

RESEARCH TOOLS 2011 LECTURE 19

2011-Nov-03

Kurt Schwehr

<http://schwehr.org>

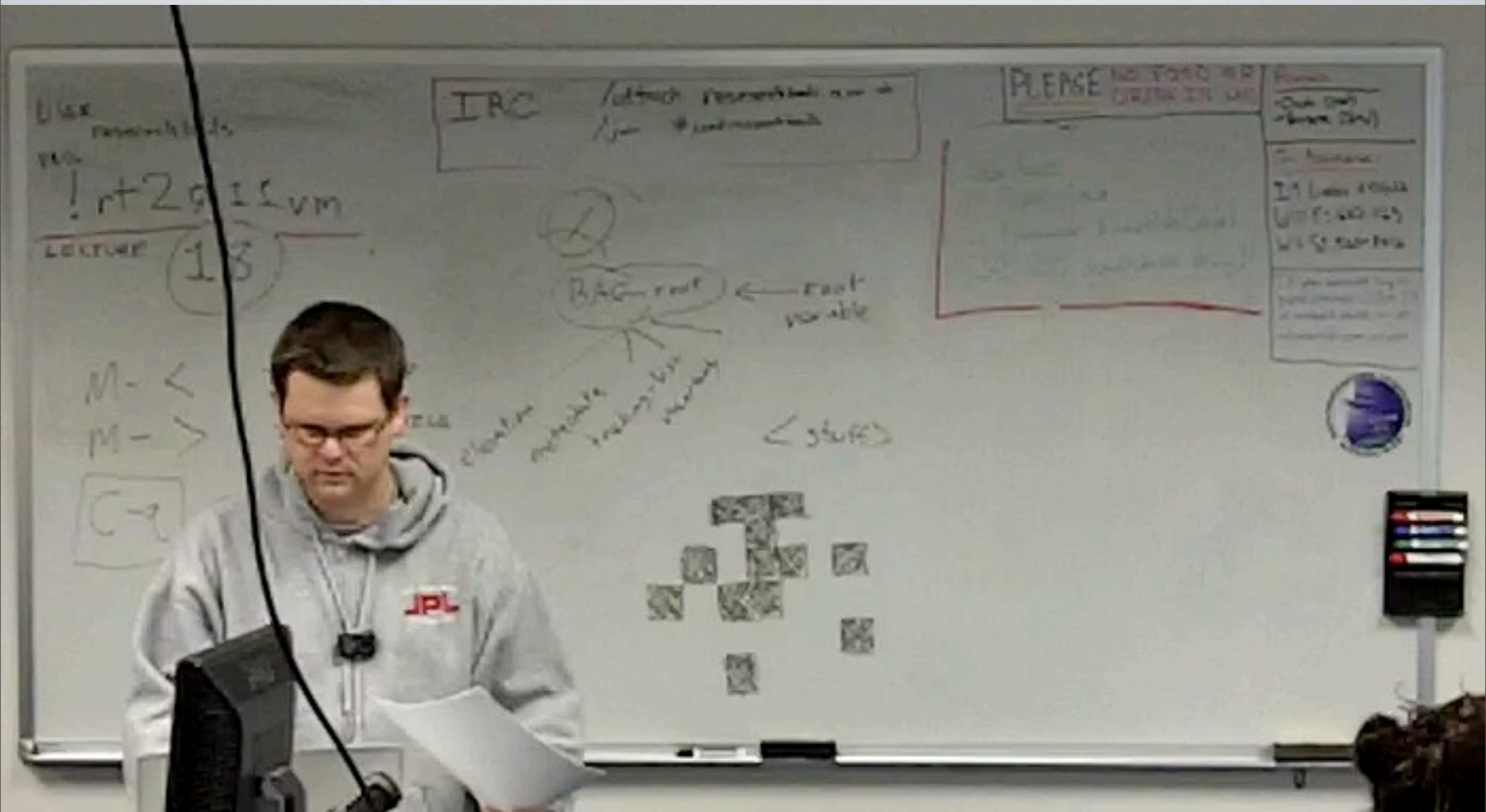
UNH CCOM/JHC

BAGs part 2 and XML metadata



<http://vislab-ccom.unh.edu/~schwehr/Courses/2011/esci895-researchtools/>

<http://creativecommons.org/licenses/by-nc-sa/3.0/>



The previous lecture (# 18)

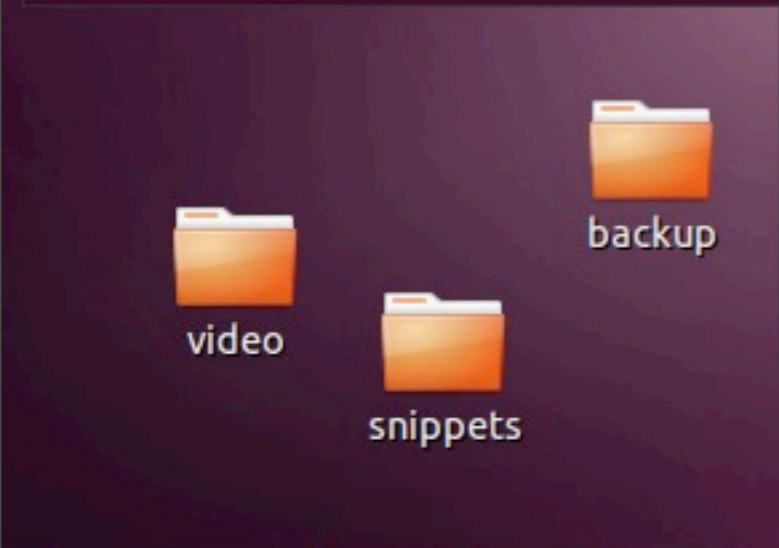
Research Tools Class 19: BAGs, HDF, Matplotlib, XML, and the kitchen sink

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```
5-researchtools/src/19-bag-2-xml-metadata.org
Resolving vislab-ccom.unh.edu... 192.168.3.3
Connecting to vislab-ccom.unh.edu|1
HTTP request sent, awaiting response
Length: 10683 (10K) [text/plain]
Saving to: `19-bag-2-xml-metadata.o
100%[=====
2011-11-03 11:07:47 (6.26 MB/s) - `205809.png
]
researchtools@ubuntu:~/class/19$
```

h.edu/~schwehr/Classe
r/Classes/2011/esci89
tools [20:57]
en mohammad Gmasetti ygh2 nhassan

```
researchtools@ubuntu: ~/class/screencapture/19-cap
File Edit View Search Terminal Help
researchtools@ubuntu:~$ cd class/screencapture/
researchtools@ubuntu:~/class/screencapture$ mkdir 19-cap
researchtools@ubuntu:~/class/screencapture$ cd 19-cap/
researchtools@ubuntu:~/class/screencapture/19-cap$ ../capture.bash
205809.png
^C
researchtools@ubuntu:~/class/screencapture/19-cap$ rm 205809.png
rm: remove regular file `205809.png'? y
researchtools@ubuntu:~/class/screencapture/19-cap$ sudo ntpdate ntp.ubuntu.com
[sudo] password for researchtools:
3 Nov 11:07:23 ntpdate[5206]: step time server 91.189.94.4 offset 50926.724943
sec
researchtools@ubuntu:~/class/screencapture/19-cap$ ../capture.bash
```



```
-U:**- #unhresearchtools@Unknown All L23 (ERC) -----
Logging in as 'kurtvm'... done
```

Research Tools Class 19: B Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```
5-researchtools/src/19-bag-2-xml-metadata
Resolving vislab-ccom.unh.edu... 192.16
Connecting to vislab-ccom.unh.edu|192.
HTTP request sent, awaiting response..
Length: 10683 (10K) [text/plain]
Saving to: `19-bag-2-xml-metadata.org'
```

100%[=====

```
2011-11-03 11:07:47 (6.26 MB/s) - `19-b
]
```

researchtools@ubuntu:~/class/19\$

```

* Introduction
* Setup

#+BEGIN_SRC sh
mkdir -p ~/class/19
cd ~/class/19
#+END_SRC

* A slight intermission

Start ipython. We had a brown out last week at the end of class
and some people lost their histories.

#+BEGIN_SRC python

```

----- 19-bag-2-xml-metadata.org 7% L16 (Org) -----

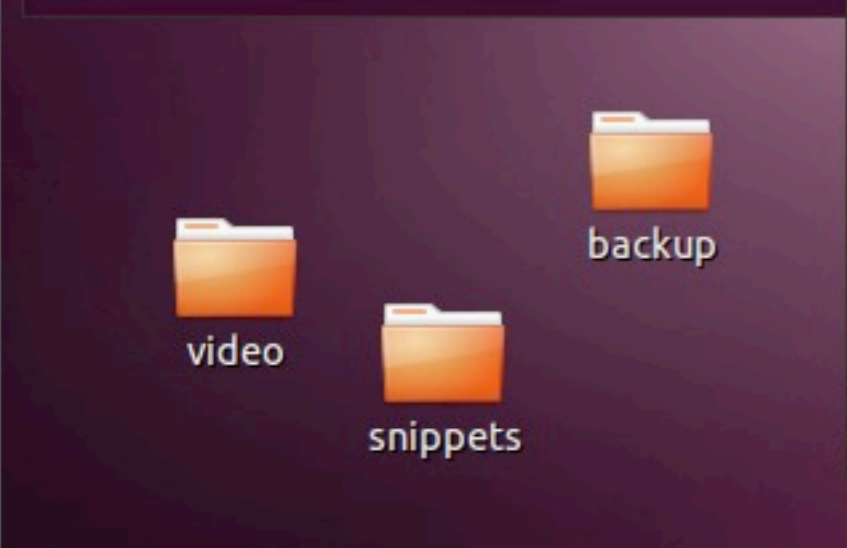
```

kurtvm on #unhresearchtools (+,lag:0)

[Wed Nov 2 2011]
*** You have joined channel #unhresearchtools [20:57]
*** Users on #unhresearchtools: kurtvm ben mohammad Gmasetti ygh2 nhassan
mluke tnguyen berrya ahyde prasadh matt_w kjerram gmitchell @sthein
*** #unhresearchtools modes: +
<mluke> hey folks
<matt_w> hi
<ben> nice day outside [20:58]
*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools

```

-U:**- #unhresearchtools@Unknown Top L3 (ERC) -----



Research Tools Class 19: BAGs, HDF, Matplotlib, XML

Search Link Text Notebook

Buffers Tools Org Tbl Help

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
Resolving vislab-ccom.unh.edu... 192.168.3.3
2 Connecting to vislab-ccom.unh.edu[192.168.3.3]:80... connected.
K HTTP request sent, awaiting response... 200 OK
h Length: 10683 (10K) [text/plain]
Saving to: `19-bag-2-xml-metadata.org'

100%[====>] 10,683 --.-K/s in 0.002s

2011-11-03 11:07:47 (6.26 MB/s) - `19-bag-2-xml-metadata.org' saved [10683/10683]

researchtools@ubuntu:~/class/19$ 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.

In [1]: %quickref

In [2]: %quickref
```

ek at the end of class

(Org)

ols [20:57]

mohammad Gmasetti ygh2 nhassan

t_w kjerram gmitchell @sthein

video backup snippets

```
<mluke> hey folks
< matt_w > hi
< ben > nice day outside
*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
< hminami > hell
< hminami > hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)
```

```

File Edit View Search Terminal Help

2 IPython -- An enhanced Interactive Python - Quick Reference Card
=====
obj?, obj??      : Get help, or more help for object (also works as
                  ?obj, ??obj).
?foo.*abc*       : List names in 'foo' containing 'abc' in them.
%magic           : Information about IPython's 'magic' % functions.

Magic functions are prefixed by %, and typically take their arguments without
parentheses, quotes or even commas for convenience.

Example magic function calls:

%alias d ls -F   : 'd' is now an alias for 'ls -F'
alias d ls -F   : Works if 'alias' not a python name
alist = %alias  : Get list of aliases to 'alist'
cd /usr/share   : Obvious. cd -<tab> to choose from visited dirs.
%cd??          : See help AND source for magic %cd

System commands:

!cp a.txt b/    : System command escape, calls os.system()
:

```

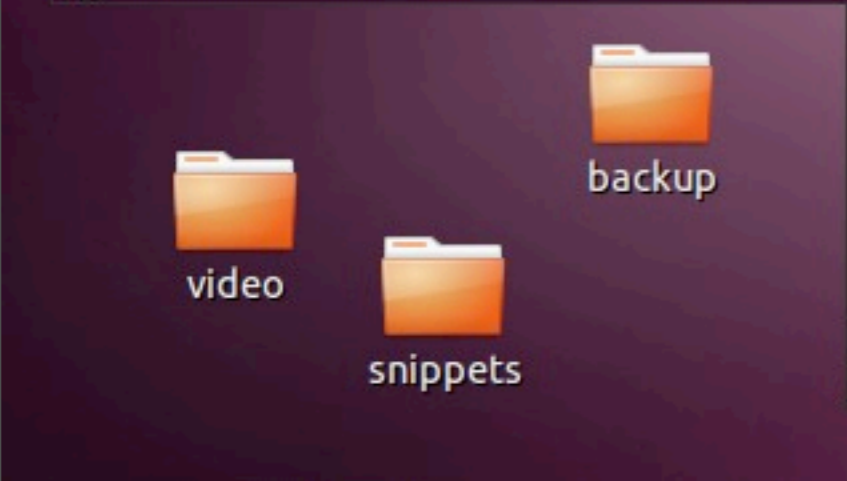
```

buffers Tools Org Tbl Help

ek at the end of class

(Org)-----

```



```

<mluke> hey folks
< matt_w> hi
<ben> nice day outside
*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----

```

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
%logoff:
  Temporarily stop logging.
%logon:
  Restart logging.
%logstart:
  Start logging anywhere in a session.
%logstate:
  Print the status of the logging system.
%logstop:
  Fully stop logging and close log file.
%lsmagic:
  List currently available magic functions.
%macro:
  Define a set of input lines as a macro for future re-execution.
%magic:
  Print information about the magic function system.
%p:
  Just a short alias for Python's 'print'.
%page:
  Pretty print the object and display it through a pager.
%paste:
  Allows you to paste & execute a pre-formatted code block from clipboard.
%pdb:
:
```

```
ek at the end of class
```

(Org) -----

```
ols [20:57]
mohammad Gmasetti ygh2 nhassan
t_w kjerram gmittchell @sthein

<mluke> hey folks
<att_w> hi
<ben> nice day outside [20:58]
*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC) -----
```

video backup snippets

```

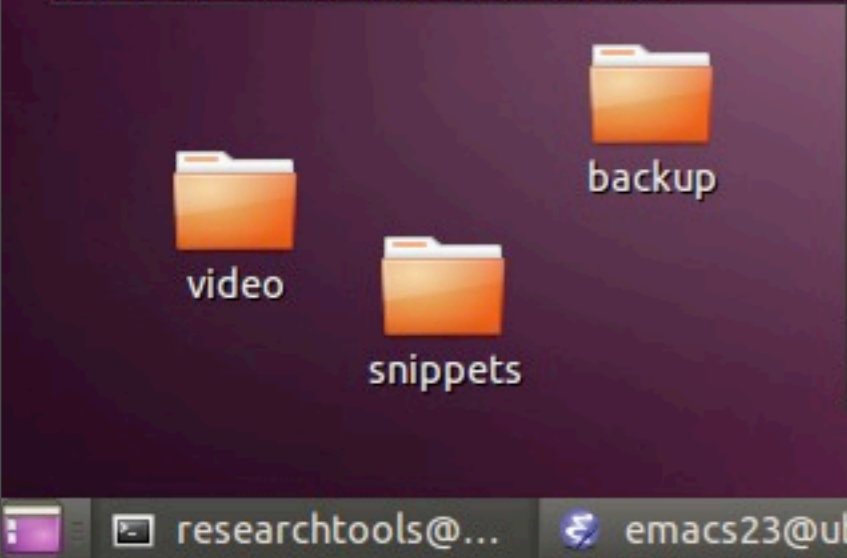
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
object? -> Details about 'object'. ?object also works, ?? prints more.
In [1]: %quickref
In [2]: %quickref
In [3]: %logstate
Logging has not been activated.
In [4]: %logstart?
In [5]: %logstart log-class-19.py
Activating auto-logging. Current session state plus future input saved.
Filename      : log-class-19.py
Mode          : backup
Output logging : False
Raw input log  : False
Timestamping  : False
State         : active
In [6]: ls
19-bag-2-xml-metadata.org  log-class-19.py
In [7]: !head log-class-19.py

