Offshore Motus Data Framework

Stakeholder Workshop

November 29, 2021

Pam Loring

U.S. Fish and Wildlife Service

Division of Migratory Birds, North Atlantic-Appalachian Region

NYSERDA Sponsored

Project Team

USFWS Migratory Birds: Pam Loring, Scott Johnston

Biodiversity Research Institute: Kate Williams, Andrew Gilbert, Evan Adams, Julia Gulka, Ed Jenkins

Univ. of Rhode Island: Peter Paton, Doug Gobeille, Erik Carlson, Rob Deluca

Birds Canada: Stu Mackenzie

NYSERDA (funding): Kate McClellan Press, Gregory Lampman

U.S. FISH & WILDLIFE SERVICE
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Overall project goal:

To develop standardized protocols for using automated radio telemetry to monitor birds and bats in offshore environments.

Overall Project Components

- **Monitoring Framework -** tags and study design
- **Guidance Document –** offshore Motus stations
- **Online Study Design Tool –** map detection coverage
- **Simulation Study –** model animal movement data
- **Motus Data Framework –** centralized portal for data management, coordination, and summary reports

Workshop goals:

- **Introduce Motus Data Framework**
- **Feedback on offshore Motus portal (under development) and automated reports**
- **Opportunities for further engagement**

Agenda (times in ET)

1:10 – 1:40: Motus Presentation & Demo (Stu Mackenzie and Lucas Berrigan, Birds Canada)
* Please put any questions in chat

1:40 – 1:55: Discussion/Q&A

1:55 – 2:10: Short break/web platform exploration

2:10 – 2:40: Breakout groups

2:40 – 2:55: Report out/discussion

2:55 – 3:00: Next steps

Atlantic Offshore Wind Assessment Collaborative

Motus

Stu Mackenzie, Director – Migration Ecology
Birds Canada
smackenzie@birdscanada.org
motus@birdscanada.org

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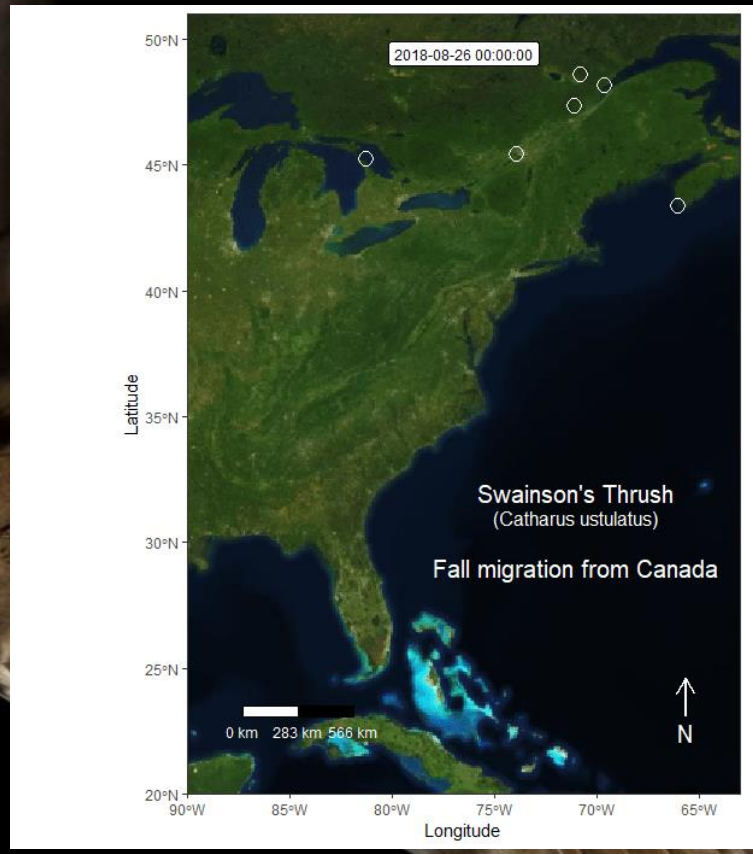
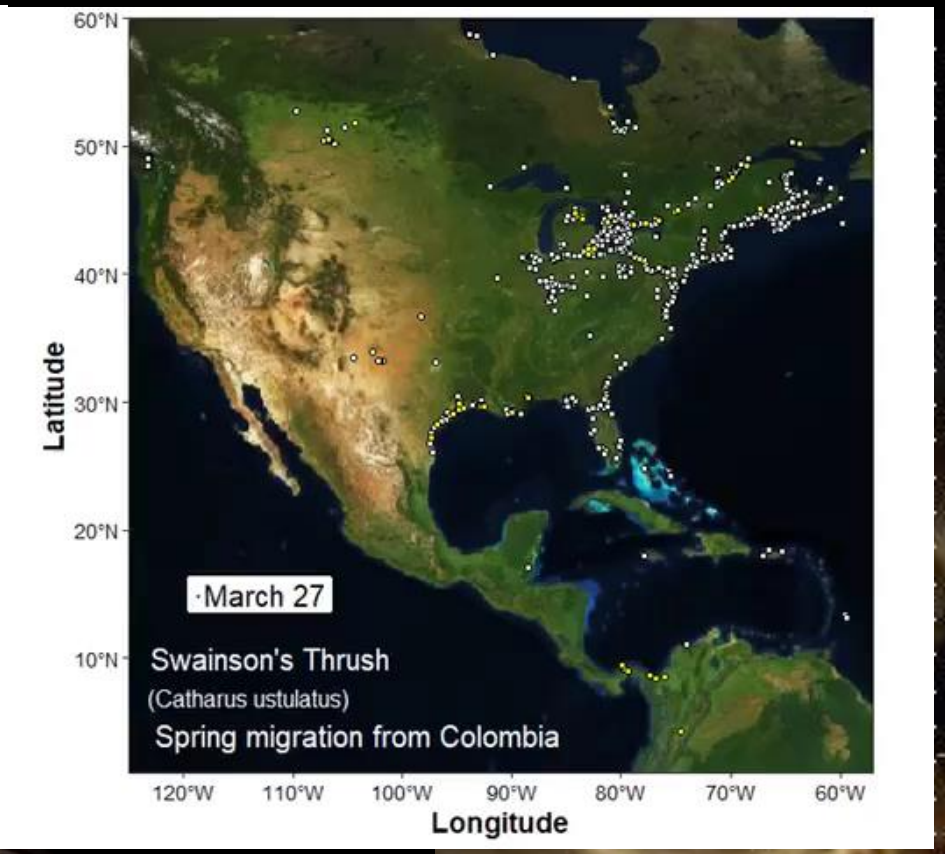
Motus is a international collaborative research network that uses coordinated automated radio telemetry to facilitate research and education on the ecology and conservation of migratory animals.

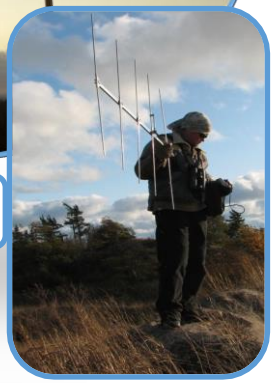




Bégin-Marchand et al. 2021. Movement Ecology
&
Gonzalez et al. 2020. J. Animal Ecology

Animals and Tracking Devices

Motus



Receiving Stations

Users

Motus Database

Conservation Science

- Basic Discovery
- Policy and Management
- Public Engagement and Education
- Conservation Action

Public Interface

Other data portals and tools

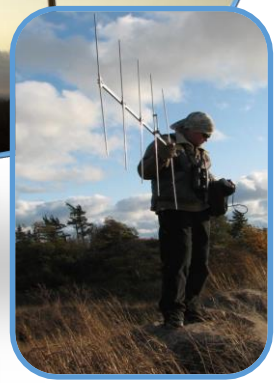
MOVEBANK For Animal Tracking Data

R

Avian Knowledge Network

Research Projects & Cooperators

Animals and Methods



Infrastructure and Technology

Motus

Conservation Science

- Discovery
- Analysis, Visualization and Tools
- Data Archive (future use and reuse)
- Policy and Management
- Public Engagement and Education
- Conservation Action

Data Products and Services

Education and Outreach

Infrastructure and Technology

'**Motus' Tags:**

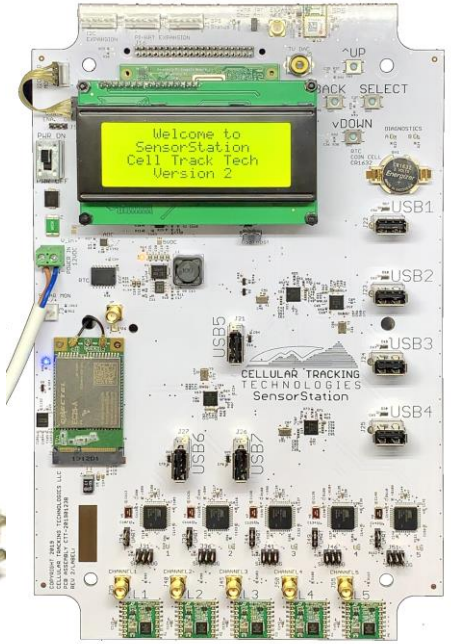
- Lotek Nanotags (150, 151, 166 MHz)
- CTT LifeTags/PowerTags (434 MHz)
- ~$2-300 USD per tag

