



# LANDFIRE'S ROLE IN FUEL TREATMENTS AND WILDFIRE RISK ASSESSMENTS

Megan Sebasky



# PULSE OF THE ROOM

Who manages land?

How many acres do you manage?

How many are “fire adapted”?

How many of you manage a fire use program?

How many burns do you have on your land in a given year?

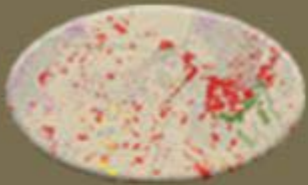
How many are concerned about fire risk from your lands?



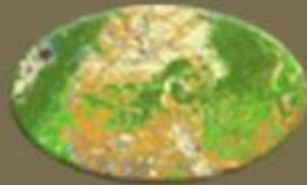
# OUTLINE

- What is LANDFIRE
- Fuels management applications
- Wildfire risk assessment applications
- Remap production update
- Remap data examples

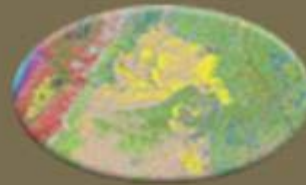
# LANDFIRE DATA PRODUCTS



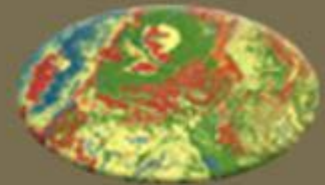
**Disturbance**



**Vegetation**



**Fuel**



**Fire Regime**

Disturbance -2 yr.  
Cycle

Existing Vegetation:  
Cover, Height, Type  
Biophysical Settings  
Environmental Site  
Potential

FBFM13  
FBFM40  
Canopy: Height, Bulk  
Density, Base Height,  
Cover

Fire Regime Group  
Mean Fire Interval  
% Low, Mixed, High  
Severity  
Succession Classes  
Veg. condition class  
Veg. departure

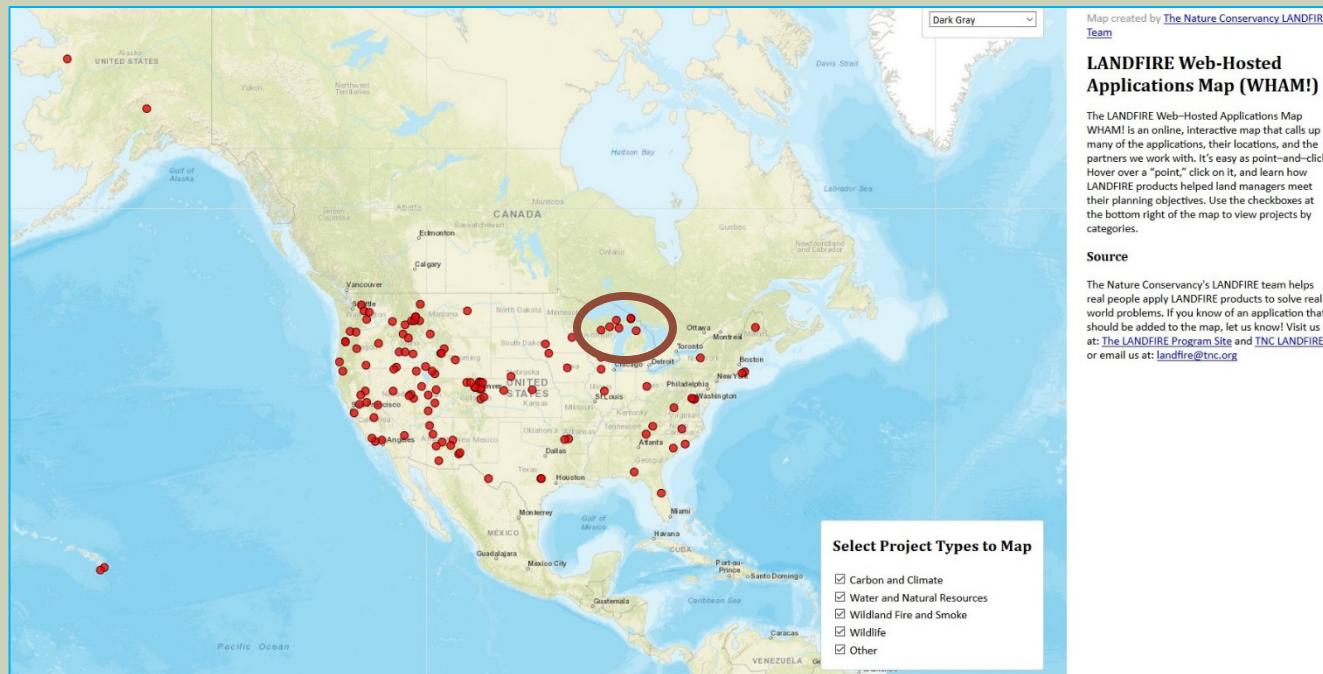
# LANDFIRE DATA USES

## ■ FIRE

- Behavior modeling
- Planning fuel treatments
- Risk assessment
- Management of ongoing fires

## ■ Non-FIRE

- Habitat mapping
- Carbon cycling
- Sustainable forestry practices
- Watershed management



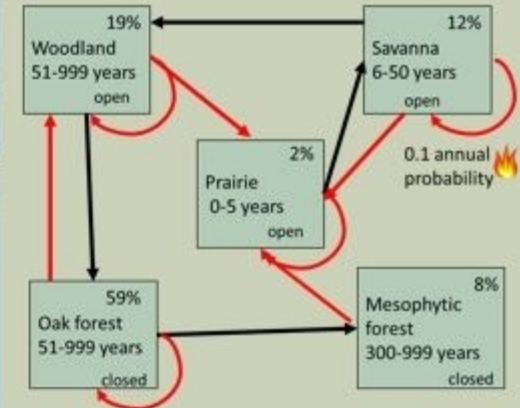
# LF AND FUELS MANAGEMENT

- Planning
  - Landscape evaluations, ecoregional assessments, and strategic outcomes/impacts
  - National Environmental Policy Act - review and assessment
  - Pre effects
  
- Reporting
  - Post Effects / change
  - Accomplishments / performance measures / effectiveness

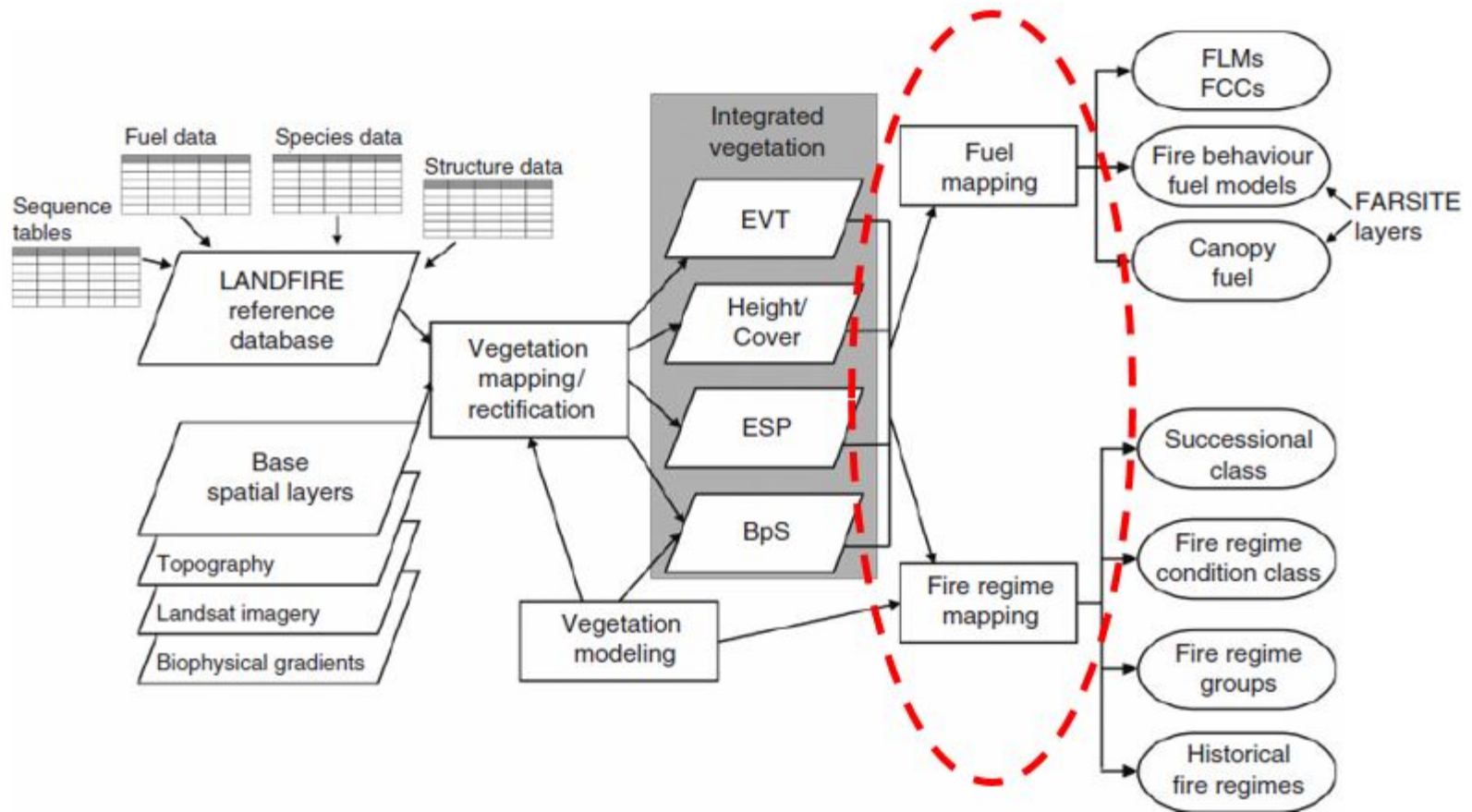


# WHAT IS LANDFIRE?

Partnership between DOI, USFS, and TNC aimed to characterize fire, fuels, and vegetation conditions across the country.

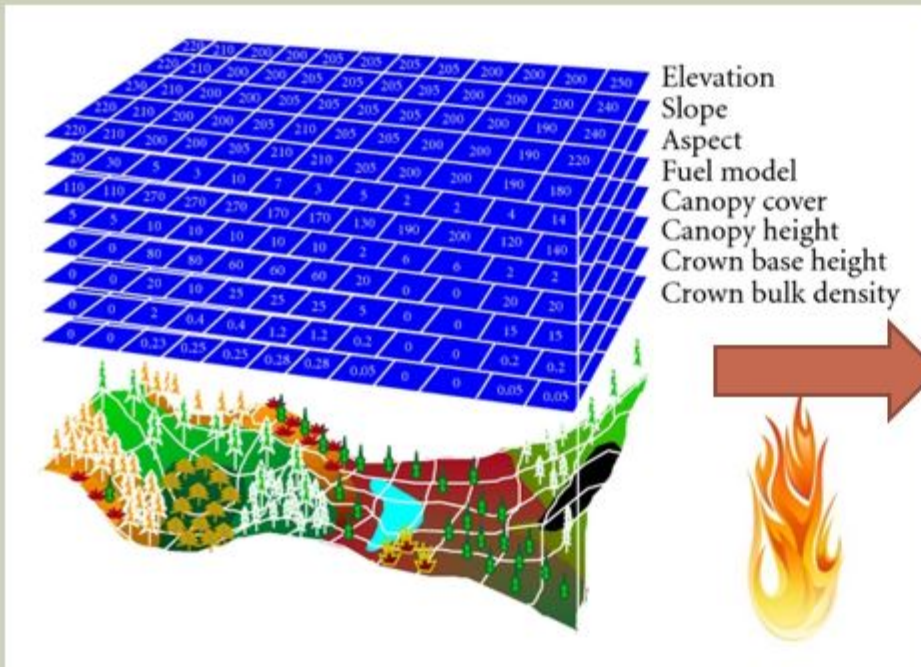


# DATA PRODUCTS ARE INTERCONNECTED





# LANDFIRE DATA AND FIRE MODELING



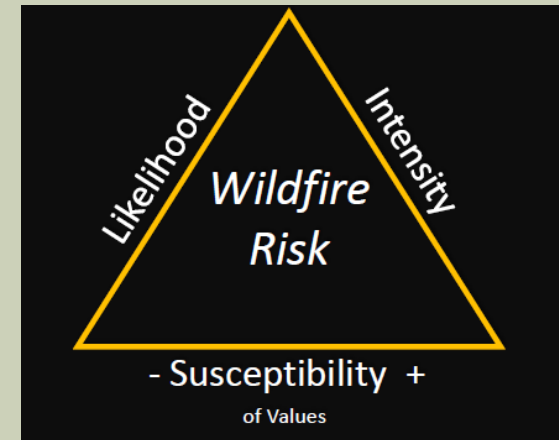
## Fire Behavior Modeling

- FlamMap
- FSim
- FARSITE
- FSPRO
- WFDSS
- IFTDS

## Fire behavior estimations to develop:

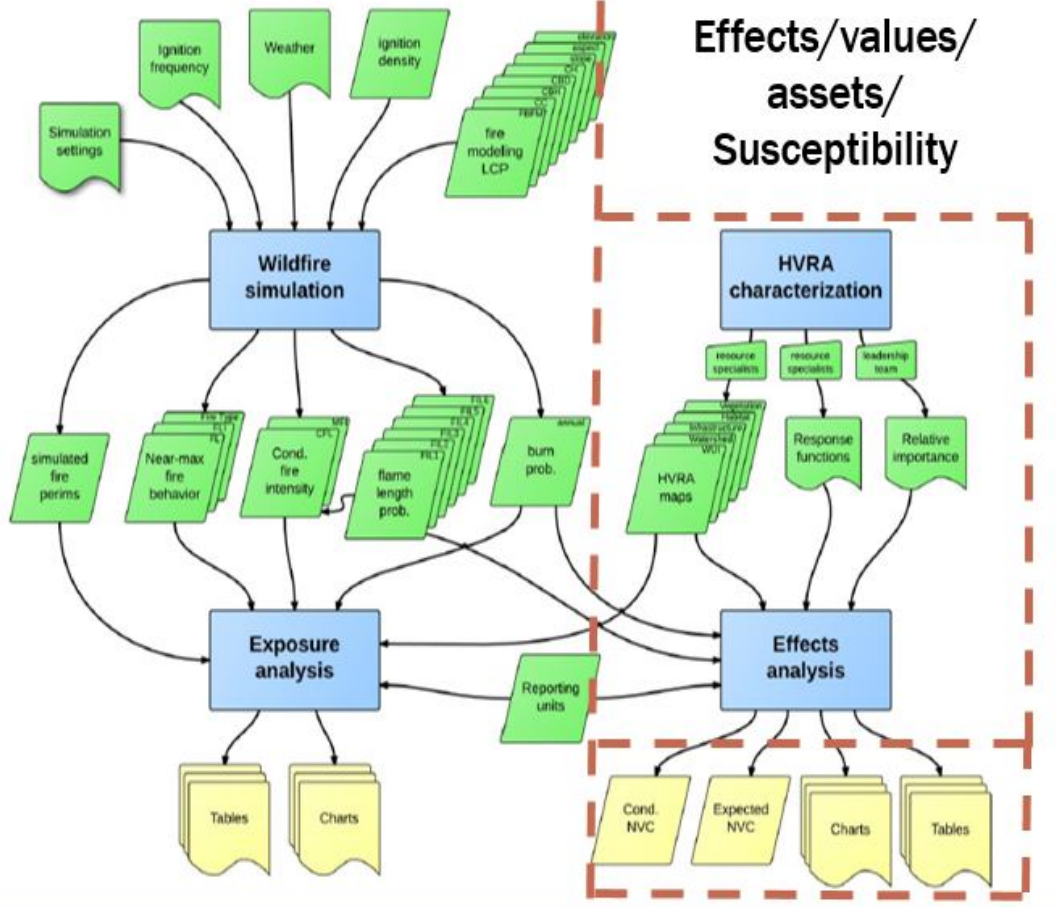
- Fuels management outcomes
- Risk scenarios

