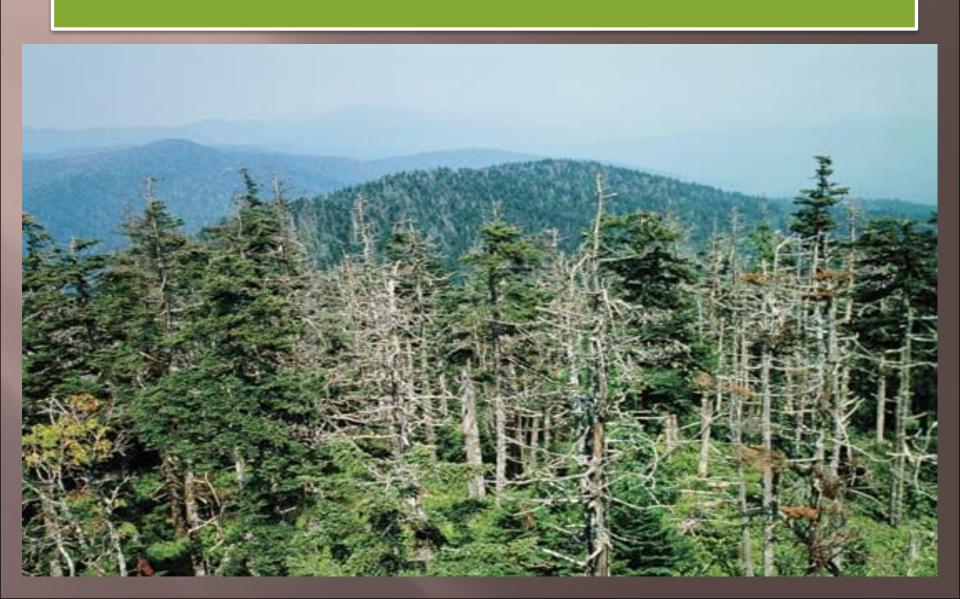
ACID RAINS

When coal When coal and petroleum are burned, they release certain harmful gases into the air. These gases combine with the oxygen and water in the air. When the water in the air comes down as rain, sleet, hail, or snow, it carries with it these gases. This is known as acid rain. Acid rain is very damaging to all life forms.

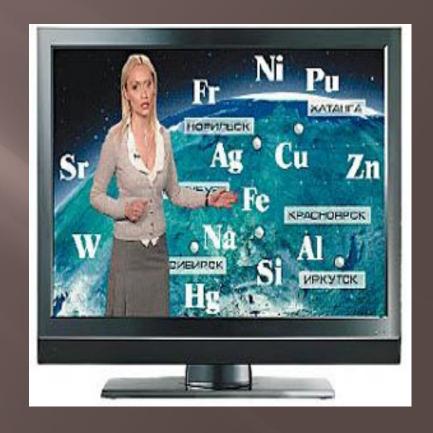
acid rains





acid rains

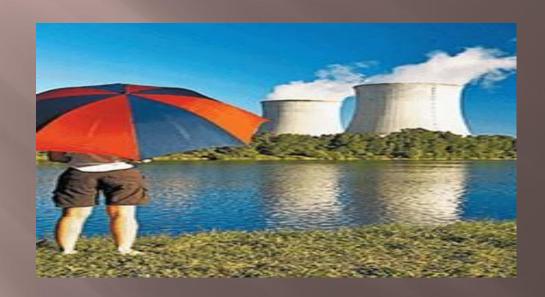
Many nations of the Northern Hemisphere, such as the United States, Canada, Japan, and most of the countries of eastern and western Europe, burn coal and petroleum, known as fossil fuels, in automobiles, electric power plants, and factories. Because of this, acid rain has become a serious form of pollution in North America and Europe.



OH' + CH₄
$$\longrightarrow$$
 H₂O + CH'₃ $SO_3^{-} + O_2 \longrightarrow SO_5^{-}$
CH'₃ + O₂ \longrightarrow CH₃O'₂ $SO_5^{-} + SO_3^{2-} \longrightarrow SO_4^{2-} +$
CH₃O'₂ + NO \longrightarrow NO₂ + $+SO_4^{-}$
CH₃O' + O₂ \longrightarrow CH₂O + HO'₂ $SO_4^{-} + SO_3^{-} + FO_3^{-} + FO_3$



