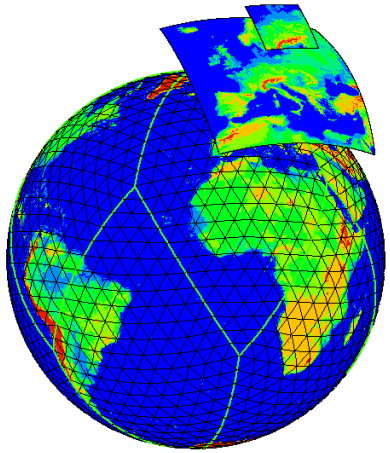
Deutscher Wetterdienst
Wetter und Klima aus einer Hand



Consolidation of the software for the generation of External Parameters and extension with new raw data sets

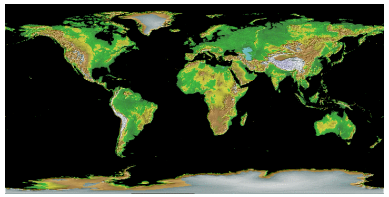
Hermann Asensio

Outline

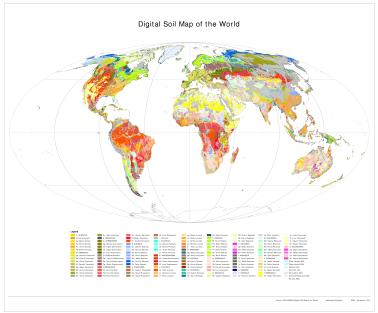
➔ Current status of „Extpar“

➔ open topics

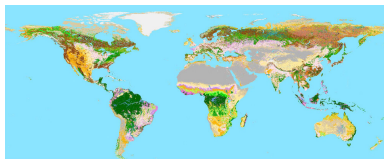
Overall description of the External Parameter System



