Determining Migratory Connectivity for Semipalmated Sandpipers

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Coauthors

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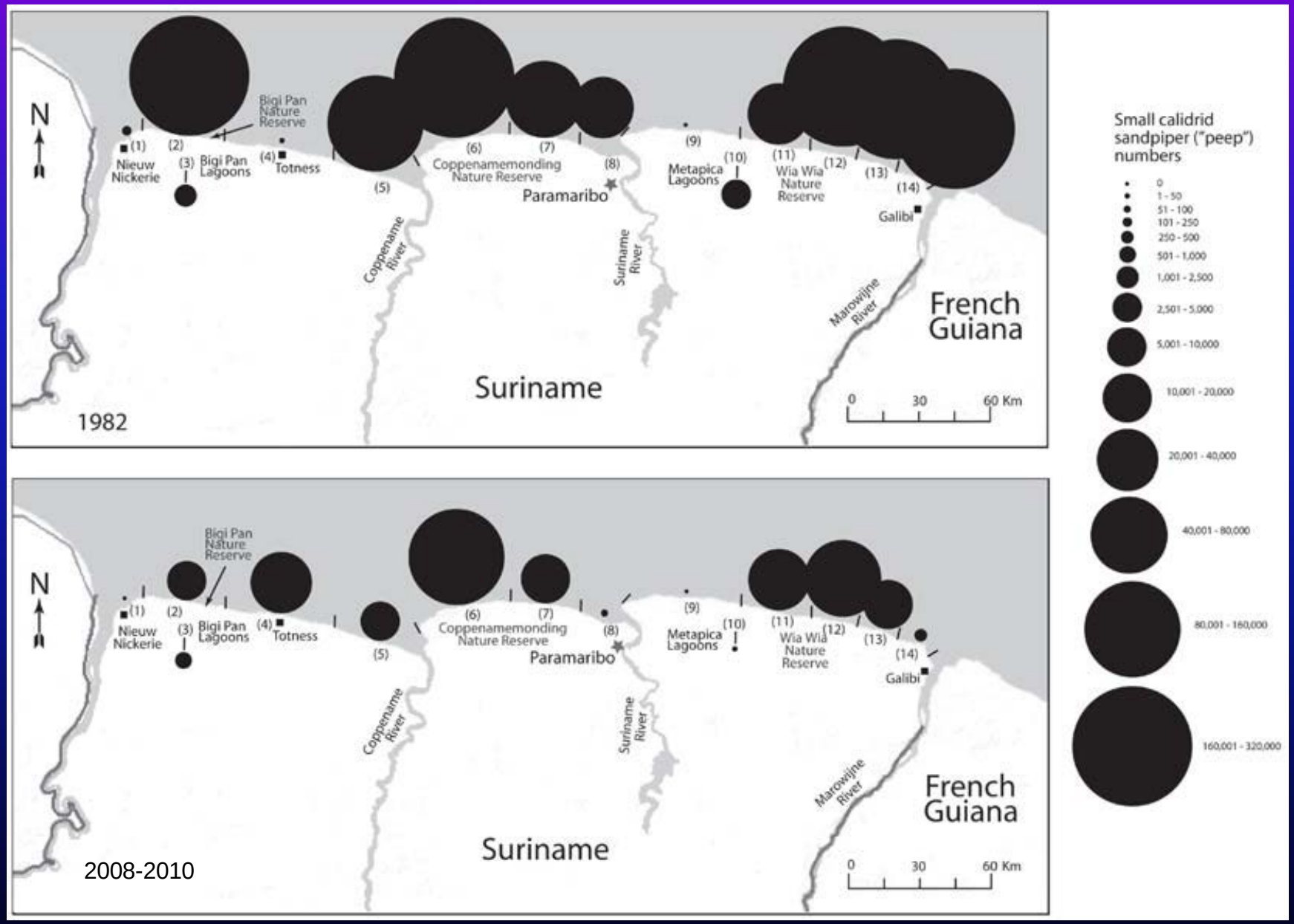
Population Status

- Signs of population decline were noticed in results from the International Shorebird Survey, eastern declines were worse
- Large declines in the core wintering range, northern coasts of South America

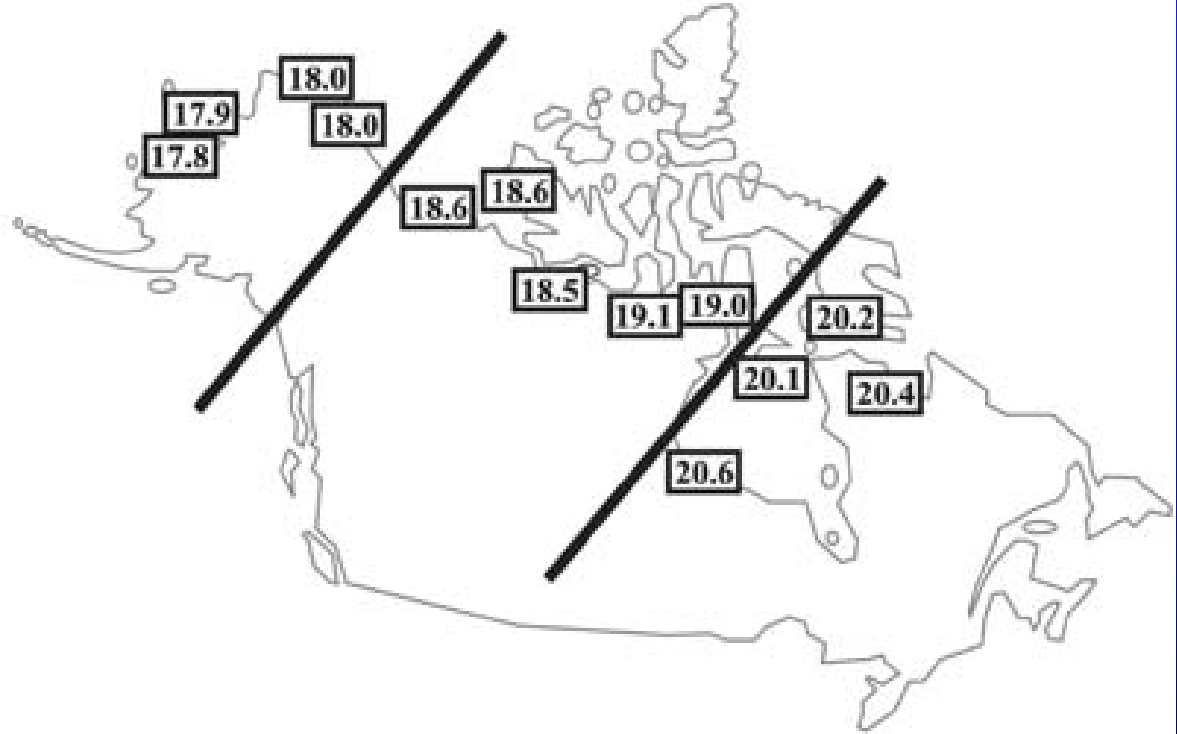
Population Estimates

- Morrison et al. 2006: ~2 million
- Arctic PRISM, Bart and Johnston 2012: ~2.2 million (with large parts of range not yet surveyed)
- 64% in AK, 36% in Canada
- Actual population likely much higher because of unsurveyed areas



Morrison et al 2012. Waterbirds. Survey data show 80% decline since 1982. Same picture in French Guiana, and in Guyana.

