

**GS407 / 507 River Environments – Summer 2003**  
**Review of Day 1 Concepts / Preview of Day 2 Concepts**

1. Using your class notes, write and explain the following equations that pertain to fluvial dynamics (show all of your unit algebra in metric units (kg-m-sec)).
  - A. Force (according to Newton's 2<sup>nd</sup> law)
  - B. Work (force as applied to a mass)
  - C. Weight (according to newton's 2<sup>nd</sup> law)
  - D. Density
  - E. Potential Energy
  - F. Kinetic Energy
  
2. Using your class notes, write and explain the following equations that pertain to river hydrology (show your unit algebra in metric units)
  - A. Flow Velocity
  - B. Discharge (according to continuity equation)
  - C. Wetted Perimeter
  - D. Manning's Equation
  - E. Stream Power
  - F. Roughness (manning's n)

### 3. Review Questions from Day 1

- A. List and briefly define the 5 agents of transport at the Earth's surface (agents of sediment transport)
  - B. What are the 4 criteria necessary to systematically analyze the geomorphic character of the landscape (forms basis of surficial mapping criteria)
  - C. What are the two primary controlling factors that allow rivers to perform geomorphic work? Briefly explain.
  - D. Define the following terms as related to surficial materials
    - i. Regolith
    - ii. Bedrock
    - iii. Alluvium
    - iv. Colluvium
    - v. Till
    - vi. Diamicton
    - vii. Cross-stratification
    - viii. Clast Imbrication
3. Find a boulder in the vicinity of the campground. Assuming an average rock density of  $3 \text{ gm/cm}^3$ , calculate the volume and weight of the boulder using Newton's second law (assume that  $g = 9.8 \text{ m/sec}^2$ ). Calculate the weight in newtons (N). Show all of your unit algebra.
- A. Based on readings in your field guide, what types of processes are used by the river to transport large boulders?
  - B. What is the density of pure water in  $\text{kg / cubic meters}$ ? Will the boulder float? Why or why not?
  - C. What would be necessary, given the density of the boulder, to cause it to float? What types of fluvial processes or conditions may result in flotation of the boulder?