in the region)

# Vulnerability Assessment Framework

- Used widely in terrestrial systems, with only a few examples from marine systems
- Uses currently existing knowledge and expert opinion
- Uses quantitative data when available, and qualitative information when data is lacking



# What do we mean by vulnerability?

- Vulnerability = risk of *changes in stock abundance or productivity in a changing climate*.
- Stocks with ability to shift distributions in a changing climate may receive a "low vulnerability" ranking.
- Subset of the attributes may be useful in identifying stocks that possess the *ability to shift distributions*.

# Vulnerability Assessment Methodology


## Exposure

- Sea surface temperature*
- Air temperature*
- Salinity*
- Ocean acidification (pH)*
- Precipitation*
- Currents**
- Sea level rise**

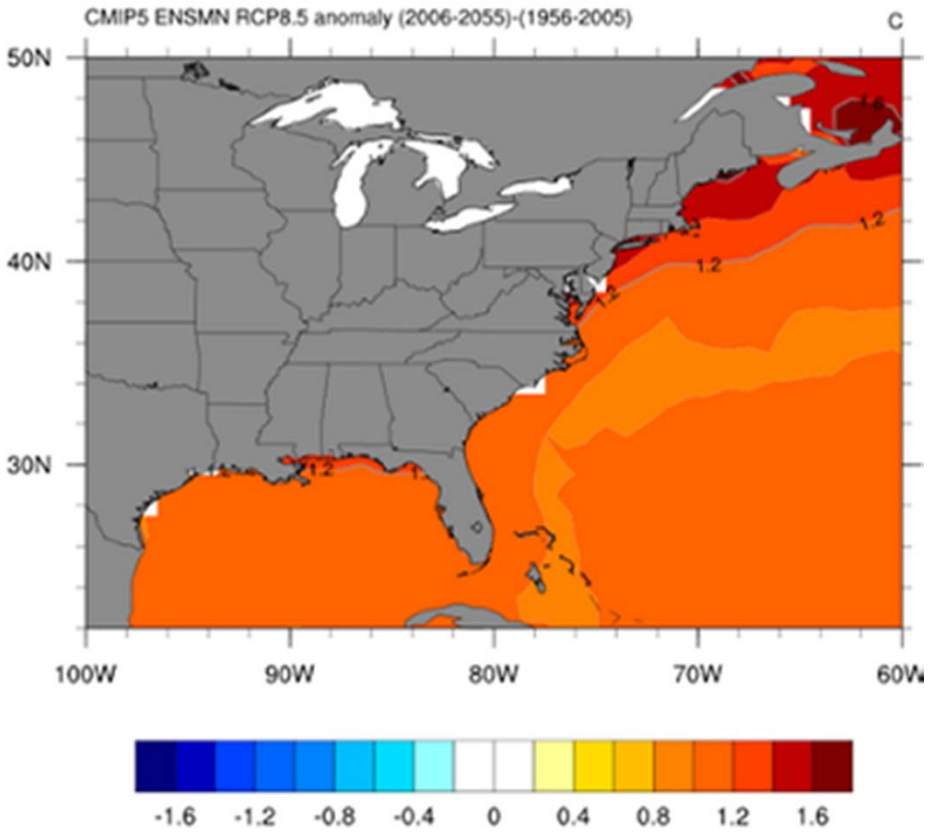
**modelled results (mean & variance)*
***written description only*

## Sensitivity

- Habitat Specificity
- Prey Specificity
- Sensitivity to Ocean Acidification
- Sensitivity to Temperature
- Stock Size/Status
- Other Stressors
- Adult Mobility
- Spawning Cycle
- Complexity in Reproductive Strategy
- Early Life History Survival and Settlement Requirements
- Population Growth Rate
- Dispersal of Early Life Stages

# Vulnerability Assessment Methodology

## Climate Exposure




- Projected magnitude of change
- Overlap of current species distribution and expected climate change
- Comparing 2006-2055 to 1956-2005
- Used RCP8.5 (representative concentration pathways)

http://www.esrl.noaa.gov/psd/ipcc/ocn/

# 5 Point Tally Scoring System

- The scoring for each attribute is done by the experts assigning 5 tallies within the 4 scoring bins
- This gives experts the ability to express uncertainty in their score

Example:

| Expert Scores - Low uncertainty scenario | | | |
|---|---|---|---|
| Low | Moderate | High | Very High |
| | 5 | | |

| Expert Scores - Moderate uncertainty | | | |
|---|---|---|---|
| Low | Moderate | High | Very High |
| | | 3 | 2 |

| Expert Scores - Higher uncertainty scenario | | | |
|---|---|---|---|
| Low | Moderate | High | Very High |
| 1 | 1 | 2 | 1 |

# Data Quality Score

- Data quality is different than uncertainty; however, they can be related
- This score will be used to identify data gaps

| Data Quality Score | Description |
|---|---|
| 3 | Adequate Data |
| 2 | Limited Data. |
| 1 | Expert Judgment. |
| 0 | No Data. |

# Vulnerability Assessment Methodology

## Sensitivity Attributes

- 14 experts
- ~ 29 species each (assigned their "expertise" plus random subset of other species)
- Each species was scored by 5 different people
- Scores were completed individually and then discussed at workshop

| Name | Expertise | Location |
|---|---|---|
| Kiersten Curti | Pelagics | Pop Dy, Woods Hole |
| David Richardson | Pelagics | Oceanogr, Narragansett |
| John Kocik | Diadromus | Pop Bio, Narrangansett |
| Dan Kircheis | Diadromus | NERO, Orono |
| Cami McCandless | Elasmobranchs | Pop Bio, Narrangansett |
| Tobey Curtis | Elasmobranchs | SF, NERO |
| Lisa Milke | Shellfish | AQ & OA, Milford |
| Toni Chute | Shellfish | Pop Dy, Woods Hole |
| Jon Hare | Coastal | Oceanogr, Narragansett |
| Harvey Walsh | Coastal | Oceanogr, Narragansett |
| Rich Bell | Groundfish | Oceanogr, Narragansett |
| Eric Robillard | Groundfish | Pop Bio, Woods Hole |
| Sean Lucey | Groundfish | Ecosystem, Woods Hole |
| Larry Alade | Groundfish | Pop Dy, Woods Hole |

