

BACKGROUND

- Local environments are changing, and populations are shifting due to climate change

Ranges?

- Areas where a population occurs. Outside of ranges there are unsuitable conditions where populations cannot exist.

Range edge populations

- More susceptible to extreme climatic conditions. Their importance will increase relative to total species' persistence in future climatic scenarios

METHODS

Mammals

- Each species will have two graphs constructed, testing both hypotheses
- Control for area sampled relative to range size
- Range maps for terrestrial mammals native to Canada and the United States from the IUCN Red List database

Genetic diversity measurement

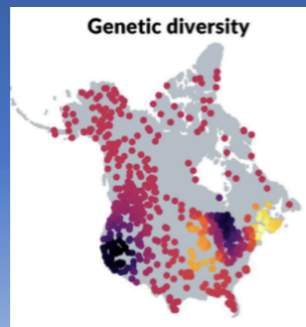
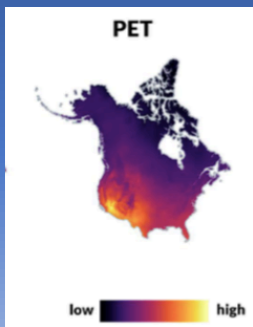
- Microsatellite data will come from over 80 studies from data repository sites

Distance from northern edge

- IUCN Red List database

Habitat quality measurement

- PET = measurement of energy availability



Patterns of genetic diversity across ranges of mammal species



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OBJECTIVE

Explore genetic diversity of mammalian populations across North American ranges

HYPOTHESES

H₁: Genetic diversity varies across ranges

P₁: Increased distance from the northern range edge will have higher genetic diversity

H₂: Habitat quality will affect genetic diversity

P₂: Better habitat quality will have higher genetic diversity

Some animals in this study include...



North American River Otter

<https://www.marylandzoo./animal/north-american-river-otter/>

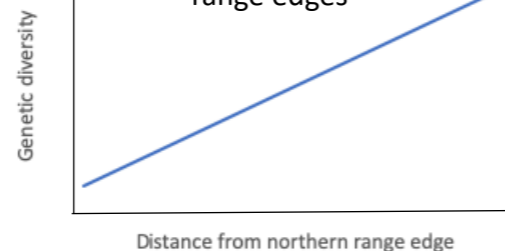


North American Deermouse

[https://en.wikipedia.org/wiki/Peromyscus_maniculatus#/media/File:Deer_Mouse_\(Peromyscus_maniculatus\)_9310532204.jpg](https://en.wikipedia.org/wiki/Peromyscus_maniculatus#/media/File:Deer_Mouse_(Peromyscus_maniculatus)_9310532204.jpg)

RESULTS

Genetic diversity is greater in southern range edges



Genetic diversity is greater in better habitat quality



CONCLUSION

- Predict if ranges will move or not
- See if edge populations are evolutionary unique and worthy of protection
- Assessment of extinction risk by understanding species' adaptation ability to shifting ranges
- Predictions when and where locally-adapted range-edge populations will be important

REFERENCES

Microsatellite data:

<https://datadryad.org/stash/dataset/doi:10.5061/dryad.cz8w9gj0c>

Distance from northern edge:

<https://www.iucnredlist.org/resources/spatial-data-download>

PET data:

<https://modis.gsfc.nasa.gov/data/dataproduct/mod16.php>

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