# WILDFIRE RISK ASSESSMENT OVERVIEW

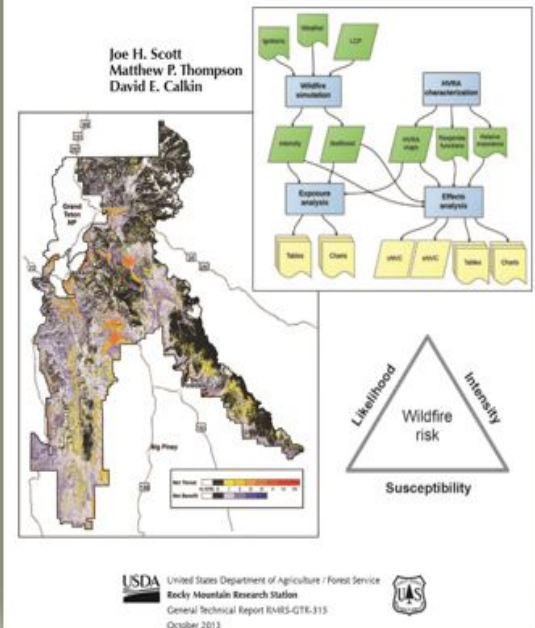


# WILDFIRE RISK ASSESSMENT

## Hazard/Exposure



## A Wildfire Risk Assessment Framework for Land and Resource Management



GTR-315

RISK (eNVC & cNVC)





COMMISSION FOR ENVIRONMENTAL COOPERATION  
COMISION PARA LA COOPERACION AMBIENTAL  
COMMISSION DE COOPERATION ENVIRONNEMENTALE



Canada  
United States of America  
Estados Unidos Mexicanos

Three countries working together to map our shared environment.  
Tres países trabajando juntos para cartografiar nuestro medio ambiente.  
Trois pays s'unissent pour cartographier notre environnement à tous.

### ECOLOGICAL REGIONS OF NORTH AMERICA

### REGIONES ECOLÓGICAS DE AMÉRICA DEL NORTE

### RÉGIONS ÉCOLOGIQUES DE L'AMÉRIQUE DU NORD

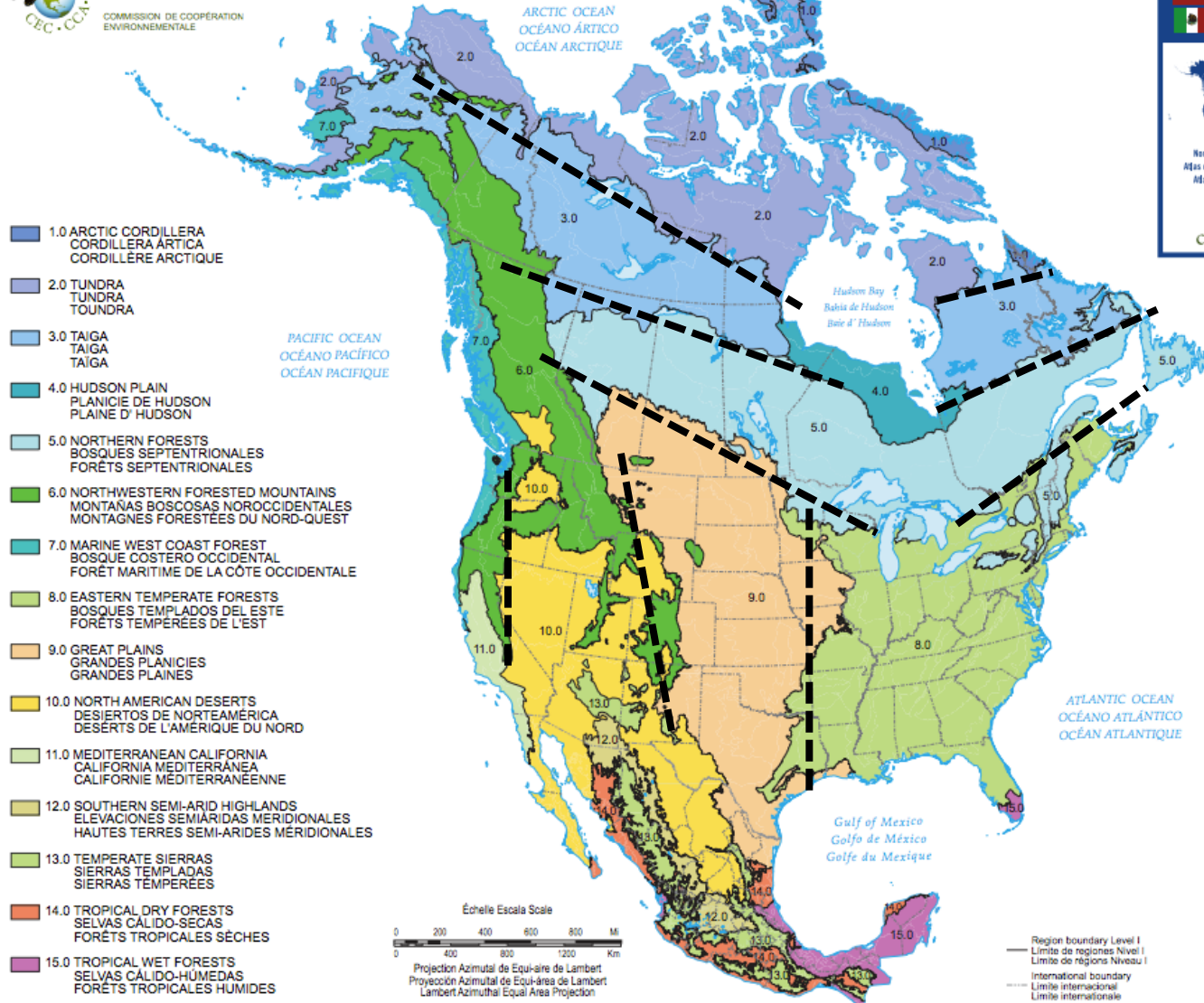
North American Atlas  
Atlas de América del Norte  
Atlas nord-américain

Level I    Nivel I    Niveau I

Produced in partnership with:    Elaborado en colaboración con:    Réalisé en partenariat avec:

Canada    nationalatlas.gov    INEGI

cec.org    atlas.gc.ca    nationalatlas.gov    www.inegi.gob.mx



- 1.0 ARCTIC CORDILLERA  
CORDILLERA ÁRTICA  
CORDILLÈRE ARCTIQUE
- 2.0 TUNDRA  
TUNDRA  
TOUNDRA
- 3.0 TAIGA  
TAIGA  
TAÏGA
- 4.0 HUDSON PLAIN  
PLANICIE DE HUDSON  
PLAINE D'HUDSON
- 5.0 NORTHERN FORESTS  
BOSQUES SEPTENTRIONALES  
FORÊTS SEPTENTRIONALES
- 6.0 NORTHWESTERN FORESTED MOUNTAINS  
MONTAÑAS BOSCOSAS NOROCCIDENTALES  
MONTAGNES FORESTÉES DU NORD-OUEST
- 7.0 MARINE WEST COAST FOREST  
BOSQUE COSTERO OCCIDENTAL  
FORÊT MARITIME DE LA CÔTE OCCIDENTALE
- 8.0 EASTERN TEMPERATE FORESTS  
BOSQUES TEMPLADOS DEL ESTE  
FORÊTS TEMPÉRÉES DE L'EST
- 9.0 GREAT PLAINS  
GRANDES PLANICIAS  
GRANDES PLAINES
- 10.0 NORTH AMERICAN DESERTS  
DESIERTOS DE NORTEAMÉRICA  
DESERTS DE L'AMÉRIQUE DU NORD
- 11.0 MEDITERRANEAN CALIFORNIA  
CALIFORNIA MEDITERRÁNEA  
CALIFORNIE MÉDITERRANÉENNE
- 12.0 SOUTHERN SEMI-ARID HIGHLANDS  
ELEVACIONES SEMI-ÁRIDAS MERIDIONALES  
HAUTES TERRES SEMI-ARIDES MÉRIDIIONALES
- 13.0 TEMPERATE SIERRAS  
SIERRAS TEMPLADAS  
SIERRAS TEMPÉRÉES
- 14.0 TROPICAL DRY FORESTS  
SELVAS CALIDO-SECAS  
FORÊTS TROPICALES SÈCHES
- 15.0 TROPICAL WET FORESTS  
SELVAS CALIDO-HÚMEDAS  
FORÊTS TROPICALES HUMIDES

Échelle Escala Scale  
0 200 400 600 800 1000 Miles  
0 400 800 1200 Kilometers  
Proyección Azimutal de Equi-área de Lambert  
Proyección Azimutal de Equi-área de Lambert  
Lambert Azimuthal Equal Area Projection

Region boundary Level I  
Limite de regiones Nivel I  
Limite de Regions Niveau I  
International boundary  
Limite internacional  
Limite internationale

Ecological regions are areas of general similarity in ecosystems and in the type, quantity and quality of environmental resources. They serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. They are effective for national and regional state of the environment reports, environmental resource inventories and assessments, setting regional resource management goals, determining carrying capacity, as well as developing biological criteria and water quality standards. The development of a clear understanding of regional and large continental ecosystems is critical for evaluating ecological risk, sustainability, and health.

Ecological classification is based on hierarchy—ecosystems are nested within ecosystems as trapped, although in reality, they may not always nest.

Such classification integrates knowledge; it is not an overlay process.

It recognizes that ecosystems are interactive—characteristics of one ecosystem blend with those of another.

Map lines depicting ecological classification boundaries generally coincide with the location of zones of transition.

The maps shown here represent a second attempt to hierarchically classify and map ecological regions across the North American continent (Commission for Environmental Cooperation Working Group, 1997). The mapping from 1997 and 2006 was built upon earlier efforts that had begun individually in all three countries (e.g. Wiken 1986, Omernik 1987). These approaches recognized the need to consider a full range of physical and biotic characteristics to explain ecosystem regions (Omernik 2004). Equally, they recognized that the relative importance of each characteristic varies from one ecological region to another regardless of the hierarchical level. In describing ecoregionization in Canada, Wiken (1986) stated:

*Ecological land classification is a process of delineating and classifying ecologically distinctive areas of the Earth's surface. Each area can be viewed as a discrete system which has resulted from the mesh and interplay of the geologic, landform, soil, vegetative, climatic, wildlife, water and human factors which may be present. The dominance of any one or a number of these factors varies with the given ecological land unit. This holistic approach to land classification can be applied incrementally on a scale related basis from very site-specific ecosystems to very broad ecoregions.*

Determining ecological regions at a continental level is a challenging task. It is difficult, in part, because North America is ecologically diverse and because a nation's territorial boundaries can be a hindrance to seeing and appreciating the perspectives across the land-mass of these continents. Developing and refining a framework of North American ecological regions has been the product of research and consultation between federal, state, provincial and municipal agencies. These agencies were often government departments, but the initiative also involved non-governmental groups, universities and institutes. The Commission for Environmental Cooperation (CEC) was instrumental in bringing these groups together. The CEC was established in 1994 by Canada, Mexico, and the United States to address environmental concerns common to the three countries. The CEC derives its formal mandate from the North American Agreement on Environmental Cooperation (NAAEC), the environmental side accord to the North American Free Trade Agreement (NAFTA).

These maps represent the working group's best consensus on the distribution and characteristics of major ecosystems on all three levels throughout the three North American countries. The methodology incorporated these points in mapping ecological regions:

- Ecological classification incorporates all major components of ecosystems: air, water, land, and biota, including humans.
- It is holistic ("the whole is greater than the sum of its parts").
- The number and relative importance of factors that are helpful in the delineation process vary from one area to another, regardless of the level of generalization.

Literature Cited:  
Commission for Environmental Cooperation Working Group, 1997. Ecological regions of North America - toward a common perspective. Montreal, Commission for Environmental Cooperation, 71 p.

McMahon, G., Omernik, S.M., Walman, S.W., Omernik, J.M., Thornau, E.B., Tregon, J.A., Hartz, A.H., and Keys, J.B., 2001. Developing a spatial framework of ecoregion ecological regions for the continental United States. Environmental Management, 28, no. 3, p. 293-316.

Omernik, J.M., 1987. Ecoregions of the conterminous United States (map supplement). Annals of the Association of American Geographers, v. 77, no. 1, p. 110-125, scale 1:7,500,000.

Omernik, J.M., 2004. Perspectives on the classification of ecological regions. Environmental Management, 34, Supplement 1, p. 427-438.

U.S. Environmental Protection Agency, 2006. Level III ecoregions of the continental United States (revision of Omernik, 1987). Corvallis, Oregon, USEPA - National Health and Environmental Effects Research Laboratory, various scales.

Wiken, E.B., 1986. Territorial ecoregions of Canada, Ontario, Environment Canada. Ecological Classification Series no. 15, 26 p.

Wiken, E.B., Gauthier, D., Marshall, J.B., Hironaka, H., 1994. A perspective on Canada: An overview of the terrestrial and marine environments. Canadian Council on Ecological Issues Paper No. 14, 95 p.

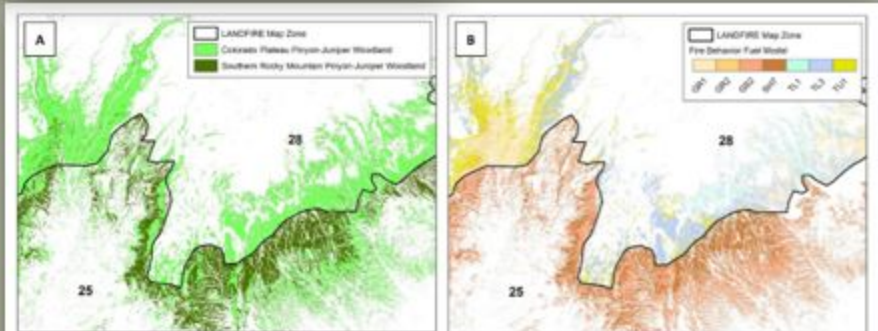
# NEED FOR LOCAL CALIBRATION

## Modifying LANDFIRE Geospatial Data for Local Applications

Version 1  
September 2016



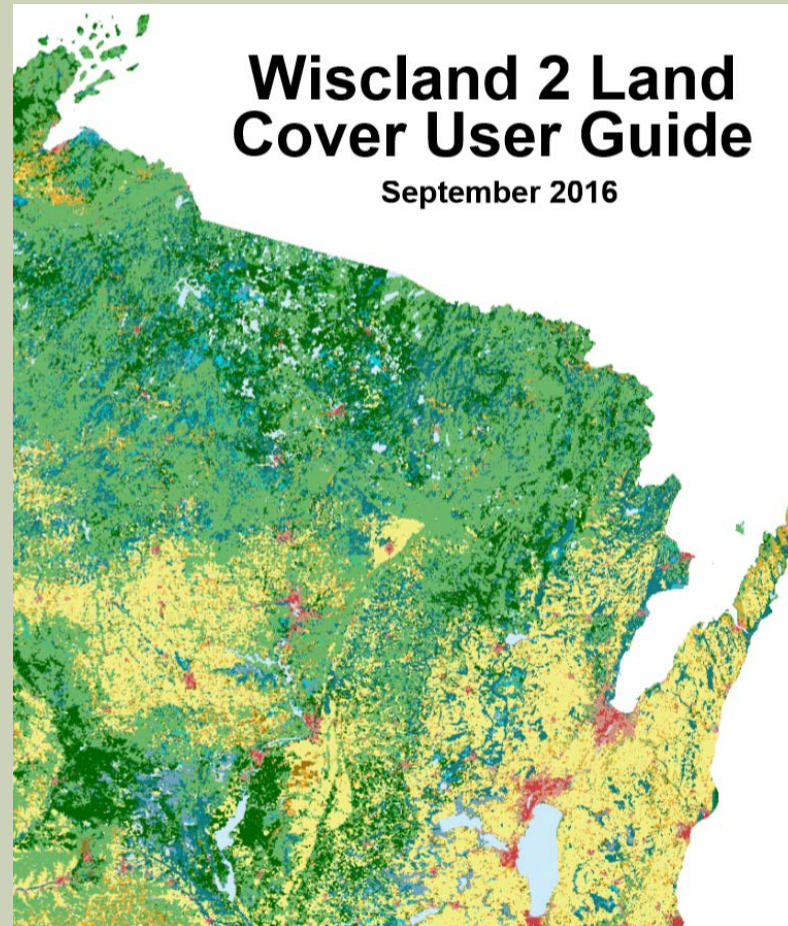
Figure 1. An example of how the spatial resolution of raster data has a direct effect on positional accuracy. LANDFIRE 30-meter resolution data does not precisely depict the shoreline or the boundary between grass (yellow shade) and forest (green shade) when viewed at a small extent (A), but at a broader extent (B), these differences are less apparent and less significant. The red rectangle in panel B shows the extent of panel A.



