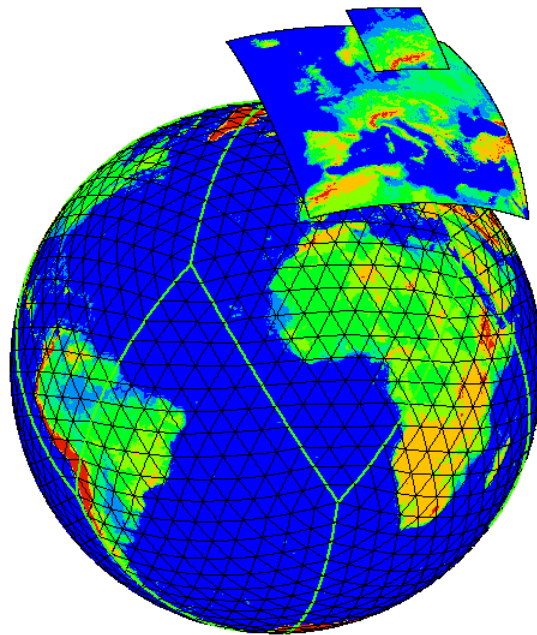


External Parameters at DWD current status and new developments Hermann Asensio



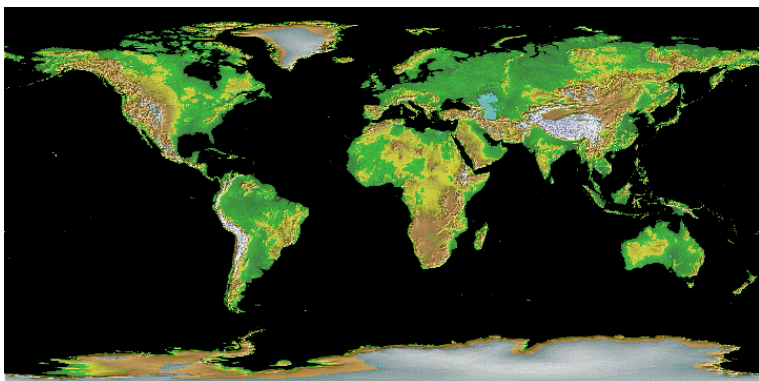
Outline

- raw data for external parameters
- current status of software system for external parameters
- planned extensions

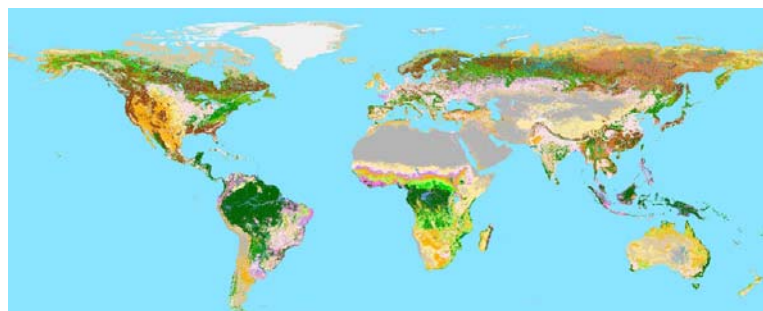
Deutscher Wetterdienst

raw data for external parameters

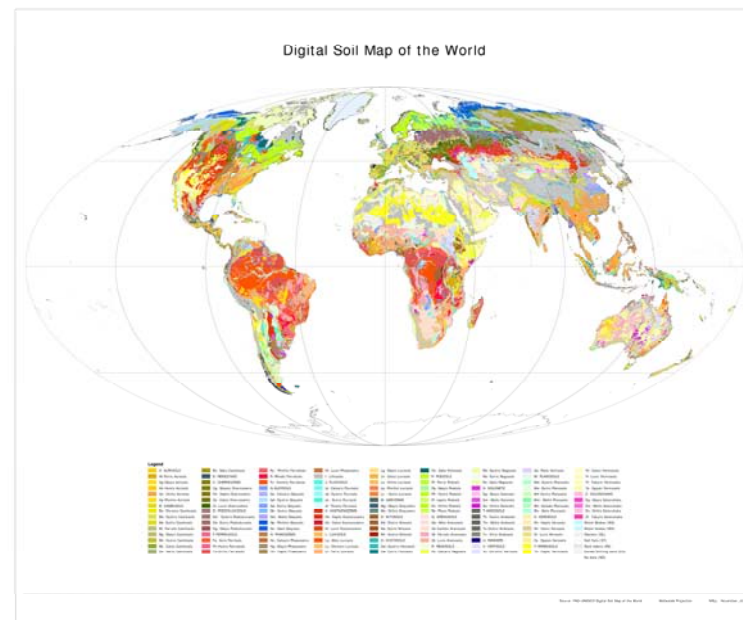
Currently used raw data for external parameters



GLOBE



GLC2000



DSMW

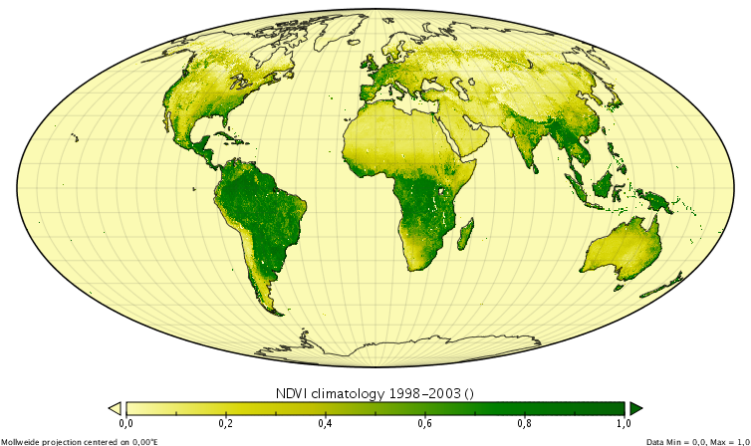
Deutscher Wetterdienst

raw data for external parameters

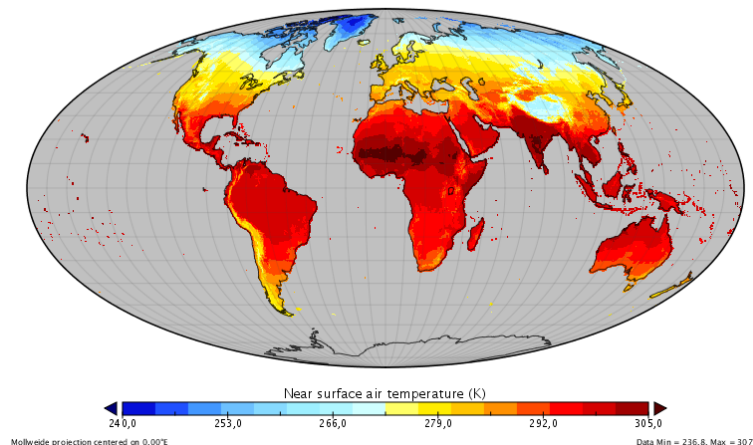
additional raw dataset

- NDVI
- climatology of near surface temperature
- lake database

NDVI climatology 1998–2003

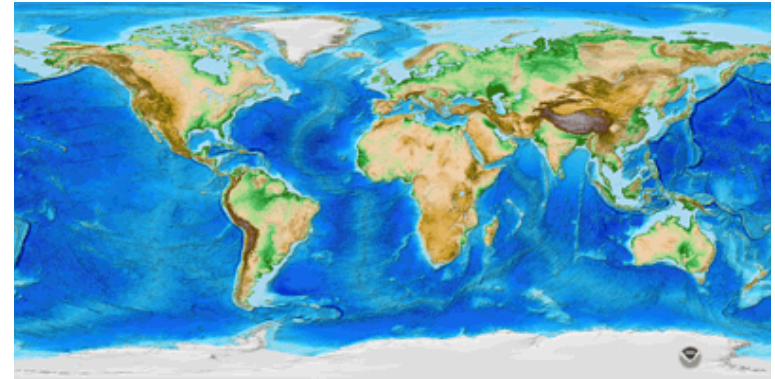
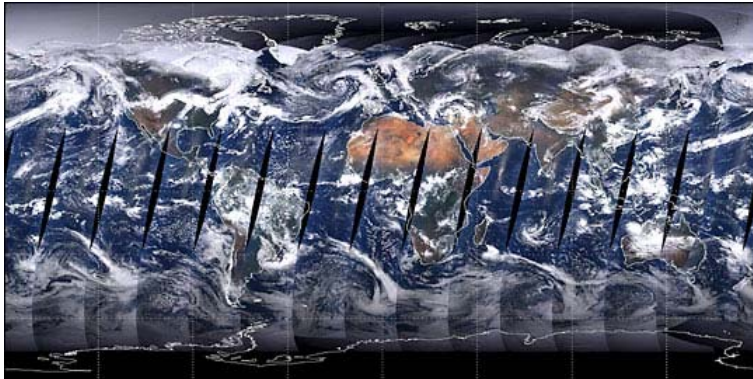


