Update on groundfish stock trends for the Gulf of Alaska

Report of the
Gulf of Alaska Groundfish
Plan Team meeting
Nov 18th -22nd , 2013

GOA Plan Team Members

James Ianelli (co-chair)	AFSC
Diana Stram (co-chair)	NPFMC
Kristen Green	ADFG
Mark Stichert	ADFG
Jan Rumble*	ADFG
Ian Stewart	IPHC
Leslie Slater	USFWS (joint)
Nancy Friday	NMML
Mike Dalton	AFSC
Chris Lunsford	AFSC
Jon Heifetz	AFSC
Sandra Lowe	AFSC
Paul Spencer	AFSC
Craig Faunce (absent)	AFSC
Obren Davis*	AKR

2013 Assessment Guidelines

- Abbreviated suite of model runs required for SSL prey species (pollock, P. cod, BSAI Atka mackerel) and species with conservation concern
- For all other Tier 1-3 stocks, updated projections using 2012-2013 catch data required at a minimum, with results in executive summaries
- For Tiers 4-6 stocks, executive summaries using "off-year" format required at a minimum
- Tier 4-5 GOA assessments included 2013 GOA trawl survey datum in estimates of biomass and harvest recommendations

Overview

Biennial cycle—**modified "on"** year for GOA

12 stocks in Tier 3

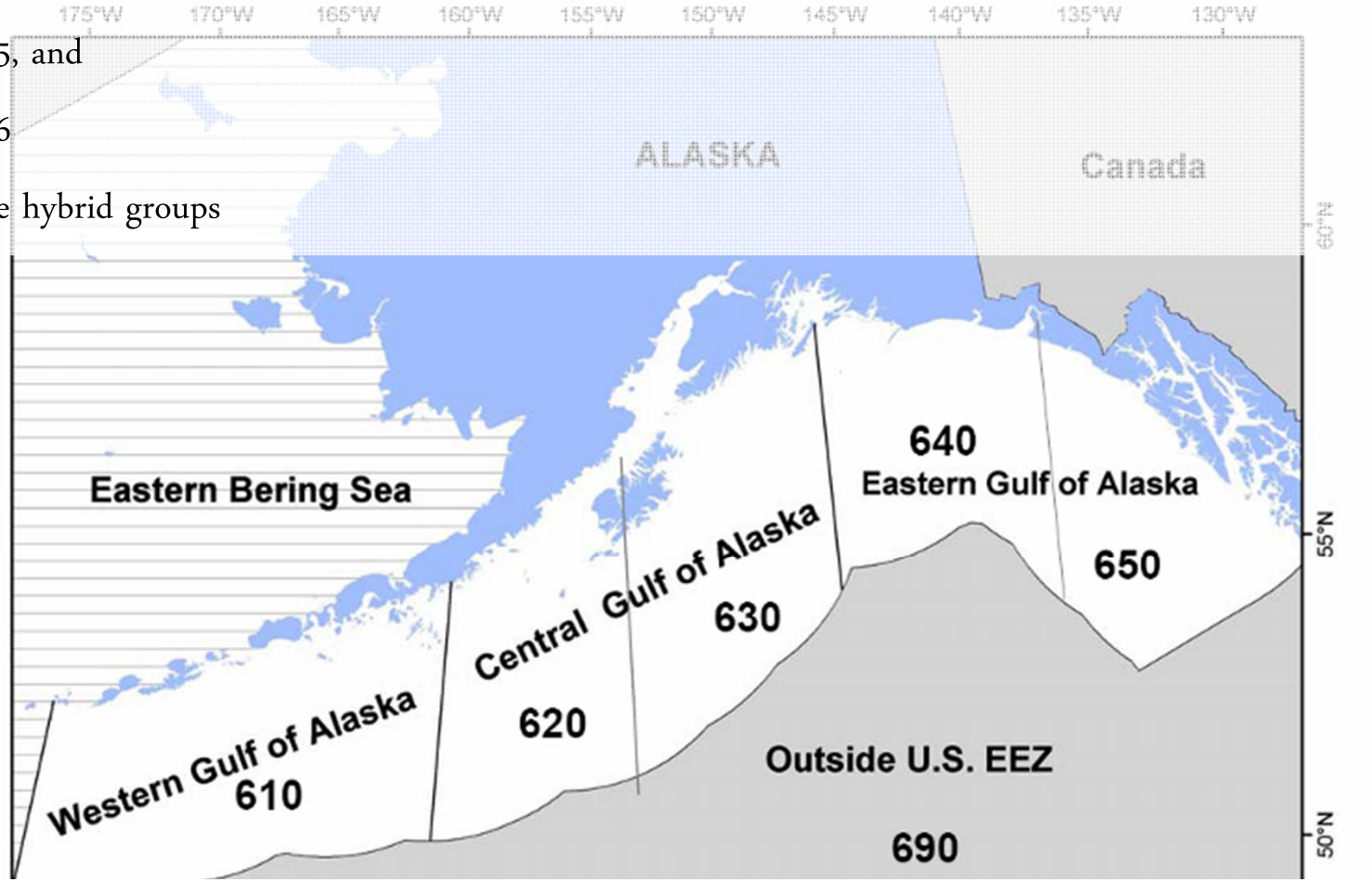
(mostly above $B_{40\%}$)

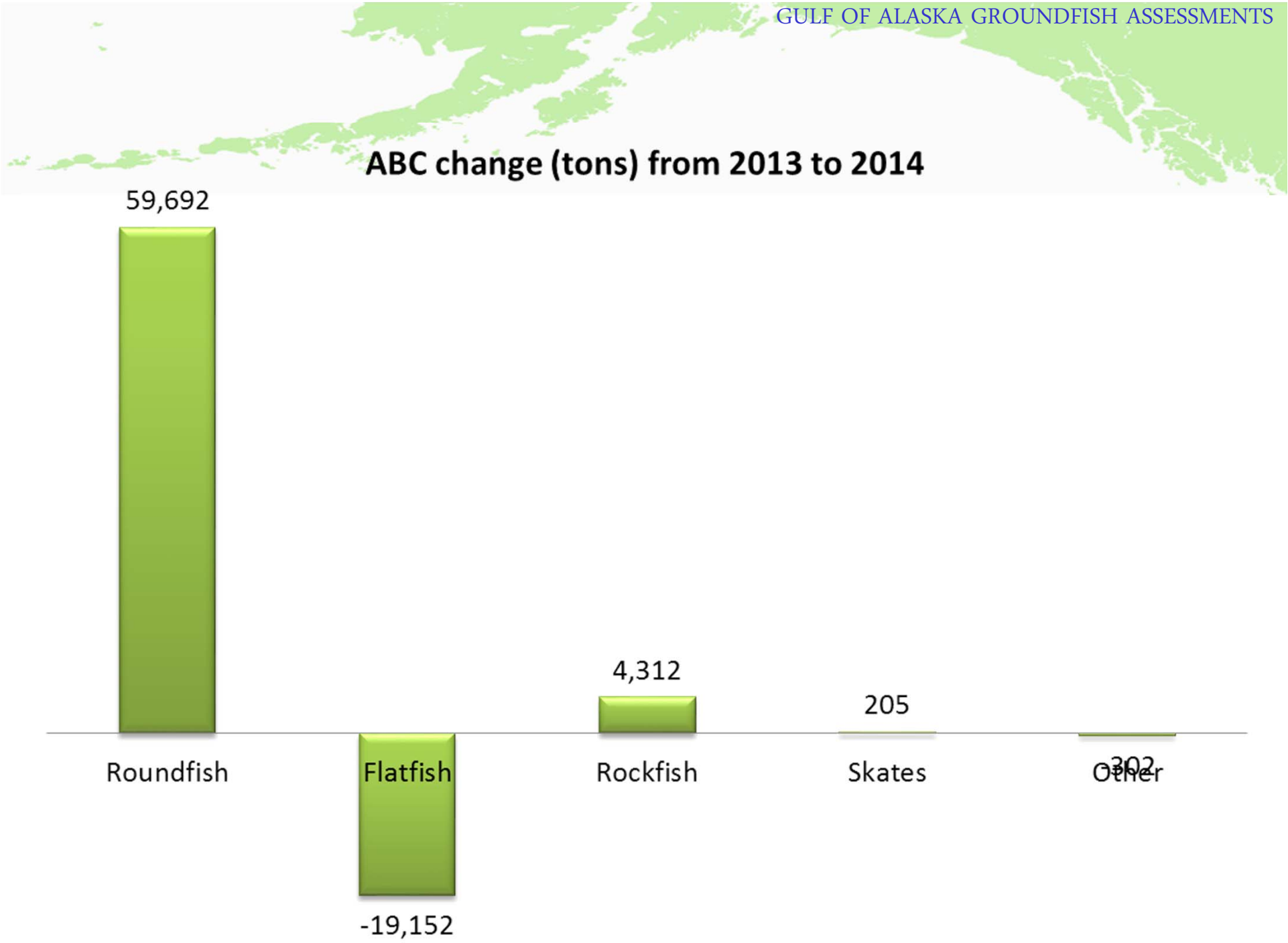
2 in Tier 4

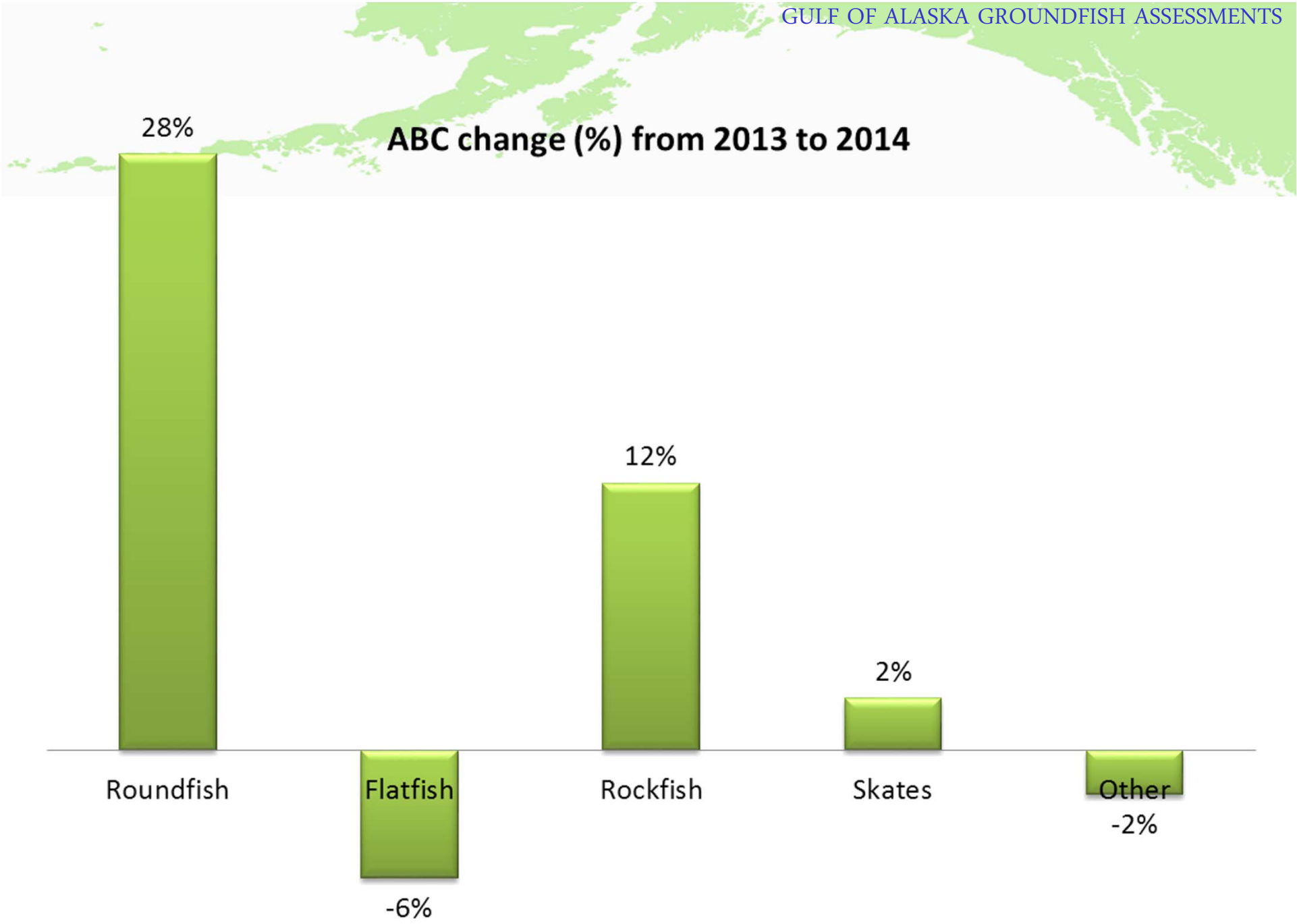
7 in Tier 5, and

5 in Tier 6

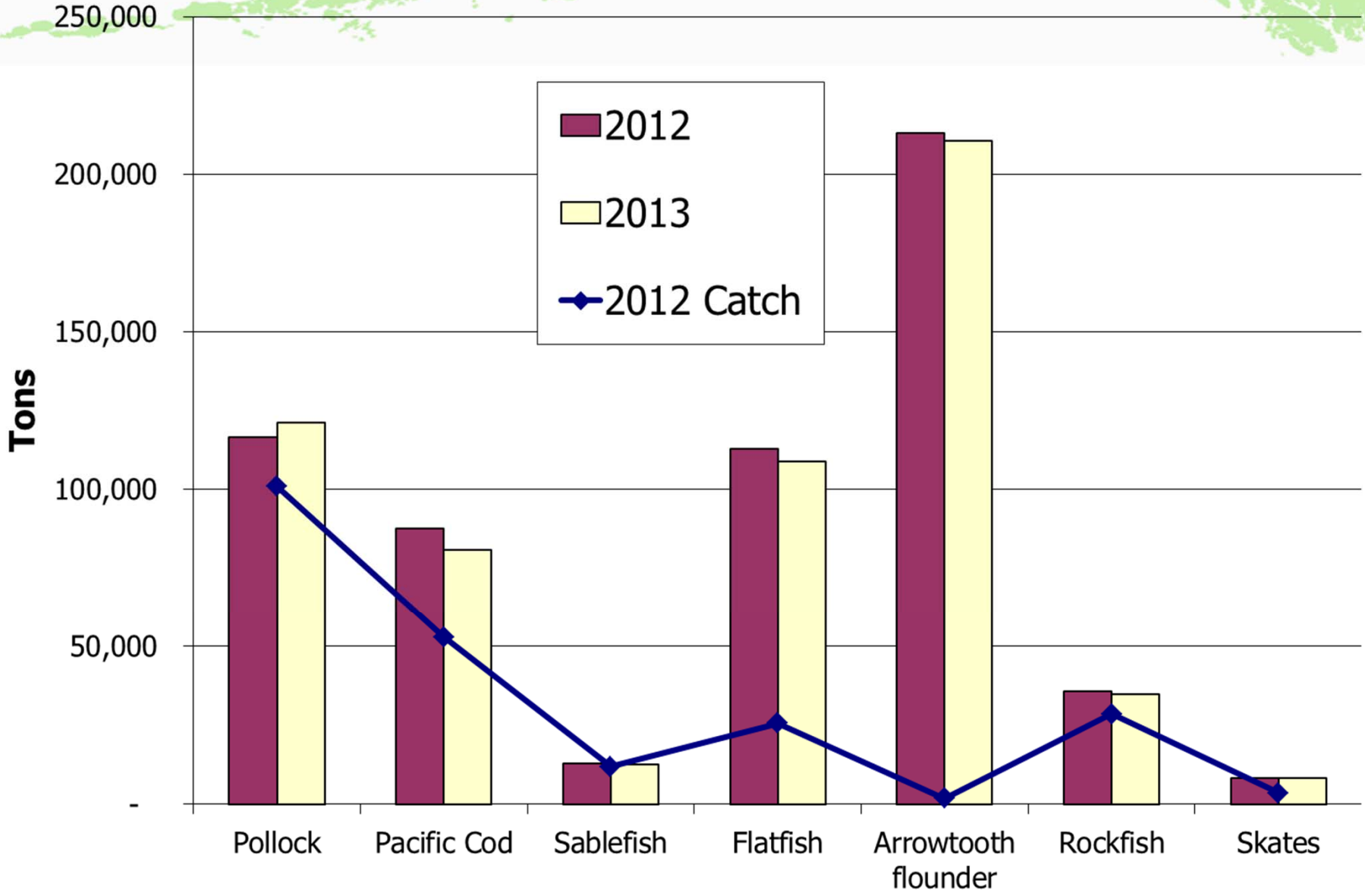
Note some hybrid groups



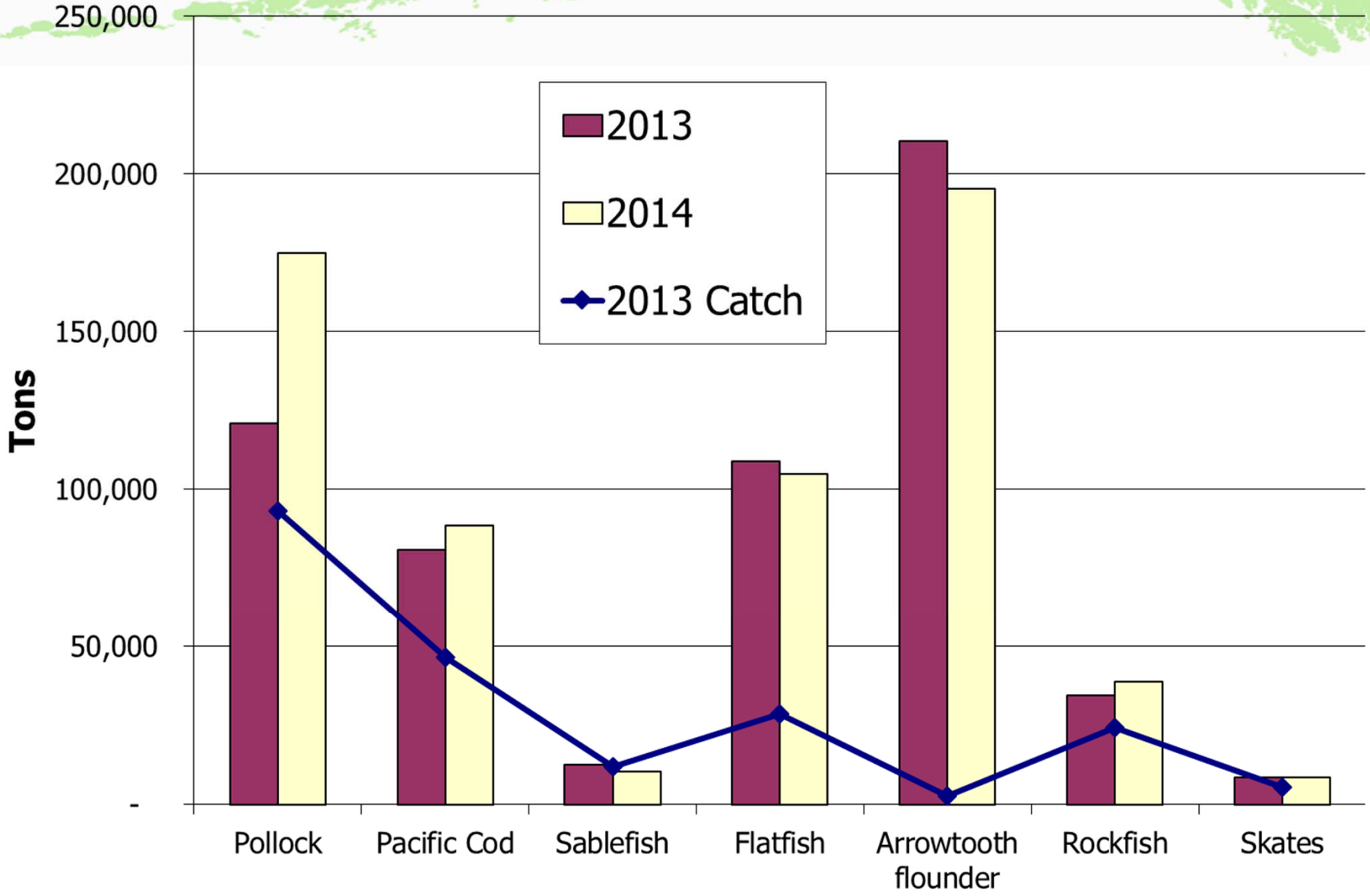

ABC change (tons) from 2013 to 2014
59,692
4,312
205
-302
Roundfish
Flatfish
Rockfish
Skates
Other
-19,152


ABC change (%) from 2013 to 2014
28%
12%
2%
-6%
-2%
Roundfish
Flatfish
Rockfish
Skates
Other

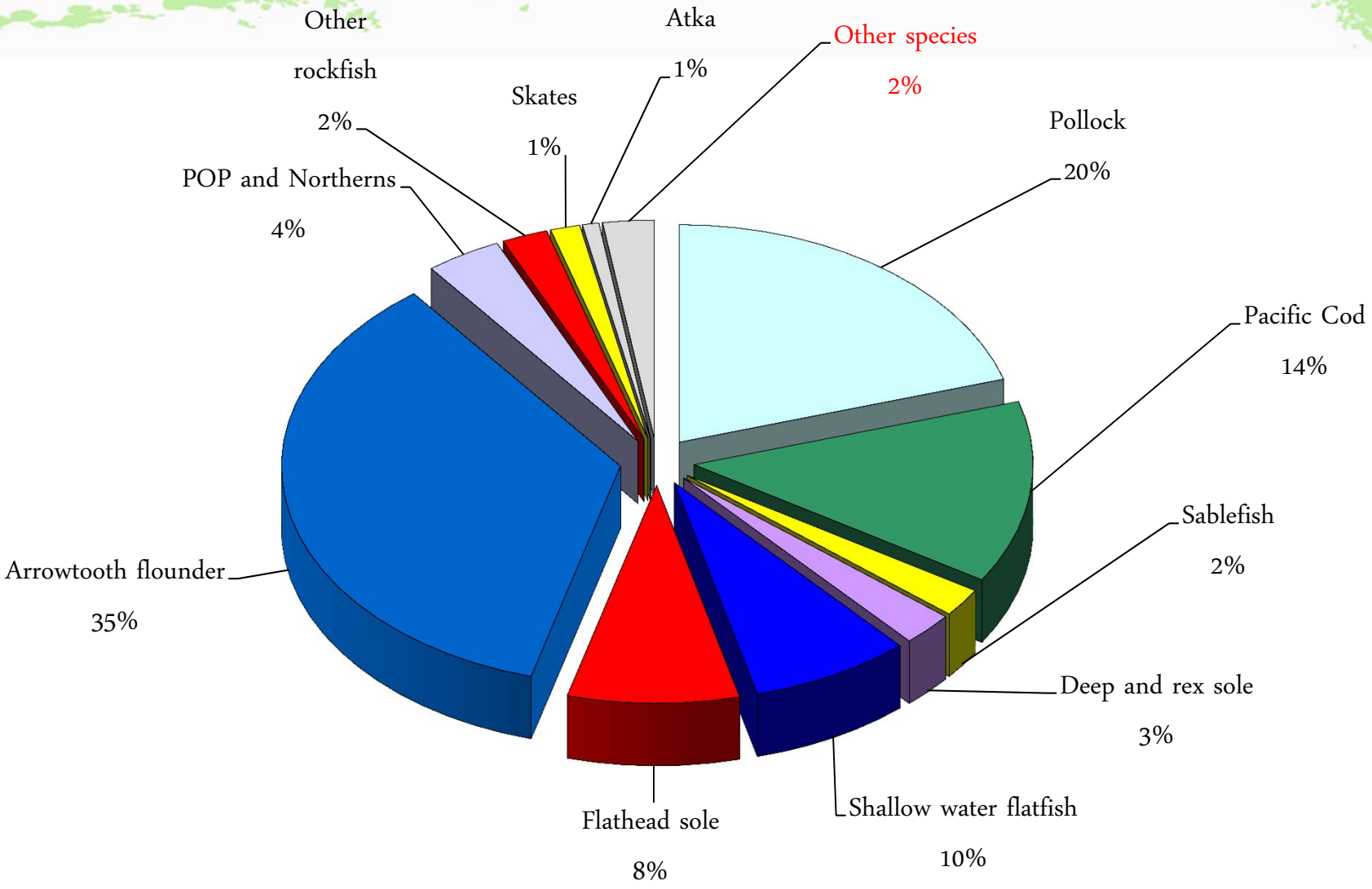
GOA Catch and ABC levels



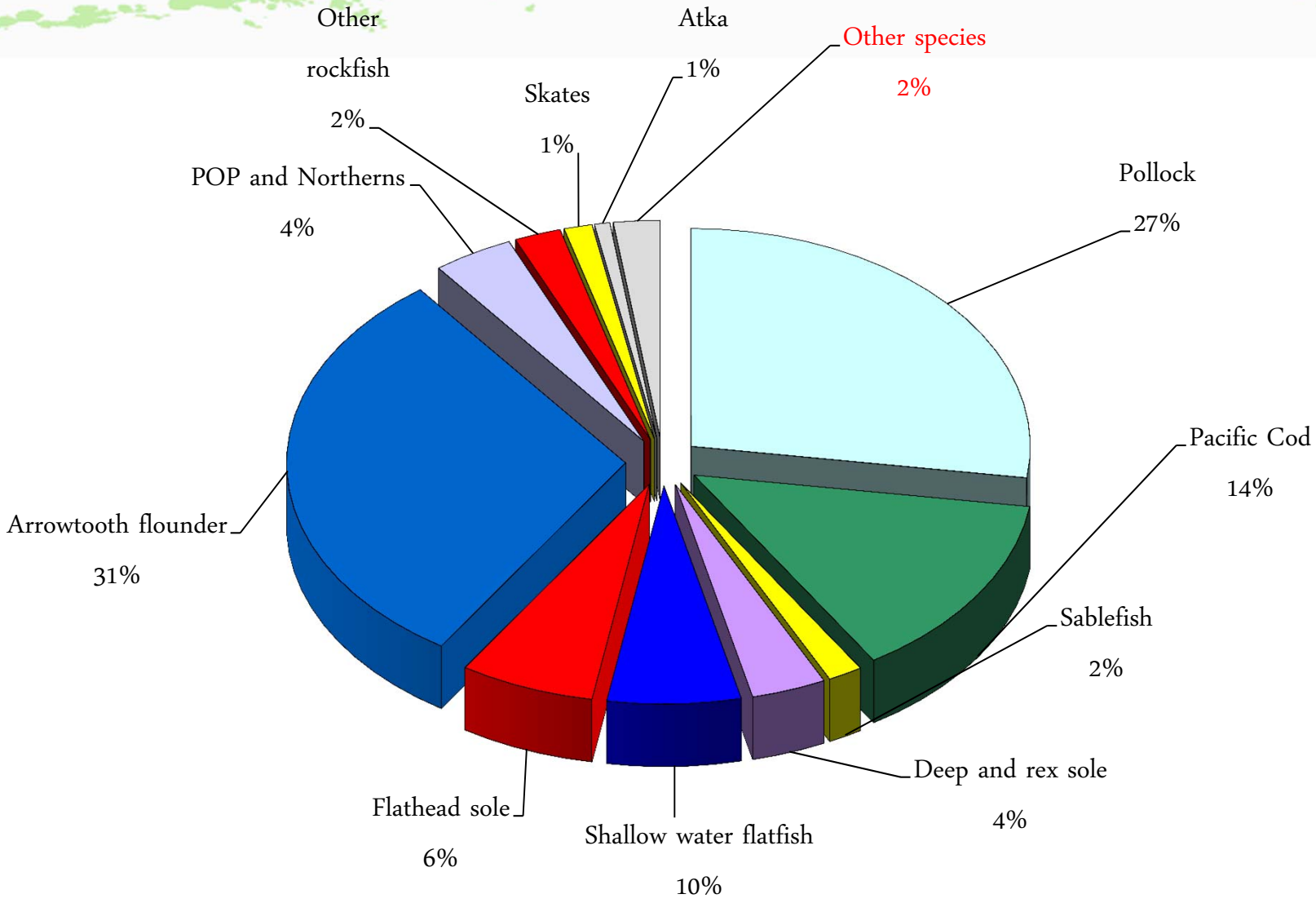
GOA Catch and ABC levels



GOA 2013 ABC's: 595,920 t



GOA 2014 ABC's: 640,675 t



ABC / TAC

Team recommendations where

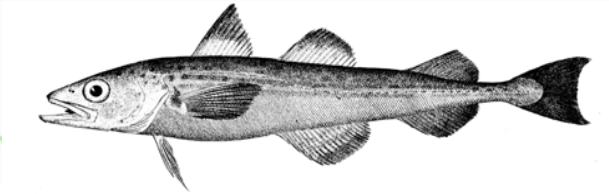
ABC <maximum permissible:

	% of Max Permissible
Pollock	88%
Demersal shelf rockfish	77%

Species overviews

1. 2014 ABC/Catch and recommended changes
2. Highlights
   - New data
   - Analytic approach (changes)
3. Stock status and trend
4. ABC/OFL
   - Tier history and recommendations
   - 2014, 2015 maxABC; recommended ABC

ABC



Species	2013 Catch	ABC 2013	ABC 2014	Change
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Other Species	4,153	14,515	14,213	down 302 (2%)
Total	218,233	595,920	640,675	up 44,755 (8%)

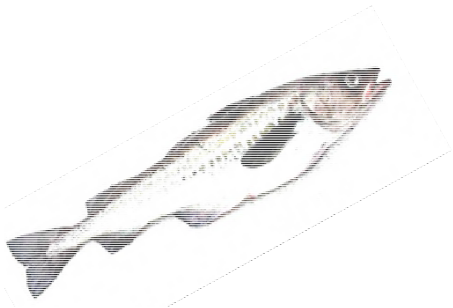
New Data-GOA pollock

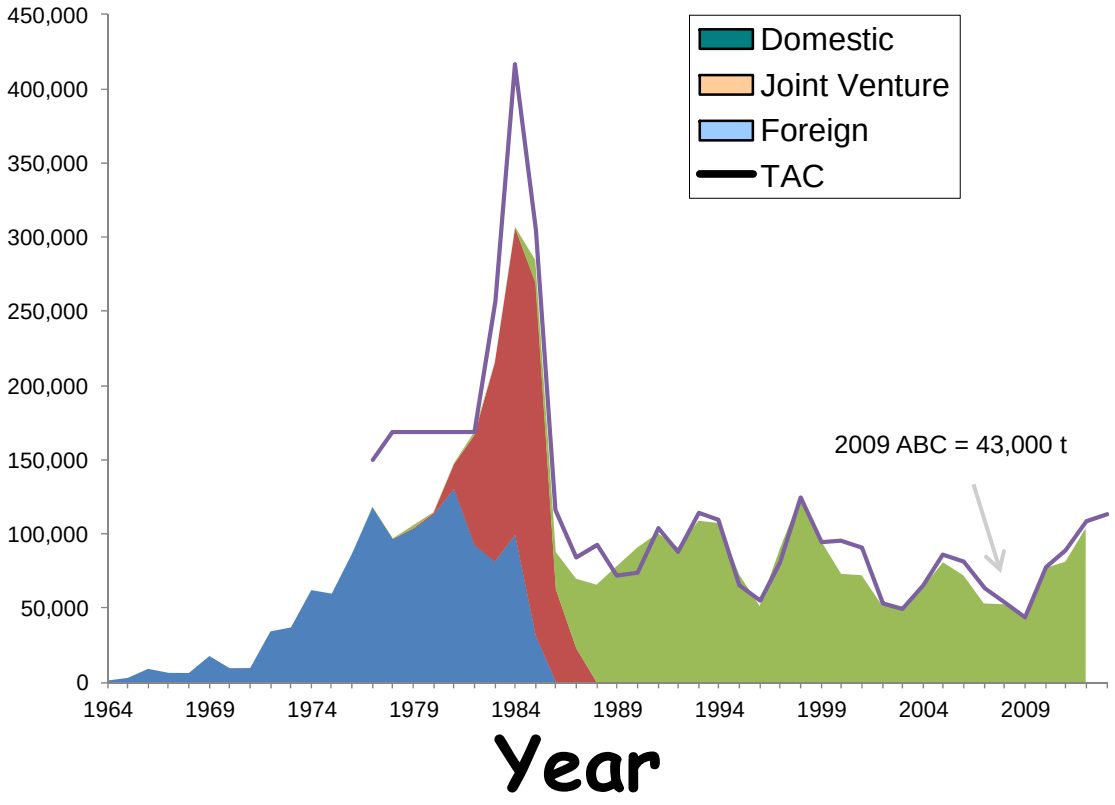
Fishery: 2012 total catch and catch at age

Shelikof EIT survey: 2013 winter biomass and age comp

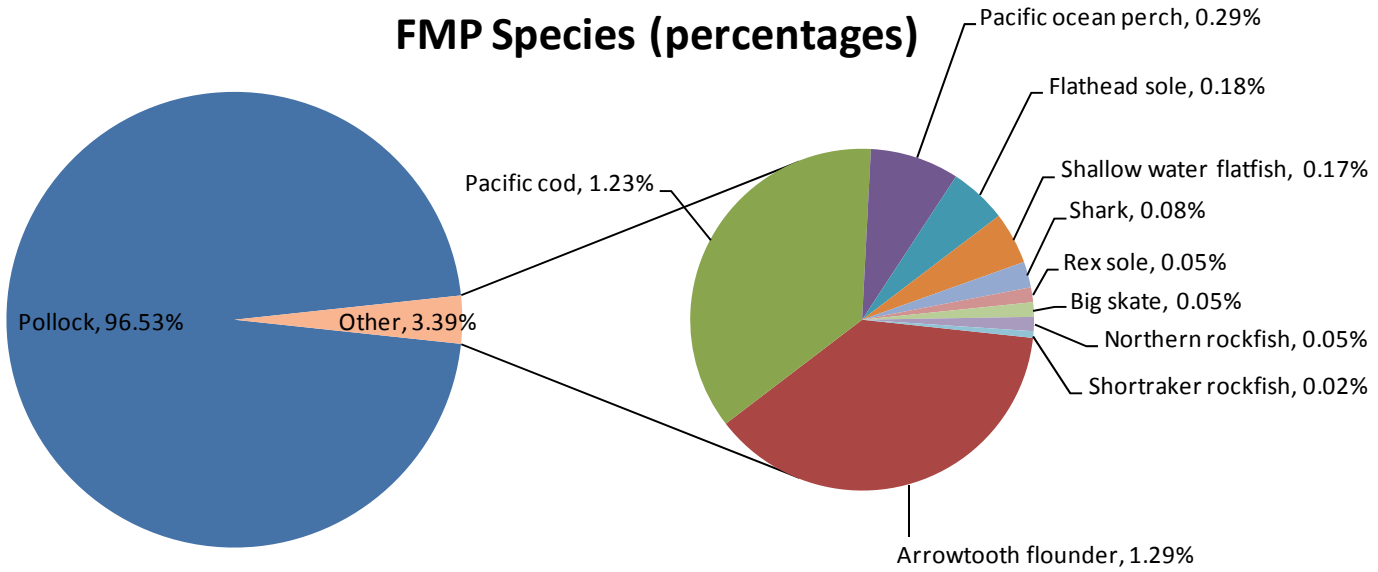
NMFS Summer trawl : 2013 biomass & length comps

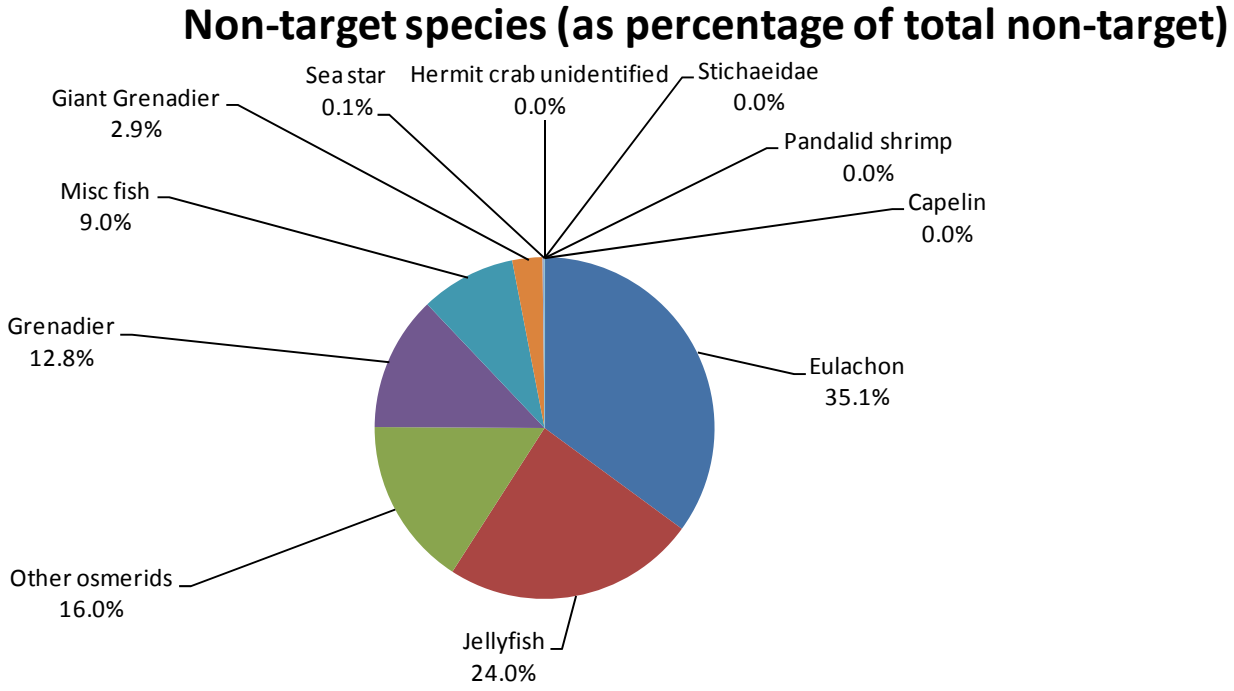
ADFG trawl survey: 2012 age comp & 2013 biomass





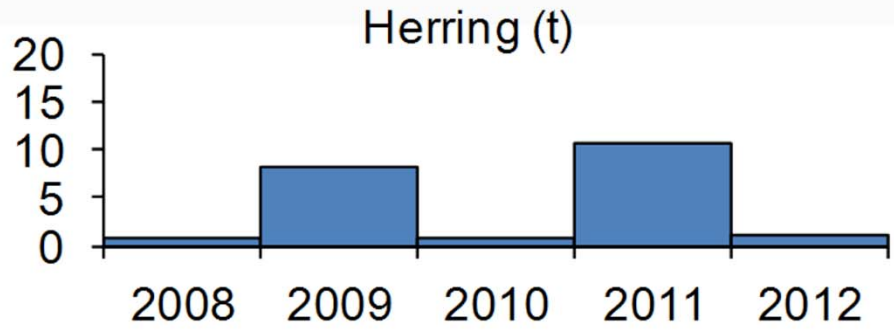
2012 Bycatch in GOA pollock fishery

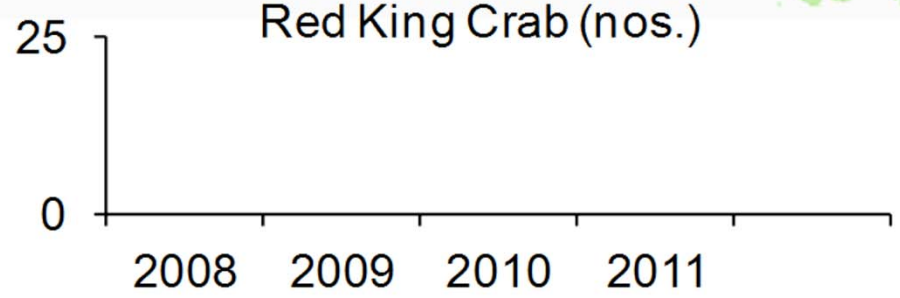


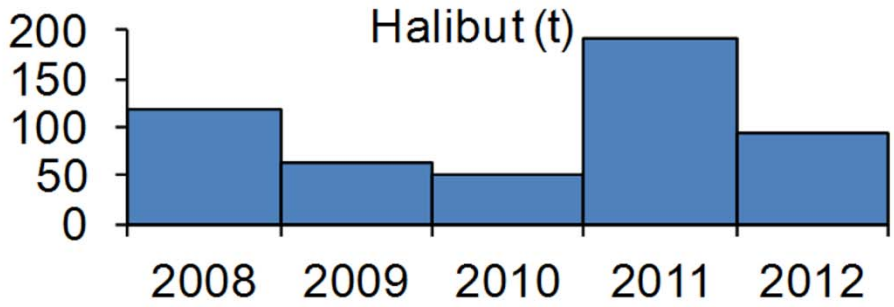


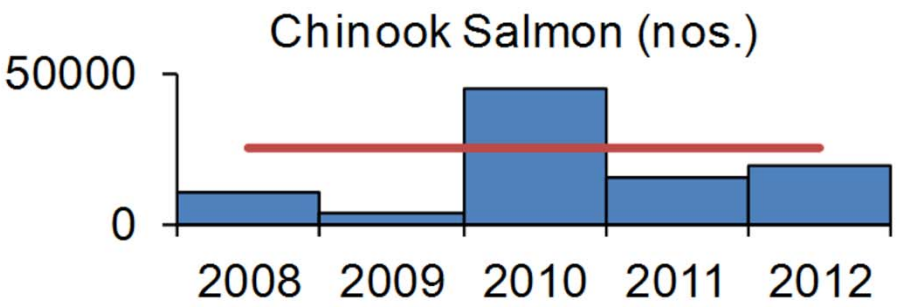
Prohibited species bycatch 2008-2012

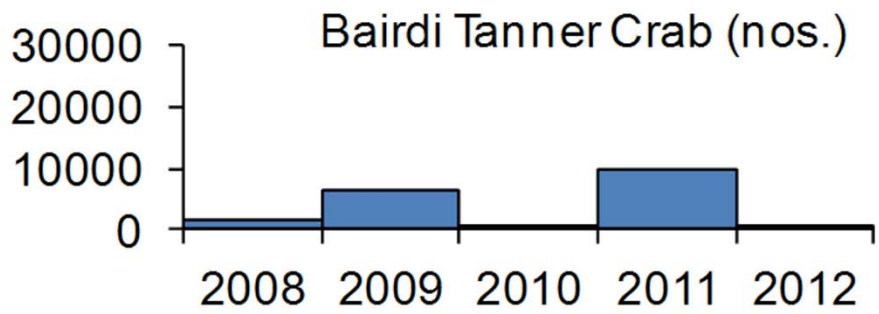
GOA pollock fishery

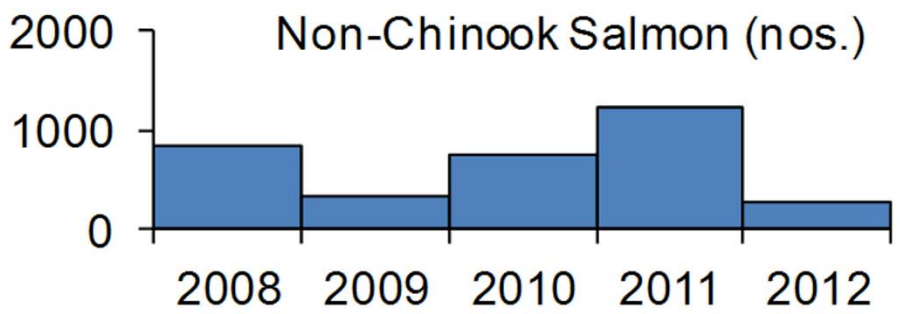




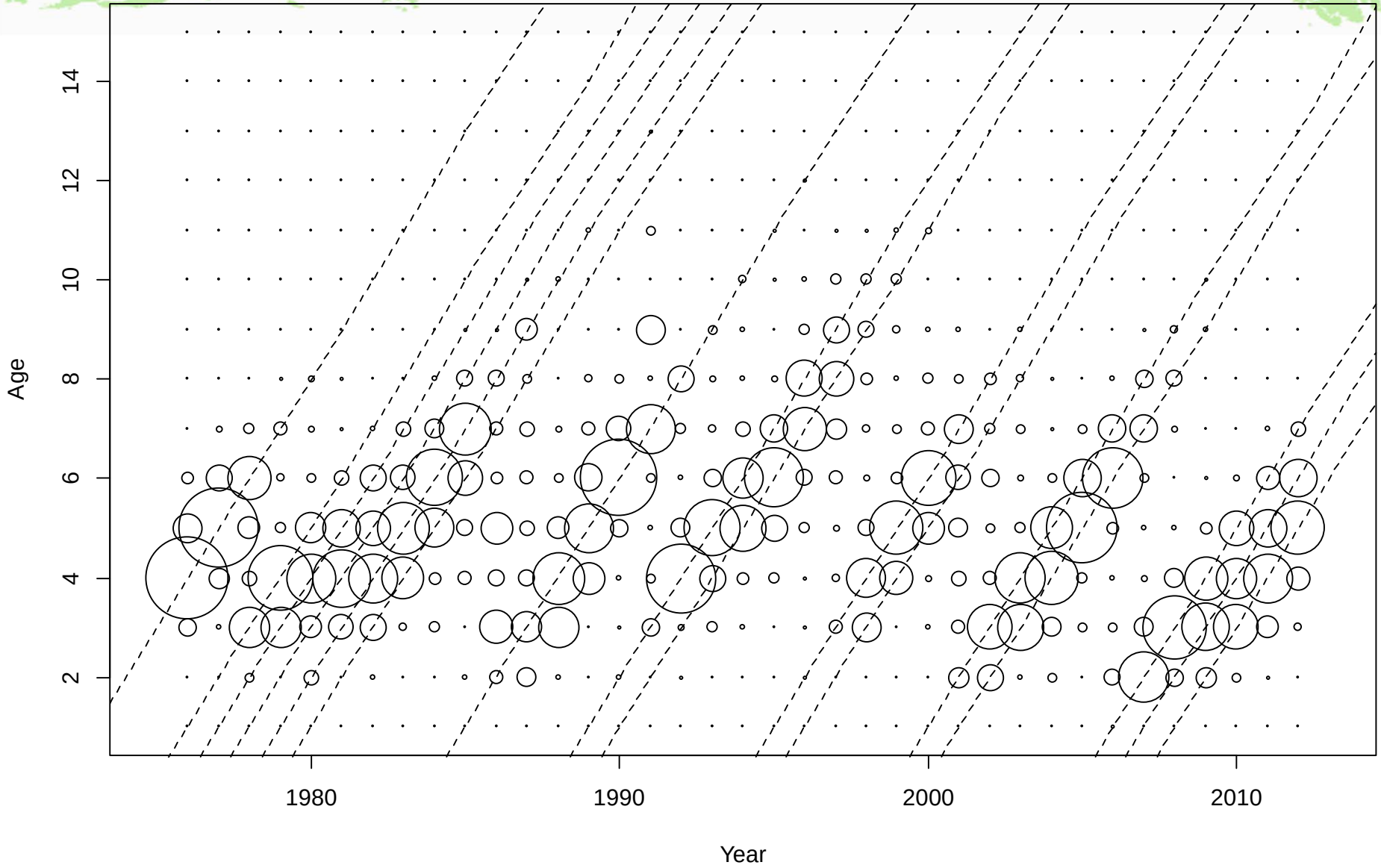




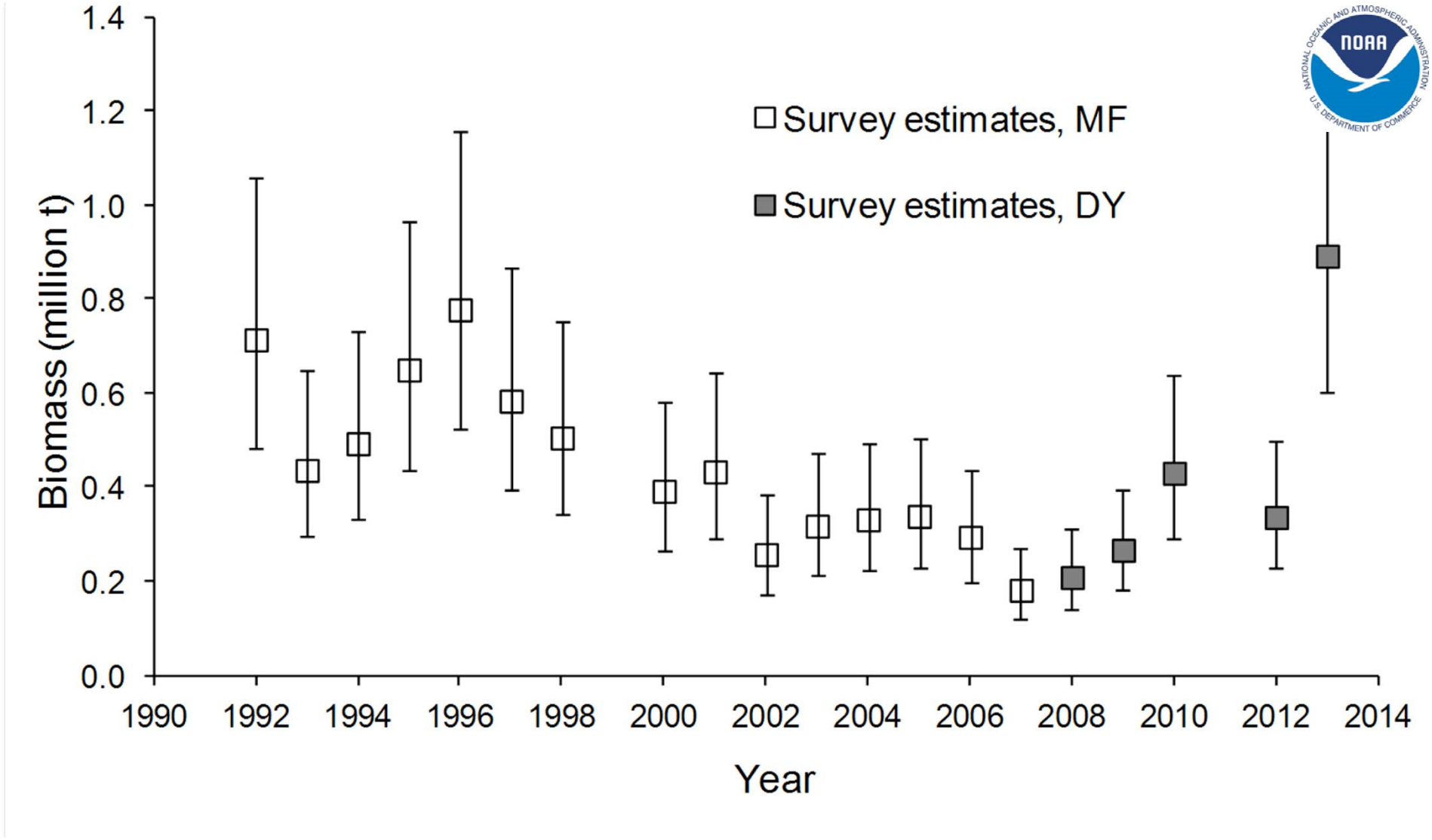




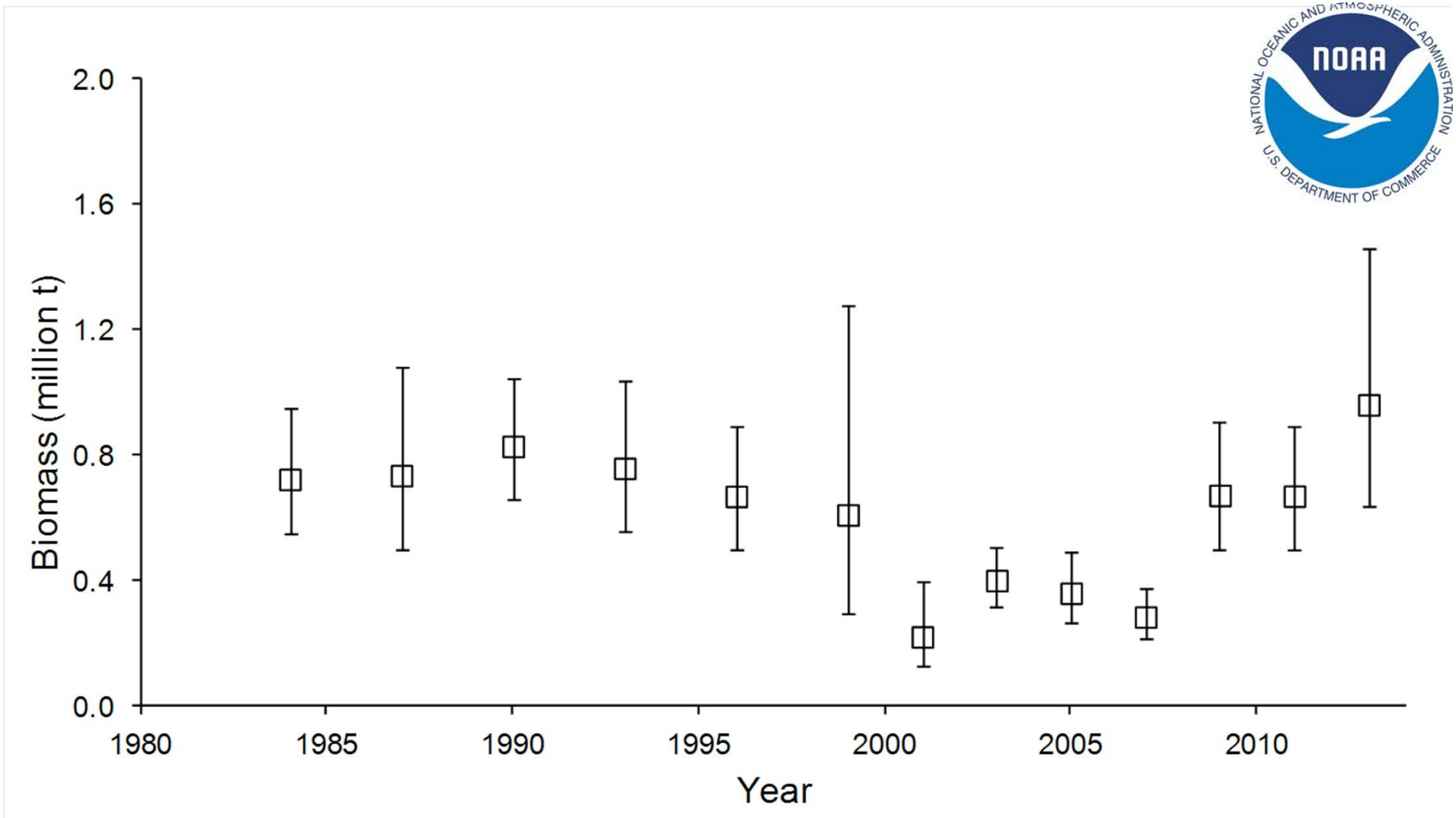
Catch at age, 1976-2012



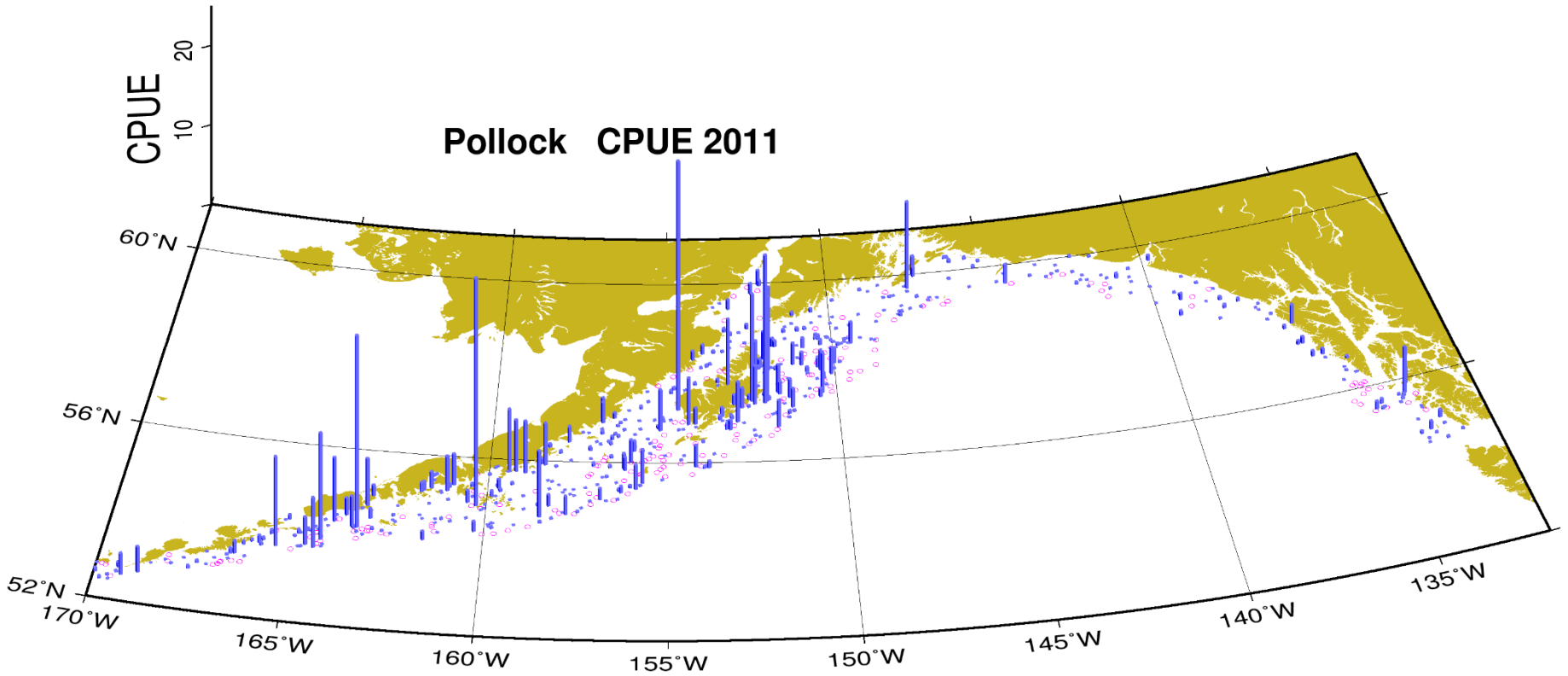
Shelikof Strait EIT survey, 1992-2013



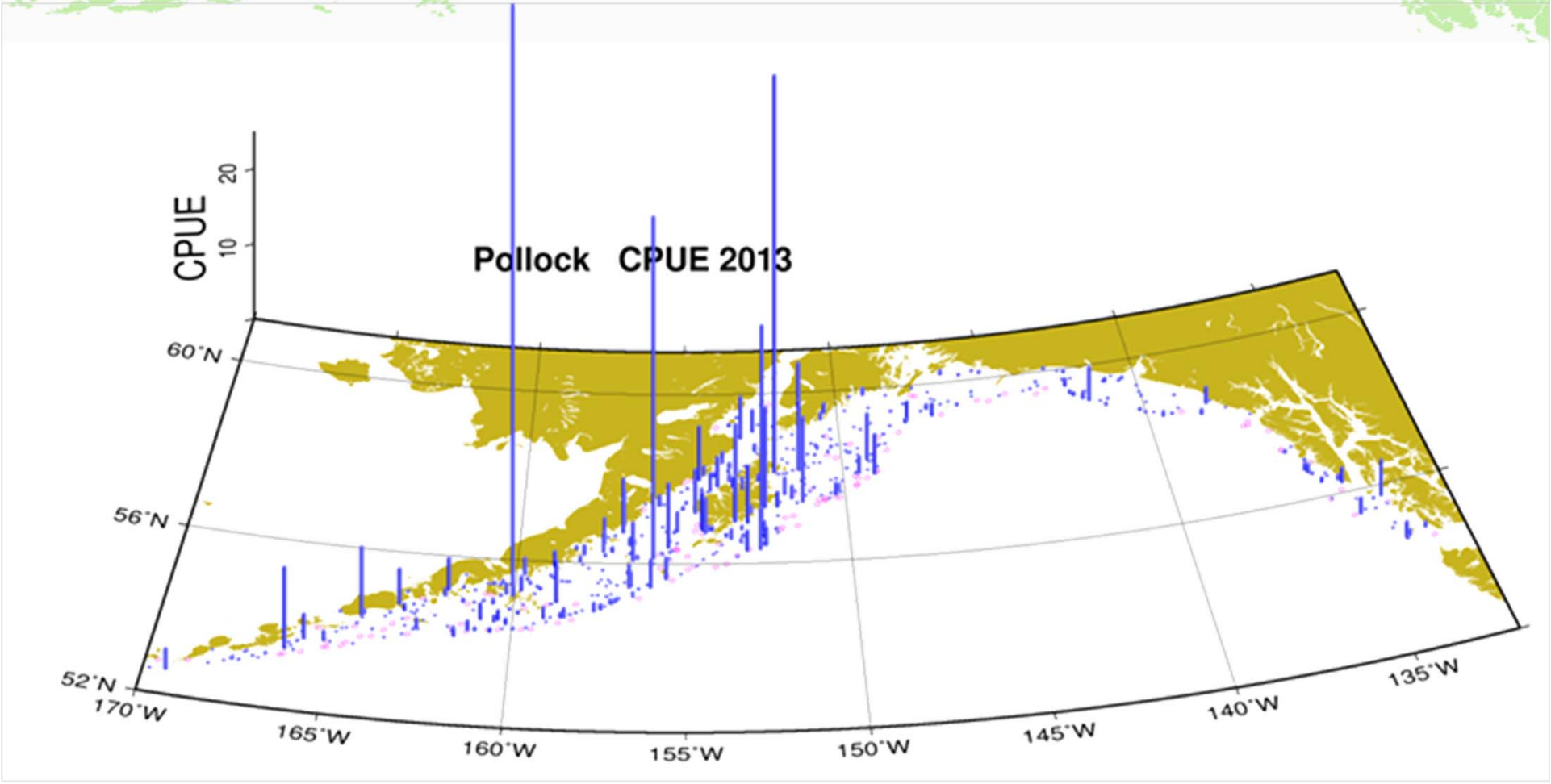
NMFS bottom trawl survey (1984-2013)



