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## Application of Science Analysis Products

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National Cohesive Wildland Fire Management Strategy  
Science Analysis Report: Application to the Southeast Region  
January, 2014

# Agenda

- Today:
  - The National Science Analysis
  - Preparing Data for Analysis
  - Application of Products
  - Basics of Belief Nets
- Tomorrow:
  - Exercise #1: Pivot Tables
  - Exercise #2: Naïve Networks
  - Exercise #3: Bayes Networks
  - Wrap-up



## Translating into Action

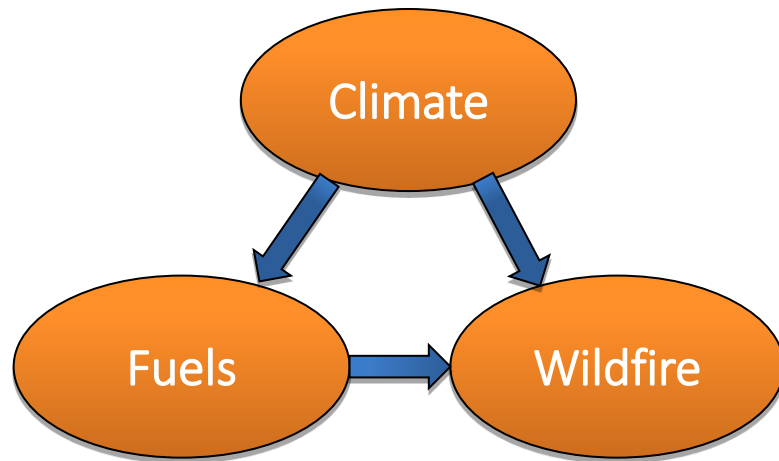
- Translating national priorities into local action requires complementary implementation decisions to be made at multiple scales-- often referred to as the “cascade of decisions.”
- The West, Southeast, and Northeast region will be able to learn how the products of the analysis can be used to answer specific questions and which tools are useful to answer them.

# WHAT DATA VARIABLES CHARACTERIZE OUR REGION? HOW DOES THE SOUTHEAST COMPARE TO OTHER REGIONS?

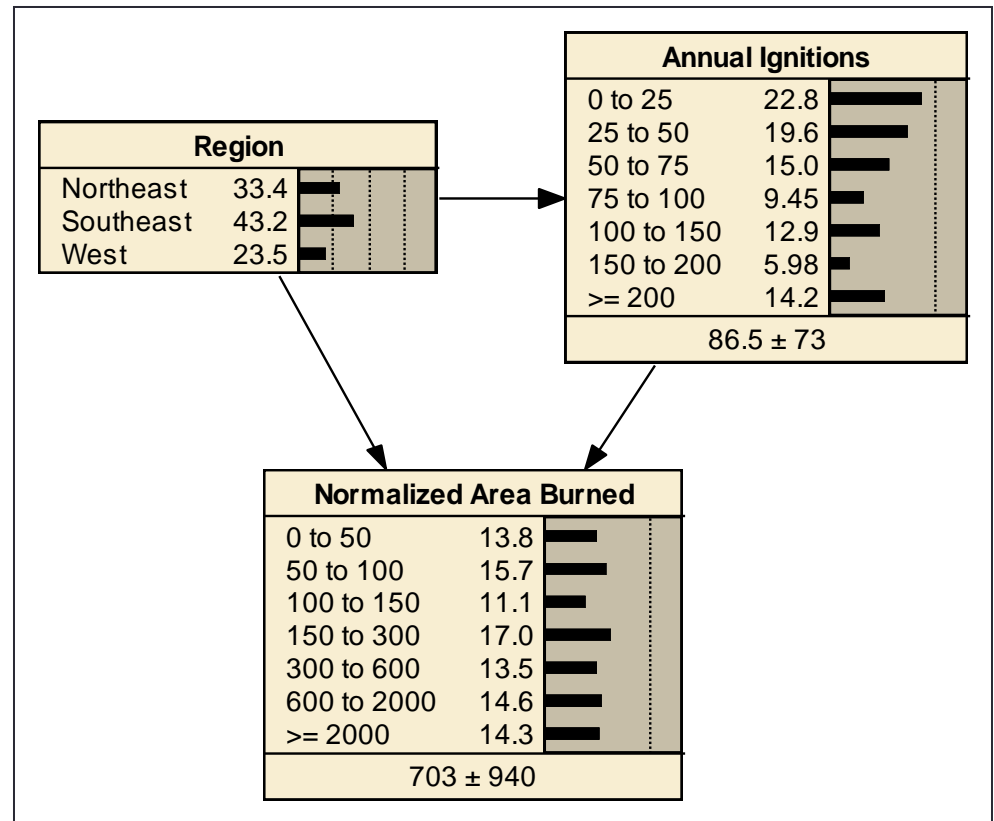
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Which tools are helpful?

# Exploring the data relationships using a Bayesian Network.



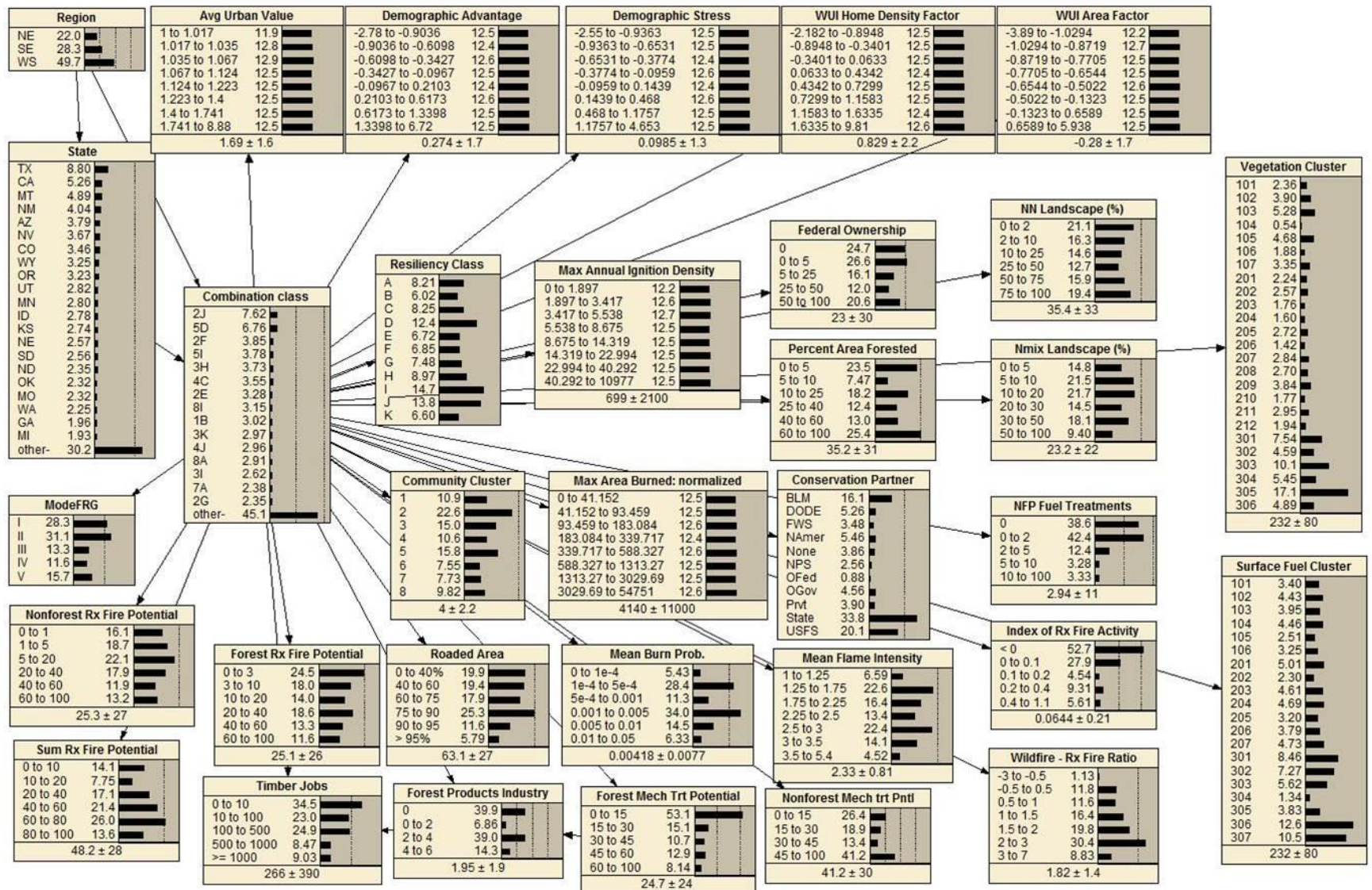
Graphical model of the relationships among climate, vegetative fuels, and wildfire. Arrows show cause and effect.



