

What's New in LANDFIRE

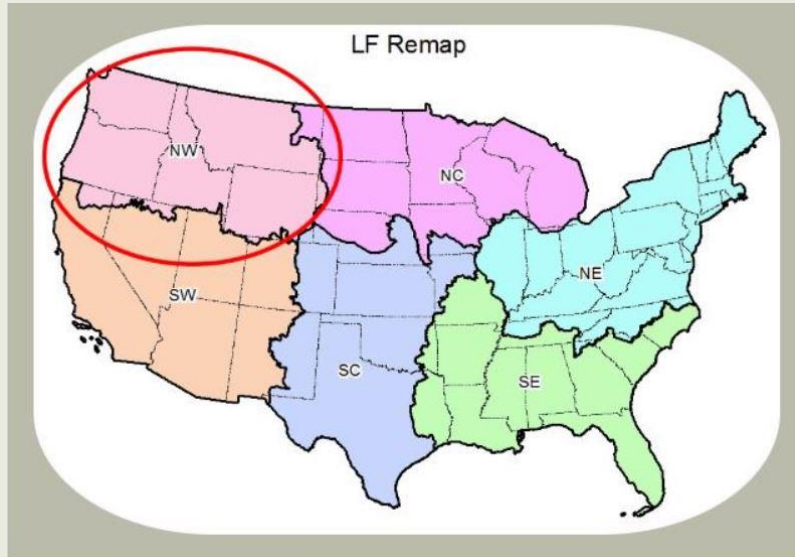
*NW Fire Science Consortium Webinar
May 9, 2019*



Kori Blankenship, Fire Ecologist
Jim Smith, Program Lead
The Nature Conservancy LANDFIRE Team

Agenda

- Background: The Past
- LF Remap: The Present
- LF Update: The Future
- NW Impacts
- BpS Review
- Support/Resources



Who is LANDFIRE?



USDA FS, DOI, USGS Production Team, Program Leaders, and GAP



The Nature Conservancy's LANDFIRE Team

An innovative program designed to create and periodically update comprehensive **vegetation**, **fire**, and **fuel** characteristics data using a consistent process for the entire U.S.



Past: The LANDFIRE Foundation

LANDFIRE Charter establishes 4-C's:

- **Comprehensive**
- **Compatible**
- **Consistent**
- **Current**

which are our design criteria/design constraints for.....

20+ current and historic vegetation/fuels/condition 30m, spatial data layers and 800+ quantitative state-and-transition BpS models and descriptions

Delivered versions circa 2000 (LF National Improved), circa 2008, 2010, 2012 and 2014, and now **Remap**

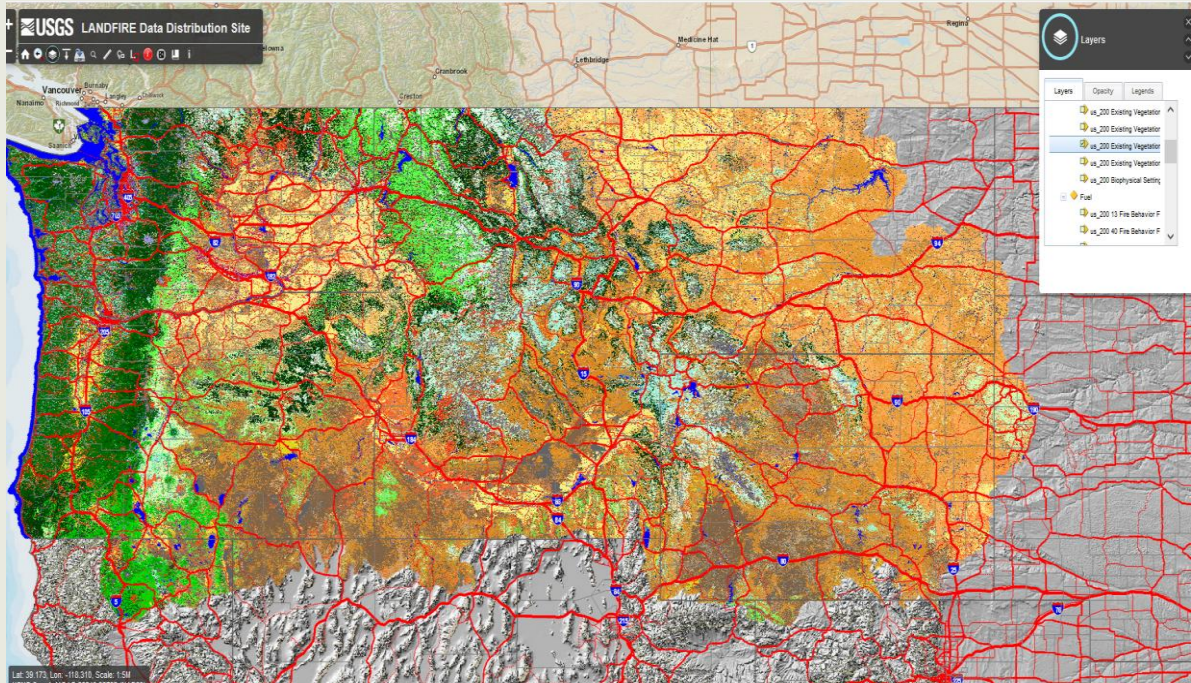
Past: The LANDFIRE Foundation

LF Version Descriptions

Under each column, links are provided to download full extent mosaics or databases. Please note that mosaics are not available until the full extent is complete. Data availability is shown on LF's [Data Distribution Site \(DDS\)](#), which offers data downloads at selected extents.

