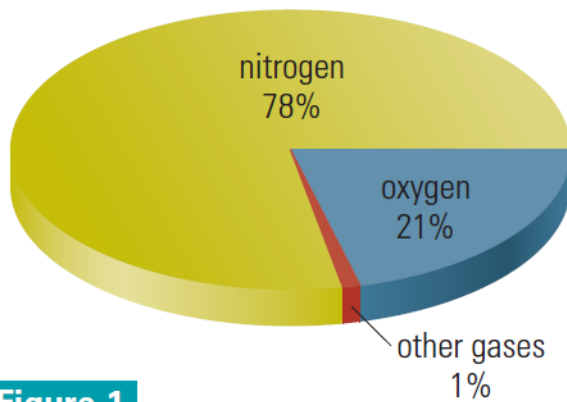


13.4

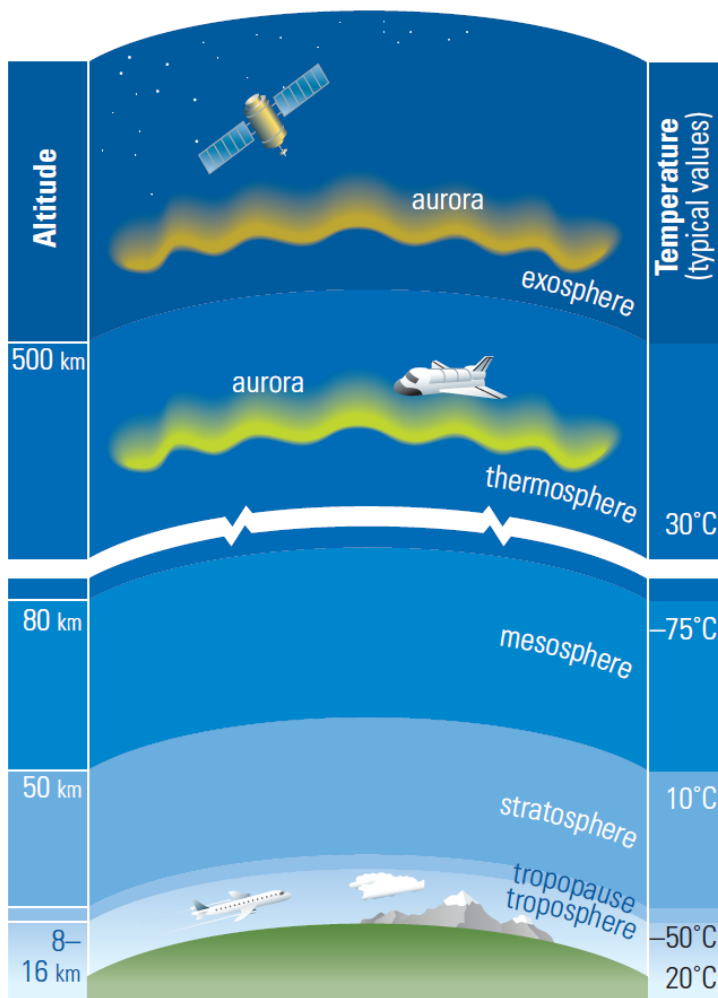
# The Atmosphere



Huh?! Why didn't we evolve to breath Nitrogen?

