LANDFIRE Webinar

Maps, Models, and Examples:
Leveraging LANDFIRE's National Datasets

Presented to Lake States Fire Science Network
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The Nature Conservancy

Hello everyone. First a quick story. Way back in 1987 my dad gave me an old Plymouth Horizon. It was free and got me to work and back, but of course I needed to modify it… I added Pirelli tires, a JVC stereo , a roof rack and well, basically modified it to suit my needs. When it needed repairs my dad would simply hand me his keys saying "my tools are in the trunk." If I got in a bind he'd help. In a way, that's what the presentation is about today- taking free LANDFIRE products and then modifying them to suit local needs. One small difference - we'd like to help before you get in a bind!

Agenda

- Intro to LANDFIRE

- LANDFIRE Fuel Mapping 101

- Fuel data modification examples

- Resources

- Questions/discussion

Today we'll go through a quick introduction to LANDFIRE, then we'll jump right into three examples of where people have used LANDFIRE in research as a way to introduce the datasets and some important concepts. As we go through the slides, please ask clarifying questions in the text box, and/or write down questions for later. We are happy to hear from you!

LANDFIRE is a partnership between the U.S. Forest Service and the U.S. Department of Interior aimed at mapping all things, or at least most things vegetation, past and present. As you might guess LANDFIRE also delivers several fire-related datasets as well. The photo on the left includes many of the LANDFIRE program staff persons. The Nature Conservancy has a cooperative agreement to assist users, glean feedback and to provide outreach. We are pictured on the right and have expertise in fire ecology, GIS, climate change, state and transition modeling, science communications and conservation planning. I'm the guy with the beard.

Wall-to-Wall

By way of introduction, I'll mention a few traits of LANDFIRE data. First, it covers all lands within the 50 states, plus the U.S. insular areas such as Puerto Rico, American Samoa and Guam. LANDFIRE is especially well suited for working across state boundaries, situations where one state may not have data, or may have data that cannot be used together.
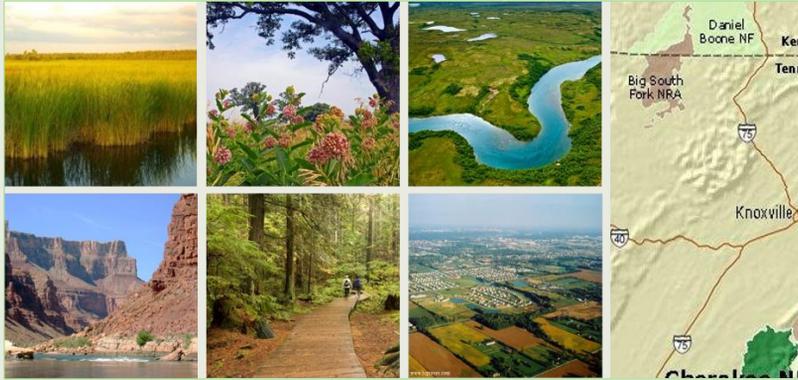
Consistent Methods

So that LANDFIRE data can be used across large areas, the they are developed using consistent methods from place to place. There are important exceptions such as with our historic ecosystems map, called the Biophysical Settings later, LANDFIRE leaned on soils more in the east than the west for mapping.

Designed with a Purpose

LANDFIRE was born out of a need for national data to help prioritize management and to provide decision support. It was designed for use over large areas, not for use in your backyard. Although LANDFIRE was designed with fire and fuels management in mind, uses range from fire behavior modeling to sage grouse habitat mapping to sighting wildlife camera traps, assisting riparian corridors and much more. There's roughly 1,000 articles citing LANDFIRE on Google Scholar.
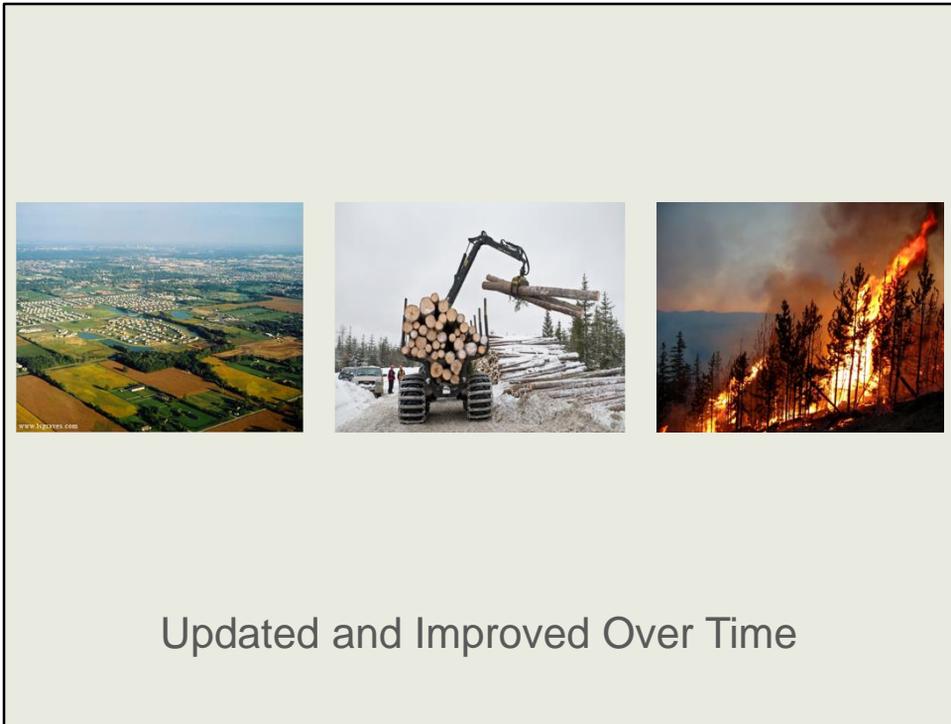
Updated and Improved Over Time

Updated and improved over time – LF updates its data bi-annually

PRO: it is expensive to keep data up to data; we learn more with every iteration and do our best to make improvements and incorporate new techniques overtime; e.g. height/cover mapping and improvements projects

CON: we have to keep up w/ the production schedule and don't have time to incorporate some improvements

SUMMARY – LANDFIRE is really good at some things, in particular the national- and regional-level planning and prioritization it was designed to support.

But, I'll be the first to admit that LANDFIRE is far from perfect. The rub is that there is a great need for the data at finer scales; localize.

All data should be reviewed; today examples from LF

[[sprawl: lsgraves.com, found http://stopurbansprawl-meredith.blogspot.com/
Logging: Ami Vitale, TNC all rights
Fire: TNC all rights

Starter list of LANDFIRE Data Products
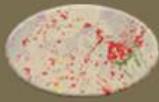
| Disturbance	Vegetation	Fuel	Fire Regime
2 yr. Cycle	Existing Vegetation: • Cover, Height, Type • Biophysical Settings • Environmental Site Potential	Canopy: • Height, Bulk Density, Base Height, Cover Fire Behavior Fuel Models: • FBFM13 • FBFM40	• Fire Regime Group • Mean Fire Interval • % Low, Mixed, High Severity • Succession Classes
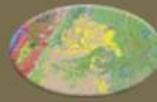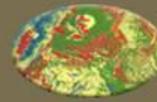
Fire Behavior Fuel Models are the focus of today

LANDFIRE delivers more than 2 dozen spatial datasets, covering vegetation, fire and fuels characteristics. In the interest of being legible I only list some here. Most LANDFIRE datasets are in grid format with 30m pixels. For the lower 48 there are roughly 9 billion pixels. Today we'll largely focus on the fire behavior fuel model datasets, specifically the 13 Anderson and the 40 Scott and Bergan.