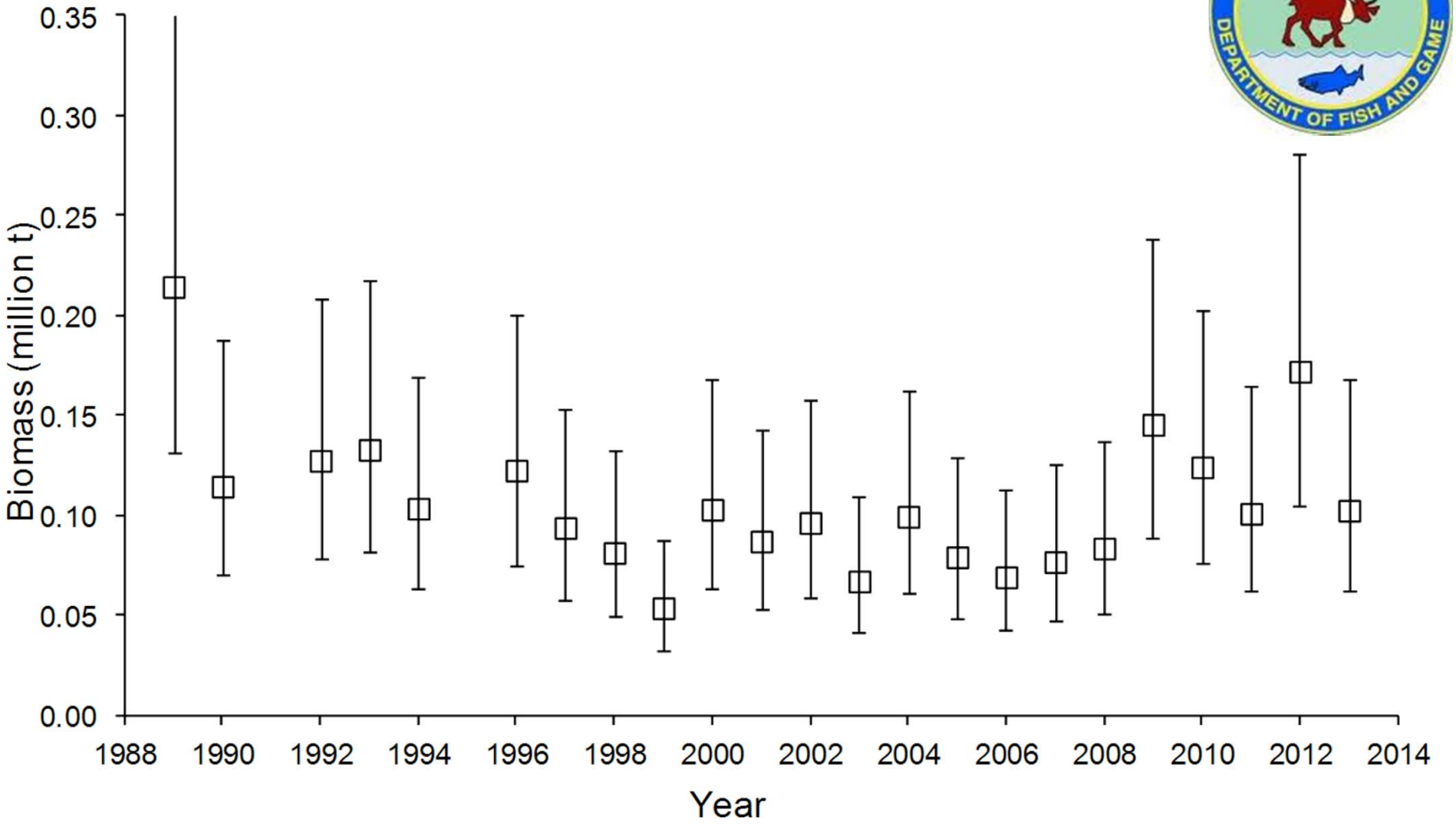
CPUE for NMFS bottom trawl survey 2011



CPUE for NMFS bottom trawl survey 2013

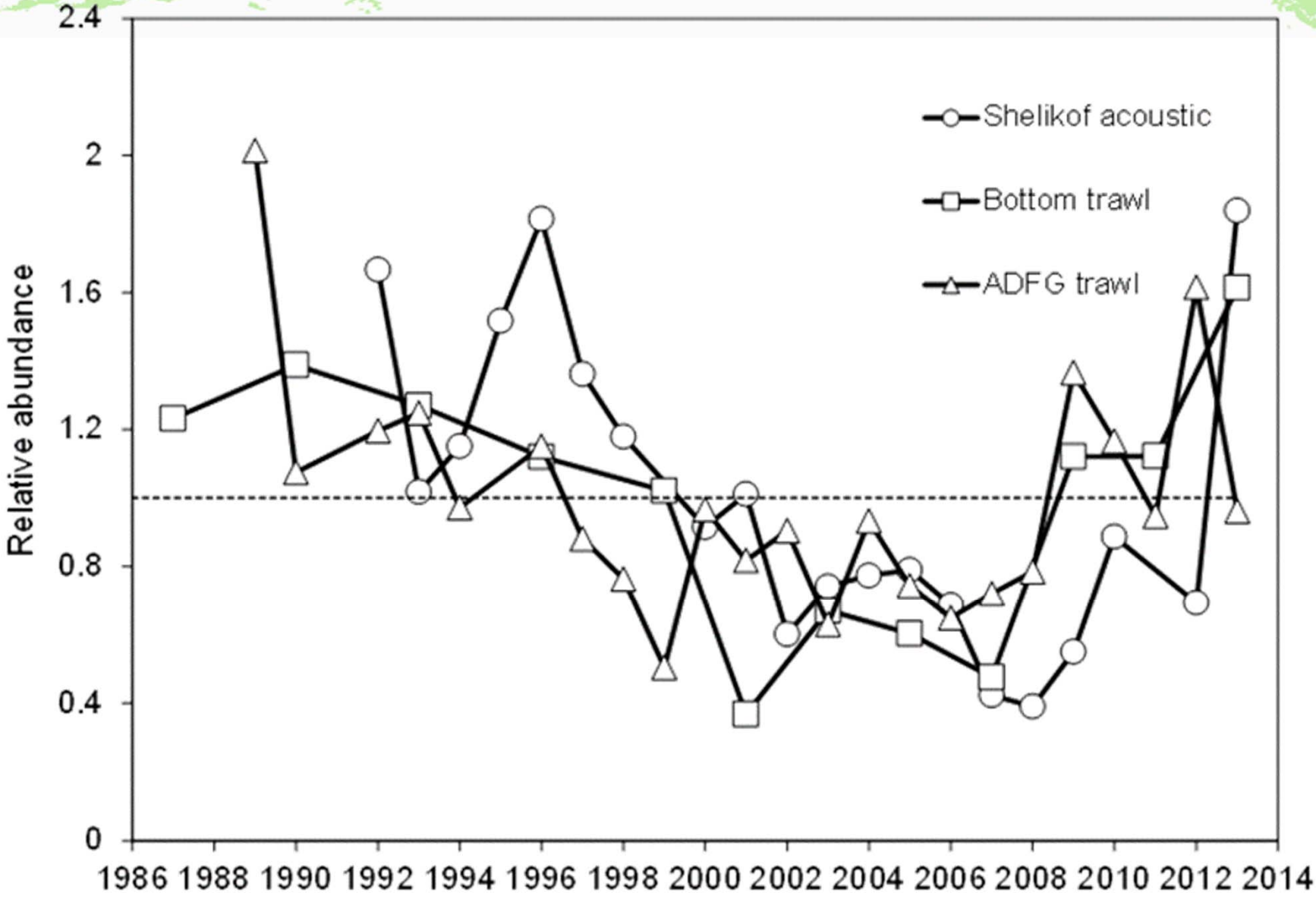


ADFG crab/groundfish trawl survey (1989-2013)



Relative trends in abundance indices

(1986-2013)

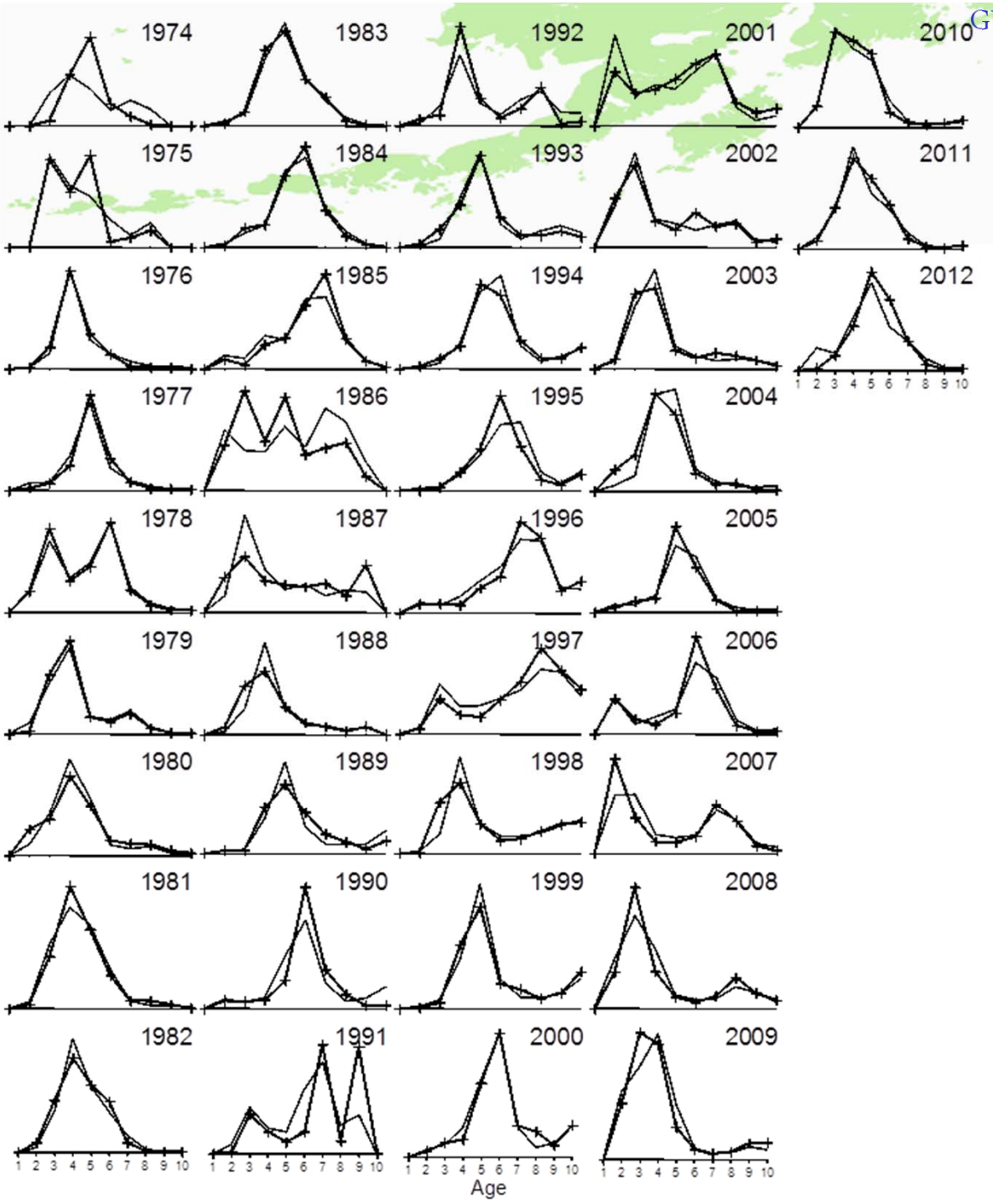


GOA pollock model changes:

4 models, 2 alternatives:

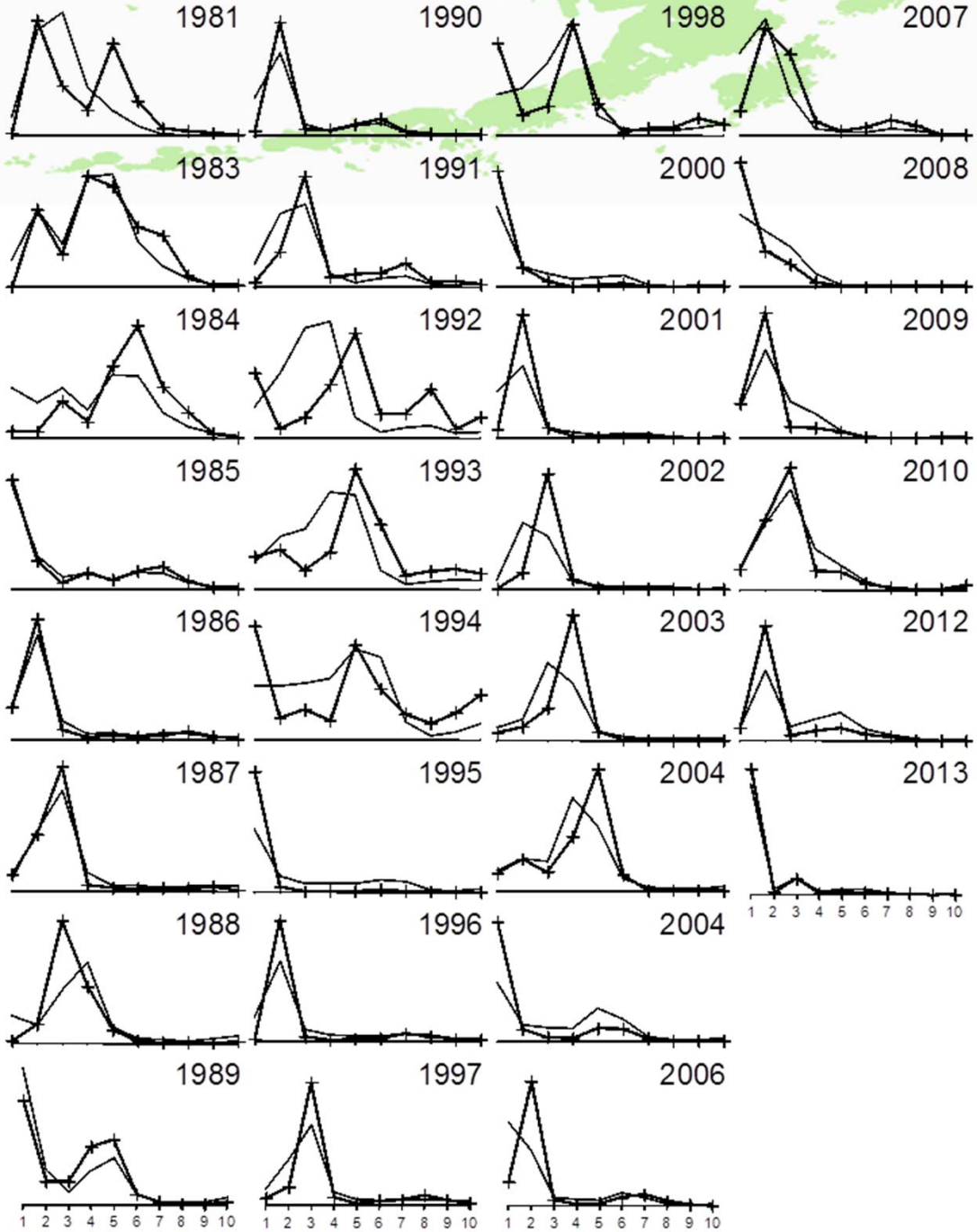
1. *Last year's model with last year's data,*
2. *Last year's model with new data (Model 0),*
3. Base model (with new data, Model 1) ,
4. Base model with 2012 year class set to average (Model 1A).

GOA pollock



Fishery age composition (predicted vs observed)

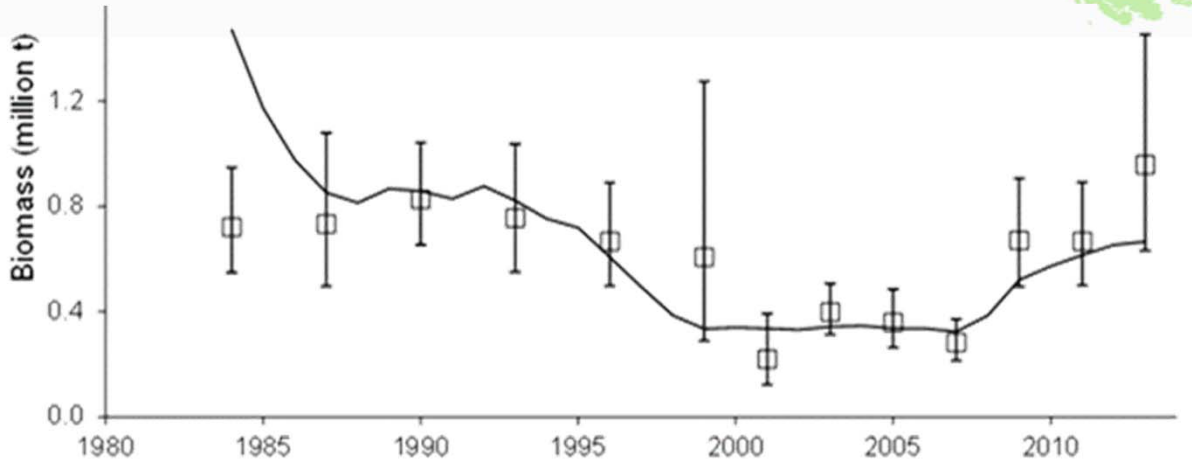
GOA pollock



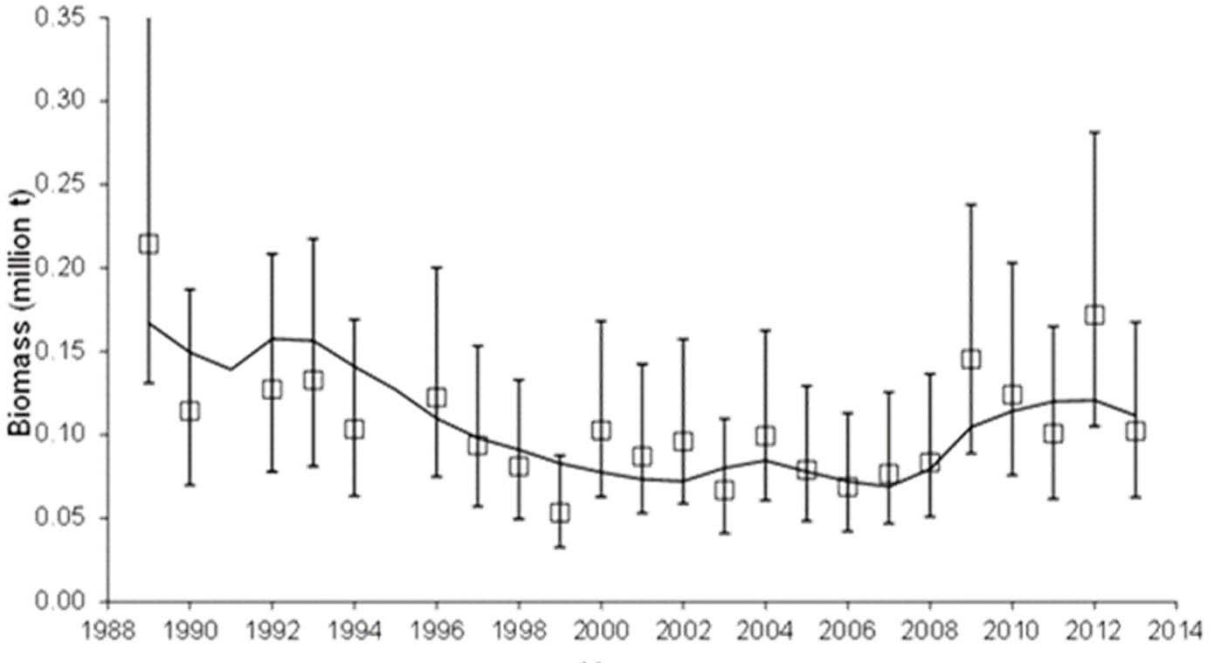
Shelikof Strait survey age composition (predicted vs observed)

GOA pollock

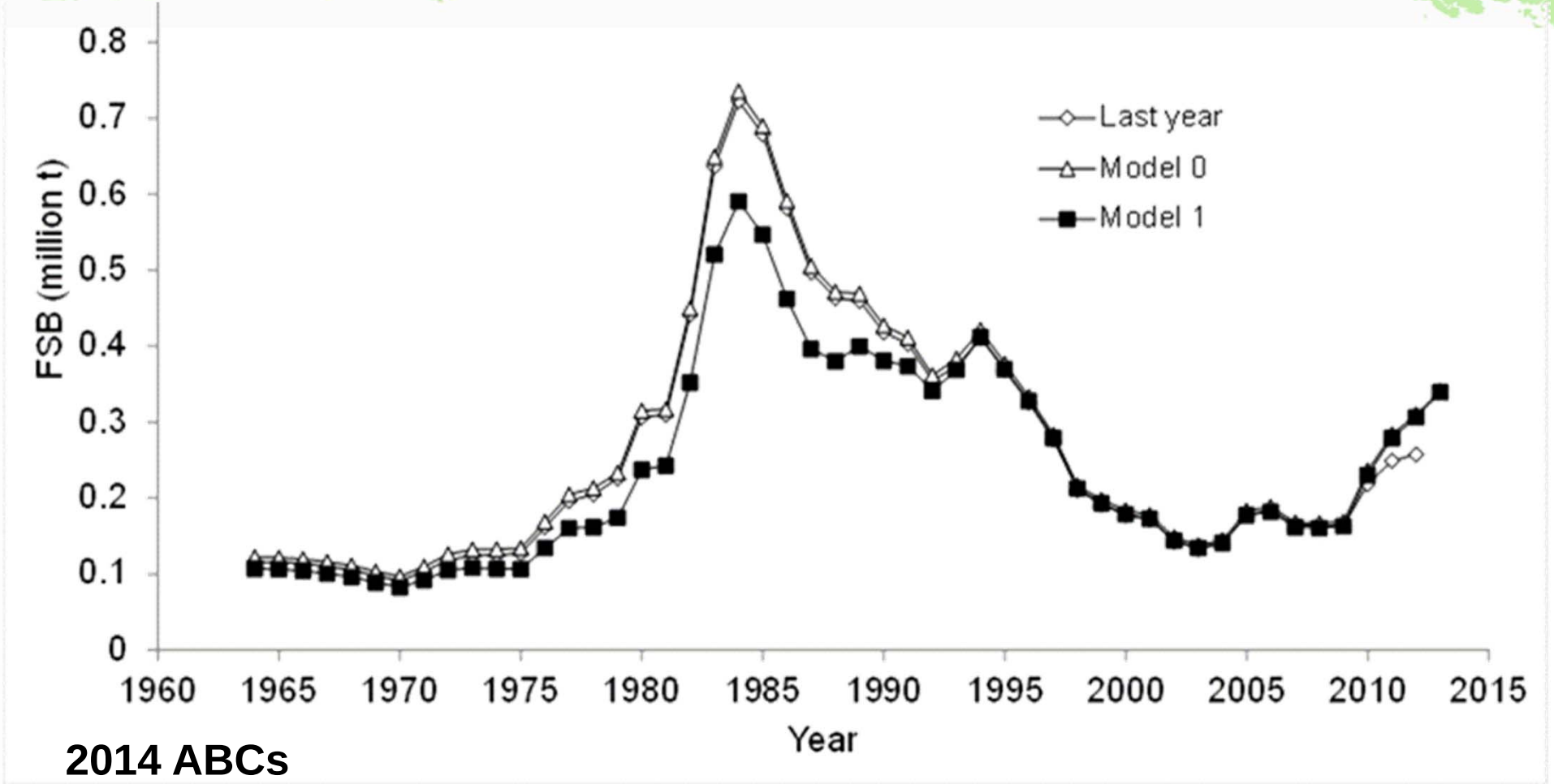
Fit to NMFS bottom trawl survey



Fit to ADFG survey



Alternative GOA pollock models



2014 ABCs

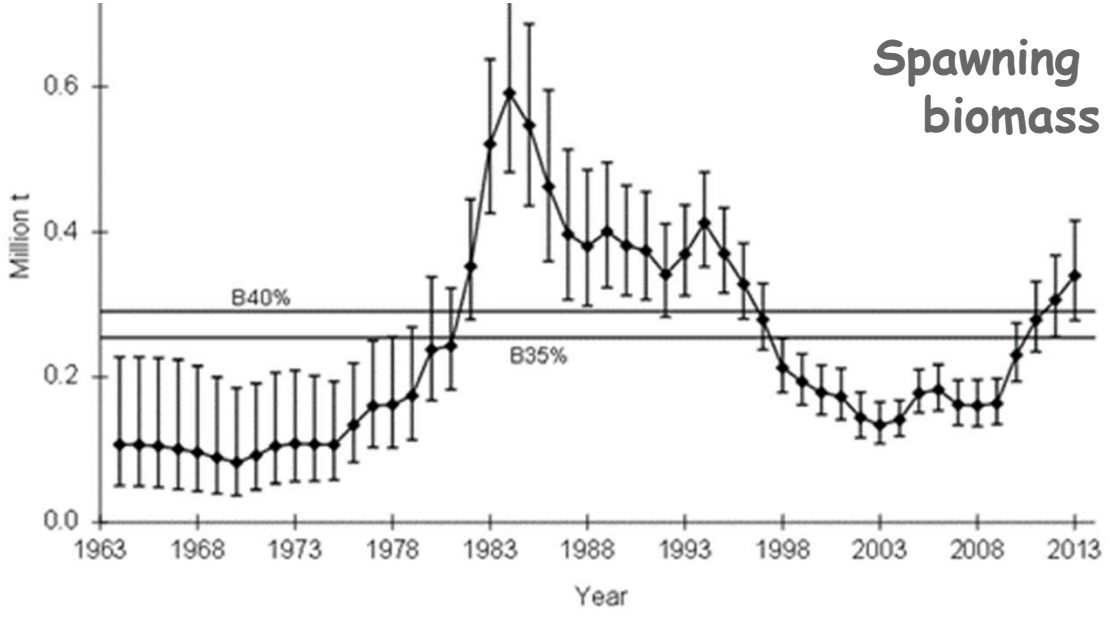
Last year's model	104.2 kt
Last year with updated data (M0)	154.4 kt
Base Model 1	167.7 kt

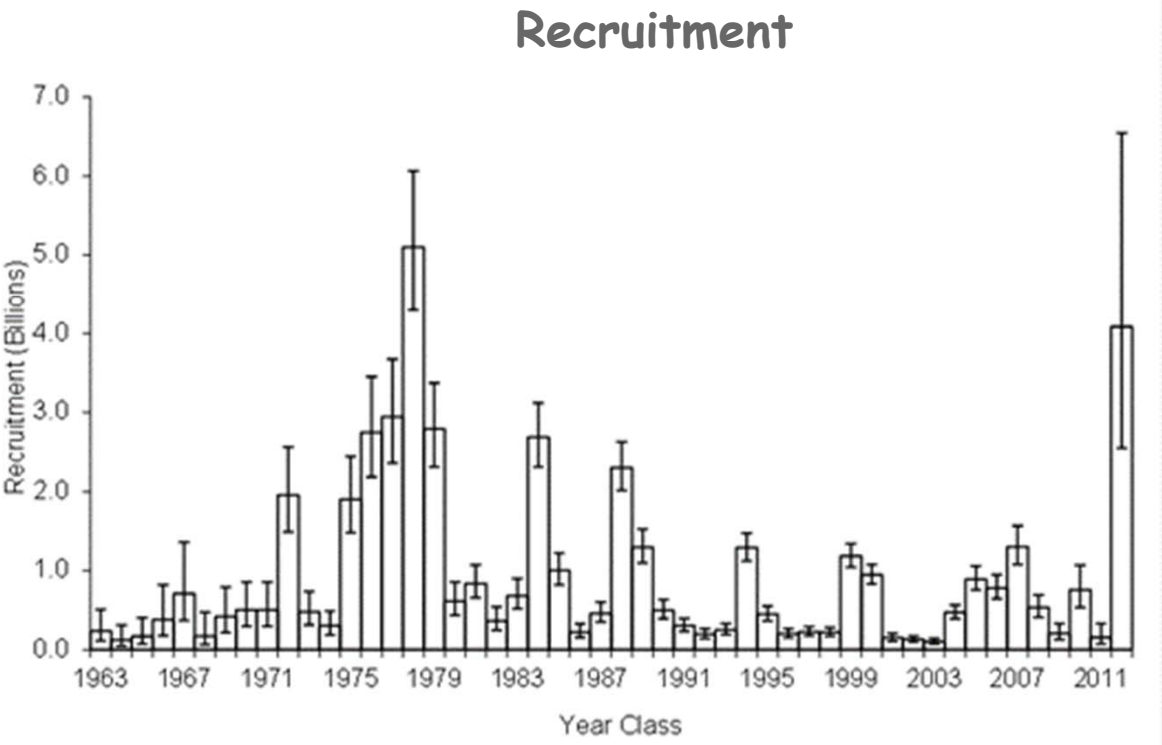
Comparison of models

GOA pollock

	Last year	*Model 0*	*Model 1*	*Model 1A*
Stock status (t)				
2014 Spawning biomass	247,699	308,465	308,541	308,135
(CV)	(10%)	(12%)	(11%)	(11%)
Depletion (B2014/B0)	33%	40%	42%	42%
$B_{40\%}$	296,519	308,975	290,460	290,460
2014 yield (000 t)				
Author's ABC	104.16	154.43	167.66	151.05
MaxABC	115.98	178.79	183.94	165.81

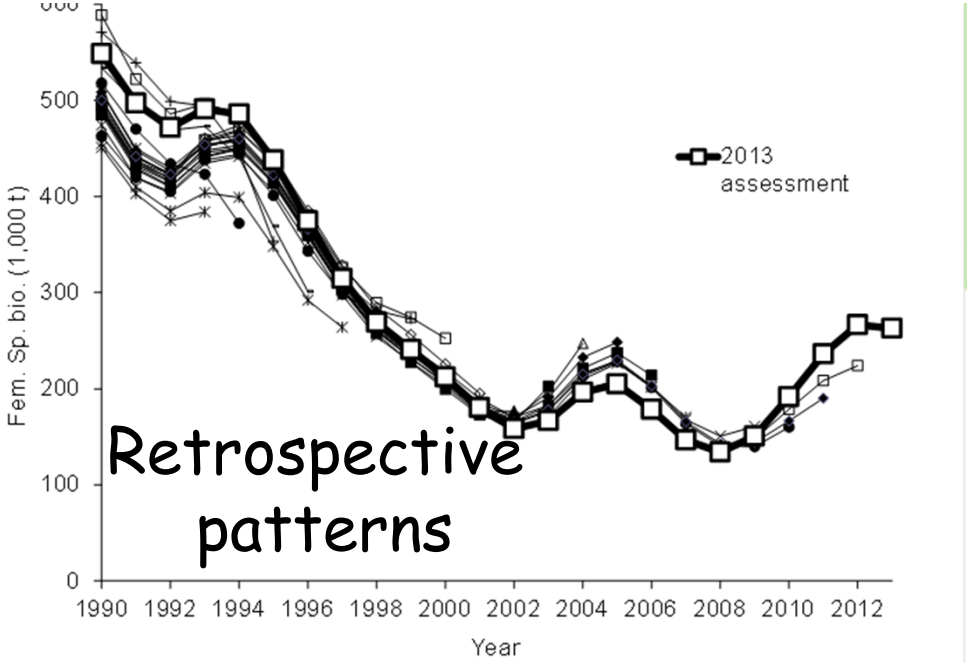
GOA pollock model results





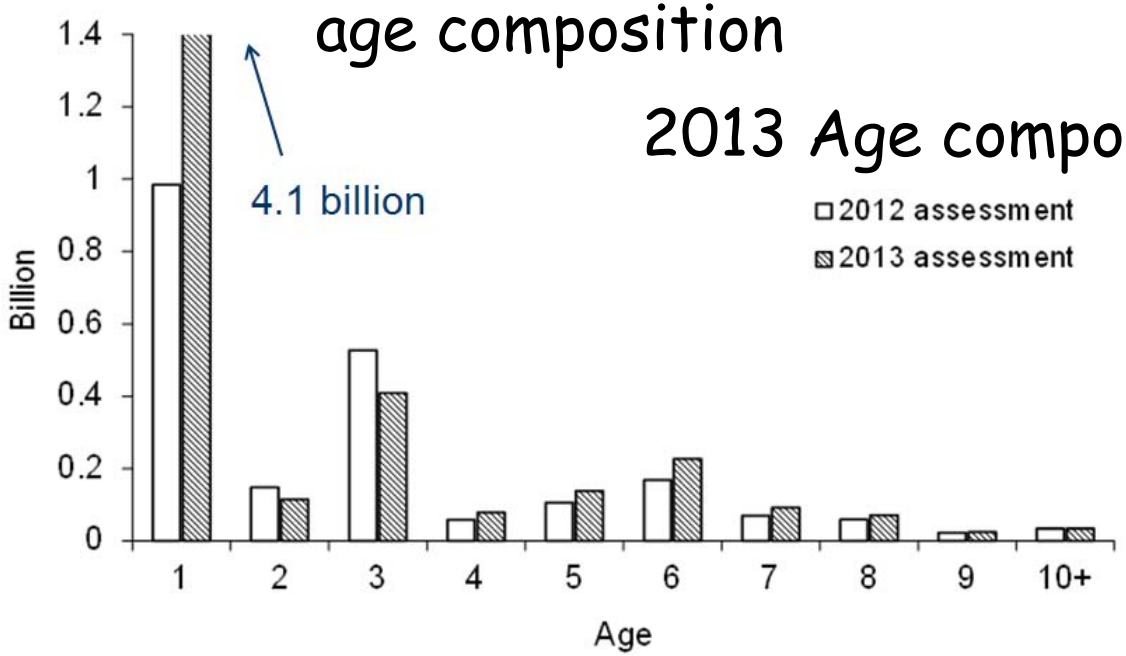
GOA Pollock

Results



Retrospective patterns

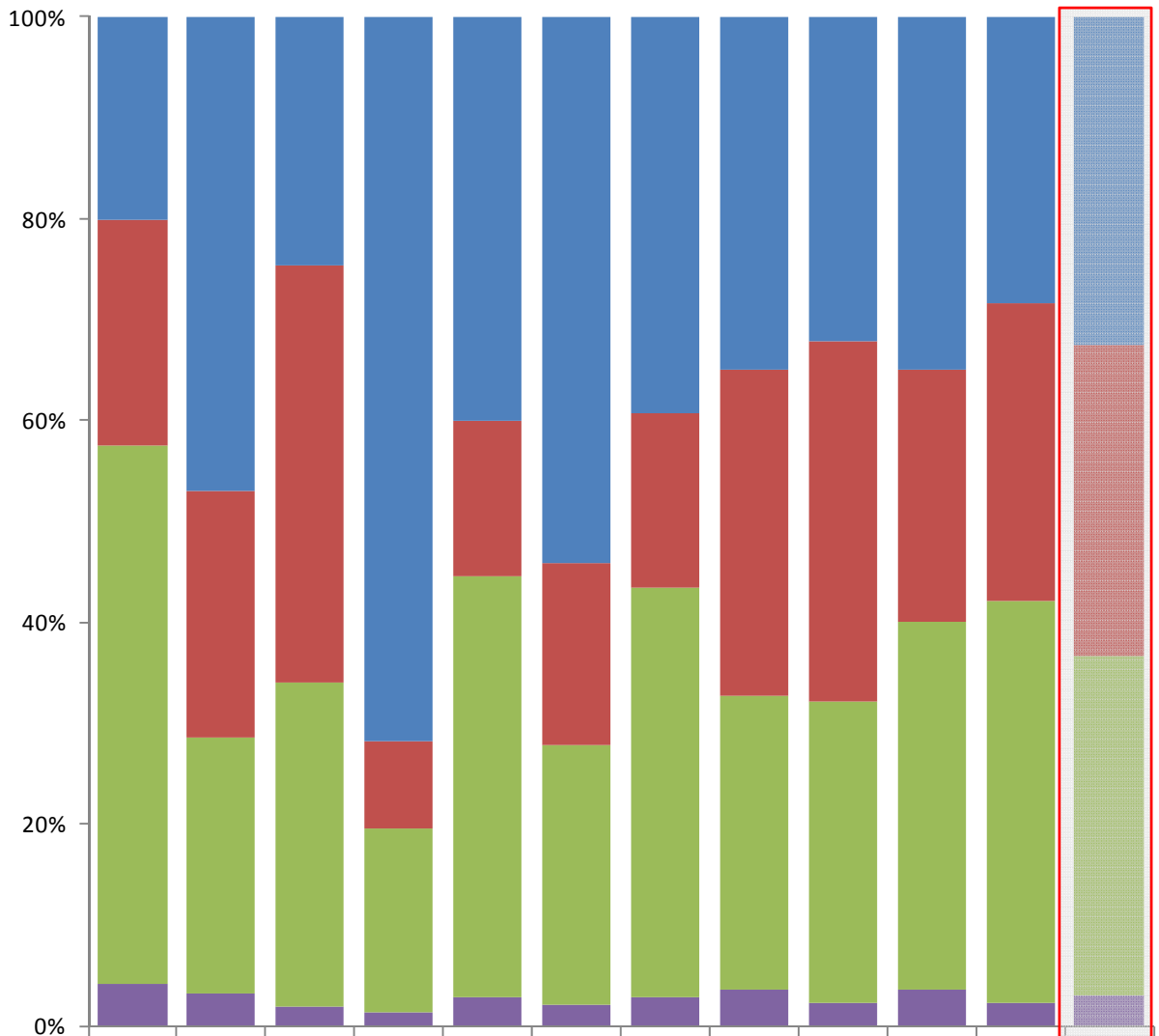
Changes in estimated age composition



GOA Pollock Team discussions

- Inclusion of the 2012 year class in projections
  - Well estimated, several data sources
  - Excluded from B100% calculation
- The Team recommends:
  - Authors consider the relevant sections of the stock recruitment working group report on which recent year classes should be used in reference points and/or projections

GOA pollock ABC apport.



	1990	1993	1996	1999	2001	2003	2005	2007	2009	2011	2013	4 survey avg
Shumagin	20.03%	47.08%	24.69%	71.90%	40.06%	54.09%	39.35%	34.94%	32.16%	34.93%	28.40%	32.61%
Chirikof	22.41%	24.27%	41.32%	8.55%	15.30%	18.14%	17.16%	32.42%	35.66%	25.04%	29.56%	30.67%
Kodiak	53.42%	25.44%	32.16%	18.23%	41.88%	25.62%	40.64%	29.06%	29.99%	36.38%	39.79%	33.80%
West Yak.	4.13%	3.20%	1.83%	1.32%	2.76%	2.15%	2.85%	3.59%	2.18%	3.65%	2.24%	2.92%

NMFS trawl survey biomass distribution

State GHL considerations

ABC considerations for the salmon excluder EFP

Prince William Sound GHL subtracted from W/C GOA ABC

- Presented in September
- Set to 2.5% of W/C ABC

Plan Team recommended 2014 W/C ABC (162,351 t) derived by first incorporating anticipated EFP pollock catches in model projection (ABC=166,514 t, GHL=4,163 t)

ABC incorporating EFP catches reduced by GHL (Plan Team ABC=162,351 t)

GOA pollock ABC considerations

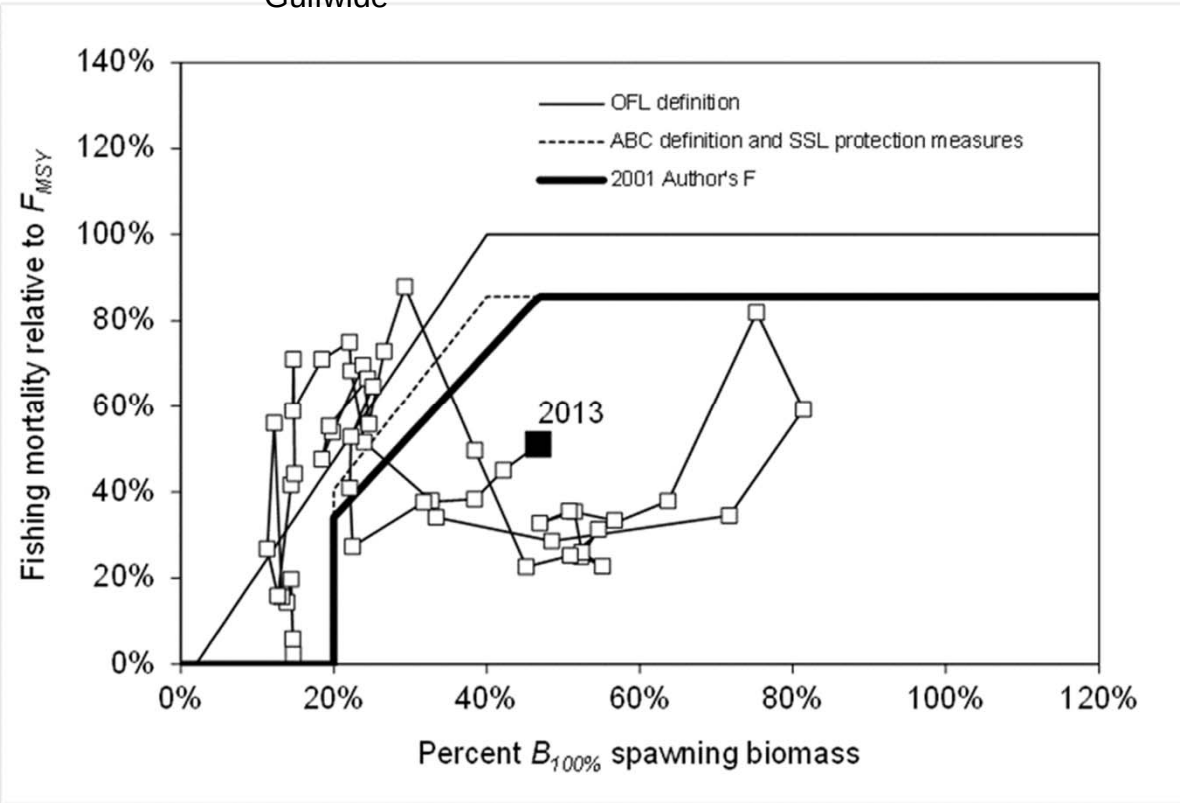
- Harvest rate below maximum permissible F_{ABC}

Tier 3a

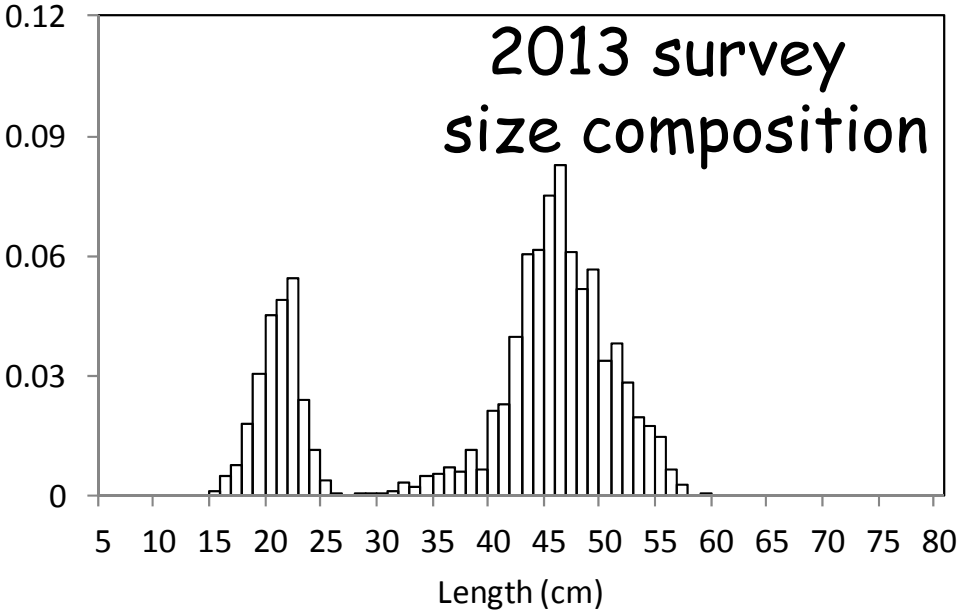
2014 SSB 43% of $B_{100\%}$

Pollock	Biomass*	OFL**	ABC**
2014	1,028,861	228,831	174,976
2015		265,217	193,809

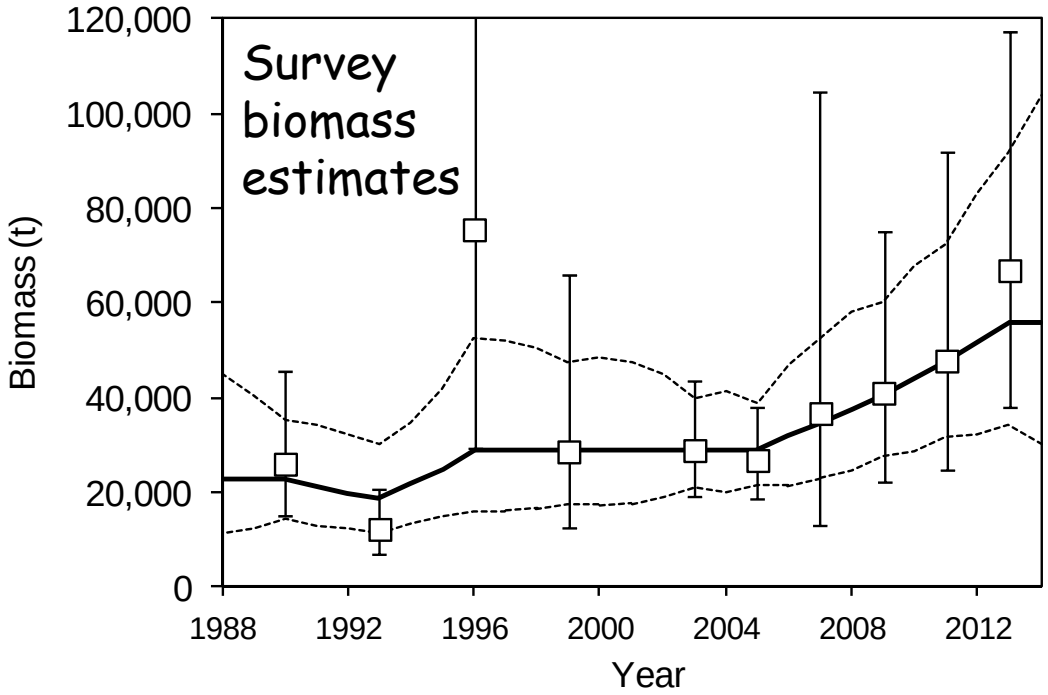
*Model estimated W/C/WYAK biomass
**Gulfwide



EGOA pollock (Tier 5)



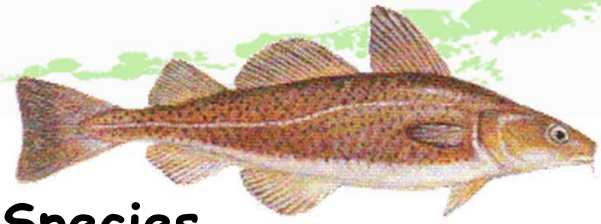
EGOA Pollock	Biomass	OFL	ABC
2014	56,111	16,833	12,625
2015		16,833	12,625



Random effects model used

ABC Summary

Pacific cod



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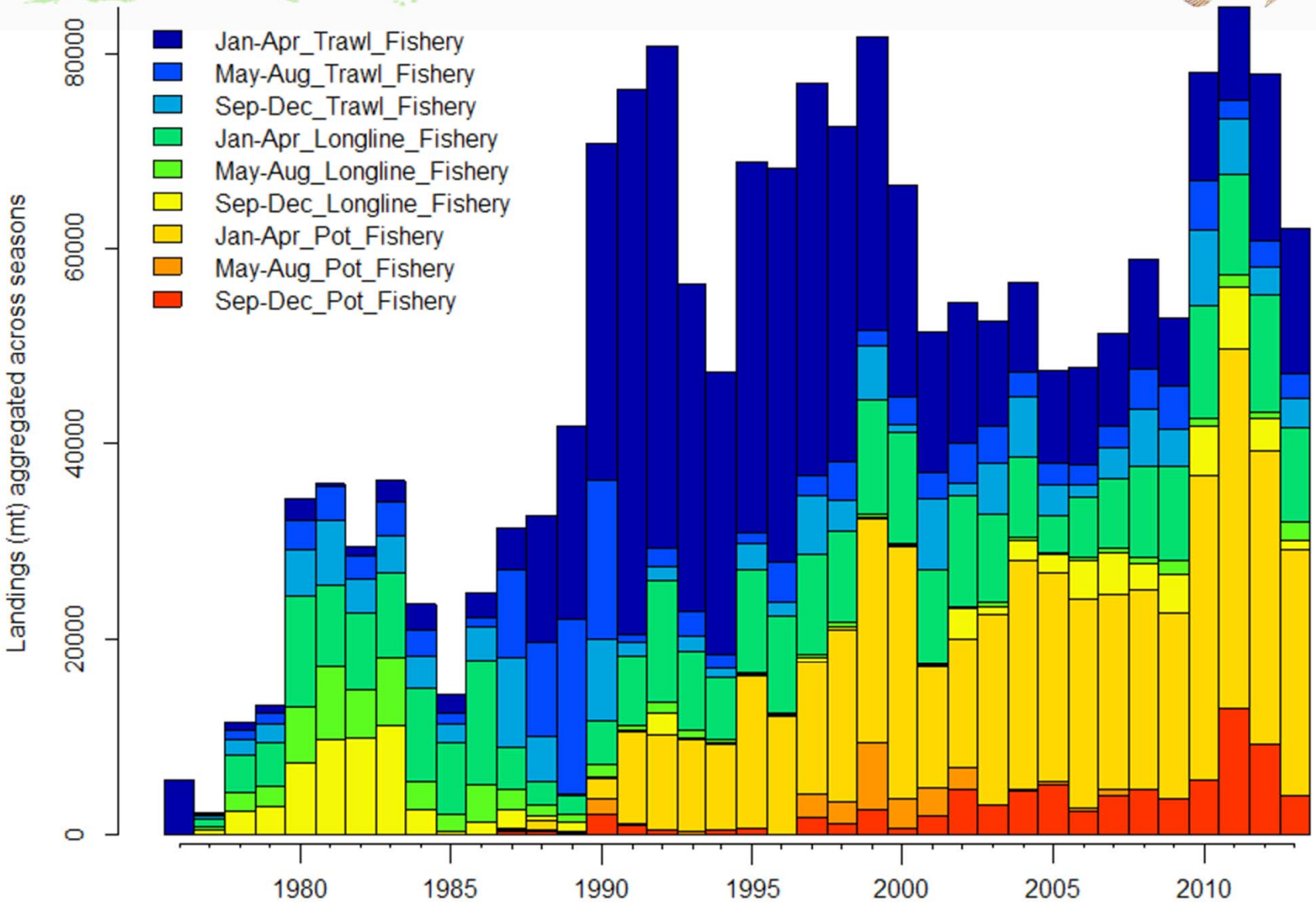
GOA Pacific cod catch by fishery



