



www.landfire.gov



LANDFIRE Program After Action Review and Scoping Workshop Virtual Webinar

- Foundational Data
- Vegetation Data
- Fire Modeling Data



December 16, 2014

LANDFIRE Workshops

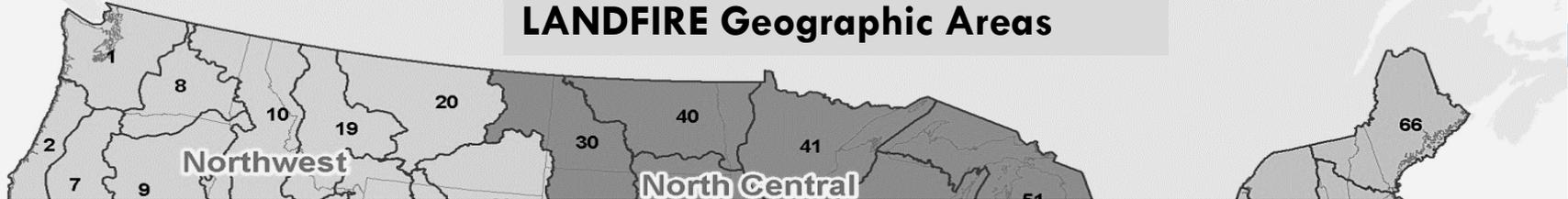
- **August - 2014: Missoula, MT**
- **September - 2014: Denver, CO**
- **October - 2014: Boise, ID**
- **Nov/Dec – 2014: Sioux Falls, SD**
- **December – 2014: Virtual Webinar**



LANDFIRE – Data for All Lands

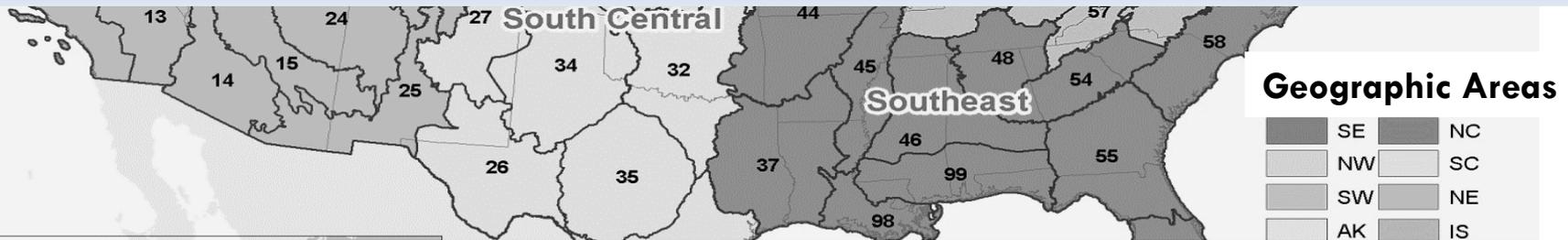


LANDFIRE Geographic Areas

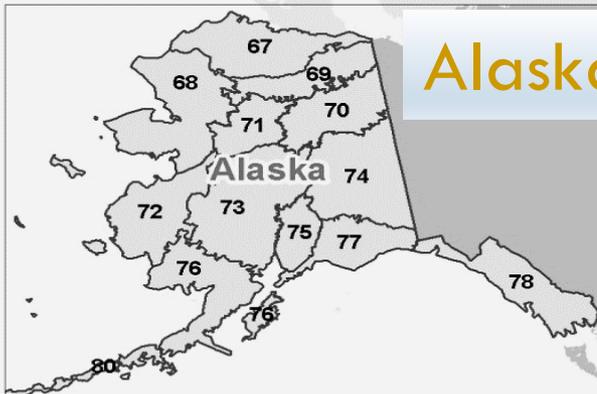


LANDFIRE (2010) = \$0.02/acre (All 50 States - 2,379,964,800 acres)

Louisiana Purchase (1803) = \$0.04/acre (530 MM acres)



Alaska (1867) = \$0.02/ acre (365 MM acres)





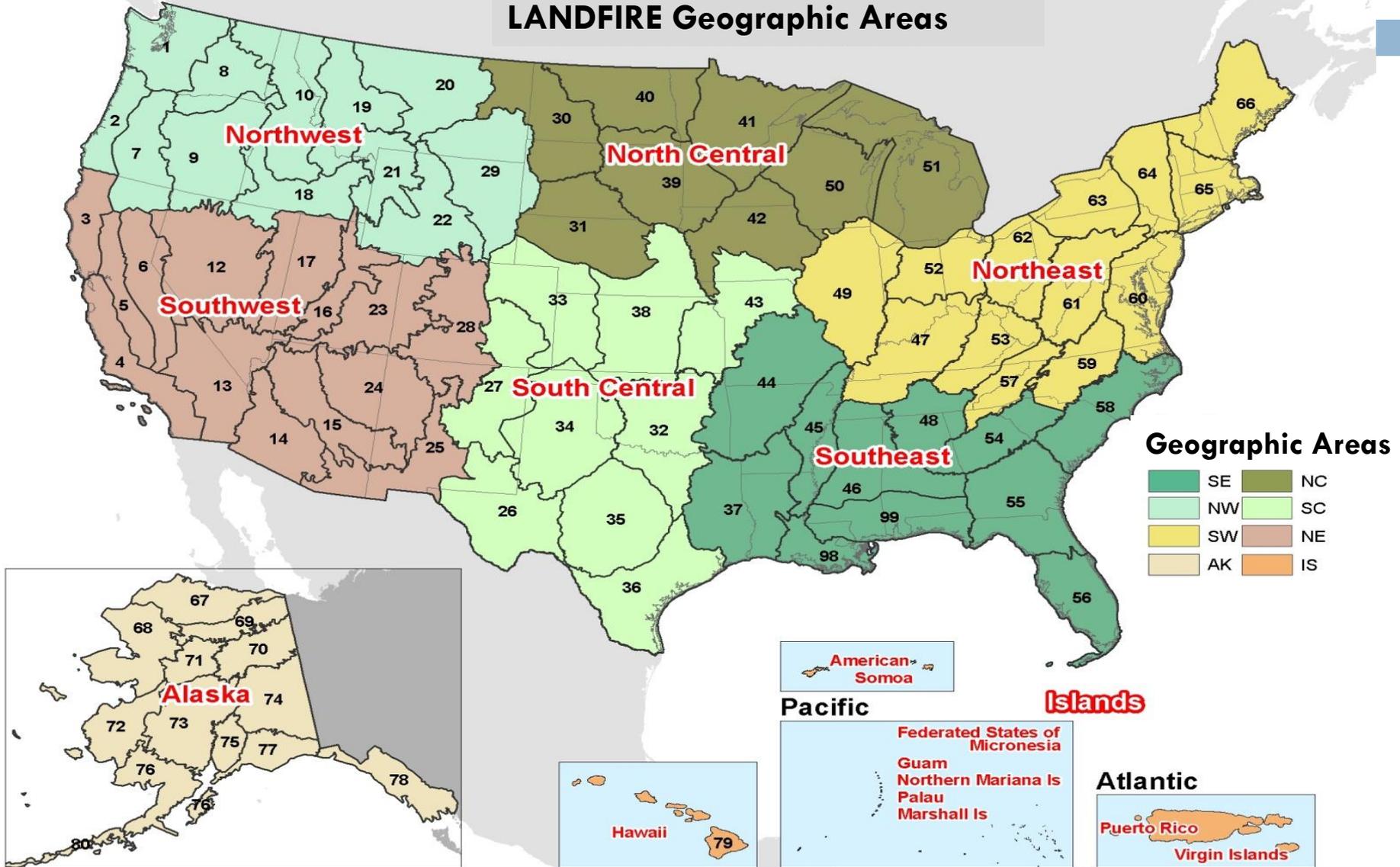
LANDFIRE – Data for All Lands



http://www.landfire.gov/library_guidelines.php

Scale and Use of LANDFIRE Data

LANDFIRE Geographic Areas



Workshop Process

First 2 to 2 ½ hours

- Product Requirements
- Product Methods
- Product Applications
- Foundational Data
- Vegetation Data
- Fire Modeling Data

Last hour to 1 ½ hours

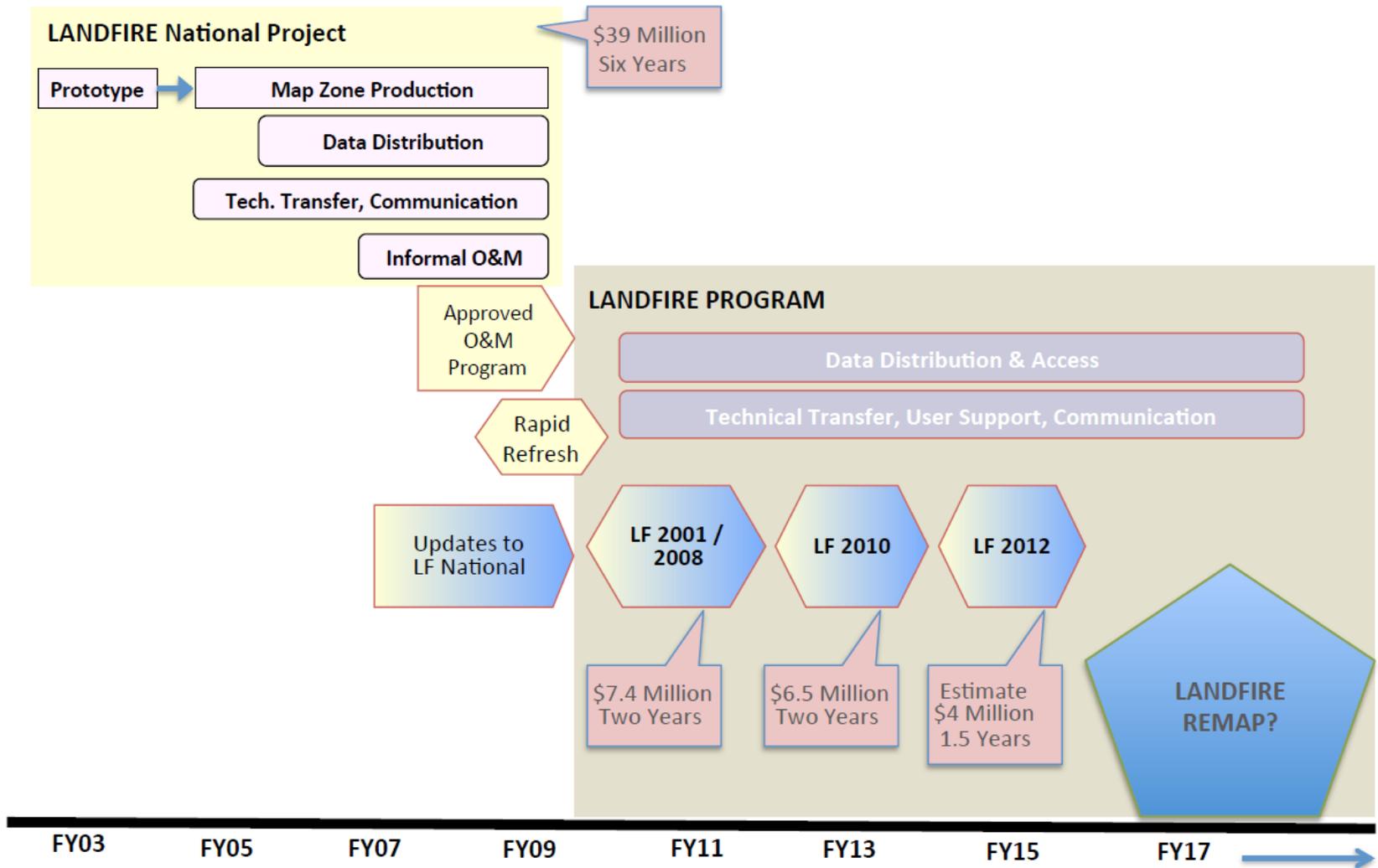
- 1. What was planned,
- 2. What really happened,
- 3. Why did it happen,
- 4. What could be done better next time
- 5. What needs to be done in the future
- 6. Recommendations

Map Unit Requirements

- ✓ **Identifiable**
 - from field or plot data
- ✓ **Map-able**
 - 30 meter resolution (Landsat)
- ✓ **Scalable**
 - link with existing classifications
- ✓ **Model-able**
 - provide required model inputs

LANDFIRE REMAP

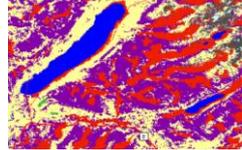
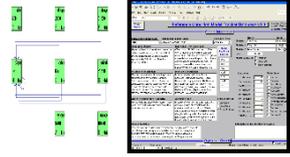
Historical and Future Context







LANDFIRE – Data Products



• Reference Data

- Public point data
- Public polygon data

• Landscape Change Data

- 14 Yearly Disturbance (1999-2012)
- 2 Integrated Disturbance (2008-2012)
- Transition (Type and Magnitude)
- Transition database

• Vegetation Data

- LF 2012 Existing Vegetation Type
- LF 2012 Existing Vegetation Cover
- LF 2012 Existing Vegetation Height
- Environmental Site Potential
- LF 2012 Succession Class
- Biophysical Settings

• Fuel Data

- LF 2012 Fire Behavior Fuel Model 40
- LF 2012 Fire Behavior Fuel Model 13
- Crown Bulk Density
- Crown Base Height
- Canopy Height
- Canopy Cover
- Fuel Loadings
 - Fuel Loading Models (FLM)
 - Fuel Characteristics Classification System (FCCS)
- Treelist (TBD)

• Fire Regime – FRCC / VCC (varies by version)

• Topographic

- Elevation
- Aspect
- Slope



Partners - Collaboration



**FIA - Forest Inventory Analysis. -
Memorandum of Understanding (MOU)**



GAP and LANDFIRE - MOU 2014



**NASS-National Agriculture
Statistics Service -
Cropland Data Layer (CDL)**

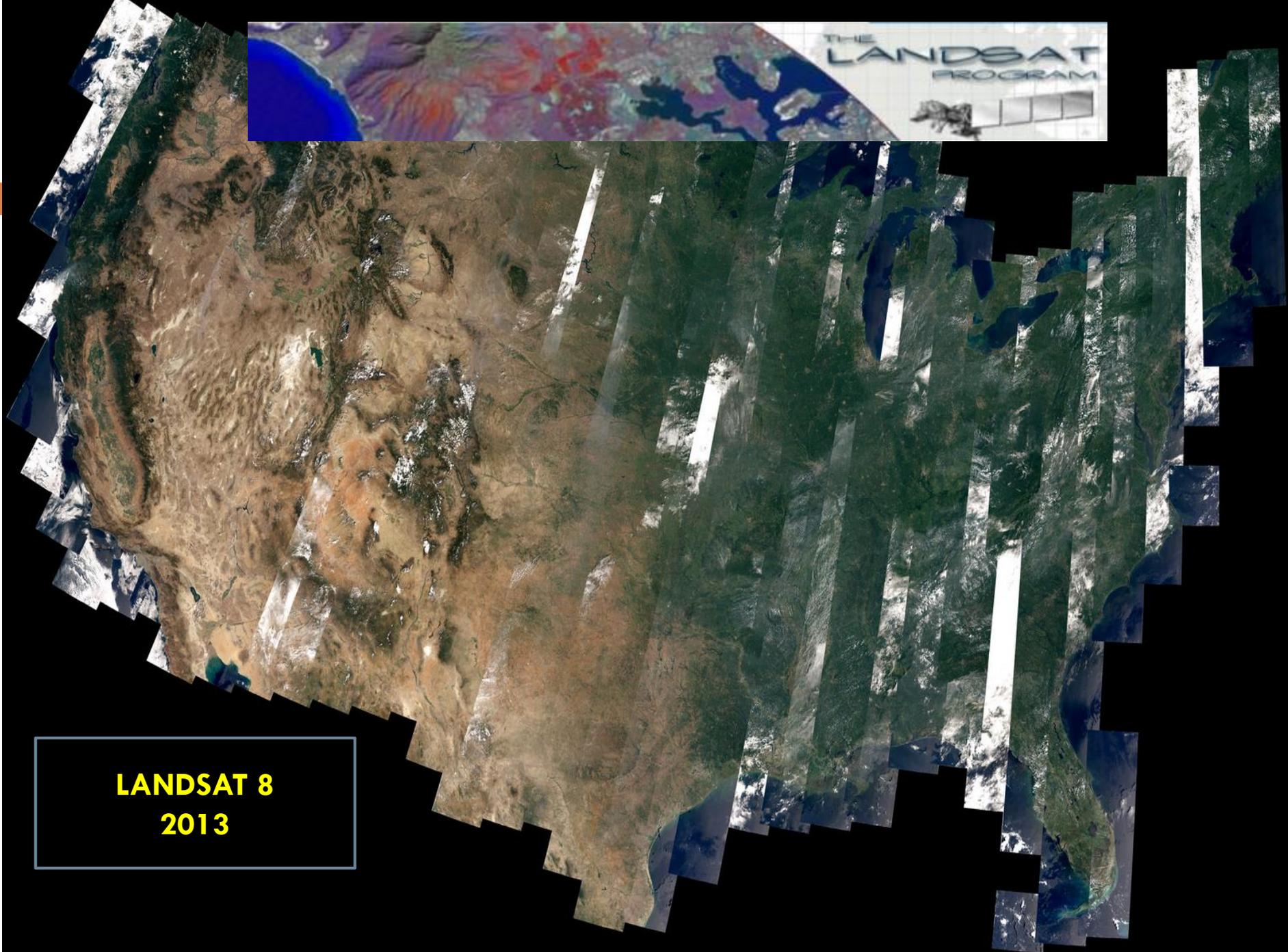


**NLCD-National Land Cover Database / MRLC -Multi-
Resolution Land Consortium (NOAA C-CAP, EPA, RSAC, etc.)**



**NRCS – Natural Resource Conservation
Service / NRI – National Resources
Inventory: MOU in 2015**



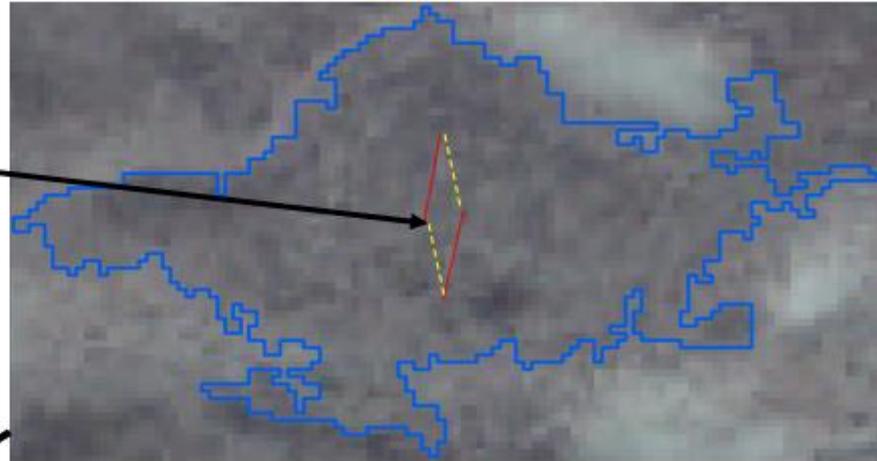


**LANDSAT 8
2013**

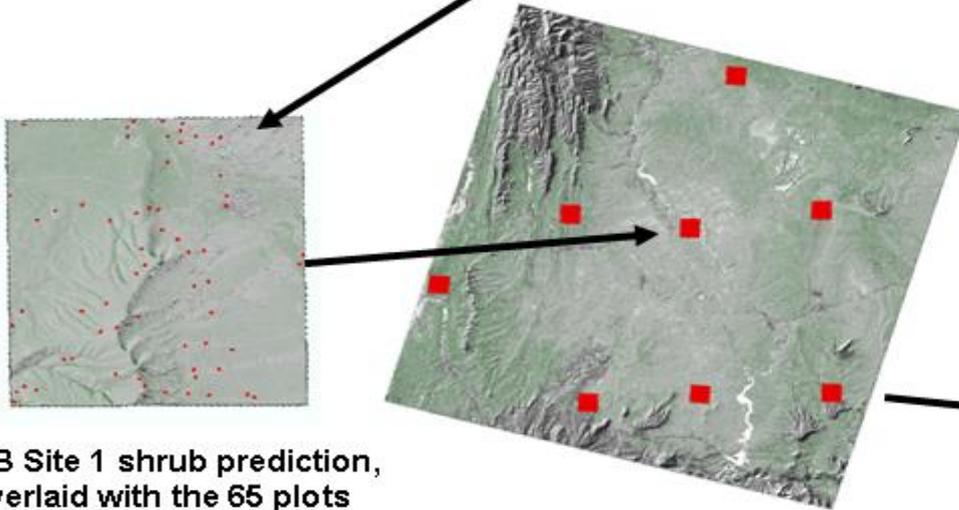
Innovations: Coordination with NLCD and BLM (Grass/Rangeland-Shrubland Stewardship)



1 Meter plot frame

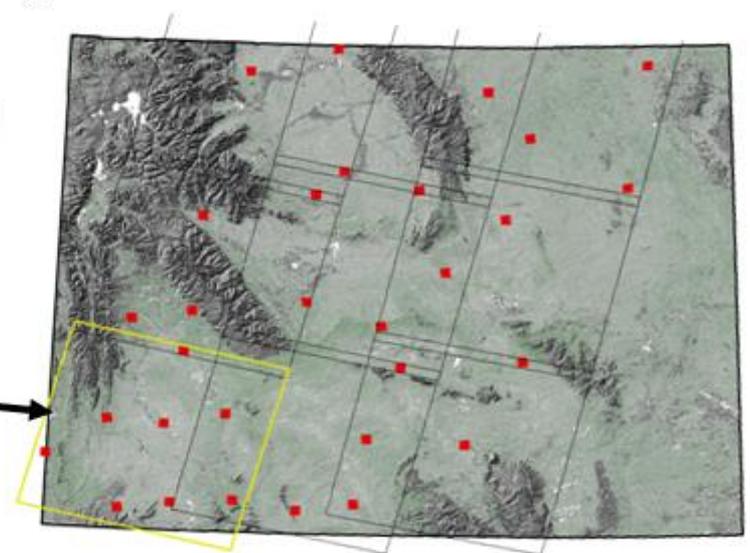


Example of actual field plot within Quick Bird segment (in blue). Plot consists of two transects (in red), with 7 1 meter frames each. Transects are closed off (yellow lines) to create a plot polygon for RT model training.



