**Chemical Oceanography**
**ODV Lab Module**

Please do #1 and #2 before the lab module

1) Take the Ocean Data View CD prepared for you and copy only the 'ODV' folder under the C drive. The 'ODV Install' folder contains zipped files that can be used if you need to install from scratch. You should not need them. However 'ODVGuide' in 'ODV Install' is the manual/help file and that should be transferred to the ODV folder on your computer.

I prepared 2 configuration files (.cfg) to facilitate getting the class up to speed with the lab and problem set. These are available on the class web site. Place them in the folder with the path: odv\data\GLODAP-v1.1\bottle\cfgs

Note that this version of ODV is for PC, but versions for other platforms are available on the web.

2) Browse the ODVGuide to become familiar with the program

3) Go into the bin_w32 folder and find the 'odvmp' program icon and make a shortcut to start it from your desktop. Start ODV and under the 'File' menu use the 'Open' command to access a 'collection' of data. Follow the path: odv\data\GLODAP-v1.1\bottle and click on the 'GLODAP-v1.1_bottle' icon. This icon looks like a contour section like the program icon.

4) Some of the parameters we need have to be calculated. Under the 'Configuration' menu use the 'Derived Variables' command and select 'AOU' for starters. Do it again but select 'Macro', and select the N' file. Repeat for nTDIC and nTALK. The macro feature allows the user to enter his/her own equations for derived quantity calculation.

5) A data visualization appears, but probably not the one you want. Under the "Configuration' menu use the 'Load Configuration' command. Use the path odv\data\GLODAP-v1.1\bottle\cfgs and open 'P16_ChemOce'. You should see a data section for the south central Pacific and 6 property-property plots. NOTE the 'canvas' I prepared may not fit horizontally on you screen. Please check by scrolling right and left.

6) Change the z-variable for the section plot to visualize the distribution of the different nutrient species, nTDIC, nTALK, CFC11 age, $^{14}C$ age, etc. Return to a section plot of salinity and create a overlay plot of sigma-theta (see ODV guide).

7) Click on different parts of the section in regions of distinct water mass type, identify on the T-S plot, and examine the effect on the distributions of points in the other property-property plots.

8) To examine specific density layers, go to the 'Configuration' menu and use the 'Selection Criteria' command. Under the 'Sample Selection' tab, choose sigma-theta with a range from 27.7 to 29. Which water masses is the visualization restricted to? What are the

remineralization ratios of Dic:$O_2$:$NO_3^-$:$PO_4^{-3}$ and how do they compare to the Redfield ratios. Is there evidence for 'preformed nutrients' and what does this term mean? Does CaCO3 dissolution contribute to the changes in nTDIC and why? If so, attempt to make a quick estimate of its contribution to the apparent nTDIC:$PO_4^{-3}$ relationship. What is the apparent $PO_4^{-3}$ remineralization rate? Should CFC age or radiocarbon age be used to make this calculation. Note: linear regression of property-property plots can be made by right-clicking on the plot, selecting the 'Extras' menu, and then the 'Statistics' command.

9) Do the same for the sigma-theta ranges of 27 to 27.5 and 25 to 26.5