

## 12. Revision of atmospheric features

**Weather** = changes over a short period of time, concerns:

- temperature
- sunshine
- precipitation
- wind

Weather is never static => constantly changing => hard to forecast, studied by meteorology.

**Climate** = average condition of the atmosphere over a much longer time period, includes:

- rainfall
- temperature
- humidity
- air pressure
- winds
- clouds
- sunshine

for a minimum period of 35 yrs => climate = expected conditions for a place rather than actual conditions

Measuring the temperature = shade temperature (temperature of the air). Recorded by thermometer (°C) in a *Stevenson screen* = box painted white to reflect sunshine, stands 1 m above the ground level, away from trees. Maximum and minimum temperatures measured there.

Measuring the humidity = measured by hygrometer (%)

Measuring the rainfall = measured by rain gauge (mm) = bin located in an open area without any trees in close surroundings.

Measuring the air pressure = measured by barometer (hPa, mbar)

Measuring the wind = wind direction measured by a wind vane (where from it blows) = wind speed recorded by an anemometer (kph, mps)

### **Temperature patterns**

Factors influencing temperature at the Earth's surface:

- ❖ latitude and insolation
- ❖ distance from the sea (continentality)
- ❖ ocean currents
- ❖ prevailing winds
- ❖ altitude
- ❖ aspect

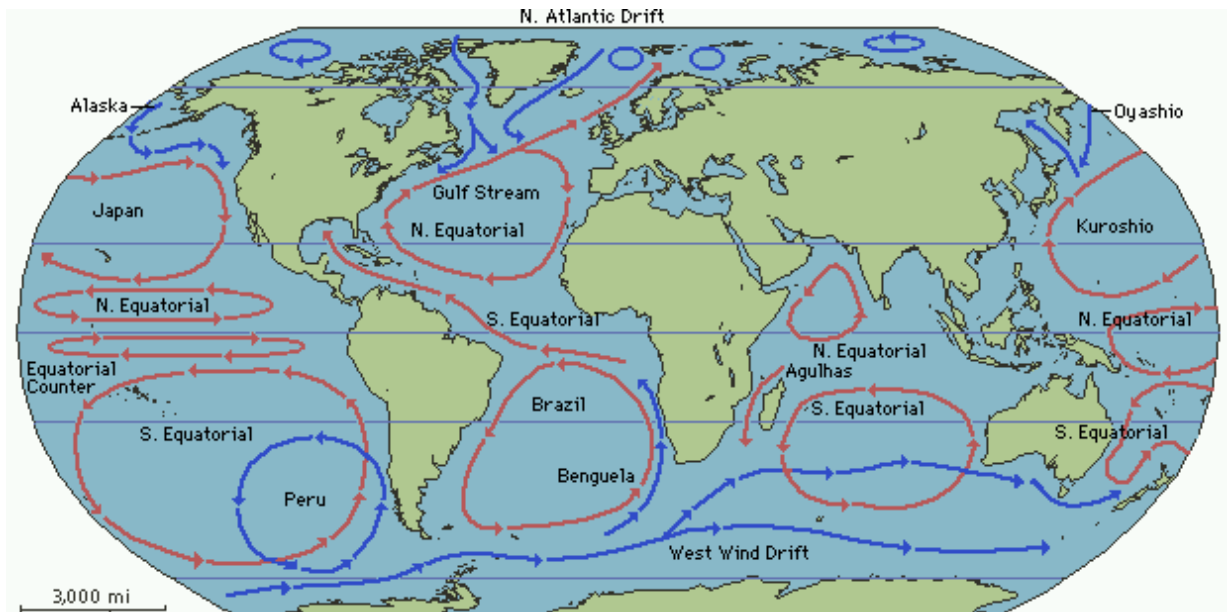
Latitude and insolation = *higher latitude = less insolation* ⇔ different angle of the Sun in the sky, layer of atmosphere surrounding the Earth => polar areas are much colder than regions located around the equator

Ocean currents (Figure 1) have great influence on the temperature of a coastal area or city (cold vs. warm ocean current)

- Warm ocean currents (e.g. Gulf stream, Kuroshio)
- Cold ocean currents (e.g. Labrador, Benguela)

Cold ocean currents contribute to arid climate, e.g. Namib desert, Atacama desert

**Figure 1: World ocean currents**

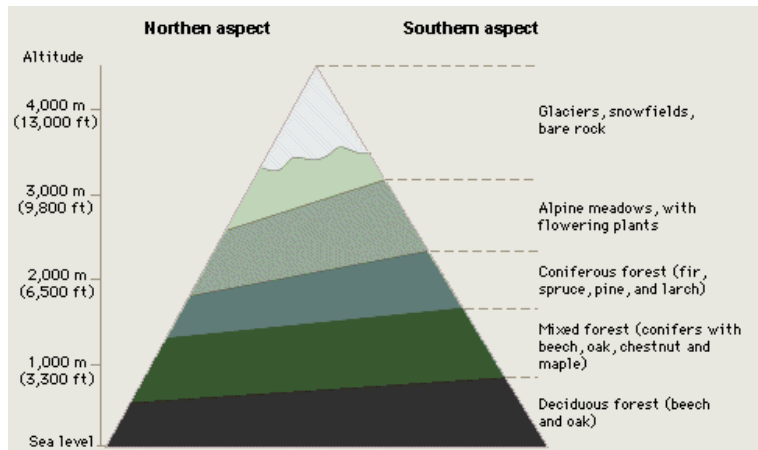


Prevailing winds = temperature of a wind is directly affected by the type of surface which it passes over. Winds blowing:

- from the oceans = humid air = warmer winter and cooler summer
- from the land mass = dry air = cooler winter and warmer summer

Altitude and aspect: mountain areas = climates and vegetation changing with altitude. Increasing altitude = decreasing temperature. Southern aspect = warmer climate. Altitude and aspect affect local conditions (Figure 2), resulting in different vegetation patterns dictating the choice of site for cultivation and settlement.

**Figure 2: Effect of altitude on vegetation**



All of these factors result in different climatic zones of the Earth (Figure 3):

*Equatorial* => rainforest

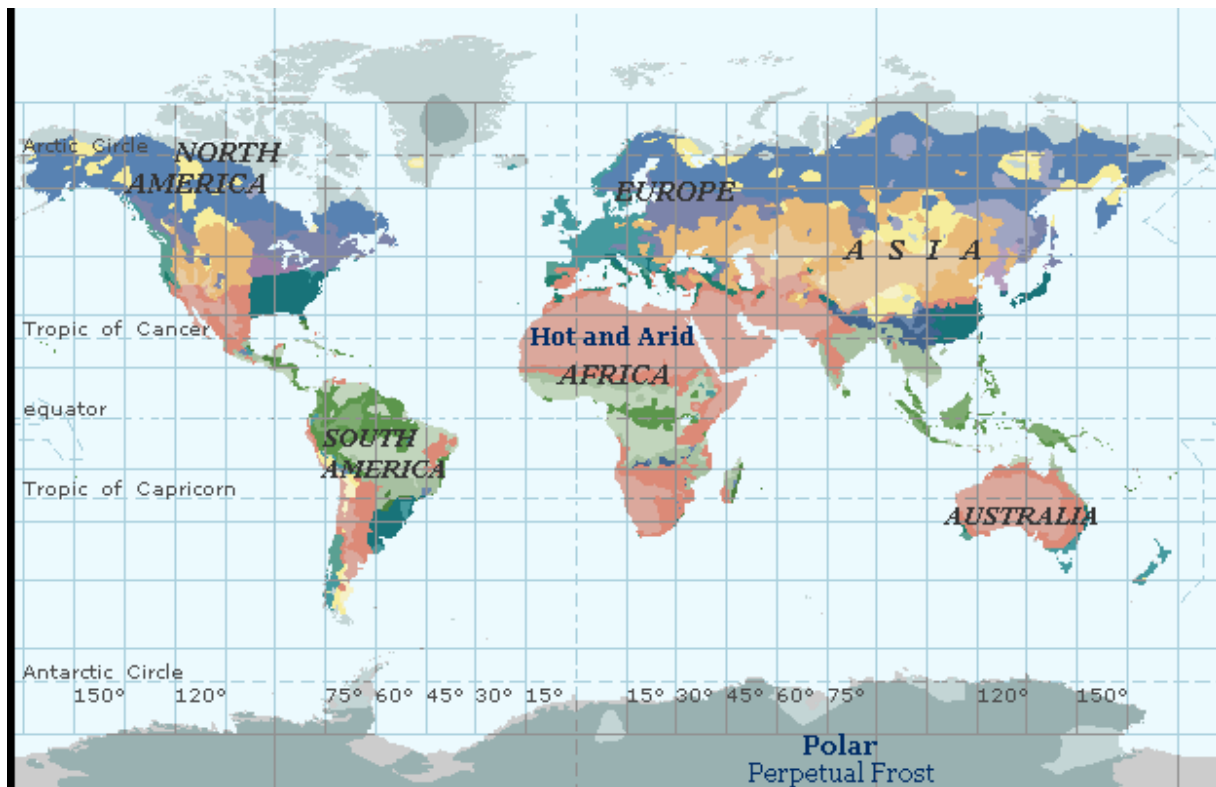
*Subequatorial* => savanna

*Tropical (the Tropics)* => desert

*Subtropical (Mediterranean)* => pines and bushes

*Temperate (Moderate)* => deciduous, mixed and coniferous forests

*Polar (Arctic and Antarctic)* => taiga, permafrost, ice and snow



**Keywords:**

weather, climate, meteorology, rainfall, temperature, humidity, prevailing winds, altitude, ocean currents, Stevenson screen, hygrometer, rain gauge, anemometer, wind vane, barometer, continentality, insolation, Gulf stream, westerlies, trade winds, aspect, vegetation zone, (sub)equatorial, (sub)tropical, temperate (moderate), polar, savanna, (semi)desert, beech, oak, chestnut, maple, spruce, fir, larch, meadows