GOA Pacific cod modeling

Updated catch

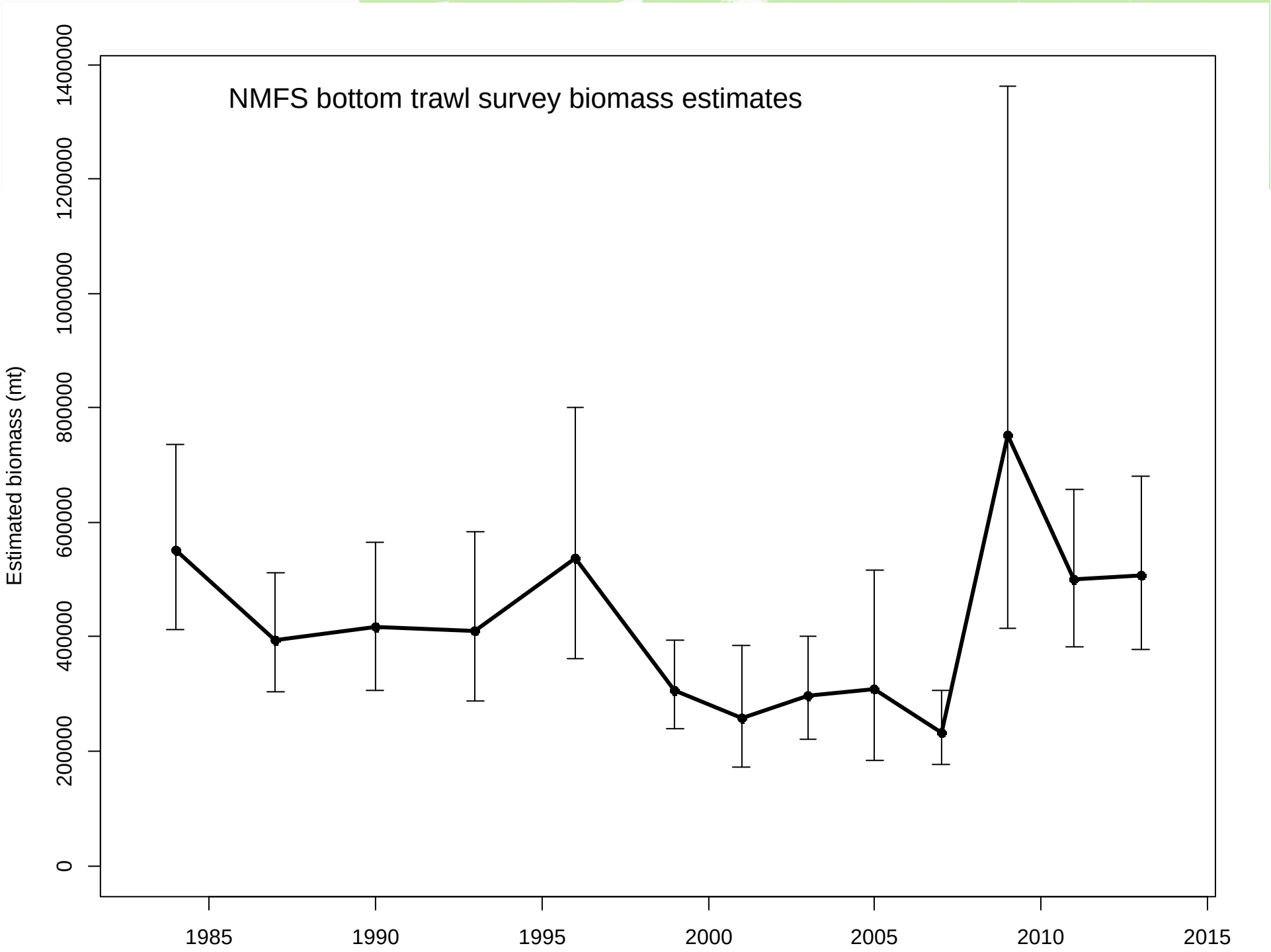
Updated 1997-2012 catch-at-length

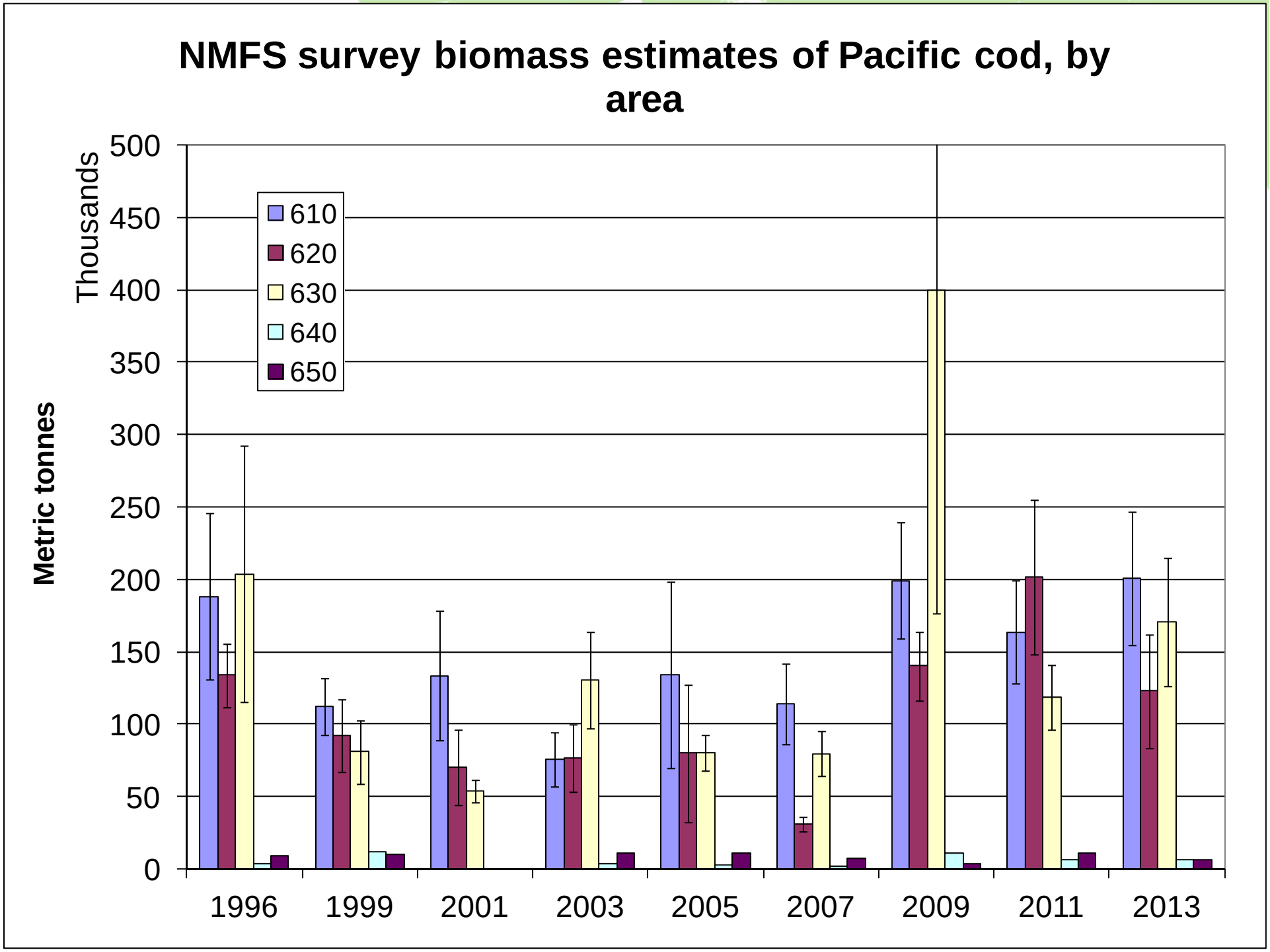
2013 trawl survey biomass and length composition included

2013 survey increased 1% from 2011 value

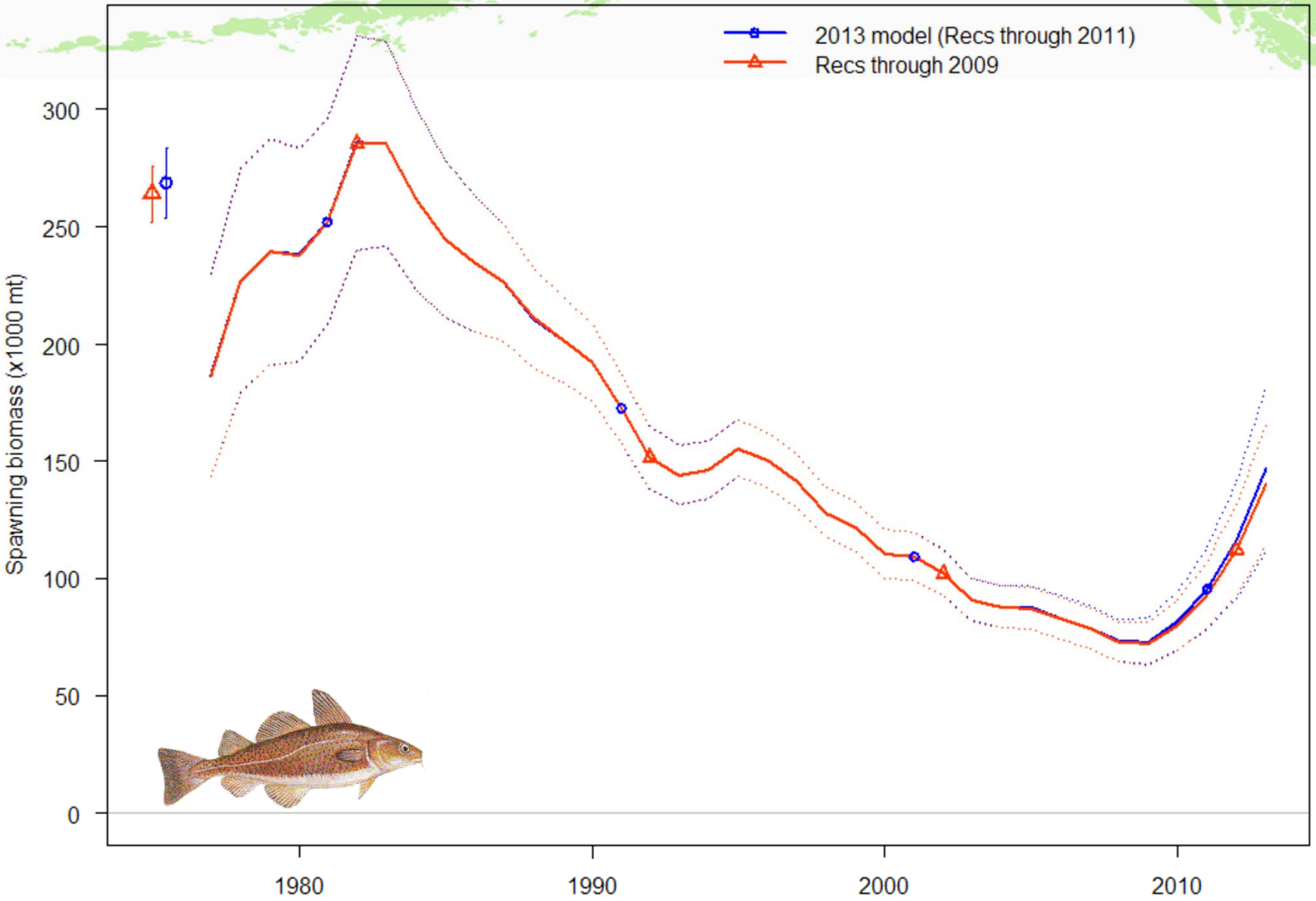
Two models presented:

1. 2012 model configuration (omitted all sub-27 survey data) and 2012-2013 year-classes set to mean
2. As model 1 but with 2010 and 2011 year-classes also set to mean

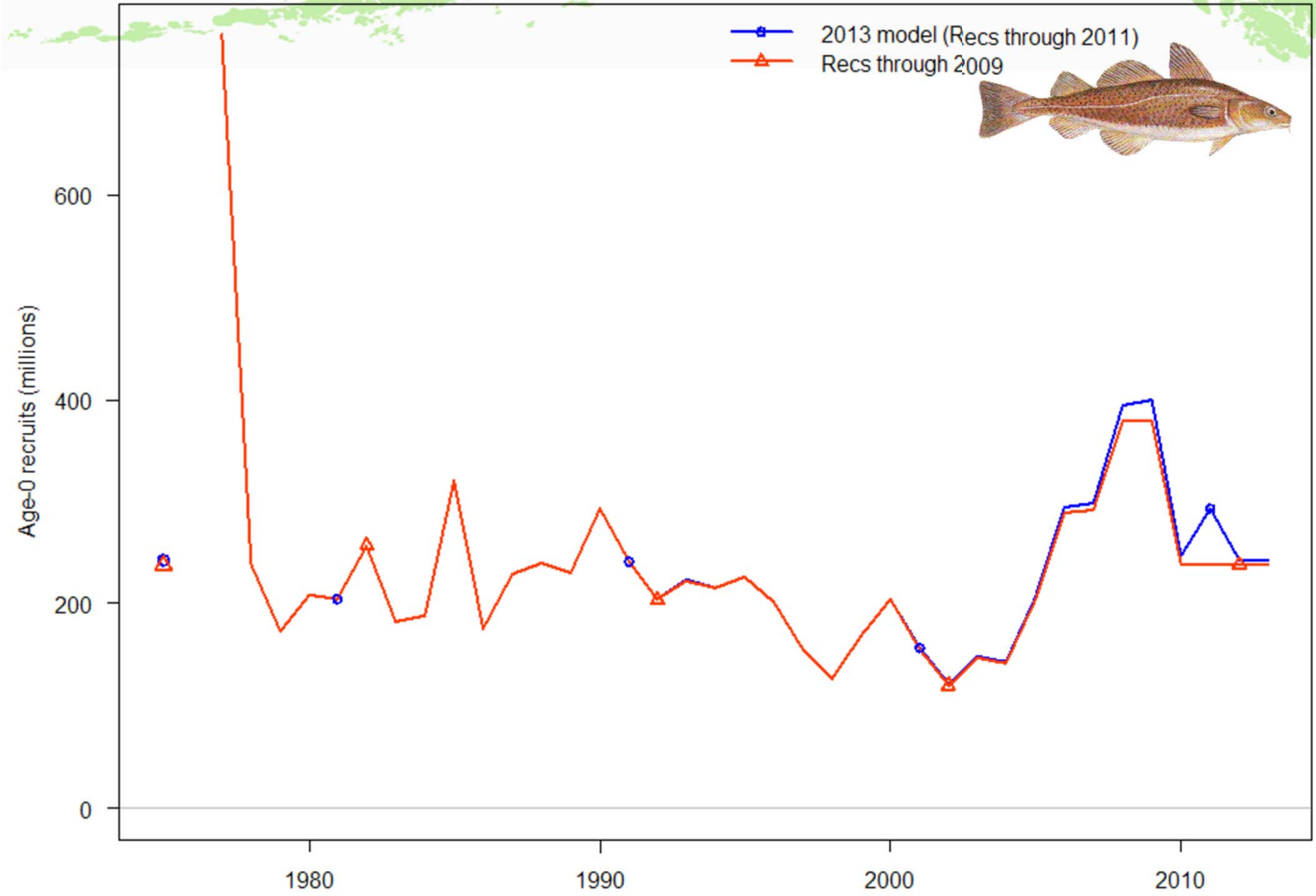

NMFS bottom trawl survey biomass estimates
Estimated biomass (mt)
0
200000
400000
600000
800000
1000000
1200000
1400000
1985
1990
1995
2000
2005
2010
2015

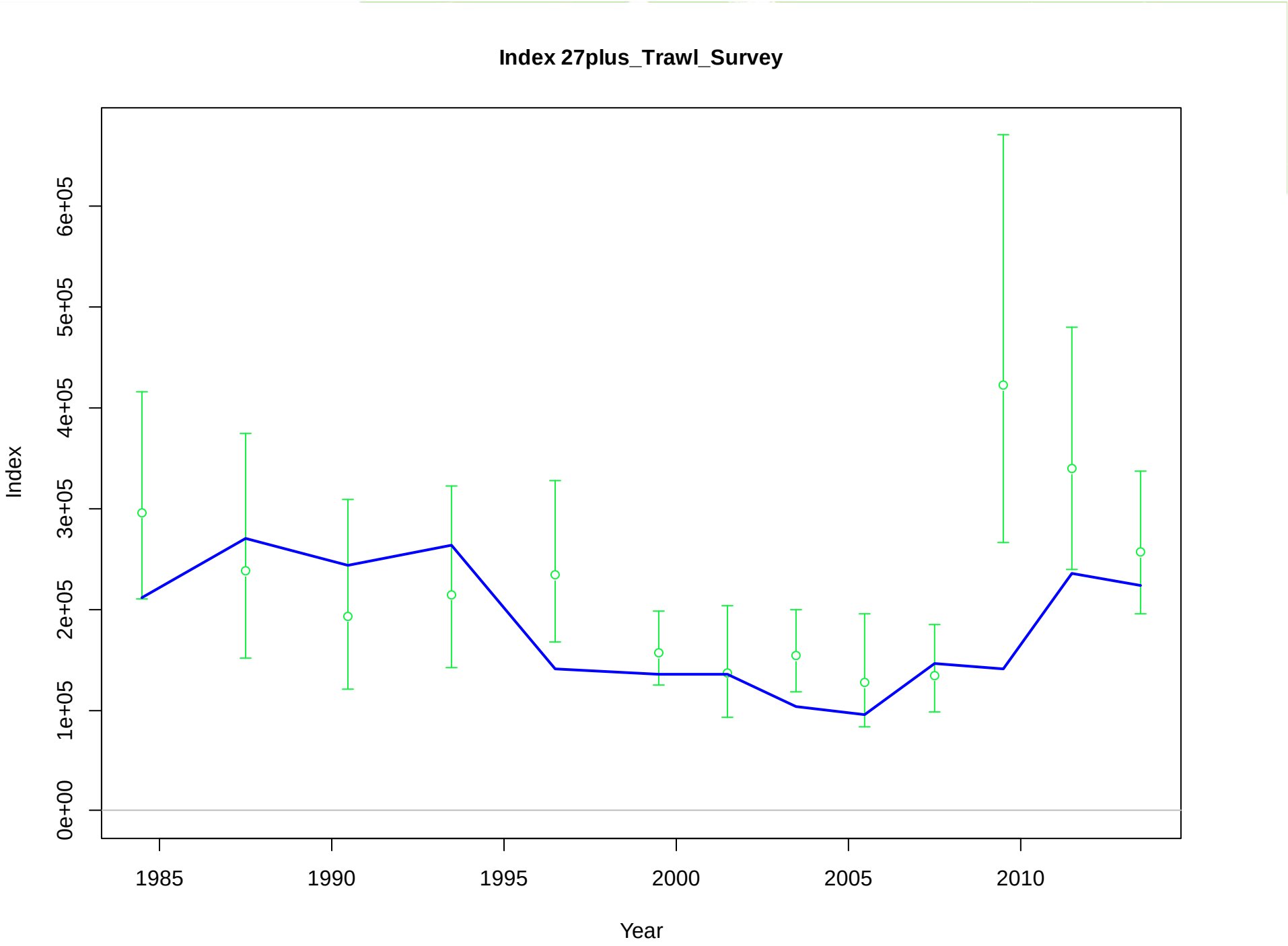

NMFS survey biomass estimates of Pacific cod, by area
Metric tonnes
Thousands
500
450
400
350
300
250
200
150
100
50
0
610
620
630
640
650
1996
1999
2001
2003
2005
2007
2009
2011
2013

GOA Pacific cod SSB by model



Pacific cod recruitment

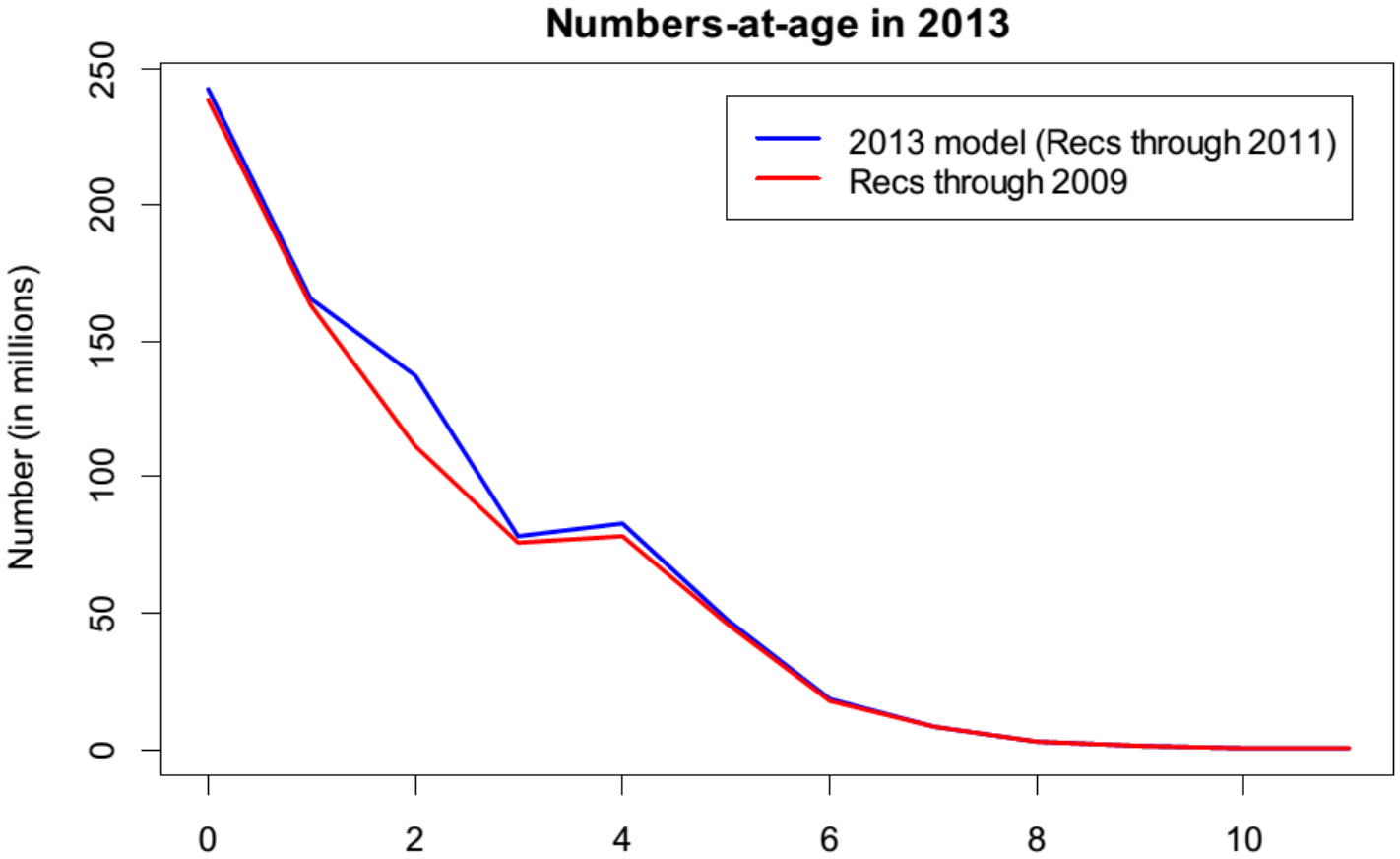



Index 27plus_Trawl_Survey
Index
0e+00
1e+05
2e+05
3e+05
4e+05
5e+05
6e+05
1985
1990
1995
2000
2005
2010
Year

GOA Pacific cod

Team discussion

- Extent of including recent recruitment
- Followed provisional recommendation of stock recruitment group



Pacific cod ABC/TAC

Tier 3a, Model 2 with recruits through 2009

- SSB above $B_{40\%}$ for 2014 (53% of $B_{100\%}$)

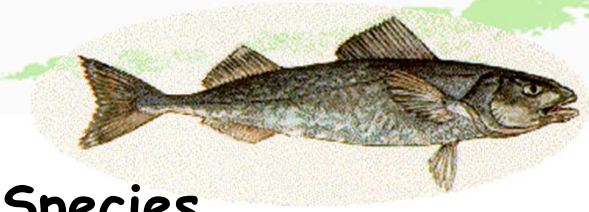
Pacific cod	Biomass	OFL	ABC
2014	422,000	107,300	88,500
2015		101,800	84,100

Area apportionments done using random-effects model

	Western (37%)	Central (60%)	Eastern (3%)	Total
2014	32,745	53,100	2,655	88,500
2015	31,117	50,460	2,523	84,100

ABC Summary

Sablefish



Species	2013 Catch	ABC 2013	ABC 2014	Change
Pollock	93,246	121,046	174,976	up 53,930 (45%)
Pacific Cod	46,642	80,800	88,500	up 7,700 (10%)
Sablefish	11,825	12,510	10,572	down 1,938 (15%)
Flatfish	28,619	108,908	104,849	down 4,059 (4%)
Arrowtooth flounder	2,627	210,451	195,358	down 15,093 (7%)
Rockfish	24,287	34,568	38,880	up 4,312 (12%)
Atka mackerel	1,244	4,700	4,700	same (0%)
Skates	5,590	8,422	8,627	up 205 (2%)
Other Species	4,153	14,515	14,213	down 302 (2%)
Total	218,233	595,920	640,675	up 44,755 (8%)

2013 sablefish assessment overview

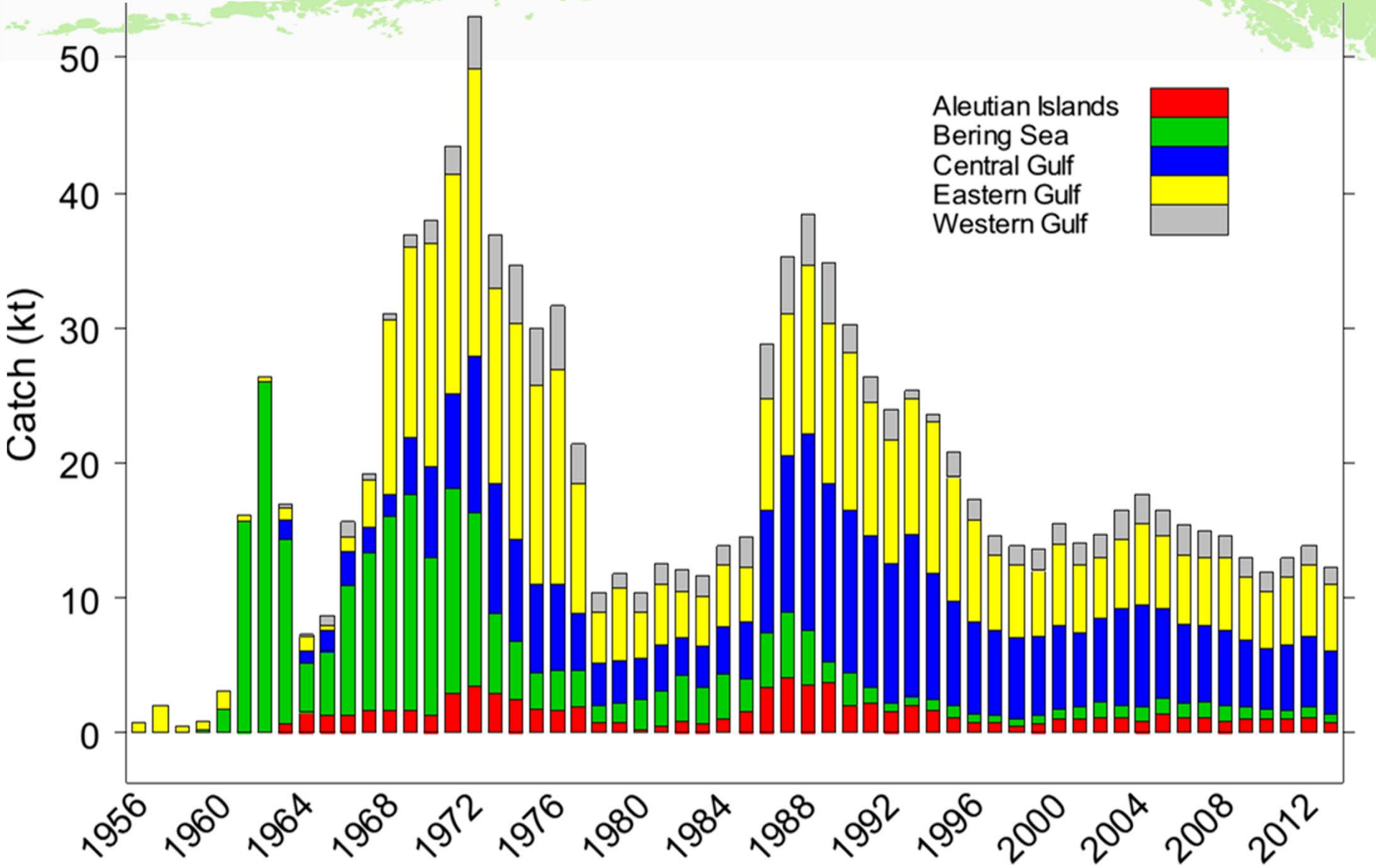
Model

No change

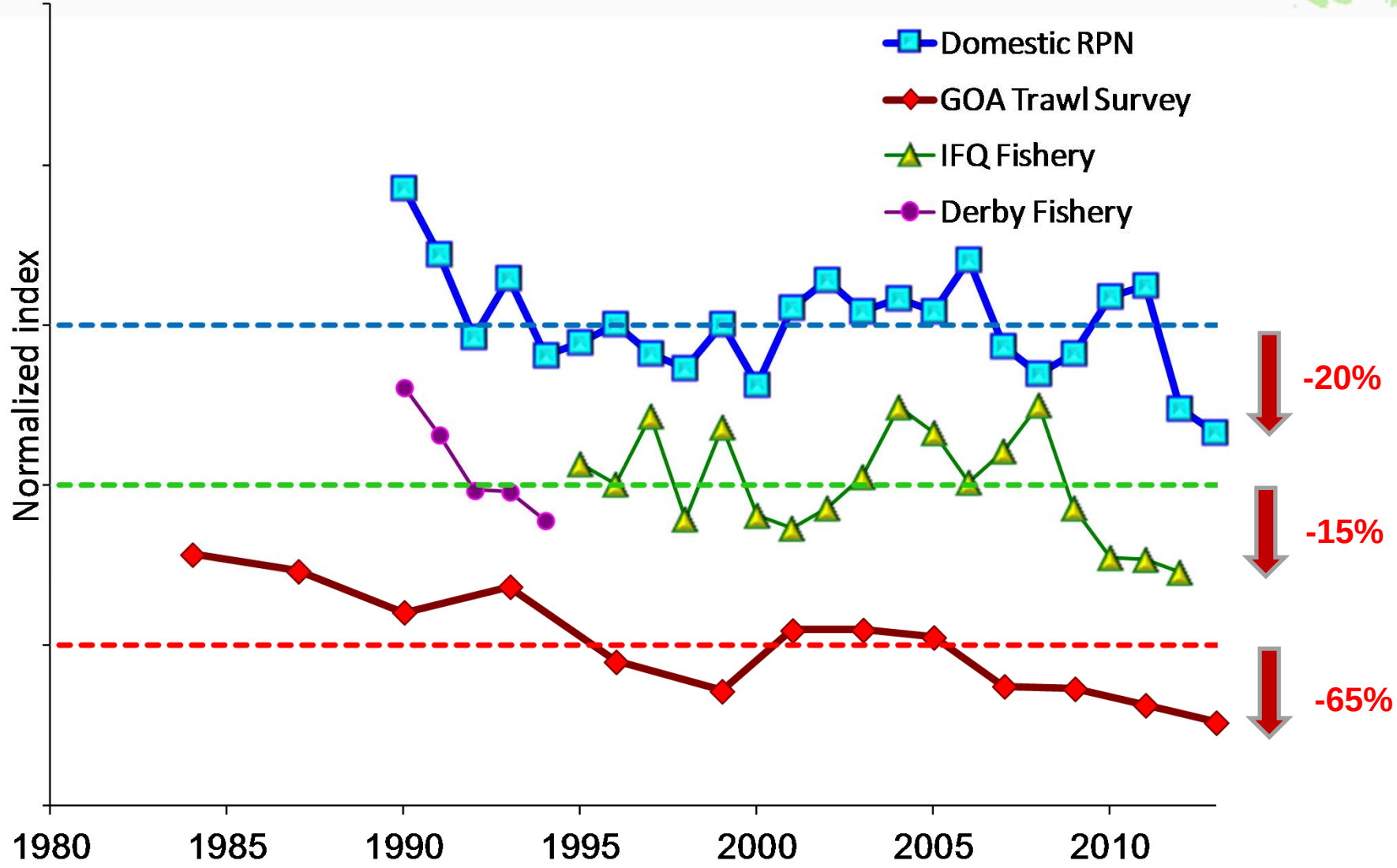
Data updates

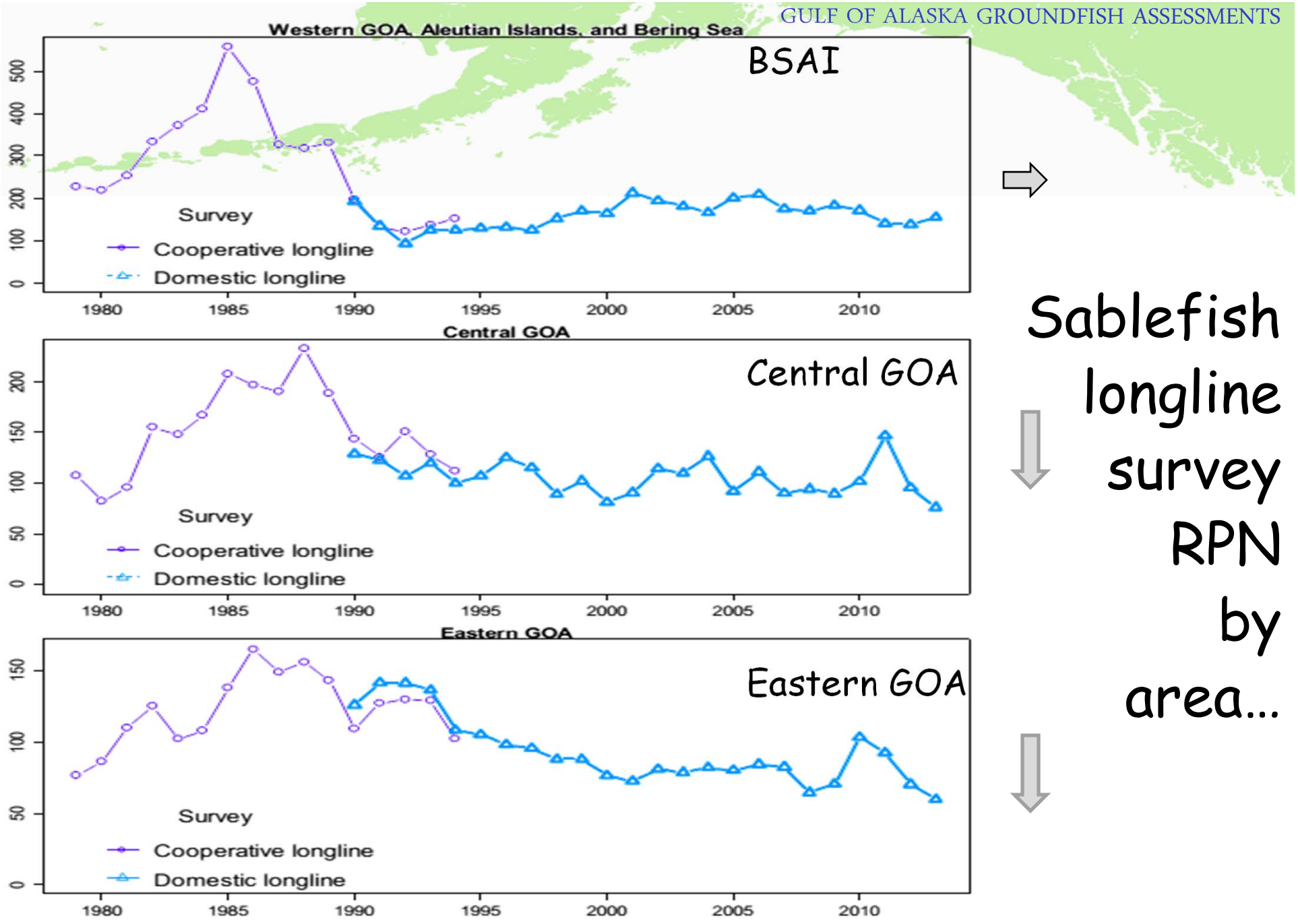
Catch:	updated 2012, and new catch for 2013
Abundance:	2013 Longline survey
	2013 NMFS GOA bottom trawl survey
	2012 Longline and trawl fisheries
Ages:	2012 Longline survey
	2012 Longline fishery
Lengths:	2013 Longline survey
	2012 Longline and trawl fisheries
	2013 Trawl survey

Sablefish Catch by Area



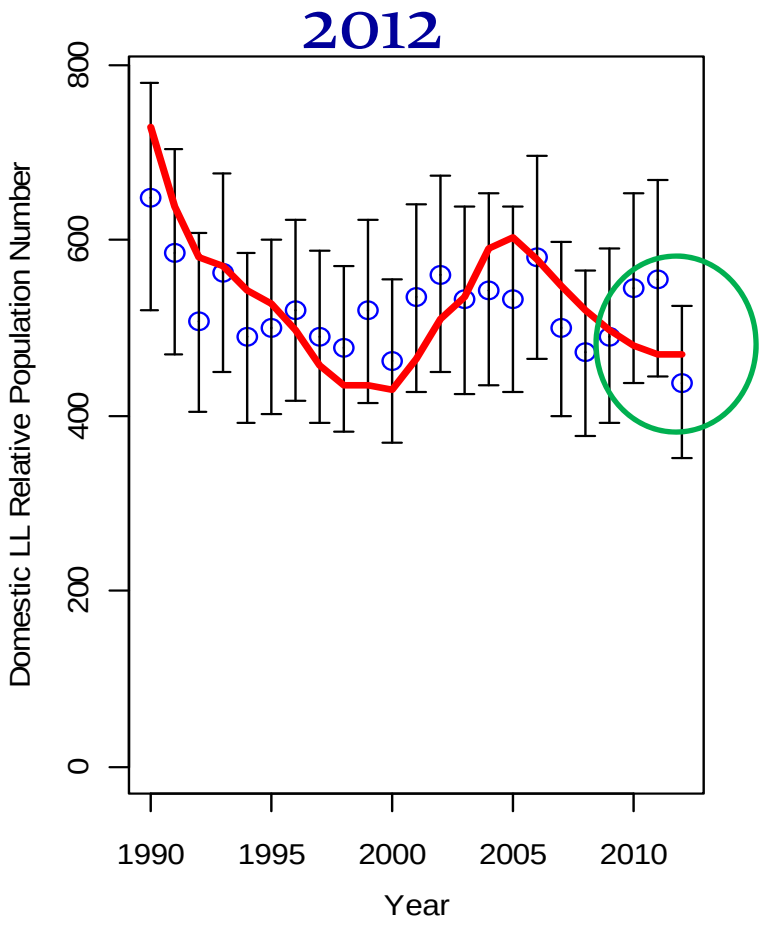
Sablefish abundance indices

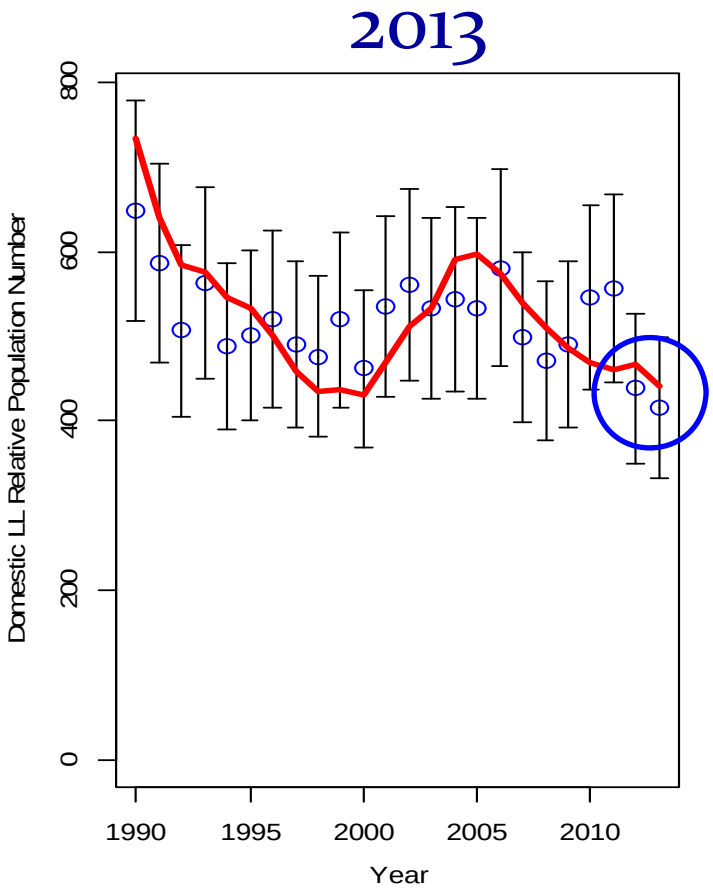




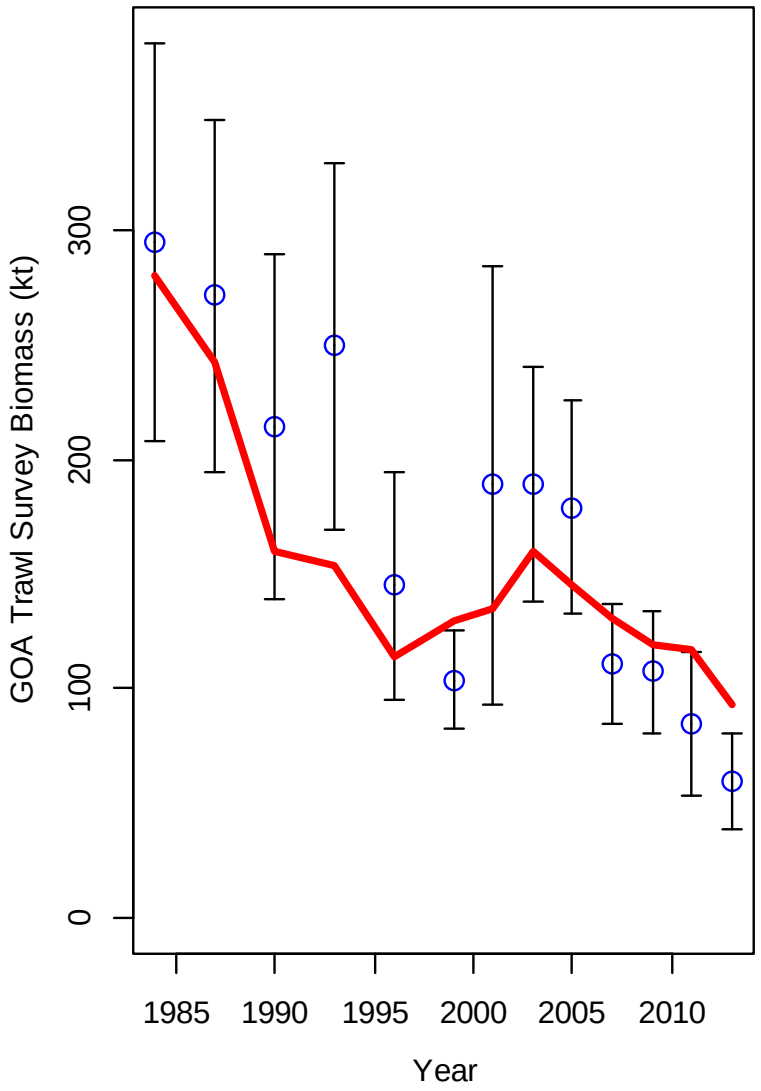
Sablefish longline survey RPN by area...

Sablefish: Fit to LL Survey RPN

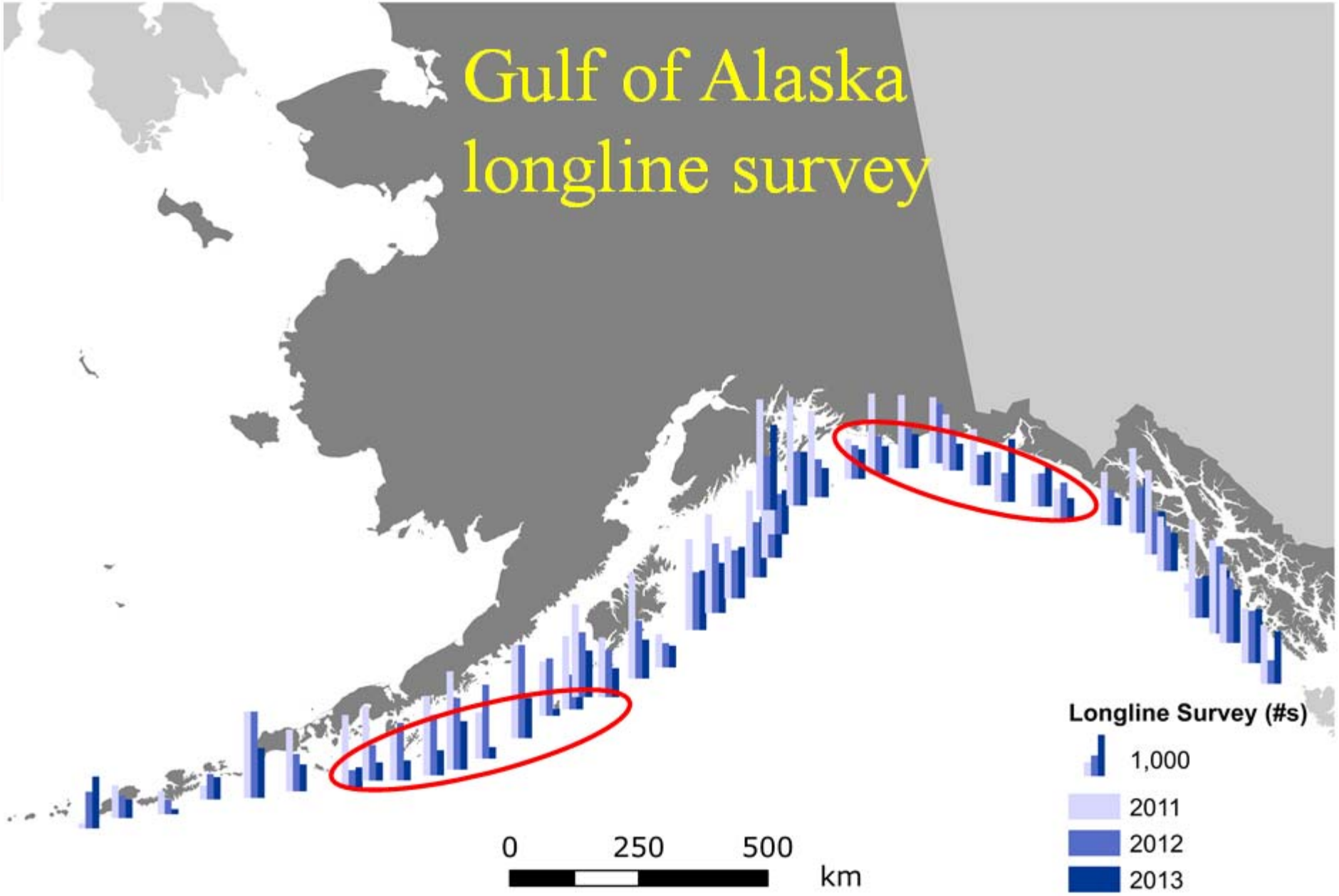


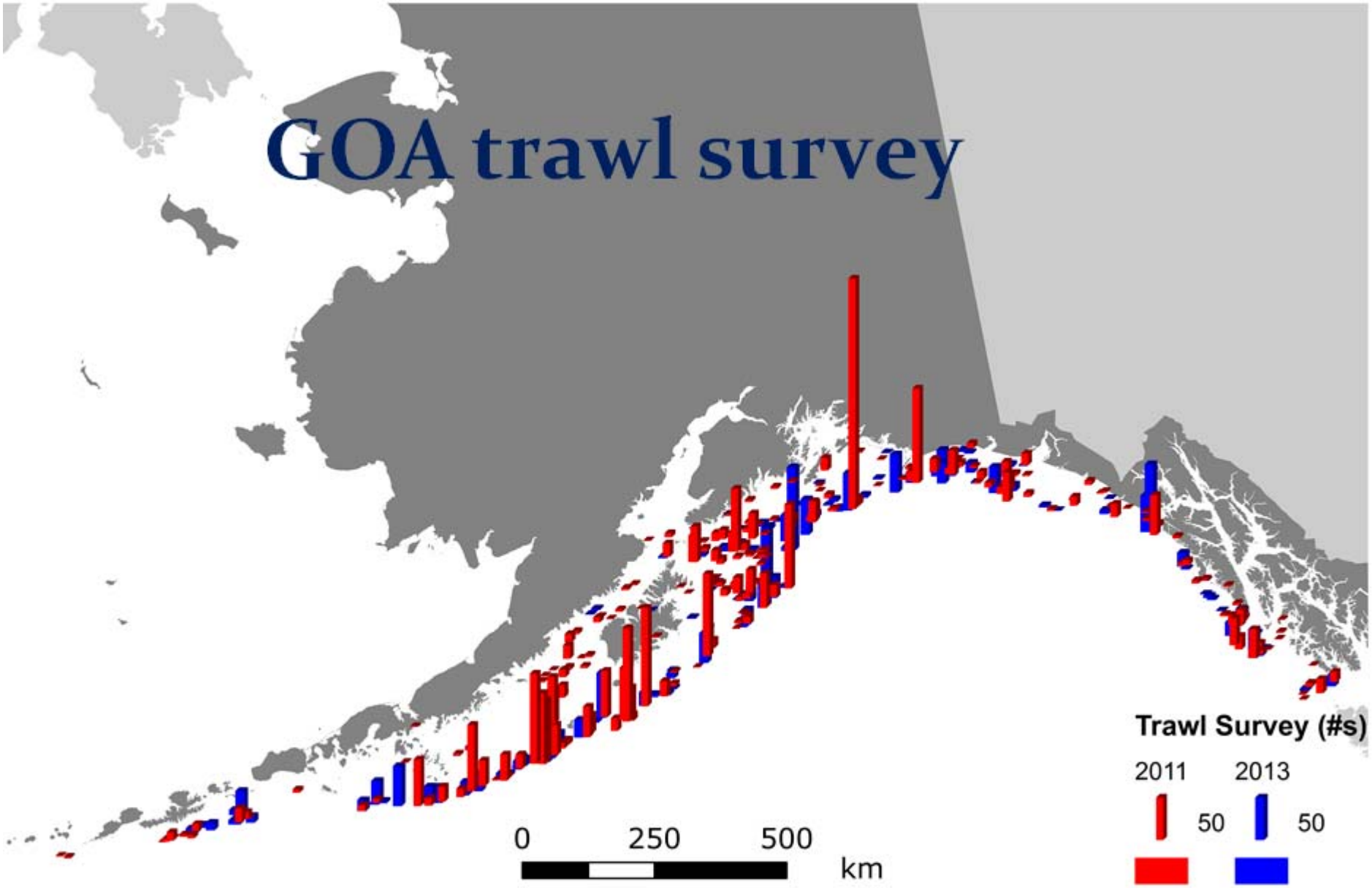


Sablefish: Fit to NMFS bottom trawl survey

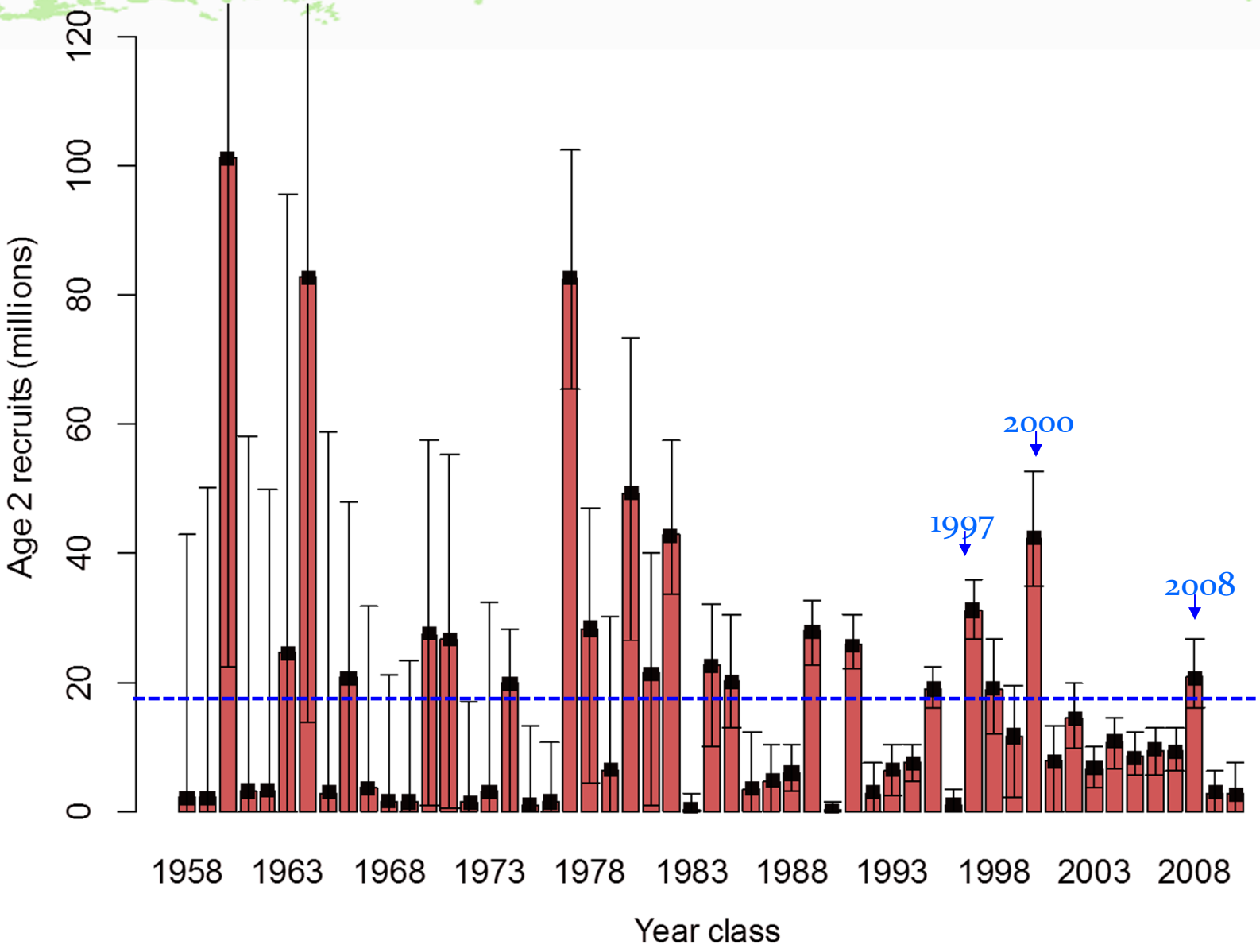


2013

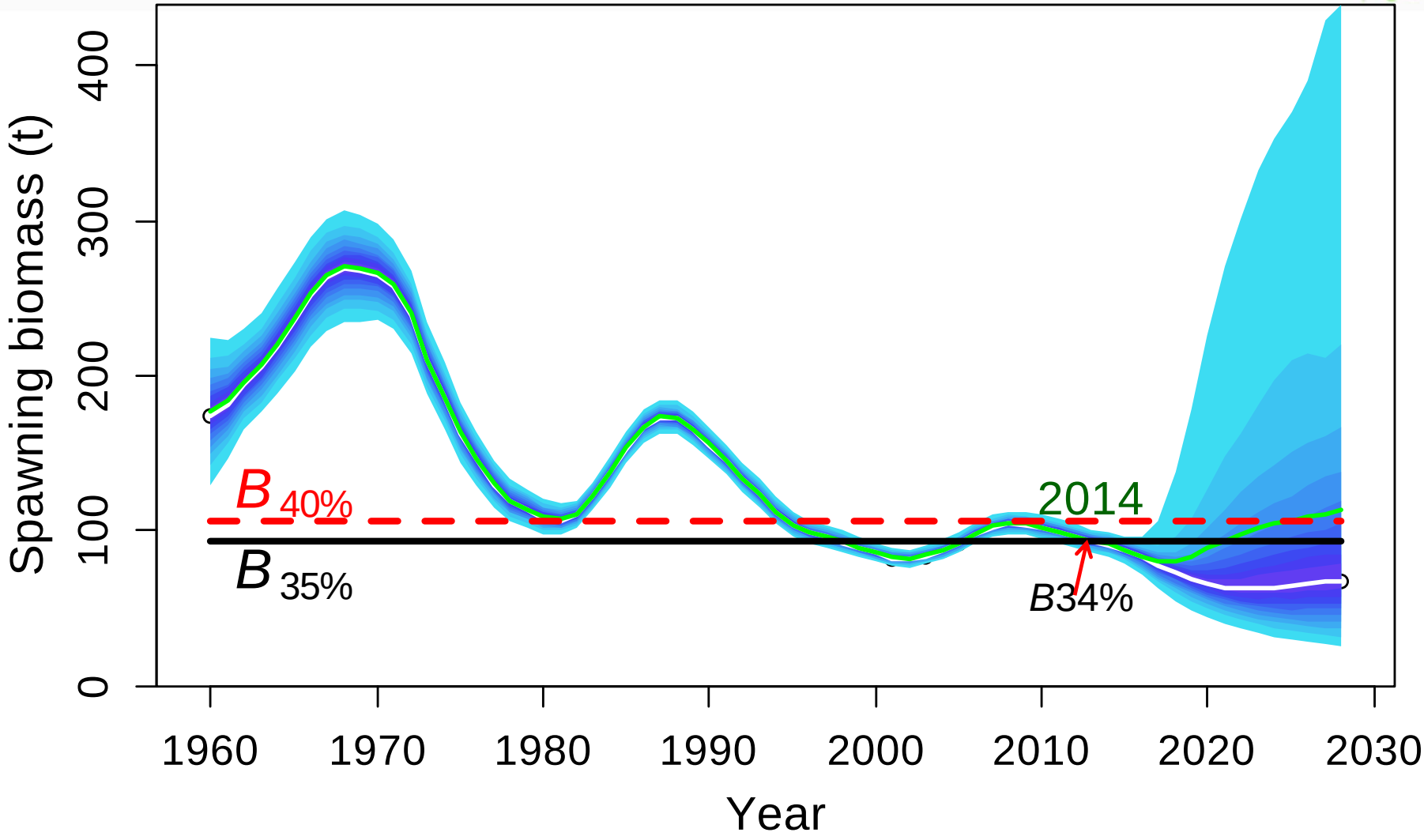

Gulf of Alaska
longline survey
Longline Survey (#s)
1,000
2011
2012
2013
0
250
500
km