```

```

buffers Tools Org Tbl Help
(0rg)-----
[20:57]
mohammad Gmasetti ygh2 nhassan
t_w kjerram gmitche ll @sthein
[20:58]
<mluke> hey folks
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<hminami> hell
<hminami> hello
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-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----

```




```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help

In [6]: ls
K19-bag-2-xml-metadata.org log-class-19.py

In [7]: !head log-class-19.py
#log# Automatic Logger file. *** THIS MUST BE THE FIRST LINE ***
#log# DO NOT CHANGE THIS LINE OR THE TWO BELOW
#log# opts = Struct({'__allownew': True, 'logfile': 'log-class-19.py'})
#log# args = []
#log# It is safe to make manual edits below here.
#log#-----
_ip.magic("quickref ")
_ip.magic("quickref ")
_ip.magic("logstate ")
#?%logstart

In [8]: import antigravity

In [9]: failed to create drawable

In [10]:

In [11]:

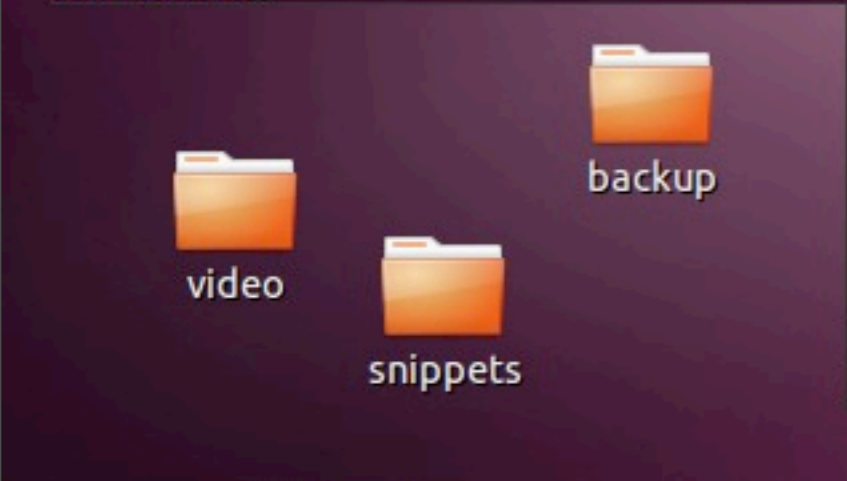
```

```

...ek at the end of class

(0rg)-----
...ols [20:57]
... mohammad Gmasetti ygh2 nhassan
... t_w kjerram gmitchell @sthein

```



```

<mluke> hey folks
< matt_w> hi
<ben> nice day outside [20:58]
*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
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<hminami> hello
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-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----

```

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [9]: failed to create drawable
In [10]:
In [11]: !wget http://vislab-ccom.unh.edu/~schwehr/rt/examples/old-bags/H11703_0
ffice_5m.bag.bz2
--2011-11-03 11:16:44-- http://vislab-ccom.unh.edu/~schwehr/rt/examples/old-bag
s/H11703_Office_5m.bag.bz2
Resolving vislab-ccom.unh.edu... 192.168.3.3
Connecting to vislab-ccom.unh.edu|192.168.3.3|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1474546 (1.4M) [application/x-bzip2]
Saving to: `H11703_Office_5m.bag.bz2'

100%[=====>] 1,474,546 8.18M/s in 0.2s

2011-11-03 11:16:44 (8.18 MB/s) - `H11703_Office_5m.bag.bz2' saved [1474546/1474
546]

In [12]: !bunzip2 H11703_Office_5m.bag.bz2
In [13]:

```

```

there is a bang ( != ) in
. The != is a shell
and bunzip2

rt/examples/old-bags/H11703_Office_5m.
process to use h5dump to view
have a better way to view the xml
t from ipython.

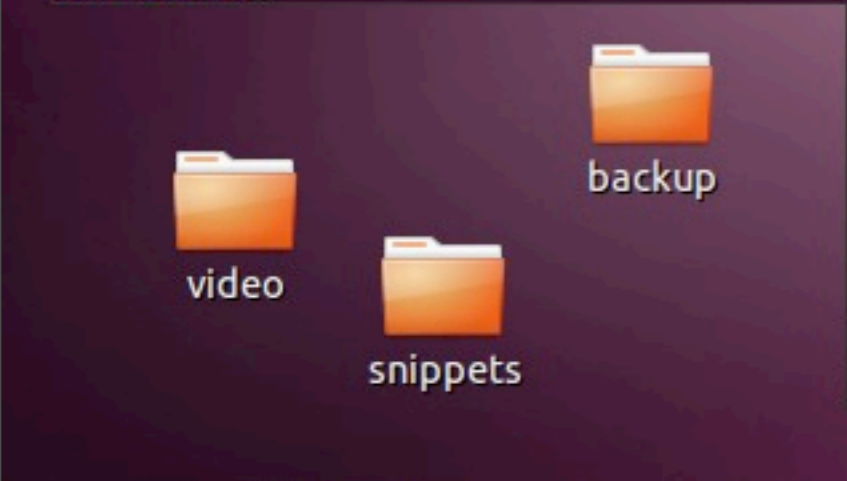
```

(Org)-----

```

ols [20:57]
mohammad Gmasetti ygh2 nhassan
t_w kjerram gmitchell @sthein

```



```

<mluke> hey folks
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<hminami> hello
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-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----

```

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [13]: ls -l
total 22484
-rw-r--r-- 1 researchtools researchtools 10683 2011-11-03 09:56 19-bag-2-xml-
metadata.org
-rw-r--r-- 1 researchtools researchtools 23003248 2011-10-27 09:44 H11703_Office
_5m.bag
-rw-r--r-- 1 researchtools researchtools 693 2011-11-03 11:17 log-class-19.
py

In [14]: ls -l
total 22484
-rw-r--r-- 1 researchtools researchtools 10683 2011-11-03 09:56 19-bag-2-xml-metadata.org
-rw-r--r-- 1 researchtools researchtools 23003248 2011-10-27 09:44 H11703_Office_5m.bag
-rw-r--r-- 1 researchtools researchtools 716 2011-11-03 11:17 log-class-19.py

In [15]: import numpy
In [16]: import h5py
In [17]: from matplotlib import pyplot
In [18]: bag = h5py.File('H11703_Office_5m.bag')
In [19]:

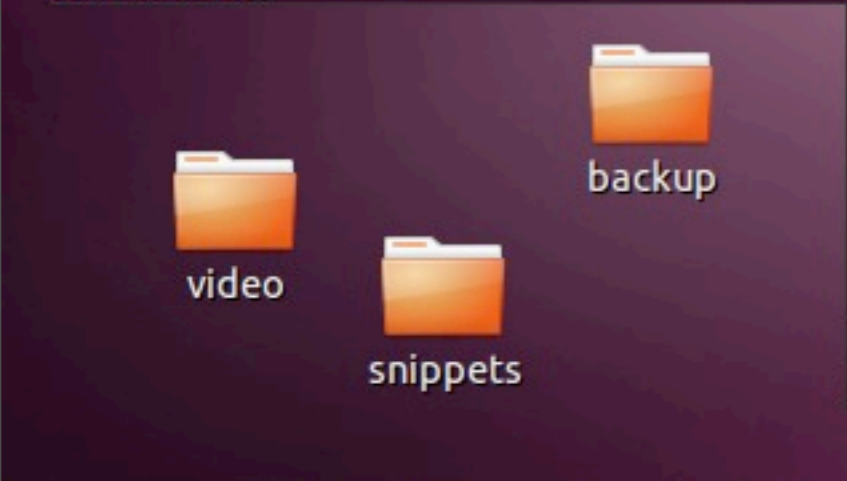
```

```

) in
l
/H11703_Office_5m.
p to view
view the xml

[20:57]
gh2 nhassan
l @sthein

```



```

<mluke> hey folks
< matt_w > hi
<ben> nice day outside
*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC) -----

```

USER: [unclear]
 TASK: !rt 29 15 vM
 LEAVE: (19)

IRC /attach [unclear] can be /use [unclear]

PLEASE NO TALKING IN CHAT

IT Lab 2012
 10/15/2012
 10:50:12

clonion reshape (1800, 2400)

BAG root ← root variable

clonion reshape (1800, 2400)

00:43:00 [play/pause] [next] [previous] [full screen] [share] -00:51:07

BAG HDF5 tree structure

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [16]: import h5py
In [17]: from matplotlib import pyplot
In [18]: bag = h5py.File('H11703_Office_5m.bag')
In [19]: bag.keys()
Out[19]: ['BAG_root']
In [20]: bag['BAG_root'].keys()
Out[20]: ['elevation', 'metadata', 'tracking_list', 'uncertainty']
In [21]: elevation = bag['BAG_root/elevation'].value
In [22]: type(elevation)
Out[22]: <type 'numpy.ndarray'>
In [23]: elevation.size
Out[23]: 2873736
In [24]: elevation.shape
Out[24]: (1434, 2004)
In [25]:

```

gh2 nhassan [20:57]

@sthein

researchtools [20:58]

researchtools

gh2 nhassan [20:57]

@sthein



```

<mluke> hey folks
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*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
Logging in as 'kurtvm'... done

```

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [24]: elevation.shape
Out[24]: (1434, 2004)
In [25]: elevation
Out[25]:
array([[ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       ...,
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.]], dtype=float32)

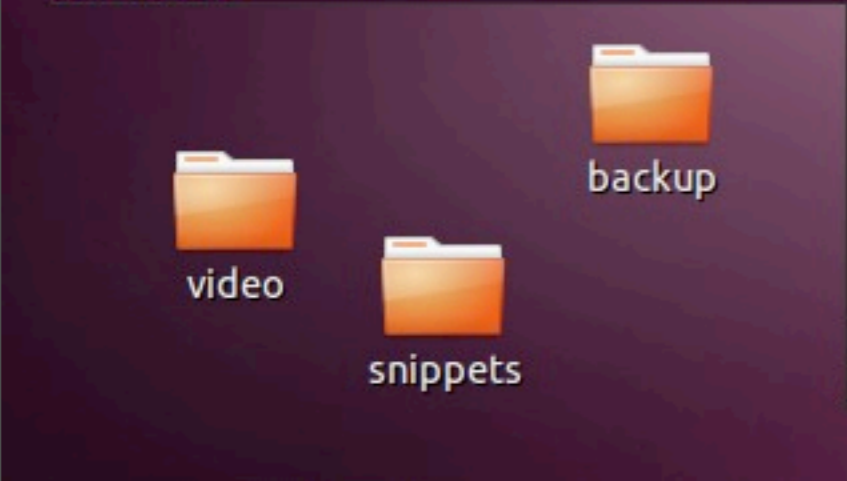
In [26]: elevation[elevation > 0] = numpy.NaN
In [27]: elevation[elevation > 999999] = numpy.NaN
In [28]:

```

[20:57] gh2 nhassan @sthein

[20:58] researchtools

[20:57] gh2 nhassan @sthein



```

<mluke> hey folks
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-U:**- #unhresearchtools@Unknown Top L3 (ERC) -----
Logging in as 'kurtvm'... done

```

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [24]: elevation.shape
Out[24]: (1434, 2004)
In [25]: elevation
Out[25]:
array([[ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       ...,
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.],
       [ 1000000., 1000000., 1000000., ..., 1000000., 1000000.,
         1000000.]], dtype=float32)

In [26]: elevation[elevation > 0] = numpy.NaN
In [27]: elevation[elevation > 999999] = numpy.NaN
In [28]: pyplot.interactive?

```

[20:57] gh2 nhassan @sthein

[20:58] researchtools

[20:57] gh2 nhassan @sthein

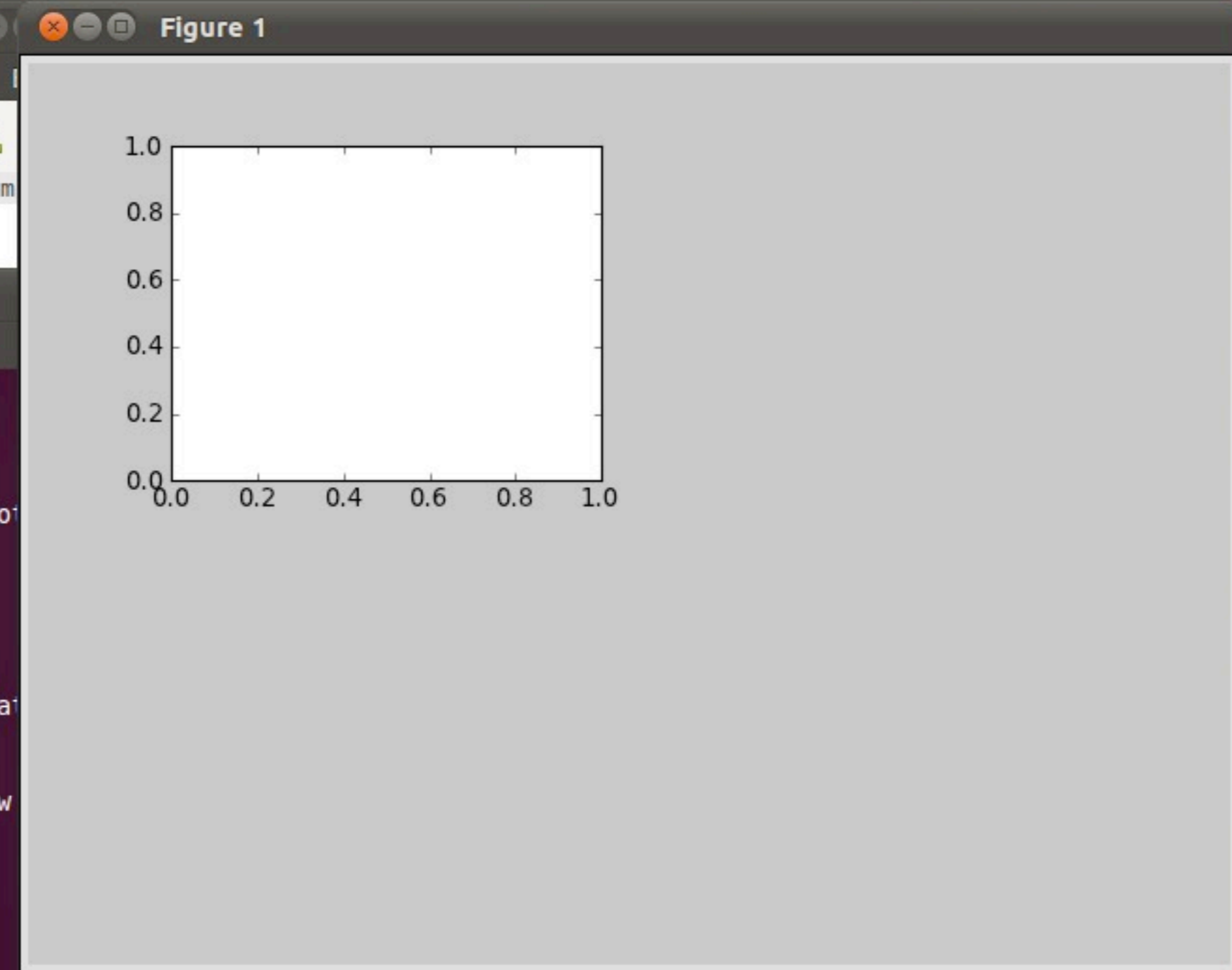
video backup snippets

