

An aerial photograph showing a large group of walrus resting on a broken ice floe. The walrus are clustered together, appearing as dark brown shapes against the white and grey ice. The ice is fragmented into various sized pieces, with some water visible between the floes. The overall scene is a vast, icy landscape.

PACIFIC WALRUS SURVEY

Spring 2006

**Featuring the U.S. Fish and Wildlife Service
USGS Alaska Science Center
AND
A supporting cast of thousands**

Overall Survey Design

Aerial survey

Thermal scanning

Estimate of on-ice numbers for each survey block

Photography

Group size assessment

correction factor

Corrected estimate of on-ice numbers for each survey block: US and Russia

Vessel-based operations

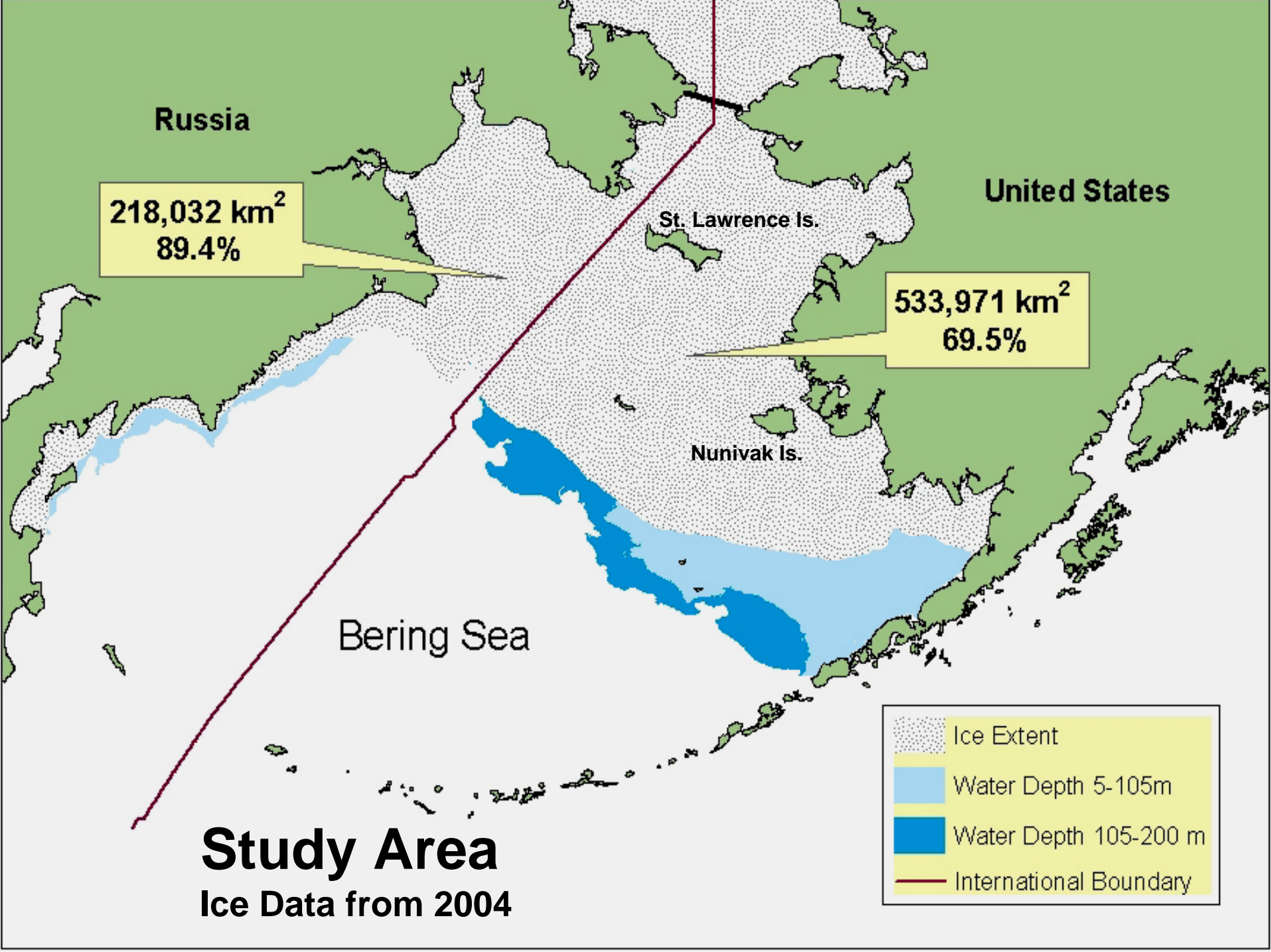
Tagged walrus

Estimate of proportion of population in water and unavailable for counting by thermal imagery

