

**Alaska Ecosystems Program
National Marine Mammal Laboratory**

Northern fur seal

**2006 Overview
2007 Research Plans**

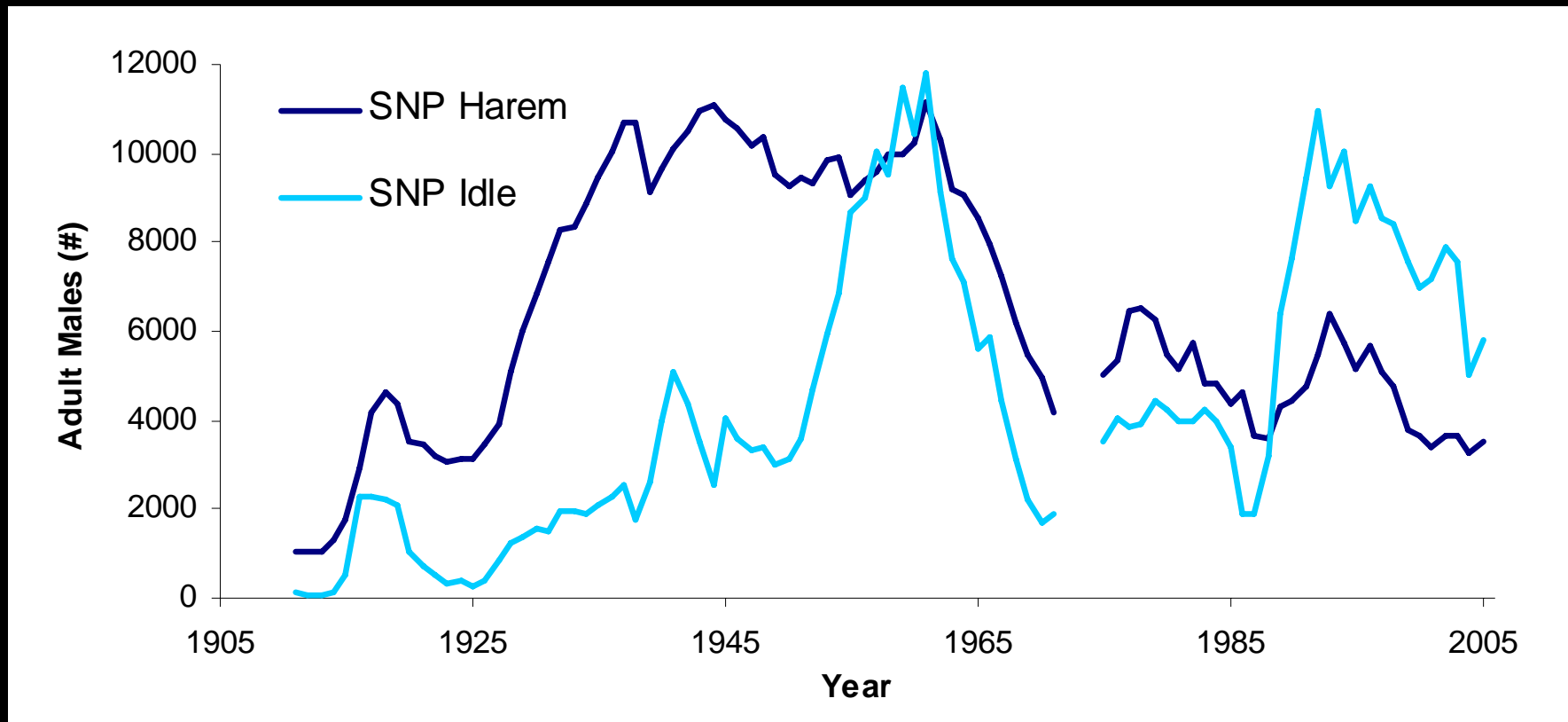


Northern fur seal research

2006

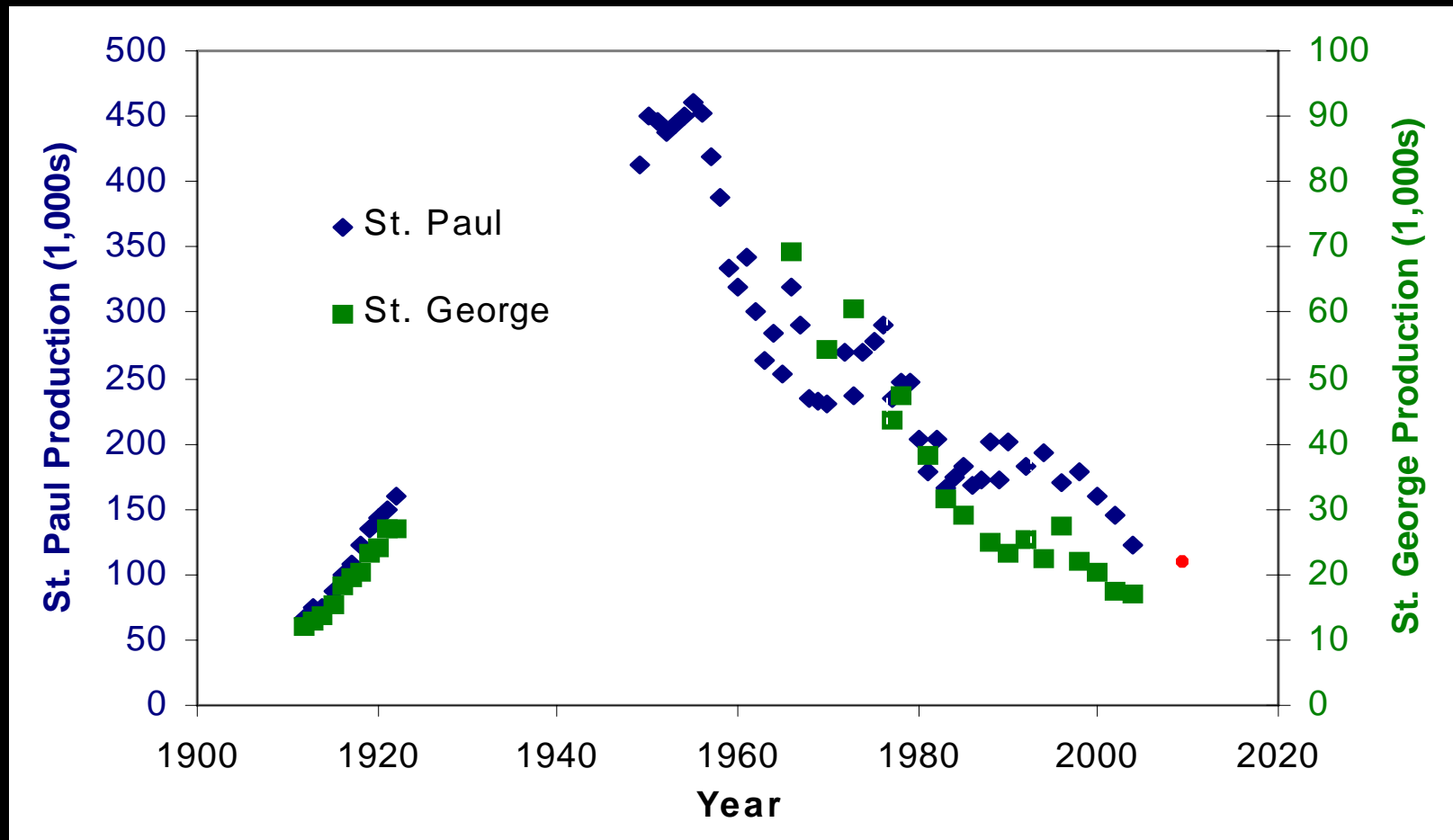
- **Population assessment**
 - Bull and pup counts (Pribilof Islands)
- **Diet habits**
 - Rookery scat collections
- **Foraging behavior**
 - Consequences of female foraging strategies
 - NPRB/NMML funded, Springer/Iverson/Ream
- **Winter migration**
 - Pup/juvenile telemetry (NRC-Lea)