```

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<hminami> hello
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-U:**- #unhresearchtools@Unknown Top L3 (ERC) -----
Logging in as 'kurtvm'... done

```

Research Tools Class 19: BAGs, HD
Search Link Text File
Research Tools Class 19: B
Matplotlib, XML, and the ki



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
Definition:      pyplot.interactive(b)
Docstring:
    Set interactive mode to boolean b.

    If b is True, then draw after every plot

In [29]: pyplot.interactive(True)

In [30]: pyplot.figure(1)
Out[30]: <matplotlib.figure.Figure object at ...>

In [31]: pyplot.imshow
pyplot.imread pyplot.imsave pyplot.imshow

In [31]: pyplot.imshow(elevation)
elevation elif else

In [31]: #pyplot.imshow(elevation)

In [32]: pyplot.subplot(221)
Out[32]: <matplotlib.axes.AxesSubplot object at 0x986642c>

In [33]:
```

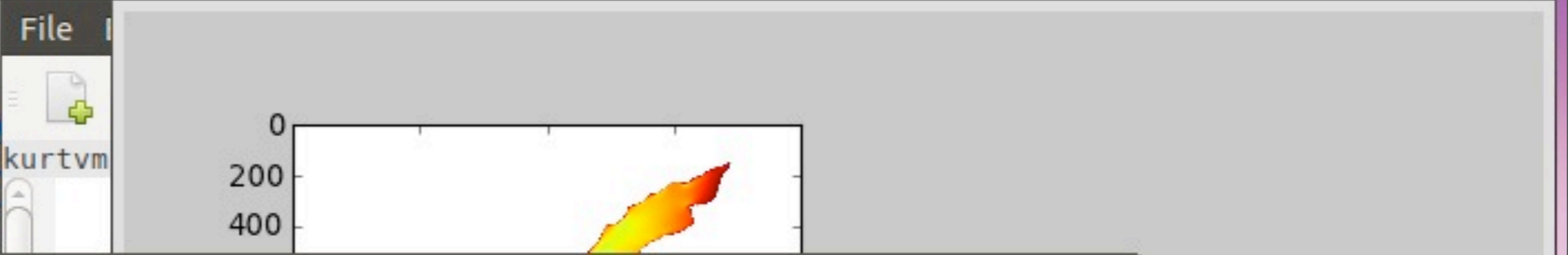
Navigation icons: Home, Back, Forward, Stop, Refresh, Print, Save

[20:58] researchtools

video snippets

```
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
Logging in as 'kurtvm'... done
```


Search Link Text File
Research Tools Class 19: B
Matplotlib, XML, and the ki



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [30]: pyplot.figure(1)
Out[30]: <matplotlib.figure.Figure object at 0x9857e8c>

In [31]: pyplot.imshow
pyplot.imread pyplot.imsave pyplot.imshow

In [31]: pyplot.imshow(elevation)
elevation elif else

In [31]: #pyplot.imshow(elevation)

In [32]: pyplot.subplot(221)
Out[32]: <matplotlib.axes.AxesSubplot object at 0x986642c>

In [33]: pyplot.imshow(elevation)
Out[33]: <matplotlib.image.AxesImage object at 0x9b7d7cc>

In [34]: e_data = elevation.reshape(
elevation.real elevation.repeat elevation.reshape elevation.resize

In [34]: e_data = elevation.reshape?
Object `e_data = elevation.reshape` not found.

In [35]: elevation.reshape?
```

[20:58]
researchtools
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
Logging in as 'kurtvm'... done

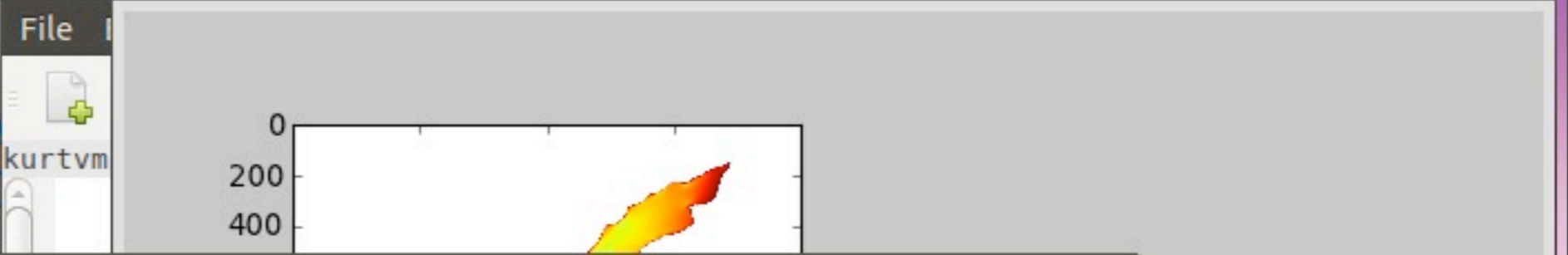
video snippets

researchtoo... emacs23@u... [Index of /~s... [researchto... Research To... Figure 1

Search Link Text

[Research Tools Class 19: B...](#)

[Matplotlib, XML, and the ki...](#)



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help

In [35]: elevation.reshape?
Type:      builtin_function_or_method
Base Class: <type 'builtin_function_or_method'>
String Form: <built-in method reshape of numpy.ndarray object at 0x92c6028>
Namespace: Interactive
Docstring:
  a.reshape(shape, order='C')

  Returns an array containing the same data with a new shape.

  Refer to `numpy.reshape` for full documentation.

  See Also
  -----
  numpy.reshape : equivalent function

In [36]: e_data = elevation.reshape(elevation.size)

In [37]: e_data
Out[37]: array([ nan,  nan,  nan, ...,  nan,  nan,  nan], dtype=float32)

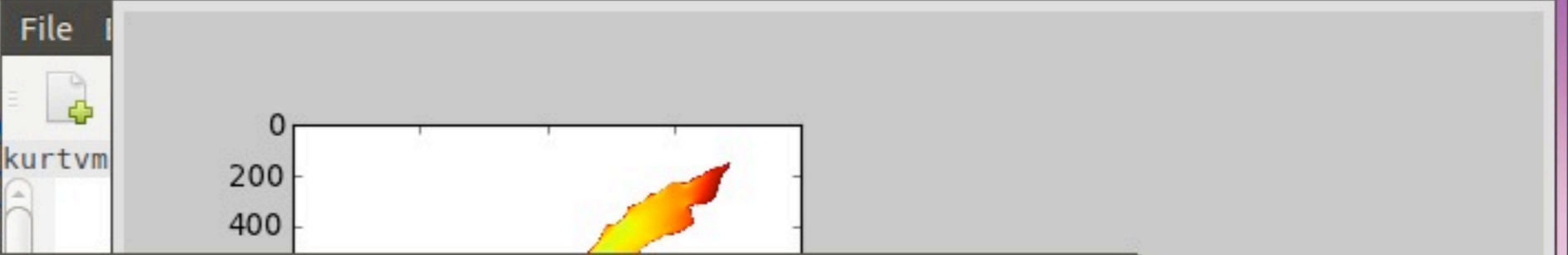
In [38]:
```

[20:58]
researchtools

video snippets

```
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
Logging in as 'kurtvm'... done
```

Search Link Text File
Research Tools Class 19: B
Matplotlib, XML, and the ki



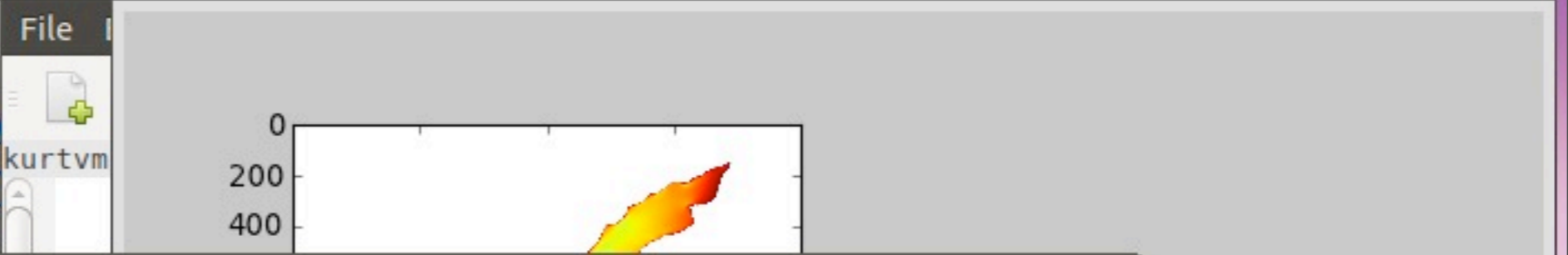
```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
Out[37]: array([ nan,  nan,  nan, ...,  nan,  nan,  nan], dtype=float32)
In [38]: e_data_clean = [ ]
In [39]: for i in range( len(e_data) ):
.....:     if not numpy.isnan (e_data[i]):
.....:
KeyboardInterrupt
In [39]:
In [40]: for i in range( len(e_data) ):
.....:     if not numpy.is
numpy.iscomplex      numpy.isinf      numpy.isreal      numpy.issubclass_
numpy.iscomplexobj  numpy.isnan      numpy.isrealobj  numpy.issubdtype
numpy.isfinite      numpy.isneginf  numpy.isscalar   numpy.issubctype
numpy.isfortran     numpy.isposinf  numpy.issctype
.....:     if not numpy.isn
numpy.isnan          numpy.isneginf
.....:     if not numpy.isnan(e_da
e_data              e_data_clean
.....:     if not numpy.isnan(e_data[i]):
.....:         e_data_clean.append = e_dat
```

[20:58]
researchtools

video snippets

```
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
Logging in as 'kurtvm'... done
```

Search Link Text File
Research Tools Class 19: B
Matplotlib, XML, and the ki



```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [40]: for i in range( len(e_data) ):
.....:     if not numpy.is
numpy.iscomplex      numpy.isinf      numpy.isreal      numpy.issubclass_
numpy.iscomplexobj  numpy.isnan      numpy.isrealobj  numpy.issubdtype
numpy.isfinite      numpy.isneginf  numpy.isscalar   numpy.issubctype
numpy.isfortran     numpy.isposinf  numpy.issctype
.....:     if not numpy.isn
numpy.isnan          numpy.isneginf
.....:     if not numpy.isnan(e_da
e_data              e_data_clean
.....:     if not numpy.isnan(e_data[i]):
.....:         e_data_clean.append = e_data[i]
.....:
-----
AttributeError                                Traceback (most recent call last)
/home/researchtools/class/19/<ipython console> in <module>()
AttributeError: 'list' object attribute 'append' is read-only

In [41]: for i in range( len(e_data) ):
         if not numpy.isnan(e_data[i]):
             e_data_clean.append( e_data[i] )

```

video snippets

```

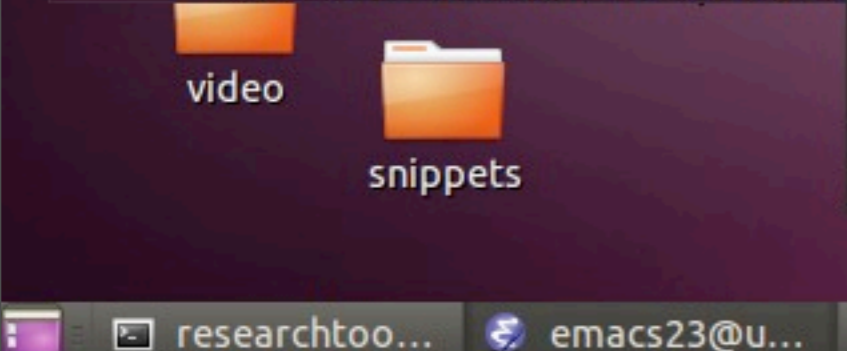
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
Logging in as 'kurtvm'... done

```

```
researchtools@ubuntu: ~/class/
File Edit View Search Terminal Help
.....: if not numpy.isnan
numpy.isnan numpy.isneginf
.....: if not numpy.isnan(e_da
e_data e_data_clean
.....: if not numpy.isnan(e_dat
.....: e_data_clean.append
.....:
-----
AttributeError
/home/researchtools/class/19/<ipython>
AttributeError: 'list' object attribu
In [41]: for i in range( len(e_data)
         if not numpy.isnan(e_data[i]):
         e_data_clean.append( e_data[i]
.....:
.....:
In [44]: for i in range( len(e_data)
         if not numpy.isnan(e_data[i]):
         e_data_clean.append( e_data[i]
```

```
emacs23@ubuntu
File Edit Options Buffers Tools Org Tbl Help
Time to try to make a histogram of the elevations. First,
make a 1D list of just the valid data. There is likely a
much faster way to do this in numpy!
#+BEGIN_SRC python
e_data = elevation.reshape(elevation.size)
e_data_clean = [ ]
for i in range(len(e_data)):
    if not numpy.isnan(e_data[i]):
        e_data_clean.append(e_data[i])
# len(e_data_clean)
# 228449
e_data.size - len(e_data_clean)
# 2645287 cells remain with NaNs
```

```
kurtvm on #unhresearchtools (+,lag:0)
[Wed Nov 2 2011]
*** You have joined channel #unhresearchtools [20:57]
*** Users on #unhresearchtools: kurtvm ben mohammad Gmasetti ygh2 nhassan
mluke tnguyen berrya ahyde prasadh matt_w kjerram gmitchell @sthein
*** #unhresearchtools modes: +
<mluke> hey folks
<matt_w> hi
<ben> nice day outside [20:58]
*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)
```



Search Link Text
Research Tools Class 19: B
Matplotlib, XML, and the ki

File Edit Options Buffers Tools Org Tbl Help
Time to try to make a histogram of the elevations. First, make a 1D list of just the valid data. There is likely a much faster way to do this in numpy!

