



# Functional diversity varies depending on the vegetation period – a remote sensing based analysis



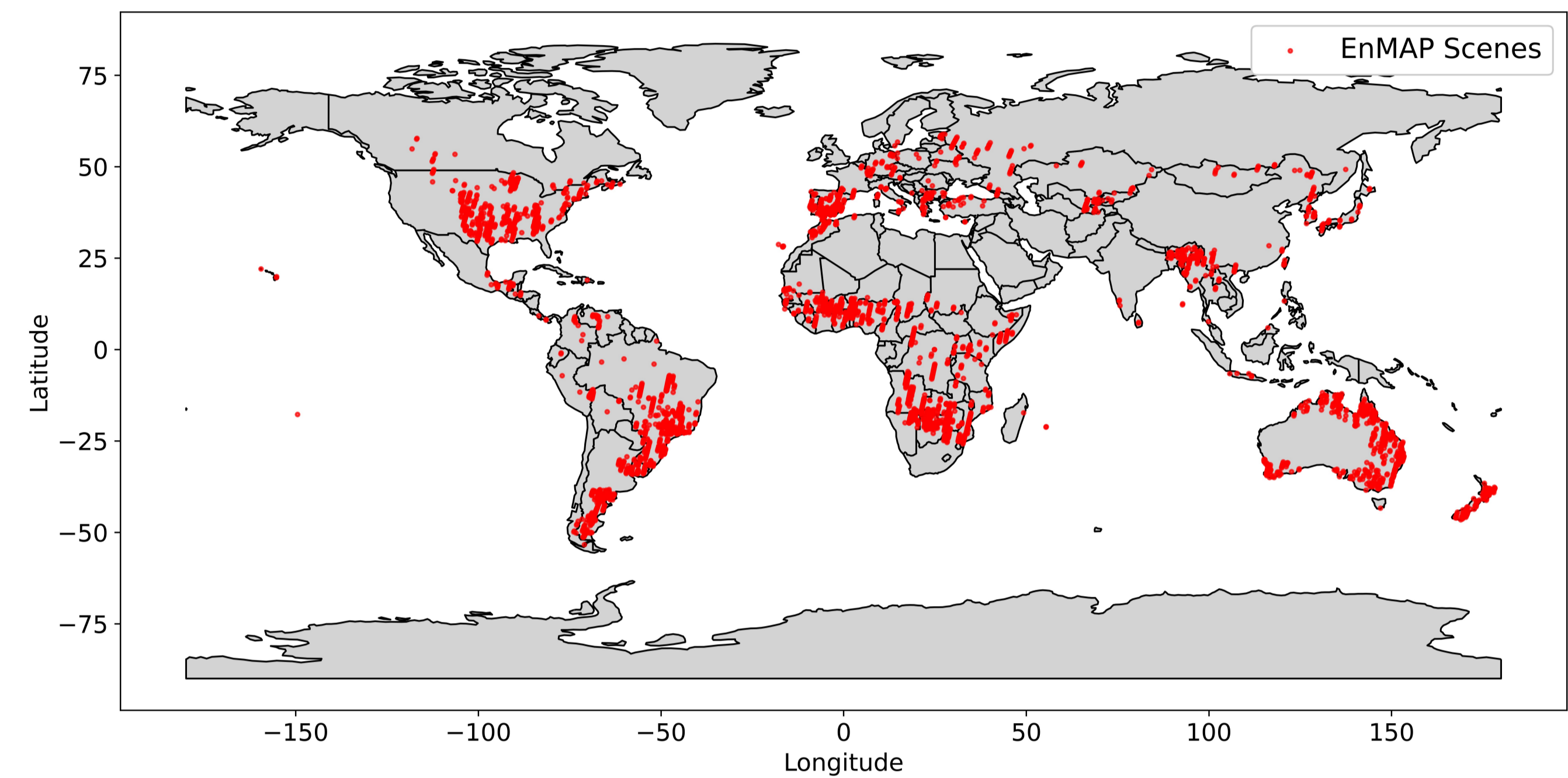
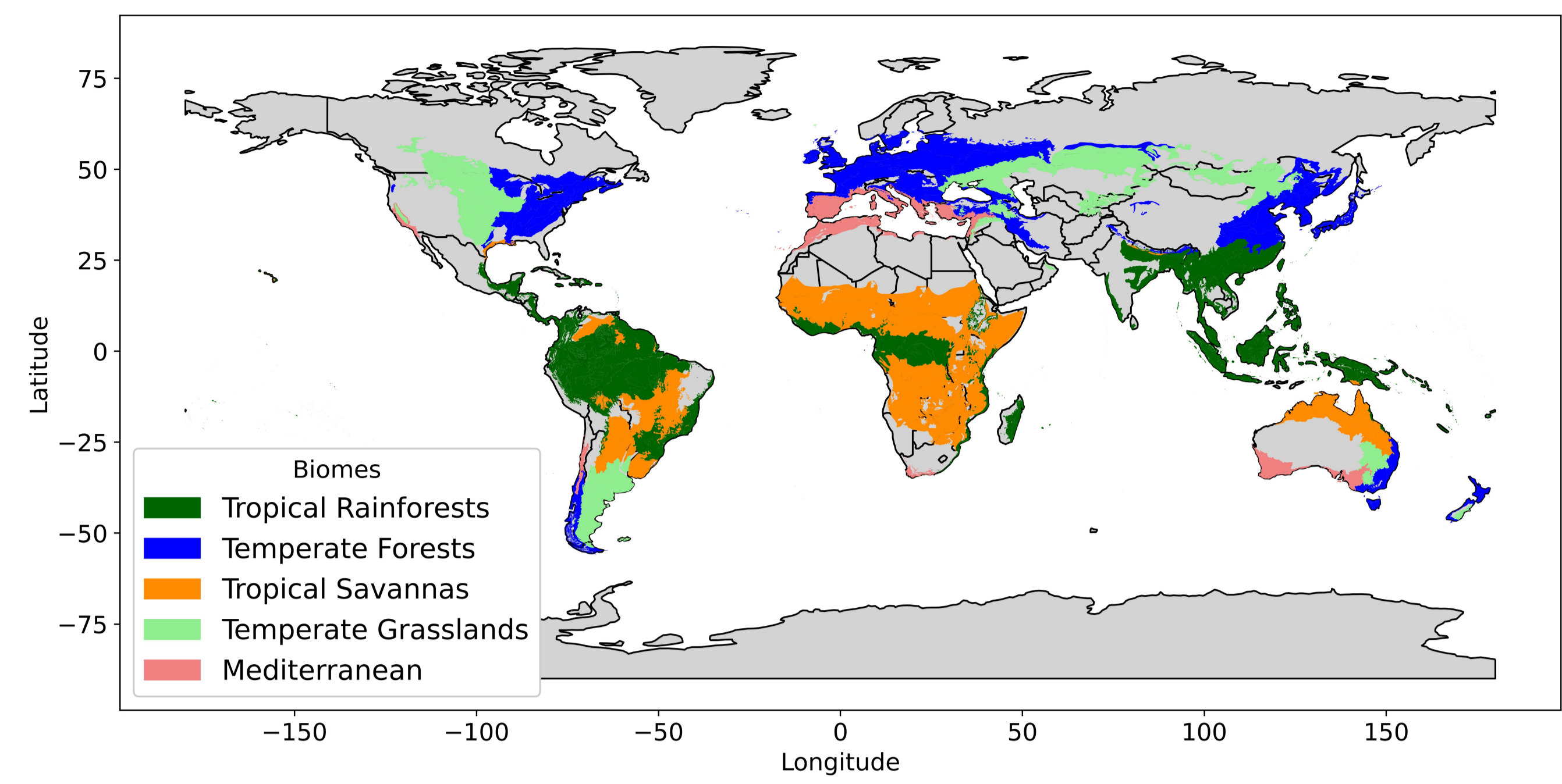
UNIVERSITÄT LEIPZIG

