

BSAI SAFE Report



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BSAI Plan Team Members (12 Members)

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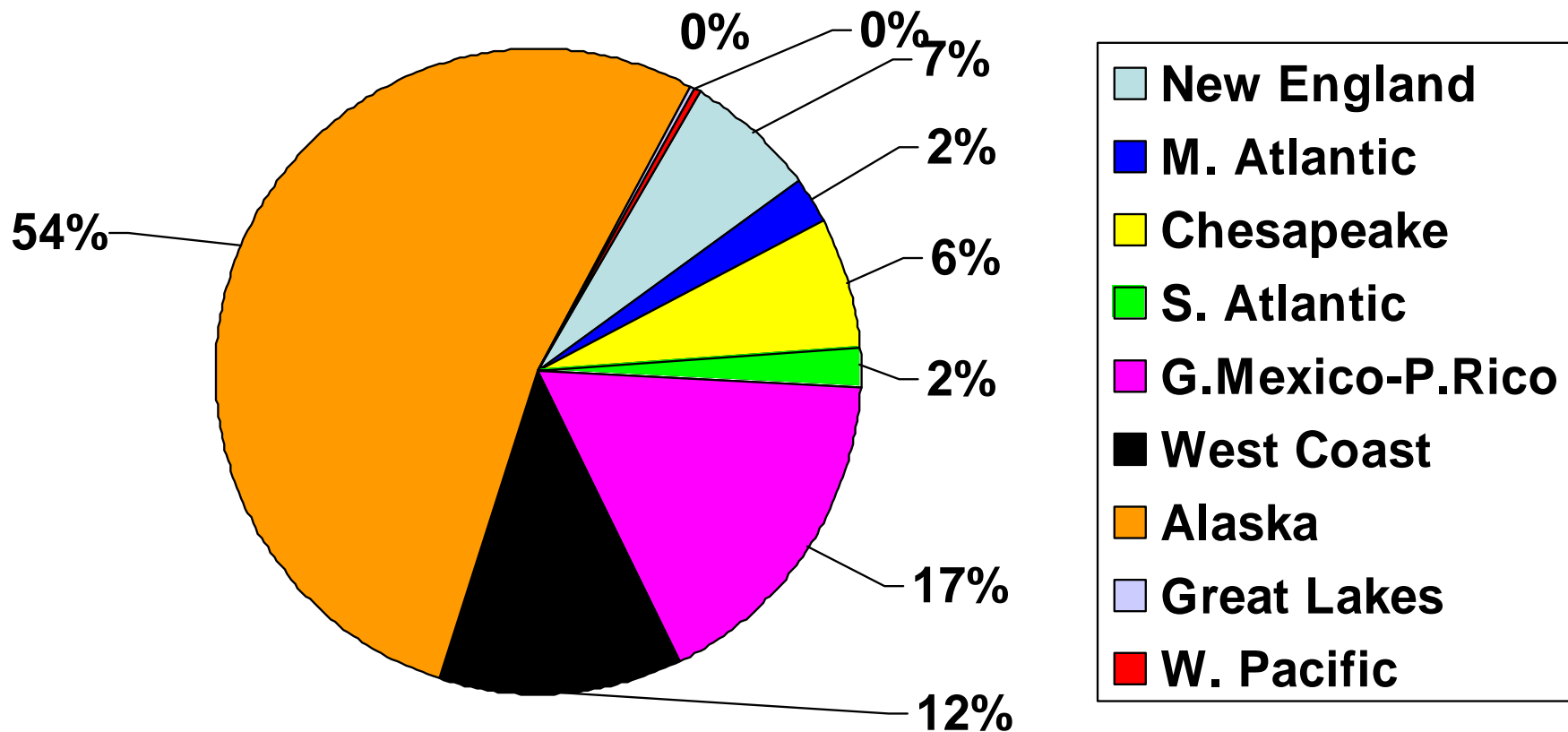
Halibut Comm-- Bill Clark

BSAI SAFE Reports (Many Contributors from Various Agencies and Universities)

- 21 Authors for Status of Stocks Section
- 78 Contributors to Ecosystems Section
- 5 Authors for Economics Chapter

Total U.S. Landings 4.3 million mt (2001)

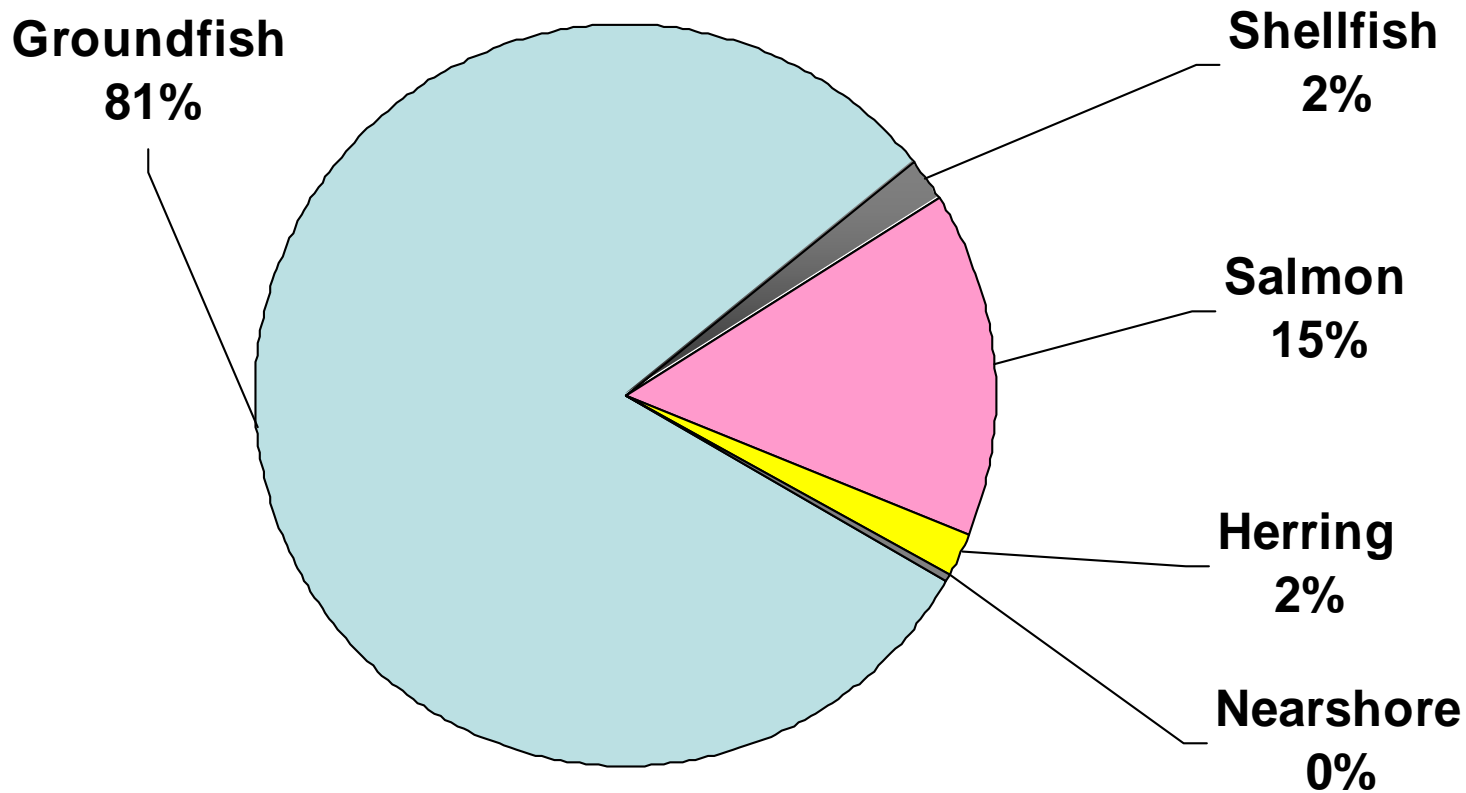
(From NOAA Fisheries 2001 Report, Our Nation's Living Resources)



Alaska Landings

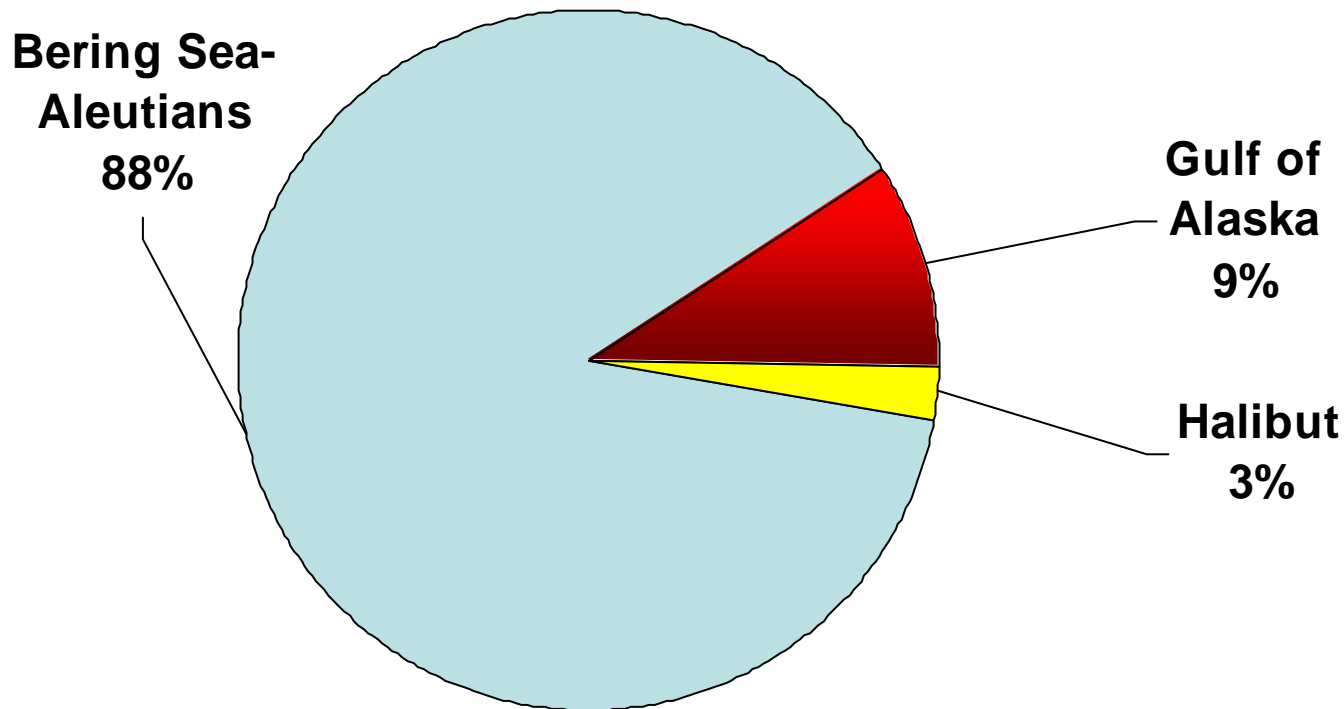
2.5 million mt (1998-2001)

(From OLO, 4 Yr Average)



Alaska Groundfish Landings 2.027 million mt (2000-2002)

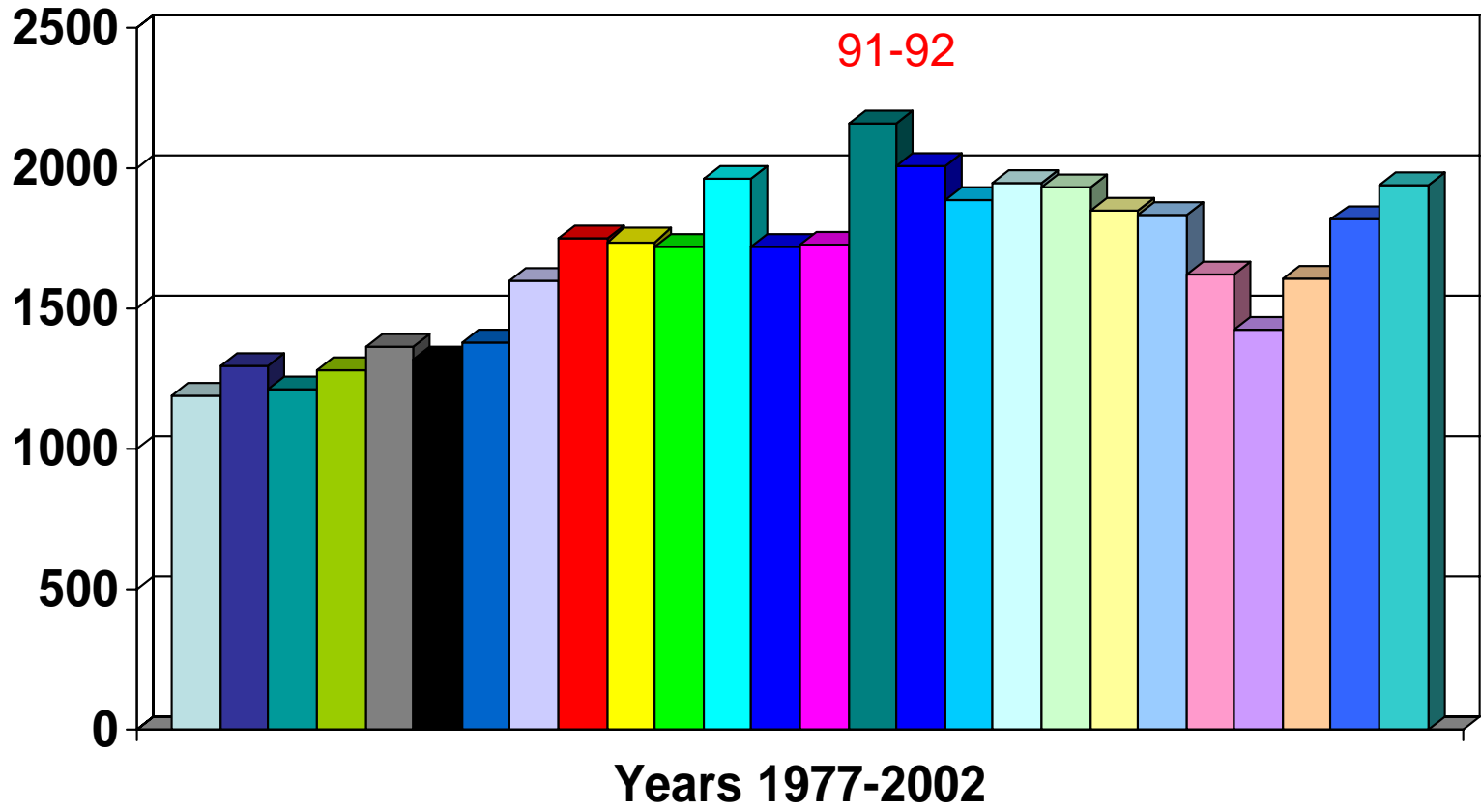
(from Table 1, Economics Section, 3 Yr Average)



Bering Sea-Aleutians Groundfish Catch

25 Year History (in thousands of mt)

(from Table 1, Economics Section)



BSAI SAFE

- 1. Assessment Theme**
- 2. Overview**
- 3. Species-by-Species Review**
- 4. Summary of Changes**

