Ecosystem Benefits and Risks:
Online Resources to Inform Natural Resource Management

Ecosystem services are the benefits people receive from nature such as clean drinking water and outdoor recreation. These services are vital to society, but are placed at risk by energy development, urbanization, and other processes altering Appalachian landscapes. Research from the Appalachian Landscape Conservation Cooperative (LCC) and the U.S. Forest Service is integrating society's value of ecosystems with future risks, to inform natural resource planning and management across the Appalachians and help decision makers, industry and the public adopt policies that protect and invest in these resources.

Current Benefits and Future Risks

The first phase of the research assembled a wealth of information and provided a synthesis of existing knowledge about Appalachian ecosystem services and future risks. Results are available on the Ecosystem Benefits and Risks site (http://applcc.org/ecosystem-risks-benefits) within the Appalachian LCC web portal, where users can interpret findings from regional assessments as well as access online reports, maps, data and tools. Key themes emerging from this synthesis include:

Nicholas A. Tonelli (2012)

Appalachian Trail thunderstorm

Water and Soils

Benefits – Forested landscapes provide clean drinking water to millions of people within and beyond the region, as well as habitat for freshwater fish and other aquatic life. Productive soils are fundamental to landscapes supporting agriculture, hydrological regulation, clean water, and carbon storage.

Risks – Increases in impervious surfaces and forest loss due to urbanization, energy development, and surface mining can impact surface water quality and availability. Soil loss and compaction is also associated with these processes.

Jason Hollinger (2007)

Flame Chanterelle

Harvested Species

Benefits – Hunting, fishing, and the harvest of non-timber forest products all have high cultural and economic value in the Appalachians, with sustainable wood production being a key economic activity supporting rural livelihoods.

Risks – These resources may be overexploited in areas where harvesting is poorly regulated. Urbanization and surface mining reduce the land area available to support outdoor recreation and working forests, while invasive species, climate change, and wildland fire may impact forest productivity.

Ralph Preston (2010)

Appalachian Landscape

Ken Thomas (2008)

Clingmans Dome

Landscape Values and Outdoor Recreation

Benefits – Appalachian communities often place value on the unique sense of place that comes from living in largely forested areas. The region's many natural areas also make it a prime destination for nature-based recreational activities, with tourism being key to the regional economy.

Risks – Rapid urbanization, energy development, and even climate change can impact the sense of place and quality of life of rural communities. Population growth will also stress the ability of natural areas to accommodate more recreational visitors.

Forest Carbon

Benefits – The storage of carbon in forests is a crucial component of climate change mitigation, a service supplied in abundance by Appalachian forests. Net carbon storage in the region has increased over recent decades as forests have matured and increased in extent.

Risks – Major drivers of forest loss include urbanization and surface mining. Future economic and land use scenarios suggest that losses are likely to begin outstripping recent gains, at which point current carbon sinks could become net carbon sources.

Model for Delivering Ecosystem Services Science

Building upon this first phase, researchers are developing new assessments to better understand how Appalachian ecosystem services have changed – and are likely to change – as a result of urbanization, energy development, and other major drivers of environmental change. New products will provide a toolkit to assist managers and partners in enhancing landscapes and their capacity to provide important natural benefits, while serving as a model for the LCC Network to deliver ecosystem services science more broadly.

For more information visit
http://applcc.org/ecosystem-risks-benefits

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The Appalachian Landscape Conservation Cooperative is a science and management partnership protecting the valued resources and biological diversity of the Appalachian region, sustaining the benefits provided by healthy and resilient ecosystems to human communities, and helping natural systems adapt to large landscape-level stressors and stressors magnified by the changing climate.

The mission of the U.S. Forest Service is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.

LANDSCAPE CONSERVATION COOPERATIVES