

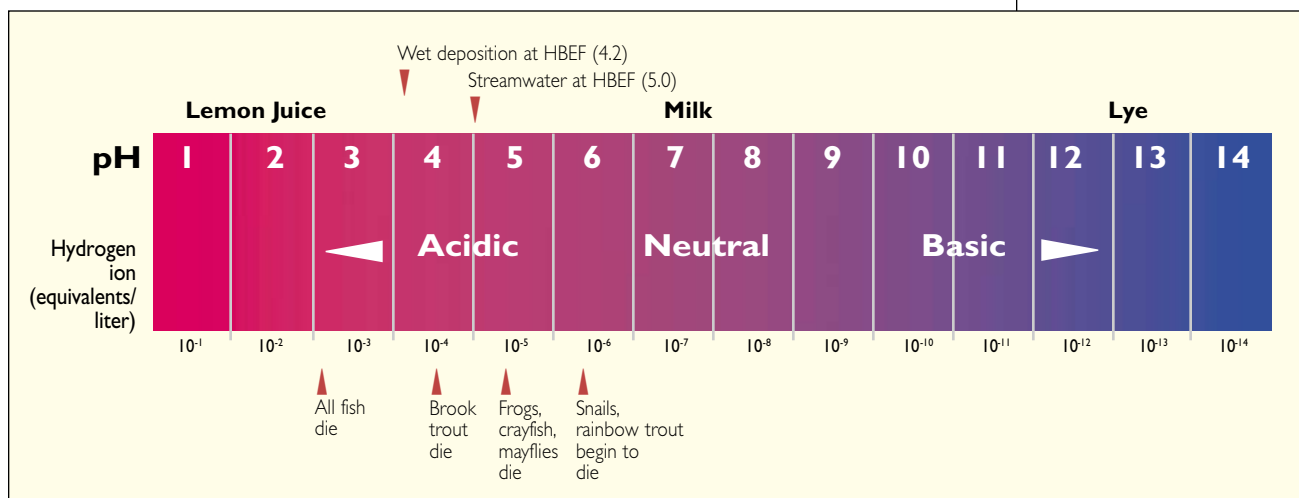
What is acid deposition?

Acid deposition is the input of acids from the atmosphere to the Earth's surface.

SUMMARY: Acid deposition is comprised of sulfuric acid, nitric acid and ammonium derived from sulfur dioxide (SO₂), nitrogen oxides (NO_x), and ammonia (NH₃). These compounds are emitted by the burning of fossil fuels and by agricultural activities. Once these compounds enter an ecosystem, they can acidify soil and surface waters and bring about a series of ecological changes. The term *acid deposition* encompasses all the forms in which these compounds are transported from the atmosphere to the Earth, including gases, particles, rain, snow, clouds, and fog.

DETAILS: Sulfuric and nitric acid lower the pH of rain, snow, soil, lakes, and streams. pH is a gauge of acidity, as measured by the concentration of hydrogen ion (see Figure 2). In 1997, wet deposition in the Northeast (i.e., deposition from forms of precipitation such as rain, snow, sleet, and hail) had an average pH of 4.4, which is about ten times more acidic than background conditions. In general, low pH levels in lakes and streams create conditions that are inhospitable to fish and other aquatic organisms. Similarly, low pH conditions alter forest soils, degrading growing conditions for some tree species.

FIGURE 2: pH scale



How is acid deposition monitored?

Acid deposition occurs in three forms: **wet deposition**, which falls as rain, snow, sleet, and hail; **dry deposition**, which includes particles, gases, and vapor; and **cloud or fog deposition** which occurs at high altitudes and in coastal areas. Wet deposition has been monitored at more than 200 sites, some such as the HBEF since 1963, by both independent researchers and the inter-agency National Atmospheric Deposition Program/National Trends Network. Dry deposition is monitored at 70 sites nationwide by the U.S. Environmental Protection Agency Clean Air Status and Trends Network and at 13 other sites by the National Oceanic and Atmospheric Administration

AIRMoN-dry Network. Cloud and fog deposition has been monitored for limited periods at selected high-elevation sites, largely by independent researchers. Dry and cloud deposition patterns are extremely variable over space and time, making it difficult to characterize regional patterns. Therefore, even though cloud and dry deposition comprise a significant proportion of total deposition, this report primarily presents general patterns and trends of wet deposition.

