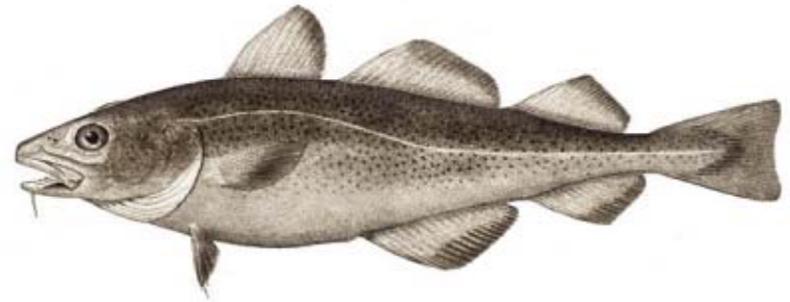
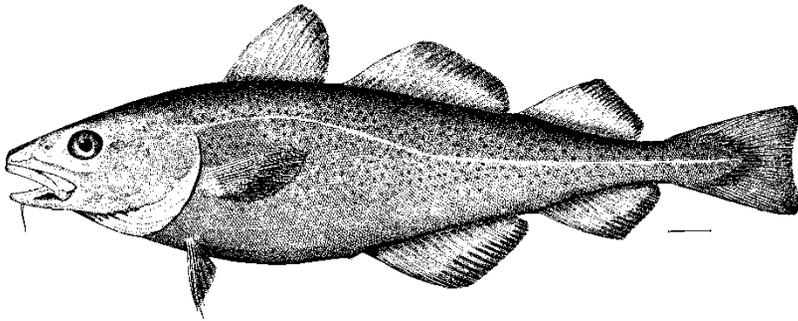


JUNE 2013 TRAC

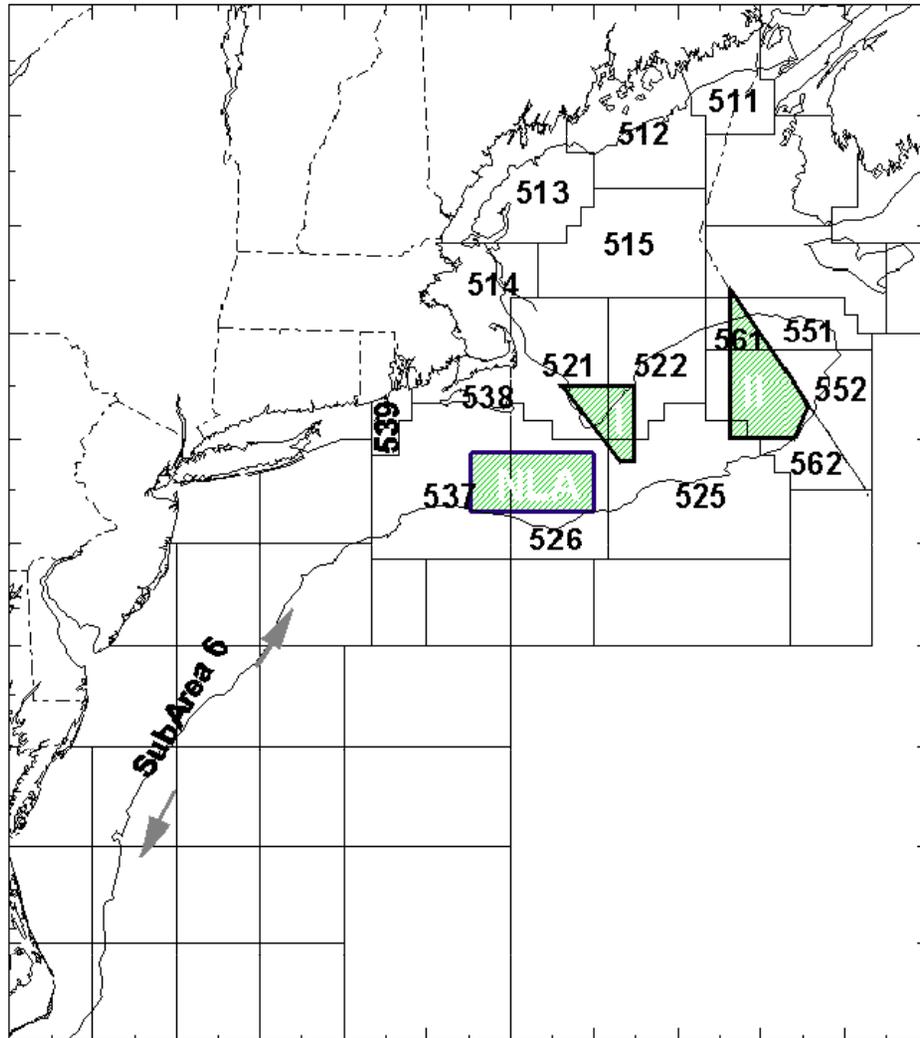
**Eastern GB cod, EGB haddock, and
GB yellowtail flounder**