Daniel Mederer, Teja Kattenborn, Eya Cherif, Katja Berger, Tobias B. Hank, Kyle R. Kovach, Phuong D. Dao, Bing Lu, Philip A. Townsend, Hannes Feilhauer

## Introduction

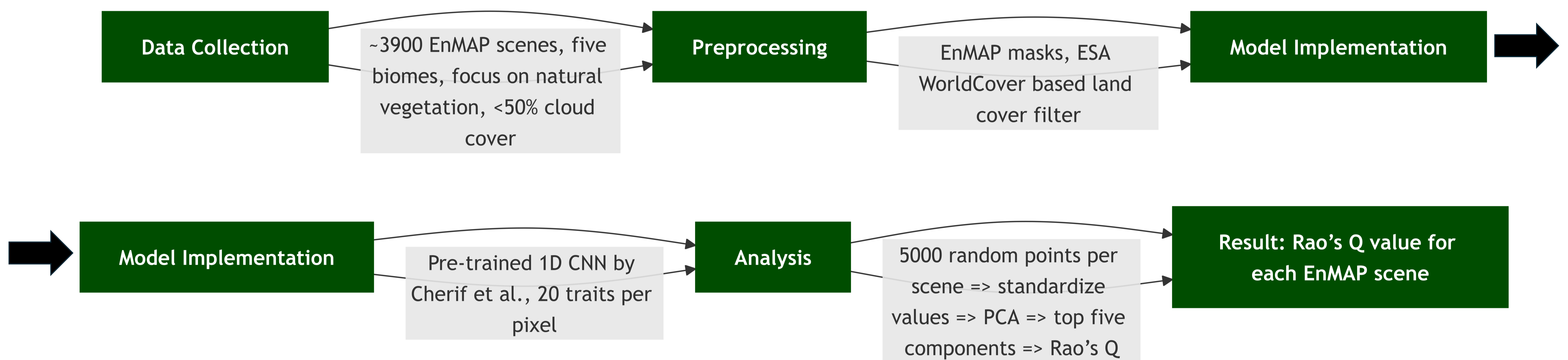
- Satellite hyperspectral remote sensing (e.g. through the EnMAP mission) provides a way to calculate functional diversity (Fdiv) for large areas by estimating plant functional traits from spectral data.
- However, it's unclear how Fdiv varies seasonally, as previous studies have mostly estimated Fdiv at single points in time.
- Leaf traits fluctuate significantly across vegetation periods, affecting trait retrieval from spectral data and potentially reducing the accuracy of Fdiv estimates.