Northern fur seal adult male counts 1911-2006



St. Paul Island 2006 Counts:
3,669 "harem" males
- 43% from 1993

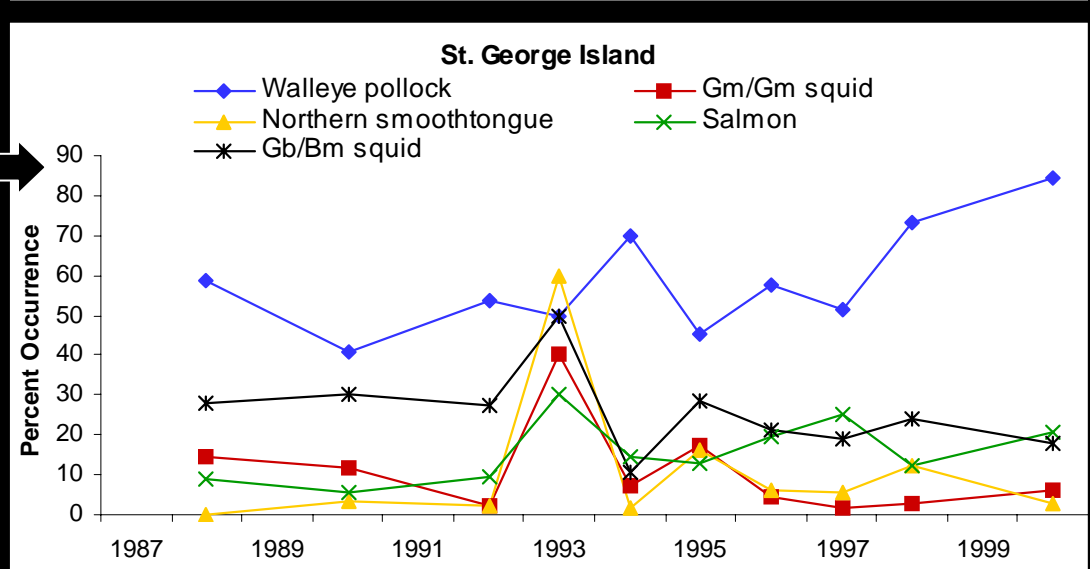
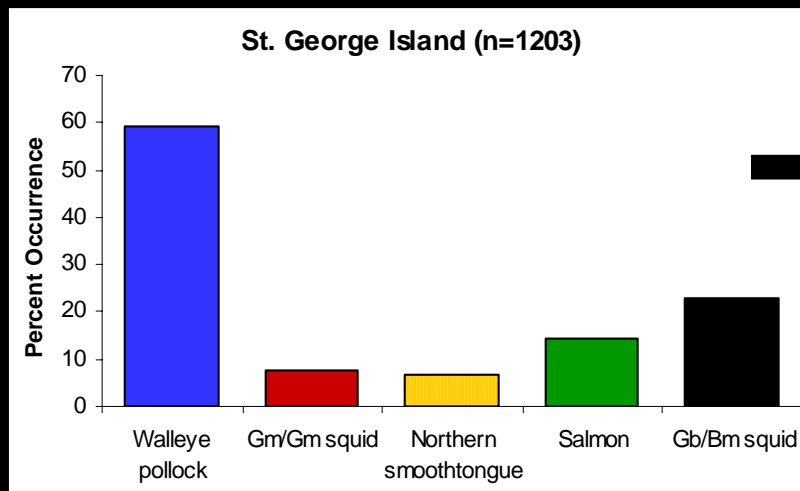
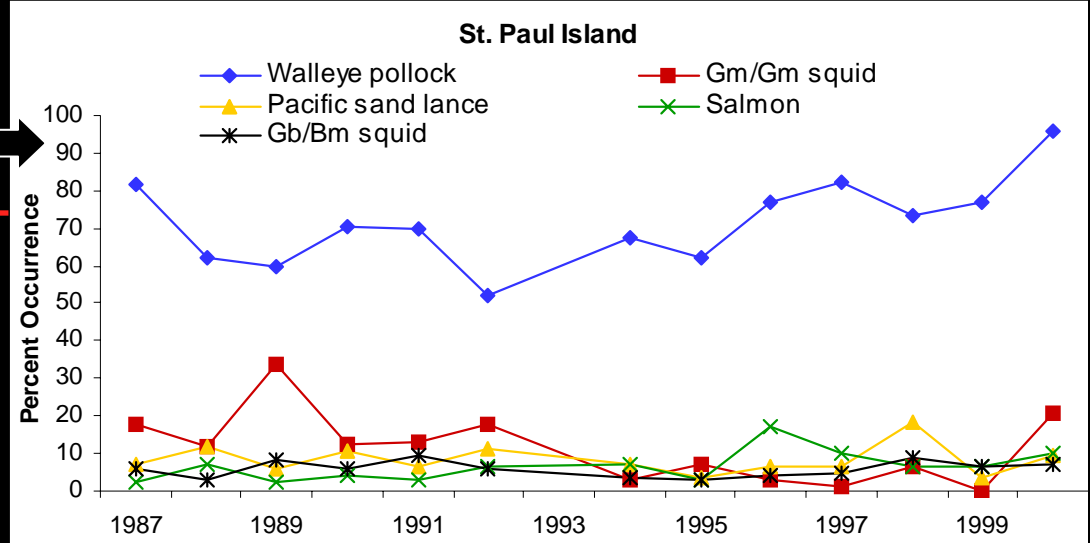
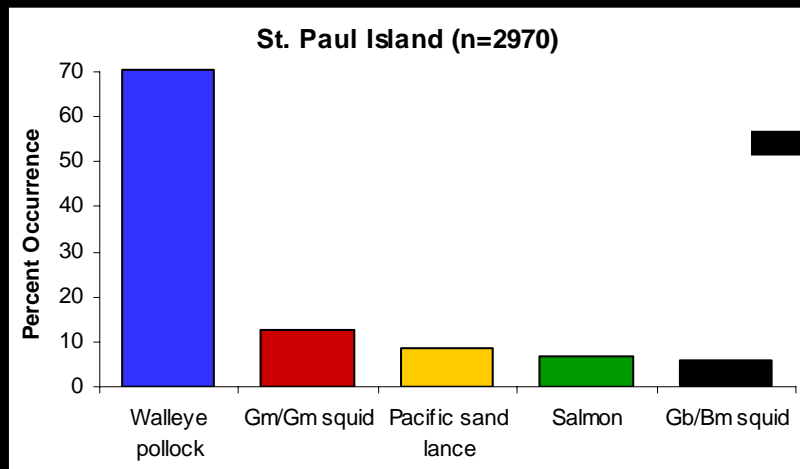
St. Paul fur seal pup production



2006 St. Paul : 109,937 = 10.5% less than 2004

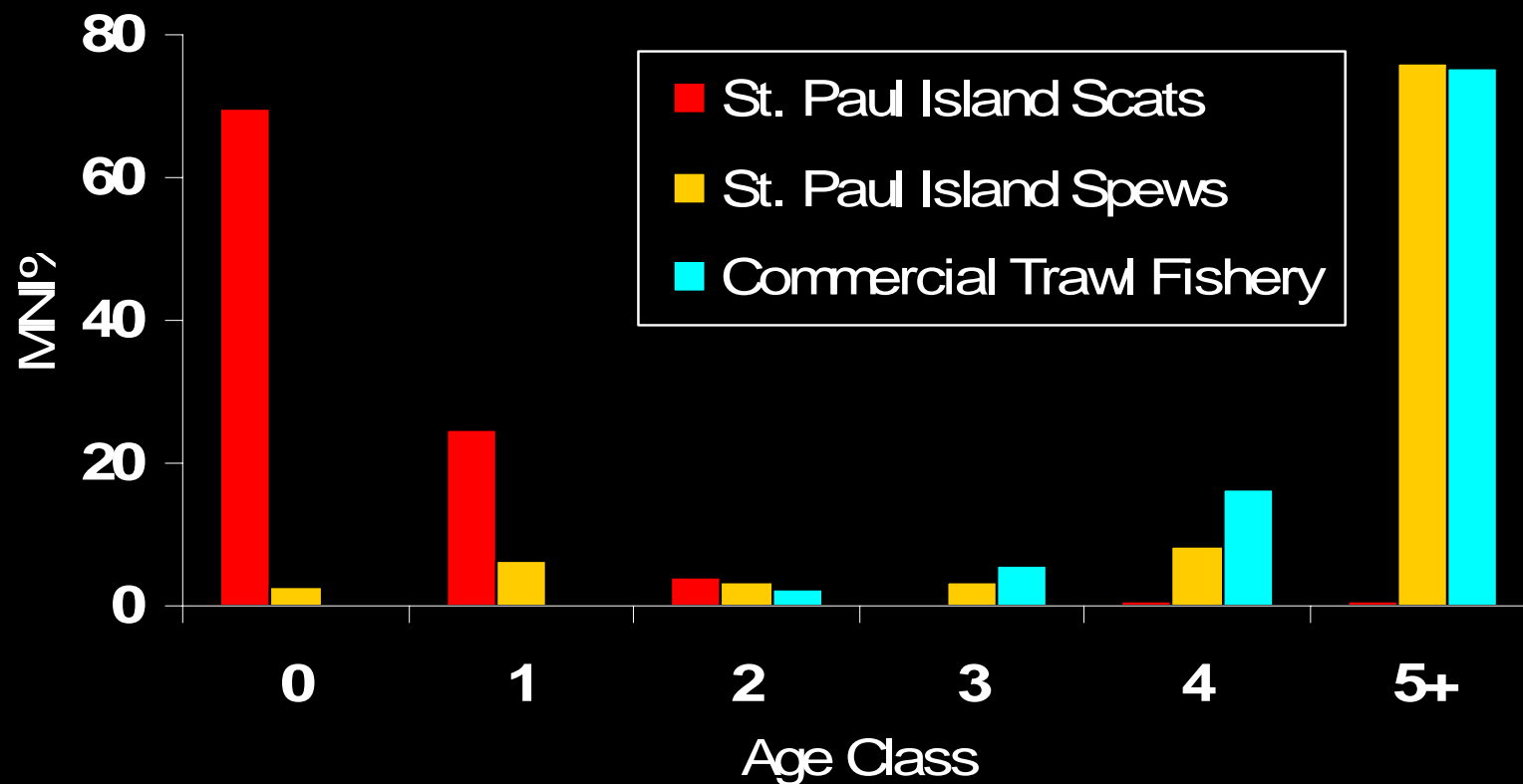
St. George: 17,070 = 1.2% greater than 2004