QB Site 1 shrub prediction, overlaid with the 65 plots used in training (in red).

Landsat 37/31 shrub prediction, overlaid with 8 QB scenes used for training (in red) consisting of about 620 plots



Wyoming shrub prediction overlaid with 30 QB scenes (in red) consisting of about 1,950 plots across 9 Landsat paths/rows (in black)



Reference Data



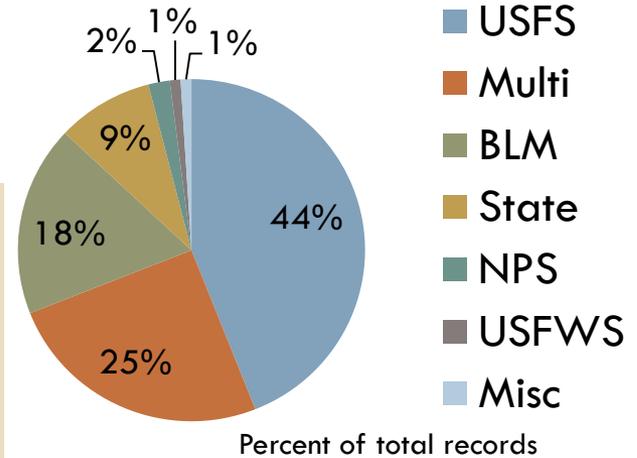
Points, Polygons, & Feedback

Yearly data call submission due date was **November 15 – Moving to January in 2015**

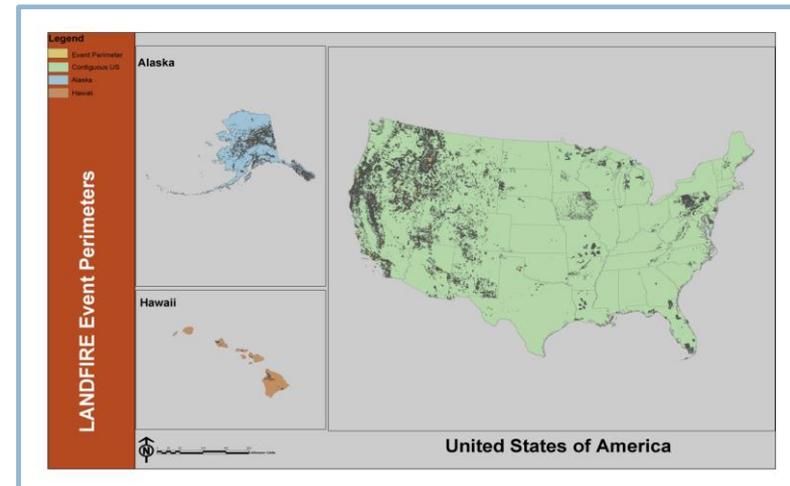
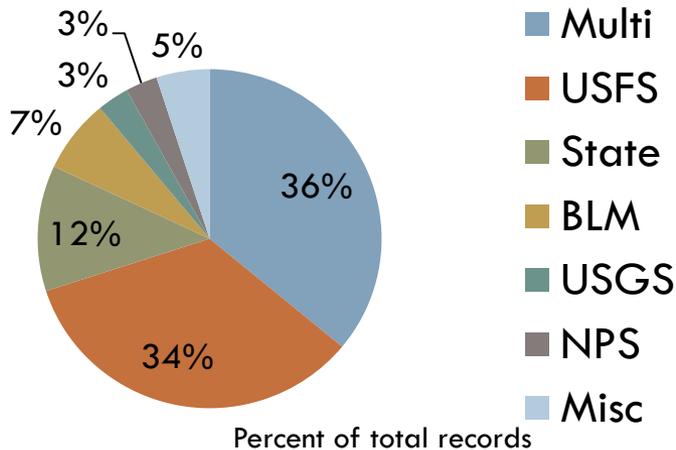


Contributor Affiliation – **Polygons** (>600,000)

Agreements
 -FIA - 2004
 -BIA – 2013
 -NRCS 2014
 -BLM 2014

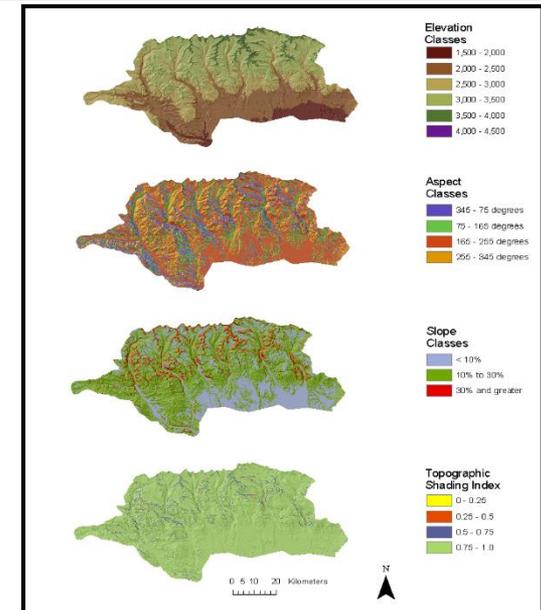
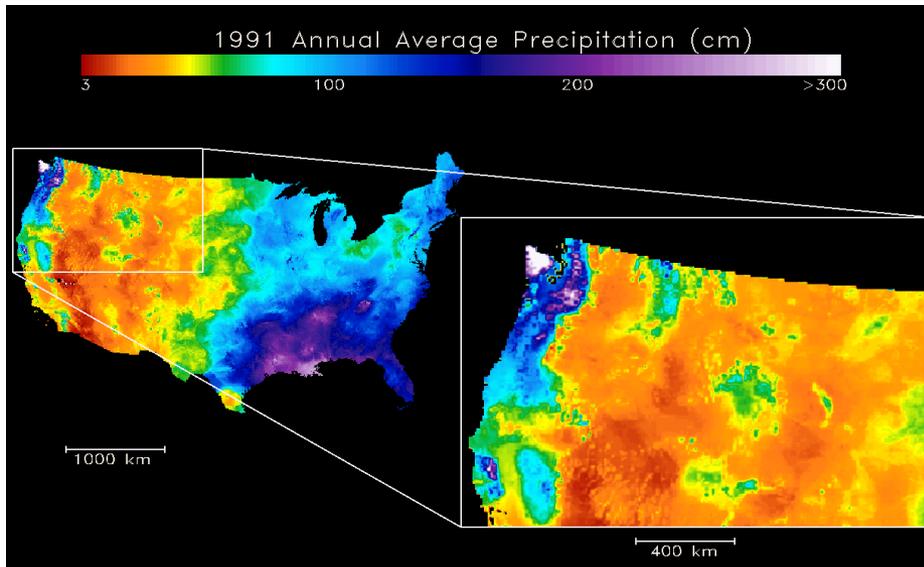
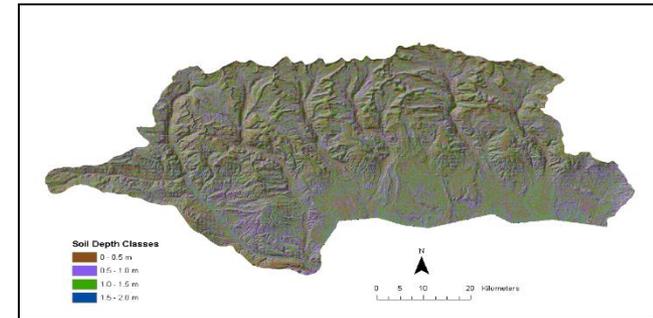
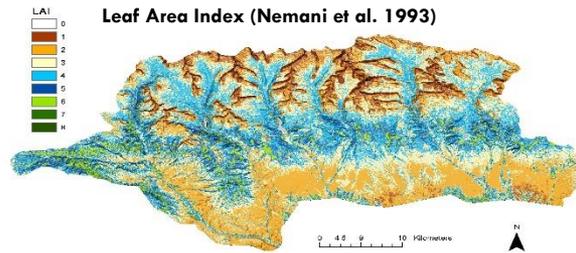


Contributor Affiliation – **Points** (>800,000)



Ecosystem Simulation modelling (WX-Fire and LF-BGC)

- Soils (Statsgo and Ssurgo)
- Soil Moisture
- Daymet Weather Grid
- LAI – Leaf Area Index
- Ecophysiological Site
- Topography (Slope, Aspect, Elevation - NED DEM)
- Temperature



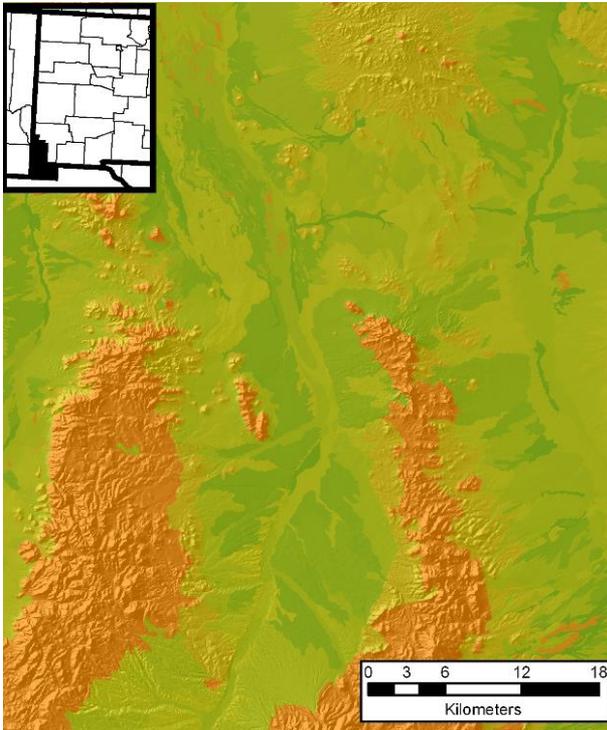


Biophysical / Environmental Gradients

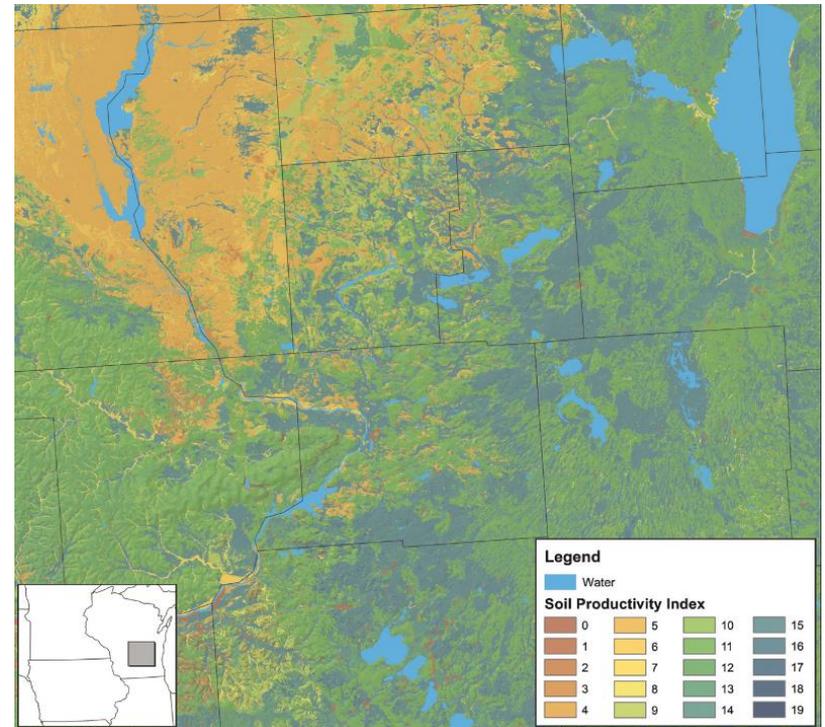


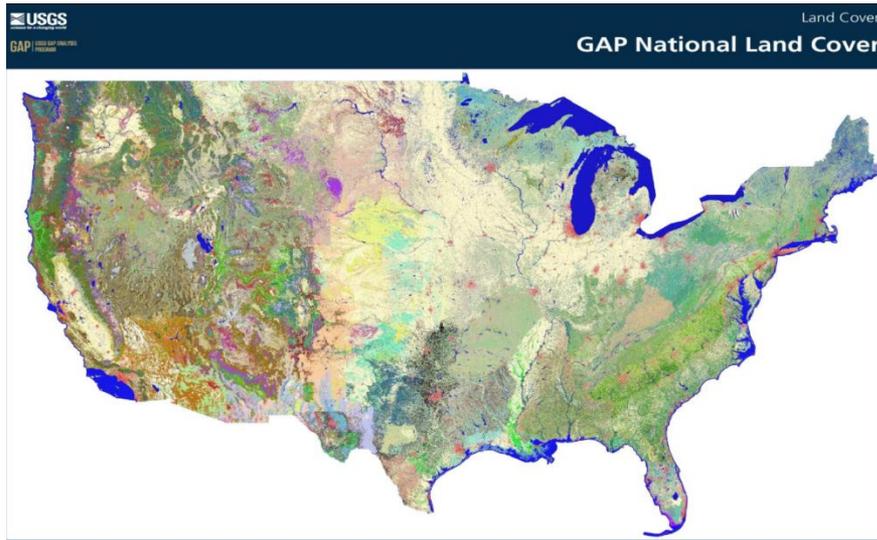
Forest Health Technology Enterprise Team

Drainage Index



Productivity Index





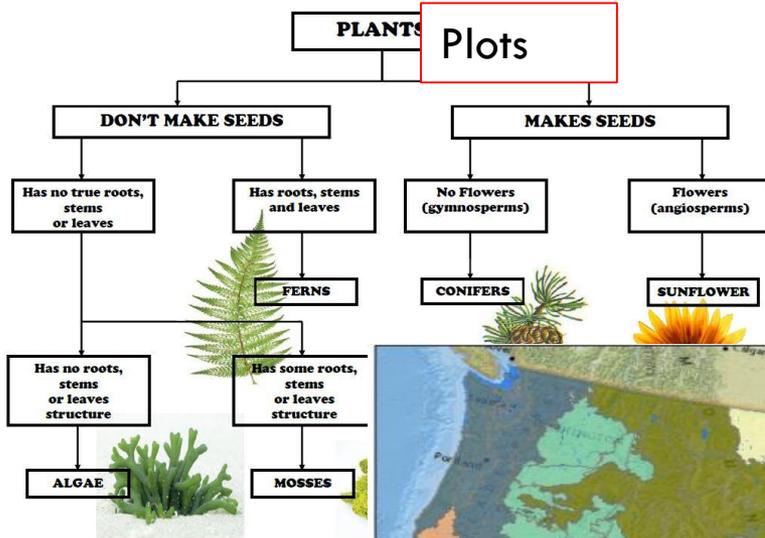
- **“ECOLOGICAL SYSTEMS+”**
- **Augmented with :**
 - **Life-form**
 - **Leaf-form**
 - **Semi-natural vegetation**
 - **Cultural vegetation**

□ National Vegetation Classification System (NVCS)

