

# Gulf of Alaska

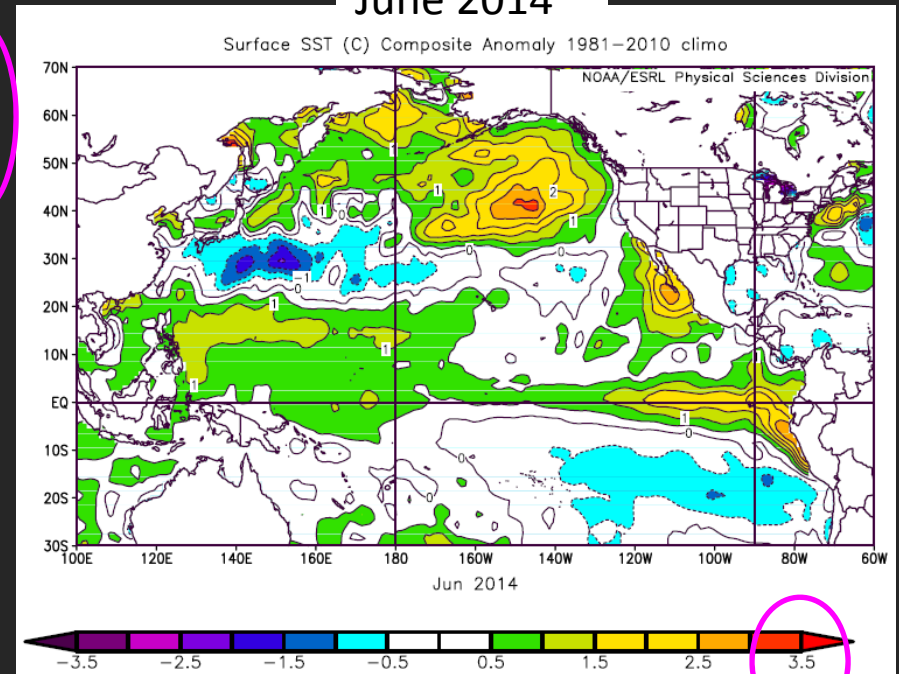
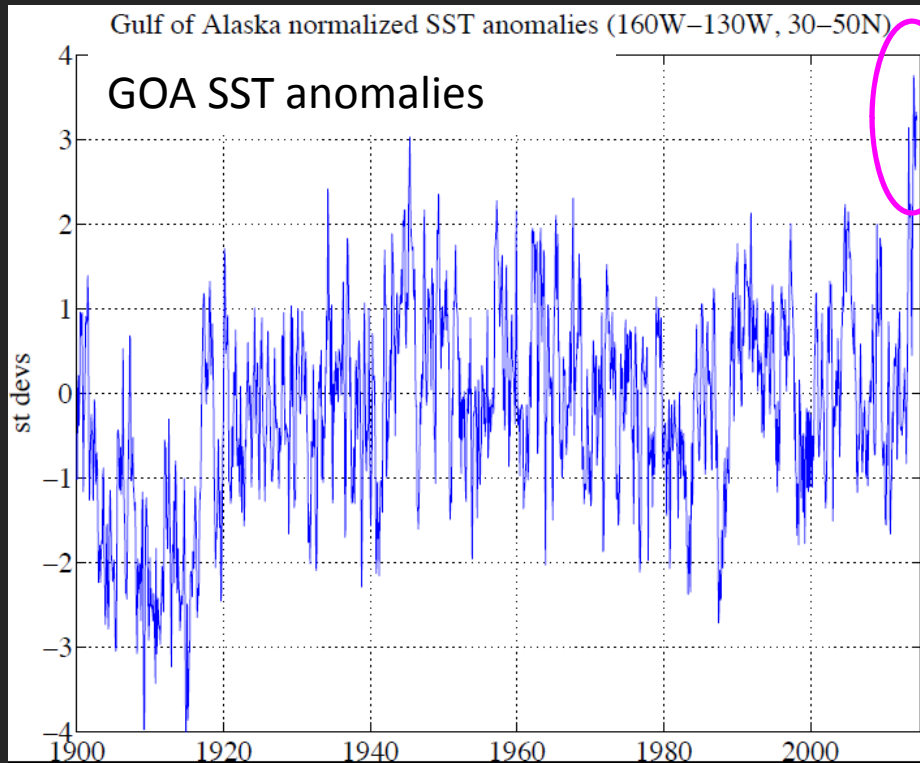


# Hot Topic #1

## The Warm Blob

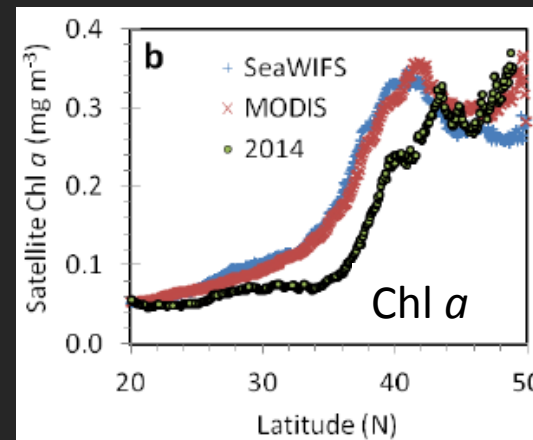


June 2014



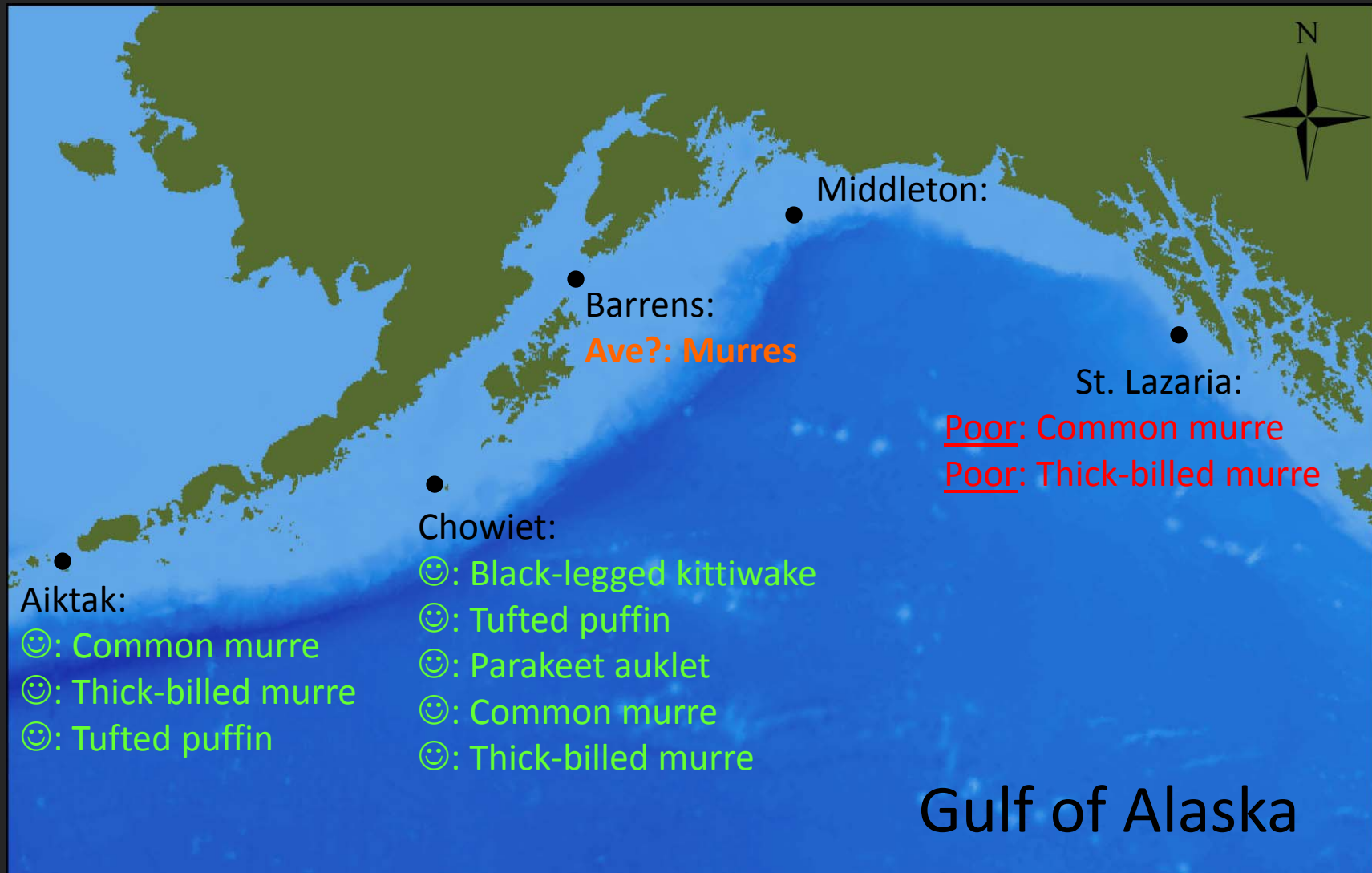
Ecosystem impacts?

