

Surfex v7.1 :

Options for PGD and forcing



Plan

- 1) General options for PGD
- 2) Ts forcing
- 3) SST forcing
- 4) Flux forcing
- 5) Physiographic forcing for nature (ISBA)
- 6) Physiographic forcing for town (TEB)
- 7) Forcing for lakes (FLAKE)
- 8) Useful link

General OPTIONS for PGD : grid

- **GRID :**

- **NAM_PGD_GRID**

CGRID = GAUSS / CONF PROJ / CARTESIAN / LONLAT REF / LONLATVAL / IGN
/ NONE

YINIFILE / YFILETYPE : to initialize GRID from a Meso-NH file

+ Specific namelists for each grid type containing characteristics of the grid :

- NAM_CONF_PROJ, NAM_CONF_PROJ_GRID, NAM_INIFILE_CONF_PROJ
- NAM_CARTESIAN, NAM_INIFILE_CARTESIAN
- NAM_LONLAT_REG
- NAM_LONLATVAL
- NAM_IGN
- NAMDIM, NAMGRI, NAMGEM



General OPTIONS for PGD : schemes

- **NAM_PGD_SCHEMES :**

CNATURE = NONE / FLUX / TSZ0 / ISBA

CSEA = NONE / FLUX / SEAFLX

CTOWN = NONE / FLUX / TEB

CWATER = NONE / FLUX / WATFLX / FLAKE

LGARDEN = T / F

General OPTIONS for PGD : physiography (1)

- **NAM_ZS :**

XUNIF_ZS = uniform value for orography

or

YZS = 'name of the file for orography'

YFILETYPE = DIRECT/BINLLF/BINLLV/ASCLLV

or

LIMP_ZS = T/F (to read orography from an existing PGD file)

with YFILETYPE = ASCII/FA/LFI

Example :

&NAM_ZS YZS = 'gtopo30', YFILETYPE = 'DIRECT' /

General OPTIONS for PGD : physiography (2)

- **NAM_FRAC :**

LECOCLIMAP = T/F *to use ECOCLIMAP or not*

XUNIF_SEA = uniform value for sea fraction
or

CFNAM_SEA = 'name of sea fraction file'

CFTYP_SEA = DIRECT/BINLLF/BINLLV/ASCLLV
(the same for WATER, NATURE, TOWN)

General OPTIONS for PGD : physiography (2)

- **NAM_ECOCLIMAP2 :**

LCLIM_LAI = T/F (*in ECOCLIMAP2, to use climatological LAI or LAI of year 2002-2006*)

General OPTIONS for PGD : physiography (3)

- **NAM_COVER : (if ECOCLIMAP is used)**

XUNIF_COVER = uniform value for cover fraction (array of 573 reals)

or

YCOVER = name of cover file

YFILETYPE = DIRECT/BINLLF/BINLLV/ASCLLV

XRM_COVER, XRM_COAST, XRM_LAKE, XRM_SEA : limit of coverage under which the fraction is removed

LIMP_COVER : to read the cover fraction in an existing PGD file

General OPTIONS for PGD : physiography (4)

- **NAM_ISBA :**

NPATCH = *between 1 and 12*

CISBA = *2-L / 3-L / DIF*

CPHOTO = *NON / AGS / LAI / AST / LST / NIT / NCB*

NGROUND_LAYER = *> 0*

CPEDO_FUNCTION = *CH78 / CO84 / CP88 / WO99 (for CISBA=DIF except CH78)*

XUNIF_CLAY *or* YCLAY + YCLAYFILETYPE *or* LIMP_CLAY (*clay*)

XUNIF_SAND *or* YSAND + YSAND_FILETYPE *or* LIMP_SAND (*sand*)

XUNIF_RUNOFFB *or* YRUNOFFB + YRUNOFFBFILETYPE (*subgrid runoff coefficient*)

General OPTIONS for PGD : physiography (5)

NAM_ISBA (cont.):

- XUNIF_WDRAIN or YWDRAIN + YWDRAINFILETYPE (*subgrid drainage*)
YCTI + YCTIFILETYPE or LIMP_CTI (*topographic indexes*)
XUNIF_ORGMAT or YORGMAT + YORGMATFILETYPE or LIMP_ORGMAT
(*organic matter*)
XUNIF_DENSITY or YDENSITY + YDENSITYFILETYPE or LIMP_DENSITY
(*soil density*)

■ **NAM_SEABATHY :**

XUNIF_SEABATHY = *uniform value for bathymetry*

or

YSEABATHY = *data file name*

YSEABATHYFILETYPE = DIRECT / BINLLF / BINLLV / ASCLLV / NETCDF

YNCVARNAME = *name of variable to be read in netcdf file*

Ts forcing

NAM_PGD_SCHEMES CISBA = TSZ0

- *In this scheme, the fluxes are computed according to the ISBA physics, but the surface characteristics (temperature, humidity...) remain constant with time.*

