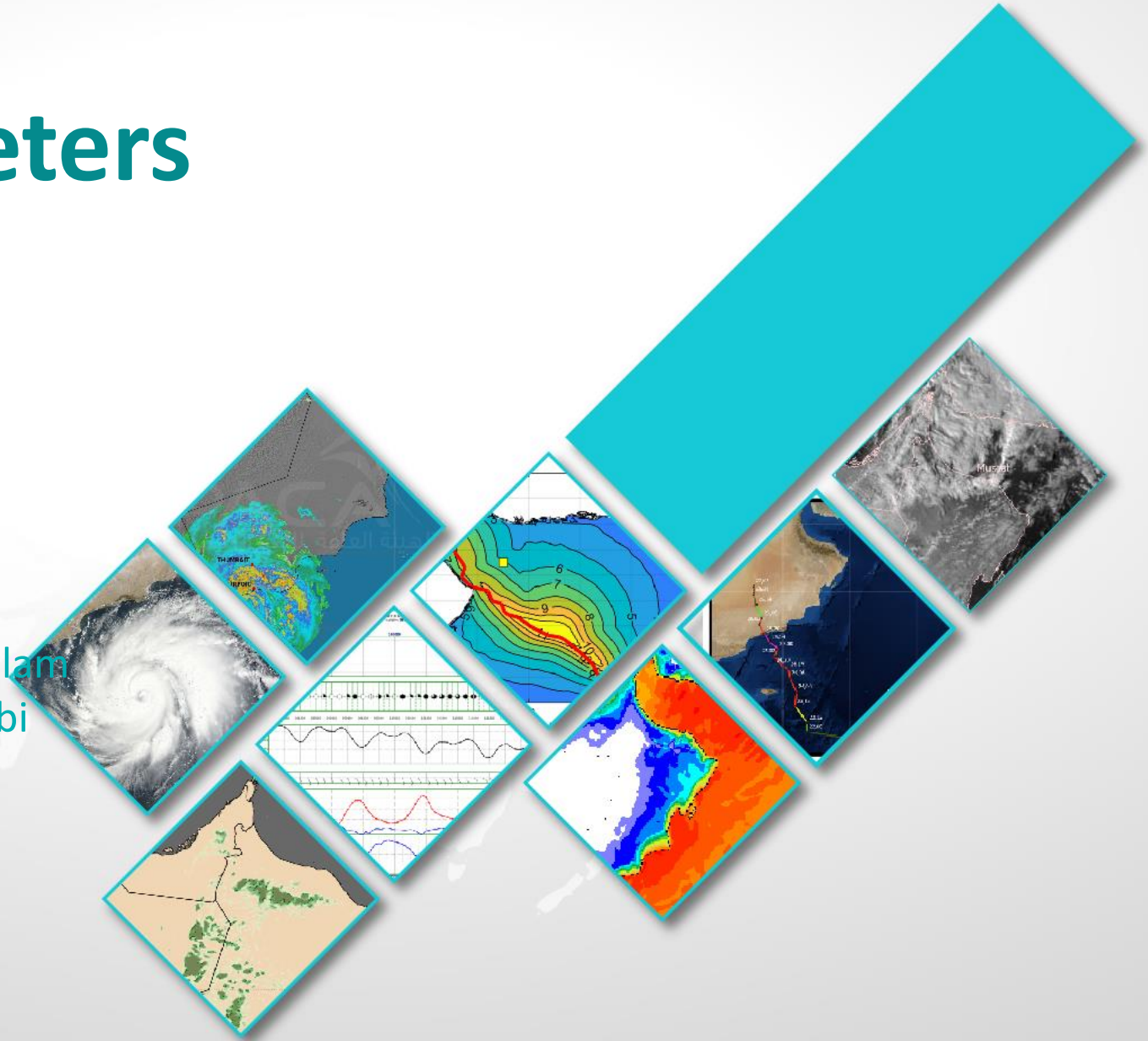
Measured Parameters of Meteorology

And their associated phenomena



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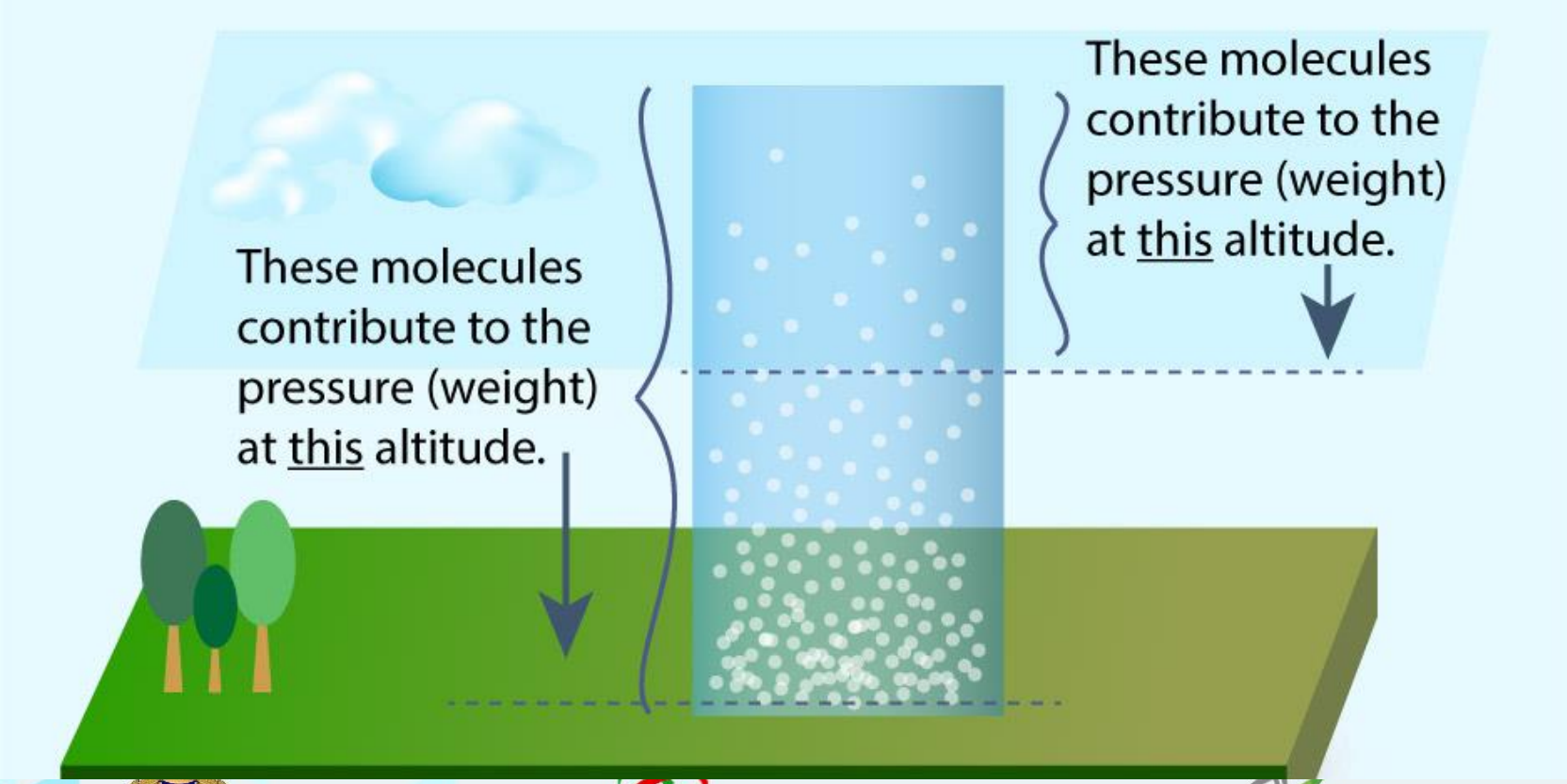
Content

