



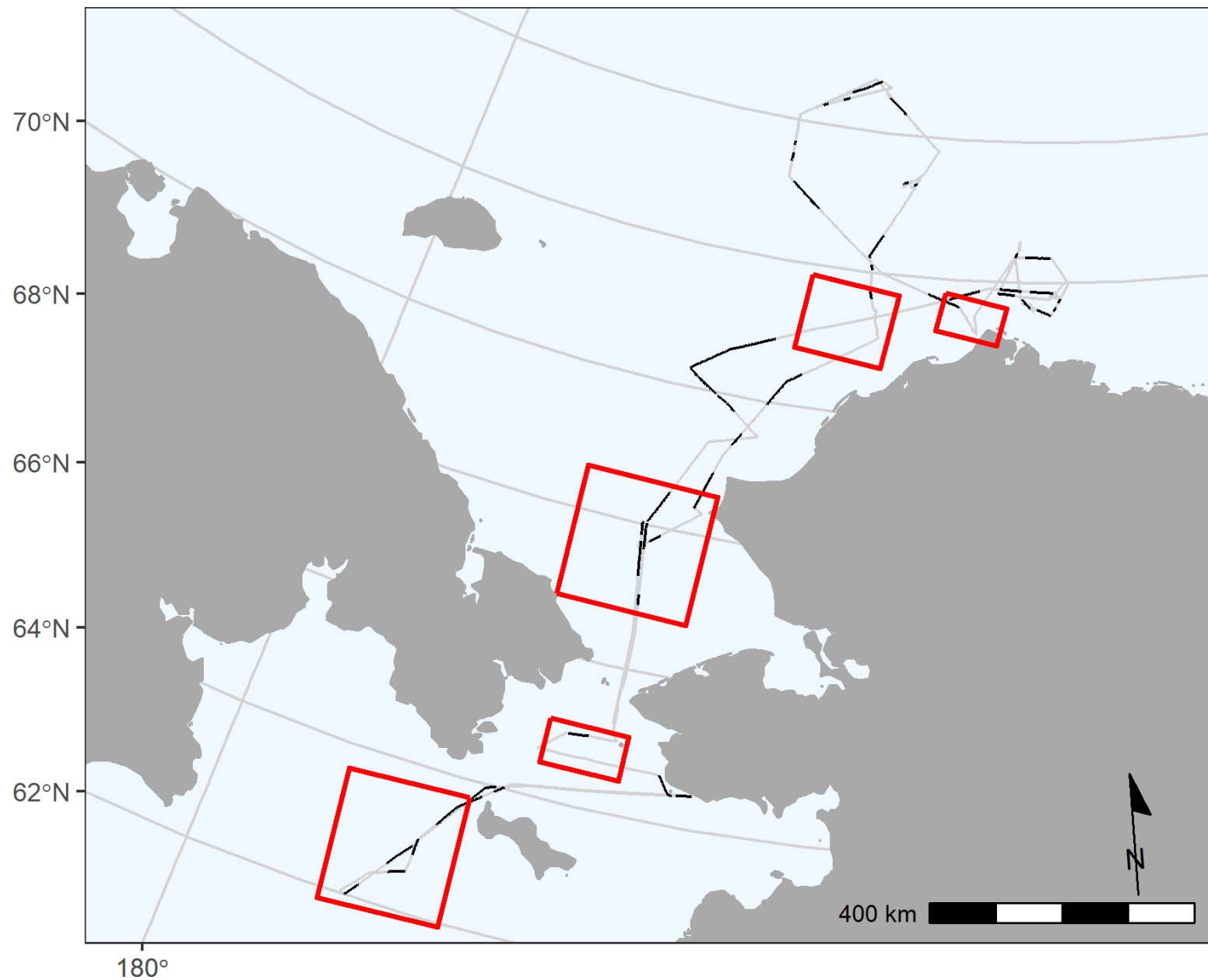
Linking coupled human and
natural systems approaches
with the
Distributed Biological
Observatory

Kelly Kapsar

22 January 2020

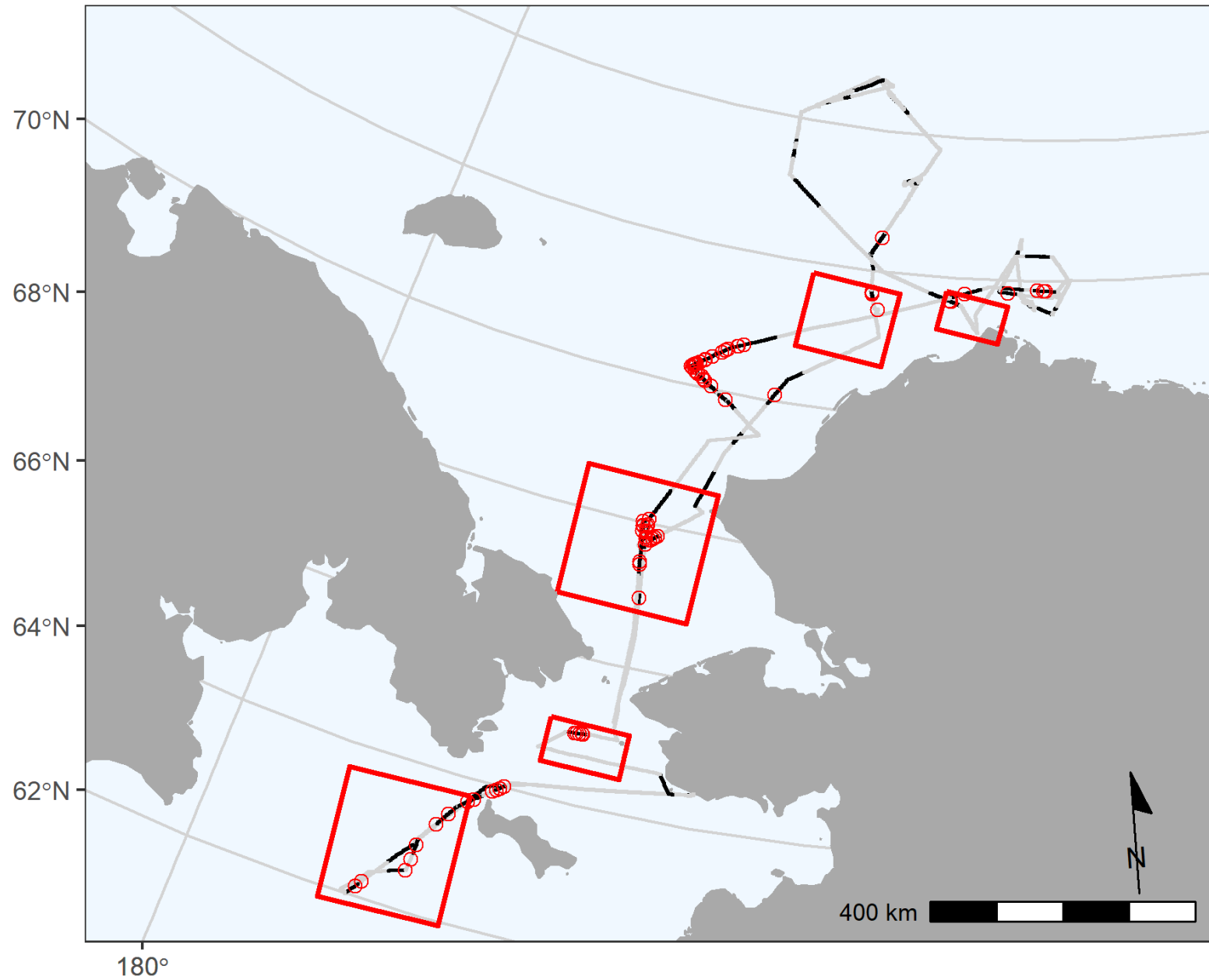
Marine Mammal Observations

- 62 hours of watch effort



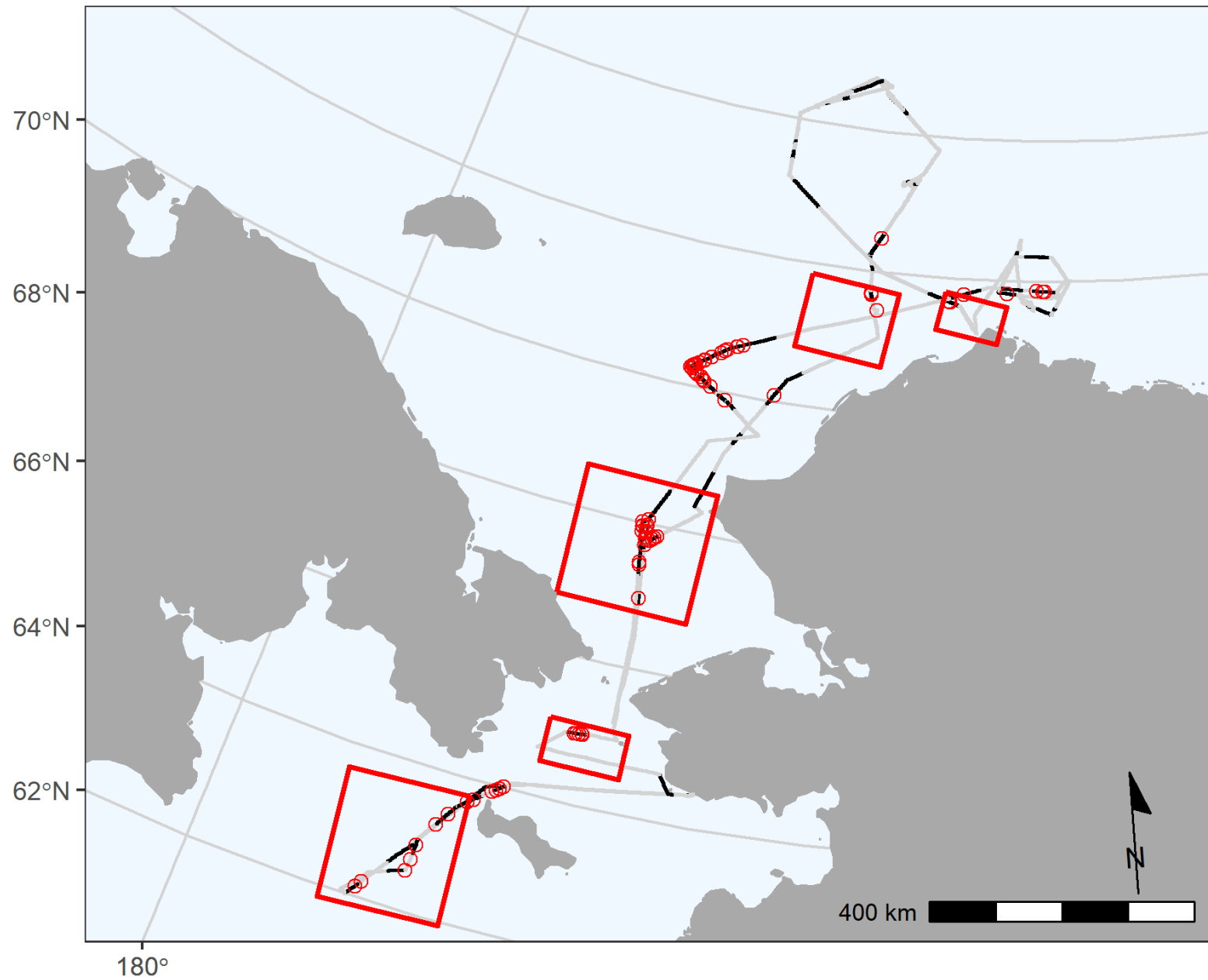
Marine Mammal Observations

- 62 hours of watch effort
- 78 independent sightings
 - 187 to 215 individual marine mammals



