



An Overview of the Composite Burn Index (CBI) and the Feat/Firemon Integrated (FFI) Database

An Overview of the Monitoring Trends in Burn Severity (MTBS) Project and Field-Based Burn Severity Assessment

02/06/2013

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Presentation Overview

- Burn Severity
- Composite Burn Index Overview
- CBI Example
- Managing CBI data within FFI
- MTBS Data Validation



Definition of Burn Severity



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Burn Severity at a Landscape Level

Overstory

Big Trees

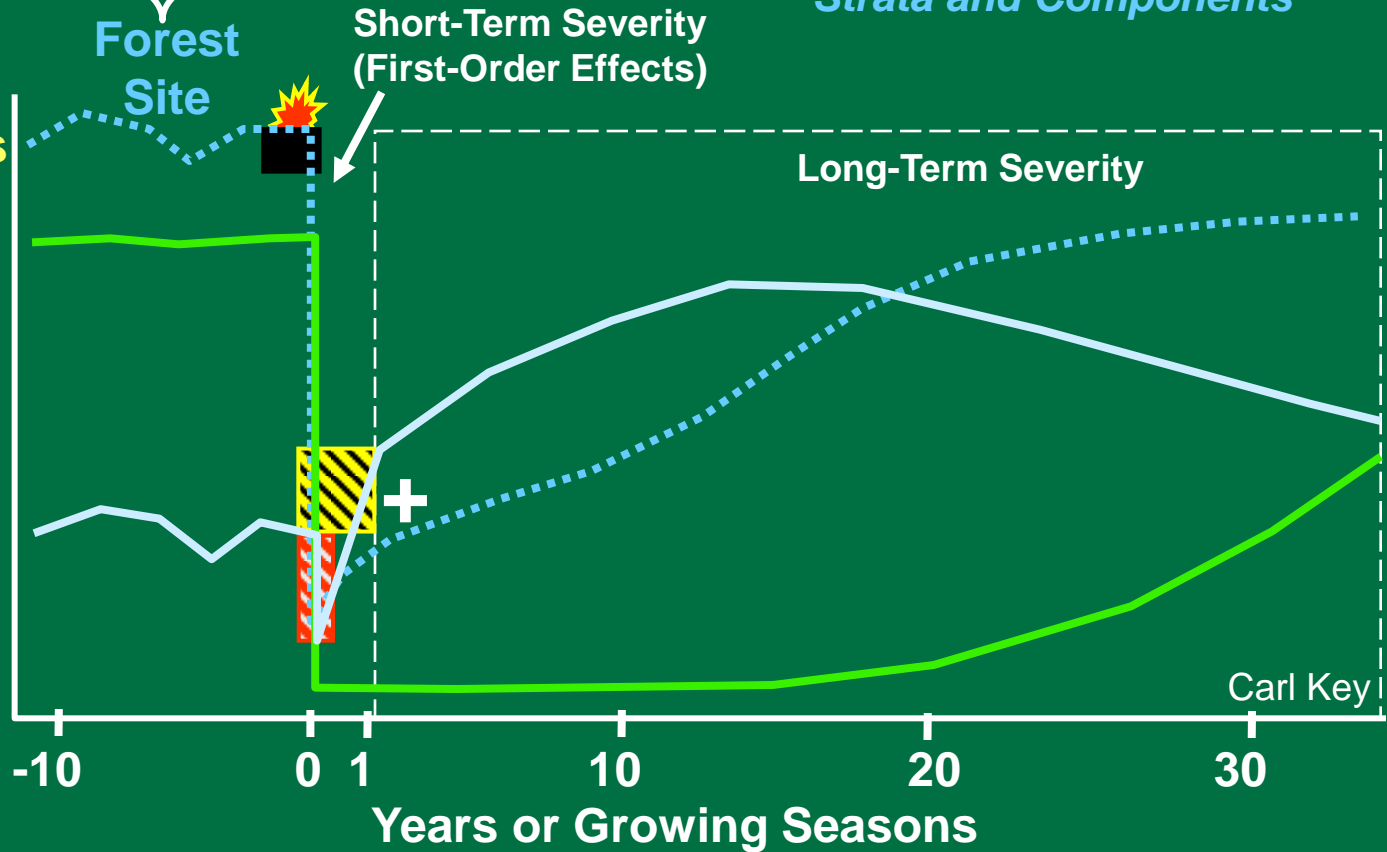
Mid-Trees

Understory

Soil, litter, Duff, Fuels,
Herbs, Shrubs

Aggregate of Many Responses - Over Area, Strata and Components

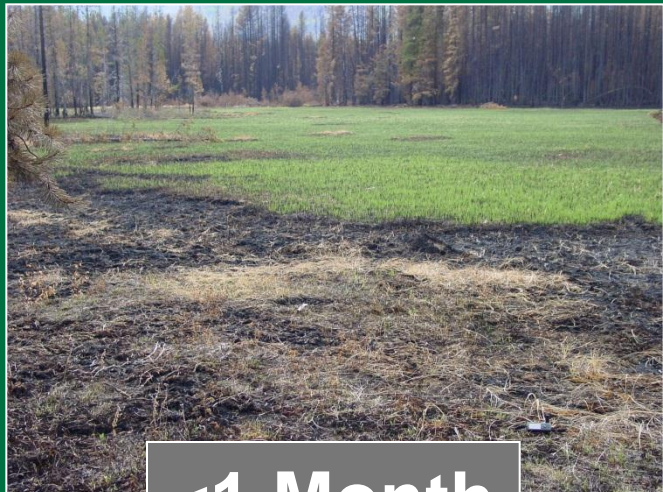
Response
 Green Biomass
 Char, Scorch
 Consumption
 Survivorship
 Mortality
 Species
 Composition
 Colonizers
 Productivity
 etc.