GLOBE
orography

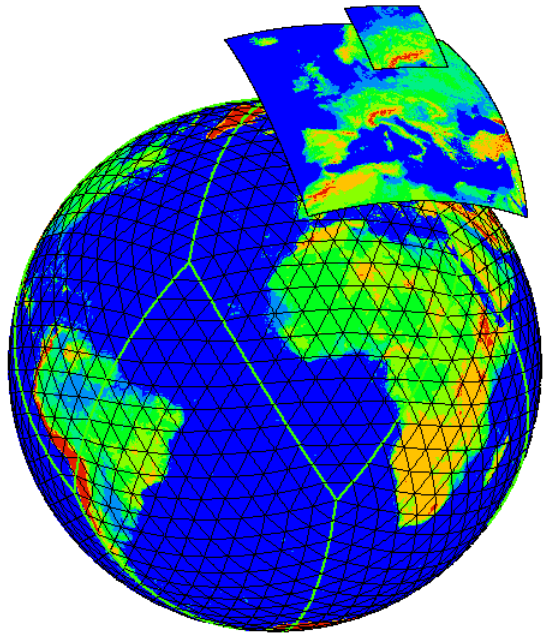


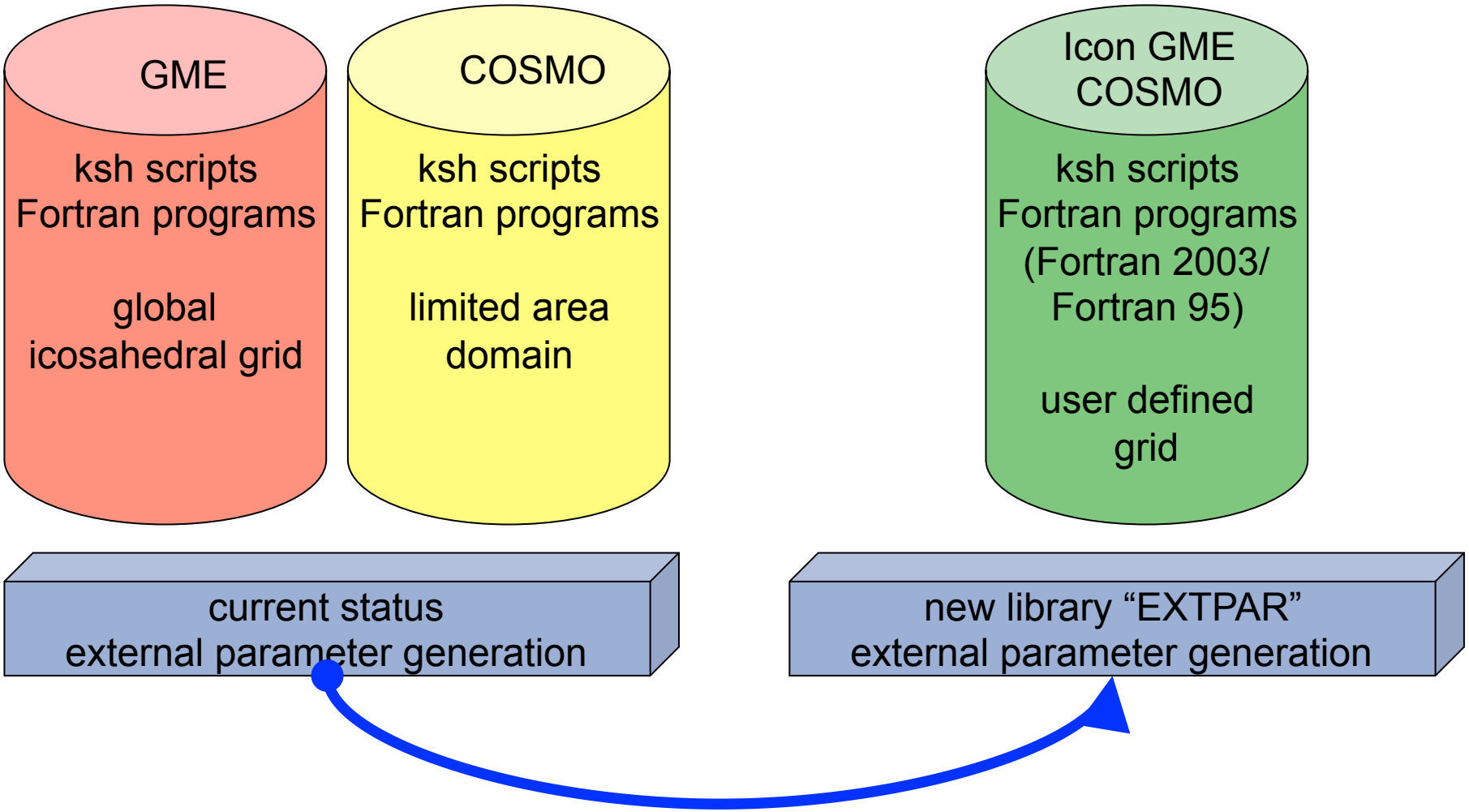
DSMW
soil data



GLC2000
land use

external
parameters
on
target
grid




GME
ksh scripts
Fortran programs
global
icosahedral grid
COSMO
ksh scripts
Fortran programs
limited area
domain
Icon GME
COSMO
ksh scripts
Fortran programs
(Fortran 2003/
Fortran 95)
user defined
grid
current status
external parameter generation
new library “EXTPAR”
external parameter generation

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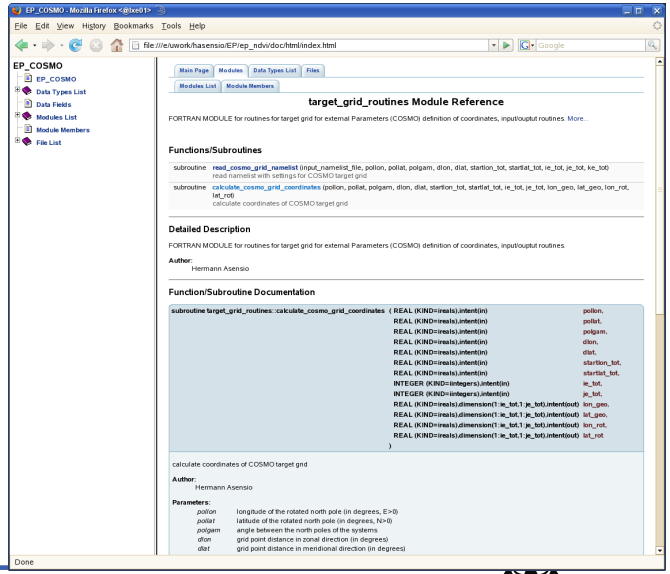
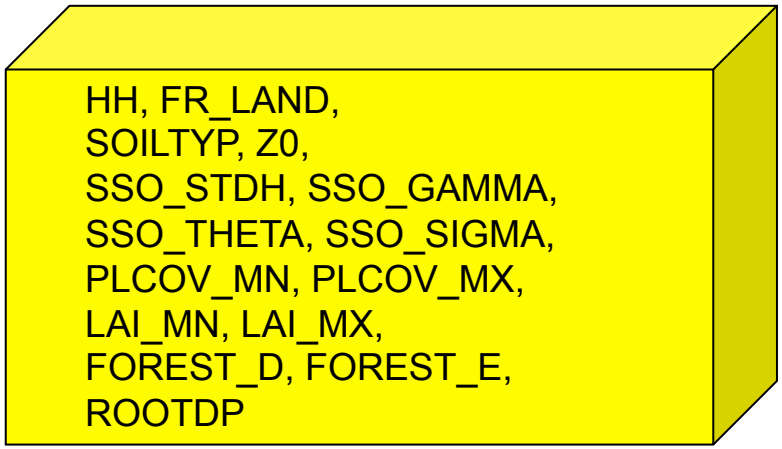
Wetter und Klima aus einer Hand