⇒ **How does functional diversity vary across seasons?**

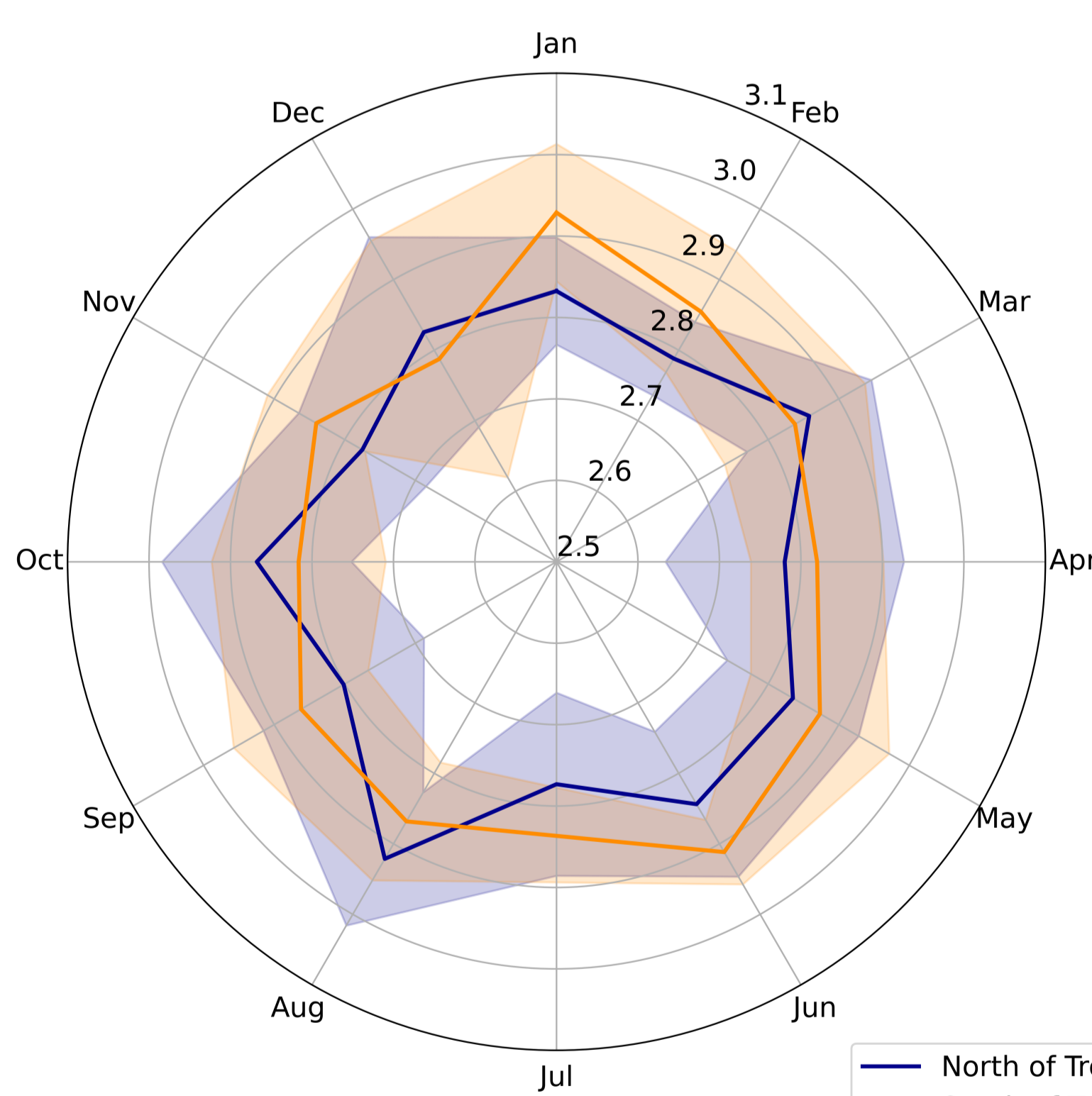


Locations of the five biomes and the EnMAP scenes in our dataset.

