Forest Service
U.S. DEPARTMENT OF AGRICULTURE

RESEARCH & DEVELOPMENT
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Forest Inventory and Analysis

For nearly 100 years, the FIA program has been recognized as a world leader in conducting national-scale forest inventories. FIA information is widely used to address local and regional issues related to trends in forest extent, health and productivity; land cover and land use change; and the changing demographics of private forest landowners.

Forest Inventory and Analysis

Programs

Forest Inventory and Analysis

The Forest Inventory and Analysis (FIA) program of the USDA Forest Service Research and Development Branch collects, processes, analyzes, and reports on data necessary for assessing the extent and condition of forest resources in the United States.

Nationwide Forest Inventory

Overview

What does the Forest Inventory and Analysis Program do?

Forest Inventory and Analysis (FIA) is a congressionally mandated program that delivers current, consistent, and credible information about the status of forests and forest resources within the United States by continually collecting and analyzing data about these forests and the values they provide. FIA works to:

- Collect annualized data relating to forest resources, health and ownership.
- Collect and analyze a consistent core set of ecological data on all forests to view trends over time.
- Utilize new and emerging technologies to acquire data through remote sensing and field activities.

FIA completes data collection and analysis work within four main inventories:

- The Nationwide Forest Inventory (NFI): a national network of permanent plots that are remeasured every 5-10 years depending on location. Land use information is collected on all plots, with additional site and tree (live and standing dead) data collected on plot areas having forest land use present. Additionally, information about down woody material, soils and understory vegetation is collected on a subset of plots.
- The National Resource Use Monitoring (NRUM): a survey which collects information on manufacturers that use harvested wood products for reporting on size of facilities, products that are manufactured, manufacturing capacity, and other data points.
- The National Woodland Owners Survey (NWOS): a survey that collects information on private forest landowners to understand why they own the land, what they use it for, and how they are planning on managing their land over time.
- Urban Inventory: an inventory program that monitors the Nation's urban forests, examines social dimensions of urban forests and green spaces, and estimates the industrial and nonindustrial uses of urban wood.

FIA also works with experts from universities and trusted partners to expand research capacity, analytical capabilities, and continually develop and enhance our inventory and monitoring techniques within these inventories.

Program Deliverables

Information and trends are important indicators of the conservation and sustainable management of United States forests, and these trends provide policymakers, partners, and other

users a variety of data that inform their land-management decisions over time. Our users can rely on the credibility of our information to make critical land management, policy, and investment decisions. Data outputs include, but are not limited to:

- Developing summaries and reports detailing forest health and productivity every five years.
- Providing current and historical data across political and administrative boundaries and land ownerships, including urban forests.
- Developing data sets and analytical products that include a wide array of forest ecosystem parameters addressing the extent, productivity, health, ownership, and utilization of United States forests.

FIA seeks to address emerging user needs by conducting development research in additional to its operational surveys. Current research focuses on seven strategic areas that were identified in previous legislation and the 2015 FIA Strategic Plan. Three of these research portfolios have successfully been operationalized and are each described above (NRUM, NWOS, and Urban). The other four research portfolios include:

- Carbon: The carbon portfolio's mission is to advance the science, monitoring, and reporting of greenhouse gas emissions and removals on land with trees in the United States. Research encompasses:
    1. developing estimation and accounting compilation systems and tools,
    2. advancing carbon pool science (including harvested wood products)
    3. leveraging FIA remeasurements and auxiliary information for change estimation and attribution across spatial and temporal scales, and
    4. information carbon management, mitigation, and adaptation activities.
- Digital Engagement: The mission of the digital engagement portfolio is to transform FIA's analysis, reporting, and delivery of information. This work is made possible through collaboration with agency and external partners to develop and publish relevant and authoritative data that supports user needs. To see examples of FIA's digital engagement work in action, visit the FIA Geospatial Showcase or learn about the BIGMAP project.
- Land Use and Land Cover (LULC): This portfolio addresses the need for FIA to understand and report changes in land use and land cover. FIA continuously monitors the largest set of ground based LULC observations in the world, thanks to the NFI plot network. FIA analysis of LULC focuses on three goals:
    1. leverage FIA's unique dataset to lead national LULC monitoring,
    2. create a forum for FIA LULC experts to coordinate research within and outside of the program; and
    3. communicate new LULC research to FIA's customers. Visit the FIA Land Resources

Explorer to view information on land use, land cover, and change in an interactive map.

