

# Migratory movements of Red Phalarope in the Beaufort, Chukchi and Bering Seas, and their association with oceanographic conditions

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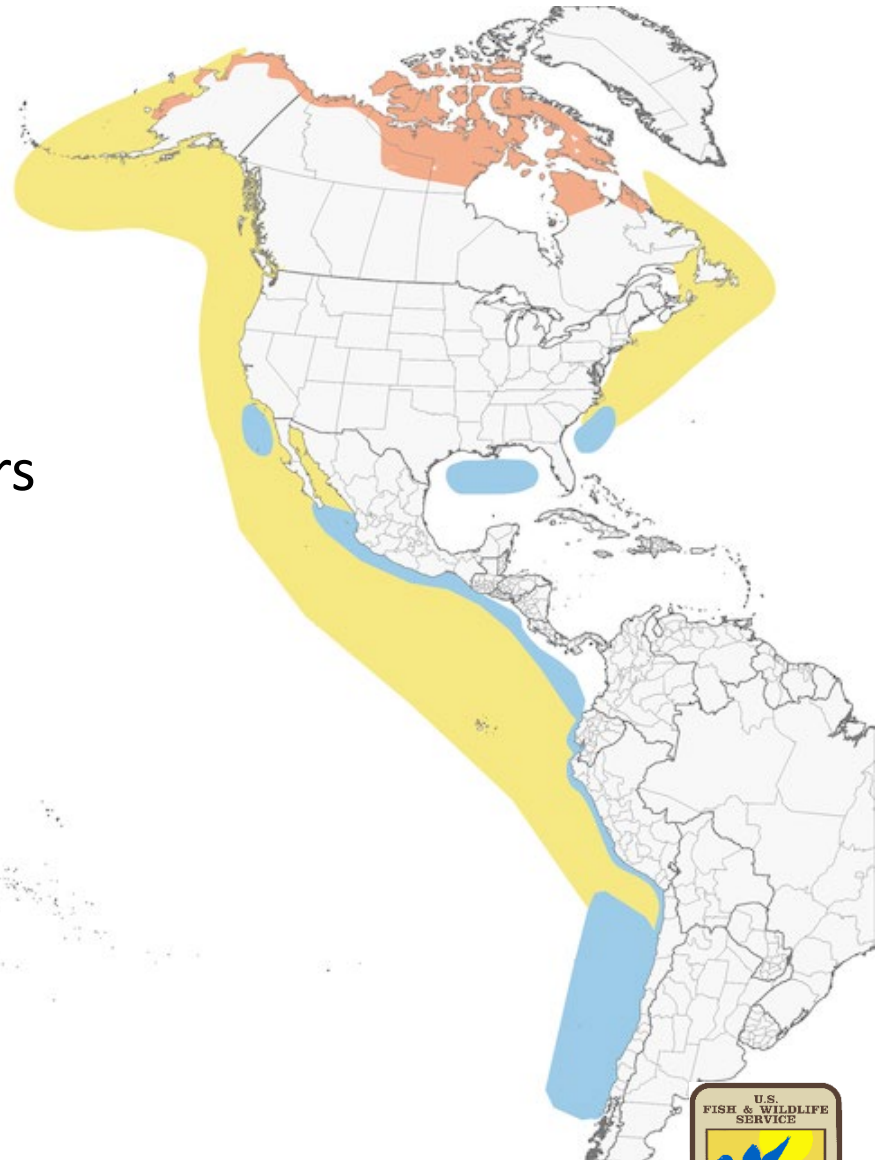


# Background

Breed in Arctic regions of North America and Russia in June / July.