Receivers:

- Sensorgnomes (DIY* open source)
- CTT SensorStations (SG inside)
- Lotek SRX series

Connectivity – GSM, WiFi,

- Cost per station $4-10K USD



Motus.org/resources

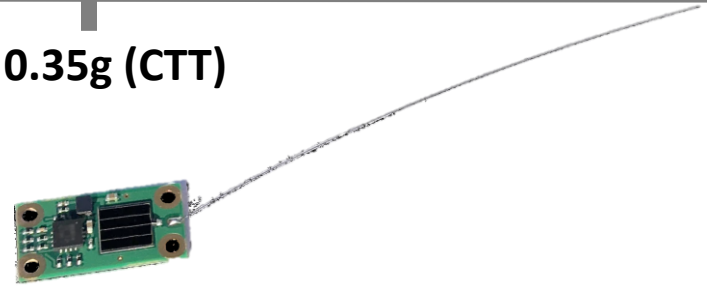
Tags

Battery Tags

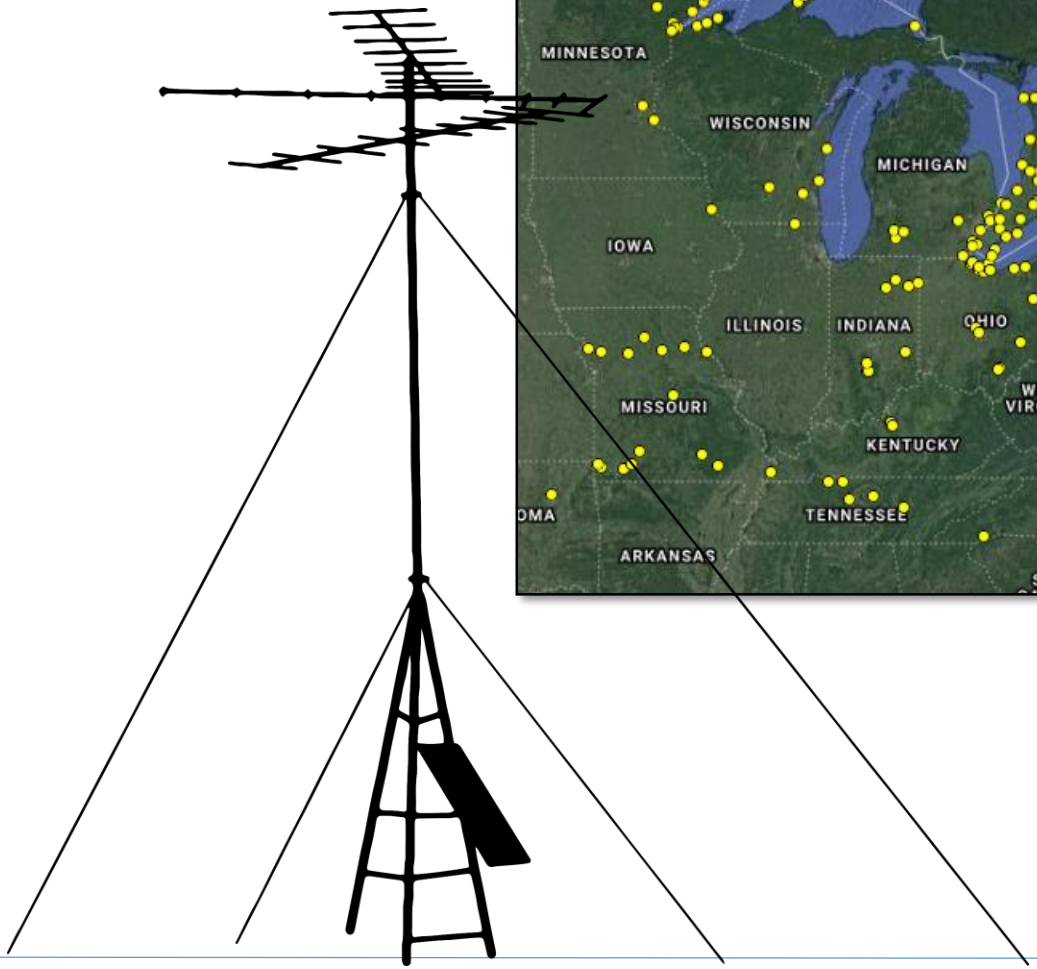
Mass	0.19g	0.45g	0.6g	1g	1.5g	3.0g
Lifespan	10-21 d	60-290d	60-365d	130-735d	359-1042d	1-5 yr

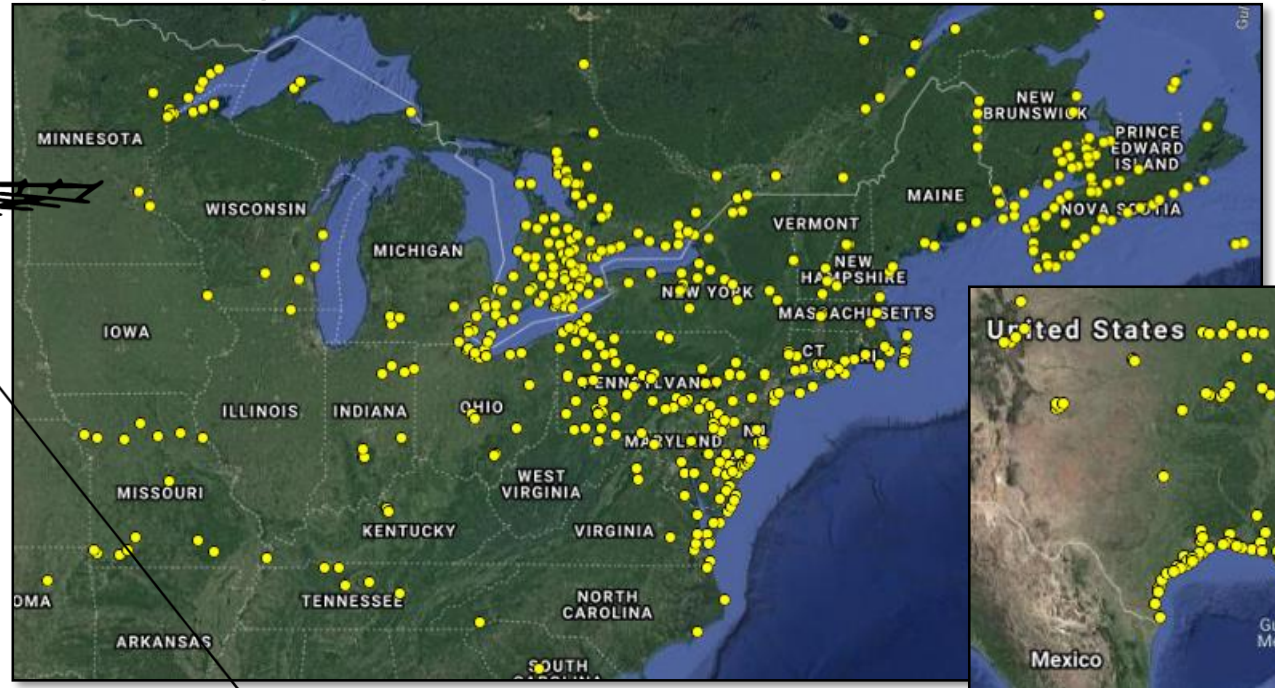
Solar and Hybrid Tags

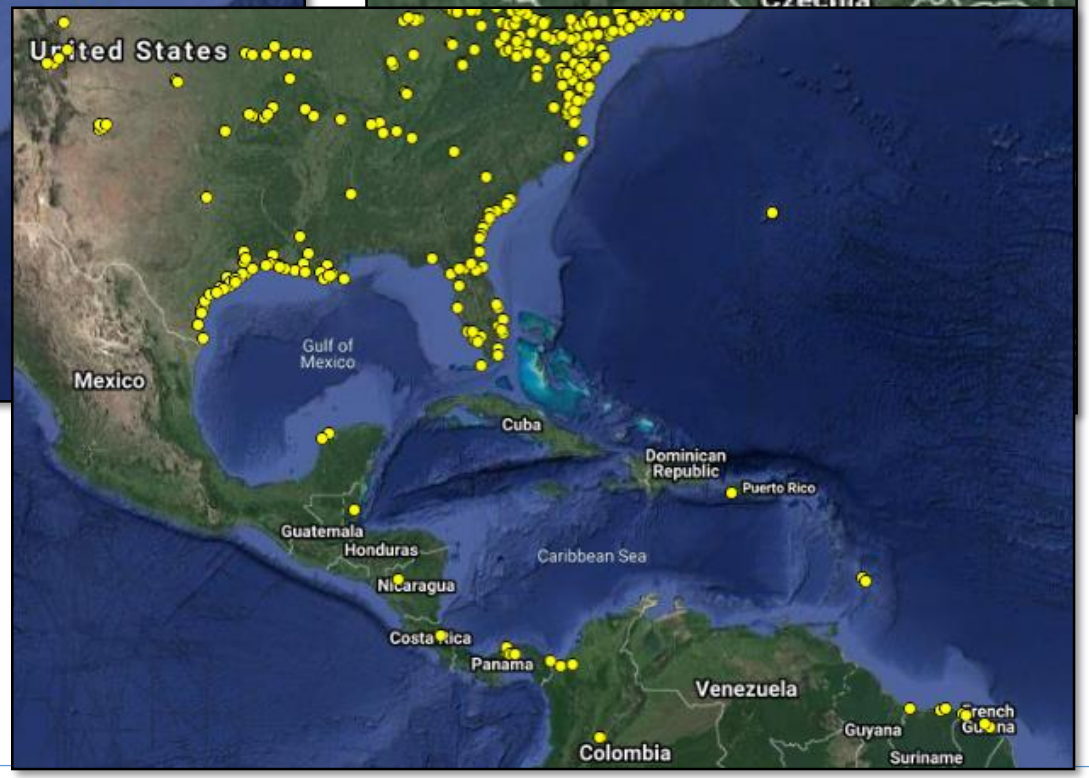
∞	∞
0.35g (CTT)	1.5g (Lotek w/t battery)