Bill lengths vary across the North American Arctic. Data from the Bay of Fundy suggest declines were most prominent in the eastern arctic



Gratto-Trevor et al. 2012. Waterbirds

Results from Band Resightings

"Western Arctic breeders appear to winter farther west in South America than eastern breeders, although there is considerable mixing among populations…"

Gratto-Trevor et al. 2012, Waterbirds

Major Questions

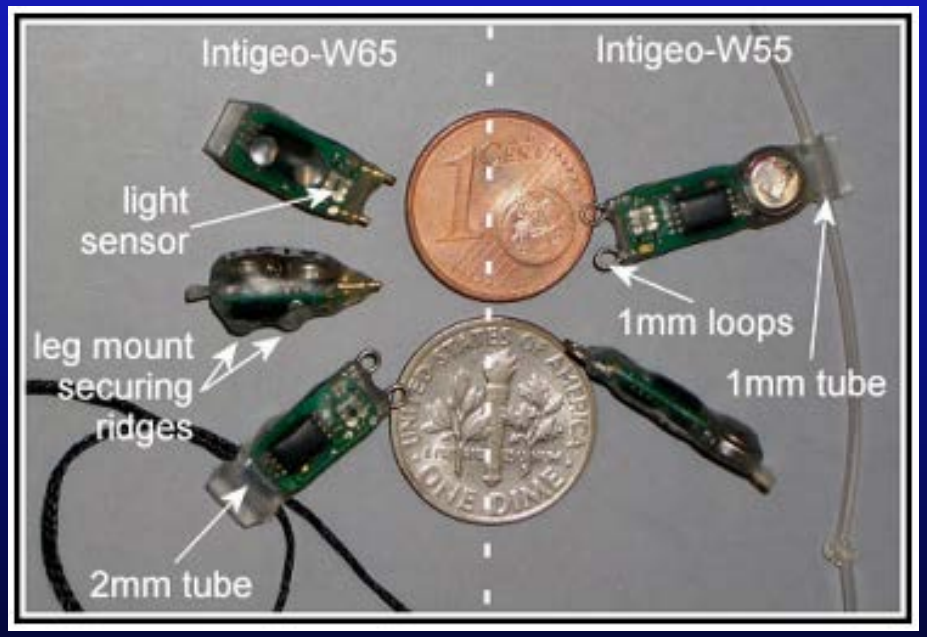
- What routes, stopover sites, and wintering sites are critical for maintaining the population?
- Is the decline rangewide, or are western arctic breeders stable while eastern arctic populations are declining?
- Important implications for conservation strategy

Arctic Shorebird
Demographics Network
Field Sites
Lower Khatanga River
Chaun River
Delta
Cape
Krusenstern
Nome
Barrow
Ikpikpuk River
Colville River
Prudhoe Bay
Canning River
Mackenzie Delta
Bylot Island
Igloolik
East Bay
Coats
Island
Churchill
Burntpoint
Creek

Arctic Demographics Network Focal Species

Light Level Geolocators

Intigeo W65, weighs 0.65 grams
Battery life of up to 1 year
Two fixes per day



migrate technology®

ASDN Sites Participating in SESA Geolocator Project

194 deployed
48 returned
42 recovered

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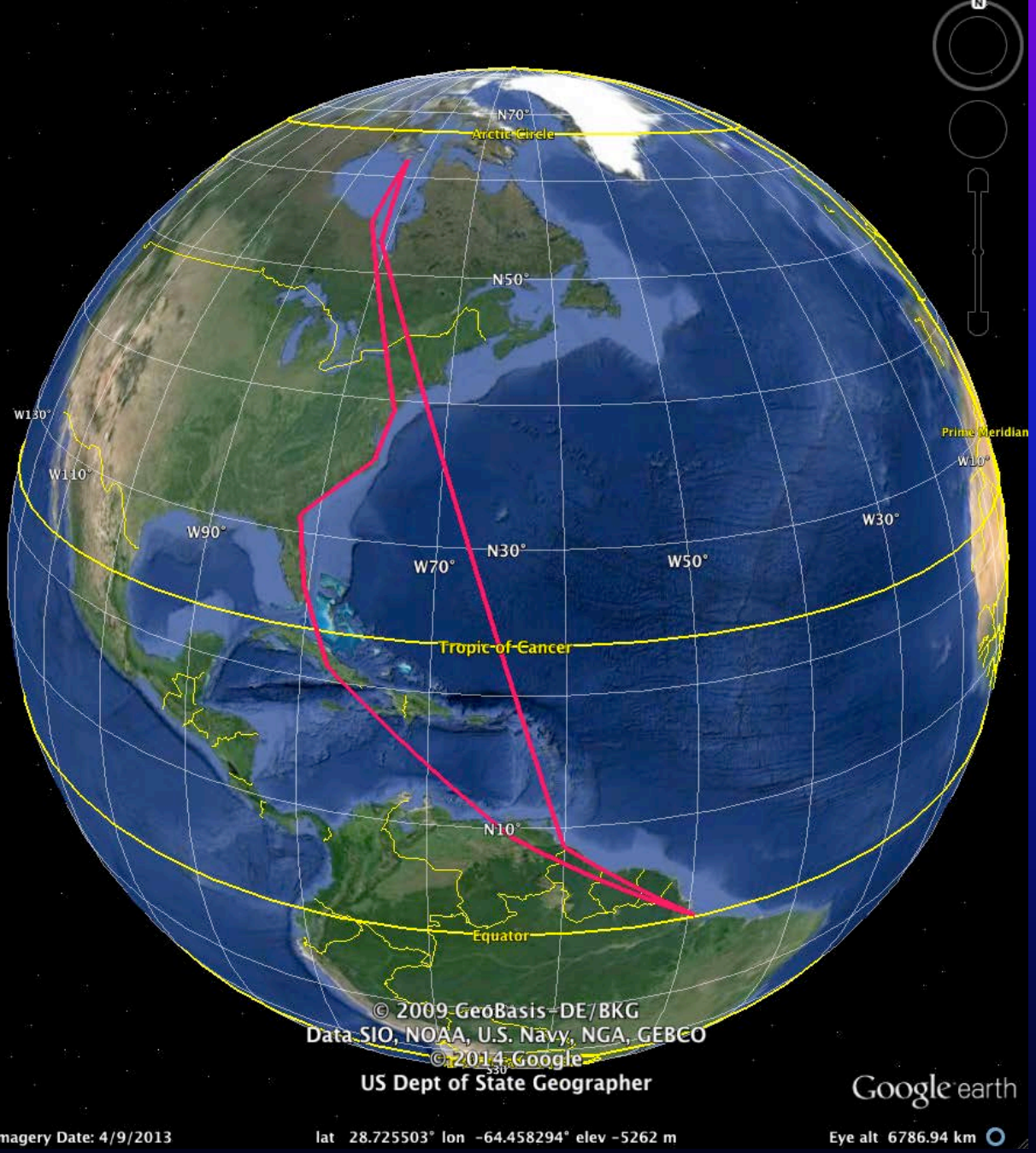
HARD WEAR