Post – TRAC
New Bedford , MA
August 12, 2013

Eastern GB Atlantic Cod Management Unit



Management Unit



USA: SA 561,562

CA: SA 551,552

- **2013 Benchmark model mtg**

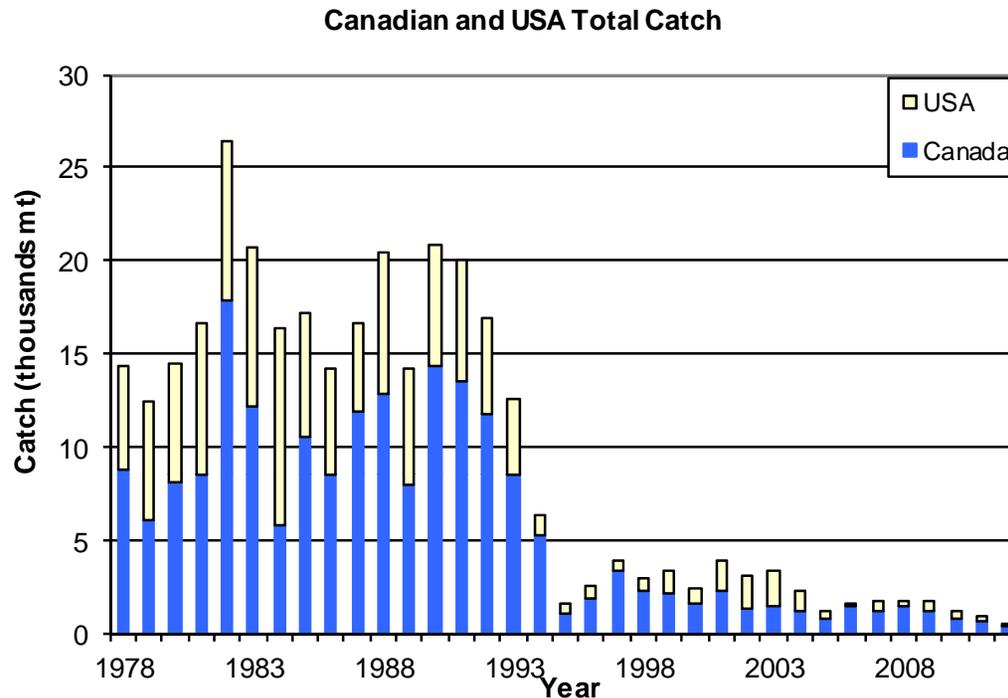
- **no consensus on final benchmark model**

- **did agree to use 1 model for stock status & catch advice**

- **“VPA M 0.8”; natural mortality (M) = 0.2 for all ages except after 1994 increased to M=0.8 for ages 6+**

- Strong retrospective bias in SSB and F from the 2013 VPA “M 0.8” model
- Caused by the substantial reduction in the estimated size of the 2003 yc; Sensitivity analyses suggest this low estimate of 2003 yc may be an outlier.
- VPA “M 0.8” model results not reliable for pop’n trends; comparison with the sensitivity analyses that adjusted for the 2003 year class indicates similar catch advice.

