EXAMPLE

Initial user query: "How much will September rainfall in Vestland county increase by 2050?"

Iteration 1
Parameter: X = rainfall in Vestland county
Output: change between two climate states (2050 and present) in X for September month
Operation: differencing
Required inputs: 1) present climate state of X for September, 2) 2050 climate state of X for September
Queries for next iteration:

1.1) What is the 2050 climate state of X for month September?
1.2) What is the present climate state of X for month September, conditioned on that it should be compared with a future climate state? (i.e., if the source of a future climate state is from climate model runs then the present state should also be from climate model runs to have a clean/unbiased comparison)

Iteration 1.1
Parameter: X = rainfall in Vestland county
Output: 2050 climate state of X for September month
Operation: time averaging, multi-model ensemble averaging
Required inputs: September data of X for 2041-2060 (21-yrs centered around 2050) from CMIP6 models
Queries for next iteration:

1.1.1) What is the September value of X for 2041?
1.1.2) What is the September value of X for 2042?
1.1.3) ...

Iteration 1.1.1
Parameter: X = rainfall
Output: September value of X in Vestland county for 2041 from CMIP6 models
Operation: spatial averaging over polygon area (see Fig 1. below)
Required inputs: 1) gridded values of X for September 2041, 2) geo-limits for Vestland county
Queries to data servers:

1.1.1.1) What are the gridded values of X for September 2041 from CMIP6 models?
1.1.1.2) What are polygon coordinates for Vestland county?

