

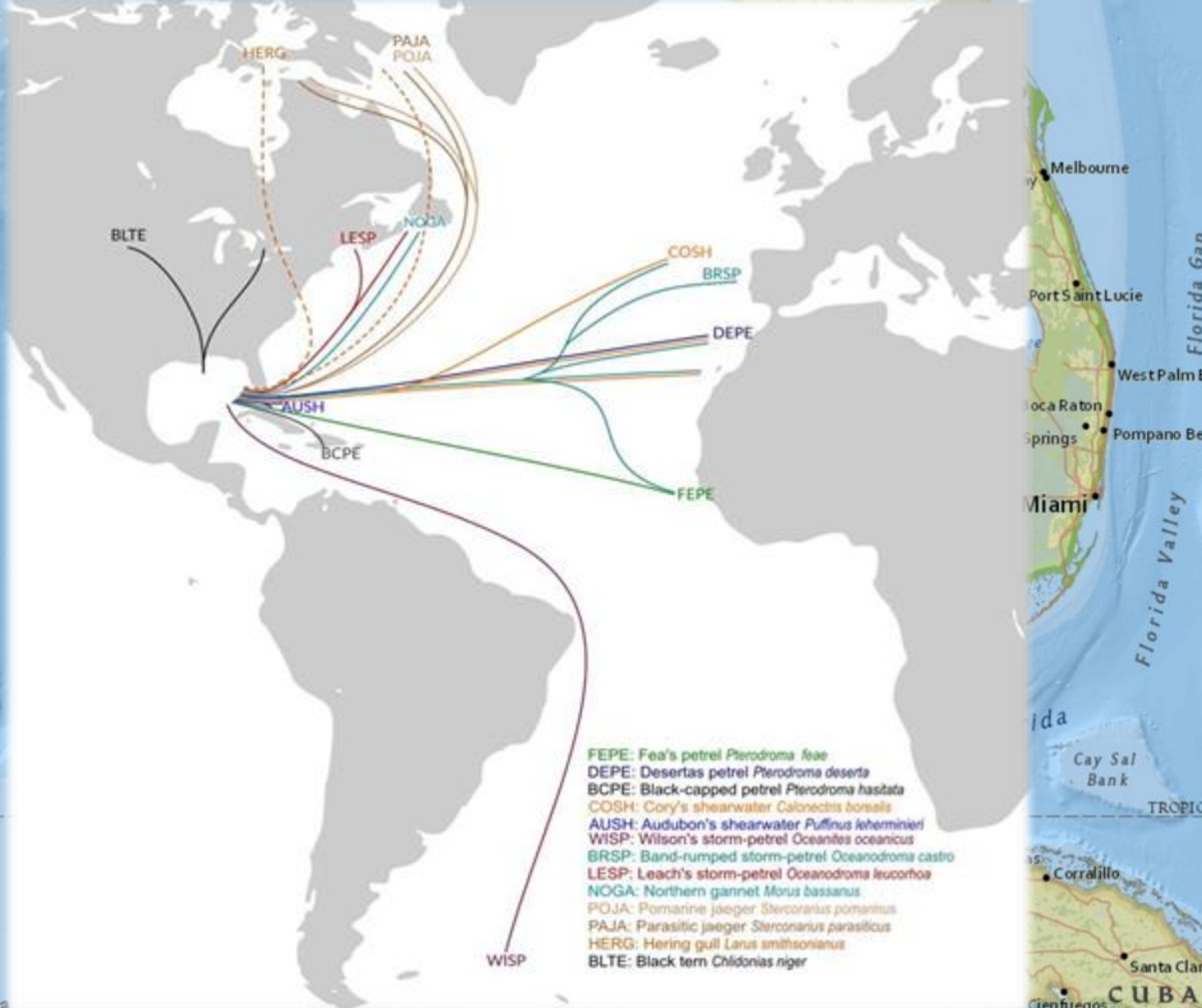
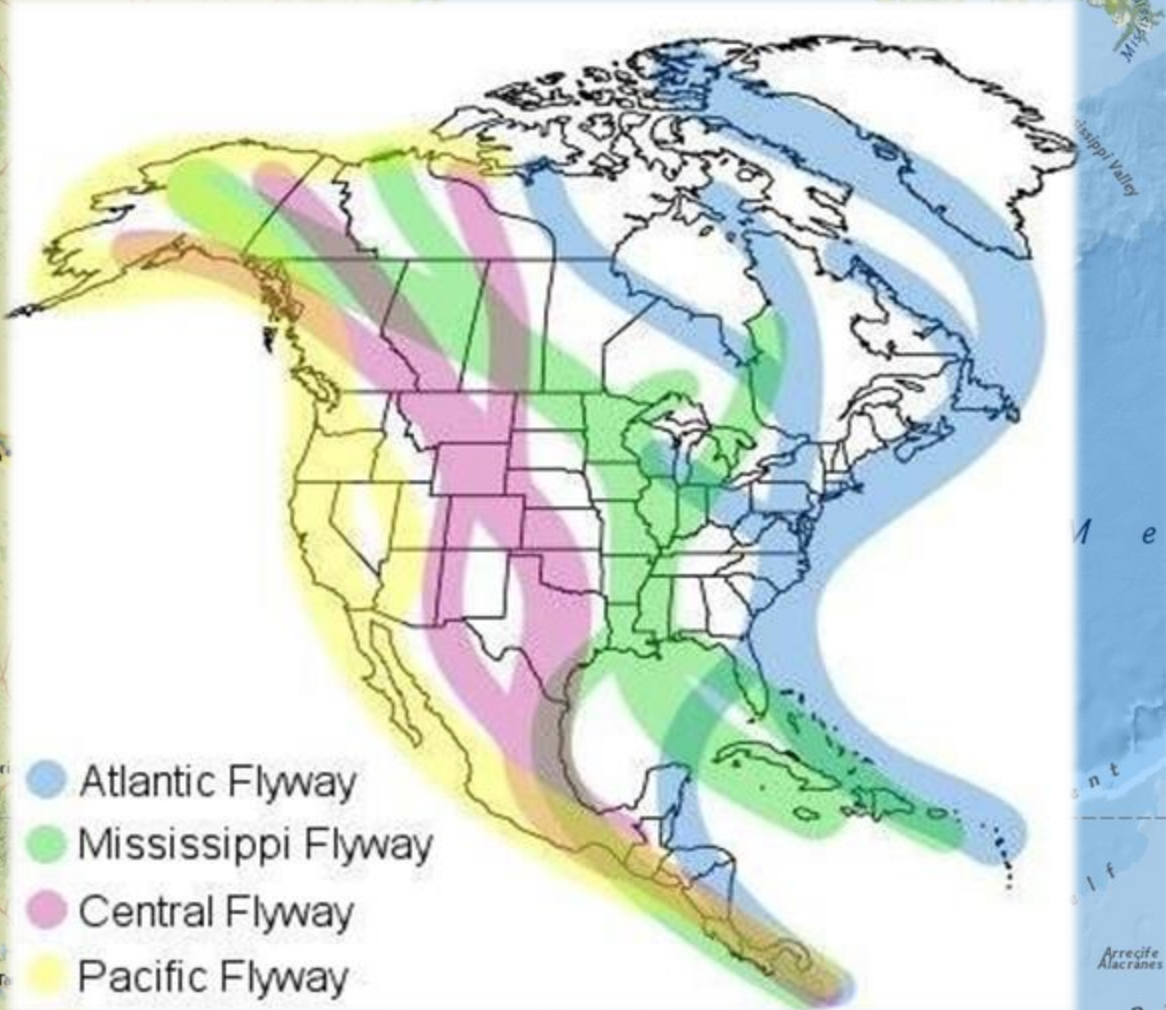


Birds and Migratory Pathways: An Overview of the Gulf of Mexico

Randy Wilson
U.S. Fish and Wildlife Service

Why is the Gulf of Mexico so important for birds?

