Marine Mammals

from NOAA photograph library

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Division of Environmental Sciences

Environmental Studies Program

R/V Pisces (from NOAA Web site)

Develops and oversees applied scientific studies required for making responsible decisions for managing energy and marine mineral resources on the U.S. Outer Continental Shelf

Environmental Protection Mandates

Outer Continental Shelf Lands Act

National Environmental Policy Act

Marine Mammal Protection Act

Endangered Species Act

Marine Protected Areas --- state and federal

Scientific Recommendations

NOAA and FWS Recovery Plans and Stock Assessment Reports

BOEM advisory committees

Addressing the Effects of Human-Generated Sound on Marine Life: An Integrated Research Plan for U.S. Federal Agencies --- Brandon Southall et al. --- Report of the Joint Subcommittee on Ocean Science & Technology (JSOST) January 2009

Ecological Variables

population --- size, reproductive success, food availability, predation, disease, harvest

geographic distribution --- migration patterns, habitat specificity, physical barriers (e.g. sea ice)

behavior --- feeding, diet diversity, communications, mating, hauling out, calving/pupping, predator-prey

interactions --- physical and chemical factors

Environmental Stress

Direct

oil spills and other chemical contaminations

noise (seismic surveying, drilling, ship propulsion, aircraft)

habitat alteration

ship strikes

Indirect or Natural

changes in sea ice, temperature, ocean currents, etc.

changes in food availability

changes in predation

changes in harvesting

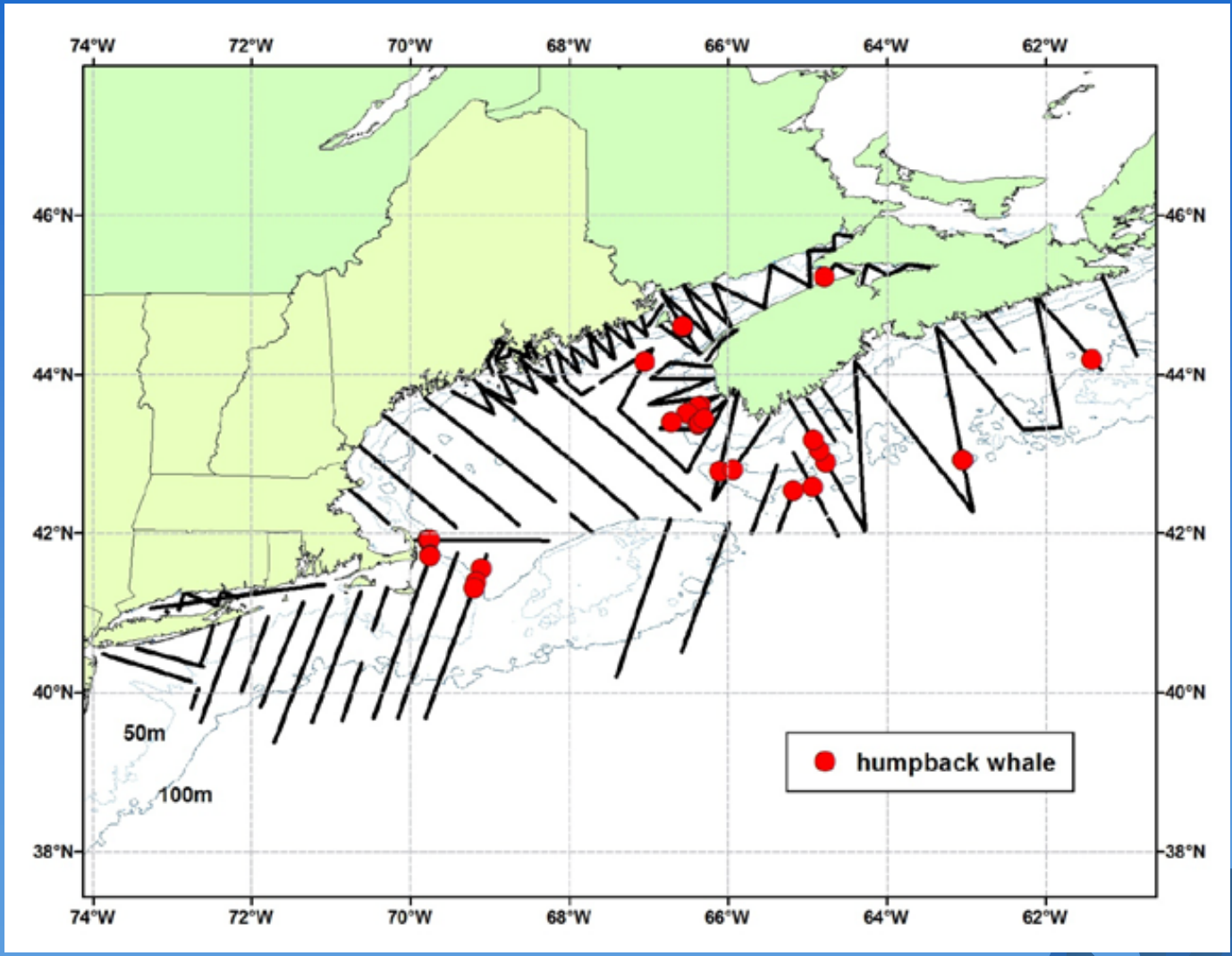
Atlantic Marine Assessment Program for Protected Species (AMAPPS)

estimate abundance and develop seasonal, localized densities of birds, turtles, and mammals

use tags on turtles, birds, pinnipeds to correct for bias and collect additional data on habitat uses