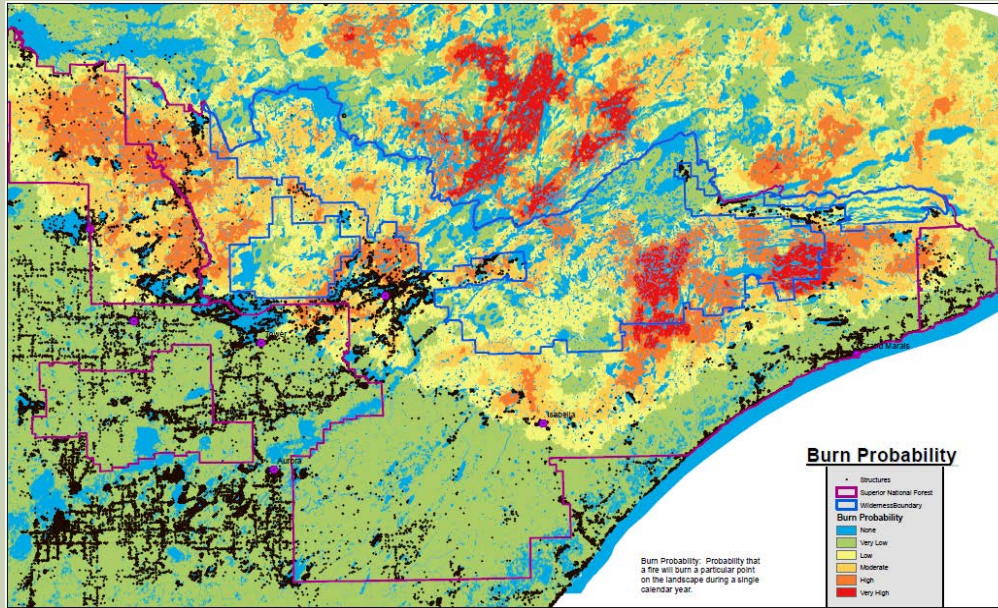
Existing Vegetation Type	Zone 28				Zone 25			
	Tree Cover (%)	Tree Height	FM	CG	Tree Cover (%)	Tree Height	FM	CG
Colorado Plateau Pinyon-Juniper Woodland	10-29	Any	GR1	1	10-19	Any	GR2	0
	30-39	Any	TU1	1	20-49	Any	GS2	0
	40-59	Any	TL3	1	50-100	Any	TL3	1
	60-100	Any	TL1	1	-	-	-	-
Southern Rocky Mountain Pinyon-Juniper Woodland	10-19	Any	GR2	1	10-29	Any	GS2	0
	20-59	Any	GS2	1	30-49	Any	SH7	0
	60-100	Any	TL3	1	50-100	Any	TL3	1

Figure 15. Example of variation in fire behavior fuel mapping rules by existing vegetation type and map zone. Panel A shows the existing vegetation type at the map zone boundary; panel B shows the fire behavior fuel model. FM refers to the standard Fire Behavior Fuel Model (Scott and Burgan 2005). CG refers to the canopy guide feature in the LANDFIRE Total Fuel Change Tool that controls how canopy fuels are mapped.

# HOME GROWN CLASSIFICATIONS



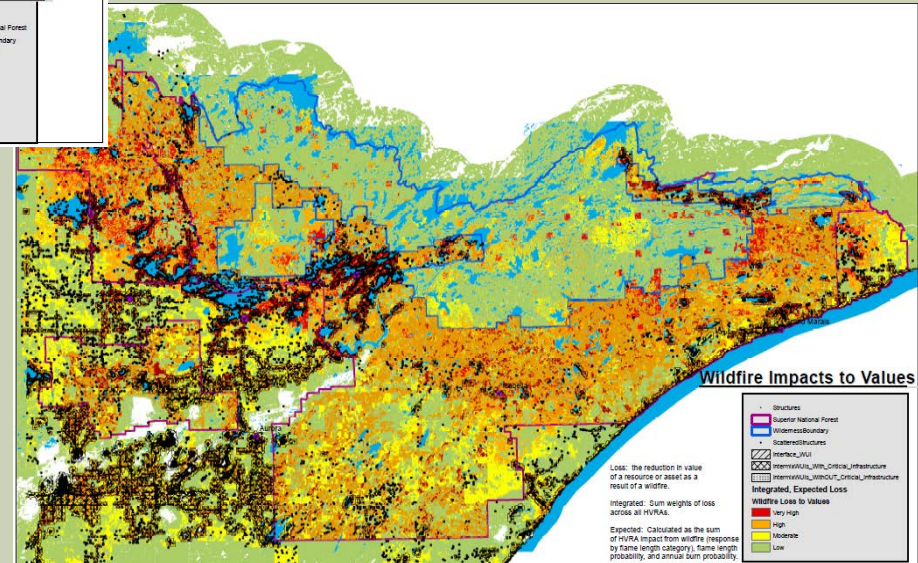
# SUPERIOR NF RISK ASSESSMENT



USDA  
United States Department of Agriculture



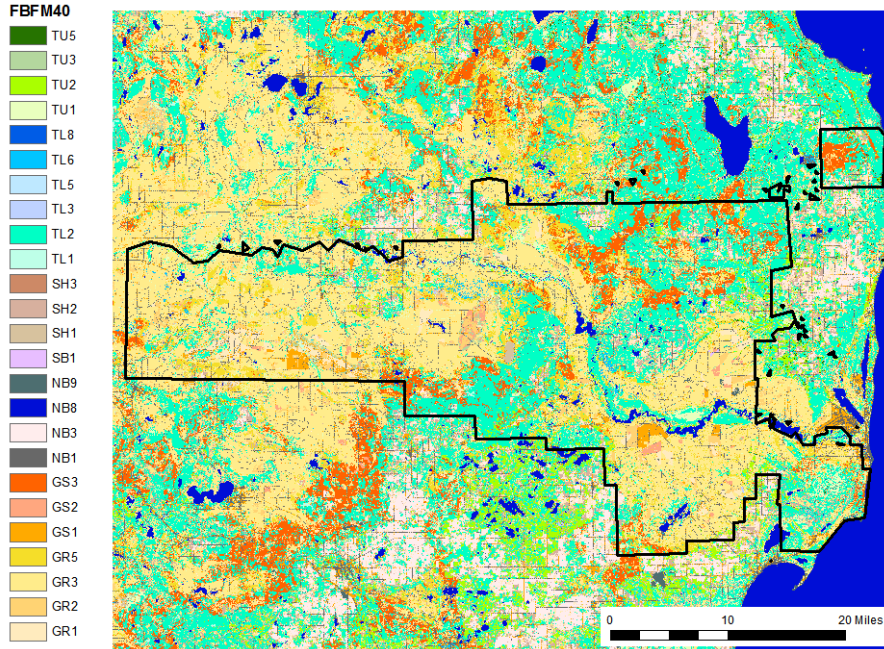
## Superior National Forest Quantitative Wildfire Risk Assessment



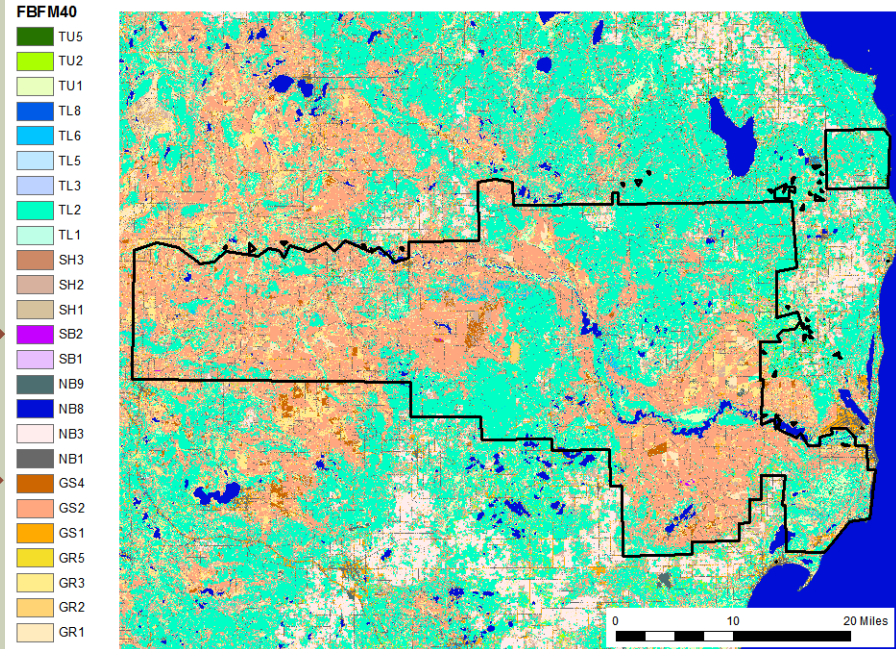


# HURON MANISTEE FUEL MODEL CRITIQUE

MU hurfm with z51 rules



MU hurfm with edited rules



Most noticeable changes:

- GR3 to GS2
- GS3 to TL2
- TU2 to TL2
- 2 FBFMs removed and 2 added

FBFM40	Acre difference	SH1	(1,956)
NB1	-	SH2	95,966
NB3	-	SH3	(475)
NB8	-	TU1	(1,295)
NB9	(659)	TU2	(67,293)
GR1	9,520	TU3	(3,863)
GR2	(29,673)	TU5	-
GR3	(539,928)	TL1	(7,236)
GR4	-	TL2	324,739
GR5	(156,137)	TL3	(1,569)
GS1	(12,980)	TL5	-
GS2	558,305	TL6	-
GS3	(179,413)	TL8	-
GS4	13,878	SB1	(226)
SH1	(1,956)	SB2	296

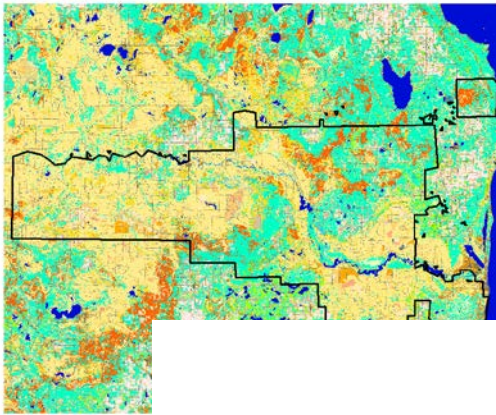
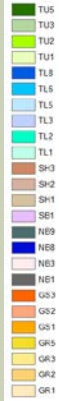


# HURON MANISTEE FUEL MODEL CRITIQUE

## LANDFIRE 2008 Original

MU hurfm with z51 rules

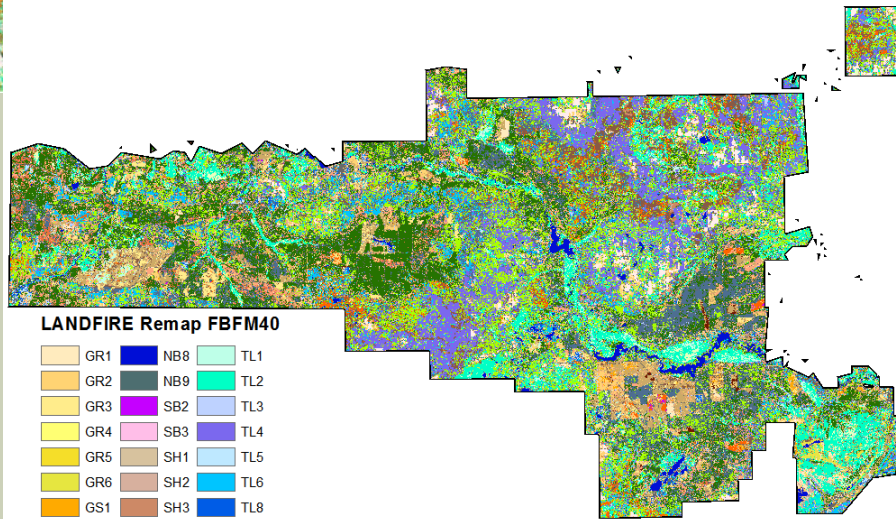
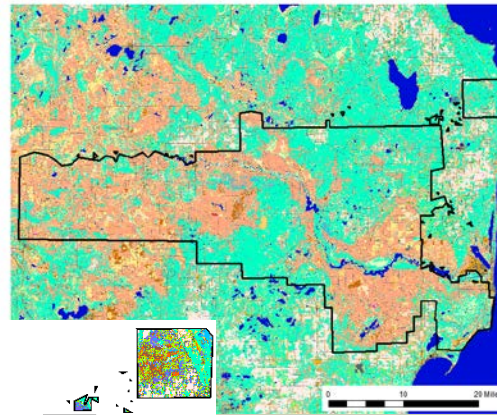
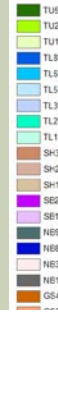
FBFM40