Station Deployments







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Motus.org/resources

BIRDS CANADA

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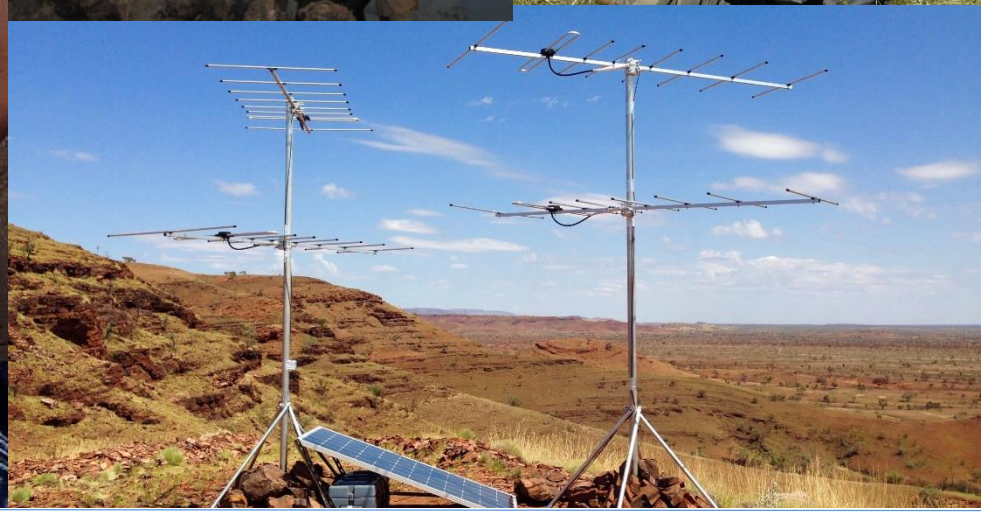
Collaborators and Projects



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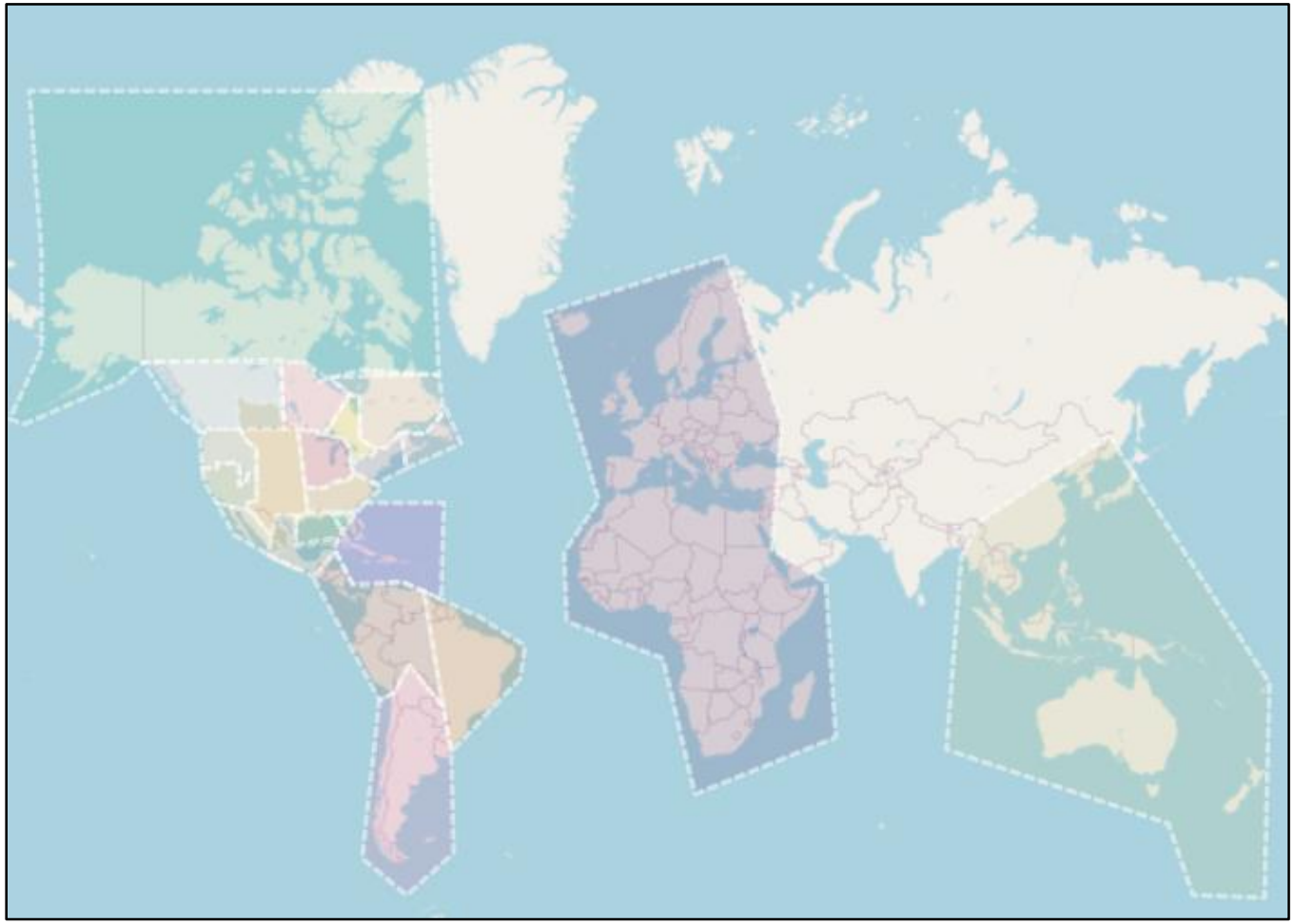
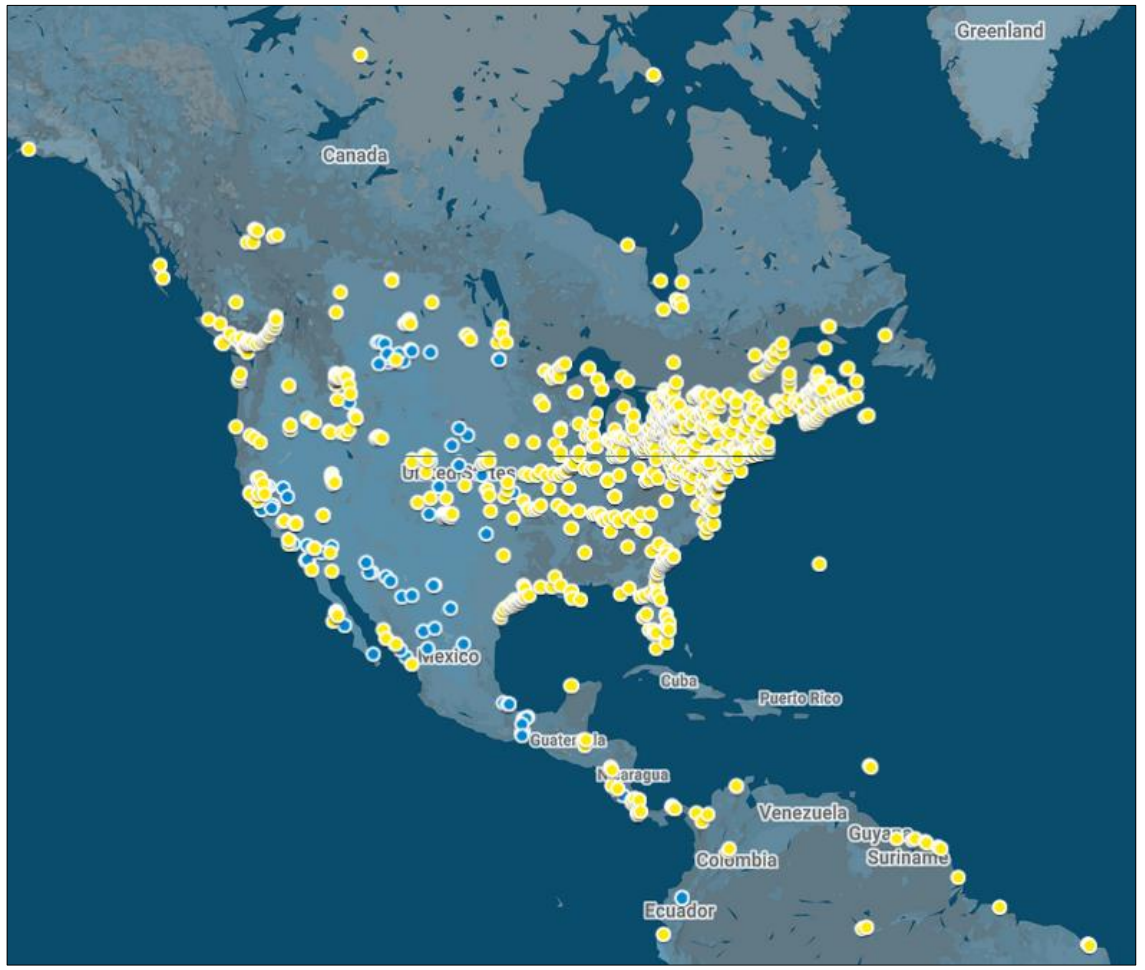
Regional Coodination and Leadership