# Sensitivity and Exposure Scoring Rubric

| | Scoring Bin | | | |
|---|---|---|---|---|
| | Low | Moderate | High | Very High |
| | 1 | 2 | 3 | 4 |
| Habitat Specificity | 1 | 6 | 13 | 5 |

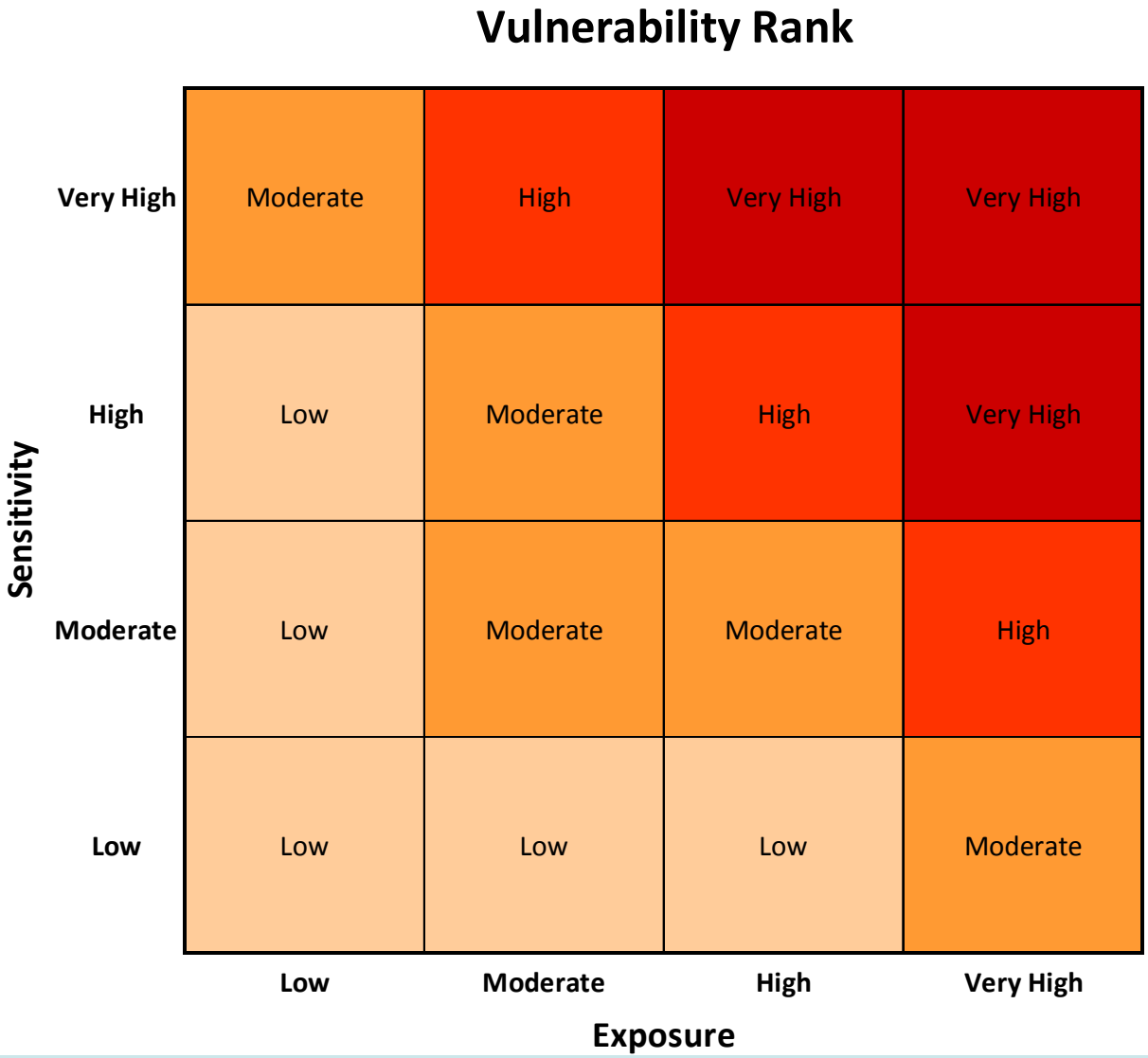
## Attribute Score

- Weighted average of “tallies” across experts

Attribute Score = ((1*1)+(2*6)+(3*13)+(4*5))/25 = 2.88

## Sensitivity/Exposure Component Score = Logic Model

# Vulnerability Scoring Rubric




NOAA FISHERIES

# Vulnerability Narratives

Winter Skate

Climate Exposure: The exposure of Winter Skate to climate change is High. Two exposure factors were important: ocean surface temperature and pH.

Biological Sensitivity: The biological sensitivity of Winter Skate is scored Low. Population growth rate was the only attribute that scored high (3.4). Elasmobranch in general have long generation times and slow population growth rates (Hoenig and Gruber 1990).

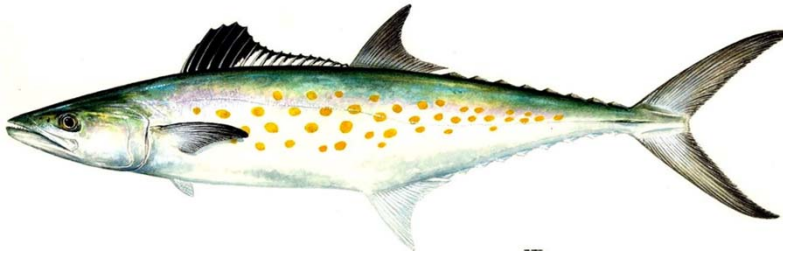
Data Quality: Two sensitivity attributes were scored with a data quality less than 2. There are questions regarding Adult Mobility. There is no empirical data regarding the scale of movements, but skates in general are thought to make seasonal scale movements on the scale of 100 km's. There is also uncertainty in Other Stressors with little information on contaminants and disease. There is some evidence indicating that predation by seals may have increased in recent years (Benoît et al. 2011).

Climate Effects on Abundance and Distribution: Winter Skate is one of the few species on the Northeast U.S. Shelf where range has extended equator wards (Nye et al. 2009). Frisk et al. (2008) hypothesized that connections between the Northeast U.S. Shelf and the Scotian Shelf are an important component of population dynamics. Understanding the effect of climate and fishing on the distribution and abundance of winter skate is necessary.