Top five fur seal prey (August-September 1887 - 2000)



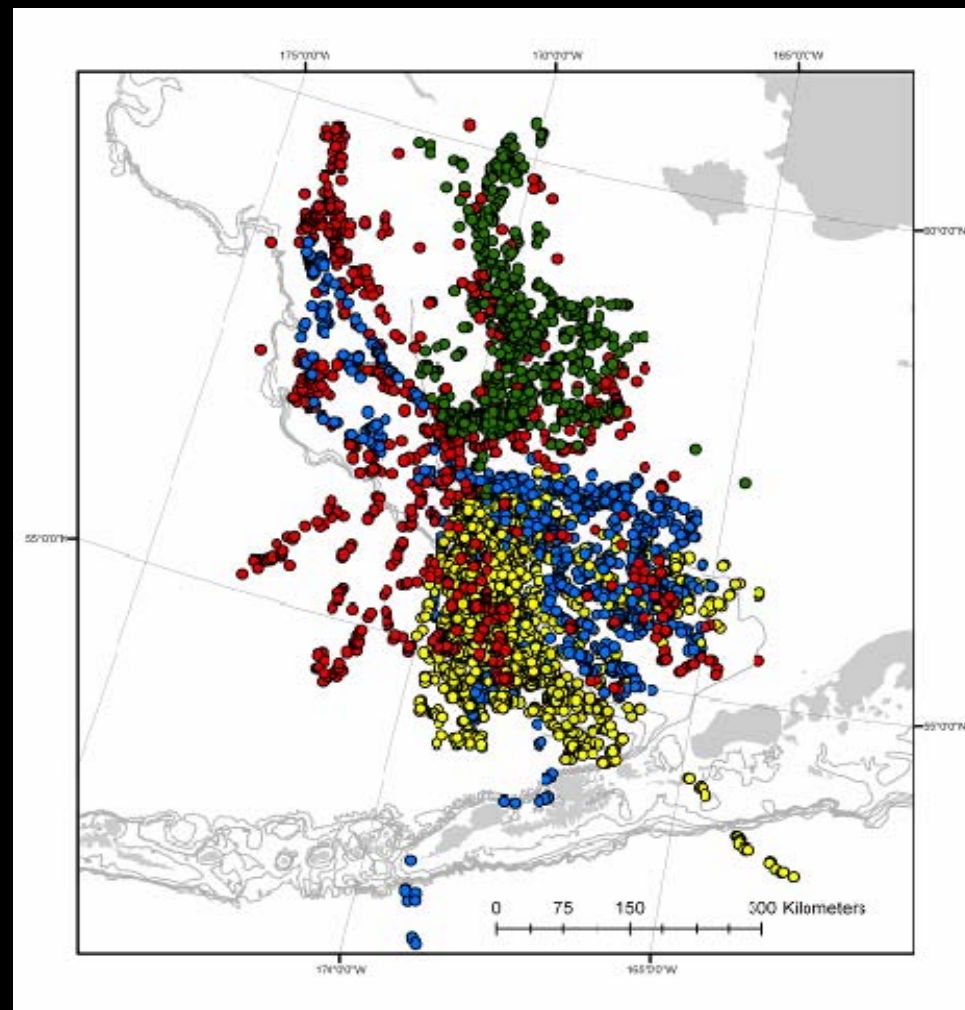
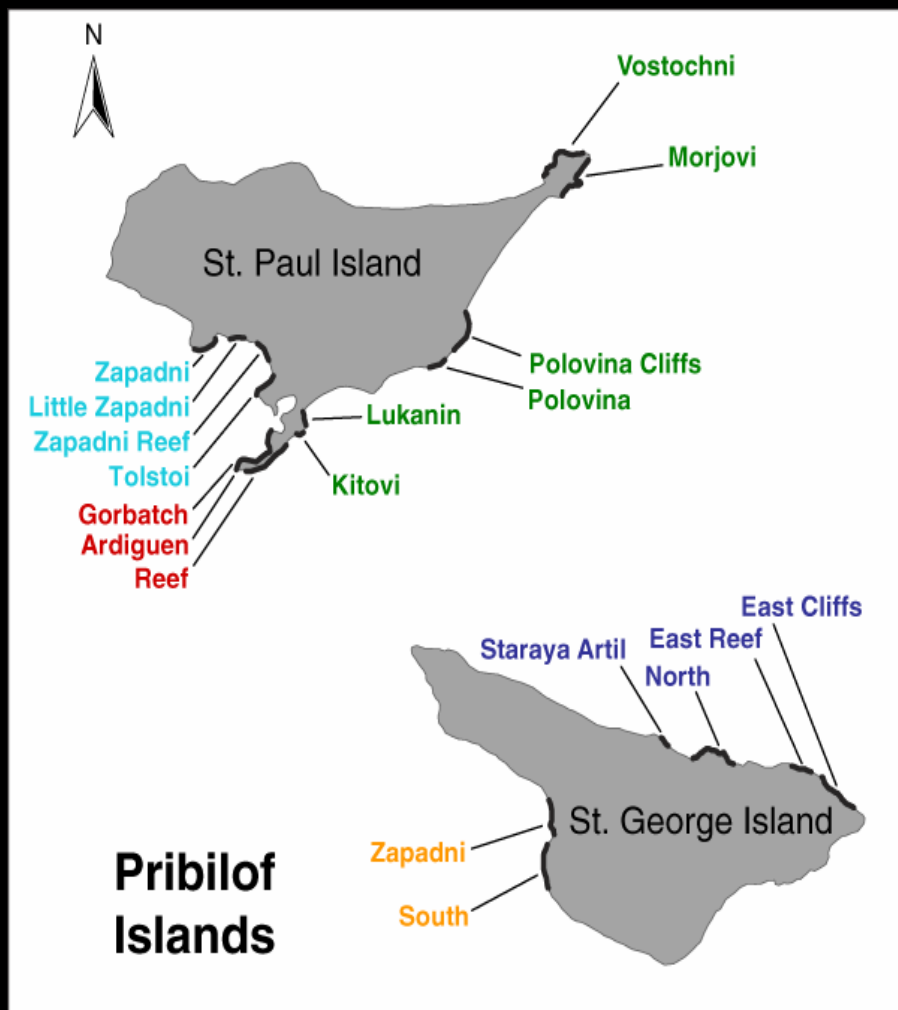
*Sinclair et al., 1994; 1996, Antonelis et al., 1997
Gudmundson et al. 2006, Zeppelin and Ream 2006*

