

# NRCS Update and Needs for Soil Quality, Dynamic Soil Properties, and Ecological Sites



Susan S. Andrews, Ph.D.  
National Leader for Soil Ecology  
May 23, 2011



# National Soil Ecology Branch

- One of two new branches at NSSC
- Formally began in Nov. 2010
- New endeavors for 'New' Soil Survey
- Three areas of responsibility
  - Soil Quality Technology
  - Dynamic Soil Properties
  - Ecological Site Inventory
- Mission: Making Soil Survey relevant in the 21<sup>st</sup> century by recognizing human effects on soil and ecosystem function

# NSEB Staff



- Dr. Susan Andrews, Leader & Ecologist
- Craig Busskohl, Forester
- Dr. Faustin Iyamuremye, Soil Scientist
- Dr. Charles Komé, Soil Scientist
- Mike Kucera, Agronomist
- Marcus Miller, Wildlife Biologist
- Curtis Talbot, Range Conservationist
- Dr. Skye Wills, Soil Scientist

# Soil Change Working Group

- Precursor to National Soil Ecology Branch
- Began at 2009 NCSS National Meeting
- Charges included research and interps for dynamic soil properties, soil quality
- 2009 Co-Chairs: Susan Andrews and Dr. Joey Shaw, Auburn University
- 2011 Co-Chairs: Susan Andrews and Dr. Mike Duniway, ARS (USGS 6/1/11)

# Needs for 3 NSEB Mission Areas

- Soil Quality –  
research, interpretations
- Dynamic Soil Properties/Soil Change –  
research, business requirements,  
standards, interpretations
- Ecological Site Descriptions –  
research, business requirements,  
standards, interpretations

# Soil Quality:

## Application of soil change information

- SSD NSEB has technology development responsibility
- S&T retained technology transfer responsibility





# Soil Quality

improving how soil works

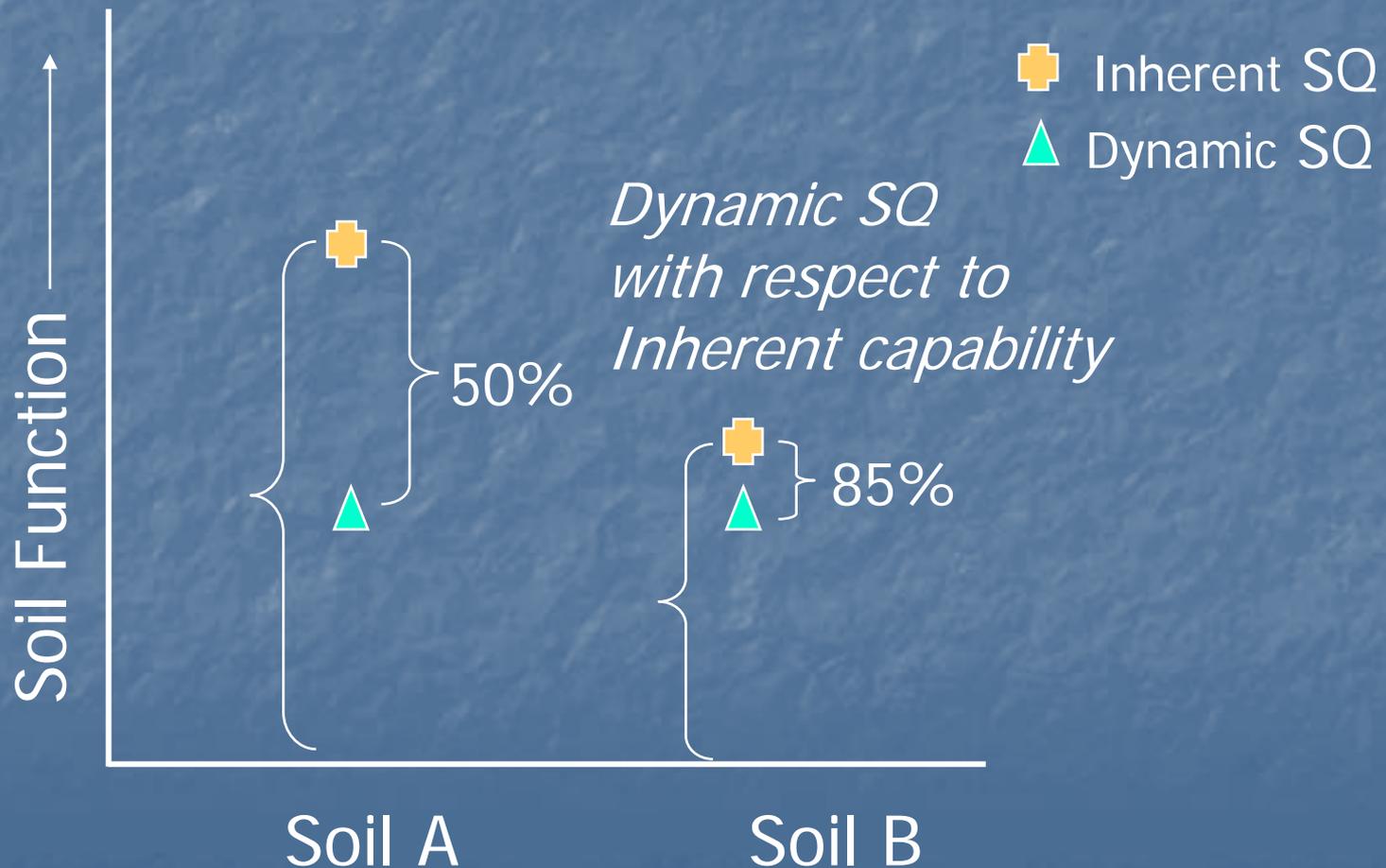
Basics | History | Soil Functions | Indicators | Assessment | Tools | Management | Resources | Partners