GOA trawl survey
Trawl Survey (#s)
2011
2013
50
50
0
250
500
km

Sablefish: Recruitment



Sablefish: Projection



Sablefish ABC/OFL

2014 spawning biomass 34% of $B_{100\%}$

Alaska-wide ABC 2014: 13,722 t (vs. 15,220 projected)

GOA specific:

Sablefish	Biomass	OFL	ABC
2013	149,000	12,500	10,572
2014		11,300	9,554

Sablefish

Apportionment review

Author noted the following goals:

- Goal 1: Take in to account actual changes in the distribution of the population
  - Solution 1: Use most recent survey and fishery CPUE distribution
- Goal 2: Reduce interannual variability in area ABCs
  - Solution 2: Use 5 year exponential average

Sablefish apportionment issues

- Volatility
  - Changes too large relative to actual shifts
  - Fails to account for observation error
    - BS estimates based on 1 or 2 vessels for the fishery
    - Reduced survey effort
- Leads to rapid changes in some areas

Sablefish apportionment

- Option 1: Go with the model, standard updated apportionment
  - 5 yr exponential weighting of survey and fishery abundance indices

Apportionments are based on survey and fishery information	2013 ABC Percent	2013 Survey RPW	2012 Fishery RPW	2014 ABC Percent	2013 ABC	2014 ABC	Change
Total					16,230	**13,722**	-15%
Bering Sea	10%	21%	11%	14%	1,580	**1,900**	20%
Aleutians	13%	13%	14%	13%	2,140	**1,801**	-16%
Gulf of Alaska	77%	66%	75%	73%	12,510	**10,021**	-20%
Western	14%	13%	12%	13%	1,750	**1,350**	-23%
Central	44%	46%	41%	44%	5,540	**4,391**	-21%
W. Yakutat*	15%	13%	16%	15%	1,860	**1,474**	-21%
E. Yakutat / Southeast*	27%	28%	31%	28%	3,360	**2,806**	-17%

Sablefish apportionment

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Western	**1,350**	-23%
Central	**4,391**	-21%
W. Yakutat*	**1,474**	-21%
E. Yakutat / Southeast*	**2,806**	-17%

Sablefish apportionment

- Option 2: Use model ABC, fixing apportionment at the same as used last year **(recommended)**

Area	2013 ABC	Standard apportionment for 2014 ABC	**Recommended fixed apportionment for 2014 ABC****	**Difference from 2013**
Total	16,230	13,722	**13,722**	-15%
Bering Sea	1,580	1,900	**1,339**	-15%
Aleutians	2,140	1,801	**1,811**	-15%
Gulf of Alaska	12,510	10,021	**10,572**	-15%
Western	1,750	1,350	**1,480**	-15%
Central	5,540	4,391	**4,681**	-15%
W. Yakutat*	1,860	1,474	**1,574**	-15%
E. Yak. / Southeast*	3,360	2,806	**2,837**	-15%

Sablefish apportionment recommendation

- Keep same as 2012 as an interim measure to reduce ABC variability
  - UAF study using sablefish spatial model to evaluate apportionment strategies to:
    - Maximize spawning biomass
    - Reduce variability
    - Consider economic yield
  - To be presented in September 2014

    (for 2015 apportionment)

Sablefish future work

- Conduct:
  - MSEs to evaluate apportionment
  - Sensitivity analysis of depredation on assessment model
- Continue investigating recruitment processes (GOAIERP)

Flatfish ABC Summary

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Flatfish ABC's

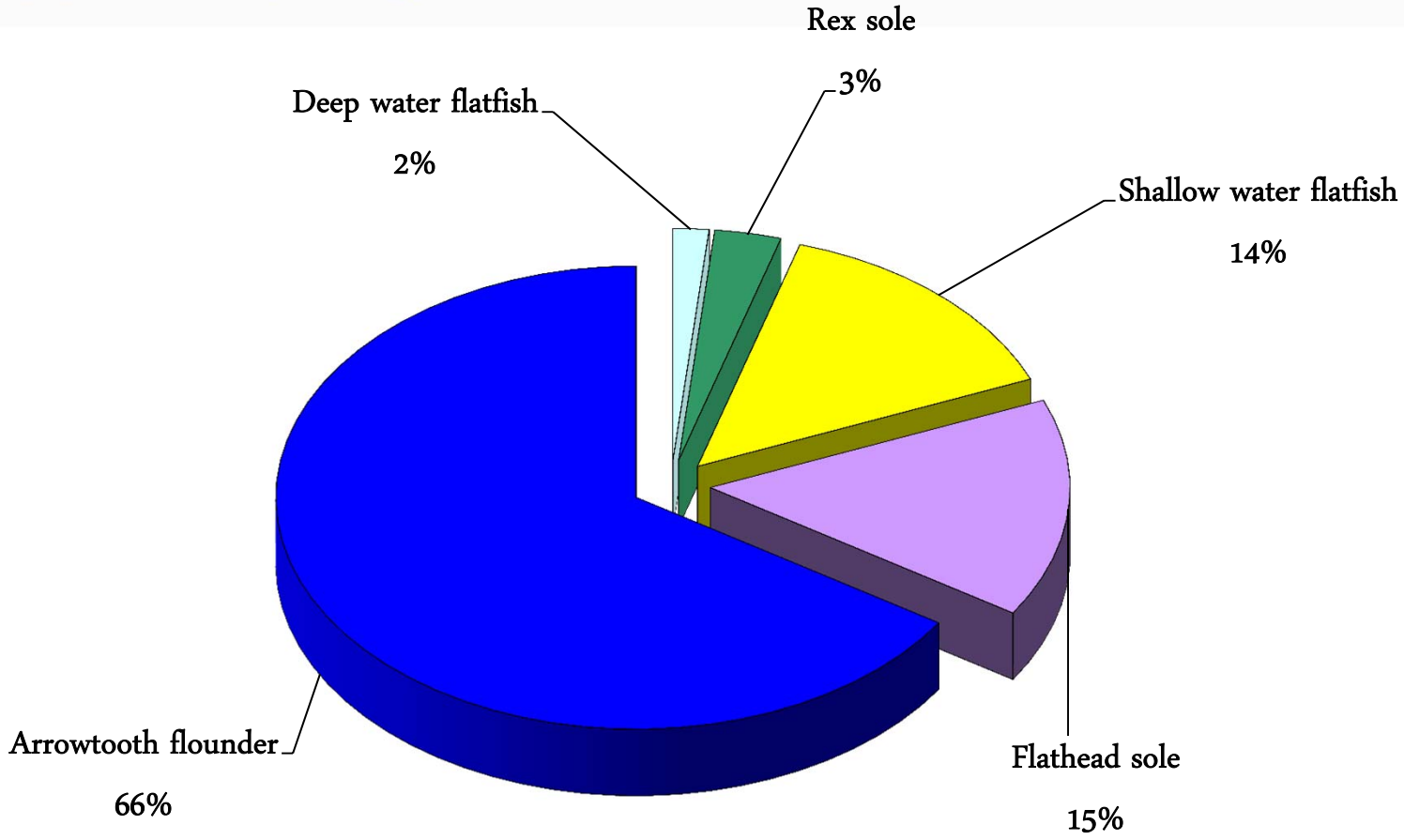
Stock	2013	2014	Change	
Shallow water	45,484	40,805	down 4,679	(10%)
Rex sole	9,560	9,341	down 219	(2%)
Deep water	5,126	13,472	up 8,346	(163%)
Flathead sole	48,738	41,231	down 7,507	(15%)
Arrowtooth	210,451	195,358	down 15,093	(7%)
Subtotal	319,359	300,207	down 19,152	(6%)

Deep-water ABC from Dover assessment Tier 3 + others Tier 6

Shallow water flats: N and S rock sole Tier 3, others Tier 5

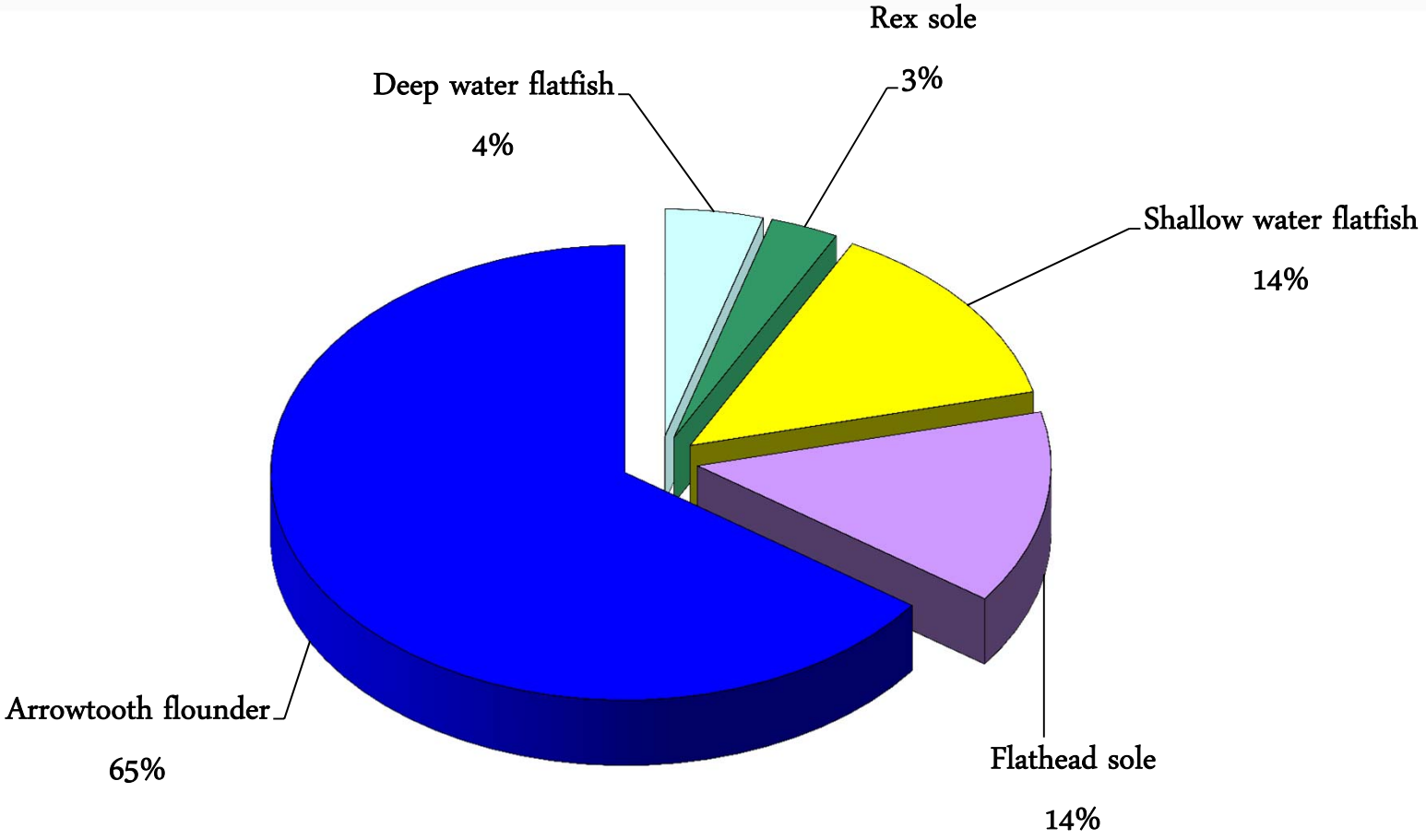
Flatfish 2013 ABC's

319,359 t combined



Flatfish 2014 ABC's

300,207 t combined



General comments on flatfish assessments

- Lightly exploited
- Model developments:
  - N & S rock sole model

    Continued development
  - Dover and flathead sole models

    Assessments conducted using Stock Synthesis modeling platform (SS3)

    Several changes in data inputs and model configuration
  - Rex sole assessment

    Same Tier 5 approach using model estimated adult biomass

Flatfish ABC's

Stock	2013	2014	Change	
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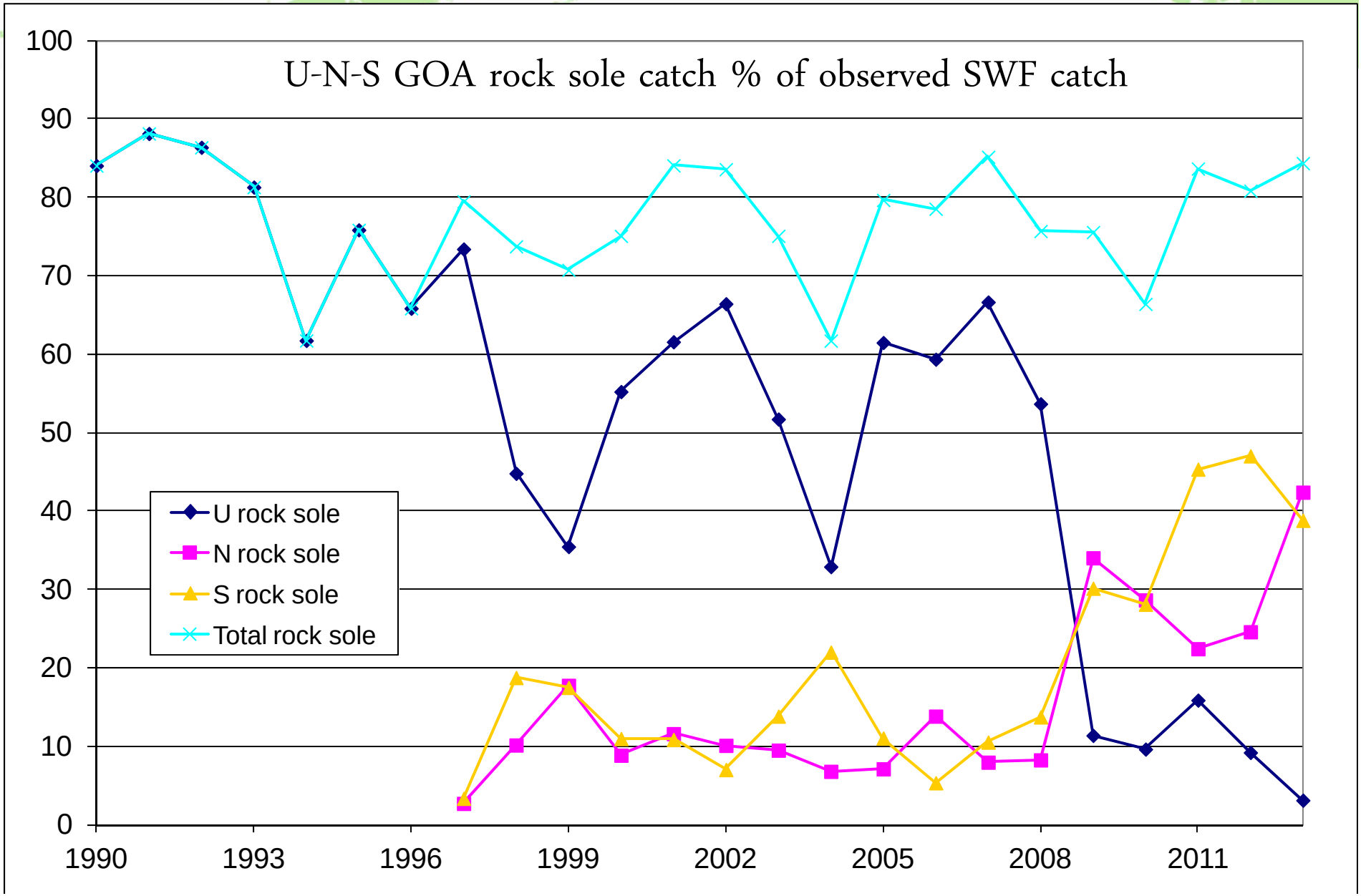
Shallow water flats: N and S rock sole Tier 3, others Tier 5

4. Shallow water flatfish

Rock sole species increased, others mainly decreased relative to 2011 survey estimates:

Survey biomass estimates (t)	2011	2013
Northern rock sole	72,875	74,586
Southern rock sole	120,573	131,441
Yellowfin sole	46,576	23,016
Butter sole	19,695	8,122
Starry flounder	39,757	30,028
English sole	16,720	18,121
Sand sole	755	703
Alaska plaice	12,266	8,044
Total	329,217	294,061

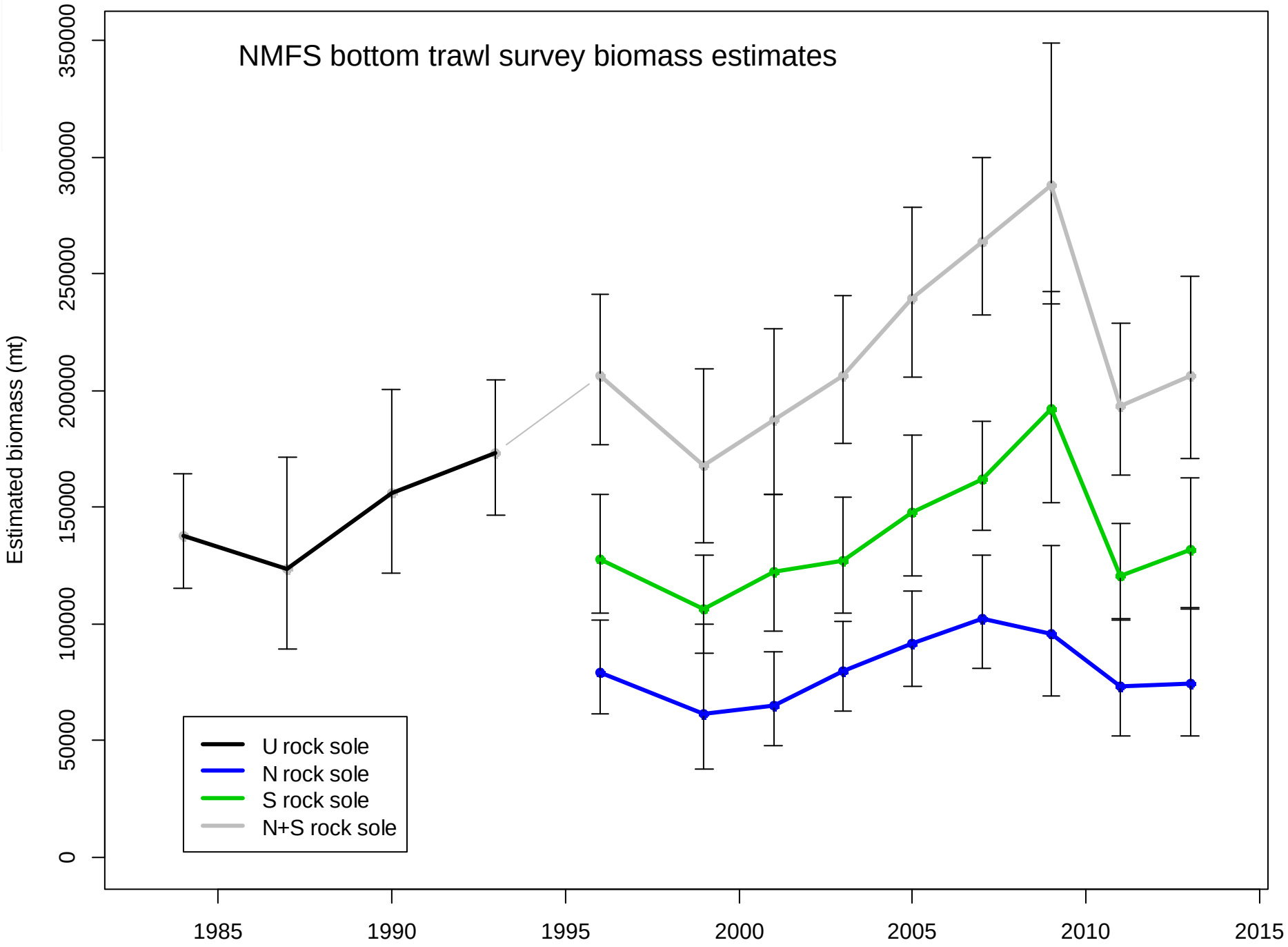
4. GOA Shallow flats (N & S rock sole)



GOA N and S rock sole Model

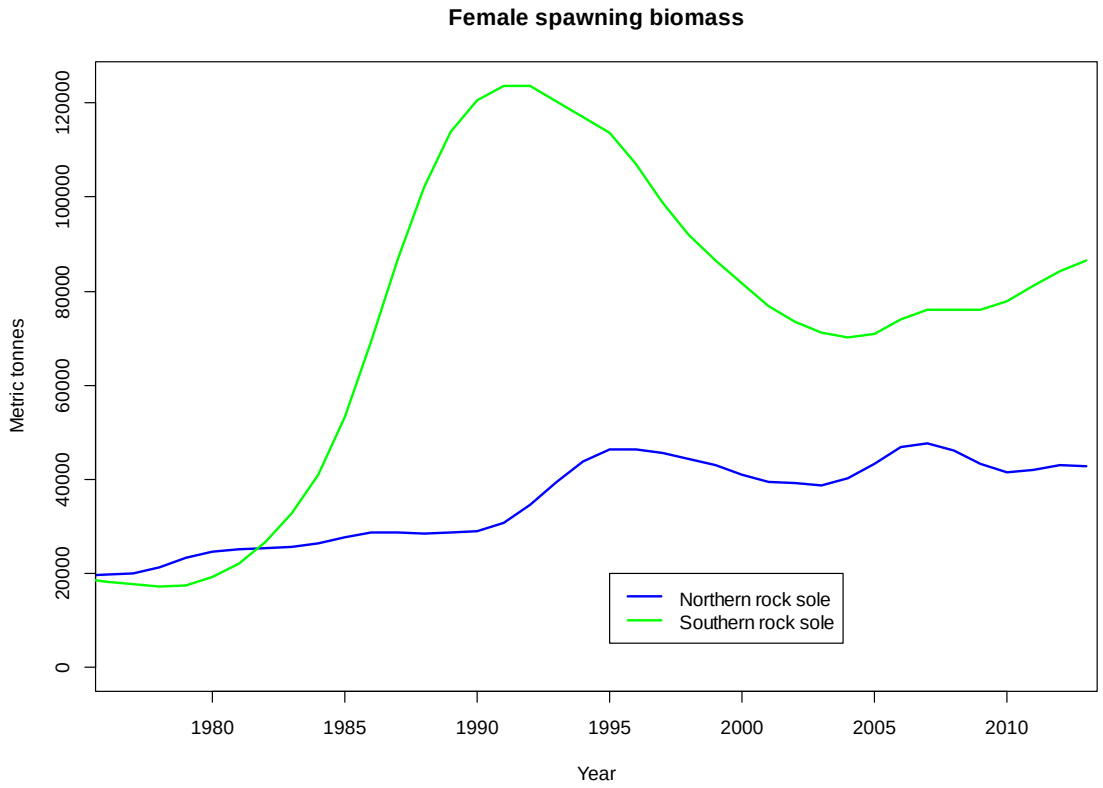
- 2012 model
  - Two species two sex mixed fishery statistical catch-at-age model

- 2013 executive summary with updated projection


NMFS bottom trawl survey biomass estimates
Estimated biomass (mt)
0
50000
100000
150000
200000
250000
300000
350000
1985
1990
1995
2000
2005
2010
2015
U rock sole
N rock sole
S rock sole
N+S rock sole

4. Shallow water flatfish summary

	Biomass	OFL	ABC
2014	384,134	50,007	40,805
2015		46,207	37,505



Plan Team recommends suite of models for

Sept 2014

Updated full assessment in Nov 2014

Flatfish ABC's

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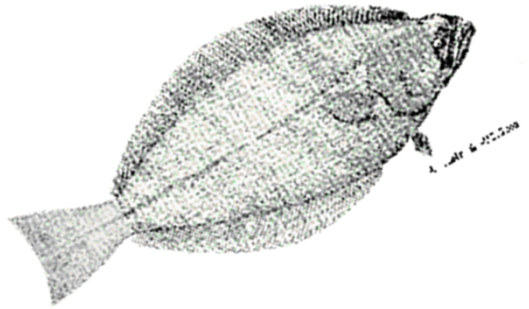
Deep-water ABC from Dover assessment Tier 3 + others Tier 6

5. Deepwater flatfish

Dover sole
Deepsea sole
Greenland turbot



Dover sole: age- and sex-structured model

- M estimated externally
- Survey catchability fixed at 1.0
- Sex-specific fishery and survey selectivity

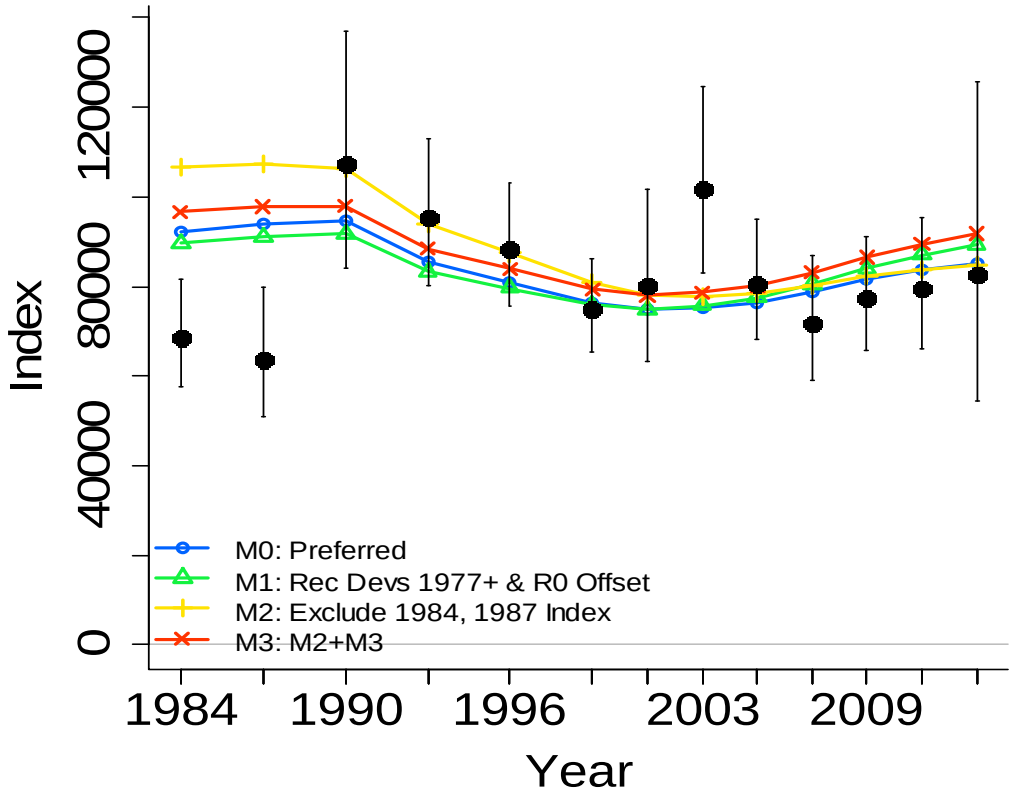
Tuned to

- Catch history, survey biomass
- Length compositions: fishery and survey
- Some survey age compositions

Dover sole

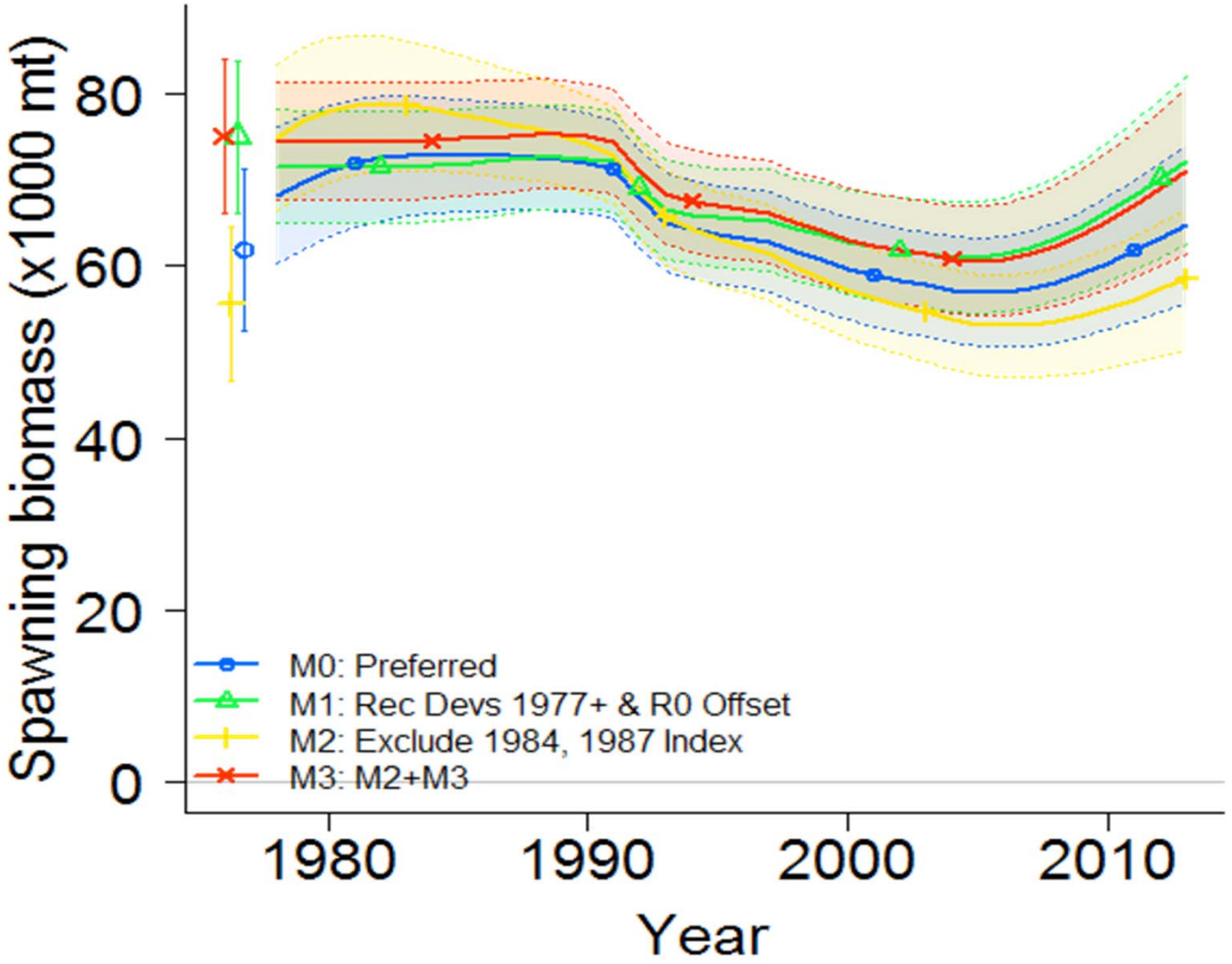
Alternative Models

- Several models presented, many new configurations
- E.g.:



Dover sole

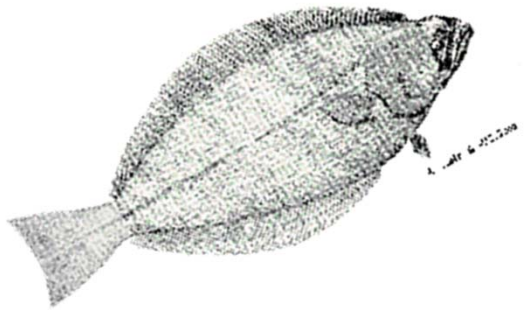
Spawning stock biomass



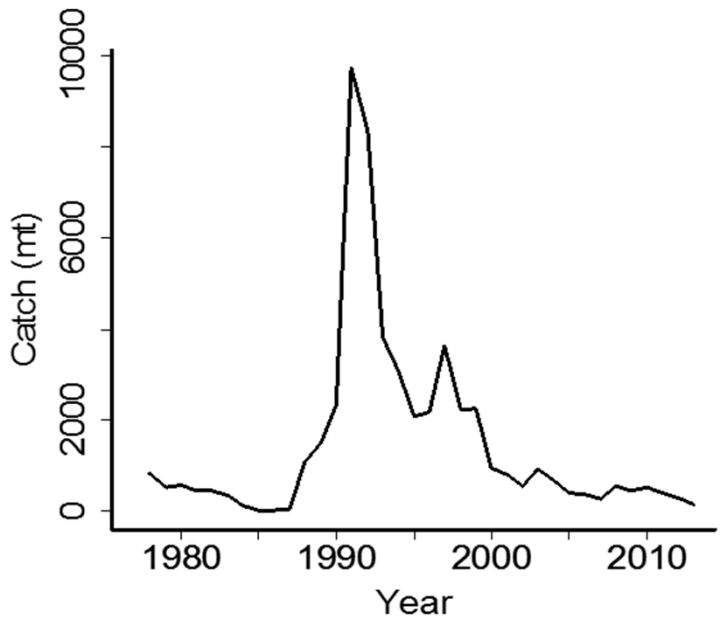
Deepwater flatfish

Dover sole
Deepsea sole
Greenland turbot

Deepwater flatfish	Biomass	OFL	ABC
2014	66,147	16,159	13,472
2015		15,955	13,303



Dover sole catch



Flatfish ABC's

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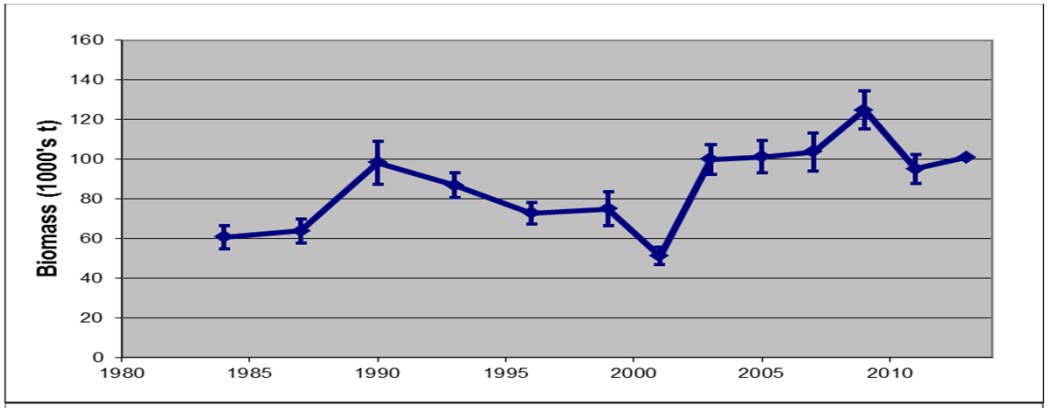
Subtotal	319,359	300,207	down 19,152	(6%)

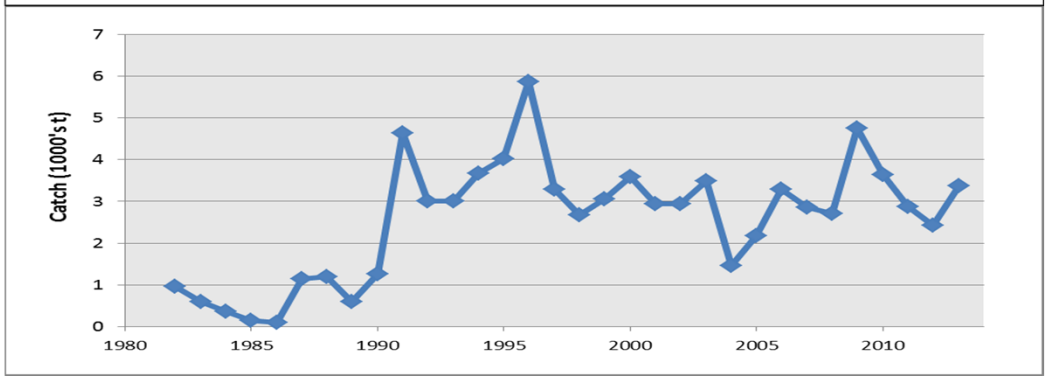
6. GOA Rex Sole

Age-structured model (since 2004), *M=0.17*

In 2005 adopted Tier 5 approach with model est. adult biomass

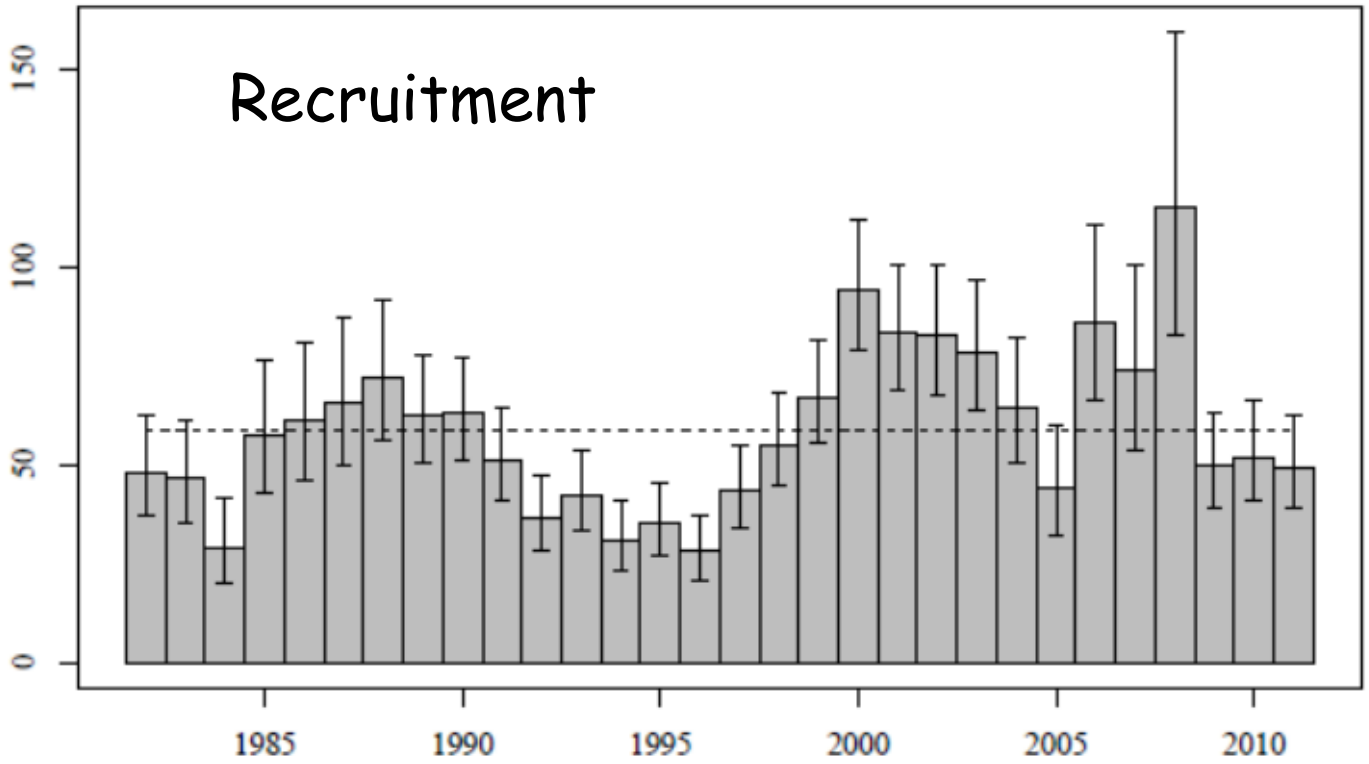
Maturity much younger than selectivity – unreliable $F_{40\%}$, $F_{50\%}$





6. Rex sole ABC/OFL

Rex sole	Biomass	OFL	ABC
2014	84,702	12,207	9,341
2015		11,963	9,155



Tier 5

(model based)

Key issue:

Selectivity estimate unreliable, hence $F_{40\%}$ also unreliable

Flatfish ABC's

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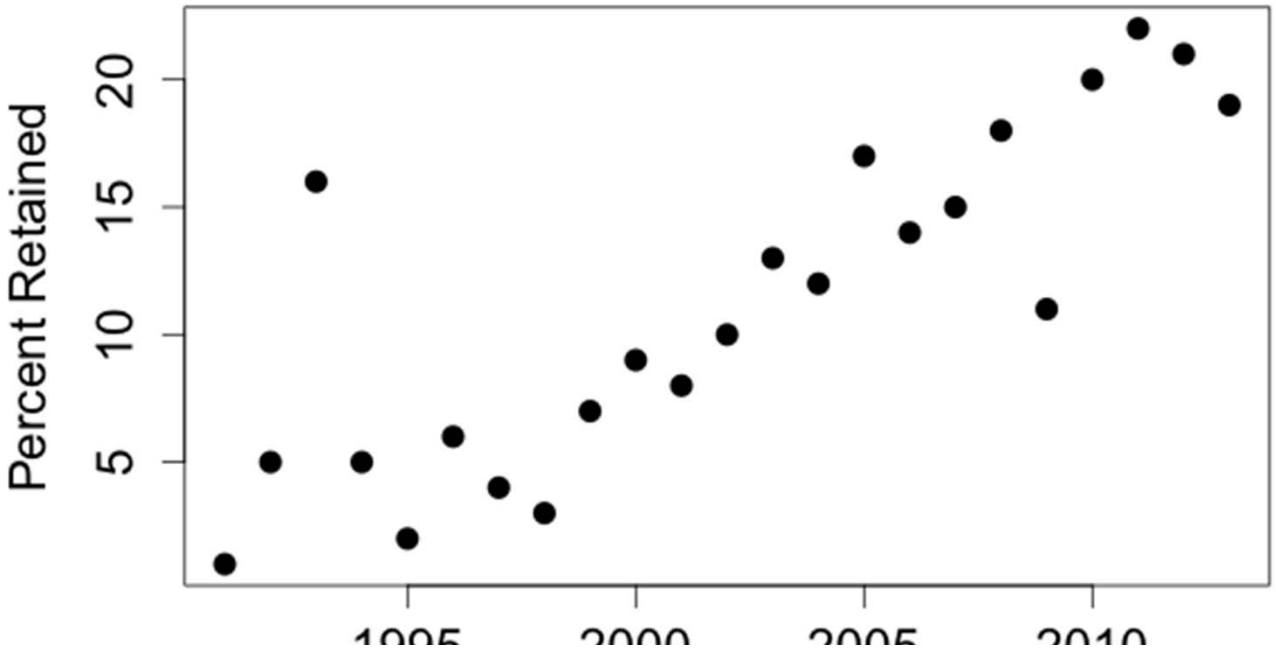
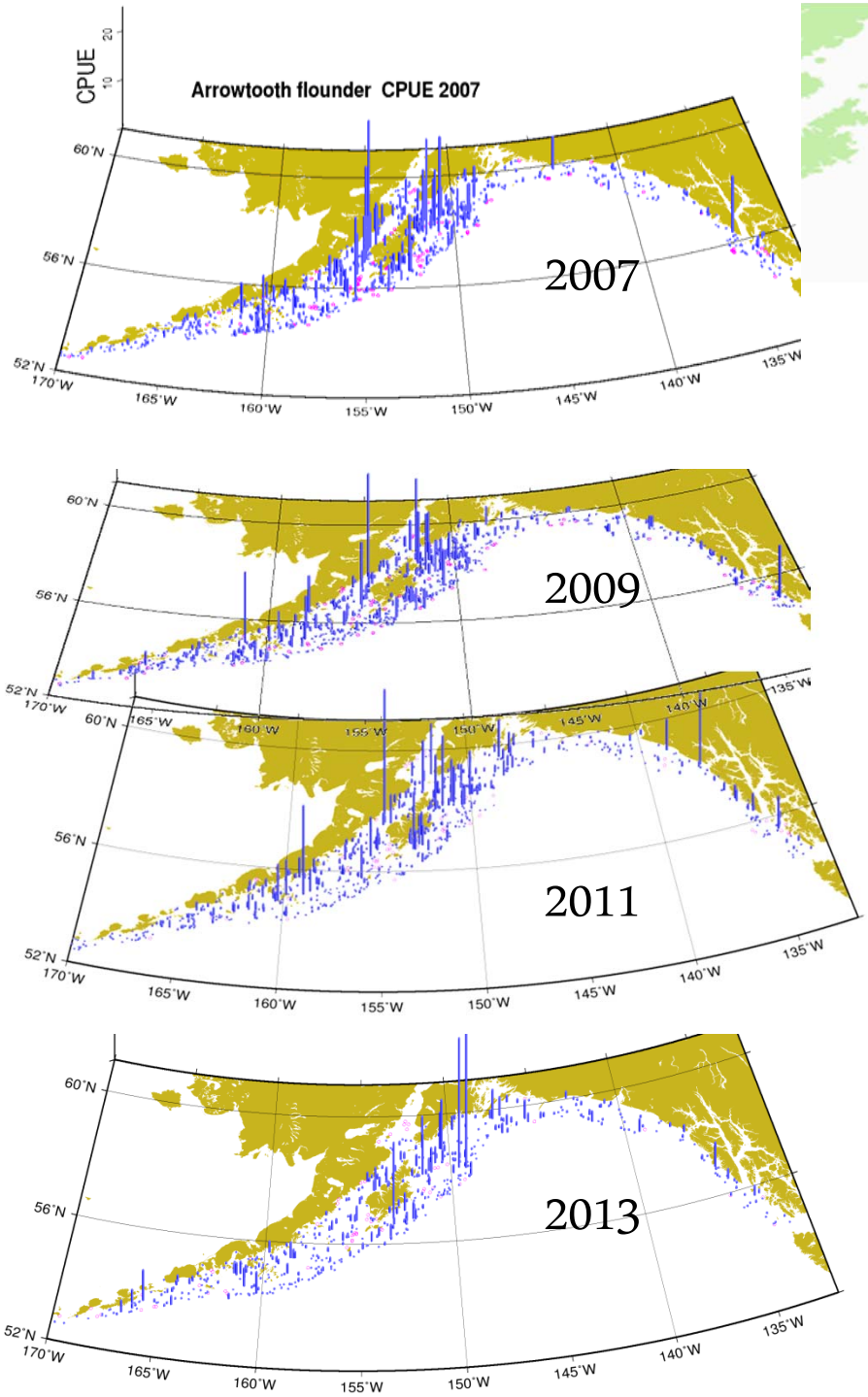
7. GOA Arrowtooth flounder

Based on age/sex structured model

2013 survey biomass and length composition

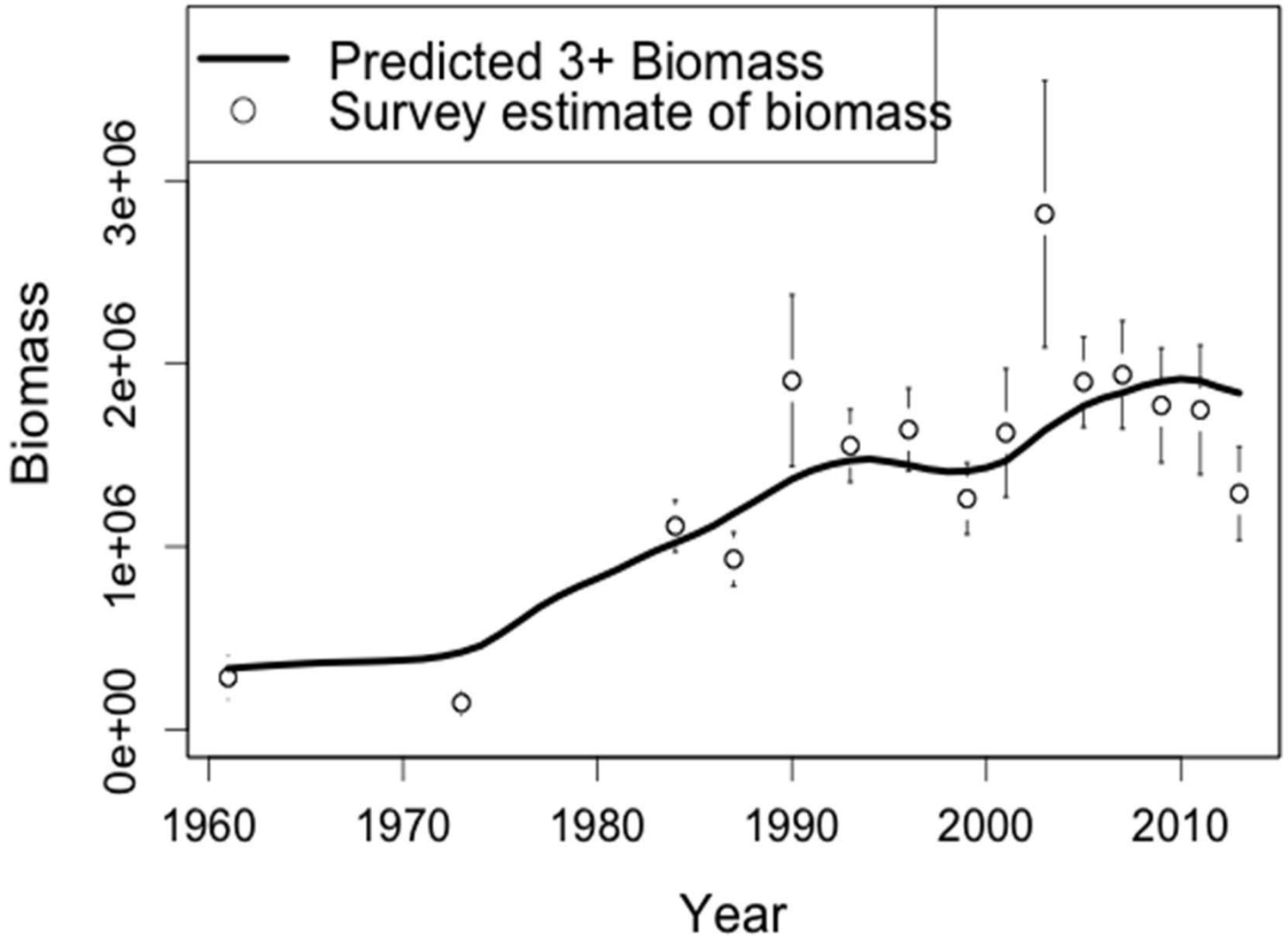
2012 and 2013 fishery length data





GOA Arrowtooth flounder survey CPUE

Total (3+) Biomass fit to survey data

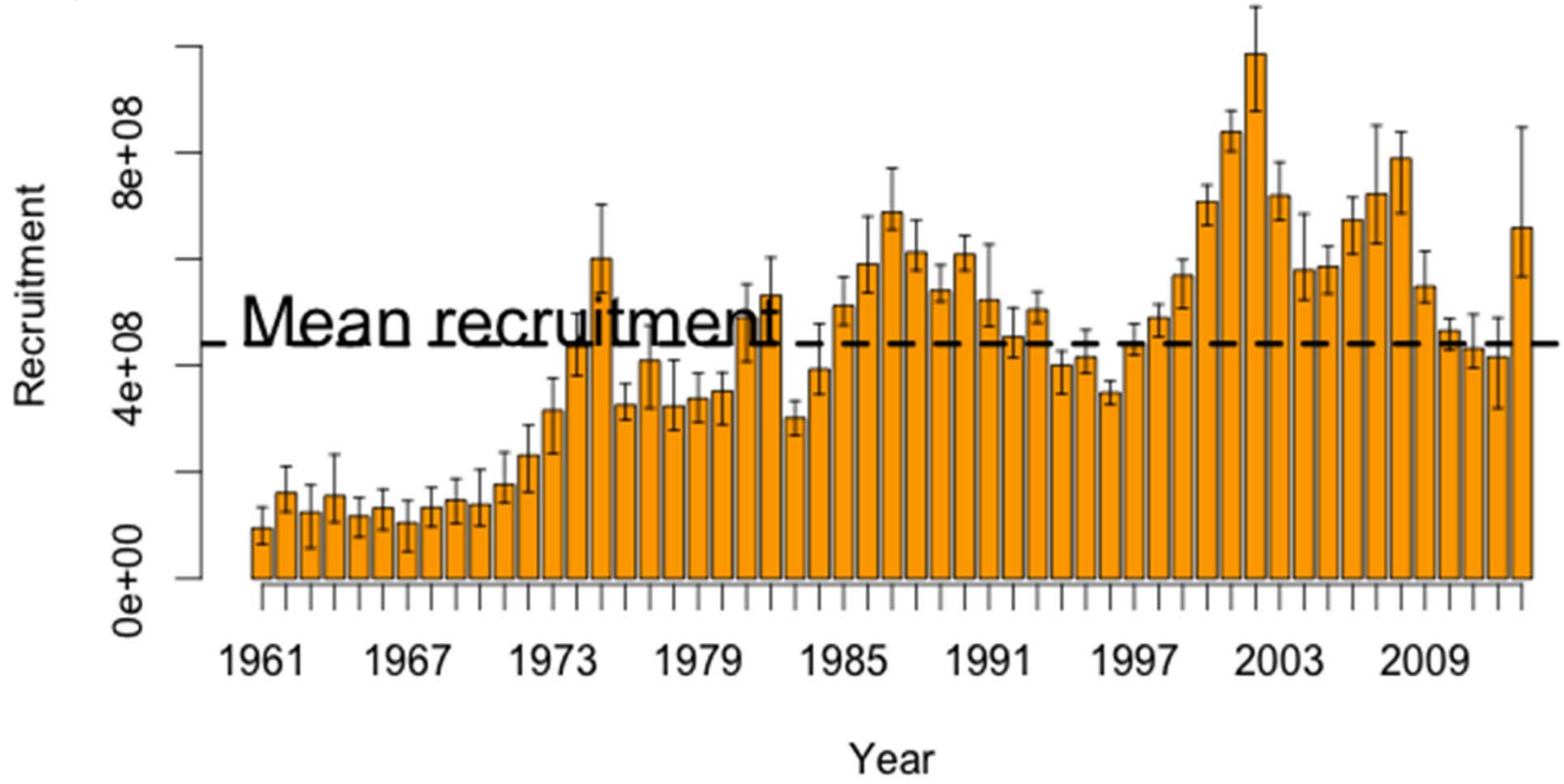


GOA Arrowtooth flounder ABC/OFL

Tier 3a

2014 ABC down slightly

Year	Biomass	OFL	ABC
2014	1,978,340	229,248	195,358
2015		222,160	189,556



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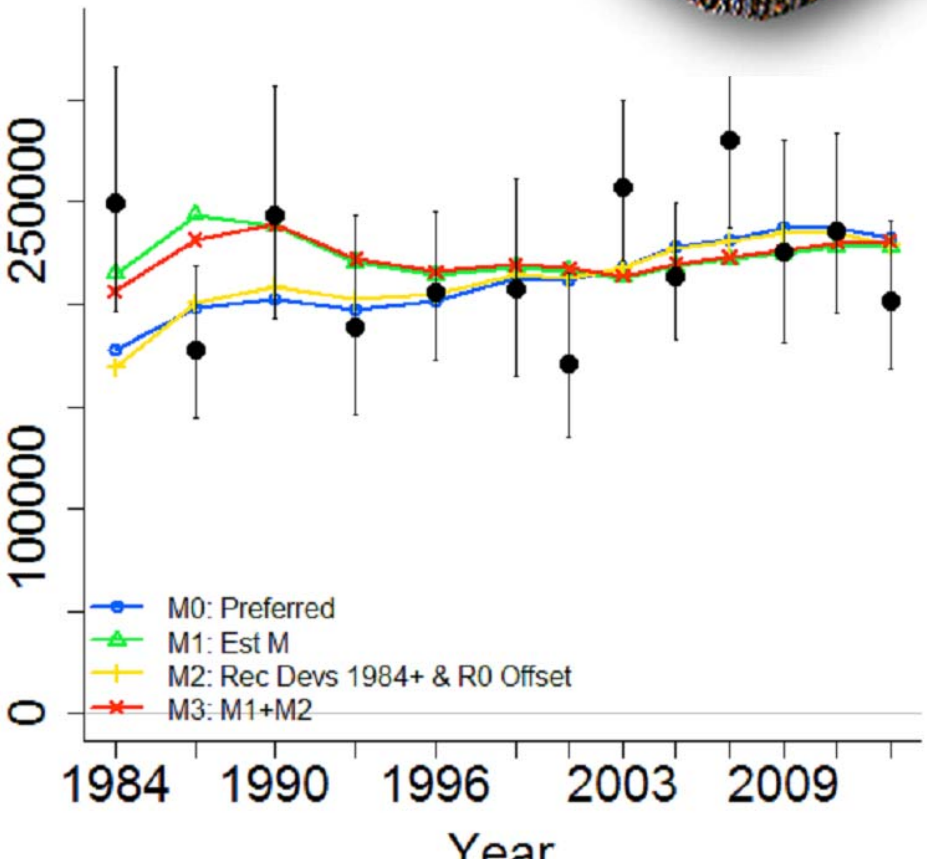
Rex sole	9,560	9,341	down 219	(2%)
Deep water	5,126	13,472	up 8,346	(163%)
Flathead sole	48,738	41,231	down 7,507	(15%)
Arrowtooth	210,451	195,358	down 15,093	(7%)
Subtotal	319,359	300,207	down 19,152	(6%)