Product Name	Abbrev	Theme	DDS	LF 2001 LF 1.0.5	LF 2008 LF 1.1.0	LF 2010 LF 1.2.0	LF 2012 LF 1.3.0	LF 2014 LF 1.4.0	LF Remap LF 2.0.0
LF Reference Database	LFRDB	Reference	--	US AK HI	n/c	n/c	n/c	n/c	
Public Events Geodatabase, 1999_YEAR	Events	Reference	x	--	US AK HI	US AK HI	US AK HI	US AK HI	e
Forest Vegetation Simulator Ready Database	FVSRDB	Reference	--	--	--	--	US AK HI	--	--
Disturbance	DistYear	Disturbance	x	--	US AK	US AK	US AK HI	US AK HI	e
Vegetation Disturbance	VDistYear	Disturbance	x	--	US AK HI	US AK HI	US AK HI	US AK HI	--
Historical Disturbance	HDist	Disturbance	--	--	--	--	--	--	e
Vegetation Transition Magnitude	VTMg	Disturbance	x	--	--	US AK	US AK HI	US AK HI	--
Forest Vegetation Transitions Database	FVTD	Disturbance	--	--	--	--	US AK HI	n/c	--
Non-forest Vegetation Transitions Database	NFVTD	Disturbance	--	--	--	--	US AK HI	n/c	--
Fuel Disturbance	FDistYear	Disturbance	x	--	US AK HI	US AK HI	US AK HI	US AK HI	e
Forest Vegetation Simulator Disturbance Database	FVSRDB	Disturbance	--	--	--	--	US AK HI	n/c	--
Biophysical Settings	BPS	Vegetation	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Environmental Site Potential	ESP	Vegetation	x	US AK HI *	n/c	US AK HI	n/c	n/c	--
Existing Vegetation Cover	EVC	Vegetation	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Existing Vegetation Height	EVH	Vegetation	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Existing Vegetation Type	EVT	Vegetation	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
National Vegetation Classification	NVC	Vegetation	--	--	--	--	--	--	
Biophysical Settings Models and Descriptions	BpS	Vegetation	--	BPS Models	n/c	n/c	n/c	n/c	--
13 Anderson Fire Behavior Fuel Models	FBFM13	Fuel	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
40 Scott and Burgan Fire Behavior Fuel Models	FBFM40	Fuel	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Canadian Forest Fire Danger Rating System	CFDRS	Fuel	x	--	--	AK	AK	AK	
Forest Canopy Bulk Density	CB	Fuel	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Forest Canopy Base Height	CBH	Fuel	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Forest Canopy Cover	CC	Fuel	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Forest Canopy Height	CH	Fuel	x	US AK HI	US AK HI	US AK HI IA	US AK HI	US AK HI	e
Fuel Characteristic Classification System Fuelbeds	FCCS	Fuel	x	US AK HI	US AK HI	--	--	US AK HI	e
Fuel Loading Models	FLM	Fuel	x	US AK	US AK	--	--	--	--
Fuel Vegetation Cover	FVC	Fuel	--	--	--	--	--	--	e
Fuel Vegetation Height	FVH	Fuel	--	--	--	--	--	--	e
Fuel Vegetation Type	FVT	Fuel	--	--	--	--	--	--	e
Fuel Rulesets Database	--	Fuel	--	--	--	US AK HI	US AK HI	US AK HI	
Fire Regime Groups	FRG	Fire Regime	x	US AK HI	n/c	US AK HI	US AK HI	US AK HI	e
Mean Fire Return Interval	MFR1	Fire Regime	x	US AK HI	n/c	US AK HI	n/c	n/c	--
Percent Low-severity Fire	PLS	Fire Regime	x	US AK HI	n/c	US AK HI	n/c	n/c	--
Percent Mixed-severity Fire	PLMS	Fire Regime	x	US AK HI	n/c	US AK HI	n/c	n/c	--
Percent Replacement-severity Fire	PRS	Fire Regime	x	US AK HI	n/c	US AK HI	n/c	n/c	--
Succession Classes	SCClass	Fire Regime	x	US AK HI	US AK HI	US AK HI	n/c	n/c	e
Vegetation Condition Class**	VCC	Fire Regime	x	US AK HI	US AK HI	--	US AK HI	US AK HI	e
Vegetation Departure Index**	VDEP	Fire Regime	x	US AK HI	US AK HI	--	US AK HI	US AK HI	e
Aspect ***	ASP	Topographic	x	n/c	n/c	US AK HI IA	n/c	n/c	US AK HI IA
Elevation ***	DEM	Topographic	x	n/c	n/c	US AK HI IA	n/c	n/c	US AK HI IA
Slope ***	SLP	Topographic	x	n/c	n/c	US AK HI IA	n/c	n/c	US AK HI IA

Present: LF Remap



Remap 2016 – What Remains the Same?

LANDFIRE Program has the **same design criteria/constraints**: comprehensive, compatible, consistent and current.

The basic product suite is the same, but there are **changes to mapping processes and thematic content** intended to improve product usability.

Should still be considered a large landscape, regional, national data set as delivered out-of-the-box.

LF Remap – What's New?

- Mapping footprints based on **Omernik Level III** ecoregions instead of NLCD Map Zones.
- **New compositing/tiling/masking methods** that provide an improved and more consistent image base.
- New, **improved plot “Auto-Keys”** for assigning vegetation type to field plots.
- **Landsat** 8 imagery and Landsat Analysis Ready Data Sets (image stacks).
- Included **external review** of the Existing Vegetation Type legend and draft products.
- Independently mapped **NVC Group**.

LF Remap – What's New?

