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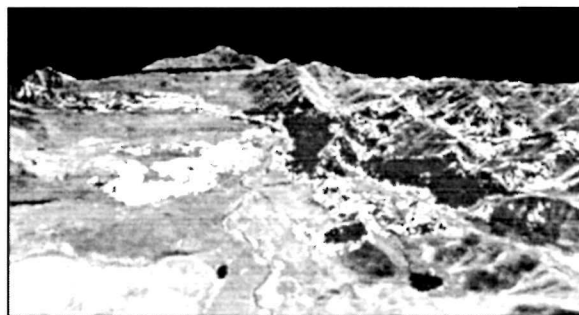
## Fire Management Program Center

*Monitoring Trends in Burn Severity: NPS Providing Leadership and Support for Interagency Burn Severity Mapping*

Recently the Wildland Fire Leadership Council (WFLC) adopted a strategy to monitor the effectiveness of the National Fire Plan (NFP) and the Healthy Forests Restoration Act (HFRA). One component of this strategy is to assess the environmental impacts of large wildland fires and identify the trends in burn severity across the United States.

Over the past several years, United States Geological Survey – Earth Resources Observation & Science (USGS/EROS), United States Geological Survey – Biological Resources Division (USGS/BRD) and the National Park Service (NPS) have cooperated to produce and deliver burn severity mapping products for national parks and other land management agencies. Because of the strength of this working relationship, these groups took on the leadership role to develop Monitoring Trends in Burn Severity (MTBS) with USDA Forest Service - Remote Sensing Applications Center (USFS RSAC) to support the WFLC monitoring strategy.

This project will map and assess burn severity for all historical and current large fires using Landsat satellite imagery and the differenced Normalize Burn Ratio algorithm. EROS and RSAC will assess burn severity for all fires greater than 500 acres in the eastern United States, and greater than 1000 acres in the West that have occurred since 1984.



*Glacier National Park.*

### Examples of Field Use of NBR Burn Severity Assessments:

1. Used to update fuels layers at Grand Teton, Glacier, Grand Canyon, Yosemite, Lassen Volcano, Jewel Cave, and national parks of Alaska.
2. Used to identify potential areas where fire has impacted culture resources.
3. Used to help Grand Canyon National Park natural resources staff understand the impact and the mosaic of their recent wildland fire use fires in relation to spotted owl habitat.
4. Used in Grand Teton National Park and Bridger-Teton National Forest for lynx habitat analysis.
5. Used to develop "crown fire risk trends and mapping zones" for the application of improving firefighter safety through increasing "situational awareness of crown fire potential" in the Salmon River country of Idaho.
6. Used in national parks of Alaska to refine and improve final fire perimeters and provide baseline information to assess the effects of climate change over time.
7. Used as part of a NASA project to predict locations of invasive species in national parks.

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# Fire Effects Monitoring Tools

Building on the National Park Service's FEAT software and Joint Fire Science Program's FIREMON application, NPS and their business partners, Systems for Environmental Management, Commonthread Inc., and Spatial Dynamics are developing the FFI (FEAT/FIREMON integration) tool. FFI is designed to be a single-source tool that all agencies can use for modeling, assessment, and reporting of fire effects.



- ♦ *FFI* (FEAT/FIREMON Integration)
- ♦ *FEAT* (Fire Ecology Assessment Tool)
- ♦ *FIREMON* (Fire Effects Monitoring and Inventory Tool)
- ♦ *Protocol Manager*

## FFI

FEAT-FIREMON Integration

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A multi-agency development project, FFI integrates FEAT and FIREMON into a single software tool. The integration of each system's unique functions will create an enhanced monitoring tool to accommodate data collection and support cooperative, interagency data management and information sharing. The FFI project is led by the National Park Service.

- ♦ Supports monitoring for federal land management agencies at the field and research level.
- ♦ Fully scalable from the site level to the landscape level.
- ♦ Exchanges data with LANDFIRE, FRCC, and the Burn Severity (dNBR) Atlas.
- ♦ Supports other natural resource applications, such as satellite imagery classification, vegetation, aquatic habitat, fisheries, and wildlife monitoring.

**FEAT**

**FIREMON**  
Fire Effects Monitoring and Inventory System



**SPATIAL  
DYNAMICS**

For more information, visit [forum.spatialdynamics.com/](http://forum.spatialdynamics.com/) and [www.fire.org/firemon](http://www.fire.org/firemon)  
 In the near future, the FFI site will be available at [frames.nbii.gov](http://frames.nbii.gov)

**commonthread  
incorporated**



## Briefing Paper

**Date:** November 28, 2005

**Prepared by:** Nate Benson, Fire Ecologist

**Topic:** Monitoring Trends in Burn Severity – Meeting WFLC Module 2 Requirement

This project is designed to map burn severity of recent and future fires using the Differenced Normalized Burn Ratio approach at 30m spatial resolution for all fires that are 500 acres or greater for eastern states and 1,000 acres or greater for the rest of the US. Fires larger than the minimum area represent less than 2% of total number of fires but approximately 92% of total area burned.

### Major Deliverables

1. Data products: map products of burn severity estimates, fire perimeters, tabular data summarizing acres burned by severity classes and by vegetation cover types (when available from LANDFIRE), and tabular data of burn severity trends stratified by fuel treatment projects and other socio-economic stratifications.
2. Reporting: annual analysis and reporting of acres burned by severity classes and other stratifications.
3. Data distribution: map products distributed to field users via web-based map servers, data and map products archived permanently at existing USGS facilities.
4. Technology transfer: documentation, training workshops, web-based training modules, as well as peer-reviewed journal publications of analysis and findings.

### Intended Uses

1. National policies and policy makers such as the National Fire Plan and WFLC, which require information about trends in burn severity, vegetation types, fuel models, condition classes, and results and accomplishments (data from NFPORS).
2. Field management units that benefit from GIS-ready maps and data for pre- and post-fire management decisions and monitoring.
3. Existing databases such as FRCC and LANDFIRE can integrate burn data produced at compatible spatial scale for validation and updating purposes.

### Budget

Schedule and costs for 1982-2010 time period.

Time period funding options	Number of years mapped	Total cost	Average cost by year	Project duration	Project years	Annual funding
1982-2010	29	7,871,600	271,434	2006-2011	6	USFS: 655,967 DOI: 655,967

### Key Milestones

- 2006-2010 fires: mapped and reported annually by 3<sup>rd</sup> Quarter of following fiscal year.
- 2000-2005 fires: mapped and reported by 3<sup>rd</sup> Quarter of FY 2008
- 1982-1999 fires: mapped and reported by 2<sup>nd</sup> Quarter of FY 2011