

# Landscape Management System

The NDCEE evaluated a landscape management system (LMS) umbrella tool to support military readiness activities. The tool can help the Department of Defense (DoD) to integrate analysis from multiple forestry management applications including applications for wildfire risk assessment, biodiversity, security, safety, and sustainability. For this effort, the NDCEE worked with the Command Navy Region Northwest, Naval Facilities Engineering Northwest Command, Fort Lewis, and the Engineer Research and Development Center-Construction Engineering Research Laboratory.

## Problem Statement

The DoD is responsible for maintaining thousands of acres of forests at its installations across the country. Several fire models are available; however, most of them cannot be used for forest planning on a stand-alone basis; several models must be used together. LMS was selected for demonstration because it incorporates a fire hazard model into a user-friendly forestry software application that can simulate several alternative approaches. As a result, the technology can compare hazard-reduction effectiveness.

## Technology Description

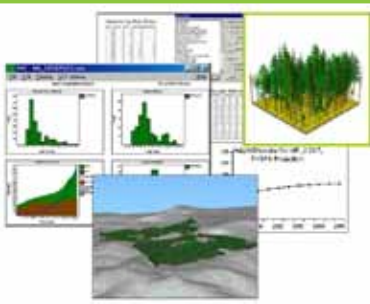
The LMS is a forestry software tool that can project changes through time across forested landscapes by integrating various simulators and visualization systems. The LMS tool can be used to assess fire hazard, timber yield, carbon sequestration, and wind risk analyses. It can also be used for visual impact analysis of targeted view sheds to facilitate landscape, ecosystem, and watershed management.

Implemented as a Microsoft® Windows® application, LMS integrates 20-plus tree growth, treatment, spatial, and visualization models into a single, user-friendly forestry software package. These programs format, classify, summarize, and export information; project tree growth and snag decay; manipulate stand inventories; and present stand and landscape-level visualization and graphics. Because LMS seamlessly transfers data between these different models, users do not need to know the commands for each program; all functionality can be accessed through “click-and-go” graphical user interfaces. A variety of outputs are available in tables and charts.

LMS was developed under a partnership between Yale University and the University of Washington with funding support from the U.S. Department of Agriculture Forest Service. It is maintained and updated by Rural Technologies Initiative (RTI), a research and technology transfer consortium of the University of Washington and Washington State University. LMS is a publicly available software application and can be downloaded at: <http://lms.cfr.washington.edu>.

## Environmental, Safety, and Occupational Health (ESOH) and Cost Benefits

- **ESOH Benefit.** The LMS application can improve the DoD’s ability to manage natural resources by helping the installation forest managers to minimize impacts from wildfires (and, if allowed by site, prescribed burns) and maintain healthy forests over the long term.
- **Cost Benefit.** A cost-benefit analysis, focused on wildfire prevention, identified cost avoidance savings ranging from \$1,500 per acre to over \$8,000 per acre.



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## Technology Benefits and Advantages

- Supports decision making by assessing multiple, often competing, outputs and promoting an understanding of the complexity and consequences of forestry actions
- Provides a framework to prepare in-depth fire management plans from multiple perspectives
- Adds value to Integrated Natural Resource Management Plans (INRMPs)
- Helps minimize impacts from wildfires (and, if allowed by site, prescribed burns)
- Helps land managers maintain healthy forests over the long term
- Improves the installation's ability to manage natural resources to meet mission objectives
- Is publicly available

## Technology Limitations

- Has not been approved for use on the Navy Marine Corps Intranet (NMCI) or other Services' Intranets.
- Requires user training

## Accomplishments

On behalf of the Services within the Pacific Northwest, the NDCEE evaluated a forest management tool on its potential to reduce impacts from wildfire to natural resources on forested military installations while helping the military meet mission objectives. Naval Magazine (NAVMAG) Indian Island, Washington was selected as the host site because the 2200-acre island is 80% forested. This naval facility functions as the ordnance management center for fleet and shore stations in the Pacific Northwest Region. It supports numerous joint exercises designed to test and validate the mobilization of ordnance to the Pacific Theater of operations. Its forested land provides habitat to a variety of animal and plant species. Forests also provide valuable training grounds and an attractive visual barrier to outside view of Service activities. In support of demonstration testing the NDCEE populated the LMS with Navy data, toured NAVMAG Indian Head to check data accuracy, and developed customized training. As a result of NDCEE's efforts, the LMS technology was successfully implemented.

## Technology Transition Opportunities

The LMS tool is designed to facilitate landscape, ecosystem, and watershed management. Any military installation with a forested landscape may benefit by implementing the LMS tool for forest management, planning, and policymaking, as well as education. The Navy and Fort Lewis are building upon the NDCEE demonstration project to further deploy LMS for numerous resource projects.

## Points of Contact

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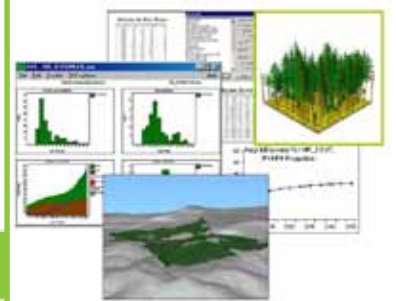
Wildfires pose a threat to the DoD with significant cost and ESOH impacts, because the DoD oversees thousands of forested acres at its installations.



DoD forested lands are managed for multiple objectives. One objective is protecting personnel and facilities against wildfires.



The NDCEE is working with a Landscape Management tool that can help foresters to assess wildfire risks as well as analyze other factors, such as tree stand (LMS visualization shown below) affecting a forest health.



LMS outputs are available in table, chart, and image formats.



Participants learn how to apply the LMS tool to help manage NAVMAG Indian Island's forests.