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Update on the Eastern Pacific Stock of Laaquadan (Northern Fur Seals): Co- management and Conservation Plan updates

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Ecosystem Committee
January 18-19, 2023



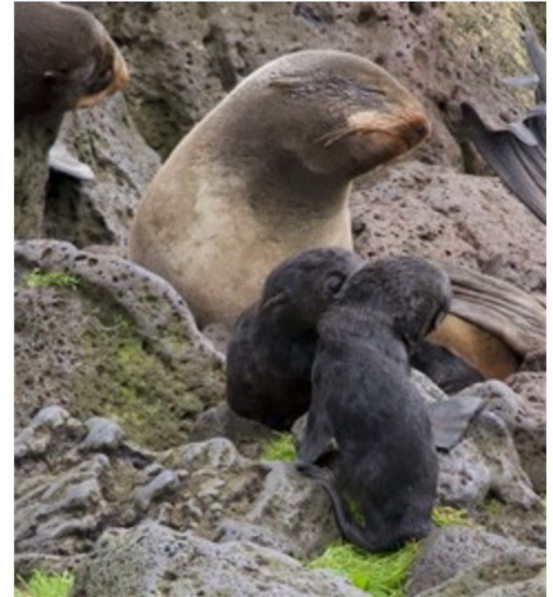
Outline

Updates on co-management activities

- Harvest management
- Entanglement, marine debris
- VHF 5-year study

Focus: Conservation Plan Update

- Synthesis of recent studies compiled
- Reflection on long-term trends, marine ecosystem changes, fisheries, and fisheries interactions
- Revision Timeline



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Co-management:

Status and Updates on Laaquudan - Northern fur seals Harvest/Hunt Management

Hunting season Jan 1 - May 31, 2022

- 6 laaquudan hunted
- 6 were retrieved (3 from Reef and 3 from Northeast Point)
- Island Sentinels collected 5 samples for aging

Juvenile harvest season June 23 - Dec 2, 2022

- 168 juvenile laaquudan were harvested from 8 haulout areas
- 166 Juvenile males (27 were pups) and 2 female taken



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Co-management:

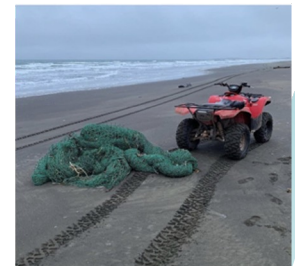
Status and Updates on Laaquadan - Northern fur seals Entanglement/Marine Debris

Entanglement

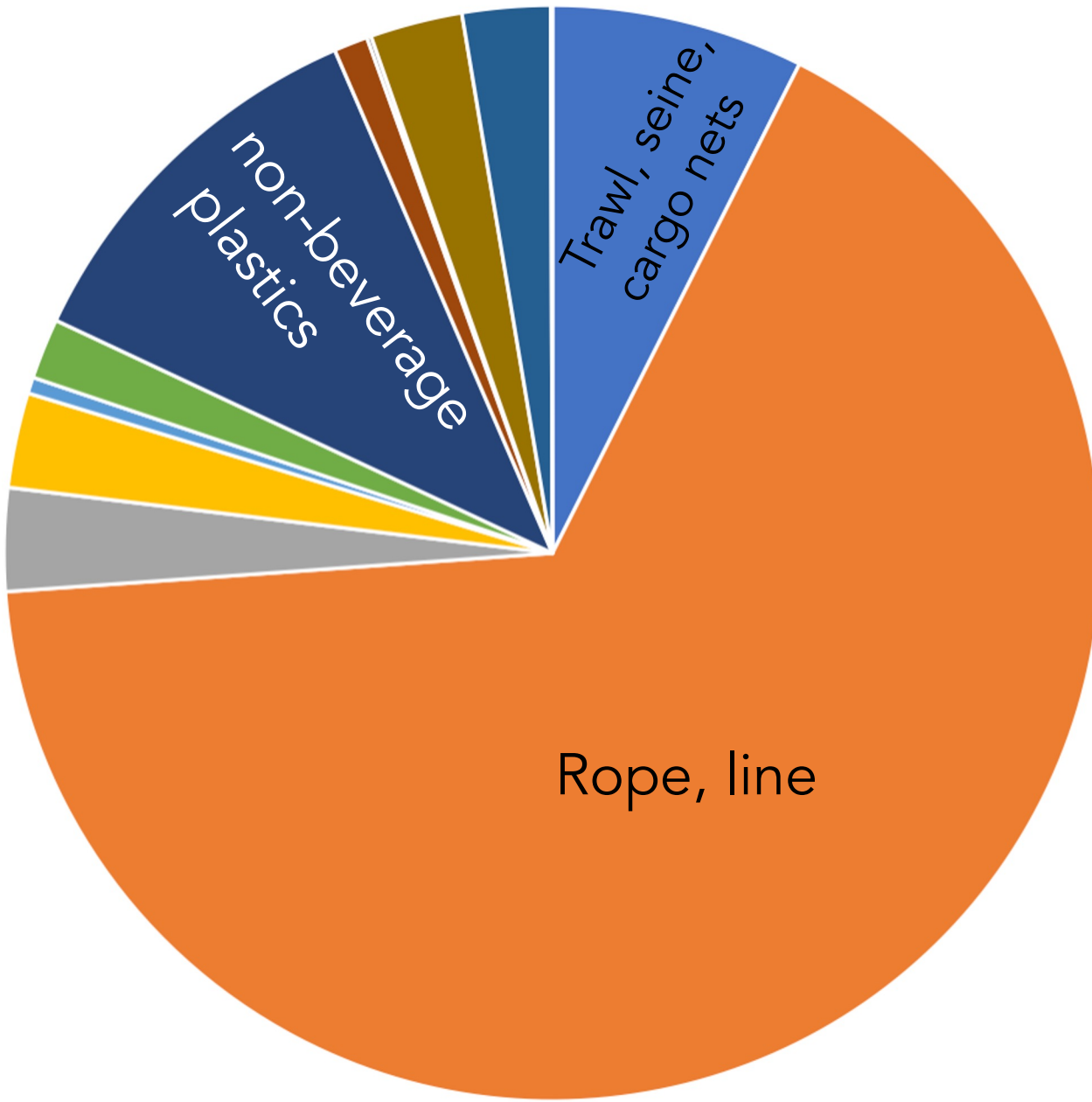
- 42 seals disentangled in 2022
- Dedicated entanglement program expanded from pilot in 2021
- Continuing and expanding 'entanglement rate' work

Marine Debris

- 2022 Community Clean-up (NOAA MDR funding)
 - 24,885 lb of debris removed
 - 284,370 lb since 2006 (13 events); 21,875 lb avg
- 2023 Cleanup planned for STG



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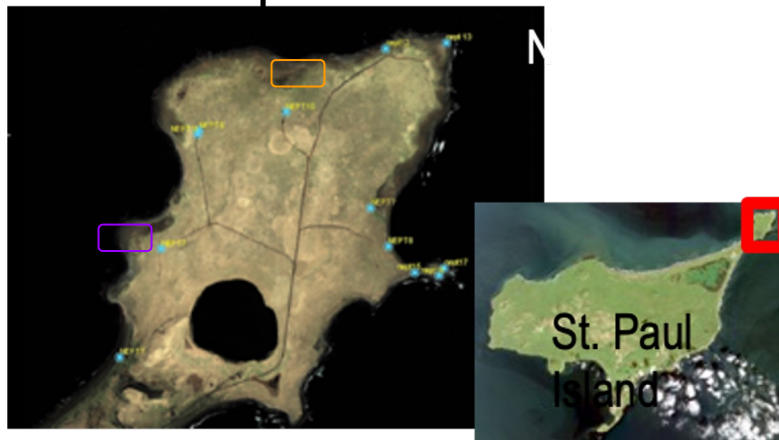


- Trawl, Seine, Cargo Net
- All Ropes/Line
- Hard Plastic Floats/Buoys
- Inflatable/Rubber Floats/Buoys
- Banding
- Plastic Beverage Bottles
- All Other Plastic, Non-Beverage
- All Other Foam
- Aluminum Cans
- Other Metal, Non-Beverage
- All Other Non-Fishing Related Debris



Co-management: VHF Study

- Research on female on-land habitat use began in 2021
- NMFS crew provided training and support for 8 ECO staff
- Tagged 49 female NFS at NEP in 2022 (control, experimental sites)
- 7 Receivers at NEP to detect fur seal arrivals and departures, along with 28 receivers deployed at other rookeries
- Annual download VHF receiver data (across the island)
- Collaborative analysis of data planned



Conservation Plan revision Updates

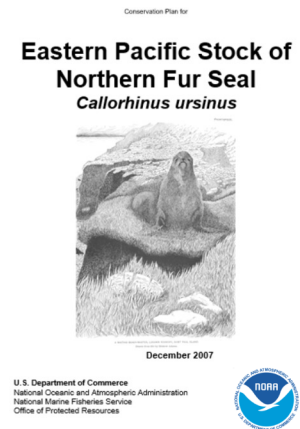
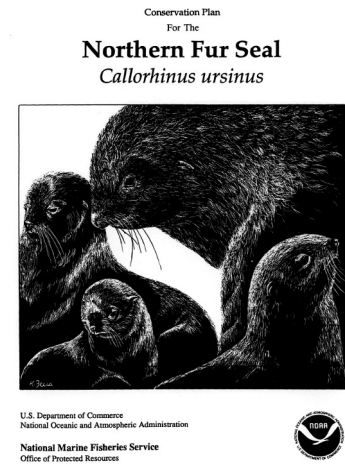
- Recent studies compiled
- Reflection on long-term trends, marine ecosystem changes, fisheries, and fisheries interactions
- Anticipated Timeline