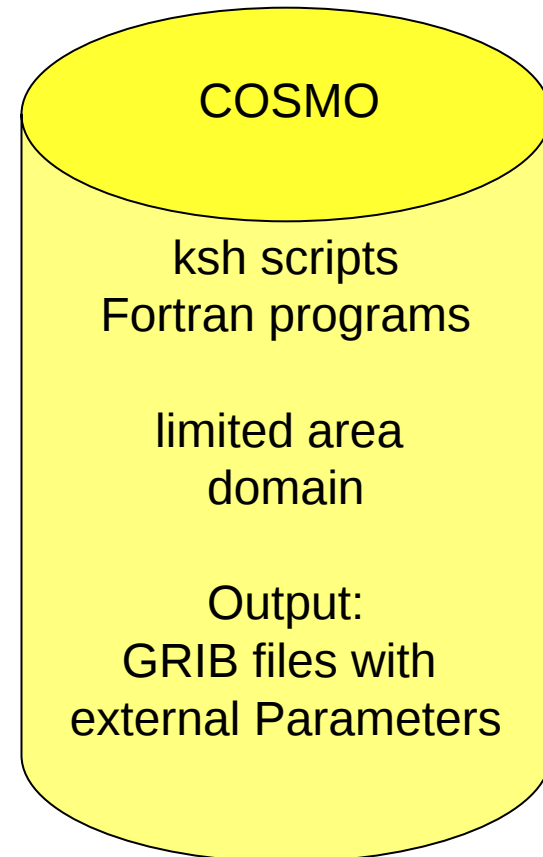
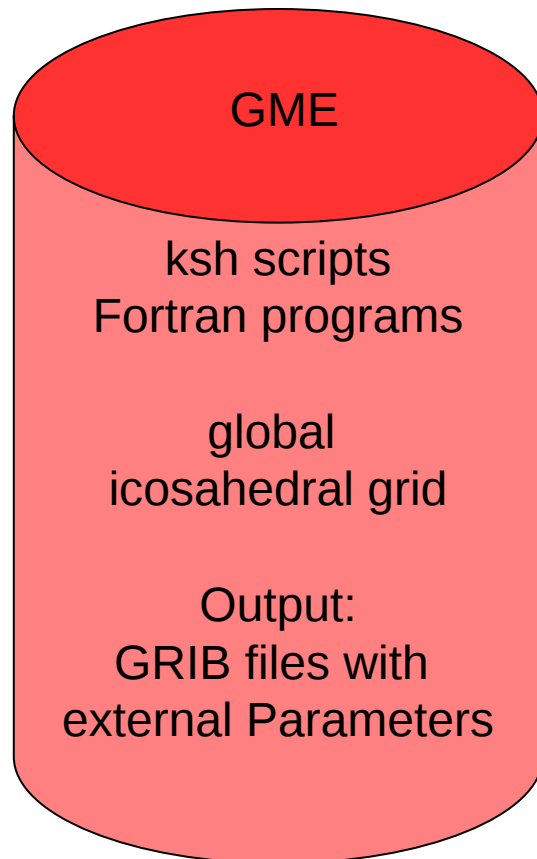
Near surface air temperature



alternative raw dataset

- Harmonized World Soil Database
- Modis data for albedo (?)
- ETOPO1 (?)

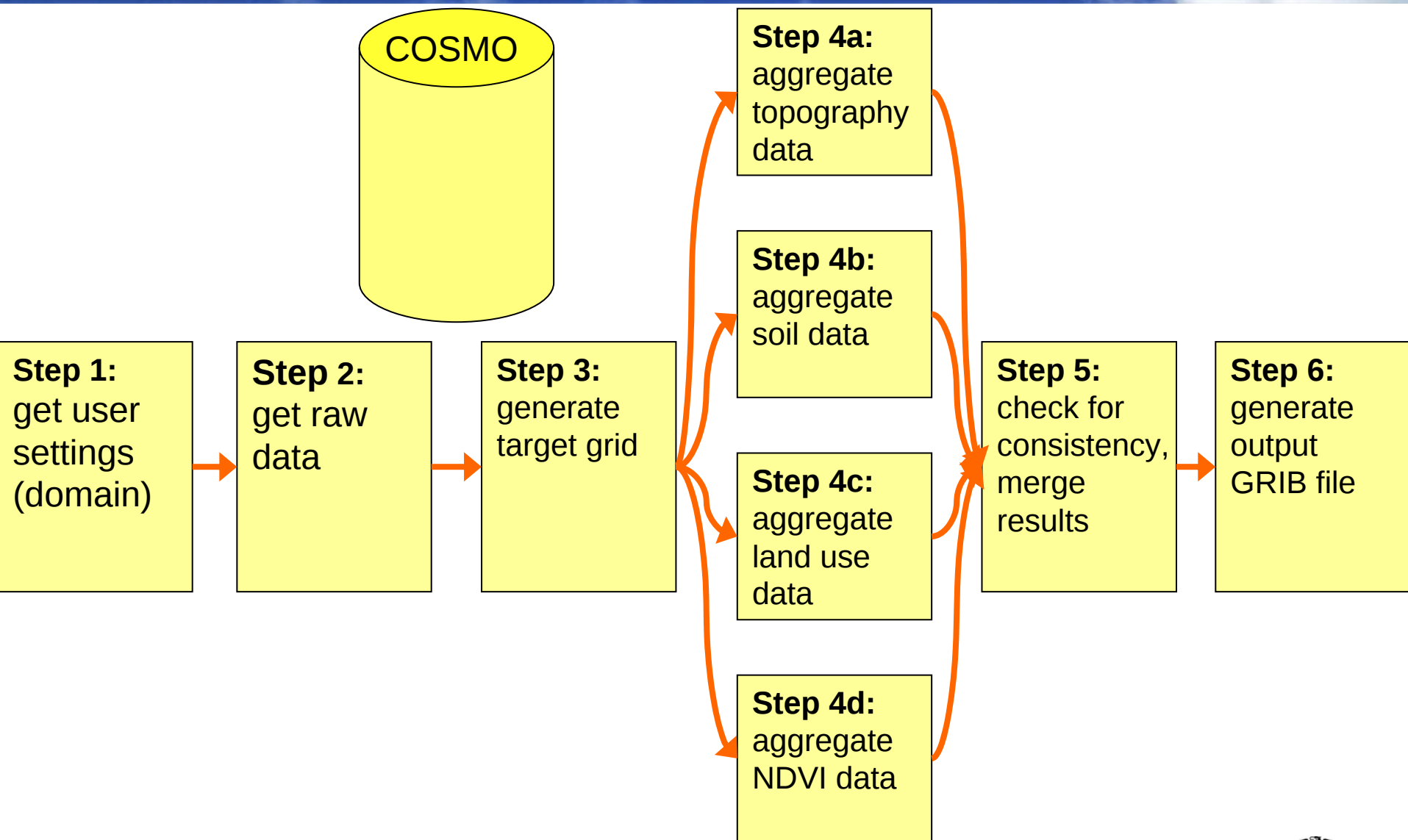




- ➔ Both systems use the same raw data sets.
- ➔ The software for the generation of external parameters for COSMO has been put to the DWD Version control system.

