

Wind



What makes the wind blow?

- A difference in air pressure is what causes the wind to blow.
- Wind is simply air moving from a place of high air pressure to a place of low air pressure.
- The greater the difference in air pressure, the stronger the winds.

Differences in Air Pressure

One example:

Extreme Cold = High Air Pressure
(at the Poles)

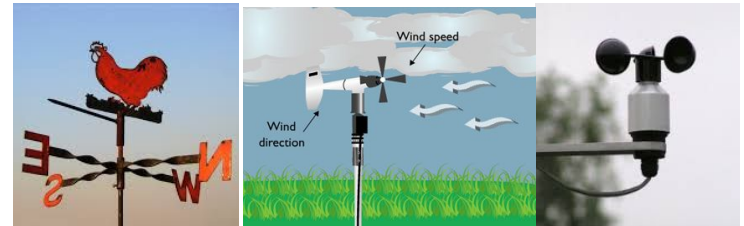


Extreme Heat = Low Air Pressure
(at the Equator)

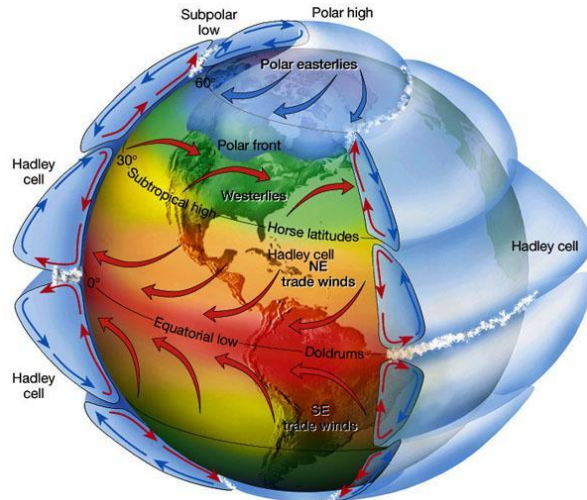


Measuring Wind

- Wind is described by direction and speed
 - Direction – where the wind is coming from
 - Speed - measured with an anemometer

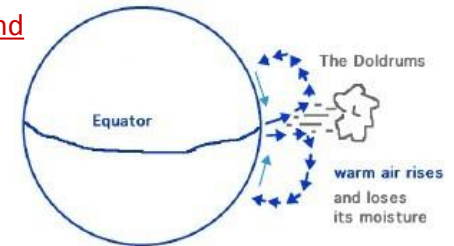


Global Winds



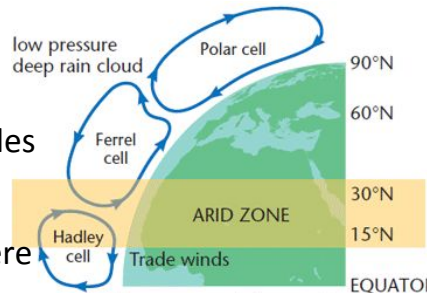
Doldrums

- Inactive winds
- Located at [the equator](#)
- Rising warm humid air
- Air at the equator rises, but with no horizontal movement of air, the doldrums are very weak
- Area has little or [no wind](#)



Horse Latitudes

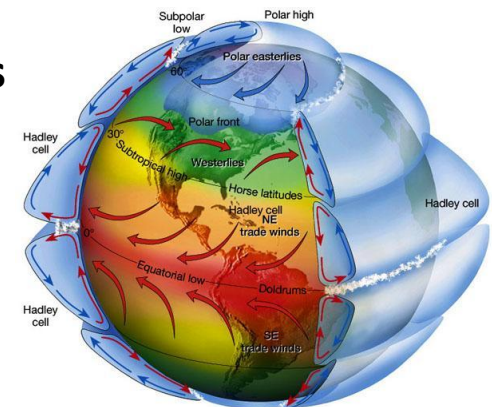
- Area of [weak winds](#)
- Located at 30° Latitudes (both North & South)
- World's [deserts](#) lie here
- No horizontal movement of air



Sailor ships would get stranded here; they would throw their horses overboard, or eat them.

