

Physical Geography Exam 2 study guide

Chapter 4 – starting on pg 118 Atmospheric Patterns of motion

Chapter 5

Chapter 7

Notes

- understand the three cell circulation model
 - tropics
 - understand the Hadley cell in terms of the ITCZ and SHPB with respect to convergence and divergence at the surface and aloft, turbulence, and precipitation levels
 - know the general windbelt direction in the tropics
 - understand how the Hadley cell migrates with seasons
 - midlatitudes
 - understand how the SHPB flows into the midlatitudes and how this affects direction of weather and winds
 - polar region
 - understand general direction of flow and strength
- understand how the winds influence oceanic currents
- know what a gyre is and the circular direction of flow in northern and southern hemispheres
- which coasts that water piles up and spreads heat north and south and how much heat
- be familiar with the gulf stream
- understand how water exists in 3 different states and what happens to energy in the atmosphere when water changes states
- understand how the molecules of water are arranged in each state what role temperature plays
- understand the processes of phase change that are associated with cooling and heating of the atmosphere
- understand in particular the latent heat of vaporization and latent heat of condensation plays in heating and cooling of the atmosphere
 - how does this relate to weather
 - how does this play a role in transferring heat from low to higher latitudes
- understand what relative humidity, absolute humidity and capacity are and how to calculate these
- understand how capacity is a function of temperature and how this also relates to dewpoint
 - how this relates to condensation and weather
- understand how vertical motion of air can cause condensation and precipitation
- understand the different mechanism of lifting for vertical motion of air (unstable air)
- be able to calculate temperatures of air parcels with the adiabatic rates given whether it's raining or not
- know the difference between the environmental lapse rate (surrounding ambient air) and the adiabatic rates (air parcels)
- know the difference between stable and unstable air and how this relates to weather
 - be able to understand how you could analyze the ELR, DAR, and MAR to tell whether air is stable or unstable
- know how clouds are formed, the different types and weather conditions associated with each, as well as what type of frontal boundary each is associated with
- know the different types of air masses, each ones locations, and impact on weather and climate
- understand the difference between the different kinds of fronts and which air mass each is associated with
- know what happens when a warm front or cold front moves through and understand the reason for the different conditions associated with each
- understand how to read a weather station model and isobar map

- symbols for fronts, cloud cover, wind direction and speed
- how to read pressure on model
- understand the stages of a mid-latitude cyclone in the northern hemisphere
- understand the different types of storms
 - thunderstorms
 - frequency, energy exchange, classification, uplift mechanisms
 - squall lines
 - hazards
 - tornado formation
 - tornado alley
 - tropical storms
 - where do they form and why and in which general direction do they travel in the trades
 - how do they intensify
 - how do they die
 - size of storm
 - structure>>where is the most intense storms? where is it calm and why?
 - classification
 - storm surges>>what 2 things play a role in causing surge? Where is the strongest surge in relation to the eye
 - generally are fatalities increasing or decreasing and why?
 - where location(s) are experiencing the highest costs of tropical storm damage in N. America
 - 4 factors of hurricane forecasting in the Atlantic
- understand how the various climate controls affect long-term weather patterns
 - solar energy as a function of latitude
 - intertropical convergence zone and subtropical high pressure
 - land vs. water (continentality vs. marine)
 - topography
- know the koppen climate regions (by name and A,B,C,D,E) and the general locations of these climates
 - two A climates by name and location
 - three C climates by name and location
 - one D climate by name and location
 - one E climate by name and location
- be able to understand how to read and interpret a climograph
- understand el nino
 - what are normal conditions of pressure and trade winds in S. Pacific
 - what causes change
 - what are the impacts of el nino changes
 - what is a thermocline and how does it relate to el nino
 - major costs of el nino
 - how often do they generally occur