

# Maine Research Array: Bird Siting Assessment Approach

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# Avian Data on Exposure Recap

## Regional Models

- MDAT

## Local data

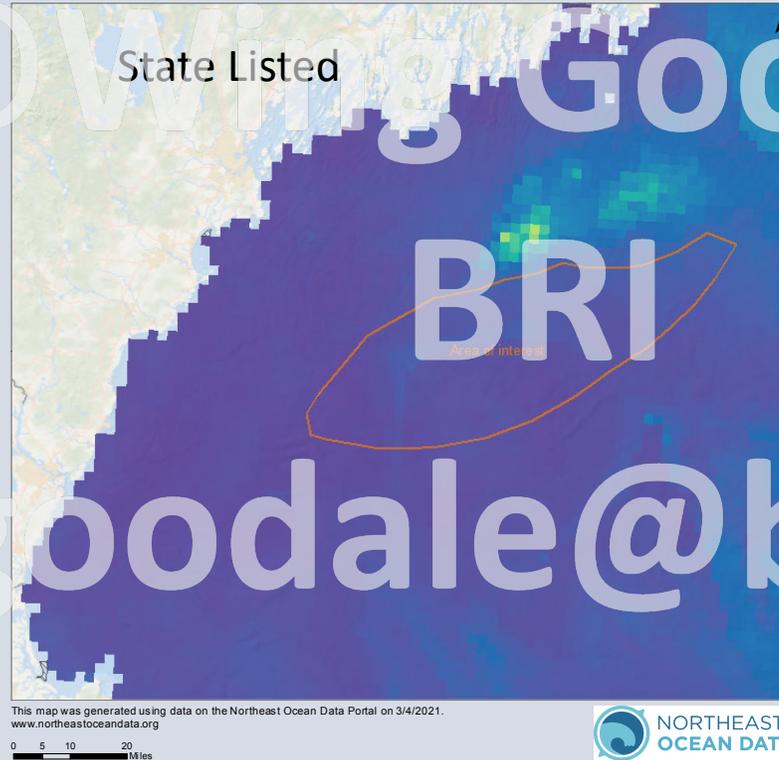
- Northwest Atlantic Catalog

## Tracking data

- Non-marine migratory
  - Songbirds
  - Raptors
  - Wading birds
- Marine
  - Colonial nesters
  - Migratory