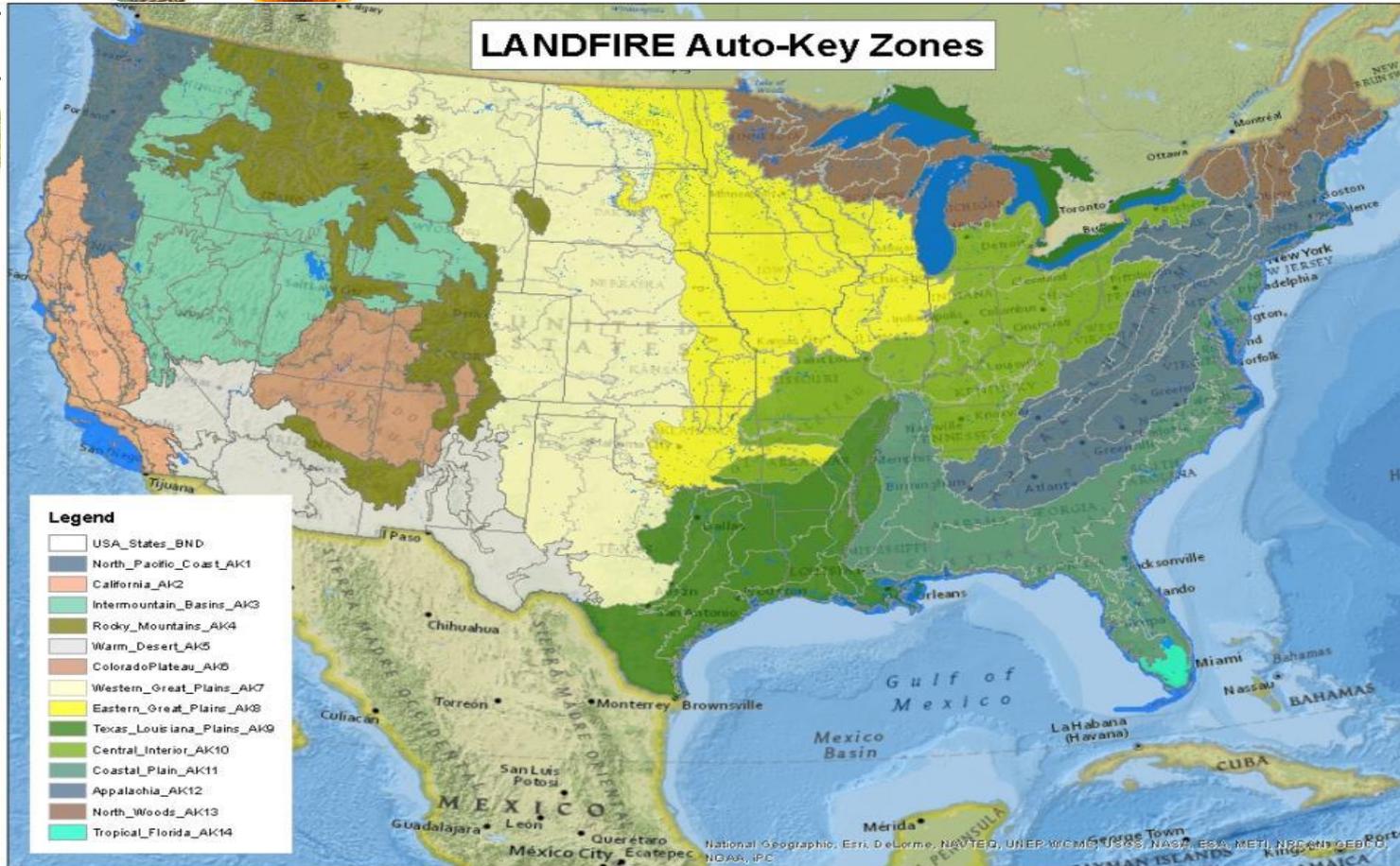
NVC LEVEL	VEGETATION CLASSIFICATION CRITERIA	ECOLOGICAL CONTEXT	SCIENTIFIC NAME	COLLOQUIAL NAME
Upper Levels	Predominantly physiognomy			
1 Formation Class	Broad combinations of general dominant growth forms.	Basic temperature (energy budget), moisture, and substrate/aquatic conditions.	Mesomorphic Tree Vegetation	Forest and Woodland
2 Formation Subclass	Combinations of general dominant and diagnostic growth forms.	Global macroclimatic factors driven primarily by latitude and continental position, or overriding substrate/aquatic conditions.	Temperate Tree Vegetation	Temperate Forest
3 Formation	Combinations of dominant and diagnostic growth forms.	Global macroclimatic factors as modified by altitude, seasonality of precipitation, substrates, and hydrologic conditions.	Cool Temperate Tree Vegetation	Cool Temperate Forest
Middle Levels	Physiognomy, biogeography, and floristics			
4 Division	Combinations of dominant and diagnostic growth forms and a broad set of diagnostic plant species that reflect biogeographic differences.	Continental differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes.	Pseudotsuga - Tsuga - Picea - Pinus Forest Division	Western North America Cool Temperate Forest
5 Macrogroup	Combinations of moderate sets of diagnostic plant species and diagnostic growth forms that reflect biogeographic differences.	Sub-continental to regional differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes.	Pseudotsuga menziesii - Quercus garryana - Pinus ponderosa - Arbutus menziesii Macrogroup	Northern Vancouverian Montane and Foothill Forest
6 Group	Combinations of relatively narrow sets of diagnostic plant species, including dominants and co-dominants, broadly similar composition, and diagnostic growth forms.	Regional mesoclimate, geology, substrates, hydrology and disturbance regimes.	Pinus ponderosa - Quercus garryana - Pseudotsuga menziesii Group	East Cascades Oak-Ponderosa Pine Forest and Woodland
Lower Levels	Predominantly floristics			
7 Alliance	Diagnostic species, including some from the dominant growth form or layer, and moderately similar composition.	Regional to subregional climate, substrates, hydrology, moisture/ nutrient factors, and disturbance regimes.	Pinus ponderosa - Quercus garryana Woodland Alliance	Ponderosa Pine - Oregon White Oak Woodland Alliance
8 Association	Diagnostic species, usually from multiple growth forms or layers, and more narrowly similar composition.	Topo-edaphic climate, substrates, hydrology, and disturbance regimes	Pinus ponderosa - Quercus garryana / Balsamorhiza sagittata Woodland	Ponderosa Pine - Oregon White Oak / Arrowleaf Balsamorhiza Woodland

Land Use Land Cover (LULC)	Cover type	NVCS (Group / Macrogroup)	Ecological System	GAP-LANDFIRE EVT
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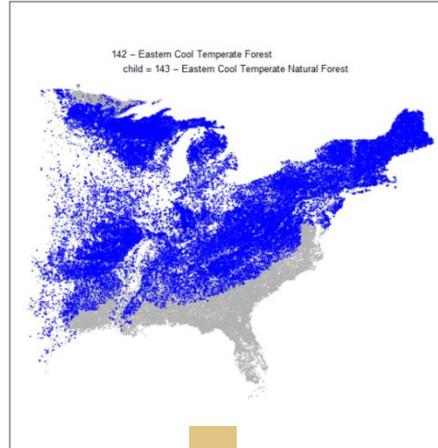
Thematic Resolution



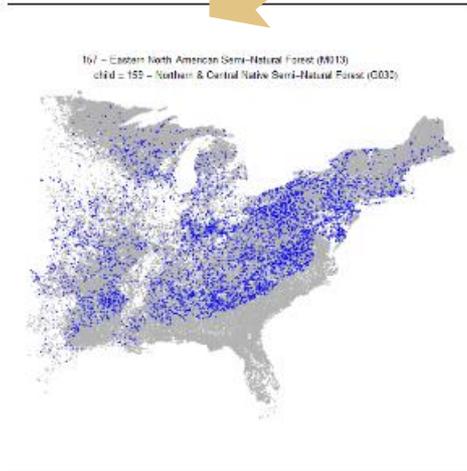
• **Sequence Tables & Auto Keys**



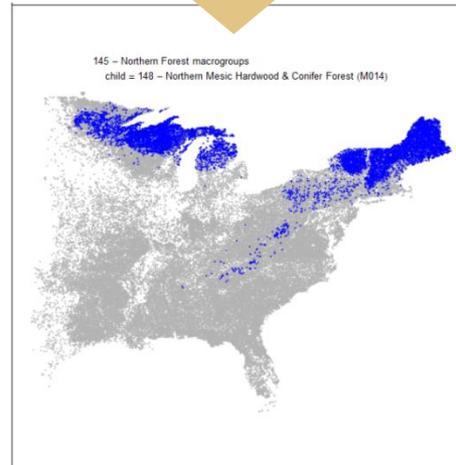
Forest Division to Macrogroup



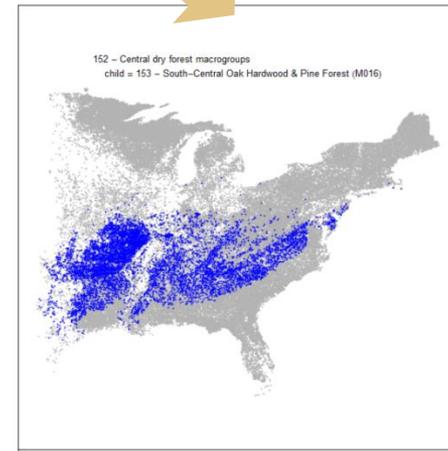
**Eastern Cool
Temperate Forest
(D008)**



**E.N.A. Semi-Natural
Forest (M013)**



**Northern Mesic
Hardwood & Conifer
Forest (M014)**



**South-Central Oak
- Hardwood & Pine
Forest (M016)**



Classification



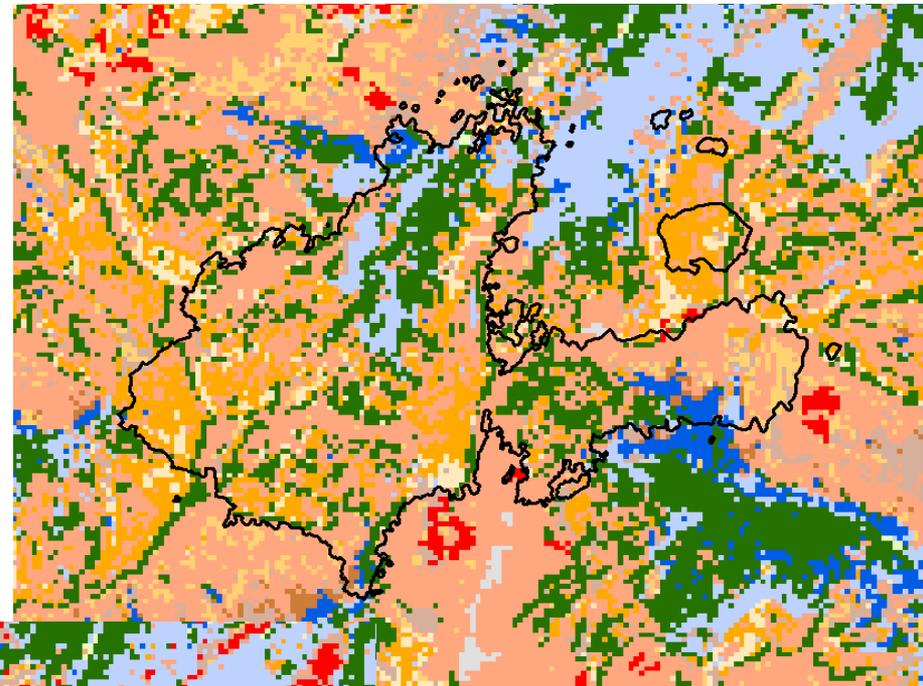
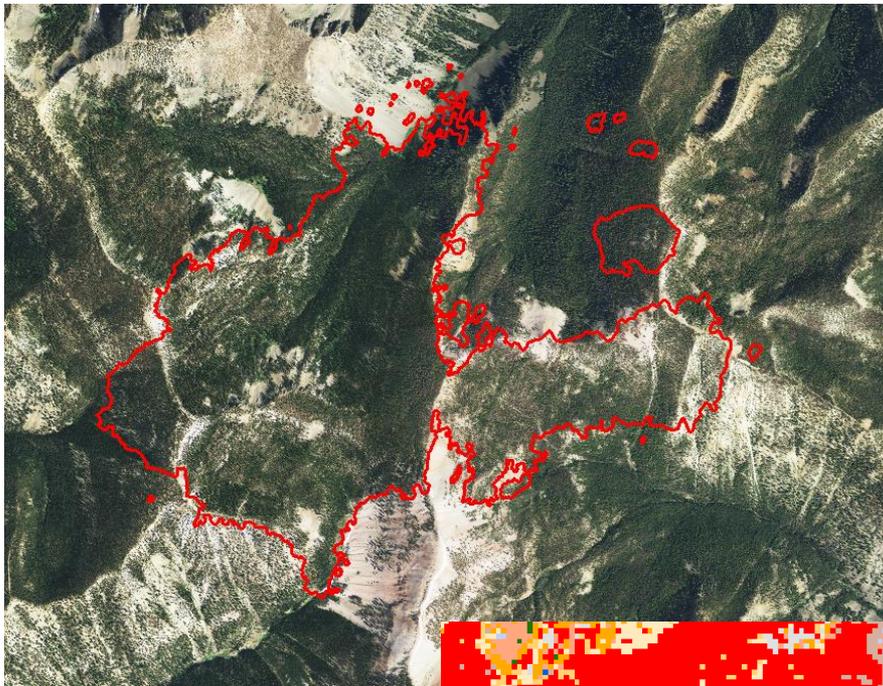
VEG-FUEL TYPE	LF National	LF 01' & 08'	LF 10'
DEVELOPED	Mapped from NLCD 2001 (+/-); values 21-24 (low-high); all types non-burnable	Mapped from NLCD 2001; values 21-22 (low-mod) mapped into burnable; all other types non-burnable	Mapped from NLCD 2001 w/ NLCD 2006 added in; values 21 (low) mapped into burnable; all other types non-burnable
AGRICULTURAL	Mapped from NLCD 2001 (+/-); values 81 (pasture-hayland) and 82 (cultivated-irrigated); all types non-burnable	Used AG mask from NLCD 2001; added in NASS data to map new types; some burnable, some non-burnable	Used AG mask from 2010 CLU data; mapped CDL types; some burnable, some non-burnable



Classification



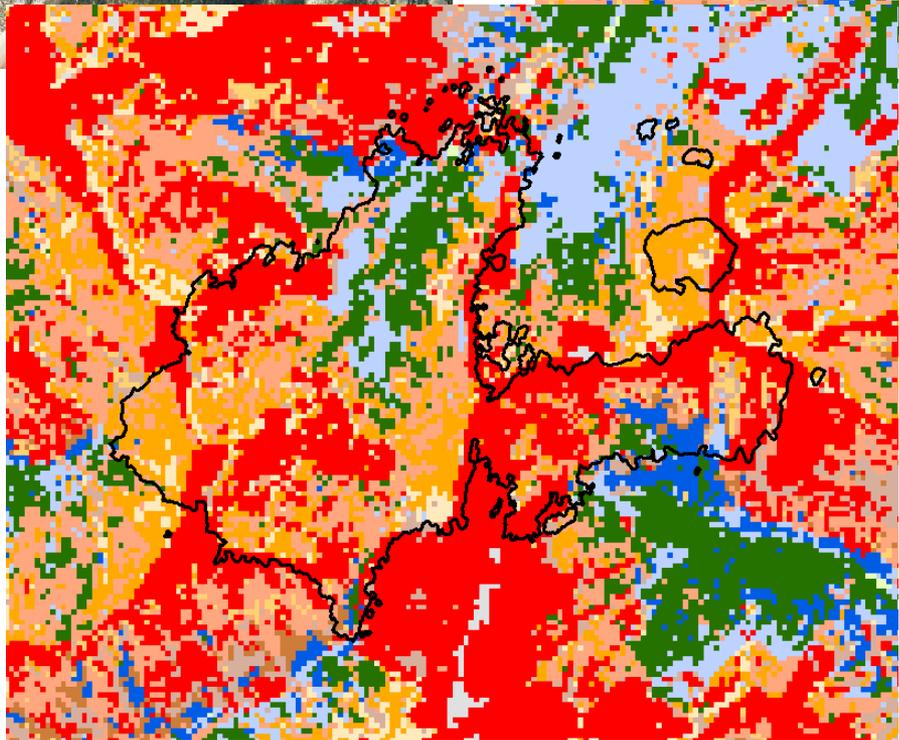
VEG-FUEL TYPE	LF National	LF 01' & 08'	LF 10'
INTRODUCED Seasonal annual grass fluctuations	Cheatgrass, other Annual Grass EVT's	Cheatgrass, other Annual Grass EVT's	Cheatgrass, other Annual Grass EVT's
RUDERAL	Specific SE EVT's	Specific SE EVT's	Specific SE EVT's; map w/ urban/ag
MODIFIED	Tallgrass prairies	Tallgrass prairies	Tallgrass prairies
MANAGED	Plantations	Plantations remapped	Plantations remapped by ownership
DISTURBED	N/A	LF08 created w/ updates due to disturbance	LF10 created w/ updates due to disturbance



**Thunder City
Fire perimeter
as of 7/29/13**

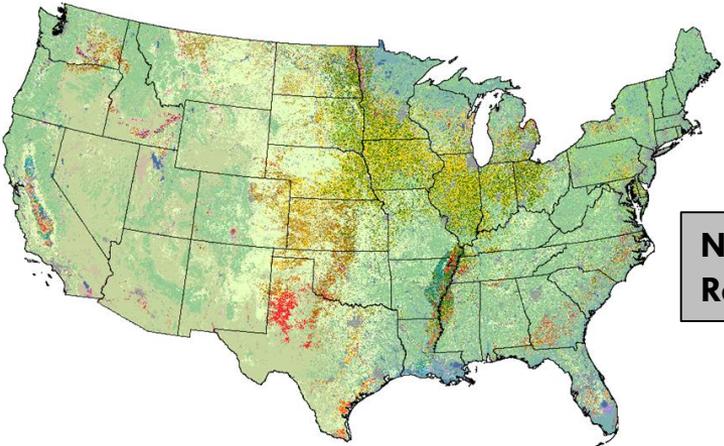
LF 2008

**Barren / Rock
Improvements
(Rock = Red)**



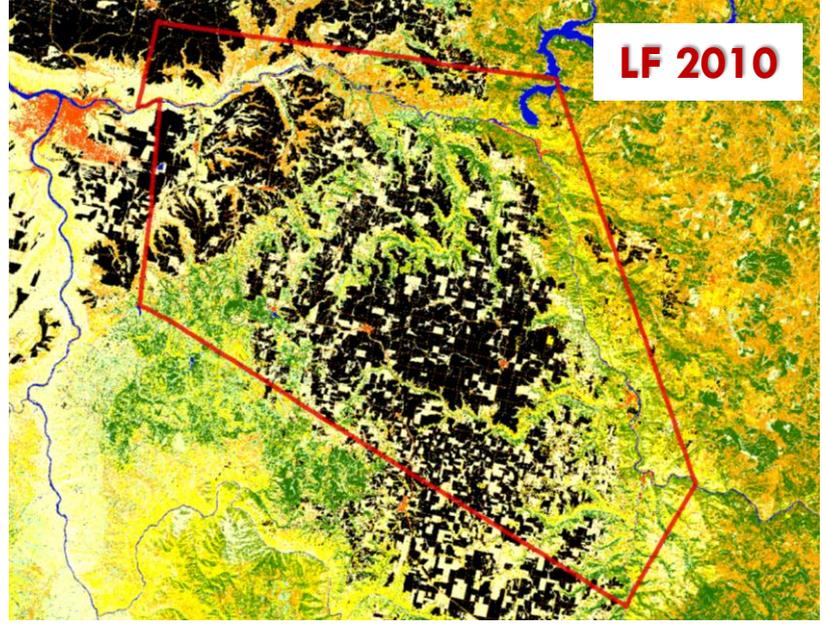
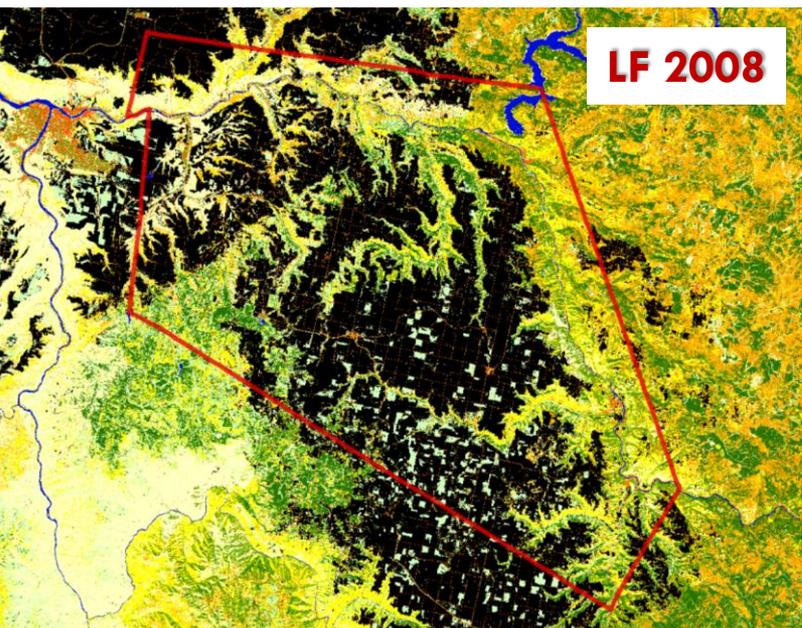
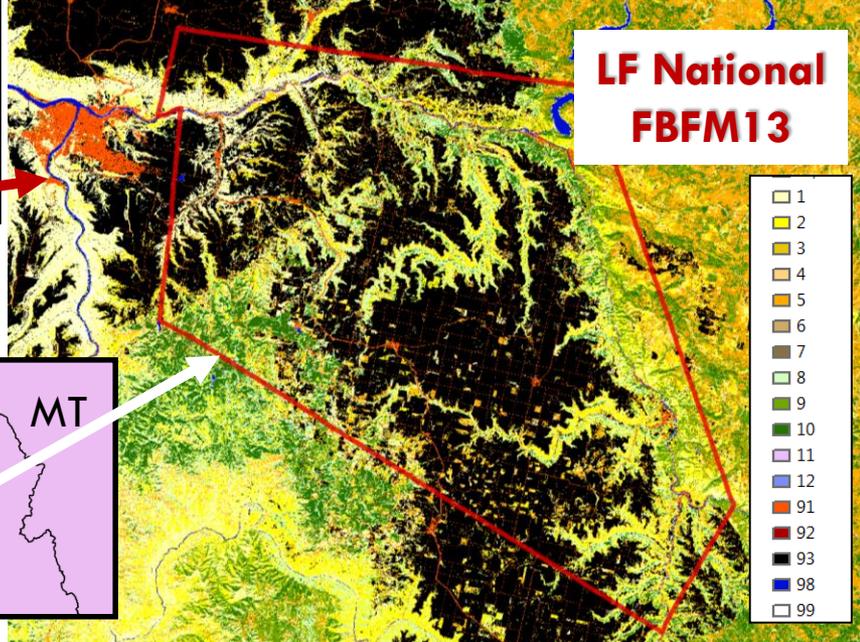
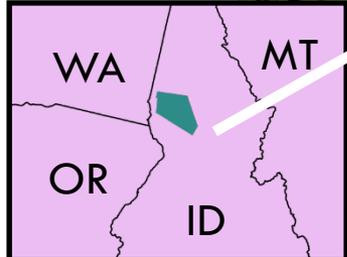
LF 2010

