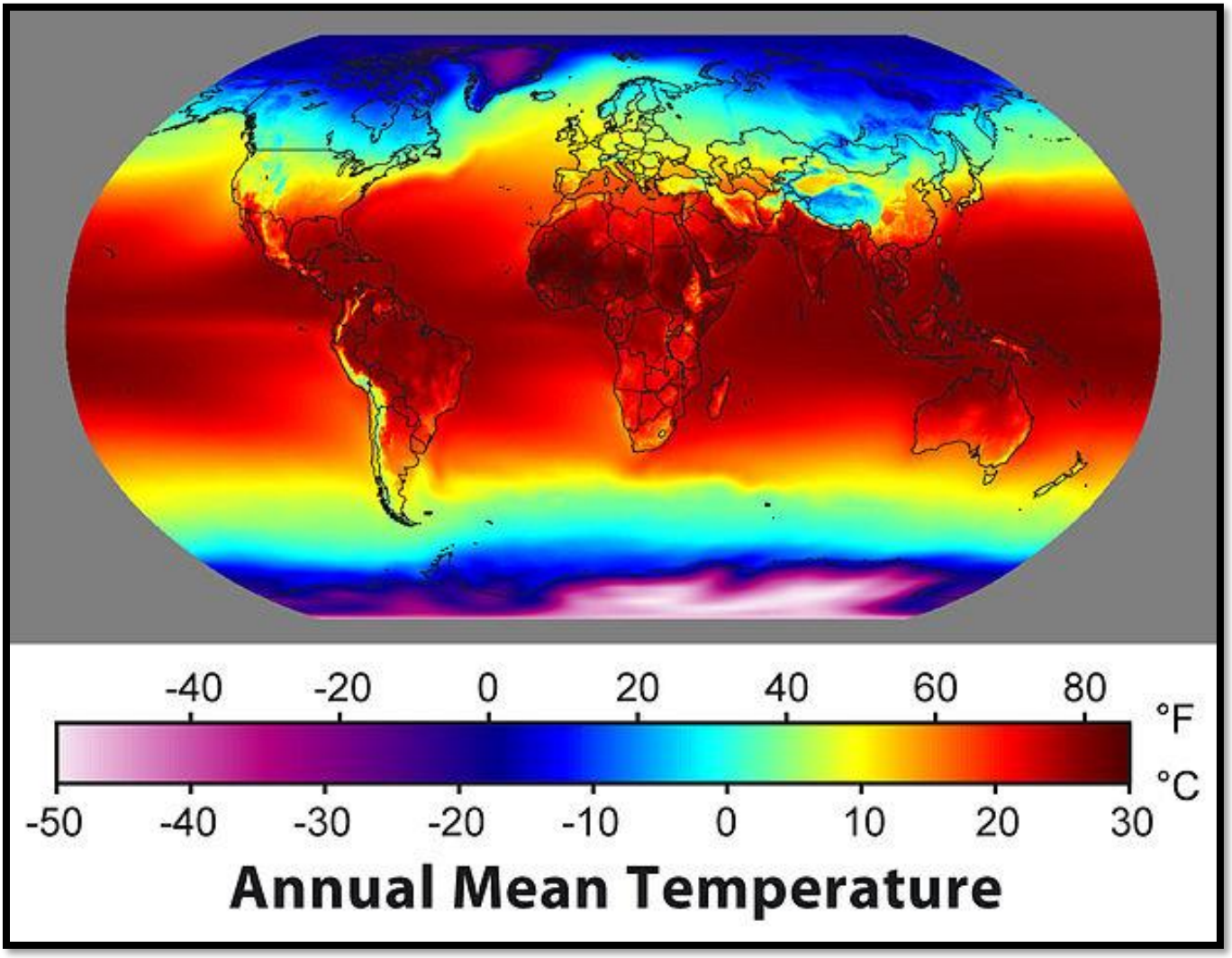
Temperature as an Ecology Factor

Background Information

Temperature is one of the essential and obvious changeable environmental factors. Temperature is a physical quantity expressing hot and cold. It's measured with a **thermometer** calibrated in one or more temperature scales. The most commonly used scales are the **Celsius** scale (formerly called centigrade) (°**C**), **Fahrenheit** scale (°**F**), and **Kelvin** scale (**K**). The kelvin is the unit of temperature in the **International System of Units** (abbreviated **SI**). The Kelvin scale is widely used in science and technology.



