

FACT SHEET

Office of Sustainability and Climate Change

FOREST CARBON

What is the importance of forest carbon?

Carbon sinks and sequestration. Forests and other ecosystems act as carbon sinks, and they sequester carbon dioxide through plant growth, removing it from the atmosphere. Carbon dioxide uptake by forests in the coterminous United States offsets approximately 16 percent of our national total carbon dioxide emissions in 2011 (US EPA 2013).

The Forest Service is a leader in developing tools for carbon assessment, management, and forest carbon cycle science. We are the official reporter nationally and internationally on the status of the forest carbon resource through the annual EPA Greenhouse Gas Inventory and the United Nations Framework Convention on Climate Change. The Forest Service champions the principles of considering carbon and other benefits together, integrating climate adaptation and mitigation, and balancing carbon uptake and storage in a wide range of ecosystem services, some of which have tradeoffs.



FOREST CARBON Glossary:

- Carbon Density:** an estimate of forest carbon stocks per unit area (e.g., tonnes per acre of carbon in standing live trees).
- Carbon sink:** a natural or man-made system that absorbs more carbon than it releases.
- Carbon stock change:** The change in carbon stocks over time, calculated by taking the difference between successive inventories and dividing by the number of years between these inventories for each national forest. A positive change means carbon is being removed from the atmosphere and sequestered by the forests (i.e., carbon sink) while a negative change means carbon is added to the atmosphere by forest-related emissions (i.e., carbon source).
- Sequestration:** The direct removal of CO₂ through biologic processes such as forest growth.

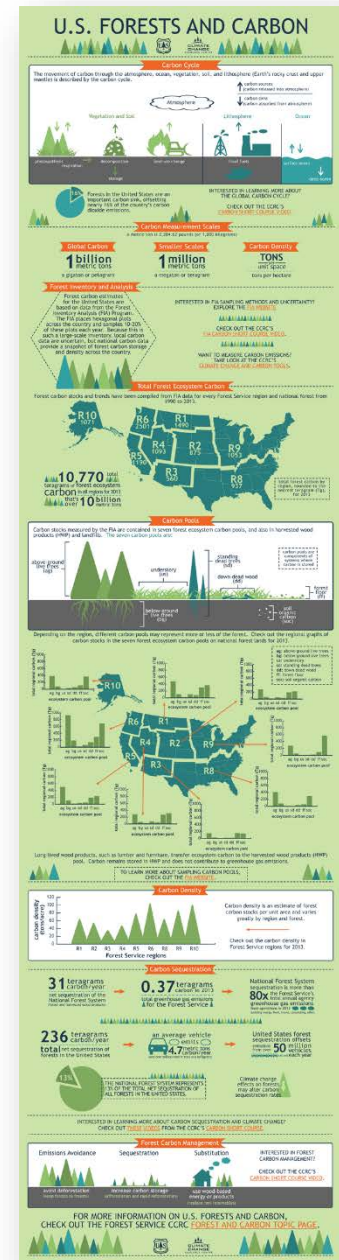
Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds. This property causes the greenhouse effect. Water vapor (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary greenhouse gases in the Earth's atmosphere.

Where can I find local forest carbon information?

Forest carbon white papers. The Forest Service has developed regional carbon assessment reports (white papers) to help forest managers and the public understand how much carbon is stored in forest ecosystems and harvested wood products. The baseline forest carbon reports provide information on carbon stocks and trends for seven different forest ecosystem carbon pools: above-ground live tree, below-ground live tree, standing dead, understory, down dead wood, forest floor, and soil organic carbon – for the baseline period 1990 to 2013 (and 2005 to 2013, truncation of the longer baseline).

- [NFS Carbon Assessments Briefing Paper](#). PDF 378 KB, 3 pp
- [Northern Region \(R1\) Report](#). PDF 2252 KB, 43 pp
- [Rocky Mountain Region \(R2\) Report](#). PDF 2128 KB, 41 pp
- [Southwestern Region \(R3\) Report](#). PDF 2093 KB, 41 pp
- [Intermountain Region \(R4\) Report](#). PDF 2139 KB, 42 pp
- [Pacific Southwest Region \(R5\) Report](#). PDF 2263 KB, 45 pp
- [Pacific Northwest Region \(R6\) Report](#). PDF 2334 KB, 48 pp
- [Southern Region \(R8\) Report](#). PDF 2346 KB, 44 pp
- [Eastern Region \(R9\) Report](#). PDF 2174 KB, 43 pp
- [Alaska Region \(R10\) Report](#). PDF 1802 KB, 34 pp
- [Regional Baseline Rationales](#). PDF 297 KB, 3 pp

Developed by the Climate Change Resource Center, the carbon infographic (right) distills the main findings of the NFS carbon assessments (see section above), in addition to providing a quick overview of the carbon cycle, carbon measurement scales, equivalencies, and carbon management activities. [Carbon Infographic](#).





Forest Service National Roadmap for Responding to Climate Change

“Managing America’s forests and grasslands to adapt to changing climates will help ensure that they continue to produce the benefits that Americans need, while helping to mitigate the effects of a changing climate and to compensate for fossil fuel emissions through carbon storage in healthy forests.”

How does climate change affect forest carbon?

Disturbances. The ability of our forests to store carbon is impacted by disturbances. [Wildland fire](#), [air pollution](#), [bark beetles](#), [forest diseases](#), [invasive plants](#), and other factors jeopardize the health of our forests and their ability to mitigate greenhouse gas emissions.

Greenhouse Gases. The agency strives to reduce its own greenhouse gas (GHG) emissions to further reduce the effects of climate change. The annual Greenhouse Gas and Energy Report includes data for greenhouse gas emissions, energy and water consumption, and other information required by laws such as the Energy Independence and Security Act of 2007 and Executive Order 13693, Planning for Federal Sustainability in the Next Decade.

The Forest Service’s three largest emissions categories are:



1. Fleet and Equipment
2. Employee Commuting
3. Building Energy Use

Looking at the distribution of GHG emissions by category can help us prioritize work for the agency in order to achieve efficiencies.

Total GHG Emissions for the USDA Forest Service (FS)