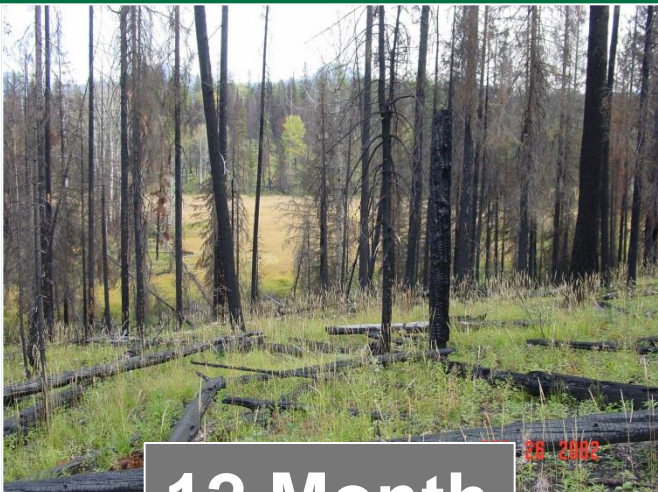
Carl Key



Time Since Fire



<1 Month



12 Month



Carl Key



CBI-Forensic Ecology



Carl Key

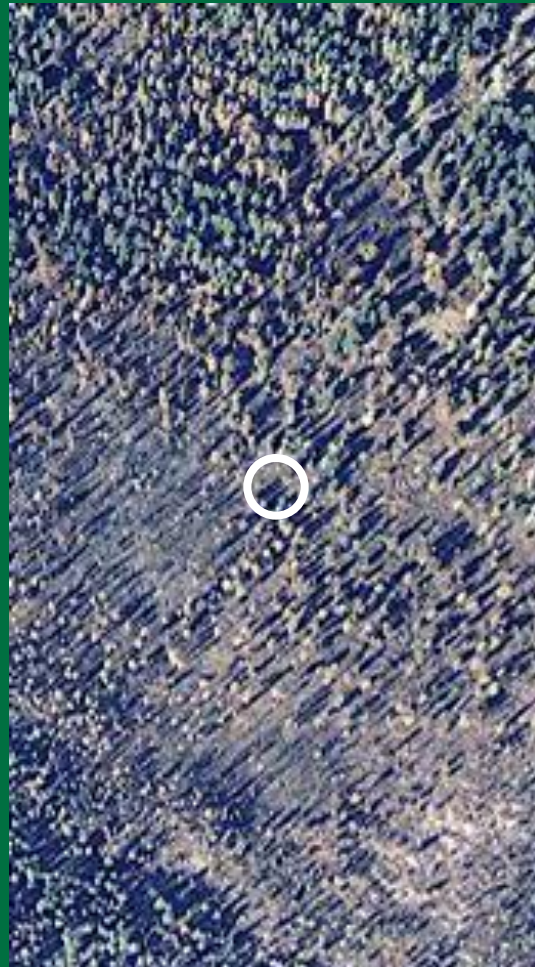


CBI-Spatial Resolution

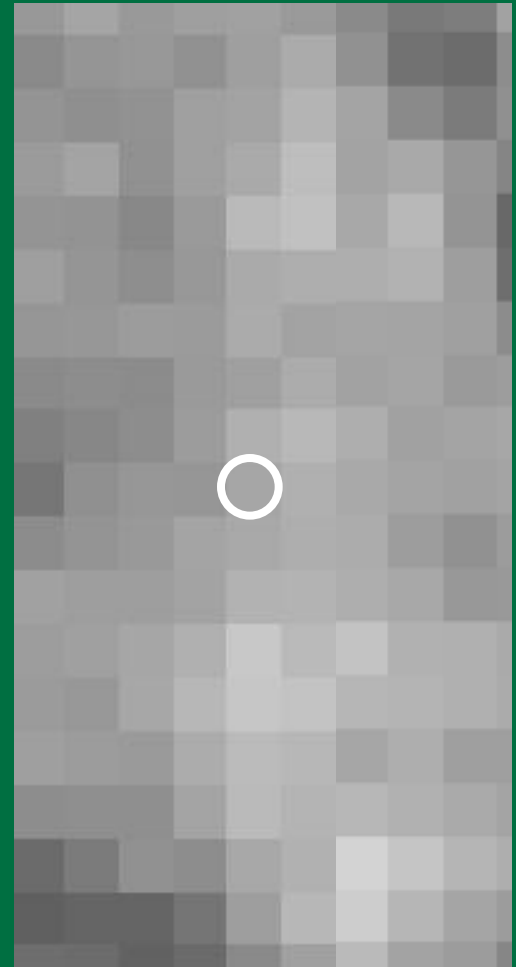


Carl Key

Plot level



0.3 to 1 meter



30 meter dNBR



CBI-Components

- Burn Index: 0-3
 - 0-Unburned
 - 3-Severe Burn

- Five Strata
 - 4-5 Ratings Factors
 - Ryan and Noste 1985
 - Landsat
 - Averaged

FIREMON LA Form

BURN SEVERITY -- COMPOSITE BURN INDEX (BI)

PD - Abridged		Examiners:		Fire Name:	
Registration Code		Project Code		Plot Number	
Field Date mm/dd/yyyy	/ /	Fire Date mm/yyyy	/ /	UTM Zone	
Plot Aspect		Plot % Slope		UTM Datum	
Plot Diameter Overstory		UTM E plot center		GPS Error (m)	
Plot Diameter Understory		UTM N plot center			
Number of Plot Photos		Plot Photo IDs			

BI - Long Form	% Burned 100 feet (30 m) diameter from center of plot =					Fuel Photo Series =
STRATA						
BURN SEVERITY SCALE						
RATING FACTORS	No Effect	Low	Moderate	High	FACTOR SCORES	
	0.0	0.5	1.0	1.5	2.0	2.5 3.0

A. SUBSTRATES

% Pre-Fire Cover: Litter		Duff	Soil/Rock	Pre-Fire Depth (inches)	Litter	Duff	Fuel Bed	
Litter: Light/Fuel Consumed	Unchanged	--	50% litter	--	100% litter	>80% light fuel	98% Light Fuel	Σ =
Duff	Unchanged	--	Light char	--	50% loss deep char	--	Consumed	N =
Medium Fuel, 3-8 in.	Unchanged	--	20% consumed	--	40% consumed	--	>40% loss, deep ch	
Heavy Fuel, > 8 in.	Unchanged	--	10% loss	--	25% loss, deep char	--	>40% loss, deep ch	X =
Soil & Rock Cover/Color	Unchanged	--	10% change	--	40% change	--	>80% change	

