

Arctic vegetation response to warming



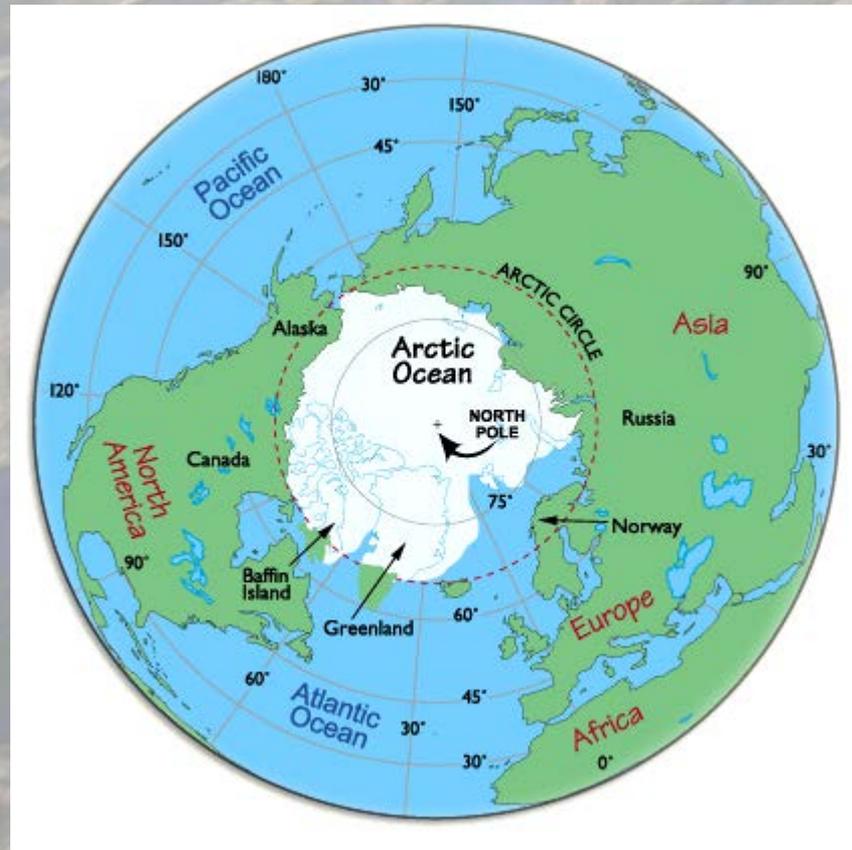
Jennifer Liebig
Robert Hollister
Jeremy May
Grand Valley State University