- Many **more field-plots** and **more diverse** field-plots to support mapping.
- Incorporation of **lidar** data sets to improve the thematic resolution of structure products.
- Incorporation of **NLCD Continuous Shrub Cover** mapping project processes.
- Review of **Biophysical Settings** models and descriptions.
- New **products** (historic disturbance, attributes for fuels).
- New, **backwardly compatible** Fire Regime Group schema.

New Fire Regime Group Schema

Original Fire Regime Group	New Group Designation	All Fire Fire Return Interval	% Replacement Fire
I	I-A	0 - 5 years	Less than 66.7%
	I-B	6 - 15 years	
	I-C	16 - 35 years	
II	II-A	0 - 5 years	66.7% or greater
	II-B	6 - 15 years	
	II-C	16 - 35 years	
III	III-A	36 - 100 years	Less than 80%
	III-B	101- 200 years	Less than 66.7%
IV	IV-A	36 - 100 years	80% or greater
	IV-B	101- 200 years	66.7% or greater
V	V-A	201 to 500 years	Any severity
	V-B	501+ years	

LF Remap Quality

- EVT assessment for Ecological Systems, NVC Group, NVC Macrogroup and SAF/SRM cover type
- 9000+ independent plots
- Traditional Contingency Table
- Category Agreement Table
- Example of how to collapse categories in the contingency table now included
- Working on Vegetation Cover (EVC) and Vegetation Height (EVH)

LF Remap EVT Quality Products

Plot Assignment											
LANDFIRE Category	7008 North Pacific Oak Woodland	7010 Northern Rocky Mountain Western Larch Savanna	7011 Rocky Mountain Aspen Forest and Woodland	7012 Rocky Mountain Bigtooth Maple Ravine Woodland	7015 California Coastal Redwood Forest	7016 Colorado Plateau Piñon-Juniper Woodland	7017 Columbia Plateau Western Juniper Woodland and Savanna	7018 East Cascades Mesic Montane Mixed-Conifer Forest and Woodland	7019 Great Basin Piñon-Juniper Woodland	7021 Klamath-Siskiyou Lower Montane Serpentine Mixed Conifer Woodland	7027 Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland
7008 North Pacific Oak Woodland	0	0	0	0	0	0	0	0	0	1	0
7010 Northern Rocky Mountain Western Larch Savanna	0	0	0	0	0	0	0	0	0	0	0
7011 Rocky Mountain Aspen Forest and Woodland	0	0	38	0	0	0	0	0	0	0	0
7012 Rocky Mountain Bigtooth Maple Ravine Woodland	0	0	2	0	0	0	0	0	0	0	0
7015 California Coastal Redwood Forest	0	0	0	0	0	0	0	0	0	0	0
7016 Colorado Plateau Piñon-Juniper Woodland	0	0	0	0	0	0	0	0	0	0	0
7017 Columbia Plateau Western Juniper Woodland and Savanna	0	0	0	0	0	0	0	0	0	0	0
7018 East Cascades Mesic Montane Mixed-Conifer Forest and Woodland	0	0	0	0	0	0	0	0	0	0	0
7019 Great Basin Piñon-Juniper Woodland	0	0	0	0	0	0	0	0	0	0	0
7021 Klamath-Siskiyou Lower Montane Serpentine Mixed Conifer Woodland	0	0	0	0	0	0	0	0	0	0	0
7027 Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	0	0	0	0	0	0	0	0	0	0	0
7028 Mediterranean California Mesic Mixed Conifer Forest and Woodland	0	0	0	0	0	0	0	0	0	0	0