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help

/home/researchtools/class/19/<ipython console> in <module>()
AttributeError: 'list' object attribute 'append' is read-only

In [41]: for i in range( len(e_data) ):
         if not numpy.isnan(e_data[i]):
             e_data_clean.append( e_data[i] )
         ....:
         ....:

In [44]: len ( e_data )
Out[44]: 2873736

In [45]: len ( e_data_clean )
Out[45]: 228449

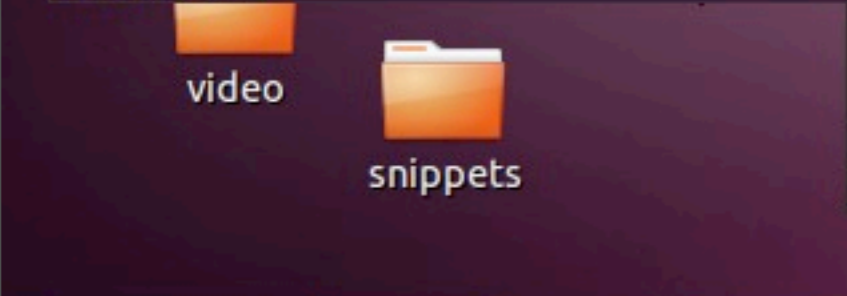
In [46]: len(e_data) - len(e_data_clean)
Out[46]: 2645287

In [47]: ( len(e_data) - len(e_data_clean) ) / float( len ( e_data ) )
Out[47]: 0.9205045279037462

In [48]:
```



[20:57]
ygh2 nhassan
l @sthein
[20:58]
researchtools



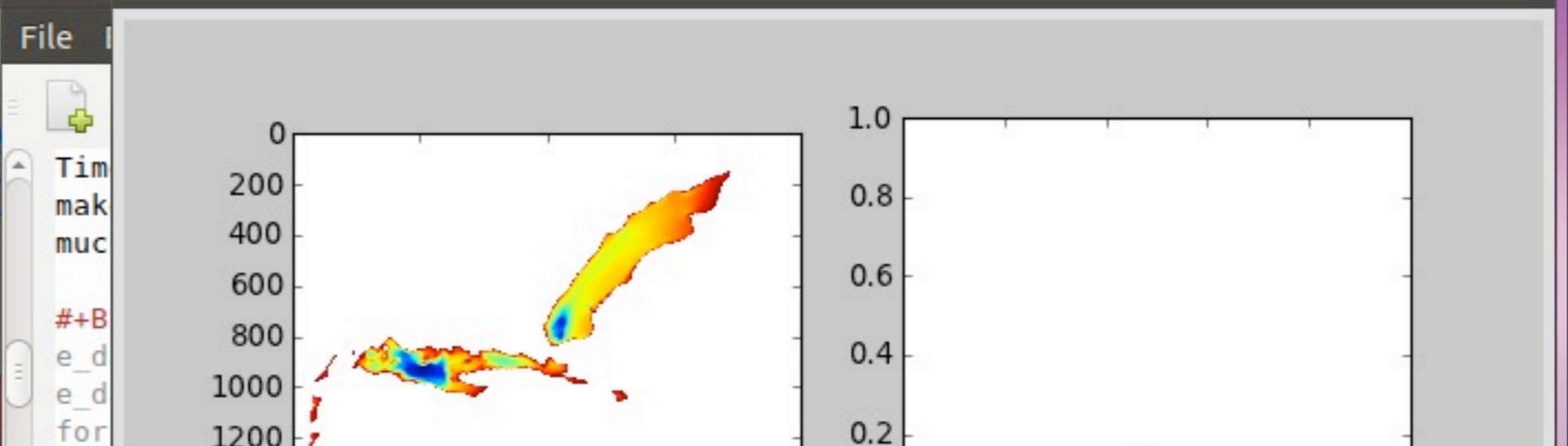
```
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
```

Search Link Text

Research Tools Class 19: B...

Matplotlib, XML, and the ki...

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [44]: len ( e_data )
Out[44]: 2873736

In [45]: len ( e_data_clean )
Out[45]: 228449

In [46]: len(e_data) - len(e_data_clean)
Out[46]: 2645287

In [47]: ( len(e_data) - len(e_data_clean) ) / float( len ( e_data ) )
Out[47]: 0.9205045279037462

In [48]: pyplot.subplot(222)
Out[48]: <matplotlib.axes.AxesSubplot object at 0x9b8f26c>

In [49]: pyplot.hist(e_da
e_data      e_data_clean

In [49]: pyplot.hist(e_data_clean, bins=100)
```

0.6 0.8 1.0

[20:58]

researchtools

video snippets

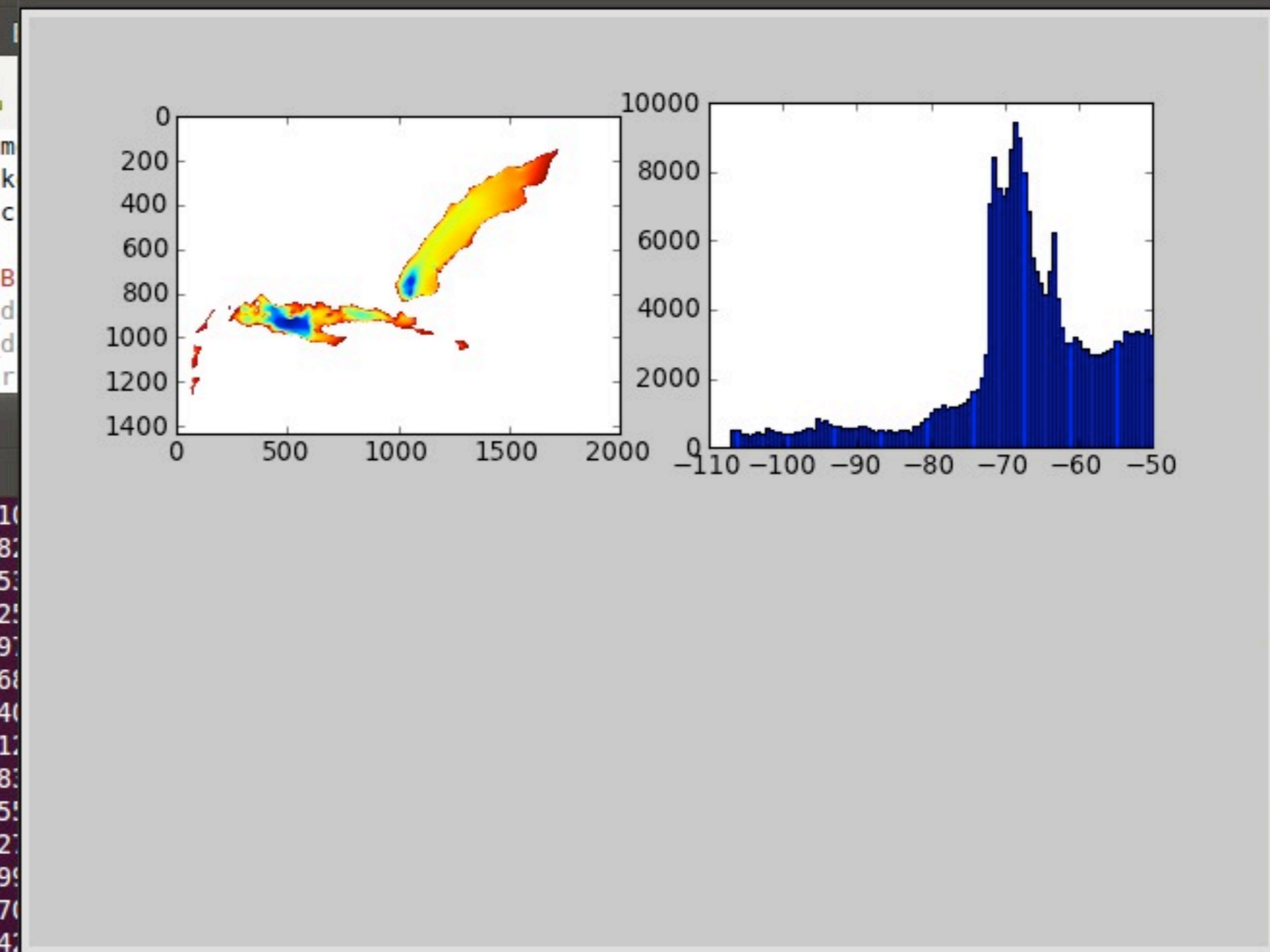
```
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC)-----
```

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Research Tools Class 19: B...

Matplotlib, XML, and the ki...

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researchtools@ubuntu: ~/class/19

```
File Edit View Search Terminal Help
-84.24581909, -83.67505665, -83.10
-81.96276932, -81.39200687, -80.8
-79.67971954, -79.1089571, -78.5
-77.39666977, -76.82590733, -76.2
-75.11362, -74.54285755, -73.9
-72.83057022, -72.25980778, -71.6
-70.54752045, -69.976758, -69.4
-68.26447067, -67.69370823, -67.1
-65.9814209, -65.41065845, -64.8
-63.69837112, -63.12760868, -62.5
-61.41532135, -60.84455891, -60.2
-59.13227158, -58.56150913, -57.9
-56.8492218, -56.27845936, -55.7
-54.56617203, -53.99540958, -53.4
-52.28312225, -51.71235981, -51.1
-50.00007248]),
<a list of 100 Patch objects>
In [50]:
```

Navigation icons: Home, Back, Forward, Pan, Zoom, Fit, Save. Status: x=1633.93 y=1223.32

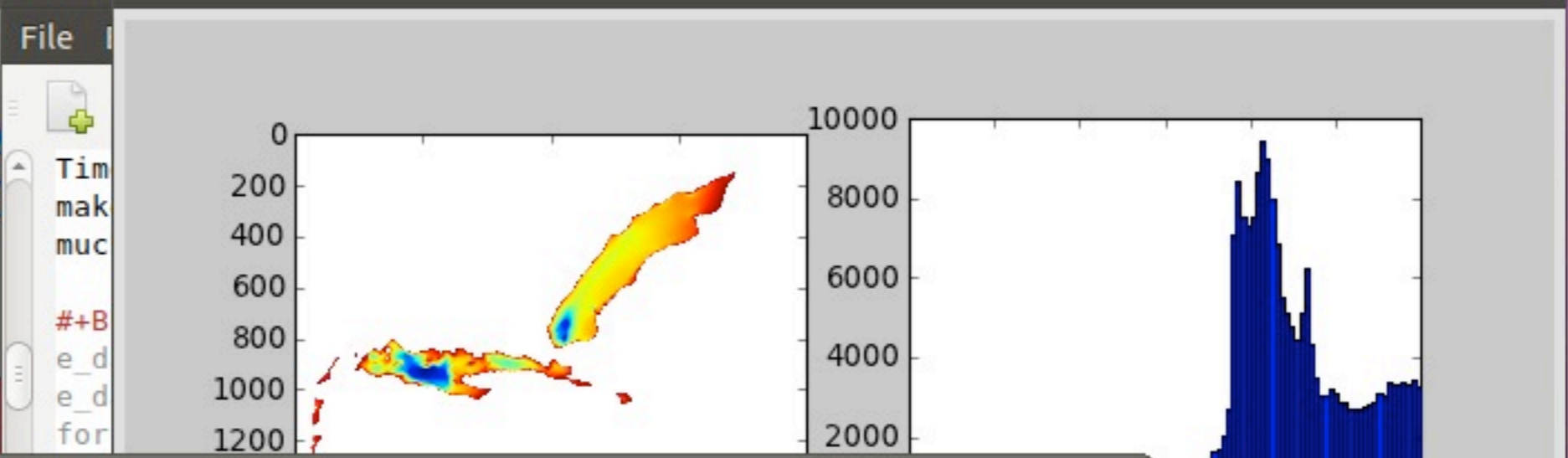
video snippets

```
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC) -----
```


Search Link Text

Research Tools Class 19: BAGs, HD, Matplotlib, XML, and the keyboard

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```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
-72.83057022, -72.25980778, -71.68904533, -71.11828289,
-70.54752045, -69.976758, -69.40599556, -68.83523312,
-68.26447067, -67.69370823, -67.12294579, -66.55218334,
-65.9814209, -65.41065845, -64.83989601, -64.26913357,
-63.69837112, -63.12760868, -62.55684624, -61.98608379,
-61.41532135, -60.84455891, -60.27379646, -59.70303402,
-59.13227158, -58.56150913, -57.99074669, -57.41998425,
-56.8492218, -56.27845936, -55.70769691, -55.13693447,
-54.56617203, -53.99540958, -53.42464714, -52.8538847,
-52.28312225, -51.71235981, -51.14159737, -50.57083492,
-50.00007248]),
<a list of 100 Patch objects>
In [50]: uncertainty = bag['/BAG_root/uncertainty'].value
In [51]: type(uncertainty)
Out[51]: <type 'numpy.ndarray'>
In [52]: whos
```

researchtools

[20:58]

video snippets

```
<hminami> hell
<hminami> hello
*** cenglert (~chatzill@lab8.ccom.nh) has joined channel #unhresearchtools
-U:**- #unhresearchtools@Unknown Top L3 (ERC) -----
Auto-saving...done
```

Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: B Matplotlib, XML, and the ki

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```
File Edit Options Buffers Tools Org Tbl Help
+ X Download Undo Cut Copy Paste Find Print Settings ?
for i in xrange(len(e_data)):
    if not numpy.isnan(e_data[i]):
        e_data_clean.append(e_data[i])

# len(e_data_clean)
# 228449

e_data.size - len(e_data_clean)
```

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [54]: uncertainty.shape
Out[54]: (1434, 2004)

In [55]: uncertainty.min
Out[55]: <built-in method min of numpy.ndarray object at 0xclace28>

In [56]: uncertainty.min()
Out[56]: 0.21800001

In [57]: uncertainty.max()
Out[57]: 1000000.0

In [58]: uncertainty[un
uncertainty unchr      unicode

In [58]: uncertainty[uncertainty > 1000] = numpy.N
numpy.NAN      numpy.NINF      numpy.NZERO      numpy.NaN

In [58]: uncertainty[uncertainty > 1000] = numpy.NAN
```

video

snippets

```
pyplot.subplot(223)
pyplot.imshow(uncertainty)
--:**- 19-bag-2-xml-metadata.org 37% L156 [# , r] (Org) -----
```

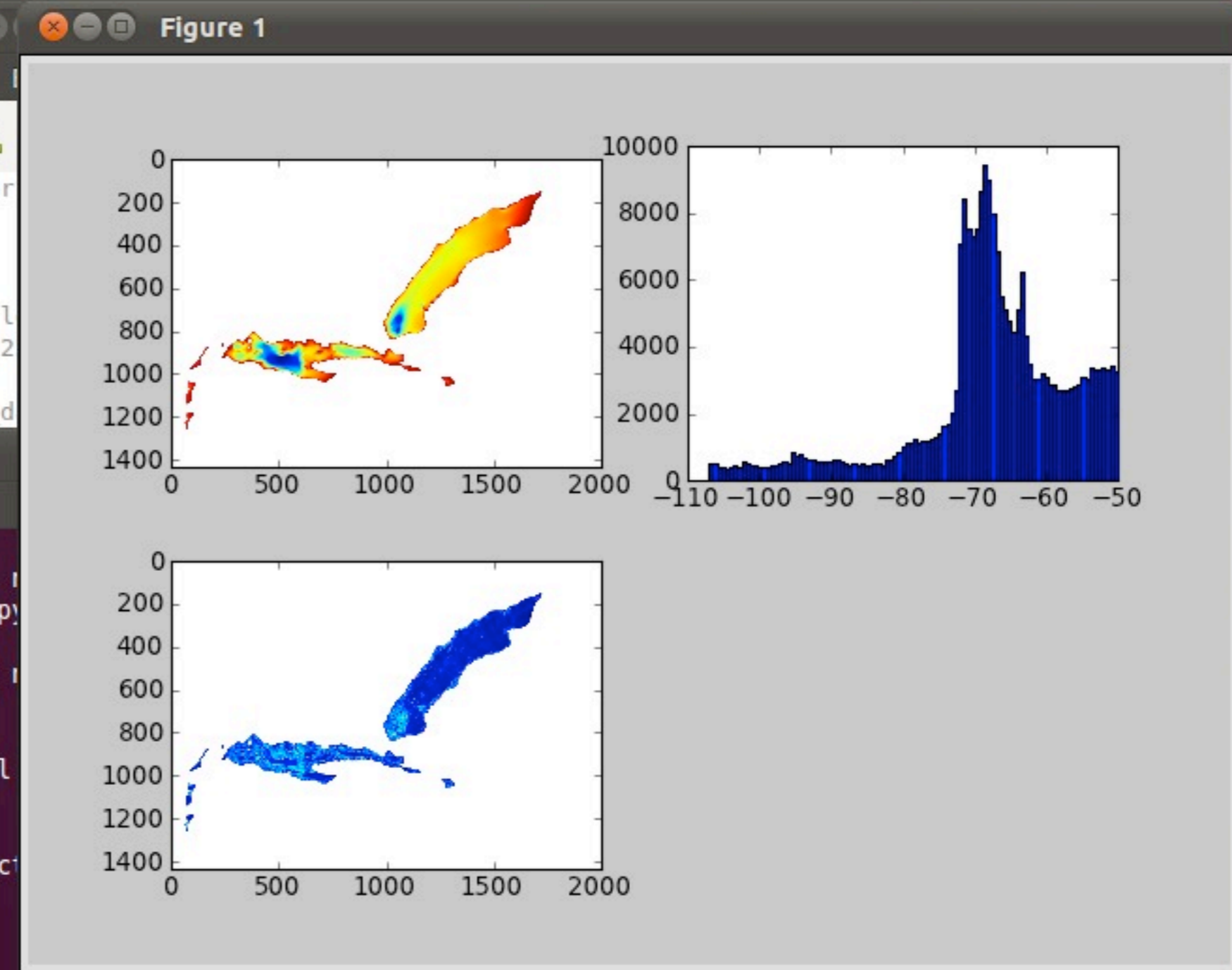
Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: B...

Matplotlib, XML, and the ki...

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```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help

In [58]: uncertainty[uncertainty > 1000] =
numpy.NAN      numpy.NINF      numpy.NZERO      numpy

In [58]: uncertainty[uncertainty > 1000] =

In [59]: pyplot.sub
pyplot.subplot      pyplot.subplot_tool

In [59]: pyplot.subplot(223)
Out[59]: <matplotlib.axes.AxesSubplot object

In [60]: pyplot.imshow(un
uncertainty unchr      unicode

In [60]: pyplot.imshow(uncertainty)
Out[60]: <matplotlib.image.AxesImage object at 0xc2c72ac>

In [61]:
```

