

RESEARCH TOOLS 2011

LECTURE 10

2011-Sept-29

Kurt Schwehr

<http://schwehr.org>

UNH CCOM/JHC

QGIS, bash script, Healy animated gif, ipython, matplotlib

- #+STA
#+TIT
#+AUT
5-filetypes-emacs.org
- tar
examples-20110913.tar
- #+TIT
#+DAT
#+AUT
Lic
video-4.org
- Dropbox
- hw
- screenshot
- #+STA
#+TIT
#+AUT
9-bash-scripting.org

Class 10: QGIS, bash variables, writing a bash script file, ipython+matplotlib - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Class 10: QGIS, bash variables, ...

http://vislab-ccom.unh.edu/~schwehr/rt/10-qgis-ba

Most Visited Getting Started Latest Headlines

Setup for today's class

You can do this one of 3 ways. You pick.

- Open a terminal and paste in the command
- Open a shell inside of emacs and paste in the command

```
mkdir -p ~/class/10
cd ~/class/10
wget http://vislab-ccom.unh.edu/~schwehr/rt/src/10-qgis-bash-python.org
```

Open the org file for lecture 10.

Creating today's work log entry **org** journaling

I will walk through creating an entry for today's research tools class. Follow along. I have pre-written some of the entry so I don't try to type it all in front of the class. You can include the text from another file into the current location in a buffer by doing C-x i

Who edited their bash alias?



```

/home/researchtools/class/10:
total used in directory 24 available 11681524
drwxr-xr-x 2 researchtools researchtools 4096 2011-09-29 09:15 .
drwxr-xr-x 4 researchtools researchtools 4096 2011-09-29 09:14 ..
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-python.org

```

-U:%%- 10 All L6 (Dired by name)-----5081/15081]

```

/home/researchtools/class/10:
total used in directory 24 available 11681524
drwxr-xr-x 2 researchtools researchtools 4096 2011-09-29 09:15 .
drwxr-xr-x 4 researchtools researchtools 4096 2011-09-29 09:14 ..
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-python.org

```

-U:%%- 10 All L5 (Dired by name)-----

Find file: ~/class/10/

```

...wehr/rt/src
10-qgis-bash
...
in 0.002s
5081/15081]

```



```

researchtools@ubuntu:~$
#+END_EXAMPLE

It is important to reboot the virtual machine after doing an update.
It is not strictly required and most updates do not need the Ubuntu
virtual machine to reboot, but it is a good habit.

#+BEGIN_SRC sh
sudo reboot
#+END_SRC

* If the date of your virtual machine is way off                    :ntp:time:

If the date of your virtual machine is way off from when "now" really
is, use this command to jump the sense of time to get in sync with now.
The "wilmot" computer is the UNH time server.

#+BEGIN_SRC sh
sudo ntpdate ntp.ubuntu.com
#+END_SRC

The output should look something like this, but with much bigger jumps.

#+BEGIN_EXAMPLE
29 Sep 06:14:35 ntpdate[9861]: adjust time server 91.189.94.4 offset 0.045046 sec
#+END_EXAMPLE

*NOTE:* "NTP" stands for network time protocol. See: http://ntp.org
or NTP on Wikipedia.

```

```

...wehr/rt/src
10-qgis-bash
...
in 0.002s
5081/15081]
589.620086 s

```



Today, we will get a brief view of Quantum GIS (QGIS), look at shell variables, create a "animated GIF" movie from the USCG Ice Breaker Healy's Aloftcon camera, and try out ipython with matplotlib.

* Setup for today's class

You can do this one of 3 ways. You pick.

- Open a terminal and paste in the command
- Open a shell inside of emacs and paste in the command

```
#+BEGIN_SRC sh
mkdir -p ~/class/10
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wget http://vislab-ccom.unh.edu/~schwehr/rt/src/10-qgis-bash-python.org
#+END_SRC
```

Open the org file for lecture 10.

* Creating today's work log entry :org:journalling:

I will walk through creating an entry for today's research tools class. Follow along. I have pre-written some of the entry so I don't try to type it all in front of the class. You can include the text from another file into the current location in a buffer by doing =C-x i=

* Who edited their .bash_alias?

Did you watch all 4 YouTube videos? If you have not, you really need to watch them right away. Seriously!

<http://www.youtube.com/playlist?list=PL7E11B34616530F5E>



```

emacs23@ubuntu
File Edit Options Buffers Tools Org Tbl Help

mkdir -p ~/class/10
cd ~/class/10
wget http://vislab-ccom.unh.edu/~schwehr/rt/src/10-qgis-bash-python.org
#+END_SRC

Open the org file for lecture 10.

* Creating today's work log entry                                :org:journalling:

I will walk through creating an entry for today's research tools
class. Follow along. I have pre-written some of the entry so I don't
try to type it all in front of the class. You can include the text
from another file into the current location in a buffer by doing =C-x i=

* Who edited their .bash\_alias?

--:**- 10-qgis-bash-python.org 7% L39 (Org)-----
became just over 1 hour. Used audacity for the editing.

- [X] export to mp3
- [X] export to m4a
- [X] export to ogg
- [X] upload to web to audio
- [X] update HEADER.org and run "make push"

--:**- researchtools-schwehr.org Bot L28 (Org)-----
C-x-

```

```

schwehr/rt/src
10-qgis-bash
in 0.002s
5081/15081]
589.620086 s

```



```
mkdir -p ~/class/10
cd ~/class/10
wget http://vislab-ccom.unh.edu/~schwehr/rt/src/10-qgis-bash-python.org
#+END_SRC

Open the org file for lecture 10.

* Creating today's work log entry :org:journalling:

I will walk through creating an entry for today's research tools
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from another file into the current location in a buffer by doing =C-x i=

* Who edited their .bash\_alias?
```

--:**- 10-qgis-bash-python.org 7% L39 (Org)-----

```
█

- [ ] Make an entry for Geo0c. Make sure to tag with "teaching"
- [ ] Export the log entry and see how it looks
- [ ] Have the students create ~/class/10.
- [ ] Put the org file in that directory.
- Having the org file for the lecture somewhere else was too confusing
- [ ] Run through making journal entry
- [ ] Demo QGIS using the kml from lecture 9
- [ ] Show bash variables and how they are somewhat strange
- [ ] Walk through the syntax of the for loop in bash
- [ ] Using imagemagick convert to make an animated gif
- [ ] Get to python ASAP! Start people into =ipython -pylab=
```

--:**- researchtools-schwehr.org Bot L27 (Org)-----

```
schwehr/rt/src
10-qgis-bash
in 0.002s
5081/15081]
589.620086 s
```

```

emacs23@ubuntu
File Edit Options Buffers Tools Minibuf Help
** An entry :dog:
** another entry
* Sept 28, NH <2011-09-29 Thu> :day:
** Edit the audio for lecture 9 :audacity:podcast:
Edited the audio file from the sansa clip: VORC012.WAV. 2 hours
became just over 1 hour. Used audacity for the editing.
- [X] export to mp3
- [X] export to m4a
- [X] export to ogg
- [X] upload to web to audio
- [X] update HEADER.org and run "make push"
* Sept 29, CCOM, NH []
- [ ] Make an entry for Geo0c. Make sure to tag with "teaching"
- [ ] Export the log entry and see how it looks
- [ ] Have the students create ~/class/10.
- [ ] Put the org file in that directory.

```

```

--:**- researchtools-schwehr.org 15% L27 (Org)-----
August 2011          September 2011          October 2011
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
  1  2  3  4  5  6      1  2  3      1
  7  8  9 10 11 12 13    4  5  6  7  8  9 10    2  3  4  5  6  7  8
14 15 16 17 18 19 20    11 12 13 14 15 16 17    9 10 11 12 13 14 15
21 22 23 24 25 26 27    18 19 20 21 22 23 24    16 17 18 19 20 21 22
28 29 30 31            25 26 27 28 29 30    23 24 25 26 27 28 29
                               30 31
< Calendar ? info / o other / . today Thu, Sep 29, 2011 >
Date+time [2011-09-29]: => <2011-09-29 Thu>

```

```

wehr/rt/src
10-qgis-bash
in 0.002s
5081/15081]
589.620086 s

```




** An entry :dog:

** another entry

* Sept 28, NH <2011-09-29 Thu> :day:

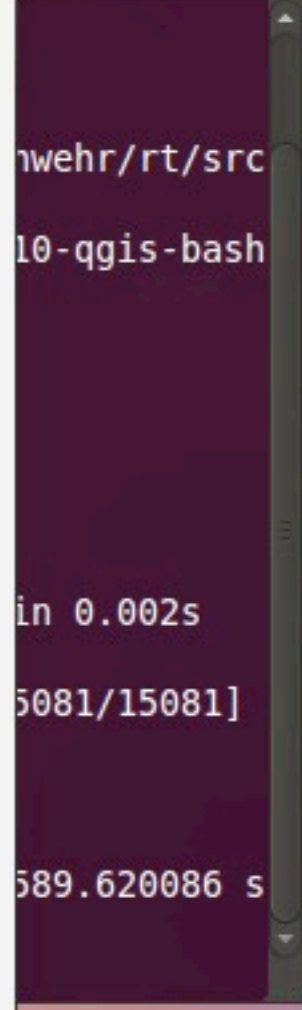
** Edit the audio for lecture 9 :audacity:podcast:

Edited the audio file from the sansa clip: VORC012.WAV. 2 hours became just over 1 hour. Used audacity for the editing.

