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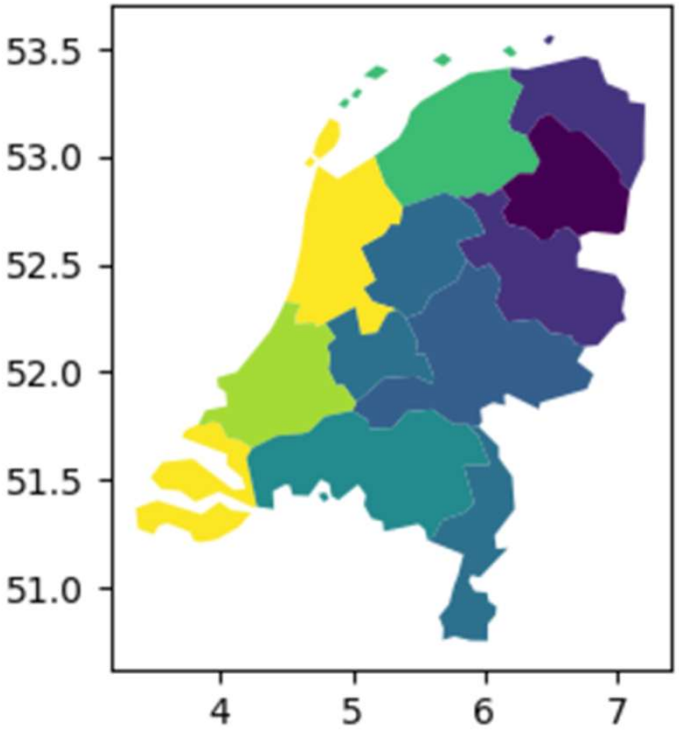
DAFS - Energy System Modelling Module

Tutorials 2 & 3



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Reminders

- Google sign-up sheet for choosing assignment buddy, region of focus and open research questions:
- https://docs.google.com/spreadsheets/d/1J0In9Y9VOvEsj2hOpw0qEi9hpJasfmV_e9DXbiSxLuE/edit?usp=sharing

Deadlines

- Assignment buddy by Dec. 15
- Region of focus, open RQ and associated data set(s) for the assignment by Jan. 5, 2026
- Upload assignment to BS by Fri. Jan. 23 at midnight

- Double-check that your installation following the instructions on BrightSpace was successful by verifying that geopandas and rioxarray packages are available in your environment, using terminal commands like *conda list* or *pip show <package_name>*
- Last resort if the local installation on your laptop is not working: ask the instructors for the *Google Collab* cloud service.