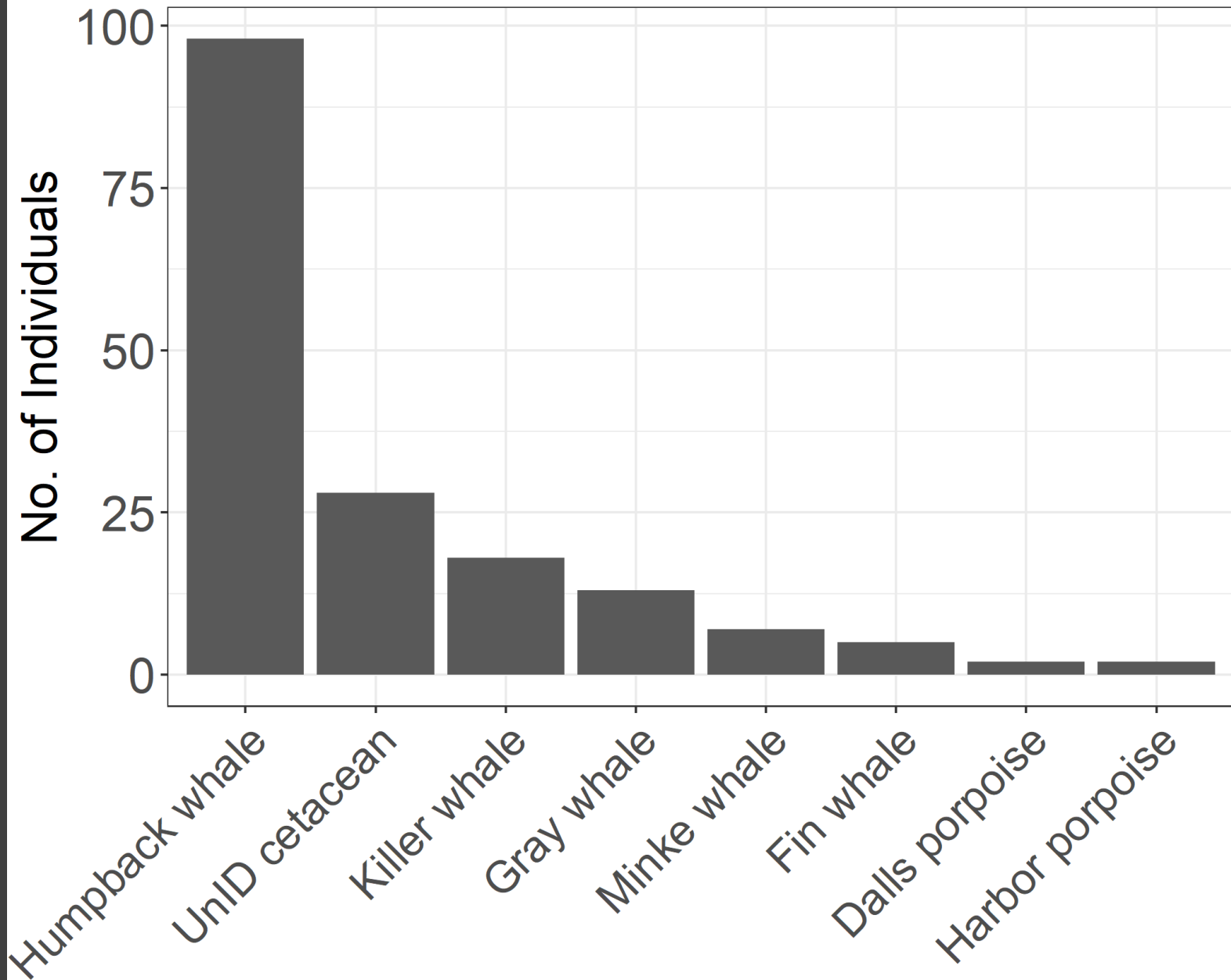
Marine Mammal Observations

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- 78 independent sightings
 - 187 to 215 individual marine mammals
- 10 species
 - 6 cetaceans
 - 4 pinnipeds



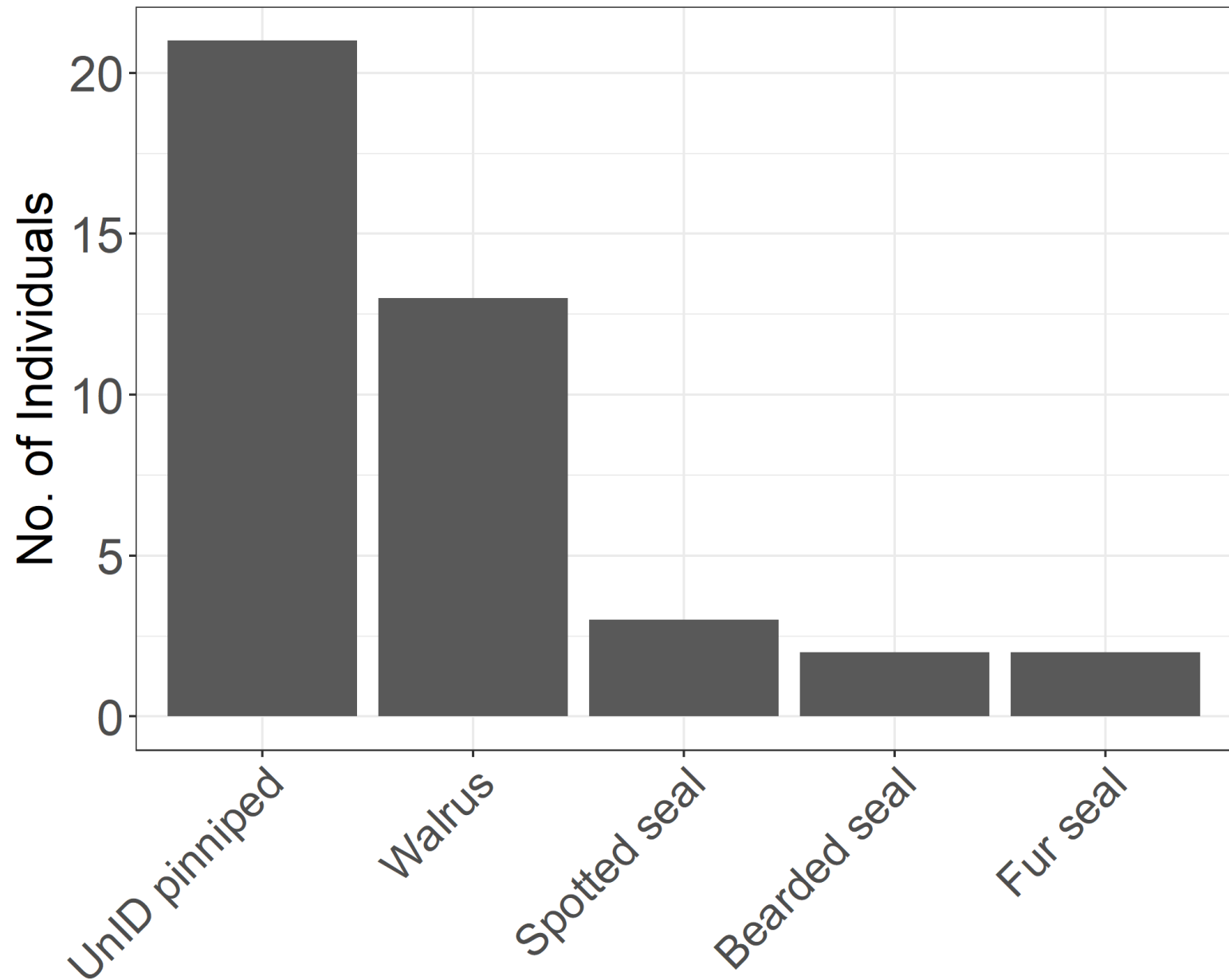
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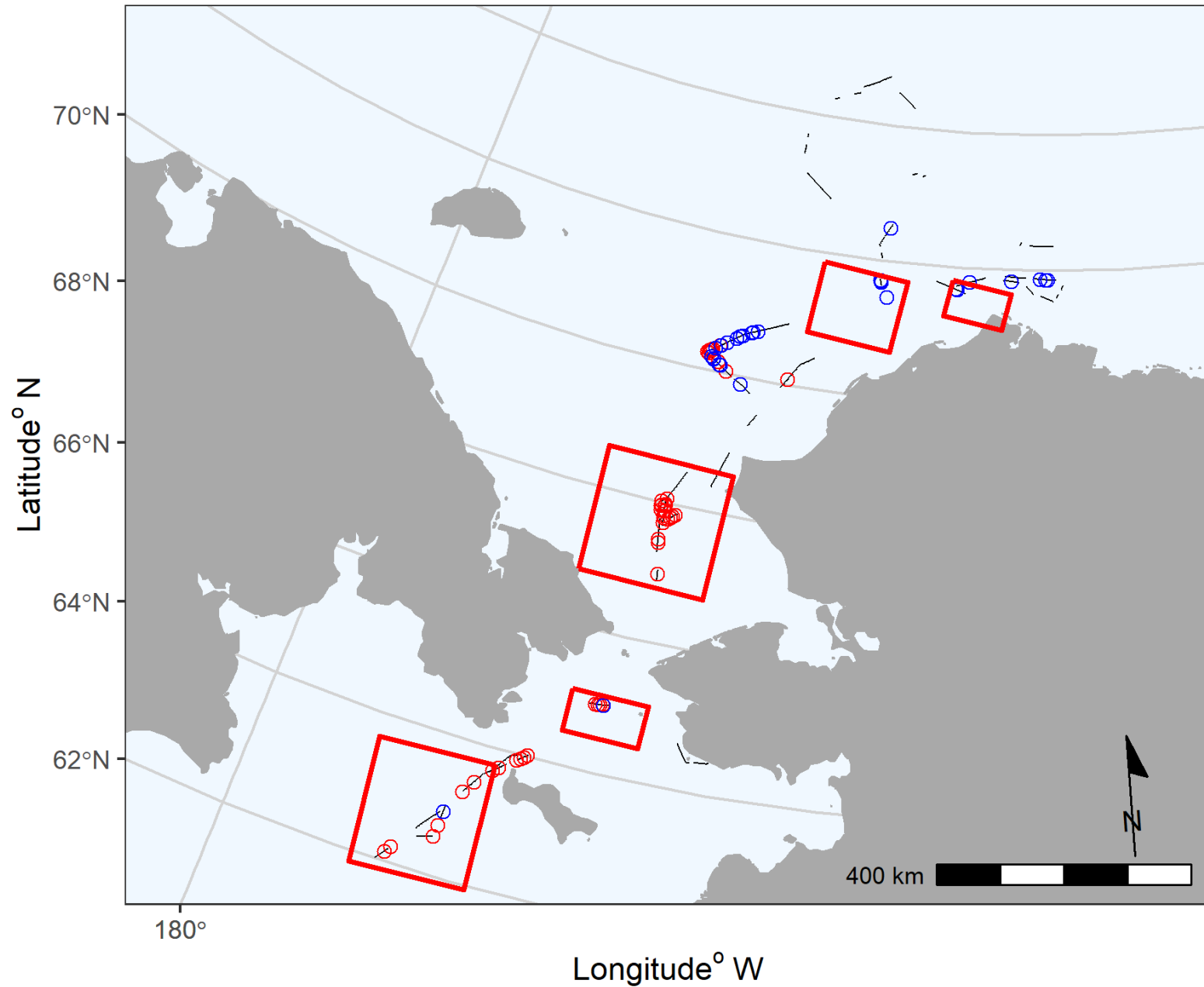
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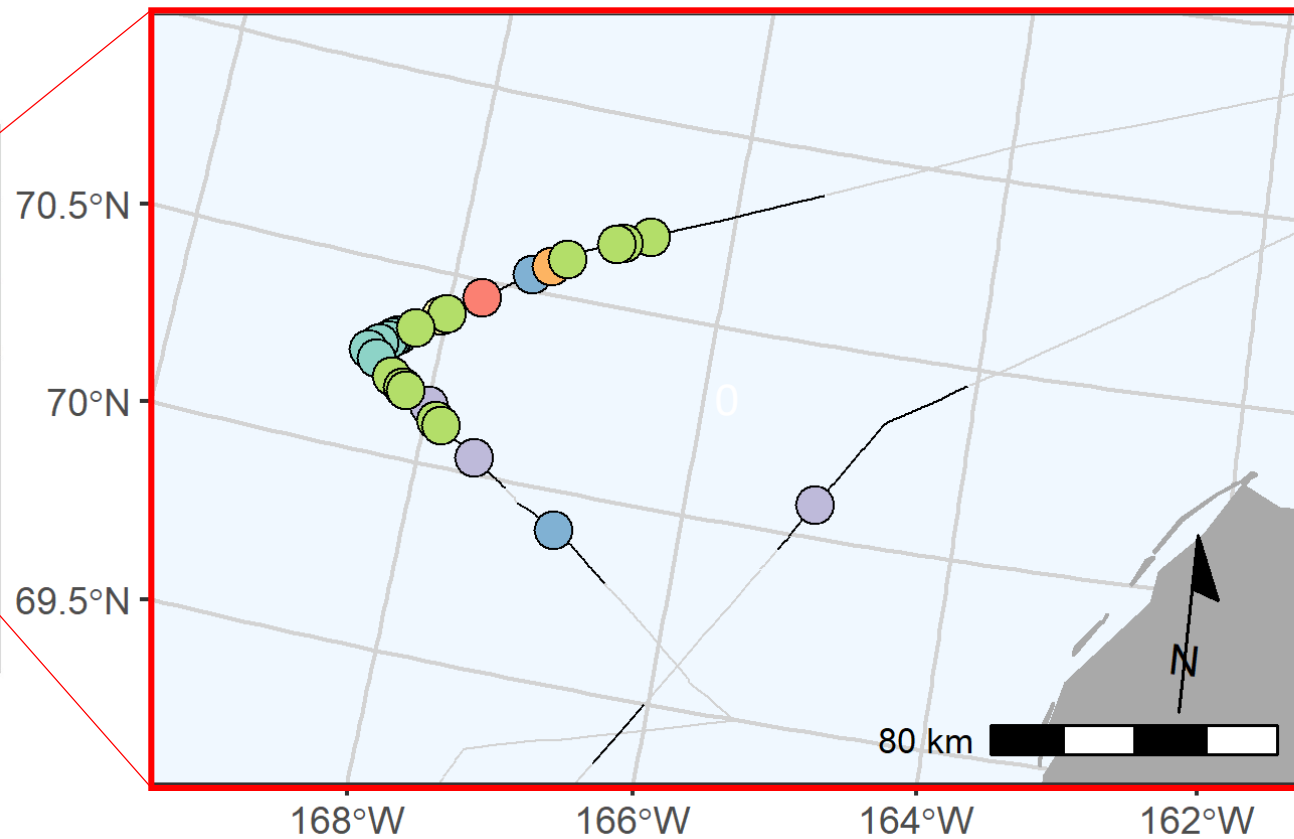
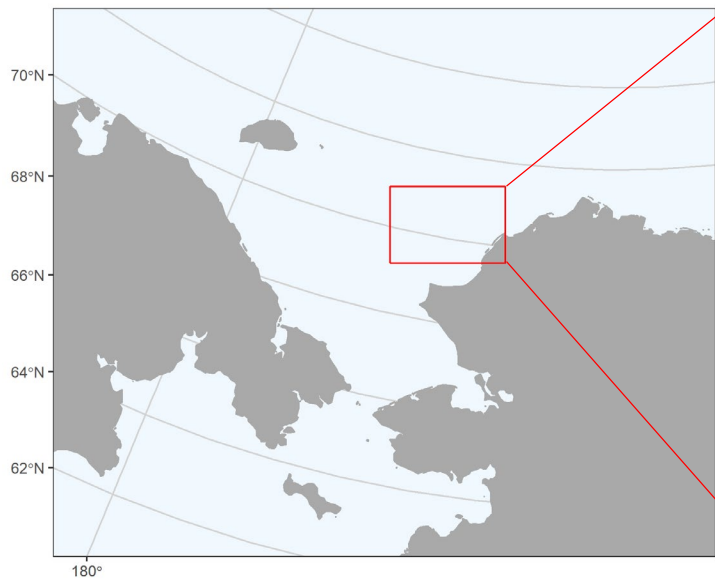
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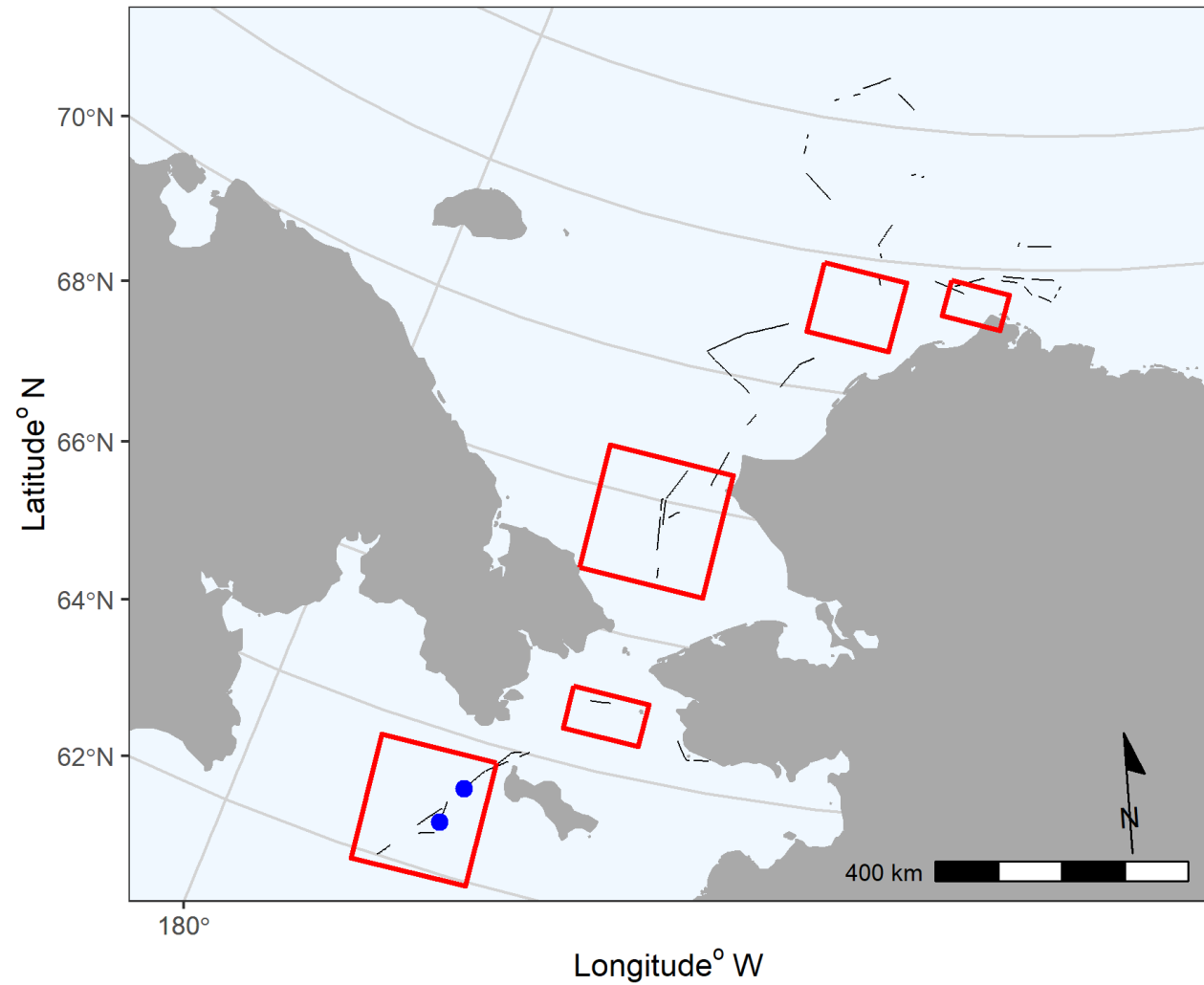