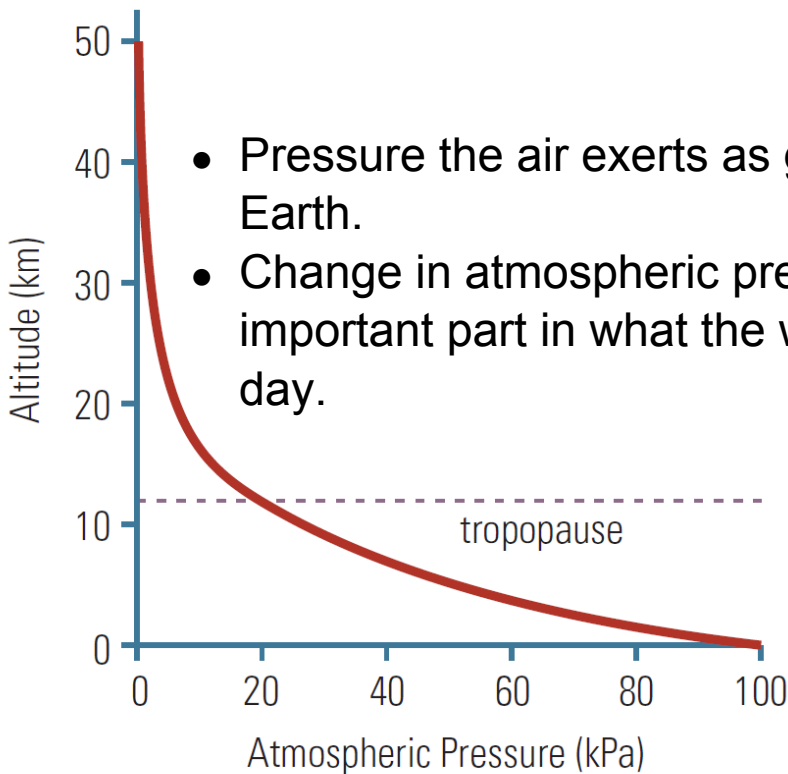
**Figure 1**

Besides nitrogen and oxygen, the atmosphere contains small amounts of water vapour, argon, carbon dioxide, neon, helium, krypton, hydrogen, and ozone.



- Temperature Gradient: change in temperature with distance.

# Atmospheric Pressure

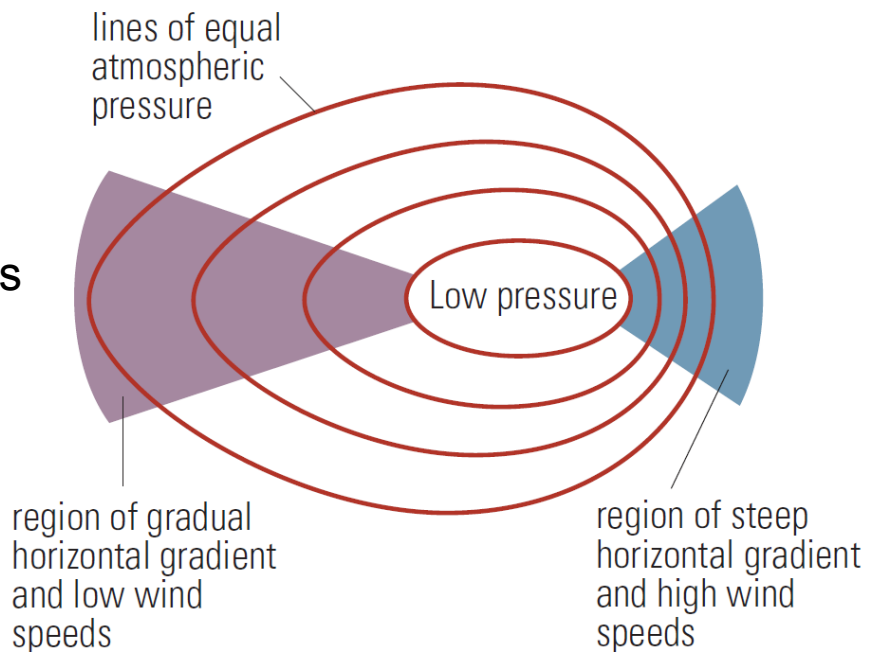


- Pressure the air exerts as gravity pulls it toward the Earth.
- Change in atmospheric pressure plays an important part in what the weather will be for the day.

