

# Success Stories

The Southern Fire Exchange and JFSP bring professionals together to improve outcomes

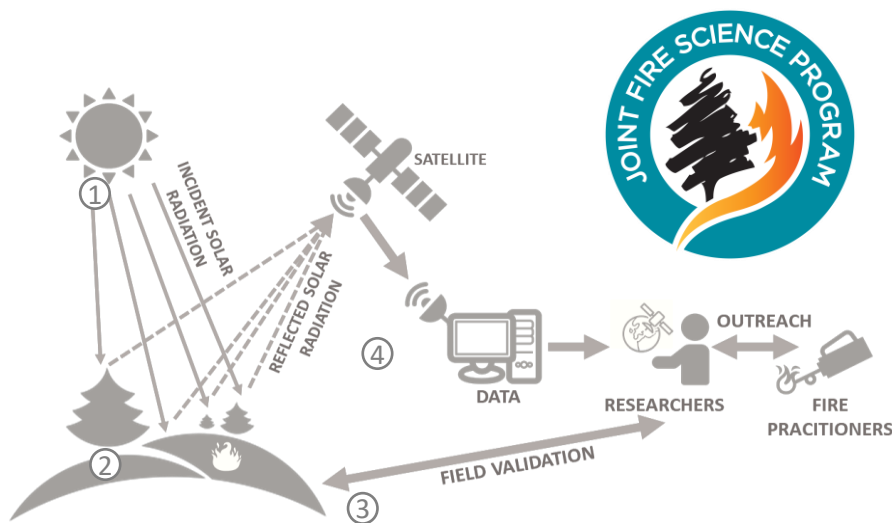
## Advancing Regional Fire Management with Improved Mapping Techniques

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 U.S. fire management. Through both prescribed fires and wildfires, over 3.9 million acres of land burn every year across this region. The size and severity of these fires are detected by satellites and are used evaluate their impacts on natural resources, air quality, and communities. These satellite data are helping to inform and prioritize regional fire management programs to conserve natural resources and protect citizens.

### Mapping Fires from Space

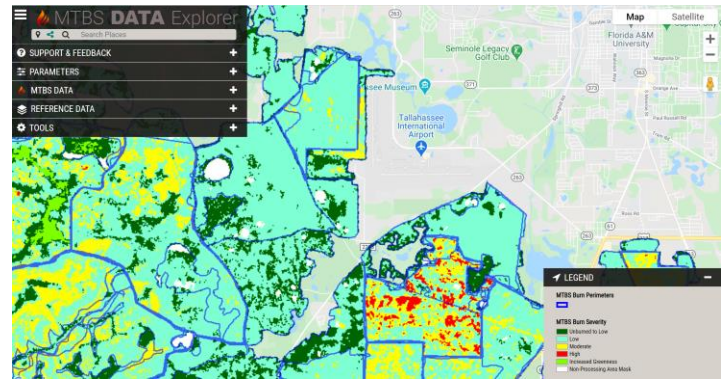
**Figure 1.** Fire mapping from satellites involves a reiterative process of data collection and validation before it is made available as a tool: **1)** Satellites measure light reflectance from the earth's surface. **2)** Reflectance values from images are used by researchers to estimate changes in 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.

