6. Best Weather Ever

Geography 106 – California Geography | M. Presses | Antelope Valley College

Today

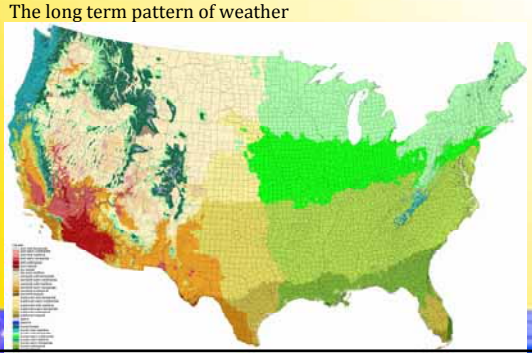
- Weather & climate basics
- California's climates
- Calif. plant communities & ecosystems

Weather

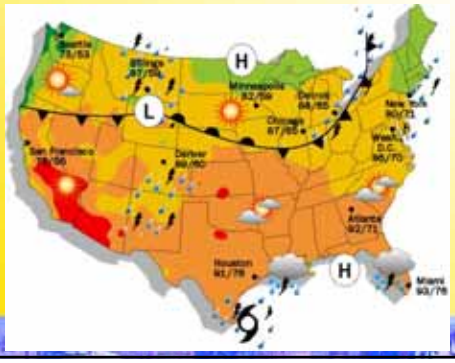
- Short term changes in atmosphere
- What's happening today

Climate

The long term pattern of weather



Climate is what you expect, weather is what you get.



Climate Basics

Climate variation = distinct ecosystems

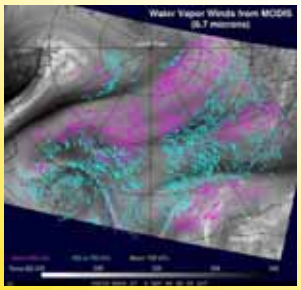
Ecosystem

- A self-regulating association of living organisms & their non-living environment

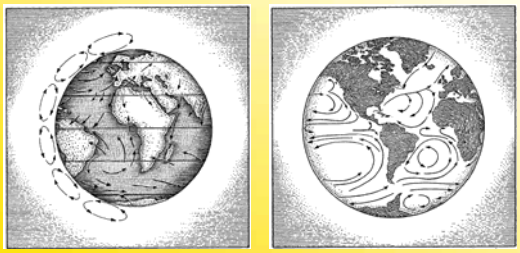
Weather Basics

H_2O + solar radiation

- Solar energy heats water, evaporation
- Causes vapor to rise, cool, sink



Winds & Ocean Currents



Atmospheric Stability

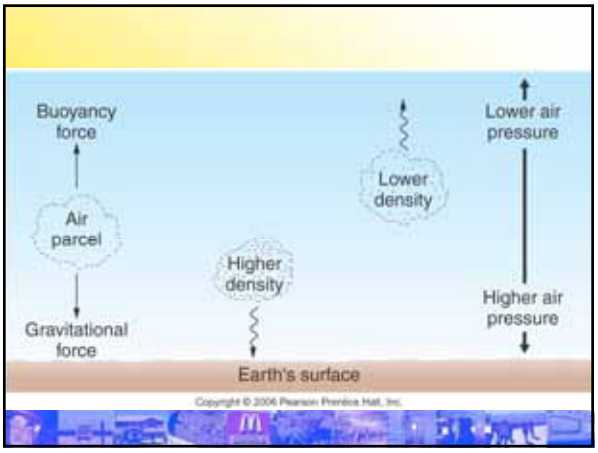
"Parcel" of air

- Term used to describe a body of air with specific temperature & humidity characteristics

