

Partnering with LANDFIRE, NatureServe, and Heritage Programs

Utilizing Legacy Data for
Ecological Site Concept
Development and Descriptions

Content

- LANDFIRE: BpS vs. EVT
- LANDFIRE: Disturbance Models
- NatureServe: Ecological Systems, Associations, and Alliances
- NatureServe: SWAPs, EOs, and a CIG Grant
- Heritage Data: MNDNR
- Heritage Data: INHS
- Questions



What is LANDFIRE?

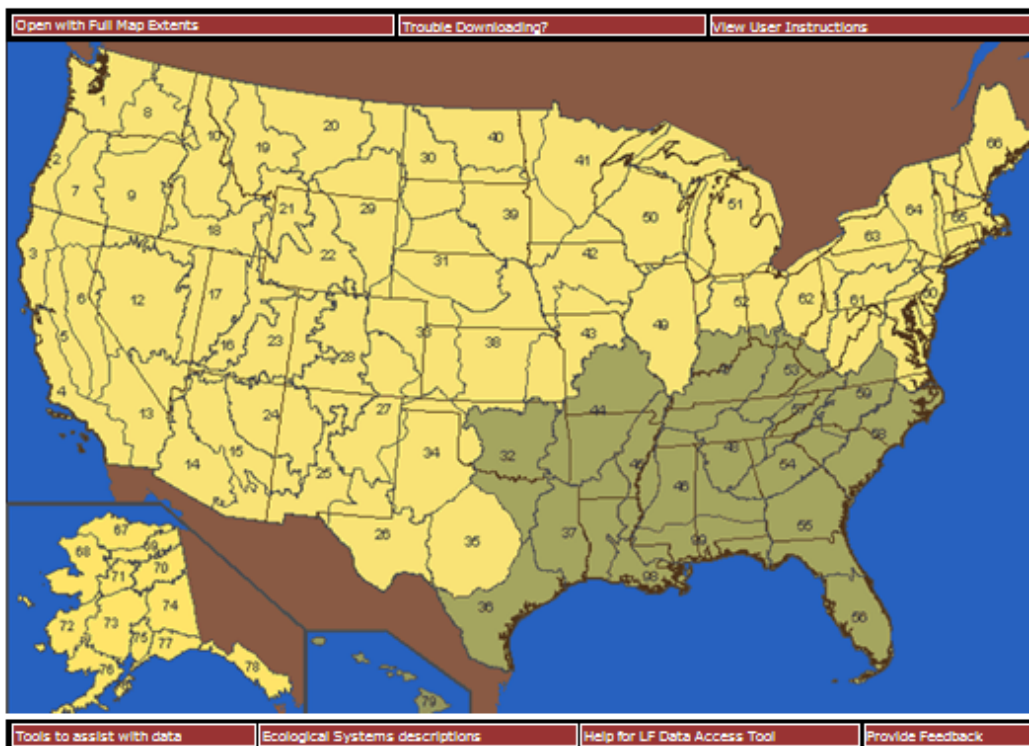
- LANDFIRE (also known as Landscape Fire and Resource Management Planning Tools) is an interagency vegetation, fire, and fuel characteristics mapping program, sponsored by the United States Department of the Interior (DOI) and the United States Department of Agriculture, Forest Service.
- 30-meter grid spatial resolution raster data sets;
- Over 50 spatial data layers in the form of maps and other data that support a range of land management analysis and modeling:
 - Existing Vegetation Type, Canopy, and Height;
 - Biophysical Settings;
 - Environmental Site Potential;
 - Fire Behavior Fuel Models, Fire Regime Classes, and Fire Effects layers.
- Data products developed through advanced scientific procedures, including relational databases, georeferenced land-based plots, satellite-enabled remote sensing, systems ecology, gradient analysis, predictive landscape modeling, and vegetation and disturbance dynamics.



With LANDFIRE, you can:

- view and download [geospatial layers](#) and data products that depict the nation's major ecosystems, wildlife habitat, vegetation, landscape features, and fire behavior, effects, and regimes;
- Provide regional, [landscape-scale](#) cross-boundary geospatial products to support fire and fuels management planning and natural resource assessment;
- Supplement planning and management activities, including monitoring, that require analysis of consistent vegetation data across political boundaries;
- Analyze and model vegetation, both historic and current, and model effects of natural disturbance

The LANDFIRE Data Distribution Site provides a dynamic online map interface that can be used to view USGS datasets. Click on area of interest in the map below to continue to the Data Distribution Site to download data.



LANDFIRE Data Availability

Available Nationwide:

LF 2008 (Refresh - LF_1.1.0)

LF 2001 (Refresh - LF_1.0.5)

National c2001 (LFc2001 - LF_1.0.0)

Coming 2013

LANDFIRE 2010 (LF2010 - LF_1.2.0)

Updates in past 6 months

Check [Data Alerts](#) for details



[Data Alerts](#)



[Data Notifications](#)

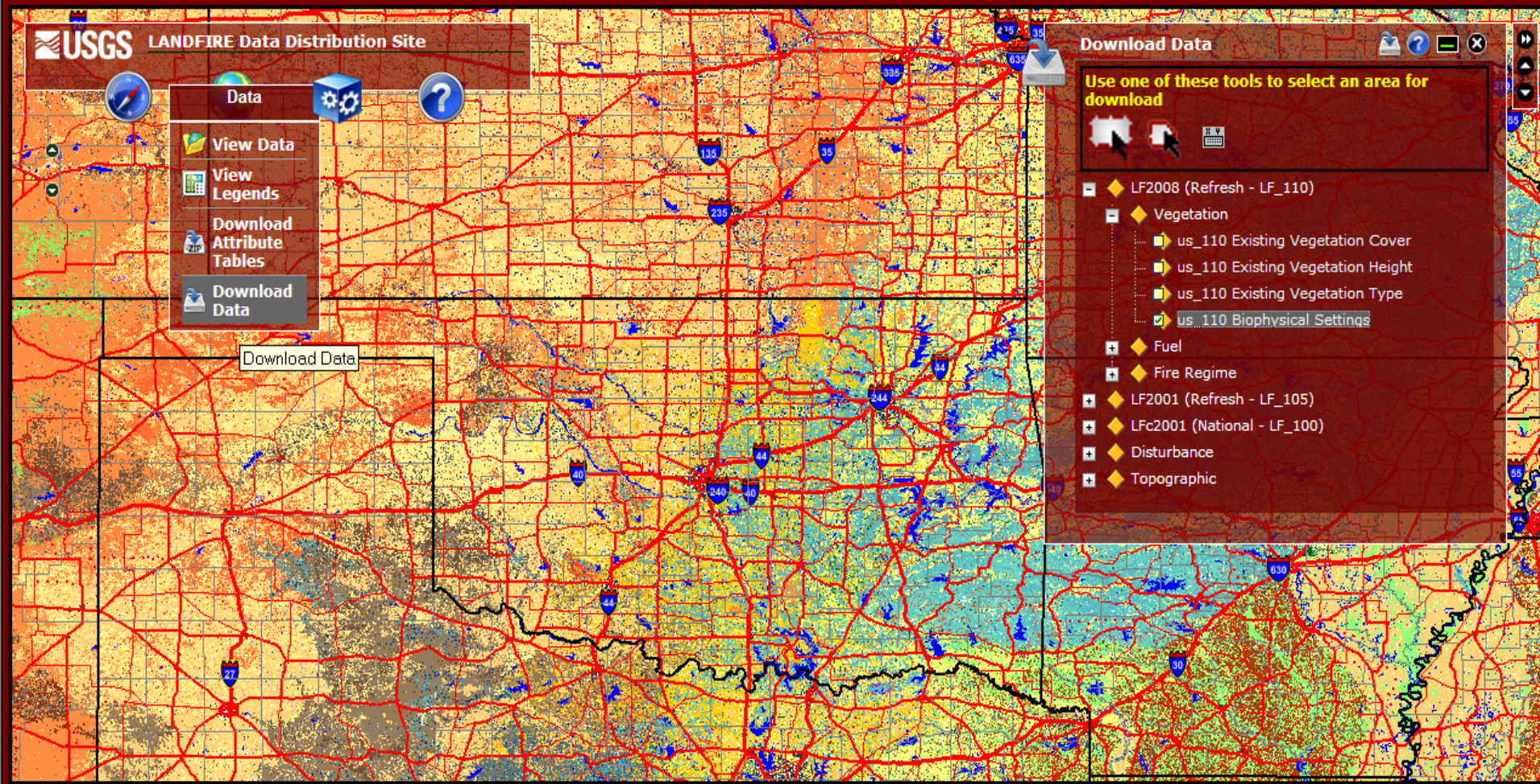
» [LANDFIRE Version Comparison Table](#)

» [Data Access and/or Download Options](#)

*NOTE: Use IE 7 or higher, or Firefox, to subscribe to RSS





<http://landfire.cr.usgs.gov/viewer/>



LANDFIRE Data Distribution Site Request Summary Page

You are logged in as LANDFIRE User.

