

Chapter 1 : Unit 1 - Interactions and Ecosystems © CW Perry Middle School

Start studying Balance in Ecosystems Module 1 Lesson3. Learn vocabulary, terms, and more with flashcards, games, and other study tools.

I will check that discussion forum often to respond. While you are there, feel free to post your own responses if you, too, are able to help out a classmate. If you have a more specific concern, please send me a message through Inbox in Canvas.

Introduction to Geography You are now in the process of doing something that few other Americans have done: In contrast with other countries such as the United Kingdom, France and India, most American colleges and universities do not even have a geography department. Because of this, you might not be familiar with geography as an advanced discipline of study and professional activity. This module is designed to introduce you to the field of geography as it is practiced at Penn State and beyond. The Penn State Geography Department and many others divides geography into four sub-disciplines: It is offered to students at both the University Park campus and the World Campus. Introductory courses for the other subdisciplines are Geog physical , human , and GISciences. Geog is World Regional Geography, which presents both the human and physical geography of every region of the world. For both University Park and World Campus, Penn State also offers many activities and resources on sustainability through the Center for Sustainability and the Institutes of Energy and the Environment. This broad focus makes geography a challenging and exciting discipline. Geography intersects with many other disciplines across the natural and social sciences, engineering, and the humanities. For example, biogeography intersects with biology; political geography intersects with political science. One hallmark of geography is place-based inquiry. Geographers recognize that natural and social conditions are often unique to a specific region. The place need not be remote or exotic. You can conduct field research simply by observing the place that you live in. Geography today is a vibrant academic and professional discipline. Geographers today work in a wide range of settings, including research, government, technology companies, and non-profits. Please scan this page to get a sense of the breadth of options available to geographers. To learn more about what the Office of the Geographer does, please read the article "MapQuest: Office of the Geographer Makes Information Visual. As you read this, consider the following questions. What does the Office of the Geographer do? What types of geography does it use? What skillsets must its employees have? What international relations issues and incidents has it been involved in? Why is geography important to international relations? Scale One of the central concepts in geography is scale. In rough terms, scale refers to how big or small something is. That "something" could be an event, a process, or some other phenomenon. In geography, we often focus on spatial scale, which is the size or distance of a thing or process. Geographers not only are interested in the patterns of physical or social processes on the Earth at a given level of spatial organization e. Geographers sometimes also discuss temporal scale, which is the duration or time length of a thing or process. Some examples can help us understand scale. This often exists at the scale of a city or metropolitan area. The city will have cars, factories, power plants, and other things that cause air pollution, and the air pollution will affect people who live in the city and breathe the air there. People elsewhere may not be significantly affected. Note that sometimes the wind sends air pollution further away. In contrast, climate change largely exists at the global scale. This is because climate is a process that covers the whole planet. When we change the climate somewhere, we change it everywhere. Scale matters in understanding the interactions between human and their environment. A nice depiction of scale can be found in the following video nine minutes: Click for a transcript of Powers of Ten video. The picnic near the Lakeside in Chicago is the start of a lazy afternoon, early 1 October. We begin with a scene one meter wide, which we view from just one meter away. Now every 10 seconds we will look from 10 times farther away, and our field of view will be 10 times wider. This square is 10 meters wide. And in 10 seconds, the next square will be 10 times as wide. Cars crowd the highway. Powerboats lie at their docks. The colorful bleachers at Soldier Field. This square is a kilometer wide, 1, meters. The distance a racing car can travel in 10 seconds. We see the great city on the lake shore. We see first the rounded end of Lake Michigan, then the whole great lake. Long parades of clouds. Soon the Earth will show as a solid sphere. We are able to see the whole Earth

