United States Department of Agriculture

NRCS Conservation Planning

Concepts and Tools

Presented by:

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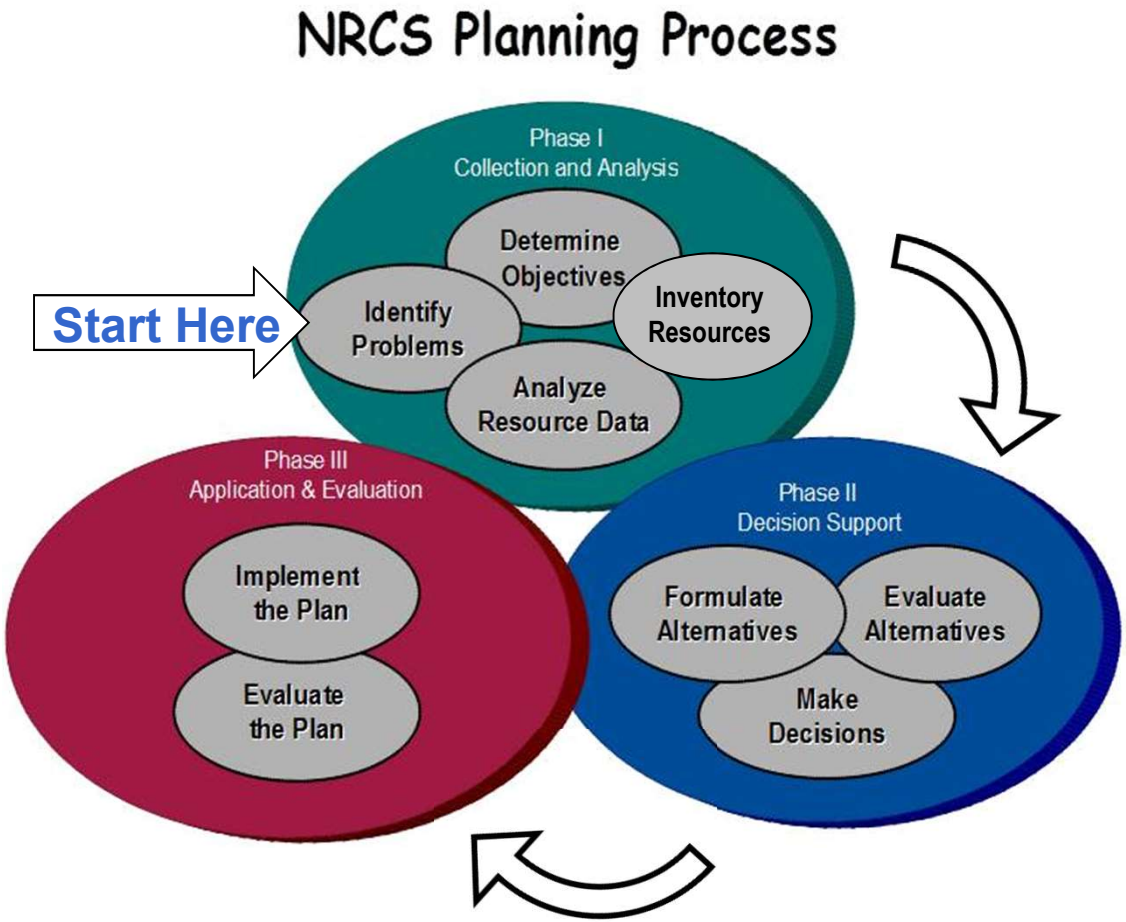
www.il.nrcs.usda.gov

Illinois Sustainable Ag Partnership – June 19, 2019

Agenda

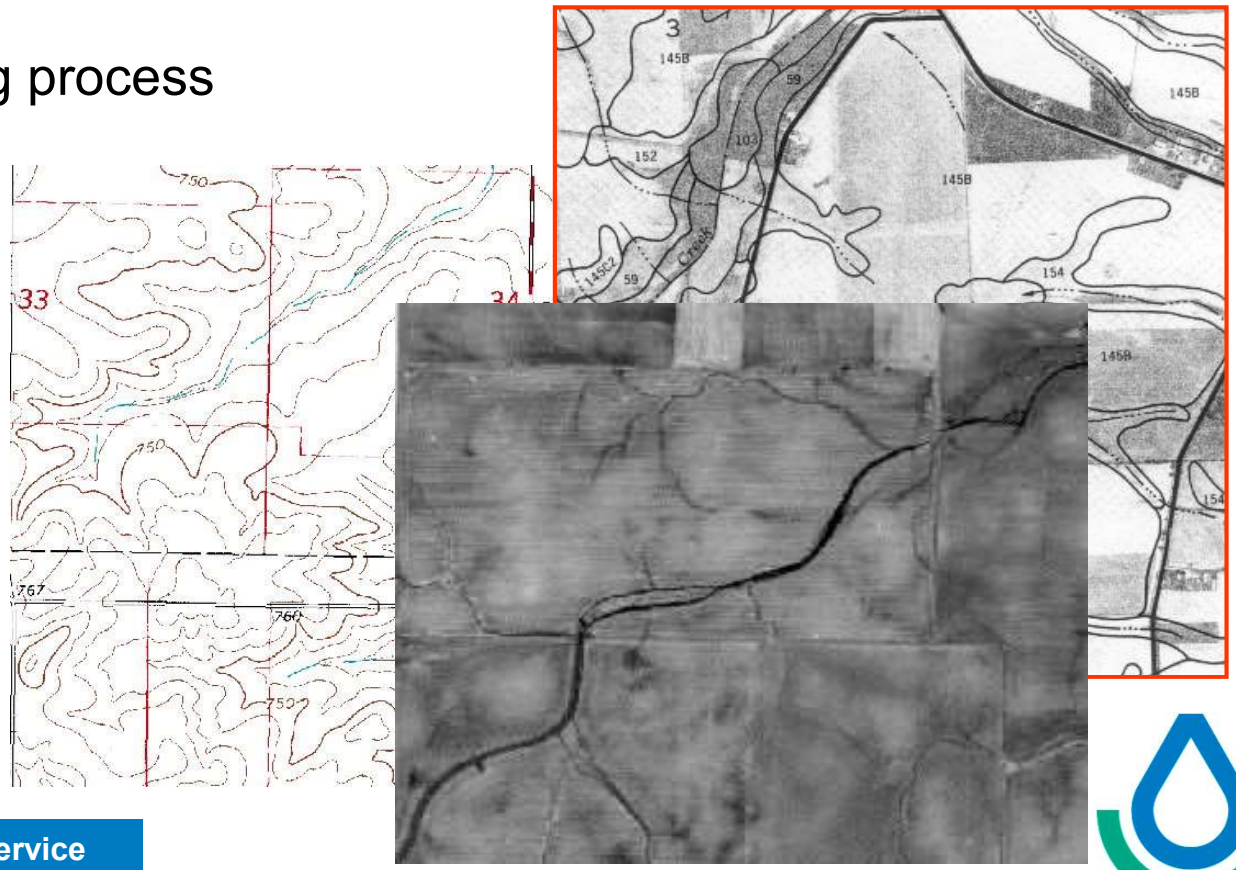
- NRCS' 9-step conservation planning process
- Finding and using NRCS technical resources

