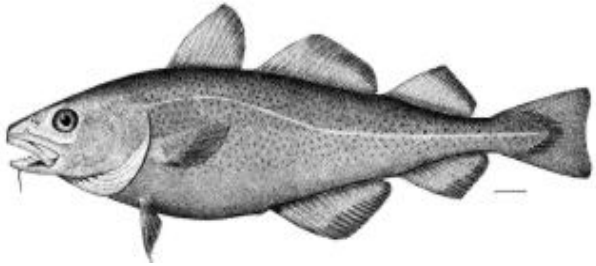
# TRAC Status Reports

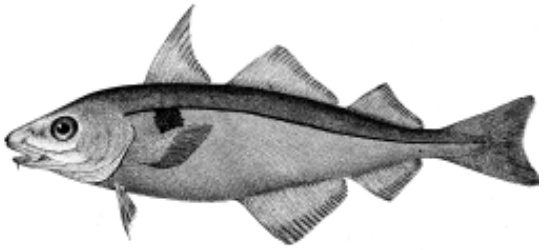
# Eastern Georges Bank Cod and Haddock and Georges Bank Yellowtail

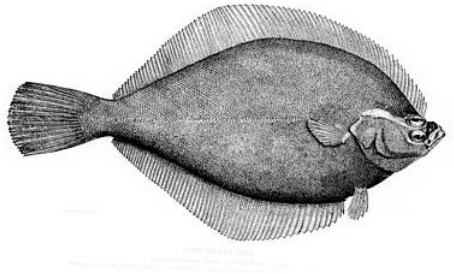
http://www.mar.dfo-mpo.gc.ca/science/trac/tsr.html

