Bats at Sea: Results of Long-term Acoustic Monitoring at Islands, Coastal Sites, and Offshore Structures

WREN Webinar

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Stantec Consulting Services Inc.

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Today's Agenda

1 Approach and Methods

2 Results: when and where do bats occur offshore?

3 What are the implications for offshore wind?

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"Offshore" =
> 3 nautical miles from land

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1 Approach

- Survey sites with minimal influence of the mainland
  - Offshore structures
  - Remote islands
  - Coastal sites
- Quantify isolation as a gradient
  - Distance from mainland
  - % Land area within 3 nm
- Account for site characteristics
  - Forested habitat

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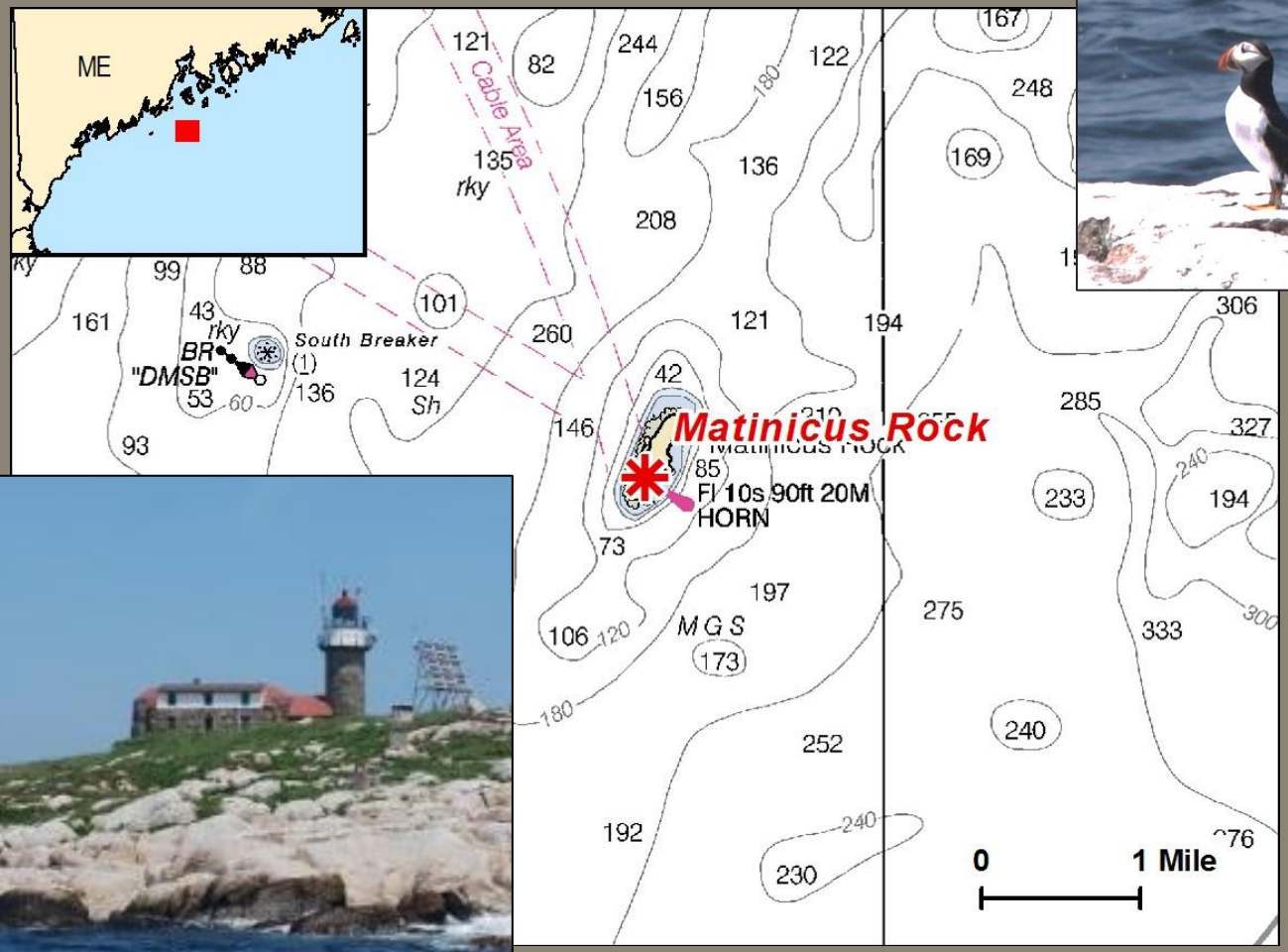
1 Approach



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Gulf of Maine (n = 24 sites)

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Great Lakes (n = 7 sites)

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Mid-Atlantic (n = 8 sites)

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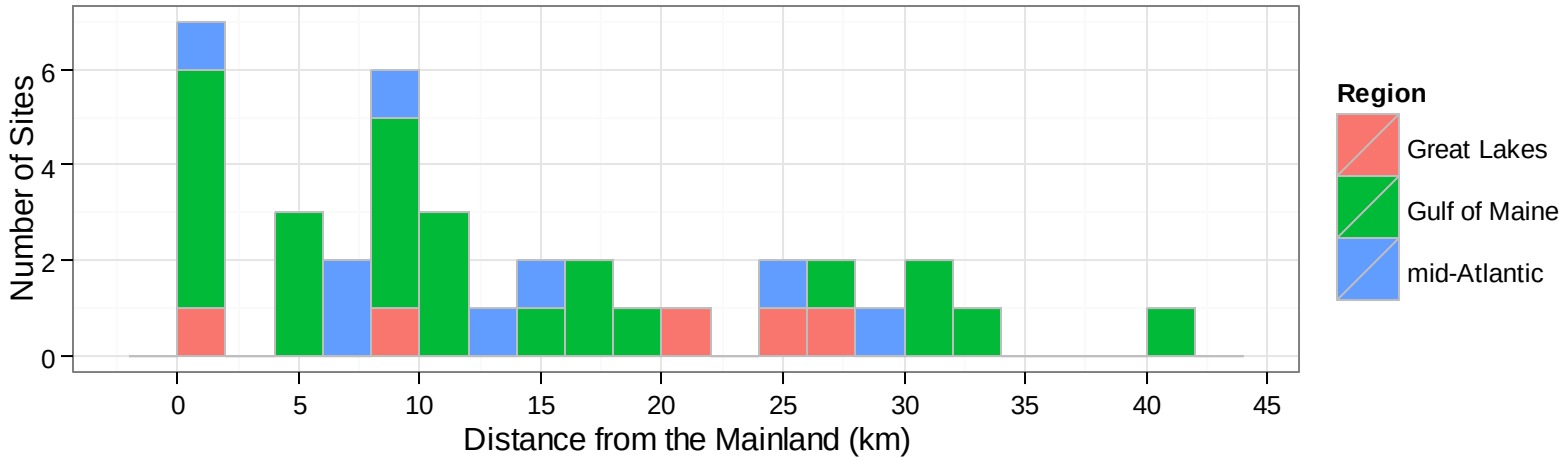
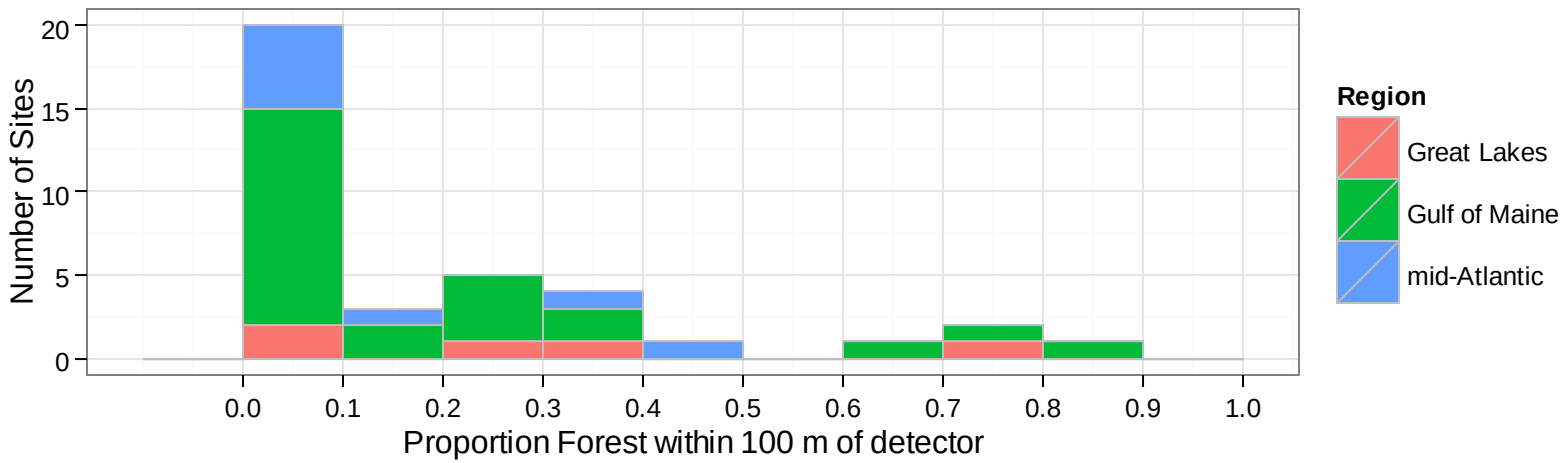
1 Where did we survey?