National Cropland Data Layer / Agriculture (Non-Burnable)



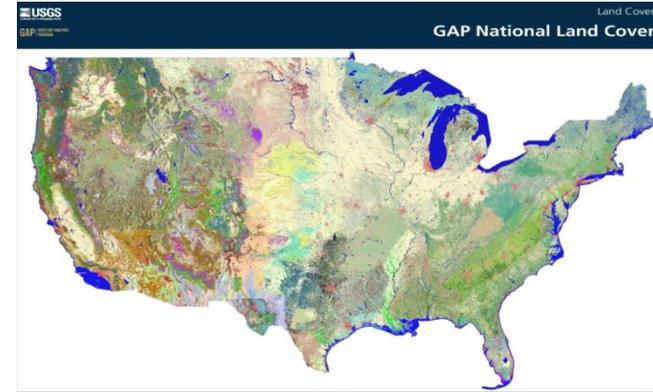
Clarkston,
WA /
Lewiston,
ID

Nez Perce
Reservation





Vegetation: Type



LULC :
Map w/
LANDSAT
imagery

NVCS Group :
Map w/ Cover
Type; range
maps; geo-
physical
models

GAP-LANDFIRE EVT :
Map w/ Ecological
Systems;
disturbance

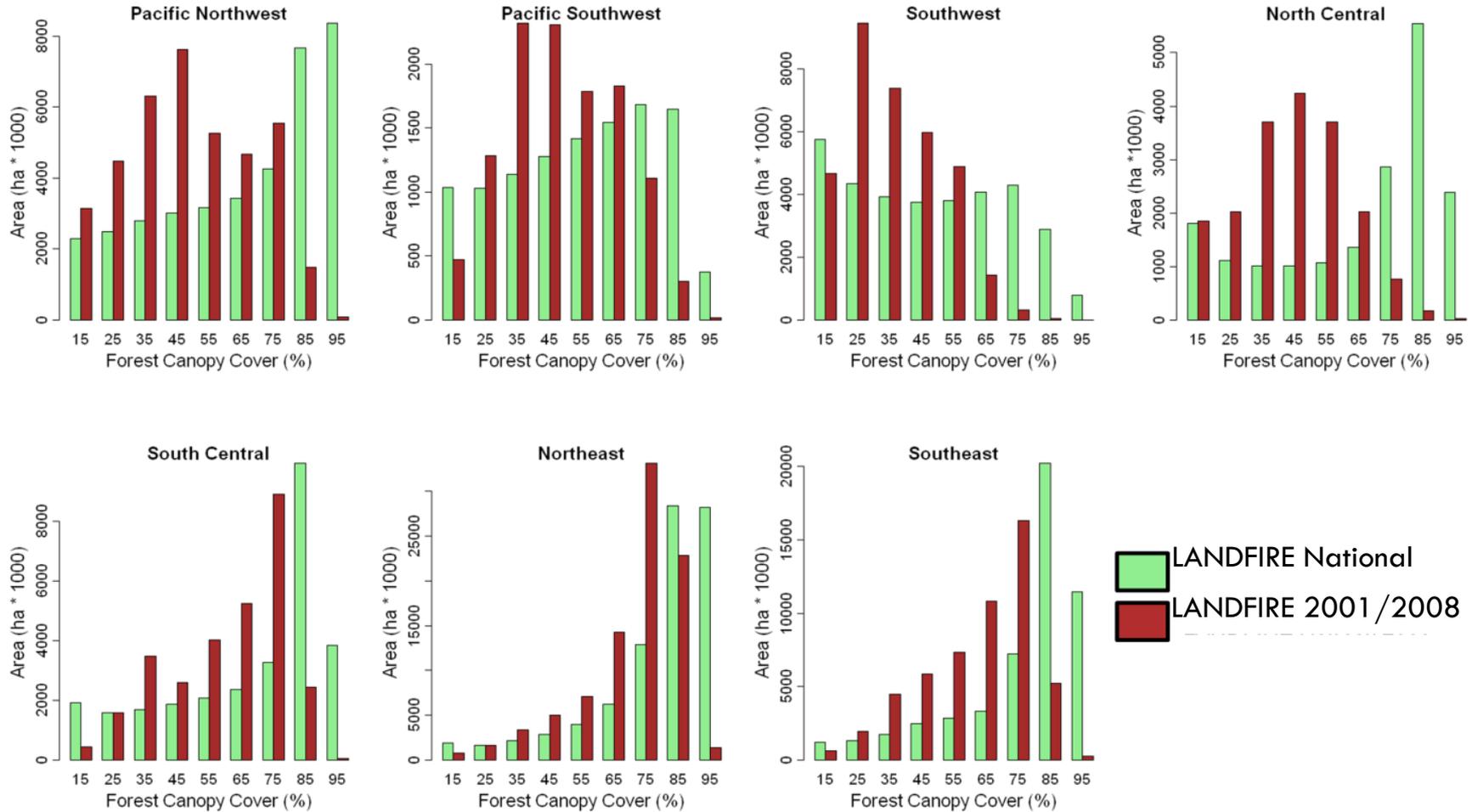
Cover type :
Map w/ LULC;
LANDSAT
imagery; terrain
models

Ecological System :
Map w/ NVCS
Group; range
maps; geo-physical
models;
(disturbance)





Vegetation: Cover



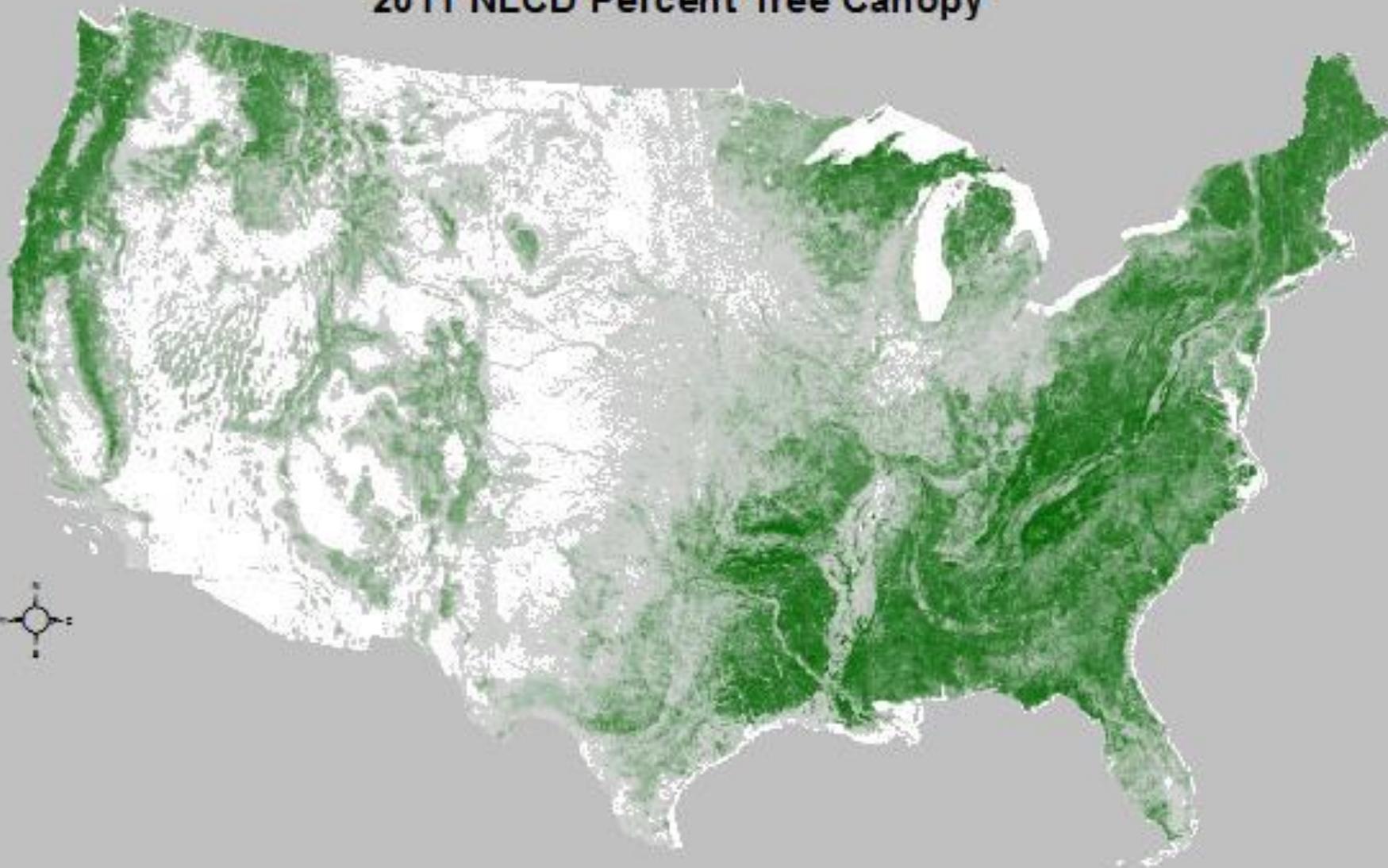
Forest Cover Remap



Vegetation: Cover

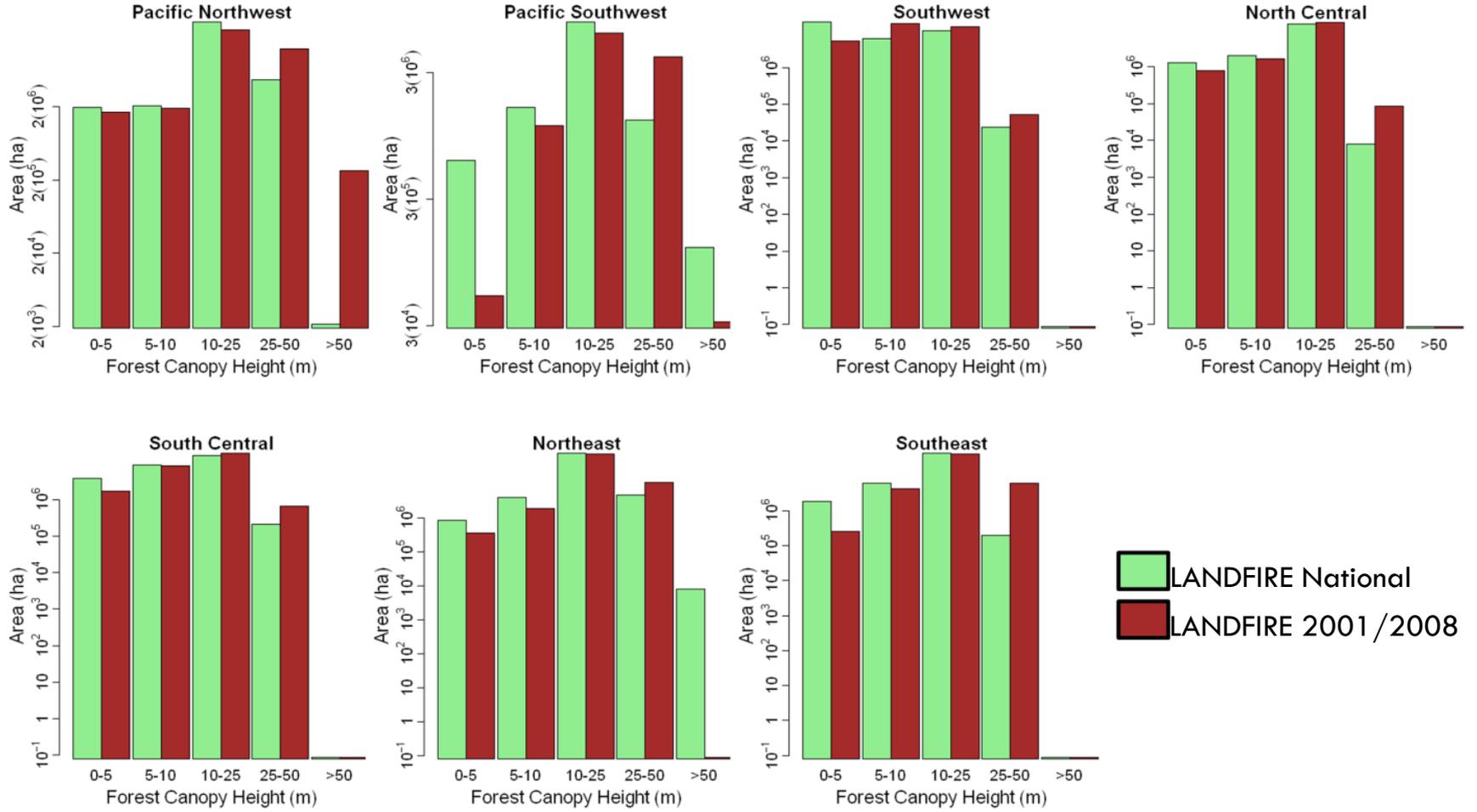


2011 NLCD Percent Tree Canopy





Vegetation: Height



Forest Height Remap



Vegetation



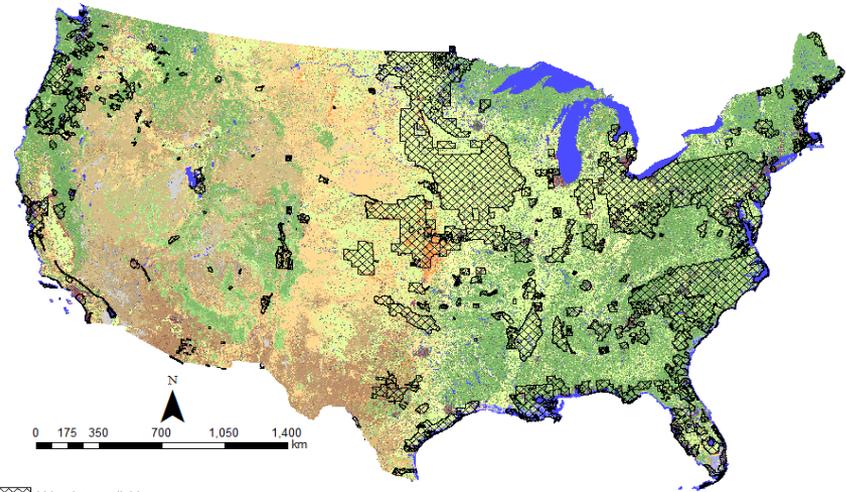
■ ICESat/GLAS

- Launched January 2003, decommissioned August 2010
- Waveform lidar
- Footprints ~ 65 m diameter
- Footprints spaced 172 m apart along track
- Almost 2 billion measurements made globally

Available lidar data



Spaceborne lidar



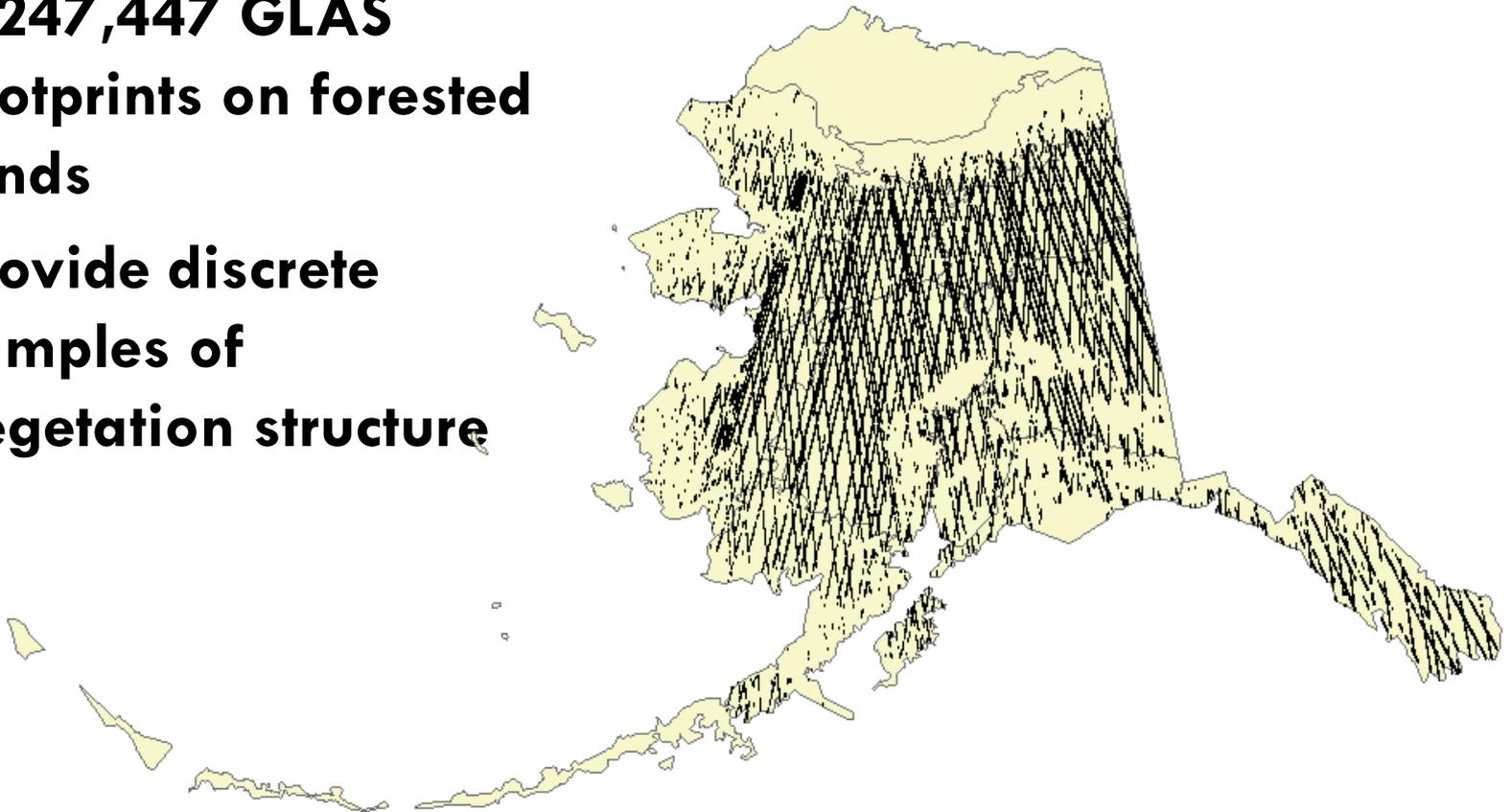
Lidar data available	Developed - Upland Vegetation	Herb Height 0 to 0.5	Shrub Height 0 to 0.5 m
Barren	Fallow	Herb Height 0.5 to 1.0 m	Shrub Height 0.5 to 1.0 m
Cultivated Crops	Pasture/Hay	Herb Height > 1.0 m	Shrub Height 1.0 to 3.0 m
Developed - High Intensity	Forest Height 0 to 5 m	Herbaceous Wetlands	Shrub Height > 3.0 m
Developed - Low Intensity	Forest Height 10 to 25 m	NASS	Small Grains
Developed - Medium Intensity	Forest Height 25 to 50 m	Open Water	Snow/Ice
Developed - Open Space	Forest Height 5 to 10 m	Quarries-Strip Mines-Gravel Pits	Sparse Vegetation Height
Developed - Roads	Forest Height > 50 m	Recently Disturbed Forest	