- Air pressure
  - Pressure and Density
  - Pressure and altitude
  - Pressure and volume
  - Pressure charts and correction
  - High- and low-pressure areas
- Wind
  - Forces governing and affecting wind
  - Pressure gradient force
  - Geostrophic wind
  - Gradient wind
  - Coriolis force
  - Wind flow in high- and low-pressure areas
  - ITCZ

Air pressure

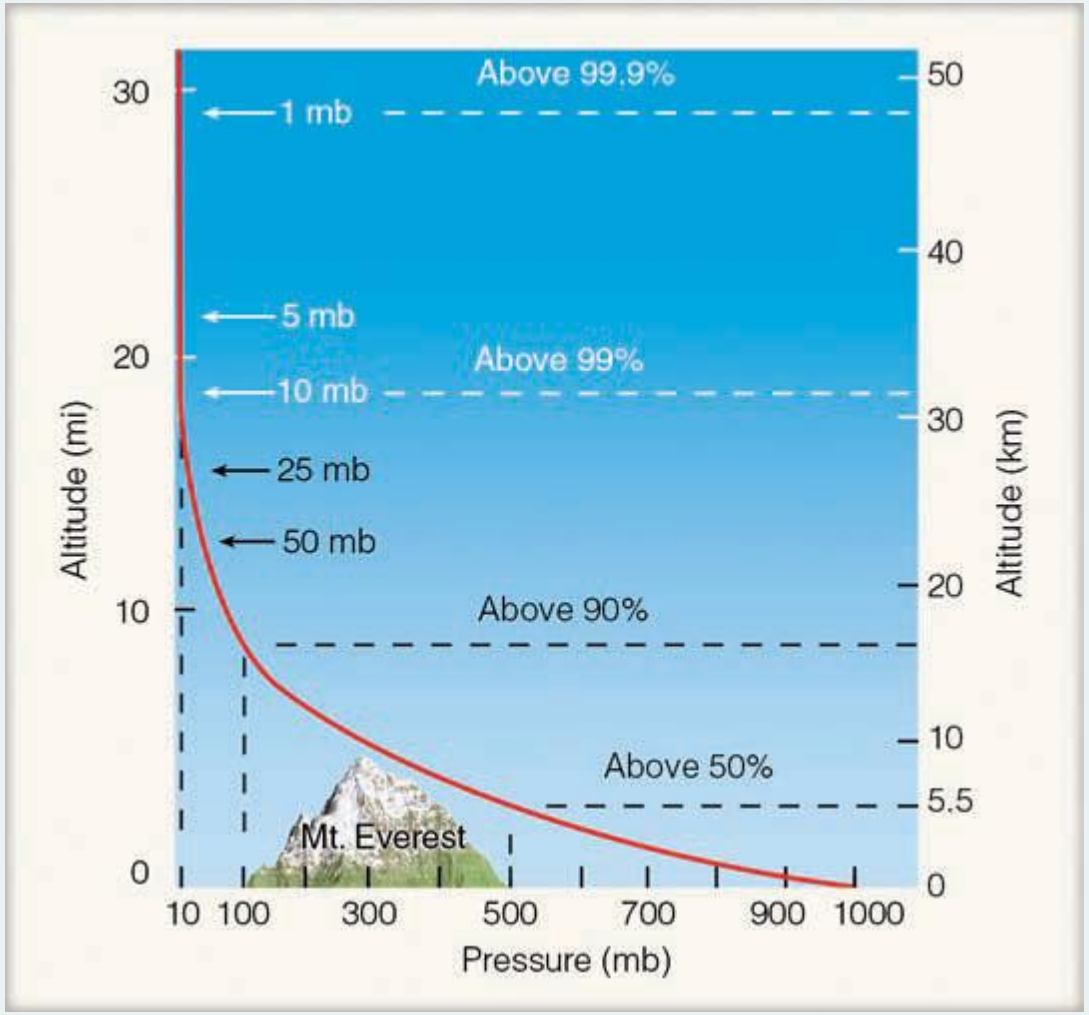
Air pressure ,or atmospheric pressure , is the force per unit area exerted on a surface by the **weight of air** above that surface.



Pressure and Density

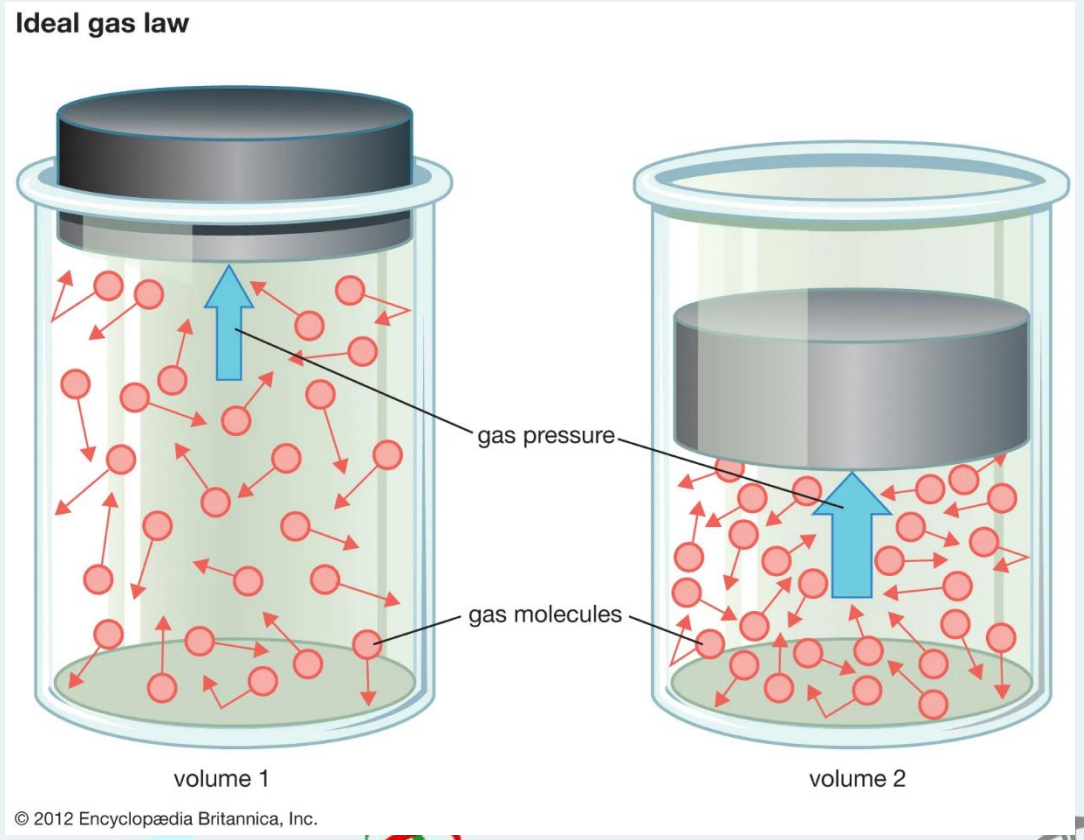
As the number of air molecules in column of air decreases, the air pressure decreases and vise versa