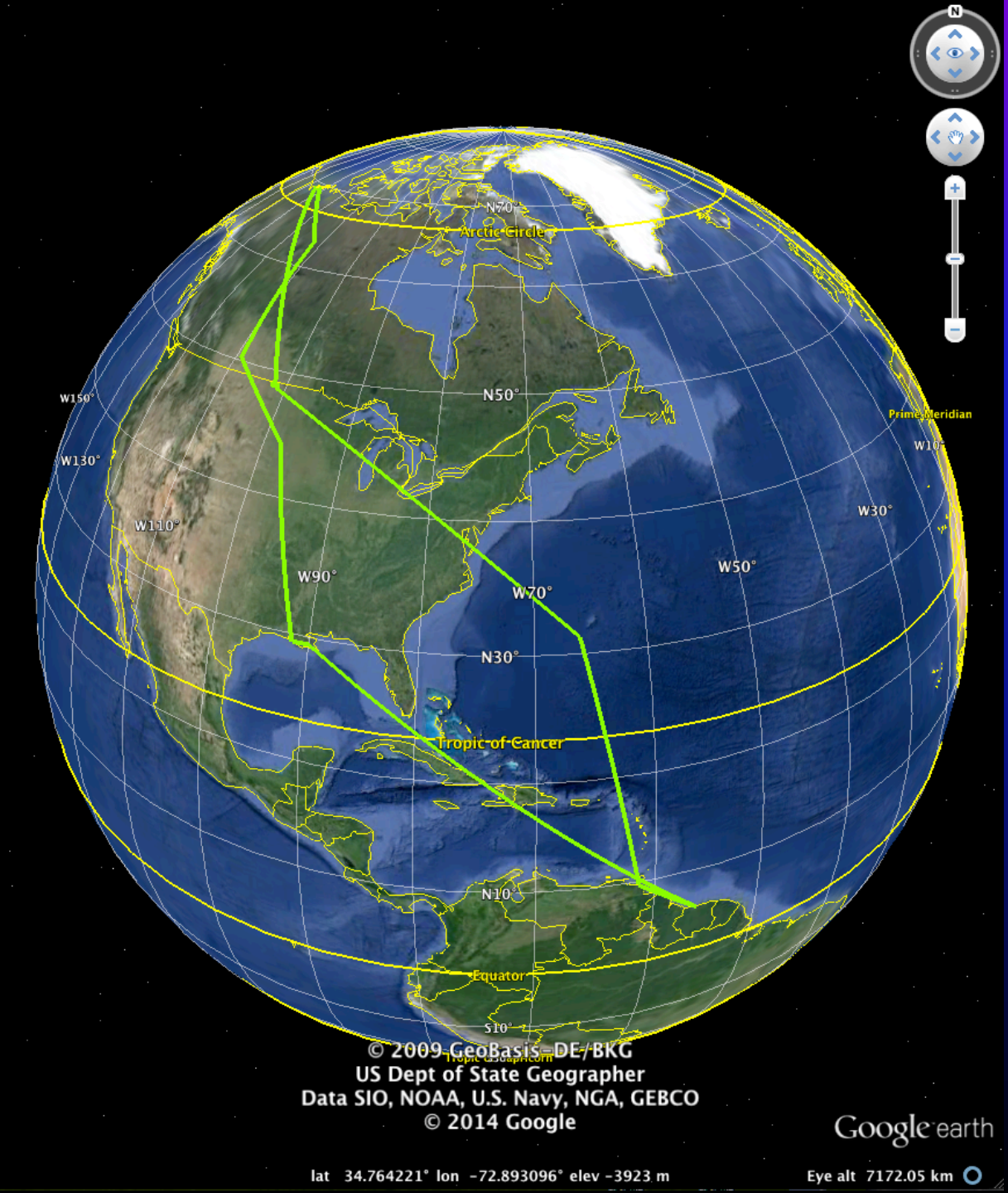
Coats Island, Nunavut

Staged in James Bay

Nonstop flight 6 days to Orinoco Delta

Wintered in Brazil

Returned up the Atlantic Coast



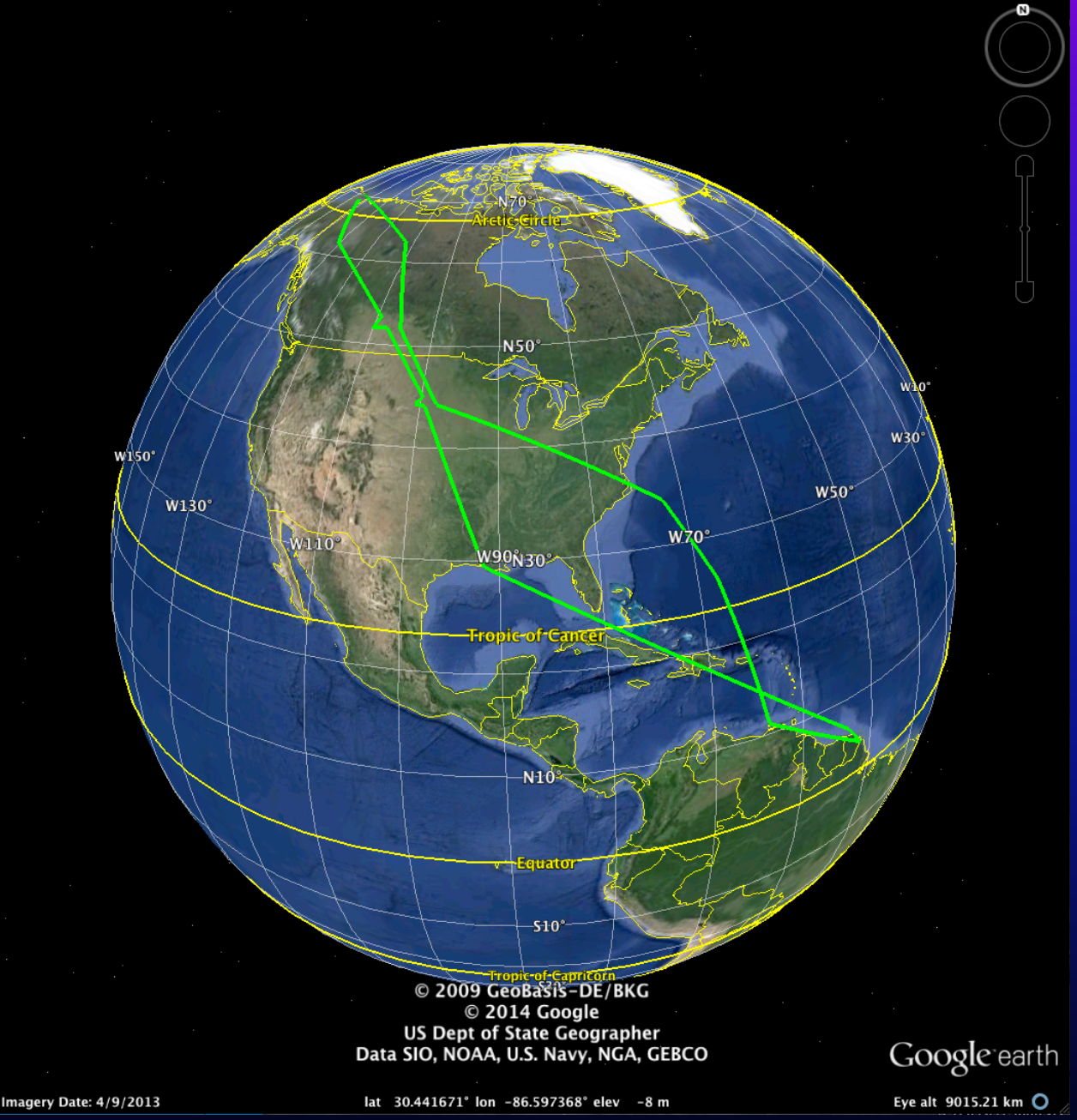
Mackenzie Delta Northwest Territories

Staged in North Dakota

4 day flight to a Leeward Island, one day stopover, then on to Venezuela

Overwintered in Suriname

Northbound staging in Louisiana