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1 Acoustic Metrics

- Standardized reporting period (15 July – 15 October); ≥ 30 nights
- Passes per night
- Percent nights with activity
- Evenness of activity among nights (Gini coefficient)
- All bats vs. species-specific

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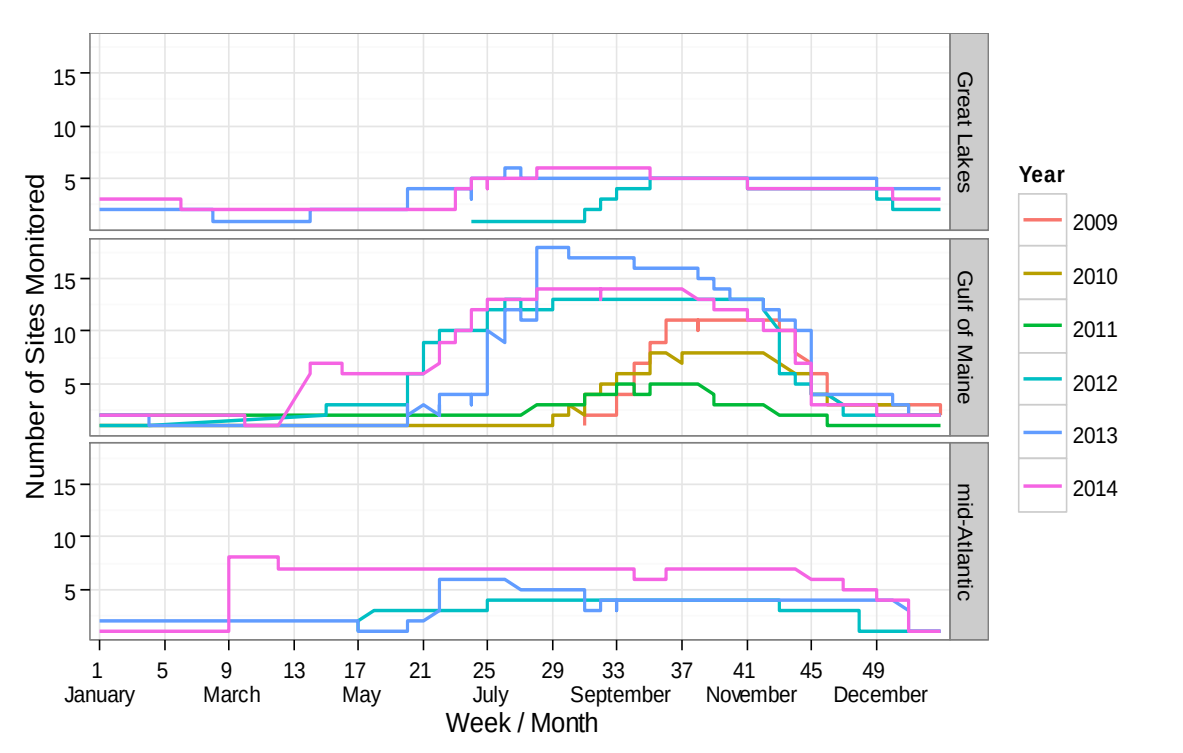
2 Results: Effort

- 38 Sites successfully monitored
- 17,730 detector-nights of data



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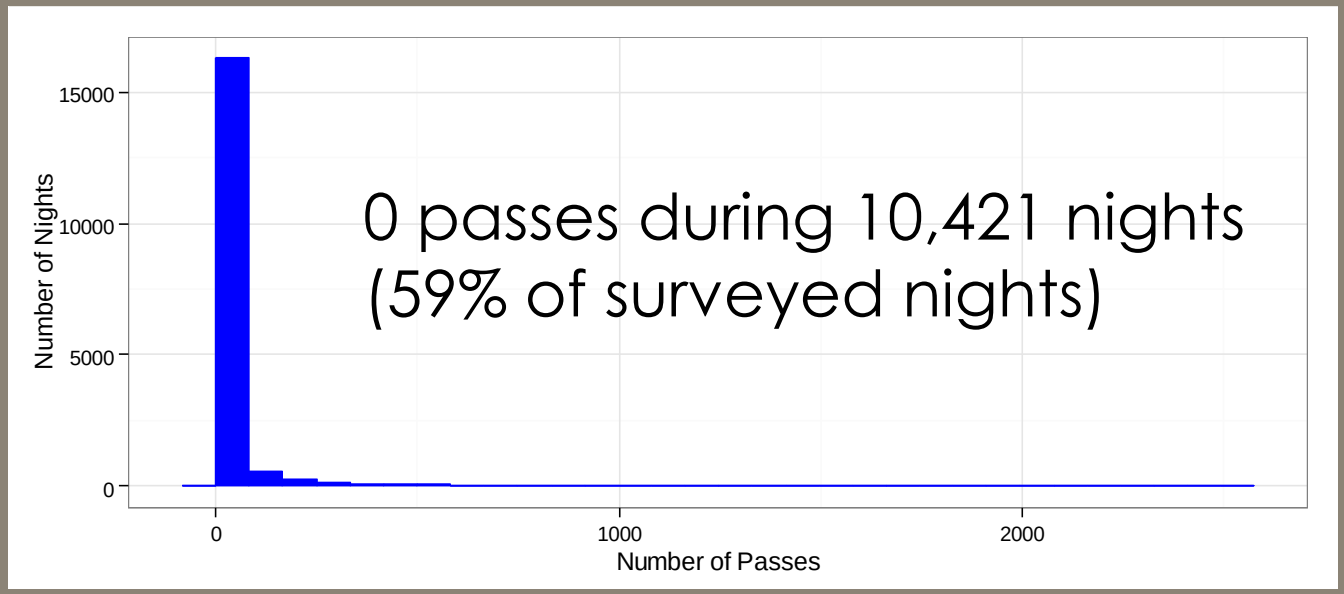
2 Results: When and Where?

- Everywhere, but not often
- Bats detected at all successfully surveyed sites in Gulf of Maine (n = 24), Great Lakes (n = 6) and mid-Atlantic (n = 8)



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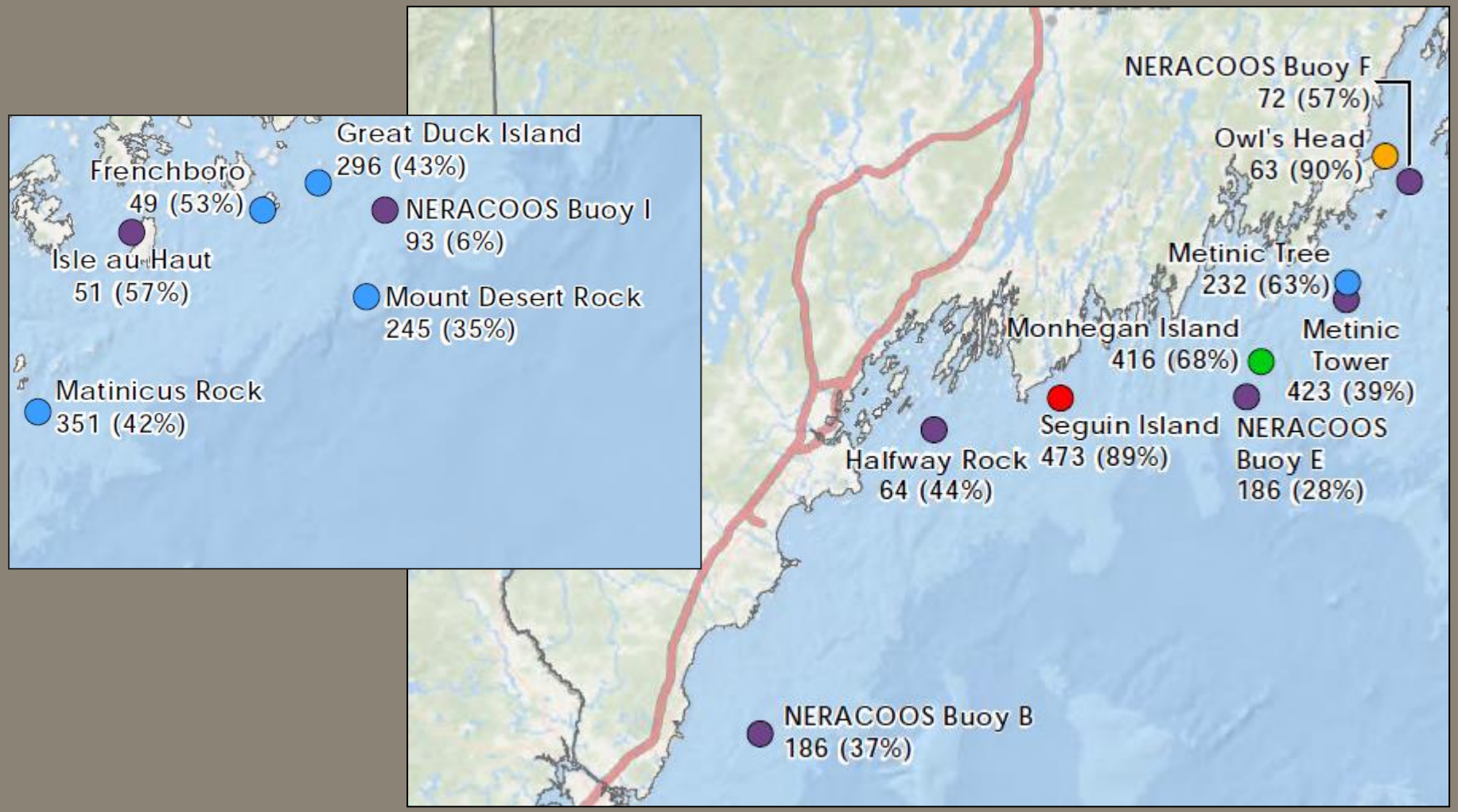
2 Results: When and Where?



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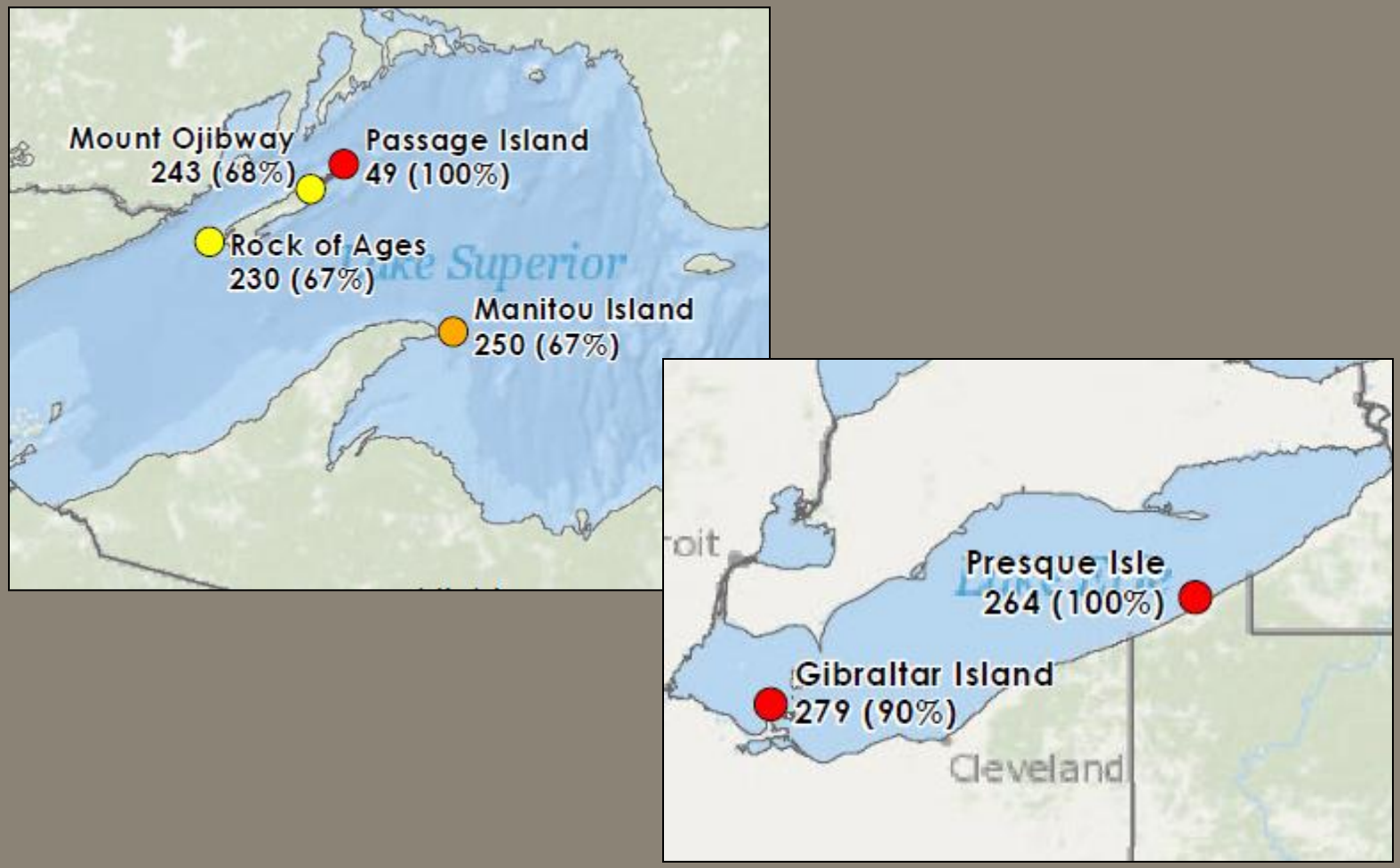
2 When and Where?