correction factor

Estimate of numbers in each survey block

Estimate of Pacific walrus population size





Step One: Launch the Field Crew

6 scientists and 4,000 pounds of gear to Adak
Flight courtesy of US Coast Guard

Step Two: Travel to Walrus Habitat



State of Alaska patrol boat – “Stimson”
Access area south of Nunivak Island

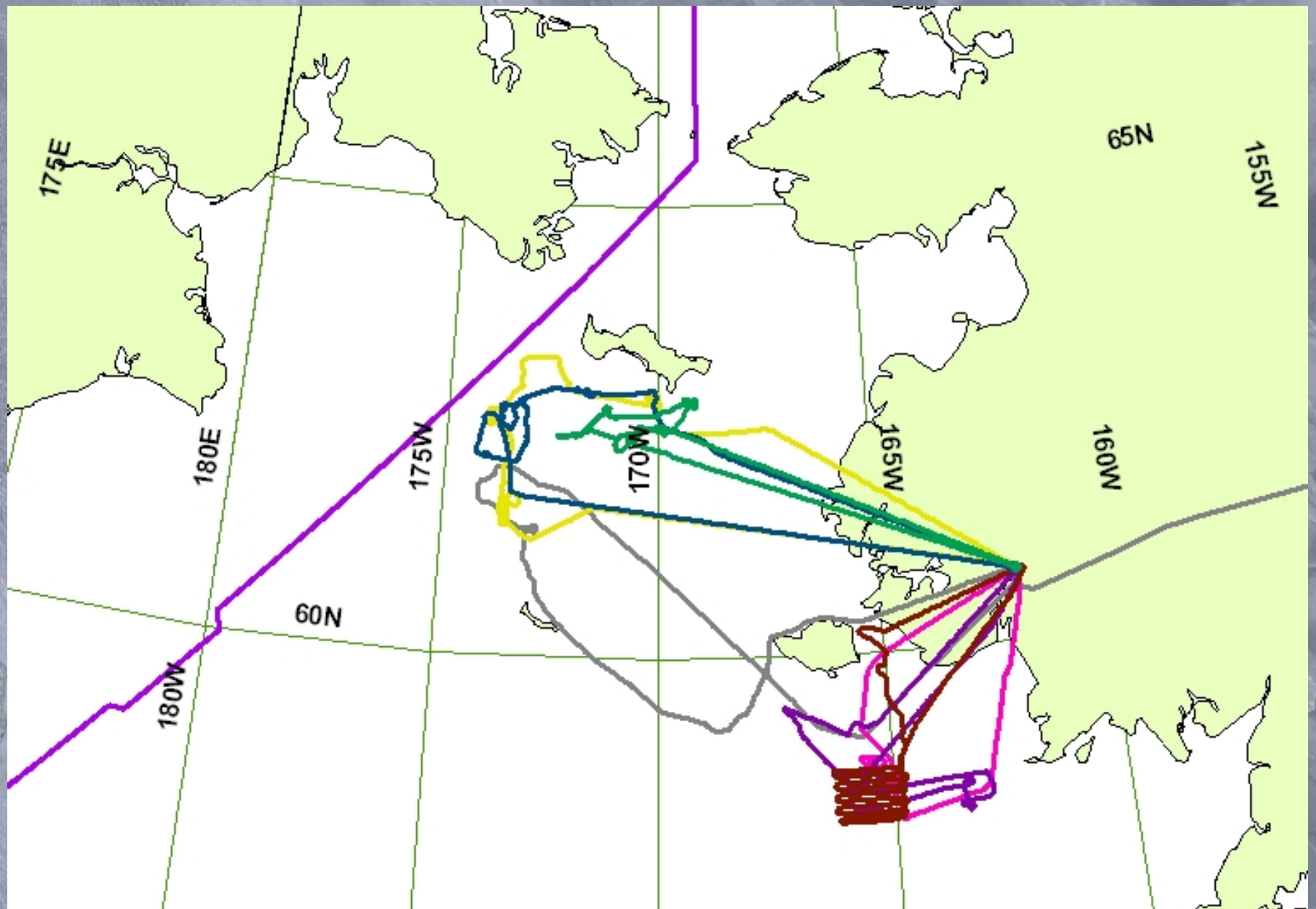
Step Three:

Aerial Reconnaissance

Finding Walrus for the ships

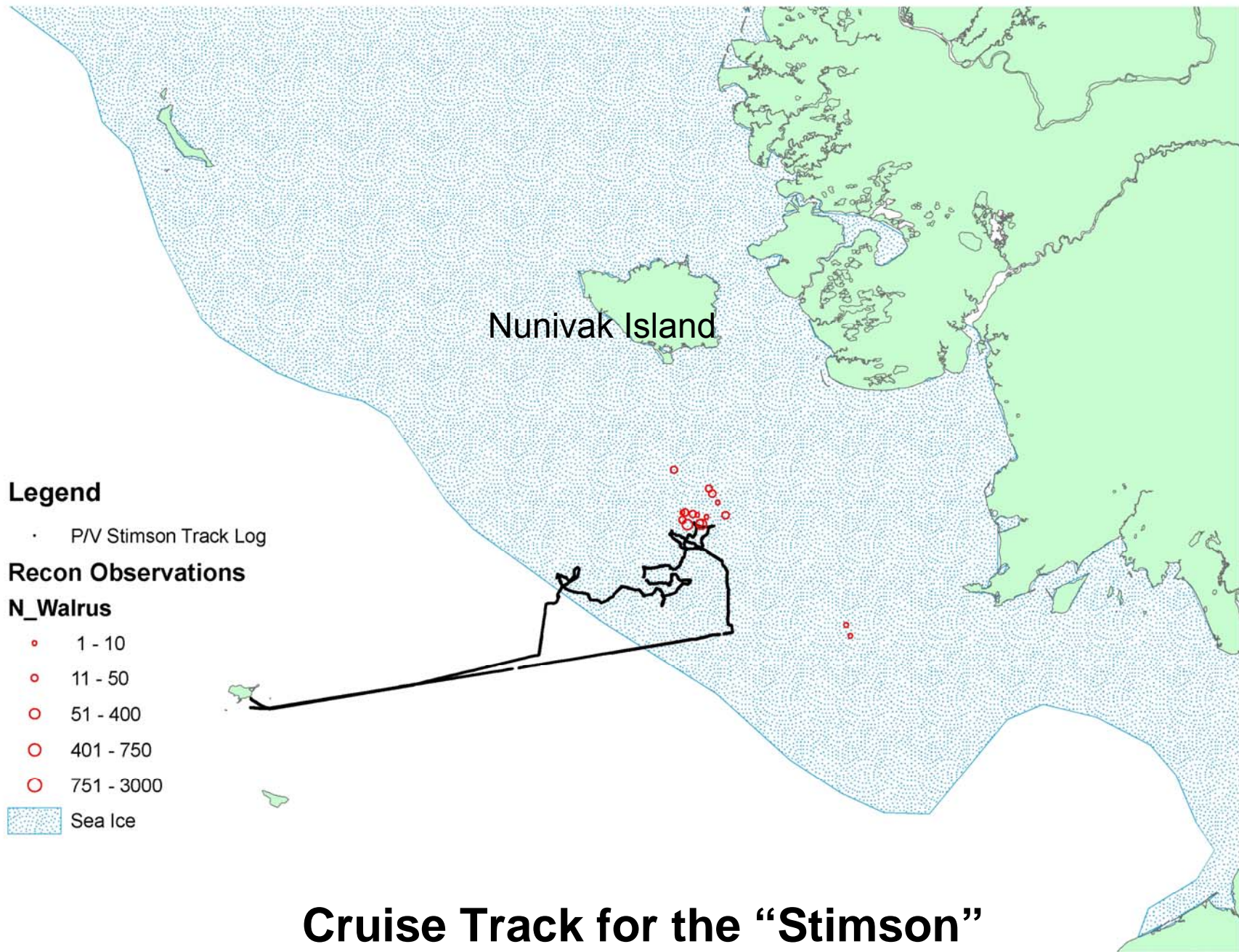


Recon Tracklines March 21-28



“Stimson” in study area





Cruise Track for the “Stimson”

Russian Icebreaker – “Magadan”

Access St. Lawrence Island Polynya

Russian Scientists boarded in Petropavlsk – US scientists in Adak



2006 Walrus Research Cruise

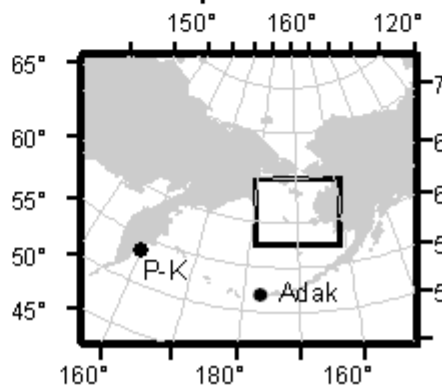
Key

- △ Radio Tagged Walrus (n = 45)
- Benthic Sampling Station (n = 7)

International Boundary

Generalized Sea Ice Extent
Reported by National Ice Center
(March 24th)