“Most roads lead to the Gulf of Mexico”



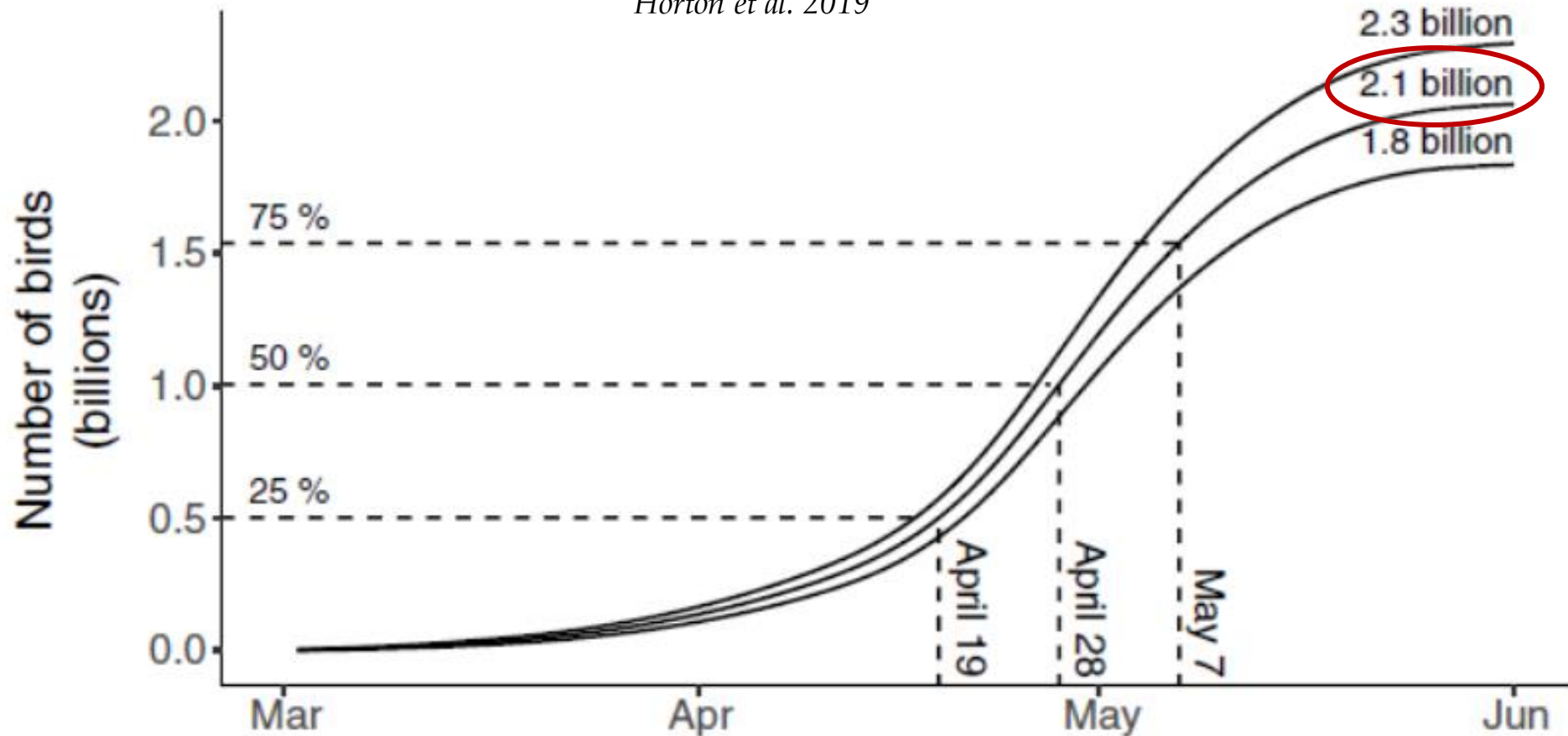
395+ Bird Species

- 18 Orders
- 53 Families



Number of Birds Using the Gulf of Mexico

Horton et al. 2019



❖ This estimate only applies to nocturnal migrants with a northward trajectory, thus is a conservative estimate (i.e., does not account for any diurnal migration, nor resident birds)

When is migration? (using citizen science – eBird data)

Bird Observations

▼ Species:

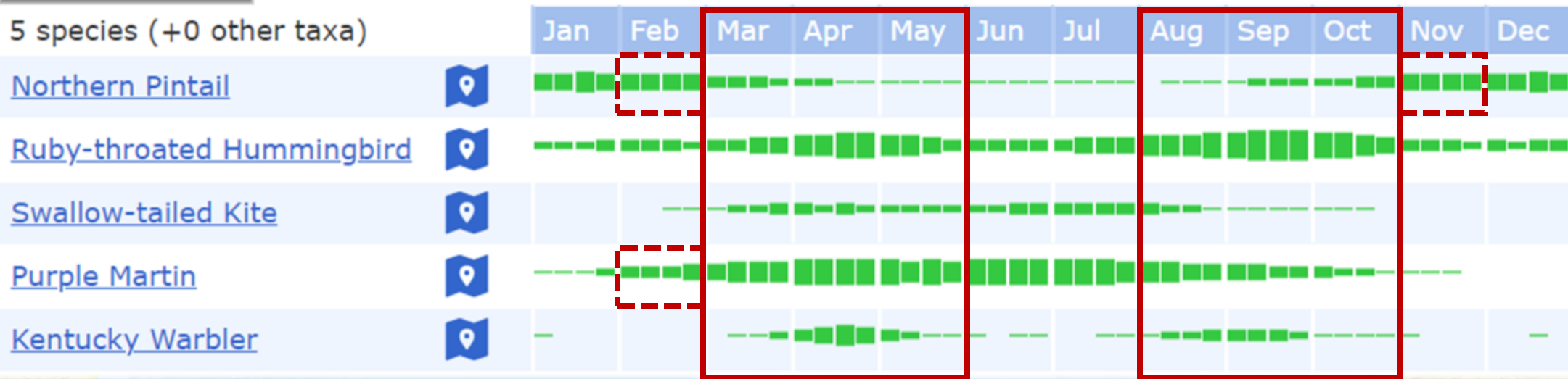
▼ Date Range:

Jan-Dec, 1900-2021

 Rare -- Widespread

[[Gulf Coastal Prairie](#)]

5 species (+0 other taxa)



eBird.org

When is migration? Nocturnal vs. Diurnal



The answer is both. A few examples include:

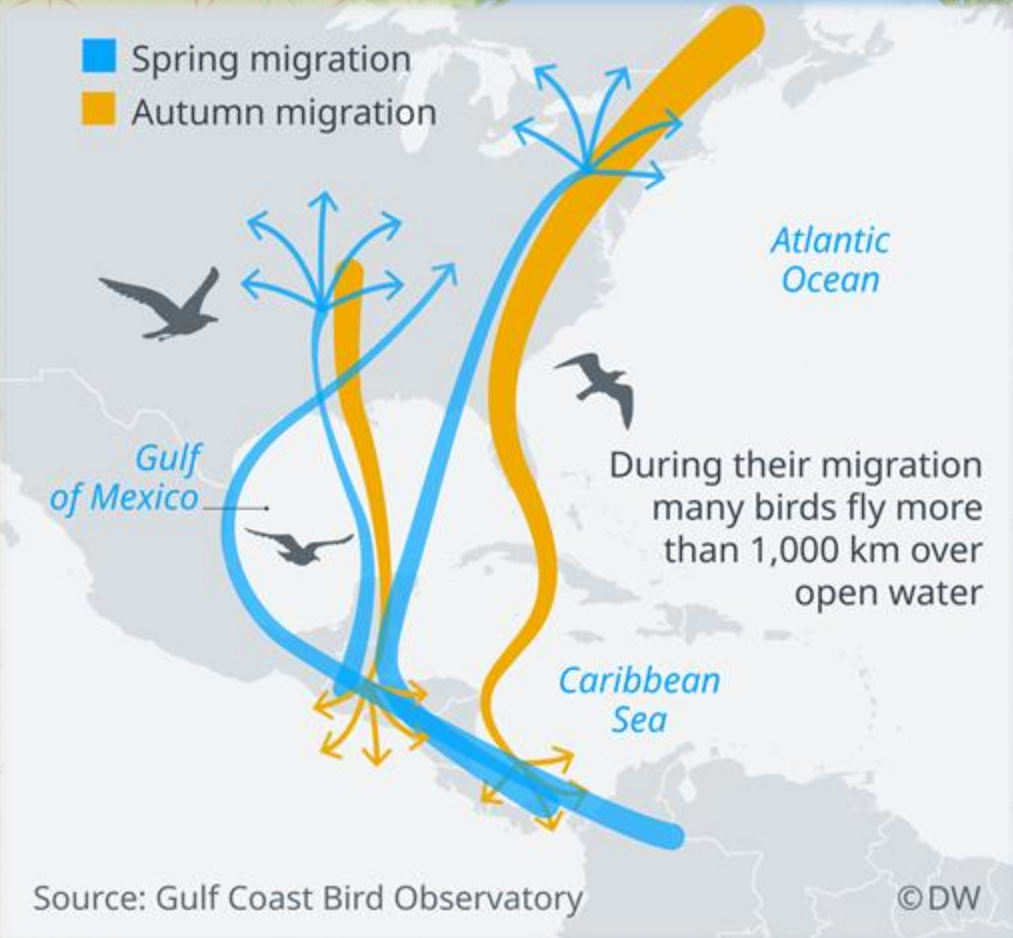
Diurnal Migrants: Pelicans, Hawks, Falcons, Swifts and Swallows