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motus.org/collaboratives

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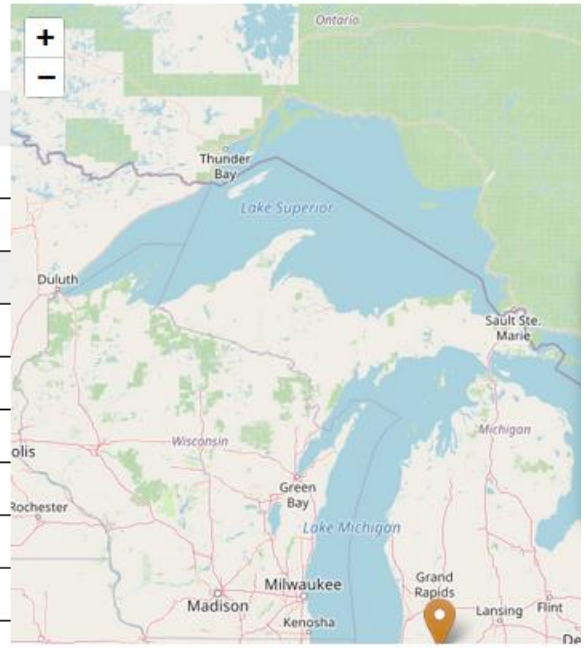
Education

About Motus | Educator Resources | Student Activities | Find Your Station | Hos

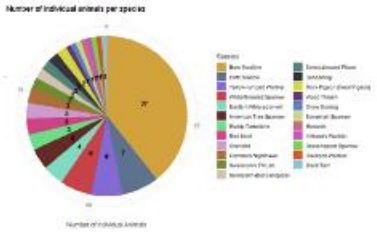
Find Your Station!



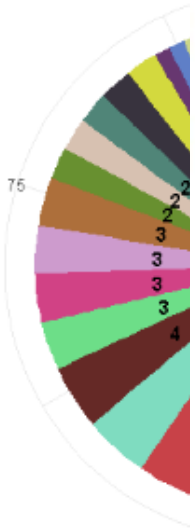
Search:

- Panamá Sanaemiento
- Northern Lights Secondary School
- Russel Reid Public School
- Horton High School
- Toronto Zoo
- Columbus Zoo
- Kalamazoo Nature Center
- Oak Hammock Marsh
- Rushton Conservation Center
- Tantramar Regional High School
- Waskaganish
- FG Leary Fine Arts Elementary

Thank you to our generous funders for suppor



Number of individual



Semipalmated Sandpiper

Latin name: *Calidris canutus*
French name: Bécasseau semipalmé
Spanish name: Correlimos Semipalmeado

CONSERVATION STATUS:

Worldwide Assessment (Global IUCN): **Near threatened**
In Canada (COSEWIC): **Sensitive**
Population trend: **Large Decrease (-5.29 % /year)**

BREEDING

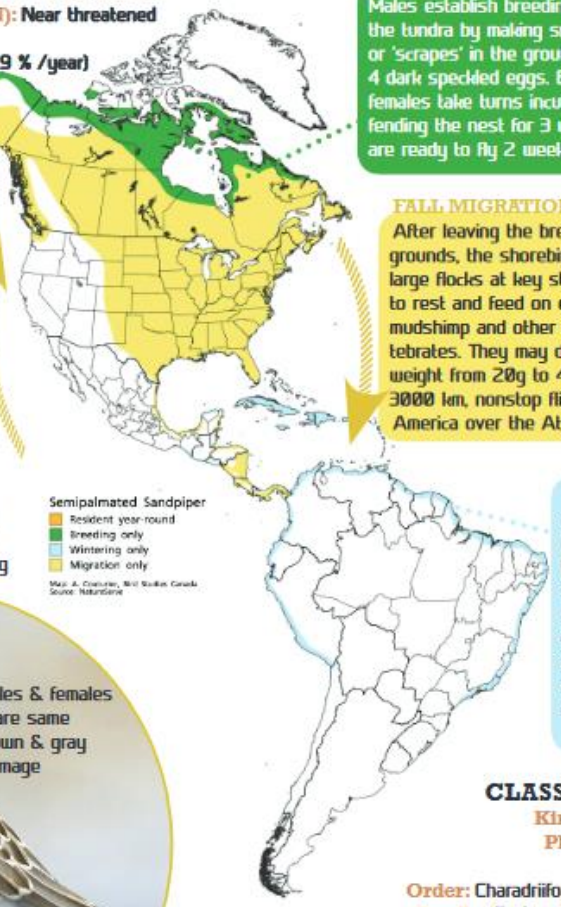
Males establish breeding territory in the tundra by making small depressions, or 'scrapes' in the ground. Females lay 4 dark speckled eggs. Both males and females take turns incubating and defending the nest for 3 weeks. The young are ready to fly 2 weeks after hatching.

SPRING MIGRATION

Semipalmated Sandpipers are neotropical migrants, travelling long distances to their breeding areas in the arctic. The northward, long-distance migration begins in early May. Short stopovers at wetlands and shorelines fuel the journey, and build fat reserves for egg production once the birds arrive in the sub-arctic regions of Canada and Alaska.

FALL MIGRATION

After leaving the breeding grounds, the shorebirds gather in large flocks at key stopover sites to rest and feed on energy-rich mudshimp and other aquatic invertebrates. They may double their weight from 20g to 40g, fuelling the 3000 km, nonstop flight to South America over the Atlantic Ocean.

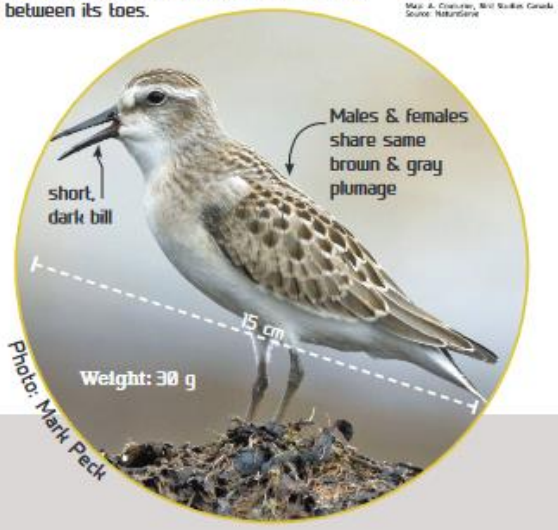


WINTER

Semipalmated Sandpipers spend the winter along the shorelines of South America. Here, they forage for aquatic invertebrates in mangroves, tidal mudflats and beaches.

DESCRIPTION

The Semipalmated Sandpipers is a small shorebird in the Sandpiper family. They are found in wetland and coastal habitats, in small groups to large flocks. The name 'semipalmated' refers to the partial webbing between its toes.



CLASSIFICATION

Kingdom: Animalia
Phylum: Chordata
Class: Aves
Order: Charadriiformes (Shorebirds)
Family: Scolopacidae (Sandpipers)
Genus: *Calidris*
Species: *pusilla*

