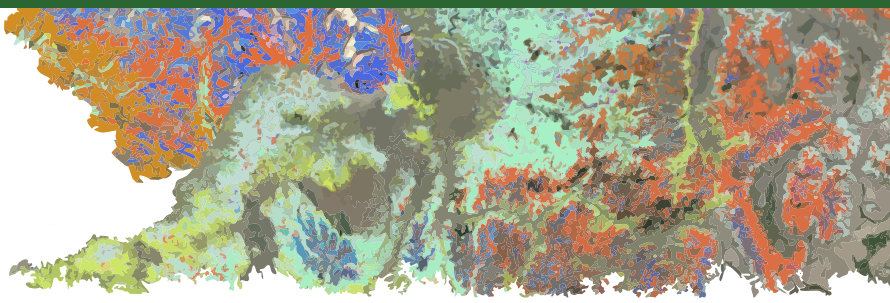
USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Rocky Mountain Research Station

TreeMap at a glance



TreeMap is a tree-level model of U.S. forests. New data delivery and visualization improvements make it easier to use.

What Is TreeMap?

The TreeMap dataset provides detailed spatial information on forest characteristics, including number of live and dead trees, biomass, and merchantable volume across the entire forested extent of the continental United States. The objective of TreeMap is to combine the complementary strengths of detailed-but-spatially-sparse Forest Inventory and Analysis (FIA) data with less-detailed-but-spatially-comprehensive LANDFIRE data to better estimate forest characteristics at a variety of scales.

TreeMap data are used in both the private and public sectors for a variety of projects, including timber resource mapping, wildfire risk modeling, and fuel treatment planning. The dataset is produced by the USDA Forest Service Rocky Mountain Research Station (RMRS), working in close partnership with the Forest Service Geospatial Office (GO) on data delivery and data visualization.

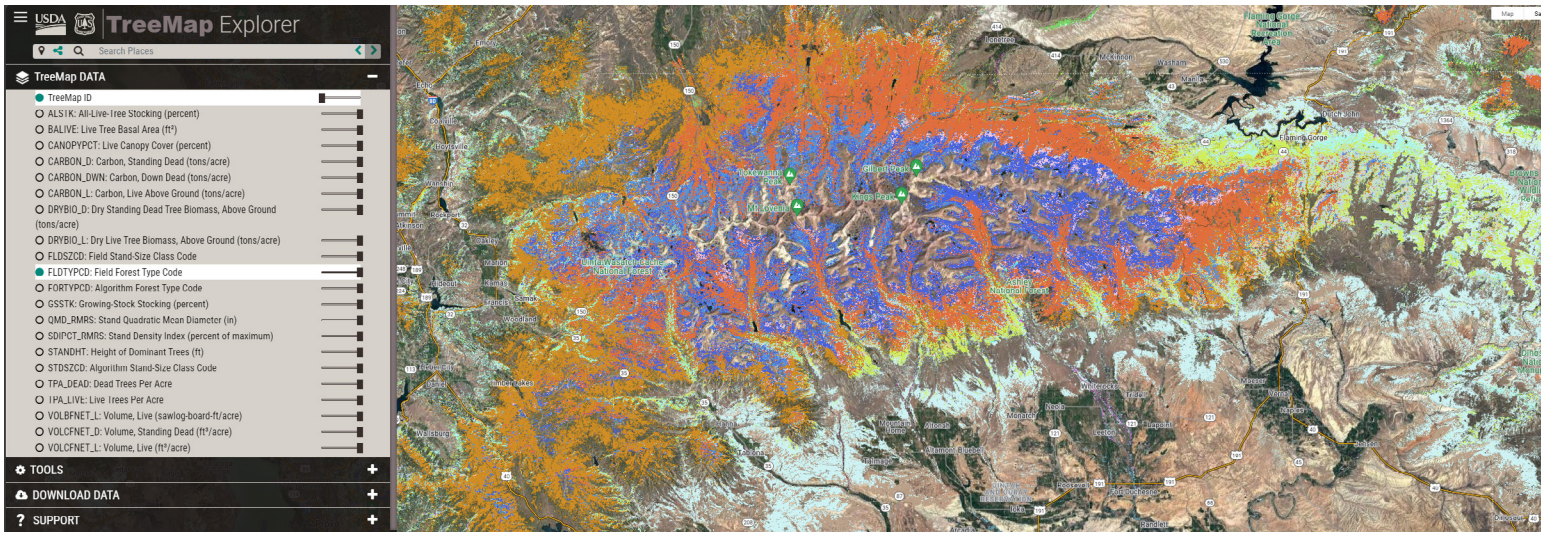
What's New With TreeMap?