## Current Projects:

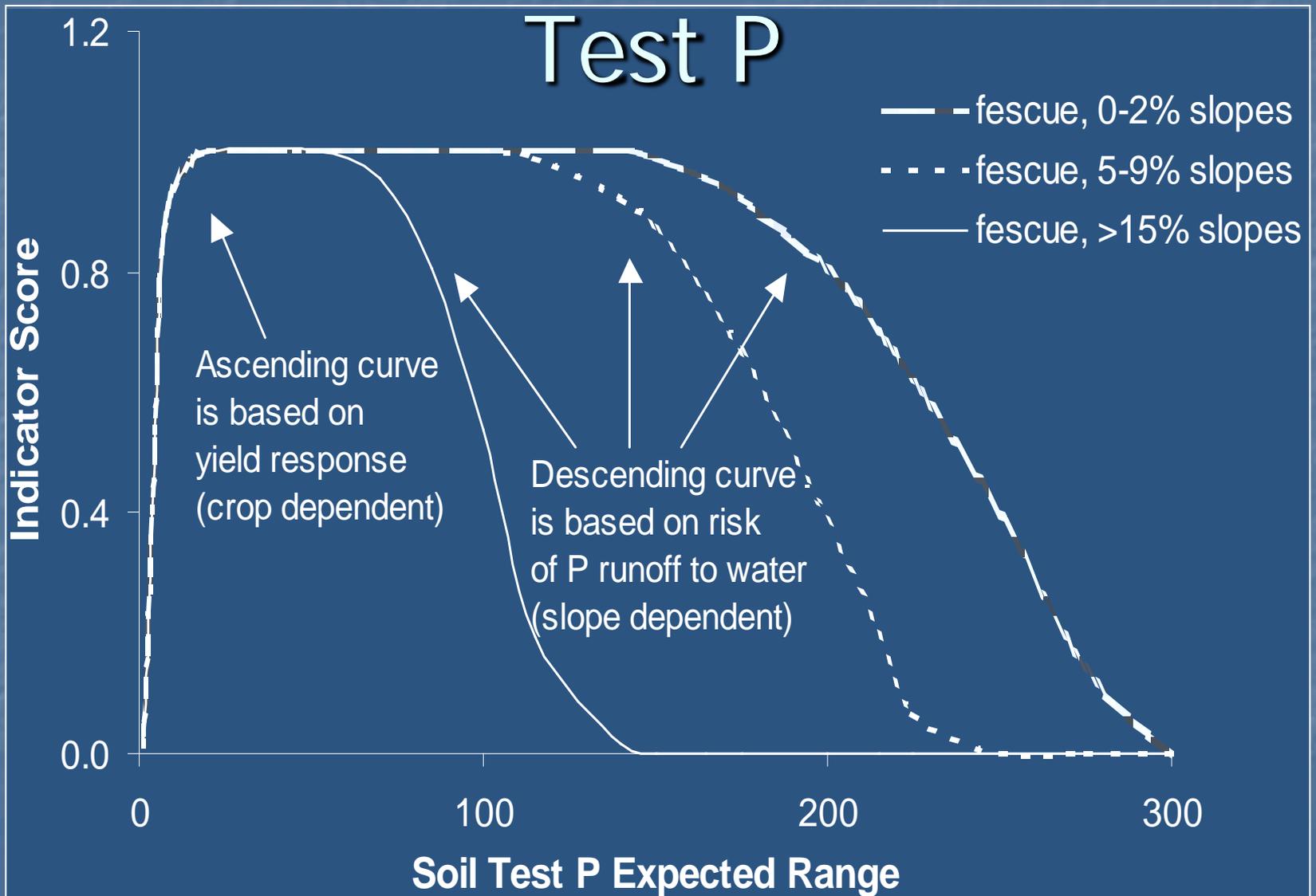
- SoilQuality.org (collaboration with S&T, UIUC, NCERA 59, ARS, others)
- Soil Quality Test Kit Guide revision
- Validation of the Conservation Management Tool for CSP
- Soil Management Assessment Framework (SMAF) workshops and collaborations