B. HERBS, LOW SHRUBS AND TREES LESS THAN 3 FEET (1 METER):

Pre-Fire Cover		% Enhanced Growth						
% Foliage Altered (tbl-btm)	Unchanged	--	30%	--	80%	95%	100% + branch loss	Σ =
Frequency % Living	100%	--	90%	--	50%	<20%	None	N =
Colonizers	Unchanged	--	Low	--	Moderate	High-Low	Low to None	
Sp. Comp. - Rel. Abund.	Unchanged	--	Little change	--	Moderate change	--	High change	X =

C. TALL SHRUBS AND TREES 3 TO 16 FEET (1 TO 5 METERS):

Pre-Fire Cover		% Enhanced Growth						
% Foliage Altered (tbl-btm)	0%	--	20%	--	60-90%	>95%	Significant branch loss	Σ =
Frequency % Living	100%	--	90%	--	30%	<15%	<1%	N =
% Change in Cover	Unchanged	--	15%	--	70%	90%	100%	
Sp. Comp. - Rel. Abund.	Unchanged	--	Little change	--	Moderate change	--	High Change	X =

D. INTERMEDIATE TREES (SUBCANOPY, POLE-SIZED TREES)

Pre-Fire % Cover		Pre-Fire Number Living		Pre-Fire Number Dead				
% Green (Unaltered)	100%	--	80%	--	40%	<10%	None	Σ =
% Black (Torch)	None	--	5-20%	--	60%	>85%	100% + branch loss	N =
% Brown (Scorch/Girdle)	None	--	5-20%	--	40-80%	<40 or >80%	None due to torch	
% Canopy Mortality	None	--	15%	--	60%	80%	%100	X =
Char Height	None	--	1.5 m	--	2.8 m	--	> 5 m	

Post Fire: %Girdled = %Felled = %Tree Mortality =

E. BIG TREES (UPPER CANOPY, DOMINANT, CODOMNANT TREES)

Pre-Fire % Cover		Pre-Fire Number Living		Pre-Fire Number Dead				
% Green (Unaltered)	100%	--	95%	--	50%	<10%	None	Σ =
% Black (Torch)	None	--	5-10%	--	50%	>80%	100% + branch loss	N =
% Brown (Scorch/Girdle)	None	--	5-10%	--	30-70%	<30 or >70%	None due to torch	
% Canopy Mortality	None	--	10%	--	50%	70%	%100	X =
Char Height	None	--	1.8 m	--	4 m	--	> 7 m	

Post Fire: %Girdled = %Felled = %Tree Mortality =

Community Notes/Comments:		CBI = Sum of Scores / N Rated:	Sum of Scores	N Rated	CBI
		Understory (A+B+C)			
		Overstory (D+E)			
		Total Plot (A+B+C+D+E)			

% Estimates: 20 m Plot: 314 m² 1% = 1x3 m 5% = 3x5 m 10% = 5x6 m After: Key and Bostom 1999; USGS NRMBS; Glacier Field Station
30 m Plot: 707 m² 1% = 1x7 m (=2x4 m) 5% = 5x7 m 10% = 7x10 m Version: 4.0 8/27/2004

Strata and Factors are defined in FIREMON Landscape Assessment, Chapter 2, and on accompanying BI "cheatsheet." www.fim.org/firemon/1c.htm



CBI Example-Understory Strata



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Substrates

		<u>Score</u>
Average: 2.6	Litter/Light Fuels	2.7
	Duff	2.6
	Medium Fuels	2.3
	Heavy Fuels	n/r
	Soil Cover/Color	2.9

Herbs/Low Shrubs

Average: 2.3	% Foliage Altered	n/r
	% Living/Resprouting	2.0
	Colonizers	2.2
	Species Composition	2.7

Tall Shrubs/Saplings

Average: 2.2	% Foliage Altered	2.8
	% Green (Unaltered)	2.8
	% Living/Resprouting	1.0
	Species Composition	2.0



CBI Example-Overstory Strata



Intermediate Trees/Subcanopy

Average: 1.9

	<u>Score</u>
% Green (Unaltered)	2.4
% Black (Torch)	1.0
% Brown (Scorch/Girdle)	2.0
% Canopy Mortality	2.0
Char Height	1.9



Big Trees/Upper Canopy

Average: 1.7

% Green (Unaltered)	2.3
% Black (Torch)	0.0
% Brown (Scorch/Girdle)	2.0
% Canopy Mortality	2.0
Char Height	2.4

