

## The NEMO model

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A few specificities of the forced NEMO configurations associated with their use with libGCM are detailed in this section.

Further information on these configurations (description, setup, documentation) is available on the official NEMO website: <http://www.nemo-ocean.eu>

To access this information you must create an account in the NEMO users' base and login with it to have detailed information about NEMO.

## 1. opa9.card

### 1.1. Model version

The choice of forcings used for the simulations depends on the model version. The available forcings correspond to NEMO versions for now is v3.6\_stable

- OPA\_version=v3.6\_stable is the version where to find all the data needed to perform de csimulatin
- mesh\_mask=n to output the grid ( named mesh\_mask.nc)
- [OutputLevel?=10](#) ( the level of the output you : 10 == full ; 1 == less )

}}}

### 1.2. Simulations

Two kinds of simulations with forced NEMO can be performed:

- a climatological simulation
- an interannual simulation

### 1.3. Atmospheric forcings

For forced ocean simulations, you need the atmospheric forcings for the :

- wind stress - zonal and meridional
- air temperature
- solar and non solar fluxes (shortwave and longwave)
- relative humidity
- precipitations (solid: snow and liquid: rain)

To specify in the **Interannual** section

```
forcing=core
R_FORCING=${R_IN}/OCE/NEMO/forcings/COREII
ListForcing=(u_10_CORE2_fill v_10_CORE2_fill t_10_CORE2_fill q_10_CORE2_fill ncar_rad_CORE2_fill ncar_precip_CORE2_fill)
YearForcingInit=1948
YearForcingEnd=2009
```

### 1.4. Initial states and boundary conditions

The initial states and the boundary conditions are listed in the **Boundary Files** section

All those files are described on the official NEMO website: [http://www.nemo-ocean.eu/Using-NEMO/Configurations/ORCA2\\_LIM](http://www.nemo-ocean.eu/Using-NEMO/Configurations/ORCA2_LIM), section

#### Configuration Inputs

```
ListNonDel= (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/ahmcoef.nc, .), \
            (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/bathy_meter.nc, .), \
            (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/coordinates.nc, .), \
            (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/coordinates_xios.nc, .), \
            (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/maskMFO_opa.nc, .), \
            (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/conservative_temperature_WOA13.nc, .), \
            (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/absolute_salinity_WOA13_decav.nc, .), \
            (${R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/sali_ref_clim_monthly.nc, .), \
```

```

({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/sss_absolute_PHC2_salx_2004_08_
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Goutorbe_ghflux.nc, .),\
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/subbasins_v10.nc
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/merged_ESACCI_BIOMER4V1R1_CHL_R
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/mixing_power_bot.nc, .),\
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/mixing_power_pyc.nc, .),\
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/mixing_power_cri.nc, .),\
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/decay_scale_bot.nc, .),\
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/decay_scale_cri.nc, .),\
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/weights_WOA13d1_2_eorcal_biline
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/weights_3D_WOA13d1_2_eorcal_bil
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/weights_reg05_2_eorcal_bilinear
({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/weights_Goutorbel_2_eorcal_bili

```

## 2. pisces.card

### 2.1. Initial states and boundary conditions

- The initial states of a few passive tracers come from monthly (NO<sub>3</sub>, PO<sub>4</sub>, O<sub>2</sub>, Si) and annual (DIC, Alkalinity) climatologies or from simulation outputs (Iron, DOC). The other PISCES tracers are initialized by constant values in the model.
- the files containing the external nutrient uptake are also listed below:
  - DUST\_INCA\_LOI6012-histAER\_1M\_\${year}.nc : interannual file of the nutrient uptake by dust derived from the INCA model
  - pmarge\_etopo\_eORCA\_R1.nc : annual climatology of iron uptake by sediments
  - river\_global\_news\_eORCA\_R1.nc : annual climatology of nutrient uptake by rivers
  - Ndep\_input4MIPs\_surfaceFluxes\_CMIP\_NCAR-CCMI-2-0\_gn\_\${year}01-\${year}12-clim.nc : interannual files of nitrogen deposit derived for the input4MIPs database
  - Solubility\_T62\_Mahowald\_eORCA\_R1.nc : solubility of iron

```
[BoundaryFiles]
```

```
List=      ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Dust_inca_LOI/DUST_INCA_LOI601
          ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Ndep_input4MIPs/Ndep_input4MIPs
```

```
ListNonDel= ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/TDIC_GLODAPv2.1_annual_r360x18
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/TALK_GLODAPv2.1_annual_r360x180
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/O2_WOA2009_monthly_r360x180x175
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/PO4_WOA2009_monthly_r360x180x17
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Si_WOA2009_monthly_r360x180x175
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/DOC_PISCES_monthly_r360x180x175
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Fer_PISCES_monthly_r360x180x175
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/NO3_WOA2009_monthly_r360x180x17
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/weights_3D_r360x180_eorcal_bili
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Dust_inca_LOI/weights_LMD144142
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/pmarge_etopo_eORCA_R1.nc
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/river_global_news_eORCA_R1.nc
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Ndep_input4MIPs/weights_CMIP_NC
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/par_fraction_gewex_clim90s00s_e
            ({R_IN}/OCE/NEMO/${config_UserChoices_TagName}/${opa9_UserChoices_OPA_version}/Solubility_T62_Mahowald_eORCA_R

```