



# Shifting social-ecological systems, limits to adaptation and biodiversity in a warming tundra biome

CHARTER: Drivers and Feedbacks of Changes in Arctic Terrestrial Biodiversity

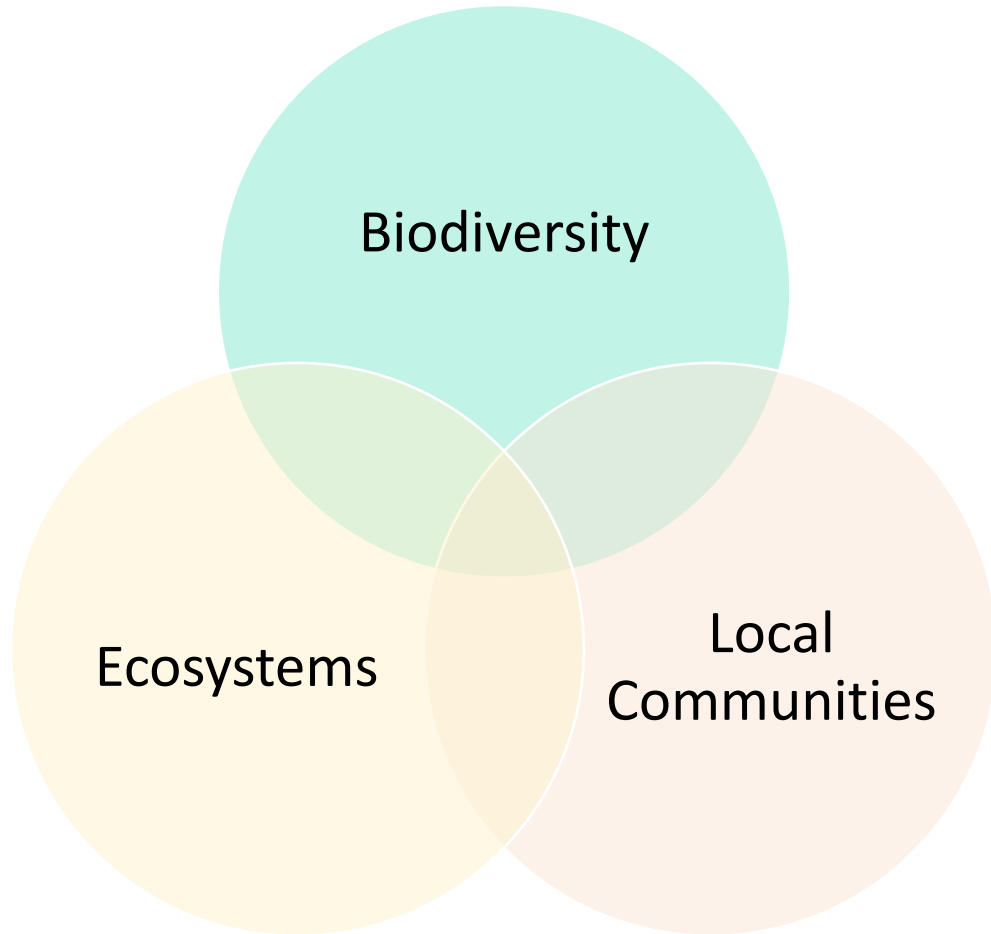
**Dr Mariana García Criado, University of Edinburgh**

