Scripts for NEMOVAR outer loop

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Assimilation of Lagrangian Data in NEMOVAR

- Contractor: 24 months engineer contract funded by ANR VODA.

Lagrangian Observation Operator

- Assimilation of drifters in NEMOVAR
  (Task 2.3, deliverable D2.3.1 T0+12)
  M.Nodet PhD, 2005
- Image Sequence Assimilation for Oceanography
  I. Souopgui, O.Titaud, A. Vidard and F.-X. Le Dimet

Assimilation of Lagrangian Data in NEMOVAR

- A toy model: GYRE,
- Tangent and adjoint for the model,
- An outer loop.

Ingredients of the outer loop

Functionalities

- User configuration

  compiler, parallel computation, directories
- Data storage
- Model configuration

  namelist, forcing
- Parameters of the run

  One execution, or full loop

  Observations
- Postprocessing

Ingredients of the outer loop

Technical requirements and difficulties

- Read / modify two namelists

  common names for NEMO and NEMOVAR namelists

  Different structure of the namelists of NEMO and NEMOVAR (comments)
- File handling

  Files to link, to delete, to copy
- Check compatibility of parameters, and exception handling

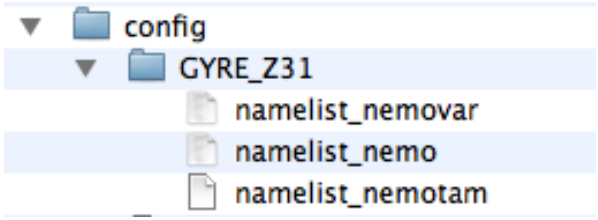
  for instance: ln_restart and restart file, check the successfull end of each execution...

A langage that gathers qualities for shell command ability, string handling, and some basic (or not) operations such as loops, linear algebra...

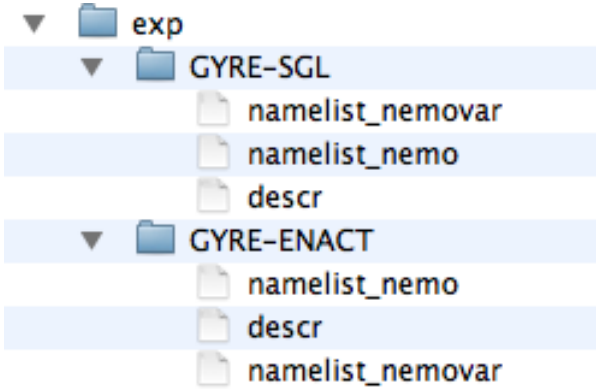
Organization of the new scripts

Data Structure

- One directory containing the Reference configurations



- One directory containing the Experiments



- The description file contains informations on the user configuration, data storage and possibly postprocessing.
- The Model configuration is detailed in Reference namelist + Exp namelist.
- Parameters of the run are either in the Exp namelist or in the description file.

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Organization of the new scripts

The description file descr

```
#
#  Description file for the Experiment
#
# should contain only fields that are used for the global setup
# of the run: directory and file handling

ndays=6
compile=mac_g95
tdir=/tmp
npx=1
npy=1
grid=GYRE_Z31
debug=no
restart_file=/Users/claire/Documents/codes/voda/simu/gyre_data/
. GYRE_00216000_restart.nc
obs_dir=/Users/claire/Documents/codes/voda/simu/gyre_data
bkgnorm_file=/Users/claire/Documents/codes/voda/simu/gyre_data/
. background.normalization.nc
ln_fb=.true.
#ndone=1
#ln_ena=.true.
```

Organization of the new scripts

The Experiment namelists for NEMO and NEMOVAR

```
&namrun
    ndate0=20060101
&namdom
   rdt = 5760
&nam_asminc
    ln_bkgwri = .true.
&namtam
    ln_trjwri = .true.
&nam_asminc
    nitbkg    = 0
    nitdin    = 0
&namobs
    ln_t3d = .true.
    ln_s3d = .true.
    ln_profb = .true.
    profbfiles='enact_fdbk_0000.nc'
    ln_profb_ena=.true.
```

```
&namobs
   ln_prf=.true.
   ln_t3d=.true.
   ln_s3d=.true.
&namalg
   noutmax = 1
   noutit  = 1
   nvarex  = 1
&namtst
   ln_tst = .true.
   ln_tst_nemotam = .true.
   ln_tst_stp_tam = .true.
   ln_tst_obsadj  = .true.
   ln_tst_bkgadj  = .true.
```

Structure of the python code

- Character and String handling.
- Data structure to interpret a namelist (e.g. a list of bocks) and a description file.
- Initialization of directories and addresses.
- Communication between inner and outer loops (increments, observations).

Conclusion

- Easy to configure its own experiment.
- Only standard python modules are used.
- Ability to make some postprocessing.

Required

- Python
- model.exe and nemovar_inner.exe for your configuration