WCPFC
MANAGEMENT OBJECTIVES WORKSHOP

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THE ESTIMATION STRATEGY OF ABC AND MANAGEMENT RULE OF TAC FOR JAPANESE WATERS

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The estimation strategy of ABC and the management rule of TAC for Japanese water

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Purpose

- Understanding the strategy to estimate ABC and rule to set TAC for Japanese water fishery stocks

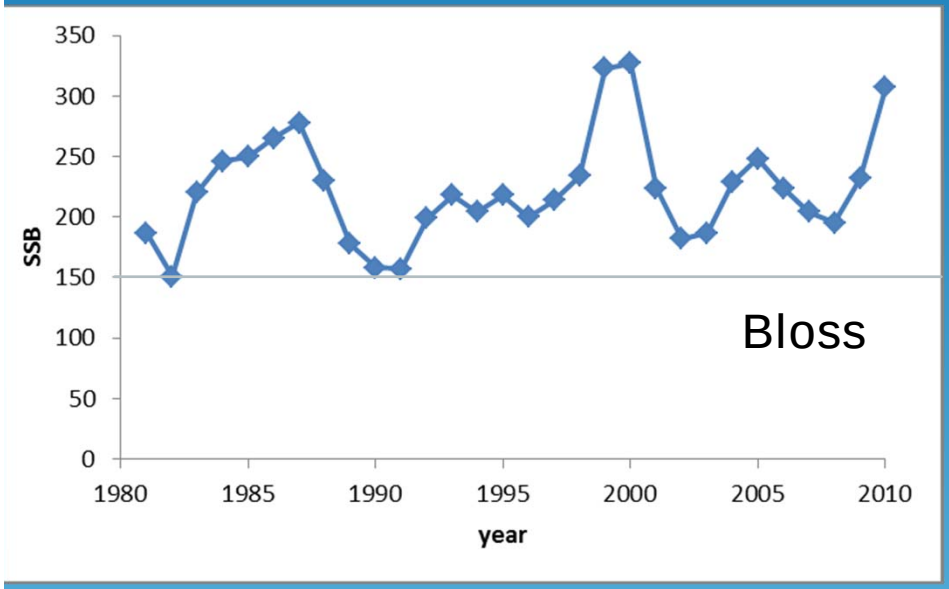
Postulate

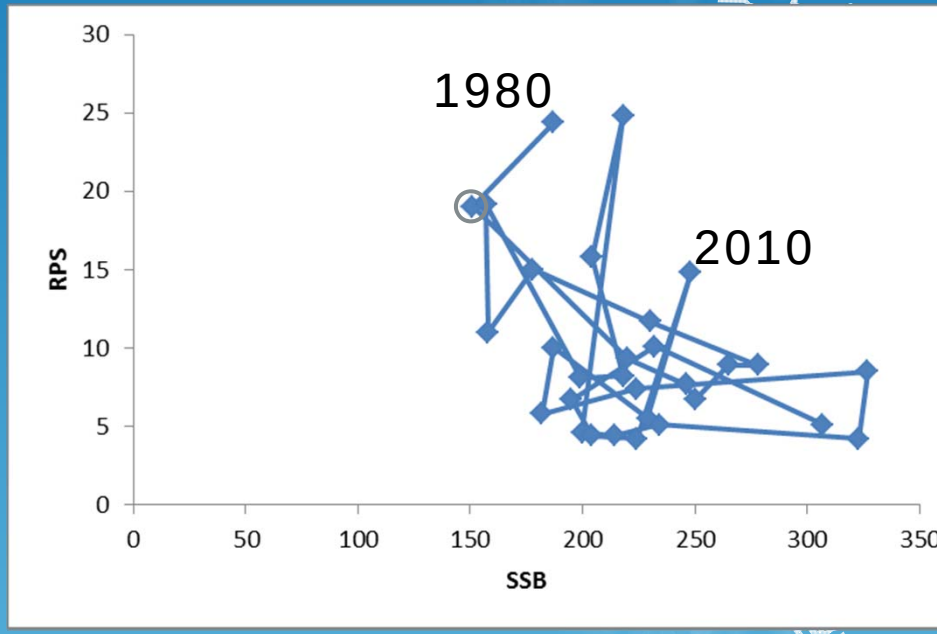
- These fisheries have long history and have never experienced the stock level of Bmsy
- The relationships between SSB & R are unclear

20 stocks for TAC

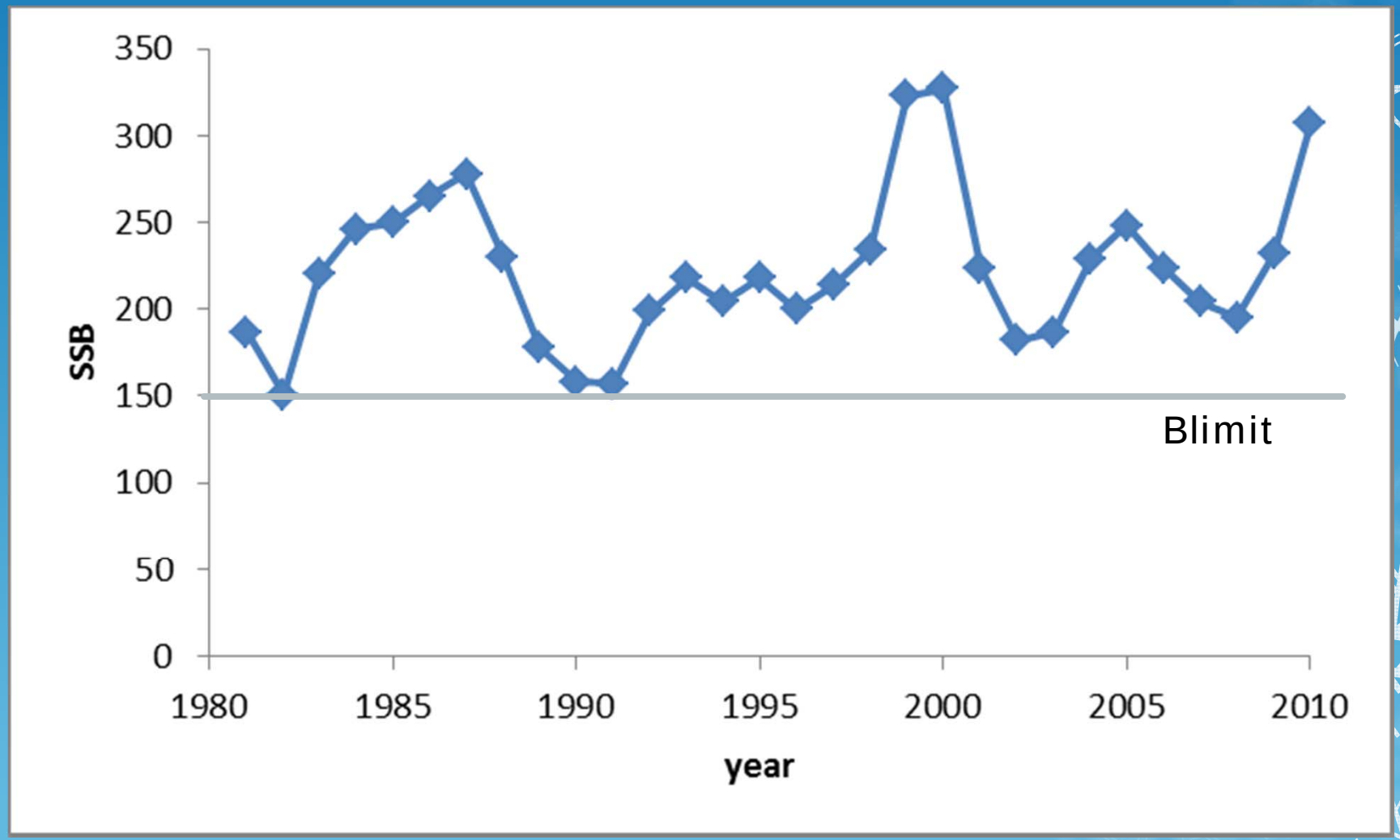
- For 12 stocks, Blimits are set to estimate ABC
- For 10 stocks, Bloss’s are used as Blimit