- *Larger birds can take advantage of daytime thermals*
- *Swifts and Swallows can feed on the wing*

Nocturnal Migrants: Flycatchers, Warblers, Vireos, Thrushes, Sparrows

- *Protection from predators (Hawks and Falcons)*
- *Less turbulent air*
- *Cooler air temperatures*
- *Stars and the moon provide navigational aid*

Migratory Pathways



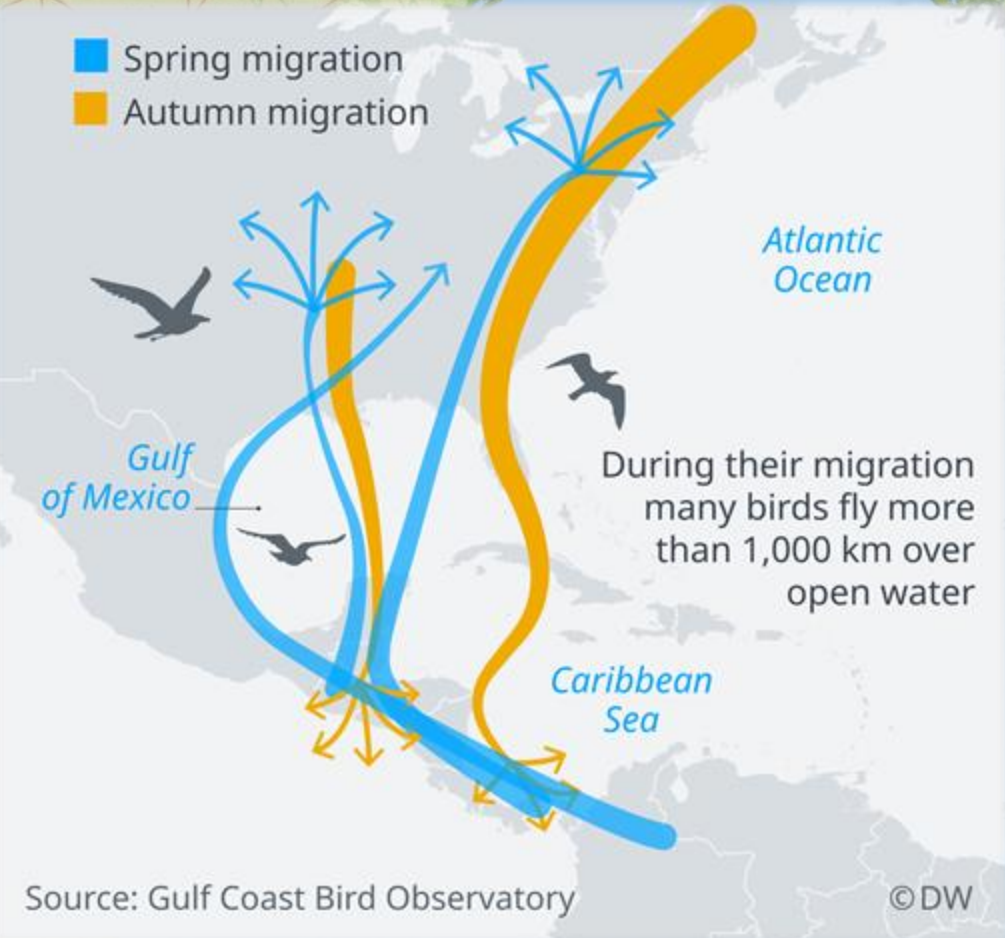
In general terms, birds make either:

- Trans-Gulf Flight – straight across

or

- Circum-Gulf Flight – hug the coastline

Migratory Pathways

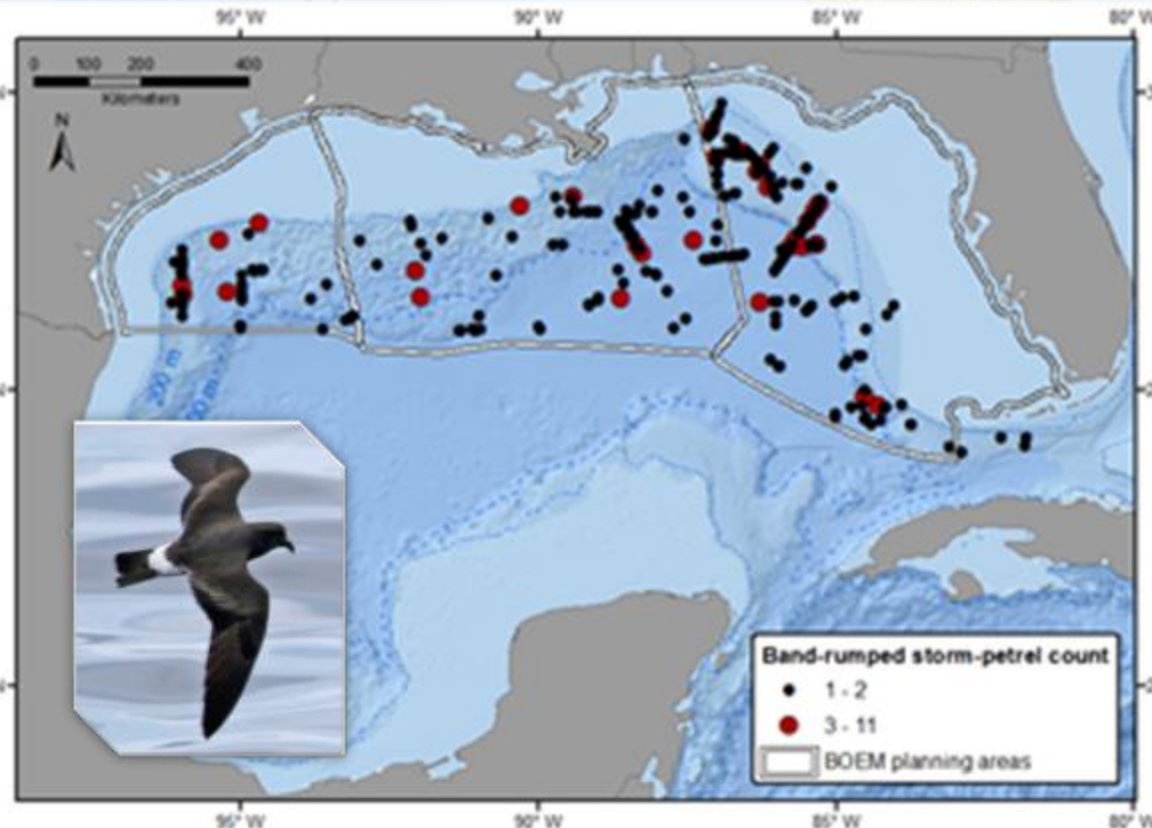
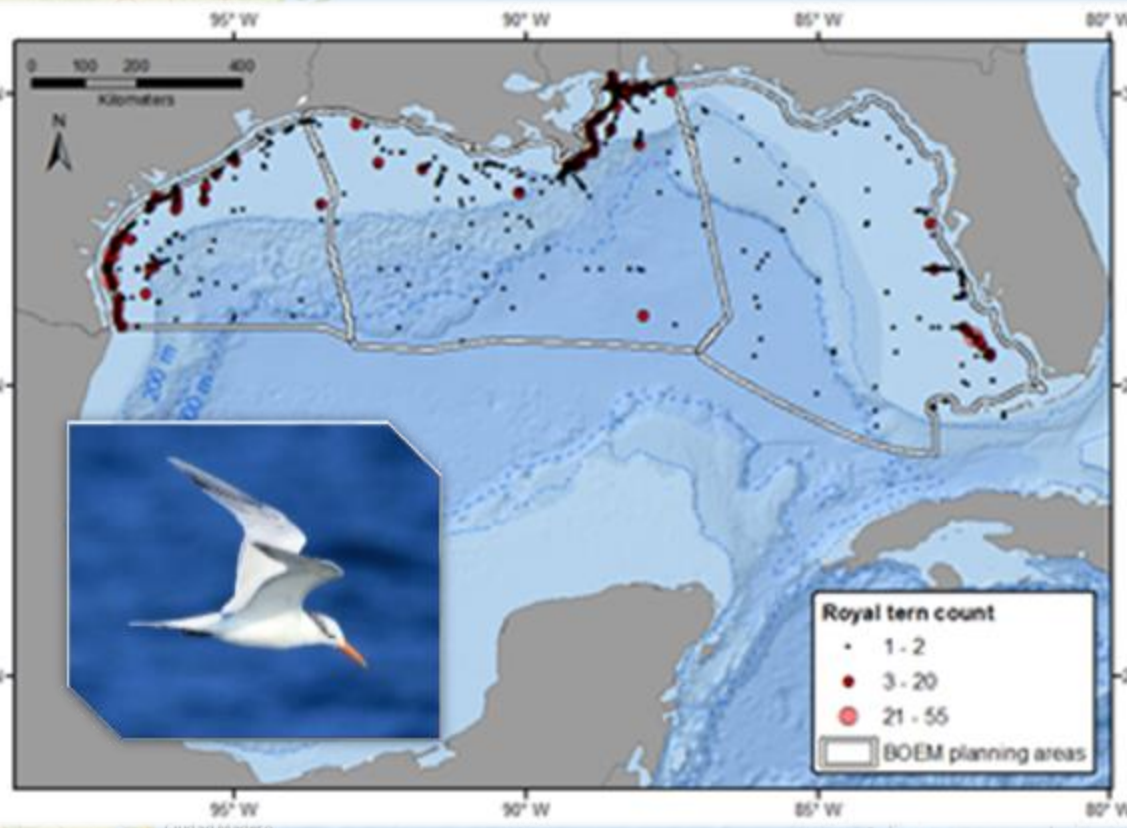


