

GEOG 3511 HYDROLOGY

Review for First Midterm Exam

General: The midterm exam will consist of 10 - 15 questions, including fill-in-the-blank, short answer, and some that require a 1/2 page to answer. Focus on material covered in lectures-anything presented in lectures from the second day of class to the present is fair game, including points discussed on handouts. The following list reviews important topics covered in class.

Chapt. 1: Introduction

- mostly overview material; don't worry about it.

Chapt. 2: Basic Hydrologic Concepts

- you should be able to write the water balance equation (eq. 2-10) without the aid of notes; you should know which terms are negligible, and be able to apply the equation to estimate terms that are difficult or impossible to measure, e.g. regional evaporation (p. 13).
- don't worry about the remainder of this chapter, pp. 15-35.

Chapt. 3: Global Climate

- review various aspects of the global energy budget; latitudinal distribution of radiation and relation to general circulation and precipitation patterns; how this affects patterns of precipitation and runoff globally, and in North America.
- carefully review lectures covering historical trends in precipitation and streamflow; you should be able to describe 20th century trends throughout the US, and the west in particular; you should be prepared to discuss plant responses to increased CO₂, and potential hydrologic effects; review the Wigley-Jones model of future climate change (p. 78 and Fig. 3-37).
- I will ask you one general question about the paper that we discussed in class (lilacs and honeysuckles), plus our own study of recent trends in snowmelt in streams in the western US; this material can be accessed through the course web site.
- review the section on material transport (dissolved load, susp. load, bed load, pp.64-72);
- don't worry about soils, pp. 84-90.

Chapt. 4: Precipitation

- you should be able to describe the steps involved in forming precipitation (discussed in lecture and in Appendix D); key words = lapse rates.
- know the 3 basic meteorological situations that produce uplift and thus cause precipitation;
- review the problems involved in rain gauge measurements (field trip);
- carefully review the lectures covering frequency analysis; you should be able to explain the rationale behind this approach; describe and/or apply the techniques covered in lecture; and complete several steps in the analysis (e.g. knowing the mean and std. deviation, plot the theoretical precipitation-frequency curve, or vice versa).
- review the material on extreme rainfall, including relation to storm types, probable maximum precipitation;
- don't worry about the many methods for estimating areal precipitation (pp. 119-130).
- don't worry about precipitation quality (p. 162-164)

Lab Exercises:

- I will not ask you to carry out lengthy computations; however, I may ask you to do some simple calculations. I suggest you review the lab assignments to refresh your memory on different types of variables, rules for significant figures, unit conversions, etc.