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Recent Studies Compiled since the 2007 Conservation Plan

- 541 fur seal references in EndNote library
 - 347 published since 2006
- 174 papers currently cited
 - 97 since 2006
- The 2007 Plan cited 255 papers



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Reflections from Conservation Plan Update

- 1. Long term trends:** *Stock, Island, Complexes*
- 2. Marine Ecosystem Changes:** *Temperature, loss of sea ice, storms, coastal erosion, fur seal foraging and diet dynamics*
- 3. Fisheries:** *Temporal distribution of catch, Spatial distribution of catch*
- 4. Fisheries Interactions:** *Bycatch, Entanglement, Indirect Effects, Biomass Indices, Ecosystem Considerations*

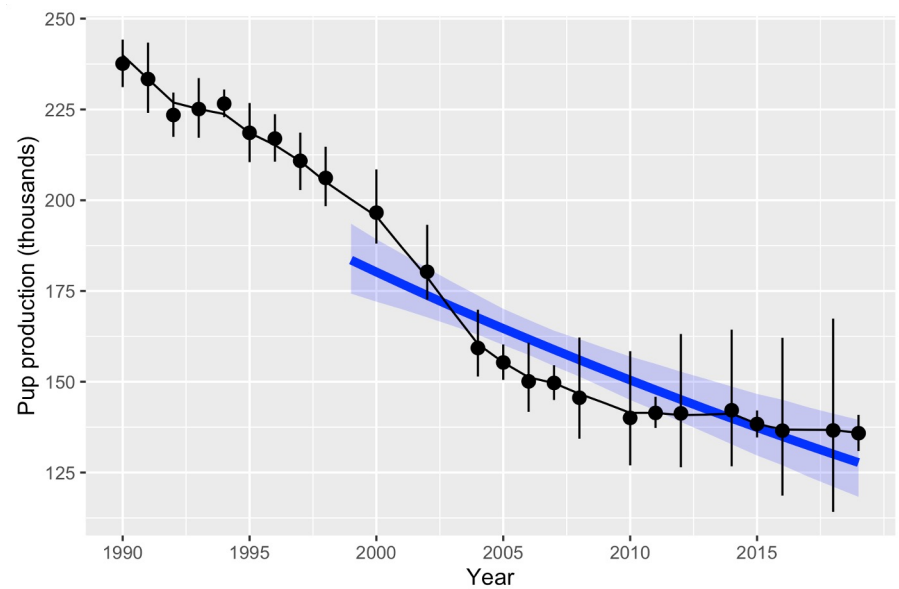
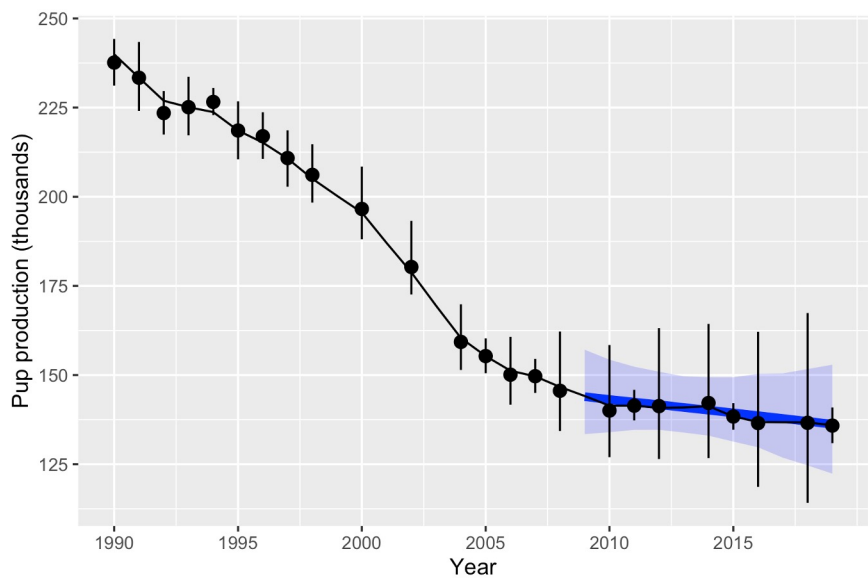


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Reflection: Long-Term trends since 1992, last decade

Stock: 1950 = 2.1 million; 1992 = 982,000; 2019 = 626,618

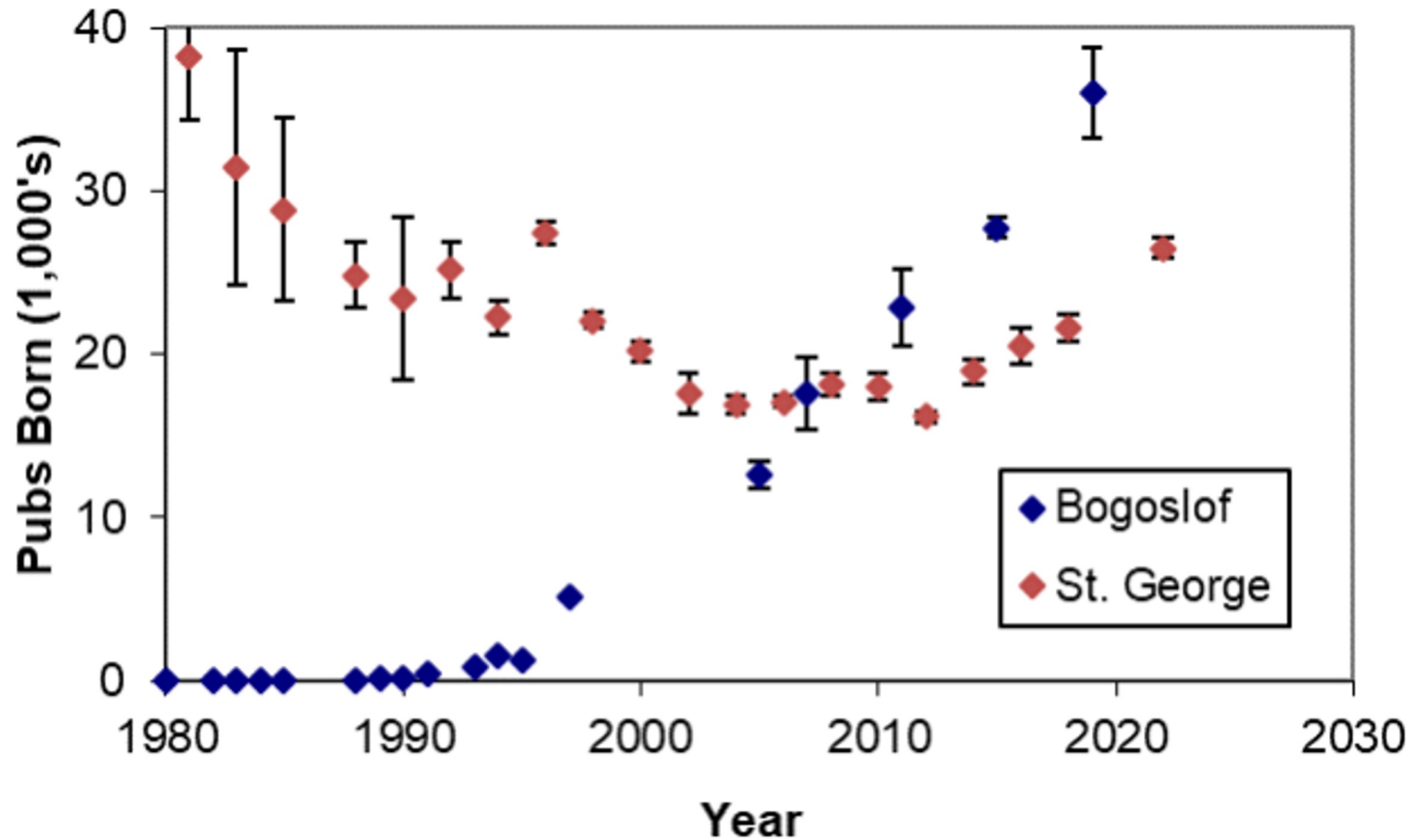
St. Paul Island (pup production)