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
- To critique rulesets and produce updated FBFM spatial data, use the LANDFIRE Total Fuels Change Tool https://landfire.gov/download_lfdat.php#lftfct

A **Fuel Model** is a stylized set of fuel bed characteristics used as input for a variety of wildfire modeling applications. A fuel model defines these input variables for a stylized set of quantitative vegetation characteristics that can be visually identified in the field. Depending on local conditions, one of several fuel models may be appropriate. Hal Anderson stated back in 1982 that "Fuel models are simply tools to help the user realistically estimate fire behavior. The user must maintain a flexible frame of mind and an adaptive method of operating to totally utilize these aids".[2]

Fuel Model

Anderson, Hal E. 1982. Aids to determining fuel models for estimating fire behavior. USDA Forest Service General Technical Report INT-122. 22 p.

Description

1	Grass	11	Light Slash
2	Pine/Grass	12	Medium Slash
3	Tall Grass	13	Heavy Slash
4	Tall Chaparral	14	Plantation/Burned last 15 years
5	Brush	15	Desert
6	Dormant Brush	28	Urban
7	Rough	97	Agricultural Lands
8	Hardwood/Lodgepole Pine	98	Water
9	Mixed Conifer Light	99	Barren/Rock/Other
10	Mixed Conifer Medium		

The original 13 (Anderson, 1982) were designed to support analysis of wildfires under peak fire conditions with cured herbaceous fuels.

There are multiple fire behavior fuel model sets, Anderson's 13 and the Scott and Bergan 40. Anderson's might be more familiar. Built from Albini's 1976 original fuel models they were developed for us in fire spread models. These were designed for the sever period of the fire season when wildfires pose greatest control problems. Furthermore they were designed for use in the dry season. hey are not dynamic.

Scott and Bergan 40 Fire Behavior Fuel Models

		Low	Moderate	High
Low Moist. Of Extinction	Grass (GR) Grass/Shrub (GS)	FB1, GR1*, GR2* GS1*	GR4* FB2, GS2*	GR7* GS2*
	Shrub (SH) Timber Understory (TU)	SH1*, SH4, SH6 TU1*	FB5, FB6, SH2 TU2, TU3*, TU4	FB4, SH5, SH7 FB10, TU5
DEAD FUELS ONLY	Timber Litter (TL)	FB8, TL1, TL3 TL2 (Broadleaf)	TL4, TL5, TL7 TL6 (Broadleaf)	TL8 FB9, TL9 (Brdlf)
	Slash/Blowdown (SB)	FB11, SB1	FB12, SB2, SB3	FB13, SB4
High Moist. Of Extinction	Grass (GR) Grass/Shrub (GS)	GR3*, GR5* GS1*	GR6* GS3*	GR8*, GR9* GS4*
	Shrub (SH) Timber Understory (TU)	FB7, SH4, SH6 TU1*	SH3 TU2, TU3*	SH8, SH9* TU5

40 Scott and Burgan Fire Behavior Fuel Models - fire behavior fuel model predictions beyond the severe fire season, such as prescribed fire and fire use applications

From Wikipedia:

Scott and Burgan's Dynamic Fuel Models were published[6] in 2005 to eliminate the assumption that the fuel bed was uniform during the dry season. This is done through the use of dynamic herbaceous fuel beds, where the "live herbaceous load is transferred to dead as a function of the live herbaceous moisture content." The use of a curing coefficient allows more realistic modeling of fire behaviors in herbaceous fuel beds. Furthermore, these models aim to move away from the correlation between vegetation type and fuel bed characteristics. For example, the original 'chaparral' model becomes the 'heavy load, tall brush" model. Like the NFDRS conversion crosswalk in Albini and Anderson's models, Scott and Burgan include a crosswalk between the original 13 and their set of 40 new models. Furthermore, they include the original 13 as models 1-13 to allow backwards compatibility in newer modeling software.

Fuel models represent fuel bed characteristics
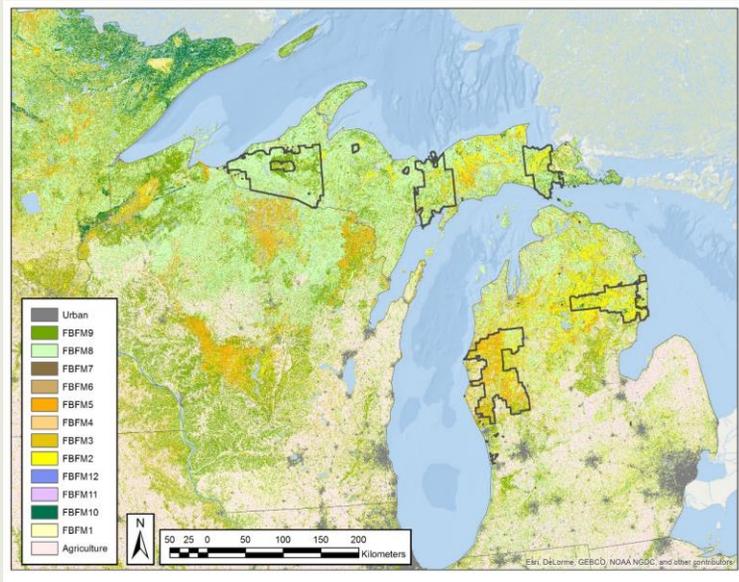
13 Anderson Fire Behavior Fuel Models

Here's a map of LANDFIRE's depiction of the 13 Anderson Fire Behavior Fuel Models for Michigan, with the Michigan National Forests highlighted.

Fuel models represent fuel bed characteristics

40 Scott and Burgan Fire Behavior Fuel Models
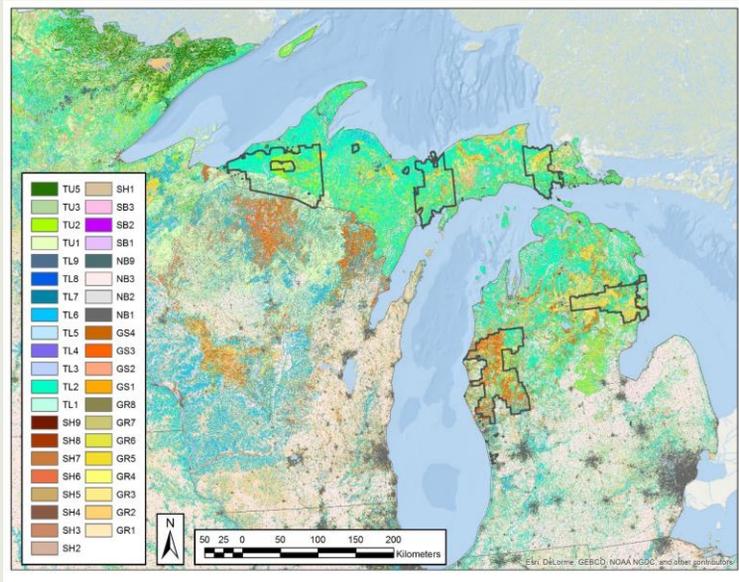
And here's a map of LANDFIRE's depiction of the 40 Scott and Bergan FBFMs for Michigan.