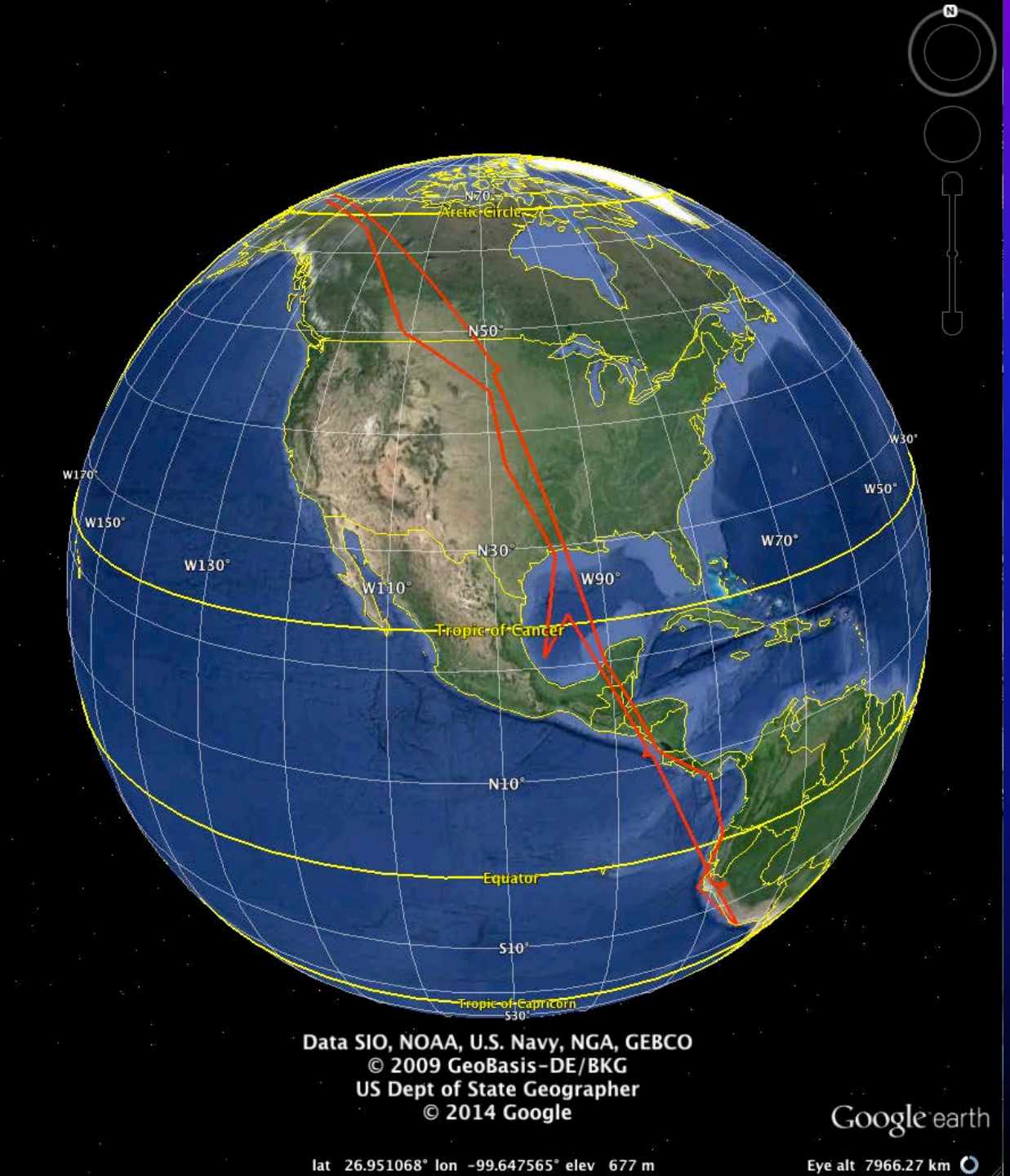


Canning River, Alaska

Interior migration routes, staged in Saskatchewan and South Dakota

But over ocean southbound leg, four day flight to Venezuela

Wintered in French Guiana



Barrow, Alaska

Interior migration route south and northbound

3 day 3000km, flight to stage on the Yucatan

Wintered in Peru, La Libertad, not known as a major wintering site