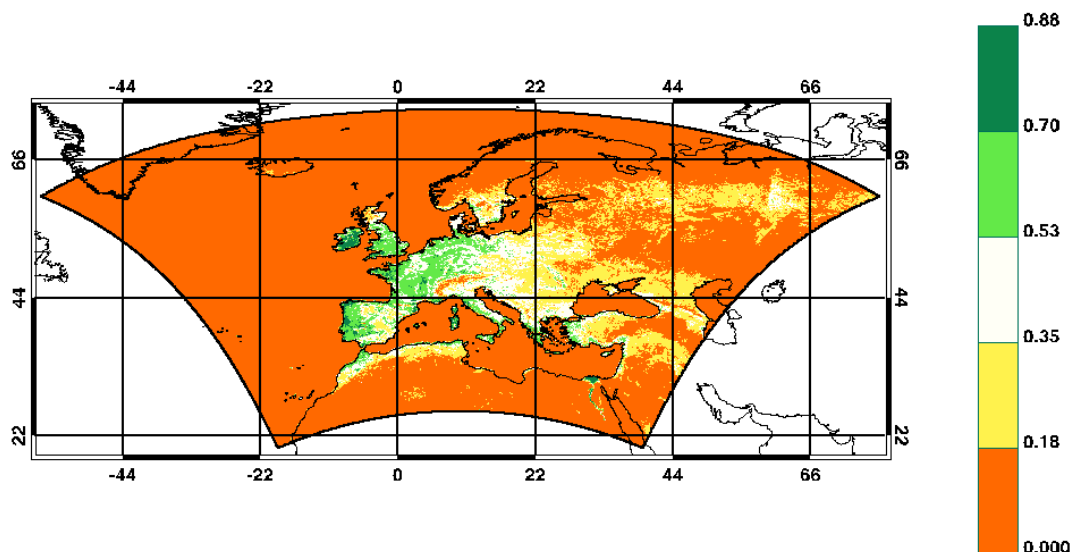
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current system for generation of external parameters



NDVI [1] 2001010100 + 000h DWD Routine

mean: 0.11 std: 0.16 min: 0.00 max: 0.88



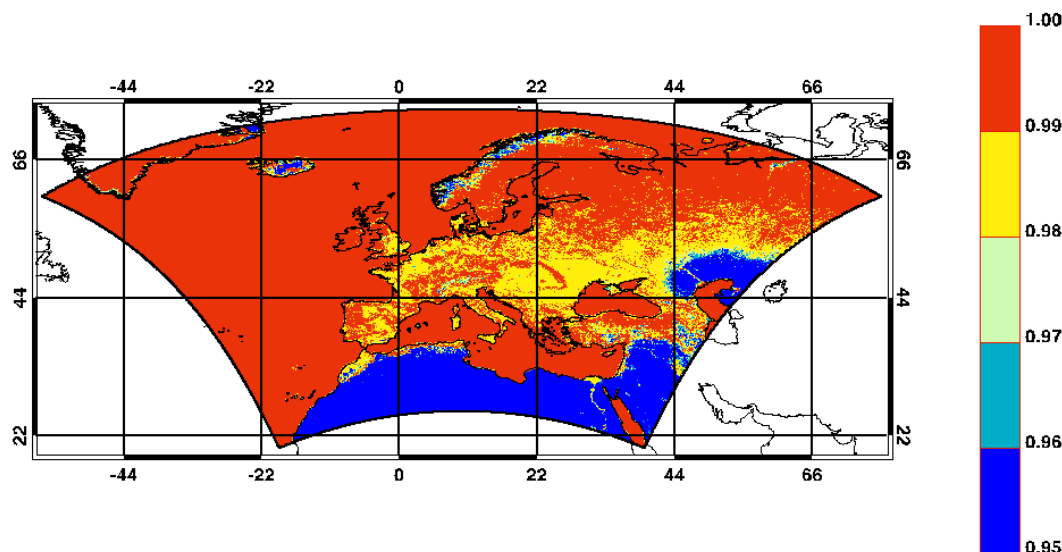
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current system for generation of external parameters

additional external parameters longwave surface emissivity

EMIS_RAD [1] 2001010100 + 000h DWD Routine

mean: 0.98 std: 0.02 min: 0.95 max: 1.00



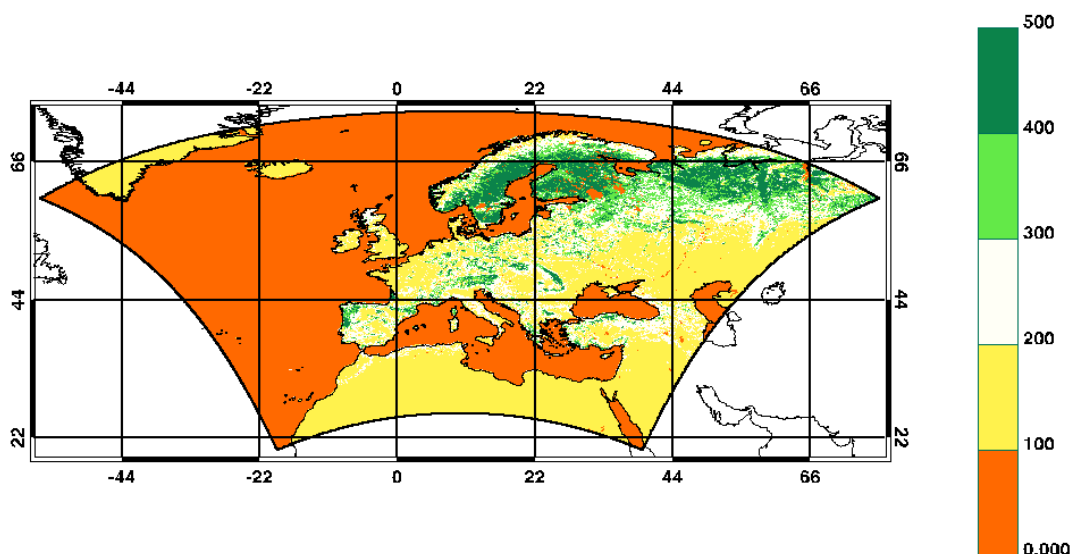
Deutscher Wetterdienst

current system for generation of external parameters

additional external parameters
minimum stomata resistance of plants

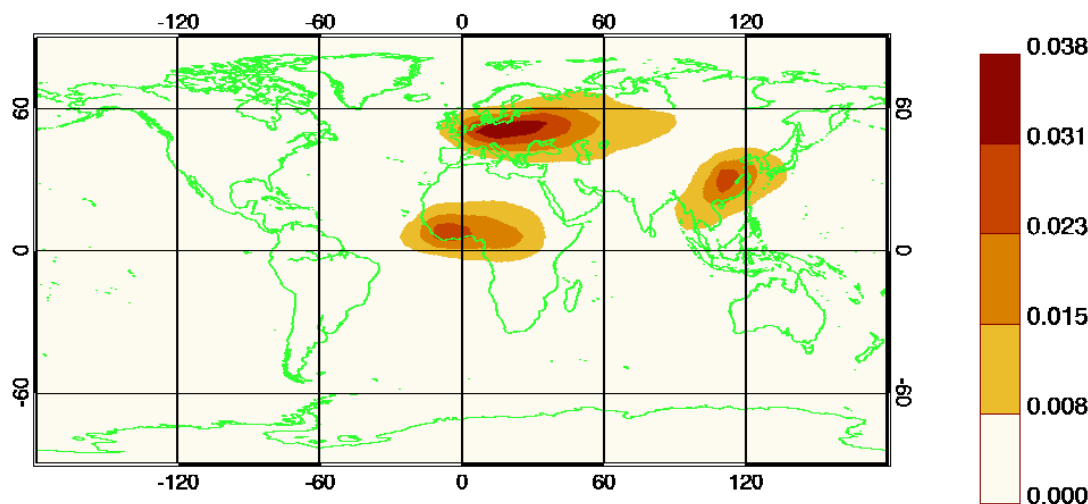
PRS_MIN [s/m] 2001010100 + 000h DWD Routine

mean: 112.69 std: 127.60 min: 0.00 max: 500.00



additional external parameters optical depth at 0.55 micrometer for aerosol (GME)