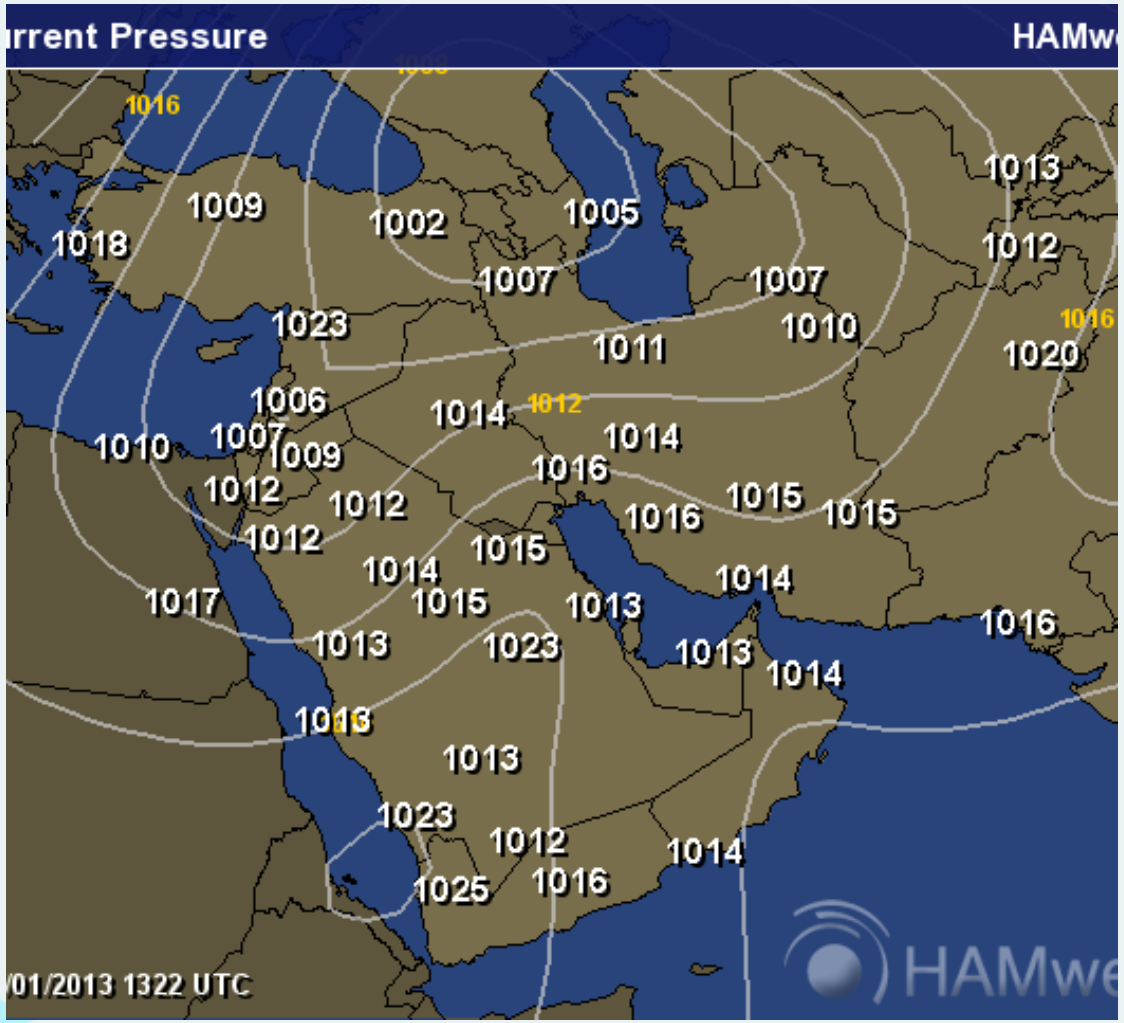
Pressure and Altitude (Height)



Pressure and Volume

- **A gas will expand to fill whatever space it is given.**
- **The decrease of volume mean increase in air pressure and vice versa.**





