

Running the tools (CMT, subseasonal,...) developed by NOAA/CPC/International Desks:

# **Prerequisite Packages Installation for Windows, Linux or Mac Users**

NOAA/CPC/International Desks

# System Requirements

- **OS version:**
  - Windows (32 or 64 bit, Windows version 7.0 or above) + Cygwin
  - Linux
  - Mac
- **MEMORY:** 4GB or more (if possible)
- **Free DISK SPACE:** 10GB or more
- **Internet Connection**
- **A windows winzip or 7-zip utility to unpack a tar file**
- **SOFTWARE:**
  - GrADS (v2.0.x or later), V2.0.2 for windows users
  - GNU FORTRAN Compiler,
  - GNU precision calculator (bc),
  - Notepad ++
  - Wget
  - ImageMagick
  - GDAL (v2.1.2 or later)

# Outline

- **Prerequisite Packages for Windows Users** (see slides 4 to 19)
- **Prerequisite Packages for Linux Users** (see slides 20 to 24)
- **Prerequisite Packages for mac Users** (see slides 25 to 31)

# Prerequisite Packages for Windows Users

- ❑ Cygwin
- ❑ GNU bc maths
- ❑ wget
- ❑ GDAL
- ❑ GNU Fortran
- ❑ ImageMagick
- ❑ notepad++
- ❑ openGrADS

# Cygwin Installation(1/6)

## (<https://cygwin.com/install.html>)

- Depending on your system type, click on either the 64-bit or 32-bit link to download the installation file (**setup-x86\_64.exe** for 64-bit system or **setup-x86.exe** for 32-bit).

← → ↻ <https://cygwin.com/install.html>

- Cygwin
  - Install Cygwin
  - Update Cygwin
  - Search Packages
  - Licensing Terms
- CygwinX
- Community
  - Reporting Problems
  - Mailing Lists
  - Newsgroups
  - IRC channels
  - Gold Stars
  - Mirror Sites
  - Donations
- Documentation
  - FAQ
  - User's Guide
  - API Reference
  - Acronyms
- Contributing
  - Snapshots
  - Source in Git
  - Cygwin Packages
- Related Sites

# Cygwin

Get that *Linux* feeling - on Windows.

## Installing and Updating Cygwin Packages

### Installing and Updating Cygwin for 64-bit versions of Windows

Run [setup-x86\\_64.exe](#) any time you want to update or install a Cygwin package for 64-bit windows. The [signature](#) for [setup-x86\\_64.exe](#) can be used to verify the validity of this binary using [this](#) public key.

### Installing and Updating Cygwin for 32-bit versions of Windows

Run [setup-x86.exe](#) any time you want to update or install a Cygwin package for 32 bit windows. The [signature](#) for [setup-x86.exe](#) can be used to verify the validity of this binary using [this](#) public key.

### General installation notes

When installing packages for the first time, `setup*.exe` *does not install every package*. Only the **minimal base packages** from the Cygwin distribution are installed by default, which takes up about 100 MB.

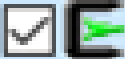
Clicking on categories and packages in the `setup*.exe` package installation screen allows you to select what is installed or updated.

Individual packages like `bash`, `gcc`, `less`, etc. are released independently of the Cygwin DLL, so the Cygwin DLL version is not useful as a general Cygwin release number. The `setup*.exe` utility tracks the versions of all installed components and provides the mechanism for **installing** or **updating** everything available from this site for Cygwin.

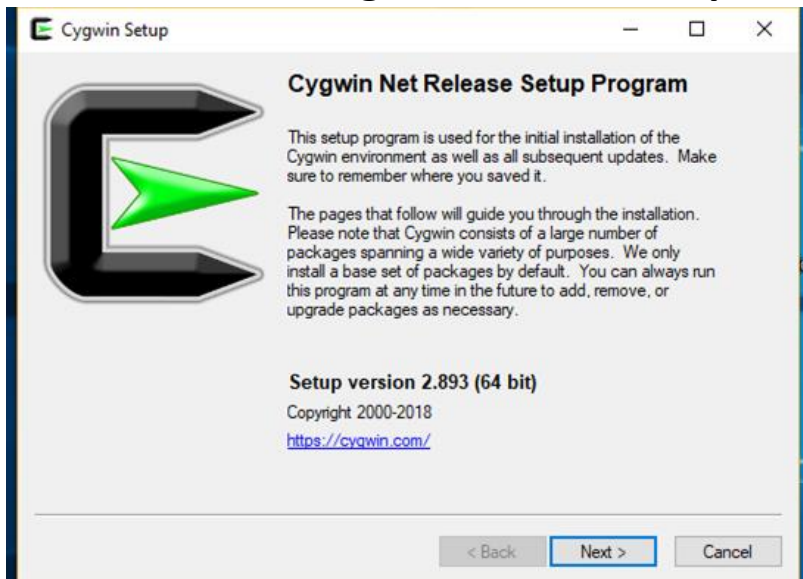
Once you've installed your desired subset of the Cygwin distribution, `setup*.exe` will remember what you selected so rerunning the program will update your system with any new package releases.

On Windows Vista and later, `setup*.exe` will check by default if it runs with administrative privileges and, if not, will try to elevate the process. If you want to avoid this behaviour and install under an unprivileged account just for your own usage, run `setup*.exe` with the `--no-admin` option.

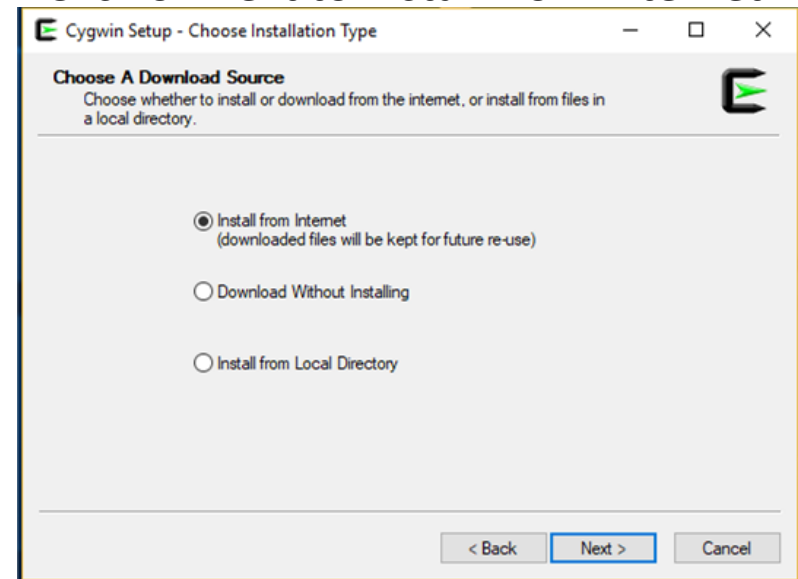
# Cygwin Installation(2/6)

