



AgEcon SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



United States Department of Agriculture

USDA's
93rd
Annual

Agricultural Outlook Forum

A New Horizon: The Future of Agriculture

February 23-24, 2017 • Crystal Gateway Marriott Hotel, Arlington, Virginia

Presentation from the USDA Agricultural Outlook Forum 2017

United States Department of Agriculture
93rd Annual Agricultural Outlook Forum
“A New Horizon: The Future of Agriculture”

February 23-24, 2017
Arlington, Virginia



United States Department of Agriculture

Soil Health at NRCS



Bianca Moebius-Clune, Ph.D.
Director
NRCS Soil Health Division
Washington, DC

Secretary's Ag Outlook Forum
Feb 23, 2017



Natural
Resources
Conservation
Service



unlock the
SECRETS
IN THE
SOIL



Natural
Resources
Conservation
Service

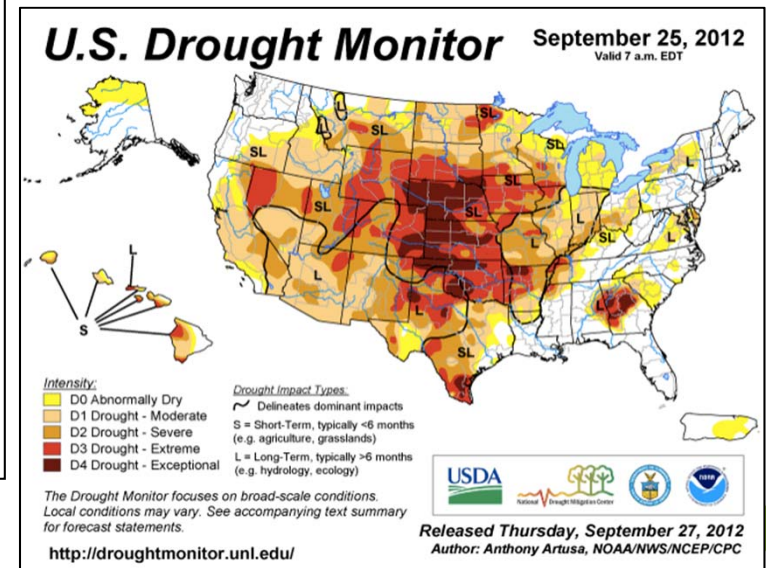
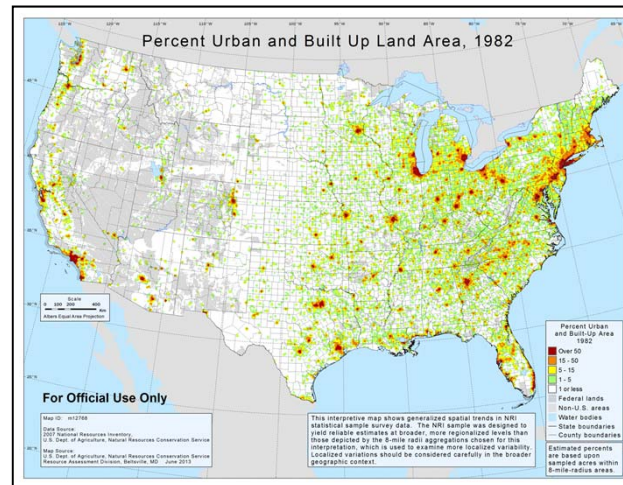
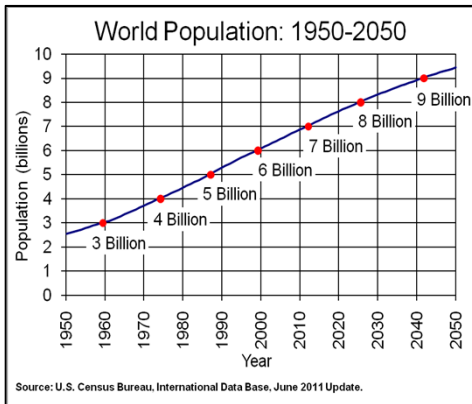
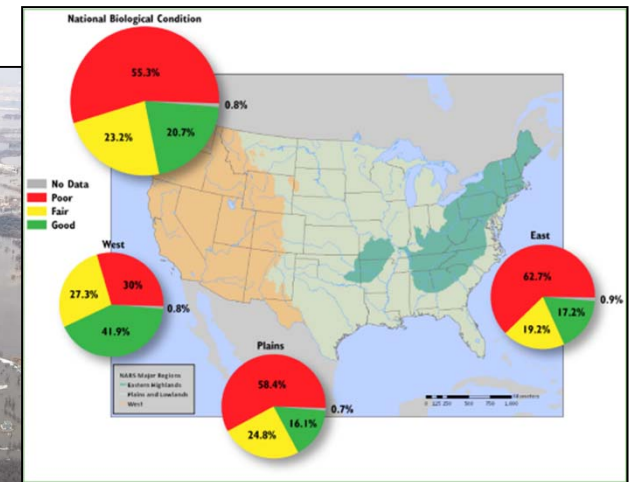
nrcs.usda.gov/



