## STEP 2: Preparation of the OTOY2D Component

The OCEAN_TOY2D model (in **TOY_MODELS/OCEAN_TOY2D** directory) is a TOY model that mimic CROCO component. It will be coupled to WRF model and it will receive WRF surface momentum, heat and water fluxes.

→ Here is the core of the **otoy2d** component **TOY_MODELS/OCEAN_TOY2D/ocean_toy2d.F**:

*Otoy2d params*

```
parameter(nx0=41,ny0=42)  !Size of the spatial grid
open(unit=271,file='OTOY.out',form="formatted")
call oasis_cpl_init
call oasis_cpl_define(nx0,ny0,nmaxfld,krcv0,krcv,prcv_nid,oasis_runtime)
idt=900   !Time step (second)
do time=0,oasis_runtime-idt,idt
  call oasis_cpl_get(nx0,ny0,..., krcv0,krcv,time,prcv_nid)
enddo
call oasis_terminate(ierr)
```

**OTOY2D EXCHANGED FIELDS:** (0=Parent, 1=first zoom, etc…)

*RECEIVED*

- **OTOYSRFL0** → 2D Field, just like a Solar Heat Flux field
- **OTOYEVPR0** → 2D Field, just like an Evaporation minus Precipitations field
- **OTOYSTFL0** → 2D Field, just like a Non-Solar Heat Flux field
- **OTOYTAUX0** → 2D Field, just like a surface zonal stress field
- **OTOYTAUY0** → 2D Field, just like a surface meridional stress field

→ Edit the **ocean_toy2d.F** and change the **spatial** grid size with your CROCO grid (LLm MMm).

➥ You can go in **WORK_MCC/SCRIPTS** and execute **./STEP1_inspect_CROCO_Grid.scr**

→ If needed: edit **jobcomp_lengau** and adjust NetCDF, MPI and OASIS-MCT library paths

→ Compile the code: **./jobcomp_lengau** and verify that the executable **otoy2d** has been created.

## STEP 3: Create the OASIS Files

→ It is done with some **bash scripts** in the **WORK_MCC/SCRIPTS** directory:

→ Edit **STEP3_make_oasis_files.scr**

- Adjust CROCO grid path (**../INPUT_FILES/CROCO_FILES**)
- Adjust WRF grid path (**../INPUT_FILES/WRF_FILES**) [file does not exist yet]
- Adjust OUTPUT path (**../INPUT_FILES/OASIS_FILES**)
- Adjust the number of domains: **max_domains_CROCO=1** and **max_domains_WRF=1**

→ Execute **./STEP3_make_oasis_files.scr**: this will create the OASIS3-MCT auxiliary NetCDF files required for **interpolation** of fields between your different model grids:

**INPUT_FILES/OASIS_FILES/grids.nc**
**INPUT_FILES/OASIS_FILES/masks.nc**
**INPUT_FILES/OASIS_FILES/areas.nc**
**INPUT_FILES/OASIS_FILES/coupling_masks_zero.nc**

**WRF GRIDS/MASKS:** (0=Parent, 1=first zoom, etc…)

- **wrn0** → WRF ***rho*** Normal (Masked)
- **wrp0** → WRF ***rho*** Processed (Land and Lakes Masked)

## STEP 4: Create the OASIS namcouple File

→ An example was provided for the CROCO-ATOY coupling exercise.
→ Create your own **INPUT_FILES_MCC/OASIS_FILES/namcouple_WRF_OTOY2D**

```
###########################################################################
#
#      Input file for OASIS3-MCT
#
###########################################################################
#
#      Input delimiters have to occupy position 1 to 9 !
#      No blank lines allowed !
#      Length of input lines <= 80 !
#
###########################################################################
#
# NFIELDS : total number of fields being exchanged.
#
 $NFIELDS
 1
#
###########################################################################
#
# RUNTIME: total simulated time for the actual run in seconds (<I8)
#
 $RUNTIME
 86400
#
###########################################################################
#
# NLOGPRT: printing level in output file cplout:
#              0 = no printing
#              1 = main routines and field names when treated
#              2 = complete output
#
 $NLOGPRT
  2
 $END
###########################################################################
 $STRINGS
###########################################################################
#
#                      ATMOS  --->>>  OCEAN
#                      --------------------
###########################################################################
#
# Field 3.4 : stress along X axis (a->o tau 1) from WRF Parent to OTOY2D
#
WRF_d01_EXT_d01_TAUX OTOYTAUX0 1 3600 2 Rwrf_d01.nc EXPOUT
88 108 41 42 wrn0 crp0 LAG=0
R 0 R 0
LOCTRANS SCRIPR
AVERAGE
BILINEAR LR SCALAR LATLON 1
###########################################################################
#
$END
```

**WRF EXCHANGED FIELDS:** (d01=Parent, d02=first zoom, etc…)

*SENT*

- **WRF_d01_EXT_d01_SURF_NET_SOLAR** → WRF Solar Heat Flux on grid **wrp0**
- **WRF_d01_EXT_d01_EVAP-PRECIP** → ROMS Evaporation minus Precipitations on grid **wrp0**
- **WRF_d01_EXT_d01_SURF_NET_NON-SOLAR** → ROMS Non-Solar Heat Flux on grid **wrp0**
- **WRF_d01_EXT_d01_TAUX** → WRF Stress along X axis on grid **wrp0**
- **WRF_d01_EXT_d01_TAUY** → WRF Stress along Y axis on grid **wrp0**

*RECEIVED*

- **WRF_d01_EXT_d01_SST** → WRF SST on grid **wrp0**
- **WRF_d01_EXT_d01_UOCE** → WRF Surface Zonal Current on grid **wrp0**
- **WRF_d01_EXT_d01_VOCE** → WRF Surface Meridional Current on grid **wrp0**

## STEP 5: Launch the CROCO/ATOY2D simulation

→ It is done with the **RUN4_wrf_inter_otoy.pbs** script located in **SCRIPTS**
→ Edit this file, check model executables/inputs and outputs paths, etc…
→ Launch the model: **SCRIPTS/RUN4_wrf_inter_otoy.pbs** **(Yeah !!!!)**