

What are ecosystem services?

A WATERSHED LEARNING NETWORK MODULE

This material was generated as part of a collaboration between members of the Atlanta Watershed Learning Network and students and faculty of a service learning course in urban ecology. The views and opinions expressed in these materials are those of the authors and do not necessarily reflect the official policy or position of the University of Georgia.



In this presentation, you will learn about ecosystem services and disservices. We will focus on services provided by urban watersheds and the disservices urban communities can face when watersheds are poorly managed.

This material was based on a curriculum developed by members of the Atlanta Watershed Learning Network, led by Dr. Yomi Noibi of Eco-Action.

Unless otherwise noted, all of the diagrams and models used in the modules were created by Diane Kelment, the video material was captured and edited in large part by Allison Krausman, and the images used in the modules were taken by the students or instructor of the urban ecology course at UGA in 2018 or the West Atlanta Watershed Alliance.

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Definition of ECOSYSTEM SERVICES

the benefits people derive from ecosystems



The [Millennium Ecosystem Assessment](#) defined Ecosystem Services as “the benefits people derive from ecosystems”.

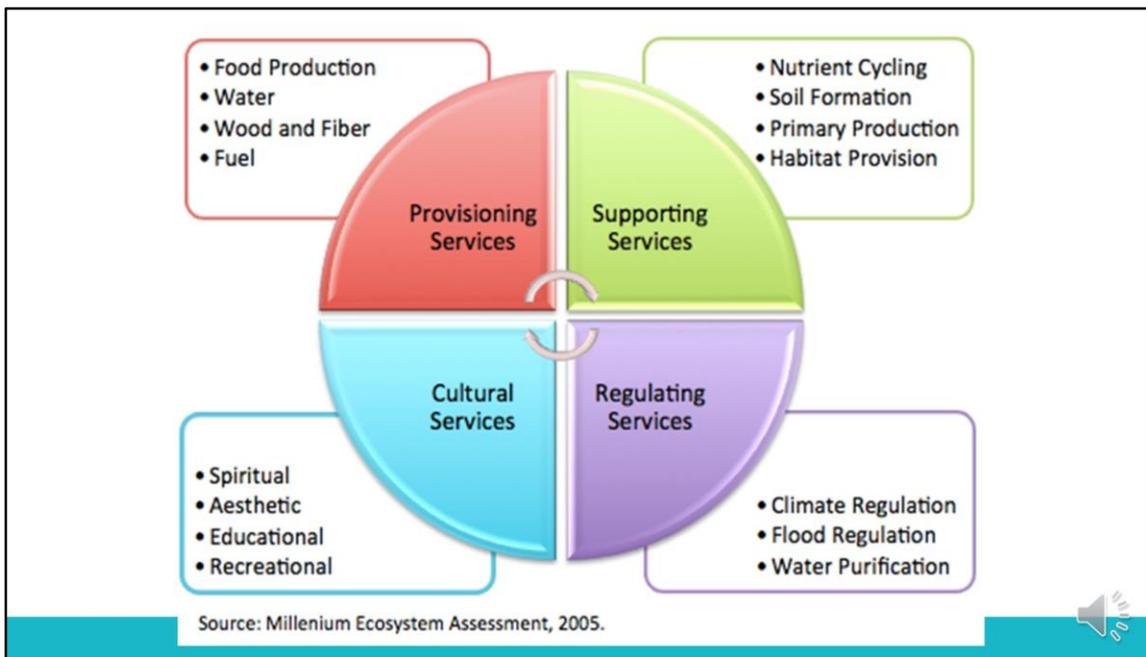
Sources:

<https://www.iucn.org/commissions/commission-ecosystem-management/our-work/cems-thematic-groups/ecosystem-services>

Ecosystem Services



There are four types of ecosystem services:
Supporting services
Regulating services
Provisioning services
Cultural services



Provisioning services are the products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources and medicines.

Regulating services are defined as the benefits obtained from the regulation of ecosystem processes such as climate regulation, natural hazard regulation, water purification and waste management, pollination or pest control.

Supporting services maintain the conditions for life on earth and include things such as soil formation, nutrient cycling, and habitat provisioning

Cultural services include non-material benefits that people obtain from ecosystems such as spiritual enrichment, intellectual development, recreation and aesthetic values.