Locator Map



Step Four: Attach Satellite Tags to Walrus



Tagging

Sex	N Walrus Instrumented
Female	35
Male	9
Unclassified	2
Total	46







Biopsy Collection

Magadan Collection	
Sex	N
Female	19
Male	9
Unclassified	1
Total	29

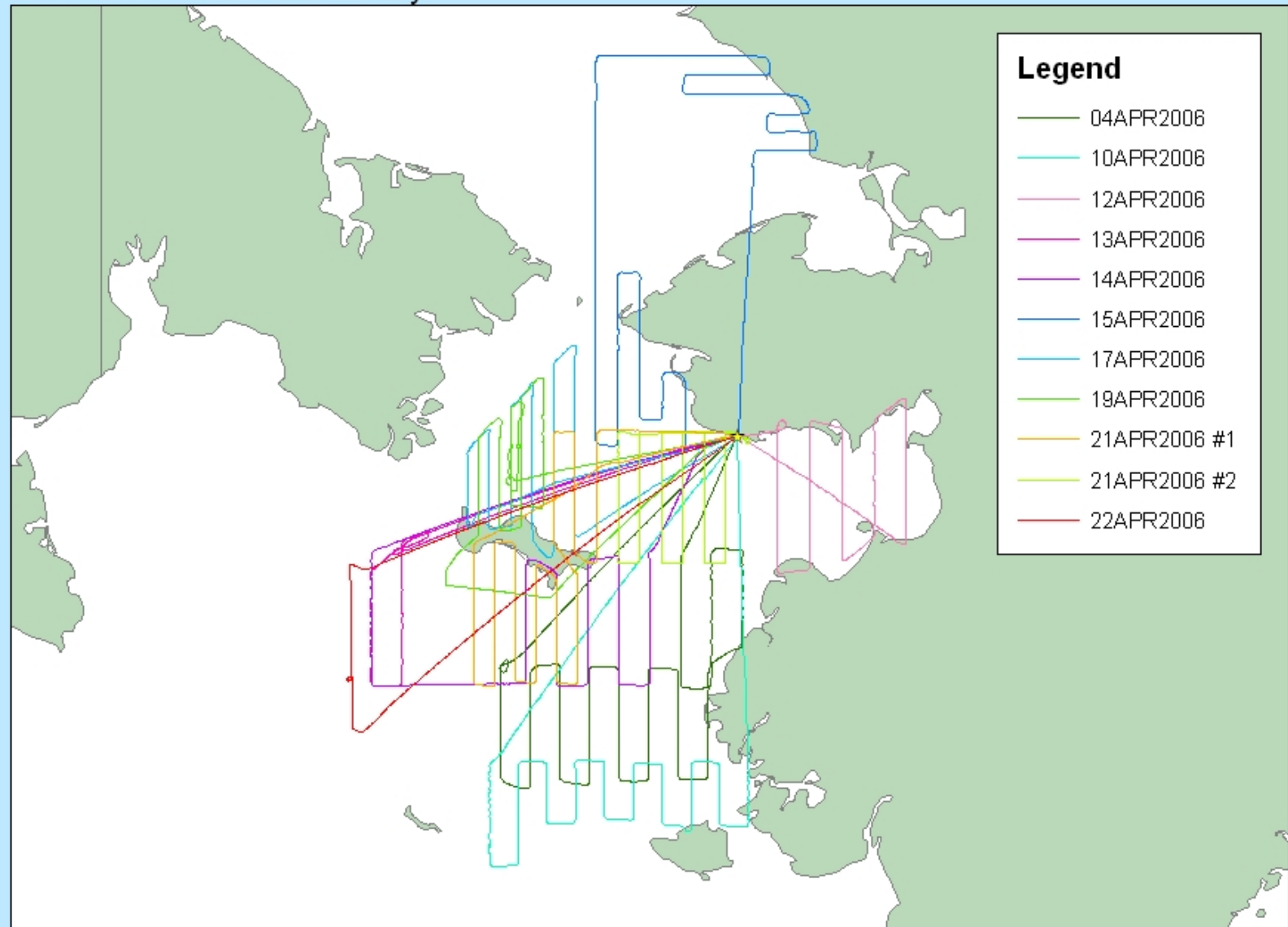
Total Available for SLIP	
Sex	N
Female	27
Male	37



