



PREP Initialization in SURFEX

The PREP tool

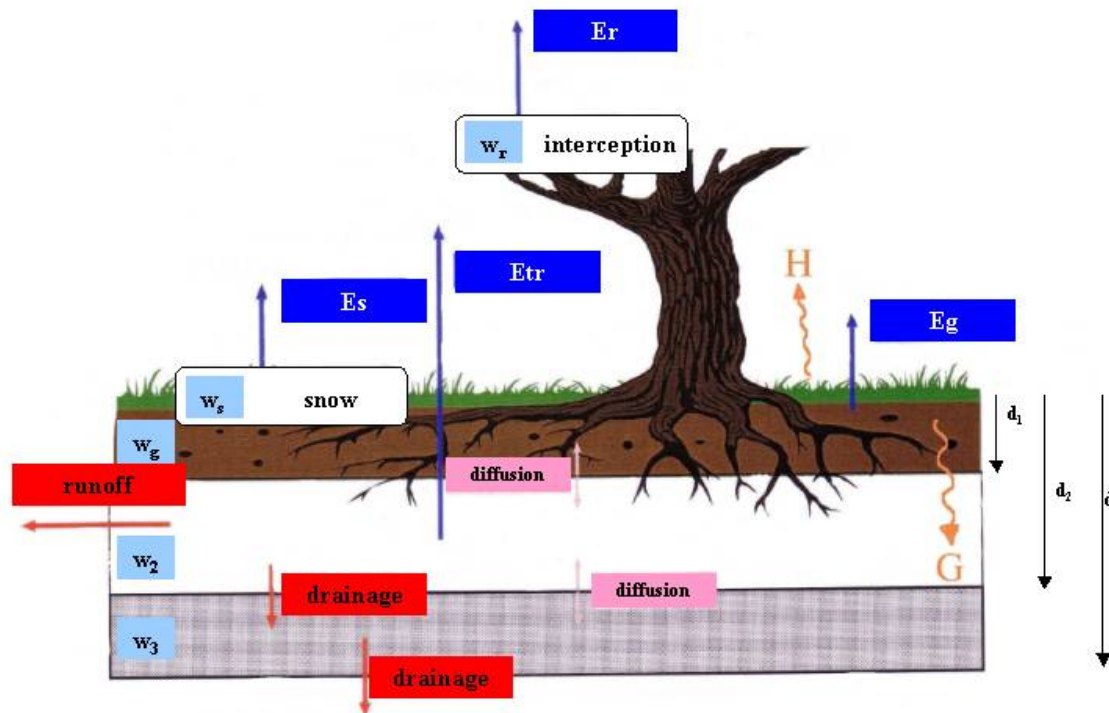
To initialize models prognostic variables for natural areas with **ISBA**, cities with **TEB**, lakes with **Flake** or **WATFLX** and sea/ocean with **CMO1D** or **SEAFLX**.

$$\frac{\partial X(t, s)}{\partial t} = F(t, s) \quad s = (x, y, z)$$

$$X(0, s) = ?$$

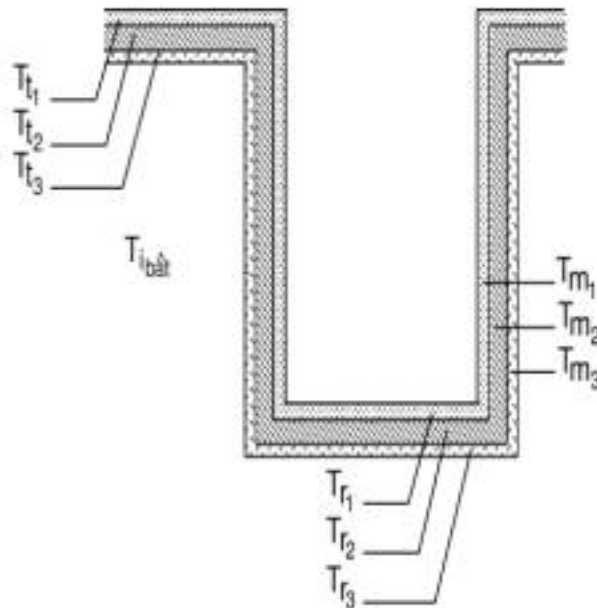
ISBA prognostic variables

- Vertical profiles of temperature, liquid and ice water contents
- Interception reservoir water content
- Snow water equivalent, albedo of snow...