Bloss Smallest Biomass with enough RPS

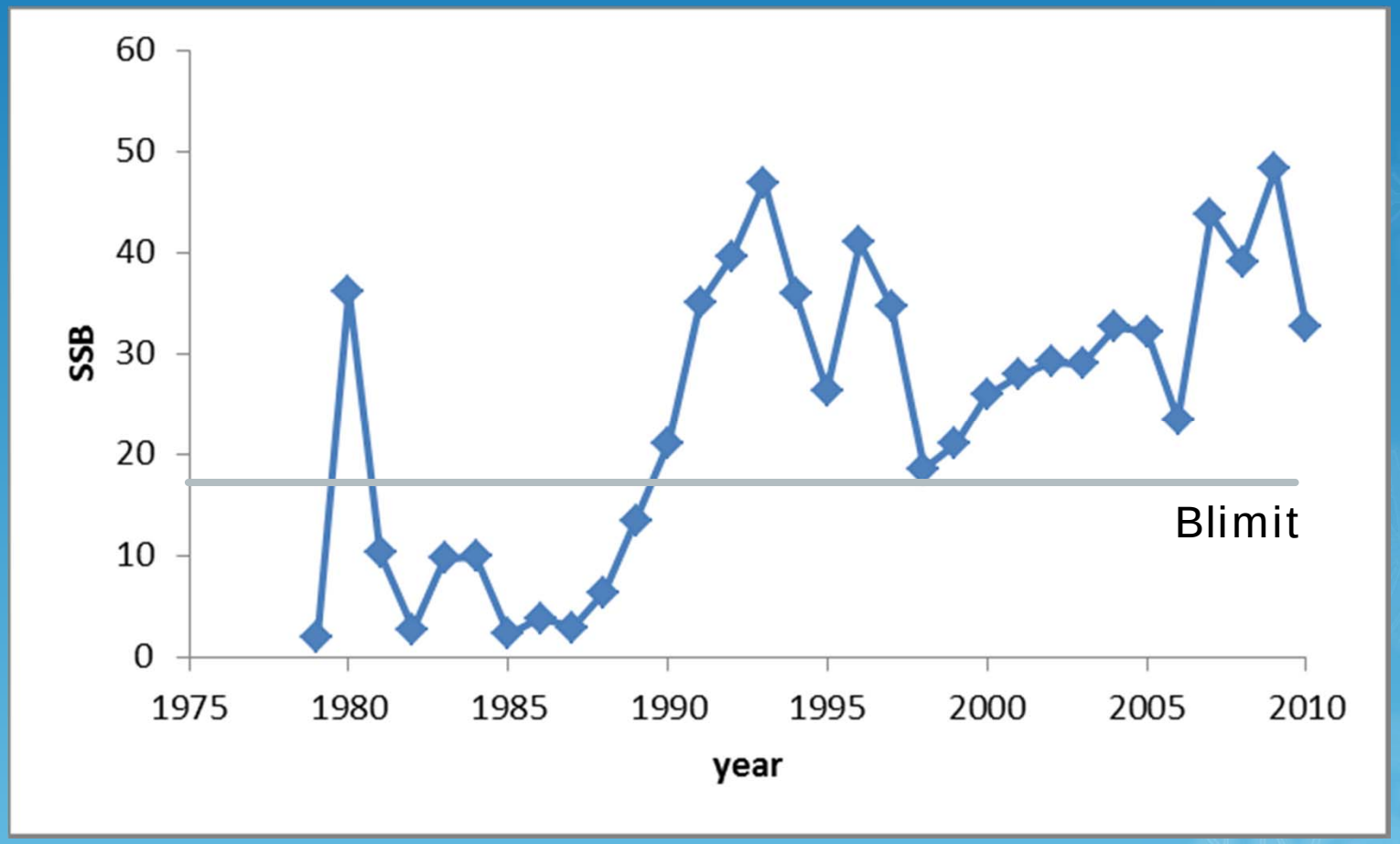




Alaska pollock in PO



Japanese flying squid of Winter spawning



Hilborn 2010

"Pretty Good Yield" (PGY: within 80% of MSY) has wide range

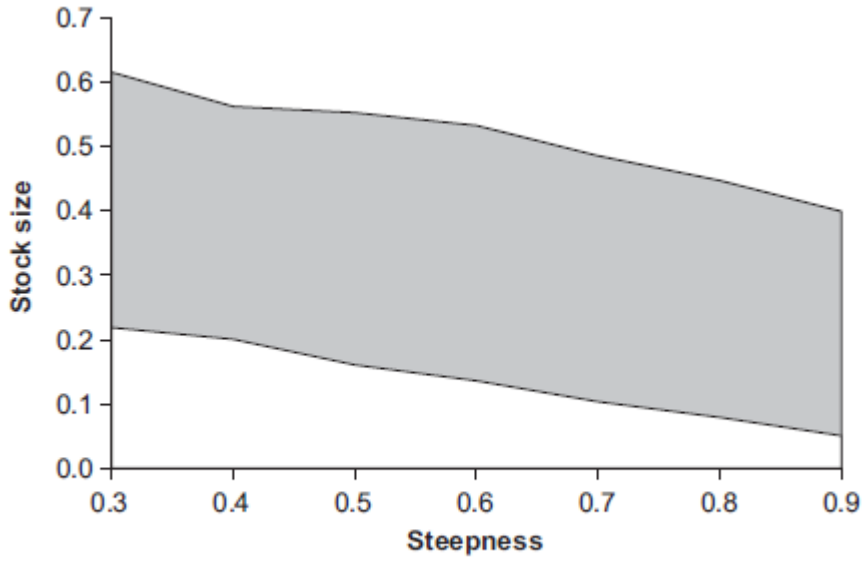


Fig. 3. The region of PGY plotted versus steepness and stock size.

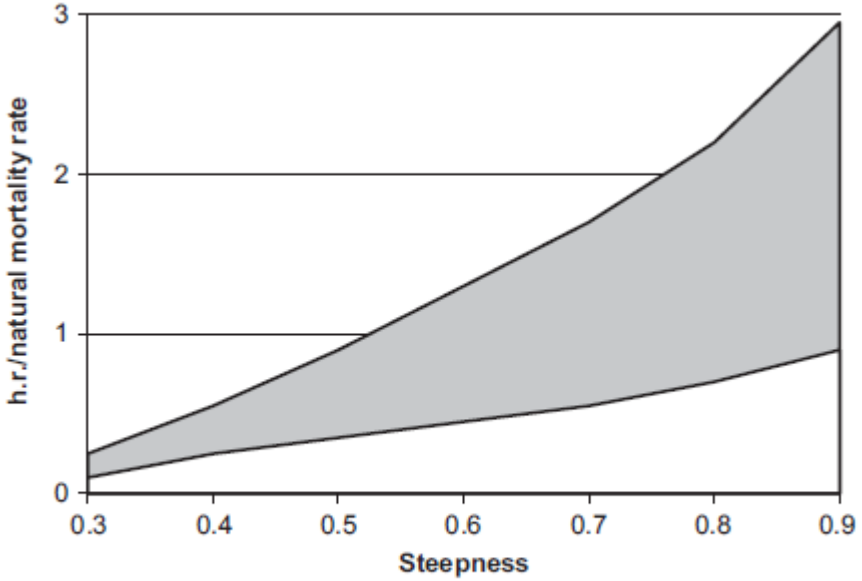


Fig. 4. The region of PGY plotted against steepness and the ratio of harvest rate to natural mortality rate.

MSY is hard to estimate and
There is high probability
Bloss is in PGY especially on high steepness

