

# Decadal Prediction Large Ensemble

Example :: 1954-11-01 → 1955-12-31

**Details:** The following namelist changes will reproduce the **second member** of the **first start year** from the Decadal Prediction ensemble. Note that small differences between your simulation and the NCAR DPLE ensemble members will be due to machine and compiler changes, or from perturbations to the initialization files. (Ensemble members within a start year were created using pertlim in user\_nl\_cam: e.g., pertlim = 2.d-14 for ensemble member 2).

1. CESM tag: **cesm1\_1\_2\_LENS\_nXX**
2. CESM compset: **B20TRLENS**
3. `./create_newcase -case $CASEROOT -mach $MACH -compset B20TRLENS -res f09_g16`
4. `cd $CASEROOT`
5. `./cesm_setup`
6. Edit env\_run.xml using xmlchange
7. Note that each startyear begins from the previous November 1, and runs for 122 months (2 months + 10 full years). E.g., **1955** begins on **November 1, 1954**

```
./xmlchange -file env_run.xml -id RUN_STARTDATE -val 1954-11-01 ← Note NOV 1 start date
./xmlchange -file env_run.xml -id RUN_REFCASE -val b.e11.BDP_IC.f09_g16.1954-11.01
./xmlchange -file env_run.xml -id RUN_REFDATE -val 1954-11-01 ← Note NOV 1 start date
```

## 8. Edit user\_nl\_cam ::

⇒ EDIT: add full path to inputdata (PATH = /glade/p/cesm/cseg/inputdata)

Note: Comment out

```
pertlim = 2.d-14 ← Remove this line for first ensemble member:
inithist='MONTHLY'
cldfrc_rhmin1 = 0.8925D0
nhtfrq=0,-24,-6
mfilt=1,365,1460
empty_htapes=.true.
fincl1='ABSORB:A','ANRAIN:A','ANSNOW:A','AODDUST1:A','AODDUST2:A','AODDUST3:A',
'AODVIS:A','AQRAIN:A','AQSNOW:A','AREI:A','AREL:A','AWNC:A','AWNI:A','CDNUMC:A',
'CLDHGH:A','CLDICE:A','CLDLIQ:A','CLDLLOW:A','CLDMED:A','CLDTOT:A','CLOUD:A',
'DCQ:A','DTCOND:A','DTV:A','FICE:A','FLDS:A','FLNS:A','FLNSC:A','FLNT:A',
'FLNTC:A','FLUT:A','FLUTC:A','FREQI:A','FREQL:A','FREQR:A','FREQS:A','FSDS:A',
'FSDSC:A','FSNS:A','FSNSC:A','FSNT:A','FSNTC:A','FSNTOA:A','FSNTOAC:A',
'ICEFRAC:A','ICIMR:A','ICWMR:A','IWC:A','LANDFRAC:A','LHFLX:A','LWCF:A',
'NUMICE:A','NUMLIQ:A','OCNFRAC:A','OMEGA:A','OMEGAT:A','PBLH:A','PRECC:A',
'PRECL:A','PRE CSC:A','PRECSL:A','PS:A','PSL:A','Q:A','QFLX:A','QRL:A','QRS:A',
```

'RELHUM:A', 'SHFLX:A', 'SNOWHICE:A', 'SNOWHLND:A', 'SOLIN:A', 'SRFRAD:A', 'SWCF:A',  
'T:A', 'TAUX:A', 'TAUY:A', 'TGCLDIWP:A', 'TGCLDLWP:A', 'TMQ:A', 'TREFHT:A', 'TS:A',  
'U:A', 'U10:A', 'UU:A', 'V:A', 'VD01:A', 'VQ:A', 'VT:A', 'VU:A', 'VV:A', 'WSUB:A', 'Z3:A',  
'CCN3:A', 'UQ:A', 'WGUSTD:X', 'WSPDSRFMX:A', 'TSMX:X', 'TSMN:M', 'TREFHTMX:X', 'TREFHTMN:M',  
'bc\_a1\_SRF:A', 'dst\_a1\_SRF:A', 'dst\_a3\_SRF:A', 'pom\_a1\_SRF:A', 'so4\_a1\_SRF:A',  
'so4\_a2\_SRF:A', 'so4\_a3\_SRF:A', 'soa\_a1\_SRF:A', 'soa\_a2\_SRF:A', 'BURDENSO4:A',  
'BURDENBC:A', 'BURDENPOM:A', 'BURDENSOA:A', 'BURDENDUST:A', 'BURDENSEASALT:A',  
'AODABS:A', 'EXTINCT:A', 'PHIS:A', 'TROP\_P:A', 'TROP\_T:A', 'TOT\_CLD\_VISTAU:A',  
'ICLDIWP:A', 'ICLDTWP:A', 'CO2:A', 'CO2\_LND:A', 'CO2\_OCN:A', 'SFCO2:A', 'SFCO2\_LND:A',  
'SFCO2\_OCN:A', 'TMC02:A', 'TMC02\_LND:A', 'TMC02\_OCN:A', 'CO2\_FFF:A', 'SFCO2\_FFF:A', 'TMC02\_FFF:A'