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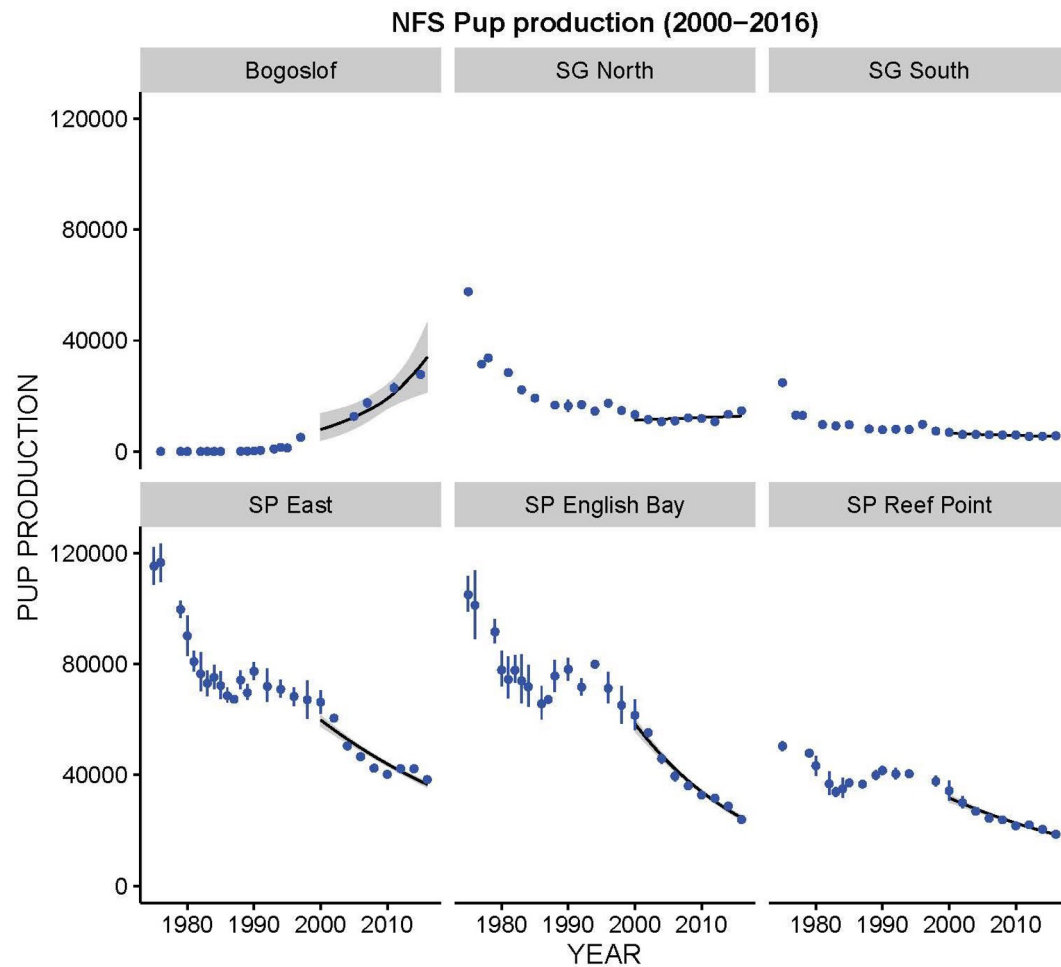
Reflection: Island Long-Term trends since 1980

St. George and Bogoslof:



Reflection: Long-Term trends since 1980, AgTrend lines 2000-2016

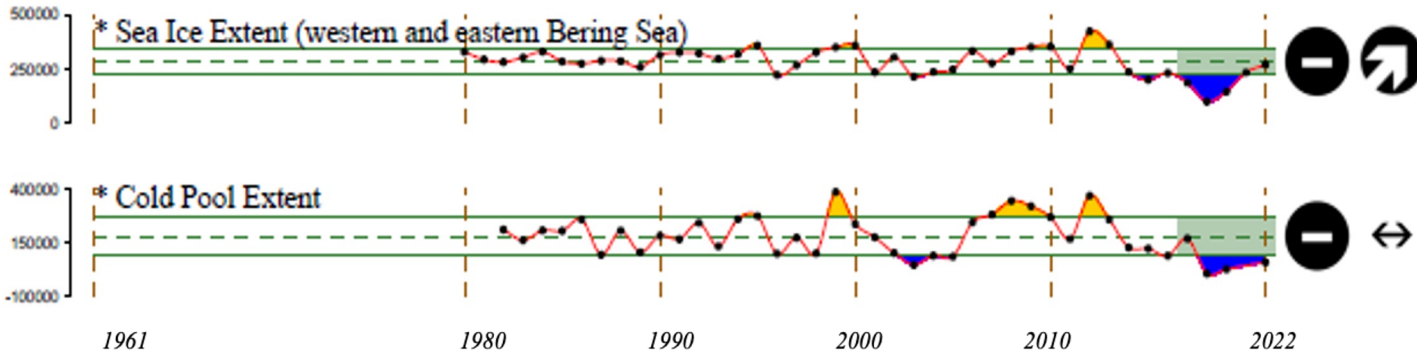
Rookery Complexes:



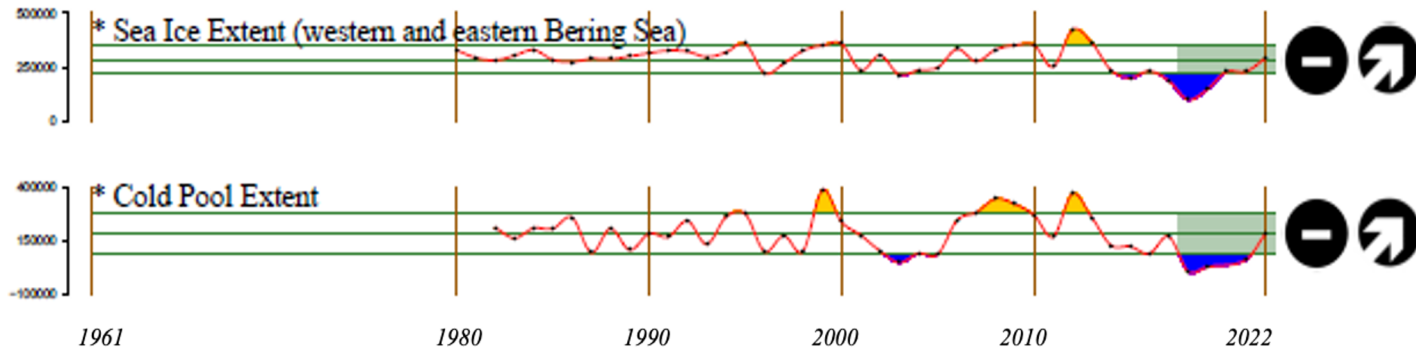
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Reflection: marine ecosystem changes