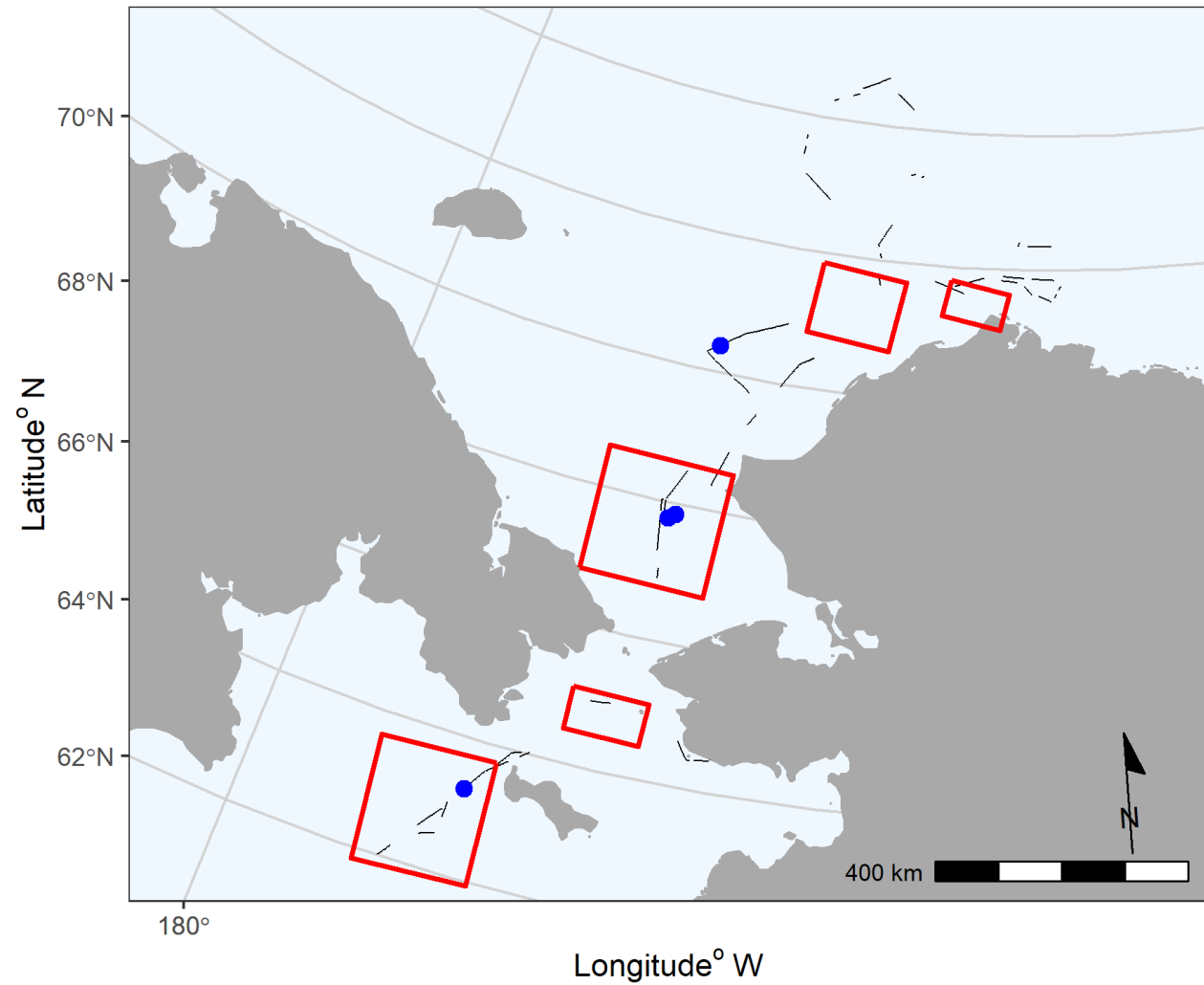
Species

-  Humpback whale
-  Minke whale
-  UnID cetacean
-  Walrus
-  Bearded seal
-  Spotted seal
-  UnID pinniped