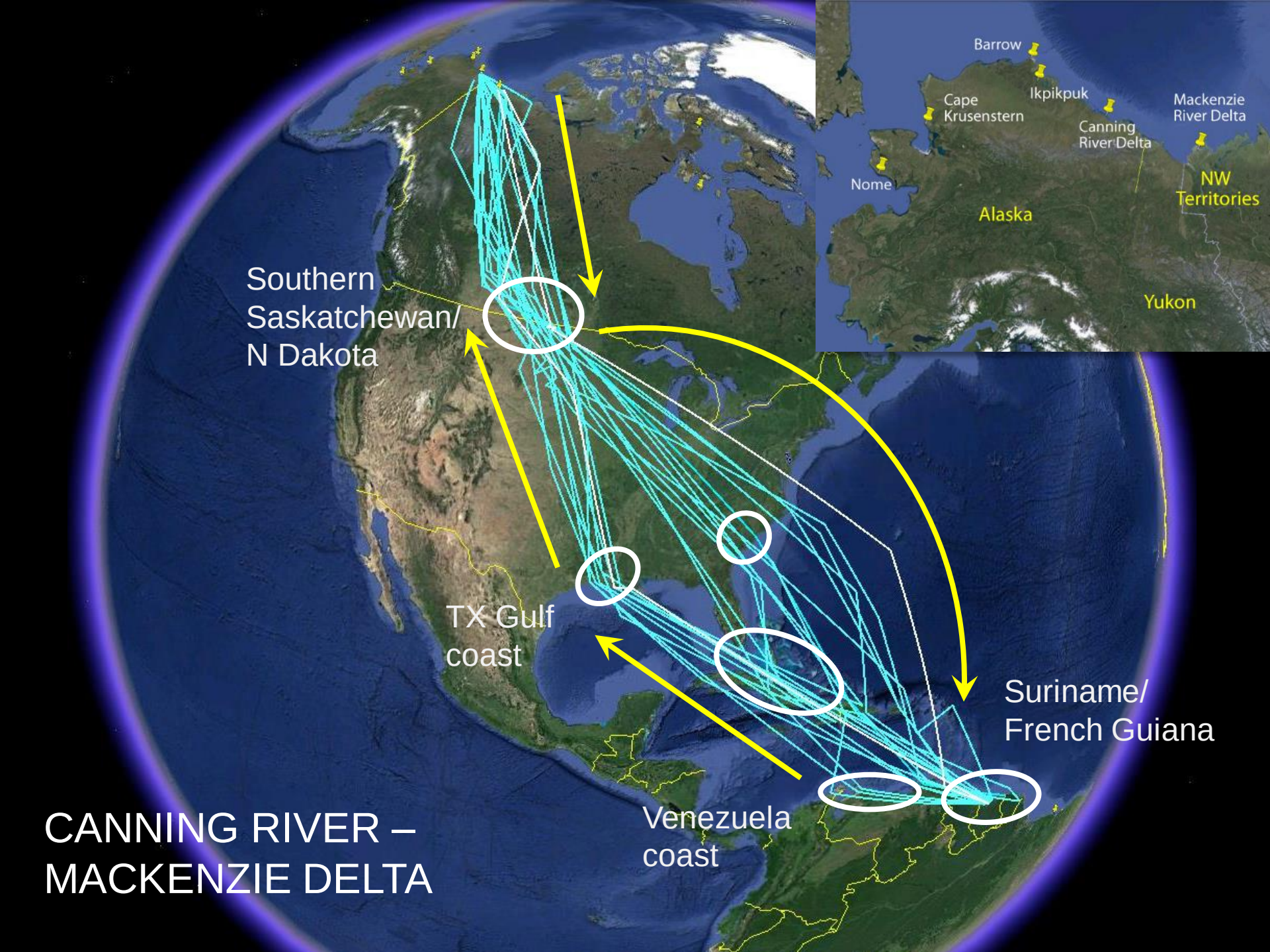
High headwinds crossing Gulf northwards

Nome, Alaska

Interior migration routes, staged in Alberta, Texas Gulf coast

Staged on the Yucatan, then three day flight to Colombia

Wintered in Ecuador at Guayas Estuary, not previously known as an important site



CANNING RIVER – MACKENZIE DELTA

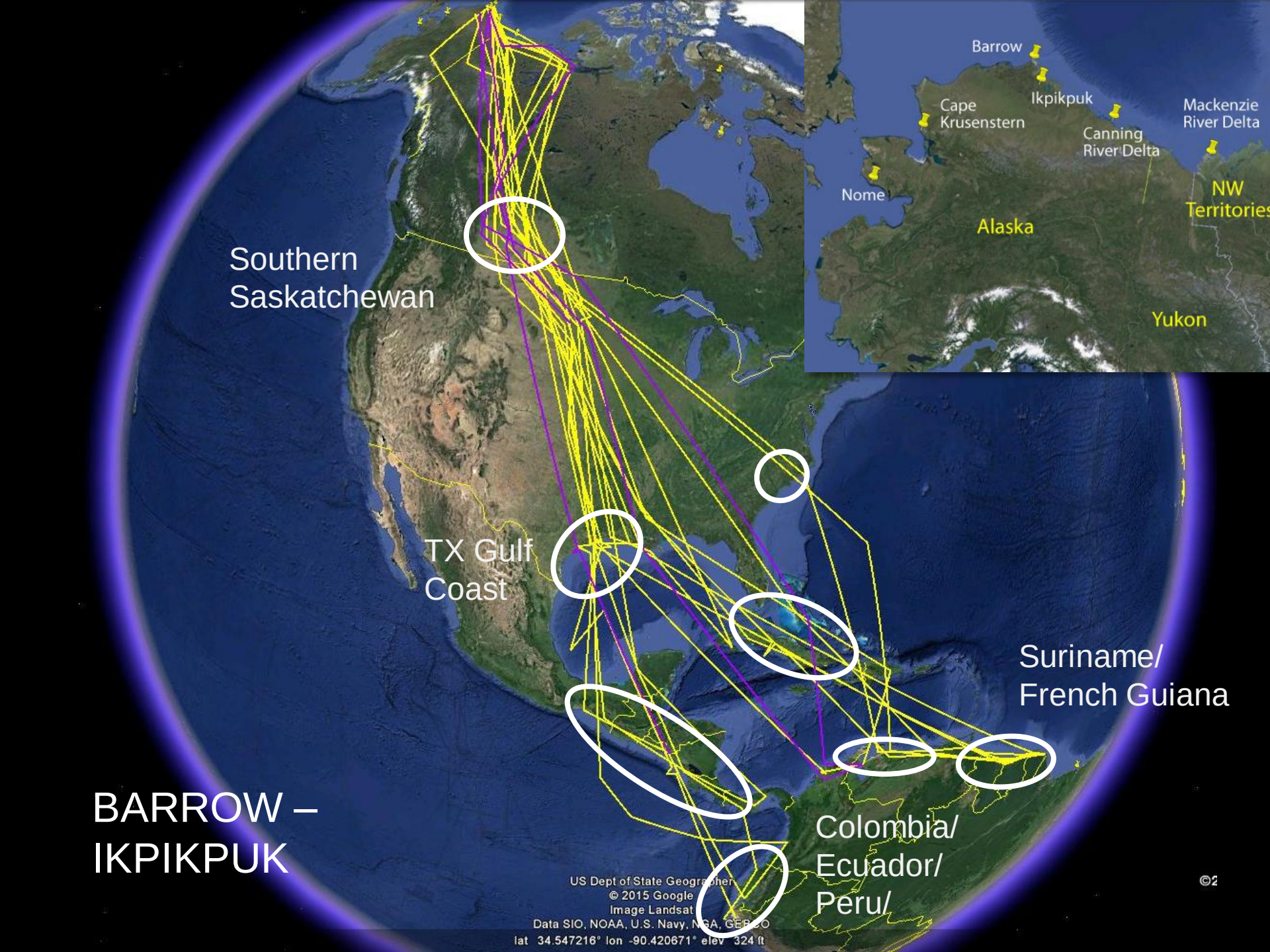

Barrow
Ikpikpuk
Cape Krusenstern
Canning River Delta