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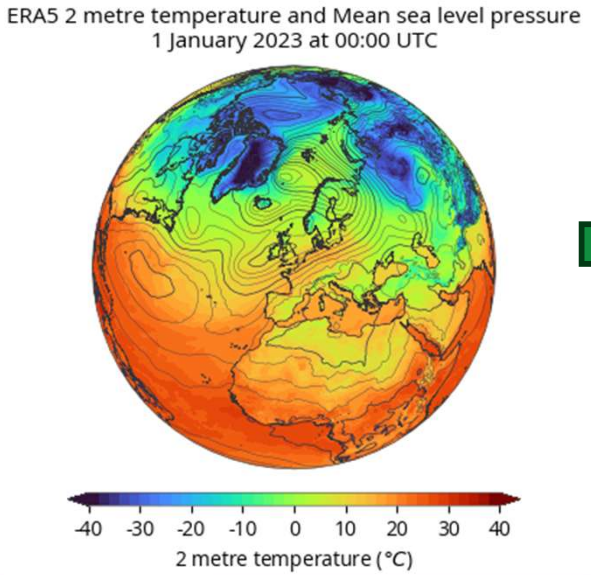
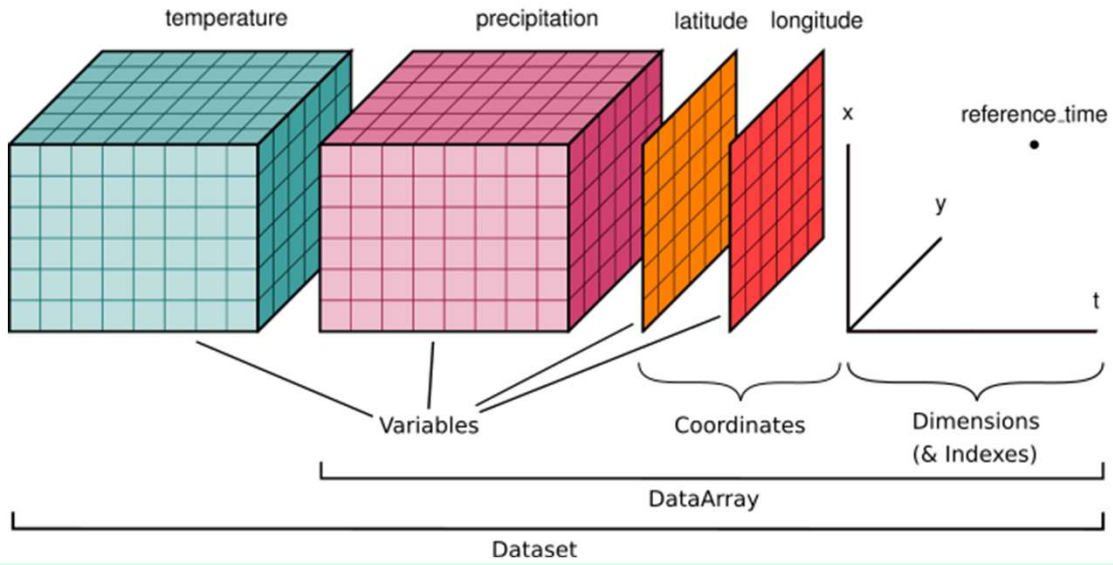
Tutorial 1: Recap

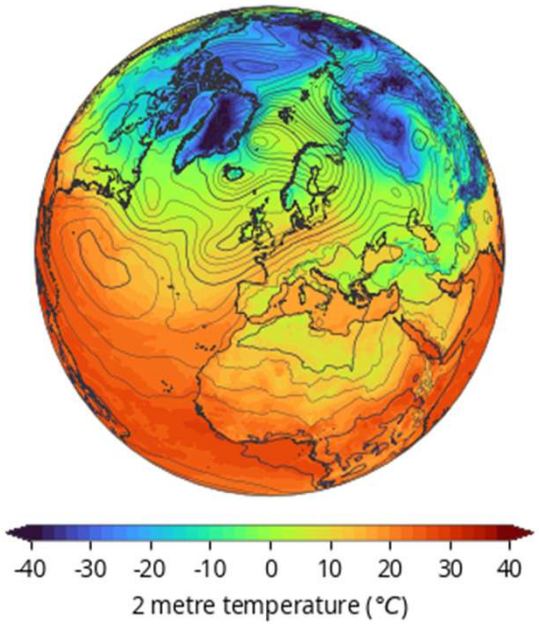
- Learnt how to download weather data from the Copernicus Climate Data Store into a NETCDF file
- Learnt how to work with multi-dimensional data using xarray
- Time slicing, spatial clipping, plotting xarray data
- Simple data statistics operations: min, max, mean.