- TZCF 240 km north
- Sunfish, skipjack tuna, Humboldt squid



## Hot Topic #2

## Banner year for seabird reproduction in western GOA



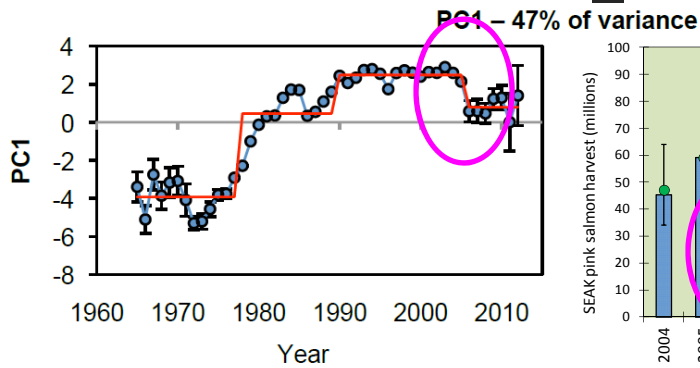
Favorable winter pre-conditioning or summer foraging?

# Hot Topic #3

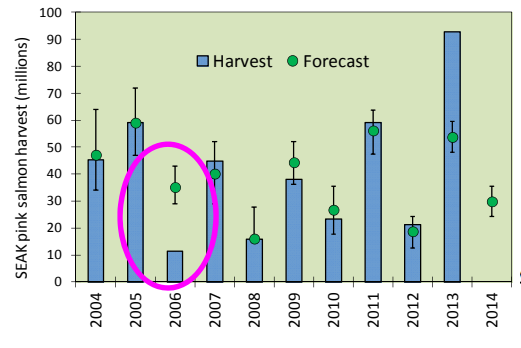
# Shift in ecosystem state in 2006?

## Biology

Regime shift indicator:  
salmon, halibut, ATF, shrimp

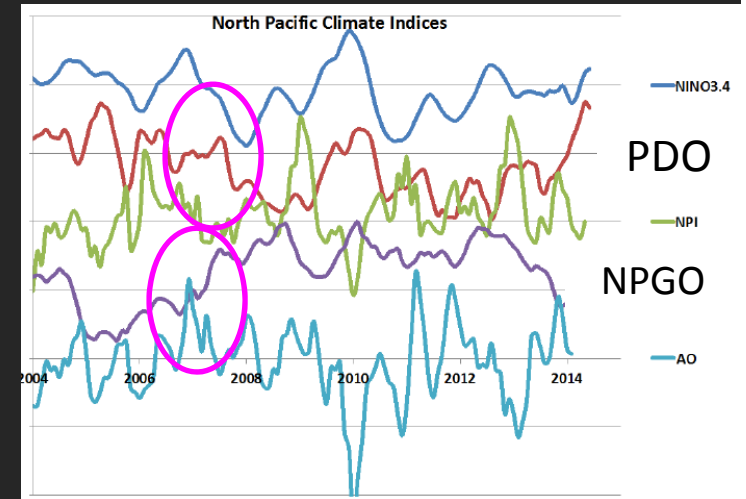
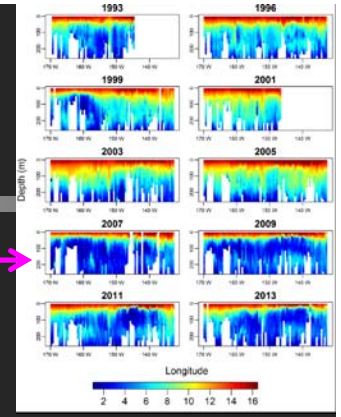


