Handling REA6 data

How to convert REA6 grb files to netCDF

This guide is in addition to our document start help. Here, we explain how to convert the original REA6 grib data into netCDF4 format. For this, the file griddes_REA6.txt is needed in order to preserve the original grid structure. Coordinates are set to unstructured geographical longitude latitude fields. In addition, the metadata of the netCDF file is corrected.

The prerequisite for these instructions to work is a working installation of CDO and NCO.

For instantaneous files (timeRangeIndicator=0) the following instructions can be followed directly. If averaged, accumulated, or min/max values are to be processed then the timeRangeIndicator needs to be set to equal zero in the original grb files:

```
grib_set -s timeRangeIndicator=0 in.grb out.grb
```

The following command is the conversion from grb into netCDF4 at high compression level using the grid description file:

```
cdo -f nc4 -z zip=9 -copy -setgrid,griddes_REA6.txt in.grb out.nc4
```

Now, one can work with the output netCDF file to some degree. However, in many cases the CDOs add an additional dimension to the data variable, which describes the height of the variable. Also, a height and grid_mapping variable are added, and the name of the data variable is incorrect. The following commands help to clean up the metadata of the netCDF file and delete the additional dimension. The technical prerequisite is that nco is allowed a 4GB RAM allocation.

This command renames the generic variable name. Here, the generic variable name is *var11* and the data variable name *T_2M*; **choose appropriately**:

```
ncrename -h -O -v var11,T_2M out.nc4
```

This command deletes the variable grid_mapping_1:

```
ncks -C -h -O -x -v grid_mapping_1 out.nc4 out.nc4
```

This command edits attributes of a variable, in this case the data variable, **adopt appropriately**:

```
ncatted -h -O -a table,T_2M,d,,
        -h -O -a grid_mapping,T_2M,d,,
        -h -O -a coordinates,T_2M,d,,
        -h -O -a standard_name,T_2M,c,c,"air_temperature"
        -h -O -a long_name,T_2M,c,c,"2m air temperature"
        -h -O -a units,T_2M,c,c,"K" out.nc4
```

The following two commands edit the global variable *history*, **adopt variable name appropriately:**

```
DATE=$(LANG=en_us_88591; date)
ncatted -h -O -a history,global,d,,
        -O -a history,global,c,c,"$DATE: COSMO-REA6 2m temperature data converted
to netCDF" out.nc4
```

In many cases, the CDOs add a height dimension and variable. This presumably happens if the level variable in the grib-file metadata is set unequal to zero. The following two commands delete the dimension and variable height. **Note**: in order to delete the dimension, the complete file needs to be read into memory; hence, a huge amount of memory is needed:

```
ncwa -a height out.nc4 new.nc4
```

```
ncks -C -h -O -x -v height new.nc4 out.nc4
```

```
rm –fv new.nc4
```

The last step again is to correct the global *history* variable, **adopt appropriately**:

```
DATE=$(LANG=en_us_88591; date)
ncatted -h -O -a history,global,d,,
        -O -a history,global,c,c,"$DATE: COSMO-REA6 2m temperature data converted
to netCDF" out.nc4
```