

# SAW/SARC-44 Summary

(February 2007)

## ***SAW/SARC Process***

- **External Peer Review by Center of Independent Experts (CIE).**
- **Emphasis on reviewing just the science/assessment.**
- **CIE provides Consensus Summary + Individual Reports**
- **Management advice is not in the SAW/SARC reports.**
- **Management advice is developed by Tech. Committees, Working Groups, PDTs.**

**The 44th Northeast Regional  
Stock Assessment Review Committee  
(44th SARC)**

**Stephen H. Clark Conference Room – Northeast Fisheries Science Center  
Woods Hole, Massachusetts  
11/28 –12/4, 2006**

**SARC Chairman:**

**Dr. Cynthia Jones  
Old Dominion Univ.  
Virginia (CIE)**

**SARC Panelists:**

**Dr. Vivian Haist  
British Columbia,  
Canada (CIE)**

**Mr. Patrick Cordue  
Wellington,  
New Zealand (CIE)**

**A. Ocean quahog**

**B. Skate Complex  
(7 spp.)**

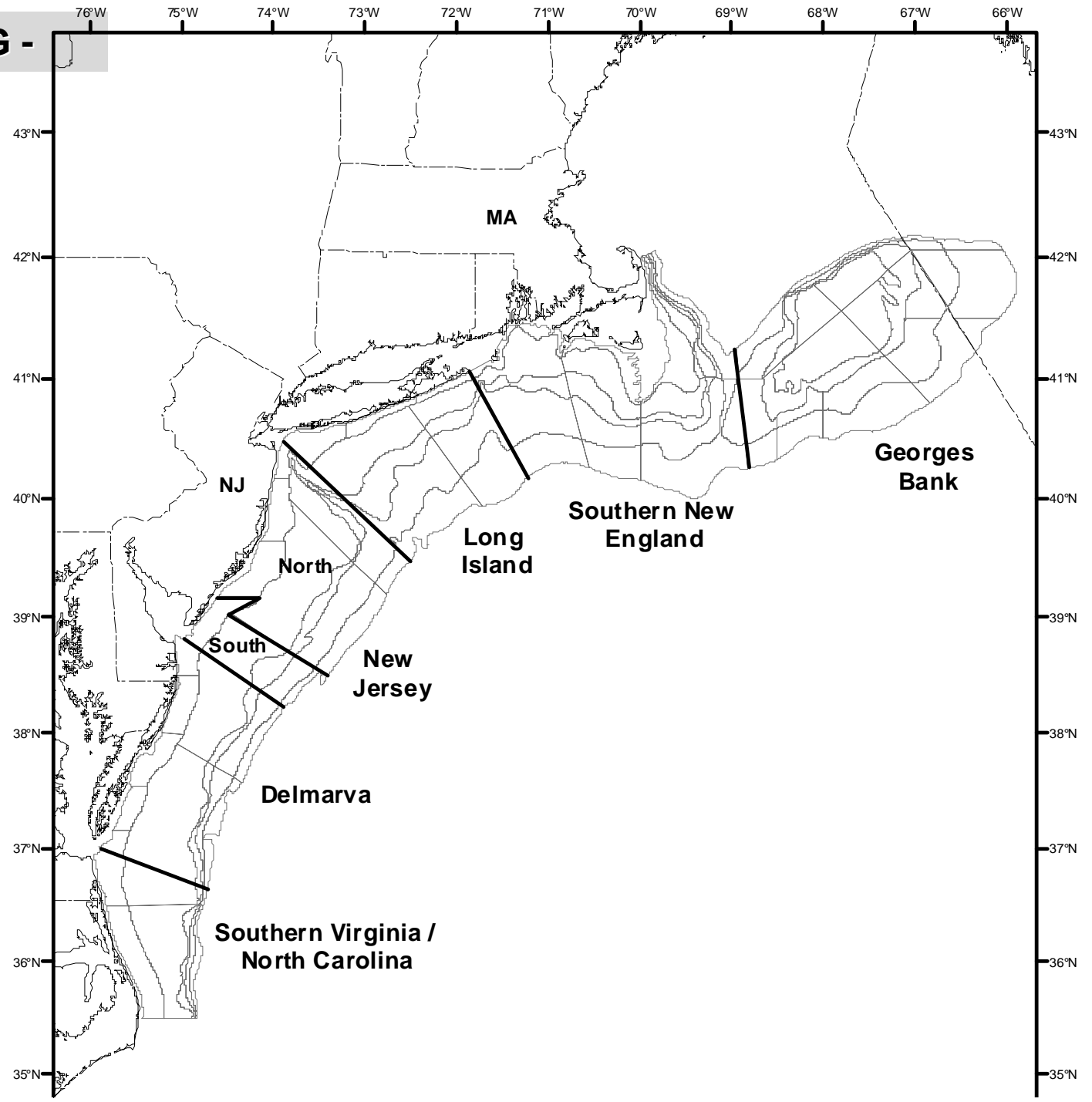
**C. Atlantic  
surfclam**

<b><u>Assessment</u></b>	<b><u>Review Outcome</u></b>
A. Ocean quahog	Accepted
B. Skates	Partially Accepted
C. Atlantic surfclam	Accepted

## OCEAN QUAHOG - TORs

1. Characterize the commercial catch including landings and discards.
2. Estimate fishing mortality, spawning stock biomass, and total stock biomass for the current year and characterize the uncertainty of those estimates. If possible, also include estimates for earlier years.
3. Either update or redefine biological reference points (BRPs; proxies for  $B_{MSY}$  and  $F_{MSY}$ ), as appropriate. Comment on the scientific adequacy of existing and redefined BRPs.
4. Evaluate current stock status with respect to the existing BRPs, as well as with respect to updated or redefined BRPs (from TOR 3).
5. Recommend what modeling approaches and data should be used for conducting single and multi-year stock projections, and for computing TACs or TALs.
6. If possible, provide numerical examples of short term projections (2-3 years) of biomass and fishing mortality rate, and characterize their uncertainty, under various TAC/F strategies and compare projected stock status to existing rebuilding or recovery schedules, as appropriate.
7. Review, evaluate and report on the status of the SARC/Working Group Research Recommendations offered in recent SARC reviewed assessments.

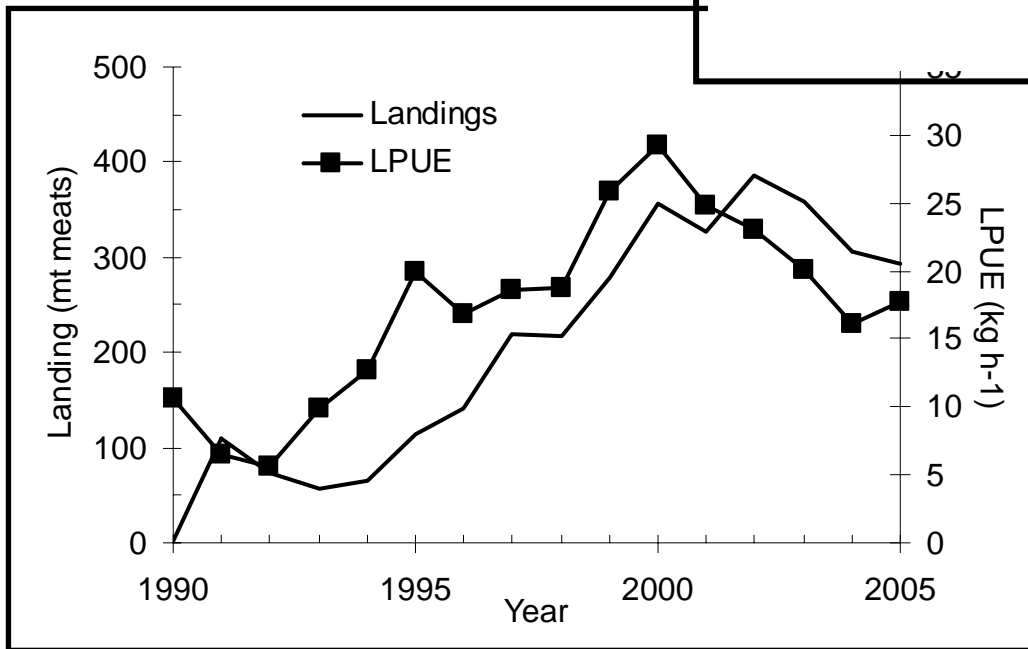
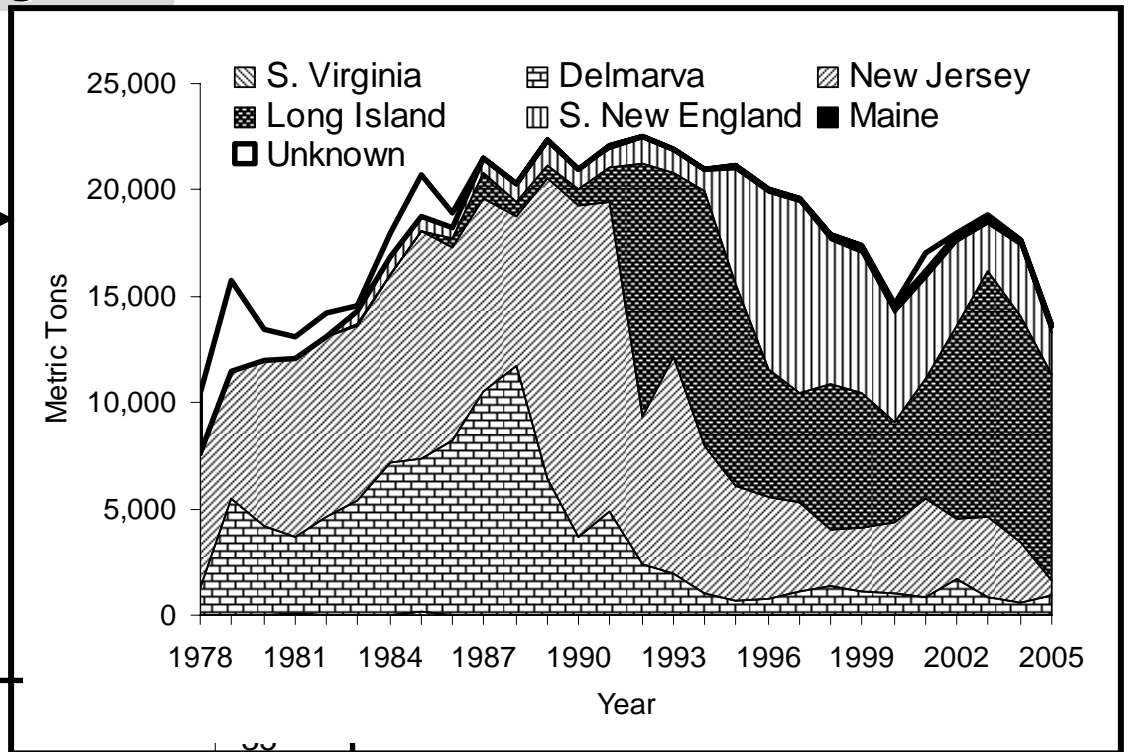
# OCEAN QUAHOG -