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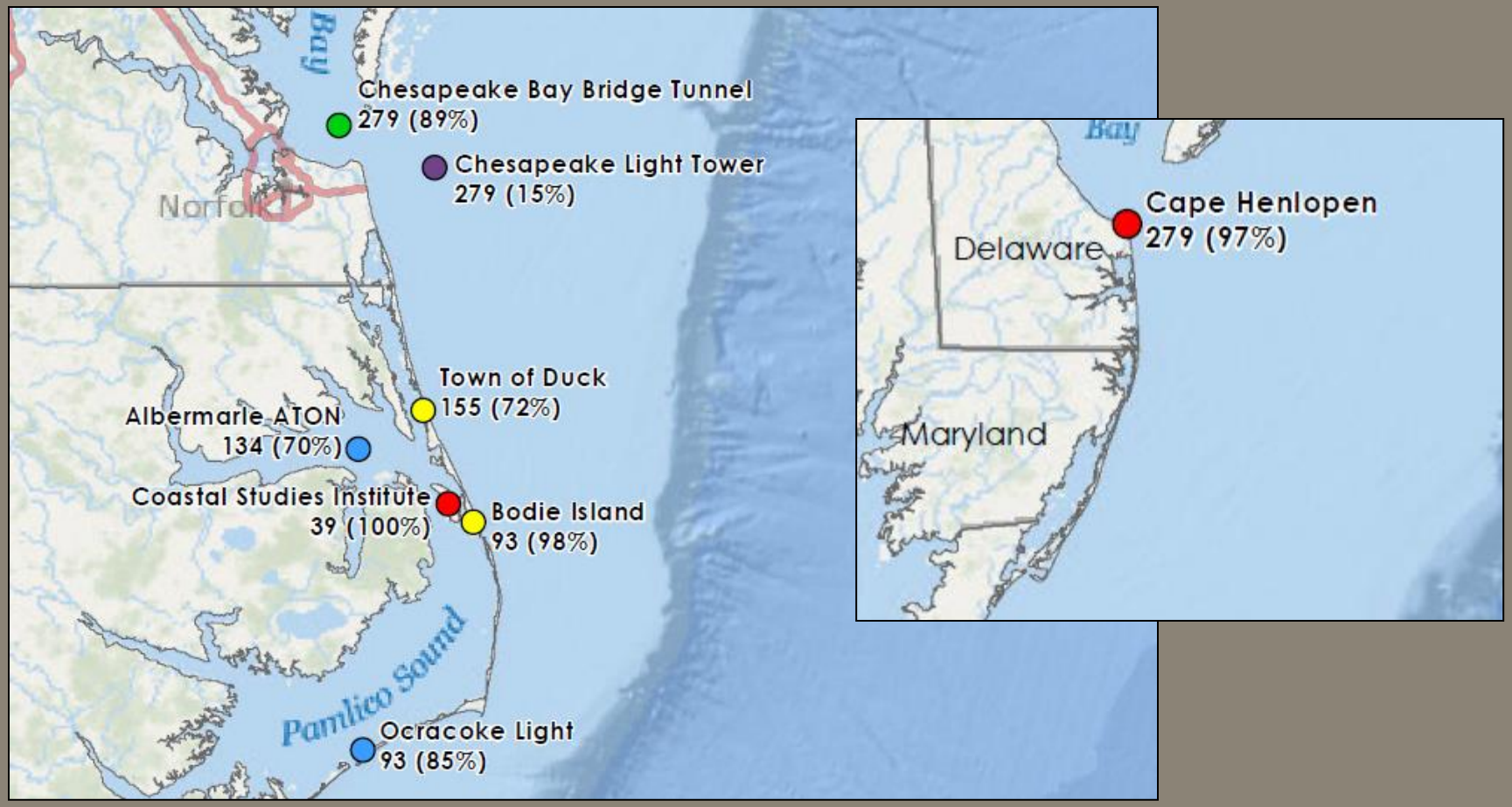

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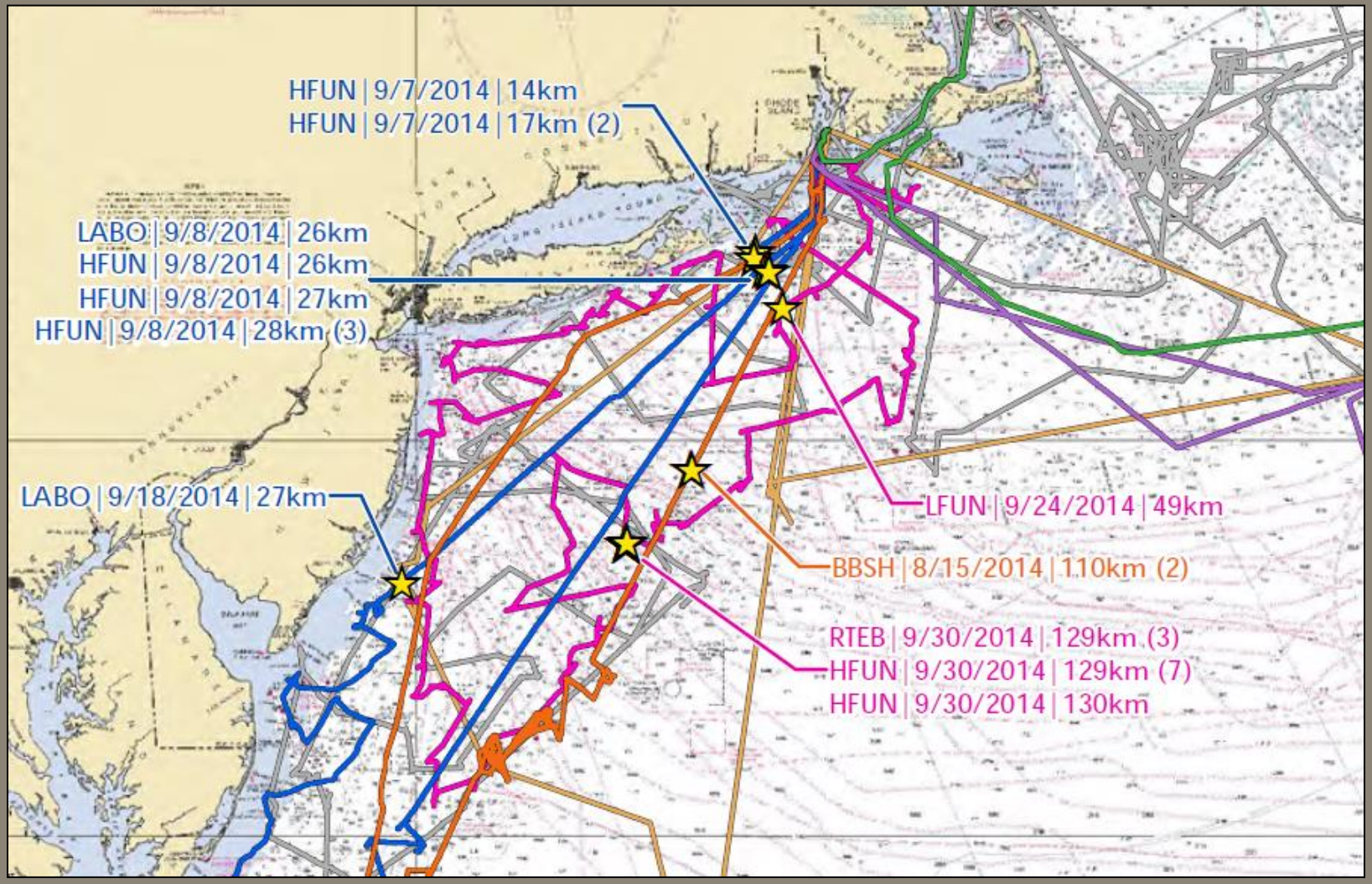

