Summer School

Hydrographic Lab

Objectives: The purpose of this lab is to introduce concepts of hydrographic surveying to the students.

**Introduction**

On August 1, 2017, a group of students and faculty participated in a cruise on a tugboat leaving out of the Port. Several students recorded data on time, location and depth:

UTC time (year month, day, hour, minute, second)

Latitude (degrees), Latitude (minutes)

Longitude (degrees), Longitude (minutes)

Depth from transducer (m).

The Captain of the tug informed us that the transducer is 4 m below the water line, so all depths have to have 4 m added to them to get the depth of the seafloor below the water line.

**Procedure**

1. Load the data into the Matlab

>> [dday,yr,mth,d,hr,m,lat,lon,dpth]=load\_tug();

This will load the variables on the left hand side:

dday is a decimal day since Jan-1-0000, yr is the year, mth, is the month, d is the day, hr is the hour, m is the minute, lat and lon are latitude and longitude in decimal degrees, and dpth is depth below the transducer in meters.

1. Add 4 m to dpth to convert depths to water depths
2. Plot latitude versus depth. If the dpths are multipled by -1, then it will deeper locations will be plotted below shallower locations:

>>plot(lat,-dpth,’s’)

>>xlabel(‘Latitude’)

>>ylabel(‘Depth [m]’)

1. Make a map with the locations of the depth data

>>figure

>>PlotMap

On this plot which direction is towards the coast? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Below are the coordinates of 4 of the depth measurements. Find these locations on the nautical chart and record the depths from the chart in the table. Compute the difference between the measured water depths and the depths from the chart.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lat  [deg] | Lat  [min] | Lon  [deg] | Lon  [min] | Water Depth  [m] | Water Depth from Chart  [m] | Water depth measured – from chart  [m] |
| 5 | 37.2467 | 0 | 1.0339 | 18.3 |  |  |
| 5 | 34.9793 | 0 | 0.2805 | 29.1 |  |  |
| 5 | 33.1503 | 0 | 1.4673 | 35.3 |  |  |
| 5 | 31.4536 | 0 | 2.4336 | 40.3 |  |  |

6. Write down as many reasons as you can (at least 5) why the measured water levels do not agree with the charted depths.