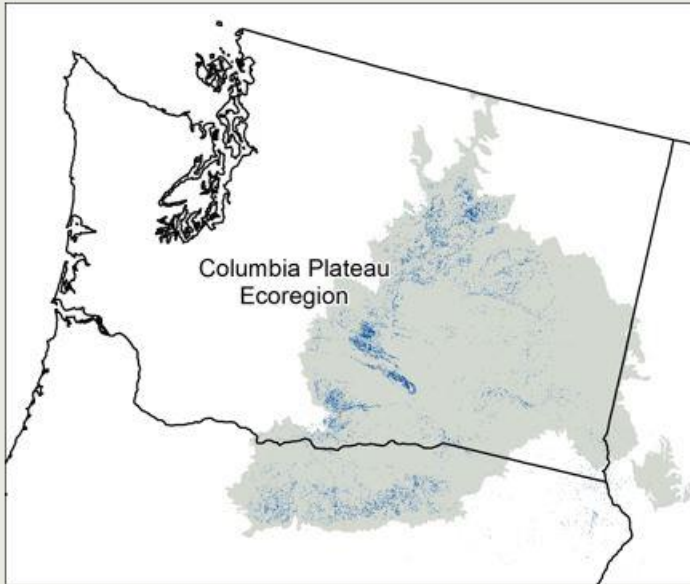
EVT Map Value	EVT_Name	Row Total (pixels)	% of Row Pixels	Row Agreement	Primary Within Row Mismatch	Secondary Within Row Mismatch	Tertiary Within Row Mismatch	Data_Source
7179	Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna	359	3.69%	90%	9828 Interior Western North American Temperate Ruderal Grassland; 7 Incorrect Pixels	7011 Rocky Mountain Aspen Forest and Woodland; 7 Incorrect Pixels	7166 Middle Rocky Mountain Montane Douglas-fir Forest and Woodland; 5 Incorrect Pixels	LANDFIRE LFRDB
7017	Columbia Plateau Western Juniper Woodland and Savanna	102	1.05%	79%	7123 Columbia Plateau Steppe and Grassland; 4 Incorrect Pixels	7019 Great Basin Piñon-Juniper Woodland; 4 Incorrect Pixels	7126 Inter-Mountain Basins Montane Sagebrush Steppe; 3 Incorrect Pixels	LANDFIRE LFRDB
7018	East Cascades Mesic Montane Mixed-Conifer Forest and Woodland	183	1.88%	77%	7045 Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest; 13 Incorrect Pixels	7174 North Pacific Dry-Mesic Silver Fir-Western Hemlock-Douglas-fir Forest; 11 Incorrect Pixels	7053 Northern Rocky Mountain Ponderosa Pine Woodland and Savanna; 8 Incorrect Pixels	LANDFIRE LFRDB
9307	Great Basin & Intermountain Introduced Annual and Biennial Forbland	90	0.93%	73%	9308 Great Basin & Intermountain Introduced Annual Grassland; 12 Incorrect Pixels	7123 Columbia Plateau Steppe and Grassland; 8 Incorrect Pixels	7135 Inter-Mountain Basins Semi-Desert Grassland; 2 Incorrect Pixels	LANDFIRE LFRDB
7134	Columbia Basin Foothill and Canyon Dry Grassland	42	0.43%	71%	7123 Columbia Plateau Steppe and Grassland; 3 Incorrect Pixels	7127 Inter-Mountain Basins Semi-Desert Shrub-Steppe; 2 Incorrect Pixels	7125 Inter-Mountain Basins Big Sagebrush Steppe; 2 Incorrect Pixels	LANDFIRE LFRDB
7072	Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	43	0.44%	70%	7126 Inter-Mountain Basins Montane Sagebrush Steppe; 3 Incorrect Pixels	7080 Inter-Mountain Basins Big Sagebrush Shrubland; 3 Incorrect Pixels	7125 Inter-Mountain Basins Big Sagebrush Steppe; 2 Incorrect Pixels	LANDFIRE LFRDB
7036	North Pacific Seasonal Sitka Spruce Forest	87	0.89%	68%	7039 North Pacific Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest; 13 Incorrect Pixels	7042 North Pacific Mesic Western Hemlock-Silver Fir Forest; 7 Incorrect Pixels	7063 North Pacific Broadleaf Landslide Forest; 3 Incorrect Pixels	LANDFIRE LFRDB
7063	North Pacific Broadleaf Landslide Forest	30	0.31%	63%	7156 North Pacific Lowland Riparian Forest; 7 Incorrect Pixels	7036 North Pacific Seasonal Sitka Spruce Forest; 2 Incorrect Pixels	7178 North Pacific Hypermaritime Western Red-cedar-Western Hemlock Forest; 1 Incorrect Pixels	LANDFIRE LFRDB

Future: What's Next?

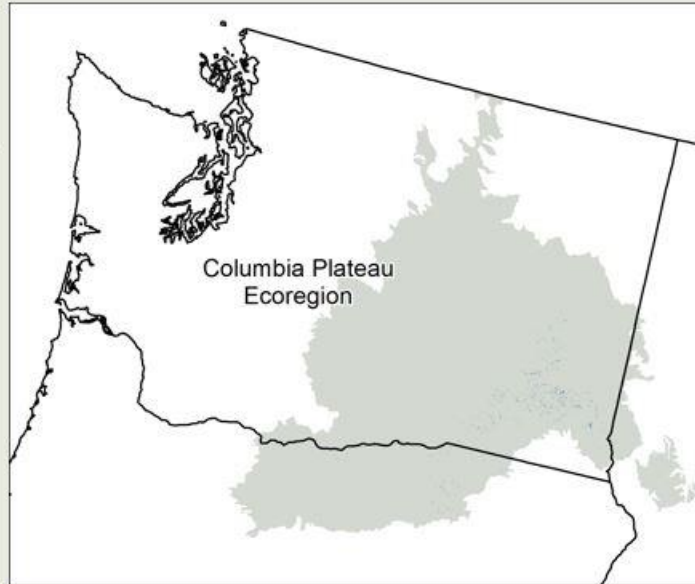
- Budgets are difficult to predict and they will impact the future of LANDFIRE products and delivery schedules, e.g. will we be able to extend “modulated fuels” into the NW?
- LF Remap will wrap up in CONUS during the summer of 2020, and then we have to determine if budgets will support completing Remap for Alaska, Hawai'i and the island territories as our charter requires.
- Because “remapping” is more expensive than “updating,” we may not be able to conduct another remap in the future.
- However, our goal is to try and find a way to provide more rapid updates along with more complete updates.