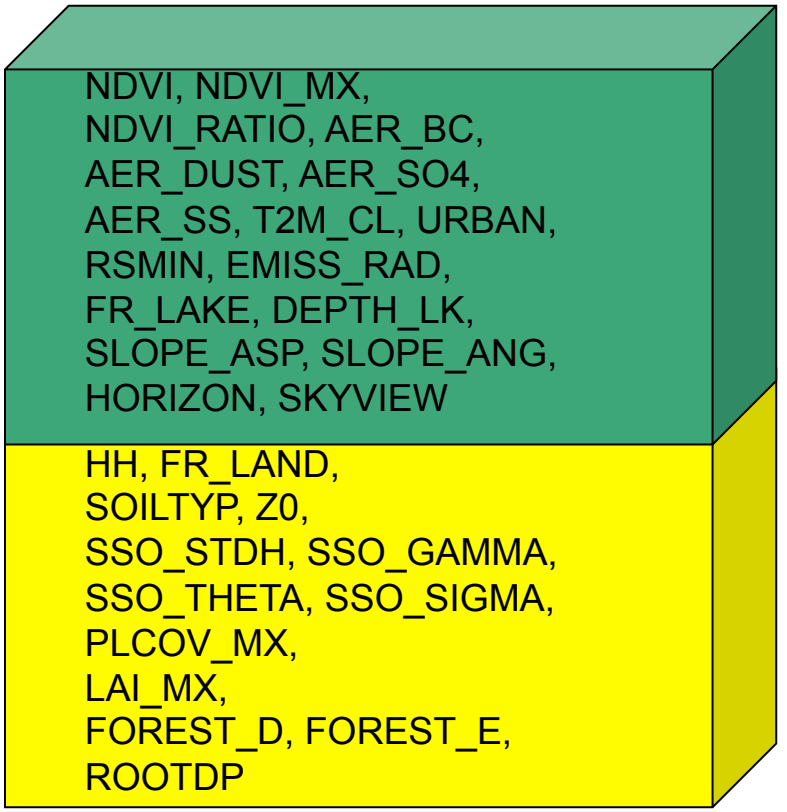
Software for the generation of External Parameters (COLBOC Task 2): technical development

- new software code basis (Fortran 2003 standard) according to the software requirement specifications, current Version “EXTPAR V1_1”
- technical documentation with doxygen as Website (HTML generated with the help of “tags” from comments in the Fortran source code)
- introductory user guide
- NetCDF as basic file format for Input/Output
- GRIB output with ECMWF “GRIB_API”



Consolidation and extension of database (COLBOC Task 3) : Additional external parameters