European Polar Science Week

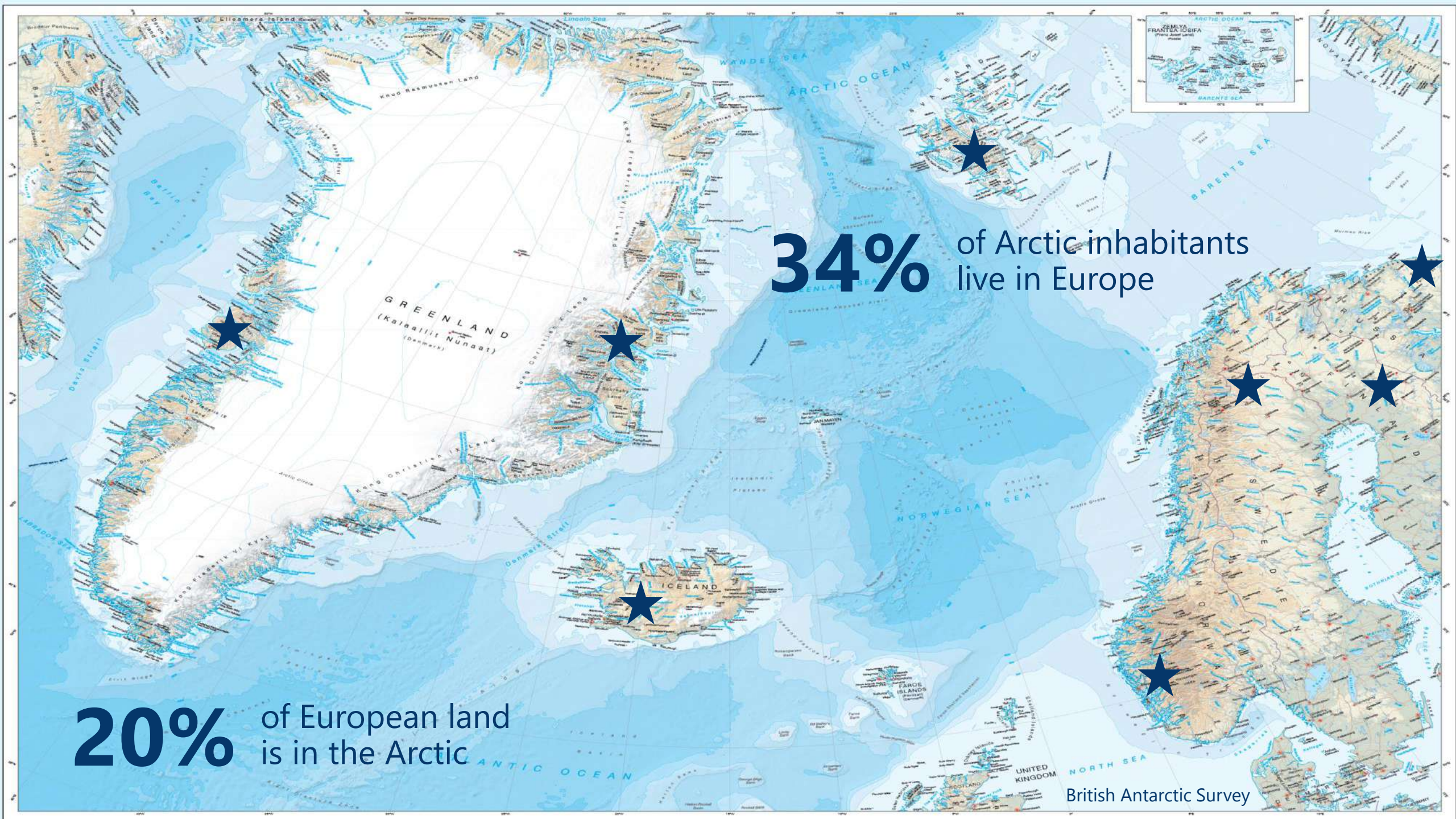
Copenhagen, 5<sup>th</sup> September 2024