Assessment Theme

$$ABC = \text{Biomass} \times \text{Exploitation Rate}$$

1. Determine Biomass from
 - Surveys....Hydroacoustics, Trawls
 - Models.....Age or Length-Structure Models
2. Determine Exploitation Rates
(By Catch Control Rules of Tier System)
 - F *overfishing* Example $F_{35\%}$
 - F *abc* Example $F_{40\%}$

Tier System

Evaluate Quality of Information about Population Dynamics of the Stocks and Use Catch Control Rules according to 6 Tiers of Data Quality (Page 3 of SAFE Summary)

Tier 1 -- Most Information - reliable B, Bmsy, pdf of Fmsy

Tier 2 -- Less Information - reliable B, Bmsy, Fmsy, F35, F40

Tier 3 - reliable B, B40, F35, F40

Tier 4 - reliable B, F35, F40

Tier 5 -- reliable B and M

Tier 6 - reliable Catch History Data

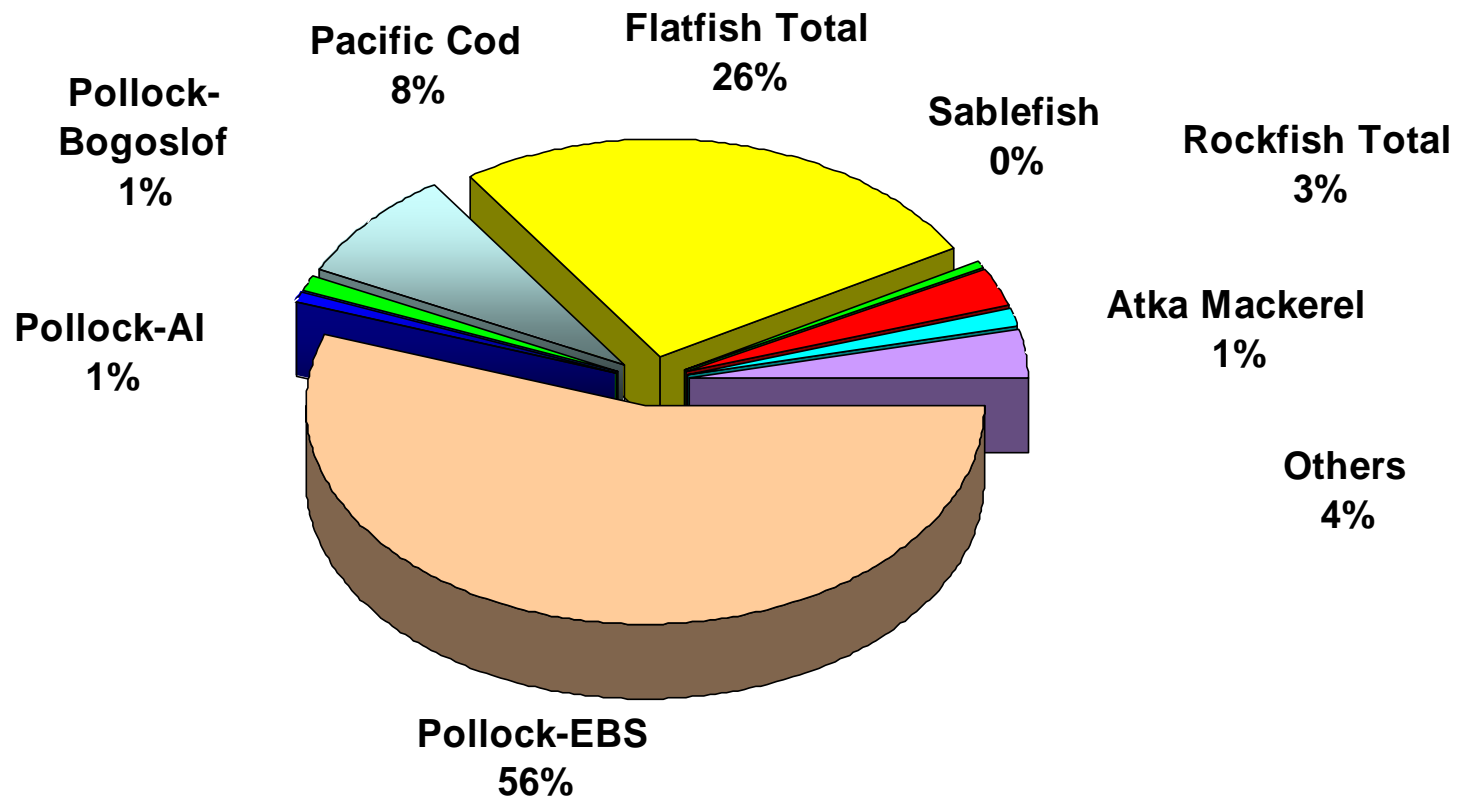
Overview of Exploitable Biomass

By
Major Species Groups

BSAI Exploitable Biomass

Yr 2003 Total = 19.869 MMT

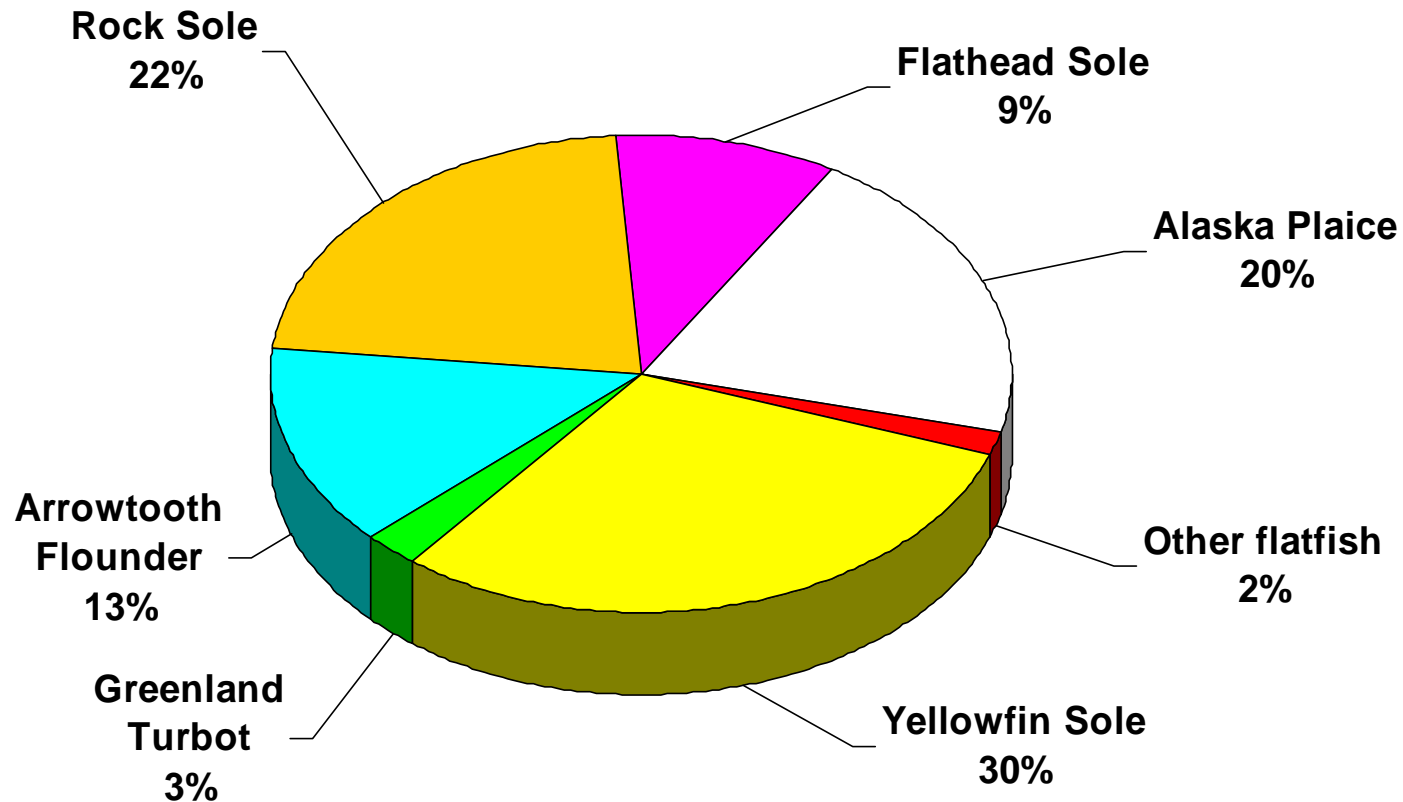
(up 94,500 mt from 2002)



BSAI Flatfish Complex Biomass

Yr 2003 Total = 5.193 MMT

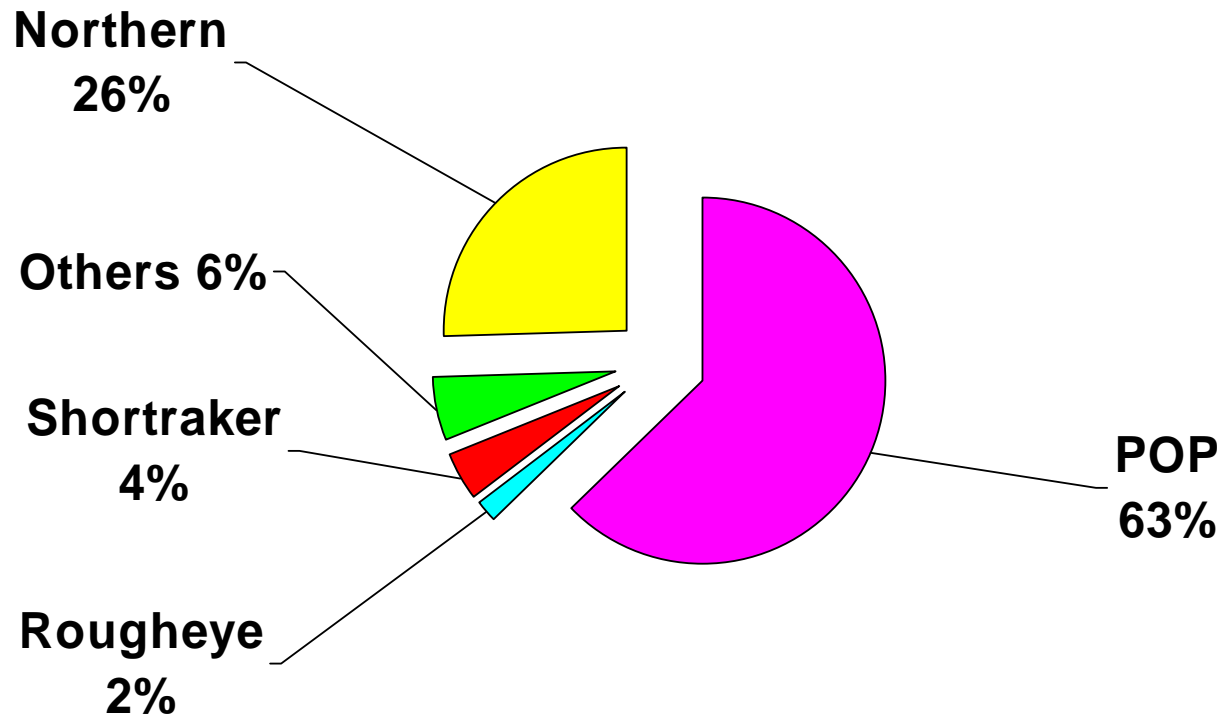
(up 320,000 mt from 2002)



BSAI Rockfish Complex Biomass

Yr 2003 Total = 555,200 MT

(down 40,800 mt from 2002)



