## Exercises - GEO4902-01 - General modeling concepts

**The assignment is due by Friday, Sep. 9, 2022**

***[Save as jupyter notebook, with your name in the filename, and upload on canvas]***

### Exercise 01a - How to access the latest weather forecast:

**Use:**

<https://github.com/maltemuellerm/GEO4902/blob/main/01/Access_Weather_Forecasts_xarray.ipynb>

1. Open the latest weather forecast from the Norwegian Arctic forecast system (AROME Arctic) as already implemented in the script.
2. Make yourself familiar with the metadata of the datafile
3. The script guides you to access and plot a single point-forecast and a surface map of the 2-meter temperature

The forecast data is retrieved from a thredds-server. An overview of the content, for the specific directory of the AROME Arctic latest files, can be found here:

<https://thredds.met.no/thredds/catalog/aromearcticlatest/catalog.html>

The syntax is for example for the full file, and the forecast with initialization date 15-08-2020 00:00 UTC: [arome\_arctic\_full\_2\_5km\_20200815T00Z.nc](https://thredds.met.no/thredds/catalog/aromearcticlatest/catalog.html?dataset=aromearcticlatest/arome_arctic_full_2_5km_20200815T00Z.nc)

The forecast archive can be found here:

<https://thredds.met.no/thredds/catalog/aromearcticarchive/catalog.html>

And similarly for the Scandinavian system (note, it is an ensemble prediction system and the file structure is a bit more complicated):

<https://thredds.met.no/thredds/catalog/mepslatest/catalog.html>

<https://thredds.met.no/thredds/catalog/meps25epsarchive/catalog.html>

1. Explore the metadata of the files arome\_arctic\_full / arome\_arctic\_pp / arome\_arctic\_sfx Speculate what they could mean.
2. Make your own weather forecast for a certain region + location. Describe how the weather system will change (e.g. surface pressure or Geopotential height) and the implications for wind, temperature, and precipitation for the coming days. Compare it with yr.no.
3. Plot the temperature and wind forecast from AROMEArctic as a map for 2020 February 04 14:00 UTC. And a point-forecast initialized on 2020 February 04 00:00 UTC for Tromsø. The forecast date is related to a polar low which made landfall in 2020 directly at Tromsø. An interesting perspective from a forecaster is written here: <https://www.itromso.no/meninger/2020/02/06/I-polarstormens-%C3%B8ye-21017365.ece>