AER BC 1 1111011111 + 000h DWD Routine
mean: -0.00 std: 0.00 min: 0.00 max: 0.04



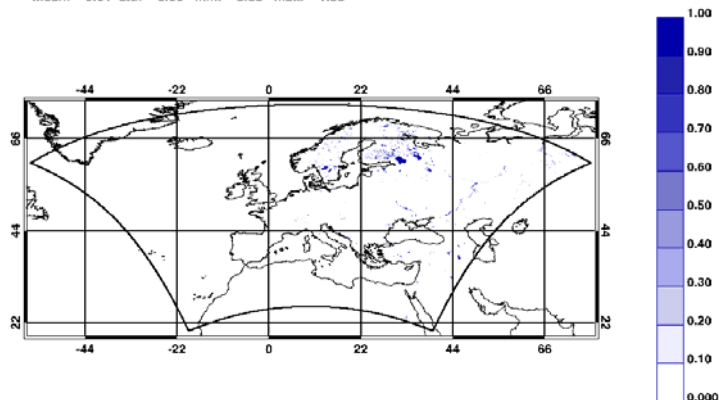
Deutscher Wetterdienst

current system for generation of external parameters

additional external parameters

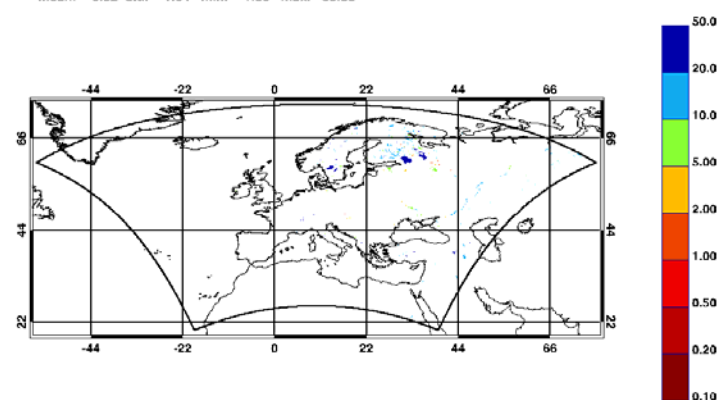
Lake Model Flake

FR_LAKE [proportion] 2001010100 + 000h DWD Routine
mean: 0.01 std: 0.06 min: 0.00 max: 1.00



fraction of inland water

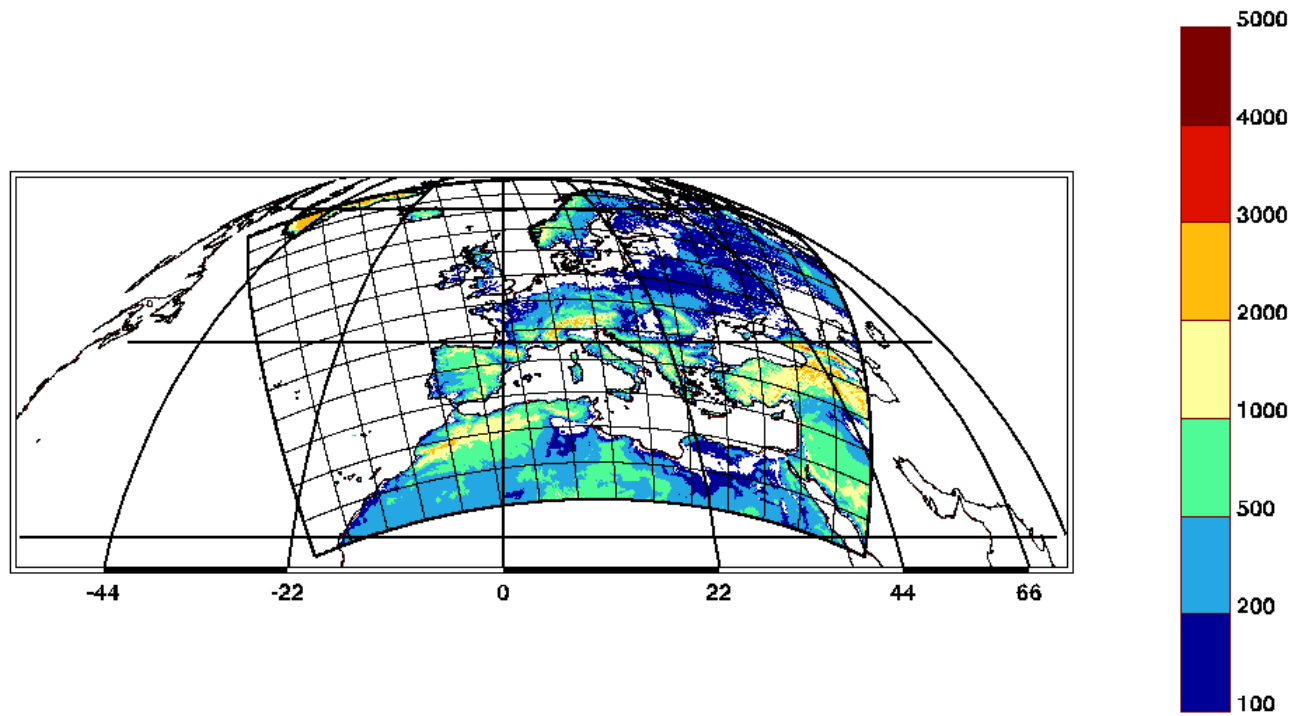
DEPTH LK [m] 2001010100 + 000h DWD Routine
mean: -0.92 std: 1.64 min: -1.00 max: 50.00



lake depth

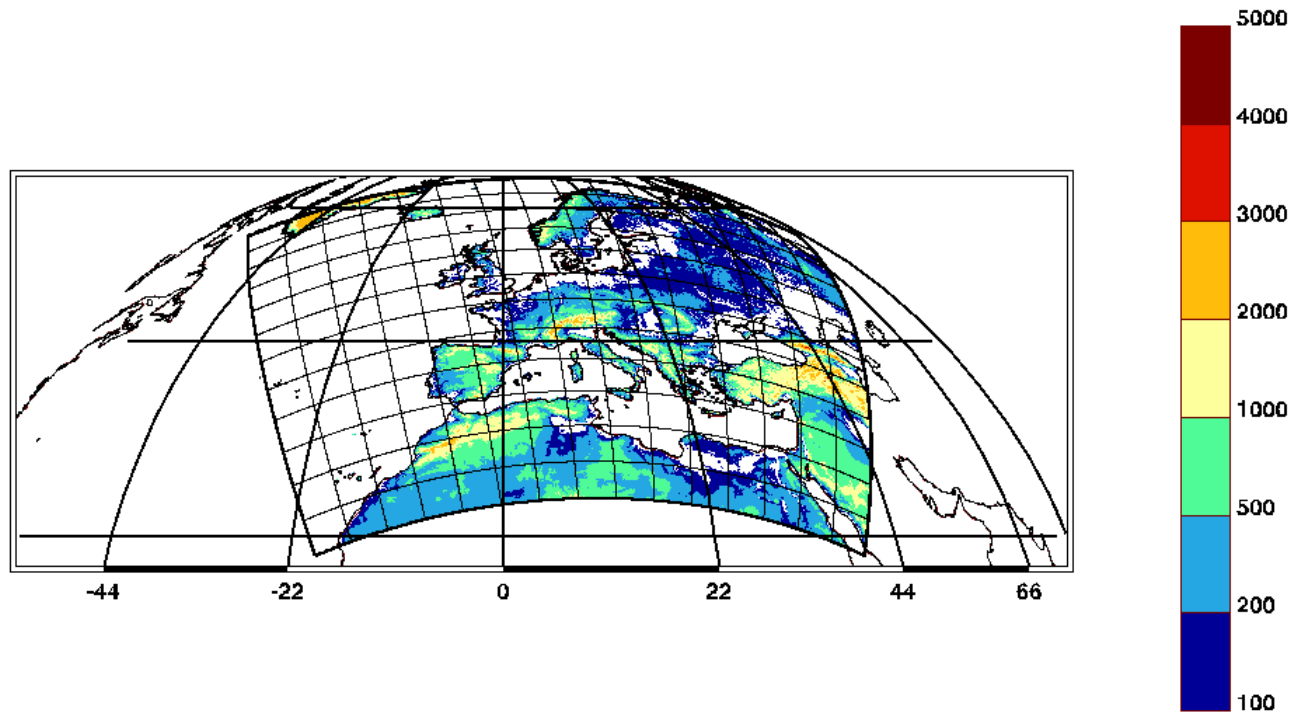
geometrical height [m]