2021 Ecosystem Status Report Temperature and Sea Ice

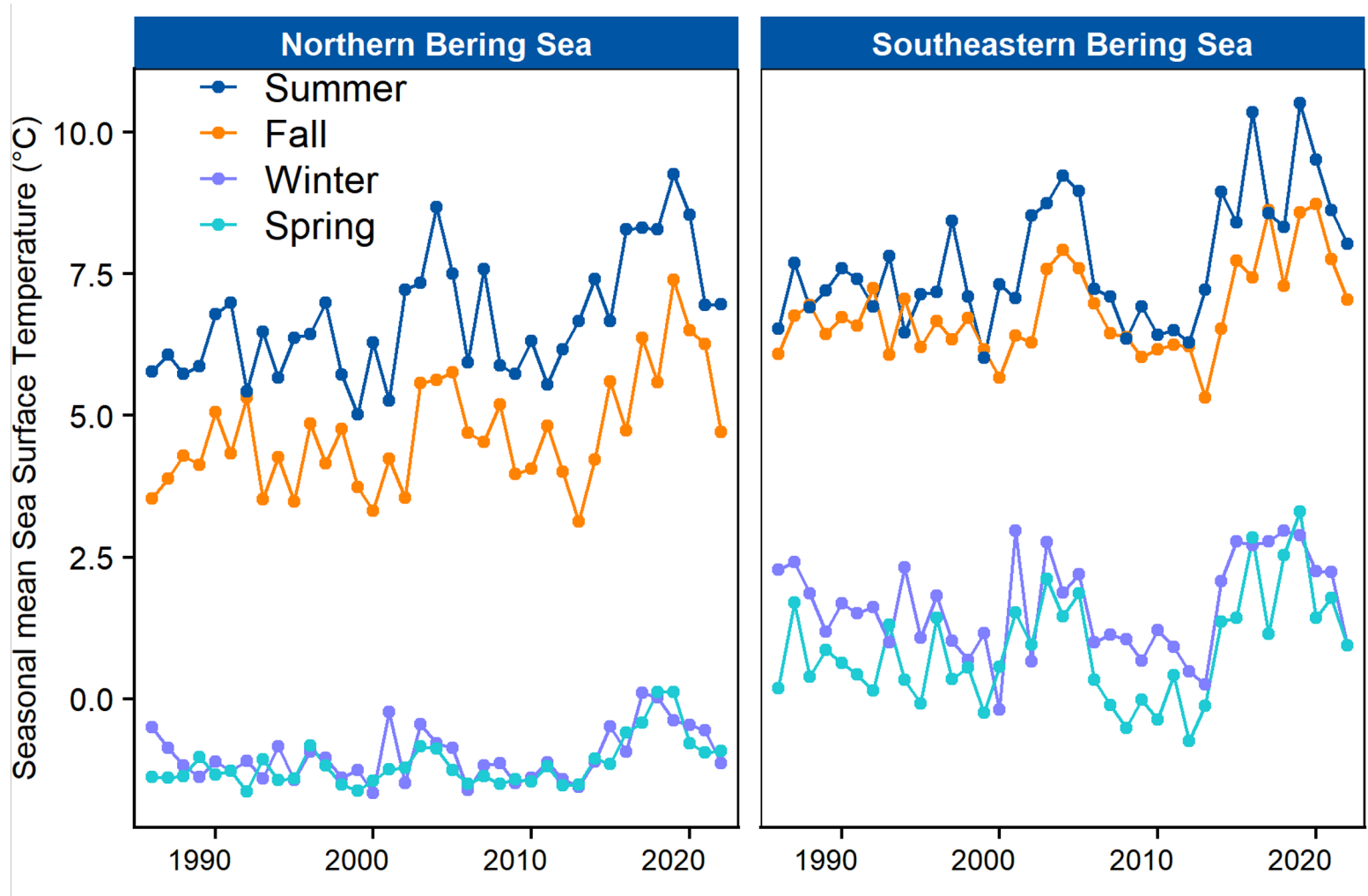


2022 Ecosystem Status Report Temperature and Sea Ice



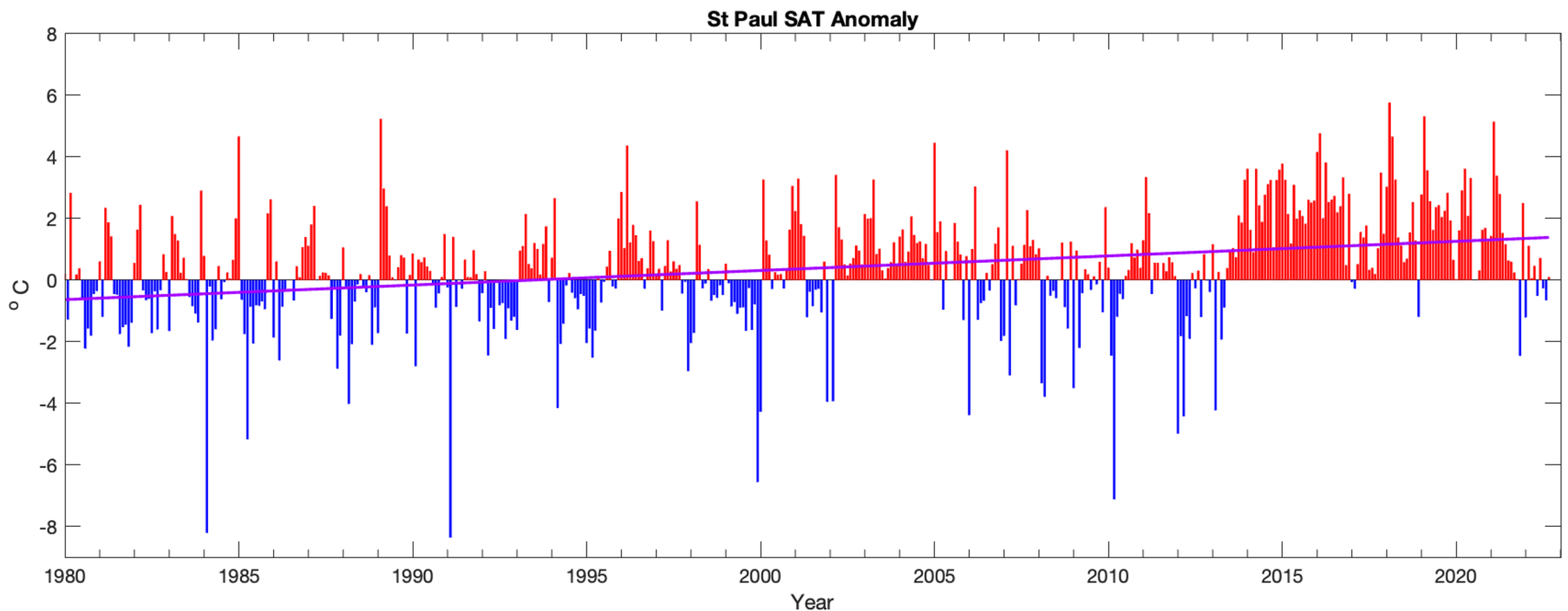
Reflection: marine ecosystem changes: temps

2022 EBS Ecosystem report seasonal mean SST



Reflection: marine ecosystem changes: temps

St. Paul air temperature anomalies updated to September 2022. Courtesy of the Bering Sea Ecosystem Status Report.

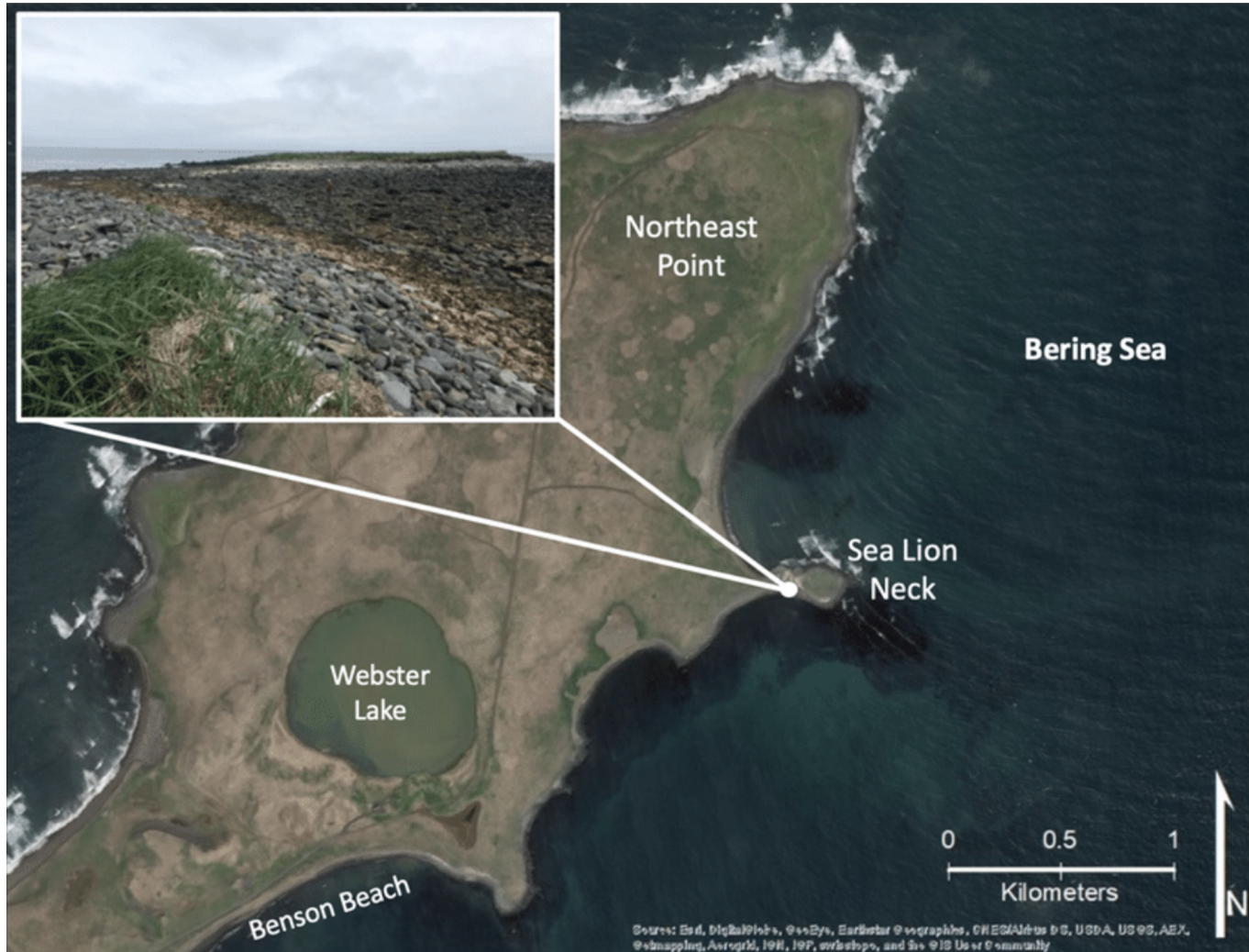


Reflection: marine ecosystem changes: storms



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Reflection: marine ecosystem changes: storms & coastal erosion

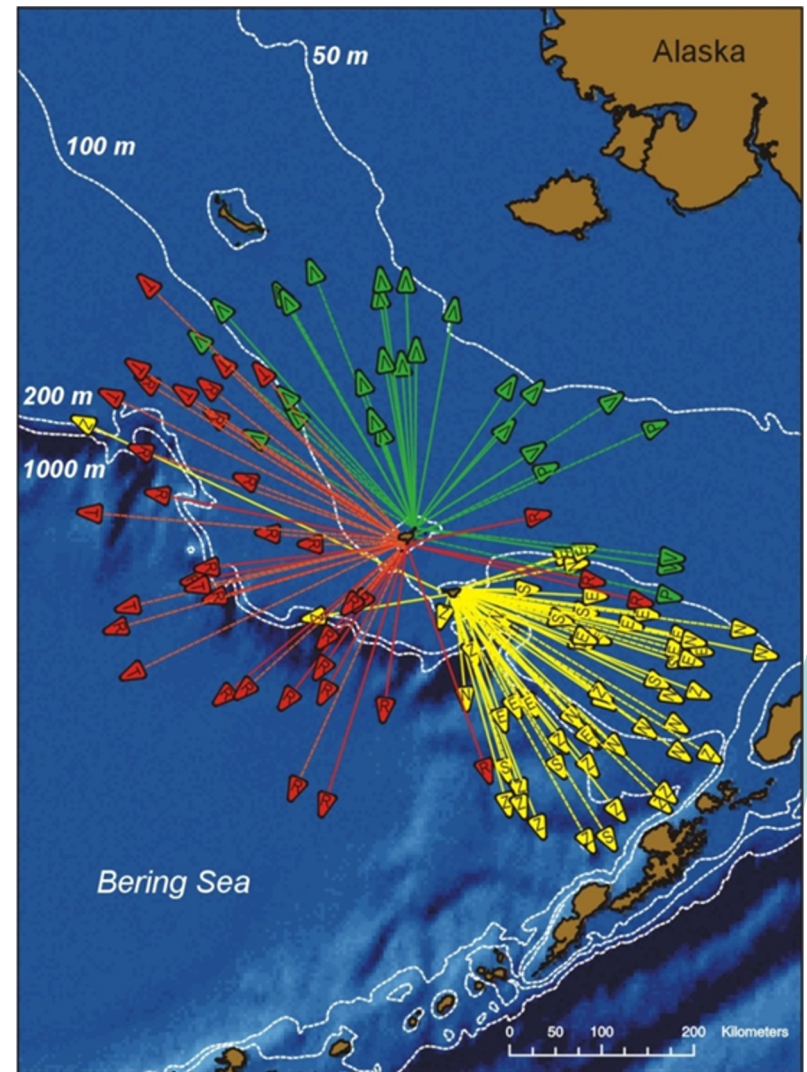


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Reflection: fur seal foraging and diet