NEFMC
September 3, 2008
Providence, RI

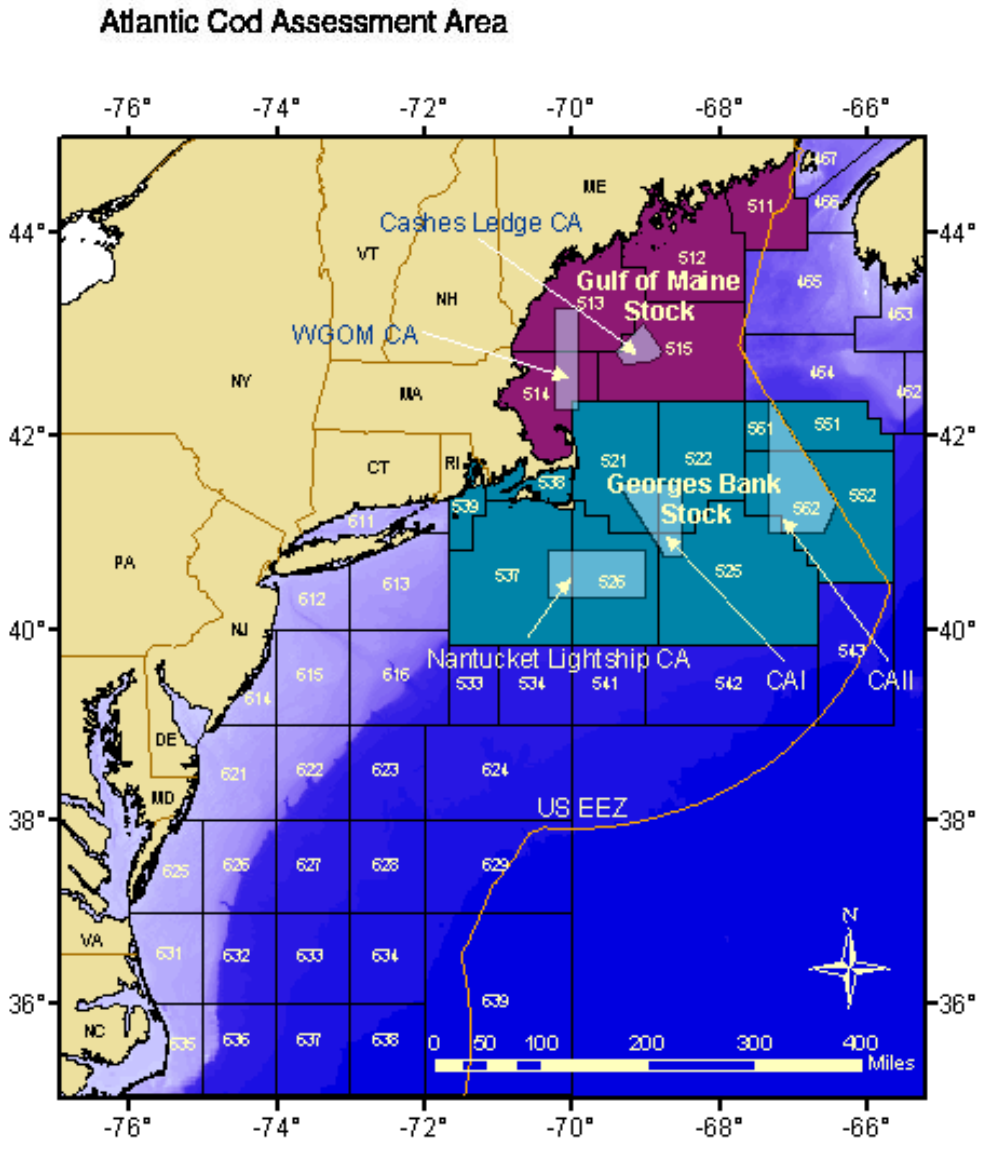
Loretta O'Brien

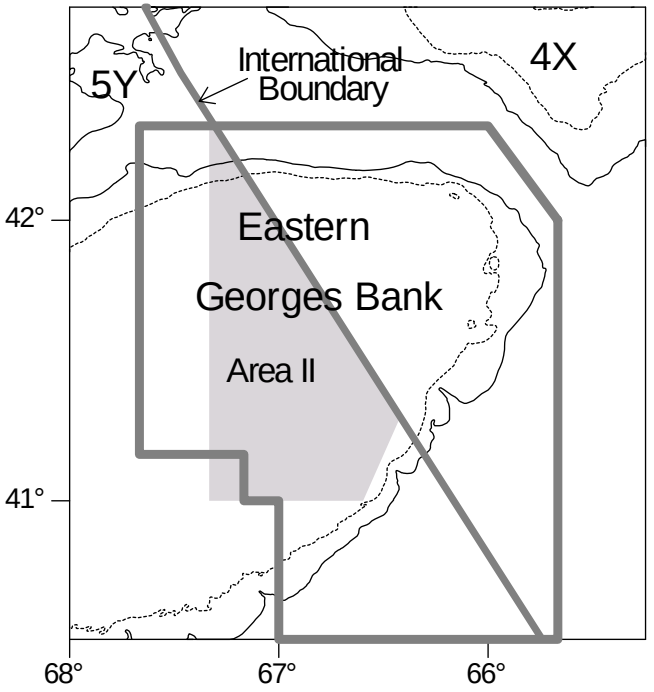


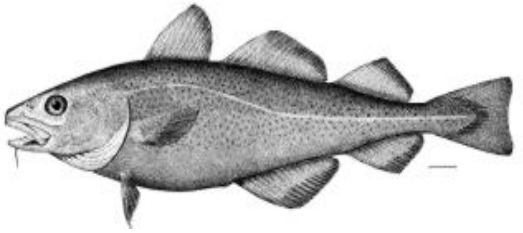




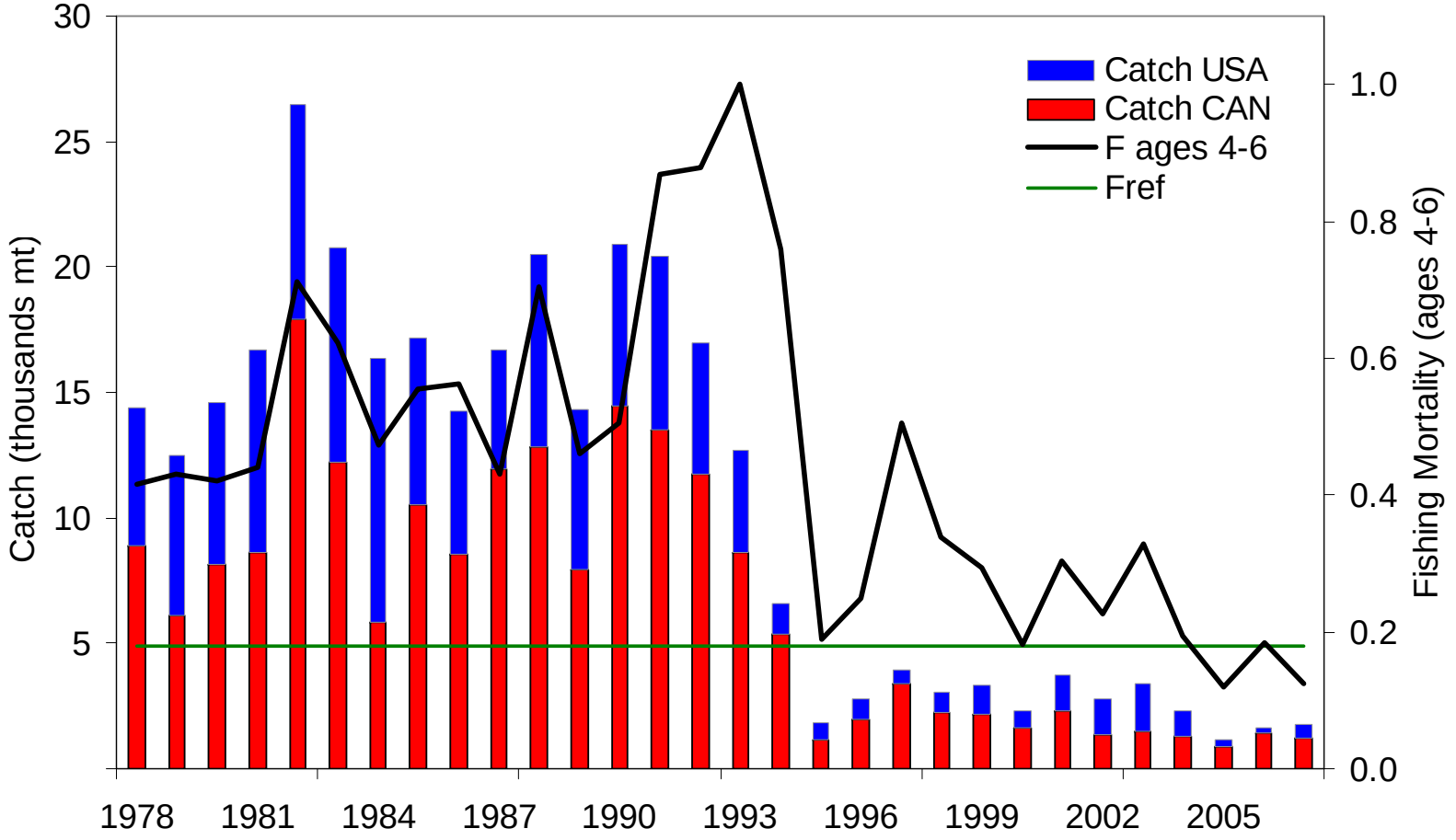
# Eastern Georges Bank Cod



# EGB Cod: Catches & Fishing Mortality

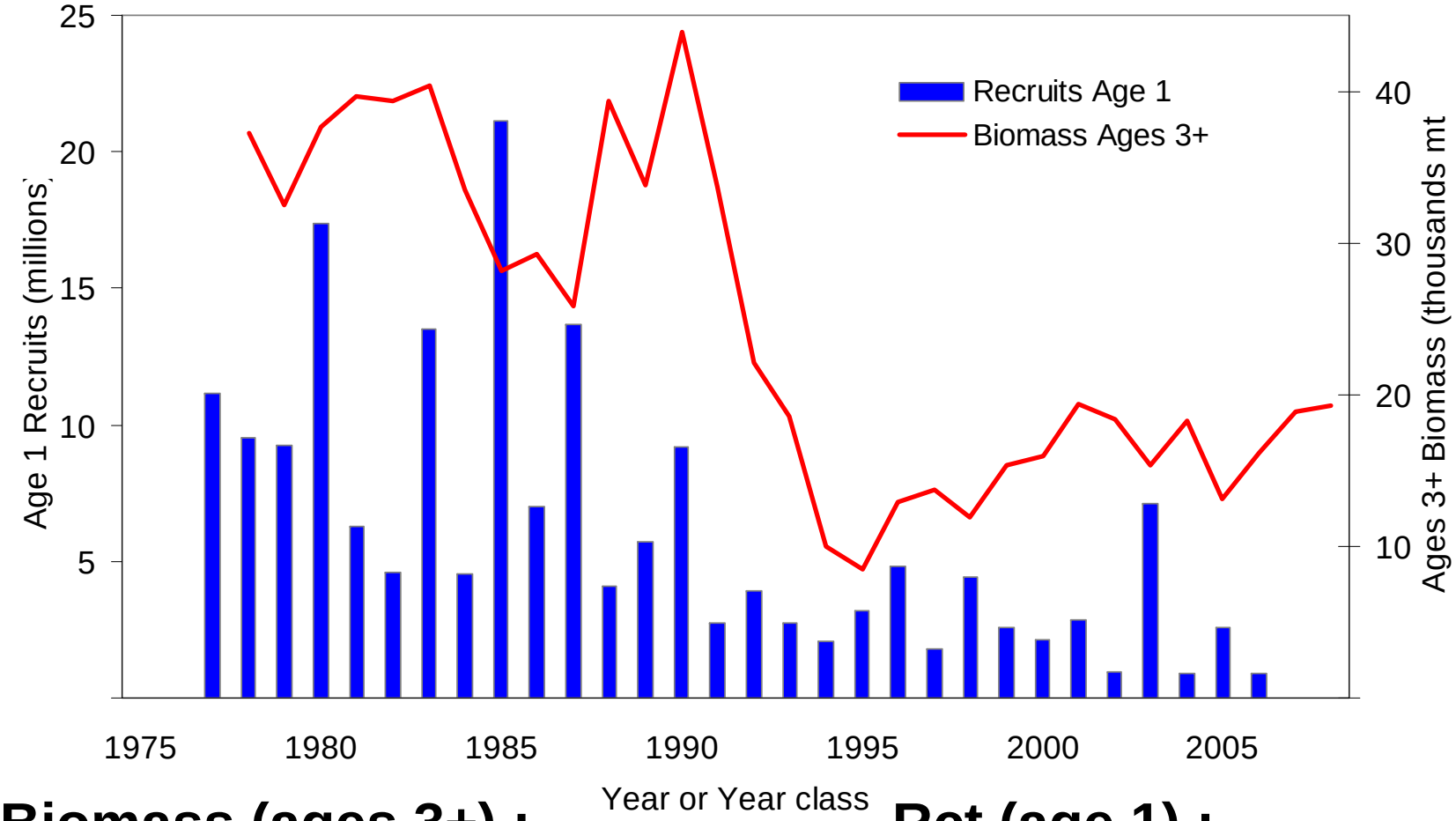



**Total USA/CDN 2007 catch = 1,796 mt (472 mt discards)**

**USA 2007 catch = 564 mt (348 mt discards)**

**F: 2007 = 0.12, below Fref = 0.18**

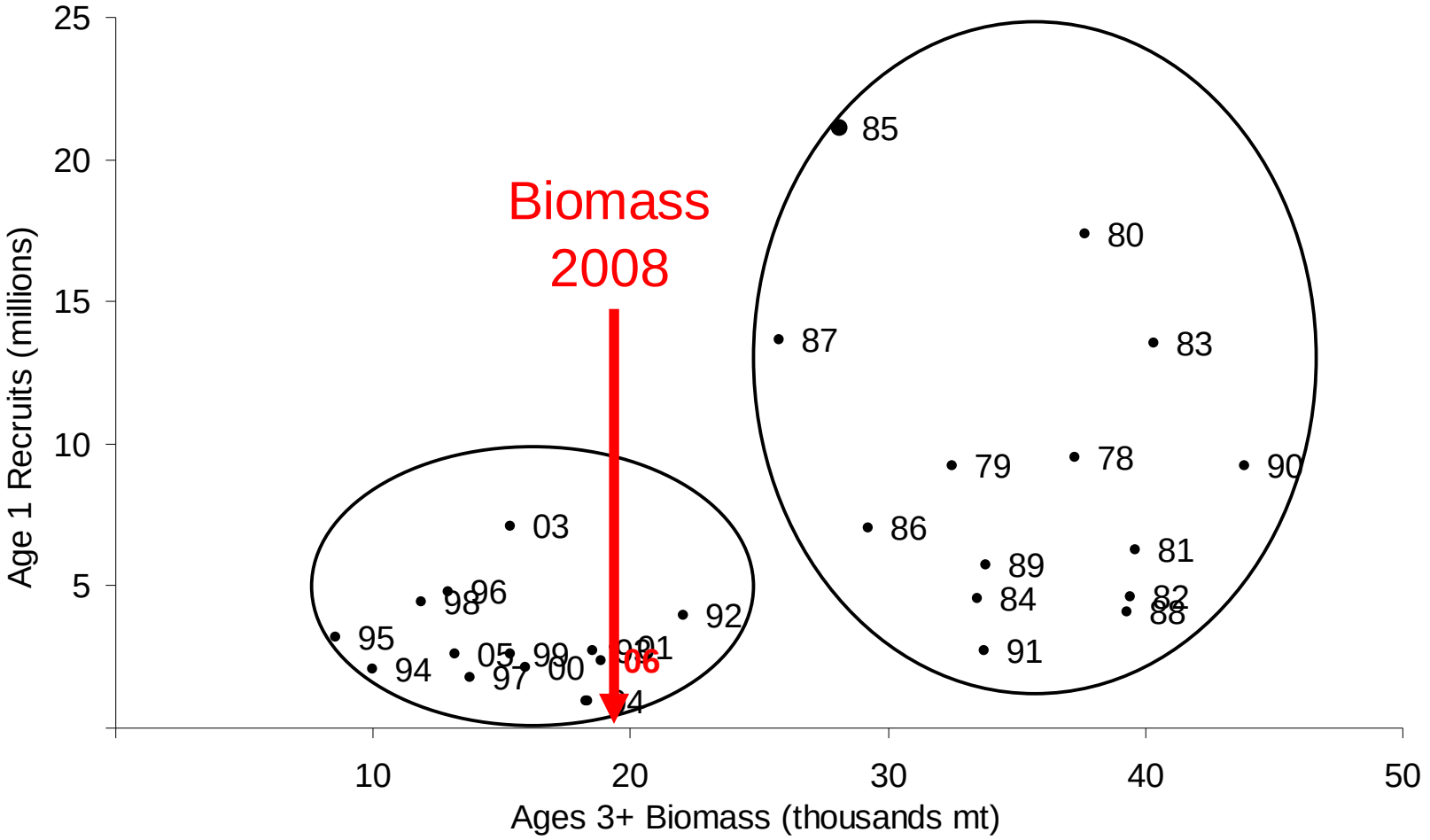
# EGB Cod: Biomass & Recruitment




**Biomass (ages 3+) :**
**19,400 mt (2001)**
**13,200 mt (2005)**
**19,300 mt (2008)**

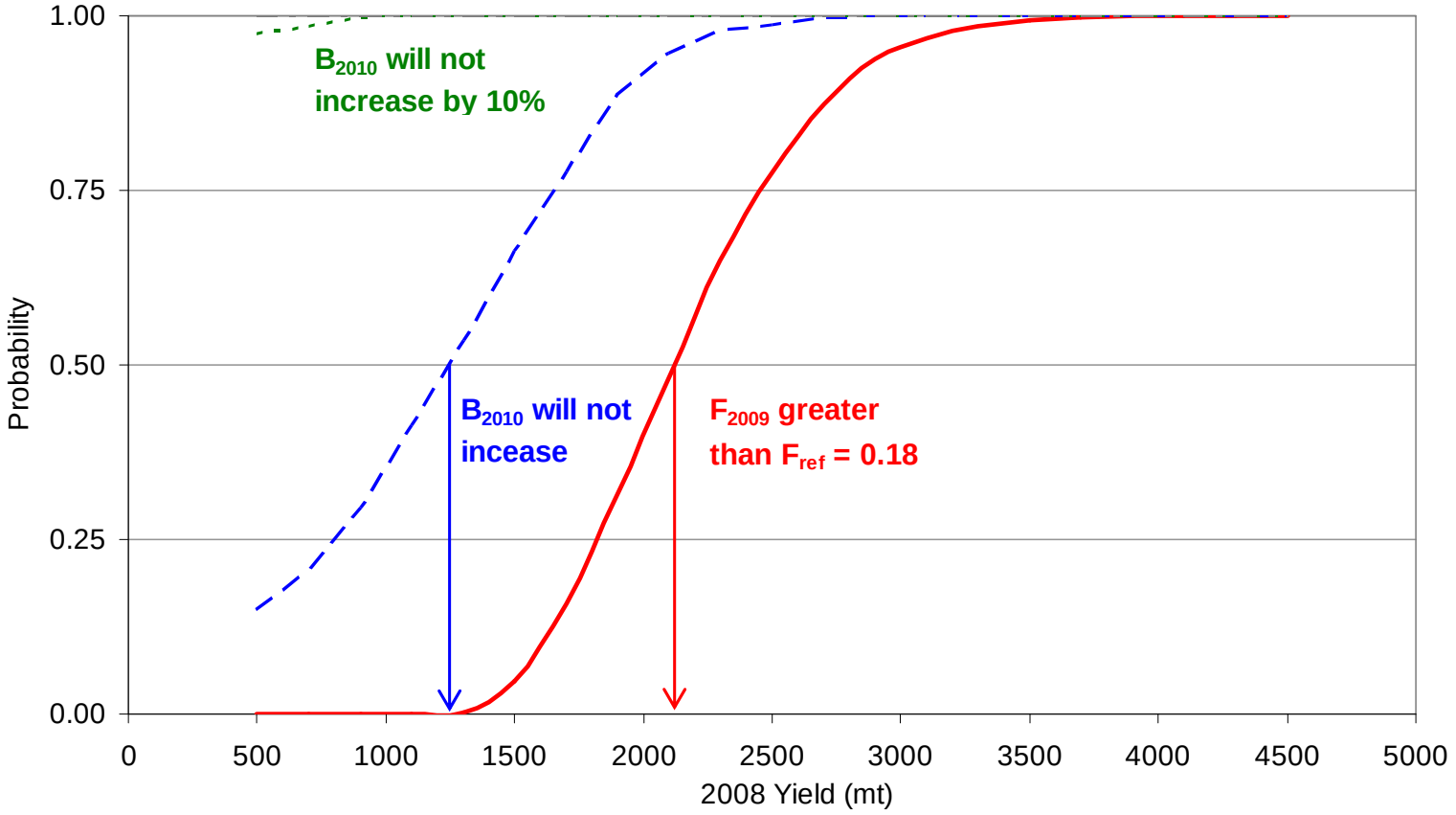