Planning before Implementation



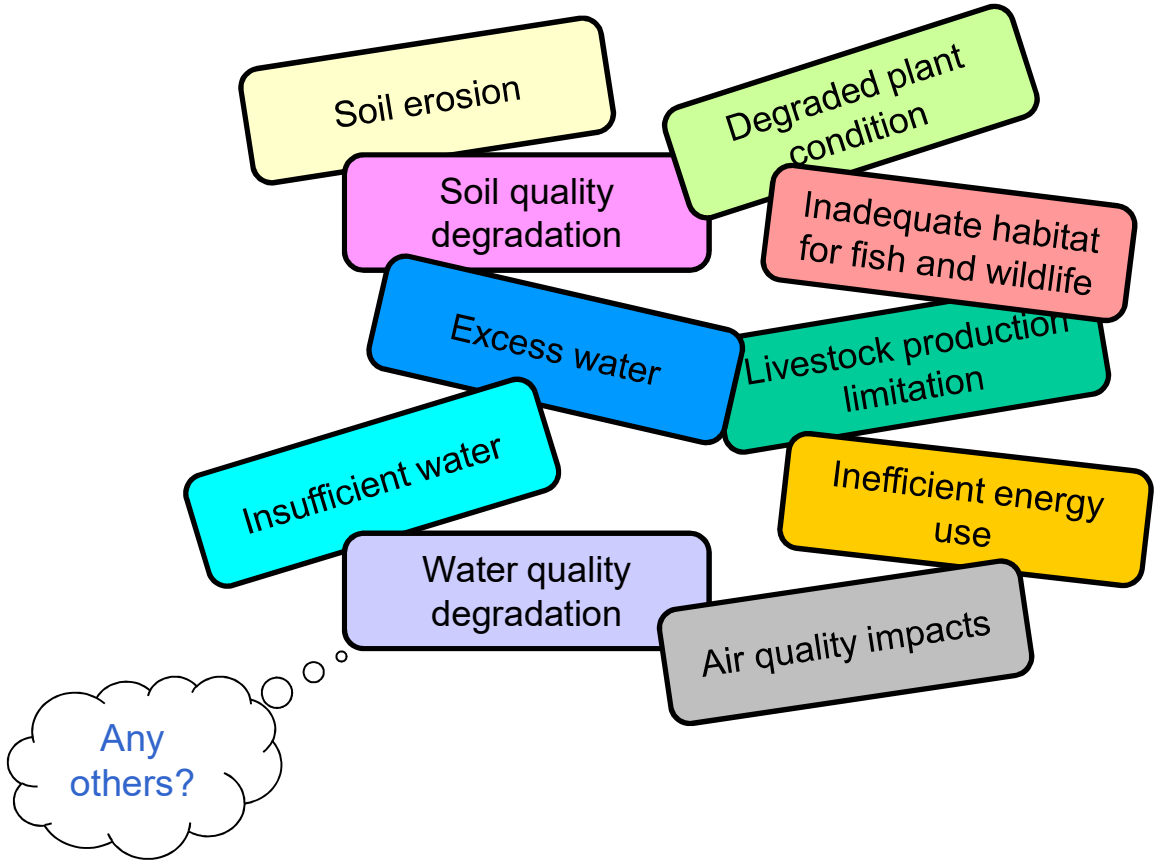
Preplanning

- Assemble the information you have so far
- Who are the clients and their roles
- Explain the planning process



Identify Problems

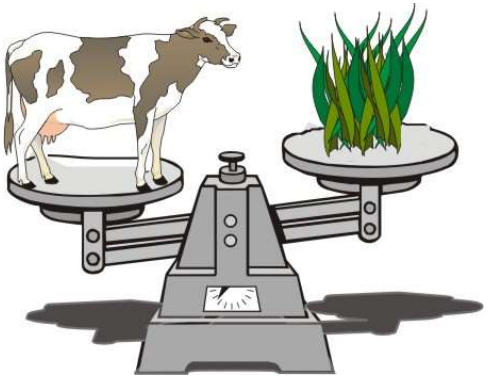
What are the Resource Concerns?