Inputs calibrated to assign fuel label

Existing Vegetation Type
Existing Vegetation Cover
Existing Vegetation Height
Biophysical Settings
Fuel Disturbance
→ Fire Behavior Fuel Model
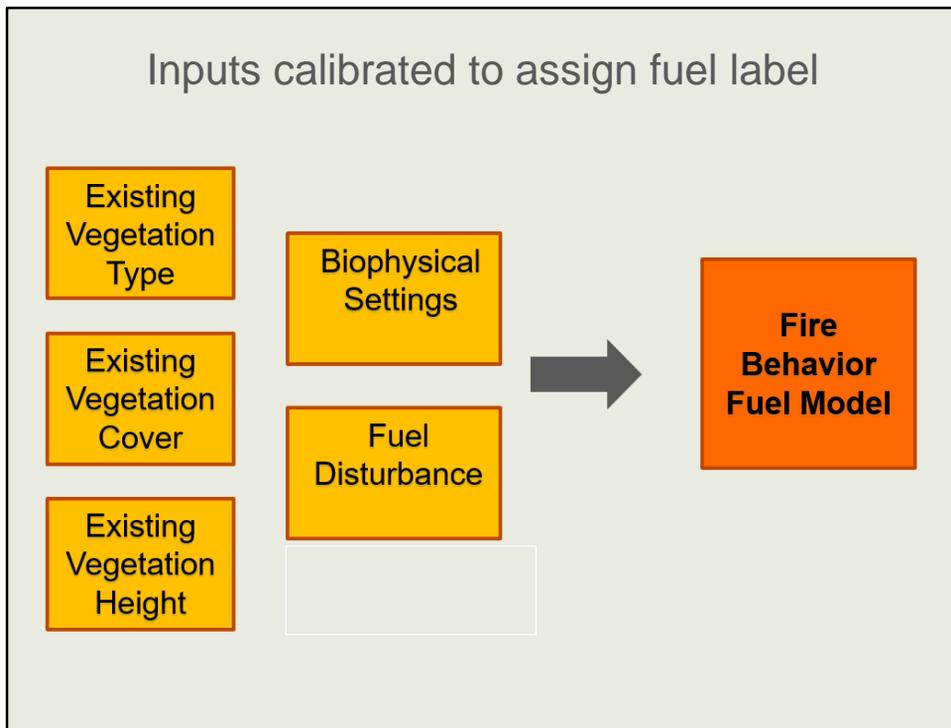
- Mapped using a rule based approach, meaning that each combination of the inputs is given a fuel model label.

- Based on EVT, EVC, EVH, sometimes BpS

- Updates also incorporate information about "events" or disturbances or activities, e.g. fires, thinning, logging, etc.

- Created by fire and fuels specialists through a series of fuel calibration workshops held across the country

- The next few slides will be maps of some of the inputs as a quick illustration

Inputs to Fuel Data - Existing Vegetation Type
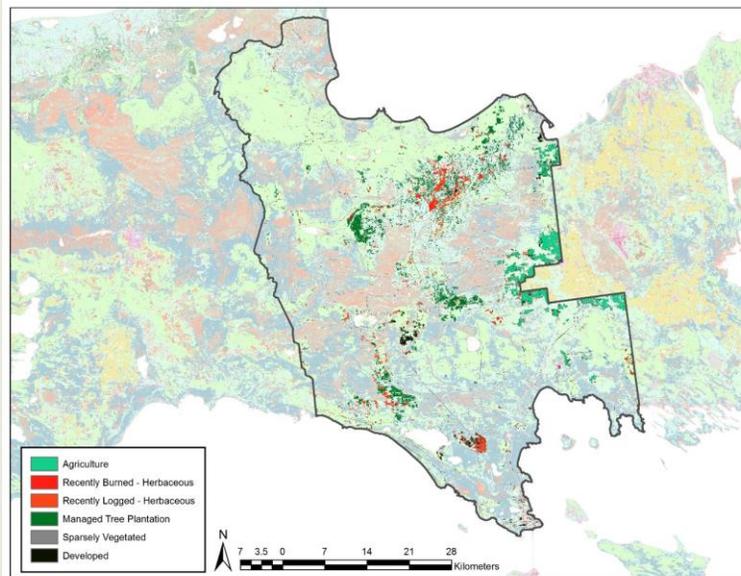
LANDFIRE's Existing Vegetation Type dataset essentially maps NatureServe's Ecological Systems, which is a mid-scale classification. In this map I have the EVTs except the ones in the legend set as 60% transparent for an areas within the eastern block of the Hiawatha National Forest. In this extent the legend would be dozens of items long. I should also note that I have grouped the multiple agricultural types together into one legend item. The total dataset (not just the legend items highlighted here) is critical to mapping fuels.

This area is complex with acid peatlands, alkaline swamps, northern hardwoods and jack pine barrens.