Source: <https://biodiversity.europa.eu/topics/ecosystem-services>

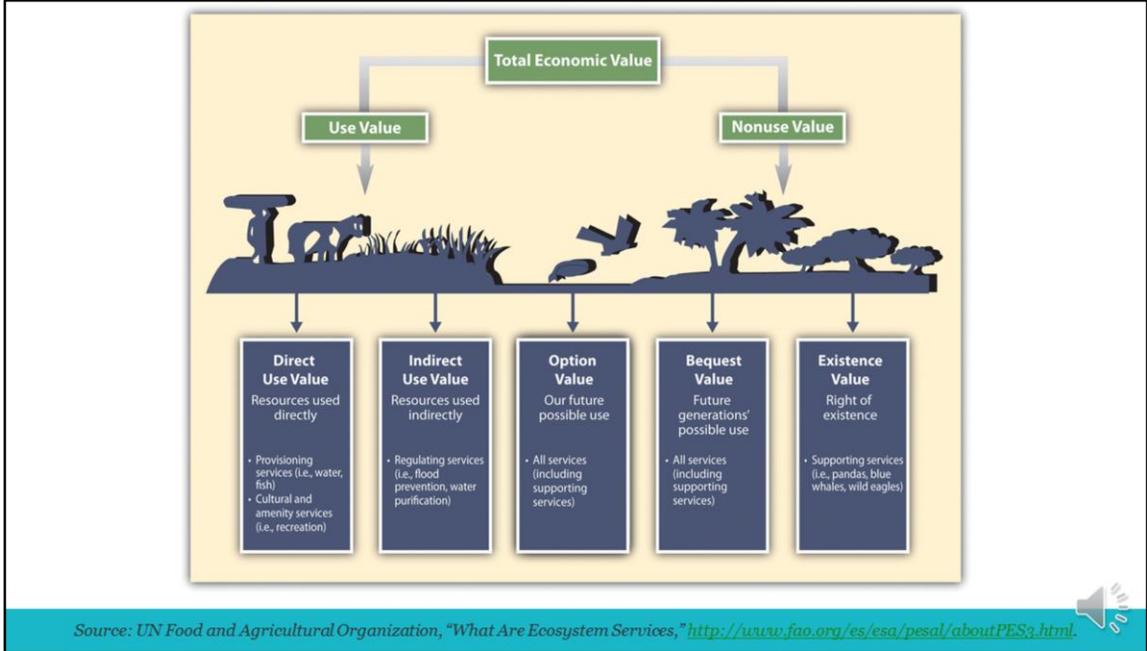


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Intact ecosystems often provide services including, but not limited to, reliable and clean flows of water, productive soil, and relatively predictable weather. People rely on these services to support economic development and their own health and well-being.

Photo: nps.gov



Estimating the value of nature can be challenging, but there are many ways to think about how to value ecosystem services. It is also important to note that history, culture, economic status, religion, etc. can all influence how people perceive value in ecosystems.

Source: UN Food and Agricultural Organization, "What Are Ecosystem Services," <http://www.fao.org/es/esa/pesal/aboutPES3.html>.



Watersheds can provide important ecosystem services, including water purification, flood control, fisheries, recreational opportunities, etc. However, they can also produce ecosystem disservices for humans living within and outside of their boundaries.

Definition of ECOSYSTEM DISSERVICES

outcomes of ecosystem functions that negatively affect human communities



Thinking about ecosystems and the provisioning of services is a two-sided coin. Saunders and Luck (2017) define ecosystem disservices as outcomes of ecosystem functions that negatively affect human communities.

Sources:

<https://onlinelibrary.wiley.com/doi/full/10.1111/cobi.12740>

Limitations of the ecosystem services versus disservices dichotomy

[Manu E. Saunders](#)

[Gary W. Luck](#)

First published: 24 April 2016

<https://doi.org/10.1111/cobi.12740>



Urban communities may be subject to ecosystem disservices associated with water, including but not limited to flooding associated with storm events and sea-level rise and exposure to contaminants and vectors of disease, such as mosquitoes.

[Wikipedia](#) Flooded I-10/I-610/West End Blvd interchange and surrounding area of northwest New Orleans from Hurricane Katrina.

[Marine Forces Reserve](#) Hurricane Sandy devastated much of the northeastern coast when it made landfall Oct. 29.

