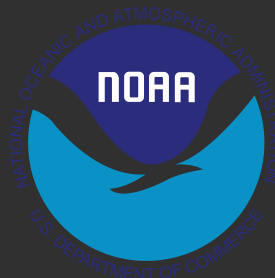


Ecosystem Considerations

for the Gulf of Alaska



North Pacific Fisheries Management Council
Groundfish Plan Team meeting
November 17, 2014



Gulf of Alaska



Ecosystem Considerations Report

Major Sections

- Report Cards
 - 2015
- Executive Summary
 - Updated
- Ecosystem Assessment
 - Prelim GOA
- Ecosystem Status and Management Indicators
 - 50 (6 new)

Executive Summary of Recent Trends

Physical and Environmental Trends

- The state of the North Pacific atmosphere-ocean system during 2012-2013 reflected the combination of mostly near-neutral ENSO conditions and intrinsic variability (p. 21).
- Cooler than normal upper ocean temperatures prevailed in the eastern portion of the North Pacific (p. 21,22).
- The Pacific Decadal Oscillation (PDO) has remained in a largely negative state since the latter part of 2007, and the North Pacific Gyre Oscillation has remained in a positive state during the same time period (p. 26).
- Models indicate a greater likelihood of near-neutral versus either El Niño or La Niña conditions for the winter of 2013-14 (p. 28).

Arctic

- There is reduced sea ice cover in the Arctic during the summer of 2013 compared to seasonal norms, but not to the extent that occurred in 2011 and 2012 (p. 21).
- Ice concentrations in the Chukchi Sea have been observed to be greater during the summer of 2013 than in 2012 (p. 21).

Eastern Bering Sea

- The eastern Bering Sea shelf experienced less storminess than normal in fall 2012 and spring 2013. On the other hand, the weather during fall and winter was cold, which resulted in another relatively heavy ice year (p. 21).
- Oceanographic surveys of regions within the northern EBS between 2002-2012 have documented spatial variations in oceanographic characteristics (salinity, temperature, and zooplankton abundance). Norton Sound stands out as most distinct from other regions because of high surface and bottom temperatures, low surface and bottom salinities, and lower than average light transmission (p. 31)

Alaska Peninsula and Aleutian Islands

- Easterly wind anomalies prevailed in this region during the fall of 2012 and spring of 2013. Anomalies in this sense tend to enhance the northward transport through Unimak Pass and perhaps also the Aleutian North Slope Current (p. 21).

Outline

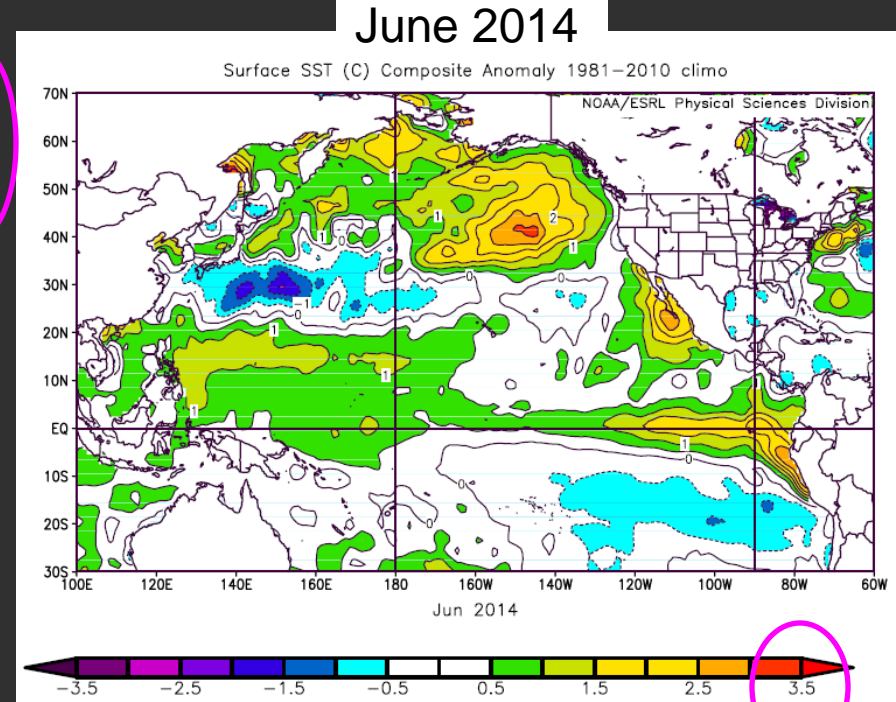
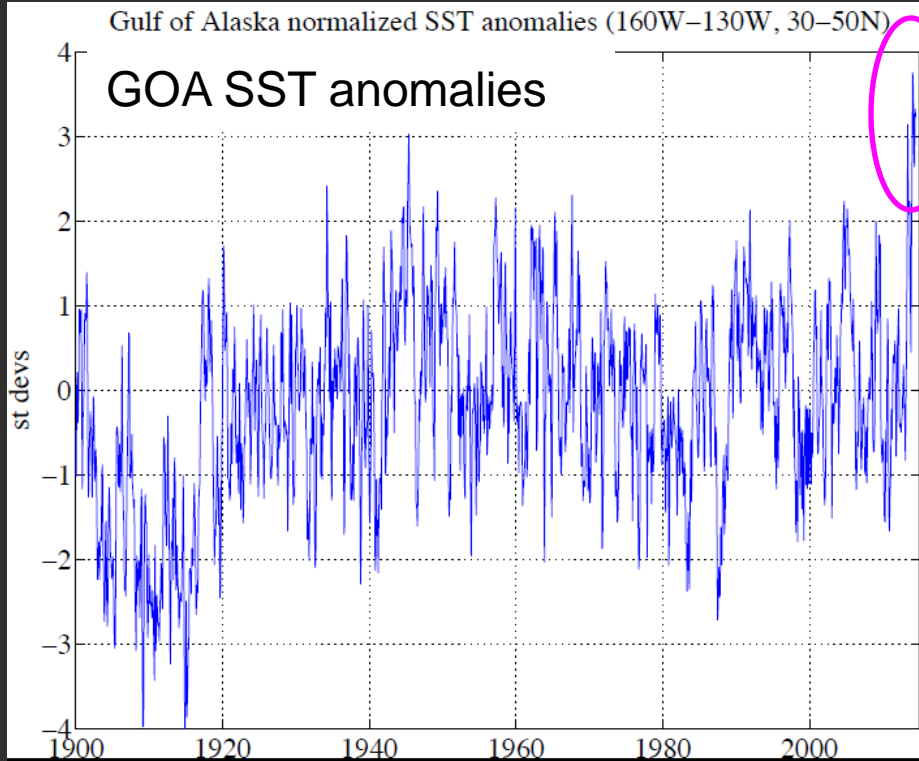
Gulf of Alaska