**Rct (age 1) :**
**2003 (7.1 million)**
**1990 (9.2 million)**
**2002, 2004, 2006 yc lowest**

# EGB Cod: Stock Recruitment Patterns




**Better rct > 25,000 mt ; Current biomass < 25,000 mt**
**Resource productivity low: declines in waa. , poor rct**
**F below Fref : maintain higher biomass inc. chance good rct**

# EGB Cod: Projection Risks & 2009 TAC




**2,100 mt in 2009 ~ 50% risk F2009>Fref**

**1,300 mt in 2009 ~ 50% risk 2010 B lower than 2009 Biomass**

**10% B increase unlikely even with no catch**

**2003 yc proj. contribute > 50% catch B in 2008-2009**

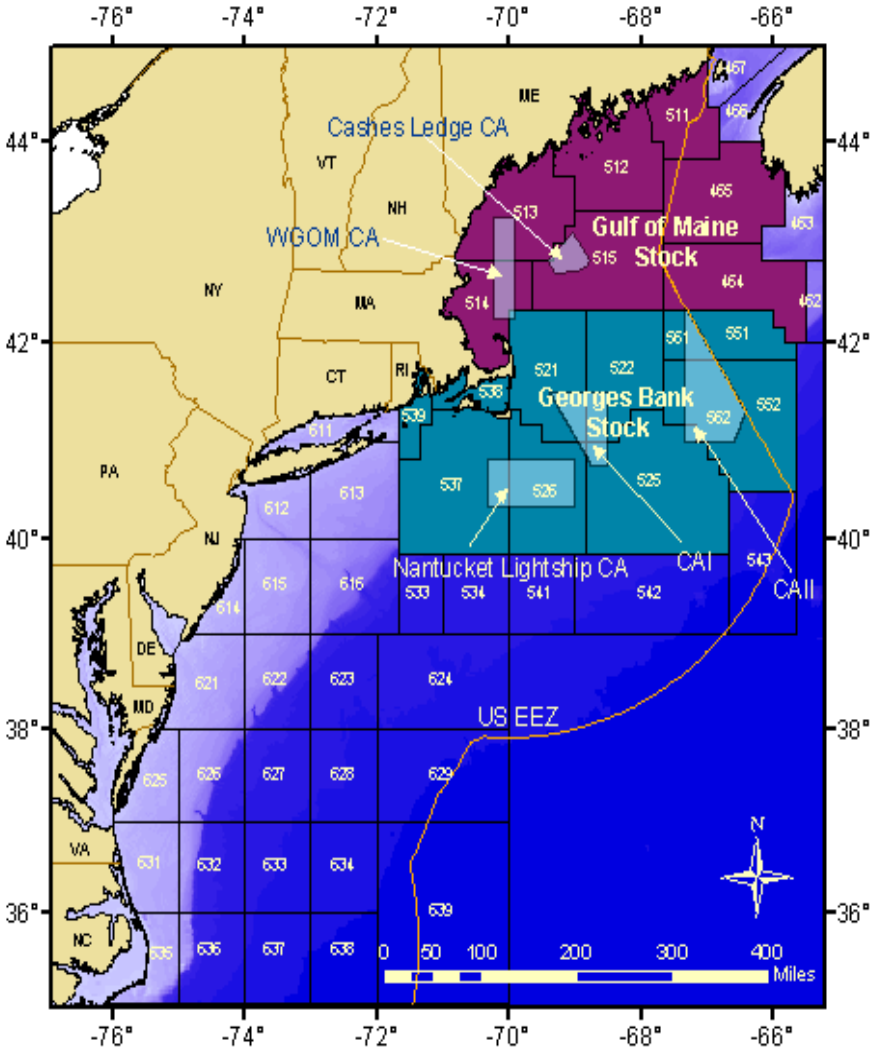
# EGB Cod Summary

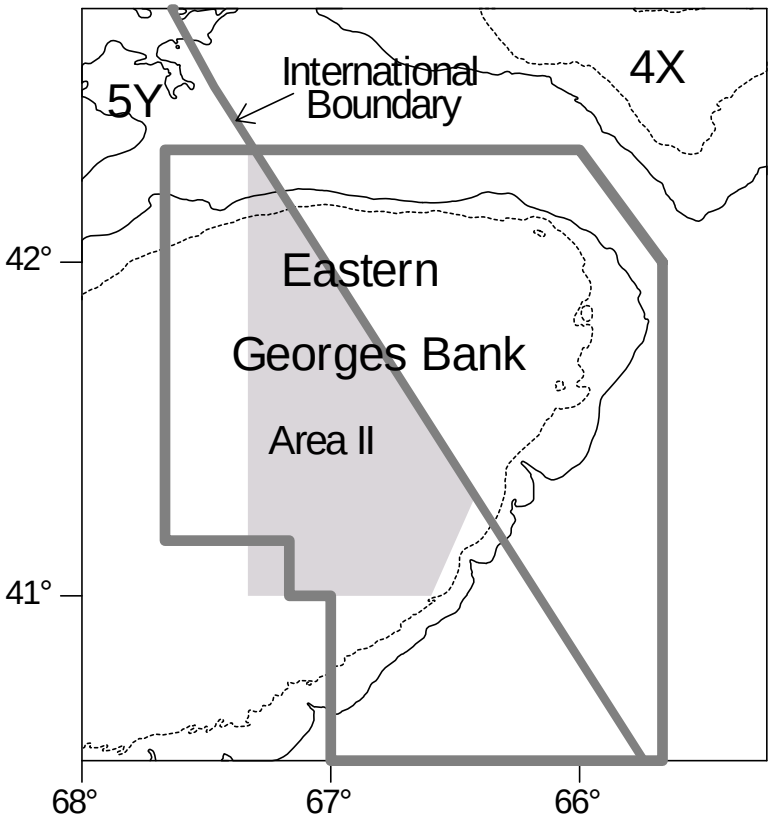
- F reduced in 2007
- Above average 2003 yc

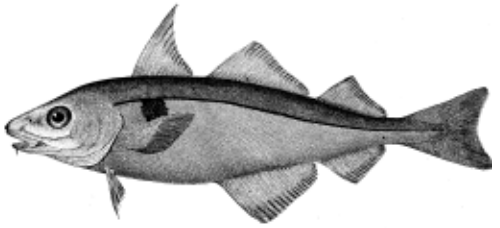
- Recent recruitment generally poor
- Lower weight at age