- Look for the setup file in your download folder, and double click on it to initiate the cygwin installation:  setup-x86\_64

Click on next to go to the next step

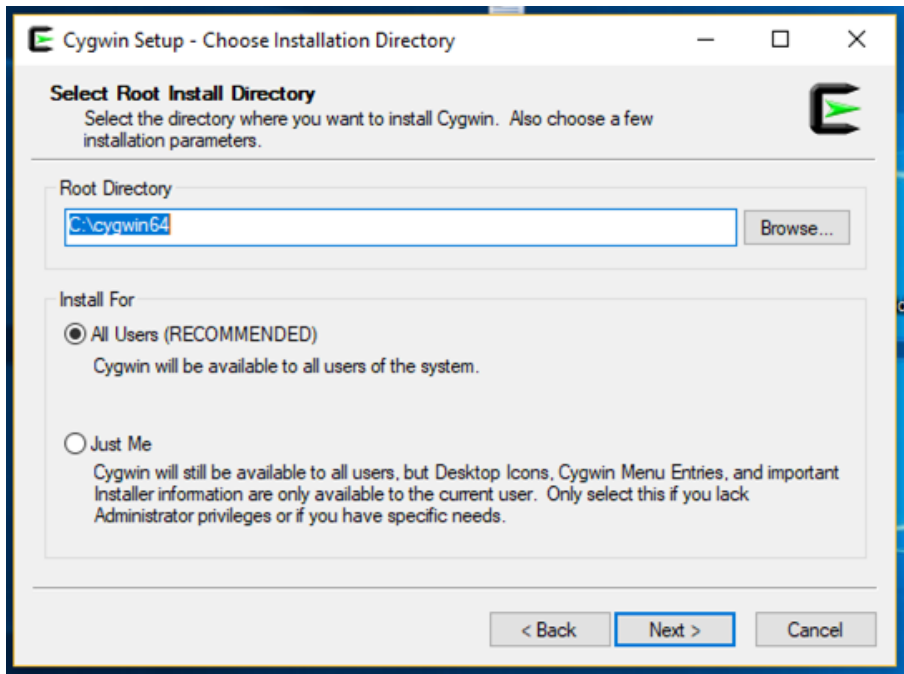


Click on next to install from internet

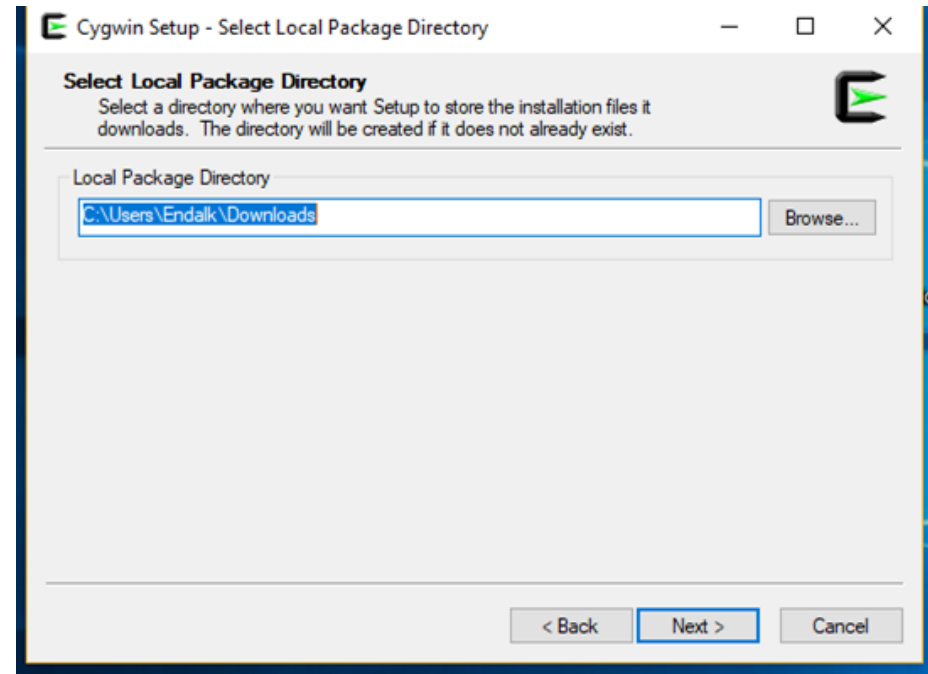


# Cygwin Installation(3/6)

Click on next to proceed with the recommended selection

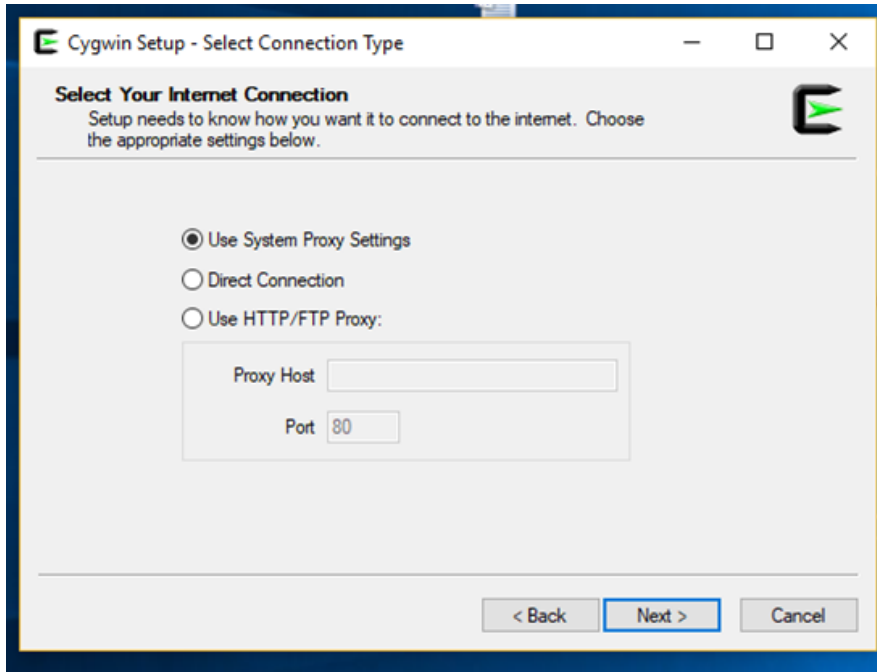