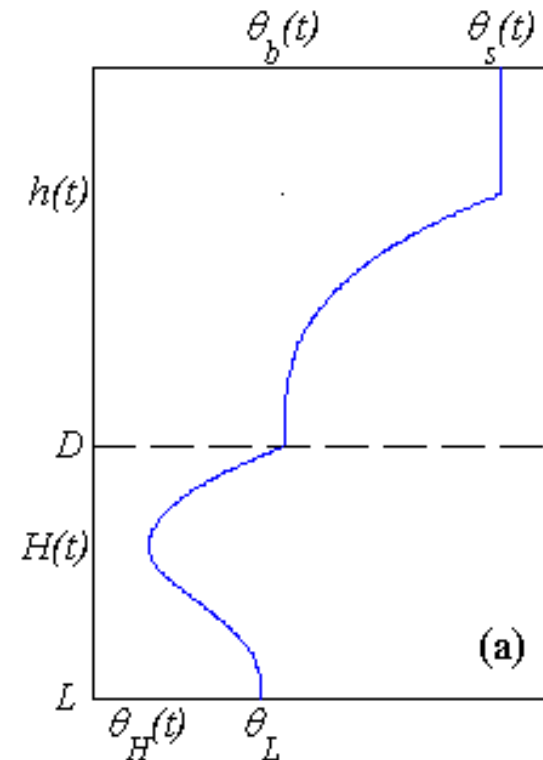
TEB prognostic variables

- Roof, walls and road temperatures
- Roof and road water contents
- Building internal temperature
- Snow



FLake Prognostic variables

- Surface, bottom, and mean water temperatures
- Mixing layer depth
- Shape of the thermocline profile
- Snow and ice thicknesses
- Snow and ice temperatures



CMO1D prognostic variables

- Surface temperature
- Salinity
- Current
- Turbulent kinetic energy

WATFLX/SEAFLX prognostic variables

- Surface temperature
(constant during a forecast)

Initialization

- Uniform (values at $z=0\text{m}$)
 - Example: to initialize the surface temperature in ISBA
 - ▶ `XTG_SURF=290.`
 - Example: to initialize surface soil moisture to field capacity
 - ▶ `XHUG_SURF=1.`
- From a model forecast or analysis file
 - ECMWF, ARPEGE, ALADIN, AROME, MOCAGE, MERCATOR
 - Example of ISBA:
 - ▶ Reading of atmospheric fields, then projection on a detailed soil grid (20 layers)
 - ▶ Horizontal interpolations on the fine grid, then vertical interpolations on the target grid
 - ▶ Back to model variables
- From an external file of (lat, lon, value) type (ASCLLV):
 - ▶ Only available for some fields
 - ▶ `CFILE_TG_SURF='tg_surf.dat' ; CTYPE_TG='ASCLLV'`

Example 1:

Initialization of tile variables from ECMWF file

&NAM_PREP_SURF_ATM

CFILE='ecmwf.OD.20050526.18', CFILETYPE='GRIB' /

&NAM_PREP_TEB

CFILE_TEB='ecmwf.OD.20050526.18', CTYPE='GRIB' /

&NAM_PREP_SEAFLUX

CFILE_SEAFLX='ecmwf.OD.20050526.18', CTYPE_SEAFLX='GRIB' /

&NAM_PREP_WATFLUX

CFILE_WATFLX='ecmwf.OD.20050526.18', CTYPE='GRIB' /

&NAM_PREP_ISBA

CFILE_ISBA='ecmwf.OD.20050526.18', CTYPE='GRIB' /

Example 2:

Initialization of ISBA variables from external file

&NAM_PREP_ISBA

CFILE_ISBA = 'ecmwf.OD.20050526.18', CTYPE = 'GRIB',

CFILE_HUG_SURF = 'SWI1_SIM_2005052618_ALL',

CFILE_HUG_ROOT = 'SWI2_SIM_2005052618_ALL',

CFILE_HUG_DEEP = 'SWI3_SIM_2005052618_ALL',

CFILE_TG_SURF = 'TG1_SIM_2005052618_ALL',

CFILE_TG_ROOT = 'TG2_SIM_2005052618_ALL',

CFILE_TG_DEEP = 'TG3_SIM_2005052618_ALL',

CFILE_HUG = 'ASCLLV', CFILE_TG = 'ASCLLV'

/