THE EFFECTS OF ACID RAIN



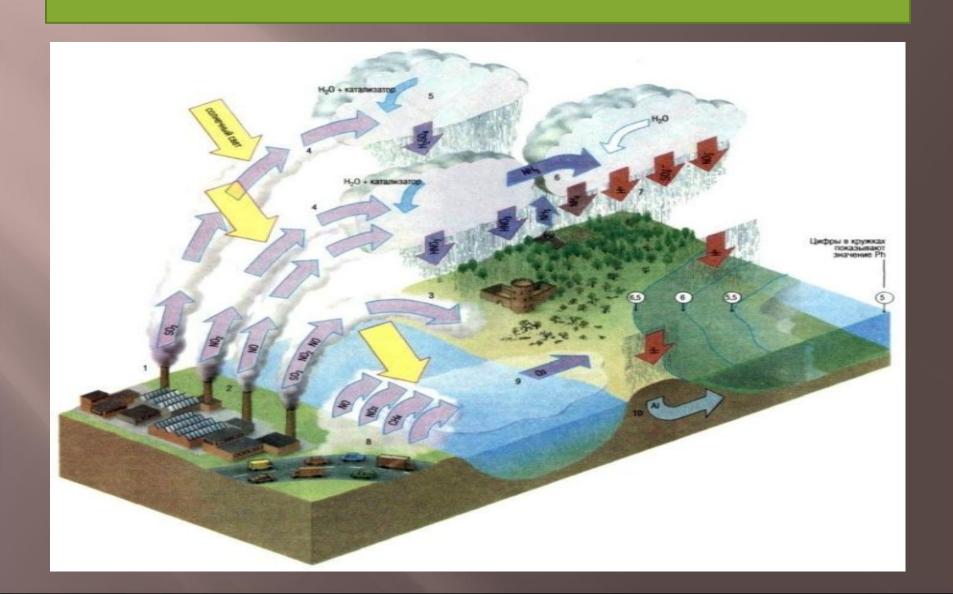
When acid rain pollutes lakes and streams, it can kill the organisms that live in them. Acid rain is particularly harmful to fish and other aquatic life forms.

The Effects of Acid Rain

A substance called aluminum is naturally found in the soil. Acid rain can bring aluminum out of the soil. Such a process is called leaching. Aquatic life can be poisoned by aluminum that is dissolved in water.



The Effects of Acid Rain



The Effects of Acid Rain

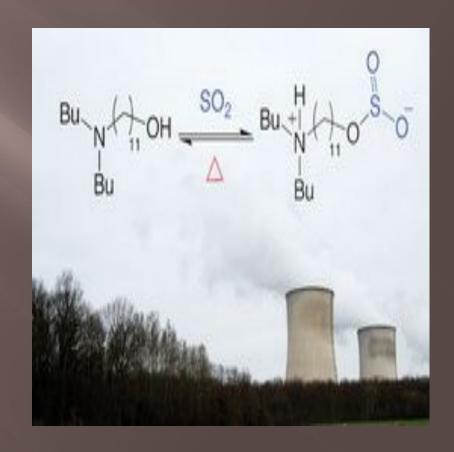
• Acid rain also damages various kinds of vegetation, including agricultural crops and trees. In addition, acid rain corrodes, or wears away, outside surfaces of buildings and other structures. Some of the world's great monuments, including the cathedrals of Europe and the <u>Colosseum</u> in Rome, have shown signs of deterioration caused by acid rain





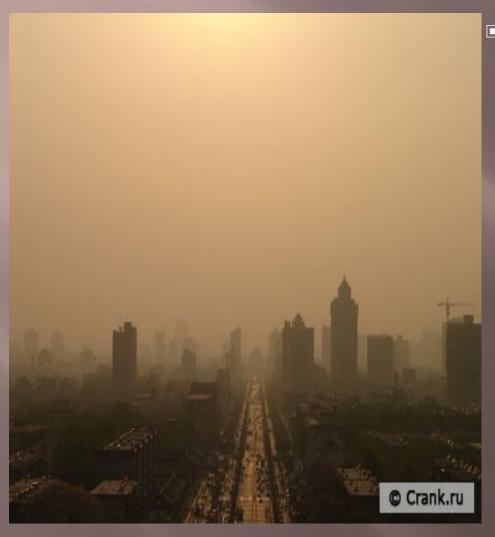
The Extent of the Problem

By the early 1990s tens of thousands of lakes had been destroyed by acid rain. The problem has been most severe in Norway, Sweden, and Canada. Damage from acid rain is not limited by geographic boundaries





The Extent of the Problem



This is because winds carry the pollution around the globe. For example, some studies indicate that pollution from coal-powered electric generating stations in the midwestern United States may be causing severe acid rain problems in eastern Canada and the northeastern United States.



The Extent of the Problem

Despite much debate and discussion between many countries, there is still no clear solution to the problem. The chief reason is that it is expensive to control the pollution. However, since the damage from acid rain to the environment is permanent, the environmental costs are greater.