explore alternative platforms and technologies to improve population assessments

NE AMAPPS Aerial Survey Aug. 17 – Sept 26, 2010



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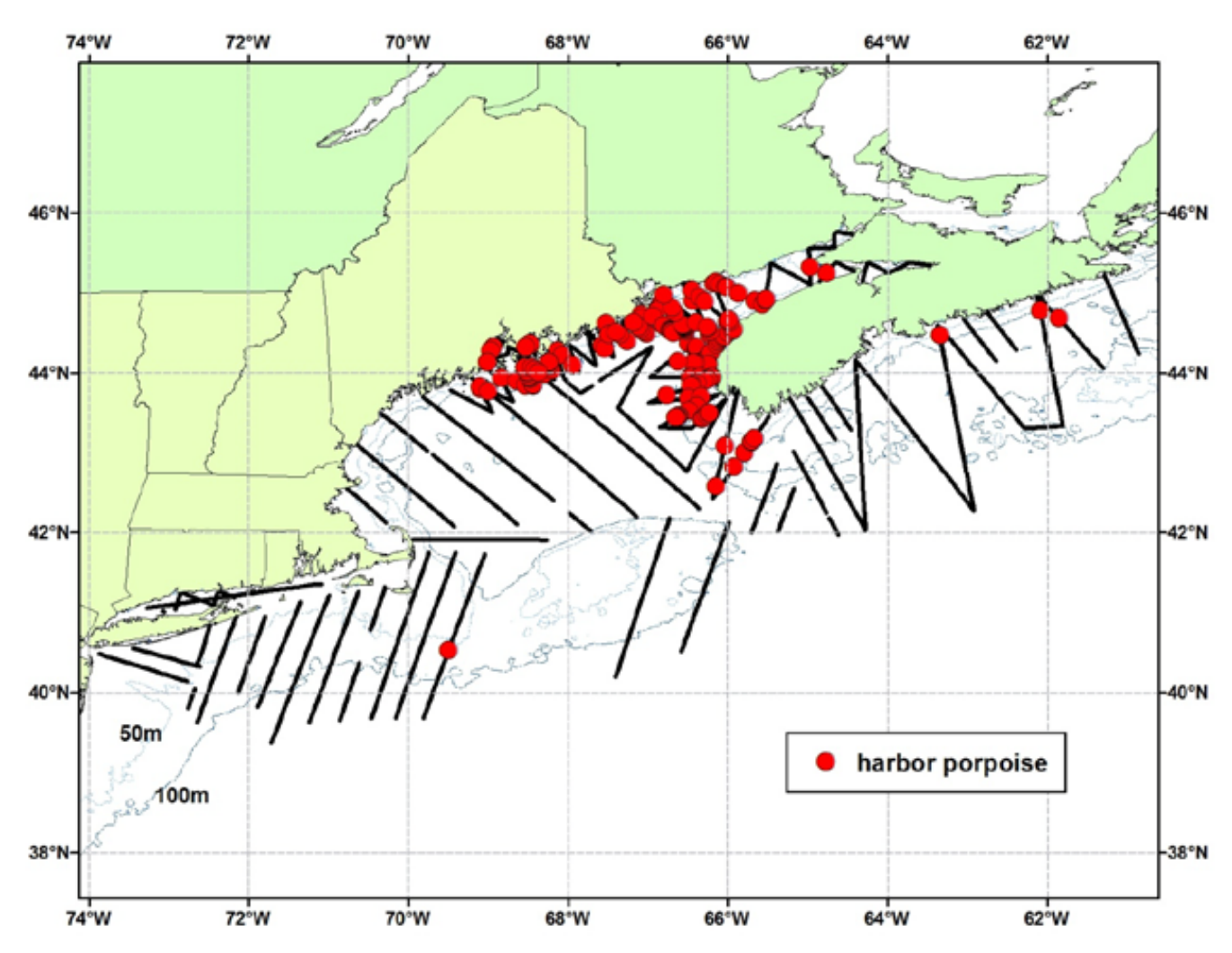
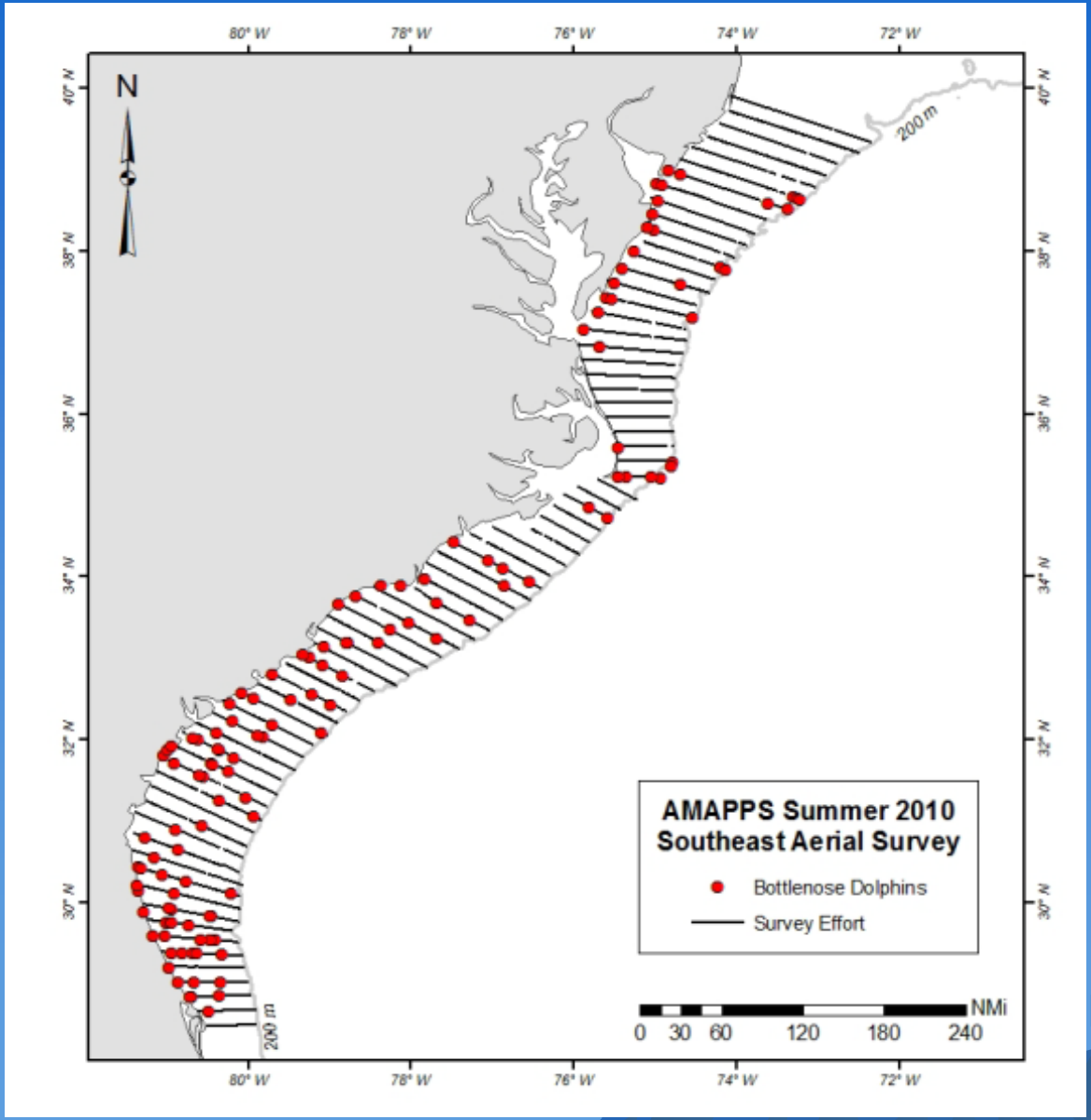
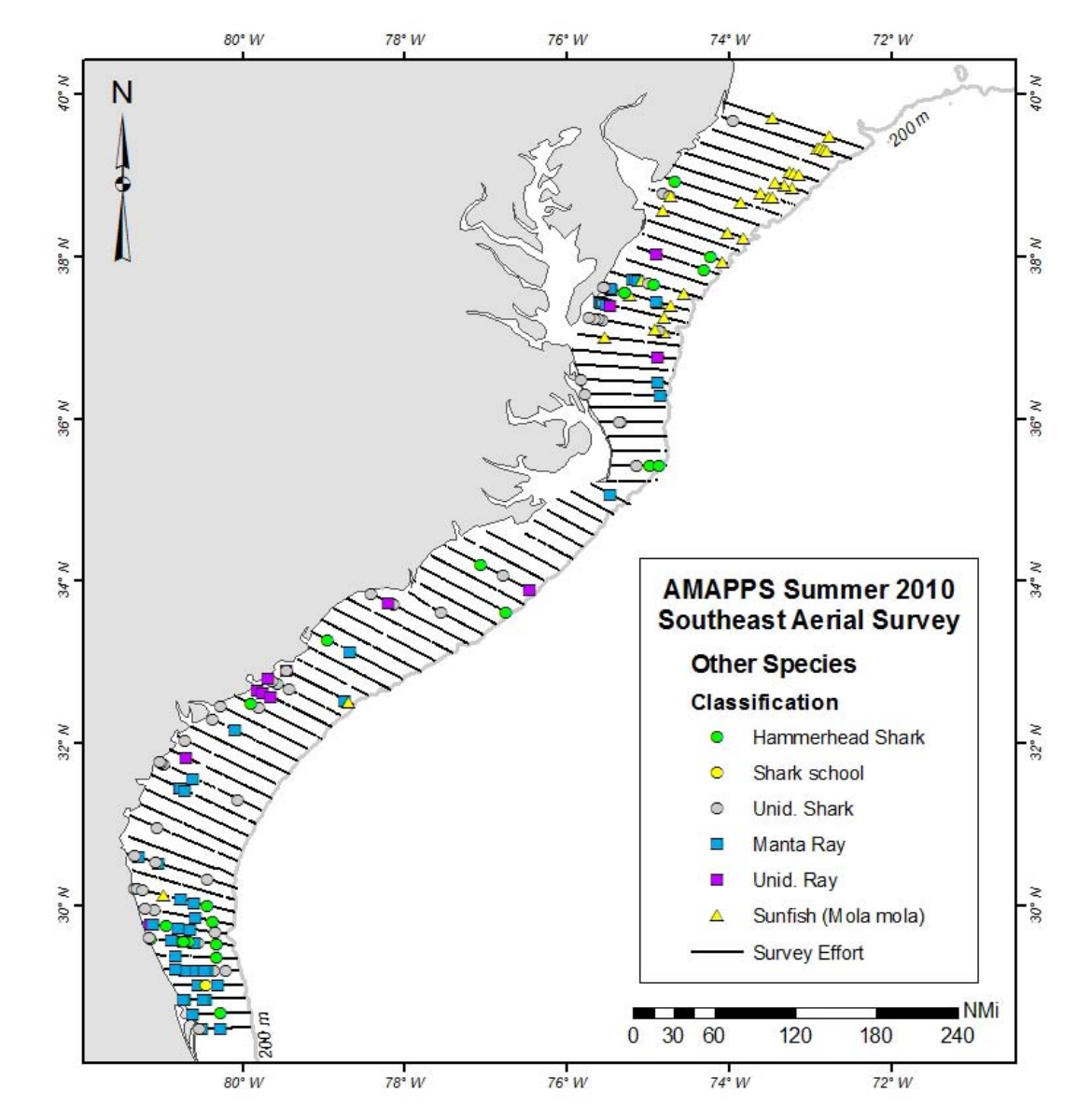