National Challenges



Population growth Risk from Extreme Weather Water quality and quantity



Return on our Nation's Soil Health Investment

Changing the Face of Agriculture and How We Feed our Nation

BENEFITS

- Water infiltration
- Less runoff, erosion, flooding
- Water storage and availability
- Soil organic matter
- Energy savings
- Nutrient cycling & pest suppression
- Resilience
- Biodiversity, groundwater, clean water and air ...
- Long-term economic viability
- Sustained reliable productivity – to feed 9 billion



Photos: NRCS and Dorn Cox, 2012



***Soil Health:
the continued capacity of the soil to function
as a vital living ecosystem that sustains plants, animals, and humans***



Dorn Cox, 2012



Bianca Moebius-Clune, 2012

Infiltration - Brookings County, SD

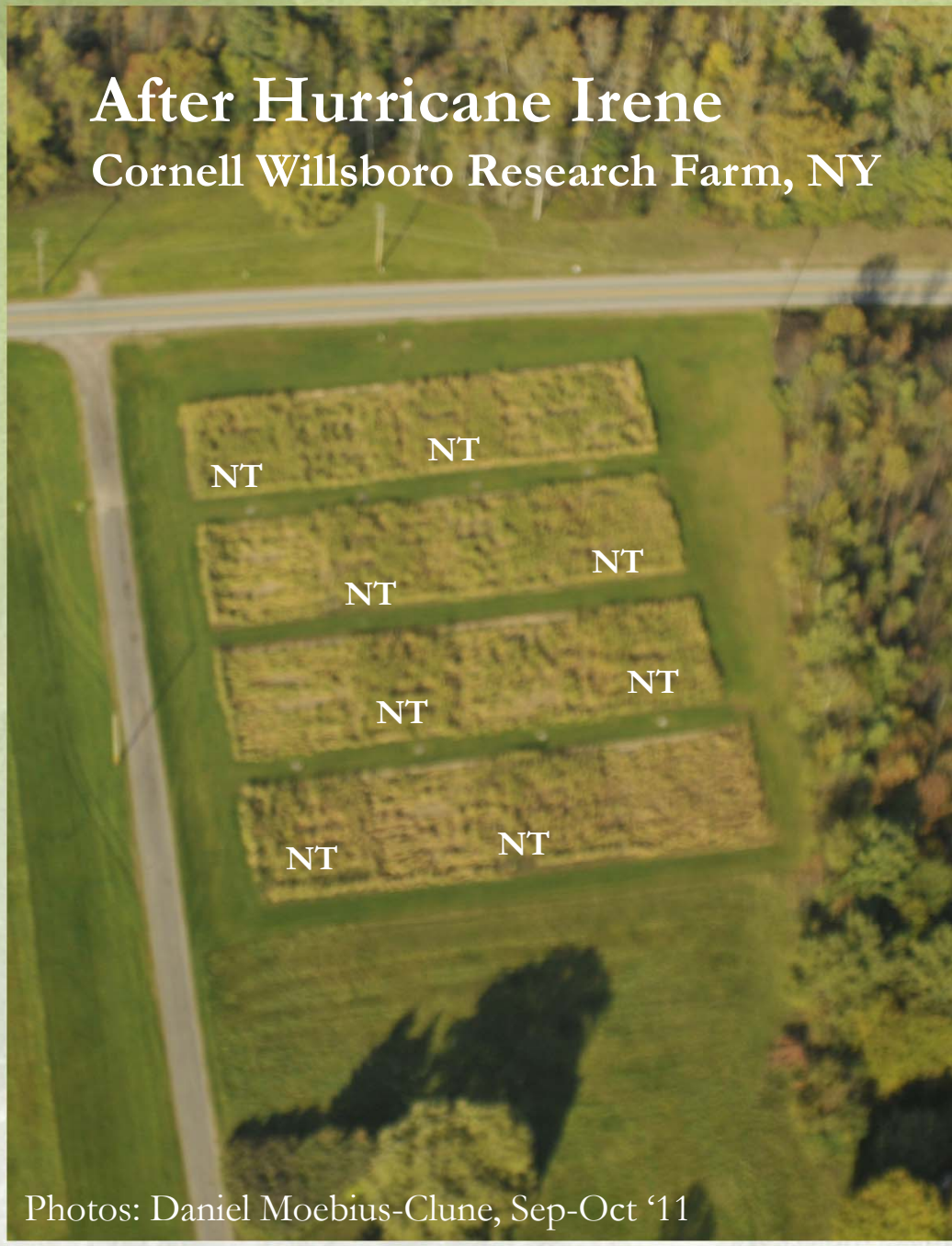
unlock the
SECRETS
IN THE