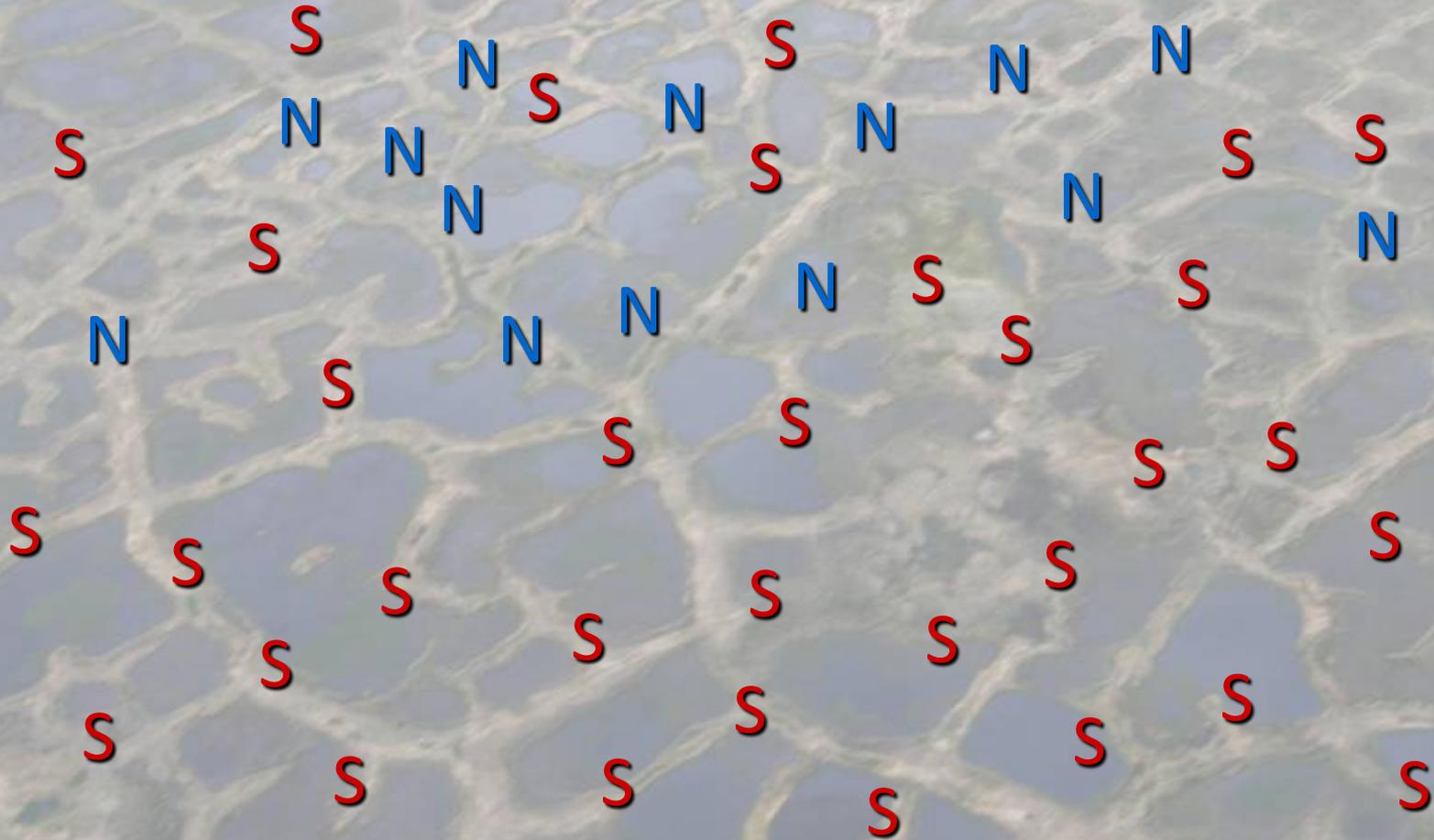
Abstract

High latitude regions are expected to experience the most profound climate change in coming decades. Here we examine the changes in plant cover in response to over a decade of experimental warming at four sites in northernmost Alaska. Plant cover was estimated using a point frame in 2007 and 2008. Previous studies have found that when compared to the control plots, vascular plants increased cover in the warmed plots. This study examines the differences between plants species classified into four different ones defined by their northernmost regional distribution developed by Steven Young. We found that species in Zone 4, the zone with the southernmost northern limit, increased cover in warmed plots, while the change in cover of species from the other zones varied among sites. These findings support the prevailing wisdom that species will expand their distribution at the northern limit of their current range.