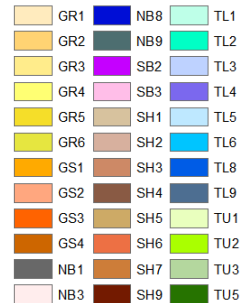
## LANDFIRE 2008 Local Edits

MU hurfm with edited rules

FBFM40

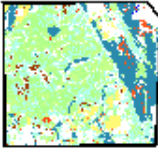


### LANDFIRE Remap FBFM40



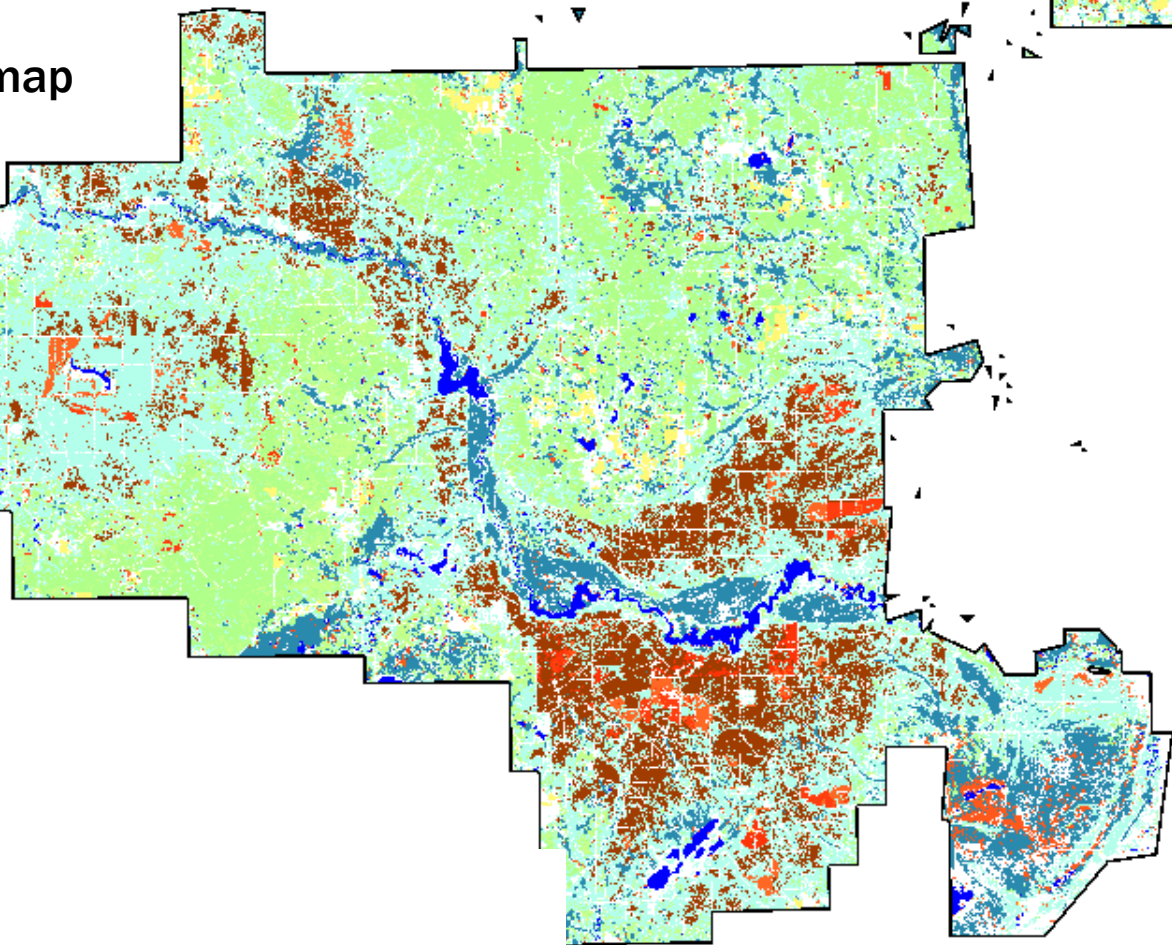
# HURON MANISTEE VEGETATION CHANGES

## LANDFIRE Remap



### LANDFIRE Remap EVT

- Laurentian-Acadian Wet Meadow
- Laurentian-Acadian Sub-boreal Aspen-Birch Forest
- Laurentian-Acadian Northern Oak Forest
- Laurentian-Acadian Northern Pine Forest
- Laurentian-Acadian Northern Pine-(Oak) Forest
- Northern & Central Ruderal Meadow
- Laurentian Jack Pine-Red Pine Forest
- Eastern Cool Temperate Close Grown Crop
- Laurentian Pine Barrens
- Laurentian-Acadian Alkaline Conifer-Hardwood Swamp
- Laurentian-Acadian Alkaline Fen
- Laurentian-Acadian Northern Hardwoods Forest
- Laurentian-Acadian Shrub Swamp
- Northeastern North American Temperate Forest Plantation
- Open Water
- Recently disturbed



# UPDATE ON REMAP

## Updates (Refresh)

## ReMap

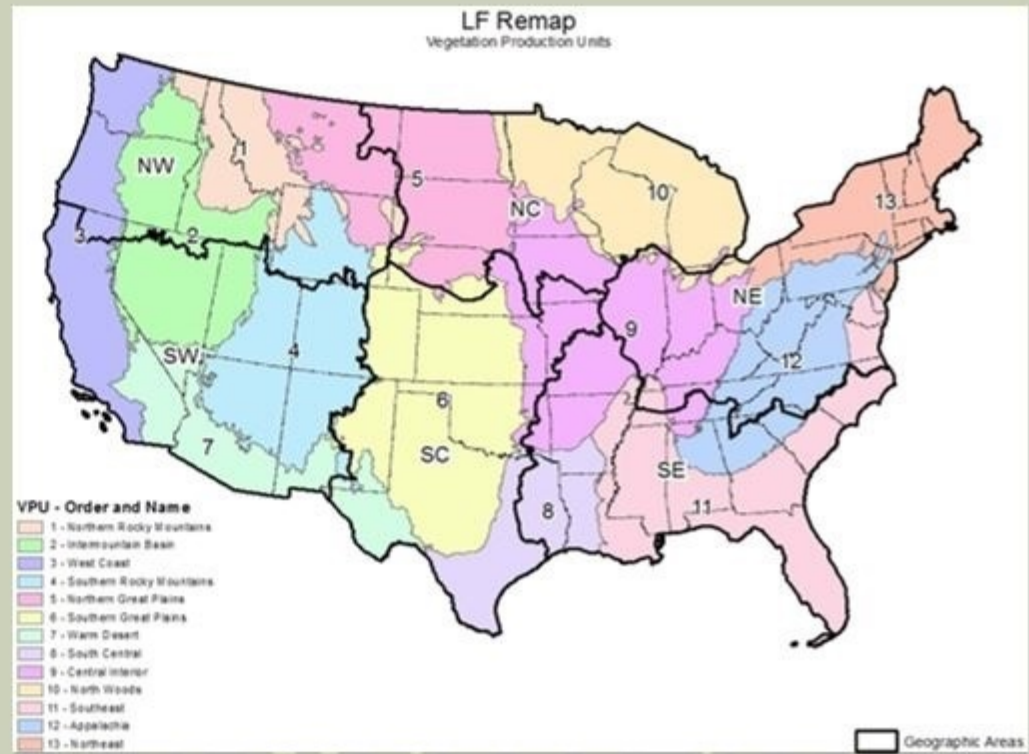
Version	LF c2001 National	2001	2008	2010	2012	2014	LF c2015 ReMap	2016	2018	2020	2022	2024
Type	Base Map	Revision	Update	Update	Update	Update	Base Map	Update	Update	Update	Update	Update

### REFRESH

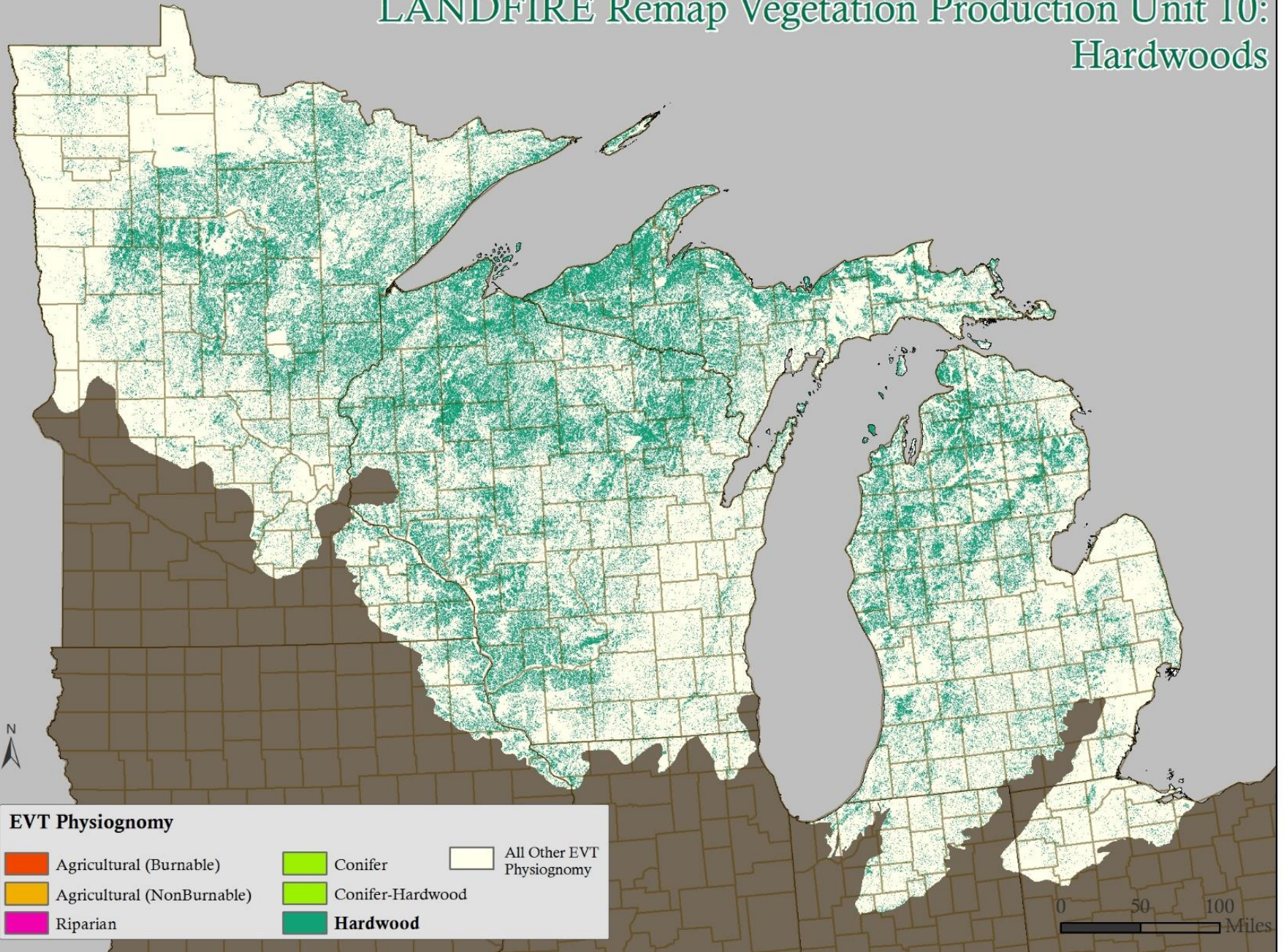
- Make updates to existing base map
  - 'Event' data – disturbances, treatments, etc.

### REMAP

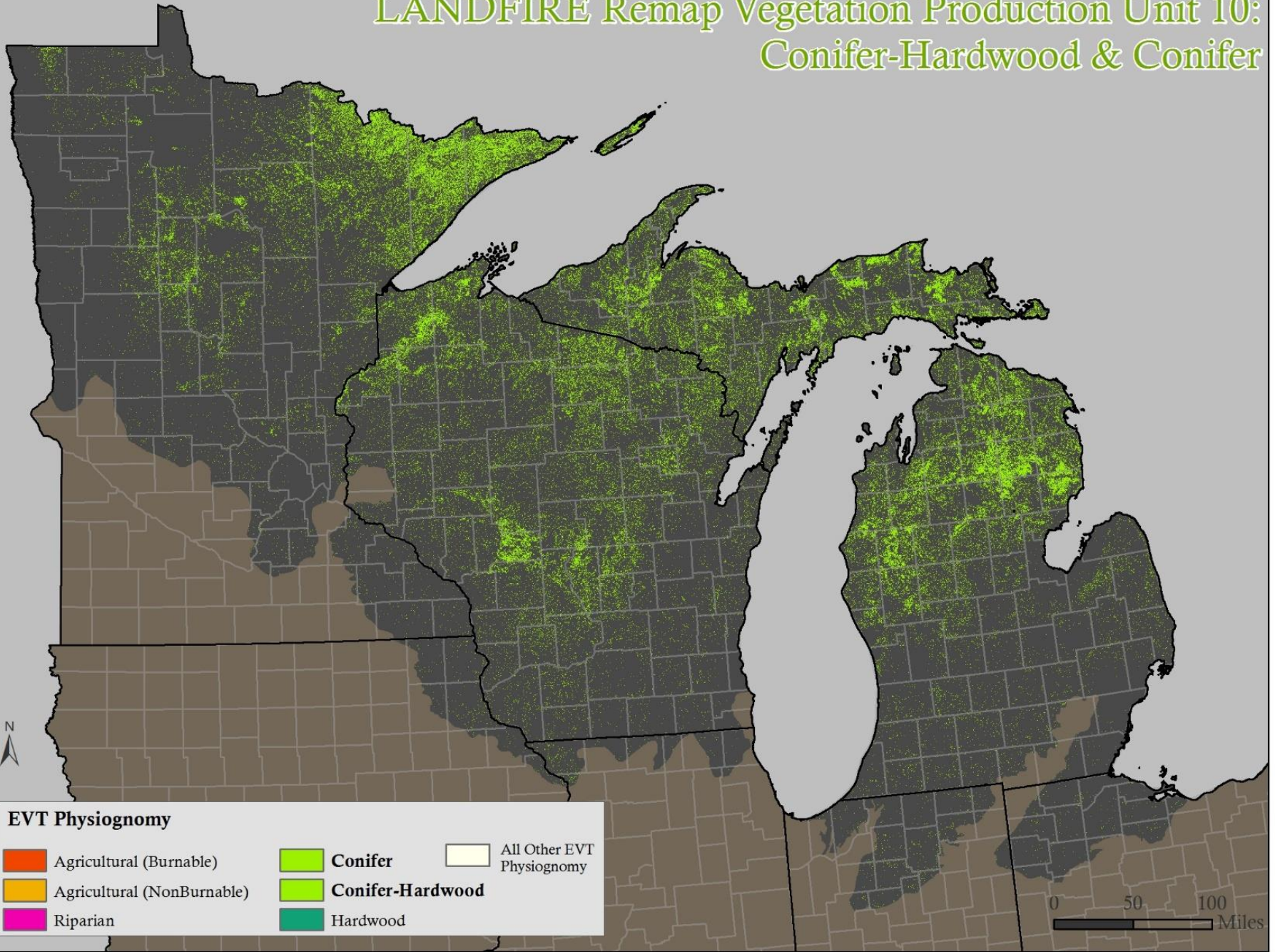
- Re-create base map
  - New 'plot' data to classify EVT
  - New satellite imagery
  - New biophysical datasets to define EVT