- *Hot Topics*
- Ecosystem trends
 - Forage fish
 - Salmon
 - Groundfish



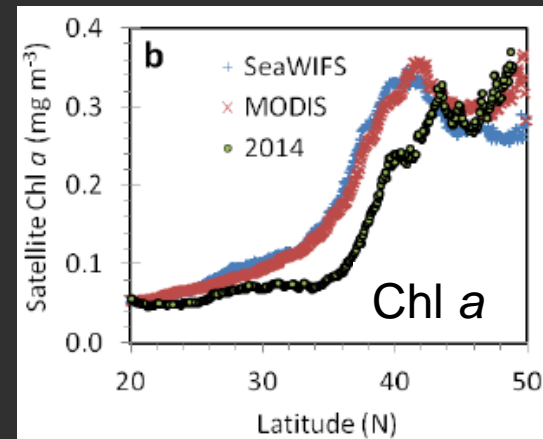
Hot Topic #1

The Warm Blob



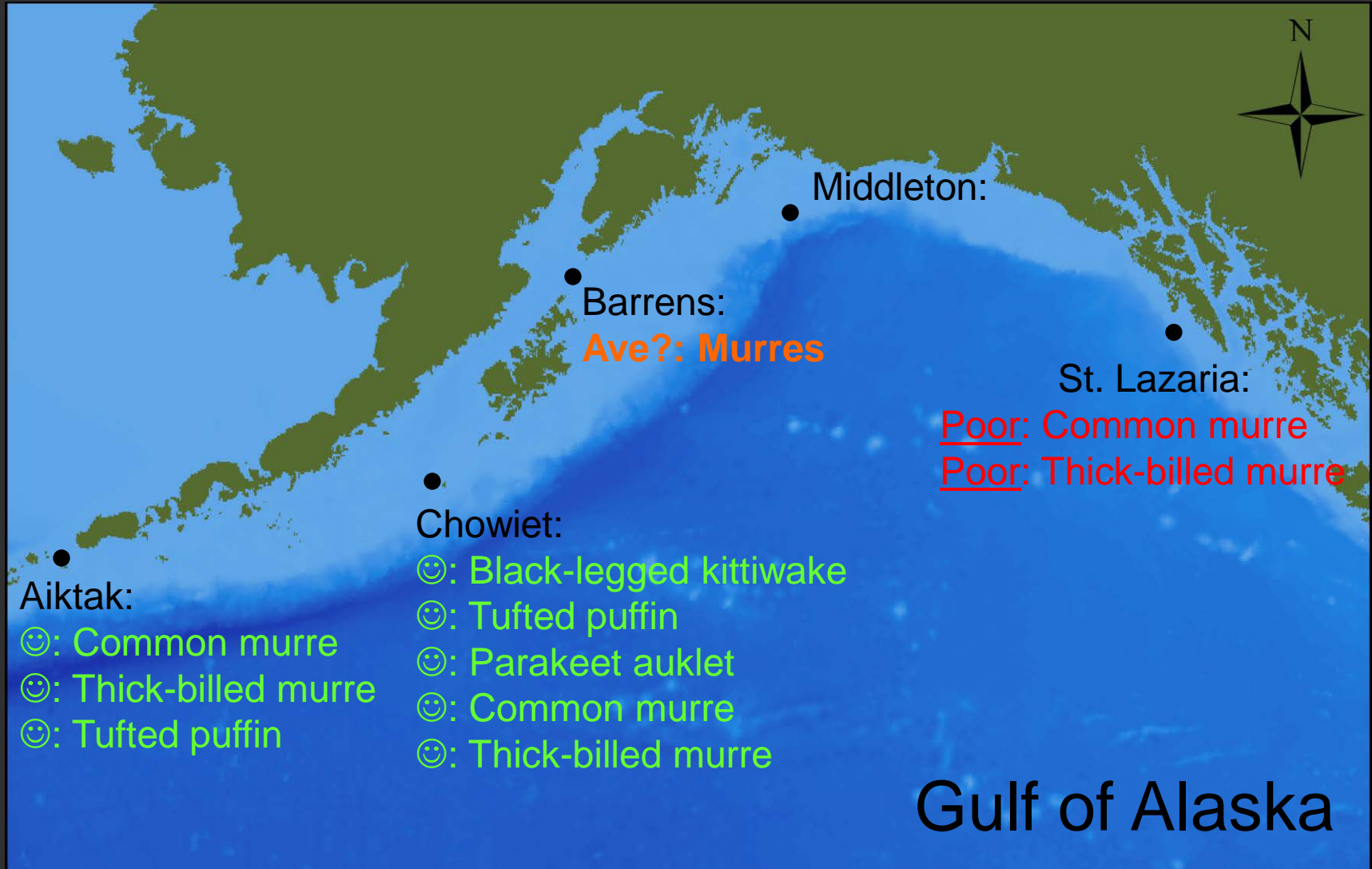
Ecosystem impacts?