Vegetation



- ▣ **1,247,447 GLAS footprints on forested lands**
- ▣ **Provide discrete samples of vegetation structure**



GLAS data availability in Alaska



BpS & ESP – Potential Vegetation



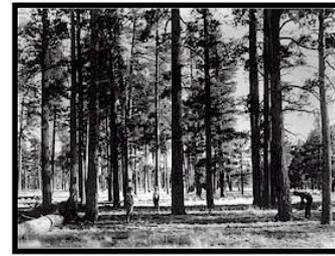
PRODUCT	LF National	LF 2001/2008	LF 2010
Bio-Physical Settings (BpS)	Mapped using regression tree models with a variety of abiotic variables by each Map-zone	Western rangelands (grass/shrub types) remapped using SSURGO data and regression tree models	Refined barren, water, and sparse map units; refined some remapped units based on life-form anomalies
Vegetation Dynamics Models	Developed by fire and vegetation ecologists through a series of workshops held around the country; packaged in Access databases; available on LF.gov as MTDB	BpS “Groups” developed resulting in the Refresh Model Tracker (RMT); cross Map-zone approach for fire regime and reference condition mapping	Identified gaps between BpS map units and models in MTDB; BpS-FEIS linkages established

Succession

Vegetation Dynamics Models and Database

The Basics

VS.



Historic Landscape



Current Landscape

Microsoft Access - [Rapid Assessment Reference Condition Models]

Reference Condition Model Tracker Database v2.0

General Information

Biophysical Setting Code: RANESP, Biophysical Setting Name: Nebraska Sandhills Prairie, Vegetation Type: Grassland

Biological Site Description: Nebraska Sandhills Prairie is found in central and western Nebraska, south central South Dakota and northeast Colorado covering approximately 5.5 million ha.

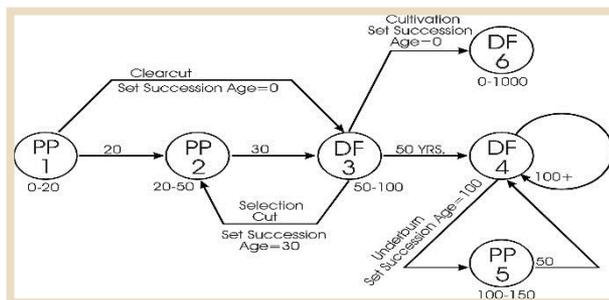
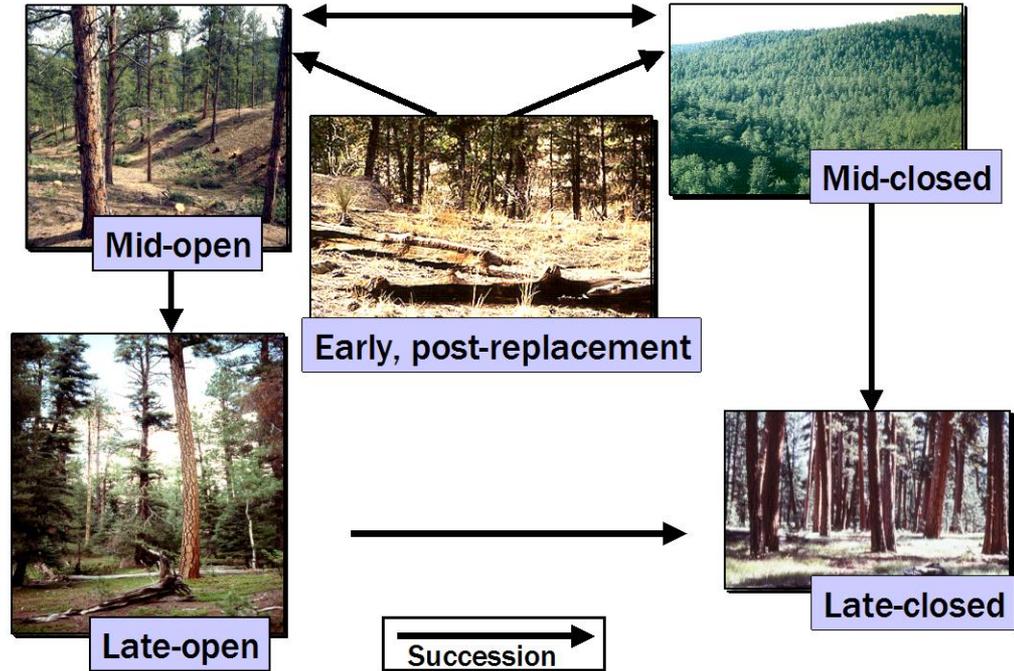
Disturbance Description: Fire, grazing, and drought were the primary disturbances in the Nebraska Sandhills.

Adjacency/Identification Concerns: The Sandhills are dissected by riparian areas which provided fire breaks and effected the movement of bison herds.

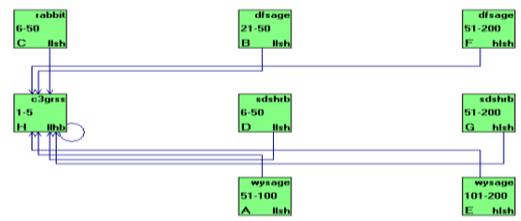
Issues/Problems: Very little data are available from presettlement times, but written accounts describe a much more sparsely vegetated landscape.

Vegetation Classes

Class	Description	Upper Layer Lifeform (select one)
Class A		



define, All pathways



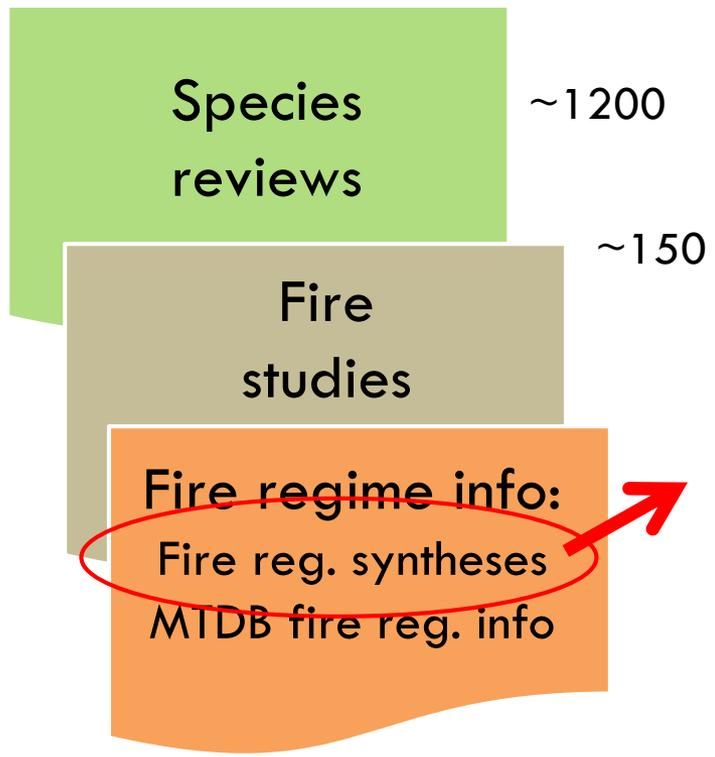
Climate / Carbon modeling



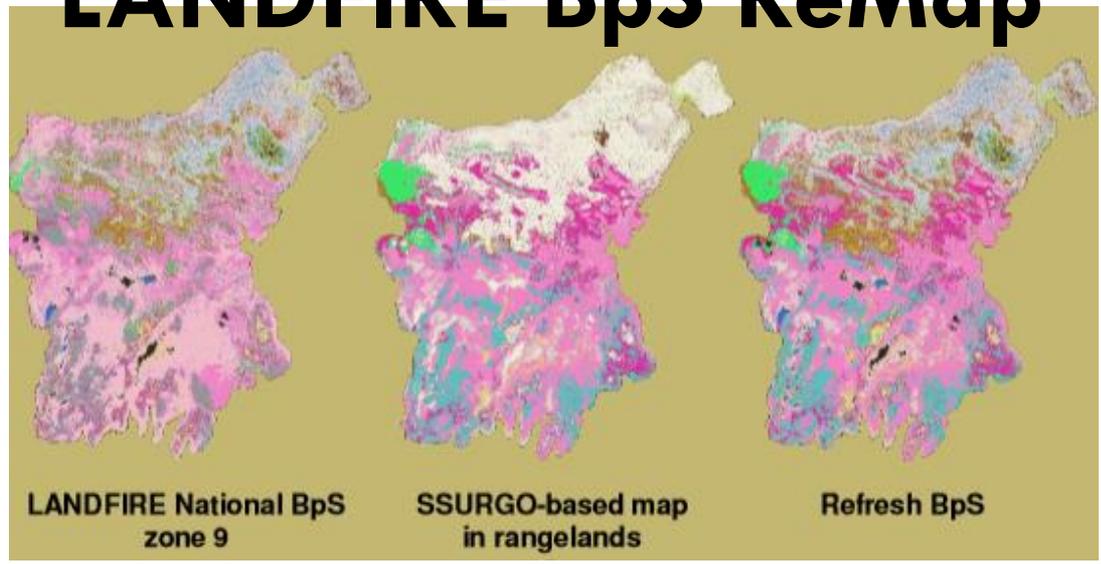
BpS & ESP – Potential Vegetation



Integrating LANDFIRE geospatial & fire regime data into FEIS



LANDFIRE BpS ReMap



1. Supplement FEIS species reviews with fire regime information
2. Provide managers with consistent, quality fire regime information

Fire regimes of Alaskan black spruce communities

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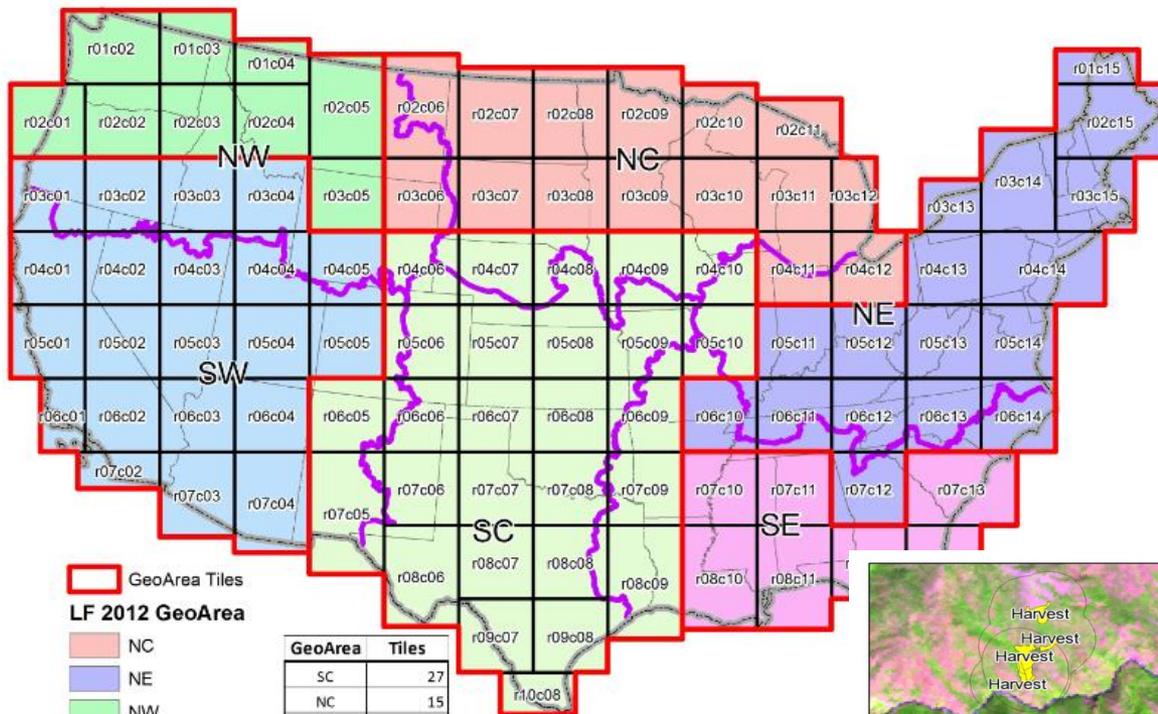
- [INTRODUCTION](#)
- [SUMMARY](#)
- [DISTRIBUTION AND PLANT COMMUNITY COMPOSITION](#)
- [HISTORICAL FIRE REGIMES](#)
- [CONTEMPORARY CHANGES IN FUELS AND FIRE REGIMES](#)
- [LIMITATIONS OF INFORMATION](#)
- [APPENDIX A: Summary of fire regime information for Biophysical Settings covered in this synthesis](#)
- [APPENDIX B: Common and scientific names of plant and lichen species and links to FEIS reviews](#)
- [REFERENCES](#)



Landscape Change: Disturbance



LANDFIRE 2012 RSLC Tiles



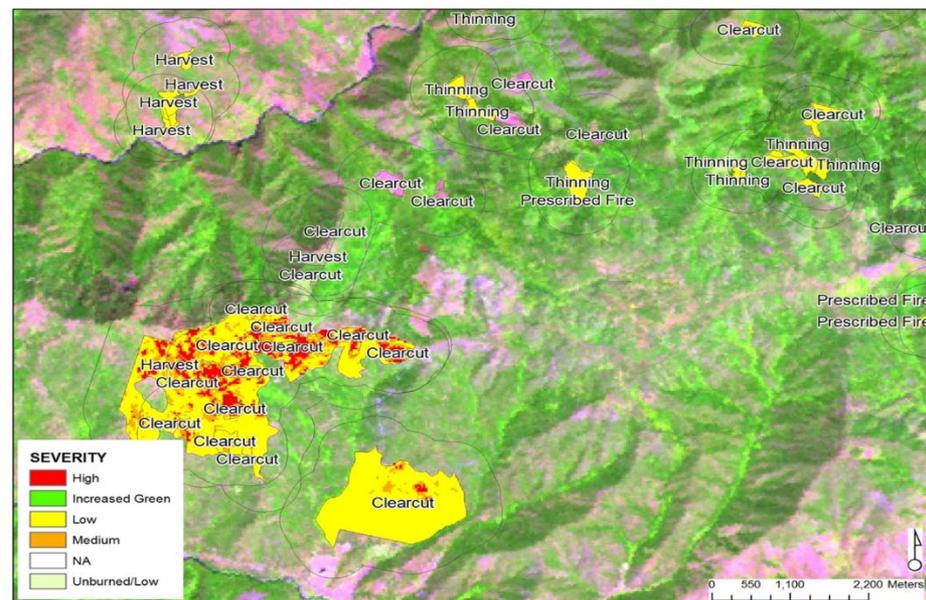
GeoArea Tiles

LF 2012 GeoArea

- NC
- NE
- NW
- SC
- SE
- SW

GeoArea	Tiles
SC	27
NC	15
SW	21
NW	9
NE	17
SE	9
All	98

Author: Joel Connot - SGT, Inc. -- 10/24/2013



SEVERITY

- High
- Increased Green
- Low
- Medium
- NA
- Unburned/Low



Landscape Change: Disturbance

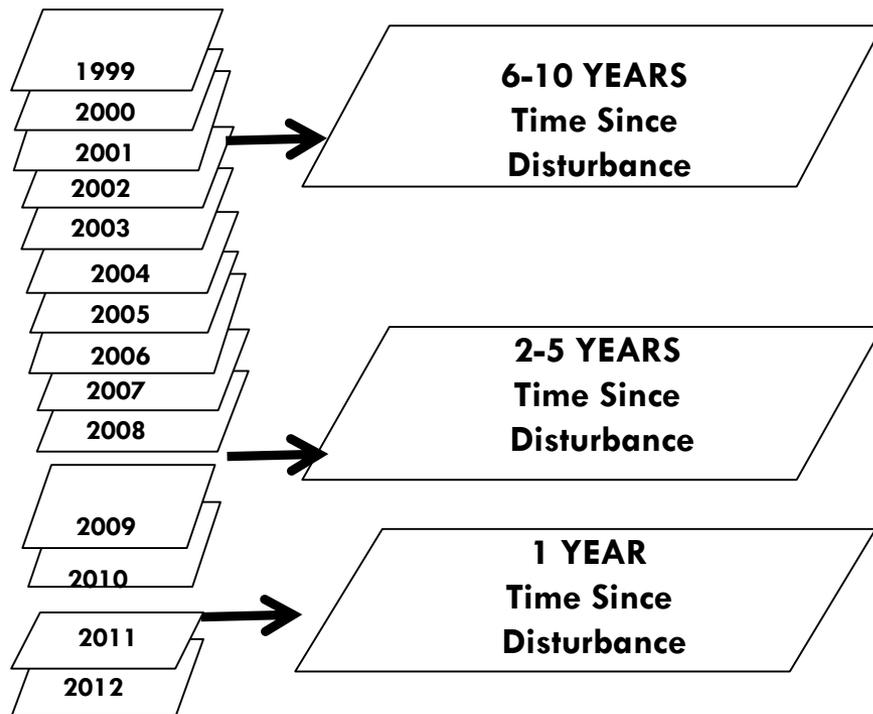


Disturbance Types

(causality)

- Fire
- Mechanical treatments that do not remove material from the site (Mechanical Add)
- Mechanical treatments that do remove material from the site (Mechanical Remove)
- Wind
- Insect and disease
- Biological
- Chemical
- Development

Event Code	Event Description
1	Development
2	Clearcut
3	Harvest
4	Thinning
5	Mastication
6	Other Mechanical
7	Wildfire
8	Wildland Fire Use
9	Prescribed Fire
10	Wildland Fire
11	Weather
12	Insecticide
13	Chemical
14	Insects
15	Disease
16	Insects/Disease
17	Herbicide
18	Biological



• **Vegetation Disturbance (VDIST)**

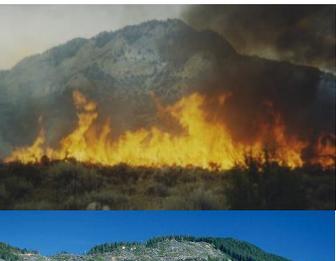
- Type
- Time Since Disturbance

• **Vegetation Transition Databases (VTDB)**

- Forest
- Non-forest

• **Veg Transition (VEGTRA)**

- Combine LF 2001 / LF08 / LF10 EVT/EVH/EVC w/ VDIST
- Create LF2010 (LF2012) EVT/EVC/EVH products





Landscape Change: Disturbance



Continuous Change Detection and Classification (CCDC)

Developed by C. Woodcock team at Boston University via membership on the NASA/USGS Landsat Science Team.

