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1: Ecosystems The Living World AQA Geography - Full Unit - Internet Geography

Ecosystems (Access to Geography) by Gillett, Meg and a great selection of similar Used, New and Collectible Books available now at www.enganchecubano.com

Download citation The study of ecosystem services involves two broad missions. The first is a biophysical one associated with ecology, hydrology, and the other natural sciences. How can we protectâ€”or, ideally, enhanceâ€”the biophysical goods and services necessary to our wellbeing? If we want clean air and water, healthy and abundant species populations, pollination, irrigation, protection from floods and fires, how can we take action to preserve these things? The second is an economic mission to measure and communicate the value of those goods and services. Quantitative measures help justify interventions to protect natural resources and systems. They also spur government and other decisionmakers to take ecological gains and losses into account. Geography is essential to both missions. In general, markets and business activity do not produce and trade ecosystem goods and services. Besides, nature is inherently complex. How does an action taken in one place affect conditions in another? Seeds and pollen disperse. Not only that, the movement of one thingâ€”say waterâ€”tends to trigger the movement of other things, like birds and fish. With the goal of managing and protecting ecosystem goods and services, we must understand this web of movement. You could say that in nature, nothing stays put. Ecologically, the constant movement and mixing of natural systems is what generates the need for geographic science. Interestingly, you could also say that in nature, everything stays putâ€”an apparent contradiction. A distinctive feature of ecosystem goods and servicesâ€”once producedâ€”is that they are unmovable. Birds will migrate where birds migrate. Beautiful mountain trails and scenery can be found in Colorado. To economists, it is this property of ecosystem goods and services that triggers the need for geography. As any realtor will tell you, three things matter: The same is true for ecosystem goods and services. The Production of Ecosystem Services: Nature in Motion Think about anything in nature you care about. It could be the beauty of a park, a species you fish for or hunt, or the quality of the air you breathe and water you drink. Now ask the following question: Downstream water quality depends on upstream land uses. The health of Gulf of Mexico fisheries, for example, depends on agricultural practices in the upper Midwest. Air quality in the Adirondacks depends on pollution emissions from the Midwest. Coastal cities and towns depend on nearby wetlands to absorb flood pulses. The point is that the ecosystem goods and services we care about often depend on physical conditions at a great distance from the thing we actually care about. Accordingly, the biophysical analysis of ecosystem goods and services must be geographic. Our ecological diseasesâ€”and their curesâ€”are geographic, because ecological systems are geographic. The challenge for ecosystem scientists and managers is to scientifically relate cause and effect when the cause-and-effect relationship is spatial. Broadly, we need spatial production functions that describe the dependence of: The science of these effects is already well underway. For example, we know that stream bank vegetation can improve water quality, help prevent soil erosion, and provide desirable habitat for certain species. But much more remains to be done. We know much less about the exact, empirical relationship between vegetation and water quality. Why is it such a challenge? First, nature is a highly complex and non-uniform system. Complexity means that causal relationships can only be tested using rigorous, data-intensive empirical and scientific methods that are difficult and costly to perform. Second, nonuniformity means that even if you establish a causal relationship in one location, that relationship may not hold in other locations. Third, empirical analysis of causality requires collaboration between different disciplines ecology and hydrology, for example. Crossdisciplinary collaboration in any scientific inquiry is always a practical barrier. Finally, the biophysical scientists have many other things to study and have limited financial support for all they are asked to do. However, deeper understanding of these production functions is necessary if the ecosystem services agenda is to be taken seriously. The good news is that maps and mapping technology are increasingly capable of capturing and manipulating this data. Watersheds can now be categorized on the basis of their adjoining land uses. As ecology becomes ever more sophisticated in its use of spatial science and data the practical ability to measure cause and effect will become more and more possible. The Value of Ecosystem Services:

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Where are the customers? How many competitors are in the vicinity? Do people have easy access from the highway? When economists value ecosystem services, the same kind of things matter. Are there other ways to get the service in that neighborhood? Do we have easy access to the service? This is most obvious when we talk about recreation. Usually, outdoor recreation requires us to travel to a park, stream, or forest. But backyard ecosystem services are the same. Chances are you chose your house based in part on its proximity to large trees, open space, clean air, and the likelihood someone interesting might show up at the birdfeeder. We can make several broad statements about the value of ecosystem goods and services and all of them relate to geography: The scarcer an ecological feature, the greater its value. The scarcer the substitutes for an ecological feature, the greater its value. The more abundant the complements to an ecological feature, the greater its value. The larger the population benefiting from an ecological feature, the greater its value. The larger the economic value protected or enhanced by the feature, the greater its value. It is one of the most valuable sources of ecosystem services in the world. Geography tells us about all of the factors noted above. We can map population densities, measure distances to similar parks, and easily detect the presence of other types of recreational open space and forms of access like roads. The general proposition holds for most kinds of ecosystem services. The value of irrigation and drinking water quality depends on how many people depend on the waterâ€”which is a function of where they are in relation to the water. Flood damage avoidance services are more valuable the larger the value of lives, homes, and businesses protected from flooding. Species important to recreation for anglers, hunters, birders, and the like are more valuable when more people can enjoy them. Placing a value on ecosystem goods and services also requires us to analyze the presence of substitutes for the good. The value of any good or service is higher the scarcer it is. How do you measure the scarcity of an ecosystem good? If recreation is the source of benefits, substitutes depend on travel times. What are walkable substitutes? The value of irrigation water depends on the availability and hence location of alternative water sources. If wetlands are plentiful in an area, then a given wetland may be less valuable as a source of flood pulse attenuation than it might be in a region in which it is the only such resource. In all of these cases, geography is necessary to evaluate the presence of scarcity and substitutes. Finally, many ecosystem goods and services are valuable only if they are bundled with certain manmade assets. Recreational fishing and kayaking require docks or other forms of access. A beautiful vista yields social value when people have access to it. Access may require infrastructureâ€”roads, trails, parks, housing. Note that these complements may themselves not be transportable. There are exceptions, in which geography is less important to valuation. For example, many of us value the existence of species and wild places wherever they are. Another important clarification is that everything in nature is valuable if it contributes to the health of the overall system. Here, though, the value arises from the way nature produces services the realm of the biophysical sciences. When it comes to the consumption of ecosystem goods and services, value tends to be determined by the social neighborhood. Geographic Information as Technological Revolution Geographic science will be challenging for both ecologists and economists of ecosystem services. The good news is that our technologies, data, and culture are becoming rapidly more map-focused. Armchair cartographers can already do amazing things with application platforms such as Google Earth. Government agencies and conservancies are making maps available that allow us to see both natural and social landscapes with remarkable detail. This technological revolution is having a cultural effect: The growing deployment of geographic information systems is not without teething problems, however.

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2: About - Decode System | Mapping the Australian Innovation Ecosystem | Sydney

The "Access to Geography" series has hit the right level and style for A-level students as well as lay readers. It offers a general introduction to key topics, case studies, summaries and exercises, and plentiful subheadings and bullet-points help easy navigation.

Biomes of the world External and internal factors Ecosystems are controlled both by external and internal factors. External factors, also called state factors, control the overall structure of an ecosystem and the way things work within it, but are not themselves influenced by the ecosystem. The most important of these is climate. Rainfall patterns and seasonal temperatures influence photosynthesis and thereby determine the amount of water and energy available to the ecosystem. Topography also controls ecosystem processes by affecting things like microclimate , soil development and the movement of water through a system. For example, ecosystems can be quite different if situated in a small depression on the landscape, versus one present on an adjacent steep hillside. Similarly, the set of organisms that can potentially be present in an area can also significantly affect ecosystems. Ecosystems in similar environments that are located in different parts of the world can end up doing things very differently simply because they have different pools of species present. Unlike external factors, internal factors in ecosystems not only control ecosystem processes but are also controlled by them. Consequently, they are often subject to feedback loops. Primary production Global oceanic and terrestrial phototroph abundance, from September to August As an estimate of autotroph biomass, it is only a rough indicator of primary production potential and not an actual estimate of it. Primary production Primary production is the production of organic matter from inorganic carbon sources. This mainly occurs through photosynthesis. The energy incorporated through this process supports life on earth, while the carbon makes up much of the organic matter in living and dead biomass, soil carbon and fossil fuels. It also drives the carbon cycle , which influences global climate via the greenhouse effect. Through the process of photosynthesis, plants capture energy from light and use it to combine carbon dioxide and water to produce carbohydrates and oxygen. The photosynthesis carried out by all the plants in an ecosystem is called the gross primary production GPP. Food web and Trophic level Energy and carbon enter ecosystems through photosynthesis , are incorporated into living tissue, transferred to other organisms that feed on the living and dead plant matter, and eventually released through respiration. The remainder is either consumed by animals while still alive and enters the plant-based trophic system, or it is consumed after it has died, and enters the detritus-based trophic system. In aquatic systems , the proportion of plant biomass that gets consumed by herbivores is much higher. The organisms that consume their tissues are called primary consumers or secondary producers â€" herbivores. Organisms which feed on microbes bacteria and fungi are termed microbivores. Animals that feed on primary consumersâ€" carnivores â€"are secondary consumers. Each of these constitutes a trophic level. Real systems are much more complex than thisâ€"organisms will generally feed on more than one form of food, and may feed at more than one trophic level. Carnivores may capture some prey which are part of a plant-based trophic system and others that are part of a detritus-based trophic system a bird that feeds both on herbivorous grasshoppers and earthworms, which consume detritus. Real systems, with all these complexities, form food webs rather than food chains. Ecosystem model A hydrothermal vent is an ecosystem on the ocean floor. The scale bar is 1 m. Ecosystem ecology studies "the flow of energy and materials through organisms and the physical environment". It seeks to understand the processes which govern the stocks of material and energy in ecosystems, and the flow of matter and energy through them. The study of ecosystems can cover 10 orders of magnitude , from the surface layers of rocks to the surface of the planet. Decomposition The carbon and nutrients in dead organic matter are broken down by a group of processes known as decomposition. This releases nutrients that can then be re-used for plant and microbial production and returns carbon dioxide to the atmosphere or water where it can be used for photosynthesis. In the absence of decomposition, the dead organic matter would accumulate in an ecosystem, and nutrients and atmospheric carbon dioxide would be depleted. Leaching As water moves through dead organic matter, it dissolves and carries with it the water-soluble components. These are then taken up by

