

US EPA ARCHIVE DOCUMENT



Western Ecology Division

Carbon Offset Forestry: Forecasting Ecosystem Effects

Amid rising concern about increasing levels of carbon dioxide (CO₂) and other greenhouse gases (GHGs), the United States may be able to limit the buildup of these gases using Carbon Offset Forestry (COF) practices to sequester some of the CO₂.

The potential for CO₂ and other atmospheric greenhouse gases (GHGs) to accelerate global climate change and have other widespread impacts has prompted consideration of cap and trade programs for emitters of CO₂. Such programs may allow a portion of the CO₂ emissions cap to be offset by CO₂ sequestration achieved elsewhere by someone other than the emitters.

The United States does not have a mandatory cap and trade program, but should one arise, assessing the environmental benefits and consequences of COF practices will be vital.

right: Oregon's Willamette Valley, with its forest resources, major river, agriculture, and dense human population, provides an ideal location for COFFEE



Why Sequester Carbon?

Removing atmospheric CO₂ and sequestering it as carbon in plants and soils reduces the amount of one of the GHGs known to contribute to climate change. CO₂ is absorbed by plants and sequestered in leaves, stems, branches, roots and soils. Forest and agricultural lands currently store large amounts of carbon and may have the potential to store even more. Among terrestrial ecosystems, there may be great potential to sequester additional carbon in forests by using COF practices.

How Do Carbon Offsets Work?

Cap and trade laws specifying COF practices would rely on a registry where CO₂ emitters (such as factories) are allowed a cap in the amount of CO₂ they could release. Emitters would pay (or trade with) with other entities, such as forest owners) to sequester carbon. Credit for reducing CO₂ in the atmosphere would go into the account of the emitter, and the landowner is compensated for sequestering the CO₂. Thus, atmospheric CO₂ levels are reduced, and the emitters meet their assigned cap targets.

What Are the Possible Effects?

The focus of the COFFEE project is to assess potential environmental effects of COF practices at a scale that is large enough to encompass interactions among public policy, economic drivers and environmental issues. COF practices that may be used likely will affect all ecological processes, thereby altering the delivery of many ecosystem services (ESs), which are the resources and processes supplied by ecosystems that benefit humans. EPA will evaluate effects of COF practices and climate change on ESs.

COFFEE: Better Decisionmaking

COFFEE will account for where and how carbon is sequestered in forest ecosystems because of the implementation of COF practices, and also will develop ways to determine quantified trade-offs among changes in the production of several ESs. How future climate conditions may interact with effects of COF also will be studied. COFFEE will collaborate with another Western Ecology Division project, the Willamette Ecosystem Services Project (WESP), to test a new decision tool for policymakers that takes into account simultaneous effects of multiple environmental and policy factors on ESs. The decision tool will be capable of providing outcomes for suites of alternative COF practices and future climate scenarios. Having such a tool is crucial to the future interests of EPA national programs and regional offices, and external stakeholders.

Project Lead: Dr. Paul Rygiewicz (541) 754-4702
Western Ecology Division, NHEERL / USEPA
200 SW 35th Street - Corvallis - OR 97333
<http://www.epa.gov/wed>