Mackenzie River Delta
Nome
Alaska
NW Territories
Yukon
Southern Saskatchewan
TX Gulf Coast
Suriname/ French Guiana
Colombia/ Ecuador/ Peru/
BARROW – IKPIKPUK
US Dept of State Geographer
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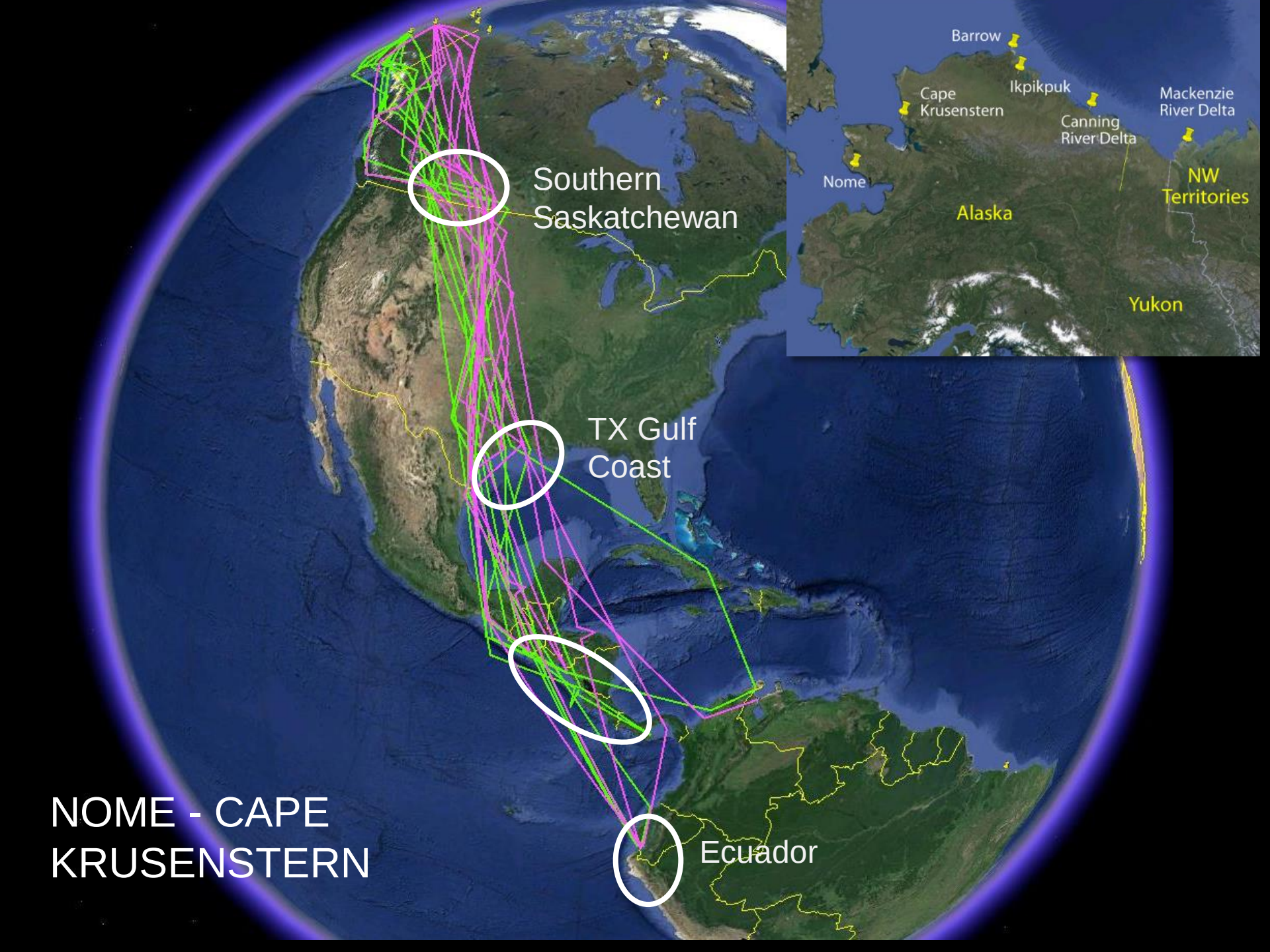
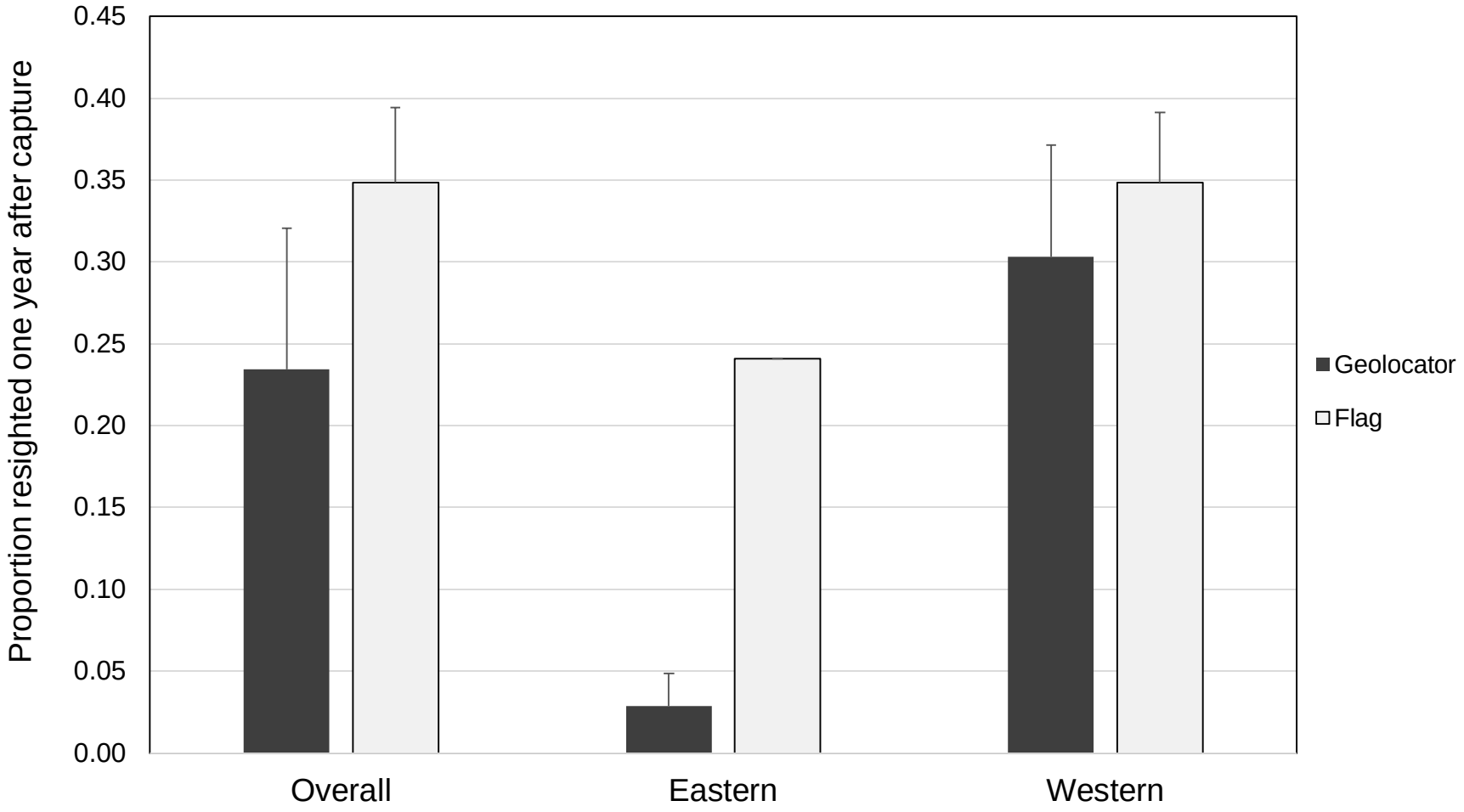
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
lat 34.547216° lon -90.420671° elev 324 ft