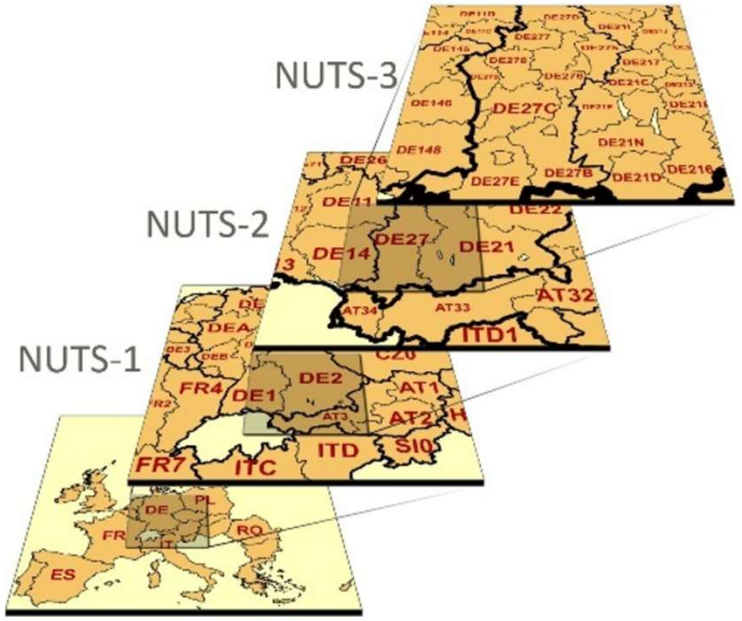




Tutorial 2: Goals 1/2

- Learn how to download NUTS spatial data from: https://ec.europa.eu/eurostat/web/gisco/geodata/statistical-units/territorial-units-statistics
- Learn how to work with *GeoPandas* data-frames, to perform simple operations like filtering, spatial clipping and plotting.





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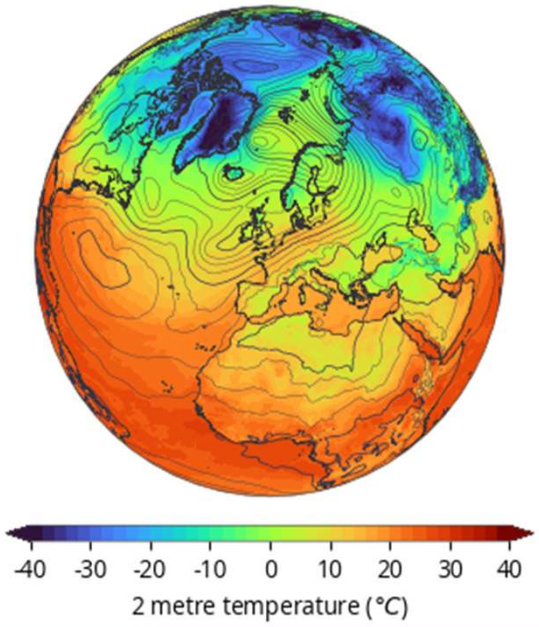
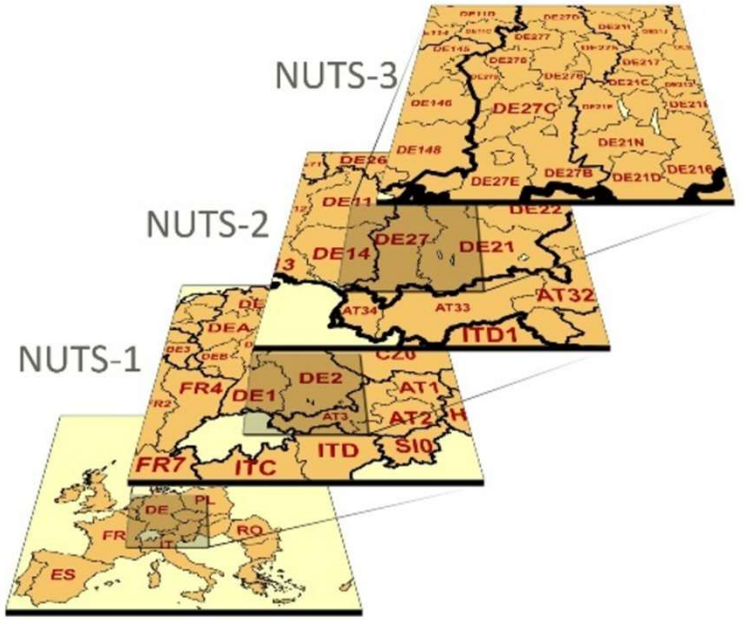
Tutorial 2: Goals 2/2

- Learn how to work with *Rioxarray* to align the coordinate systems of the weather and geospatial data
- Learn how to clip the xarray weather data into subsets aligned with the NUTS regions
- Learn how to write the weather data subsets into smaller NETCDF files for later use.





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Tutorial 3: Goals

- Combine all we learnt in the previous 2 tutorials: how to manipulate aligned weather and spatial NUTS data
- Learn to calculate simple statistical indicators for the weather data in separate NUTS regions