Determine Objectives

Inventory Resources

- Soil
- Water
- Air
- Plants
- Animals
- Energy
- Human considerations



Analyze Resource Data

- Use all information gathered so far
- Analyze why the issues are happening
- Establish a benchmark condition – scientifically speaking
- Sort out any potential issues with regulations and program rules

Formulate & Evaluate Alternatives

- What practices could work?
- Which ones would be most effective?
- Do we need several practices together as a system?

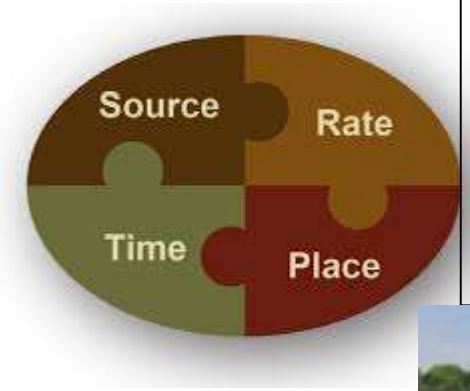
Resource Concern	Grassed Waterway	Nutrient Mgt	DWM	Bioreactor
Soil Erosion	5	0	0	0
Excess Water	3	0	-2	0
Water Quality	2	5	3	3

Conservation Practice Physical Effects

Suites of Practices

- Conservation Drainage +
  - Nutrient Management
  - Filter Strips
  - Cover Crops

- Drainage Water Management
- Saturated Buffers
- Constructed Wetlands
- Denitrifying Bioreactors



Are they really BMP's?

- BMP = "Best Management Practice"
- What is best for a particular site?
- Figure out what the problem is…
- Consider the conservation practices available…
- Choose the "best"! Now you've got a "BMP".

Make Decisions

- CLIENT makes the decisions
- Write it all down

WHAT'S RIGHT *for your farm?*

Implement the Plan

- Apply for program dollars (if desired)
- Design the conservation practices
- Preconstruction conference
- Work with the contractor
- Provide Operation & Maintenance instructions

Evaluate the Plan

- How's it working?
- Any changes needed?
- Lessons learned?

Agenda

- NRCS' 9-step conservation planning process
- Finding and using NRCS technical resources

Technical References

- Field Office Technical Guide
- National Handbooks
- Web Soil Survey
- Software

and much, much more...

United States Department of Agriculture

FIELD OFFICE TECHNICAL GUIDE

Support Help Login

Welcome to NRCS Field Office Technical Guide (FOTG)

Select a state for documents.

State:

Select... SUBMIT

About FOTG

Technical guides are the primary scientific references for NRCS. They contain technical information about the conservation of soil, water, air, and related plant and animal resources.

Technical guides used in each field office are localized so that they apply specifically to the geographic area for which they are prepared. These documents are referred to as Field Office Technical Guides (FOTGs).

Appropriate parts of the Field Office Technical Guides are automated as databases, computer programs, and other electronic-based materials such as those included in these web based pages.

FOTG Sections

Section I - General References

- General state maps.
- Descriptions of Major Land Resource Areas, watershed information, and links to NRCS reference manuals and handbooks.
- Links to researchers, universities, and agencies we work with.
- Conservation practice costs and agricultural laws and regulations.

Section II - Natural Resources Information

- Detailed information about soil, water, air, plant, and animal resources.
- Cultural resources and information about protected plant

Section III - Conservation Management Systems

- NRCS Quality Criteria, which establish standards for resource conditions that help provide sustained use.

Section IV - Practice Standards and Specifications

- NRCS Conservation Practice Standards that 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.

nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/

Natural Resources Conservation Service

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FOTG – Section I – General References

NATURAL RESOURCES CONSERVATION SERVICE

EDGE-OF-FIELD WATER QUALITY MONITORING
DATA COLLECTION AND EVALUATION

CONSERVATION ACTIVITY
(Code 201)

...d evaluation under this conservation activity standa...
... and protocols, by which a producer will me...
...stems. Evaluation of conservation...
...d to a better understandin...
...lidating the appli...

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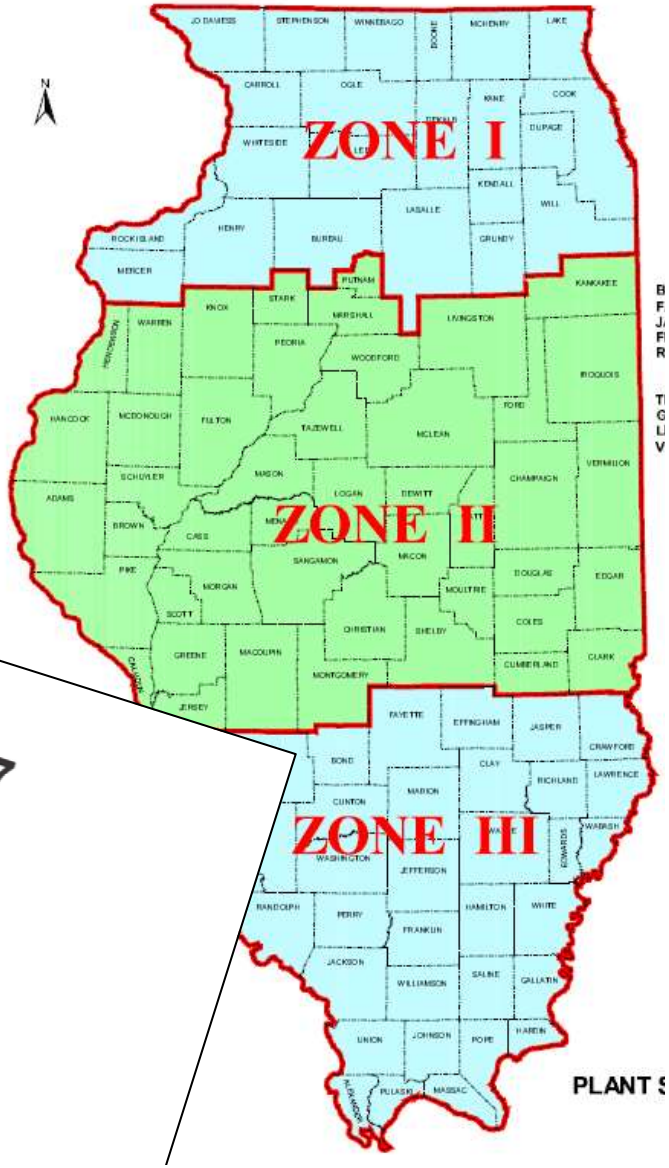
Natural Resources Conservation Service

