Global wind belts diagram

Global wind patterns wind belts of general circulation The global wind pattern is also known as general circulation and surface winds in each hemisphere are divided into three wind belts: Polar Easterlies: 60-90 degrees latitude. Dominant speakers: 30-60 degrees of latitude (also known as Westeros). Tropical Easter: 0-30 degrees latitude (also known as trade winds). Commercial winds from both hemispheres converge in an area near the equator called the Intertropical Convergence Zone (ITCZ), producing a narrow band of clouds and thunderstorms surrounding parts of the world. Coggle requires JavaScript to view documents. the main global wind belts are commercial winds, polar easterlies, and the dominant speakers warm the surface strongly near the equator whose fresh air moves in the area, but quickly heats up and rises before moving very far from the latitude = distance from the equator measured in degrees of cold air over horse latitudes and produces high pressure wind region that blows towards the equator and turned west 30 degrees and 60 no and south , winds blow east by wind effect Coriolis is the horizontal movement of the air from the high pressure area to the wind zone of lower pressure = caused by differences in wind speed air pressure measured with the strongest anemometer wind, colder than feels - the increase in cooling is called wind chilly winds that blow at short distances the wind local blowing from an ocean or lake takes more energy to heat the water than the earth becomes warmer. the air above the water is exoaned and raised, creating a low pressure air flow from the ground to a body of water winds that constantly blow from specific directions on the global long-distance convection the current warm air rises to the equator and the cold air sinks into the poles, so that the air pressure is usually lower near the equator and closer to the poles the Earth's rotation makes the curve called Coriolis, it makes global winds in the northern hemisphere gradually turn right. Wind belts are the three wind belts or wind patterns that cover the planet: tropical easters (or commercial winds) are located near the equator, polar easterlies are found in the north and south poles, and the dominant speakers are between the two. Previous wind belts exist in both hemispheres (see image below). Global winds blow from high to low pressure at the base of atmospheric circulation cells. Polar easterlies are found at the base of the polar atmospheric cell, the dominant speakers are at the base of the Ferrel cell, and the easterlies they are at the base of the Hadley cell. For more information, watch this video: The air expands when heated and compressed when cooled. This results in variations in atmospheric pressure. Differences in atmospheric pressure cause air movement at low pressure, putting the air in motion. Atmospheric pressure also determines when the air will rise or sink. The horizontal moving air is wind. The wind redistributes heat and humidity through latitudes, thus maintaining a constant temperature for the planet as a whole. The vertical increase in moist air forms clouds and brings rainfall. Since the air has too much, it also has weight. Air pressure in a given place is defined as a force exercised in all directions by virtue of the weight of all air above it. The weight of a column of air contained in an area of unity from the average sea level to the top of the atmosphere is called atmospheric pressure. Atmospheric pressure is expressed in several units. Atmospheric pressure is the weight of the air column anywhere and given time. It is measured by an instrument called a barometer. The units used by meteorologists for this purpose are called millibars (mb). A millibar equals the strength of one gram in a square centimeter. A pressure of 1000 millibars equals the weight of 1,053 kilograms per square centimeter. In other words, it will equal the weight of a mercury column 75 cm high. Normal sea level pressure is taken at about 76 centimeters (1013.25 millibars). In the lower atmosphere the pressure decreases rapidly with height. At the height of Everest, air pressure is about two-thirds less than it is at sea level. The decrease in pressure with altitude, however, is not constant. Since the factors that control the density of the air – temperature, amount of water vapour and gravity are variable, there is no simple relationship between altitude and pressure. In general, atmospheric pressure decreases on average at a rate of about 34 millibars per 300 meters high. The vertical pressure gradient force is much greater than that of the horizontal pressure gradient. However, it is generally balanced by an almost equal but opposite gravitational force. Therefore, we do not experience strong upward winds. Due to gravity the air on the surface is denser and therefore has a higher pressure. Since air pressure is proportional to density as well as