

Trends in abundance of Steller sea lions and northern fur seals across the North Pacific Ocean



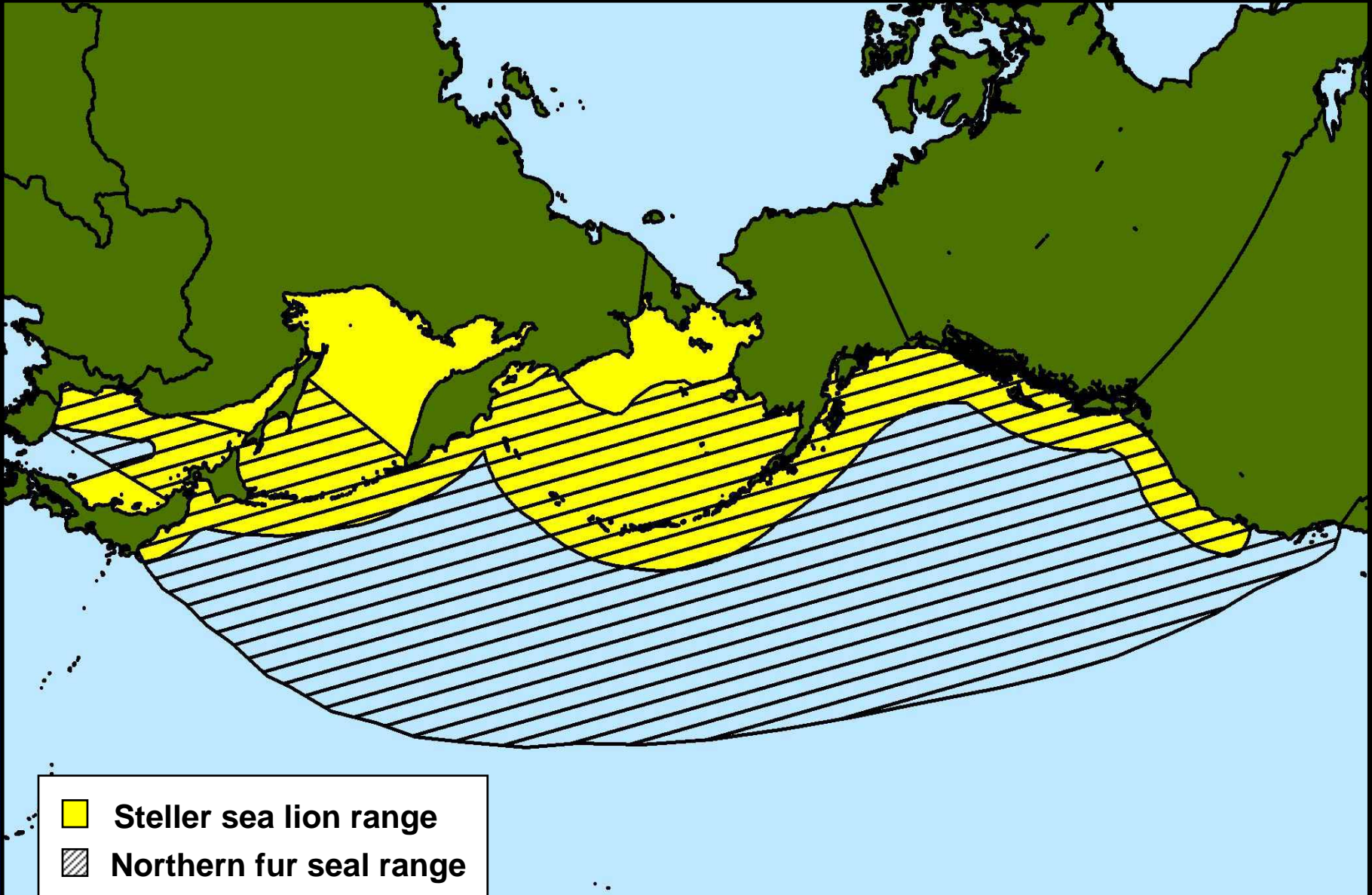
Rolf R. Ream

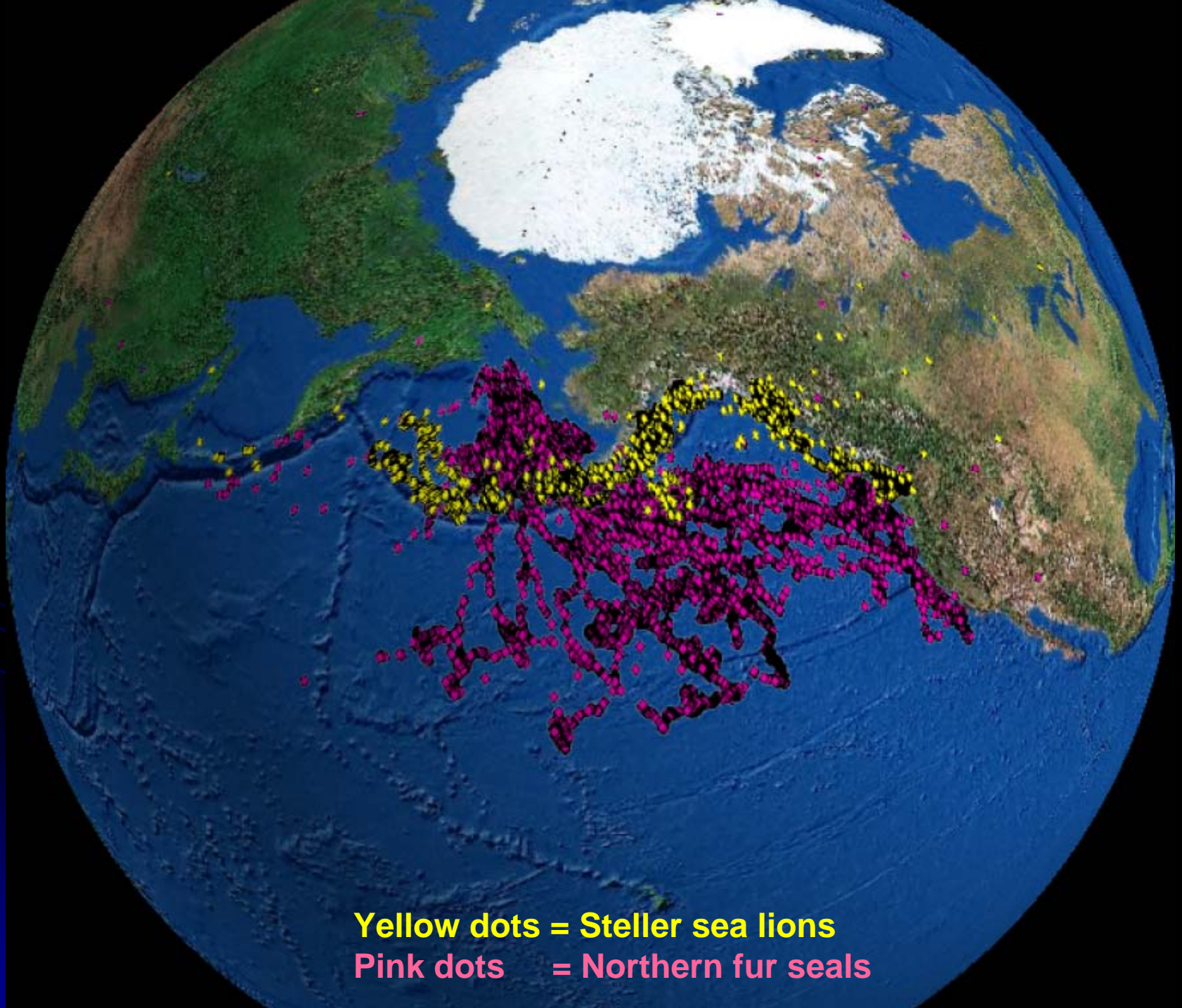
National Marine Mammal Laboratory, NMFS, Seattle, WA

Vladimir Burkanov

Natural Resources Consultants, Inc., Seattle, WA

Steller sea lion and northern fur seal range





Yellow dots = Steller sea lions

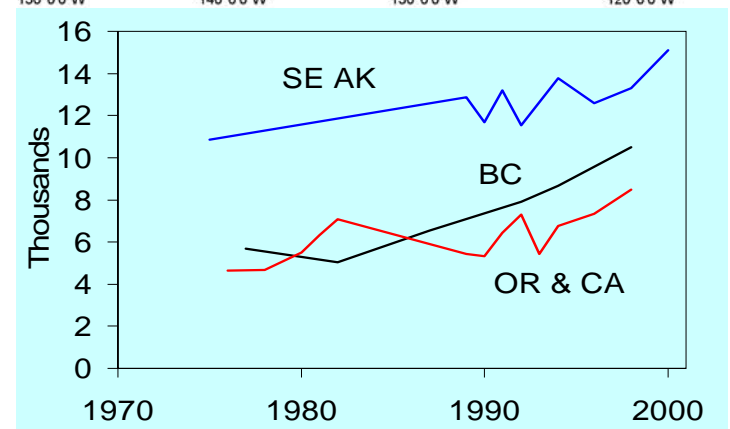
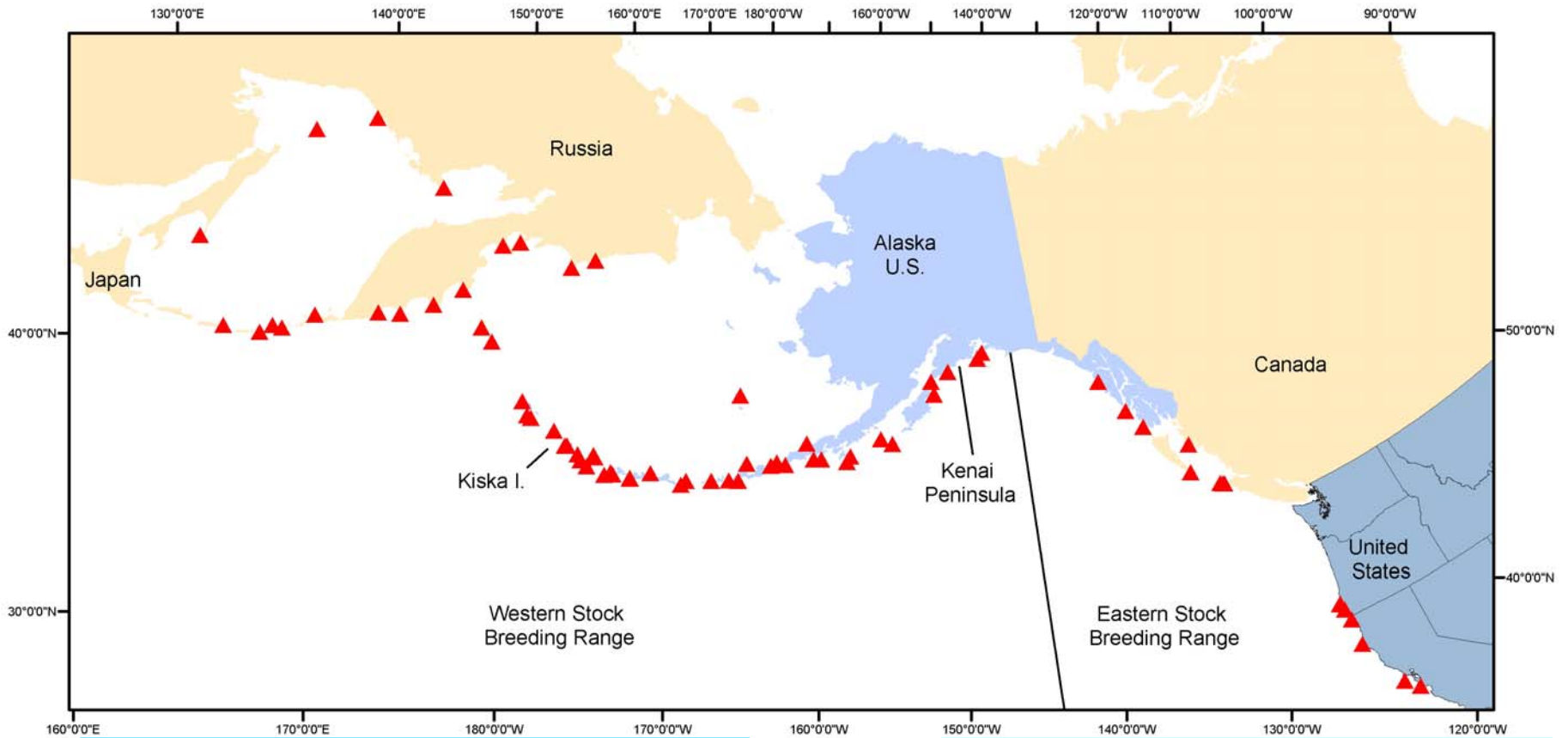
Pink dots = Northern fur seals

