



Mapping Options to Identify Spruce Restoration Opportunities

Spruce Restoration Meeting
Dec 4, 2012

Josh Kelly
Public Lands Biologist

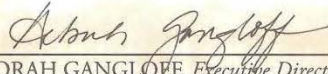


National Register of
Big Trees
proudly recognizes

Jess Riddle and Josh Kelly

of the following National Champion Tree, the largest of its species growing in the United States

Red Spruce	153	146.68	24
<i>Common Name</i>	<i>Circumference</i>	<i>Height</i>	<i>Crown Spread</i>
Picea rubens	305		
<i>Scientific Name</i>	<i>Points</i>		
Swain, North Carolina	May 5, 2008		
<i>Location</i>	<i>Date</i>		


DEBORAH GANGLOFF, Executive Director

SPONSORED BY
DAVEY 
THE DAVEY TREE EXPERT COMPANY



Options for Identifying Spruce Restoration Areas

- Soil Mapping – discussed previously
- Historical Records
- Ecological Modeling

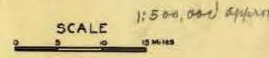
FOREST CONDITIONS WESTERN NORTH CAROLINA

FIELD EXAMINATION BY J.S.HOLMES, W.B.WILEY AND A.W.WILLIAMSON
JULY-NOVEMBER, 1909

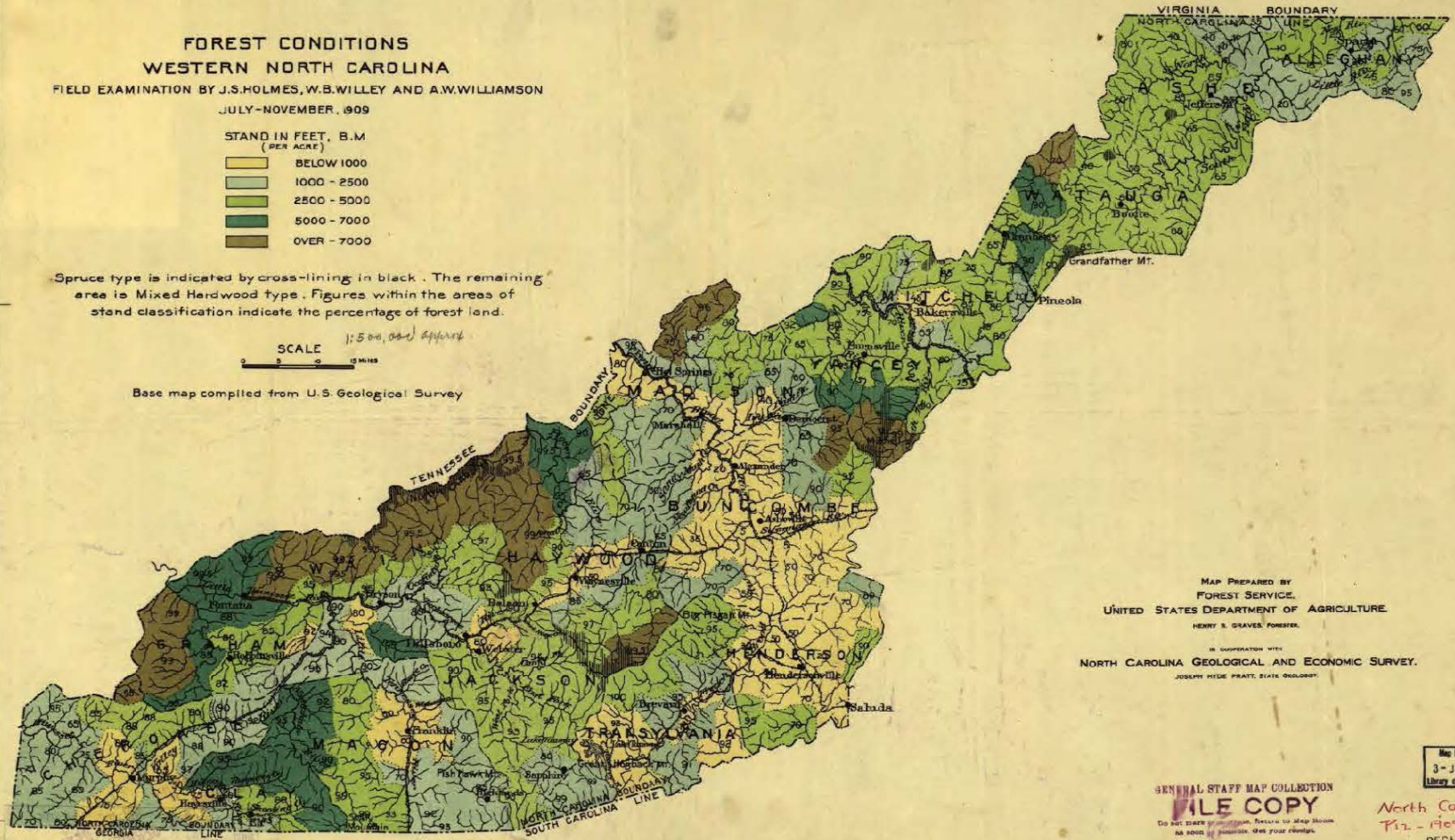
STAND IN FEET, B.M.
(PER ACRE)

