Xoregobs.txt

The file is used for introducing time series of output region variables into the model. The time series are observations used for evaluation of the model, e.g. `rgrswe` snow water equivalent.

The file is located in the `modeldir` folder. File should include a continuous time period of values for each time step, which doesn't need to cover the whole simulation time period. Missing values should be given as -9999.

The first row is a comment row which is skipped when reading the file. The second row gives the variable names. For the first column, the date column, the name "date" can be used (no name may not be omitted). The third row gives which output region (`outregid` in Outregions.txt) the column's data is given for. The date column may in this case belong to subbasin 0 (may not be omitted). The first column is date in format yyyy-mm-dd [HH:MM]. If set in info.txt that matlab-format should be read (`readformat 1`) the date format is yyyymmdd[HHMM]. Second to last columns are data columns.

Observation variables that can be given in *Xobs.txt* are tabled below. They are a selection of the HYPE variables. The outregion version of the variables can be given in *Xoregobs.txt* by extending the name of the variable with 'rg' in the beginning (e.g. `rswe` correspond to outregion variable `rgrswe`). Some regional variables may give result that is (e.g. `rgwstr`).

Column **#** refers to the column in HYPE variable table for the corresponding subbasin variabel.

Column **Agg.** indicates the type of aggregation of the variables. The type determines how the variable is treated when asked for as an output variable or in a criterion calculation. The `meanperiod` of the output/criterion determines the period over which the variables values will be aggregated. They will be averaged, weight-averaged or summed according to the type of aggregation. Similarly variable values in *Xobs.txt* represent either averages, weighted averages, or sums over the timestep.

#	Variable ID	Unit	Description	Agg.	Reference area
5	`rswe`	*mm*	observed snow water equivalent, provided in Xobs.txt	Avg.	subbasin land area
6	`rsnw`	*cm*	observed snow depth, provided in Xobs.txt	Avg.	subbasin land area
27	`resf`	*cm*	observed frost depth, provided in Xobs.txt	Avg.	subbasin land area
28	`regw`	*m*	observed groundwater level, provided in Xobs.txt	Avg.	subbasin land area
39	`rfsc`	-	recorded fractional snow cover area, provided in Xobs.txt	Avg.	subbasin land area
41	`rfse`	-	recorded fractional snow cover area error, provided in Xobs.txt	Avg.	subbasin land area
42	`rfsm`	-	recorded fractional snow cover multi, provided in Xobs.txt	Avg.	subbasin land area
43	`rfme`	-	recorded fractional snow cover multi error, provided in Xobs.txt	Avg.	subbasin land area
45	`wstr`	*m*	observed water level olake, provided in Xobs.txt	Avg.	outlet lake area

#	Variable ID	Unit	Description	Agg.	Reference area
56	rinf	m^3/s	observed (derived) flow (including P-E) to olake, provided in Xobs.txt	Avg.	subbasin upstream area
69	roli	*cm*	recorded olake ice depth, provided in Xobs.txt	Avg.	outlet lake area
70	rili	*cm*	recorded ilake ice depth, provided in Xobs.txt	Avg.	internal lake area
71	rolb	*cm*	recorded olake blackice depth, provided in Xobs.txt	Avg.	outlet lake area
72	rilb	*cm*	recorded ilake blackice depth, provided in Xobs.txt	Avg.	internal lake area
73	rols	*cm*	recorded olake snow depth, provided in Xobs.txt	Avg.	outlet lake area
74	rils	*cm*	recorded ilake snow depth, provided in Xobs.txt	Avg.	internal lake area
81	rmri	*cm*	recorded main river ice depth, provided in Xobs.txt	Avg.	main river area
82	rlri	*cm*	recorded local river ice depth, provided in Xobs.txt	Avg.	local river area
83	rmrb	*cm*	recorded main river blackice depth, provided in Xobs.txt	Avg.	main river area
84	rlrb	*cm*	recorded local river blackice depth, provided in Xobs.txt	Avg.	local river area
85	rmrs	*cm*	recorded main river snow depth, provided in Xobs.txt	Avg.	main river area
86	rlrs	*cm*	recorded local river snow depth, provided in Xobs.txt	Avg.	local river area
97	rolt	*°C*	recorded olake surface temperature, provided in Xobs.txt	Avg.	outlet lake area
98	rilt	*°C*	recorded ilake surface temperature, provided in Xobs.txt	Avg.	internal lake area
99	rmrt	*°C*	recorded main river surface temperature, provided in Xobs.txt	Avg.	main river area
112	xom0..9	*depends on variable type*	optional, not predefined variable (averaged over output time interval) provided in Xobs.txt or XobsXOMn.txt	Avg.	depends on variable type
115	rgmb	*mm*	recorded glacier mass balance, provided in Xobs.txt	Avg.	specific glacier area
117	rgma	km^2	area used in recorded mass balance, provided in Xobs.txt	Avg.	specific glacier area
118	rgmp	*days*	recorded mass balance period, provided in Xobs.txt	Avg.	none
119	S105	-	recorded (FSUHSS) snow cover surrounding terrain open (fraction from 0 to 10), provided in Xobs.txt	Avg.	area of non-forest land cover
120	S106	-	recorded (FSUHSS) snow cover course open (fraction from 0 to 10), provided in Xobs.txt	Avg.	area of non-forest land cover
121	S108	*cm*	recorded (FSUHSS) mean depth open, provided in Xobs.txt	Avg.	area of non-forest land cover