- [X] export to mp3
- [X] export to m4a
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- [X] update HEADER.org and run "make push"

* Sept 29, CCOM, NH <2011-09-29 Thu>

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- [] Walk through the syntax of the for loop in bash
- [] Using imagemagick convert to make an animated gif
- [] Get to python ASAP! Start people into =ipython -pylab=



```

- [X] export to m4a
- [X] export to ogg
- [X] upload to web to
- [X] update HEADER.org

* Sept 29, CCOM, NH <20
** Teach GeoOc

Smith and Sandwell

** Research Tools - QGIS

Talked all about gravity

- [X] Make an entry for
- [ ] Export the log en
- [ ] Have the students
- [ ] Put the org file
- Having the org file
- [ ] Run through makin
- [ ] Demo QGIS using
- [ ] Show bash variab
- [ ] Walk through the
- [ ] Using imagemagick
- [ ] Get to python ASA

```

Research Tools work log file for Kurt Schwehr - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Class 10: QGIS, bash variabl... x Research Tools work log fil... x +

file:///home/researchtools/Dropbox/logs/researchtools/2011-09-29/3.2%20Research%20Tools%20-%20QGIS%2C%20shell%2C%20ipython

Most Visited Getting Started Latest Headlines

3.2 Research Tools - QGIS, shell, ipython

Talked all about gravity

- Make an entry for GeoOc. Make sure to tag with "teaching"
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- Have the students create ~/class/10.
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- Get to python ASAP! Start people into ipython -pylab

Author: Kurt Schwehr

Date: 2011-09-29 11:18:46 EDT

HTML generated by org-mode 7.4 in emacs 23

```

emacs23@ubuntu
File Edit Options Buffers Tools Minibuf Help
- [ ] Run through making journal entry
- [ ] Demo QGIS using the kml from lecture 9
- [ ] Show bash variables and how they are somewhat strange
- [ ] Walk through the syntax of the for loop in bash
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--:**- researchtools-schwehr.org Bot L50 (Org)-----
- [ ] Run through making journal entry
- [ ] Demo QGIS using the kml from lecture 9
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- [ ] Walk through the syntax of the for loop in bash
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- [ ] Get to python ASAP! Start people into =ipython -pylab=

--:**- researchtools-schwehr.org Bot L50 (Org)-----
IRC server:

```

src
ash
1]
6 s

emacs23@ubuntu

File Edit Options Buffers Tools Org T File Edit View Search Terminal Help

class. Follow along. I have pre-wr
 try to type it all in front of the c
 from another file into the current l

* Who edited their .bash_alias?

Did you watch all 4 YouTube videos?
 to watch them right away. Seriously

<http://www.youtube.com/playlist?list=...>

* Using QGIS to view a KML

Copy the kml and xy files from the l

```

#+BEGIN_SRC sh
cp ../09/2007-boston-construction.kml
cp ../09/2007-boston-construction.xy
ls -l
#+END_SRC
  
```

If you do not have the lecture 09 results files, you can download them like this:

```

#+BEGIN_SRC sh
wget http://vislab-ccom.unh.edu/~schwehr/rt/examples/10/2007-boston-construction.kml.bz2
wget http://vislab-ccom.unh.edu/~schwehr/rt/examples/10/2007-boston-construction.xy.bz2
bunzip2 *.bz2
#+END_SRC
  
```

Start Quantum GIS ([qgis](#)):

Applications -> Science -> Quantum GIS

--:**- 10-qgis-bash-python.org 9% L58 (0rg)-----

Auto-saving...done

```

researchtools@ubuntu: ~/class/10
researchtools@ubuntu:~/class/10$ ls ../09
2007-boston-construction.csv      google-earth-line-end.kml
2007-boston-construction.kml.bz2 google-earth-line-start.kml
2007-boston-construction.xy.bz2
researchtools@ubuntu:~/class/10$ bunzip2 ../09/*.bz2
researchtools@ubuntu:~/class/10$ ls ../09
2007-boston-construction.csv      google-earth-line-end.kml
2007-boston-construction.kml      google-earth-line-start.kml
2007-boston-construction.xy
researchtools@ubuntu:~/class/10$ cp ../09/2007-boston-construction.kml .
researchtools@ubuntu:~/class/10$ cp ../09/2007-boston-construction.xy .
researchtools@ubuntu:~/class/10$ ls -l
total 3084
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 11:25 #10-qgis-bash-
python.org#
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-p
ython.org
-rw-r--r-- 1 researchtools researchtools 26259 2011-09-29 11:26 2007-boston-co
nstruction.kml
-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-co
nstruction.xy
researchtools@ubuntu:~/class/10$
  
```

- Accessories
- Games
- Graphics
- Internet
- Office
- Other
- Programming
- Science
- Sound & Video
- System Tools
- Ubuntu Software Center

Tools Org Tbl Help

have pre-written some of the entry so I don't
 nt of the class. You can include the text
 e current location in a buffer by doing =C-x i=
 _alias?

have not, you really need

Geographical Information System

[aylist?list=PL7E11B54618530F5E](#)

:kml:qgis:

```

python.org#
non.org
struction.kml
truction.xy
  
```

```

Copy the kml and xy files from the lecture 09 directory.

#+BEGIN_SRC sh
cp ../09/2007-boston-construction.kml .
cp ../09/2007-boston-construction.xy .
ls -l
#+END_SRC

If you do not have the lecture 09 results files, you can download them like this:

#+BEGIN_SRC sh
wget http://vislab-ccom.unh.edu/~schwehr/rt/examples/10/2007-boston-construction.kml.bz2
wget http://vislab-ccom.unh.edu/~schwehr/rt/examples/10/2007-boston-construction.xy.bz2
bunzip2 *.bz2
#+END_SRC

Start Quantum GIS (qgis):

Applications -> Science -> Quantum GIS
--:**- 10-qgis-bash-python.org 9% L67 (Org)-----
  
```

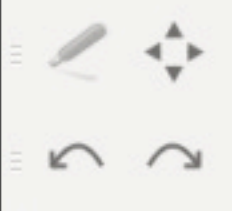
Quantum GIS 1.4.0-Enceladus

- File
- Edit
- View
- Layer**
 - New Vector Layer... Ctrl+Shift+N
 - Add Vector Layer... Ctrl+Shift+V**
 - Add Raster Layer... Ctrl+Shift+R
 - Add PostGIS Layer... Ctrl+Shift+D
 - Add SpatiaLite Layer... Ctrl+Shift+L
 - Add WMS Layer... Ctrl+Shift+W
 - Open Attribute Table
 - Toggle editing
 - Save as Shapefile...
 - Save Selection as Shapefile...
 - Remove Layer Ctrl+D
 - Properties...
 - Add to Overview Ctrl+Shift+O
 - Add All to Overview
 - Remove All From Overview
 - Hide All Layers Ctrl+Shift+H
 - Show All Layers Ctrl+Shift+U
- Plugins
- Vector
- Help

Layers

Add a Vector Layer

Coordinate: Scale: Render



Open an OGR Supported Vector Layer

researchtools class 10

Places	Name	Size	Modified
Search			
Recently Used			
researchtools			
File System			
Floppy Drive			

Add Remove [OGR] ESRI Shapefiles

Cancel Open



Open an OGR Supported Vector Layer

researchtools class 10

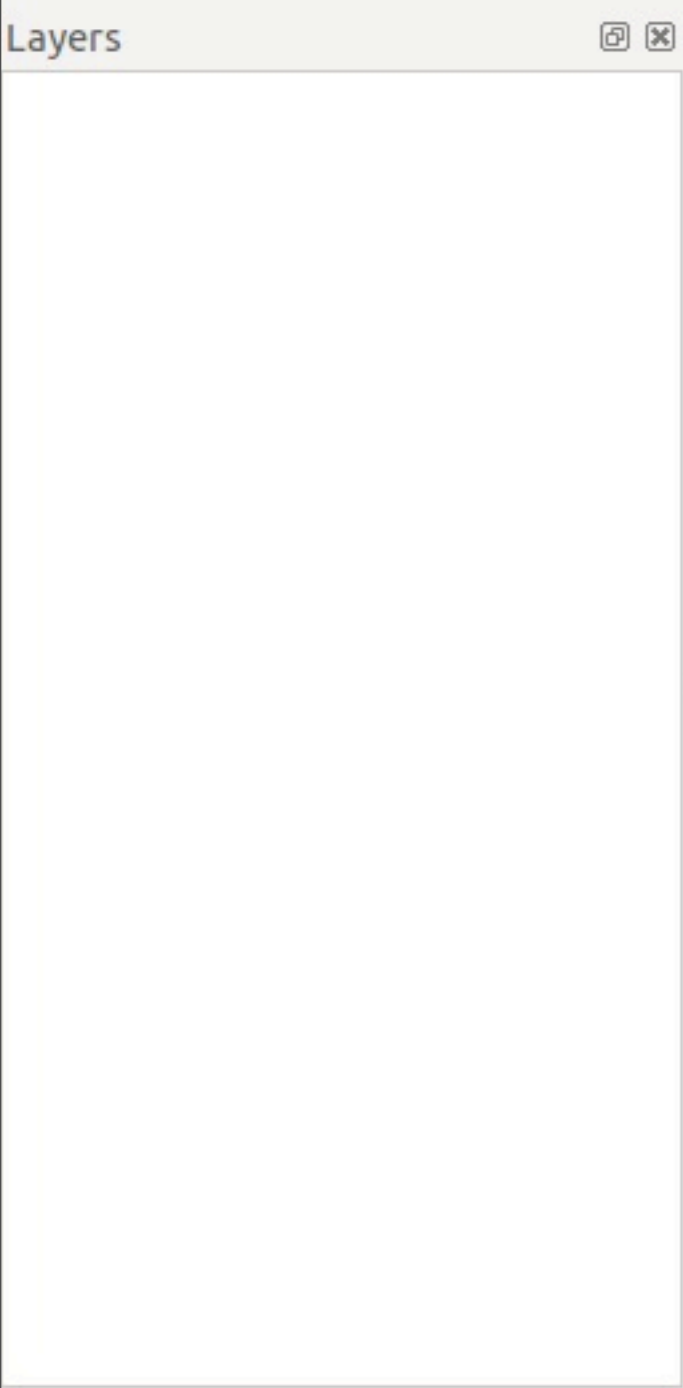
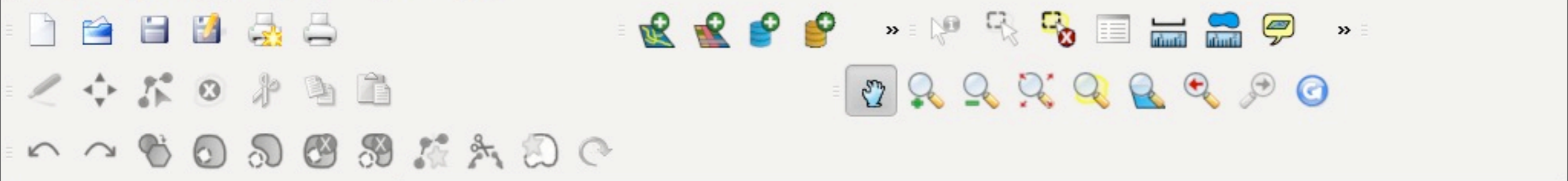
Places	Name	Size	Modified
Search			
Recently Used			
researchtools			
File System			
Floppy Drive			