Three new utilities are available for inspecting and downloading TreeMap data:

1. TreeMap Explorer: An interactive web-based application for viewing and downloading TreeMap data (see figure 1 below).
2. TreeMap Raster Data Gateway: Data and standardized symbology are hosted on the Forest Service Geodata Clearinghouse.
3. Google Earth Engine (GEE) Data Catalog Entry: To facilitate using TreeMap in cloud-based geospatial workflows.

TreeMap will continue to be stored in the Forest Service Research Data Archive, which contains the full dataset download, metadata, and supporting documents.

TreeMap Explorer, showing Forest Type in the Uinta Mountains, Northeast Utah, and Southwest Wyoming. The TreeMap Explorer utilizes Google Earth Engine (GEE). Data processing and visualization in GEE is made possible by a Forest Service enterprise agreement with Google.



TreeMap Explorer

The TreeMap Explorer is a lightweight, quick-loading platform for inspecting and downloading TreeMap data products. Previously, the only alternative was to download the full dataset (> 5 GB) and render each attribute in a GIS to investigate TreeMap. Now, users can browse the data in a public-facing web map and download the specific attributes they're interested in.

Raster Data Gateway

The Raster Data Gateway is a Forest Service website for downloading the TreeMap dataset, with standardized symbology and detailed metadata. Users can download one or all 21 data layers in the TreeMap dataset. This may be a better alternative than downloading the full dataset for users who are interested in only one or a few of the layers. Standardized symbology also means that the raster layers are easy to interpret and more likely to be represented in the same fashion in downstream applications.

Google Earth Engine Data Catalog

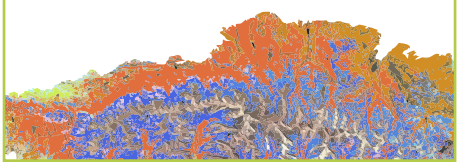
The Google Earth Engine (GEE) Data Catalog contains petabytes of satellite imagery and scientific datasets and facilitates using GEE cloud computation for geospatial analysis. With TreeMap in the GEE Data Catalog, users will be able to access and combine the TreeMap data into new or existing cloud-based workflows. For example, the GO could estimate forest biomass lost due to fires by incorporating TreeMap data into the existing Monitoring Trends in Burn Severity (MTBS) workflow.

What Else Should I Know About TreeMap?

The TreeMap dataset represents the FIA plot that is most similar to each pixel of gridded LANDFIRE input data as predicted by a random forest machine learning imputation. TreeMap is distinct from other imputed forest vegetation products in that it provides an FIA plot identifier to each pixel, whereas other datasets provide forest characteristics such as live basal area (e.g., BIGMAP). The FIA plot identifier can be linked to the hundreds of variables and attributes recorded for each tree and plot in the FIA DataMart, FIA's public repository of plot information.

TreeMap is used to:

- *Estimate merchantable volume and biomass*
- *Determine which trees might be removed during fuel treatments by applying prescriptions in the Forest Vegetation Simulator*
- *Update the Snag Hazard dataset to inform fire managers of landscape-scale distribution of dead trees*
- *Predict risk to standing live and dead trees from fire*
- *Estimate risk to forest resources from wildfire*
- *Calculate tradeoffs in fire emissions between prescribed fire and wildfire*
- *Map wildlife habitat*



Planned Updates

RMRS and the GO are refining the TreeMap production workflow and producing TreeMap data for more recent years. TreeMap data are currently available for 2014, 2016, 2020, and 2022. More people are using TreeMap in response to these updates and better data accessibility.

Contact

Contact the GO TreeMap team at SM.FS.treemaphelp@usda.gov with specific data requests and questions about accessing the data platforms.

For questions about TreeMap methodology or data, contact Karin Riley, RMRS Missoula Fire Sciences Laboratory, at karin.l.riley@usda.gov.

Further Reading

Riley, Karin L.; Grenfell, Isaac C.; Shaw, John D.; Finney, Mark A. 2022. TreeMap 2016 dataset generates CONUS-wide maps of forest characteristics including live basal area, aboveground carbon, and number of trees per acre. Journal of Forestry. 120(6): 607–632.

Science You Can Use (in 5 minutes): Seeing the forest AND the trees: TreeMap provides a tree-level forest model. 2021. Rocky Mountain Research Station.