## SEAK pinks

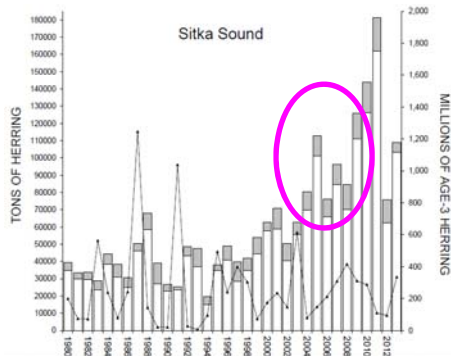


2007 →

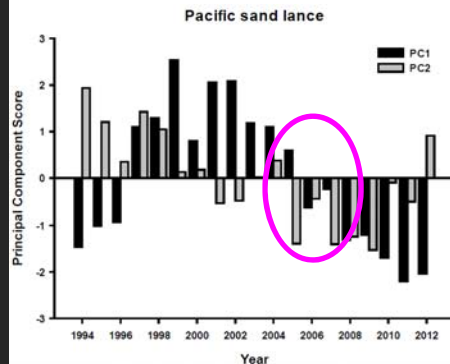
## Environment



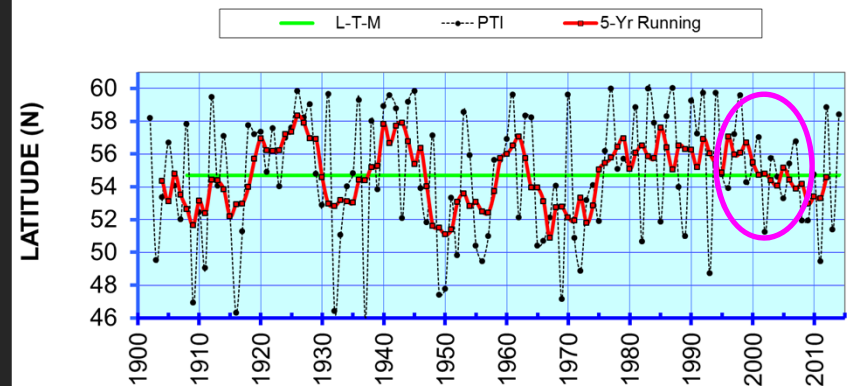
## SEAK herring



## Sand lance

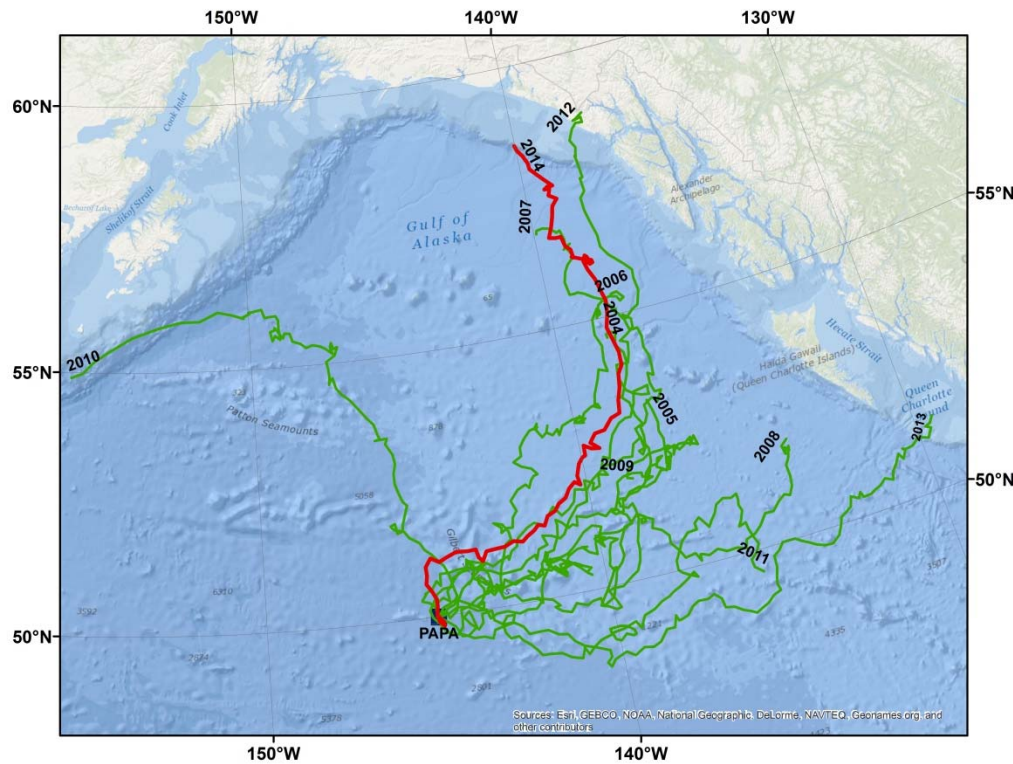


## Papa Trajectory Index (PTI) End-point Latitudes (Winters 1902-2014)



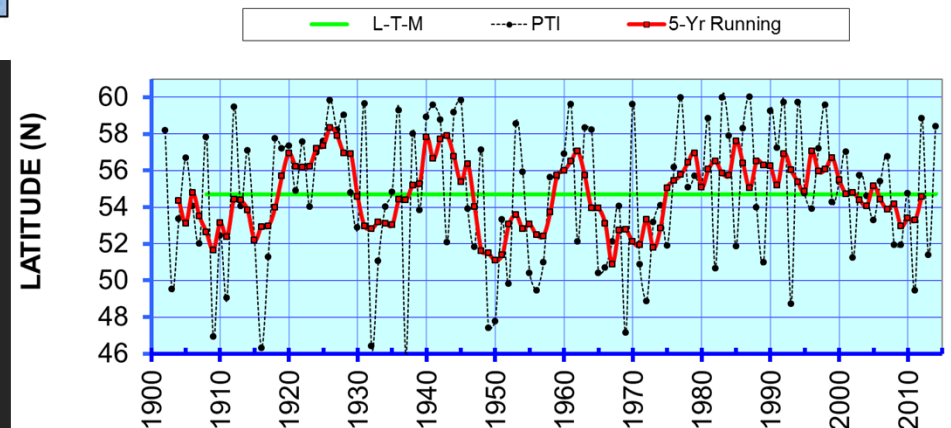
Also: capelin

# Ocean Surface Currents – PAPA Trajectory Index (Stockhausen and Ingraham)



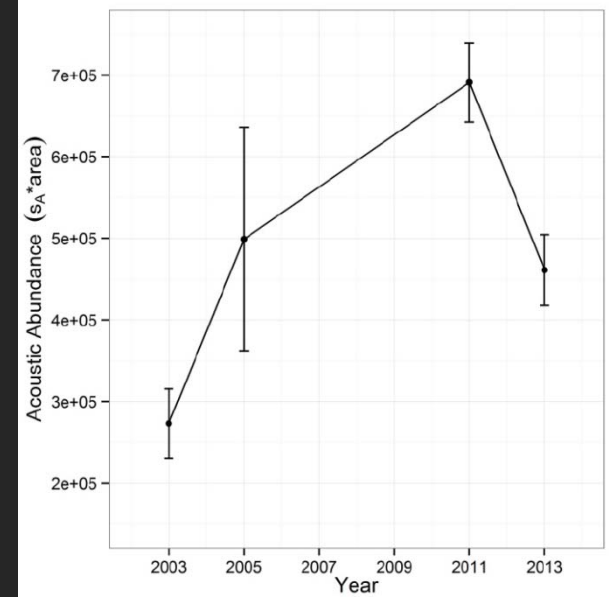
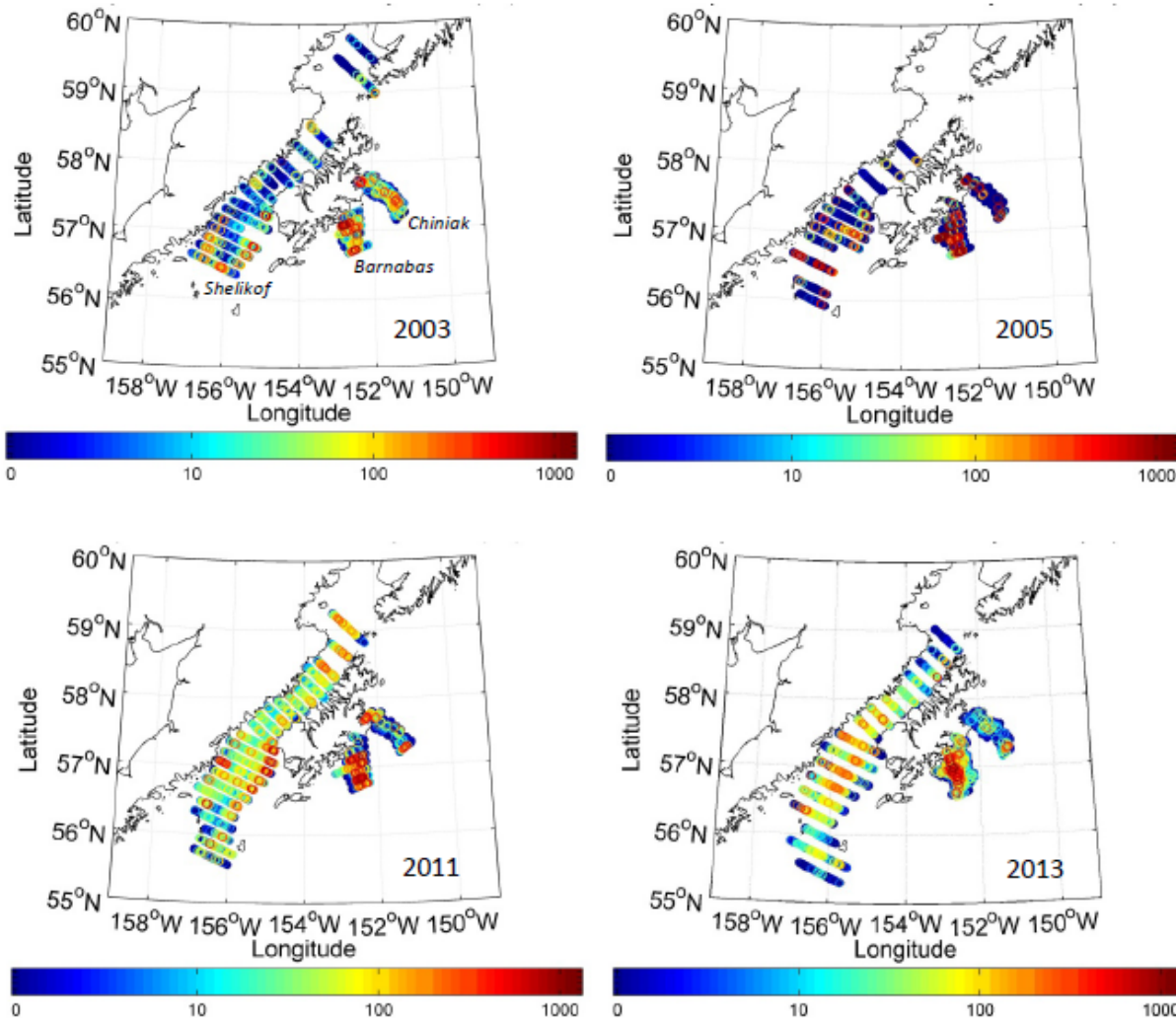
- Simulated surface drifter released from Ocean Station PAPA Dec 1 90 days
- 2013/14 trajectory: similar to 2011/12 (s wind anomalies -> NE)
- N-ward shift in “boundary” between sub-arctic and sub-tropical species; absence of open ocean LT organisms in SE AK

