

GLY 150 Study Guide Partial Exam #3

This guide contains in an outline/question format the important points that have been covered in the course since the second exam. You will be expected to have an understanding of this material for the exam on **Tuesday Nov. 10, 2009**. The exam will cover all of Chapters 7, 8 and 9 (Ocean Circulation, Waves and Tides). **Please bring a wide (blue) scantron sheet to the exam.**

Chapter 7, Ocean Circulation

What is a sverdrup? How are surface currents measured? How are deep currents measured?

Study Figure 7.5. Be able to identify the location of major surface currents: equatorial currents, western and eastern boundary currents, and subtropical gyres. What is a gyre?

How do ocean surface currents impact coastal climates?

Define Ekman Spiral and Ekman Transport. How are these caused?

How do geostrophic flow/gyres form? How do western and eastern boundary surface currents differ (table 7.2)? Know examples of each. What is westward intensification?

What are some examples of wind-induced vertical circulation? Where is coastal upwelling occurring on the Earth today? What is divergence and convergence in relation to surface water masses?

What is thermohaline circulation? Where do deepwater masses form? Why do they form in these areas? Know the different deepwater masses in the Atlantic (Figures 7.25, 7.26, 7.27).

Why is thermohaline circulation important to ocean life and global climate?

What is Conveyer-Belt Circulation? What could cause a shut down of the Conveyer-Belt Circulation. What could be the potential results of this shut down?

Know that the Gulf Stream is the fastest current in the world (up to 9 km/hr) and the West Wind Drift (Antarctic Circumpolar Current) has the large flow volume. What are warm core and cold core eddies? Where is the Sargasso Sea located?

What is El Niño? On average how long does it usually last? Be able to describe the atmospheric and oceanic conditions in the Pacific associated with El Niño (Table 7.3). What happens to the Peruvian anchovy fisheries during El Niño events?

What is La Niña? Be able to describe the atmospheric and oceanic conditions in the Pacific associated with La Niña (Table 7.3).

What is the Southern Oscillation? What is ENSO?

What are some global effects of El Niño (Fig. 7.23)? Prior to 1997/1998 El Niño when was the last intense El Niño? How does the 1997/1998 El Niño compare?

Chapter 8, Waves and Water Dynamics

What is a disturbing force when discussing waves? What are progressive waves? What are orbital (interface waves)?

Define wave characteristics (crest, trough, height, wavelength, wave steepness, period, frequency, speed, wave base) (Figure 8.3)

What is the difference between deep-water, shallow-water and transitional waves? Know the equation of wave speed of deep-water waves and of shallow-water waves.

What are capillary waves, gravity waves and the "Sea"? What does the Beaufort scale measure?

What are the differences and similarities of sea waves, swell and surf? What are the three main factors affecting wind wave energy? What is wave dispersion? What is a wave train? What is fetch?

What are the differences between constructive, destructive and mixed wave interference? What is a rogue wave?

What happens to wind waves when they approach shore (study fig. 8.15)? What are the different types of breakers? What determines the type of breaker to form along a shoreline?

What are the differences between wave refraction and wave reflection?

What are tsunamis? How do they develop? What are typical wavelengths and velocities of tsunamis? Is a tsunami a deep or shallow water wave?

Why would an earthquake occurring off the coast of Alaska be of concern to the inhabitants of Hawaii? Washington state? How is the speed of a tsunami determined? What instruments typically make up a tsunami warning system?

Chapter 9 Tides

How does the law of gravitation apply to the tides? Why does the moon generate bigger tides than the Sun? How does centripetal force apply to tide generating forces?

What is the difference between equilibrium (ideal) theory of tides and the dynamical (real world) theory of tides?

Are tides shallow water waves or deep water waves? What is the hypothetical wavelength of tides?

What is a spring tide, neap tide and when do they occur? What phase is the moon in when they occur? Be able to identify spring and neap tides on a tidal record.

How does the declination of the Moon affect the location of the tidal bulges?

Define apogee, perigee, perihelion, aphelion.

What is a lunar day? Why is it longer than a solar day?

What is an amphidromic point? Cotidal lines? Corange lines?

Define diurnal, semidiurnal and mixed tides. Be able to distinguish between each given a tidal record.

In general what type of tides occur along the Atlantic Coast of the US? Along the Gulf Coast? Along the Pacific Coast?

Know the typical tidal range of microtidal, mesotidal and macrotidal. What is the typical tidal range of SE North Carolina?

Where does the largest tidal range known in the world occur? How can tides be used as a source of power? Where are tides used as a source of power?