# Pre-Workshop Setup

To participate in the eReefs Dashboard workshop you will need access to the software described below. You will also need an up-to-date web browser. Most of you will need an IT administator from your organisation to help you install this software, but for those of you who have your own computer or admin rights to your work computer the instructions below should be detailed enough to get you up and running.

Due to time constraints on this initial workshop we may not use all of the software that we're asking you to pre-install. So why do we ask you to install it? We are asking you to install it as it's a generic stack of scientific computing tools that will be useful for you to use some of the materials we will provide for you to take away and investigate on your own.

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## Text Editor

When you're writing code, it's nice to have a text editor that is optimized for writing code, with features like automatic color-coding of key words. The default text editor on Mac OS X and Linux is usually set to Vim, which is not famous for being intuitive. If you accidentally find yourself stuck in it, try typing the escape key, followed by ':q!' (colon, lower-case 'q', exclamation mark), then hitting Return to return to the shell.

### Windows

[Notepad++](http://notepad-plus-plus.org/) is a popular free code editor for Windows.

### Mac OS X

We recommend [Text Wrangler](http://www.barebones.com/products/textwrangler/) or [Sublime Text](http://www.sublimetext.com/). In a pinch, you can use nano, which should be pre-installed.

### Linux

[Kate](http://kate-editor.org/) or [Atom](https://atom.io/) are nice options for Linux users. In a pinch, you can use nano, which should be pre-installed.

## The Bash Shell

Bash is a commonly-used [shell](https://en.wikipedia.org/wiki/Unix_shell) that gives you the power to do simple tasks more quickly. We are installing this system upfront but we may bot use it in the workshop.

### Windows

Install [Git for Windows](http://msysgit.github.io/) by download and running the installer. This will provide you with both Git and bash in the Git Bash program.

#### Software Carpentry Windows Installer

The Software Carpentry Windows Installer helps mimic a \*nix environment on Windows with as little work as possible.

It installs and configures the nano text editor ([Among other things](http://github.com/swcarpentry/windows-installer)). *This installer requires an active internet connection.*

After installing Git Bash: \* Download the [Software Carpentry Windows installer](http://files.software-carpentry.org/SWCarpentryInstaller.exe). \* Double click on the file to run it.

### Mac OS X

The default shell in all versions of Mac OS X is bash, so no need to install anything. You access bash from the Terminal (found in /Applications/Utilities).

### Linux

The default shell is usually bash, but if your machine is set up differently you can run it by opening a terminal and typing bash. There is no need to install anything.

## Git

Git is a [version control system](https://en.wikipedia.org/wiki/Revision_control) that lets you track who made changes to what when and it has options for easily updating a shared or public version of your code on [github.com](www.github.com). You will need a supported web browser (current versions of Chrome, Firefox or Safari, or Internet Explorer version 9 or above).

### Windows

Git should be installed on your computer as part of your Bash install (described above).

### Mac OS X

**For OS X 10.8 and higher**, install Git for Mac by downloading and running the [installer](http://sourceforge.net/projects/git-osx-installer/files/latest/download). After installing Git, there will not be anything in your /Applications folder, but it will be available as git at the command line (the shell).

**For older versions of OS X (10.5-10.7)** use the most recent available installer for your OS [available here](http://sourceforge.net/projects/git-osx-installer/files/). Use the Leopard installer for 10.5 and the Snow Leopard installer for 10.6-10.7.

### Linux

If Git is not already available on your machine you can try to install it via your distro's package manager. For Debian/Ubuntu run sudo apt-get install git and for Fedora/Centos/RHEL run sudo yum install git.

### Basic Git Configuration

It's a good idea to do some simple configuration of your git environment right away so that you're git install knows who you are and can keep track of things correctly.

Open your bash shell and type the following commands, with your name where Your Name is and your email address where your@email.address is:

git config --global user.name "Your Name"  
git config --global user.email "your@email.address"

## Python

[Python](python.org) is a popular language for scientific computing, and great for general-purpose programming as well. We use Python to interact with the data servers and will be teaching a series of simple examples in Python at the workshop. Python has a bunch of pre-made packages to do commonly used operation. Installing all of its scientific packages individually can be a bit difficult, so we recommend an all-in-one installer.

Regardless of how you choose to install it, **please make sure you install Python version 2.x and not version 3.x** (e.g., 2.7 is fine but not 3.4). Python 3 introduced changes that will break some of the code we teach during the workshop.