Wind Belts

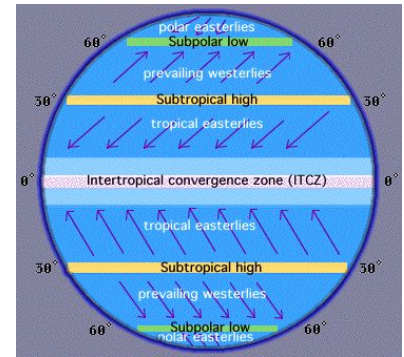
1. Trade Winds
2. Westerlies
3. Easterlies



Wind Belts

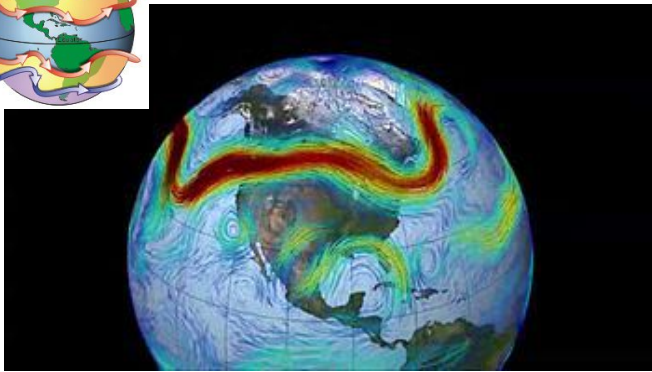
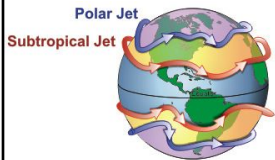
	Latitudes	Direction of Travel
Trade Winds	0° - 30° N&S Latitudes	East to West
Westerlies	30° - 60° N&S Latitudes	West to East
Easterlies	60° - 90° N&S Latitudes	East to West

- **Trade Winds** – Winds from the horse latitudes sink and blow South. Sailors relied on these winds for hundreds of years
- **Prevailing Westerlies** – winds from horse lats sink and blow North – because of coriolis effect they blow from West to East
- **Polar Easterlies** – Cool air sinks at the poles creating a Easterly wind



Jet Stream

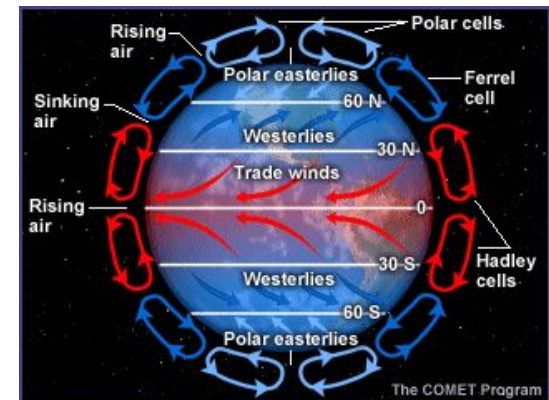
Bands of high speed winds, 125 mph – 250 mph