Pressure Charts

Pressure chart is drown in one atmospheric level

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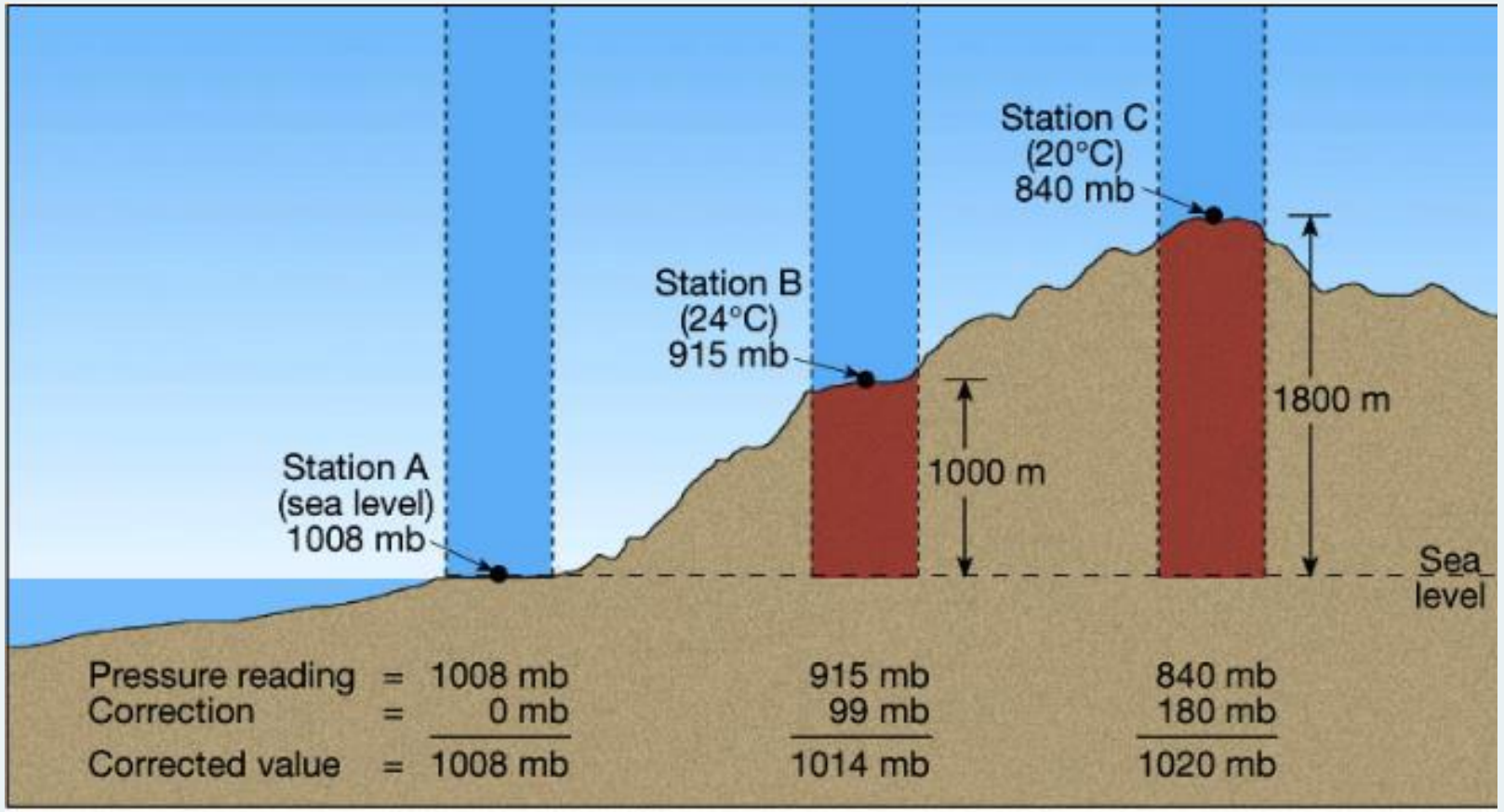
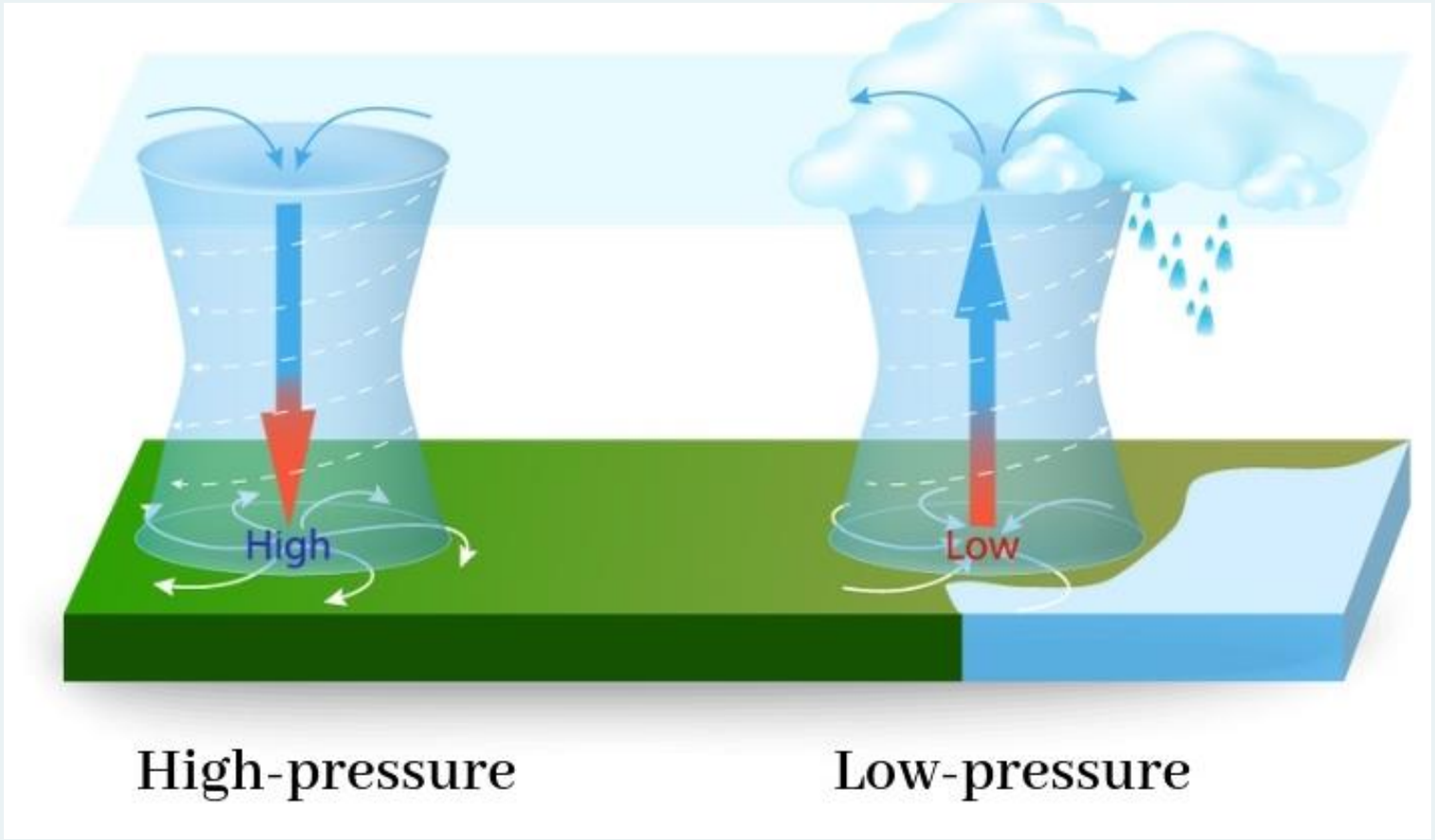
Pressure Correction

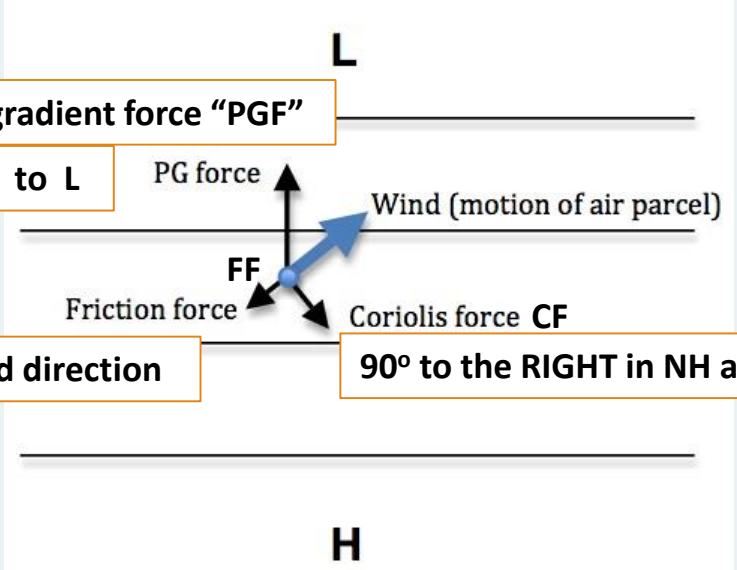


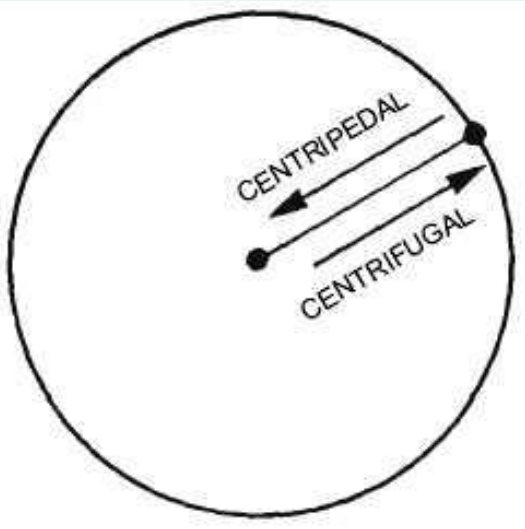
Air pressure corrections owing to elevation, using a temperature of approximately 20°C.