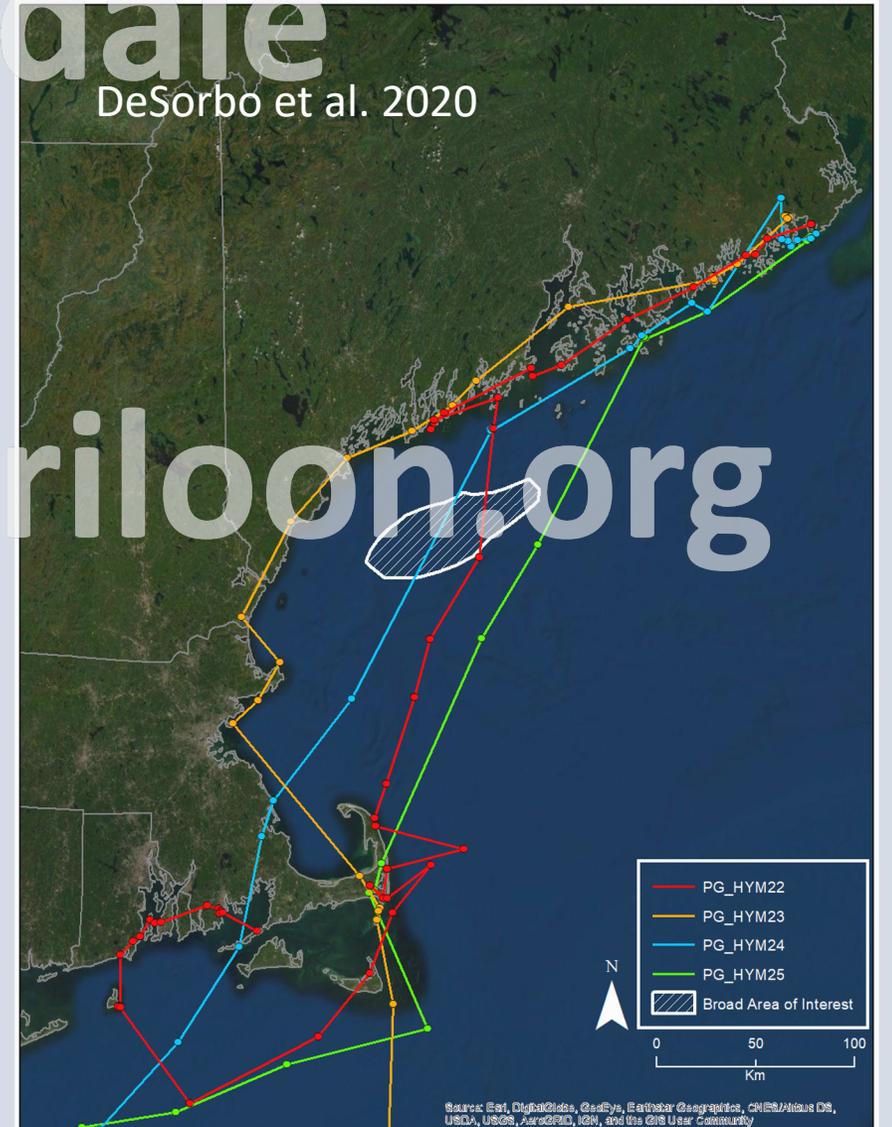
## Coastal use data

- Colonies
- Radar
- Stopover sites



## What can you learn from MDAT?

- Spatiotemporal use patterns
- Relative abundance
- Distribution
- Seasonal changes



# Avian Data on Exposure: Catalog Data

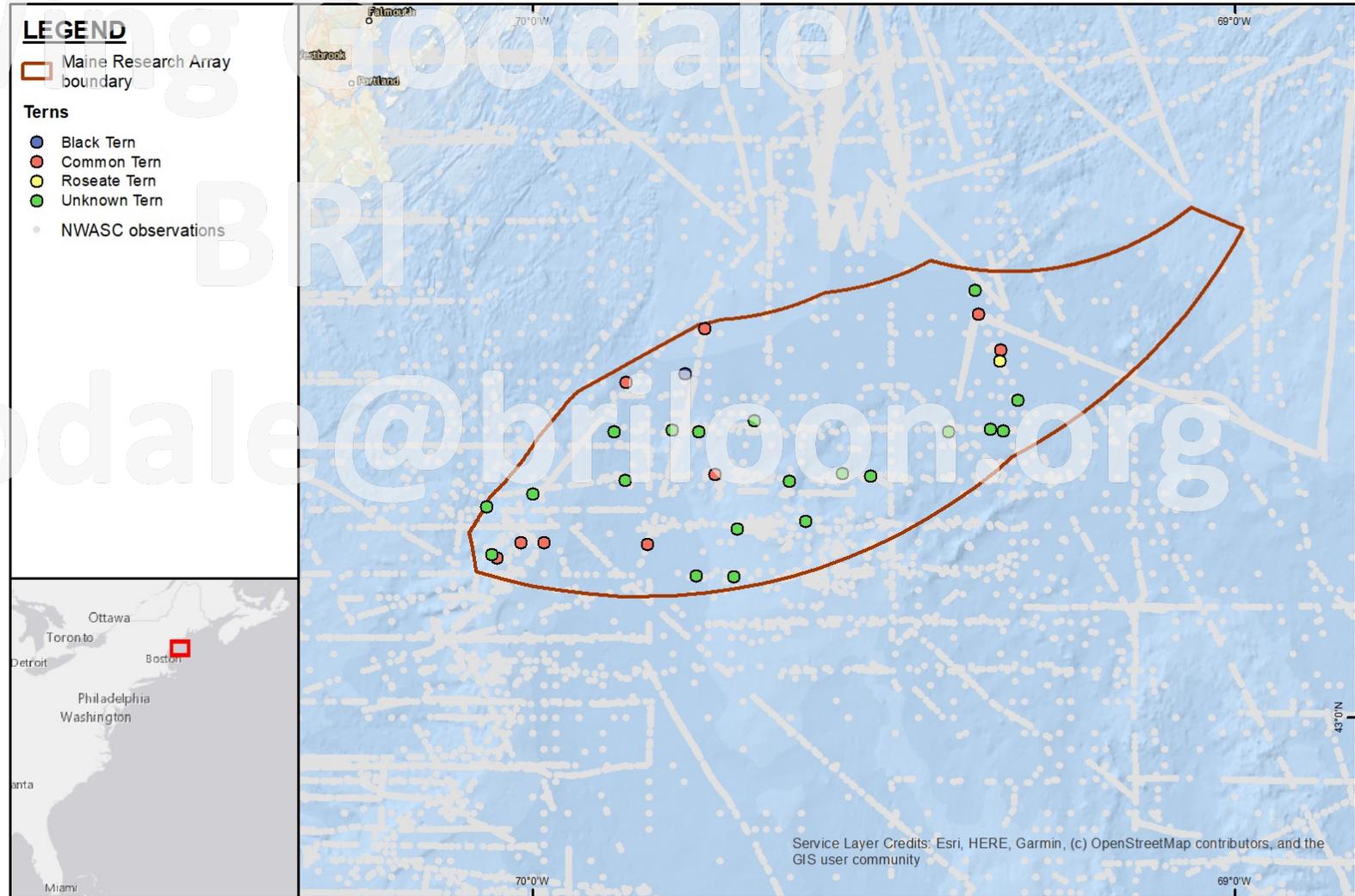
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## Northwest Atlantic Seabird Catalog