# CHARTER advances the adaptive capacity of Arctic ecosystems and communities





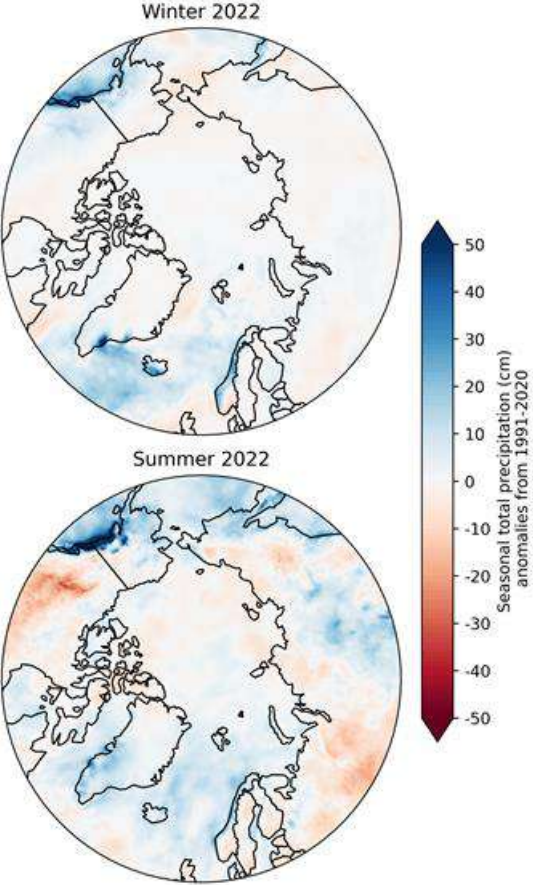
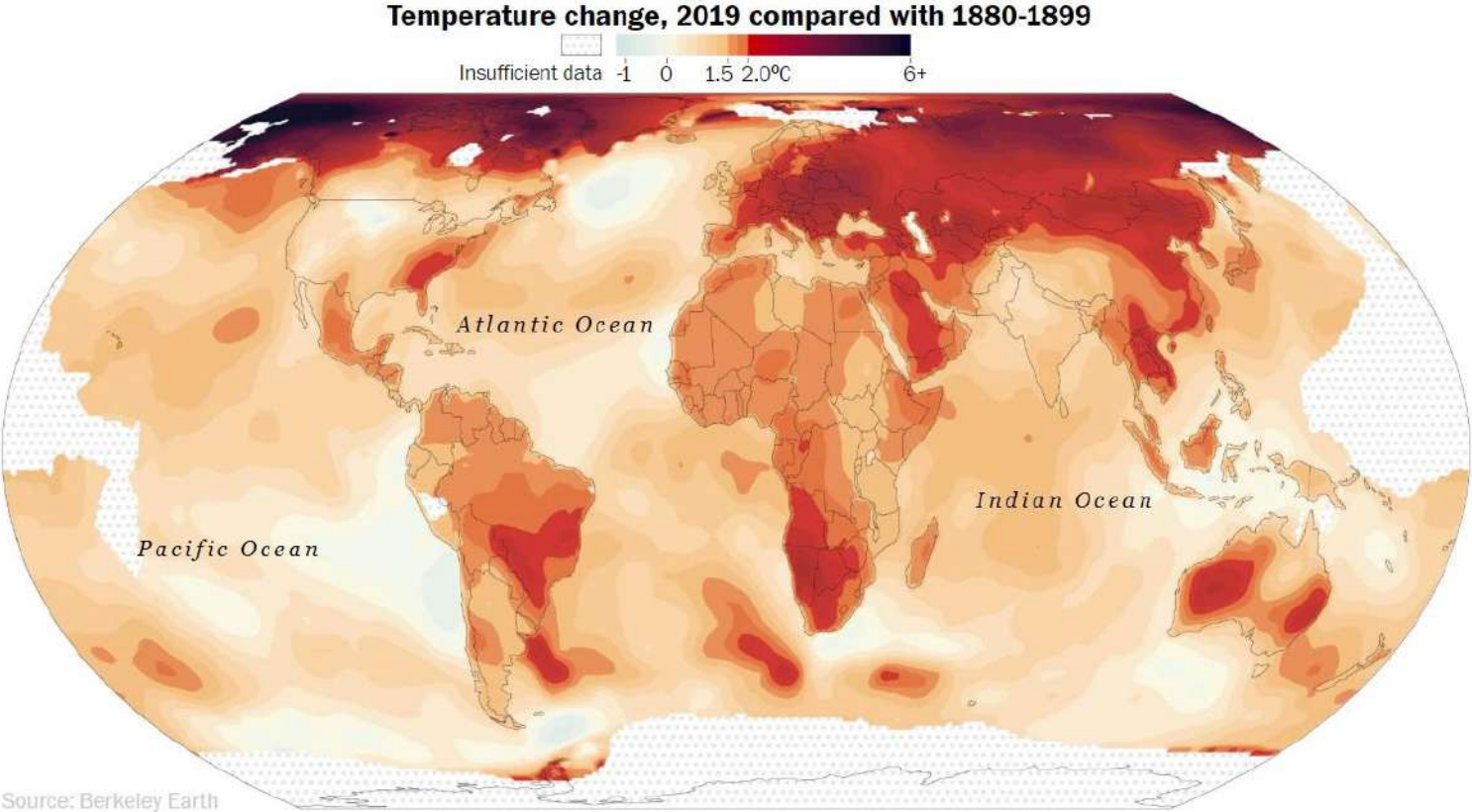