# OCEAN QUAHOG - Landings

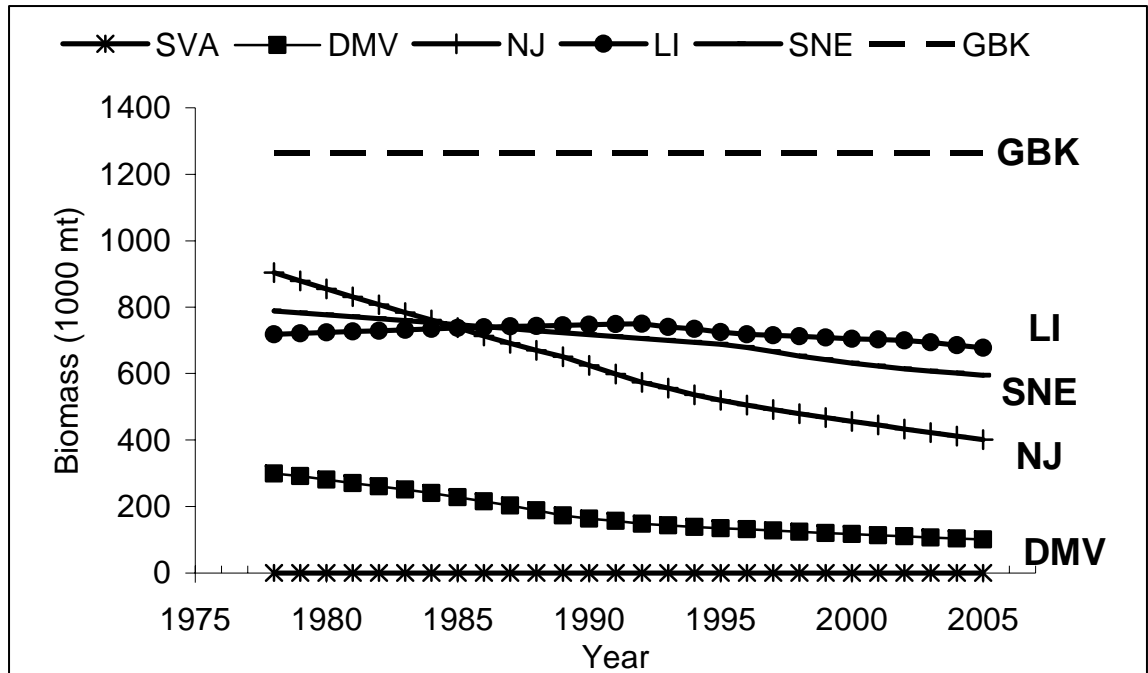
Mid-Atlantic →

↓  
Maine

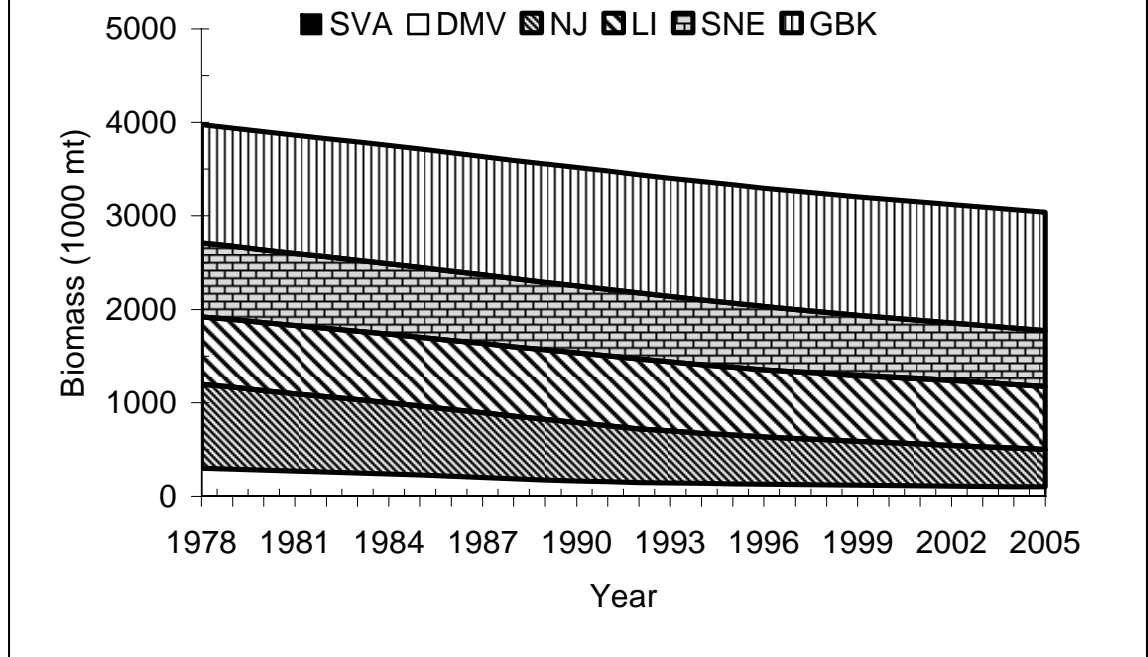


# OCEAN QUAHOG - BIOMASS

By region →

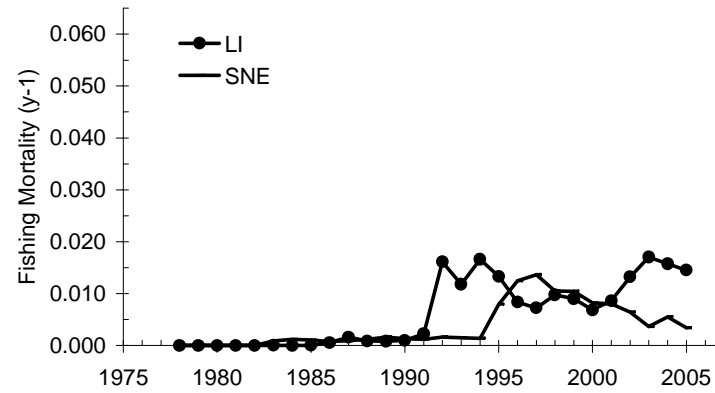
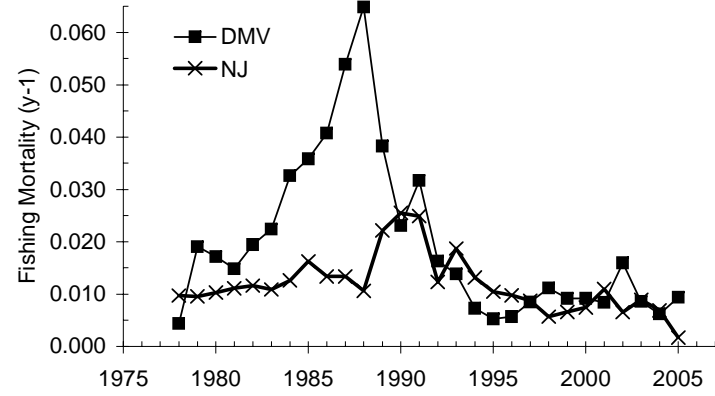