now, just over a minute along the journey. Earth diminishes into the distance, but those background stars are so much farther away. They do not yet appear to move. A line extends at the true speed of light, in one second it half crosses the tilted orbit of the moon. Now we mark a small part of the path in which the Earth moves about the sun. Now the orbital paths of the neighbor planets, Venus and Mars, then Mercury. Entering our field of view is the glowing center of our solar system, the sun. Followed by the massive outer planets, swinging wide and their big orbits. That odd orbit belongs to Pluto. A fringe of a myriad comets too faint to see completes the solar system. As the solar system shrinks to one bright point in the distance, our sun is plainly now only one among the stars. Looking back from here, we know four Southern constellations still much as they appear from the far side of the Earth. This square is 10 to 16th meters, one light year. Not yet out to the next star. Our last 10 second step took us 10 light years further. The next will be Our perspective changes so much in each step now, that even the background stars will appear to converge. At last we pass the bright star Arcturus, and some stars of the Dipper. Normal but quite unfamiliar stars and clouds of gas surround us as we traverse the Milky Way galaxy. Giant steps carry us into the outskirts of the galaxy. And as we pull away, we begin to see the great flat spiral facing us. That time and path we chose to leave Chicago has brought us out of the galaxy along a course nearly perpendicular to its disk. The two little satellite galaxies of our own are the clouds of Magellan. Groups of galaxies being a new level of structure to the scene. Glowing points are no longer single stars, but whole galaxies of stars seen as one. We passed the big Virgo ago cluster of galaxies among many others, million light years out. As we approach the limit of our vision, we pause to start back home. This lonely scene, the galaxies like dust, is what most of space looks like. This emptiness is normal. The richness of our own neighborhood is the exception. Notice the alternation between great activity and relative inactivity, a rhythm that will continue all the way into our next goal, a proton in the nucleus of a carbon atom beneath the skin on the hand of a sleeping man at the picnic. Seven, six, five, four, three, two, one. We are back at our starting point. We slow up at 1 meter, 10 to the zero power. Each step much smaller than the one before. At 10 to the minus 2, one one-hundredth of a meter, one centimeter, we approach the surface of the hand. Skin layers vanish and turn, an outer layer of cells, felty collagen. The capillary containing red blood cells in a roughly lymphocyte.

Chapter 2 : Module D : Ecology : Chapter Ecosystems and Biomes

Introduction to Climate Change (ICC) module provides students with necessary knowledge, skills and attitudes on a broad range of climate change topics, including causes and impacts of climate change, mitigation and adaptation, application of tools and technologies and effective communications.

Regulation of the earth? The concept of ecosystem services is important for many reasons including: Humans rely on ecosystem services. Ecosystems provide these services when they are working well. Most ecosystem services are greatly undervalued by society because they are considered "free" and inexhaustible, i. This lack of awareness of the value of ecosystems helps drive the conversion of natural ecosystems into other systems that produce marketable goods e. Current trends suggest that we are in the process of dramatically altering our ecosystems and that these changes could have severely detrimental effects on the future provision of ESS and our quality of life. That is, in the process of living, growing and changing, all the different parts that make up ecosystems provide the essential elements needed to support and sustain human life e. For example, soil might be considered to have six categories of ecosystem services. Buffering and moderation of the hydrological i. Ecosystem Services are produced by Transformations of Natural Capital For definitions used in the above diagram, please Click on Figure 1 Definitions Natural capital produces ecological goods and services Natural capital is the stock of all the elements of ecosystems e. The term natural capital is derived from the economics concept that equates the natural capital of ecosystems with the highly valued capital of economic systems. Capital is considered to be a stock of materials or information that exists at a point in time and can be used to generate, by itself, or in conjunction with services from other capital, a flow of services that benefits the well being of humans into the future. Therefore natural capital can be considered as a stock from which ecosystem services flow and the processes of ecosystems are the procedures or methods used to create the flow of services. Refer to Figure 1 for a diagrammatic representation of how the "flow" of ecosystem services are produced. In summary, parts of ecosystems have been defined as "natural capital" so that they can be considered and accounted as valuable capital like other forms of capital such as financial capital or human capital. Return to the list of ecosystem services you produced to answer Q3 in Activity 1. You could use the following table: Ecosystem Service How the service is produced Natural Pest Control Regulation of population size by other organisms i. However, biodiversity is often equated to species diversity i. Biodiversity and Ecosystem Processes A major area of ecological research involving biodiversity conservation is based on looking for possible connections between species diversity and how well ecosystems are able to perform the various ecosystem processes. As we discussed above biodiversity is an important part of natural capital. However, for the production of ecosystem services it is more important that there are enough of the appropriate species to perform different roles in the system for example, enough plants to capture energy and create biomass, enough decomposers to breakdown waste products etc. Therefore in terms of ecosystem services it is more important to conserve species that perform each of the ecosystem processes than it is to conserve any one specific species. For example if we were able to identify the level of biodiversity or specific species required by an ecosystem to function sufficiently to produce the desired ESS we would be able to value and conserve the appropriate level of biodiversity. You may have come across the concept of the functional role of species and functional diversity. This concept is based on the fact that the functional role of species i. To date research in this area has focused on plant communities rather than the full array of biotic organisms. Loss of Biodiversity Due primarily to human interventions, particularly land clearing, habitat alteration and the intentional or accidental introduction of exotic species, large numbers of species have become extinct, approximately 1, in the last or so years Lomborg These numbers are much lower than the estimated numbers thought to have become extinct during the mass extinctions million and 65 million years ago. Half of all marine animals and four legged vertebrates and two thirds of all insects are thought to have been wiped out million years ago. However, the major difference between mass extinctions in the past and current concerns about species loss is the role humans have in the process. This is largely because the same populations of species, geological elements and other components of natural capital are involved in multiple