**Step Five:
Aerial Data Acquisition
US Team based in Nome**



2006 Pacific Walrus Aerial Survey



Area surveyed by U.S. Team

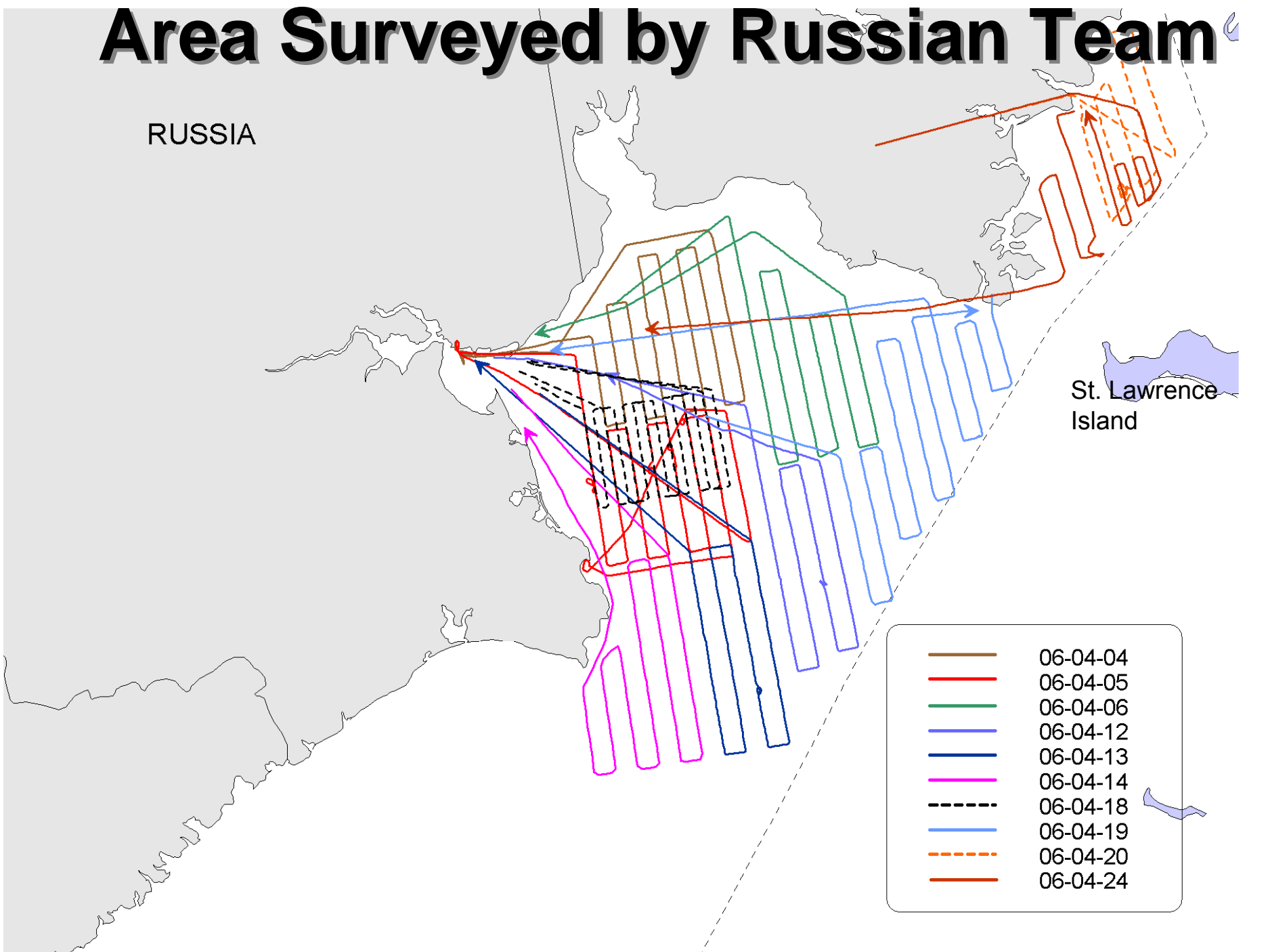
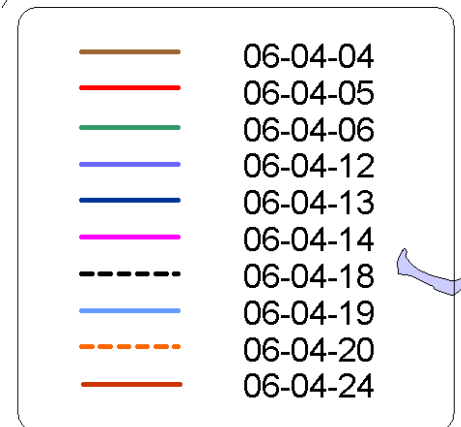
Вариант самолета – лаборатории на базе Russian team based in Anadyr