[Modify Data Request](#) [Tutorial](#) [HELP!](#)

Data Extraction Request Pieces:			
Area	Output Parameters	Size (MB)	Download Links
us_110 Biophysical Settings			
(WGS 84) N: 36.89631 W: -101.4275  S: 35.93759 E: -99.1464	Output Format: ArcGRID_with_attris USA Contiguous Albers Equal Area Conic USGS version X cell Size: 30.00 METERS Y cell Size: 30.00 METERS	11	 USGS/EROS Download

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File Actions View Jobs Options Help

New Open Favorites Add Extract

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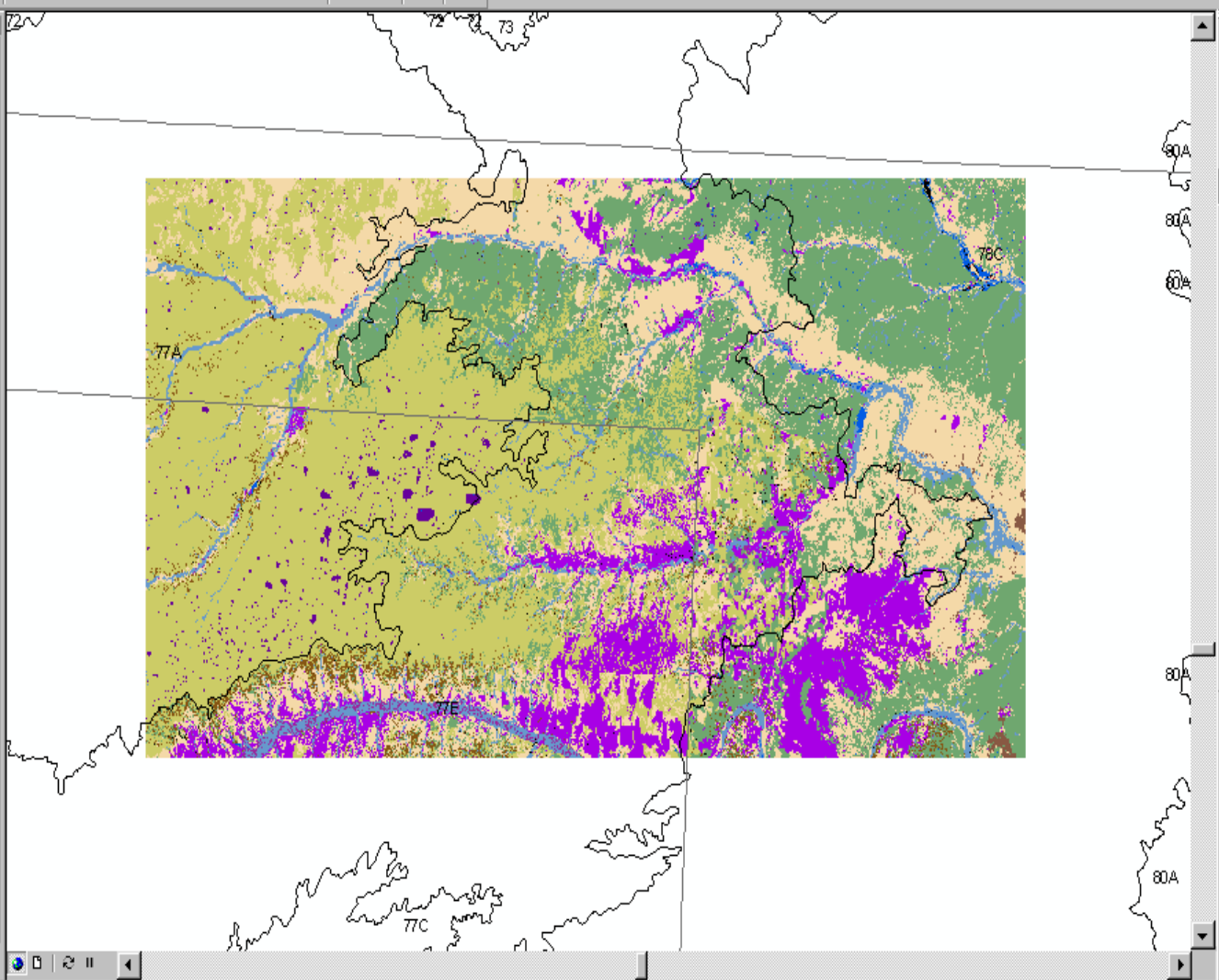
Folders

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- US_110BPS

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Layers

- st99_d00_Project
- mlra_a_us
- MLRA_Soil_Survey_Areas_Oct2012
- us_110bps
 - GROUPNAME
 - American Sycamore-Cedar Elm-Texas Ash
 - Barren-Rock/Sand/Clay
 - Big Bluestem-Little Bluestem-Indiangrass-2
 - Big Bluestem-Little Bluestem-Post Oak-1
 - Big Bluestem-Switchgrass-2
 - Blue Grama-Buffalo Grass-2
 - Bluebunch Wheatgrass-Big Bluestem-Little
 - Buffalo Grass-Blue Grama-2
 - Bur Oak-Chokecherry-1
 - Eastern Cottonwood-Green Ash-Ginger-3
 - Eastern Cottonwood-Sandbar Willow-Greer
 - Loblolly Pine-Southern Magnolia-Cypress-1
 - Mesquite-Little Bluestem-Sideoats Grama-1
 - Oneseed Juniper-Pinchots Juniper-3
 - Open Water
 - Post Oak-Blackjack Oak-Big Bluestem-1
 - Sand Bluestem-Prairie Sandreed-2
 - Sand Sagebrush-Shinnery-4
 - Sandpaper Oak-Pinchots Juniper-1
 - Sparsely Vegetated
 - Sugar Maple-Beech-Basswood-5
 - Western Wheatgrass-Needle Spikerush-2



pivot_table.xlsx - Microsoft Excel

PivotTable Tools

Home Insert Page Layout Formulas Data Review View Acrobat Options Design

Clipboard Font Alignment Number Styles Cells Editing

A10 104

	A	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1																						
2			Vegetation types per soil map units by % of total MU acreage																			
3	Sum of ACRES																					
4	Row Labels		Appalachian (Hemlock-Northern Hardwood Forest	Barren-Rock/Sand/Clay	Pine Oak Forest	Central Appalachian Dry Oak-Pine Woodland	Central Appalachian Floodplain Systems	Central Interior and Appalachian Riparian Systems	Central Interior and Appalachian Swamp Systems	Gulf and Atlantic Coastal Plain Swamp Systems	Gulf and Atlantic Coastal Tidal Marsh Systems	Laurentian Acadian Floodplain Systems	Laurentian Acadian Northern Hardwoods Forest	Laurentian Acadian Northern Pine-Oak Forest	Laurentian Acadian Hemlock-Herbaceous Wetland Systems	Laurentian Acadian Shrub-Herbaceous Wetland Systems	Laurentian Acadian Swamp Systems	North-Central Interior Wetlands	Northeastern Interior Dry-Mesic Oak Forest	Northern Atlantic Coastal Plain Dune and Swale	Northern Atlantic Coastal Plain Hardwood Open Water	
92	84D		15	0	76	3	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0
93	85B		8	0	86	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
94	85C		13	0	80	4	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0
95	86C		13	0	79	3	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0	0
96	86D		20	0	71	3	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0	0
97	87B		55	0	28	4	2	0	4	0	0	0	1	0	0	0	0	0	1	2	0	2
98	87C		59	0	26	7	2	0	3	0	0	0	0	0	0	0	0	0	1	1	0	0
99	87D		59	0	26	7	3	0	2	0	0	0	0	0	0	0	0	0	1	2	0	0
100	88B		41	0	45	5	1	0	3	0	0	0	0	0	0	0	0	0	1	3	0	0
101	88C		46	0	39	8	1	0	2	0	0	0	0	0	0	0	0	0	1	3	0	0
102	89C		39	0	44	5	0	0	2	0	0	0	0	0	0	0	0	0	0	9	0	0
103	89D		47	0	32	11	1	0	1	0	0	0	0	0	0	0	0	0	1	7	0	0
104	9		6	0	9	0	2	0	33	0	0	0	1	0	0	1	0	46	2	0	0	
105	W		3	0	2	0	4	0	15	0	0	0	0	0	0	2	0	1	0	0	0	
106	Grand Total		15	0	59	4	3	0	12	0	0	0	0	0	0	1	0	2	1	0	1	
107	column max		67	3	100	51	75	0	70	3	0	0	2	0	0	13	0	86	9	0	14	
108	column min		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
109	column mean		17	0	54	4	5	0	12	0	0	0	0	0	0	0	0	4	1	0	1	
110	column SD		13	0	25	6	10	0	12	0	0	0	0	0	0	1	0	13	2	0	2	

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Normal Page Layout Page Break Preview Custom Views Full Screen