- Lower quota required to prevent biomass decline

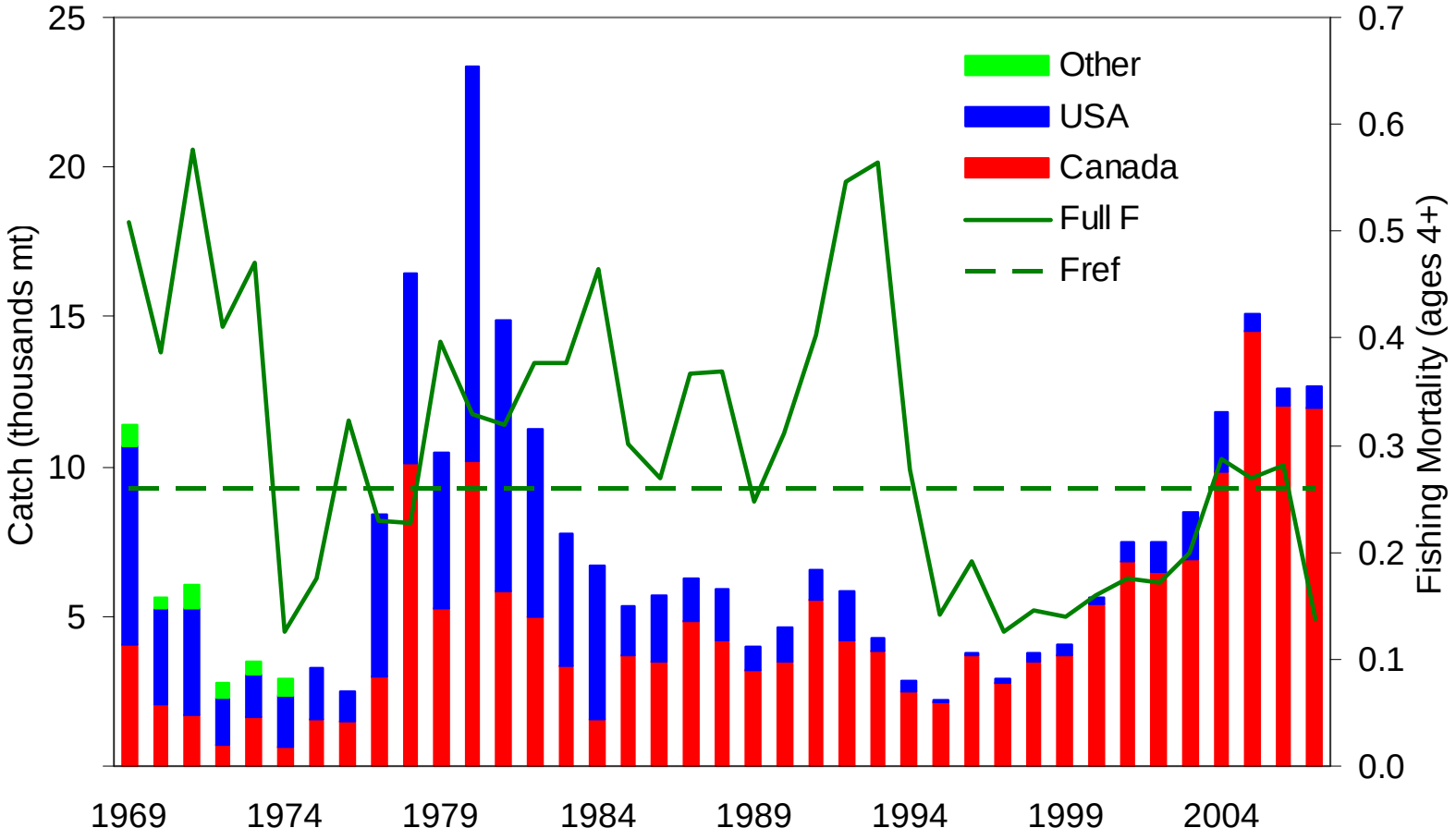
# Eastern Georges Bank Haddock



# EGB Haddock: Catches & Fishing Mortality

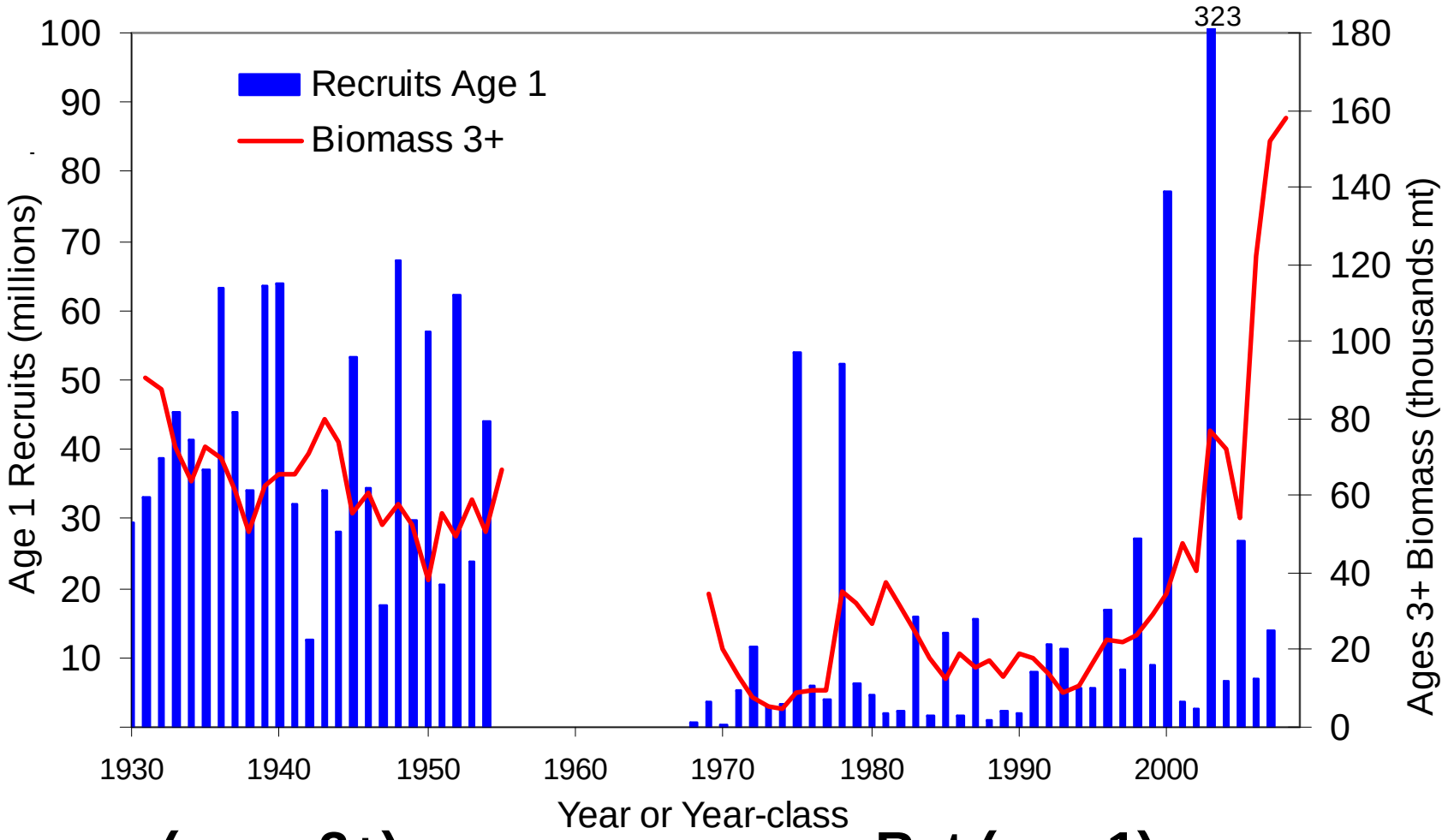



**Total USA/CDN 2007 catch = 12,680 mt (543 mt discards)**

**USA 2007 catch = 729 mt (482 mt discards)**

**F: 2007 = 0.14, below Fref = 0.26**

# EGB Haddock: Biomass & Recruitment




**Biomass (ages 3+) :**

**9,000 mt (1993)**

**77,100 mt (2003)**

**158,100 mt (2008)**

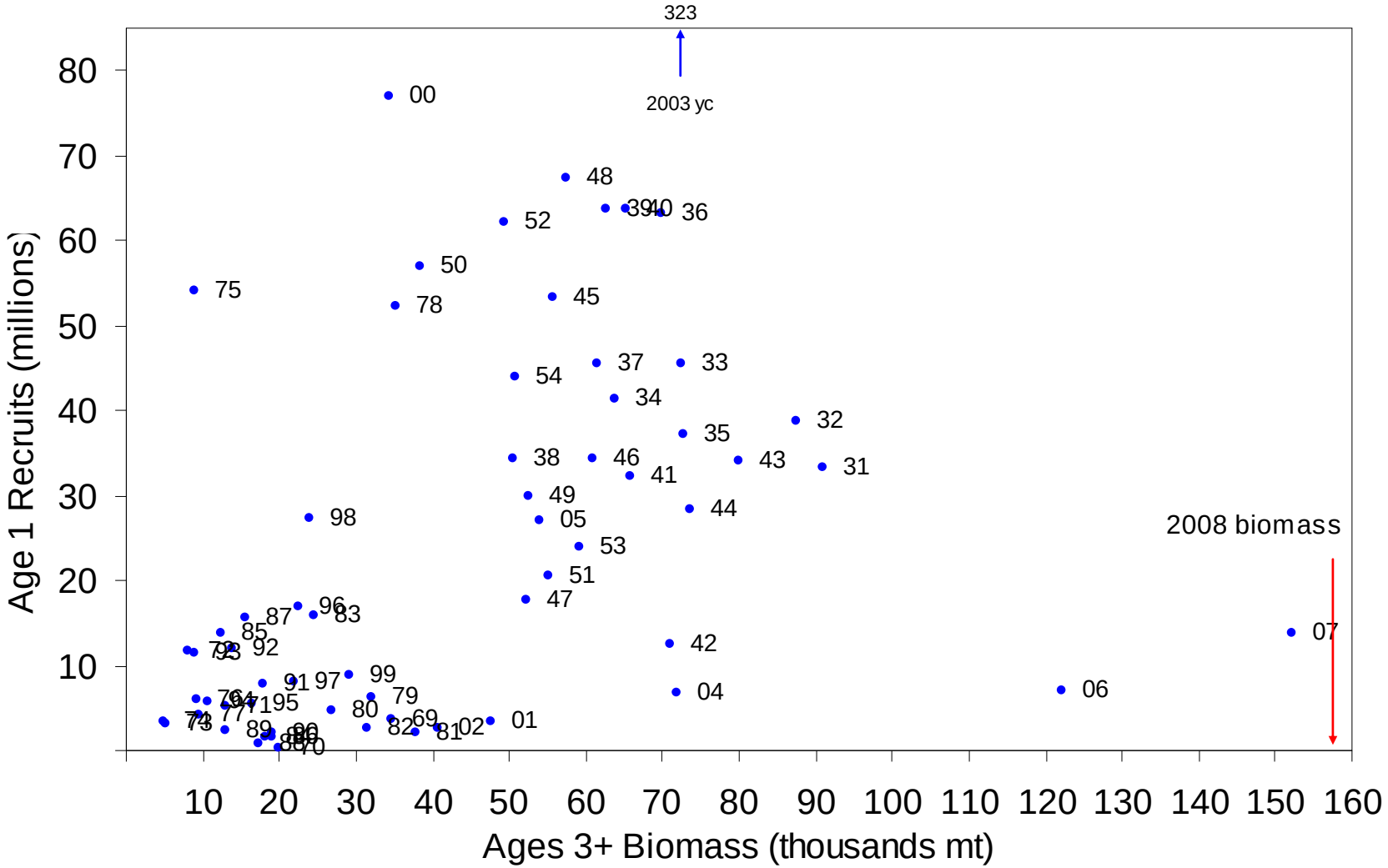
**Rct (age 1) :**

**2003 (322.7 million)**

**2005 (26.9 million, > 10-yr avg)**

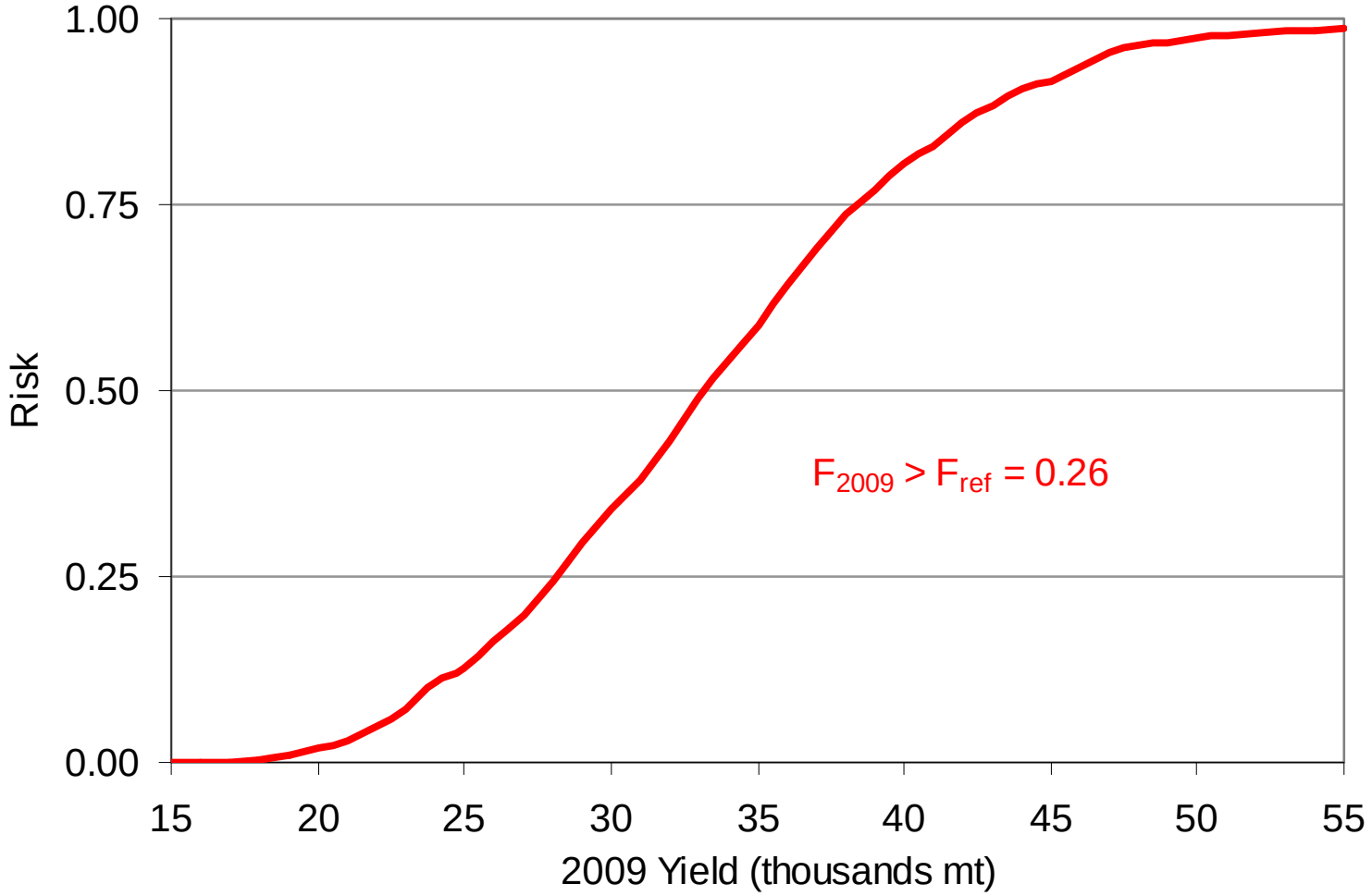