Pribilof Island – northern fur seal at-sea distribution

Summer Breeding
(November)

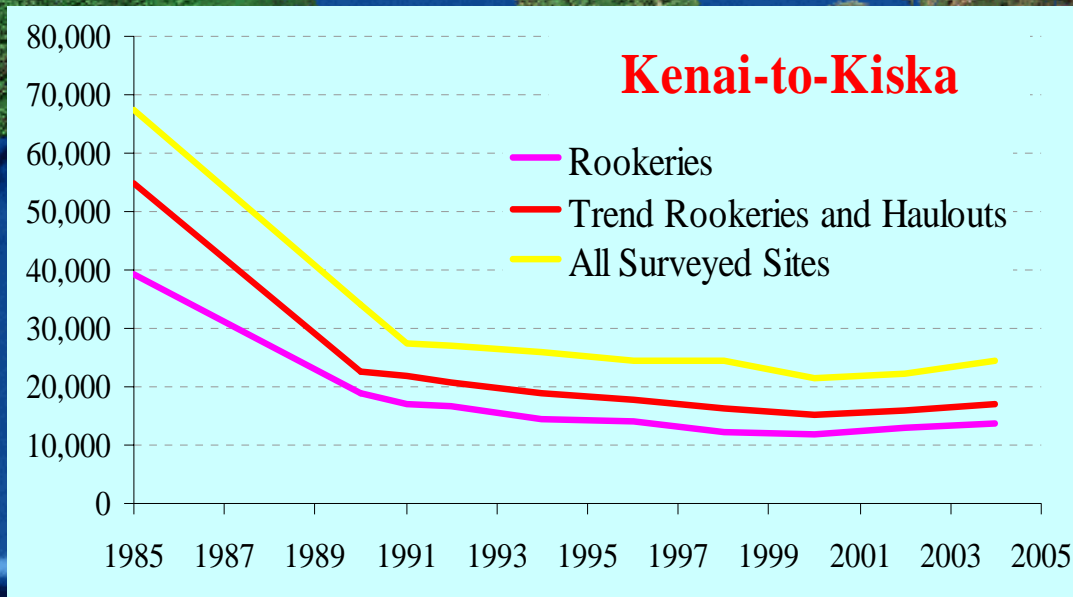


Steller Sea Lion Rookeries and Stock Structure



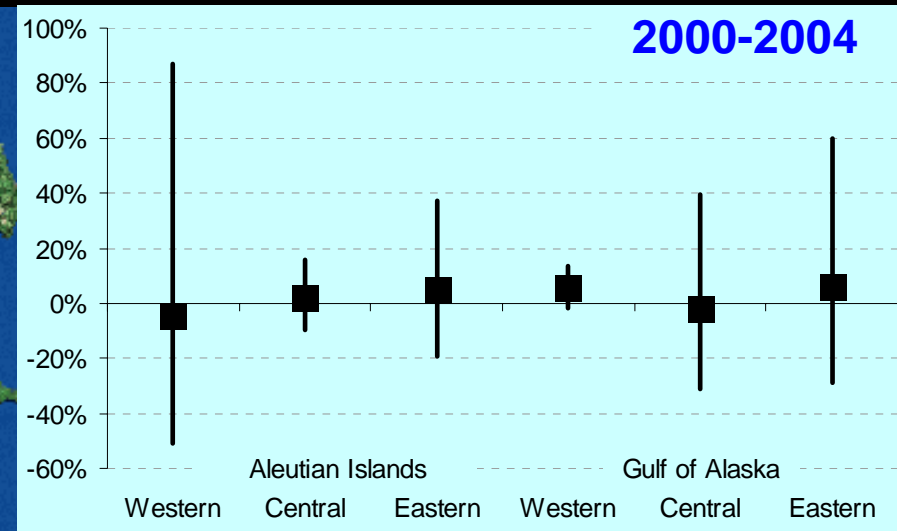
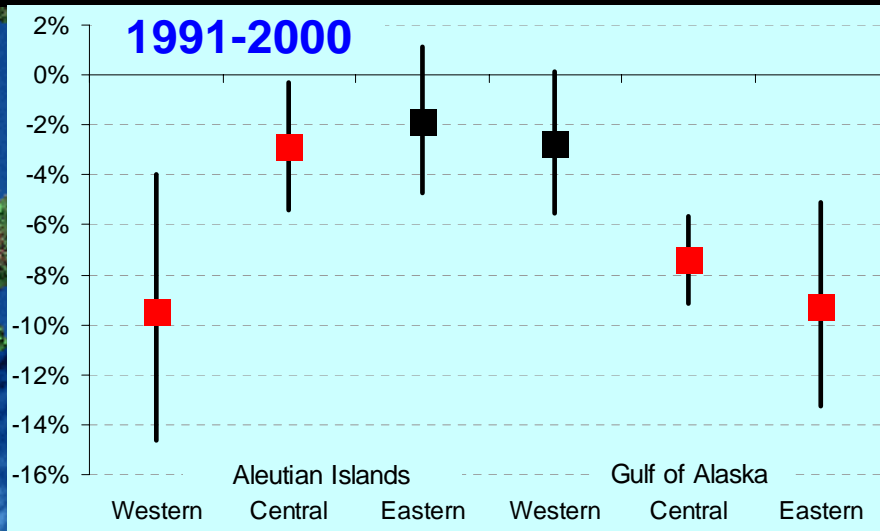
Eastern Stock