Area Surveyed by Russian Team

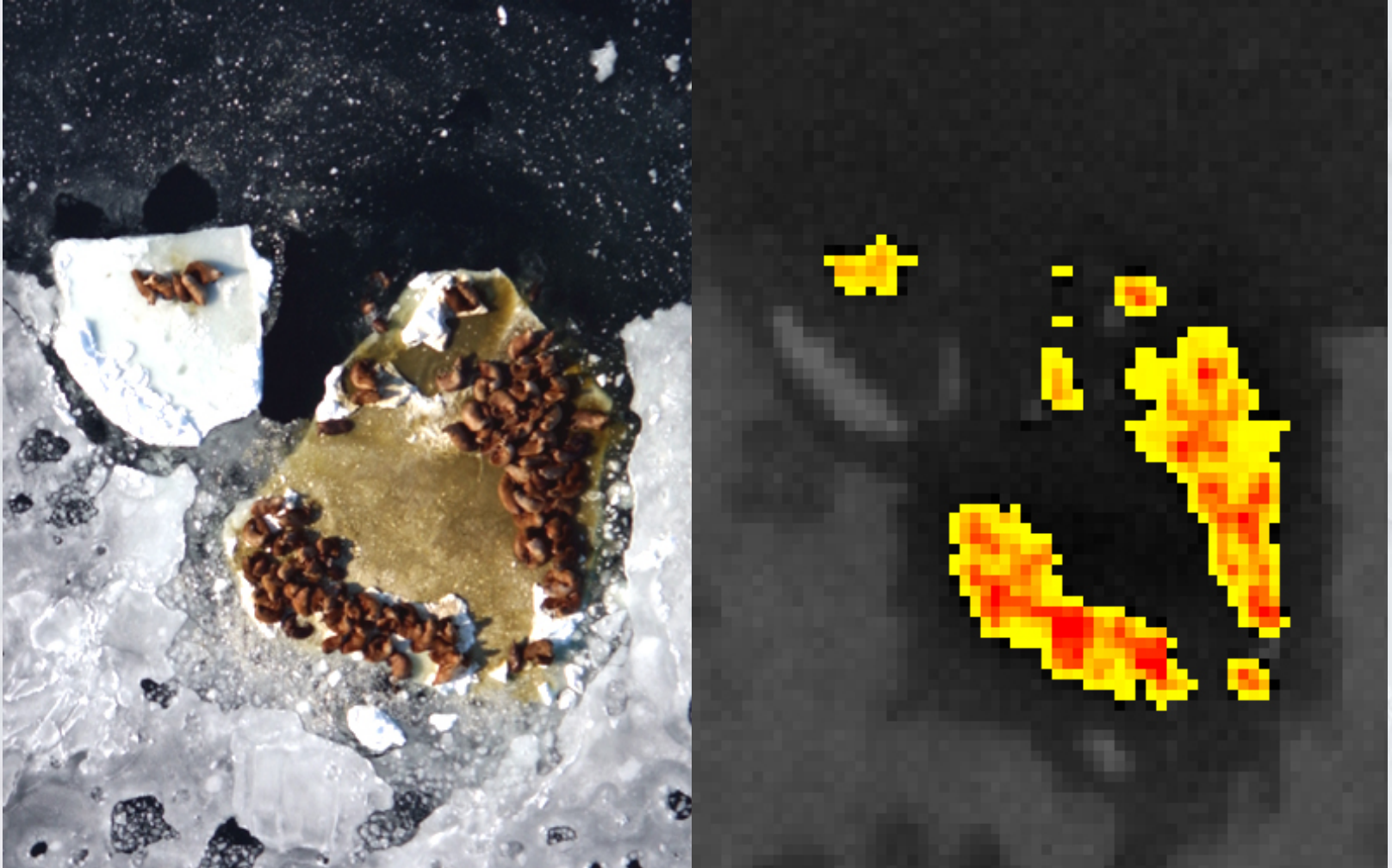
RUSSIA

St. Lawrence
Island



Thermal Imagery

Comparable Data from US and Russia





Photos to verify thermal imagery

An aerial photograph of a snowy, mountainous landscape. A vertical line of dark, dense vegetation or structures runs through the center of the frame. The surrounding terrain is covered in snow, with shadows indicating the contours of the land. The text is overlaid on the right side of the image.