Comparison of pollock age classes found in fur seal scats and spewings, and caught by the commercial trawl fishery



Gudmundson *et al.*, 2006, *Fisheries Bulletin* 104:445-455

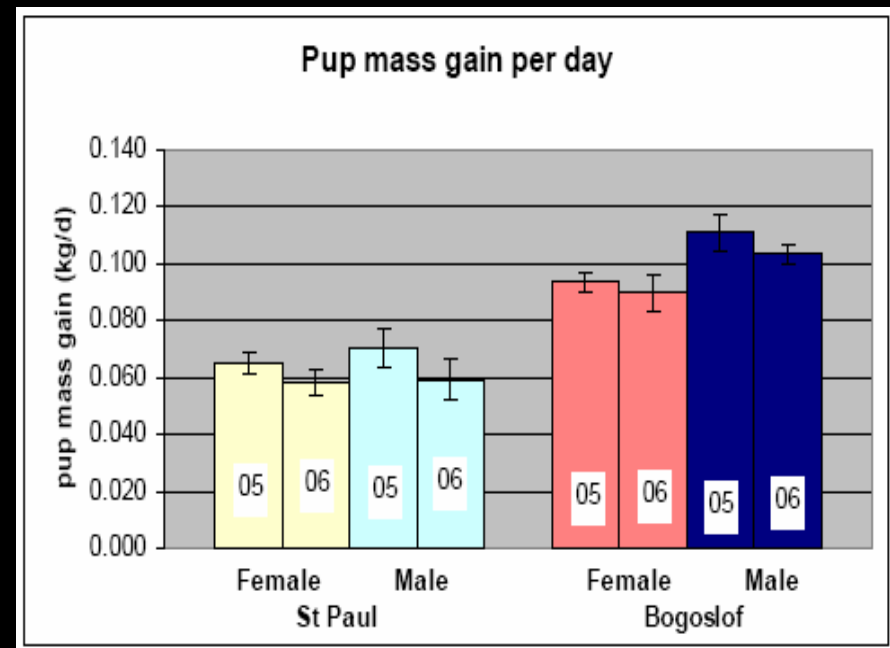
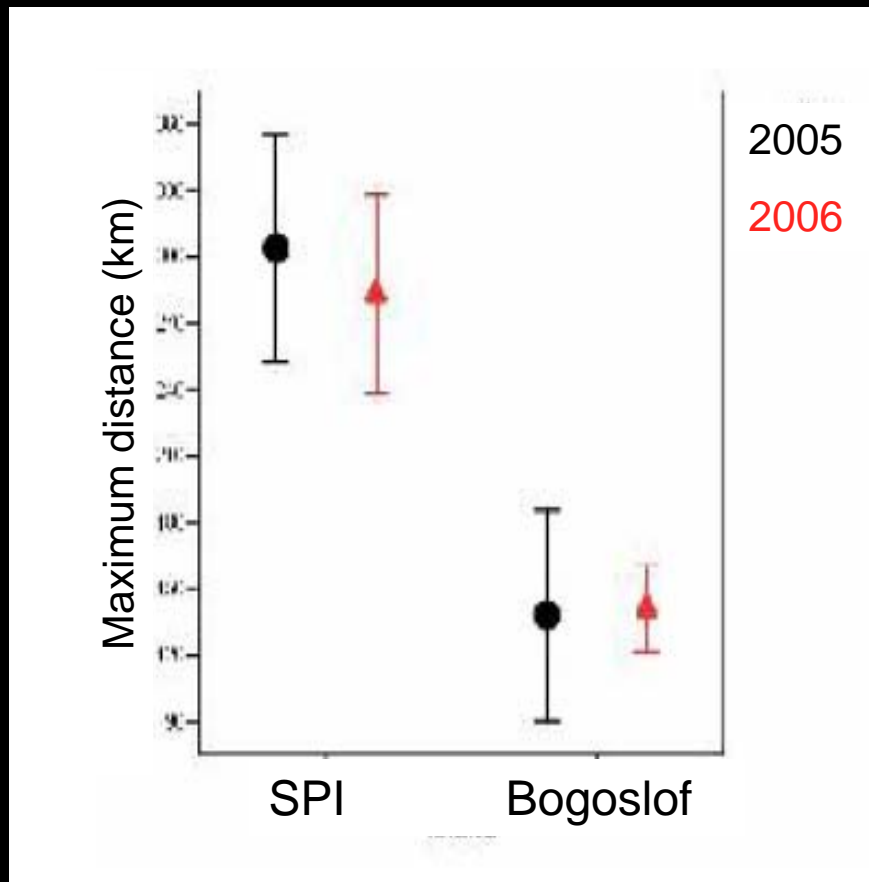
Rookery complexes classified by 1987-2000 diet and telemetry data suggest unique foraging habitats