Click on next to proceed with the default installation location

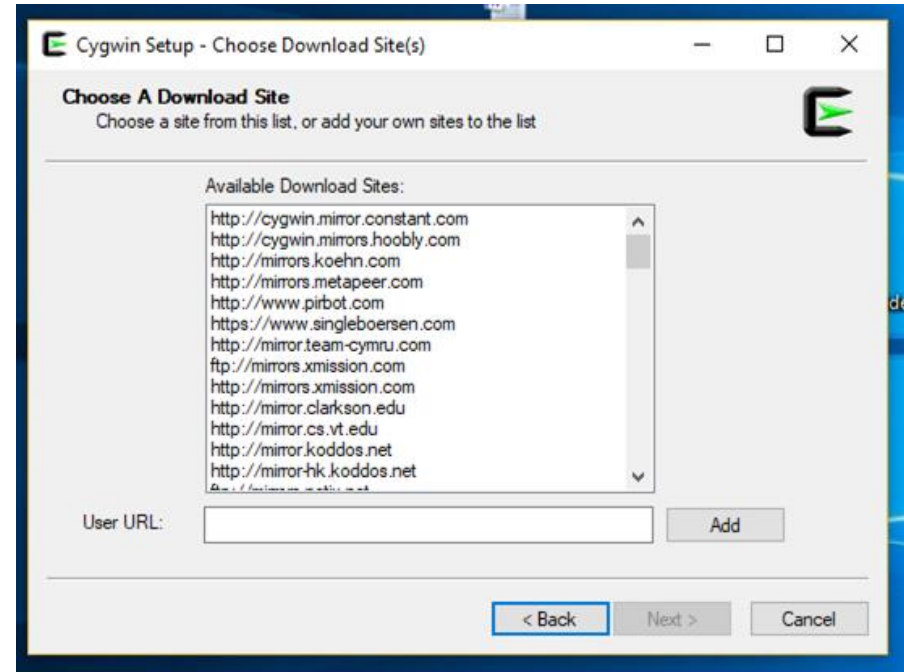


# Cygwin Installation (4/6)

Click on next to proceed with the default installation location



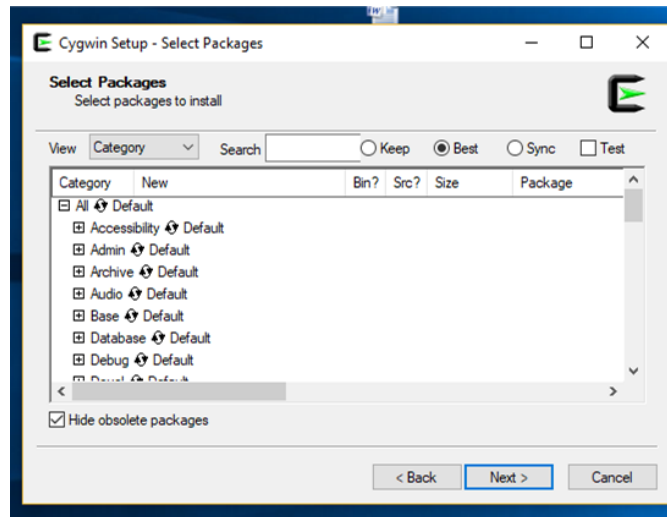
Select one of the download sites, click on next to initiate cygwin download



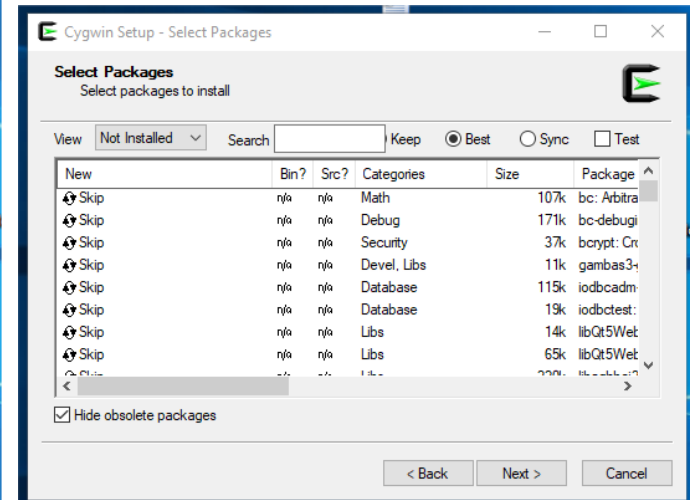


# Cygwin Installation (5/6)

a)

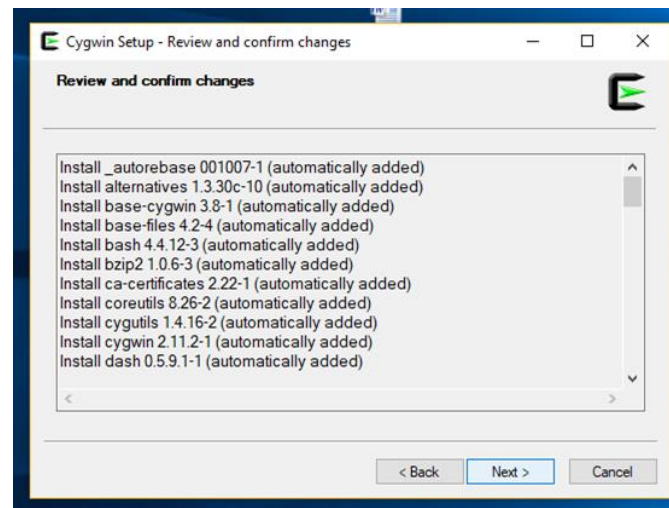


b)