- ## Means of Assessing Bird Movements
- Individual Observations
 - Tagging Studies
 - Radar Ornithology

Individual Observations (GoMMAPPS Data)

Royal Tern (resident)

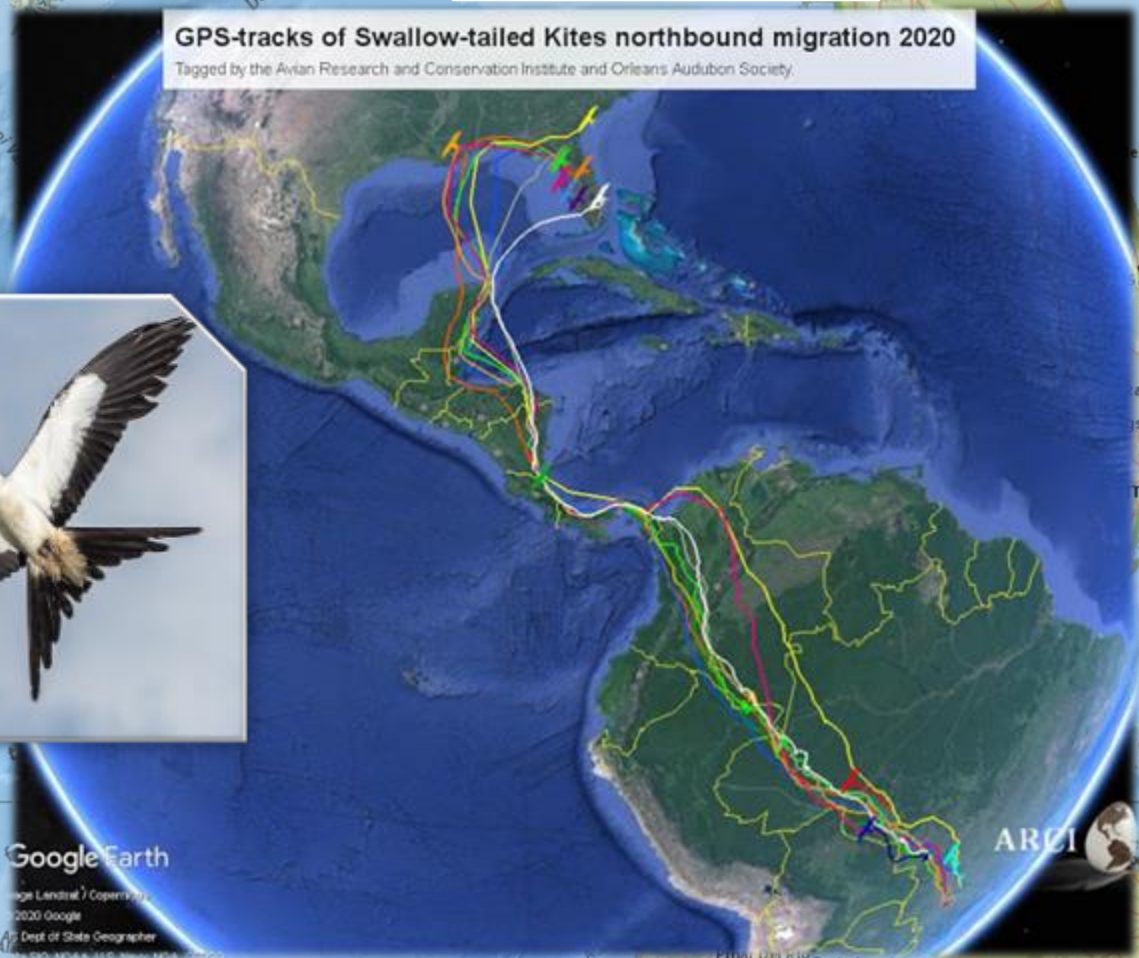
Band-rumped Storm Petrel (transient)



Individual Tracking (Swallow-tailed Kites)

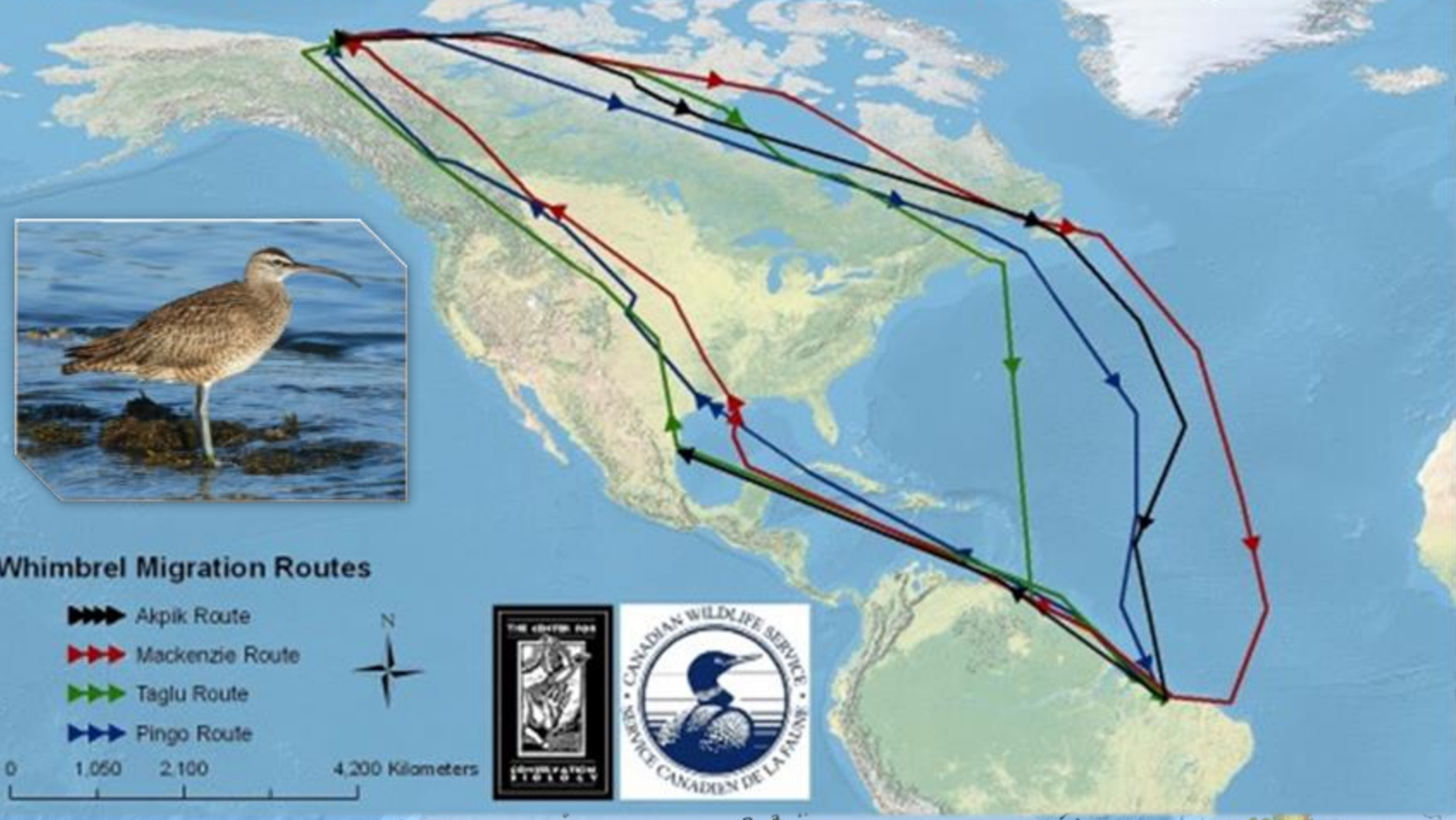
Fall Migration

Spring Migration



Individual Tracking (Whimbrel)

