

OpenDAP, NetCDF + Python

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Python

Available modules for reading NetCDF and OpenDAP in Python.

Python

Available modules for reading NetCDF and OpenDAP in Python.

- netCDF4
- pydap
- Scientific.IO.NetCDF
- pupynere

Which one?

What library should I use?

Name	No dll needed?	NetCDF4?	OpenDAP?
netCDF4	✗	✓	✓
pydap	✓	✗	✓
S.I.N	✗	✗	✓
pupynere	✓	✗	✗

pydap

Reading an opendap file

```
#!/usr/bin/env python
# use the pydap client this time
import pydap.client
# specify an url, the JARKUS dataset in this case
url = 'http://dtvirt5.deltares.nl:8080/thredds/dodsC/
      opendap/rijkswaterstaat/jarkus/profiles/transect.
      nc'
# create a dataset object
dataset = pydap.client.open_url(url)
```

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Reading

Read some variables. They are stored as array.

```
# lookup a variable (directly on the dataset)
id = dataset['id'][:]
cross_shore = dataset['cross_shore'][:] 3
time = dataset['time'][:]
import numpy
# 3 indexes, first returns a grid, 2nd the variable
#   object, 3rd the data
z = dataset['altitude']['altitude'][:, numpy.nonzero(id
    ==7003600)[0][0],:]
# let's use a masked array 8
import numpy.ma
z_masked = numpy.ma.masked_array(z, mask=z==-9999)
```

Reading

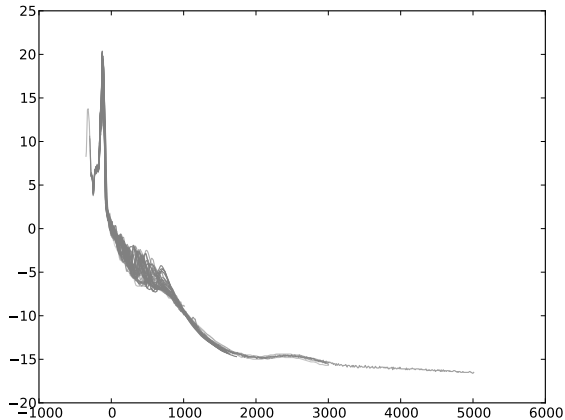
Transform the variables into something useful.

```
cross_shore.shape
>>> (1925,)
time.shape
>>> (45, )
z.shape
>>> (45, 1925)
import matplotlib
matplotlib.use('MacOSX')
import matplotlib.pyplot
for i, row in enumerate(z_masked):
    matplotlib.pyplot.plot(cross_shore[~row.mask], row
        [~row.mask], color='grey', alpha=0.3+0.7*i/
        time.shape[0])

matplotlib.pyplot.savefig('profiles.pdf')
```

Reading

This is the plot we created



Reading a NetCDF file

Reading a NetCDF file, using the example dataset from ToxLim.

```
import netCDF4
dataset = netCDF4.Dataset('limbarents.nc') 2
flow = dataset.variables['flow'][:]
species = netCDF4.chartostring(dataset.variables['
    speciesname'][:])
# Convert into edges
edges = [(species[row[0]], species[row[1]], flow[row
    [0], row[1]])
    for row 7
    in zip(*numpy.nonzero(flow))]
```

Reading a NetCDF file

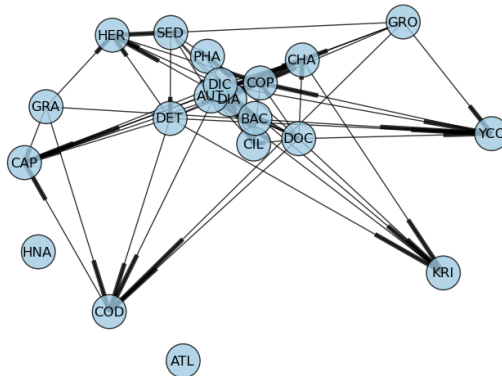
Reading a NetCDF file, using the example dataset from ToxLim.

```
import networkx
import networkx.drawing
dg=networkx.DiGraph()
dg.add_nodes_from(species)
dg.add_weighted_edges_from(edges)
pos = networkx.drawing.layout.spring_layout(dg, dim=2)
networkx.drawing.draw(dg, pos=pos,
                      node_color='#AOCBE2',
                      node_size=700, alpha=0.8)
```

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Graph drawn using the Fruchterman Reingold layout (force based layout).



- 1 <http://pypi.python.org/pypi> information about netCDF4, pydap.
- 2 <http://code.google.com/p/pythonxy/> python x,y, distribution containing a lot of packages, for example netCDF4.
- 3 <http://www.unidata.ucar.edu/software/netcdf/> information about netcdf.
- 4 <http://cf-pcmdi.llnl.gov/> information about CF convention.
- 5 <http://public.deltares.nl/display/0ET/Data+tutorials> tutorials from OpenEarth