Atmospheric Stability

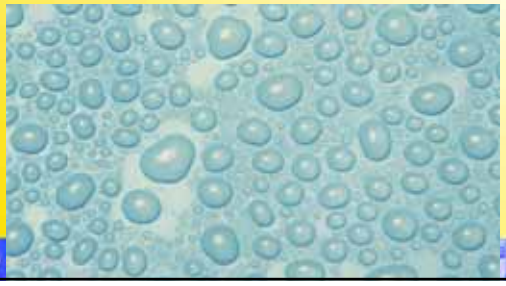
Stability

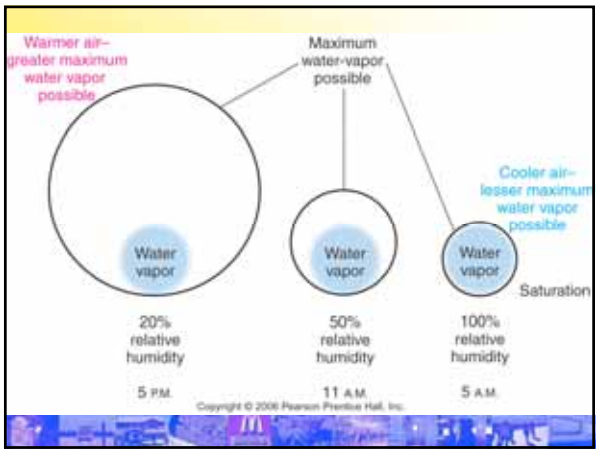
- The air is stable if a parcel ***does not move vertically***
- **Unstable** air causes changes in weather



Relative Humidity

A ratio of the amount of water vapor actually in the air compared to the max. water vapor possible





Relative Humidity

Saturation

- The air is saturated at 100% relative humidity

Relative Humidity

Dew point

- The temperature at which a given mass of air becomes saturated & net condensation begins to form water droplets

Forecasting

Clouds and Fog

Formation Processes

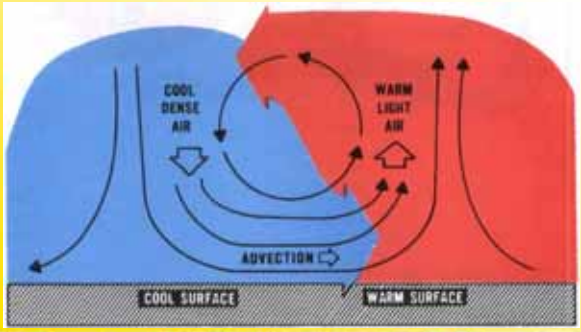
Air parcel Rises, may cool to the dew-point temperature

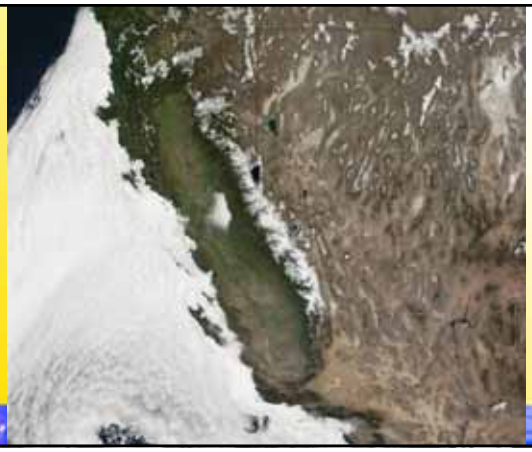
- Water vapor condenses into water

Advection Fog

When air migrates to another place where conditions are right for saturation

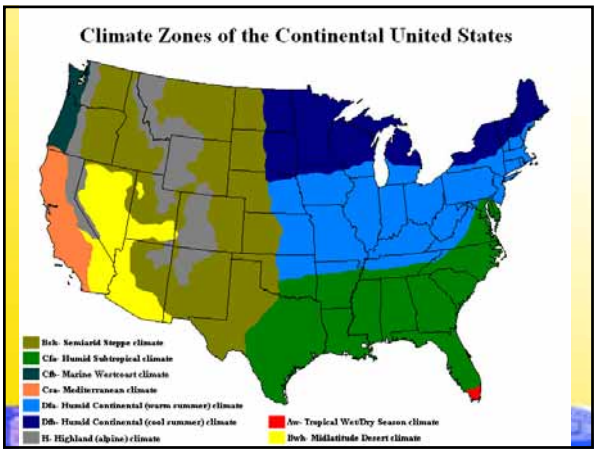
- *Warm moist air overlays cooler bodies of water*