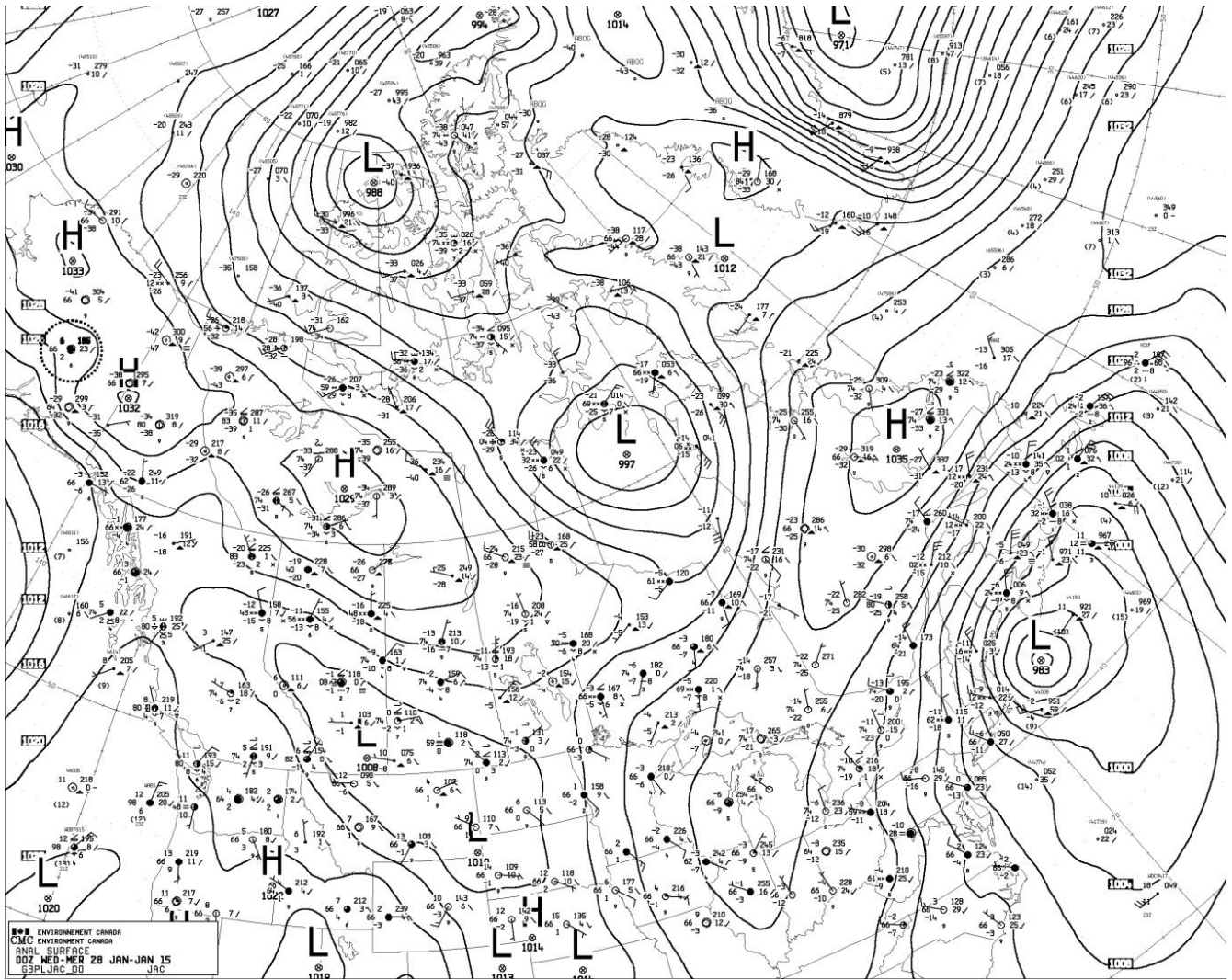
- Measured in kPa, kilo-Pascals. A Pascal is a measure of force per unit area.
- Measured with a barometer.