Robson et al. 2004

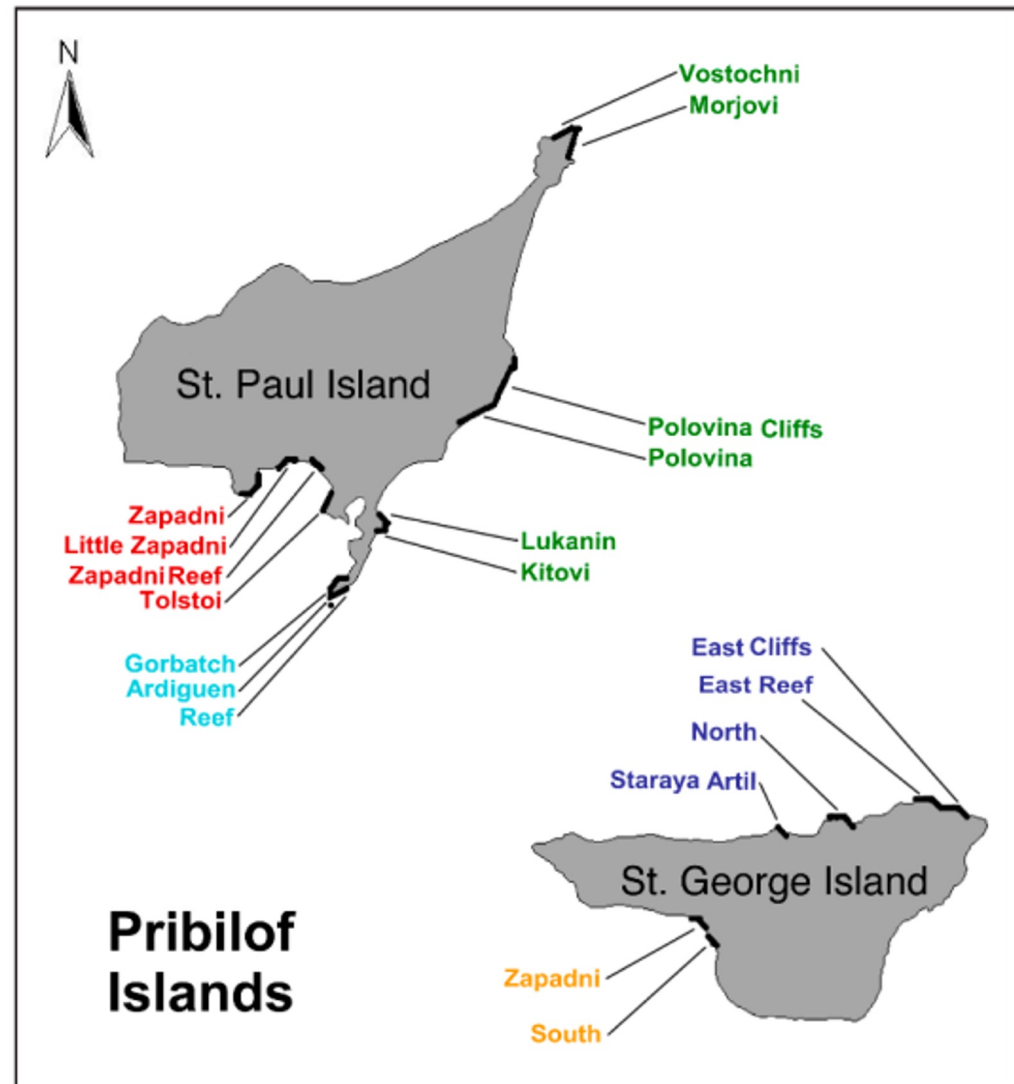
- Changed our understanding of fur seal foraging ecology
- Fur seals segregate their use of foraging habitat by groups of rookeries (hereafter, complexes)
- Two complexes on St. Paul representing the northeast side rookeries and southwest rookeries and St. George rookeries appeared to be a single complex



Reflection: fur seal foraging and diet

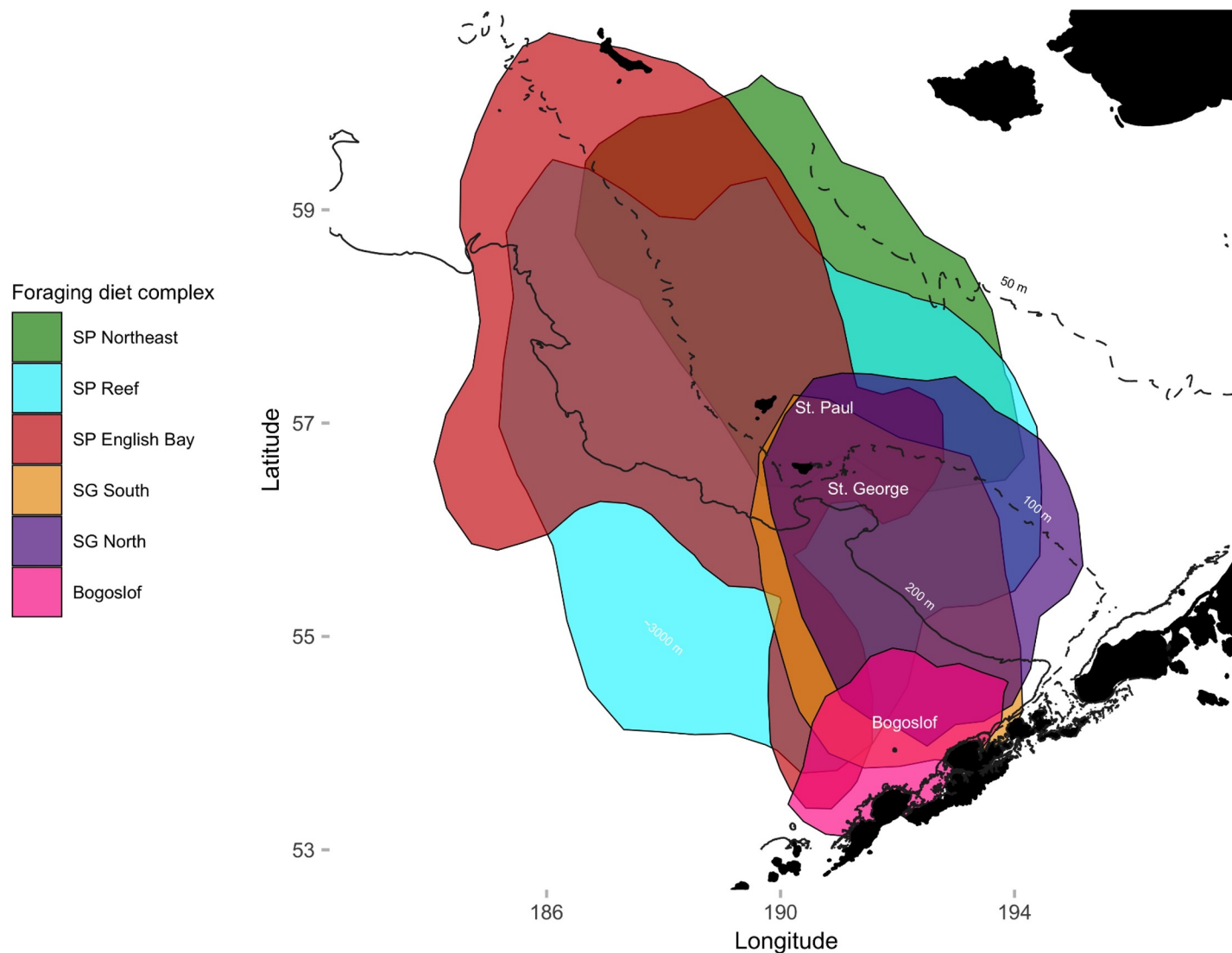
Zeppelin and Ream 2006

- Fur seal scat analysis from 1987-2000
- Differentiated 5 rookery complexes based on diet diversity
- Pollock predominance (46-76 FO)
- Biases
- Aligned with results of Robson et al. 2004