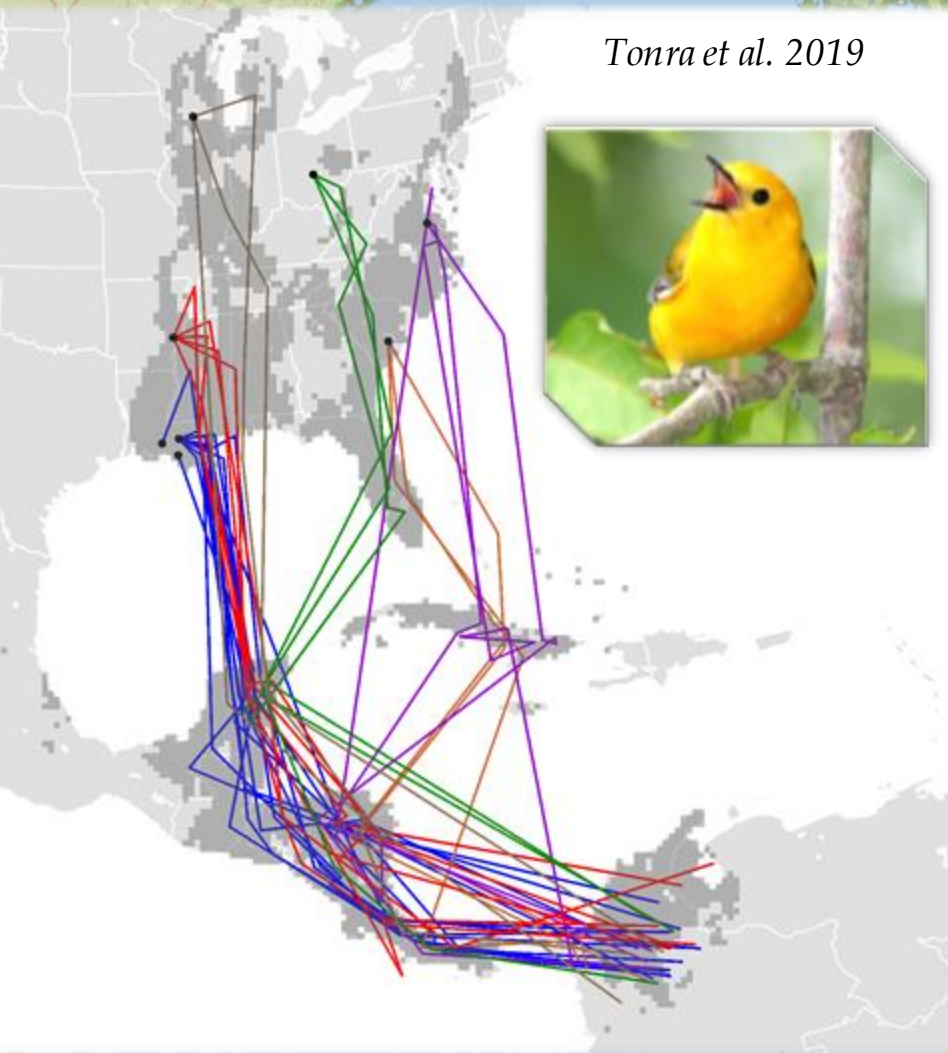
The Center for Conservation Biology and Canadian Wildlife Service
Mackenzie River Delta Whimbrel Migrations Fall 2012 and Spring 2013



Individual Tracking

Prothonotary Warbler

Tonra et al. 2019

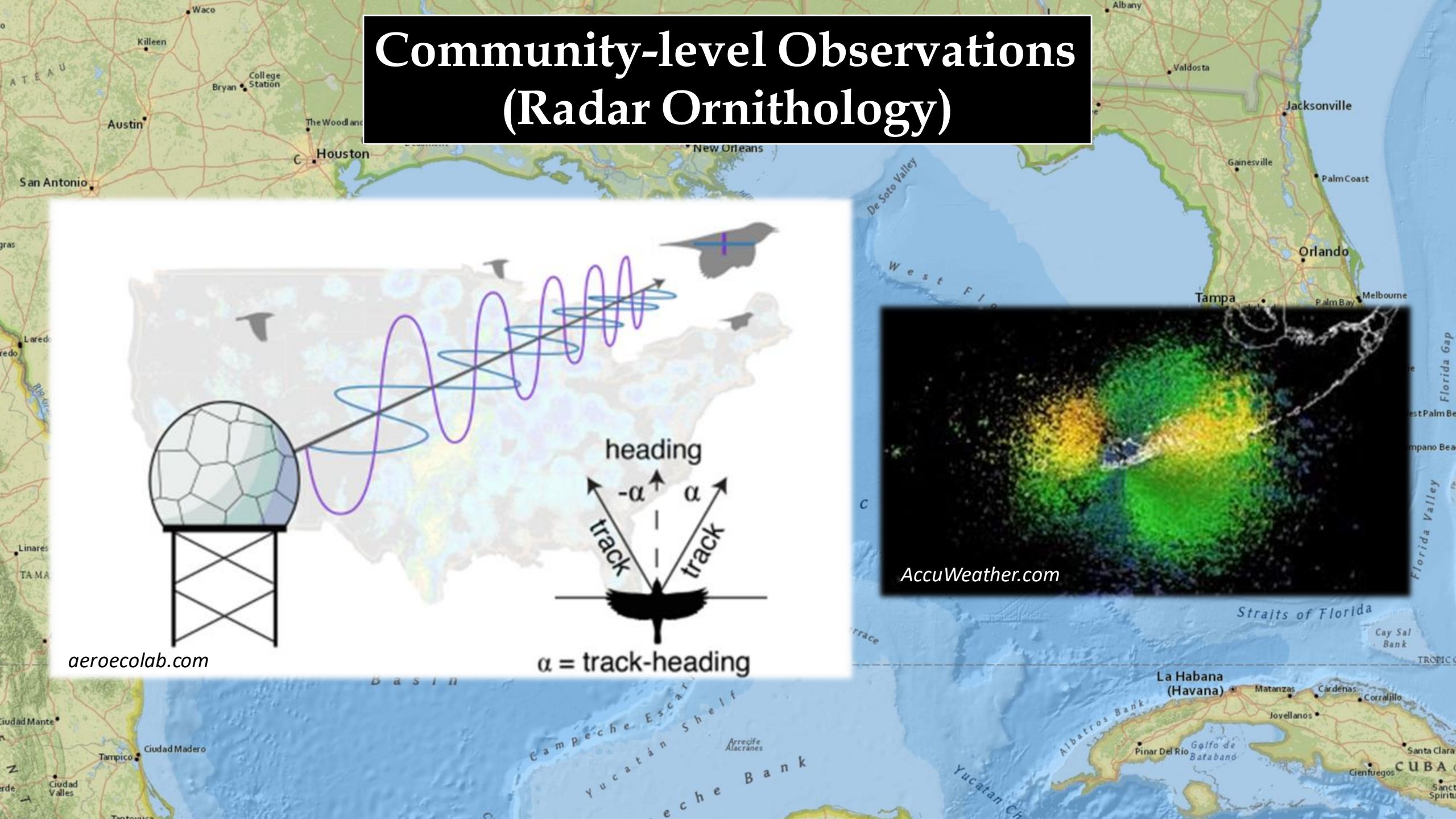
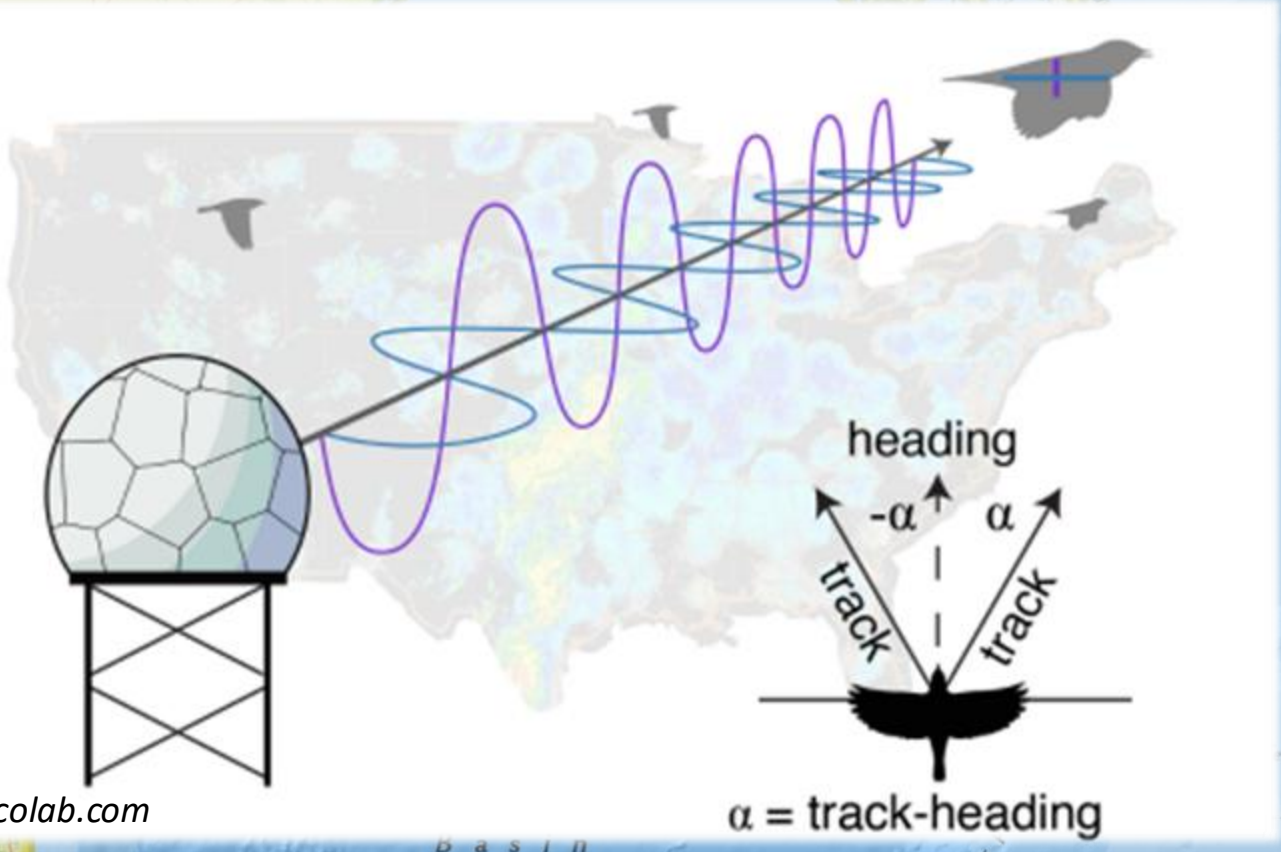