8. GOA Flathead Sole

Age-structured model

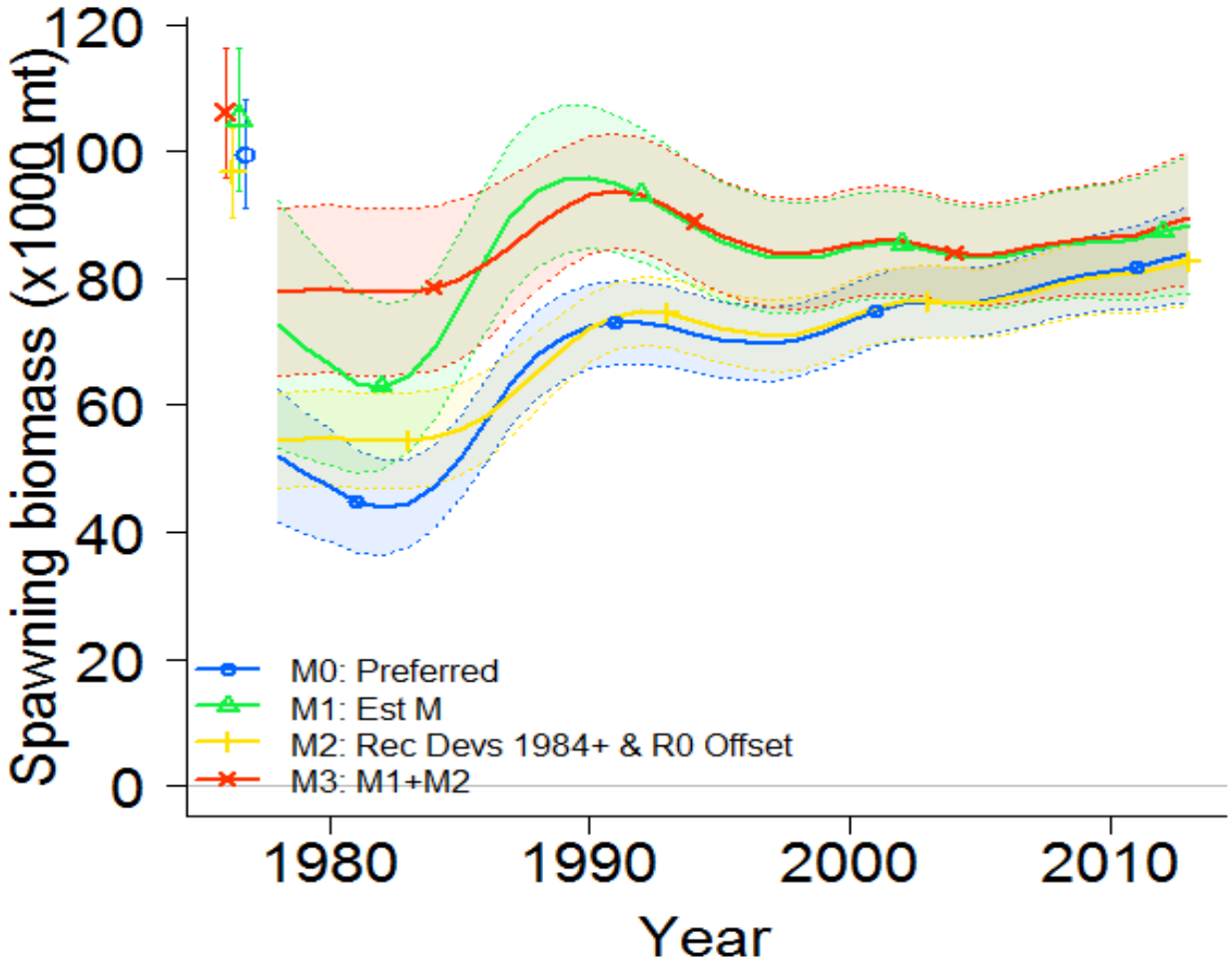
2013 survey biomass down slightly

Further development of stock synthesis application



Spawning stock biomass

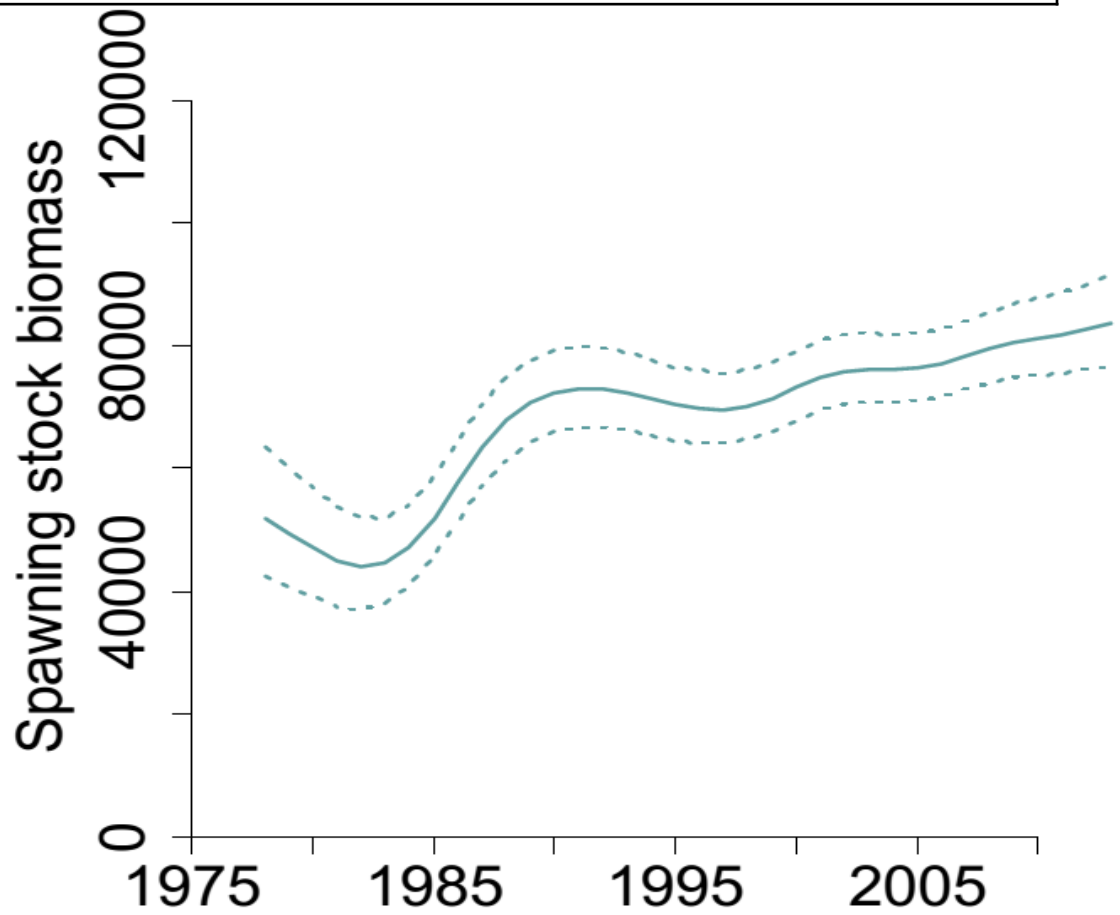
- Several models presented, many new configurations
- E.g.:



GOA Flathead sole ABC/OFL

	Biomass	OFL	ABC
2014	252,361	50,664	41,231
2015		50,376	41,007

Tier 3a

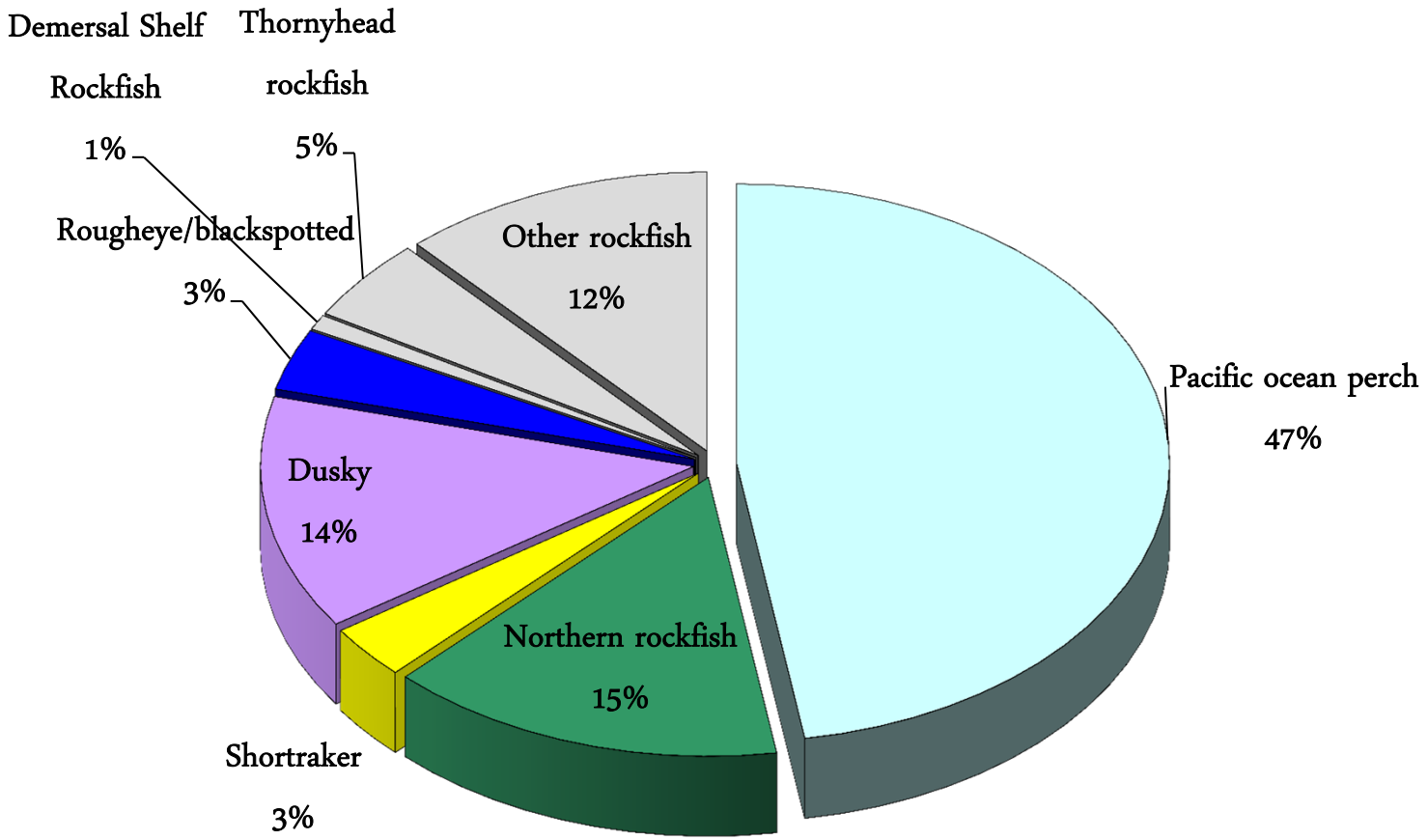


GOA Rockfish

Species	2013 Catch	ABC 2013	ABC 2014	Change
Pollock	93,246	121,046	174,976	up 53,930 (45%)
Pacific Cod	46,642	80,800	88,500	up 7,700 (10%)
Sablefish	11,825	12,510	10,572	down 1,938 (15%)
Flatfish	28,619	108,908	104,849	down 4,059 (4%)
Arrowtooth flounder	2,627	210,451	195,358	down 15,093 (7%)
Rockfish	24,287	34,568	38,880	up 4,312 (12%)
Atka mackerel	1,244	4,700	4,700	same (0%)
Skates	5,590	8,422	8,627	up 205 (2%)
Other Species	4,153	14,515	14,213	down 302 (2%)
Total	218,233	595,920	640,675	up 44,755 (8%)

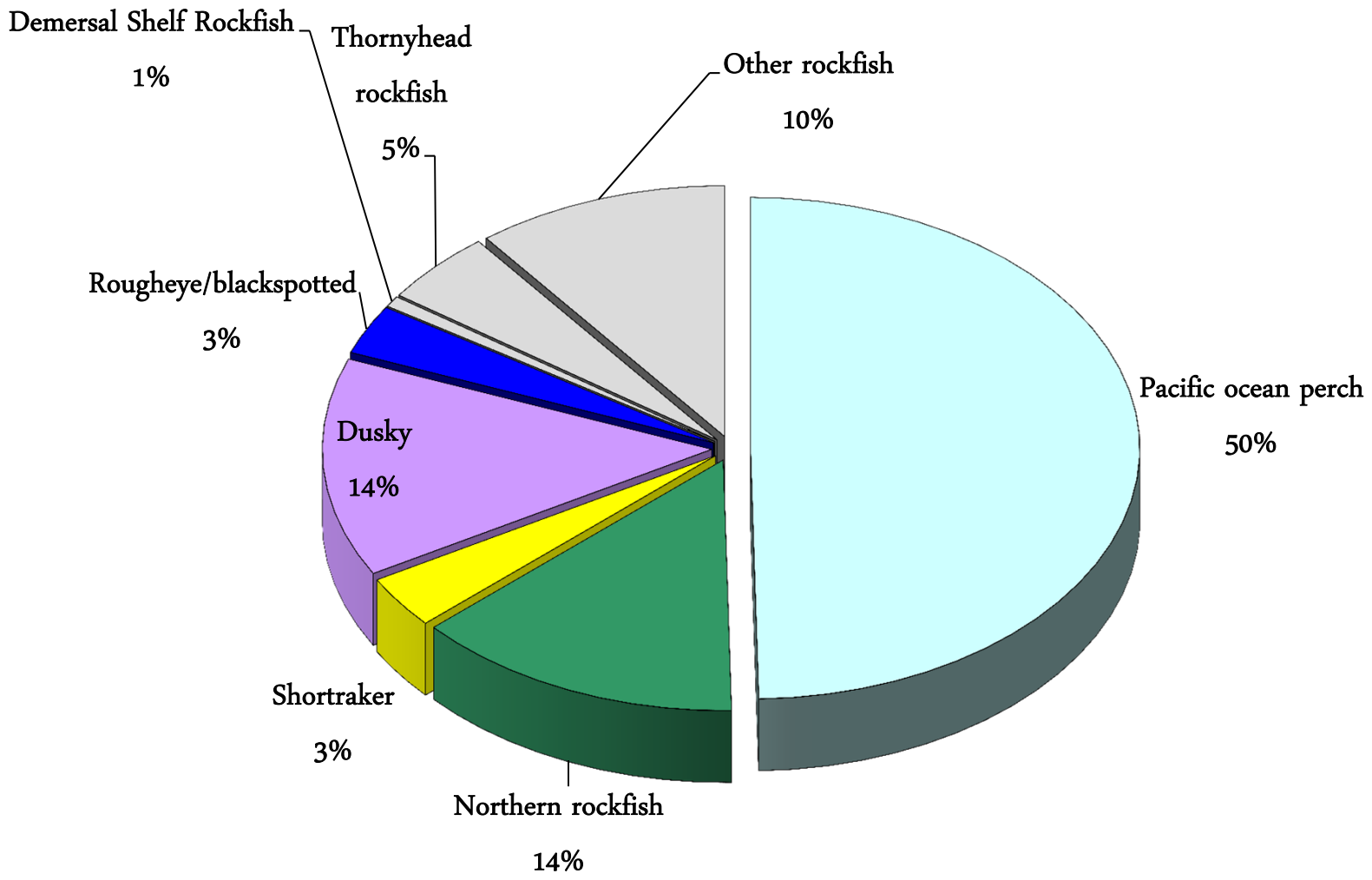
Slope Rockfish 2013 ABC's

34,568 t total



Rockfish 2014 ABC's

38,880 t total



GOA Rockfish overview

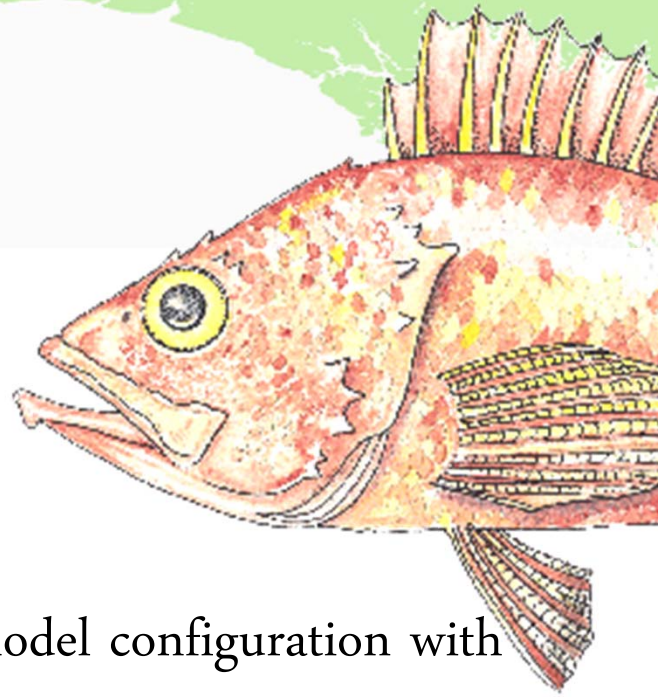
Assessed on biennial schedule to coincide with new survey data

- Typically odd year = full assessment year
- 2013:
  - Modified full assessments for POP, northern and dusky rockfish
  - Executive summaries for shortraker, rougheye and blackspotted, thornyheads, other rockfish, and demersal shelf rockfish

POP ABC Summary

Species	2013	2014	Change
POP	16,412	19,309	up 2,897 (18%)
northern rockfish	5,130	5,322	up 192 (4%)
Shortraker Rockfish	1,081	1,323	up 242 (22%)
Dusky	4,700	5,486	up 786 (17%)
Rougheye and Blackspotted Rockfish	1,232	1,244	same (0%)
Demersal shelf rockfish	303	274	same (0%)
Thornyhead	1,665	1,841	up 176 (11%)
Other rock	4,045	4,081	up 36 (1%)
Sub Total	34,568	38,880	up 4,312 (12%)

9. Pacific ocean perch



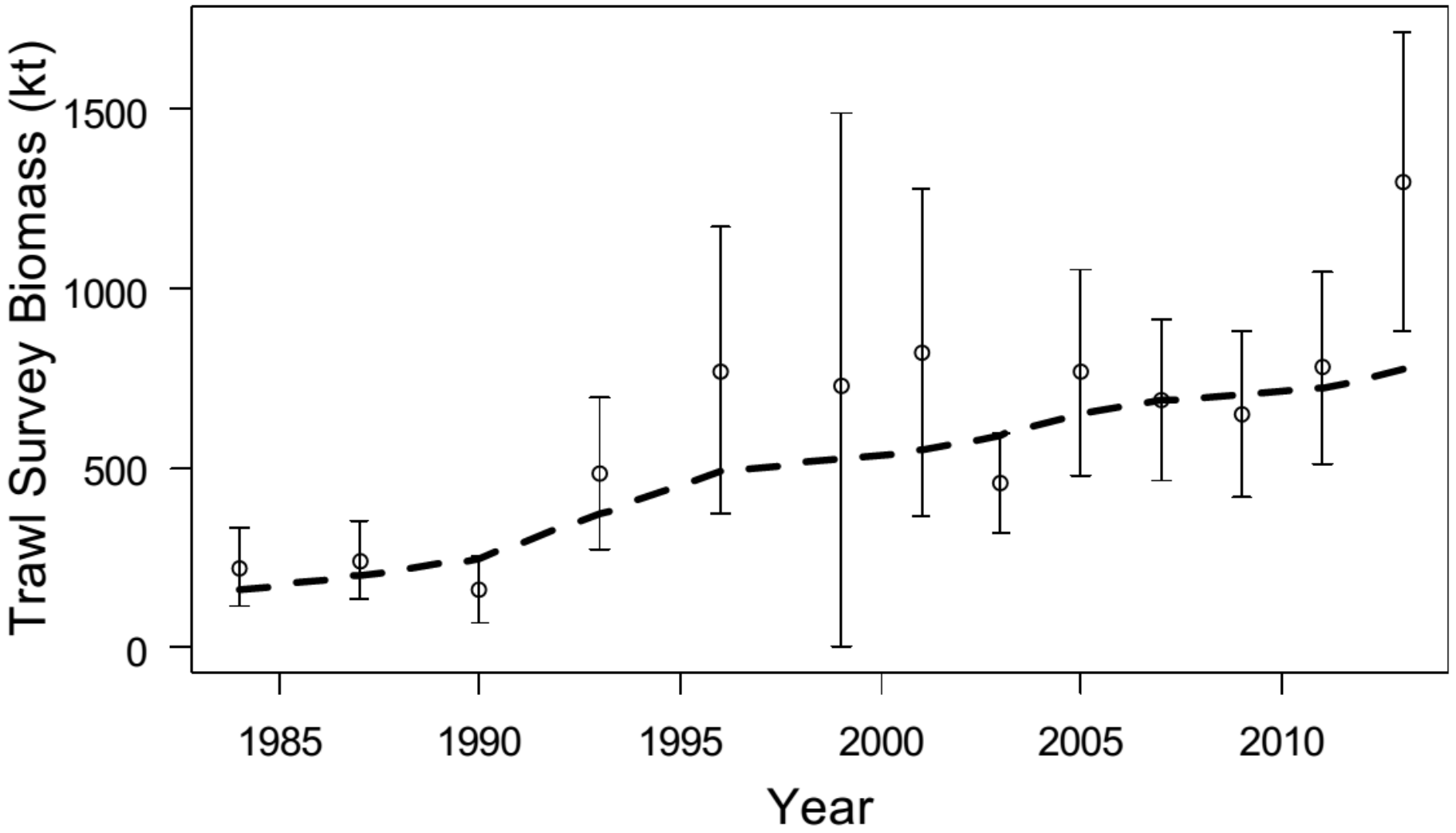
New Data

- 2013 survey biomass
- 2011 survey age compositions
- 2012 fishery age compositions

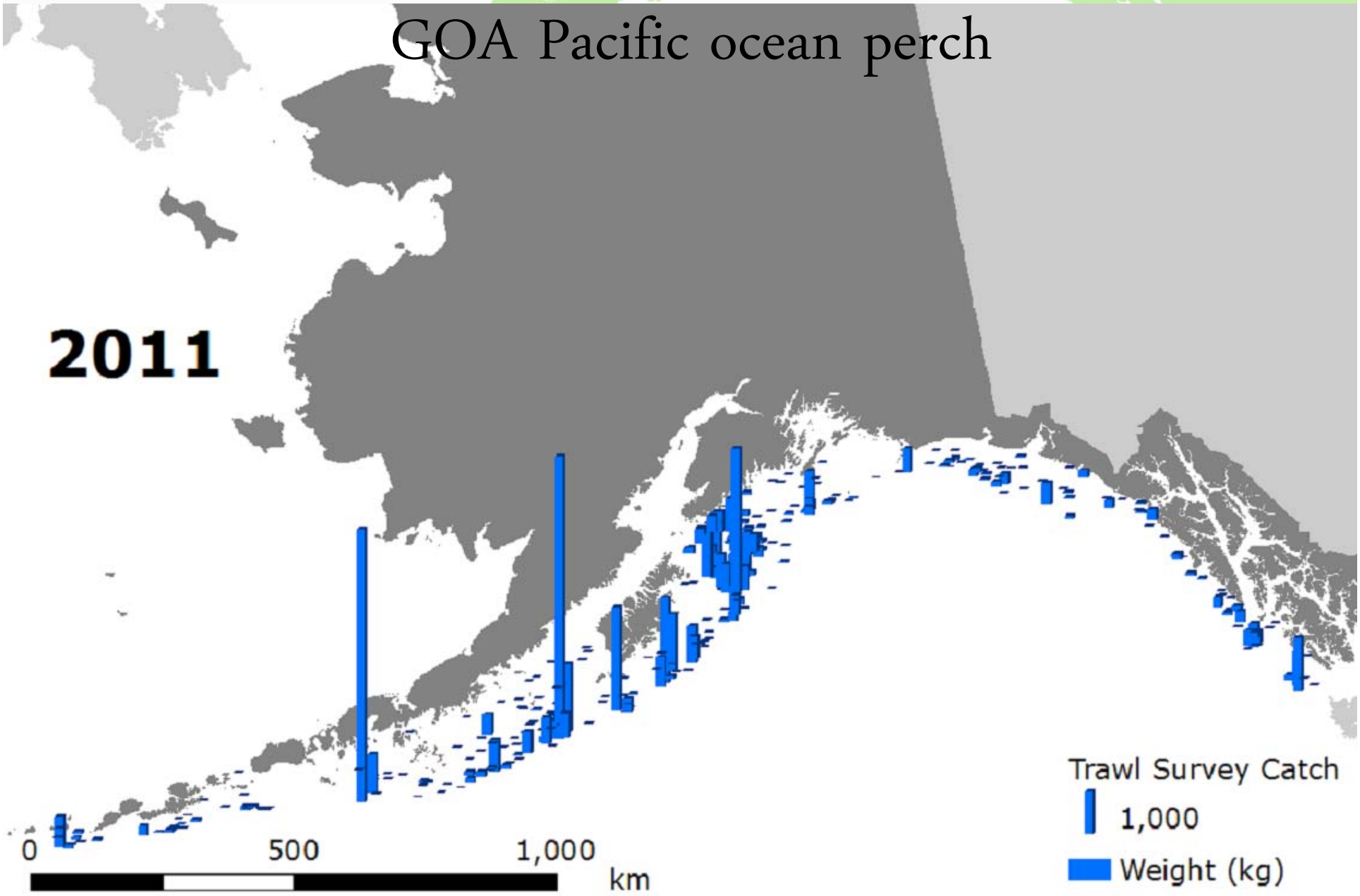
No new assessment methodology or alt. models, 2011 model configuration with updated data

Large increase in 2013 survey biomass contributed to increase in est. recruitment of 2006 year-class with large uncertainty

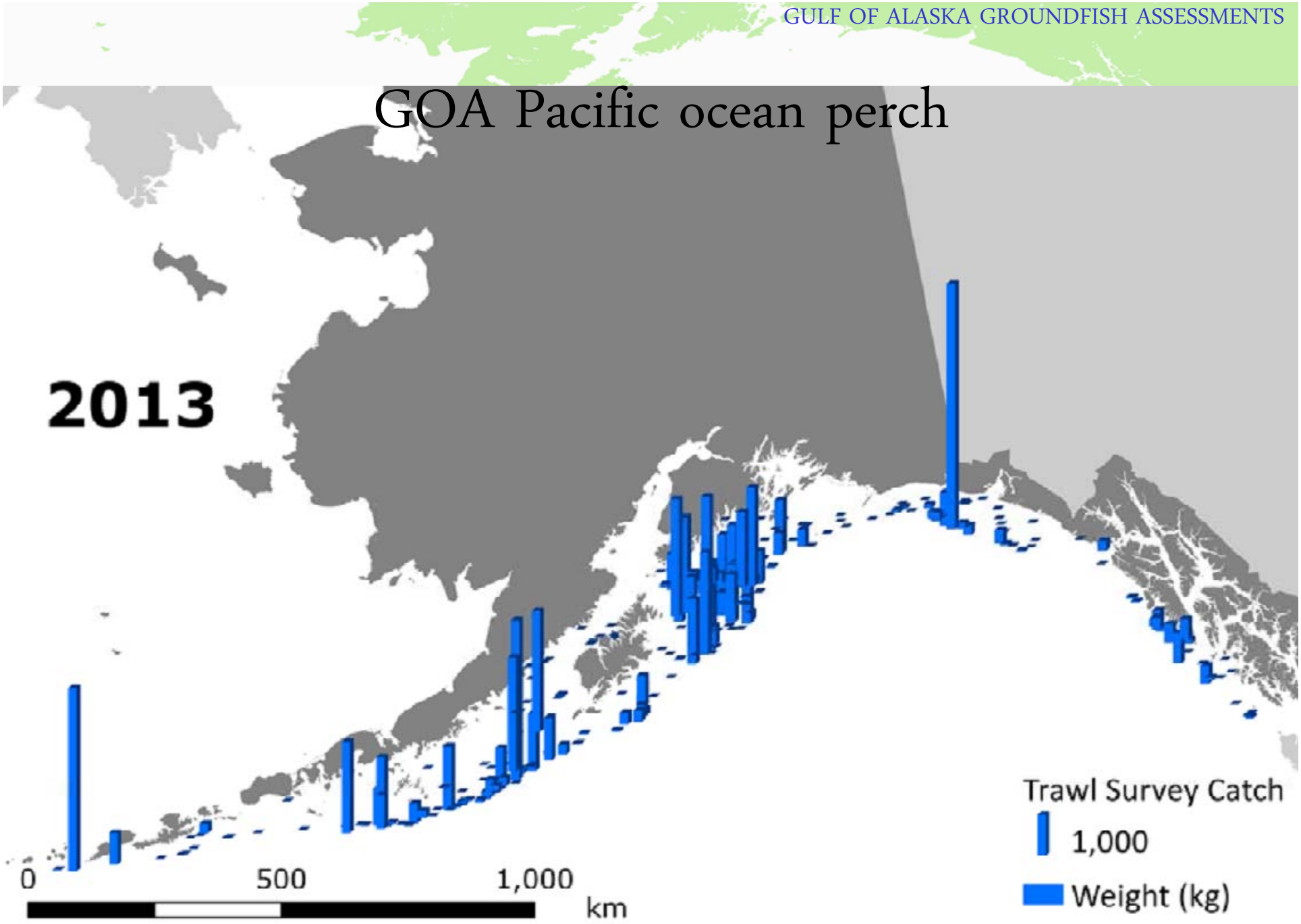
GOA POP fit to survey



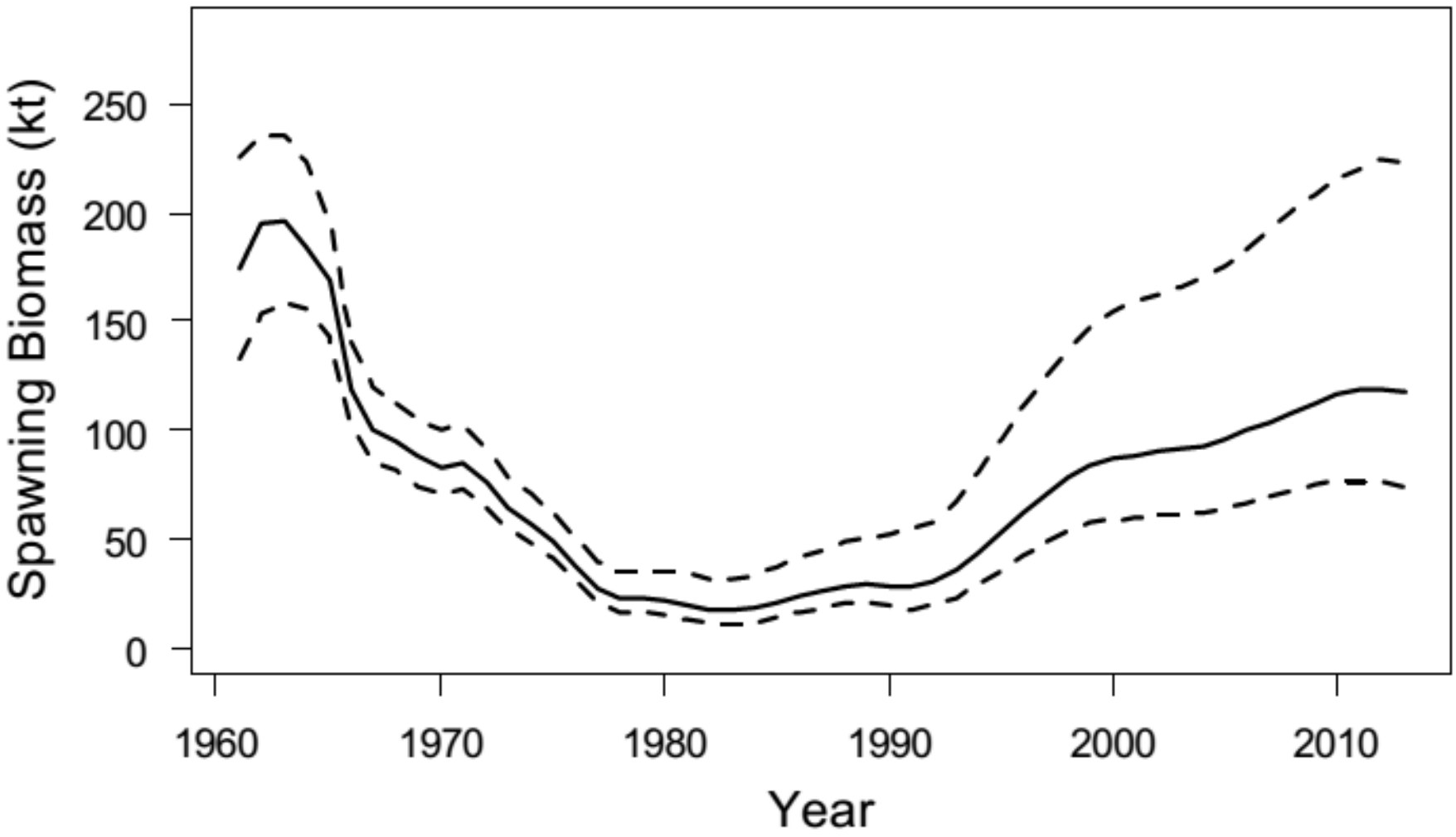
GOA Pacific ocean perch



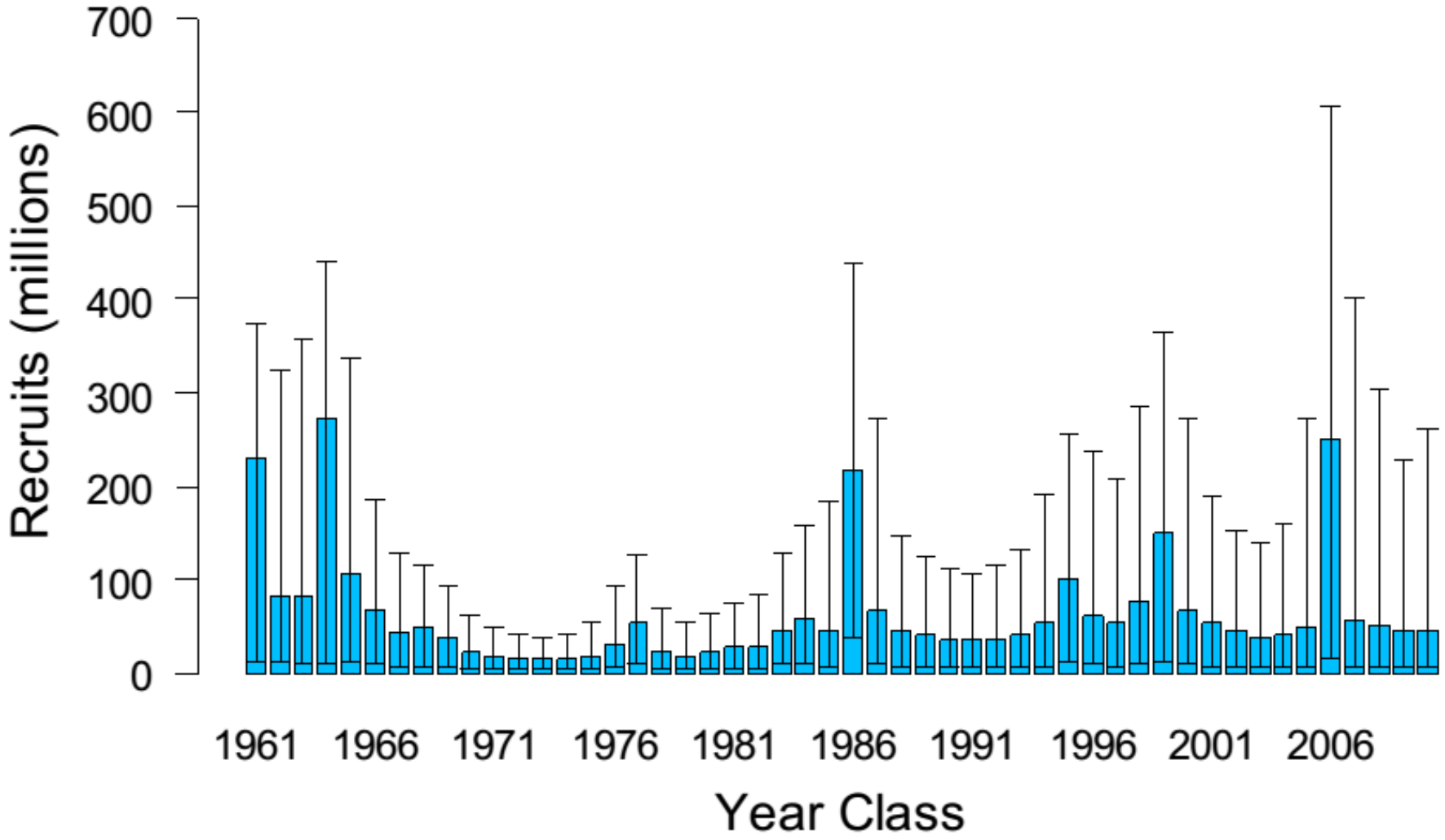
GOA Pacific ocean perch



Pacific ocean perch spawning biomass

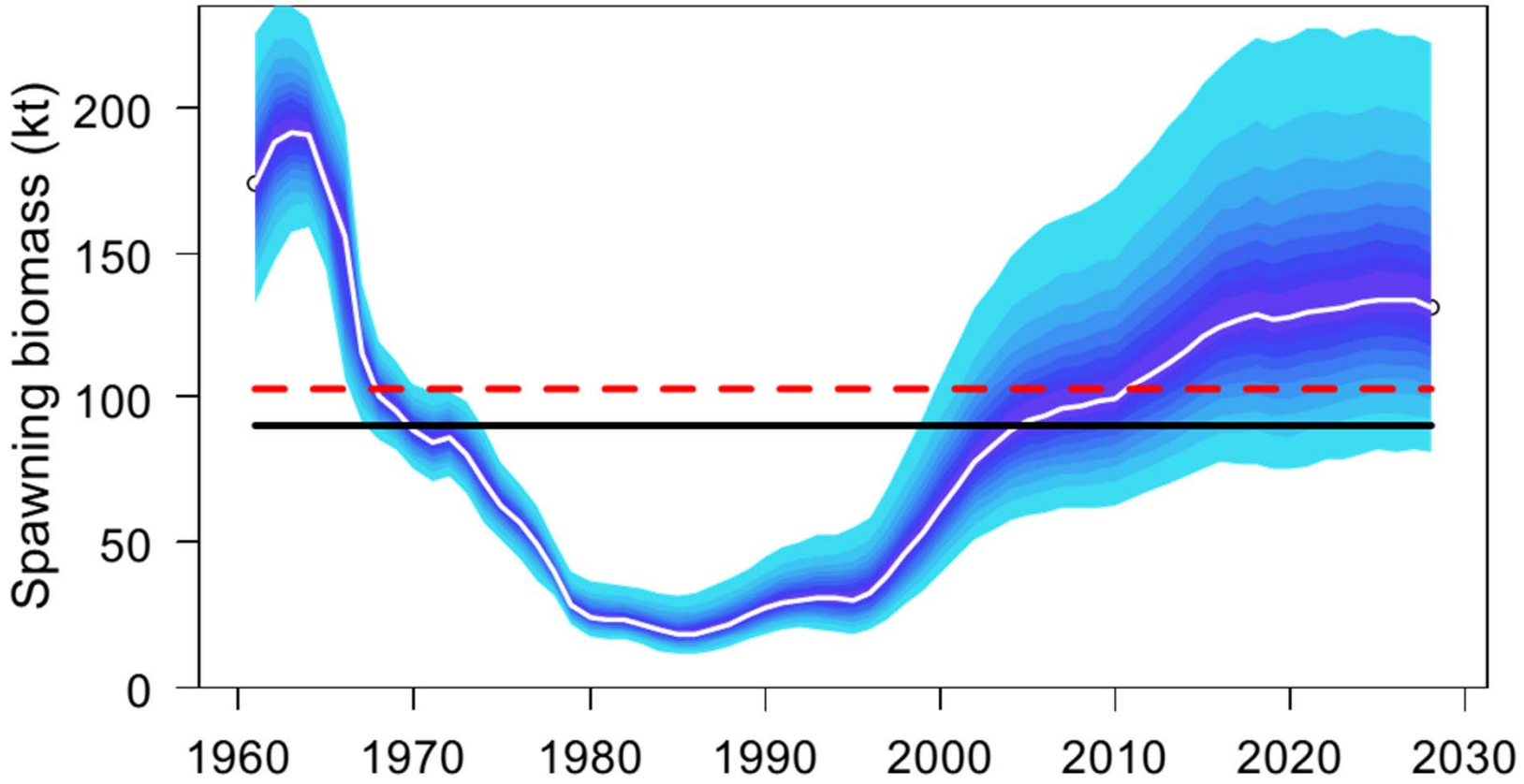


Pacific ocean perch recruitment



GOA Pacific ocean perch

Pacific ocean perch	Biomass	OFL	ABC
2014	410,712	22,319	19,309
2015		22,849	19,764



GOA POP Area apportionment

	Western	Central	Eastern	WYAK	SEO	Total
2014 ABC	2,086	13,323	2,772	1,128	19,309	2,086
2015 ABC	**2,135**	**13,637**	**2,838**	**1,154**	**19,764**	**2,135**

	Western	Central	Eastern	WYAK	SEO	Total
2014 OFL		**21,016**			1,303	22,319
2015 OFL		21,515			1,334	22,849

Consideration of survey averaging working group explorations on apportionment methods

Rockfish Summary

Species	2013	2014	Change
POP	16,412	19,309	up 2,897 (18%)
Northern rockfish	5,130	5,322	up 192 (4%)
Shortraker Rockfish	1,081	1,323	up 242 (22%)
Dusky	4,700	5,486	up 786 (17%)
Rougheye and Blackspotted Rockfish	1,232	1,244	same (0%)
Demersal shelf rockfish	303	274	same (0%)
Thornyhead	1,665	1,841	up 176 (11%)
Other rock	4,045	4,081	up 36 (1%)
Sub Total	34,568	38,880	up 4,312 (12%)

10. Northern rockfish

Changes in input data:

- 2013 trawl survey biomass
- 2012 fishery catch (and preliminary 2013)
- 2011 bottom trawl survey age composition
- 2011 fishery length composition

No changes in the assessment methodology

- 2011 model configuration with updated data

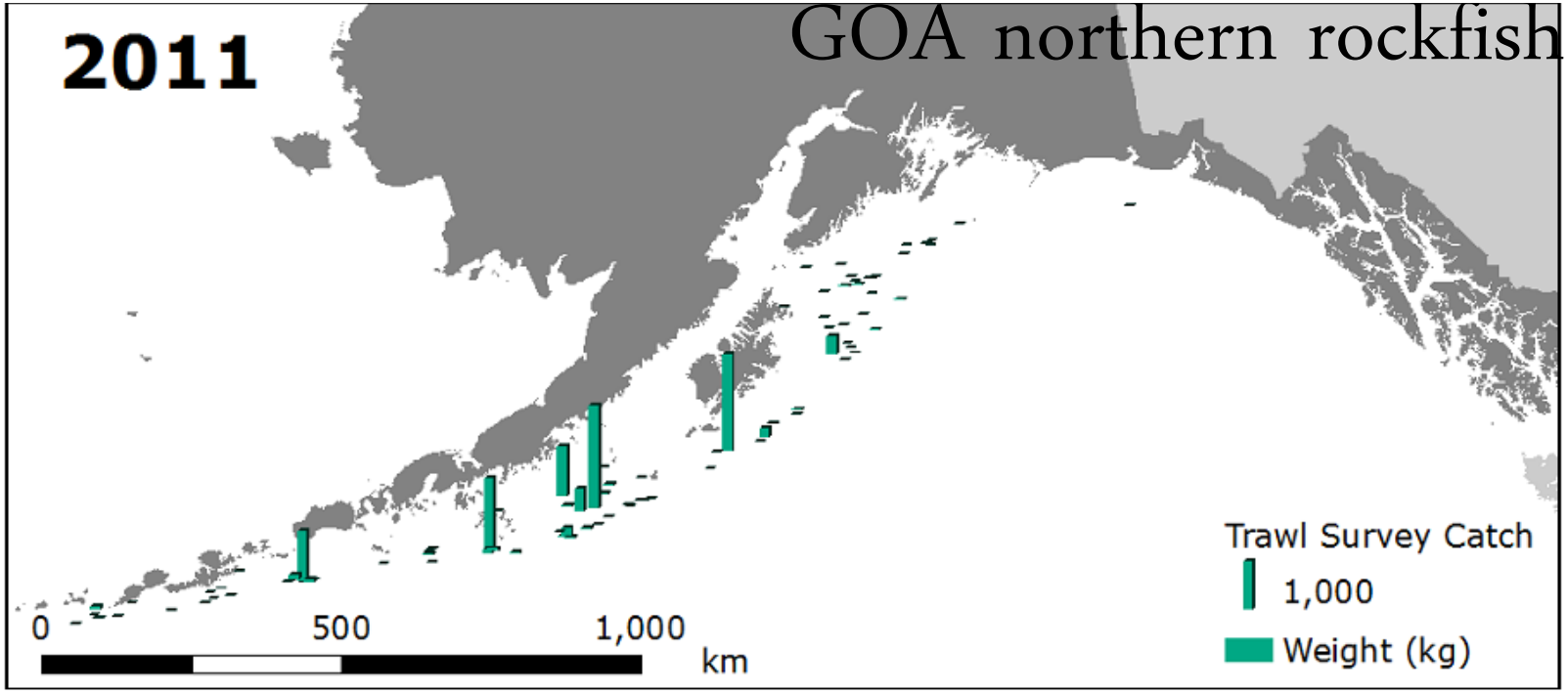
GOA northern rockfish

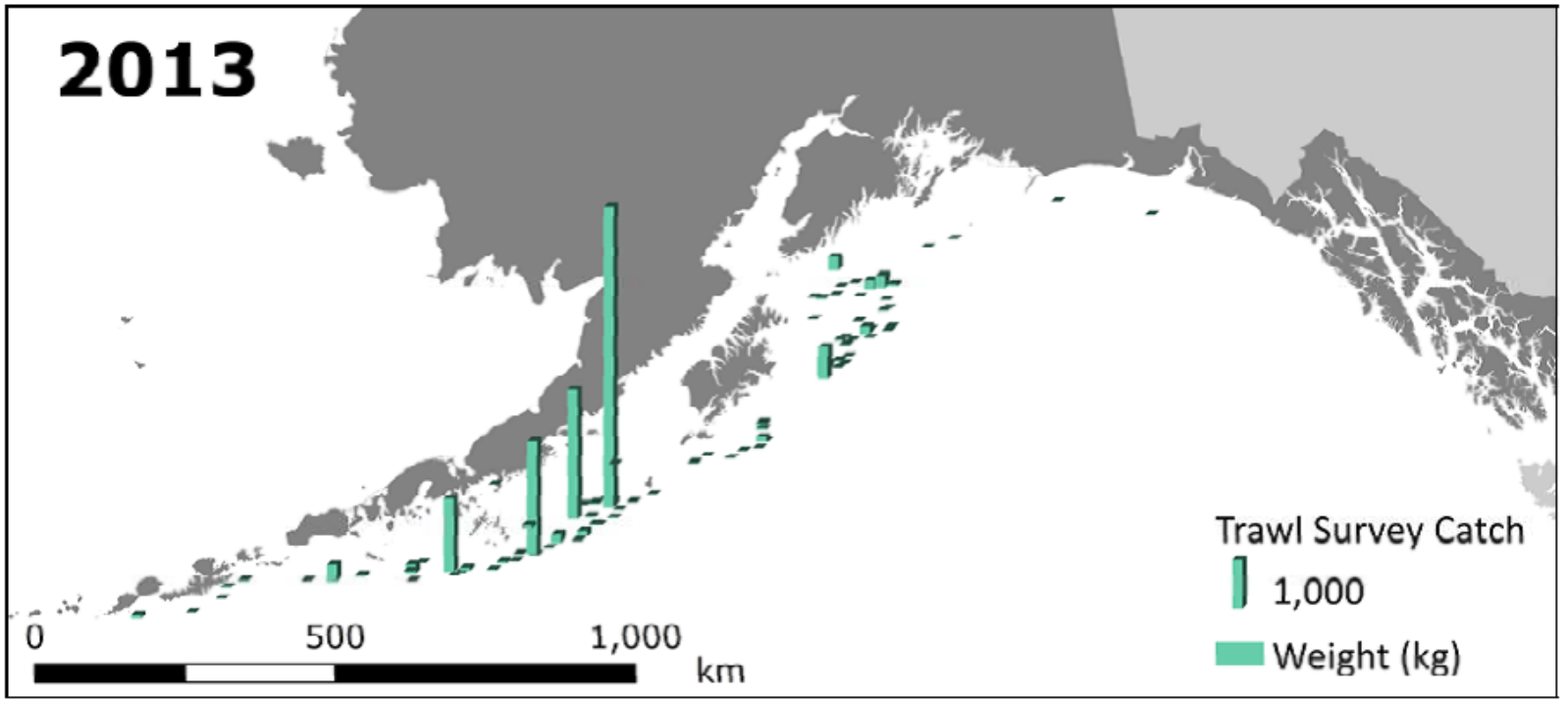
NMFS

Bottom-trawl

survey

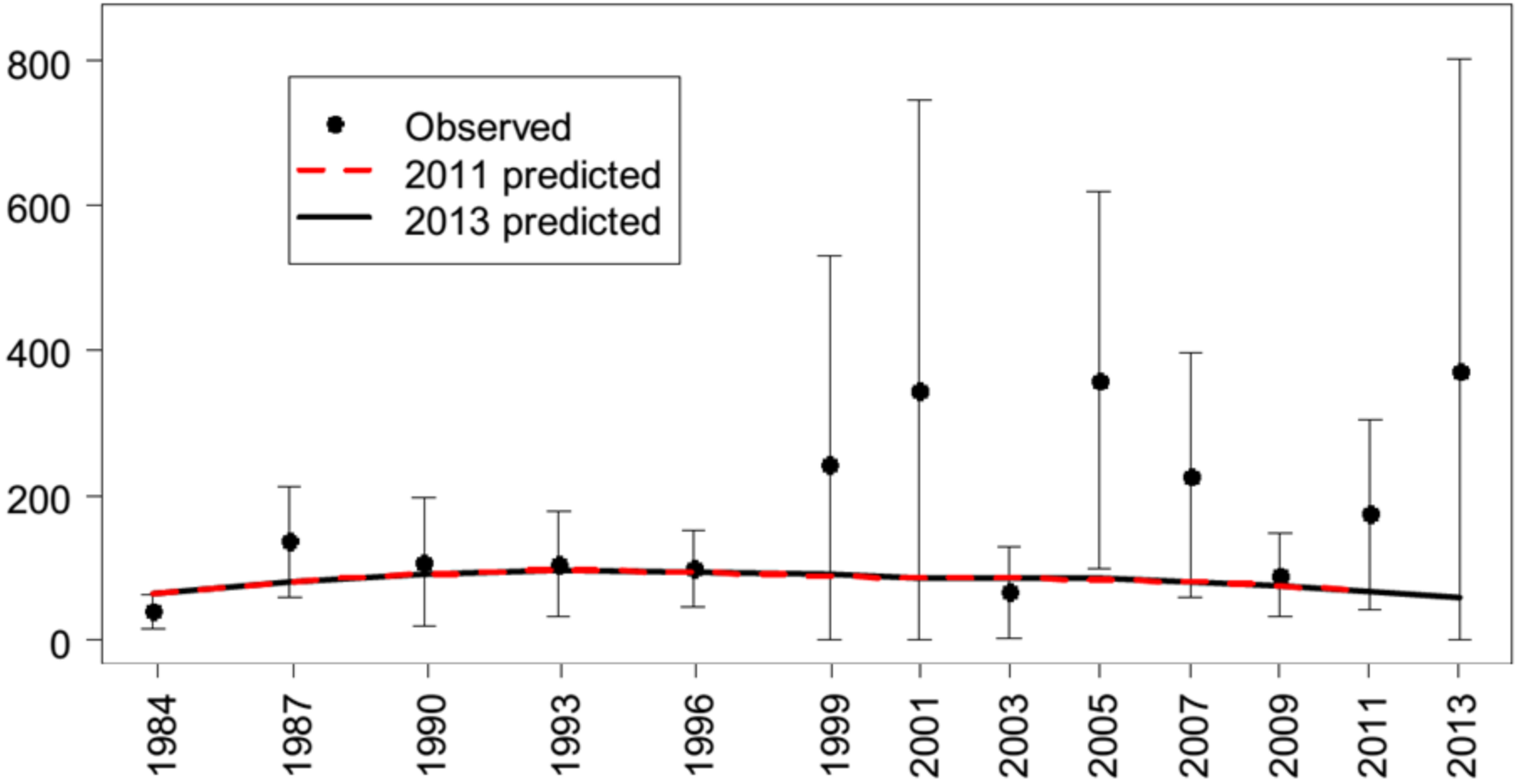
distribution





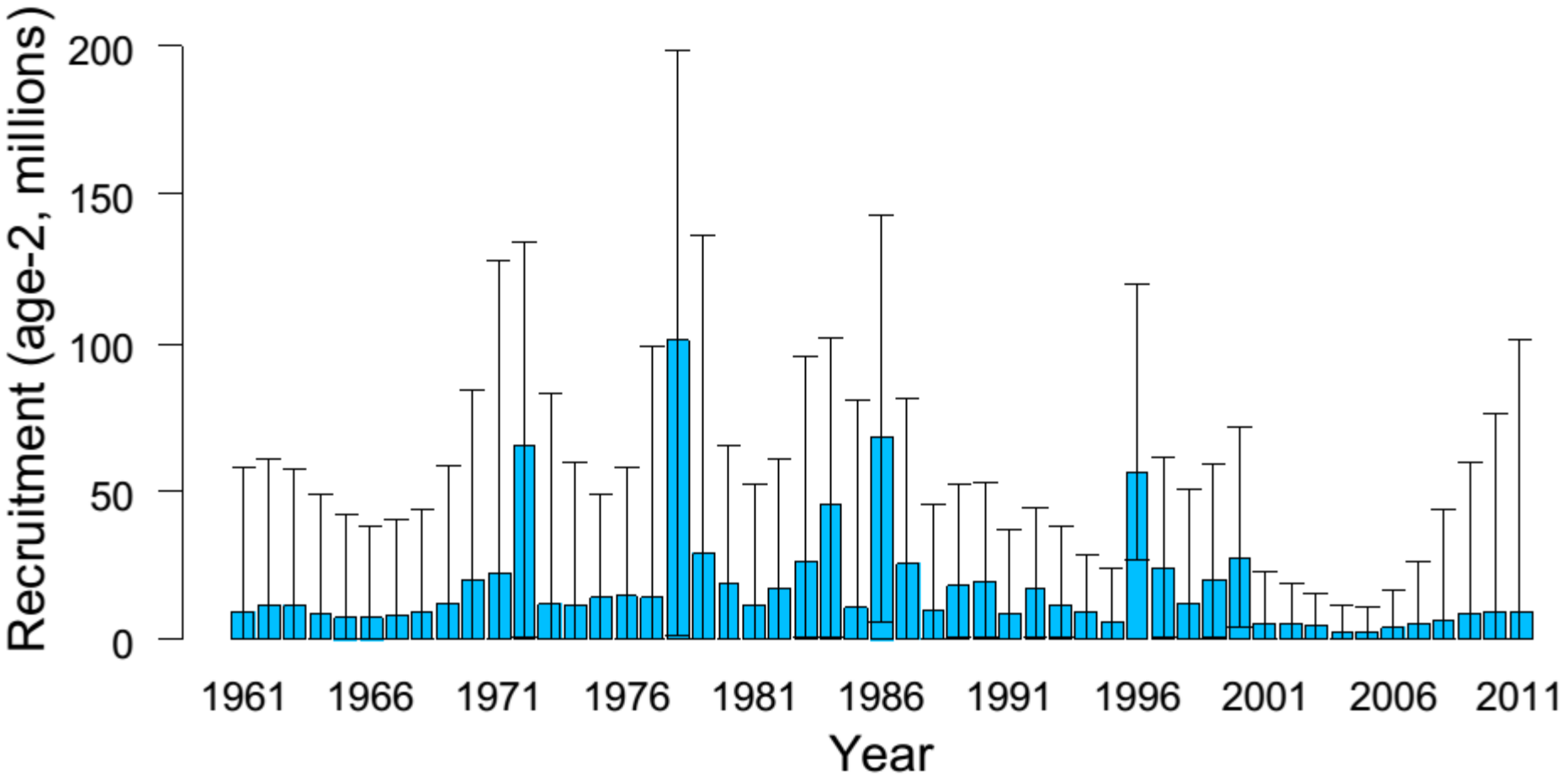
10. Northern rockfish

- Fit to survey biomass (kt)



