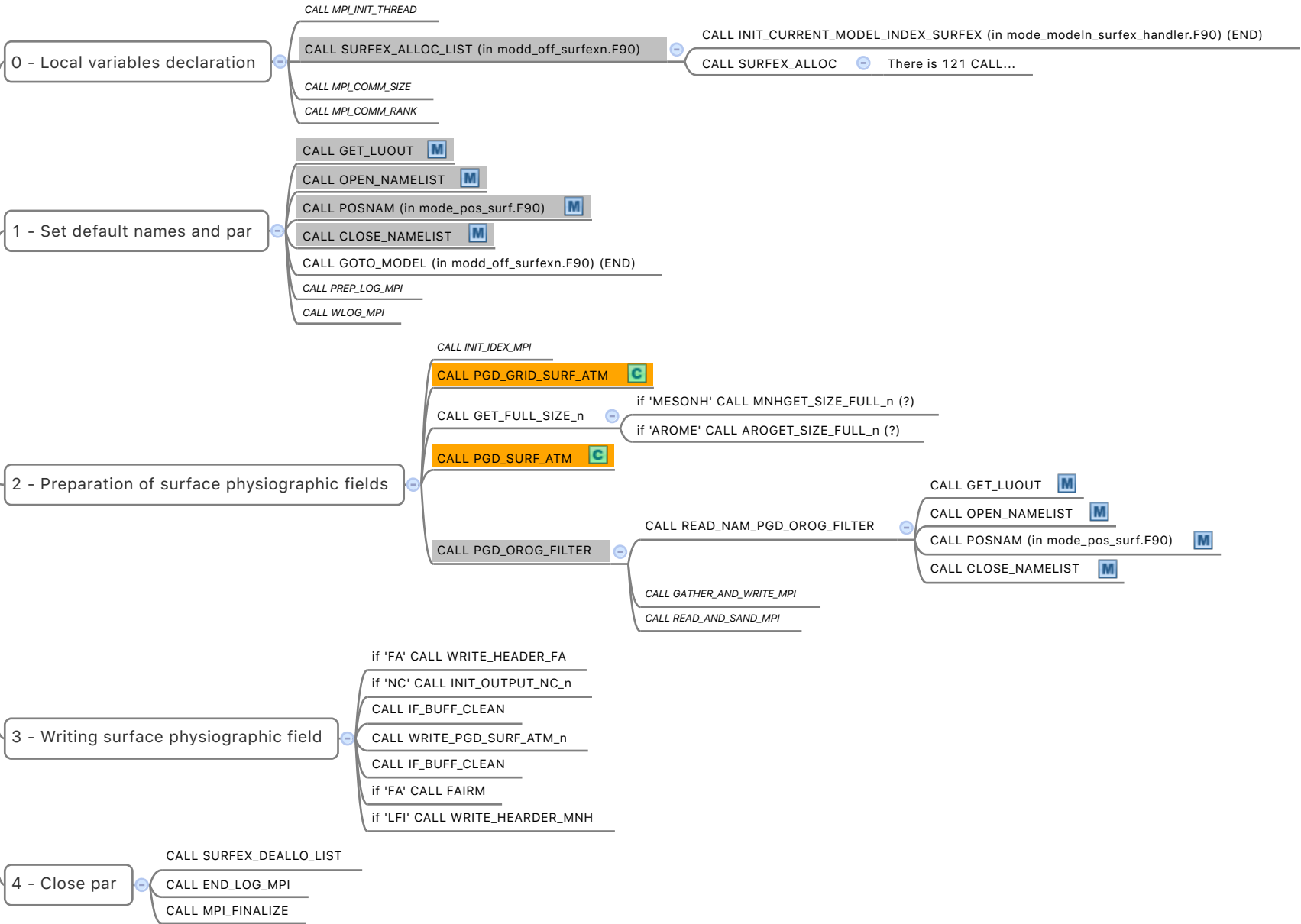


This program prepares the physiographic data fields

pgd.F90



pgd_grid_surf_atm.F90

1. Set default constant values

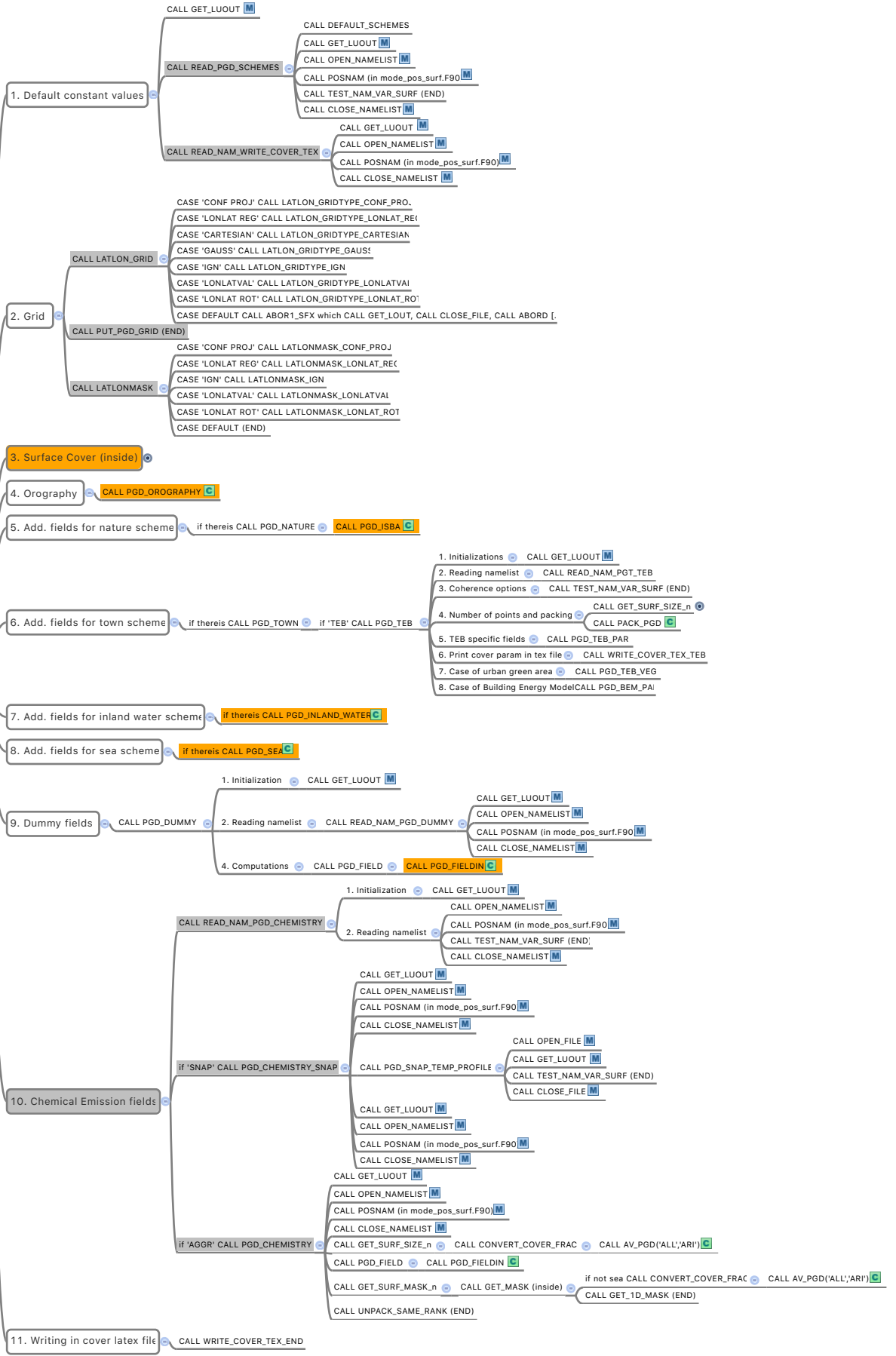
- CALL SURF_VERSION (END)
- 1. Fundamental constants
- 2. Astronomical constants
- 3. Terrestrial geoid constants
- 4. References pressure
- 5. Radiation constants
- 6. Thermodynamic constants
- 7. Turbulence constants CALL INI_CTURBS (END)
- 8. Ocean constants CALL INI_OCEAN_CSTS (END)
- 9. Surface constants CALL INI_SURF_CSTS
 - CALL GET_LUOUT
 - CALL OPEN_NAMELIST
 - CALL POSNAM (in mode_pos_surf.F90)
 - CALL TEST_NAM_VAR_SURF (END)
 - CALL CLOSE_NAMELIST