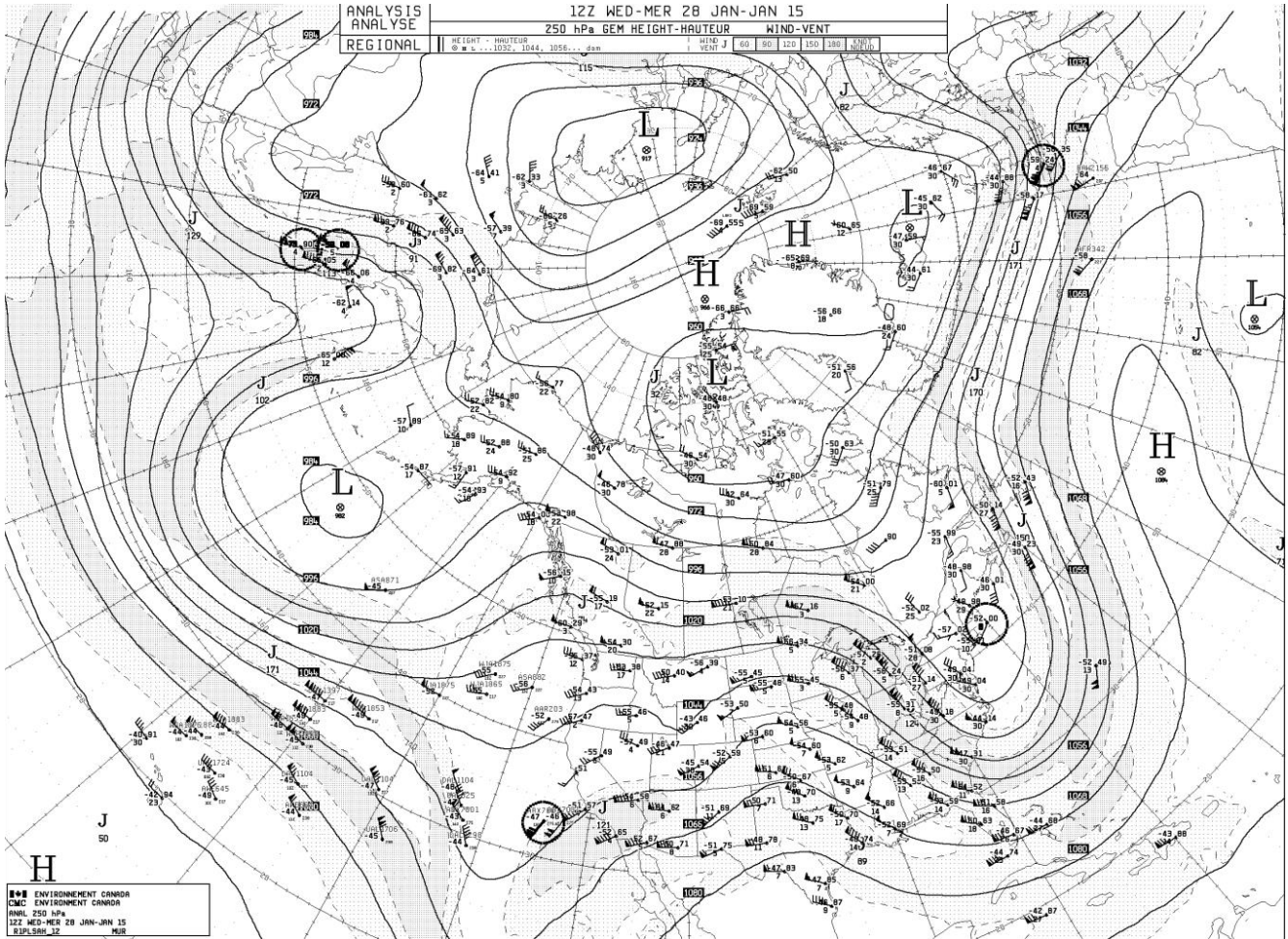
**(a)** Vertical pressure gradients

- Wind generally blows from high to low pressure areas.



**(b)** Horizontal pressure gradients





## Pressure Videos

Large Can Crush

Pop Can Crush

## 13.6

## Prevailing Wind Patterns

Of the many features we call weather, winds are one of the most important. A wind is a movement of air in the atmosphere. Some winds are local or regional, which means they occur in fairly small areas. But major wind patterns cover much larger areas. Winds that affect large areas are called **prevailing winds**. Since they affect weather around the world, we study them first. Later in the unit, we will explore some local and regional winds.

## The Coriolis Effect

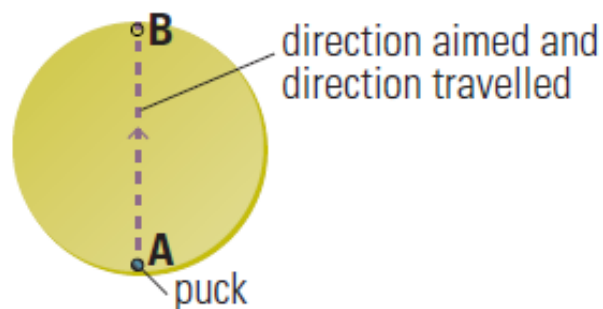
Video #1



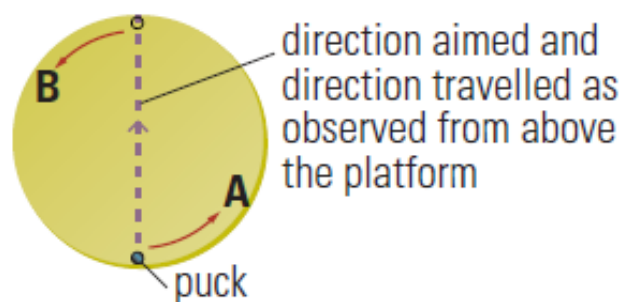
Video #2



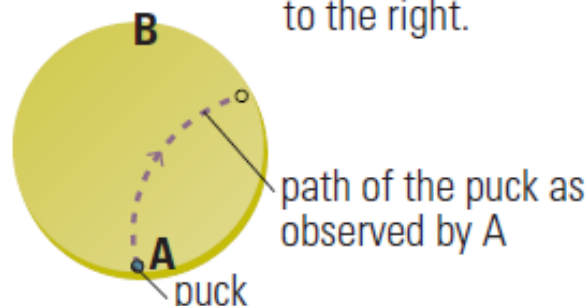
(a) The platform is not rotating.