GOA Northern rockfish

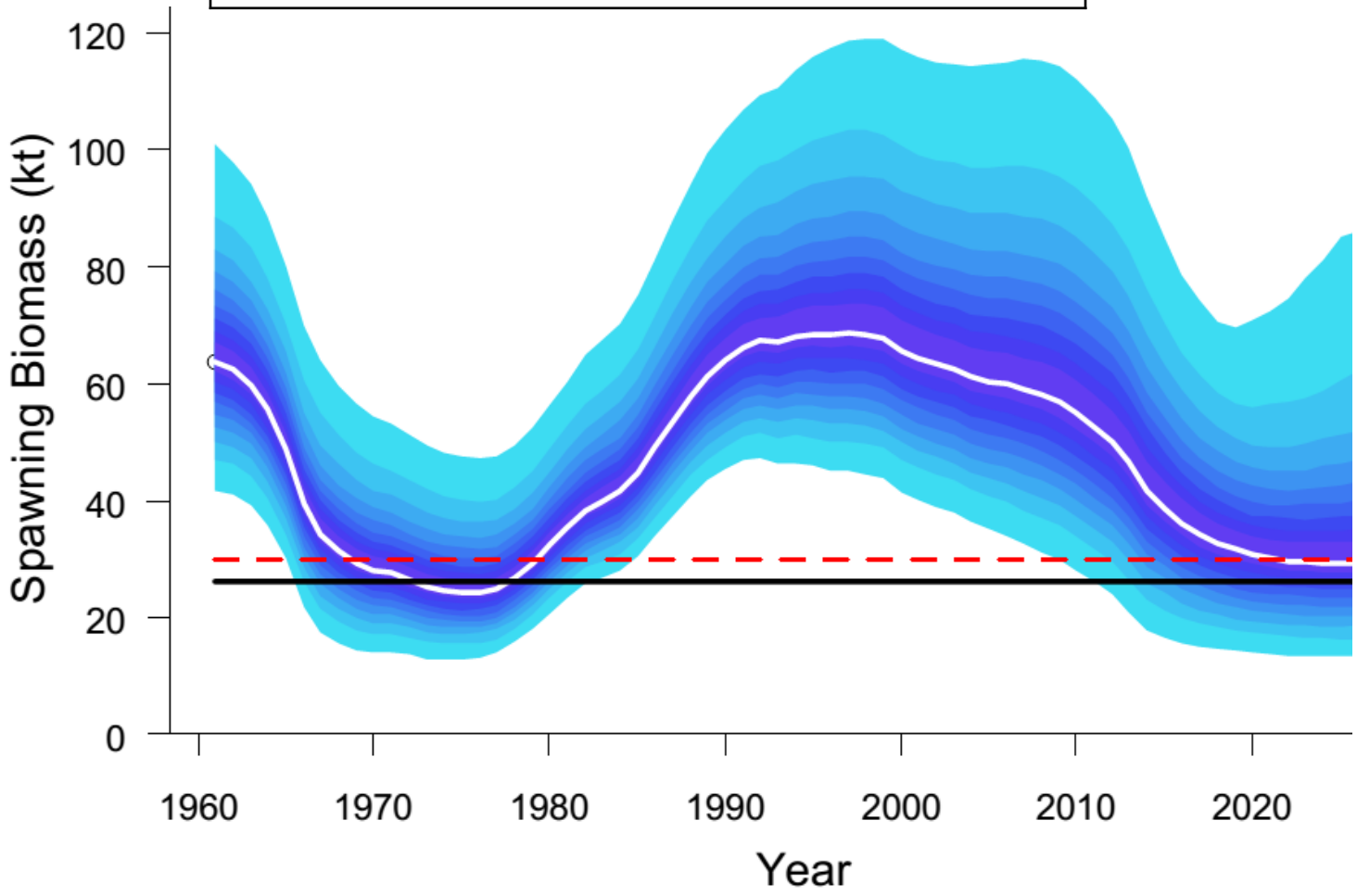
Recruitment



10. Northern rockfish

Tier 3a

	Biomass	OFL	ABC
2014	102,893	6,349	5,322
2015		5,978	5,010



Rockfish Summary

Species	2013	2014	Change
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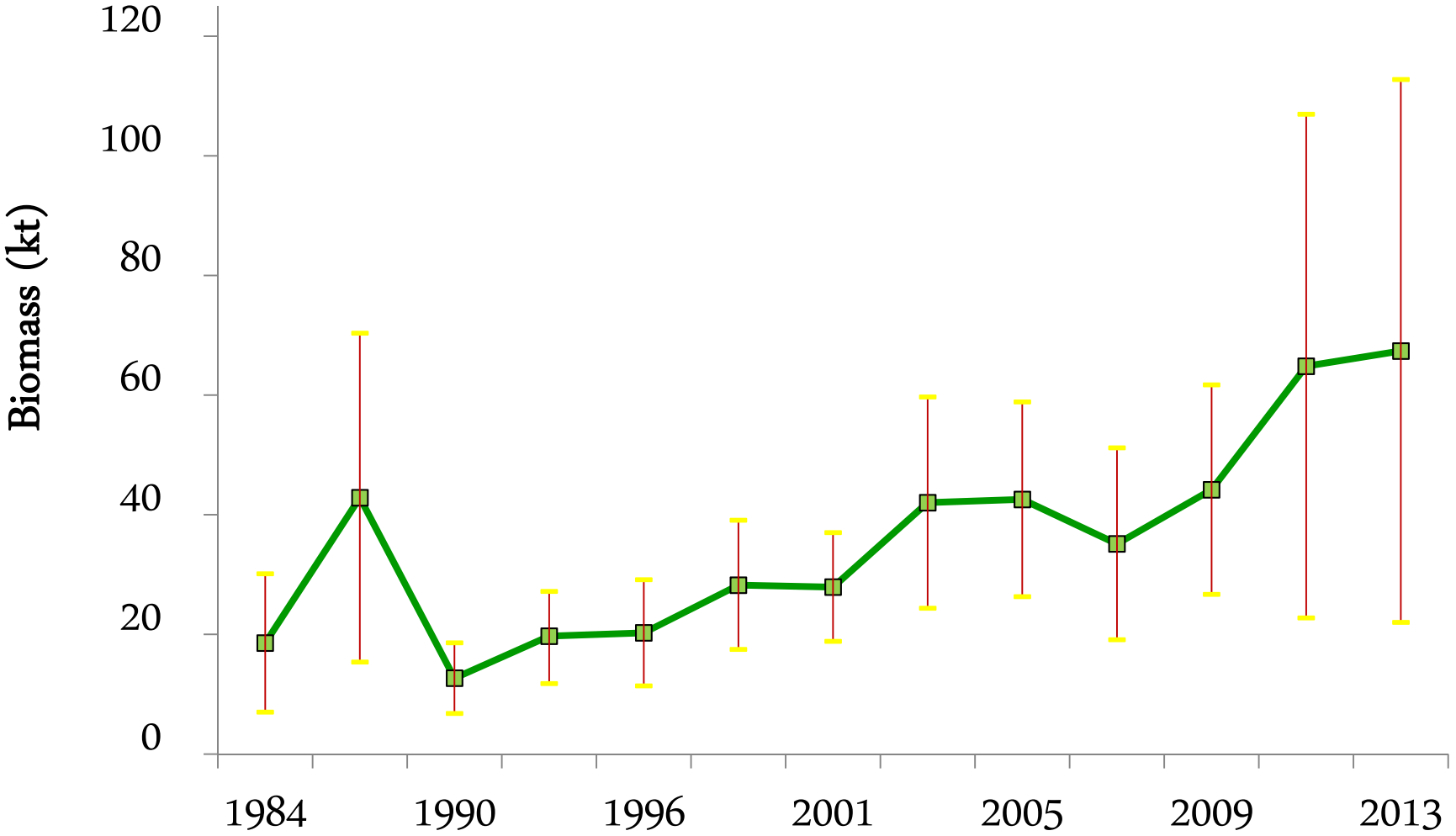
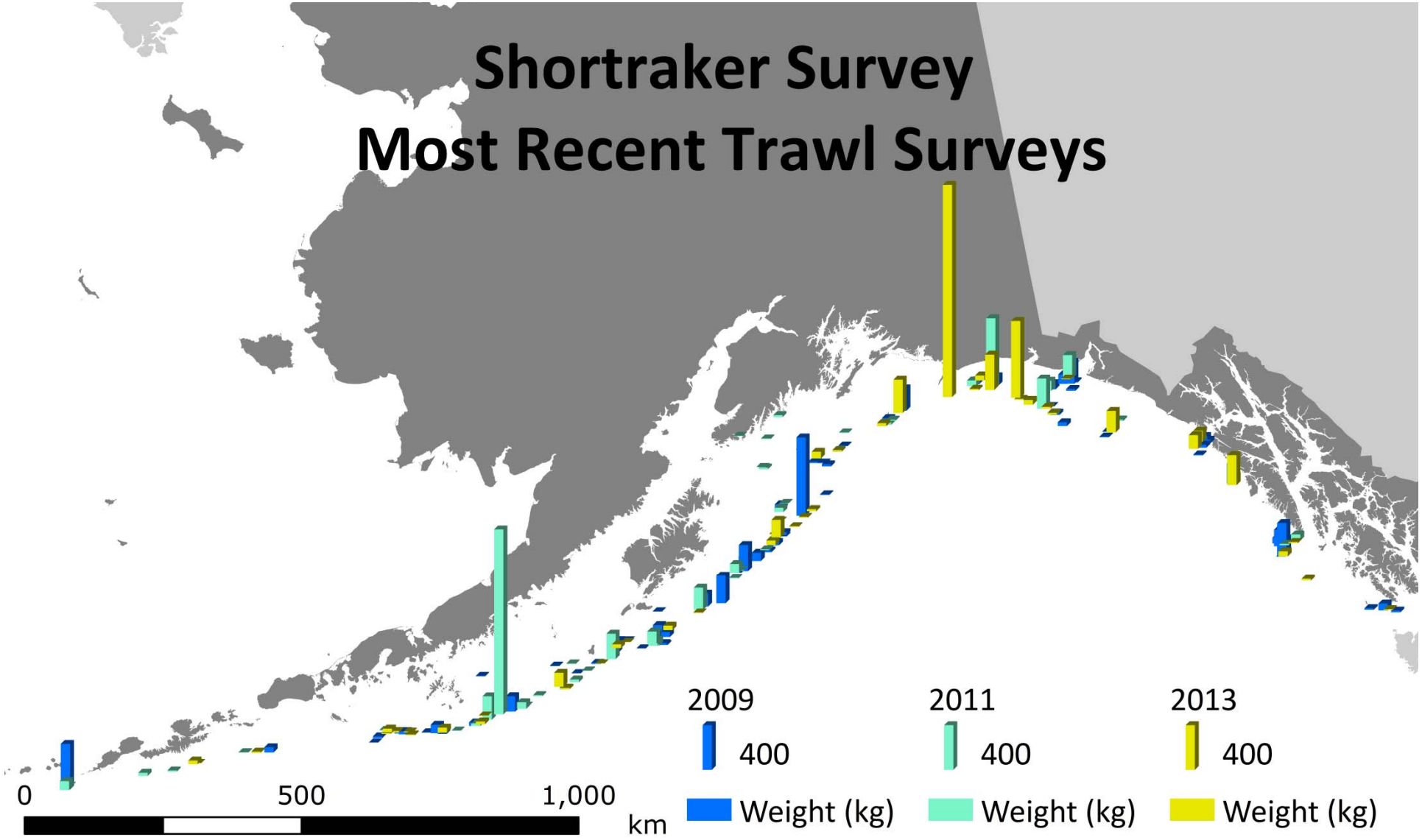
Other rock	4,045	4,081	up 36 (1%)
Sub Total	34,568	38,880	up 4,312 (12%)

11. Shortraker rockfish

Tier 5

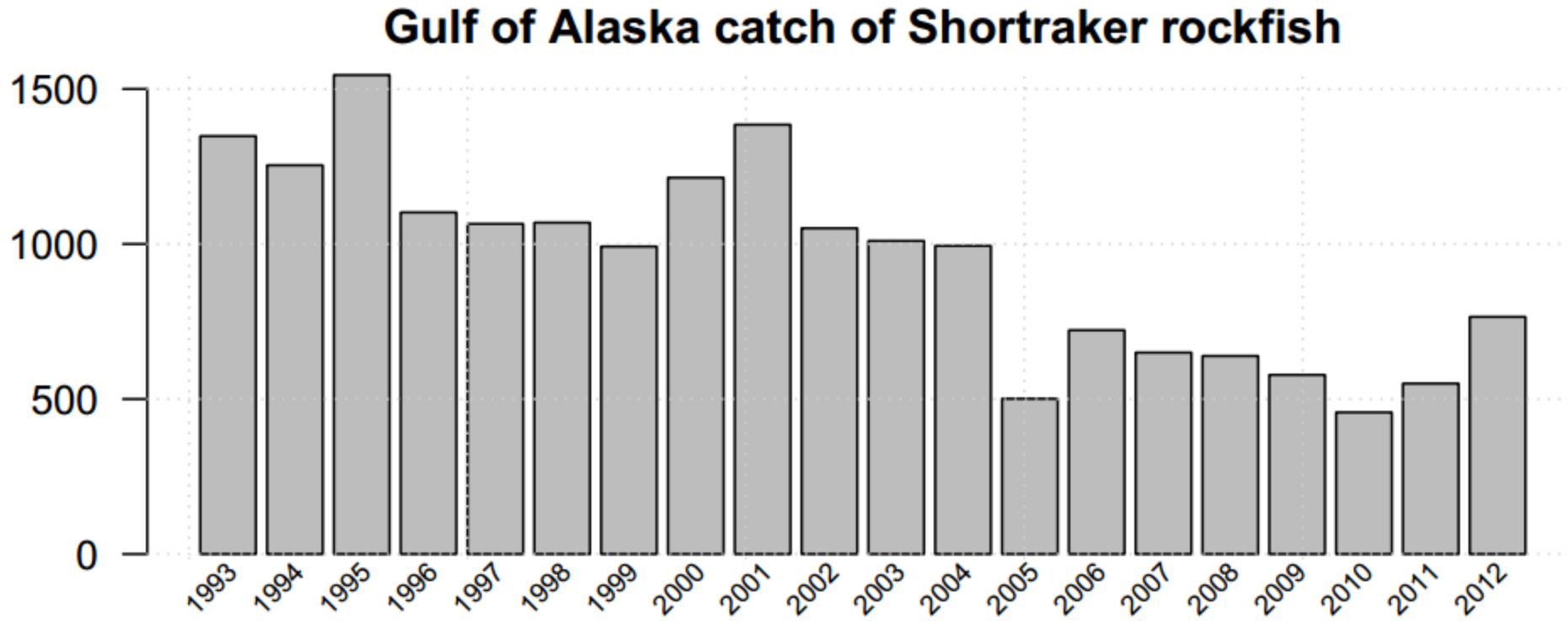



Shortraker Survey
Most Recent Trawl Surveys
2009
400
Weight (kg)
2011
400
Weight (kg)
2013
400
Weight (kg)
0
500
1,000
km

11. Shortraker rockfish

Tier 5

Shortraker	Biomass	OFL	ABC
2014	58,797	1,764	1,323
2015		1,764	1,323



Rockfish Summary

Species	2013	2014	Change
POP	16,412	19,309	up 2,897 (18%)
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Thornyhead	1,665	1,841	up 176 (11%)
Other rock	4,045	4,081	up 36 (1%)
Sub Total	34,568	38,880	up 4,312 (12%)

12. Dusky rockfish

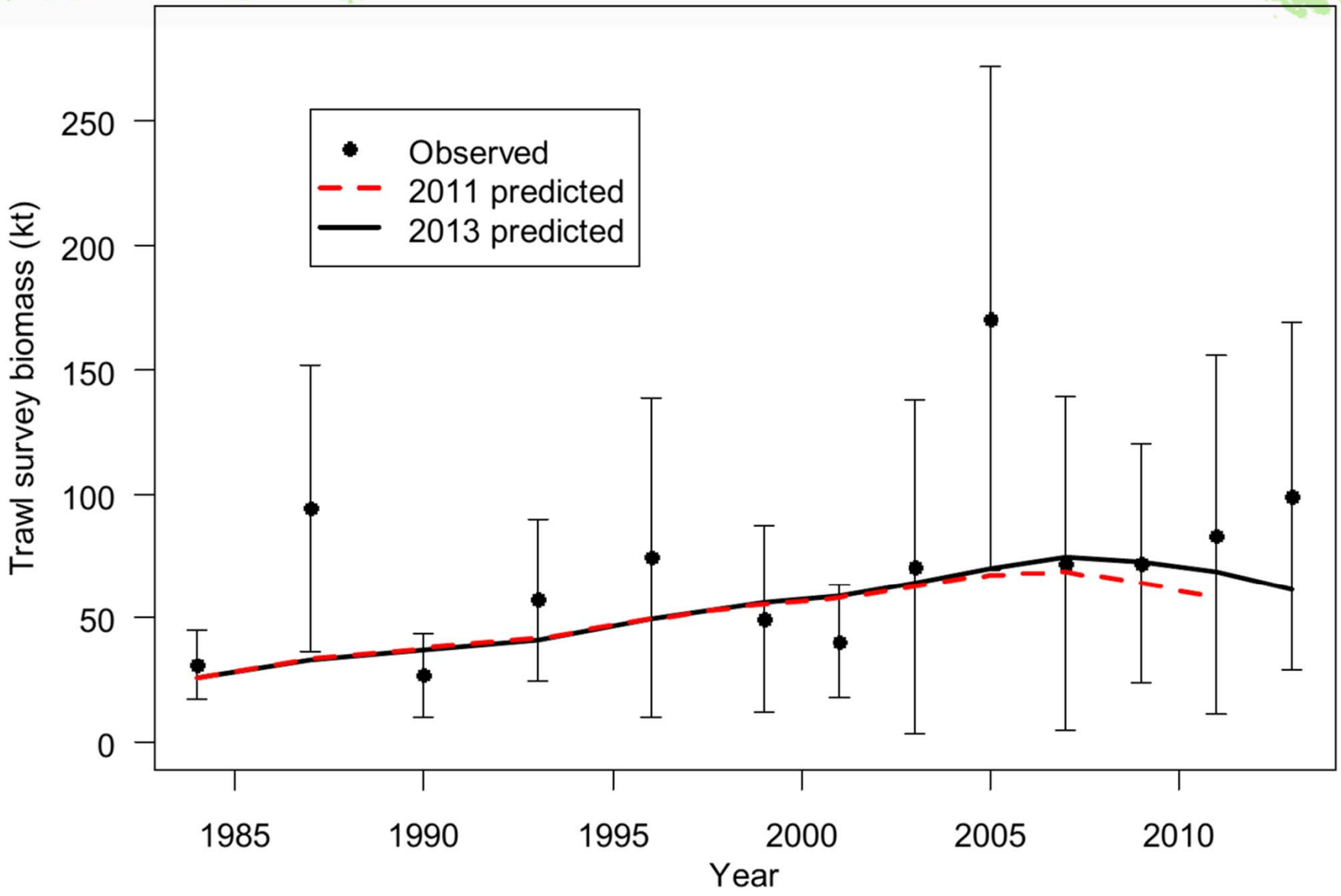
Changes in input data:

- 2013 trawl survey biomass
- 2012 fishery catch (and preliminary 2013)
- 2011 bottom trawl survey age composition
- 2011 fishery length composition

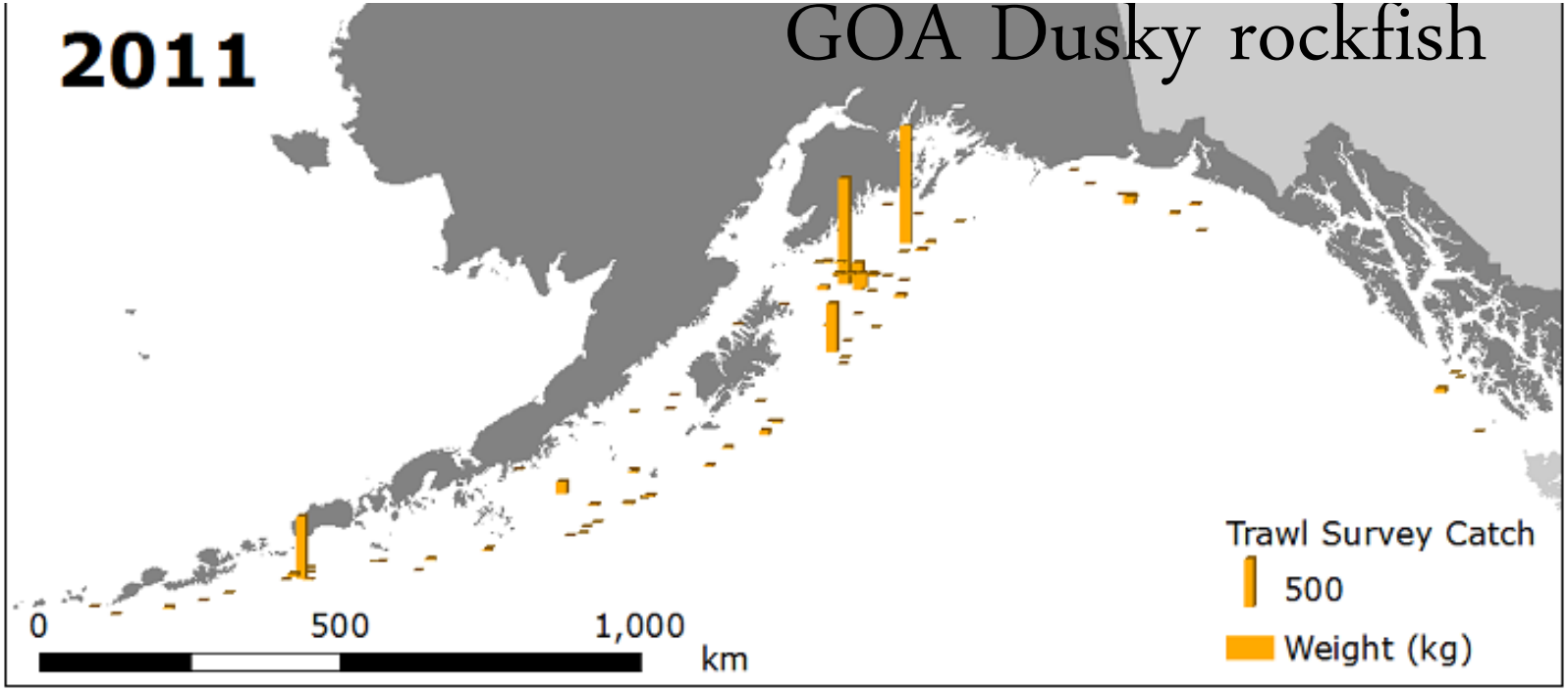
No changes in the assessment methodology

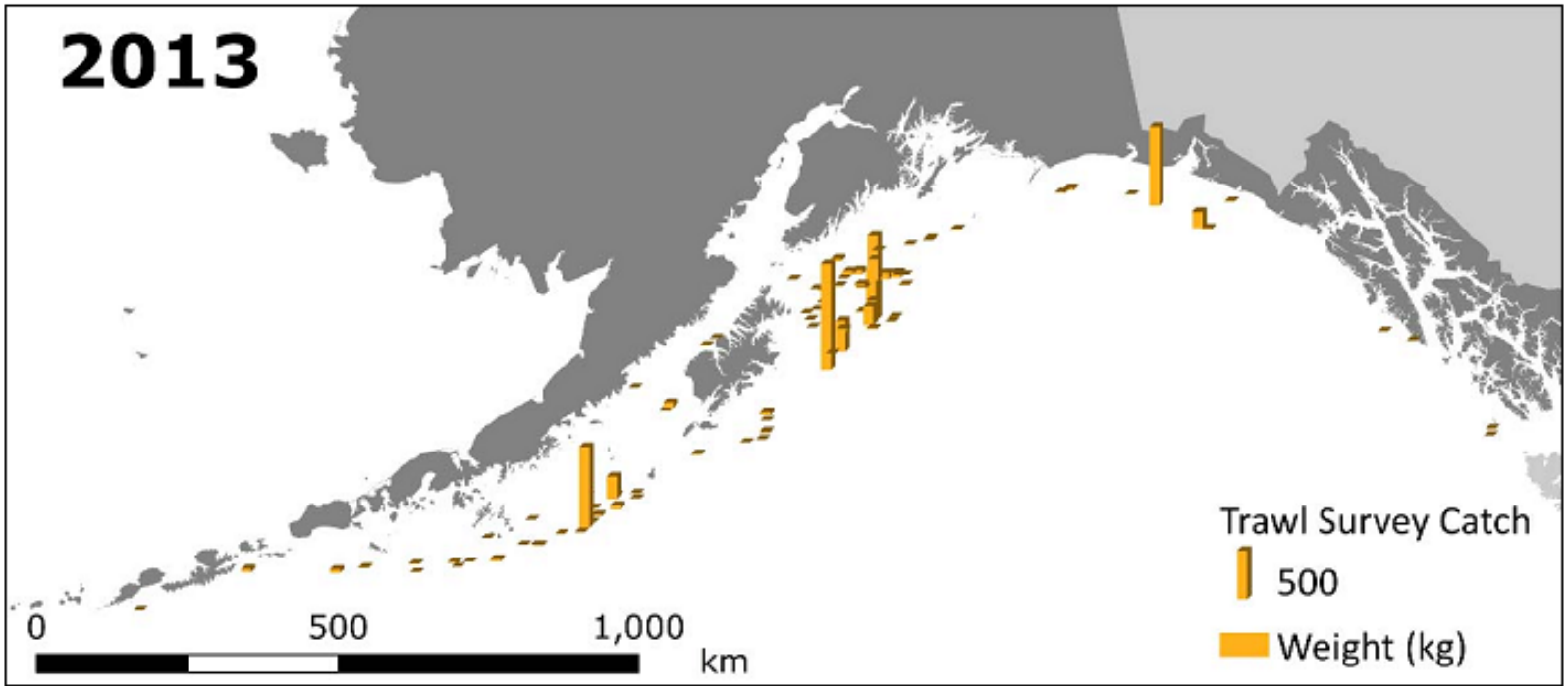
- 2011 model configuration with updated data

GOA Dusky rockfish

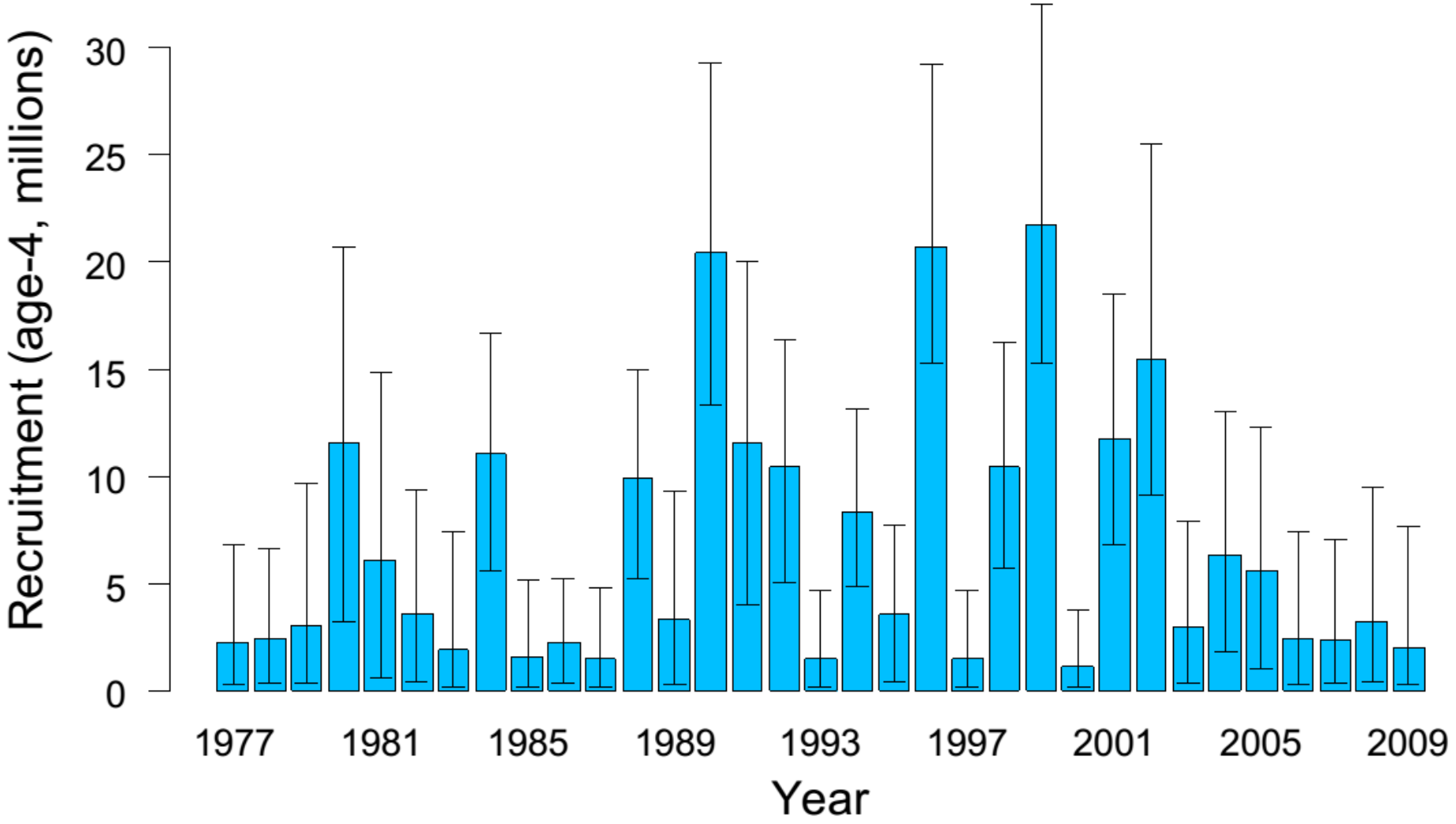


NMFS bottom-trawl survey



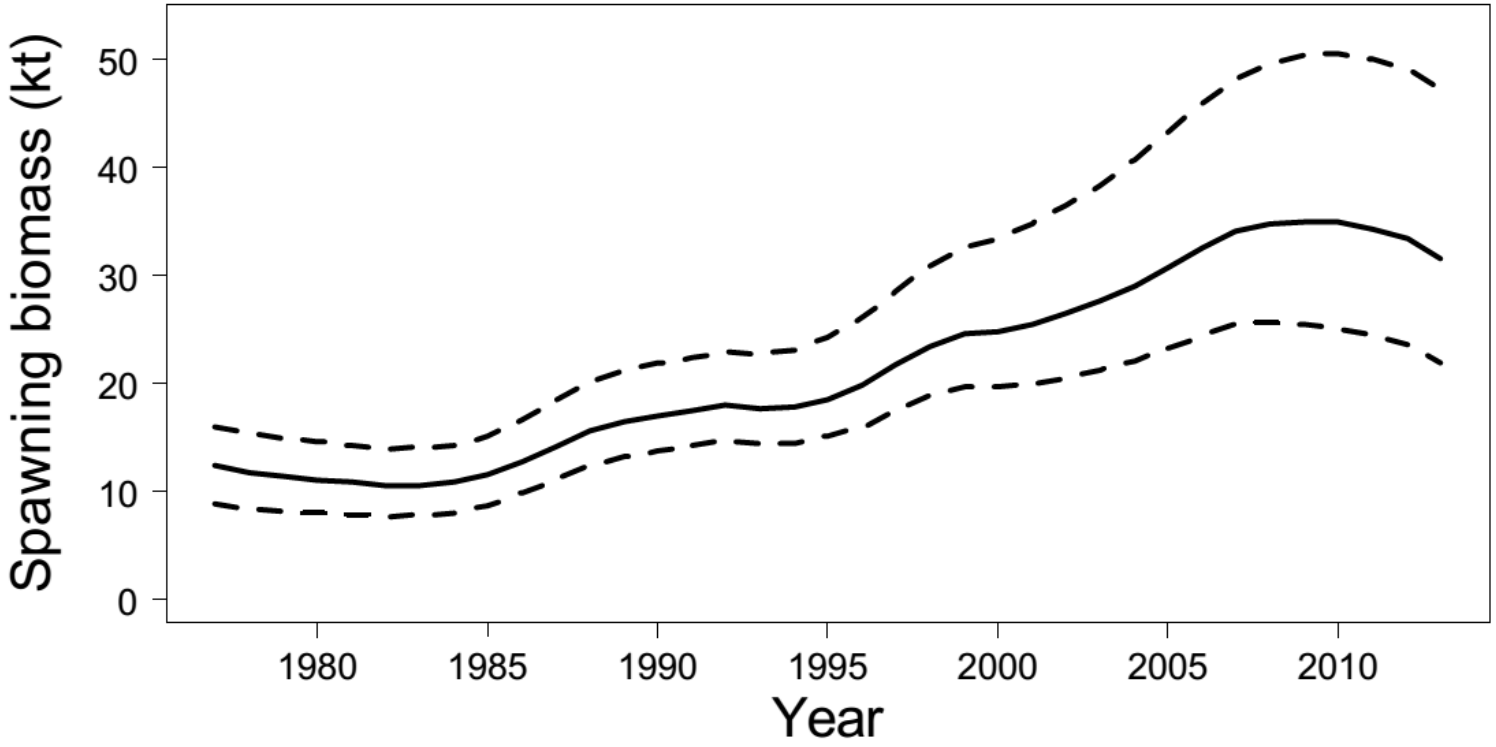


GOA Dusky rockfish



12. Dusky rockfish summary

Dusky rockfish	Biomass	OFL	ABC
2014	69,371	6,708	5,486
2015		6,213	5,081



Dusky rockfish

Rockfish Summary

Species	2013	2014	Change
POP	16,412	19,309	up 2,897 (18%)
Northern rockfish	5,130	5,322	up 192 (4%)
Shortraker Rockfish	1,081	1,323	up 242 (22%)
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Thornyhead	1,665	1,841	up 176 (11%)
Other rock	4,045	4,081	up 36 (1%)
Sub Total	34,568	38,880	up 4,312 (12%)

13. Rougheye/blackspotted rockfish

- Executive summary with updated projection model
- Plans for next year:
  - Standard Updated/New Data
    - Fishery: 2011-2014 updated catch, 2009 updated ages, 2010 and 2012 new ages, 2011 & 2013 new size compositions
    - Trawl survey: 2013 biomass, 2009 and 2011 new ages
    - Longline survey: fully revised RPWs and length frequencies and evaluation of new strata
  - Biological Data on Growth
    - Size-at-age and aging error data to update conversion and error matrices
    - Weight-at-age update using RACE data
  - Address CIE reviewer comments specific to RE/BS

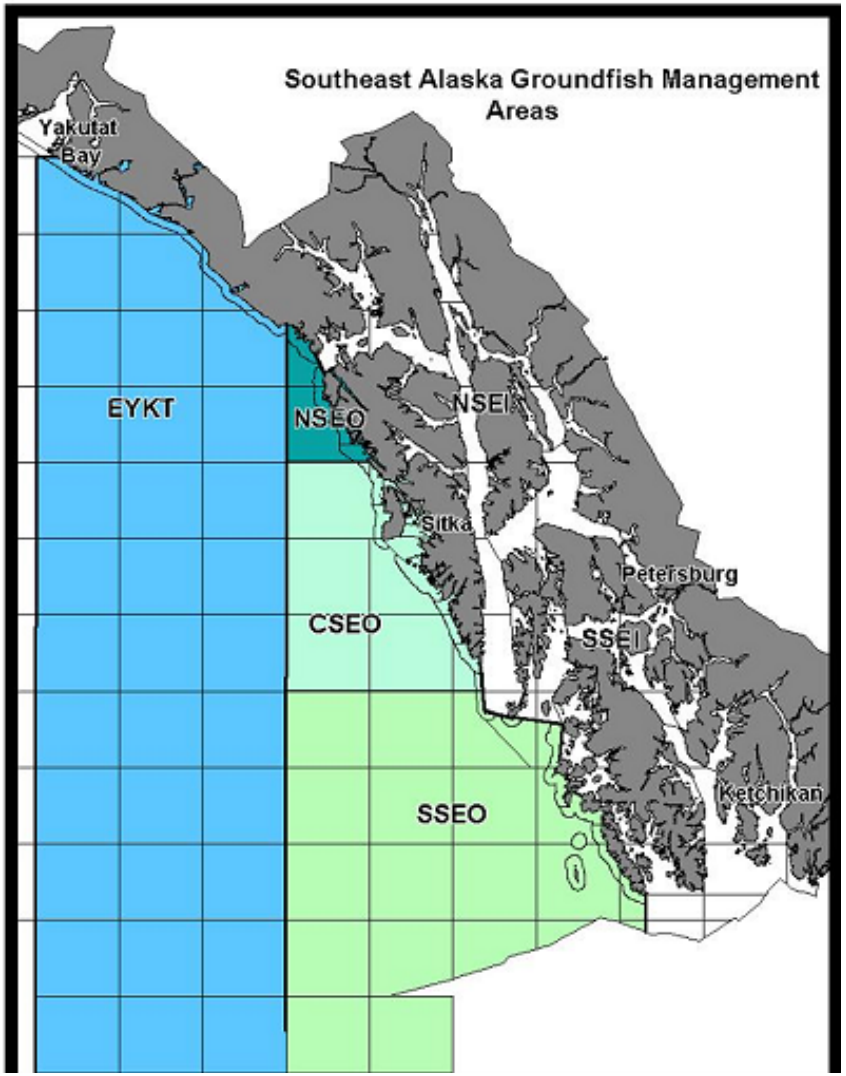
13. Rougheye/blackspotted rockfish

summary

Rougheye-BS	Biomass	OFL	ABC
2014	42,810	1,497	1,244
2015		1,518	1,262

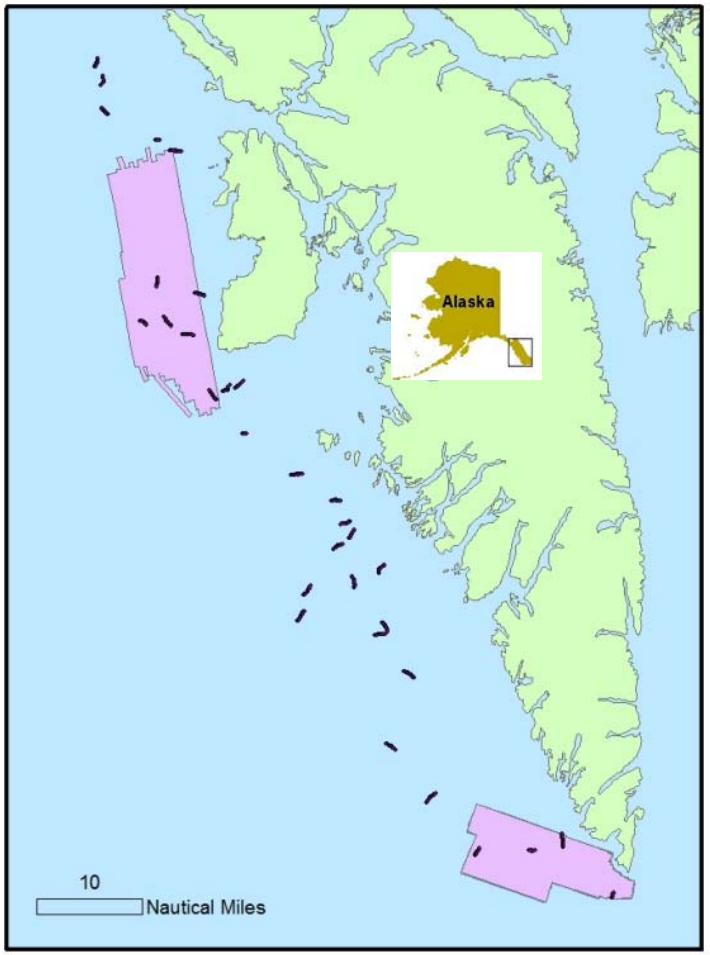
14. Demersal shelf rockfish

- Executive summary presented
- Density and biomass estimates based on yelloweye rockfish
- Submersible estimates no longer available
- Alt. survey (ROV) used to collect 2012 data in CSEO
- 2013 ROV data collected for SSEO, not yet available
- Plans for surveys in EYKT and NSEO for 2014
  - Result in ROV data available for all DSR management areas

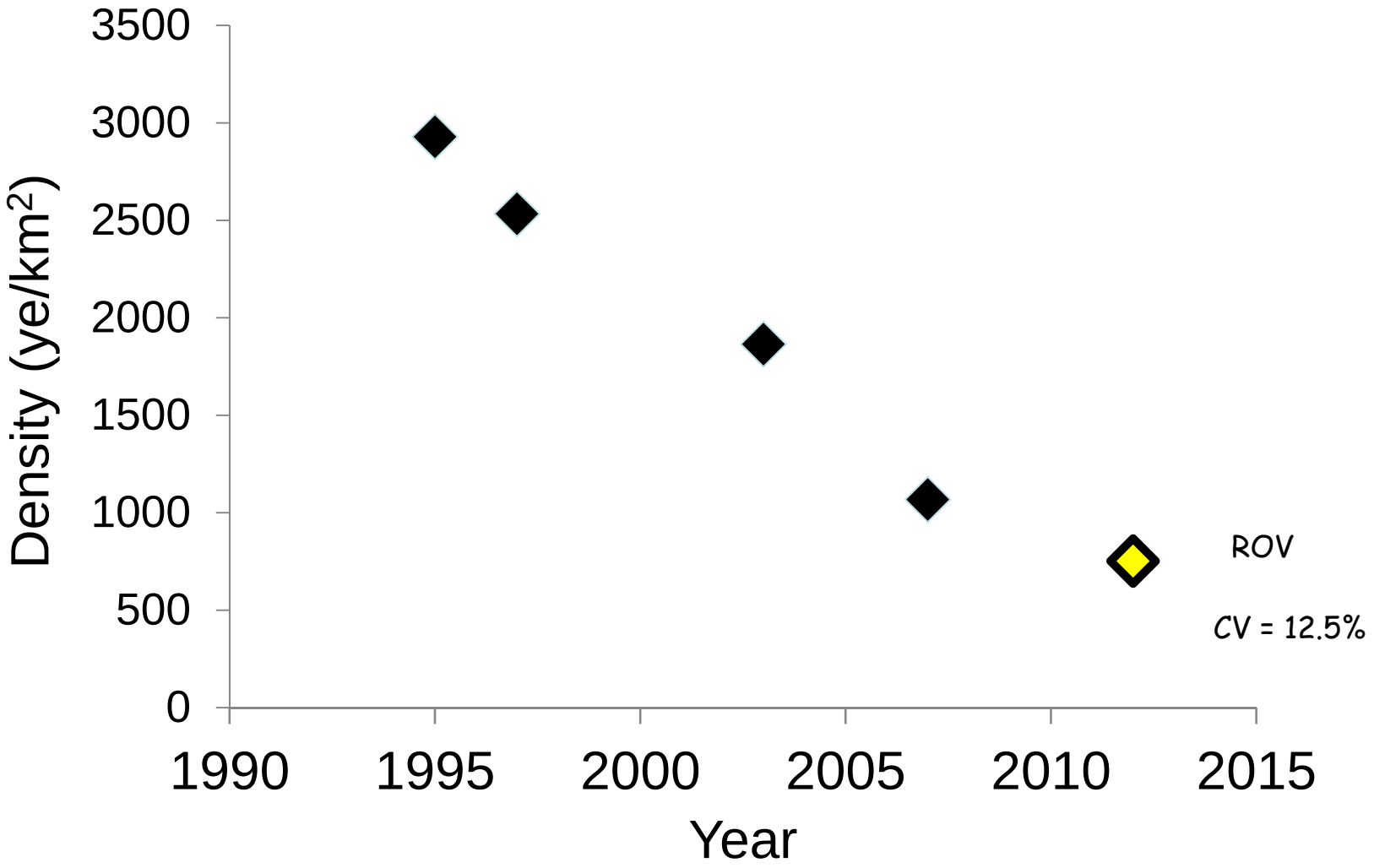


ROV Surveys To Date

- Completed first ROV survey August 2012
  - 46 transects, CSEO management area
  - 118 yelloweye observed



CSEO management area



Update on DSR ASA

(age structured assessment)

- Model results pending-ADF&G internal review
  - 2014 an off year, could provide draft SAFE to Plan Team with new ROV index

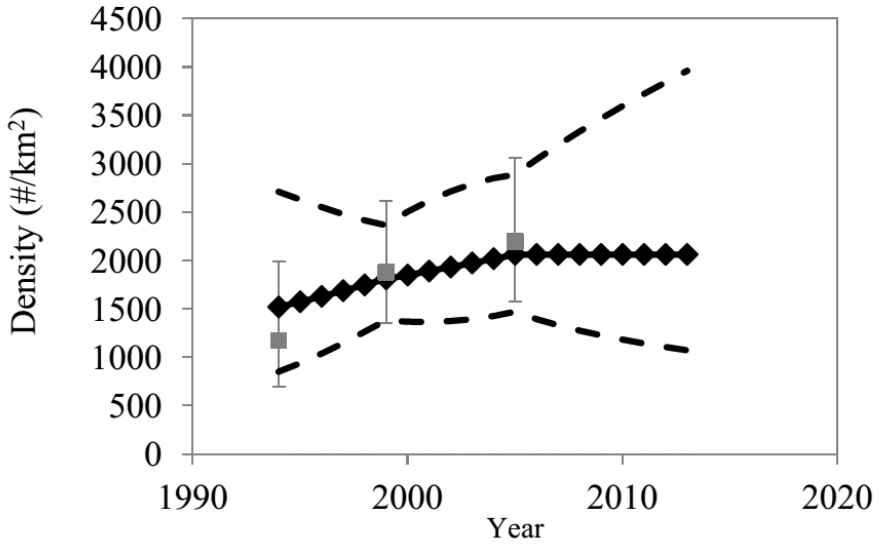
14. Demersal shelf rockfish

Random

effects

model

applied



Demersal shelf rockfish	Biomass	OFL	ABC
2014	13,274	438	274
2015		438	274

Rockfish Summary

Species	2013	2014	Change
POP	16,412	19,309	up 2,897 (18%)
Northern rockfish	5,130	5,322	up 192 (4%)
Shortraker Rockfish	1,081	1,323	up 242 (22%)
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Other rock	4,045	4,081	up 36 (1%)
Sub Total	34,568	38,880	up 4,312 (12%)

15. Shortspine thornyheads

Tier 5, executive summary

2013 trawl survey biomass up 11% from 2011

- Only depths less than 700 m sampled
- Biomass inflated to account for lack of sampling in deep strata (2011 methodology)

	Biomass	OFL	ABC
2014	81,816	2,454	1,841
2015		2,454	1,841

Rockfish Summary

Species	2013	2014	Change
POP	16,412	19,309	up 2,897 (18%)
Northern rockfish	5,130	5,322	up 192 (4%)
Shortraker Rockfish	1,081	1,323	up 242 (22%)
Dusky	4,700	5,486	up 786 (17%)
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Thornyhead	1,665	1,841	up 176 (11%)
Other rock	4,045	4,081	up 36 (1%)
Sub Total	34,568	38,880	up 4,312 (12%)

16. Other rockfish

Included 2013 GOA bottom trawl survey estimates

(3-survey average)

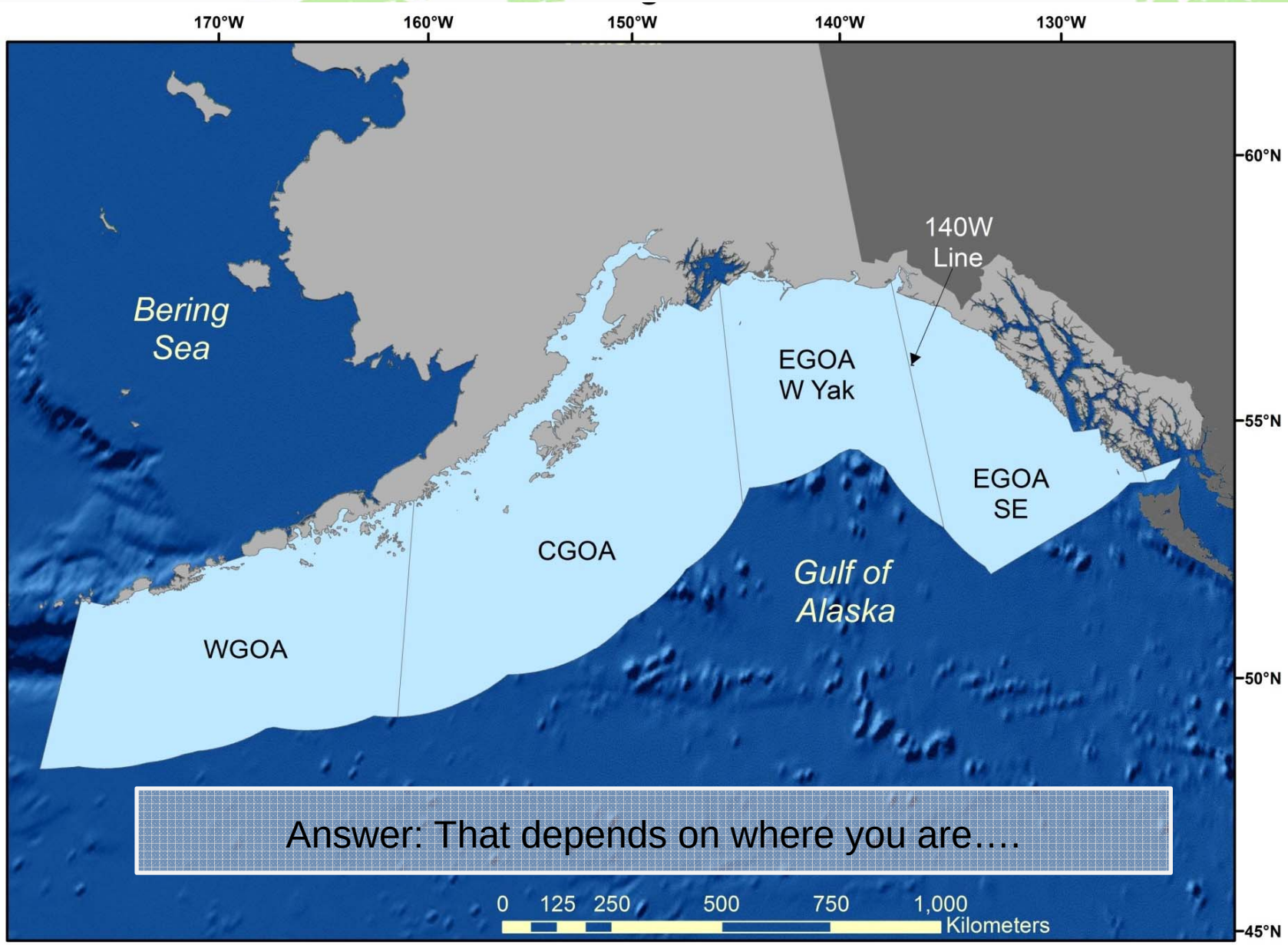
Composition of complex reviewed in September

Complex sum of individual species ABC/OFLs:

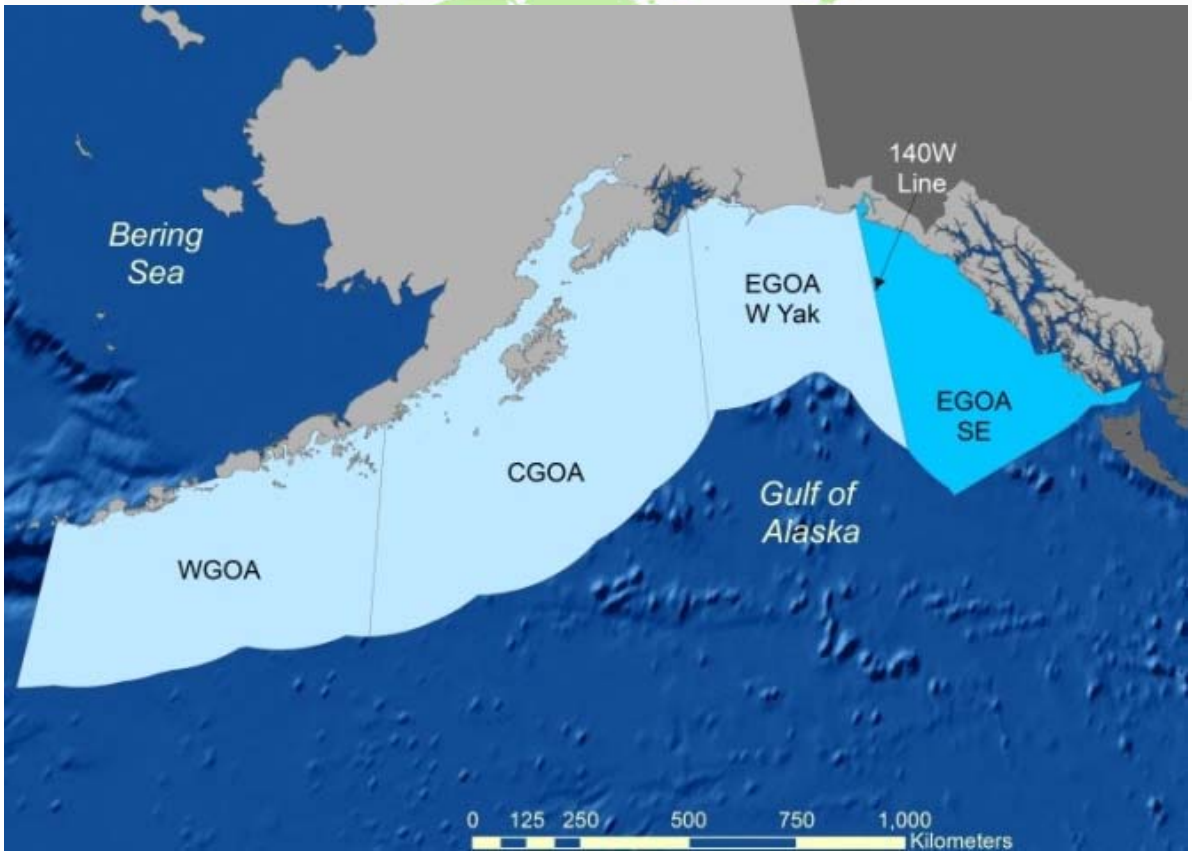
Tier 4: Sharpchin rockfish

Tier 5: 24 species

What are the Other Rockfish?



What are the Other Rockfish?



EGOA/Southeast

Blackgill rockfish
Bocaccio

Chilipepper rockfish

Darkblotched rockfish
Greenstriped rockfish
Harlequin rockfish
Northern rockfish
Pygmy rockfish

Redbanded rockfish
Redstripe rockfish

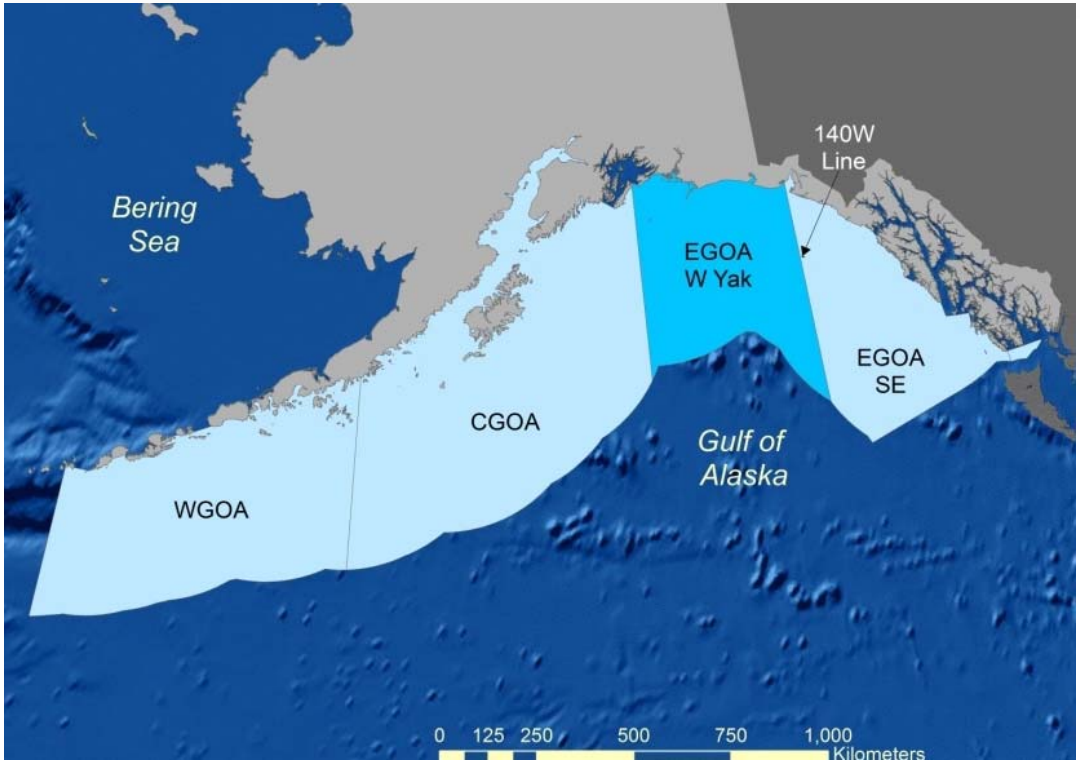
Sharpchin rockfish
Silvergray rockfish
Splitnose rockfish
Stripetail rockfish

Vermilion rockfish
Widow rockfish

Yellowmouth rockfish
Yellowtail rockfish

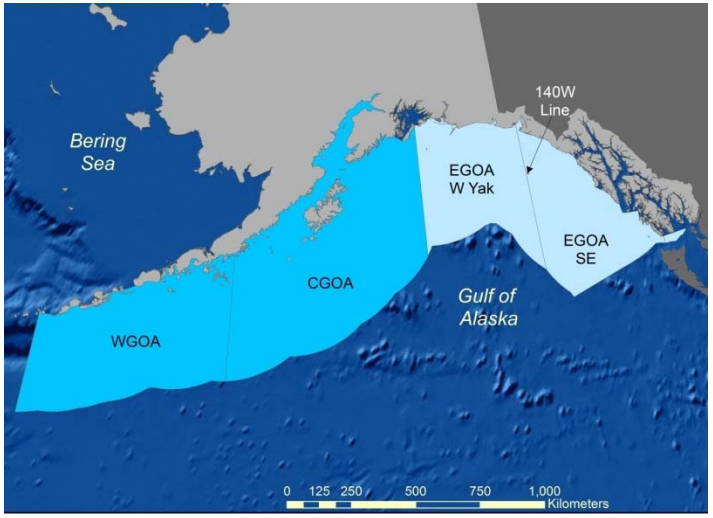
18 Species

What are the Other Rockfish?