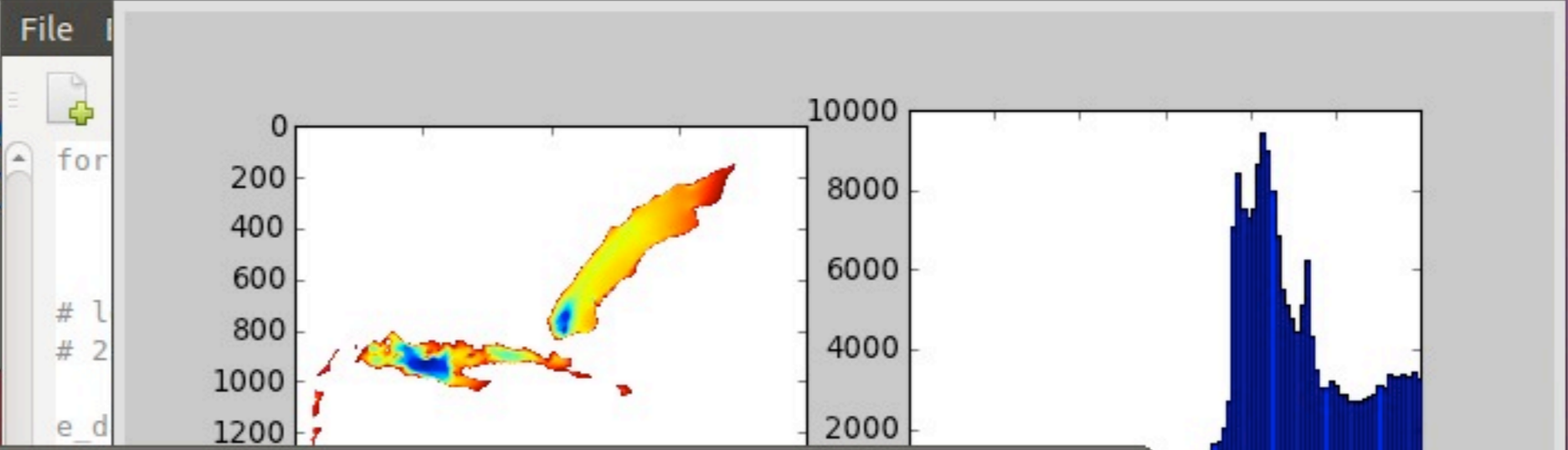
```
pyplot.subplot(223)
pyplot.imshow(uncertainty)
--:**- 19-bag-2-xml-metadata.org 37% L156 [# , r] (0rg) -----
```

Search Link Text

Research Tools Class 19: B...

Matplotlib, XML, and the ki...

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<http://schwehr.org>



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [60]: pyplot.imshow(uncertainty)
Out[60]: <matplotlib.image.AxesImage object at 0xc2c72ac>

In [61]: un
uncertainty unichr unicode

In [61]: uncertainty.min()
Out[61]: nan

In [62]: uncertainty.max()
Out[62]: nan

In [63]: u_data = un
uncertainty unichr unicode

In [63]: u_data = uncertainty.re
uncertainty.real uncertainty.repeat uncertainty.reshape uncertainty.resize

In [63]: u_data = uncertainty.reshape(u
```

```
pyplot.subplot(223)
pyplot.imshow(uncertainty)
--:**- 19-bag-2-xml-metadata.org 37% L156 [# , r] (0rg)-----
```

Search Link Text

Research Tools Class 19: B Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```
File Edit Options Buffers Tools Org Tbl Help
#+BEGIN_SRC python
uncertainty = bag['/BAG_root/uncertainty'].value

uncertainty.shape
# (1434, 2004)

uncertainty.min()
# 0.21800001
```

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
uncertainty.real      uncertainty.repeat    uncertainty.reshape  uncertainty.resize

In [63]: u_data = uncertainty.reshape(un
uncertainty unchr      unicode

In [63]: u_data = uncertainty.reshape(uncertainty.size)

In [64]: u_data_clean = [ ]

In [65]: for i in range(len(u_data)):
.....:     if not numpy.isn
numpy.isnan      numpy.isneginf
.....:     if not numpy.isnan(u_data[i]):
.....:         u_data_clean.append(u_data[i])
.....:
.....:

In [66]: u_data_clean
```

video snippets

Normally, you would have properly labeled all of the subplots!

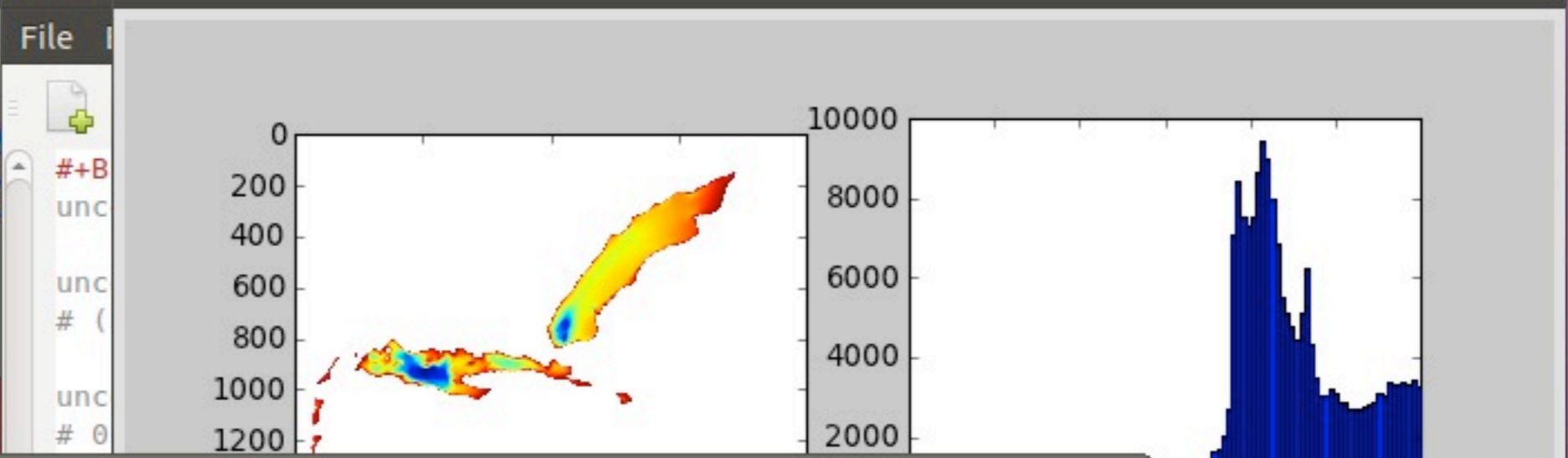
--:**- 19-bag-2-xml-metadata.org 40% L180 [# , r] (Org) -----

Search Link Text

Research Tools Class 19: B...

Matplotlib, XML, and the ki...

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
0.22500001,
0.22400001]

In [67]: pyplot.subplot(224)
Out[67]: <matplotlib.axes.AxesSubplot object at 0xc3255cc>

In [68]: pyplot.hist(u_da
u_data      u_data_clean

In [68]: pyplot.hist(u_data_clean)
Out[68]:
(array([117485, 48643, 45638, 14561, 1835, 234, 39, 11,
        0, 3]),
 array([ 0.21800001, 0.28517643, 0.35235286, 0.41952928, 0.48670571,
        0.55388213, 0.62105855, 0.68823498, 0.7554114 , 0.82258783,
        0.88976425]),
 <a list of 10 Patch objects>)

In [69]:
```

Normally, you would have properly labeled all of the subplots!

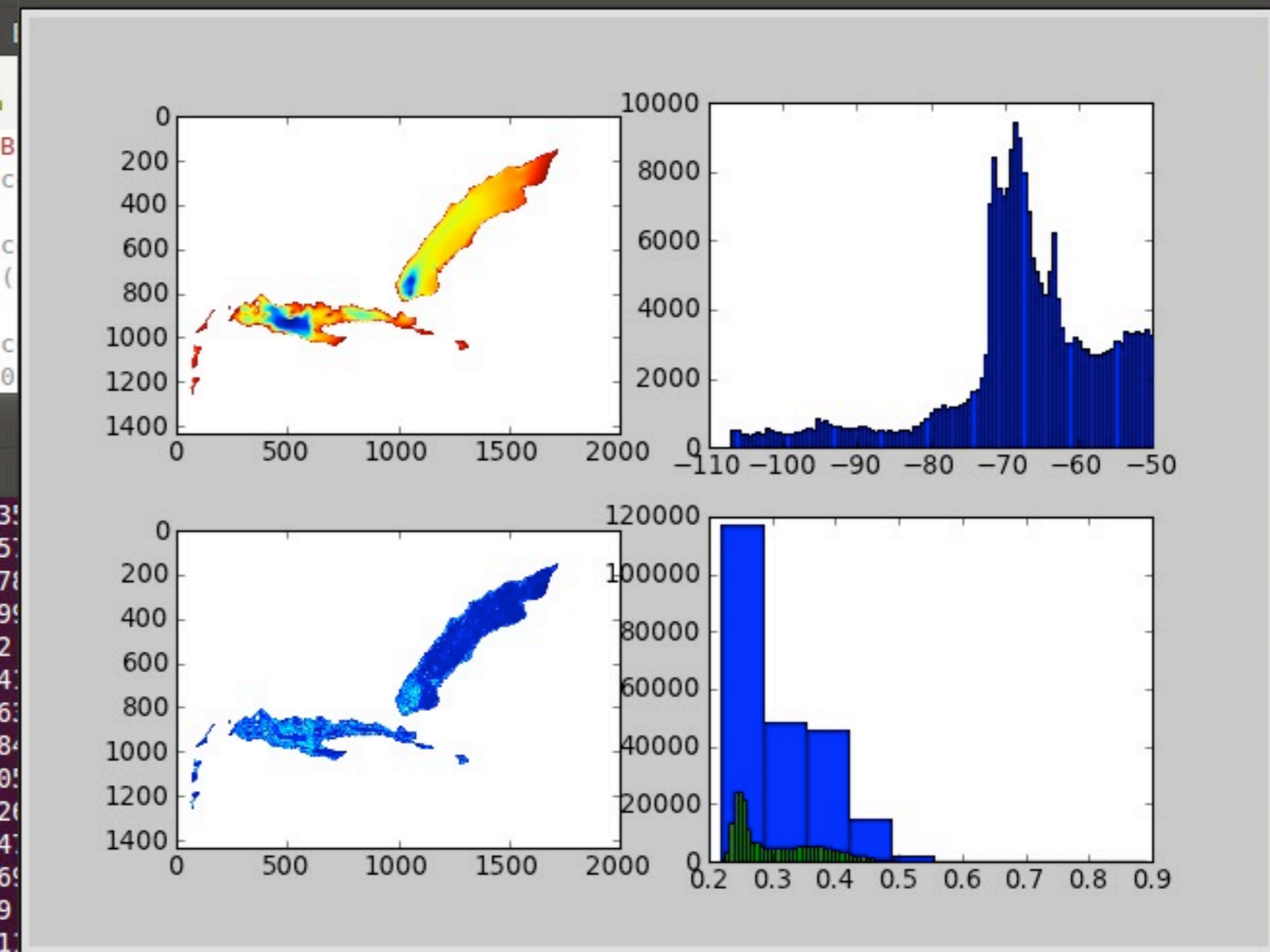
--:**- 19-bag-2-xml-metadata.org 40% L180 [# , r] (Org) -----

Search Link Text

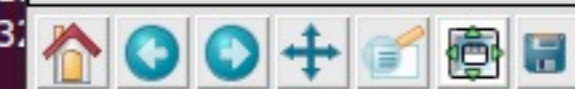
Research Tools Class 19: B...

Matplotlib, XML, and the ki...