Zeppelin and Ream, 2006, *J. Zoology*

Call et al. In Press, *Deep Sea Research II*

Consequences of female foraging strategies - COFFS

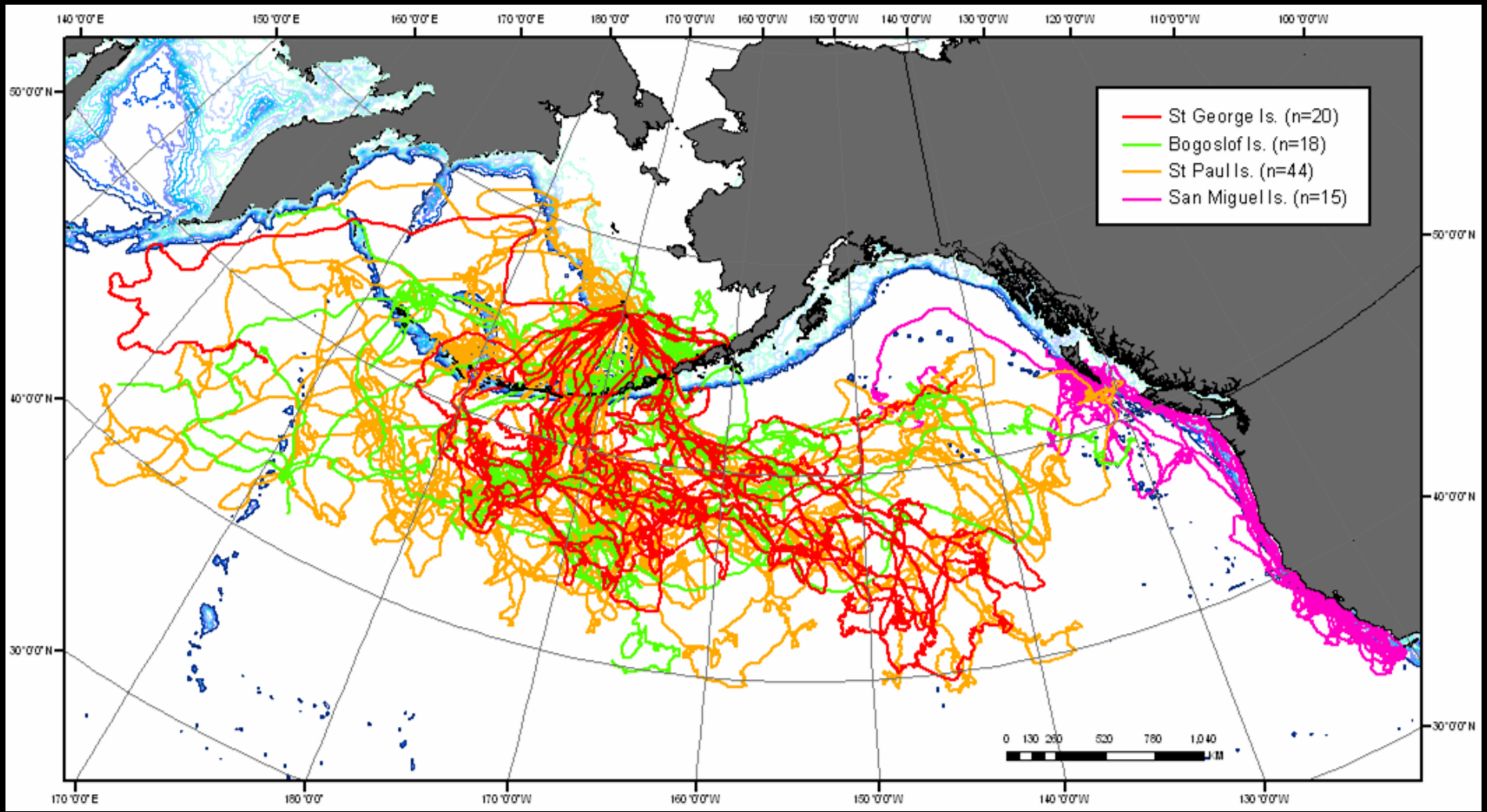


Shorter maternal foraging trips from Bogoslof

Bogoslof pups grow faster

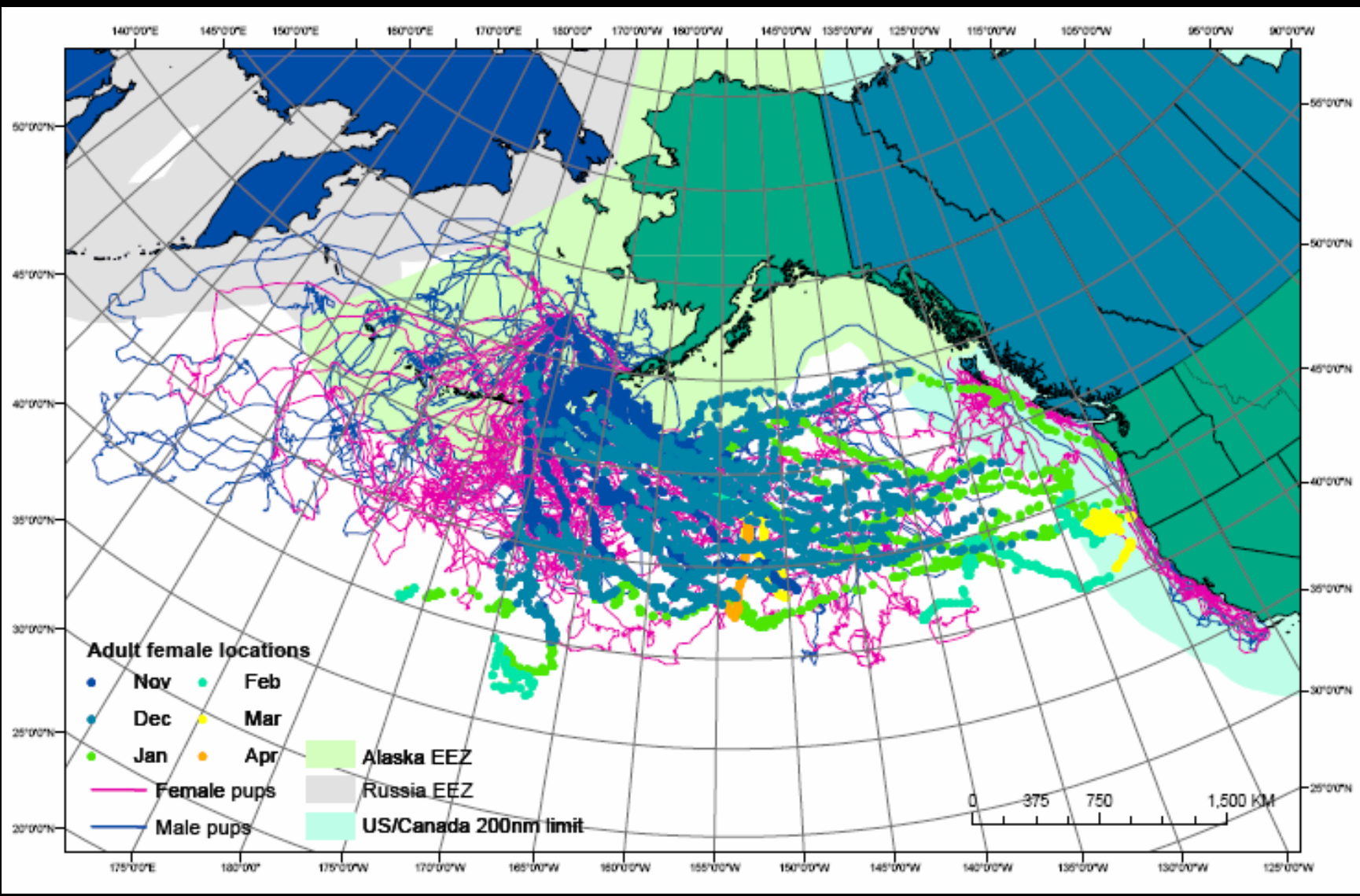
Tracks of 97 northern fur seal pups

Nov 2005 – August 2006



Lea et al.

Distribution in relation to age class and gender

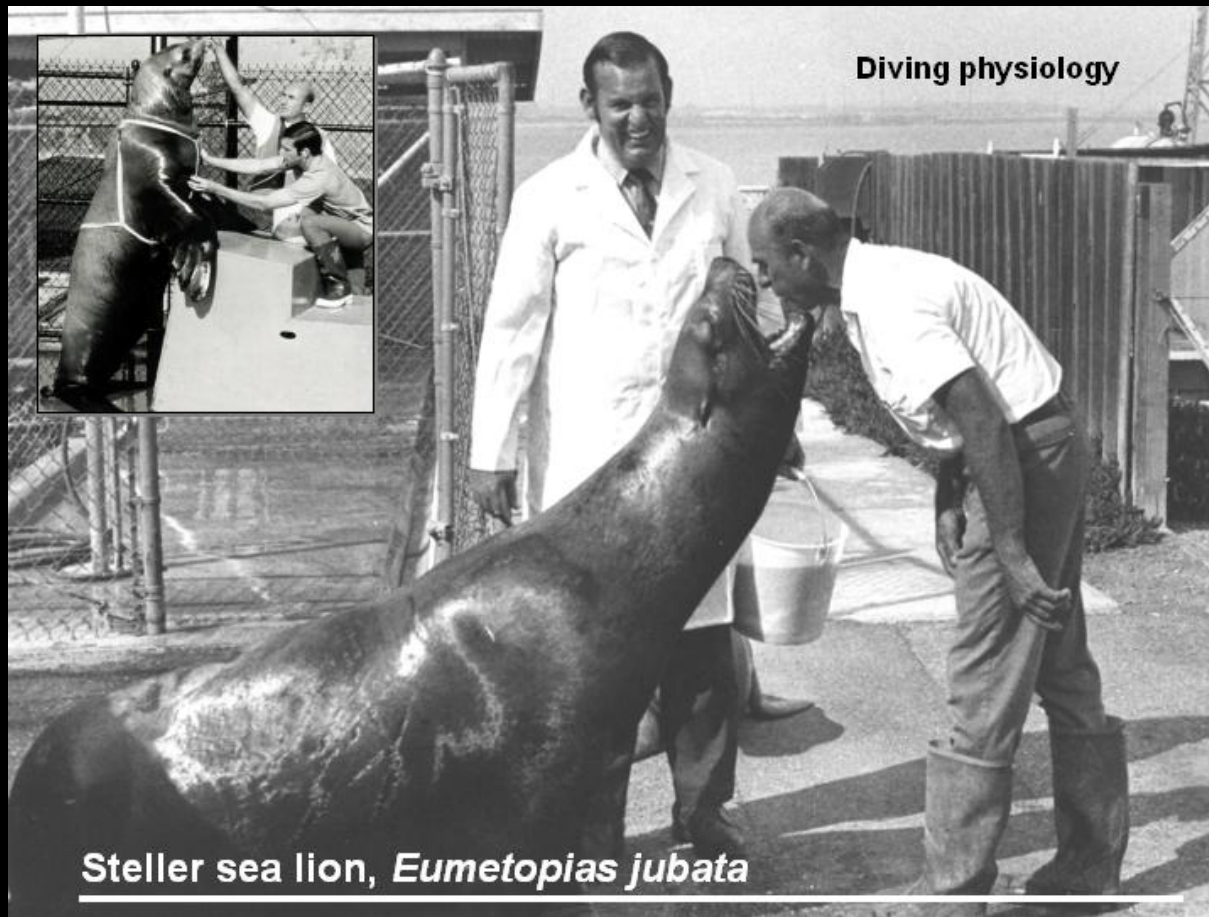


Northern fur seal research

2007

- **Population assessment**
 - Pribilof Island bull counts, Jul 8-16
 - Bogoslof pup count, ~Aug 8-15
- **Foraging behavior**
 - St. Paul maternal trip tracking, Aug 15-25
 - St. Paul adult female foraging, late Sep
 - Stomach temperature pill test (NRC)
- **Winter migration**
 - Pribilof pups, juveniles, adults, mid-Oct – early-Nov
- **Vital rates**
 - St Paul pilot tagging study, mid-Oct – early-Nov