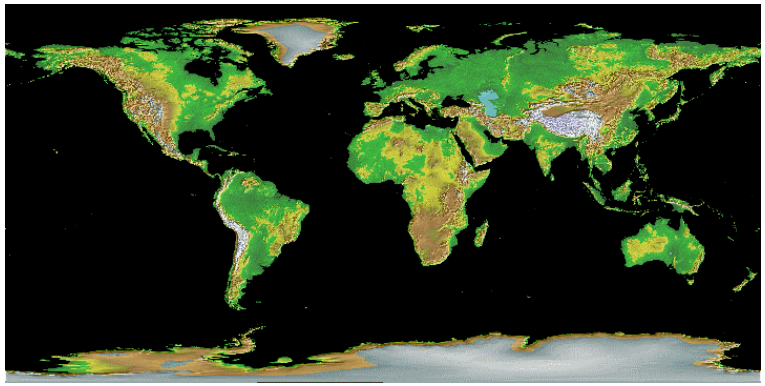




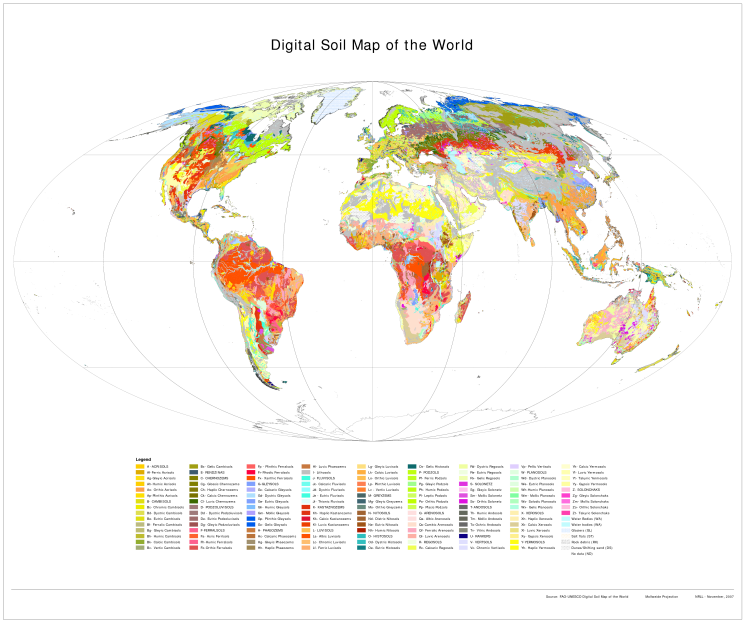
➔ external parameter fields for the COSMO model, total 15 fields

➔ planned extensions for the COSMO model, total 30 fields

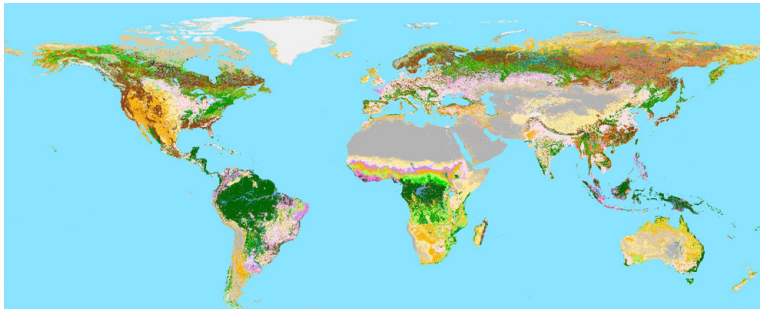
Currently used raw data for external parameters