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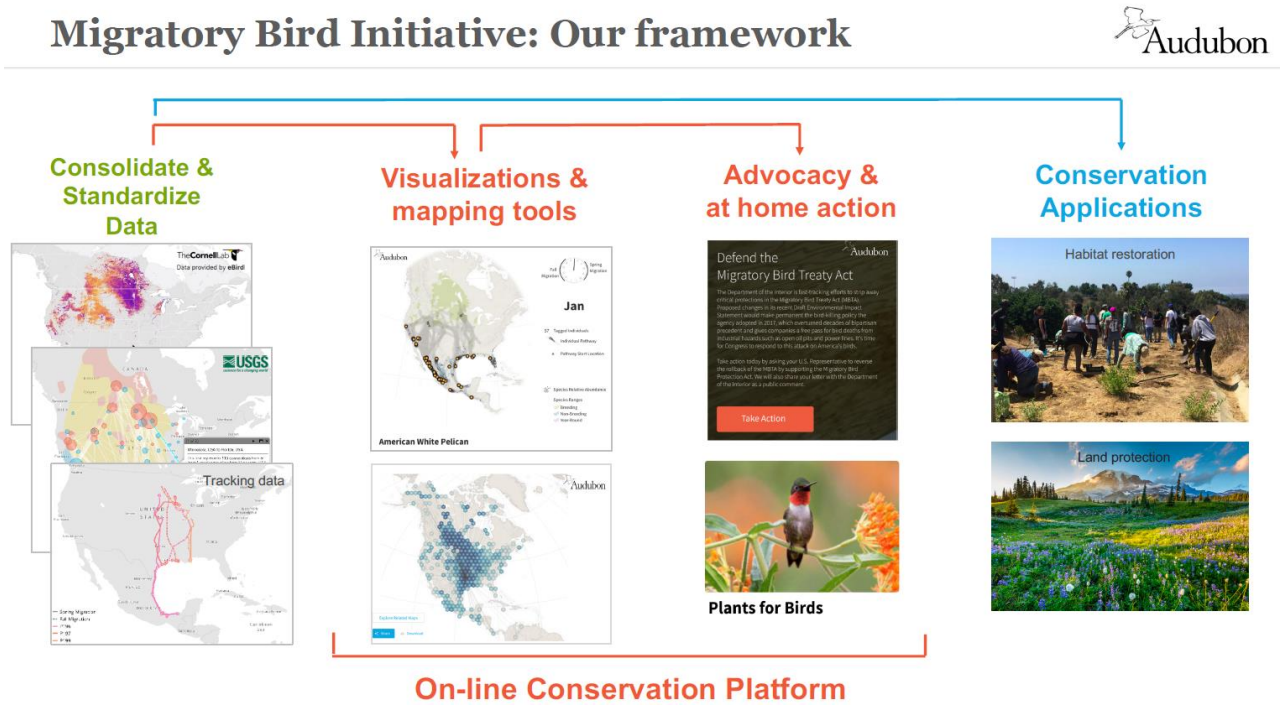
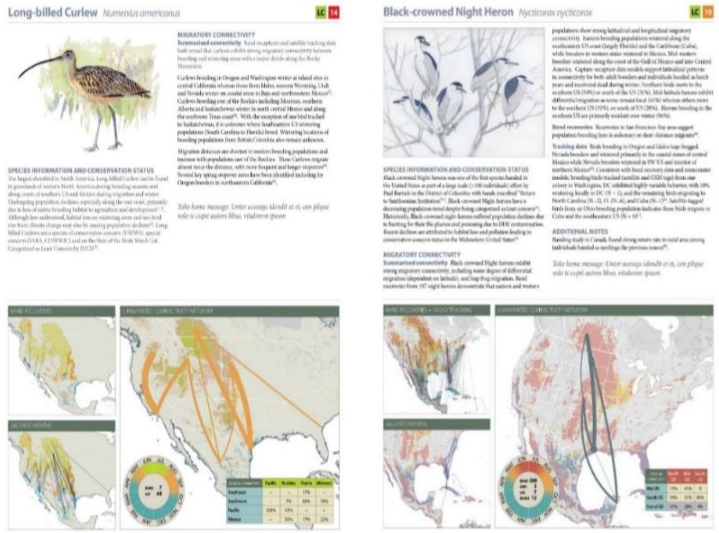
VALUE-ADDED DATA SERVICES AND PRODUCTS



Discovering Unknown Migrations:
The Atlas of Migratory Connectivity for the Birds of North America



Smithsonian
Conservation Biology Institute

GEORGETOWN UNIVERSITY
Georgetown College
Department of Biology

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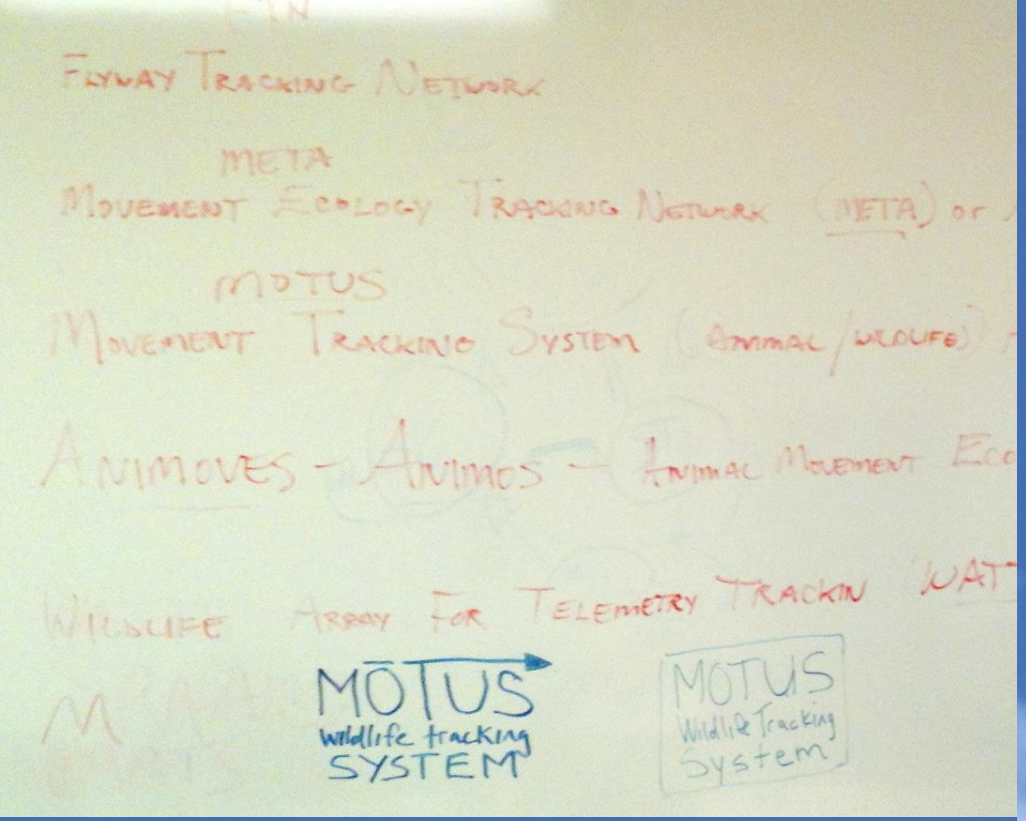

MŌTUS
wildlife tracking
SYSTEM

Motus

By the Numbers

- 4 — Continents (of 7)
- 31 — Countries with Motus receiver stations
- 1,269 — Motus receiver stations
- 264 — Species tagged
- 30,630 — Animals tagged
- 445 — Projects to date
- 1,187 — Motus Partners and Collaborators
- 129 — Publications based on Motus data

