Data Visualization Assignment - 1

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I. INTRODUCTION

Salinity of ocean water is not the same around the globe. Here we try to understand variation of salinity in Indian ocean from the visualization of the data.

II. DATA

The data is obtained from Indian National Centre for Ocean Information Services(INCOIS). The data after the keyword "SAL" is considered for our 90x60 grid. The salinity values for land is taken to be -999.

III. VISUALIZATION ALGORITHM AND IMPLEMENTATION

A. 2D Color Map

Two different color map was used to visualize the data. The different color maps used are:

1) Grey Scale - r = g = b = t, $0 \leq t \leq 1$.
2) $r = 0$, $g = 1 - t$, $b = 0.25$, $0 \leq t \leq 1$.

B. 2D Contour Map

Marching squares algorithm was implemented to find the contours, i.e, regions of the ocean having same salinity. Features that are available for 2D color and contour map are translation in x and y direction, and zooming.

C. Elevation Map

3D image was obtained by using the salinity value as z coordinate to see the variation of salinity and the gradient of variation. Features that are available for 2D color and contour map are translation in x and direction, zooming and rotation over x and y axis.

IV. CONCLUSIONS

The visualization obtained can be used to understand the following aspects:

1) How the salinity is distributed.
2) How rapidly is it varying.
3) Where the salinity is high and where it is low.

V. REFERENCES

1) http://www.incois.gov.in/portal/index.jsp
2) OpenGL tutorials: PyOpenGL.pdf
3) https://www.opengl.org/wiki/Getting_Started