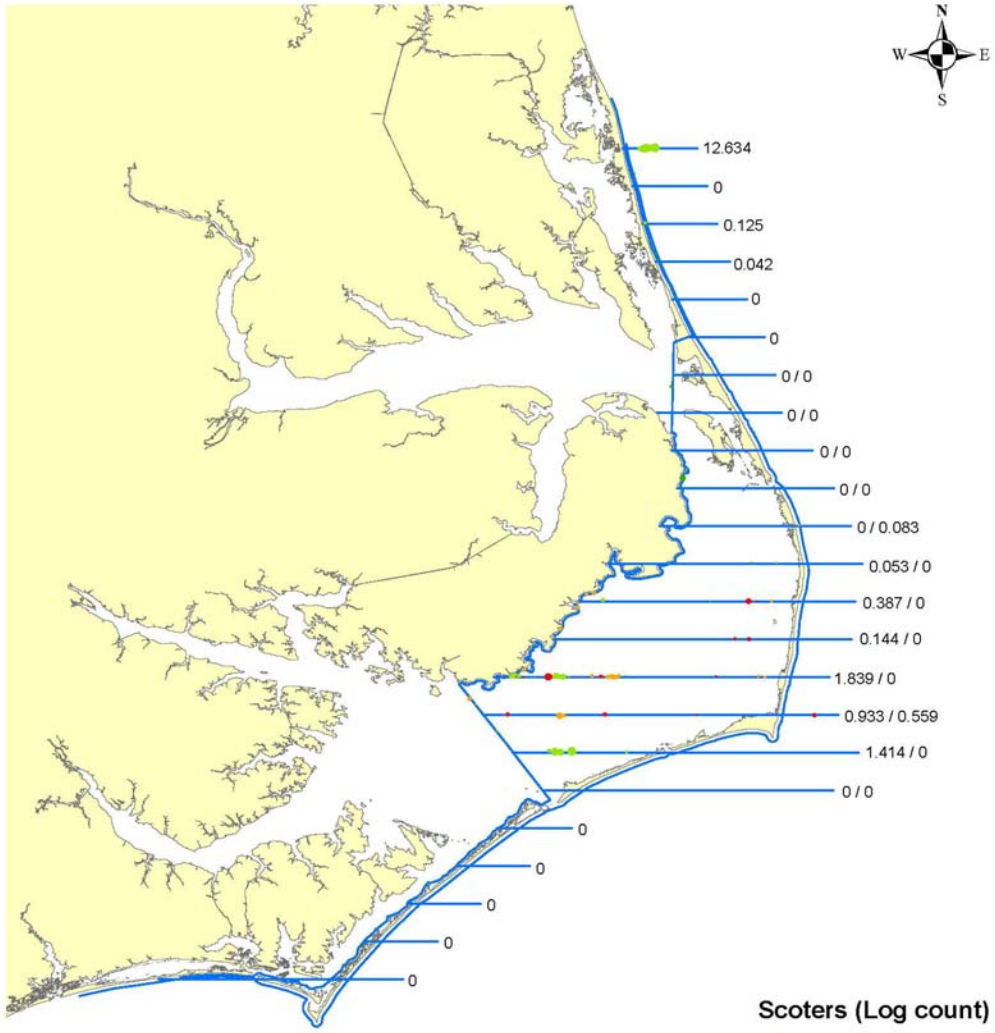
SE AMAPPS Aerial Survey Summer 2010



SE AMAPPS Aerial Survey Summer 2010

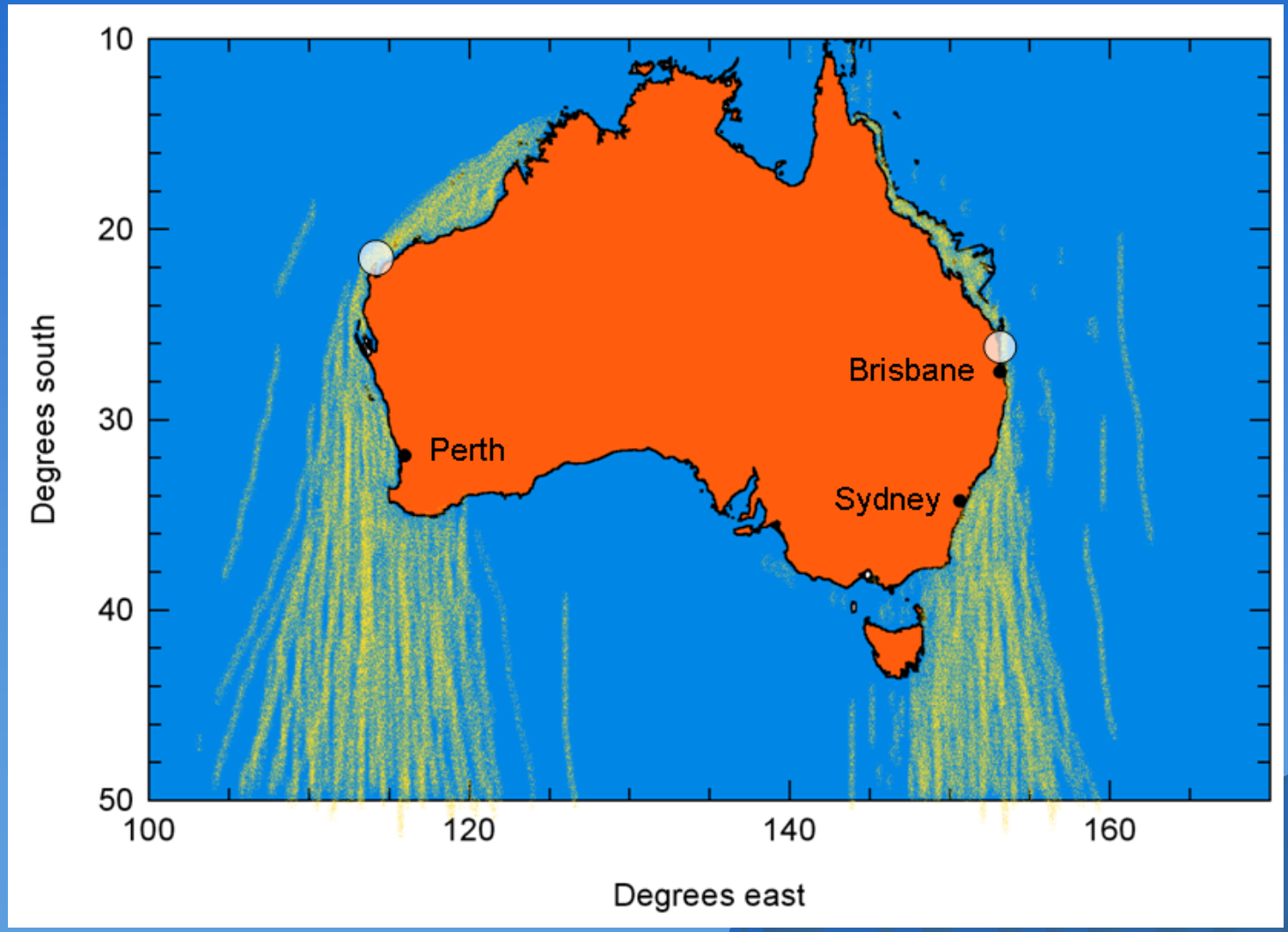


Pamlico Sound
Surf Scoters by Year (all replicates)



Note: East/West transects are labeled as avg. number of birds per nautical mile (yrs 2009-11).
Transects that crossed the Outer Banks list two bird densities:
West of the Outer Banks / East of the Outer Banks.

Behavioral Response Study with Australian Humpback Whales and Seismic Air Guns



Objectives

determine the response of humpback whales to a typical commercial seismic survey

determine their response to soft start or ramp-up to assess its effectiveness as mitigation

relate these responses to the range of normal behavior and the response of the whales to other stimuli, such as passing ships, using results from previous research

Sperm Whale Seismic Study (SWSS)

6-year ; 9.3 M$ study via state, federal, university, and other organizations

establish baseline for whale's biology and behavior

delineate habitat and habitat use

determine response to seismic survey noise

