

## 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?