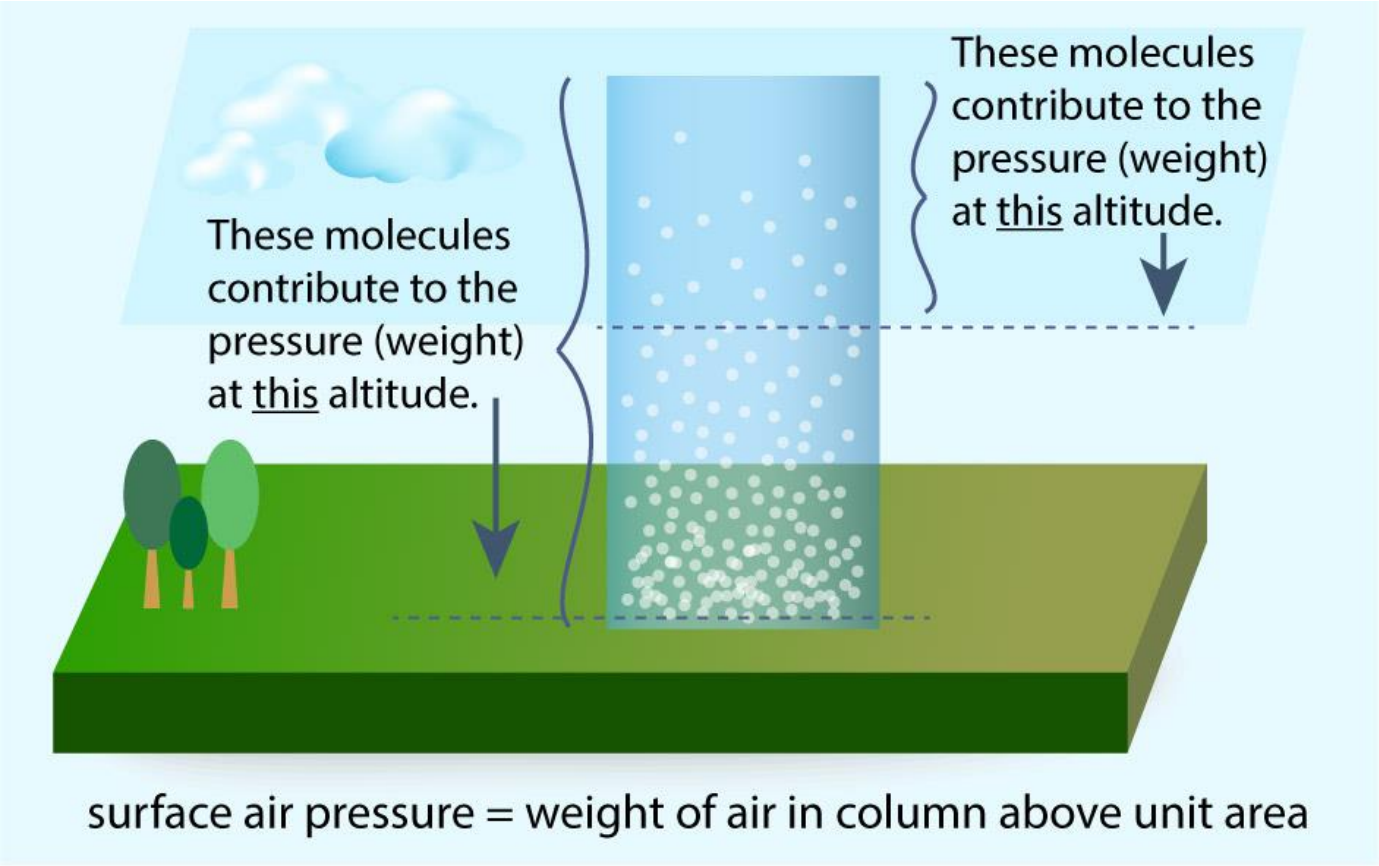
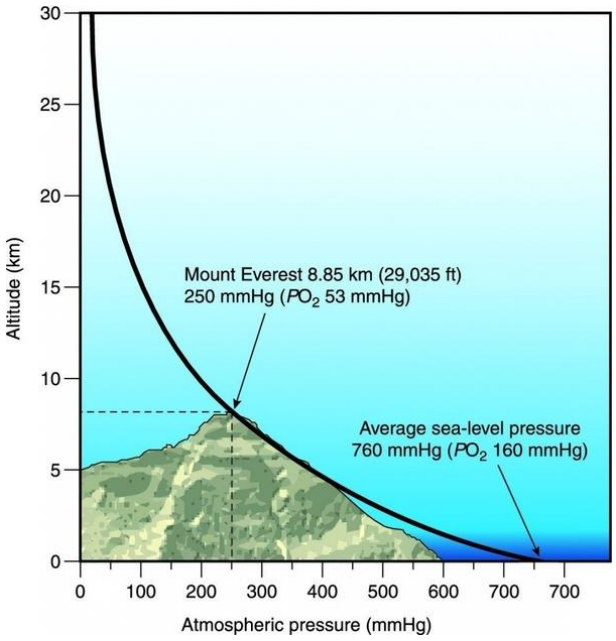
Atmospheric pressure as an Ecological Factor