Climate Change: Impacts on the Arctic

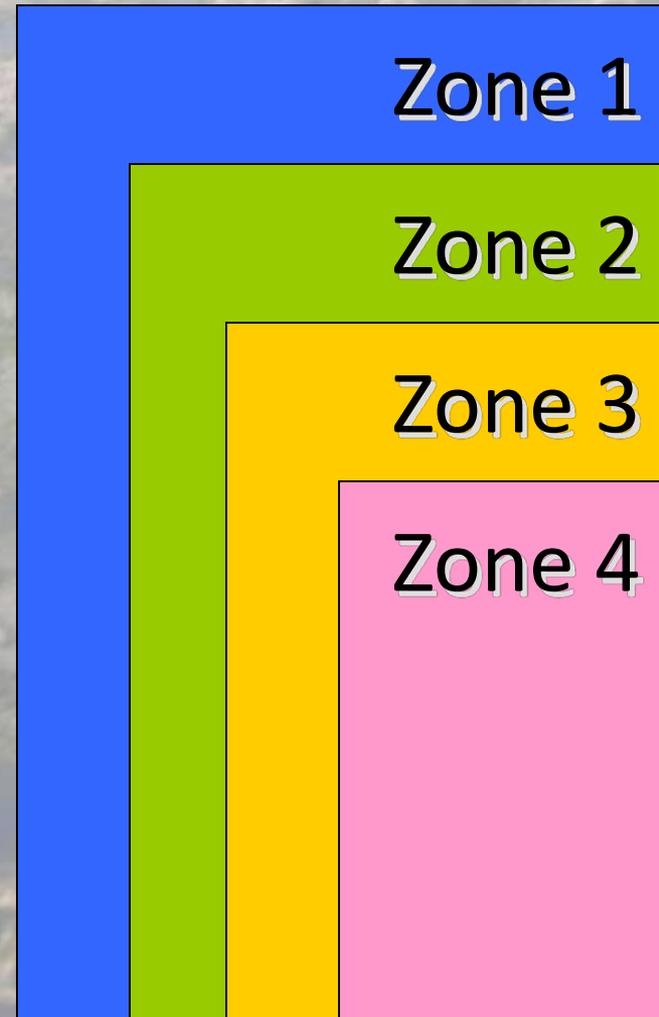


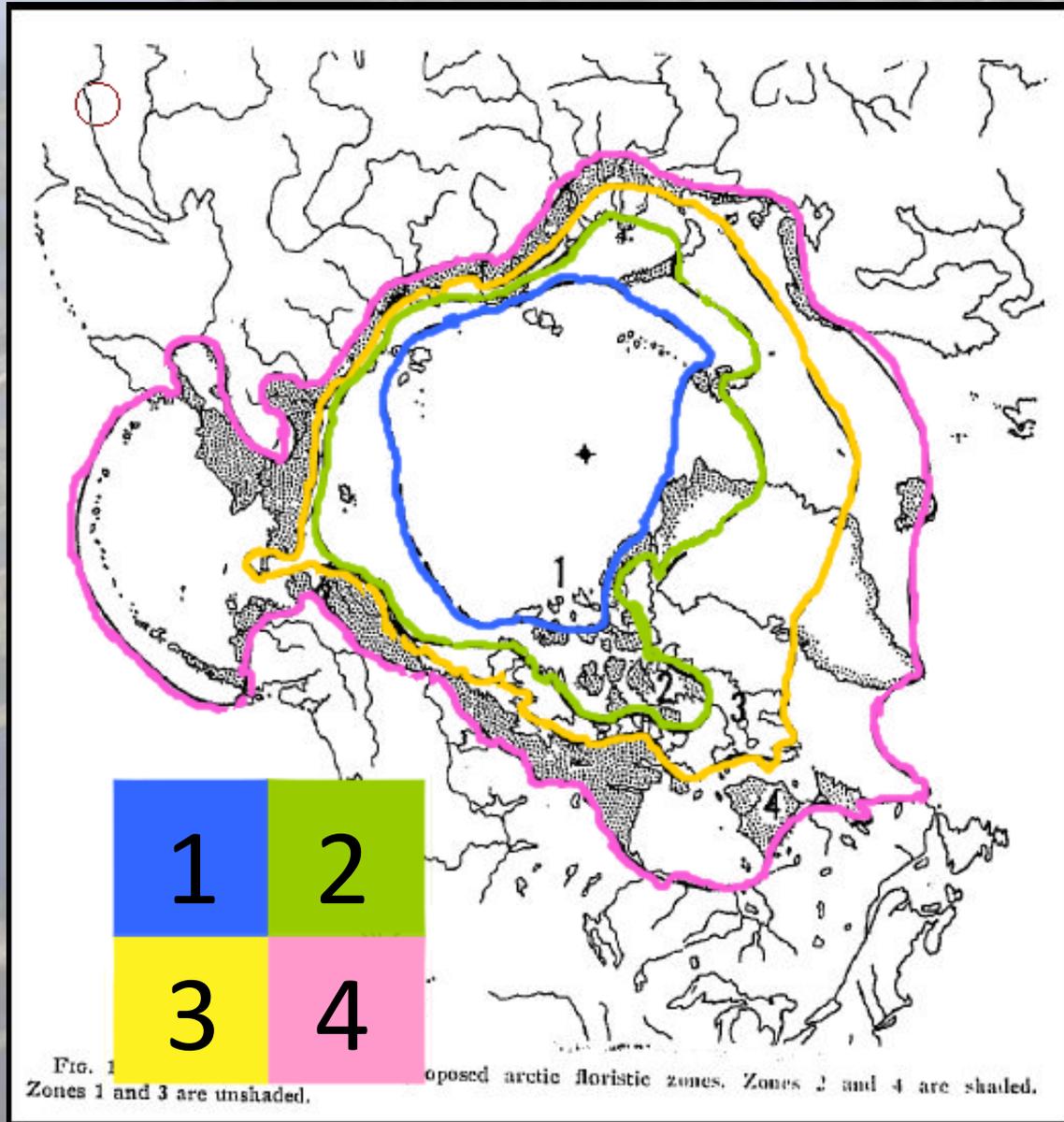
Expected Trends



Steven B Young (1971)

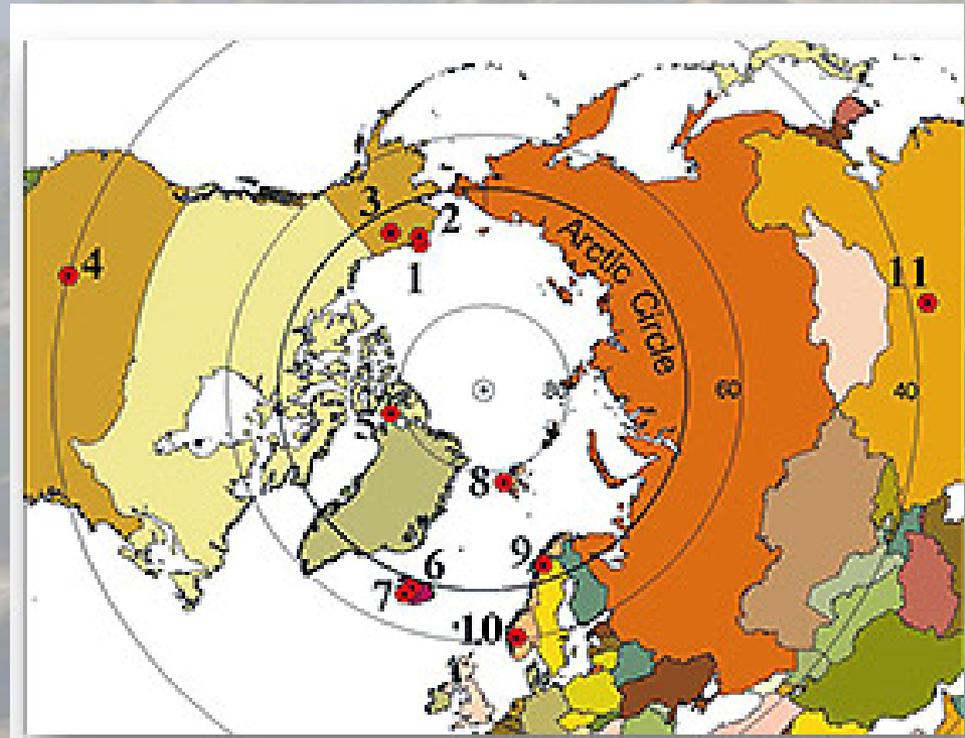
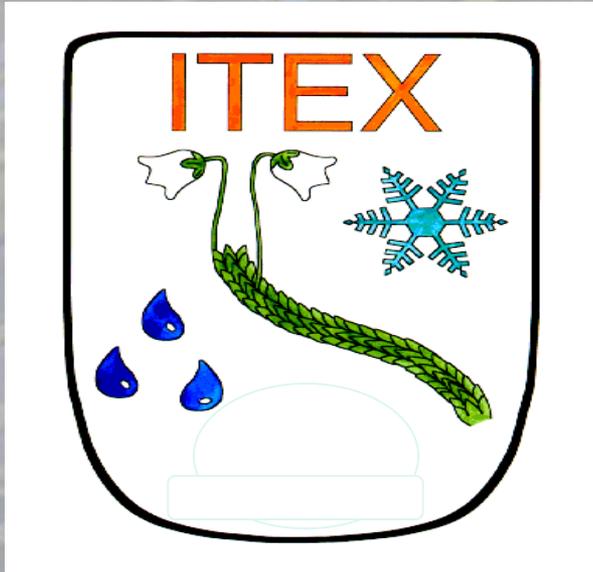
Used observations of vegetation on St. Lawrence Island to establish a zonation scheme of four zones based on the northern limits of species.