Simple Bayesian network illustrating the relationships among Cohesive Strategy *Region*, Annual Ignitions, and Normalized Area Burned. Probability histograms represent the percent of the counties within the conterminous United States within each class.



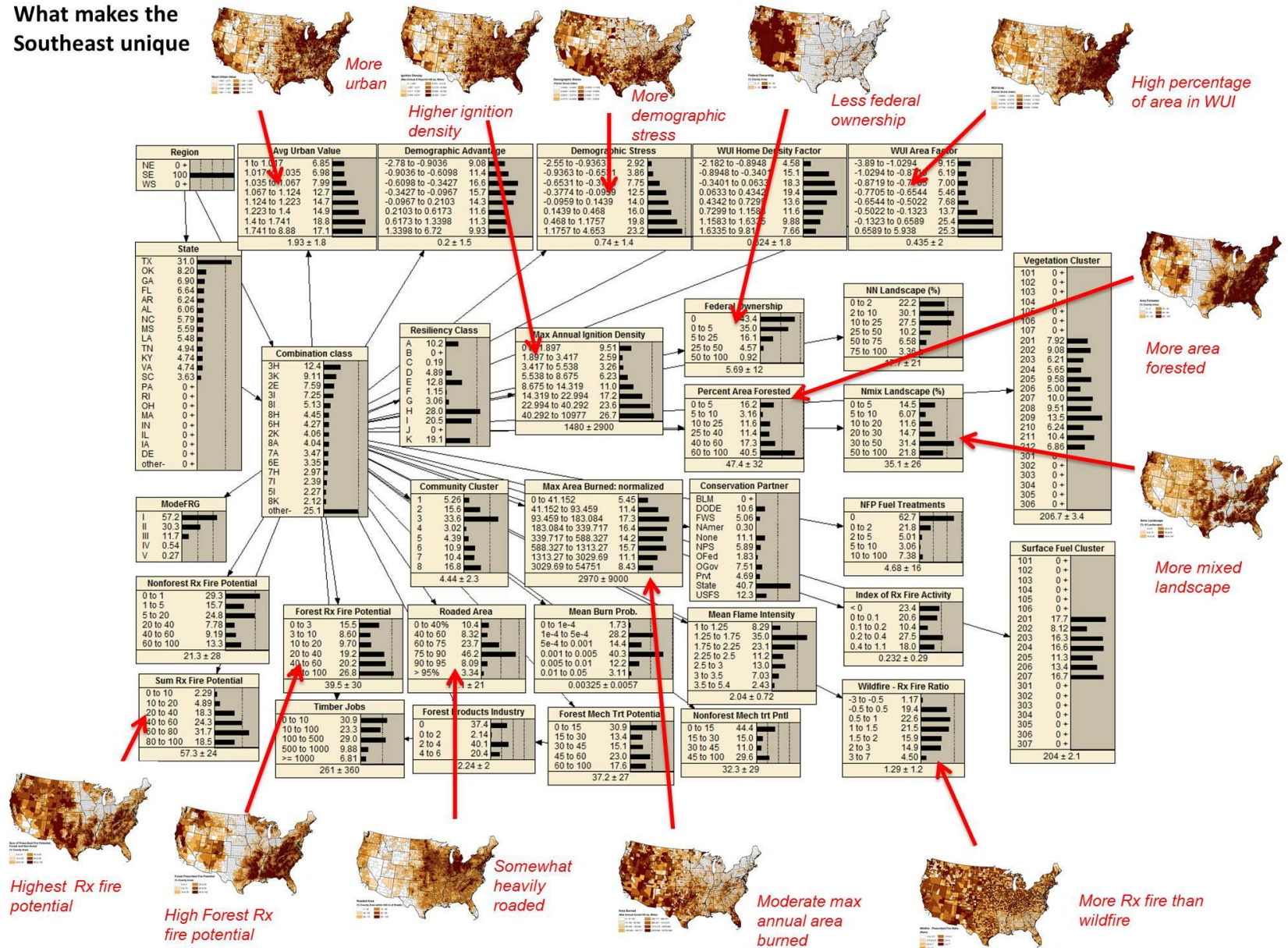
# Belief Network





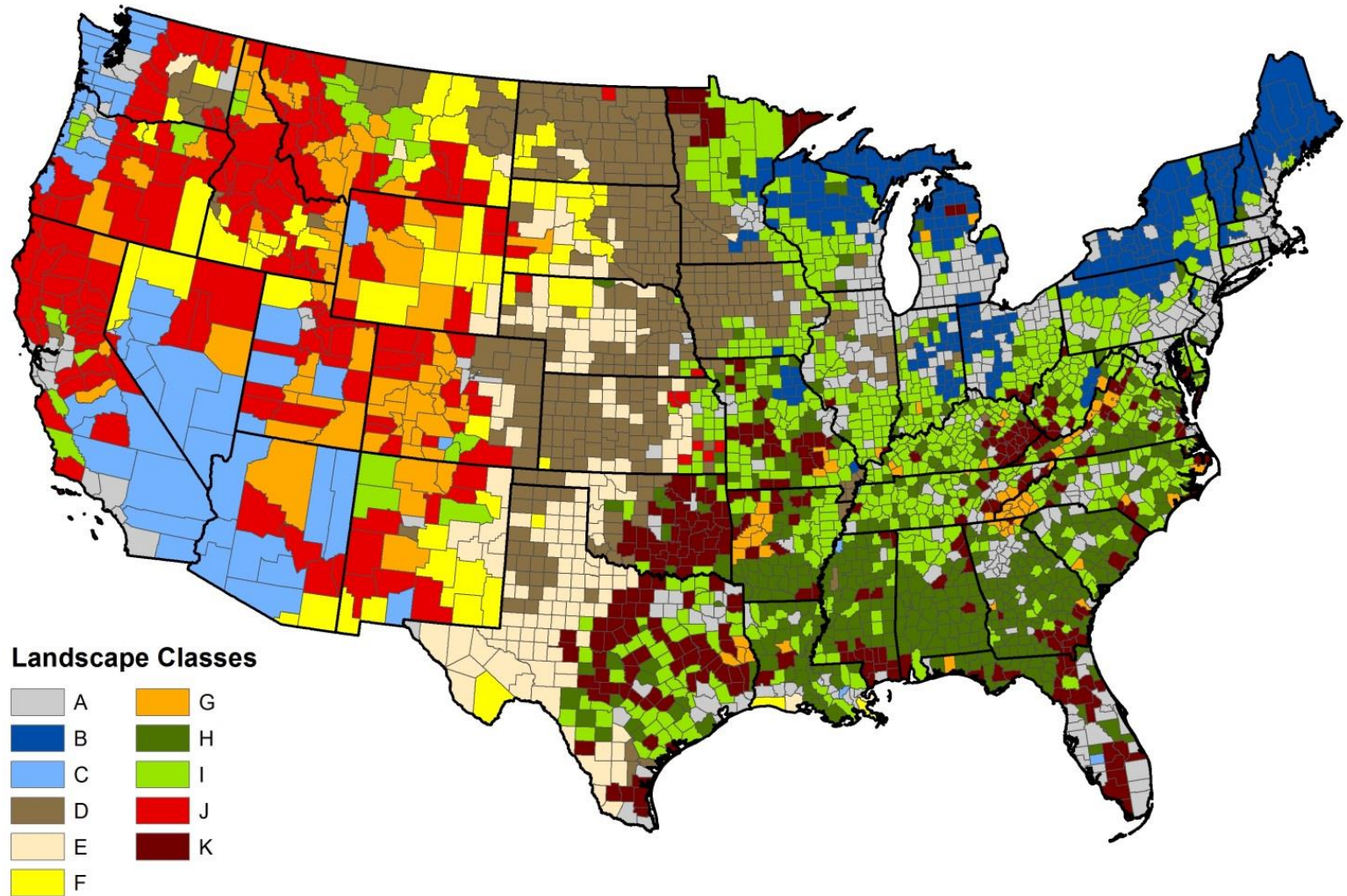
# Belief Network

What makes the Southeast unique