- Some local data used in MDAT models
- Inconsistent effort
- Old data
- Poor spatial coverage



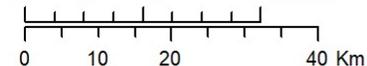
Produced by:  
A. Gilbert

Version date: 3/25/2021

Document: MEResearch\_Array\_NWASC\_terns



0 5 10 20 Miles



Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Terns in the NWASC Observations  
in the proposed Maine Research Array  
Offshore southern Maine

# Step 1: Spatial Assessment with MDAT Model

## Spatial Analysis with MDAT

- Currently species are weighed equally
- Will combine based upon vulnerability
- Based upon methods used by Kelsey et al. 2018 and others

$$\text{Population Vulnerability(PV)} = (\text{POP} \pm \text{POPu}) + (\text{AO} \times (\text{POCSpop} \pm \text{POCSpopu})) + \text{TS} + (\text{BR} \times (\text{AS} \pm \text{ASu}))$$

$$\text{Collision Vulnerability(CV)} = ((\text{NFA} \pm \text{NFAu}) + (\text{DFA} \pm \text{DFAu}))/2 + (\text{RSZt} \pm \text{RSZtu}) + (\text{MAc} \pm \text{MAcu})$$

$$\text{Displacement Vulnerability(DV)} = (\text{MA}d \pm \text{MA}u) + (\text{HF} \pm \text{HF}u)$$

## Collision

- Avoidance (literature)
- Time in RSZ (Catalog data)
- Flight activity (literature & Catalog)

## Displacement

- Avoidance (literature)
- Habitat flexibility (literature)

## Population

- Proportion population exposed (MDAT)
- Conservation status, including state Species of Greatest Conservation Need (SGCN)
- Adult survival (literature)

# Step 2: Covariate Considerations

## Considering relationships

- Physical or environmental factors related to bird relative abundance
- Included in MDAT models