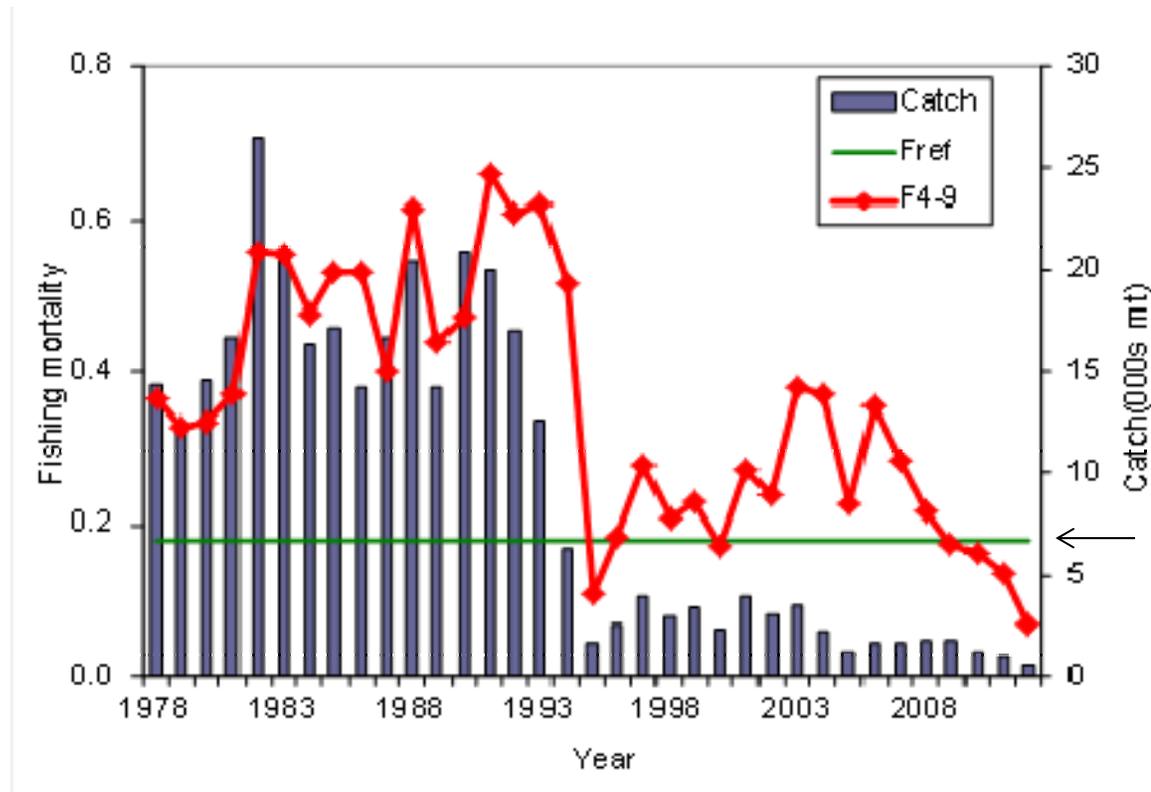
Catch



- USA+CA 2012 total catch: **614** mt (CY)
- USA 2012 catch **146** mt : **91** mt Indngs; **55** mt discards
- CA 2012 catch **468** mt: **437** mt Indngs; **31** mt discards
- US: 42% of 162 mt quota (FY2012) ,
- CA: 91% of 513 quota (CY)

Fishing Mortality

EGB Cod

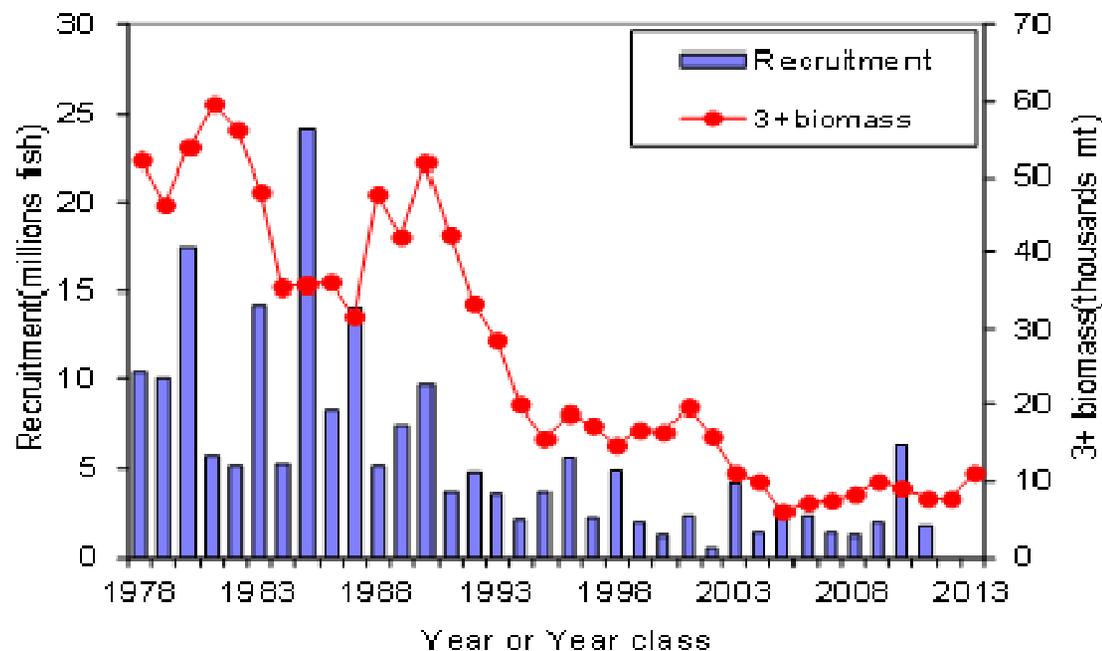


$F_{ref} = 0.18$

- **2012 $F = 0.07$**
- **Change in perception of stock status; F_{ref} no longer consistent with VPA 0.8 model**

