

Bio390

**Problem: Solubility**

thanks to Dr. J.F. Anderson,  
Dept. Zoology  
Univ. of Florida, Gainesville

1. Calculate how much oxygen will dissolve in one liter of fresh water at sea level (i.e.,  $P_b = 760$  mm Hg). Assume the air is saturated with water vapor (look in notes), the temperature is  $20^\circ\text{C}$ , and oxygen constitutes 20.94% of the volume in of the dry fraction of the air. The solubility coefficient for oxygen in water at  $20^\circ\text{C}$  is about  $31 \text{ mlO}_2 / (\text{liter H}_2\text{O} * \text{atm})$

2. Calculate how much oxygen will dissolve in one liter of fresh water at an altitude where the barometric pressure is 450 mm Hg. Again assume the air is saturated with water vapor, the temperature is  $20^\circ$ , and oxygen constitutes 20.94% of the volume in air on a dry gas basis.