BELOW 1000
1000 - 2500
2500 - 5000
5000 - 7000
OVER 7000

Spruce type is indicated by cross-lining in black. The remaining area is Mixed Hardwood type. Figures within the areas of stand classification indicate the percentage of forest land.



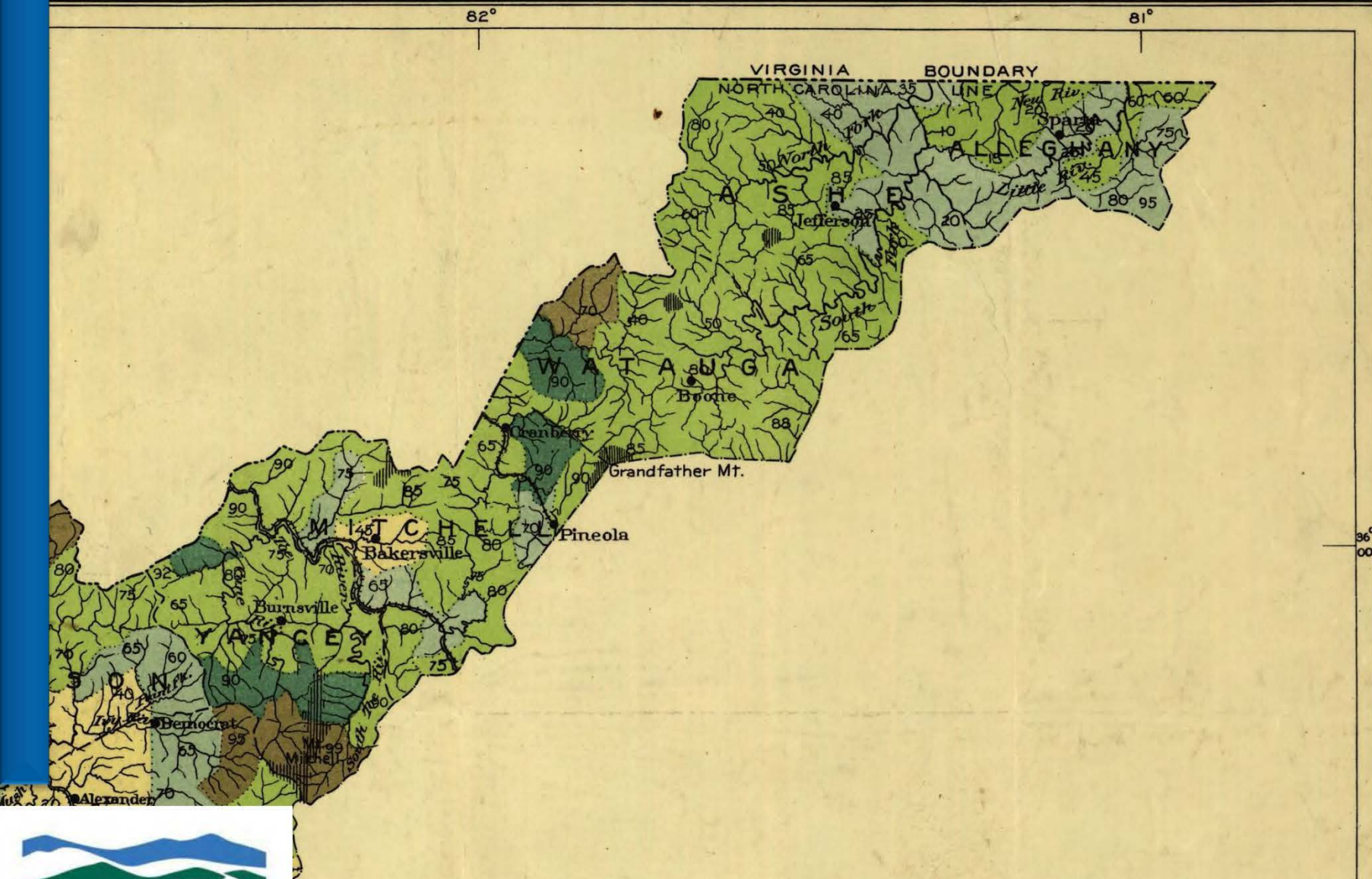
Base map compiled from U.S. Geological Survey



MAP PREPARED BY
FOREST SERVICE,
UNITED STATES DEPARTMENT OF AGRICULTURE
HENRY S. GRAVES, FORESTER.
IN COOPERATION WITH
NORTH CAROLINA GEOLOGICAL AND ECONOMIC SURVEY.
JOSEPH HYDE PRATT, STATE GEOLOGIST.