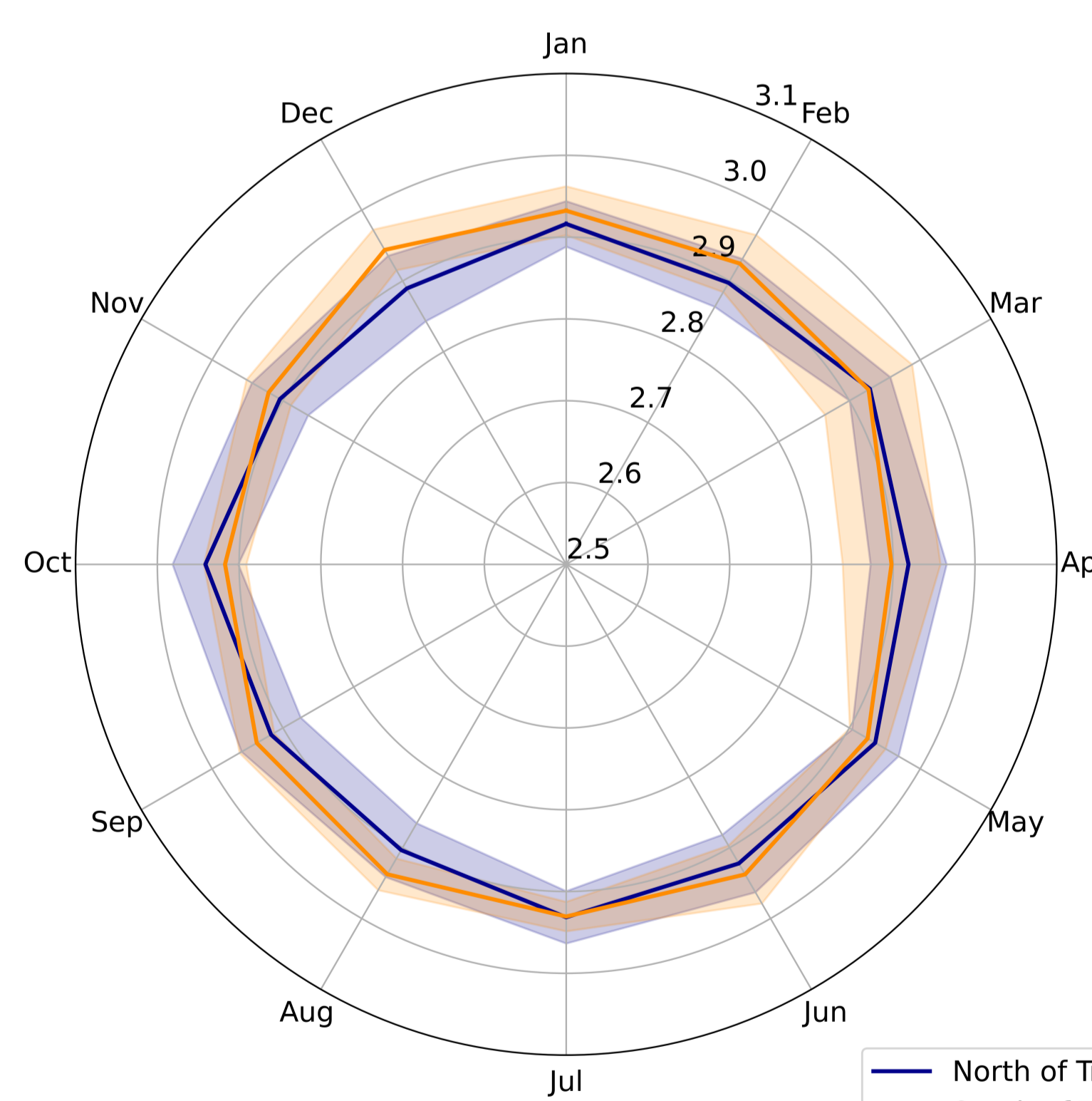
## Methods



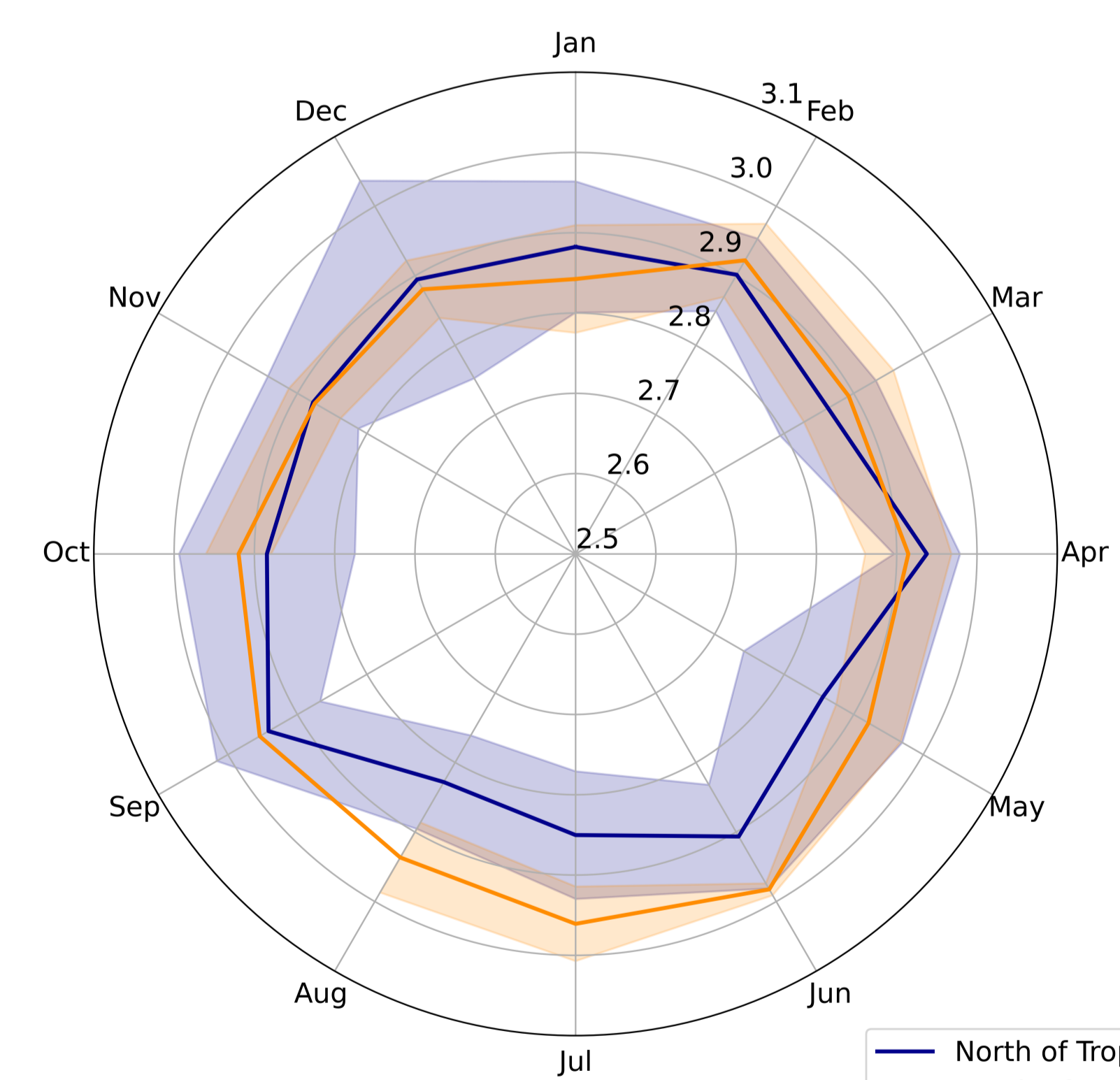
**Preliminary results:** Rao's Q monthly averages for each of the five biomes. Standard deviations are shown as transparent color bars. Rao's Q values are divided into three groups according to latitude.