**Papa Trajectory Index (PTI) End-point Latitudes  
(Winters 1902-2014)**



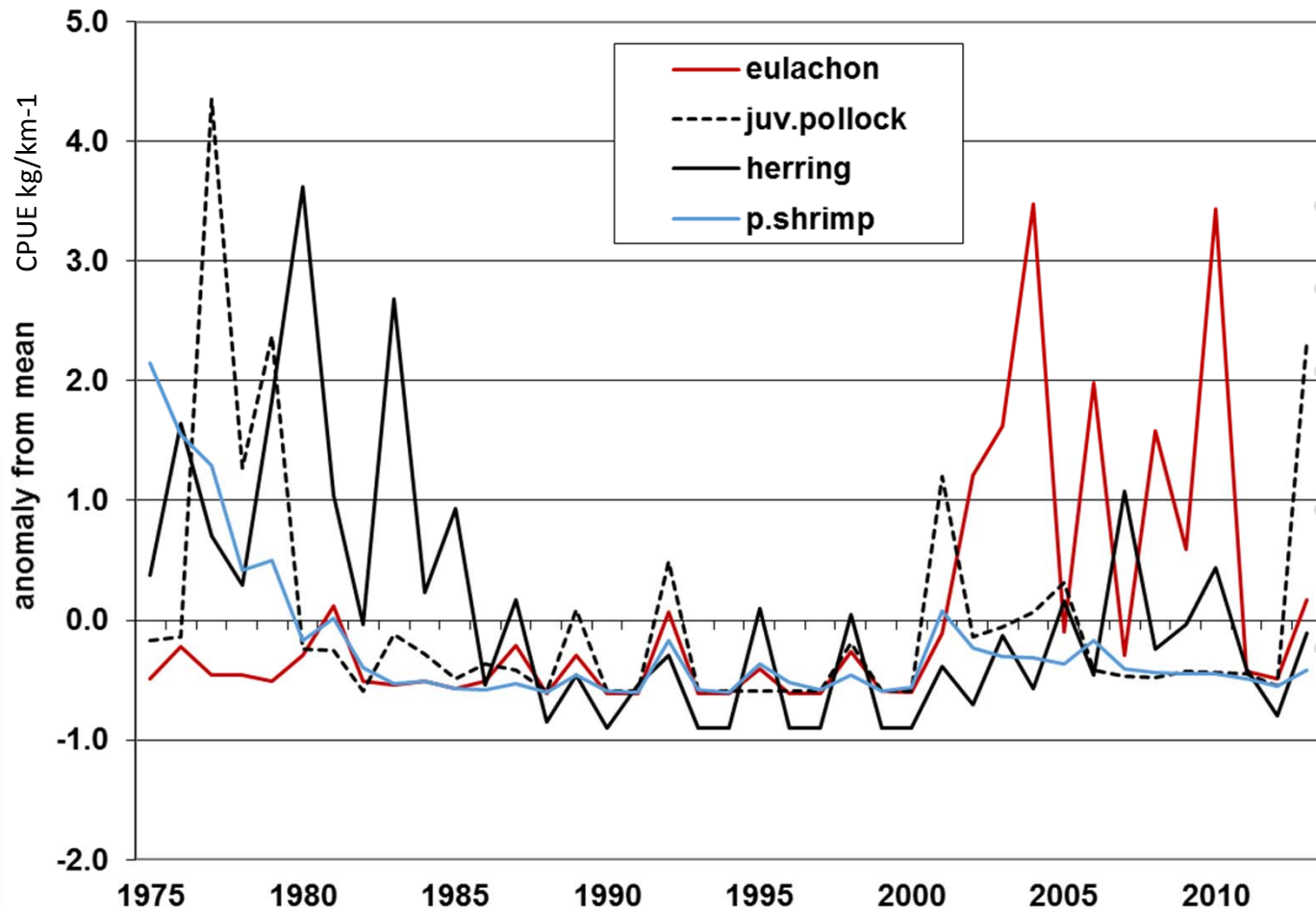
- Recent period of mostly southerly flow is shortest in time-series
- Does **not** indicate return to surface drift conditions similar to <1977 regime shift

# Gulf of Alaska Euphausiids (Ressler and Simonsen)



- Preliminary data
- Estimated abundance proportional to area, 95% CI
- Patchy distributions: consistently highest in Barnabas and in 2011 overall
- 2005 biased low?