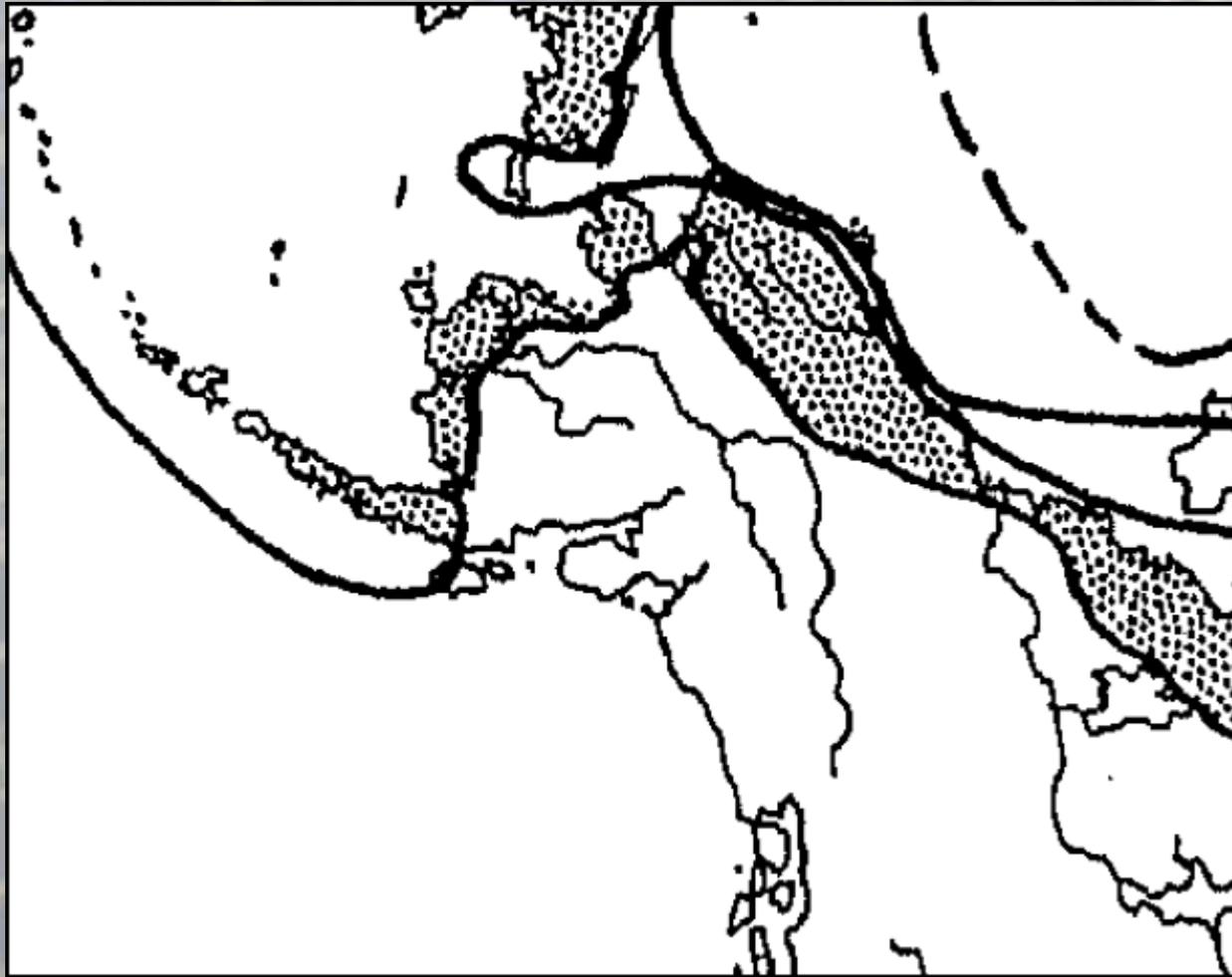


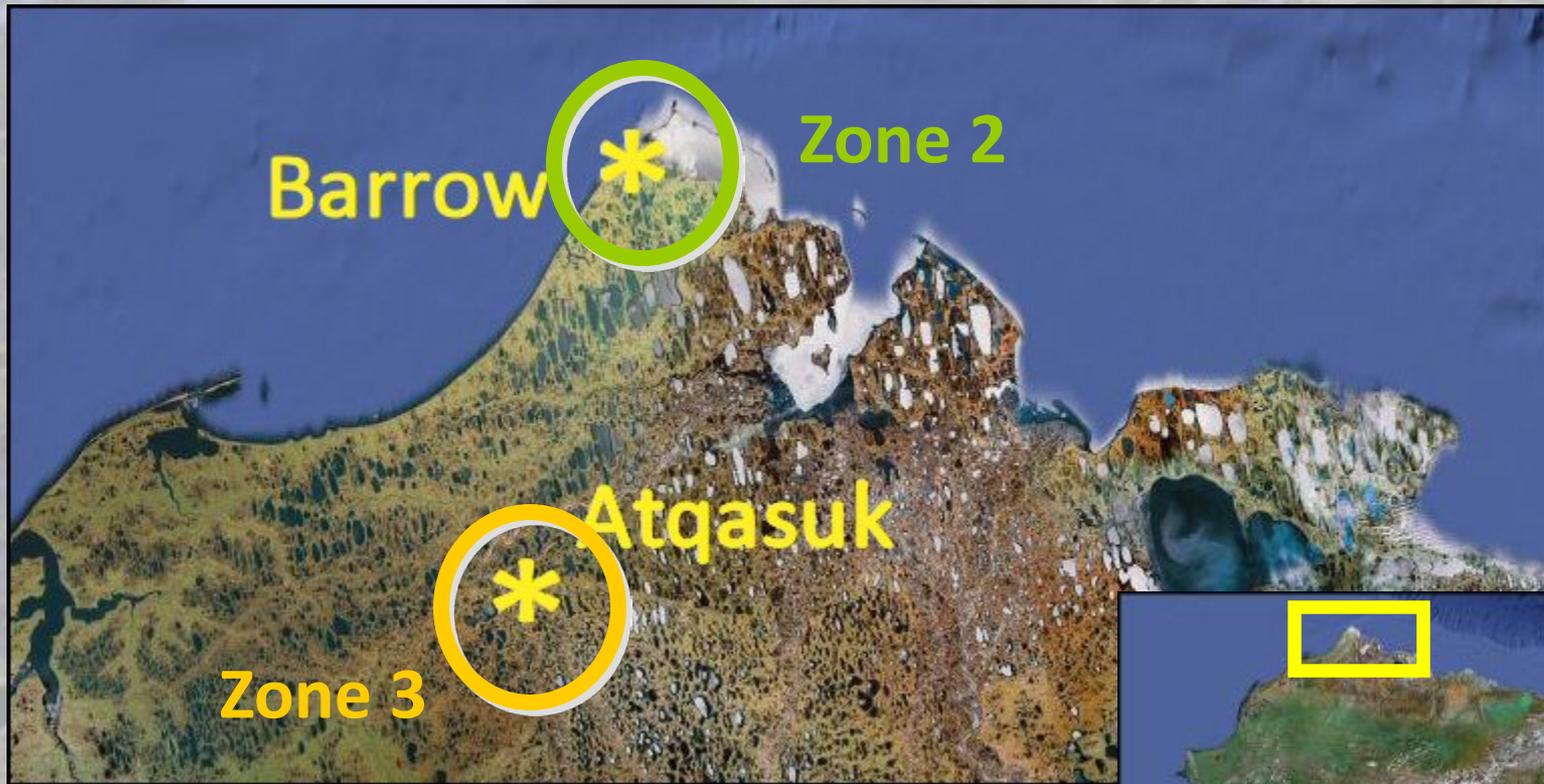


Zones:

International Tundra Experiment







Site Locations



Zone 2 (Cooler)

Barrow

Dry Heath



Wet Meadow



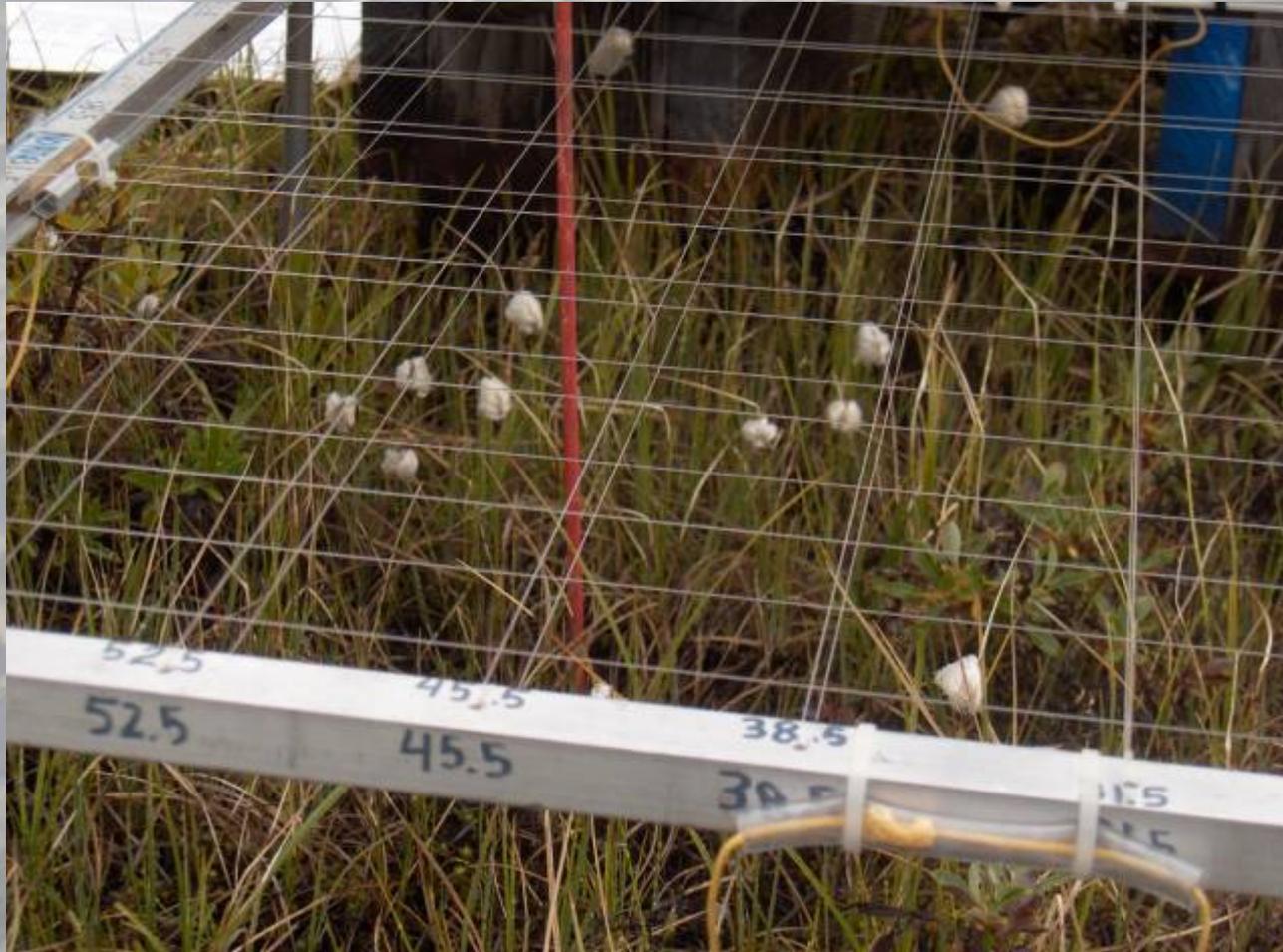
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Zone 3 (Warmer)