Existing Vegetation Improvements

Columbia Basin Palouse Prairie Existing Vegetation



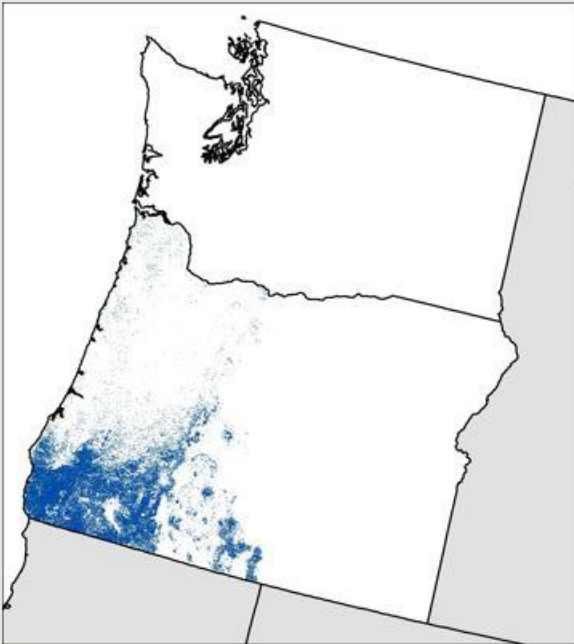
2014



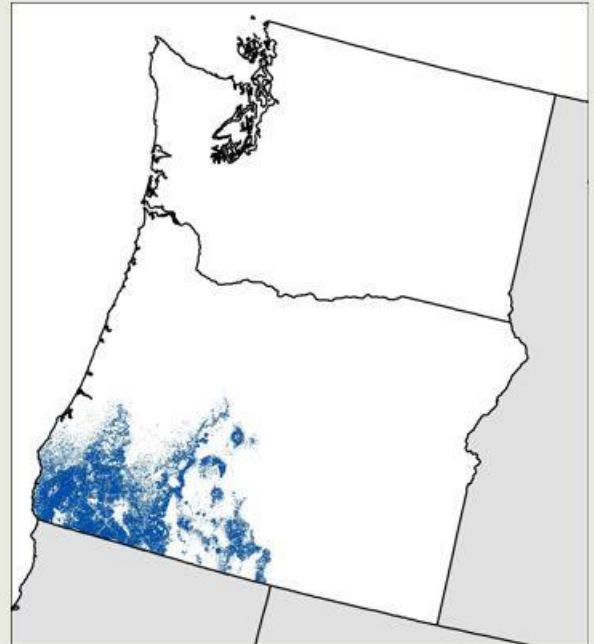
Remap 2016

Existing Vegetation Improvements

California, Mediterranean, and Sierra Nevada
Existing Vegetation Types

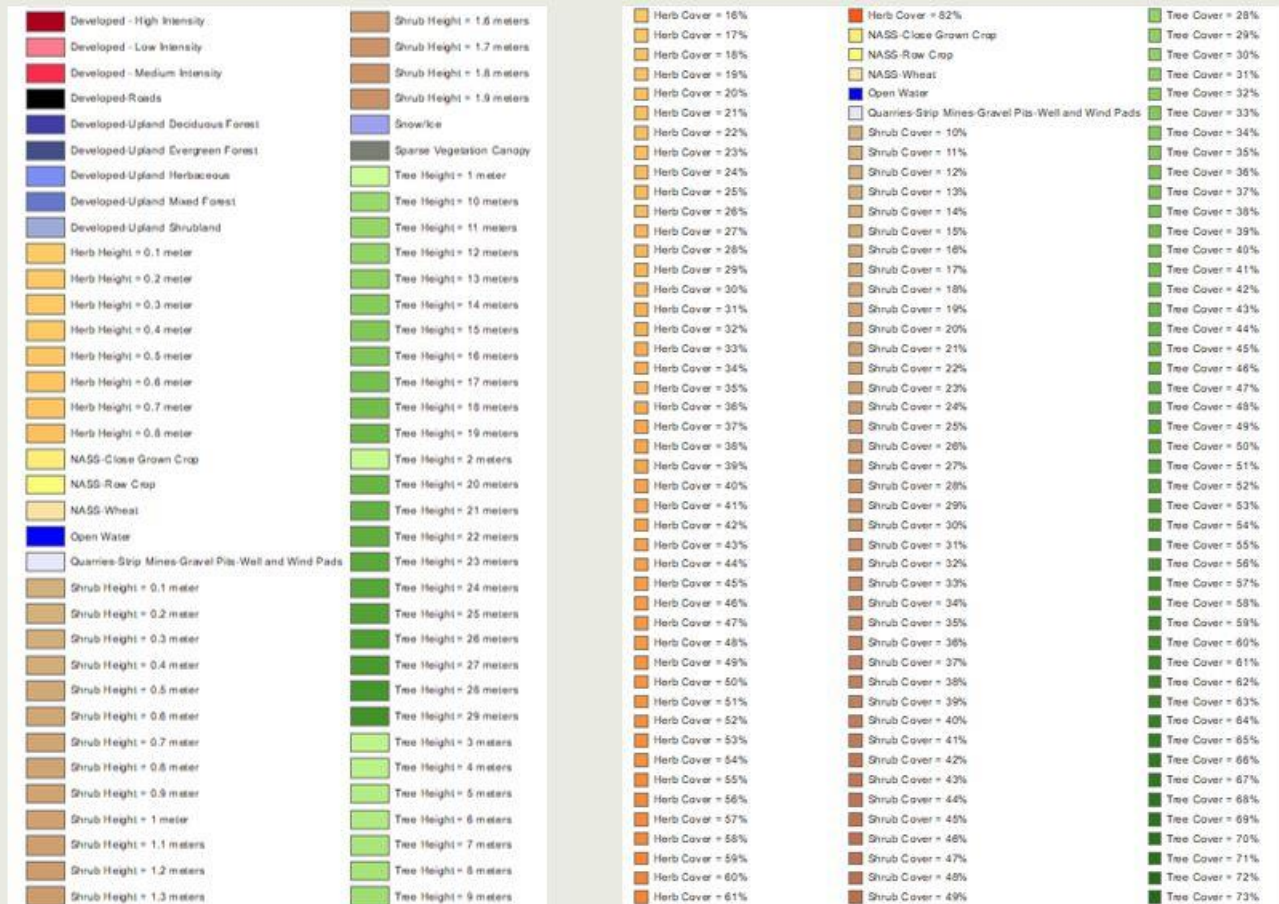


2014

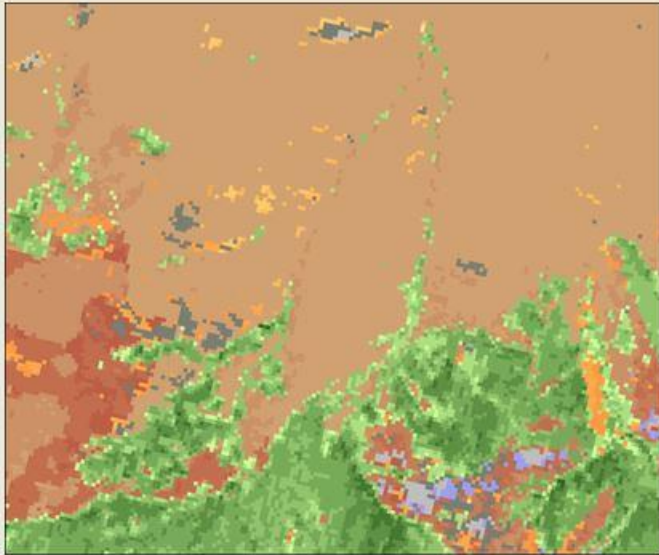


Remap 2016

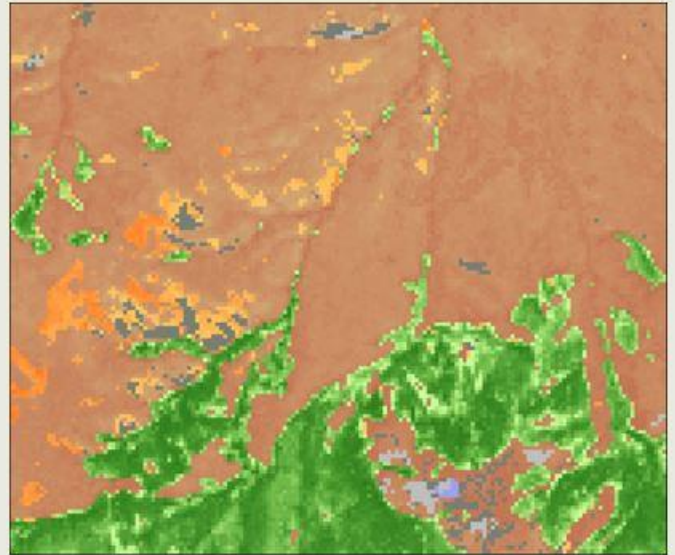
Continuous Height & Cover