Entire stock →

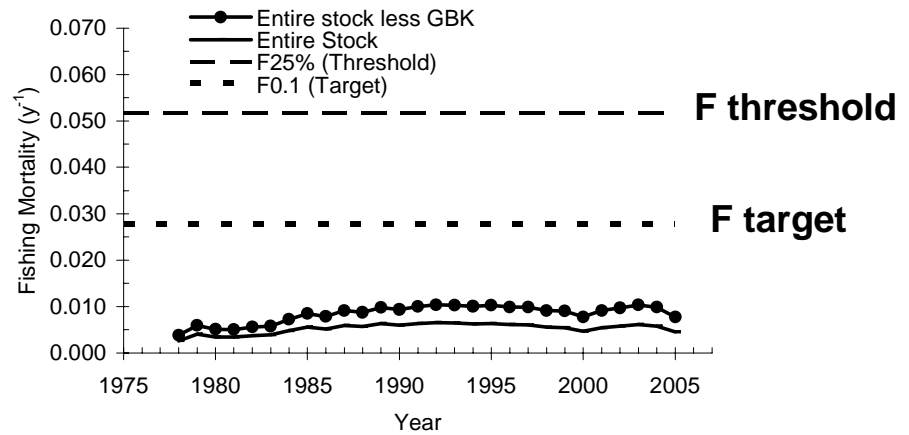


# A. OCEAN QUAHOG – Fishing Mortality Rate

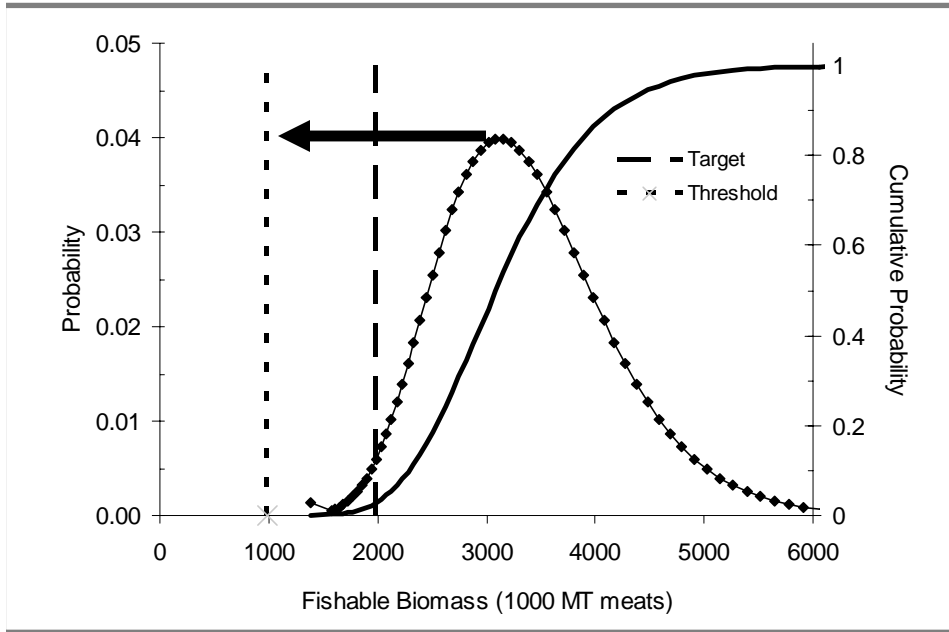
By region



Entire stock

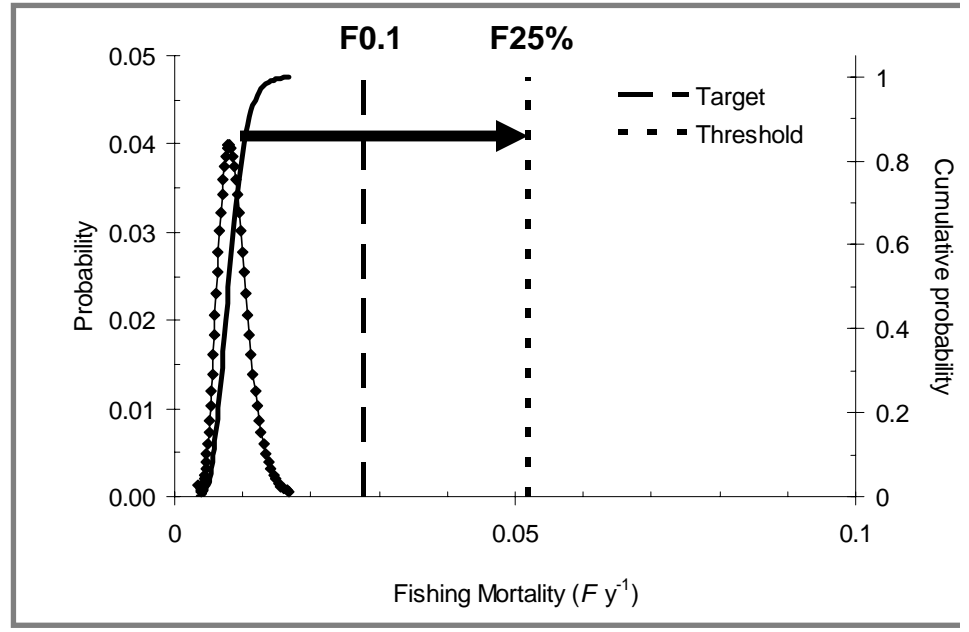


# OCEAN QUAHOG – Stock Status in 2005



**Biomass**

**Not Overfished**



**Fishing Mortality Rate**

**Not Overfishing**

## OCEAN QUAHOG - Projections

Year	Biomass All Regions (1000 mt)	Biomass less GBK (1000 mt)	Landings (1000 mt)	F All Regions (y <sup>-1</sup> )	F less GBK (y <sup>-1</sup> )
<b>Quota = 4 million bushels (18,144 mt meats)</b>					
2006	3,016	1,753	13	0.004	0.008
2007	2,995	1,731	18	0.006	0.011
2008	2,967	1,703	18	0.006	0.011
2009	2,940	1,676	18	0.007	0.011
2010	2,912	1,649	18	0.007	0.012
<b>Quota = 5.333 million bushels (24,189 mt meats)</b>					
2006	3,016	1,753	13	0.004	0.008
2007	2,995	1,731	24	0.009	0.015
2008	2,961	1,697	24	0.009	0.015
2009	2,927	1,663	24	0.009	0.015
2010	2,893	1,630	24	0.009	0.016
<b>Quota = 6 million bushels (27,215 mt meats)</b>					
2006	3,016	1,753	13	0.004	0.008
2007	2,995	1,731	27	0.010	0.017
2008	2,957	1,694	27	0.010	0.017
2009	2,921	1,657	27	0.010	0.017
2010	2,884	1,620	27	0.010	0.018
<b>F = F<sub>0.1</sub>=0.028 y<sup>-1</sup> in exploited regions (F=0 for GBK)</b>					
2006	3,016	1,753	13	0.004	0.028
2007	2,960	1,696	44	0.016	0.028
2008	2,905	1,642	42	0.015	0.028
2009	2,853	1,589	40	0.015	0.028
2010	2,802	1,538	39	0.015	0.028

## OCEAN QUAHOG – Special Comments

Mean annual recruitment to the whole stock was small (<1% per year during 2005).

The ocean quahog population is a relatively unproductive stock that is being fished down from its virgin state towards its  $B_{MSY}$  reference point

## OCEAN QUAHOG – Reviewer's Comments

**1. Model should be constrained making the estimate of  $B_0$  directly linked to recruitment.**

**2a. Results are very sensitive to dredge efficiency estimate, making the results uncertain.**

**2b. Nevertheless, Panel accepted the results because point estimates are far below  $F_{threshold}$  and far above  $B_{threshold}$ .**

**3. More conservative BRPs are probably appropriate. Examine next time.**

## B. SKATES - TORs

1. Characterize the commercial and recreational catch including landings and discards.
2. Estimate fishing mortality, spawning stock biomass, and total stock biomass for the current year and characterize the uncertainty of those estimates. If possible, also include estimates for earlier years.
3. Either update or redefine biological reference points (BRPs; proxies for  $B_{MSY}$  and  $F_{MSY}$ ), as appropriate. Comment on the scientific adequacy of existing and redefined BRPs.
4. Evaluate current stock status with respect to the existing BRPs, as well as with respect to updated or redefined BRPs (from TOR 3).
5. Review, evaluate and report on the status of the SARC/Working Group Research Recommendations offered in recent SARC-reviewed assessments.
6. Examine the NEFSC Food Habits Database to estimate diet composition and annual consumptive demand for seven species of skates for as many years as feasible.

## **SKATES – Reviewer Comments :**

**1. Important terms of reference have not been met.**

**2. Lack of species-specific catch data makes it very difficult to assess skate stocks.**

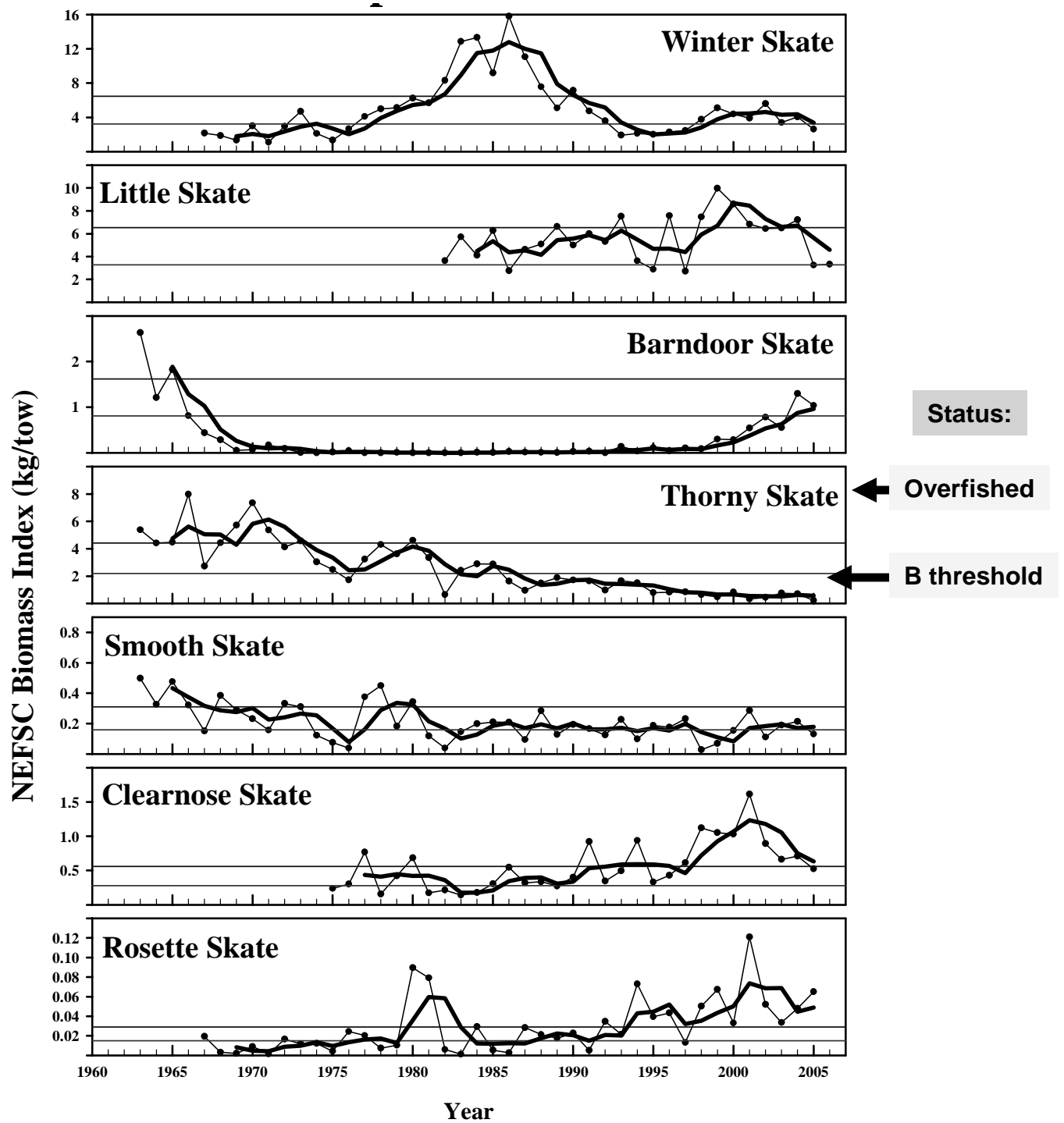
**3. New estimates of F and BRPs not accepted.  
Additional work needed.**