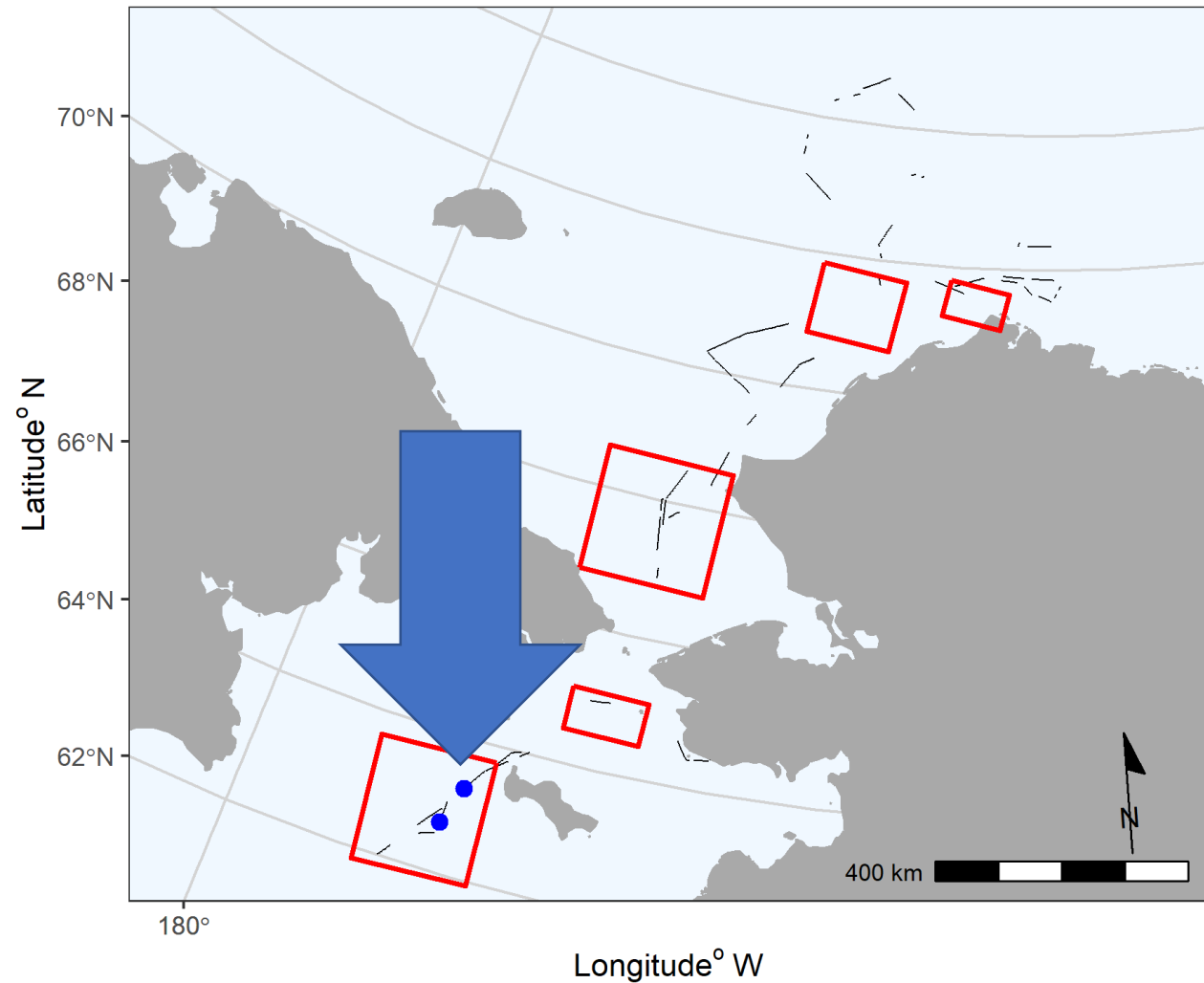
Killer whale



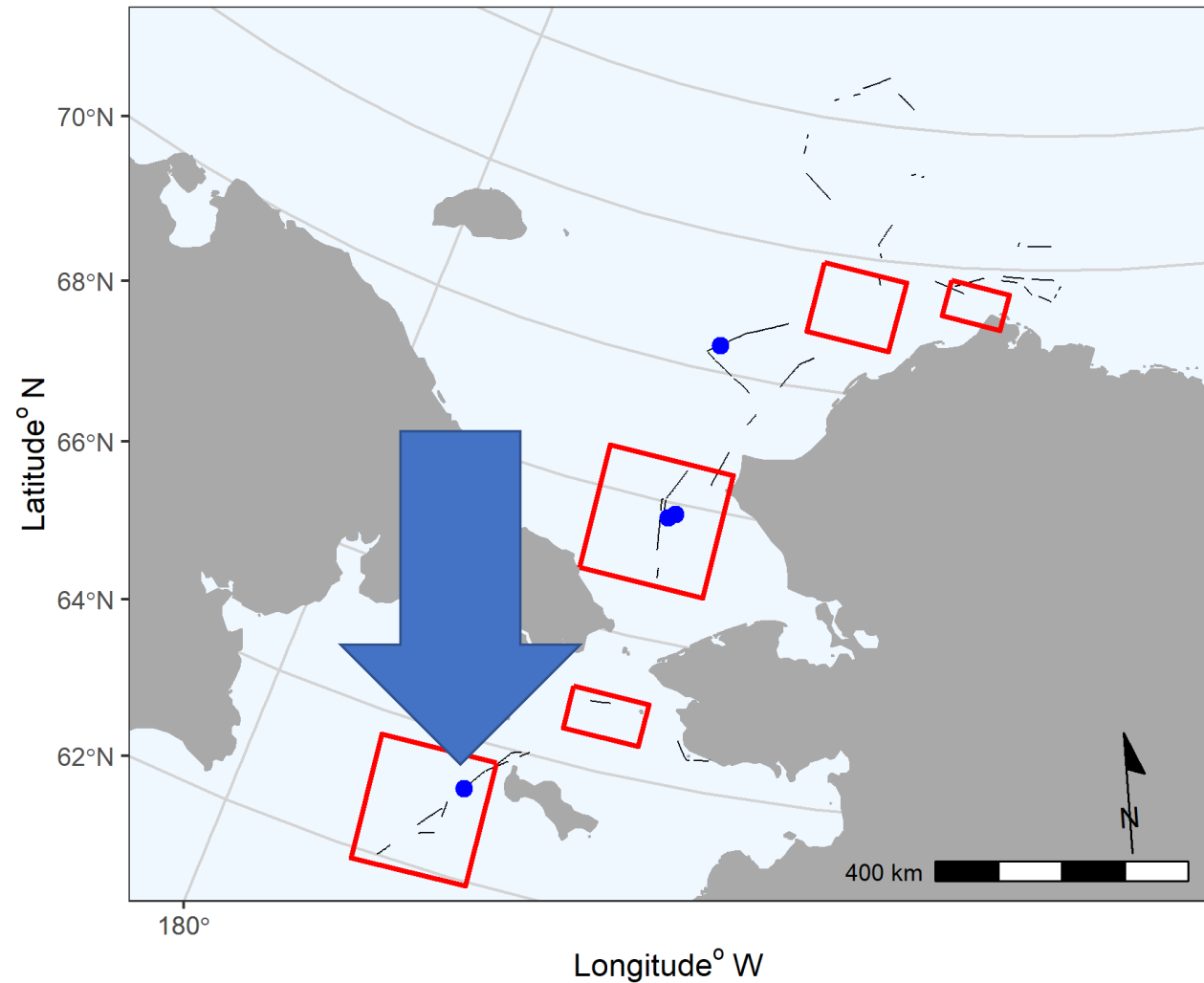
Minke whale



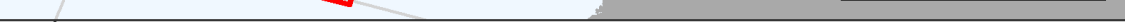
Killer whale



Minke whale



Killer whale



180°

Longitude° W

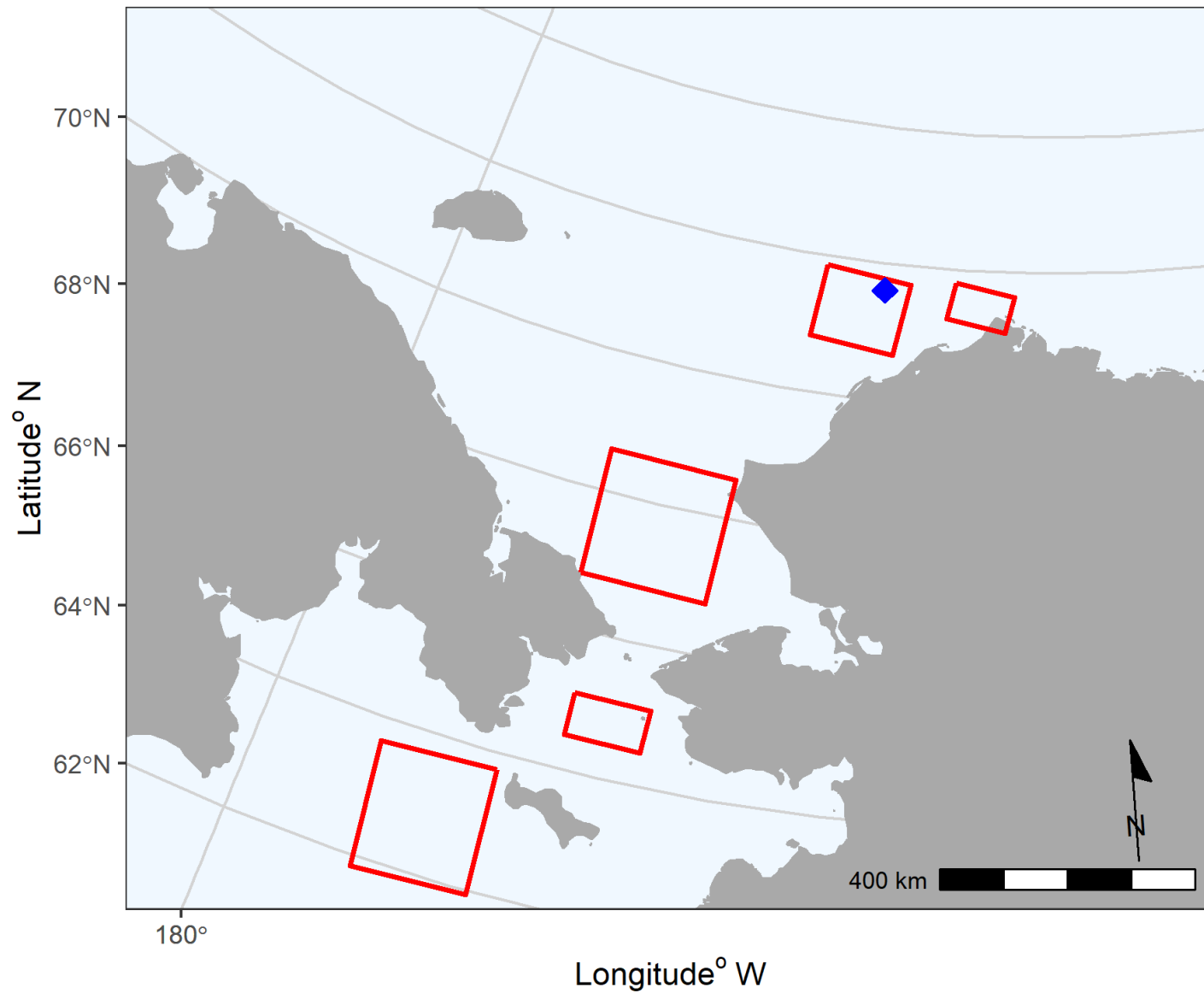
Minke whale