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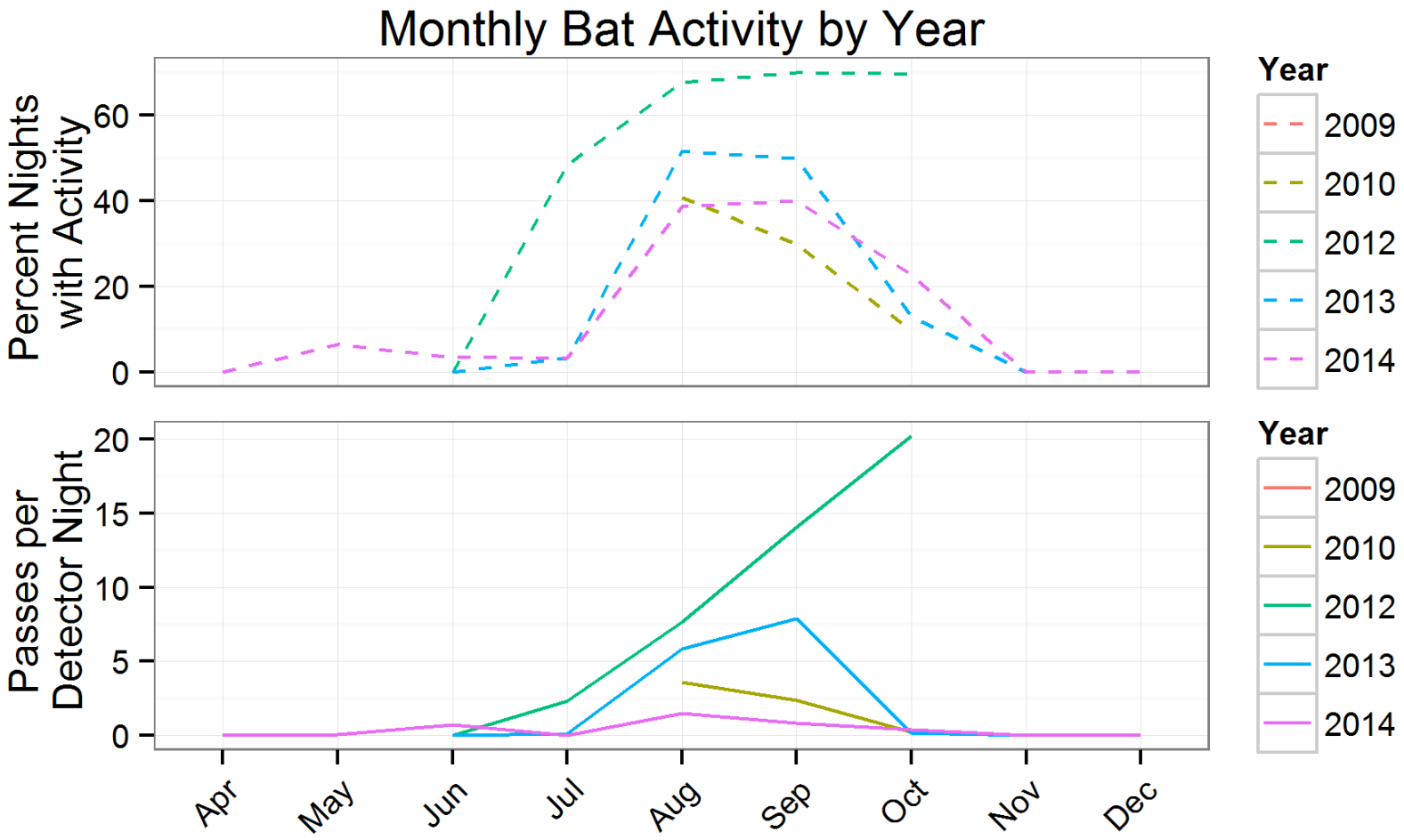
2 Matinicus Rock



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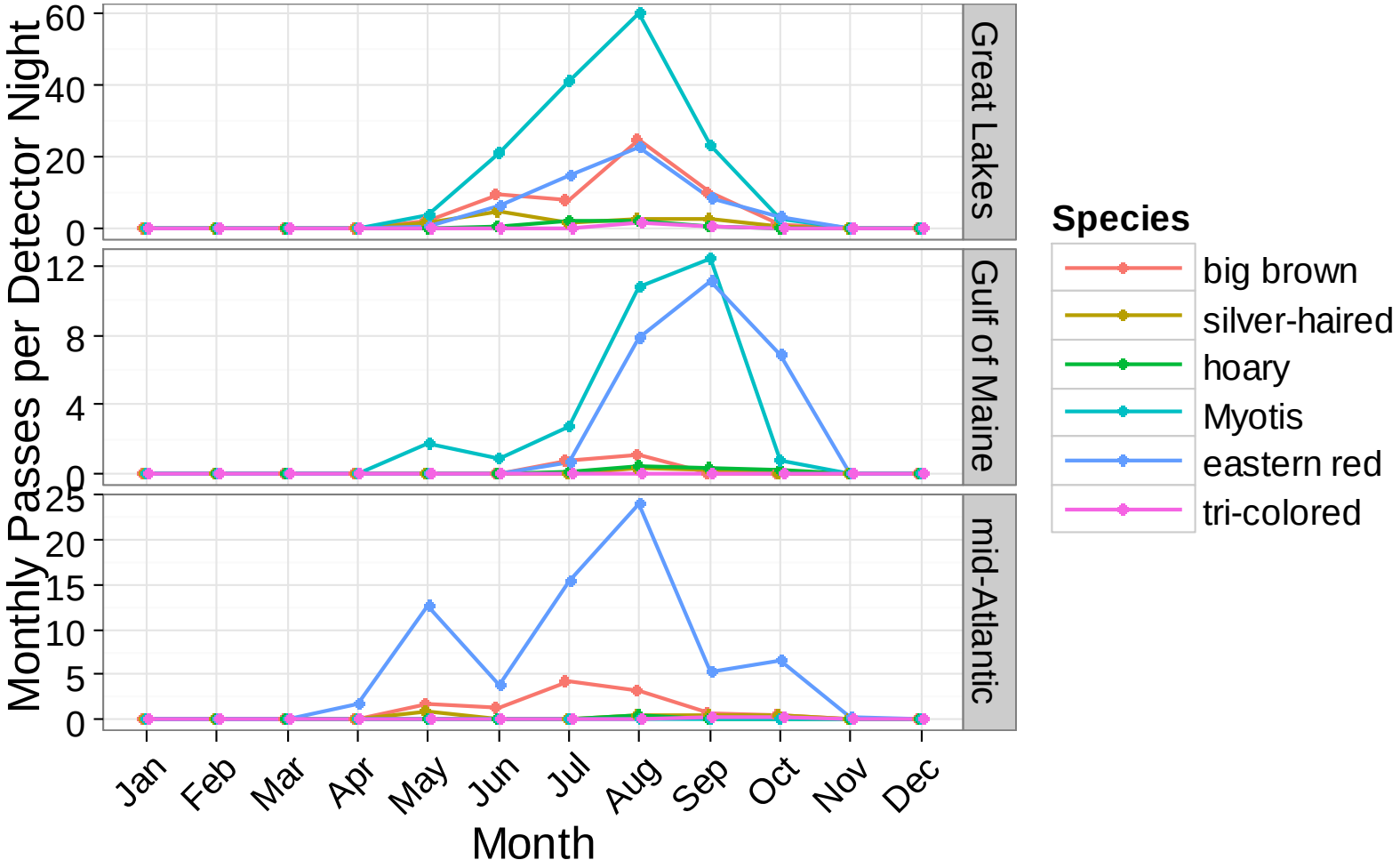
2 Seasonal Patterns



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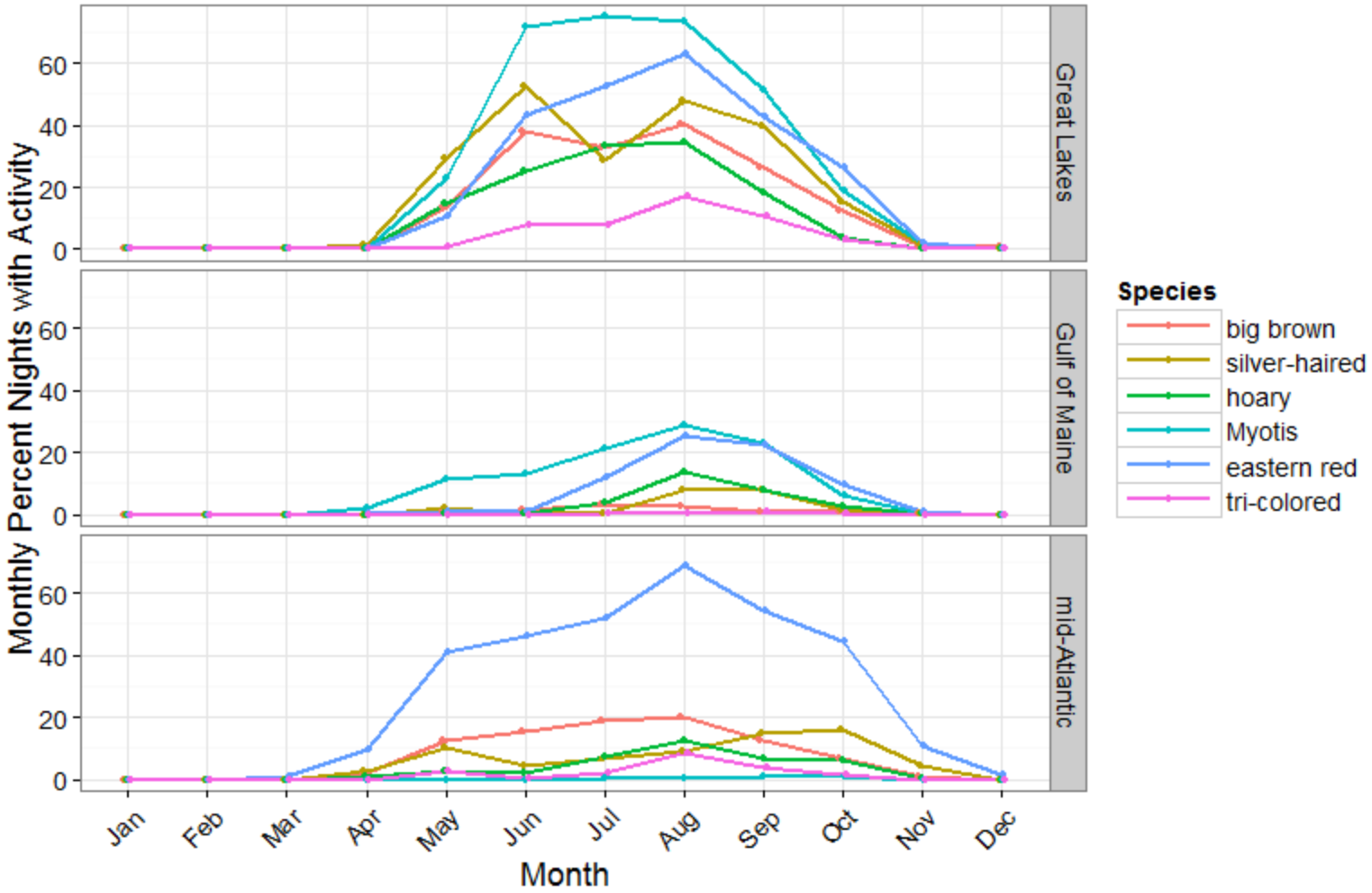

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Buoy Data

- 1,600 nights
- Bats detected during 15% nights (1 – 57% among buoys)
- 73% eastern red bats, 22% hoary bats