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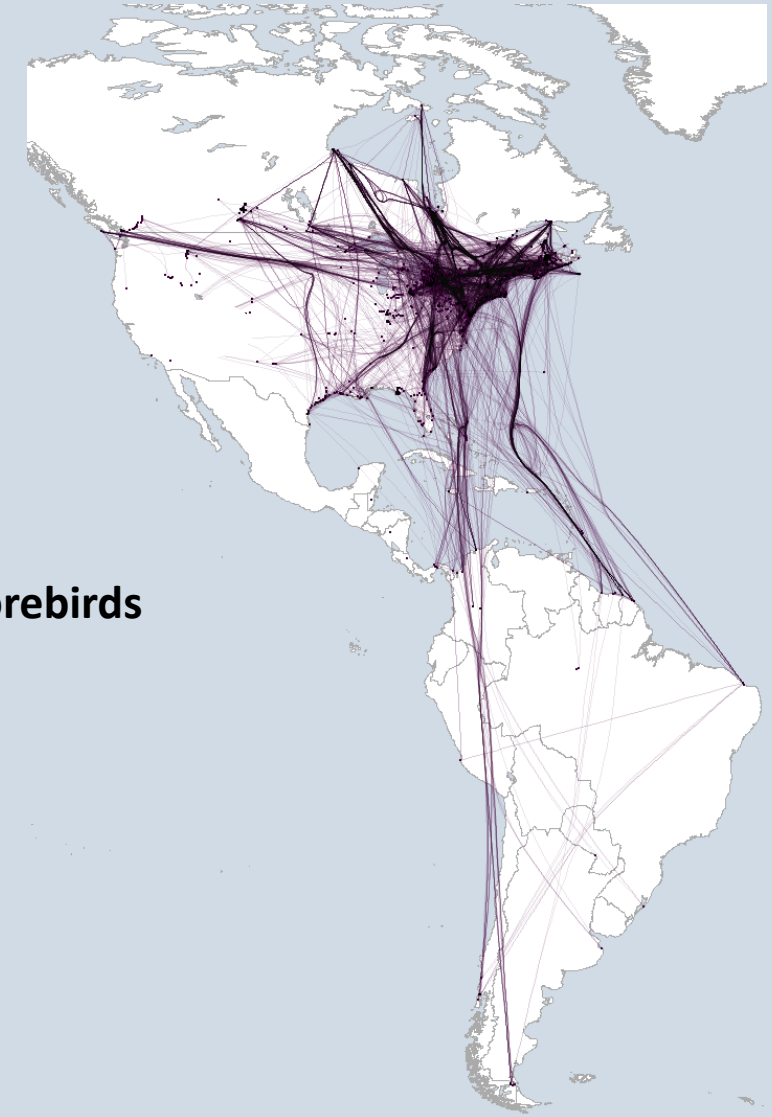
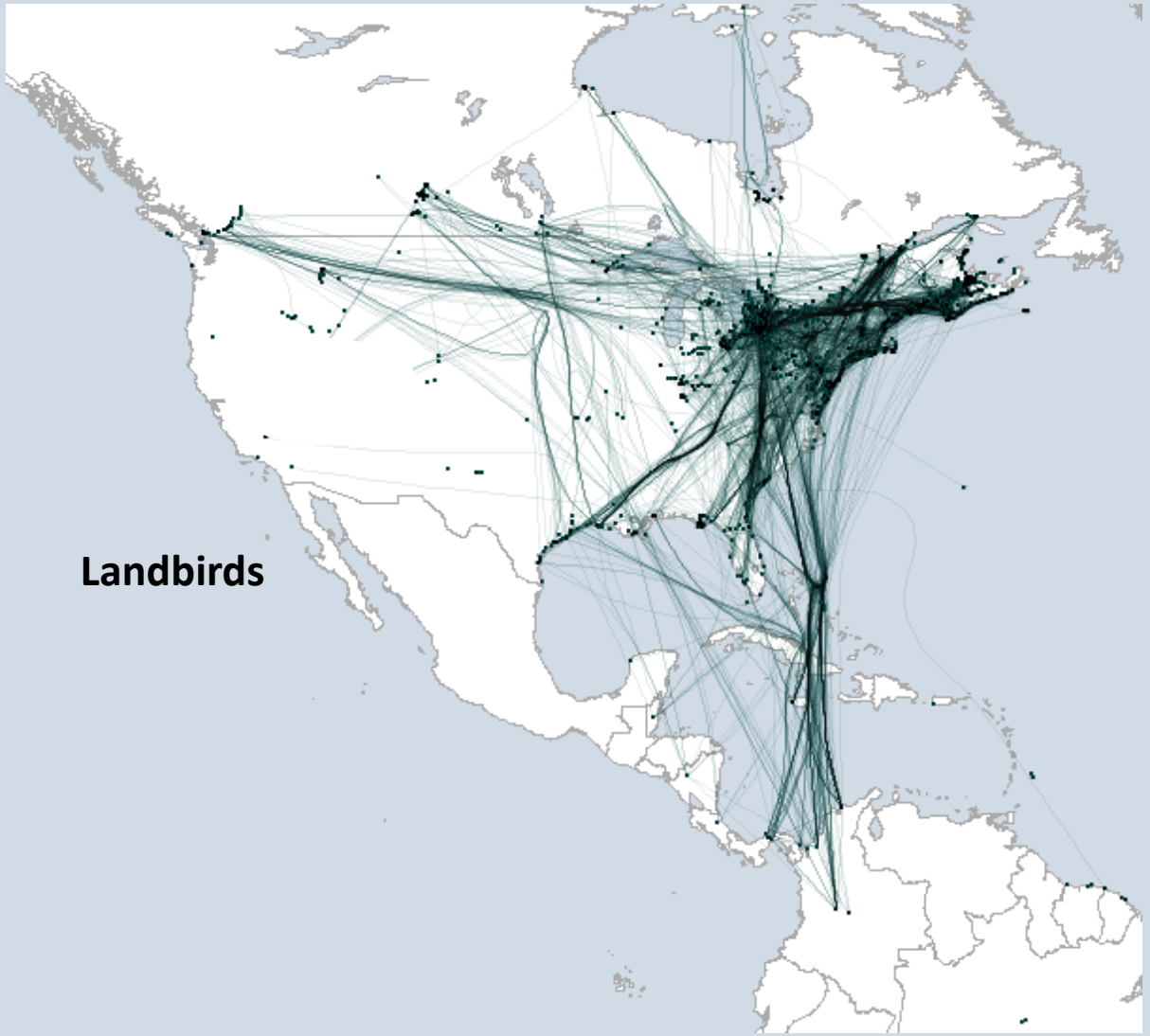
Wildlife Tracking System

BIRDS CANADA



Shorebirds



Landbirds

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ATLANTIC OFFSHORE WIND ASSESSMENT PORTAL

GOALS:

- Collaboration platform & data hub for offshore wind monitoring projects
- Ensure open and robust data access, storage, and standardization
- Provide summary-level reports of information needed to support offshore wind assessments at site specific and regional scales
- Coordinate timely access to detailed data from offshore wind monitoring projects for use in assessments

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OFFSHORE MOTUS DATA FRAMEWORK

OBJECTIVES:

- Develop Atlantic Offshore Wind Assessment Portal (AOWA Portal) within Motus to coordinate information among projects collecting data for offshore wind assessments in the U.S. Atlantic

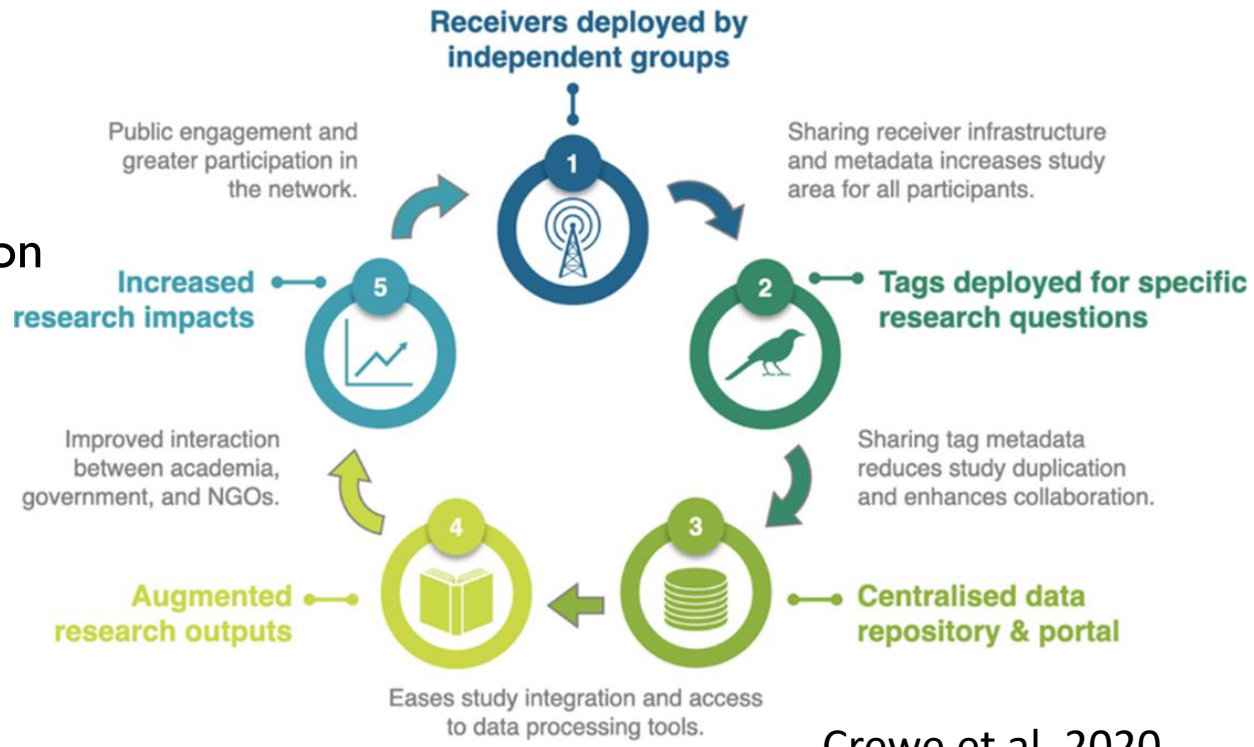
- Establish minimum standards and centralized data management for various types of data within the AOWA Portal, including: station metadata, calibration data, tag metadata, tag detection data, station health data and station maintenance data

- Develop framework for automated report generation to provide standardized, transparent, and timely summary-level information for offshore wind assessments and other monitoring efforts

Atlantic Offshore Wind Collaborative

Why Join – Why work together?