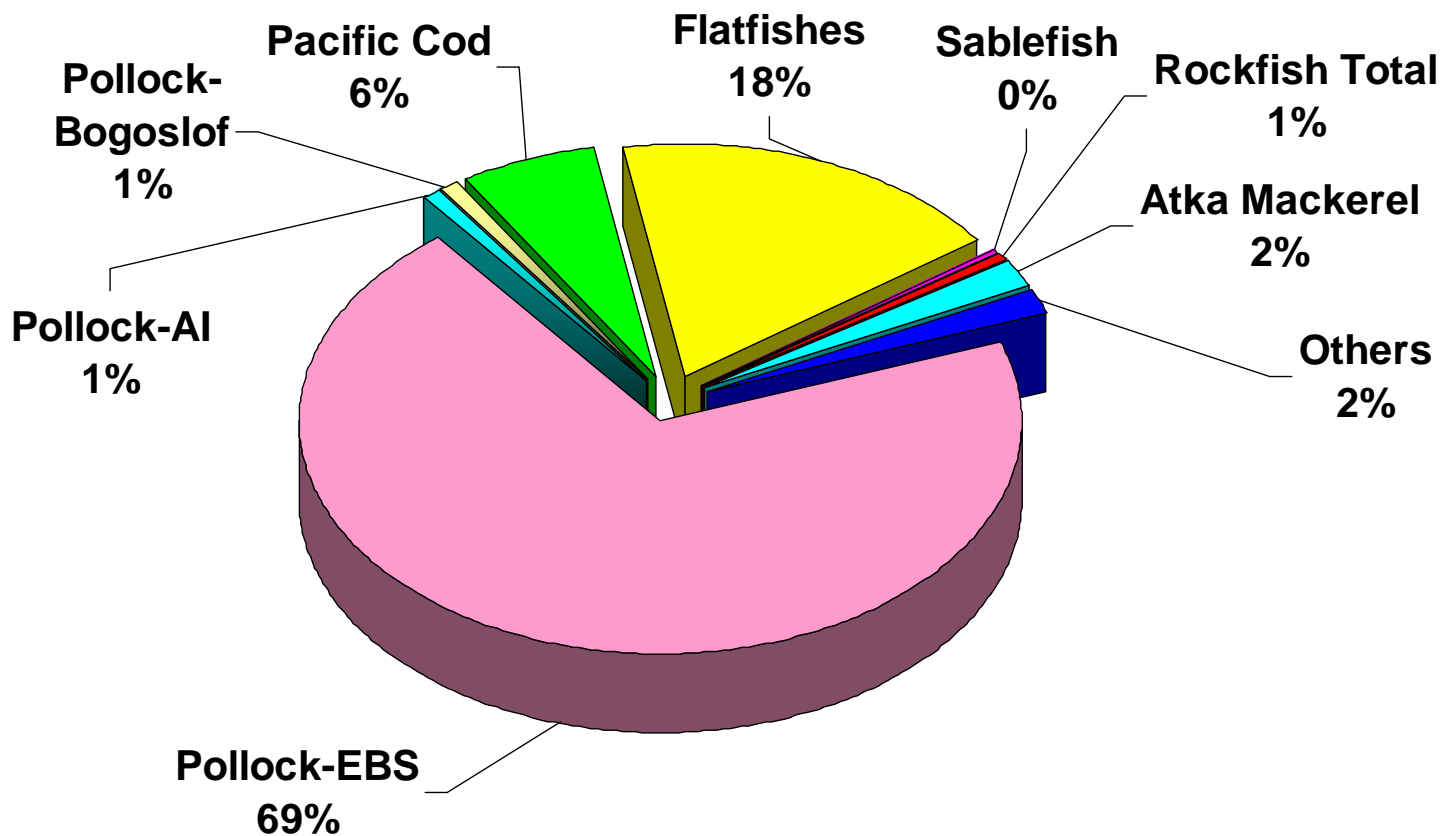
Overview of Plan Team Estimated ABCs

By
Major Species Groups

BSAI Groundfish Complex ABCs

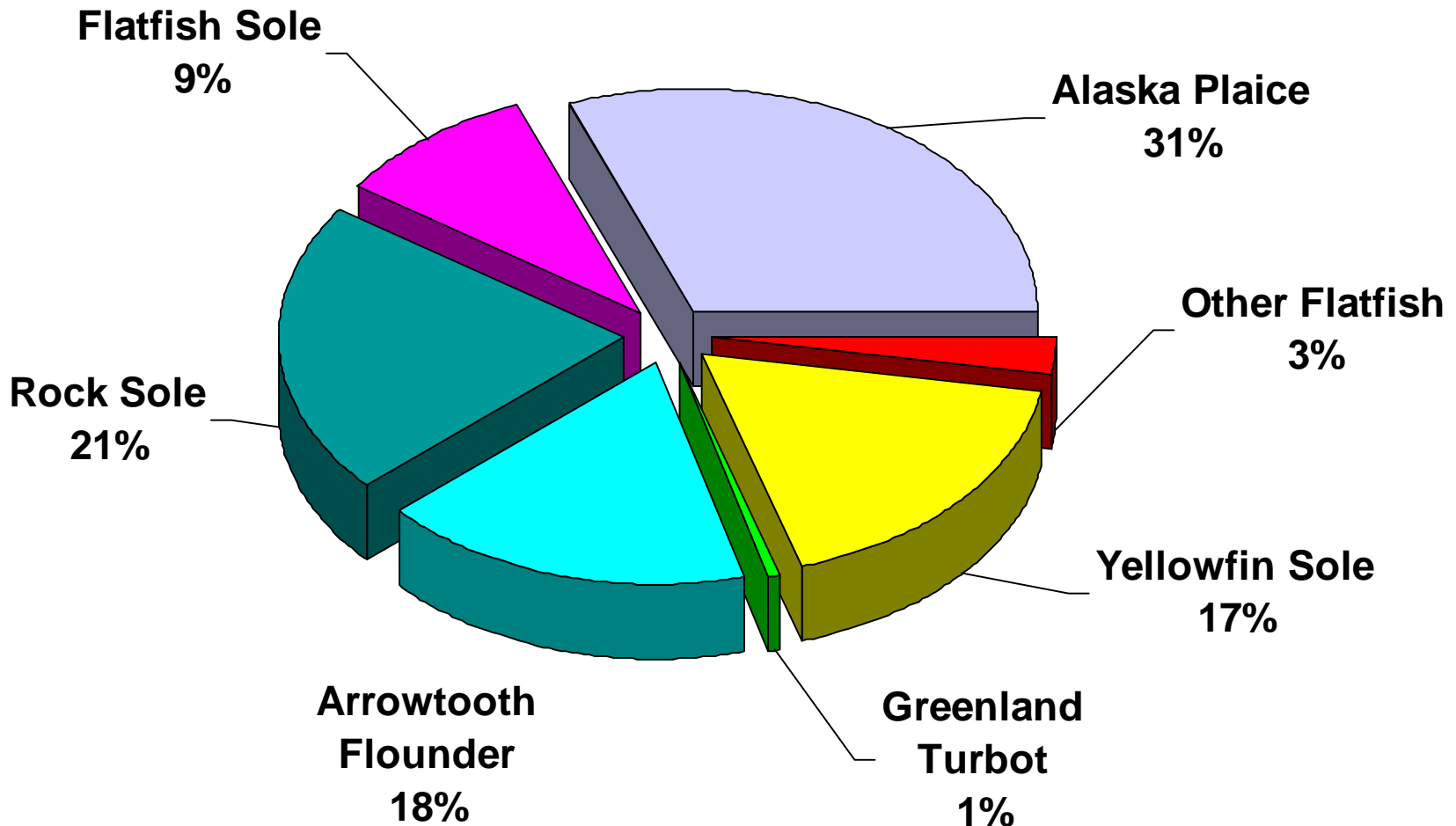
2004 Total = 3.664 MMT

(Up 347,700 mt from 2003 - mostly from EBS Pollock)



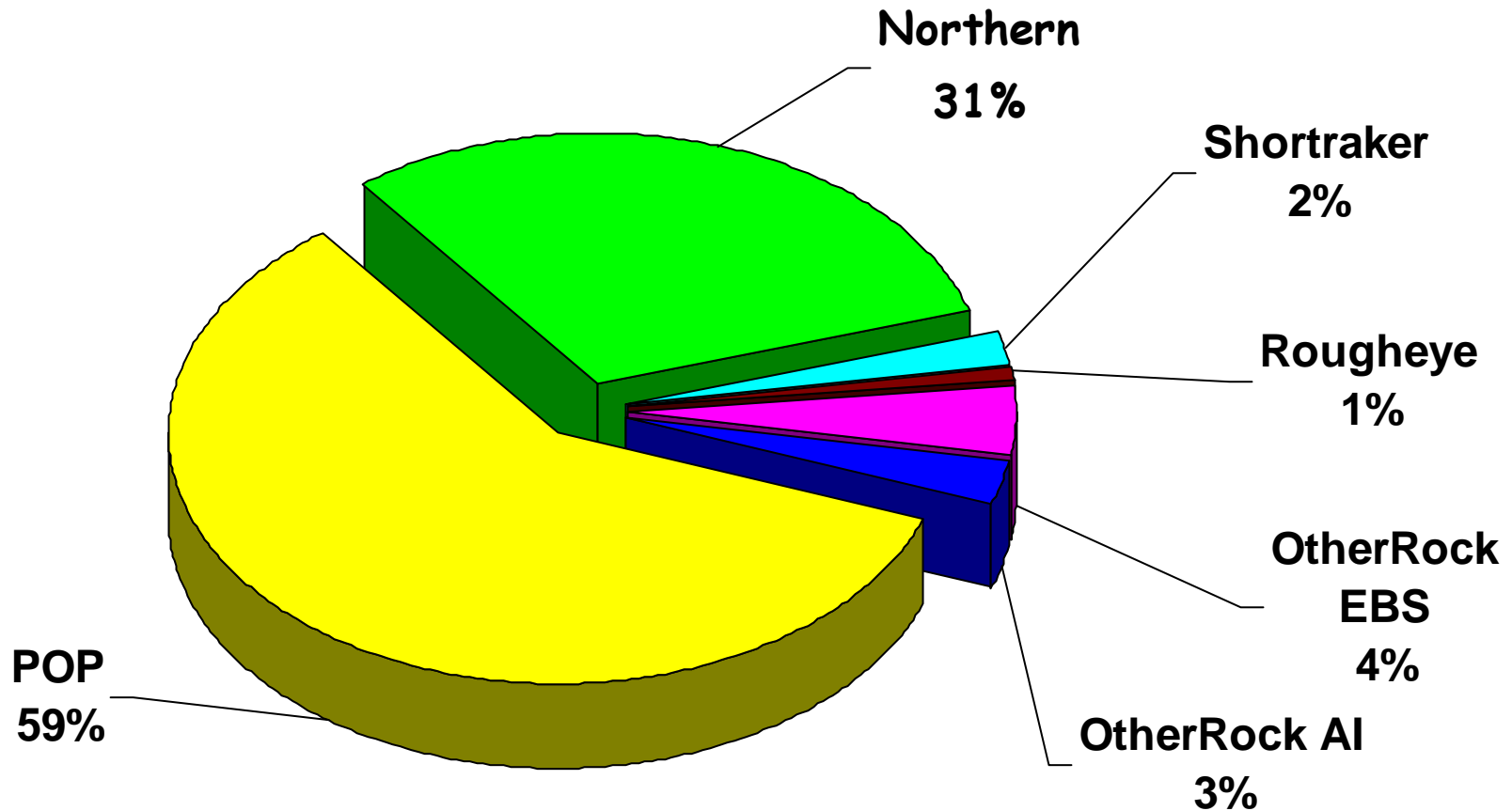
BSAI Flatfish Complex ABC

2004 Total = 651,140 MT
(Up 90,300 mt from 2003)



BSAI Rockfish Complex ABCs

2004 Total = 22,495 MT
(down 2,300 mt from 2003)



Description

Species-by-Species

EBS Pollock Assessment

Notable Features

1. 2003 Surveys

Bottom Trawl Biomass = 8.51 mmt, up 77% from 2002
Very warm

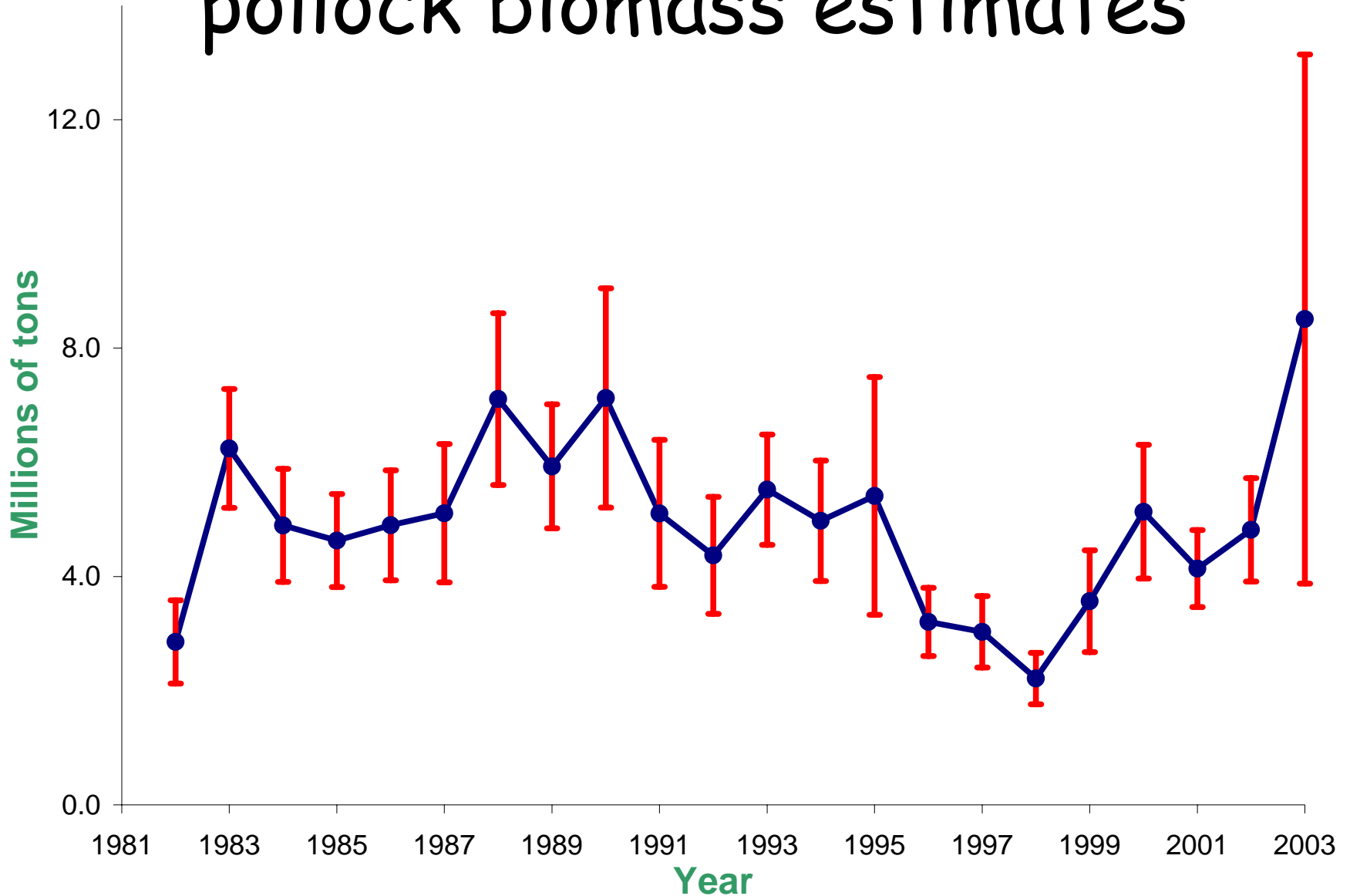
2. 2003 Models:

7 scenarios of Age-Structure Models, Used Model 1
Age3+ Biomass for 2003 = 11 mmt, down 1% from last
year's estimate