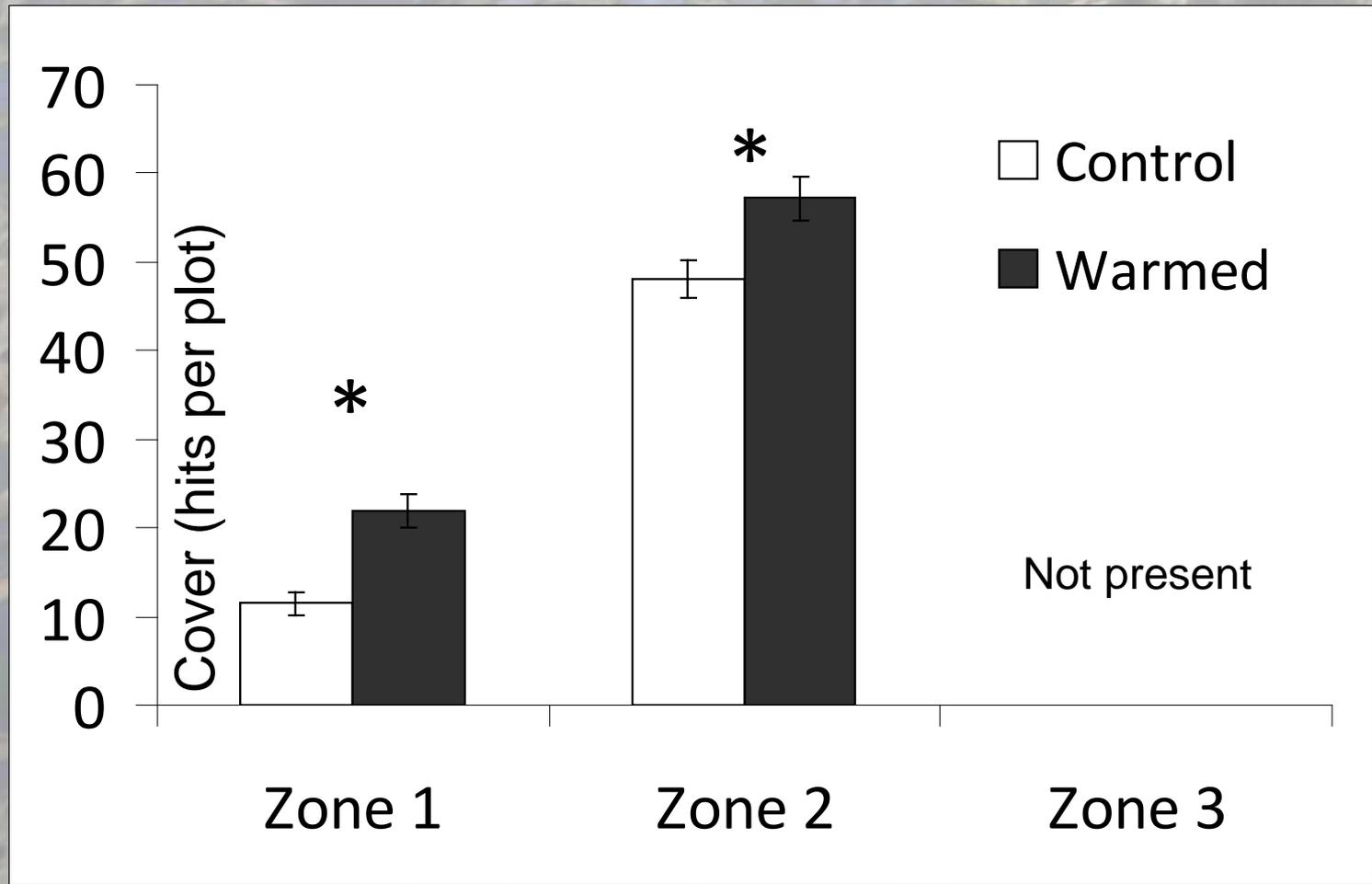
Warming Treatment



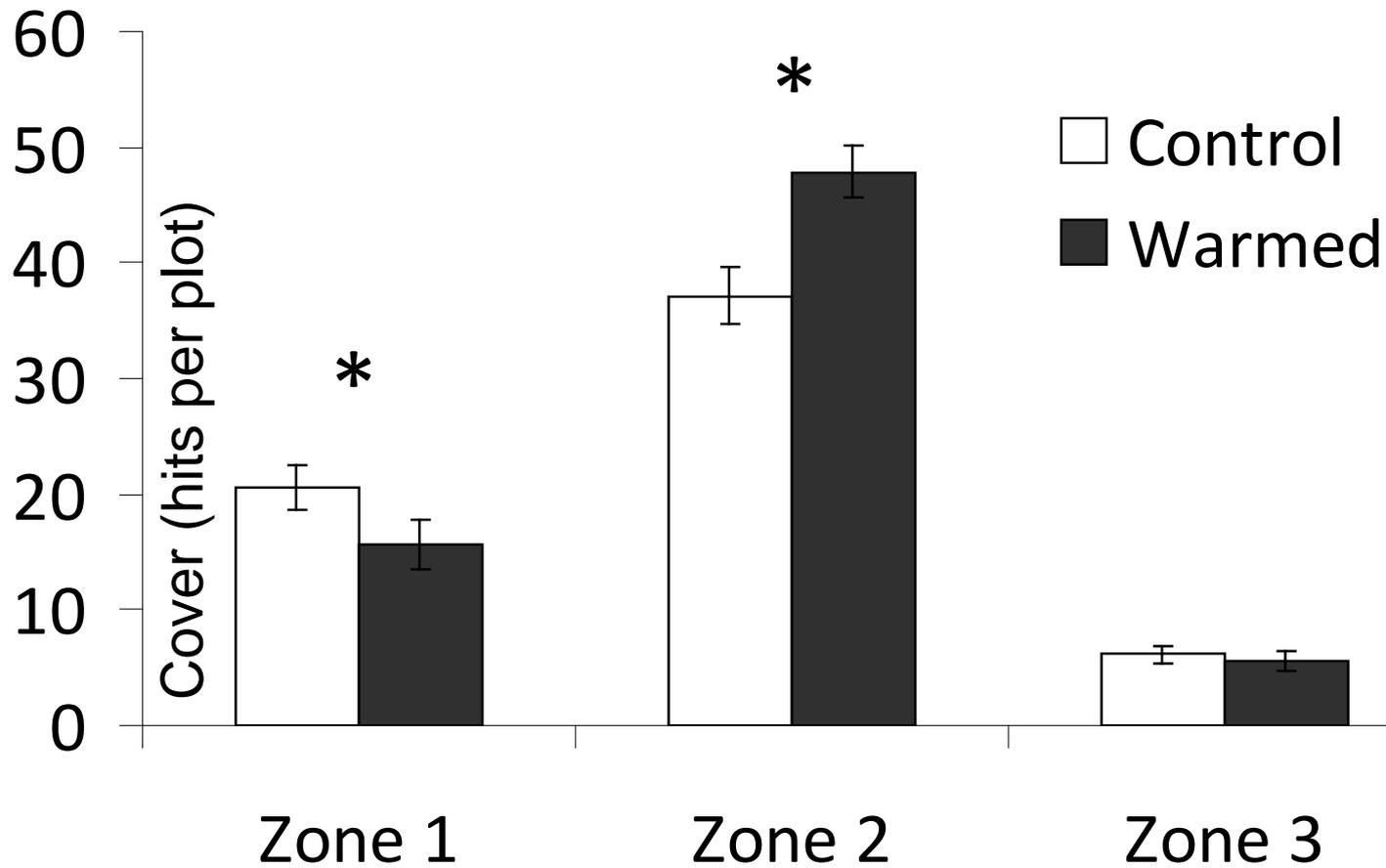
Point frame data collection



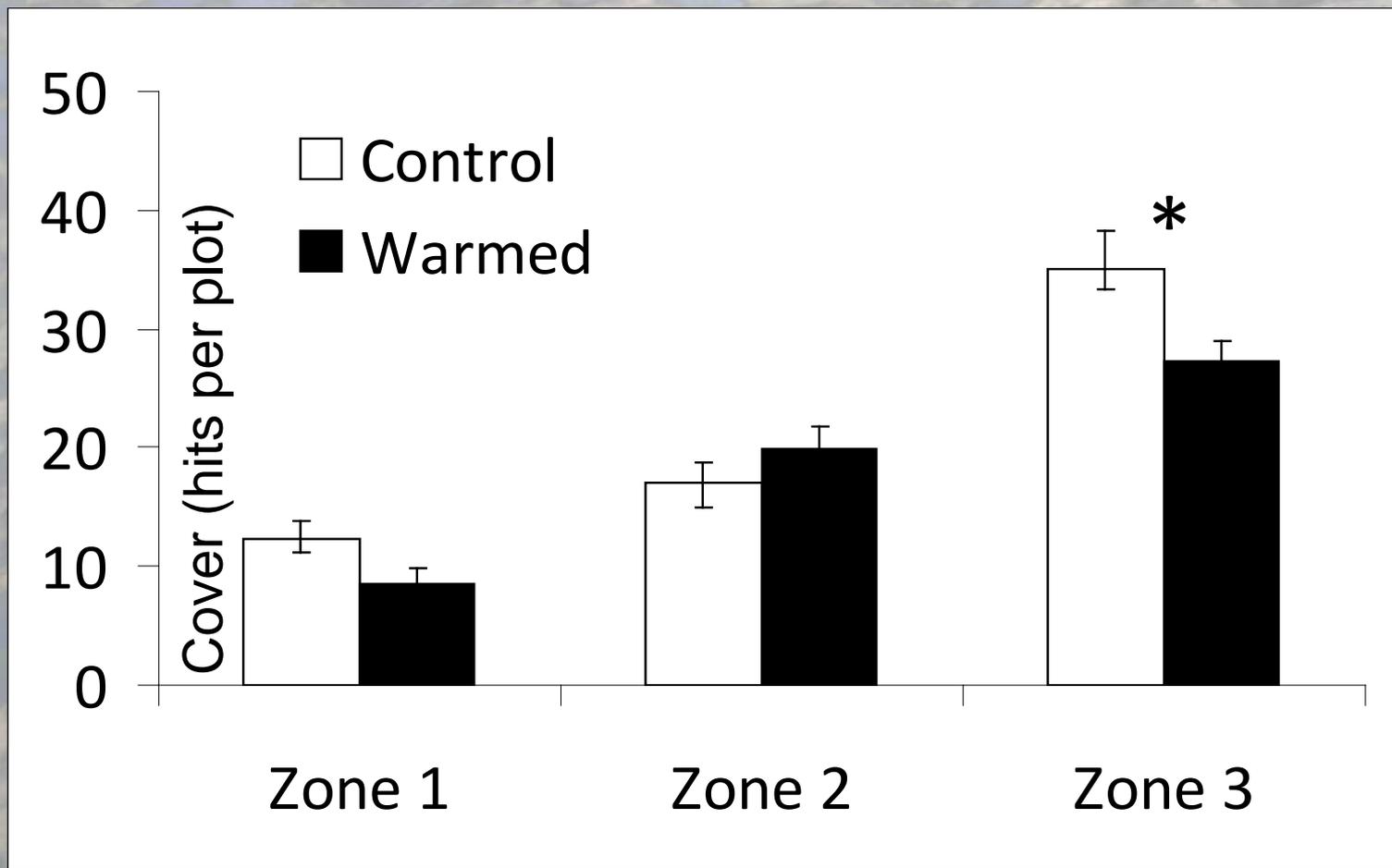
Barrow Dry



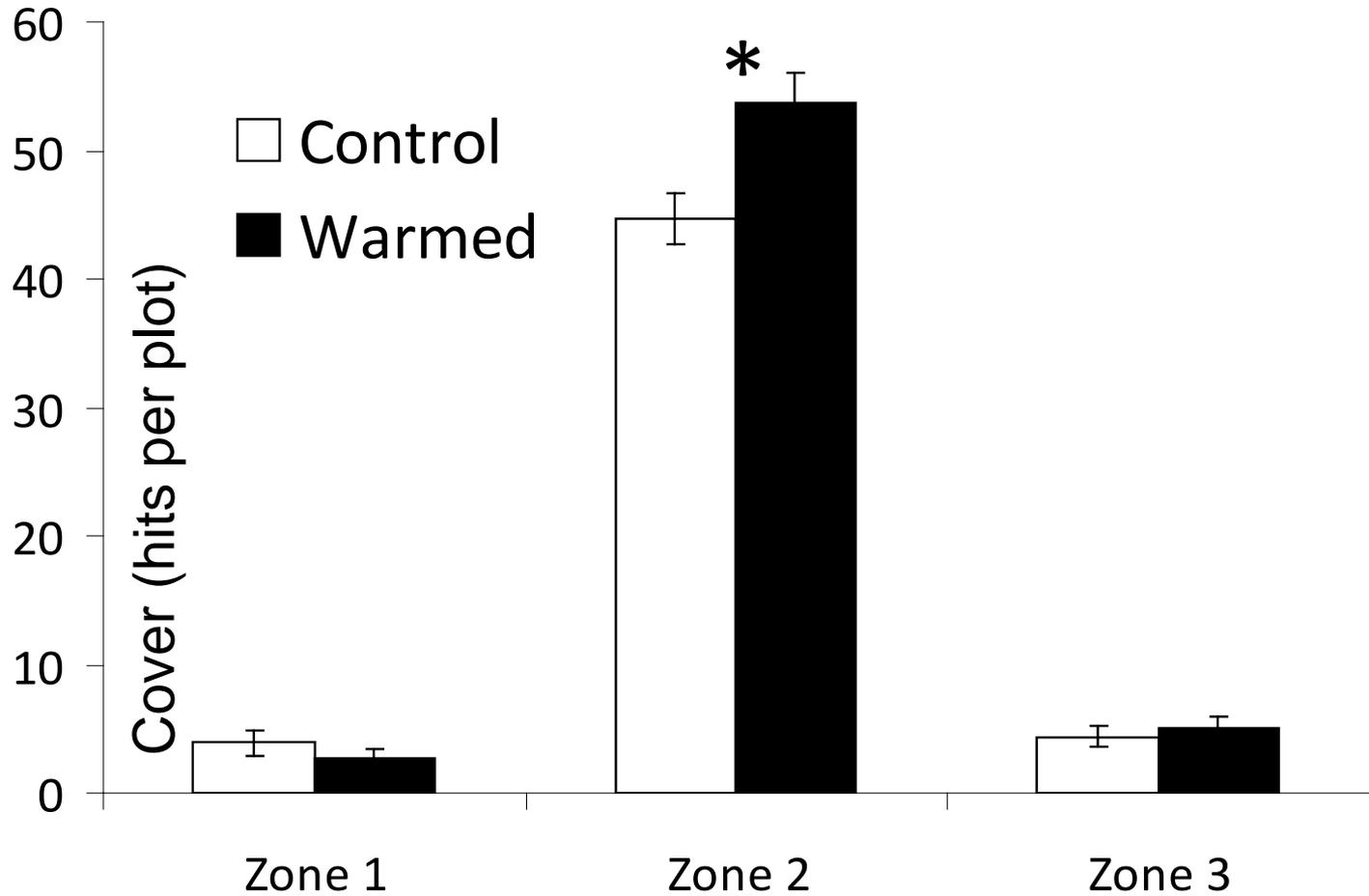
Barrow Wet



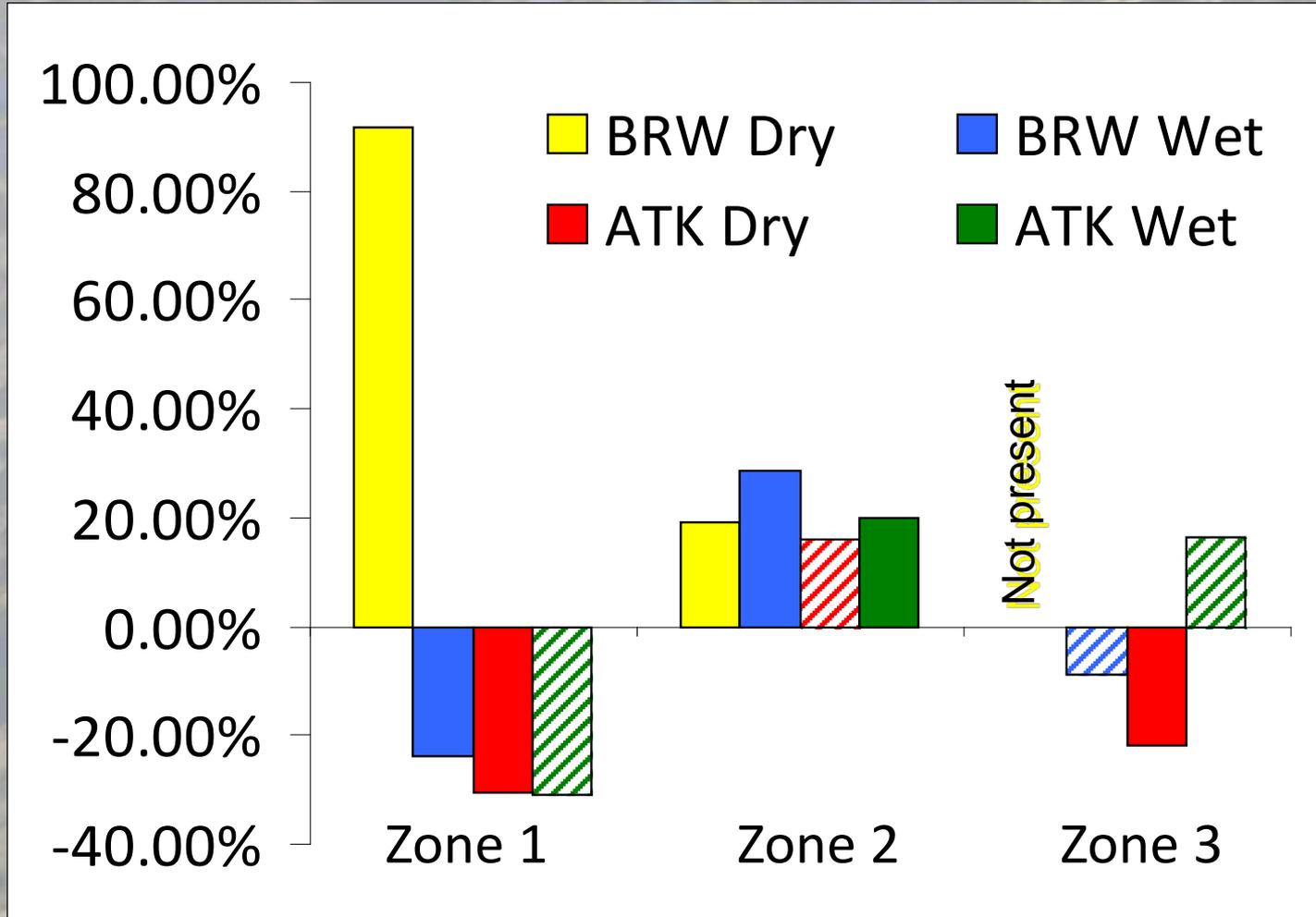
Atqasuk Dry



Atqasuk Wet



Percent Change



Summary

- **Vegetation responded to warming**
- **Young's zonation scheme is a useful classification tool- the zones are reasonable and behave differently from each other**
- **Zone 1's performance was poor**
- **Zone 2 did well in the warmed environment**
- **Zone 3 is poorly represented in the sites and showed mixed results**

References

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Acknowledgements

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