- use of data management tools available through Motus
- sharing of metadata and detection data, transparency
- a positive feedback loop of information and participation
- broader contribution to conservation science
- permanent data archive
- legislative requirements



Crewe et al. 2020

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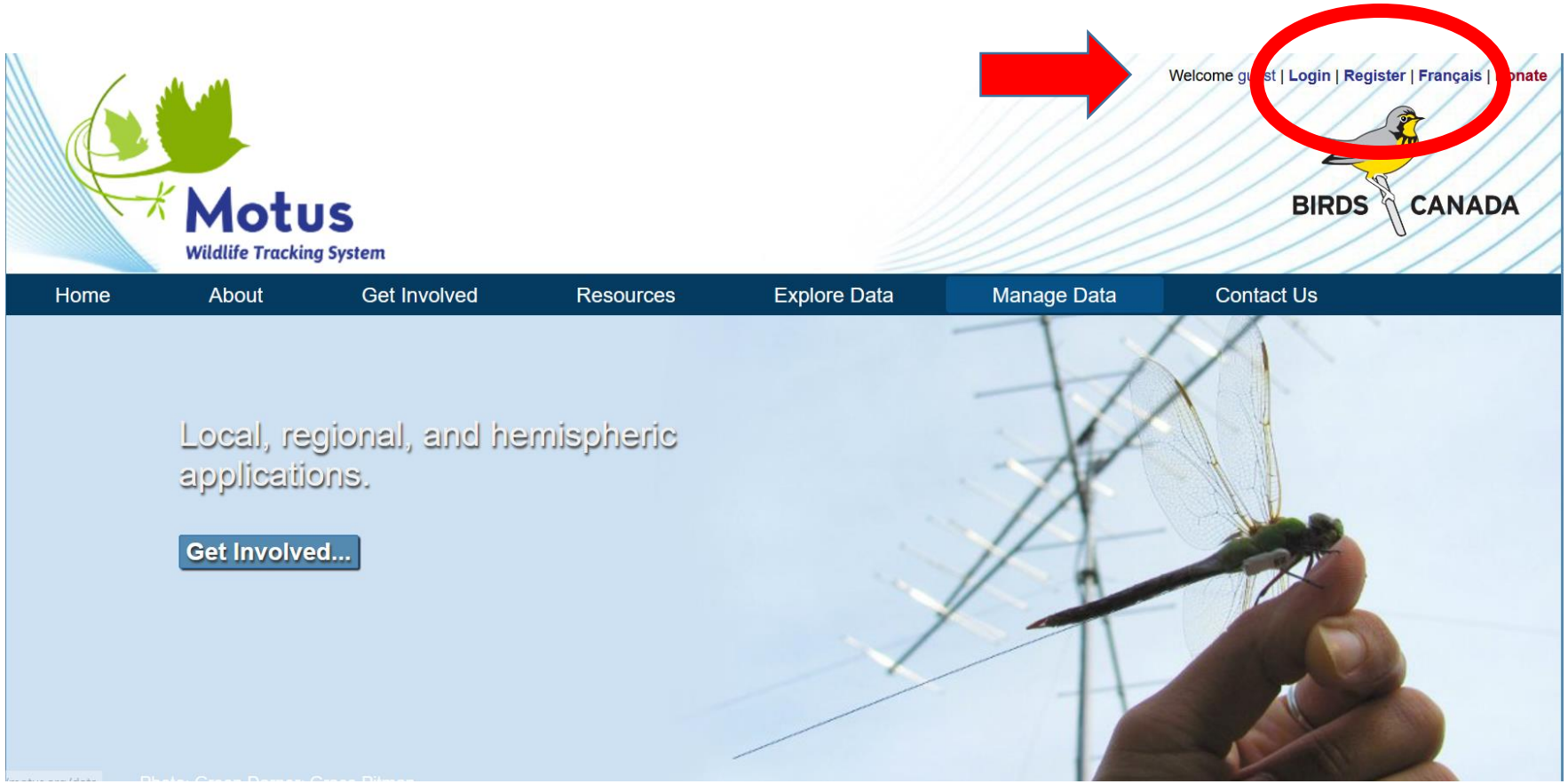
JOINING: Atlantic Offshore Wind Collaborative

How to Join:

Step 1 – Register

Step 2 – Create Project

Step 3 – Assign Group



Citation

The current citation for this project. You may manage your citation here.:

Loring, P. Atlantic Offshore Wind Pilot (Project350), 2021-2021. Data accessed from Motus Wildlife Tracking System, Birds Canada. Available: https://motus.org/. Accessed: 2021-11-23

Data sharing

More information about data sharing and attribution can be found in the Motus Collaboration Policy. By registering tags with Motus you have agreed that all summary level data will be open to the public unless specifically exempt.

Use the options below to set your project's data permissions.

Open Data: All tag detections, receiver GPS and activity data will be publicly available for visualization and download. A record of when project data has been accessed, and by who, is available on the project management page.

Open Summary Data: Daily summaries of tag detections, not individual detections, station GPS and activity data will be visible to the public. Motus collaborators that detect your tags on their receivers will have access to your tag detection data on their receivers only. By registering tags with Motus you are agreeing to this level of data sharing unless specifically exempt.

- (•) Open Data
- ( ) Open Summary Data

Primary contact

Pam Loring, U.S. Fish and Wildlife Service

Administration (including fees) of this project is managed by

Atlantic Ocean Offshore Wind Assessment

Save Cancel

The Motus Collaboration Policy

The Motus collaboration policy is intended to maximize efficacy of Motus data for science, conservation and wildlife and resource management.

By registering a receiver or tag with Motus, collaborators agree to the terms of the policy.

Open Data: All tag metadata, station metadata, and **summary** tag detection data is open and used for public visualization, **download**, and augmented data products.

- Data access is only available for registered collaborators.

collaborators control access to detailed detection data for up to 3 years

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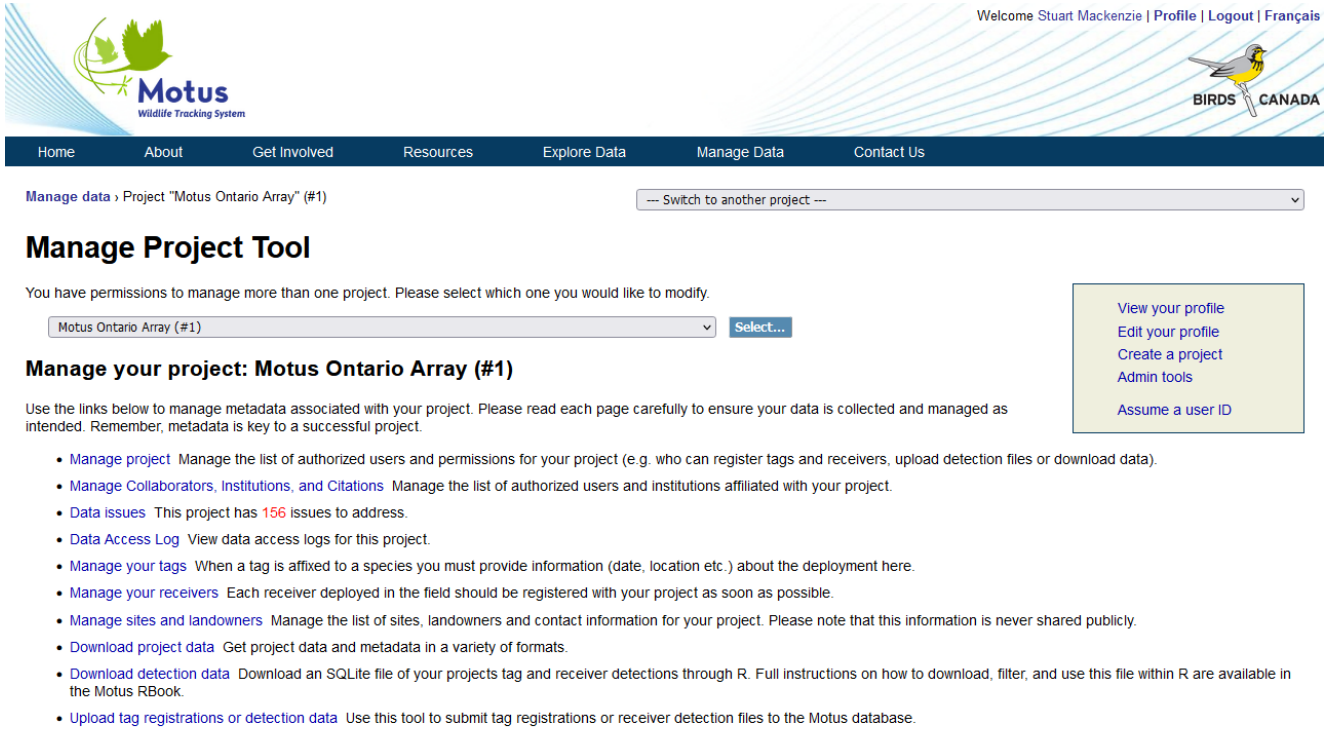
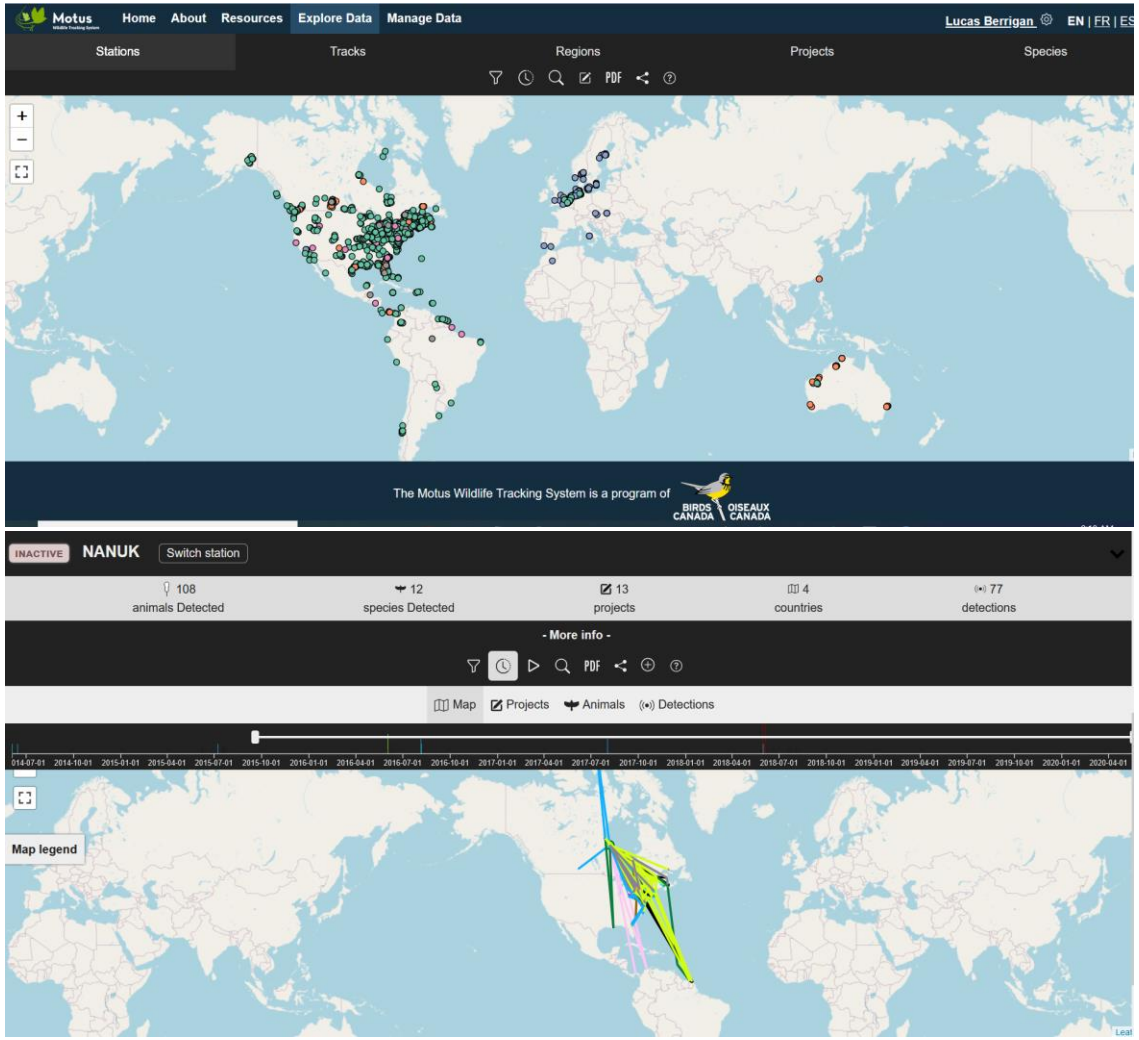
PROJECT MANAGEMENT AND REPORTING TOOLS