2. Initialisation of output grid

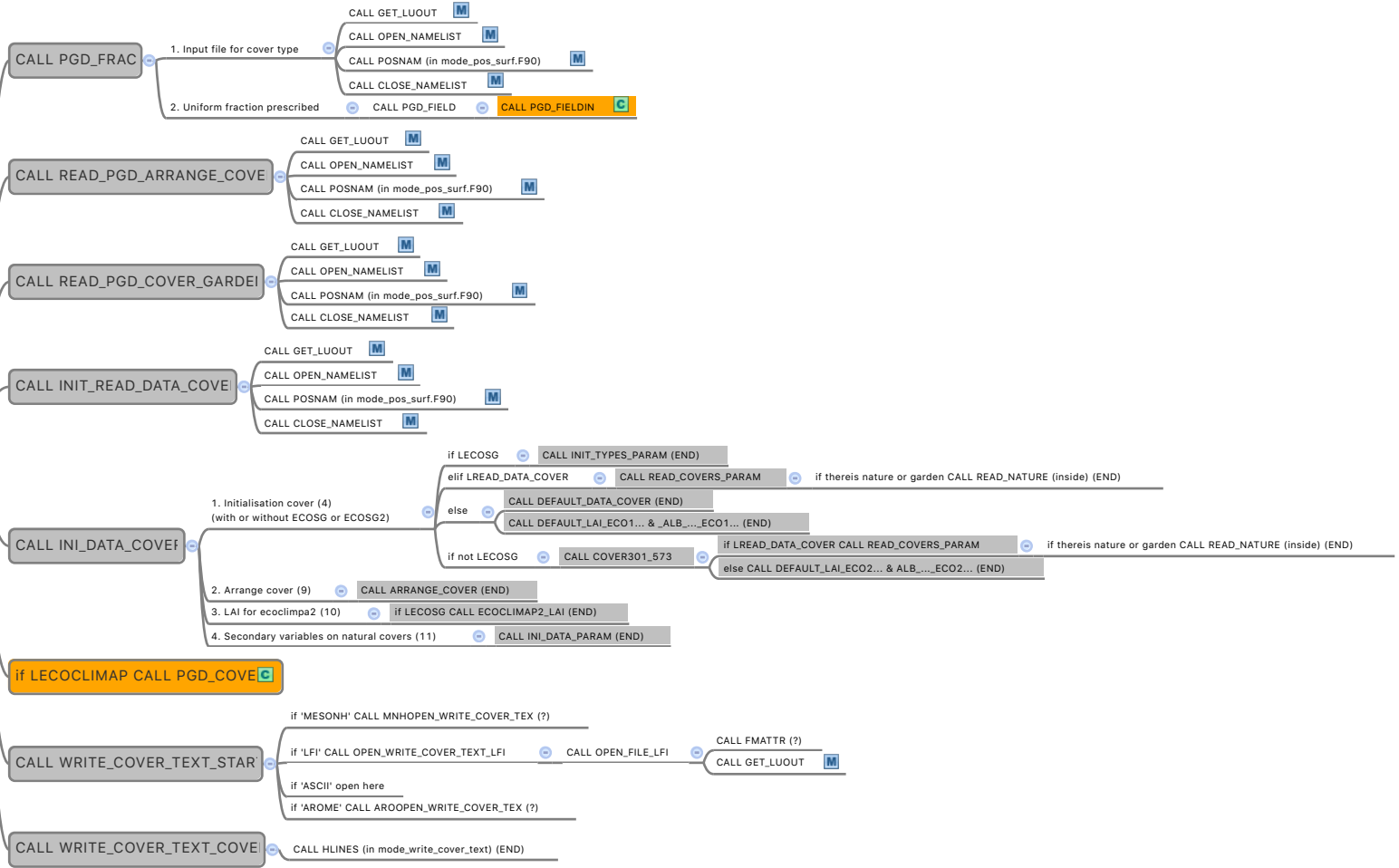
- 1. Default Value
 - CALL DEFAULT_GRID
 - if 'MESONH' CALL DEFAULT_GRID_MNH (?)
- 2. Grid in namelist and test
 - CALL GET_LUOUT
 - CALL OPEN_NAMELIST
 - CALL POSNAM (in mode_pos_surf.F90)
 - CALL CLOSE_NAMELIST
 - CALL TEST_NAM_VAR_SURF (END)
- 3. Initialize grid characteristic from other file
 - CALL GRID_FROM_FILE
 - CALL GET_LUOUT
 - CALL OPEN_AUX_IO_SURF
 - CALL READ_SURF
 - CALL GET_DIM_PHYS_II
 - CALL READ_GRIDTYPE
 - CALL CLOSE_AUX_IO_SURF
 - CALL OPEN_NAMELIST
 - CALL GRID_MODIF
 - CALL CLOSE_NAMELIST
 - CALL READ_NAM_GRIDTYPE
 - CALL OPEN_NAMELIST
 - CALL POSNAM (in mode_pos_surf.F90)
 - CALL CLOSE_NAMELIST
 - CALL PGD_GRID_IO_INIT
 - if 'MESONH' CALL PGD_GRID_TO_INIT_MNH (?)
 - CALL GET_SIZE_FULL_n
 - if 'MESONH' CALL MNHGET_SIZE_FULL_n (?)
 - if 'AROME' CALL AROGET_SIZE_FULL_n (?)
 - CALL ABOR1_SFX which CALL GET_LOUT, CALL CLOSE_FILE, CALL ABORD [...]
 - CALL ABOR1_SFX which CALL GET_LOUT, CALL CLOSE_FILE, CALL ABORD [...]
 - CALL READ_NAM_GRIDTYPE
 - 14 CALL following HGRID type...
 - CALL PGD_GRID_IO_INIT
 - if 'MESONH' CALL PGD_GRID_TO_INIT_MNH (?)
 - CALL GET_SIZE_FULL_n
 - if 'MESONH' CALL MNHGET_SIZE_FULL_n (?)
 - if 'AROME' CALL AROGET_SIZE_FULL_n (?)
- 4. Initialize grid characteristic from another other file
 - CALL SPLIT_GRID
 - CASE 'CONF PROJ' CALL SPLIT_GRID_CONF_PROJ
 - CALL GET_GRIDTYPE_CONF_PROJ
 - CALL SPLIT_GRID_PARAMETERNO
 - CALL SPLIT_GRID_PARAMETERX1
 - CALL PUT_GRIDTYPE_CONF_PROJ
 - CASE 'CARTESIAN' CALL SPLIT_GRID_CARTESIAN
 - CALL GET_GRIDTYPE_CARTESIAN
 - CALL SPLIT_GRID_PARAMETERNO
 - CALL SPLIT_GRID_PARAMETERX1
 - CALL PUT_GRIDTYPE_CARTESIAN
 - CASE DEFAULT CALL GET_SIZE_FULL_n
 - if 'MESONH' CALL MNHGET_SIZE_FULL_n (?)
 - if 'AROME' CALL AROGET_SIZE_FULL_n (?)
- 5. Latitude and longitude
 - CALL LATLON_GRID
 - CASE 'CONF PROJ' CALL LATLON_GRIDTYPE_CONF_PROJ
 - CASE 'LONLAT REG' CALL LATLON_GRIDTYPE_LONLAT_REG
 - CASE 'CARTESIAN' CALL LATLON_GRIDTYPE_CARTESIAN
 - CASE 'GAUSS' CALL LATLON_GRIDTYPE_GAUSS
 - CASE 'IGN' CALL LATLON_GRIDTYPE_IGN
 - CASE 'LONLATVAL' CALL LATLON_GRIDTYPE_LONLATVAL
 - CASE 'LONLAT ROT' CALL LATLON_GRIDTYPE_LONLAT_ROT
 - CASE DEFAULT CALL ABOR1_SFX which CALL GET_LOUT, CALL CLOSE_FILE, CALL ABORD [...]
- 6. Average grid length
 - CALL GET_MEAN_OF_COORD_SORT_II (?)
 - CALL GATHER_AND_WRITE_MPI
 - CALL MPL_BCAST