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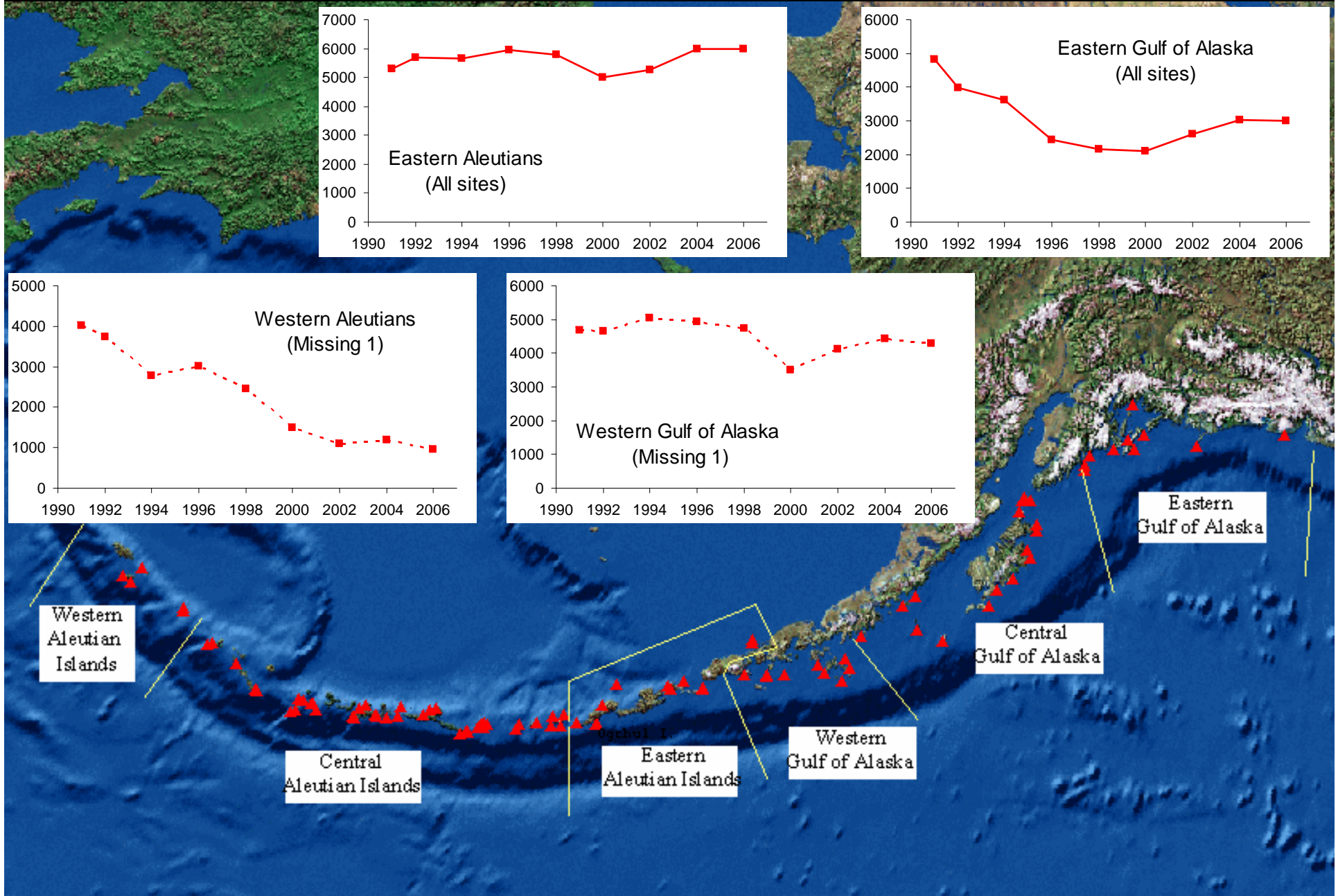
Steller sea lion 2006 Overview
2007 Research Plans

Steller sea lion field work

2006

-
- **Population assessment-aerial survey**
 - Cape St Elias-Attu Island, 14-30 June
 - (incomplete; late, poor weather)
 - Western, Eastern Gulf and Eastern Aleutian: stable since 2004
 - Western Aleutian: 19% decline since 2004
 - **Demographic/behavioral observations**
 - Missed early-mid breeding season at Marmot
 - Cancelled Ugamak Island field work