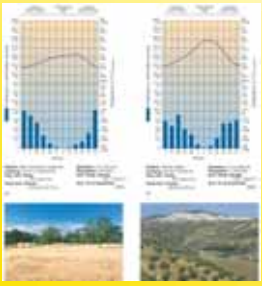


Radiation Fog

- When a surface cools and chills the above air layer to the dew point
- *Tule fog*

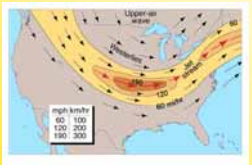


Mediterranean Climates

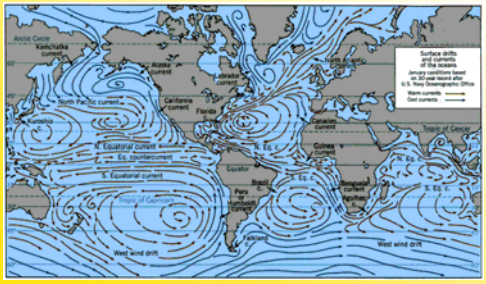


Result of cold Cal. current

- Shifting of high pressure cells interacting with polar storms



Ocean Currents

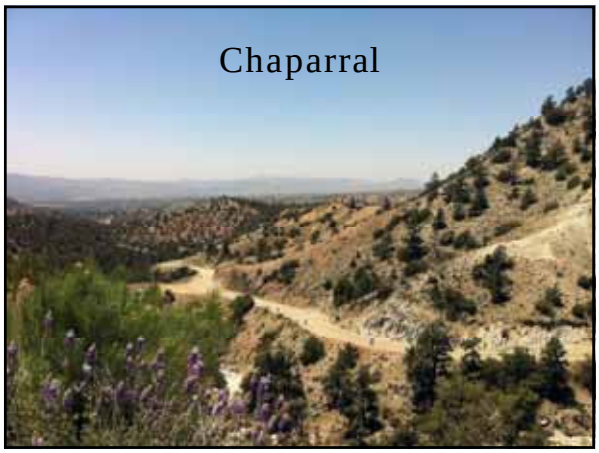


Mediterranean Shrubland

High-pressure cells

- Cuts off moisture in the summer

Plants must adapt



Mediterranean Shrubland

Sclerophyllous plants

- Drought resistant plants
- Leathery leaves, short, well-developed roots
- Varies between woody shrubs & grassy woodlands
- *Manzanita, oak trees, poison oak*

Mediterranean Shrubland

Regions of **high fire danger** in the summer

- Well adapted to fire
  - Quick recovery afterwards

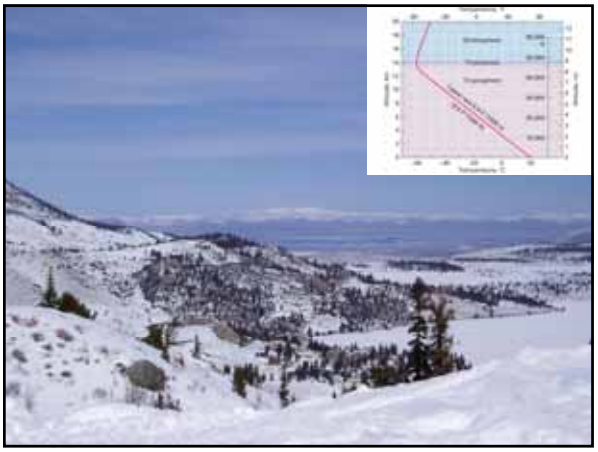
Wildfires

- Recognized as a natural component & not an enemy of nature
  - Seed dispersal
  - Nutrients in ash lead to quick recovery