Discussion

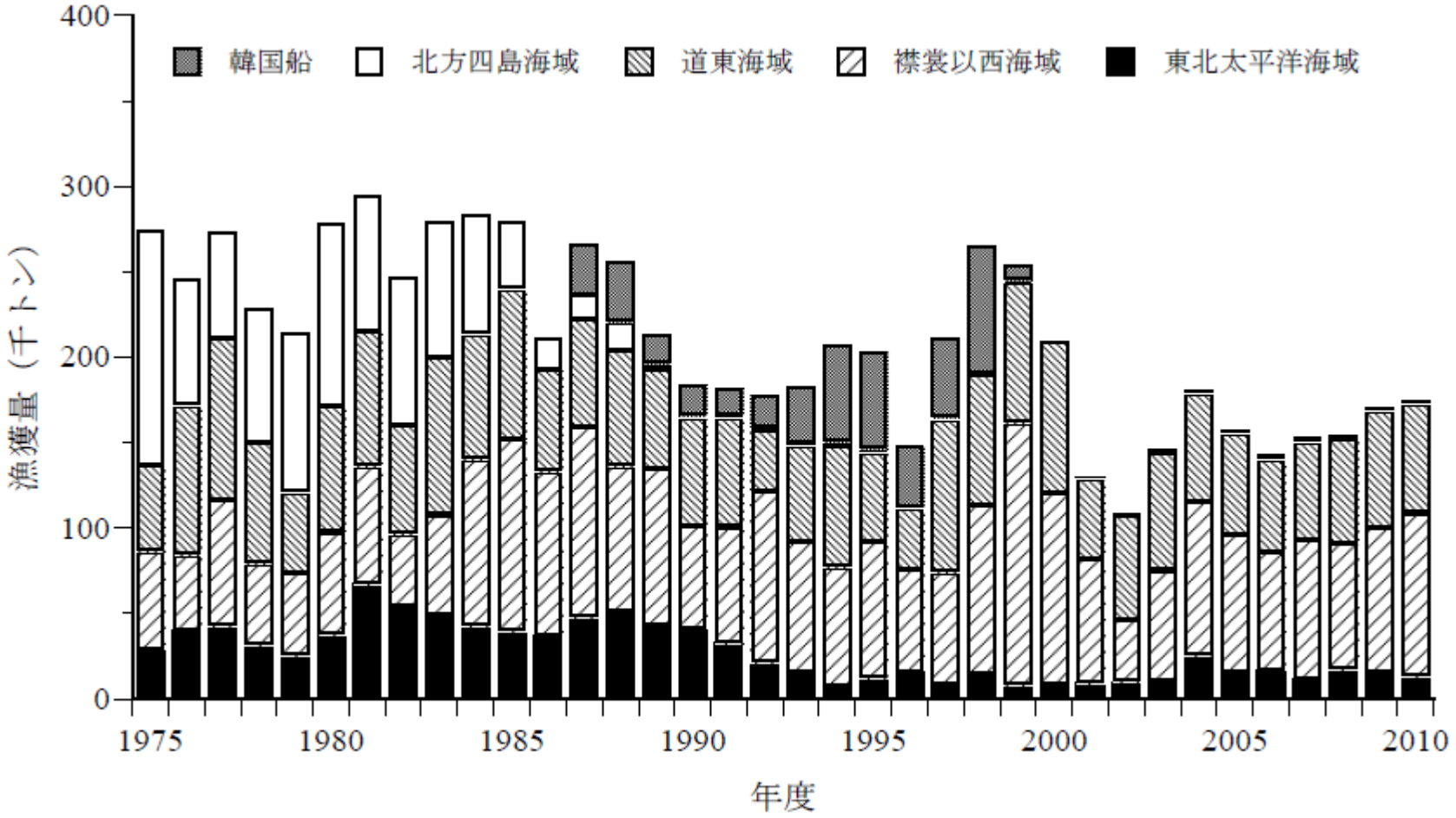
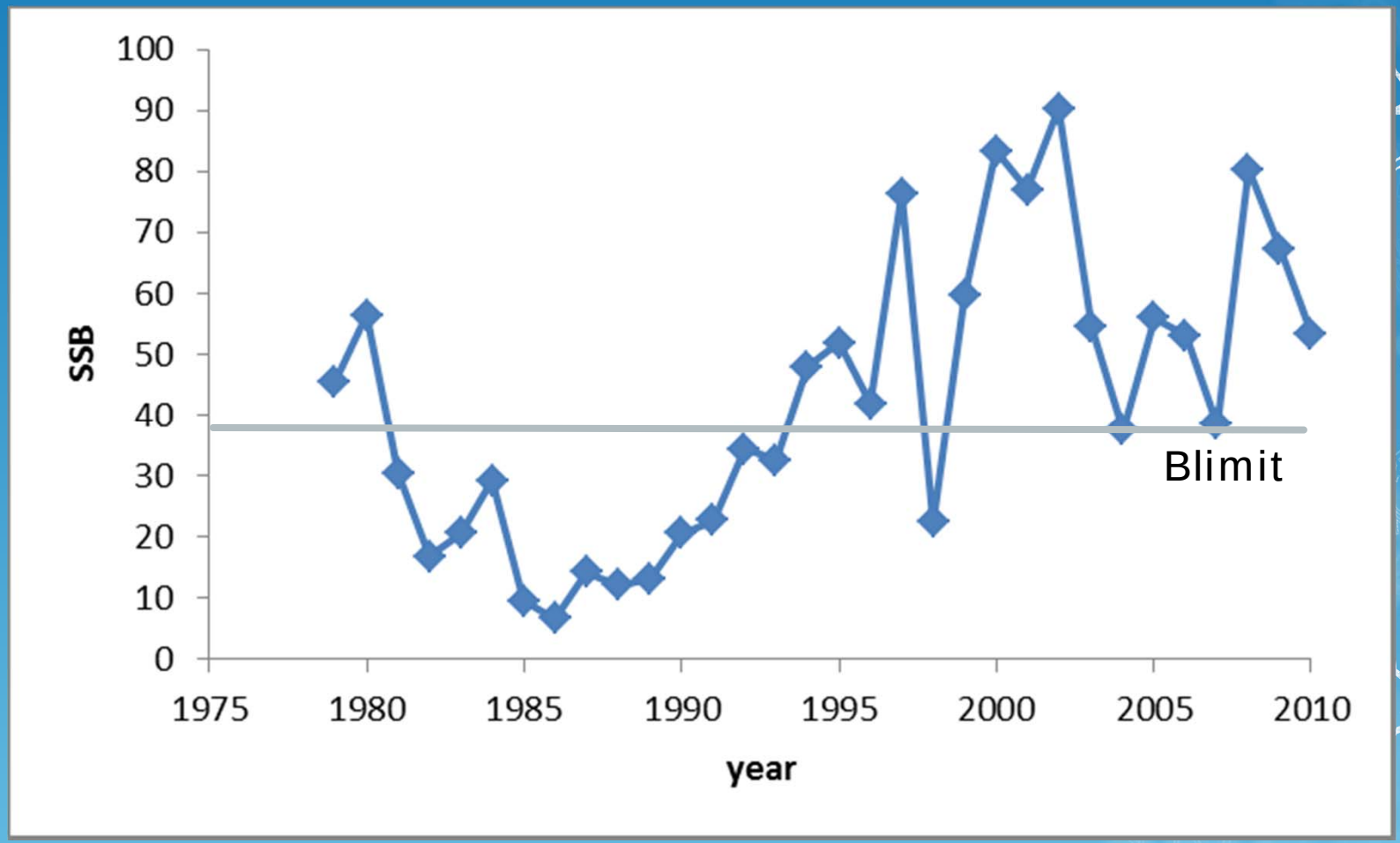
