

# Earth Systems I – Unit 2 Study Guide

## es1u2sg (Stream Studies and the Freshwater Biome)

### Study Objectives (things to learn):

1. Know the dominant characteristics of a watershed and how looking at a problem from the watershed level is important (Watershed Dynamics Chapter 1)
  - Describe how water is dynamic.
  - List the characteristics of a watershed.
  - Diagram the “Water Cycle” and make a table showing distribution of all the water on earth.
  - Why is water so important? List many reasons.
  - Describe how water has **competing** demands.
2. Describe the biological communities in streams. (Watershed Dynamics Chapter 3)
  - Compare and contrast food chains and food webs.
  - Provide an example of how terrestrial organisms interact with aquatic organisms through food chains or webs.
  - Compare and contrast complete and incomplete metamorphosis in insects and provide aquatic examples.
  - Describe how one can use aquatic invertebrates to assess stream quality.
3. List and describe the physical characteristics of a stream. (Watershed Dynamics Chapter 4)
  - Temperature
  - Turbidity
  - Stream Order
  - Rates of Flow and its influences
4. List and describe the chemical characteristics of a stream. Be sure to include what affects them and how they affect living things. (Watershed Dynamics Chapter 5)
  - What does mg/L or ppm actually mean?
  - Dissolved Oxygen and its influences
  - pH and its influences
  - Alkalinity
  - Phosphorous and the phosphorous cycle
  - Nitrogen and the nitrogen cycle
  - Chloride
5. Demonstrate understanding of how energy flows into and through the aquatic system (Wild World Down Under)
6. Evaluate stream health of the Midway and St. Louis rivers using both chemical data and invertebrate data. (assorted resources)

### Terms to be familiar with: (quiz1; quiz2)

run pool riffle stream order stream flow reach substrate turbidity watershed base flow food chains  
food webs producers consumers transpiration hydrographs

pH nitrate nitrogen fixation eutrophic eutrophication phosphate dissolved oxygen(DO) allochthonous input  
DOM CPOM FPOM biofilm hyporheic zone hydrologic cycle benthic macro invertebrate

### Assignments

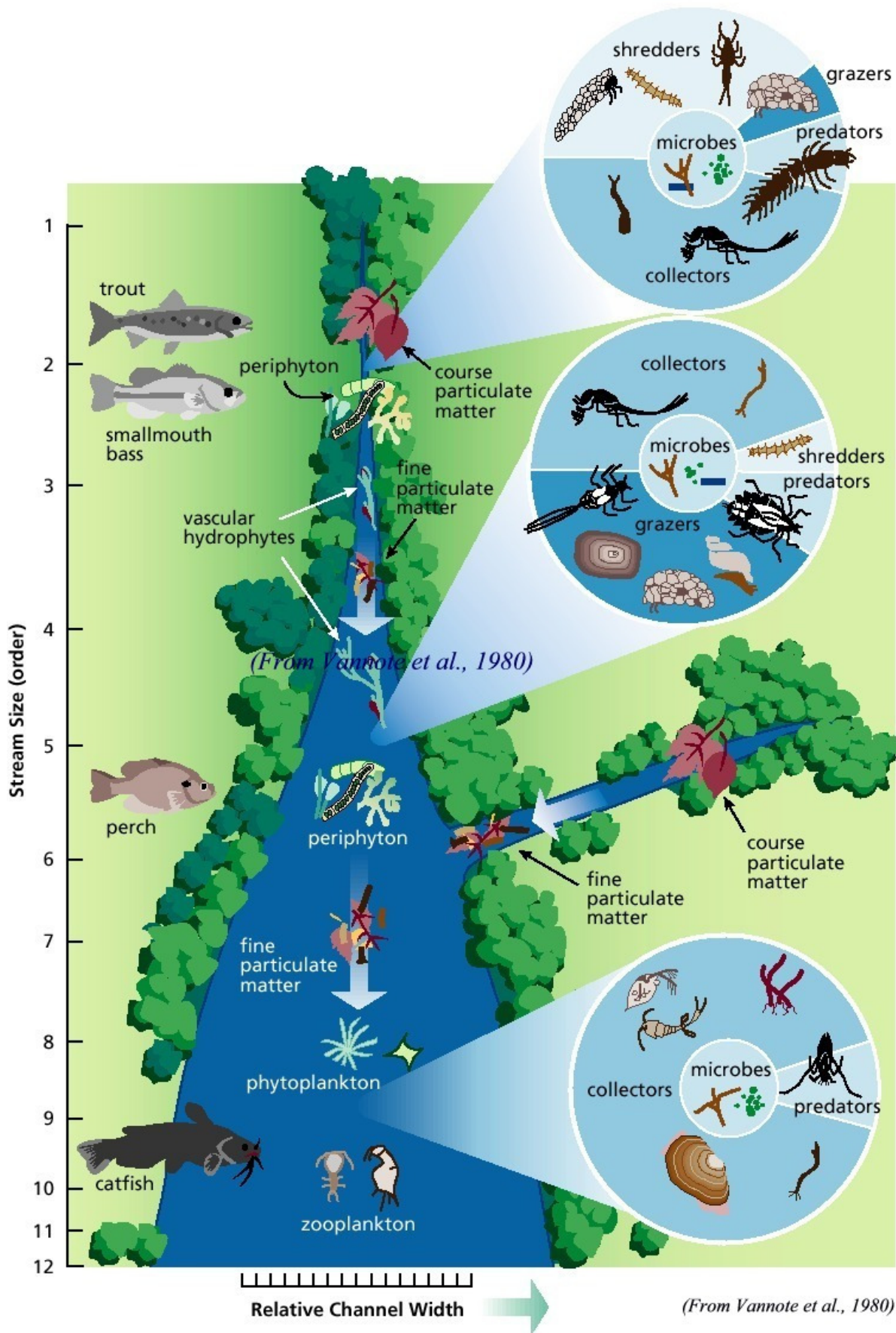
- Primary Resource: **Watershed Dynamics**
- Science Notebook: **10pts**
  - Notes/Reflection/Reaction
  - “Wild World Down Under” – web activity
  - Midway and St. Louis river data sheets
- Stream Side Field Work (or alternative) **10pts** (professionalism/completion of task)
- **Quiz1 10pts** (from SO’s 1-3)
- **Quiz2 10pts** (from SO’s 4 and 5)
- Stream Studies **Exam 20pts**

### 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)

Wild World Down Under: <http://www.nps.gov/sitk/naturescience/stream-ecology-the-wild-world-down-under.htm>

# The River Continuum



(From Vannote et al., 1980)