Z [m] 2001010100 + 000h DWD Routine
mean: 221.99 std: 412.42 min: -405.00 max: 3935.88



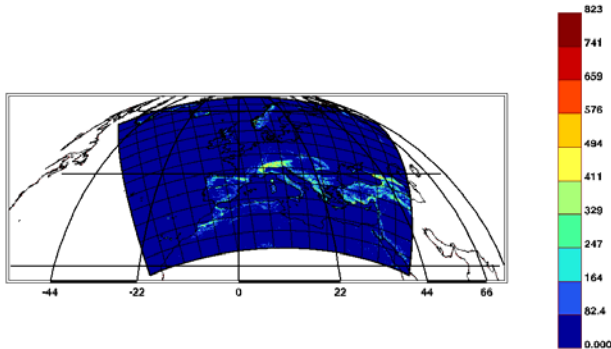
geopotential $[(m^{**2})/(s^{**2})]$

{ FIS $[(m^{**2})/(s^{**2})]$ 2001010100 + 000h DWD Routine } * 0.10
mean: 217.72 std: 404.45 min: -397.17 max: 3968.13



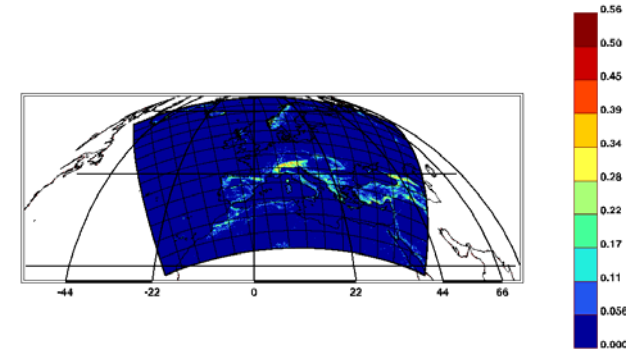
subgrid scale orography parameters

SSO_STDH [m] 2001010100 + 000h DWD Routine
mean: 23.18 std: 54.80 min: 0.00 max: 823.96



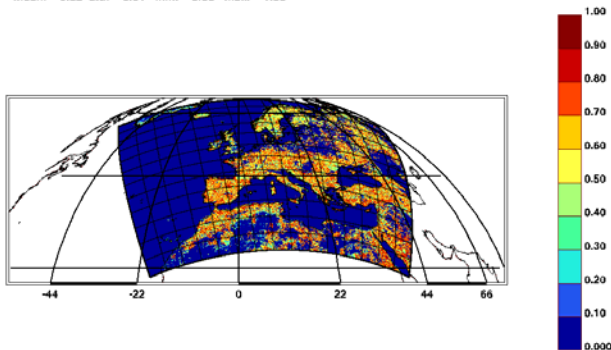
standard deviation of subgrid scale orogr. height

SSO_SIGMA [1] 2001010100 + 000h DWD Routine
mean: 0.02 std: 0.04 min: 0.00 max: 0.56



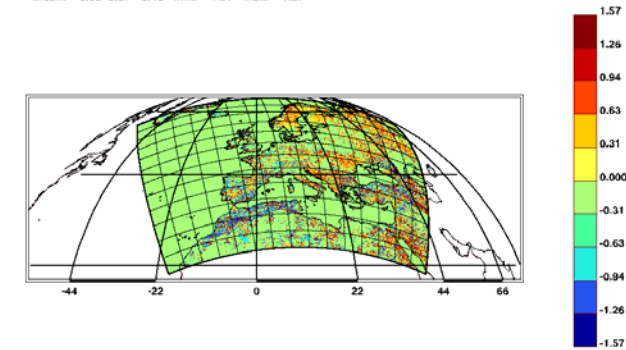
mean slope of subgrid scale orography

SSO_GAMMA [1] 2001010100 + 000h DWD Routine
mean: 0.22 std: 0.31 min: 0.00 max: 1.00



SSO_GAMMA anisotropy of topography

SSO_THETA [1] 2001010100 + 000h DWD Routine
mean: 0.05 std: 0.46 min: -1.57 max: 1.57



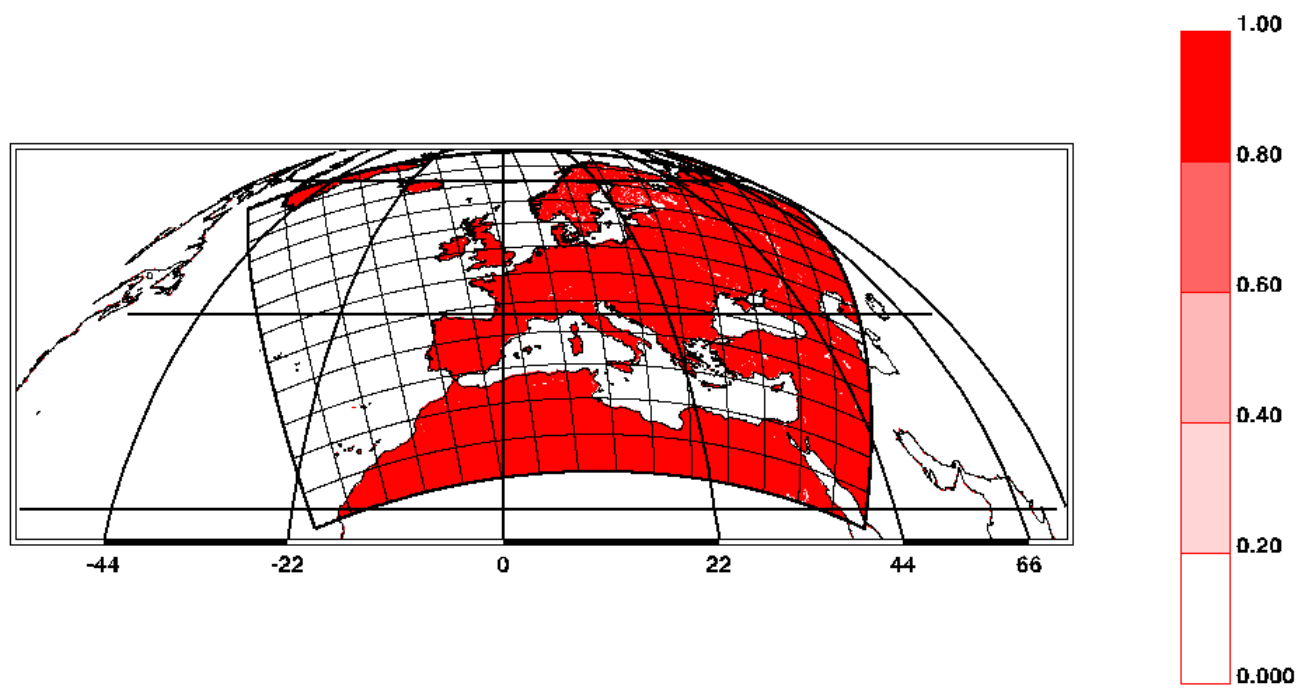
angle betw. principal axis of orogr. and global E