SOIL





2011: Resilience to extreme weather

After Hurricane Irene Cornell Willsboro Research Farm, NY



NT corn remained standing



PT corn lodged in high winds

Photos: Daniel Moebius-Clune, Sep-Oct '11

No Cover



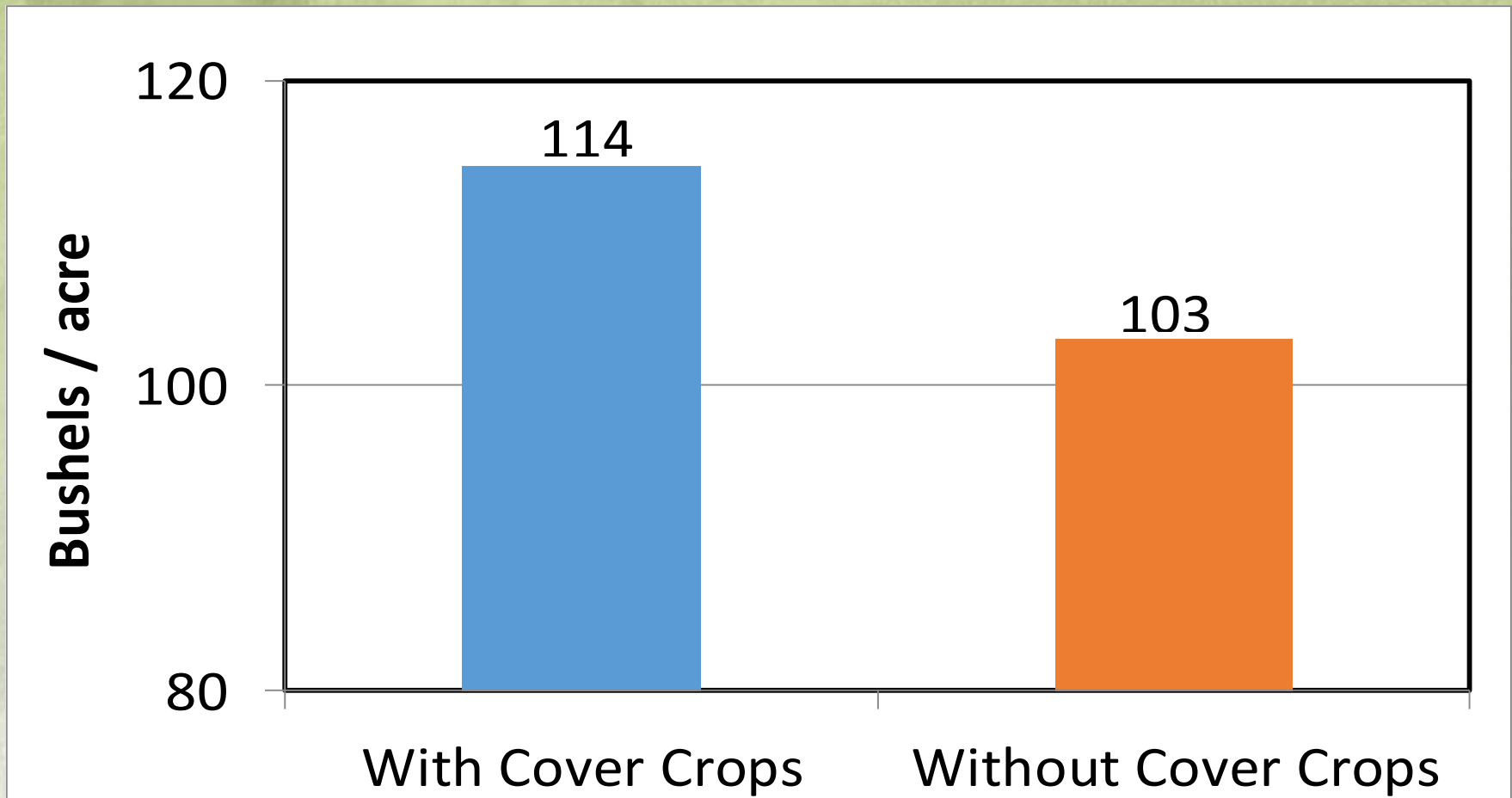
With Cover Crop



USDA-SARE, CTIC Survey 2013



2012 Corn Yield, Drought States



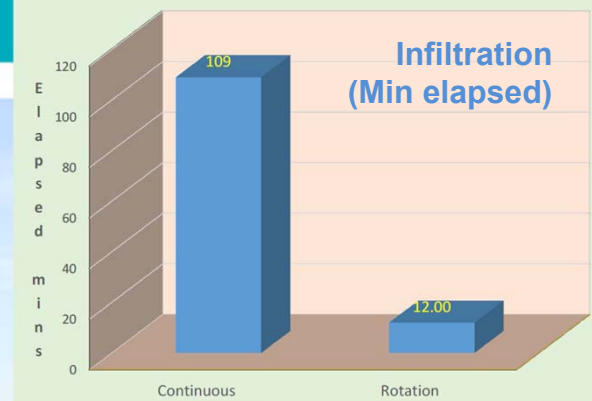
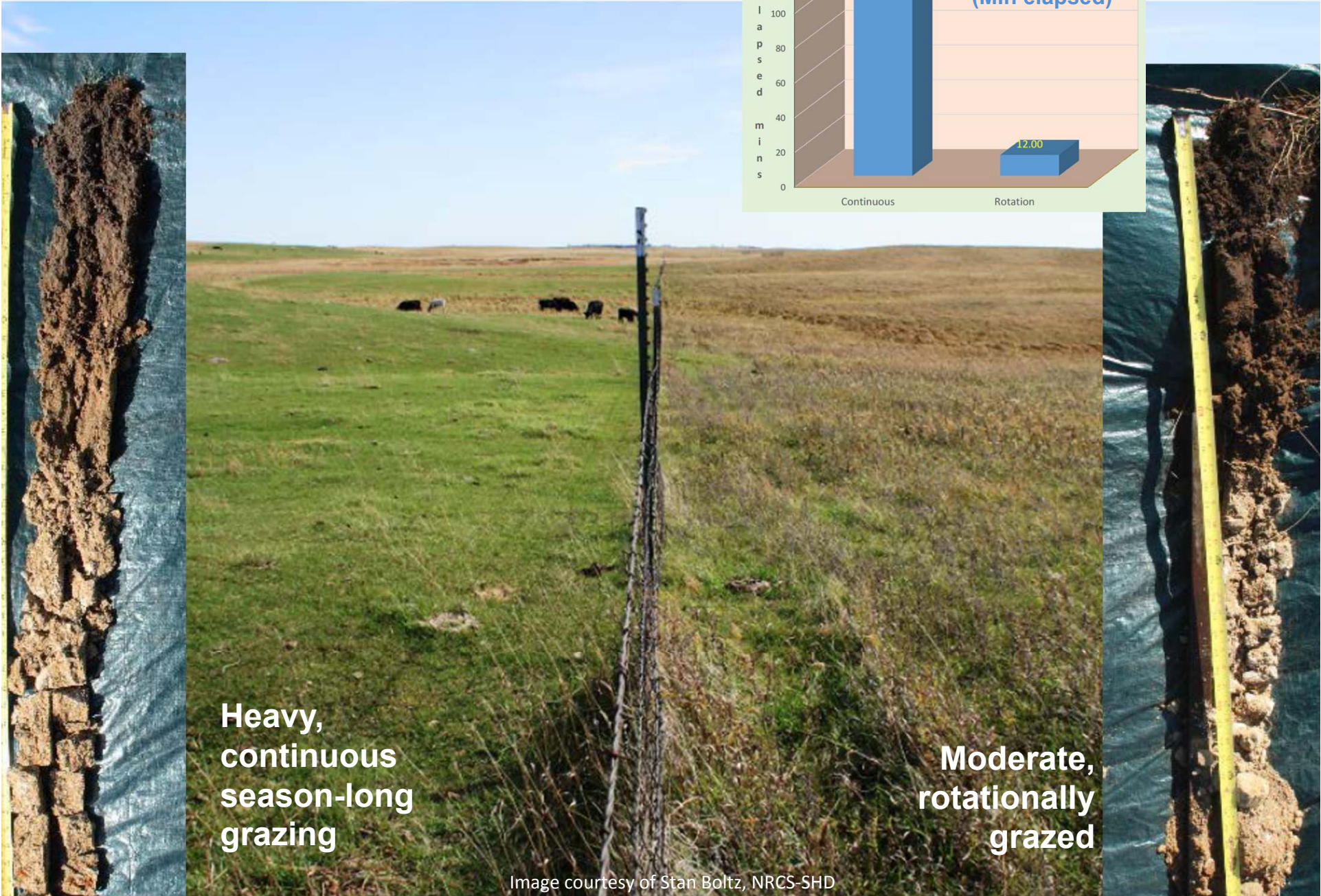