Add Remove

- [OGR] ESRI Shapefiles
- [OGR] Mapinfo File
- [OGR] Spatial Data Transfer Standard
- [OGR] S-57 Base file
- [OGR] Microstation DGN
- [OGR] VRT - Virtual Datasource
- [OGR] Atlas BNA
- [OGR] Comma Separated Value
- [OGR] Geography Markup Language
- [OGR] GPX
- [OGR] KML**
- [OGR] GeoJSON
- [OGR] INTERLIS 1
- [OGR] INTERLIS 2
- [OGR] GMT
- [OGR] SQLite
- [OGR] X-Plane/Flighgear
- [OGR] Arc/Info ASCII Coverage
- All files

Coordinate: -1.40

Render



Add vector layer

Source type

File Directory Database Protocol

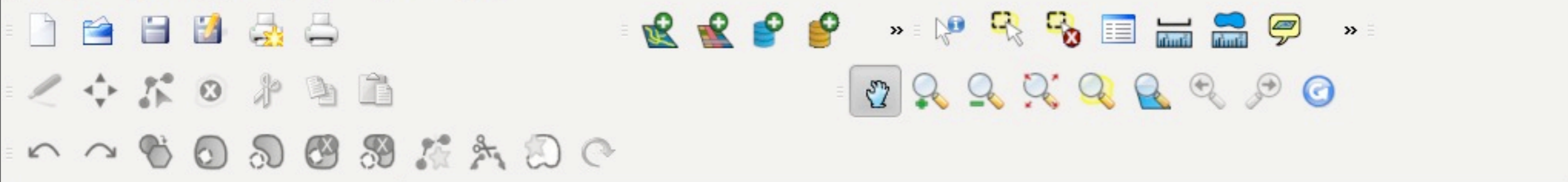
Encoding: System

Source

Dataset:

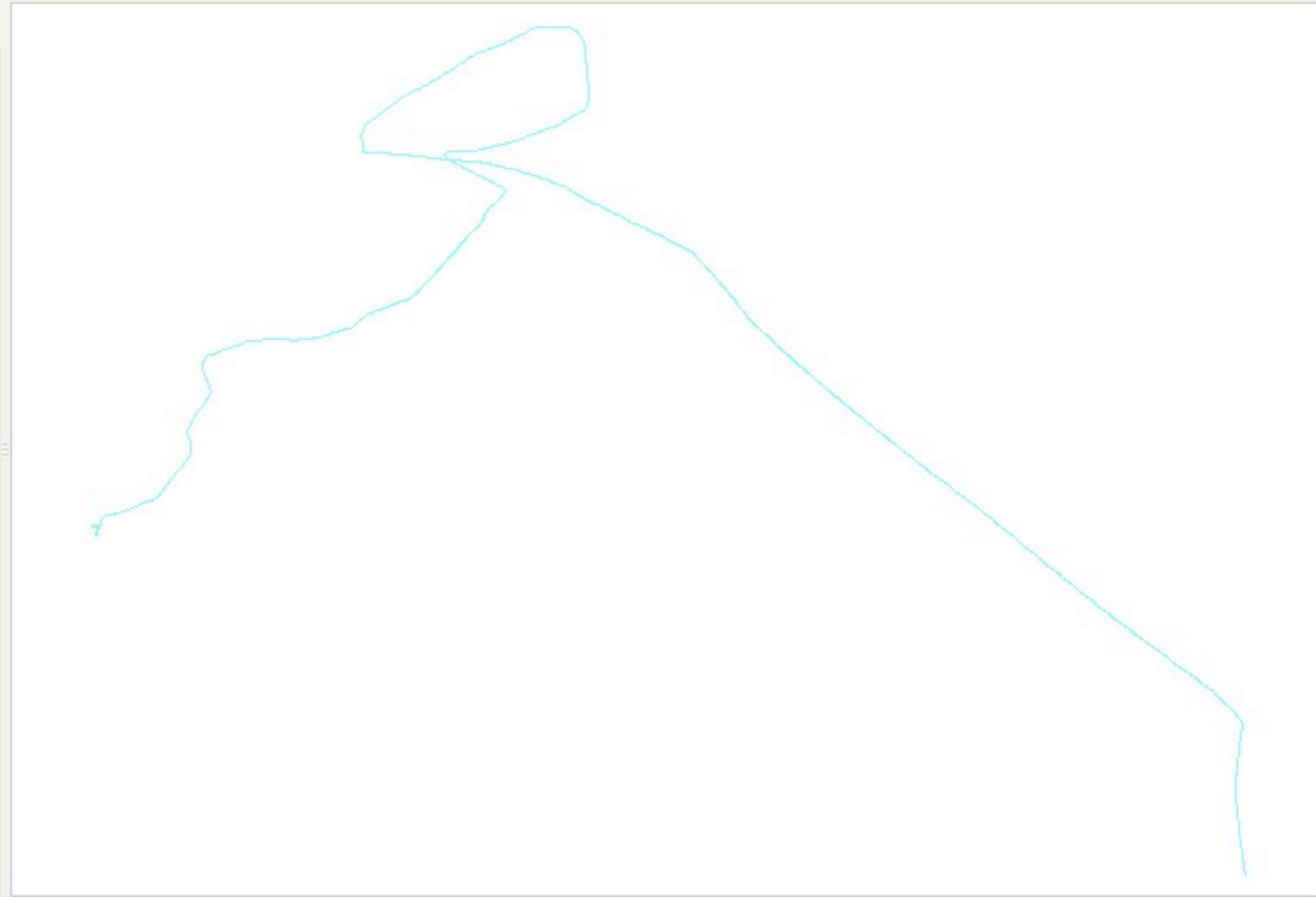
Quantum GIS 1.4.0-Enceladus

File Edit View Layer Plugins Vector Help



Layers

- Layer #0



-71.00,42.09 : -70.47,42.45

Coordinate: -70.9737,42.1916 Scale 1:156139 Render



```

researchtools@ubuntu:~/class/10$ testing = 123
testing: command not found
researchtools@ubuntu:~/class/10$ testing=123
researchtools@ubuntu:~/class/10$ echo $SHELL
/bin/bash
researchtools@ubuntu:~/class/10$ echo $testing
123
researchtools@ubuntu:~/class/10$ testing="hello world"
researchtools@ubuntu:~/class/10$ echo $testing
123
researchtools@ubuntu:~/class/10$ testing="hello world"
researchtools@ubuntu:~/class/10$ echo $testing
hello world
researchtools@ubuntu:~/class/10$ bash
researchtools@ubuntu:~/class/10$ echo

```

-U:**- *shell* All L15 (Shell:run)

```

Open up a shell inside of emacs by doing:

- Split the window: C-x 2
- Start the shell: M-x shell

#+BEGIN_SRC sh
# Set a variable
testing=123

# Print the variable
echo $testing
# 123

# Start a new bash shell inside the original one
bash

```

--:**- 10-qgis-bash-python.org 24% L113 (Org)

```

thon.org#
non.org
struction.kml
truction.xy

```

File Edit Options Buffers

File Edit View Search Terminal Help

```

researchtools@ubuntu:~/
/bin/bash
researchtools@ubuntu:~/
123
researchtools@ubuntu:~/
researchtools@ubuntu:~/
123
researchtools@ubuntu:~/
researchtools@ubuntu:~/
hello world
researchtools@ubuntu:~/
researchtools@ubuntu:~/
researchtools@ubuntu:~/
researchtools@ubuntu:~/
exit
researchtools@ubuntu:~/