**High Resolution Video
For
Group Size Assessment**



Final Step – Analysis and reporting

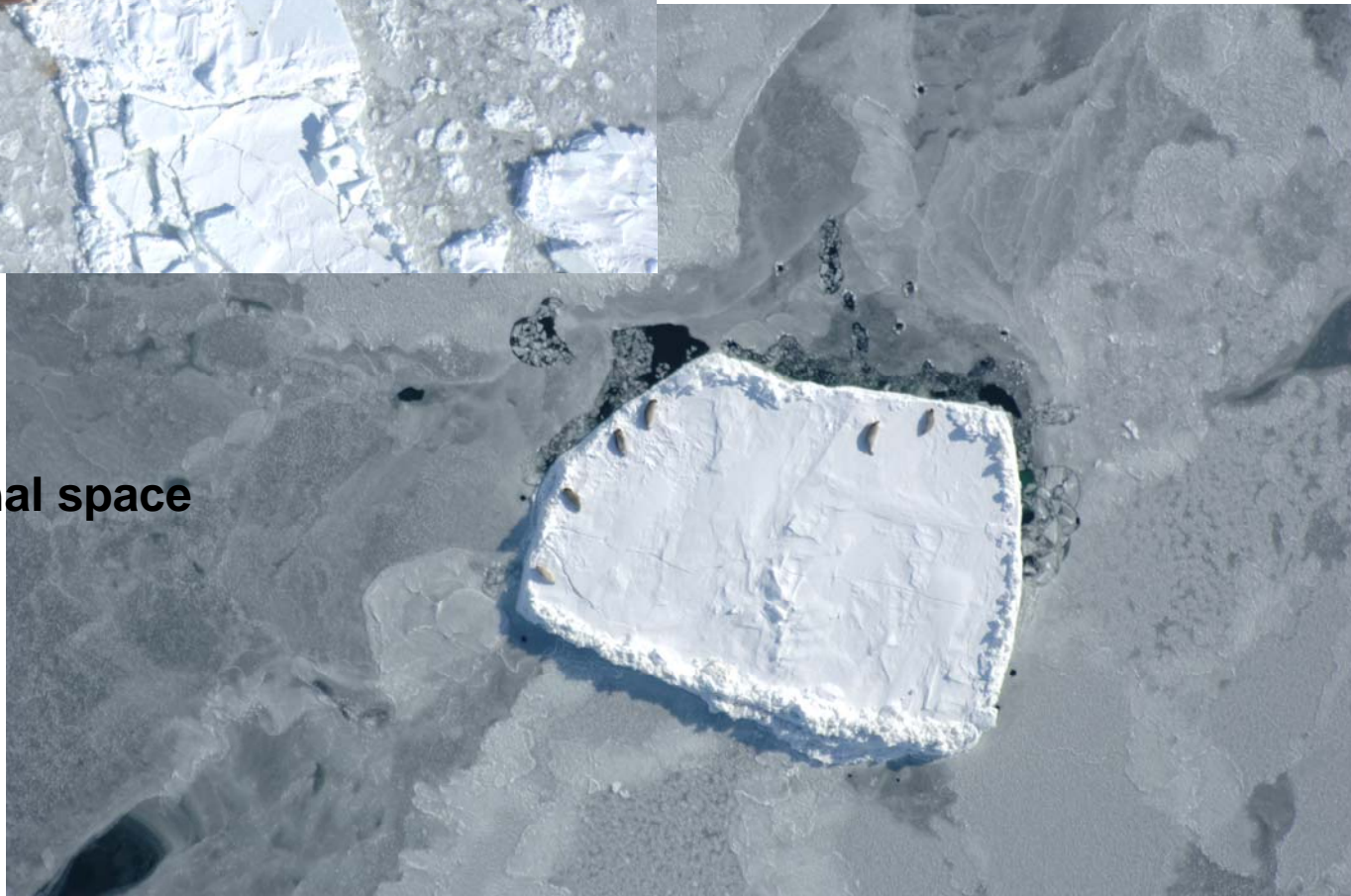
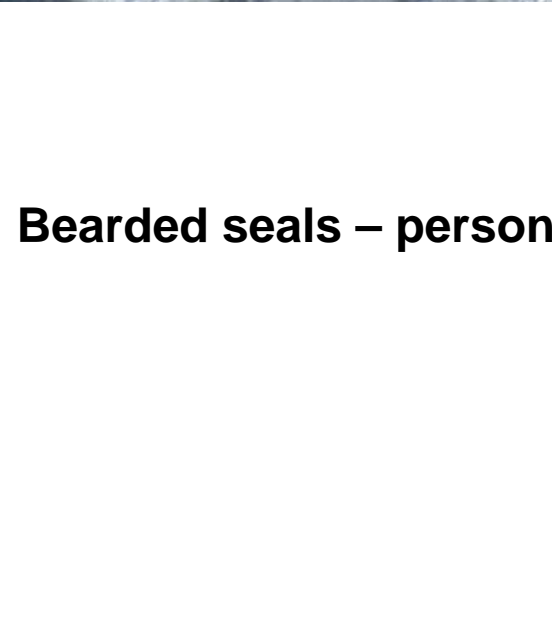
Beginning Summer 2006