temperature, it is deduced that a change in temperature or density will cause a corresponding change in pressure. The pressure decreases with height. In any elevation it varies from place to place and its variation is the main cause of air movement, i.e. wind moving from high pressure areas to low pressure areas. Increasing pressure indicates fine and settled climate, while falling pressure indicates unstable and cloudy weather. The small pressure differences are very significant in terms of wind direction and speed. Horizontal pressure distribution isobars at constant levels. Isobars are lines that connect places with the same pressure. In order to eliminate the altitude over pressure, is measured in any station after being reduced to sea level for comparison purposes. The spading of isobars expresses the speed and direction of pressure changes and is known as a pressure gradient. The nearby spate of isobars indicates a steep or strong pressure slope, while wide spading suggests a weak gradient. The pressure gradient can be defined as well as decreasing pressure per unit away in the direction in which pressure decreases more quickly. There are clearly identifiable areas of homogeneous horizontal pressure regimes or 'pressure belts'. On the Earth's surface, there are seven pressure belts. The seven pressure belts are : equatorial low, subtropical highs, low polar subr, and polar highs. Except for equatorial lows, all others form matching pairs in the northern and southern hemispheres. Closed isobars or closed pressure centers The low pressure system is closed by one or more isobars with the lowest pressure of the center. The high pressure system is also closed by one or more isobars with the highest pressure of the center. Global distribution of sea level pressure The atmosphere exerts a pressure of 1034 gm per square cm at sea level. This amount of pressure is exerted by the atmosphere at sea level in all animals, plants, rocks, etc. Near the equator sea level pressure is low and the area is known as equatorial low. Throughout 30° N and 30° S are high pressure areas known as subtropical highs. More pole wards along 60° N and 60° S, low pressure belts are seated like low polar subs. Near the poles the pressure is high and is known as the high polar. These pressure belts are not of a permanent nature. They oscillate with the apparent movement of the sun. In the northern hemisphere in winter they move south and summer to the north. Equatorial low pressure belt or 'Doldrums' is between latitudes of 10°N and 10 °S. The width can vary between 5°N and 5°S and 20°N and 20°S. This belt becomes the convergence zone of commercial winds of two hemispheres of high pressure subtropical belts. This belt is also called Doldrums, due to extremely calm air movements. The position of the belt varies with the apparent movement of the Sun. Due to intense heating, the air heats up and rises over the equatorial region (convection). As long as there is vertically upward movement of the air, the surface region will be at low pressure. Thus, the belt along the equator is called the equatorial low pressure belt. Climate This belt is characterized by extremely low pressure with calm. This is due to the absence of surface winds, as winds approaching this belt begin to rise near its margin. Therefore, only vertical currents are found. Vertical. most of the low pressure belt passes along the oceans, the winds get a lot of moisture. The vertical winds (convection) that carry moisture form cumulonimbus clouds and lead to thunderstorms (convectional rainfall). Despite the high temperatures, cyclones do not form at the equator due to the force of 'zero' coriolis. (we'll see later) Subtropical belt of high pressure or horse latitudes Subtropical highs extend from near the tropics to about 35 ° N and S. After saturation (complete loss of moisture) in THE ITCZ, the air that moves away from the equatorial belt of low pressure in the upper tropics becomes dry and cold. This dry and cold wind is reduced to 30 °N and S. So the high pressure along this belt is due to the subsidence of air coming from the equatorial region that descends after becoming heavy. High pressure is also due to the effect of air blocking on higher levels due to coriolis force. Subsidy air is warm and dry, so most deserts are present along this belt, in both hemispheres. In this high pressure belt a calm (anticychic) condition is created with weak winds. Descending air currents feed the winds blowing towards adjacent low pressure belts. This belt is often invaded by tropical and extratropical disturbances. The corresponding latitudes of the high pressure subtropical belt are called horse latitudes. In the early days, horse-loading sailboats found it difficult to navigate in calm conditions of this high pressure belt. They used to throw horses into the sea when the fodder had vassed. Hence the name of horse latitudes. Answer: Subsidy air is warm and