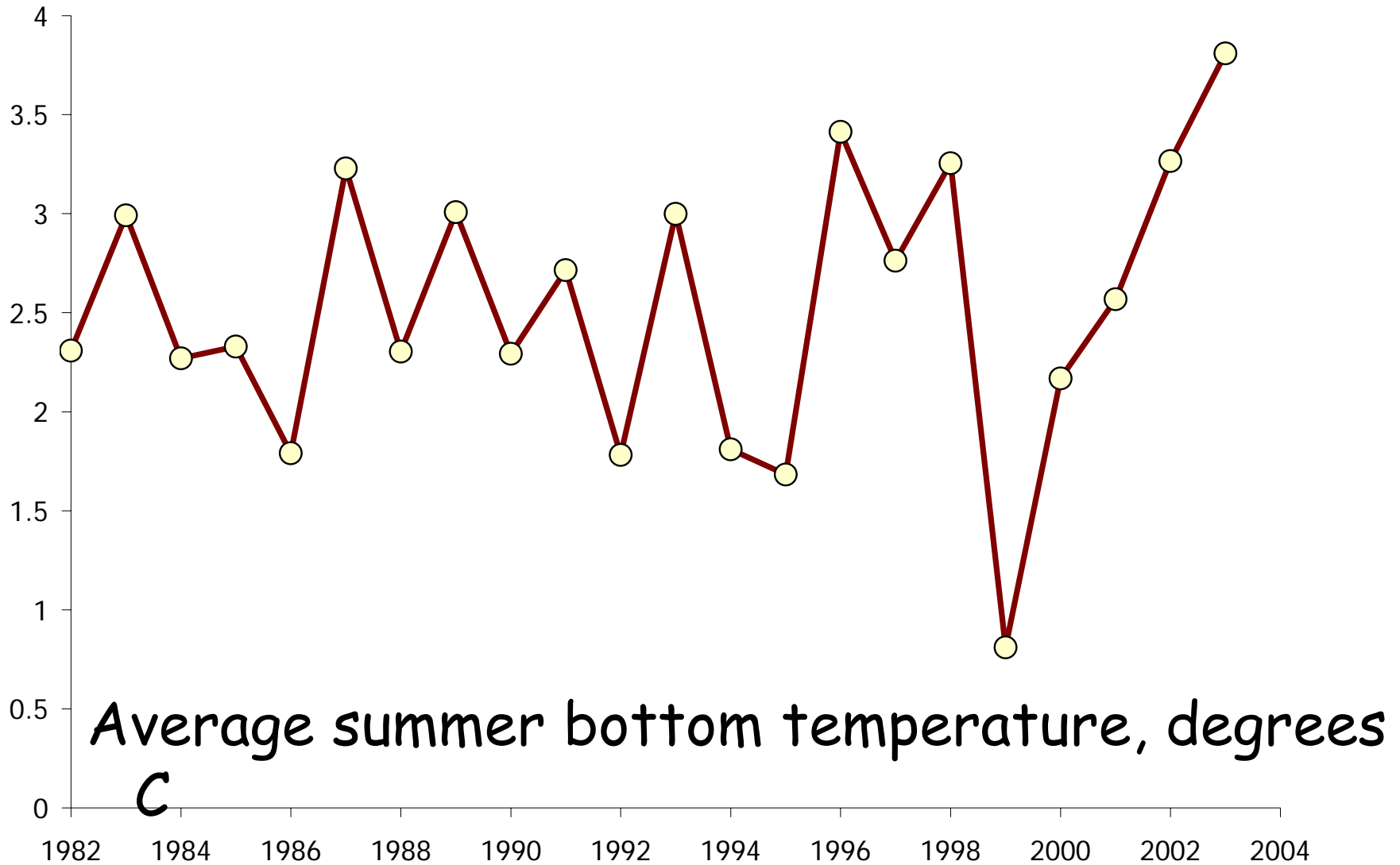
3. Recruitment

1999 & 2000 Year Classes both Above Average

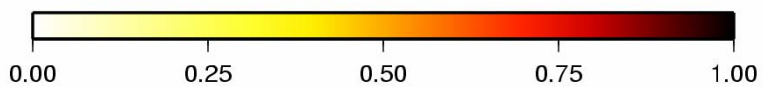
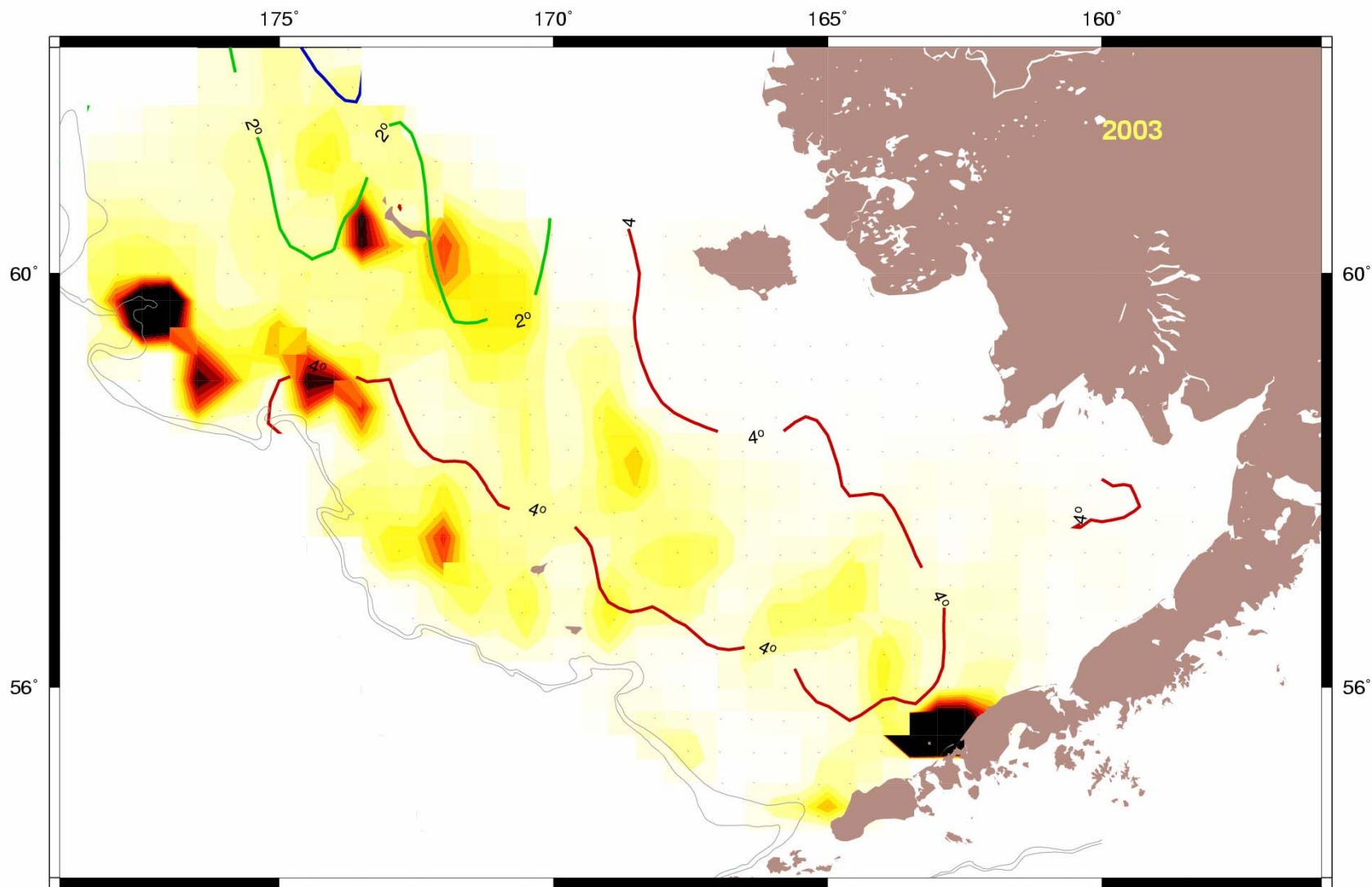
Summer bottom-trawl pollock biomass estimates



Temperature trends

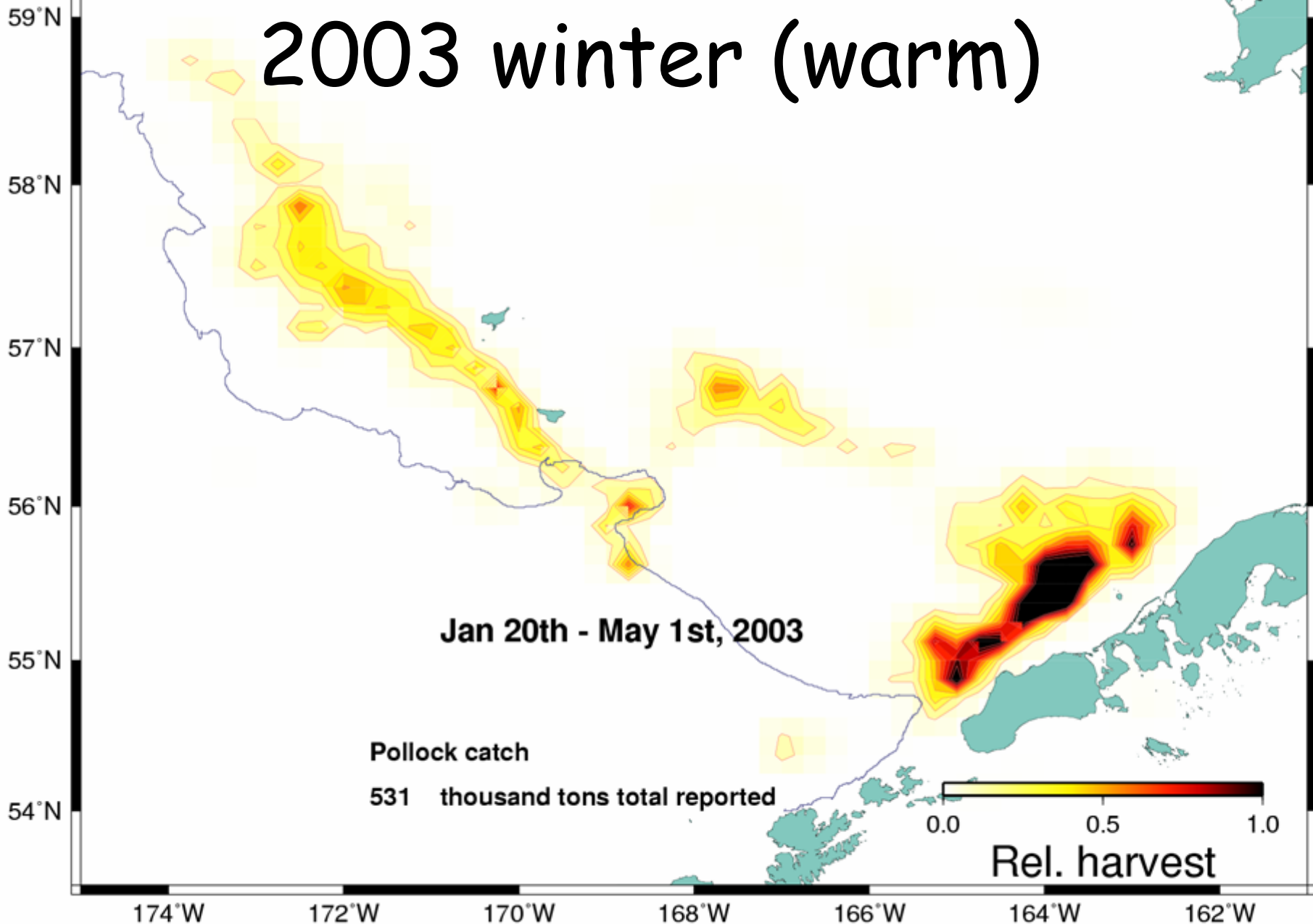


2003 8.51 mmt



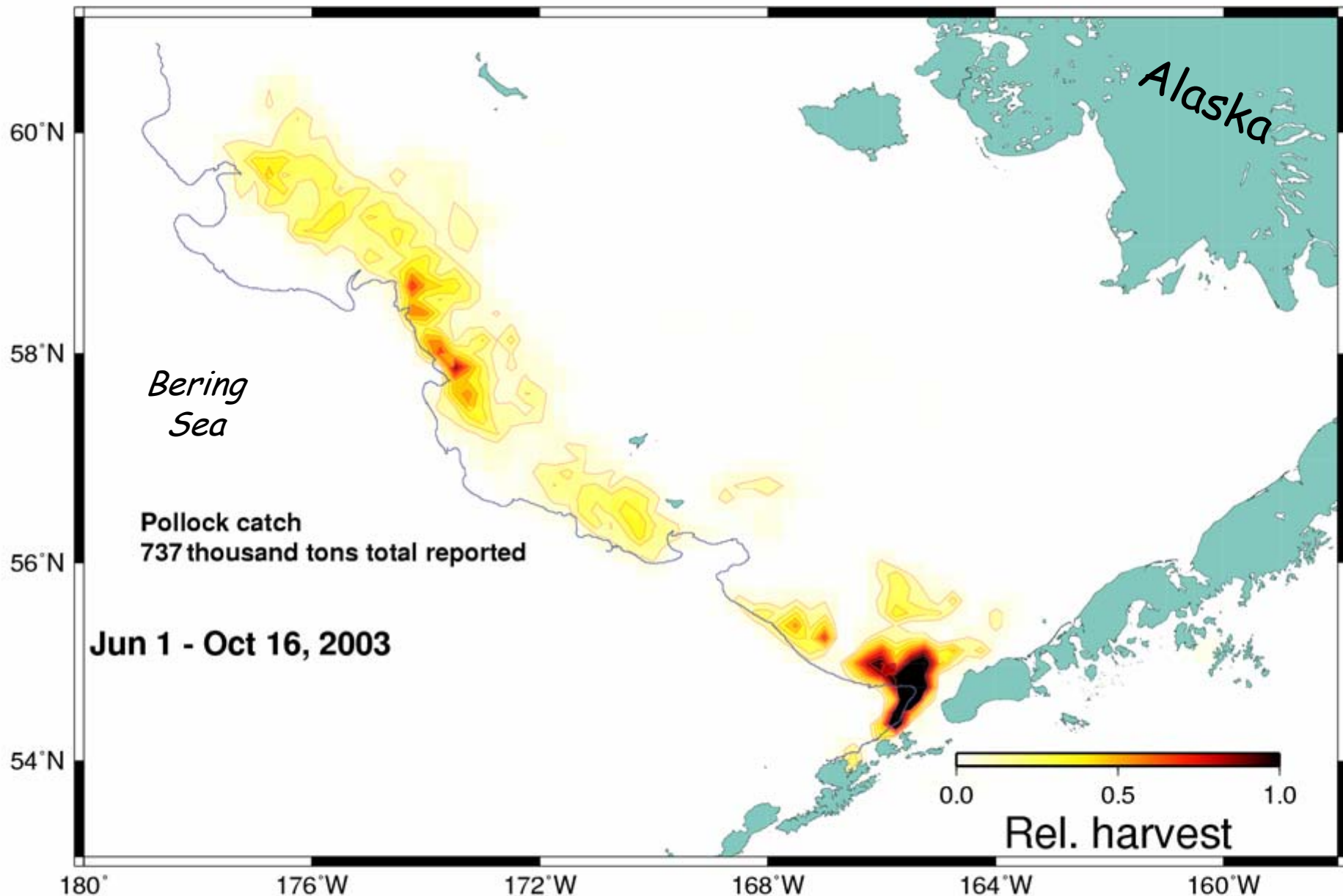
Relative CPUE

2003 winter (warm)