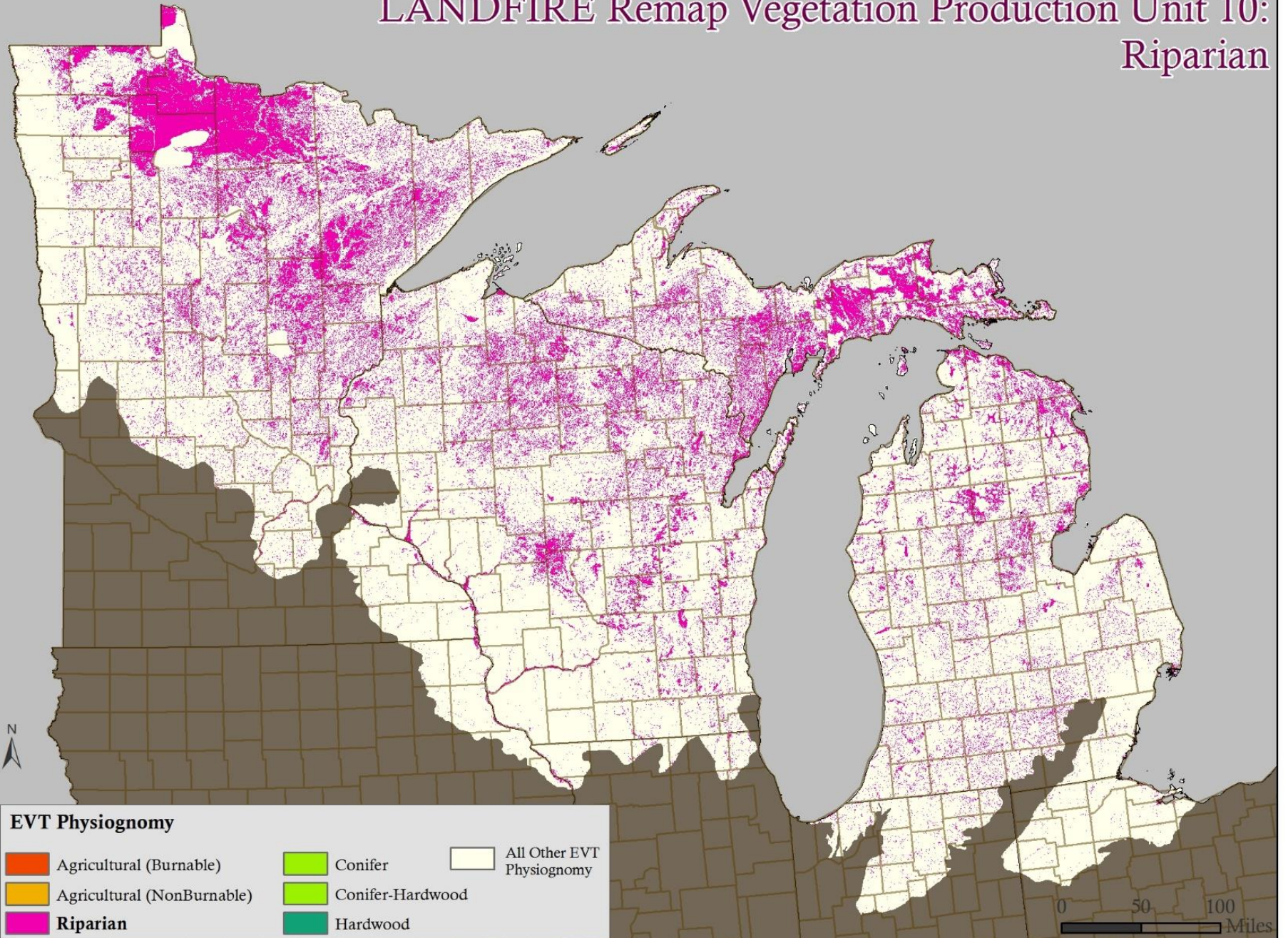
# LANDFIRE Remap Vegetation Production Unit 10: Hardwoods



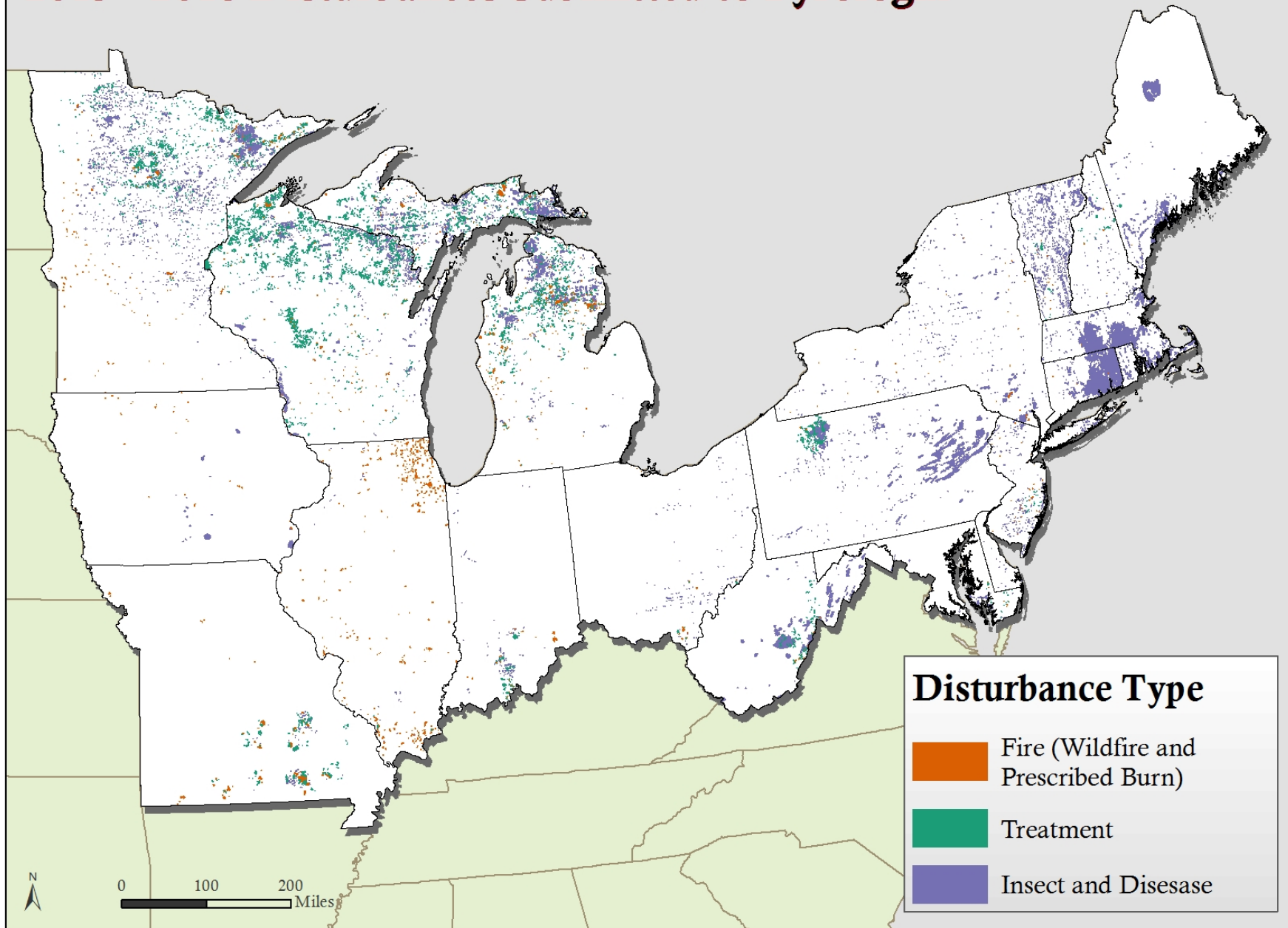
# LANDFIRE Remap Vegetation Production Unit 10: Conifer-Hardwood & Conifer



# LANDFIRE Remap Vegetation Production Unit 10: Riparian



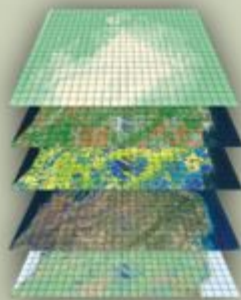
# 2015 - 2018 Disturbances Submitted to Pyrologix





# SURFACE FIRE BEHAVIOR FUEL MODELS

- Original: Anderson 13
- Updated: Scott and Burgan 40
- LANDFIRE mapped based on tabular rule sets calibrated to each map zone
- Full database of rule sets is available online: [https://landfire.gov/fuel\\_rulesets\\_db.php](https://landfire.gov/fuel_rulesets_db.php)
- To critique rulesets and produce updated FBFM rasters, use the LANDFIRE Total Fuels Change Tool  
[https://landfire.gov/download\\_lfdat.php#lftfct](https://landfire.gov/download_lfdat.php#lftfct)



Fuel Rules for MU v3.1.10

Display Rules: For  Fuel    Order EVT by:  Name  Number    Filter EVT by: All by Type    Selected Existing Vegetation Type (EVT) is not .distfx

SClass    Tr Boreal Aspen-Birch Forest 2301[0]

Session Name:    Ruleset: Compare FM    Distribution Graph    EVT Description

New Session

	Range of Cover	Range of Height	BPS	Wild	SClass	FM13	FM40	ConFM	FCCS	FLM	CG	CC	CH	CB013	CB040	CB401
Add Rule Cnt + A	30%-100%	T_ 0(m)-50(m)	Tr_ any	any		8	TU1_	9_	9999	9999	1	9_	9_	9999	9999	9999
Edit Rule Cnt + B	30%-100%	T_ 5(m)-50(m)	Tr_ 1625	any		9	TU2_	9999	911	911	1	9_	9_	9999	9999	9999
Delete Rule Cnt + D	30%-100%	T_ 5(m)-50(m)	Tr_ 1624	any		9	TU2_	9999	911	911	1	9_	9_	9999	9999	9999
Copy Rule Cnt + C																
Auto Rule Cnt + U																

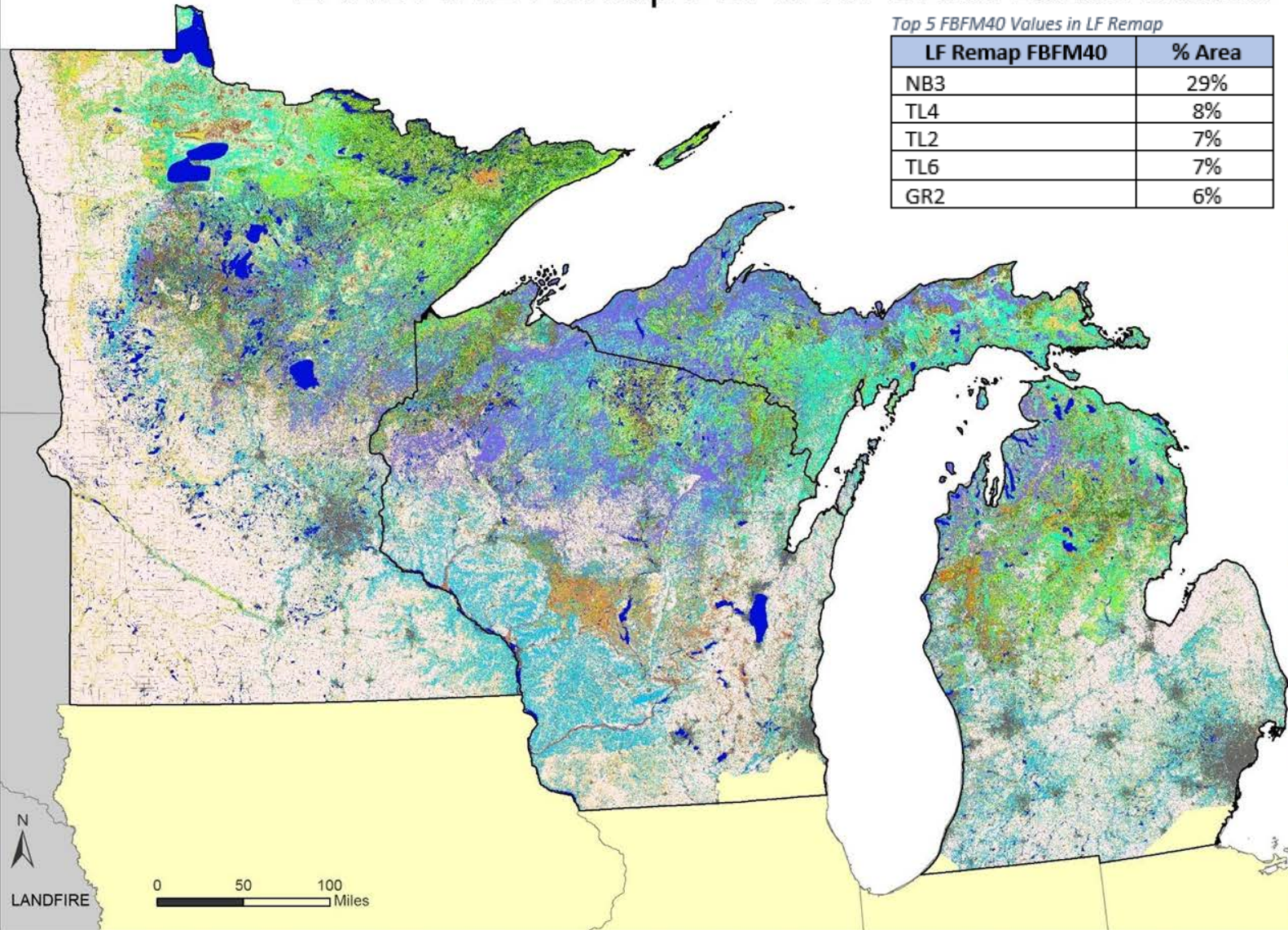


# FUEL MODEL CLASSIFICATIONS

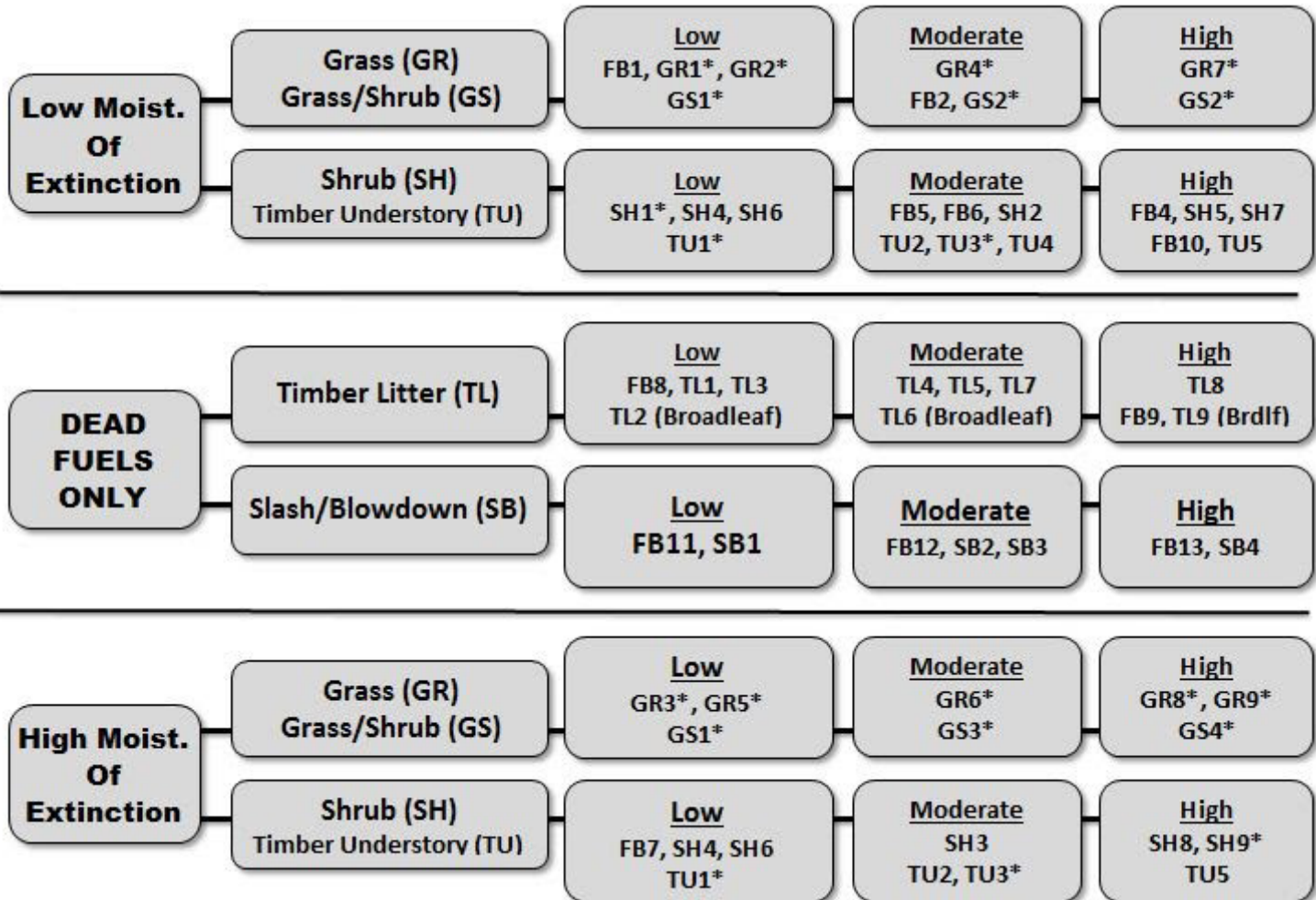
## LANDFIRE Remap FBFM40: Great Lakes States