Workbook Views

Ruler Formula Bar

Gridlines Headings

Message Bar

Show/Hide

Zoom 100% Zoom to Selection

New Window Arrange All Freeze Panes Unhide

Split Hide

View Side by Side Synchronous Scrolling Reset Window Position

Save Switch Workspace Windows

Macros

	A	B	C	D	E	F	G	H	I	J
37	Sum of ACRES	Column Labels								
38	Row Labels	Barren-Rock/Sand/Clay	Central Interior and Appalachian Floodplain Systems	Central Interior and Appalachian Shrub-Herbaceous Wetland Systems	Central Interior and Appalachian Swamp Systems	Central Tallgrass Prairie	Great Lakes Coastal Marsh Systems	North-Central Interior Beech-Maple Forest	North-Central Interior Dry Oak Forest and Woodland	North-Central Interior Dry-Mesic Forest and Woodland
39	Group 1	0.38%	11.15%	17.98%	14.82%	0.67%	25.46%	1.79%	1.45%	2.00%
40	Group 2	0.00%	7.19%	12.37%	3.35%	1.40%	5.57%	2.56%	0.18%	0.00%
41	Group 3	0.00%	4.31%	3.99%	0.06%	0.08%	0.00%	0.03%	0.12%	0.00%
42	Group 4	0.00%	3.00%	7.89%	0.00%	0.11%	0.00%	0.32%	0.19%	0.00%
43	Group 5	7.93%	18.75%	13.71%	17.34%	12.21%	11.15%	0.02%	5.18%	2.00%
44	Group 6	0.36%	0.15%	0.00%	0.00%	1.24%	0.00%	0.00%	0.02%	0.00%
45	Group 7	0.26%	0.01%	0.00%	0.00%	0.72%	0.00%	0.00%	0.03%	0.00%
46	Group 8	1.68%	6.77%	1.34%	4.25%	0.97%	1.66%	0.01%	2.64%	0.00%
47	Group 9	3.72%	6.56%	0.28%	2.10%	1.54%	2.05%	0.00%	1.86%	0.00%
48	Group 10	3.92%	6.68%	6.96%	15.89%	1.17%	1.78%	0.12%	68.88%	5.90%
49	Group 11	10.93%	10.44%	3.95%	13.30%	29.42%	9.37%	82.19%	0.93%	14.00%
50	Group 12	1.00%	0.31%	0.00%	0.00%	2.22%	0.00%	0.00%	0.06%	17.00%
51	Group 13	3.67%	0.54%	1.34%	10.76%	0.30%	5.36%	3.38%	1.45%	10.00%
52	Group 14	6.95%	1.31%	0.00%	0.73%	13.05%	0.00%	0.02%	0.02%	0.00%
53	Group 15	0.14%	0.05%	0.00%	0.00%	1.40%	0.00%	0.00%	0.04%	0.00%
54	Group 16	0.01%	4.34%	8.13%	0.47%	0.16%	0.15%	1.74%	7.30%	4.30%
55	Group 17	2.55%	2.03%	0.29%	0.63%	0.86%	0.99%	0.01%	1.75%	5.80%
56	Group 18	0.00%	0.09%	0.11%	0.24%	0.02%	0.00%	0.01%	0.14%	0.00%
57	Group 19	0.00%	0.03%	0.00%	0.00%	1.50%	0.00%	0.00%	0.02%	0.00%
58	Group 20	0.00%	2.45%	3.19%	4.61%	0.32%	0.12%	0.01%	0.16%	0.80%
59	Group 21	0.32%	0.05%	0.00%	0.00%	0.34%	0.00%	0.00%	0.02%	2.40%



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Data Products >> LANDFIRE Vegetation Product Descriptions

Vegetation Dynamics Models

LANDFIRE developed state-and-transition models to represent pre-settlement reference conditions for all Ecological Systems in the United States through an expert-based model development process. Each model represents a single ecosystem called a **Biophysical Setting** (BpS) and consists of:

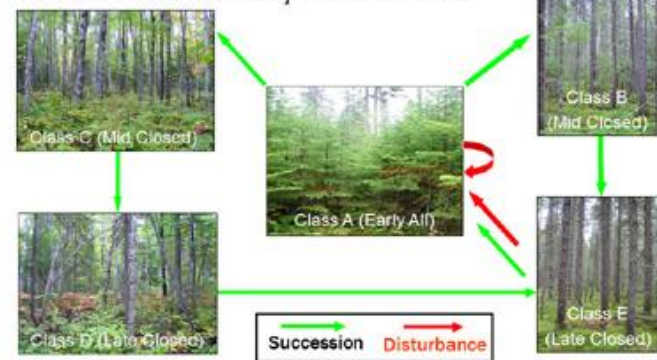
- ◆ a quantitative state-and-transition model
- ◆ a description document published as a pdf

LANDFIRE used the models to estimate reference conditions, which are used to help assess ecosystem health. "[Using the LANDFIRE Biophysical Settings Model Descriptions](#)" examines major elements of the Vegetation Dynamics Models descriptions and their use. The guide book "[Adapting LANDFIRE Vegetation Dynamics Models](#)" helps users adapt LANDFIRE Vegetation Dynamics Models for use in modeling current and future landscapes. Once adapted, these models may be useful in predicting future vegetation conditions, exploring the impacts of potential environmental changes and comparing the results of different management options.

Additional Model Products



VDDT DB: NE Lowland Spruce-Fir Forest



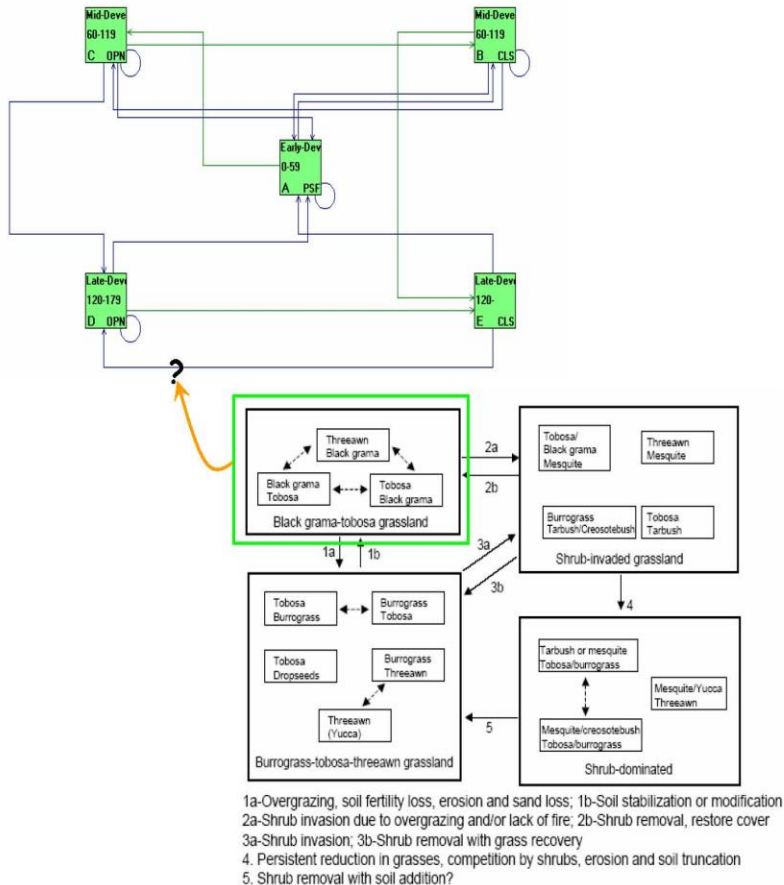
A Review and Comparison of LANDFIRE Biophysical Settings and NRCS Ecological Site Descriptions and their Potential for Shared Application

A Review and Comparison of LANDFIRE Biophysical Settings and NRCS Ecological Site Descriptions and their Potential for Shared Application

Final Report

Steven Yanoff¹, M. Reese Lolley², Joanna Bate³, Patrick McCarthy¹, Anne Bradley¹
The Nature Conservancy

June 30, 2007



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1. Summary
2. Terminology
3. Scope of Work and Tasks Performed
4. Crosswalk Approach
5. Key Findings
6. Recommendations
7. Acknowledgements
8. Further Information

Figure 1. Generalized ecological site description-biophysical setting group crosswalk structure

