

# Earth Systems I - Unit 2 Study Guide

es1u2sg (Freshwater Biome)

## Study Objectives

1. Know the dominant characteristics of a watershed and how looking at a problem from the watershed level is important (Watersheds and Rivers Handout)
2. List and describe the abiotic factors critical to life in a stream (Indian River Project/Field Study)
3. Know the common benthic macro invertebrates of aquatic ecosystems and why these critters are such good indicators of stream health (Indian River Project/Field Study)
4. Demonstrate understanding of how energy flows into and through the aquatic system (Indian River Project)
5. Evaluate stream health of the Midway and St. Louis rivers (Field Study)
6. Analyze the impact on major human systems if various parts of the Antarctic ice sheet melted causing a significant rise in sea level (Water World GIS activity)

## Generalized Unit Flow

- Day 1: K - What do you already know about water? Create class concept map with student knowledge using Cmap; W - generate a list of what we might want to know about a water ecosystem; "All the Water in the World" demonstration
- Day 2: L - Overview of Freshwater Biome; "Watersheds and Rivers" handout
- Day 3: Walk to the River
- Day 4: L - "Indian River Project" (computer lab)
- Day 5: L - "Indian River Project" (computer lab)
- Day 6: Case Study - "Plumbing the Colorado River"
- Day 7: Aquatic Investigation Tools and Skills
- Day 8: Field Work (half day field trip collecting data at both Midway and St. Louis rivers)
- Day 9: Making sense of our data
- Day 10: Introduce the power of GIS
- Day 11: Water World (computer lab)
- Day 12: Water World (computer lab)
- Day 13: Student Wrap-up Day
- Day 14: Crossword Vocabulary Quiz
- Day 15: Learning Demonstrations Due (with self-assessment and peer review)

## New Skills

- ✓ GIS Mapping using ArcGIS Desktop

## Vocabulary

benthic macro invertebrate biochemical oxygen demand(BOD) dissolved oxygen(DO) run pool riffle stream order stream flow reach phosphate riparian zone riprap substrate turbidity watershed pH nitrate cfs allochthonous input DOM CPOM FPOM biofilm hyporheic zone littoral zone benthic zone limnetic zone profundal zone oligotrophic eutrophic hydrologic cycle

## Assignments

- Text Resource: Environment - the science behind the stories, Chapter 15, pages 432-439
- Science Notebook: **10pts (Evidence)**
  - [Handout: "Watersheds and Rivers"](#)
  - Class/Discussion/Reading Notes
  - Concept Map <http://www.mreclassroom.com/conceptmapping.pdf>
  - [Indian River Project](#)
  - [Midway and St. Louis river data sheets](#)
  - Case Study: "Plumbing the Colorado River"
- Stream Side Field Work **10pts (Professionalism)**
- Crossword Vocabulary Quiz **10pts (Language of Science)**
- [Water World](#) - a GIS activity (computer lab)
- Demonstration of Learning **10pts (Understandings)**
  - Podcast <http://www.mreclassroom.com/podcasts/>
  - Interactive Concept Map
  - Web Page

## Web Resources:

Stream Ecology Tutorial: [http://www.biology-online.org/6/1\\_producers\\_consumers.htm](http://www.biology-online.org/6/1_producers_consumers.htm)

Indian River Project: <http://www.nps.gov/archive/sitk/Natural%20Resources/Stream%20Ecology/Index.htm>