Non-Pup Steller Sea Lion Counts

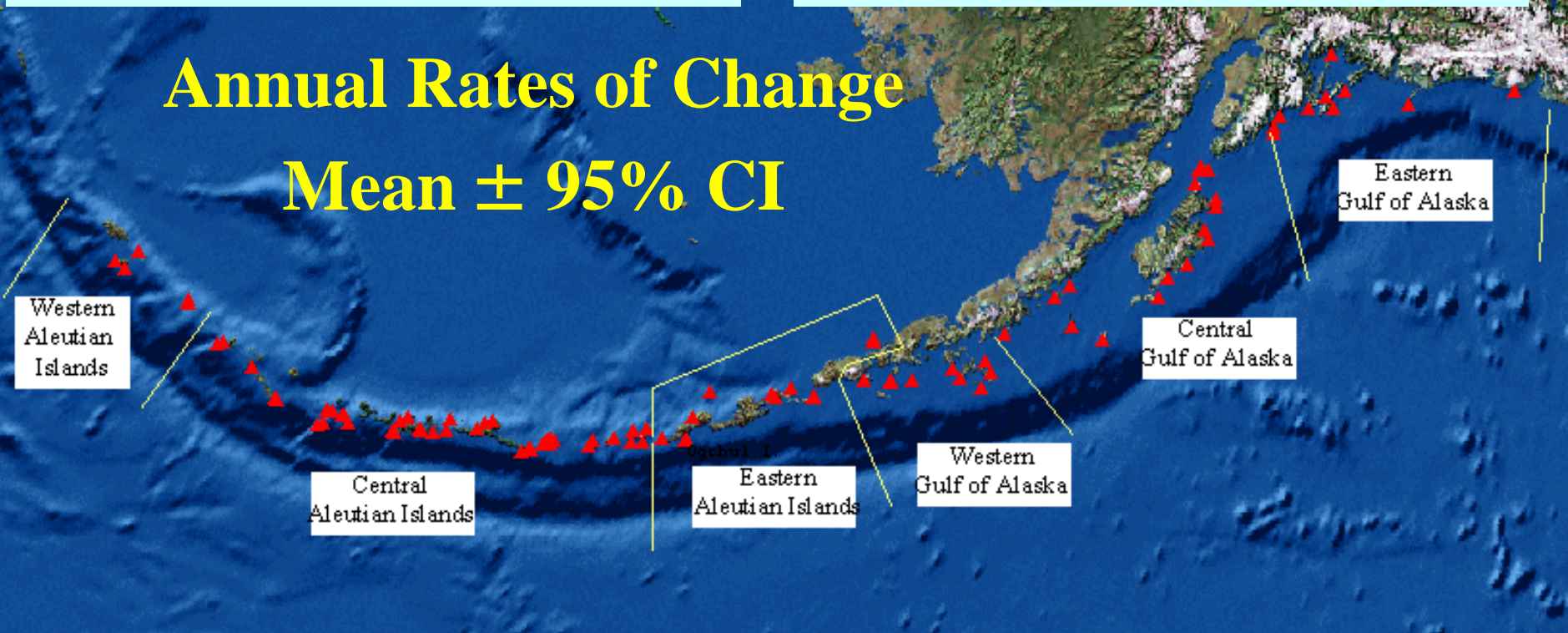


Kenai-Kiska Area

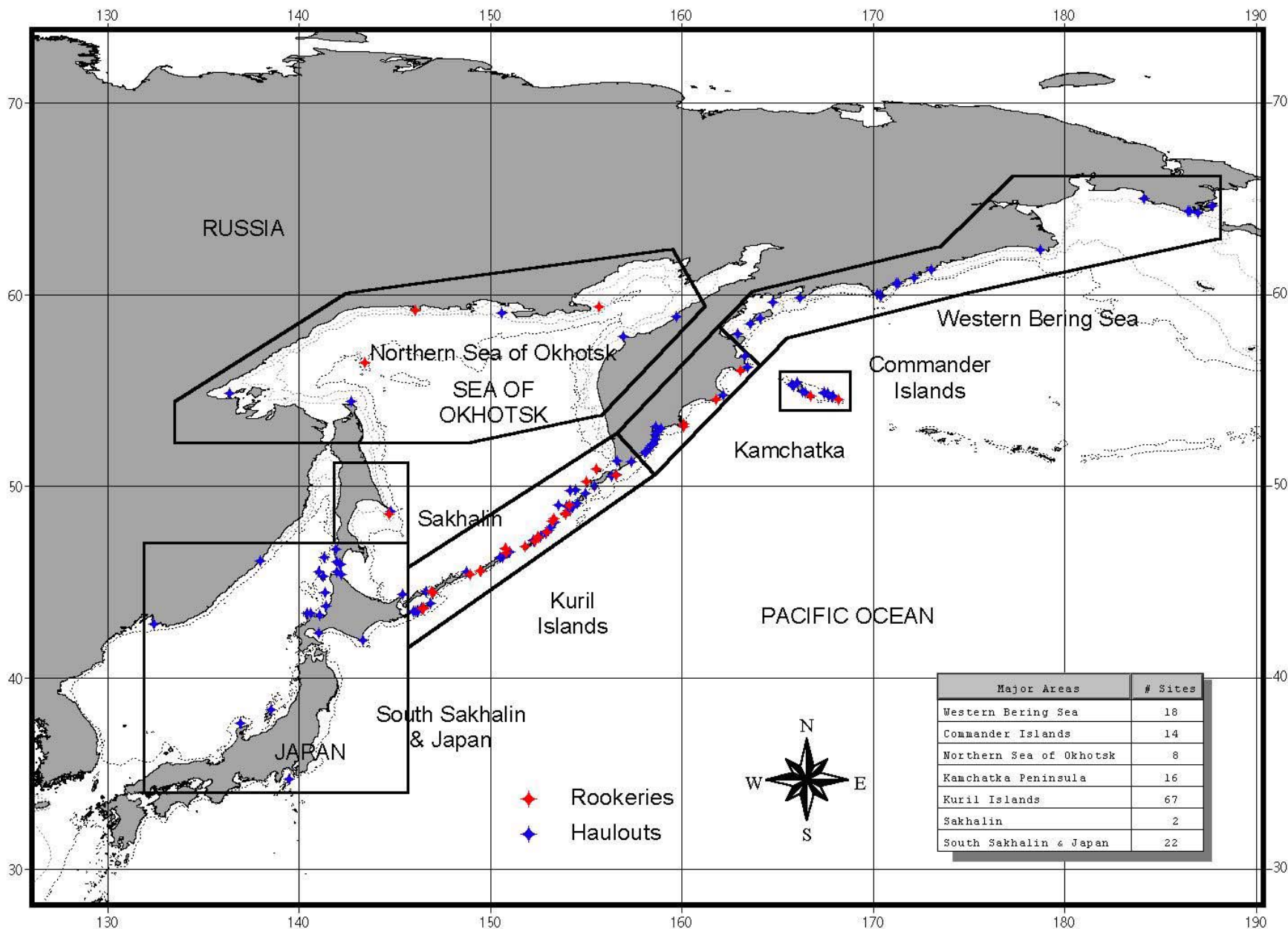
Non-Pup Steller Sea Lion Counts



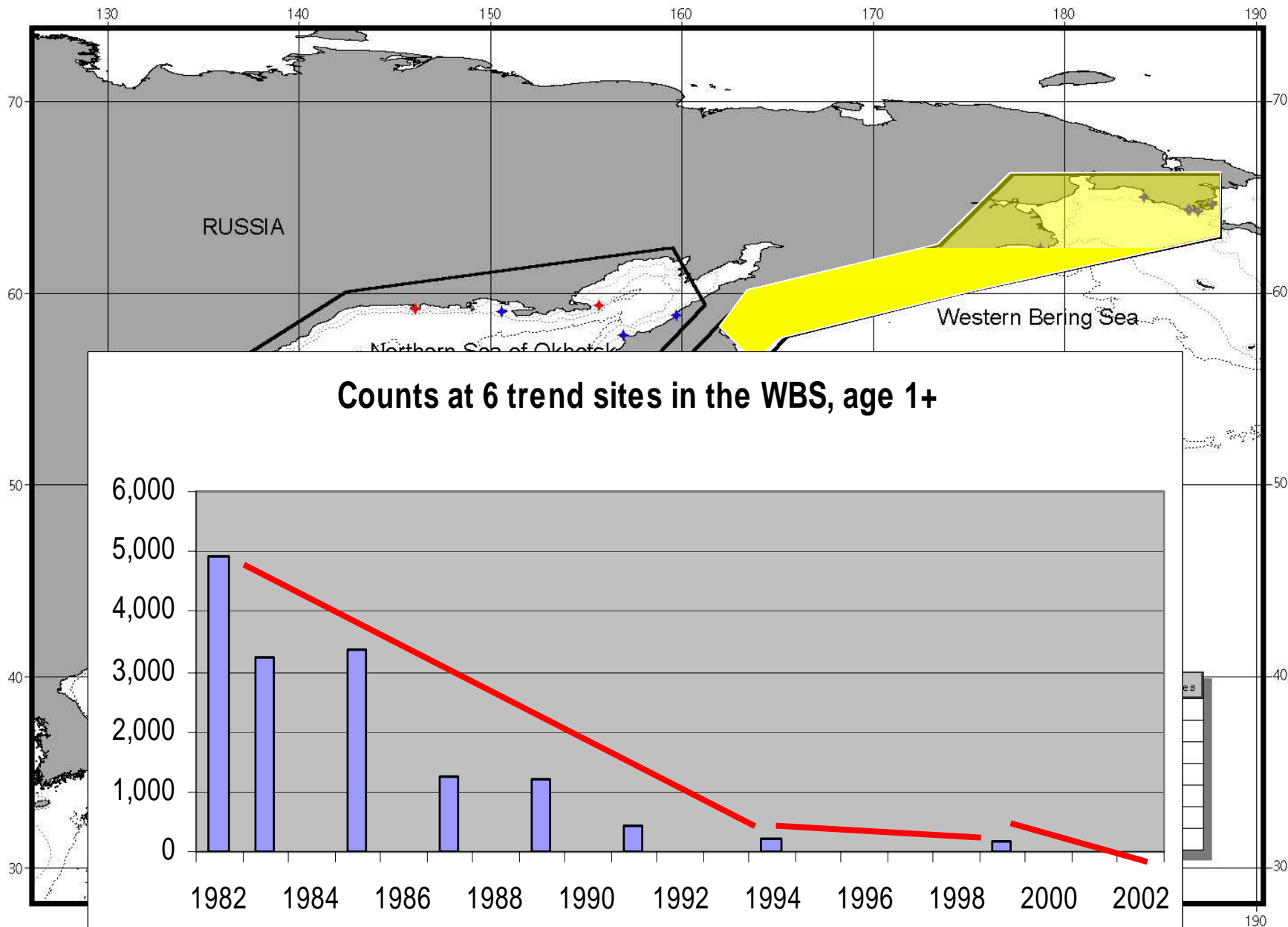
Annual Rates of Change
Mean \pm 95% CI



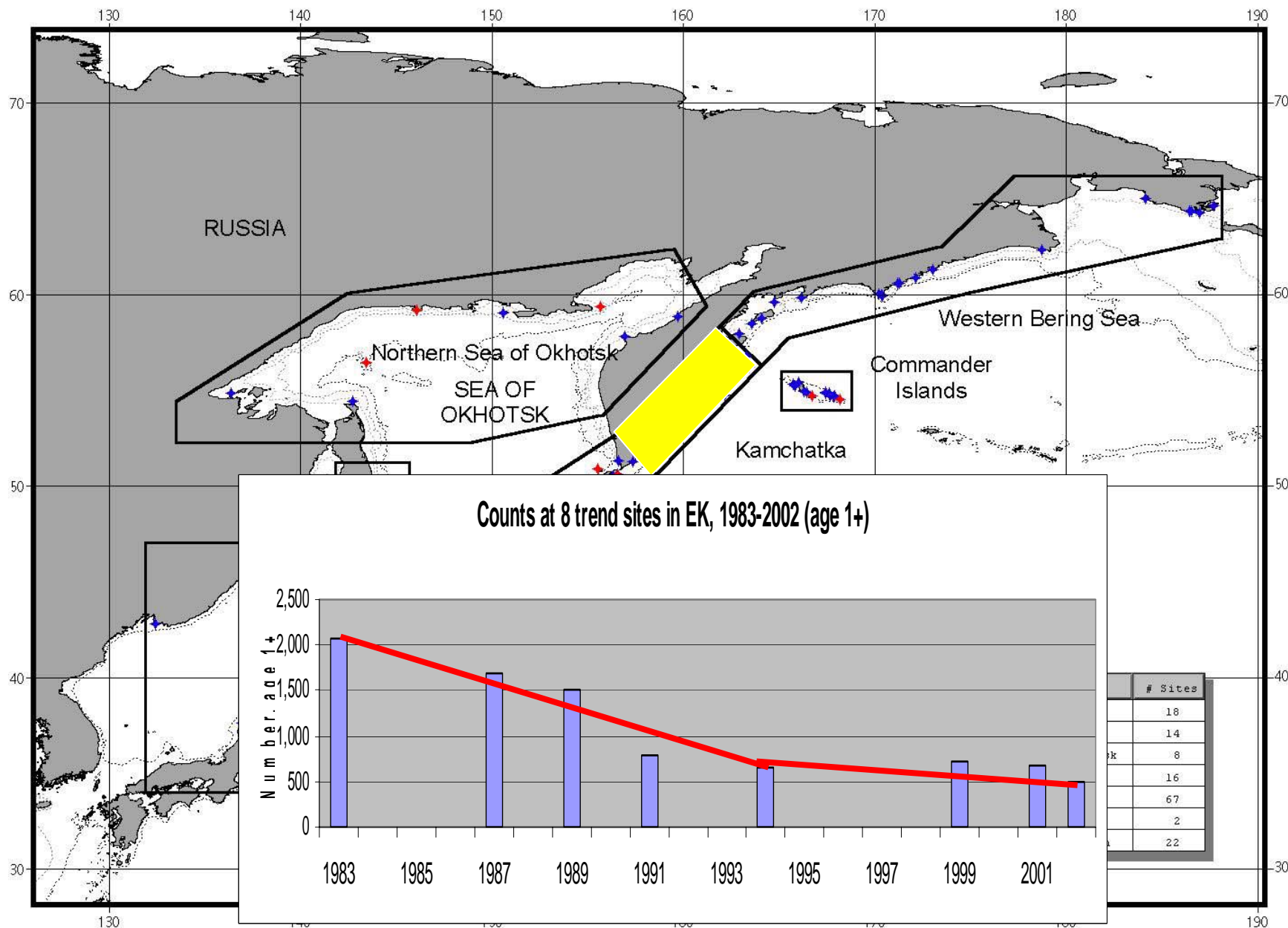
Steller sea lion rookeries and haulouts along Asia coast, 1700s-2002



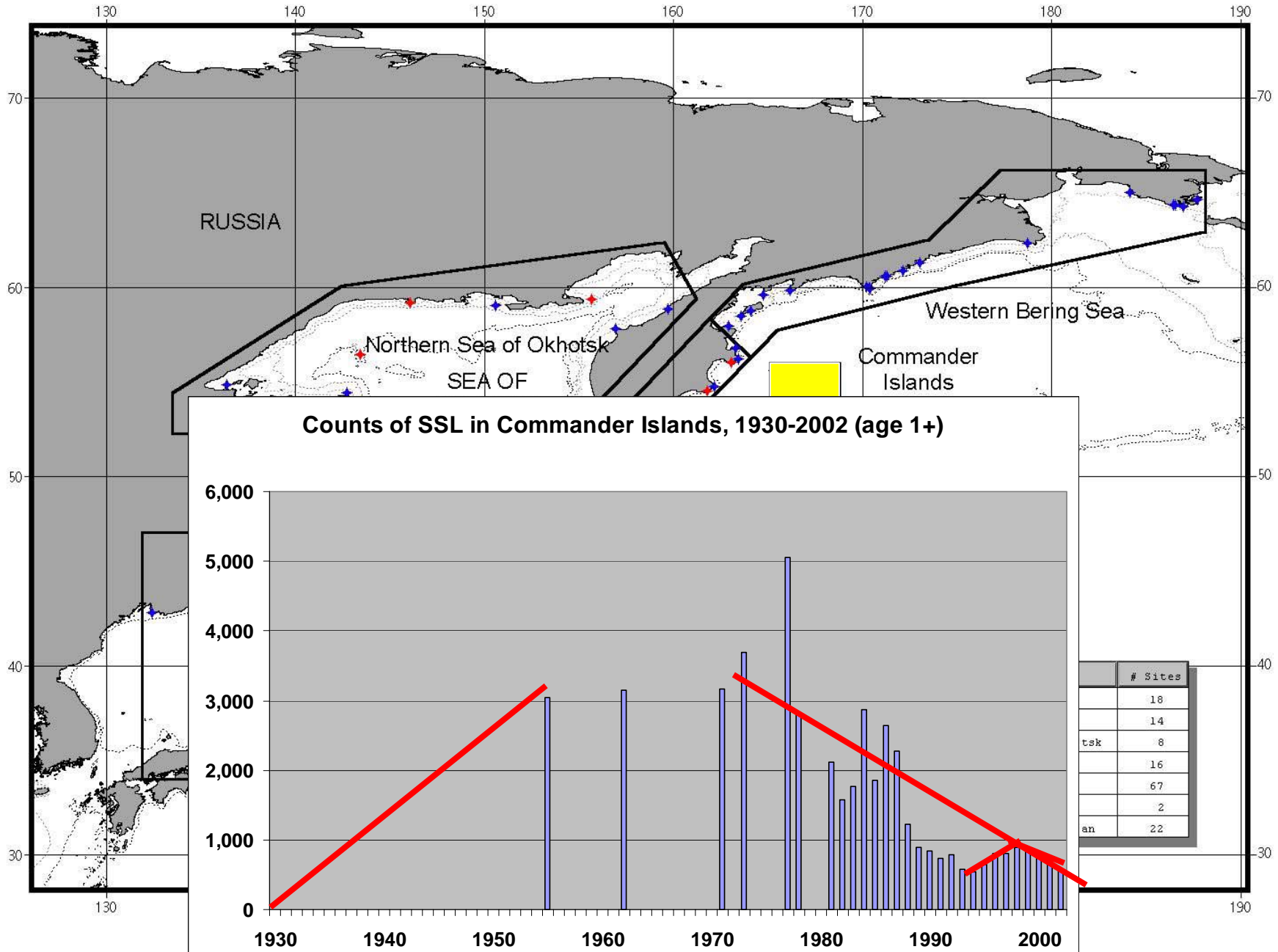
Steller sea lion rookeries and haulouts along Asia coast, 1700s-2002