**34%** of Arctic inhabitants live in Europe

**20%** of European land is in the Arctic



# The Arctic is becoming warmer and wetter

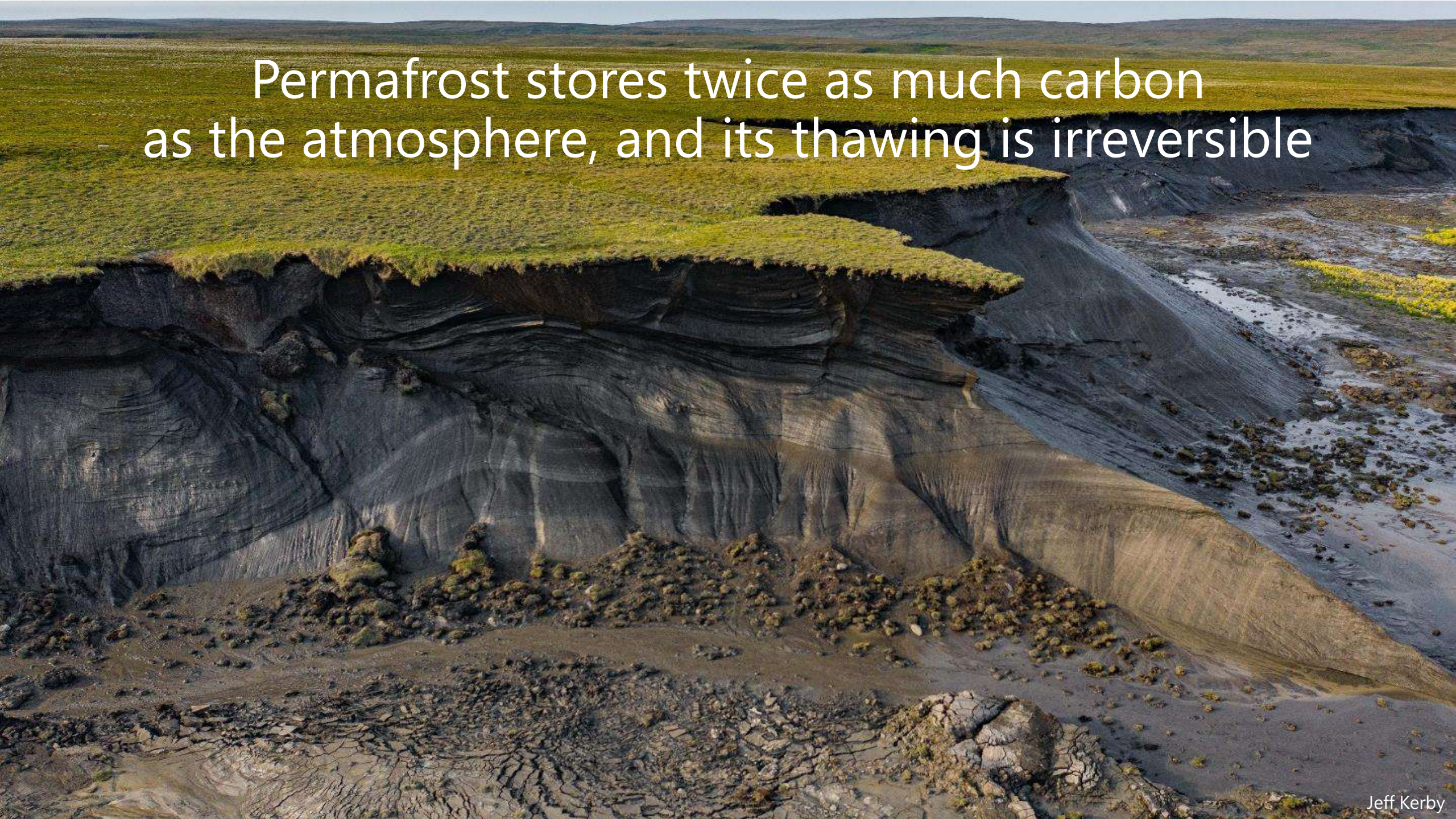


# Extreme climate events are affecting wildlife





Permafrost stores twice as much carbon as the atmosphere, and its thawing is irreversible