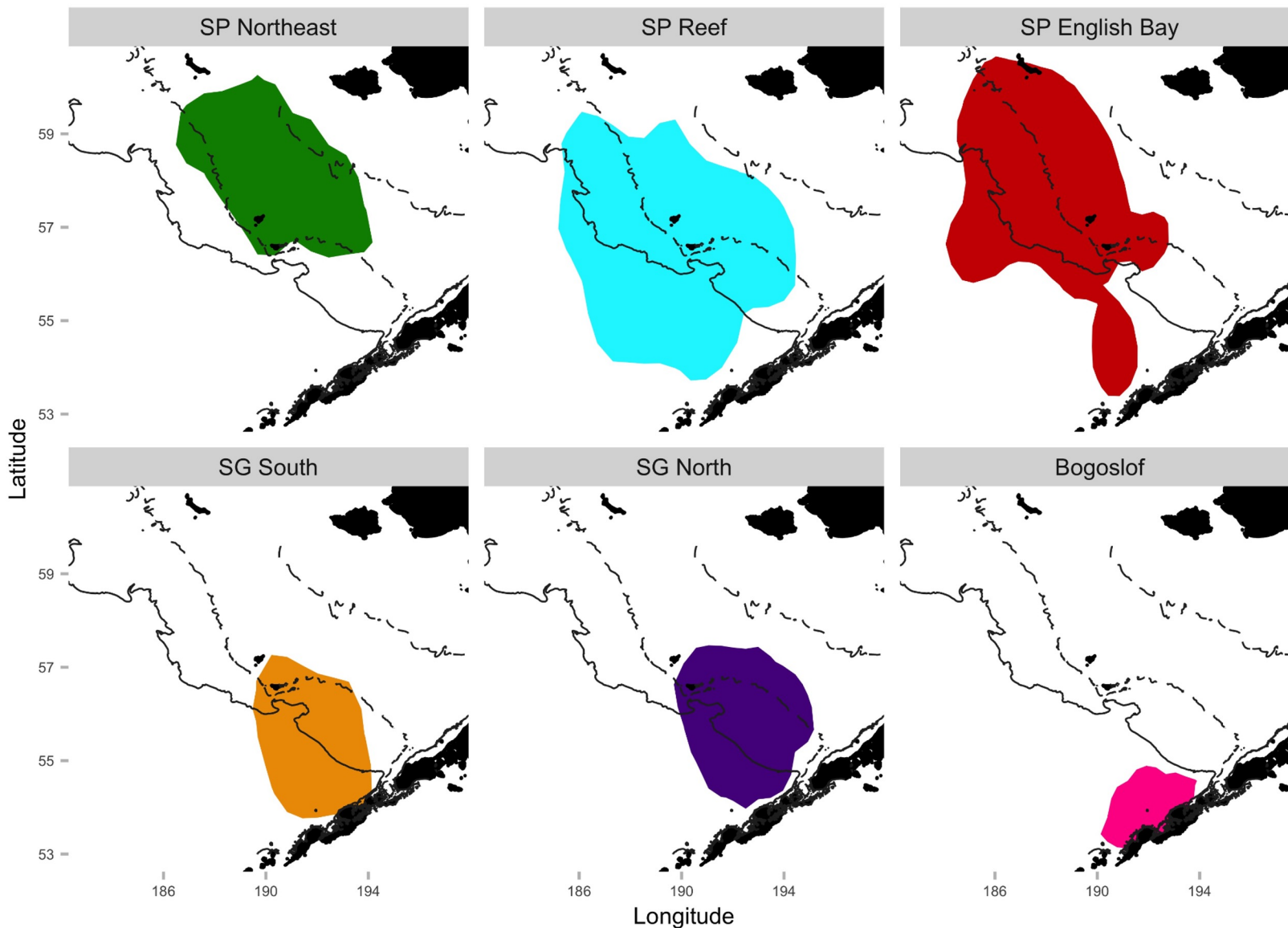
Reflection: contemporary fur seal foraging

A



Reflection: contemporary fur seal foraging

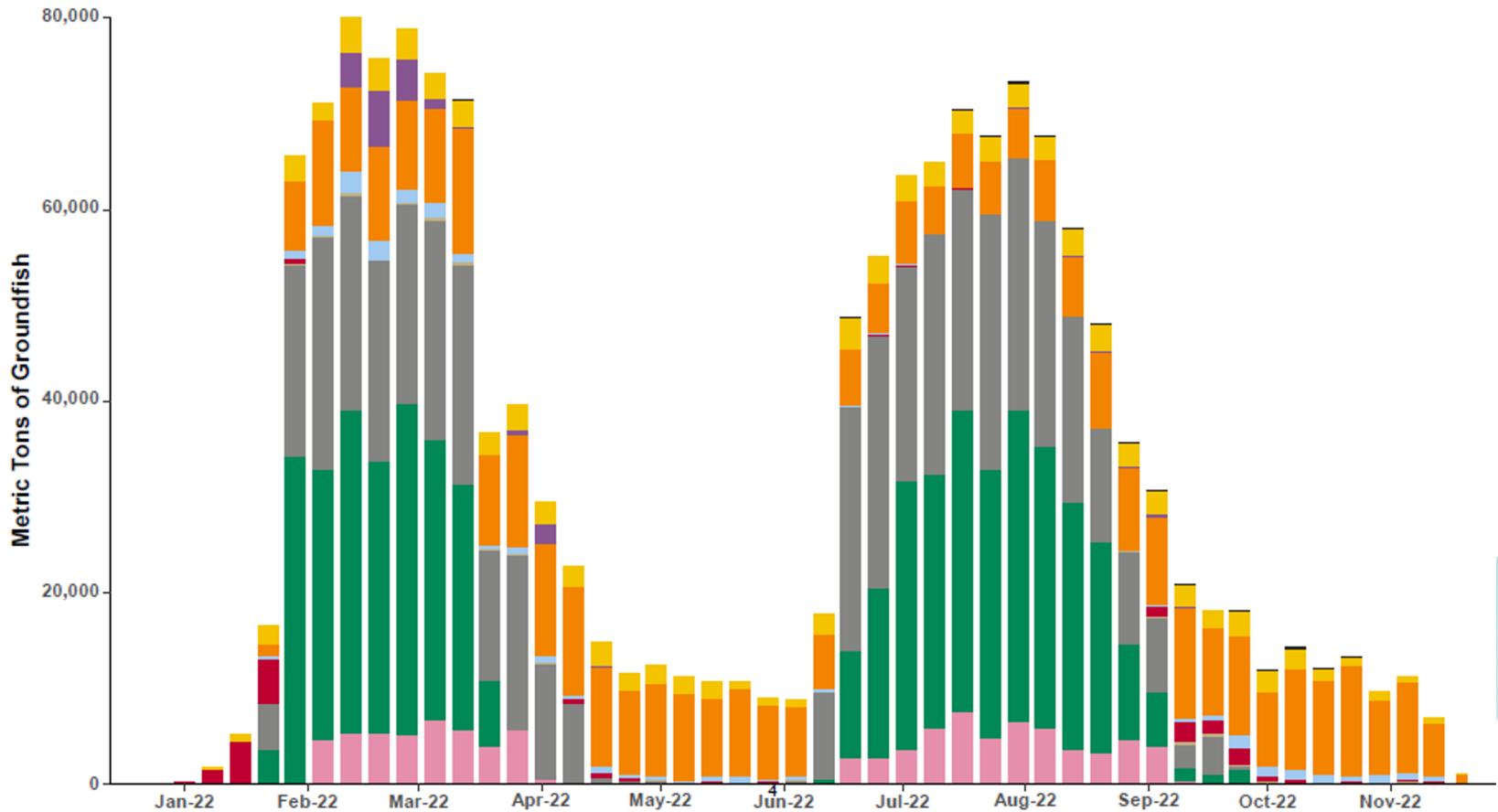
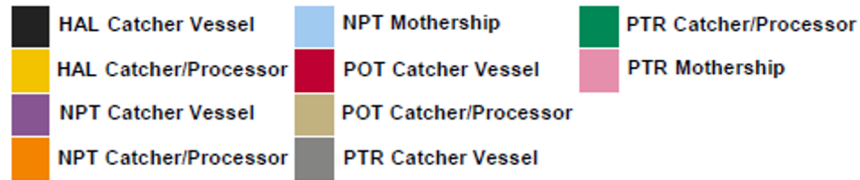
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Reflection: fisheries