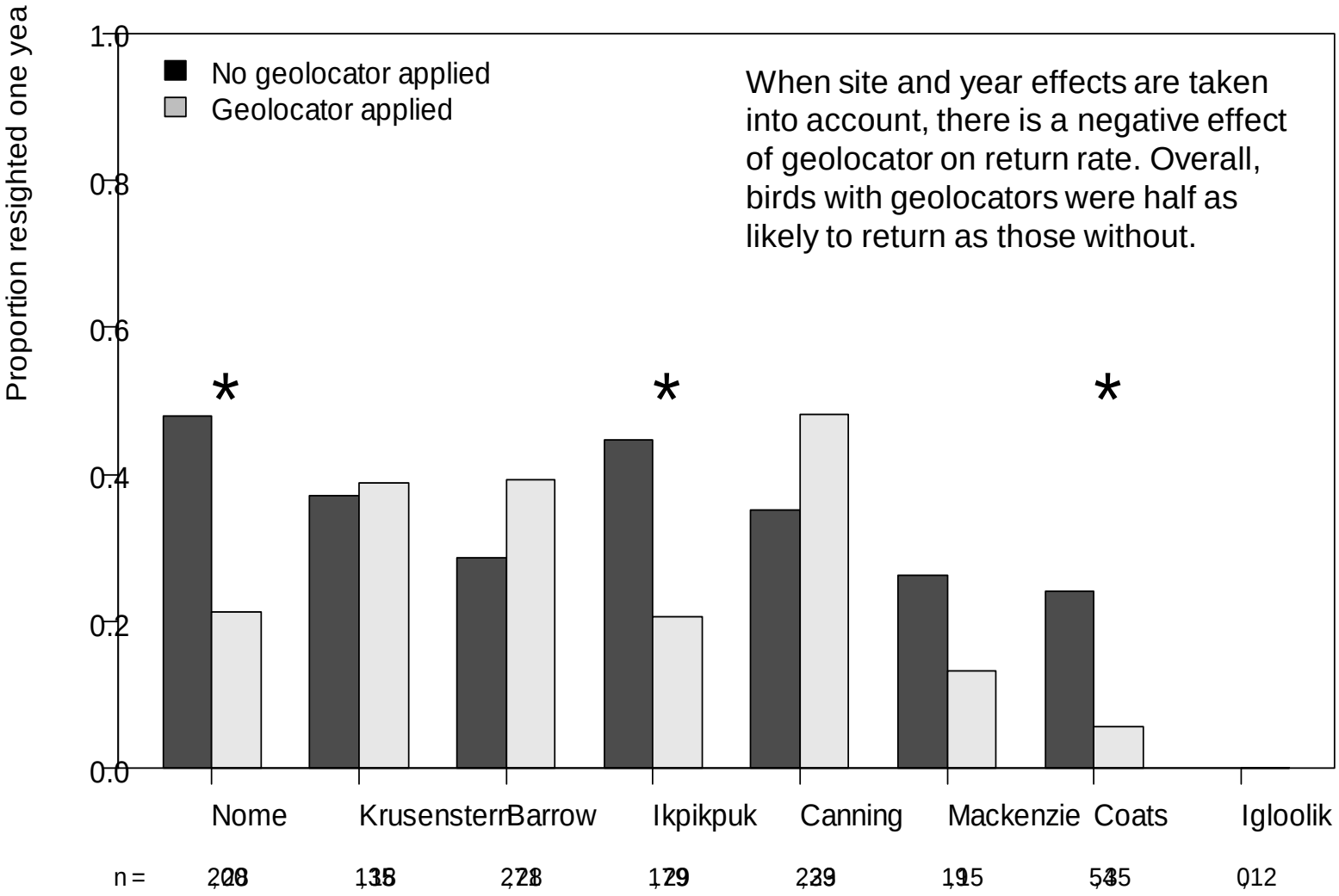
NOME - CAPE KRUSENSTERN

Semipalmated Sandpiper Return Rates



Means and standard errors for return rates for all sites, and for Eastern sites (Coats Island and Igloolik), and Western (all others)

Effects of Geolocators on Resighting Probability



*Fisher's Exact Test, $p < 0.05$; Analysis by Emily Weiser

Conclusions

- Routes used on migration follow east to west pattern and parallel wintering sites
- Migratory connectivity follows patterns identified through banding and morphometric results
- The core wintering areas do not represent all of the wintering population, so declines are likely focused in the eastern population
- Western arctic birds winter in other sites, not previously understood to be important

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Acknowledgments

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Ian Davies

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Problems on the wintering grounds?

Suriname

- 10s of thousands of shorebirds are killed annually by hunters
- Hunting in Suriname is illegal

Magnitude of problem in other countries unclear but apparent in Guyana, French Guiana and Brazil

