



**NOAA**  
**FISHERIES**

Northeast  
Fisheries  
Science  
Center

# History of Previous Modeling Reviews

## TOR 1 Modeling Approaches

*By*  
*Paul Rago*  
*Chief, Population Dynamics Branch*  
*and Colleagues*

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**NOAA FISHERIES**

# Term of Reference I: Modeling Approaches

Does the Center apply a suitable scientific/technical approach to fishery stock assessment modeling?

# Overview

Mission of Population Dynamics Branch

The People

Stock status It's not all bad news!

Major interventions

A brief history of reviews

Strengths, challenges and solutions

# Responsibilities of the Branch

## Provide a scientific basis for management advice

- Conduct fishery stock assessments for about 60 commercial and recreational species

## Serve on fishery management council and commission committees

- New England Fishery Management Council
- Mid-Atlantic Fishery Management Council
- Atlantic States Marine Fisheries Commission



*Put the knife down and we'll talk*

# Responsibilities of the Branch

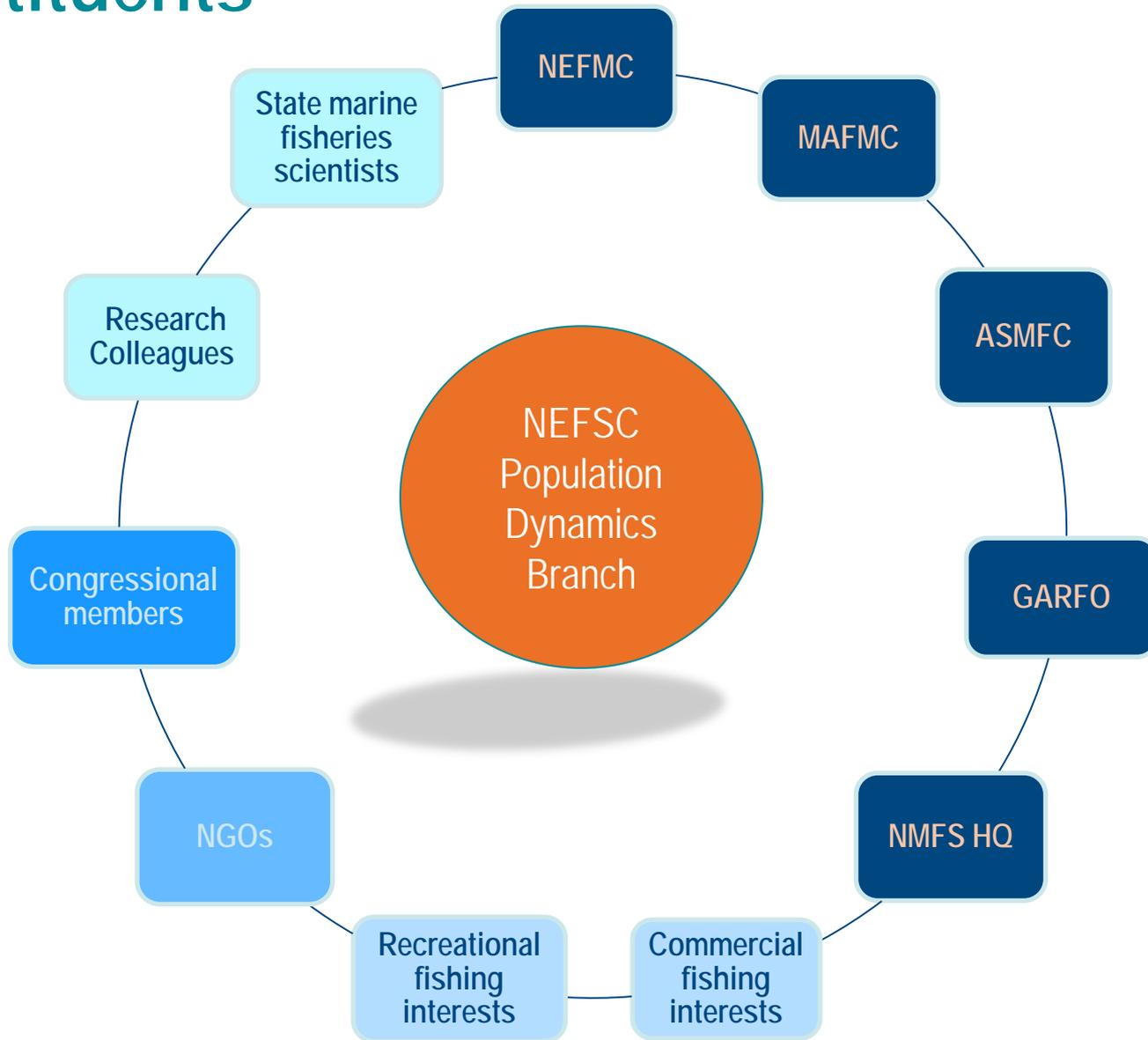
## Conduct stock assessment research

- Capitalize on extraordinary wealth of data in the Northeast
- Support national and regional research initiatives