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current system for generation of external parameters

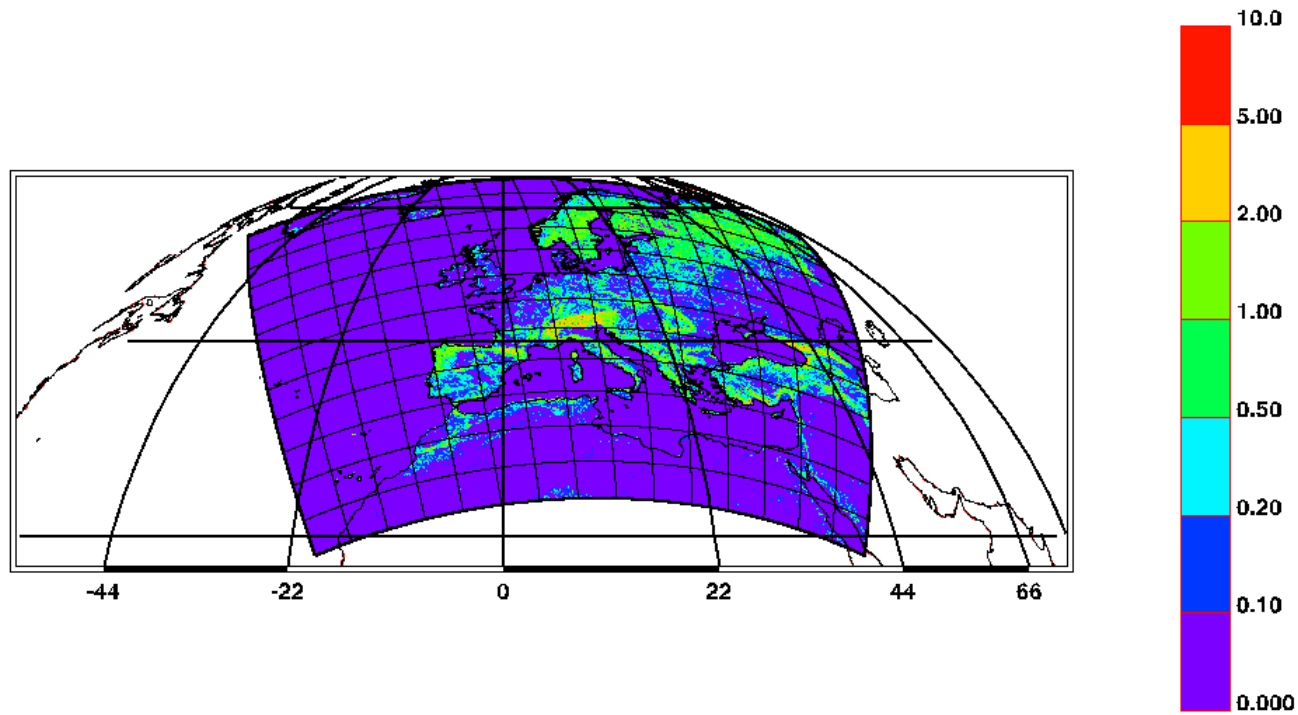
fraction land cover (land-sea mask)

FR_LAND [proportion] 2001010100 + 000h DWD Routine
mean: 0.52 std: 0.49 min: 0.00 max: 1.00



surface roughness

Z0 [m] 2001010100 + 000h DWD Routine
mean: 0.18 std: 0.38 min: 0.00 max: 9.25

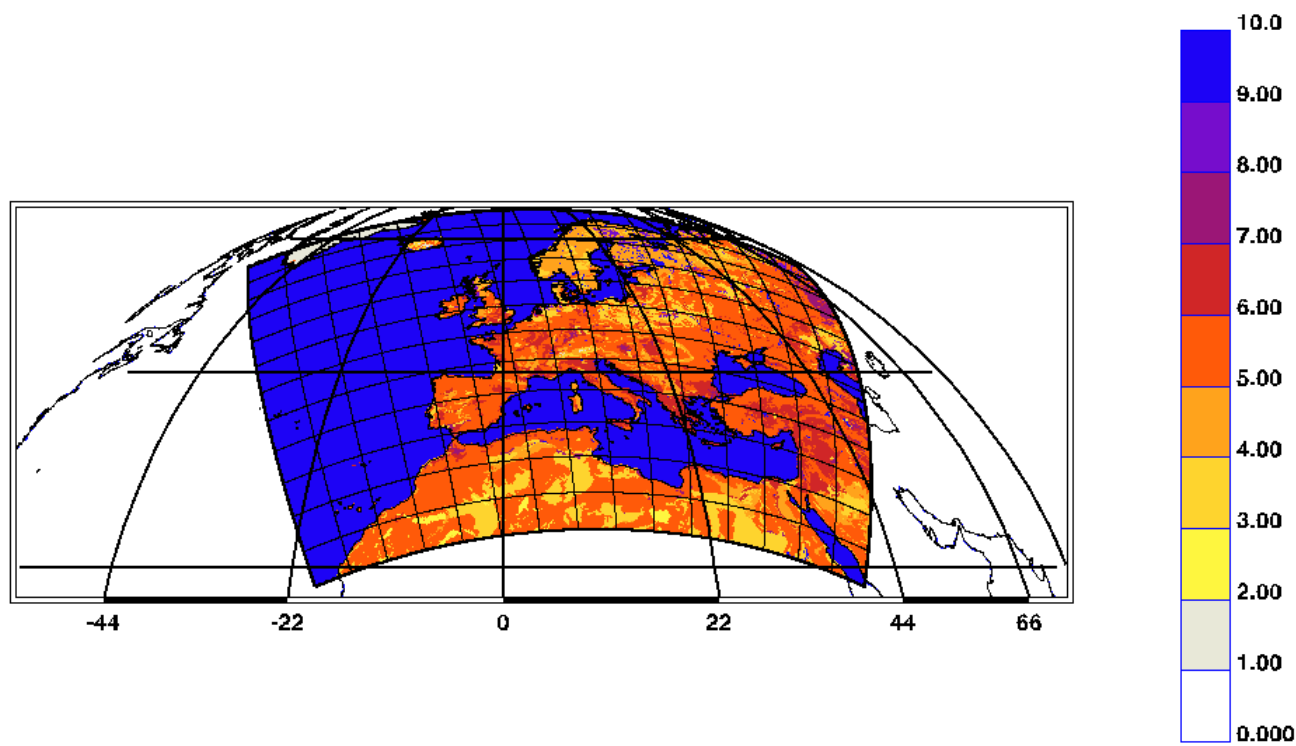


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current system for generation of external parameters

soil texture

SOILTYP [1] 2001010100 + 000h DWD Routine
 mean: 6.72 std: 2.34 min: 1.00 max: 9.00