Background Information

Atmospheric pressure, also called **barometric pressure**, force per unit area exerted by an atmospheric column. Atmospheric pressure can be measured with a **mercury barometer**. As elevation increases, there is less overlying atmospheric mass, so that atmospheric pressure decreases with increasing elevation. Pressure measures force per unit area, with SI units of **Pascal's**. On average, a column of air with a cross-sectional area of 1 square centimeter (cm^2), measured from sea level to the top of Earth's atmosphere, has a mass of about **1.03 kilogram** and exerts a force or "weight" of about **10.1 newton's**.

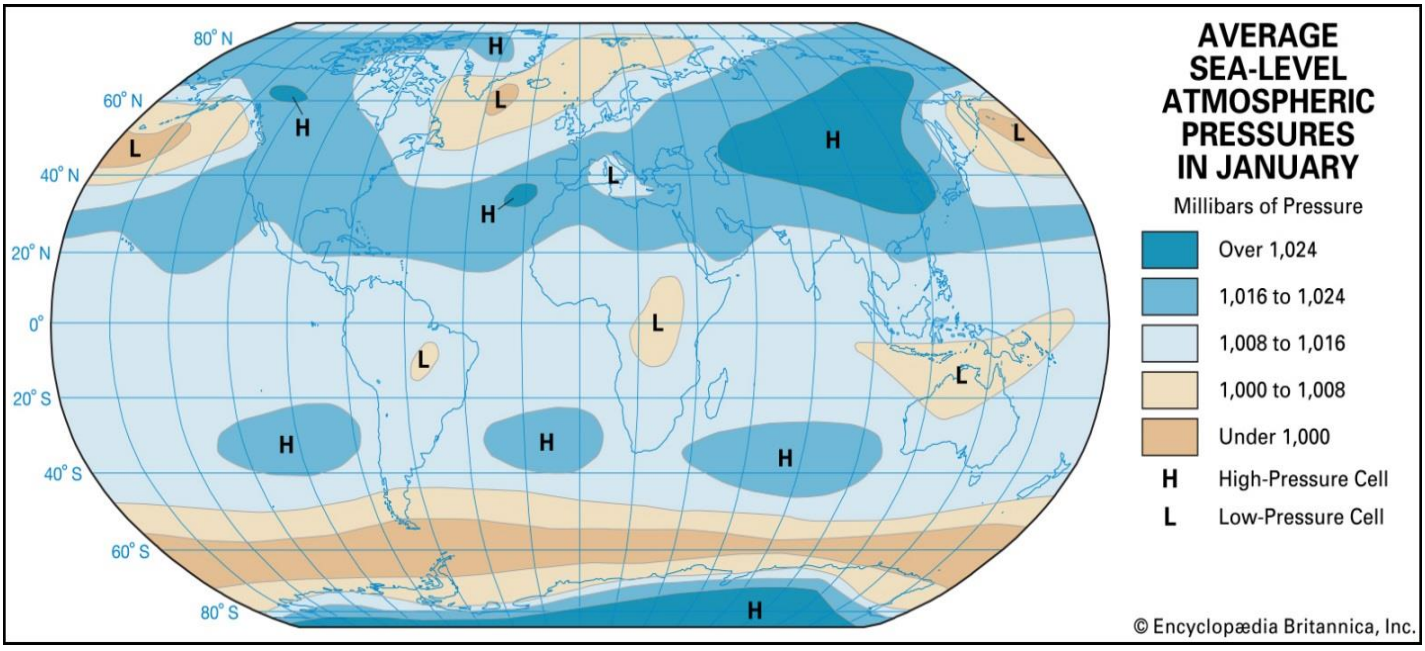


An **atmosphere (atm)** is a unit of measurement equal to the average air pressure at sea level at a temperature of 15 degrees Celsius (59 degrees Fahrenheit). One atmosphere is **1,013 millibars, or 760 millimeters (29.92 inches)** of **mercury**.