Top 5 FBFM40 Values in LF Remap

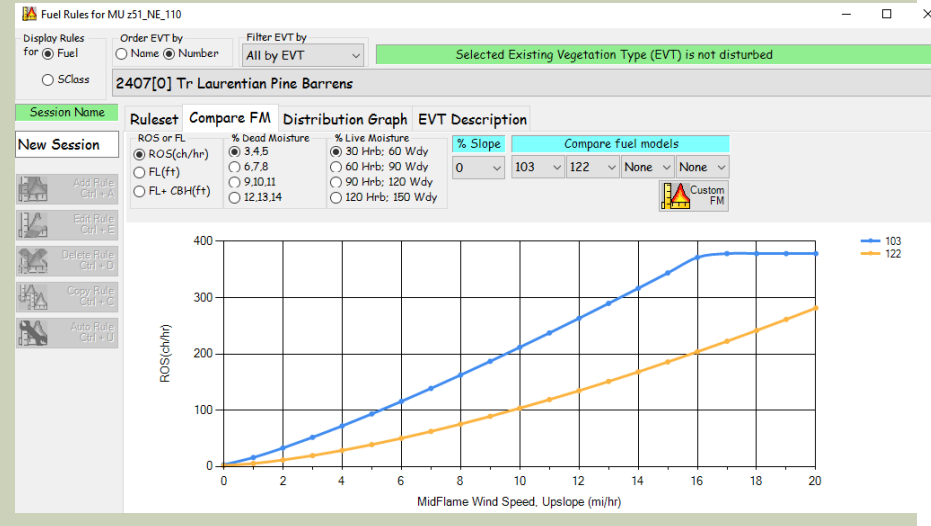
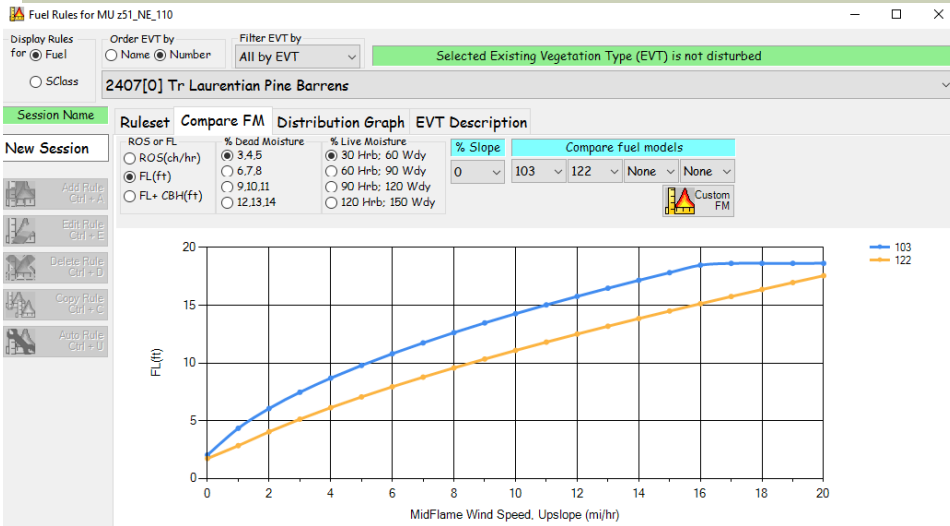
LF Remap FBFM40	% Area
NB3	29%
TL4	8%
TL2	7%
TL6	7%
GR2	6%



# US FIRE BEHAVIOR FUEL MODELS



# LAURENTIAN PINE OAK BARRENS GR3 TO GS2



Original MZ 51 rules

2407[0] Tr Laurentian Pine Barrens											
Ruleset	Compare FM	Distribution Graph	EVT Description								
No pixels are left behind.											
Range of Cover	Range of Height	BPS	Wild	SClass	FM13	FM40			On/Off	Acres	% EVT
10%- 59% Tree	0(m)- 50(m) Tree	any	any		2	GR3 / 103			On	216797.12	65.07%
60%- 100% Tree	0(m)- 50(m) Tree	any	any		2	GR3 / 103			On	116402.77	34.93%

Edited HMF rules

2407[0] Tr Laurentian Pine Barrens										
Ruleset	Compare FM	Distribution Graph	EVT Description							
No pixels are left behind.										
Range of Cover	Range of Height	BPS	Wild	FM13	FM40			On/Off	Acres	% EVT
10%- 39% Tree	0(m)- 50(m) Tree	any	any	2	GR3 / 103			On	53576...	16.08%
40%- 100% Tree	0(m)- 50(m) Tree	any	any	2	652 / 122			On	27962...	83.92%



# HURON MANISTEE

## EVT: 2407 Tr Laurentian Pine Barrens (applying same rules to 2243 and 2344)

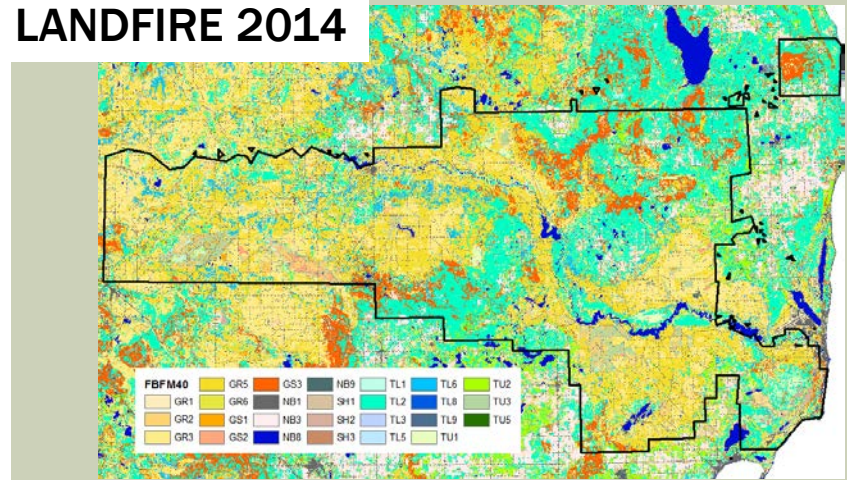
### Original non-disturbed ruleset

Fuel Model for FDIST 000	CL	CH	HL	HH	BPS	CG
GR3 / 103	101	105	108	111	any	1
GR5 / 105	106	109	108	111	any	1
GS3 / 123	111	115	104	107	any	0
GS4 / 124	116	117	104	107	any	0

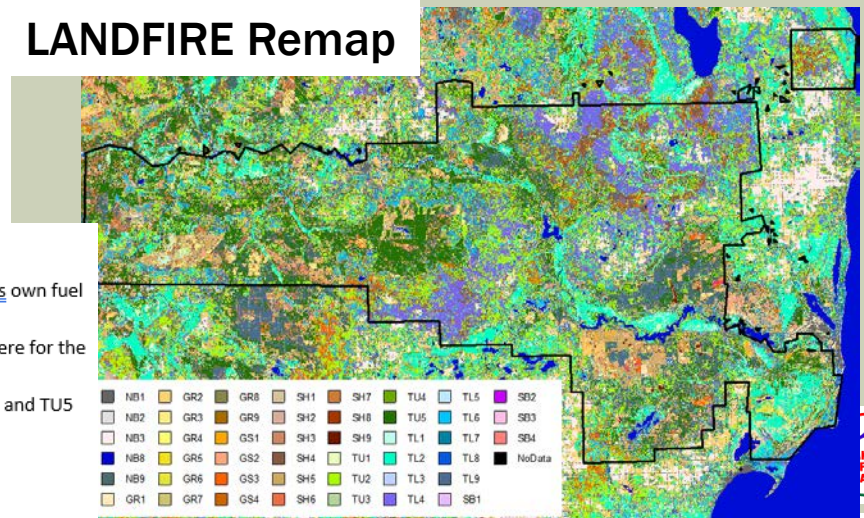
### Updated ruleset

Fuel Model for FDIST 000	CL	CH	HL	HH	BPS	CG
SH9 / 149	101	106	108	108	any	0
SH5 / 145	101	109	109	109	any	0
SH5 / 145	101	107	110	112	any	1
SH5 / 145	107	109	108	108	any	0
★ TU5 / 165	108	109	110	112	any	1
SH9 / 149	111	116	104	106	any	0
SH5 / 145	111	119	107	107	any	0
SH5 / 145	117	119	104	106	any	0

## LANDFIRE 2014



## LANDFIRE Remap



### Summary of changes

- o This applies to FVTs 2407, 2243, 2344 -- we discussed plantations (FVT 2534) but ended up giving it its own fuel box because it was different
- o Note that FVT 2243 originally had some BpS exceptions for BpS models 1628, 1601, 1572 but those were for the model "Laurentian Pine-Oak Barrens" so they were discarded after generating this fuel box
- o Started essentially from scratch for this fuel box... tree lifeform is mostly SH5 with SH9 for short/open and TU5 for tall/closed; shrub is mostly SH9 with SH5 for tall/closed
- o Canopy Guide of 0 for tree lifeform <10 meters
- o Need TI of 15-20 mph range for TU5
- o Copied rules for Mech Add into Wind and Mech Remove into I & D

# GREAT LAKES LANDFIRE REMAP TOP 10 FUEL CHANGES

<https://bit.ly/38bCw00>

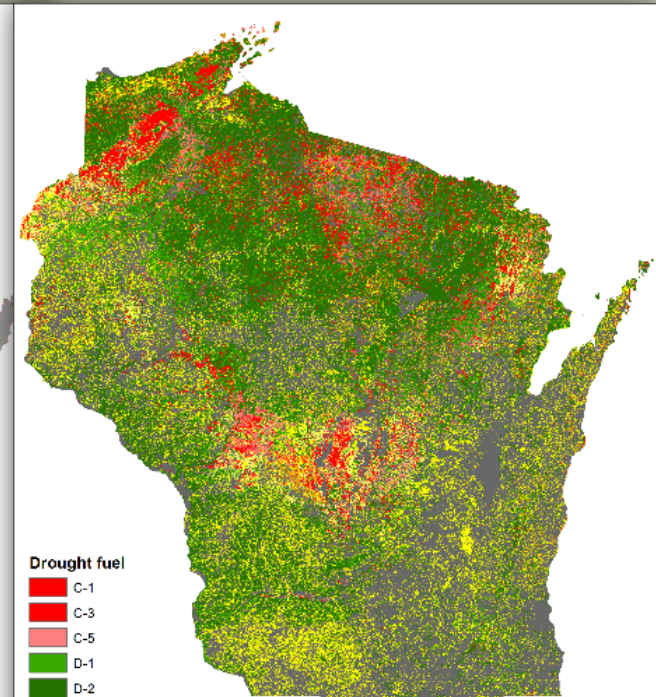
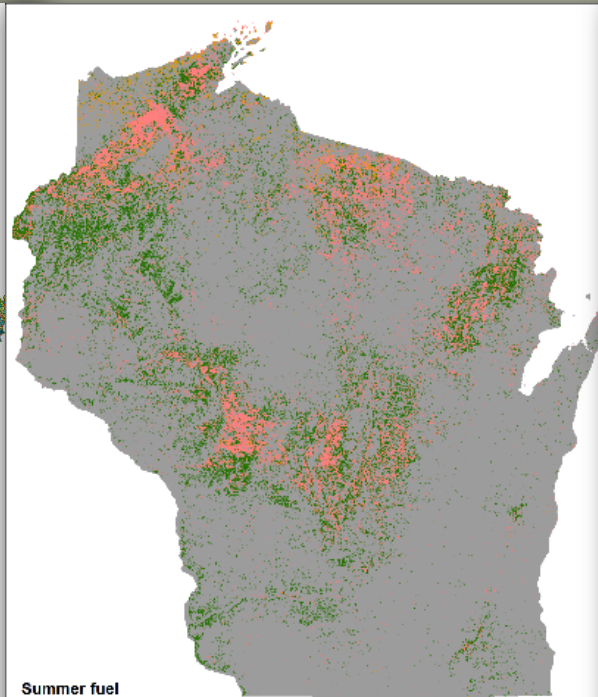
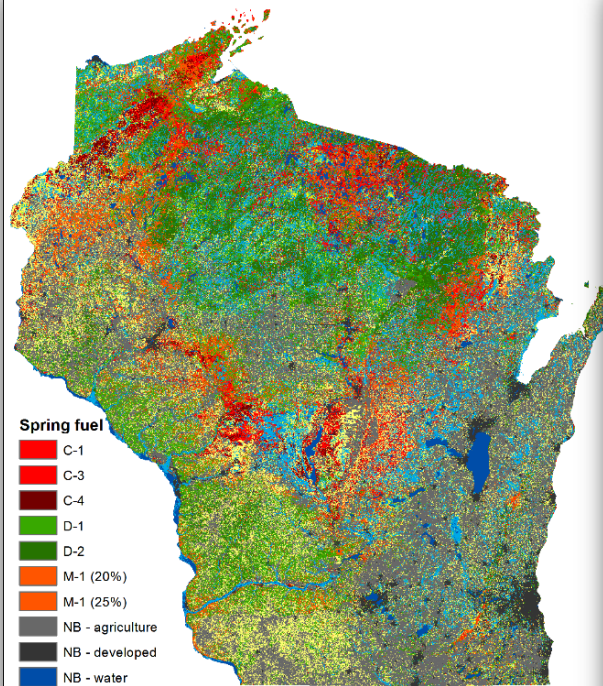
FBFM40		Total Area Changed	% of All Area Changed	Changes In Fire Behavior		LF Remap EVT driving this change	Explanation/rationale
LF 2014	LF Remap			Rate of Spread	Flame length		
TU1	TL4	4,857,358	7.4%	-	-	Laurentian-Acadian Northern Hardwoods Forest	Very complex EVT and fuel rules. "Hardwood" BpS identifying maple systems, original rules overstate fire behavior
TL2	TL4	3,700,817	5.6%	+	+	Laurentian-Acadian Northern Hardwoods Forest	
TL2	TU2	1,825,350	2.8%	+	+	Laurentian-Acadian Sub-boreal Aspen-Birch Forest	Workshop attendees noted TU2 is more appropriate at mid-range of canopy cover
GR3	GR2	1,697,922	2.6%	-	-	Eastern Cool Temperate Pasture and Hayland/Northern & Central Ruderal Meadow	Mostly in Minnesota; does not match our workshops as this was one of the two rules where LF did not implement our changes (2014 EVT was Developed Ruderal Grassland)
TU1	TL2	1,623,455	2.5%	-	-	Laurentian-Acadian Alkaline Conifer-Hardwood Swamp	Driven by a change in EVT from Boreal Acidic Peatland Forest or Northern Hardwoods Forest
TL2	TL6	1,484,951	2.3%	-	-	North-Central Interior Dry-Mesic Oak Forest and Woodland/North-Central Interior Beech-Maple Forest	At workshops, introduced Hardwood BpS rule, identifying mostly hardwood component with less extreme fire behavior
GR2	NB3	1,206,782	1.8%	-	-	Eastern Cool Temperate Close Grown Crop/Eastern Cool Temperate Row Crop	Reclassified from Eastern Cool Temperate Pasture and Hayland in 2014
TL6	SH4	1,181,876	1.8%	+	+	Laurentian-Acadian Northern Hardwoods Forest	Change in fuel assigned to Hardwood-Conifer BpS vegetation group, which helps identify oak and pine components which increase fire behavior
TL6	TL9	1,117,911	1.7%	+	+	Laurentian-Acadian Northern Hardwoods Forest	Change in fuel assigned to Conifer BpS vegetation group, which mostly identifies largest conifer component, increasing fire behavior
NB3	GR2	1,013,583	1.5%	+	+	Eastern Cool Temperate Pasture and Hayland/Northern & Central Ruderal Meadow	Reclassification of Close Grown Crop and Row Crop

