

THOUGHTS ON ENVIRONMENTAL PHYSIOLOGY and ECOLOGY:

As described on page 1 of your Syllabus, in BIO 3610 we have been studying *physiological mechanisms and adaptations by which plants, animals, and humans regulate life processes in response to light, temperature, moisture, and chemical substances in their environment.*

Our recently completed Personal Inquiry Project (PIP) presentations demonstrated instances wherein plant and animal distribution, survival, and reproduction cannot be fully understood or appreciated without an understanding of the morphological and physiological processes that result from the genetic makeup of these creatures.

Beginning with this Study Guide, we will shift to a greater emphasis on “Ecology” and how it is that historical events and climate as well as present-day climate, soil properties, and topography influence the distribution and abundance of organisms on Earth.

Objectives: The student should be able to...

1. Explain how morphological and physiological adaptations account for the spatial distribution and activity of animal and plant species within the wider context of biotic communities and bioregions (Syllabus, Objective #3).
2. List three or more criteria which are used to divide the Earth into biogeographic regions (or *bioregions*) and explain how the regions are subdivided in a hierarchical manner.
3. Apply Bailey’s (1995) “Ecoregions” concept and accessible information on the internet to gain ecological insights into the “place” you have called “home.”
4. Explain how the Holdridge Life Zone System provides an objective biogeographical context within which ecophysiology of plants and animals can be researched and interpreted.

Assignment:

- A. Textbook, Smith & Smith, Chapter 27; especially, pages 549-552
- B. Internet: Ecoregions: http://www.fs.fed.us/land/ecosysmgmt/ecoreg1_home.html website
Note: The above site, has interactive maps that allow you to find your ecoregion to complete the assigned “Worksheet” noted below. A second website, <http://www.nationalatlas.gov> (and select “Biology” from top menu tabs) is needed to complete the latter part of the worksheet.
- C. Procedure:
 1. To help you accomplish the above objectives, your assignment centers around certain tasks outlined on the attached “Environmental Physiology-Ecology Worksheet.”
 2. Go to the “Worksheet” and follow the instructions to complete this assignment worth up to 20 quiz points if completed and submitted on the assigned date.

Instructions: Utilize your Ecology text (Smith & Smith, Ch. 27) and internet sources to complete this worksheet worth up to 15 quiz points. You may work with a peer if you can agree that the arrangement is to be symbiotic ☺.

1. Environmental Physiology and Ecology – Looking backward as we prepare to go forward: Compose a statement that reflects your understanding of the essential nature of “environmental physiology” in developing an understanding of “ecology.” Select one aspect of our study of environmental physiology so far to specifically support your statement. Compose your statement and then print or handwrite it on the back of this page.

2. Ecoregion Definition: Consult <http://cnx.org/content/m12155/latest/> and write a definition:

3. Ecoregions are classified hierarchically, somewhat analogous to the Linnaean classification system. Complete the following using the PPT Slides “23ecoregion_net” on S:\drive:
 - a. Bailey’s four Ecoregion domains of Earth (found in N. America) are named as follows:

 - b. Each domain is subdivided into fourteen (14) _____, based upon

 - c. Each division is subdivided into “broad vegetation regions” called _____, each having a “uniform regional climate and the same distinct vegetation and _____.

4. Please use the internet sites given earlier and PPT slides to complete the following table applied to the place you call “home” or former home:

Home Town and State →	
# / Name of your Province* :	
No. of provinces in your state:	
Major Native Vegetation*:	
Major Native Animals*:	
Approx. % Cover of your state by Purple Loosestrife (from “nationalatlas.gov”)	%

*Please print and bring Bailey’s description of the Province of your “home”; be prepared to discuss

NOTE: Study the PPT slides which present the Holdridge Life Zones and come prepared to discuss how the various provinces are defined and useful to ecophysiological studies. See Objective #4.