# Shrubs have expanded into new areas



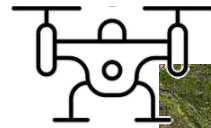
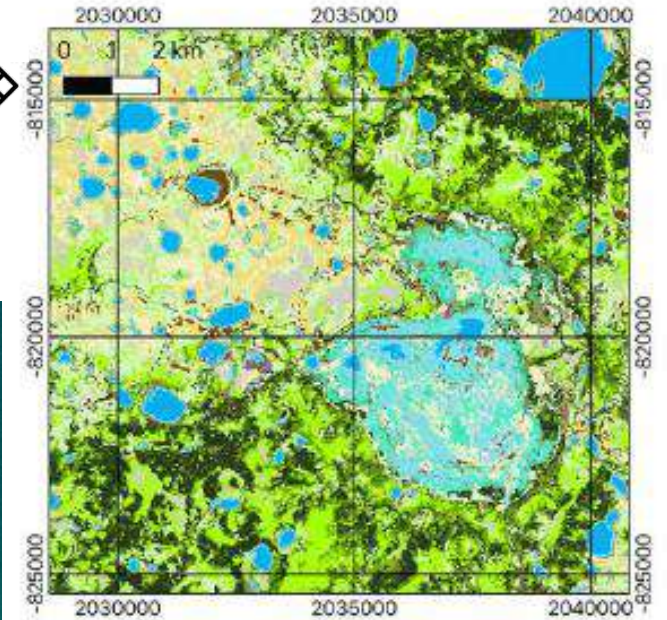
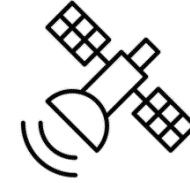