Purple Martin

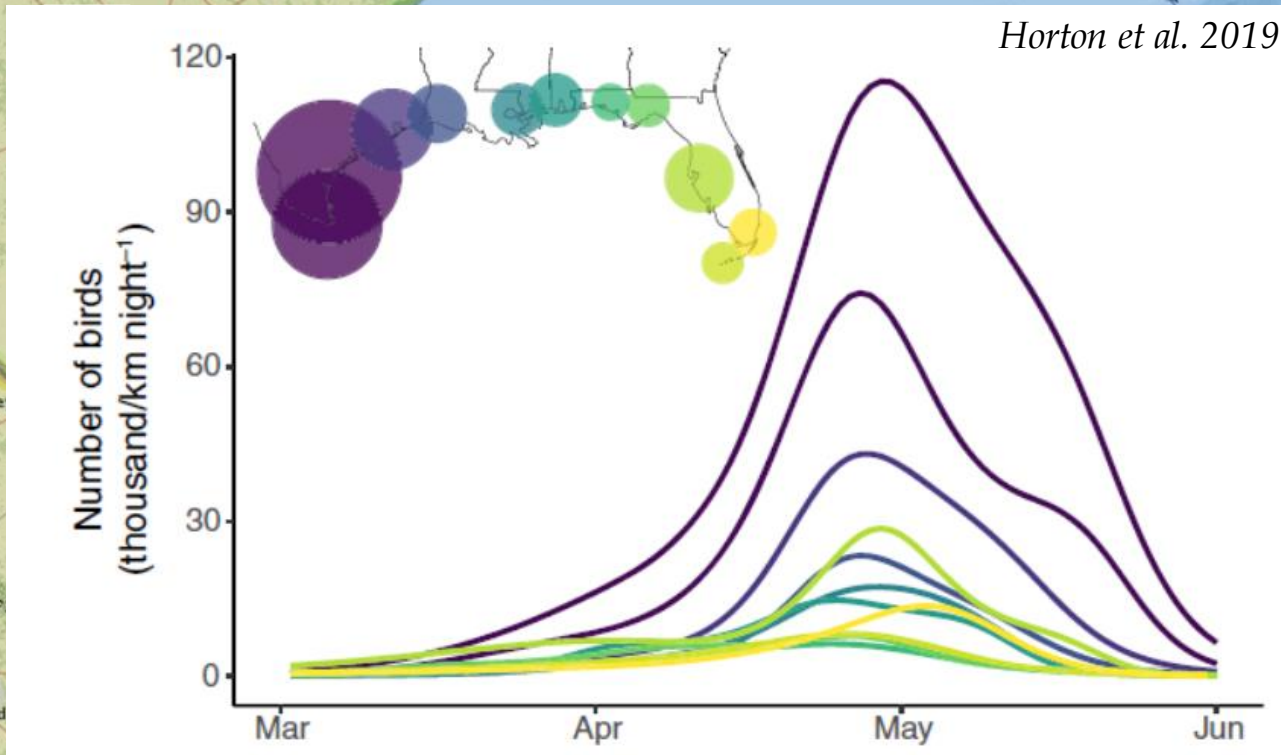


Lavallée et al. 2021

Community-level Observations (Radar Ornithology)



Community-level Observations (Radar Ornithology)



Spring Migration (2007-2015)

- Spatial Relevance
- Temporal Relevance

Community-level Observations (Radar Ornithology)