pgd_surf_atm.F90

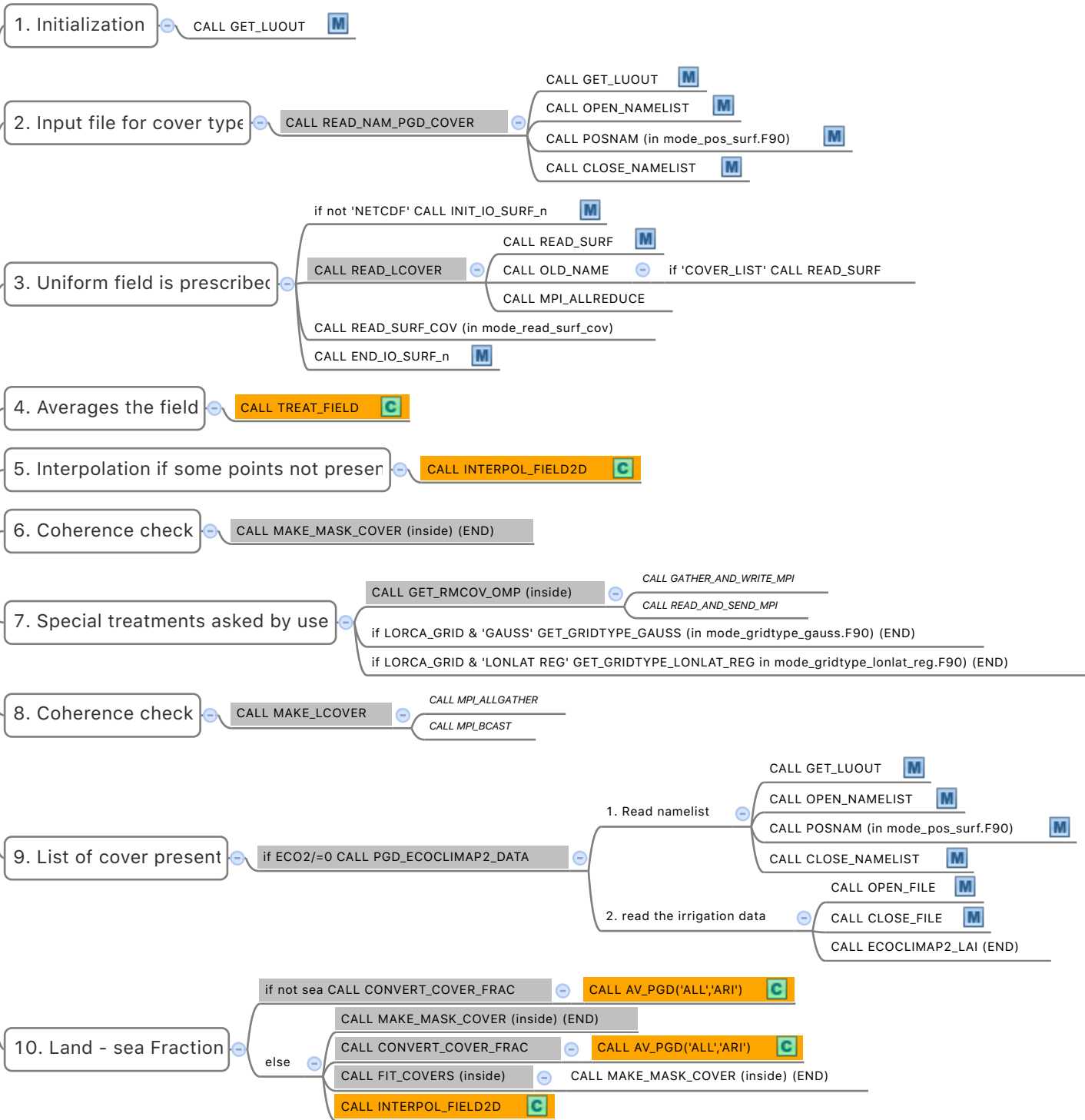
in SURFEX



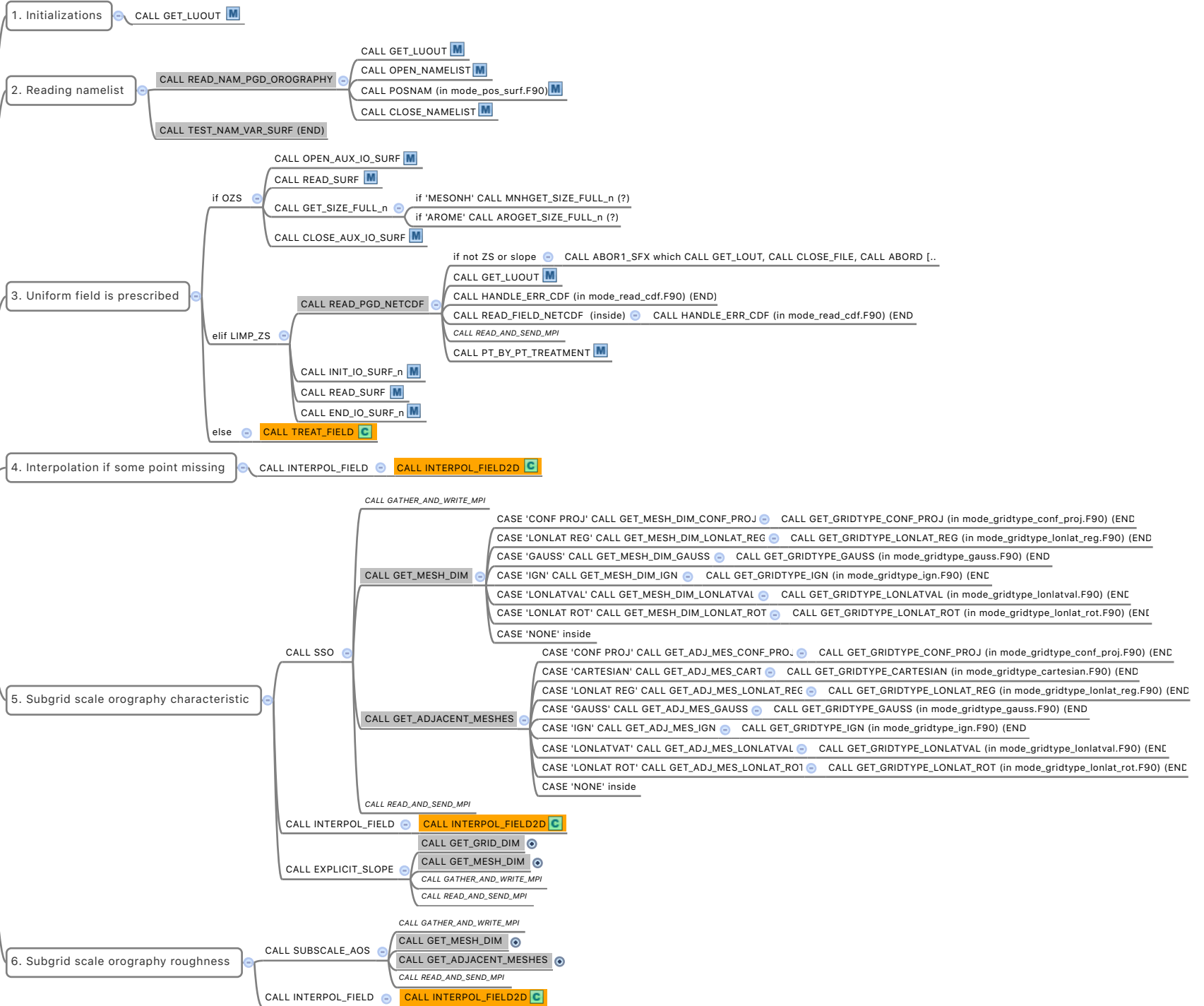
Surface Cover in pgd_surf_atm.F90



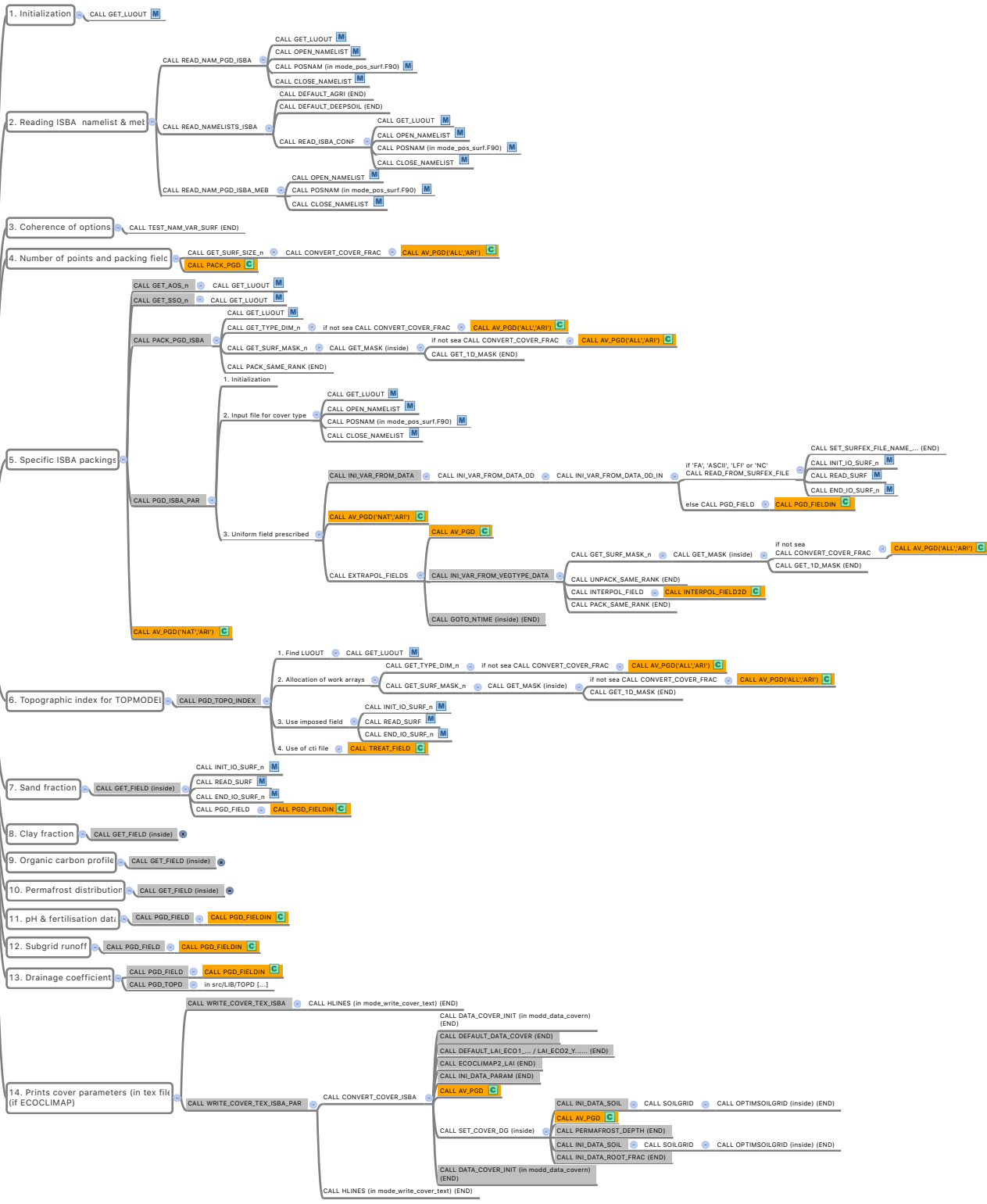
pgd_cover.F90



pgd_oroography.F90



pgd_isba.F90



