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10.2 Topographic data

The model orography and land use fields are based on the terrain elevation data set GTOPO30 at 30" resolution (Gesch and Larson, 1998), the terrain elevation data for Greenland KMS DEM also at 30" resolution (Ekholm, 1996) and the Global Land Cover Characteristics (GLCC) data set at 1 km resolution.

The GTOPO30 data set, as used in the IFS, was completed in 1996 through a collaborative effort led by the US Geological Survey's Data Centre (EDC, see http://edcwww.cr.usgs.gov/landdaac/gtopo30 /gtopo30.html) and was derived from a variety of information sources. It contains terrain elevation above mean sea level at a resolution of 30 arc seconds with -9999 code for sea points. A lake mask is not included.

Greenland KMS DEM replaces GTOPO30 for the Greenland area, because of the better accuracy of the Greenland data.

The Global Land Cover Characteristics (GLCC) data set has been derived from 1 year of Advanced Very High Resolution Radiometer (AVHRR) data, digital elevation models, ecoregions and map data. The nominal resolution is 1 km, and the data comes on a Goode Homolosine global projection. The data base provides for each pixel a biome classification based on several of the popular classifications, including BATS, SiB and SiB2. The BATS classification has been adopted for the IFS because it contains inland water as one of its classes.

Due to their high resolution and global coverage, these data sets are rather big and therefore difficult to handle by the standard PREPCLIM software. Therefore the original data has been converted to an intermediate resolution of 2'30" which is much easier to handle by the standard PREPCLIM software. The derived 2'30" data set contains the following fields:

- Mean elevation above mean sea level
- Land fraction
- Lake fraction

- Fractional cover for all 20 BATS biome classes (see Table 10.1

Table 10.1 Land use classification according to BATTS

Index	Vegetation type	H/L veg
1	Crops, Mixed Farming	L
2	Short Grass	L
3	Evergreen Needleleaf Trees	H
4	Deciduous Needleleaf Trees	H
5	Deciduous Broadleaf Trees	H
6	Evergreen Broadleaf Trees	H
7	Tall Grass	L
8	Desert	-
9	Tundra	L
10	Irrigated Crops	L
11	Semidesert	L
12	Ice Caps and Glaciers	-
13	Bogs and Marshes	L
14	Inland Water	-
15	Ocean	-
16	Evergreen Shrubs	L
17	Deciduous Shrubs	L
18	Mixed Forest/woodland	H
19	Interrupted Forest	H
20	Water and Land Mixtures	L

Finally, also the original US-Navy 10' data is still used for the subgrid

orography contribution to the roughness length. It contains the average terrain height of each grid element, as well as maximum and minimum height, number and orientation of significant ridges, and percentages of water and urban areas. In future the roughness length computation will be upgraded to make optimal use of the high resolution GTOPO30 data.

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