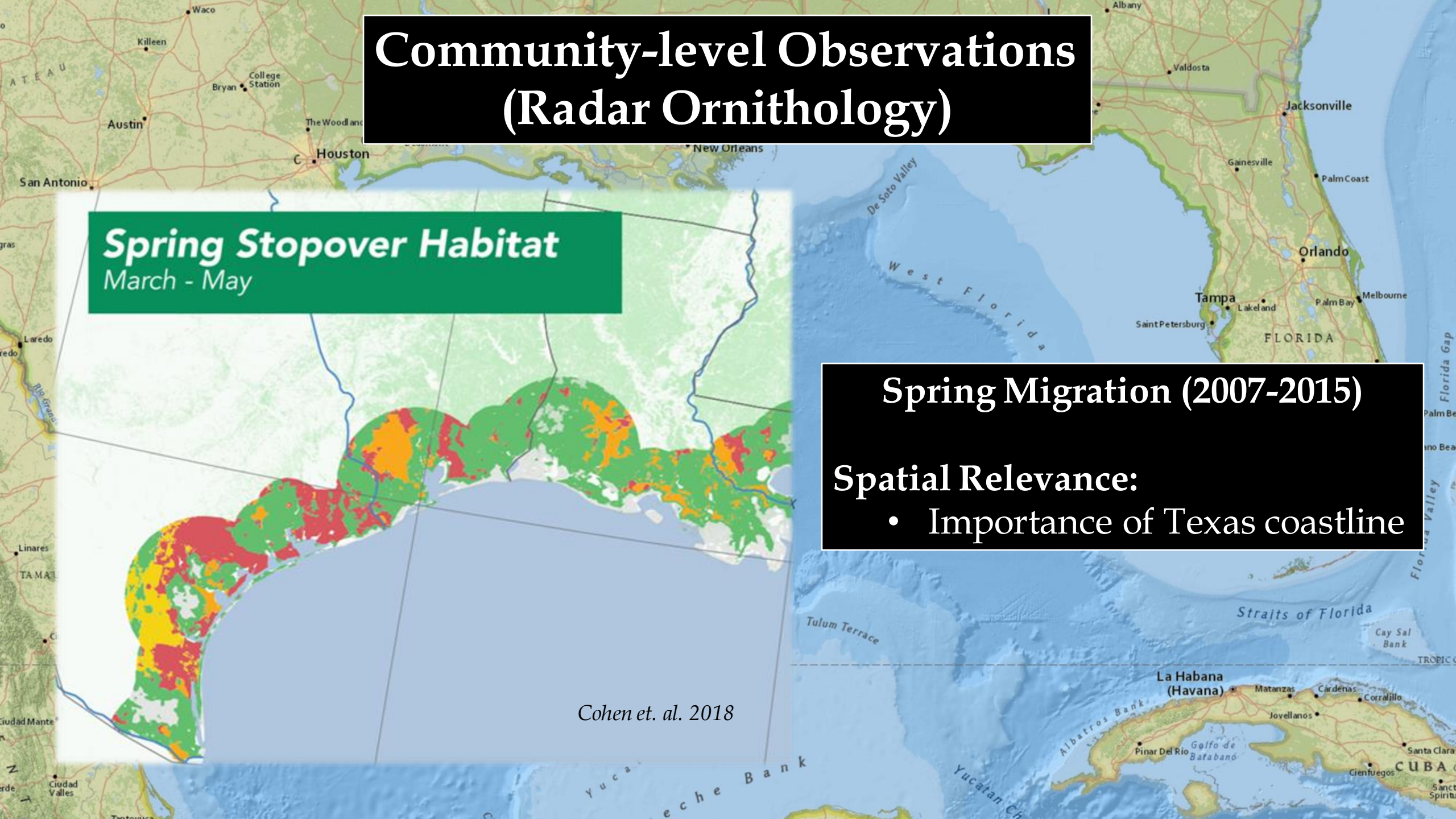
Spring Stopover Habitat
March - May

Spring Migration (2007-2015)

Spatial Relevance:

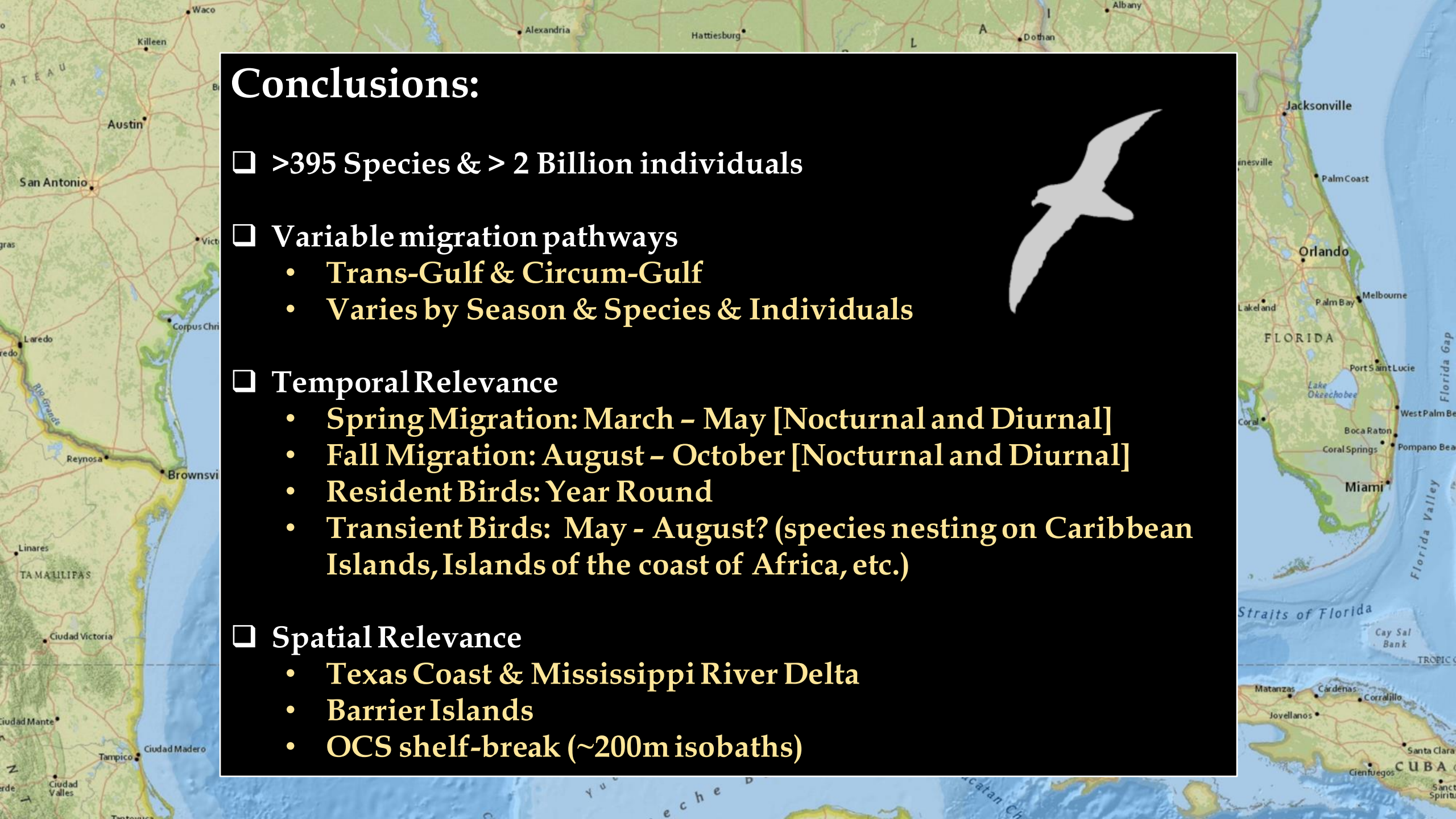
- Importance of Texas coastline

Cohen et. al. 2018



Conclusions:

- ❑ **>395 Species & > 2 Billion individuals**
- ❑ **Variable migration pathways**
 - **Trans-Gulf & Circum-Gulf**
 - **Varies by Season & Species & Individuals**
- ❑ **Temporal Relevance**
 - **Spring Migration: March – May [Nocturnal and Diurnal]**
 - **Fall Migration: August – October [Nocturnal and Diurnal]**
 - **Resident Birds: Year Round**
 - **Transient Birds: May - August? (species nesting on Caribbean Islands, Islands of the coast of Africa, etc.)**
- ❑ **Spatial Relevance**
 - **Texas Coast & Mississippi River Delta**
 - **Barrier Islands**
 - **OCS shelf-break (~200m isobaths)**



Available Data & Relevant Publications

- NRDA Aerial Surveys (early assessments)
- Various Projects funded by DWH Trustee Implementation Groups
- Gulf of Mexico Marine Assessment Program for Protected Species
- Radar Ornithology [Birdcast.info]
- eBird
- Data from Various Publications on Individual Bird Movements