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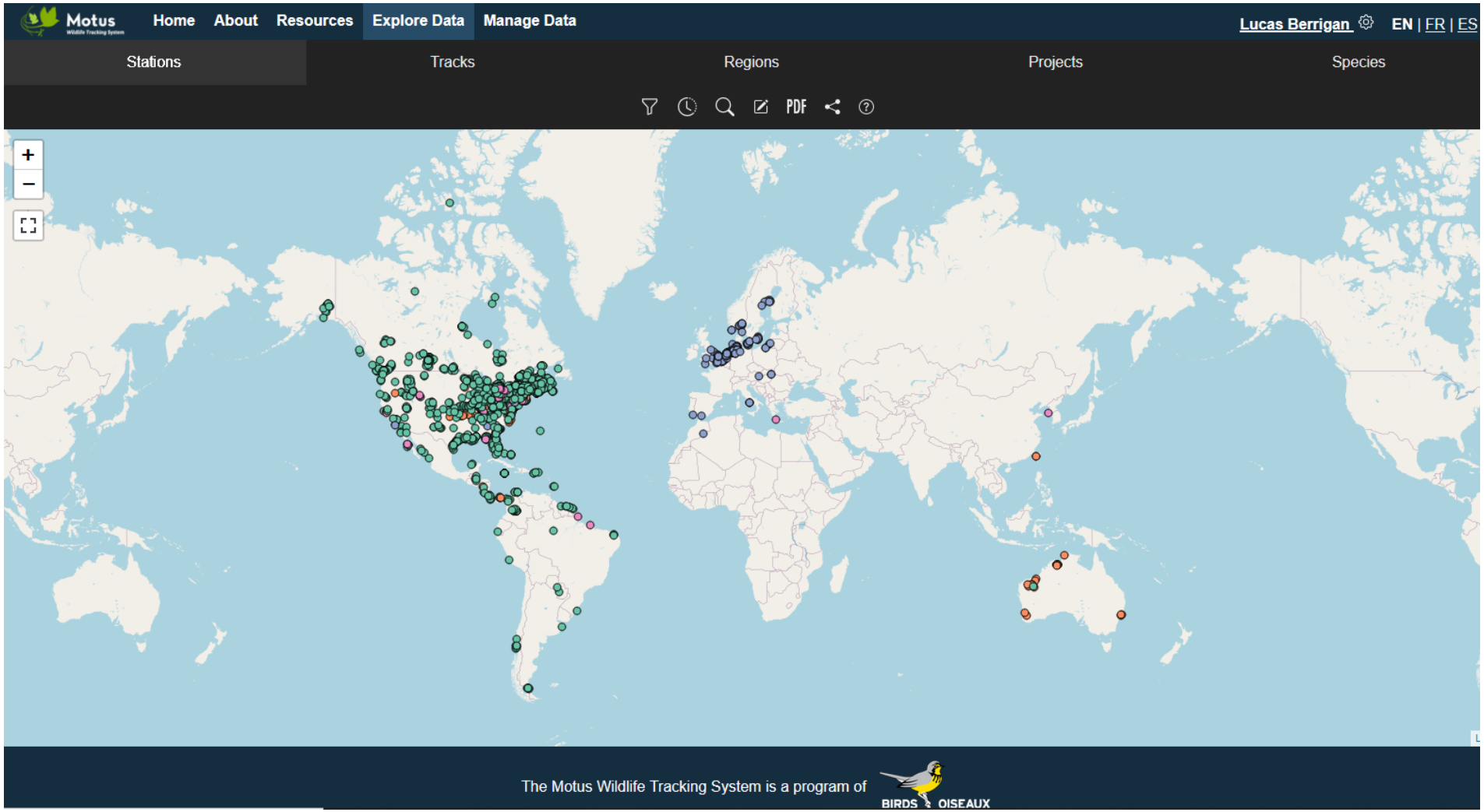
EXPLORE DATA PORTAL



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AUTOMATED REPORT TEMPLATES

Station: Cordova

Location: 60.4076, -145.5052

Start Date: April 21, 2021

Report Date: November 09, 2021

Number of species detected: 3

Number of individuals detected: 27

The table below summarizes all tagged animals that have been detected at this station during its operation. In an effort to remove false positives (where background radio static can resemble the signature of a tag) only tags whose signals were detected at least four consecutive times are included in this summary. Click on the link to view more details about each tag deployment on the Motus website, such as where it was tagged, the project that tagged it, as well as an overview of all the other stations that have detected this same tag.

Show 10 entries Search:

	Species	Date Detected	View on Motus.org
1	Western Sandpiper	2021-06-28	View on Motus.org
2	Western Sandpiper	2021-05-28	View on Motus.org
3	Western Sandpiper	2021-05-25	View on Motus.org
4	Dunlin	2021-05-21	View on Motus.org
5	Western Sandpiper	2021-05-21	View on Motus.org
6	Western Sandpiper	2021-05-21	View on Motus.org
7	Western Sandpiper	2021-05-20	View on Motus.org

DATA ACCESS, QUALITY ASSURANCE

Data Access	QCAC
The Motus R-Package and Book	• All data made available to collaborators. Tools and guidelines for data visualize, cleaning, analysis.
Online reporting tools and downloads	• 'Public' summary data screened at a high level for false positives and incorrect data. Heavily dependent on user-defined metadata and management.
Publications	• Collaborator driven cleaning and analysis. (*not currently fed back into the system*)
Augmented data products	• Collaborator driven cleaning and analysis. (*not currently fed back into the system*)

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BREAKOUTS/FEEDBACK

Initial feedback? Did you find the reports easy to read and process? Did any of the aesthetic choices make it difficult for you to understand the report?

Who is the target audience for automated reporting in your organization?

What would you use the reports for? 1) Static, 2) Dynamic

What should be included in dynamic online reports versus the static pdf reports?

Gaps/anything missing?

Would having access to public data tools incentivize summary-level data sharing?

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Short Break – Back at 2:10 ET

Breakout Groups (2:10 - 2:40 ET):

- Goal: feedback on automated reports (e.g. site specific and regional)
- Reconvene at 2:40 ET with a group discussion on key feedback
- Groups assigned randomly and facilitated by a co-lead on project

Breakout Groups – Report out (2:40 - 2:55 ET)

- **Key feedback**
- **Any other ideas?**

Next steps

- Opportunities for more detailed feedback (spring 2022)
- Offshore Motus projects? Reach out!
- Summary report
- Upcoming workshops: monitoring framework (winter 2022), calibration methods (spring 2022) draft final products (summer 2022)
- Final products – fall 2022

Thank you!

Contact: Pam Loring (pamela_loring@fws.gov), Kate Williams (kate.williams@briwildlife.org)