# Conservation Management Plans

What is currently being done in mandatory and voluntary programs?

# Proposed Soil Sustainability Guidelines

- Carbon content
- Erosion
- Crop rotation
- Nutrition/chemical management
- Productivity
- Crop expansion

Source: July 28, 2010 LCFS Sustainability Workgroup

# Many of these already being addressed by NRCS and others

- Carbon content
- Erosion
- Crop rotation
- Nutrition/chemical management
- Productivity
- Crop expansion

Source: http://www.nrcs.usda.gov/about/history/story.html

# Special Thanks to:

- Gerald Hrdina, Executive Director MO FSA
- Bob Ball, State Conservationist, MO NRCS
- Michael Lafolette, MO FSA
- Stan Wilson, Chief Program Specialist, IL FSA
- Kevin McKlure, IA FSA
- Diane Holcomb, State Conservationist CA NRCS
- Dewaine Gelnar, Asst. State Conservationist MO NRCS

Source:
http://www.nrcs.usda.gov/about/history/story.html

# Topics to cover

- Brief history and accomplishments
- Describe existing USDA programs
- Quantify participation in most popular programs
- Describe mandatory minimum requirements of popular programs
- Briefly cover other voluntary efforts

# History of Erosion Prevention

- Soil Erosion Service established 1933
- Soil Conservation Act passed 1935
- Soil Conservation Service changed to Natural Resource Conservation Service in 1994
- Conservation districts establish local priorities
- Minimum standards unite protection nation-wide

Source: http://www.nrcs.usda.gov/about/history/story.html

# NRCS Guided by these Principles

- Assess the resources on the land, the conservation problems and opportunities.
- Draw on various sciences and disciplines and integrate all their contributions into a plan for the whole property.
- Work closely with land users so that the plans for conservation mesh with their objectives.
- Through implementing conservation on individual properties, contribute to the overall quality of the life in the watershed or region.

Source: http://www.nrcs.usda.gov/about/history/story.html

# USDA Farm Program Agencies

- NRCS-Natural Resource Conservation Service
  - Administers engineering and conservation plans
  - Administers conservation programs
- FSA- Farm Service Agency
  - Administers Commodity Programs
  - Relies on NRCS to Approve Conservation Systems
  - Relies on NRCS to enforce compliance with approved plans/systems

Source: MO NRCS State Resource Conservationist, MO FSA Executive Director

# Soil Quality

- The concept of tolerable soil loss (T factor) created to quantify the soil loss than can occur on a particular soil while sustaining long-term agricultural productivity
- Concept later introduced to go beyond T and manage for soil carbon

Source: Source: Conservation Resource Brief: Soil Quality

# Practices that enhance soil organic matter

- High biomass crop rotations
- Cover crops
- Reduced tillage
- Manage traffic (equipment, livestock, vehicles)

Source: Source: Conservation Resource Brief: Soil Quality

# Managing for Soil Quality

- Each combination of soil type and land use calls for different practices to enhance soil quality:
- Add organic matter
  - Surface residue
  - Roots of cover crops
  - Manure
  - compost
- Avoid excessive tillage
- Manage Fertilizer and pesticide use

Source: Source: Conservation Resource Brief: Soil Quality

# Soil Erosion

- From 1982 to 1997, there was a significant progress to reduce soil erosion on all cropland.
- Sheet & rill erosion dropped by 41%.
- Wind erosion dropped by 43%.
- Saved more than 1.2 billion tons of soil per year.

Source: Conservation Resource Brief: Soil Erosion

# Cropland converted to other uses

- Soil loss on cultivated crop decreased by 39.2%
- From 1982 to 2003 HEL acreage decreased by 27.8%
- Non HEL cropland decreased by 13.4%
- Significant soil erosion reduction were made by the Conservation Compliance and Sod Buster provisions of the Farm Bill

Source: Source: Conservation Resource Brief: Soil Erosion

# RUSLE2

- NRCS and ARS continue to improve upon erosion prediction models for conservation planning.
- RUSLE2 used to generate documented estimates required in USDA farm bill programs.
- Soil Conditioning Index and Soil Tillage Intensity Rating are required for determining eligibility and payment category.

Source: Source: Conservation Resource Brief: Soil Erosion

# RUSLE2

- Outputs include:
  - soil loss,
  - detachment,
  - sediment deposition by segment and at the end of the slope.
  - Flat and standing crop residue pools are racked daily and by operation as is live biomass and canopy cover, surface roughness, and other parameters important to the erosion assessment process.

