

## **Wikiprint Book**

**Title: 1. Description**

**Subject: Igcmg\_doc - Doc/Config/ORCHIDEE\_OL**

**Version: 15**

**Date: 06/29/24 09:15:33**

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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. Extract ORCHIDEE offline configurations

#### 2.1. Extract a predefined configuration

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 DYNAMICO
- `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`.

#### 2.2. 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 several directories containing predefined experiments already set up. This means that the submit folder already exists with the config.card and all folders ready inside: COMP, PARAM, POST. Note that the comp.driver files are stored inside the COMP folder together with the comp.card files. You can copy one of the existing folders, change the JobName in config.card and if you need to change other options, then run `../../libGCM/ins_job` to create the main job.

Following experiments are predefined, they all use the standard driver `orchidee_ol` except `OOL_SEC_STO_FG3nd`:

- `SPINUP_ANALYTIC_FG1` : Set up with the analytical spinup, full ORCHIDEE model, using CRU-NCEP forcings.
- `OOL_SEC_STO_FG1trans` : Set up for a transitory simulation to be used after the analytical spinup and before the FG2 simulation, using CRU-NCEP forcings.
- `OOL_SEC_STO_FG2` : Set up for historical simulation, by default it starts without restart files but it is recommended to set the start from the `OOL_SEC_STO_FG1trans` simulation, CRU-NCEP forcings.
- `OOL_SEC_STO_FG3` : Set up for historical simulation using WFDEI forcing files, using the `orchidee_ol` driver
- `OOL_SEC_STO_FG3nd` : As `OOL_SEC_STO_FG3` but using the `orchideedriver` under development
- `OOL_SEC` : experiment set up for a simulation with `sechiba` only (without stomate). You can also perform such an experiment in `OOL_SEC_STO` by deactivating stomate.

There are 2 other directories containing experiments which have a different structure. These experiments are looping over several sub-jobs and often used for site simulations. This documentation do not describe the usage of these specific experiments, contact the ORCHIDEE group if you need to use them:

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

The following experiments are currently not maintained in the default version, if you need them, contact the ORCHIDEE group:

- `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).

## 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.