Sperm Whales and Bottlenose Dolphins in the GOM

similar to SWSS but with "naive" population , including detailed characterization of age, sex, genetic profiles, habitat use, seasonal movement

detailed measurements of ambient noise, physical oceanographic conditions, sightings and passive acoustical detection of near-by whales and dolphins

S-tags and D-tags to track whale seasonal migration and habitat use, foraging strategies, and mixing with other populations (N. GOM and W. Atlantic)

(38 stocks of oceanic, continental shelf, coastal, and estuarine bottlenose dolphins --- Unusual Mortality Events mostly with algal blooms; one preceding big GOM spill and overlapping in space and time)

- collect skin and blubber samples from estuarine and coastal bottlenose dolphins
- assess population structure using mitochondrial and nuclear DNA
- assess trophic status and relationships from stable isotope analysis of skin
- assess exposure to toxic chemicals via analysis of blubber

Bowhead Whale Aerial Survey Project (BWASP)

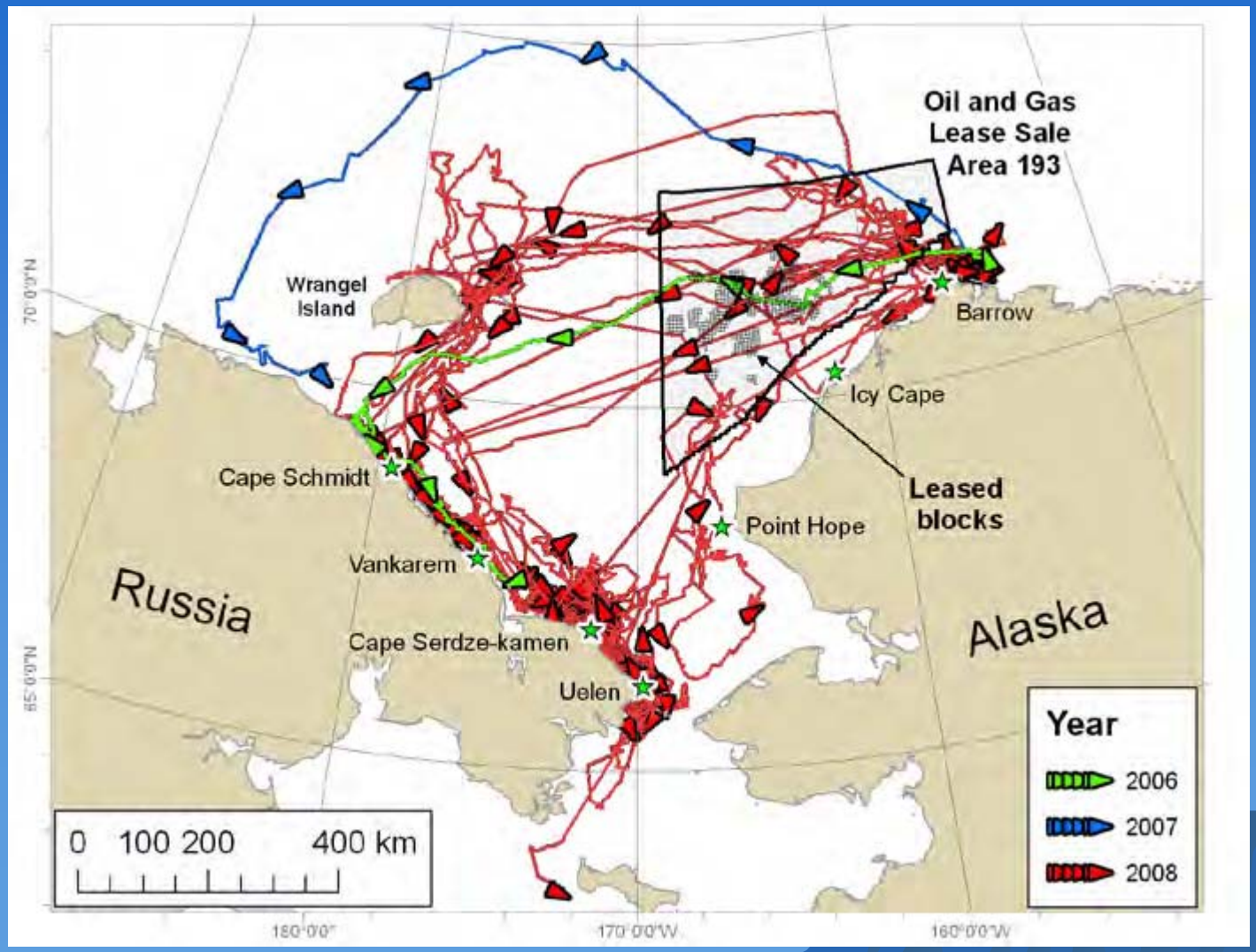
fall migration of bowhead whales out of Beaufort Sea, along Alaskan coast