Source: Source: Conservation Resource Brief: Soil Erosion

# RUSLE2

- RUSLE2 databases are now quite extensive, including:
  - Soils
  - Climate
  - Operations
  - Vegetation
  - And practices used in all states
- Over 21,000 locally adapted crop management and tillage system scenarios are available

Source: Source: Conservation Resource Brief: Soil Erosion

# Soil Quality

- Amount of cropland managed to improve soil organic matter increased by 46 million acres between 1982 and 1997.
- Residue management is the primary practice for increasing organic matter
- Organic matter binds pesticides and nutrients and reduces impact on surface and groundwater
- Wildlife habitat improves with residue management

Source: Source: Conservation Resource Brief: Soil Quality

# Water Quality

- 6 million acres of buffers help protect water quality
- Erosion rates on  cropland have dropped significantly in the last 20 years (NRI data)
- Erosion reductions on private lands from 1982-1992 produced benefits to water-based recreation of $373 million

Source: Source: Conservation Resource Brief: Water Quality

# Water Management

- Improvements on irrigated acres between 1998 and 2003:
  - reduced water use on 18.5 million acres,
  - Improved crop yield on 18.7 million acres, and
  - Decreased energy cost on 15.3 million acres
- Average irrigation rate decreased 30% between 1950 and 2000 (USGS)

Source: Source: Conservation Resource Brief: Water Management

# Water Quality

- Developed land contributes twice the amount of nitrogen and phosphorus runoff per acre compared to farm land. (NRCS)
- 2 acres of farmland converted to other used every minute. (AFT)

Source: Source: Conservation Resource Brief: Water Quality and American Farmland Trust

# Water Quality

- Conservation Effects Assessment Project (CEAP)
- Cooperative between NRCS and ARS
- Determine specific effects of conservation practices
- Using National Resource Inventory (NRI)
- Improve performance on a watershed scale

Source: Source: Conservation Resource Brief: Water

# Water Quality

- Cooperative State Research Education and Extension Service (CSREES)
- Studies underway on sediment transport, attached nutrients, and efficacy of conservation systems
- Design better conservation systems to address nutrient loss

Source: Source: Conservation Resource Brief: Water

# Water Quality

- Conservation Innovation Grants (CIG)
- Stimulates development and adoption of conservation approaches and technologies

Source: Source: Conservation Resource Brief: Water

# Conservation Connection

- Installation of practices must be in a system designed to work together
- Key to conservation reminas helping the farmer make good decisions through:
- Conservation Planning
- Conservation System Guides (CSG) specific to geographic area.

Source: Source: Conservation Resource Brief: Water

# Resource Investment

- Soil Quality Investment
  - $956,872,638 financial assistance
  - $1,078,133,263 technical assistance
- Water Quality
  - $1,130,584,621 financial assistance
  - $862,268,999 technical assistance
- Water management
  - $736,548,261 financial assistance
  - $476,533,337 technical assistance
- Total = $5,240,941,119

Source: Source: Conservation Resource Brief: Water Quality and Soil Quality 2002-2005

# Conservation Tillage

- 37.2% of all planted acres in 1998
- Due to compliance standards containing residue management practices.
- By 2004, 113 million acres were in conservation tillage, with added acres of no-till.
-

Source: Conservation Resource Brief: Soil Erosion

# Voluntary & Mandatory

- Participation in USDA farm programs is voluntary
- Voluntary participation comes with mandatory requirements
  - Food Security Act provisions
  - Protection of Highly Erodible Land
  - Wetland Protection
  - Sod-busting provisions
- Participation rates are extremely high

Source: NRCS Highly Erodible Land & Wetland Conservation Compliance

# USDA Conservation Programs

- Conservation Reserve Program (CRP)
- Conservation Security Program
- Conservation Stewardship Program
- Environmental Quality Incentives Program (EQUIP)
- Watershed protection and Flood Prevention Act payments or loan assistance
- Farm and Ranch Lands Protection Program
- Grassland Reserve Program
- Wetlands Reserve Program
- Wildlife Habitat Incentives Program
- Agricultural Management Assistance Program
- Chesapeake Bay Watershed Initiative
- Cooperative Conservation Partnership Initiative
- Conservation of Private Grazing Lands
- Conservation Innovation Grants
- Healthy Forest Reserve Program
- Small Watershed Rehabilitation Program