Inputs to Fuel Data - Existing Vegetation Height

Forest Height 0 to 5 meters
Forest Height 10 to 25 meters
Forest Height 25 to 50 meters
Forest Height 5 to 10 meters
Herb Height 0 to 0.5 meters
Herb Height 0.5 to 1.0 meters
Herb Height > 1.0 meter
Shrub Height 0 to 0.5 meters
Shrub Height 0.5 to 1.0 meter
Shrub Height 1.0 to 3.0 meters
Shrub Height > 3.0 meters
Sparse Vegetation Height
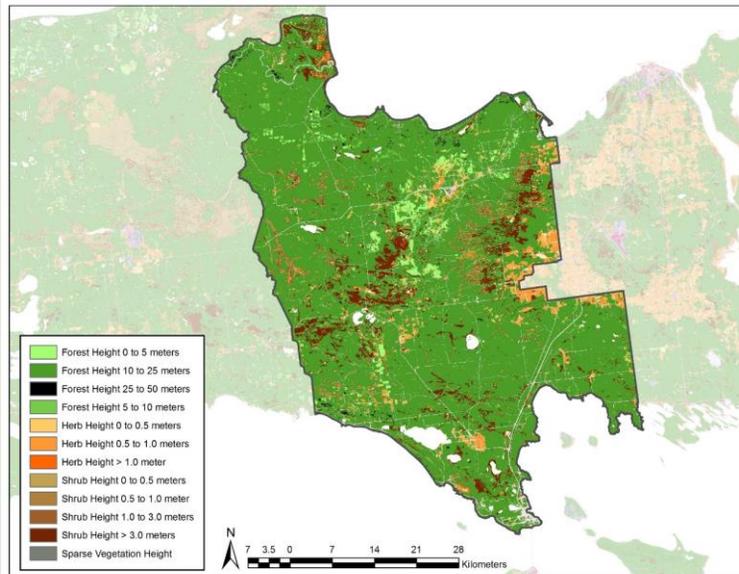
Here I've shown the entire legend of LANDFIRE's Existing Vegetation Height of the eastern part of the Hiawatha NF for your enjoyment.
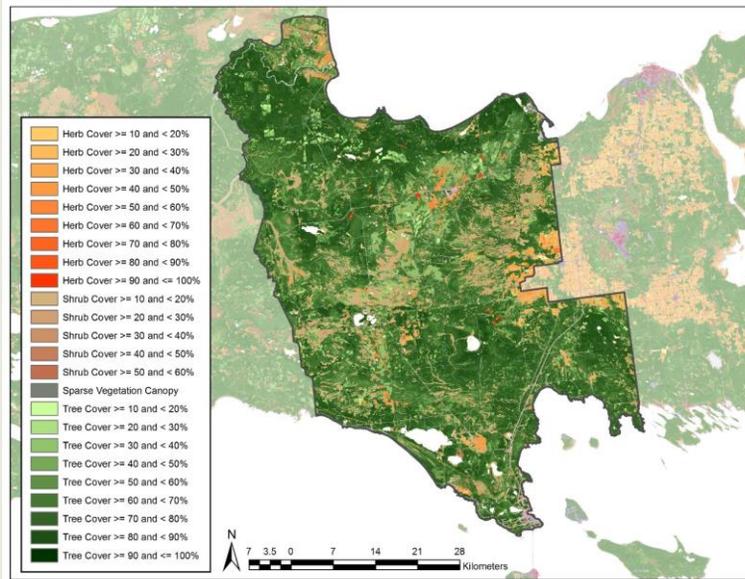
This is the Existing Vegetation Cover for the eastern block of the Hiawatha NF.

Inputs to Fuel Data – Fuel Disturbance
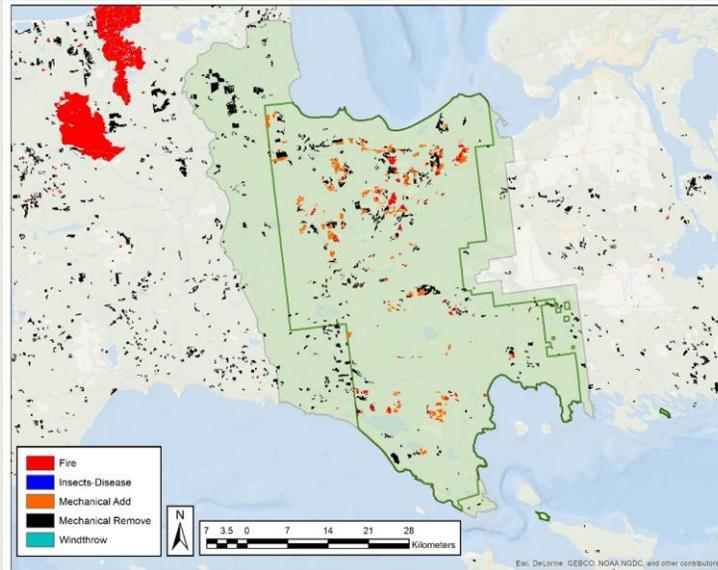
LANDFIRE also maps disturbances with your help. Have you reported a disturbance today? As you might expect we mine all governmental databases and use satellite imagery to map disturbances. As we do our 2 year updates disturbances are key to changing other datasets. This map represents some disturbances going back 10 years.

Inputs to Fuel Data - Biophysical Settings (BpS)

Legend:
- Pine-Hemlock-Hardwood Forest
- Northern Pine(-Oak) Forest
- Northern Hardwoods Forest - Hemlock
- Northern Hardwoods Forest
- Jack Pine Barrens and Forest
- Floodplain Systems
- Alkaline Conifer-Hardwood Swamp
- Pine-Oak Barrens
- Spruce-Fir
- Pine Barrens
- Coastal Marsh Systems
- Eastern Boreal Floodplain
- Boreal White Spruce-Fir-Hardwood Forest
- Boreal Acid Peatland Systems

And finally I wanted to show you our Biophysical Settings data which can also serve as an input to fuels mapping. This dataset represents dominant vegetation types prior to major European settlement. It is modeled based on environmental inputs such as slope, soils, surficial geology and climate parameters.

An issue with any input or the ruleset can lead to unsatisfactory fuel model data

Existing Vegetation Type

Existing Vegetation Cover

Existing Vegetation Height

Biophysical Settings

Fuel Disturbance

Fire Behavior Fuel Model
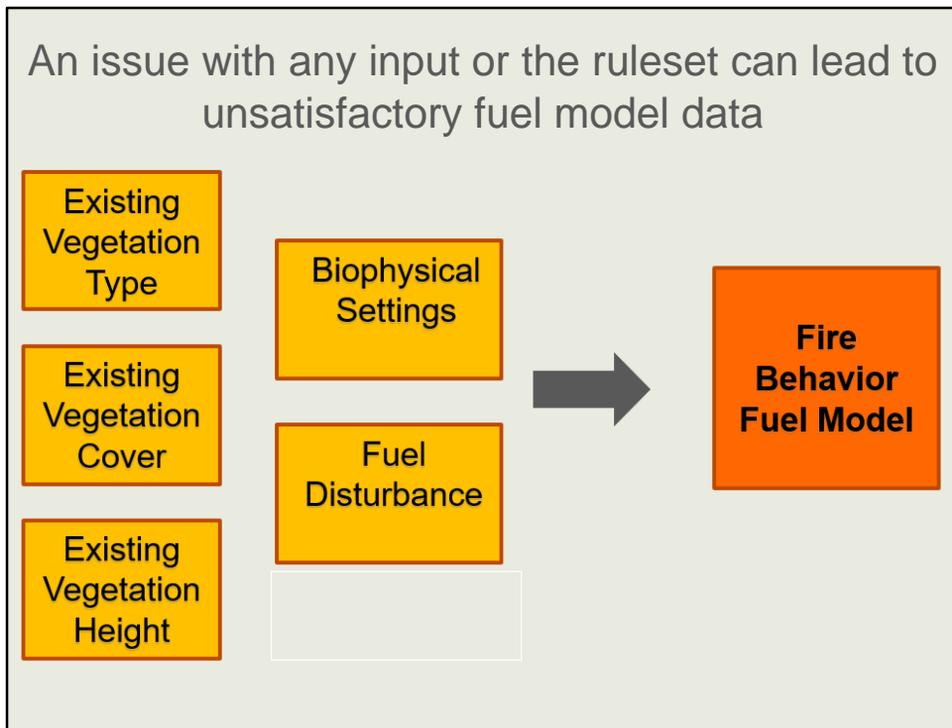
To me this is an amazing dataset, super difficult to create.   With the fuels data there are several places where improvements can make a difference.