Temperature is a measurement of the degree of heat. Like light, heat is a form of energy. The radiant energy received from the sum converted into heat energy. The temperature at which physiological processes are at their maximum efficiency called optimum temperature.

Important of temperature as ecological factor

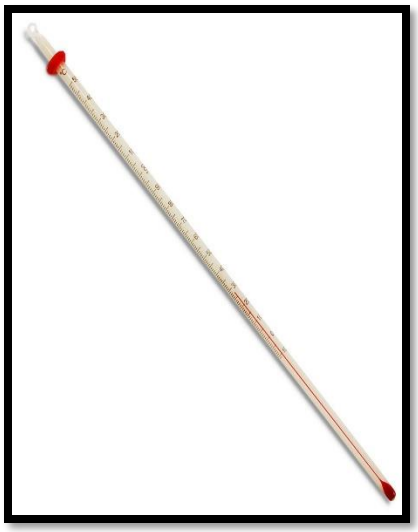
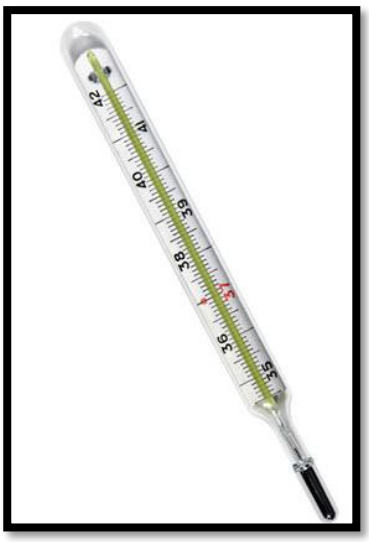
1. Effect on cell and Protoplasm
2. Effect on Metabolism
3. Effect on Respiration
4. Effect on Development
5. Effect on Growth
6. Effect on Transpiration in Plants
7. Effect on Reproduction
8. Effect on Sex ratio
9. Effect on Morphology
10. Effect of Coloration

Temperature measurement method & devices

Many methods have been developed for measuring temperature. Most of these rely on measuring some physical property of a working material that varies with temperature.

1. Thermometers

Thermometers are well-known liquid expansion devices. They come in two main classifications: the **mercury type** and the **organic**, usually red, liquid type. The distinction between the two is notable, because mercury devices have certain limitations when it comes to how they can be safely transported or shipped.


2. Bimetallic Devices

Bimetallic devices take advantage of the expansion of metals when they are heated. In these devices, two metals are bonded together and mechanically linked to a pointer. When heated, one side of the bimetallic strip will expand more than the other. In addition, when geared properly to a pointer, the temperature is indicated.

3. Infrared Sensors

An infrared thermometer measures temperature by detecting the infrared energy emitted by all materials. The most basic design consists of a lens to focus the infrared (IR) energy on to a detector, which converts the energy to an electrical signal that can be displayed in units of temperature.

Sample measurement procedures for thermometers/thermistors

A. Clean the probe end with de-ionized water and immerse into sample.

B. If not measuring in-situ, swirl the instrument in the sample for mixing and equilibration.

C. Allow the instrument to equilibrate with the sample for at least one minute.

Units

Degrees **Celsius (°C)** or Degrees **Fahrenheit (°F)**

Conversion Formulas:

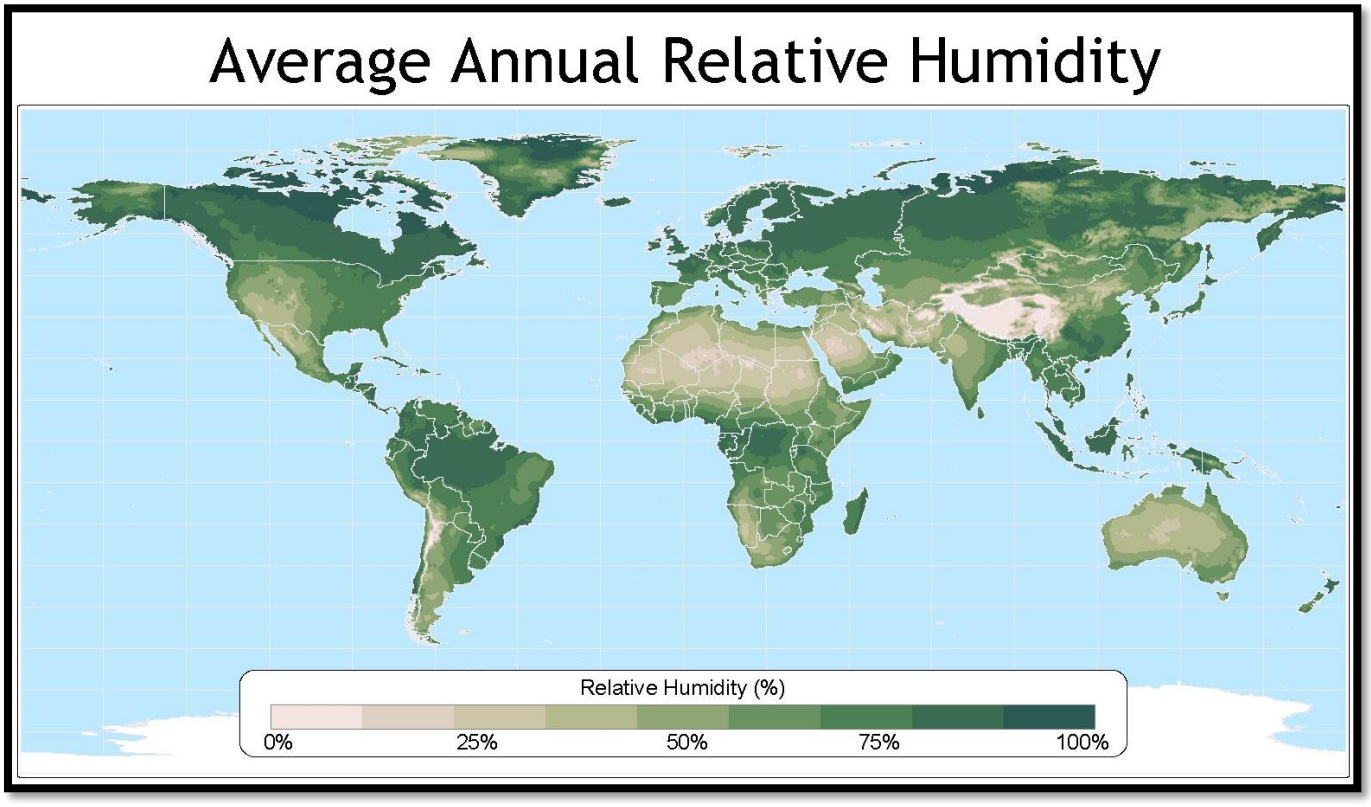
°F = (9/5 °C) + 32 or **°C = 5/9 (°F - 32)**

Humidity as an Ecology Factor

Background Information

Humidity is a term used to describe the amount of water vapor present in air. Water vapor, the gaseous state of water, is generally invisible to the human eye. Humidity indicates the likelihood for precipitation, dew, or fog to be present. Three primary measurements of humidity are widely employed: **absolute**, **relative** and **specific**.

- **Absolute humidity** describes the water content of air and is expressed in either grams per cubic meter or grams per kilogram.
- **Relative humidity**, expressed as a percentage, indicates a present state of absolute humidity relative to a maximum humidity given the same temperature.
- **Specific humidity** is the ratio of water vapor mass to total moist air parcel mass.



Effects of Humidity

Humidity is one of the fundamental abiotic factors that defines any habitat, and is a determinant of which animals and plants can thrive in a given environment. The human body dissipates heat through perspiration and its evaporation. Processes as transpiration, ab-sorption of water etc. are influenced by atmospheric humidity. Humidity, thus, plays an important part in the life of plants and animals.

Humidity measurement method & devices

1. **Psychrometer:** The device consists of two thermometers - wet and normal. Analyzing the difference between the readings of thermometers determine the dew point.

2. **Dew-point hygrometer:** Cooling small mirror placed in the sample gas stream. With photocell, fixing education mirror dew is governed by its temperature. Measuring the temperature, determine the dew point. .

3. **Hygrometer infrared.** By measuring, the absorption of infrared radiation is the absolute humidity.

4. **Hair hygrometer.** In such hygrometers will measure fat human hair extensions and defined humidity.