pgd_inland_water.F90

if 'WATFLX' CALL PGD_WATFLUX

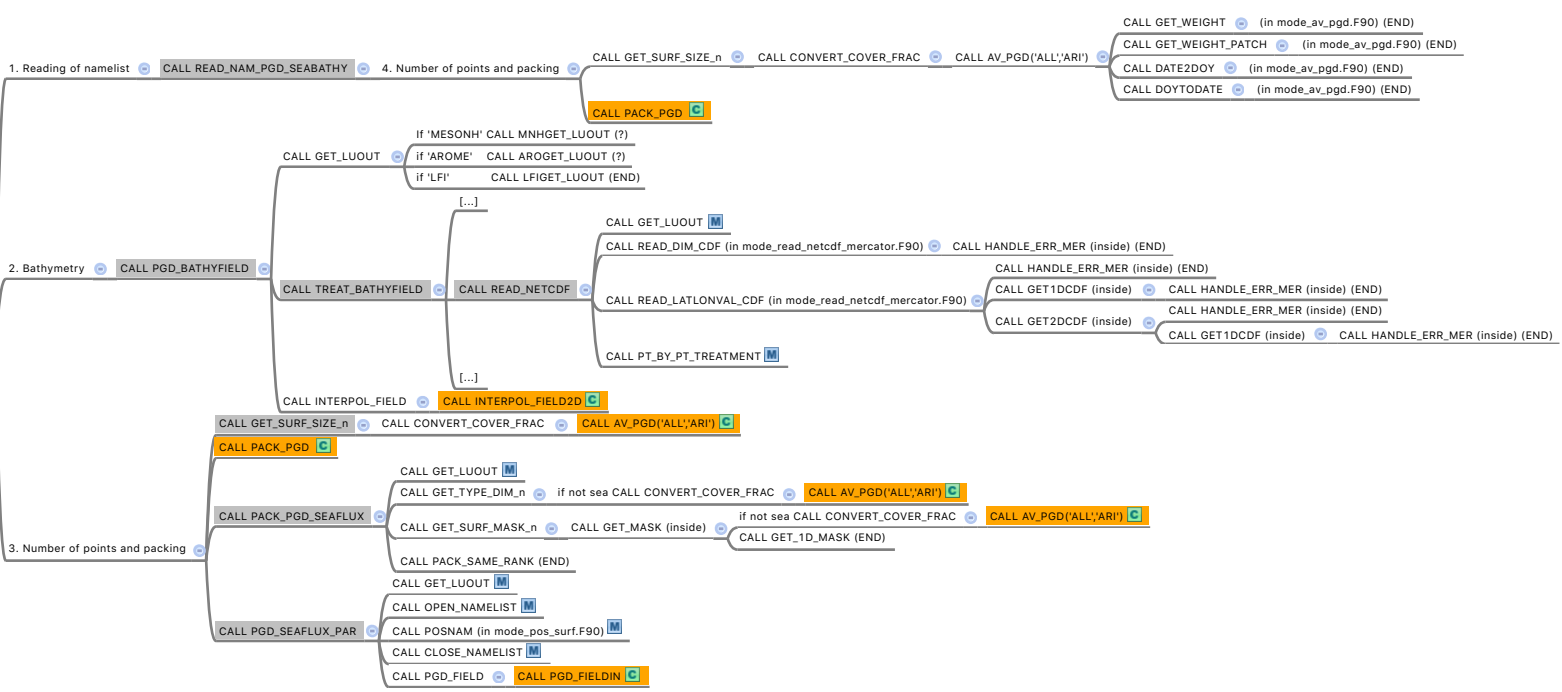
- CALL GET_SURF_SIZE_n
- CALL CONVERT_COVER_FRAC
- CALL AV_PGD('ALL','ARI')
- CALL PACK_PGD
- CALL WRITE_COVER_TEX_WATER
- CALL HLINEs (in mode_write_cover_text) (END)