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
0.38594107, 0.39265871, 0.39937635
0.41952928, 0.42624692, 0.43296457
0.45311749, 0.45983514, 0.46655278
0.48670571, 0.49342335, 0.50014099
0.52029392, 0.52701156, 0.53372921
0.55388213, 0.56059977, 0.56731744
0.58747034, 0.59418798, 0.60090561
0.62105855, 0.6277762, 0.63449384
0.65464677, 0.66136441, 0.66808205
0.68823498, 0.69495262, 0.70167026
0.72182319, 0.72854083, 0.73525847
0.7554114, 0.76212904, 0.76884669
0.78899961, 0.79571726, 0.80243491
0.82258783, 0.82930547, 0.83602312
0.85617604, 0.86289368, 0.86961133
0.88976425)),
<a list of 100 Patch objects>
In [70]:
```



Normally, you would have properly labeled all of the subplots!

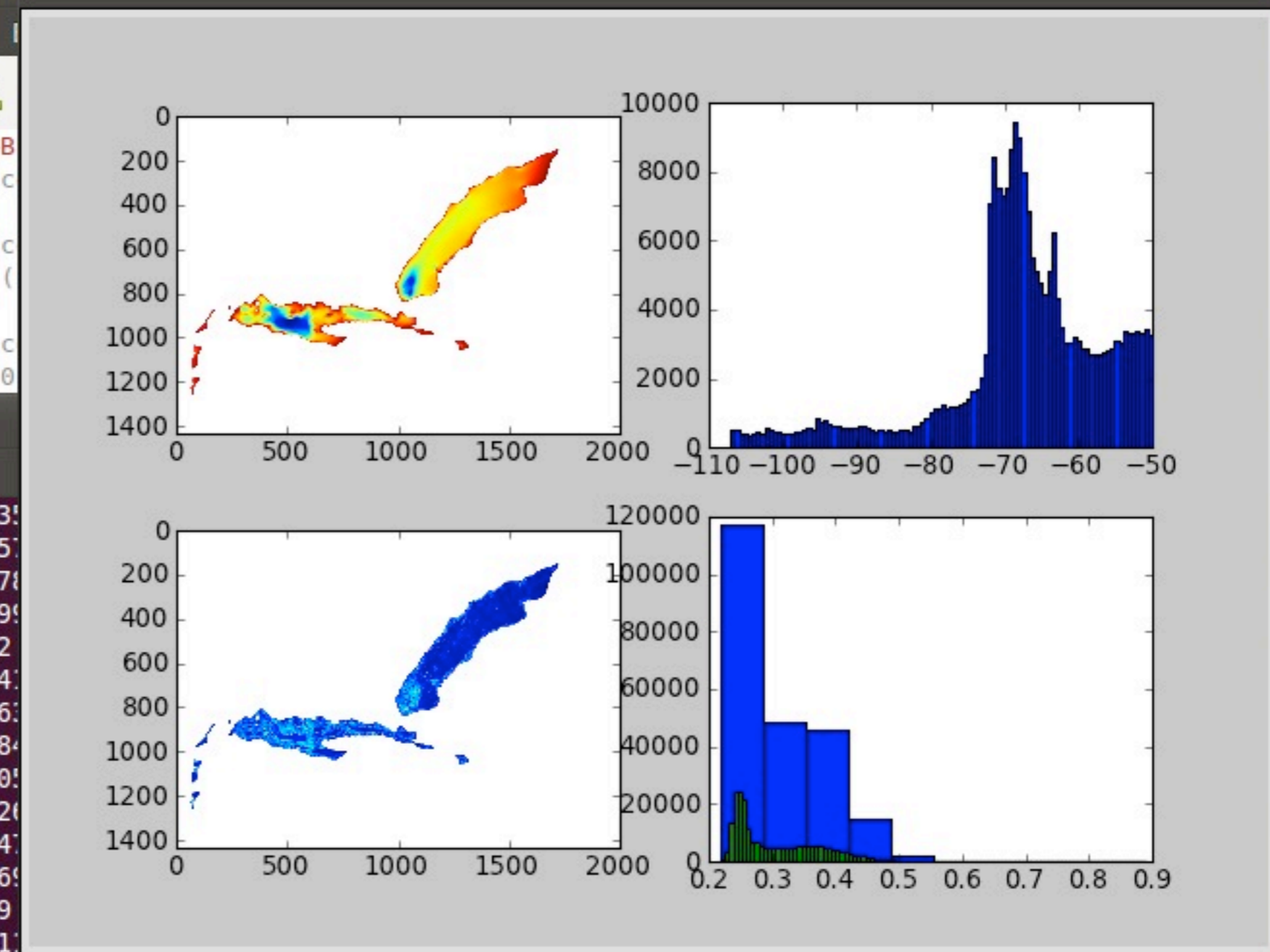
--:**- 19-bag-2-xml-metadata.org 40% L180 [# , r] (Org) -----

Search Link Text

Research Tools Class 19: B...

Matplotlib, XML, and the ki...

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>



```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
0.38594107, 0.39265871, 0.39937635
0.41952928, 0.42624692, 0.43296457
0.45311749, 0.45983514, 0.46655278
0.48670571, 0.49342335, 0.50014099
0.52029392, 0.52701156, 0.53372921
0.55388213, 0.56059977, 0.56731744
0.58747034, 0.59418798, 0.60090561
0.62105855, 0.6277762, 0.63449384
0.65464677, 0.66136441, 0.66808205
0.68823498, 0.69495262, 0.70167026
0.72182319, 0.72854083, 0.73525847
0.7554114, 0.76212904, 0.76884669
0.78899961, 0.79571726, 0.80243491
0.82258783, 0.82930547, 0.83602312
0.85617604, 0.86289368, 0.86961133
0.88976425)),
<a list of 100 Patch objects>
In [70]: pyplot.cla()
```

Navigation icons: Home, Back, Forward, Pan, Zoom, Save. Status: x=0.202988 y=41081.6

Normally, you would have properly labeled all of the subplots!

--:**- 19-bag-2-xml-metadata.org 40% L180 [# , r] (Org) -----

Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: B Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```
researchtools@ubuntu: ~/class/
File Edit View Search Terminal Help
0.38594107, 0.39265871, 0.3
0.41952928, 0.42624692, 0.4
0.45311749, 0.45983514, 0.4
0.48670571, 0.49342335, 0.5
0.52029392, 0.52701156, 0.5
0.55388213, 0.56059977, 0.5
0.58747034, 0.59418798, 0.6
0.62105855, 0.6277762, 0.6
0.65464677, 0.66136441, 0.6
0.68823498, 0.69495262, 0.7
0.72182319, 0.72854083, 0.7
0.7554114, 0.76212904, 0.7
0.78899961, 0.79571726, 0.8
0.82258783, 0.82930547, 0.8
0.85617604, 0.86289368, 0.8
0.88976425]),
<a list of 100 Patch objects>
In [72]:
```

```
emacs23@ubuntu
File Edit Options Buffers Tools Org Tbl Help
#+BEGIN_SRC python
uncertainty = bag['/BAG_root/uncertainty'].value

uncertainty.shape
# (1434, 2004)

uncertainty.min()
# 0.21800001

uncertainty.max()
# 1000000.0

uncertainty[uncertainty > 1] = numpy.NAN

pyplot.subplot(223)
pyplot.imshow(uncertainty)
#+END_SRC

And make a histogram of the uncertainty

#+BEGIN_SRC python
u_data = uncertainty.reshape(uncertainty.size)
u_data_clean = [ ]
for i in range(len(u_data)):
    if not numpy.isnan(u_data[i]):
        u_data_clean.append(u_data[i])

pyplot.subplot(224)
pyplot.hist(u_data_clean, bins=100)
#+END_SRC

Normally, you would have properly labeled all of the subplots!
```

--:**- 19-bag-2-xml-metadata.org 40% L186 [# , r] (Org)-----

Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: B

Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

And make a histogram of the uncertainty

```

#+BEGIN_SRC python
u_data = uncertainty.reshape(uncertainty.size)
u_data_clean = [ ]
for i in range(len(u_data)):
    if not numpy.isnan(u_data[i]):

```

researchtools@ubuntu: ~/class/19

File Edit View Search Terminal Help

```

0.62105855, 0.6277762 , 0.63449384, 0.64121148, 0.64792912,
0.65464677, 0.66136441, 0.66808205, 0.67479969, 0.68151734,
0.68823498, 0.69495262, 0.70167026, 0.7083879 , 0.71510555,
0.72182319, 0.72854083, 0.73525847, 0.74197612, 0.74869376,
0.7554114 , 0.76212904, 0.76884669, 0.77556433, 0.78228197,
0.78899961, 0.79571726, 0.8024349 , 0.80915254, 0.81587018,
0.82258783, 0.82930547, 0.83602311, 0.84274075, 0.84945839,
0.85617604, 0.86289368, 0.86961132, 0.87632896, 0.88304661,
0.88976425]),
<a list of 100 Patch objects>)

In [72]: from lxml import etree

In [73]: metadata_txt = ''.join(bag['/BAG_root/metadata'])

In [74]: metadata_txt[:50]
Out[74]: '<?xml version="1.0"?>\n<smXML:MD_Metadata xmlns:smX'

In [75]:

```

:xml:

provided by the lxml

nt.

video snippets

```

out.write(metadata_txt)
out.close()
!diff H11703_Office_5m.xml H11703_Office_5m-try2.xml
---:--- 19-bag-2-xml-metadata.org 42% L199 [# , r] (Org)-----
menu-bar edit copy

```

Research Tools Class 19: BAGs, HD

Search Link Text [icons]

Research Tools Class 19: B Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

[icons]

We are going to use the "Element Tree" interface to XML as provided by the lxml →

<http://lxml.de/tutorial.html#the-elementtree-class>

`xpath` is a way to search the tree of XML for parts that we want.

`#+BEGIN_SRC python`

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
0.85617604, 0.86289368, 0.86961132, 0.87632896, 0.88304661,
0.88976425]),
<a list of 100 Patch objects>
In [72]: from lxml import etree
In [73]: metadata_txt = ''.join(bag['/BAG_root/metadata'])
In [74]: metadata_txt[:50]
Out[74]: '<?xml version="1.0"?>\n<smXML:MD_Metadata xmlns:smX'
In [75]: out = open('H11703_Office_5m.xml', 'w')
In [76]: type(out)
Out[76]: <type 'file'>
In [77]: out.write(metadata_txt)
In [78]: out.close()
```

```
title = root.xpath('//*/title')
title
# it's a list with one "Element"
---:--- 19-bag-2-xml-metadata.org 47% L202 [# , r] (Org) ---
```

Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: B Matplotlib, XML, and the ki

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<http://schwehr.org>

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File Edit Options Buffers Tools XML YASnippet Help

```

<?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml"><identificationInfo><smXML:BAG_DataIden
tification><citation><smXML:CI_Citation><title>BAG file created from: N:\OPR0322
KR07\Surveys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m_Final.hns</
title><date><smXML:CI_Date><date>2008-05-09</date><dateType>creation</dateType><
/smXML:CI_Date></date><citedResponsibleParty><smXML:CI_ResponsibleParty><individ
ualName>Chief, Pacific Hydrographic Branch</individualName><organisationName>NOA
A, NOS, OCS, Hydrographic Surveys Division</organisationName><positionName>Chief
, Pacific Hydrographic Branch</positionName><role>pointOfContact</role></smXML:CI
I_ResponsibleParty></citedResponsibleParty></smXML:CI_Citation></citation><abstr
act>Project: OPR-0322-KR-07; Survey: H11703; State: Alaska; General Locality: Ch
atham Strait; Sublocality: North and South Arm Hood Bay; Date of Survey: 09/01/
2007 - 09/09/2007; Surveyed by: Fugro Pelagos, Inc; Verification by: Pacific Hyd
rographic Branch</abstract><status>historicalArchive</status><spatialRepresentat
ionType>grid</spatialRepresentationType><language>en</language><topicCategory>el
evation</topicCategory><extent><smXML:EX_Extent><geographicElement><smXML:EX_Geo
graphicBoundingBox><westBoundLongitude>-134.49</westBoundLongitude><eastBoundLon
gitude>-134.32</eastBoundLongitude><southBoundLatitude>57.34</southBoundLatitude
><northBoundLatitude>57.40</northBoundLatitude></smXML:EX_GeographicBoundingBox>
</geographicElement></smXML:EX_Extent></extent><verticalUncertaintyType>Unknown<
/verticalUncertaintyType></smXML:BAG_DataIdentification></identificationInfo><me
tadataConstraints><smXML:MD_LegalConstraints><useConstraints>otherRestrictions</
useConstraints><otherConstraints>Not to be used for Navigation</otherConstraints
></smXML:MD_LegalConstraints></metadataConstraints><metadataConstraints><smXML:MD_Se
curityConstraints><classification>unclassified</classification></smXML:MD_Se
curityConstraints></metadataConstraints><dataQualityInfo><smXML:DQ_DataQuality><
scope><smXML:DQ_Scope><level>dataset</level></smXML:DQ_Scope></scope><lineage><s
mXML:LI_Lineage><source><smXML:LI_Source><description>BASE = N:\OPR0322KR07\Surv
veys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m.hcs</description></s
mXML:LI_Source></source><processStep><smXML:BAG_ProcessStep><description>Softwar
e: CARIS HIPS and SIPS; Version: 6.1; Method: Finalize; Parameters: MaxDepth = 1
-U:--- H11703_Office_5m.xml Top L1 [# ,r] (nXML Valid Server yas)-----
When done with a buffer, type C-x #

```

researchtools@ubuntu: ~/class/

File Edit View Search Terminal Help

```

Out[76]: <type 'file'>
In [77]: out.write(metadata_txt)
In [78]: out.close()
In [79]: ls -l
total 22504
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
In [80]: edit -x H1
H11703_Office_5m.bag H11703_Office_5
In [80]: edit -x H11703_Office_5m.xml
Editing...Waiting for Emacs...

```

video snippets

Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: B Matplotlib, XML, and the ki

2011-Nov-03
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<http://schwehr.org>

```
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File Edit View Search Terminal Help

In [78]: out.close()

In [79]: ls -l
total 22504
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto

In [80]: edit -x H1
H11703_Office_5m.bag H11703_Office_5

In [80]: edit -x H11703_Office_5m.xml
Editing...Waiting for Emacs...

In [81]:
```

video snippets

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File Edit Options Buffers Tools Minibuf Help

```
?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml"><identificationInfo><smXML:BAG_DataIden
tification><citation><smXML:CI_Citation><title>BAG file created from: N:\OPR0322
KR07\Surveys\H11703\Caris\Field sheets\H11703_Office\H11703_Office_5m_Final.hns</
title><date><smXML:CI_Date><date>2008-05-09</date><dateType>creation</dateType><
/smXML:CI_Date></date><citedResponsibleParty><smXML:CI_ResponsibleParty><individ
ualName>Chief, Pacific Hydrographic Branch</individualName><organisationName>NOA
A, NOS, OCS, Hydrographic Surveys Division</organisationName><positionName>Chief
, Pacific Hydrographic Branch</positionName><role>pointOfContact</role></smXML:CI
I_ResponsibleParty></citedResponsibleParty></smXML:CI_Citation></citation><abstr
act>Project: OPR-0322-KR-07; Survey: H11703; State: Alaska; General Locality: Ch
atham Strait; Sublocality: North and South Arm Hood Bay; Date of Survey: 09/01/
2007 - 09/09/2007; Surveyed by: Fugro Pelagos, Inc; Verification by: Pacific Hyd
rographic Branch</abstract><status>historicalArchive</status><spatialRepresentat
-U:--- H11703_Office_5m.xml Top L1 [# ,r] (nXML Valid yas)-----

Click <mouse-2> on a completion to select it.
In this buffer, type RET to select the completion near point.

Possible completions are:
serial-term          server-edit          server-force-delete
server-mode          server-start         services-clear-cache
services-lookup

-U:%%- *Completions* All L1 [# ,r] (Completion List)-----
M-x ser
```

Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: BAGs, HD, Matplotlib, XML, and the ki

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Kurt Schwehr
<http://schwehr.org>

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File Edit Options Buffers Tools XML YASnippet Help

```
?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml"><identificationInfo><smXML:BAG_DataIden
tification><citation><smXML:CI_Citation><title>BAG file created from: N:\OPR0322
KR07\Surveys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m_Final.hns</
title><date><smXML:CI_Date><date>2008-05-09</date><dateType>creation</dateType><
/smXML:CI_Date></date><citedResponsibleParty><smXML:CI_ResponsibleParty><individ
```

researchtools@ubuntu: ~/class/19

File Edit View Search Terminal Help

```
In [78]: out.close()

In [79]: ls -l
total 22504
-rw-r--r-- 1 researchtools researchtools 10684 2011-11-03 11:50 19-bag-2-xml-metadata.org
-rw-r--r-- 1 researchtools researchtools 10683 2011-11-03 09:56 19-bag-2-xml-metadata.org~
-rw-r--r-- 1 researchtools researchtools 23003248 2011-10-27 09:44 H11703_Office_5m.bag
-rw-r--r-- 1 researchtools researchtools 5096 2011-11-03 11:56 H11703_Office_5m.xml
-rw-r--r-- 1 researchtools researchtools 2587 2011-11-03 11:56 log-class-19.py

In [80]: edit -x H1
H11703_Office_5m.bag H11703_Office_5m.xml

In [80]: edit -x H11703_Office_5m.xml
Editing...Waiting for Emacs...

