ClassData.txt

SLC classes divide the subbasins of the model based on land use etc. The *ClassData.txt* file (alternative file to GeoClass.txt) describes the characteristics of all classes. The SLC classes are defined as combinations of soil type and land use/land cover, but can also have other properties that separates them. SLC stands for Soil type - Land use Combination. The classes as defined in HYPE act as Hydrological Response Units (HRU).

Lakes, rivers, wetlands and glaciers make up special classes, while all other classes are land classes and combinations of land use and soil type. Two SLC classes can have the same land use and soil type, but differ in other aspects, e.g. soil depth or crop/vegetation. Additional information for land classes are e.g. tile drainage depth, stream drainage depth and time of travel.

File content

The *ClassData.txt* file is located in the `modeldir` folder. Information for a SLC is given on a single row in the file. The data is tab-separated and information is defined by a header row with variable names. Variable names are not case-sensitive (max. 11 characters, no spaces). Columns with headings unknown to HYPE are skipped while reading the file, but must not longer than eleven characters. A maximum of 15 columns can be read. Columns containing character strings are not allowed. The columns may be in any order. A value must exist for every column and row, i.e. empty cells are not allowed.

Comment rows can be added in the beginning of the file and are denoted with a '!' in the first position. A maximum of 999 classes can be defined. The data of SLC:s in GeoData.txt is not necessary to be in slc order.

Example snippet of a ClassData.txt file structure:

```
!! Three classes in this set up:
!! grass on sand, forest on sand, forest on till soil.
!! Two landuses: 1=grass, 2=forest and two soil types: 1=sand, 2=till
class landuse  soiltype  cropid ...
1    1    1    1   ...
2    2    1    2   ...
3    2    2    2   ...
```

Description of class characteristics provided in *ClassData.txt* columns. Mandatory headings in bold:

Header	Unit	Data	Description
class	-	Soil type-land use combination (slc)	Should be 1,2,3.... The number is the same used for the class's area fraction (slc_nn) in GeoData.txt.
landuse	-	Land use/Land cover code	An integer 1,2,3,.. The land use code is determined by the modeller, e.g. 1 could be water, 2 grass, 3 forest. Used for land use dependent model parameters.
soiltype	-	Soil type code	An integer 1,2,3,.. The soil type code is determined by the modeller, e.g. 1 could be peat, 2 till soil, 3 sand. Used for soil type dependent model parameters.

Header	Unit	Data	Description
cropid	-	Main crop cropid	An integer 1,2,3,.. The cropid is determined by the modeller, and couples the class to a vegetation/crop in CropData.txt. Used for nutrient simulation and irrigation classes. If not relevant, e.g. for water classes, set to 0.
2ndcropid	-	Second crop cropid	An integer 1,2,3,... Some agriculture land has a secondary crop, e.g. a catch crop. If not relevant set to 0.
rotgroup	-	Crop rotation group	An integer 0,1,2,... Determines which crops/classes are inter-changed on a piece of land. 0=no crop rotation for this class, 1=class belong to crop rotation group 1, etc. The classes within the same crop rotation group will exchange soil nutrients. The crop rotation is only used for NP-simulations.
atmdepveg	-	Vegetation type	The vegetation types are pre-defined in HYPE: 1=open, 2=forest, 3=water. The vegetation type is only used for NP-simulations (atmospheric deposition) and snow output (C106-C214). If not set (0) vegetation type 1 will be used.
classmodel	-	Special class code	Some classes are special and separated by this code. Use 0 for all others. The following classes are pre-defined in HYPE: 1=outlet lake, 2=internal lake, 3=glacier, 5=traveltime soilmodel, 6=rootzone leakage soilmodel, 11=local stream, 12=main river, 13=internal wetland, 14=outlet wetland.
tiledepth	m	Tile depth	Distance from soil surface to (average) tile drainage system level. Set to 0 to not use tile drainage routine for a class.
streamdepth	m	Stream depth	Distance from soil surface to local stream depth. The depth may not be larger than the total soil profile depth for the class.
numlayers	-	Number of soil layers	May be 1-3. For water classes set to 1 layer with depth 1 m (the values are not used).
depthsl1	m	Soil layer depth	Distance from the soil surface to the bottom of the uppermost soil layer.
depthsl2	m	Soil layer depth	Distance from the soil surface to the bottom of the second soil layer. Must be larger than (or equal) to previous depth. If less than two layers set value equal to soil layer one (or zero).
depthsl3	m	Soil layer depth	Distance from the soil surface to the bottom of the third soil layer. Must be larger than (or equal) to previous depth. If less than three layers set value equal to soil layer two (or zero).
traveltime	-	time of travel	Scaling factor for the class toime of travel in relation to the reference time of travel
tilegroup	-	tile type group	An integer 0,1,2,..., 10. Determines which classes are to have reduced tile drainage based on fraction of drained area. 0=no reductions, 1=reduction based on fraction for tile group 1, etc.
redischarge	-	recharge or discharge class	Positive values for discharge classes and negative values (of fraction of class that is recharge area) for recharge classes. Limitation: recharge classes need to have lower **class** values than all discharge classes.