Benefits of this type of approach:

- Uses the full history of information for each pixel (pixel data mining).
- The full history provides monitoring context for recognizing discrete events and long-term trends.
- Cyclical responses and seasonality of time series support detailed classifications.



SURFACE FUEL REQUIREMENTS

- **Fire Behavior Fuel Model (FBFM)13, FBFM40, and Canadian Forest Fire Danger Rating System (CFFRDS) map layers**
- **Fire behavior represents average burning conditions.**
- **Anthropogenic features present**
 - ▣ **Features in EVT map are mapped as non-burnable fuel types (roads, developed/urban areas, agricultural fields, etc.)**



Fuels



LFTFC - LANDFIRE TOTAL FUEL CHANGE TOOL

Fuel Rules for MU DI_z37_chk

Session Name:
 Select Rules:
 All
 FCCS
 FBFM
 FLM

Existing Vegetation Number and Name

232300 West Gulf Coastal Plain Mesic Hardwood Forest

Ruleset | Compare FM | Distribution Graph | EVT Description

100% of EVT | 0% of BPS | 0% of Wild | 0% of BPS Wild | Pixels left behind: 0

Range of Cover	Range of Height	BPS	Wild	FM13	FM40	CanFM	FCCS	FLM	CG	CC
10%- 69% Tr...	5(m)- max Tr...	any	any	9	TL6 ...	9999	9999	9999	2	9...
70%- 79% T...	0(m)- 10(m) Tr...	any	any	9	TL6 ...	9999	9999	9999	2	9...
70%- 79% T...	10(m)- 25(m) T...	any	any	8	TL2 ...	9999	9999	9999	2	9...
70%- 79% T...	25(m)- 50(m) T...	any	any	9	TL6 ...	9999	9999	9999	2	9...
80%- 100% T...	0(m)- 50(m) Tr...	any	any	8	TL2 ...	9999	9999	9999	2	9...



CANOPY FUEL REQUIREMENTS

- **CBD, CBH, CC, and CH maps should capture a reasonable approximation of current canopy fuels and CBH should be in values of meters X 10, CBD should be $\text{kg/m}^3 \times 100$, CC should be in percent and CH should be in meters X 10.**
- **All anthropogenic features present in EVT shall be mapped as areas of zero for canopy fuel. (e.g., roads, developed/urban areas, agricultural fields, reservoirs or barren areas etc.)**
- **Areas where torching and crown fire do not occur, but tree cover is present should be represented by a $\text{CBH} = 10$ meters, $\text{CBD} = 0.012 \text{ kg/m}^3$, CC and CH stay as predicted.**
- **No canopy fuel should be present in areas of just shrub or grass cover. If tree cover is not present canopy fuels should not exist.**
- **CBH should not exceed CH.**

Seasonality of fuels

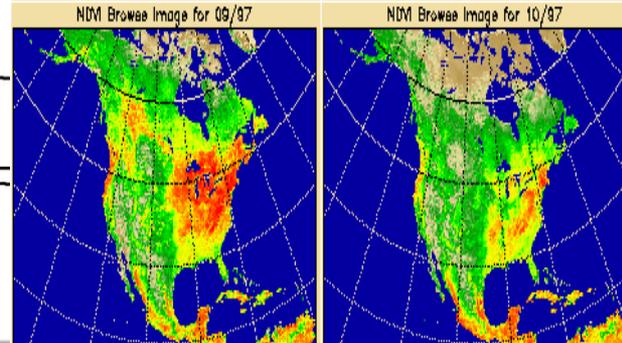
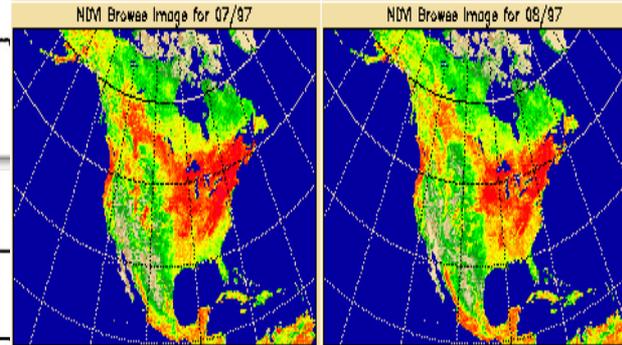
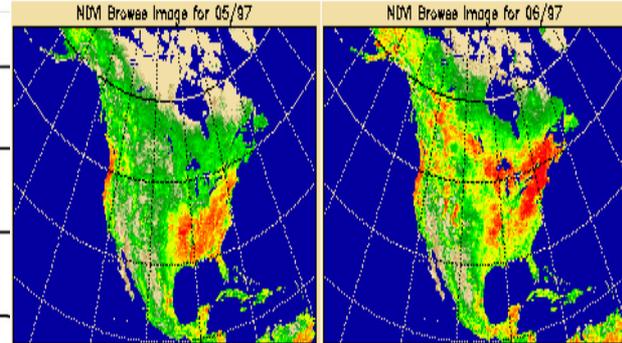
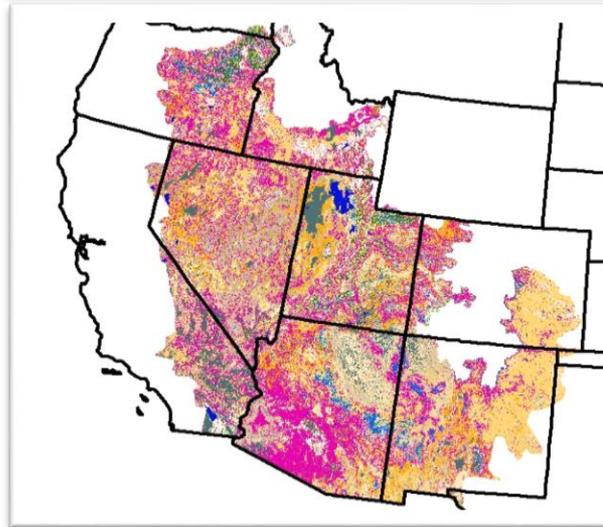
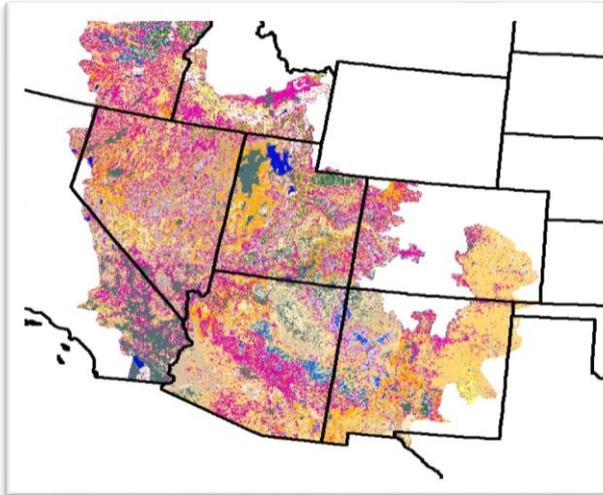
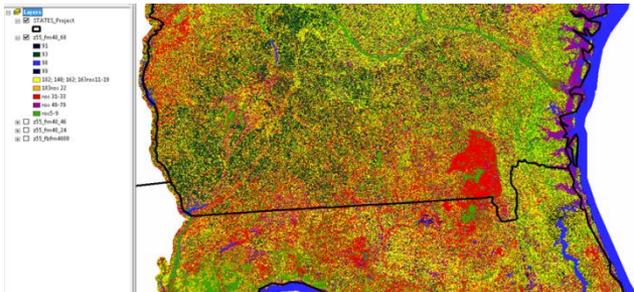
NDVI



LOW- KBDI



HIGH - KBDI



CANOPY FUEL

Leaf off / Leaf-off and phenology

- Main fire season may be leaf-off in most of the Eastern CONUS

- Leaf-on conditions for prescribed fire

Tree list mapping

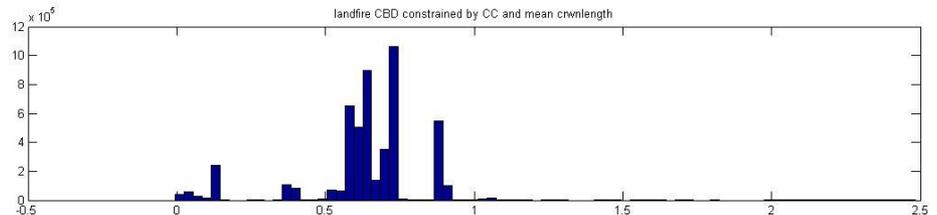
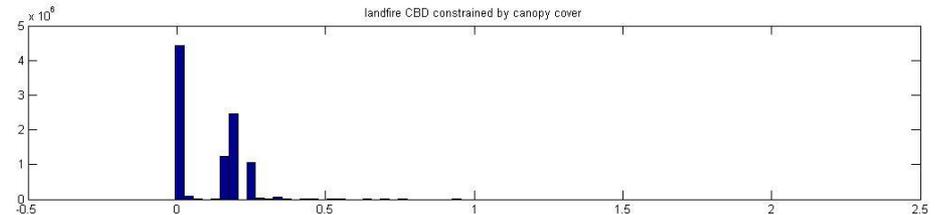
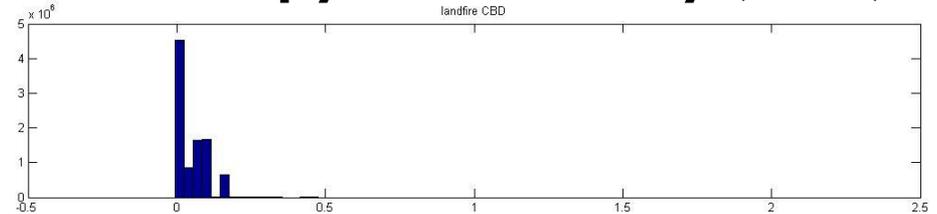
- Improved canopy fuels
- Enables 3-D modeling
- Engage w/ FIA; FHTET; FVS

Increase resolution in the EVH layer

Creating Hybrid Structure from LANDFIRE AND Lidar Combinations ((CHISLIC) Tool

LIDAR availability as mapping and/or training data

Canopy Bulk Density (CBD)



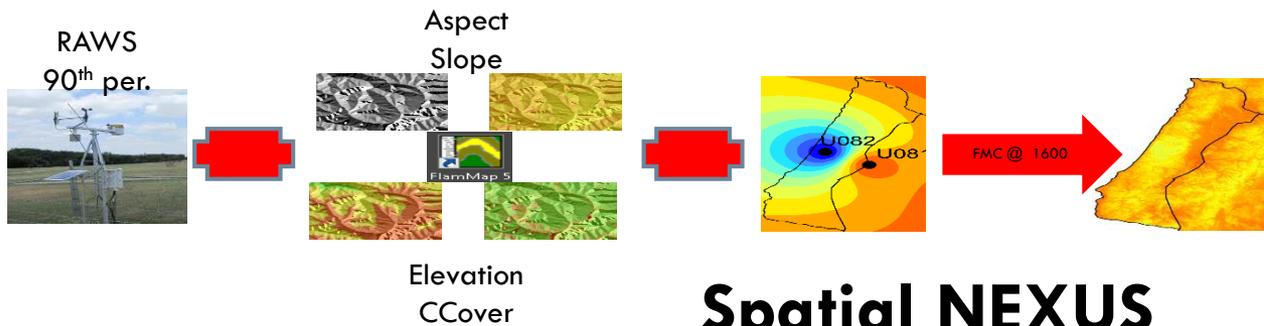


Fuels



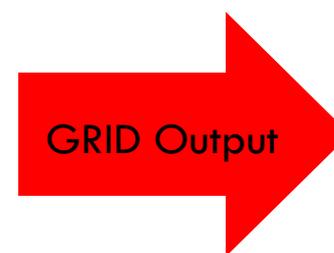
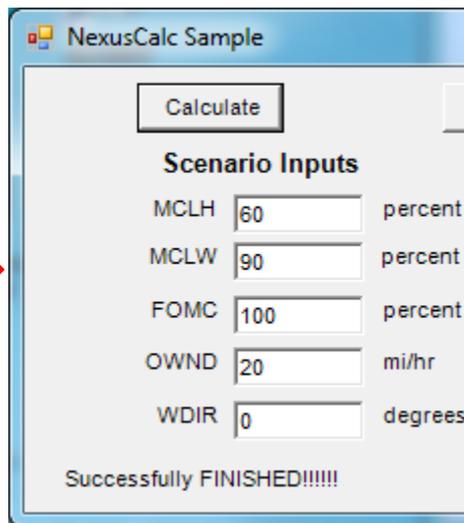
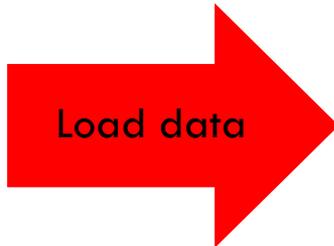
LANDFIRE INNOVATIONS: FIRE BEHAVIOR

Create fuel moisture GRIDs from Flammap outputs



Spatial NEXUS

FMC 90
FBFM40
CBH
CBD
CC
CH
Slope



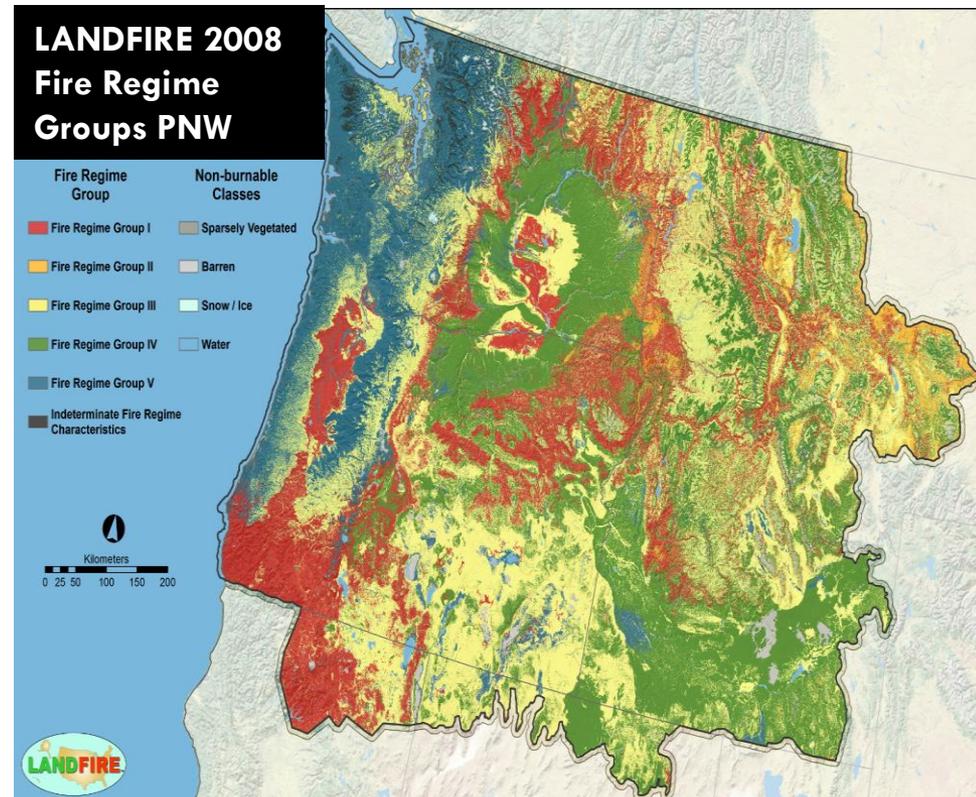
Fire Type
Crown Frac. Burned
Spread Rate
Heat/Unit Area
Fireline Intensity
Flame Length
Eff. Mid-Flame WS
Torching Index
Crowning Index

□ Fire Frequency and Severity Products

- Mean Fire Return Interval (MFRI)
- Historical fire probabilities (% Low, Mixed, Replacement Fire {PLS, PMS, PRF})
- Fire Regime Group (FRG)

□ Departure Products

- Succession Class (SCLASS)
- Vegetation Departure (VDEP)
- Vegetation Condition Class (VCC)



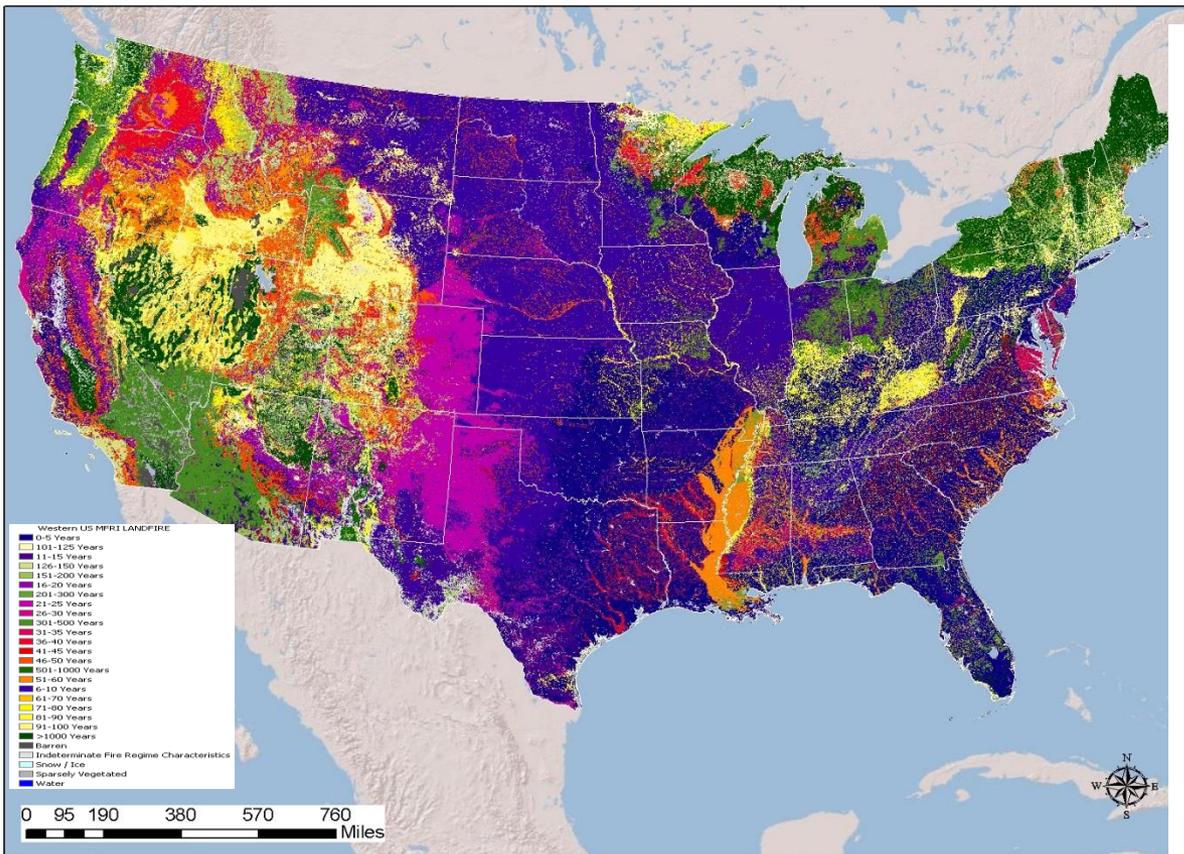


Fire Regime



PRODUCT	LF National	LF 01' / 08'	LF 10'
Mean Fire Return Interval	LANDSUM – fire frequency from veg dynamics models; fire size, spread, and effects modeled explicitly	BpS Groups – data from Refresh Model Tracker (RMT)	Individual BpS's from Model Tracker DataBase (MTDB)
(% Low, Mixed, Replacement Fire PLS PMS PRF	LANDSUM – fire type and probability from veg dynamics models; fire size, spread, and effects modeled explicitly	BpS Groups – data from RMT	Individual BpS's from MTDB
Fire Regime Group	LANDSUM modeling and rule set combining MFRI and PLS, PMS, PRF	BpS Groups – data from RMT	Individual BpS's - data from MTDB

- ❑ FRG definitions changed to Interagency Fire Regime Condition Class Guidebook.
- ❑ Definitions refined to create discrete, mutually exclusive criteria for use with LANDFIRE's fire frequency and severity data products.
- ❑ Are these definitions still valid and working?