## Recover and maintain naturally reproducing Atlantic salmon populations and supporting ecosystems



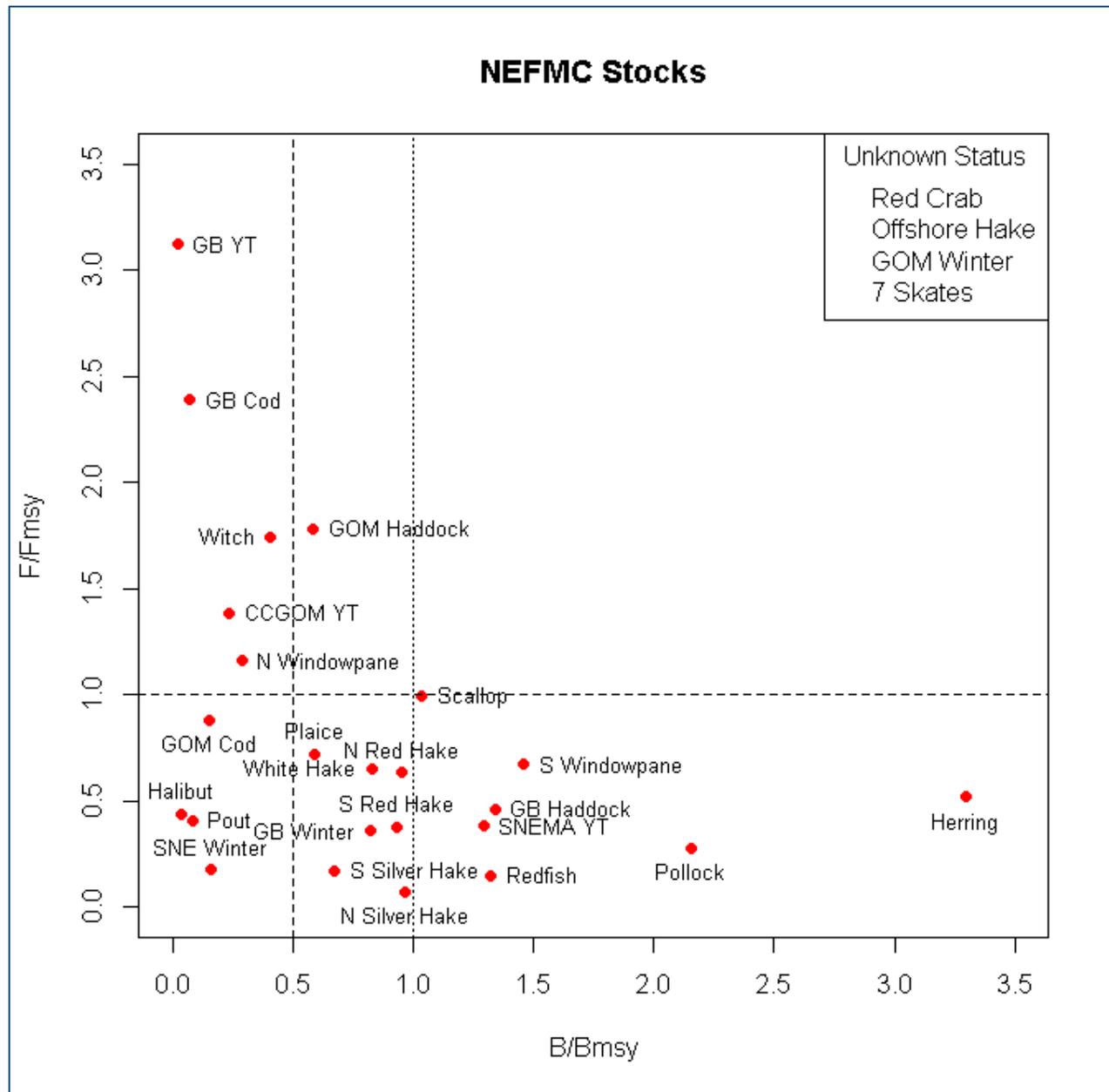
# Constituents



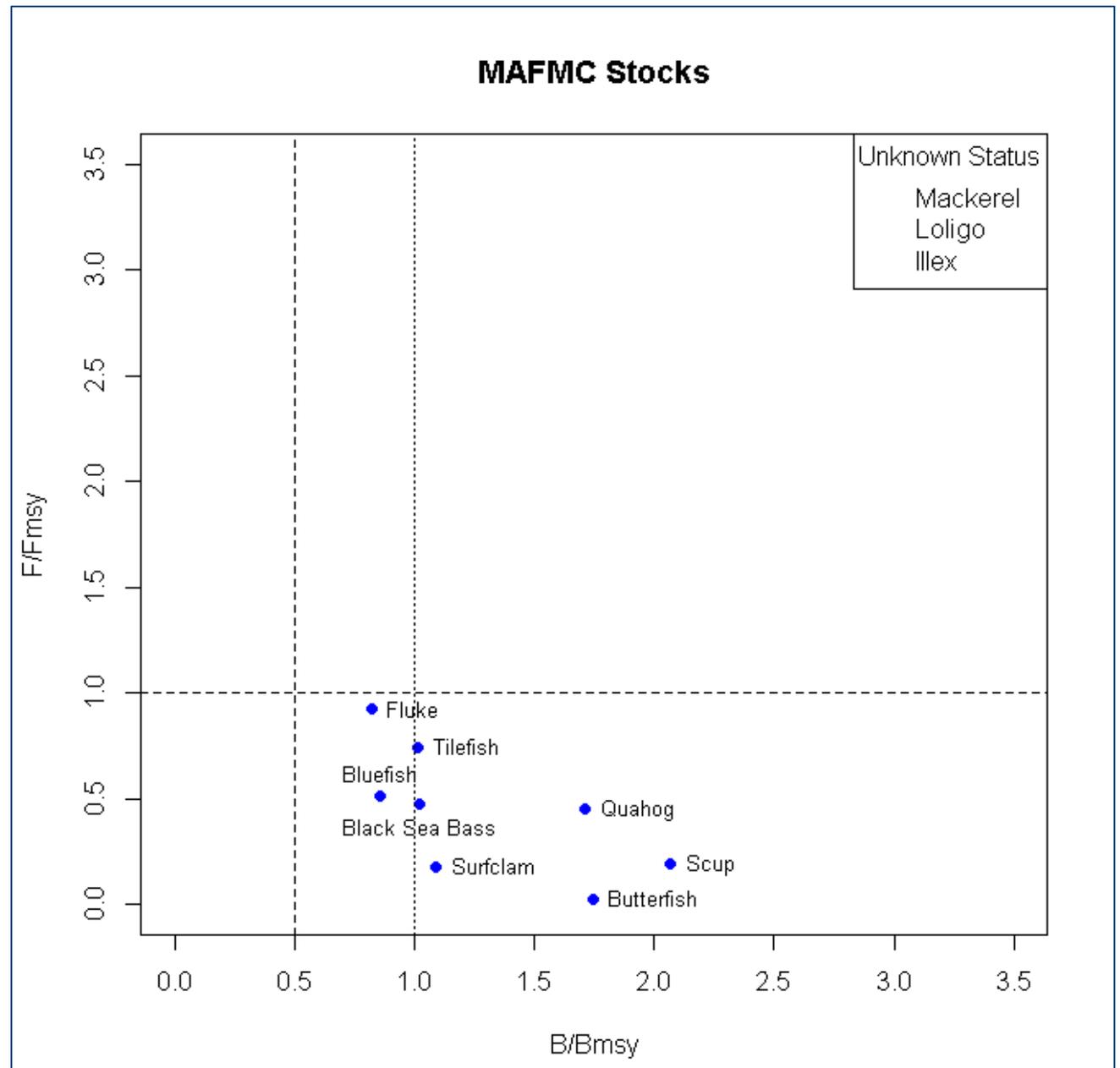
# Population Dynamics Branch 2011



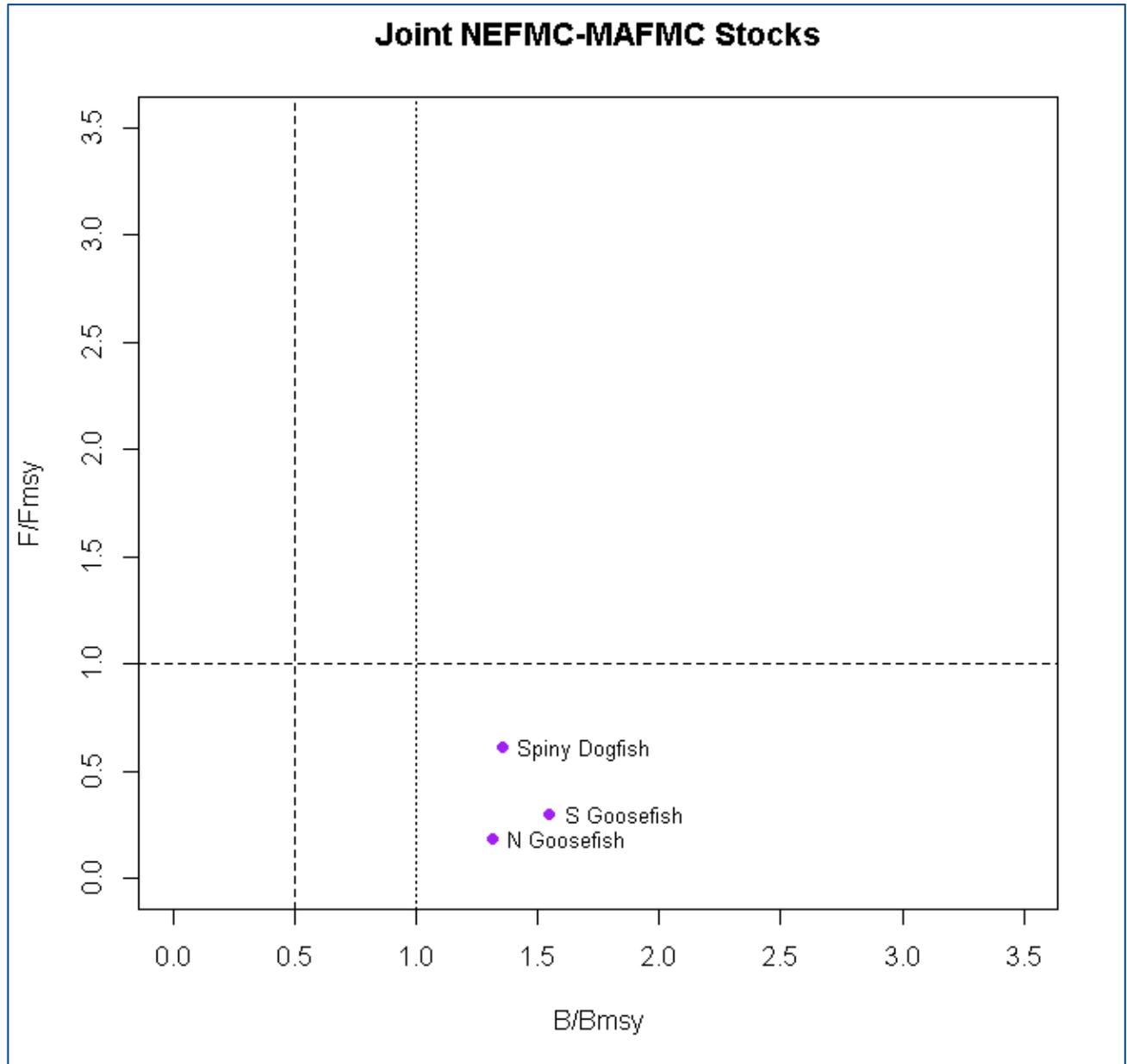
# Stock Status



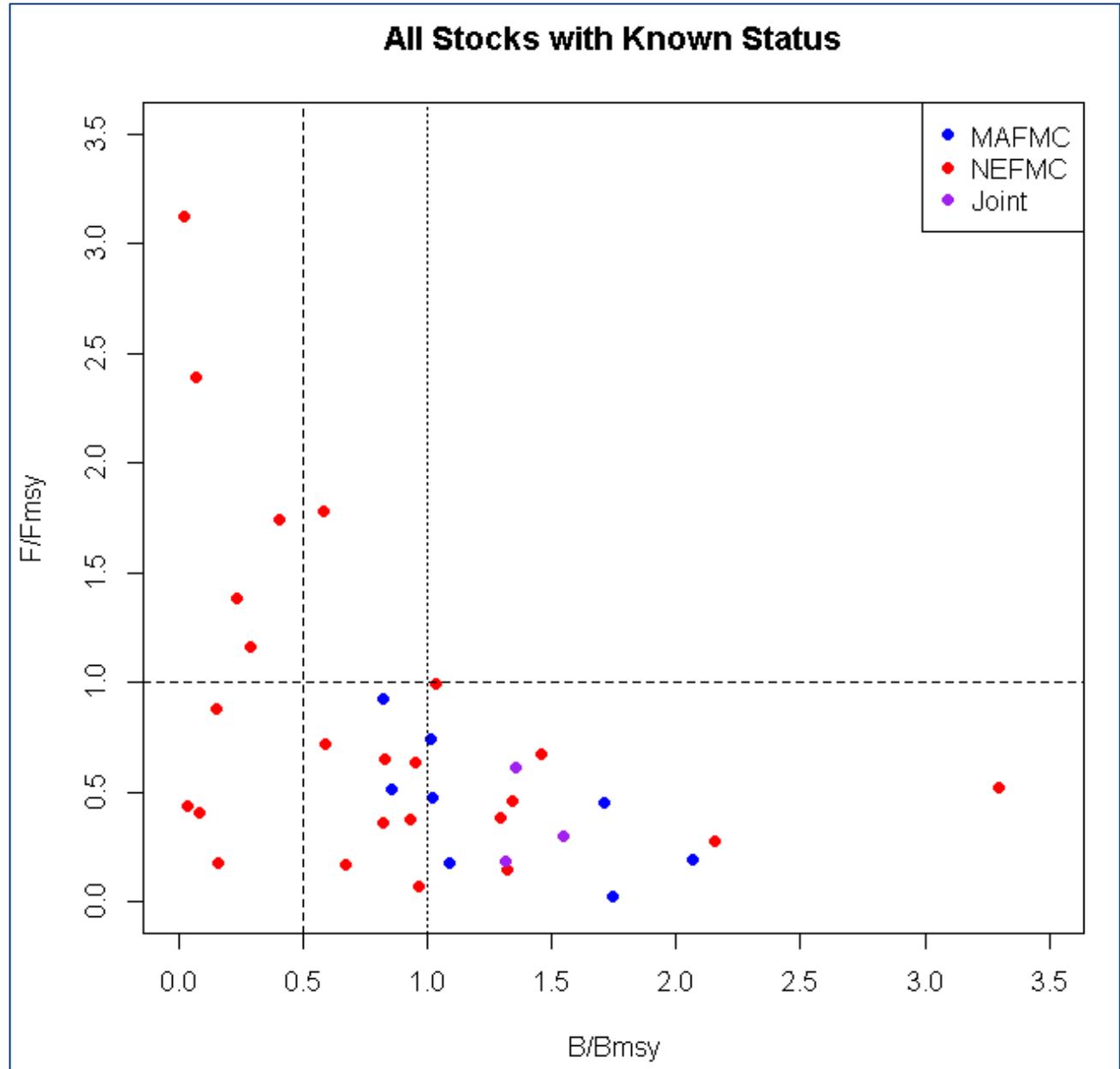