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



Hot Topic #2

Banner year for seabird reproduction in western GOA



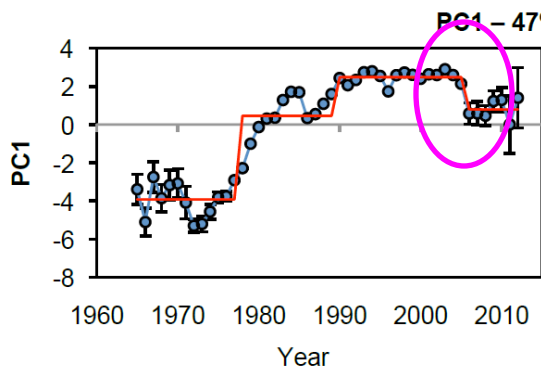
Favorable winter pre-conditioning or summer foraging?

Hot Topic #3

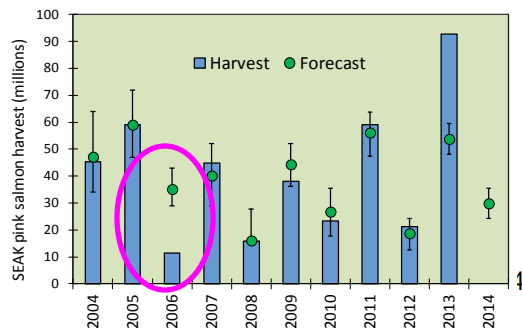
Shift in ecosystem state in 2006?

Biology

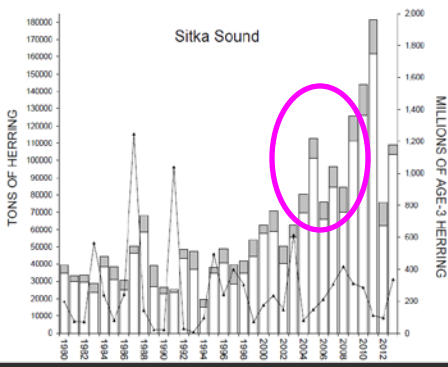
Regime shift indicator: salmon, halibut, ATF, shrimp



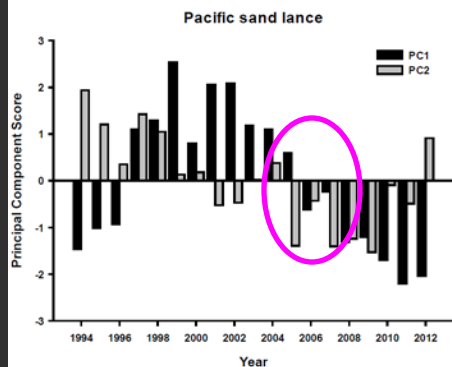
SEAK pinks



SEAK herring



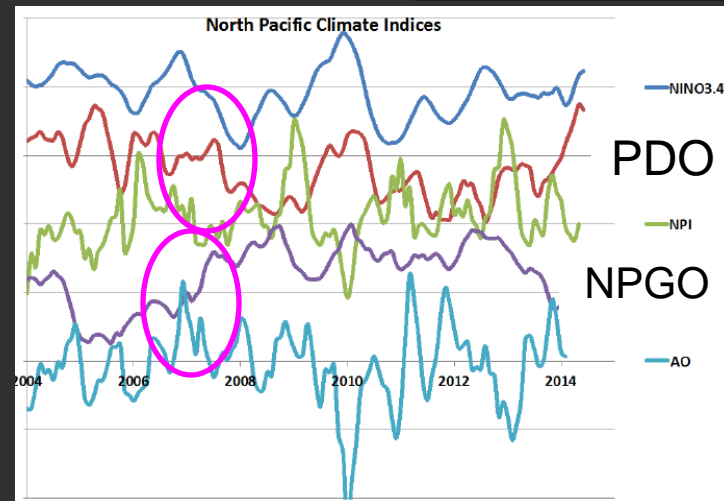
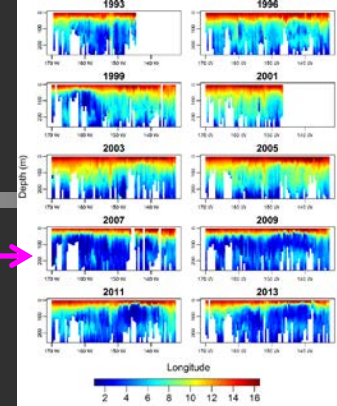
Sand lance