GLOBE



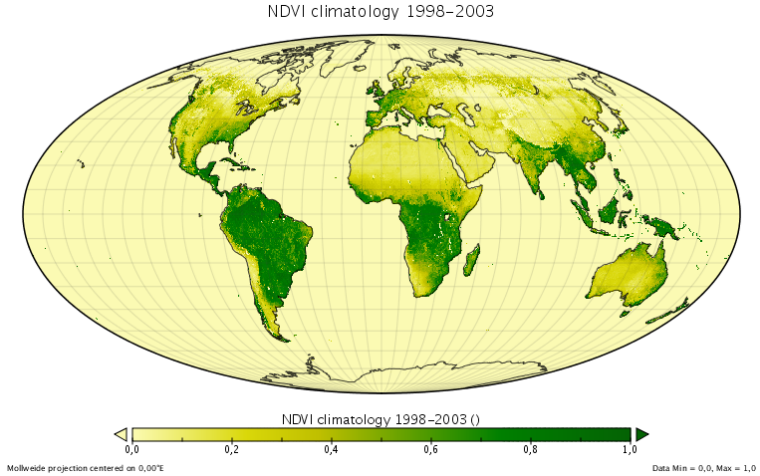
DSMW

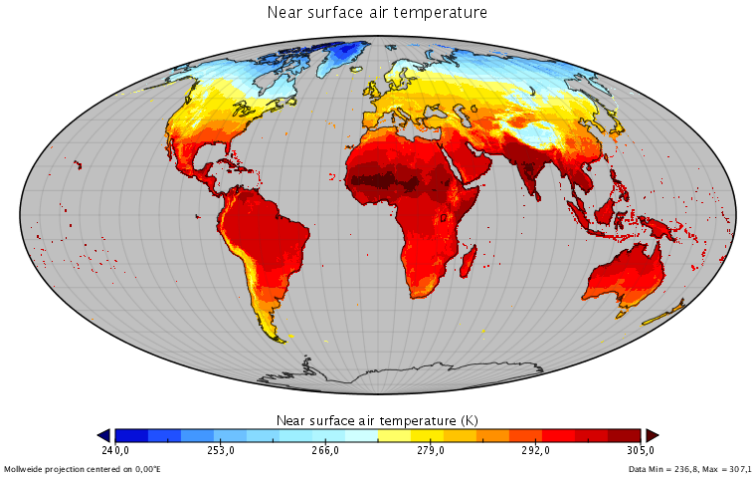


GLC2000

Additional raw datasets

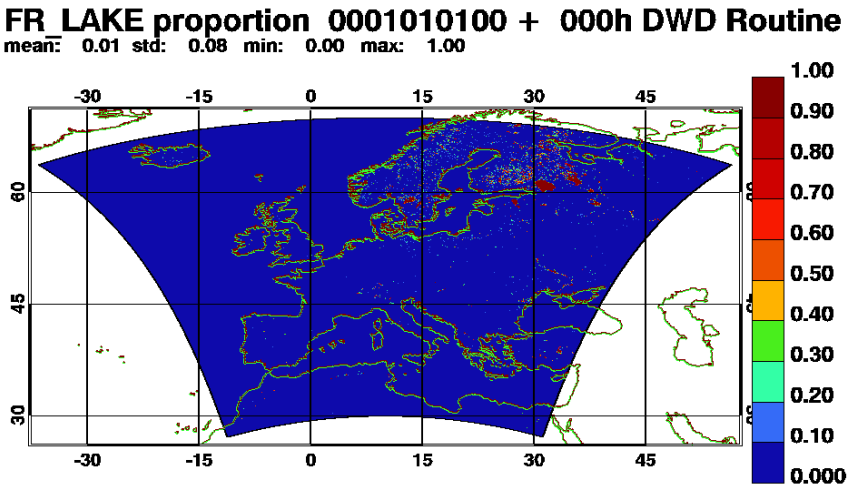
- NDVI (SEAWiFS)
- climatology of near surface temperature (CRU)
- climatology of aerosol optical thickness (I. Tegen)
- lake depth database (30'' gridded global field, Eakterina Kourzeneva: DWD, RSHU, MeteoFrance)

