seNorge_2018 observational gridded datasets over Norway

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seNorge_2018 is the newest member of the seNorge family of observational gridded datasets that has been produced routinely on a daily basis at the Norwegian Meteorological Institute (MET Norway) from 1980 to the present day. seNorge_2018 builds on top of the previous versions and it includes: daily total precipitation; daily mean, minimum and maximum temperature for the Norwegian mainland covering the time period from 1957 to present day. The data are presented on a regular grid with 1 km of grid spacing on both easting and northing directions. seNorge data are used for several applications in climate, hydrology and meteorology.

seNorge_2018 is based on in-situ observations from the MET Norway's climate archive and the ECA&D dataset. The data are quality controlled both by MET Norway staff and through automatic checks. The gauge observations are adjusted for wind-induced undercatch, which is quite important in Norway.

This presentation focuses on the spatial interpolation procedure for precipitation. A successive correction algorithm has been implemented, which iterates an Optimal Interpolation (OI) scheme over a sequence of decreasing spatial scales. This is done in a way that transfers information from larger scales (i.e. regions including dozens of observations) to local scales (i.e. regions including few observations). The interpolation is performed over transformed data so as to better comply with the assumption of normality, which is implicit in OI. Regardless of the spatial interpolation method, the observational network is rather sparse in the mountains and in the remote regions above the arctic circle, so for those areas the successive correction algorithm stops updating the precipitation field at comparatively large spatial scales. As a consequence, precipitation is underestimated here, since the values represent a mean over a very large area. To remedy this, a gridded adjustment factor is added. This factor is derived by processing a decade of precipitation data from a high-resolution numerical model.

seNorge_2018 performances are evaluated through cross-validation and also by comparing it with other precipitation datasets.

The dataset is available for public download at http://thredds.met.no/thredds/catalog/senorge/seNorge_2018/catalog.html