Appendices

1. Schematic of Crosswalk Approach
2. Selected Crosswalks
3. Source Information for Crosswalks

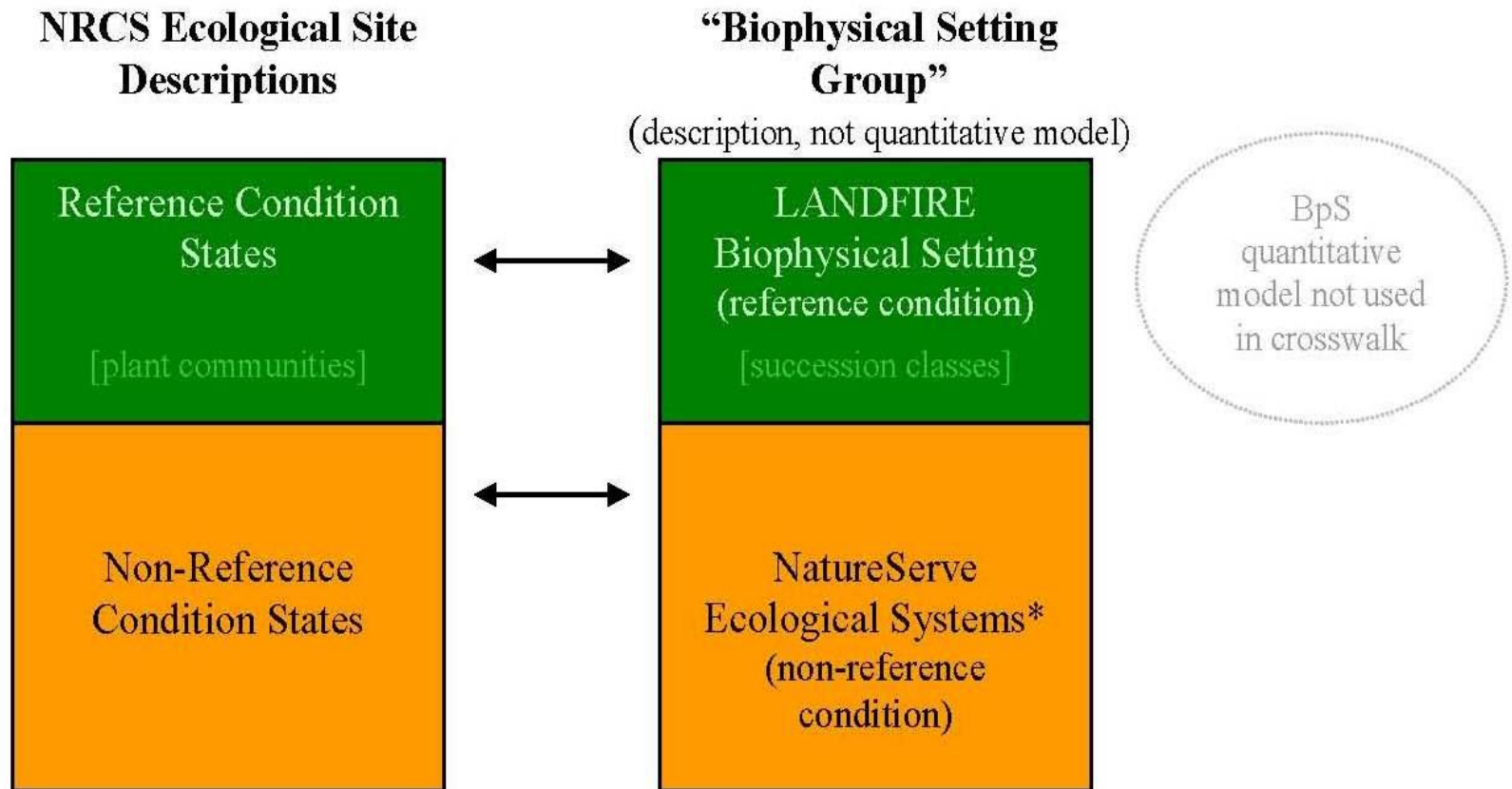
A PowerPoint presentation accompanies this report.

Top – LANDFIRE Biophysical Setting quantitative model of expected succession classes under reference conditions (simulated)
Bottom – NRCS Ecological Site Description (ESD) descriptive model of expected “States” under reference conditions & departure
Green box & Arrow – possible crosswalk between reference condition elements, see text

Content & interpretations are those of the authors and not necessarily other project participants, agencies, organizations, LANDFIRE or The Nature Conservancy. LANDFIRE biophysical settings used in crosswalks were drafts as of this report’s publication & are subject to change.

Figure 1. Generalized Ecological Site Description-Biophysical Setting Group Crosswalk Structure

Multiple ecological site descriptions (ESDs) and their states typically crosswalked to one biophysical setting group. Reference condition ESD states crosswalked to one biophysical setting, and non-reference condition states to one non-reference condition ecological system, within a biophysical setting group. The plant communities within reference condition states do not necessarily correspond directly to the succession classes within a BpS. See Key Finding 2 & appendices for details.



*NatureServe ecological systems reflect reference or non-reference conditions, or both, depending on the particular system, where it occurs and our interpretation.

What is NatureServe?

- Nonprofit conservation organization whose mission is to provide the scientific basis for effective conservation action.
- The leading source for information about rare and endangered species and threatened ecosystems.
- Represents an international network of independent member programs operating throughout most of the Western Hemisphere.
- Collect and manage detailed local information on plants, animals, and their habitats, and also develop information products, data management tools, and conservation services to help meet local, national, and global conservation needs.

<http://www.natureserve.org/>

What does NatureServe Do?

- Provide information products and conservation services to guide natural resource decision-making;
- Develop comprehensive databases on at-risk species and ecological communities;
- Establish scientific standards for biological inventory and biodiversity data management, and design advanced biodiversity data management systems;
- Support the work of member programs to identify, understand, and protect critical natural areas and special places;
- Make biodiversity information readily available through our websites, publications, and custom services



An Online Encyclopedia of Life



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Welcome to **NatureServe Explorer**, an authoritative source for information on more than 70,000 plants, animals, and ecosystems of the United States and Canada. Explorer includes particularly in-depth coverage for rare and endangered species.



Highlights

July 2012 Data Refresh!

NatureServe Explorer species and ecological community data updated July 2012.

Freshwater Mussel Distribution Maps Available!

Explorer's distribution data now include detailed watershed range maps of all native U.S. and Canadian species of freshwater mussel.

Updated Fish Distribution Maps!

With help from the USGS, NatureServe has updated the distribution maps for



Species Quick Search

or search [Species](#) and/or [Ecological Communities & Systems](#) by Name, Taxonomy, Location, or Conservation Status.

NatureServe Explorer is a product of [NatureServe](#) and its natural heritage member programs.

Use the database to easily find:

- scientific and common names
- conservation status
- distribution maps
- images for thousands of species
- life histories, conservation needs, and more



Search Results: 1 - 20 of 253 records matching [your criteria](#).
[Systems: 45](#) | [Associations: 208](#) | [Alliances: 0](#)

Show Details: Yes No

<< [Prev](#) | [Next](#) >>

[Deselect All](#)

[Select All](#)

[Show Selected Only](#)

[Download Systems PDF](#)



[New Search](#)

[Change Criteria](#)

Ecological Systems Records = Selected for report browsing.

Browse <input checked="" type="checkbox"/> (Unique ID) (ESP Code)	Scientific Name	Distribution: United States & Canada	 Image Available
Forest and Woodland			
<input checked="" type="checkbox"/> CES202.692 1383	Central Interior Highlands Dry Acidic Glade and Barrens	USA: AR, IL, IN, KY, MO, OK, TN?	
<input checked="" type="checkbox"/> CES205.682 1308	Crosstimbers Oak Forest and Woodland	USA: AR, KS, OK, TX	
<input checked="" type="checkbox"/> CES205.679 1519	East-Central Texas Plains Post Oak Savanna and Woodland	USA: OK, TX	
<input checked="" type="checkbox"/> CES303.680 1383	Edwards Plateau Limestone Savanna and Woodland	USA: OK, TX	
<input checked="" type="checkbox"/> CES202.454	Interior Highlands Unglaciaded Flatwoods	USA: AR, MO, OK?	
<input checked="" type="checkbox"/> CES202.308 1312	Ouachita Montane Oak Forest	USA: AR, OK	

A Animal Species Reported for this Ecological System

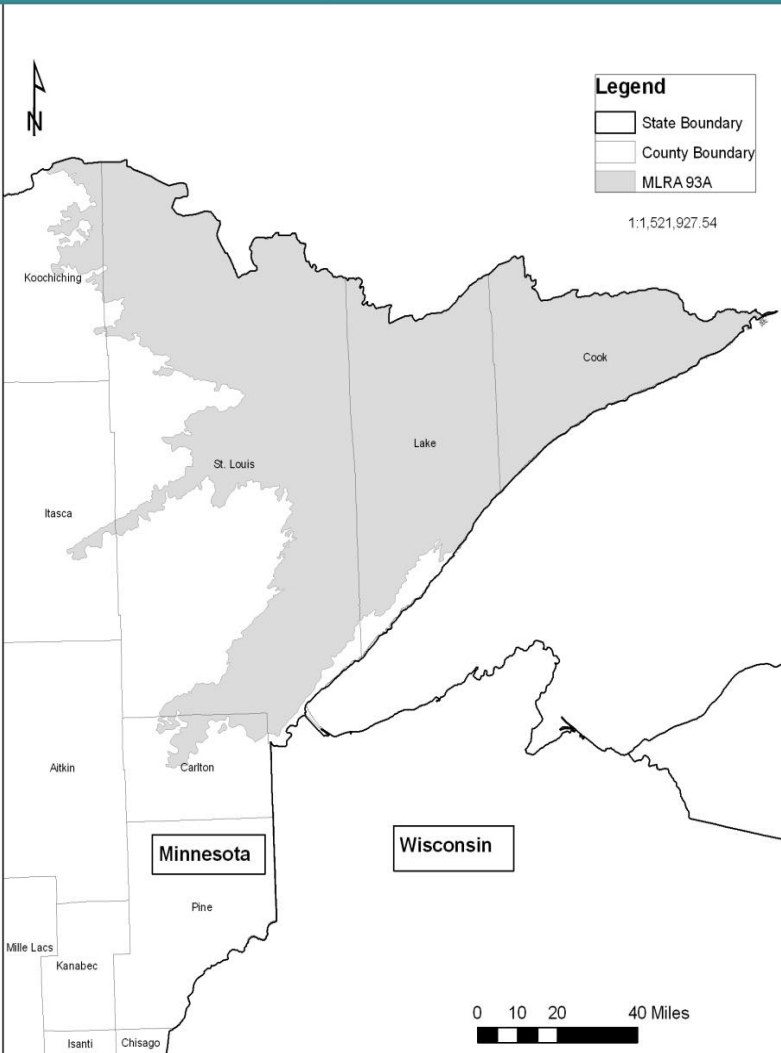
S	Scientific Name (Common Name)	Global Status	U.S. Endangered Species Act Status	Character- istic	Exotic
B	<i>Aspidoscelis sexlineata</i> (Six-lined Racerunner)	G5		✓	
C	<i>Catocala delilah</i> (Delilah Underwing)	G3G4		✓	
C	<i>Catocala herodias herodias</i> (Herodias Underwing)	G3T3		✓	
V	<i>Catocala jair</i> (Jair Underwing)	G4?		✓	
S	<i>Catocala messalina</i> (Messalina Underwing)	G4?		✓	
S	<i>Coluber constrictor</i> (Racer)	G5		✓	
C	<i>Plestiodon septentrionalis</i> (Prairie Skink)	G5		✓	
Q	<i>Sceloporus olivaceus</i> (Texas Spiny Lizard)	G5		✓	
Q	<i>Sceloporus undulatus</i> (Fence/prairie/plateau Lizard)	G5		✓	
Q	<i>Storeria dekayi</i> (Brownsnake)	G5		✓	
B	<i>Brazoria truncata</i> var. <i>pulcherrima</i>	G5	Herb (field)	✓	
S	<i>Nassella leucotricha</i>	G5	Graminoid Herb (field)	✓	
S	<i>Sporobolus cryptandrus</i>	G5	Graminoid Herb (field)	✓	

Example: A NatureServe- NRCS Partnership...

