Acid Rain

The burning of fossil fuels releases many gases and particles into the atmosphere, not just carbon dioxide.

Two of the gases released in the greatest concentration are nitrogen oxides and sulfur oxides.

When water vapor condenses to form clouds, the droplets actually dissolve these gases, turning them into drops of acid rain.

A Review of Acids

Acidity is measured by the pH scale, which ranges from 0 to 14. Substances with a ***low*** pH are classified as acids and substances with a ***high*** pH are classified as bases. A pH of 7 is neutral. Pure water has a neutral pH.

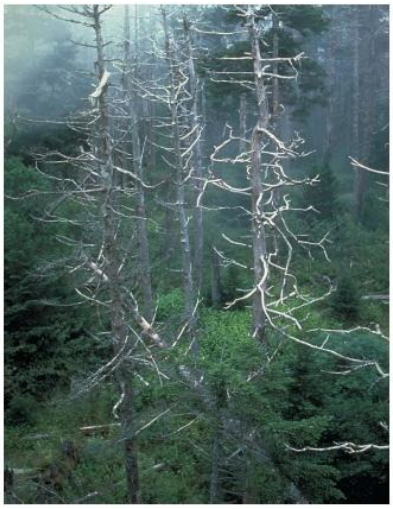
Therefore, acid rain is basically precipitation that has a pH lower than 7.

Nitrogen oxide is produced when gasoline is burned, and is a major contributor to smog. When dissolved in water, it turns into nitric acid.

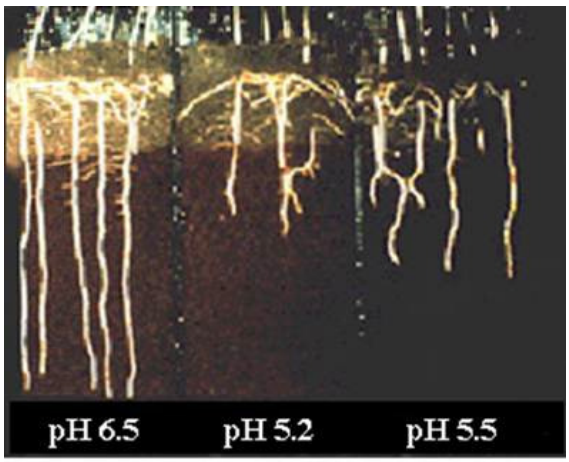
Sulfur oxides are produced when coal is burned. Coal is the major energy source used to produce electrical energy. Sulfur oxides, when dissolved in water, form sulfuric acid.

As you can imagine, acid falling from the sky can have severe impact on the environment, including:

Plant growth can be stunted, bark damaged, and leaves fall off.

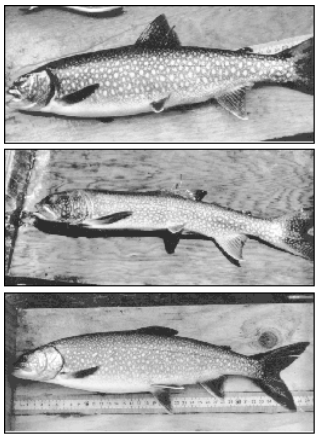


Acid rain that soaks into the ground can damage roots and burrowing animals.



COTTON ROOT GROWTH RESTRICTION DUE TO ACID SUB-SOIL AND ALUMINUM TOXICITY

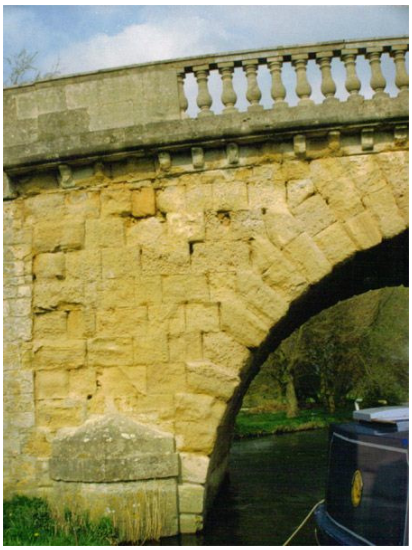
Acid can destroy sensitive aquatic ecosystems. High levels of acid can cause fish kills and loss of eggs, but even small increases in acidity can stunt the growth of fish. Often fish are important food sources for other organisms, like birds.



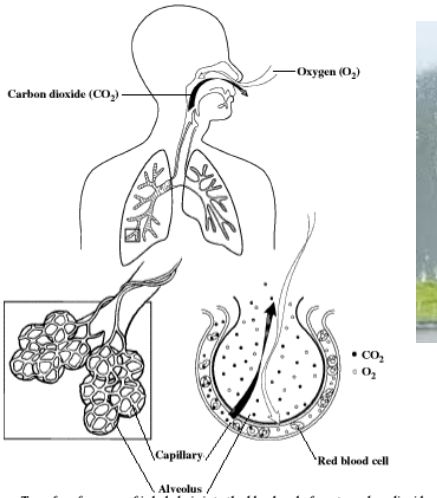
Air Pollution

Acid rain also greatly speeds up the process of weathering, particularly on limestone and marble. This is important not only because of statues and sculptures, but also buildings and bridge supports.

How acid rain affects stonework.
The picture on the left was taken in 1908.
The picture on the right was taken in 1968



Humans can also be directly affected by acid rain. Lung tissue is easily damaged and very sensitive to changes in pH. People with respiratory ailments like asthma are particularly susceptible.



Transfer of oxygen of inhaled air into the blood and of waste carbon dioxide of blood into the lungs occur in the alveolus.

Ways to decrease air pollution:

1. Sulfur dioxide can be removed from power stations by "scrubbers" (expensive)

2. Reduce the amount of electricity we use.

3. Use renewable energy like wind power, solar panels, tidal power, and geothermal energy.

4. Fit catalytic converters to vehicle exhausts which remove the nitrogen oxides.

5. Limit the number of vehicles on the roads and increase public transport.