3+ Biomass (lines)

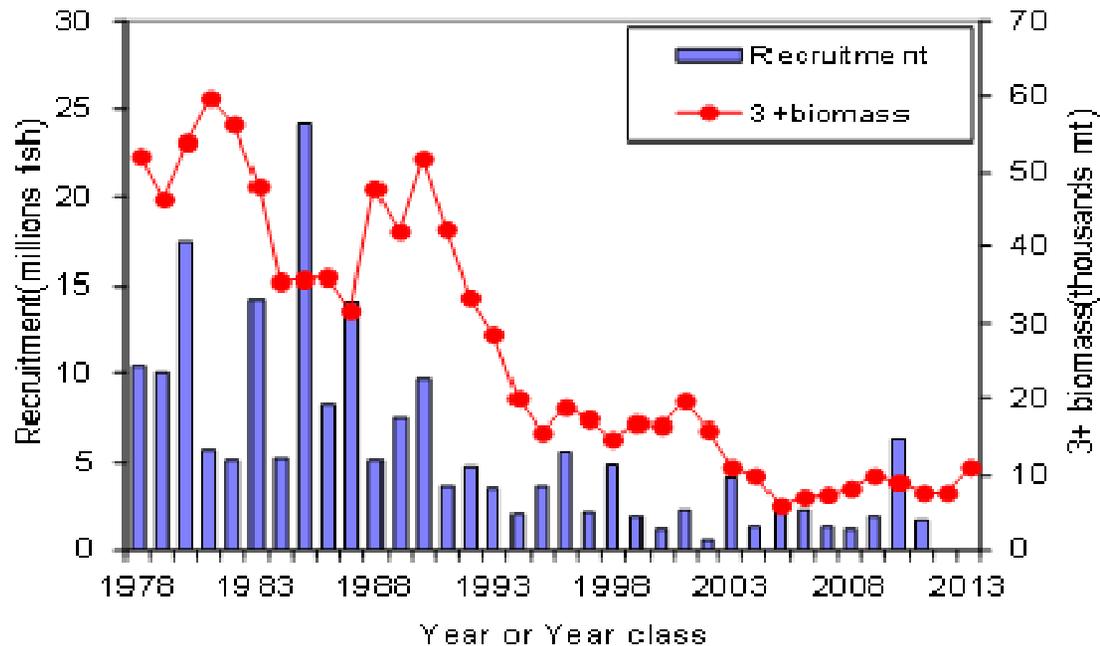
EGB Cod



- 2013 Jan 1 3+ biomass increasing (growth 2010 yc)

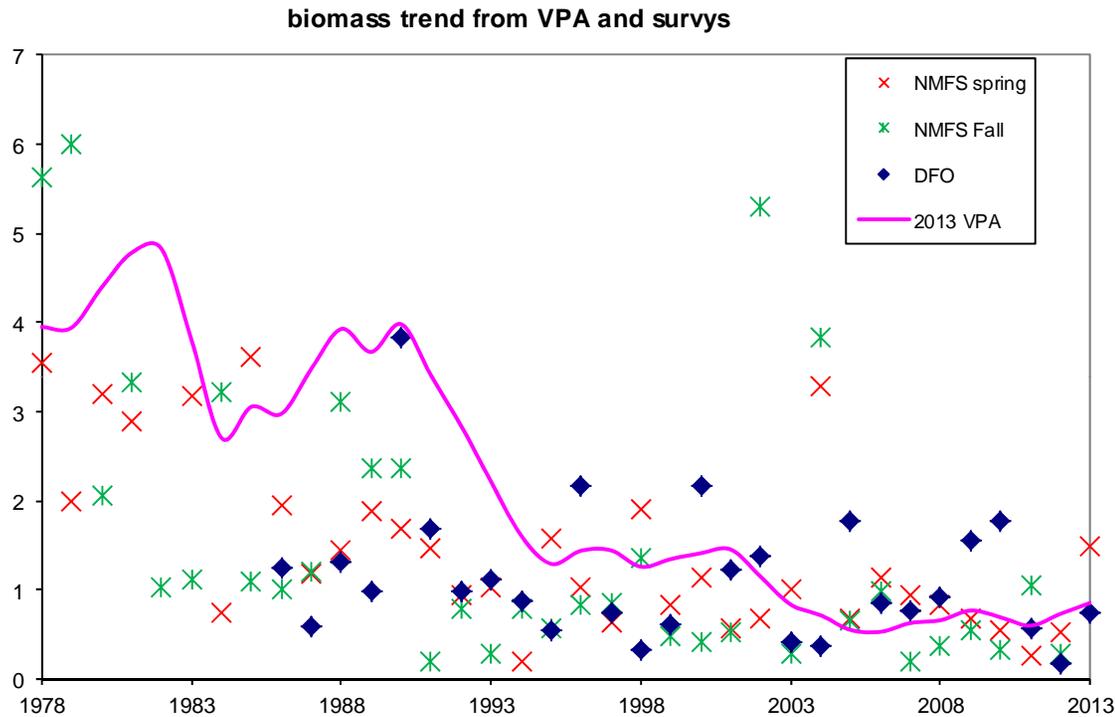
Recruitment (bars)

