

EISI DESCHUTES RIVER MODULE: PRE-TRIP READING QUESTIONS

Reading 1: Excerpts from Ritter et al., 2006 - Introduction to Drainage Basins and Fluvial Hydrology

Read the Ritter et al. introductory chapter on drainage basins. Provide a brief definition for the following key words and concepts (arranged in order of appearance in chapter).

Watershed-

Drainage divide-

List the external variables influencing watershed processes-

Evapotranspiration-

Runoff-

Infiltration-

Interflow-

Return flow-

Hydrograph-

Base flow-

Flood stage-

Unsaturated (vadose) zone / Saturated (phreatic) zone-

Water table-

Aquifer-

Surface water discharge-

Mean annual discharge-

Recurrence interval-

Paleoflood Hydrology

Denudation-

Sediment Yield-

Sediment Budget-

List the range of historic denudation rates determined in U.S. drainage basins (mm/1000 yr).

What about ranges of global denudation rates?

List the factors that influence river morphology and process-response patterns over time.

Reading 2: O'Connor et al., 2003a - Overview of Deschutes Geology, Hydrology, Geomorphology

Read the O'Connor et al. Deschutes overview paper. Answer the following questions (arranged in order of appearance).

1. According to the authors, what are the two remarkable aspects of the Deschutes River?

2. True or False – the Deschutes is impounded.

3. True or False – The Deschutes is in a significant state of ecological degradation.

4. Fill in the Deschutes Fact Table Below:

Drainage area _____ sq. km

Basin length _____ km

No. of Dams _____

Primary Tributaries: _____

General Flow Direction: _____

Western Physiographic Boundary: _____

Eastern Physiographic Boundary: _____

Northern Physiographic Boundary: _____

Oldest Bedrock Underlying Basin: _____

Youngest Bedrock Underlying Basin: _____

Bedrock types in the eastern portion of the Basin: _____

Bedrock types in the western portion of the Basin: _____

Average Annual Runoff for Basin: _____ cu. m _____ m

Average High Flow Months: _____

Average Low Flow Months: _____

5. Would you best characterize the Deschutes River discharge as “seasonally flashy” or “perennially steady”? Explain your answer.

6. What are the primary climatic and geologic factors that control the hydrologic characteristics of your answer in question 5 above?

7. On a geologic time frame (1000's to millions of years), what types of geologic events influence the sediment load and sediment transport capacity of the Deschutes River?

8. How do historic records of sediment transport on the Deschutes compare to the long-term, geologic rates of transport?