GENERAL STAFF MAP COLLECTION
FILE COPY
Do not mark or alter. Please to keep record
of work of this collection. Use your change.

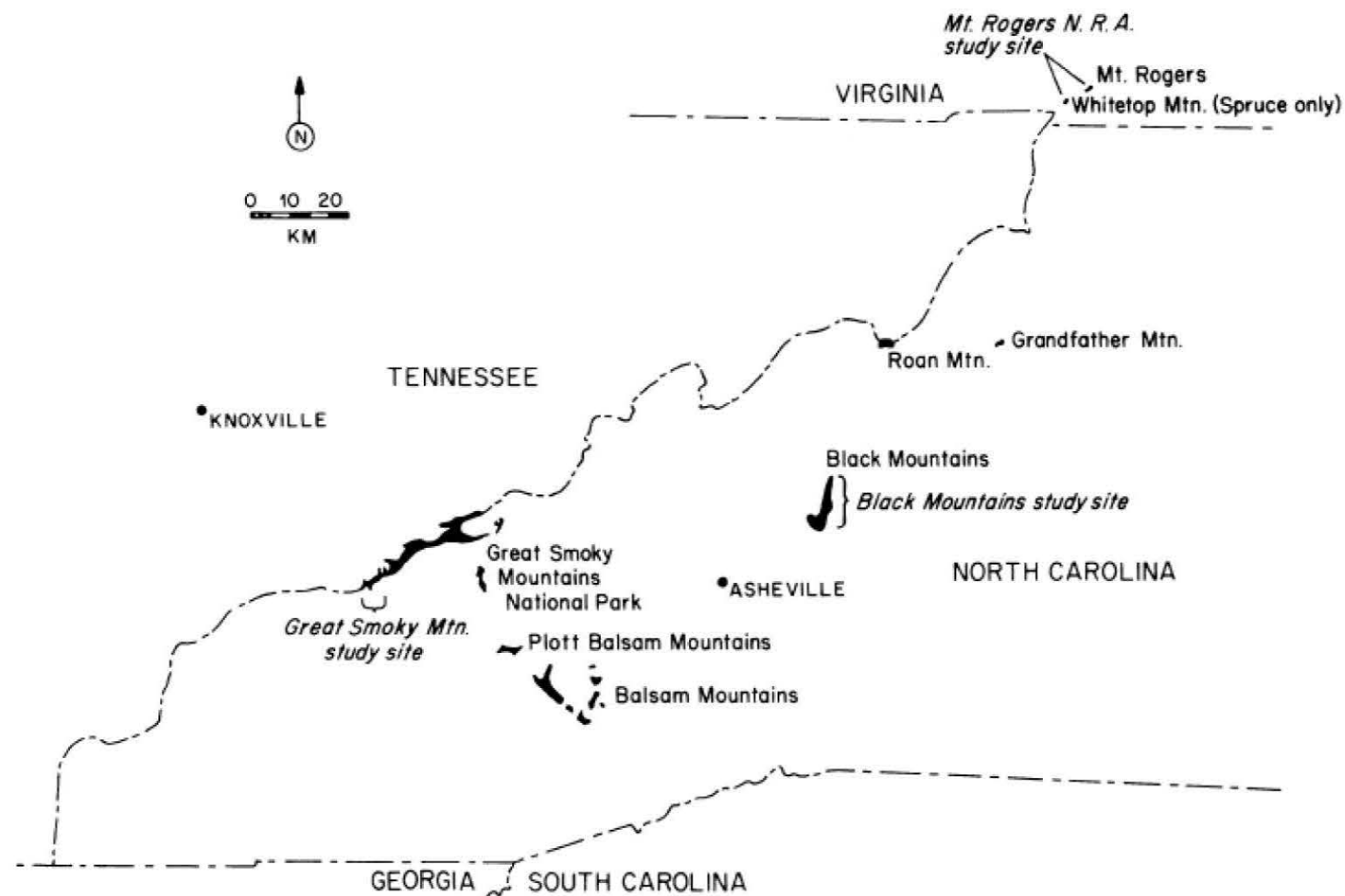
Map Division
3 - JUL 1961
Library of Congress
North Carolina
P12 - 1709 - 300
RECATALOGED



Land Use History of Three Spruce-Fir Forest Sites in Southern Appalachia

by Charlotte Pyle and Michael P. Schafale





(adapted from Research and Management Operating Plan for Southern Appalachian Research/Resource Management Cooperative Spruce-Fir Ecosystem Assessment Program, p. 8)