32 years of continuous observation

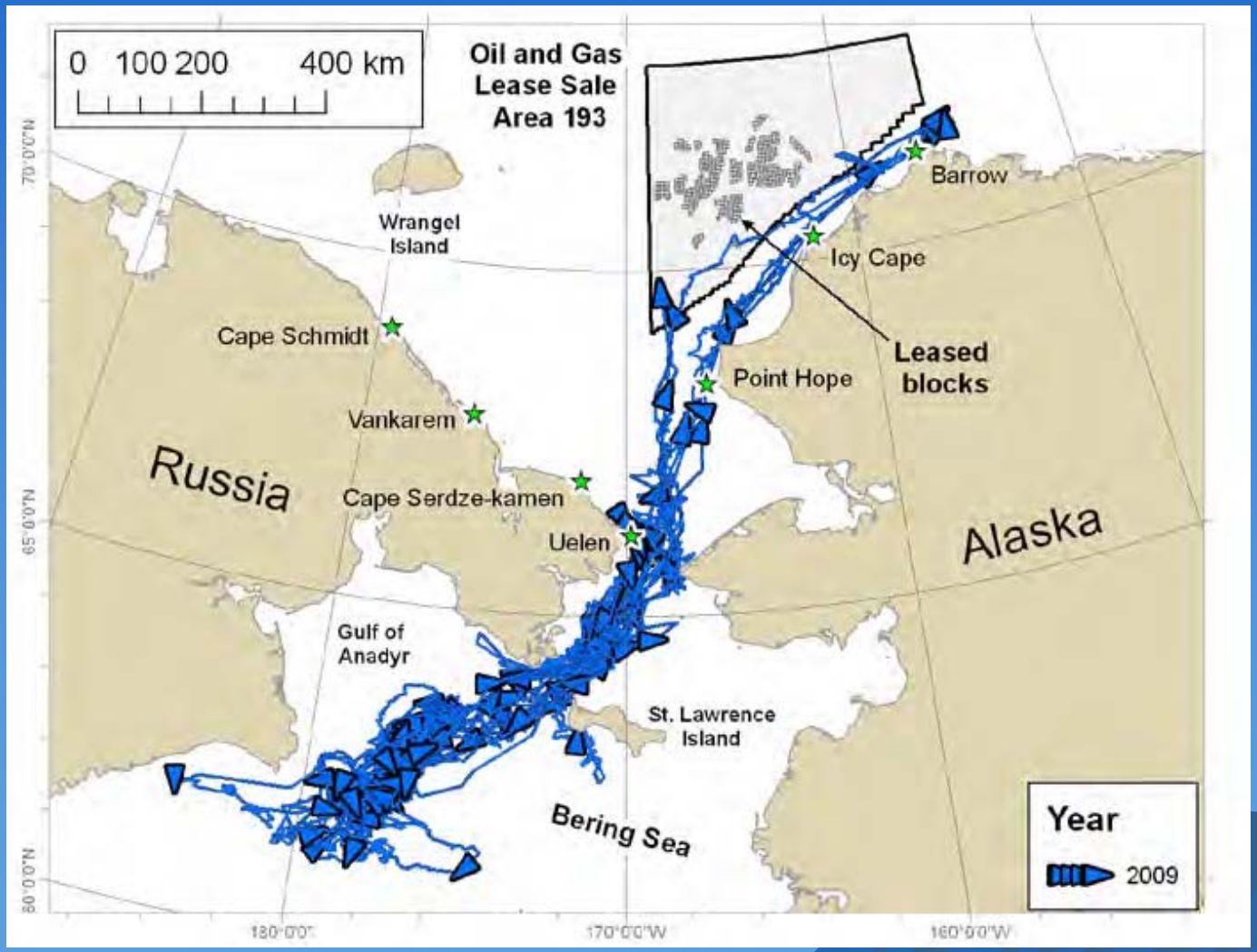
originally “in-house” investigation; now performed by NOAA’s marine mammal laboratory