**4. Current BRPs are ad hoc (i.e., not great), but are “Best Available Science”.**

**5. Excellent job describing skate diets and amount they consume.**

# SKATE SPECIES Biomass Indices and Stock Status

Data Included:  
Fall 2005,  
Spring 2006



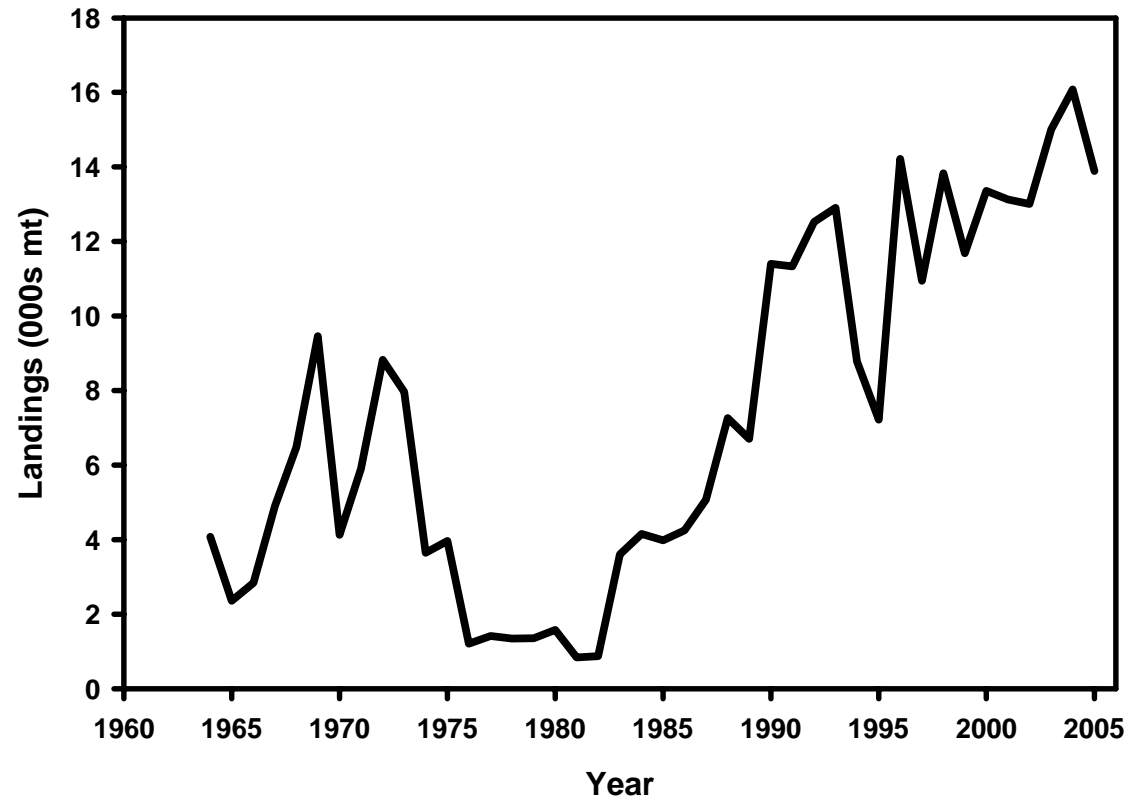
**Overfishing Status**  
(based on change in  
3-yr moving average of survey index)

Data Included:  
Fall 2005,  
Spring 2006

Skate Species	Overfishing Status	Critical neg. % Change	Observed %
Winter	yes	-20	-22.9
Little	Not	-20	-15.9
Barndoor	Not	-30	+9.8
Thorny	Not	-20	-11.2
Smooth	Not	-30	+3.7
Clearnose	Not	-30	-16.2
Rosette	Not	-60	+9.7

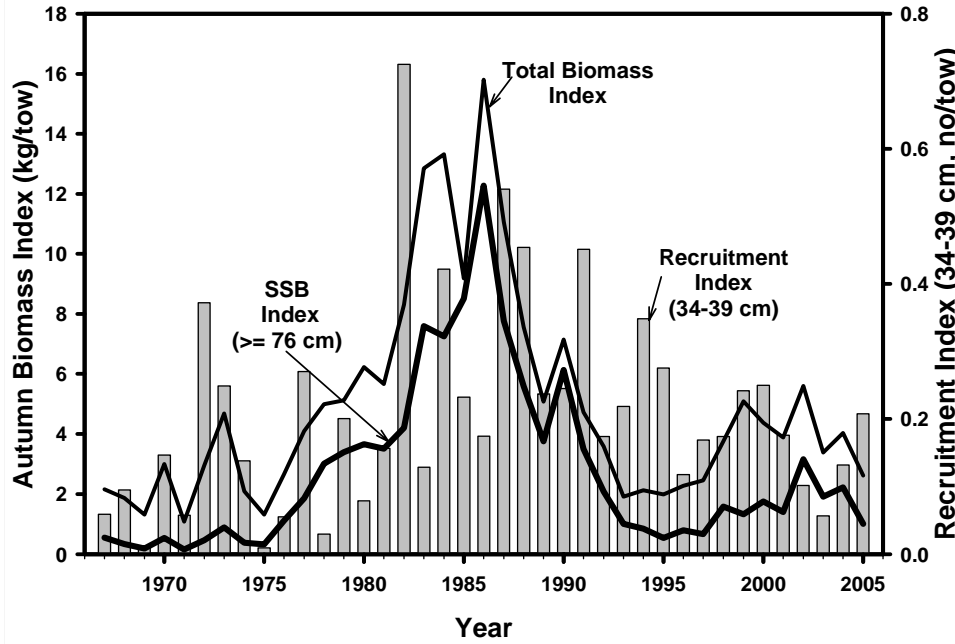
# SKATES

*Trends in Commercial Landings*

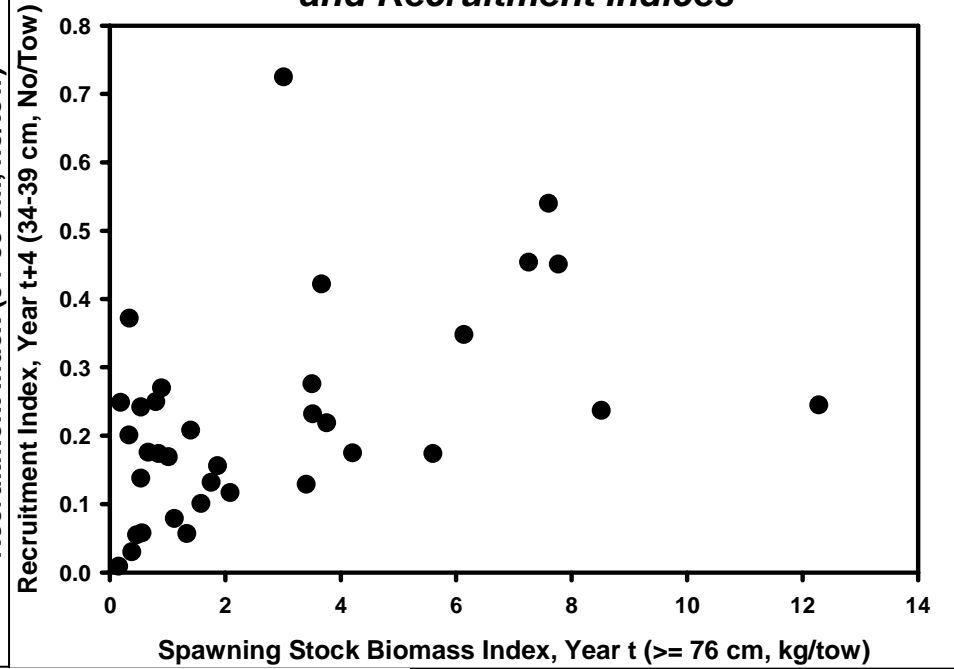


**Landings are not known by species.**

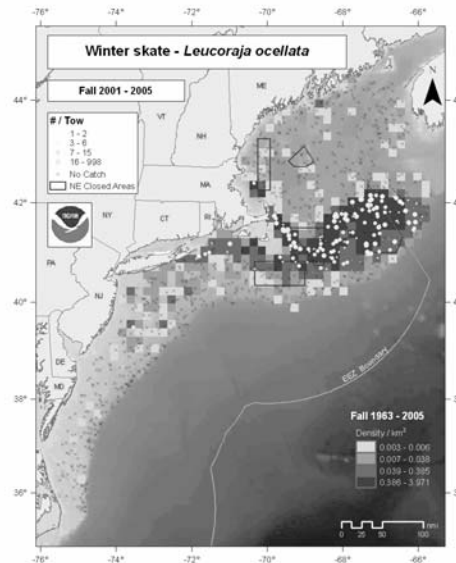
### Winter Skate Trends in Relative Survey Biomass Indices and Recruitment Indices



### Winter Skate Relationship Between SSB Indices and Recruitment Indices



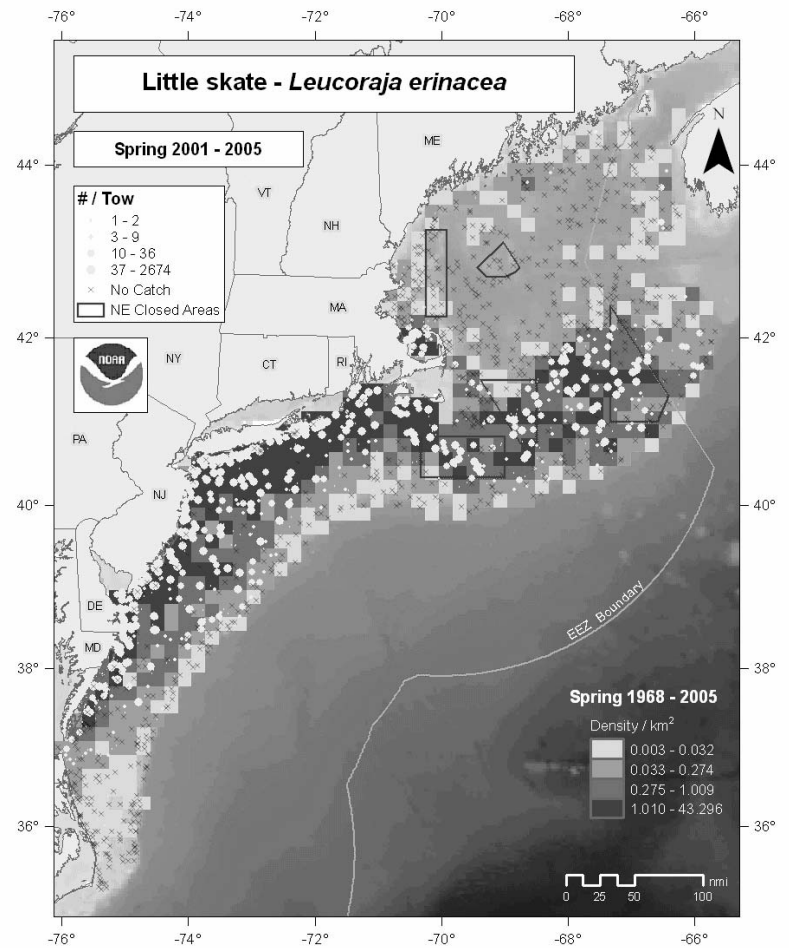
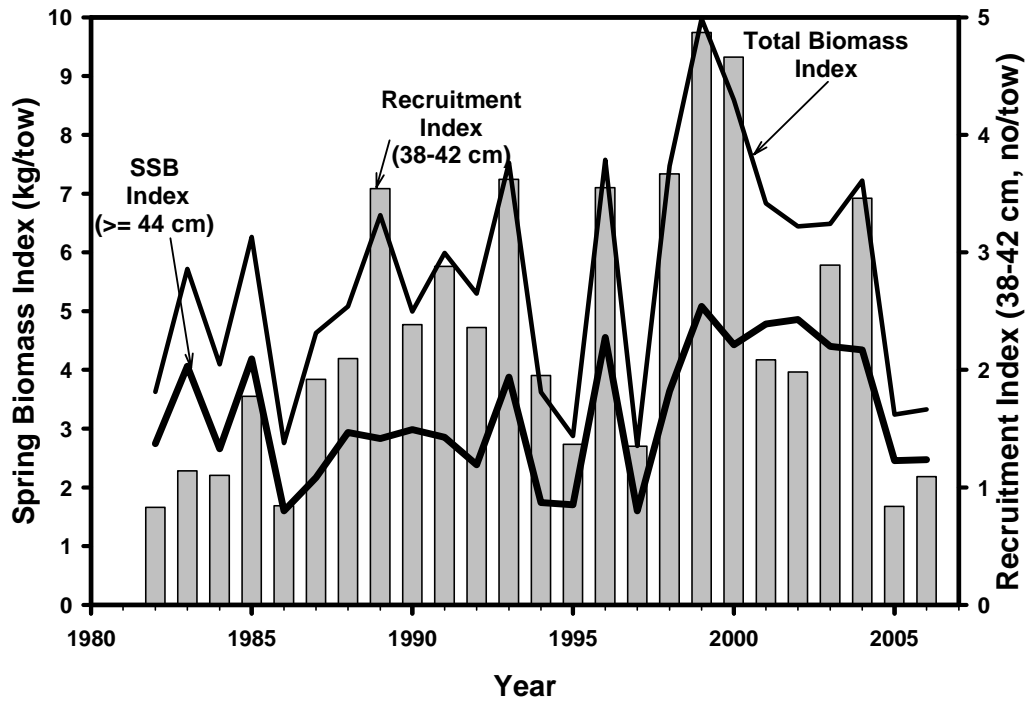
## Winter Skate