Pelagic migrant to southern waters off the coast of South America (Alaska birds) and Africa (Canada birds)

Listed as “moderate” concern by USSCPP (2016)



# Background

Native community indicating declines occurring

Historic comparisons – Yukon Delta

- Decline from late 19<sup>th</sup>/early 20<sup>th</sup> century to 1946 at St. Michael and Hooper Bay
- Decline from 1924 to 2009-2010 in Hooper Bay region
- Decline in post-breeding flocks on central Delta from 1950 to 1978-1979
- Decline from 1988 to 2010 at Hazen Bay

Declines in other locations in Canada, Gulf of Mexico

Data from BJ McCaffery (unpubl. Data)

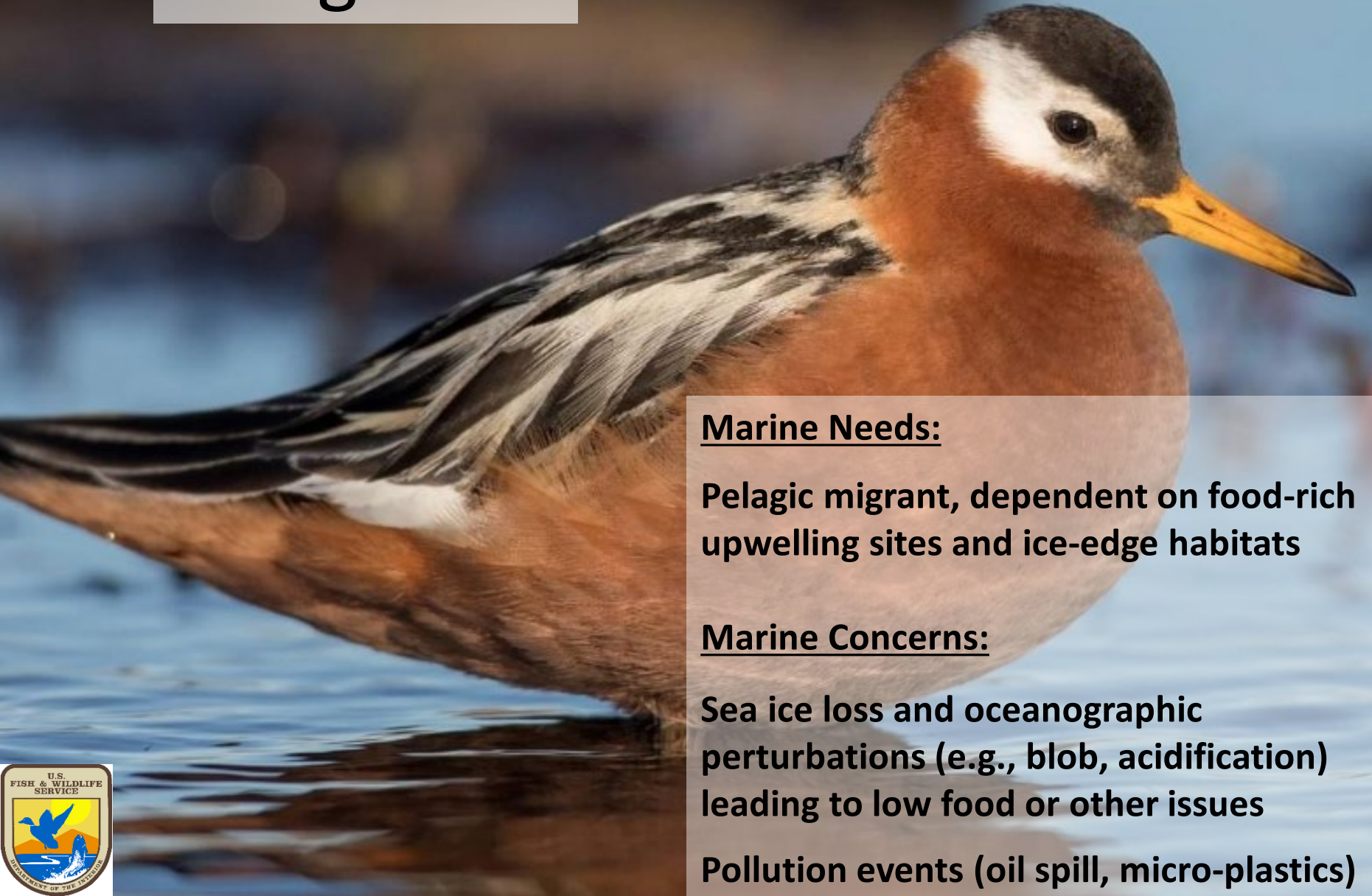




# Search for clues in the marine environment



# Background



## Marine Needs:

**Pelagic migrant, dependent on food-rich upwelling sites and ice-edge habitats**

## Marine Concerns:

**Sea ice loss and oceanographic perturbations (e.g., blob, acidification) leading to low food or other issues**

**Pollution events (oil spill, micro-plastics)**





# Objectives

- *Document migration routes and stopover sites in the Beaufort, Chukchi, and Bering seas*
- *Relate Red Phalarope distributions with oceanographic conditions*
- *Compare distributions from tracking studies with that collected from at-sea surveys from ships of opportunity*