Source: NMFS Observer database

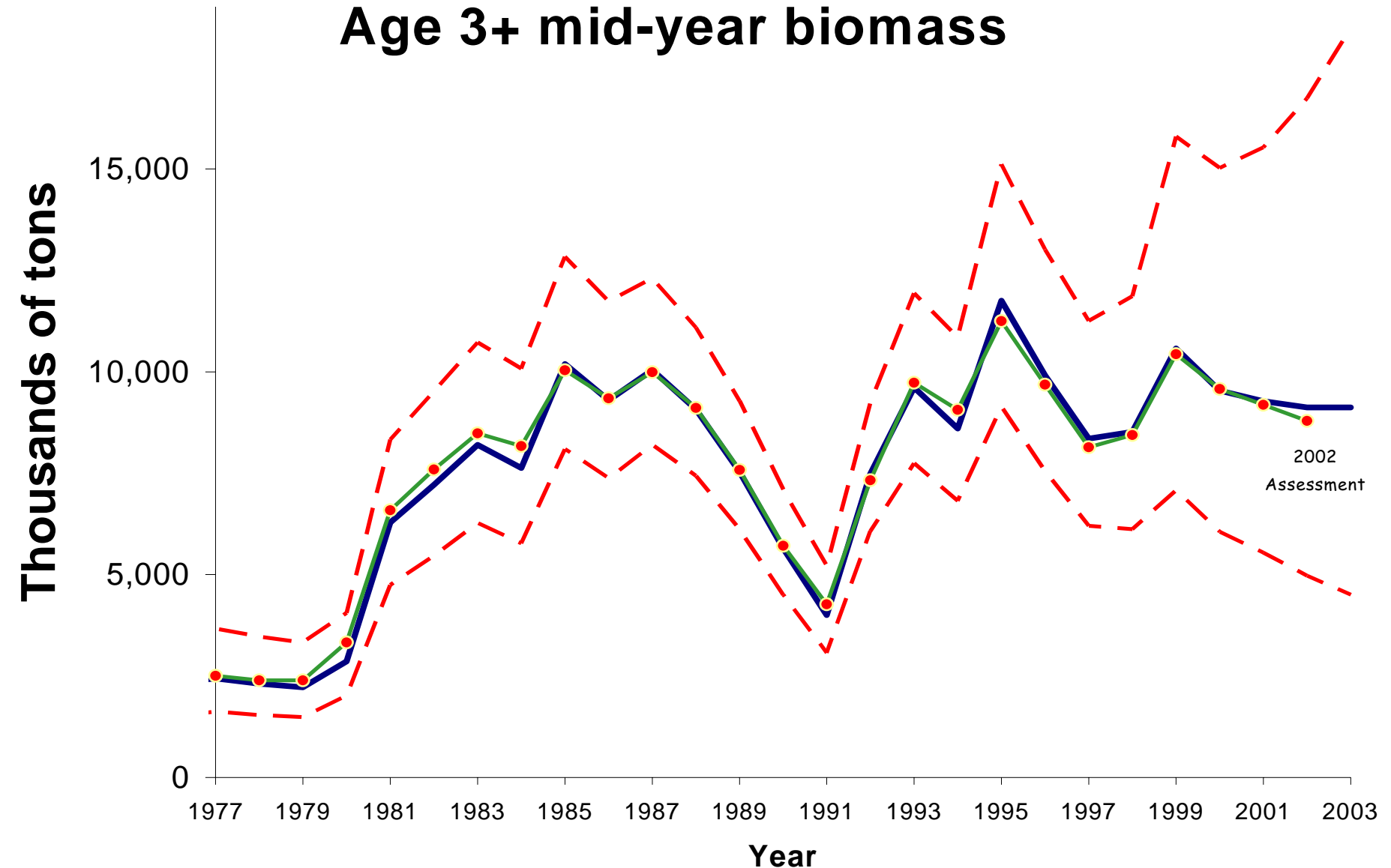
2003 summer-fall fishery



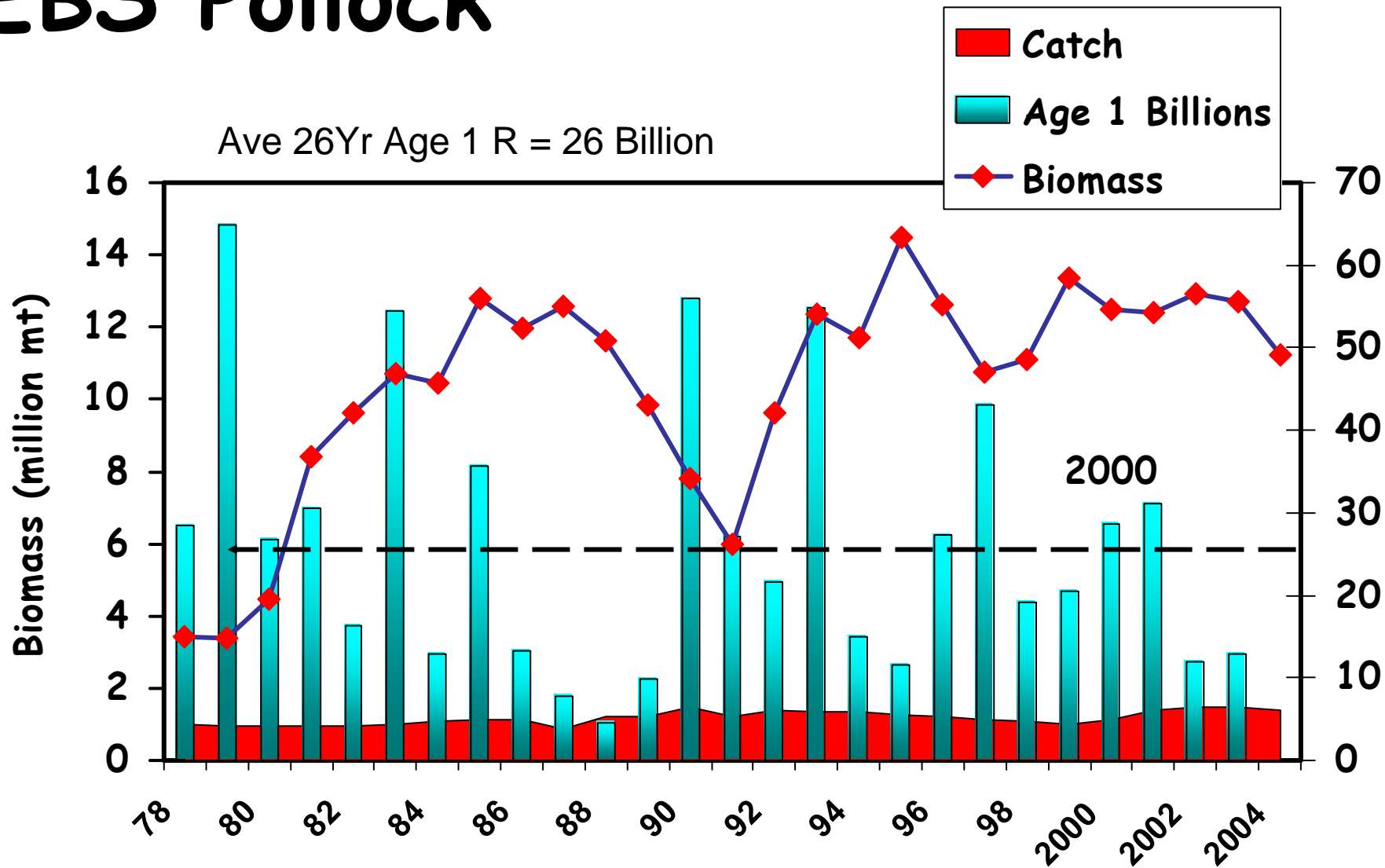
Source: NMFS Observer database

EBS pollock biomass trend

Age 3+ mid-year biomass

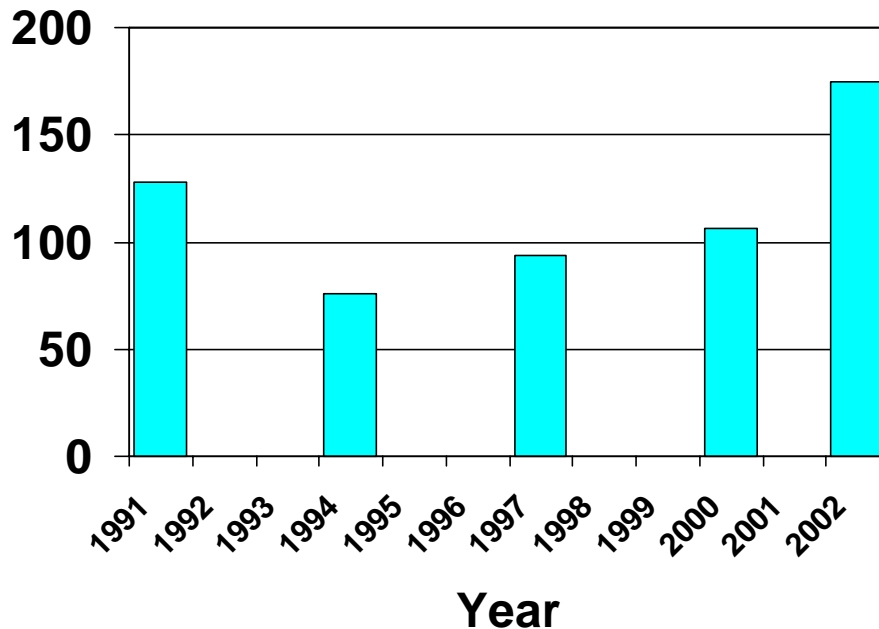


EBS Pollock



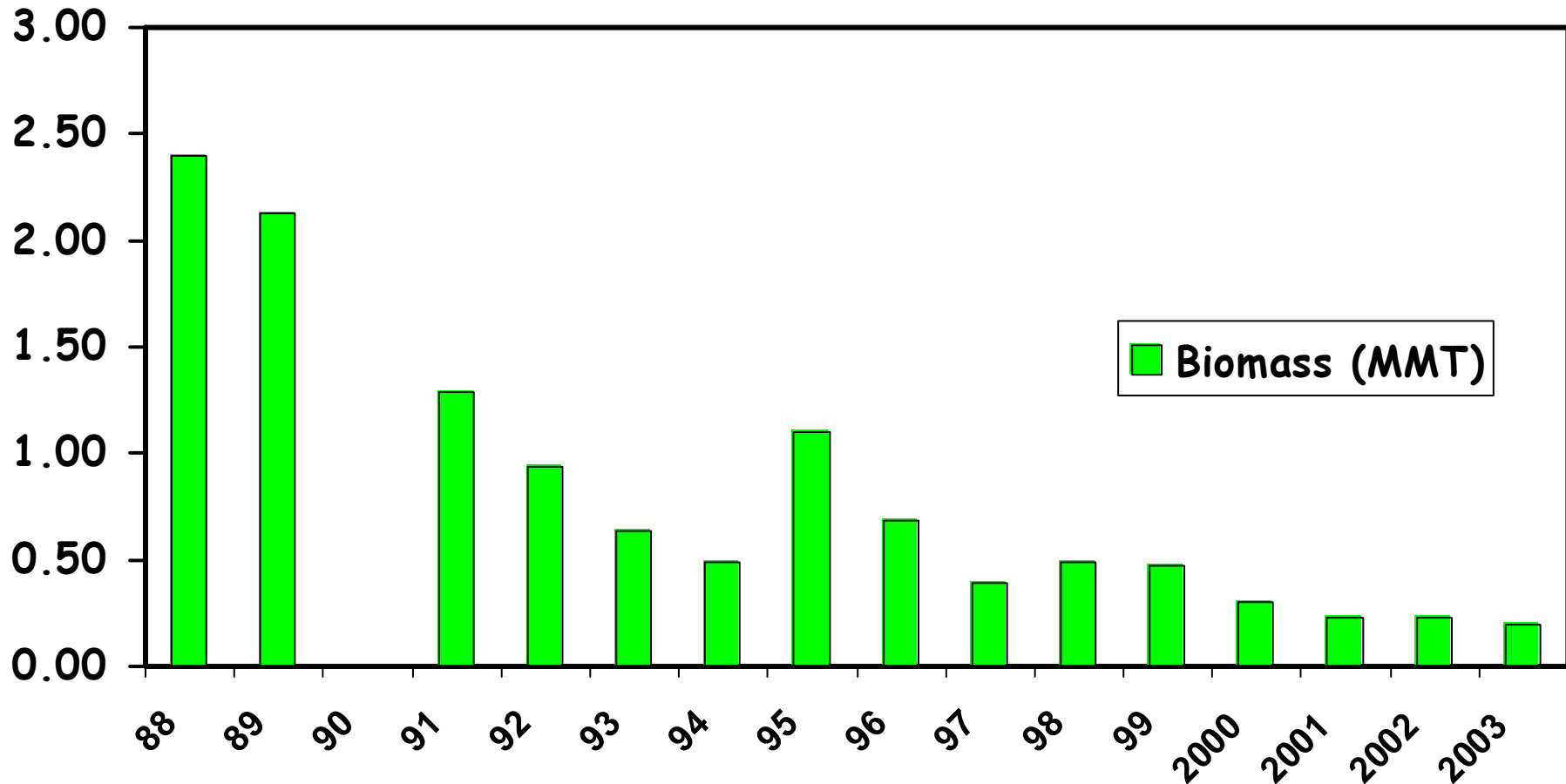
Aleutian Island Region Pollock Assessment

Survey Biomass



1. New age structured assessment; but needs further development
2. Depend on Survey Biomass
 - 1991 167,140
 - 1994 77,503
 - 1997 93,512
 - 2000 105,554
 - 2002 175,000
3. ABC from Tier 5 = 39,400 mt

Bogoslof Region Pollock Survey Biomass



Bogoslof Region Pollock ABC

1. Plan Team Method Uses Tier 5

ABC max permissible = Biomass \times 0.75 M

ABC = 29,700 mt

2. SSC Method Uses 2 mmt as Target Biomass and since 2003 Biomass was less than 10% of Target

ABC was adjusted down by formula to 2,570 mt

Pacific Cod Assessment

Notable Features

1. 2003 Surveys

EBS Trawl Biomass = 605,681 mt, down 2%

2. 2003 Model

Update of Last Year's Model

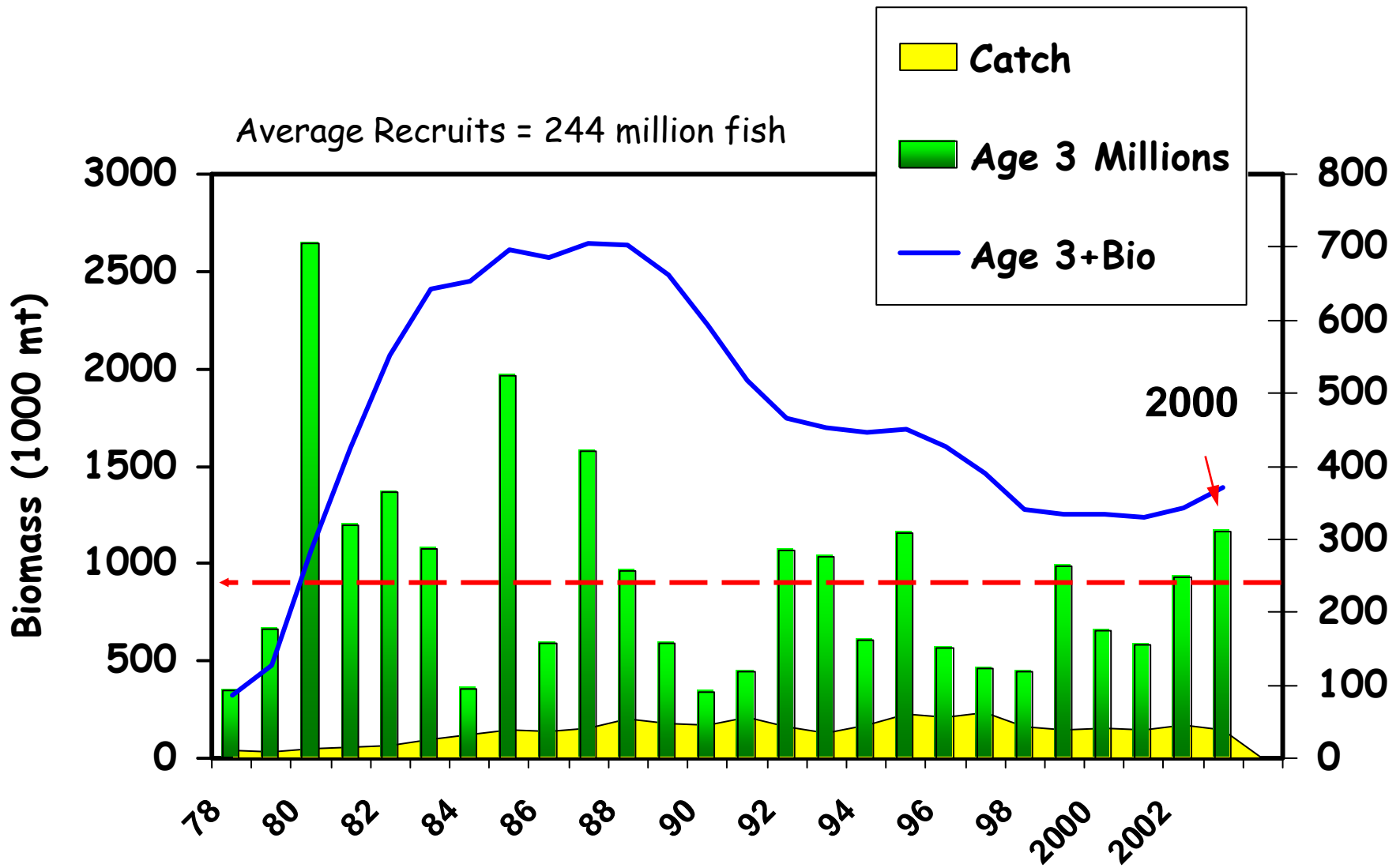
Estimated 2004 Age 3+ Biomass = 1,660,000 mt
down 1% from 2003, down 3% from projected