finc12='PSL:A', 'TS:A', 'TREFHT:A', 'TREFHTMN:M', 'TREFHTMX:X', 'PRECT:A', 'PRECL:A',  
'PRECSL:A', 'PRESCS:A', 'PRECTMX:A', 'TMQ:A', 'Z500:A', 'T500:A', 'Q500:A', 'U500:A',  
'V500:A', 'WSPDSRFV:A', 'U200:A', 'V200:A', 'T200:A', 'Q200:A', 'U850:A', 'V850:A',  
'T850:A', 'Q850:A', 'UBOT:A', 'VBOT:A', 'QBOT:A', 'Z050:A', 'T010:A', 'U010:A',  
'FSNTOA:A', 'FLUT:A', 'LHFLX:A', 'SHFLX:A', 'FSNS:A', 'FLNS:A', 'FSNSC:A', 'FLNSC:A',  
'TAUX:A', 'TAUY:A', 'ICEFRAC:A', 'bc\_a1\_SRF:X', 'dst\_a1\_SRF:X', 'dst\_a3\_SRF:X', 'pom\_a1\_SRF:X',  
'so4\_a1\_SRF:X', 'so4\_a2\_SRF:X', 'so4\_a3\_SRF:X', 'soa\_a1\_SRF:X', 'soa\_a2\_SRF:X'

finc13='PSL:I', 'T400:I', 'U850:I', 'UBOT:I', 'V850:I', 'VBOT:I', 'Z300:I', 'Z500:I'

```
ext_frc_specifier = 'S02 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_so2_elev_19500115-20401215_c150715.nc',
'bc_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_bc_elev_19500115-20401215_c150715.nc',
'num_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_num_a1_elev_19500115-20401215_c150715.nc'
,
'num_a2 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_num_a2_elev_19500115-20401215_c150715.nc'
,
'pom_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_oc_elev_19500115-20401215_c150715.nc',
'so4_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_so4_a1_elev_19500115-20401215_c150715.nc'
,
'so4_a2 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_so4_a2_elev_19500115-20401215_c150715.nc'
ext_frc_type = 'INTERP_MISSING_MONTHS'
srf_emis_specifier = 'DMS ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/aerocom_mam3_dms_surf_1849-2300_c120214.nc',
'S02 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_so2_surf_19500115-20401215_c150715.nc',
'SOAG ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_soag_1.5_surf_19500115-20401215_c150715.nc',
'bc_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_bc_surf_19500115-20401215_c150715.nc',
'num_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_num_a1_surf_19500115-20401215_c150715.nc'
,
'num_a2 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_num_a2_surf_19500115-20401215_c150715.nc'
,
'pom_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_oc_surf_19500115-20401215_c150715.nc',
```

```

'so4_a1 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_so4_a1_surf_19500115-20401215_c150715.nc'
,
'so4_a2 ->
/inputdata/atm/cam/chem/trop_mozart_aero/emis/RCP85_mam3_so4_a2_surf_19500115-20401215_c150715.nc'
srf_emis_type = 'INTERP_MISSING_MONTHS'
tracer_cnst_datapath = '/inputdata/atm/cam/chem/trop_mozart_aero/oxid'
tracer_cnst_file = 'oxid_rcp85_v1_1.9x2.5_L26_19450115-20351215_c150715.nc'

bndtvghg = '/inputdata/atm/cam/ggas/ghg_rcp85_1765-2500_c100203.nc'
co2flux_fuel_file =
'/inputdata/atm/cam/ggas/co2flux_fossil_RCP85_monthly_0.9x1.25_19500115-20351215_c150715.nc'
prescribed_volcaero_datapath = '/inputdata/atm/cam/volc'
prescribed_volcaero_file = 'CCSM4_volcanic_1950115-20300115_prototype1_c150715.nc'
solar_data_file =
'/inputdata/atm/cam/solar/spectral_irradiance_Lean_1610-2140_ann_c100408.nc'
prescribed_ozone_datapath = '/inputdata/atm/cam/ozone'
prescribed_ozone_file = 'ozone_rcp85_v1_1.9x2.5_L66_19500115-20351215_c150915.nc'

```

## 9. Edit user\_nl\_clm ::

⇒ EDIT: add full path to inputdata (PATH = /glade/p/cesm/cseg/inputdata)

```

fpftdyn =
'/inputdata/lnd/clm2/surfddata/surfddata.pftdyn_0.9x1.25_rcp8.5_simyr1850-2100_c130702.nc'
stream_fldfilename_ndep =
'/inputdata/lnd/clm2/ndepdata/fndep_clm_rcp8.5_simyr1849-2106_1.9x2.5_c100428.nc'
stream_year_last_ndep = 2100

```

## 10. Edit user\_nl\_pop2 ::

⇒ EDIT: add full path to inputdata (PATH = /glade/p/cesm/cseg/inputdata)

```

pcfc_file = '/inputdata/ocn/pop/res_indpt/forcing/pcfc1112_1931-2100_atm_sio1993_c150717.nc'
ndep_data_type = 'shr_stream'
ndep_shr_stream_file =
'/inputdata/ocn/pop/gx1v6/forcing/ndep_ocn_1850-2100_rcp85_gx1v6_c150818.nc'
ndep_shr_stream_scale_factor = 7.1429e+06
ndep_shr_stream_year_align = 1849
ndep_shr_stream_year_first = 1849
ndep_shr_stream_year_last = 2101

```

## 11. Edit user\_nl\_rtm

```

rtmhist_nhtfrq=0,-24
rtmhist_mfilt=1,365
rtmhist_finc12='QCHANR:A','VOLR:A'

```

## 12. Compile and run model as usual

