

= Westerlies =

The Westerlies , anti @-@ trades , or Prevailing Westerlies , are prevailing winds from the west toward the east in the middle latitudes between 30 and 60 degrees latitude . They originate from the high @-@ pressure areas in the horse latitudes and tend towards the poles and steer extratropical cyclones in this general manner . Tropical cyclones which cross the subtropical ridge axis into the Westerlies recurve due to the increased westerly flow . The winds are predominantly from the southwest in the Northern Hemisphere and from the northwest in the Southern Hemisphere .

The Westerlies are strongest in the southern hemisphere and at times when the pressure is lower over the poles , while they are weakest in the northern hemisphere and when pressures are higher over the poles . The Westerlies are particularly strong in areas where land is absent , because land amplifies the flow pattern , making the current more north @-@ south oriented , slowing the Westerlies . The strongest westerly winds in the middle latitudes can come in the Roaring Forties , between 40 and 50 degrees latitude . The Westerlies play an important role in carrying the warm , equatorial waters and winds to the western coasts of continents , especially in the southern hemisphere because of its vast oceanic expanse .

= Behaviour =

If the Earth were a non @-@ rotating planet , solar heating would cause winds across the mid @-@ latitudes to blow in a poleward direction , away from the subtropical ridge . However , the Coriolis effect caused by the rotation of Earth causes winds to steer to the right of what would otherwise be expected across the Northern Hemisphere , and left of what would be expected in the Southern Hemisphere . This is why winds across the Northern Hemisphere tend to blow from the southwest , but they tend to be from the northwest in the Southern Hemisphere . When pressures are lower over the poles , the strength of the Westerlies increases , which has the effect of warming the mid @-@ latitudes . This occurs when the Arctic oscillation is positive , and during winter low pressure near the poles is stronger than it would be during the summer . When it is negative and pressures are higher over the poles , the flow is more meridional , blowing from the direction of the pole towards the equator , which brings cold air into the mid @-@ latitudes .

Throughout the year , the Westerlies vary in strength with the polar cyclone . As the cyclone reaches its maximum intensity in winter , the Westerlies increase in strength . As the cyclone reaches its weakest intensity in summer , the Westerlies weaken . An example of the impact of the Westerlies is when dust plumes , originating in the Gobi desert combine with pollutants and spread large distances downwind , or eastward , into North America . The Westerlies can be particularly strong , especially in the Southern Hemisphere , where there is less land in the middle latitudes to cause the progression of west to east winds to slow down . In the Southern hemisphere , because of the stormy and cloudy conditions , it is usual to refer to the Westerlies as the Roaring Forties , Furious Fifties and Shrieking Sixties according to the varying degrees of latitude .

= Impact on ocean currents =

Due to persistent winds from west to east on the poleward sides of the subtropical ridges located in the Atlantic and Pacific oceans , ocean currents are driven in a similar manner in both hemispheres . The currents in the Northern Hemisphere are weaker than those in the Southern Hemisphere due to the differences in strength between the Westerlies of each hemisphere . The process of western intensification causes currents on the western boundary of an ocean basin to be stronger than those on the eastern boundary of an ocean . These western ocean currents transport warm , tropical water polewards toward the polar regions . Ships crossing both oceans have taken advantage of the ocean currents for centuries .

The Antarctic Circumpolar Current (ACC) , or the West Wind Drift , is an ocean current that flows from west to east around Antarctica . The ACC is the dominant circulation feature of the Southern Ocean and , at approximately 125 Sverdrups , the largest ocean current . In the northern

hemisphere , the Gulf Stream , part of the North Atlantic Subtropical Gyre , has led to the development of strong cyclones of all types at the base of the Westerlies , both within the atmosphere and within the ocean . The Kuroshio (Japanese for " Black Tide ") is a strong western boundary current in the western north Pacific Ocean , similar to the Gulf Stream , which has also contributed to the depth of ocean storms in that region .

= = Extratropical cyclones = =

An extratropical cyclone is a synoptic scale low pressure weather system that has neither tropical nor polar characteristics , being connected with fronts and horizontal gradients in temperature and dew point otherwise known as " baroclinic zones " .

The descriptor " extratropical " refers to the fact that this type of cyclone generally occurs outside of the tropics , in the middle latitudes of the planet , where the Westerlies steer the system generally from west to east . These systems may also be described as " mid @-@ latitude cyclones " due to their area of formation , or " post @-@ tropical cyclones " where extratropical transition has occurred , and are often described as " depressions " or " lows " by weather forecasters and the general public . These are the everyday phenomena which along with anti @-@ cyclones , drive the weather over much of the Earth .

Although extratropical cyclones are almost always classified as baroclinic since they form along zones of temperature and dewpoint gradient , they can sometimes become barotropic late in their life cycle when the temperature distribution around the cyclone becomes fairly uniform along the radius from the center of low pressure . An extratropical cyclone can transform into a subtropical storm , and from there into a tropical cyclone , if it dwells over warm waters and develops central convection , which warms its core and causes temperature and dewpoint gradients near their centers to fade .

= = Interaction with tropical cyclones = =

When a tropical cyclone crosses the subtropical ridge axis , normally through a break in the high @-@ pressure area caused by a system traversing the Westerlies , its general track around the high @-@ pressure area is deflected significantly by winds moving towards the general low @-@ pressure area to its north . When the cyclone track becomes strongly poleward with an easterly component , the cyclone has begun recurvature , entering the Westerlies . A typhoon moving through the Pacific Ocean towards Asia , for example , will recurve offshore of Japan to the north , and then to the northeast , if the typhoon encounters southwesterly winds (blowing northeastward) around a low @-@ pressure system passing over China or Siberia . Many tropical cyclones are eventually forced toward the northeast by extratropical cyclones in this manner , which move from west to east to the north of the subtropical ridge . An example of a tropical cyclone in recurvature was Typhoon Ioke in 2006 , which took a similar trajectory .