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CBI Example-Average CBI Score



Understory Average:

2.4

Overstory Average:

1.8

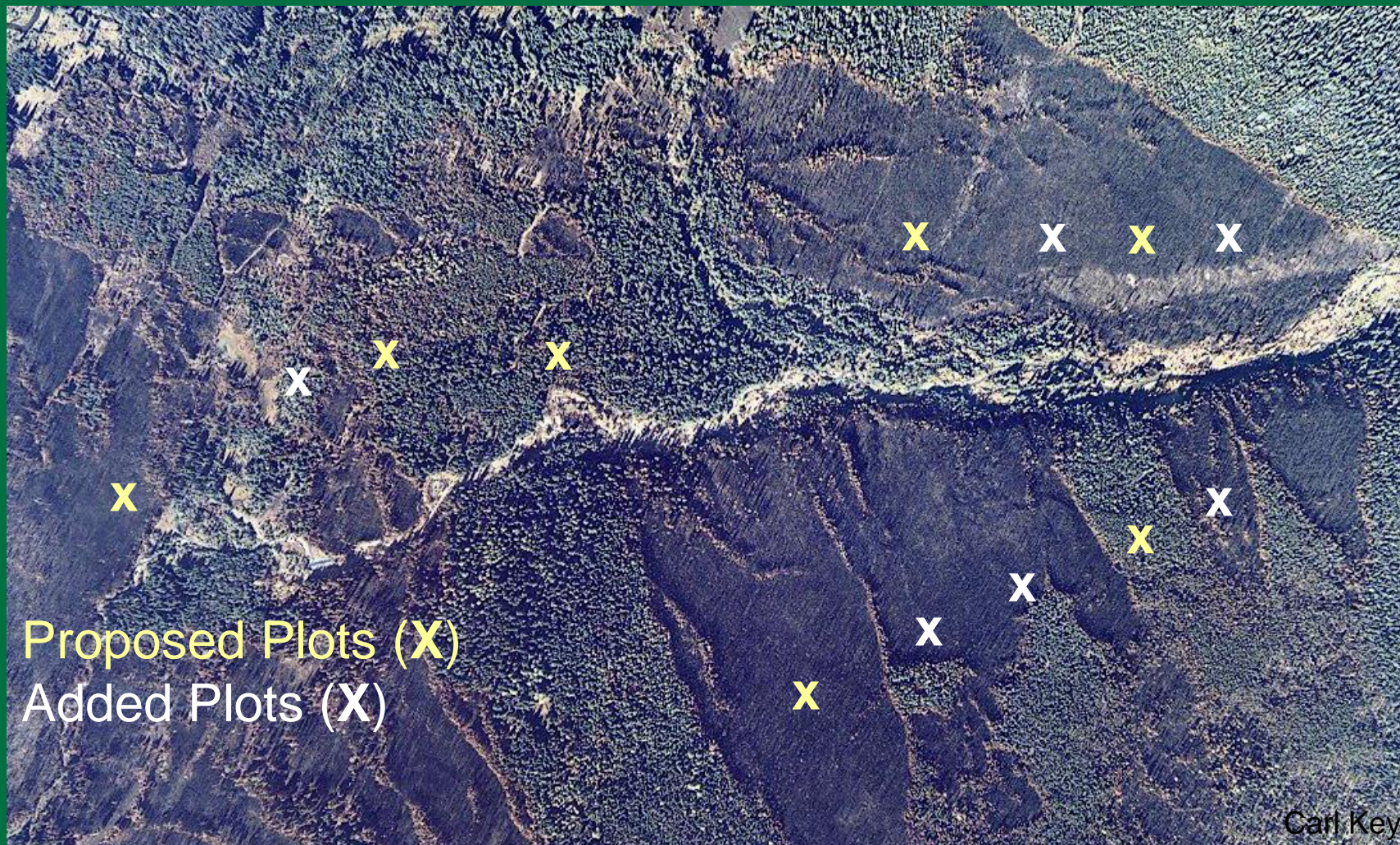
Overall Average:

2.1



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CBI-Site Selection



Keep in mind..