Source: NRCS Highly Erodible Land & Wetland Conservation Compliance and MO NRCS Asst. State Conservationist and http://www.nrcs.usda.gov/programs/farmbill/2008/index.html

# USDA Commodity Programs

- Direct and Counter Cyclical Program
- Average Crop Revenue Election Program
- Deficiency payments
- Consolidated Farm and Rural Development Act farm operating loans
- Dairy Marketing Assistance Program
- Non-insured Assisted Program
- Emergency Feed Program
- Wool and Mohair Programs
- Farm Storage Loans
- Crop Disaster Program
- Emergency Conservation Program
- Livestock Indemnity Program
- Livestock Compensation Program

Source: NRCS Highly Erodible Land & Wetland Conservation Compliance and MO FSA Executive Director

# Applied Conservation Practices

- Conservation Cover
- Conservation Crop Rotation
- Contour Buffer Strips
- Contour Farming
- Cover Crop
- Critical Area Planting
- Cross Wind Ridges
- Cross Wind Trap Strips
- Diversion
- Field Border
- Herbaceous Wind Barriers
- Irrigation Water Management
- Mulching
- Pasture and Hay Planting
- Residue Management, Mulch Till
- Residue Management Ridge Till
- Residue Management Seasonal
- Stripcropping
- Surface Roughening
- Terrace
- Tree/Shrub Establishment
- Vegetative Barrier
- Water and Sediment Control Basin
- Windbreak/Shelterbelt Establishment
- Windbreak/Shelterbelt Renovation

Source: Conservation Resource Brief: Soil Erosion

# Applied Conservation Practices

- 55,579,763 acres enrolled in some form of applied conservation practices

Source: Conservation Resource Brief: Soil Erosion

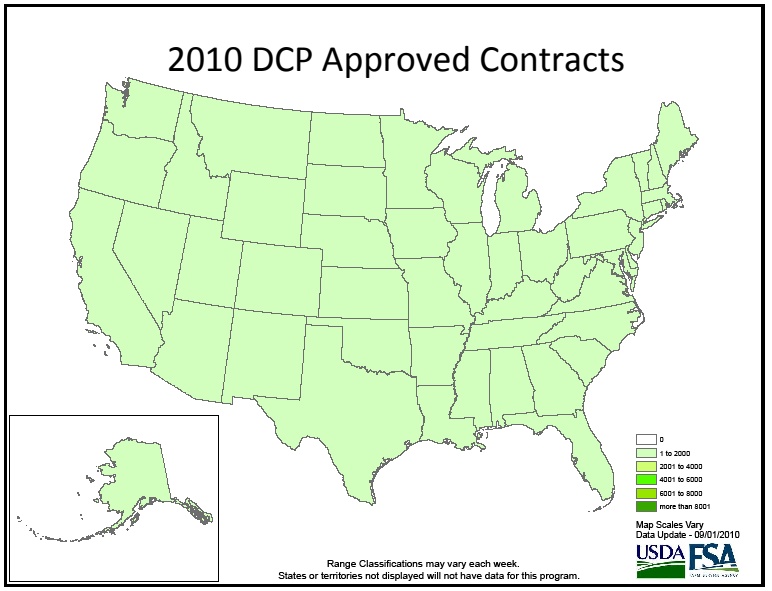
# Requirements Common to All Programs

- Each of these programs have specific requirements of farmers to implement Approved Conservation Systems
- There is a minimum requirement common to all programs.
- The minimum requirements apply to the whole farm, not just acres enrolled in a specific program.
- NRCS determines which acres require specific practices.
- Additional requirements apply to those specific acres.

Source: IL FSA Chief Program Specialist and MO NRCS Asst. State Conservationist

# What are the participation rates?

- The vast majority of farmers are enrolled in at least one USDA farm program
  - Especially large, commercial farms growing commodity crops




Source: http://www.fsa.usda.gov/FSA/webapp?area=home&subject=dccp&topic=dpr

# What are the participation rates?

- Rates for different programs vary
- Most popular programs are DCP and CRP
- Missouri
  - 73,000 farms enrolled in DCP
  - 100,000 producers enrolled in DCP
  - 42,000 CRP contracts
  - 35,000 individual producers in CRP

Source: MO FSA

# Difference between Farms and Producers

- Missouri
  - 73,000 farms enrolled in DCP
  - 100,000 producers enrolled in DCP

- Multiple producers may share in the inputs and profits to a single farm.
- Single producers often share in the inputs and profits of multiple farms