Conventional Potato System



Soil Improving Potato System

Honeycutt et al., 2007; Maine ARS

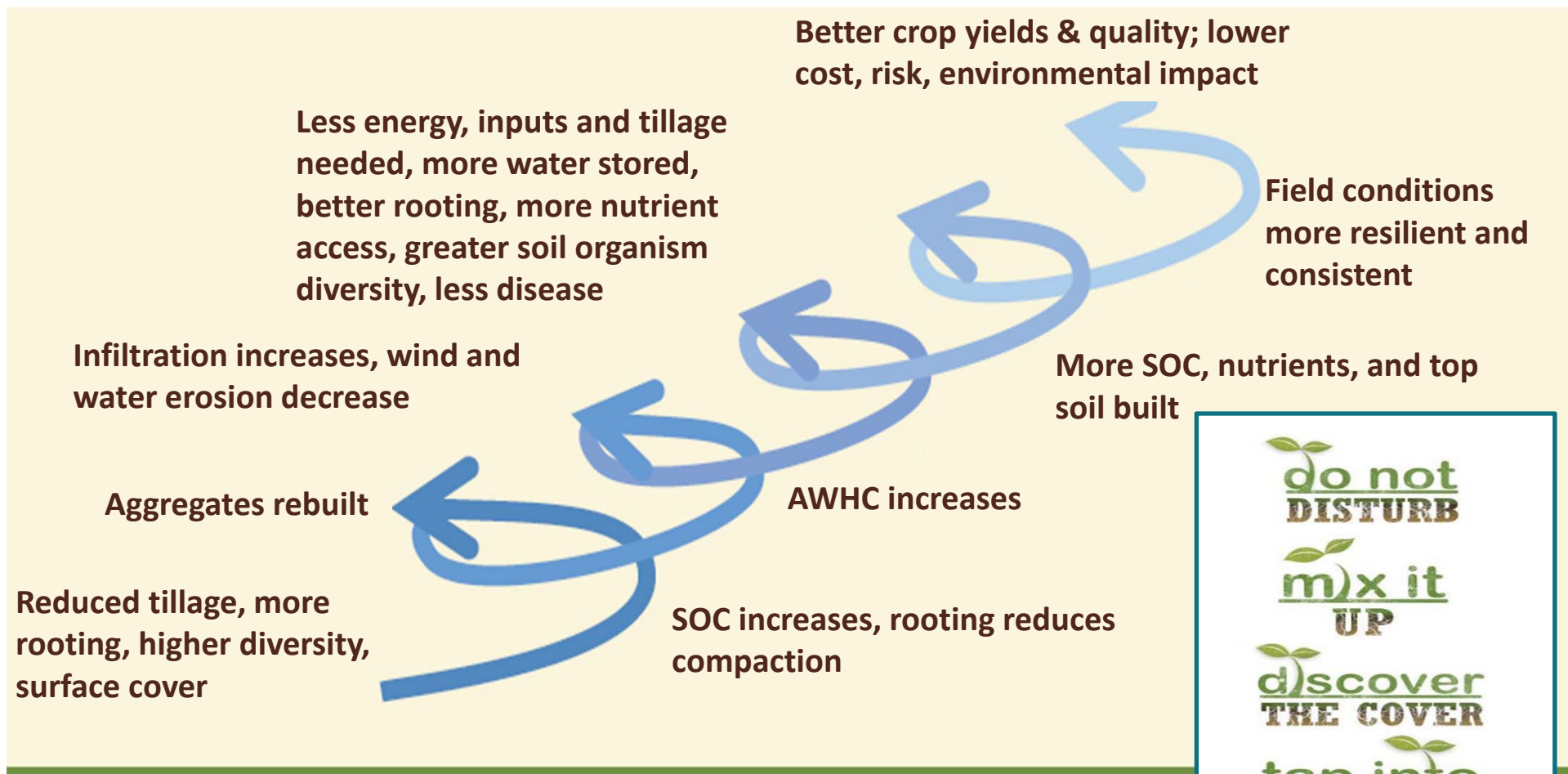


**Heavy,
continuous
season-long
grazing**

**Moderate,
rotationally
grazed**

Image courtesy of Stan Boltz, NRCS-SHD

Goal: WIN-WIN Regenerative Soil Health Management Systems Become the Common Place on America's Working Lands



Soil Health Management Systems for Resilient & Productive Soils

Provide diverse C sources and biochemicals

- Stimulate microbial diversity and abundance, services
- Break disease cycles
- Increase SOM, aggregation, and nutrient cycling
- Enhance plant growth
- Increase predator & pollinator populations



Protect microbial habitat

- Maintain SOM & aggregates
- Increase water storage/access
- Reduce erosion & runoff risk
- Buffer temperature
- Reduce evaporation



Soil Health at NRCS

- Agency born in Dust Bowl
- Boots on the ground working with producers to implement conservation
- Agency uniquely positioned to assist producers in adopting soil health management systems (SHMS)
- NRCS Soil Health Campaign:
 - Fundamental Shift: reducing erosion to building a healthy agroecosystem. *Practices to Systems*
 - Raised awareness, expanded adoption
 - Growing customer demand for system adapted soil health management support
 - Encountering knowledge gaps
 - Predicted demand: catalyzed SHD



The collage features several key resources:

- Profiles in Soil Health (Oklahoma):** A cover featuring a man in a cowboy hat holding soil, with the text "PROFILES IN soil health" and "unlock the SECRETS in the SOIL".
- Profiles in Soil Health (Montana):** A cover featuring Julie Taylor, with the text "PROFILES IN soil health" and "Farming Focus on".
- Soil Health Awareness:** A section titled "soil health THEATER" with a "Watch Our Video" button.
- Learn a Little, Learn a Lot:** A section titled "LEARNING RESOURCES" with a "GROW! with it" button.
- Media:** A section titled "MEDIA get the DIRT on it" with a "News Media Resources" button.
- Growing & Sharing:** A section titled "Partner Resources" with a "GROWING & SHARING" button.
- Biology & Beyond:** A section titled "SOIL HEALTH SCIENCE" with a "BIOLOGY & BEYOND" button.
- Unlock the Secrets in the Soil:** A central article with the text "Soil is a living and life-giving natural resource. As world population and food production demands rise, leaving our soil healthy and productive is of paramount importance. So much so that we believe improving the health of our nation's soil is one of the most important conservation endeavors of our time." It includes a map of the United States and a "Vote and help promote Soil Health" section.
- Behold the Living Soil:** A section titled "BEHOLD the Living SOIL" with the text "NRCS has developed a series of soil health print aids to help consumers better understand the benefits and benefits of soil health and one of them will become a full-sized poster. Give them to vote for your favorite soil health print aid today and help us select a winner that will become our national poster in 2015. Once the winner is chosen and printed, you'll be able to order one, free of charge, for your home, office or school. Vote as often as you'd like and please feel free to ask others to vote, too!"
- Explore the Science of Soil Health:** A section titled "The Science of Soil Health, Season Two" with a "Please vote today!" button.