```

```

-rw-r--r-- 1 researchtools researchtools 26259 2011-09-29 11:26 2007-boston-co
nstruction.kml
-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-co
nstruction.xy
researchtools@ubuntu:~/class/10$ ls -l
total 3084
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 11:25 #10-qgis-bash-python.org#
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-python.org
-rw-r--r-- 1 researchtools researchtools 26259 2011-09-29 11:26 2007-boston-construction.kml
-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-construction.xy
researchtools@ubuntu:~/class/10$ echo $L
$LANG $LESSCLOSE $LINENO $LOGNAME
$LANGUAGE $LESSOPEN $LINES $LS_COLORS
researchtools@ubuntu:~/class/10$ echo $S
$SECONDS $SHELL $SHLVL $SSH_AUTH_SOCK
$SESSION_MANAGER $SHELLOPTS $SSH_AGENT_PID
researchtools@ubuntu:~/class/10$ echo $SHLVL
1
researchtools@ubuntu:~/class/10$ bash
researchtools@ubuntu:~/class/10$ echo $SHLVL
2
researchtools@ubuntu:~/class/10$

```

-U:**- *shell* Bo

researchtools@ubuntu:~/class/10\$ bash

Open up a shell inside

researchtools@ubuntu:~/class/10\$ echo \$SHLVL

- Split the window: C-x

researchtools@ubuntu:~/class/10\$

- Start the shell: M-x shell

```

#+BEGIN_SRC sh
# Set a variable
testing=123

# Print the variable
echo $testing
# 123

# Start a new bash shell inside the original one
bash

```

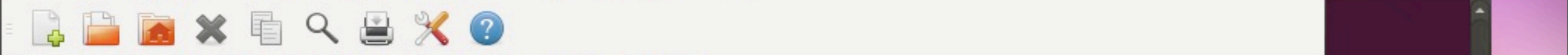
```

researchtools@ubuntu:~/class/10$

```

--:**- 10-qgis-bash-python.org 24% L113 (0rg)

Auto-saving...done



```

researchtools@ubuntu:~/class/10$ testing="hello world"
researchtools@ubuntu:~/class/10$ echo $testing
hello world
researchtools@ubuntu:~/class/10$ bash
researchtools@ubuntu:~/class/10$ echo $testing

researchtools@ubuntu:~/class/10$ exit
exit
researchtools@ubuntu:~/class/10$ export testing=123
researchtools@ubuntu:~/class/10$ echo $EDITOR

researchtools@ubuntu:~/class/10$ export EDITOR=emacs
researchtools@ubuntu:~/class/10$ bash
researchtools@ubuntu:~/class/10$ echo $testing
123
researchtools@ubuntu:~/class/10$ less ~/.bashrc

```

-U:**- *shell* Bot L26 (Shell:run)-----

```

# See that "testing" is not set. If there is no variable, bash gives
# an empty string
echo $testing

# quit back to the main bash shell
exit

# Set testing to have a value that will be inherited
export testing="hello world"

bash

# Now see that the exported variable went through
echo $testing
# hello world
#+END_SRC

```

--:**- 10-qgis-bash-python.org 26% L129 (Org)-----



```

# don't put duplicate lines in the history. See bash(1) for more options
# ... or force ignoredups and ignorespace
HISTCONTROL=ignoredups:ignorespace

# append to the history file, don't overwrite it
shopt -s histappend

# for setting history length see HISTSIZE and HISTFILESIZE in bash(1)
HISTSIZE=1000
HISTFILESIZE=2000

# check the window size after each command and, if necessary,
# update the values of LINES and COLUMNS.
shopt -s checkwinsize

# make less more friendly for non-text input files, see lesspipe(1)
[ -x /usr/bin/lesspipe ] && eval "$(SHELL=/bin/sh lesspipe)"

# set variable identifying the chroot you work in (used in the prompt below)
if [ -z "$debian_chroot" ] && [ -r /etc/debian_chroot ]; then
    debian_chroot=$(cat /etc/debian_chroot)
:

```

```

-U:**- *shell* Bo
# See that "testing" is
# an empty string
echo $testing

# quit back to the main bash shell
exit

# Set testing to have a value that will be inherited
export testing="hello world"

bash

# Now see that the exported variable went through
echo $testing
# hello world
#+END_SRC

```



```

esac

# uncomment for a colored prompt, if the terminal has the capability; turned
# off by default to not distract the user: the focus in a terminal window
# should be on the output of commands, not on the prompt
#force_color_prompt=yes

if [ -n "$force_color_prompt" ]; then
  if [ -x /usr/bin/tput ] && tput setaf 1 >&/dev/null; then
    # We have color support; assume it's compliant with Ecma-48
    # (ISO/IEC-6429). (Lack of such support is extremely rare, and such
    # a case would tend to support setf rather than setaf.)
    color_prompt=yes
  else
    color_prompt=no
  fi
fi

:q
researchtools@ubuntu:~/class/10$

```

-U:**- *shell* Bot L78 (Shell:run)-----

```

# See that "testing" is not set. If there is no variable, bash gives
# an empty string
echo $testing

# quit back to the main bash shell
exit

# Set testing to have a value that will be inherited
export testing="hello world"

bash

# Now see that the exported variable went through
echo $testing
# hello world
#+END_SRC

```

--:**- 10-qgis-bash-python.org 26% L129 (Org)-----

Kill buffer (default *shell*):

```

# See that "testing" is
# an empty string
echo $testing

# quit back to the main
exit

# Set testing to have a
export testing="hello world"

bash

# Now see that the export
echo $testing
# hello world
#+END_SRC

* Creating a script

How can we use a variable
one image every hour for
2011 set of images for
- http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/

Open emacs open a file

#+BEGIN_SRC sh
for hour in 01 02 03 04
do
  echo $hour
done

```

Mozilla Firefox

File Edit View History Bookmarks Tools Help

Class 10: QGIS, bash var... Research Tools work lo... http://mgds...tcon/2011/

http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/

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**USCGC HEALY SCIENCE SUPPORT
ALOFTCON WEBCAM:**

- [20110929-1501.jpeg](#)
- [20110929-1401.jpeg](#)
- [20110929-1301.jpeg](#)
- [20110929-1201.jpeg](#)
- [20110929-1101.jpeg](#)
- [20110929-1001.jpeg](#)
- [20110929-0901.jpeg](#)
- [20110929-0801.jpeg](#)
- [20110929-0701.jpeg](#)
- [20110929-0601.jpeg](#)
- [20110929-0501.jpeg](#)
- [20110929-0401.jpeg](#)
- [20110929-0301.jpeg](#)
- [20110929-0201.jpeg](#)
- [20110929-0101.jpeg](#)
- [20110929-0001.jpeg](#)
- [20110928-2301.jpeg](#)
- [20110928-2201.jpeg](#)
- [20110928-2101.jpeg](#)


```

# See that "testing" is
# an empty string
echo $testing

# quit back to the main
exit

# Set testing to have a
export testing="hello world"

bash

# Now see that the export
echo $testing
# hello world
#+END_SRC

* Creating a script

How can we use a variable
one image every hour for
2011 set of images for

- http://mgds.ldeo.columbia.edu/healy/reports/alof

Open emacs open a file

#+BEGIN_SRC sh
for hour in 01 02 03 04
do
  echo $hour
done

```


20110929-1101.jpeg (JPEG Image, 1280x960 pixels) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Class 10: QGIS, bash var... Research Tools work lo... 20110929-1101.jpeg (JP... +

http://mgds.ldeo.columbia.edu/healy/reports/alof Google

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* Creating a script

How can we use a variable to help out? What if we want to download one image every hour from one day on the USCGC Healy? Here is the 2011 set of images for the Healy:

- <http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/>

Open emacs open a file in emacs called `~/class/10/healy.bash` and start typing:

```
#+BEGIN_SRC sh
for hour in 01 02 03 04 05 06 07
do
  echo $hour
done
#+END_SRC
```



* Creating a script

How can we use a variable to help out? What if we want to download one image every hour from one day on the USCGC Healy? Here is the 2011 set of images for the Healy:

- <http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/>

Open emacs open a file in emacs called [~/class/10/healy.bash](#) and start typing:

```

#+BEGIN_SRC sh
for hour in 01 02 03 04 05 06 07
do
  echo $hour
done
#+END_SRC

```

```

--:**- 10-qgis-bash-python.org 28% L147 (Org)-----

```

```

-U:--- healy.bash All L1 (Shell-script[bash])-----

```



* Creating a script

How can we use a variable to help out? What if we want to download one image every hour from one day on the USCGC Healy? Here is the 2011 set of images for the Healy:

- <http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/>

Open emacs open a file in emacs called [~/class/10/healy.bash](#) and start typing:

```

#+BEGIN_SRC sh
for hour in 01 02 03 04 05 06 07
do
  echo $hour
done
#+END_SRC

```

--:**- 10-qgis-bash-python.org 28% L142 (Org)-----

```

for hour in 01 02 03 04 05 06 07
do
  echo $hour
done

```

-U:**- healy.bash All L5 (Shell-script[bash])-----

```

Open emacs open a file
#+BEGIN_SRC sh
for hour in 01 02 03 04
do
  echo $hour
done
#+END_SRC

```

```

Try running the above with the
buffer. You should see the
output.

Save that file and try running
the script.

#+BEGIN_SRC sh
source healy.bash

```

```

researchtools@ubuntu:~/class/10$ ls -l
total 3084
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 11:51 #10-qgis-bash-python.org#
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-python.org
-rw-r--r-- 1 researchtools researchtools 26259 2011-09-29 11:26 2007-boston-construction.kml
-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-construction.xy
researchtools@ubuntu:~/class/10$ ls -l
total 3088
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 11:51 #10-qgis-bash-python.org#
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-python.org
-rw-r--r-- 1 researchtools researchtools 26259 2011-09-29 11:26 2007-boston-construction.kml
-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-construction.xy
-rw-r--r-- 1 researchtools researchtools 55 2011-09-29 11:53 healy.bash
researchtools@ubuntu:~/class/10$ source healy.bash
01
02
03
04
05
06
07
researchtools@ubuntu:~/class/10$

