The NEMO configurations

Table of Content

The NEMO configurations **1**
NEMO configurations **2**
1. Retrieving NEMO and the reference configurations **2**
1.1. Setting up NEMO with the modipsl environment 3
1.1.1. Retrieval 3
1.1.2. Compiling and installing 3
2. Creating the job **4**
3. Running the model **4**
3.1. Input files: atmospheric forcings, initial states, namelists 4
3.2. The run 4
3.3. Performance 5

Person in charge: Christian Ethé

NEMO configurations

The forced NEMO is available in its reference version with different configurations, two of which are used and updated jointly with the IPSL tools:

- ORCA2_LIM : a coupled ocean-sea ice configuration based on the ORCA (2° resolution) tripolar grid;
- ORCA2_LIM_PISCES : the ORCA2_LIM configuration described below and coupled with the marine biogeochemistry model PISCES.

To find out more about the model description and the reference configurations, go here: ■http://www.nemo-ocean.eu/About-NEMO

1. Retrieving NEMO and the reference configurations

Two NEMO model versions are available with modipsl:

- the model version used to perform CMIP5: ■http://forge.ipsl.jussieu.fr/nemo/browser/branches/CMIP5_IPSL
- the latest version which can be compiled with FCM - starting from v3.3: ■http://forge.ipsl.jussieu.fr/nemo/browser/branches/2012/dev_v3_4_STABLE_2012

```
#---- NEMO in forced mode : CMIP5_IPSL branches

#-H- NEMO  NEMO in forced mode : version until v3.2
#-H- NEMO  OPA
#-H- NEMO  LIM
#-H- NEMO  TOP
#-H- NEMO  IOIPSL/src - svn - tag v2_2_1
#-H- NEMO  NEMO sources and configurations - svn - branch CMIP5_IPSL
#-H- NEMO  XMLF90 svn trunk revision 193
#-H- NEMO  XMLIO_SERVER svn trunk revision 193
#-H- NEMO  libIGCM tag libIGCM_v2.0_rc2
#-M- NEMO  nemo_st@locean-ipsl.upmc.fr
#-C- NEMO  IOIPSL/tags/v2_2_1/src                              HEAD  8  IOIPSL/src             modeles
#-C- NEMO  XMLF90                                               193  12 XMLF90                modeles
#-C- NEMO  XMLIO_SERVER/trunk                                   193  12 XMLIO_SERVER          modeles
#-C- NEMO  branches/CMIP5_IPSL/EXTERNAL/XMLF90                 HEAD  7  XMLF90/external       modeles
#-C- NEMO  branches/CMIP5_IPSL/EXTERNAL/XMLIO_SERVER           HEAD  7  XMLIO_SERVER/external  modeles
#-C- NEMO  tags/libIGCM_v2.0_rc2                              HEAD  10 libIGCM                .
#-C- NEMO  branches/CMIP5_IPSL/AGRIF                           HEAD  7  .                      modeles
#-C- NEMO  branches/CMIP5_IPSL/NEMO                            HEAD  7  .                      modeles
#-C- NEMO  branches/CMIP5_IPSL/UTIL                            HEAD  7  .                      modeles
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/GYRE                     HEAD  7  GYRE                   config
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/GYRE_LOBSTER             HEAD  7  GYRE_LOBSTER           config
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/ORCA2_LIM                HEAD  7  ORCA2_LIM              config
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/ORCA2_LIM_PISCES         HEAD  7  ORCA2_LIM_PISCES       config
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/ORCA2_OFF_PISCES         HEAD  7  ORCA2_OFF_PISCES       config
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/POMME                    HEAD  7  POMME                  config
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/ORCA2_LIM/EXP00          HEAD  7  PARAM                  config/ORCA2_LIM/IGCM00
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/ORCA2_LIM_PISCES/EXP00  HEAD  7  PARAM                  config/ORCA2_LIM_PISCES/IGCM
#-C- NEMO  branches/CMIP5_IPSL/CONFIG/ORCA2_OFF_PISCES/EXP00  HEAD  7  PARAM                  config/ORCA2_OFF_PISCES/IGCM


#---- NEMOGCM in forced mode : reference version


#-H- NEMOGCM  NEMOGCM  in forced mode   version since v3.3 ;  Compilation using FCM
#-H- NEMOGCM  libIGCM tag libIGCM_v2.0_rc2
#-M- NEMOGCM  Christian.Ethe@ipsl.jussieu.fr
#-C- NEMOGCM  tags/libIGCM_v2.0_rc2                                        HEAD  10 libIGCM     .
#-C- NEMOGCM  branches/2012/dev_v3_4_STABLE_2012/NEMOGCM                          HEAD  7  .
```

```
#-C- NEMOGCM  branches/2012/dev_v3_4_STABLE_2012/NEMOGCM/CONFIG/ORCA2_LIM/IGCM00          HEAD  7  ORCA2_LIM/IGCM00
#-C- NEMOGCM  branches/2012/dev_v3_4_STABLE_2012/NEMOGCM/CONFIG/ORCA2_LIM_PISCES/IGCM00  HEAD  7  ORCA2_LIM_PISCES/IGCM00
#-C- NEMOGCM  branches/2012/dev_v3_4_STABLE_2012/NEMOGCM/CONFIG/ORCA2_OFF_PISCES/IGCM00  HEAD  7  ORCA2_OFF_PISCES/IGCM00
#-C- NEMOGCM  branches/2012/dev_v3_4_STABLE_2012/NEMOGCM/CONFIG/ORCA2_LIM/EXP00          HEAD  7  PARAM
#-C- NEMOGCM  branches/2012/dev_v3_4_STABLE_2012/NEMOGCM/CONFIG/ORCA2_LIM_PISCES/EXP00  HEAD  7  PARAM
#-C- NEMOGCM  branches/2012/dev_v3_4_STABLE_2012/NEMOGCM/CONFIG/ORCA2_OFF_PISCES/EXP00  HEAD  7  PARAM
```