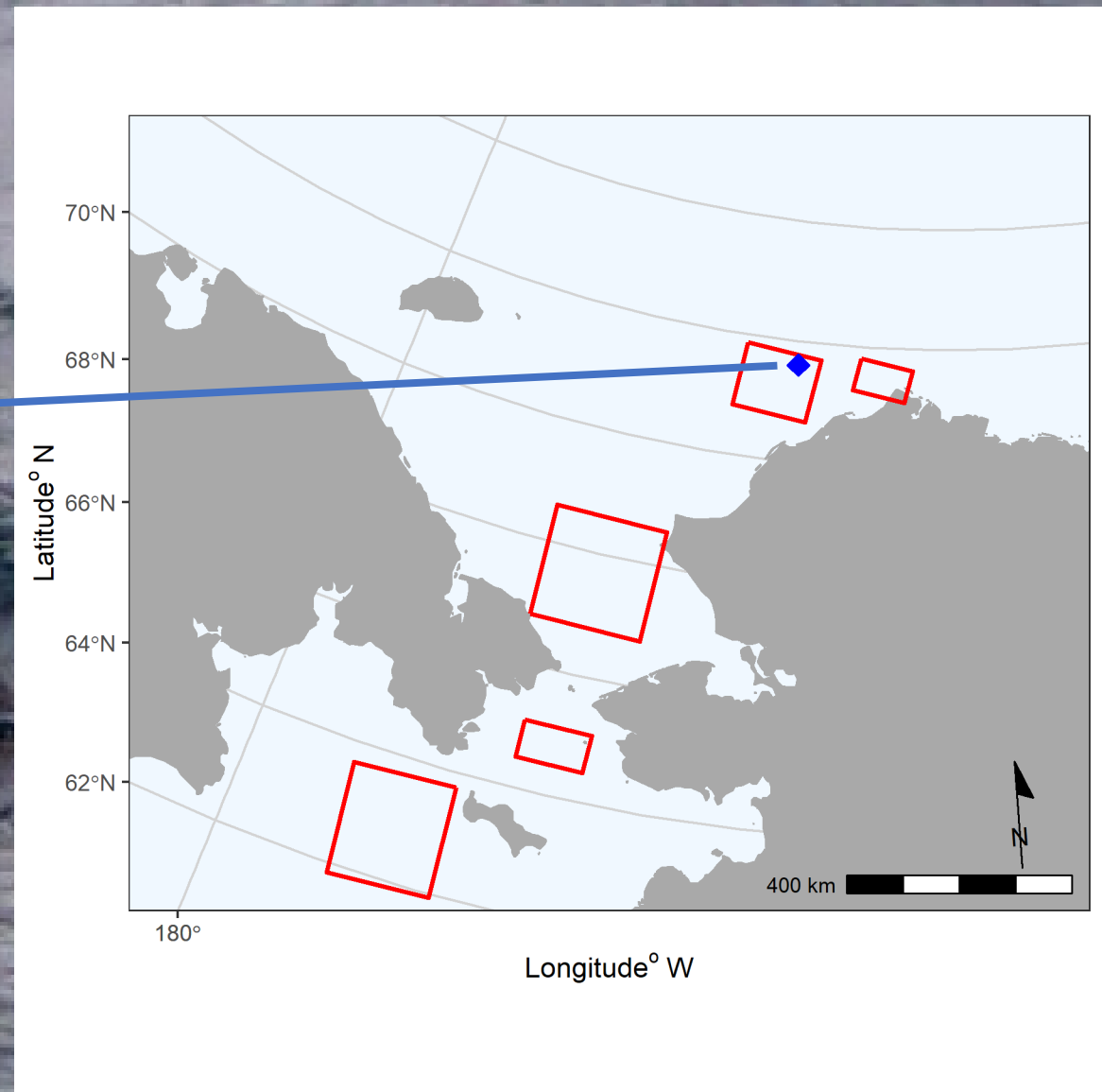
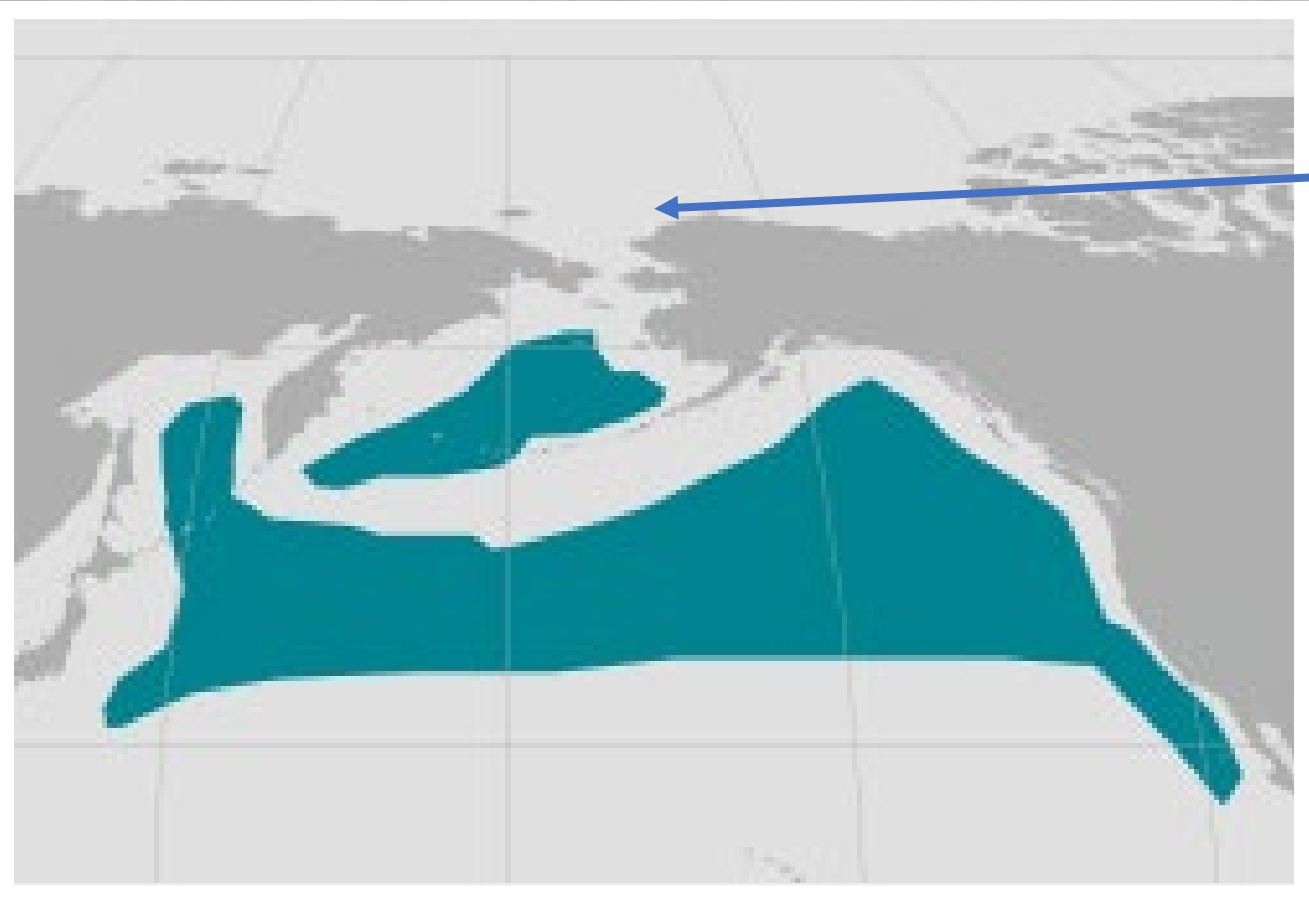


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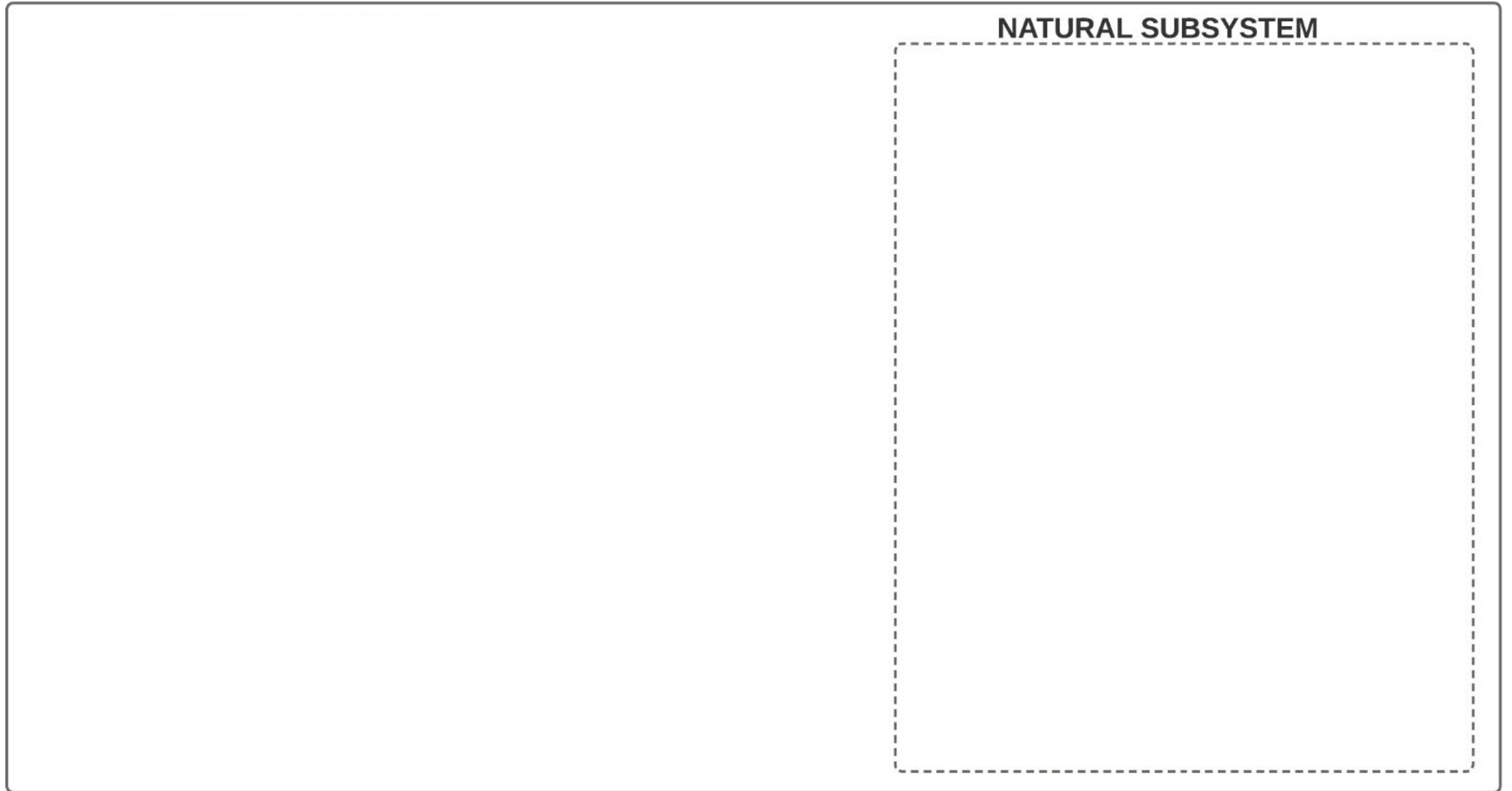


<https://www.fisheries.noaa.gov/species/northern-fur-seal>

Coupled Human and Natural System (Social-Ecological System)



