

CABLE-POP with CMIP6 Inputs

Running CABLE with CMIP6 Meteorological Forcing
with Land Use Change and Tree Demography

How

- Use the TRENDY configuration as a starting point.
- Change the meteorological inputs to be those from the CMIP6 historical runs.

Issues

The CABLE code is extremely prescriptive in its inputs.

- Input filenames are hardcoded.
- Data format and frequency is assumed.
- Configuration options are hidden in the source code.
- Each meteorological forcing has it's own set of routines for everything.

```

if (trim(CRU%MetVersion) == "VERIFY_2021") then
  select case(par)
  case(rain)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_Precipalign.nc"
  case(lwdn)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_LWdownnoalign.nc"
  case(swdn)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_SWdownalign.nc"
  case(pres)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_Psurfnoalign.nc"
  case(qair)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_Qairnoalign.nc"
  case(tmax, PrevTmax)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_Tmaxalign.nc"
  case(tmin, NextTmin)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_Tminalign.nc"
  case(uwind)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_Wind_Enoalign.nc"
  case(vwind)
    FN = trim(FN)//"/"//trim(cruver)//"_//cy//"_daily_Wind_Nnoalign.nc"
  end select
else
  select case(par)
  case(rain)
    fn = trim(fn)//"/pre/"//trim(cruver)//".5d.pre."//cy//".365d.noc.daytot.1deg.nc"
  case(lwdn)
    fn = trim(fn)//"/dlwrf/"//trim(cruver)//".5d.dlwrf."//cy//".365d.noc.daymean.1deg.nc"

```

```

! Assign Forcing and CO2 labels based only on the value of CRU%Run
select case(trim(CRU%Run))
case("S0_TRENDY")
  CRU%Forcing = "spinup"
  CRU%CO2     = "static1860"
  CRU%Ndep    = "static1860"
  write(*,'(a)') "Run = 'spinup': Therefore Forcing = 'spinup', CO2 = 'static1860'"
  write(logn,*)  "Run = 'spinup': Therefore Forcing = 'spinup', CO2 = 'static1860'"
case("S0_TRENDY_CO2")
-- 5 lines: CRU%Forcing = "spinup".....
case("S0_TRENDY_Ndep")
-- 5 lines: CRU%Forcing = "spinup".....
case("S0_TRENDY_Precip")
-- 5 lines: CRU%Forcing = "spinup".....
case("S0_TRENDY_Temp")
-- 5 lines: CRU%Forcing = "spinup".....
case("S0_TRENDY_Temp_Precip")
-- 5 lines: CRU%Forcing = "spinup".....
case("S0_TRENDY_CO2_Temp")
-- 5 lines: CRU%Forcing = "spinup".....
case("S0_TRENDY_CO2_Precip")
-- 5 lines: CRU%Forcing = "spinup".....
case("S0_TRENDY_CO2_Temp_Precip")
-- 5 lines: CRU%Forcing = "spinup".....
case("S1_TRENDY")
-- 5 lines: CRU%Forcing = "spinup".....
case("S2_TRENDY")
-- 5 lines: CRU%Forcing = "1901_2015".....

```

Improvements (for now)

- Generalise the input routines.
- Move configuration options to the namelists.

File Naming Conventions

Set a template that all input data file names must adhere to, for different dataset types.

Spatial datasets, temporal datasets and spatio-temporal datasets have individual templates so we can read them appropriately.

Choosing these templates is an iterative process, that we will ask for feedback on.

Example: Spatio-Temporal Dataset

The files for a variable should follow a consistent convention.

Taking rain data from CMIP6 as a demo, files are:

- 1) pr_day_ACCESS-ESM1-5_historical_r1i1p1f1_gn_18500101-18991231.nc
- 2) pr_day_ACCESS-ESM1-5_historical_r1i1p1f1_gn_19000101-19491231.nc
- 3) pr_day_ACCESS-ESM1-5_historical_r1i1p1f1_gn_19500101-19991231.nc
- 4) pr_day_ACCESS-ESM1-5_historical_r1i1p1f1_gn_20000101-20141231.nc

The entry in the namelist would be:

- rainFile = pr_day_ACCESS-ESM1-5_historical_r1i1p1f1_gn_<startdate>-<enddate>.nc