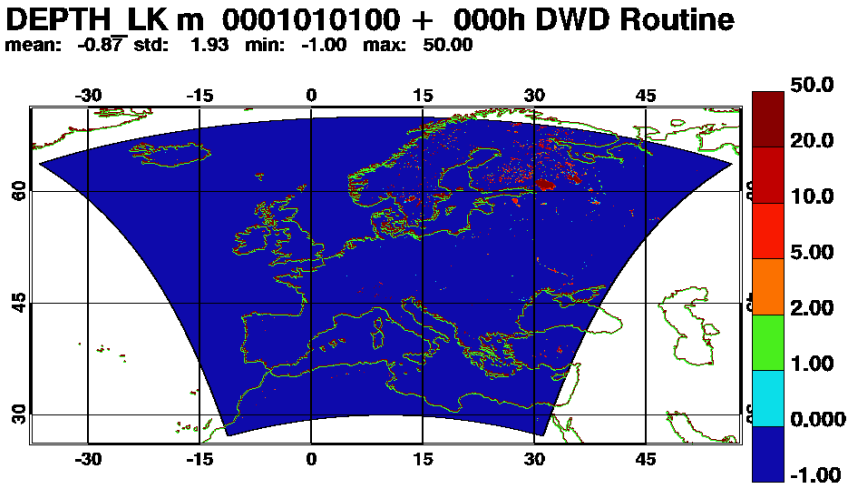




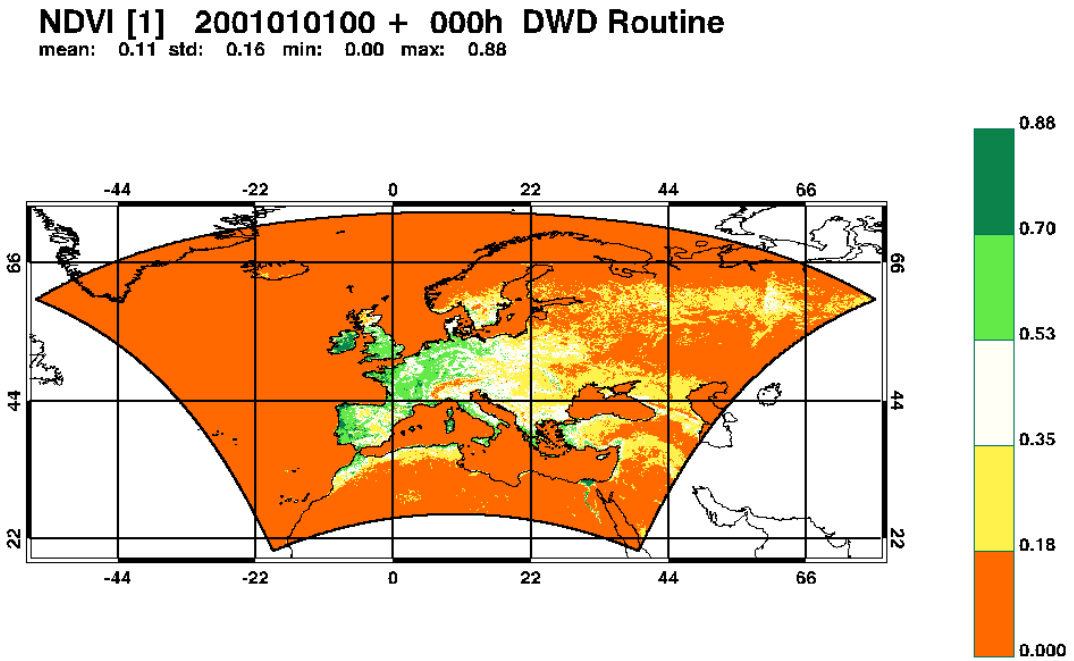
Additional external parameters

- ➔ Fraction Lake FR_LAKE
- ➔ Lake Depth DEPTH_LK required for FLake





Additional external parameters
Normalized Differential Vegetation Index (NDVI)



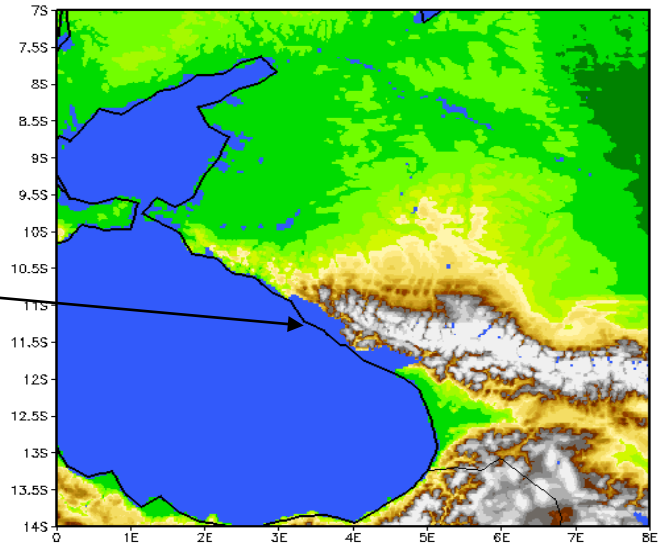
Caveats

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

Problem: The Olympic Winter Games 2014 in Sochi, Russian Federation:

The map

Sochi



Most raw data sets provide values (for soiltype etc.)
But the land-sea-mask of the GLC2000 data set gives sea water!

