Homework 2: Due Sep. 23, 2014

Hand in a hard copy at the beginning of class. Show your work.

1. Pressure increases with depth. Using the hydrostatic equation calculate the pressure in the Kermadec Trench, where the maximum depth is 10,000 m. To simplify the calculation use constant density of $\rho_0 = 1023$ kg/m^3. Give your answer in N/cm^2 (one cm^2 is about the size of your figure nail).

2. In question 1, we used a constant density throughout the water column. This assumption is wrong for the real ocean. Density of seawater is a function of three things, what are these?

3. Planet X rotates in the same direction as Earth, and has a southern ocean that circumnavigates the globe bounded north (45°) and south (55°) by continental land masses. A westerly wind blows across the surface.

   (a) Draw on the figure below the direction of the Ekman transport caused by the wind stress on the ocean surface.

   (b) Sketch on the latitude-depth figure below:

      i. The shape of sea surface height as a function of latitude.

      ii. Indicate regions of downwelling and upwelling.

   (c) On a copy of both figures indicate the direction of the surface geostrophic current. If the flow is 'out of the page' use the $\odot$, if the flow is 'into the page' use $\otimes$, otherwise use arrows.