The ORCHIDEE_OL configurations

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Person in charge: Josefine Ghattas

1. Description

ORCHIDEE_OL is the generic name of the forced ORCHIDEE configurations. They are also called offline configurations. In this context the ORCHIDEE model is forced with climatic variables based on observations or on existing climatic simulations. Each ORCHIDEE model version contains a version of offline configurations ORCHIDEE_OL. There are 3 forced ORCHIDEE executables:

- orchidee_ol : the complete ORCHIDEE model
- teststomate : to allow the vegetation to reach equilibrium
- forcesoil : to allow the carbon in the soil to reach equilibrium

2. Retrieval possibilities according to the sources' version

2.1. Retrieval with ./model of a predefined configuration

You can retrieve several predefined configurations with the command ./model *nom_config* and with the following nom_config :

- ORCHIDEE_TAG : the latest ORCHIDEE tag (currently 1.9.6)
- ORCHIDEE_SVN_AR5 : the CMIP5 version
- ORCHIDEE_trunk : the latest trunk version (HEAD). **Be careful: if you use this version the trunk results have not been evaluated!**

2.2. Retrieving another configuration version with ./model

If you want to use a branch or a personal version on the SVN file depository of ORCHIDEE and **if this version contains the ORCHIDEE/src_driver directory**, we recommend to change the ORCHIDEE_trunk configuration in mod.def and to retrieve this version with ./model ORCHIDEE_trunk. Go here to learn more about how to change mod.def.? In general we recommend you to change the version ORCHIDEE sources but to keep the version of available ORCHIDEE_OL configurations in the trunk.

2.3. Retrieving with ./recup_my_ORCHIDEE

If the version you want to retrieve contains the ORCHIDEE and ORCHIDEE_OL directories (sources and scripts of the configurations) you can use the available recup_my_ORCHIDEE script in modipsl/util. In this case the sources and scripts of the configuration must be from a same version. This script is based on the ORCHIDEE_SVN_DEV configuration which is predefined in mod.def.

```
# Syntaxe : ./recup_my_ORCHIDEE MYUSERNAME MYBRANCHE [REV]
#    MYUSERNAME  : personal login on the SVN server of ORCHIDEE (firstname.lastname) or public login "sechiba"
#    MYBRANCH    : branch or personal directory which must contain ORCHIDEE and ORCHIDEE_OL
#    REV         : optional : revision number (by default the latest HEAD version)
#
# For example :
cd modipsl/util
./recup_my_ORCHIDEE josefine.ghattas perso/josefine.ghattas
./recup_my_ORCHIDEE josefine.ghattas branches/Hydrology
./recup_my_ORCHIDEE sechiba        trunk
```

3. Resolution

The compiled executable can be used at all spatial resolutions (from local to global scales). The forcing file or the options in the parameter file determine the domain (LIMIT_WEST, LIMIT_EAST, LIMIT_NORTH and LIMIT_SOUTH) and the spatial resolution (MERID_RES and ZONAL_RES).

4. Special compiling cases

The compilation of ORCHIDEE drivers (the executables needed to run ORCHIDEE in forced/offline mode) is not made in the modipsl/config/ORCHIDEE_OL directory. It is made in:

- modipsl/modeles/ORCHIDEE_OL for the tags and a few ORCHIDEE branches with one target per driver:

```
gmake orchidee_ol; gmake teststomate; gmake forcesoil
```

- modipsl/modeles/ORCHIDEE for the trunk version starting from the 1042 revision with a target for all drivers (you can compile the library with gmake only) :

```
gmake driver
```

The *.resol* file does not exist for ORCHIDEE_OL because the executables can be used for all resolutions.

5. The experiments

In the ORCHIDEE_OL configuration, there are 4 directories containing experiments following the *classical logic* of configurations (as described in this manual) :

- OOL_SEC_STO : experiment with the orchidee_ol executable for a complete ORCHIDEE simulation.
- OOL_SEC: experiment with the orchidee_ol executable for a simulation with sechiba only (without stomata).You can also perform such an experiment in OOL_SEC_STO by deactivating stomate.
- TESTSTOMATE : experiment with the teststomate executable (for the carbon in the vegetation to reach equilibrium).
- FORCESOIL : experiment with the forcesoil executable (for the carbon in the soil to reach equilibrium).

There are 3 other directories containing experiments which use the 4 directories above. To use these experiments, you must not have previously changed the directories of other configurations.

- SPINUP : this experiment loops on the various sub-experiments of OOL_SEC_STO, OOL_SEC, TESTSTOMATE and FORCESOIL.
- FLUXNET : a chain of SPINUP on the FLUXNET site to validate ORCHIDEE
- ENSEMBLE : an ensemble of FLUXNET experiments

You will find below the list of parameters you must swith on before starting a SPINUP simulation.

```
    # SPINUP configuration :
   # ---------------------
# Initialisation for spin-up :
# sechiba alone (!!! only if ok_stomate == n !!!)
duree_nostomate=0 : number of years during which stomata is not activated
# sechiba and stomate
duree_inistomate=1 : number of years with sechiba and stomate
# teststomate (only if duree_nostomate or duree_inistomate > 0)
duree_offlineini=0 : number of years during which only teststomate is used

# Loop configuration for spin-up :
# The whole job is restarted n_iter times
n_iter=10 : number of loops
# orchidee with sechiba (and stomate if ok_stomate=y below)
duree_sechiba=1 : number of years when only the orchidee_ol executable is used (within the loop)
# teststomate
duree_stomate=0 : number of years when only teststomate is used (within the loop)
# forcesoil
duree_carbonsol=100 : number of years during which only forcesoil is used (within the loop)

# Finalization for spin-up :
# all orchidee
duree_final=1 : number of years during which only orchidee_ol is used (final step)
```

Find out more information on ■the wiki ORCHIDEE for specific experiments with ORCHIDEE.