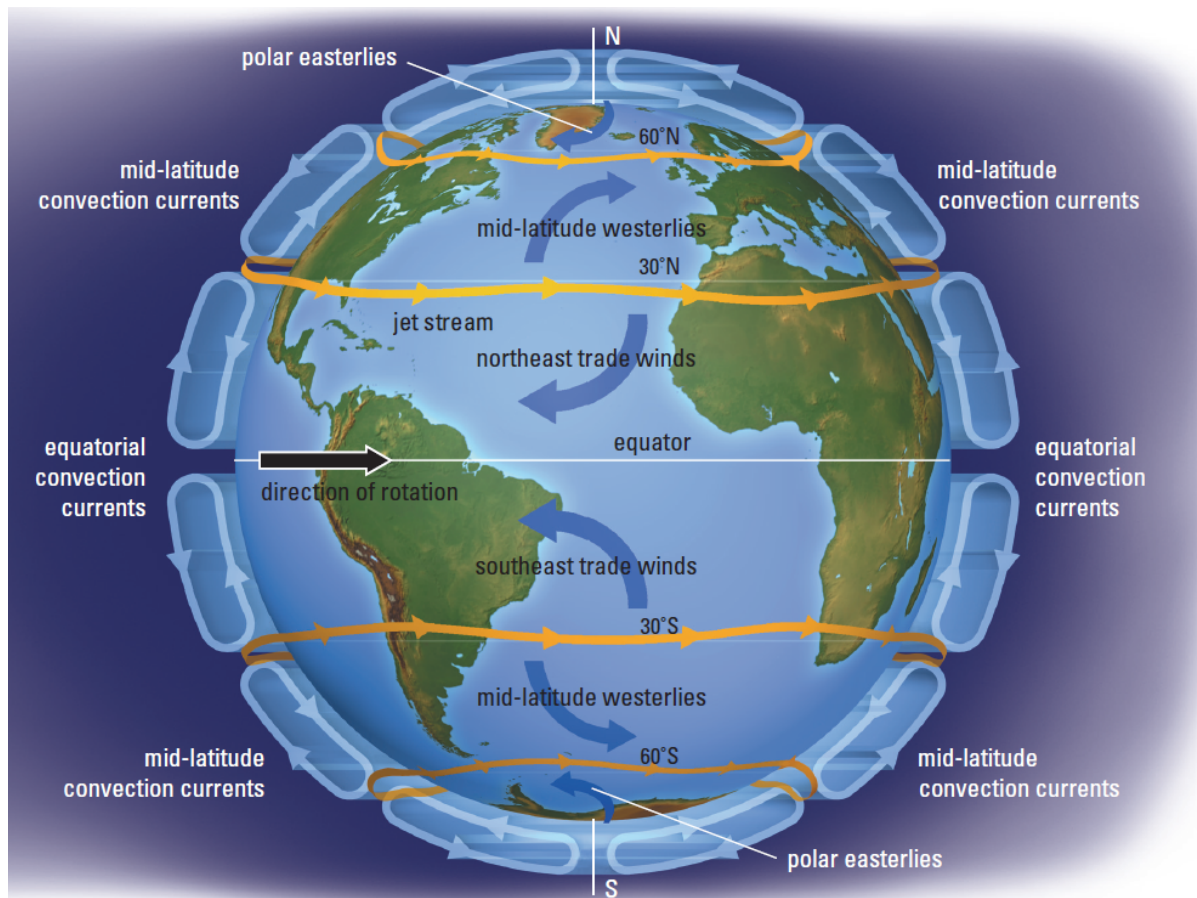
(b) View from above as the platform rotates



(c) From A's point of view, B is still on the opposite side, but the puck twists to the right.