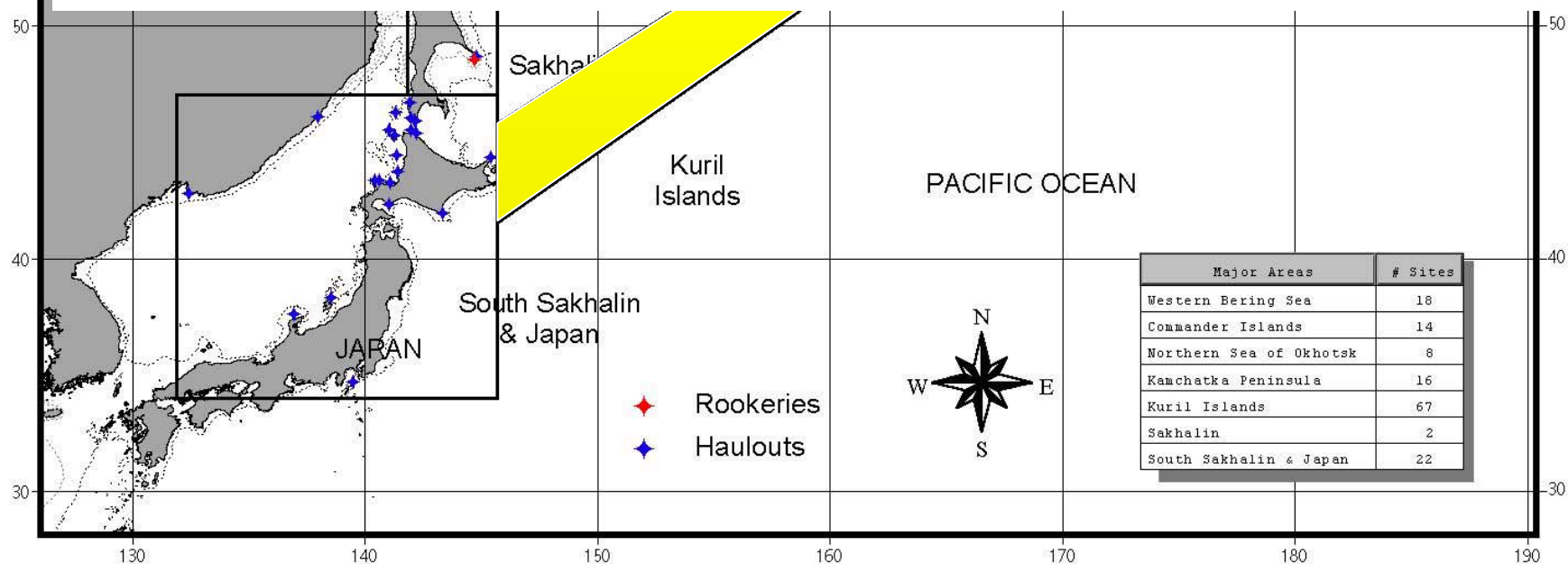
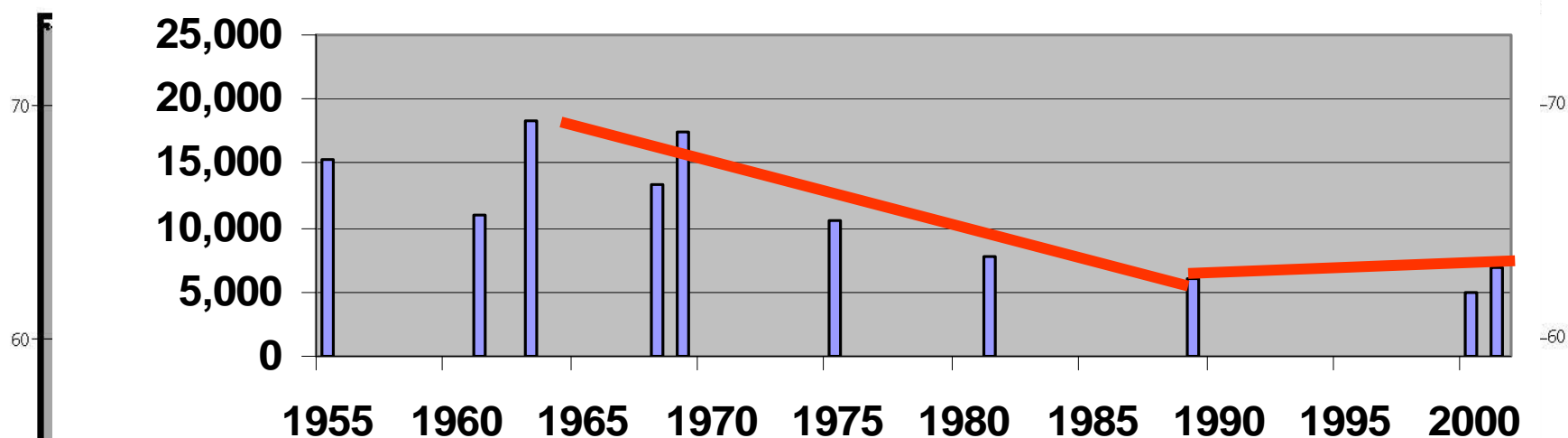
EK: ABUNDANCE & TRENDS, 1982-2002:

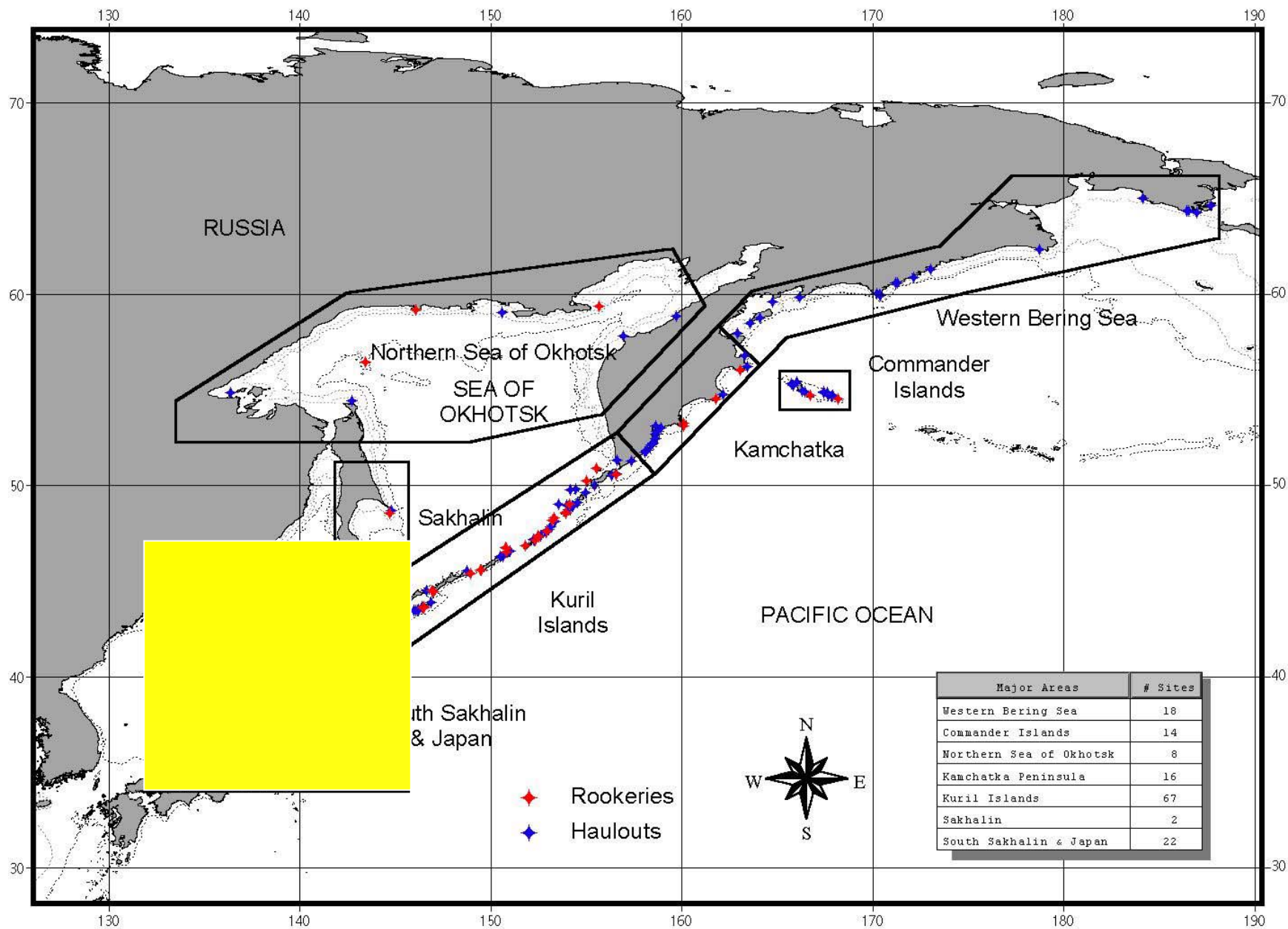


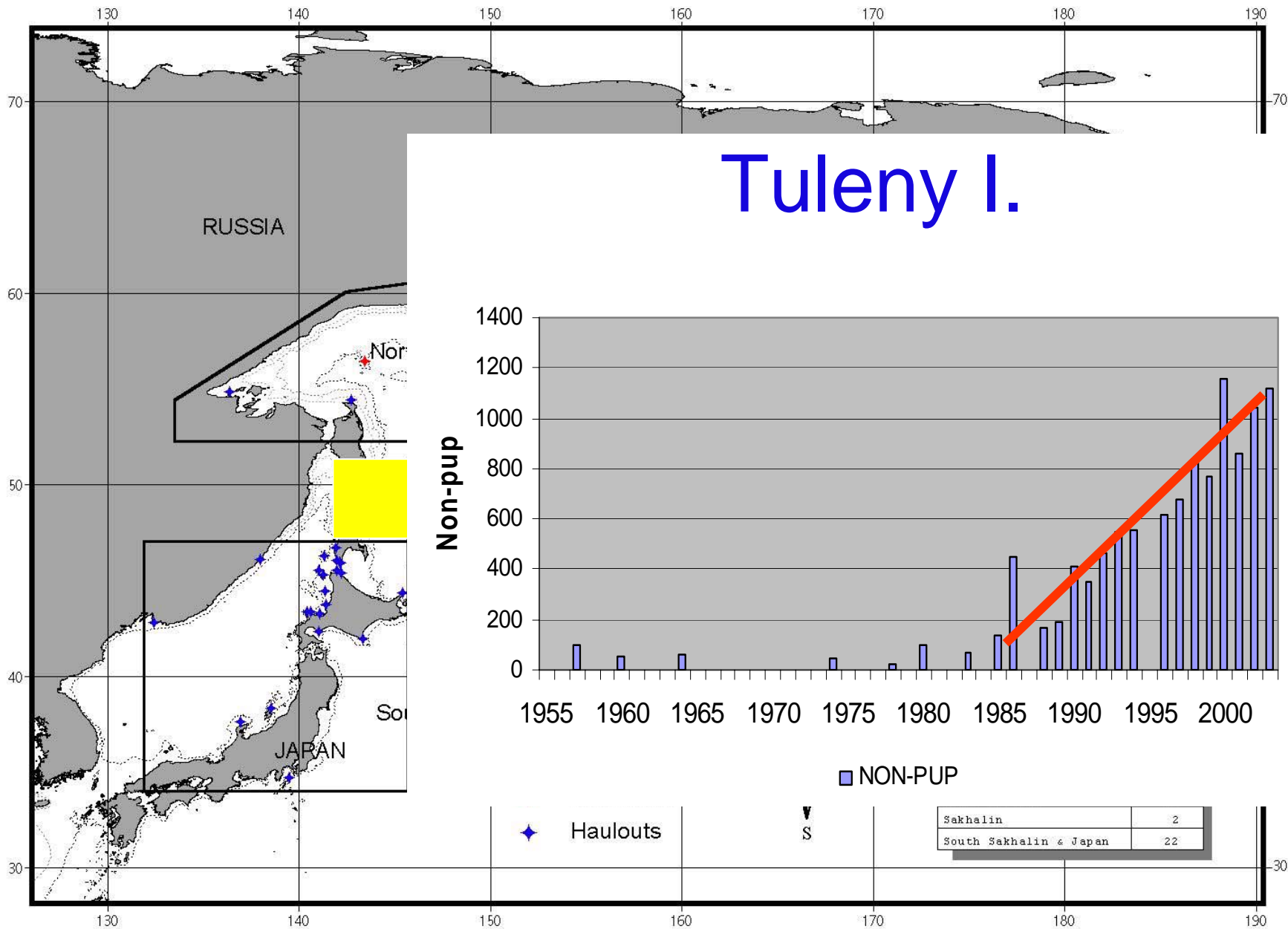
CI: ABUNDANCE & TRENDS, 1930-2002:

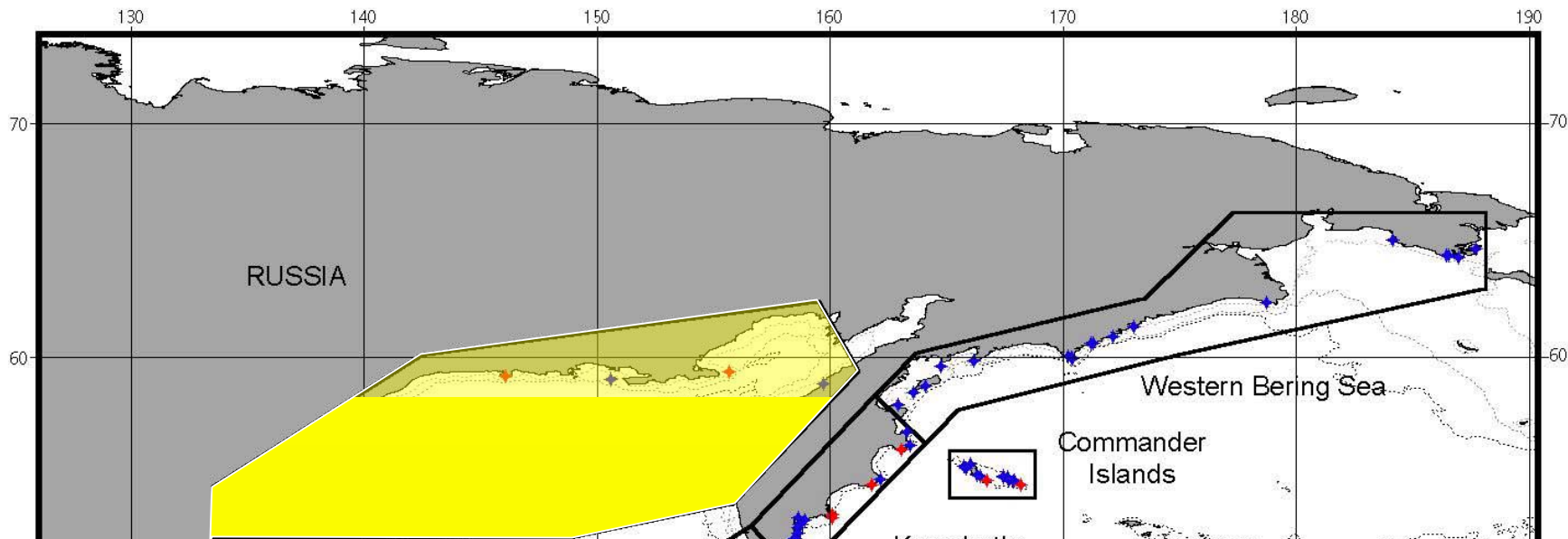


Kuril Islands trend sites: 1955-2001

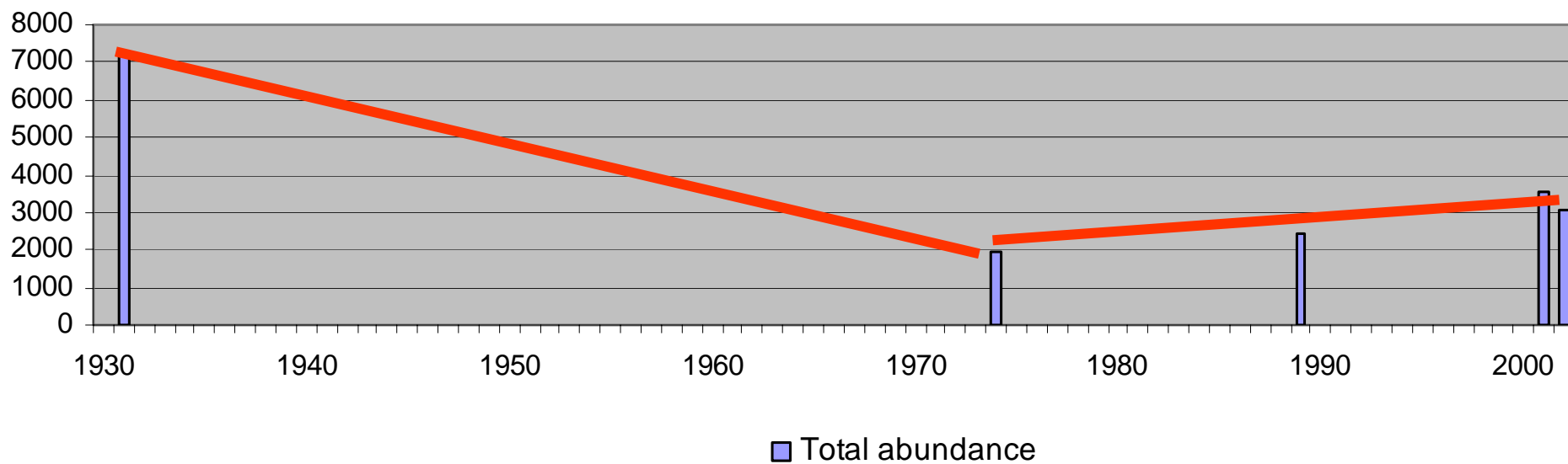




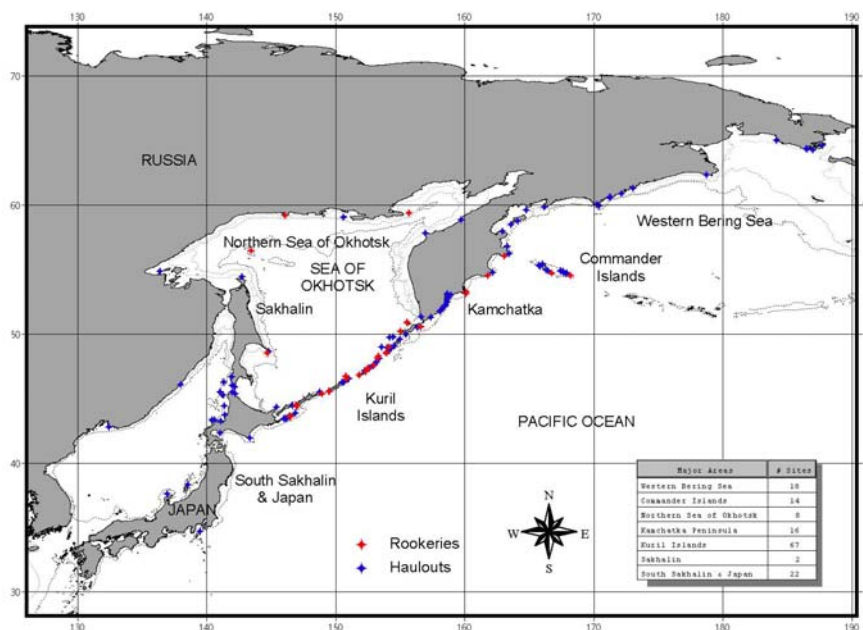
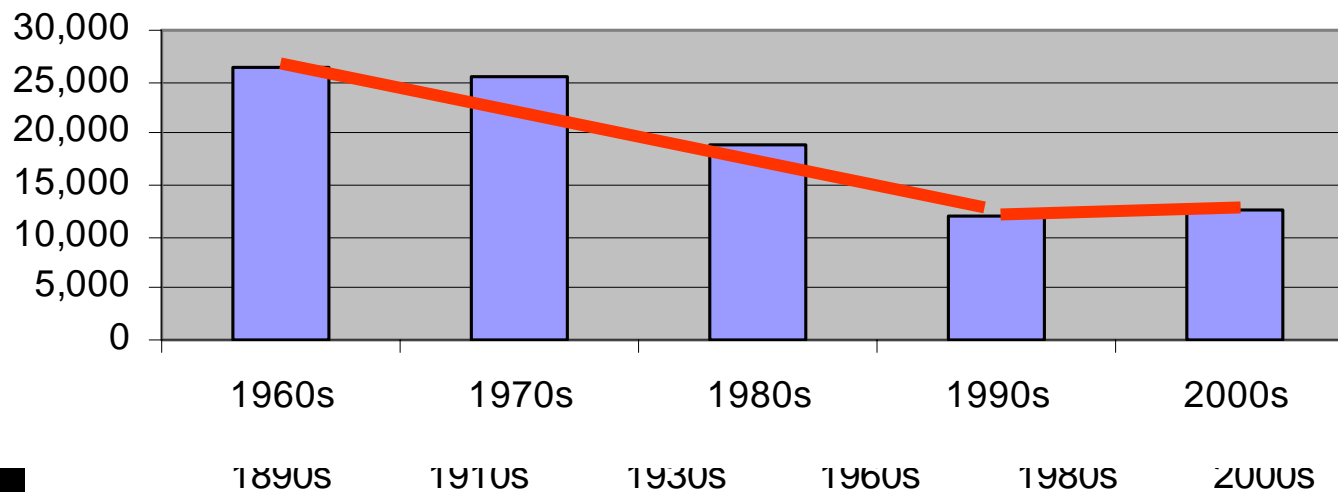