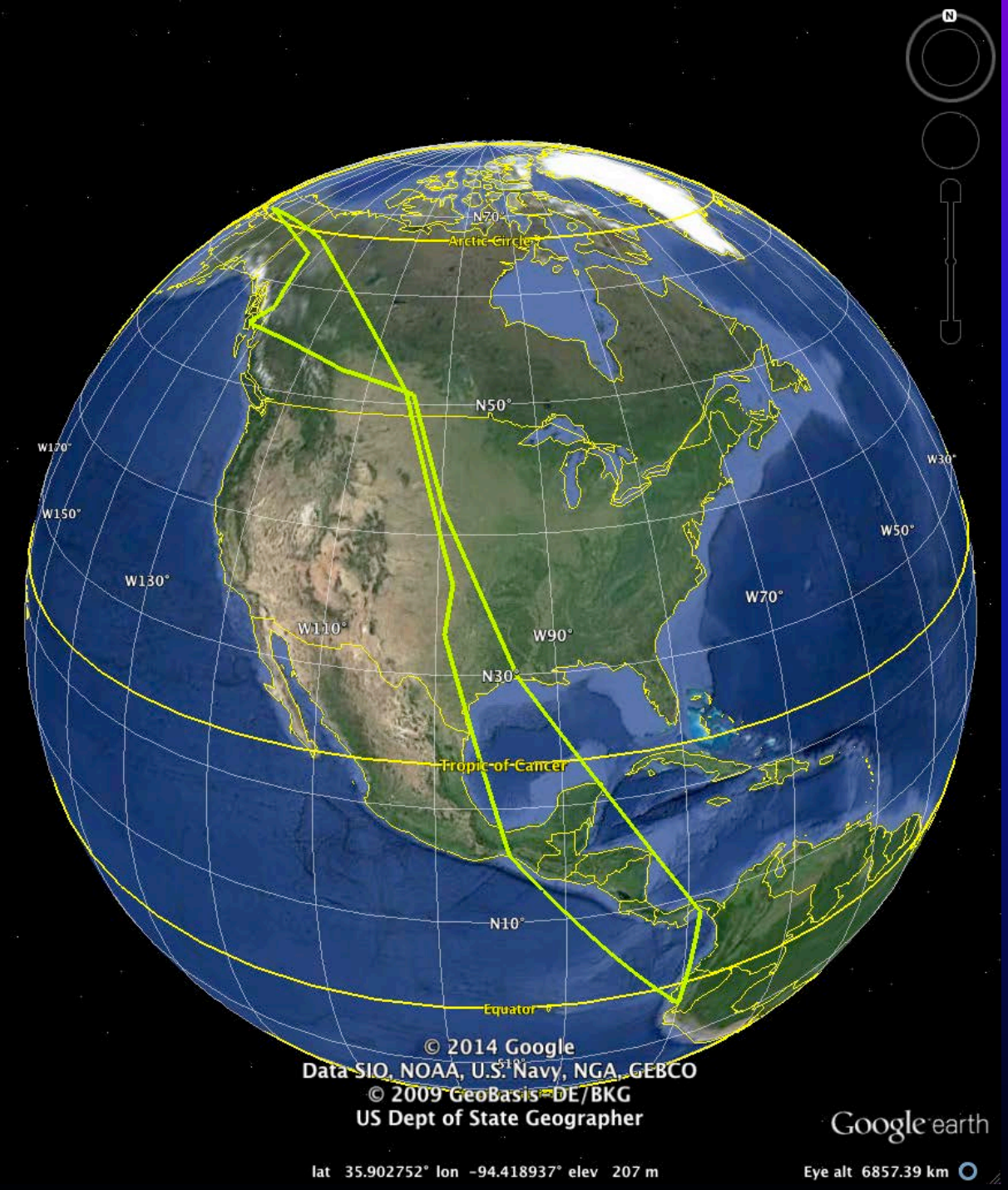
Small steps to change

- Patrols to curtail illegal hunting in Suriname are increasing with support from USFWS, NFWF, and Disney Worldwide Conservation Fund through grants to New Jersey Audubon Society
- Arrests of poachers are increasing
- Overall awareness about importance of South America's northern coast to migratory shorebirds on the rise
- New shorebird conservation action plan developed in Brazil

NEW JERSEY AUDUBON
www.njaudubon.org

Time of twilight gives longitude
Time from dawn to dusk gives latitude

GORE-TEX

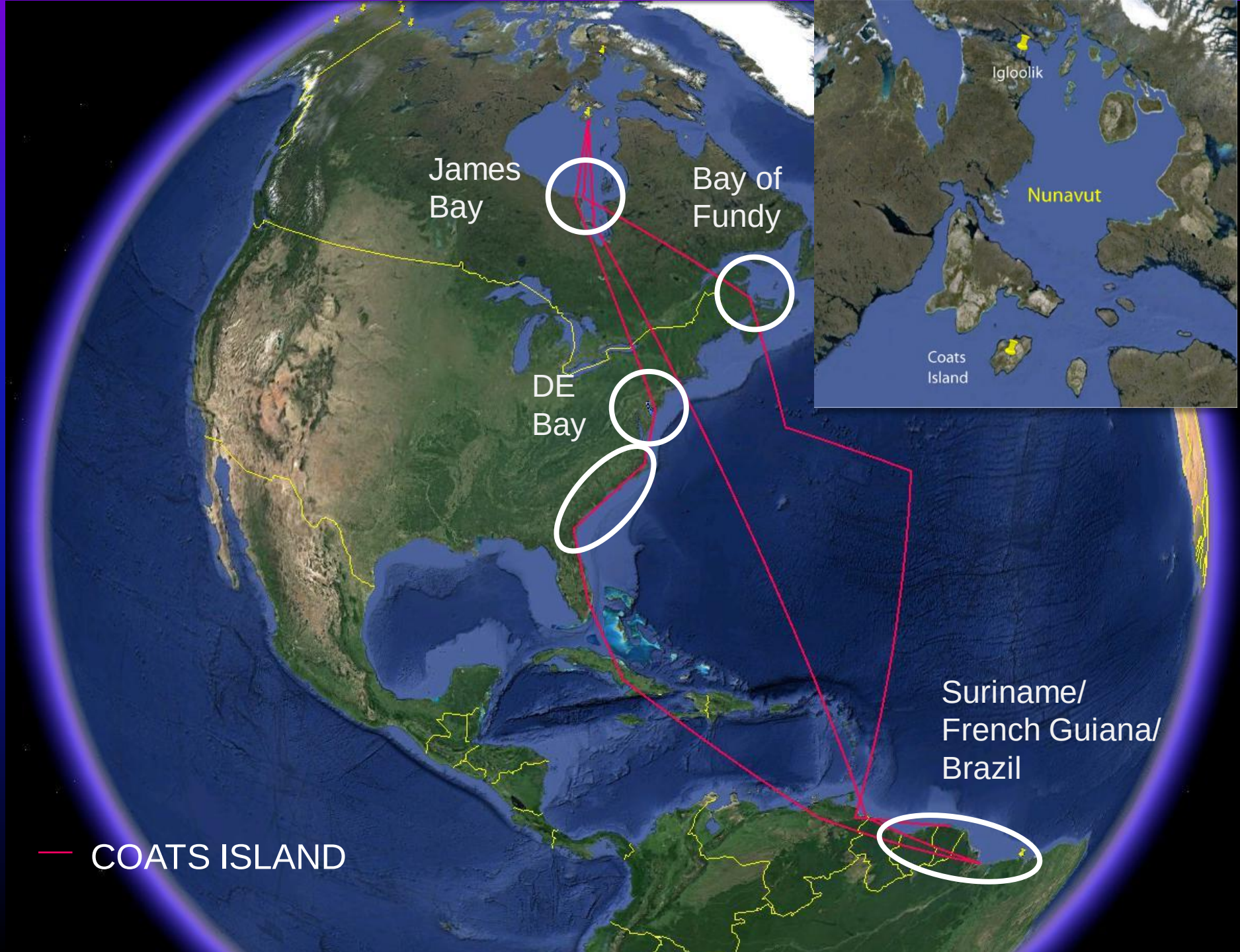


Cape Krusenstern, Alaska

Also interior migration routes, but short stopovers, staged in LA

Two day flight to Panama

Wintered in Ecuador at the Guyas estuary, not previously a known important area


James Bay
Bay of Fundy
DE Bay
Suriname/ French Guiana/ Brazil
Igloolik
Nunavut
Coats Island
COATS ISLAND

ALX
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