# Wind Patterns

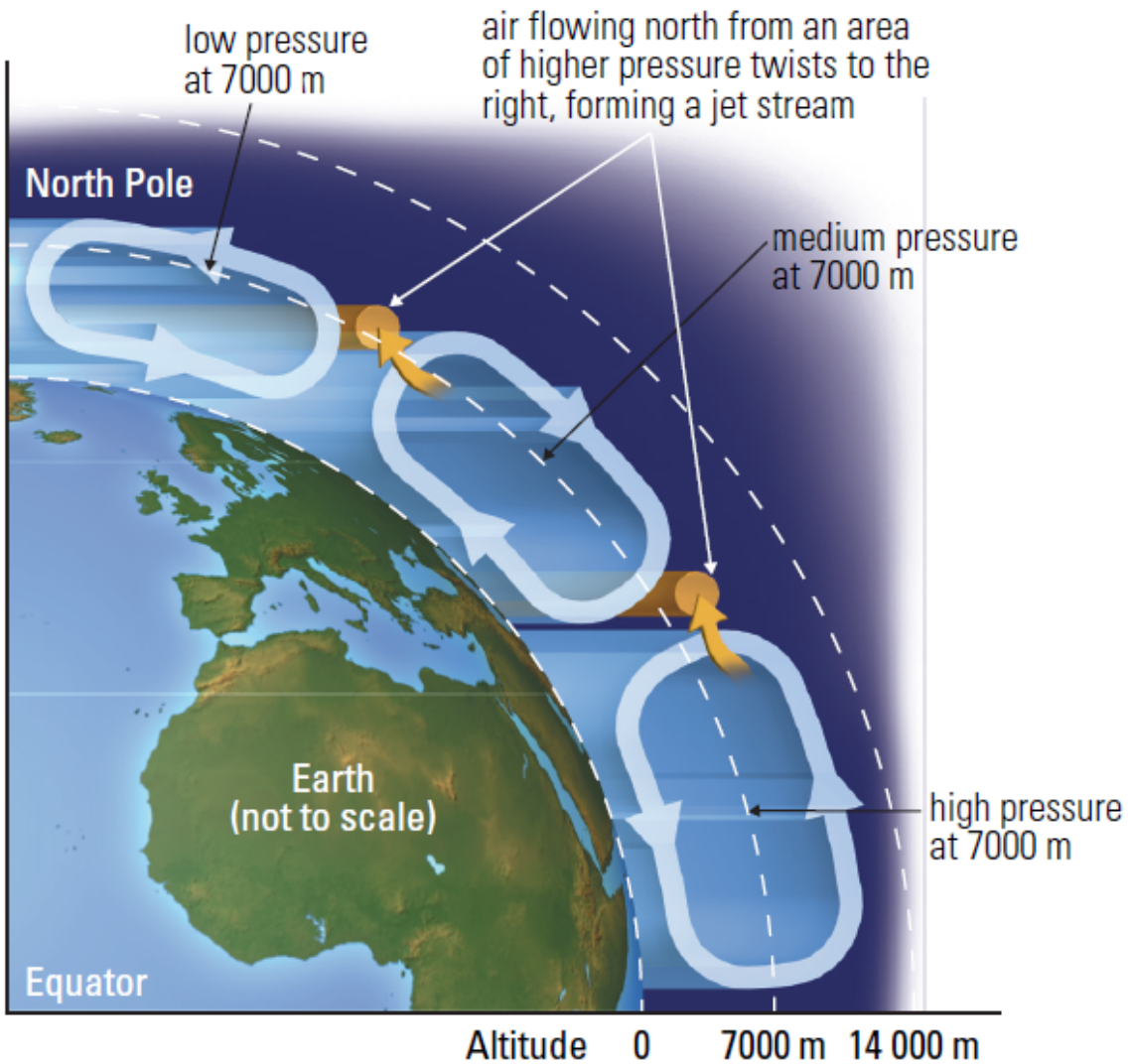


- **Causes of Prevailing Winds**

- > Solar energy striking at the equator.
- > Air warms and rises leaving a low pressure area.
- > Warm air moves northward when it reaches the troposphere.
- > Air cools and sinks to surface creating high pressure.
- > Air at surface moves towards southern low pressure area and twists to the right as it does.
- > Similar process for the other prevailing winds.

# Jet Stream

Generally borders warm and cool air.



## Effects of Prevailing Winds

- Distribute large amounts of solar energy from the equator.
- Brings cool air southward.
- Rising air is warm with high humidity.
- Falling air is cool and dry (where we see deserts).
- 60° latitude get lots of cloud and precipitation.
- Storms are stronger in winter because the arctic gets no sunlight so it gets cold rapidly.
  - > Create large temperature differences which in turn create greater pressure differences.

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