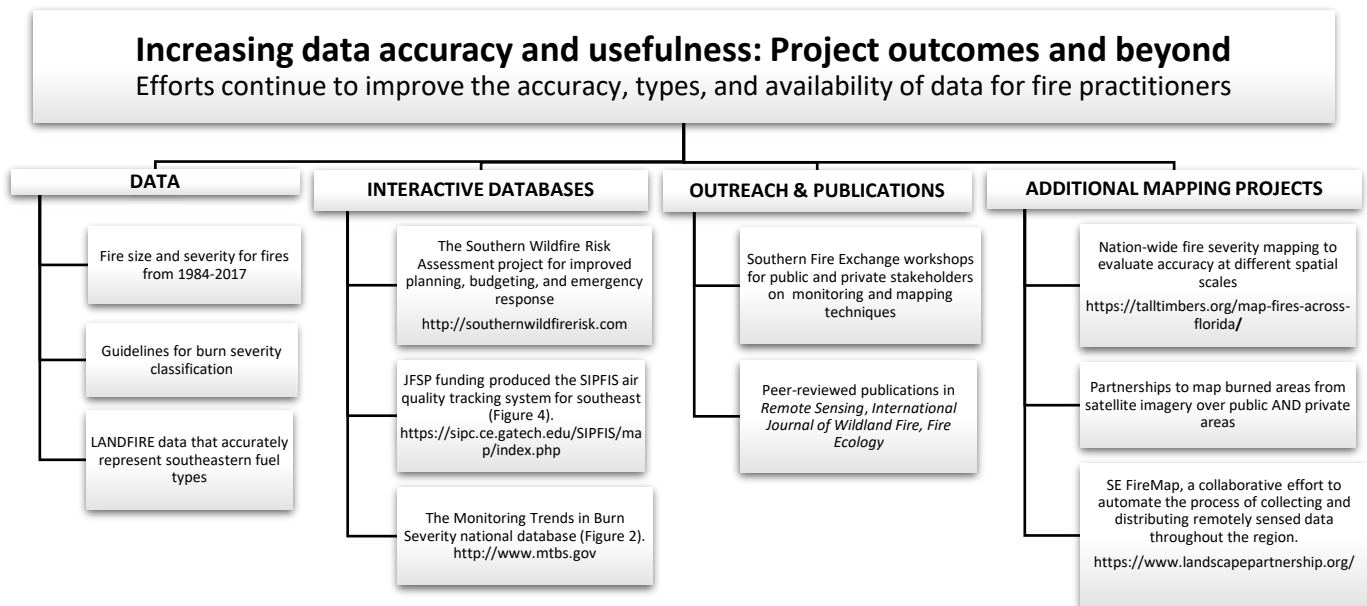
## Case Study: Burn Severity Mapping

Historically, burn severity mapping techniques were mostly applied to western U.S. ecosystems. In 2006, the JFSP funded a team of scientists from Tall Timbers Research Station and the U.S. Geological Survey to develop new satellite-based methods for mapping burn severity in the southeastern U.S. The research team evaluated the accuracy of existing satellite-derived burn severity mapping techniques and modified these techniques specifically for southeastern vegetation types.



**Figure 2.** Fire perimeter and severity data from 1984-2017 near Tallahassee, Florida, from the MTBS (Monitoring Trends in Burn Severity) data explorer ([www.mtbs.gov](http://www.mtbs.gov)). In this example, each pixel displays data corresponding to the year of highest severity for that pixel.

This research was the first in a series of efforts to increase the availability and accuracy of fire size and severity mapping in the southeast. These efforts culminated in revised mapping guidelines and data at [www.mtbs.gov](http://www.mtbs.gov).





**Figure 3.** The southeast uses more prescribed fire than any other region in the U.S. One use of remote sensing tools is to understand the patterns of prescribed fire use on private land.

## Connecting Practitioners with Mapping Tools

Since 2011, the Southern Fire Exchange has hosted events that connect land managers with new remote sensing tools. Events have covered the JFSP supported research on:

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

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

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

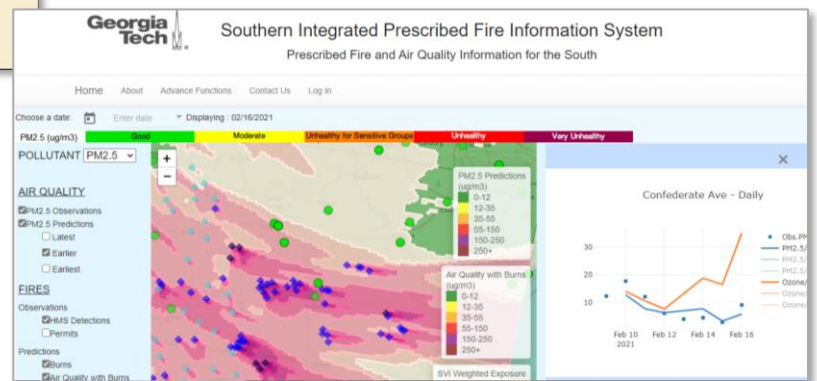
**Presenters**  
Dr. Talat Odman, Georgia Tech  
Dr. Fernando Garcia Menendez, NC State University

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

Georgia Tech | NC STATE UNIVERSITY | SOUTHERN FIRE EXCHANGE | UF IFAS UNIVERSITY OF FLORIDA

Webinars on the Monitoring Trends in Burn Severity (MTBS), LANDFIRE, and SIPPIS databases are available at: <https://southernfireexchange.org/events/archived-webinars/gis-and-mapping/>

**Figure 4.** The Southern Integrated Prescribed Fire Information System (SIPPIS) was developed by Georgia Tech and North Carolina State University through a research grant from the JFSP. SIPPIS maps the observed and predicted impacts of wildland fire smoke across the state of Georgia. The Southern Fire Exchange supported the project through science delivery programs.



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.

