



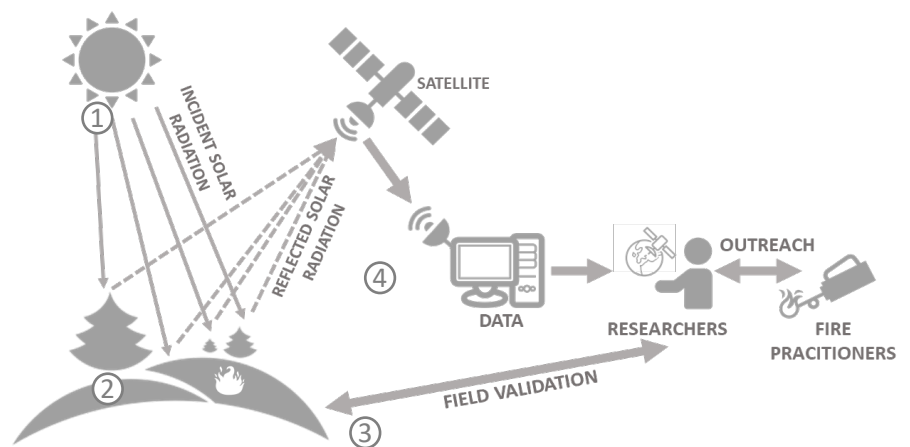
## Advancing Regional Fire Management with Satellite Technology

By: Jennifer M. Fill, Raelene M. Crandall, and David R. Godwin

Fire mapping research funded by the Joint Fire Science Program (JFSP) has produced game-changing remote sensing tools for Southeastern US fire management. Through both prescribed fires and wildfires, over 7.5 million acres of land burn every year across Southeast. Satellite data on the size and severity of these fires show their impacts on natural resources, air quality, and communities. These maps and tools are helping to inform and prioritize regional fire management programs to conserve natural resources and protect citizens.

### Mapping Fires from Space

- 1) Satellites measure light reflectance from the earth's surface.
- 2) Reflectance values from images are used by researchers to estimate changes in soils and vegetation
- 3) Data accuracy can be checked on the ground.
- 4) Groups like the Southern Fire Exchange (SFE) work with fire practitioners to ensure the data meet their needs and that new mapping tools are put into practice.



**The mission of the Southern Fire Exchange (SFE)** is to increase the availability and application of fire science information for natural resource management and to serve as a conduit for fire managers to share new research needs with the research community. The SFE is part of the Joint Fire Science Program Fire Science Exchange Network, a national consortium of 15 regional fire science exchanges.

# Case Study: MTBS Burn Severity Mapping

Historically, fire-severity mapping techniques were mostly applied to western US ecosystems. In 2006, the JFSP funded a team of scientists from Tall Timbers Research Station and the US Geological Survey to develop new satellite-based methods for mapping burn severity in the southeastern US (Figure 1). The research team evaluated the accuracy of existing satellite-derived burn severity mapping techniques and then developed new thresholds specific to southeastern vegetation types. This research was the first in a cascade of efforts to ensure data availability and accuracy on fire size and severity mapping in the Southeast. These efforts have recently culminated in revised mapping guidelines and data at [www.mtbs.gov](http://www.mtbs.gov).

