

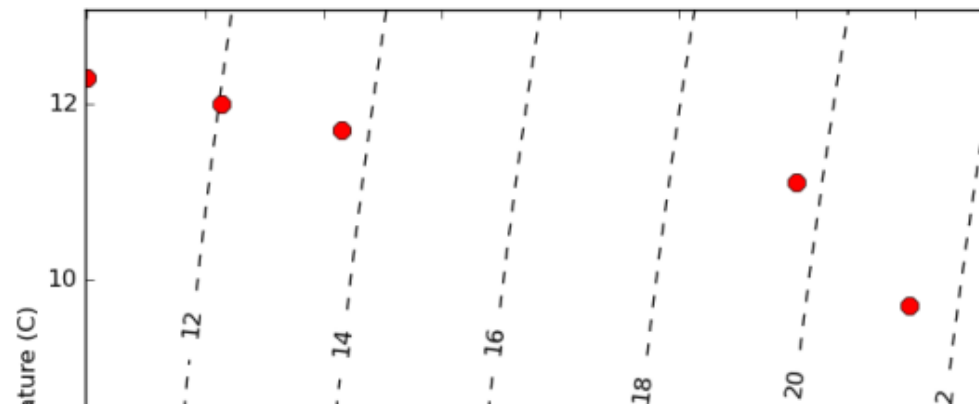
# T-S Diagram

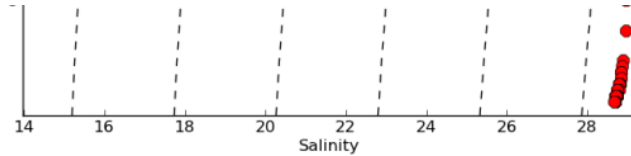
Posted on **February 17, 2013** by **dondiegoibarra**

Make a temperature-salinity (TS) diagram from a CTD profile. TS diagrams show density isolines as reference and are useful to identify different water masses.

This example follows the simple tutorial on how to [Plot a CTD profile...](#) and uses the same [CTD\\_profile.csv](#) file.

This tutorial needs the **Python Seawater Package** (download [HERE](#), or see documentation [HERE](#)).





2

```

1  import numpy as np
2  import seawater.gibbs as gsw
3  import matplotlib.pyplot as plt
4
5  # Extract data from file *****
6  f = open('CTD_profile.csv', 'r')
7  data = np.genfromtxt(f, delimiter=',')
8  f.close()
9
10 # Create variables with user-friendly names
11 temp = data[1:,1]
12 salt = data[1:,2]
13 del(data) # delete "data"... to keep things c
14
15 # Figure out boudaries (mins and maxs)
16 smin = salt.min() - (0.01 * salt.min())
17 smax = salt.max() + (0.01 * salt.max())
18 tmin = temp.min() - (0.1 * temp.max())
19 tmax = temp.max() + (0.1 * temp.max())
20
21 # Calculate how many gridcells we need in the
22 xdim = round((smax-smin)/0.1+1,0)
23 ydim = round((tmax-tmin)+1,0)
24
25 # Create empty grid of zeros
26 dens = np.zeros((ydim,xdim))
27
28 # Create temp and salt vectors of appropriate
29 ti = np.linspace(1,ydim-1,ydim)+tmin
30 si = np.linspace(1,xdim-1,xdim)*0.1+smin
31
32 # Loop to fill in grid with densities
33 for j in range(0,int(ydim)):
34     for i in range(0, int(xdim)):

```

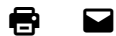
```
35         dens[j,i]=gsw.  
36  
37     # Subtract 1000 to co  
38     dens = dens - 1000  
39  
40     # Plot data *****>  
41     fig1 = plt.figure()  
42     ax1 = fig1.add_subplot  
43     CS = plt.contour(si,t:  
44     plt.clabel(CS, fontsi:  
45  
46     ax1.plot(salt,temp,'o'  
47  
48     ax1.set_xlabel('Salin:  
49     ax1.set_ylabel('Tempei
```

---

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THOUGHTS  
ON "T-S  
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Jon  
on  
February  
20,  
2013  
at  
12:46  
pm  
said:

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seawater  
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Python  
to  
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latest  
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seawater  
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snj  
on  
February  
16,  
2017  
at  
3:37



pm

said:

Nice!

How

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27.7?