# CFFBP FUELS CONCEPT

Pre-Green

Growing Season

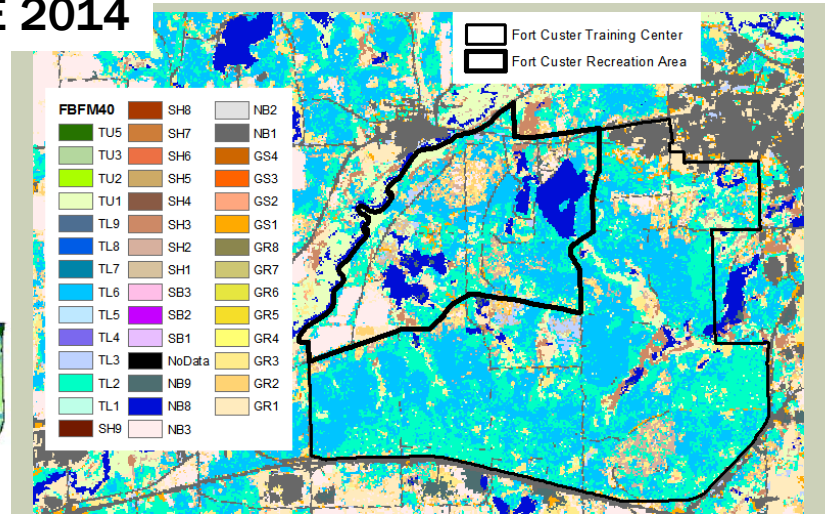
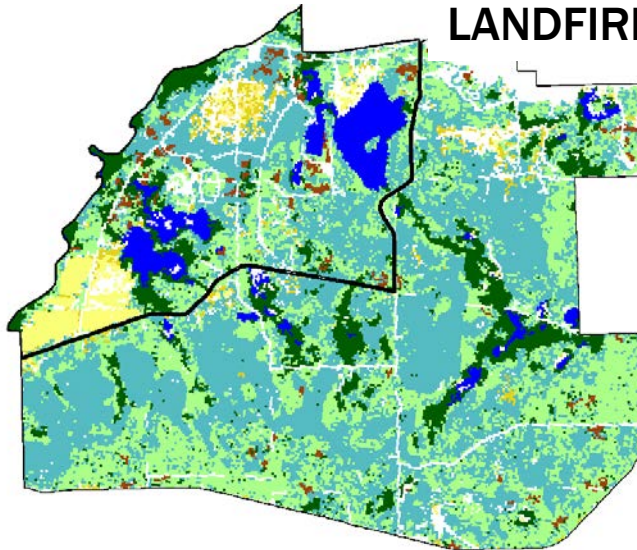
Drought/Late Season



# FORT CUSTER IN LANDFIRE

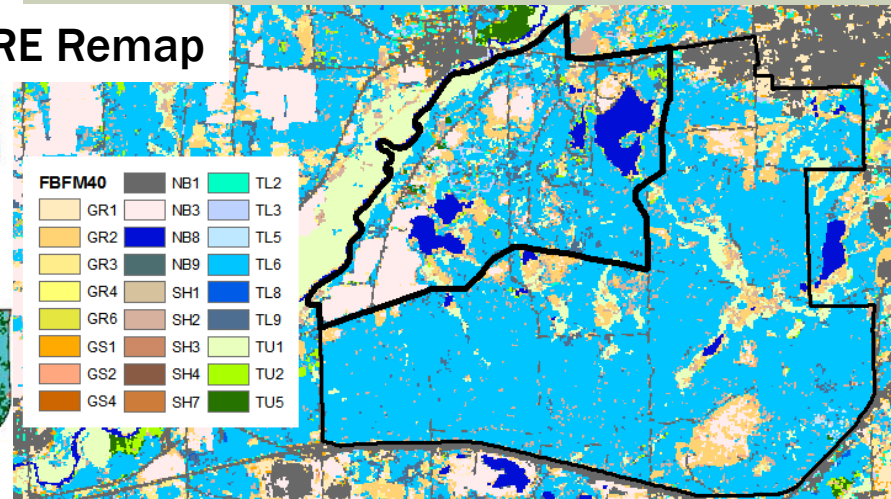
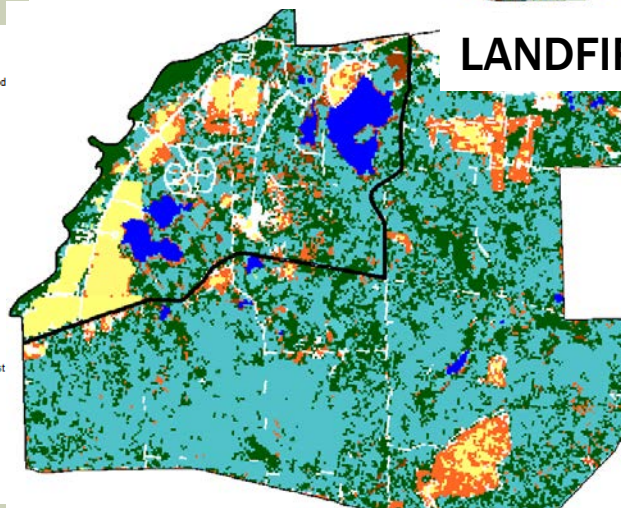
## LANDFIRE 2014

- Managed Tree Plantation-Northern and Central
- Central Interior and Appalachian Swamp Forest
- Central Interior and Appalachian Swamp Shrub
- Central Interior and Appalachian Floodplain Shrub
- North-Central Interior Dry Oak Forest and Woodland
- North-Central Interior Dry-Mesic Oak Forest and Woodland
- Eastern Cool Temperate Close Grown Crop
- Eastern Cool Temperate Fallow/Idle Cropland
- Eastern Cool Temperate Pasture and Hayland
- Eastern Cool Temperate Row Crop
- Eastern Cool Temperate Row Crop - Close Grown
- Open Water
- Central Interior and Appalachian Floodplain Forest
- Central Interior and Appalachian Floodplain Shrub
- Central Interior and Appalachian Floodplain Shrub
- North-Central Interior Dry Oak Forest and Woodland
- North-Central Interior Maple-Basswood Forest



## LANDFIRE Remap

- Eastern Cool Temperate Row Crop
- Eastern Cool Temperate Close Grown Crop
- North-Central Interior and Appalachian Acidic Peatland Woodland
- North-Central Interior and Appalachian Rich Swamp
- North-Central Interior Beech-Maple Forest
- North-Central Interior Dry Oak Forest and Woodland
- North-Central Interior Dry-Mesic Oak Forest and Woodland
- North-Central Interior Floodplain Forest
- North-Central Interior Floodplain Shrubland
- North-Central Interior Freshwater Marsh
- North-Central Interior Graminoid Alkaline Fen
- North-Central Interior Sand and Gravel Tallgrass Prairie
- North-Central Interior Shrub Alkaline Fen
- North-Central Interior Shrub Swamp
- North-Central Interior Wet Meadow
- Northeastern North American Temperate Forest Plantation
- Northern & Central Native Ruderal Flooded & Swamp Forest
- Northern & Central Native Ruderal Forest
- Northern & Central Ruderal Meadow
- Northern & Central Ruderal Shrubland
- Northern & Central Ruderal Wet Meadow & Marsh
- Open Water
- Recently Logged-Shrub Cover





# LANDFIRE.GOV

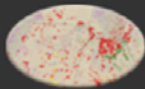


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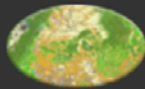
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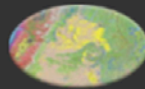
Reference



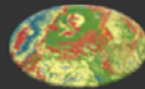
Disturbance



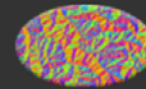
Vegetation



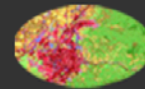
Fuel



Fire Regime



Topographic



Seasonal

[Homepage](#) » [Data Products Overview](#) » [Tools, Services, and Training](#)

## Data Products: Tools, Services, and Training

### Tools

- [Data Distribution Site \(DDS\)](#)
- [LANDFIRE \(LF\) Data Access Tool \(LFDAT\)](#)
- [LF Total Fuel Change Tool \(LFTFC\)](#)
- [State-and-transition simulation \(ST-Sim\)](#)

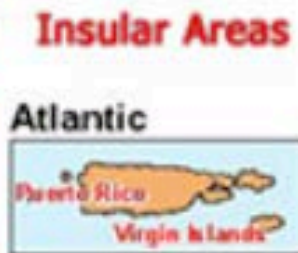
### Services

- [Landscape \(.LCP\) File](#)
- [Data Mosaics](#)
- [Web Service Calls](#)
- [Modifying Geospatial Data Guidebook](#)
- [Videos and Tutorials](#)
- [LF product codes for scripting](#)
- [Library](#)
- [Frequently Asked Questions](#)

### Training Resources

- [WFMRD&A-FFE Resources](#)
- [Fire Research and Management Exchange System \(FRAMES\) Resources](#)
- [Professional Resources](#)
- [Training Video Resources](#)
- [Interagency Fuels Treatment Decision Support System \(IFTDSS\)](#)
- [Modifying LF Geospatial Data for Local Applications guide](#)

# LANDFIRE GeoAreas



# STAY UP-TO-DATE WITH LANDFIRE



## LANDFIRE Postcard



*It's fire season. Take care out there.*

[LF Remap Release: SW GeoArea, Capable Fuels Products](#)

[Spring 2019 MoD-FIS](#)

[Q & A: LF Total Fuels Change Tool](#)

[For Your Information](#)

Subscribe: <http://eepurl.com/cajG91>

# THERE IS A REASON THIS IS A THING

<https://iftdss.firenet.gov>

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## Welcome to IFTDSS

The Interagency Fuel Treatment Decision Support System



**Use Google Chrome with IFTDSS** IFTDSS has been developed and tested for Google Chrome. If you don't currently have Google Chrome installed, visit our [Chrome help page](#) for agency-specific guidance.

### NEW! Map Values

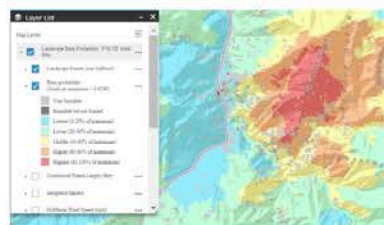


[Read about Map Values \(PDF\)](#)

[Watch the intro to Map Values video](#)

[Get started with Map Values in the Help Center](#)

### Phasing in Risk Assessment



[Read about Quantitative Wildfire Risk Assessment \(PDF\)](#)

[Read about Landscape Burn Probability modeling \(PDF\)](#)

[Get Started with Landscape Burn Probability](#)

### FTEM is Part of IFTDSS



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[FTEM Flyer \(PDF\)](#)

### We Want to Hear from You



[Take a 5 min. survey](#)

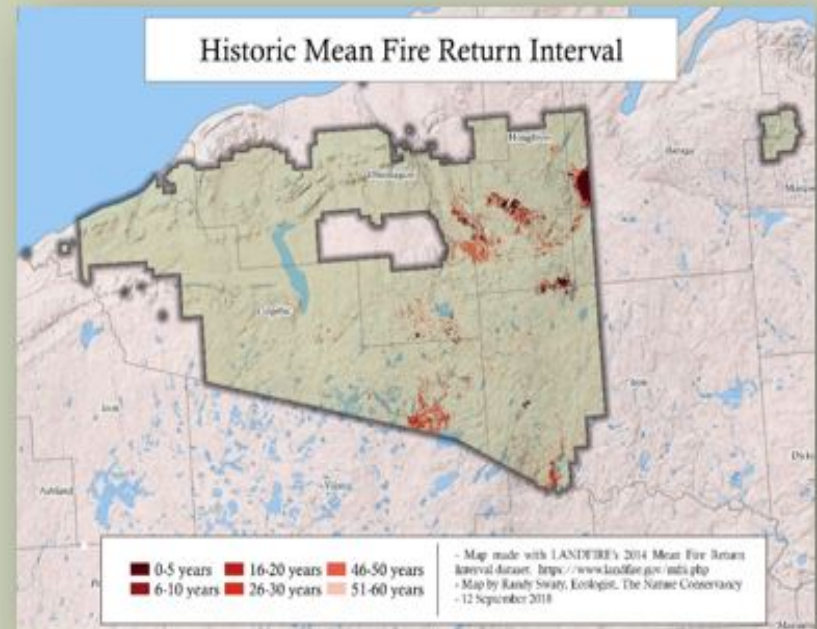
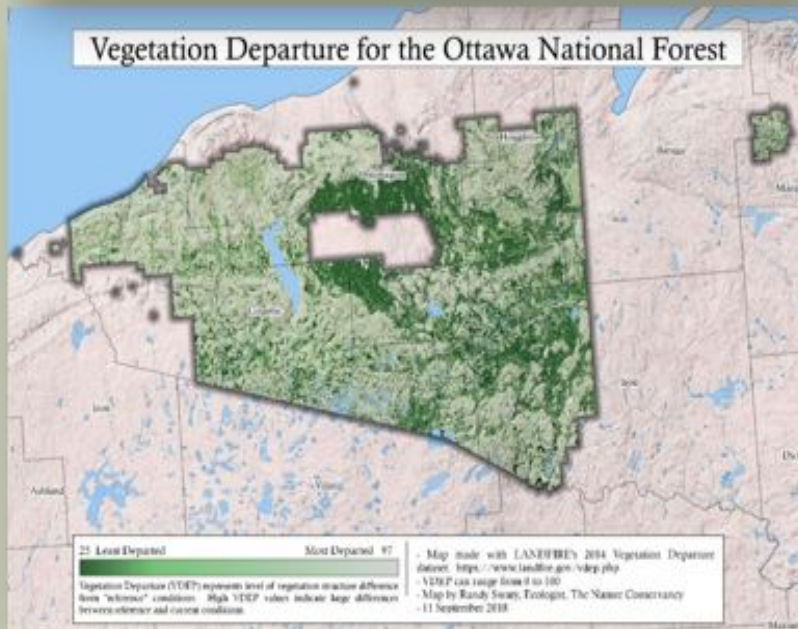
[Check out the forum](#)



# OTTAWA NATIONAL FOREST

- Restoring fire-dependent ecosystems while reducing current fire behavior.
- Build resilient ecosystems at the landscape level to be able to “live with fire”

Maps by Randy Swaty, TNC LANDFIRE



# FUEL PLOTS FOR LANDFIRE

## FBInputs

This table contains fuel data relevant to fire-behavior modeling.