# Gulf of Alaska Small Mesh Trawl Survey (Urban)



Western GOA

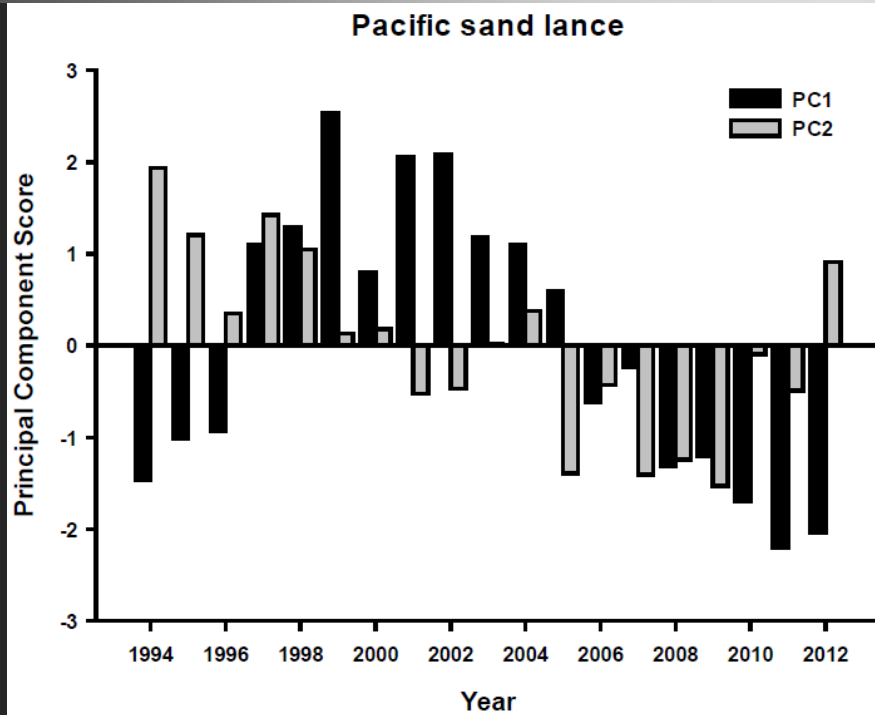
Sept-Oct 2013

Herring and pink shrimp catch remain low

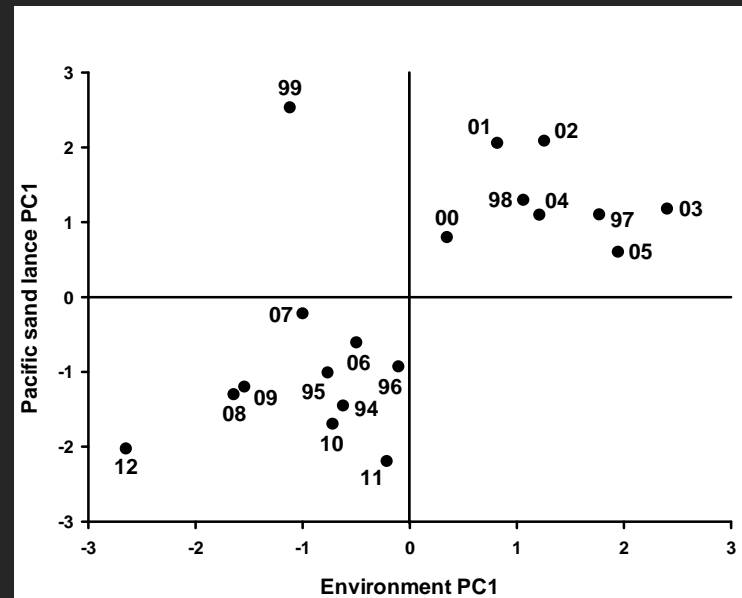
Juv pollock ( $\leq 20\text{cm}$ ) catch highest since 1979

Catch varied among bays surveyed

# Sand lance trends from puffin diets (Sydeman et al)



- Pacific sand lance % diet comp by number delivered to chicks
- PC1 = Central/Western GOA (Aiktak TUPU, Middleton TUPU and RHAU)
- PC2 = SE AK (RHAU St Lazaria)
- PC environment = annual SSTs



TUPU: tufted puffin



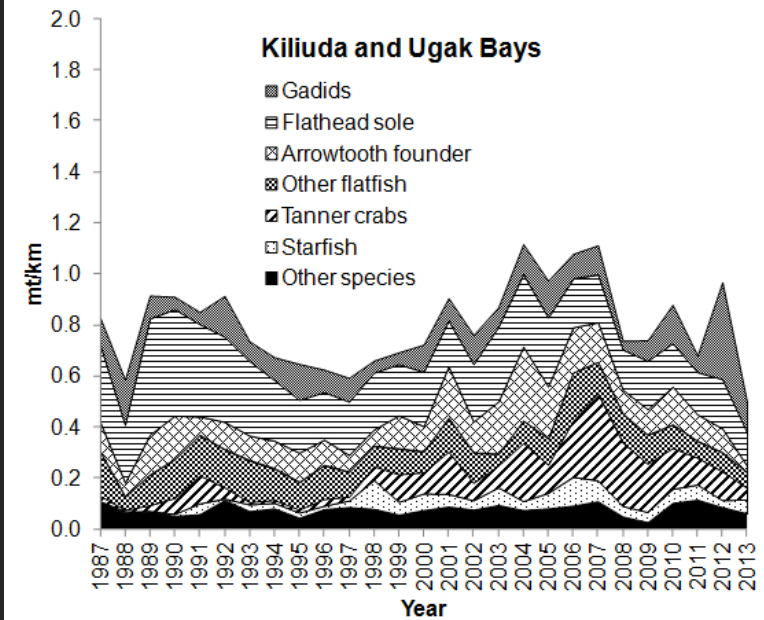
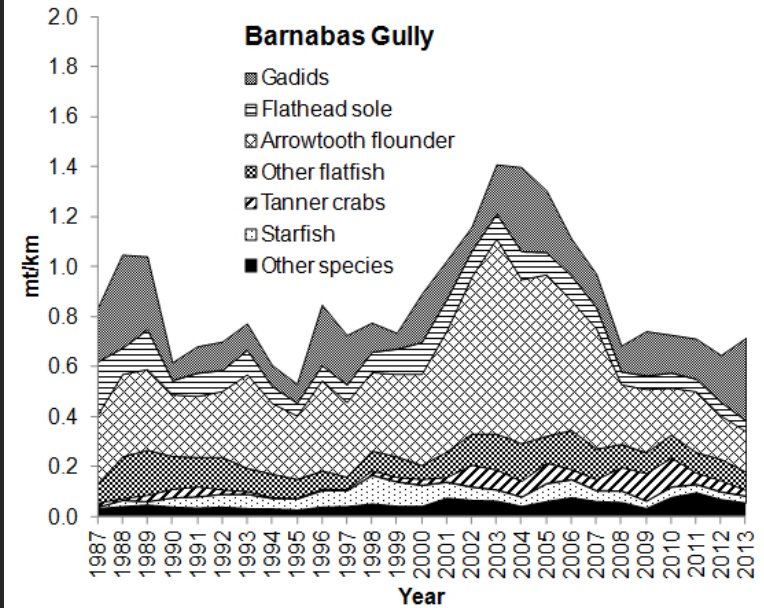
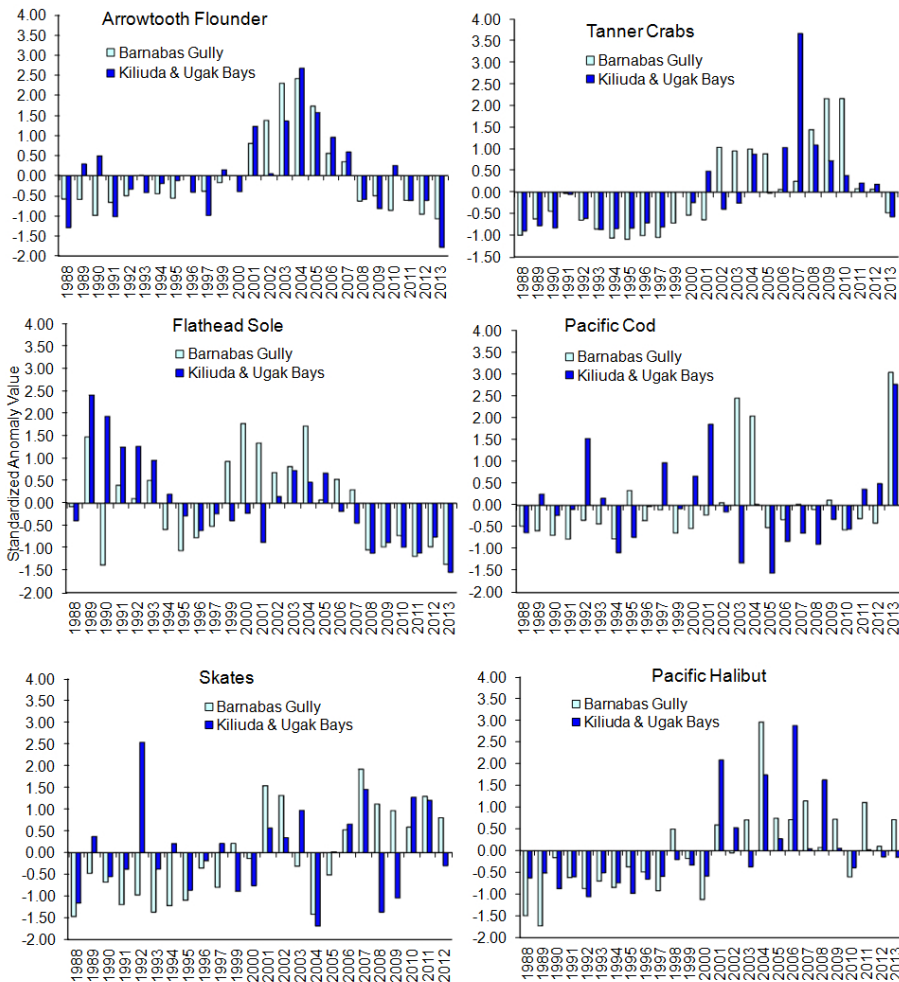
RHAU: rhinoceros auklet



