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BACKGROUND:

Understanding when and where there are positive and negative effects of prescribed, human-caused, and natural fires is a critical need identified by a consortium of conservation partners, including members of the Southeast Regional Partnership for Planning and Sustainability (SERPPAS) and America's Longleaf Restoration Initiative (ALRI). Monitoring fire patterns and trends is a critical task made difficult by a lack of both accurate and comprehensive approaches to satellite imagery and fire mapping records.

In 2020, the USDA Natural Resources Conservation Service (NRCS) provided funds through an agreement with the U.S. Endowment for Forestry and Communities (Endowment) to support a new Southeast FireMap ("SE FireMap") product. The SE FireMap team would improve upon previous efforts to use satellite imagery and remote sensing to map fires in addition to creating a decision support tool to display the data. The SE FireMap launched the first version of the decision support tool in 2021, with major updates launching in 2025. The SE FireMap has also released accompanying burned area and fire history metrics data annually since 2021.

PROCESS:

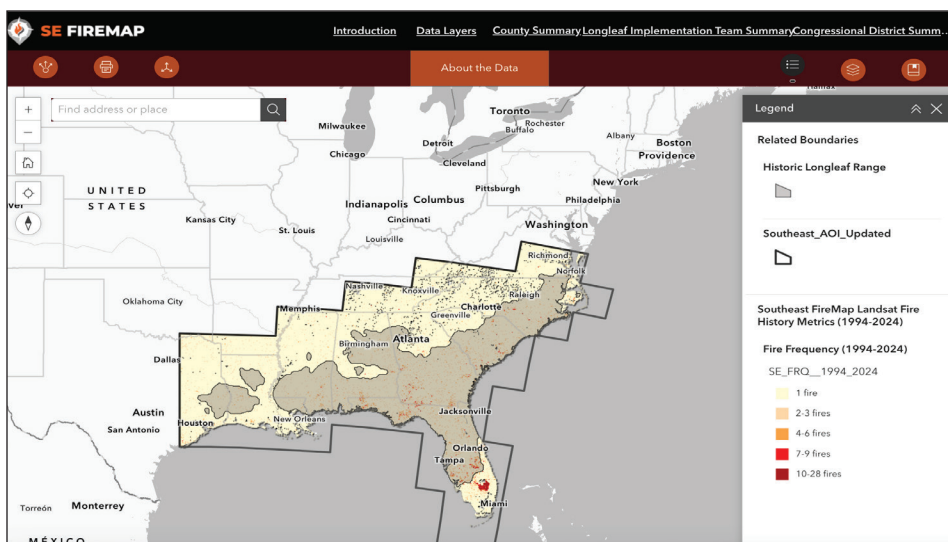
The Endowment and NRCS led a regional consortium of partners, with The Longleaf Alliance (TLA) coordinating the project. In parallel, ALRI and SERPAS partners nominated subject matter experts to a technical oversight team (TOT). The TOT consists of ten members who are guiding the project through all phases of development. The project has a target completion date in 2026.

Key Objectives:

- Provide comprehensive fire mapping coverage of both public and private lands; Achieve a mapping scale that balances the desire to support site-specific management decisions with high-level accuracy;
- Identify existing databases to test mapping accuracy and help train the SE FireMap toward reducing error rates;
- Coordinate continuously with fire mapping experts within the U.S. to facilitate future expansion of this project to include other regions, especially the Western U.S.;

Accomplishments:

- Developed a cohesive system using remote sensing to track prescribed fires, wildfires, and anthropogenic fires across the Southeast, providing significantly improved resolution over other regional and national systems currently in use;
- Delivered the SE FireMap online for public use as a decision support tool with standard query options, as well as spatial data and PDF informational downloads, promoting the efficiency and effectiveness of fire management toward conservation, economic and public safety goals.



Phase I: Scoping and Development 1.0

A Request for Proposals (RFP) was released in 2019 for a national assessment of existing tools and approaches to develop an improved fire mapping system. Tall Timbers received the award and completed the scoping effort in 2021.

The team started with datasets like the Landsat Burned Area Essential Climate Variable (BAECV), which comes from processing images acquired by Landsat satellites. The USGS improved upon the BAECV products with the Landsat Burned Area (BA) products that incorporated an improved algorithm, Landsat 8 imagery, and a new data delivery format. In addition, the BA products have the longest running record (1984–2023), finest spatial resolution (30 m), and have been thoroughly described, evaluated, and validated in a number of studies (Hawbaker et. al., 2017; Vanderhoof et. al., 2017a, Vanderhoof et. al., 2017b; Hawbaker et. al., 2020; and Vanderhoof et. al., 2021). Additional research (Teske et. al. 2021) demonstrated how fire history metrics could be generated from the Landsat BA products and their value for fire and conservation management decision making.

The Landsat BA products and fire history metrics were integrated in the SE FireMap viewer 1.0 as the primary data layer. The viewer was released to the public on the Landscape Partnership Portal in April of 2021.

Phase II: Scoping and Development 2.0

Based on the findings presented by TTR during SE FireMap Phase I, the NRCS, Endowment, and TOT made several recommendations as SE FireMap transitioned to Phase II:

- Continue generation of products incorporated in SE FireMap Phase I and;
- Conduct new work to support and improve products for use in SE FireMap Phase II, as well as;

Additional research to demonstrate the value of SE FireMap and its products for land management and conservation planning.

Research and Tool Improvements

Since the start of the Development Phase, TTR and USGS solicited input from decision-support tool users through workshops held at TTR; at a workshop in Atlanta, GA; and at the 2024 Longleaf Alliance Meeting, and at other workshops and meetings throughout the project duration. That input guided the development of the information and summaries available in the decision support tool.

TTR and USGS streamlined their process to generate updated data sets for the decision support tool by the end of March each year that incorporated the Burned Area products for the previous year and updated fire history metrics.

Research so far has focused on developing burn severity data layers to accompany the Landsat Burned Area products, improving burned area mapping using Harmonized Landsat Sentinel-2 imagery, and analyzing burning trends across the Southeast. Ongoing research efforts include an evaluation of SE FireMap uncertainty across seasons and landcover types and an effort to attribute burn detections as prescribed fires or wildfires.

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