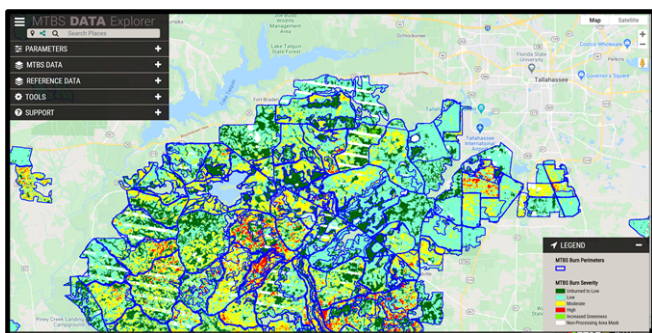


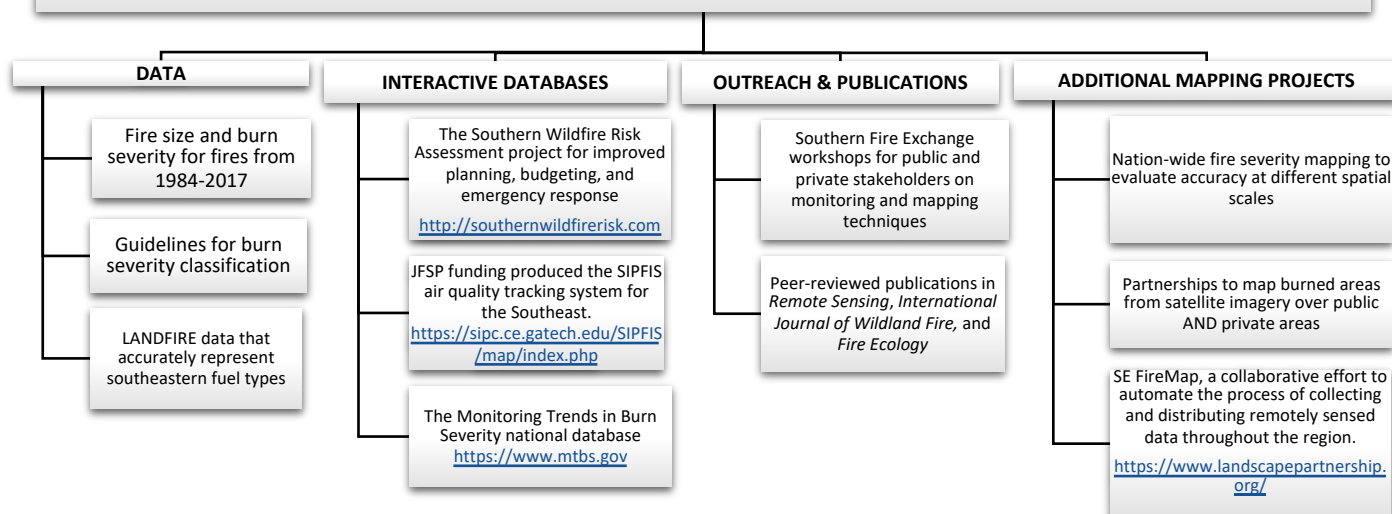
Figure 1. Fire perimeter and severity data from 1984-2017 for the Apalachicola National Forest near Tallahassee, Florida, from the MTBS (Monitoring Trends in Burn Severity) data explorer (<http://www.mtbs.gov/>). In this example, each pixel displays data corresponding to the year of highest severity for that pixel.



Figure 2. The Southeast uses more prescribed fire than any other region in the US. With highly diverse landownership patterns, remote sensing tools are helping to understand the complex patterns of prescribed fire use on public and private land.

## Increasing spatial data accuracy and usefulness: Project outcomes and beyond

Efforts continue to improve the accuracy, types, and availability of data for fire practitioners



Learn more about our partners, products, and activities at [southernfireexchange.org](http://southernfireexchange.org).  
Learn more about the Joint Fire Science Program and the Fire Science Exchange Network at [firescience.gov](http://firescience.gov).



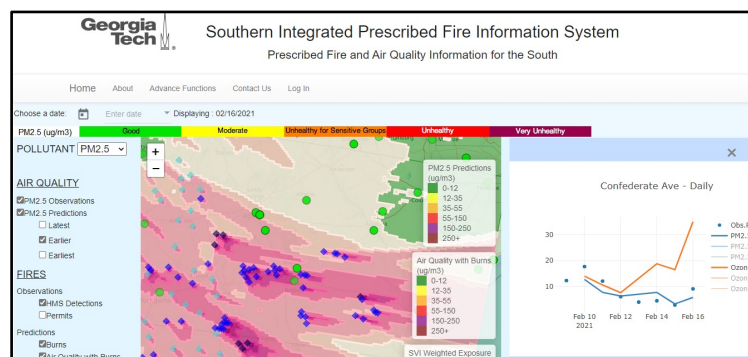
# Connecting Fire Practitioners with New Mapping Tools

Over the past 10 years, the Southern Fire Exchange has hosted events focused on connecting land managers with new remote sensing tools. Events covered JFSP supported research on:

- Mapping Burn Severity
- Predicting Prescribed Fire Occurrence
- Mapping Prescribed Fire Use
- Understanding Regional Fire Frequency
- Mapping Regional Fuels

Other SFE outreach efforts include:

- Identifying and sharing regional fire research needs with JFSP and partners.
- Hosting fire training workshops
- Promoting new mapping tools with regional fire partners and agencies.



**SOUTHERN Fire Exchange**  
Uniting Fire Science and Natural Resource Management

**Prescribed Fire Tracking with SIPFIS:**  
Prescribed fire and air quality tracking for the South

**Presenters**  
Dr. Talat Odman, Georgia Tech  
Dr. Fernando Garcia Menendez, NC State University

**Webinar Host**  
Dr. David Godwin  
Southern Fire Exchange  
University of Florida

Figure 3. The Southern Integrated Prescribed Fire Information System (SIPFIS) was developed by Georgia Tech and North Carolina State University through a research grant from the JFSP. SIPFIS maps the observed and predicted impacts of wildland fire smoke across the state of Georgia. The Southern Fire Exchange supported the project in science delivery programs. SFE mapping demonstration and training webinars on SIPFIS, MTBS and LANDFIRE are available at <https://southernfireexchange.org/events/archived-webinars/gis-and-mapping/>



The Southern Fire Exchange is a member of the JFSP Fire Science Exchange Network. The goal of the FSEN is to accelerate the awareness, understanding, adoption, and implementation of readily available wildland fire science information.