THE NORTHERN PART OF THE SEA OF OKHOTSK: 1931-2002



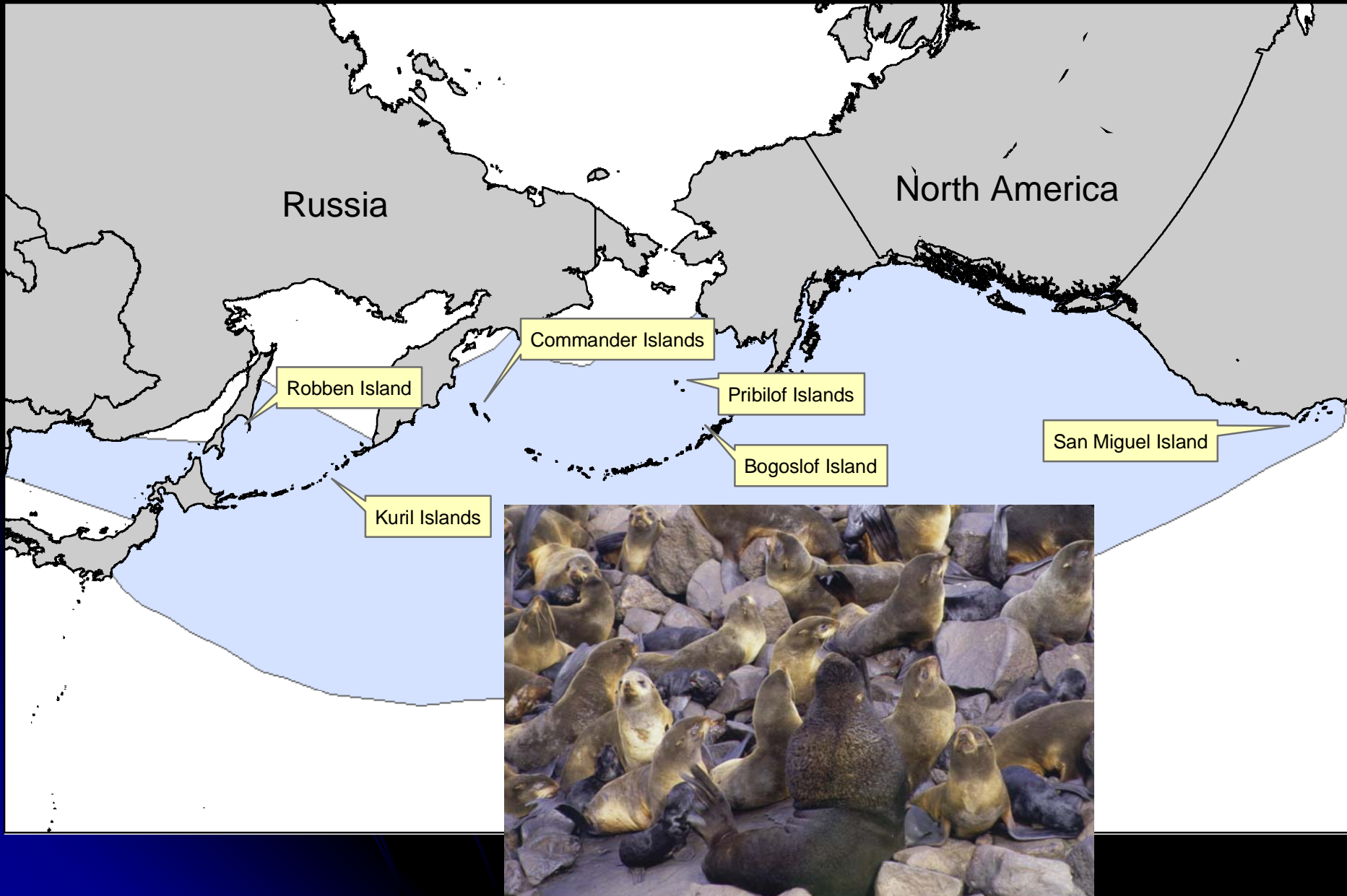
Reconstructed Steller sea lion abundance along Asian coast, 1960-2000



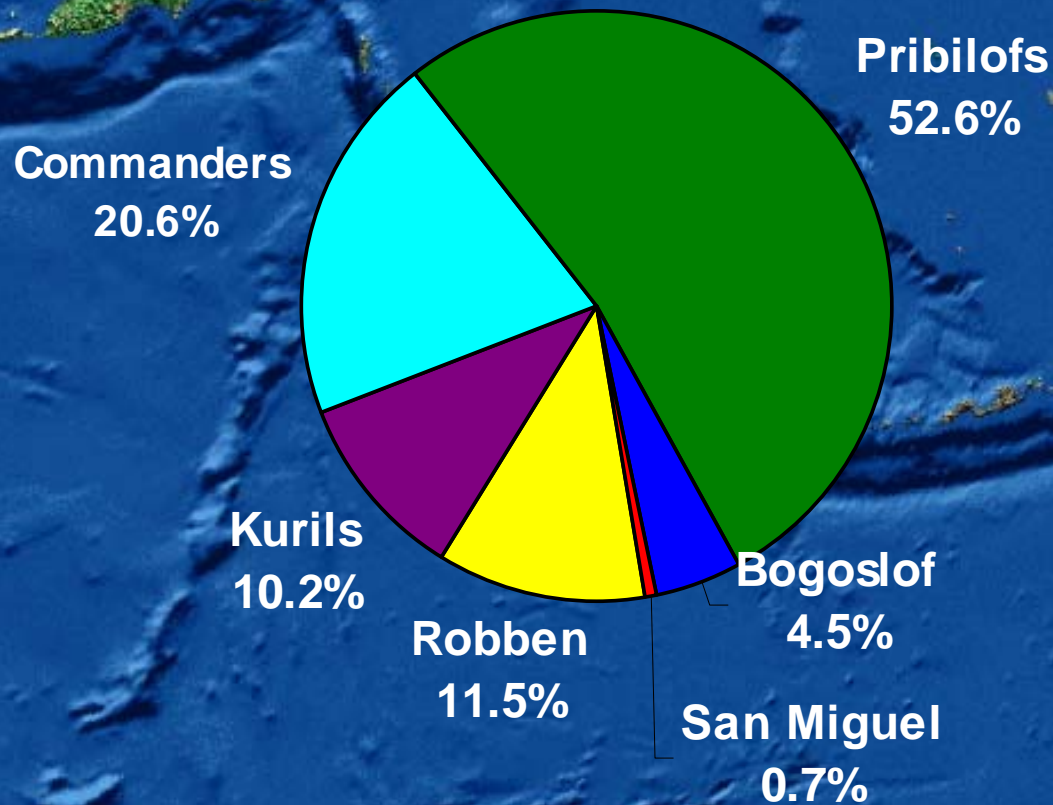
Summary of SSL along the Asian coast

- Steller sea lion abundance declined from a maximum of 115,000 to 15,000 individuals from 1890 to 1990; early decline likely influenced by harvests at some sites
- Changes in abundance occurred during all time periods but varied by site and period. Recent increases observed in Okhotsk region
- Southern extent of Steller sea lion distribution has moved north by some 500-900 km over the past 50 years