**'01,'02, '04, '06 yc < 10-yr avg**

# EGB Haddock: Stock Recruitment Patterns




**Better rct >40,000 mt ; Current biomass >150,000 mt**
**Resource productivity high: exp. age struc., broad spatial dist., imp.rct , only offset by declines in waa.**

# EGB Haddock: Projection Risks & 2009 TAC




**28,000 mt in 2008; 33,000 mt in 2009 ~ 50% risk F2009>Fref**

**28,000 mt in 2009 ~ 25% risk F2009>Fref**

**No concern re: biomass fluctuations at current biomass**

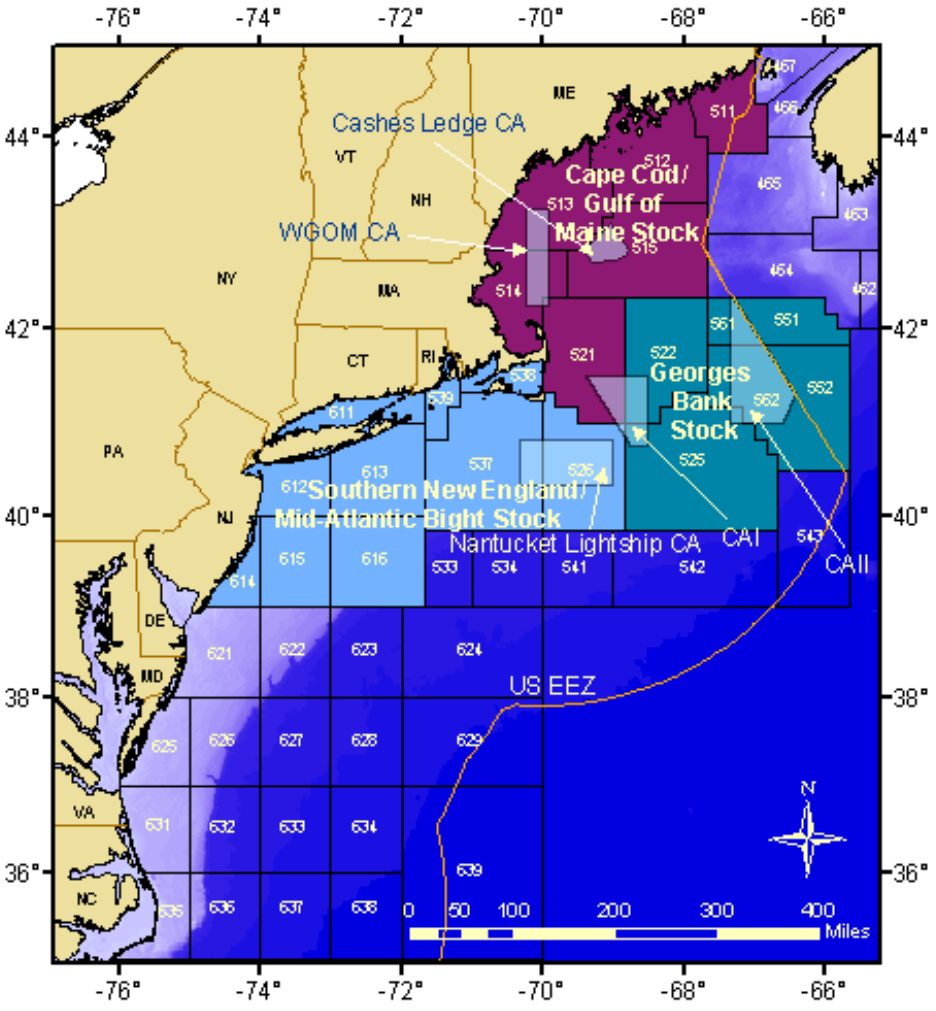
# EGB Haddock Summary

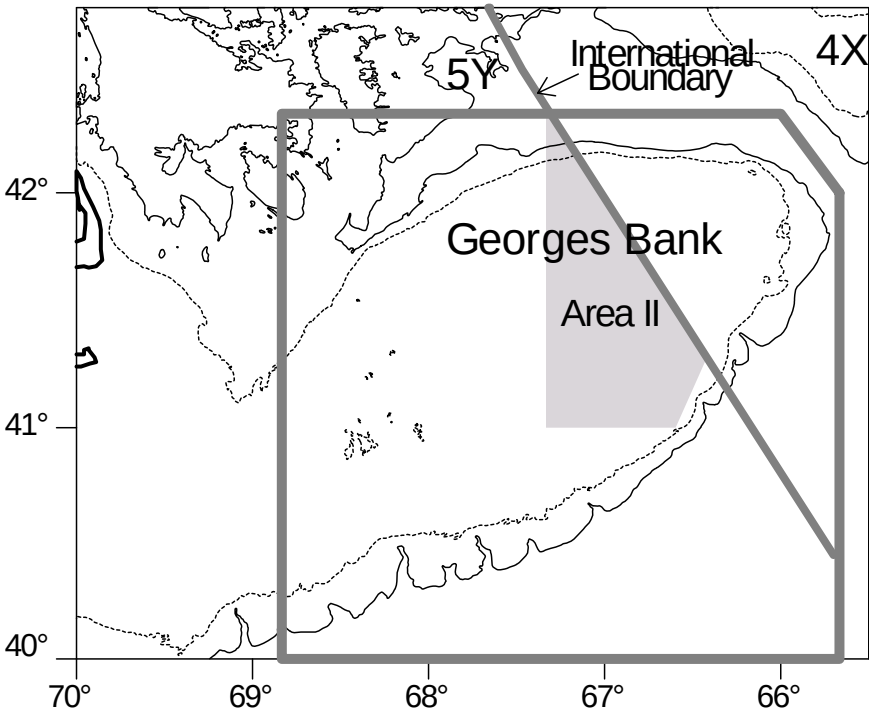
- Low F
- Improved recruitment
- High biomass

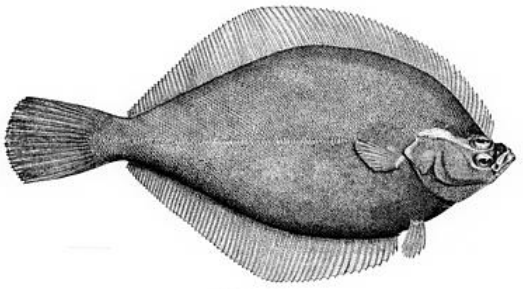
- Fishing up to $F_{ref}$ does not pose conservation concerns for haddock