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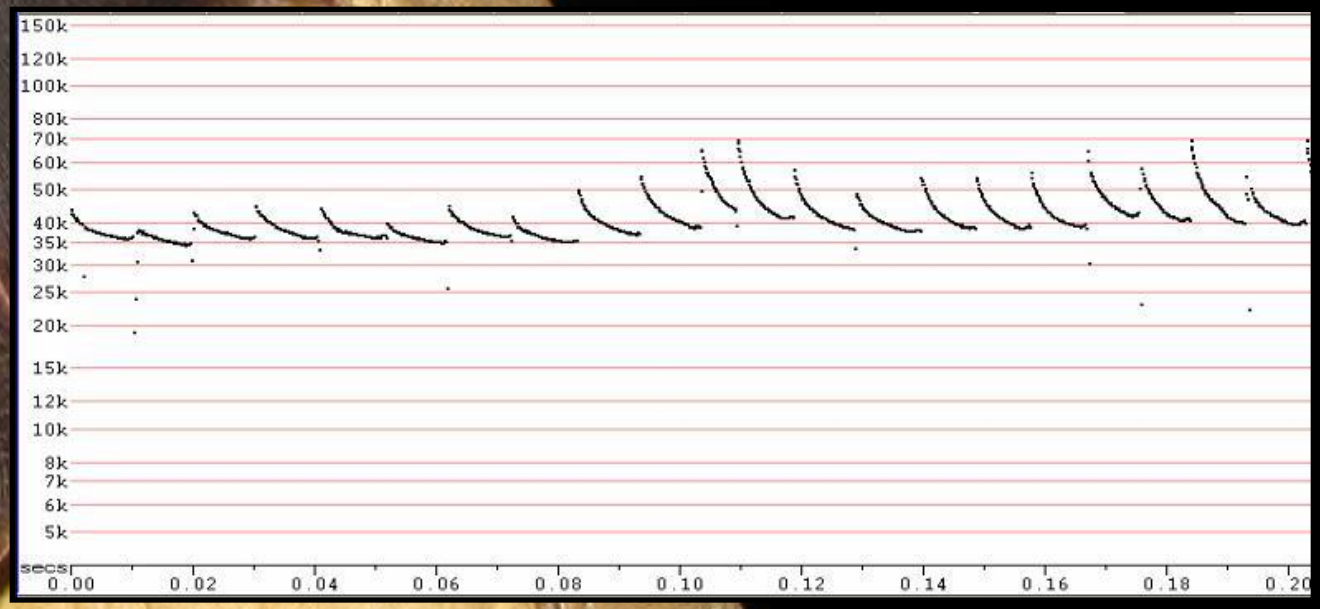
Eastern red bat (*Lasiurus borealis*)



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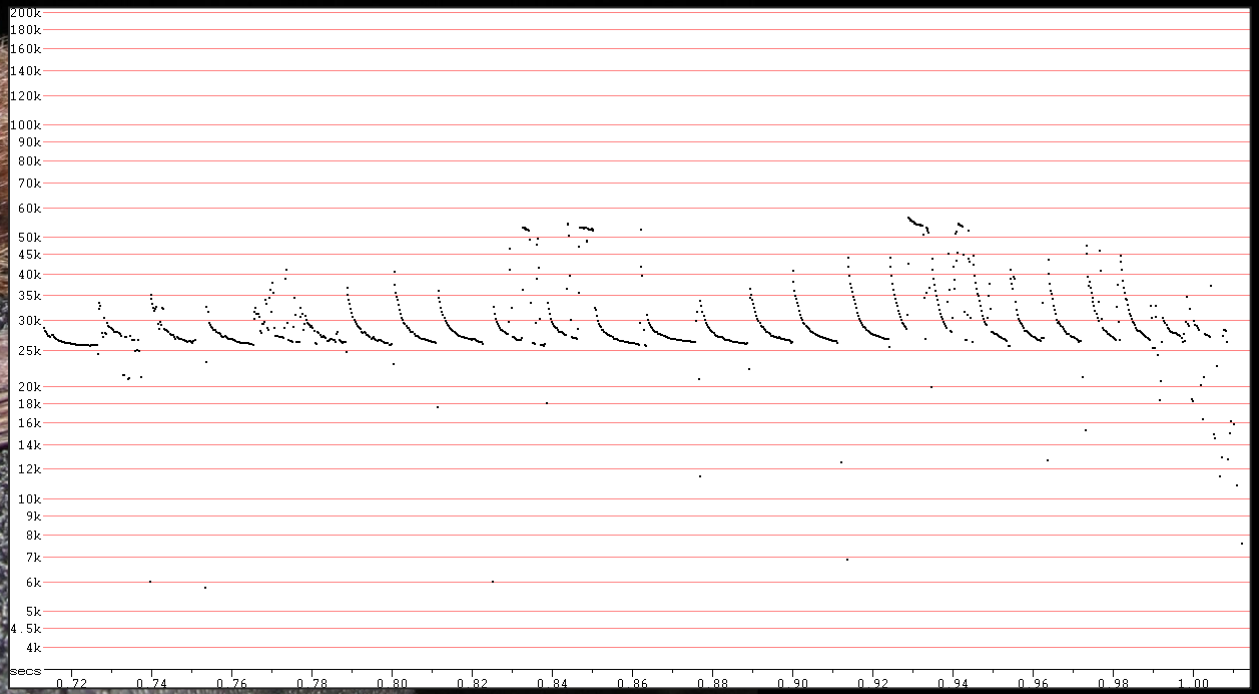
Silver-haired bat (*Lasionycteris noctivagans*)



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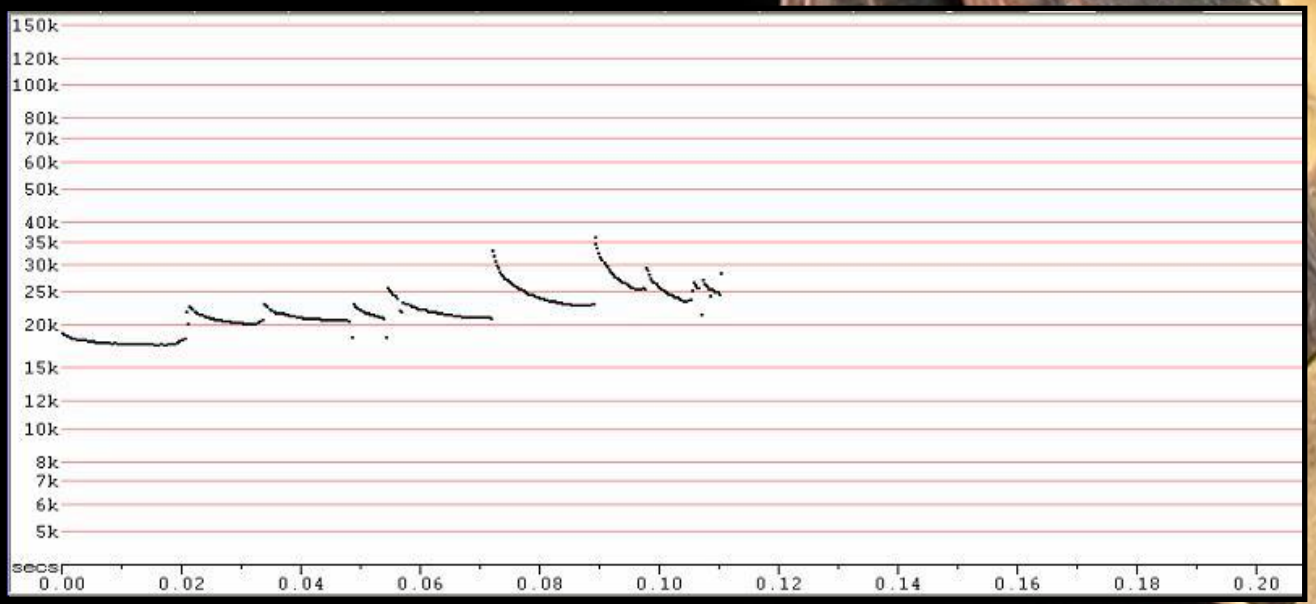
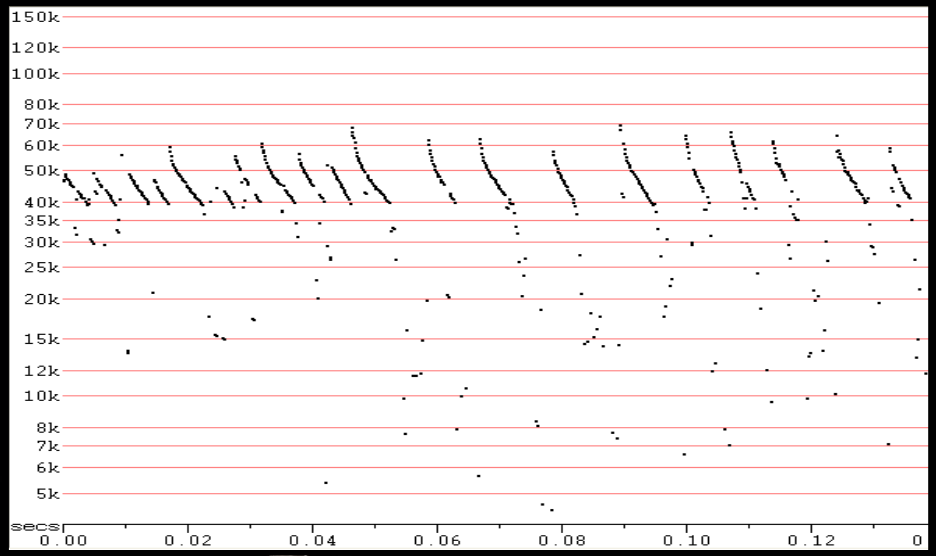
Hoary bat (*Lasiurus cinereus*)