[Pixnio](#) macro, image, mosquito, insect, aedes japonicus, ochlerotatus japonicus

The image is a screenshot of a CNN news article. At the top, the CNN logo is on the left, and navigation links for 'Health', 'Diet + Fitness', 'Living Well', and 'Parenting + Family' are in the center. On the right, there are links for 'Live TV', 'U.S. Edition', and a search icon. The main headline reads 'Too much water outside, not enough inside for Texas hospitals'. Below the headline, it says 'By Jen Christensen, CNN' and 'Updated 9:42 PM ET, Thu August 31, 2017'. To the right of the byline are social media sharing icons for WhatsApp, Facebook, Twitter, and a red 'More' icon. The main image shows a person in a blue shirt and orange vest inside a vehicle, looking out at a flooded landscape. Overlaid on the image are several text boxes: 'CNN EXCLUSIVE' in red, 'Beaumont, Texas' in white, '11:07 AM CT' in white, 'BREAKING NEWS' in red, and 'LIVE: RESCUE UNDERWAY IN SOUTHEAST TEXAS' in white. The CNN logo is in the bottom right corner of the image. Below the image, it says 'source: CNN'. To the right of the main image is a 'Top stories' section with two items: 'How Houston's layout may have led to flooding' and 'How this toddler overcame his addiction'. At the bottom right of the screenshot is a speaker icon.

At times, water can create dichotomies of ecosystem disservices as was evident in states confronted with simultaneous drinking water shortages and flooding after hurricanes.



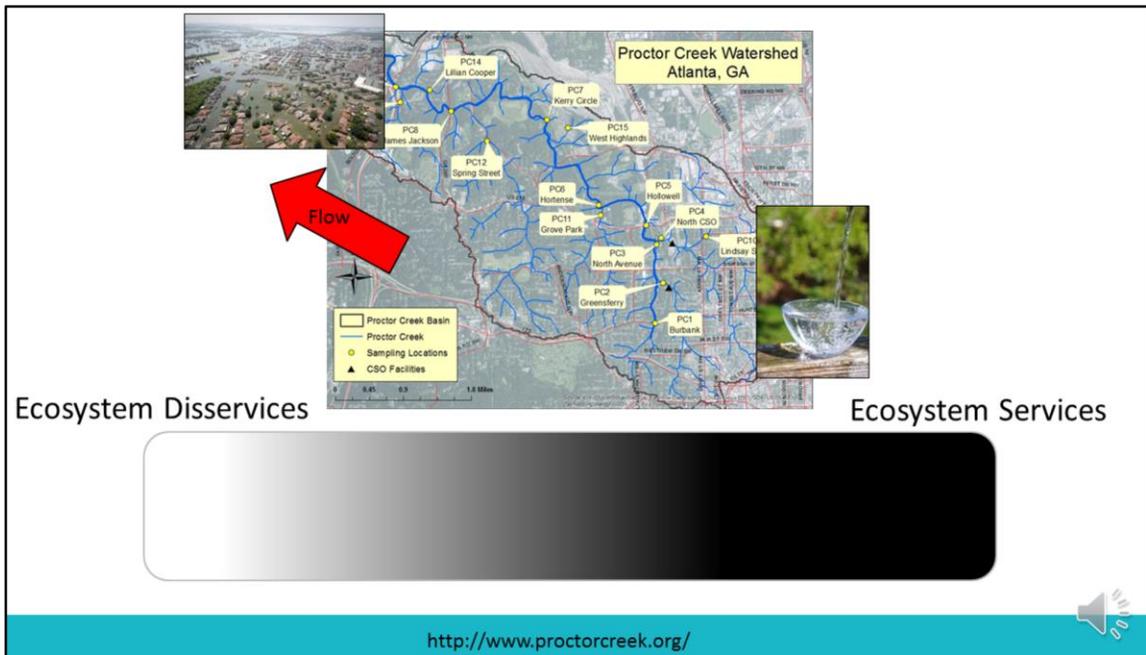
It is important to mention that often times, the ways in which we perceive the line between ecosystem services and disservices is not clear or fixed. Again, culture, religion, history, and many other factors influence our valuation of services. For example, pollination is a vital ecosystem service, but members of the general public may not value that service in the same way as a farmer.

Ecosystem Disservices

Ecosystem Services



It is also important to understand that the same environmental condition, may simultaneously provide an ecosystem service and a disservice. For example, a rain storm, may provide an important ecosystem service by re-charging drinking water supplies, but may also lead to extreme flooding in certain areas. Notably, the same event may produce services for one community while subjecting other groups to negative situations. For instance, the rainstorm mentioned above may just provide services for communities living in higher parts of the watershed, and may provide both services and disservices for people living downstream.



Notably, the same event may produce services for one community while subjecting other groups to negative situations. For instance, the rainstorm mentioned above may just provide services for communities living in higher parts of the watershed, and may provide both services and disservices for people living downstream. This is the case in Proctor Creek in Atlanta.

[EPA](#) On this page: This map outlines the watershed and identifies the sampling locations, CSO facilities and the proctor