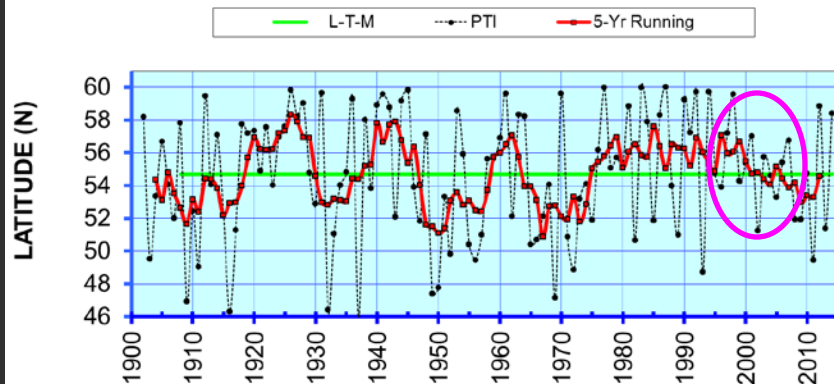
Also: capelin

Environment

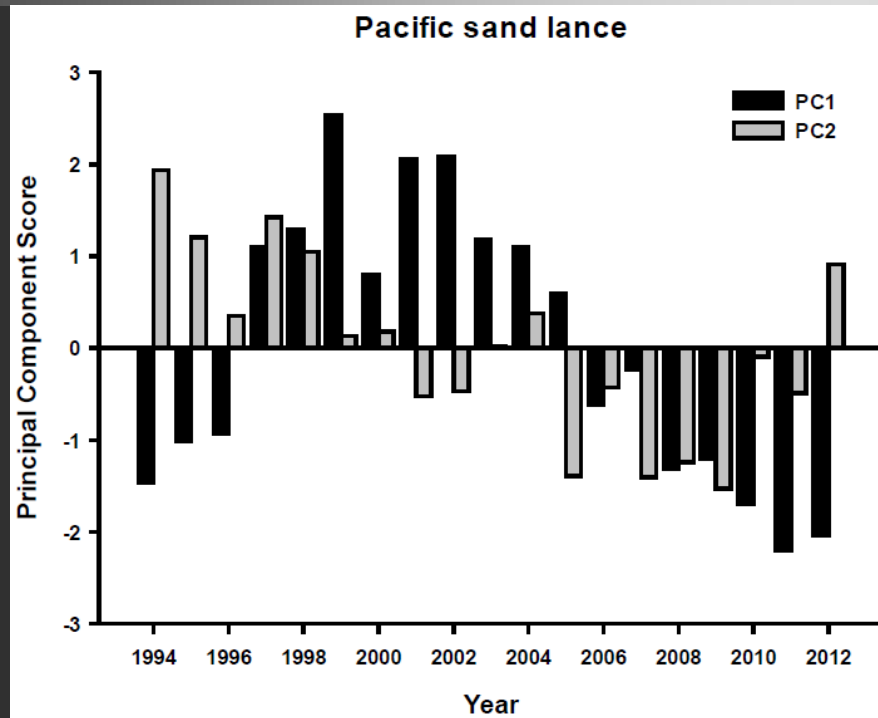
2007 →



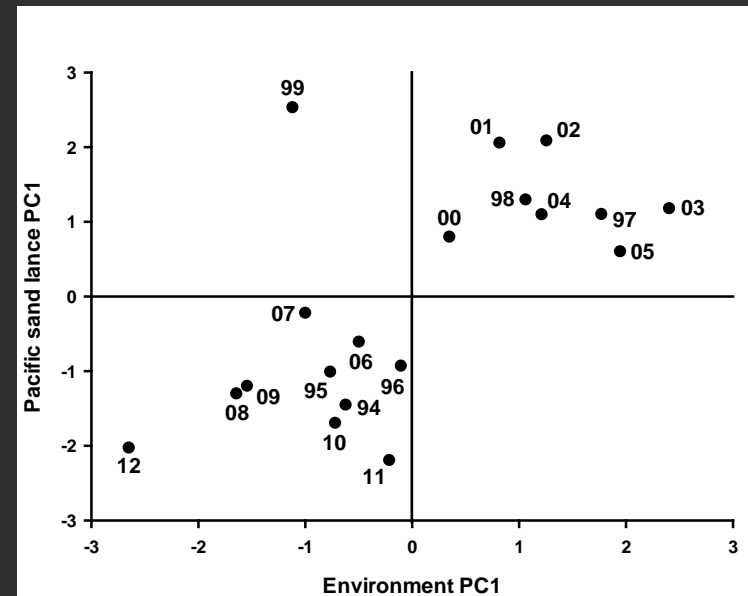
Papa Trajectory Index (PTI) End-point Latitudes (Winters 1902-2014)