# Landscape Classes



Map of the geographical distribution of the eleven landscape classes across the conterminous United States

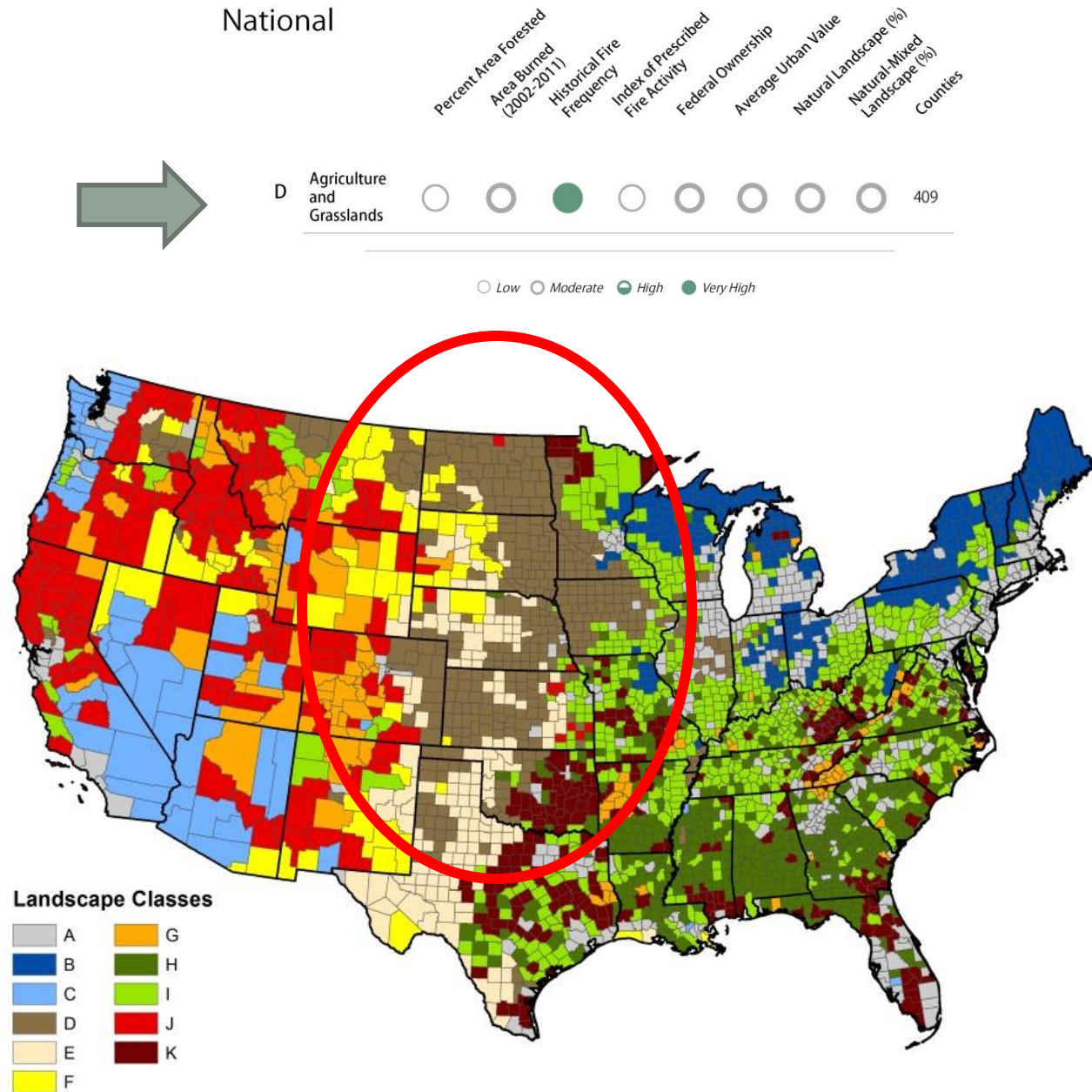
## For comparison...

The nature of each class is revealed by looking at the classification tree and the broader range of descriptive variables for each county.

Using this figure, one can develop an informative, general narrative that applies to the counties within each class.