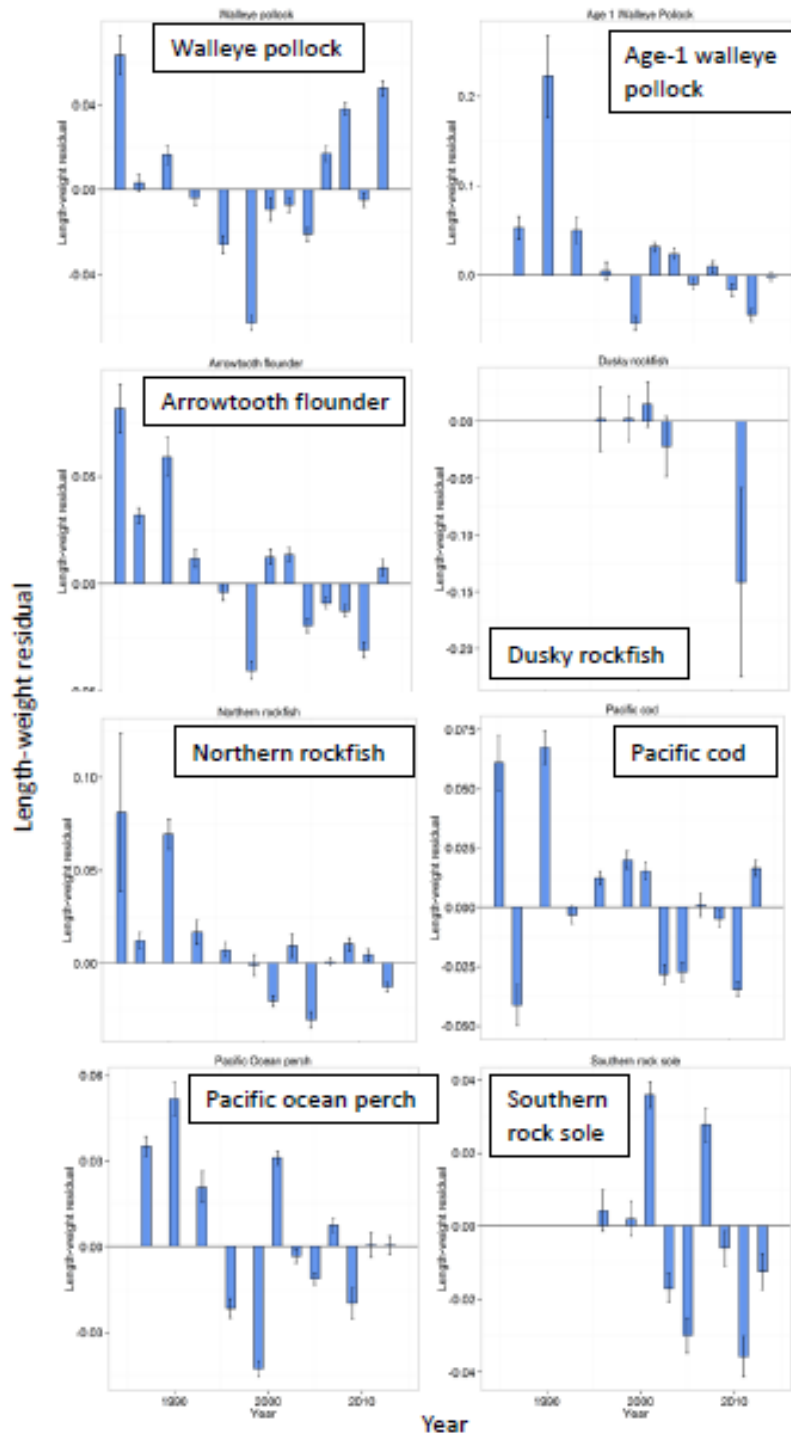
# ADF&G Gulf of Alaska Trawl Survey (Worton)



- Decrease in overall biomass since 2007; gadids and flatfish continue to dominate catch
- In 2013, gadid catches increased offshore, but decreased inshore; flathead sole/ATF below; higher cod



# GOA groundfish condition (Boldt, Rooper)



- Length-weight residuals positive in early years
- Variable since
- Uptick for pollock in 3 of last 4 surveys

## Mushy halibut (Zador)



[http://www.adfg.alaska.gov/static/species/disease/pdfs/fishdiseases/mushy\\_halibut\\_syndrome.pdf](http://www.adfg.alaska.gov/static/species/disease/pdfs/fishdiseases/mushy_halibut_syndrome.pdf)

- No reports this year
- Improved foraging conditions, particularly relative to 2011 and 2012?