2022 BSAI Total Groundfish Catch by Gear & Sector

B2 BSAI 2022 Inseason Mgmt Report
December 2022



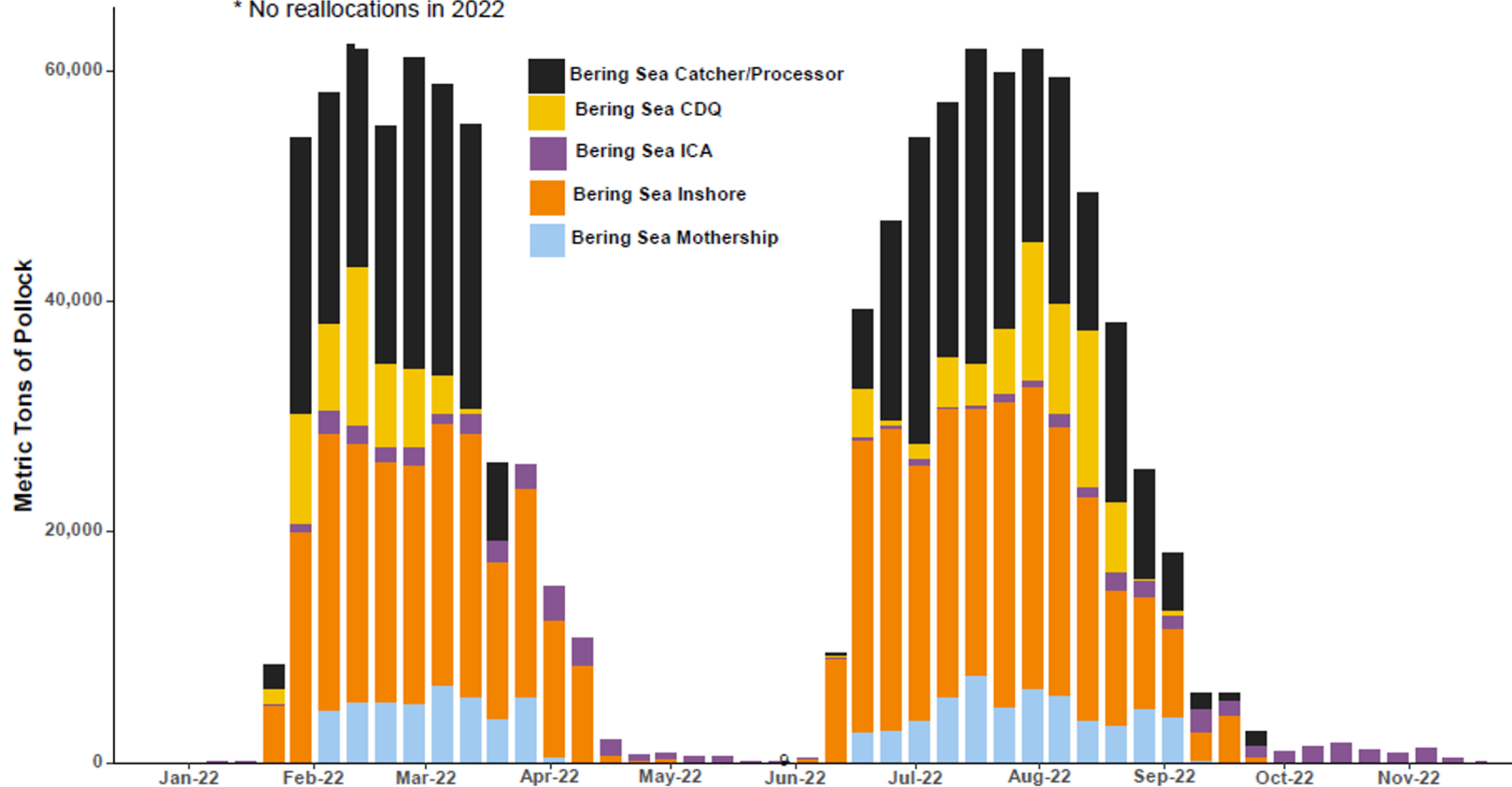
Reflection: fisheries

2022 Bering Sea Pollock Catch by Week and Sector

B2 BSAI 2022 Inseason Mgmt Report
December 2022

2022	TAC (mt)	Catch (mt)	%
Inshore	475,200	473,491	100%
Catcher/Processor	380,160	380,089	100%
Mothership	95,040	95,008	100%
CDQ	111,100	111,033	100%
Incidental Catch	49,500	44,781	90%
TOTAL	1,111,000	1,104,402	99%