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

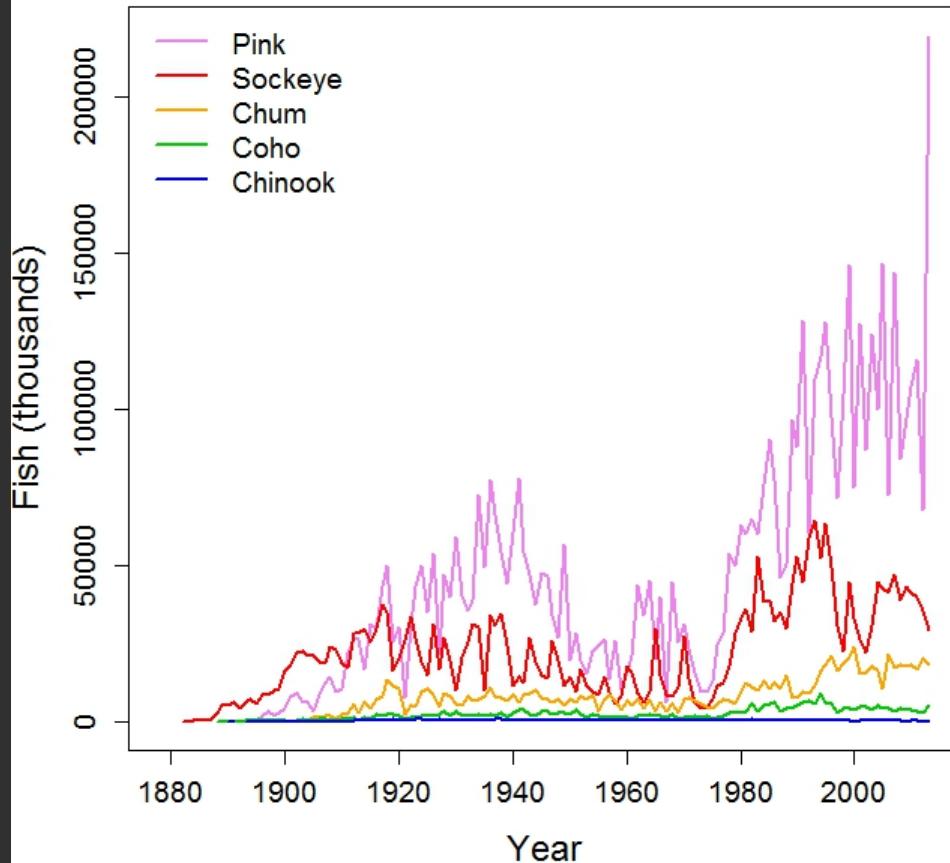


TUPU: tufted puffin

RHAU: rhinoceros auklet

Historical and Current Alaska Salmon Trends (Whitehouse)

Total commercial catches

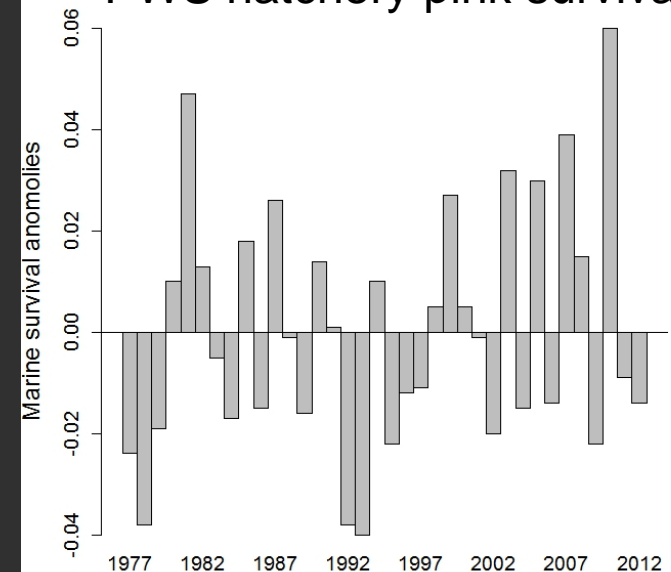


2013: 282.9 million fish, >100 million more than the pre season.

2013 = 2 x 2012

Marine survival of 11.17% in 2010 (2008 brood year) was an all-time high since 1977, but dropped to 4.34% in 2011 and 3.80% in 2012