Geographically specific management challenges

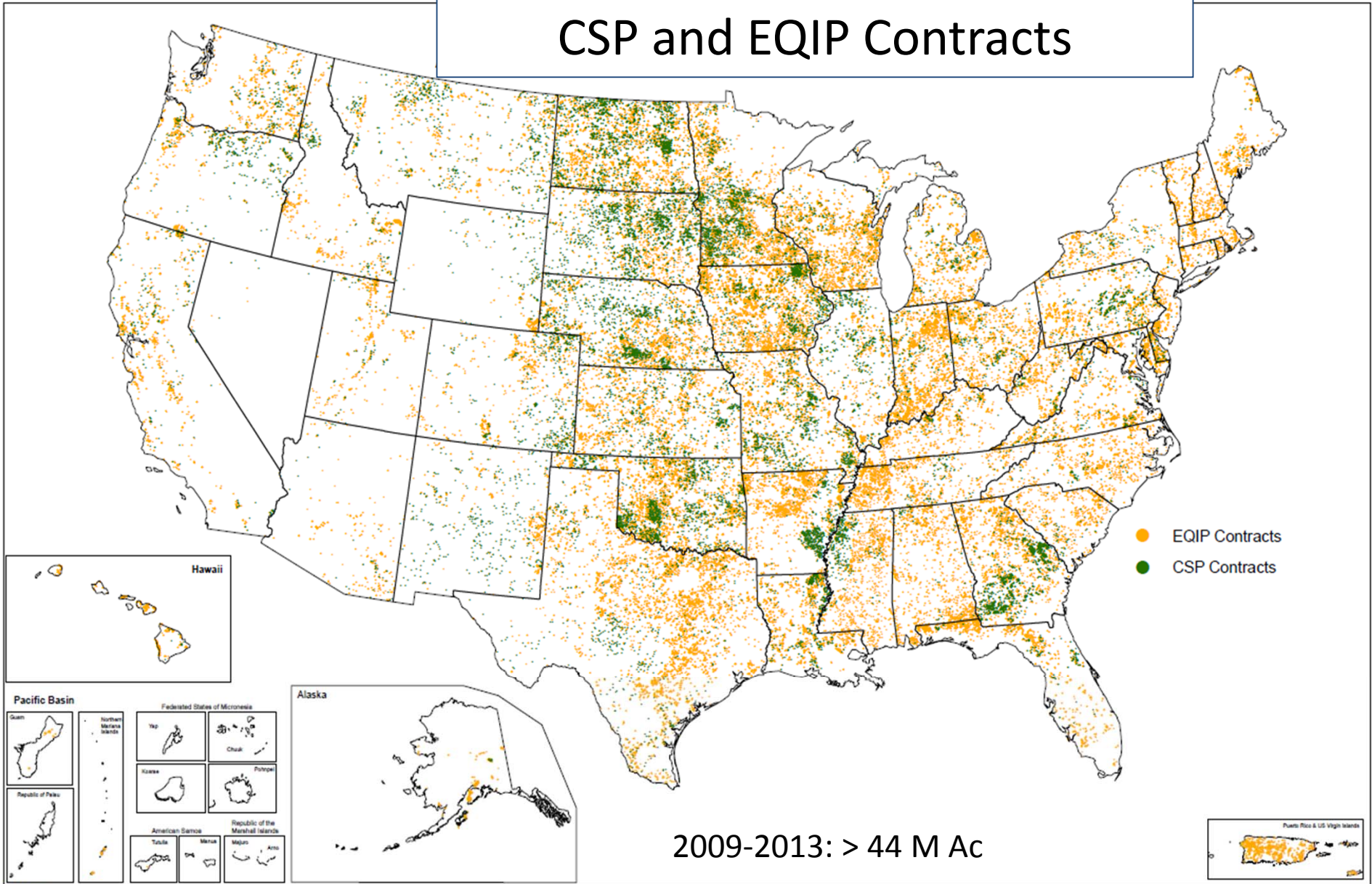


For example:

- **KS:** Is there enough water for a cover crop?
- **VT:** Is there enough growing season for cover crop establishment?
- **FL:** Will enough residue remain to suppress weeds?
- **NY:** Will residue keep the soil too wet or cold in the spring?
- **CA:** how to economically justify a cover crop, when a high value vegetable crop could grow instead?
- **WY:** What management effort is economically worth while when climate variability controls soil functioning?