Non-Pups at 1990s Trend Sites by Region

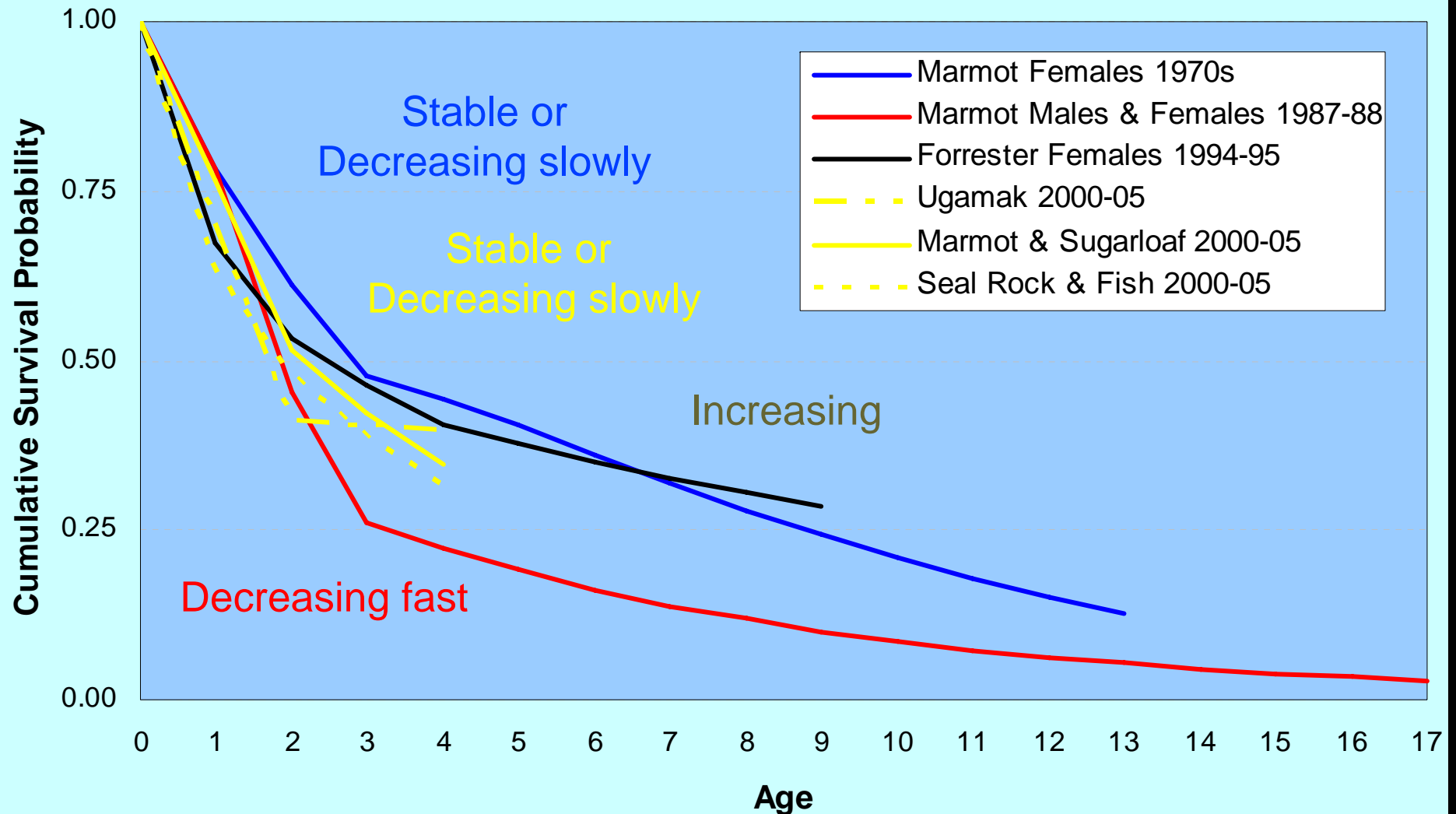


Steller sea lion field work continued

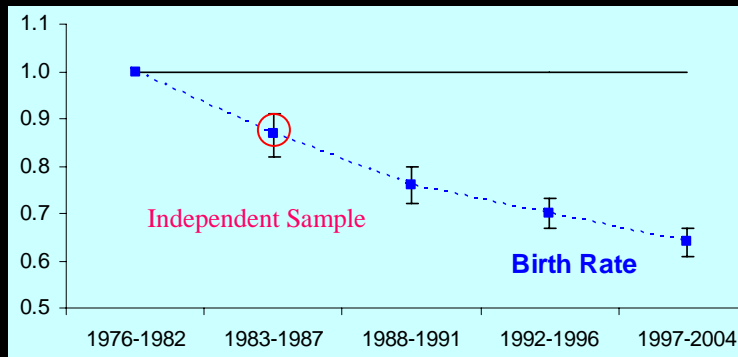
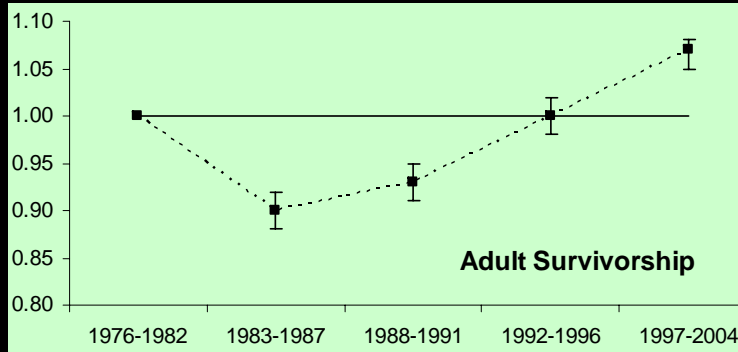
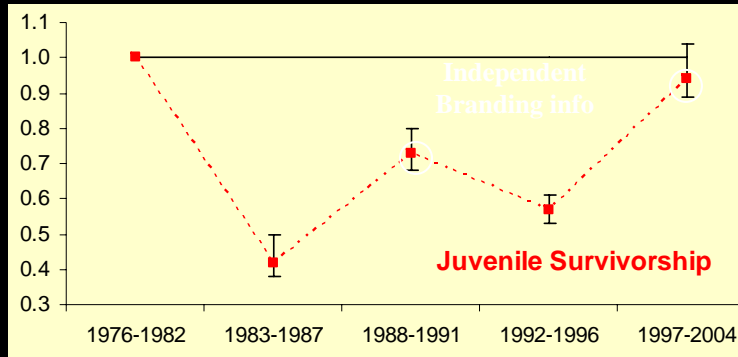
2006

- **Vital rates/diet habits**
 - Two brand resight/scat sampling trips, May
 - Eastern Aleutian Islands
 - Central/Eastern Gulf of Alaska
 - **Cancelled breeding season rookery work**
 - W Aleutians-E Gulf
- **Foraging behavior**
 - **Cancelled juvenile/adult captures**

Steller Sea Lion Survival Based on Branding East and West in 1970s-2000s



Central Gulf of Alaska Survivorship and Natality



- Modeling using Pup/Non-pup Counts and Size Distribution on Haulouts (update of Holmes and York 2003)

- 1 = mid-1970s rates; all other rates relative to period when population stable

- Juvenile survivorship has increased considerably after large initial decline

- Adult survivorship rebounded

- However, birth rate (female pups per female) has steadily eroded and currently only 64% of 1970s rate

Steller sea lion field work

2007

- **Population assessment**
 - Aerial pup survey, Jun 8-30
- **Vital rates/health**
 - Pup branding (Marmot, Sugarloaf, Seal Rocks), Jul 1-6
 - Pup condition (West-East Aleutians) Jun 22-Jul 7
 - **Resights/reproductive status**
 - Central/Eastern Gulf, Jun 19-30
 - East Aleutians, Aug 8-30

Steller sea lion field work continued

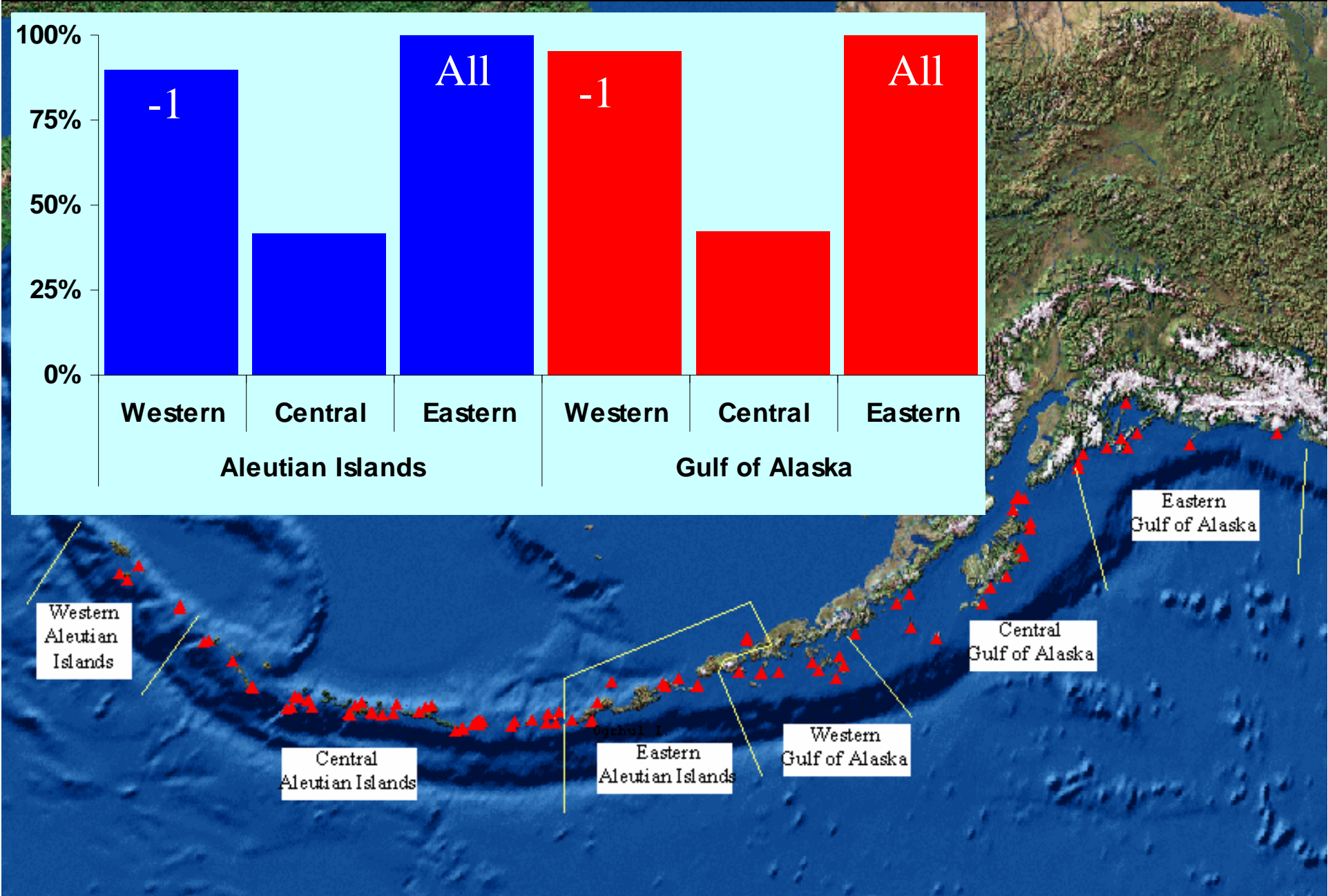
2007

- **Demographic/behavioral observations**
 - Marmot and Ugamak Islands
 - late-May – early Jul
- **Foraging behavior**
 - Juvenile/Adult (Kodiak pen captures)
 - late Sep-early Oct
 - At-sea captures
 - late Oct-early Nov

