

## 1. The prerequisites:

- (1) **gcc-4.8 full package**
- (2) **mpich-3.0.3 built with gcc-4.8**
- (3) **netcdf-4.1.3 built with gcc-4.8, bundled with mpich-3.0.3**
- (4) **python 2.7, with library of numpy, Scientific, nco support**
- (5) **perl**

## 2. modification/addition of machine

**(1) machine name: darwin-gnu, so two files needed under /scripts/  
env\_mach\_specific.darwin-gnu**

```
setenv GCC_PATH /usr/local
setenv PATH ${GCC_PATH}/bin:${PATH}
setenv LD_LIBRARY_PATH ${GCC_PATH}/lib
setenv DYLD_LIBRARY_PATH ${GCC_PATH}/lib
```

```
alias gmake make
alias gcc-4.8 gcc
alias g++-4.8 g++
alias gfortran-4.8 gfortran
```

```
#--- set env variables for Macros if needed
setenv NETCDF_PATH /usr/local/netcdf-4.1.3-gcc48
```

```
#-----
# GENERIC_USER
# Machine specific environment variables are set here. This might be needed
# to set MPI, core file, IO, memory or many other things.
#-----
setenv MPICH_PATH /usr/local/mpich-3.0.3-gcc48
setenv PATH ${MPICH_PATH}/bin:${PATH}
```

**mkbatch.darwin-gnu**

## (2) adding 'darwin-gnu' into 'config\_machines.xml', as following:

```
<machine MACH="darwin-gnu">
  <DESC>Mac OS X10.8, Mountain Lion, with gnu/mpich2</DESC>      <!-- mac os Darwin with
gnu compiler -->
  <OS>Darwin</OS>          <!-- LINUX,Darwin,CNL,AIX,BGL,BGP -->
  <COMPILERS>gnu</COMPILERS>      <!--
intel,ibm,pgi,pathscale,gnu,cray,lahey -->
  <MPILIBS>mpich,mpi-serial</MPILIBS>      <!-- openmpi, mpich, ibm, mpi-
serial -->
  <RUNDIR>USERDEFINED_required_build</RUNDIR>      <!-- complete path to the
run directory -->
  <EXEROOT>USERDEFINED_required_build</EXEROOT>      <!-- complete path to the
build directory -->
  <DIN_LOC_ROOT>USERDEFINED_required_build</DIN_LOC_ROOT>      <!-- complete path
to the inputdata directory -->
  <DIN_LOC_ROOT_CLMFORC>USERDEFINED_optional_build</DIN_LOC_ROOT_CLMFORC> <!--
path to the optional forcing data for CLM (for CRUNCEP forcing) -->
  <DOUT_S>FALSE</DOUT_S>      <!-- logical for short term archiving
-->
  <DOUT_S_ROOT>USERDEFINED_optional_run</DOUT_S_ROOT>      <!-- complete path
to a short term archiving directory -->
  <DOUT_L_MSROOT>USERDEFINED_optional_run</DOUT_L_MSROOT>      <!-- complete
path to a long term archiving directory -->
  <CCSM_BASELINE>USERDEFINED_optional_run</CCSM_BASELINE>      <!-- where the
cesm testing scripts write and read baseline results -->
  <CCSM_CPRNC>USERDEFINED_optional_test</CCSM_CPRNC>      <!-- path to the cprnc
tool used to compare netcdf history files in testing -->
  <BATCHQUERY>USERDEFINED_optional_run</BATCHQUERY>
  <BATCHSUBMIT>USERDEFINED_optional_run</BATCHSUBMIT>
  <SUPPORTED_BY>USERDEFINED_optional</SUPPORTED_BY>
</machine>
```

## (3) modifying 'OS="Darwin"' into 'config\_compilers.xml', as following:

```
<compiler OS="Darwin">
```

```
<ADD_CPPDEFS> -DSYSDARWIN </ADD_CPPDEFS>
<ADD_LDFLAGS MODEL="driver"> -all_load </ADD_LDFLAGS>
<!-- in Darwin, blas-lpack library in vec.lib, but soft-linked to /usr/bin -->
<LAPACK_LIBDIR> /usr/bin </LAPACK_LIBDIR>
</compiler>
```

**(4) adding 'COMPILER="gnu" OS="Darwin"' into  
'config\_compilers.xml', as following:**

```
<compiler COMPILER="gnu" OS="Darwin" >
  <!-- since netcdf 4, fortran library is named as 'libnetcdf' -->
  <ADD_LDFLAGS MODEL="driver"> -L$(NETCDF_PATH)/lib -lnetcdf </ADD_LDFLAGS>
</compiler>
```

# runCLM.py setup and test on Mac OS X10.8 6/10/13 3:14 PM

## **(1) PTCLM tools and files**

Author: Dan Ricciuto, ORNL

There are two python scripts:

**runCLM.py** – the main script to: create/configure a case; setup/build the case; and run the case.

**makepointdata.py** – a script to extract point grid/fraction and surface data from global half degree datasets.

(Dan's scripts also include a point meteorological data extraction from

## **(2) Input data**

- /atm/datm7/CLM1PT\_data/1x1pt\_??? (this is the primary climate driver data. Basically you need to prepare by your own. The ??? is the name of point used throughout the setup procedure. And ??? must be defined in  
/scripts/PTCLM\_files/PTCLM\_sitedata/xxx\_pftdata.txt,  
xxx\_sitedata.txt, xxx\_soildata.txt)
- /atm/datm7/domain.clm/domain.lnd.1x1pt\_???\_navy.nc (this is generated by /scripts/makepointdata.py
- other /atm data is automatically updated, if connected to CESM's site by SVN when build the case
- /lnd/clm2/surfddata/surfddata.1x1pt\_???.nc, (or  
surfddata\_dynpft.1x1pt\_???.nc for I20TRCLMCN45), also generated by makepointdata.py
- /ugrid/0.5x0.5data: the following global datasets are required for makepointdata.py to produce the point data:  
domain.360x720\_ORCHIDEE0to360.100409.nc  
surfddata\_360x720cru\_simyr1850\_c130415.nc  
surfddata.pftdyn\_0.5x0.5\_simyr1850-2010.nc

## **(3) Test run: site US-Brw in AmeriFlux**

compset I1850CLM45CN and I20TRCLM45CN

### **Step 1: ad\_spinup**

```
./runCLM.py --site=US-Brw --sitegroup=AmeriFlux
--caseroot=/Users/f9y/mygit/clm4-pf/cases
--runroot=/Users/f9y/clm4_5_simulations
--ccsm_input=/Users/f9y/clm4_5_inputdata
--cesmdir=/Users/f9y/mygit/clm4-pf
--compset=I1850CLM45CN --coldstart --vertsoilc --CH4 --
no_fire --ad_spinup --nyears_ad_spinup 10
--mach=darwin-gnu --compiler=gnu --debug --mpilib=mpi-
serial
--ugridir=ugrid/0.5x0.5data
--rmold --clean_config --clean_build
```

NOTE – this script will

- a. clean-create/setup a case in \$caseroot/US-Brw\_I1850CLM45CN\_ad\_spinup;
- b. clean-build the case in \$runroot/US-Brw\_I1850CLM45CN\_ad\_spinup;
- c. run the case in \$runroot/US-Brw\_I1850CLM45CN\_ad\_spinup/run, for 10 years (default 600+1 years)

FYI, clm45 no more needs to run 'exit-spinup'.

### **Step 2: I1850CLM45cn (i.e. spinup)**

```
./runCLM.py --site=US-Brw --sitegroup=AmeriFlux
--caseroot=/Users/f9y/mygit/clm4-pf/cases
--runroot=/Users/f9y/clm4_5_simulations
--ccsm_input=/Users/f9y/clm4_5_inputdata
--cesmdir=/Users/f9y/mygit/clm4-pf
--compset=I1850CLM45CN --vertsoilc --CH4 --no_fire --
finidat_year 11 --run_n 10
--mach=darwin-gnu --compiler=gnu --debug --mpilib=mpi-
serial
--ugridir=ugrid/0.5x0.5data
--rmold --clean_config --clean_build
```

NOTE – this script will

- a. clean-create/setup a case in \$caseroot/US-Brw\_I1850CLM45CN;
- b. clean-build the case in \$runroot/US-Brw\_I1850CLM45CN;
- c. copy all restart files from \$runroot/US-Brw\_I1850CLM45CN\_ad\_spinup/run to this case's run root (see below); note the 'finidat\_year 11' is from the last run year of the ad\_spinup run.
- d. run the case in \$runroot/US-Brw\_I1850CLM45CN/run, for 10 years (default 600 years)

### **Step 3: transit**

```
./runCLM.py --site=US-Brw --sitegroup=AmeriFlux
           --caseroot=/Users/f9y/mygit/clm4-pf/cases
           --runroot=/Users/f9y/clm4_5_simulations
           --ccsm_input=/Users/f9y/clm4_5_inputdata
           --cesmdir=/Users/f9y/mygit/clm4-pf
           --compset=I20TRCLM45CN --vertsoilc --CH4 --no_fire --
finidat_year 11 --run_n 10
           --mach=darwin-gnu --compiler=gnu --debug --mpilib=mpi-
serial
           --ugriddir=ugrid/0.5x0.5data
           --rmold --clean_config --clean_build
```

NOTE – this script will do similar run as I1850CLM45CN (spinup), i.e.,

- a. clean-create/setup a case in \$caseroot/US-Brw\_I20TRCLM45CN, including preparation of surface data;
- b. clean-build the case in \$runroot/US-Brw\_I20TRCLM45CN;
- c. copy all restart files from \$runroot/US-Brw\_I1850CLM45CN/run to this case's run root (see below); note the 'finidat\_year 11' is from the last run year of the ad\_spinup run.
- d. run the case in \$runroot/US-Brw\_I1850CLM45CN/run, for 10 years (default from 1850 – 2006 (the last year in the metdata))

### **Historical CO2 into 'transit' run –**

(TO be updated soon)