- Time affects observation
- 1st post-fire growing season
- Numeric ratings
- Averages spatial variation
- Fire effects weighted equally
- Observer bias
- Experience improves accuracy
- CBI is not a perfect measure

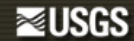


FFI Database-Website



Ecological Monitoring Utilities

Frames



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FRAMES Maintenance Announcement

FRAMES maintenance scheduled for March 3rd through March 6th!

FRAMES is undergoing a significant software upgrade this week. Between Thursday, March 3rd and Sunday, March 6th, those with MyFRAMES accounts will be locked out of their accounts. The public view of FRAMES will remain the same Thursday and Friday, then beginning Saturday the site will change to the upgraded view. We appreciate your patience during this transition and we apologize for the inconvenience. Beginning on Monday, March 7th if you notice any problems with the site, please report them to: contact_frames@nbii.gov

NEW!

Upcoming Training Classes

In conjunction with the Southern Area Advanced Fire and Aviation Academy
Chattanooga, TN

June 13 - June 16, 2011

Open to all agencies and locations. Get more information [here](#).

FFI: Ecological Monitoring Utilities



Read the [FFI Overview](#)

FFI (FEAT/FIREMON Integrated) is a monitoring software tool designed to assist managers with collection, storage and analysis of ecological information. It was constructed through a complementary integration of the Fire Ecology Assessment Tool (FEAT) and FIREMON. FFI was funded by the National Interagency Fuels Coordination Group and developed in cooperation with the National Park Service, U.S. Forest Service, Systems for Environmental Management and Spatial Dynamics.

http://frames.nbii.gov/portal/server.pt?open=512&objID=483&mode=2&in_hi_userid=2&cached=true0



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FFI Manuals and Software

FFI Manuals

FFI User Guide - Most users will want to download this document. Includes FFI and SQL Server installation instructions

PDF (14MB): [FFI_UG_March2010.pdf](#)

HTML (66MB): [FFI_UG_March2010.chm](#)

Protocol Manager User Guide - Download only if using Protocol Manager to create protocols or manage protocol files

PDF (17MB): [FFI-PM_June2008.pdf](#)

HTML (19MB): [FFI-PM_June2008.chm](#)

GIS Module User Guide - Included with the GIS installer below

PDA Field Handbook - Download only if using a PDA to collect FFI data

PDF (2MB): [FFI-PDA_June2008.pdf](#)

FFI Software Installation Files & Training data

To use the FFI monitoring software you will need to download and install: 1) *FFI Install Package for Windows XP/Windows 7* and 2) *Microsoft SQL Server Express 2005 Edition SP3*. If you want to use the FFI GIS utility then download and install the files in *FFI GIS Installers and User Guide*. If attending a FFI training class or if you wish to have a practice dataset available for your use download the *FFI Training Dataset*.

Download the files to a temporary directory on your hard drive. Installation instructions for FFI and SQL are available in the *FFI User Guide* posted above.

General instructions for upgrading to FFI v1.04.01 - Use only when updating to the new version of FFI

[FFI upgrade installation instructions v1.04.01](#)

Microsoft SQL Server Express 2005 Edition SP3 32-bit (36MB): [SQLEXP32.EXE](#)

Microsoft SQL Server Express 2005 Edition SP3 64-bit (56MB): [SQLEXP32.EXE](#)