organisms in the soil, react with mineral soil, or are transported beyond the confines of the ecosystem and are considered lost to it. Leaching is more important in wet environments and much less important in dry ones. Freshly shed leaf litter may be inaccessible due to an outer layer of cuticle or bark , and cell contents are protected by a cell wall. Newly dead animals may be covered by an exoskeleton. Fragmentation processes, which break through these protective layers, accelerate the rate of microbial decomposition. Freeze-thaw cycles and cycles of wetting and drying also fragment dead material. Fungal hyphae produce enzymes which can break through the tough outer structures surrounding dead plant material. They also produce enzymes which break down lignin , which allows them access to both cell contents and to the nitrogen in the lignin. Fungi can transfer carbon and nitrogen through their hyphal networks and thus, unlike bacteria, are not dependent solely on locally available resources. The rate of decomposition is governed by three sets of factorsâ€"the physical environment temperature, moisture, and soil properties , the quantity and quality of the dead material available to decomposers, and the nature of the microbial community itself. It also affects soil moisture, which slows microbial growth and reduces leaching. Freeze-thaw cycles also affect decompositionâ€"freezing temperatures kill soil microorganisms, which allows leaching to play a more important role in moving nutrients around. This can be especially important as the soil thaws in the spring, creating a pulse of nutrients which become available. Decomposition rates are highest in wet, moist conditions with adequate levels of oxygen. Wet soils tend to become deficient in oxygen this is especially true in wetlands , which slows microbial growth. In dry soils, decomposition slows as well, but bacteria continue to grow albeit at a slower rate even after soils become too dry to support plant growth. Nutrient cycling See also: Nutrient cycle and Biogeochemical cycle Biological nitrogen cycling Ecosystems continually exchange energy and carbon with the wider environment. Mineral nutrients, on the other hand, are mostly cycled back and forth between plants, animals, microbes and the soil. Most nitrogen enters ecosystems through biological nitrogen fixation , is deposited through precipitation, dust, gases or is applied as fertilizer. Nitrogen cycle Since most terrestrial ecosystems are nitrogen-limited, nitrogen cycling is an important control on ecosystem production. Nitrogen-fixing bacteria either live symbiotically with plants or live freely in the soil. Many members of the legume plant family support nitrogen-fixing symbionts. Some cyanobacteria are also capable of nitrogen fixation. These are phototrophs , which carry out photosynthesis. Like other nitrogen-fixing bacteria, they can either be free-living or have symbiotic relationships with plants. Microbial decomposition releases nitrogen compounds from dead organic matter in the soil, where plants, fungi, and bacteria compete for it. Some soil bacteria use organic nitrogen-containing compounds as a source of carbon, and release ammonium ions into the soil. This process is known as nitrogen mineralization. Others convert ammonium to nitrite and nitrate ions, a process known as nitrification. Nitric oxide and nitrous oxide are also produced during nitrification. As ecosystems age this supply diminishes, making phosphorus-limitation more common in older landscapes especially in the tropics. Although magnesium and manganese are produced by weathering, exchanges between soil organic matter and living cells account for a significant portion of ecosystem fluxes. Potassium is primarily cycled between living cells and soil organic matter. Biodiversity Loch Lomond in Scotland forms a relatively isolated ecosystem. Biodiversity plays an important role in ecosystem functioning. The nature of the organismsâ€"the species, functional groups and trophic levels to which they belongâ€"dictates the sorts of actions these individuals are capable of carrying out and the relative efficiency with which they do so. Ecological theory suggests that in order to coexist, species must have some level of limiting similarity â€"they must be different from one another in some fundamental way, otherwise one species would competitively exclude the other. Ecologically distinct species, on the other hand, have a much larger effect. Similarly, dominant species have a large effect on ecosystem function, while rare species tend to have a small effect. Keystone species tend to have an effect on ecosystem function that is disproportionate to their abundance in an ecosystem. Dynamics Ecosystems are dynamic entities. They are subject to periodic disturbances and are in the process of recovering from some past disturbance. The tendency of an ecosystem to remain close to its equilibrium state, despite that disturbance, is termed its resistance. On the other hand, the speed with which it returns to its initial state after disturbance is called its resilience. A drought, an especially cold winter and a pest outbreak all constitute short-term variability in environmental conditions. Animal populations vary from