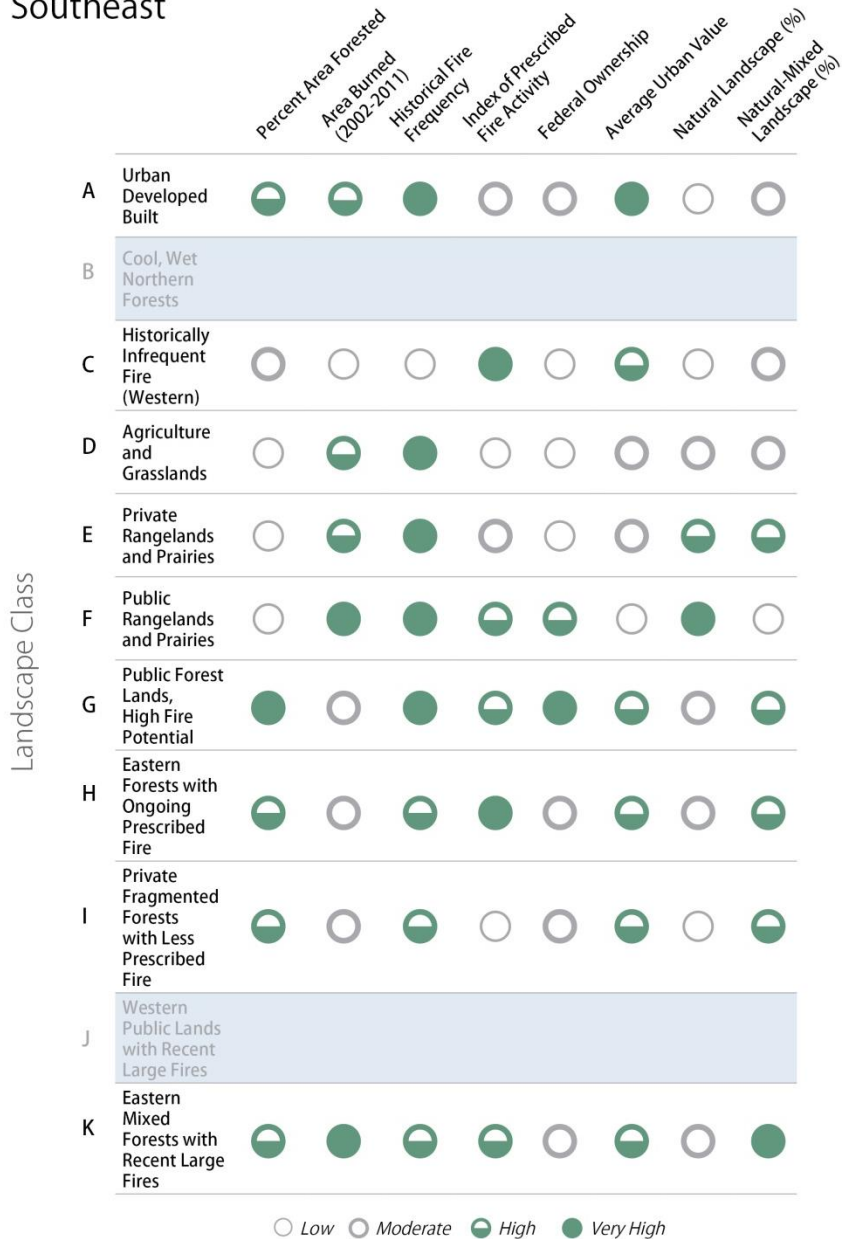
For example, landscape class “D” characterizes agricultural and grasslands areas that have relatively little forested area or federal ownership and have historically experienced very high levels of natural fire.





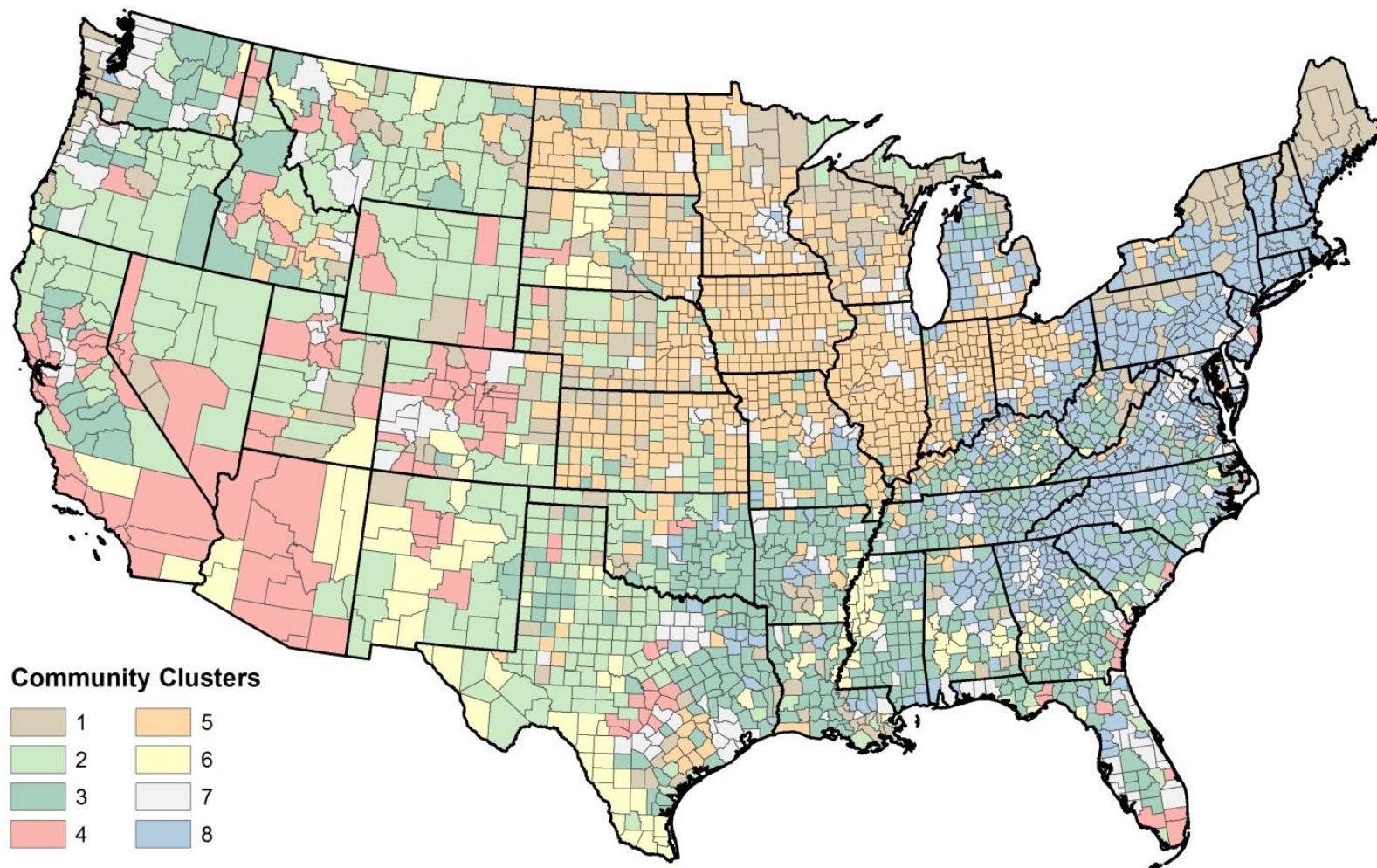
# For comparison...