- Small Area Estimation (SAE): The purpose of the small area estimation research portfolio is to modernize FIA's methods for estimation of forest characteristics within small geographic areas (generally smaller than a state or county) and short time intervals (less than 5 years). Current research is anticipated to lead to operational techniques and tools that will produce the following products:
    1. a nationwide, experimental series of annual, county level forest area and biomass estimates by 2025, and
    2. area and biomass change by 2027.

National Program Coordination

The FIA Program is implemented across four units located at USDA Forest Service Research Stations: The Northern Research Station, the Pacific Northwest Research Station, the Rocky Mountain Research Station, and the Southern Research Station. National teams of FIA specialists work together to ensure consistency and efficiency in data collection, management, and analysis. They review and implement modifications, additions, or deletions to any component of the National FIA Program. These teams cross four functional areas, known as Bands:

- **Data Acquisition Band:** Focuses on standardization of FIA's core field data collection across the US. This includes testing new protocols, developing documentation and training programs, and conducting quality assurance. For more information on data acquisition contact the Data Acquisition Band Lead, Maryfaith Snyder.
- **Information Management Band:** Focuses on data management systems for FIA data, including systems for data collection, data editing and validation, internal and public databases, and web applications that allow all users to access and analyze FIA data. For more information, contact the Information Management Band Lead, Chad Keyser.
- **Analysis Band:** Focuses on reporting and providing statistically defensible methods for summarizing FIA data, including identification of new variables (either field measured or computed) needed by FIA customers. For more information, contact the Analysis Band Lead, Randy Morin.
- **Techniques Research Band:** Focuses on improving the efficiency, timeliness, and quality of the FIA program through research that assesses and integrates new technologies and methodologies into current FIA workflows. The band addresses problem areas outlined in the FIA strategic plan or identified by Congress, FIA Program Managers for each unit, or National FIA leadership. For more information on the Techniques Research Band contact the Techniques Research Band Lead, Hans Andersen.

Background Information and History

The FIA program concept is over 120 years old. The Organic Act of 1897, which established the National Forest System, included provisions for inventory and management of those lands. In 1928, the Forestry Research Act (McSweeney-McNary) directed the Secretary of Agriculture to make and keep current a comprehensive inventory and analysis of the Nation's forest resources. The Resources Planning Act of 1974 (RPA, PL 93-378) amended the earlier research act. The Forest and Rangeland Renewable Resources Research Act of 1978 (PL 95-307) replaced earlier Forestry Research legislation but repeated the amendment contained in the RPA and further instructed the Secretary of Agriculture to:

> "...obtain, analyze, develop, demonstrate, and disseminate scientific information about protecting, managing, and utilizing forest and rangeland renewable resources in rural, suburban, and urban areas"

The National Forest Management Act of 1976 (PL 94-588) directed the USDA Forest Service to:

> "ensure research on and (based upon continuous monitoring and assessment in the field) evaluation of the effects of each management system…"

More recently, in 1999 (Farm Bill, Public Law 105-185) and again in 2014 (Farm Bill, Public Law 113-79), Congress directed the Forest Service to reevaluate its statewide inventory mission and to transition to survey each State annually rather than periodically, with the exception of Interior Alaska and U.S. associated islands of the Caribbean and Pacific Ocean. Additionally, FIA was directed to implement urban forest inventories, improve sub-state estimation precision, and improve the timber product output program among other provisions. In collaboration with partners, FIA developed strategic plans to fully transition into an annualized inventory and comply with other requirements.

Events and Alerts

User Notifications and Bulletins

- **October 31, 2024:** Users are advised that DATIM is no longer available. Please use EVALIDator for your data summary needs.
- FIADB v1.9.1 release is now available. EVALIDator has been updated to accommodate the database changes. Updates include changes

to cubic-foot volume, biomass, and carbon estimates. More information about those changes can be found here: [Tree Volume, Biomass and Carbon Models.](#)

- **June 21, 2022:** Estimates and statistics based on Alaska borough and census areas may be misleading. FIA's Alaska inventory is ongoing and many survey units have yet to be sampled. The FIA inventory Alaska survey unit boundaries do not follow Alaska's borough and census area boundaries or ecoregions. The survey units were outlined broadly encompassing major watershed boundaries. Because much of Alaska is not organized into a recognized borough (county equivalent), the FIA program utilizes the Census Bureau Census Area boundaries as the county equivalents in those areas. However, Alaskan borough and municipality boundaries have changed multiple times since the inception of the FIA annualized inventory (~2004). The Census Bureau has also frequently changed Alaskan Census Area boundaries over that same timeframe. Therefore, any FIA reported estimates reflect only the Alaska survey units involved. Any estimates and summary statistics calculated based on borough or Census Area spatial extents may be misleading due to the variability of these features. For more information, please see the supporting documentation [here](#).

