These assessments were projects of the Northwest Advanced Renewables Alliance (NARA).

Using residual biomass from logging operations as feedstocks, NARA aims to create a sustainable industry to produce aviation biofuels and value-added co-products.

November 2016:
Alaska Airlines made the first commercial flight powered in part by renewable fuel made from wood waste salvaged from tribal and private lands in Washington, Oregon, and Montana.

NARA

Northwest Advanced Renewables Alliance

About NARA

https://nararenewables.org

Led by Washington State University, the NARA project includes a broad alliance of private industry, government laboratories, and educational institutions throughout the United States. The project includes study sites affiliated with the North American Long-Term Soil Productivity Network (Fall River, Matlock, and Molalla) which were established with support from the forest industry and U.S. Forest Service Research and Development through the Agenda 2020 Program.

WASHINGTON STATE UNIVERSITY

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USDA United States Department of Agriculture

WOOD TO WING

The Economics of a Wood-based Biorefinery in Longview, Washington

Assessment highlights about the effects of harvest slash collection on carbon and soil productivity - projects of the Northwest Advanced Renewables Alliance

Residual Biomass Harvesting and Carbon Emissions

Do avoided emissions from slash pile burning offset emissions from collecting, transporting, and using post-harvest biomass residuals?

About 40 percent of a tree (excluding roots) is left behind during timber harvests in the Interior West. This residual biomass is generally piled and burned or left to decompose, it could be used as feedstock for wood-based biofuel.

Burning it releases the embedded carbon with air pollutants. The machinery used to collect and transport the feedstock to the treatment facility also emits carbon—but comparatively how much?

A researcher measures the efflux of carbon dioxide from the soil near a planted Douglas-fir to determine soil microbial activity.

Tim Harrington

KEY FINDINGS

Harvesting residual biomass rather than burning it:

- Reduces greenhouse gases
- Improves local air quality

Collecting, grinding, and transporting residual biomass comprise 20 to 30 percent of the global warming potential associated with the conversion of biomass to jet fuel.

How does the global-warming potential of wood-based jet fuel compare to petroleum-based jet fuel?

KEY FINDINGS

A 70-percent reduction in global-warming potential can be achieved by substituting 100-percent petroleum-based jet fuel with 100-percent wood-based jet fuel.

Co-products that displace other coal-based products would further improve the environmental footprint of the residual-biomass-to-jet-fuel conversion process. Activated carbon, used in water and air filters, is one such possible co-product.

A slash pile: it can be burned, left to decompose, or used to produce biofuel.

NARA

Residual Biomass Harvesting and Soil Productivity

Is residual biomass harvesting detrimental to the long-term productivity of the soil?

Four study sites in the Pacific Northwest are helping to answer this question.

KEY FINDINGS 15 YEARS IN

Soil type matters

- Removing biomass residuals has little effect on tree regrowth at sites with rich, highly productive soil.
- Tree regrowth was negatively affected at sites with coarse, lower productivity soil.

Competing vegetation fills void, resulting in reduced tree growth

- Residual biomass can act as mulch by conserving soil water and cooling the soil, which inhibits germination of invasive species, such as Scotch broom, that compete with Douglas-fir for water, nutrients, and light. Residual biomass also provides habitat for native vines that help exclude non-native forbs, grasses, and shrubs.

Soil compaction isn't an issue

- Standard harvesting practices did not negatively affect tree regrowth. A positive response was seen at sites with coarser soil, likely because compaction increased water-retention capacity of soil.

A planted Douglas-fir following whole-tree harvesting.

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