Figure 1. Major Areas of Spruce-Fir Forest in the Southern Appalachian Mountains

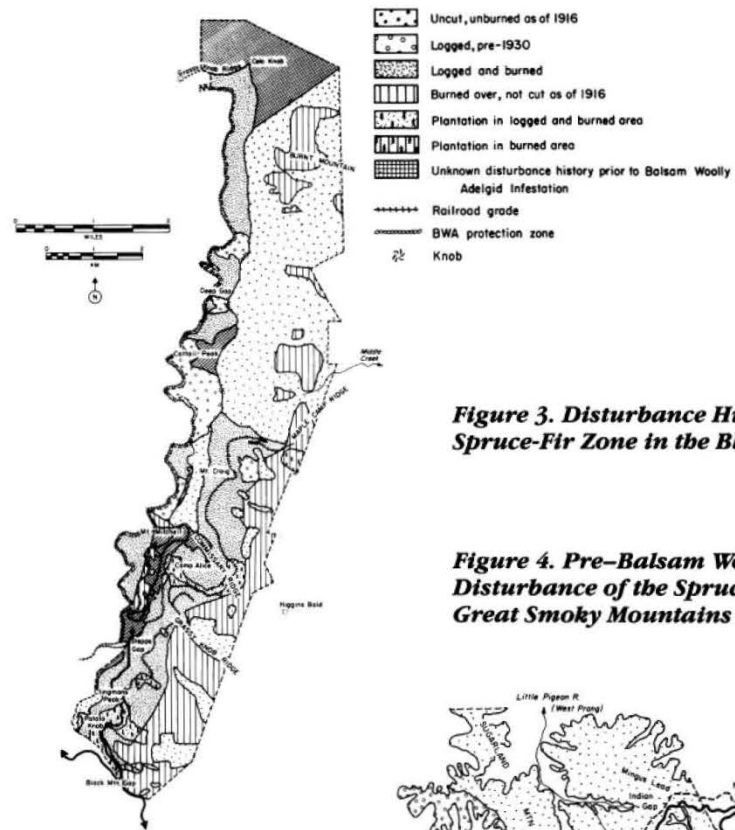
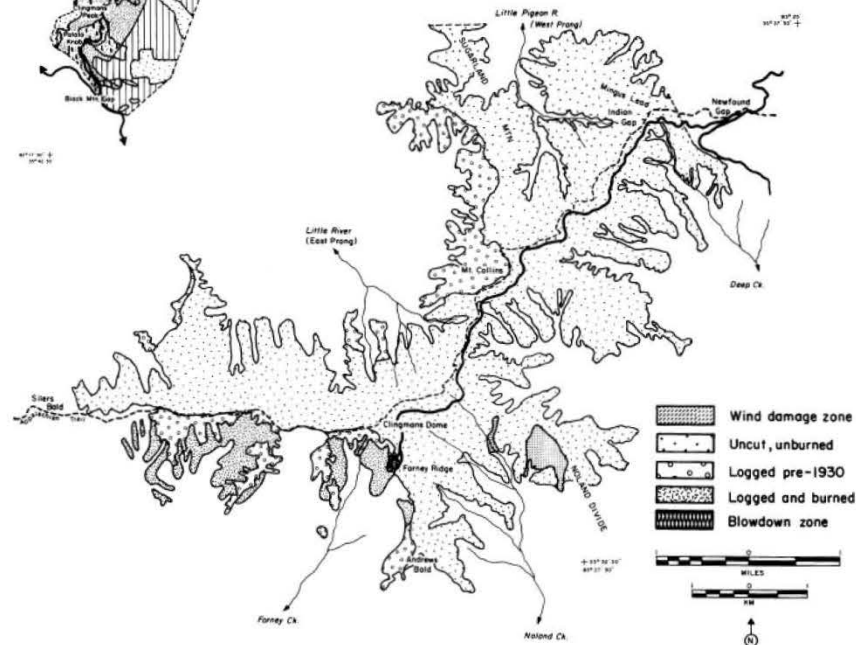


Figure 3. Disturbance History of the Spruce-Fir Zone in the Black Mountains

Figure 4. Pre-Balsam Woolly Adelgid Disturbance of the Spruce-Fir Zone in Great Smoky Mountains National Park



Historical Mapping & Research

- Mapping often coarse scale
- Historical records provide unique information
- A centralized library of historical papers and forest maps is needed
- Large areas of Spruce Forest were lost to logging and burning in the historic period
- Many of these areas are now beloved high elevation grass and shrublands



