Quantifying confidence in simulations of permafrost variables

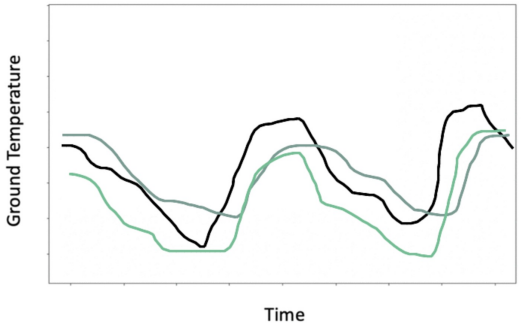
Hannah Macdonell – Theme 3

Project completed in partnership with NTGS, ECCC, & UVic

Background

Models used to simulate permafrost variables such as **ground temperature** act as an inexpensive alternative to fieldwork allow for future projections.

Models undergo **validation** using observational data to ascertain how well they model a variable of interest.

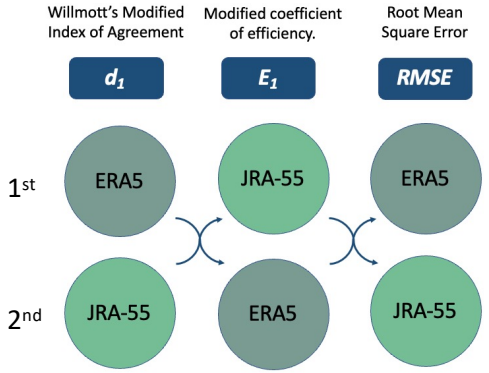


There is often **deviance** between models (coloured data lines) in how they compare to **site-scale observations** (black line).

Problem Statement

However, **performance scores can vary** depending on:

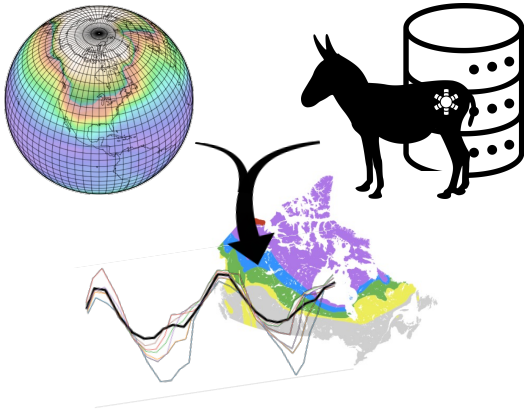
- Statistical measure (e.g. d_1, E_1, *RMSE)*
- Terrain
- Seasonality
- Variable of interest



This example above shows how three different **accordance measures rank** ground temperature predictions driven by **ERA5 and JRA-55**.

Approach

Using **global reanalysis data** as forcing for point-scale models and exploring how they perform under different conditions.



Observational ground temperature data will be accessed from Cryospheric Observations Longterm Database Storage System (**COLDASS**) and **PDSP** resources.

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