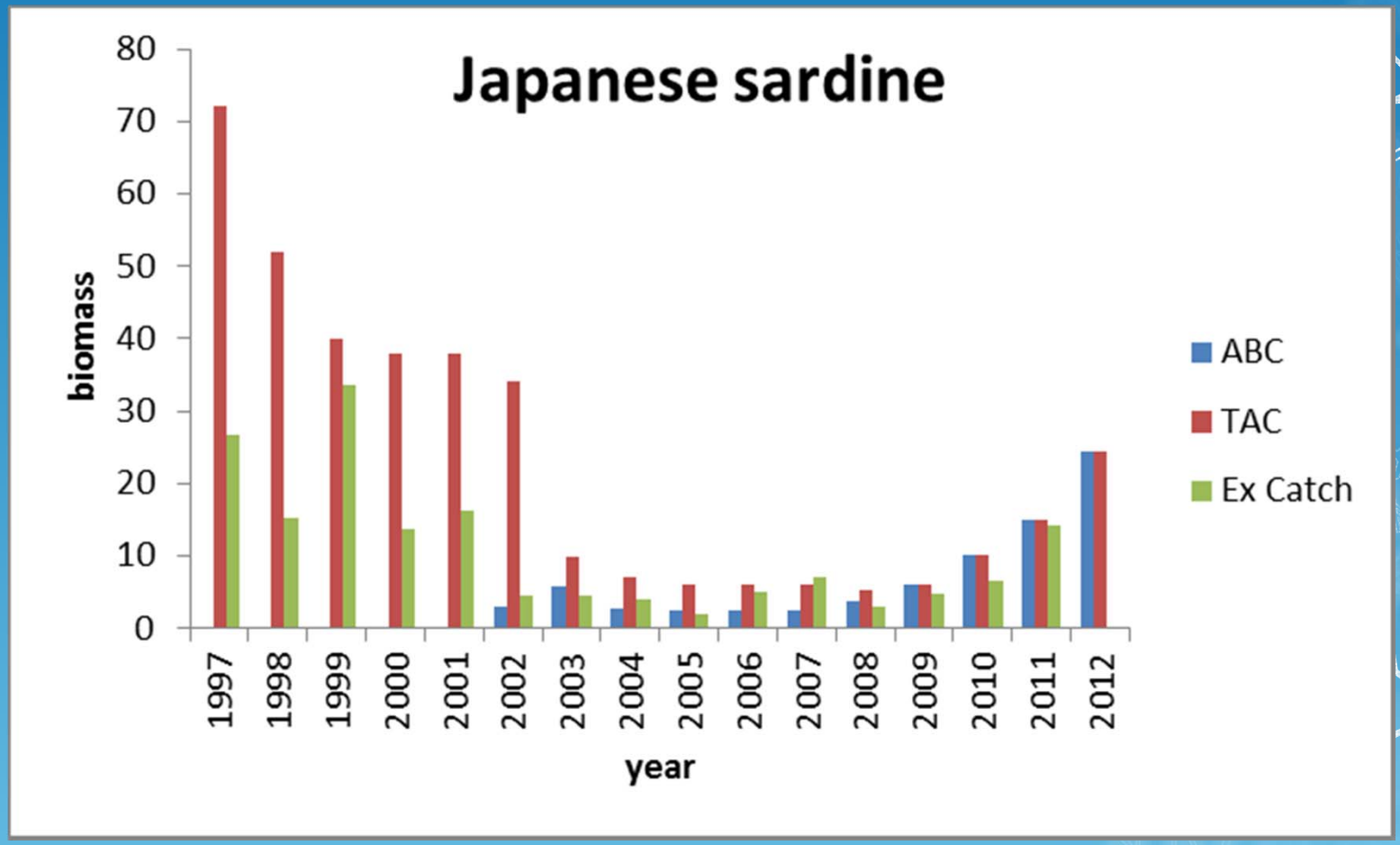
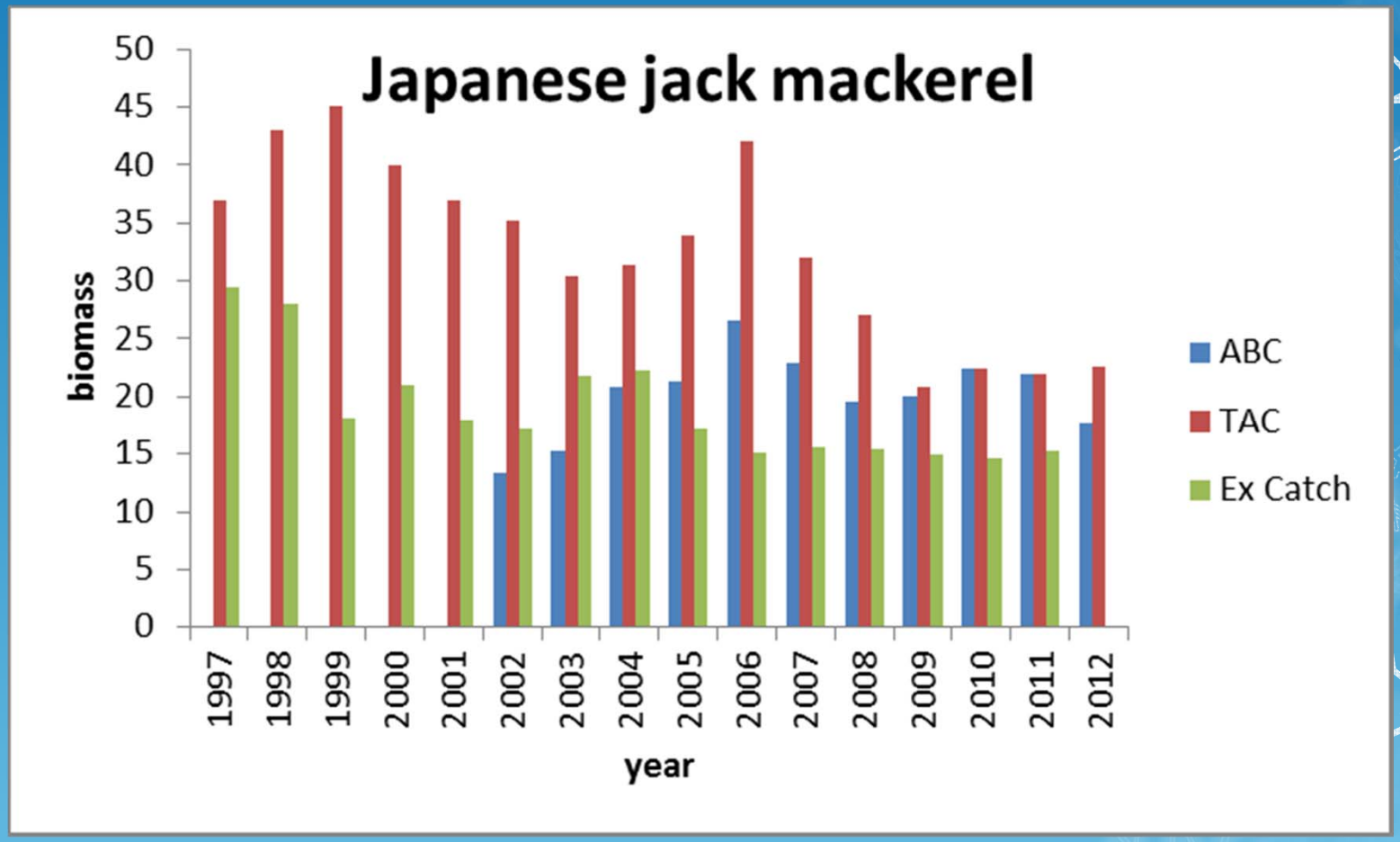