Caveats

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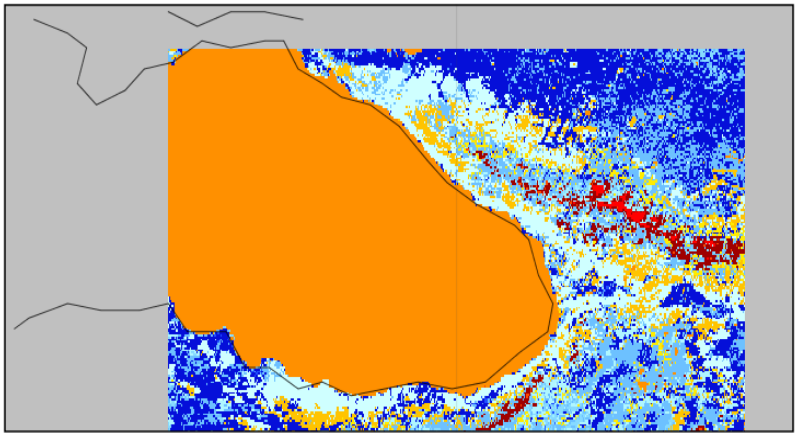
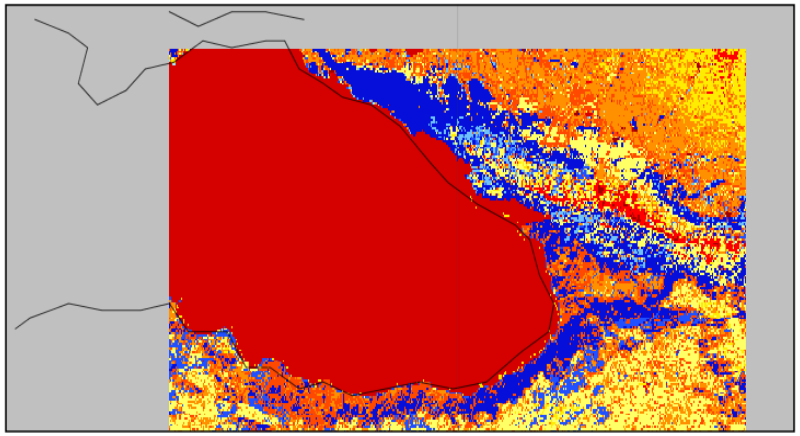
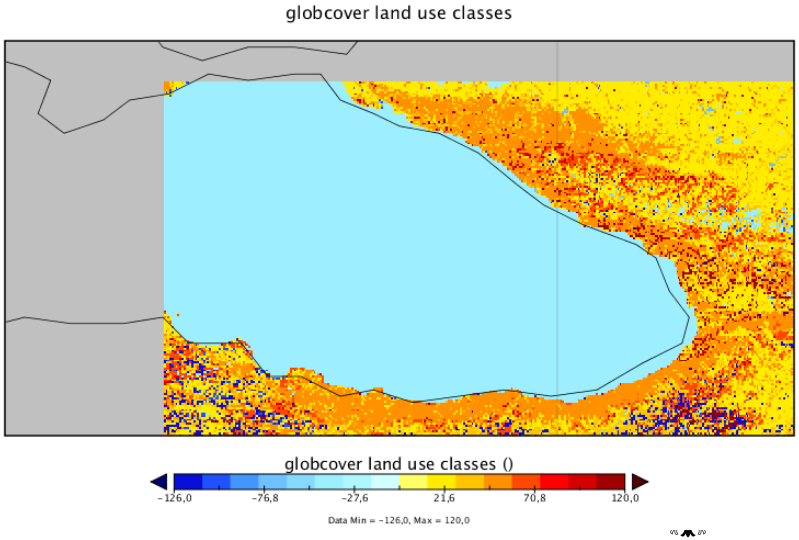
The external parameters are only as good as the available raw data sets.



GLCC USGS land use / land cover system



GLC2000 land use classes
(currently used)



Globcover 2009

Open topics

Software for the generation of External Parameters (COLBOC Task 2) : open topics

- distribution of software (and raw datasets)
- Webinterface for standard requests for the generation of external parameters for arbitrary domains (prototype available https://webservice.dwd.de/)
- update documentation and user guide

Consolidation and extension of database (COLBOC Task 3) : open topics

- smoothing of orography in EXTPAR for parameters for sub-grid scale orography effects (proper scale separation for Z0 / SSO ?)
- External parameters for orographic radiation correction
- consolidate and extend raw datasets:
  - Harmonized World Soil Database
  - MODIS data for surface background albedo
  - ETOPO1, SRTM or ASTER DEM for orography
  - Globcover 2009 for land use data
  - ...

Thank you for your attention!