# Methods – Satellite Tracking

92 PTT transmitters deployed from 2017-2020 on breeding grounds in northern Alaska

9 additional PTT transmitters put on birds in northern Canada





# Satellite Transmitter Deployment

Utqiagvik  
40 in 2017  
30 in 2018  
5 in 2019  
10 in 2020

Colville River  
1 in 2019

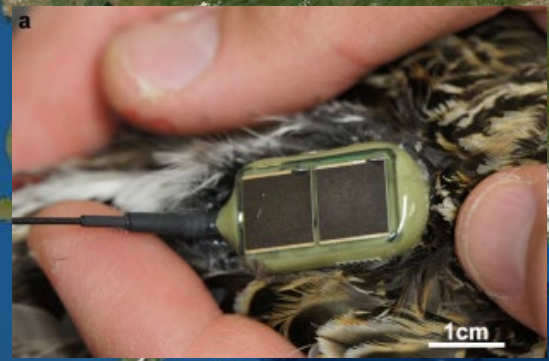
Qupaluk  
3 in 2019

Canning River  
3 in 2019

Cambridge Bay  
1 in 2019

Igloodik  
4 in 2019

East Bay  
4 in 2019

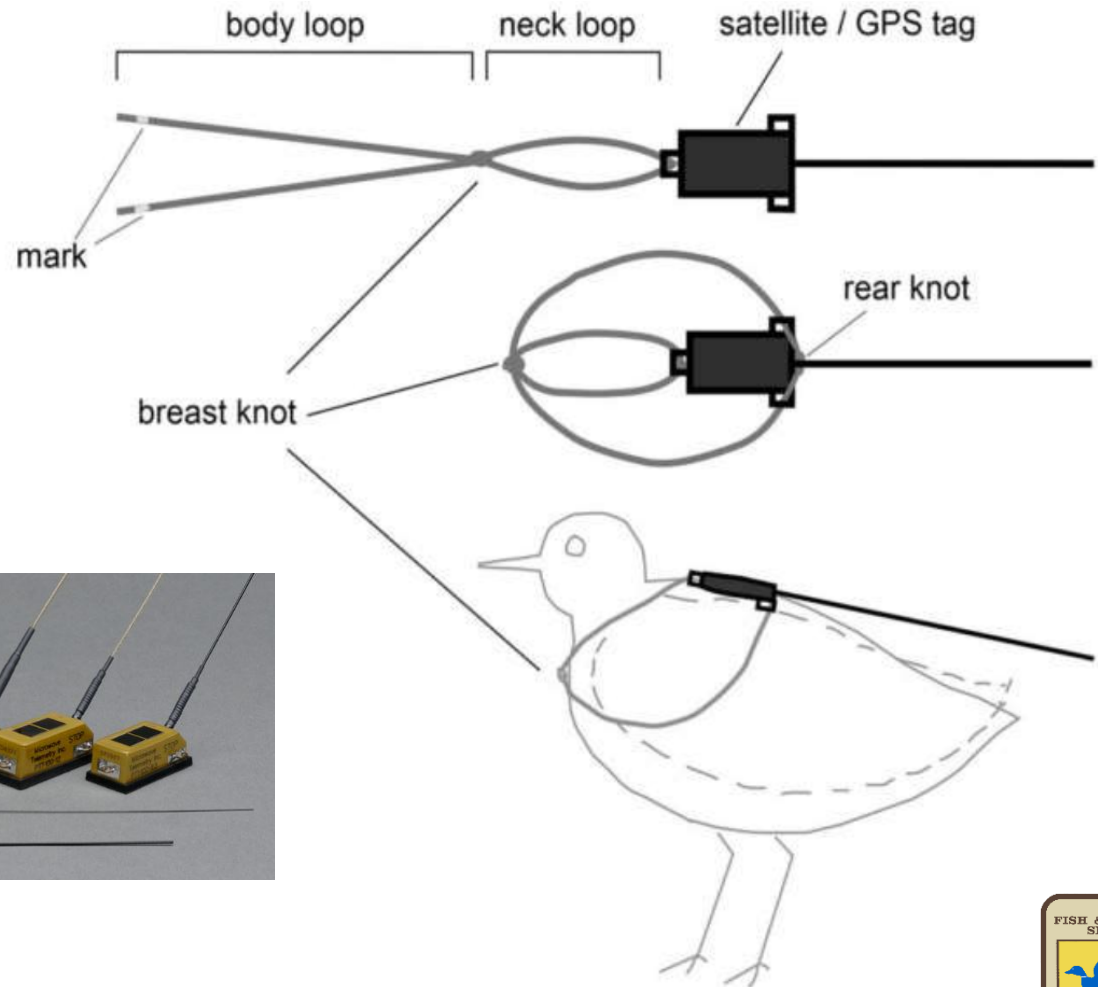


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN, and the GIS User Community



# Methods – Satellite Tracking

2-gram, solar powered transmitters attached with body harness



Microwave Telemetry, Inc.



# Methods – Satellite Tracking

- Data downloaded from Argos satellites provided on average 1,014 locations over 88 days
- Variable accuracy and frequency of transmissions
  - Location mistakes removed with simple speed filter
  - Developed track lines using a correlated random walk fitted movement model that generated predicted locations for each bird every 15 minutes of each day
- ***No photos please! Max Planck Institute for Ornithology has proprietary rights to the 2017 and 2018 data***