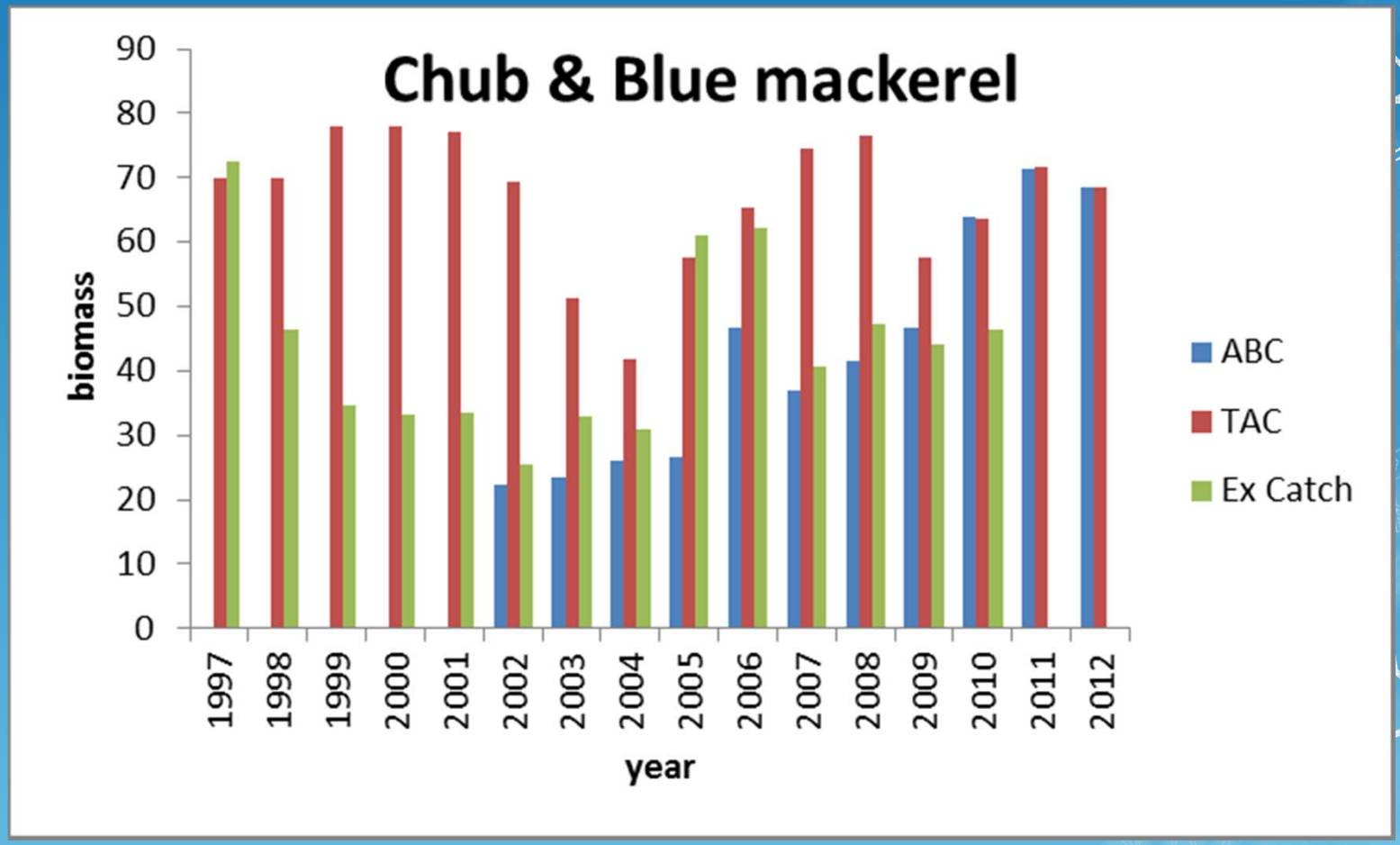
図 5. 海域別漁獲量の推移

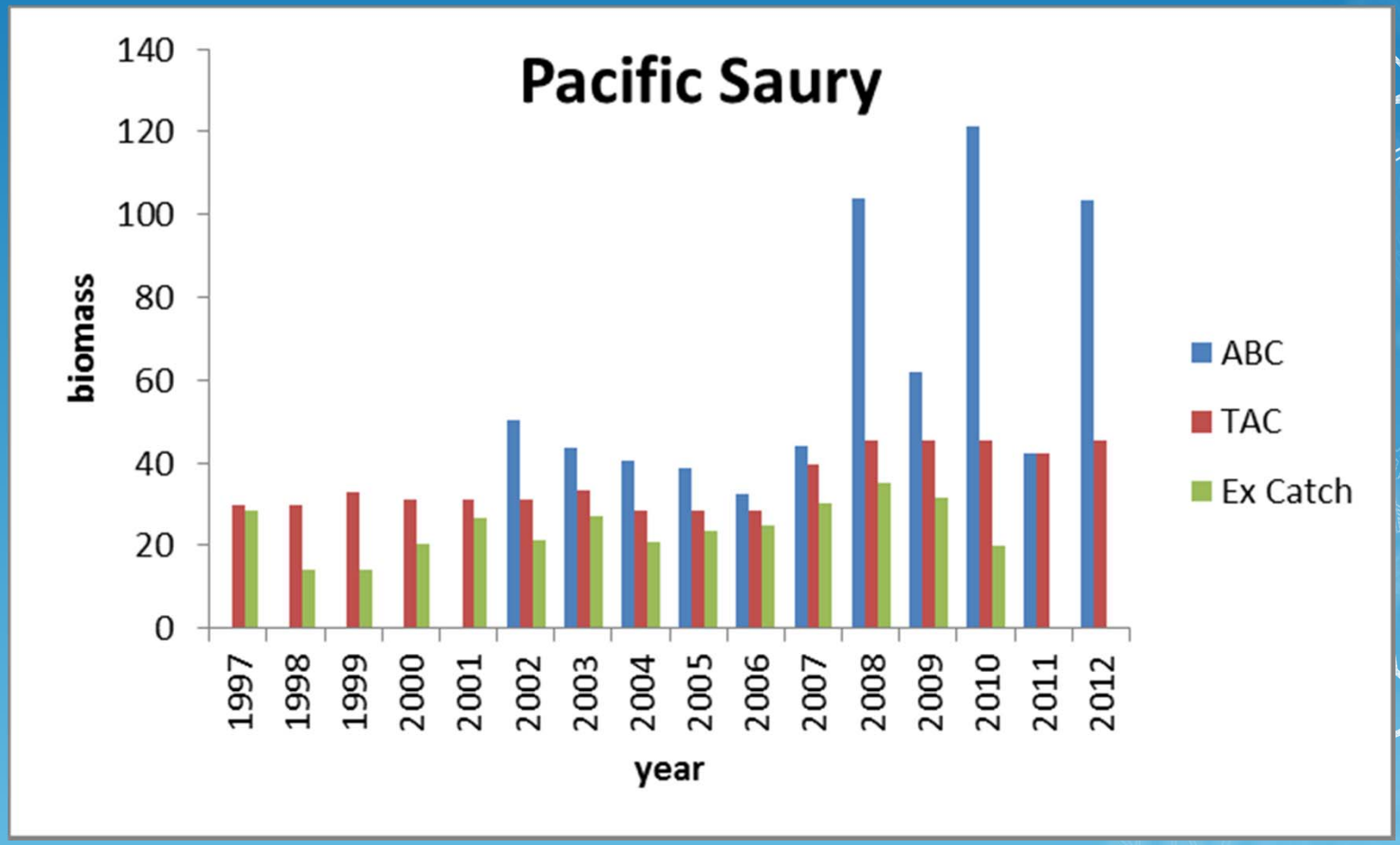
Japanese flying squid of Autumn spawning




Japanese sardine
biomass
80
70
60
50
40
30
20
10
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
year
ABC
TAC
Ex Catch


Japanese jack mackerel
biomass
50
45
40
35
30
25
20
15
10
5
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
year
ABC
TAC
Ex Catch


Chub & Blue mackerel
biomass
90
80
70
60
50
40
30
20
10
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
year
ABC
TAC
Ex Catch


Pacific Saury
biomass
140
120
100
80
60
40
20
0
1997
1998
1999
2000
2001
2002
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2005
2006
2007
2008
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2010
2011
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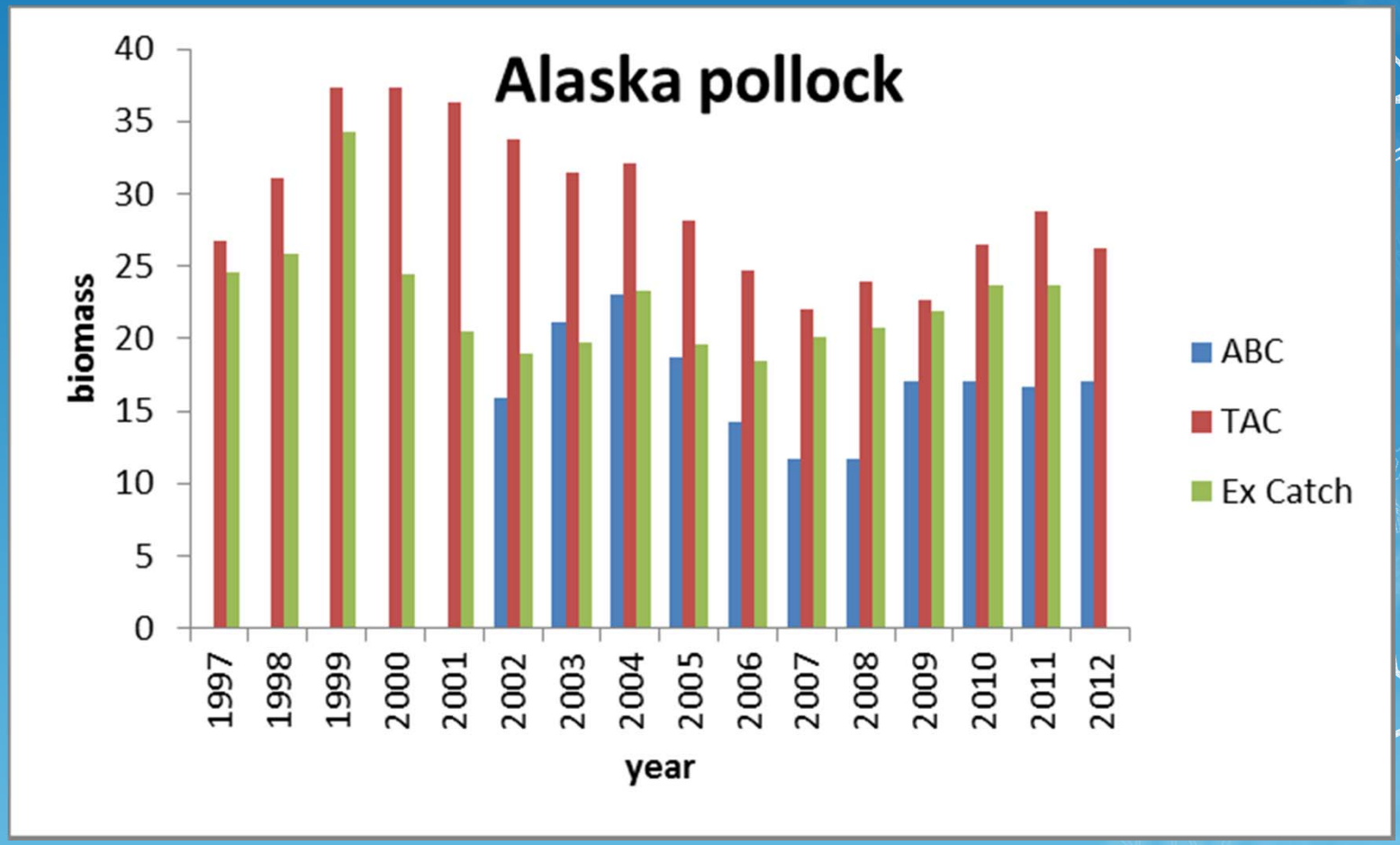
year
ABC
TAC
Ex Catch