## Conflicting & uncertain relationship

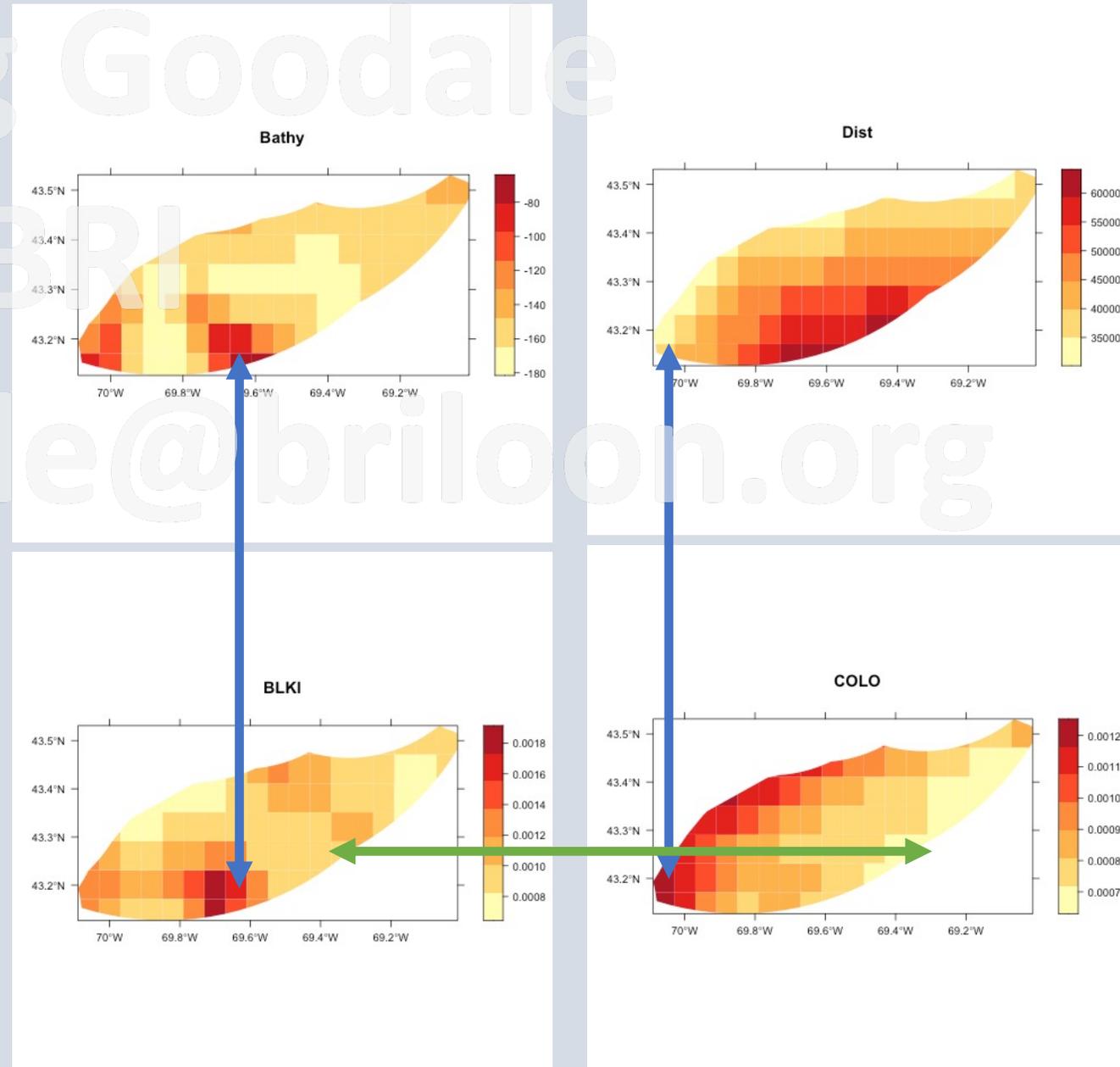
- Highly variable by species
- Some relations generally known
- But high uncertainty

## Species groups and life cycle

- Seabirds (breeding, wintering, migrating)
- Terrestrial migrants

## General heuristics possible for some species

- Further from shore; deeper water



# Step 3: Tracking and Other Data

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## How do we use tracking data?