if 'FLAKE CALL PGD_FLAKE

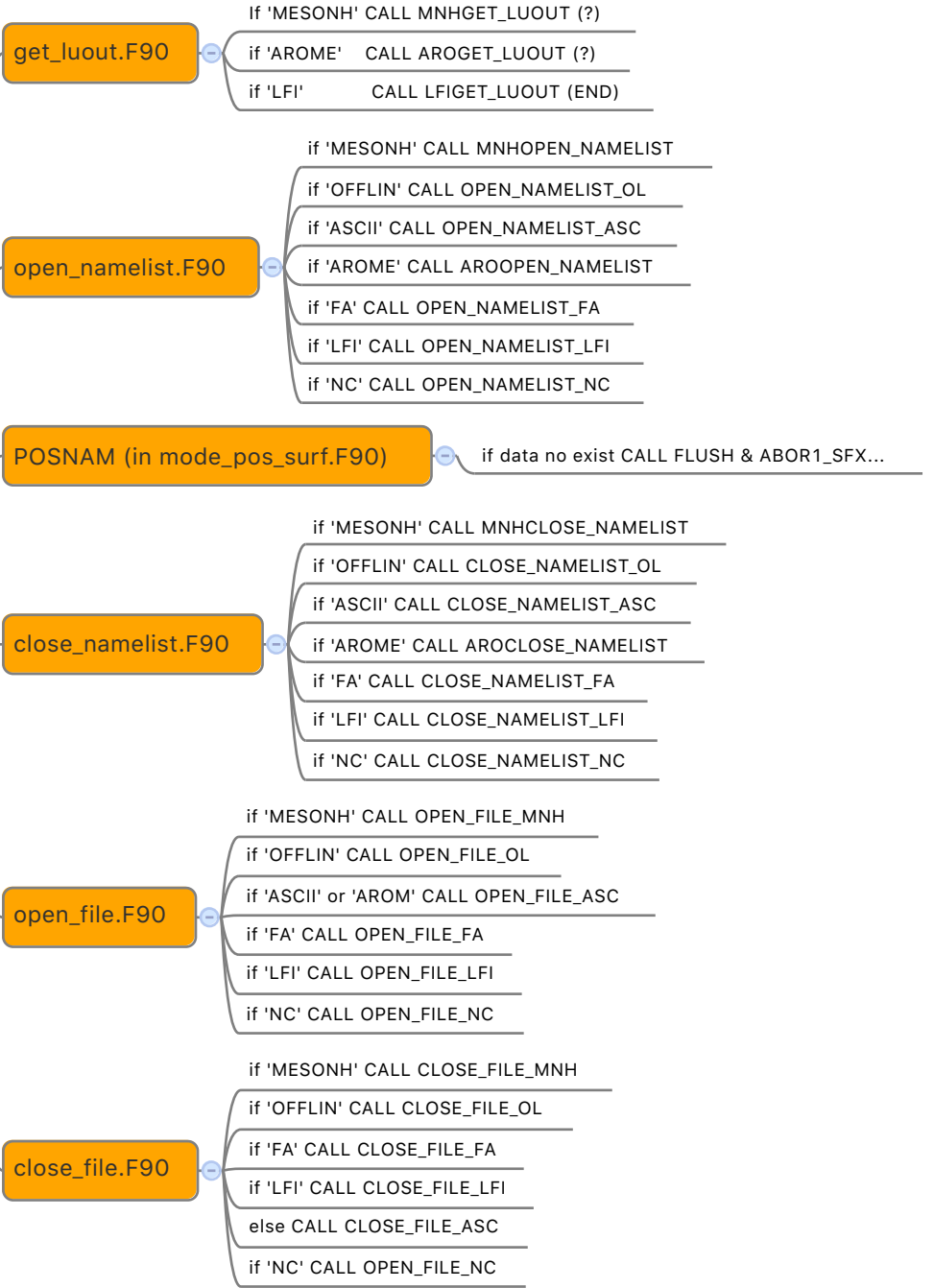
1. Initializations
 - CALL GET_LUOUT
2. Reading namelist
 - CALL OPEN_NAMELIST
 - CALL POSNAM (in mode_pos_surf.F90)
 - CALL CLOSE_NAMELIST
4. Number of points and packing
 - CALL GET_SURF_SIZE_n
 - CALL CONVERT_COVER_FRAC
 - CALL AV_PGD('ALL','ARI')
 - CALL PACK_PGD
5. Water depth
 - CALL TREAT_GLOBAL_LAKE_DEPTH
 - CALL GET_LUOUT
 - CALL TREAT_FIELD
 - CALL GET_TYPE_DIM_n
 - if not sea CALL CONVERT_COVER_FRAC
 - CALL AV_PGD('ALL','ARI')
 - CALL GET_SURF_MASK_n
 - CALL GET_MASK (inside)
 - if not sea CALL CONVERT_COVER_FRAC
 - CALL AV_PGD('ALL','ARI')
 - CALL GET_1D_MASK (END)
 - CALL PACK_SAME_RANK (END)
6. Wind fetch
 - CALL PGD_FIELD
 - CALL PGD_FIELDIN
7. Sediments bottom temperature
 - CALL PGD_FIELD
 - CALL PGD_FIELDIN
8. Depth of sediments layer
 - CALL PGD_FIELD
 - CALL PGD_FIELDIN
9. Water extinction coef
 - CALL PGD_FIELD
 - CALL PGD_FIELDIN
10. Print of flake param in tex file
 - CALL WRITE_COVER_TEX_WATER
 - CALL HLINEs (in mode_write_cover_text) (END)