Relative species abundance and distribution from NEFSC bottom trawl survey by time block and relative species density for the full time series.

## Little Skate

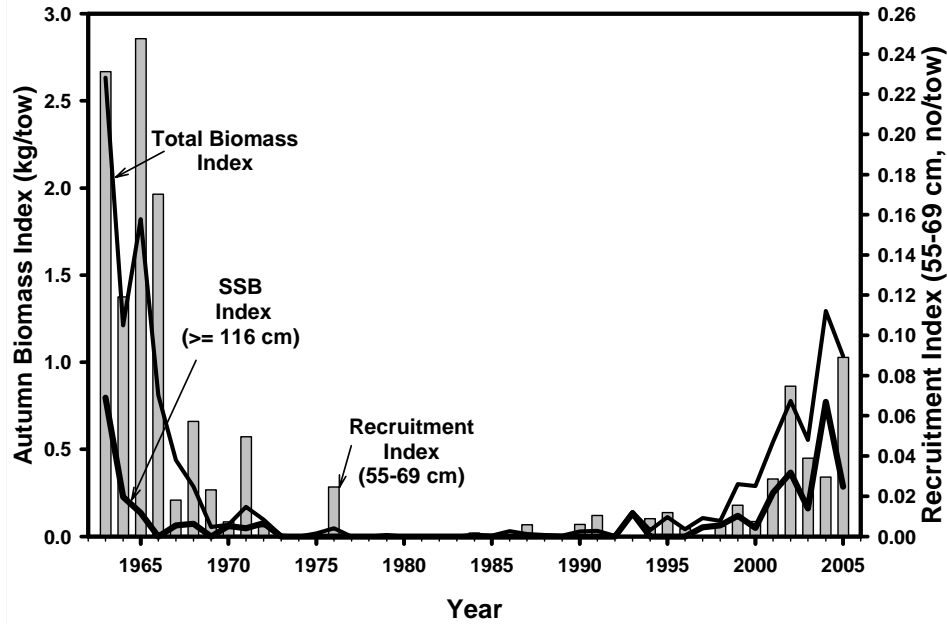
### Trends in Relative Survey Biomass Indices and Recruitment Indices



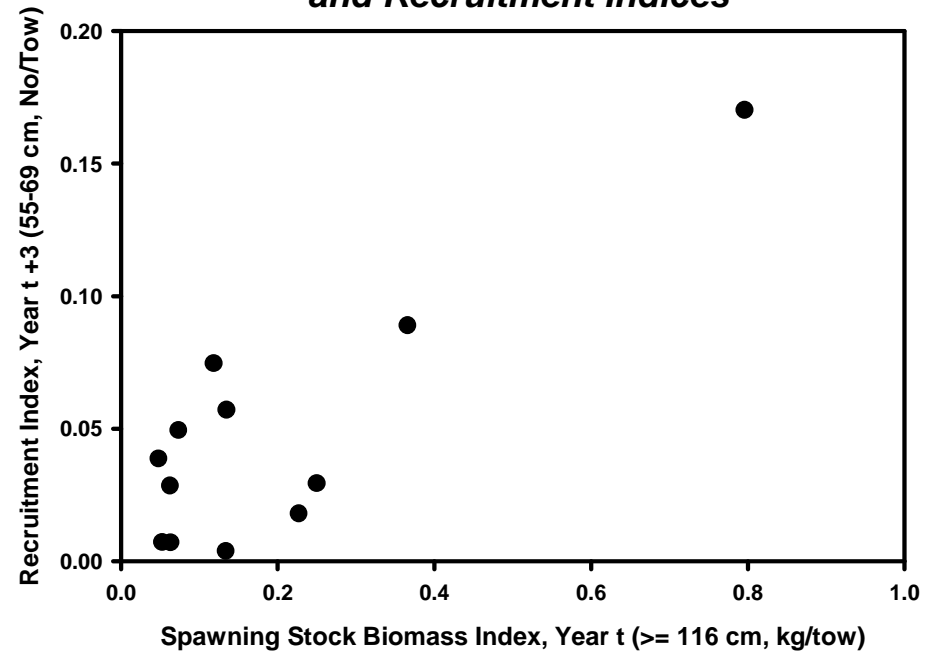
**Little Skates**

Relative species abundance and distribution from NEFSC bottom trawl survey by time block and relative species density for the full time series.

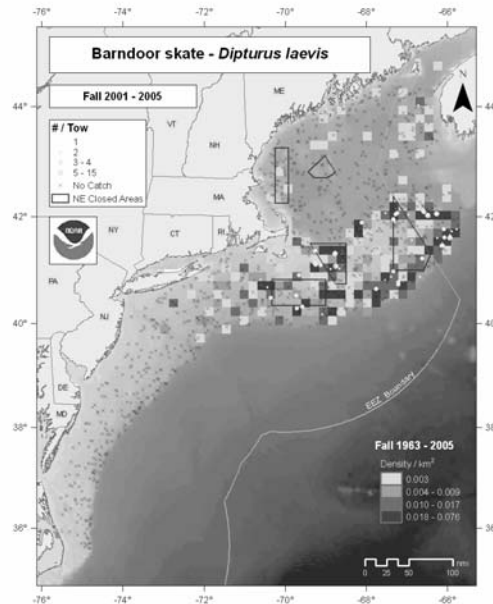
**Barndoor Skate**  
**Trends in Relative Survey Biomass Indices**  
**and Recruitment Indices**



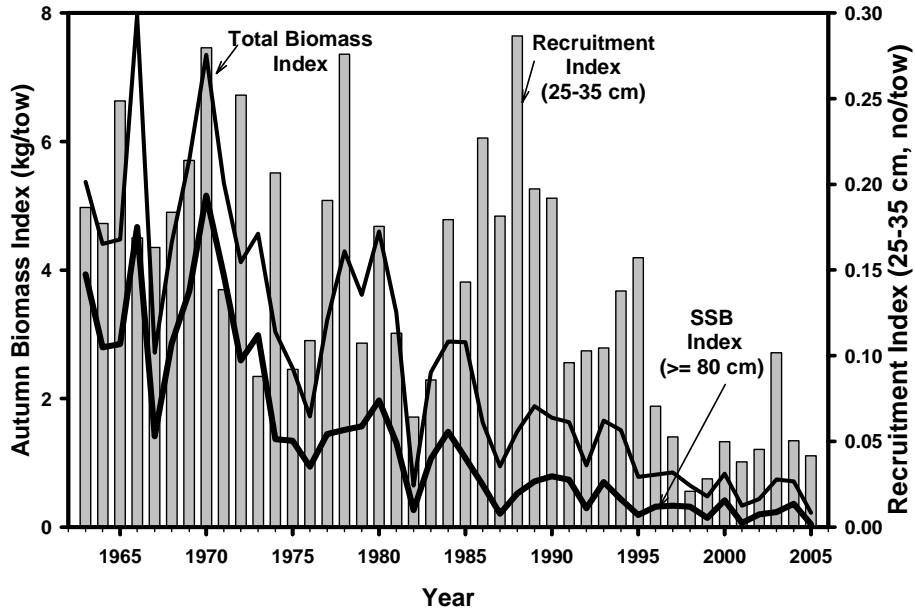
**Barndoor Skate**  
**Relationship Between SSB Indices**  
**and Recruitment Indices**



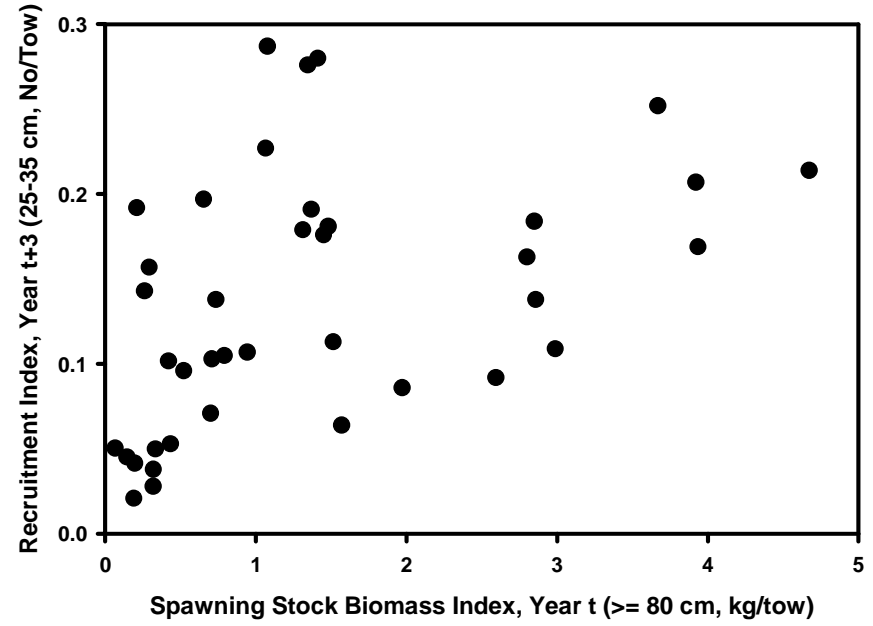
**Barndoor Skates**



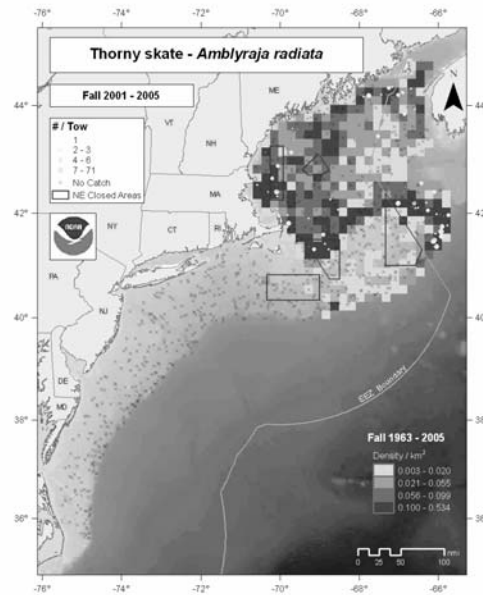
**Thorny Skate**  
**Trends in Relative Survey Biomass Indices**  
**and Recruitment Indices**