Soil Health Related Practices in CSP and EQIP Contracts



Regional Conservation Partnership Program (RCPP) Projects to Improve Soil Health Management Systems Adoption

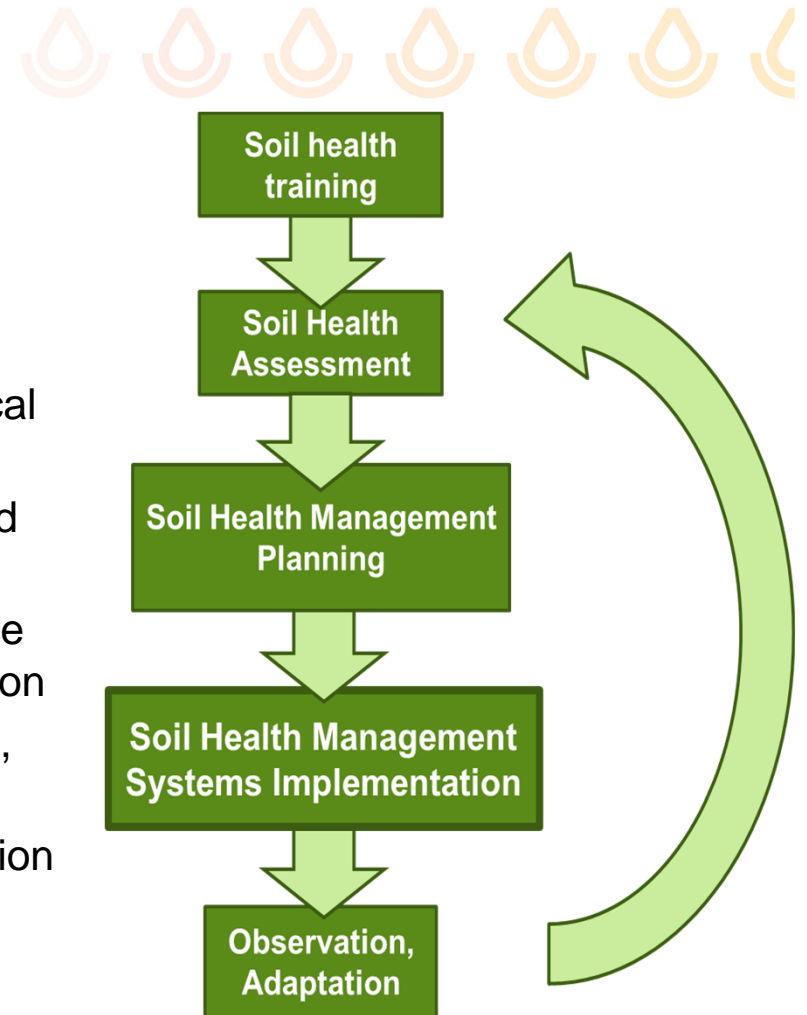
- Adoption of SHMS: promoting, demonstrating, guiding, and cost sharing
- Projects nation wide in production systems ranging from high tunnels to commodity and row crops, to vegetables, to mixed operations to pasture, range, and forest lands
- 2015-2017 funded > 20 such projects, > \$35M



Soil Health Division

Assess needs • Build partnerships
Develop and carry out strategies

- **Training** to build NRCS staff and partner technical capacity
- **Coordination** - national and regional agency and partners, to meet expanding soil health demand
- **Bridge** to external partners for soil health science and technology acquisition and expanded adoption
- **Further integration** of soil health into standards, agency policy, tools, programs
- **Soil health testing standardization**, interpretation guidance, tools for conservation planning
- **Compiling SHMS innovation** and broadly leveraging localized