Ecological Modeling

- Ecological Zone Modeling or “Potential Natural Vegetation Modeling” by Steve Simon covers the entire Southern Appalachians
- Nantahala-Pisgah National Forest
- Northern Cherokee National Forest
- George Washington National Forest
- Jefferson National Forest*

United States
Department of
Agriculture

Forest Service



Southern
Research Station

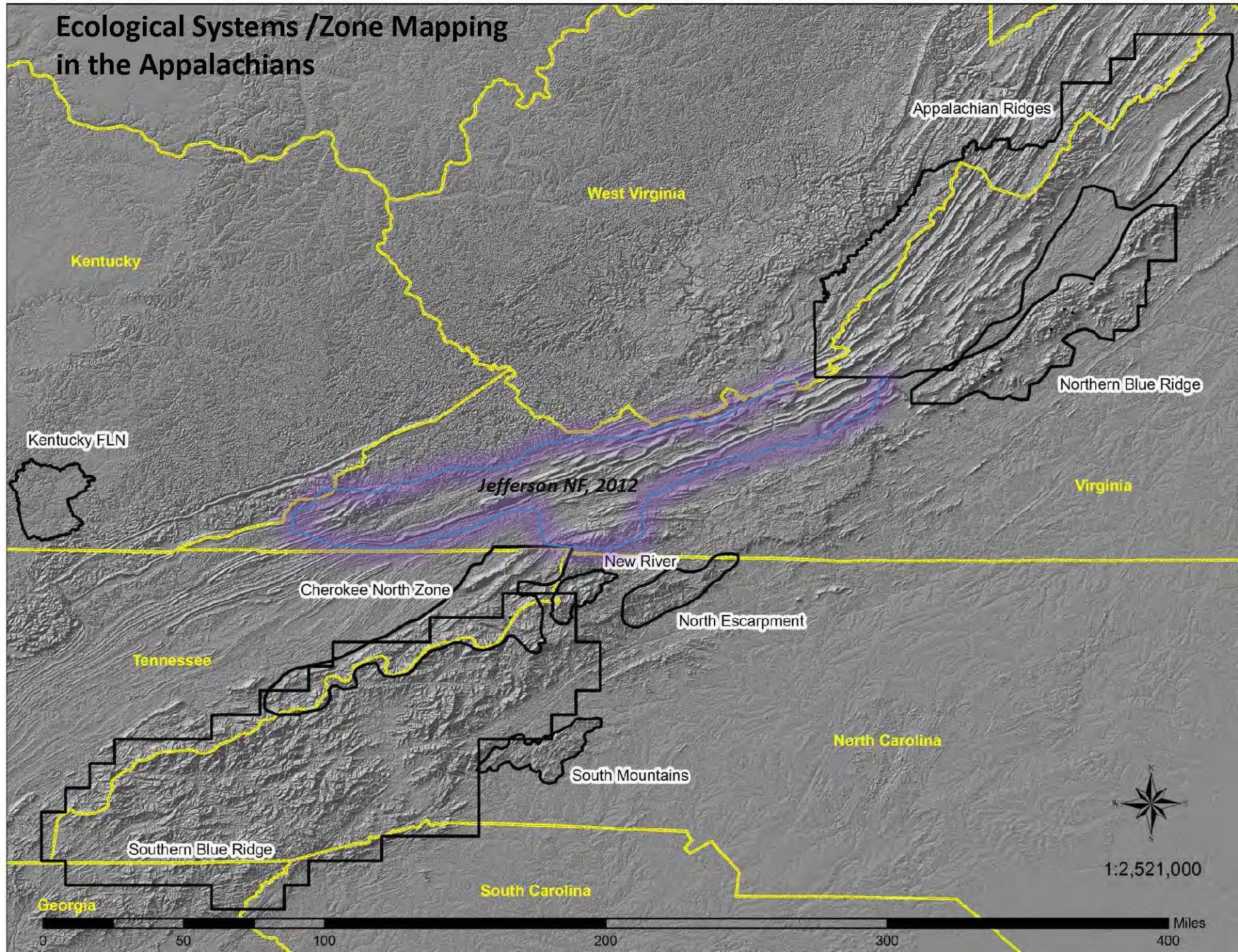
Research Paper
SRS-41

Ecological Zones in the Southern Appalachians: First Approximation

Steve A. Simon, Thomas K. Collins,
Gary L. Kauffman, W. Henry McNab, and
Christopher J. Ulrey