Red lines denote map zones going through Ottawa NF
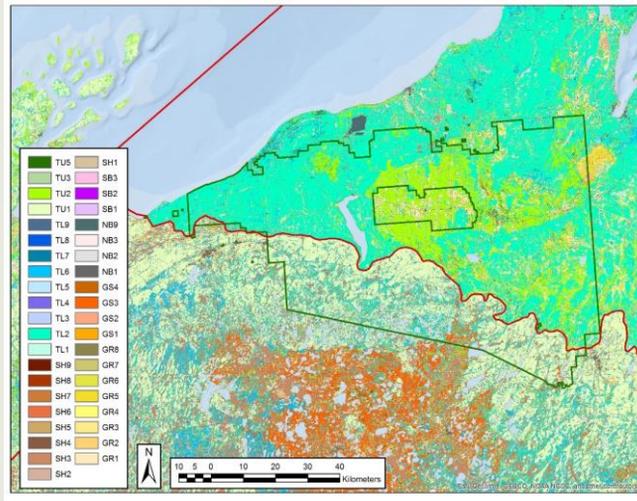
Difference in fuel model data largely driven by ruleset in this case

Just a quick example of this. LANDFIRE delivers data by Map Zone, and the fuels rules were created per zone. In this case the red line is a map zone, and you can see where the fuel data follows this. I do not know which ruleset is better, but I do know that if you are managing the Ottawa National Forest which is bounded by green, you'll need to dig into the rules and input data to understand and modify as needed to remove the line which certainly appears to be artificial in this case!

Preview of three examples

Ottawa N. F.
Preview of work to come!

Hiawatha N. F.
Fuels assessment

Huron-Manistee
Fuels modification
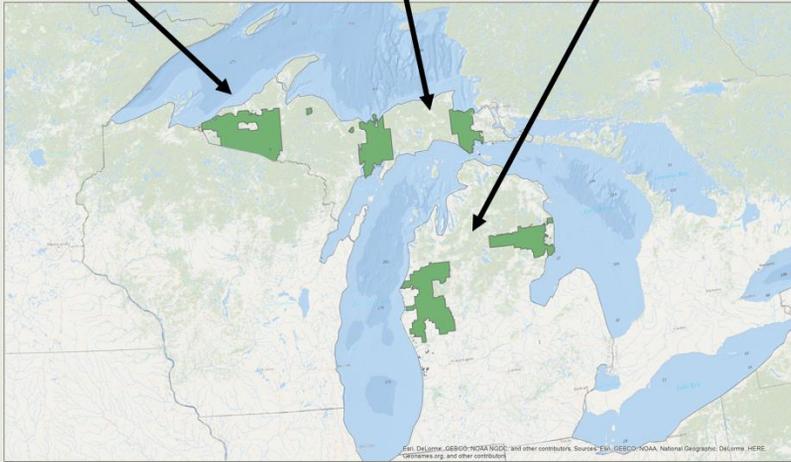
Most of the rest of the presentation will focus on the Hiawatha and Huron-Manistee National Forests, with a quick note about upcoming work on the Ottawa.

Data critique and modification process

Define Objectives

Identify Data Requirements — Critique — Modify — Analyze
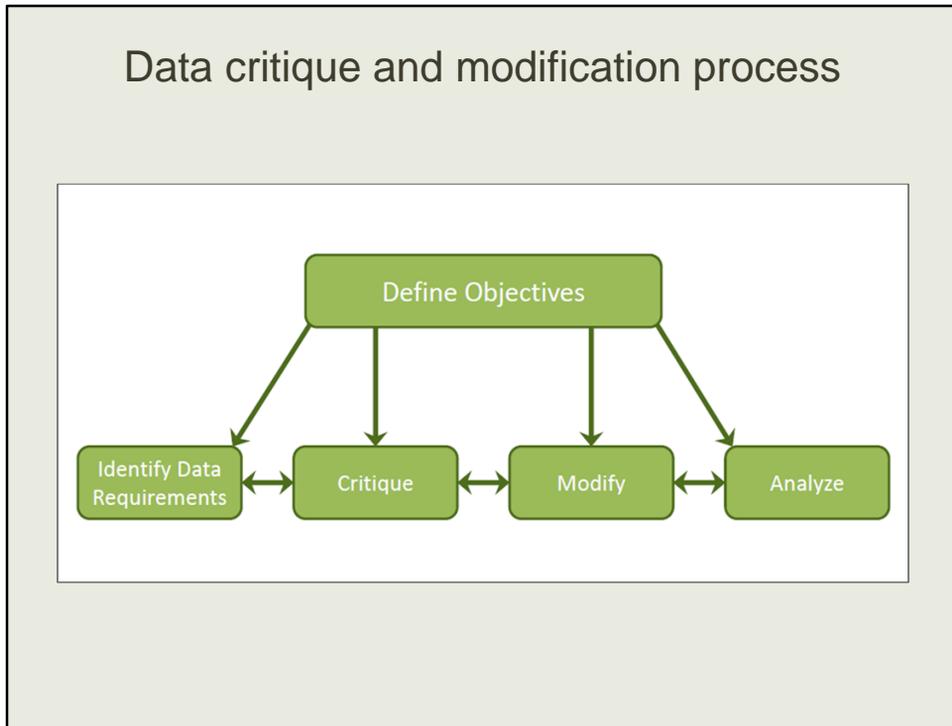
This is Don Helmbrecht's figure, who led the technical aspects of the Huron Manistee calibration effort

> See his presentation online – link to slides and video in the resources provided after this webinar

> The fuels calibration requires these steps and many people, including on-the-ground fire professionals in the area, GIS technicians, fuel model experts.

> After defining objectives, process is not one direction from beginning to end, but revisit each step as necessary throughout the calibration

On the Huron-Manistee National Forest

Photo: Persephone Whelan

The first example I will review today is at the eastern zone of the Huron Manistee National Forest. Persephone Whelan, who is the West Zone Fire Management Officer currently, was very involved with the calibration and helped us recollect the process and what changes were made. Her presentation of this project is available in the resources we will provide after this webinar, as well as presentations from Megan Sebasky on the more technical details, and from Robert Zeil (Zeke) on how to select appropriate fuel models

Huron-Manistee NF critique and modification steps

Summary of Modification Steps:

- Updated LANDFIRE disturbance data
- Updated Existing Vegetation Cover to reflect new disturbances.
- Critiqued FBFM mapping rules and made modifications
- Conducted preliminary fire behavior modeling to evaluate data modifications.

See: Helmbrecht, Donald J. and Kori Blankenship. 2016.
Modifying LANDFIRE Geospatial Data for Local Applications

Every place and situation is different. Here is the basic process followed by the Huron-Manistee National Forest. In the next few slides we'll dig into more details.