- MFRI = historical fire regime characteristics
 - Landscape interactions of: vegetation dynamics, fire spread, fire effects, and spatial context as modeled by LANDSUM
 - Represented by LANDFIRE Biophysical Settings (BPS) layer as described by the BPS Group Model documentation.

MEAN FIRE RETURN INTERVAL REQUIREMENTS



Fire Regime



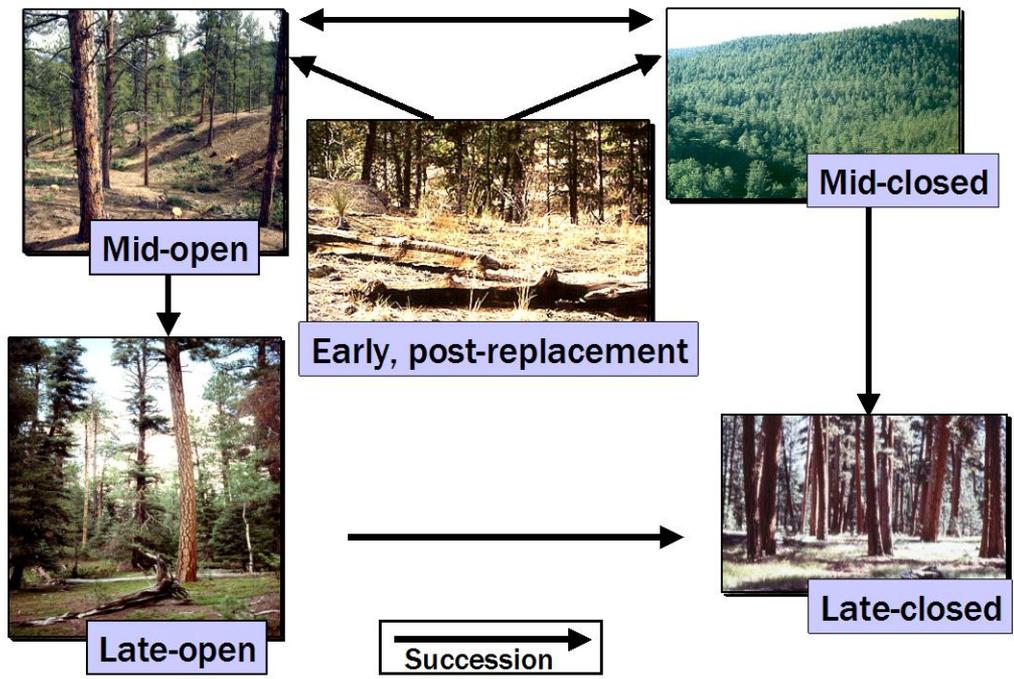
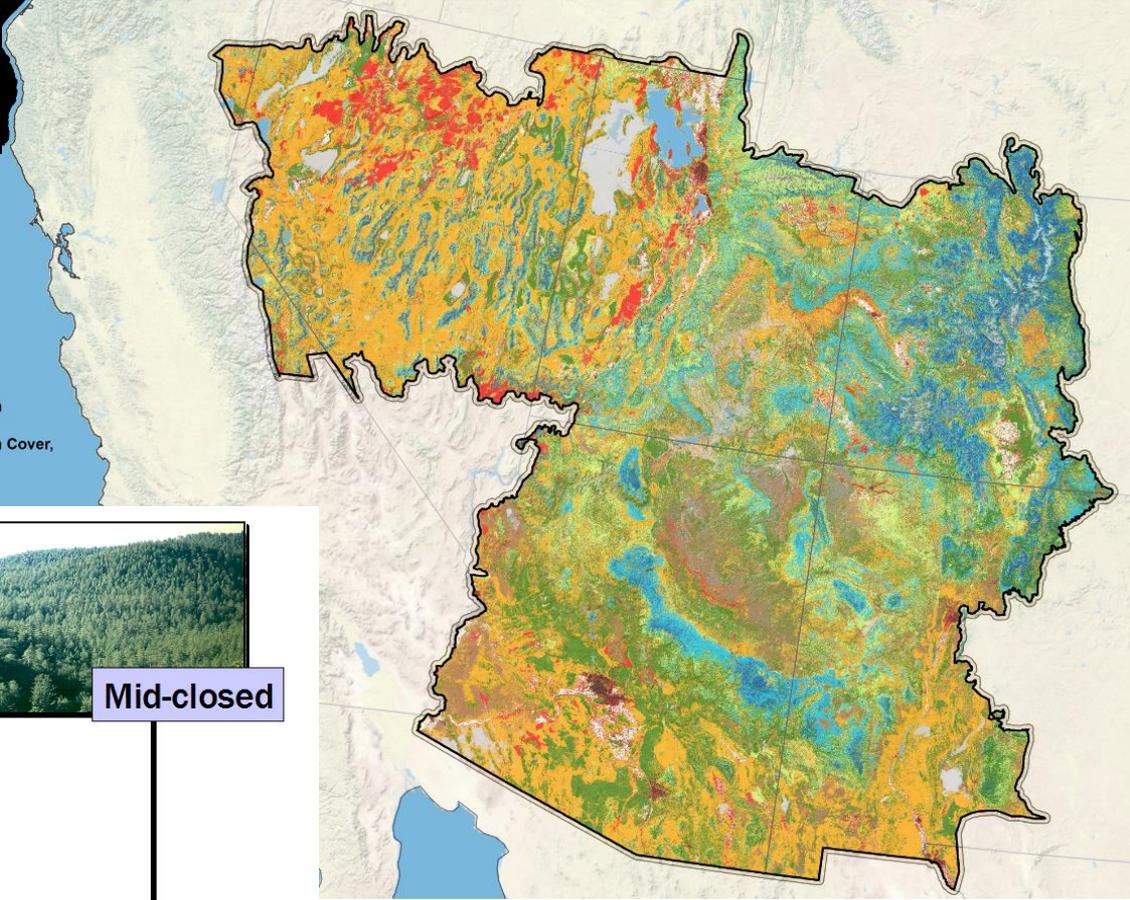
PERCENT LOW, MODERATE, REPLACEMENT SEVERITY REQUIREMENTS

- **Average top-kill for a given vegetation type within a typical fire perimeter**
 - **Low severity = less than 25 percent**
 - **Mixed severity = between 25 and 75 percent**
 - **Replacement severity = greater than 75 percent**

(Hann and others 2004)

- **Intermediate FRG update in 2015 (Hann)**

LANDFIRE 2008 Succession Classes SW





Succession



SUCCESSION CLASS (SCLASS) “CONCEPT” REQUIREMENTS

- **SCLASS layer characterizes current vegetation conditions (species composition, cover, and height) and ranges of successional states within each biophysical setting**
- **SCLASS can also represent uncharacteristic vegetation components, such as exotic species.**
- **Classes represent vegetative states**
 - ▣ **Disturbance-related dynamics (fire frequency),**
 - ▣ **Structural/Growth development.**



Succession



PRODUCT	LF National	LF 01' / 08'	LF 10'
Succession Class	MTDB rules and map review and editing	RMT rules with back filling	LF National maps with back filling
Departure Simulation Unit	Mapzone w/ buffer	Exemplar model from the BPS Group	N/A
Reference Condition	LANDSUM simulations	Exemplar model from the BPS Group	
Summary Unit	Mapzone / Subsection	HUC 4,5,6 depending on BPS Group FRG	
Condition Class	Grouped VDEP	Grouped VDEP	N/A



Succession



SUCCESSION CLASS

“MAPPING” REQUIREMENTS

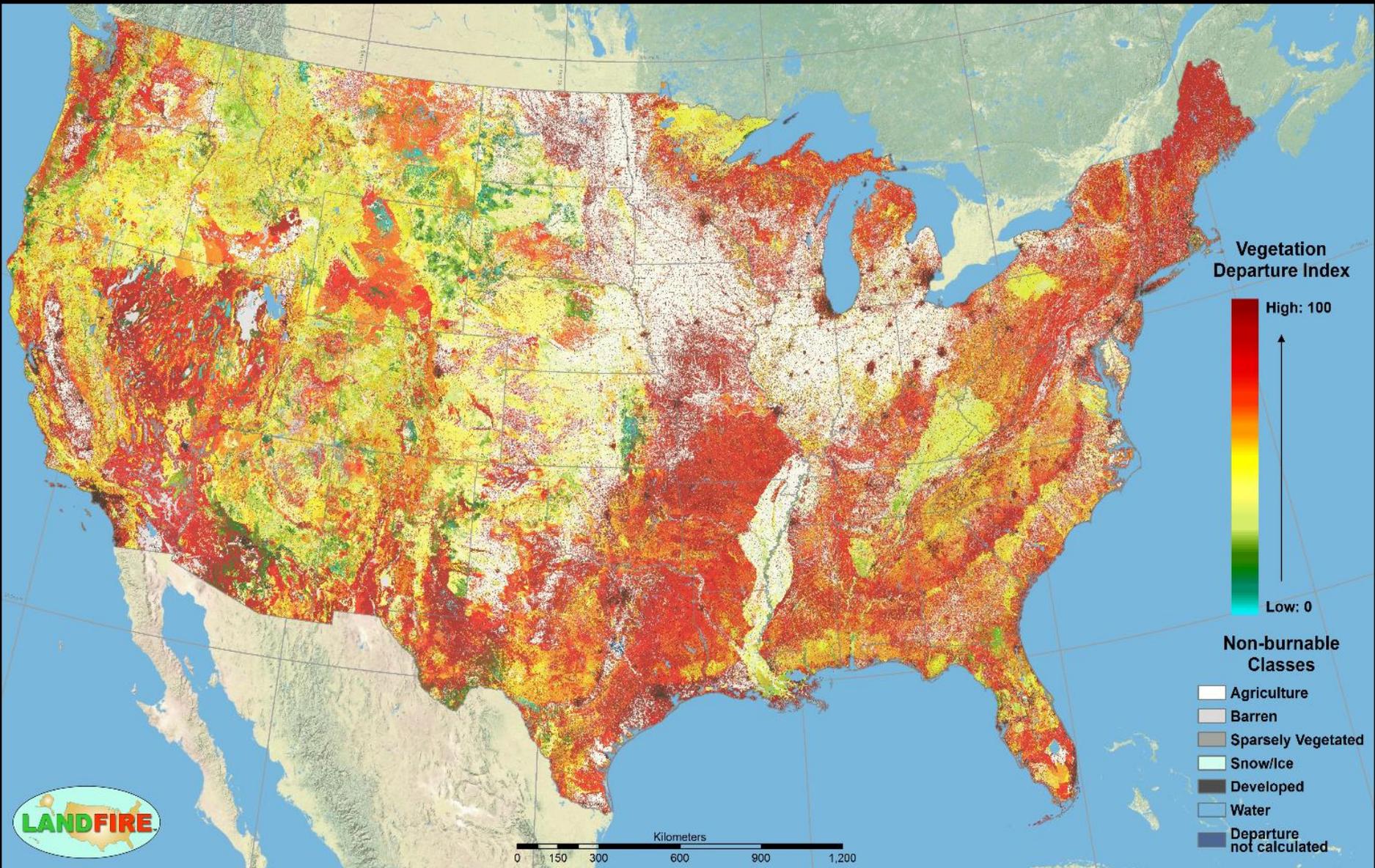
- **S-class = capture a reasonable approximation of current conditions (both characteristic and uncharacteristic vegetation)**
- **Map units nested within the corresponding BPS and include only allowable succession class units specified by the BPS' vegetation model (described in the MTDB S-class descriptions). Additionally, units may include Uncharacteristic Natural/Exotic.**
- **Map units correspond to EVT, EVC and EVH layers and model rules.**
- **Spatial distribution of map units generally consistent with adjacent map zones to minimize seam lines.**
- **Anthropogenic features (roads, developed/urban areas, and agricultural) labeled (e.g. Ruderal vegetation types, plantations, etc.)**



Vegetation Departure



LANDFIRE 2008 Refresh Updates: Vegetation Departure Index





VEGETATION DEPARTURE “CONCEPT” REQUIREMENTS

- **Vegetation Departure (VDEP) ranges from 0 - 100**
 - ▣ **Depicts current vegetation departure from simulated historical vegetation reference conditions (e.g. changes in species composition, structural stage, and canopy closure).**
 - ▣ **Three condition classes describe low departure (VCC 1), moderate departure (VCC 2), and high departure (VCC 3) – formerly Fire Regime Condition Class {FRCC}.**
- **VDEP is calculated using species composition, structural stage, and canopy closure using methods described in the **Interagency Fire Regime Condition Class Guidebook**.**

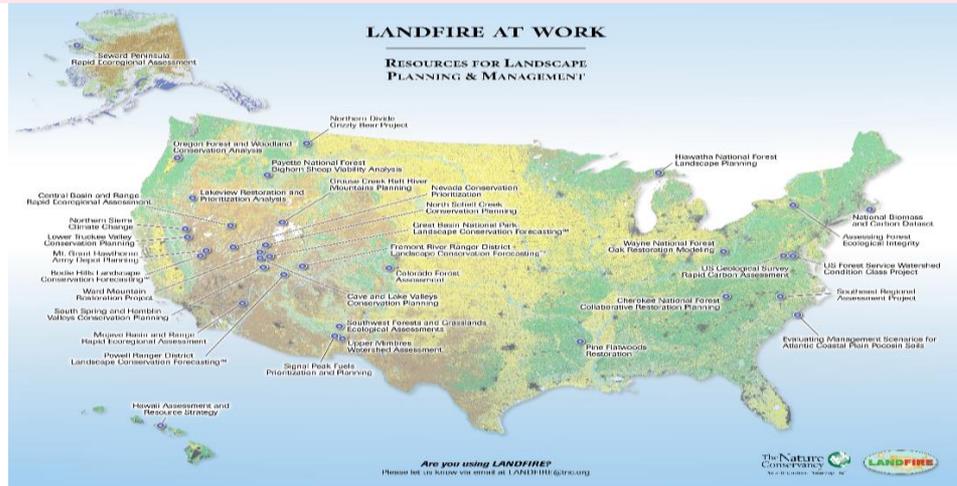


VEGETATION DEPARTURE “MAPPING” REQUIREMENTS

- Reasonable approximation of continuous vegetation departure from historical conditions. (FRCC Guidebook documentation).**
- Spatial distribution generally consistent with adjacent map zones to minimize seam lines.**
- Anthropogenic features are excluded from the map product (roads, developed/urban areas, and agricultural).**

Web-Hosted Applications Map - TNC Conservation GATEWAY

- Developing statewide forest assessments
- Analyzing the impact of habitat fragmentation on bobcat populations
- Looking at how climate change could affect flora and fauna

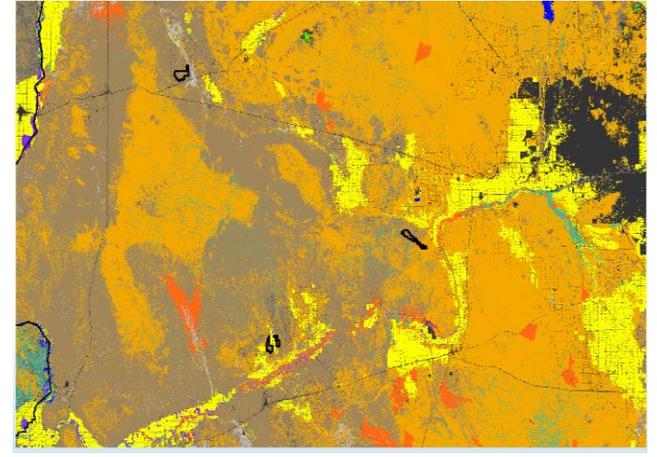


Arizona Solar Regional Mitigation Project

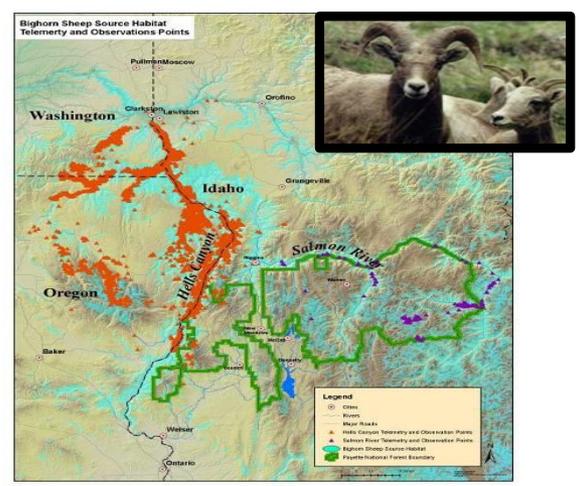
- 2012

Vegetation Communities

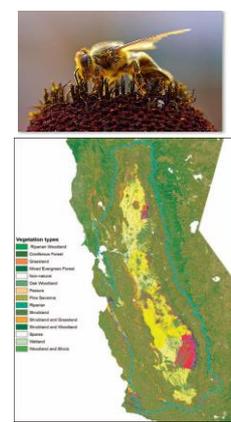
LandFire Existing Vegetation Type (EVT)



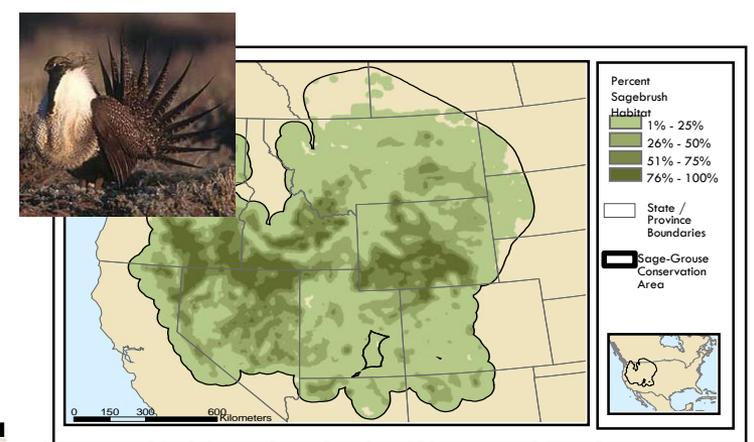
Bureau of Land Management (BLM) Sonoran Desert Ecoregional Assessment