Name	Description
EventID <i>Required</i>	Unique identifier for this sampling event.
LwdyCov	Cover (%) of live trees and shrubs in sampling plane (i.e., below 6 feet).
DwdyCov	Cover (%) of dead trees and shrubs in sampling plane (i.e., below 6 feet).
WdyHgt	Average height (feet) of trees and shrubs in sampling plane (i.e., below 6 feet).
LherbCov	Cover (%) of live herbaceous vegetation.
DherbCov	Cover (%) of dead herbaceous vegetation.
HerbHgt	Average height (feet) of herbaceous vegetation.
IntegFbedDpth	Average shrub/herb heights (feet).
StandHgt	Typical height (feet) of vegetation taller than 6 feet.
CanBaseHgt	Typical lowest point above the ground (feet) at which there is sufficient amount of live and/or dead woody vegetation to spread a fire vertically into the overstory vegetation.
CanCov	Cover (%) of woody vegetation taller than 6.5 feet.
FBFM13	Fire Behavior Fuel Model (Anderson 1982). See lutFBInputsFBFM13 for code definitions.
FBFM40	Fire Behavior Fuel Model (Scott and Burgan 2005). See lutFBInputsFBFM40 for code definitions.

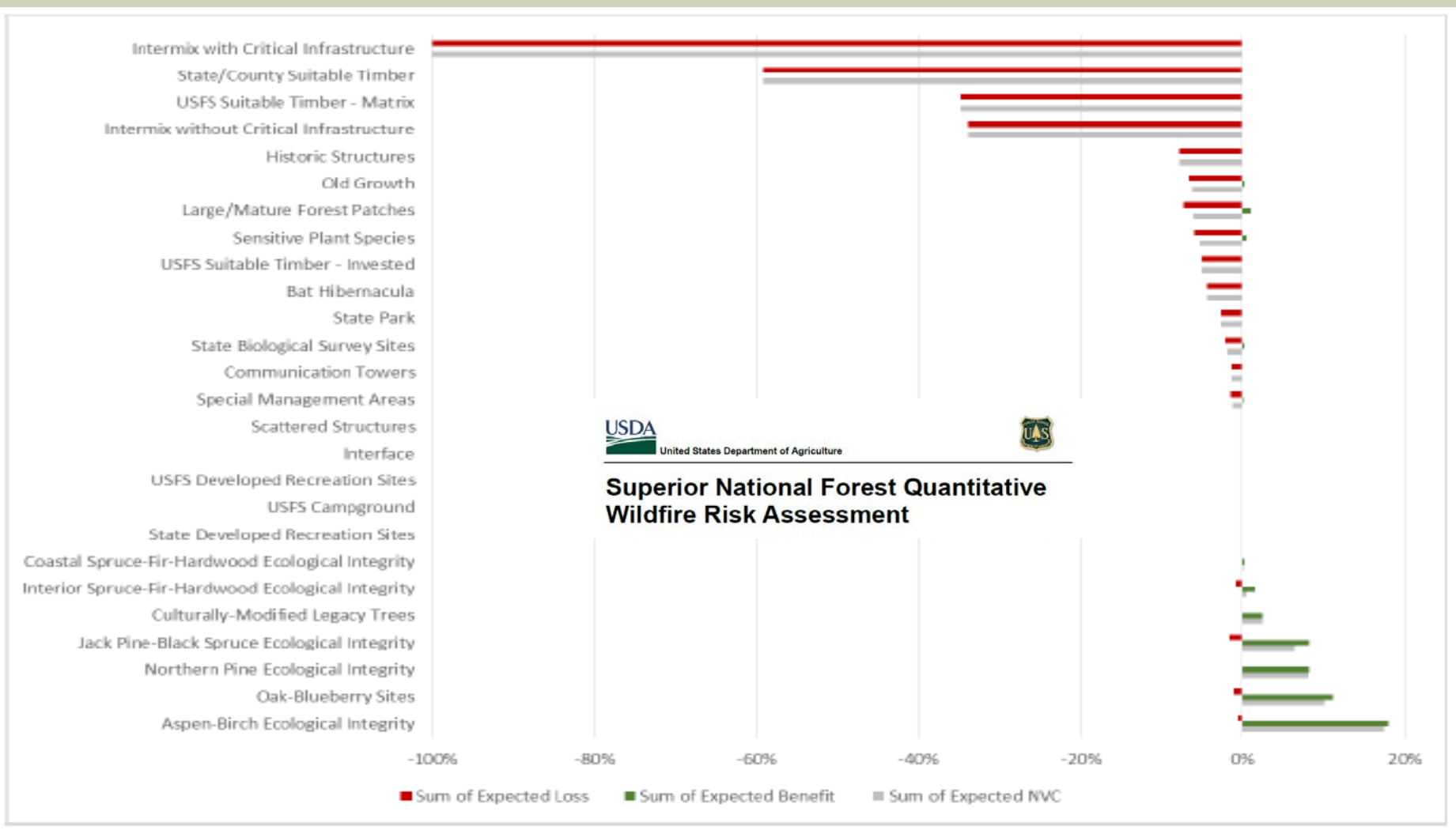
## FBInputs

This table contains fuel data relevant to fire-behavior modeling.

Name	Description
EventID <i>Required</i>	Unique identifier for this sampling event.
FWD1hBmass	1-hour fuel (small Fine Woody Debris [FWD]; 0.00-0.24 inches diameter) biomass (tons/acre).
FWD10hBmass	10-hour fuel (medium FWD; 0.25-0.99 inches diameter) biomass (tons/acre).
FWD100hBmass	100-hour fuel (large FWD; 1.00-2.99 inches diameter) biomass (tons/acre).
FWDTotBmass	1 to 100-hour fuel (total FWD) biomass (tons/acre).
CWDSndBmass	1000-hour sound fuel biomass (tons/acre).
CWDRotBmass	1000-hour rotten fuel biomass (tons/acre).
CWDTotBmass	1000-hour fuel (total Coarse Woody Debris [CWD]; 3.00 inches in diameter and greater) biomass (tons/acre).
CWD9plusSndBmass	10,000-hour sound fuel biomass (tons/acre).
CWD9plusRotBmass	10,000-hour rotten fuel biomass (tons/acre).
CWD9plusTotBmass	10,000-hour fuel (total Coarse Woody Debris [CWD]; 9.00 inches in diameter and greater) biomass (tons/acre).
DuffLittDpth	Combined duff and litter depth (inches).
DuffDpth	Duff depth (inches).
DuffBmass	Duff biomass (tons/acre).
LittDpth	Litter depth (inches).
LittBmass	Litter biomass (tons/acre).
SlshBmass	Slash biomass (tons/acre).
TotFuelBmass	Combined biomass of FWD, CWD, duff, and litter (tons/acre).
LWdyBmass	Biomass (tons/acre) of live trees and shrubs in sampling plane (i.e., below 6 feet).
DWdyBmass	Biomass (tons/acre) of dead trees and shrubs in sampling plane (i.e., below 6 feet).
TotWdyBmass	Biomass (tons/acre) of live and dead trees and shrubs in sampling plane (i.e., below 6 feet).
LHerbBmass	Biomass (tons/acre) of live herbaceous vegetation.
DHerbBmass	Biomass (tons/acre) of dead herbaceous vegetation.
TotHerbBmass	Biomass (tons/acre) of live and dead herbaceous vegetation.
FCCSProtoFuelbed	Fire behavior fuel model selected from 113 options in the FCCS Prototype Fuelbed set.



# SUPERIOR RA: CUMULATIVE EXPECTED LOSS AND BENEFITS FROM WILDFIRE

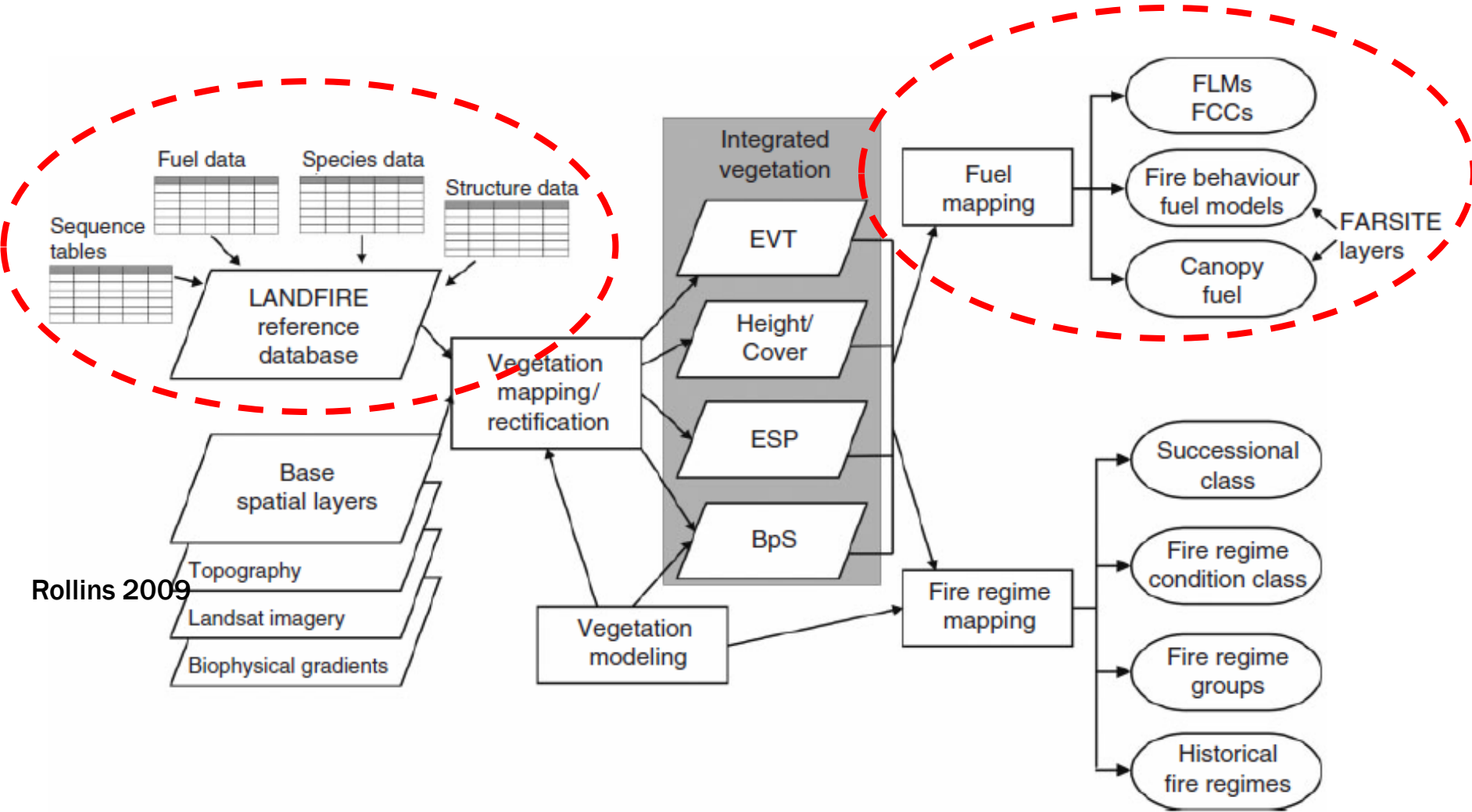




# EXTRA SLIDES



# SHARE YOUR DATA WITH LANDFIRE



Rollins 2009

- Guidance on submitting data to LANDFIRE
- E-mail Brenda.Lundberg at [blundberg@contractor.usgs.gov](mailto:blundberg@contractor.usgs.gov)

**LANDFIRE Reference Data Attributes:** This table lists the minimum information LANDFIRE needs to continue to improve our products. Additionally, more specific details are requested from stakeholders when possible to further assist with data improvements. Not all attributes are needed for each observation or event. Any information you can provide is useful as long as the minimum requirements are met.

2014 LANDFIRE	Event Data	LFRRDB Plot Data	Feedback Data
Minimum Requirements	<ul style="list-style-type: none"> <li>•GIS polygon</li> <li>•generalized event type or exotic species</li> <li>•year</li> </ul>	<ul style="list-style-type: none"> <li>•plot geo-reference</li> <li>•basic vegetation or fuel attributes (i.e. cover type label or fuel model call)</li> <li>•code definitions in data tables</li> </ul>	<ul style="list-style-type: none"> <li>•narrative</li> </ul>
Good	<ul style="list-style-type: none"> <li>•GIS polygon</li> <li>•detailed event type or exotic species</li> <li>•year</li> <li>•start and end date</li> </ul>	<ul style="list-style-type: none"> <li>•plot geo-reference</li> <li>•sampling date</li> <li>•list of plant taxa with canopy cover</li> <li>•fine and coarse woody material counts or biomass</li> <li>•code definitions in data tables</li> </ul>	<ul style="list-style-type: none"> <li>•narrative</li> <li>•GIS data outlining areas of concern</li> </ul>
Better	<ul style="list-style-type: none"> <li>•GIS polygon</li> <li>•detailed event type or exotic species</li> <li>•year</li> <li>•start and end date</li> <li>•official event name</li> <li>•reporting agency</li> </ul>	<ul style="list-style-type: none"> <li>•plot geo-reference</li> <li>•sampling date</li> <li>•list of plant taxa with canopy cover and height               <ul style="list-style-type: none"> <li>▪ individual tree measurements</li> </ul> </li> <li>•fine and coarse woody material counts or biomass</li> <li>•code definitions in data tables</li> </ul>	<ul style="list-style-type: none"> <li>•narrative</li> <li>•existing vegetation or fuel maps that depict ground conditions</li> </ul>
Best	<ul style="list-style-type: none"> <li>•GIS polygon</li> <li>•detailed event type or exotic species</li> <li>•year</li> <li>•start and end date</li> <li>•official event name</li> <li>•reporting agency</li> <li>•event severity</li> <li>•exotic species percent cover/infestation level</li> </ul>	<ul style="list-style-type: none"> <li>•plot geo-reference</li> <li>•sampling date</li> <li>•full list of plant taxa with canopy cover and height               <ul style="list-style-type: none"> <li>▪ individual tree measurements</li> </ul> </li> <li>•fine and coarse woody material counts or biomass</li> <li>•litter and duff layers depth or biomass</li> <li>•live and dead shrub or herbaceous material biomass</li> <li>•code definitions in data tables</li> </ul>	<ul style="list-style-type: none"> <li>•narrative</li> <li>•edited previous version of LANDFIRE data products</li> </ul>
Bonus Information	<ul style="list-style-type: none"> <li>•post disturbance/event fuel model or vegetation type</li> <li>•description of treatment's success level in meeting management objectives</li> <li>•additional comments about the event and resulting landscape changes</li> </ul>	<ul style="list-style-type: none"> <li>•plot photographs</li> <li>•project descriptions or final reports</li> <li>•data dictionaries</li> </ul>	<ul style="list-style-type: none"> <li>•additional information or supporting documentation that will document the issue</li> </ul>
Examples Datasets with Beneficial Attributes	<ul style="list-style-type: none"> <li>•<a href="#">USFS FACTS data</a></li> <li>•<a href="#">CAL Fire perimeters</a></li> </ul>	<ul style="list-style-type: none"> <li>•<a href="#">FIREMON data</a></li> <li>•<a href="#">FFI data</a></li> </ul>	