**Thorny Skate**  
**Relationship Between SSB Indices**  
**and Recruitment Indices**



**Thorny Skates**

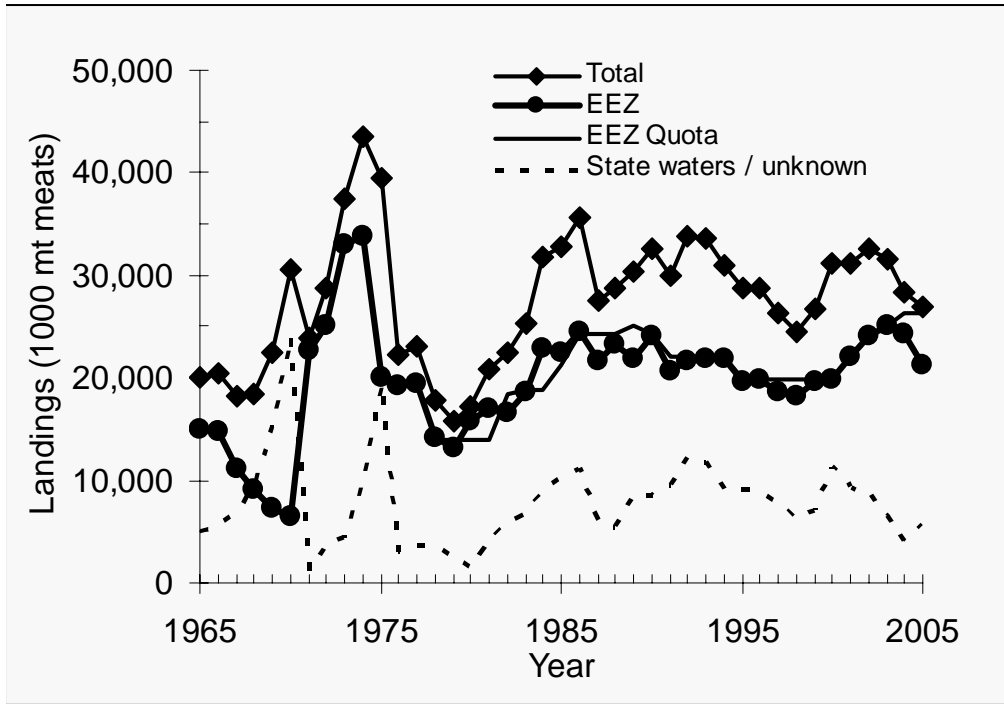


Relative species abundance and distribution from NEFSC bottom trawl survey by time block and relative species density for the full time series.

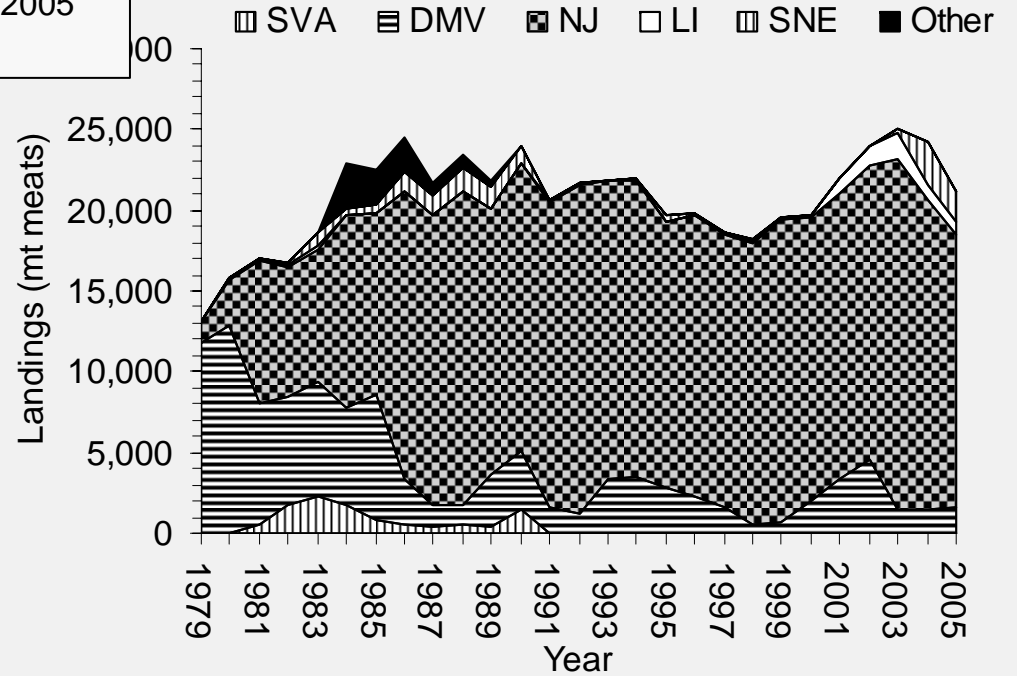
## C. Atlantic Surfclam - Terms of Reference

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2. Estimate fishing mortality, spawning stock biomass, and total stock biomass for the current year and characterize the uncertainty of those estimates. If possible, also include estimates for earlier years.
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6. If possible,
  - a. provide numerical examples of short term projections (2-3 years) of biomass and fishing mortality rate, and characterize their uncertainty, under various TAC/F strategies and
  - b. compare projected stock status to existing rebuilding or recovery schedules, as appropriate.
7. Review, evaluate and report on the status of the SARC/Working Group Research Recommendations offered in recent SARC reviewed assessments.