# What are the participation rates?

- Most popular programs are DCP and CRP
- Illinois
  - 129,745 farms enrolled in DCP in 2009
  - 130,994 farms enrolled in DCP in 2010
  - 26,000 farms enrolled in ACRE

Source: IL FSA Chief Program Specialist

# What are the participation rates?

- Most popular programs are DCP and CRP
- Iowa
  - 154,000 farms enrolled in DCP in 2009
  - 98% of farms participating

Source: IL FSA Chief Program Specialist

# Participation as % of farms

**Missouri**

- 73,000 farms enrolled in DCP
- 100,000 producers enrolled in DCP
- Approx. 100,000 total farms
- 73% by # of farms
  - 95% by # of acres

**Illinois**

- 129,745 farms enrolled in DCP in 2009
- 130,994 farms enrolled in DCP in 2010
- Approx. 155,000 farms
- 85% by # of farms

**Iowa**

- 154,000 farms enrolled in DCP
- 98% enrollment
  - By # farms
  - Consistent year-to-year

Source: MO, IL, and IA FSA Chief Program Specialists

# 85-98% of Farms Participate

- Who doesn't participate?
  - Small farms
  - Hobby farmers
  - Recreation/hunting lands
  - Farm bases lost to development & suburban sprawl
- Who does participate?
  - Commercial commodity farmers

Source: MO and IL FSA Chief Program Specialists

# USDA Farm Programs

- Direct and Counter Cyclical Program (DCP)
- Average Crop Revenue Election Program
- Deficiency payments
- Consolidated Farm and Rural Development Act farm operating loans
- Dairy Marketing Assistance Program
- Non-insured Assisted Program
- Emergency Feed Program
- Wool and Mohair Programs
- Farm Storage Loans
- Crop Disaster Program
- Emergency Conservation Program
- Livestock Indemnity Program
- Livestock Compensation Program
- Conservation Reserve Program
- Conservation Security Program
- Conservation Stewardship Program
- Environmental Quality Incentives Program
- Watershed protection and Flood Prevention Act payments or loan assistance
- Farmland Protection Program
- Grassland Reserve Program
- Wetlands Reserve Program
- Wildlife Habitat Incentives Program
- Agricultural Management Assistance Program
- Chesapeake Bay Watershed Initiative
- Cooperative Conservation Partnership Initiative
- Conservation of Private Grazing Lands
- Conservation Innovation Grants
- Healthy Forest Reserve Program
- Small Watershed Rehabilitation Program

Source: NRCS Highly Erodible Land & Wetland Conservation Compliance and MO FSA Executive Director and http://www.nrcs.usda.gov/programs/farmbill/2008/index.html

# DCP Requirements

- Must comply with Food Security Act of 1985
- Including:
  - Sodbuster
  - Swampbuster
  - Highly Erodible Land Conservation
  - Wetland Conservation

Source: http://www.nrcs.usda.gov/programs/compliance/index.html

# DCP Requirements

- **B CCC-509 Requirements**
- **Producers signing CCC-509 for participation in DCP agree to:**
- Comply with Highly Erodible Land and Wetland Conservation provisions on all their land,
- Devote acreage to agricultural or conserving use,
- Control noxious weeds and otherwise,
- Maintain sound agricultural practices, and
- File acreage report with respect to all cropland on the farm
- Notify FSA when there is a transfer of or change of interest of a producer.

Source: FSA Handbook Direct and Counter-Cyclical Program http://www.fsa.usda.gov/Internet/FSA_File/1-dcp.pdf

# Food Security Act of 1985 authorized: Highly Erodible Land Conservation and Wetland Conservation Provisions

The objectives of HELC and WC are to:

- Reduce soil loss because of wind and water erosion
- Protect the nation's long-term capability to produce food and fiber
- Reduce sedimentation and improve water quality
- Preserve the nation's wetlands
- Remove incentives for persons to produce agricultural commodities on HEL or converted wetland.

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Highly Erodible Land Conservation Provisions

- HEL is to be set aside, devoted to conservation uses, or otherwise not cultivated
- Persons not abiding by this provision shall be ineligible for benefits under programs administered by USDA.