High- and low-pressure areas



Forces Governing and Affecting Wind

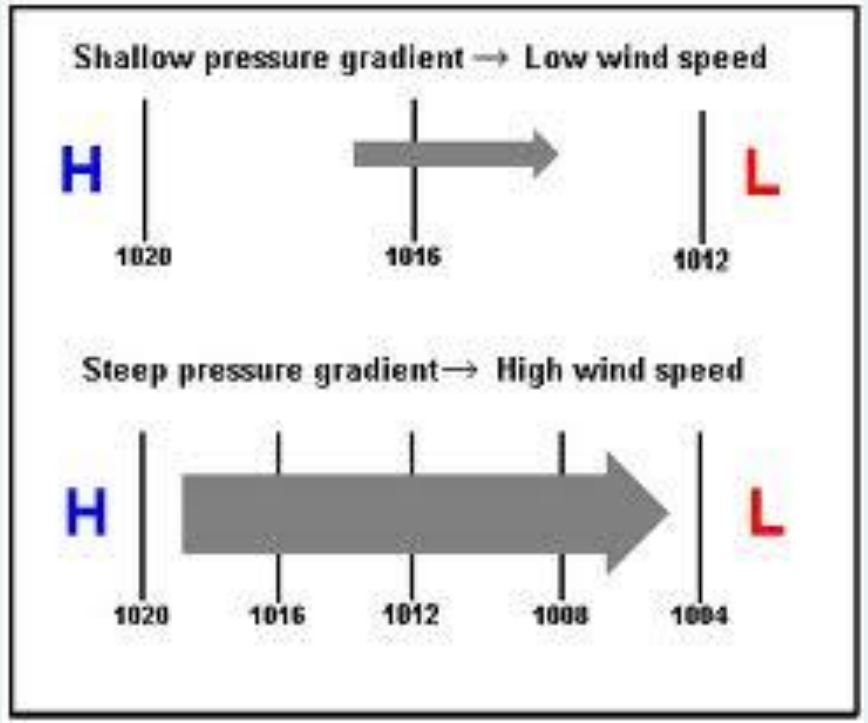


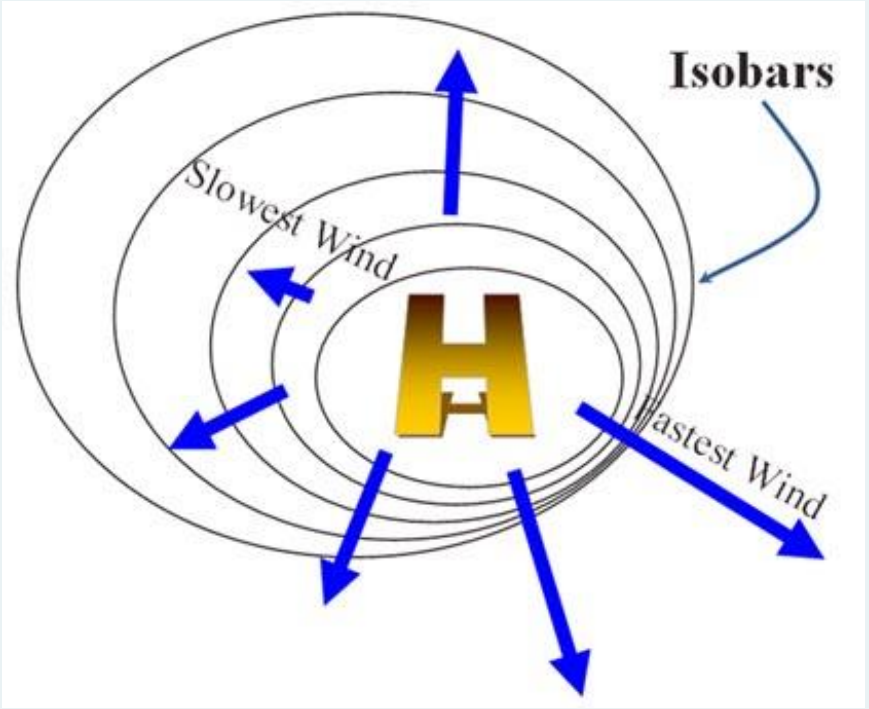


- **Other forces:**
  - **Centripetal force aka Gravity force "GF" "acts toward Earth center"**
  - **Centrifugal force "CentriF" "acts outward from the radius of curvature"**

Pressure Gradient Force

- Which pressure gradient would result in greater wind velocity?