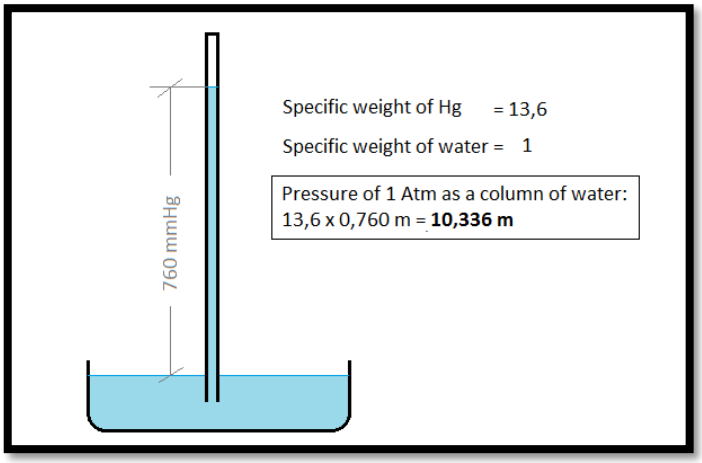
As the pressure decreases, the **amount of oxygen** available to breathe also decreases. At very high altitudes, atmospheric pressure and available oxygen get so low that people can become sick and even die.

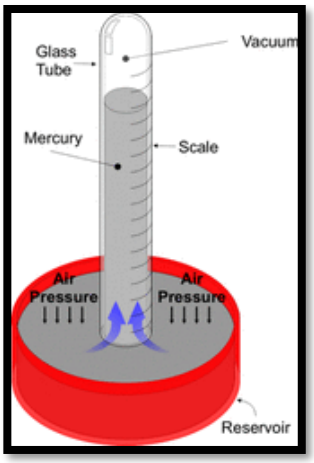
Atmospheric pressure is an **indicator** of weather. When a low-pressure system moves into an area, it usually leads to cloudiness, wind, and precipitation. High-pressure systems usually lead to fair, calm weather.

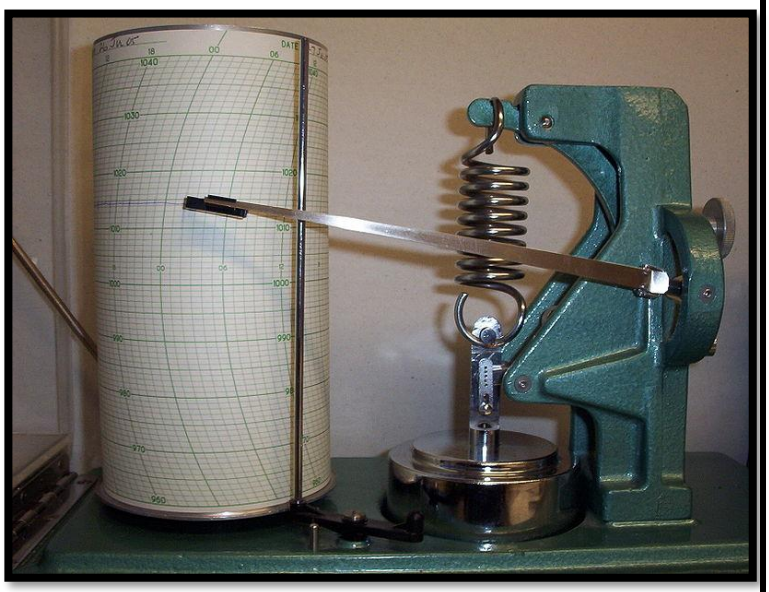


Atmospheric pressure measurement method & devices

1. **Water-based barometers**
2. **Mercury barometers**
3. **Aneroid barometers**
4. **Barographs**





