Further Reading: Chapter 09 of the text book

Outline

- climate controls

- temperature and precipitation influences

- climate classification methodology
Where are we now?

• **GG101, Part I (L02-L11)**
  – General context/physical geography
  – Global radiation and energy system
  – Temperature regimes and temperature cycles

• **Part II (L12-L23)**
  – Focus on the dynamics/processes associated with weather and general circulation
    • Global pressure and wind patterns, ocean circulation, etc.
    • Clouds, winds, fronts, air masses, etc…

• **Part III (L24-L32)**
  – Global climates and geographic distribution of climates (4 Lectures)
  – Climate Change (5 Lectures)
• **Climate**
  - Long term *average* weather conditions at a given location
    - averages and variations at different time scales

• **Climate Controls**
  - The key variables we usually consider when talking about climate are *temperature* and *precipitation*
  - These are generally controlled by the *amount of radiation* and general *circulation* of the atmosphere and oceans
  - Other controls include
    - Distribution of land, ocean
    - Presence of mountain barriers
    - Altitude

• **Static Controls**: Controls that don’t change with time

• **Varying Controls**: Controls that change with time
As mentioned there are two main variables to consider when defining climate:

- **Temperature**
  - Main control on climate
  - Widely measured

- **Precipitation**
  - Much more complex than temperature
  - Whereas there are three main temperature regimes (based on latitude) there are seven different precipitation regimes:
    - They are mentioned in the book
    - We will cover them as part of the climate regime discussions
  - There are also different ways to “measure” these variables
    - **Annual mean**
    - **Seasonality**
      - Can be uniform
      - Winter peak, summer minimum
      - Winter minimum, summer peak
  - Through the next set of lectures will be referring to **climographs** which depict the seasonal variations in both temperature and precipitation at a given location.
Temperature Influences

- Controlled by **latitude**, **continental location**, and **altitude**
- Mean temperature increases with decreasing latitude, continental locations and lower altitudes
- Seasonality in temperature increases with increasing latitude, continental locations, and high altitudes
Precipitation Influences

- As mentioned, the influences on precipitation are much more complex.
- Must also account for the general circulation of the atmosphere and the influence of air masses.
- For instance, Florida is considered a moist subtropical region because of the influence of maritime air masses (mT).
- However, Arizona is at the same latitude but there we find dry subtropical regions because it is influenced by continental air masses (cT).
Climate Classification Methodology-1

- Define regions with similar temperature and precipitation characteristics (both mean and seasonal variability)
- We will use one involving 3 latitude groups and 13 classes total
Climate Classification Methodology-2

- A traditional one discussed in the book is the Koppen system of classification based purely on temperature/precipitation records.

- The book uses a modification of this in order to highlight regions that have similar characteristics for similar reasons.

- Hence, we will be focusing on the processes that control climate in various regions.

- Overall this will entail looking at three latitude groups which are then subdivided into a total of 13 different climate regimes.