Ecological Systems /Zone Mapping in the Appalachians

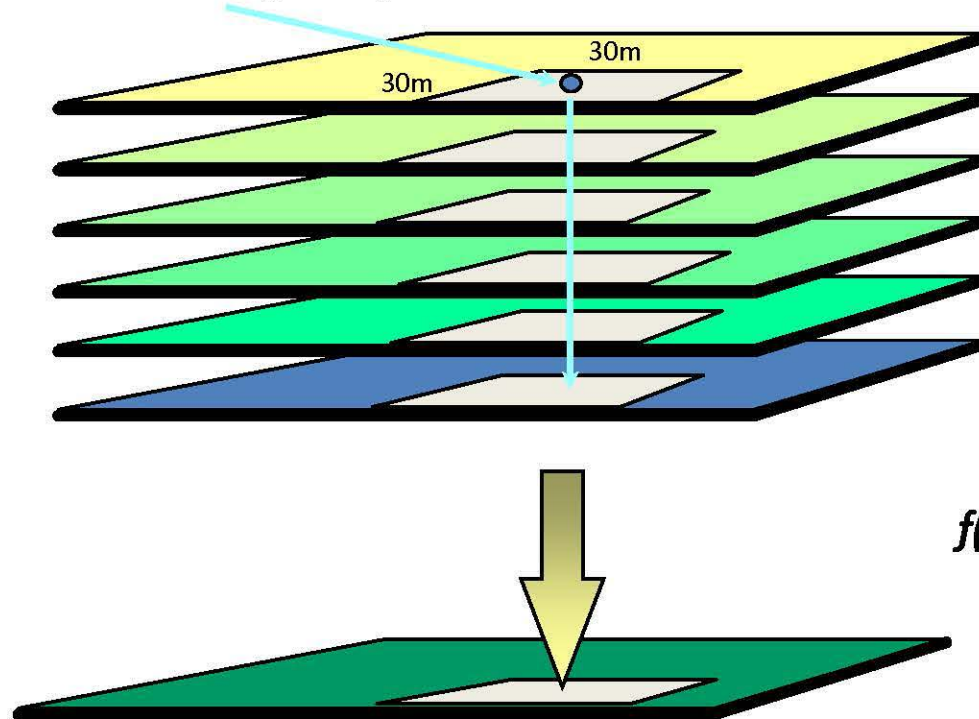




Heath Bald

Ecological Systems / Zone modeling

Known Location (point)



Spatial Data Layers (DTMs)

Elevation

Aspect

Slope

Ave. annual precipitation

Relative slope position

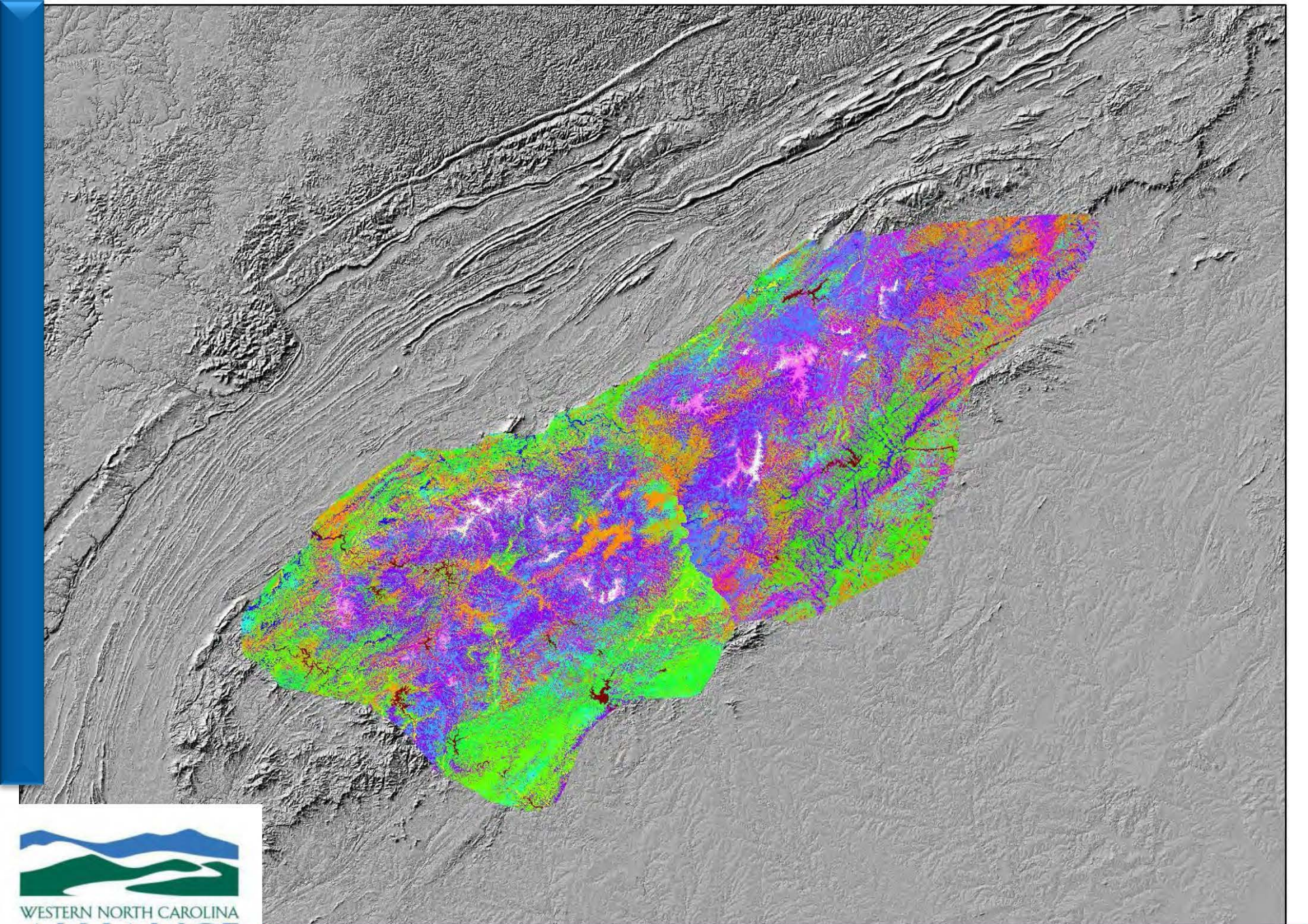
Geology (+ 24 others)