Click on next to proceed with the default packages

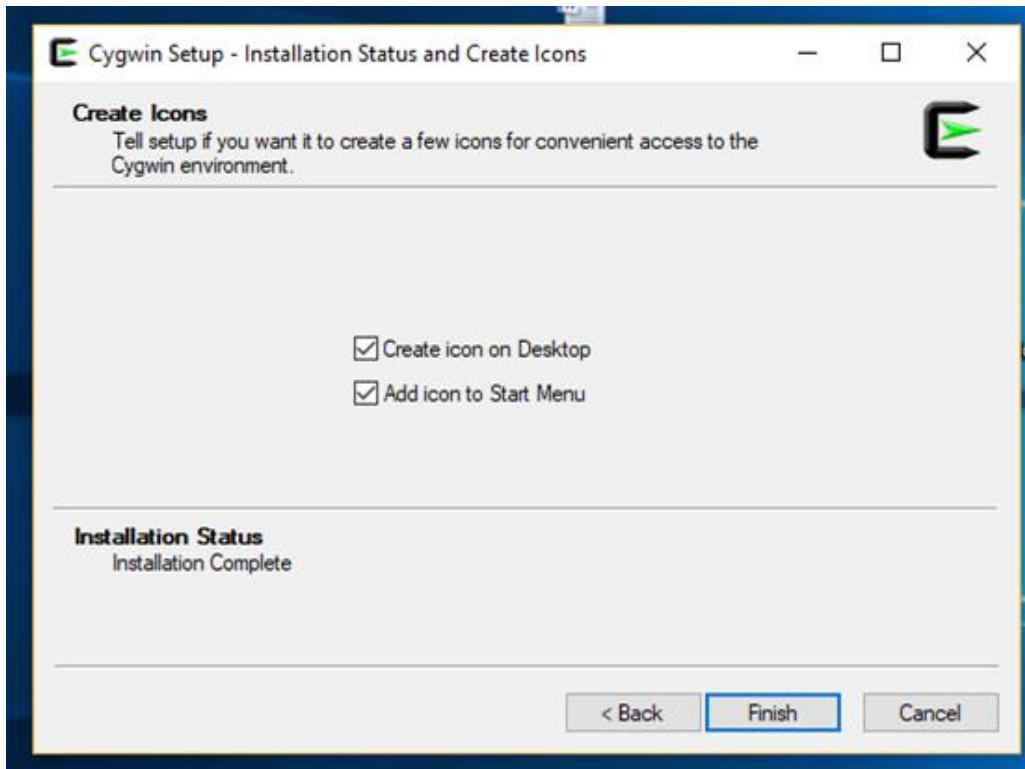
c)



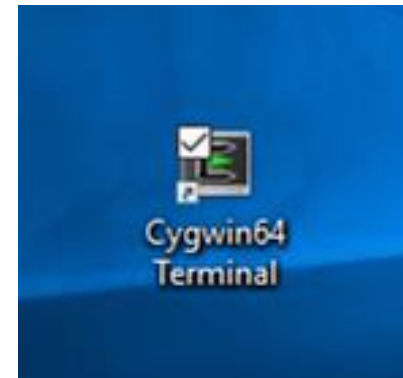
Click on next to proceed with the final cygwin installation

# Cygwin Installation (6/6)

Click on two check boxes, and finish the installation

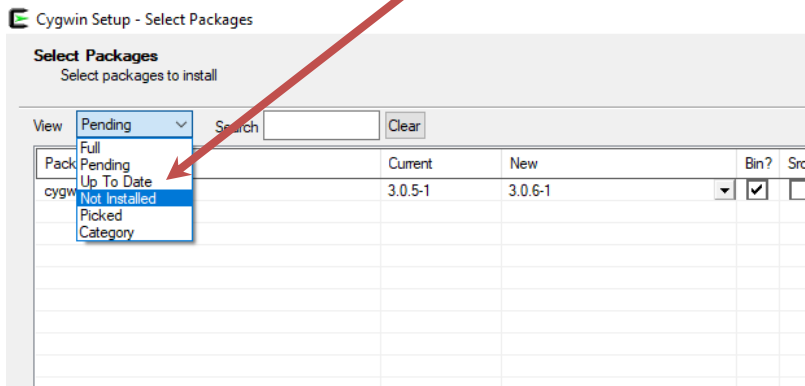


- If everything goes well, you should see the cygwin shortcut icon on your desktop:

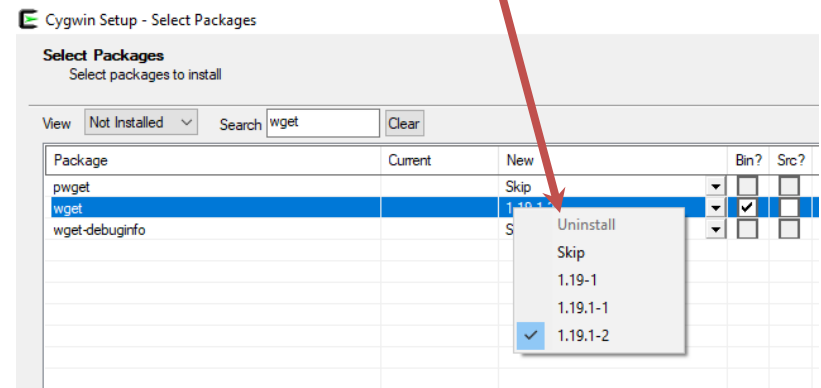


# wget installation

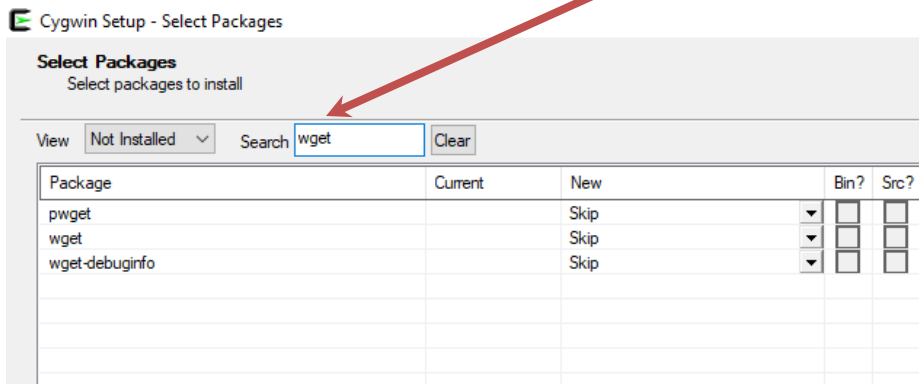
1. Using the dropdown menu, choose Not installed