## Southeast





# Community Clusters



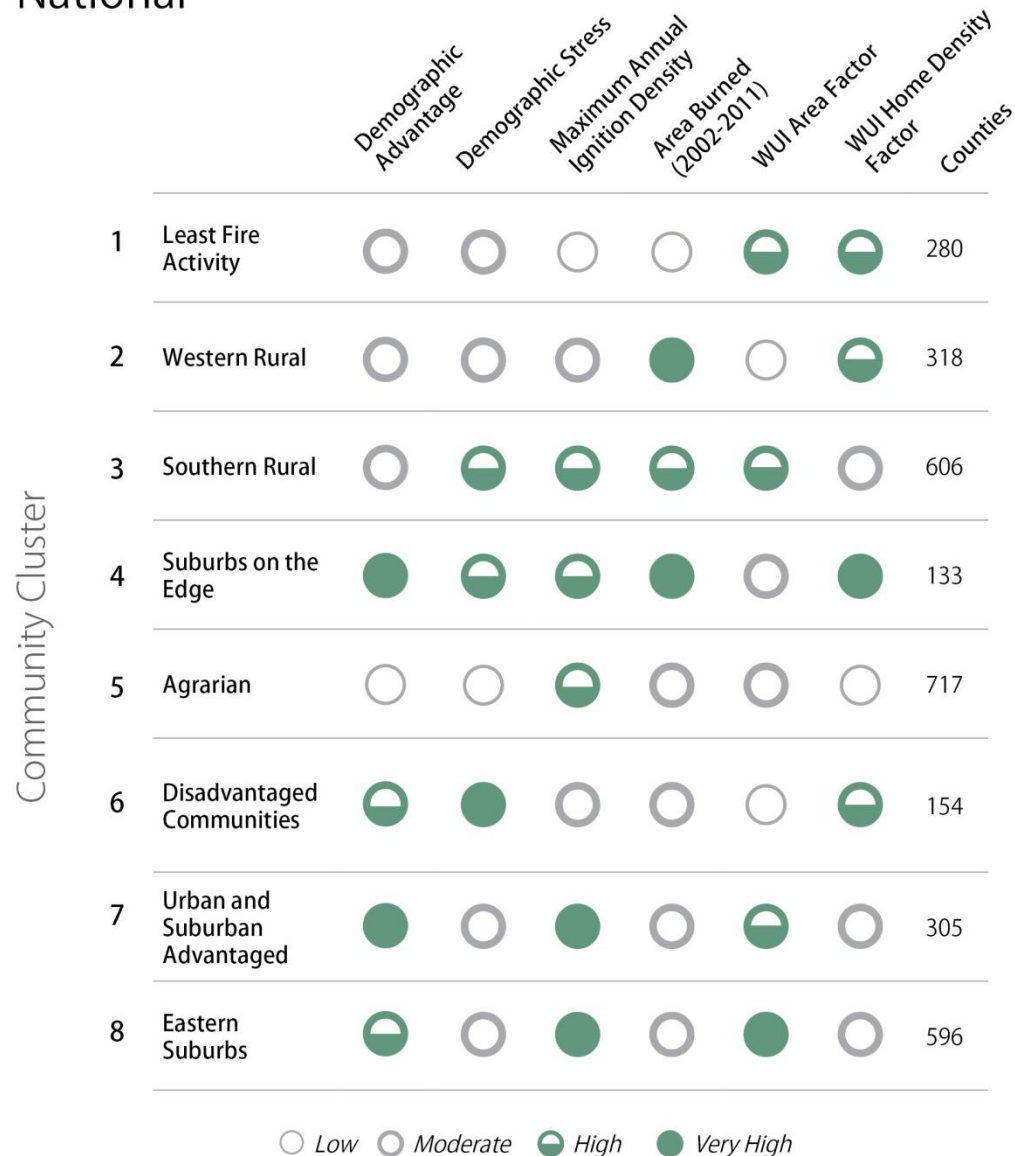
Geographical affinity of several clusters is apparent, but is not as strong as the resiliency classes. This result highlights the fact that there are counties with similar fire histories, WUI patterns, and socioeconomic attributes scattered throughout the country.

## For comparison...

The nature of each cluster is seen in this visual summary of the characteristic features with respect to six variables of interest:

- Demographic advantage and stress
- Ignition density
- Area burned
- WUI area and density

## National



## Southeast



## Southeast



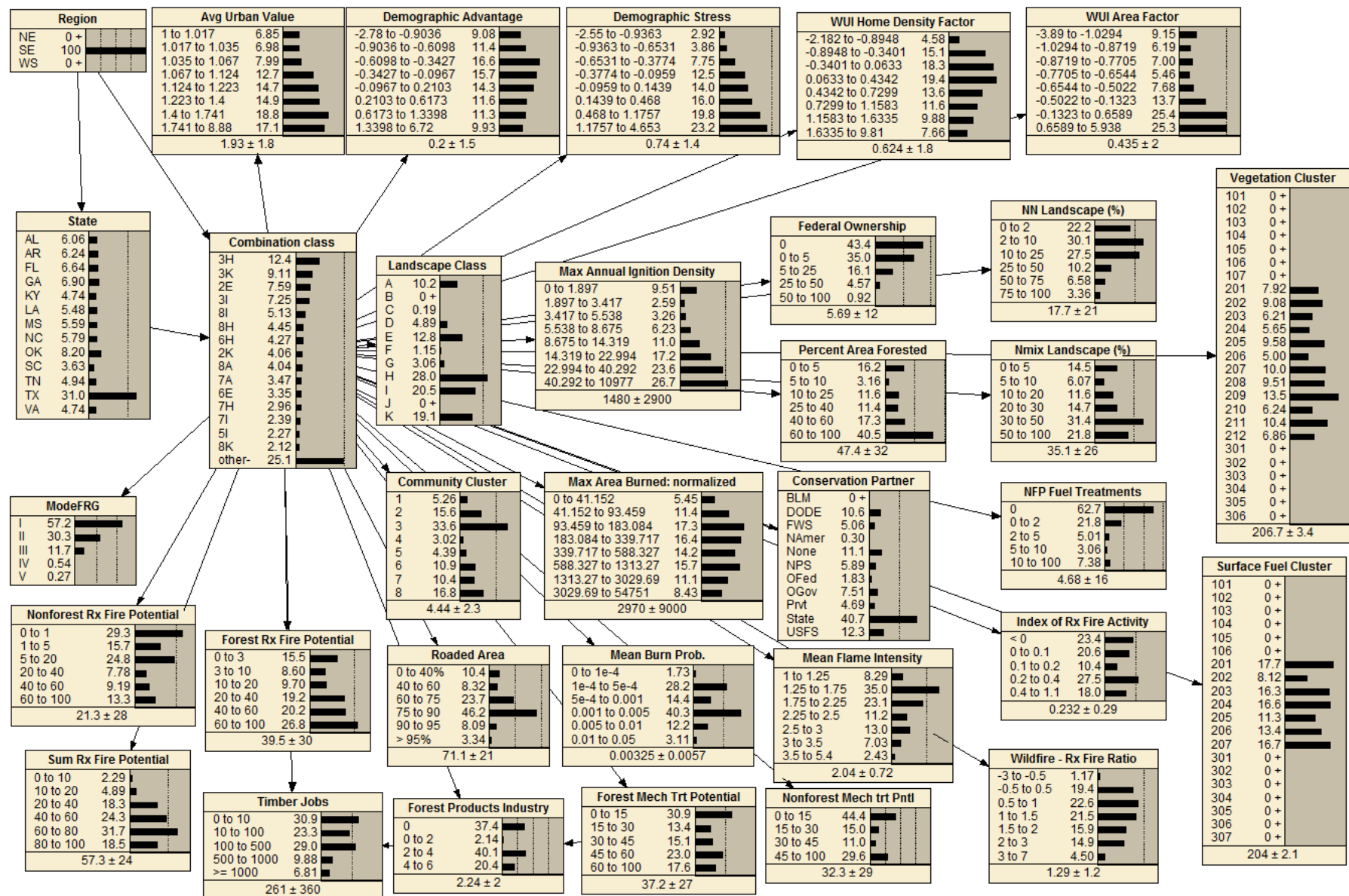
WHAT COMBINATIONS ARE MOST  
PREVALENT IN THE SOUTHEAST? ARE THESE  
COMBINATIONS NATIONAL PRIORITIES?