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Highly Erodible Land Conservation Provisions

- A conservation system must provide for a substantial reduction in soil erosion.
- The conservation system must include all treatments and measures needed to meet the HELC requirements, including treatment required to control sheet and rill, wind, and ephemeral and classic gully erosion.
- A Substantial Reduction in Soil Erosion is generally defined as 75%

Source: http://www.nrcs.usda.gov/programs/compliance/helcindex.html

# Wetland Conservation Provisions

- persons are ineligible for benefits under programs administered by USDA if they:
  - plant an agricultural commodity on wetland that was converted after December 23, 1985
  - convert a wetland after November 28, 1990

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Highly Erodible Land Conservation and Wetland Conservation Provisions

- Apply to all land owned by the person or the person's affiliates
- HEL or WC determination must be made for all acres.

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Highly Erodible Land Conservation and Wetland Conservation Provisions

- NRCS will determine  whether a producer is actively applying a conservation system that is based on the local NRCS technical guide as approved.

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Conservation Plan

- Describes the:
  - Conservation system applicable to said cropland
  - Decisions of the person with respect to location, land use, tillage systems, and conservation treatment measures and schedules
- Is approved by the local soil and conservation district in consultation with the local committees established under section b(b)(5) of the Soil Conservation and Domestic Allotment Act (16 U.S.C. 590h(b)(5)) and NRCS.

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Approved Conservation System AD1026

- means a combination of 1 or more conservation measures or management practices that are:
  - Based on local resource conditions, available conservation technology, and standards and guidelines in NRCS Field Office Technical Guides
  - Designed to achieve a substantial reduction in soil erosion or a substantial improvements in soil conditions

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Electronic Field Office Technical Guide

http://www.nrcs.usda.gov/technical/efotg/

Technical guides used in each field office are localized so that they apply specifically to the geographic area for which they are prepared.

Source: http://www.nrcs.usda.gov/about/history/story.html

# Electronic Field Office Technical Guide

- **Section I — General References**
  descriptions of Major Land Resource Areas, watershed information, and links to NRCS reference manuals and handbooks, researchers, universities, and agencies, conservation practice costs, agricultural laws and regulations, cultural resources, and information about protected plant and animal species.
- **Section II — Soil and Site Information**
  detailed information about soil, water, air, plant, and animal resources, NRCS Soil Surveys, Hydric Soils Interpretations, Ecological Site Descriptions, Forage Suitability Groups, Cropland Production Tables, Wildlife Habitat Evaluation Guides, Water Quality Guides, and other related information
- **Section III — Conservation Management Systems**
  NRCS Quality Criteria, which establish standards for resource conditions that provide sustained us.
- **Section IV — Practice Standards and Specifications**
  NRCS Conservation Practices. Practice Standards define the practice and where it applies. Practice specifications are detailed requirements for installing the practice in the state.
- **Section V — Conservation Effects**
  background information on how Conservation Practices affect each identified resource concerns in the state.

Source:
http://www.nrcs.usda.gov/programs/compliance/WCindex.html

# eFOTG Section IV — Practice Standards and Specifications

- Example: Conservation Practice Standard 590, Nutrient Management
- Annual plan updates shall document the crops, tillage, nutrient application rates, and methods actually implemented."
- Soils shall be tested a minimum of once every four years by a DATCP-certified laboratory for pH, phosphorus (P), potassium (K), and organic matter…

Source:
http://www.nrcs.usda.gov/programs/compliance/WCindex.html

# Conservation Plans and Systems

- **Mandatory Requirements**
- Designed to achieve substantial reduction in soil erosion according to the NRCS eFOTG
- Technically feasible based on local resource conditions and conservation technology
- Economically feasible and not cause undue hardship

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

- Can NRCS voluntary standards be incorporated into regulation?

# Compliance Checks

- NRCS completes status review each calendar year.
- NRCS determines producer is actively applying approved conservation plan or system.
- FSA also ensures compliance through normal business activity and compliance spot checks.

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Enforcement Tentacles

- Example from FSA handbook:
- Producer A violates HELC on farm 100.
- Producer B places beehives on farm 100.
- Producer A is ineligible according to paragraph 705 for honey benefits on farm 100.