First update disturbances as needed
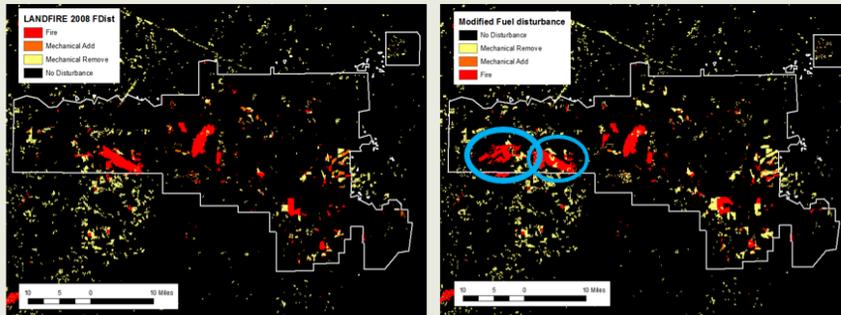
Updates to disturbances were applied

Update disturbance data – LANDFIRE maps disturbances based on event data they receive as well as identifying disturbances from Landsat imagery. However, LANDFIRE will miss some disturbances, and due to the vintage of LANDFIRE data, you will have more disturbance in the years since the data publication (e.g. 2008 LF data was used for this calibration done in 2013). Additionally it may be useful to review LANDFIRE labels of disturbances. For example you may know that a polygon should be labeled as a different type of disturbance than LANDFIRE does.

Enter the LANDFIRE Total Fuel Change Tool

ArcGIS toolbar that allows users to translate knowledge and data into spatially explicit Fire Behavior Fuel Models
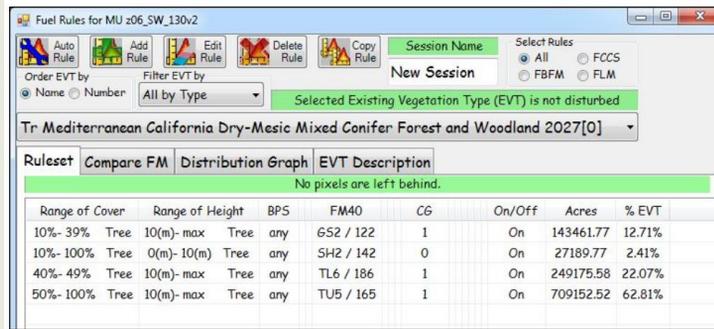
Figure 14. Example LANDFIRE Total Fuel Change Tool (LFTFCT) rule set. The LFTFCT is a custom ArcGIS toolbar that links to the LANDFIRE fuel mapping rules through a Microsoft Access database.

Once you have your disturbance data or other input data adjusted, then what? Use the LANDFIRE Total Fuel Change tool, your knowledge and experts to modify the Fire Behavior Fuel Models.   This tool allows you to tweak the fuel model rulesets, then quickly map and test their new rules. You can define rules then compare on the fly.

How changes to fuel models were made

Original map zone 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	GS2 / 122	On	27962...	83.92%

In this example, experts reviewed the Laurentian Pine Barrens. In the LANDFIRE rules any pixel mapped as Laurentian Pine Barrens, with height ranging from 0-50 meters and cover 10-100% was labeled as GR3, typified by relatively light loads of grass and herbaceous fuels. Experts on the Huron-Manistee split out pixels that were 10-39% cover, leaving them as GR3, then labeling pixels 40-100% cover as GS2, moderately loaded grass-shrub.

Undisturbed Pine Oak Barrens GR3 to GS2
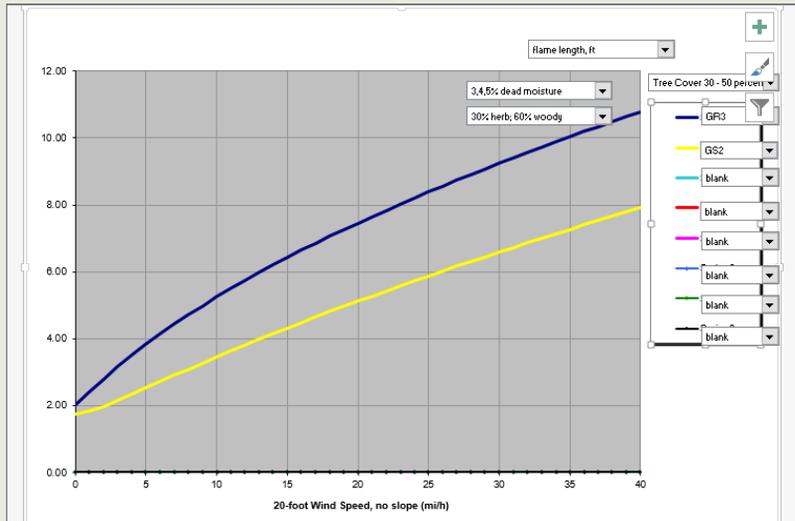
From the "CompareModelsFour" spreadsheet by Pyrologix

Using the CompareModelsFour spreadsheet distributed by Pyrologix you can do a simple and quick check of the fire behavior for different fuel models. Here in this example we see that flame heights were higher with the GR3 fuel model represented in Blue/Purple.

Within the Total Fuels Change tool you can add in an additional discrete variable to help parse out different fuel models. As I mentioned LANDFIRE has a standard set of inputs to develop the fuel model maps-you may know that the addition of another variable can make the data more accurate. In this example the Huron-Manistee added in what was essentially a management dataset as shown here. For example the orange pixels were labeled as broadcast burns.

For EVT Laurentian Pine Barrens, with disturbance 323 = moderate severity mechanical removal 6-10 years ago the team:

1. Edited the rules for the EVT wherever it occurred (GR3 to GS4)

2. Also added rules for specific values of the wildcard.   For example if you had 5-50m tall Laurentian Pine Barrens with 10-30% canopy cover and a value of "32" from the wildcard (which happens to be conversion to hardwood)

3. Wildcard in this project was another disturbance related raster, but you can use anything. For example, we are thinking about using a percent conifer wildcard for mapping in the Northeast. It's just another dataset you can bring in to specify fuels.

Meaningful changes made to fuel models

Before

After

GR3 to GS2; GS3 to TL2; TU2 to TL2
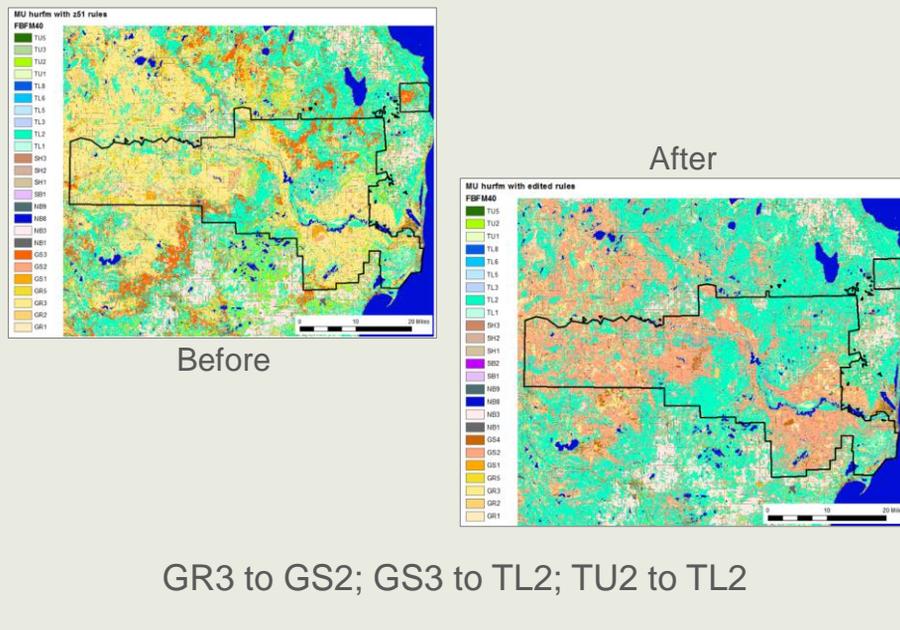
The process undertaken on the Huron-Manistee National Forest resulted in some pretty substantial changes to the fire behavior fuel model data. I have not heard this from them directly, but my guess is that this process was easier than starting from scratch.