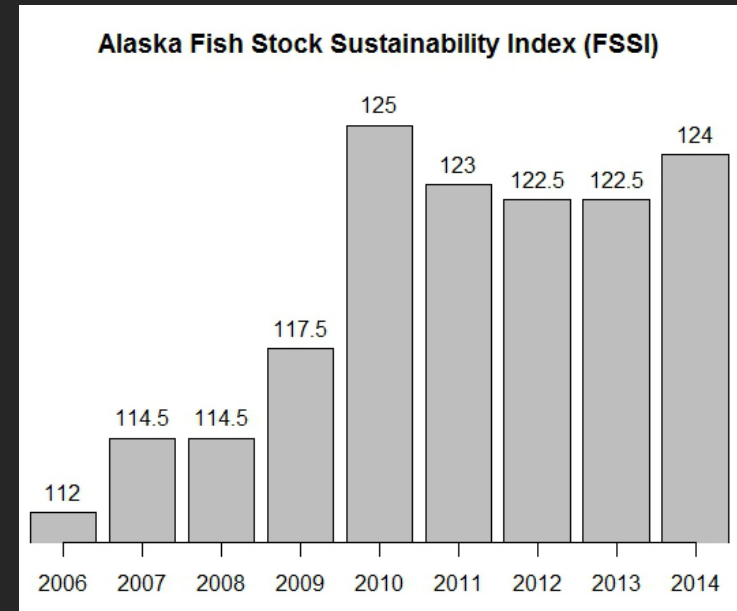
# Fishing and Fisheries Trends



## 2014 Fish Stock Sustainability Index (Whitehouse)

- Performance measure for sustainability of stocks selected for importance to commercial and recreational fishing

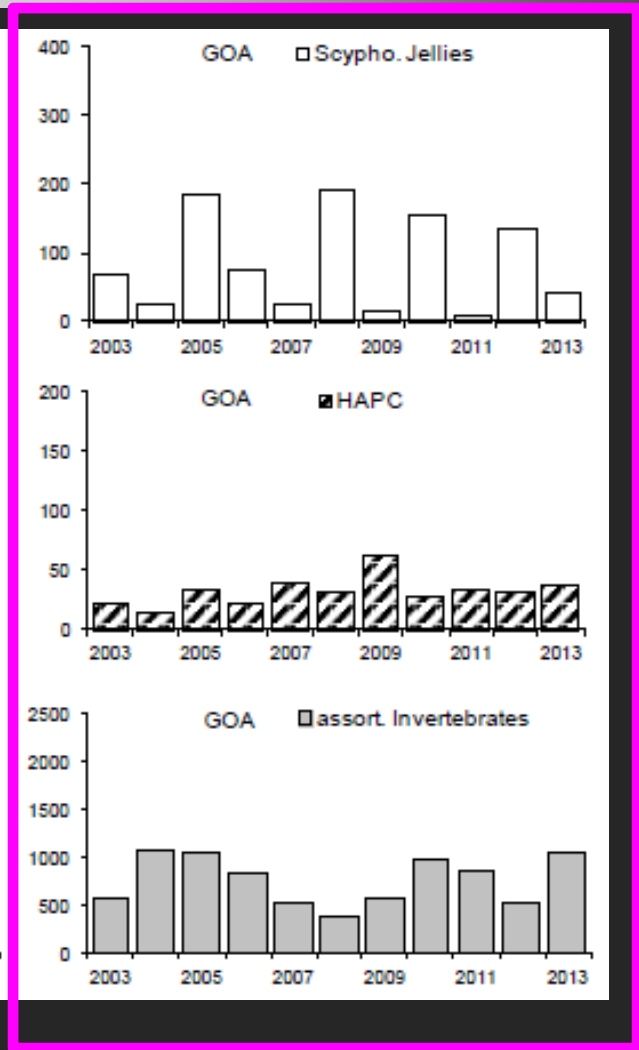
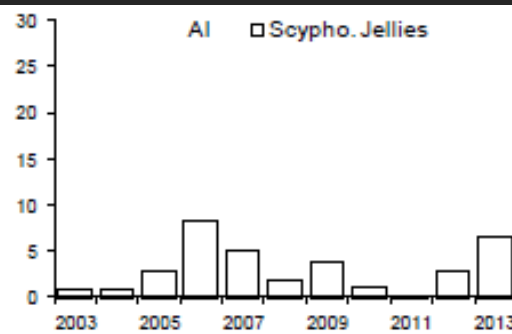
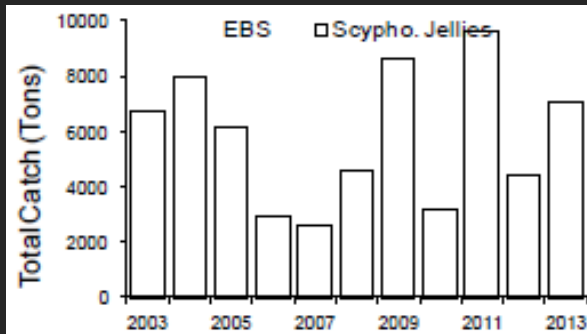
- No *groundfish* stock or stock complexes are overfished or subject to overfishing
- Overfished: Pribilof Island blue king crab



Jurisdiction	Stock Group	Number of Stocks	Overfishing				Overfished				Approaching Overfished Condition
			Yes	No	Unk	Undef	Yes	No	Unk	Undef	
NPFMC	FSSI	35	0	35	0	0	1	30	4	0	0
NPFMC	NonFSSI	30	0	29	1	0	0	5	25	0	0
	Total	65	0	64	1	0	1	35	29	0	0

- Total possible score = 140
- GOA groundfish = 43/48
- BSAI groundfish = 54/56

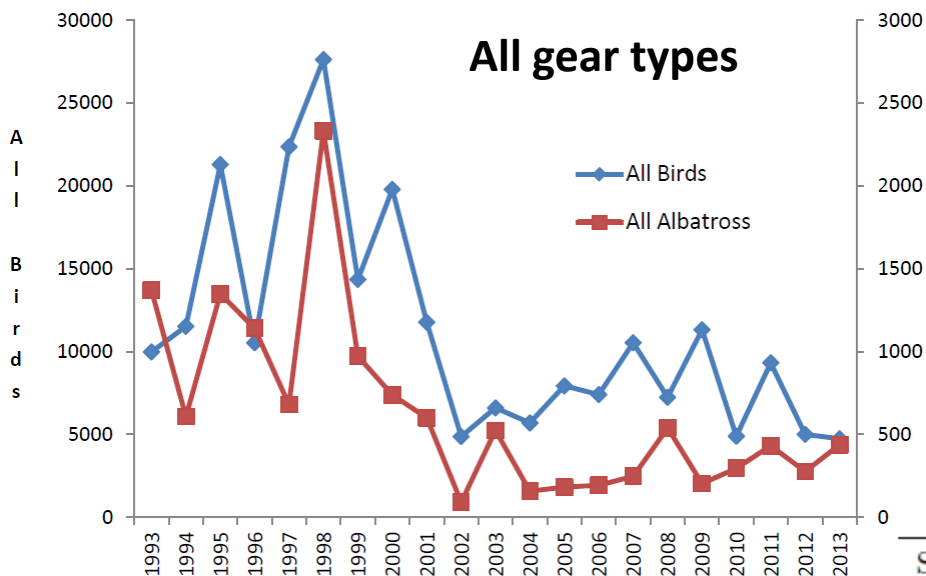
# Time Trends in Non-Target Catch (Whitehouse)



GOA

- Jellies caught in pollock fishery
- Anemones comprise most of HAPC, flatfish fishery
- Sea stars are 90% of inverts, cod pot fishery