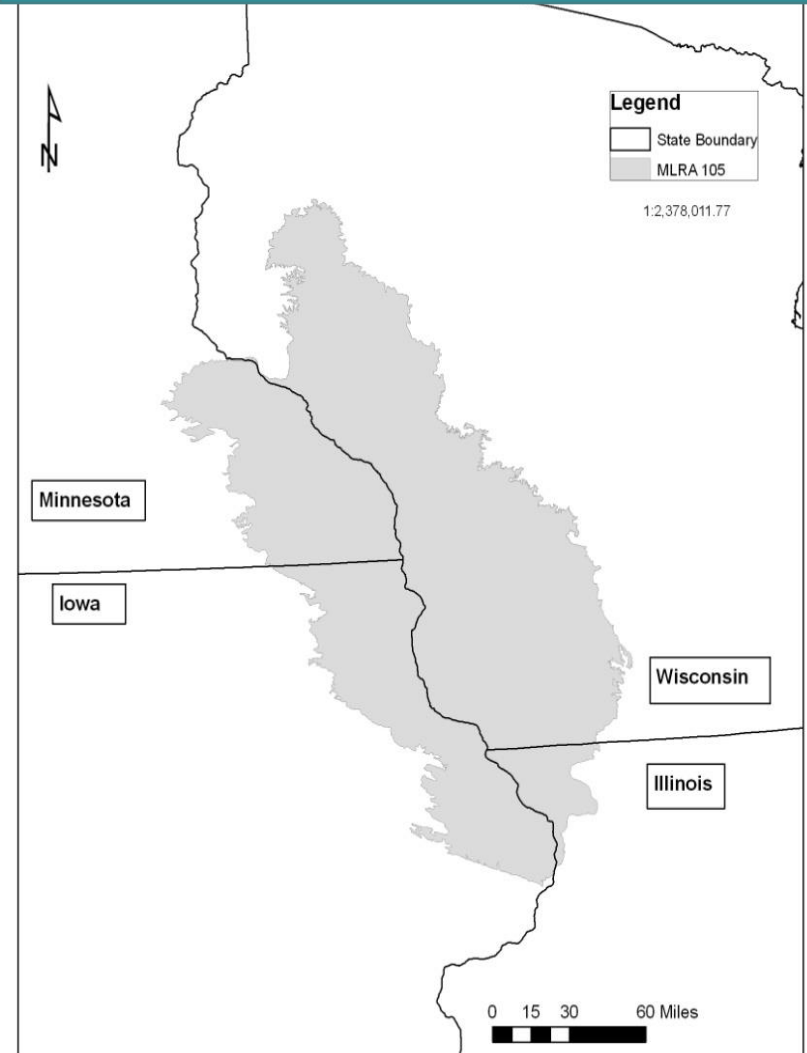
How one Conservation Innovation Grant is shaping Ecological Site Development in the Upper Midwest

Project Areas

MLRA 93A



MLRA 105



Project Objectives:

1. **Contribute to the development of ESDs by linking NatureServe data, technology, and expertise with ESD development.**
 - enhance the regional significance and context appropriateness of ESDs
 - easier to compare ESDs within or across MLRA boundaries based on their links to Ecological Systems units.
 - Links to Associations will provide information on floristic composition, community dynamics, and environmental characteristics that could help inform ESDs.

2. **Expand the NatureServe Wildlife Habitat Characterization database to all of the project area.**
 - After the ESDs and USNVC are linked, NatureServe would develop an innovative enhancement to the Wildlife Interpretation section of ESDs. NatureServe has developed a “Habitat Characterization” database to monitor the relationship of species to habitats.
 - include a generalized process for applying a habitat-based approach to addressing at-risk biodiversity, enhancing the ability to apply standards efficiently for conserving at-risk biodiversity.

3. **Assist NRCS in presenting wildlife-habitat data to producers through NatureServe’s wildlife , EO, and SWAP databases.**
 - These data can help producers both identify possible habitat and species of concern on their lands and identify possible ways that conservation management would enhance this habitat.

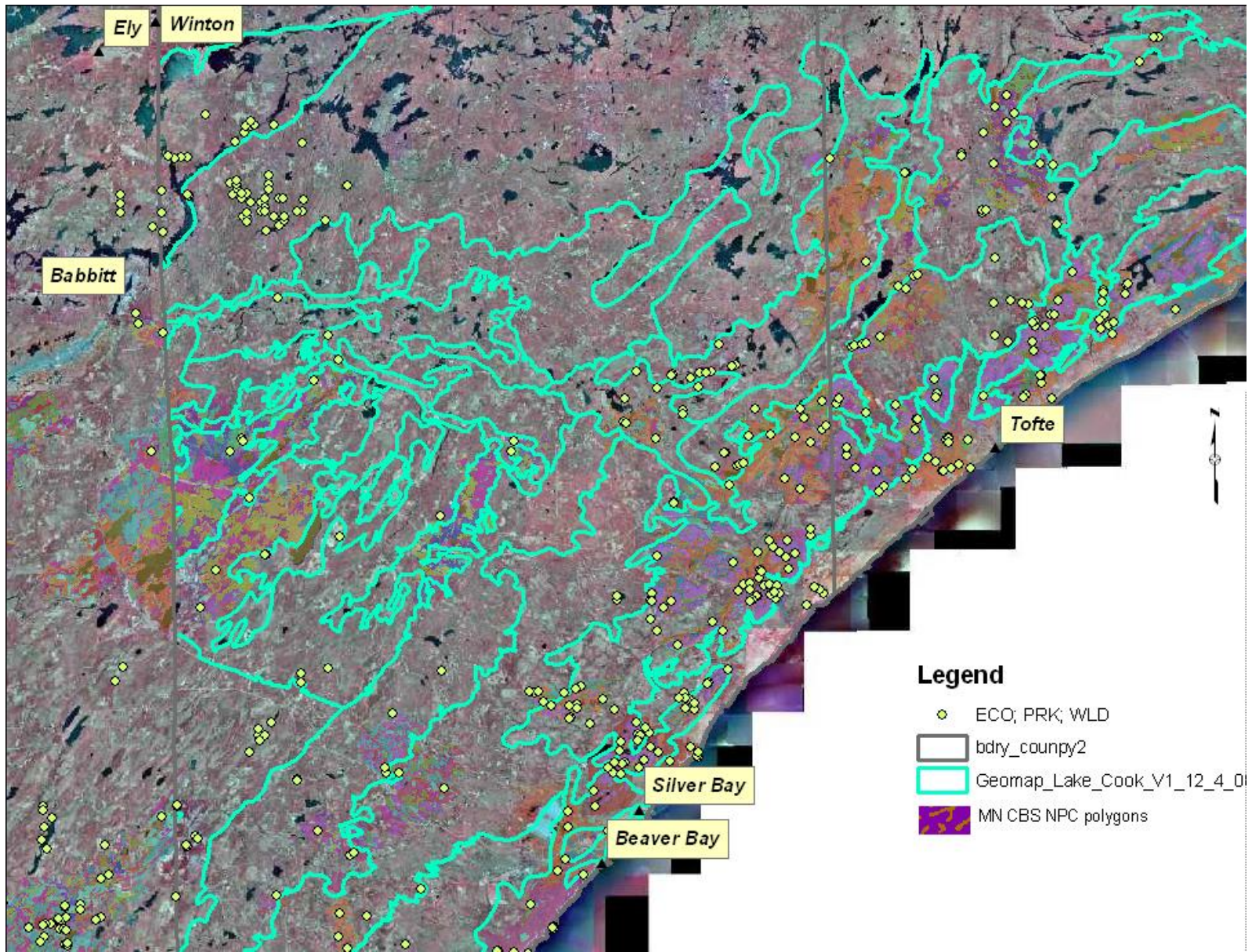
Summary:

- LANDFIRE BpSs/NatureServe's Systems can help us establish broad categories for reference communities or "ecological site concepts", and visualize where they were located on the landscape;
- Existing Vegetation layers can assist with locating and providing information on alternative states, or can help locate reference conditions for sampling;
- Environmental Site Potential & Vegetation Dynamics Development Tool (VDDT) can help guide State & Transition Model development and biomass/productivity estimates;
- NatureServe's Associations can help define states or phases, especially where heritage data is limited or not digitized.
- Partnerships with LANDFIRE can assist with interpretation of data and modeling of disturbances across states;
- Partnerships with NatureServe can assist with beginning stages of ES concept development, provide regional assessments and crosswalking, and a wealth of wildlife, habitat, and ecosystem data that has been regionalized across political boundaries.