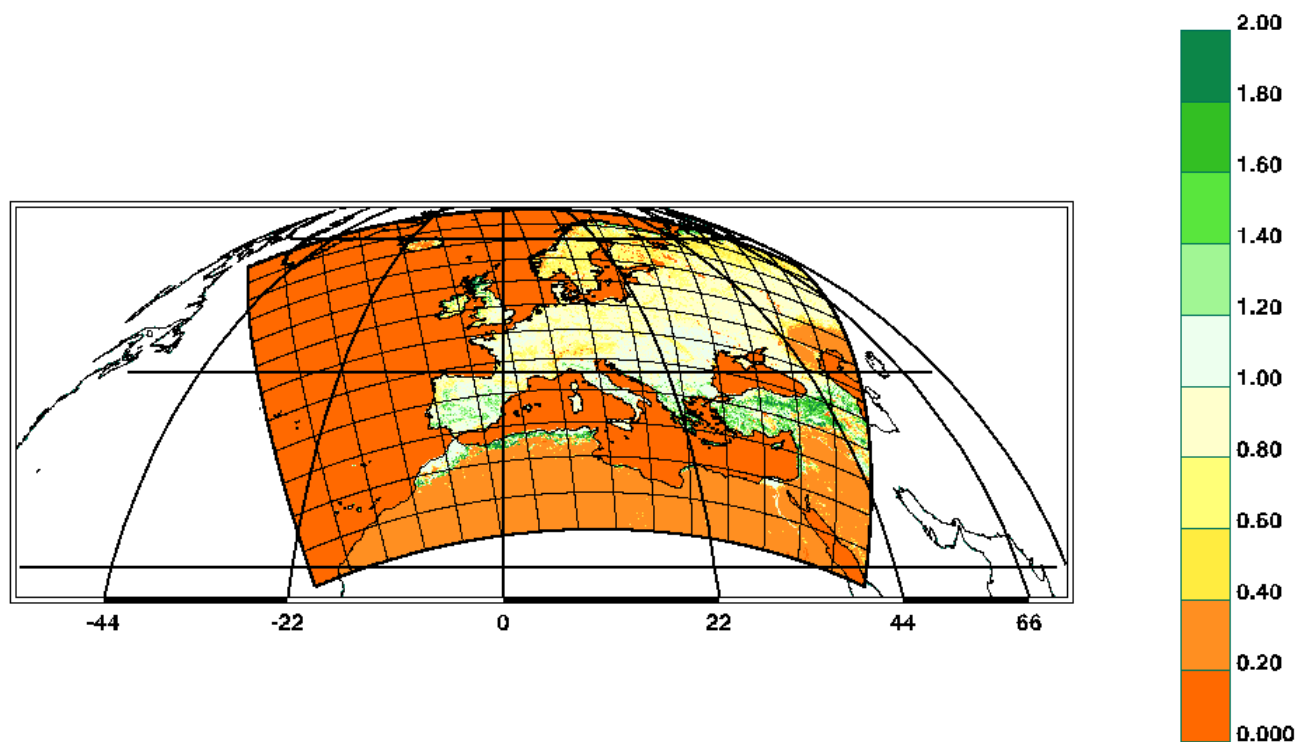


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current system for generation of external parameters

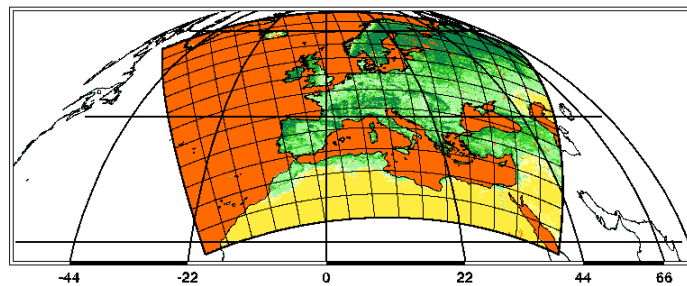
root depth

ROOT [m] 2001010100 + 000h DWD Routine
 mean: 0.36 std: 0.44 min: 0.00 max: 2.00

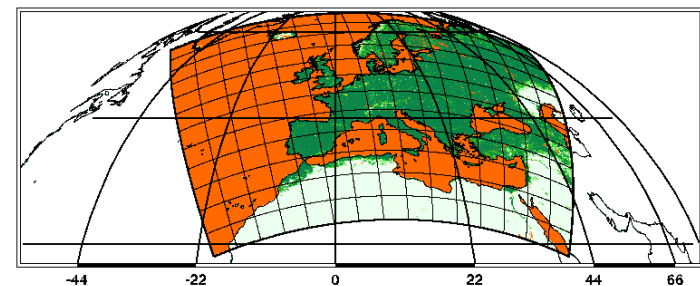


plant cover

PLCOV_MN [1] 2001010100 + 000h DWD Routine
mean: 0.26 std: 0.30 min: 0.00 max: 0.80



PLCOV_MX [1] 2001010100 + 000h DWD Routine
mean: 0.37 std: 0.38 min: 0.00 max: 0.90

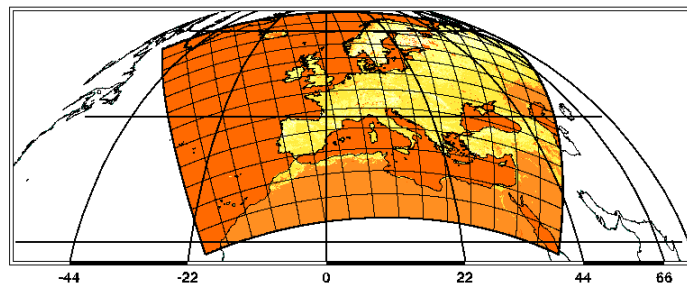


ground fraction covered by plants
(time of rest)

ground fraction covered by plants
(vegetation period)

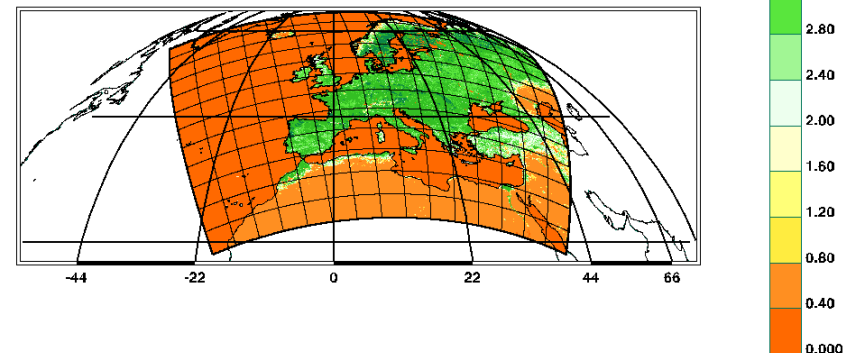
leaf area index

LAI_MN [1] 2001010100 + 000h DWD Routine
mean: 0.38 std: 0.43 min: 0.00 max: 3.00



leaf area index (time of rest)

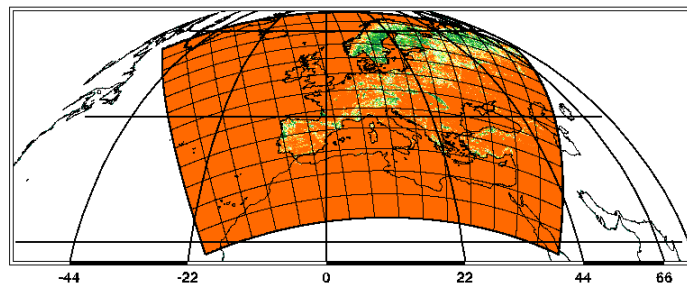
LAI_MX [1] 2001010100 + 000h DWD Routine
mean: 1.14 std: 1.42 min: 0.00 max: 4.00



leaf area index (vegetation period)

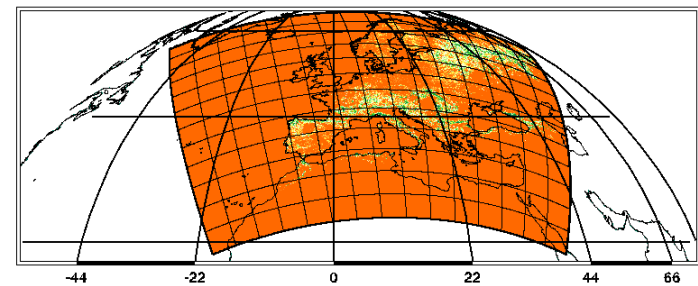
type of forest

FOREST_E [1] 2001010100 + 000h DWD Routine
mean: 0.07 std: 0.20 min: 0.00 max: 1.00