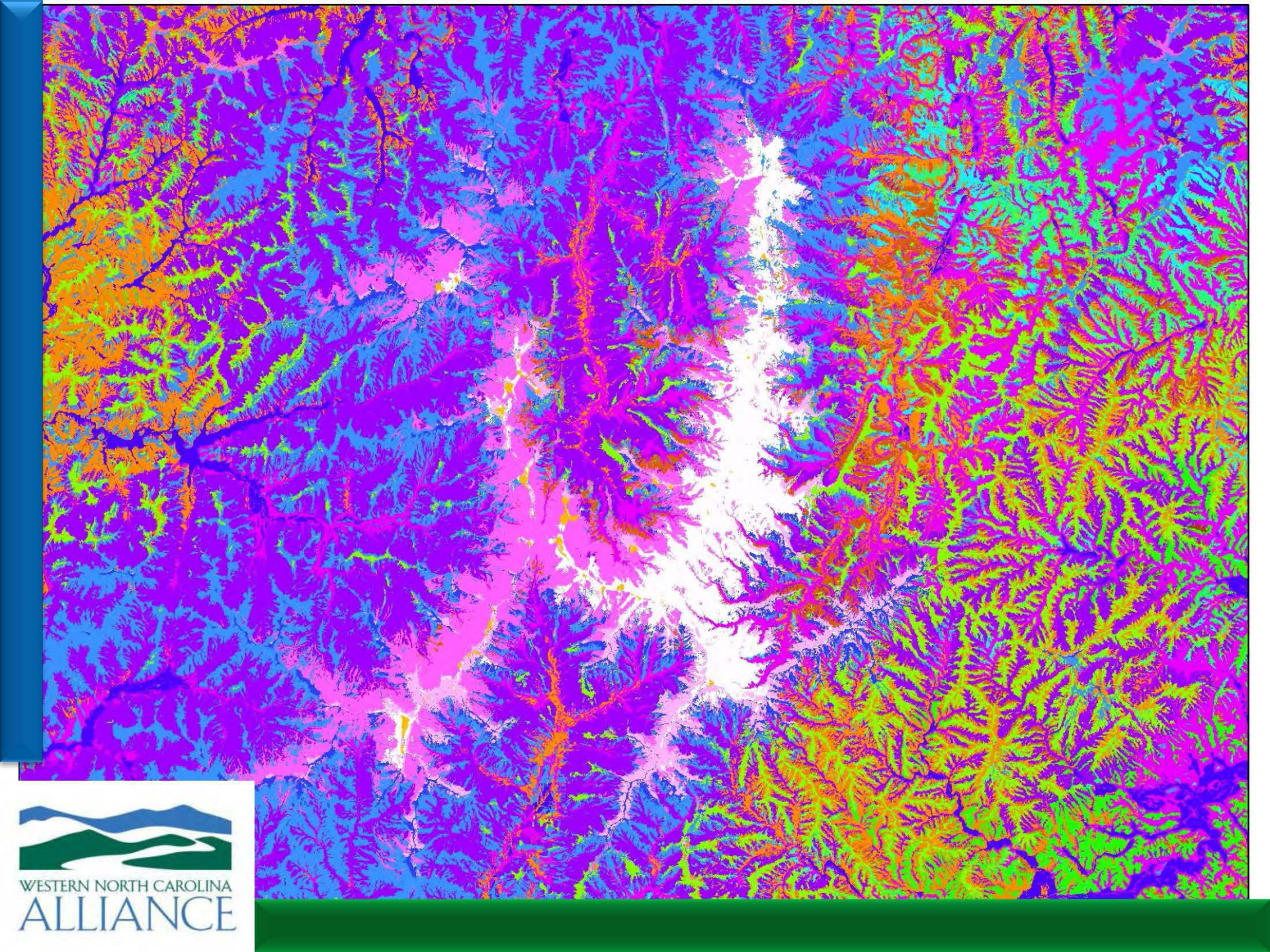
$f(x) \rightarrow$ statistical function*