The Lucky Ones

When you're lucky enough to have heritage data...

Integrating MN CBS Vegetation Data with Soils Groups



Aspen Parklands ECS and Soil Survey Relationship : Report

GEOMORPHIC REGION	CLASSCODE	TYPECODE	MUSYM	MUNAME
Alluvium				
	FDw24			
		FDw24b	1006	Fluvaquents-Haploborolls complex
	FDw44			
		FDw44b	116F	Fluvaquents, flooded-Hapludolls complex, 0 to 30 percent slopes
	FFn57			
		FFn57a	1006	Fluvaquents-Haploborolls complex
		FFn57a	114B	Fairdale silt loam, 1 to 6 percent slopes, occasionally flooded
	FFn67			
		FFn67a	1002	Borosaprists and Fluvaquents soils, frequently flooded
		FFn67a	116F	Fluvaquents, flooded-Hapludolls complex, 0 to 30 percent slopes
	MHw36			
		MHw36a	1006	Fluvaquents-Haploborolls complex
		MHw36a	116F	Fluvaquents, flooded-Hapludolls complex, 0 to 30 percent slopes
Beach Interbeach Area				
	FDs36			
		FDs36a	258B	Sandberg loamy sand, 1 to 6 percent slopes
		FDs36a	258C	Sandberg loamy sand, 6 to 12 percent slopes
	FDw24			
		FDw24a	258B	Sandberg loamy sand, 1 to 6 percent slopes
		FDw24a	176A	Karlstad loamysand, 0 to 3 percent slopes
		FDw24b	258B	Sandberg loamy sand, 1 to 6 percent slopes
		FDw24b	258B	Sandberg loamy sand, 1 to 6 percent slopes
		FDw24b	258B	Sandberg loamy sand, 1 to 6 percent slopes
		FDw24b	258B	Sandberg loamy sand, 1 to 6 percent slopes
		FDw24b	435	Syrene sandy clay loam
		FDw24b	148A	Radium loamy sand, 0 to 3 percent slopes

Illinois Natural History Survey: Summary Statistics

Dry Mesic Woodland

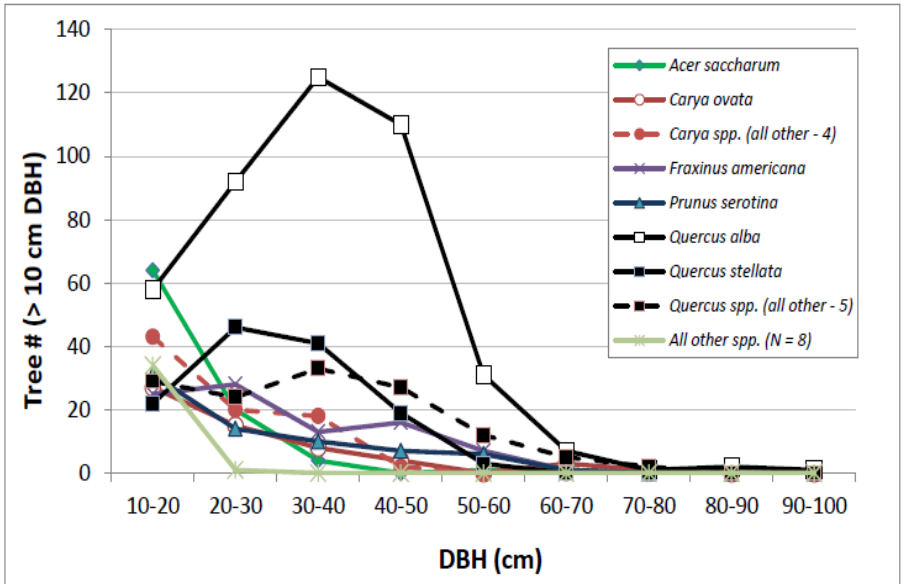
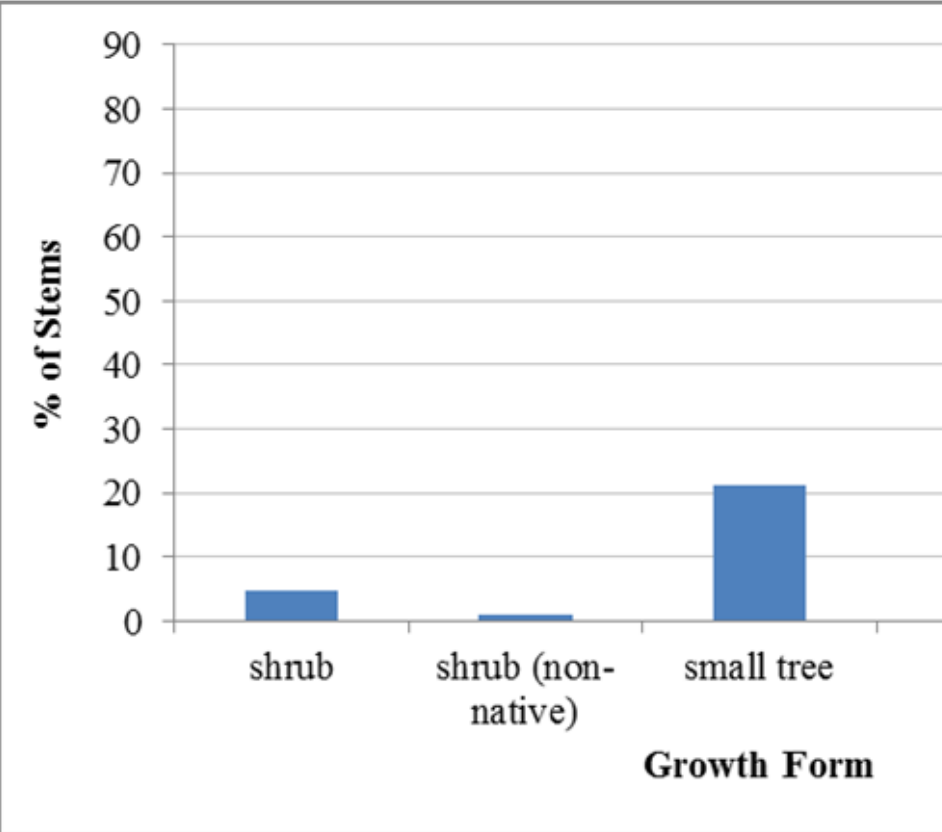


Figure 2. Size-class distribution of overstory trees from eight dry-mesic woodland reference sites sampled in Illinois.

Figure 4. Relative importance of growth forms among woody species recorded in the understory samples (stems < 10 cm DBH) in Group 1 of Dry-Mesic Forest reference sites. Percent (%) of stems is based on proportion of stem density for each growth form group.

Cluster Analysis

What it does

- Classifies units into discrete groups
- Uses a hierarchal, polythetic process
- Several methods of group linkage possible
- Displays final groups as a dendrogram
- Will produce distinctive “chain” if data are truly not linked or if linkage methods are not appropriate

Things to keep in mind

- Groups that combine earlier in the process are more similar to each other than those that get grouped later
- Later groupings are constrained by early groupings
- Interpretation of the dendrogram usually involves applying a “decision rule” to identify “natural” groups
- Important to standardize or relativize data