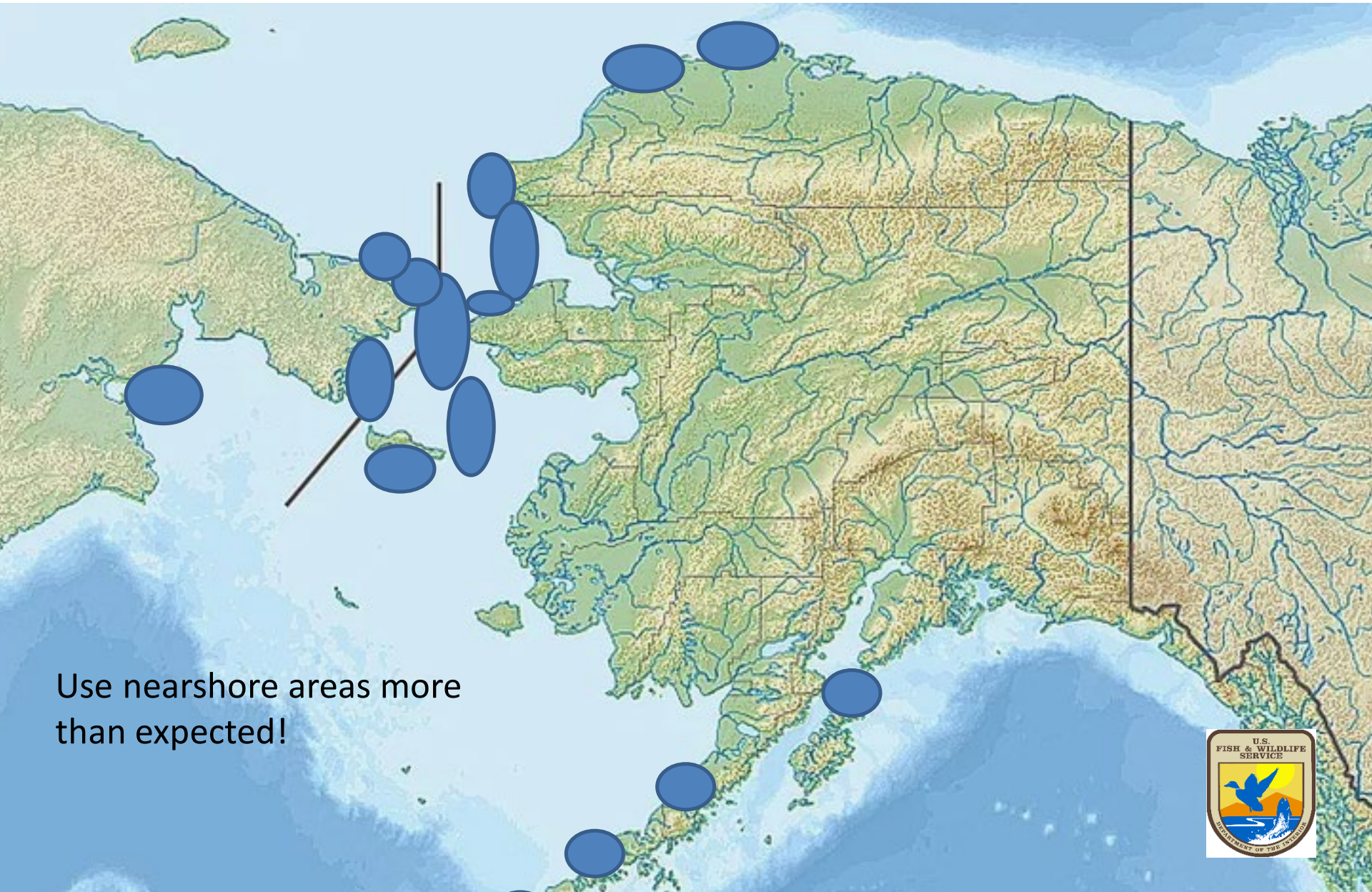




Results removed due to  
proprietary rights



# Red Phalarope Hotspots



Use nearshore areas more than expected!