EGB Cod



- **Poor rct since 1990 yc; 2010 yc strongest since**
- **2010 yc >2003 but estimate still uncertain**
- **Mean weight at age remains low**

Survey & VPA 1+ Biomass



- 1+ popn. biomass & SV biomass indices:**
- fluctuating at low values since 1994

Harvest Strategy : TMGC adopted a strategy to maintain a low to neutral risk of exceeding the fishing mortality limit reference, $F_{ref} = 0.18$ (established in 2002 by the TMGC).

When stock conditions are poor, fishing mortality rates should be further ***reduced*** to promote rebuilding.

Catch Projections

EGB Cod

- At the 2013 cod benchmark meeting, it was agreed that the current $F_{ref}=0.18$ was inconsistent with the VPA “M 0.8” model given that it was derived based on models with an $M=0.2$
- TRAC recommended using a lower value of F for projections and catch advice; an arbitrary value of $F = 0.11$ was used

2013 Catch Projection

Probability of exceeding target F in 2014	0.25	0.5	0.75
“M 0.8”(F =0.11)	1,075 mt	1,225 mt	1,425mt
“M 0.8”(Fref=0.18)	1,800 mt	2,100 mt	2,400 mt

- A 50% probability of not exceeding F= 0.11 implies a catch less than **1,225** mt

Neutral risk (50%) that biomass will not increase by:	0%	10%
“M 0.8”	2,075 mt	600 mt

- Achieving a 10% increase in SSB between 2014 and 2015 implies catches less than **600** mt

Catch Projection Summary

Given the extremely low SSB, TRAC advises that management should try to realize the growth potential from the 2010 year class to rebuild the SSB. In order to not exceed $F=0.11$, & to achieve a 10% increase in biomass, catches must not exceed 600 mt

Consequence Analysis : reflect uncertainties

		VPA 0.8	ASAP
Catch 2012		813 mt	813 mt
quota 2013		800 mt	800 mt
2012 biomass (3+)		7700 mt	2091 mt
2013 biomass (3+)		11160 mt	
Projected Catch			
2028 mt (VPA F=0.18)	2014 F	0.18	0.75
	2015 Biomass	13314	3328
	% Inc B from 2014	0.4%	-20.2%
1225 mt (VPA F=0.11)	2014 F	0.11	0.40
	2015 Biomass	14018	4153
	% Inc B from 2014	6%	-0.42%
801 mt (ASAP F=0.18)	2014 F	0.05	0.18
	2015 Biomass	14646	4794
	% Inc B from 2014	10.0%	15.0%
378 mt (ASAP F=0.11)	2014 F	0.03	0.11
	2015 Biomass	14858	5029
	% Inc B from 2014	12%	20.6%
	F<=Fref and a 10% biomass increase in 2015		
	F< =Fref and biomass increase less than 10% in 2015		
	F>Fref and biomass increase less than 10% in 2015		
	not feasible projection		

Summary : EGB Cod

- Biomass increasing, F reduced
- Recent rct generally poor, except for 2003 and 2010 yc
- 2010 year class highest since 1990; estimate still uncertain
- Reduced weights at age
- Lower biomass hampers improved recruitment
- Low numbers of 7+ fish
- Rebuilding will not occur without improved recruitment
- Not exceeding $F = 0.11$ and achieving a 10% increase in biomass implies catches of less than 600 mt.

Questions ?