pgd_sea.F90

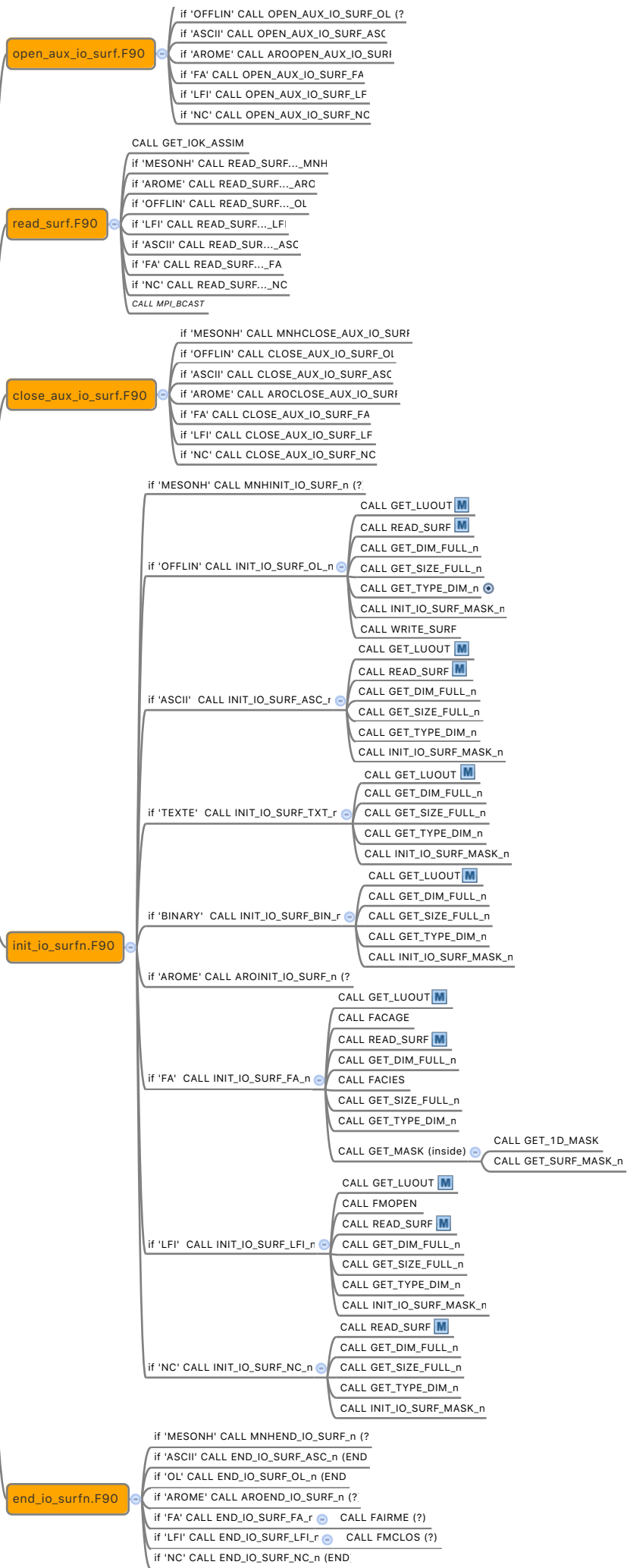
if 'SEAFLX' CALL PGD_SEAFLUX

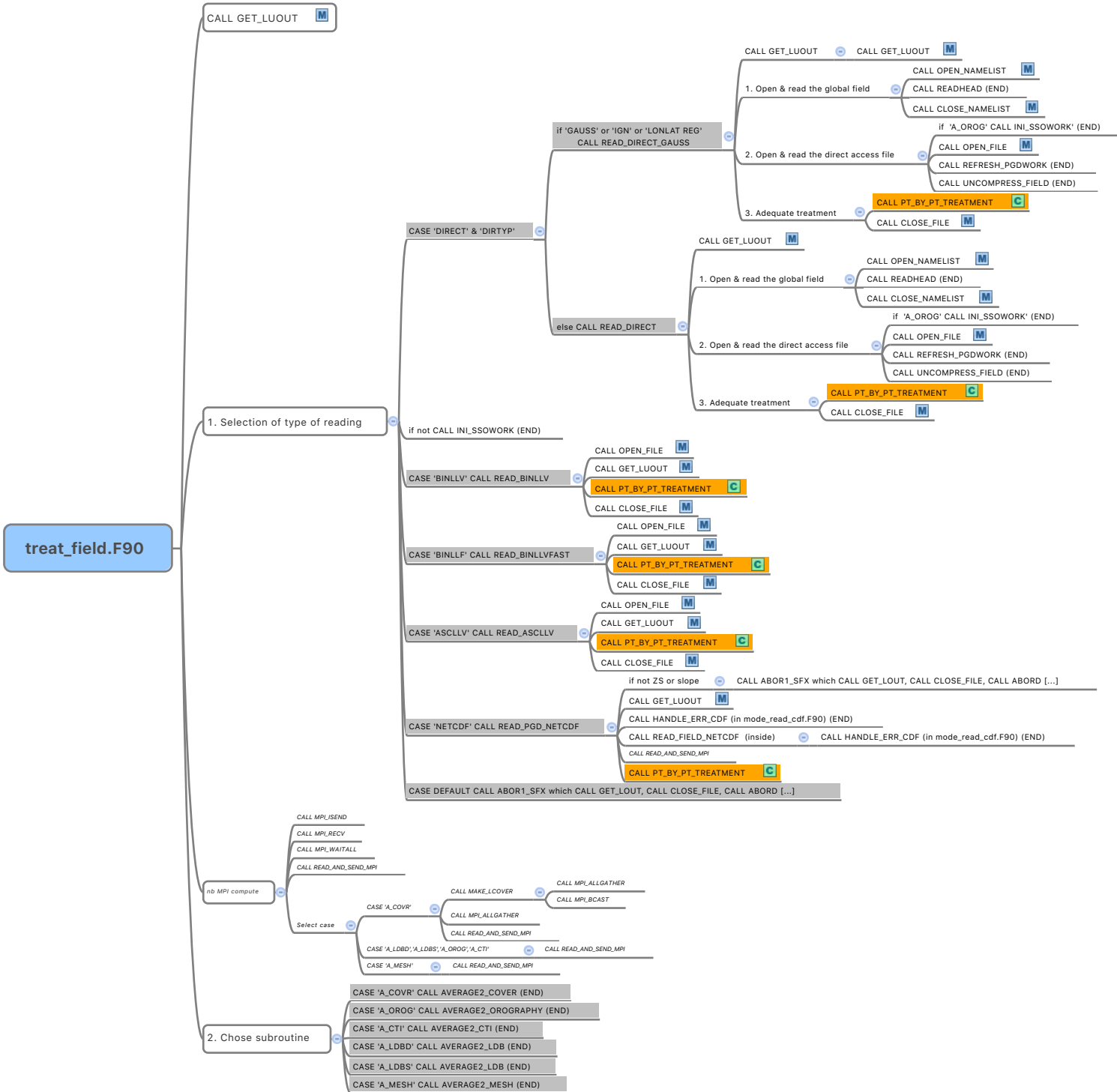


RoutinesPack#1



RoutinesPack#2





interpol_field2d.F90

CALL GET_GRID_COORD

```
CASE 'CONF PROJ' CALL GET_GRID_COORD_CONF_PROJ CALL GET_GRIDTYPE_CONF_PROJ (in mode_gridtype_conf_proj.F90) (END)
CASE 'LONLAT REG' CALL GET_GRID_COORD_LONLAT_REG CALL GET_GRIDTYPE_LONLAT_REG (in mode_gridtype_lonlat_reg.F90) (END)
CASE 'CARTESIAN' CALL GET_GRID_COORD_CARTESIAN CALL GET_GRIDTYPE_CARTESIAN (in mode_gridtype_cartesian.F90) (END)
CASE 'GAUSS' CALL GET_GRID_COORD_GAUSS CALL GET_GRIDTYPE_GAUSS (in mode_gridtype_gauss.F90) (END)