= Predicted distribution
map from 700+ points

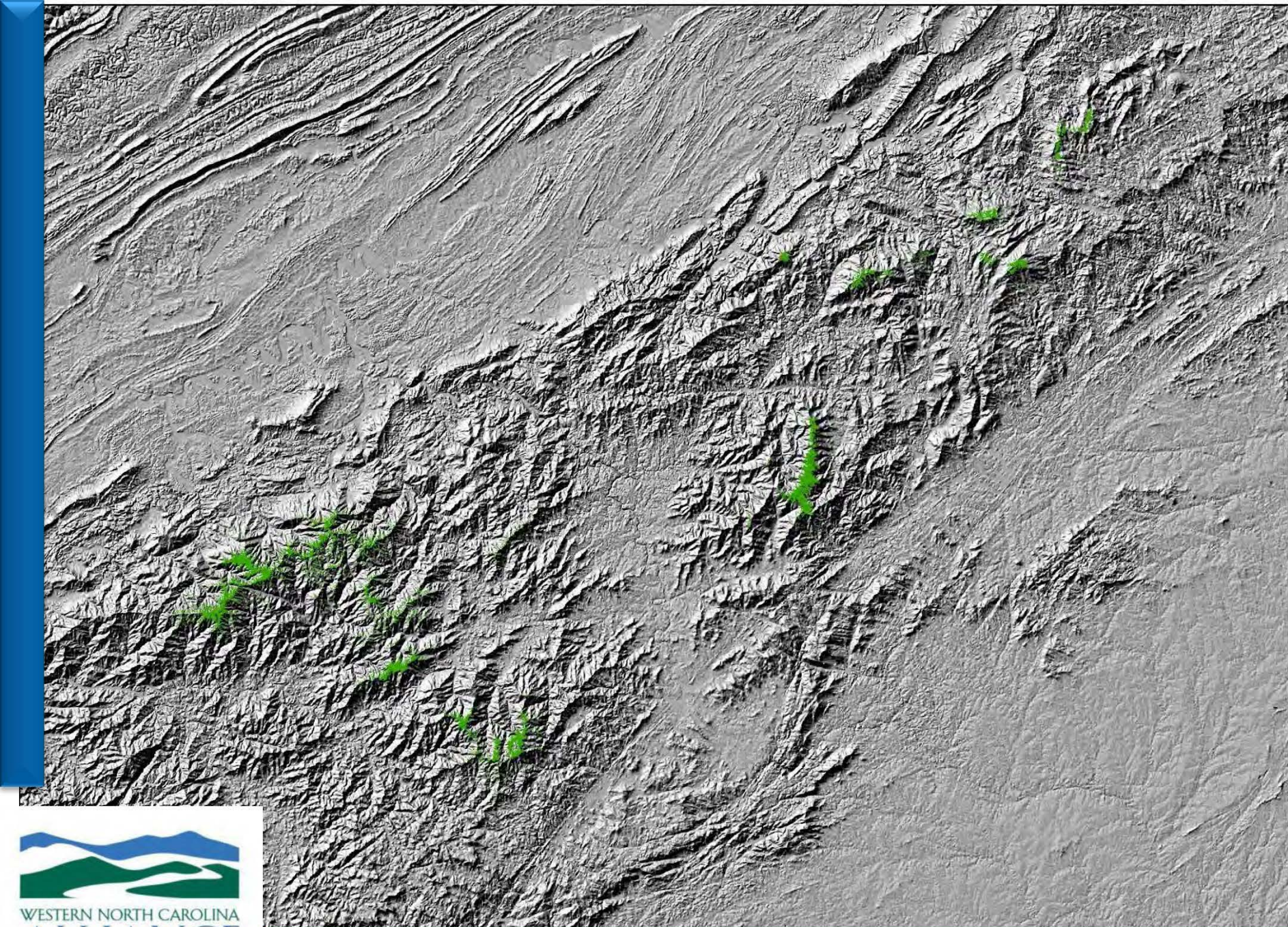
* e.g. Maximum entropy, Logistic regression, Discriminant analysis

From "Assessment and Mapping of Vegetation Communities in the Shenandoah National Park," John Young, USGS





WESTERN NORTH CAROLINA
ALLIANCE



WESTERN NORTH CAROLINA
ALLIANCE