NAM_DATA_TSZ0

NTIME : 1 or 25 (1 by day or 1 by hour)

XUNIF_DTS : *prescribed values of the surface temperature increment over land (K)*

XUNIF_DHUGRD : *prescribed values of the soil humidity increment over land (fraction)*

SST forcing

- **NAM_DATA_SEAFLUX**

NTIME = *number of data for SST (max=1 by day of the year, 365)*

LSST_DATA = *T/F to use SST data*

XUNIF_SST = *uniform value for SST for each time*

or

CFNAM_SST + CFTYP_SST = *name and type of data file*

NYEAR_SST = *year of data, for each time*

NMONTH_SST = *month of data, for each time*

NDAY_SST = *day of data, for each time*

XTIME_SST = *time of data, for each time*

- A temporal interpolation is performed to get the instantaneous SST

Flux forcing

- **NAM_PGD_SCHEMES** CISBA/CSEA/CTOWN/CWATER = FLUX
- **NAM_IDEAL_FLUX** : read during initialization
 - 1 uniform value by $\frac{1}{2}$ hour (49 values in all, temporal interpolation) -
 - XSFTH = *heat surface flux (def = 0.)*
 - CSFTQ = *unit for the evaporation flux : kg/m²/s '(def) or W/m²*
 - XSFTQ = *water vapor surface flux (def = 0.)*
 - XSFCO2 = *CO2 surface flux (def = 0.)*
 - CUSTARTYPE = *type of computation for friction : USTAR or Z0 (def)*
 - XUSTAR = *data of friction (def = 0.)*
 - XTSRAD = *radiative temperature (def = XTT = 273,15 K) (constant)*
 - XZ0 = *roughness length (needed if CUSTARTYPE=Z0 (default=0,01)*
 - XALB = *albedo (def=0.)*
 - XEMIS = *emissivity (def = 1.)*

Physiographic forcing for nature (ISBA)

- **NAM_DATA_ISBA**

uniform (XUNIF_PARAM) of *data file* (CFNAM_DATA + CFTYP_DATA = DIRECT/BINLLF/BINLLV/ASCLLV)

for

VEGTYPE : *fractions of the 12 ECOCLIMAP types of vegetation*

VEG, LAI, Z0, EMIS : *depend on NTIME=1,2,12,36*

DG, ROOTFRAC : *ground depths, root fraction (CISBA=DIF)*

RSMIN, GAMMA, WRMAX_CF, RGL, CV, Z0_O_Z0H, ALBNIR_VEG, ALBVIS_VEG, ALBUV_VEG, ALBNIR_SOIL, ALBVIS_SOIL, ALBUV_SOIL

GMES, BSLAI, LAIMIN, SEFOLD, GC, DMAX, F2I, H_TREE, RE25, CE_NITRO, CF_NITRO, CNA_NITRO : *ISBA-AGS parameters*

- **Possibility to combine ECOCLIMAP with only some of the ISBA parameters prescribed**

Physiographic forcing for town (TEB)

- **NAM_DATA_TEB**

uniform (XUNIF_PARAM) of *data file* (CFNAM_DATA + CFTYP_DATA =
DIRECT/BINLLF/BINLLV/ASCLLV)

for

BLD, BLD_HEIGHT, WALL_O_HOR, Z0_TOWN

ALB_ROOF, EMIS_ROOF, HC_ROOF, TC_ROOF, D_ROOF ALB_ROAD,
EMIS_ROAD, HC_ROAD, TC_ROAD, D_ROAD

ALB_WALL, EMIS_WALL, HC_WALL, TC_WALL, D_WALL

H_TRAFFIC, LE_TRAFFIC, H_INDUSTRIES, LE_INDUSTRIES

URBTYPE : *links with ECOCLIMAP town covers, 13-21 refer to 251-261, 252-253-254
grouped together*

- **Possibility to combine ECOCLIMAP with only some of the TEB parameters prescribed**

Forcing for lakes (FLAKE)

- **NAM_DATA_FLAKE**

XUNIF_WATER_DEPTH : *uniform value for lake depth*

YWATER_DEPTH, YWATER_DEPTHFILETYPE : *data file for lake depth*

if YWATER_DEPTH = 'GlobalLakeDepth',

YWATER_DEPTH_STATUS='GlobalLakeStatus' is needed

- *XUNIF_PARAM or YPARAM + YPARAMFILETYPE for :*

WATER_FETCH : *lake fetch*

T_BS : *temperature at the outer edge of the thermally active layer of the bottom sediments (K)*

DEPTH_BS : *depth of the thermally active layer of the bottom sediments (m)*

EXTCOEF_WATER : *extinction coefficient for the water*

Useful link

- Surfex home page : <http://www.cnrm.meteo.fr/surfex/>
- *Scientific Documentation*
- *User's Guide*
- *User's Guide Browser*



Thank you for your attention !