Northern Fur Seal Breeding Sites

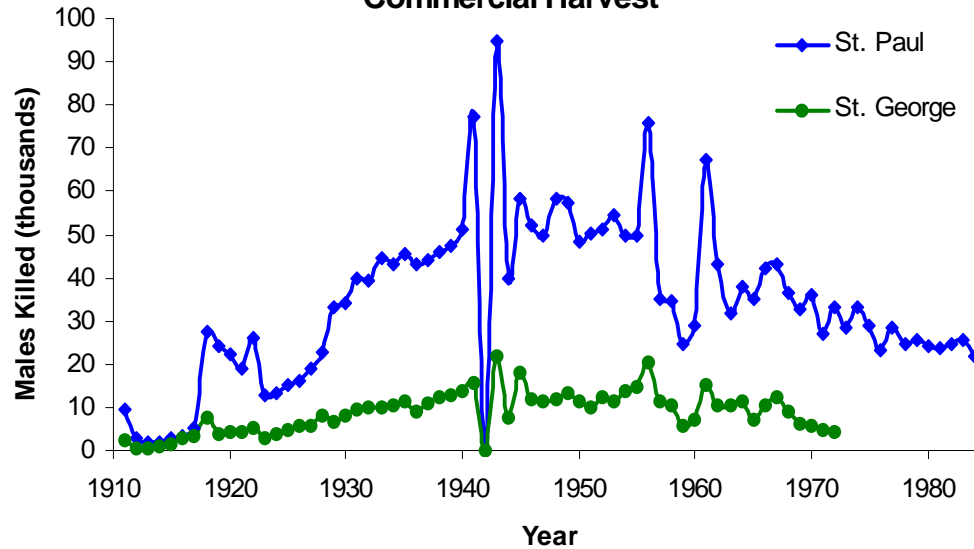


Current worldwide population size ~1.1 million

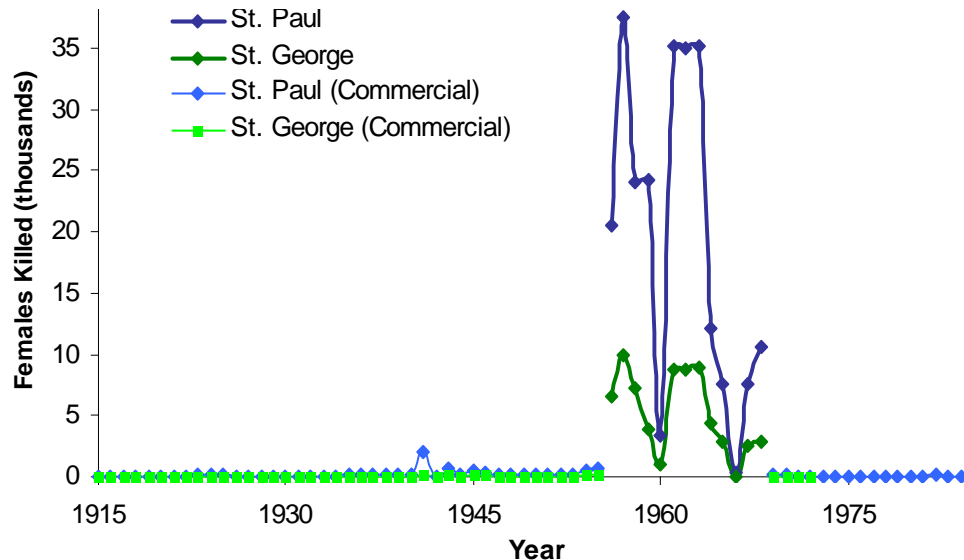


NFS harvest on Pribilof Is., 1911-1984

Commercial Harvest



Juvenile males



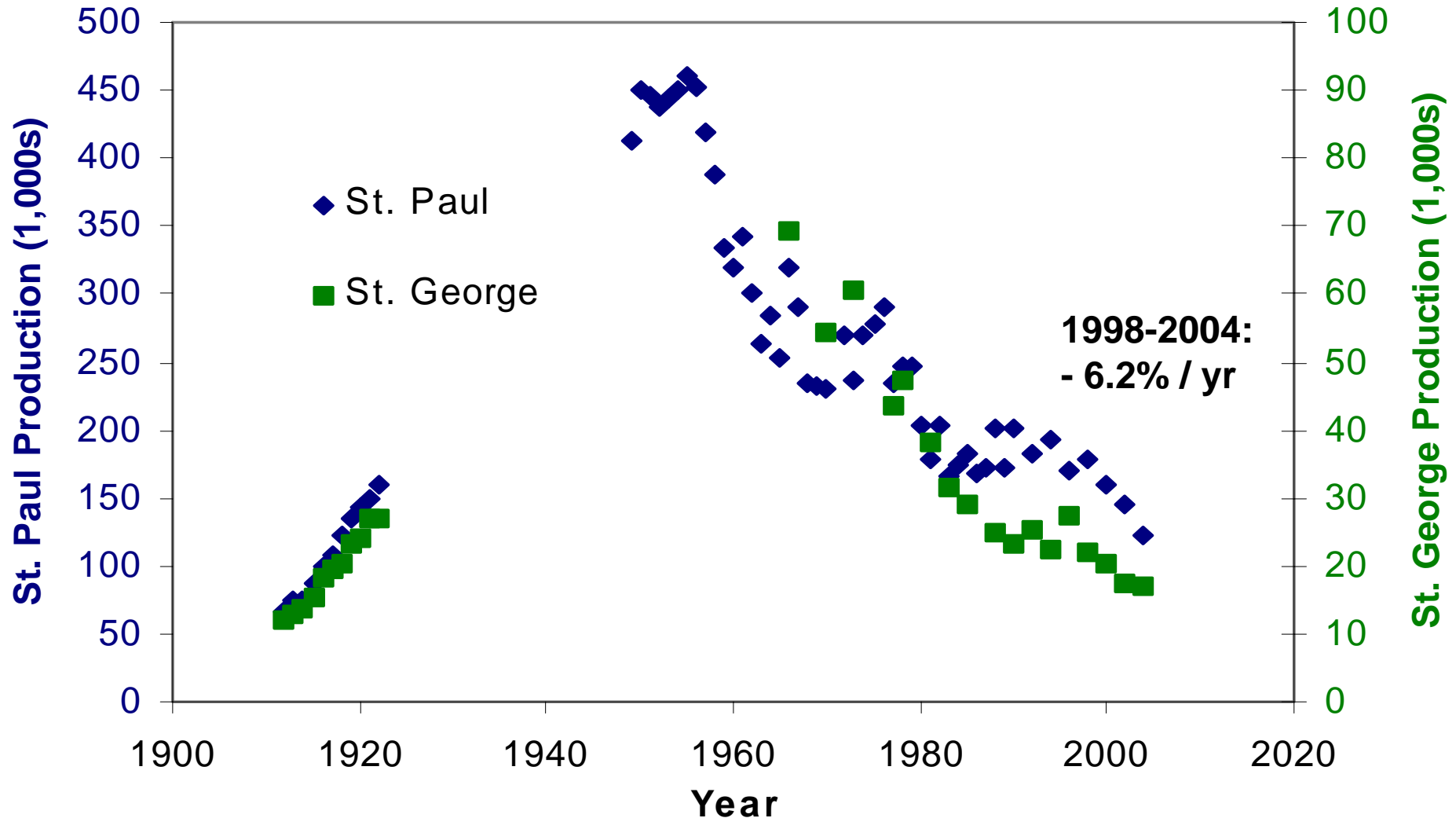
Females: ~320,000

1956-1968

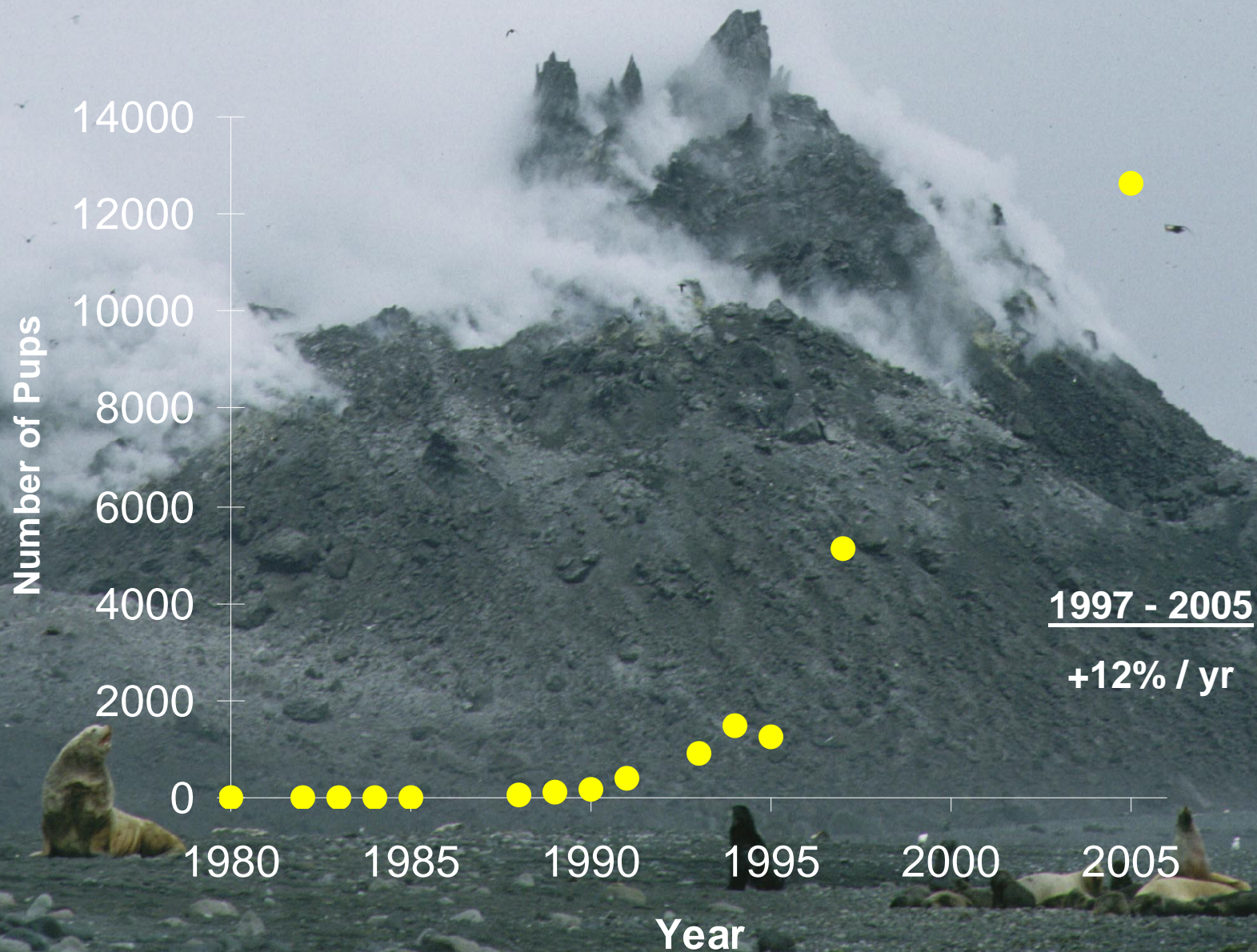
Pelagic collections for
science: >38,000

1958-1974

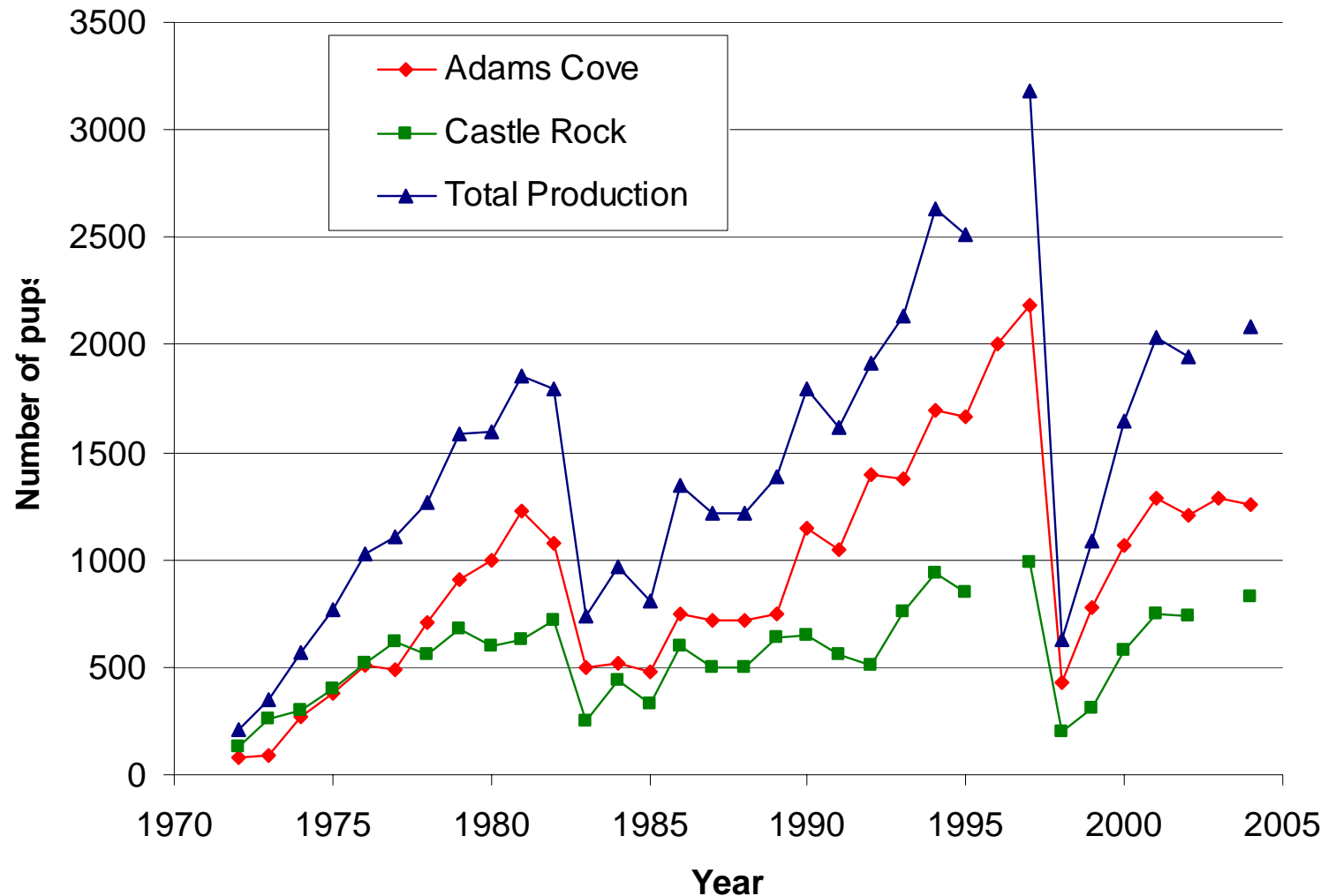
Pribilof Islands pup production, 1912-2004



