Round: 14B

Figure 1: Concentration of Pb^{2+}

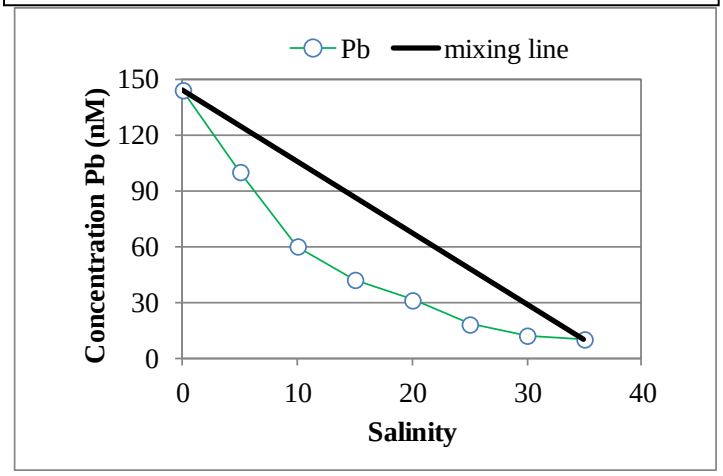


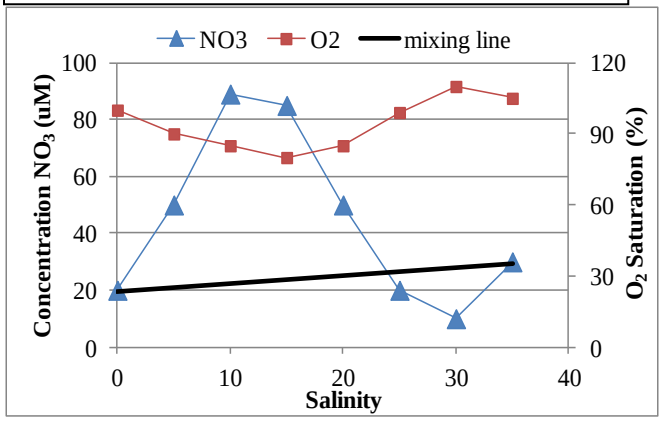
Figure 1 shows a conservative mixing (bold line) between river water (Salinity=0 ppt) and ocean water (Salinity=35 ppt) in an estuarine system. The concentration distribution of dissolved lead (Pb^{2+}) in surface water is presented on the same plot with open circles.

1. What type of Pb^{2+} mixing is occurring in the estuary? (2pts)

2. What two (2) possible processes are causing this distribution of Pb^{2+} in the estuary? (4pts)

The bold line in Figure 2 presents conservative mixing line for nitrate (NO^{3-}) between river water (Salinity=0) and ocean water (Salinity=35) in an estuary. The distribution of the concentration of nitrate (NO^{3-}) and percent oxygen saturation (O_2) is presented with triangles and square symbols respectively.

Figure 2: Concentration of NO^{3-} and O_2



3. a. Determine the type of mixing of NO_3^- in the estuary. (3 pts)

   b. What are most likely the processes driving this distribution? (5pts)

4. Explain the coupled behavior of percent saturated level of O_2 in the water and the NO_3^- concentration? (6 pts)