- Migration routes
- Foraging areas, distance
- Phenology
- Qualitatively validate MDAT
- Presence of species not represented in MDAT  
(terrestrial migrants and bats)

## How do we use colony and other data?

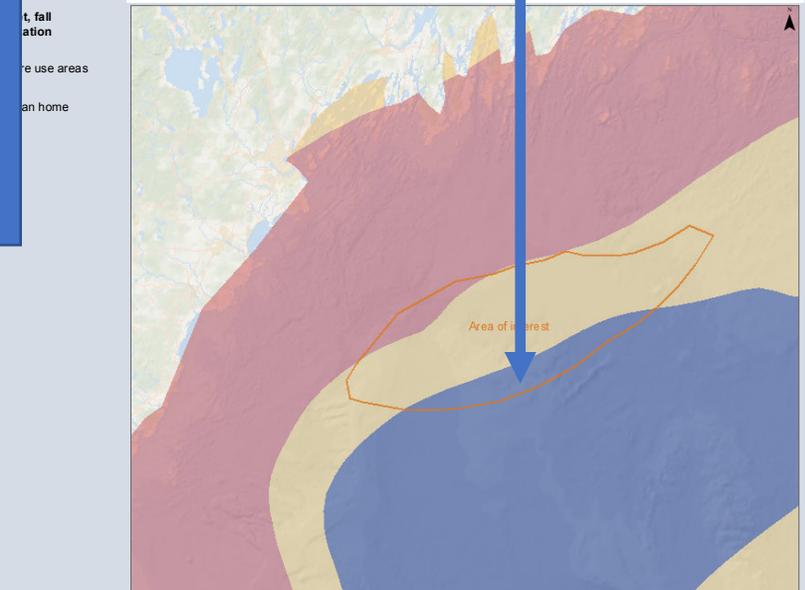
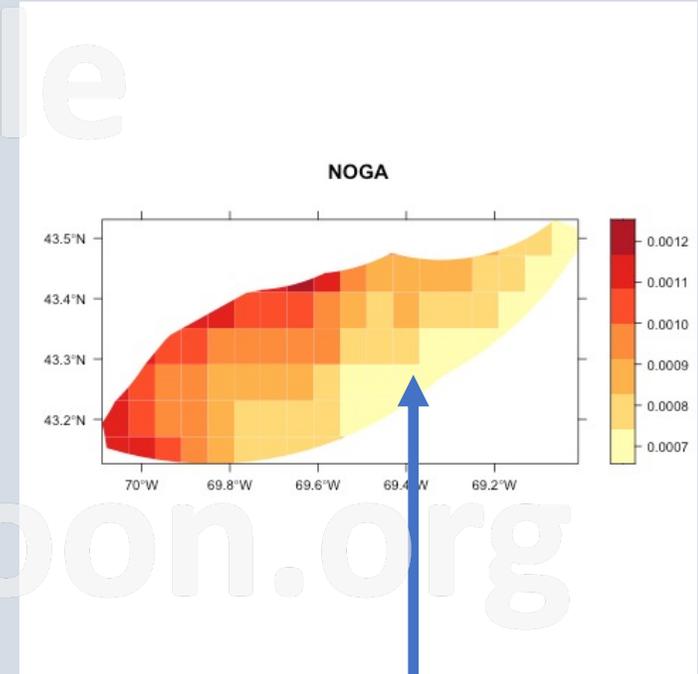
- Potential foraging areas
- Migration routes based upon ecology