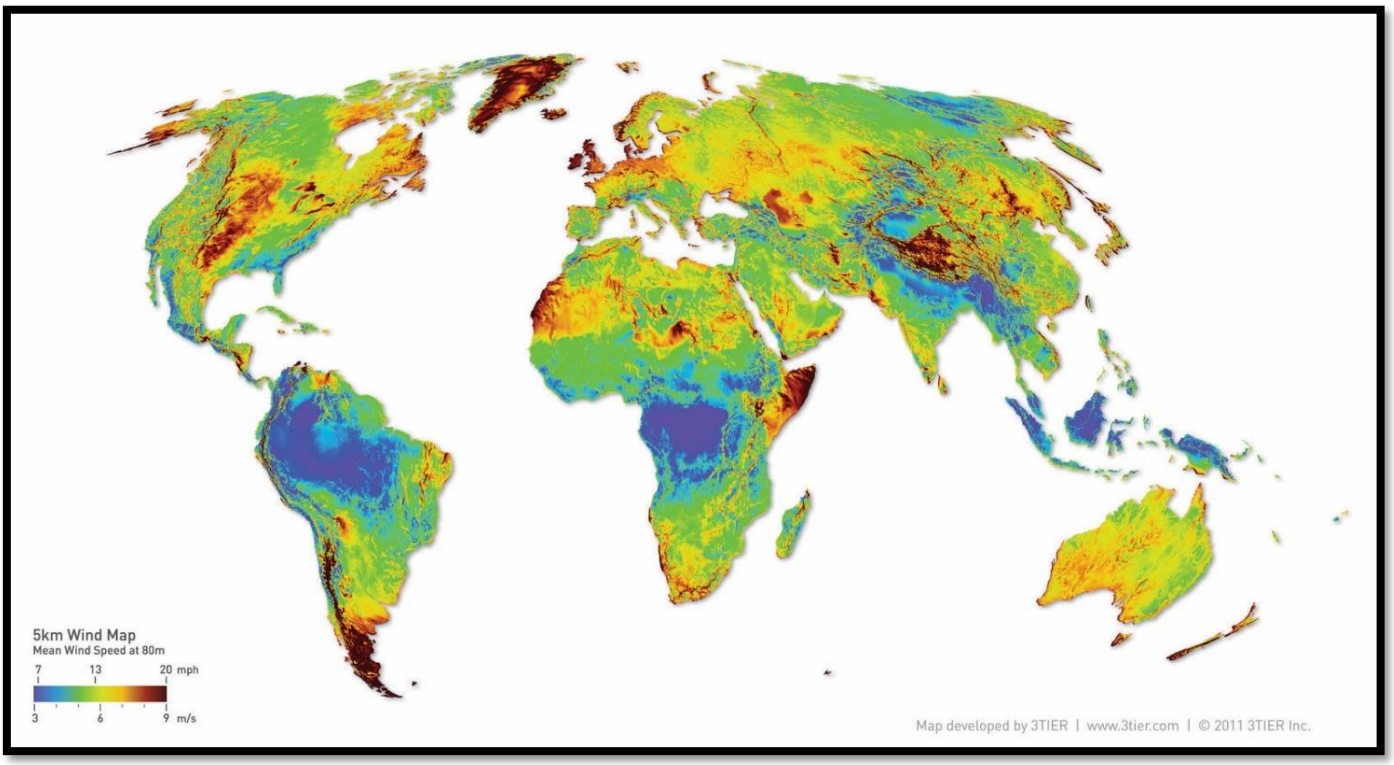


Wind as an Ecological Factor

Background Information

Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air. In **meteorology**, winds are often referred to according to their **strength**, and the **direction** from which the wind is blowing. winds have various names associated with their average strength, such as **breeze**, **gale**, **storm**, and **hurricane**.