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Enforcement Tentacles

- Violation data is entered into the National Database, FSA-493

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# Part 9 Section 1

- A person may be denied all program benefits if determined that the person participated in a scheme or device to evade HELC or WC provisions. Including:
  - Concealing information
  - Submitting false information
  - Concealing interests in farming operations

Source: FSA Handbook Highly Erodible Land and Conservation Wetland Provisions
http://www.fsa.usda.gov/Internet/FSA_File/6-cp.pdf

# DCP Summary

- 95-98% of farms participate voluntarily in DCP
- USDA programs require mandatory conservation systems/plans
- Conservation systems/plans are approved by NRCS personnel
- NRCS & FSA enforce compliance with conservation plans

# Conservation Reserve Program

- 33,720,678 CRP acres
- FSA administers CRP, while technical support functions are provided by:
  - USDA's Natural Resource Conservation Service (NCRCS);
  - USDA's Cooperative State Research, Education, and Extension Service;
  - State forestry agencies;
  - Local soil and water conservation districts;
  - Private sector providers of technical assistance.

Source: http://www.nrcs.usda.gov/about/history/story.html

# Conservation Reserve Program

- For erodible land or land located in a conservation priority area
- Participants must establish long-term, resource-conserving cover.
- Offers for CRP contracts are ranked according to the Environmental Benefits Index (EBI). FSA collects data for each of the EBI factors based on the relative environmental benefits for the land offered. Each eligible offer is ranked in comparison to all other offers and selections made from that ranking. FSA uses the following EBI factors to assess the environmental benefits for the land offered:
  - Wildlife habitat benefits resulting from covers on contract acreage;
  - Water quality benefits from reduced erosion, runoff, and leaching;
  - On-farm benefits from reduced erosion;
  - Benefits that will likely endure beyond the contract period;
  - Air quality benefits from reduced wind erosion; and
  - Cost.

Source: http://www.nrcs.usda.gov/about/history/story.html

# Conservation Stewardship Program

- CSP addresses resource concerns in a comprehensive manner by:
  - Undertaking additional conservation activities; and
  - Improving, maintaining, and managing existing conservation activities.
- The entire operation must be enrolled and must include all eligible land operated under the applicant's control

Source: http://www.nrcs.usda.gov/programs/new_csp/csp.html

# CSP Enhancement Activities

- Enhancement Activities

- Air Quality
- Animal
- Energy
- Plant
- Soil Erosion
- Soil Quality
- Water Quality
- Water Quantity
- Special Projects
- Bundles

Source: http://www.nrcs.usda.gov/programs/new_csp/csp.html

# Soil Quality under CSP

- **Soil Quality:**
- SQL01 Controlled Traffic System (PDF, 105KB)

  SQL02 Continuous Cover Crops (PDF, 51KB)

  SQL03 Drainage Water Management for Nutrient Pathogen or Pesticide Reduction (PDF, 65KB)

  SQL04 Use of Cover Crop Mixes (PDF, 62KB)

  SQL05 Use of Deep Rooted Crops to Break up Soil Compaction (PDF, 105KB)

  SQL06 Conversion of Cropland to Grassbed Agriculture (PDF, 61KB)

  SQL07 Forest Stand Improvement for Soil Quality (PDF, 56KB)

  CCR99 Resource-Conserving Crop Rotation (PDF, 149KB)

Source: http://www.nrcs.usda.gov/programs/new_csp/2010_jobsheets-rp-two.html#soil_ero

# EQIP

- The EQIP objective to optimize environmental benefits is achieved through a process that begins with National priorities that address:
- Impaired water quality;
- Conservation of ground and surface water resources;
- Improvement of air quality;
- Reduction of soil erosion and sedimentation; and
- Improvement or creation of wildlife habitat for at-risk species.

Source: http://www.nrcs.usda.gov/programs/farmbill/2008/pdfs/EQIP_factsheet.pdf

# Other Efforts

- Council for Agricultural Science and Technology (CAST)
- Keystone Alliance for Sustainable Agriculture
- Certified Environmental Management Systems for Agriculture

# Council for Agricultural Science and Technology (CAST)

- Publications like:
- Comparative Environmental Impacts of Biotechnology-derived and Traditional Soybean, Corn, and Cotton

Source: http://www.nrcs.usda.gov/about/history/story.html

# Keystone Alliance for Sustainable Agriculture

- Soybean land use decreased by 26% per bushel
- Energy use decreased 54% per acre
  - 61% per bushel
- Decreased soil loss by more than 1 ton per acre (37%)
- Reduced carbon emissions by 22 lbs per acre (24%)

Field to Market study (1987-2008)

# Certified Environmental Management Systems for Agriculture

- Piloted by Iowa Soybean Association
- Now starting in six other states for multipel commodity crops
- Soil management
- Nutrient management
- Pest management
- Energy conservation

Source: http://www.nrcs.usda.gov/about/history/story.html