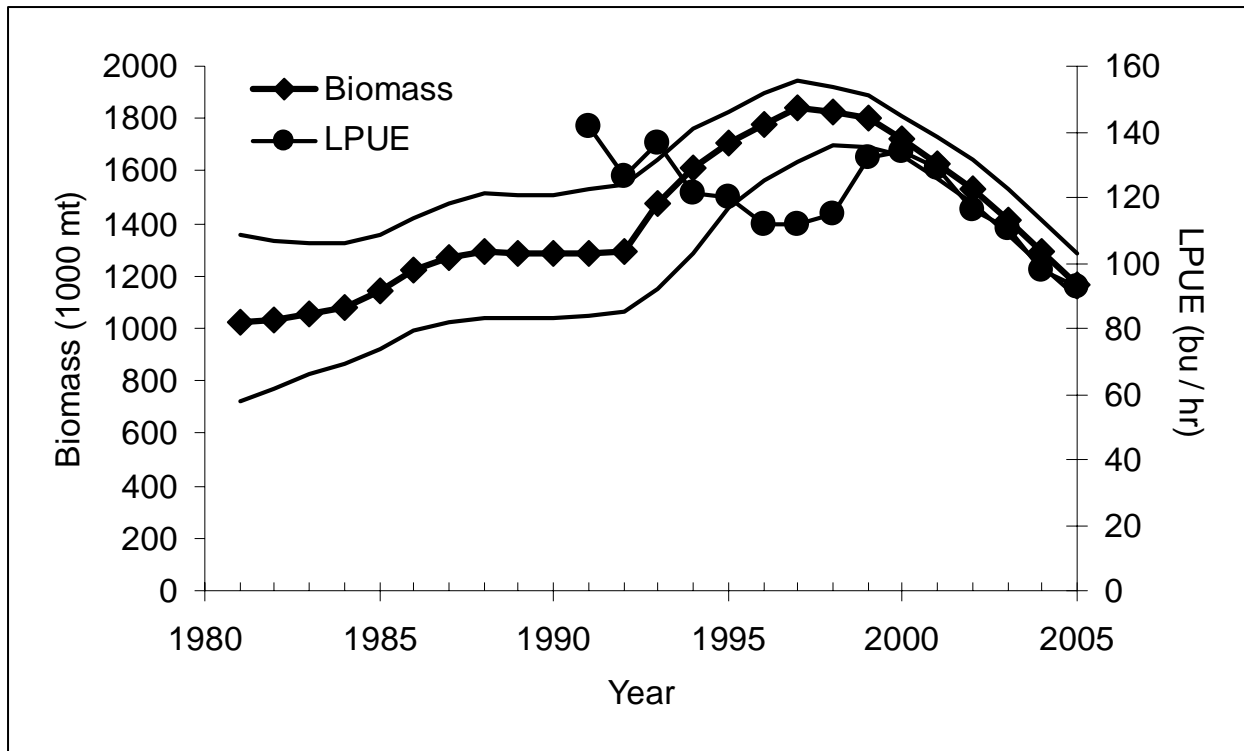
# Atlantic Surfclam - Landings



By region →



## C. Atlantic Surfclam - Biomass



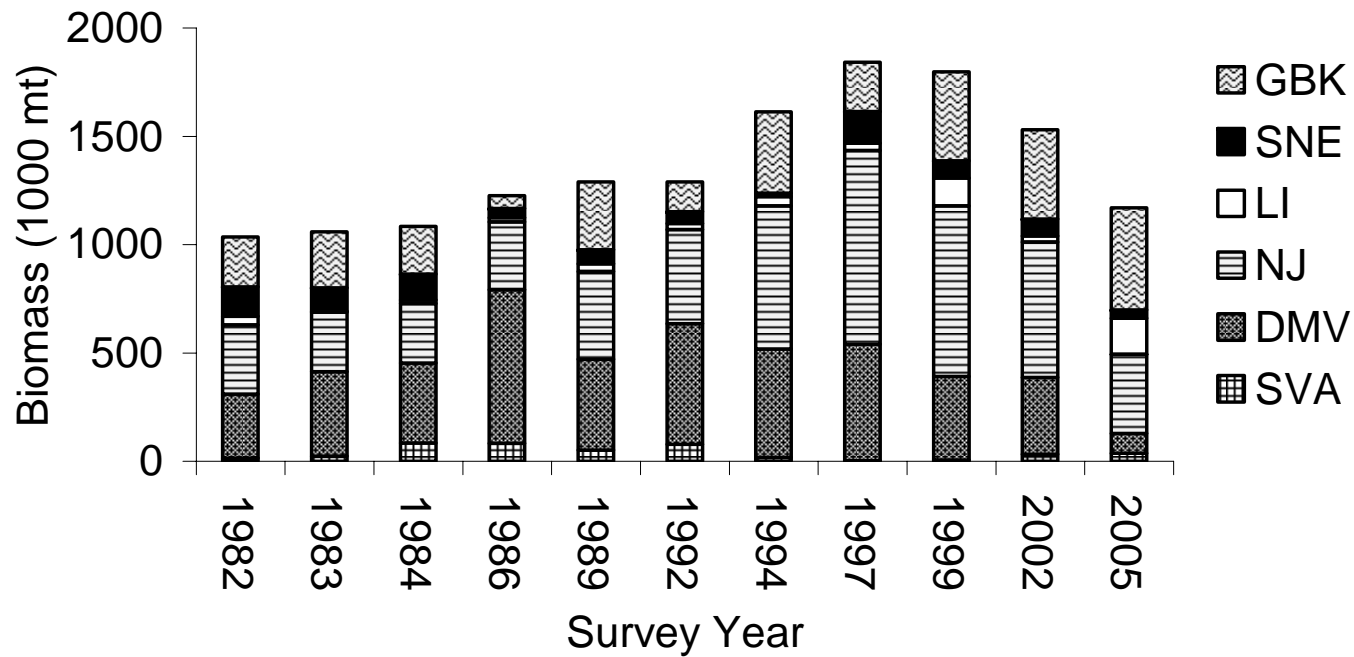
**1. Biomass is declining.**

**2. Commercial LPUE shows the same trend as the assessment model.**

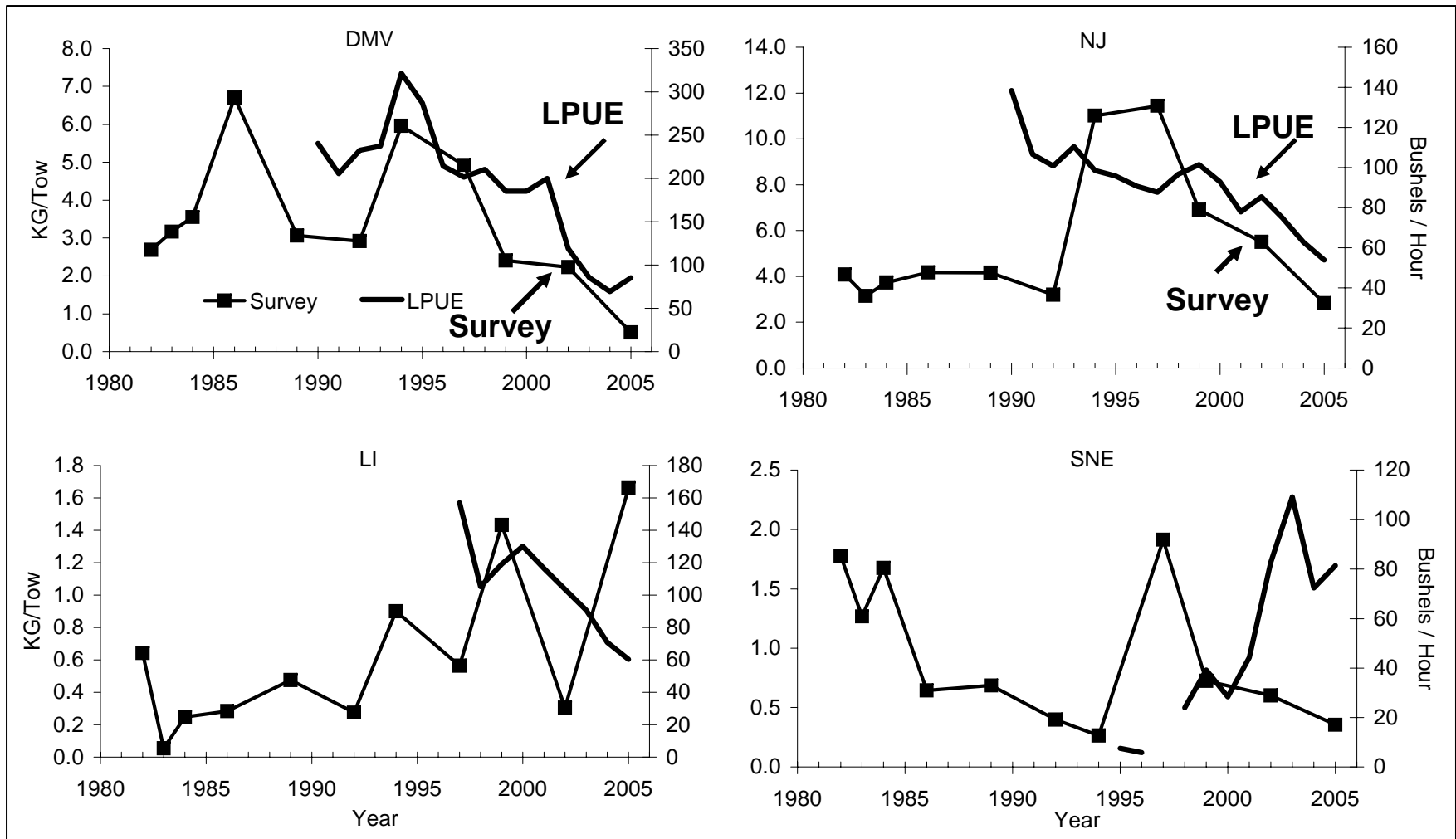
## Atlantic Surfclam - Biomass by Region

**Biomass is declining and a greater fraction is on GBK,**

**22% (in 1982) vs. 41% (in 2005).**

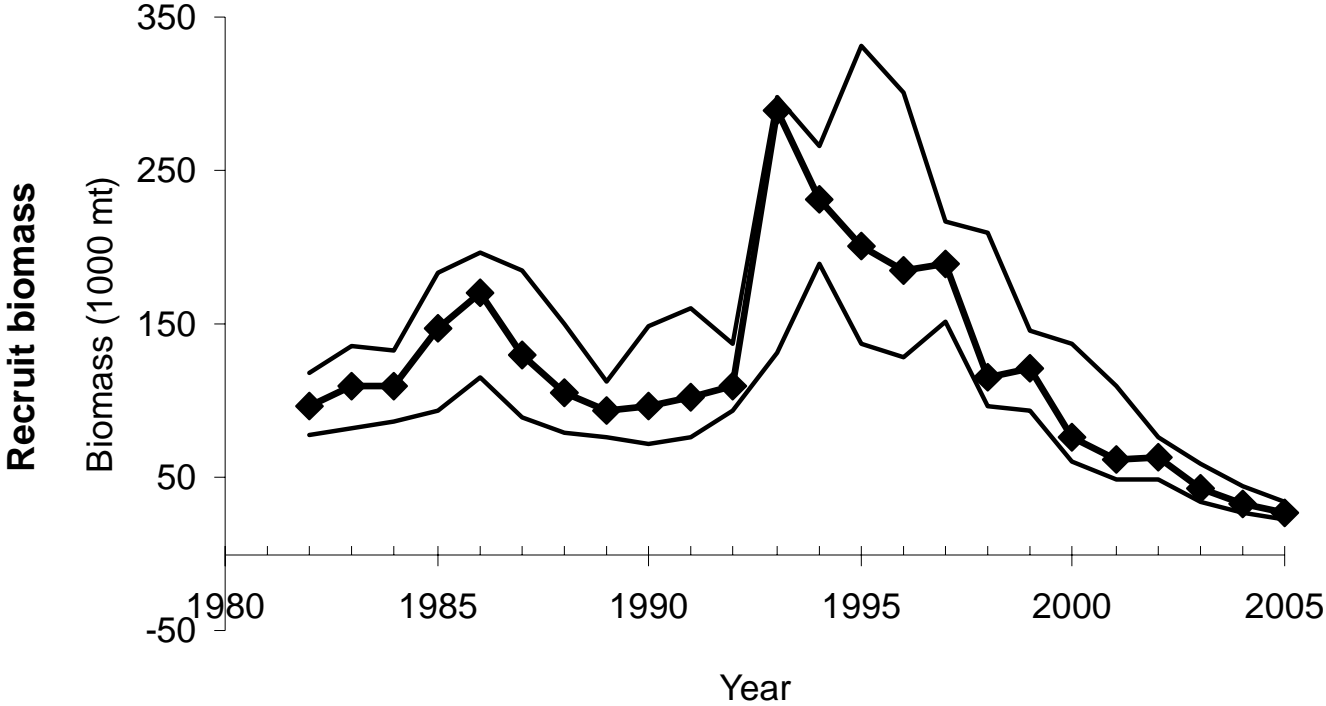


# Atlantic Surfclam - LPUE and Survey Index



## Atlantic Surfclam - Recruitment and Growth

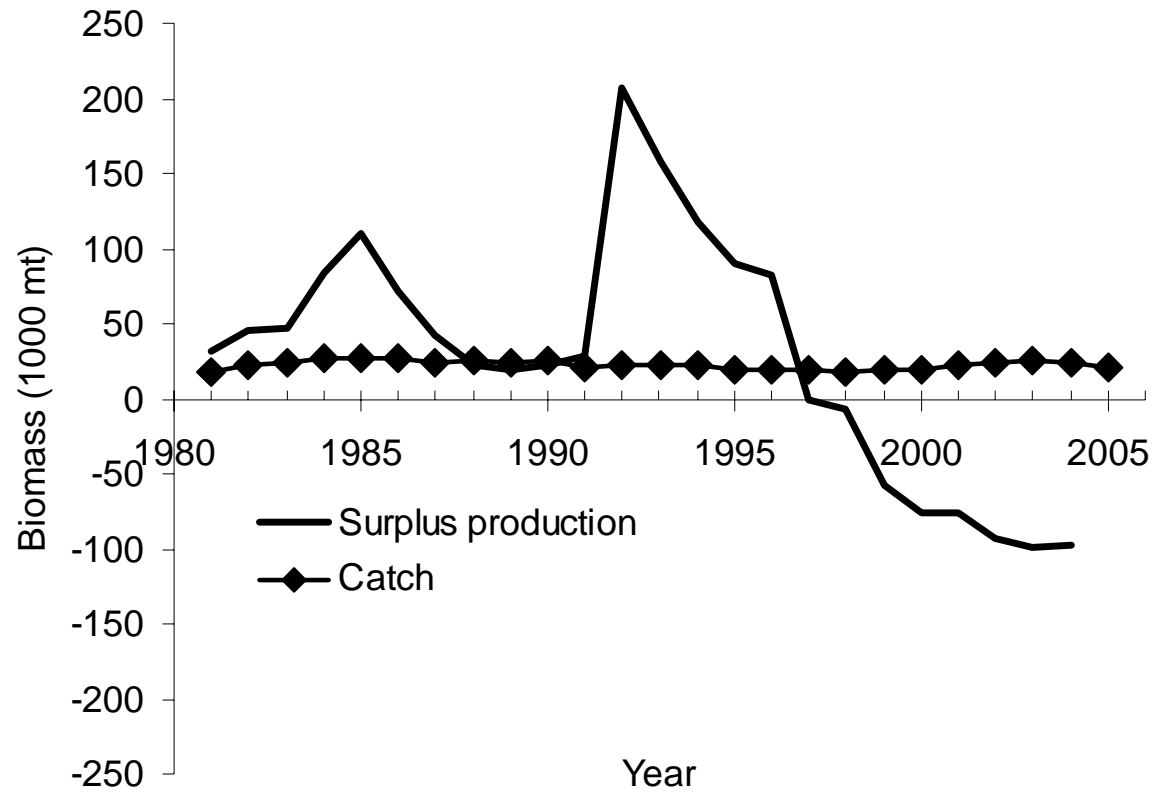
**Recruitment has declined recently,  
and is now lowest in the time series.**