- Catch of cod needs to be considered

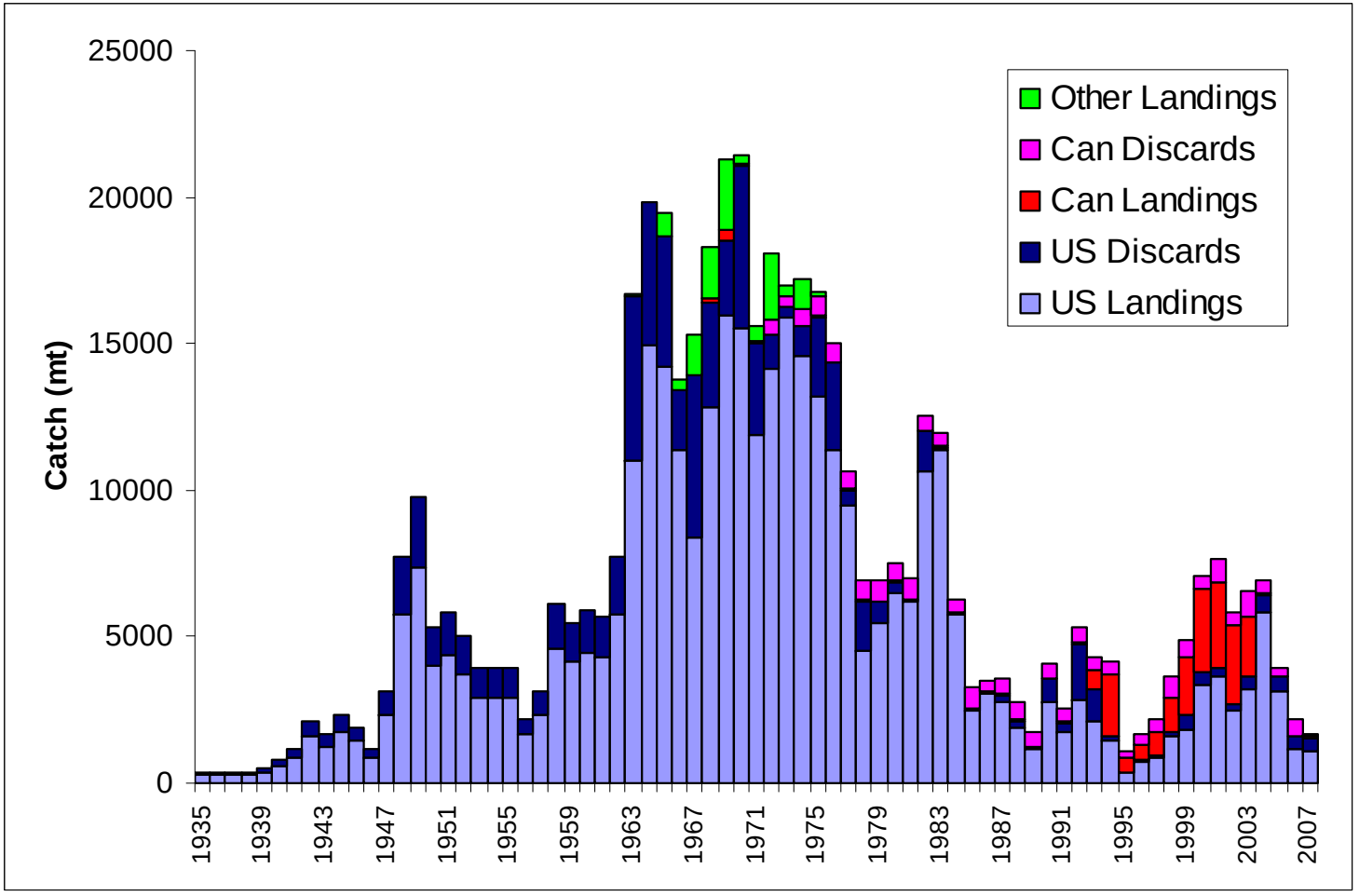
# Georges Bank Yellowtail Flounder



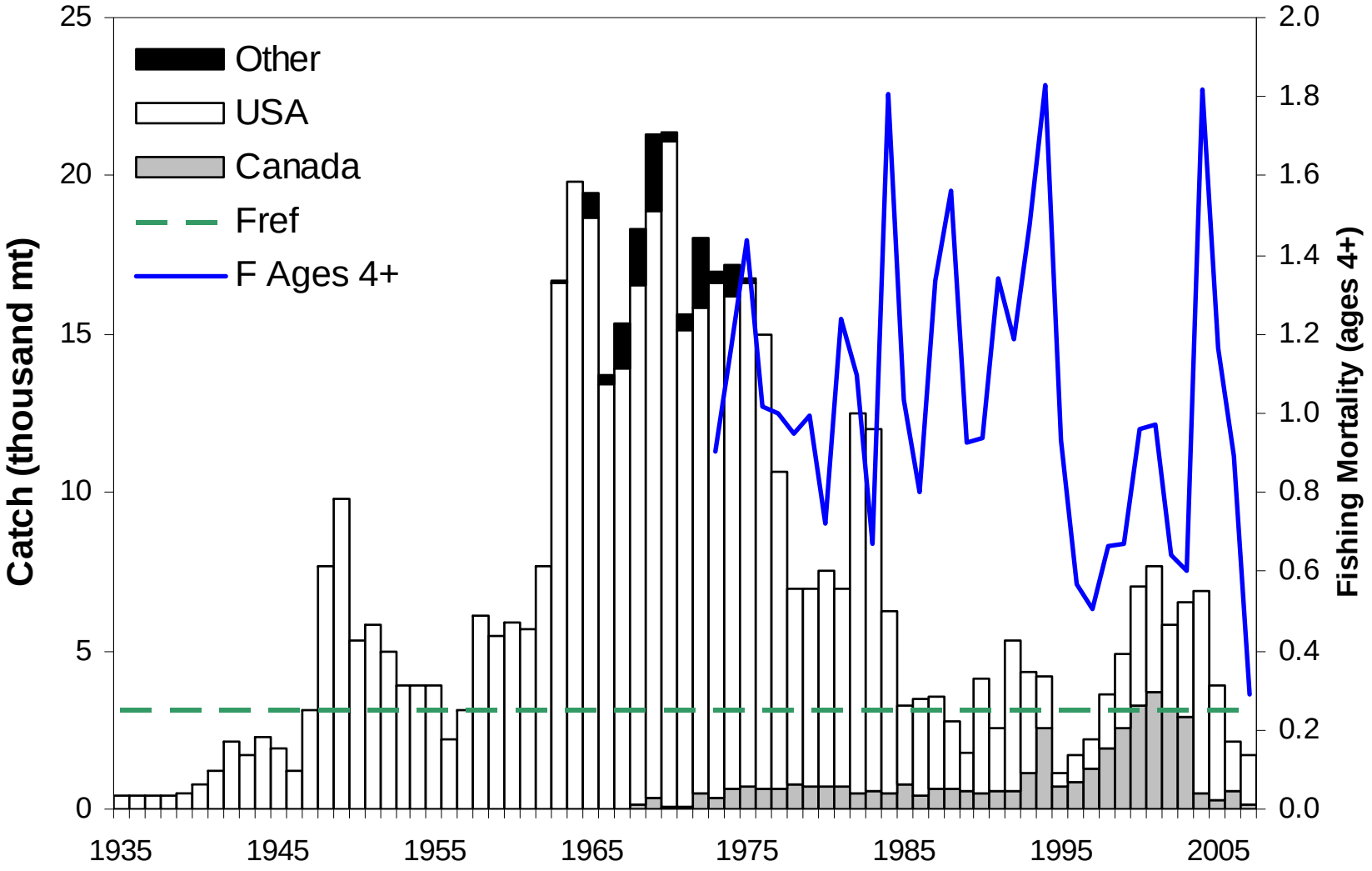
# GB Yellowtail: Catches




**Total USA/CDN 2007 catch = 1,686 mt (608 mt discards)**

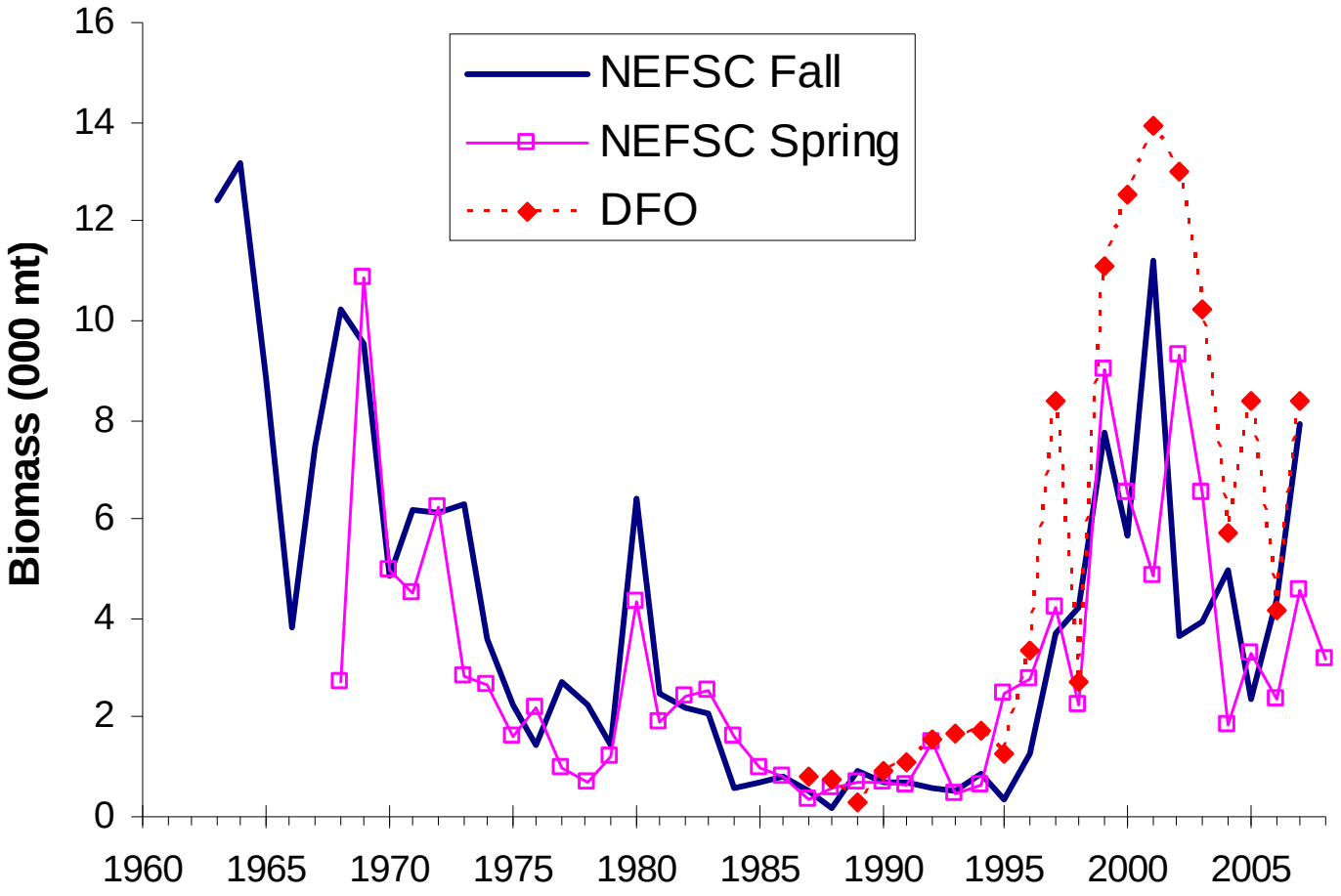
**USA 2007 catch = 1,061 mt (503 mt discards)**

