SIO 210 Data Projects (using Java OceanAtlas)

From: Jim Swift, Research Oceanographer, SIO (jswift@ucsd.edu; 858-534-3387)

Some of you will choose to do a data project for SIO 210. I can help you choose a project, find data, and work out an analytic approach. If you select to do a data project you should plan to meet with me to get started and then touch base as needed to discuss your progress.

There are many important and useful types of oceanographic data - from ships, moored instruments, floats, drifters, satellites, and more. I collect and study water column data collected from research ships - temperature, salinity, dissolved oxygen, and other substances such as CFCs and ocean carbon related parameters. These data - "hydrographic data" - underlie the property maps and cross-sections of the oceans which Professor Talley will be showing in class, which in turn help to illuminate the structure and circulation of the oceans.

I have a global collection of deep-sea hydrographic data, and I also have a Mac OS or Windows Java application one can use to examine and explore those data: Java OceanAtlas (JOA). It may also be possible to use JOA to work with certain Argo data files, too. [If you do a data project with me, it is easier for me to advise you if you use JOA, but use of JOA is not required.] The first step in a data/JOA project is to download JOA and get it running on your computer. You would think this would be a snap, and it should be. But I suggest not waiting to install JOA - do this right away. Then if you have problems, we can solve them. In fact, that is one purpose of this note: to urge you to get started with JOA, so that we can iron out any problems.

My web site http://joa.ucsd.edu has the JOA application, support files, data, and more. The JOA developer has prepared versions of the JOA installers for Mac OS X and Windows. The latest versions have self-contained Java runtime environments—you don't have to separately install Java on your computer. The latest version, 5.3, is available from the JOA web site.

For Windows download JOA 5.2.1 if you have Windows XP and download JOA 5.3 for Windows 7 and above. For Mac OS download JOA 5.2.1 if you have Mac O X 10.9 or earlier and download JOA 5.3 if you have Mac OS X 10.10 or higher. For Mac OS X, 10.9 or earlier you may need to install Apple's Java runtime. See the web pages for links to this.

If you have installation issues, contact me and the JOA developer, John "Oz" Osborne at tooz@oceanatlas.com.

My recommendation:

1. Download the version of JOA appropriate for your computer OS from http://joa.ucsd.edu/joa.

2. Install JOA on your computer: carefully follow the linked instructions you will find if you scroll down the http://joa.ucsd.edu/joa page.

3. Do the JOA Guided Tour http://joa.ucsd.edu/tour/1. If you get this far, you are good to go with JOA, and ready to use JOA to do the DPO Examples (http://joa.ucsd.edu/dpo/), or explore any of the data at http://joa.ucsd.edu/data.

For your data projects you will work on your own or, if you wish, with another student. You will need to pick a project theme. That is not as critical as you might think because after you think up some project ideas, we will meet and can work these into something feasible.

There are many types of projects one can do. Here are a few general ideas which you could perhaps use as a framework for a specific project idea (but there are many other possibilities):

Trace the influence of a water mass of your choice away from its source. Or trace some oceanographic feature (e.g., a property maximum or minimum - almost anything that can be described or calculated). Calculate and map the thickness and average properties of a feature.

Examine water properties on surfaces, such as an isopycnals (perhaps with an intent to examine the influence of some process).

Compare selected aspects of regions of the ocean which have some sort of conceptual connection, such as two or more subtropical or subpolar gyres, Labrador Sea versus area around Sea of Okhotsk, Weddell Seas vs. Ross Sea, etc.

Compare data from different years from the same area (we have transects across key ocean regions at about 10 year intervals starting in the 1980s or 1990s). [T, or S, or O2, or CFC, or ocean carbon data.]

Compare results from actual data (your choice of region or water mass or feature, etc.) with results from data from a widely-used statistical compilation of oceanographic data ("World Ocean Atlas" data) used in many models.

Examine (and calculate) seasonal differences using the World Ocean Atlas data.

Examine interannual variability of nearly any layer in the Labrador Sea or the subtropical North Pacific off Hawaii (both are locations where we have multi year monthly or seasonal data ready to use).

Compare waters with some particular characteristic in common in different ocean regions.

Please contact me by email (jswift@ucsd.edu) and we can start a conversation. I am usually on campus between 8:00 am and 3:00 pm, but I do have meetings and trips and I work some half days, so it's best to contact me ahead instead of just dropping by. My office is in the Deep Sea Drilling West building, Room 57, which is near the northeast corner of the building, and most easily reached via a door in the mid-building breezeway that divides the building. My office phone is 858-534-3387 (or on-campus extension x43387).

Jim Swift