EGOA/W Yakutat	EGOA/Southeast
Blackgill rockfish	Blackgill rockfish
Bocaccio	Bocaccio
Canary rockfish	
Chilipepper rockfish	Chilipepper rockfish
China rockfish	
Copper rockfish	
Darkblotched rockfish	Darkblotched rockfish
Greenstriped rockfish	Greenstriped rockfish
Harlequin rockfish	Harlequin rockfish
Northern rockfish	Northern rockfish
Pygmy rockfish	Pygmy rockfish
Quillback rockfrish	
Redbanded rockfish	Redbanded rockfish
Redstripe rockfish	Redstripe rockfish
Rosethorn rockfish	
Sharpchin rockfish	Sharpchin rockfish
Silvergray rockfish	Silvergray rockfish
Splitnose rockfish	Splitnose rockfish
Stripetail rockfish	Stripetail rockfish
Tiger rockfish	
Vermilion rockfish	Vermilion rockfish
Widow rockfish	Widow rockfish
Yelloweye rockfish	
Yellowmouth rockfish	Yellowmouth rockfish
Yellowtail rockfish	Yellowtail rockfish
25 Species	18 Species

What are the Other Rockfish?



WGOA & CGOA	EGOA/W Yakutat	EGOA/Southeast
Blackgill rockfish	Blackgill rockfish	Blackgill rockfish
Bocaccio	Bocaccio	Bocaccio
Canary rockfish	Canary rockfish	
Chilipepper rockfish	Chilipepper rockfish	Chilipepper rockfish
China rockfish	China rockfish	
Copper rockfish	Copper rockfish	
Darkblotched rockfish	Darkblotched rockfish	Darkblotched rockfish
Greenstriped rockfish	Greenstriped rockfish	Greenstriped rockfish
Harlequin rockfish	Harlequin rockfish	Harlequin rockfish
	Northern rockfish	Northern rockfish
Pygmy rockfish	Pygmy rockfish	Pygmy rockfish
Quillback rockfrish	Quillback rockfrish	
Redbanded rockfish	Redbanded rockfish	Redbanded rockfish
Redstripe rockfish	Redstripe rockfish	Redstripe rockfish
Rosethorn rockfish	Rosethorn rockfish	
Sharpchin rockfish	Sharpchin rockfish	Sharpchin rockfish
Silvergray rockfish	Silvergray rockfish	Silvergray rockfish
Splitnose rockfish	Splitnose rockfish	Splitnose rockfish
Stripetail rockfish	Stripetail rockfish	Stripetail rockfish
Tiger rockfish	Tiger rockfish	
Vermilion rockfish	Vermilion rockfish	Vermilion rockfish
Widow rockfish	Widow rockfish	Widow rockfish
Yelloweye rockfish	Yelloweye rockfish	
Yellowmouth rockfish	Yellowmouth rockfish	Yellowmouth rockfish
Yellowtail rockfish	Yellowtail rockfish	Yellowtail rockfish
24 Species	25 Species	18 Species

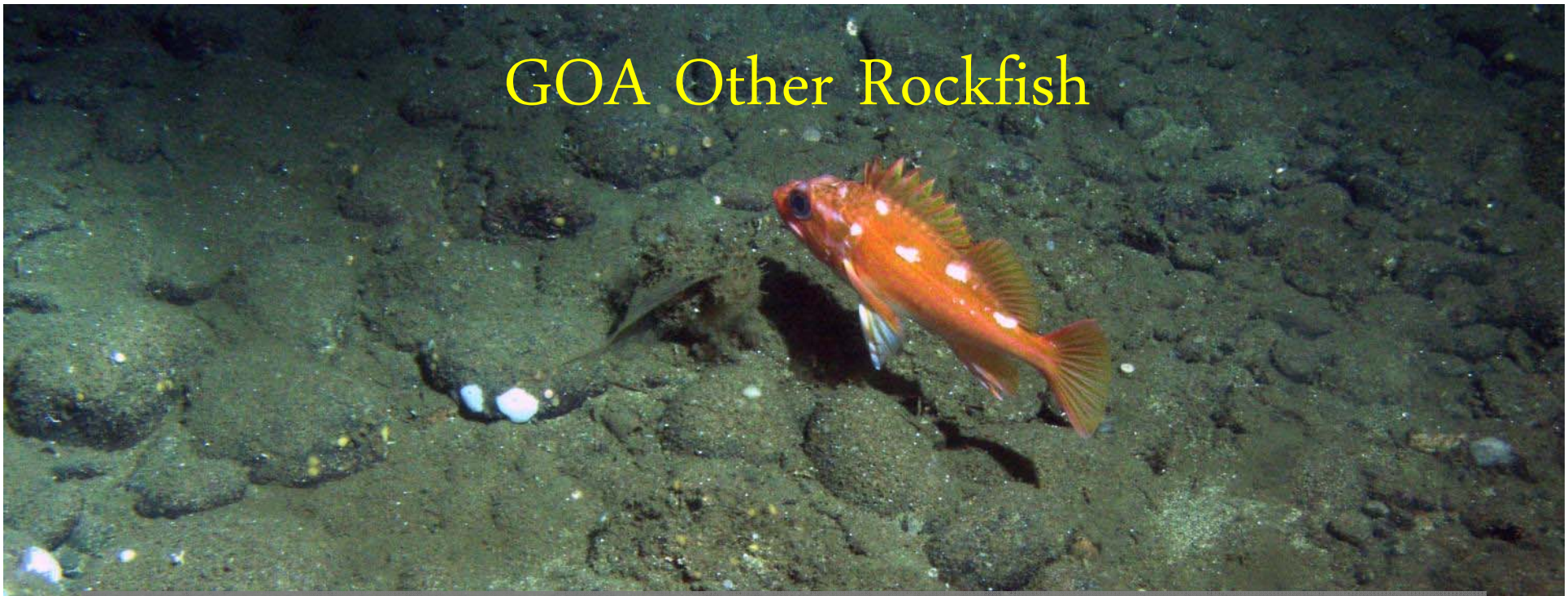
What are the Other Rockfish?

© ADFG

New to assessment: DSR Species west of the DSR assessment (hereafter termed WDSR)

WGOA & CGOA	EGOA/W Yakutat	EGOA/Southeast
Blackgill rockfish	Blackgill rockfish	Blackgill rockfish
Bocaccio	Bocaccio	Bocaccio
Canary rockfish (WDSR)	Canary rockfish (WDSR)	
Chilipepper rockfish	Chilipepper rockfish	Chilipepper rockfish
China rockfish (WDSR)	China rockfish (WDSR)	
Copper rockfish (WDSR)	Copper rockfish (WDSR)	
Darkblotched rockfish	Darkblotched rockfish	Darkblotched rockfish
Greenstriped rockfish	Greenstriped rockfish	Greenstriped rockfish
Harlequin rockfish	Harlequin rockfish	Harlequin rockfish
	Northern rockfish	Northern rockfish
Pygmy rockfish	Pygmy rockfish	Pygmy rockfish
Quillback rockfrish (WDSR)	Quillback rockfrish (WDSR)	
Redbanded rockfish	Redbanded rockfish	Redbanded rockfish
Redstripe rockfish	Redstripe rockfish	Redstripe rockfish
Rosethorn rockfish (WDSR)	Rosethorn rockfish (WDSR)	
Sharpchin rockfish	Sharpchin rockfish	Sharpchin rockfish
Silvergray rockfish	Silvergray rockfish	Silvergray rockfish
Splitnose rockfish	Splitnose rockfish	Splitnose rockfish
Stripetail rockfish	Stripetail rockfish	Stripetail rockfish
Tiger rockfish (WDSR)	Tiger rockfish (WDSR)	
Vermilion rockfish	Vermilion rockfish	Vermilion rockfish
Widow rockfish	Widow rockfish	Widow rockfish
Yelloweye rockfish (WDSR)	Yelloweye rockfish (WDSR)	
Yellowmouth rockfish	Yellowmouth rockfish	Yellowmouth rockfish
Yellowtail rockfish	Yellowtail rockfish	Yellowtail rockfish
24 Species	25 Species	18 Species

GOA Other Rockfish

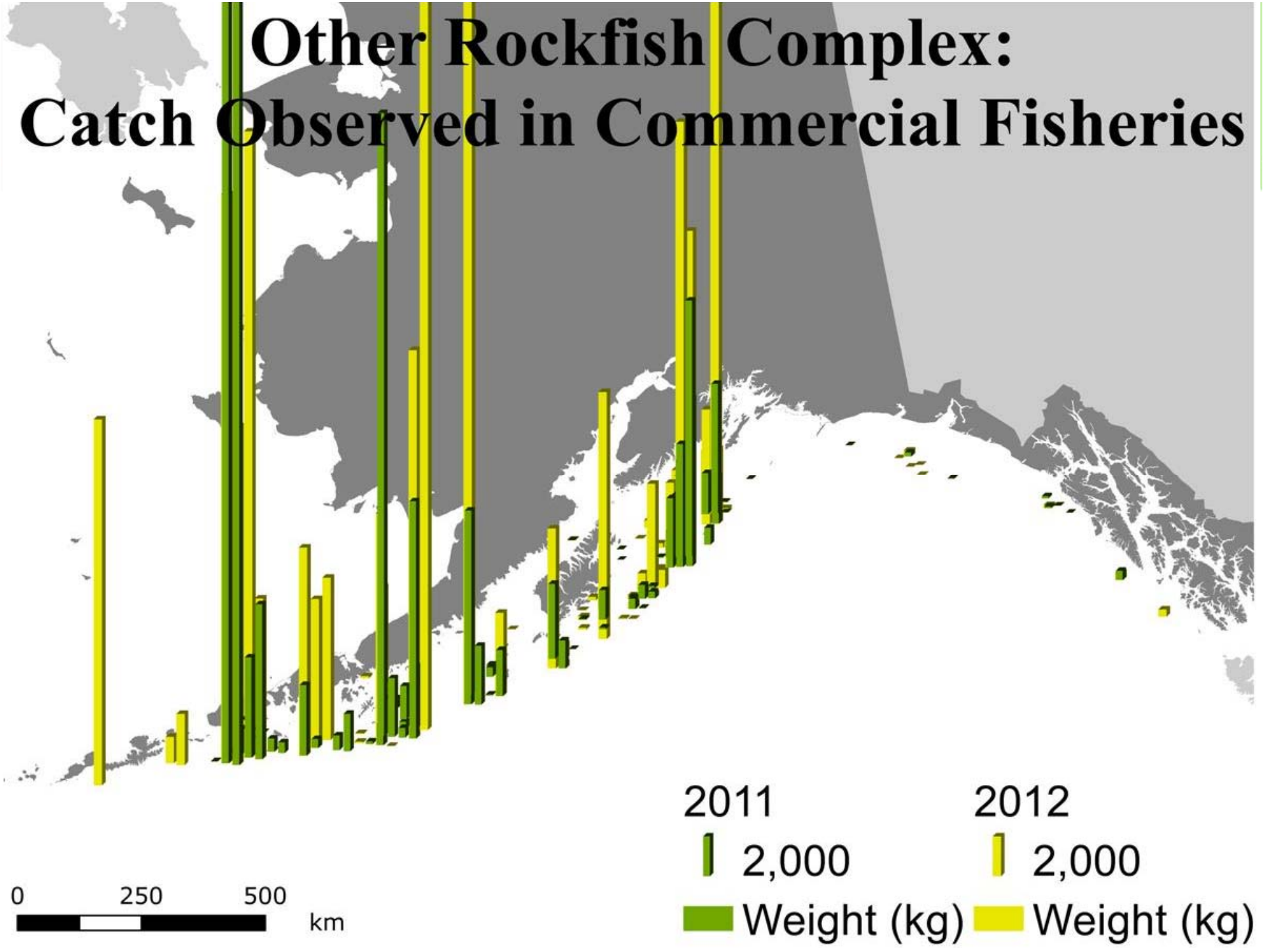


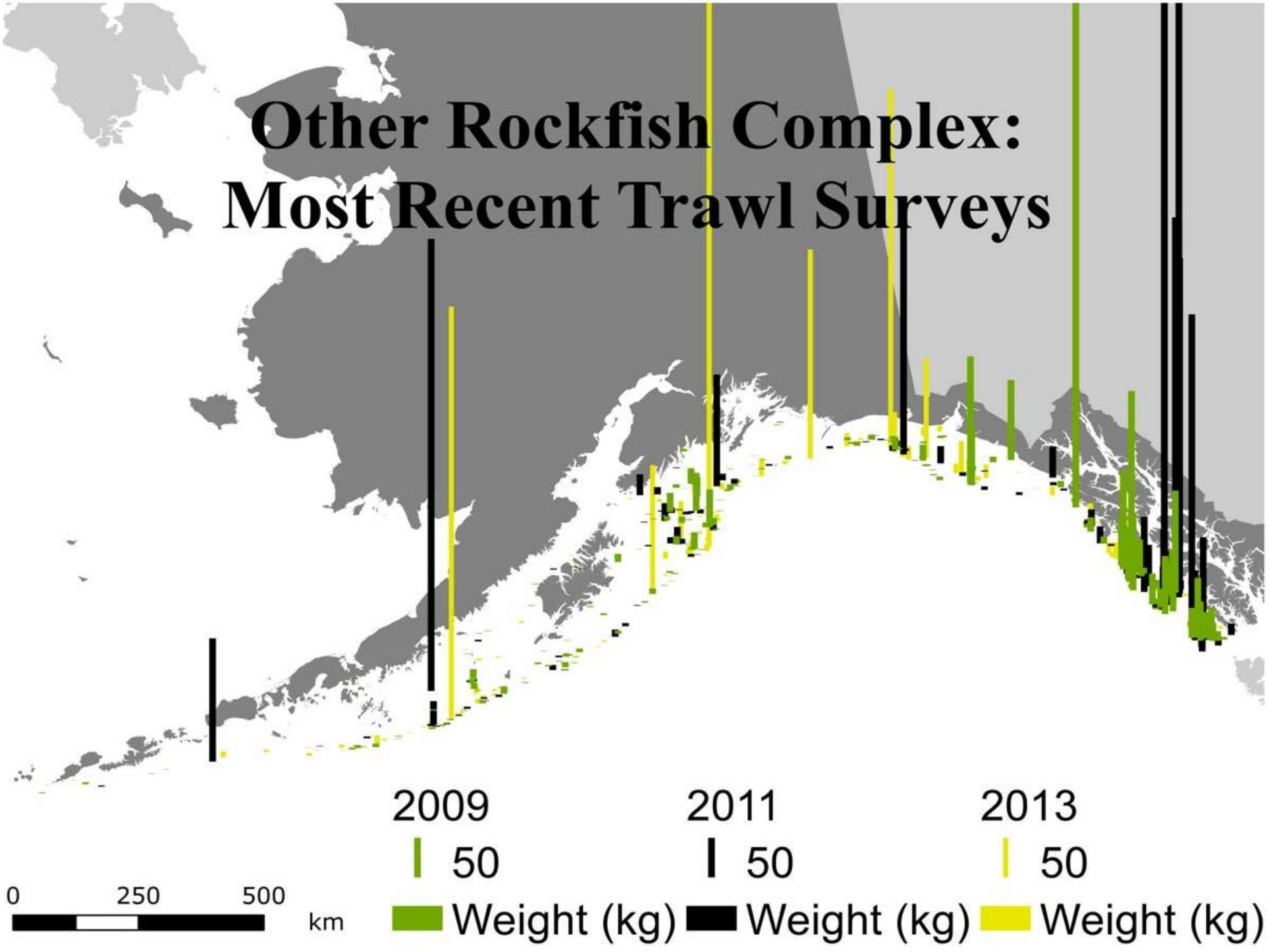
- No changes to assessment methodology
  - Tier 4: Sharpchin
  - Tier 5: 24 species
  - Complex ABC/OFL are sum of individual species estimates

GOA Other Rockfish Catch

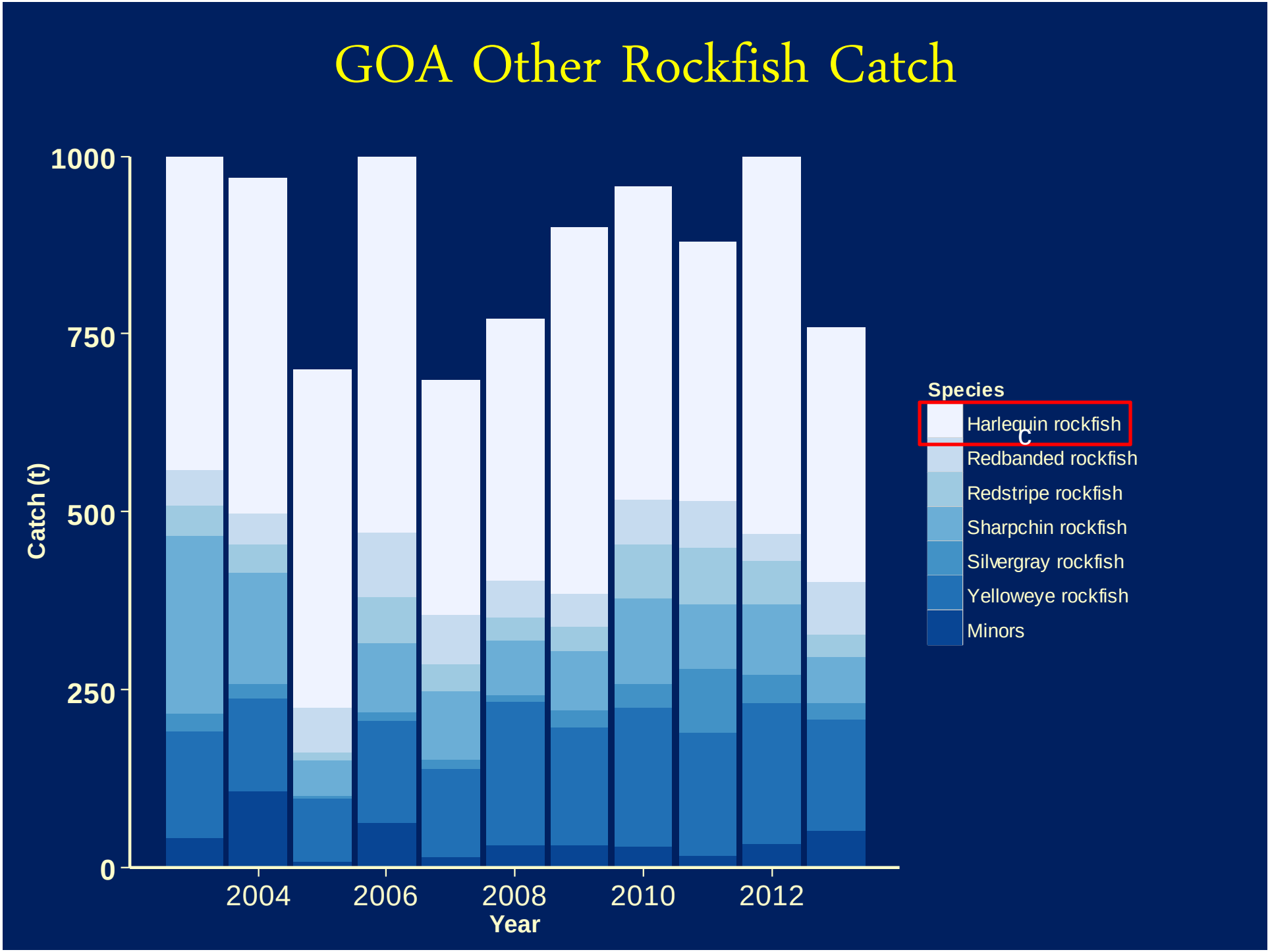
- ABC was exceeded in WGOA
- Well below total ABC for GOA

Area		2013 OFL	ABC	TAC	Catch[2]
WGOA			44	44	195
CGOA			606	606	446
EGOA	WY		230	230	70
	EY/SE		3,165	200	49
Total		5,305	4,045	1,080	760

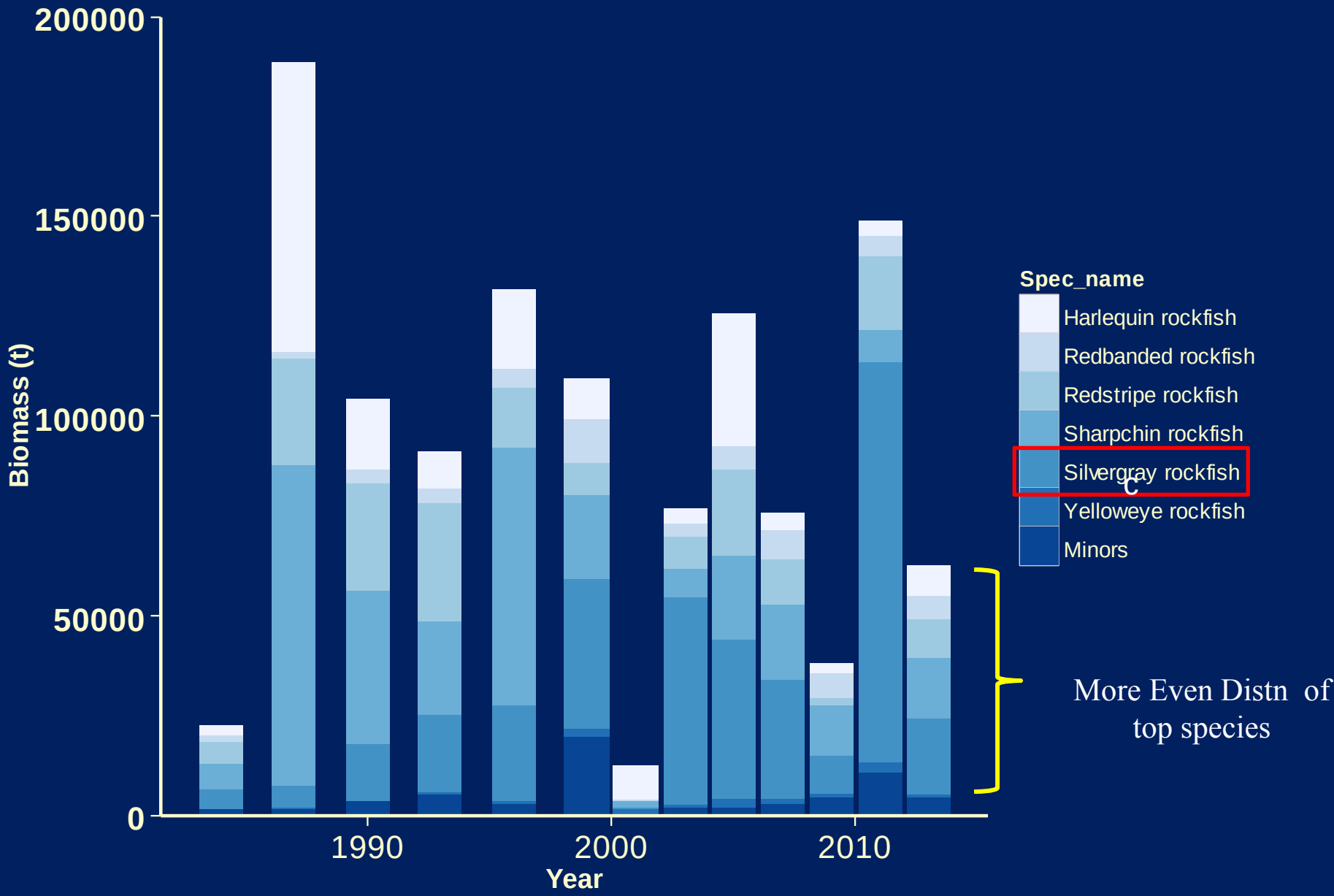

Other Rockfish Complex:
Catch Observed in Commercial Fisheries
2011
2,000
Weight (kg)
2012
2,000
Weight (kg)
0
250
500
km


Other Rockfish Complex:
Most Recent Trawl Surveys
2009
50
Weight (kg)
2011
50
Weight (kg)
2013
50
Weight (kg)
0
250
500
km

GOA Other Rockfish Catch



GOA Other Rockfish Biomass



Other Rockfish Summary

- ABC was exceeded in WGOA
- 3 yr avg biomass down slightly

- No apparent impacts due to observer restructuring

GOA Team recommendations Other rockfish

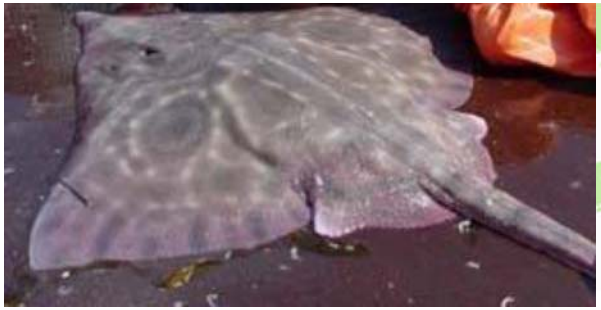
1. ...DSR remain in the Other Rockfish complex for areas outside of the eastern Gulf
2. ...for November the author apply the survey averaging technique for smoothing the survey biomass estimates in addition to the current method
3. ...provide these estimates for individual management regions and estimates for the central and western management areas combined

Other rockfish	Biomass	OFL	ABC
2014	83,383	5,347	4,079
2015		5,347	4,079

Other Rockfish Summary

- Apportionment: combine W/CGOA
- based on 4:6:9 weighting of biomass in the three most recent trawl surveys (2009, 2011, 2013).

	West GOA	Central GOA	Eastern GOA (74.7%)		Total
			West Yakutat1	E Yakutat/ Southeast1	
Area Apportionment	1%	24.3%	19%	81%	100%
Area ABC (t)	(40)	(991)	580	2,468	4,079
W/C GOA ABC	1.031				
OFL (t)					5,347



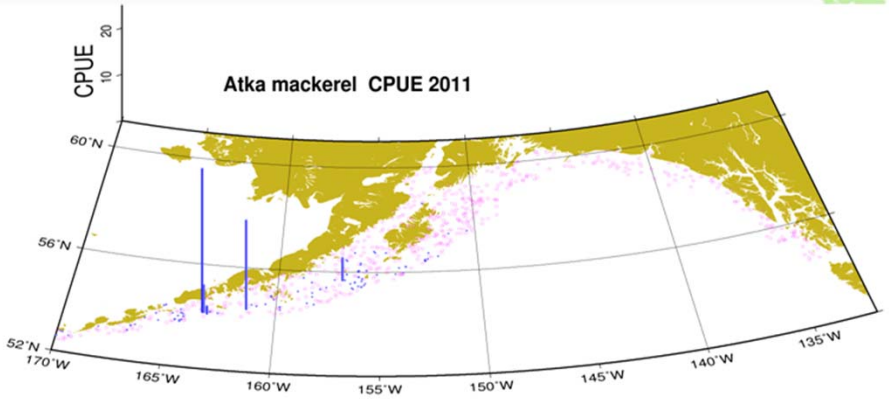
ABCs for remaining GOA species

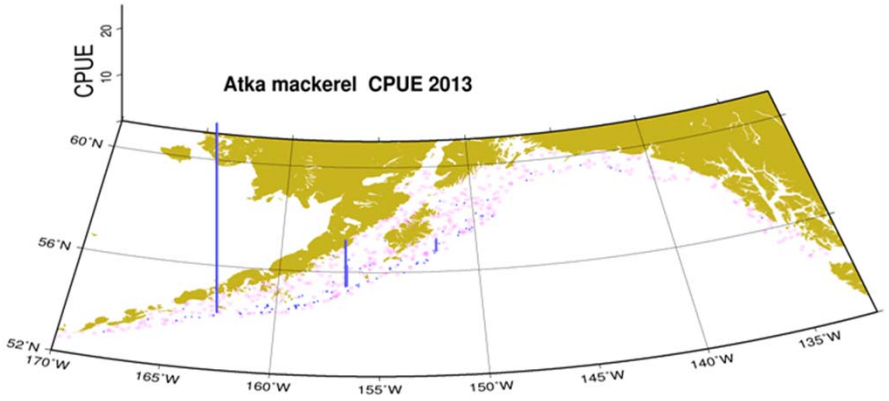
Species	2013 Catch	ABC 2013	ABC 2014	Change
Pollock	93,246	121,046	174,976	up 53,930 (45%)
Pacific Cod	46,642	80,800	88,500	up 7,700 (10%)
Sablefish	11,825	12,510	10,572	down 1,938 (15%)
Flatfish	28,619	108,908	104,849	down 4,059 (4%)
Arrowtooth flounder	2,627	210,451	195,358	down 15,093 (7%)
Rockfish	24,287	34,568	38,880	up 4,312 (12%)
Atka mackerel	1,244	4,700	4,700	same (0%)
Skates	5,590	8,422	8,627	up 205 (2%)
Other Species	4,153	14,515	14,213	down 302 (2%)
Total	218,233	595,920	640,675	up 44,755 (8%)

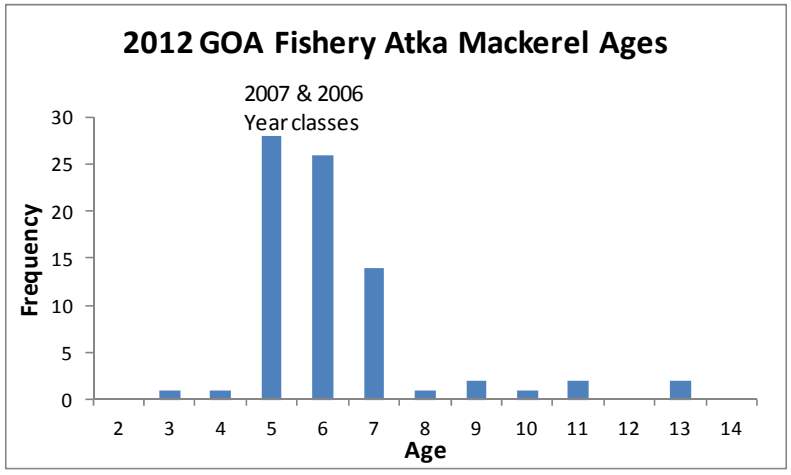
GOA Atka mackerel

- Tier 6, unreliable biomass
- Status quo ABC and OFL:

ABC - 4,700 t OFL – 6,200 t







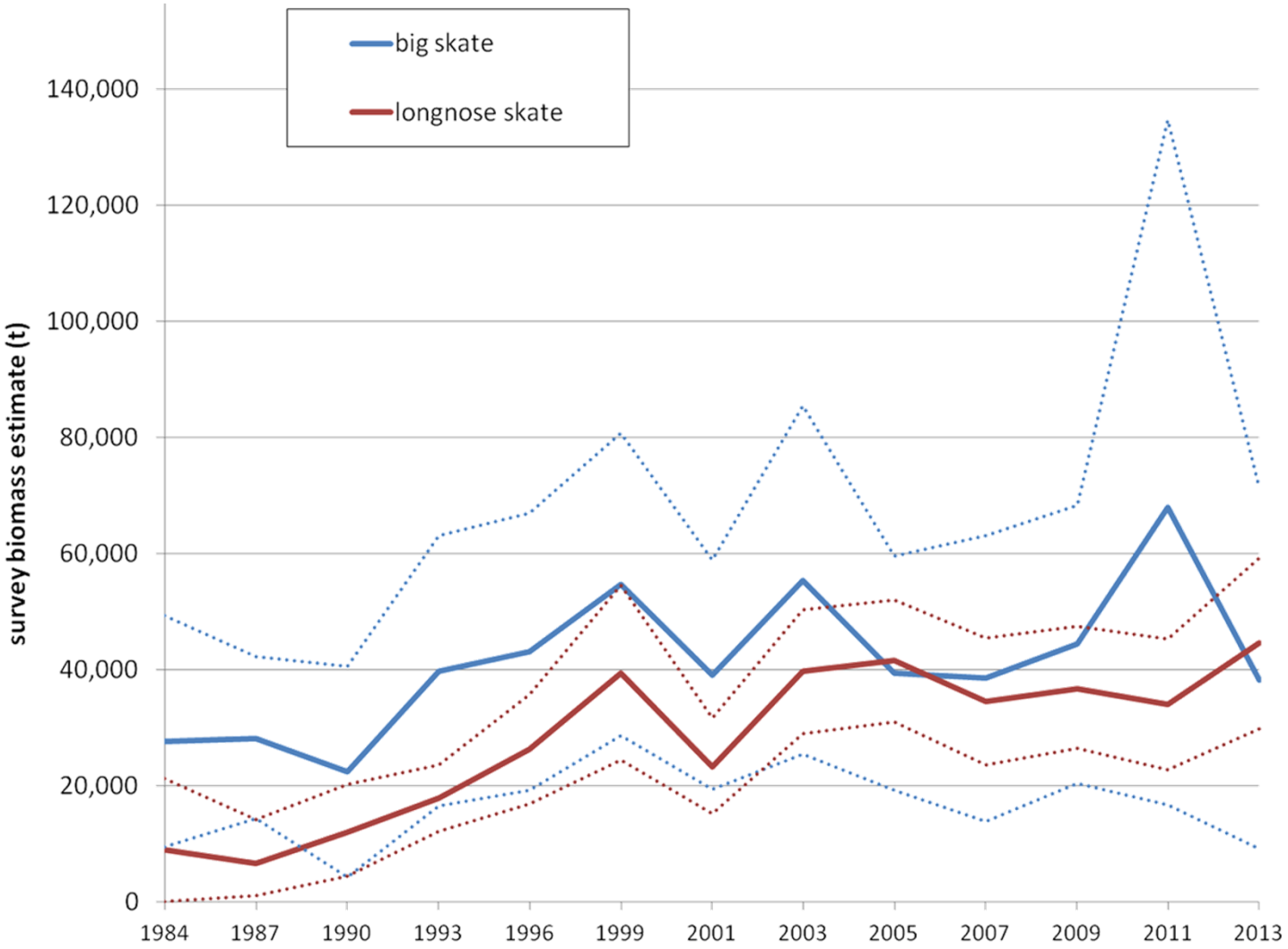
18. GOA skates

Species	2013 Catch	2013	2014	Change
Big skate	1,650	2,625	2,876	up 251(10%)
Longnose skate	1,611	2,030	1,989	down 41(2%)
Other skate	2,083	6,028	5,989	down 39(1%)
All skates	5,344	10,683	10,854	up 171(2%)

GOA Skate developments

- CIE review in 2013
- Abbreviated assessment
  - Update only w/ 2013 survey results
  - Biomass up for longnose & other skates
  - Interesting aspects of big skate biomass
- Catch
  - Increased catches of all skates – halibut data?
  - Area ABCs exceeded for big & longnose
- UAF students working on skate modeling, discard mortality

2013 GOA skate survey biomass



- big skate down relative to 2011, similar to earlier years
- increased WGOA biomass (largest skates)
- much reduced CGOA biomass (majority of biomass)

2013 GOA Skate catches

	ABC			OFL	estimated skate catch			stock
	W	C	E		W	C	E	
2011	598	2,049	681	4,438	94	2,075	126	big
	81	2,009	762	3,803	62	863	106	longnose
2012	469	1,793	1,505	5,023	66	1,894	59	big
	70	1,879	676	3,500	38	771	104	longnose
*2013**	469	1,793	1,505	5,023	*83*	*1,853*	*167*	big
	70	1,879	676	3,500	*43*	*995*	*724*	longnose

- longnose catches up, presumably due to increased small-boat reporting
- big skate CGOA ABC exceeded 2010-2013
- longnose EGOA ABC exceeded in 2013 [if 649/659 included]
- no mgmt. measures available to stop exceeding ABC (already bycatch-only)

Skates ABC/OFL

Tier 5

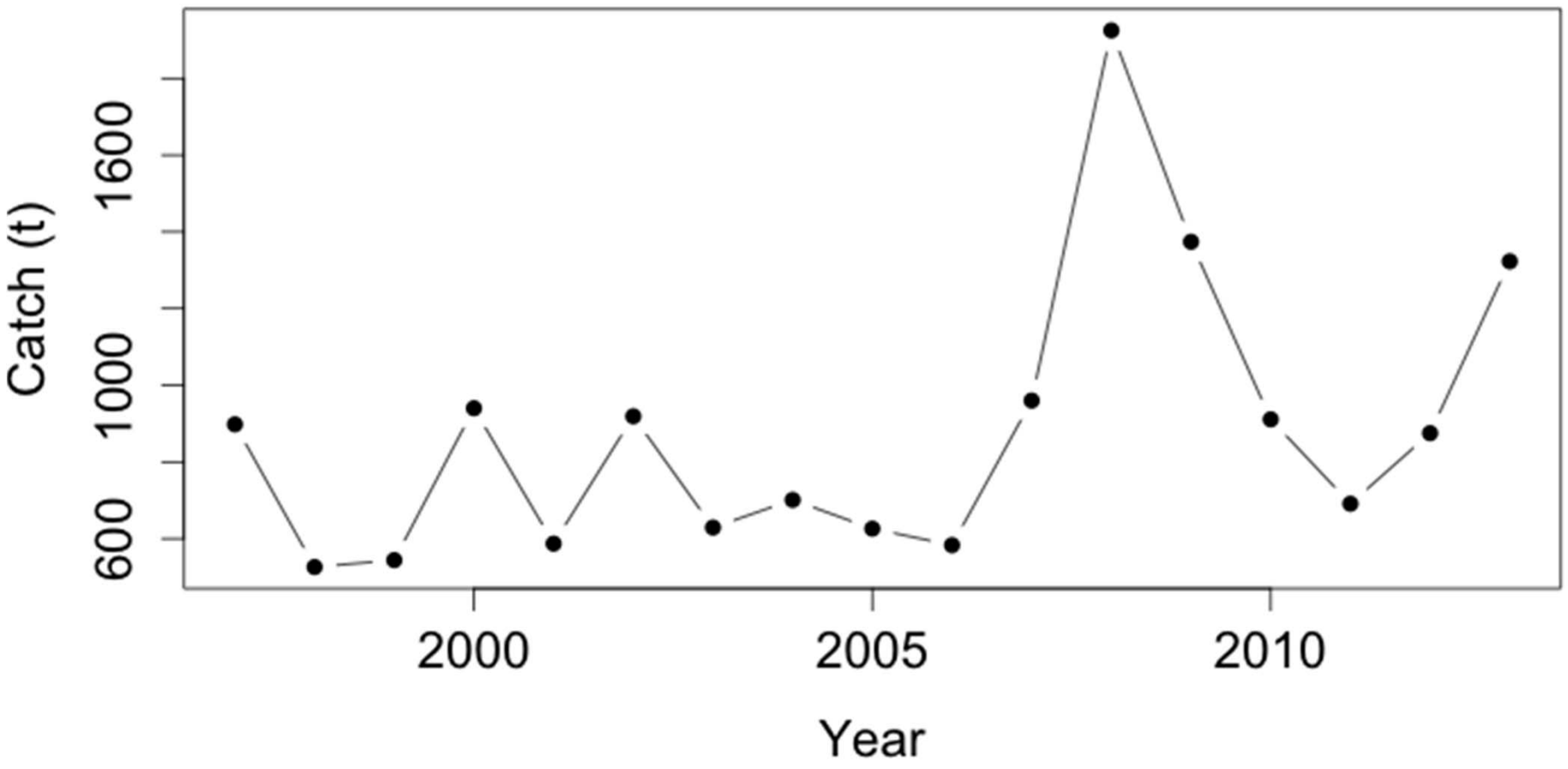
Age-structured model may be available for Big and/or longnose skates next year

Big skates		Biomass	OFL	ABC
	2014	50,155	5,016	3,762
	2015		5,016	3,762

Longnose skates				
	2014	38,349	3,835	2,876
	2015		3,835	2,876

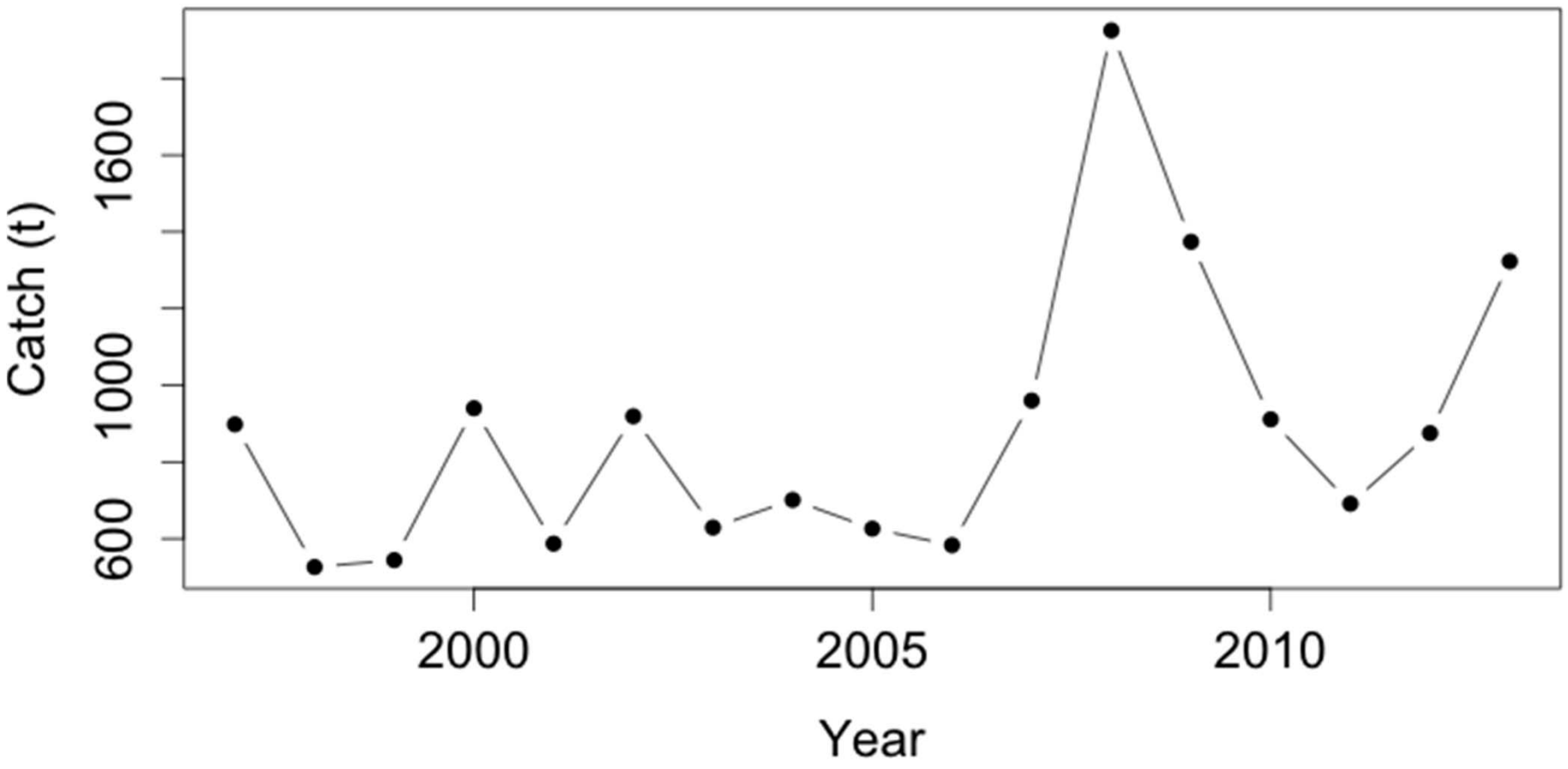
Other Skates				
	2014	26,518	2,652	1,989
	2015		2,652	1,989

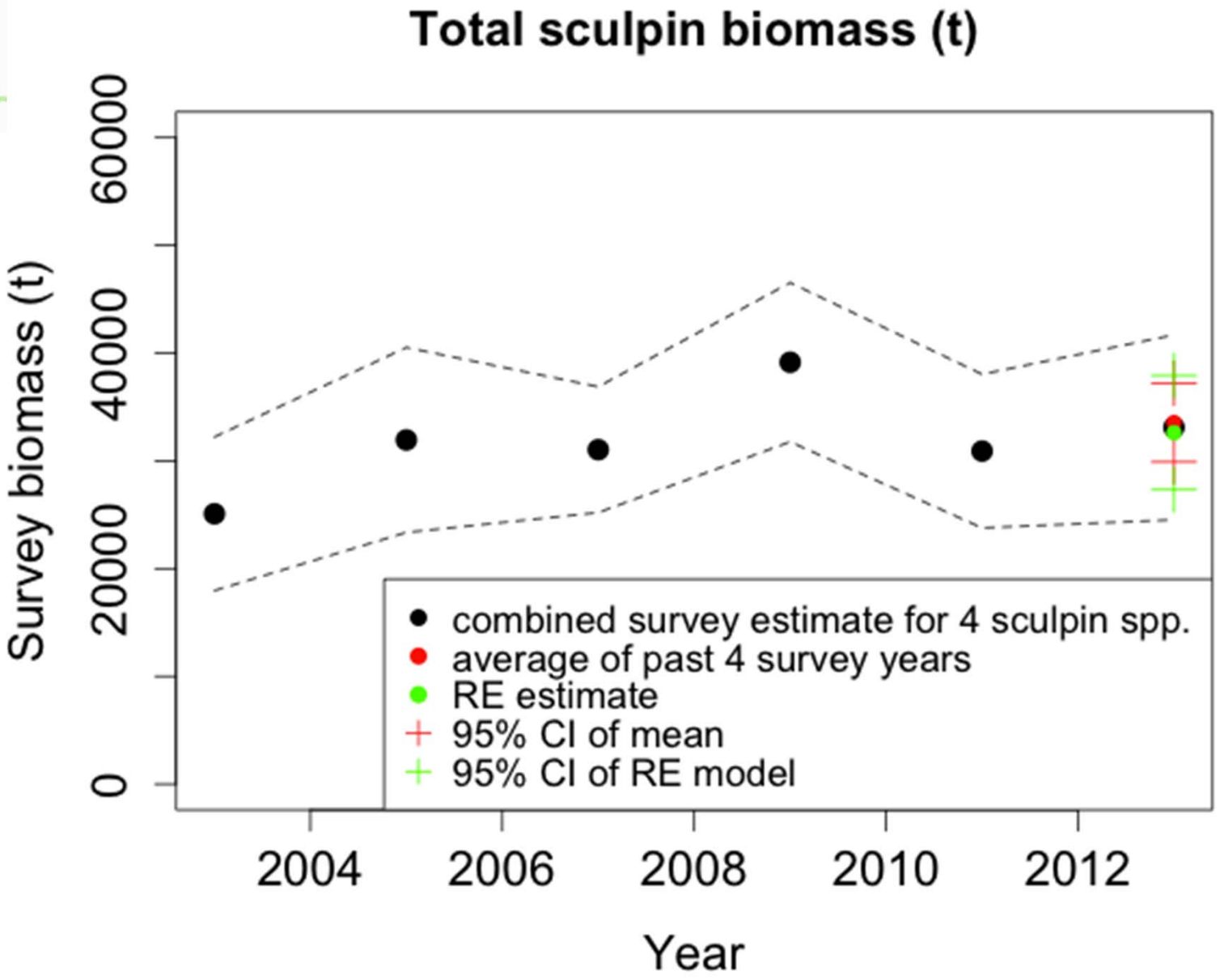
19. Sculpins

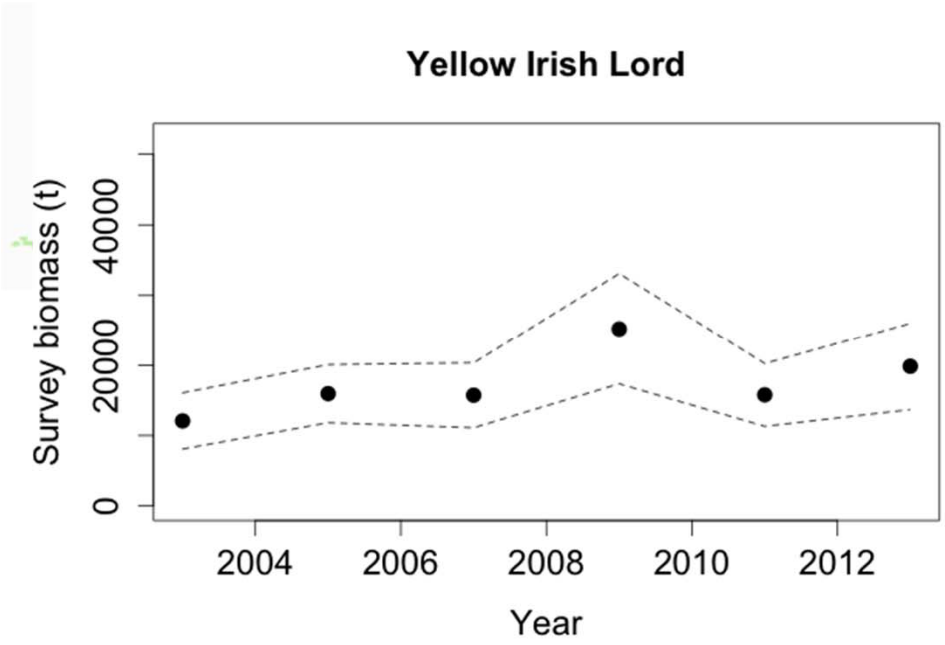


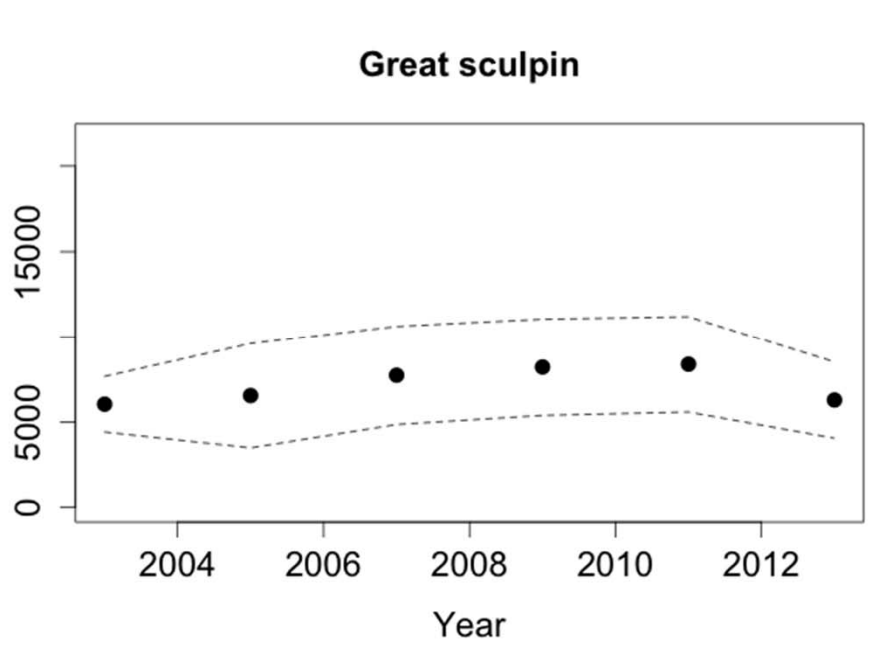
GOA sculpin catch history

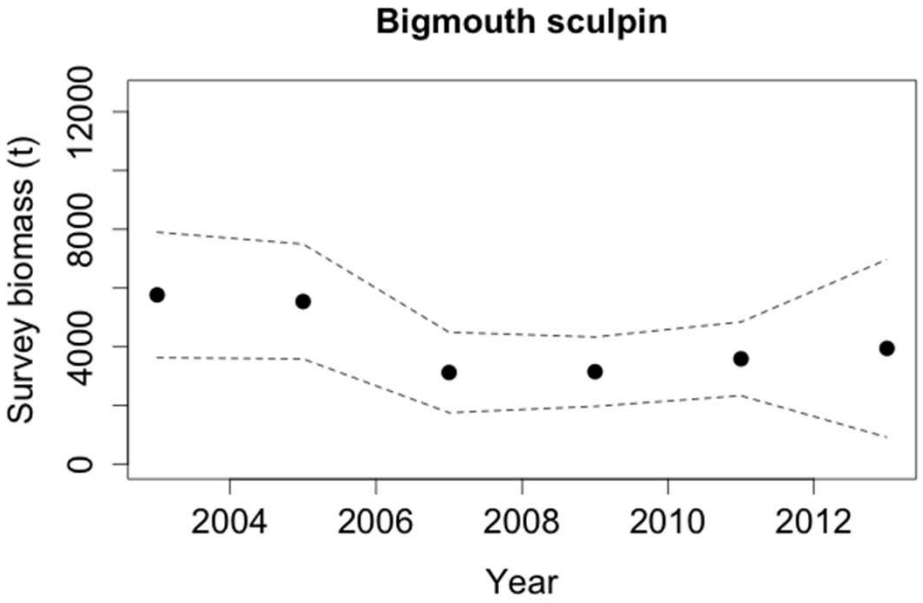
46 species found in GOA, focus on large sculpin species:
Yellow irish lord, great sculpin, big mouth sculpin, plain sculpin

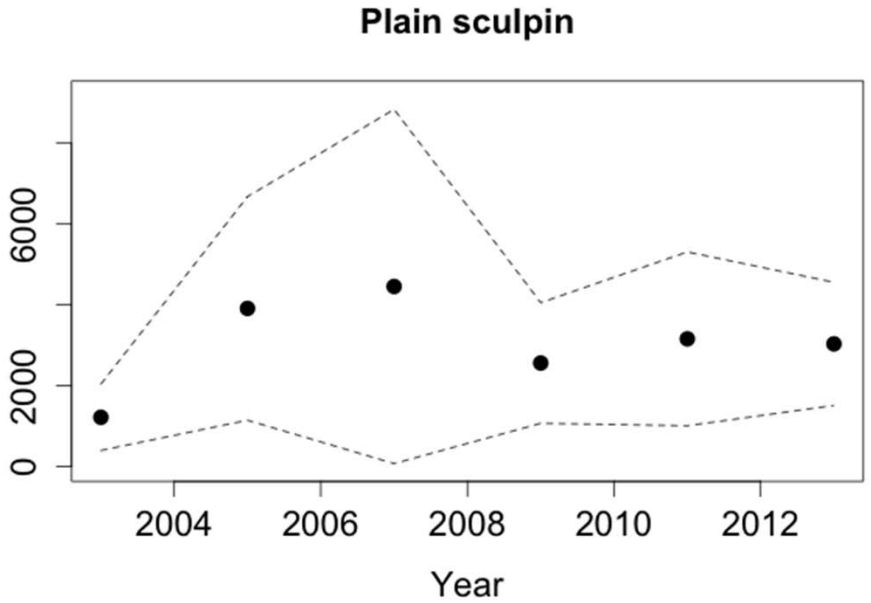



Total sculpin biomass (t)
Survey biomass (t)
0
20000
40000
60000
2004
2006
2008
2010
2012
Year
combined survey estimate for 4 sculpin spp.
average of past 4 survey years
RE estimate
95% CI of mean
95% CI of RE model


Yellow Irish Lord
Survey biomass (t)
0
20000
40000
2004
2006
2008
2010
2012
Year


Great sculpin
0
5000
15000
2004
2006
2008
2010
2012
Year


Bigmouth sculpin
Survey biomass (t)
0
4000
8000
12000
2004
2006
2008
2010
2012
Year