3. Click on the skip next to wget, and choose the latest version(1.19.1-2)



2. Type wget next to search



# curl installation

1. Type curl next to search

Cywin Setup - Select Packages

Select Packages  
Select packages to install

View Not Installed Search  Clear

Package	Current	New	Bin?	Src?
curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>
curl-debuginfo		Skip	<input type="checkbox"/>	<input type="checkbox"/>
gambas3-gb-net-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>
libcurl-devel		Skip	<input type="checkbox"/>	<input type="checkbox"/>
libcurl-doc		Skip	<input type="checkbox"/>	<input type="checkbox"/>
libcurl4		Skip	<input type="checkbox"/>	<input type="checkbox"/>
mingw64-i686-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>
mingw64-x86_64-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>
perl-WWW-Curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>
perl-WWW-Curl-debuginfo		Skip	<input type="checkbox"/>	<input type="checkbox"/>
php-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>

2. Click on the skip next to curl, and choose the latest version(7.65.3-1)

Cywin Setup - Select Packages

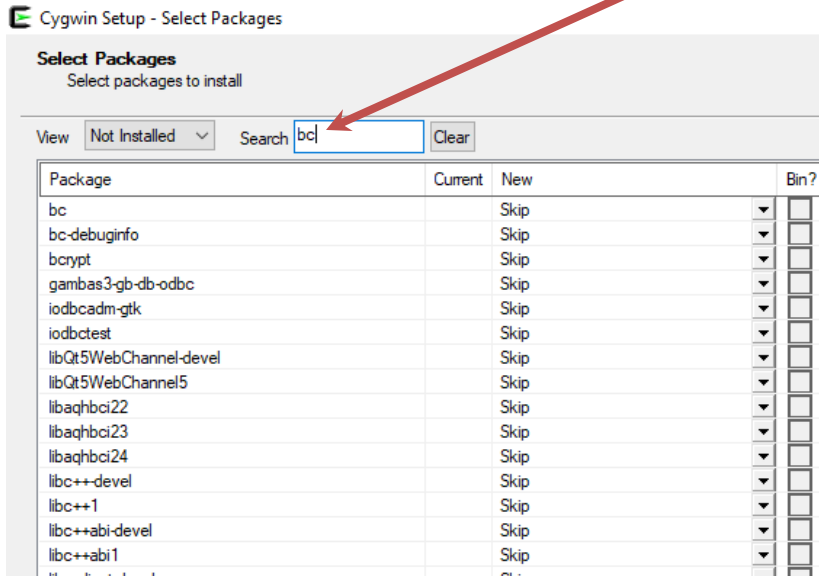
Select Packages  
Select packages to install

View Not Installed Search  Clear

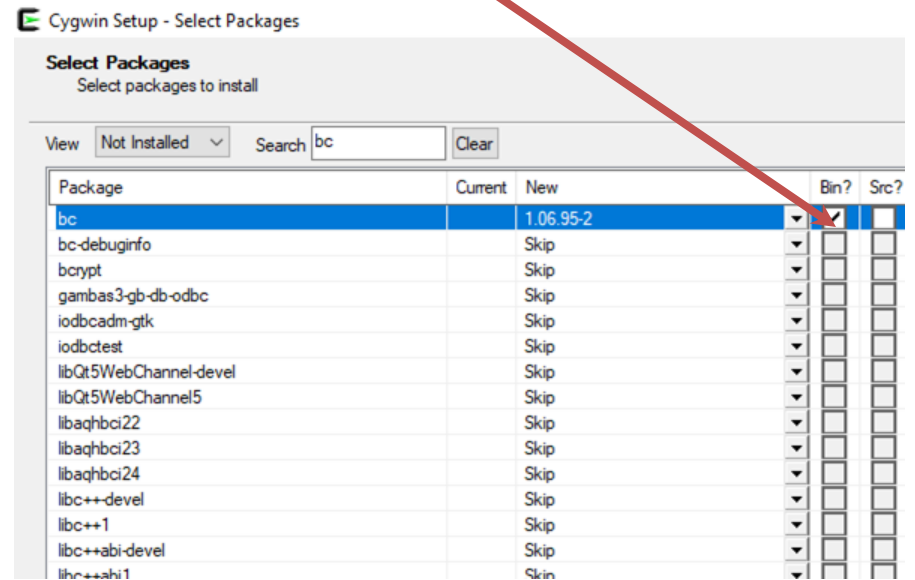
Package	Current	New	Bin?	Src?	Categories
curl		7.65.3-1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Net
curl-debuginfo		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Debug 1.
gambas3-gb-net-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Devel, Libs
libcurl-devel		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Libs
libcurl-doc		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Doc
libcurl4		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Libs
mingw64-i686-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Devel
mingw64-x86_64-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Devel
perl-WWW-Curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Perl
perl-WWW-Curl-debuginfo		Skip	<input type="checkbox"/>	<input type="checkbox"/>	Debug
php-curl		Skip	<input type="checkbox"/>	<input type="checkbox"/>	PHP