Illinois Natural History Survey: Cluster Analysis

Dry Mesic Upland Forest

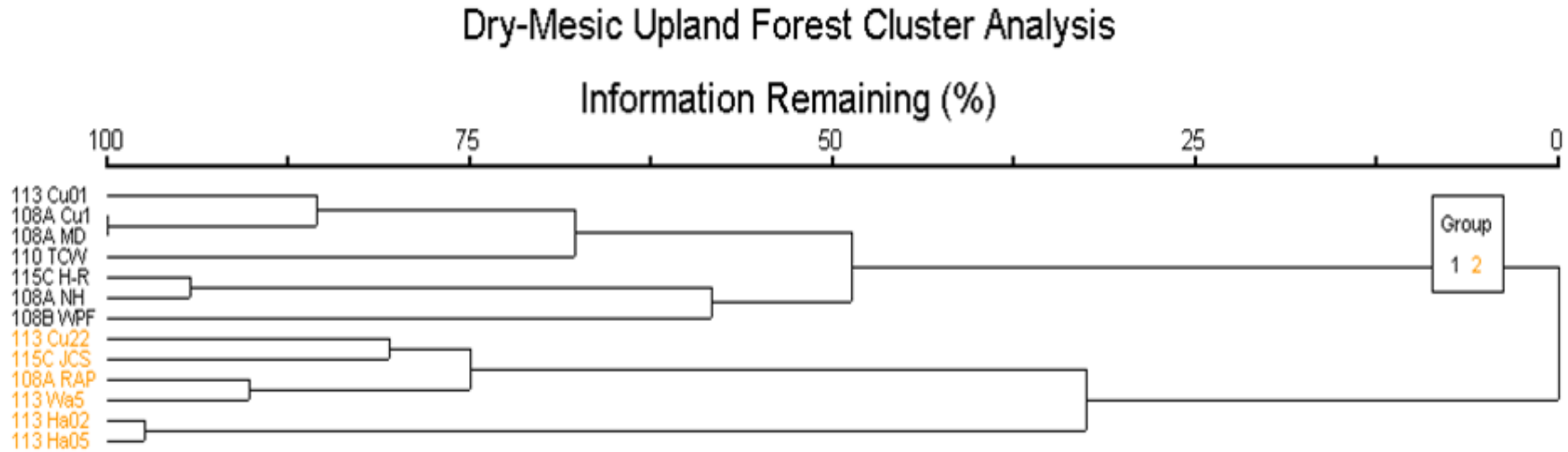


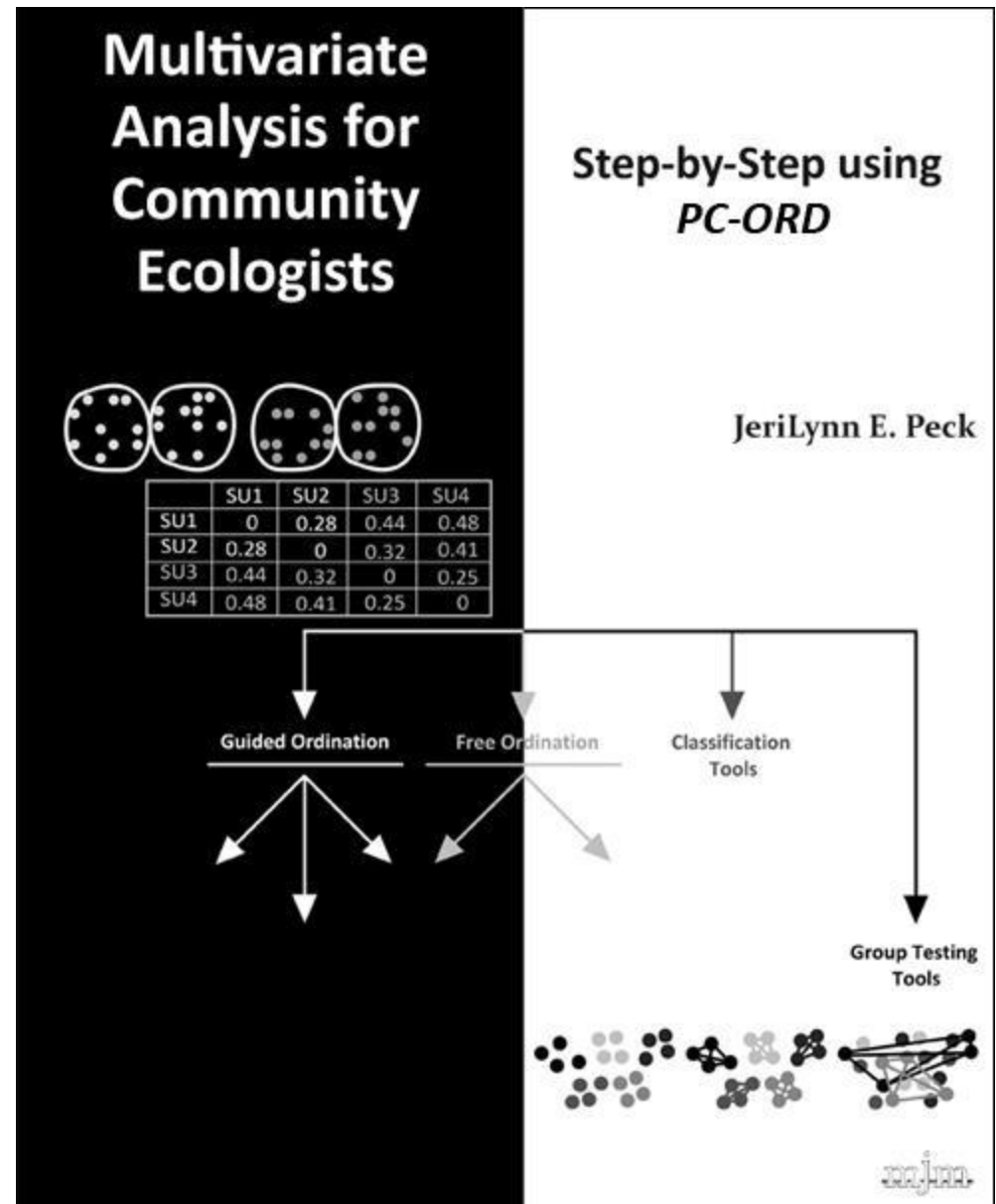
Figure 2. Results from hierarchical cluster analysis indicating two main groupings of sites from Dry-Mesic Upland Forest reference site data using basal area. Site labels include MLRA and site code.

Ordination

- **Multivariate Approach**
- “The displaying of a swarm of data points in a two or three-dimensional coordinate frame so as to make the relationships among the points in many-dimensional space visible on inspection” ([Pielou](#) 1984).
- Arranges data groups along axes on the basis of variables within the group.
- Many approaches to ordination, **must know your data and the constraints of each approach**
- Results cannot really be cross-checked with other analyses, so must use interpretations of stress (NMS) and randomization tests

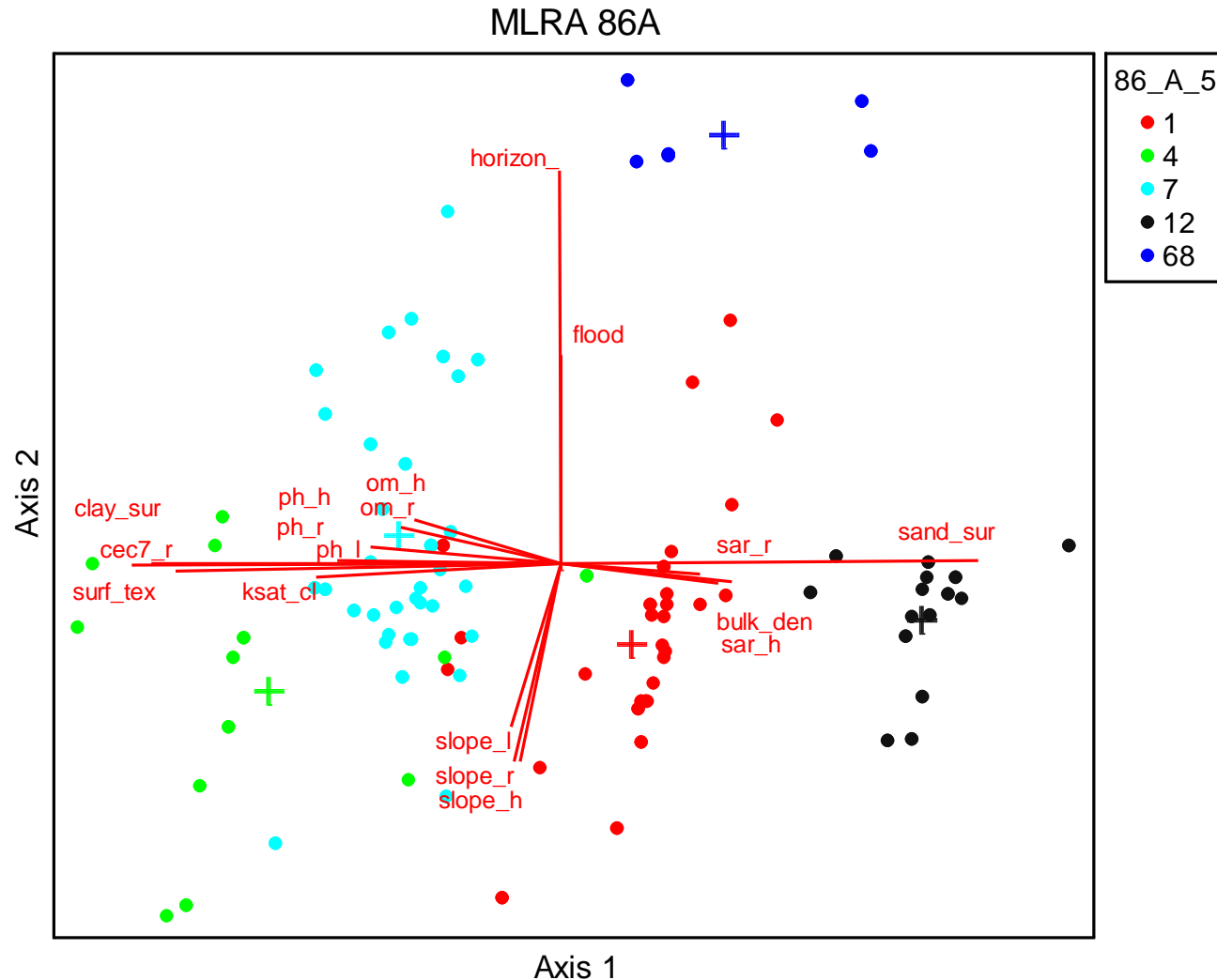
If Attempting
Ordinations,
YOU NEED
THIS BOOK:

... (and
preferably, lots
of training!)