Bighorn Sheep Viability Analysis - Payette National Forest



Bee Pollination Study: California



Sage-Grouse Habitat Analysis: Western North America

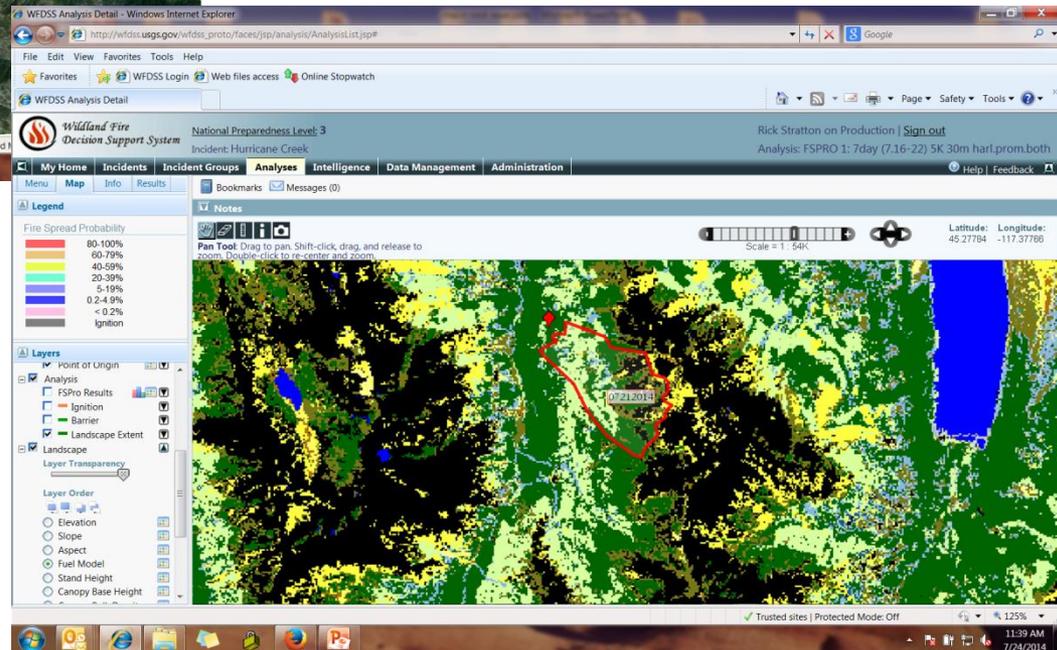
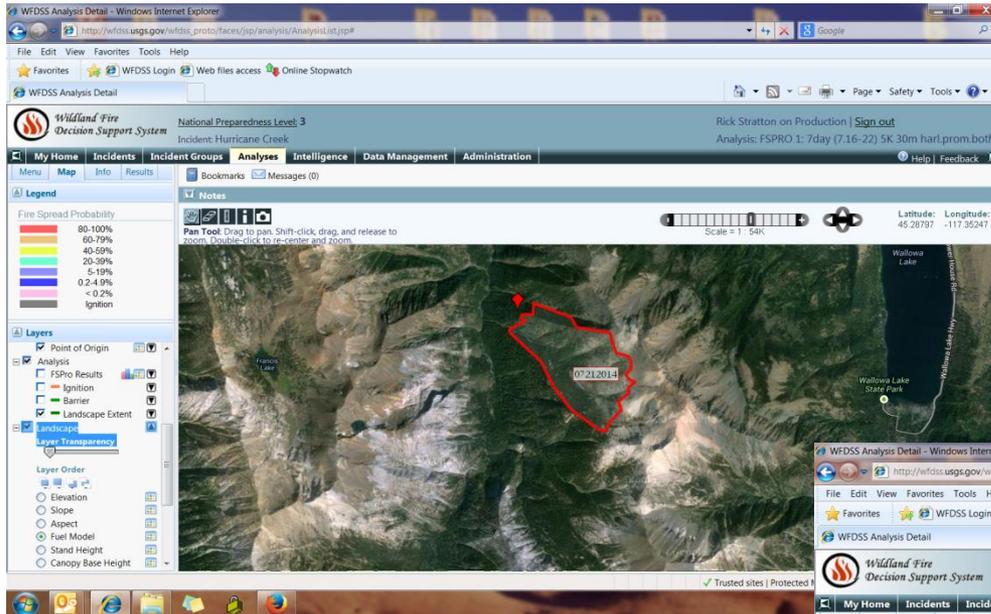
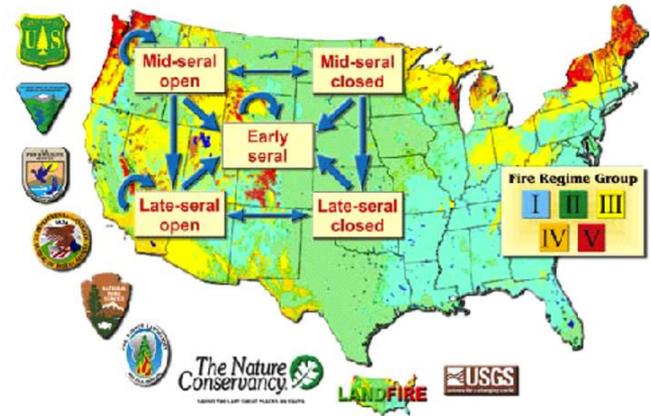


Applications



WFDSS – Wildland Fire Decision Support System

INTERAGENCY FIRE REGIME CONDITION CLASS



- Fuel layer editing
- Fire behavior analysis

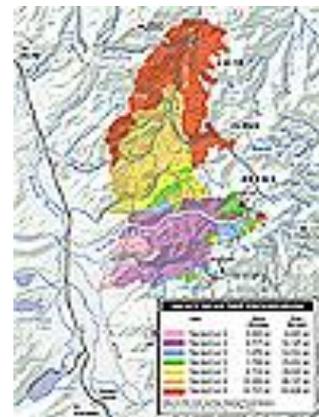
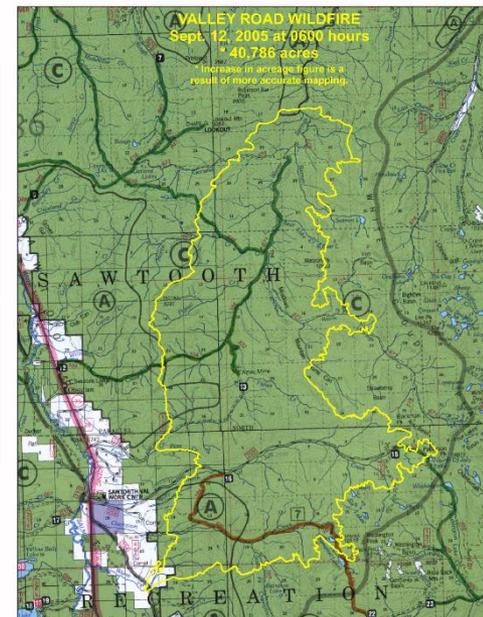
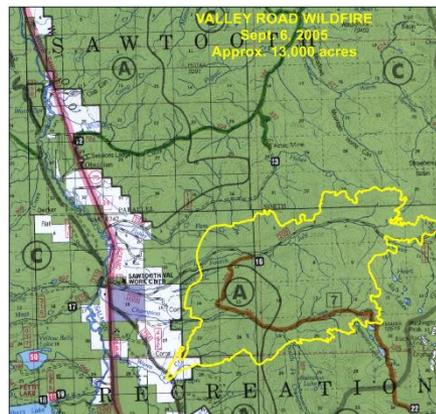


Copyright 2005 Boulder-White Clouds Council

Valley Road Fire burns Fisher Creek, three miles behind this Shaw Mesa home near Highway 75 in the Sawtooth Valley, Idaho.

Copyright photo: Lynne Stone, Boulder-White Clouds Council.

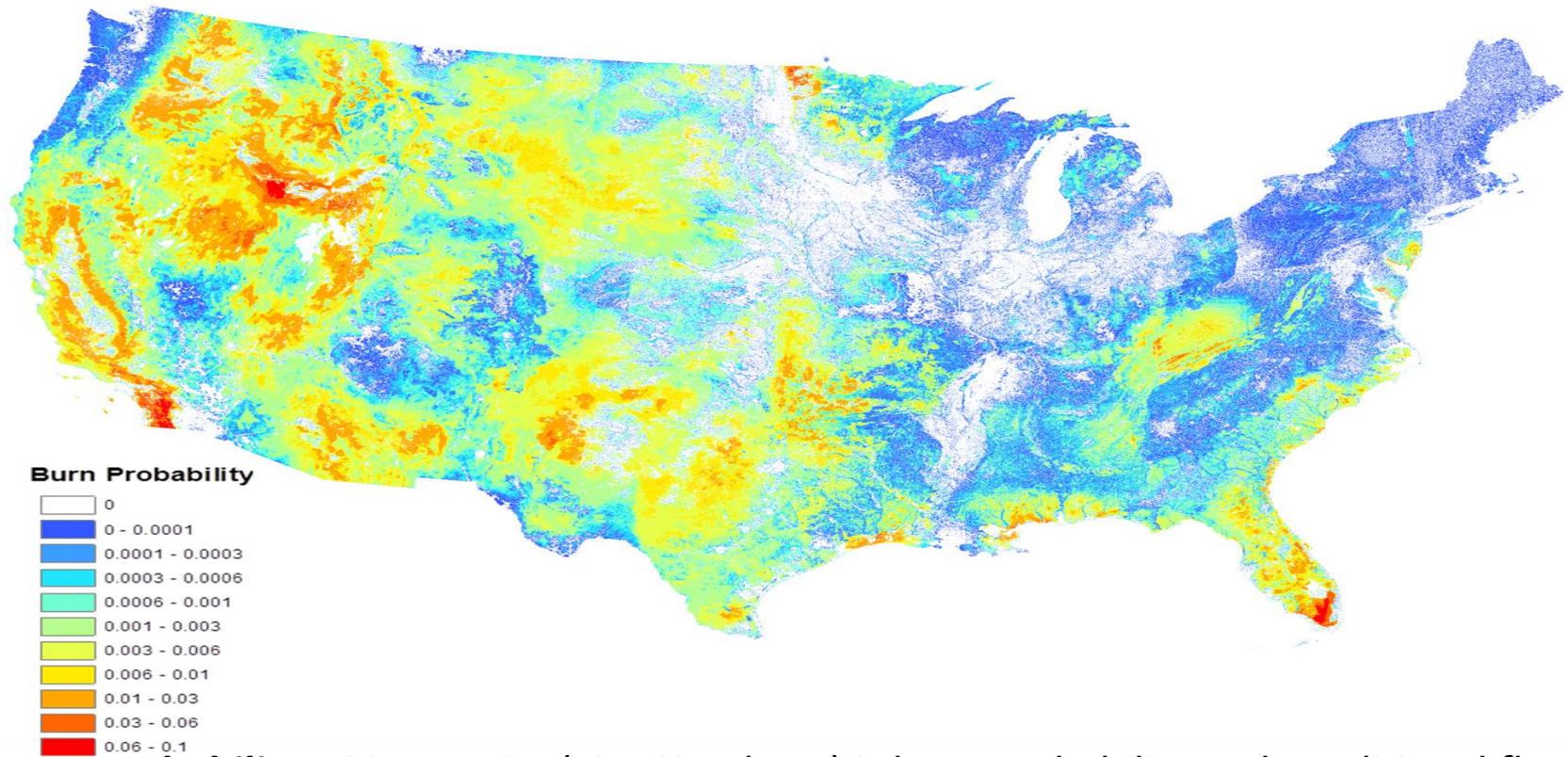
Tim Sexton - Valley Road IC. Stated, "**millions** of dollars were **saved** on these fires due to modified tactical decisions **based upon** better informed fire progression and spread predictions using **LANDFIRE data.**"



WUI developments, a **power grid**, and locally significant **transportation** corridor in central Idaho

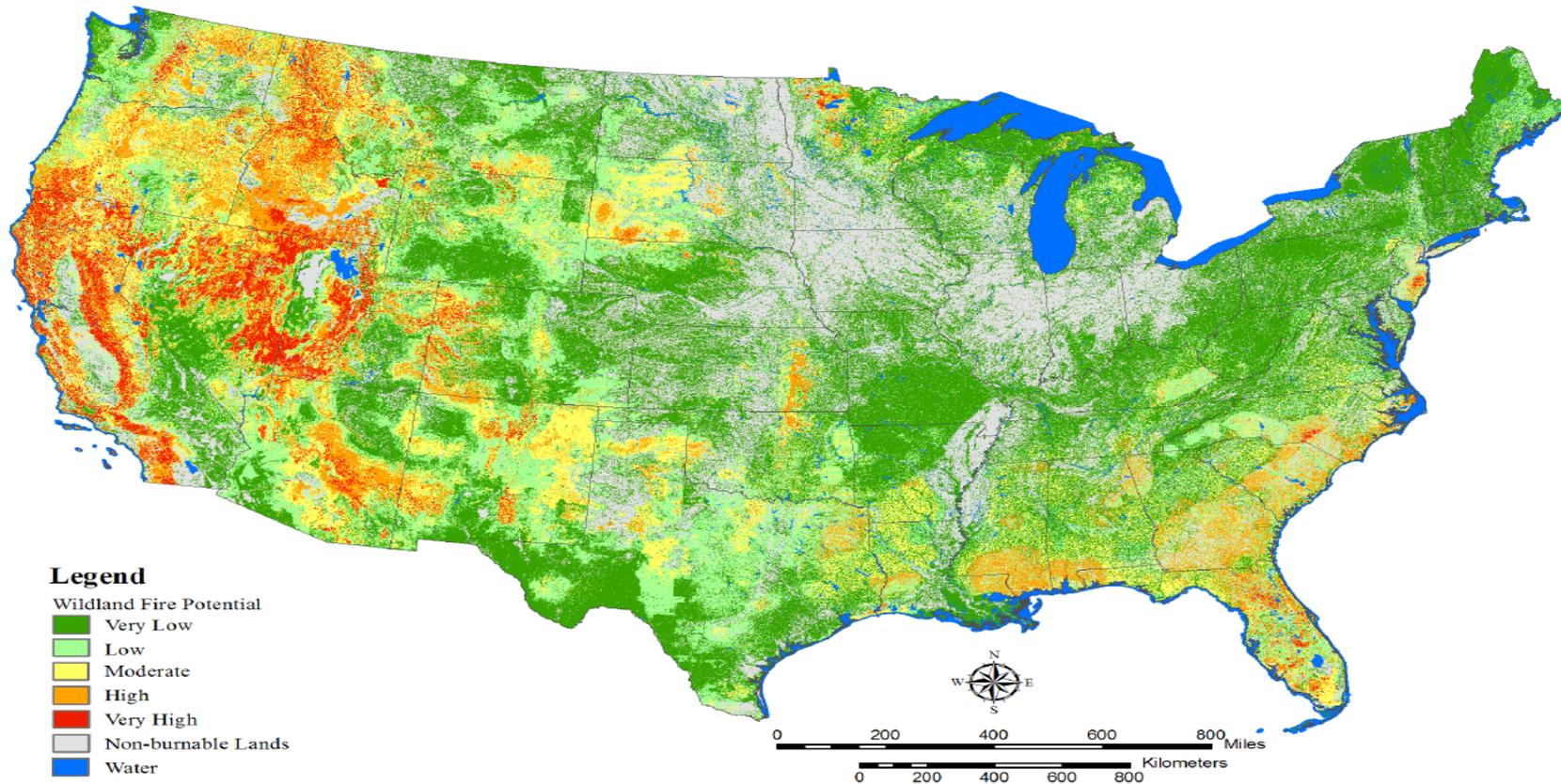
Idaho Gov. Dirk Kempthorne, Maj. Gen. Lawrence Lafrenz of the Idaho National Guard, and representatives and others visited the fire

Tim Sexton, incident commander of the fire, summed it up: "The Sawtooth Valley is still a catastrophe waiting to happen, due to dense, unburned stands of beetle-killed lodgepole pine on the west side of Highway 75."



Fsim Burn Probability - 2014. Fsim (Fire Simulator) is burn probability and conditional flame length probabilities based on large-fire-perimeter event sets.

- Since 2010, data generated on a semi-annual basis within the Fire Program Analysis (FPA).
- Future development of the National wildfire risk assessments is planned to continue as part of the **Wildland Fire Investment Planning System (WFIPS)**.
- **LANDFIRE (LF2010) data** {surface fuels, canopy characteristics, and terrain} are **fundamental** part of this process.



Wildland Fire Potential map 2012.

Relative potential for wildfire

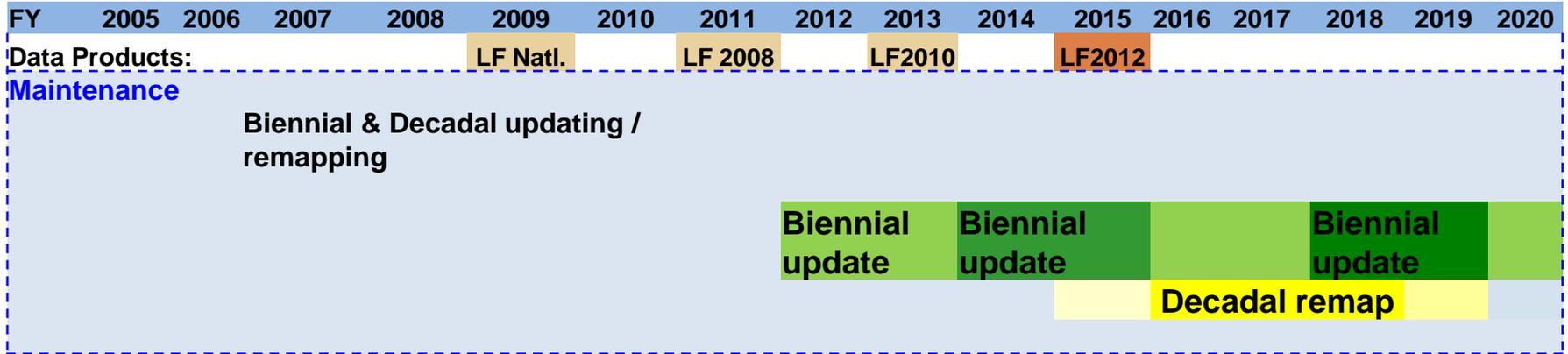
- **Difficult to contain fires** (based on past fire occurrence and estimates of wildfire likelihood)
- Higher WFP values represent fuels w/**increased probability of high-intensity fire**
- LANDFIRE (LF2008) data of canopy height, canopy cover, and canopy base height as well as existing vegetation type and shrub canopy cover are used to define locations with crown fire potential.



LANDFIRE Future

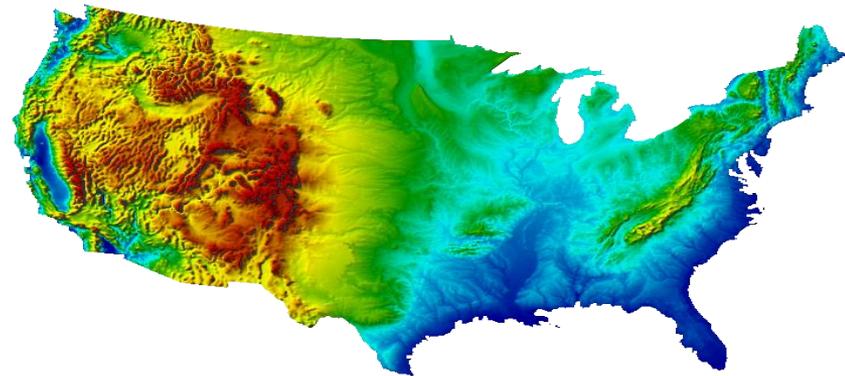


Timeline



LANDFIRE remap

- Planning, Coordination, Transition year 2015
 - Questionnaire, After Action Review/Scoping Workshops
- Implementation 2016



Workshop Process

QUESTIONS?

- 1. What was planned,
- 2. What really happened,
- 3. Why did it happen,
- 4. What could be done better next time
- 5. What needs to be done in the future
- 6. Recommendations