Important Issues: Relative little is known of the impact of environmental conditions on skate dynamics.

# Results

## Spanish Mackerel



Bootstrap Expert scores:

| | |
|---|---|
| 0 | Very High |
| 3 | High |
| 97 | Moderate |
| 0 | Low |

Spanish mackerel - *Scomberomorus maculatus*
Overall vulnerability rank = Moderate
Sensitivity = Low
Exposure = Very High
Data Quality = 0.79

| *Scomberomorus maculatus* | Expert Scores | Data Quality | Expert Scores Plots (Portion by Category) |
|---|---|---|---|
| Stock Status | 1.9 | 2.2 | |
| Other Stressors | 2.1 | 1.8 | |
| Population Growth Rate | 1.7 | 2.6 | |
| Spawning Cycle | 2.4 | 2.8 | |
| Complexity in Reproduction | 2.1 | 2.6 | |
| Early Life History Requirements | 2.3 | 1.2 | |
| Sensitivity to Ocean Acidification | 1.1 | 2.2 | |
| Prey Specialization | 1.3 | 2.8 | |
| Habitat Specialization | 1.6 | 3.0 | |
| Sensitivity to Temperature | 1.3 | 3.0 | |
| Adult Mobility | 1.3 | 2.4 | |
| Dispersal & Early Life History | 2.0 | 2.6 | |
| Sensitivity Score | Low | | |
| Sea Surface Temperature | 4.0 | 3.0 | |
| Variability in Sea Surface Temperature | 1.0 | 3.0 | |
| Salinity | 3.1 | 3.0 | |
| Variability Salinity | 1.2 | 3.0 | |
| Air Temperature | 4.0 | 3.0 | |
| Variability Air Temperature | 1.0 | 3.0 | |
| Precipitation | 1.2 | 3.0 | |
| Variability in Precipitation | 1.3 | 3.0 | |
| Ocean Acidification | 4.0 | 2.0 | |
| Variability in OA | 1.0 | 2.2 | |
| Currents | 2.0 | 1.0 | |
| Sea Level Rise | 1.2 | 1.5 | |
| Exposure Score | Very High | | |
| Overall Vulnerability Rank | Moderate | | |