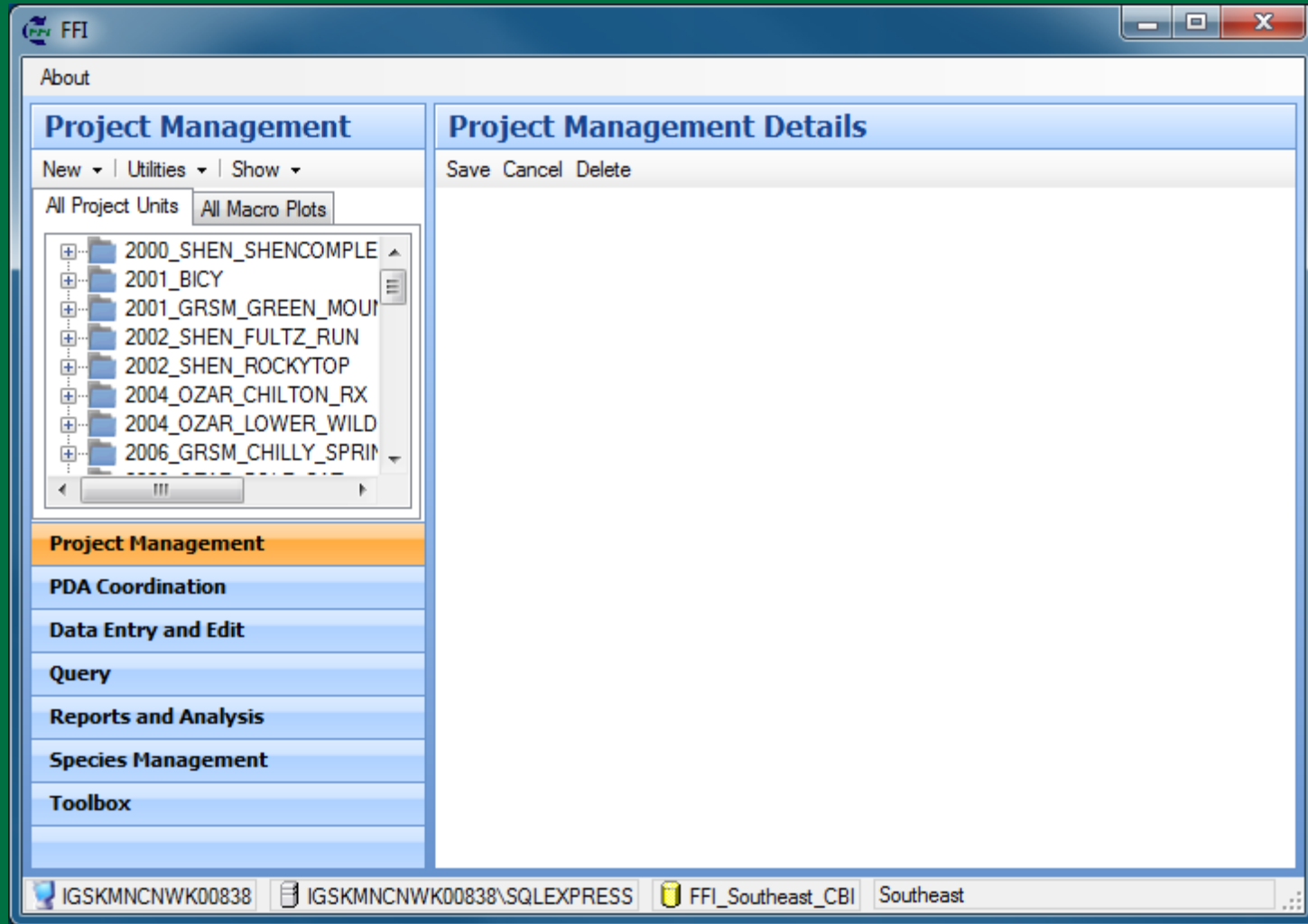
FFI Install Package for Windows XP/Windows 7 (21MB): [FFIv10401.zip](#)

FFI Training Dataset (12MB): [FFI_TrainingData_v10401.zip](#)

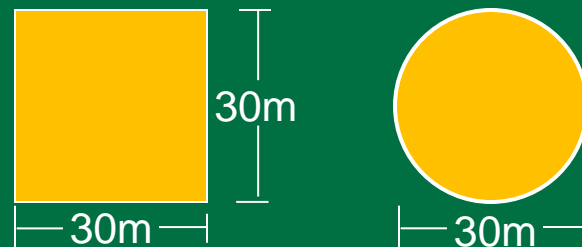
FFI GIS Installers and User Guide (4MB): [FFI GIS Installers and User Guide.zip](#)