Alaska pollock
biomass
40
35
30
25
20
15
10
5
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
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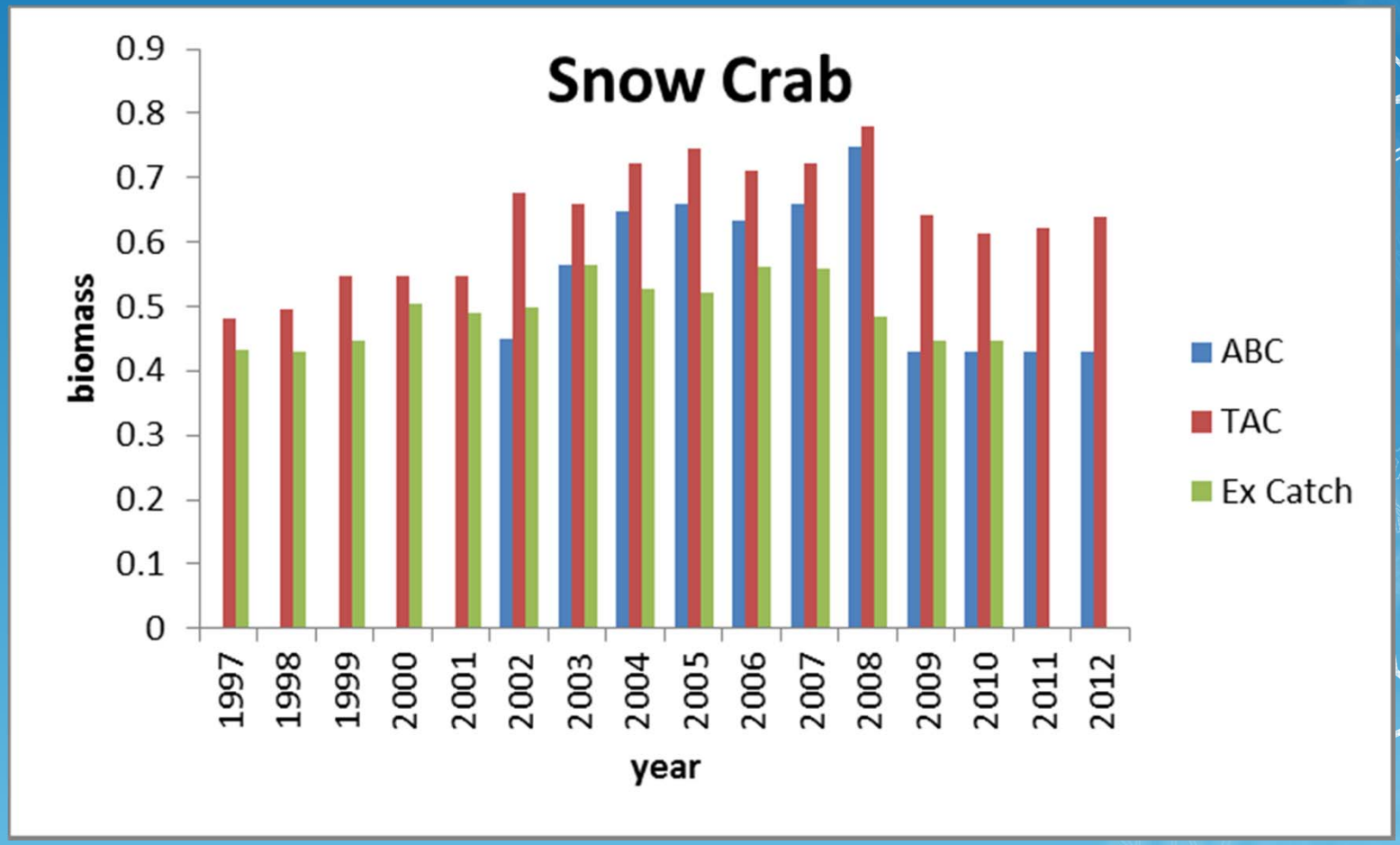
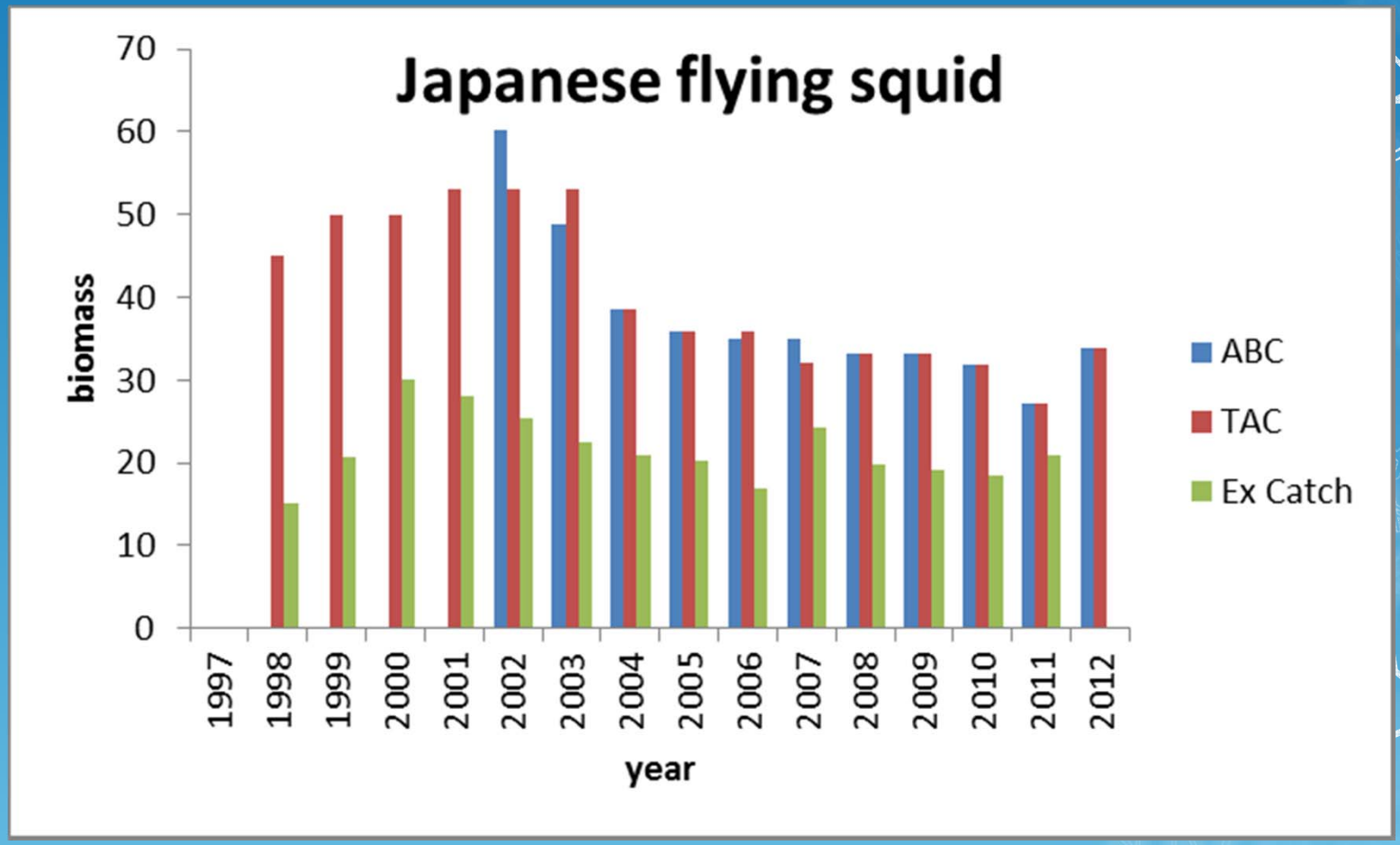
2010
2011
2012
year
ABC
TAC
Ex Catch

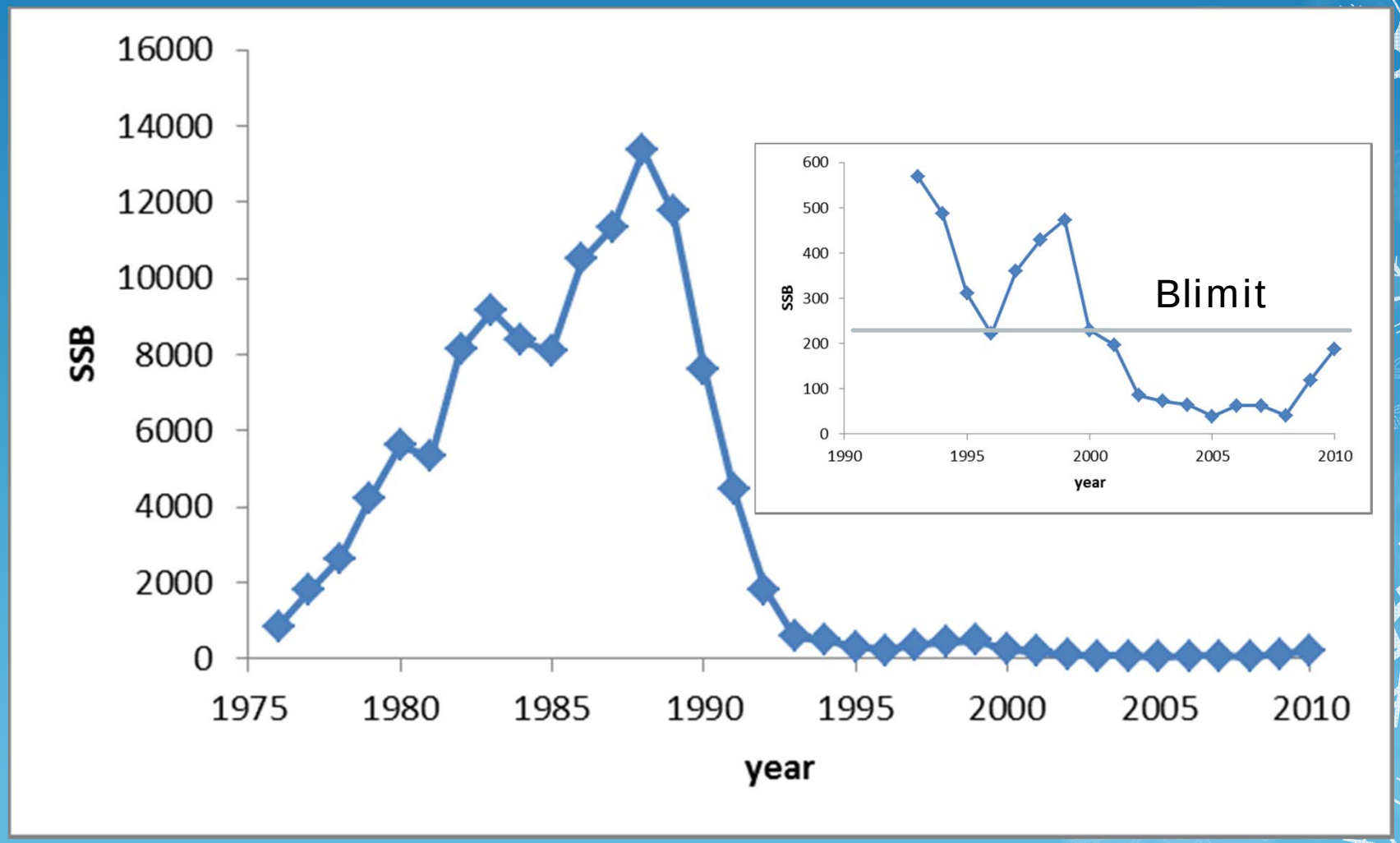

Snow Crab
biomass
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
year
ABC
TAC
Ex Catch