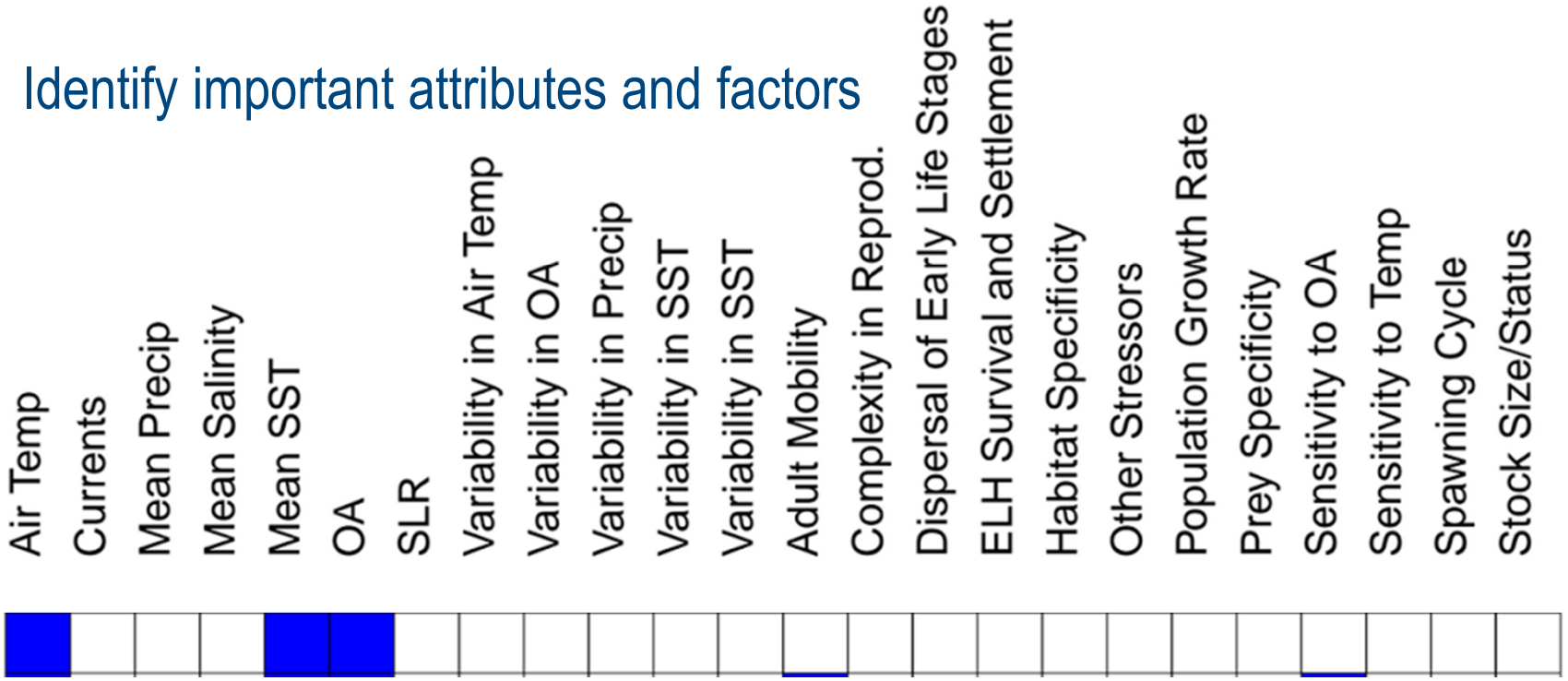
Low
Moderate
High
Very High

# Results

## Spanish Mackerel

## Sensitivity Analysis

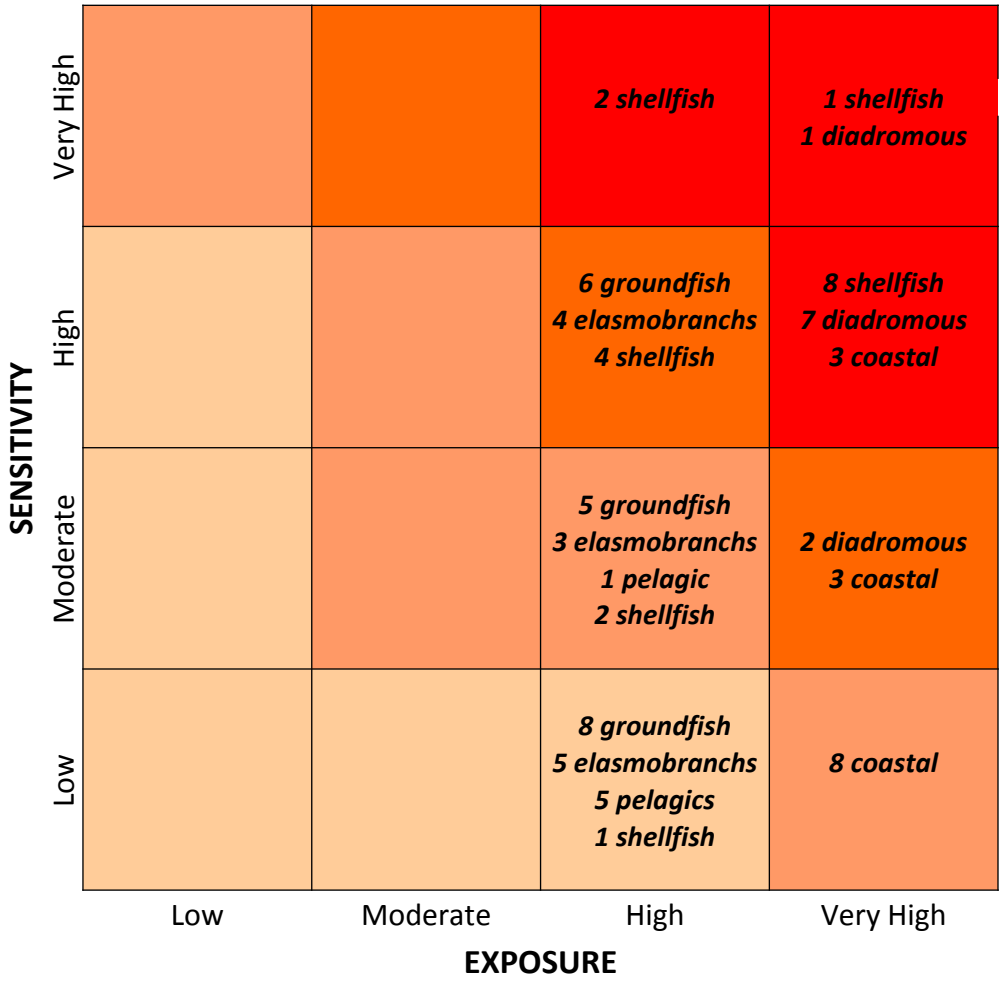
### Identify important attributes and factors



# Results

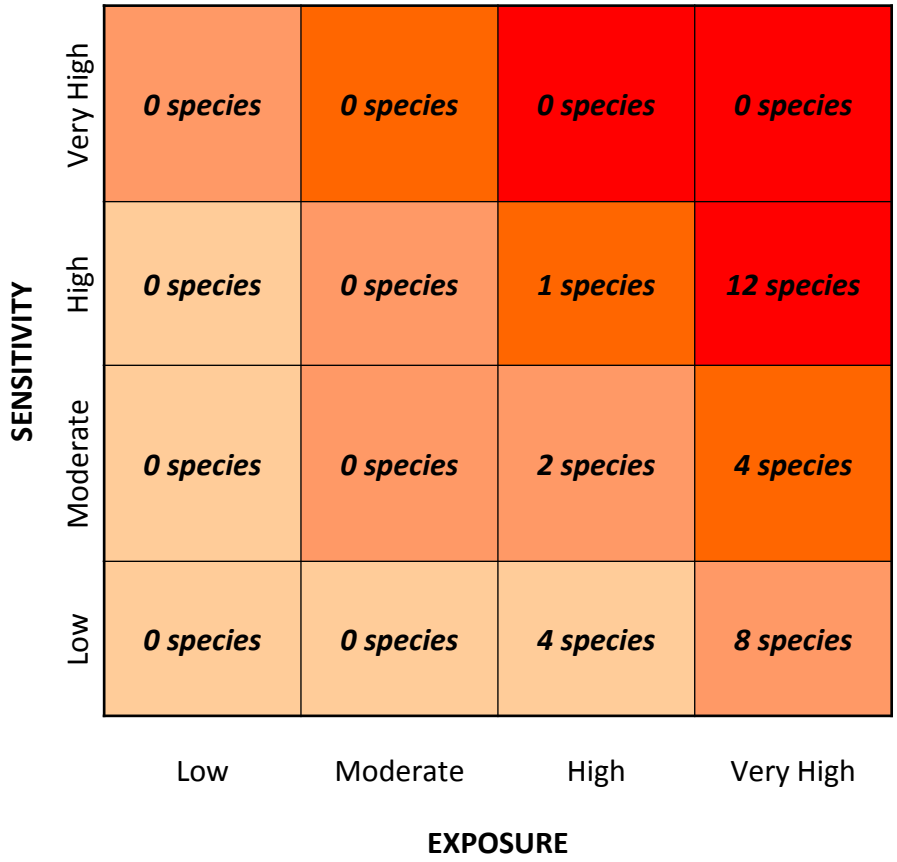
## Overall

- Exposure to climate change in NEUS is high to very high
- Sensitivity higher for diadromous and shellfish; lower for groundfish and pelagics