Continuous Cover Comparison



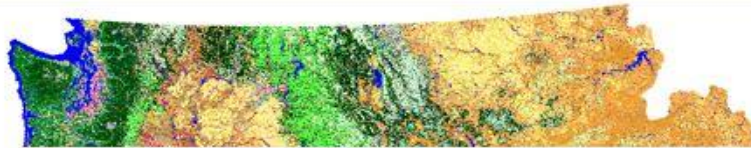
2014



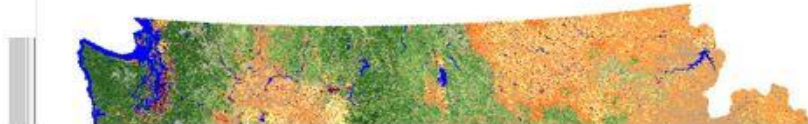
LF Remap 2016

New Fuel Datasets

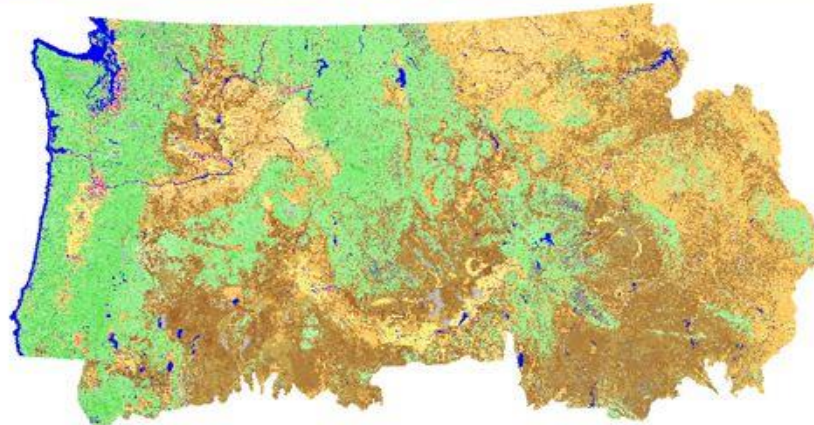
Fuel Vegetation Type



Fuel Vegetation Cover



Fuel Vegetation Height



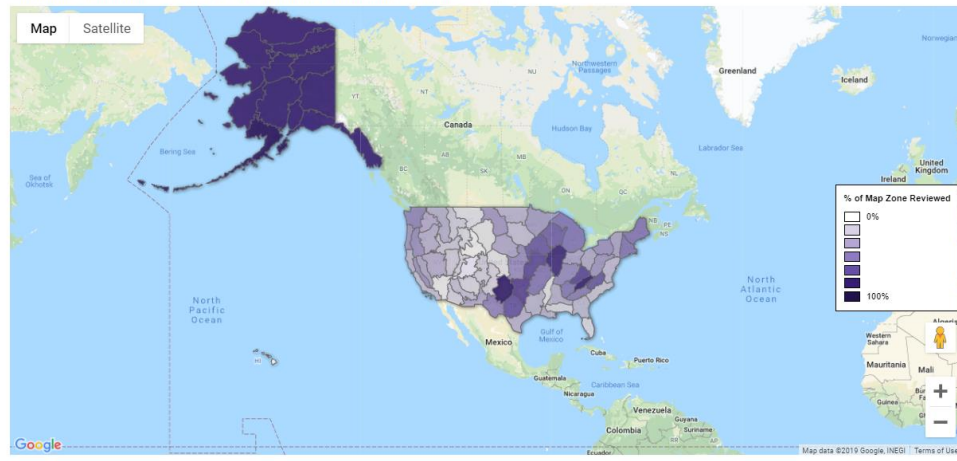
BpS Review

- BpS updated with new science
- Succession class mapping rules completed
- New model description document
- User friendly data access website