In [81]:
```

```
organisationName>NOA
positionName>Chief
act</role></smXML:C
n></citation><abstr
General Locality: Ch
e of Survey: 09/01/
lon by: Pacific Hyd
spatialRepresentat
e><topicCategory>el
ement><smXML:EX_Geo
tude><eastBoundLon
southBoundLatitude
graphicBoundingBox>
taintyType>Unknown<
ntificationInfo><me
otherRestrictions</
</otherConstraints
onstraints><smXML:M
ation></smXML:MD_Se
ML:DQ_DataQuality><
/scope><lineage><s
:\OPR0322KR07\Surv
veys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m.hns</description></s
smXML:LI_Source></source><processStep><smXML:BAG_ProcessStep><description>Softwar
e: CARIS HIPS and SIPS; Version: 6.1; Method: Finalize; Parameters: MaxDepth = 1
-U:--- H11703_Office_5m.xml Top L1 [# , r] (nXML Valid yas)-----
Restarting server
```

video snippets

researchtoo... emacs23@u... [Index of /~s... [researchto... Research To... Figure 1

Research Tools Class 19: BAGs, HD
 Matplotlib, XML, and the ki

2011-Nov-03
 Kurt Schwehr
<http://schwehr.org>

```
File Edit Options Buffers Tools XML YASnippet Help
?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml"><identificationInfo><smXML:BAG_DataIden
tification><citation><smXML:CI_Citation><title>BAG file created from: N:\OPR0322
KR07\Surveys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m_Final.hns</
title><date><smXML:CI_Date><date>2008-05-09</date><dateType>creation</dateType><
/smXML:CI_Date></date><citedResponsibleParty><smXML:CI_ResponsibleParty><individ
```

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
-rw-r--r-- 1 researchtools researchtools 5096 2011-11-03 11:56 H11703_Office_5m.xml
-rw-r--r-- 1 researchtools researchtools 2587 2011-11-03 11:56 log-class-19.py

In [80]: edit -x H1
H11703_Office_5m.bag H11703_Office_5m.xml

In [80]: edit -x H11703_Office_5m.xml
Editing...Waiting for Emacs...

In [81]: out2 = open('H
H11703_Office_5m.bag H11703_Office_5m.xml

In [81]: out2 = open('H11703_Office_5m-try3.xml','w')

In [82]: out2.write(me
memoryview metadata_txt

In [82]: metadata_txt.replace('><','>\n<')
```

```
organisationName>NOA
positionName>Chief
act</role></smXML:C
n></citation><abstr
General Locality: Ch
e of Survey: 09/01/
lon by: Pacific Hyd
spatialRepresentat
e><topicCategory>el
ement><smXML:EX_Geo
tude><eastBoundLon
southBoundLatitude
graphicBoundingBox>
caintyType>Unknown<
ntificationInfo><me
otherRestrictions</
n</otherConstraints
onstraints><smXML:M
ation></smXML:MD_Se
ML:DQ_DataQuality><
/scope><lineage><s
:\OPR0322KR07\Surv
```

```
veys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m.hns</description></s
smXML:LI_Source></source><processStep><smXML:BAG_ProcessStep><description>Softwar
e: CARIS HIPS and SIPS; Version: 6.1; Method: Finalize; Parameters: MaxDepth = 1
-U:--- H11703_Office_5m.xml Top L1 [# ,r] (nXML Valid yas)-----
Restarting server
```

Research Tools Class 19: BAGs, HD
 Matplotlib, XML, and the ki
 2011-Nov-03
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```
File Edit Options Buffers Tools XML YASnippet Help
?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml"><identificationInfo><smXML:BAG_DataIden
tification><citation><smXML:CI_Citation><title>BAG file created from: N:\OPR0322
KR07\Surveys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m_Final.hns</
title><date><smXML:CI_Date><date>2008-05-09</date><dateType>creation</dateType><
/smXML:CI_Date></date><citedResponsibleParty><smXML:CI_ResponsibleParty><individ
```

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
>point</cellGeometry>\n<transformationParameterAvailability>>false</transformationParameterAvailabili
ty>\n<checkPointAvailability>0</checkPointAvailability>\n<cornerPoints>\n<gml:Point>\n<gml:coordinat
es decimal="." cs="," ts=" ">530793.90,6354913.60 540808.90,6362078.60</gml:coordinates>\n</gml:Poin
t>\n</cornerPoints>\n</smXML:MD_Georectified>\n</spatialRepresentationInfo>\n<referenceSystemInfo>\n
<smXML:MD_CRS>\n<projection>\n<smXML:RS_Identifier>\n<code>UTM</code>\n</smXML:RS_Identifier>\n</pro
jection>\n<ellipsoid>\n<smXML:RS_Identifier>\n<code>WGS84</code>\n</smXML:RS_Identifier>\n</ellipsoi
d>\n<datum>\n<smXML:RS_Identifier>\n<code>WGS84</code>\n</smXML:RS_Identifier>\n</datum>\n<projectio
nParameters>\n<smXML:MD_ProjectionParameters>\n<zone>8</zone>\n<longitudeOfCentralMeridian>-135.00</
longitudeOfCentralMeridian>\n<falseEasting>500000.00</falseEasting>\n</smXML:MD_ProjectionParameters
>\n</projectionParameters>\n</smXML:MD_CRS>\n</referenceSystemInfo>\n<referenceSystemInfo>\n<smXML:M
D_CRS>\n<datum>\n<smXML:RS_Identifier>\n<code>MLLW</code>\n</smXML:RS_Identifier>\n</datum>\n</smXML
:MD_CRS>\n</referenceSystemInfo>\n<language>en</language>\n<contact>\n<smXML:CI_ResponsibleParty>\n<
individualName>Chief, Pacific Hydrographic Branch</individualName>\n<organisationName>NOAA, NOS, OCS
, Hydrographic Surveys Division</organisationName>\n<positionName>Chief, Pacific Hydrographic Branch
</positionName>\n<role>pointOfContact</role>\n</smXML:CI_ResponsibleParty>\n</contact>\n<dateStamp>2
008-05-09</dateStamp>\n<metadataStandardName>ISO 19115</metadataStandardName>\n<metadataStandardVers
ion>2003</metadataStandardVersion>\n</smXML:MD_Metadata>\n'
```

```
In [83]: print ( metadata_txt.replace('><', '>\n<') )
```

```
keys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m.hns</description></s
<smXML:LI_Source></source><processStep><smXML:BAG_ProcessStep><description>Softwar
e: CARIS HIPS and SIPS; Version: 6.1; Method: Finalize; Parameters: MaxDepth = 1
-U:--- H11703_Office_5m.xml Top L1 [# ,r] (nXML Valid yas)-----
Restarting server
```


Research Tools Class 19: BAGs, HD

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Research Tools Class 19: BAGs, HD, Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

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File Edit Options Buffers Tools XML YASnippet Help

```
?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml"><identificationInfo><smXML:BAG_DataIden
tification><citation><smXML:CI_Citation><title>BAG file created from: N:\OPR0322
KR07\Surveys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m_Final.hns</
title><date><smXML:CI_Date><date>2008-05-09</date><dateType>creation</dateType><
/smXML:CI_Date></date><citedResponsibleParty><smXML:CI_ResponsibleParty><individ
```

researchtools@ubuntu: ~/class/19

File Edit View Search Terminal Help

```
<contact>
<smXML:CI_ResponsibleParty>
<individualName>Chief, Pacific Hydrographic Branch</individualName>
<organisationName>NOAA, NOS, OCS, Hydrographic Surveys Division</organisationName>
<positionName>Chief, Pacific Hydrographic Branch</positionName>
<role>pointOfContact</role>
</smXML:CI_ResponsibleParty>
</contact>
<dateStamp>2008-05-09</dateStamp>
<metadataStandardName>ISO 19115</metadataStandardName>
<metadataStandardVersion>2003</metadataStandardVersion>
</smXML:MD_Metadata>
```

In [84]: out2.write(metadata_txt.replace('><', '>\n<'))

In [85]: out2.close()

In [86]: ls -l

```
<organisationName>NOAA
<positionName>Chief
</role></smXML:CI
</citation><abstr
General Locality: Ch
e of Survey: 09/01/
on by: Pacific Hyd
<spatialRepresentat
e><topicCategory>el
ement><smXML:EX_Geo
tude><eastBoundLon
southBoundLatitude
graphicBoundingBox>
taintyType>Unknown<
ntificationInfo><me
otherRestrictions</
</otherConstraints
onstraints><smXML:M
ation></smXML:MD_Se
ML:DQ_DataQuality><
/scope><lineage><s
:\OPR0322KR07\Surv
veys\H11703\Caris\Fieldsheets\H11703_Office\H11703_Office_5m.hns</description></s
smXML:LI_Source></source><processStep><smXML:BAG_ProcessStep><description>Softwar
e: CARIS HIPS and SIPS; Version: 6.1; Method: Finalize; Parameters: MaxDepth = 1
-U:--- H11703_Office_5m.xml Top L1 [# ,r] (nXML Valid yas)-----
Restarting server
```

video snippets

researchtoo... emacs23@u... [Index of /~s... [researchto... Research To... Figure 1

Research Tools Class 19: BAGs, HD

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Research Tools Class 19: BAGs, HD, Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```
researchtools@ubuntu: ~/class/
File Edit View Search Terminal Help
In [85]: out2.close()

In [86]: ls -l
total 22512
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto

In [87]: edit -x H11
H11703_Office_5m-try3.xml H11703_off

In [87]: edit -x H11703_Office_5m-try
Editing...Waiting for Emacs...

In [88]:
```

video snippets

```
emacs23@ubuntu
File Edit Options Buffers Tools XML YASnippet Help

<?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml">
<identificationInfo>
<smXML:BAG_DataIdentification>
<citation>
<smXML:CI_Citation>
<title>BAG file created from: N:\OPR0322KR07\Surveys\H11703\Caris\Fieldsheets\H1
1703_Office\H11703_Office_5m_Final.hns</title>
<date>
<smXML:CI_Date>
<date>2008-05-09</date>
<dateType>creation</dateType>
</smXML:CI_Date>
</date>
<citedResponsibleParty>
<smXML:CI_ResponsibleParty>
<individualName>Chief, Pacific Hydrographic Branch</individualName>
<organisationName>NOAA, NOS, OCS, Hydrographic Surveys Division</organisationNam
e>
<positionName>Chief, Pacific Hydrographic Branch</positionName>
<role>pointOfContact</role>
</smXML:CI_ResponsibleParty>
</citedResponsibleParty>
</smXML:CI_Citation>
</citation>
<abstract>Project: OPR-0322-KR-07; Survey: H11703; State: Alaska; General Localiz
ity: Chatham Strait; Sublocality: North and South Arm Hood Bay; Date of Survey:
09/01/2007 - 09/09/2007; Surveyed by: Fugro Pelagos, Inc; Verification by: Pacifi
c Hydrographic Branch</abstract>
<status>historicalArchive</status>
<spatialRepresentationType>grid</spatialRepresentationType>
-U:--- H11703_Office_5m-try3.xml Top L1 [# , r] (nXML Valid Server yas)-----
No server buffers remain to edit
```

Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: BAGs, HD, Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```

emacs23@ubuntu
File Edit Options Buffers Tools XML YASnippet Help

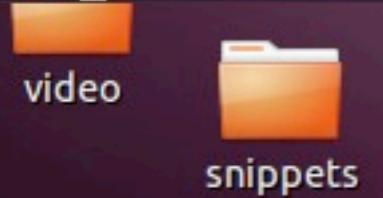
<?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml">
<identificationInfo>
<smXML:BAG_DataIdentification>
<citation>
<smXML:CI_Citation>
<title>BAG file created from: N:\OPR0322KR07\Surveys\H11703\Caris\Fieldsheets\H1
1703_Office\H11703_Office_5m_Final.hns</title>
<date>
<smXML:CI_Date>
<date>2008-05-09</date>
<dateType>creation</dateType>
</smXML:CI_Date>
</date>
<citedResponsibleParty>
<smXML:CI_ResponsibleParty>
<individualName>Chief, Pacific Hydrographic Branch</individualName>
<organisationName>NOAA, NOS, OCS, Hydrographic Surveys Division</organisationName
e>
<positionName>Chief, Pacific Hydrographic Branch</positionName>
<role>pointOfContact</role>
</smXML:CI_ResponsibleParty>
</citedResponsibleParty>
</smXML:CI_Citation>
</citation>
<abstract>Project: OPR-0322-KR-07; Survey: H11703; State: Alaska; General Localiz
ty: Chatham Strait; Sublocality: North and South Arm Hood Bay; Date of Survey:
09/01/2007 - 09/09/2007; Surveyed by: Fugro Pelagos, Inc; Verification by: Pacifi
c Hydrographic Branch</abstract>
<status>historicalArchive</status>
<spatialRepresentationType>grid</spatialRepresentationType>
-U: --- H11703_Office_5m-try3.xml Top L7 [# , r] (nXML Valid yas)

```

```

researchtools@ubuntu: ~/class/
File Edit View Search Terminal Help
In [85]: out2.close()
In [86]: ls -l
total 22512
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
-rw-r--r-- 1 researchtools researchto
In [87]: edit -x H11
H11703_Office_5m-try3.xml H11703_off
In [87]: edit -x H11703_Office_5m-try
Editing...Waiting for Emacs...
In [88]:

```



Research Tools Class 19: BAGs, HD

Search Link Text

Research Tools Class 19: B Matplotlib, XML, and the ki

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```
File Edit Options Buffers Tools Org Tbl Help
edit -x H11703_Office_5m-try3.xml
# Use this to tell emacs you are done editing the file: C-x #
# Use the element tree interface to xml
root = etree.fromstring(metadata_txt).getroottree()
title = root.xpath('//*/title')
title
```

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [87]: edit -x H11703_Office_5m-try3.xml
Editing...Waiting for Emacs...
In [88]: root = etree.from
etree.fromstring      etree.fromstringlist
In [88]: root = etree.fromstring(me
memoryview      metadata_txt
In [88]: root = etree.fromstring(metadata_txt).getroottree()
In [89]: title = root.xpath('//*/title')
In [90]: title
Out[90]: [<Element title at 0xabf2d4c>]
In [91]:
```

an element offers.

ML" xmlns:xlink="ht
XMLSchema-instance

aris\Fieldsheets\H12

```
<datatype>creation</datatype>
</smXML:CI_Date>
</date>
-U:--- H11703_Office_5m-try3.xml Top L7 [# , r] (nXML Valid yas)---
```

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```

File Edit Options Buffers Tools XML YASnippet Help
edit -x H11703_Office_5m-try3.xml
# Use this to tell emacs you are done editing the file: C-x #

# Use the element tree interface to xml
root = etree.fromstring(metadata_txt)

title = root.xpath('//*/title')
title

```

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [88]: root = etree.from
etree.fromstring      etree.fromstringlist

In [88]: root = etree.fromstring(me
memoryview      metadata_txt

In [88]: root = etree.fromstring(metadata_txt).getroottree()

In [89]: title = root.xpath('//*/title')

In [90]: title
Out[90]: [<Element title at 0xabf2d4c>]

In [91]: title = title[0]

In [92]: title
Out[92]: <Element title at 0xabf2d4c>

In [93]: title.