May 2013

Agronomy Technical Note No. 7

Adaptive Nutrient M...
Process



FOTG – Section II
Natural Resources Information

Climate Data for Champaign County, Illinois

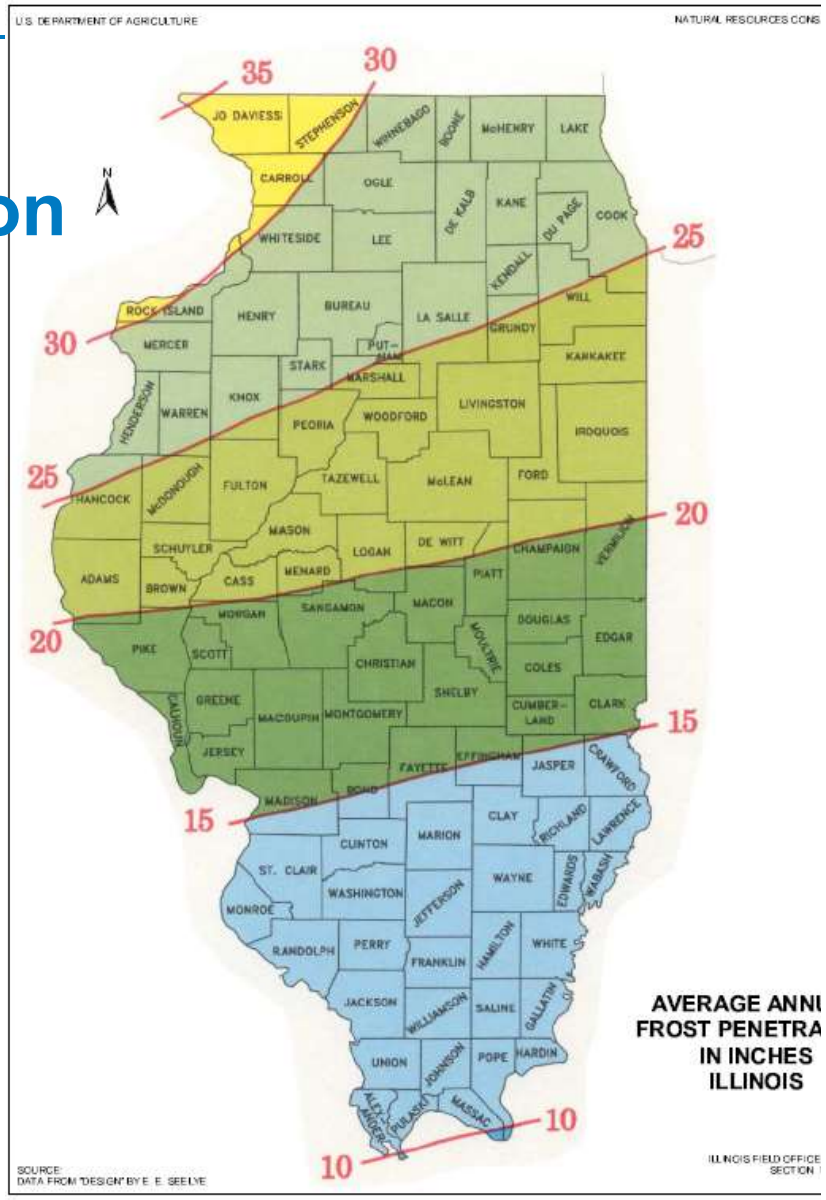
1. Product	2. Location	3. Variable	4. Year	5. View
○ Daily data for a month	CHAMPAIGN 9 SW	◉ Max Temperature	◉ This year	Go
○ Daily almanac	CHAMPAIGN WILLARD AP	○ Min Temperature	○ Last year	
◉ Monthly avgs/totals	RANTOUL CHANUTE AFB	○ Avg Temperature	○ 1971-2000	
○ Monthly occurrences	FISHER	○ Precipitation	○ 1981-2010	
○ Monthly extremes	HOMER 4 NNW	○ Snowfall	○ Select year: 2015	
○ Daily extremes	MAHOMET	○ Snow Depth		
○ Daily/monthly normals	OGDEN	○ GDD (Base 50)		
○ Record extremes	PHILO			
○ Frost/freeze dates	RANTOUL			
○ TAPS	URBANA			
○ FROST				
○ GROWTH				
○ WETS				
○ DAYS				

Product Description:

MONTHLY AVERAGES/TOTALS - calculates averages or totals, as appropriate, for the selected variable for each month of the year. This product is available for the current year, the previous year, an average of the normal periods, or any other year in the period of record. Additional

Questions, comments

Powered by ACIS NOAA Regional Climate Centers



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FOTG – Section III – Conservation Management Systems

DRAINAGE WATER MANAGEMENT PLAN CRITERIA
PRACTICE/ACTIVITY CODE (130) (NO.)