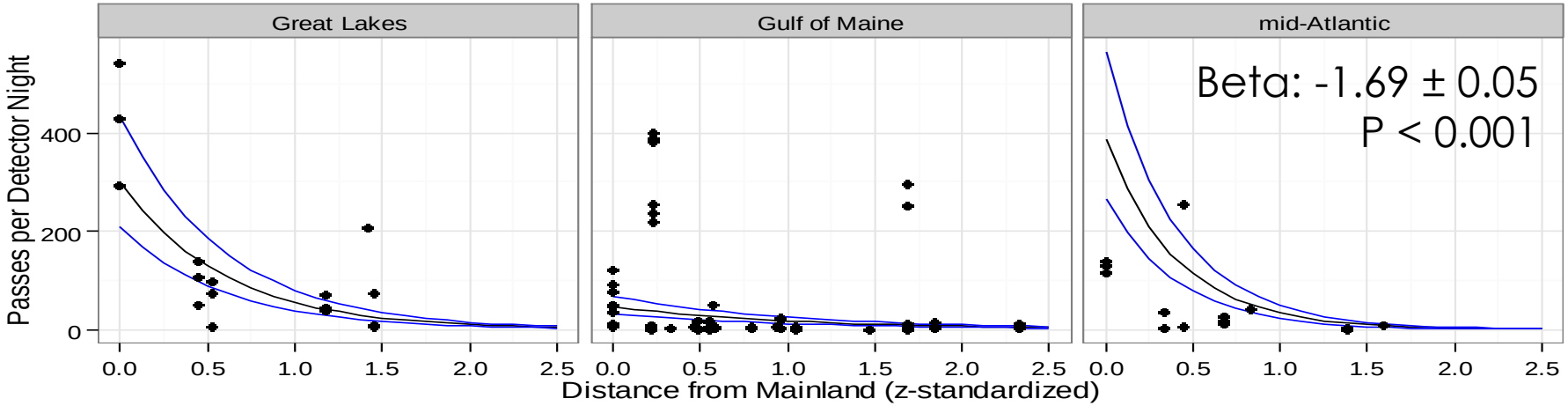
Little brown bat *(Myotis lucifugus)*

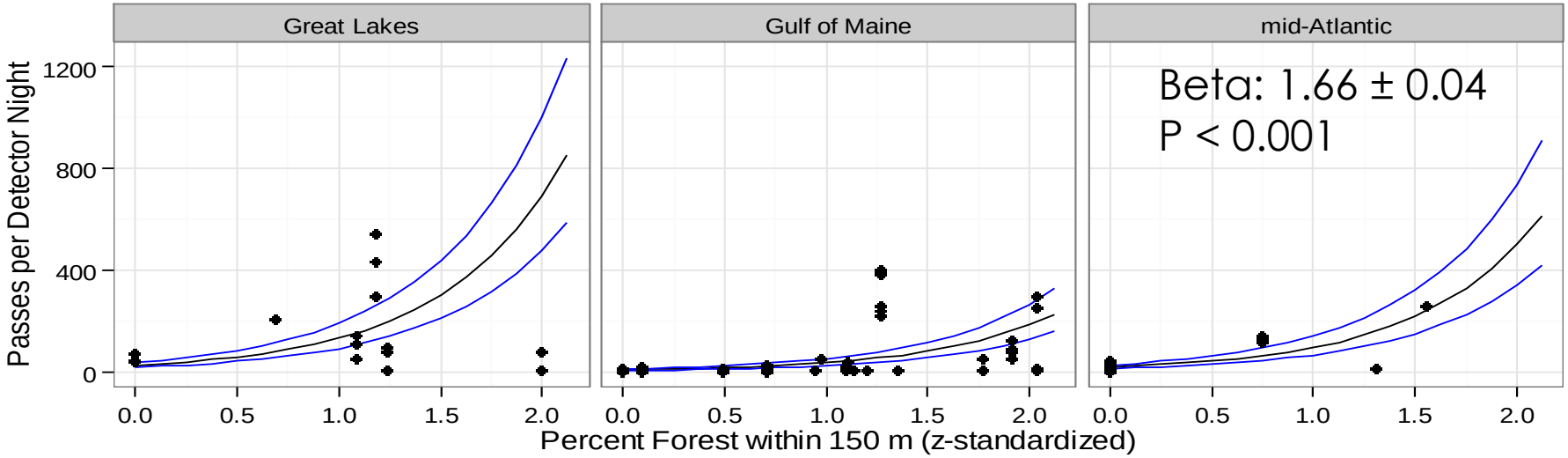


Northern long-eared bat *(Myotis septentrionalis)*

Eastern small-footed bat *(Myotis leibii)*

2 Habitat and Isolation?





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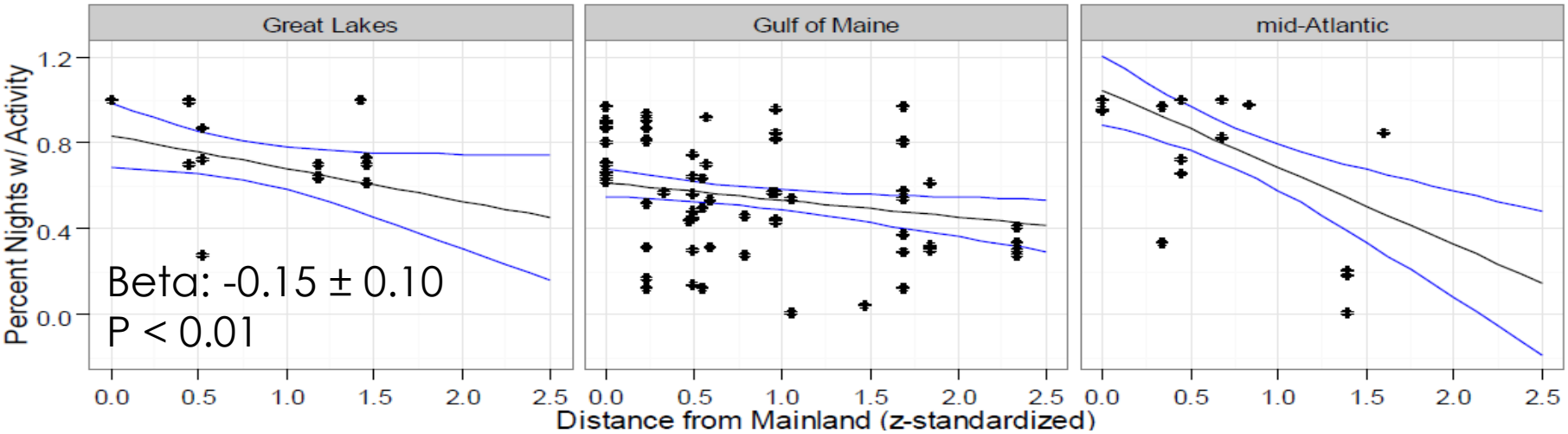

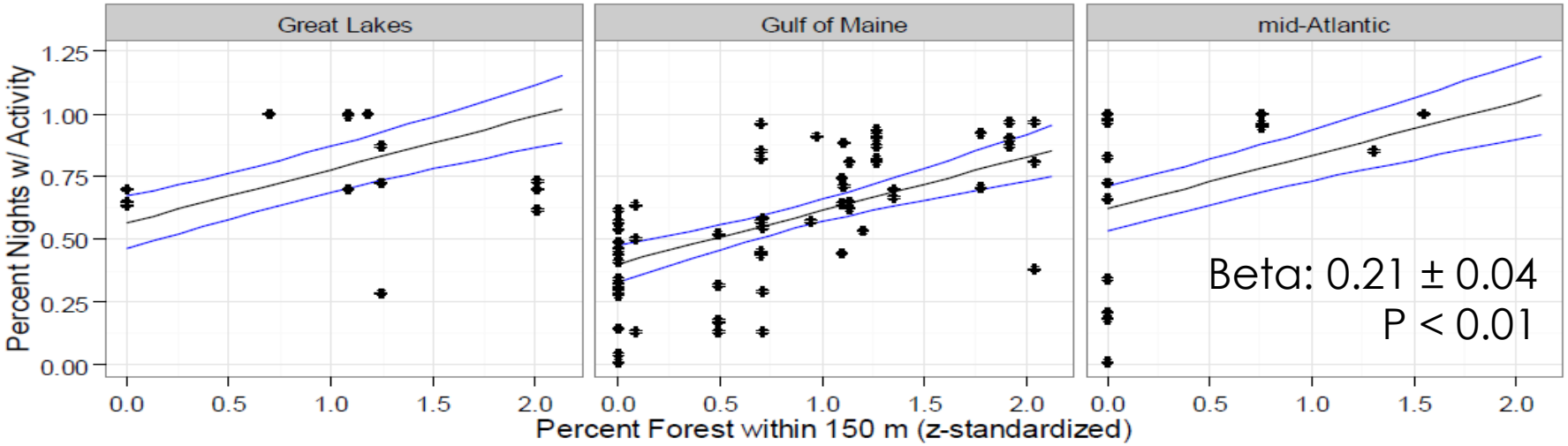

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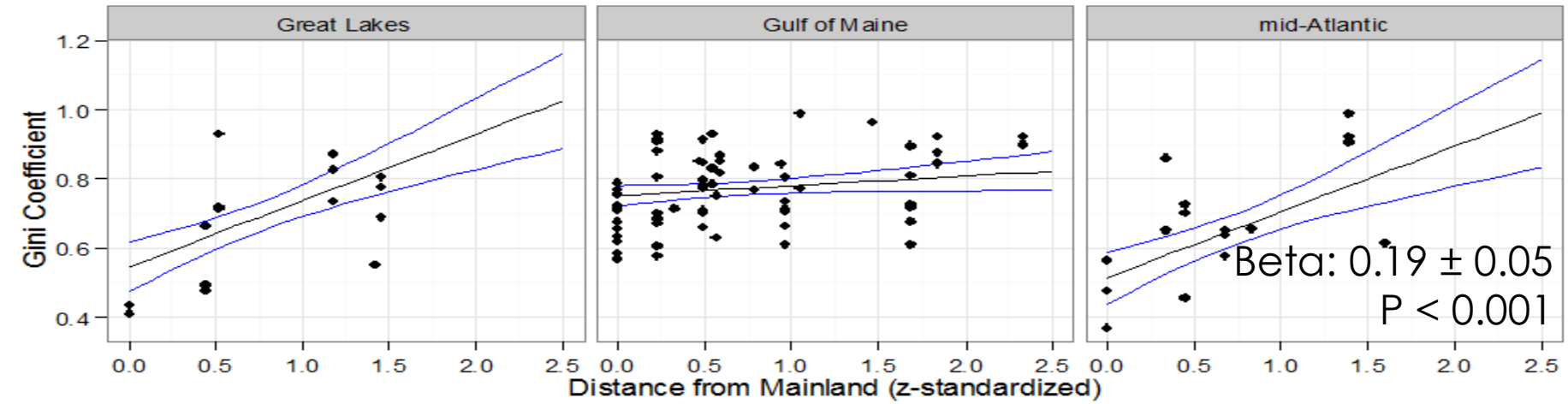