3. Recruitment

-- 3 Recent year classes above average

1996-1999-2000

BSAI Pacific Cod



Yellowfin Sole Assessment

Notable Features

1. Survey biomass

Relatively high biomass, doubled from 1975-79
Declining in recent years

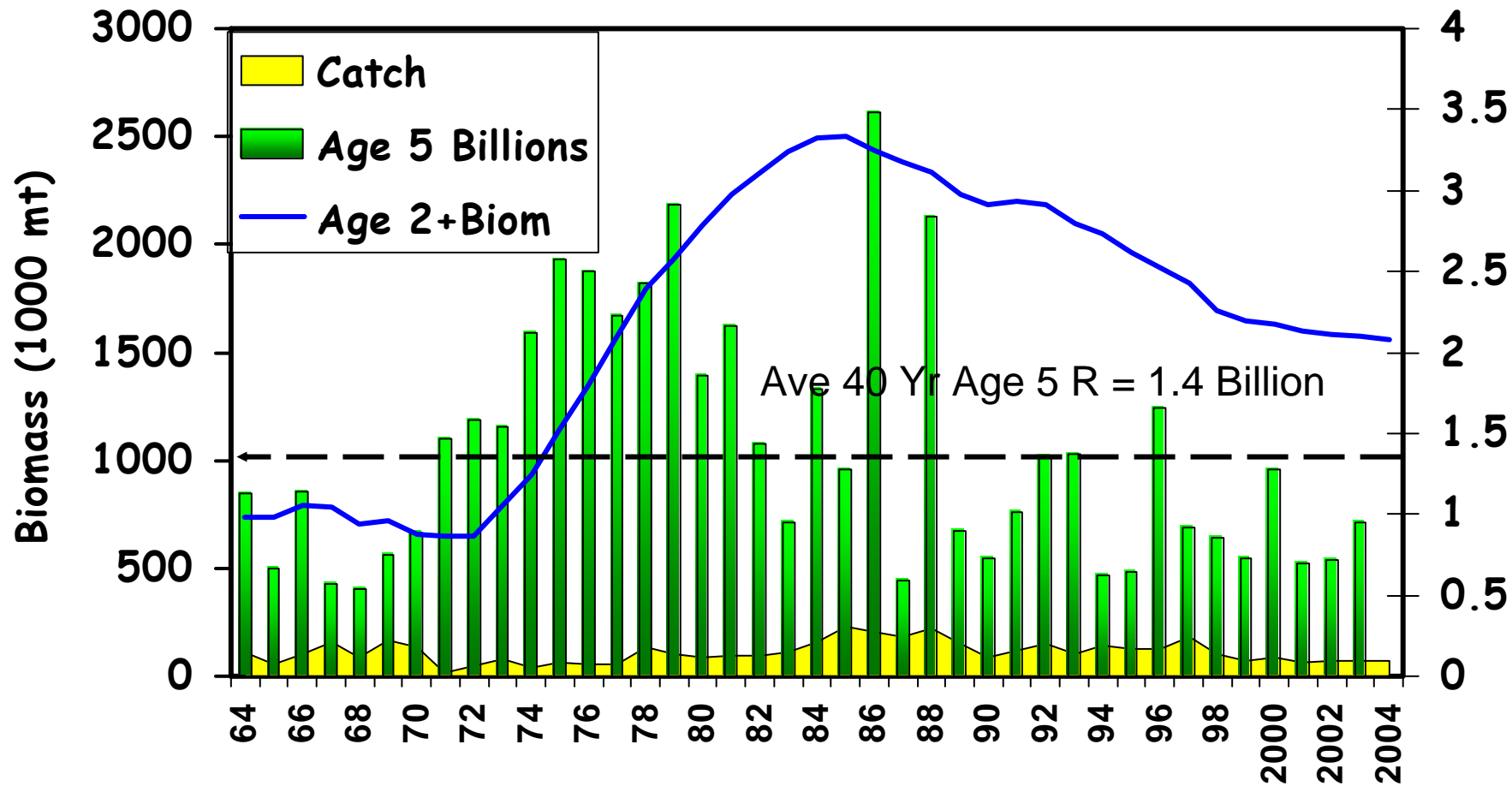
2. Models

Estimated 2003 Age 3+ Biomass = 1.55 mmt,
no change from last year
biomass is still high and possibly stabilizing

3. Recruitment

Ricker S/R curve fitted
MSY calculated for two time periods.
Discussion of Tier 1 implications

EBS Yellowfin Sole



Arrowtooth Flounder Assessment

Notable Features

1. Survey Biomass

The 2003 shelf trawl survey estimate 553,900 mt
56% increase from 2002.

2. Assessment model

Estimated 2004 Age 1+ Biomass = 696,400 mt,
17% increase from last years estimate.

