

# Wrap Up

Topics to think about for final exam:

## The Earth's Atmosphere

General temperature, pressure and density change w/height for troposphere  
Where are the troposphere, tropopause & stratosphere?

## Warming The Earth And The Atmosphere

Heating processes: conduction, convection, latent & sensible heating, radiation  
Blackbody absorber vs selective absorbers  
Sun and earth's primary emission region of the electromagnetic spectrum  
Greenhouse gases, the greenhouse effect and the runaway greenhouse effect, ozone hole, ozone pollution  
Why do we have seasons?

## Air Temperature

General idea of what daily & seasonal temperature changes look like  
How are they different over land vs ocean?

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## Humidity, Condensation & Clouds \*\*\*\* (tough chapter for all!)

What are different ways of representing moisture in the air?

Relative measures of moisture

Absolute measures of moisture

How do dew, frost, fog happen?

General categories of clouds by height (cirro, alto), by shape (cumulo/cumulus, strato/stratus), rain (nimbo/nimbus)

## Cloud Development & Precipitation

Atmospheric stability - stable, conditionally unstable, unstable

Cloud formation using air parcel - lifting condensation level (LCL), dry adiabatic ascent, moist adiabatic ascent, free vs forced lifting of surface parcel

Precipitation process - types of precipitation and generally where they are formed in the cloud

## Air Pressure and Winds

Forces that move the wind - PGF, CF, Friction

Surface vs upper-air plots

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## Air Pressure & Winds \*\*\*\* (tough chapter for all!)

How does an air column change as it is warmed? Cooled?

Forces that move the wind - PGF, CF, Friction

Surface vs upper-air plots - What are isobars? What are constant height surfaces? How does temperature affect the way they look on a map?

How are winds drawn on a surface plot? Upper-level plot?

Convergence and divergence

Vertical motion above a surface low? High?

## Atmospheric Circulations

Thermal Circulations - understand and apply to local and global motion

Eddies - what are they? How are they formed?

Wind forcing on ocean, upwelling

El Nino/La Nina, PDO, NAO

## Air Masses, Fronts, and Mid-latitude Cyclones

Four air masses defined in class notes

Types of fronts and occlusion process

How do we get a mid-latitude cyclone? - Mid-latitude cyclogenesis

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## Thunderstorms & Tornadoes

Steps to the development and decay of an ordinary thunderstorm? A supercell thunderstorm?

What are gust fronts? What is their role in the storm?

What is wind shear? What is its role in a storm?

How does charge build up in a cloud? Where does it build up? (Electrification)

What are the steps to releasing the build-up? (Discharge)

What are the steps to the formation of a tornado?

Forward vs rotational winds

Mesocyclone

Vortex tube or rotating tube of air

Role of wind shear?

## Hurricanes

See today's Key Concepts!