Coupled Human and Natural System



Coupled Human and Natural System

NATURAL SUBSYSTEM

Sea Ice



Marine Mammals



Coupled Human and Natural System

HUMAN SUBSYSTEM

NATURAL SUBSYSTEM

Sea Ice



Marine Mammals



Coupled Human and Natural System

HUMAN SUBSYSTEM



NATURAL SUBSYSTEM

Sea Ice



Marine Mammals



Coupled Human and Natural System

HUMAN SUBSYSTEM



**HUMAN-NATURE
INTERACTIONS**



NATURAL SUBSYSTEM

Sea Ice



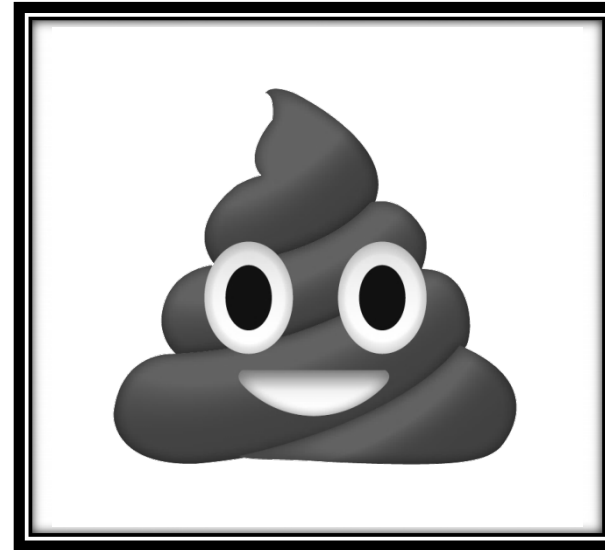
Marine Mammals



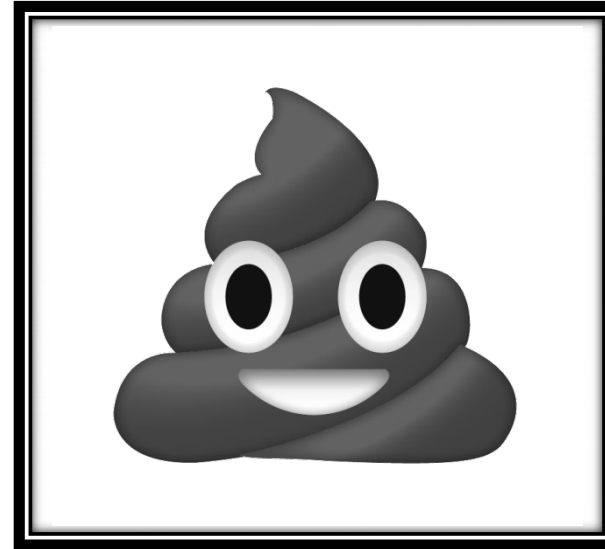
Environmental risks posed by shipping



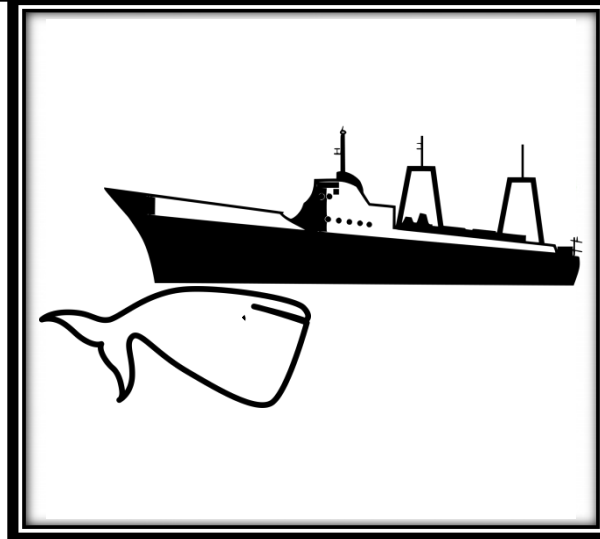
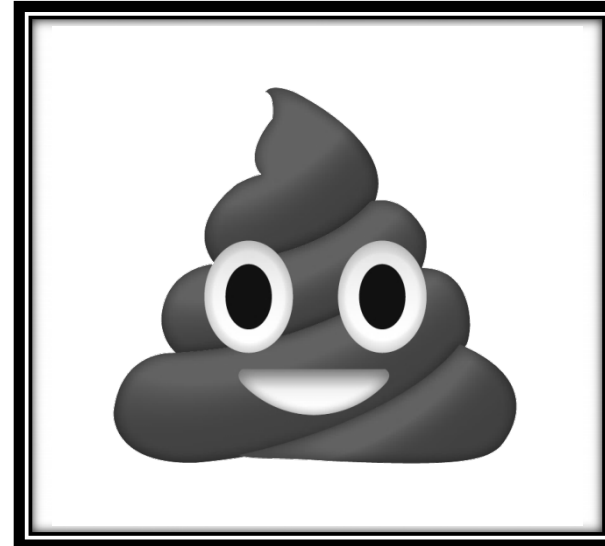
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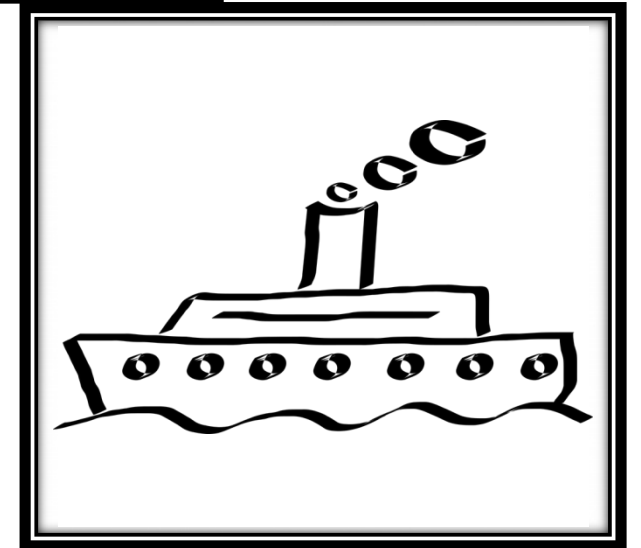
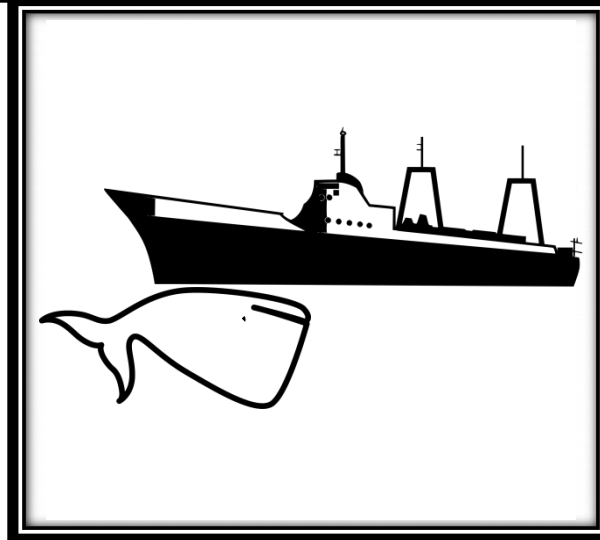
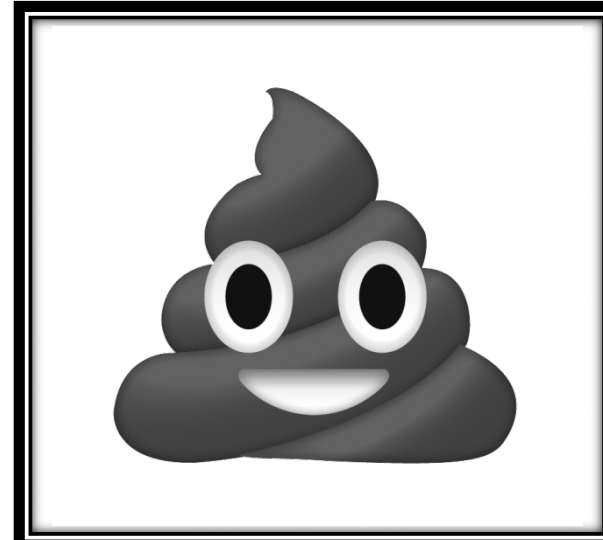
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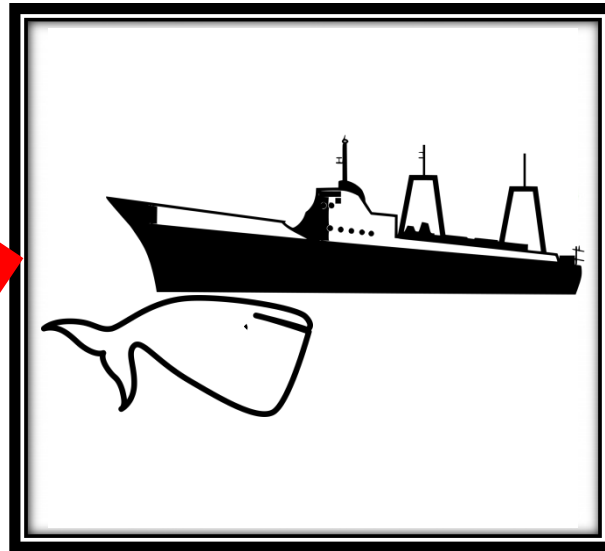
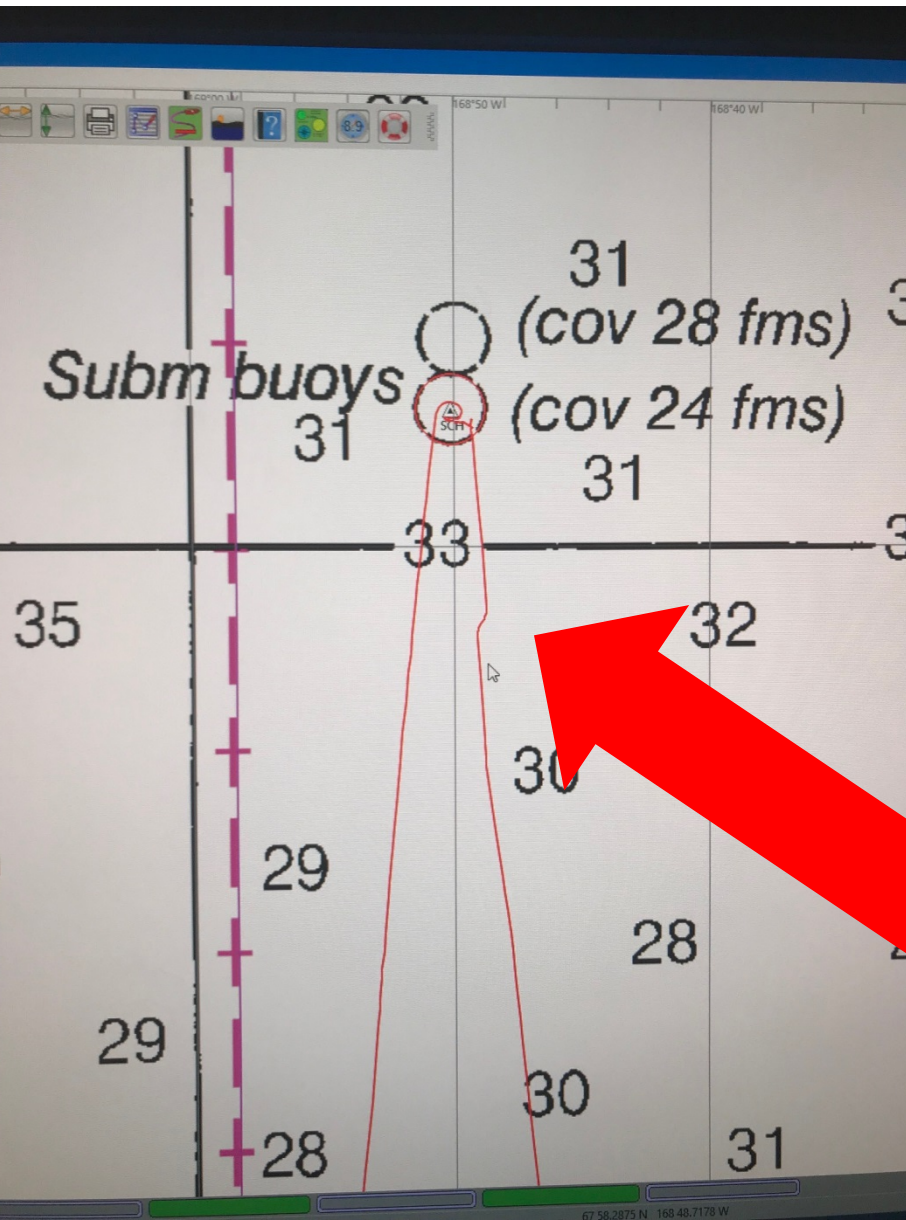
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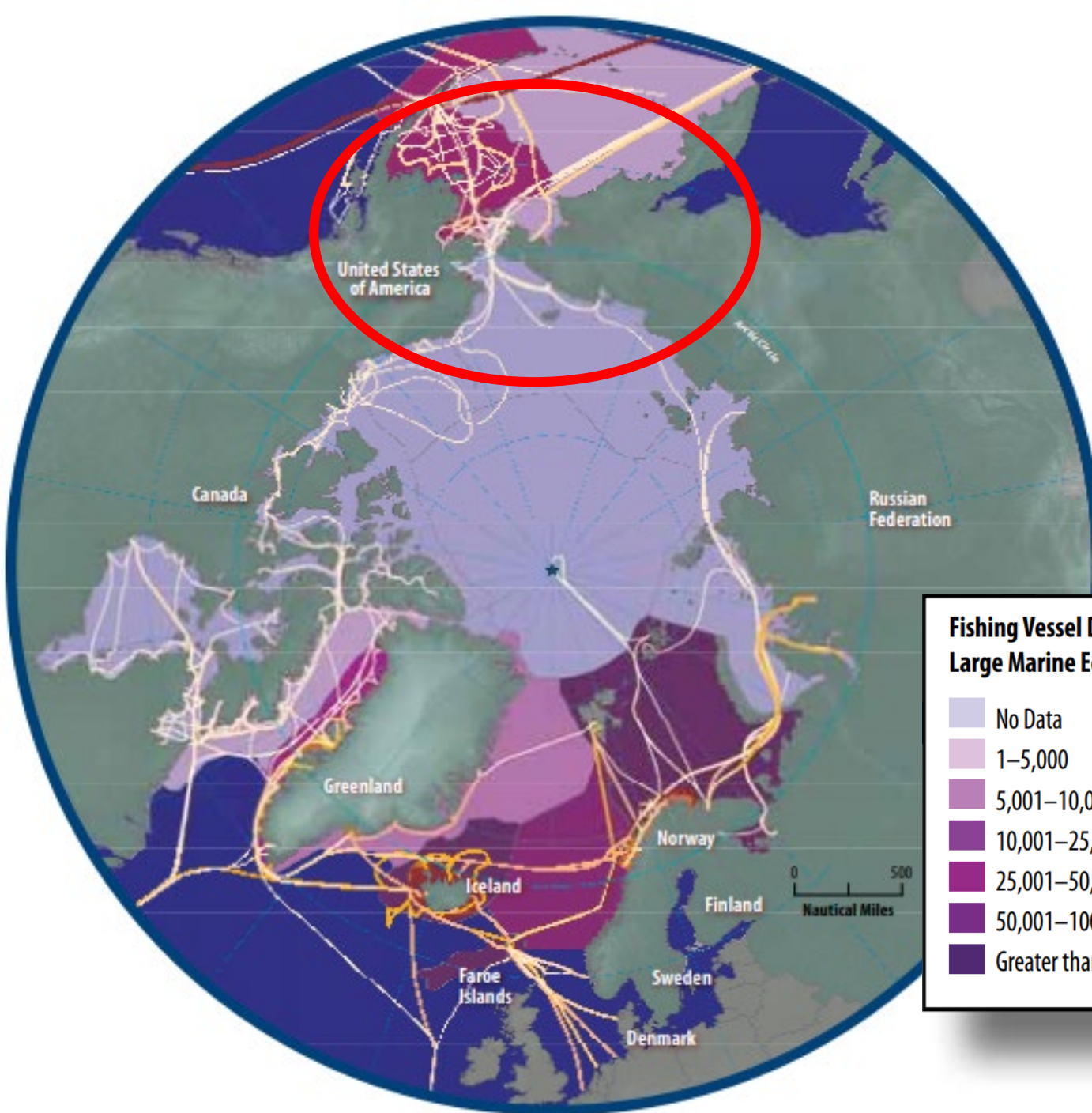


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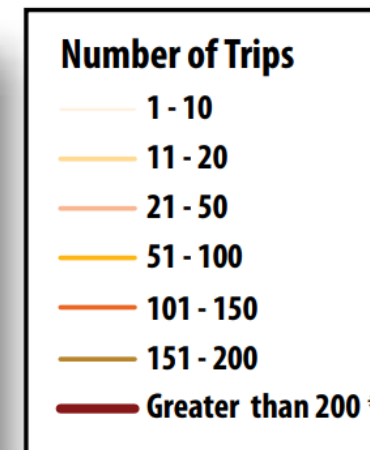
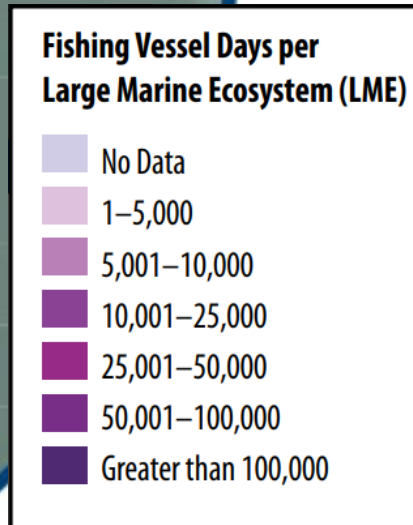