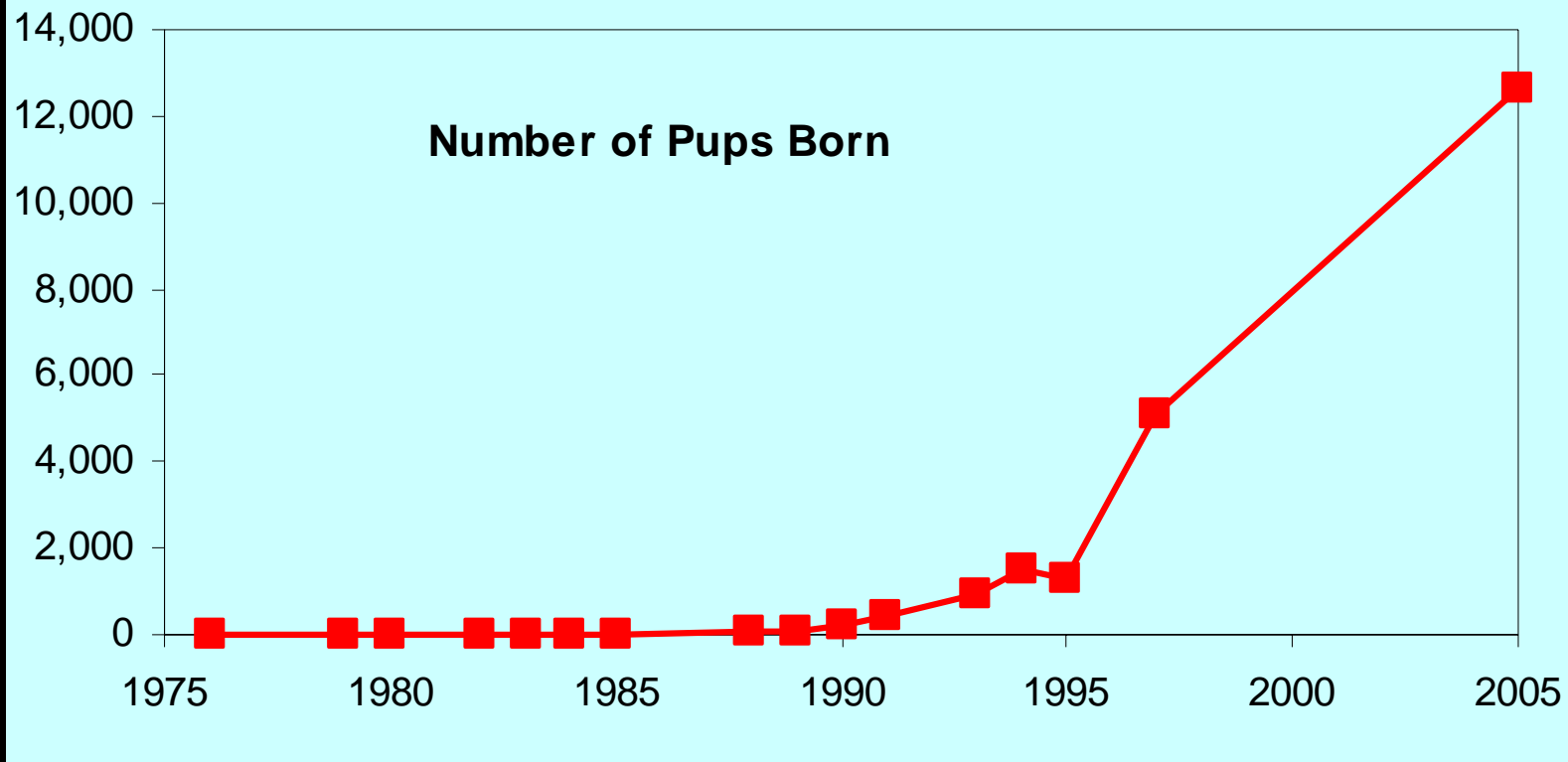




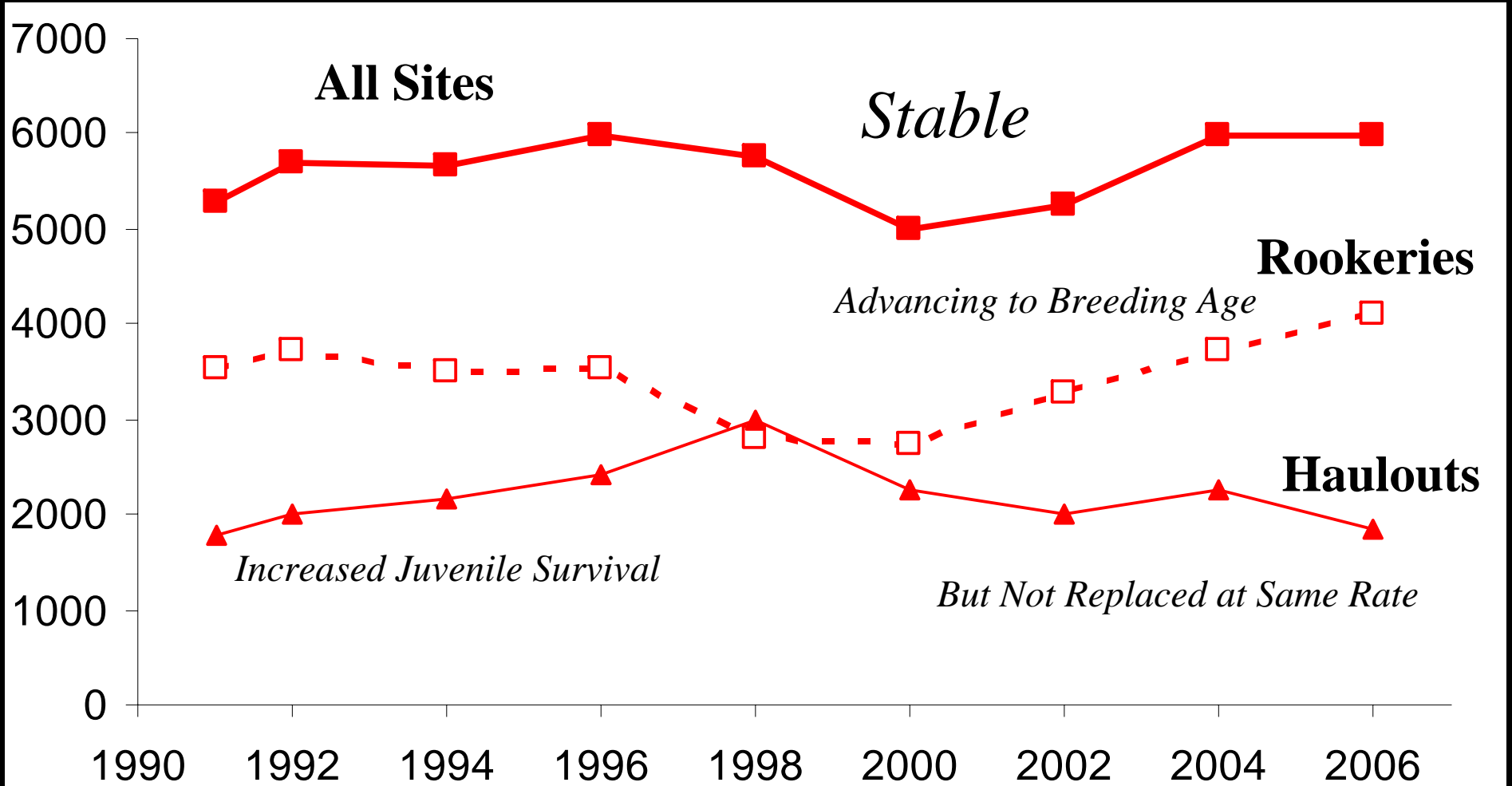
% of 1990s Trend Sites for Adults and Juvenile SSLs Surveyed in 2006



Bogoslof Island Pup Production



EAI: Rookery vs. Haulout Trend Sites



Estimated number of 'missing' males due to the annual removal of 150 male pups on St. George Island

Method	Scenario	'Missing' Adult Males	'Missing' Harem Males
1) St George	Random	68	20
1) St George	Size	132	40
2) Modified Lander	Random	68	39
2) Modified Lander	Size	135	77

Two different methods were used to determine the number of 'missing' adult (age 7+) and harem (with females) males, as were two different harvest scenarios (random and size selection). This analysis assumes that mortality from harvest is additive to all other sources and that other available males would not replace those taken as pups.