Japanese flying squid
biomass
70
60
50
40
30
20
10
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
year
ABC
TAC
Ex Catch

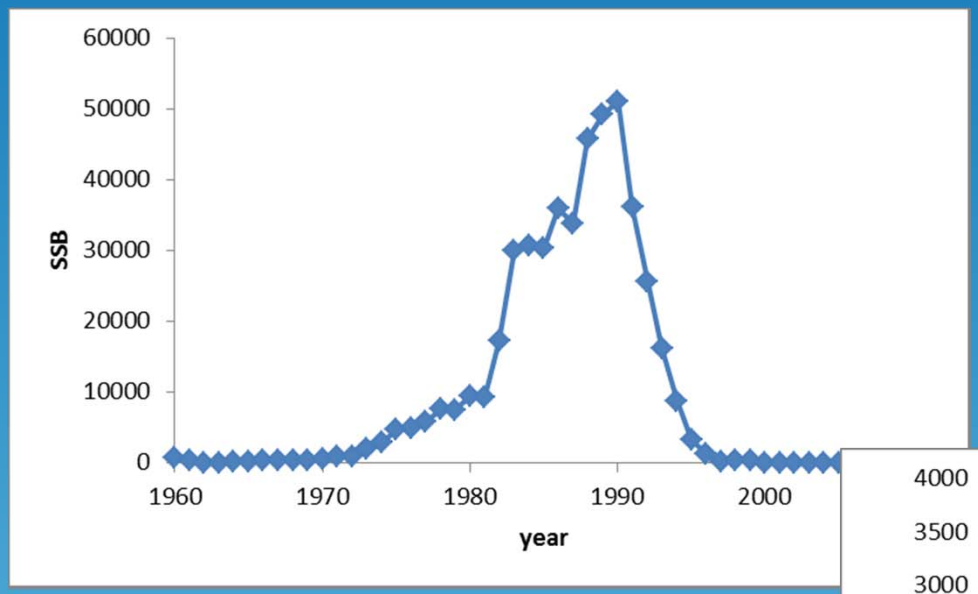
Stock conditions

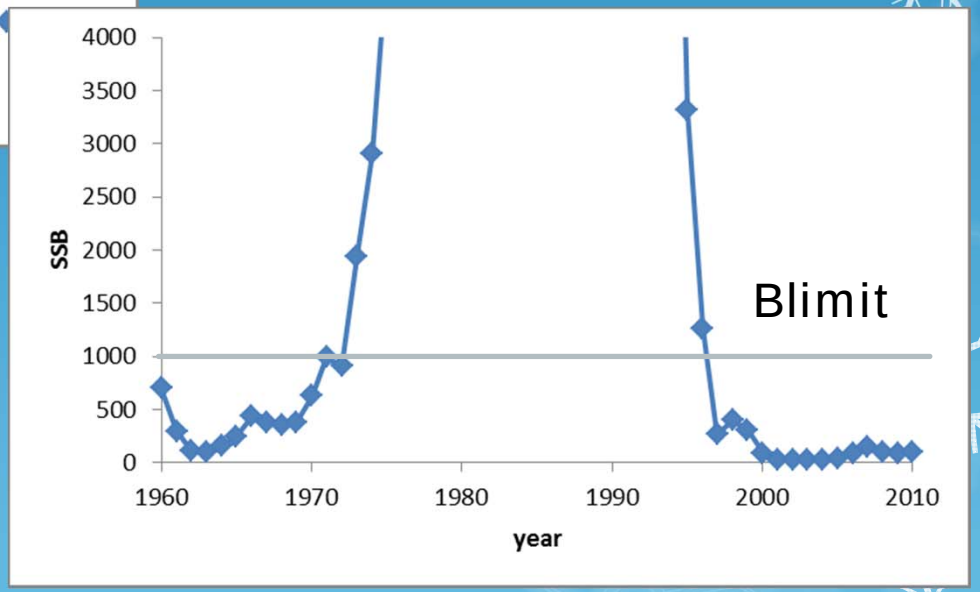
Species	Population	Current Condition	Bcurrent vs Blimit
Japanese sardine (*Sardinops melanostictus*)	Pacific Ocean	Low	−
	Tushima warm current	Low	−
Japanese Jack Mackerel (*Trachurus japonicus*)	Pacific Ocean	Middle	−
	Tushima warm current	Middle	+
Chub Mackerel (*Scomber japonicus*)	Pacific Ocean	Low	−
	Tushima warm current	Middle	+
Blue Mackerel (*Scomber australasicus*)	Pacific Ocean	High	+
	East China Sea	Middle	+
Pacific Saury (*Cololabis saira*)	North West Pacific Ocean	Middle	
Alaska pollock (*Theragra chalcogramma*)	Sea of Japan	Low	−
	Nemuro Channel	Low	
	South Sea of Okhotsk	Low	
	Pacific Ocean	Middle	+
Snow Crab (*Chionoecetes opilio*)	Sea of Okhotsk	Low	
	North Pacific Ocean	Middle	+
	South Sea of Japan (A)	Middle	+
	North Sea of Japan (B)	High	
	West Hokkaido	Middle	
Japanese Flying Squid (*Todarodes pacificus*)	Winter Spawning	Middle	+
	Autumn Spawning	High	+