A New Tool with Lots of Potential Applications



www.birdcast.info

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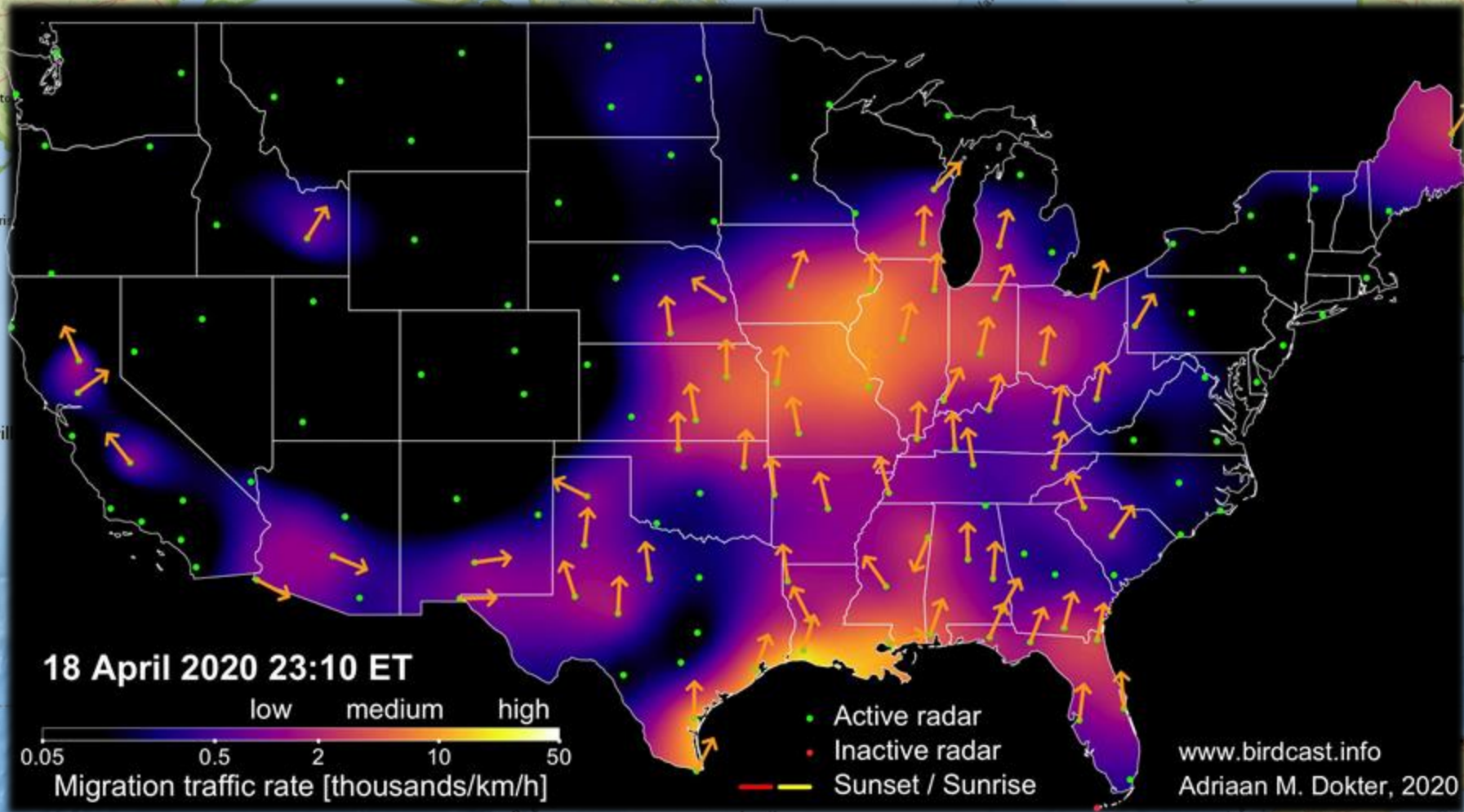
Search for...



Migration Forecasts in Real-Time

When, where, and how far will birds migrate? Our real-time forecasts will answer these questions for the first time.

Birdcast.info - Migration Forecasts





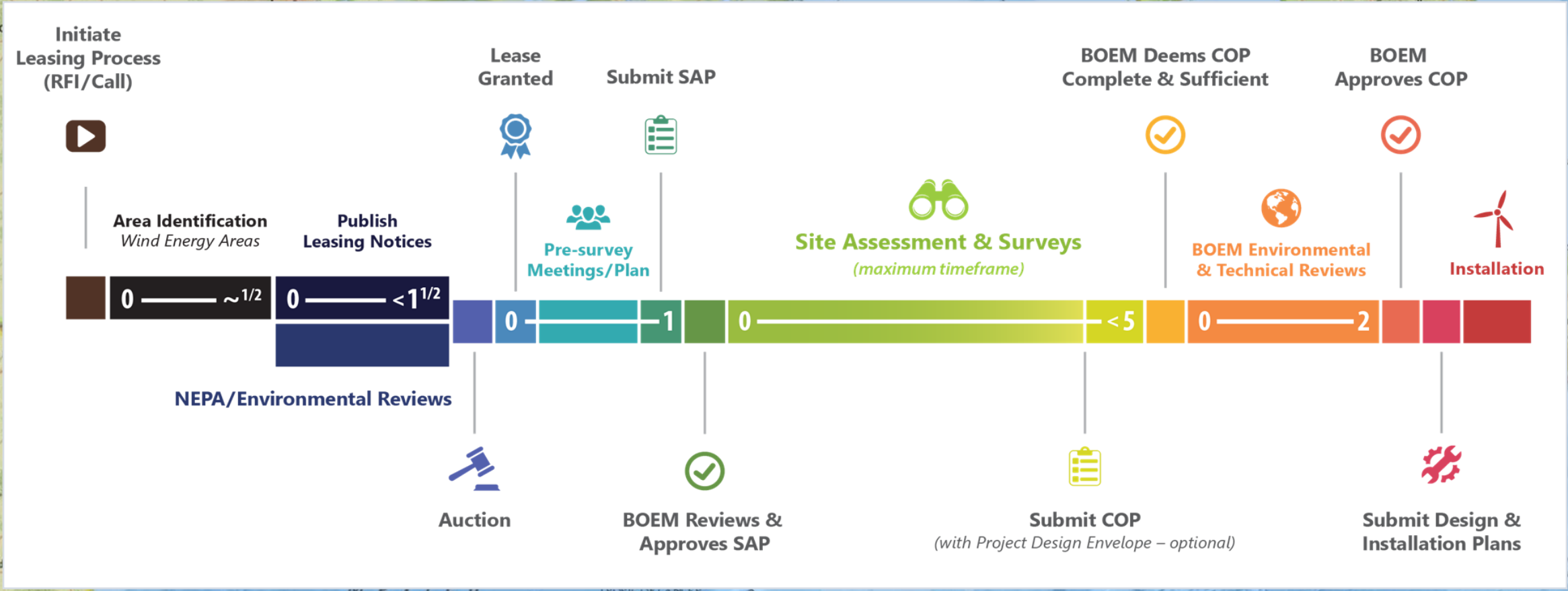
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- Radar Ornithology [Birdcast.info]
- eBird
- Data from Various Publications on Individual Bird Movements
- Other Relevant Publications
 - Lamb et al. 2020: *Ecological Drivers of Brown Pelican Movement Patterns, Health, and Reproductive Success in the Gulf of Mexico*
 - R. W. Russell 2005: *Interactions Between Migrating Birds and Offshore Oil and Gas Platforms in the Northern Gulf of Mexico*
 - Davis et al. 2000: *Cetaceans, Sea Turtles and Seabirds in the Northern Gulf of Mexico: Distribution, Abundance, and Habitat Associations*
 - Ribic et al. 1997: *Distribution of Seabirds in the Northern Gulf of Mexico in relation to mesoscale features: Initial Observations*

Estimates of Annual Avian Mortality in the United States

| Source of mortality | Estimated mortality | Reference |
|---|--------------------------------|--|
| Vehicles | 89 – 340 million (↑) | Erickson et al. (2001), Loss et al. (2014b) |
| Buildings and/or windows | 365 – 988 million (↑) | Erickson et al. (2001), Klem (2009), Loss et al. (2014a) |
| Powerlines | Low Millions – 174 million (↑) | Manville (2005a, 2009), Rioux et al. (2013), Loss et al. (2014) ^a |
| Communication towers | ≥6.5 million (↑) | Manville (2005a, 2009), Longcore et al. (2012, 2013) |
| Mortality by cats | 1.4 – 3.7 billion* | Dauphine and Cooper (2009, 2011), Loss et al. (2013a) |
| Mortality assoc. w/ open-pit oil ponds | 500,000 – 1 million (↑) | Trail (2006) |
| Mortality assoc. w/ wind-farms (onshore) | 140,000 – 679,000 (↑) | Smallwood (2013), Loss et al. (2013b) |
| Mortality assoc. w/ offshore oil platforms | 200,000 – 321,000** | Russell (2005) |
| Mortality assoc. w/ commercial fishing | High thousands – low millions | Manville (2005b), Brothers et al. (2010) |
| Mortality assoc. w/ lead (Pb) ingestion | Millions (↓)*** | Scheuhammer and Norris (1995), Kendall et al. (1996) |
| Mortality assoc. w/ insecticides/pesticides | Low Millions (↑)**** | Mineau (2004), Mineau and Whiteside (2006, 2013) |

Consultation & Technical Assistance



U.S. Fish & Wildlife Service

A topographic map of the Gulf of Mexico region. The map shows the Gulf of Mexico in the center, with the Gulf of Mexico Basin to the south. To the north, the states of Louisiana and Florida are visible. Major cities like Houston, New Orleans, Jacksonville, Orlando, Tampa, and Miami are marked. The map also shows the Yucatan Peninsula and the island of Cuba to the south. The Tropic of Cancer is indicated by a dashed line. The text "Thanks for your attention!" is overlaid in the upper middle part of the map.

Thanks for your attention!

Questions??

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