1. Definition of a Drainage Water Management Plan

The objective of Drainage Water Management (DWM) is to control soil water table
elevations and the timing of water discharges from subsurface or surface agricultur
drainage systems for the following purposes:

en, and pesticide loading from drainage systems
aters.
ealth, and vigor of plants.
ation of organic soils.

Management Plan (DWMP) is to provide the pro
of DWM on existing artificially drained land. Th
stem can be effectively determined by intervie
es and soil types, obtaining a drain map, develo
ng these components to produce a DWMP for t

m criteria to be addressed in the development

with Section 1240 (A), the Environmental Quali
des funding support through contracts with

Resource Concerns and Planning Criteria for Conservation Planning
10/1/2015

	Component	Screening	Assessment Level	Assessment Tools
	Excess nutrients in surface water	Organic or inorganic nutrients are not applied **AND** PLU is not grazed	Nutrient and amendment applications are based on soil or tissue tests and nutrient budgets for realistic yields **AND** Conservation practices and management are in place to minimize surface water impacts	Client input / planner observation
	Excess nutrients in groundwater		Nutrient and amendment applications are based on soil or tissue tests and nutrient budgets for realistic yields AND Conservation practices and management are in place to minimize groundwater impacts	Nutrient budget
	Excess nutrients in surface water		Streambanks are grazed but stable. Mix of pasture plants and native water's edge species present. Muddy livestock stream crossing(s) or pond entrance(s) not used heavily. Alternative water sites present. (PCS - Streambank / shoreline erosion element score ≥ 4) **AND** PCS - Livestock concentration areas element score ≥ 4 **AND** Nutrient and amendment applications are based on soil or tissue tests and nutrient budgets for realistic	PCS – Pasture Condition Score Nutrient budget
	Excess nutrients in groundwater			

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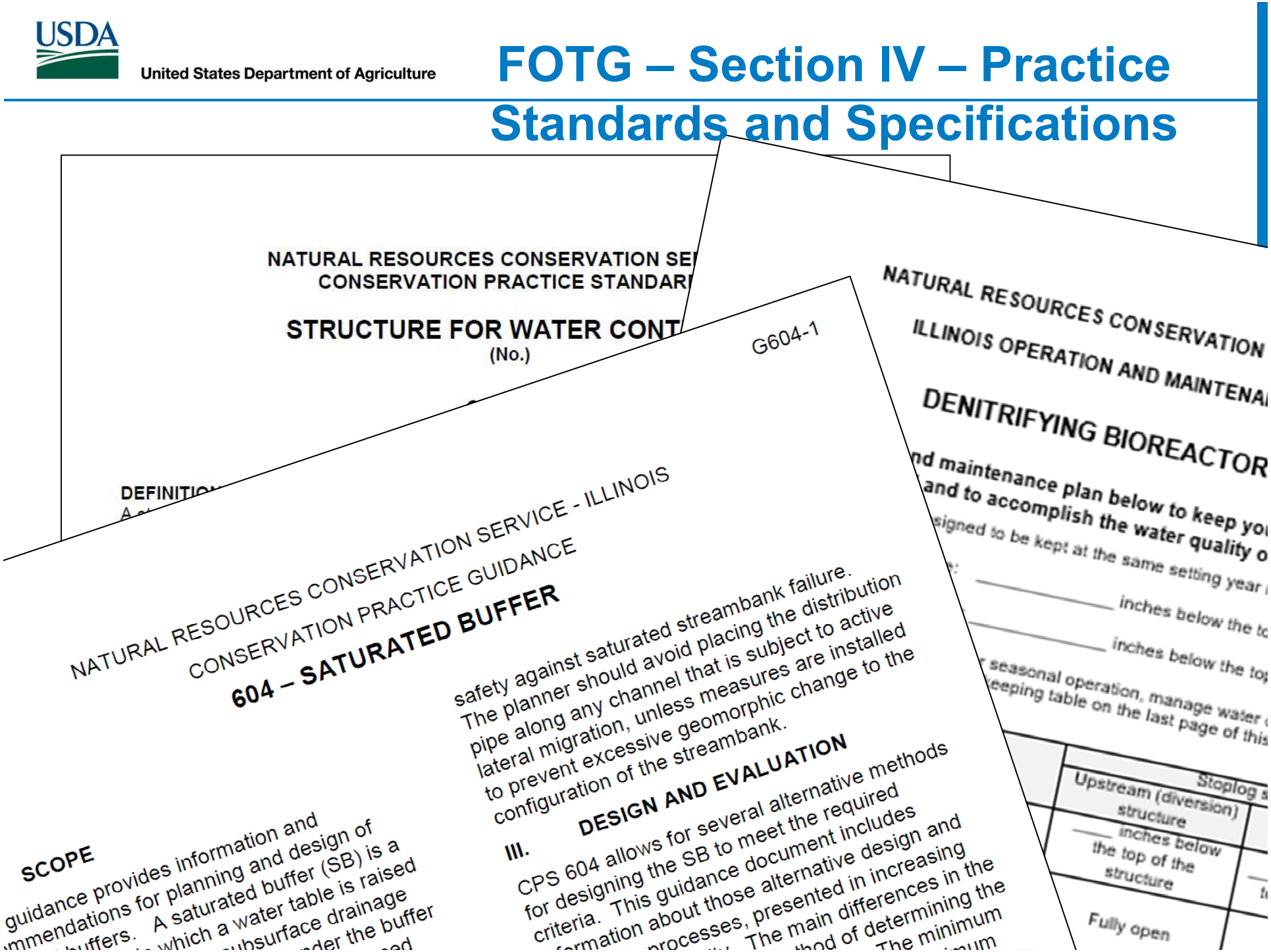
FOTG – Section IV – Practice Standards and Specifications



NATURAL RESOURCES CONSERVATION SE
CONSERVATION PRACTICE STANDAR

STRUCTURE FOR WATER CONT
(No.)