rest of annual migration route is mostly unknown

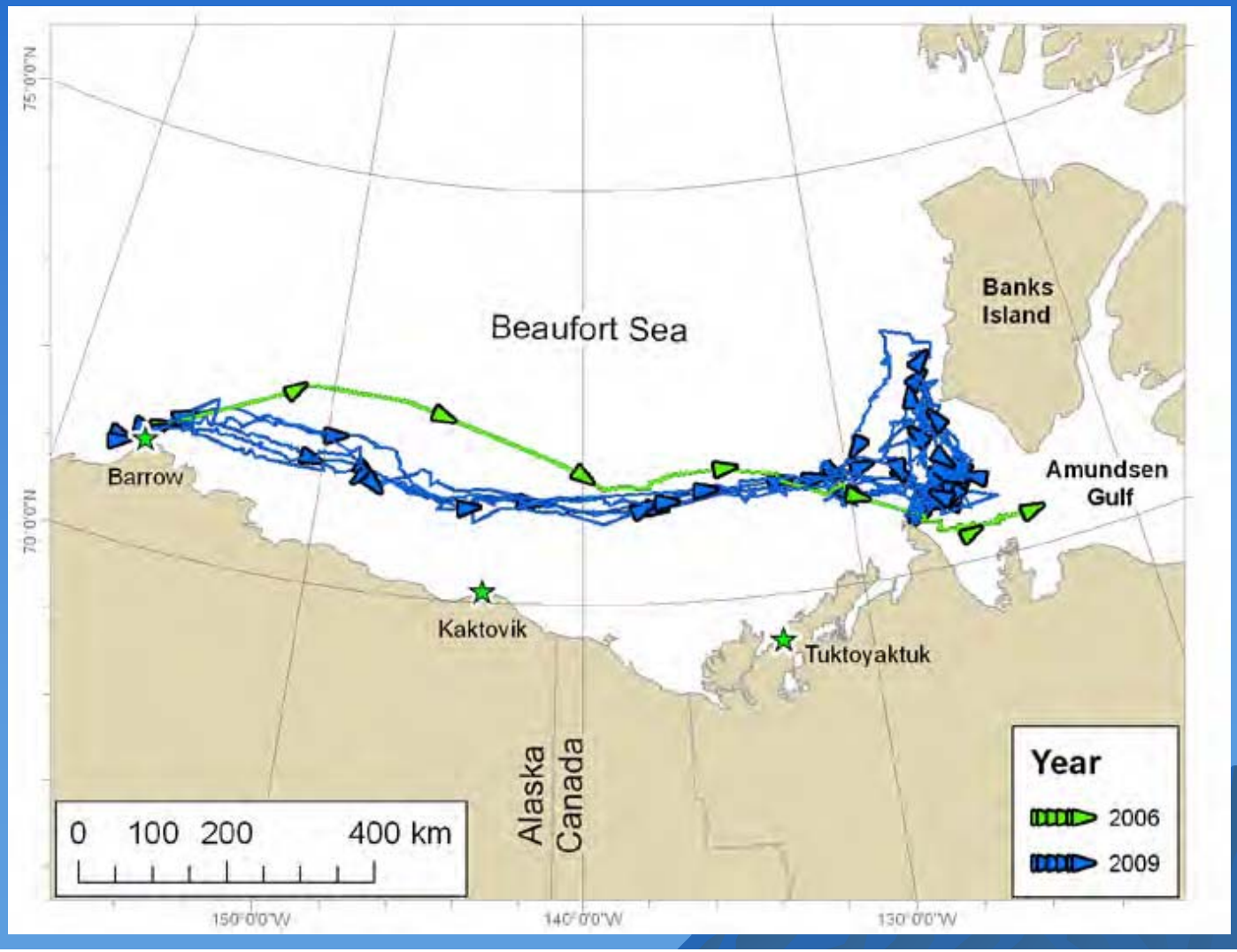
Fall (late August–December) tracks of 19 bowhead whales tagged near Pt. Barrow, Alaska and near the Mackenzie River Delta, Canada between 2006 and 2008



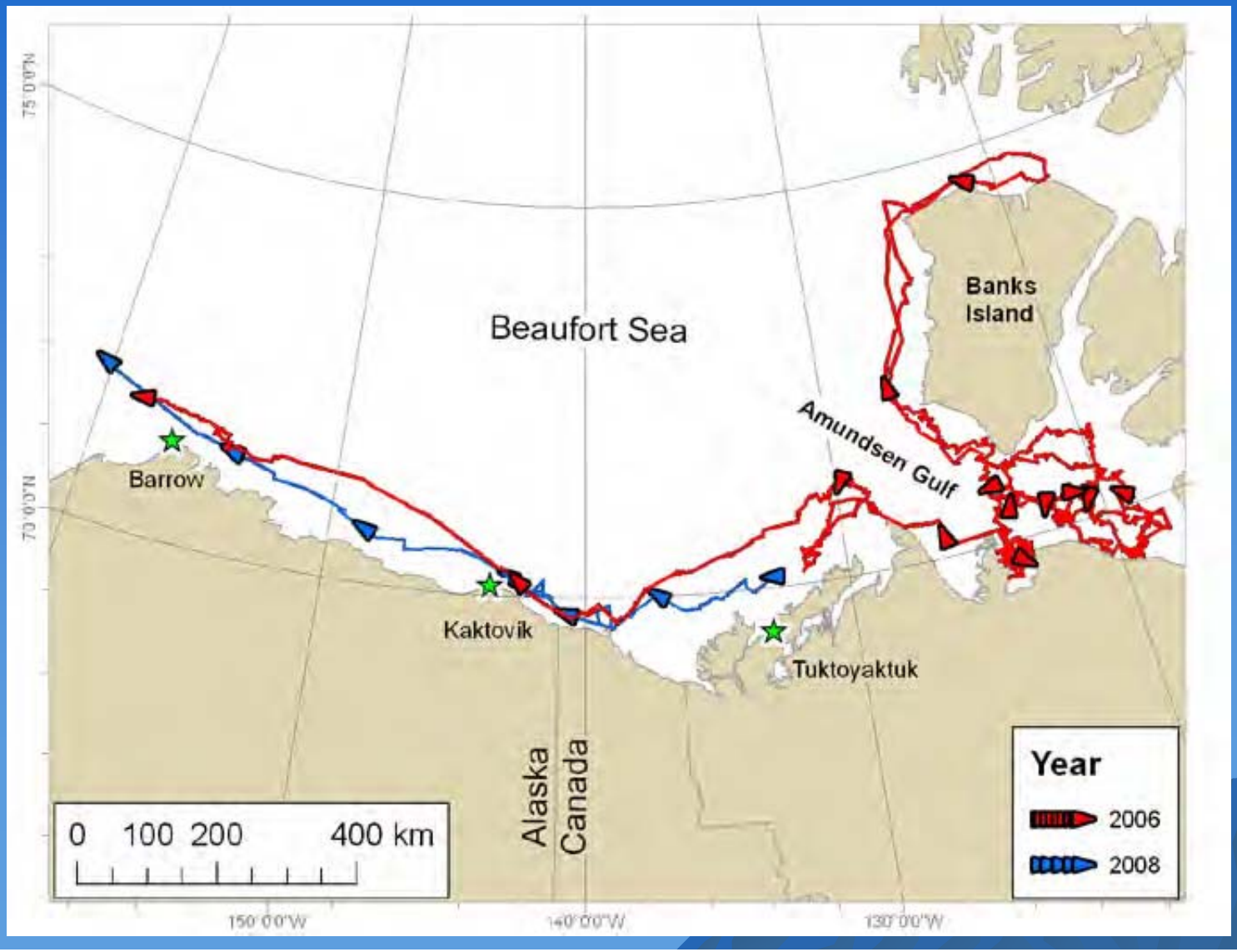
Winter and spring (December 2008– May 2009) tracks of 6 to 14 bowhead whales tagged near Pt. Barrow, Alaska and near the Mackenzie River Delta, Canada in August and September 2008