# Stock Status



# Stock Status



# Stock Status



# Factors influencing fisheries management and science in the Northeast

High historical fishing mortality rates

Major sequential changes in fishery management

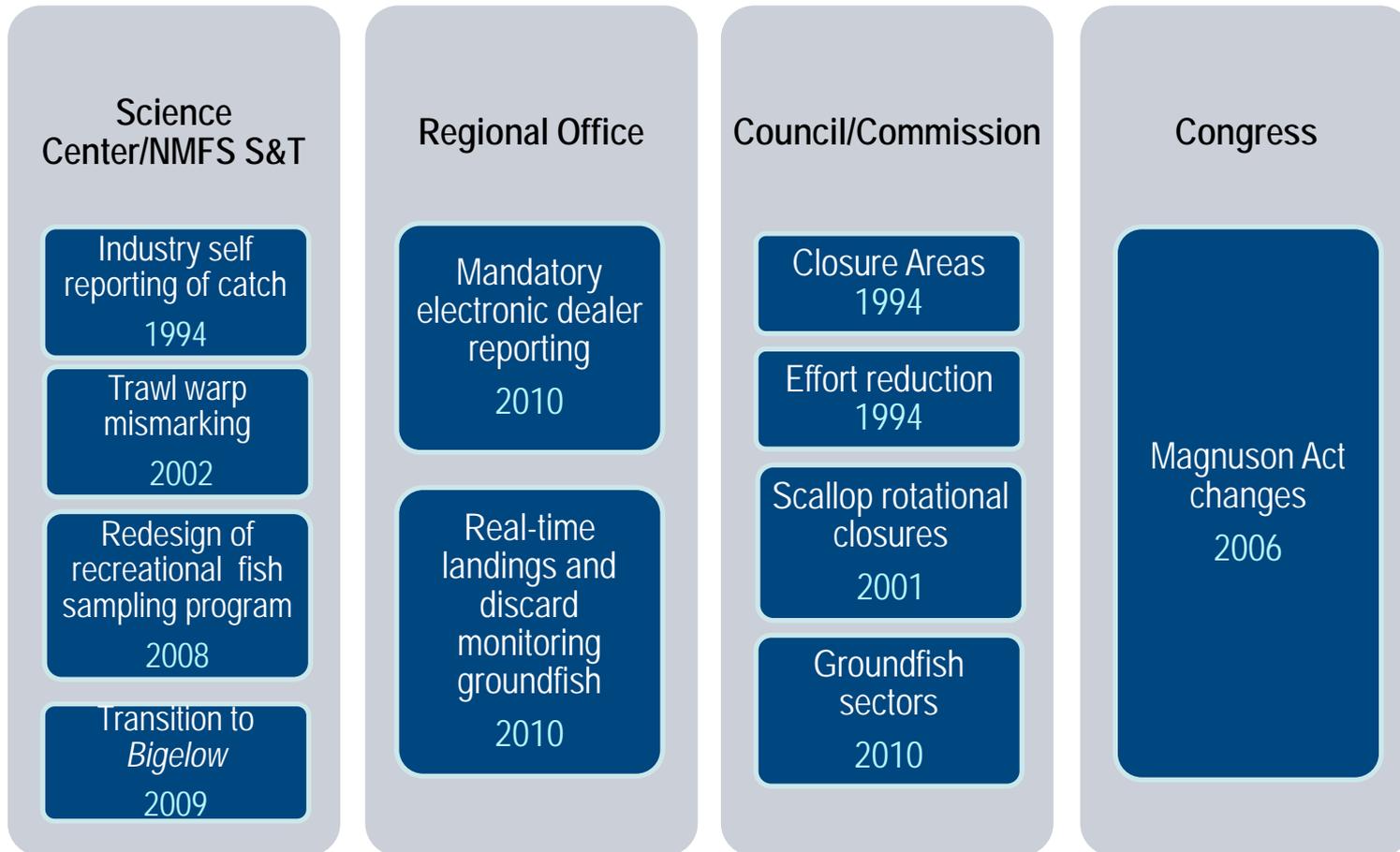
Changes in catch monitoring