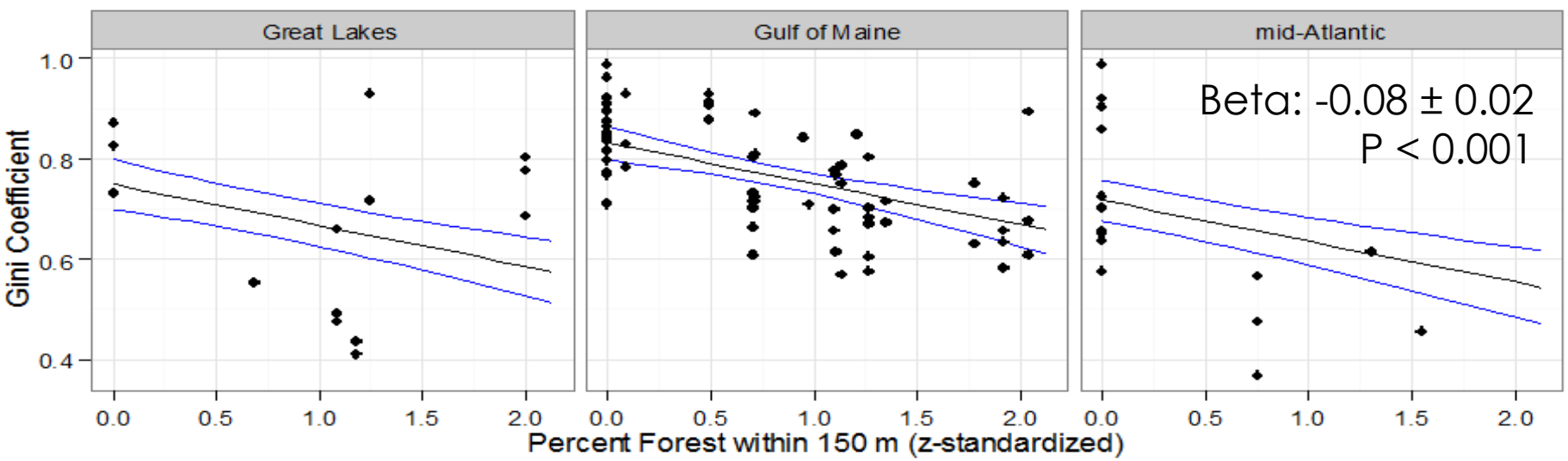

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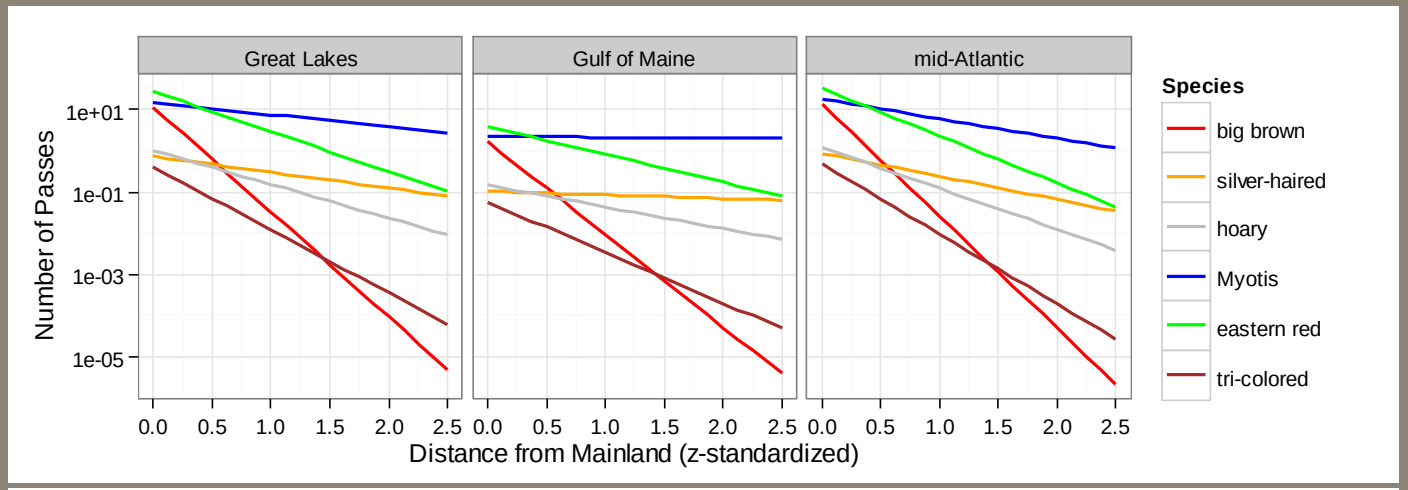
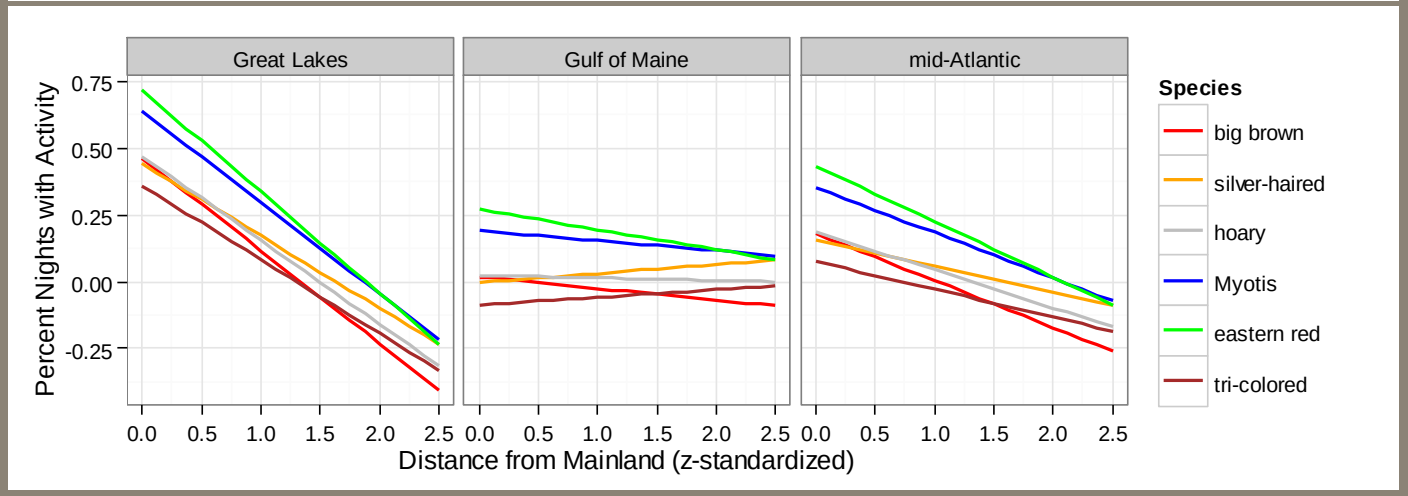
2 Species Differences?





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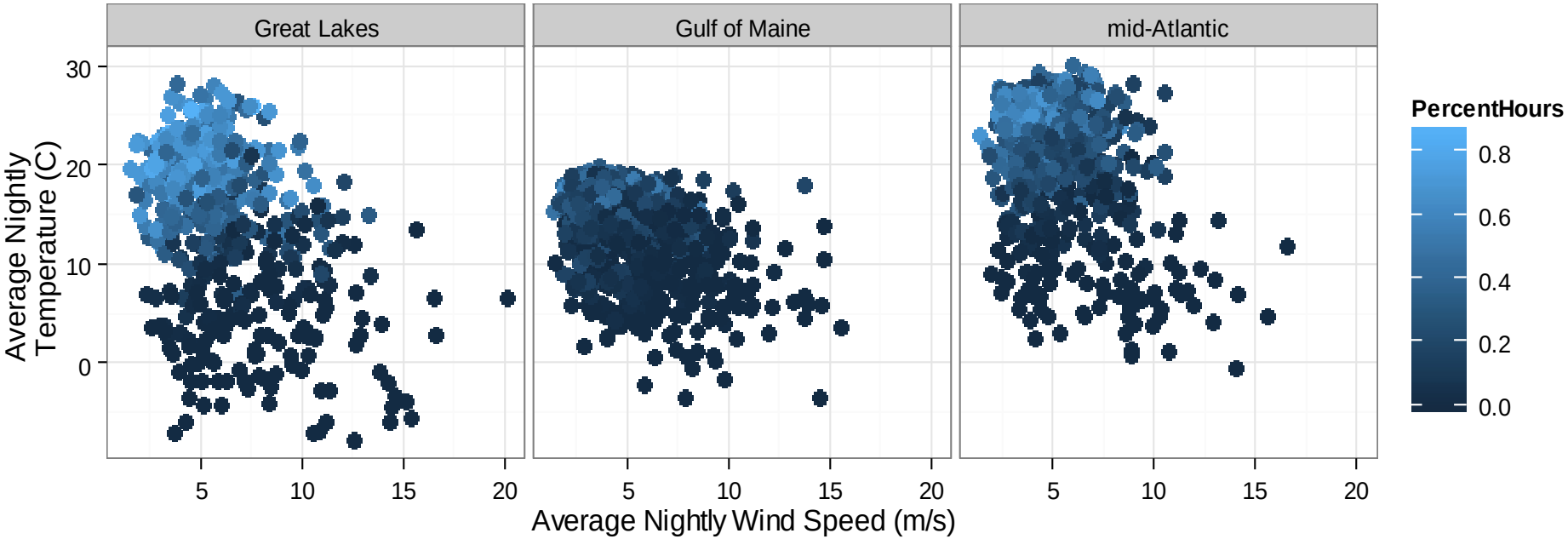
2 Effect of Conditions?



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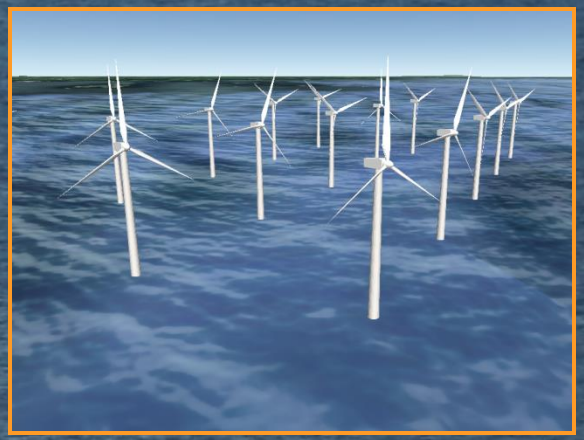
3 Implications for offshore wind?



- Presence = Risk
- ↑ Isolation = ↓ Risk
- Risk varies seasonally
- Risk varies with conditions

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3 Implications for offshore wind?

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3 Implications for offshore wind?