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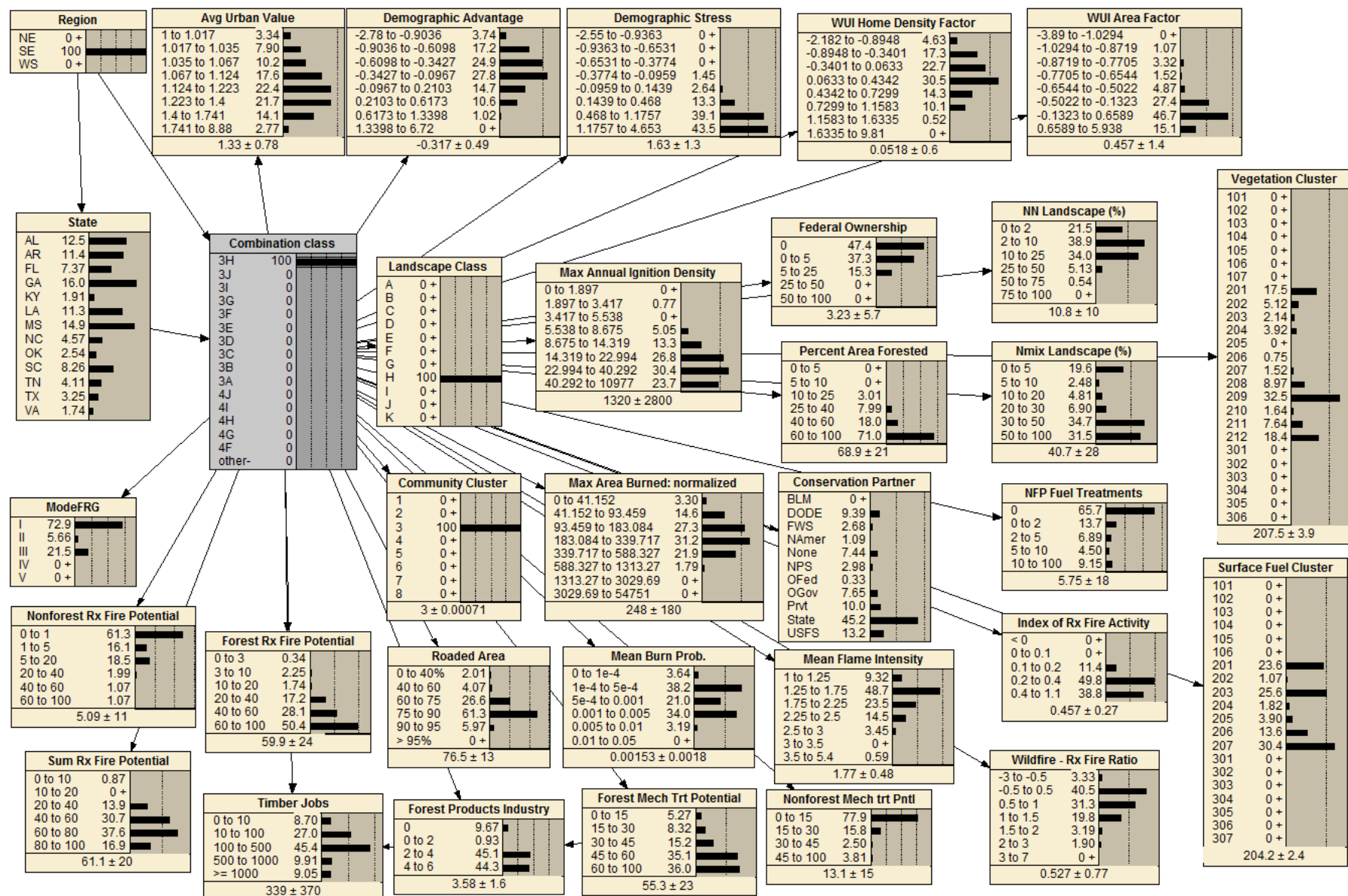
Which tools are helpful?