# Do oceanographic conditions relate to Red Phalarope locations?

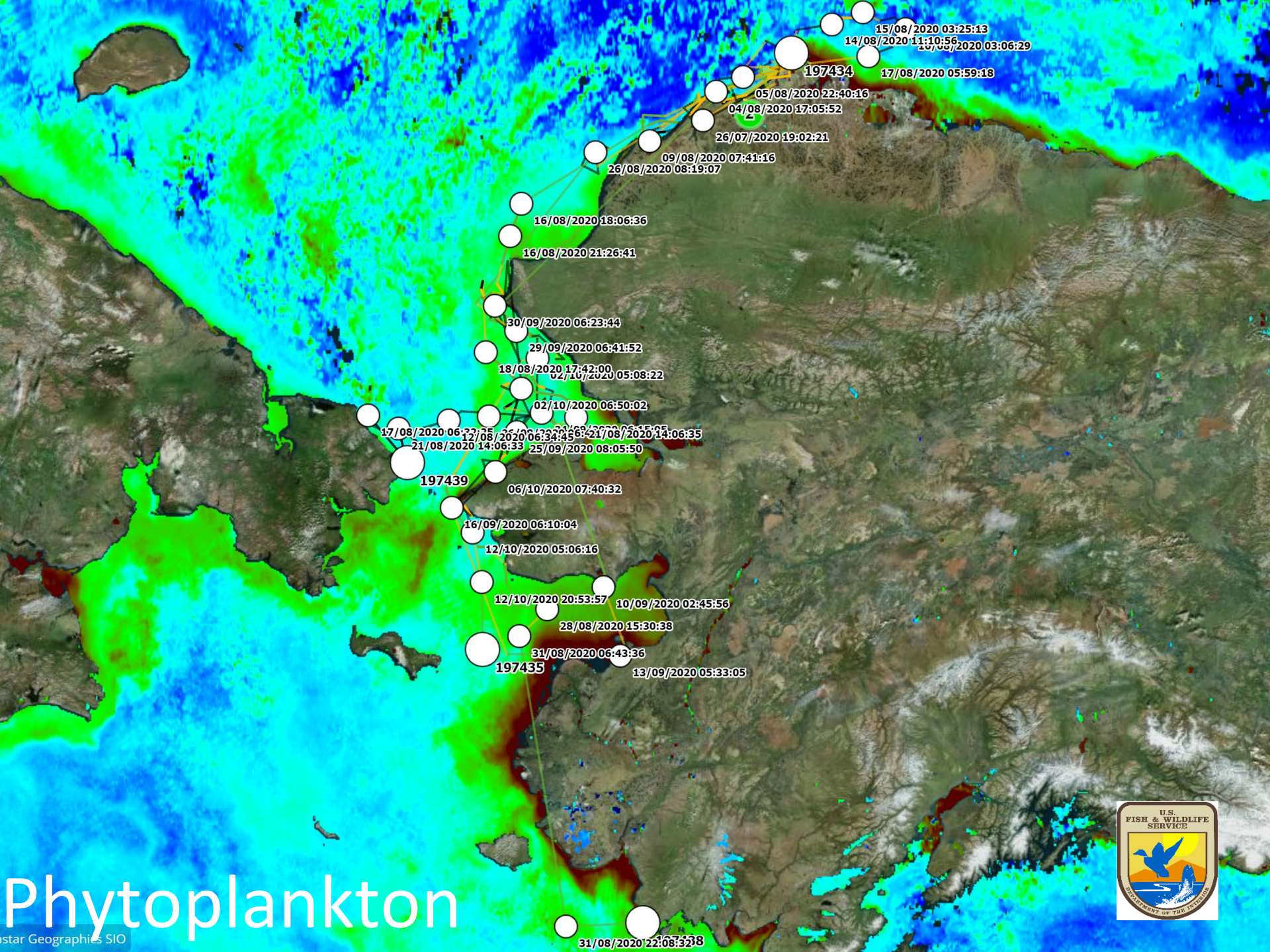


## *Movebank Environmental Data*

- *Phytoplankton availability*
- *Primary productivity*
- *Sea surface temperature*
- *Distance to coast*







- 15/08/2020 03:25:13
- 14/08/2020 11:10:56
- 16/08/2020 03:06:29
- 197434
- 17/08/2020 05:59:18
- 05/08/2020 22:40:16
- 04/08/2020 17:05:52
- 26/07/2020 19:02:21
- 09/08/2020 07:41:16
- 26/08/2020 08:19:07
- 16/08/2020 18:06:36
- 16/08/2020 21:26:41
- 30/09/2020 06:23:44
- 29/09/2020 06:41:52
- 18/08/2020 17:42:00
- 02/10/2020 05:08:22
- 02/10/2020 06:50:02
- 17/08/2020 06:22:35
- 12/08/2020 06:34:45
- 21/08/2020 14:06:33
- 25/09/2020 08:05:50
- 197439
- 06/10/2020 07:40:32
- 16/09/2020 06:10:04
- 12/10/2020 05:06:16
- 12/10/2020 20:53:57
- 10/09/2020 02:45:56
- 28/08/2020 15:30:38
- 31/08/2020 06:43:36
- 197435
- 13/09/2020 05:33:05
- 31/08/2020 22:08:32
- 16/08/2020 18:06:36
- 197438

# Phytoplankton





# Acknowledgements



Many, many field technicians that tagged birds

Funding and logistic support from many organizations



Questions?