Technical interactions among fisheries and rigid governance

Allocation

Changes in the environment

# Major Interventions in past two decades



# Reviews often associated with updated science or management measures

## Assessment/Management Events

1995 - SARC declares collapse of cod, haddock and yellowtail flounder stocks

Groundfish biological reference points redefined

2008 - GARM III conducts 19 groundfish benchmarks

2010 – Groundfish sector management implemented

## Review Events

1990 - External Review

1998 - NRC review

2001 - Stock Assessment Improvement Plan (SAIP)

2009 – NOAA Inspector General review

2010 - ACL/AM Review

2011 - Sissenwine & Rothschild Review

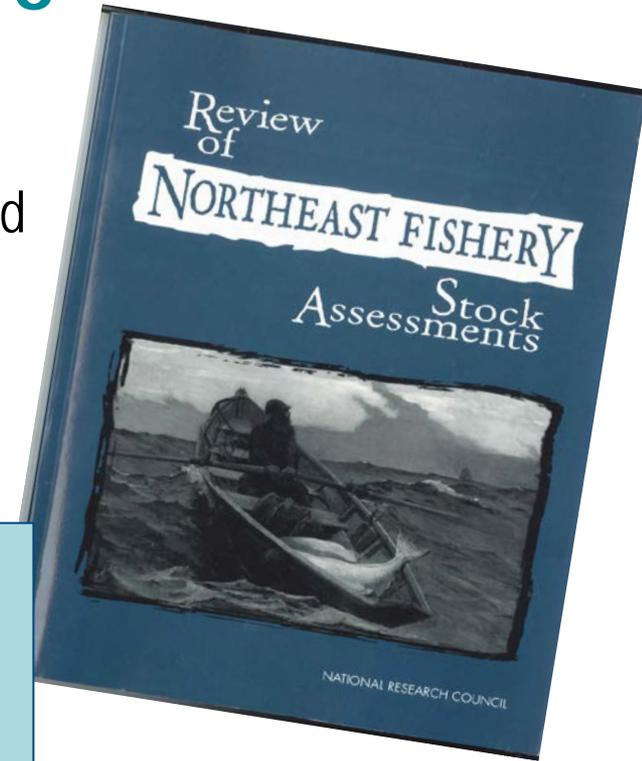
2011- Pate and Touchstone Review

# National Research Council 1998

- Reviewers included Terry Quinn, Wayne Getz, Ray Hilborn, JJ Maguire, Ana Parma, Tore Schweder and Gunnar Stefansson
- Required by Congress in the 1996 Reauthorization of Magnuson Stevens Act.

## Conclusion

"...stock assessment science is not the real source of contention in the management of New England Groundfish fisheries ... the social and economic concerns created by strong management measures and lack of participation in the management process were the more important concerns."