```

```

<datatype>creation</datatype>
</smXML:CI_Date>
</date>
-U: --- H11703_Office_5m-try3.xml Top L2 [# , r] (nXML Valid yas)

```

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emacs23@ubuntu

File Edit Options Buffers Tools XML YASnippet Help

```

edit -x H11703_Office_5m-try3.xml
# Use this to tell emacs you are done editing the file: C-x #

# Use the element tree interface to xml
root = etree.fromstring(metadata_txt).getroottree()

title = root.xpath('//*/title')
title
# it's a list with one "Element"
title = title[0]
title # Yuck, not very nice
title?
title. # Press <TAB> after the period (full stop) to see what an element offers.

title.tag
# 'title'

```

19-bag-2-xml-metadata.org 53% L216 [# , r] (Org)

```

<?xml version="1.0"?>
<smXML:MD_Metadata xmlns:smXML="http://metadata.dgiwg.org/smXML" xmlns:xlink="ht
tp://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
" xmlns:gml="http://www.opengis.net/gml">
<identificationInfo>
<smXML:BAG_DataIdentification>
<citation>
<smXML:CI_Citation>
<title>BAG file created from: N:\OPR0322KR07\Surveys\H11703\Caris\Fieldsheets\H1
703_Office\H11703_Office_5m_Final.hns</title>
<date>
<smXML:CI_Date>
<date>2008-05-09</date>
<dateType>creation</dateType>
</smXML:CI_Date>
</date>

```

H11703_Office_5m-try3.xml Top L7 [# , r] (nXML Valid yas)

researchtools@ubuntu: ~/class

File Edit View Search Terminal Help

```

title.__format__ title.__subcl
title.__getattr__ title.__init
title.__getitem__ title.addnext
title.__hash__ title.addprev
title.__init__ title.append
title.__iter__ title.attrib
title.__len__ title.base
title.__new__ title.clear
title.__nonzero__ title.extend
title.__reduce__ title.find

```

In [93]: title.tag
Out[93]: 'title'

In [94]: title.text
Out[94]: 'BAG file created from: N:\
\H11703_Office_5m_Final.hns'

In [95]:

video snippets

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Research Tools Class 19: B Matplotlib, XML, and the ki

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```
researchtools@ubuntu: ~/class/
File Edit View Search Terminal Help

In [94]: title.text
Out[94]: 'BAG file created from: N:\\
\\H11703_Office_5m_Final.hns'

In [95]: title = root.xpath('//*/titl

In [96]: title
Out[96]: 'BAG file created from: N:\\
\\H11703_Office_5m_Final.hns'

In [97]: abstract = root.xpath('//*/a

In [98]: abstract
Out[98]: 'Project: OPR-0322-KR-07; Su
Sublocality: North and South Arm Hoo
gro Pelagos, Inc; Verification by: Pa

In [99]:
```

```
emacs23@ubuntu
File Edit Options Buffers Tools XML YASnippet Help

edit -x H11703_Office_5m-try3.xml
# Use this to tell emacs you are done editing the file: C-x #

# Use the element tree interface to xml
root = etree.fromstring(metadata_txt).getroottree()

title = root.xpath('//*/title')
title
# it's a list with one "Element"
title = title[0]
title # Yuck, not very nice
title?
title. # Press <TAB> after the period (full stop) to see what an element offers.

title.tag
# 'title'

----- 19-bag-2-xml-metadata.org 53% L216 [# , r] (Org) -----
<organisationName>NOAA, NOS, OCS, Hydrographic Surveys Division</organisationName>
<positionName>Chief, Pacific Hydrographic Branch</positionName>
<role>pointOfContact</role>
</smXML:CI_ResponsibleParty>
</citedResponsibleParty>
</smXML:CI_Citation>
</citation>
<abstract>Project: OPR-0322-KR-07; Survey: H11703; State: Alaska; General Locali
ty: Chatham Strait; Sublocality: North and South Arm Hood Bay; Date of Survey:
09/01/2007 - 09/09/2007; Surveyed by: Fugro Pelagos, Inc; Verification by: Pacif
ic Hydrographic Branch</abstract>
<status>historicalArchive</status>
<spatialRepresentationType>grid</spatialRepresentationType>
<language>en</language>
<topicCategory>elevation</topicCategory>

----- H11703_Office_5m-try3.xml 13% L24 [# , r] (nXML Valid yas) -----
```

video snippets

researchtoo... emacs23@u... [Index of /~s... [researchto... Research To... Figure 1

Research Tools Class 19: BAGs, HD

Search Link Text [icons]

Research Tools Class 19: B...

Matplotlib, XML, and the ki...

2011-Nov-03
Kurt Schwehr
<http://schwehr.org>

```
File Edit Options Buffers Tools Org Tbl Help
# Yes! This gives us the title
# Put it all together
title = root.xpath('//*[@title'])[0].text
abstract = root.xpath('//*[@abstract'])[0].text
xmin = float(root.xpath('//*[@westBoundLongitude'])[0].text)
```

```
researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [97]: abstract = root.xpath('//*[@abstract'])[0].text
In [98]: abstract
Out[98]: 'Project: OPR-0322-KR-07; Survey: H11703; State: Alaska; General Locality: Chathman Strait;
Sublocality: North and South Arm Hood Bay; Date of Survey: 09/01/2007 - 09/09/2007; Surveyed by: Fu
gro Pelagos, Inc; Verification by: Pacific Hydrographic Branch'
In [99]: xmin = float( root.xpath('//*[@westBoundLongitude'])[0].text )
-----
IndexError                                Traceback (most recent call last)
/home/researchtools/class/19/<ipython console> in <module>()
IndexError: list index out of range
In [100]: xmin = float( root.xpath('//*[@westBoundLongitude'])[0].text )
In [101]:
```

```
<extent>
<smXML:EX_Extent>
<geographicElement>
-U:--- H11703_Office_5m-try3.xml 16% L31 [# , r] (nXML Valid yas)-----
```

video snippets


```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
In [104]: ymin = float(root.xpath('//*[@southBoundLatitude'])[0].text)
In [105]: ymax = float(root.xpath('//*[@northBoundLatitude'])[0].text)

In [106]: whos
Variable      Type          Data/Info
-----
abstract      str           Project: OPR-0322-KR-07; <...>cific Hydrographic Branch
antigravity   module       <module 'antigravity' fro<...>thon2.7/antigravity.pyc'>
bag           File         <HDF5 file "H11703 Office<...>5m.bag" (mode r+, 21.9M)>
e_data        ndarray      2873736: 2873736 elems, type `float32`, 11494944 bytes (10 Mb)
e_data_clean  list         [-50.034557, -50.004082, <...>, -50.598961, -50.438999]
elevation     ndarray      1434x2004: 2873736 elems, type `float32`, 11494944 bytes (10 Mb)
etree         module       <module 'lxml.etree' from<...>-packages/lxml/etree.so'>
h5py          module       <module 'h5py' from '/usr<...>on2.7/h5py/__init__.pyc'>
i             int          2873735
metadata_txt  str          <?xml version="1.0"?>\n<s<...>on></smXML:MD_Metadata>\n
numpy         module       <module 'numpy' from '/us<...>n2.7/numpy/__init__.pyc'>
out           file         <closed file 'H11703 Offi<...>', mode 'w' at 0xabeea18>
out2          file         <closed file 'H11703 Offi<...>', mode 'w' at 0xabeeec28>
pyplot        module       <module 'matplotlib.pyplo<...>7/matplotlib/pyplot.pyc'>
root          _ElementTree <lxml.etree.ElementTree object at 0xac07d8c>
title         str          BAG file created from: N:<...>11703_Office_5m_Final.hns
u_data        ndarray      2873736: 2873736 elems, type `float32`, 11494944 bytes (10 Mb)
u_data_clean  list         [0.28764406, 0.38523766, <...>, 0.22500001, 0.22400001]
uncertainty   ndarray      1434x2004: 2873736 elems, type `float32`, 11494944 bytes (10 Mb)
xmax          float        -134.32
xmin          float        -134.49
ymax          float        57.4
ymin          float        57.34

In [107]:

```

video snippets

```

<extent>
<smXML:EX_Extent>
<geographicElement>
-U:--- H11703_Office_5m-try3.xml 16% L31 [# ,r] (nXML Valid yas)

```

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
xmin          float          -134.49
ymax          float          57.4
ymin          float          57.34

In [107]: 'hello %d world' % (1234, )
Out[107]: 'hello 1234 world'

In [108]: ' {myvalue} '.format()

-----
KeyError                                Traceback (most recent call last)

/home/researchtools/class/19/<ipython console> in <module>()

KeyError: 'myvalue'

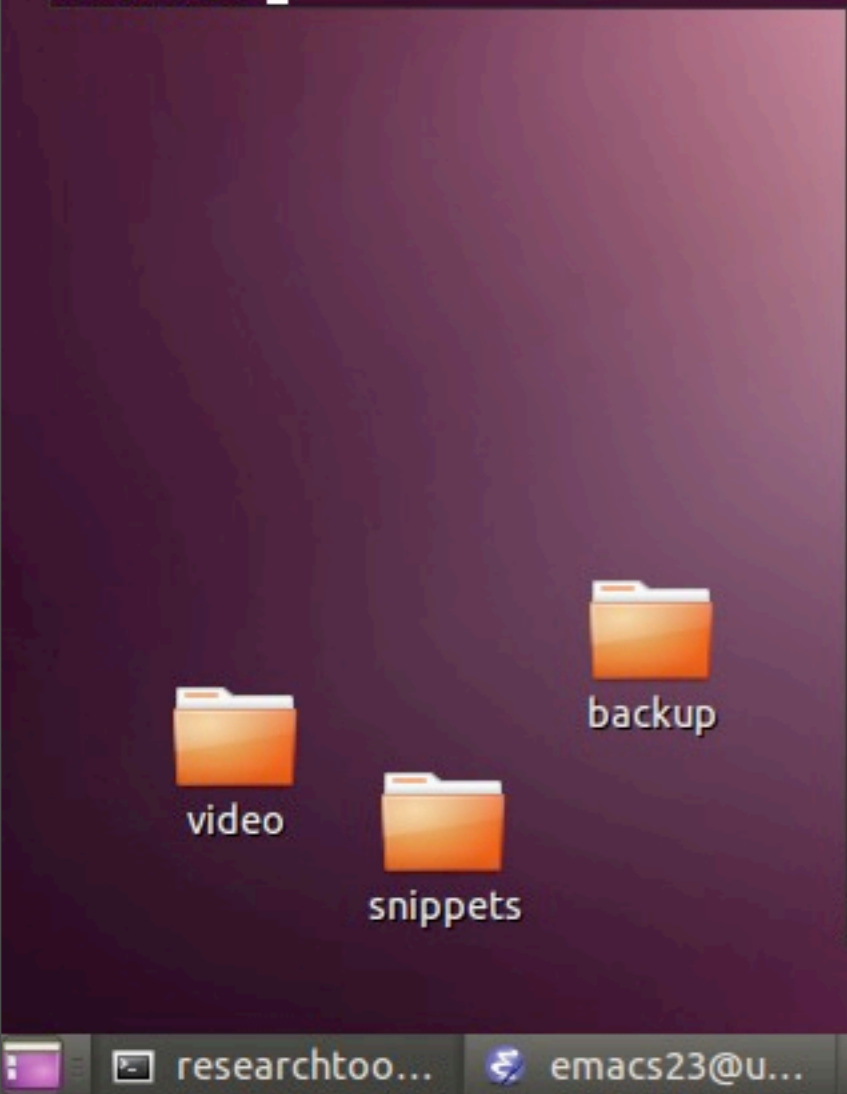
In [109]:

```

```

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```

#+BEGIN_SRC python
'{myvalue}'.format()
# Error!

'{myvalue}'.format(myvalue='hello world')
'{myvalue}'.format(myvalue=123)

'{xmin}'.format(xmin=xmin)
'{xmin} and {ymax}'.format(xmin=xmin, ymax=ymax)

bbox = {'xmin': xmin, 'ymin': ymin, 'xmax': xmax, 'ymax': ymax}
bbox

'{xmin} and {ymax}'.format(bbox)
# ERROR!

# Use the crazy expansion syntax of ** to use bbox as arguments
# to the format method of a string
'{xmin} and {ymax}'.format( **bbox )
--:**- 19-bag-2-xml-metadata.org 61% L258 [# , r] (Org) -----

```

```

researchtools@ubuntu: ~/class/19
File Edit View Search Terminal Help
KeyError                                Traceback (most recent call last)
/home/researchtools/class/19/<ipython console> in <module>()

KeyError: 'myvalue'

In [109]: '{myvalue}'.format(myvalue='hello world')
Out[109]: 'hello world'

In [110]: '{myvalue}'.format(myvalue=123.45)
Out[110]: '123.45'

In [111]: '{xmin}'.format(xmin=xmin)
Out[111]: '-134.49'

(reverse-i-search)`xmin': xmin = float( root.xpath('//*[@westBoundLongitude'])[0].text )

```

```

#+BEGIN_SRC python
'{myvalue}'.format()
# Error!

'{myvalue}'.format(myvalue='hello world')
'{myvalue}'.format(myvalue=123)

'{xmin}'.format(xmin=xmin)
'{xmin} and {ymax}'.format(xmin=xmin, ymax=ymax)

bbox = {'xmin': xmin, 'ymin': ymin, 'xmax': xmax, 'ymax': ymax}
bbox

'{xmin} and {ymax}'.format(bbox)
# ERROR!

# Use the crazy expansion syntax of ** to use bbox as arguments
# to the format method of a string
'{xmin} and {ymax}'.format( **bbox )

```

```

In [111]: '{xmin}'.format(xmin=xmin)
Out[111]: '-134.49'

In [112]: xmin = float( root.xpath('//*[@westBoundLongitude'])[0].text )
KeyboardInterrupt

In [112]:

In [113]: '{xmin} and {ymax}'.format(xmin=xmin, ymax=ymax)
Out[113]: '-134.49 and 57.4'

In [114]: '{xmin} and {wahoo}'.format(xmin=xmin, wahoo=ymax)
Out[114]: '-134.49 and 57.4'

In [115]: str(ymax)

```

```

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```



```

#+BEGIN_SRC python
'{myvalue}'.format()
# Error!

'{myvalue}'.format(myvalue='hello world')
'{myvalue}'.format(myvalue=123)

'{xmin}'.format(xmin=xmin)
'{xmin} and {ymax}'.format(xmin=xmin, ymax=ymax)

bbox = {'xmin': xmin, 'ymin': ymin, 'xmax': xmax, 'ymax': ymax}
bbox

'{xmin} and {ymax}'.format(bbox)
# ERROR!

# Use the crazy expansion syntax of ** to use bbox as arguments
# to the format method of a string
'{xmin} and {ymax}'.format( **bbox )

```

```

KeyboardInterrupt
In [112]:
In [113]: '{xmin} and {ymax}'.format(xmin=xmin, ymax=ymax)
Out[113]: '-134.49 and 57.4'
In [114]: '{xmin} and {wahoo}'.format(xmin=xmin, wahoo=ymax)
Out[114]: '-134.49 and 57.4'
In [115]: str(ymax)
Out[115]: '57.4'
In [116]: locals()

```

```

:kml:
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```



```

#+BEGIN_SRC python
'{myvalue}'.format()
# Error!

'{myvalue}'.format(myvalue='hello world')
'{myvalue}'.format(myvalue=123)

'{xmin}'.format(xmin=xmin)
'{xmin} and {ymax}'.format(xmin=xmin, ymax=ymax)

bbox = {'xmin': xmin, 'ymin': ymin, 'xmax': xmax, 'ymax': ymax}
bbox

'{xmin} and {ymax}'.format(bbox)
# ERROR!

# Use the crazy expansion syntax of ** to use bbox as arguments
# to the format method of a string
'{xmin} and {ymax}'.format( **bbox )

```

---:--- 19-bag-2-xml-metadata.org 61% L261 [# , r] (Org) ---