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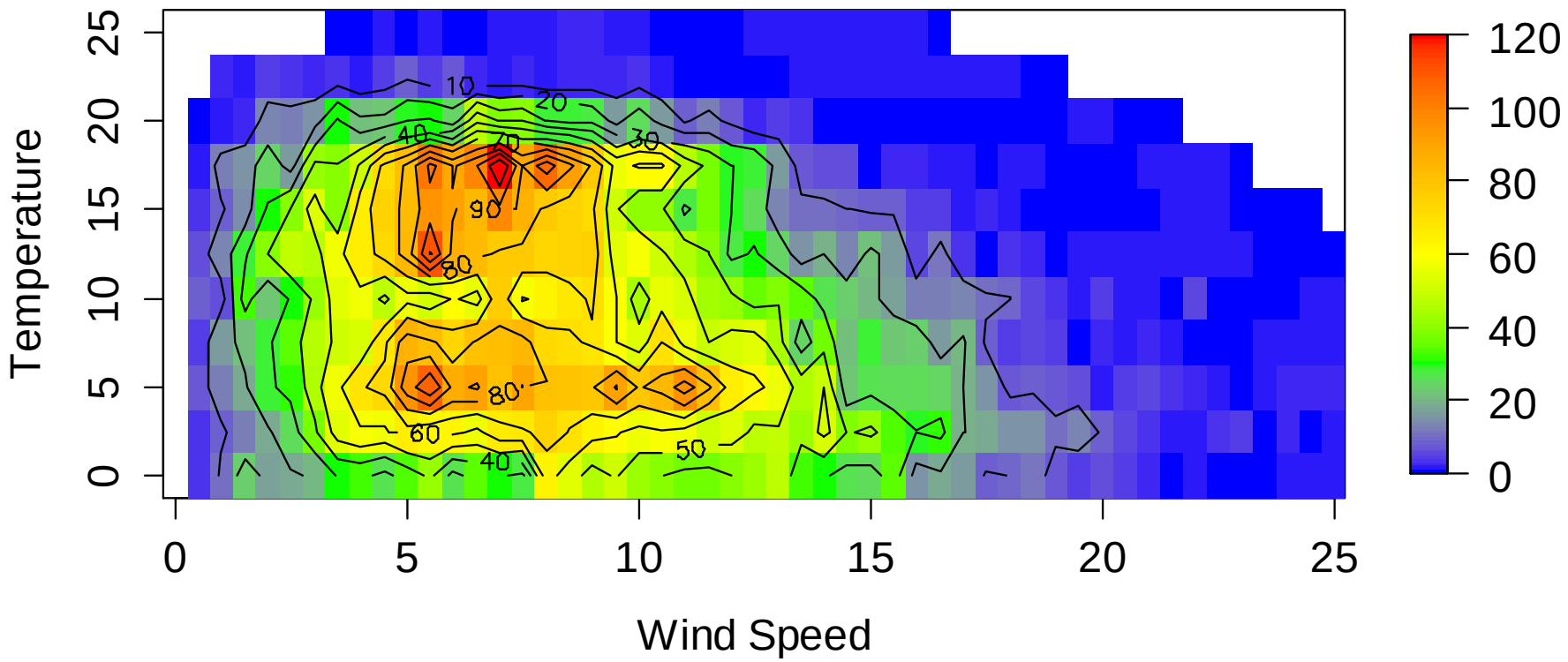
3 Availability of Conditions (Matinicus Rock)



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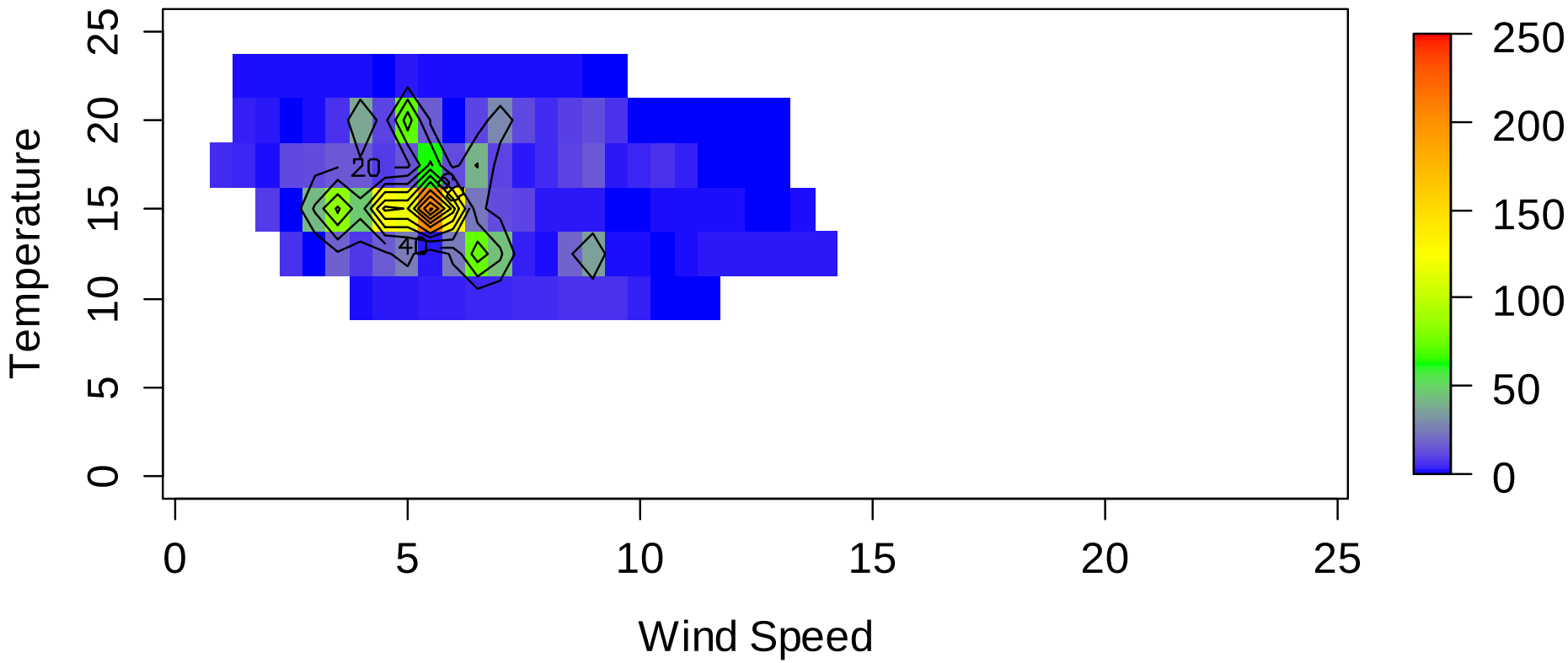
3 Conditions with Bat Activity (Matinicus Rock)



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Conclusions

- Bats occur offshore on a seasonally predictable basis
- ↑ Isolation = ↓ Activity
- Magnitude of risk harder to predict
- Acoustics can manage potential impacts by characterizing high risk conditions

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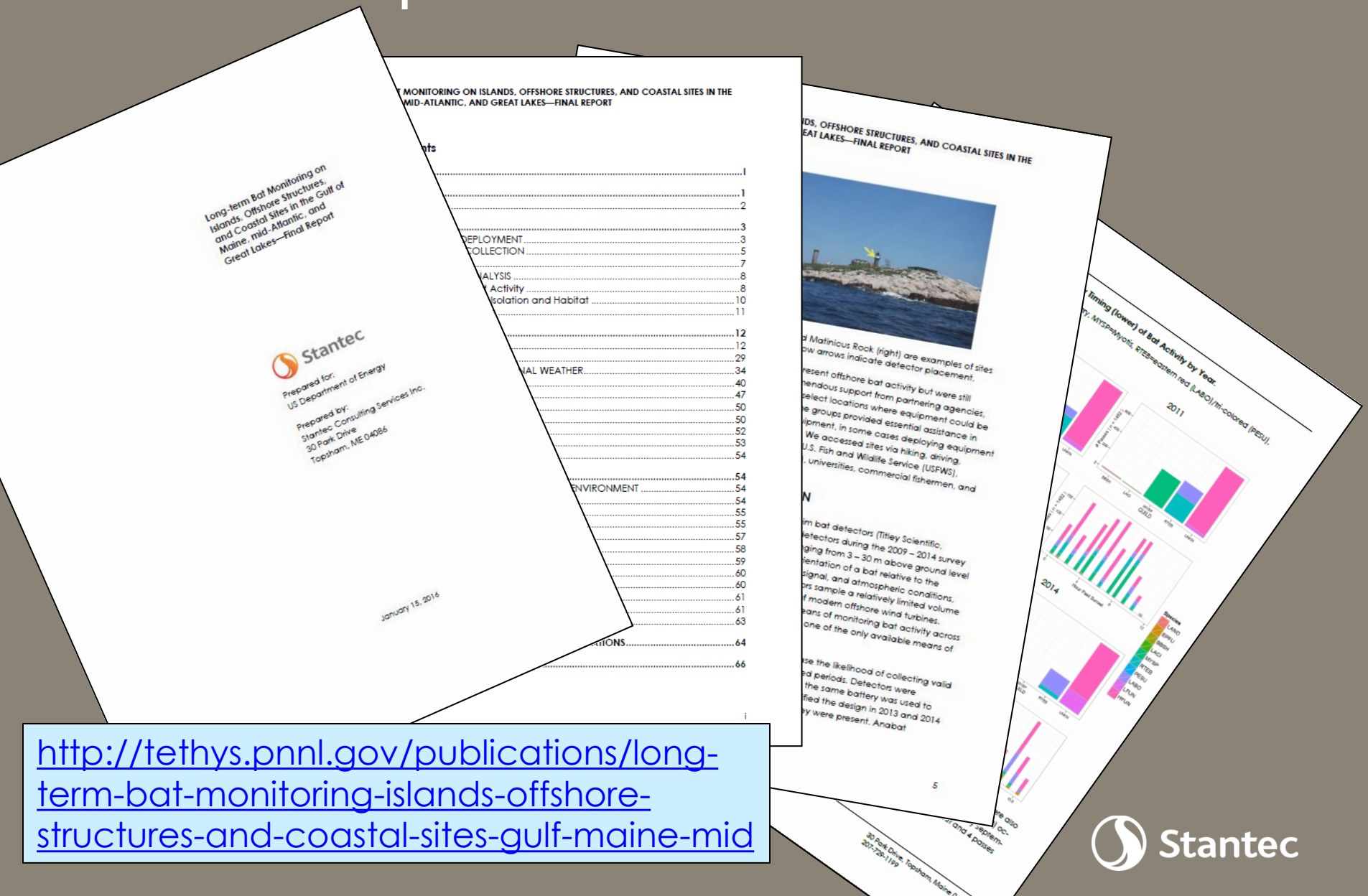
Final Report



http://tethys.pnnl.gov/publications/long-term-bat-monitoring-islands-offshore-structures-and-coastal-sites-gulf-maine-mid

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Collaborating Organizations

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