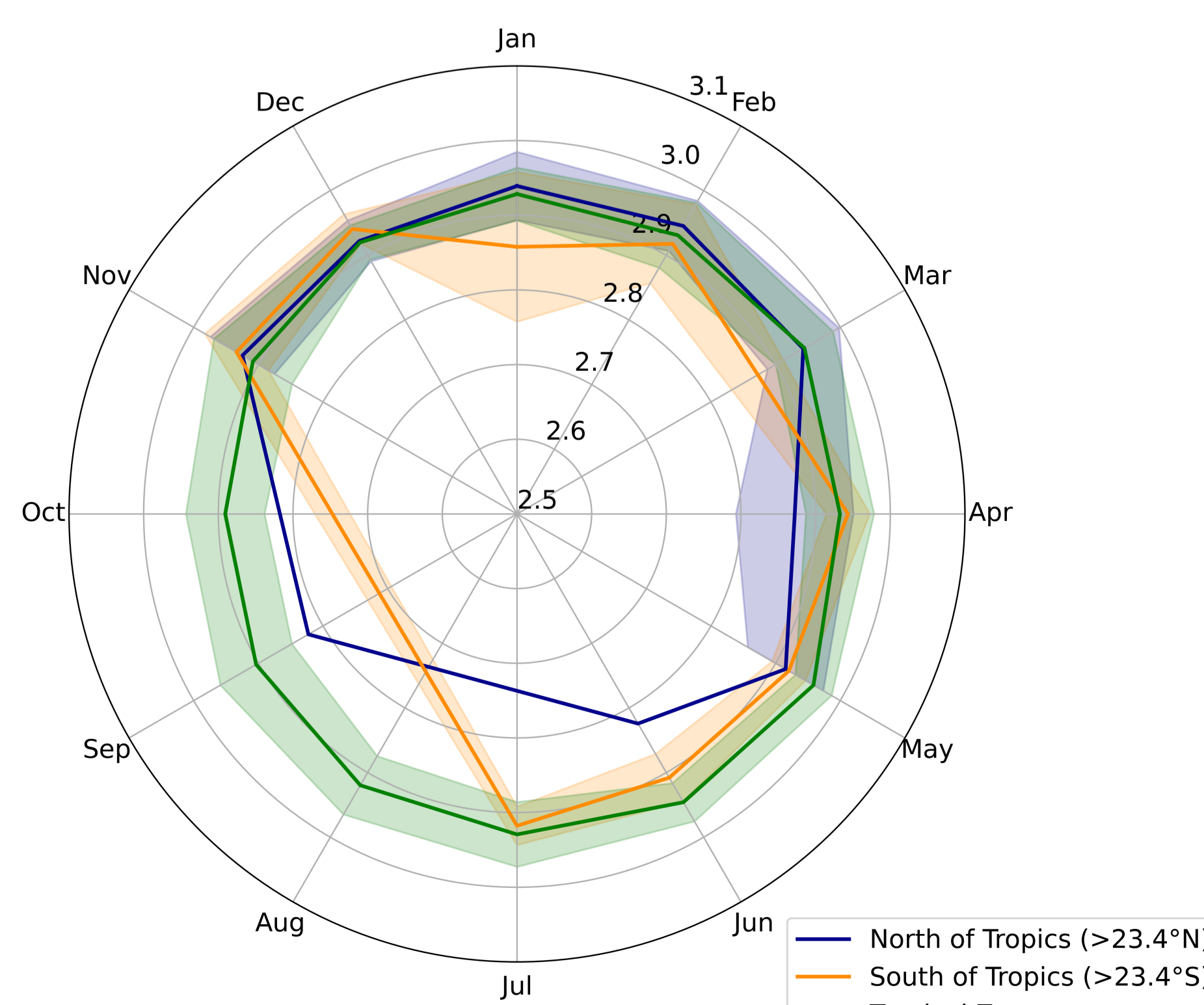
Temperate Grasslands



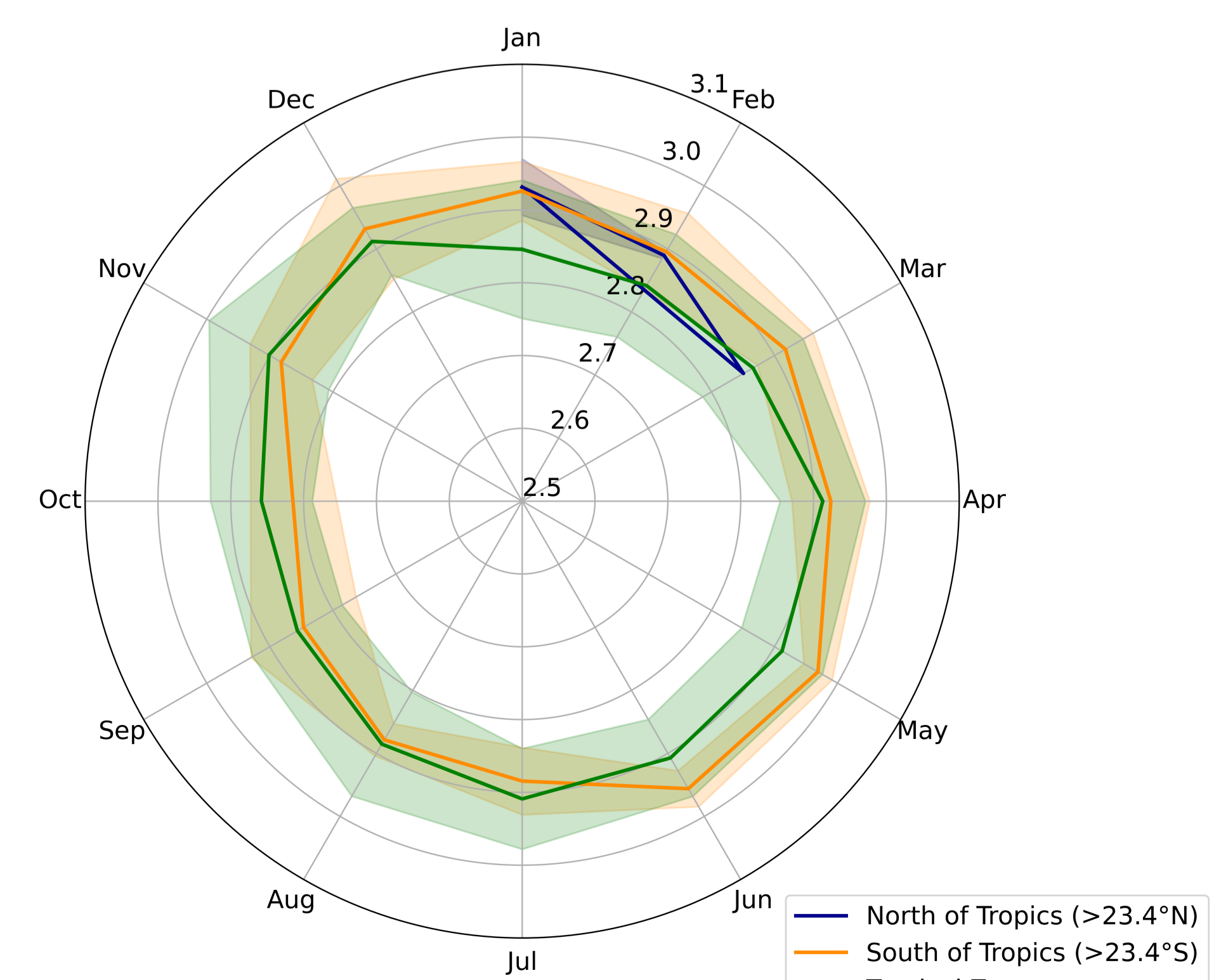
Temperate Forests



Mediterranean



Tropical Rainforests



Tropical Savannas

- Small seasonal variations in Rao's Q values for temperate forests and grasslands
- High variance for temperate grasslands and mediterranean
- Low variation in Rao's Q values for tropical rainforests
- Biannual pattern in Rao's Q values for savannas south of the tropics