Soil quality provides the foundation for environmental quality and sustainable agriculture.

# Assessment of Dynamic Function with respect to Inherent Capability

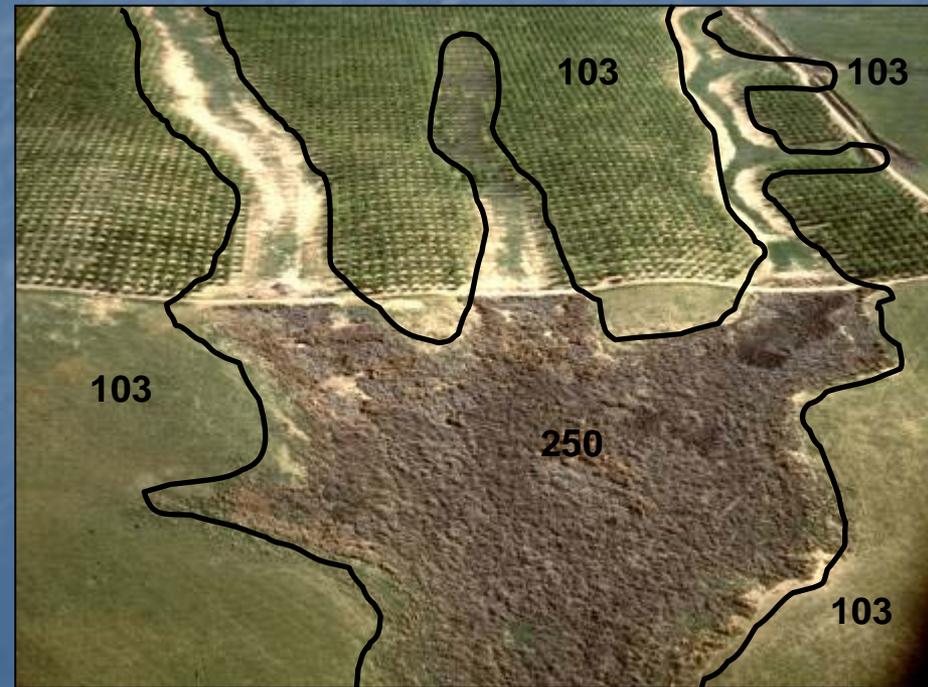


# Interpretation Example:



# Dynamic Soil Properties

- Soil Survey databases do not reflect effects of
  - Change at the human time scale
  - Management (in most cases)
- Comparison studies, model data, and PTFs to improve accuracy of SS databases