Upcoming Events

Forest Inventory and Analysis Science Symposium, November 19-21, 2024

- The symposium offers an opportunity for scientific and technical exchange, drawing together a world-class group of partners, practitioners, and scientists with regional, national, and international inventory and monitoring missions. Find more information about the symposium [HERE](#).

Past Events

Forest Inventory and Analysis Science Symposium

- Held every two to three years, the FIA Science Symposium offers an opportunity for scientific and technical exchange, drawing together a world-class group of partners, practitioners, and scientists with regional, national, and international inventory and monitoring missions.

National User Group

- The Biometrics Working Group (BWG), administered by the National Council for Air and Stream Improvement, Inc. (NCASI), organizes meetings where knowledgeable forest biometricians from academia, government forestry agencies and industry discuss technical issues. Meeting topics are often related to the USDA Forest Service Forest Inventory and Analysis (FIA) program; however, technical issues on carbon monitoring or sustainable forestry are also of interest.

  Notes from recent BWG meetings can be found on the FIA User Community page of the Society of American Foresters site.

Work with Us

FIA work is coordinated and accomplished out of four regional units that cover the nation, including U.S. territories. Staff and contractors complete our work from different locations across the country. For more information on contracts for field work, contact the person associated with the location you are interested in.

- Northern (CT, DE, IA, IL, IN, KS, MA, MD, ME, MI, MN, MO, ND, NE, NH, NJ, NY, OH, PA, RI, SD, VT, WI, WV): Gayle Geiger
- Pacific Northwest (AK): Dan Irvine
- Pacific Northwest (OR, CA, and WA): Jonny Beals-Nesmith
- Rocky Mountain (AZ, CO, ID, MT, NM, NV, WY, UT): Maryfaith Snyder
- Southern (AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA): Angie Rowe

Data and Tools

Data Download

Data/Tool Name	Description
FIA DataMart	The FIA DataMart allows visitors to download raw FIA data in comma delimited tables, SQLite databases, and customizable batch estimate workbooks. The DataMart map also provides a quick visual reference for the most recent data available for each state or inventory area.
National Resource Use Monitoring - Data Downloads	The NRUM data download allows users to access files that contain data from both the Timber Products Output (TPO) and Harvest Utilization (HU) studies, combined with FIA inventory data and residential firewood estimates derived from the U.S. Department of Energy residential energy consumption survey
	Urban DataMart allows visitors to download raw urban data, as well

| Urban DataMart | as Urban FIADB User Guides. |

Data Analysis Tools

Data/Tool Name	Description
Business Report Dashboard	The Forest Inventory and Analysis (FIA) Program produces an annual business report aimed at ensuring accountability and transparency to Congress and the public. This dashboard summarizes key financial, partner, and plot measurement information from the business report in an interactive format designed to make it easier for stakeholders to explore the data.
FIA Geospatial Showcase	A showcase of FIA maps, tools, data and applications.
FIA Land Resources Explorer	The Land Resources Explorer is an interactive, user-friendly suite of tools for viewing land area estimates and maps from multiple information sources, including information on land use, land cover, and change.
EVALIDator and FIADB-API	EVALIDator and FIADB-API allows users to produce a large variety of population estimates and their sampling errors based on the current FIA database. Estimates can be produced as totals (e.g. number of trees) or as ratios (e.g., number of trees per acre of forest land).
FIA DataMart	FIA DataMart allows visitors to download raw data files, standard tables, SQLite databases, and a desktop EVALIDator reporting tool. DataMart also provides access to the FIA State reports, FIADB load history, API EVALIDator, and FIADB User Guides.
FIA One-Click State Factsheets	Allows users to view FIA snapshots of a state's forest land through an interactive tool. "One-Click" to the desired state to produce a real-time factsheet based on most current FIA data available in EVALIDator.
Timber Products Output Interactive Reporting Tool	The TPO Interactive Tool includes estimates of timber products, logging residue, mill residue, residential fuelwood, and other removals based on the selected area.

[Timber Products One Click Factsheets](#)	Data include state-wide production, products, number of primary mills and types, roundwood exports/imports, and retained production.
[Timber Products Output and Use: Wood Flow Factsheet](#)	Wood Flow Fact Sheets allows visitors to view statewide timber products output and use information, with detailed roundwood exports/imports and retained production.
[National Woodland Owner Survey Dashboard](#)	This tool generates plots and tables for user selected survey question, cycle (i.e. time period), and geography (e.g. national-, regional-, or state-level summaries).
[My City's Trees](#)	My City's Trees enables anyone to access Urban FIA data and produce custom analyses and reports. Currently, My City's Trees includes information for all targeted cities with a complete certified dataset.
[i-Tree](#)	i-Tree is a suite of software tools that provides forestry analysis and benefits assessment tools, within urban and non-urban forests that quantify forest structure and the environmental benefits that trees provide.