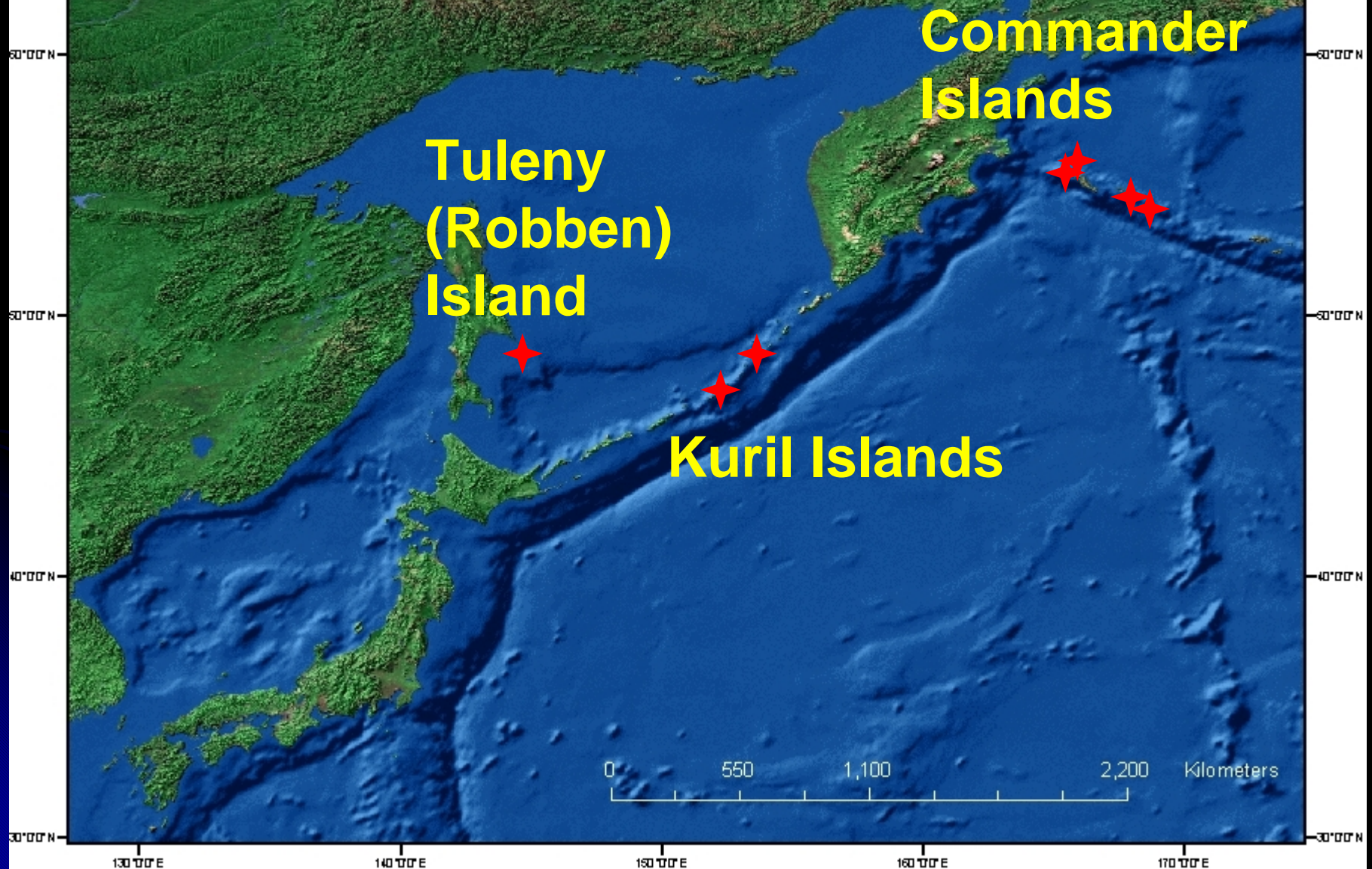
Bogoslof Island Pup Production



San Miguel Island (California) Pup Production



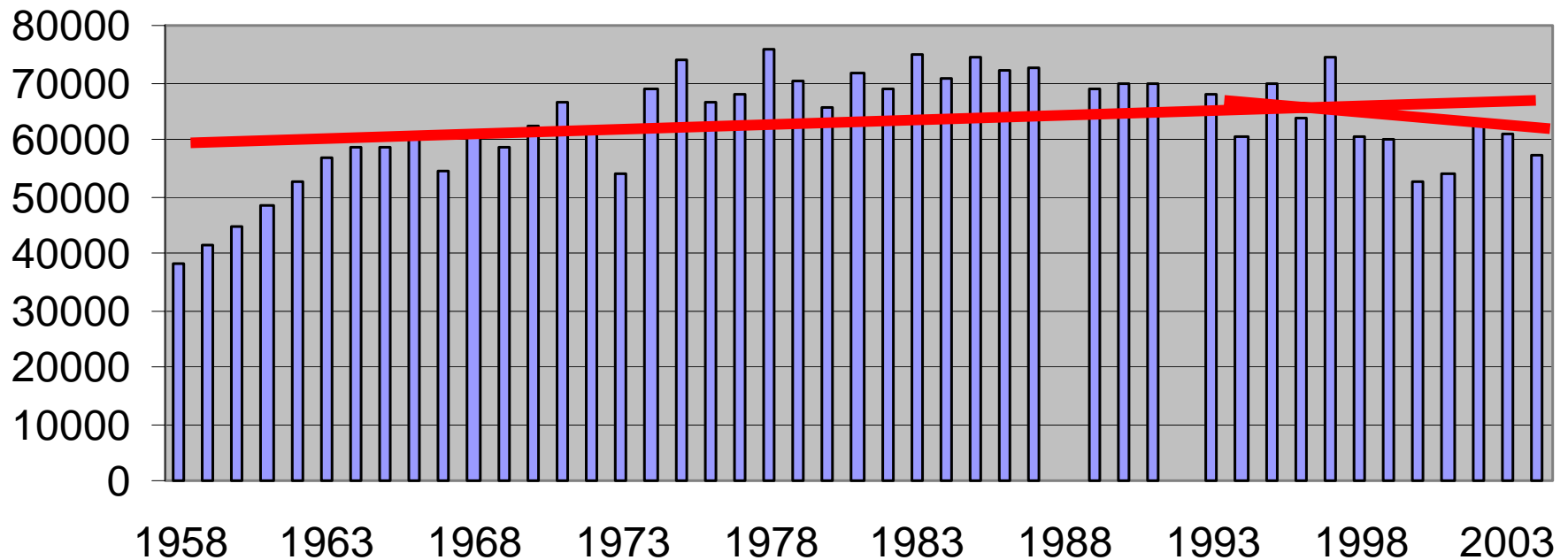
NFS distribution in Russia



Commander Islands:

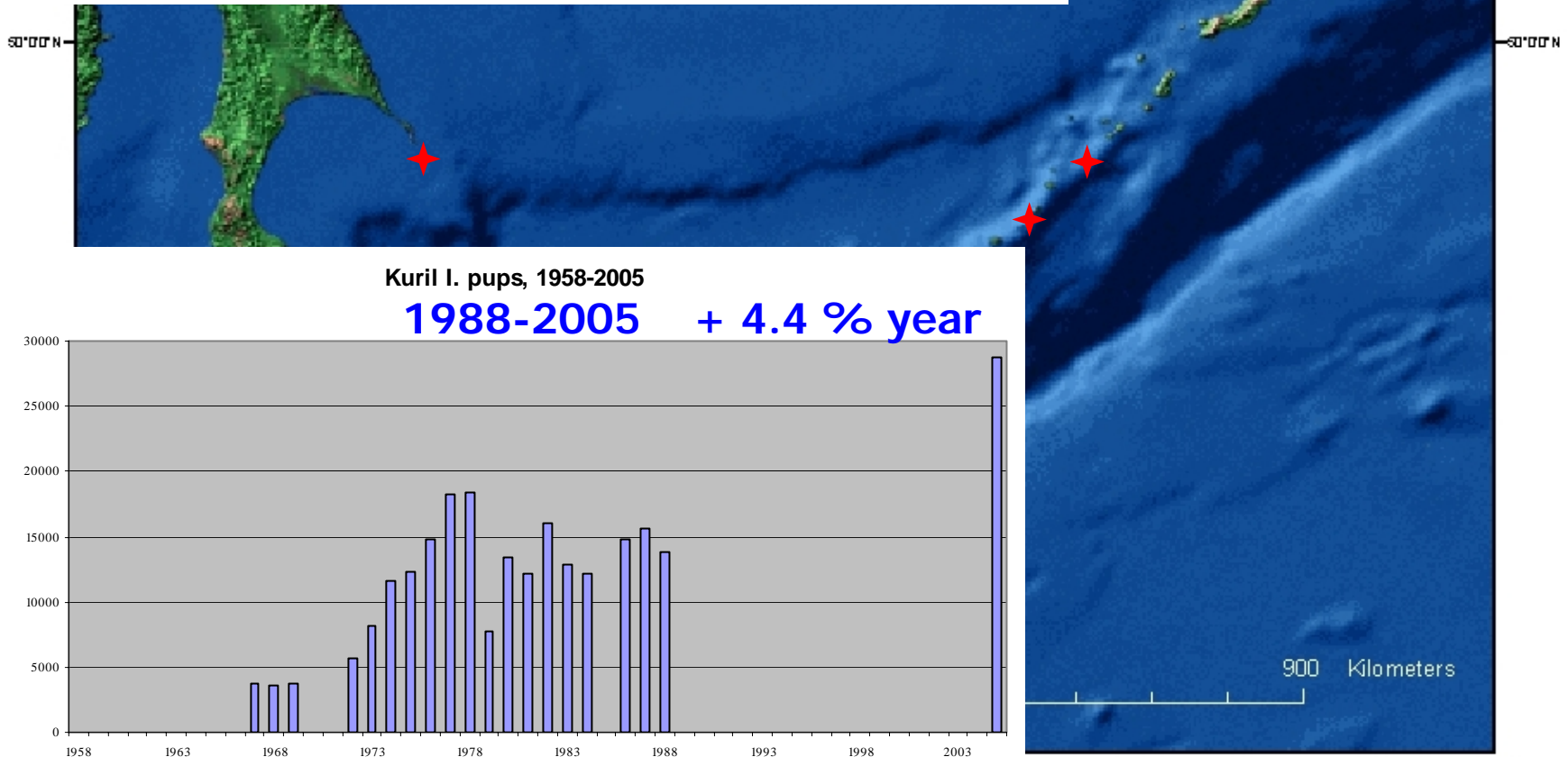
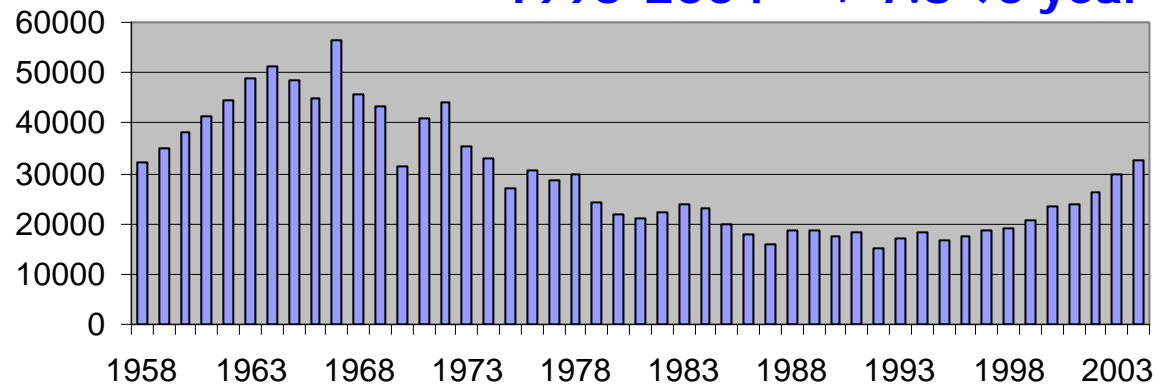
1958-2004 +0.5 % year 1995-2004 - 2.1 % year

ALL rookeries pups born, 1958-2004



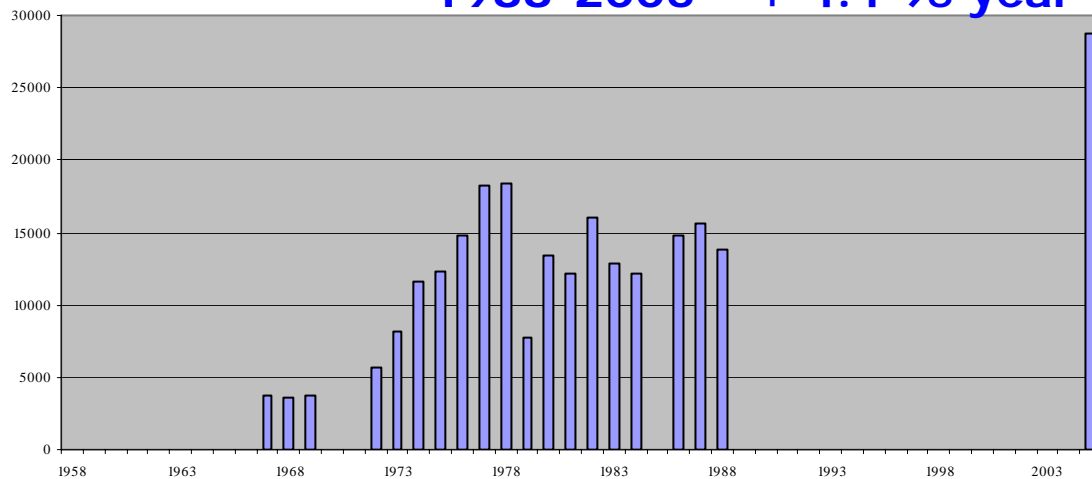
Tuleny pups born

1995-2004 + 7.8 % year



Kuril I. pups, 1958-2005

1988-2005 + 4.4 % year



Summary of NFS trends

- Some past declines largely influenced by harvests
 - Female harvest on the Pribilofs; may have affected other populations
- Recently:
 - Declines in the Bering Sea
 - Substantial increases at Tuleny, Kuril, and Bogoslof Islands

Using pinniped population trends as indicators of ecosystem change

- Use of historical data complicated by:
 - Gaps in time series
 - Effects of harvests
- Current/future data promising. Needs:
 - Assess influence of human activities on population trends (development, fishing, etc.)
 - Consider other population characteristics
 - Demographic: trends may be driven by changes in age structure (A. Kuzin; NFS at Tuleny I.)
 - Behavioral: seasonal geographic distribution



Спасибо!

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