CASE 'IGN' CALL GET_GRID_COORD_IGN CALL GET_GRIDTYPE_IGN (in mode_gridtype_ign.F90) (END)
CASE 'LONLATVAL' CALL GET_GRID_COORD_LONLATVAL CALL GET_GRIDTYPE_LONLATVAL (in mode_gridtype_lonlatval.F90) (END)
CASE 'LONLAT ROT' CALL GET_GRID_COORD_LONLAT_ROT CALL GET_GRIDTYPE_LONLAT_ROT (in mode_gridtype_lonlat_rot.F90) (END)
CASE DEFAULT CALL ABOR1_SFX which CALL GET_LOUT, CALL CLOSE_FILE, CALL ABORD [...]
```

CALL GET_INTERP_HALC

```
if 'MESONH' CALL GET_INTERP_HALO_MNH (?)
else CALL GET_INTERP_HALO_OL (END)
```

CALL INTERPOL_NPTS

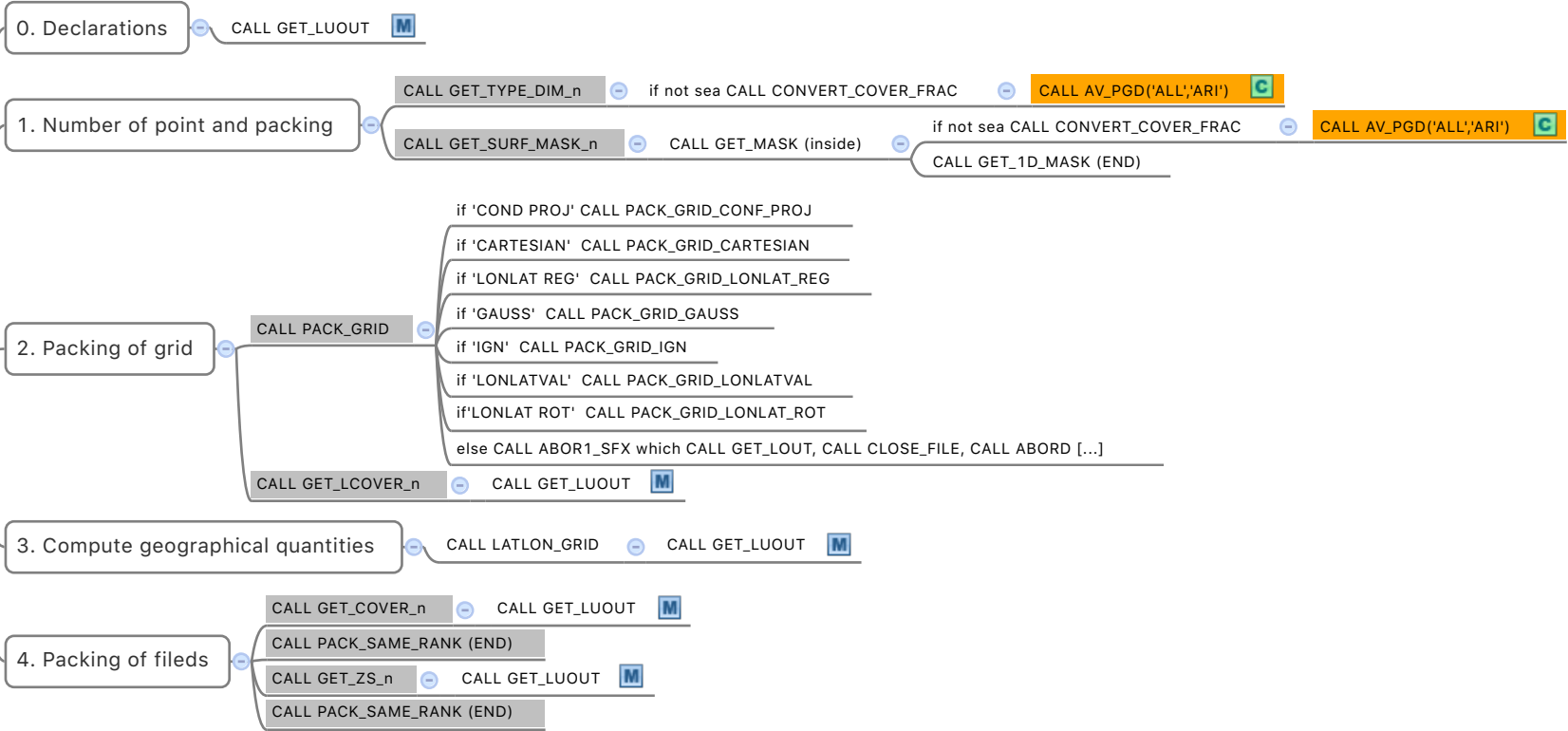
```
CALL GET_DIM_PHYS_II (?)
CALL GET_GLOBALDIMS_II (?)
CALL GATHER_XYFIELDS (?)
CALL GATHER_AND_WRITE_MPI
CALL MPL_BCAST
CALL READ_AND_SEND_MPI
```

