MacOS H08 installation procedure

0 Introduction

This document assumes the MacOS version is Ventura, so for Monterey, replace the string as follows

/usr/local --> /opt/homebrew

*Note] Difference in installation location depending on Brew

Ventura : in /usr/local/Cellar

Monterey : in /opt/homebrew/Cellar/.

1 Pre-installation of relevant software

1.1 Package management software: Homebrew installation

(1) Installing CLT (Command Line Tools)

```
% xcode-select --install
```

(2) Installing Homebrew

```
% /bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
```

(3) Add the path to the brew command to the environment variable (in the case of $SHELLeq ”zsh”)

```
% echo '# Set PATH, MANPATH, etc., for Homebrew.' >> ~/.zshrc
% echo 'eval "$(/usr/local/Homebrew/bin/brew shellenv)"' >> ~/.zshrc
% echo 'export PATH="/usr/local/bin:$PATH"' >> ~/.zshrc
% source ~/.zshrc
```

*If you use package management software such as MacPorts or Fink, please use MacPorts or Fink without installing Homebrew. (Coexistence is not recommended.)

1.2 Installing gfortran, cmake

```
% brew install gfortran
% brew install cmake
```

1.3 Installing XQuartz

```
% brew install --cask xquartz
% echo 'export DISPLAY=:0' >> ~/.zshrc
% source ~/.zshrc
```

1.4 Installing HDF5

1.4.1 Installing zlib

```
% brew install zlib
% echo '# zlib' >> ~/.zshrc
% echo 'export LDFLAGS="-L/usr/local/opt/zlib/lib $LDFLAGS"' >> ~/.zshrc
% echo 'export CPPFLAGS="-I/usr/local/opt/zlib/include $CPPFLAGS"' >> ~/.zshrc
% echo 'export PKG_CONFIG_PATH="/usr/local/opt/zlib/lib/pkgconfig:$PKG_CONFIG_PATH "' >> ~/.zshrc
% source ~/.zshrc
```

1.4.2 Installing curl

```
% brew install curl
% echo '# curl' >> ~/.zshrc
% echo 'export PATH="/usr/local/opt/curl/bin:$PATH"' >> ~/.zshrc
```

% echo 'export LDFLAGS="-L/usr/local/opt/curl/lib $LDFLAGS"' >> ~/.zshrc

% echo 'export CPPFLAGS="-I/usr/local/opt/curl/include $CPPFLAGS"' >> ~/.zshrc

% echo 'export PKG_CONFIG_PATH="/usr/local/opt/zlib/lib/pkgconfig:$PKG_CONFIG_PATH"' >> ~/.zshrc

% source ~/.zshrc

1.4.3 Installing hdf5

% brew install hdf5

1.5 Installing netcdf-c

% brew install netcdf

1.6 Installing netcdf-fortran

% brew install netcdf-fortran

Open the file /usr/local/Cellar/netcdf-fortran/4.6.1/bin/nf-config with an editor (vim), change the following string and save it.

${CMAKE_INSTALL_PREFIX} -> $prefix

Set the PATH to NetCDF in .zshrc.

(1) % vi ~/.zshrc

(2) Add the following statements to the .zshrc file

```
# NetCDF 4
export NETCDF_CONFIG="nc-config"
export NETCDF_ROOT="$(${NETCDF_CONFIG} --prefix)"
export NETCDF_F_CONFIG="nf-config"
export NETCDF_F_ROOT="$(${NETCDF_F_CONFIG} --prefix)"
export LD_LIBRARY_PATH="${NETCDF_ROOT}/lib":${LD_LIBRARY_PATH}
export LD_LIBRARY_PATH="${NETCDF_F_ROOT}/lib":${LD_LIBRARY_PATH}
export NETCDF=${NETCDF_ROOT}
```

Reflect the changes.

% source ~/.zshrc

1.7 Installing gmt

1.7.1 Installing ghostscript

% brew install ghostscript

1.7.2 Installing ffmpeg

% brew install ffmpeg

1.7.3 Installing imagemagick

% brew install tlk/imagemagick-x11/imagemagick --with-graphviz

Then, open the policy file of ImageMagick (/etc/Imagemagick/policy.xml) and disable the ghostscript format types (PS, PS2, PS3, EPS, PDF, XPS).

Example:

<!-- <policy domain="coder" rights="none" pattern="PS" />

<policy domain="coder" rights="none" pattern="PS2" />

<policy domain="coder" rights="none" pattern="PS3" />

<policy domain="coder" rights="none" pattern="EPS" />

<policy domain="coder" rights="none" pattern="PDF" />

<policy domain="coder" rights="none" pattern="XPS" /> -->

※Here, the script is commented out from <!—to -->.