# National Research Council 1998 – additional conclusions

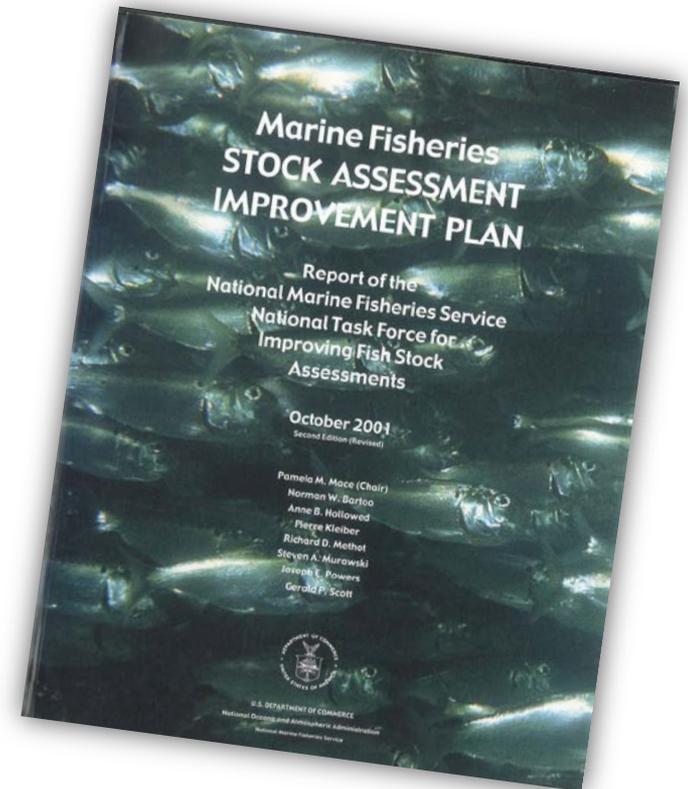
- The stock assessment process in the Northeast region, despite the need for improvements, “appears to provide a valid scientific context for evaluating the status of fish populations and the effects of fishery management.”
- The Northeast region’s stock assessment process is analogous to processes and standards used in jurisdictions elsewhere in the world.
- Recommended improvements in NMFS’ collection, analysis, and modeling of stock assessment data, although it noted that the strict regulations in question “might have been avoided if fishing mortality in the New England groundfisheries had been effectively controlled from the mid-1980s (p. 2).”

# Stock Assessment Improvement Plan 2001

- Authors included: Pamela Mace, Pierre Kleiber, Rick Methot, Steve Murawski, Joe Powers, Gerry Scott and Anne Hollowed

## Conclusion

“Because of reductions in fishing effort, the closure of large areas of productive fishing grounds, trip limits and other measures, managers want to know the incremental effect of these measures on attaining required fishing mortality and biomass targets.”



# Inspector General 2009

- *“Our findings show that the pervasive lack of trust and confidence the groundfish industry has in NOAA manifests itself as doubt in the science. And our investigation ultimately turned its focus on what NOAA is doing and can do to improve its relationship with the groundfish industry. Without an improved relationship, we believe the science will continue to be questioned.”*
- *“The challenges inherent in balancing a sustainable fishery with industry’s interests, coupled with limited success in rebuilding stocks have contributed to this unproductive relationship.”*
- *“...found merit with several of the specific allegations, overall we found the Science Center meets the “best available science” requirements of National Standard 2.”*
- Believed that “NMFS has considered other competing models, adequately articulated plausible distinctions, used intelligible standards, and made readings of the data that were reasonable. We do not believe that NMFS is basing its determination on anything but what it has determined to be the best available science.”

# Strengths

Large number of diverse, talented and dedicated scientists

High quality, long-term survey data bases

Comprehensive discard monitoring program

Long time series of landings data

Strong modeling capabilities

Commitment to scientific integrity

# Challenges

Data processing issues (see Data Review!)

Consequences of high exploitation rates by foreign fleets in '60's and '70's still being felt.

Large and continuous changes in management measures increases heterogeneity of fishing

Reductions in  $F$  make natural fluctuations more important, slight changes at low  $F$  are harder to detect.

Trust with industry

# Solutions

Improve quality and timeliness of fishery dependent data

Streamline the assessment process

Improve measures of scale in stock assessments, allowing confounded parameters (Q and M) to be estimated

When found to improve assessment advice, incorporate environmental and ecological data.

# Questions?