# GB YT: Catches & Fishing Mortality




**F well above Fref = 0.25 except F2007 =0.29**

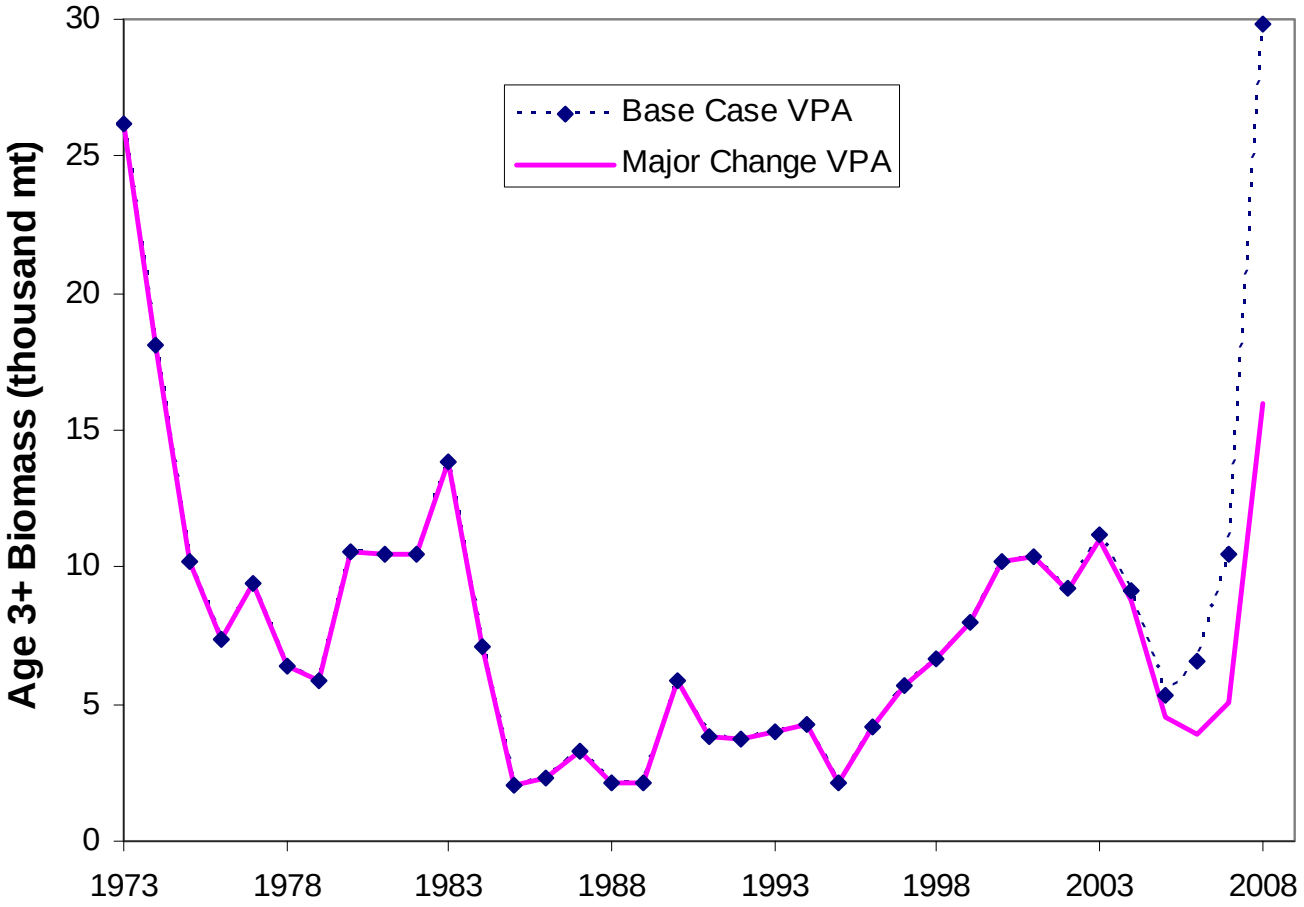
# GB YT: Survey Index Trends




**Biomass inc. from mid 1990s, peaked ~ 2000,**

**Declined until mid 2000s, increase in 2007 due 2005 yc**

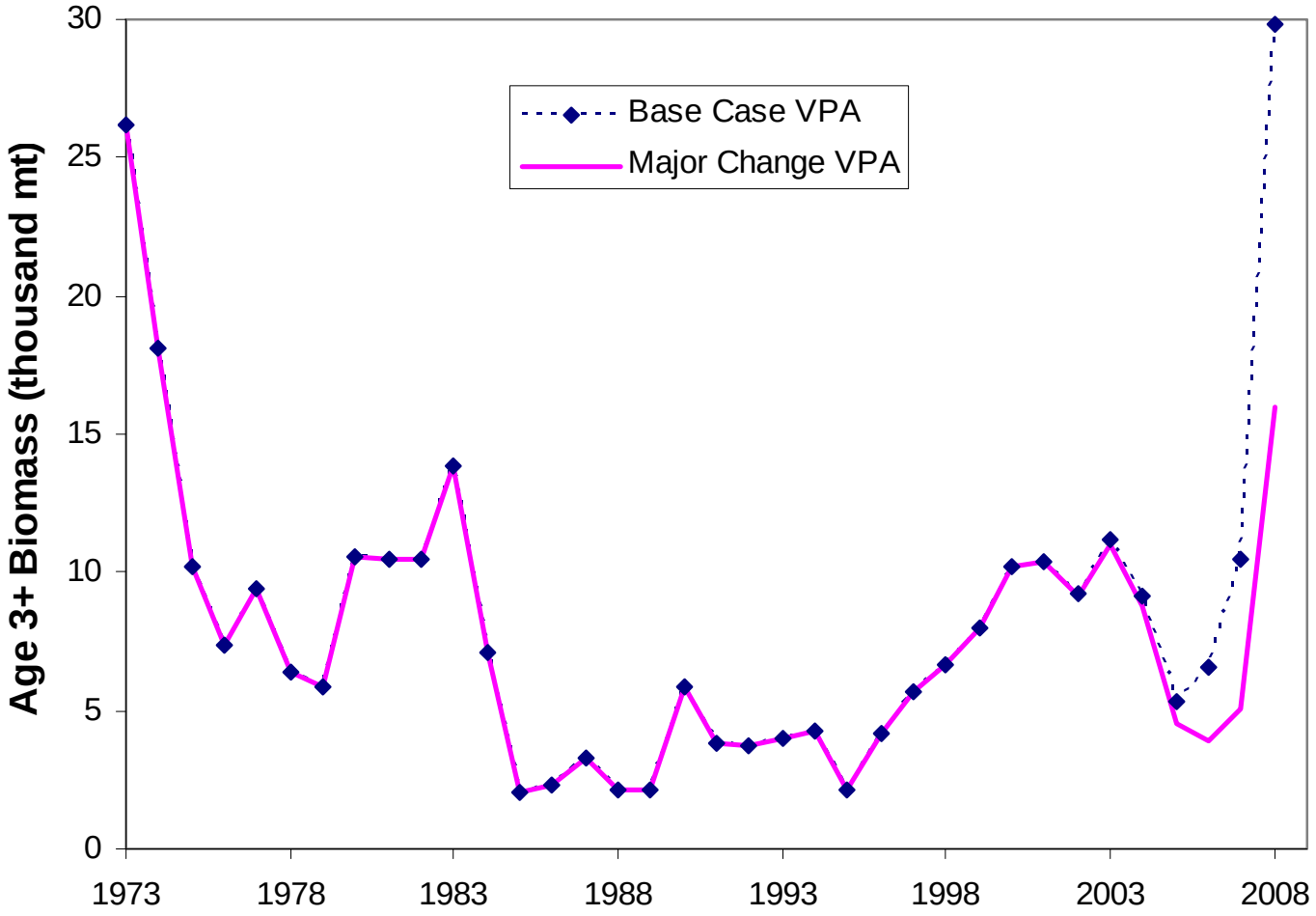
# GB YT: Model Fit




**Major Change: large changes in SV catchability adds uncertainty to assessment**

**Reflects Survey Trends in Abundance: recommended model**

# GB YT: Model Fit

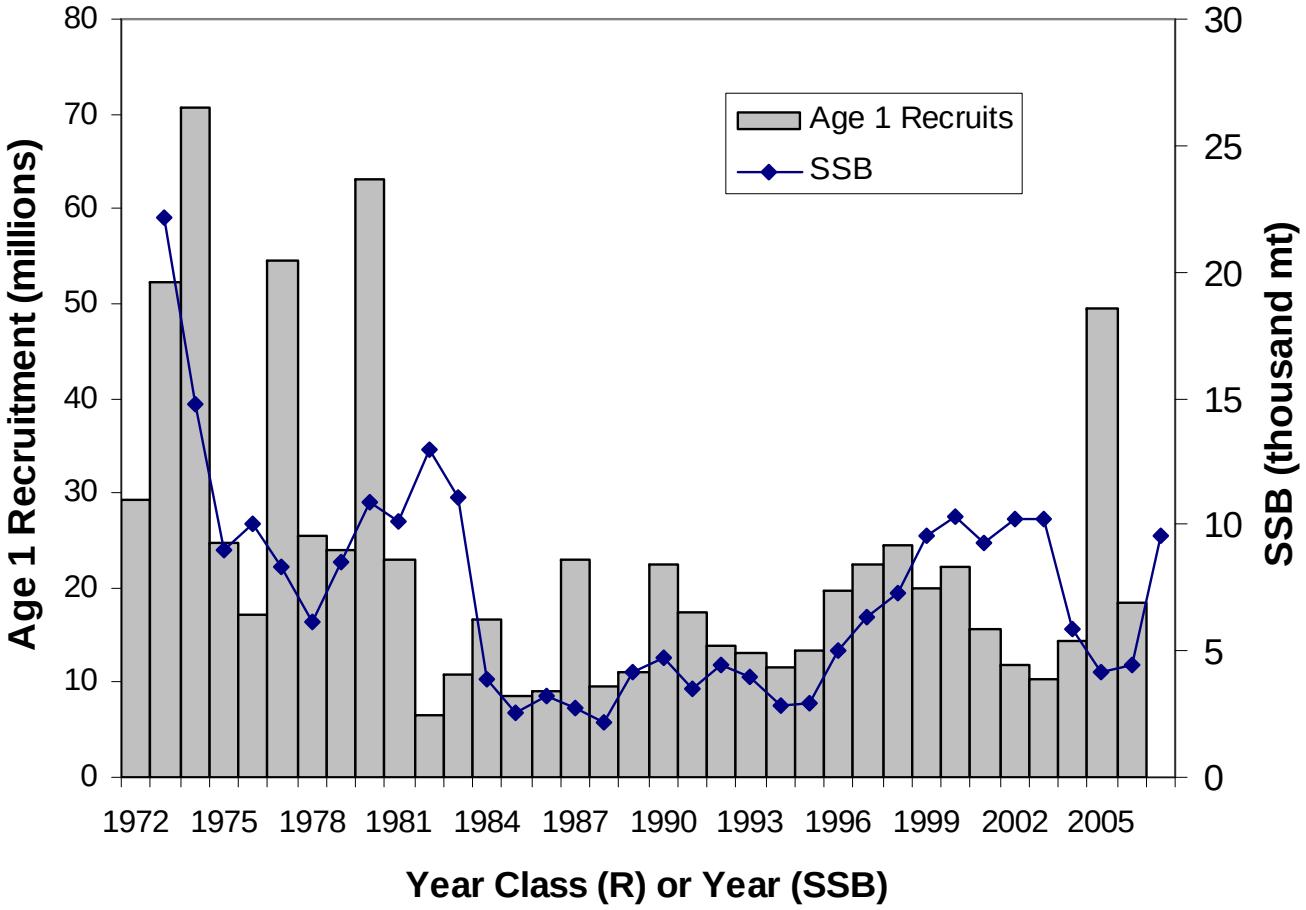



**Biomass (ages 3+) :**

**2,100 mt (1995)** **3,900 mt (2006)**

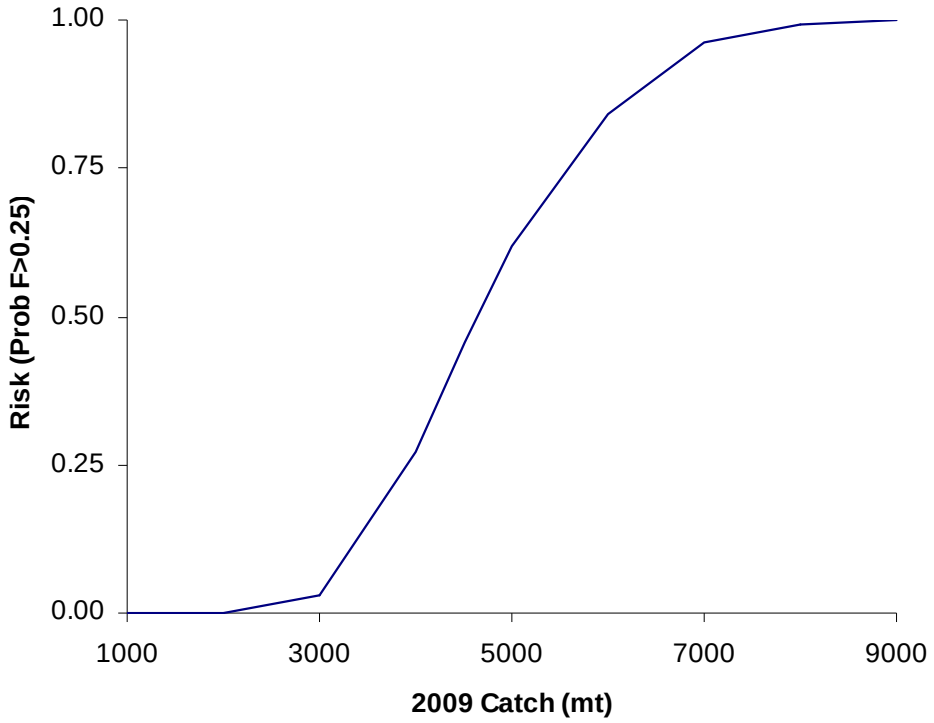
**11,000 mt (2003)** **15,900 mt (2008)**

# GB YT: SSB & Recruitment




- **SSB: 2007 SSB : 9,500 mt**
- **Recruitment: averaged 22.3 million (1998-2001), below 20 million (2002-2006), exception 2005 yc (49.4 million), strongest since 1980**

# GB YT: Projection Risks & 2009 TAC




**2,500 mt in 2008; 4,600 mt in 2009 ~ 50% risk F2009>Fref**

**Fishing at Fref=0.26 in 2009:**

**9% increase in median age 3+ Biomass**

**from 20,500 mt in 2009 to 23,300 mt in 2010**

# GB Yellowtail flounder Summary

- F was very high and only recently approaching $F_{ref}$
- Biomass increasing

- Improvement heavily dependent on only one strong year class
- Rebuilding still required

# Allocation Sharing Agreement

***Resource Utilization***

| | Cod | Haddock | Yellowtail |
|---|---|---|---|
| USA | 40% | 45% | 98% |
| CANADA | 60% | 55% | 2% |

***Resource Distribution*** ***Allocation Shares***

| | Survey Year | Cod | Haddock | Yellowtail | Fishing Year | Utilization | Distribution | Cod | Haddock | Yellowtail |
|---|---|---|---|---|---|---|---|---|---|---|
| USA | **2000** | 18% | 20% | 54% | **2002** | 40% | 60% | 27% | 30% | 72% |
| CANADA | | 82% | 80% | 46% | | | | 73% | 70% | 28% |
| USA | **2001** | 14% | 16% | 64% | **2003** | 40% | 60% | 24% | 28% | 78% |
| CANADA | | 86% | 84% | 36% | | | | 76% | 72% | 22% |
| USA | **2002** | 12% | 26% | 62% | **2004** | 40% | 60% | 23% | 34% | 76% |
| CANADA | | 88% | 74% | 38% | | | | 77% | 66% | 24% |
| USA | **2003** | 18% | 27% | 56% | **2005** | 35% | 65% | 26% | 33% | 71% |
| CANADA | | 82% | 73% | 44% | | | | 74% | 67% | 29% |
| USA | **2004** | 14% | 29% | 56% | **2006** | 30% | 70% | 22% | 34% | 69% |
| CANADA | | 86% | 71% | 44% | | | | 78% | 66% | 31% |
| USA | **2005** | 21% | 29% | 63% | **2007** | 25% | 75% | 26% | 33% | 72% |
| CANADA | | 79% | 71% | 37% | | | | 74% | 67% | 28% |
| USA | **2006** | 26% | 32% | 73% | **2008** | 20% | 80% | 29% | 35% | 78% |
| CANADA | | 74% | 68% | 27% | | | | 71% | 65% | 22% |
| USA | **2007** | 29% | 36% | 73% | **2009** | 15% | 85% | 31% | 37% | 77% |
