

Geol 155 Oceanography Lab - Boat Trip October 11, 2008

Stations:

1. Reservation Point	water data	secchi disk	Forel Ule	sediment sample
2. San Pedro Canyon (data on handout)	water data	secchi disk	Forel Ule	
3. Rock Pile	water data	secchi disk	Forel Ule	
4. Relict Beach (data on handout)	water data	secchi disk	Forel Ule	sediment sample
5. LA River	water data	secchi disk	Forel Ule	

Class/Homework:

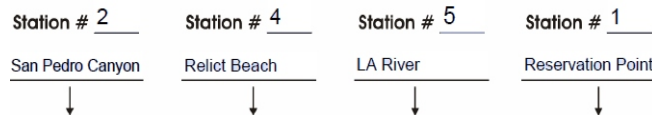
1. Salinity, Dissolved Oxygen, pH, and Temperature Graphs

Plot the water data gathered on our boat trip on each graph. At the bottom of each graph is a legend - be sure to fill it out and use the correct color and line type for each station. Add in the information for station 5 yourself - you may choose the line type and color. For station 2 (San Pedro Canyon) plot data for every five meters (1, 5, 10, etc) down to a depth of 40 meters.



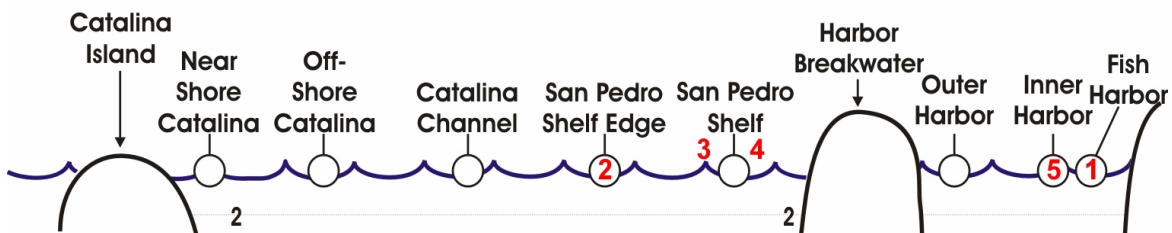
2. Surface (1 meter) graphs - Salinity, Dissolved Oxygen, pH, and Temperature Graphs

Use the data from the 1 meter reading ONLY for each station. Stations should read, from left to right, Station 2, Station 4, Station 5, and Station 1. Please use the same color key for these stations as you did for the previous graphs.



3. Water Clarity (Secchi Disk) Readings & Light Transmissivity Graph Sheet

If you didn't do so on the boat, fill out the data on the Water Clarity Table. Next, use this data to fill out the graph on the following page. Use the image below to guide you in where to plot the data. The directions on how to plot the data are located on the bottom of the graph.



4. **Bottom Sediment Survey Data Table**

If you didn't do so on the boat, transfer the data you recorded on the two sediment samples we collected onto this table.

5. **Plankton Survey Table**

Be sure you filled out this table on the boat.

Discussion of what we saw:

1. **Salinity** levels increase with depth. When you plot your data, see if this trend is visible. Also, the salinity values should be less at the surface at the LA River - why do you think this might be so?
2. **Dissolved Oxygen** is a measure of how much oxygen is - or isn't - in the water. Plants take in CO₂ and release O₂ and are confined to the photic zone. Thus, O₂ production is concentrated at the surface in the photic zone, and decreases with depth. When plotting your data, O₂ levels should be higher at the surface and decrease with depth. This may not be too apparent in the shallower waters.
3. **Acidity (pH)** is a measure of how much CO₂ is in the water. Animals take in O₂ and release CO₂ but are NOT confined to the photic zone and can move about the water column as desired. When organisms die in the ocean, they descend to the sea floor to decompose (if they don't get eaten first). Production of CO₂ can occur throughout the water column, but is concentrated at the seafloor due to decomposition. Thus, CO₂ levels are low at the surface and increase with depth.

Recall that pH is a measure of CO₂ in the water. On the pH scale, 0 is a strong acid and 14 a strong base (7 is neutral). So an increase in acidity will show as a shift towards 0 on the pH scale.

4. **Temperature** is the measure of the amount of heat added to or removed from an object. Sunlight warms the water, therefore increasing the temperature of the water. The time of day and year also play a role in how much sunlight enters the water. Since light is found in the photic zone, that surface layer is warmer than the aphotic zone. When plotting your data you should see that the surface waters are warm and the temperature of the water decreases with depth. Recall that the rapid shift from warm to cold is called the *thermocline*, which is located at the photic, aphotic boundary. Can we see it?
5. The **Secchi Disk** is used to measure water clarity. It is lowered into the water and watched as it descends into the water. The base of the photic zone can be determined when the disk is no longer visible.
6. The **Forel Ule** scale is used to describe water clarity. Since everyone has a different idea of what a color looks like, "colors" are given a numerical value, ranging from I to XXI. Green shades indicate that there is a lot of chlorophyll in the water, and reds indicate that an algal bloom is present.
7. **Sediments** are particles of rocks or minerals. The larger the particle, the more energy is required to move it. Sand is actually fairly heavy for water to move, and is typically concentrated along the coastline. Mud is silt + clay, fine grained sediments that the water can move easily. The water must be very quiet in order for it to be deposited. Most of the sediments on the sea floor beneath most of our stations was a green-gray mud. This mud is unconsolidated and oxidized - do you remember why? Stations 3 & 4 are relict coastline features from the last ice age. During that time sea level was about 70 meters lower than it is today. The "Rock Pile" represents a tide pool area, and "Relict Beach" is where a beach once was.