# Seabird Bycatch Estimates for Alaskan Groundfish Fisheries 1993-2013 ( Fitzgerald)



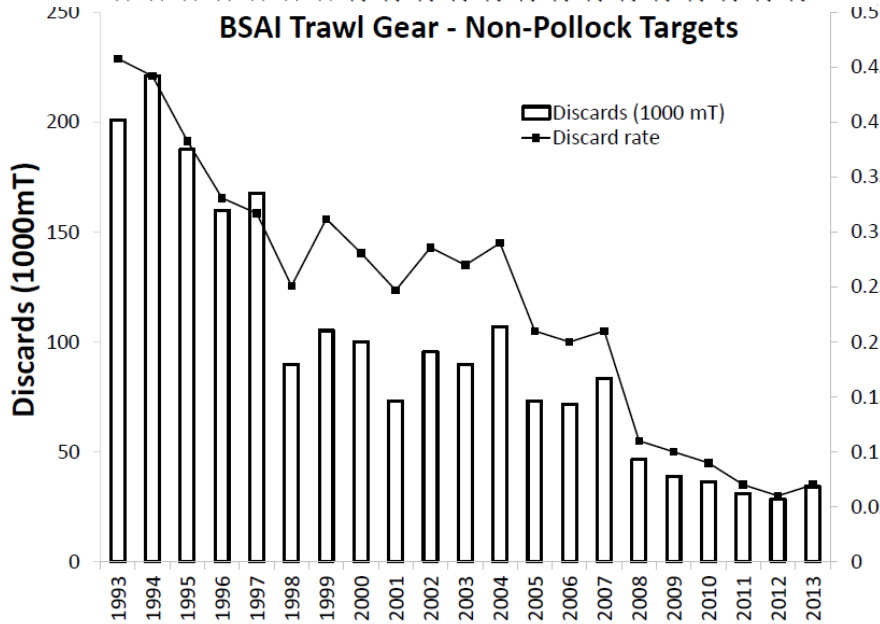
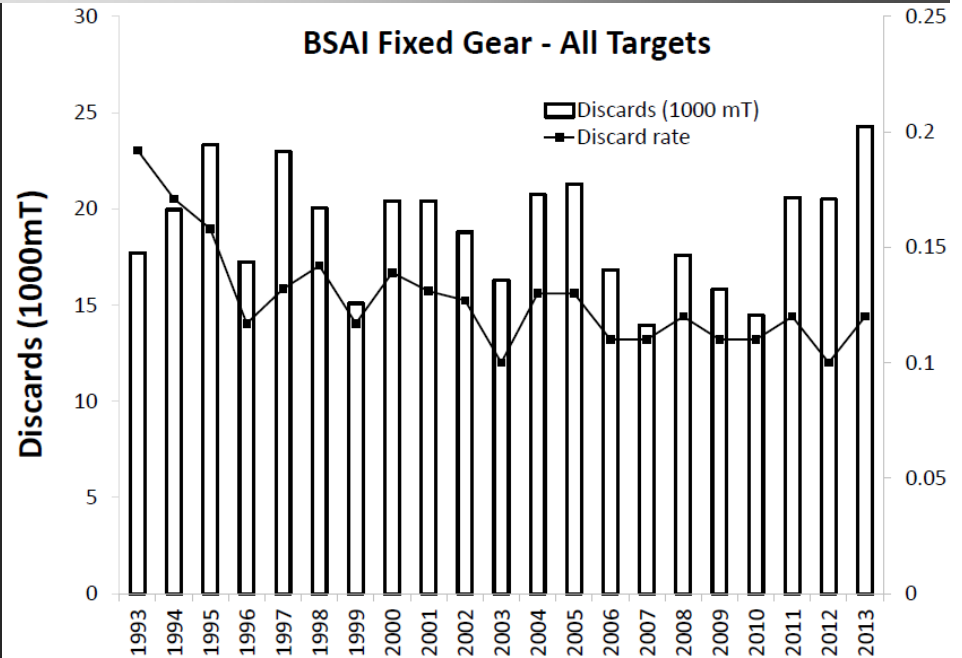
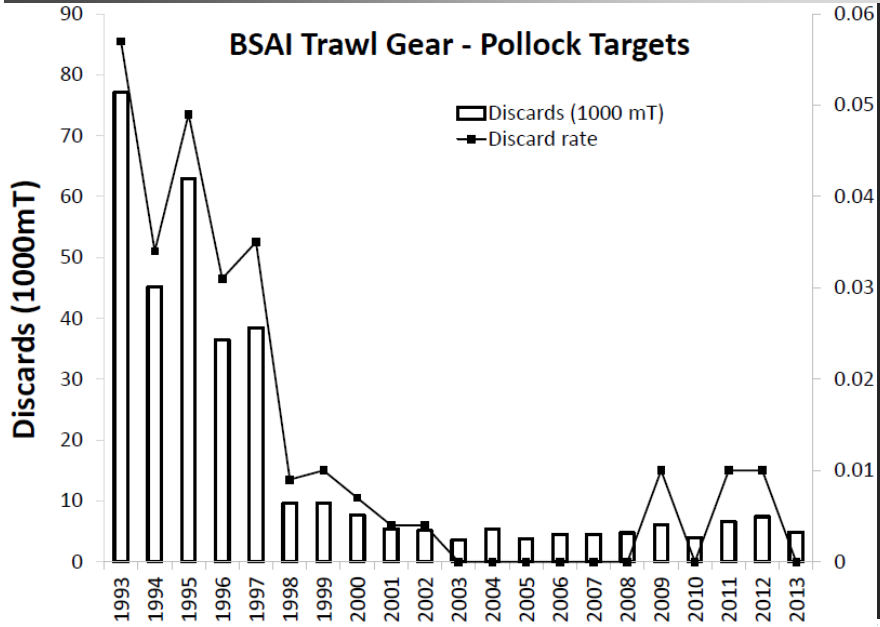
- 2013 numbers lowest in time series (began 1993)

## Estimated numbers of seabird bycatch

Species/Species Group	2007	2008	2009	2010	2011	2012	2013
Unidentified Albatross	23	0	0	0	0	0	0
Short-tailed Albatross	0	0	0	15	5	0	0
Black-footed Albatross	208	314	56	48	221	141	249
Laysan Albatross	17	226	148	233	206	135	189
Northern Fulmar	4806	3334	8200	2452	6214	3022	3277
Shearwaters	3587	1224	620	653	194	514	191
Storm Petrels	1	44	0	0	0	0	0
Gull	1360	1551	1335	1145	2158	890	556
Kittiwake	10	0	16	0	6	5	3
Murre	6	6	13	102	14	6	3
Puffin	0	0	0	5	0	0	0
Auklets	0	3	0	0	0	7	4
Other Alcid	0	0	105	0	0	0	0
Other	0	0	136	0	0	0	0
Unidentified	522	541	696	240	306	285	267
<b>Grand Total</b>	<b>10540</b>	<b>7243</b>	<b>11325</b>	<b>4894</b>	<b>9324</b>	<b>5005</b>	<b>4740</b>

- Notable decreases in shearwaters and gulls
- More albatrosses than in 2012

# 2013 Time Trends in Groundfish Discards (Lee)



Beginning in 2013, includes estimates from fixed gear halibut, so 2013 not comparable to earlier years