```

-U:--- healy.bash All L5 (Shell-script[bash])
Wrote /home/researchtools/class/10/healy.bash



```

04
05
06
07
#+END_EXAMPLE

Now we can try to construct a curl command in the echo.

#+BEGIN_SRC sh
for hour in 01 02 03 04 05 06 07
do
  echo curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928- $\{hour\}$ 01.jpeg
done
#+END_SRC

Try it and you should see the follow, but since we are using the echo

```

--:**- 10-qgis-bash-python.org 33% L175 (Org)-----

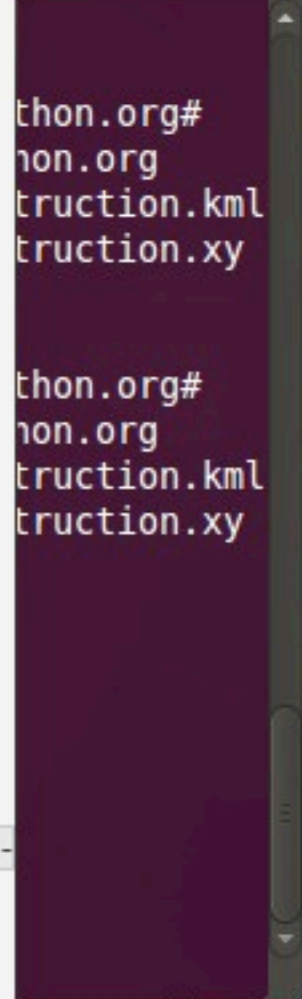
```

for hour in 01 02 03 04 05 06 07
do
  echo curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928- $\{hour\}$ 01.jpeg
done

```

-U:**- healy.bash All L3 (Shell-script[bash])-----

Mark set



```

04
05
06
07
#+END_EXAMPLE
Now we can try to const
#+BEGIN_SRC sh
for hour in 01 02 03 04
do
  echo curl -0 http://
done
#+END_SRC
Try it and you should s
--:**- 10-qgis-bash-pytho
for hour in 01 02 03 04
do
  echo curl -0 http://
done

```

```

-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 11:51 #10-qgis-bash-python.org#
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-python.org
-rw-r--r-- 1 researchtools researchtools 26259 2011-09-29 11:26 2007-boston-construction.kml
-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-construction.xy
-rw-r--r-- 1 researchtools researchtools 55 2011-09-29 11:53 healy.bash
researchtools@ubuntu:~/class/10$ source healy.bash
01
02
03
04
05
06
07
researchtools@ubuntu:~/class/10$ source healy.bash
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0101.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0201.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0301.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0401.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0501.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0601.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0701.jpeg
researchtools@ubuntu:~/class/10$

```

```

-U:--- healy.bash All L3 (Shell-script[bash])-----
Wrote /home/researchtools/class/10/healy.bash

```



```

04
05
06
07
#+END_EXAMPLE

Now we can try to construct a curl command in the echo.

#+BEGIN_SRC sh
for hour in 01 02 03 04 05 06 07
do
  echo curl -O http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-${hour}01.jpeg
done
#+END_SRC

Try it and you should see the follow, but since we are using the echo
--:**- 10-qgis-bash-python.org 33% L175 (Org)-----
for hour in 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
do
  curl -O http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-${hour}01.jpeg
done

-U:--- healy.bash All L3 (Shell-script[bash])-----

```

```

thon.org#
non.org
struction.kml
struction.xy

eg
eg
eg
eg
eg
eg
eg

```

```

Wrote /home/researchtools/class/10/healy.bash

```


File Edit Options Buffers

File Edit View Search Terminal Help

```

04
05
06
07
#+END_EXAMPLE

Now we can try to const

#+BEGIN_SRC sh
for hour in 01 02 03 04
do
  echo curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0101.jpeg
done
#+END_SRC

Try it and you should

```

```

-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-construction.xy
-rw-r--r-- 1 researchtools researchtools      55 2011-09-29 11:53 healy.bash
researchtools@ubuntu:~/class/10$ source healy.bash
01
02
03
04
05
06
07
researchtools@ubuntu:~/class/10$ source healy.bash
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0101.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0201.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0301.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0401.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0501.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0601.jpeg
curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0701.jpeg
researchtools@ubuntu:~/class/10$ source healy.bash

```

```

--:**- 10-qgis-bash-pyth
for hour in 01 02 03 04
do
  curl -0 http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928-0101.jpeg
done

```

```

researchtools@ubuntu:~/class/10$ source healy.bash
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload  Total   Spent    Left   Speed
0         0    0     0    0     0     0     0    0  0

```

-U:--- healy.bash All L3 (Shell-script[bash])

Wrote /home/researchtools/class/10/healy.bash

File Edit Options Buffers

File Edit View Search Terminal Help

```

04
05
06
07
#+END_EXAMPLE
Now we can try to const
#+BEGIN_SRC sh
for hour in 01 02 03 04
do
  echo curl -O http://mgds.
done
#+END_SRC
Try it and you should s
-:***- 10-qgis-bash-pytho
for hour in 01 02 03 04
do
  curl -O http://mgds.
done
-U:--- healy.bash

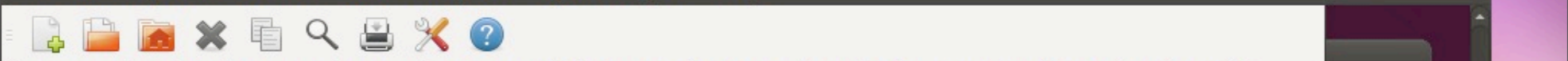
```

```

100 114k 100 114k 0 0 612k 0 --:--:-- --:--:-- --:--:-- 687k
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 111k 100 111k 0 0 652k 0 --:--:-- --:--:-- --:--:-- 755k
researchtools@ubuntu:~/class/10$ ls -l
total 5648
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 11:54 #10-qgis-bash-python.org#
-rw-r--r-- 1 researchtools researchtools 15081 2011-09-29 07:52 10-qgis-bash-python.org
-rw-r--r-- 1 researchtools researchtools 26259 2011-09-29 11:26 2007-boston-construction.kml
-rw-r--r-- 1 researchtools researchtools 3093687 2011-09-29 11:26 2007-boston-construction.xy
-rw-r--r-- 1 researchtools researchtools 118995 2011-09-29 12:01 20110928-0101.jpeg
-rw-r--r-- 1 researchtools researchtools 109445 2011-09-29 12:01 20110928-0201.jpeg
-rw-r--r-- 1 researchtools researchtools 108887 2011-09-29 12:01 20110928-0301.jpeg
-rw-r--r-- 1 researchtools researchtools 114888 2011-09-29 12:01 20110928-0401.jpeg
-rw-r--r-- 1 researchtools researchtools 104719 2011-09-29 12:01 20110928-0501.jpeg
-rw-r--r-- 1 researchtools researchtools 118438 2011-09-29 12:01 20110928-0601.jpeg
-rw-r--r-- 1 researchtools researchtools 116262 2011-09-29 12:01 20110928-0701.jpeg
-rw-r--r-- 1 researchtools researchtools 120211 2011-09-29 12:01 20110928-0801.jpeg
-rw-r--r-- 1 researchtools researchtools 119197 2011-09-29 12:01 20110928-0901.jpeg
-rw-r--r-- 1 researchtools researchtools 118772 2011-09-29 12:01 20110928-1001.jpeg
-rw-r--r-- 1 researchtools researchtools 118729 2011-09-29 12:01 20110928-1101.jpeg
-rw-r--r-- 1 researchtools researchtools 116161 2011-09-29 12:01 20110928-1201.jpeg
-rw-r--r-- 1 researchtools researchtools 119117 2011-09-29 12:01 20110928-1301.jpeg
-rw-r--r-- 1 researchtools researchtools 119848 2011-09-29 12:01 20110928-1401.jpeg
-rw-r--r-- 1 researchtools researchtools 117143 2011-09-29 12:01 20110928-1501.jpeg
-rw-r--r-- 1 researchtools researchtools 74683 2011-09-29 12:01 20110928-1601.jpeg
-rw-r--r-- 1 researchtools researchtools 80251 2011-09-29 12:01 20110928-1701.jpeg
-rw-r--r-- 1 researchtools researchtools 109393 2011-09-29 12:01 20110928-1801.jpeg
-rw-r--r-- 1 researchtools researchtools 106489 2011-09-29 12:01 20110928-1901.jpeg
-rw-r--r-- 1 researchtools researchtools 111653 2011-09-29 12:01 20110928-2001.jpeg
-rw-r--r-- 1 researchtools researchtools 116118 2011-09-29 12:01 20110928-2101.jpeg
-rw-r--r-- 1 researchtools researchtools 117616 2011-09-29 12:01 20110928-2201.jpeg
-rw-r--r-- 1 researchtools researchtools 114457 2011-09-29 12:01 20110928-2301.jpeg
-rw-r--r-- 1 researchtools researchtools 181 2011-09-29 12:01 healy.bash
-rw-r--r-- 1 researchtools researchtools 55 2011-09-29 11:53 healy.bash~
researchtools@ubuntu:~/class/10$