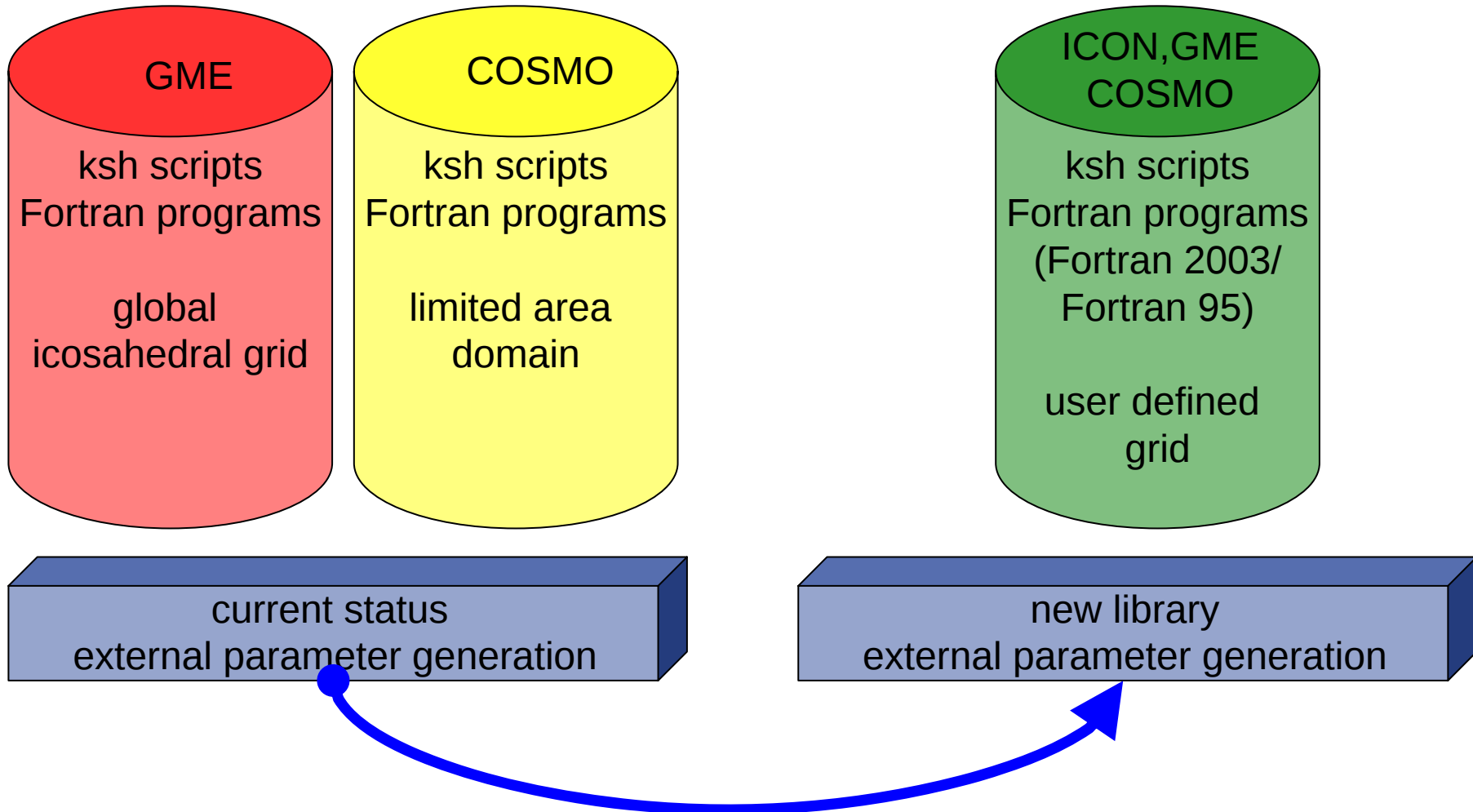
ground fraction covered by evergreen forest

FOREST_D [1] 2001010100 + 000h DWD Routine
mean: 0.05 std: 0.15 min: 0.00 max: 1.00



ground fraction covered by deciduous forest

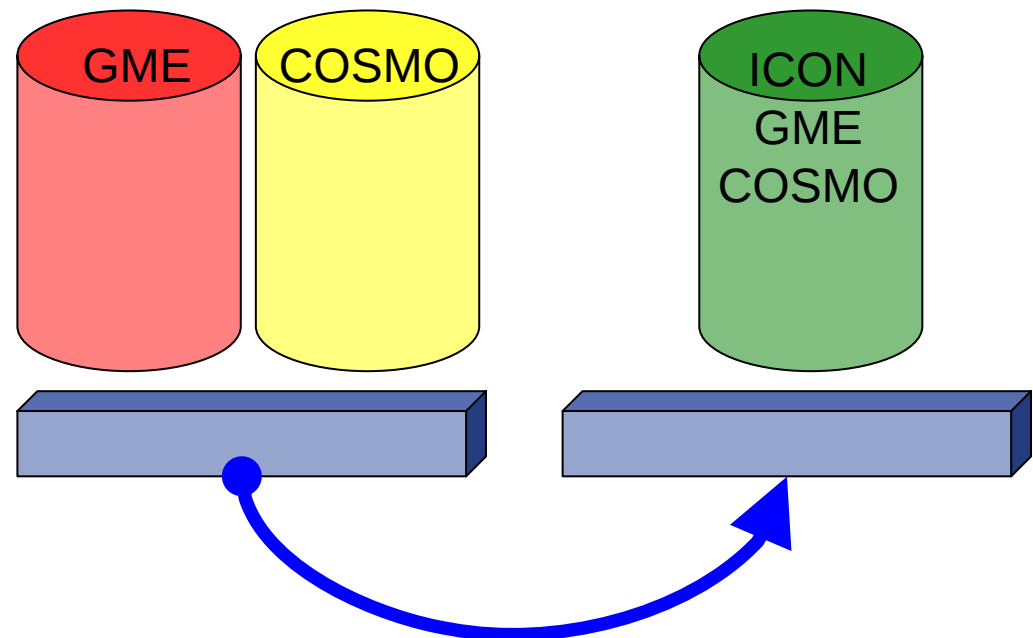
Deutscher Wetterdienst planned extensions



next steps in software development

general changes

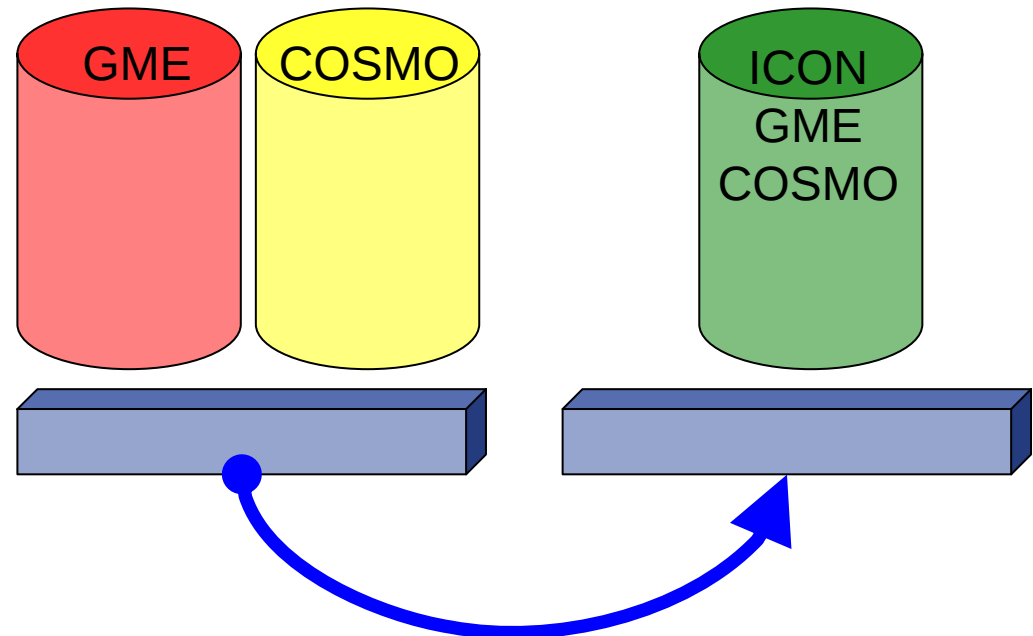
- write software requirements specification
 - software design
 - additional external parameters
 - user interface
- put the software for the generation of external parameters for GME into the DWD Version control system



next steps in software development

general changes (long term)

- recode software according to the software requirements specification
- write documentation



Thank you for your attention!