1.7.4 Installing gmt

% brew install gmt

2 Installing H08

H08 source code is obtained from Github.

2.1 Creating your Github account

2.2 Requesting Access to the Global_2018 Repository

Global_2018 is a repository for the distribution of H08 source code.

Please send an email to Tarumoto with the name of your Git account.

You will receive an email invitation to Global_2018, please follow the instructions to accept the invitation.

2.3 Creating a Git Environment on Your Local PC

2.3.1 Installing git

% brew install git

* AppleGit may be pre-installed

2.3.2 Setting up your personal Git environment

(1) User Name Setup

% git config --global user.name 'your name'

(2) Setting up email

% git config --global user.email 'Your email address'

(3) Default Branch Name Setting

% git config --global init.defaultbranch 'main'

(4) Check the settings

% git config --list

2.3.3 Local configuration for SSH access to Github

(1) Create an access authentication key pair

% ssh-keygen -t rsa -b 4096 -C "[your email address]" -f ~/.ssh/git_rsa

(2) Add the following statement to the ~/.ssh/config file.

Host github github.com

Hostname github.com

User git

IdentityFile ~/.ssh/git_rsa

---

* Note 1) Copy and paste with indentation.

* Note 2) If necessary, perform the following.

% chmod -R go-rwx ~/.ssh

2.3.4 Github authentication settings for SSH access from local PC

(1) Personal icon in the upper right corner of GitHub Page > Settings > SSH and GPG keys

(2) Click the "New SSH key" button.

(3) Enter a (suitable) key name in the Title field of the displayed page, and copy and paste the contents of the public key (~/.ssh/git_rsa.pub) generated in 2.3.3, (1) into the Key field.

The Copy to Clipboard command makes it easy to paste.

% pbcopy < ~/.ssh/git_rsa.pub

(4) Click the "Add SSH Key" button.

2.4 Copying the Global_2018 Repository to your PC

% cd ~

% git clone git@github.com:organization-h08/Global_2018.git

2.5 Compiling & Installing the H08 Source Code

(1) Change LIB, INC and FC preferences in adm/Mkinclude as follows

INC = -I/opt/local/include

LIB = -L/opt/local/lib -lnetcdf -lnetcdff

FC = gfortran -finit-local-zero -O3 -fd-lines-as-comments

(2) Modify the cpl/bin/main.f file as follows

Move the code on line 549 in front of the code on line 336.

Line 549 : character*128 c0lndara

Line 336 : namelist /setriv/ c0qtot, c0rivstoini,

(3) Keep the following line alive in the "# GMT command preference" block of bin/htdraw.sh

PSBASEMAP="gmt psbasemap" # ubuntu (if command "gmt" works in your system)

XYZ2GRD="gmt xyz2grd" # ubuntu

GRDIMAGE="gmt grdimage" # ubuntu

PSSCALE="gmt psscale" # ubuntu

PSTEXT="gmt pstext" # ubuntu

PSCOAST="gmt pscoast" # ubuntu

(4) Keep the following line alive in the "# GMT command preference" block of bin/htdrawts.sh

PSBASEMAP="gmt psbasemap" # ubuntu (if command "gmt" works in your system)

PSTEXT="gmt pstext" # ubuntu

PSXY="gmt psxy" # ubuntu

(5) Run the H08 installation script

% cd ~/Global_2018

% sh . /install.sh

(6) Setting Environment Variables for H08 Execution

% cd adm

Create a script to modify the sample.bashrc file in this directory to suit your PC environment.

[[ch_sample.sh]]

```
---------------------------------------------------------------------------------------------
#! /bin/zsh

cat sample.bashrc | \
    sed -e 's/PATH=.:${DIRH08}/PATH=${DIRH08}/' | \
    sed -e "s%export PATH=\$PATH:\/sw\/bin%export PATH=${NETCDF}\/bin:\$PATH%" | \
    sed -e "s%export DIRH08=\/Users\/Naota\/H08%export DIRH08=${HOME}\/Global_2018%" \
    sed -e "s%\'%\"%g" \
    > add.zshrc

echo "\n" >> add.zshrc
---------------------------------------------------------------------------------------------
```

Run this script.

% sh . /ch_sample.sh

Add the created add.zshrc file to ~/.zshrc.

% cat add.zshrc >> ~/.zshrc

Reflect the changes.

% source ~/.zshrc