Dissolved Oxygen

- The presence of oxygen gas molecules ($O_2$) in the water.

- Why is it important?

- The oxygen in $H_2O$ is not dissolved oxygen.

What’s coming out of the diffuser?
Dissolved Oxygen

Oxygen enters a river by diffusion from the surrounding air during the process of photosynthesis.

On sunny days the oxygen released by aquatic plants may sometimes be visible as bubbles.
DO levels are affected by:

- Altitude
- Temperature
- Speed of water movement (dams as well as natural differences and tides)
- Addition of wastes
- Vegetation
Which do you think has more DO: the stream on the left or the stream on the right? Why?
Different Organisms Require Different Amounts of DO

- Trout and salmon require high amounts of dissolved oxygen

- Carp and catfish can survive with much less.
How do Humans Affect the Amount of DO in the Water?

- Addition of oxygen-consuming organic wastes
Addition of Nutrients
Changing the Flow of the Water

Which dam is this?

The Croton Dam
Activities That Raise the Water Temperature
pH

- The measure of the acidity of a solution
- Acids produce $H^+$ (hydrogen ions)
- Bases produce $OH^-$ (hydroxide ions)
Why is pH important?

- The pH is critical to an aquatic ecosystem because pH affects many chemical and biological processes in water.
How is pH measured?

- pH is measured on a scale of 0 to 14.

- A solution with equal hydrogen and hydroxide ions would have a pH of 7.

- What would the pH of a solution be that had more hydrogen than hydroxide ions?

- A decrease of one unit on the pH scale is the result of a 10 fold increase in hydrogen ions.
How Does pH Affect a River?

- It changes the availability of different nutrients and metals in the water.
- Metals that leech from the soils when pH changes especially affect immature stages of aquatic insects and fish.
Macroinvertebrates

- A way to measure the health of an ecosystem’s aquatic life
- Scientists usually take several samples, looking at diversity and abundance, as well as species evenness
Species Diversity

- Diversity differs depending on: time of year, habitat, ecosystem, sampling location, and water quality.
- Macroinvertebrates are one way to assess water quality, but other measurements should be taken to ensure accuracy.