Wildfires

Native American fire ecology
- Improve seed harvests
- Control vegetation
- Herd game

Highland Climates

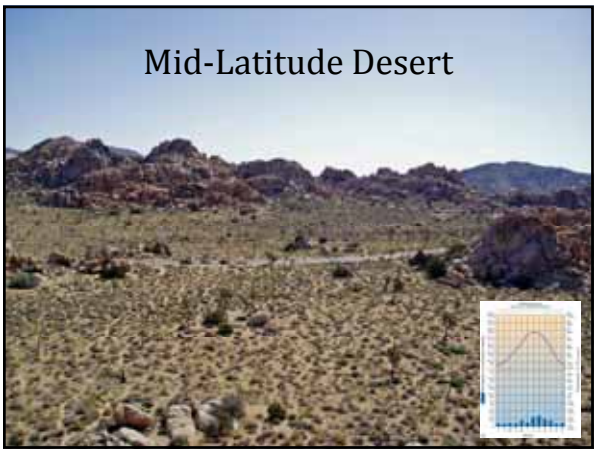


Arid & Semiarid

Permanent moisture deficits

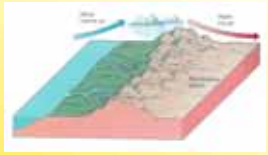
- **Arid desert**
  - A region with precipitation **less** than ½ of the natural moisture demand
- **Semiarid steppe**
  - A region with precipitation **more** than ½ of the natural moisture demand

Mid-Latitude Desert



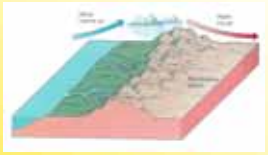
Desert Landscapes

- Found in subtropical high pressure cells



Desert Landscapes

- Or a rain shadow on the leeward side of mountain ranges



Ecosystem Adaptations

Creosote bushes

- Roots spread toxins to limit competition with other plants

El Niño & La Niña

ENSO

- *El Niño Southern Oscillation*
- In Pacific Ocean
- Produces greatest variability of temperature & precipitation on a global scale

- In last 120 years
  - Strongest ENSO years 1997-1998 & 1982-1983

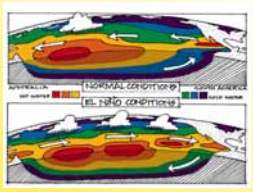
Normal Years

The *Peru Current* moves north towards the Equator

- Ecuador receives about 36" of rain per year
- Indonesia receives about 100"

El Niño Years

- Warm current moves southward
- Pressure patterns & surface ocean temps shift
  - Ocean temps can raise 14°F above normal