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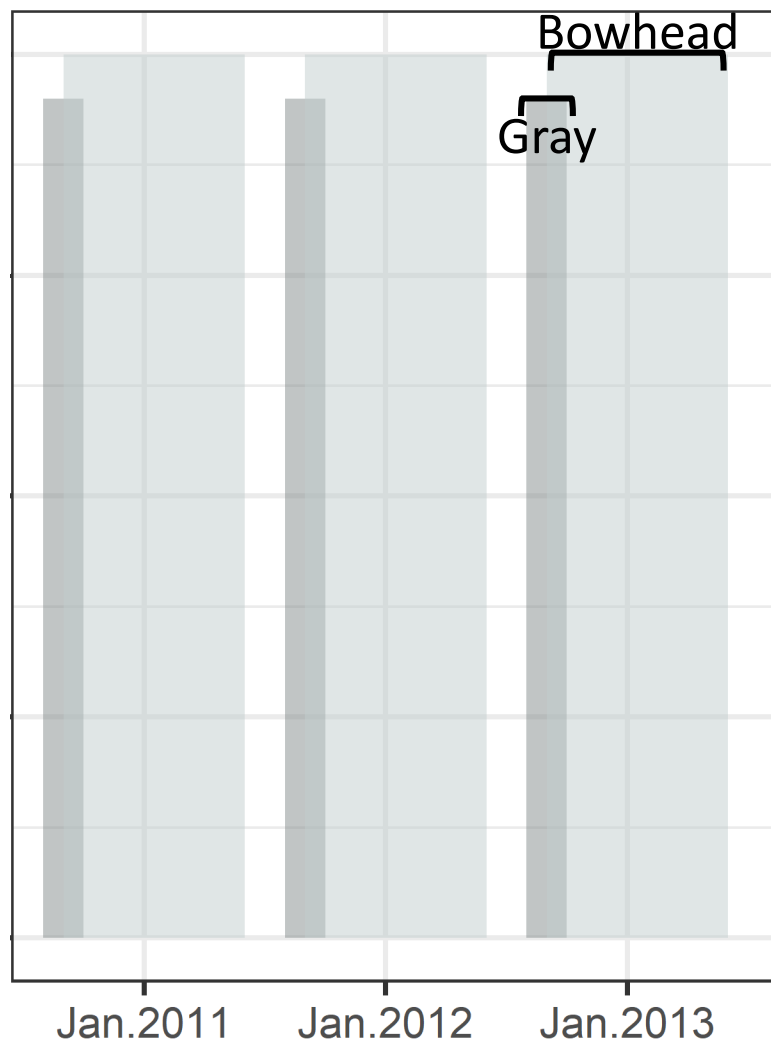
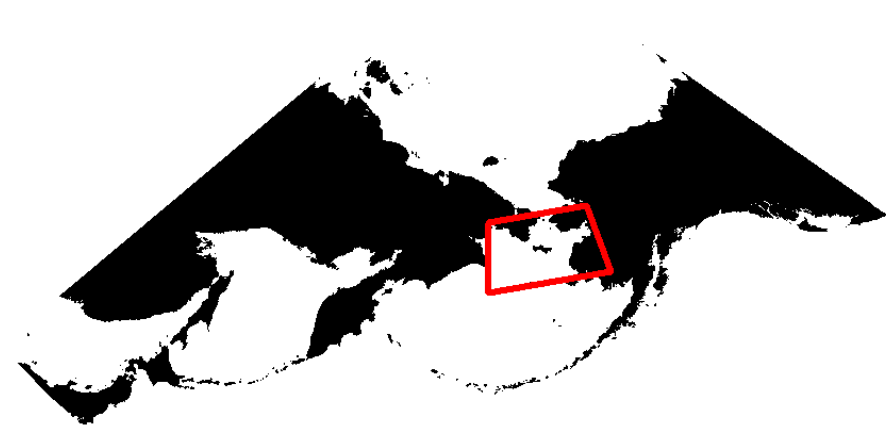


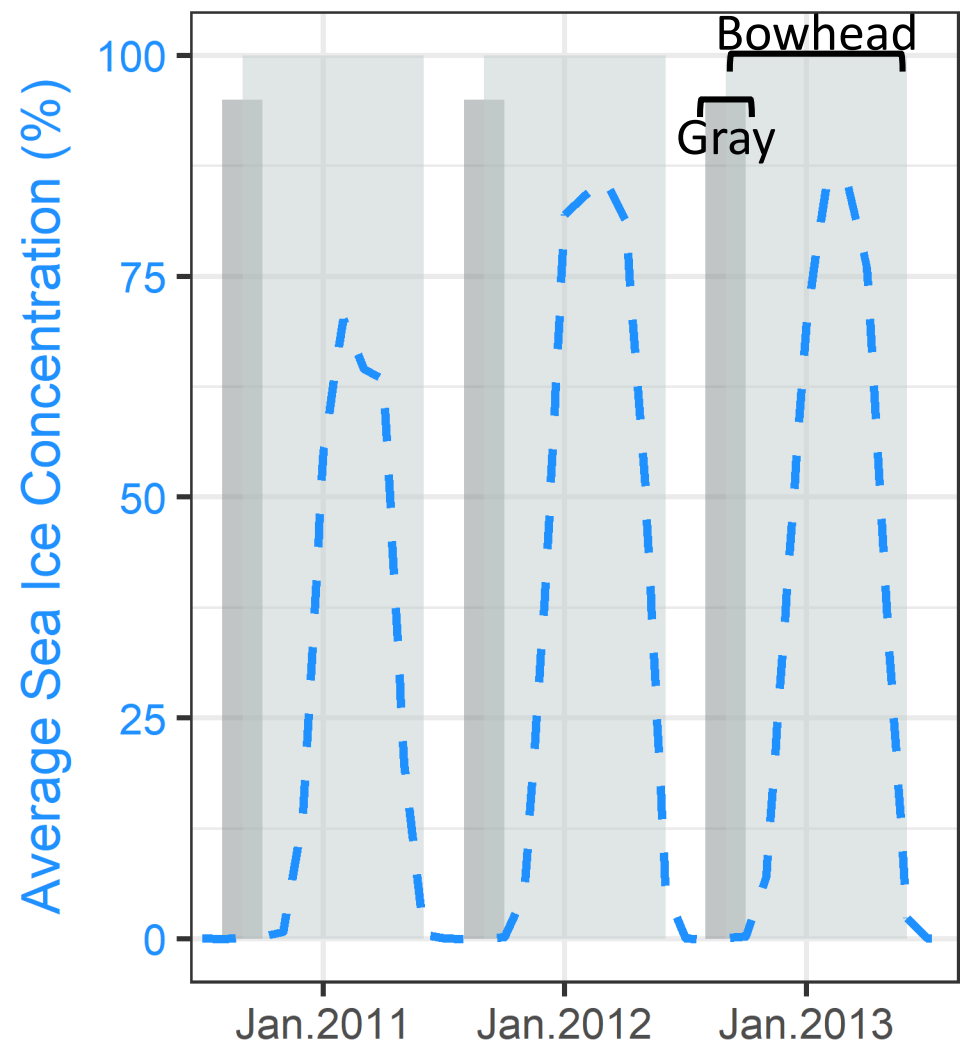
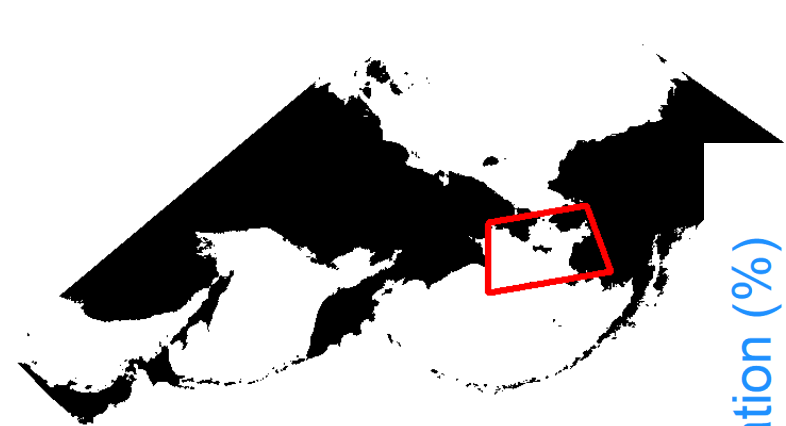


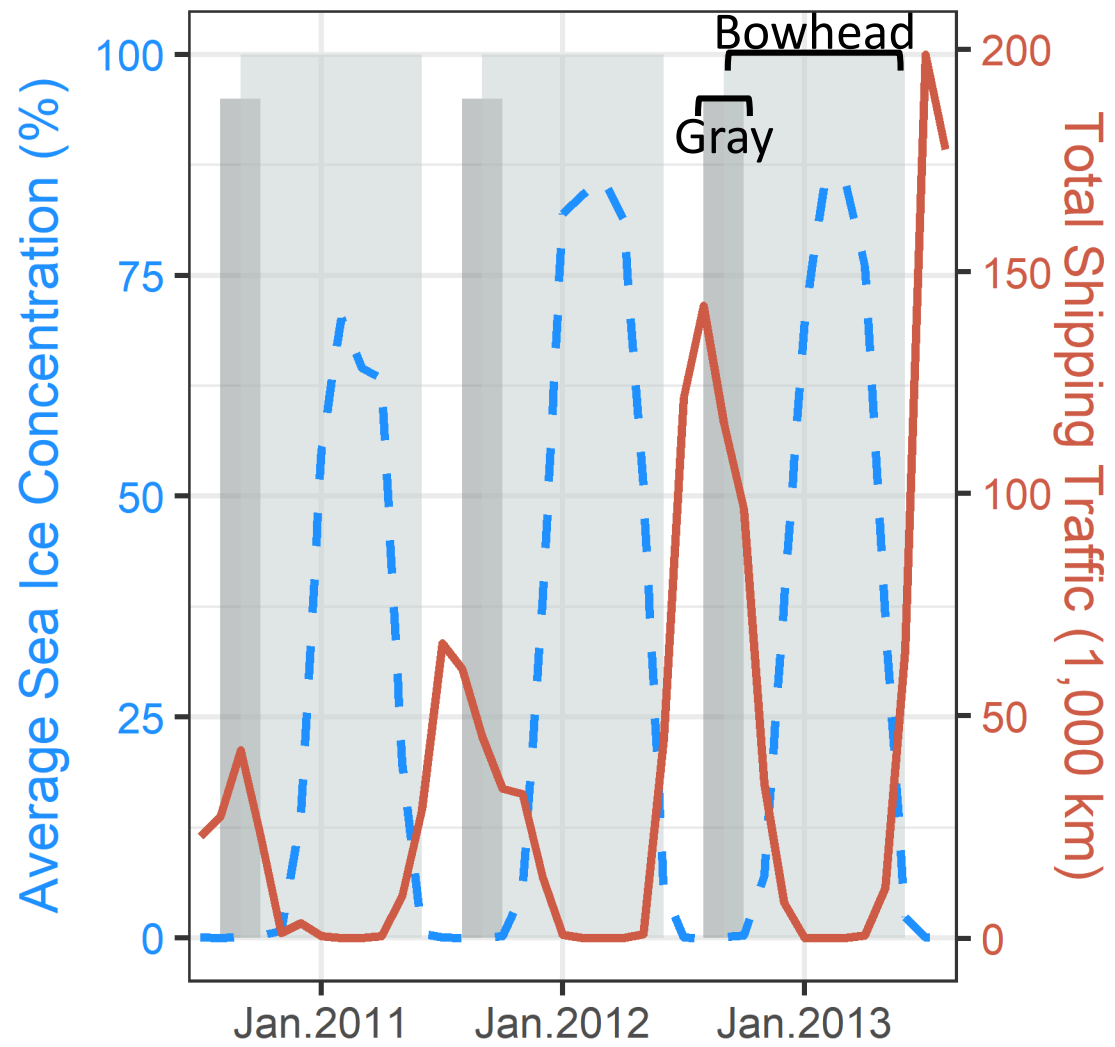
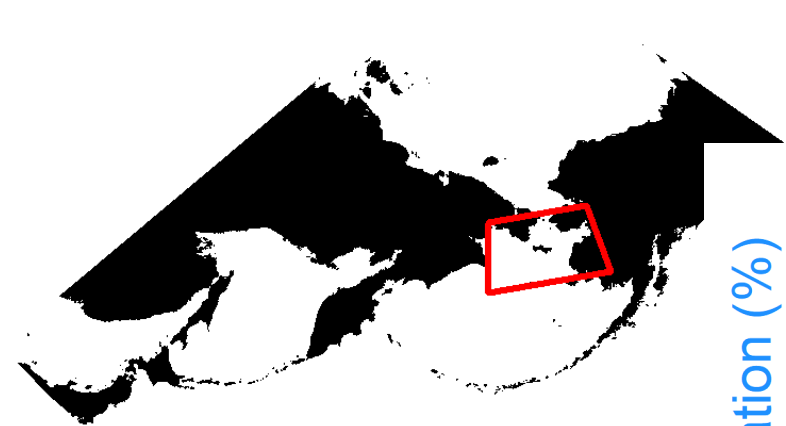
The Bering Strait is a critical shipping corridor