Circulation Cells

3 Types:

Hadley Cells
Ferrel Cells
Polar Cells



Low Pressure Areas:
Equator & 60° N & S

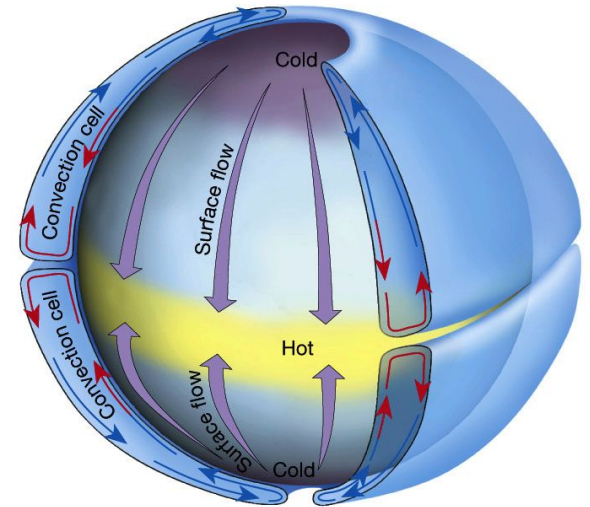
High Pressure Areas:
30° N & S

Circulation Cells

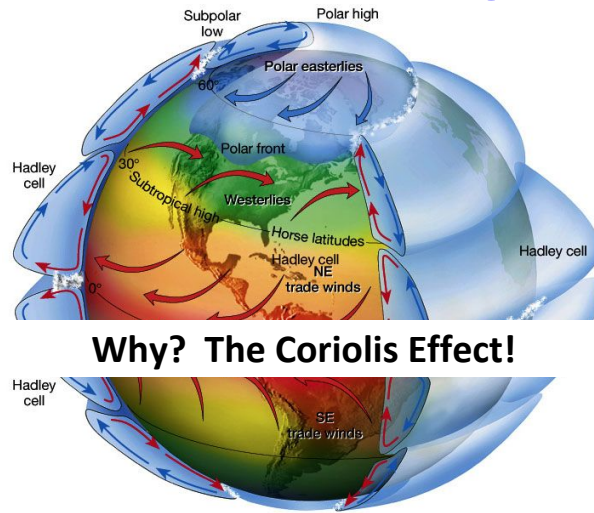
	Latitudes
Hadley Cell	0° - 30° N & S Latitudes
Ferrel Cell	30° - 60° N & S Latitudes
Polar Cell	60° - 90° N & S Latitudes

Circulation in a **Non-Rotating** Earth

Just one convection cell in each hemisphere



Circulation in a **Rotating** Earth

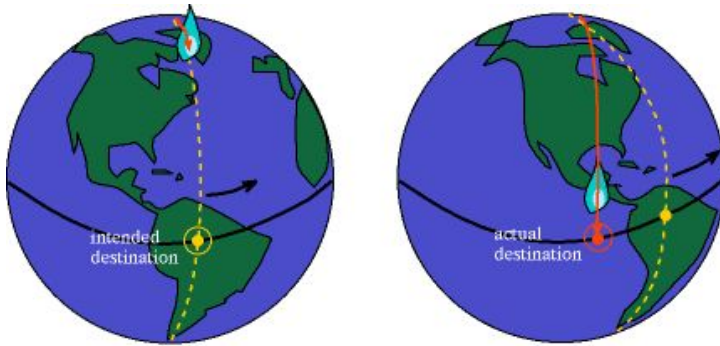


Why? The Coriolis Effect!

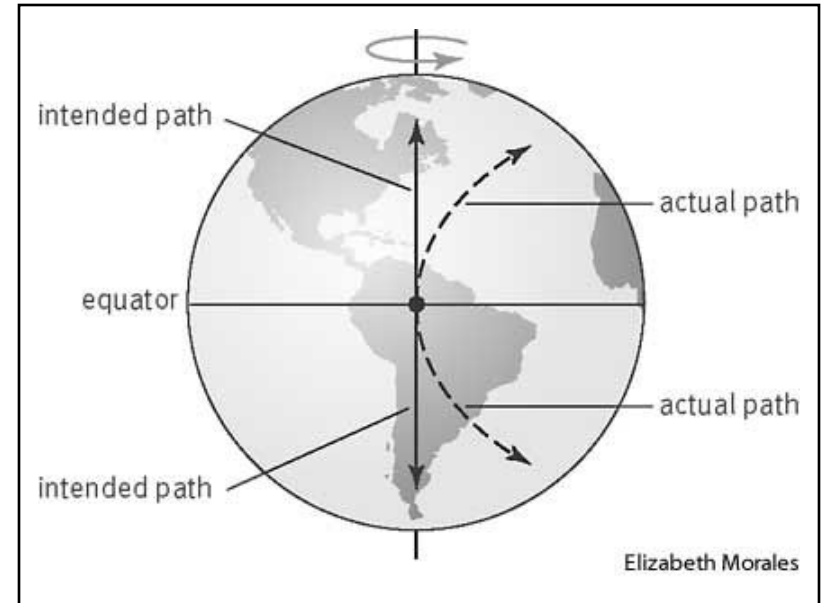
Coriolis Effect:

- The effect of Earth's rotation on the direction of wind and currents.
- Causes global winds to blow West in the Northern Hemisphere (East in the Southern Hemisphere) because of the Earth's rotation

Coriolis Effect:



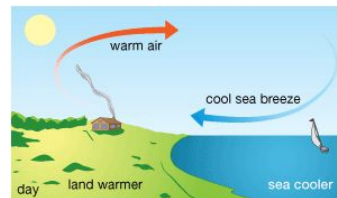
Coriolis effect: Original path of air is deflected westward by the rotation of the planet.



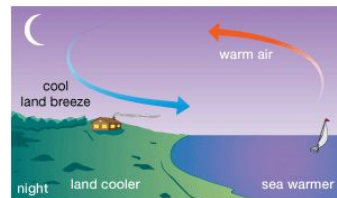
Local Winds:

Blow over short distances

Sea Breeze – land heats up faster than water hot air rises



Land Breeze – water cools down slower at night than land



© 2010 Encyclopædia Britannica, Inc.