Data Consultations and Requests

Data/Tool Name	Description
Data Consultations and Requests	- National: [General FIA Questions](#) - Rocky Mountain (AZ, CO, ID, MT, NM, NV, WY, UT): [RMRS Data Services](#) - Pacific Northwest (AK, CA, HI, OR, WA; Pacific Islands: AS, FM, GU, MH, MP, PW): [PNW Data Services](#) - Northern (CT, DE, IA, IL, IN, KS, MA, MD, ME, MI, MN, MO, ND, NE, NH, NJ, NY, OH, PA, RI, SD, VT, WI, WV): [NRS Data Services](#) - Southern (AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA; Caribbean Islands: PR, VI): [SRS Data Services](#)

In order to protect the privacy of landowners and the integrity of the FIA sample, the exact coordinates of plot locations are kept confidential. Exact plot locations are protected by federal law. Therefore, actual FIA plot locations are very rarely shared and only under a specific, limited set of circumstances. Visit the Spatial Data Services page to learn more.

People

Jump to: Key Personnel National Contacts Regional Program Managers

Key Personnel

National Contacts

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Michael J. Wilson
Program Manager

Resources

Jump to: The Inventories   Sampling and Estimation Documentation   Business and Organizational
Documents   Additional Resources   Contributions to National and Global Reporting

The Inventories

Program

**Nationwide Forest
Inventory (NFI)**

Program

**National Resource Use
Monitoring (NRUM)**

Program

**National Woodland Owner
Survey (NWOS)**

Program

[Urban Forest Inventory and Analysis Program](#)

Sampling and Estimation Documentation

- J.A. Westfall, J.W. Coulston, G.G. Moisen, H.-E Andersen. 2022. [Sampling and estimation documentation for the Enhanced Forest Inventory and Analysis Program: 2022](#)
- William A. Bechtold, Paul L. Patterson, [Editors]. 2005. [The enhanced forest inventory and analysis program - national sampling design and estimation procedures](#)

Business and Organizational Documents

Strategic Plan

Business Report

[Forest Inventory and Analysis Strategic Plan](#)

[2022 Forest Inventory and Analysis Business Report](#)

Business Reports from all available years can be found on [Understory](#).

Additional Resources

User Guide

User Guide

Contributions to National and Global Reporting

- Resources Planning Act (RPA)

  FIA data is analyzed on a five-year cycle to produce The Forest Resources of the United States, a supporting document to the RPA Assessment that contains information on the status, condition, and trends in the Nation's Forest resources.

- National Report on Sustainable Forests

  FIA data is an essential foundation for the National Report on Sustainable Forests and its 54 indicators of forests sustainability, particularly those indicators covering forest extent, structure, and productivity. Without FIA data, the National Report would not be possible.

- FAO Global Forest Resources Assessment

  Data concerning the state of the Nation's forests reported by the United States to the Global Forest Resources Assessment and assembled by the United Nations Food and Agriculture Organization (UN-FAO) come almost exclusively from the Forest Inventory and Analysis Program.

- Greenhouse gas inventories to the United Nations Framework Convention for Climate Change

  FIA estimates of carbon in forests are crucial for the U.S. national reporting of greenhouse gas inventories to the United Nations Framework Convention for Climate Change.

- The North American Forest Database

  A platform for enhanced North American forest inventory and monitoring data integration that complements the national forest assessment tools of Canada, Mexico and the USA and the UN FAO Global Forest Resources Assessment (FRA).

- Carbon Assessments

  The Forest Service produces the authoritative research, analyses, and tools for carbon monitoring and estimation across the nation The Forest Inventory and Analysis (FIA) program is the foundation for data on forest carbon stocks and fluxes at all scales, from farm scale to the National Greenhouse Gas Inventory reporting for the United Nations Framework Convention on Climate Change (UNFCCC), Forest Sustainability Reporting for the Montreal Process, carbon assessment across National Forests and Grasslands, and beyond.

- [Fifth National Climate Assessment](#)
  The Fifth National Climate Assessment is the US Government's preeminent report on climate change impacts, risks, and responses. FIA scientists and FIA data contributed to the sections related to forests.

Last updated November 14, 2024