

Review Sheet for GEOL 1305

Review Sheet #1

Lecture 1 – Overview of Hydrological Cycle

Resources: Textbook pgs. 432-436; CEES Lab 1

Terms you need to know:

| | | | |
|----------------------|--------------------|----------------|-------------|
| Atmosphere | Hydrosphere | Discharge | Runoff |
| Hydrology | Reservoirs | Flux | Evaporation |
| Transpiration | Evapotranspiration | Precipitation | Groundwater |
| Atmospheric Moisture | Infiltration | Residence Time | |

Concepts you need to know:

The relative sizes of the different reservoirs

What physical parameter influence evaporation rates?

Why do we combine evaporation and transpiration together?

What happens to the water that precipitates on the land surface in South Texas?

Why are the streams in Laredo dry most of the time?

Lecture 2 and 3 – Rivers and Flooding

Resources: Textbook Chp. 9; CEES Lab 2

Terms you need to know:

| | | | |
|-----------------|----------------|-----------------------|-----------------|
| Source | Mouth | Drainage Basin | Drainage Divide |
| Stage | Hydrograph | Peak Discharge | Lag Time |
| Discharge Meter | Base Flow | Bed Load | Dissolved Load |
| Load | Suspended Load | Reoccurrence Interval | Competence |
| Sediment | Gravel | Sand | Silt |
| Clay Ions | Cation | Anion | Capacity |

Concepts you need to know:

What are the three types of river stage?

What is the precise mathematical definition of discharge? What are the units for discharge?

What happens to flow velocity if the cross-sectional area of the channel is decreased?

How does the size of the drainage basin impact discharge and lag times? What about urbanization? Surface Geology? Presence or absence of vegetation?

Be able to discuss the three approaches that can be used to lessen flooding.

What is the difference between a 2, 10 and 100-year flood?

Lecture 4 –Drought

Resources: CEES Lab 4

Terms you need to know:

| | | |
|------------------------|----------------------|--------------------|
| Meteorological Drought | Agricultural Drought | Hydrologic Drought |
| Monitoring | Preparedness | Adaptation |
| | | Mitigation |

Concepts you need to know:

What is the definition for a dry climate

What is drought? What are the different types of drought and are they short of long-term phenomena

What makes drought unique as a geohazard?

What are some of the direct and indirect impacts of drought?

What are the four public policy options that are available to cope with drought?

What are the five mitigation options available for coping with a drought?

Lecture 5 – Groundwater

Resources: Textbook pgs. 437-448; CEES Lab 3

Terms you need to know:

| | | | |
|---------------------|---------------|----------------------|---------------|
| Infiltration | Sinkhole | Sea Water Intrusion | Karst |
| Porosity | Permeability | Zone of Unsaturation | Water Table |
| Saturated Zone | Aquifer | Aquitard | Artesian Well |
| Perched Water Table | Recharge Zone | Zone of Saturation | Well |
| Sinkhole | Caverns | Gasoline | Solvents |

Concepts you need to know:

Through which material will water travel the fastest? The slowest?

What types of lithologies make good aquifers?

What types of lithologies make good aquitards?

What is the difference between a confined and unconfined aquifer? And a perched water table

What is an artesian well?

What causes surface subsidence? What hazards result from surface subsidence?

What causes sea-water intrusion? What hazards result from sea-water intrusion?

What happens to limestone in contact with rainwater? What are some features formed on a karst landscape?

Describe the difference in how gasoline contaminates an aquifer compared with solvents

Lecture 6 –Water Resources

Resources: CEES Lab 4

Terms you need to know:

| | | | |
|-----------|---------------|--------------------|-------|
| Recharge | Pumpage | Cone of Depression | Dry |
| Renewable | Non-Renewable | Groundwater Mining | Humid |

Concepts you need to know:

What is the difference between a renewable and non-renewable resource?

Why is water a renewable resource and some places and a non-renewable resource in others?

Describe the problems communities downstream of Laredo may experience during a severe drought.

Describe the features, both below and on the surface, associated with a limestone aquifer. What factor accounts for the extremely high hydraulic conductivities associated with these types of aquifers

The Edwards Aquifer around San Antonio needs to be managed carefully, Discuss the conflict between using this aquifer for supplying urban demands versus the broader ecological concerns in the central Texas and gulf regions

Describe the problems associated with the depletion of the Ogallala Aquifer in the Texas Panhandle