Japanese sardine in Pacific ocean

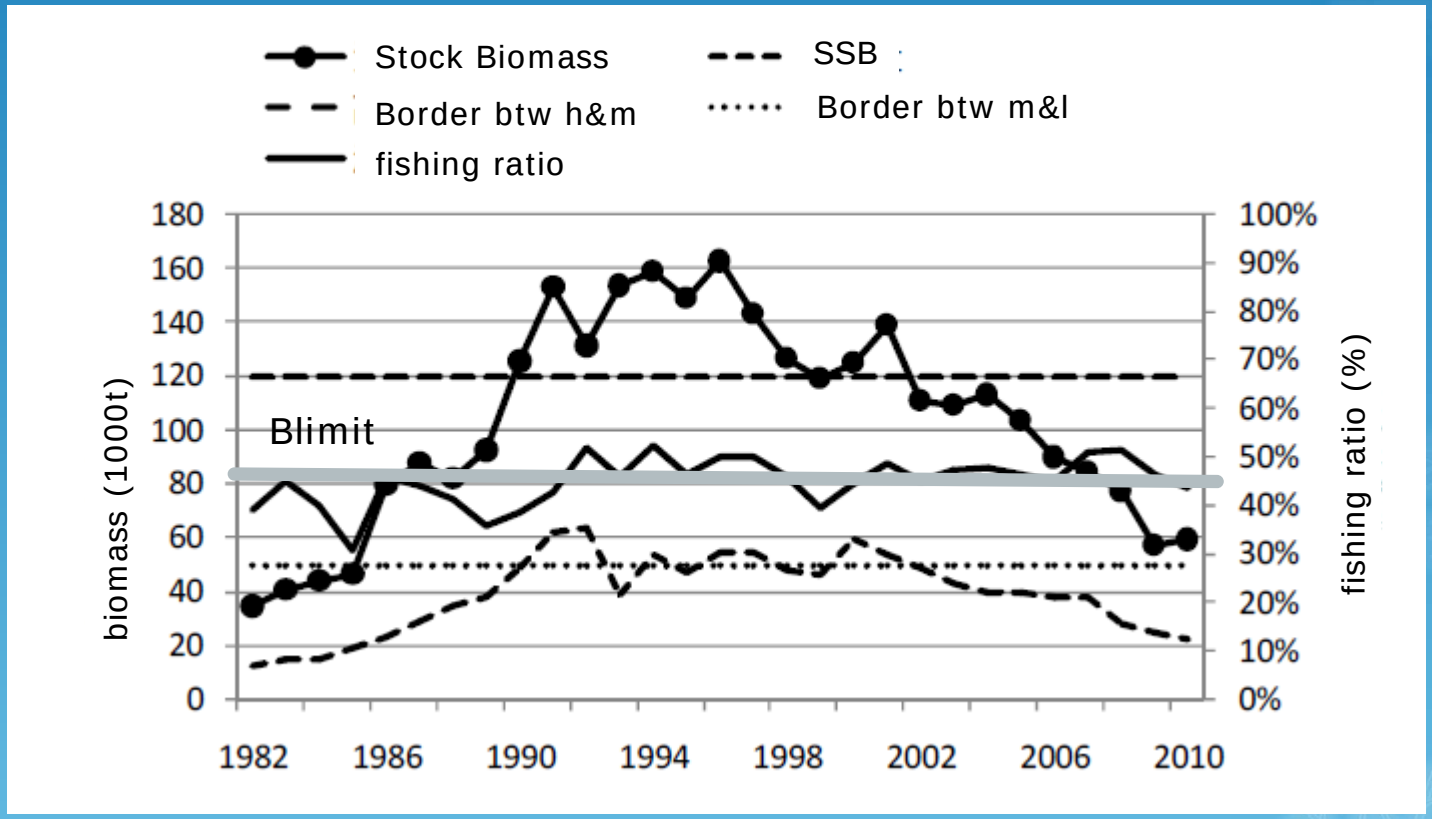


Japanese sardine in Tsushima Warm Current

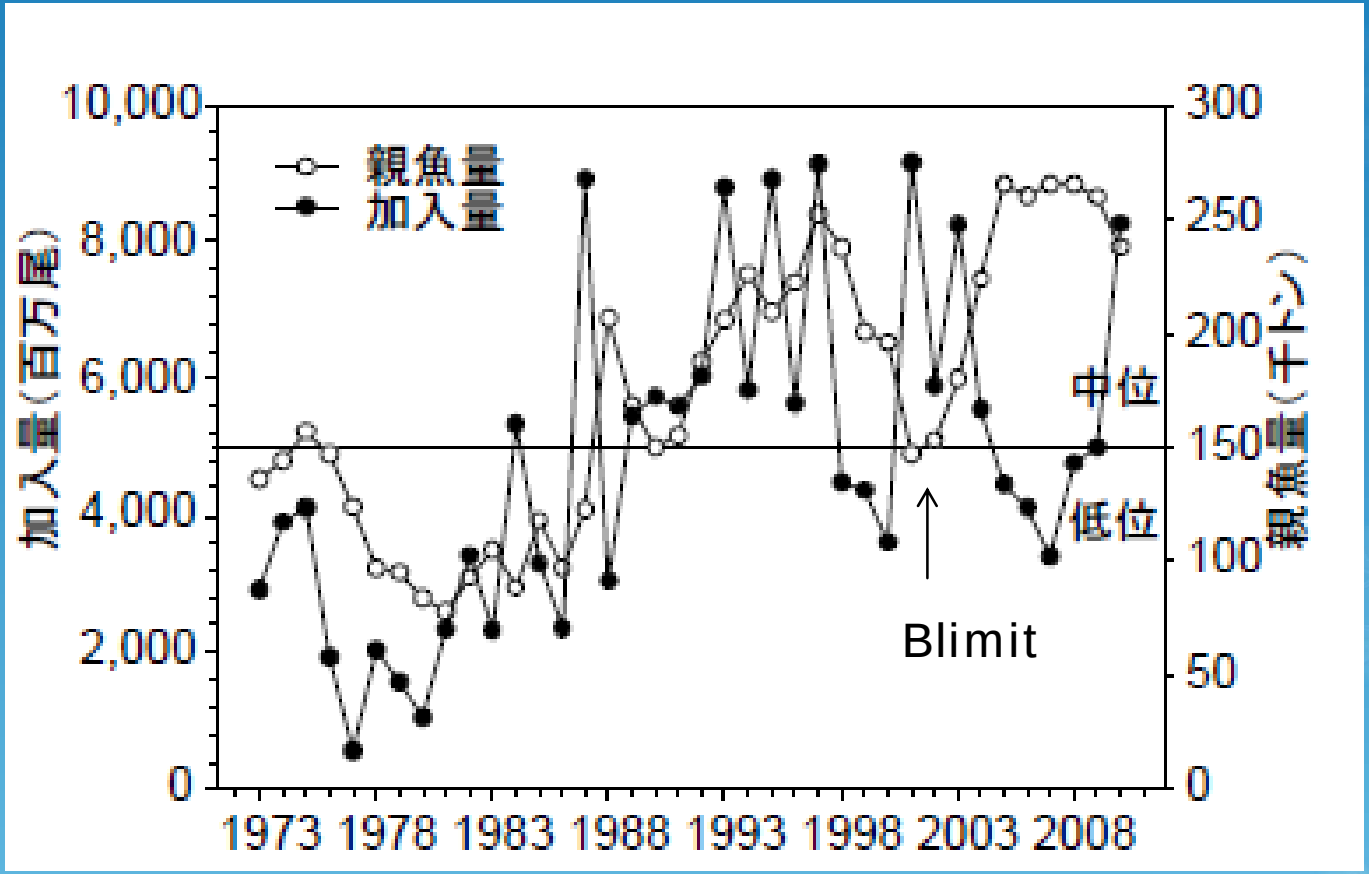




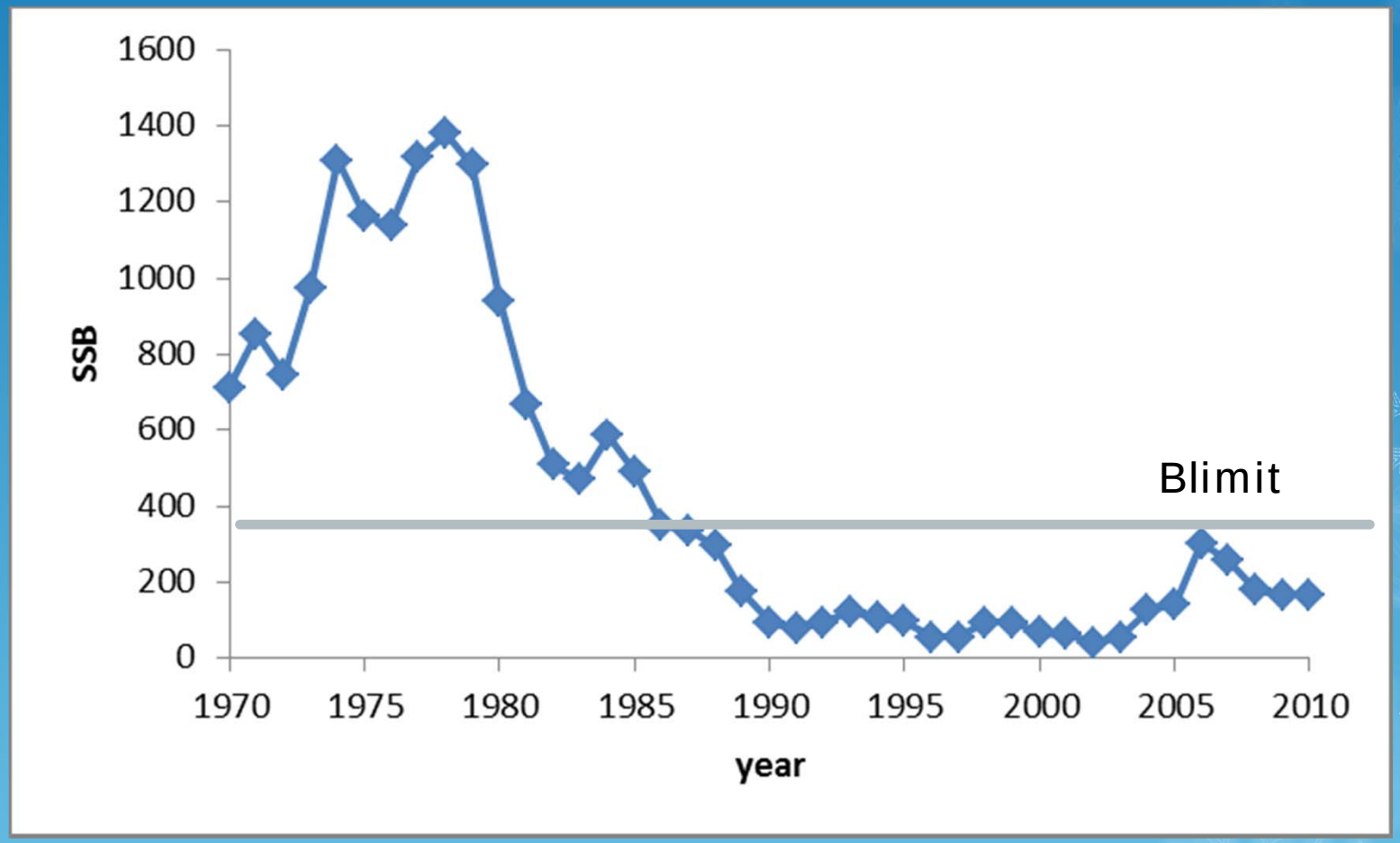
Japanese jack mackerel in PO



Japanese jack mackerel in TWC



Chub Mackerel in PO



Alaska pollock in Sea of Japan