1. **Answer one of the following (7 points) (Indicate which one you are answering):**

   a) Describe how aerenchyma in salt marsh plants relieves sulfide toxicity to plants at low tide
   b) Describe why salt marsh plants that are located further away from creeks are more affected by sulfide toxicity than plants near the creek.

   a) Plants transpire water from the sediments at low tide, which lowers the water table forcing air through the aerenchyma to replace the lost water. This air oxidizes sulfide.
   b) Creek-bank sediments experience tidal effects every day and the sediment pore water is constantly flushed by the rise and fall of the tides, removing toxins like sulfide. The higher regions rarely see tidal water and water stagnates allowing sulfide to accumulate.

2. **What is a “Jubilee” and why does it occur? (6 Points)**

   When winds blow in the correct direction, the thermocline tilts bringing anoxic bottom water to the surface. As fish try to escape the toxic water they rush to the surface and literally jump out of the water onto the shore. A “jubilee” for the locals.

3. **Answer one of the following (7 points) (Indicate which one you are answering):**

   a) You added a lot of nitrogen fertilizer to your lawn last year. How might that have affected the microbial biomass in your soil?
   b) You put a lot of bark mulch on your flower garden last year. Your neighbors are laughing at the tiny flowers you have this year. What happened?