

N: CLOUD FORMATION

Goal: Explain how interactions of air masses form clouds

Question: How do clouds form?

Note: An air mass is a portion of air with the same characteristics (temperature and density)

Saturation → Condensation = Clouds

- In order for a cloud to form, condensation must occur!
- → In order for condensation to occur the air must be saturated.
- **Saturation will occur when:**
 - 1) enough water vapor is returned to the atmosphere during **evaporation**
 - 2) when air is **cooled** enough to reach it's dew point

We will now focus on what happens when air is cooled enough to reach its dew point (saturation)

- Clouds will form when the air is cooled enough for condensation to form.

- Remember this order→

Cool, **C**ondense, **C**louds (**CCC**)

Let's find out how air **cools** enough to condense!

- 1) Expansion- When air is allowed to expand, it will cool. This is called an **adiabatic temperature change** (as warm air expands, it will cool)
 - a) Reminder: air pressure is 'thick' near earth's surface because there are so many gases near the surface.
 - b) As we move away from earth's surface the amount of gases decrease, the air is thinner, and air pressure decreases.

Cloud Formation

The last step is cloud formation!

Eventually the air will condense enough for a cloud to form.

In conclusion once the air begins to **cool** at the wet adiabatic rate, it will **condense** and **clouds** will form.

Next....

- Now that we know that lifting the air causes cloud formation. Let's find out more about the processes that actually lift the air.

4 Processes that lift the air:

- Note: Air tends to resist vertical movement. Therefore, air that is near the surface tends to stay near the surface.