Iteration 1.1.1.1
gridded CMIP6 data fetched via data server

Iteration 1.1.1.2
geo-data for Vestland county fetched via data server

Iteration 1.1.2
…
Iteration 1.2
…

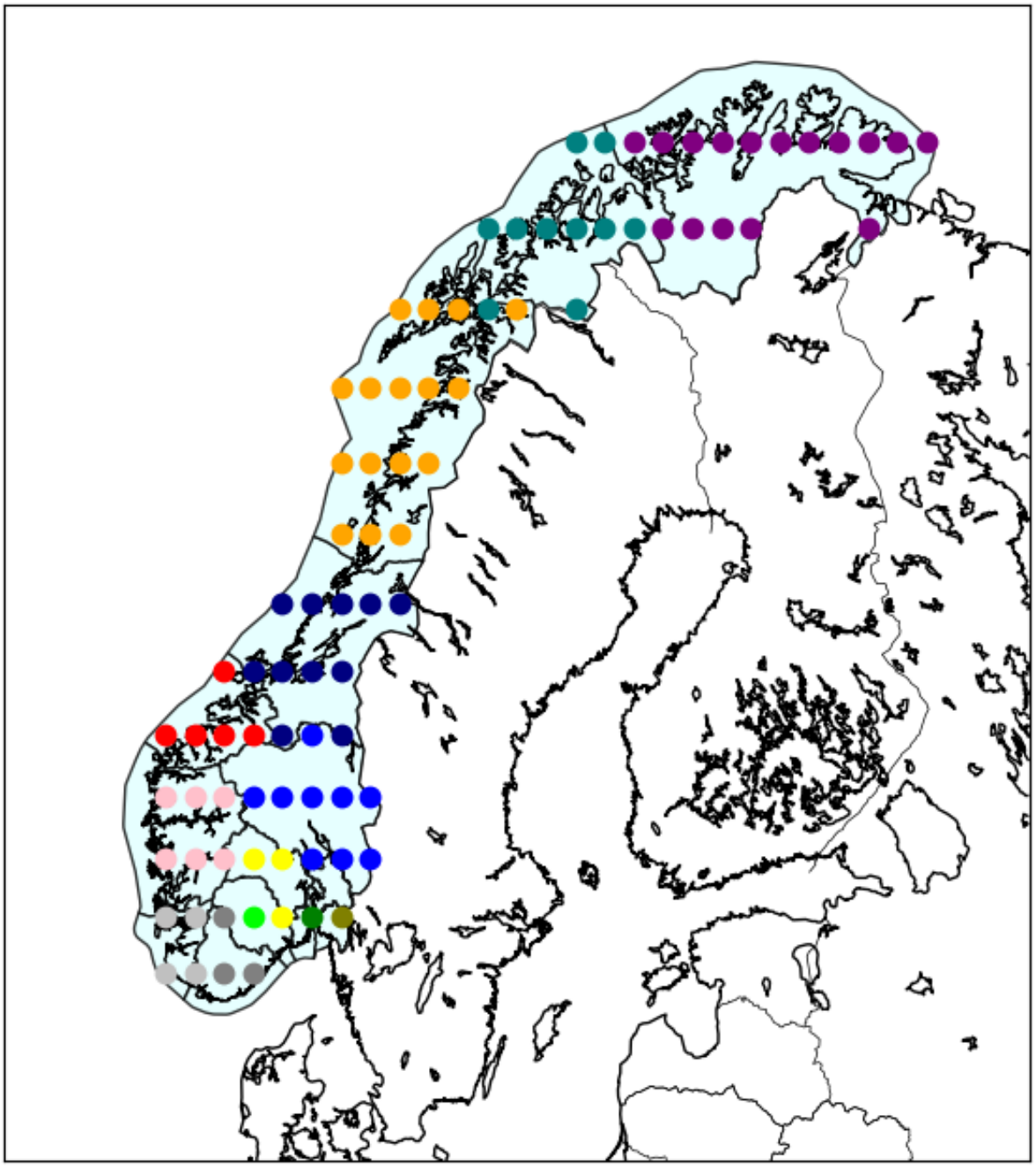
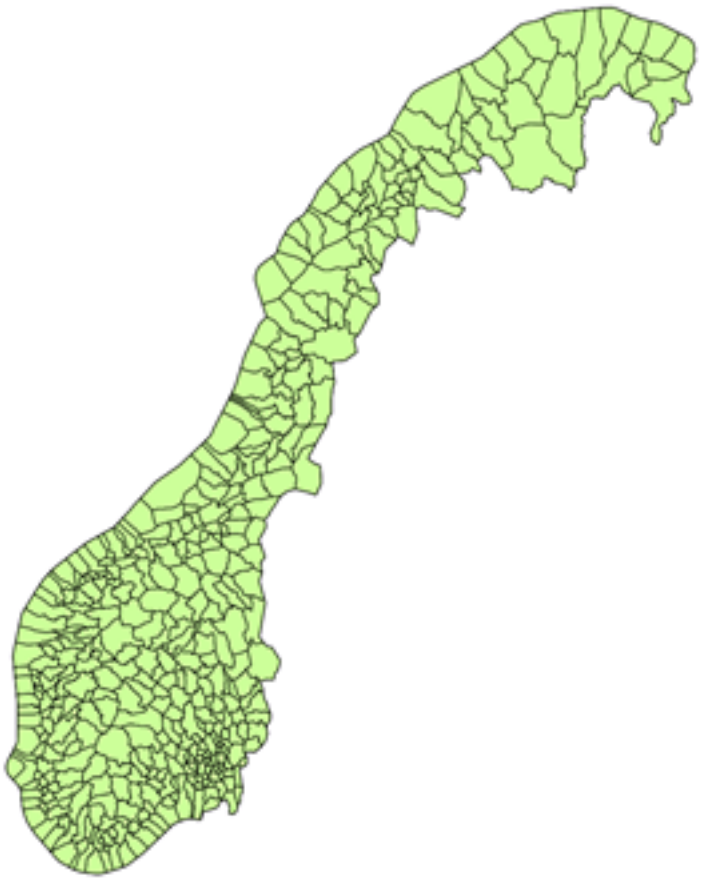


Fig 1: Norwegian counties based on latest GIS data from Kartverket (Basisdata_0000_Norge_4258_Fylker_GeoJSON.geojson downloaded from https://kartkatalog.geonorge.no/nedlasting) and association with model grid points.



https://kartkatalog.geonorge.no/metadata/administrative-enheter-kommuner/041f1e6e-bdbc-4091-b48f-8a5990f3cc5b