# Results

## ASMFC Managed Species

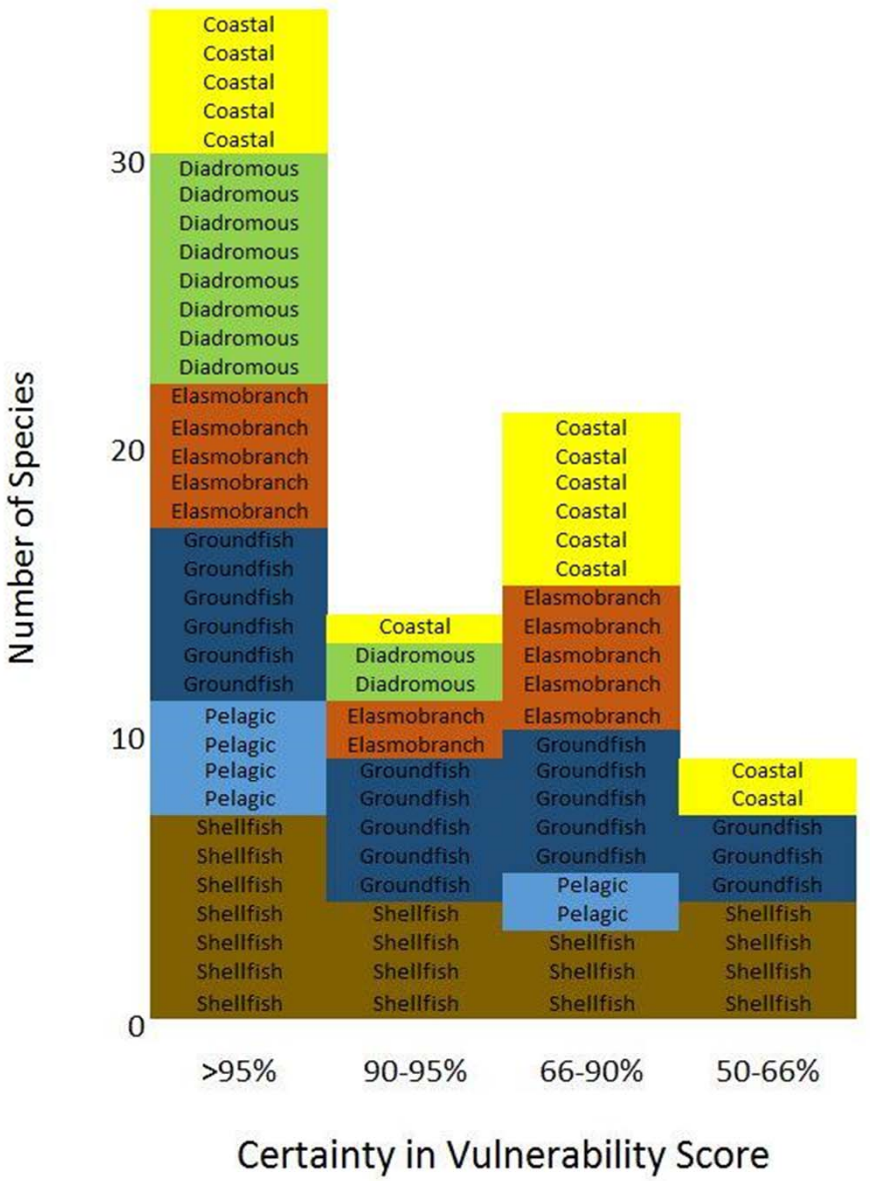



| | |
|---|---|
| Coastal | Atlantic croaker |
| Coastal | Atlantic menhaden |
| Coastal | Red drum |
| Coastal | Spanish mackerel |
| Coastal | Spot |
| Coastal | Spotted seatrout |
| Coastal | Striped bass |
| Coastal | Tautog |
| Coastal | Weakfish |
| Coastal | Black sea bass |
| Coastal | Scup |
| Coastal | Summer flounder |
| Coastal | Winter flounder |
| Coastal | Northern kingfish |
| Diadromous | Atlantic sturgeon |
| Diadromous | Shortnose sturgeon |
| Diadromous | Alewife |
| Diadromous | American shad |
| Diadromous | Blueback herring |
| Diadromous | Hickory shad |
| Diadromous | American eel |
| Shellfish | American lobster |
| Shellfish | Horseshoe crab |
| Shellfish | Northern shrimp |
| Shellfish | Cancer crabs |
| Shellfish | Channeled whelk |
| Shellfish | Knobbed whelk |
| Elasmobranch | Spiny dogfish |
| Elasmobranch | Smooth dogfish |
| Pelagic | Bluefish |
| Pelagic | Atlantic herring |

# Results

## Overall

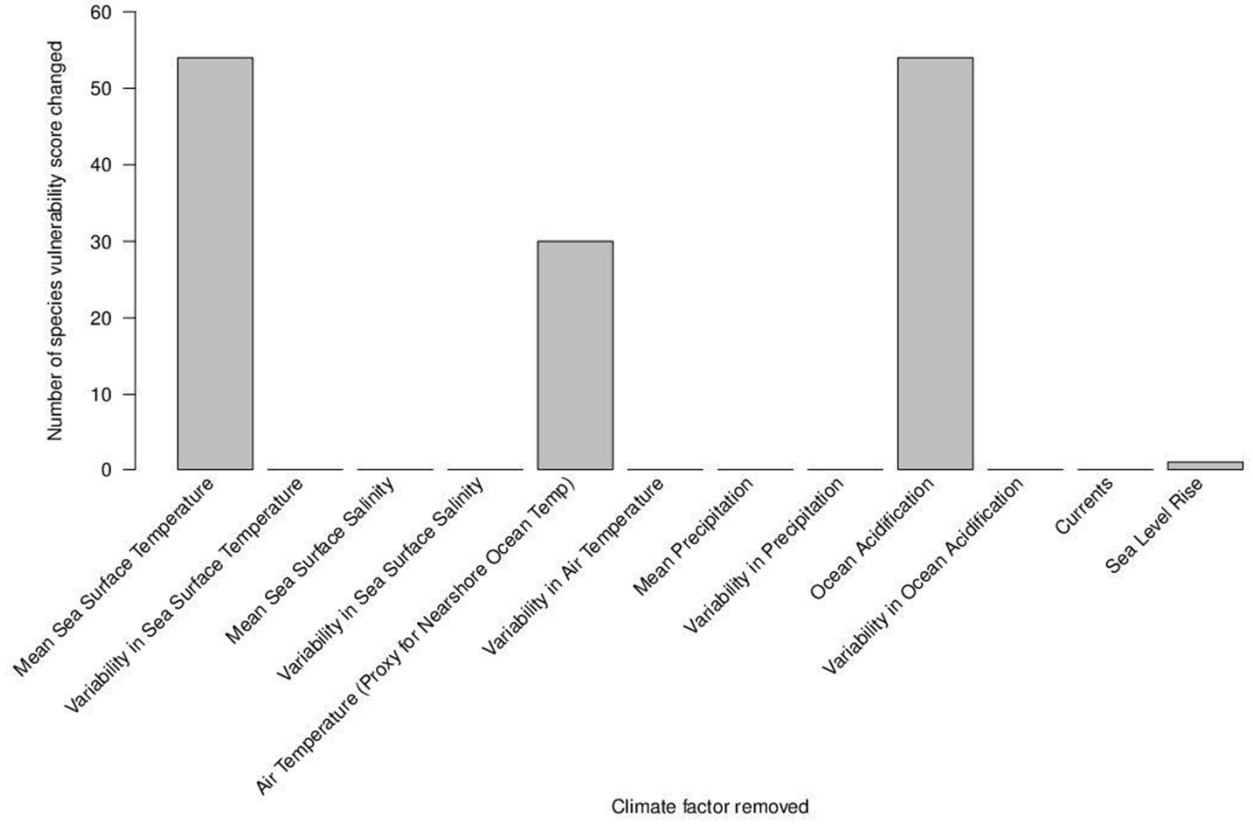
- ~60% species with very high and high certainty
- No obvious group bias