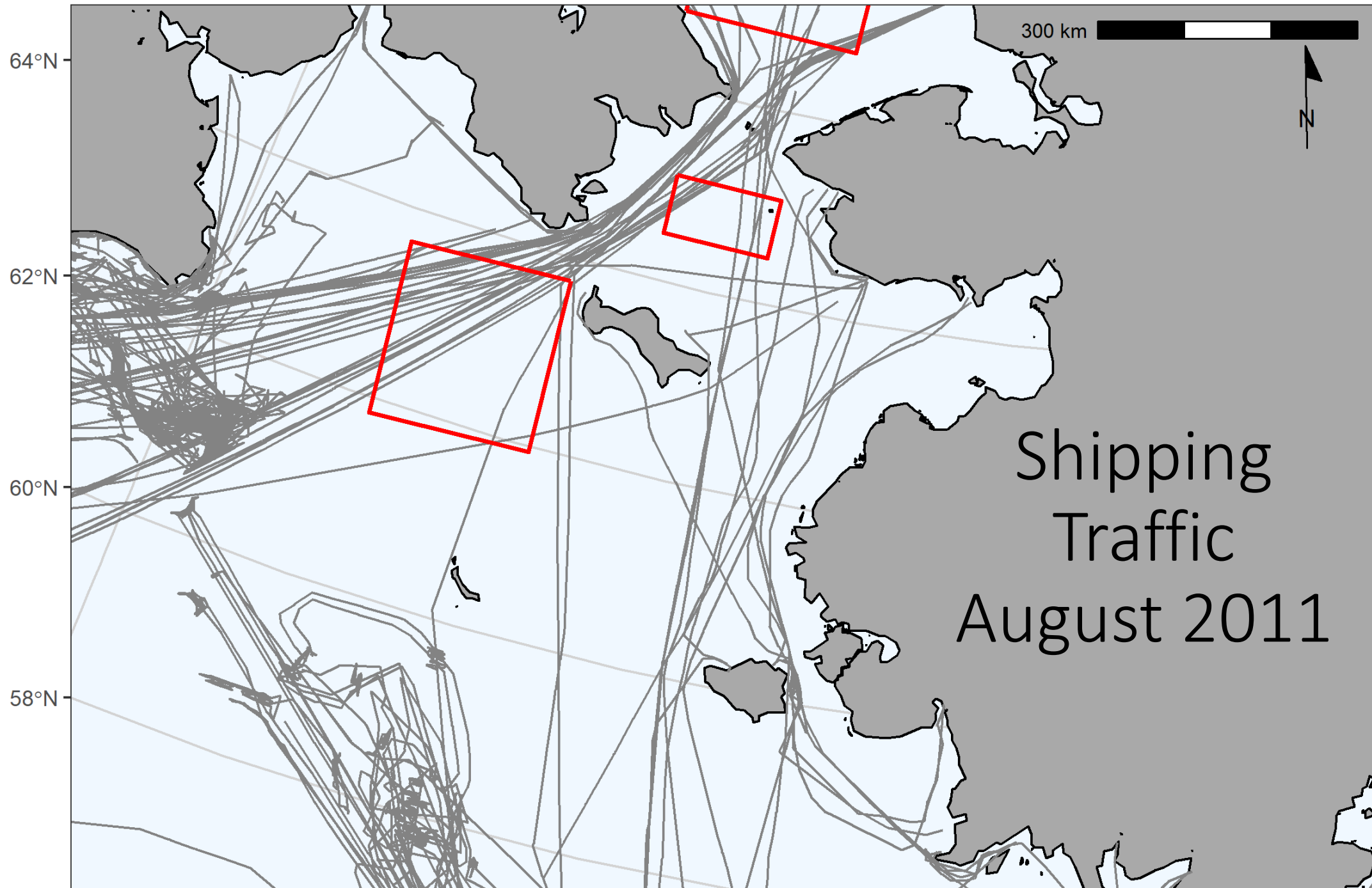


**Note: Ship traffic off the coast of Norway much higher than legend indicates.*

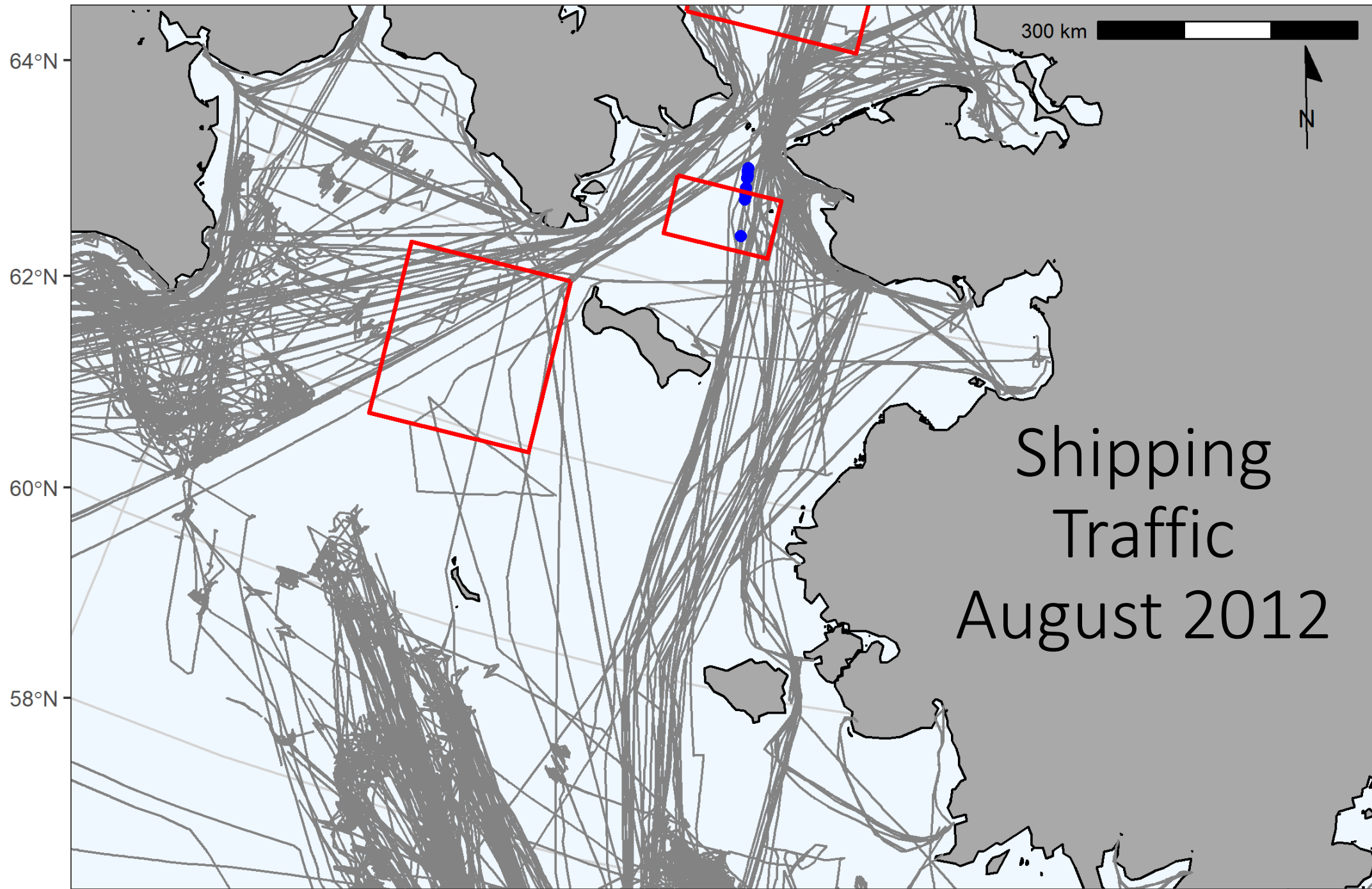


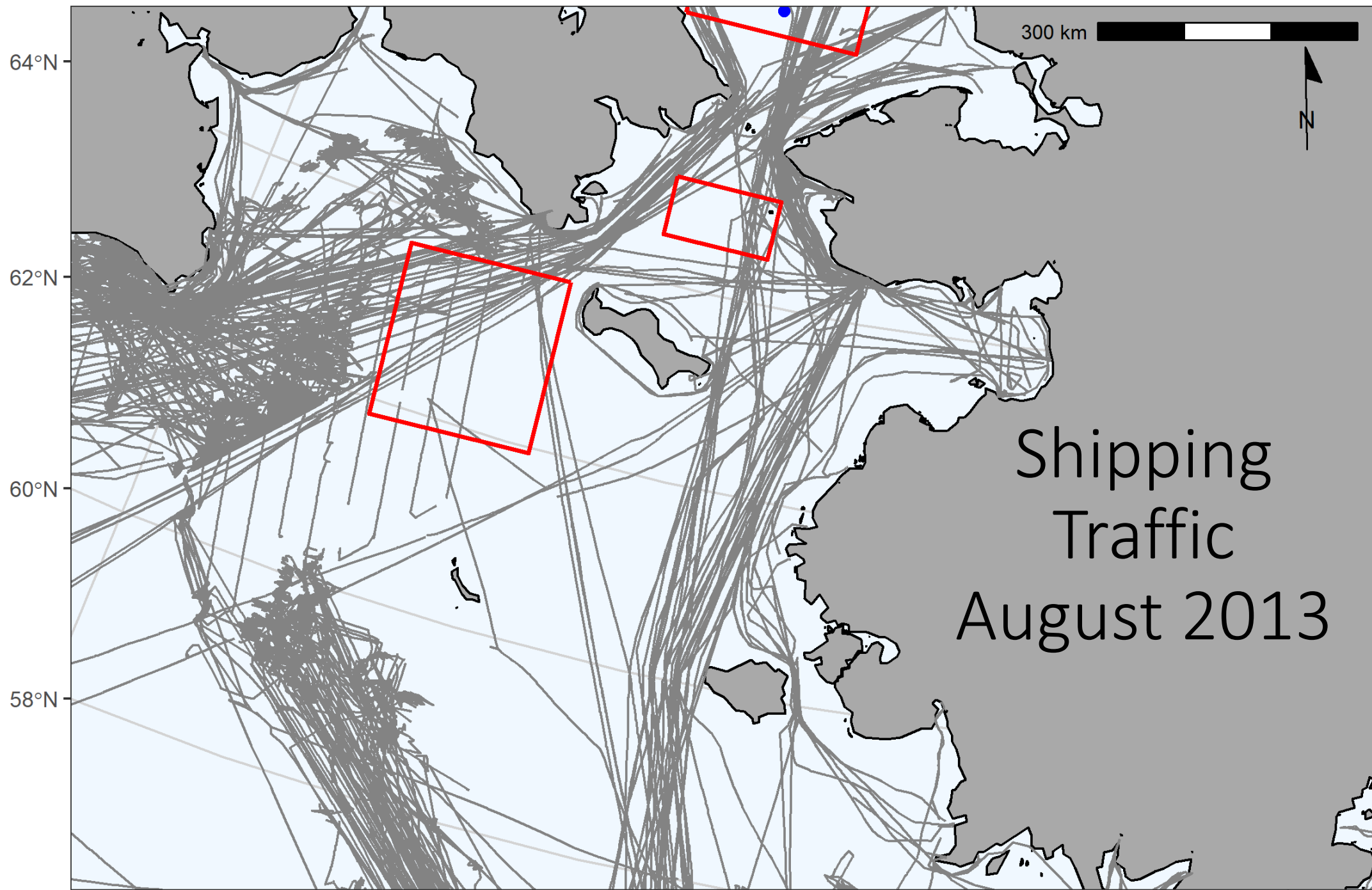






Shipping Traffic August 2011





Conclusion

- DBO data provide a unique opportunity to examine the spatial and temporal patterns of physical processes and their effects on biological patterns.



Conclusion

- DBO data provide a unique opportunity to examine the spatial and temporal patterns of physical processes and their effects on biological patterns.
- Pairing DBO data with information on human influences in the region (e.g., shipping) can help us to better understand the interactions between humans and the natural environment.



References

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Thank you!

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