Wind is caused by **differences** in the **atmospheric pressure**. When a difference in atmospheric pressure exists, air moves from the **higher** to the **lower** pressure area, resulting in winds of various speeds**. Wind direction** is usually expressed in terms of the direction from which it originates. **For example**, a northerly wind blows from the north to the south.



Role of wind in the natural world and environment

1- **Erosion**

2- **Desert dust migration**

3- **Effect on plants**

4- **Effect on animals**

5- **Sound generation**

Wind speed measuring devises

- **Anemometer**

An anemometer is a device used for measuring wind speed. The term is derived from the Greek word **anemos**, which means wind, and is used to describe any wind speed instrument used in **meteorology**

1- Vane style anemometer
2- Helicoid propeller anemometer
3- Hand held anemometer
4- Digital anemometer

Vane style of anemometer

Helicoid propeller anemometer incorporating a wind vane for orientation

Hand-held low-speed vane anemometer

Hand-held digital anemometer

Turbidity as an Ecological Factor

Background Information

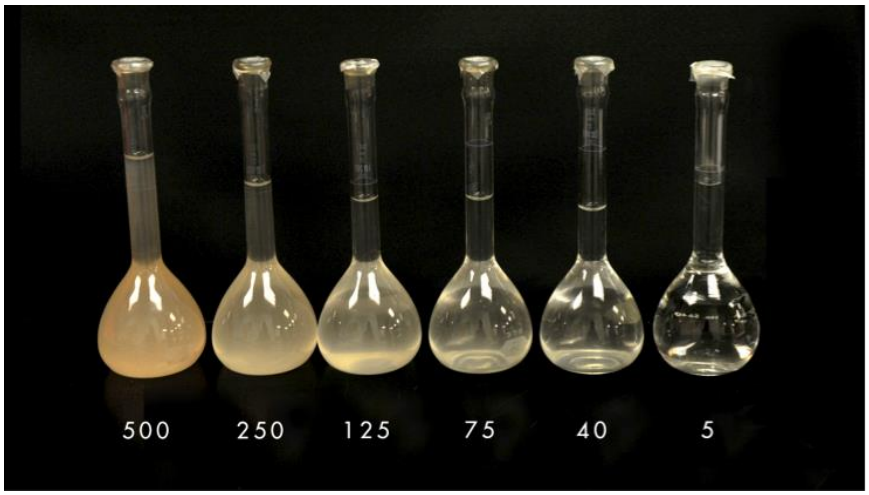
Turbidity is the **cloudiness** or **haziness** of a fluid caused by large numbers of **individual particles** that are generally **invisible** to the naked eye, similar to smoke in air. The measurement of turbidity is a key test of **water quality.**

Fluids can contain suspended solid matter consisting of particles of many different sizes. While some **suspended material** will be **large** enough and heavy enough to **settle rapidly** to the bottom of the container if a liquid sample is left to stand (the **settable solids**), **very small particles** will settle only very slowly or not at all if the sample is regularly agitated or the particles are **colloidal**. These small solid particles cause the liquid to appear turbid.

Turbidity in open water may be caused by growth of **phytoplankton**. Human activities that disturb land, such as **construction**, **mining** and **agriculture**, can lead to high sediment levels entering water bodies during rain storms due to storm water runoff. In **drinking water**, the higher the turbidity level, the higher the risk that people may develop **gastrointestinal diseases**.

Turbidity Measurement

Turbidity measured with an instrument called a **nephelometer,** the units of turbidity from a calibrated **nephelometer** are called **Nephelometric Turbidity Units** (**NTU**).



Turbidity in **lakes**, reservoirs, channels, and the ocean can be measured using a **Secchi disk**.

The **World Health Organization**, establishes that the turbidity of drinking water should not be more than **5 NTU**, and should **ideally** be below **1 NTU**.