# Results

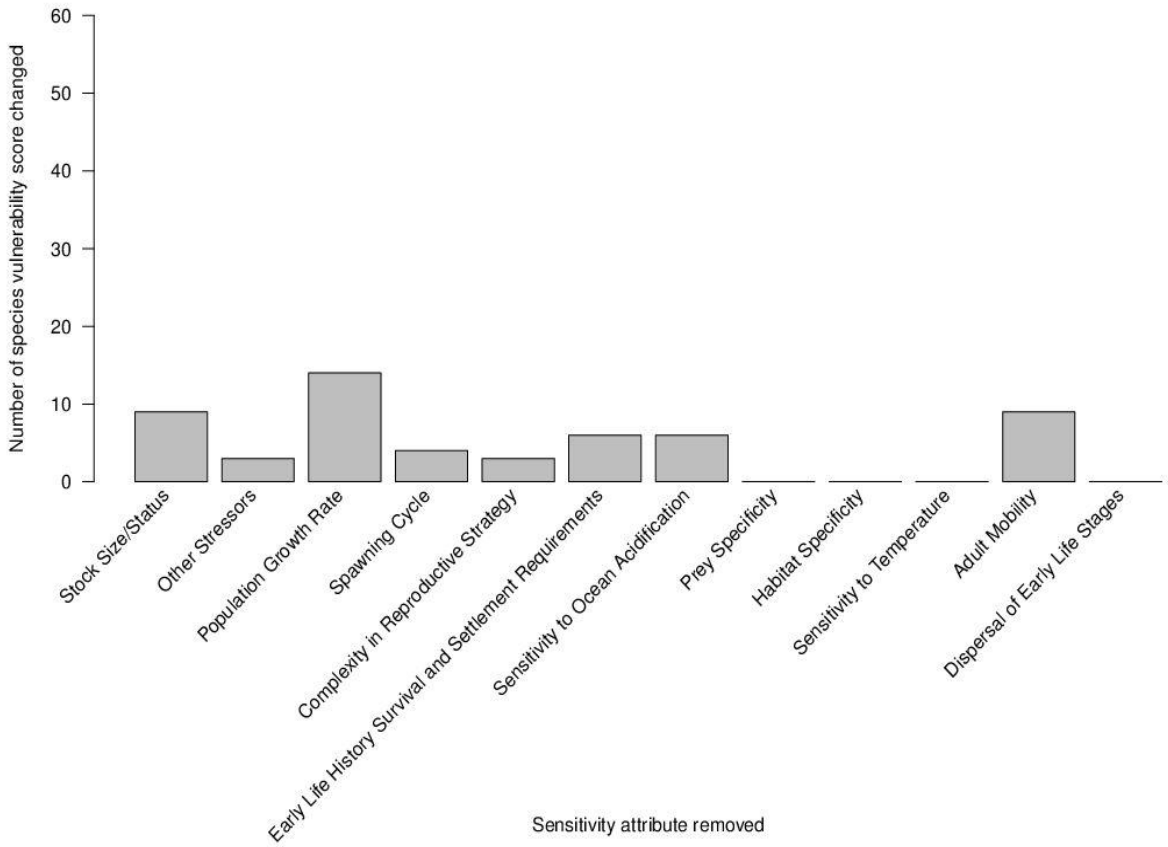
## Overall

- Exposure to temperature and OA most important



# Results

## Overall



# Next Steps

- Publish results in peer-review journal
- Conduct CIE review of methodology and NE implementation
- Present results to science and management institutions in NE

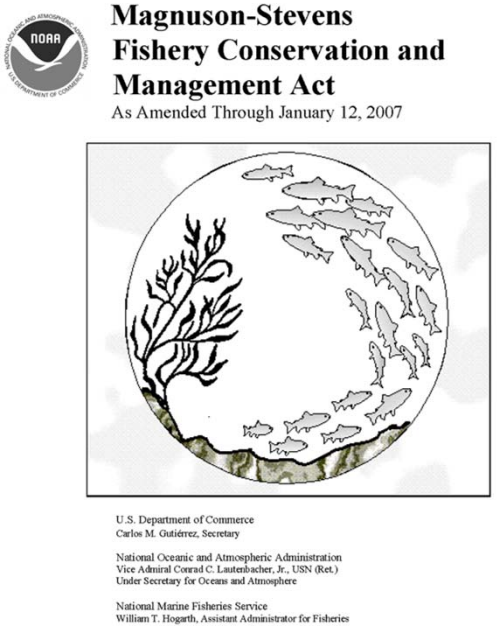
# Next Steps

*Science:*

- Identify important unknowns in terms of species biology and ecology
- Identify important climate drivers to link with assessments

*Management:*

- Decisions regarding catch levels and rebuilding plans
- Information for EIS's, BiOps and others
- Identify potential management actions to reduce climate vulnerability



# Questions?

*Photo by: Chris Melrose (NEFSC)*

Sensitivity and Exposure Scoring Rubric

| | Scoring Bin | | | |
|---|---|---|---|---|
| | Low | Moderate | High | Very High |
| | 1 | 2 | 3 | 4 |
| **Habitat Specificity** | 1 | 6 | 13 | 5 |

