

## **Wikiprint Book**

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## The ORCHIDEE\_OL configurations

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### 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. Following executables can be compiled depending on the version:

- `orchidee_ol` : the standard driver for complete ORCHIDEE model
- `orchideedriver` : a new driver to run the complete ORCHIDEE model, this version is under development
- `teststomate` : *Currently not maintained*: to allow the vegetation to reach equilibrium
- `forcesoil` : *Currently not maintained*: to allow the carbon in the soil to reach equilibrium

### 2. Existing predefined configurations

Following predefined configurations exist currently for ORCHIDEE offline use, the install a different version of ORCHIDEE source code:

- `ORCHIDEE_trunk` : the latest version on the trunk. **Be careful: if you use this version the trunk results have not been evaluated!** This is often the version which is advised.
- `ORCHIDEE_2_2` : a branch created from the tag `ORCHIDEE_2_1`. This branches contains bug corrections and new developements needed for DYNAMICICO
- `ORCHIDEE_2_1` : the most recent tag, created from the trunk before inclusion of the nitrogen cycle in ORCHIDEE
- `ORCHIDEE_2_0` : the CMIP6 version of ORCHIDEE
- `ORCHIDEE_AR5` : the CMIP5 version, only sources code is extracted without configuration files

The configuration is extracted in `modipsl/util` using `./model`. For example: `./model ORCHIDEE_trunk`.

#### 2.1. Extract a branch or another version of ORCHIDEE

If you want to use a branch or a personal version on the SVN file depository of ORCHIDEE, we recommend to change the `ORCHIDEE_trunk` configuration in `mod.def` and extract this version with `./model ORCHIDEE_trunk`. [Go here to learn more about how to change mod.def.](#)

### 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`). Default in the configurations is global grid.

The `.resol` file does not exist for ORCHIDEE\_OL because the executables can be used for all resolutions.

### 4. Compilation

The compiling is done from `modipsl/config/ORCHIDEE_OL` using

- `gmake` : the executable `orchidee_ol` can be used with XIOS or IOIPSL. The executable `xios.server` is also created.
- `gmake without_xios` : XIOS is not compiled and can not be used for the output.

Read more about compile methods here: <https://forge.ipsl.jussieu.fr/orchidee/wiki/Documentation/UserGuide/CompileMethods>

### 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 stomate). 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 2 or 3 other directories (depending on the version) containing experiments which have a different structure. These experiments are looping over several sub-jobs. This documentation do not describe the usage of these specific experiments.

- SPINUP : this experiment loops on the various sub-experiments of OOL\_SEC\_STO, OOL\_SEC, TESTSTOMATE and FORCESOIL.
- FLUXNET/ENSEMBLE : a chain of SPINUP on the FLUXNET site to validate ORCHIDEE.

## 6. XIOS / IOIPSL

XIOS can be used with ORCHIDEE\_trunk configuration as option. All other versions can only run with IOIPSL output.

To run with XIOS with ORCHIDEE\_trunk configuration you need to :

1. Compile using *gmake with\_xios*
2. Activate XIOS by setting XIOS=y in section [UserChoices] in COMP/orchidee\_ol.card. Use experiment OOL\_SEC\_STO, OOL\_SEC or SPINUP\_ANALYTIC.
3. To be more optimized: Activate XIOS in server mode. This is done by specifying XIOS as a specific component in config.card. In OOL\_SEC\_STO the file config.card.xios\_server is an example for this. In config.card you need :

```
#D-- ListOfComponents -
[ListOfComponents]
SRF= (sechiba, orchidee_trunk)
SBG= (stomate, orchidee_trunk)
OOL= (orchidee_ol, OOL_trunk)
IOS= (xios, XIOS)

#D-- Executable -
[Executable]
SRF= ("", "")
SBG= ("", "")
OOL= (orchidee_ol, orchidee_ol, 31MPI)
IOS= (xios_server.exe, xios.x, 1MPI)

...

#D-- IOS -
[IOS]
WriteFrequency=""
Restart= n
RestartDate=
RestartJobName=
RestartPath=
OldName=
```

Once the XIOS output is activated it is functioning the same way as for the other v6 configurations. Read more in [chapter of ORCHIDEE](#) for the use of XIOS output.