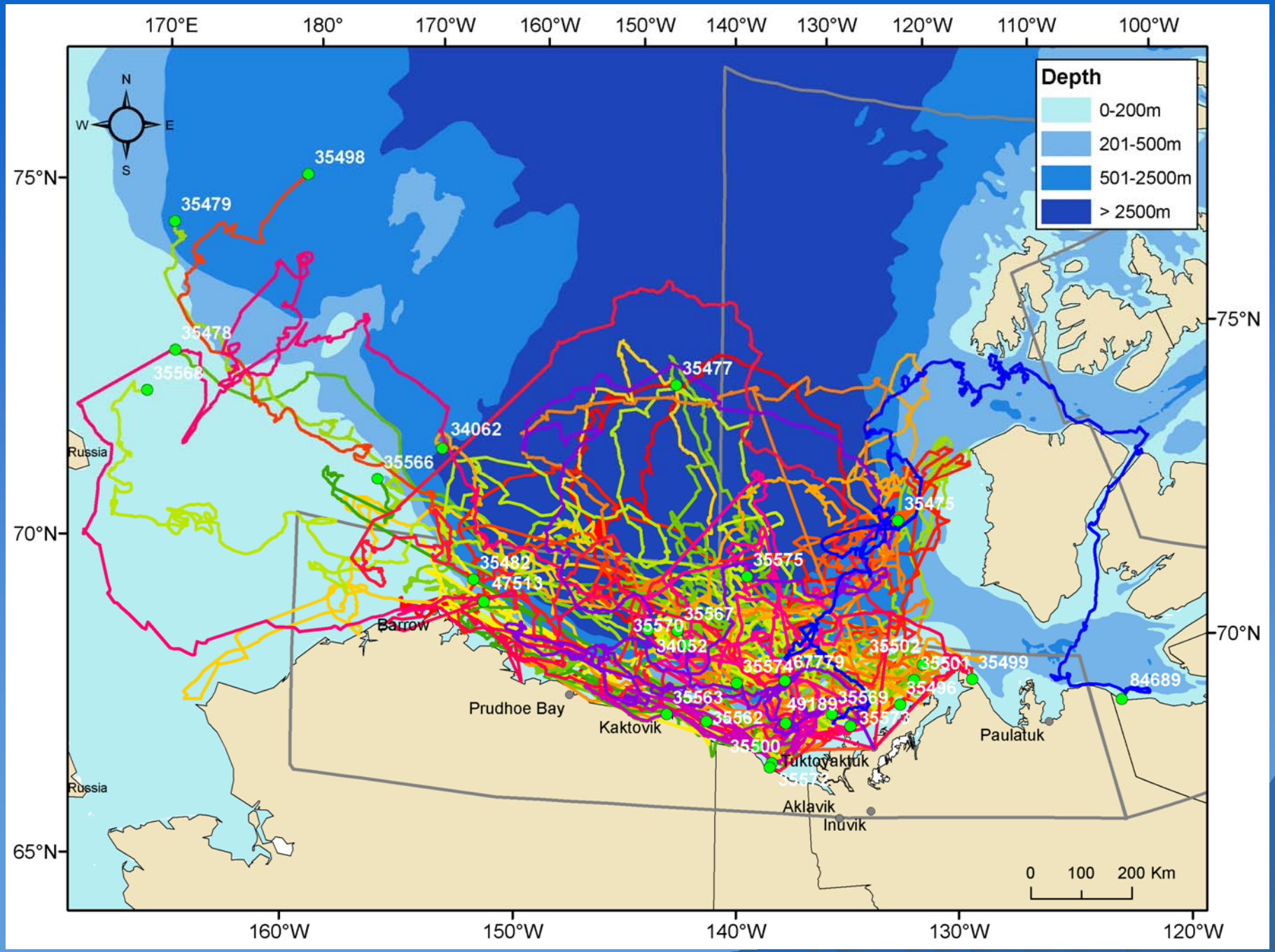


Spring (April–June) tracks of bowhead whales (tagged near Pt. Barrow, Alaska in May 2006 and September 2008 and near the Mackenzie River Delta, Canada in August 2008) from Barrow to Amundsen Gulf in the Alaskan and Canadian Beaufort Sea



Summer and fall (June – October) tracks of a bowhead whale tagged near Barrow, Alaska in 2006 (red) and one tagged near Tuktoyaktuk, Canada in 2008 (blue)




Depth
0-200m
201-500m
501-2500m
> 2500m
N
W
E
S
170°E
180°
170°W
160°W
150°W
140°W
130°W
120°W
110°W
100°W
75°N
70°N
65°N
35498
35479
35478
35568
35477
34062
35566
35475
35482
47513
35575
35567
35570
34052
35502
35574
67779
35501
35499
84689
35496
35563
49189
35569
35562
35500
Barrow
Prudhoe Bay
Kaktovik
Tuktoyaktuk
Paulatuk
Aklavik
Inuvik
Russia
Russia
0
100
200 Km

BOEM is committed to the protection of the marine environment and all that dwell there.