| CANADA | | 71% | 64% | 27% | | | | 69% | 63% | 23% |

**•DFO 2008 survey not included..due to very large tow (7.5 mt)**

**• Previous maximum tow = 1 mt**

**• If include 2008: substantial increase in abundance of ages 2-5 , inconsistent with stock dynamics , and indicates that tow is outlier**

**• sensitivity runs…using DFO 2008 SV**
**with tow: abund and rct higher as expected , however,**
**with or without tow: generate a higher F for ages 4-5, counter-intuitive, but explained by age structure of fish caught in tow.**

**Influence mitigated by other surveys:**
**w/tow : 2005 yc , age 3 in 2008 = 36.1 million**
**w/o tow = 31.7 million**

## Summary of Georges Bank Yellowtail Flounder Projections v2

| Case | Filename |
|---|---|
| **A** | MAJORCHANGE_NO2008DFO_EMPIR_2014_FSTQUO |
| **B** | MAJORCHANGE_NO2008DFO_EMPIR_F40 |
| **C** | MAJORCHANGE_NO2008DFO_EMPIR_2014_FREBUILD |
| **D** | FREF |
| **E** | FREBUILD75 |
| **F** | FREBUILD50 |

| Case | **A** | **B** | **C** | **D** | **E** | **F** |
|---|---|---|---|---|---|---|
| R 2008 | All Years | All Years | All Years | Last 10 | Last 10 | Last 10 |
| Catch 2008 | C2007 | C2007 | C2007 | Quota | Quota | Quota |
| Strategy | F status quo | F40% | Frebuild 50% prob | **Fref** | **Frebuild 75% prob** | Frebuild 50% prob |
| Rebuild w/ 75% prob? | No | No | No | No | Yes | No |
| Rebuild w/ 50% prob? | No | No | Yes | No | Yes | Yes |
| Name in GARM Doc | Fstquo | Fmsy | Frebuild | Fref | Freb75 | N/A |

| Year | median Catch (000 mt) | | | | | |
|---|---|---|---|---|---|---|
| 2008 | 1.686 | 1.686 | 1.686 | 2.500 | 2.500 | 2.500 |
| 2009 | 5.503 | 4.908 | 3.989 | **4.650** | **2.114** | 3.798 |
| 2010 | 5.947 | 5.444 | 4.599 | 5.222 | 2.643 | 4.428 |
| 2014 | 8.711 | 8.285 | 7.451 | 8.193 | 4.984 | 7.373 |

| Year | median F (4-5 unweighted) | | | | | |
|---|---|---|---|---|---|---|
| 2008 | 0.126 | 0.126 | 0.126 | 0.191 | 0.191 | 0.191 |
| 2009 | 0.289 | 0.254 | 0.202 | 0.250 | 0.107 | 0.200 |
| 2010 | 0.289 | 0.254 | 0.202 | 0.250 | 0.107 | 0.200 |
| 2014 | 0.289 | 0.254 | 0.202 | 0.250 | 0.107 | 0.200 |

| Year | median SSB (000 mt) | | | | | |
|---|---|---|---|---|---|---|
| 2008 | 18.760 | 18.760 | 18.760 | 18.421 | 18.421 | 18.421 |
| 2009 | 22.196 | 22.468 | 22.895 | 21.719 | 22.844 | 22.098 |
| 2010 | 24.810 | 25.702 | 27.079 | 25.122 | 28.968 | 26.421 |
| 2014 | 36.263 | 38.827 | 43.216 | 38.983 | 53.221 | **43.212** |

| Year | 25%ile SSB | | | | | |
|---|---|---|---|---|---|---|
| 2008 | 16.092 | 16.092 | 16.092 | 15.743 | 15.743 | 15.743 |
| 2009 | 19.104 | 19.338 | 19.700 | 18.507 | 19.444 | 18.830 |
| 2010 | 21.622 | 22.403 | 23.628 | 21.748 | 25.164 | 22.878 |
| 2014 | 28.911 | 31.083 | 34.741 | 31.178 | **43.183** | 34.742 |