Largest changes made, in undisturbed areas: GR3 (grass model) to GS2 (grass shrub) - (sand to pink colored pixels), GS3 (grass shrub) to TL2 (timber litter) – (orange to teal – adding to the already widespread teal), TU2 (timber) to TL2 (timber litter) – (lime green to teal)

Huron-Manistee National Forest Summary

- Needed to adjust LANDFIRE Fuels data to help meet management objectives

- Updated input data and fuel rules

- Held fuels calibration workshop, brought in some outside assistance

- Made meaningful adjustments using the LANDFIRE Total Fuels Change Tool

I hope I've given you a sense of how people use LANDFIRE data, and perhaps even inspired you to give it a go. It's not perfect for all uses or all landscapes…that's why the authors drilled in an did review. They really understood what they were getting into, the strengths and weaknesses of the data. We are ready to help you explore the datasets for your area and questions of interest. While there are many automated processes involved with LANDFIRE data development, in the end it comes down to people.

If you want to know more:

- Megan Sebasky and Persephone Whelan have been super generous in sharing information
- Don Helmbrecht and Kori Blankenship have literally written the guide on modifying LANDFIRE data
- Megan has a Google Group with a post sharing PowerPoint presentations, videos and more

We will be sending out links to all of these resources- we want to help!

I have many people to thank for sharing resources and experiences including Megan Sebasky of the WI DNR, Persephone Whelan of the Huron-Manistee, Don Helmbrecht of the USFS Enterprise TEAM and Kori Blankenship who is on TNC's LANDFIRE team. These folks, plus others such as Robert Zeil and probably many of you on the call can help managers adjust fuel models.

Hiawatha Fuels Assessment

Fuels assessment requires multiple modifications due to objectives:

- Modified fuels data
- Modifying Biophysical Settings Data and input models
- Reviewed Existing Vegetation Type, Height and Cover data

Like all national forests the Hiawatha has many objectives. With the fuels assessment that is currently underway the staff on the Hiawatha are not only trying to prioritize where to treat hazardous fuels, but also to better understand the fire ecology of the area and to identify areas where they can increase resiliency to climate change and other threats.

Hiawatha Fuels Assessment

Top 5 Changes for West Side of Hiawatha National Forest
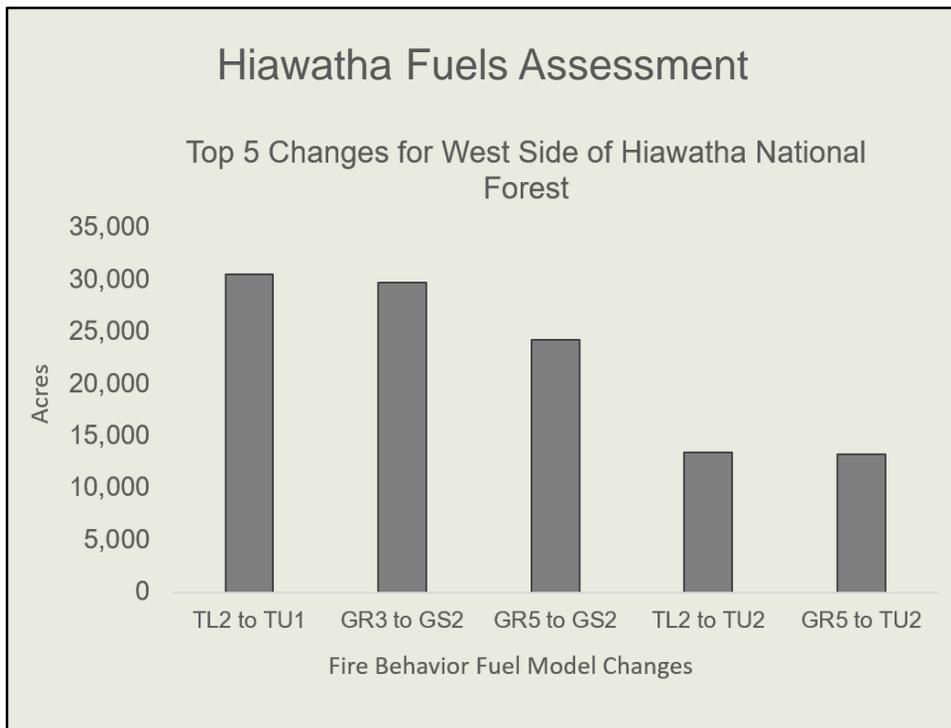
Don Helmbrecht and Persephone Whelan ran a fuels calibration workshop for the Hiawatha, going through a very similar process to what the Huron-Manistee did. Here I have the top five changes graphed. Playing around with the Compare Models worksheet you can quickly see that these changes have implications for flame length, fireline intensity and other parameters.

Fuel models changed during assessment
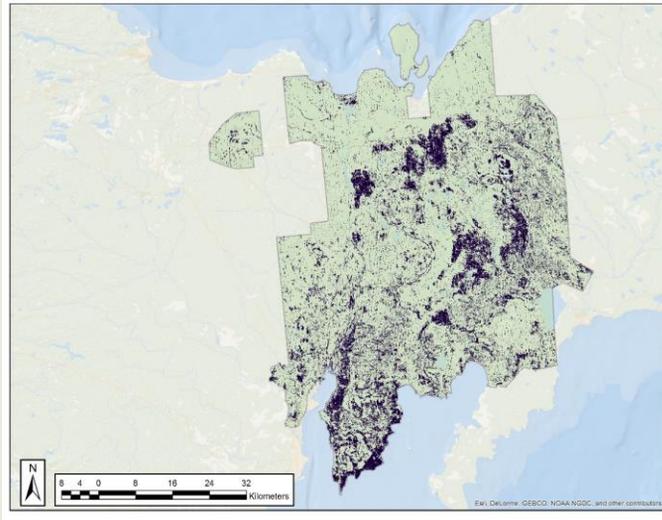
~20% of the west side of the
Hiawatha NF changed

This map depicts the pixels on the west block of the Hiawatha that were changed.
Roughly 20% of the area was adjusted during the workshop and during the pre-
workshop data preparations. Interestingly these changes were spread across the
block, that is they are not just in one corner or area.