year to year, building up during resource-rich periods and crashing as they overshoot their food supply. These changes play out in changes in net primary production decomposition rates, and other ecosystem processes. Stuart Chapin and coauthors define disturbance as "a relatively discrete event in time and space that alters the structure of populations, communities, and ecosystems and causes changes in resources availability or the physical environment". Such disturbances can cause large changes in plant, animal and microbe populations, as well soil organic matter content. A major disturbance like a volcanic eruption or glacial advance and retreat leave behind soils that lack plants, animals or organic matter. Ecosystems that experience such disturbances undergo primary succession. A less severe disturbance like forest fires, hurricanes or cultivation result in secondary succession and a faster recovery. Ecosystem diversity , Ecoregion , Ecological land classification , and Ecotope Classifying ecosystems into ecologically homogeneous units is an important step towards effective ecosystem management. A variety of systems exist, based on vegetation cover, remote sensing, and bioclimatic classification systems. Although humans exist and operate within ecosystems, their cumulative effects are large enough to influence external factors like climate.

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3: Ecosystem - Wikipedia

Written to deliver biogeography for AS and A2 geography students, this work covers: an introduction to a systems approach and ecosystems, biomes and climates, soils, tropical biomes, temperate and.

Cyclists, walkers and horse riders can have a negative impact on the natural environment. Managing Ecosystems Ecosystems often need managing, either to prevent their destruction by invasive species for example or to allow sustainable use of their resources. This GCSE Geography quiz looks at some of the methods of management used, their advantages, their disadvantages and their effect on the environment. Mankind has been managing the ecosystems in Britain ever since the arrival of hunter-gatherers to our shores - not only to prevent their destruction, but also to exploit their resources. Forest clearings were maintained to allow deer to graze in these areas. The deer would shed their antlers yearly and these could be collected and used in mines as shovels and picks. Coppicing is the growth and management of trees to allow specific growth to be cut, for example the thinner branches for willow weaving, or thicker branches for hedging, making longbows and even for fire wood. Ecosystems management looks at managing natural resources by focusing on maintaining ecosystems in a sustainable manner. This will help to meet both ecological and human needs now and in the future. This system of management needs to be adaptive to changing needs and new information. One key technique is to balance the needs of the ecosystems with the realistic facts of the context of the ecosystem and the humans that might use the area. The Yorkshire Dales National Park is a key source of minerals such as building stone. The mining and quarrying is managed so as to limit the damage being done to the ecosystem whilst still allowing this important economic activity. Other management includes removing plants and animal species that are considered invasive, reducing access to areas during sensitive periods such as the bird nesting season , removing or reducing predators, and creating methods by which people can continue to rely on the ecosystem for an income in a sustainable manner. Try this quiz and see how much you have learned about the management methods used to prevent the destruction of ecosystems and to allow us to sustainably use their resources. Click the button to sign up or read more. Sign up here 1. How does this encourage sustainability in the Amazon? People are made aware of the importance of the ecosystem and will be more inclined to protect it The local people protect the forest and the river system in order to protect the fish which provide a worthwhile income The fish would have damaged the natural environment if left in the wild Species kept in captivity can be released back into the wild at a later date Projects which work with local populations to export high-value products which require the natural ecosystem to be maintained, encourage sustainable use of those resources. Fish can command 10 times the price as aquarium pets than they do as a food source 2. Removing trees to plant crops Burning trees to enrich soils Growing trees as a crop Growing trees and crops at the same time Growing crops among the trees allows farmers to use the shelter provided by the tree canopy. The trees reduce the soil erosion and the crops benifit from the nutrients resulting from decaying organic matter 3. Which of the following is not an advantage of ecotourism? The number of tourists can disrupt breeding and nesting Money is put into the economy, providing jobs for the locals Sustainable hunting can give money to regions with no other tourist resources Local infrastructure may be improved to take cars and provide places for the tourists to stay Recently, tourists have gathered to see turtles come ashore in such large numbers that they have physically stopped the turtles finding places to nest. Whilst systems like hunting may seem disagreeable, it can be a better option than some 4. There has been a shift away from clean forests towards leaving wood to rot on the forest floor. What does leaving tree trunks and branches to rot do for the ecosystem? It discourages people from walking through the woodland It draws up toxins from the soil The fallen trees and branches may take root and regrow It encourages wildlife and fungi Many species have evolved to make use of fallen tree trunks and branches. By our removing this part of the ecosystem many species have suffered in the past 5. Which of the following is not a way recreational users of ecosystems such as cyclists, walkers, and horse riders can negatively impact the natural environment? Which of the following is not an example of sustainable logging? Trees are only felled when they reach a particular height. This allows young trees a guaranteed life span and the forest will regain full maturity after around years Trees are removed