dry, so most deserts are present along this belt, in both hemispheres. Let's get an answer for this while studying ocean currents. Low pressure sub polar belt Located between latitudes 45°N and S and Arctic and Antarctic circles (66.5° N and S). Possessing at low temperatures at these latitudes the sub polar sub pressure belts are not very well pronounced for a year. In medium long-term climate maps, low-pressure sub-polar belts in the northern hemisphere are grouped into two centers of atmospheric activity: low-4d Iceland and Aleutian depression (low Aleutian). These belts in the southern hemisphere surround the periphery of Antarctica and are not so well differentiated. These occur dynamically due to the Coriolis Force produced by the rotation of the earth in its axis, and. Air ascension as a result of the convergence of polar speakers and easterlies (let's further on these on the next topic – wind systems). Sub polar low pressure belts are Mainly above during the winter, due to a high contrast between land and sea, this belt is divided into two different low centers: one in the vicinity of the Aleutian Islands and the other between Iceland and Greenland. In summer, summer, minor contrast results in a more developed and regular belt. The contrast area between the masses of cold and warm air produces polar water currents that surround the earth at latitudes of 60 degrees and focuses on these low pressure areas. Due to a great contrast between the temperatures of the winds of the regions of subtropical and polar sources, additional tropical cyclones or low cyclones occur' (temperate cyclones or frontal cyclones) in this region. High pressure polar belt The high polars are small in the area and extend around the poles. They are found around poles between latitudes 80 -90° N and S. The air of the sub polar low pressure belts after saturation dries. This dry air turns cold as it moves towards the poles through the upper tropics. Cold (heavy) air when reaching the poles decreases creating a high pressure belt on the earth's surface. The lowest temperatures are on the poles. In the northern hemisphere, during the summer, with the apparent change to the north of the sun, the thermal equator (higher temperature belt) is located north of the geographic equator. Pressure belts move slightly north of their average annual locations. Pressure belts in January During the winter, these conditions are completely reversed and the pressure belts move south of their average annual locations. Opposite conditions prevail in the southern hemisphere. The amount of displacement is, however, less in the southern hemisphere due to the predominance of water. Similarly, the distribution of continents and oceans has a marked influence on the distribution of pressure. In winter, continents are colder than oceans and tend to develop high pressure centers, while in summer, they are relatively warmer and develop low pressure. It's just the other way around with the oceans. Pressure control factors There are two main causes, thermal and dynamic, due to pressure differences resulting in high and low pressure systems. When the air heats up, it expands and therefore its density decreases. This, of course, leads to low pressure. On the contrary, cooling leads to contraction. This increases density and therefore leads to high pressure. The formation of low and polar equatorial highs are examples of low thermal and thermal maximums, respectively. Apart from temperature variations, the formation of pressure belts can be explained by dynamic controls derived from the pressure gradient forces and earth rotation (force coriolis). After saturation (complete loss of sampling) in the ITCZ, the air that moves away from the equatorial belt of low pressure in the upper latroposphere becomes dry and cold. This dry and cold wind is reduced to 30 °N and S. pressure along this belt is due to the subsidence of air from the equatorial region that descends after becoming heavy. The deflection rate increases with the distance of the equator (quite coriolis). As a result, for as the winds heading towards the pole reach latitude of 25°, they become almost west-to-east flow. It produces a blocking effect and the air accumulates. This causes a general subsidence in areas between the tropics and 35°N and S, and develop into high pressure belts. The location of the pressure belts is further affected by differences in clean radiation as a result of the apparent movement of the sun and variations in the warming of earth's surfaces and water. Thus, the formation of high and subtropical low pressure belts is due to dynamic factors such as pressure gradient forces, apparent sun movement and earth rotation (Coriolis force) Primary references: NCERT Geography, Physical and Human Geography Certificate [Amazon and Flipkart], Spectrum Geography [Amazon and Flipkart] and Savindra Singh [Amazon and Flipkart] and Savindra Singh [Amazon and Flipkart]