Change primarily due to new model configuration

Equal emphasis on all data

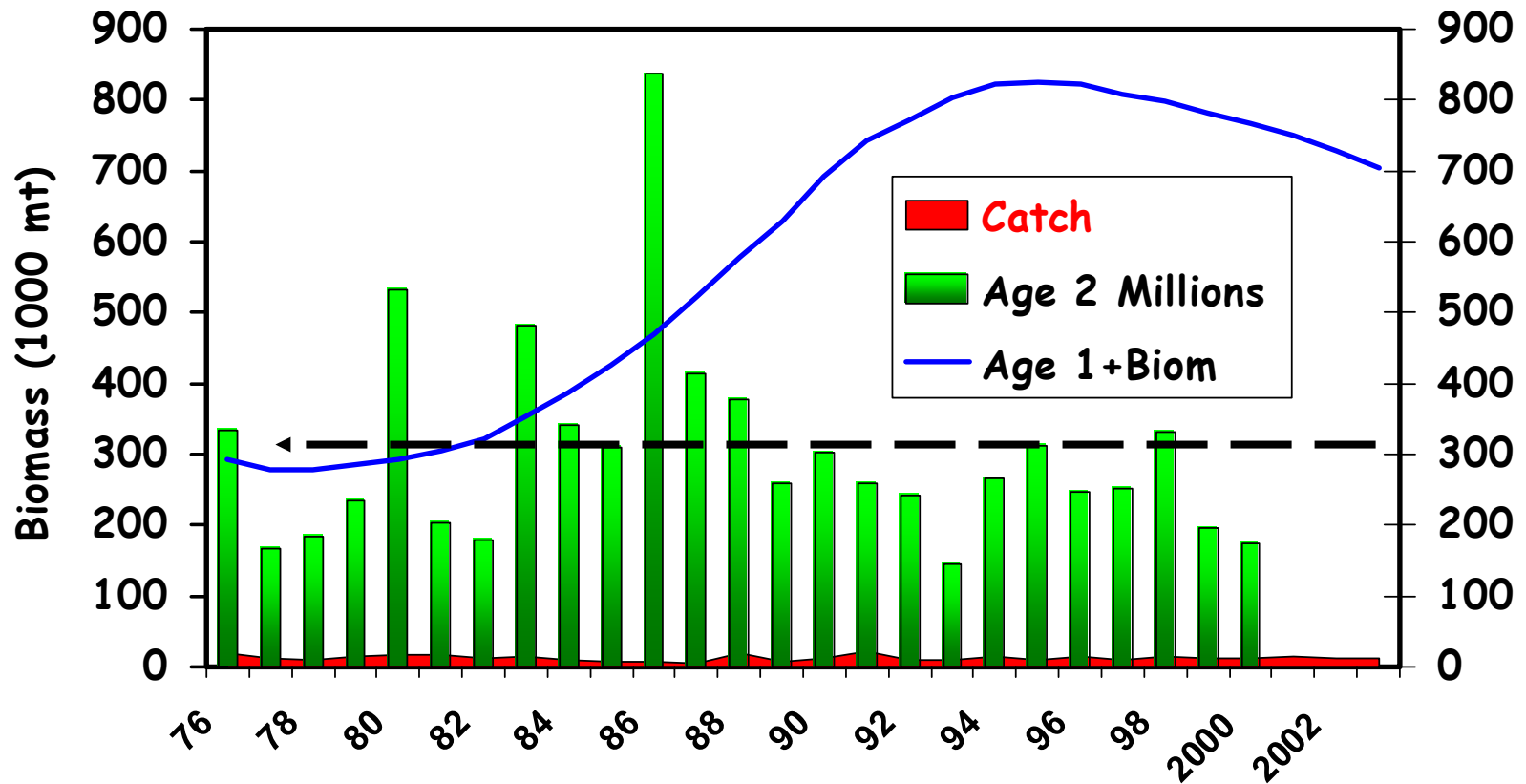
Used sex ratio data

Allowed estimation of sex-specific natural mortality rate

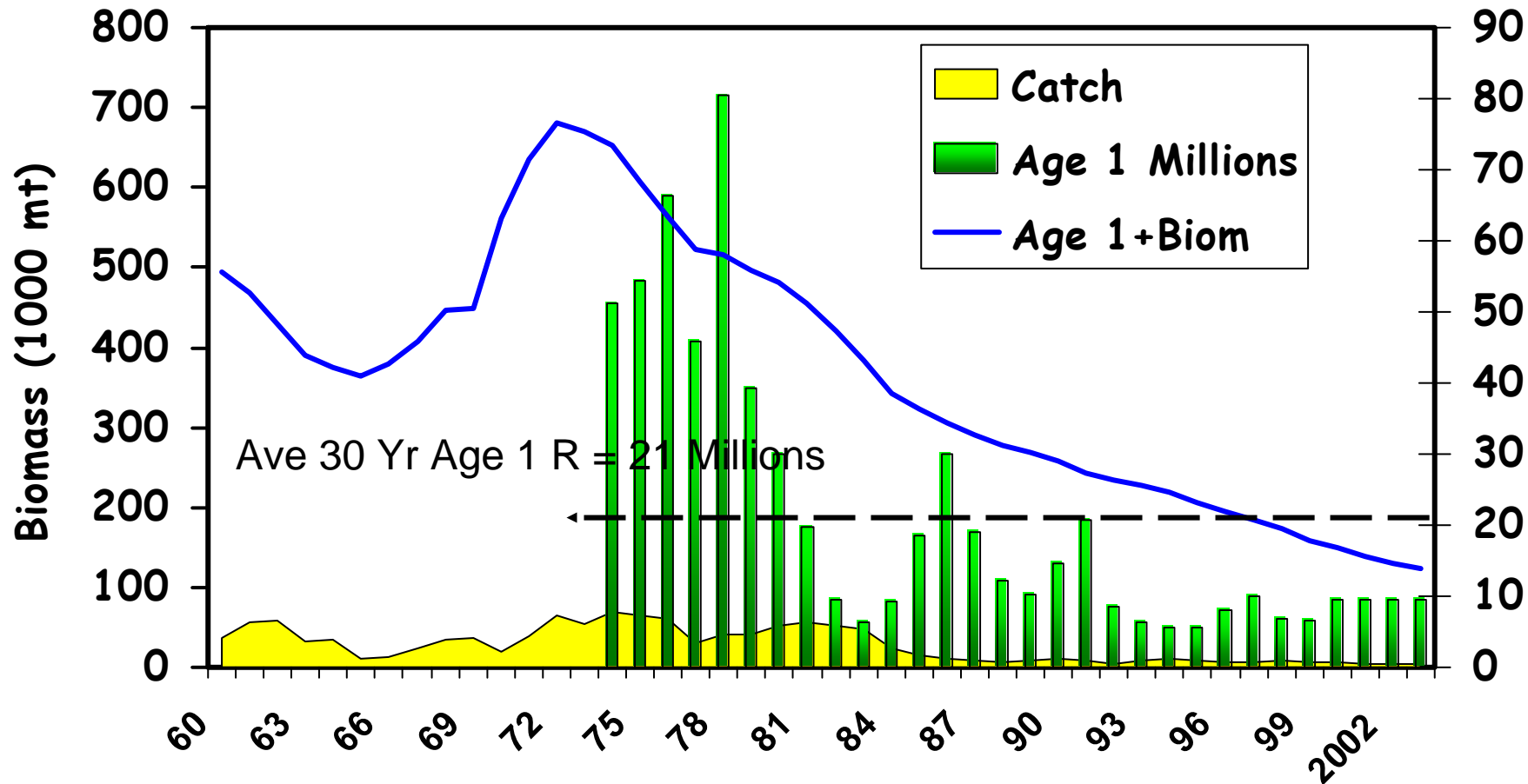
Temperature effect on q explored

EBS Arrowtooth Flounder

Ave 25 Yr age 2 R = 303 Millions



EBS Greenland Turbot



Rock sole Assessment

Notable Features

1. Survey Biomass

The 2003 shelf survey estimate 2.1 mmt

An increase from the 2002 level

2. Models

Survey q estimated with prior

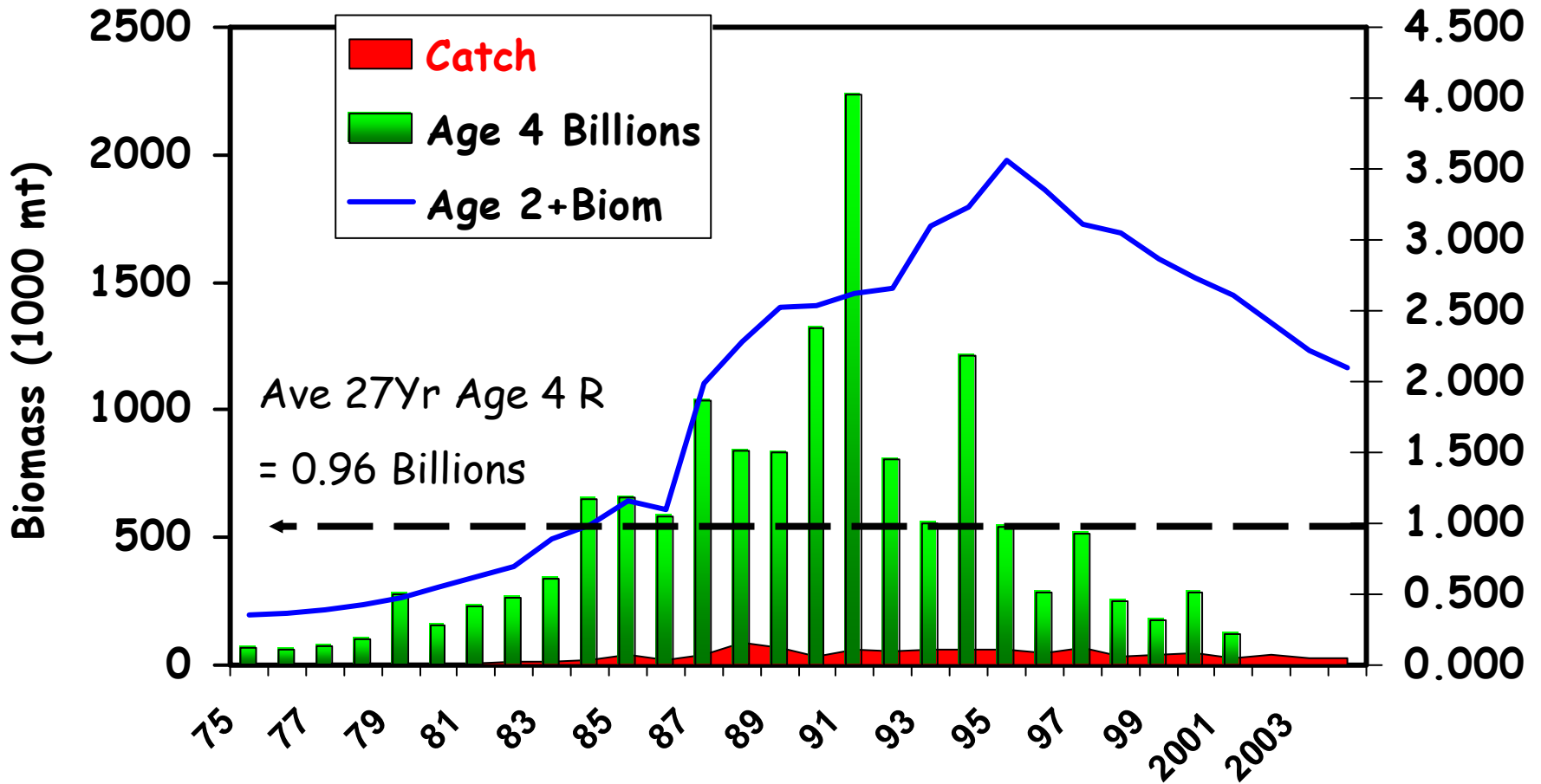
From herding experiment data

Estimated $q = 1.45$

Temperature effect on q

not evident for this species

EBS Rock Sole



Flathead sole Assessment

Notable Features

1. Survey Biomass

The 2003 shelf survey estimate 529,000 mt
Slight decrease from 2002

2. Models

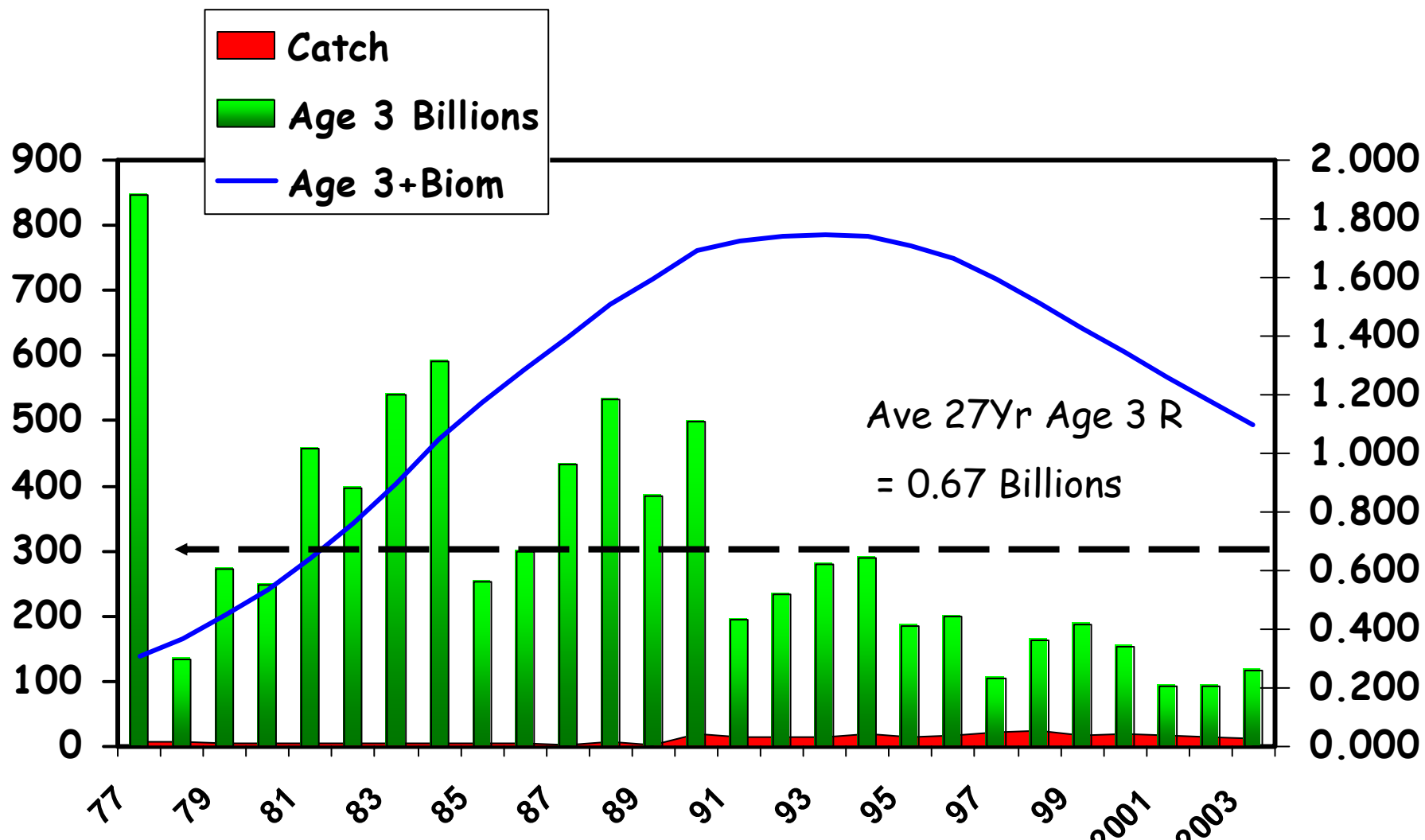
Recent recruitment low

ABC 61,900 t

Slight decrease from 2002

Temperature effect on q was incorporated

EBS Flathead Sole



Alaska Plaice Assessment

Notable Features

1. Survey Biomass

The 2003 shelf survey estimate 467,000 mt
Slight increase from 2002

2. Models

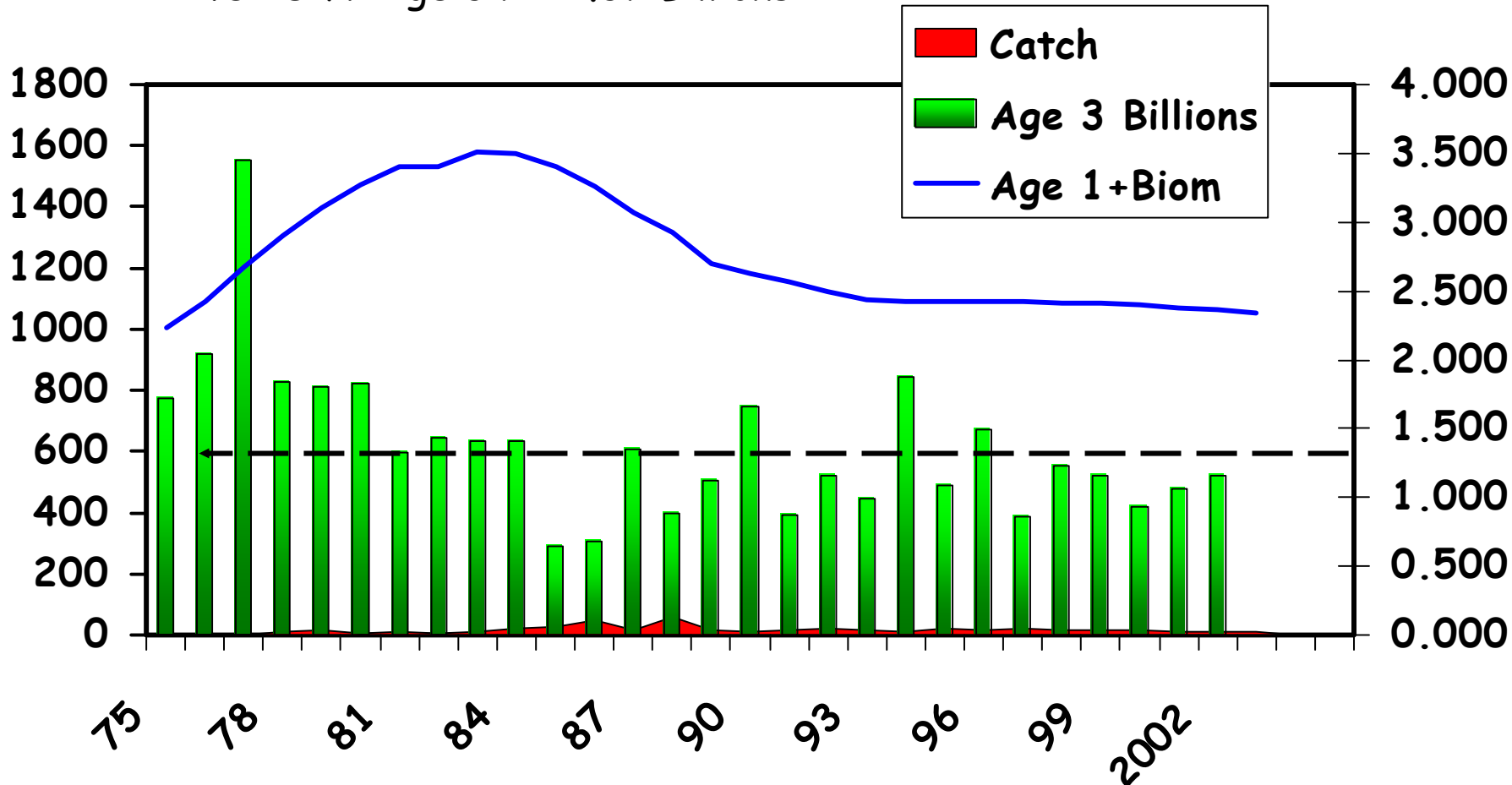
Length composition data used in assessment
12 years of survey length data
Estimated growth curve re-computed

ABC increased

From 137,015 mt in 2002 to 203,056 mt in 2003

EBS Alaska Plaice

Ave 28 Yr Age 3 R = 1.37 Billions



POP Assessment

Notable Features

1. Assessment model

Combined BSAI areas

2. Biomass Trend

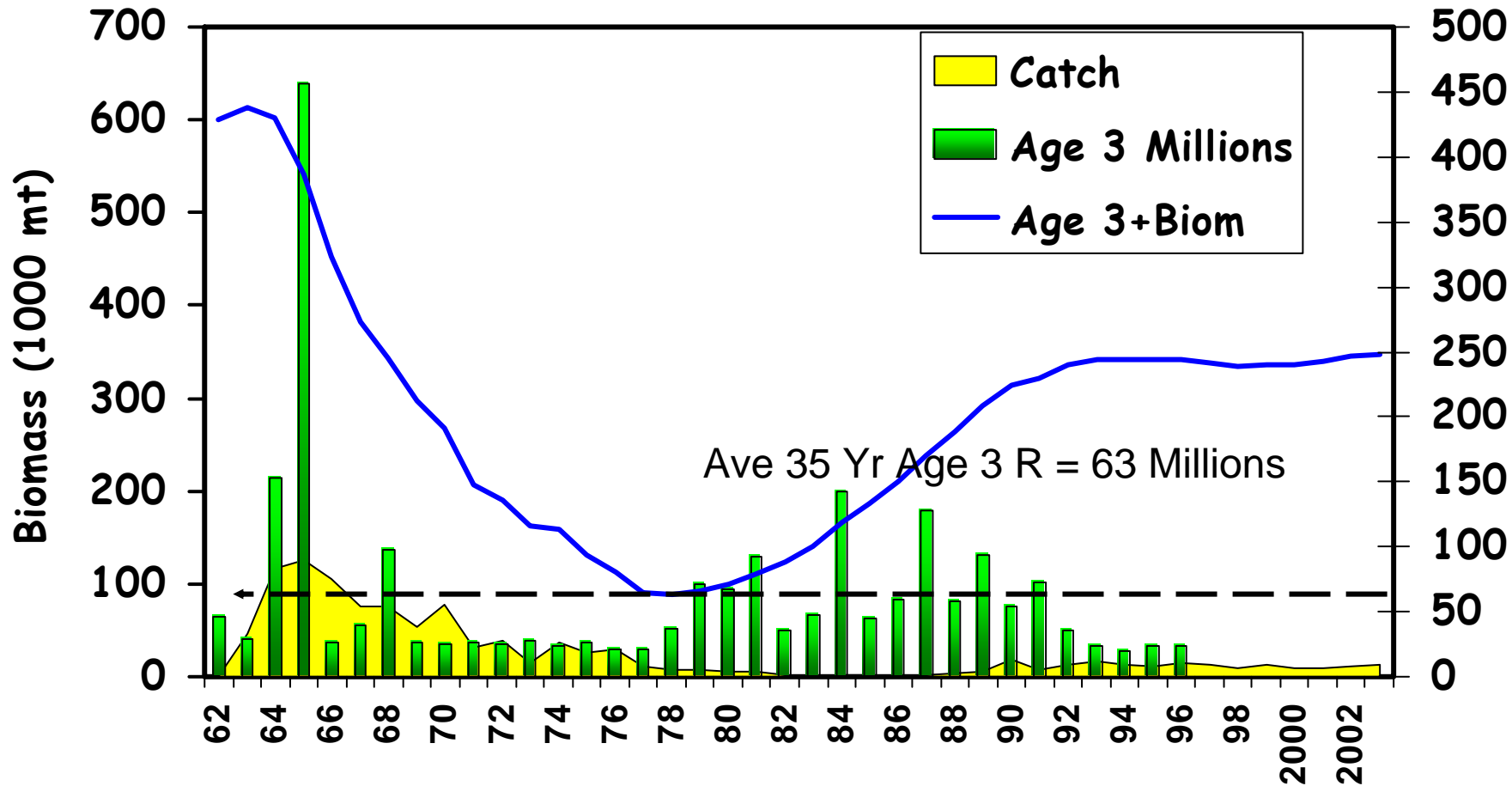
Stable in recent years after some rebuilding

Recruitment

Poorer Recruitment in recent years

1988 YC most recent above average year
class

Bering Sea/Aleutians POP



Other Red Rockfish Assessment

(Species split)

1. Original Species Splits

Pacific ocean perch

Other Red Rockfish through Year 2000:

Northern/Sharpchin vs Shortraker/Rougheye

2. New Splits:

Northern, Shortraker, Rougheye

Sharpchin is merged into Other Rockfish
category

Northern Rockfish Assessment

Notable Features

1. New age-structured assessment

Made possible by reading archived otoliths

Shift to Tier 3 from Tier 5

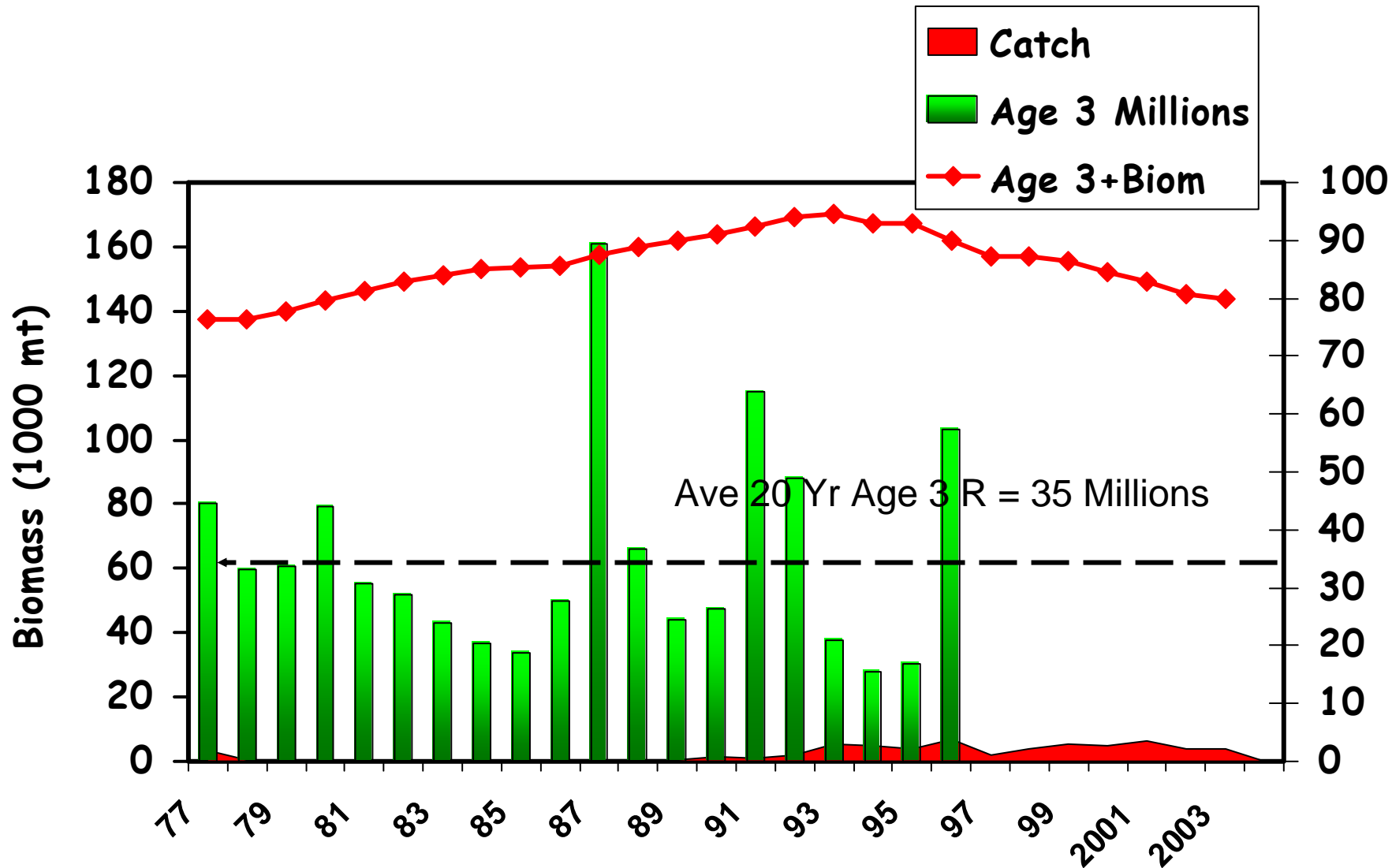
2. Biomass Trend

Stable

3. Recruitment

Good in recent years

Bering Sea/Aleutians Northern Rockfish



Shortraker and Rougheye Assessments

Notable Features

1. In 2001 & 2002, managed as a group

2. Now separated

Observer Program & NMFS track separately

3. Tier 5 ABC

Based on Average 1991-2002 biomass:

Species	Biomass	ABC
Shortraker	23,400 mt	526 mt
Rougheye	10,400 mt	195 mt

Other Rockfish Assessments

Notable Features

1. Presently Managed as a Complex (8 species)
2. Author recommend separating shortspine thornyhead & manage as tier 5
Remaining other rockfish stay in Tier 6
3. Plan Team disagreed as procedure needs further evaluation and recommends Mgmt as before.

Thus Plan Team ABC is according to Tier 5 :

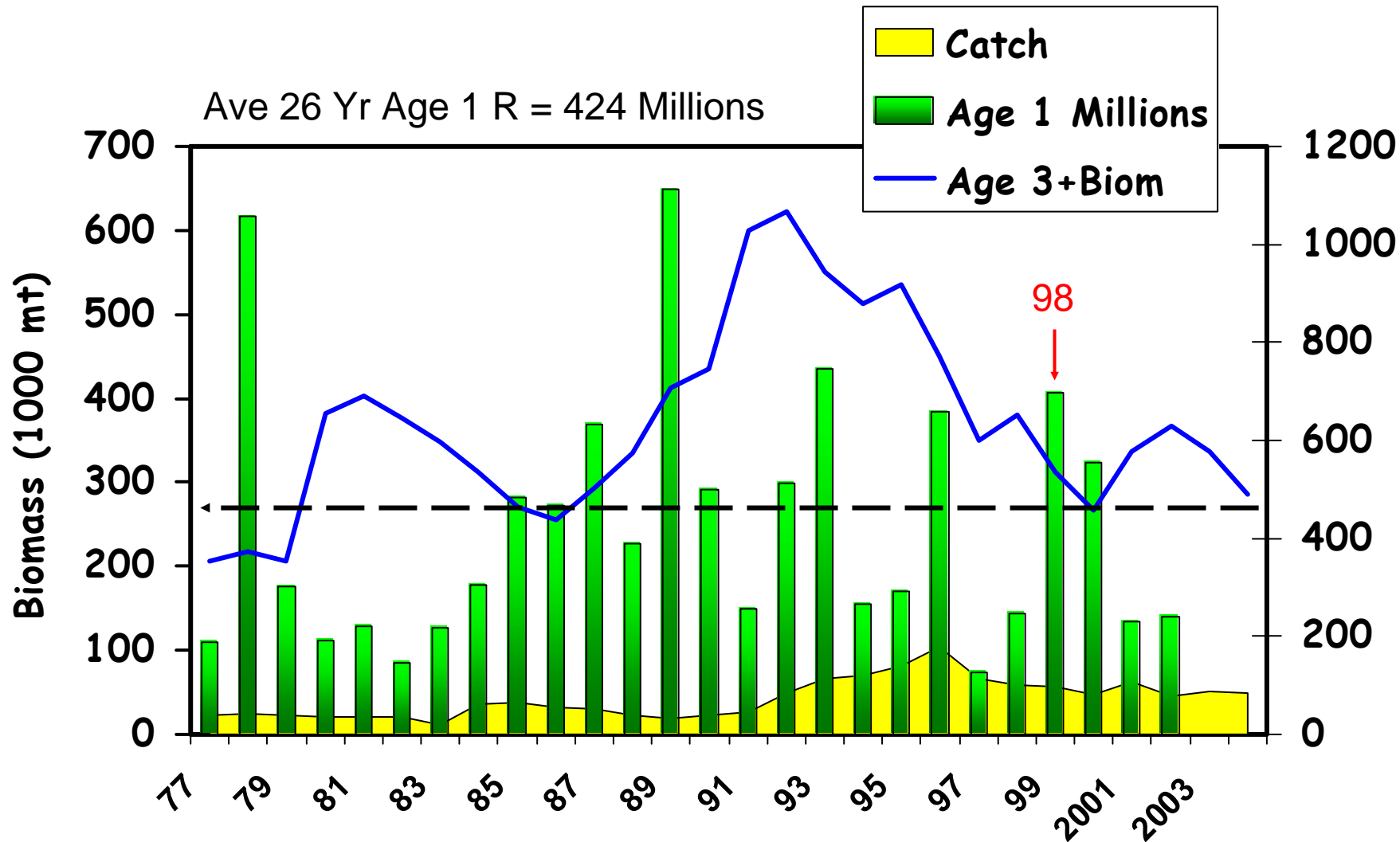
Stock	Year	Survey Biomass	ABC
EBS	2004	18,000	960
AI	2004	15,000	634

Atka Mackerel Assessment

Notable Features

1. Survey Biomass 2002 = 773,000 mt up 51% from 2000 survey; Shows high variability.
2. Yr 2004 Model 3+ biomass = 286,200 mt, down 15 % from Yr 2003; Probably an underestimate.
3. Max Permissible F40 would yield ABC = 66,700 mt an increase from last year (51,000 mt)
4. ABC = 66,700
5. 1998, 1999 Year Classes showing strength

Aleutian Islands Atka Mackerel



Squid and other species Assessment

Notable Features

- 1 Squid ABC is calculated under Tier 6
.... average catch from 1977-1995
2. Other species: author recommends managing by major taxonomic groups

Species	Biomass (mt)	ABC (mt)
Sharks	29,300	1,980
Skates	484,000	36,300
Sculpins	212,000	23,800
Octopus	4,980	1,120

Summary (From Table 4)

(Pollock)

Stock	Biomass (mt)	ABC (mt)	ABC Change from 2003
Pollock, EBS	11,000,000	2,560,000	Up 10 %
Pollock, AI	175,000	39,400	Up 34%
Pollock, Bogoslof	198,000	29,700 (PT)	Down 13%

Summary (from Table 4) (Cod and Sablefish)

Stock	Biomass (mt)	ABC (mt)	ABC Change from 2003
Pacific Cod, BSAI	1,680,000	223,000	Same
Sablefish, EBS	31,000	3,010	Up 4 %
Sablefish, AI	39,000	3,450	Up 11 %

Summary (from Table 4) (Flatfishes)

Stock	Biomass (mt)	ABC (mt)	ABC Change from 2003
YellFn. Sole	1,550,000	114,000	Same
Grn. Turbot	112,000	4,740	Down 19 %
Arrow. Fl	597,000	115,000	Up 3 %
Rock Sole	877,000	139,000	Up 26 %
Flathead S	550,000	61,900	Down 6 %
Alaska Plaice	1,080,000	203,000	Up 48 %
Other Flats	107,000	13,500	Down 16%

Summary (from Table 4) (Rockfishes)

Stock	Biomass (mt)	ABC (mt)	ABC Change from 2003
POP, BSAI	375,000	13,300	Down 12 %
Northern R	142,000	6,880	Down 3 %
ShortRaker	23,400	526	New Category
Rougheye		195	New Category
Other R, EBS	18,300	960	Same
Other R, AI	12,100	634	Same

Summary (from Table 4)

(Atka Mackerel & Other Species)

Stock	Biomass (mt)	ABC (mt)	ABC Change From 2002
Atka Mackerel	286,000	66,700	Up 6 %
Squid	NA	1,970	Same
Other Species	695,000	Various	New Species Breakdown, SSSO

Adjustments of ABCs Below Max. Permissible Levels - due To Uncertainties -

Stock	Maximum Permissible ABC (mt)	Recommend ABC (mt)	Main Reasons for Adjustment
Pollock, Bogoslof	29,700 (Plan Team)	2,570 (SSC)	SSC Procedure
Pacific Cod	297,000	223,000	Risk-averse adjustment due to q , M uncertainty
Green. Turbot	15,700	4,740	Low B & R
Sablefish, All	25,400	23,000	Simulated Catch

Adjustments to ABCs due to Ecosystems

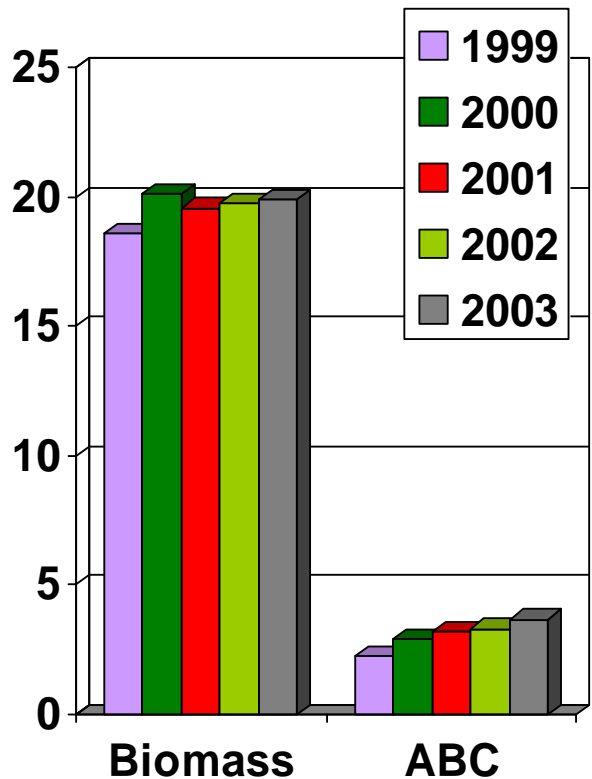
1. The Team did not make specific adjustments to ABCs for ecosystem concerns
2. General concerns about uncertainties have already been built into the Analyses

Differences of ABCs Plan Team vs SSC

Stock	Plan Team	SSC	Main Reasons for Adjustment
Pollock, Bogoslof	29,700	2,570	B is 10% of B target of 2 mmt Diff = 27,130
Other Species (Sculpins, Skates, Sharks, Octopi)	Species Breakdown, Tier 5, ABC adds up to 63,200	Species Breakdown, Tiers 5 & 6 Combine and Stair-step increase from 1997 ABC= 46,810	Quality of Data Diff = 16,390

BSAI Groundfish Complex

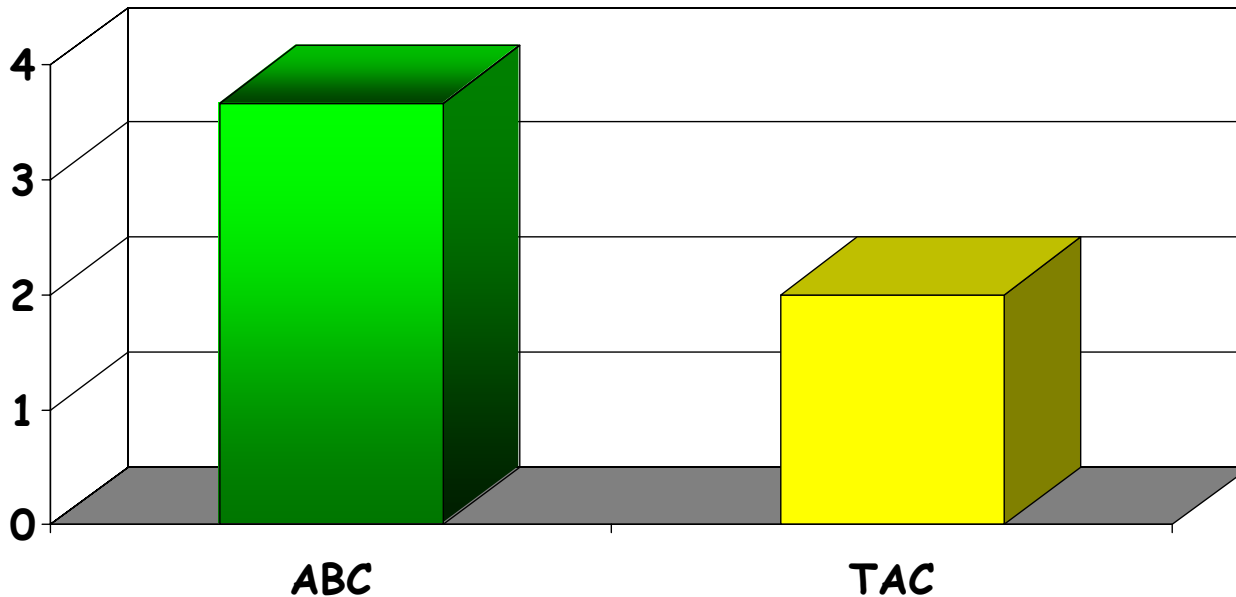
Yr 1999 to Yr 2003



- **Exploitable Biomass**
 - 19.87 mmt for Yr 2003
 - Historical High
- **ABC**
 - 3.664 mmt for Yr 2003
 - Historical High

Summary for 2003

- $ABC = 3,664,065$ mt
- Max TAC = 2 million mt (< 55% of ABC)
- Catch in 2003 thru Nov 8 = 1,957,029 mt



Catch (2001-2003)

Year	Catch	Difference from 2 mmt
2001	1,815,227	184,773
2002	1,937,386	62,614
2003 (thru Nov 8)	1,957,029	42,971