DEFINITIO

NATURAL RESOURCES CONSERVATION SERVICE - ILLINOIS
CONSERVATION PRACTICE GUIDANCE

604 – SATURATED BUFFER

G604-1

SCOPE

guidance provides information and
mmendations for planning and design of
buffers. A saturated buffer (SB) is a
which a water table is raised
subsurface drainage
der the buffer
ed

safety against saturated streambank failure.
The planner should avoid placing the distribution
pipe along any channel that is subject to active
lateral migration, unless measures are installed
to prevent excessive geomorphic change to the
configuration of the streambank.

III. DESIGN AND EVALUATION

CPS 604 allows for several alternative methods
for designing the SB to meet the required
criteria. This guidance document includes
formation about those alternative design and
processes, presented in increasing
The main differences in the
thod of determining the
The minimum
mum

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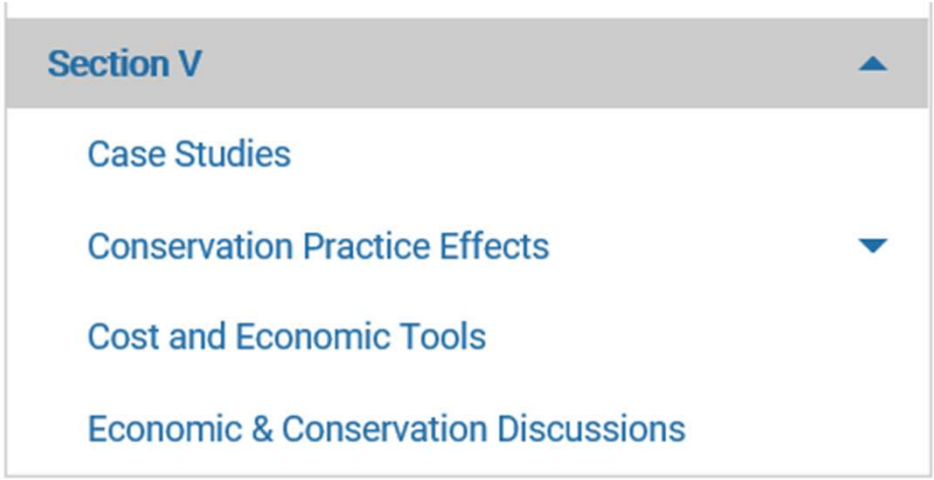
ILLINOIS OPERATION AND MAINTENA

DENITRIFYING BIOREACTOR

nd maintenance plan below to keep yo
and to accomplish the water quality o
signed to be kept at the same setting year
inches below the to
inches below the to
seasonal operation, manage water
eeping table on the last page of this

Stoplog s	
Upstream (diversion) structure	
___ inches below the top of the structure	t
Fully open	

FOTG – Section V – Conservation Effects



- Soil
- Water
- Air
- Plants
- Animals
- Energy

5 Substantial Improvement
4 Moderate to Substantial Improvement
3 Moderate Improvement
2 Slight to Moderate Improvement
1 Slight Improvement
0 No Effect
-1 Slight Worsening
- 2 Slight to Moderate Worsening
- 3 Moderate Worsening
- 4 Moderate to Substantial Worsening
- 5 Substantial Worsening