# bc installation

1. Type bc next to search

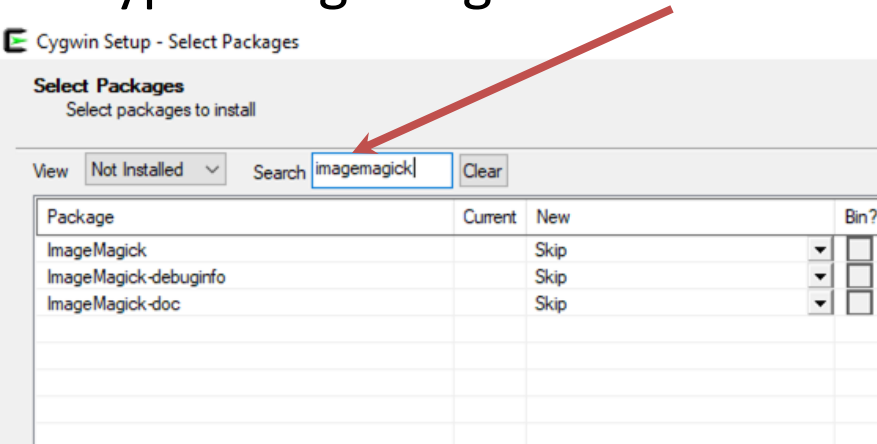


2. Click on the skip next to bc, and choose the latest version(1.06.95-2)

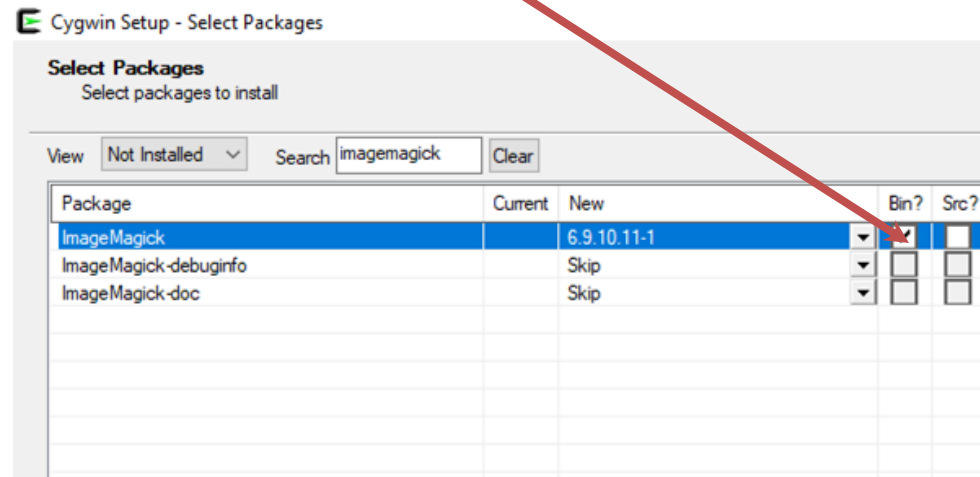


# ImageMagick installation

1. Type imagemagick next to search

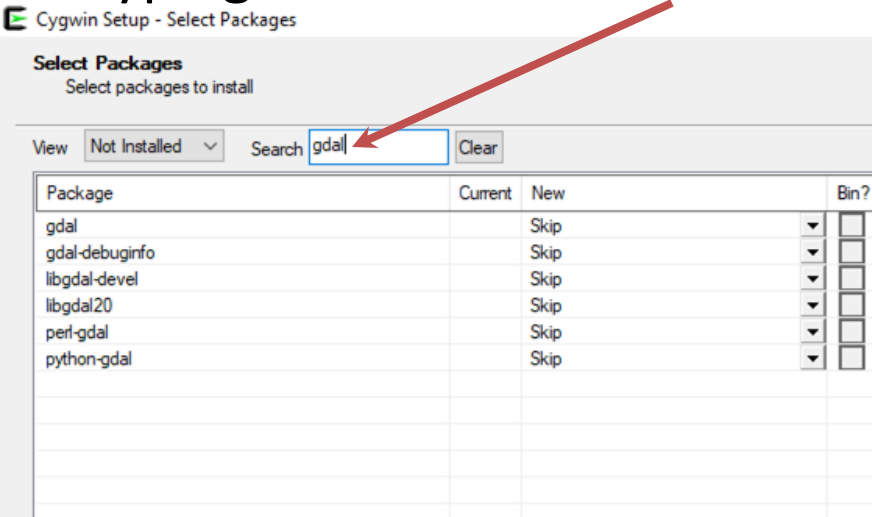


2. Click on the skip next to imagemagick, and choose the latest version(6.9.10.11-1)

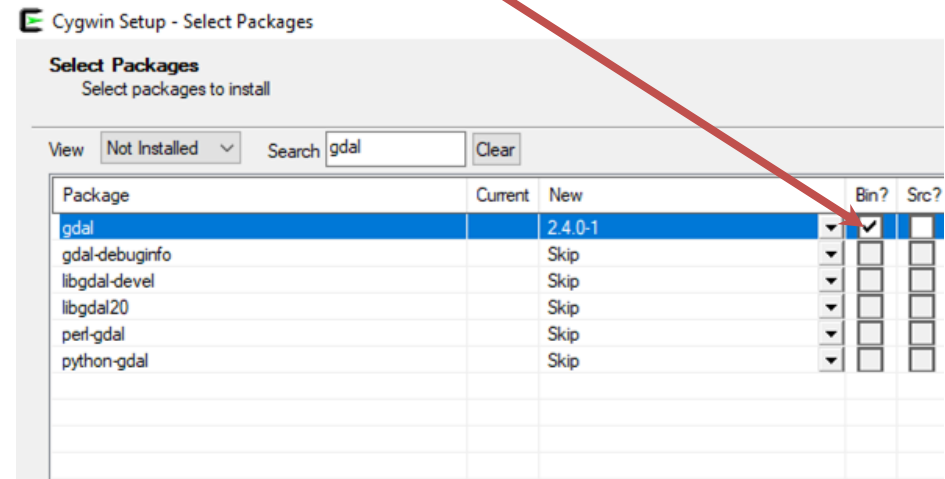


# gdal installation

1. Type gdal next to search



2. Click on the skip next to gdal, and choose the latest version(2.4.0-1)



3. Click on next several times to finalize your installation

# GNU GFORTRAN Installation (1/1)

<https://gcc.gnu.org/wiki/GFortranBinaries>

- Download the latest executable file to install GFORTRAN compiler

## Windows

If in doubt, or if you don't know what Cygwin and MinGW are, the package for you is the MinGW ("native Windows") package!