CALL GET_NEAR_MESHES

```
CASE 'CONF PROJ' CALL GET_NEAR_MESHES_CONF_PROJ CALL GET_GRIDTYPE_CONF_PROJ (in mode_gridtype_conf_proj.F90) (END)
CASE 'CARTESIAN' CALL GET_NEAR_MESHES_CARTESIAN CALL GET_GRIDTYPE_CARTESIAN (in mode_gridtype_cartesian.F90) (END)
CASE 'LONLAT REG' CALL GET_NEAR_MESHES_LONLAT_REG CALL GET_GRIDTYPE_LONLAT_REG (in mode_gridtype_lonlat_reg.F90) (END)
CASE 'GAUSS' CALL GET_NEAR_MESHES_GAUSS CALL GET_GRIDTYPE_GAUSS (in mode_gridtype_gauss.F90) (END)
CASE 'IGN' CALL GET_NEAR_MESHES_IGN CALL GET_GRIDTYPE_IGN (in mode_gridtype_ign.F90) (END)
CALL QUICK_SORT (inside) CALL QUICK_SORT_1 (inside) CALL INTERCHANGE_SORT (inside (END)
CASE 'LONLATVAL' CALL GET_NEAR_MESHES_LONLATVAL CALL GET_GRIDTYPE_LONLATVAL (in mode_gridtype_lonlatval.F90) (END)
CASE 'LONLAT ROT' CALL GET_NEAR_MESHES_LONLAT_ROT CALL GET_GRIDTYPE_LONLAT_ROT (in mode_gridtype_lonlat_rot.F90) (END)
CASE 'NONE' = 0
```

```
CALL MPL_ALLGATHER
CALL MPL_GATHER
```

pack_pgd.F90



PT_BY_PT_TREATMENT

pt_by_pt treatment.F90

```
CASE 'A_COVR' CALL AVERAGE1_COVER CALL GET_MESH_INDEX M
CASE 'A_OROG' CALL AVERAGE1_OROGRAPHY CALL GET_MESH_INDEX M
CASE 'A_CTI' CALL AVERAGE1_CTI CALL GET_MESH_INDEX M
CASE 'A_LDBD' CALL AVERAGE1_LDB CALL GET_MESH_INDEX M
CASE 'A_LDBS' CALL AVERAGE1_LDB CALL GET_MESH_INDEX M
CASE 'A_MESH' CALL AVERAGE_MESH CALL GET_MESH_INDEX M
```

get_mesh_index.F90

```
CASE 'CONF PROJ' CALL GET_MESH_INDEX_CONF_PROJ CALL GET_GRIDTYPE_CONF_PROJ (in mode_gridtype_conf_proj.F90) (END)
CALL XY_CONF_PROJ (in mode_gridtype_conf_proj.F90) (END)
CASE 'LONLAT REG' CALL GET_MESH_INDEX_LONLAT_REG CALL GET_GRIDTYPE_LONLAT_REG (in mode_gridtype_lonlat_reg.F90) (END)
CALL GET_GRIDTYPE_GAUSS (in mode_gridtype_gauss.F90) (END)
CASE 'GAUSS' CALL GET_MESH_INDEX_GAUSS CALL GAUSS_GRID_LIMITS (in mode_gridtype_gauss.F90) CALL LATITUDES_GAUSS (inside) (END)
CALL XY_GAUSS (in mode_gridtype_gauss.F90) (END)
CASE 'IGN' CALL GET_MESH_INDEX_IGN CALL GET_GRIDTYPE_IGN (in mode_gridtype_ign.F90) (END)
CALL XY_IGN (in mode_gridtype_ign.F90) (END)
CASE 'LONLATVAL' CALL GET_MESH_INDEX_LONLATVAL CALL GET_GRIDTYPE_LONLATVAL (in mode_gridtype_lonlatval.F90) (END)
CASE 'LONLAT ROT' CALL GET_MESH_INDEX_LONLAT_ROT CALL GET_GRIDTYPE_LONLAT_ROT (in mode_gridtype_lonlat_rot.F90) (END)
CALL REGROT_LONLAT_ROT (END)
CASE DEFAULT CALL ABOR1_SFX which CALL GET_LOUT, CALL CLOSE_FILE, CALL ABORD [...]
```

pgd_fieldin.F90

1. Output listing logical unit

CALL GET_LUOUT **M**

2. Mask for the field

CALL GET_TYPE_DIM_n if not sea CALL CONVERT_COVER_FRAC CALL AV_PGD('ALL','ARI') **C**

CALL GET_SURF_MASK_n CALL GET_MASK (inside) if not sea CALL CONVERT_COVER_FRAC CALL AV_PGD('ALL','ARI') **C**
CALL GET_1D_MASK (END)

3. Averages the fields

CALL TREAT_FIELD ('SURF','A_MESH') **C**

4. Mask for the interpolations

CALL UNPACK_SAME_RANK (END)

5. Interpolation if some points not initialized

CALL INTERPOL_FIELD CALL INTERPOL_FIELD2D **C**

6. Use of prescribed field

CALL PACK_SAME_RANK (END)