Plain sculpin
0
2000
6000
2004
2006
2008
2010
2012
Year

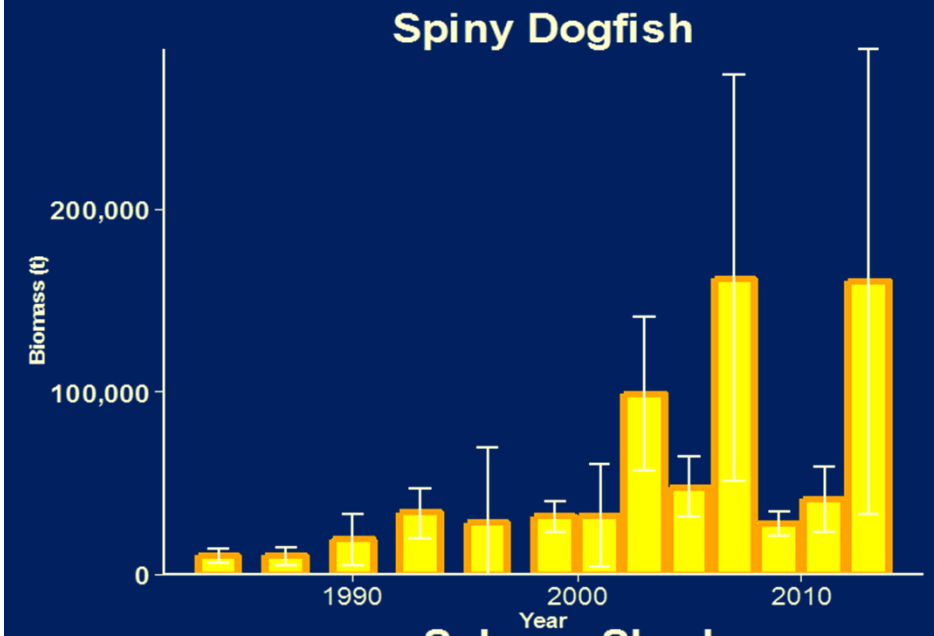
GOA sculpins

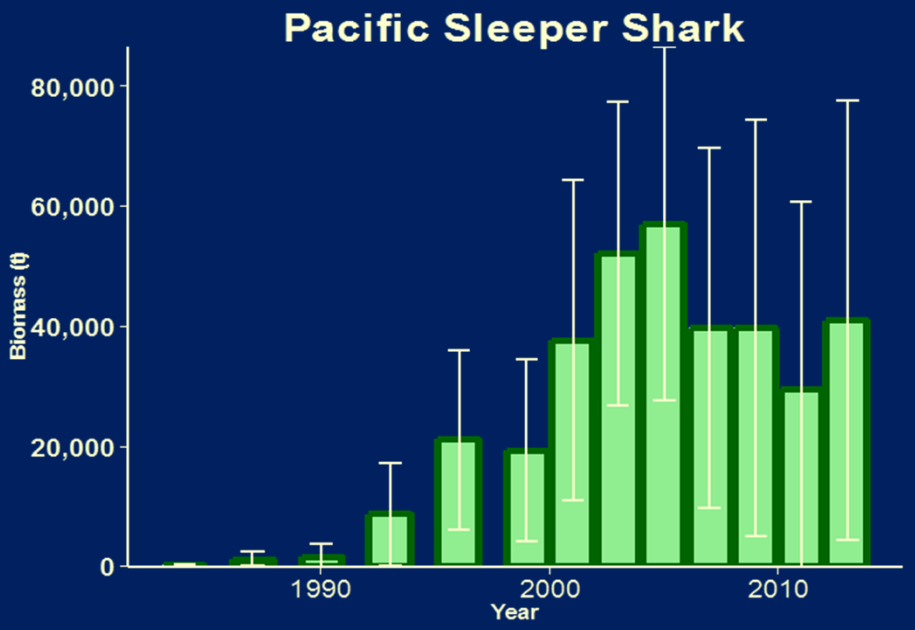
	Biomass	OFL	ABC
2014	33,550	7,448	5,569
2015		7,448	5,569

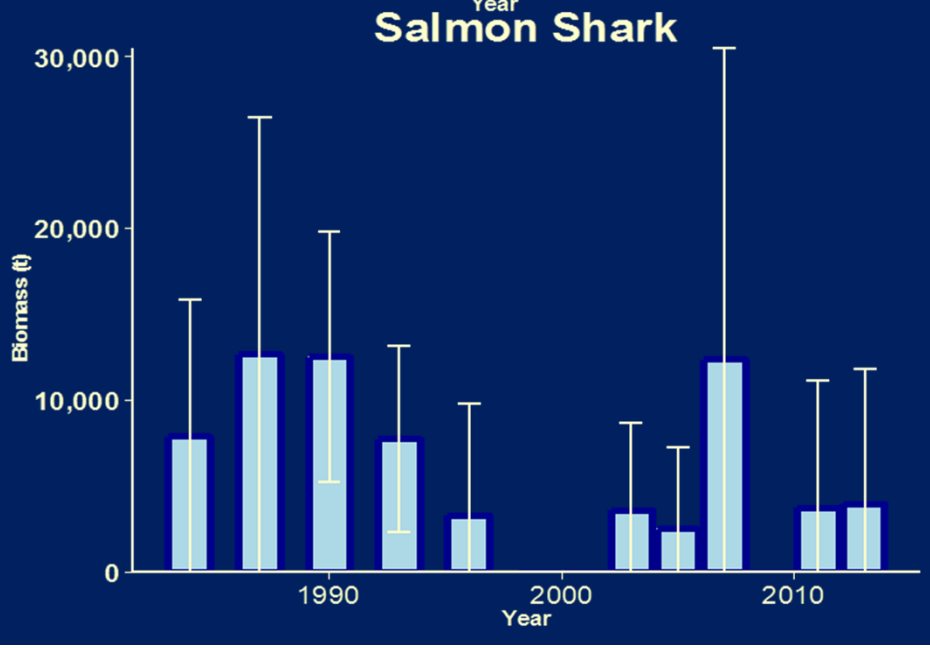
20. Sharks

- Complex of Spiny dogfish, Pacific sleeper shark, Salmon shark and 'other'/unidentified
- Biomass estimates available for some sharks but not considered reliable for all species

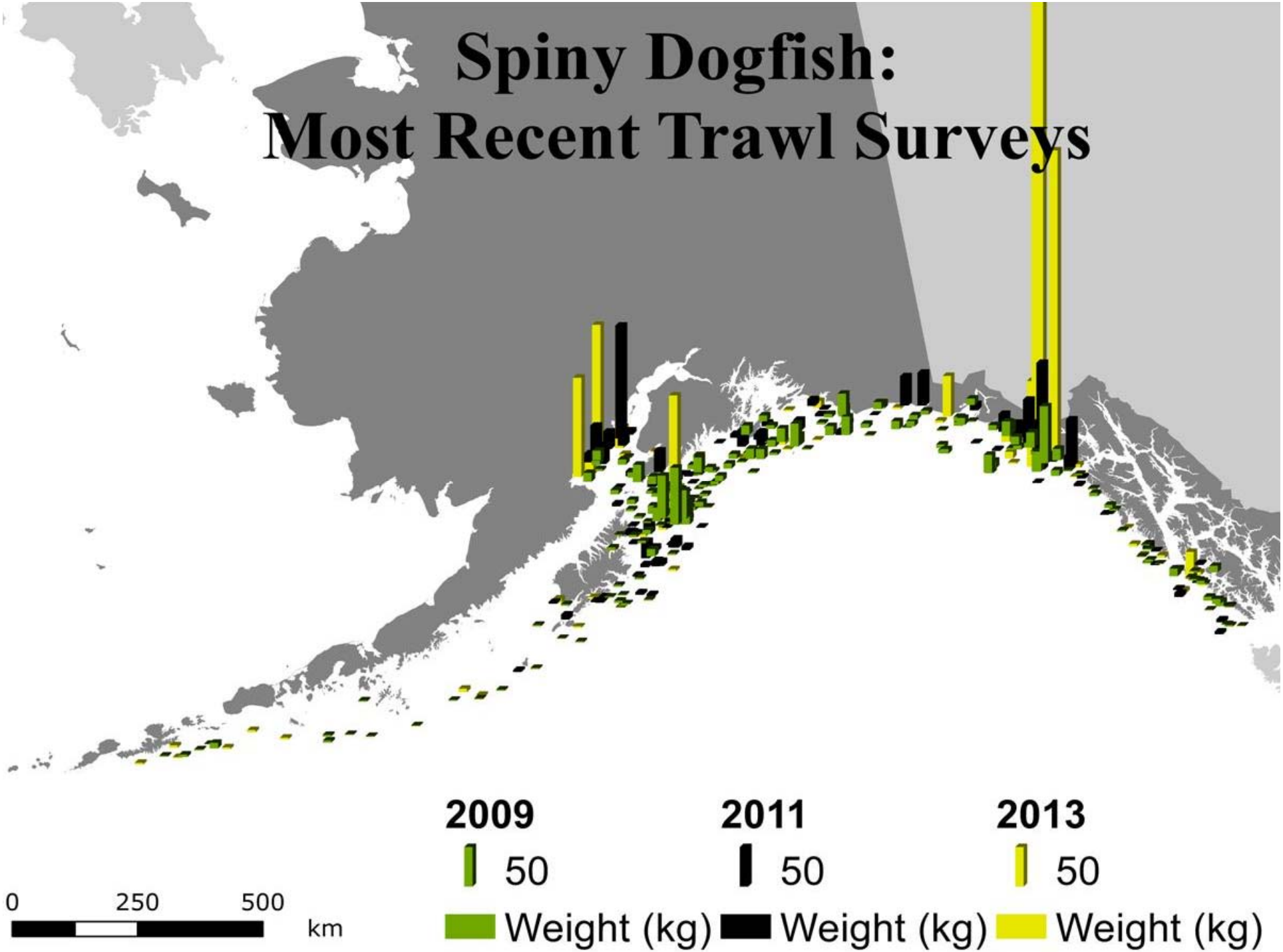
GOA shark trawl survey biomass

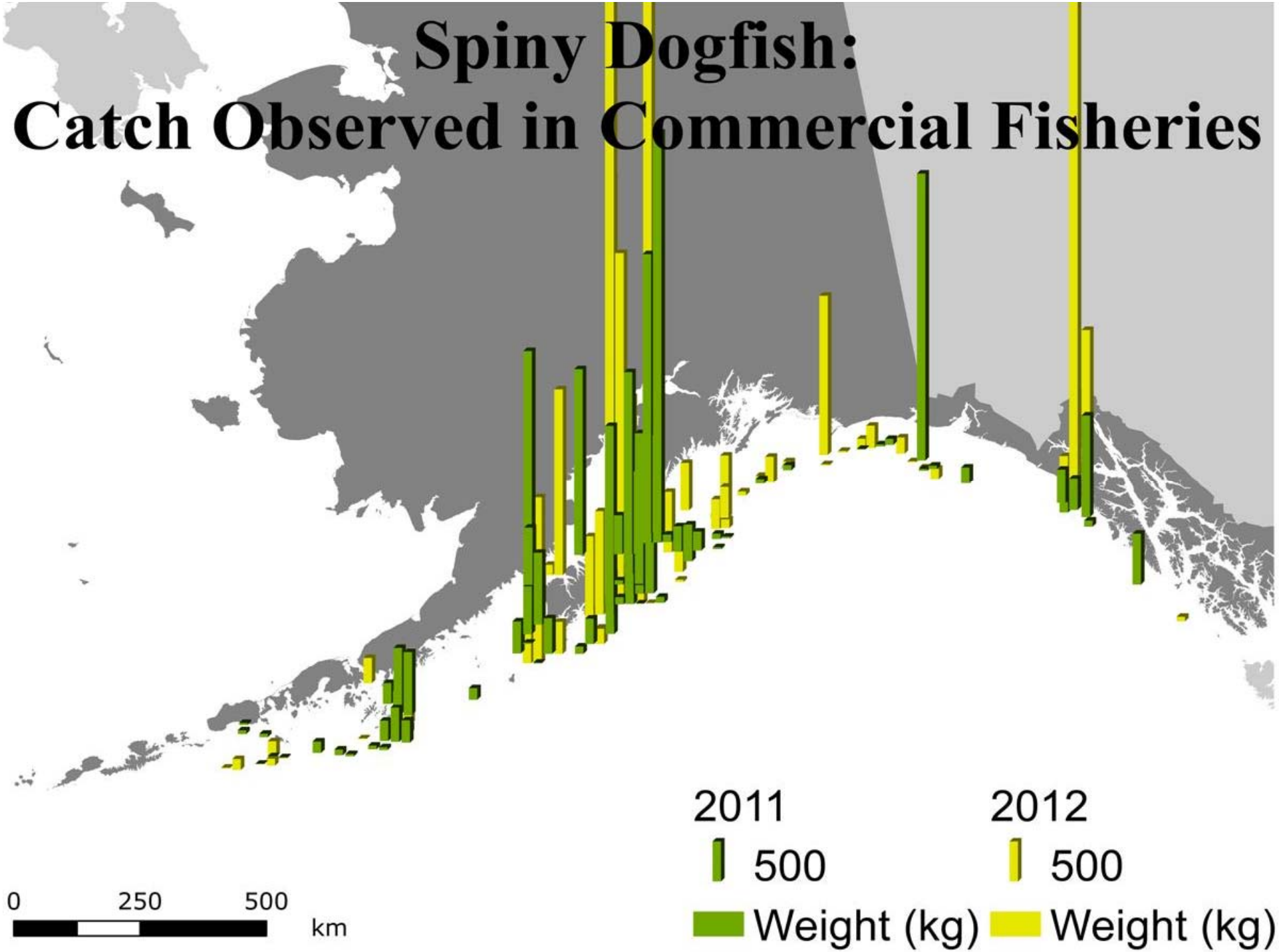


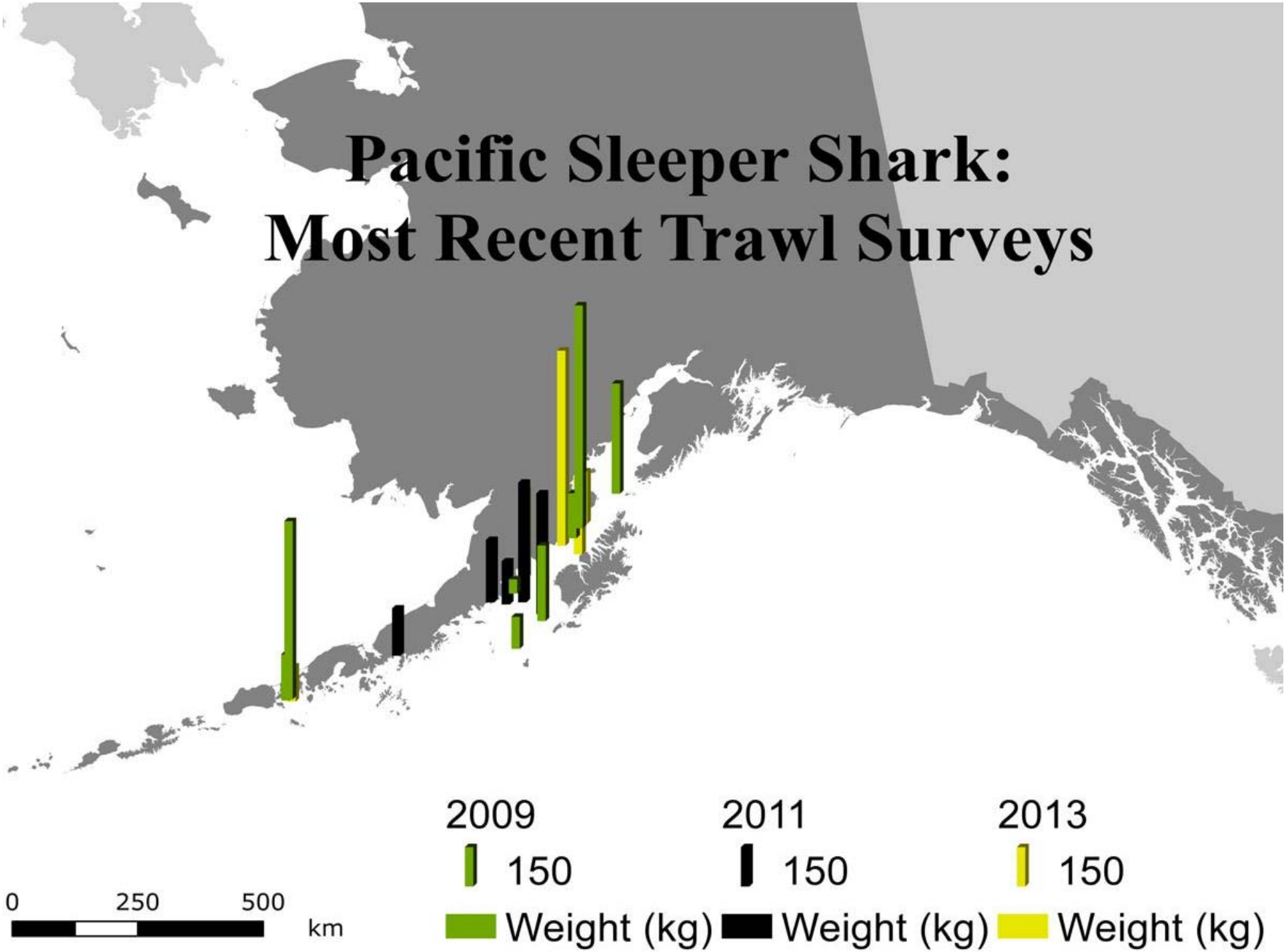


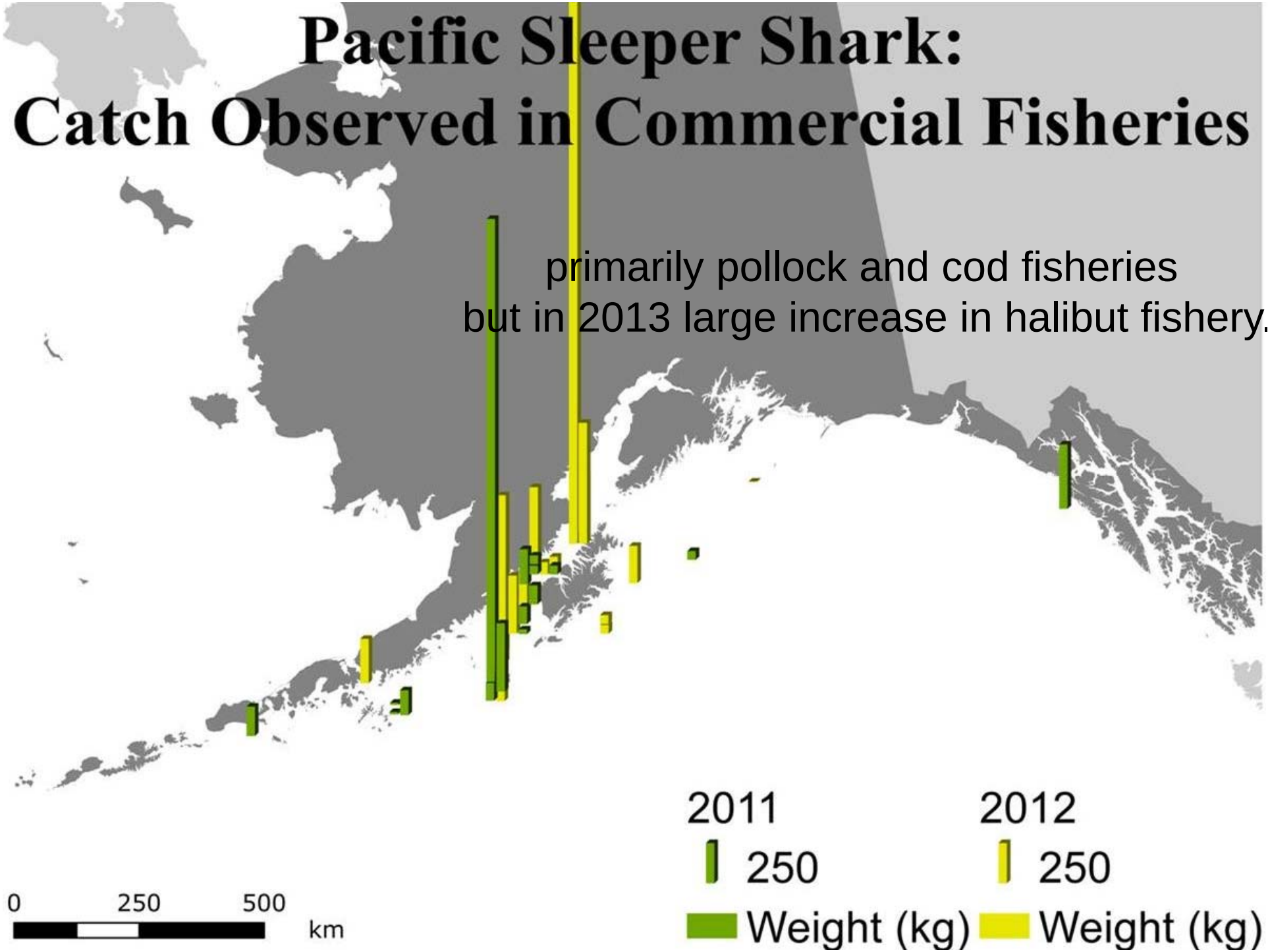


Biomass is not estimated for other or unidentified sharks

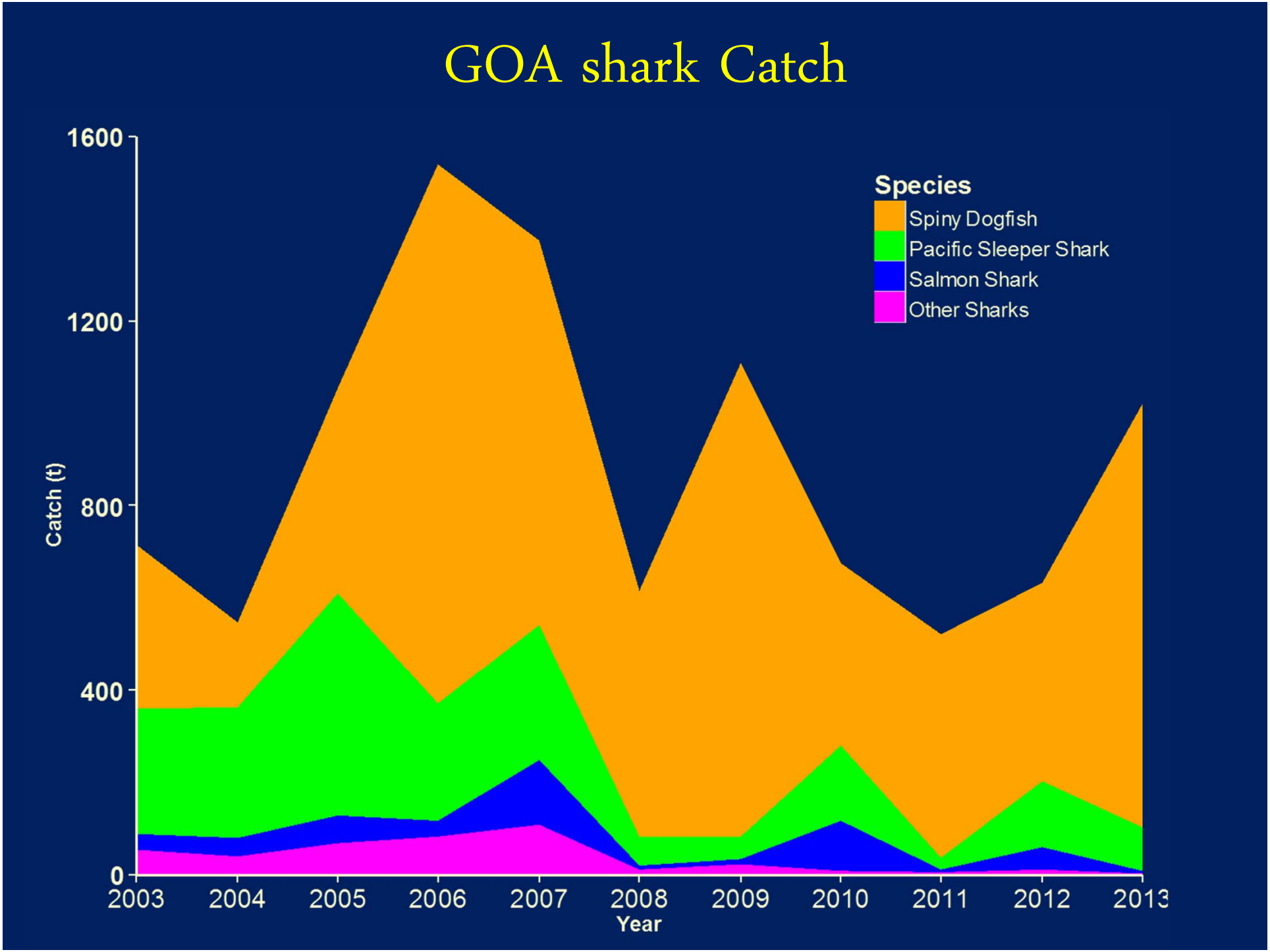

Spiny Dogfish:
Most Recent Trawl Surveys
2009
50
Weight (kg)
2011
50
Weight (kg)
2013
50
Weight (kg)
0
250
500
km


Spiny Dogfish:
Catch Observed in Commercial Fisheries
2011
500
Weight (kg)
2012
500
Weight (kg)
0
250
500
km


Pacific Sleeper Shark:
Most Recent Trawl Surveys
2009
150
Weight (kg)
2011
150
Weight (kg)
2013
150
Weight (kg)
0
250
500
km


Pacific Sleeper Shark:
Catch Observed in Commercial Fisheries
primarily pollock and cod fisheries
but in 2013 large increase in halibut fishery.
0
250
500
km
2011
250
Weight (kg)
2012
250
Weight (kg)

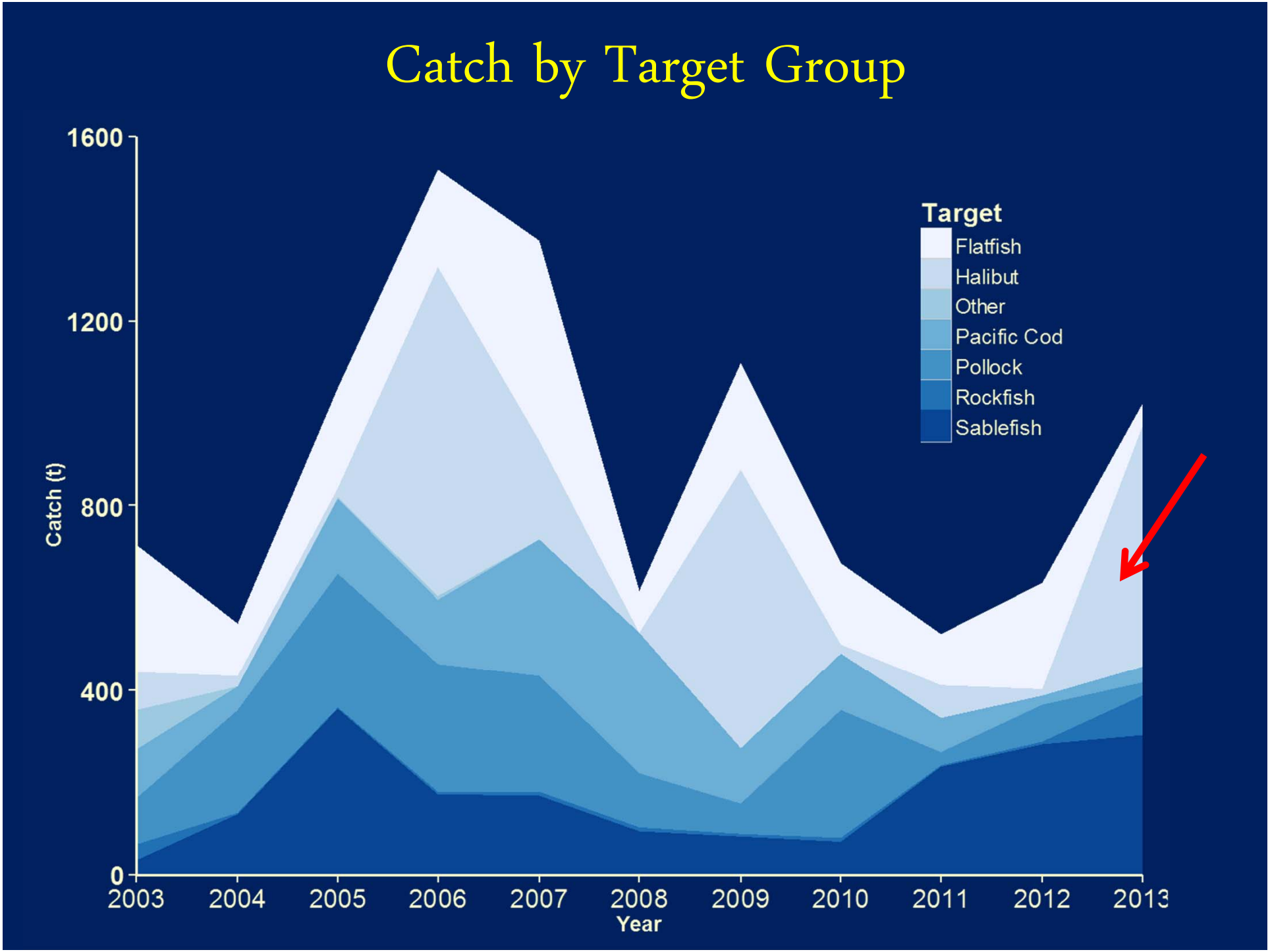
GOA shark Catch



Impacts of Observer Restructuring

- Preliminary:
  - New target group catching sharks
  - Catch reported in new areas

Catch by Target Group



Catch in New Areas

- Inside waters areas 649 (Prince William Sound) and 659 (Southeast Alaska inside waters)
- Large increase in catch of sharks by halibut target group in these areas
- Mostly Pacific sleeper shark (~ 125 t) and spiny dogfish (~ 50 t)
  - (small amount of "other sharks")
- Does not count against TAC

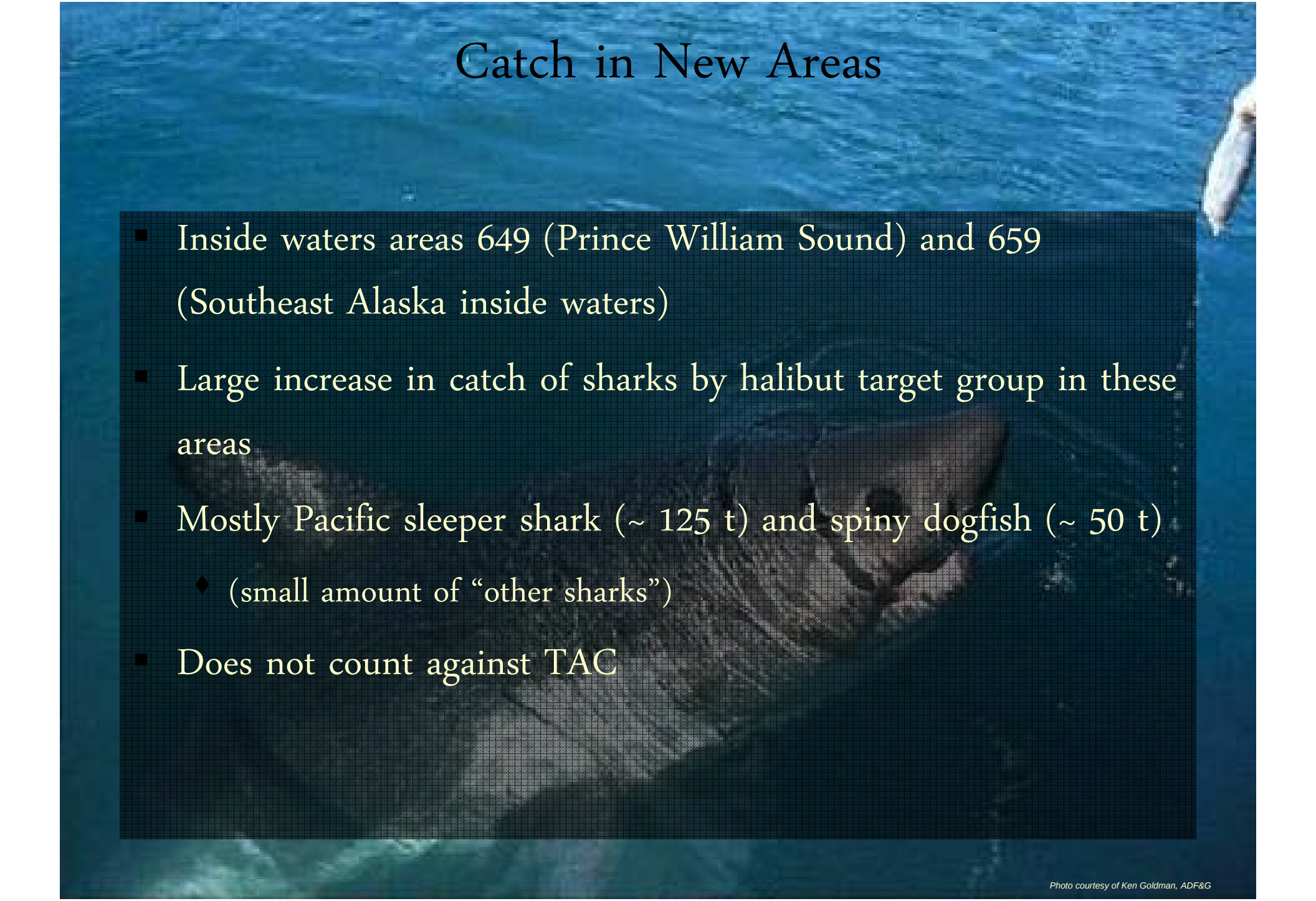
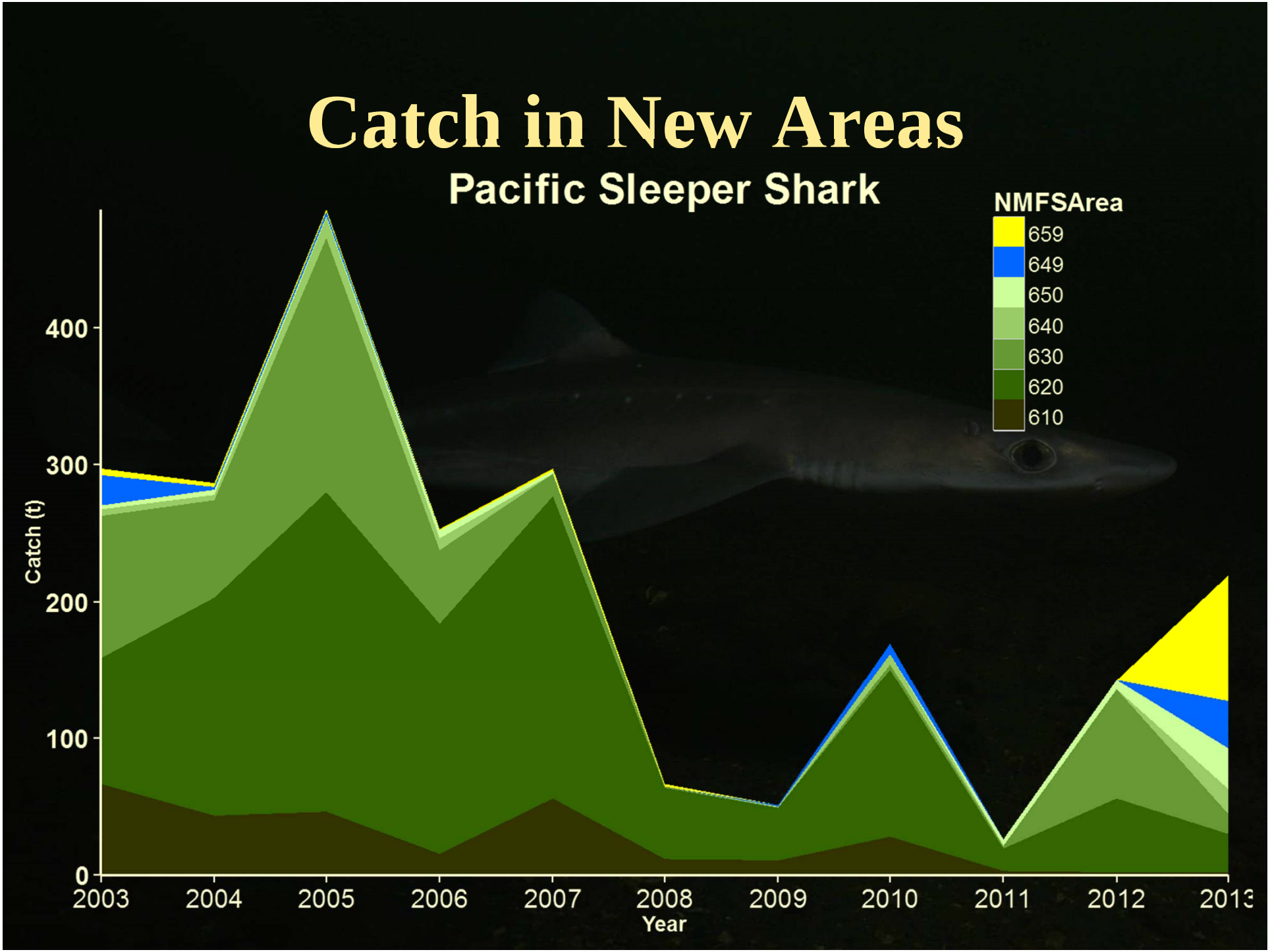
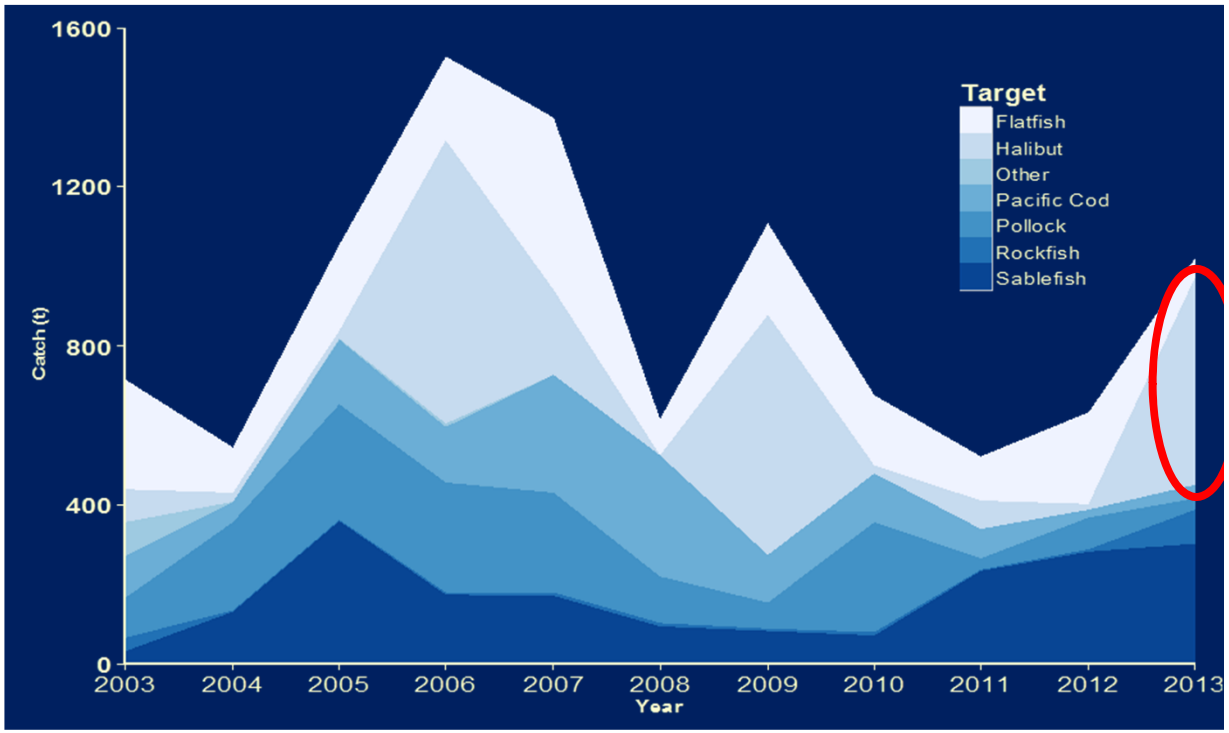


Photo courtesy of Ken Goldman, ADF&G


Catch in New Areas
Pacific Sleeper Shark
NMFSArea
659
649
650
640
630
620
610
Catch (t)
0
100
200
300
400
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Year

Other Catch Notes

- 82 t of dogfish caught in rockfish fishery
  - Average 7 t
  - Most during 3 weeks in May
  - Area 630
  - Unlikely an observer effect
  - Fishing behavior unchanged



ABC and OFL Calculations

- Spiny Dogfish
  - Tier 6*
  - OFL = M * 3yr avg biomass = 7,416 t
  - ABC = 0.75 * M * 3yr avg biomass = 5,562 t
- Pacific sleeper, salmon and other/unidentified sharks
  - Tier 6
  - OFL = avg historical catch (1997 – 2007) = 571 t
  - ABC = 0.75 * OFL = 428 t
- Shark Complex
  - OFL = 7,986 t
  - ABC = 5,989 t

21. Squid

- Unreliable biomass estimates for squid
- Predominant species in catch assumed to be *B. magister*, primarily caught in pollock fishery
- Managed under Tier 6 based maximum catch 1997-2007
- Catch: 2013 = 200 t
  - Compared to 22 t in 2012
  - Similar to most years since 2006 (1,530 t)

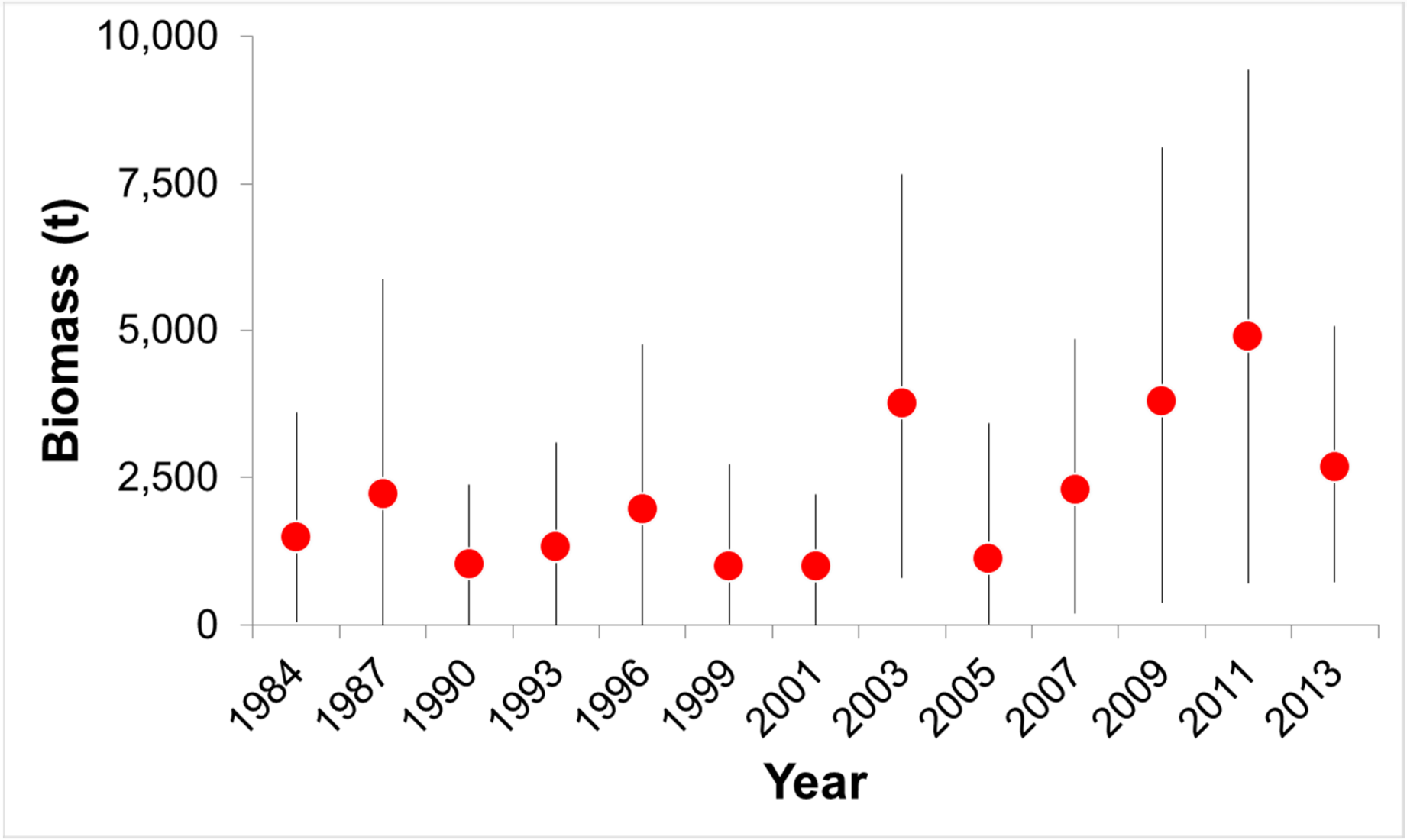
2013 recommendations

	last year		**this year**	
Quantity/Status	*2013*	*2014*	**2014**	2015
M (natural mortality)	*n/a*	*n/a*	**n/a**	n/a
Specified/recommended Tier	*6*	*6*	**6**	6
Biomass	*n/a*	*n/a*	**n/a**	n/a
average historical catch 1997-2007	*272*	*272*	**272**	272
maximum historical catch 1997-2007	*1,530*	*1,530*	**1,530**	1,530
Recommended OFL (max. hist. catch; t)	*1,530*	*1,530*	**1,530**	1,530
Recommended ABC (0.75*OFL; t)	*1,148*	*1,148*	**1,148**	1,148
Status	*As determined last year for:*		As determined this year for:	
	2011	*2012*	2012	2013
Overfishing	*No*	*n/a*	No	n/a
Overfished	*n/a*	*n/a*	n/a	n/a
Approaching overfished	*n/a*	*n/a*	n/a	n/a
(for Tier 6 stocks, data are not available to determine whether the stock is in an overfished condition)				

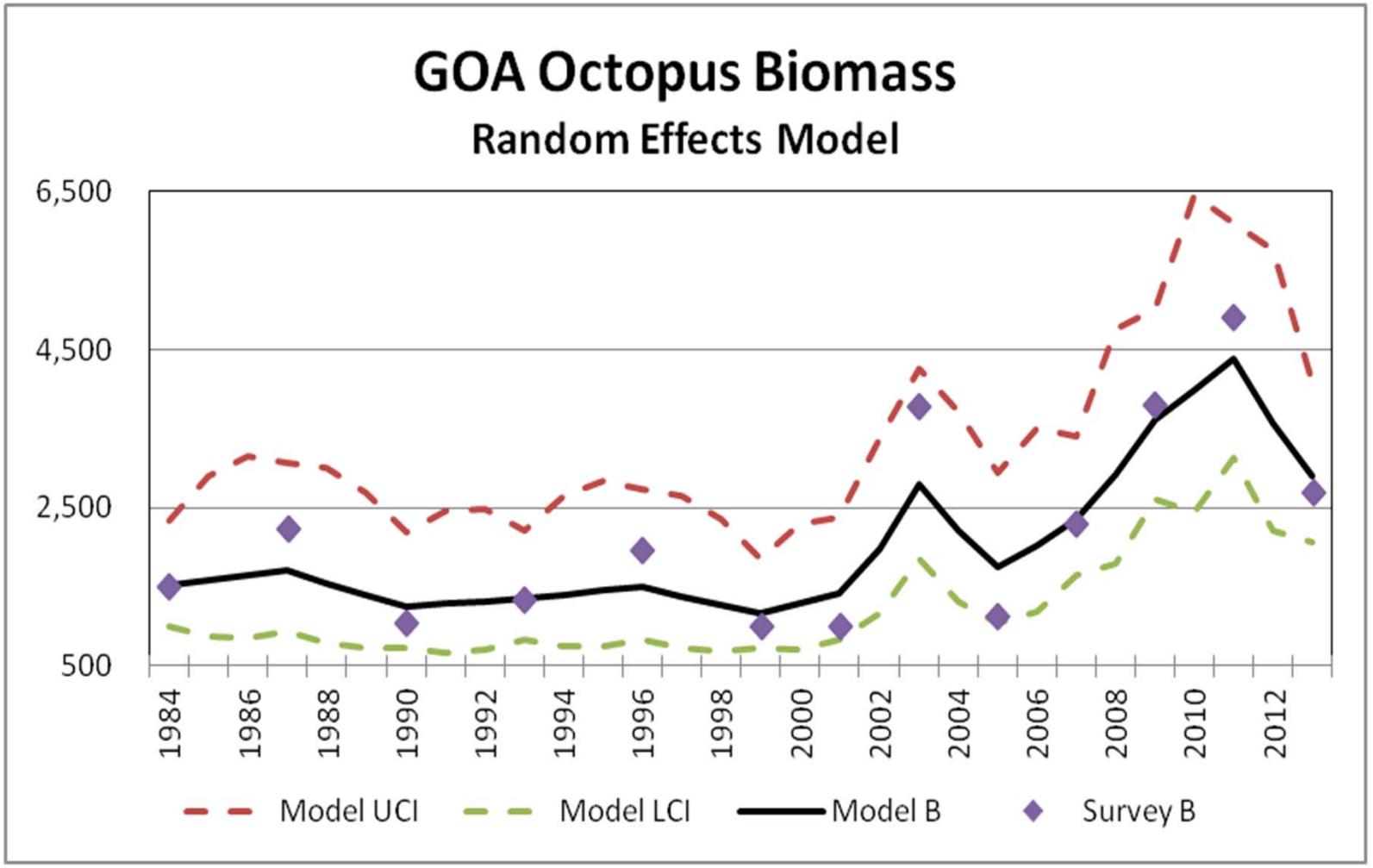
22. Octopus

- **Seven species of octopus: catches and biomass predominantly Giant Pacific octopus**
- **Tier 6 approach inadequate for management of octopus**
- **Tier 5 considerations**
  - Bottom-trawl reasonable as a minimum biomass estimate
  - Survey smaller octopus than fishery
  - Conservative *M* assumption could apply (M= 0.53)
  - Life-history information (esp M) insufficient for Tier 5 management

GOA octopus survey biomass estimates



Smoothing Model for Biomass Time Series – Random Effects



Octopus

Alternative Tier 6

	Biomass	OFL	ABC
2014	3,791	2,009	1,507
2015		2,009	1,507

Tier 6 computed using Tier 5 approach:

OFL = B×M

= 3,791 t × 0.53

= 2,009 t

Area Apportionment

	610	620	630	640	650
2013 Survey Biomass	35%	21%	40%	4%	1%
2012 Incidental Catch	42%	6%	52%	0%	0%

GOA octopus plans for 2014

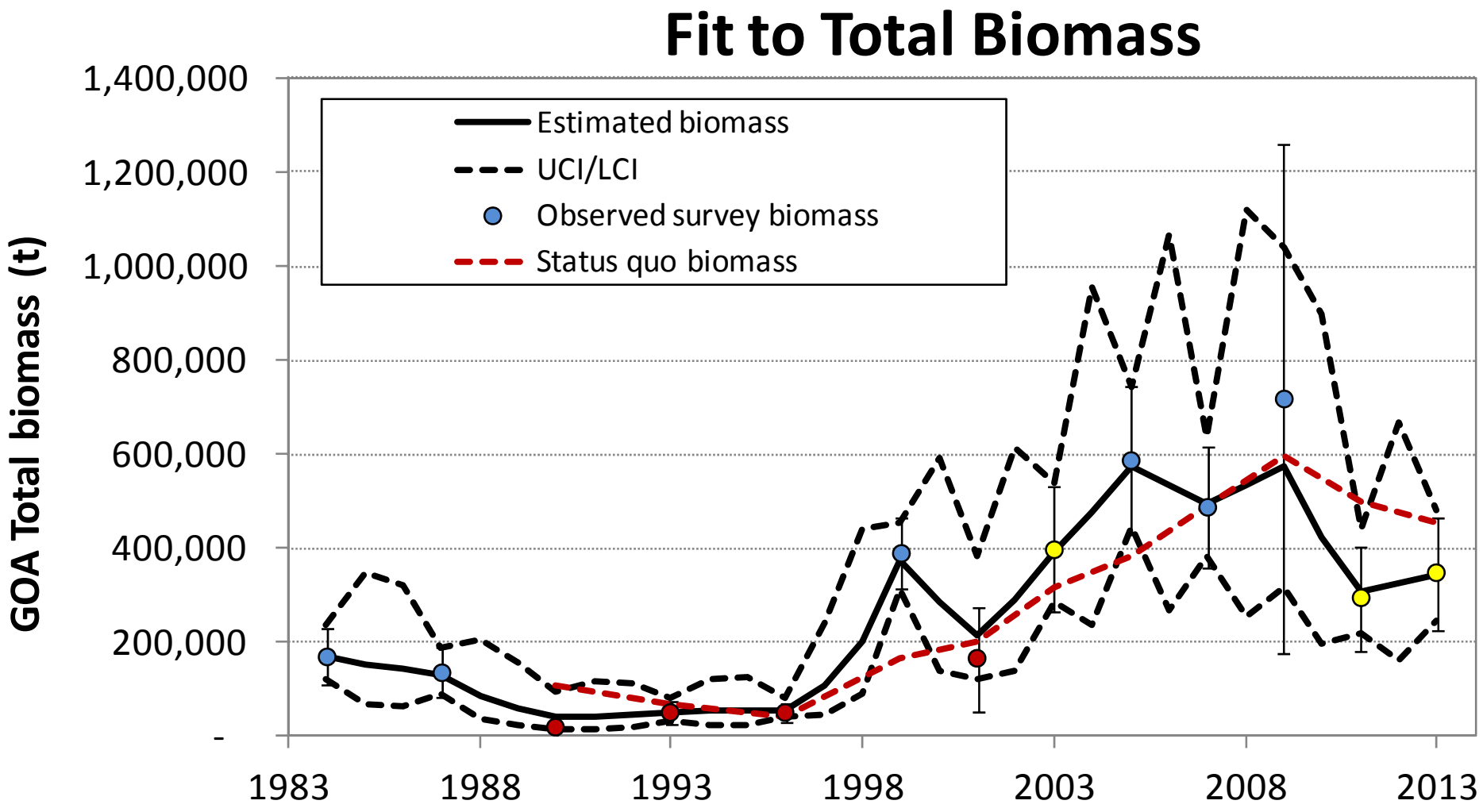
- Tagging study results – mortality rate
- Growth rates from current studies
- Size-structured model ?
- Respond to CIE comments
  - Update and review state survey data more closely
  - Exploratory model based on life history
  - Review commercial CPUE trends
- More research results: life history, discard mortality, possible index survey gear

Appendix: Grenadiers

- Not part of FMPs so assessment not officially required
- 7 species, giant grenadier by far the dominant species;
  Pacific & popeye grenadier much less important
- In assessments, giant grenadier is proxy for group (most commonly caught in survey and fishery)
- Executive summary presented, full assessments presented in even years
- New data includes 1) updated catch, 2) trawl survey results for GOA in 2013, 3) longline survey results for GOA and EBS for 2013
- No changes in assessment methodology (Tier 5 approach)

Biomass estimation: random effects model

1-1,000 m sampled > 700 m not sampled > 500 m not sampled



BSAI Grenadiers – Tier 5 Recommendations

- EBS and GOA Biomass = avg. 3 most recent deepwater trawl surveys (GOA -2005, 2007, 2009; EBS – 2008, 2010, 2012)
- AI Biomass = avg. from last 3 years (new biomass estimation method in 2012 using RPW)
- Same ABC and OFL as last year (no new survey data)

Recommended "unofficial" OFLs and ABCs for 2014/2015 (t):

Area	Biomass	M	OFL	ABC	catch
GOA	597,884	0.078	46,635	34,976	10,525
EBS	553,557	0.078	43,177	32,383	1,482
AI	598,727	0.078	46,700	35,026	2,367
BSAI total	1,152,284		89,878	67,409	3,849

Max ABC = 0.75 x OFL
OFL = biomass x M

Estimated Fishery Catch

	EBS	AI	GOA	total
2012	2,913	4,570	7,913	15,415
2013	1,482	2,367	10,524	14,374
1997-2013	2,900	2,621	9,920	15,413

Catch well below ABCs

- BSAI = 67,409; GOA = 34,976

BS: down 49% from 2012 & down 45% from avg.

- Decrease in Greenland turbot fishery and "other flatfish"

AI: down 48%, but variation is normal

GOA: up 33%

- Increase in "other flatfish" and rockfish

Appendix: Grenadiers

- **Plan Team recommendations**
  - Tier 5 seems reasonable given reliable biomass estimates from the trawl surveys
  - GOA Team recommend moving into the FMP and manage as "in the fishery"

Additional Plan Team discussions

- State waters catch issues
  - Areas 649 and 659
  - **Proposal that Federal catch accounting system deduct the catch from areas 649 and 659 from the Federal TACs for federally specified species (50 CFR part 679, Table 2a FMP Groundfish Species) that do not have State GHL fisheries in Areas 649 and 659.**
- Stock structure
  - Octopus, skates, northern/southern rocksole, arrowtooth flounder, DWFs (Dover sole)