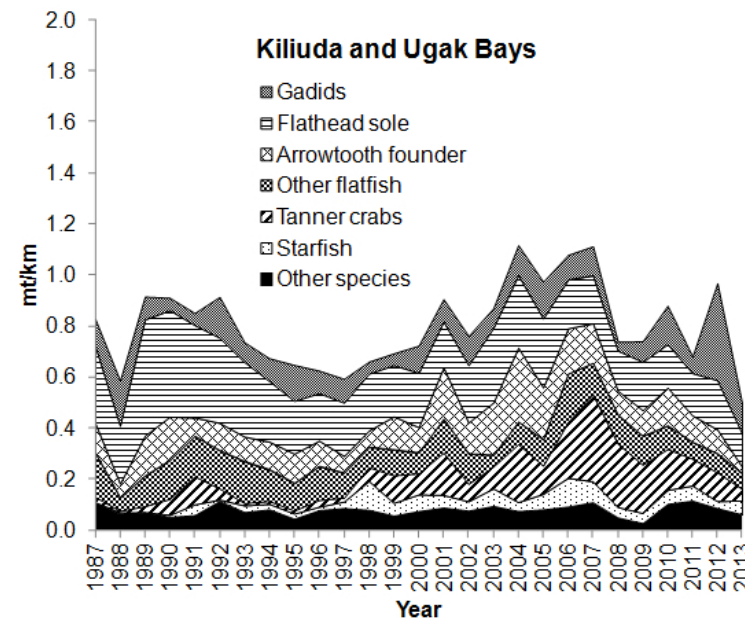
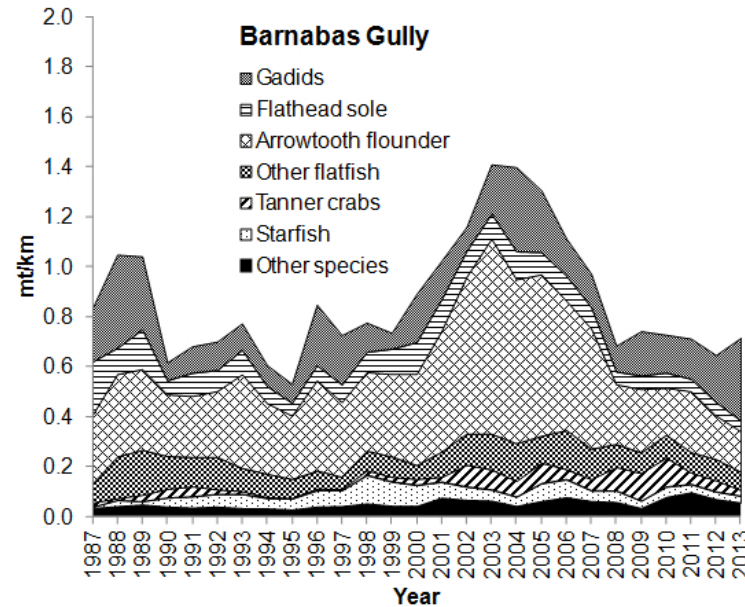
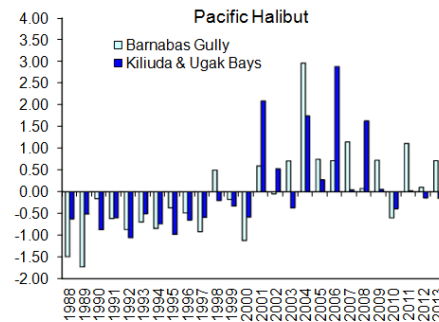
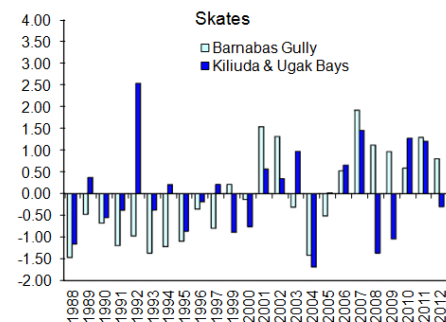
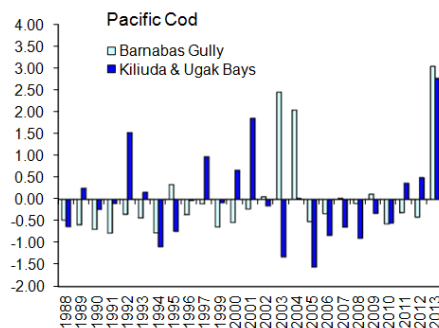
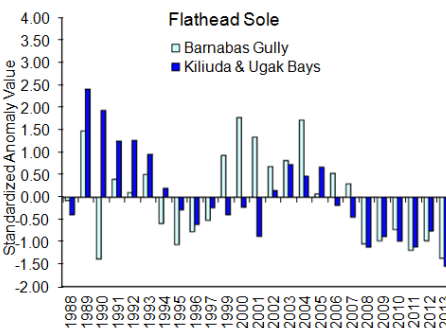
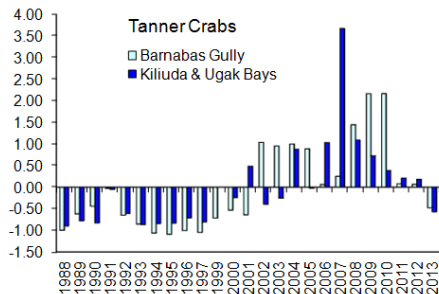
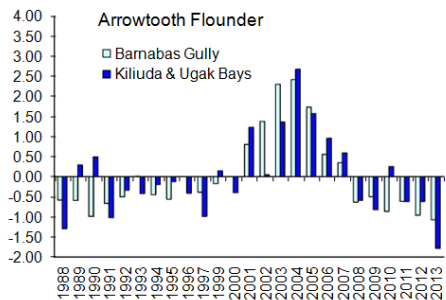
PWS hatchery pink survival