ecosystem functions and therefore a number of different ESS. Consider the components of this environment and the multiple ways that each provides ecosystem services. For example, the atmosphere forms clouds from the water cycle in the hydrological cycle, and it also acts as a nitrogen sink in the nitrogen cycle, and is involved in climate regulation. Refer also to Fig , , List at least four other ecosystem services provided by the oceans and the vegetation in the figure below. The tutorial in Week 1 will be based on producing diagrams that illustrate how ecosystem services work. For more information refer to the information on tutorials and preparation. A summary of the discussion will be posted on the web site for external students. Valuation of Ecosystem Services Additional Readings ESS valuation has become a central theme in ecosystem services science with increasing efforts to incorporate consideration of maintaining ESS into environmental policy decisions. Why Value Ecosystem Services?

Chapter 3 : Week 8 - Interactions and Ecosystems Unit Test

Ecosystems 1 Learning Objectives Name and describe how the biotic components (living: biological communities) and abiotic components (non-living: climate, soil, atmosphere, and/or water) in an ecosystem interact.

An Overview of the Module Textbook Skimming This module has a few key concepts which should stand out once you have completed all the lessons and activities. You should have learned about how living things interact and interdepend on one another. You will see how changes to the environment can have far reaching effects. As well, we have learned about ways to monitor and manage our global ecosystems so that future generations will be able to sustain an enjoyable way of life for all. Skimming Activity This is an optional activity - complete it only if you feel it will help you in your review. Pull out your textbook and your vocabulary log for this activity. Now that you have a log of all the key terms from the module, I want you to choose 10 of the terms that you are unsure of and use them in a sentence which shows a relationship back to the key concepts for the module listed below: Relationships exist between living things and their environment. The flow of energy and the cycling of matter can be traced and interpreted in the ecosystem. Changes can be observed and monitored in ecosystems. Maintaining sustainable environments requires knowledge, decisions, and actions. There is an ecosystem in my backyard where my dog, Flip, spends hours chasing the birds, lying in the shade, and barking at the neighbours when they play next door. You can use the glossary at the back of the textbook to learn the meaning of the word. However, I do not want you to write the definition down. You must show that you understand the definition by using the word in a sentence of your own words. If you prefer, you could complete this review activity orally with another person. I do not need to see evidence of this work - this is for your study purposes only. Study Guide iiInteractions and Ecosystems - Study Guide Below is a list of the topics covered by the questions that may appear on your exam. The entire exam consists of 50 multiple choice questions. Use the text, your notes, and information from the activities in Lotus Notes to help study for this exam. Topics on the Interactions and Ecosystems Exam: Prepare by studying for the test using your notes, the online course, and or the textbook Get Set: Parents have received an email with the unit test passwords and give to the student when ready to write the test Get a calculator, scrap paper, pencil, eraser Write the test - pace yourself and choose "Finish" at the end to submit your test Go: All tests are to be supervised, completed without the aid of your notes, books, or the help of another person.

Chapter 4 : Module 1: Ecosystem Services concept | ENV Environmental Issues

Course Outline. ECOLOGY AND MANAGEMENT OF GRAZING (An Online Course in Grazing Animal Management) MODULE 1: ECOSYSTEMS AND THE EFFECTS OF GRAZING.

Chapter 5 : Week 8 - Interactions and Ecosystems Unit Test: Review Activity

In this module, we will talk about agonistic and foraging interactions between species (such as predation, herbivory and parasitism) and mutualistic interactions (such as symbiosis, commensalism, endosymbiosis, etc.).

Chapter 6 : Module 1 - Geographic Perspectives

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Chapter 7 : Ecosystems 1 | Biology Biological Principles

such as a) the definition of an ecosystem, b) indirect interactions within ecosystems, c) direct interactions between organisms in ecosystems, d) food chains and food webs, e) energy flows in ecosystems, f) trophic levels and g) biomass

in ecosystems.