

Class 4a: Atmospheric moisture

Introduction to water

- Earth's temperature → special properties of water

Introduction to water

- Energy needed to change state

Evaporation

- How does water evaporate?

Evaporation

- Water vapor stores latent heat
- *Vapor pressure*: pressure exerted by water vapor

Vapor pressure

Evaporation

- How quickly does water evaporate?

Humidity

- *Absolute humidity*: ratio of water vapor to a given *volume* of air
- *Specific humidity*: ratio of water vapor to a given *mass* of air

Humidity

- *Relative humidity*: ratio of water vapor to maximum water vapor capacity

Dew point

- When air cools, water vapor capacity _____
and relative humidity _____

Condensation

- *Condensation*: water vapor becomes liquid, releases latent heat

Lapse rates

- *Normal lapse rate: 3.5°F/1000 feet*

Adiabatic processes

- Air changes temperature by convection, not conduction

Adiabatic processes

- If a rising parcel of air cools to its dewpoint, then _____ occurs

Adiabatic processes

Stability of air

- Buoyancy: tendency of an object to rise

Stability of air

Stability of air

- Stability: normal lapse rate of surrounding air is *less than* DALR

Stability of air

- Unstable air: normal lapse rate of surrounding air is *greater than* DALR

Stability of air

- *Conditionally unstable* air: stable up to a point

Stability of air