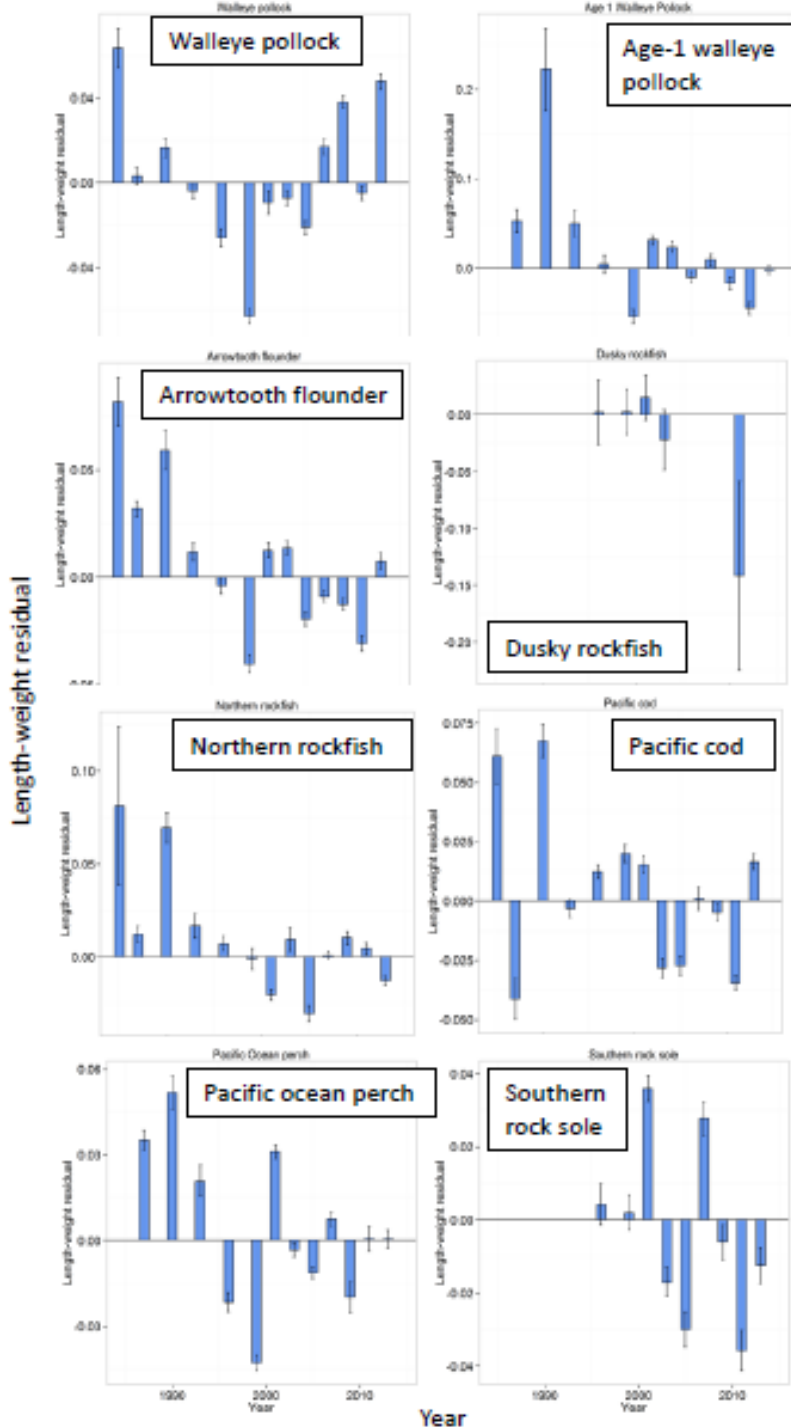
ADF&G Gulf of Alaska Trawl Survey (Worton)