# Plant species are responding differently, which can impact animals and food security



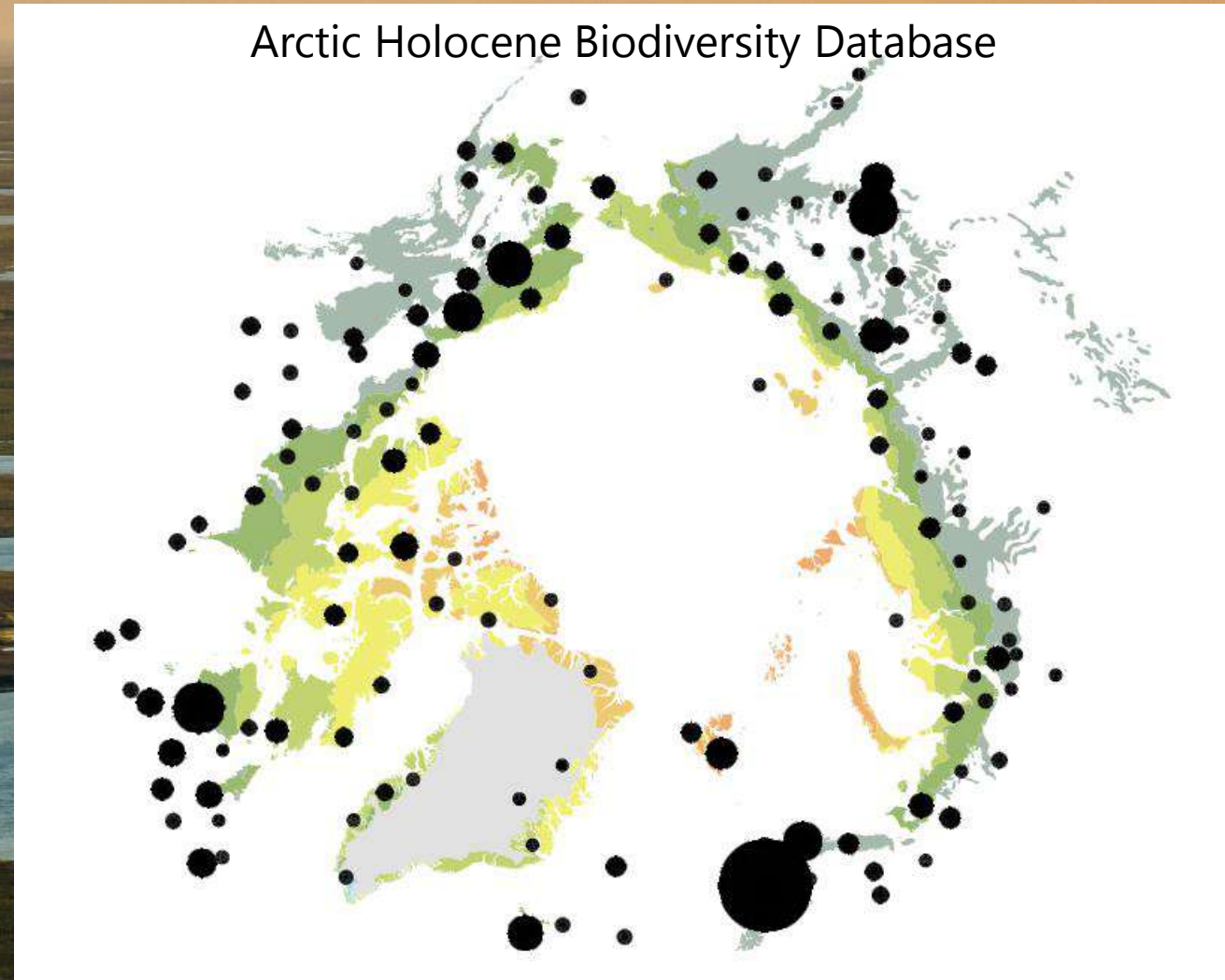
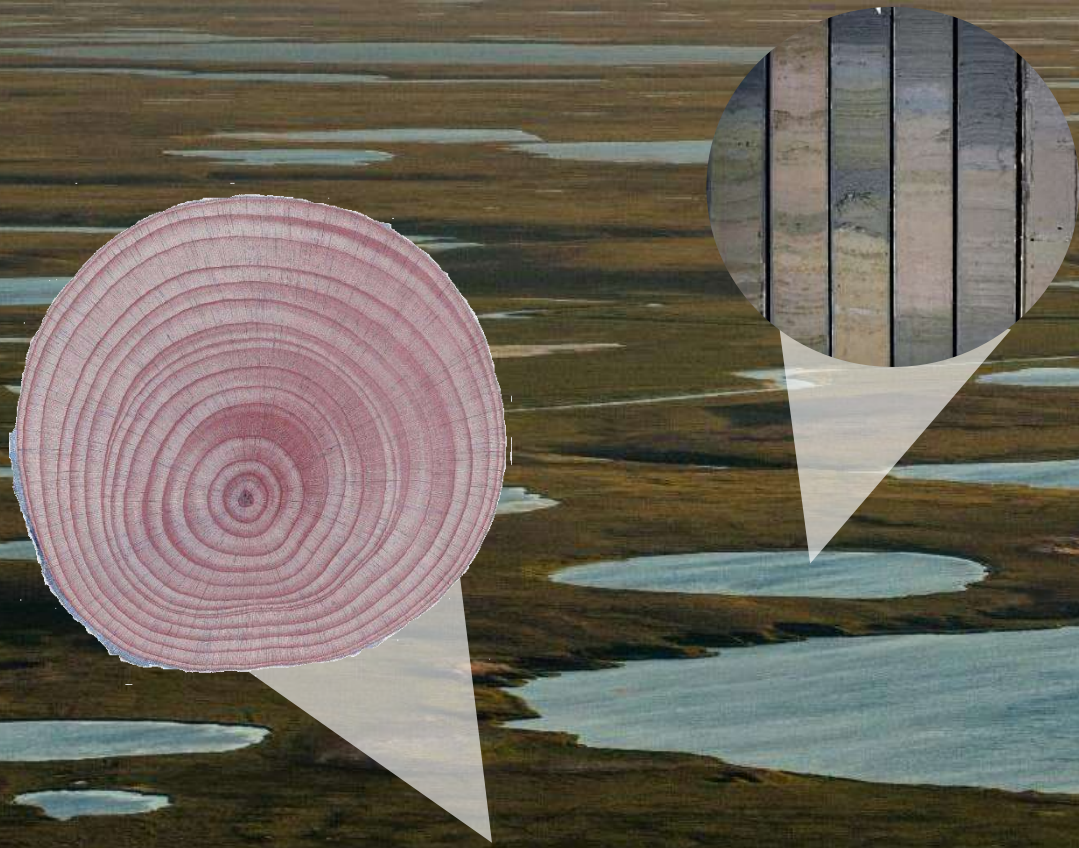


# Diverse data collection across scales





Paleoecological records help us understand past centuries/millennia to inform future projections