# Belief Network



# Belief Network









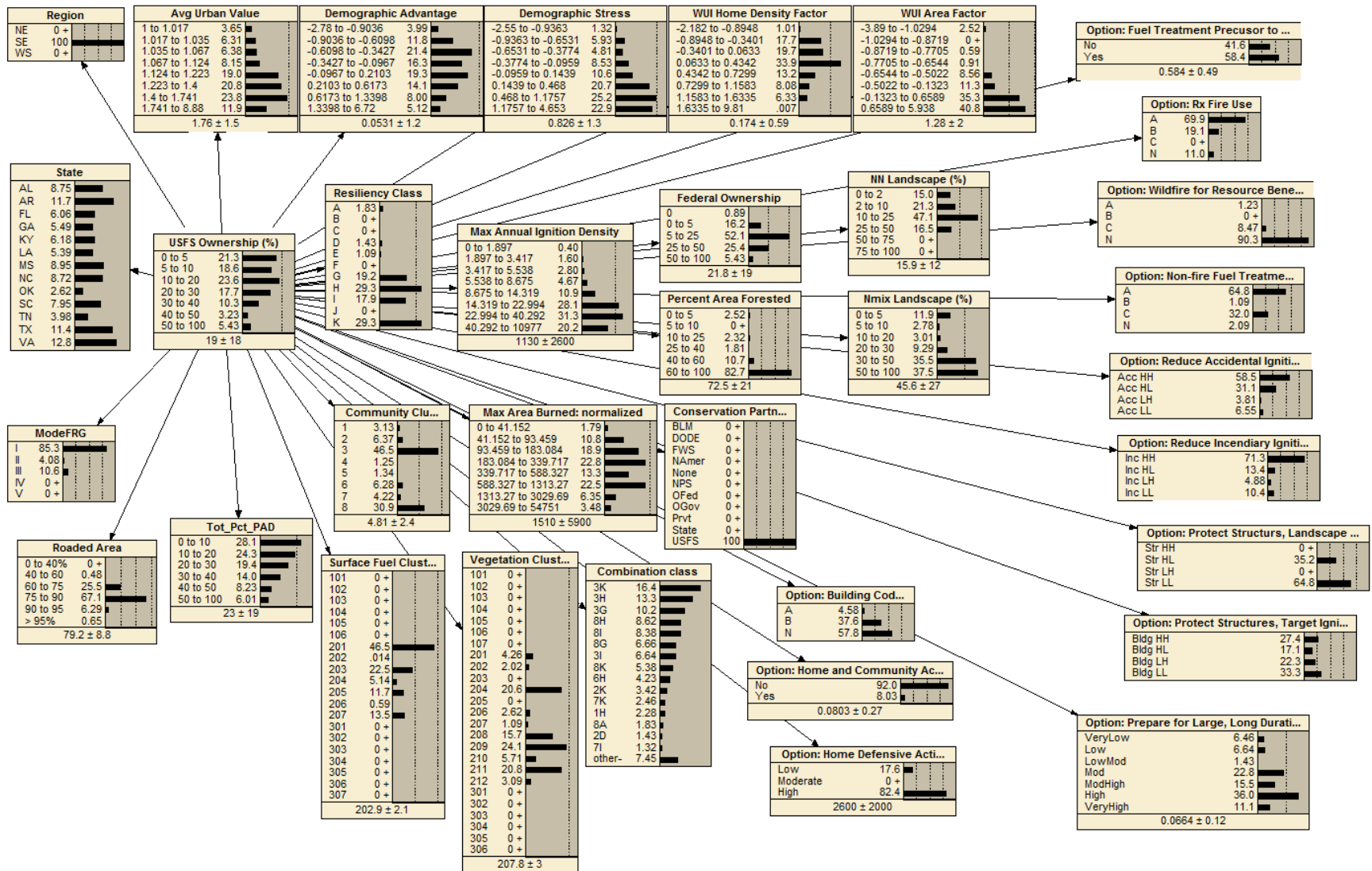


# HOW DOES A MAJOR AGENCY OR GROUP EXPLORE THEIR OPTIONS?

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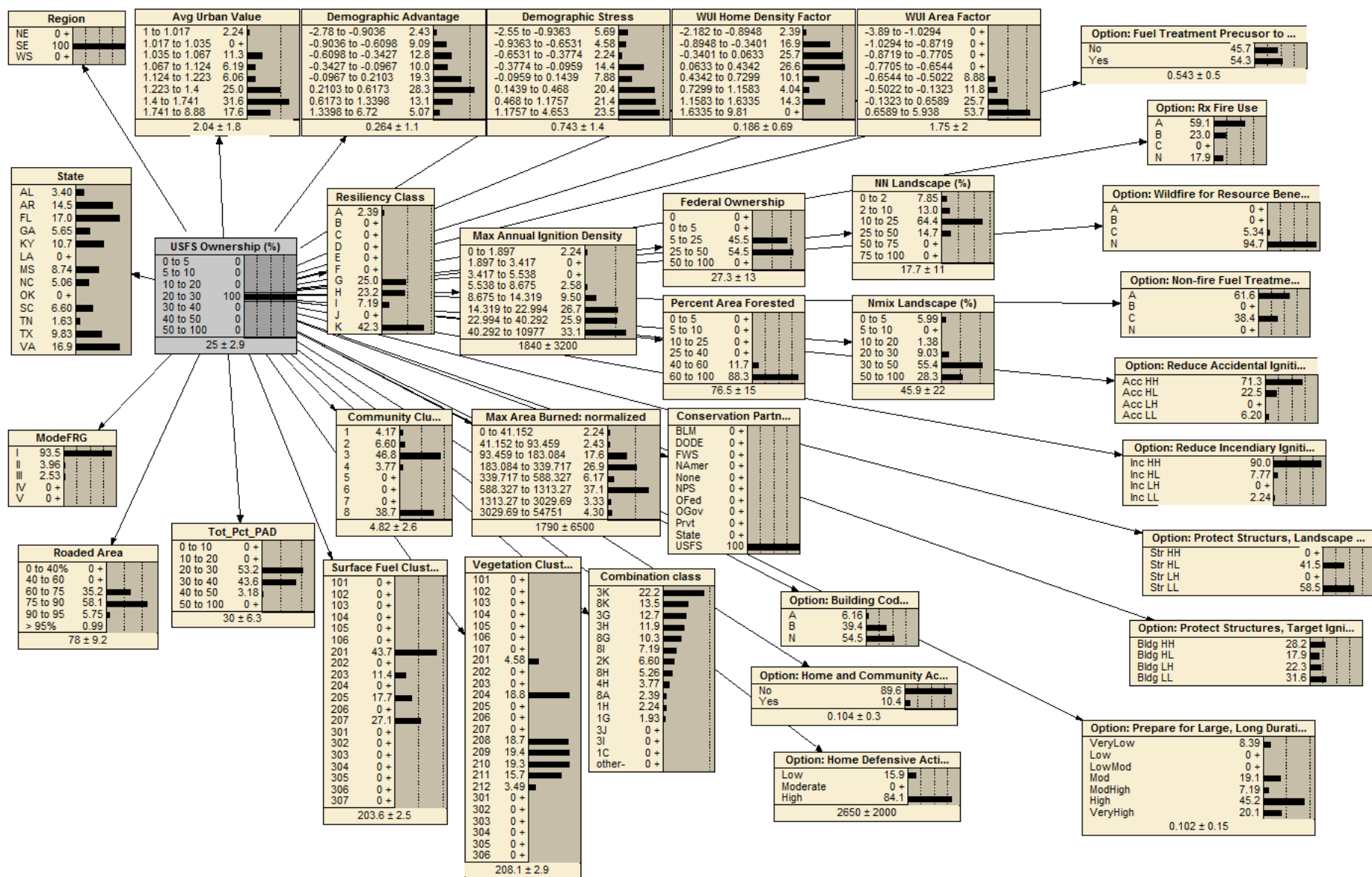
Which tools are helpful?

# Belief Network



The network is structured to examine the attributes and options of US Forest Service managed land, can be done for each agency or conservation partner.