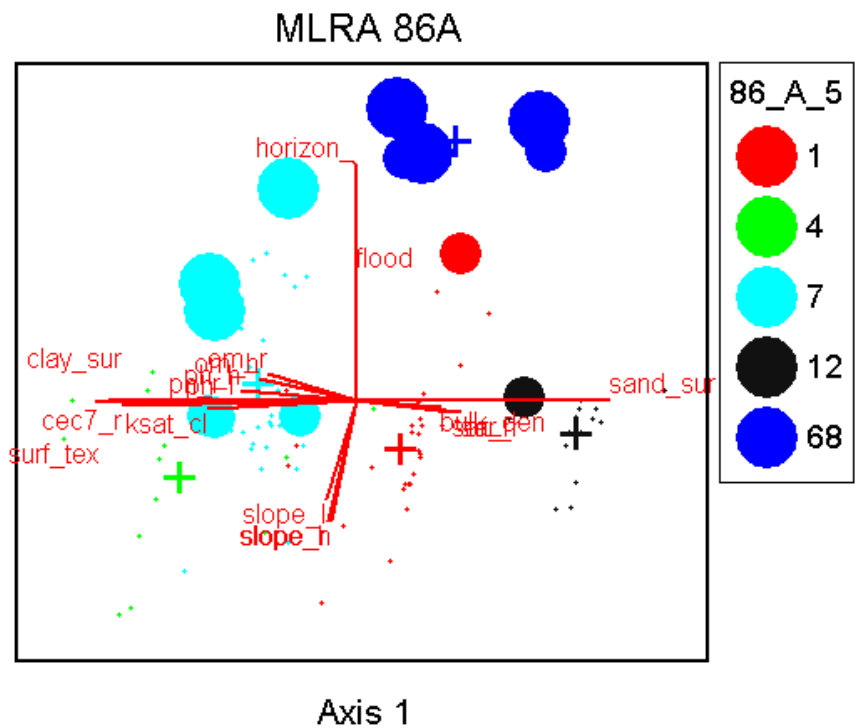
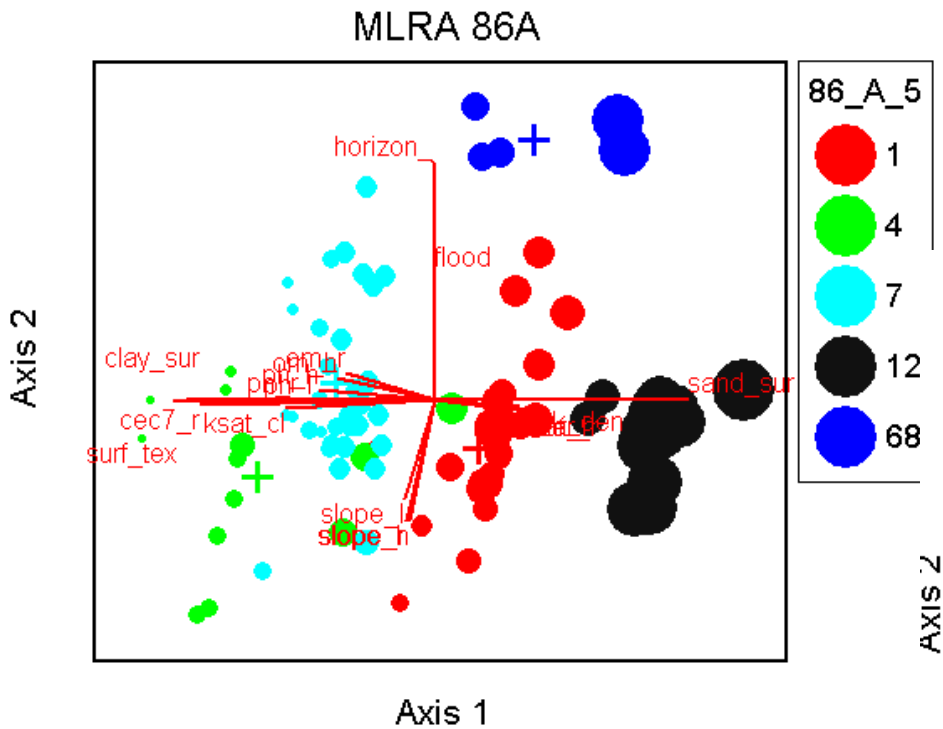
NRI Data: Ordinations

Ken Spaeth, NRCS Rangeland Management Specialist



NRI Data: Ordinations

Ken Spaeth, NRCS Rangeland Management Specialist



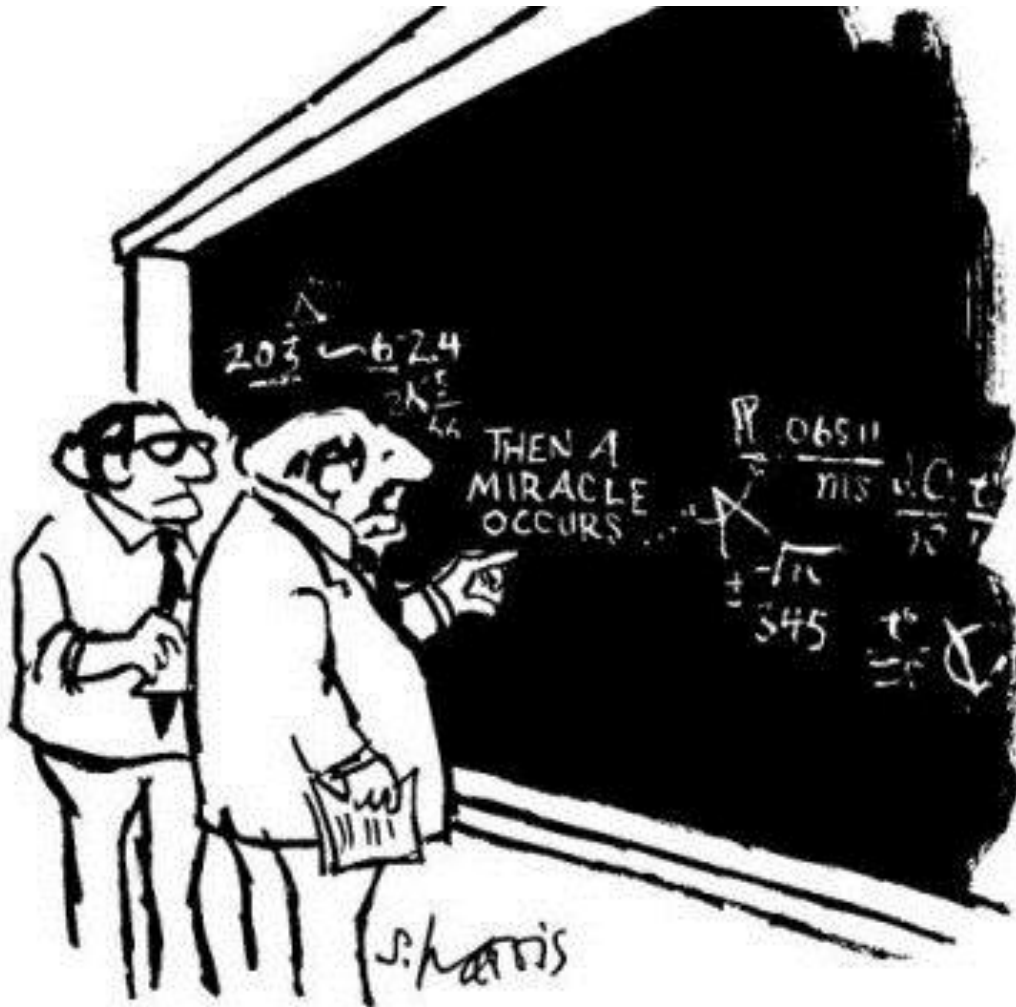
INDICATOR VALUES (% of perfect indication,
 based on combining the above values for relative abundance
 and relative frequency)

10/21/2015

		Group							
		Sequence:	1	2	3	4	5		
		Identifier:	1	4	7	12	68		
		Number of items:	39	17	56	26	12		
Column	Avg Max	MaxGrp							
1	slope_as	20 20	1	20	20	20	20	20	
2	parent_m	20 22	4	19	22	21	21	18	
3	slope_l	16 37	4	20	37	16	7	0	
4	slope_r	20 35	4	26	35	23	14	3	
5	slope_h	20 34	4	26	34	22	14	4	
6	drainage	20 23	12	21	18	21	23	18	
7	hsg	20 25	7	18	24	25	23	10	
8	flood	20 43	68	13	12	18	14	43	←
9	restrict	20 23	1	23	8	23	22	23	
10	ksat_cl	20 25	7	19	22	25	18	17	
11	horizon_	20 50	68	10	11	20	8	50	←
12	bulk_den	20 21	12	19	20	19	21	20	
13	om_l	20 25	7	18	18	25	15	25	←
14	om_r	20 27	7	17	19	27	14	22	
15	om_h	20 28	7	17	19	28	14	22	
16	ph_l	20 23	4	19	23	21	17	20	
17	ph_r	20 22	4	19	22	21	18	20	
18	ph_h	20 21	4	19	21	21	19	21	
19	awc_l	20 22	68	20	20	21	17	22	
20	awc_r	20 21	68	20	20	20	19	21	
21	awc_h	20 21	68	20	19	21	20	21	
22	cec7_r	20 32	7	16	31	32	9	12	
23	surf_tex	20 25	7	20	24	25	13	18	
24	sand_sur	20 36	12	17	11	10	36	25	←
25	clay_sur	20 33	7	18	27	33	8	15	
Averages		20 28		19	21	22	17	20	

Data Analysis Summary:

- Having lots of data can be a blessing, but be careful how you use it!
- Summary Statistics can help identify and illustrate vegetation or soil characteristics of groups.
- Cluster Analysis can illustrate which groups of data are potential separate ecological sites, states, or phases based on unique criteria.
- Ordinations will group data for you and determine which criteria are indicators for each group



"I THINK YOU SHOULD BE MORE EXPLICIT HERE IN STEP TWO."

Questions?

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