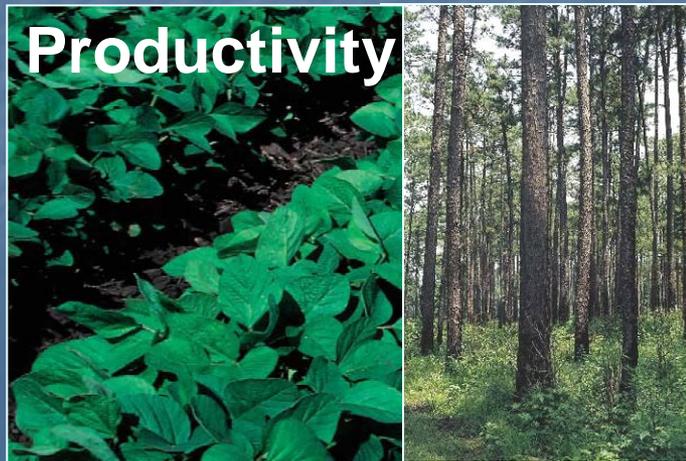


# DSP Obj. 3: Develop Interpretations of Management Effects on Soil Function

- The importance of soil change is its affect on function.
- The consequences of change depend on its reversibility.

(Arnold et al.,1990)

- Need predictive models & PTFs



# Ecological Site Inventory

- New responsibility for Soil Survey
- Policy on workflow near completion
- New standards under development
- Interpretations fall under S&T
  - However, the same people will do inventory and interps portions of the ESD
  - Important for SS to be up-to-speed on how to develop management interpretations, restoration, and reference state ID.

# Ecological Site Inventory



Post oak/flowering dogwood/  
tick trefoil-goldenrod. Multi-  
story. Canopy: 30-90%

Hot summer burn and  
/or long-term grazing



Burn, Site prep &  
Planting / Seeding.  
No grazing or limited  
controlled grazing



Post oak/buckbrush (or  
similar) Lacks mid-story.  
Understory single species  
woody dominated  
Canopy: open 30-90%

Harvest, site  
prep, seeding



Post oak/blackjack  
oak/little bluestem  
ESD, Missouri

Westoby, et. al., 1989  
Stringham et.al., 2001



Pasture (improved)  
Non-native grass sod



Abandonment  
for 20+ yr with  
recruitment of  
woody natives

# ES Inventory Data Management

## Ecological Site Information System



Business Requirements for ESI include enhancements in:

- query capability
- management interpretations
- WSS report customization

# Recommendations

- Move Ecological Site Descriptions out of Interpretations Committee and into Soil Change Working Group
  - New National Soil Ecology Branch has responsibility for both
- Consider name change to reflect broader charge: Soil & Ecology Committee (?)
- Change Working Group to Standing Cmte.

# Recommendations

- Move Ecological Site Descriptions out of Interpretations Committee and into Soil Change Working Group
  - New National Soil Ecology Branch has responsibility for both
- Consider name change to reflect broader charge: Soil & Ecology Committee (?)
- Change Working Group to Standing Cmte.

“... it is much better to have a stable taxonomy and to make your interpretations according to the level of management and the properties which will exist under different levels of management.”

-Guy Smith Interviews, 1986

# Questions and Discussion

Contact:

Susan Andrews

National Leader for Soil Ecology

[susan.andrews@lin.usda.gov](mailto:susan.andrews@lin.usda.gov)

402-437-5687