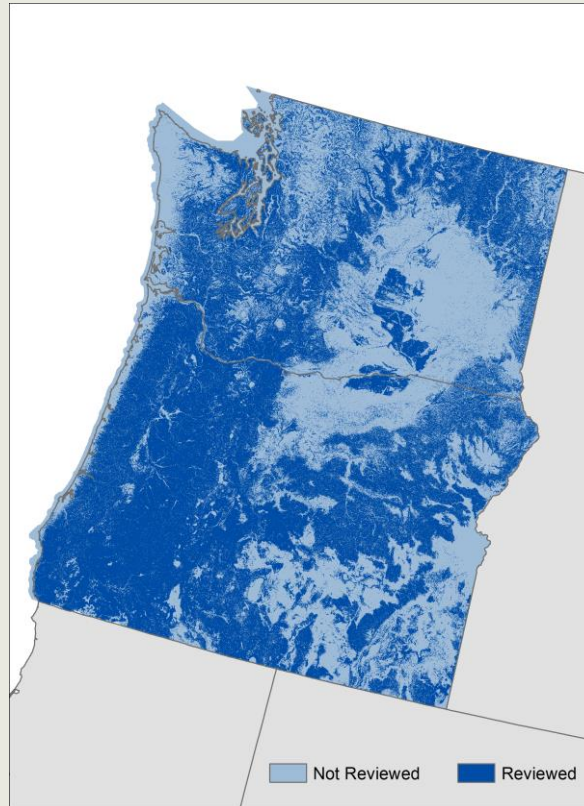
BpS Review Progress

Does your area need review?

Click on a Map Zone below to see a status report for your area. Help us fill in the map and improve the data!



BpS Review – Reviewed Area

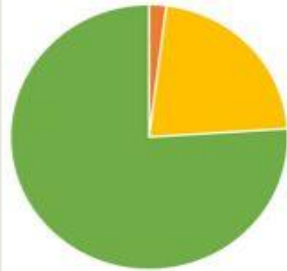


BpS Review – Data Model Improvements

Fire Severity:

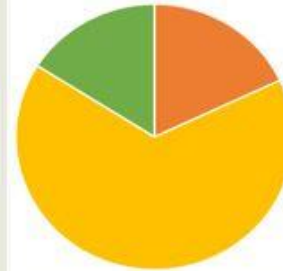
- Replacement
- Moderate (Mixed)
- Low (Surface)

Mixed
Evergreen



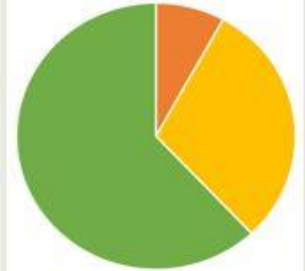
8 years

Mixed
Evergreen -
Coastal



39 years

Mixed
Evergreen -
Interior



14 years

Overall Fire
Frequency:

BpS Review – Data Access



LANDFIRE Biophysical Settings Review Site



[Home](#) [BpS Search](#) [About](#) [Review](#) [Resources](#) [Progress](#) [Contacts](#)

Vegetation Types

<input type="checkbox"/> Forest and Woodland	(330)
<input type="checkbox"/> Shrubland	(139)
<input type="checkbox"/> Herbaceous	(104)
<input type="checkbox"/> Steppe/Savanna	(82)
<input type="checkbox"/> Woody Wetland	(82)
<input type="checkbox"/> Mixed Upland and Wetland	(56)
<input type="checkbox"/> Herbaceous Wetland	(26)

Map Zones

<input type="checkbox"/> 7	(63)
<input type="checkbox"/> 16	(44)
<input type="checkbox"/> 25	(44)
<input type="checkbox"/> 6	(43)
<input type="checkbox"/> 15	(42)
<input type="checkbox"/> 1	(40)
<input type="checkbox"/> 28	(39)
<input type="checkbox"/> 9	(38)
<input type="checkbox"/> 23	(37)
<input type="checkbox"/> 24	(37)
<input type="checkbox"/> 10	(35)
<input type="checkbox"/> 19	(35)
<input type="checkbox"/> 4	(35)
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<input type="checkbox"/> 17	(34)
<input type="checkbox"/> 29	(32)
<input type="checkbox"/> 21	(31)
<input type="checkbox"/> 27	(31)
<input type="checkbox"/> 3	(31)

[View map of LANDFIRE Map Zones](#)

819 results found in 2ms

- ☐ **Hawai'i Subalpine Mesic Shrubland**
Model Number: 18280 **Map Zone(s):** 79
Vegetation Type: Shrubland
- ☐ **Hawai'i Wet-Mesic Coastal Strand**
Model Number: 18270 **Map Zone(s):** 79
Vegetation Type: Shrubland
- ☐ **Hawai'i Dry Coastal Strand**
Model Number: 18260 **Map Zone(s):** 79
Vegetation Type: Shrubland
- ☐ **Hawai'i Dry Cliff**
Model Number: 18250 **Map Zone(s):** 79
Vegetation Type: Shrubland

Documents selected for download:
No documents selected for download.

