## Definitions of Ecosystem Services

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| Food           | Crops        | Cultivated plants or agricultural produce harvested by people for human or animal consumption as food | • Grains  
• Vegetables  
• Fruits |
|                | Livestock    | Animals raised for domestic or commercial consumption or use                                  | • Chicken  
• Pigs  
• Cattle |
|                | Capture fisheries | Wild fish captured through trawling and other nonfarming methods                              | • Cod  
• Crabs  
• Tuna |
|                | Aquaculture  | Fish, shellfish, and/or plants that are bred and reared in ponds, enclosures, and other forms of freshwater or saltwater confinement for purposes of harvesting | • Shrimp  
• Oysters  
• Salmon |
|                | Wild foods   | Edible plant and animal species gathered or captured in the wild                              | • Fruits and nuts  
• Fungi  
• Bushmeat |
| Fiber          | Timber and other wood fiber | Products made from trees harvested from natural forest ecosystems, plantations, or nonforested lands | • Industrial roundwood  
• Wood pulp  
• Paper |
|                | Other fibers (e.g., cotton, hemp, silk) | Nonwood and nonfuel fibers extracted from the natural environment for a variety of uses | • Textiles (clothing, linen, accessories)  
• Cordage (twine, rope) |
| Biomass fuel   |             | Biological material derived from living or recently living organisms – both plant and animal – that serves as a source of energy | • Fuelwood and charcoal  
• Grain for ethanol production  
• Dung |
| Freshwater     |             | Inland bodies of water, groundwater, rainwater, and surface waters for household, industrial, and agricultural uses | • Freshwater for drinking, cleaning, cooling, industrial processes, electricity generation, or mode of transportation |
| Genetic resources |             | Genes and genetic information used for animal breeding, plant improvement, and biotechnology | • Genes used to increase crop resistance |
| Biochemicals, natural medicines, and pharmaceuticals |             | Medicines, biocides, food additives, and other biological materials derived from ecosystems for commercial or domestic use | • Echinacea, ginseng, garlic  
• Paclitaxel as basis for cancer drugs  
• Tree extracts used for pest control |
| **Regulating services** |             |                                               |                                                                                               |
| Air quality regulation |             | Influence ecosystems have on air quality by emitting chemicals to the atmosphere (i.e., serving as a “source”) or extracting chemicals from the atmosphere (i.e., serving as a “sink”) | • Lakes serve as a sink for industrial emissions of sulfur compounds  
• Vegetation fires emit particulates, ground-level ozone, and volatile organic compounds |
| Climate regulation | Global       | Influence ecosystems have on global climate by emitting greenhouse gases or aerosols to the atmosphere or by absorbing greenhouse gases or aerosols from the atmosphere | • Forests capture and store carbon dioxide  
• Cattle and rice paddies emit methane |
|                | Regional and local | Influence ecosystems have on local or regional temperature, precipitation, and other climatic factors | • Forests can impact regional rainfall levels |
| Water regulation |             | Influence ecosystems have on the timing and magnitude of water runoff, flooding, and aquifer recharge, particularly in terms of the water storage potential of the ecosystem or landscape | • Permeable soil facilitates aquifer recharge  
• River floodplains and wetlands retain water – which can decrease flooding during runoff peaks – reducing the need for engineered flood control infrastructure |
## Definitions of Ecosystem Services (continued)

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| Erosion regulation          | Role vegetative cover plays in soil retention                             | • Vegetation such as grass and trees prevents soil loss due to wind and rain and prevents siltation of water ways  
                                                                                        • Forests on slopes hold soil in place, thereby preventing landslides                                                                 |
| Water purification          | Role ecosystems play in the filtration and decomposition of organic wastes and pollutants in water; assimilation and detoxification of compounds through soil and subsoil processes | • Wetlands remove harmful pollutants from water by trapping metals and organic materials  
                                                                                        • Soil microbes degrade organic waste, rendering it less harmful                                                                                                                                                                               |
| and waste treatment         |                                                                            |                                                                                            |
| Disease regulation          | Influence that ecosystems have on the incidence and abundance of human pathogens | • Some intact forests reduce the occurrence of standing water – a breeding area for mosquitoes – which can lower the prevalence of malaria |
| Pest regulation             | Influence ecosystems have on the prevalence of crop and livestock pests and diseases | • Predators from nearby forests – such as bats, toads, and snakes – consume crop pests                                                                 |
| Pollination                 | Role ecosystems play in transferring pollen from male to female flower parts | • Bees from nearby forests pollinate crops                                                                                               |
| Natural hazard regulation   | Capacity for ecosystems to reduce the damage caused by natural disasters such as hurricanes and to maintain natural fire frequency and intensity | • Mangrove forests and coral reefs protect coastlines from storm surges  
                                                                                        • Biological decomposition processes reduce potential fuel for wildfires                                                                                                    |
| Cultural services           |                                                                            |                                                                                            |
| Recreation and ecotourism   | Recreational pleasure people derive from natural or cultivated ecosystems   | • Hiking, camping, and bird watching  
                                                                                        • Going on safari                                                                                                                  |
| Ethical values              | Spiritual, religious, aesthetic, intrinsic, “existence,” or other values people attach to ecosystems, landscapes, or species | • Spiritual fulfillment derived from sacred lands and rivers  
                                                                                        • Belief that all species are worth protecting regardless of their utility to people – “biodiversity for biodiversity’s sake” |
| Supporting services         |                                                                            |                                                                                            |
| Nutrient cycling            | Role ecosystems play in the flow and recycling of nutrients (e.g., nitrogen, sulfur, phosphorus, carbon) through processes such as decomposition and/or absorption | • Decomposition of organic matter contributes to soil fertility                                                                 |
| Primary production          | Formation of biological material by plants through photosynthesis and nutrient assimilation | • Algae transform sunlight and nutrients into biomass, thereby forming the base of the food chain in aquatic ecosystems |
| Water cycling               | Flow of water through ecosystems in its solid, liquid, or gaseous forms    | • Transfer of water from soil to plants, plants to air, and air to rain                                                                 |

*Source: Adapted by the World Resources Institute from the reports of the Millennium Ecosystem Assessment, 2005. For more information, see Hanson, C. et. al. 2008. The Corporate Ecosystem Services Review. Washington, DC: World Resources Institute. Available at: www.wri.org/ecosystems/es*