Lots of Photos





Walrus on ice – closer the better



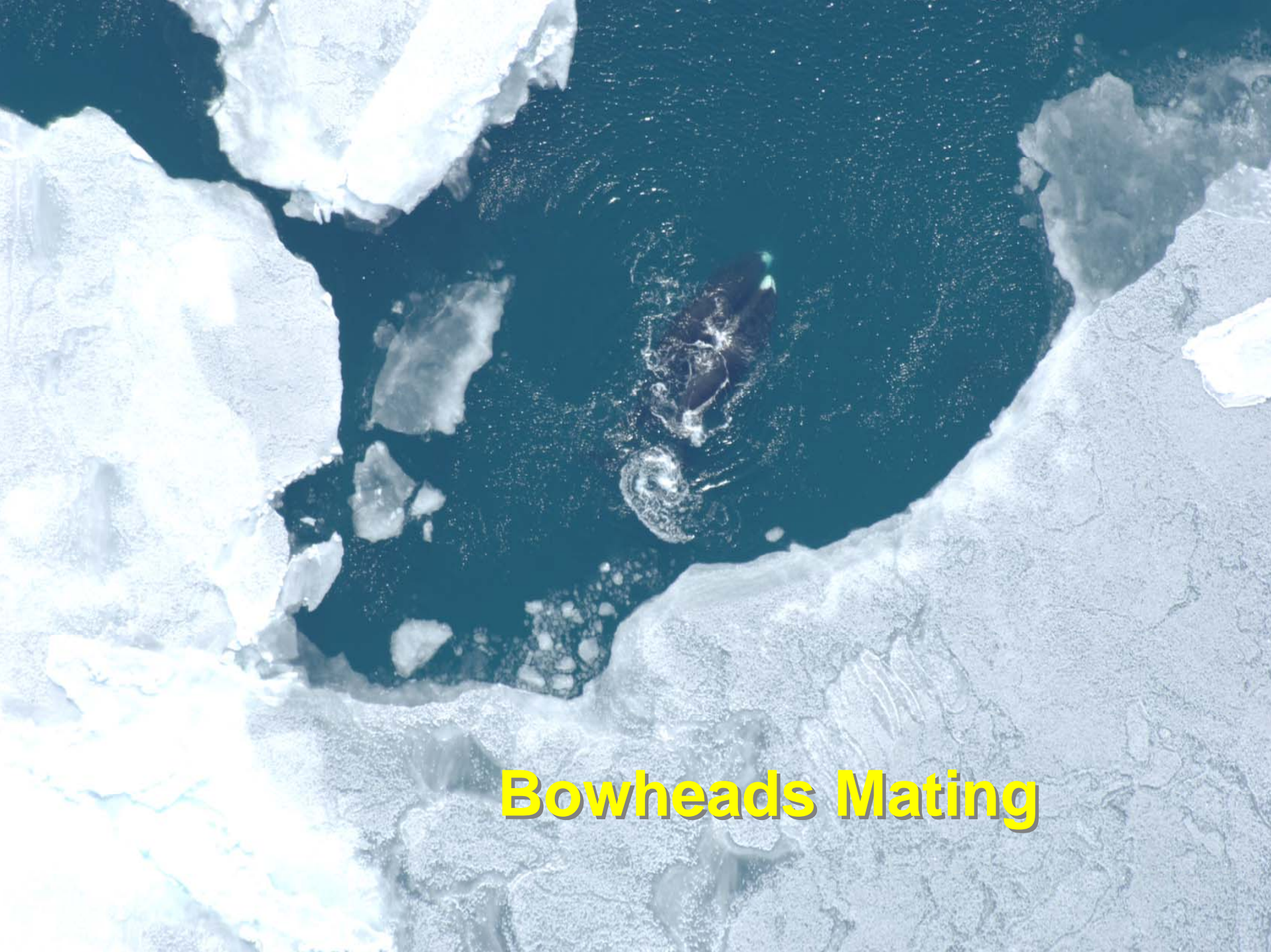
Bearded seals – personal space

“Magadan” in lead



“Magadan” in ice pack





Bowheads Mating



Belugas

Calving Walrus



Cooperators – AKA – Supporting Cast of Thousands

US Coast Guard
Marine Mammal Commission
Eskimo Walrus Commission
Alaska Department of Fish and Game
North Pacific Wildlife Consulting
Commander Northwest Ltd.
Argon ST, Inc.

National Park Service
North Slope Borough
Alaska Ocean Observation System
NASA

USFWS – Migratory Birds

- Area V
- Kodiak NWR
- Yukon Delta NWR
- Alaska Maritime NWR

RUSSIAN COLLEAGUES

Giprorybflot

ChukotTinro

PINRO

Union of Traditional Marine
Mammal Hunters

Russian Marine Mammal
Council

Phoenix Fund

Locations of tagged walrus at:

<http://alaska.usgs.gov/science/biology/walrus/animation.html>