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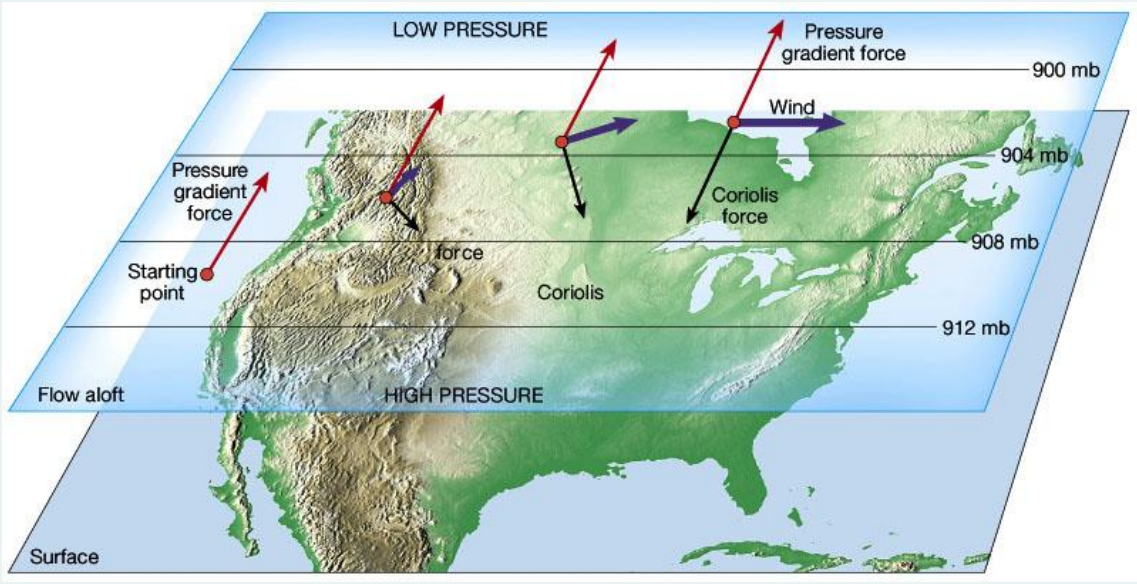
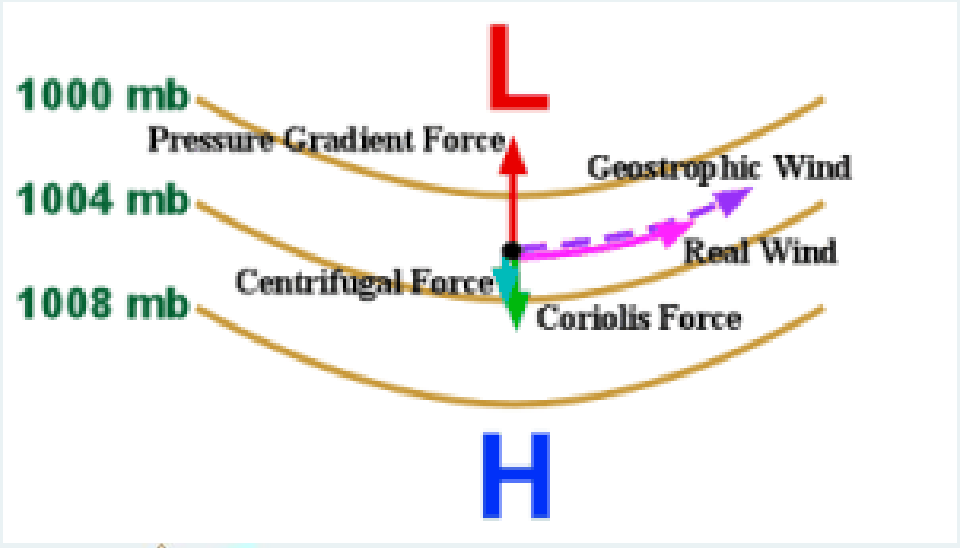
Geostrophic wind





Gradient wind

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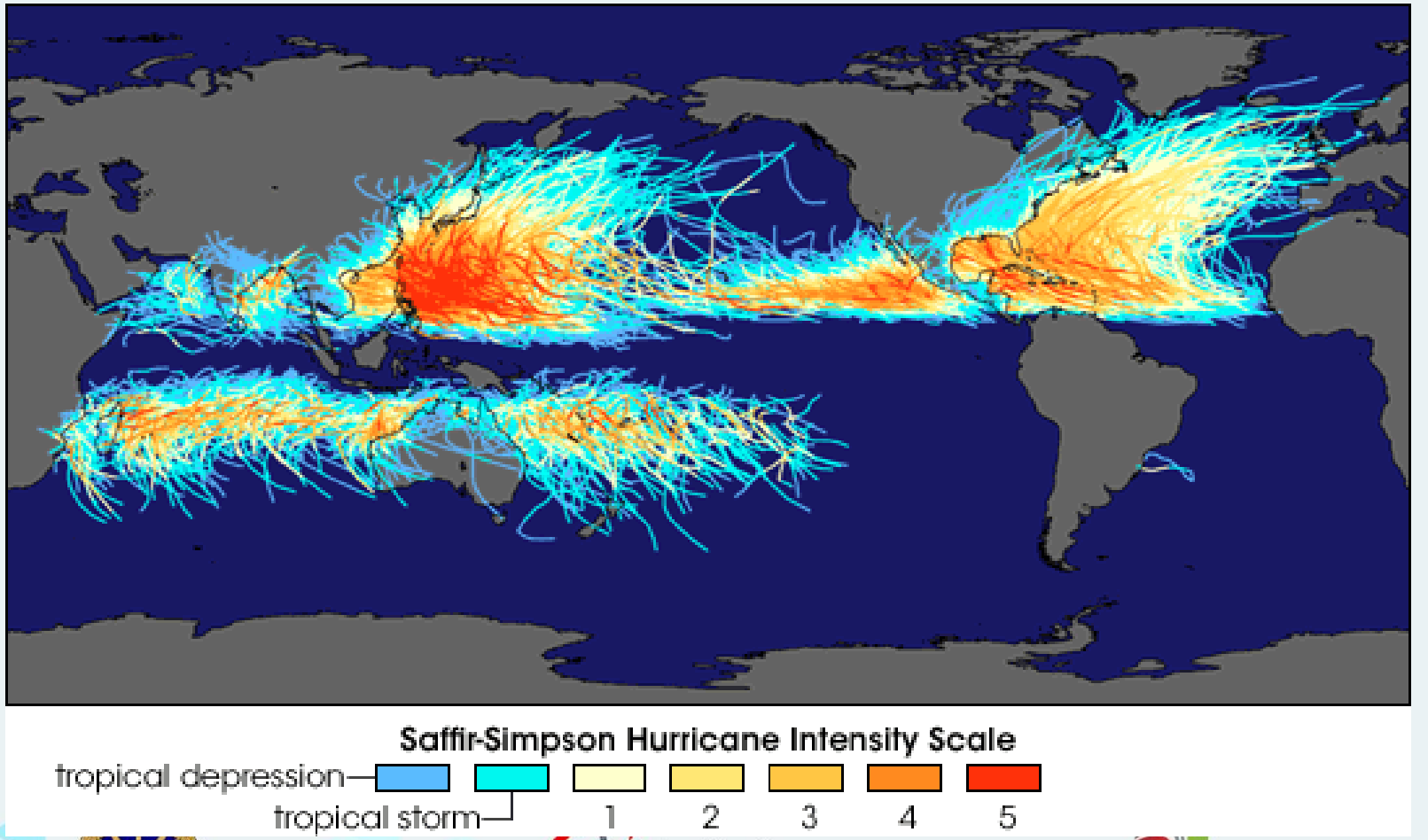
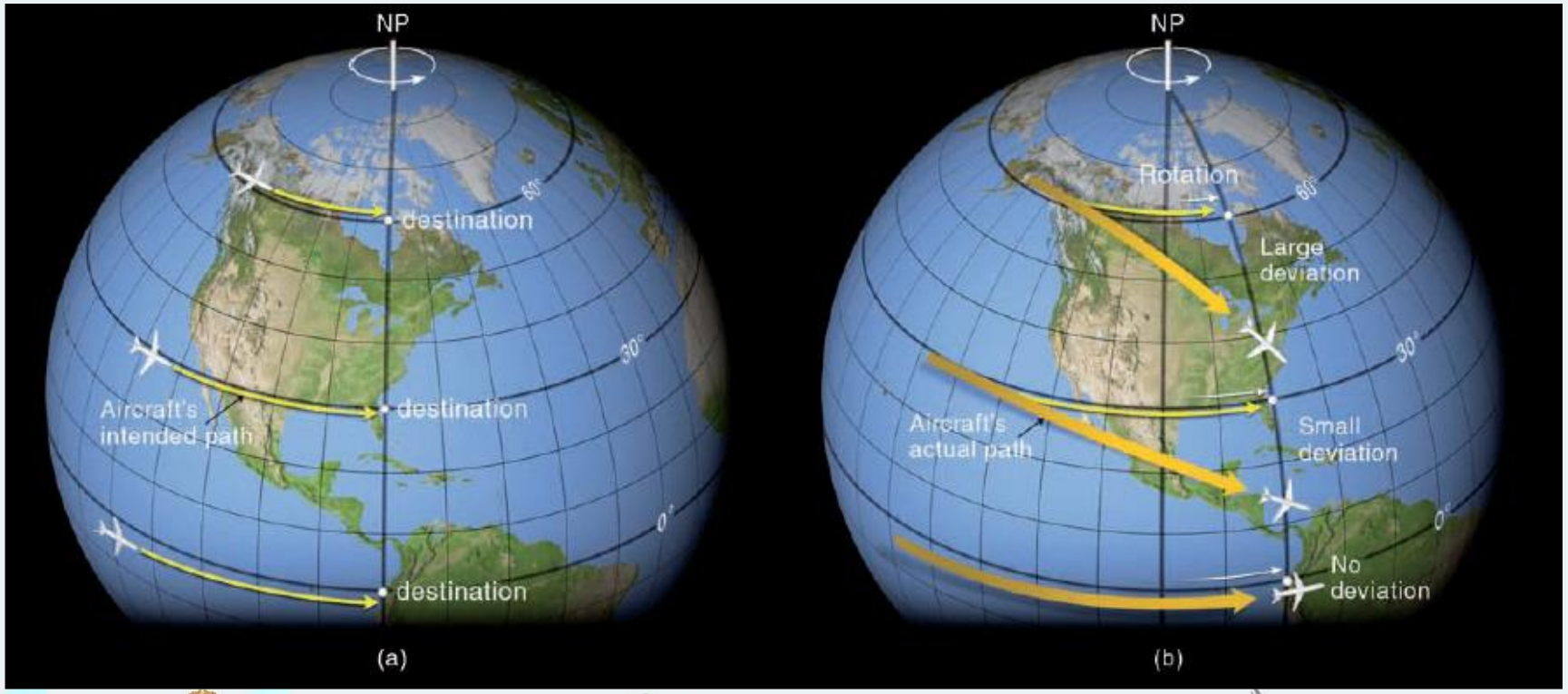
Why are there no cyclones at the equator?