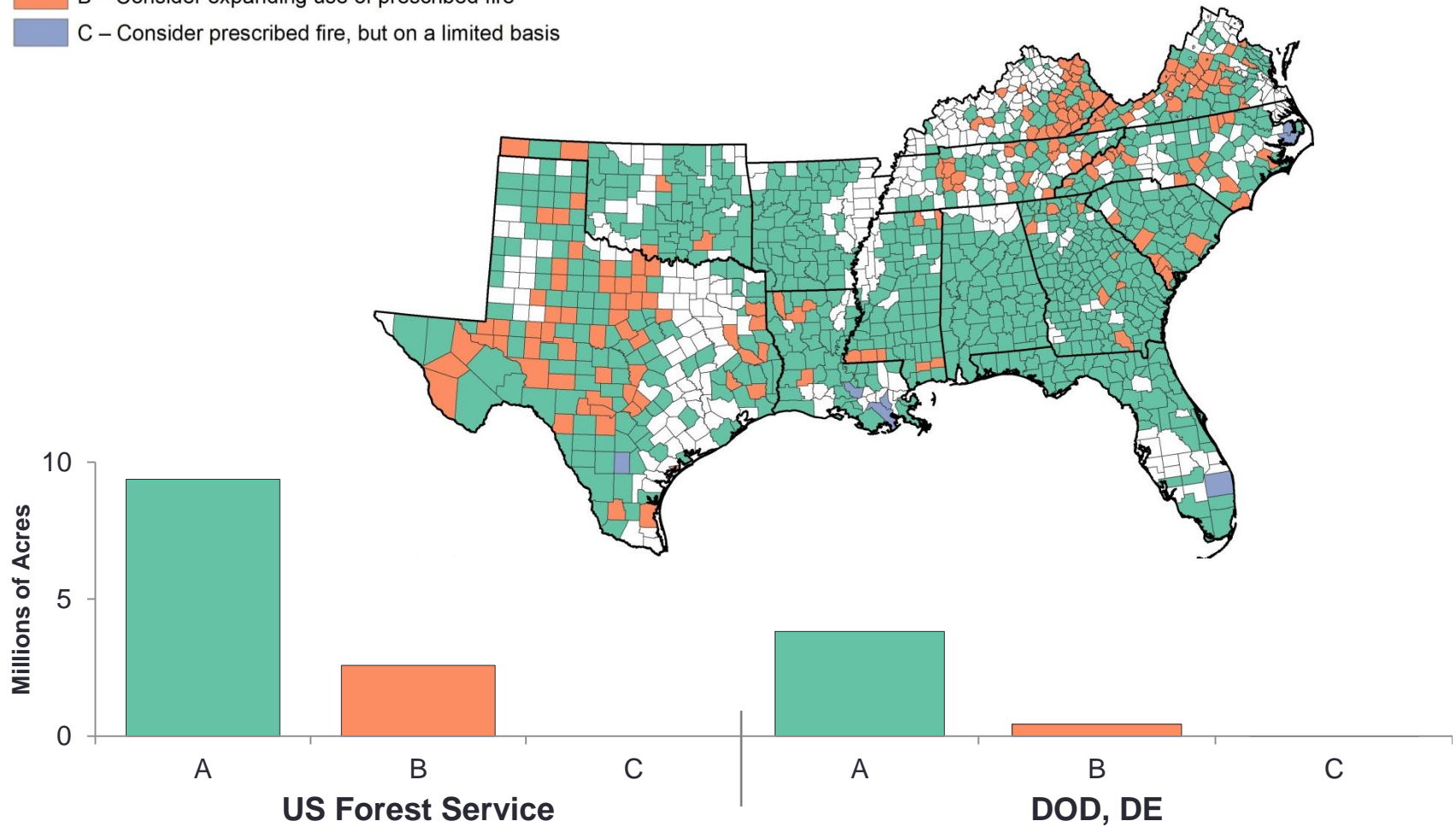
# Belief Network



# Pivot Table

## Prescribed Fire

- A – Use prescribed fire to manage fuels where it is already being used
- B – Consider expanding use of prescribed fire
- C – Consider prescribed fire, but on a limited basis





# HOW DO REGIONS ACCESS THE DATA AND INFORMATION?

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# Science Analysis Website

## The National Cohesive Wildland Fire Management Strategy and Risk Analysis – Phase III Report

INTRODUCTION NATIONAL CHARACTERIZATION CHALLENGES AND OPPORTUNITIES THE NATIONAL STRATEGY INPUT VARIABLES

ABOUT

[Home](#) » Prescribed Fire Use

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Prescribed Fire Use

## The National Cohesive Wildland Fire Management Strategy and Risk Analysis – Phase III Report

INTRODUCTION

NATIONAL CHARACTERIZATION

CHALLENGES AND OPPORTUNITIES

THE NATIONAL STRATEGY

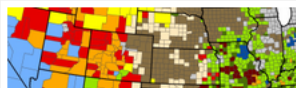
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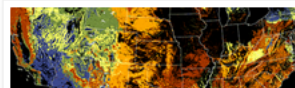
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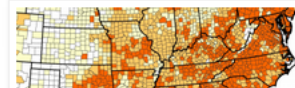
### National Characterization

Data spanning a broad spectrum of environmental, socioeconomic, and fire related statistics were assembled to support development of the Cohesive Strategy. These data have been summarized and consolidated to the county level in order to provide a comparable unit of analysis across data sets. Counties are grouped together based upon the similarities among them with respect to key variables that are relevant to the principal themes of landscape character and risk to communities.



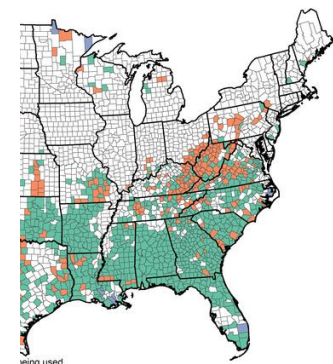
### Challenges and Opportunities

Wildland fire encompasses numerous interacting and complex social, ecological, and physical factors. The analysis and discussion is organized around four national challenges that include: Vegetation and Fuels; Homes, Communities, and other Values at Risk; Human -caused Ignitions; and Effective and Efficient Wildfire Response.



### The National Strategy

The attributes of counties falling within each combination of community clusters and landscape classes were considered relative to the four national challenges. The match between county characteristics and thematic actions were then used to suggest relative priorities from a national perspective.



being used

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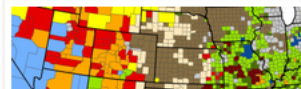
INPUT VARIABLES

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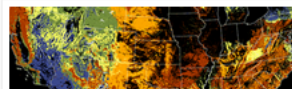
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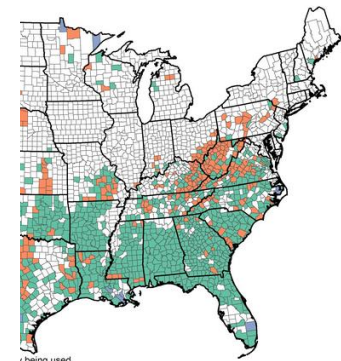
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Plans of managing vegetation for multiple purposes, including hazard and others. In general, prescribed fire is an effective tool in areas with prescribed fire is also used to a lesser extent as site preparation in (controlling invasive species) or post-harvest clean-up in forested systems.

Prescribed perimeter or produce hazardous smoke if not managed (rain, weather, and the critical nature of fire, making it difficult to control).

# Science Analysis Website- Regional Sections

## The National Cohesive Wildland Fire Management Strategy and Risk Analysis – Phase III Report

INTRODUCTION	NATIONAL CHARACTERIZATION	CHALLENGES AND OPPORTUNITIES	THE NATIONAL STRATEGY	INPUT VARIABLES
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#### National Materials

<p>Community Clusters Appendix</p>	<p>Landscape Classes Appendix</p>	<p>National Landscape Classes and Community Clusters Appendix</p>	<p>National Priorities Appendix</p>
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#### Southeast Materials

<p>Southeast Landscape Classes and Clusters Appendix</p>
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## Review: Helpful tools

- Summary documents (Science Analysis Report)
- Bayesian Belief Networks (Netica)
- Pivot Tables (Microsoft Excel)
- Science Analysis Website