- **MinGW for Win64:** The [Mingw-w64](#) project has regularly updated [snapshots](#) of compilers generating 64-bit Windows executables. They provides several compilers, which run on Windows (32-bit and 64-bit Windows), Cygwin, Linux, and Darwin/MacOS - and which generate binaries for 32bit or 64bit Windows. The file name pattern is `<target>-<host>-<option-version>-<date>`; thus, `mingw-w64-bin_x86_64-mingw_20100527.zip` is a compiler targeting 64bit Windows (`mingw-w64`) but also running ("host") on 64bit Windows (`xx86-64-mingw`); you might search for the file in `Toolchains` targeting Win64 (Personal Builds or Automatized Builds).
- **MinGW build** ("native Windows" build)
  - **Official** [MinGW builds](#) (only releases), [last seen was 6.3.0](#) (2017-05-30)
  - The *MinGW for Win64* project has also [binaries for 32bit Windows](#); e.g. `mingw-w32-bin_i686-mingw_<date>.zip` runs on and generates binaries for 32bit Windows (cf. above); you might search for the file in `Toolchains` targeting Win32 (Personal Builds or Automatized Builds).
  - Unofficial build of current development (GCC 5) source. Download the latest [installer](#) (dated 2014-06-29). It's very easy to use (basically, just click on the OK buttons), but [some detailed info](#) is also available. These binaries work on Windows XP and later versions.
- [TDM GCC: MinGW/MinGW-W64 Builds](#)
- MinGW 32/64bit builds by [www.Equation.com](#) (builds were announced at `comp.lang.fortran`; note - `equation.com` is not affiliated with any MinGW or GCC developer. Use at your own risk)
- **Cygwin:** The [Cygwin](#) project offers up-to-date builds of GCC and gfortran

- In your download folder, double click on **gfortran-windows-20140629.exe** to initiate the GFORTRAN compiler installation.
- Click on " I agree" and next, click on close to finish the installation
- Open the cygwin window, and type gfortran to verify your gfortran installation

- The message that looks like the screenshot on the right verifies successful installation of GFORTRAN

```
$ gfortran
gfortran.exe: fatal error: no input files
compilation terminated.

Endalk@Endalk_LT_01d ~
$ |
```



# Notepad++ Installation (1/2)

<https://notepad-plus-plus.org/download/v7.6.3.html>

- Click on the appropriate link to download the installation files

**Notepad++ Installer 32-bit x86:** Take this one if you have no idea which one you should take.

- **Notepad++ zip package 32-bit x86:** Don't want to use installer? Check this one (zip format).
- **Notepad++ 7z package 32-bit x86:** Don't want to use installer? 7z format.
- **Notepad++ minimalist package 32-bit x86:** No theme, no plugin, no updater, quick download and play directly. 7z format.
- **SHA-256/SHA-1/MD5 digests for binary packages:** Check it if you're paranoid.

## Download 64-bit x64

- **Notepad++ Installer 64-bit x64:** Take this one if you have no idea which one you should take.
- **Notepad++ zip package 64-bit x64:** Don't want to use installer? Check this one (zip format).
- **Notepad++ 7z package 64-bit x64:** Don't want to use installer? 7z format.
- **Notepad++ minimalist package 64-bit x64:** No theme, no plugin, no updater, quick download and play directly. 7z format.
- **SHA-256/SHA-1/MD5 digests for binary packages:** Check it if you're paranoid.

Download **Notepad++ source code** of current version and/or check **sha-256/sha1/md5 digests** for binary packages on GitHub

- In your download folder, double click on **npp.7.6.3.Installer.x64.exe** to initiate notepad++ installation.
- Accept the agreement, and click next several times to agree with the default setup.

# Notepad++ Installation (2/2)

<https://notepad-plus-plus.org/download/v7.6.3.html>

- You need to set alias and environment variable to have access notepad++ from your cygwin terminal
- Go to you cygwin home folder (C:\cygwin64\home\your user name)
- Open **.bashrc** using your favorite text editor
- Scroll down to the end and add the following two lines, and save and exit:

```
188 # [[ ${x2:0:1} == '~' ]] && x2="${HOME}${x2:1}"
189 # if [[ "${x2}" == "${the_new_dir}" ]]; then
190 #     popd -n +$cnt 2>/dev/null 1>/dev/null
191 #     cnt=cnt-1
192 #     fi
193 # done
194 #
195 # return 0
196 # }
197 #
198 # alias cd=cd_func
199
200 export EDITOR="/cygdrive/C/Program\ Files/Notepad++/Notepad++.exe"
201 alias npp="/cygdrive/C/Program\ Files/Notepad++/Notepad++.exe"
202
```

```
export EDITOR="/cygdrive/C/Program\ Files/Notepad++/Notepad++.exe"alias
npp="/cygdrive/C/Program\ Files/Notepad++/Notepad++.exe"
```

- This allows you to run notepad++ from your cygwin window (typing npp)

# Installation of OpenGrADS

- Download opengrads installation file from:

[https://sourceforge.net/projects/opengrads/files/grads2/2.0.2.oga.2/Windows/grads-2.0.2.oga.2-win32\\_superpack.exe](https://sourceforge.net/projects/opengrads/files/grads2/2.0.2.oga.2/Windows/grads-2.0.2.oga.2-win32_superpack.exe)

- In your download folder,
  - Double click [grads-2.0.2.oga.2-win32\\_superpack.exe](#) to initiate the GrADS installation.
  - Click on English, next, and select I agree and click on next.
  - Click on next several times to initiate the installation.
- If your installation is successful, you should see GrADS shortcut icon on your desktop.
- Open the cygwin window and type **grads -p** to verify installation of GrADS.
- If the GrADS display window opens, it confirms successful installation of GrADS.

# Prerequisite Packages for Linux Users

- perl
- GNU bc Maths
- GNU Fortran
- ImageMagick
- GDAL
- openGrADS

# Installing Perl-Env and Gnu bc Precision

- Install perl-Env

- `sudo apt-get install perl-Env` (Debian/Ubuntu users)
- `sudo yum install perl-Env` (RHEL/CentOS users)
- `sudo dnf install perl-Env` (Fedora 22+ users)

- Install gnu precision calculator (bc)

- `sudo apt-get install bc` (Debian/Ubuntu users)
- `sudo yum install bc` (RHEL/CentOS users)
- `sudo dnf install bc` (Fedora 22+ users)

# Installing **gfortran** and **ImageMagick**

- **Install gfortran compiler**
  - `sudo apt-get install gcc-gfortran` (Debian/Ubuntu users)
  - `sudo yum install gcc-gfortran` (RHEL/CentOS users)
  - `sudo dnf install gcc-gfortran` (Fedora 22+ users)
- **Install ImageMagick**
  - `sudo apt-get install imagemagick` (Debian/Ubuntu users)
  - `sudo yum install ImageMagick` (RHEL/CentOS users)
  - `sudo dnf install ImageMagick` (Fedora 22+ users)