The effect of the Coriolis Force

The farther from the equator the object is, the greater the deflection, and the faster an object is moving, the greater the deflection



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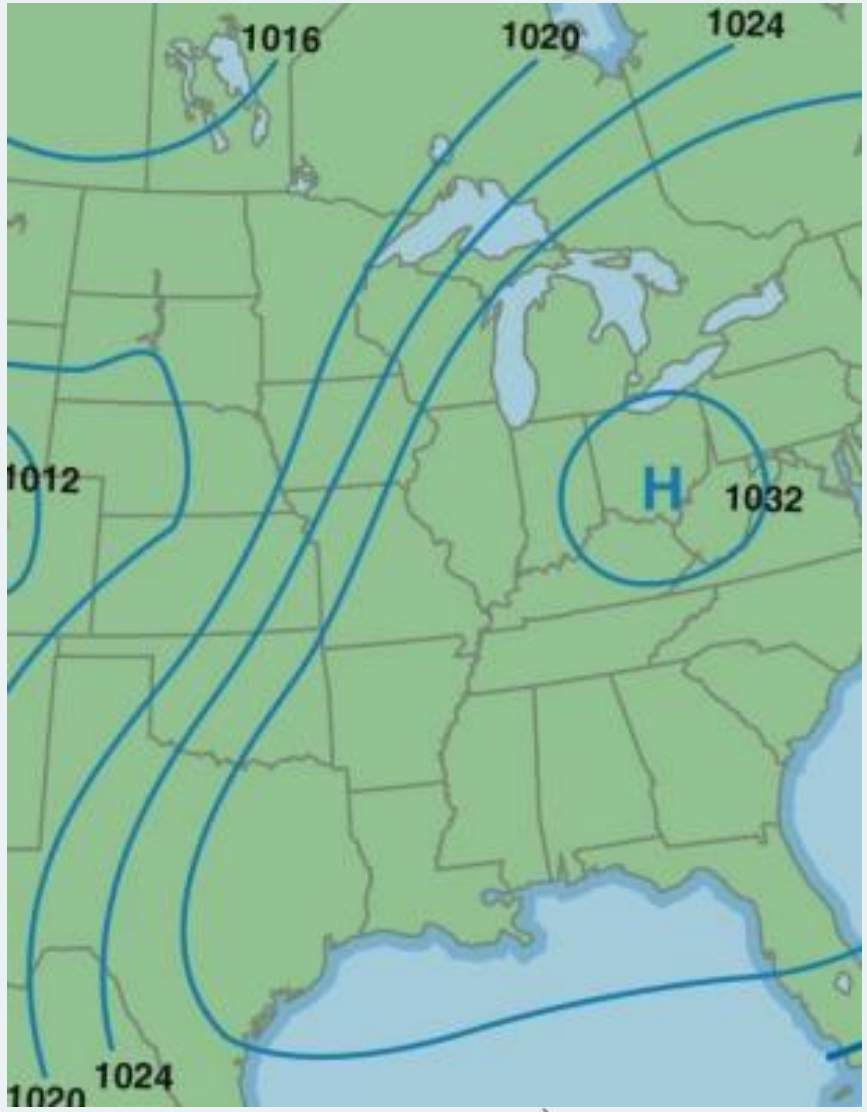
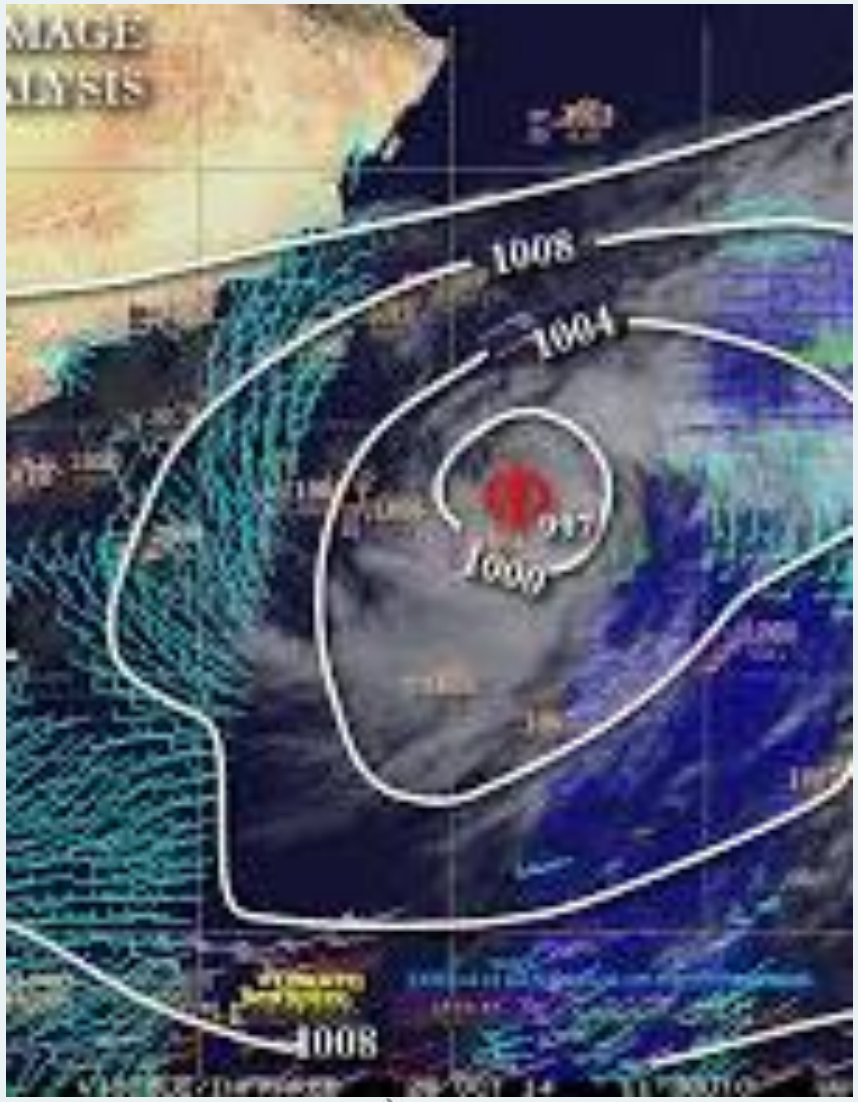
High Pressure area