1.1. Setting up NEMO with the modipsl environment

1.1.1. Retrieval

```
mkdir NEMO_STD
cd NEMO_STD
svn co http://forge.ipsl.jussieu.fr/igcmg/svn/modipsl/trunk modipsl
cd modipsl/util
```

then

```
./model NEMO
```

or instead

```
./model NEMOGCM
```

1.1.2. Compiling and installing

Compiling NEMO : 32 CPus

```
vi ../modeles/NEMO/OPA_SRC/par_oce.F90
```

to position

```
   jpni = 4
  jpnj = 8
```

```
cd ../modipsl/modeles/UTIL
./fait_config ORCA2_LIM   # ou ORCA2_LIM_PISCES
cd ../../config/ORCA2_LIM # ou ORCA2_LIM_PISCES ]
../../util/ins_make
gmake clean
gmake
```

Compiling NEMOGCM : config ORCA2_LIM [ORCA2_LIM_PISCES] on CURIE

```
cd modipsl/modeles/NEMOGCM/CONFIG
./makenemo -h  all   # help to see the options and the available arch
```

Available compilers at CNRS :

- ALTIX_JADE : ifort compiler options for CINES SGI-ALTIX Jade, ■http://www.cines.fr/spip.php?rubrique291
- BG_BABEL : babel IBM BlueGene/P at french IDRIS, ■http://www.idris.fr/su/Scalaire/babel
- x3750_ADA : Ada IBM x3750 at french IDRIS, ■http://www.idris.fr/ada/ada-hw-ada.html
- TX7_ULAM : ulam IBM X3950 M2 at french IDRIS, ■http://www.idris.fr/su/Scalaire/ulam/hw-ulam.html
- X64_CURIE : Curie BULL at french TGCC, ■http://www-hpc.cea.fr/en/complexe/tgcc-curie.htm
- X64_TITANE : titane BULL at french CCRT, ■http://www-ccrt.cea.fr/fr/moyen_de_calcul/titane.htm
- X86_CESIUM : cesium pre/post processing HP at french CCRT, doesn't exist anymore.

```
./makenemo  –n ORCA2_LIM[_PISCES]        -m X64_CURIE -j 8  add_key "key_mpp_mpi"
cp ORCA2_LIM[_PISCES]/BLD/bin/nemo.exe   ../../../bin/.
```

2. Creating the job

```
vi config/ORCA2_LIM[_PISCES]/IGCM00/config.card
```

to position

```
#============================
#-- PBS Class
JobClass=multi
#============================
#-- Total Number of Processors
JobNumProcTot=32
#============================
#-- Run Options :
JobRunOptions='"-np "${BATCH_NUM_PROC_TOT}"'
#============================
```

then

```
cd config
../util/ins_job
```

3. Running the model

3.1. Input files: atmospheric forcings, initial states, namelists

The card files (opa9.card for orca2_lim and pisces.card for pisces) contain the list of files needed to perform the simulation.
These files are described here: ■https://forge.ipsl.jussieu.fr/igcmg_doc/wiki/DocImodelAnemo

3.2. The run

This example is a 5-year run of ORCA2_LIM [ORCA2_LIM_PISCES] splitted in 1-year jobs.

```
#============================
#-- leap, noleap, 360d
CalendarType=noleap
#-- Begin and end of Job
#-- "YYYY-MM-DD"
DateBegin=2001-01-01
DateEnd=2005-12-31
#============================
#-- 1Y, 1M, 5D, 1D
PeriodLength=1Y
#============================
```

The output frequencies are different than those of the IPSLCM5A configuration.

```
#============================================================================
#D-- OCE -
[OCE]
WriteFrequency="1Y 1M 5D"
#============================================================================
#D-- ICE -
[ICE]
```

```
WriteFrequency="5D"
#============================================================================
#D-- MBG -
[MBG]
WriteFrequency="1Y 1M 5D"
```

```
ccc_msub Job_ORCA # ou Job_OR2LP
```

3.3. Performance

The ORCA2_LIM and ORCA2_LIM_PISCES configurations' performance can be found here:
■https://forge.ipsl.jussieu.fr/igcmg/wiki/PerformancesIPSLCM5A#NEMO2