# Installing GDAL

- For Debian/Ubuntu users
  - `sudo add-apt-repository ppa:ubuntugis/ppa`
  - `sudo apt-get update`
  - `sudo apt-get install gdal-bin`
- For Fedora 22+ Users:
  - `sudo dnf copr enable neteler/GDAL`
  - `sudo dnf update`
  - `sudo dnf install gdal gdal-python gdal-devel`
- For RHEL/CentOS Users:
  - `sudo wget -O /etc/yum.repos.d/gdal-copr.repo https://copr.fedoraproject.org/coprs/neteler/GDAL/repodata/epel-7/neteler-GDAL-epel-7.repo`
  - `sudo yum update`
  - `sudo yum install gdal gdal-python gdal-devel`

# Installing OpenGrADS

- Using your linux terminal change your directory to /usr/local/bin, by typing  
`cd /usr/local/bin`

- Download grads package using:

```
sudo wget
```

```
https://sourceforge.net/projects/opengrads/files/grads2/2.0.2.oga.2/Linux/grads-2.0.2.oga.2-bundle-x86\_64-unknown-linux-gnu.tar.gz
```

- Unpack the package using:

```
sudo tar -xzvf grads-2.0.2.oga.2-bundle-x86_64-unknown-linux-gnu.tar.gz
```

- Copy GrADS binaries and associated files into the current folder:

```
sudo cp -rf opengrads-2.0.2.oga.2/Contents/* .
```

- You may remove the unwanted files and folders:

```
sudo rm -rf opengrads-2.0.2.oga.2
```

```
sudo rm -rf grads-2.0.2.oga.2-bundle-x86_64-unknown-linux-gnu.tar.gz
```

- Test your GrADS installation:

- Close and reopen the terminal and type `grads -p`
- your installation is successful, if GrADS runs without error message



# Prerequisite Packages for Mac Users

perl

gcc

GNU bc Maths

curl

wget

GNU Fortran

GDAL

ImageMagick

gedit

XQuartz

openGrADS

# Pre-Installed packages

Usually Mac comes with preinstalled packages such as: **perl**, **gcc**,**bc**,and **curl**. You may check this out typing:

```
which perl; echo $?
```

```
which gcc; echo $?
```

```
which bc; echo $?
```

```
which curl; echo $?
```

For each of these command lines, check status number display on the terminal:  
if you see 0, then the package is installed; but if you have 1, the package is not installed.

# Missing packages

You may not have some packages on your Mac such as: **wget**, **gfortran**, **GDAL**, **ImageMagick**, **gedit**, **Xquartz** and **Grads** (openGrADS).

---

➤ For **wget** and **gfortran**, check out by typing:

```
which wget; echo $?
```

```
which gfortran; echo $?
```

---

➤ For **GDAL**, check if **gdal\_rasterize** is install:

```
which gdal_rasterize; echo $?
```

---

➤ For **ImageMagick**, check if **convert** is install:

```
which convert; echo $?
```

---

➤ For **gedit**, **XQuartz** and **GrADS** (openGrADS), check by typing:

```
which gedit; echo $?
```

```
which xquartz; echo $?
```

```
which grads; echo $?
```

---

For each of these command lines, check status number display on the terminal:  
**if you see 0, then the package is installed; but if you have 1, the package is not installed.**

# Installing or Updating HomeBrew

Your password may be required

- to make sure that you have homebrew install and up to date, using your terminal, enter the following command line and press enter:

```
ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)" < /dev/null 2> /dev/null
```

# Installing : wget, gfortran and gdal

Your password may be required

- Install wget :

**brew install wget**

To check if the installation was completed, in terminal type **wget** and press enter. The tools is correctly install if you see the following message:

*wget: missing URL*

*Usage: wget [OPTION]... [URL]...*

- Install gfortran :

**brew cask install gfortran**

To check if the installation was completed, in terminal type **gfortran** and press enter. The tools is correctly install if you see the following message:

*gfortran: fatal error: no input files*

*compilation terminated*

then you successfully installed gfortran

- Install gdal :

**brew install gdal**

To check if the installation was completed, in terminal type **gdal\_rasterize** and press enter. The tools is correctly install if you see the following message:

*ERROR 6: One and only fone of -3d, -burn or -a is required.*

*Usage: gdal\_rasterize []\* [-i] [-at] ...*

# Installing ImageMagick, gedit and XQuartz

Your password may be required

- Install ImageMagick :

**brew install imagemagick**

To check if the installation succeed, in terminal type **which convert; echo \$?** and press enter. ImageMagick is correctly installed if you see the following message:

```
/usr/local/bin/convert  
0
```

- Install gedit :

**brew install gedit or brew cask install gedit**

To check if the installation was completed, in terminal type **which gedit; echo \$?** and press enter. gedit is correctly installed if you see the following message:

```
/usr/local/bin/gedit  
0
```

- Install XQuartz:

**brew install xquartz or brew cask install xquartz**

To check if the installation was completed, in terminal type **which XQuartz; echo \$?** and press enter. XQuartz is correctly installed if you see the following message:

```
/opt/X11/bin/xquartz  
0
```

# Installing GrADS (opengrads)

**Your password may be required**

- Using your linux terminal change your directory to /usr/local/bin, by typing  
`cd /usr/local/bin`
- Download grads package using:  
`sudo wget`  
[https://sourceforge.net/projects/opengrads/files/grads2/2.0.2.oga.2/Mac%20OS%20X/grads-2.0.2.oga.2-bundle-x86\\_64-apple-darwin13.2.0.tar.gz](https://sourceforge.net/projects/opengrads/files/grads2/2.0.2.oga.2/Mac%20OS%20X/grads-2.0.2.oga.2-bundle-x86_64-apple-darwin13.2.0.tar.gz)
- Unpack the package using:  
`sudo tar -xzvf grads-2.0.2.oga.2-bundle-x86_64-apple-darwin13.2.0.tar.gz`
- Copy GrADS binaries and associated files into the current folder:  
`sudo cp -rf grads-2.0.2.oga.2/Contents/* .`
- You may remove the unwanted files and folders:  
`sudo rm -rf grads-2.0.2.oga.2`  
`sudo rm -rf grads-2.0.2.oga.2-bundle-x86_64-unknown-linux-gnu.tar.gz`
- Test your GrADS installation:
  - Close and reopen the terminal and type `grads -p`
  - your installation is successful, if GrADS runs without error message