- A high pressure center is where the pressure has been measured to be the highest relative to its surroundings. That means, moving in any direction away from the "High" will result in a decrease in pressure.
- A high pressure center also represents the center of an anticyclone and is indicated on a weather map by a blue "H".
- Winds flow **clockwise** around a high pressure center in the northern hemisphere, while in the southern hemisphere, winds flow counterclockwise around a high.
- Sinking air in the vicinity of a high pressure center suppresses the upward motions needed to support the development of clouds and precipitation. This is why fair weather is commonly associated with an area of high pressure.

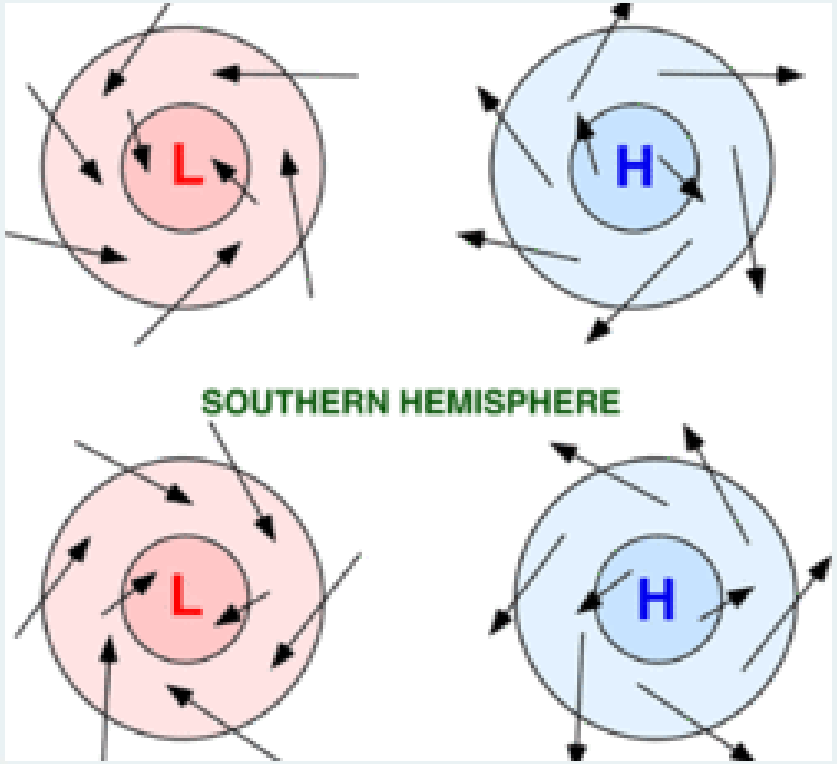


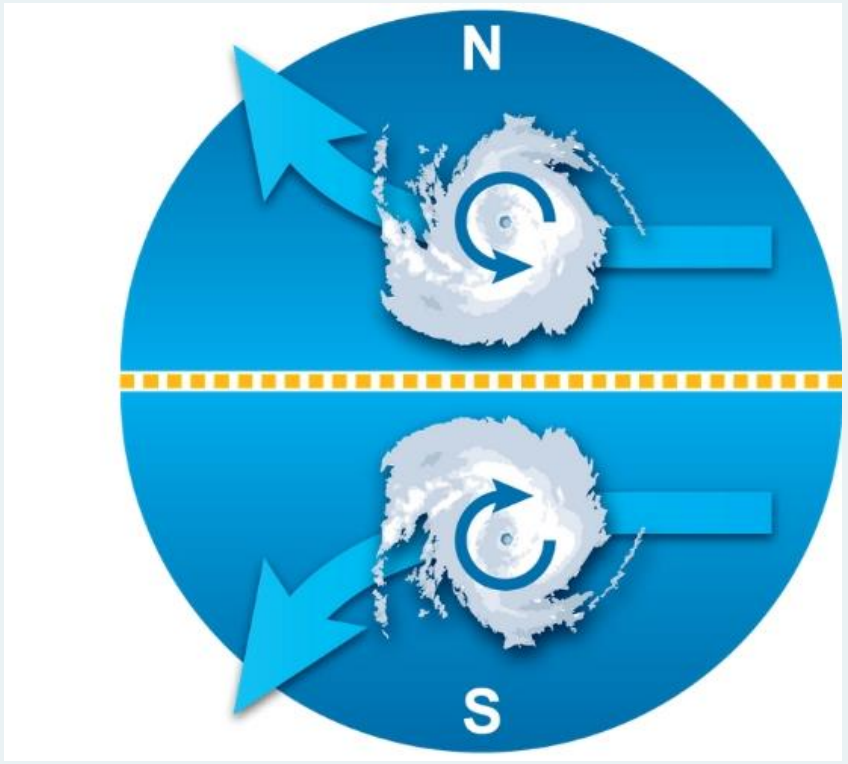
Low Pressure area

- A low pressure center is where the pressure has been measured to be the lowest relative to its surroundings. That means, moving in any horizontal direction away from the "Low" will result in an increase in pressure.
- Low pressure centers also represent the centers of cyclones.
- A low pressure center is indicated on a weather map by a red "L" and winds flow counterclockwise around a low in the northern hemisphere. The opposite is true in the southern hemisphere, where winds flow clockwise around an area of low pressure.
- Rising motion in the vicinity of a low pressure center favors the development of clouds and precipitation, which is why cloudy weather (and likely precipitation) are commonly associated with an area of low pressure.



High, low and Wind Flow





Thank you

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