



Tools meeting

**Ocean and atmospheric
diagnostics**

Pierre-Antoine Bretonnière, 06/11/2014



Ocean diagnostics

http://ic3.cat/wikicfu/index.php/Tools/Ocean_postprocessing

https://gitlab.cfu.local/cfu/ocean_diagnostics.git

Allows calculation of different diagnostics from monthly or daily outputs:

indexes (sea ice volume, MOC intensity, integrated heat content),

vertical sections (meridional overturning streamfunction, temperature sections at a given latitude/longitude)

Concatenation of members and forecast times

Formatting to CFU conventions (moc_i00k_19930501.nc - moc_i00k_19930501_fc0-9_199305_199308.nc)

Ocean diagnostics

`ocean_pp.bash`, `common_ocean_post.txt`,
`config_file-ocean_pp.bash`

```

#!/bin/bash
# This is an example of a configuration_file needed to launch ocean_pp.bash. For any other information about how to use it, you can refer to the README or the cfu wiki (http://ic3.cat/wikicfu/index.php/Tools#update\_February\_2013).

listpost=( )
    # Valid options : ('siasiessiv' 'ohc' 'moc' 'max_moc' 'area_moc' 'ext_raw_ice' (previously 'ice') 'ext_raw_oce' (previously 'sstsssmld') 'heat_sal_mx1' 'psi' 'usalc' 'lmsalc' 'uohc' 'mohc' 'lohc' 'xohc' 'ohc_sp
ed_layer' 'stc' 'vert_Tsections' 'vert_Ssections' '3dtemp' '3dsal' 'TSec_avel190-220E' 'SSec_avel190-220E' 'NATLohc' 'xNATLohc' 'mNATLohc' 'LNATLohc' 'NPacohc' 'uNPacohc' 'mNPacohc' 'lNPacohc' 'TAtlhc' 'xTAtlhc' 'tlhc' 'lTAtlhc' 'lTPacohc' 'xTPacohc' 'uTPacohc' 'mTPacohc' 'lTPacohc' 'TIndohc' 'xTIndohc' 'uTIndohc' 'mTIndohc' 'lTIndohc' 'Antaohc' 'xantaohc' 'uAntaohc' 'mAntaohc' 'lAntaohc' 'Arctohc' 'xArctohc' 'uArctohc' 'mAroctohc'
Arctohc' )
    # Beware that the max_moc diagnostics can not be computed if you don't process complete years (because that's a diagnostic computed from annual means)
raw_vars_ocean=( 'default' )  # If listpost contains "ext_raw_oce" option, this is the list ocean variables you want to extract. If nothing is specified, all variables present in input file will be treated. If raw_vars_ocean='defau
sosstsst, sosaline, somixhgt and somxml010 will be extracted.
raw_vars_ice=( 'default' )  # If listpost contains "ext_raw_ice" option, this is the list of seaice variables you want to extract. If nothing is specified, all variables will be treated. If raw_vars_ice='default', isnowthi, iicet
ileadfra, iicetemp, and ice_pres will be extracted.
expid=000k  # expid or nemovar_s4 / nemovar_combine / glorys2v1
mod=ecearth  # nemo / ecearth
typeoutput=MMO  # diag / MMO
#-----
listmemb=( 0 1 2 3 4 )  # list of members
syeari=1960  # first start date, format "yyyy"
syearf=2005  # last start date, format "yyyy"
moni=11  # first month of the hindcast, format "mm", e.g. 05 for May
intdate=1  # interval between start dates
chunklen=4  # length of the chunks (in months)
#
ltimed0=1  # first leadtime to post-process
ltimedf=4  # last leadtime to postprocess
# Fill up either ltimed0/ltimedf or year0/yearf
year0=  # first year to post-process in the fist start date
yearf=  # last year to post-process in the fist start date
# If you fill up the year argument, complete years will be processed, year by
# year from moni
#-----
NEMOVERSION=Ec2.3_01L42 # NEMO version
# Valid options : Ec2.3_01L42      for Ec-Earth 2.3 ORCA1    L42
#           Ec3.0_01L46      for Ec-Earth 3.0 ORCA1    L46
#           Ec3.0_025L46     for Ec-Earth 3.0 ORCA0.25 L46
#           N3.2_01L42       for Nemo    3.2 ORCA1    L42
#           N3.3_01L46       for Nemo    3.3 ORCA1    L42
#           nemovar_01L42    for Nemo    COMBINE and ORAS4 ORCA1L42
#           === Development in progress : ===
#           glorys2v1_025L75 for Nemo    GLORYS2v1    ORCA025L75
#           ucl_02L31         for Nemo    UCL        ORCA2L31
#-----
PATHCOMMONOCEANDIAGE='/home/`${USER}`/autosubmit/postp/ocean'
CON_FILES='/cfu/autosubmit/con_files'
rootout='/cfunas/exp/${mod}/${flexpid}/monthly_mean'

```

Atmosphere diagnostics

http://ic3.cat/wikicfu/index.php/Tools/Atmosphere_diagnostics

https://gitlab.cfu.local/cfu/atmosphere_diagnostics.git

Set of bash and nco functions used to format atmospheric monthly and daily means

Concatenation of members and forecast times

Formatting to CFU conventions (uas_19930501.nc – uas_19930501_fc0-9_199305_199308.nc)

Atmosphere diagnostics

nccf_atm_monthly.sh, config_file-nccf_atm_monthly.bash

```
config_file-nccf_atm_monthly.bash (~atmosphere_diagnostics) - VIM
```

```
#!/bin/bash
#This is an example of the configuration file needed to run the nccf_atm_monthly_new.sh. You can copy it to the directory where you run the script. For any other information, you can look at the details of how to use this file or the nccf_atm_monthly_new in the cfu wiki
INSTITION="IC3"
SOURCE="EC-Earth2.3.0"
LEVEL_LST=(92500,85000,70000,50000,20000,10000,5000)
DATADIR="/cfunas/exp/ecearth" #where MMA files located
SAVEDIR="/cfunas/exp/ecearth" # for Saving outputs
HEAD_DIR="/cfu/pub/scripts/postp_ecearth/header" # some of the header information
WORKDIR="/scratch/$USER/pp/nccf_atm monthly $$"
NFRP=0 # ecearth output frequency (hours), this is for computing the accumulated precipitation and flux variables
EXPID=1024
SDATE=19800201
LEAD_LIST=(1980 02 1982 02 12) #lead times to be treated (1st_year 1st_month last_year last_month chunk_size(in months))
MEM_LST=(fc2) # list of members you want to post-process (with format [ fc? fc?? fc?? ]). If left empty, it will post-process all the members for which it finds
VAR_LST_2D=() #T2M D2M MSL PRECIP SSR STR TTR TSR TSRC TTTC SLHF SSHF VIOM VIOM SSRD CP SF E SSRU SSRC STRU STRD TCC # list of 2D variables to be processed (if left blank, the script will automatically look for the variables present in the files and treat them all)
VAR_LST_3D=() # T U V Z Q W CC CIWC CLWC
MASK_PATH=/cfunas/exp/ecearth/land_sea_mask_320x160.nc # path of the mask for the actual resolution (used to change tos from 0 to NaN on the continents)
~
```



Ocean/Atmosphere diagnostics



Developments following Mingu's github presentations
(development in development-branches from master,
merge requests, opening issues...)

(<http://ic3.cat/wikicfu/index.php/Computing/GitLab>)

Follow bash style guide

(<http://ic3.cat/wikicfu/index.php/Tools/StyleGuides/BASH>)