individually using traditional methods such as pony logging. These trees are often removed to improve the overall health of the forest Mimicking natural disasters such as forest fires, tornados and land-slides in areas where the ecosystems have adapted to this occurrence Growing monocultures of fast-growing trees that are removed in one single occurrence. Often these faster-growing trees are conifers and similar As well as logging, there are multiple ways that people can generate an income from forests in a sustainable manner. Coppicing, and harvesting of higher priced speciality products, can provide more than cutting down large amounts of trees does 7. In some forests, as trees are chopped down, they are replaced and allowed to grow to a reasonable size before being logged in turn. What is this known as? Afforestation Cycle logging Reserve planting Afforestation can also refer to the planting of trees for later logging or for other purposes, such as habitat renewal or to protect species of economic value 8. Cutting the bark of a tree to allow it to die naturally Digging up the roots of tree stumps to clear the land A traditional method of woodland management involving hard pruning to keep the trees smaller A modern method of growing trees by allowing the roots to grow into specific mediums and water troughs By pollarding, the trees grow numerous small branches. These are cut and used for thatch, canes, fencing, firewood and more 9. Which of the following is not a way that humans manage ecosystems? Urban sprawl Removing bracken from particular areas Building footpaths Much of the ways we interact with the natural environment can be seen as managing, from removing rats and other pests from islands, working to encourage tourism and recreational activities, and even reducing plastic bag use - even though it shows an indirect benefit to the environment How do nature reserves help protect biodiversity? The reserves allow animals and plants to exist and breed in safety The reserves stop entire species being hunted or harvested The reserves allow hunting in that area alone, protecting the rest of the landscape The reserves prevent all access by people to the area Reserves act as reservoirs for the ecosystem. Many marine species often breed in specific locations before moving into the wider ocean. By protecting the reefs, beaches and estuaries where breeding and the juvenile stages occur, the entire species is assisted. Harvesting of the plants and animals can still take place outside the reserve Author: This quiz is for members only, but you can play our Abbreviations and Acronyms quiz to see how our quizzes work.

4: WJEC B and Yr11 Revision - Ace Geography

Geography tells us about all of the factors noted above. We can map population densities, measure distances to similar parks, and easily detect the presence of other types of recreational open space and forms of access like roads.

5: Ecosystems | Revision World

The study of ecosystem services involves two broad missions. The first is a biophysical one associated with ecology, hydrology, and the other natural sciences. How can we protectâ€”or, ideally, en-.

6: KS3, GCSE, and A-Level Geography Resources | AQA, OCR, Edexcel, WJEC, CIE

An ecosystem is a community of living and non-living things that work together and sustain each other in an environment. Organisms and their surroundings support each other and allow life to.

7: GCSE Geography | Managing Ecosystems to Prevent their Destruction

GCSE Geography revision section covering Ecosystems. An ecosystem is a living community of plants and animals within a natural environment. The distribution of ecosystems across the world is dependent on the climate and soil they rely on in order to grow.

8: BBC Bitesize - GCSE Geography

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9: BBC Bitesize - GCSE Geography - Ecosystems - OCR - Revision 1

Ecosystem Geography was written in , at a time when few published materials on ecosystem geography were available, and none had systematically elaborated the principles underlying the mapping of ecosystems in a form accessible to advanced students and practitioners.

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