Assessment about more than fuels
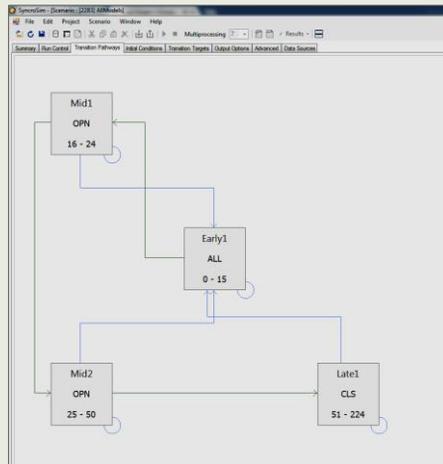
LANDFIRE uses modeling to estimate "reference" percentages of succession classes

It's rare that an assessment be focused on one thing…we are greatly summarizing the work of the Huron-Manistee and Hiawatha National Forests today. I do want to briefly describe some of the other related work on the Hiawatha for you. They are bringing in outside researchers and data to better understand how their ecosystems would have worked under natural disturbance regimes. To start they have provided feedback on LANDFIRE's Biophysical Settings models which incorporate disturbance information to estimate how much of each ecosystem's succession classes would have been on the landscape historically. In this screenshot you see the modeling software called SyncroSim, the boxes which represent succession classes, and lines which represent succession or disturbance. We are working together to modify this LANDFIRE model to better represent their knowledge of disturbances on their landscapes.

Here's a quick example of how the Hiawatha is looking at a metric called Vegetation Departure. They are starting with LANDFIRE Products-the modeled reference conditions and the mapped current conditions. This graph depicts the Great Lakes Pine Barrens that would have been dominated by the more open canopy succession classes historically. Today LANDFIRE has mapped dominance of closed canopy Jack Pine. Questions immediately arise:

- Are the models correct?
- Is LANDFIRE mapping current conditions correctly?

Reviewing Vegetation Departure Inputs

When comparing reference to current:

- Hiawatha is refining reference condition models internally and through work with Michigan Technological University and the WI Department of Natural Resources
- Reviewed Existing Vegetation Type, Height and Cover data, which are the inputs to current succession classes
- Need to address the "So what?" question
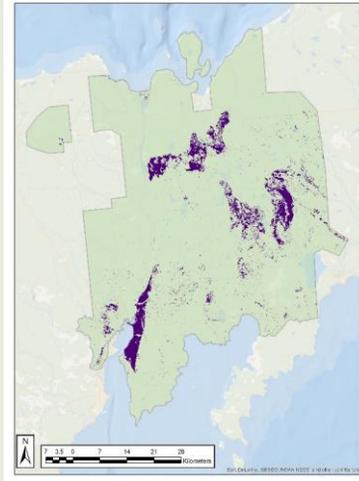

We are working to review and adjust LANDFIRE products. We are:

- Revising historic disturbance regimes in the SyncroSim models to better represent what we expected was happening locally prior to European Settlement

- Looking at and adjusting the inputs to succession class mapping, then remapping succession classes in ArcGIS. No special tools here, but general raster processing skills

- The Hiawatha is currently supporting work by Michigan Technological University and the WI Department of Natural Resources to get more information on historic fire regimes

- Then, importantly the Hiawatha has to do the juggle and answer the "So what?" question. Over representation of some succession classes may or may not be an issue when weighed across all objectives.

Hiawatha Fuels Assessment

- The Hiawatha work is in progress

- Multiple stakeholders are participating in process to increase ecological knowledge and improve datasets

- "Rapid Assessment" of Ottawa National Forest fire, fuels and vegetation to begin this summer

To summarize:

- The Hiawatha is working to glean the best information possible to characterize current conditions, differences from historic and to prioritize vegetation treatments
- It takes a village. I am super happy to see the inclusion of Michigan Tech and WI DNR
- Starting this summer we are conducting a "Rapid Assessment" of the Ottawa NF

Rapid Assessment of the Ottawa National Forest
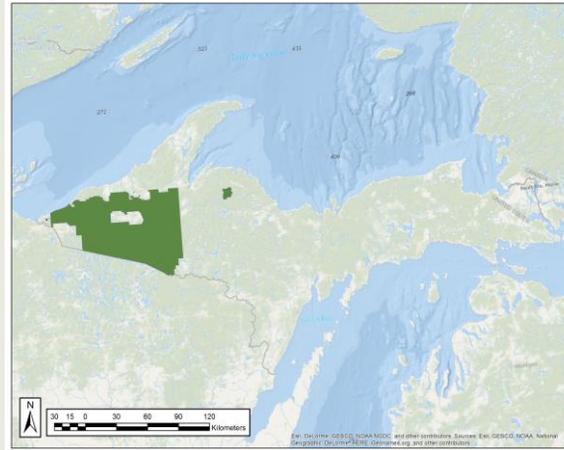
Using base LANDFIRE data we will characterize Vegetation Departure and run FlamMap to assess potential fire behavior

This summer we will do a relatively quick assessment of vegetation conditions and fire behavior using base LANDFIRE products. We will then review, and revise as necessary.

Interagency Fuel Treatment Decision Support System

With GR3
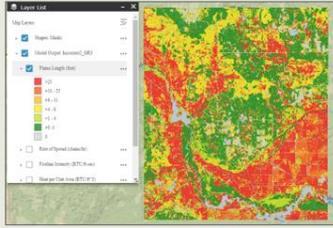
With GS2
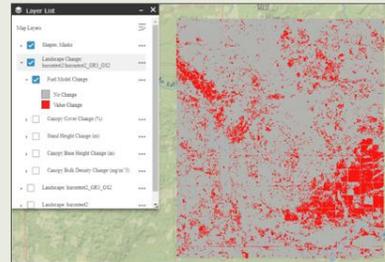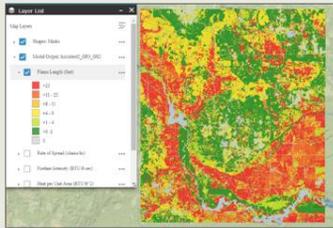
Difference in modeled flame length
(made up weather conditions)

Here's a totally made up example to demonstrate what we'll do. Within the Interagency Fuel Treatment Decision Support System we can use the compare treatment alternatives tool to see the difference in basic FlamMap outputs for the different fuel model scenarios (using the same weather inputs – totally made up).

Fuels perspective and resources

Adapted from LANDFIRE Business Lead Henry Bastian --

People should view and understand Fire Behavior Fuel Models using FBFM glasses instead of vegetation glasses. Most (far too many) simply look at the pictures in the books and then relate their vegetation to a FBFM. Rather, people should ignore the pictures and focus on the details with the surface and canopy fuels.

- The "compare fuel model" spreadsheets developed by Joe Scott. S-495
- Geospatial Fire Analysis, Interpretation & Application Self Study 2017
- Introduction to the 40 Fire Behavior Fuel Models

OK. We've talked about how two forests have taken free LANDFIRE data and modified it, or are modifying it for their needs. I'm not here to say that is free, quick or always easy, but for most situations it's better than starting from scratch. Also, it's important to know that we, the broader LANDFIRE community wants to help, and that there are resources to help get you started…here are a few. Megan Sebasky has prepared a sheet of links and tools that we will be sending out to you soon!

Feedback

E-mail: helpdesk@landfire.gov

Website:
https://landfire.gov/contactus.php

If you do review LANDFIRE data, provide feedback to us via e-mail, or better yet directly to the LANDFIRE helpdesk.

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