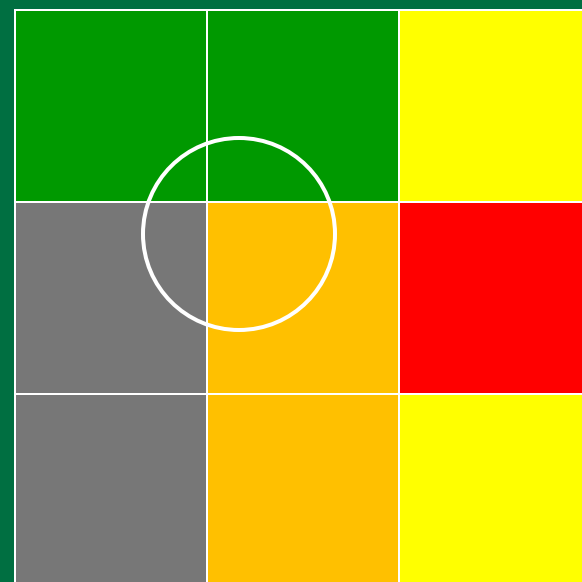
FFI Database-Demo



Burn Severity Comparison

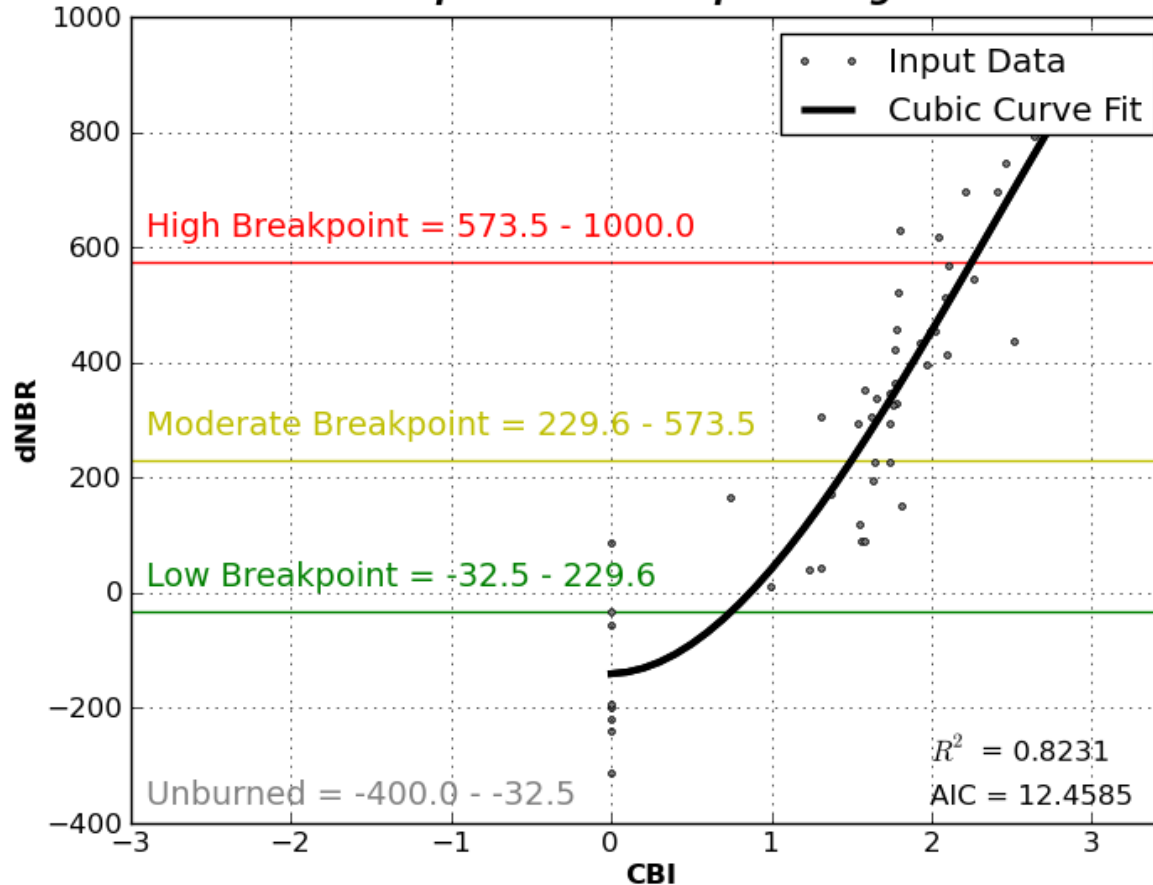


Severity	dNBR
Unburned	-100 - 99
Low	99 - 269
Low-Moderate	269 - 439
Moderate-High	439 - 659
High	659 - 1300



CBI versus dNBR-Thresholding

CBI Versus dNBR in Depression Swamps During the Dormant Season



Questions ?

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