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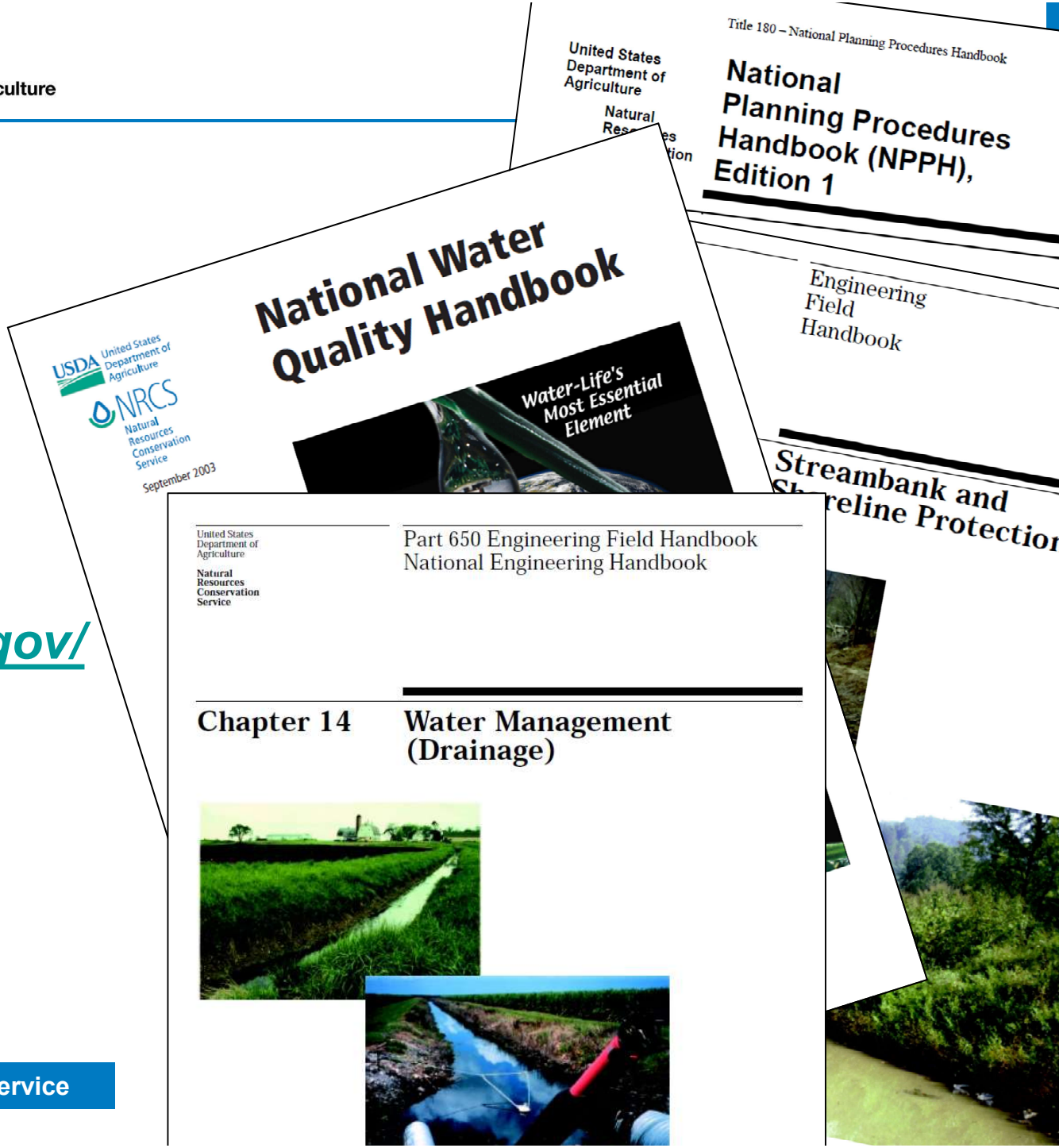
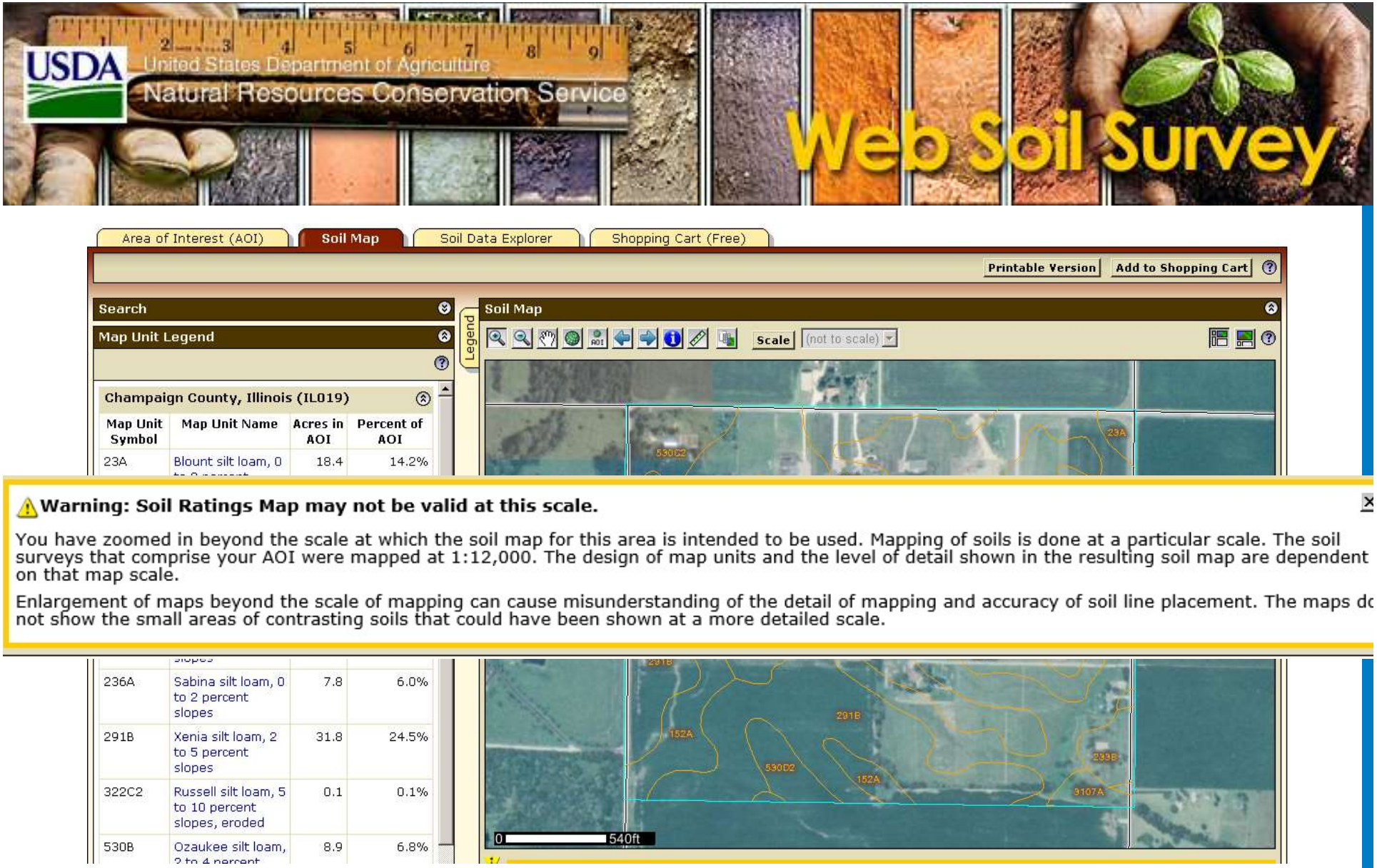
National Handbooks