Attribute Score

- Weighted average of "tallies" across experts

Attribute Score = ((1*1)+(2*6)+(3*13)+(4*5))/25 = **2.88**

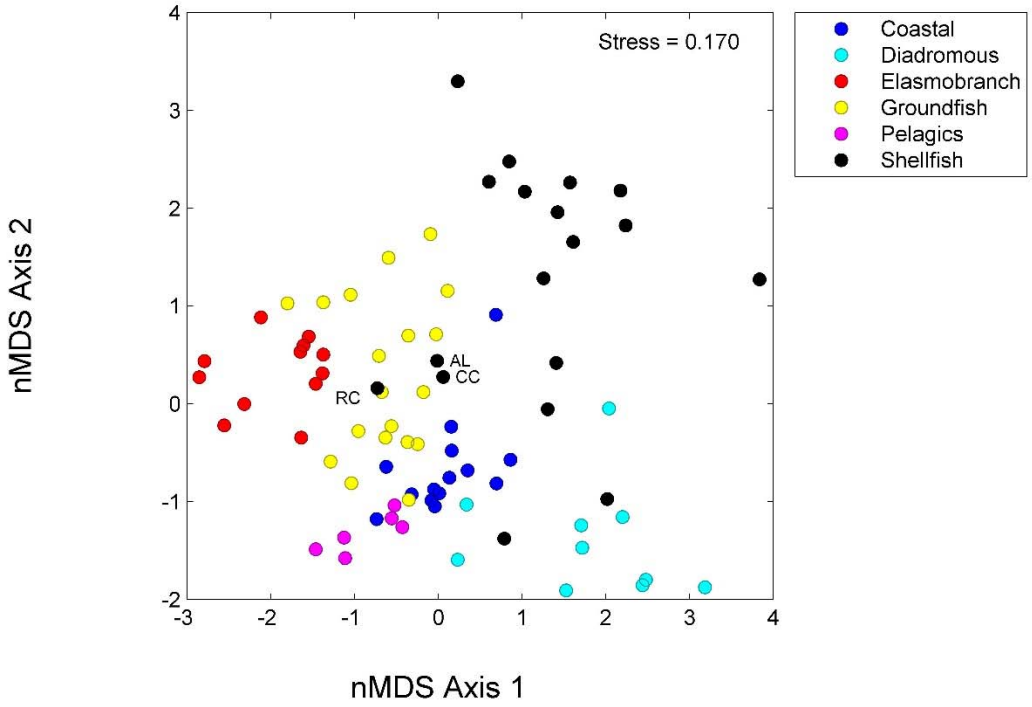
Sensitivity/Exposure Component Score = Logic Model

- **Very high** = 3 or more attribute scores ≥ 3.5
- **High** = 2 or more attribute scores ≥ 3.0
- **Moderate** = 2 or more attribute scores ≥ 2.5
- **Low** = less than 2 attributes scores ≥ 2.5

# Sensitivity and Exposure Scoring Rubric

## Sensitivity/Exposure Component Score = Logic Model

- Very high = 3 or more attribute scores ≥ 3.5
- High = 2 or more attribute scores ≥ 3.0
- Moderate = 2 or more attribute scores ≥ 2.5
- Low = less than 2 attributes scores ≥ 2.5


Stress = 0.170
Coastal
Diadromous
Elasmobranch
Groundfish
Pelagics
Shellfish
AL
CC
RC
nMDS Axis 1
nMDS Axis 2
4
3
2
1
0
-1
-2
-3
-2
-1
0
1
2
3
4

# *FY2013 FUNDED PROJECTS: Status Updates*

**Atlantic States Marine Fisheries Commission and the Mid-Atlantic Fishery Management Council**

# "Observer Program for Mid-Atlantic (New York, New Jersey, Maryland, Virginia) and Rhode Island Small Mesh Otter Trawls "

**PRESENTED BY: Shanna Madsen**
***smadsen@asmfc.org***

*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*

# Project Status

- Goal to increase observer coverage of small mesh bottom trawl fishery with a mesh size of <5.5” on otter trawl vessels in state and federal waters off RI, NY, NJ, MD and VA
- Document discards and collect biosamples of river herring, scup, weakfish, croaker, bluefish, black sea bass, fluke, spiny dogfish
- Collect catch and effort
- Buy sea days from NFMS Northeast Fishery Observer Program (NEFOP)
- Single or multi-day trips, broken down by month, over the 12 month period (August 17, 2013 through August 16, 2014)
- Data uploaded into NEFOP master database

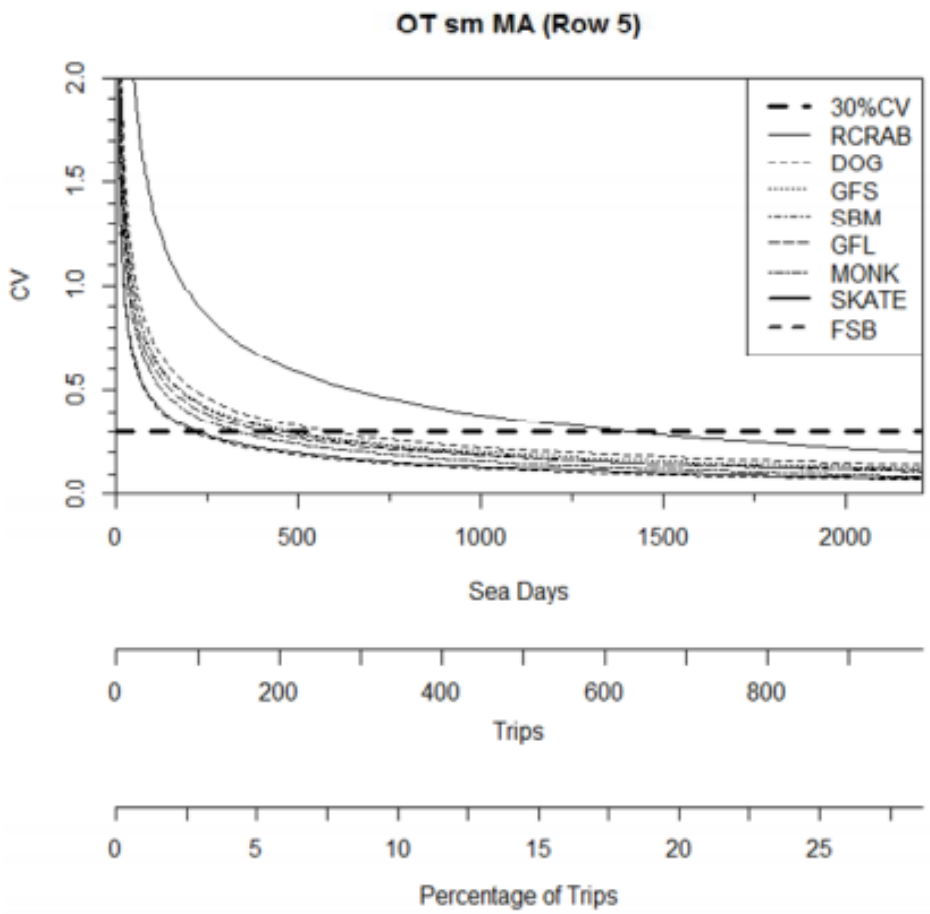
*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*

