General Oceanography **Name_____**
Geology 105
Expedition 13 – Diving into the Canyon
See Due Date in Greensheet or in Module Area of Canvas

Expedition Objective:

- To discover life in the mid-water environment, the most neglected habitat on the planet, as you dive in a submersible deep into the Monterey Submarine canyon between depths of 100 to 1500 meters.
- Understand the distribution of marine life between the mixed (surface) layer, the thermocline and mid-water
- **Homework** - post in your expedition learning group according to the instructions in the Module Area of Canvas for this expedition

Remember to answer the questions posted by one other student and give feedback on the clarity and quality of their questions.

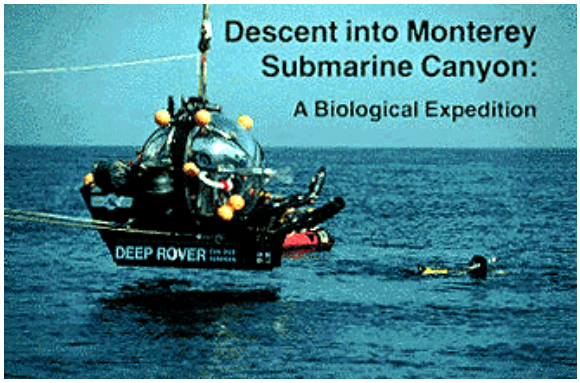
Begin expedition at http://oceansjsu.com/105d/exped_canyon/1.html

1. **Introduction**

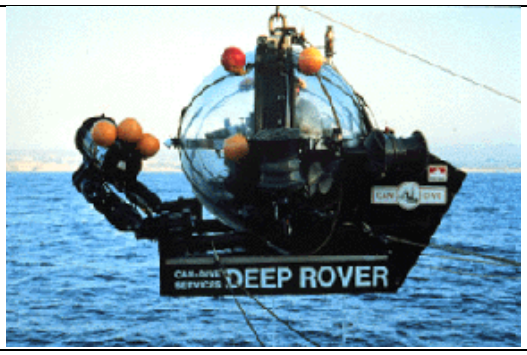
   What will you be doing in this expedition?

   Pack your bags, journey to Moss Landing at the head of the Monterey submarine canyon and prepare to board the ship!

2. **Join a dive in the mid-water region of the Monterey submarine canyon**



3. **Meet Deep Rover**



Describe Deep Rover and Our "Mother Ship?"

4. **Meet the Chief Scientist**

   Who is the Chief Scientist?

   _____

5. **Let's Prepare to Dive** – What are the preparations for the dive?

6. **Let's Launch!**

   How deep will "Robey" descend on this Dive? _____

   Will Robey be examining the surface (mixed) layer, the mid-water, or the deep water in this dive?

   _____

7. Deep Rover is in the Water!

Look at the sequence of pictures on the next few web pages

Describe the changing environmental conditions as Deep Rover descends from the surface waters to a depth of 300 meters in the submarine canyon. How do the penetration of sunlight, water temperature and pressure vary from the surface to a water depth of 300 meters .

8. The Lights Go On! It is Snowing Underwater!

What do you see suspended in the water, known as **marine snow?** Describe the particles.

9. Organisms in the Mid-Water – Detailed descriptions are very important in scientific research

Describe the jellyfish

Describe the amphipod

Describe the siphonophore colony

Describe the pelagic red crabs, known as galatheid crabs, floating in the mid-water.

10. The Predators of the Mid-Water

Describe the squid

Describe the flying snails (heterpods, which are similar to pteropods, or swimming snails)

Describe the lantern fish

Describe the ctenophore (also called comb jellies)

11. Let's Go Back to the Surface

12. Back on Board

What did you think of your dive?

13. Life and Challenges of the Deep

This is a good review of our research, so take notes.

Why did some scientists, long ago, believe that life could not exist in the mid- and deep water of the ocean?

What are the three basic challenges for organism in the mid-water?

How do these organisms receive nourishment?

Which organisms consume marine snow?

What is the water pressure in this environment?

What is the average water temperature in this environment? (notice the plot of the thermocline from the temperature sensor on the submersible)

What is the oxygen minimum zone?

Describe three examples of how organisms capture food

What is bioluminescence?

Describe an example of how an organism mates in this environment?

What role does pigment color play in the survival of these organisms?

Is there still much to learn about the oceans?

Let's go back to the ocean surface!

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