policy.nrcs.usda.gov/

Natural Resources Conservation Service





websoilsurvey.nrcs.usda.gov

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Illinois NRCS Engineering

Illinois NRCS Engineering

Illinois Engineering Index

- Illinois Engineering Software
- Illinois Standard Engineering Drawings
- Illinois Engineering Construction Specs and O&M Documents
- Illinois Engineering Conservation Practice Guidance
- Illinois Urban Manual
- Engineering Field Handbook (EFH)
  - Illinois EFH Supplements and Notices
- Agricultural Waste Management Field Handbook (AWMFH)
  - Illinois AWMFH Supplements and Notices
- National Engineering Handbook (NEH)
  - NEH654 Tech Supplement 3c Streambank Inventory and Evaluation
- National Engineering Manual (NEM)
  - Illinois NEM Amendments and Notices
- RAP-M (Rapid Assessment, Point Method)

nrcs.usda.gov/wps/portal/nrcs/main/il/technical/engineering/

Engineering Software

Spreadsheet Software

Topic	Ver.	Date	Spreadsheet Software	File Type
Terraces	2.08	7-04	ILSS01Terrace_v2_08.xls	Excel
Waterways	3.10	10-18	ILSS02Waterway_v3_10.xlsb	Excel
EFH2 Hydrology	2.6	1-18	ILSS03HydrologyEFH2_v2_6.xls	Excel
Open Channel Flow	1.08	1-10	ILSS04OpenChannelFlow_v1_08.xls	Excel
Floodrouting	1.0	11-02	ILSS05FloodRouting_v1_0.xls	Excel
Stream Stabilization	3.4	5-13	ILSS06StreamStabilization_v3_5.xls	Excel
Pipeline	1.14	10-03	ILSS07Pipeline_v1_14.xls	Excel
Vegetated Treatment Area	5.0	1-18	ILSS08VTA_v5_0.xlsb	Excel
Roof Runoff	3.0	1-18	ILSS09Roof_Runoff_v3_0	Excel
Mortality Composter Design	2.1	3-17	ILSS10Mortality_Composter_v2.1	Excel
Bioreactor Design	1.9	4-19	ILSS11Bioreactor_v1.9	Excel
Saturated Buffer Design	2.1	4-17	ILSS12SaturatedBuffer_v2.1	Excel

Illinois NRCS Engineering Toolbox

Toolbox	Version	Date	Supporting Documents
Illinois NRCS GIS Tools	2.1	10-17	GIS Tool_User Guide V 2.pdf (PDF, 1 mb) LiDAR DEM Product guide 2019 .pdf (PDF, 300kb)

Standard Engineering Drawings

Engineering Drawings

Illinois NRCS Engineering Standard Drawings

List by Category

1. Dams, Ponds and Reservoirs
2. Grade Control Structures
3. Livestock Facilities - Confinement
4. Livestock Facilities - Grazing
5. Waterways, Diversions,
6. Streambank Stabilizatio
7. Wetland Structures
8. Temporary Erosion Cont
9. Miscellaneous
10. Engineering Forms

7/13	In-Line Water Control Structure 2 Compartments	130.dwg	130.dxf	130.pdf
4/19	Denitrifying Bioreactor Type 1 -Single Structure (2 Pages)	131.dwg	131.dxf	131.pdf
4/19	Denitrifying Bioreactor Type 2 -Double Structure (2 Pages)	132.dwg	132.dxf	132.pdf
4/19	Denitrifying Bioreactor Type 3 -Single Structure With DWM/Monitoring Capability (2 Pages)	133.dwg	133.dxf	133.pdf
4/19	Denitrifying Bioreactor Type 4 -Double Structure With DWM/Monitoring Capability (2 Pages)	134.dwg	134.dxf	134.pdf
6/17	Saturated Buffer Type 1	135.dwg	135.dxf	135.pdf
6/17	Saturated Buffer Type 2 w/DWM/Monitoring Capability	136.dwg	136.dxf	136.pdf

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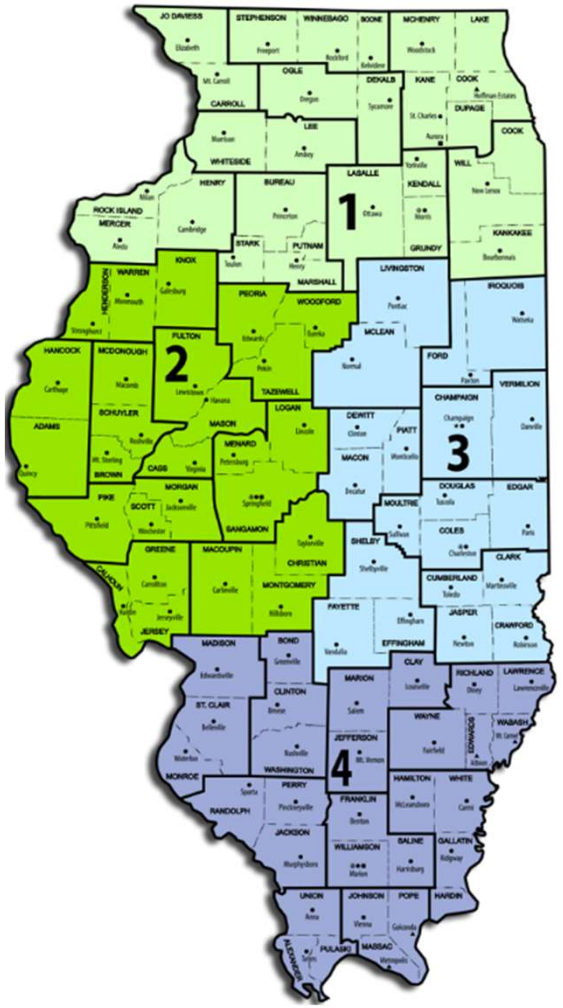
Contacting NRCS in Illinois

- Field Offices in almost every county
- Co-located with the county's *Soil and Water Conservation District*
- www.il.nrcs.usda.gov
- Or look in your phone book:
  - United States Government
  - Department of Agriculture
  - Natural Resources Conservation Service



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