```

Wrote /home/researchtools/class/10/healy.bash



```
researchtools@ubuntu:~/class/10$ convert -delay 100 -loop 0 *.jpeg healy-20110928-day-animation.gif
researchtools@ubuntu:~/class/10$ ls -l *.gif
-rw-r--r-- 1 researchtools researchtools 18076478 2011-09-29 12:06 healy-20110928-day-animation.gif
researchtools@ubuntu:~/class/10$ file healy-20110928-day-animation.gif
healy-20110928-day-animation.gif: GIF image data, version 89a, 1280 x 960
researchtools@ubuntu:~/class/10$
```

-U:**- *shell* All L6 (Shell:run)

```
curl -O http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928- $\{hour\}$ 01.jpeg
done
#+END_SRC

Run it! You should now have all the images down. Time to make an "animated
gif" using imagemagick/graphicsmagick.

#+BEGIN_SRC sh
convert -delay 100 -loop 0 *.jpeg healy-20110928-day-animation.gif

file healy-20110928-day-animation.gif
#+END_SRC

View that animated gif movie!!

#+BEGIN_SRC sh
```

--:**- 10-qgis-bash-python.org 42% L212 (Org)



```

emacs23@ubuntu
File Edit Options Buffers Tools Complete In/Out Signals Help
healy-20110928-day-animation.gif[16] GIF 1280x960 1280x960+0+0 8-bit PseudoClass 256c 18.08MB 0.010u 0:02
healy-20110928-day-animation.gif[17] GIF 1280x960 1280x960+0+0 8-bit PseudoClass 256c 18.08MB 0.010u 0:02
healy-20110928-day-animation.gif[18] GIF 1280x960 1280x960+0+0 8-bit PseudoClass 256c 18.08MB 0.010u 0:02
healy-20110928-day-animation.gif[19] GIF 1280x960 1280x960+0+0 8-bit PseudoClass 256c 18.08MB 0.010u 0:02
healy-20110928-day-animation.gif[20] GIF 1280x960 1280x960+0+0 8-bit PseudoClass 256c 18.08MB 0.010u 0:02
healy-20110928-day-animation.gif[21] GIF 1280x960 1280x960+0+0 8-bit PseudoClass 256c 18.08MB 0.010u 0:02
healy-20110928-day-animation.gif[22] GIF 1280x960 1280x960+0+0 8-bit PseudoClass 256c 18.08MB 0.010u 0:02
researchtools@ubuntu:~/class/10$ firefox *.gif
-U:**- *shell* Bot L30 (Shell:run)-----
curl -O http://mgds.ldeo.columbia.edu/healy/reports/aloftcon/2011/20110928- $\{hour\}$ 01.jpeg
done
#+END_SRC

Run it! You should now have all the images down. Time to make an "animated
gif" using imagemagick/graphicsmagick.

#+BEGIN_SRC sh
convert -delay 100 -loop 0 *.jpeg healy-20110928-day-animation.gif

file healy-20110928-day-animation.gif
#+END_SRC

View that animated gif movie!!

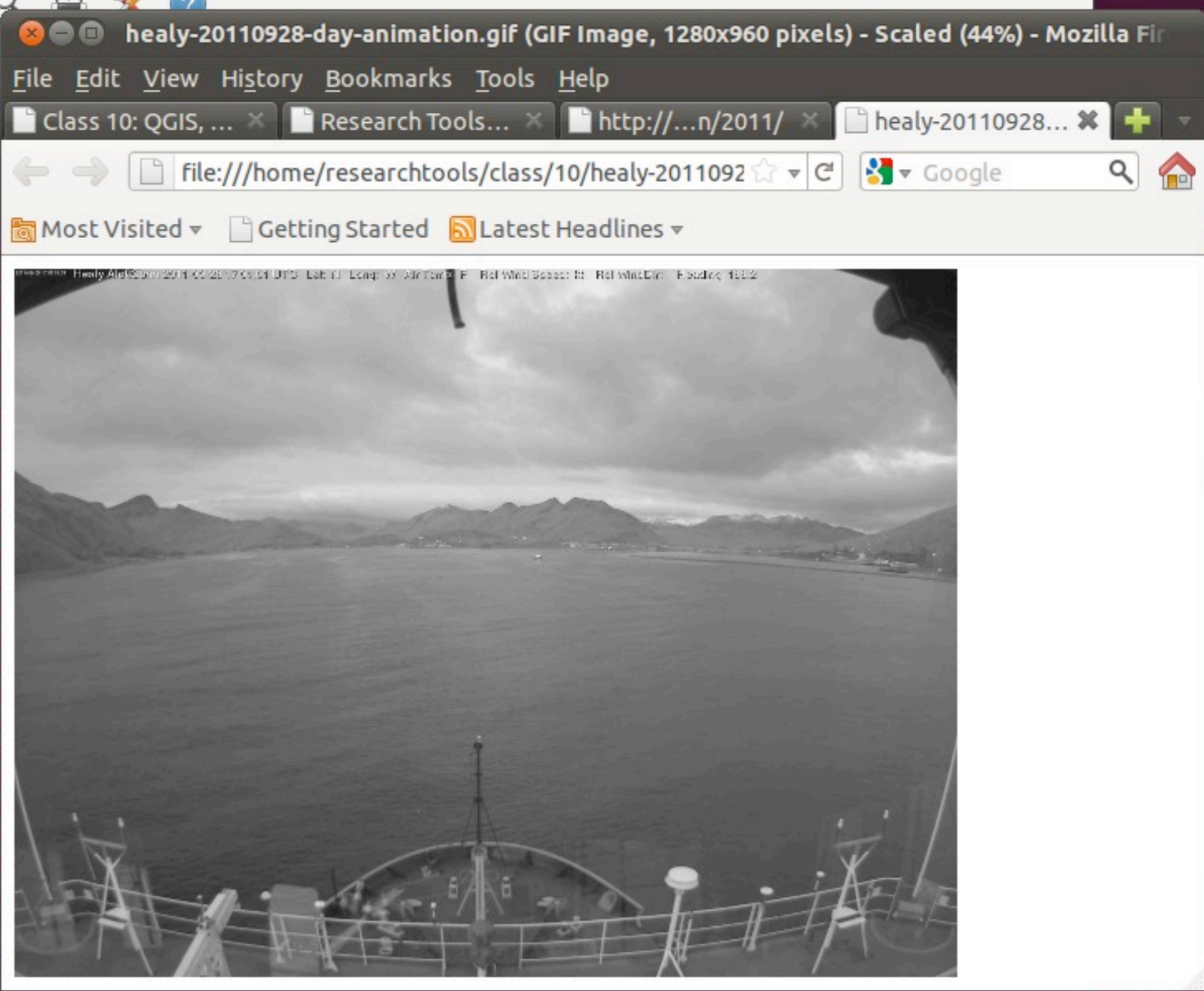
#+BEGIN_SRC sh
--:**- 10-qgis-bash-python.org 42% L212 (0rg)-----

```

```

healy-20110928-day-anim
0.000
healy-20110928-day-anim
0.000
healy-20110928-day-anim
0.000
researchtools@ubuntu:~
20110928-0101.jpeg: JPE
20110928-0201.jpeg: JPE
20110928-0301.jpeg: JPE
20110928-0401.jpeg: JPE
20110928-0501.jpeg: JPE
20110928-0601.jpeg: JPE
20110928-0701.jpeg: JPE
20110928-0801.jpeg: JPE
20110928-0901.jpeg: JPE
20110928-1001.jpeg: JPE
20110928-1101.jpeg: JPE
20110928-1201.jpeg: JPE
20110928-1301.jpeg: JPE
20110928-1401.jpeg: JPE
20110928-1501.jpeg: JPE
20110928-1601.jpeg: JPE
20110928-1701.jpeg: JPE
20110928-1801.jpeg: JPE
20110928-1901.jpeg: JPE
20110928-2001.jpeg: JPE
20110928-2101.jpeg: JPE
20110928-2201.jpeg: JPE
20110928-2301.jpeg: JPE
researchtools@ubuntu:~
failed to create drawa
researchtools@ubuntu:~
-U:**- *shell*

```



```

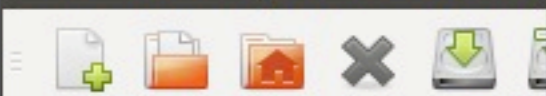
emacs23@ubuntu
File Edit Options Buffers
#+END_SRC
You can now see that th
We can turn that script
proper script. Add th
#+BEGIN_SRC sh
#!/bin/bash
#+END_SRC
Now make the script "ex
permissions for a file
You can also put that
#+BEGIN_SRC sh
chmod +x healy.bash
./healy.bash
#+END_SRC
* Introduction to pytho
It is time to get away
We will be using ipytho
http://ipython.org/ipython
** Starting up ipython
The very first time you
up your account. You w
--:**- 10-qgis-bash-pytho