### Windows

Download and install the [Anaconda all-in-one python system](https://store.continuum.io/cshop/anaconda/). Download the FREE default Python 2 installer (do not follow the link to version 3). Use all of the defaults for installation except **be sure to check "Make Anaconda the default Python"**.

### Mac OS X

Download and install the [Anaconda all-in-one python system](https://store.continuum.io/cshop/anaconda/). Download the FREE default Python 2 installer (do not follow the link to version 3). Use all of the defaults for installation except **be sure to check "Make Anaconda the default Python"**.

### Linux

We recommend the [all-in-one scientific Python installer Anaconda](https://store.continuum.io/cshop/anaconda/). (Installation requires using the shell and if you aren't comfortable doing the installation yourself just download the installer and we'll help you at the workshop, assuming you have permission to install software on your machine.)

1. Download the installer that matches your operating system and save it in your home folder. Download the default Python 2 installer (do not follow the link to version 3).
2. Open a terminal window.
3. Type: bash Anaconda- and then press tab. The name of the file you just downloaded should appear.
4. Press enter. You will follow the text-only prompts. When there is a colon at the bottom of the screen press the down arrow to move down through the text. Type yes and press enter to approve the license. Press enter to approve the default location for the files. Type yes and press enter to prepend Anaconda to your PATH (this makes the Anaconda distribution the default Python).

### Additional Python Packages

Most of the packages you will need for the workshop have been installed when you installed anaconda, but you will need a couple of others to be able to connect to the Bureau's data thredds and opendap systems.

The main python package you will need is pydap. pydap allows you to connect use opendap to query the eReefs thredds data catalog from within python. After you have completed one of the above python installs please run the following command in your bash shell terminal.

pip install pydap

## Panoply

A useful piece of softawre for interacting with the eReefs dataset is Panoply. Panoply is an application that plots geo-referenced data arrays from netCDF, HDF, GRIB, and other datasets.

The Panoply homepage says that: With Panoply you can: - Slice and plot geo-referenced latitude-longitude, latitude-vertical, longitude-vertical, time-latitude or time-vertical arrays from larger multidimensional variables. - Slice 1D arrays from larger multidimensional variables and create line plots. - Combine two geo-referenced arrays in one plot by differencing, summing or averaging. - Plot lon-lat data on a global or regional map using any of over 100 map projections or make a zonal average line plot. - Overlay continent outlines or masks on lon-lat map plots. - Use any of numerous color tables for the scale colorbar, or apply your own custom ACT, CPT, or RGB color table. - Save plots to disk GIF, JPEG, PNG or TIFF bitmap images or as PDF or PostScript graphics files. - Export lon-lat map plots in KMZ format. - Export animations as AVI or MOV video or as a collection of invididual frame images. - Explore remote THREDDS and OpenDAP catalogs and open datasets served from them.

#### Download and Install from:

<http://www.giss.nasa.gov/tools/panoply/>

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## Testing the setup

There are two scripts to run to test your machine to make sure you have the software you'll need for your workshop installed.

To use these scripts:

1. Download eReefs-installation-test-1.py
2. Run it from the shell:

$ python eReefs-installation-test-1.py  
 Passed

1. Download eReefs-installation-test-2.py.
2. Run it from the shell:

$ python swc-installation-test-2.py  
 check virtual-shell... pass  
 ...  
 Successes:  
  
 virtual-shell Bourne Again Shell (bash) 4.2.37  
 ...

If you see something like:

$ python swc-installation-test-2.py  
check virtual-shell... fail  
...  
check for command line shell (virtual-shell) failed:  
 command line shell (virtual-shell) requires at least one of the following dependencies  
 For instructions on installing an up-to-date version, see your install instructions.  
 causes:  
 check for Bourne Again Shell (bash) failed:  
 could not find 'bash' executable for Bourne Again Shell (bash)  
 For instructions on installing an up-to-date version, see  
...

follow the suggestions to try and install any missing software. For additional troubleshooting information, you can use the --verbose option:

$ python eReefs-installation-test-2.py --verbose  
check virtual-shell... fail  
...  
==================  
System information  
==================  
os.name : posix  
...

## Troubleshooting

Participants must bring a laptop with the above specific software packages installed before the workshop starts. We do not have time to work on installing this software during the workshop. If you are having trouble installing this software or need more information please contact Jamie Treleaven (J.Treleaven[at]bom.gov.au).