### Prioritize monitoring for permitting

- Optimized survey methods

### Identify data gaps and research questions

- Exposure of terrestrial migrants
- Flight heights and avoidance rates



# Questions and Discussion

## MDAT analysis approach

- Questions?
- Feedback

## Use of covariates

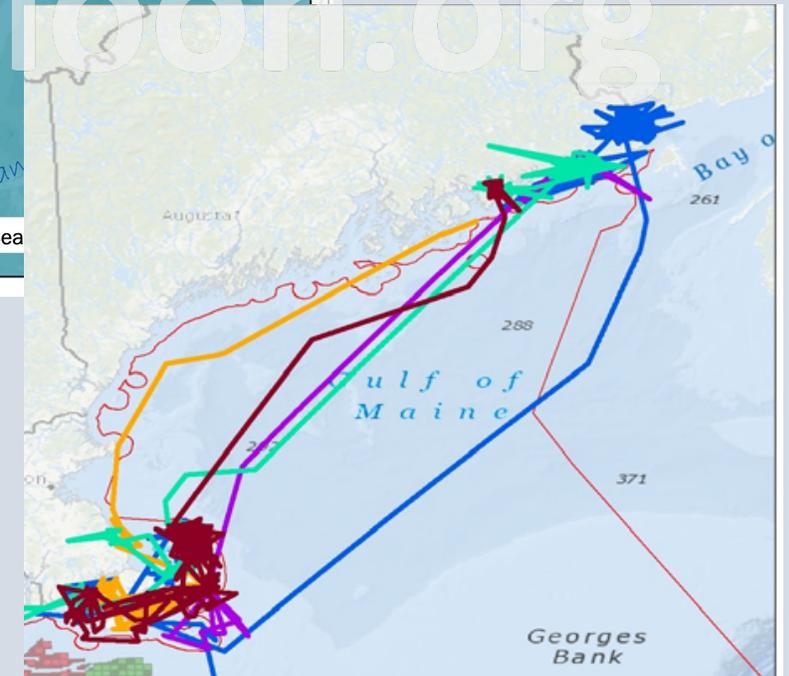
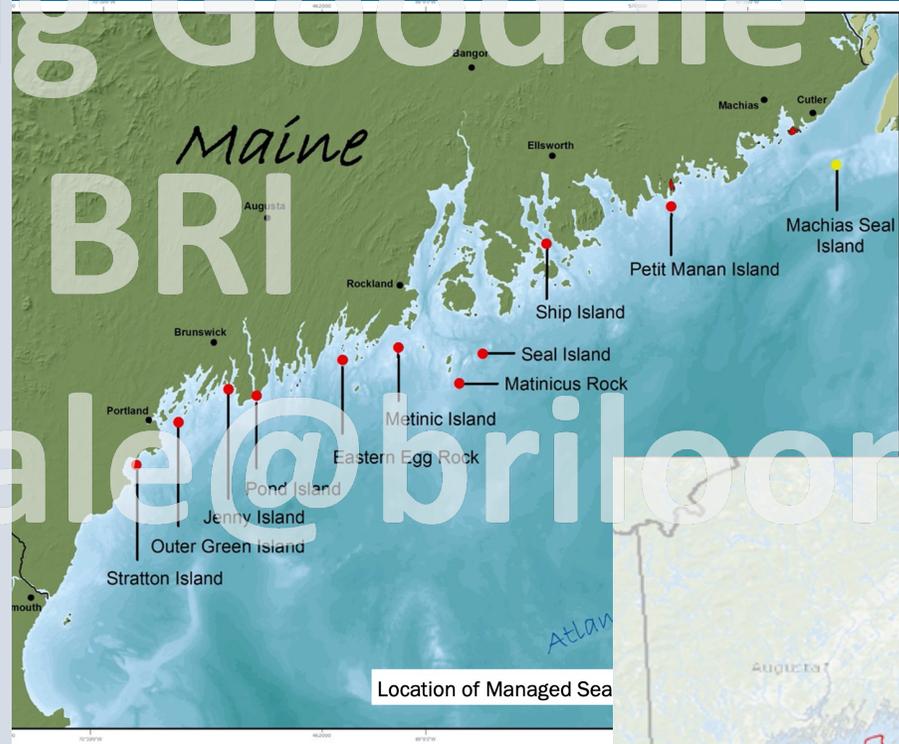
- Key relationships?
- Priority species?

## Priority monitoring for permitting

- We have time
- Priority species?

## Identify data gaps and research questions

- Priority questions?



Thanks! @Wing Goodale

Questions?

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