```

```

researchtools@ubuntu: ~/class/10
File Edit View Search Terminal Help
-rw-r--r-- 1 researchtools researchtools 119197 2011-09-29 12:01 20110928-0901.jpeg
-rw-r--r-- 1 researchtools researchtools 118772 2011-09-29 12:01 20110928-1001.jpeg
-rw-r--r-- 1 researchtools researchtools 118729 2011-09-29 12:01 20110928-1101.jpeg
-rw-r--r-- 1 researchtools researchtools 116161 2011-09-29 12:01 20110928-1201.jpeg
-rw-r--r-- 1 researchtools researchtools 119117 2011-09-29 12:01 20110928-1301.jpeg
-rw-r--r-- 1 researchtools researchtools 119848 2011-09-29 12:01 20110928-1401.jpeg
-rw-r--r-- 1 researchtools researchtools 117143 2011-09-29 12:01 20110928-1501.jpeg
-rw-r--r-- 1 researchtools researchtools 74683 2011-09-29 12:01 20110928-1601.jpeg
-rw-r--r-- 1 researchtools researchtools 80251 2011-09-29 12:01 20110928-1701.jpeg
-rw-r--r-- 1 researchtools researchtools 109393 2011-09-29 12:01 20110928-1801.jpeg
-rw-r--r-- 1 researchtools researchtools 106489 2011-09-29 12:01 20110928-1901.jpeg
-rw-r--r-- 1 researchtools researchtools 111653 2011-09-29 12:01 20110928-2001.jpeg
-rw-r--r-- 1 researchtools researchtools 116118 2011-09-29 12:01 20110928-2101.jpeg
-rw-r--r-- 1 researchtools researchtools 117616 2011-09-29 12:01 20110928-2201.jpeg
-rw-r--r-- 1 researchtools researchtools 114457 2011-09-29 12:01 20110928-2301.jpeg
-rw-r--r-- 1 researchtools researchtools 181 2011-09-29 12:01 healy.bash
-rw-r--r-- 1 researchtools researchtools 55 2011-09-29 11:53 healy.bash~
researchtools@ubuntu:~/class/10$ ls -l healy*
-rw-r--r-- 1 researchtools researchtools 18076478 2011-09-29 12:06 healy-20110928-day-animatio
n.gif
-rw-r--r-- 1 researchtools researchtools 181 2011-09-29 12:01 healy.bash
-rw-r--r-- 1 researchtools researchtools 55 2011-09-29 11:53 healy.bash~
researchtools@ubuntu:~/class/10$ chmod +x healy.bash
researchtools@ubuntu:~/class/10$ ls -l healy.bash
-rwxr-xr-x 1 researchtools researchtools 181 2011-09-29 12:01 healy.bash
researchtools@ubuntu:~/class/10$ ./healy.bash
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 116k 100 116k 0 0 297k 0 --:--:-- --:--:-- --:--:-- 317k
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 106k 100 106k 0 0 224k 0 --:--:-- --:--:-- --:--:-- 235k
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
0 0 0 0 0 0 0 0 --:--:-- --:--:-- --:--:-- 0^Cresearchtools@
ubuntu:~/class/10$

```

researchtools@ubuntu:~/class/10\$ clear

Now make the script "executable" by giving it permissions for a file. You can also put that code in a script file.

```

#+BEGIN_SRC sh
chmod +x healy.bash

./healy.bash
#+END_SRC

```

* Introduction to python

It is time to get away from the command line. We will be using ipython.

<http://ipython.org/ipython>

** Starting up ipython

The very first time you use ipython, you need to set up your account. You will do this by running ipython with the "-pylab" option.

In a terminal, run this:

```

#+BEGIN_SRC sh
ipython -pylab
#+END_SRC

```

You will see something like this:




```

emacs23@ubuntu
File Edit Options Buffers
Now make the script "ex
permissions for a file
You can also put that
#+BEGIN_SRC sh
chmod +x healy.bash
./healy.bash
#+END_SRC
* Introduction to python
It is time to get away
We will be using ipytho
http://ipython.org/ipy
** Starting up ipython
The very first time you
up your account. You w
ipython with the "-pyla
In a terminal, run this
#+BEGIN_SRC sh
ipython -pylab
#+END_SRC
You will see something
--:**- 10-qgis-bash-pytho
ESC w

```

```

researchtools@ubuntu: ~/class/10
File Edit View Search Terminal Help
researchtools@ubuntu:~/class/10$ #ipython -pylab
researchtools@ubuntu:~/class/10$ ipython -pylab
*****
Welcome to IPython. I will try to create a personal configuration directory
where you can customize many aspects of IPython's functionality in:
/home/researchtools/.ipython
Initializing from configuration: /usr/lib/python2.7/dist-packages/IPython/UserConfig
Successful installation!
Please read the sections 'Initial Configuration' and 'Quick Tips' in the
IPython manual (there are both HTML and PDF versions supplied with the
distribution) to make sure that your system environment is properly configured
to take advantage of IPython's features.
Important note: the configuration system has changed! The old system is
still in place, but its setting may be partly overridden by the settings in
"~/ipython/ipy_user_conf.py" config file. Please take a look at the file
if some of the new settings bother you.
Please press <RETURN> to start IPython.

```

```

emacs23@ubuntu: ~
researchtools@ubuntu: ~/class/10

File Edit Options Buffers File Edit View Search Terminal Help

/home/researchtools/.ipython
Initializing from configuration: /usr/lib/python2.7/dist-packages/IPython/UserConfig

Successful installation!

Please read the sections 'Initial Configuration' and 'Quick Tips' in the
IPython manual (there are both HTML and PDF versions supplied with the
distribution) to make sure that your system environment is properly configured
to take advantage of IPython's features.

Important note: the configuration system has changed! The old system is
still in place, but its setting may be partly overridden by the settings in
"~/ .ipython/ipy_user_conf.py" config file. Please take a look at the file
if some of the new settings bother you.

Please press <RETURN> to start IPython.
*****
Python 2.7.1+ (r271:86832, Apr 11 2011, 18:05:24)
Type "copyright", "credits" or "license" for more information.

IPython 0.10.1 -- An enhanced Interactive Python.
?          -> Introduction and overview of IPython's features.
%quickref  -> Quick reference.
help       -> Python's own help system.
object?    -> Details about 'object'. ?object also works, ?? prints more.

Welcome to pylab, a matplotlib-based Python environment.
For more information, type 'help(pylab)'.

In [1]: exit
Out[1]: Type exit() to exit.

In [2]: exit()
Do you really want to exit ([y]/n)?
researchtools@ubuntu:~/class/10$

```

```

? -> Introduction and overview of IPython's features.
%quickref -> Quick reference.
help -> Python's own help system.
object? -> Details about 'object'. ?object also works, ?? prints more.

Welcome to pylab, a matplotlib-based Python environment.
For more information, type 'help(pylab)'.

In [1]: pwd
Out[1]: '/home/researchtools/class/10'

In [2]: ls
#10-qgis-bash-python.org# 20110928-0701.jpeg 20110928-1701.jpeg
10-qgis-bash-python.org 20110928-0801.jpeg 20110928-1801.jpeg
2007-boston-construction.kml 20110928-0901.jpeg 20110928-1901.jpeg
2007-boston-construction.xy 20110928-1001.jpeg 20110928-2001.jpeg
20110928-0101.jpeg 20110928-1101.jpeg 20110928-2101.jpeg
20110928-0201.jpeg 20110928-1201.jpeg 20110928-2201.jpeg
20110928-0301.jpeg 20110928-1301.jpeg 20110928-2301.jpeg
20110928-0401.jpeg 20110928-1401.jpeg healy-20110928-day-animation.gif
20110928-0501.jpeg 20110928-1501.jpeg healy.bash*
20110928-0601.jpeg 20110928-1601.jpeg healy.bash~

In [3]: cd ..
/home/researchtools/class

In [4]: pwd
Out[4]: '/home/researchtools/class'

In [5]: ls
09/ 10/

In [6]: cd 10
/home/researchtools/class/10

In [7]:

```

```

Now, if you start ipyth
** Looking around with
Start ipython

#+BEGIN_SRC sh
ipython -pylab
#+END_SRC

ipython provides some
are *not* available in

#+BEGIN_EXAMPLE
In [1]: ls
10-qgis-bash-python.org
2007-boston-construction
2007-boston-construction
20110928-0101.jpeg
20110928-0201.jpeg
20110928-0301.jpeg
20110928-0401.jpeg
20110928-0501.jpeg
20110928-0601.jpeg
20110928-0701.jpeg

In [2]: pwd
Out[2]: '/home/researchtools/class/10'
#+END_EXAMPLE

** An initial plot

Before we dig into the
--:**- 10-qgis-bash-pyth

```

Auto-saving...done

```

In [3]: cd ..
/home/researchtools/class

In [4]: pwd
Out[4]: '/home/researchtools/class'

In [5]: ls
09/ 10/

In [6]: cd 10
/home/researchtools/class/10

In [7]: numpy.loadtxt('2007
2007-boston-construction.kml 2007-boston-construction.xy

In [7]: numpy.loadtxt('2007-boston-construction.xy')

```

```

** An initial plot

Before we dig into the data, let's just load the data. Don't
not worry about how this works for now.

#+BEGIN_EXAMPLE
numpy.loadtxt('2007-boston-construction.xy', delimiter=',')
Out[3]:
array([[ -70.50145667,  42.10068333],
       [ -70.50164667,  42.101755   ],
       [ -70.501845   ,  42.10287667],
       ...,
       [ -70.97004    ,  42.24342833],
       [ -70.969975   ,  42.24361    ],
       [ -70.970045   ,  42.24345833]])
#+END_EXAMPLE

But really, we want to save the x and y into their own variables so
that we can plot x versus y.

#+BEGIN_SRC python
x,y = numpy.loadtxt('2007-boston-construction.xy', delimiter=',', unpack=True)
#+END_SRC

```

```

20110928-0301.jpeg
20110928-0401.jpeg
20110928-0501.jpeg
20110928-0601.jpeg
20110928-0701.jpeg

In [2]: pwd
Out[2]: '/home/researchtools'
#+END_EXAMPLE

** An initial plot

Before we dig into the details,
not worry about how this works.