# Herbivores shape ecosystems (and so our management strategies)





# Reindeer herding can mitigate climate change





# Reindeer herding is a vital livelihood



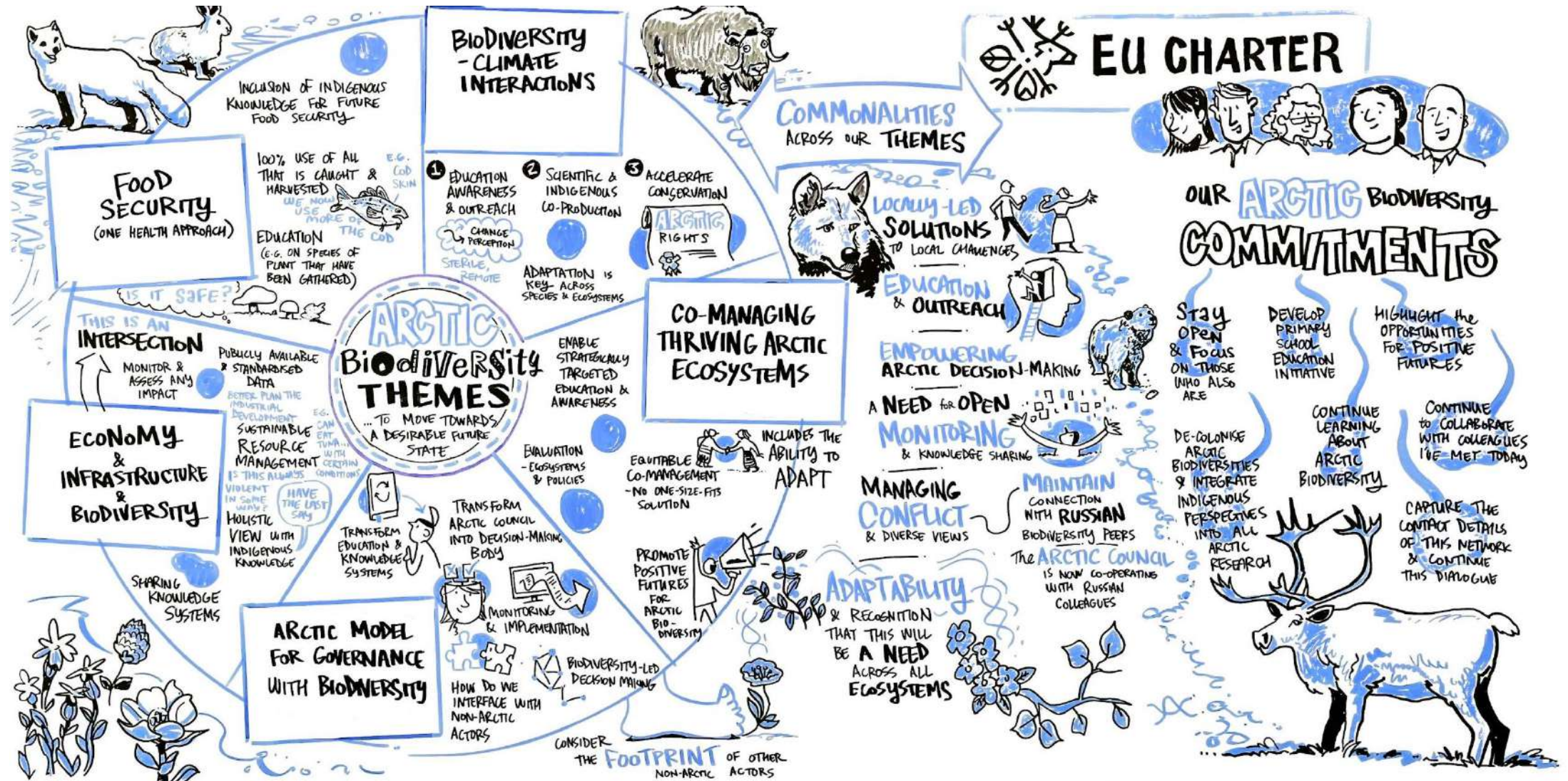


# Policy-making must consider the perspectives of local and Indigenous stakeholders





# Envisioning desirable futures for Arctic biodiversity





# Take-away messages

Rapid and interlinked socio-environmental changes in the Arctic.

Land use planning is critical: at the intersection of energy, mining, tourism, biodiversity protection, nature-based solutions and adaptation for local livelihoods.

**Governance and legislation need to consider links between climate, biodiversity, land use and local livelihoods, and meaningful participation of local and Indigenous Peoples.**





# Research priorities

Research on land use changes and socio-ecological systems is key.

The emergence of novel ecosystems poses new challenges and opportunities for local and Indigenous communities.

Co-creation of cross-disciplinary knowledge with local and Indigenous communities is essential to achieve desired futures.

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