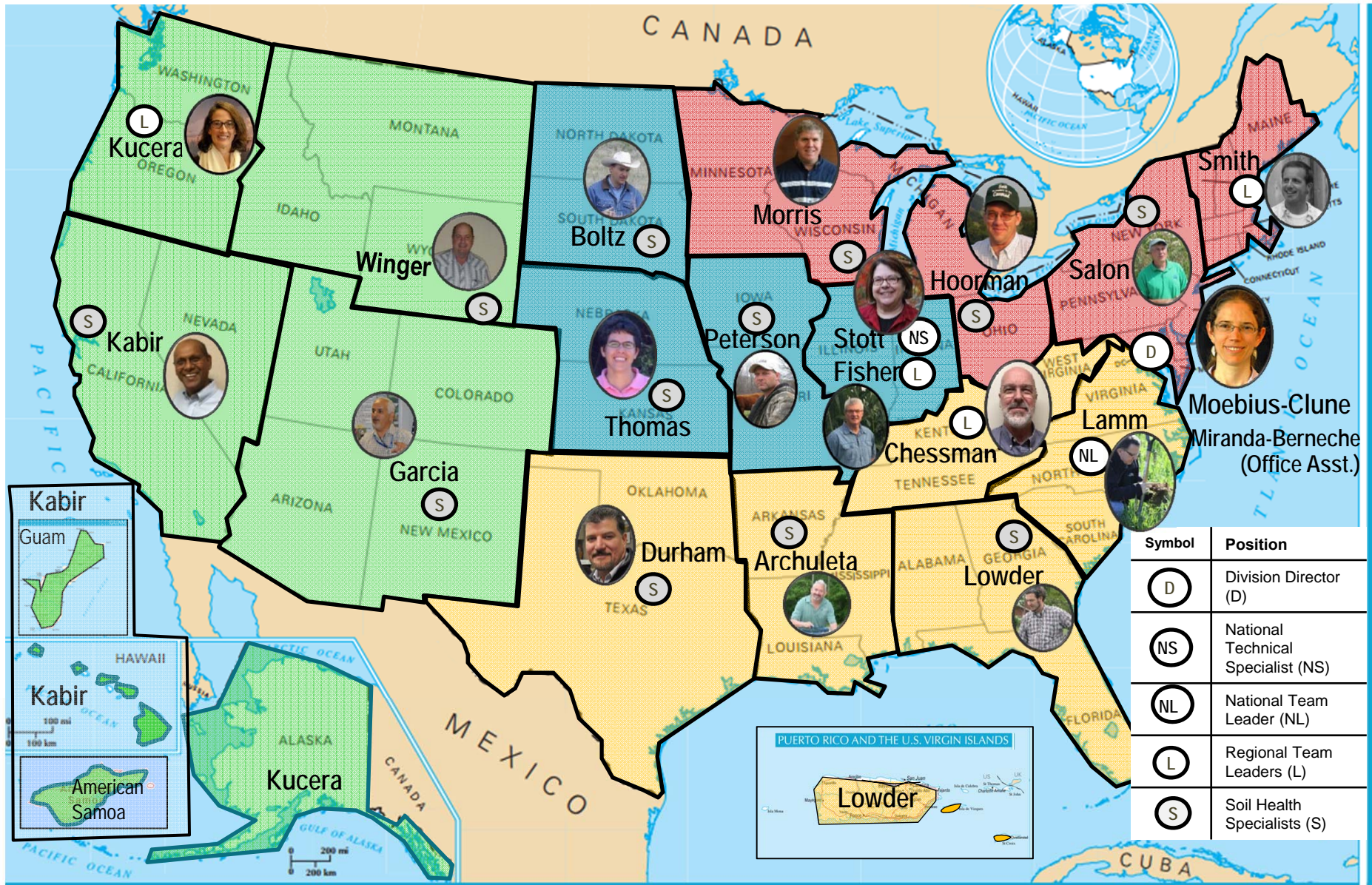


Natural Resources Conservation Service

nrcs.usda.gov/

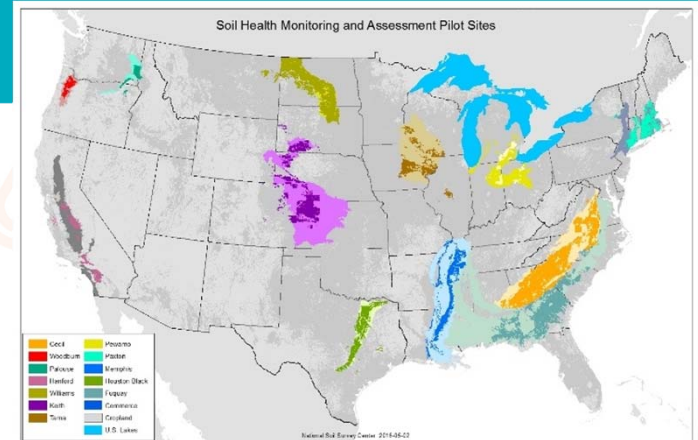


National USDA-NRCS Soil Health Division



Contacts: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/contact/conservation/st/#soil>

Strengthening the Science of Soil Health



Leveraging agency wide technical capacity and infrastructure, as well as partner resources to assess, monitor, and enhance Soil Health

Components:

1. *Evaluate existing literature on indicators and their interpretation, soil health management systems implementation*
2. *Leverage existing projects*
3. *Build and populate NRCS soils database with soil health data*
4. *Develop soil health management decision tools and citizen science portal*
5. *Monitor soil health on representative benchmark soils and evaluate management impact*



Soil Health Research Needs



1. **Soil Health Indicator soil-climate-adjusted interpretation**
2. **Indicators for further processes (pest suppression, nutrient dynamics, growth promotion, other biological processes)**
3. **Rates of change as affected by which SHMS (cropped and grazed)**
4. **Soil Health potential – what is achievable?**
5. **Relationship of soil health status to:**
 - a. Yield, yield variability and risk, crop quality, and production system economics
 - b. Environmental outcomes, ecosystem services
6. **Soil Health Management Systems (SHMS) impact on nutrient dynamics**
7. **Targeted system appropriate recommendations**
 - a. Location- and cropping system-appropriate
 - b. Economically viable
 - c. Effective for improving soil health/soil functioning
 - d. For example – for cover crops: optimal species/varieties for cropping system, mixes, seeding rates and seeding methods, management methods by cropping system/climate/soil



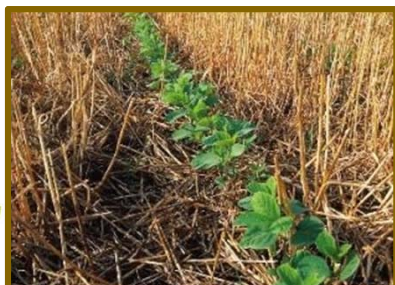


United States Department of Agriculture

Thank you! Questions?



Contacts: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/contact/conservation/st/#soil>



**Bianca Moebius-Clune, Ph.D., Director, Soil Health Division
USDA-NRCS, Washington, DC**

bianca.moebius-clune@wdc.usda.gov