```

```

#+BEGIN_EXAMPLE
numpy.loadtxt('2007-boston-construction.xy', delimiter=',')
Out[3]:
array([[ -70.50145667,  42.10068333],
       [ -70.50164667,  42.101755   ],
       [ -70.501845   ,  42.10287667],
       ...,
       [ -70.97004    ,  42.24342833],
       [ -70.969975   ,  42.24361    ],
       [ -70.970045   ,  42.24345833]])
#+END_EXAMPLE

But really, we want to save the x and y into their own variables so
that we can plot x versus y.

#+BEGIN_SRC python
x,y = numpy.loadtxt('2007-boston-construction.xy', delimiter=',', unpack=True)
#+END_SRC

```

```

ValueError                                Traceback (most recent call last)
/home/researchtools/class/10/<ipython console> in <module>()
/usr/lib/pymodules/python2.7/numpy/lib/npio.pyc in loadtxt(fname, dtype, comments, delimiter,
converters, skiprows, usecols, unpack)
    711
    712         # Convert each value according to its column and store
--> 713         X.append(tuple([conv(val) for (conv, val) in zip(converters, vals)]))
    714     finally:
    715         if own_fh:
ValueError: invalid literal for float(): -70.5014566667,42.1006833333
In [8]: numpy.loadtxt('2007-boston-construction.xy', delimiter=',')

```

```

20110928-0301.jpeg
20110928-0401.jpeg
20110928-0501.jpeg
20110928-0601.jpeg
20110928-0701.jpeg

In [2]: pwd
Out[2]: '/home/research'
#+END_EXAMPLE

** An initial plot

Before we dig into the
not worry about how this

```

```

714     finally:
715         if own_fh:

ValueError: invalid literal for float(): -70.501456667,42.100683333

In [8]: numpy.loadtxt('2007-boston-construction.xy',delimiter=',')
Out[8]:
array([[ -70.50145667,  42.10068333],
       [ -70.50164667,  42.101755  ],
       [ -70.501845   ,  42.10287667],
       ...,
       [ -70.97004    ,  42.24342833],
       [ -70.969975   ,  42.24361   ],
       [ -70.970045   ,  42.24345833]])

In [9]: history

```

```

#+BEGIN_EXAMPLE
numpy.loadtxt('2007-boston-construction.xy', delimiter=',')
Out[3]:
array([[ -70.50145667,  42.10068333],
       [ -70.50164667,  42.101755  ],
       [ -70.501845   ,  42.10287667],
       ...,
       [ -70.97004    ,  42.24342833],
       [ -70.969975   ,  42.24361   ],
       [ -70.970045   ,  42.24345833]])
#+END_EXAMPLE

But really, we want to save the x and y into their own variables so
that we can plot x versus y.

#+BEGIN_SRC python
x,y = numpy.loadtxt('2007-boston-construction.xy', delimiter=',', unpack=True)
#+END_SRC

```

```


```

```

In [8]: numpy.loadtxt('2007-boston-construction.xy',delimiter=',')
Out[8]:
array([[ -70.50145667,  42.10068333],
       [ -70.50164667,  42.101755   ],
       [ -70.501845   ,  42.10287667],
       ...,
       [ -70.97004    ,  42.24342833],
       [ -70.969975   ,  42.24361    ],
       [ -70.970045   ,  42.24345833]])

In [9]: x,y = numpy.loadtxt('2007-boston-construction.xy',delimiter=',', unpack=True)
In [10]: len(x)
Out[10]: 119194
In [11]: plot(

```

```

#+END_EXAMPLE

But really, we want to
that we can plot x vers

#+BEGIN_SRC python
x,y = numpy.loadtxt('20
#+END_SRC

Now make a plot of x vs

#+BEGIN_SRC python
plot(x, y)
#+END_SRC

file:./figures/10-matplotlib-first.png

* Updating Ubuntu                                     :sysadmin:

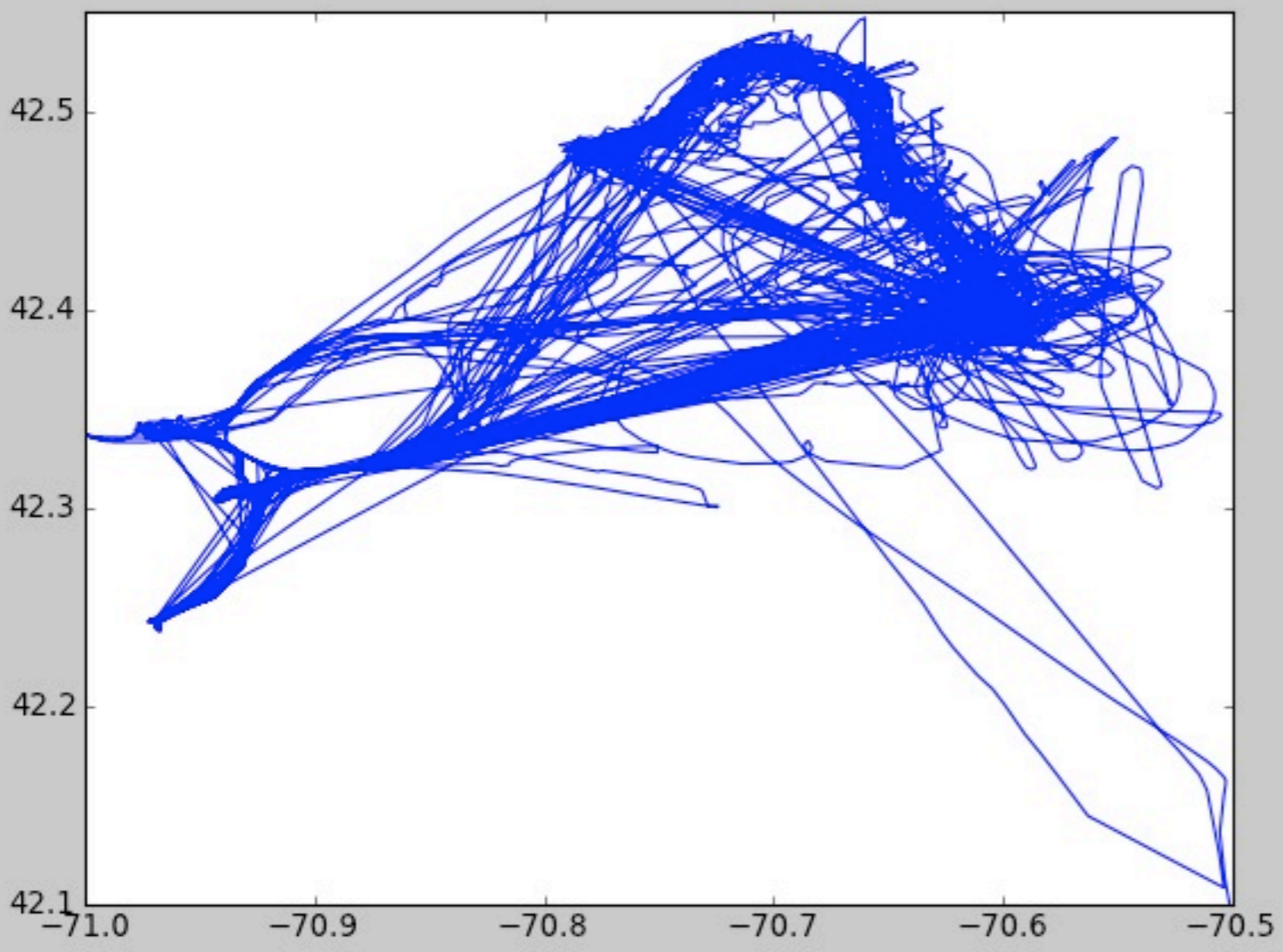
*NOTE:* please do this at the end of class before you leave.

It is a good idea to keep your computer up-to-date with patches. The
same goes with your Ubuntu virtual machine. Open a normal terminal
and run these commands one at a time. Remember that the researchtools
account password is "!rt2011vm".

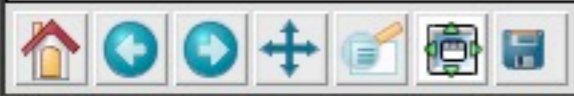
#+BEGIN_SRC sh
sudo apt-get update
sudo apt-get upgrade
#+END_SRC

```

Figure 1



```
'',delimiter=',', unpack=True)
```



```
#+BEGIN_SRC sh
sudo apt-get update
sudo apt-get upgrade
#+END_SRC
```



```

[-70.97004 ,
[-70.969975 ,
[-70.970045 ,
#+END_EXAMPLE

But really, we want to
that we can plot x vers

#+BEGIN_SRC python
x,y = numpy.loadtxt('20
#+END_SRC

Now make a plot of x v

```

```

In [10]: len(x)
Out[10]: 119194

In [11]: plot(x,y)
Out[11]: [<matplotlib.lines.Line2D object at 0xa60034c>]

In [12]: exit
Out[12]: Type exit() to exit.

In [13]: exit
Out[13]: Type exit() to exit.

In [14]: exit()
Do you really want to exit ([y]/n)?
researchtools@ubuntu:~/class/10$

```

```

#+BEGIN_SRC python
plot(x,y)
#+END_SRC

file:./figures/10-matplotlib-first.png

* Updating Ubuntu                                     :sysadmin:

*NOTE:* please do this at the end of class before you leave.

It is a good idea to keep your computer up-to-date with patches. The
same goes with your Ubuntu virtual machine. Open a normal terminal
and run these commands one at a time. Remember that the researchtools
account password is "!rt2011vm".

#+BEGIN_SRC sh
sudo apt-get update
sudo apt-get upgrade
#+END_SRC

```