- 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



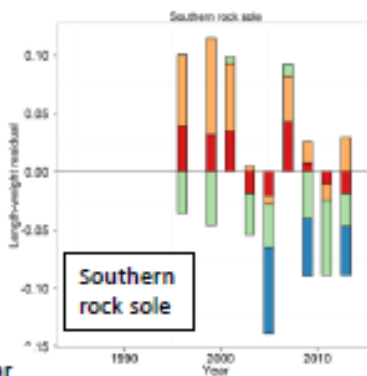
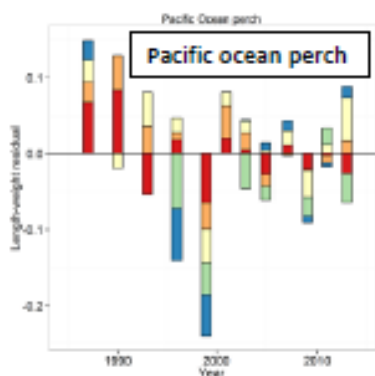
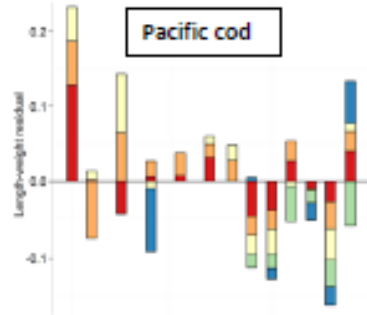
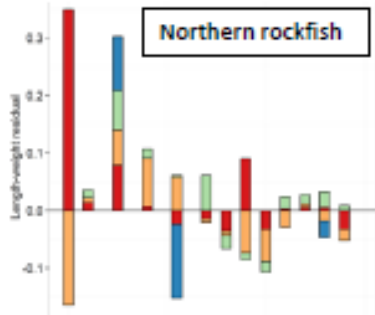
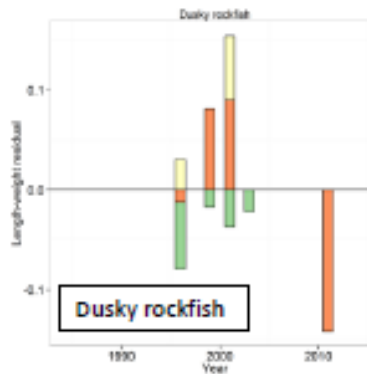
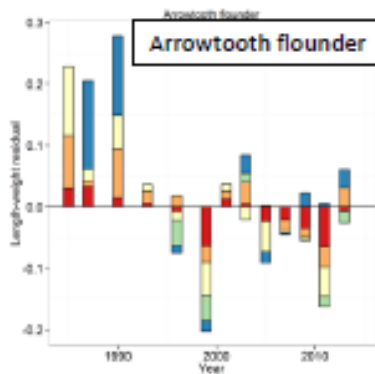
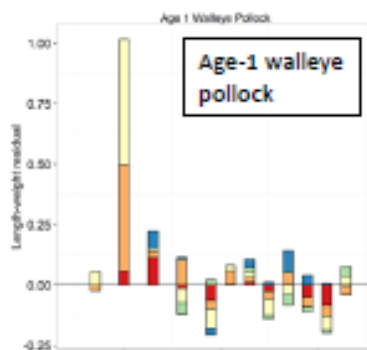
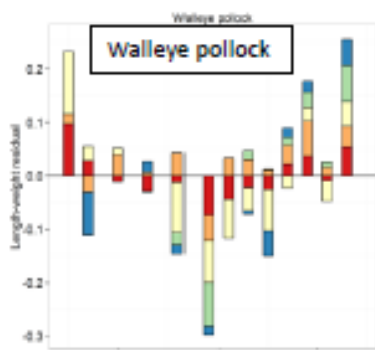
GOA groundfish condition (Boldt, Rooper)



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

GOA groundfish condition (Boldt, Rooper)

Length-weight residual



- Generally higher length-weight residuals near Kodiak
- Southeastern area generally worse than other areas
- POP resid highest in Kodiak and Shumagins
- ATF only species with higher resid in Yakutat

Mushy halibut (Zador)

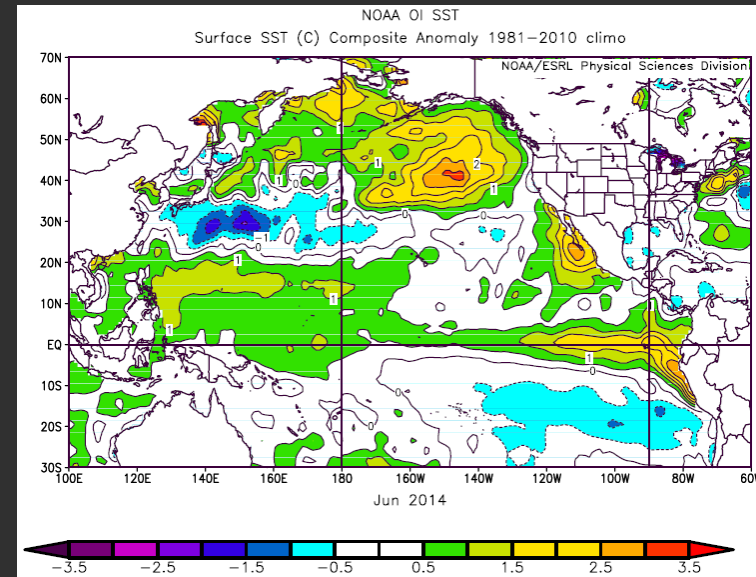


- No reports this year
- Improved foraging conditions, particularly relative to 2011 and 2012?



Possible NPRB proposal discussion

- Goal: to coordinate survey efforts throughout the GOA to provide a synoptic view of the impacts of the warm blob
- Now predicted to continue into 2015
 - GOA trawl and acoustics
 - CCS: hake trawl, acoustics, including BC



Website

<http://access.afsc.noaa.gov/reem/ecoweb/index.cfm>



Alaska Marine Ecosystem Considerations

This work is made possible through support from the Fisheries and the Environment (FATE) program

This report is produced annually to compile and summarize information about the Alaska Marine Ecosystem for the [North Pacific Fisheries Management Council](#), the scientific community and the public. The report includes an ecosystem assessment, contributions with updated status and trend indices, and ecosystem-based management indices and information for the Bering Sea (BS), Aleutian Islands (AI) and the Gulf of Alaska (GOA) ecosystems.

December 2012 Update

- [Download current report](#) (PDF approx. 6.5 MB)
- [Download Eastern Bering Sea Report Card](#) (PDF approx. 500 KB)
- [Download Aleutian Island Report Card](#) (PDF approx. 700 KB)
- [Guidelines for citing this document](#)

Links

- [2012 Stock Assessments for 2013 Fishery Recommendations](#)
- [Data access](#) for most contributions (Dec. 2011 Update)
- Data use is contingent upon compliance with the [AFSC Data Use Conditions](#)
- A collection of [links relevant to the report contents](#)
- Contact [Stephani Zador \(Editor\)](#) for further information

Archive

- [Contribution archive](#)
- [Stock assessment archives](#)