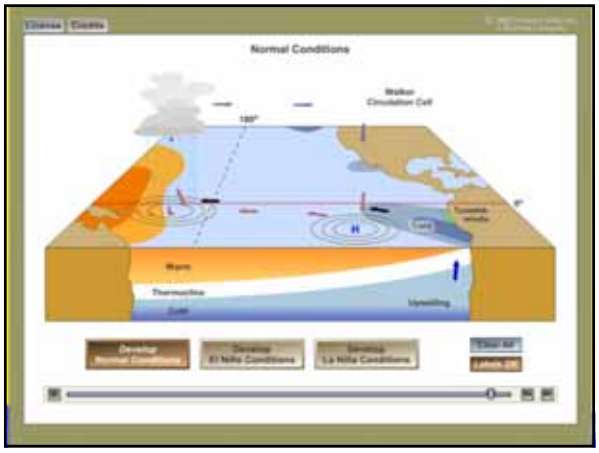


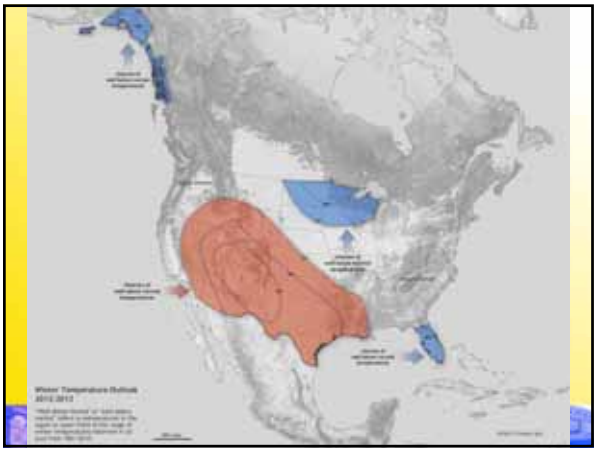
Effects

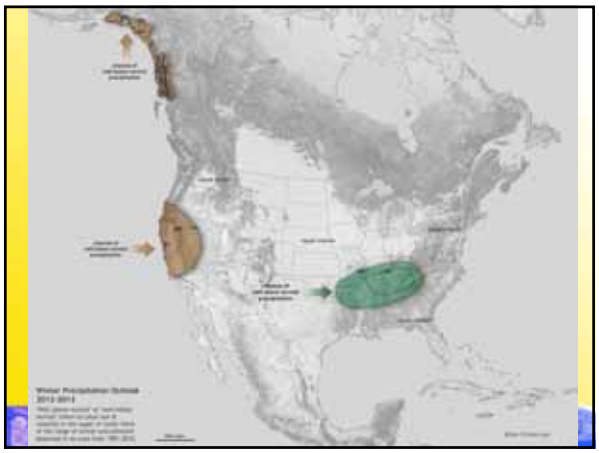
- *Drought in the West Pacific, Southern India, & South Africa*
- *Brush fires in Australia*
- *Strong Pacific & weak Atlantic Hurricanes*
- *Flooding in Southwest US*

La Niña

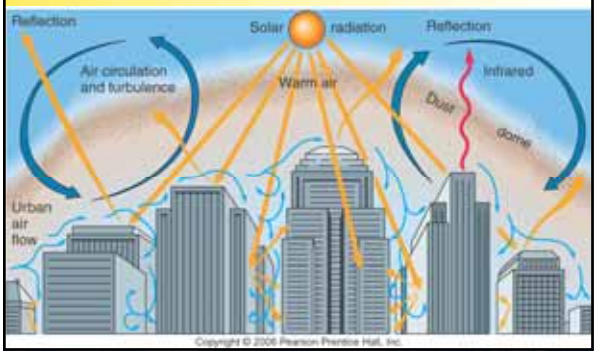
- Surface waters in the Eastern Pacific cool to below normal
- Effects are **reverse** of El Niño
  - Atlantic hurricanes weak in ENSO, strong in La Niña
    - But no real correlation between the strength of the two
      - A strong ENSO can be followed by a weak La Niña

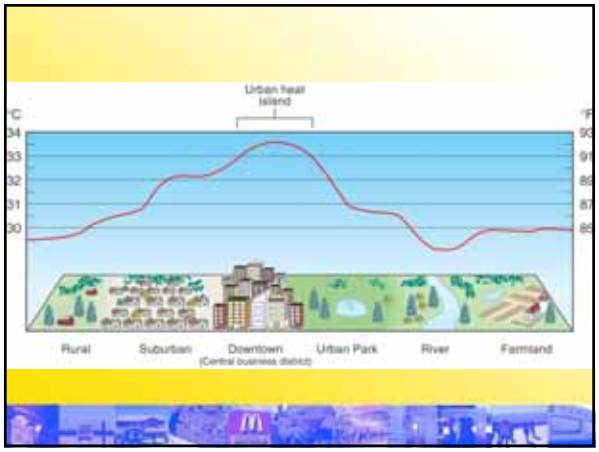






The Urban Environment





Urban Heat Island Pilot Project

Next Time

Midterm I, Huzzah!