#	Variable ID	Unit	Description	Agg.	Reference area
122	S111	*g/cm^3*	recorded (FSUHSS) mean density open, provided in Xobs.txt	Avg.	area of non-forest land cover
123	S114	*mm*	recorded (FSUHSS) snow water equivalent open, provided in Xobs.txt	Avg.	area of forest land cover
124	S205	-	recorded (FSUHSS)snow cover surrounding terrain forest (fraction from 0 to 10), provided in Xobs.txt	Avg.	area of forest land cover
125	S206	-	recorded (FSUHSS) snow cover course forest (fraction from 0 to 10), provided in Xobs.txt	Avg.	area of forest land cover
126	S208	*cm*	recorded (FSUHSS) mean depth forest, provided in Xobs.txt	Avg.	area of forest land cover
127	S211	*g/cm^3*	recorded (FSUHSS) mean density forest, provided in Xobs.txt	Avg.	area of forest land cover
128	S214	*mm*	recorded (FSUHSS) snow water equivalent forest, provided in Xobs.txt	Avg.	area of forest land cover
143	reT1	*undefined*	observed concentration of stable water isotope tracer in outflow from olake/subbasin, unit dependent on unit in user-provided precipitation concentration of cpT1, typically ‰ deviation from V-SMOW, provided in Xobs.txt	W. Avg.	subbasin upstream area
144	reT2	*°C*	observed water temperature in outflow from olake/subbasin, provided in Xobs.txt	W. Avg.	subbasin upstream area
146	reIN, reON, reSP, rePP, reTN, reTP	*µg/L*	observed concentration of N and P species in outflow from olake/subbasin, provided in Xobs.txt	W. Avg.	subbasin upstream area
147	cpT1	*undefined*	observed concentration of stable water isotopes in precipitation, unit user-provided, typically ‰ deviation from V-SMOW, provided in Xobs.txt	W. Avg.	subbasin area
160	reOC	*mg/L*	observed OC concentration in outflow from olake/subbasin, provided in Xobs.txt	W. Avg.	subbasin upstream area
169	repo	*mm/[timestep]*	observed potential evapotranspiration, provided in Xobs.txt	Sum	subbasin area
170	eobs	*mm/[timestep]*	observed evapotranspiration, provided in Xobs.txt	Sum	subbasin area
175	rrun	*mm/[timestep]*	observed local runoff from soil, provided in Xobs.txt	Sum	subbasin land area
193	xos0..9	*depends on variable*	optional, not predefined variable (summed over output time interval) provided in Xobs.txt or XobsXOSn.txt	Sum	depends on variable
202	cpIN	*µg/L*	observed concentration of inorganic nitrogen in precipitation, provided in Xobs.txt	W. Avg.	subbasin area

#	Variable ID	Unit	Description	Agg.	Reference area
203	cpSP	*µg/L*	observed concentration of soluble phosphorus in precipitation, provided in Xobs.txt	W. Avg.	subbasin area
263	roum	m^3/s	observed outflow from olake outlet 1	Avg.	subbasin upstream area
264	roub	m^3/s	observed outflow from olake outlet 2	Avg.	subbasin upstream area