* No reallocations in 2022

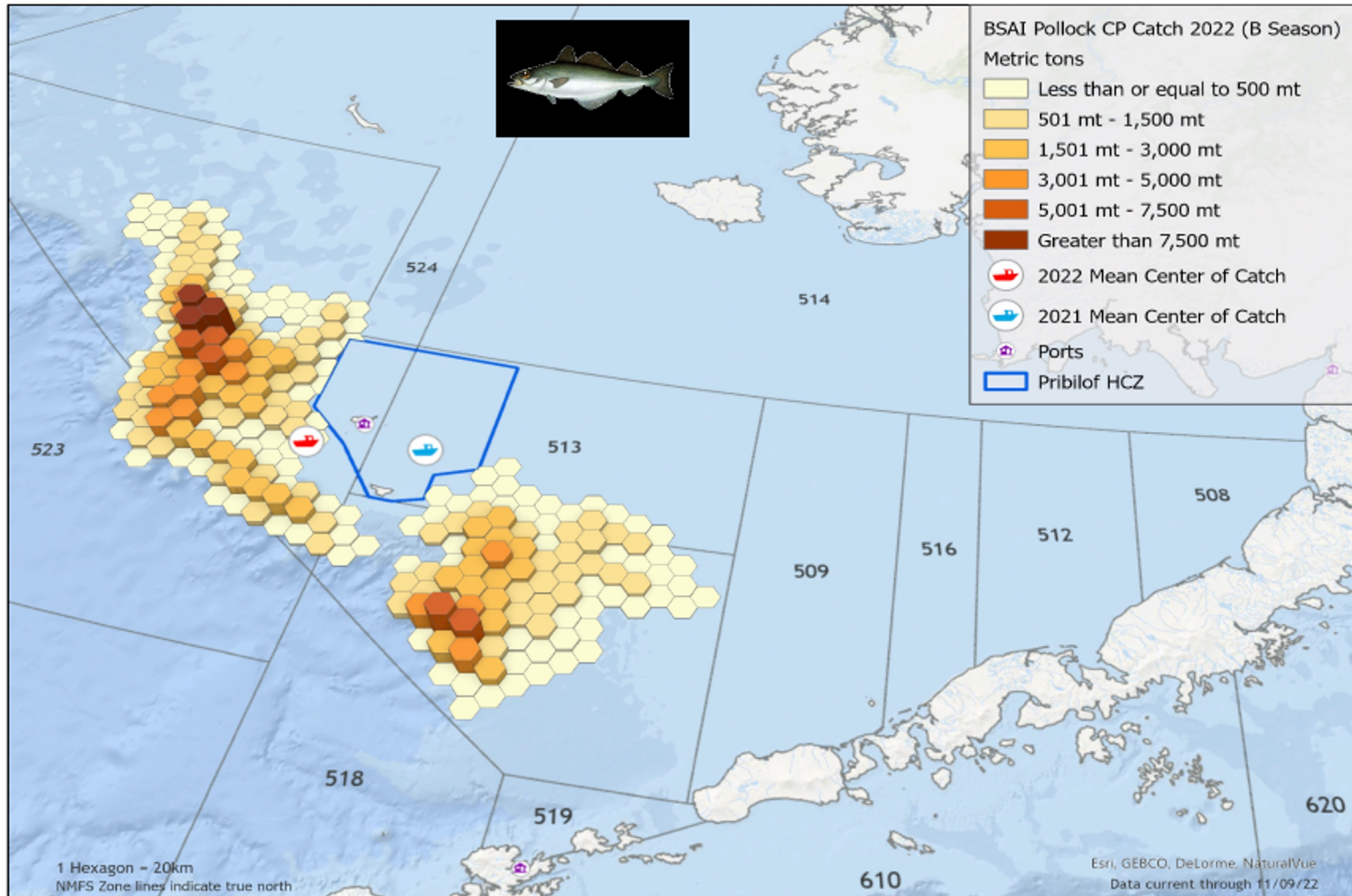


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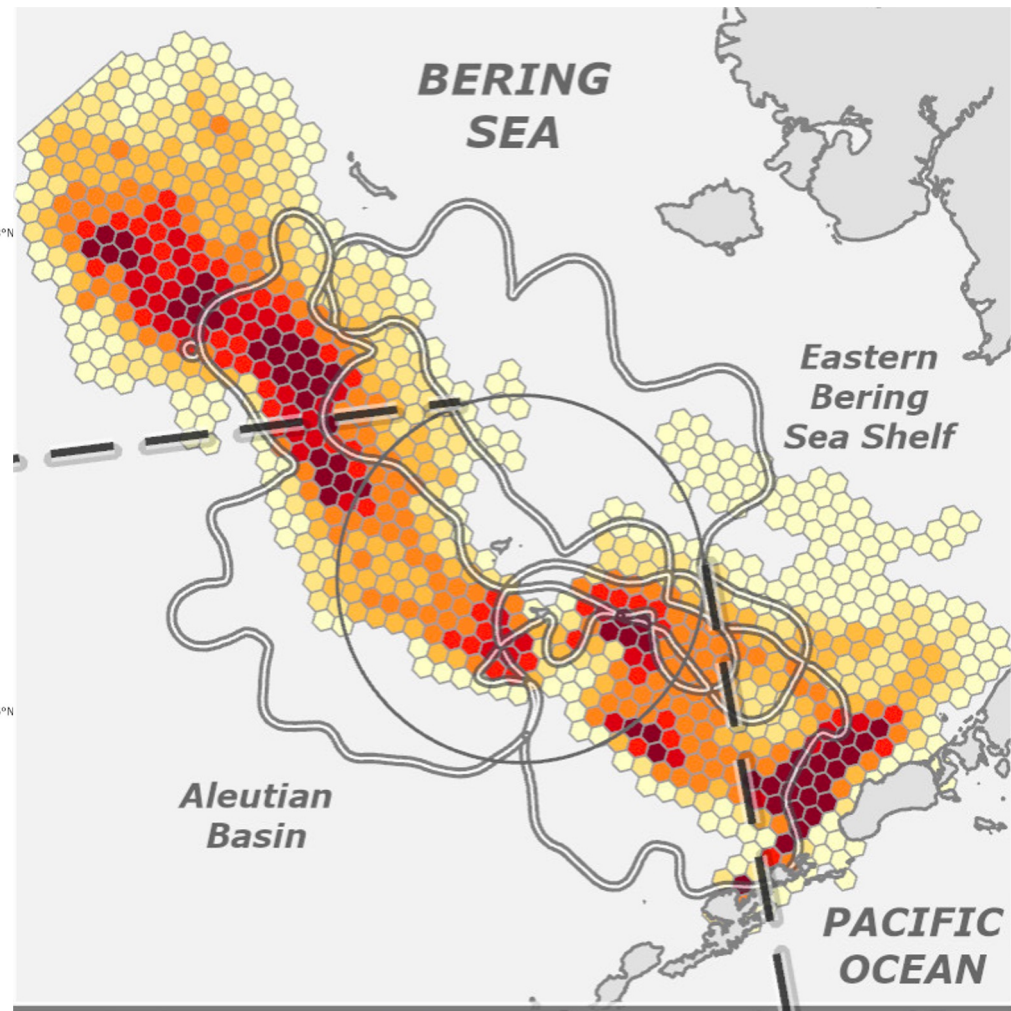
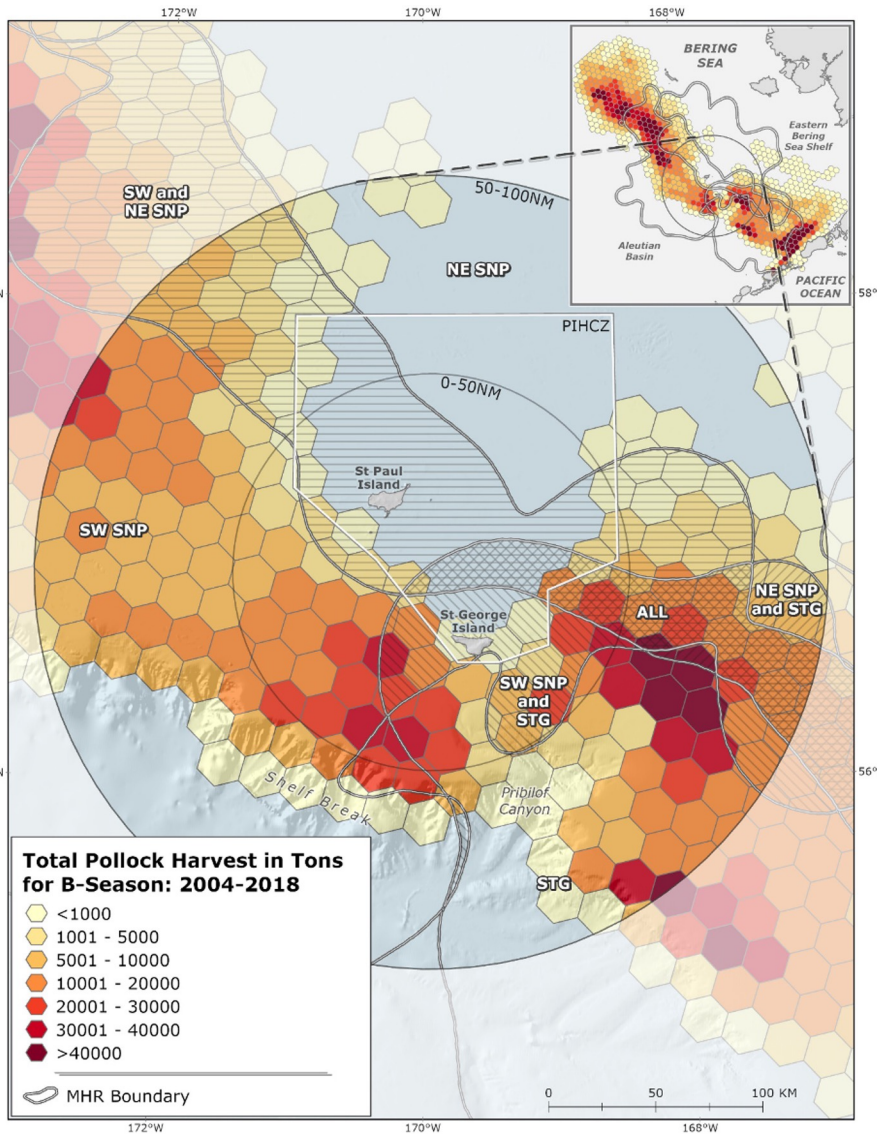
Reflection: fisheries

2022 B Season Bering Sea Pollock Directed Fishery (CP)

B2 BSAI 2022 Inseason Mgmt Report
December 2022

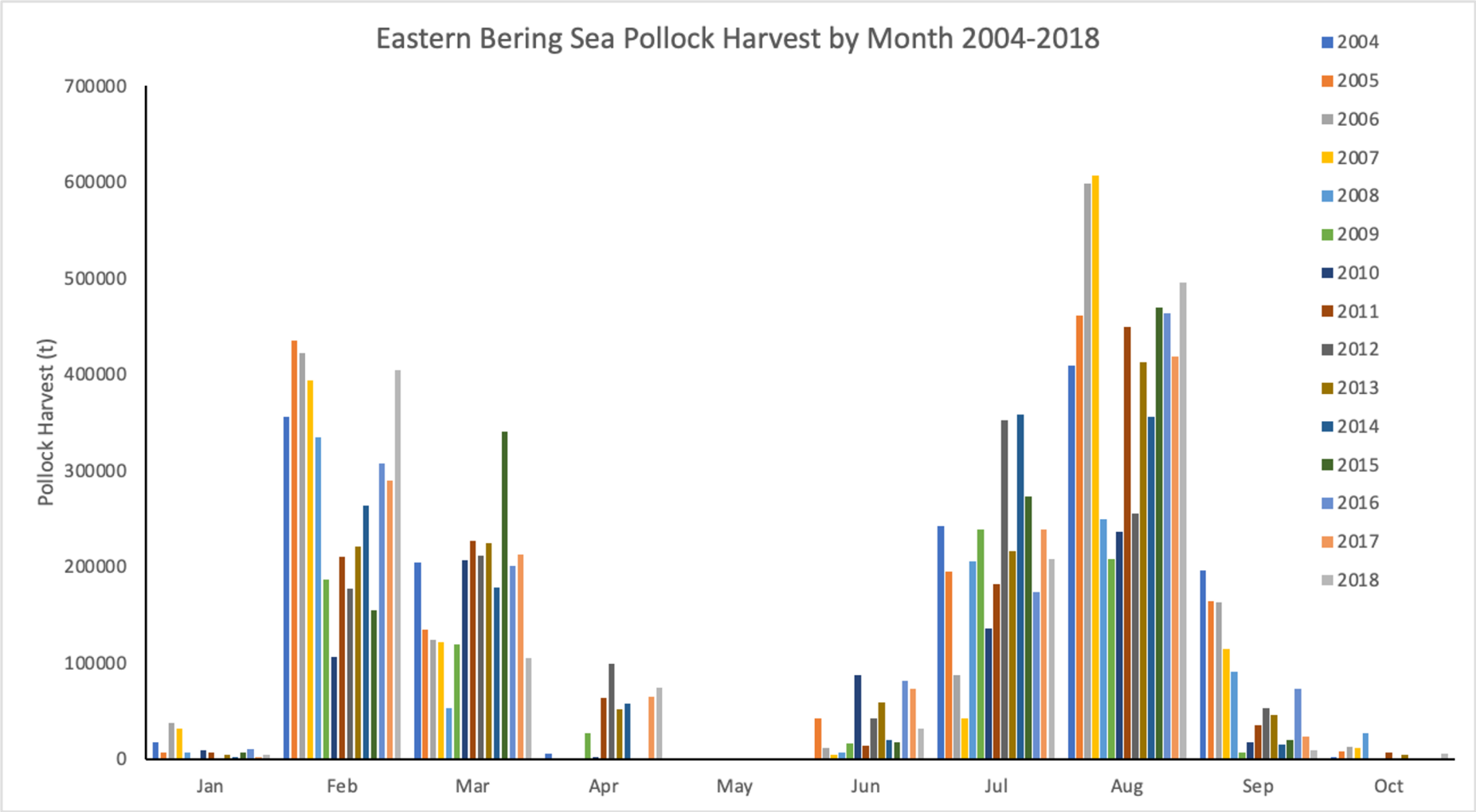


Reflection: fisheries interactions



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Reflection: fisheries interactions



Reflection: fisheries interactions

Direct interactions between fur seals and fisheries

- Bycatch continues to be low (high observer coverage)
- 2019, 11 male NFS bycaught in BSAI flatfish trawl
- entanglement in marine debris (observations on land vs at sea)

Indirect fishery interactions (*Competitive Interactions*)

- Do fishery sectors have similar temporal and spatial distribution of catch?
- Do pollock competitors (fish) all consume 0-1 OR 0-2 year classes?
- How do bycatch reduction measures (e.g., salmon) change the temporal and spatial distribution of the fisheries and how might those differentially affect NFS at the different complexes?
- How do the different spatial and temporal variability (seasonal, annual, sector averages) of fisheries affect predictions of NFS interactions?

NFS ecology

- Should NFS respond to TAC, ABC minus TAC, Biomass minus TAC?
- What are the measures of fur seal response we should be interested in?
- Breeding area complexes appear to be persistent ecological units that have different foraging, diet, and pup production trends
- Male NFS are a larger component of the population than any time in the last 200 years (cessation of commercial harvest in 1984)



Conservation Plan revision Timeline

- Internal review to begin in late January
- Continued NMFS review, MML, ADFG, February
- Anticipated delivery to HQ for review by March 31
- Notice of availability for 30-day public review after HQ review



Qaġaasakuq, Thank you! Questions?



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