# Seaday Schedule 2013-2014

| | RI | | | | NJ | | | | NY | | | | MD | | | | VA | | | | Proposed Days | Actual Days |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Trips | | Days | | Trips | | Days | | Trips | | Days | | Trips | | Days | | Trips | | Days | | | |
| **JAN** | 6 | 2 | 12 | 2 | 14 | 6 | 35 | 16 | 2 | | 4 | | 2 | | 2 | | | | | | 53 | 18 |
| **FEB** | 6 | 5 | 12 | 5 | 14 | 4 | 35 | 7 | | | | | 2 | | 2 | | 1 | 2 | 7 | 9 | 56 | 21 |
| **MAR** | 6 | 2 | 12 | 2 | 14 | 3 | 35 | 6 | 2 | 1 | 4 | 6 | 2 | | 2 | | 1 | 2 | 7 | 11 | 60 | 25 |
| **APR** | 2 | | 4 | | 2 | 7 | 5 | 10 | 2 | | 4 | | 2 | 1 | 2 | 4 | | | | | 15 | 14 |
| **MAY** | 2 | 7 | 4 | 7 | 2 | 5 | 5 | 9 | 2 | 7 | 4 | 7 | 2 | | 2 | | | | | | 15 | 23 |
| **JUN** | 2 | 4 | 4 | 4 | 2 | 8 | 5 | 8 | | | | | | 2 | | 2 | | 1 | | 5 | 9 | 19 |
| **JULY** | 2 | 1 | 4 | 15 | | | | | | 1 | | 1 | | | | | 1 | 1 | 7 | 6 | 11 | 22 |
| ***AUG*** | | | | | | | | | | | | | | | | | 1 | | 7 | | 7 | 0 |
| **SEPT** | 9 | 1 | 18 | 14 | 8 | 2 | 20 | 7 | | | | | | | | | 1 | | 7 | | 45 | 21 |
| **OCT** | 10 | 6 | 20 | 13 | 17 | 2 | 43 | 2 | | | | | 1 | 1 | 1 | 1 | 1 | | 7 | | 71 | 16 |
| **NOV** | 2 | 2 | 4 | 2 | 5 | 2 | 12 | 9 | | | | | 2 | | 2 | | 1 | 1 | 7 | 5 | 25 | 16 |
| **DEC** | | 1 | | 1 | 7 | 3 | 18 | 4 | | | | | 2 | 1 | 2 | 1 | 1 | | 7 | | 27 | 6 |

- Start August 17th 2013- August 16th 2014
- 201 completed seadays in FY13 out of 394
- 193 SD will rollover to FY14

*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*




**Sample size analysis** – Susan Wigley

•Increased number of trips increased precision for four species groups:

-small mesh groundfish
-squid/butterfish/mackerel
-large mesh groundfish
-fluke/scup/bsb (NE SMOT)

*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*

# Project Status

- Age Structure Sampling
  - ~ 2699 scale samples, ~ 600 otolith samples collected through Aug 2013
- Stored at Northeast Fisheries Science Center
- Processed at Virginia Institute of Marine Science

| Species | Number Successfully Aged | Number Sampled for Ageing |
|---|---|---|
| Alewife | 5 | 18 |
| American Shad | 0 | 1 |
| Atlantic Croaker | 24 | 26 |
| Atlantic Herring | 0 | 1 |
| Atlantic Menhaden | 7 | 10 |
| Black Sea Bass | 188 | 301 |
| Blueback Herring | 1 | 3 |
| Bluefish | 93 | 117 |
| Butterfish | 5 | 5 |
| Hickory Shad | 2 | 3 |
| Monkfish | 19 | 29 |
| Scup | 578 | 709 |
| Spotted Sea Trout | 0 | 1 |
| Striped Bass | 5 | 7 |
| Summer Flounder | 222 | 441 |
| Weakfish | 124 | 140 |
| Windowpane Flounder | 35 | 38 |
| Winter Flounder | 61 | 64 |
| Witch Flounder | 2 | 4 |
| Yellowtail Flounder | 3 | 6 |

*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*

# Challenges

Challenges

- Lack of effort in certain states, need to move coverage
- Communicating needs to observers through NEFOP

- Ageing sample issues
  - Samples missing from packets, missing packets
  - Broken samples
  - Not enough (3-5 scales)
  - Data missing from database

# Next Steps

- Funding for FY14 will cover sea day coverage through August 2015
- Maintenance $57,400 – 60 SD
- 193 Rollover sea days from FY13
  - This will cover the 248 SD requested to maintain project at current coverage levels in each state (4-5%)

*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*

# Funding Outlook

| State Coverage Level | RI | NJ | MD | VA | Total Days | | Reduction |
|---|---|---|---|---|---|---|---|
| VA, RI=5% MD, NJ= 4% | 52 | 102 | 10 | 49 | 213 | **202750** | |
| VA=5%, RI, MD, NJ=4% | 8 | 102 | 10 | 49 | 169 | 160950 | 41800 |
| All @ 4% | 8 | 102 | 10 | 7 | 127 | 121050 | 81700 |

*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*

# Next Steps

- Expand preliminary evaluation of the observer program through collaboration with NEFOP
  - In-depth analysis with target species assessment scientists
  - Further collaborate with NEFOP for sample size analysis

*Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.*