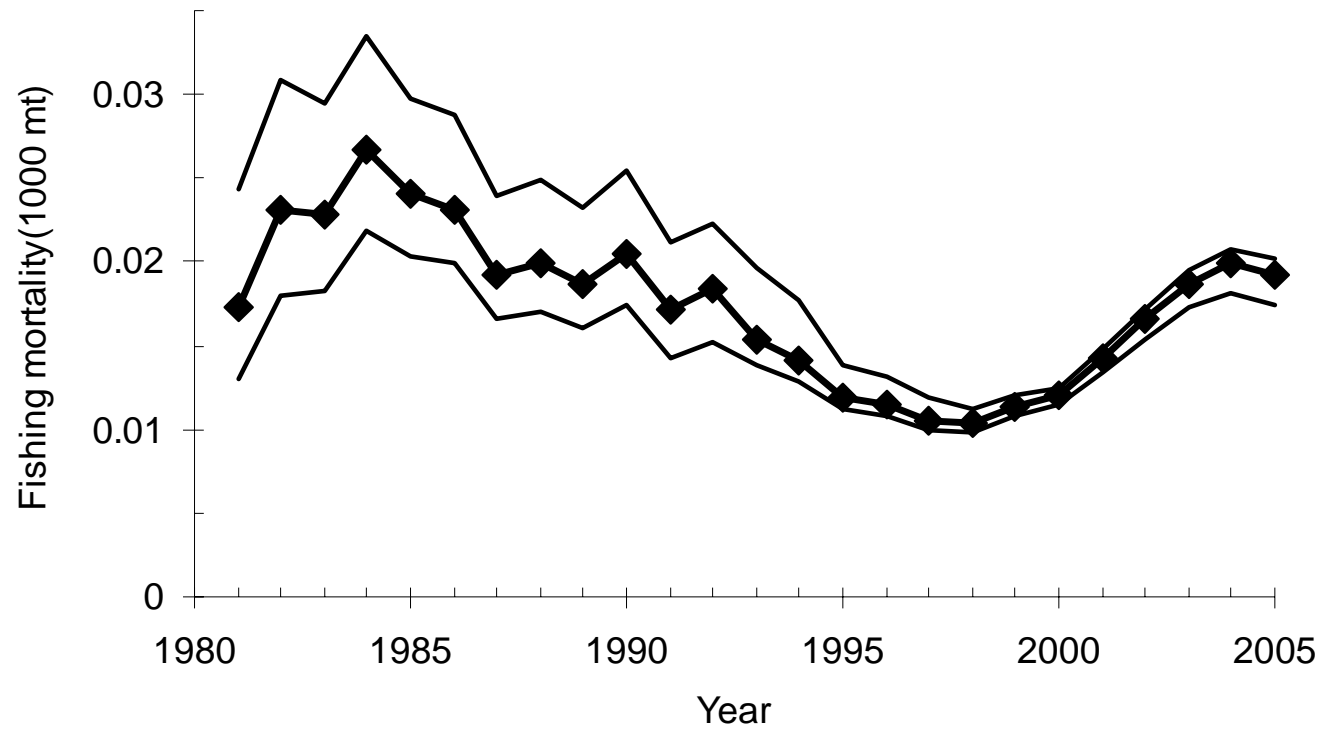
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**Growth rate has also declined.**

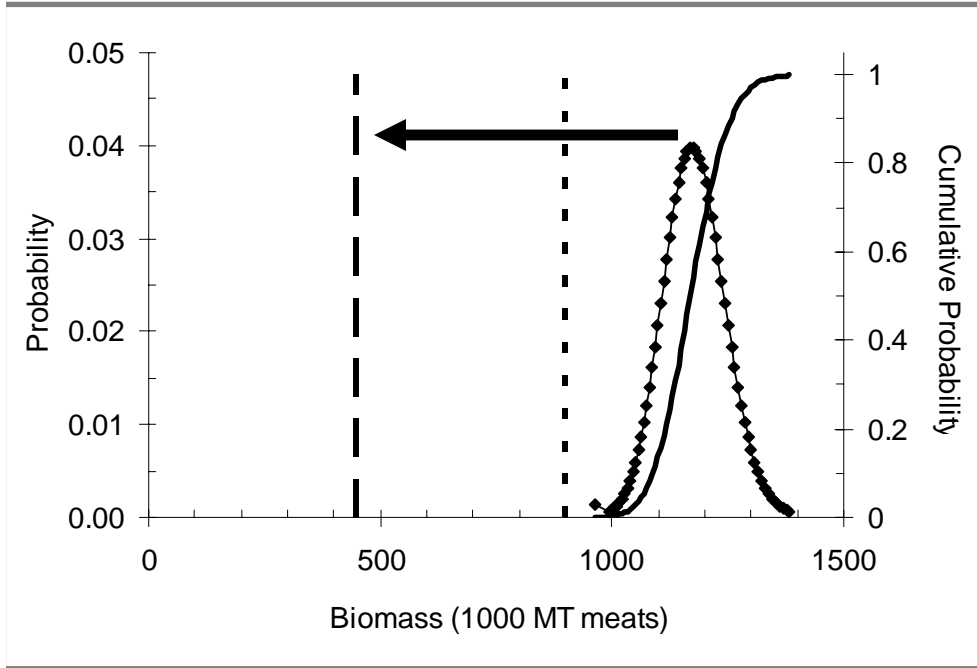
## Atlantic Surfclam - Surplus Production and Landings



## Atlantic Surfclam - Fishing Mortality

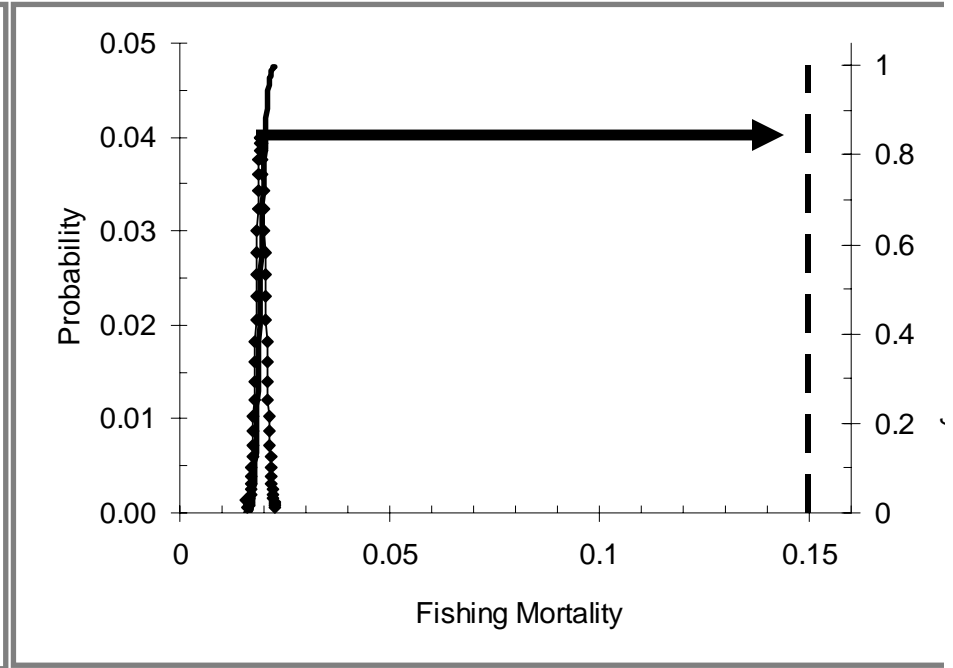


### C. Atlantic surfclam – Stock Status in 2005



**Biomass**

**Not Overfished**



**Fishing Mortality Rate**

**Not Overfishing**

## Atlantic Surfclam - Example Projections

Year	Example 1: Landings = min quota = 1.85 million bu	Example 2: Status quo landings = mean 2003-2005 = 3.042 million bu	Example 3: Landings = max quota = 3.4 million bu	Example 4: $F = F_{MSY}$ = $M = 0.15$	CV
<i>Annual Catch in 1000s mt (= landings + 12%)</i>					
All	16.0	26.3	29.4	variable	NA
<i>Biomass (1000 mt)</i>					
2005	1,198	1,198	1,198	1,198	251%
2006	1,093	1,093	1,093	1,093	275%
2007	1,010	1,001	998	889	322%
2008	944	925	920	739	417%
2009	892	866	858	632	560%
2010	856	823	813	559	744%
<i>Fishing mortality (annual rate)</i>					
2005	0.0188	0.0188	0.0188	0.0188	255%
2006	0.0156	0.0258	0.0288	0.1500	279%
2007	0.0169	0.0282	0.0317	0.1500	327%
2008	0.0181	0.0306	0.0345	0.1500	412%
2009	0.0193	0.0329	0.0372	0.1500	531%
2010	0.0202	0.0349	0.0396	0.1500	676%

**Biomass expected to decline through 2010.**

## **Atlantic Surfclam - Comments**

- 1. Recruitment is down.**
- 2. Growth rate is down.**
- 3. Population biomass is projected to decline gradually through 2010.**

## Surfclam – Reviewers Comments

**An age-structured model would be more appropriate than KLAMZ (delay-difference model).**

**Improve methods of estimating missing survey data.**

**The proxy for Bmsy is questionable, and might be re-examined next time.**