[Download All Search Results Documents](#)

Application: The Missing Fire

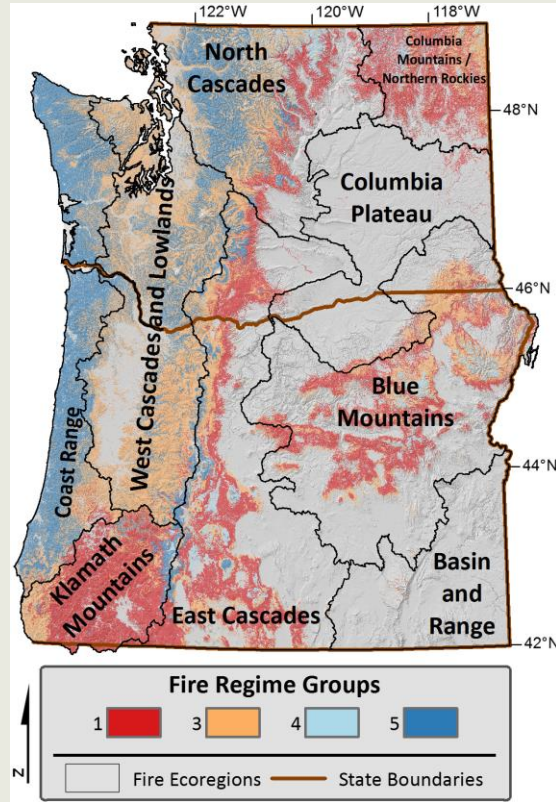
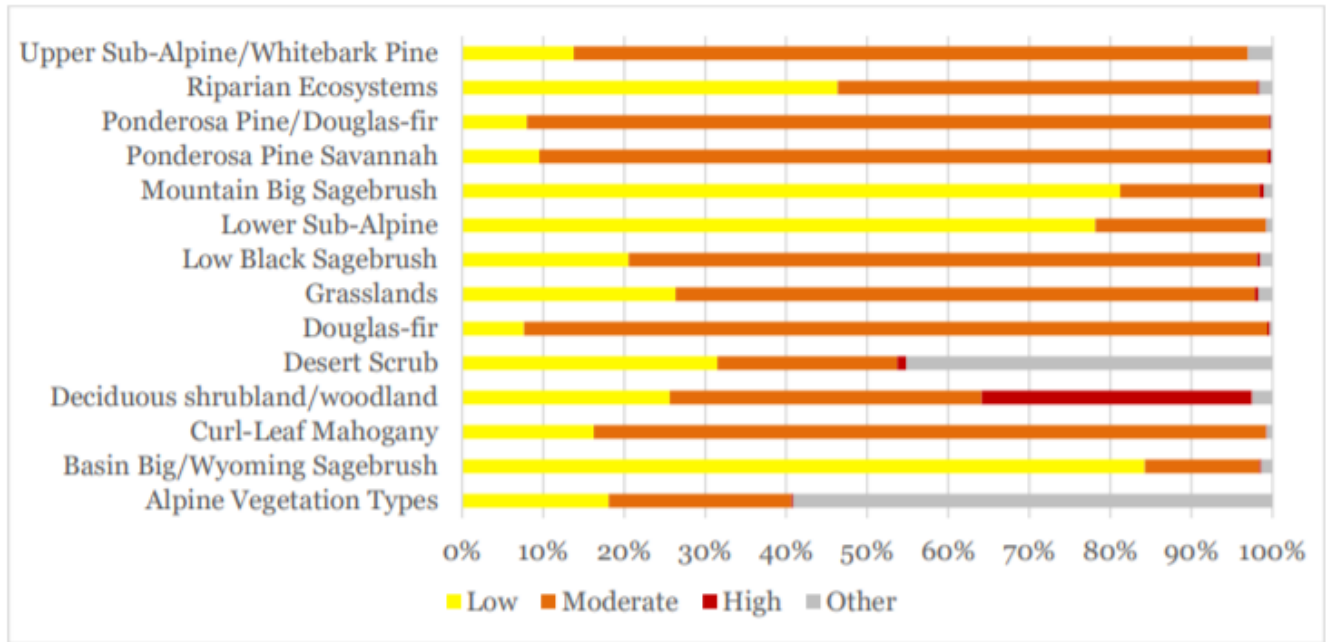


Figure from: Haugo, R. D., B. S. Kellogg, C. A. Cansler, C. A. Kolden, K. B. Kemp, J. C. Robertson, K. L. Metlen, N. M. Vaillant, and C. M. Restaino. 2019. The missing fire: quantifying human exclusion of wild fire in Pacific Northwest forests, USA. *Ecosphere* 10(4).

Application: Forest Plan Revision

Figure 73. Amount of Departure from Historical Conditions on the Salmon-Challis by Vegetation Group



Take-Home Messages

LANDFIRE products:

- are comprehensive, compatible, consistent and current. (4 C's)
- are designed for use at regional and national scales.
- can be modified for local use.

LF Remap incorporated new processes and data sets to improve usability of the products, and represents conditions in 2016.

User can help improve LANDFIRE products by providing plots and data + feedback.

Feedback

E-mail: helpdesk@landfire.gov

Website:

<https://landfire.gov/contactus.php>

A screenshot of the LANDFIRE website's contact form. The website has a green header with the LANDFIRE logo and navigation links: Home, About, Data Products, Contribute Data, Methods & Applications, Improvements, and Search. Below the header is a section titled "LANDFIRE Helpdesk" with a "Data" menu and icons for various data types: Bathymetry, Meteorology, Vegetation, Fuel, Fire Weather, and Topography. The contact form is titled "Contact Us" and includes a note: "Please fill out the form below if you have questions or want to provide feedback for the LANDFIRE (JF) team." and "NOTE: You should receive a confirmation email from the Helpdesk within one business day. If you do not, please resend your question or feedback." The form fields are: First Name, Last Name, Email, Subject, and Feedback/Concerns. There is a "Submit" button at the bottom.

Contact Info



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LANDFIRE Online



<https://www.landfire.gov>



<http://bit.ly/Tvz2yl>



http://twitter.com/nature_LANDFIRE



LANDFIREvideo



Postcard opt-in: <http://eepurl.com/cajG91>



LANDFIRE@tnc.org