NRCS
Natural Resources Conservation Service

Agricultural Research Service
the in-house research arm of the U.S. Department of Agriculture

CSREES
Cooperative State Research, Education, and Extension Service
Research, Education, and Economics

NASS

USDA
Farm Service Agency

Conservation Effects Assessment Project (CEAP)

- ***Measuring the Environmental Benefits of Conservation***
- ***Managing the Agricultural Landscape for Environmental Quality***

Why CEAP?

- OMB requests for outcome-based reporting
- 2002 Farm Bill significantly increased conservation funding → call from both inside and outside government for better accountability
- Assessment is needed to guide development and implementation of future conservation programs

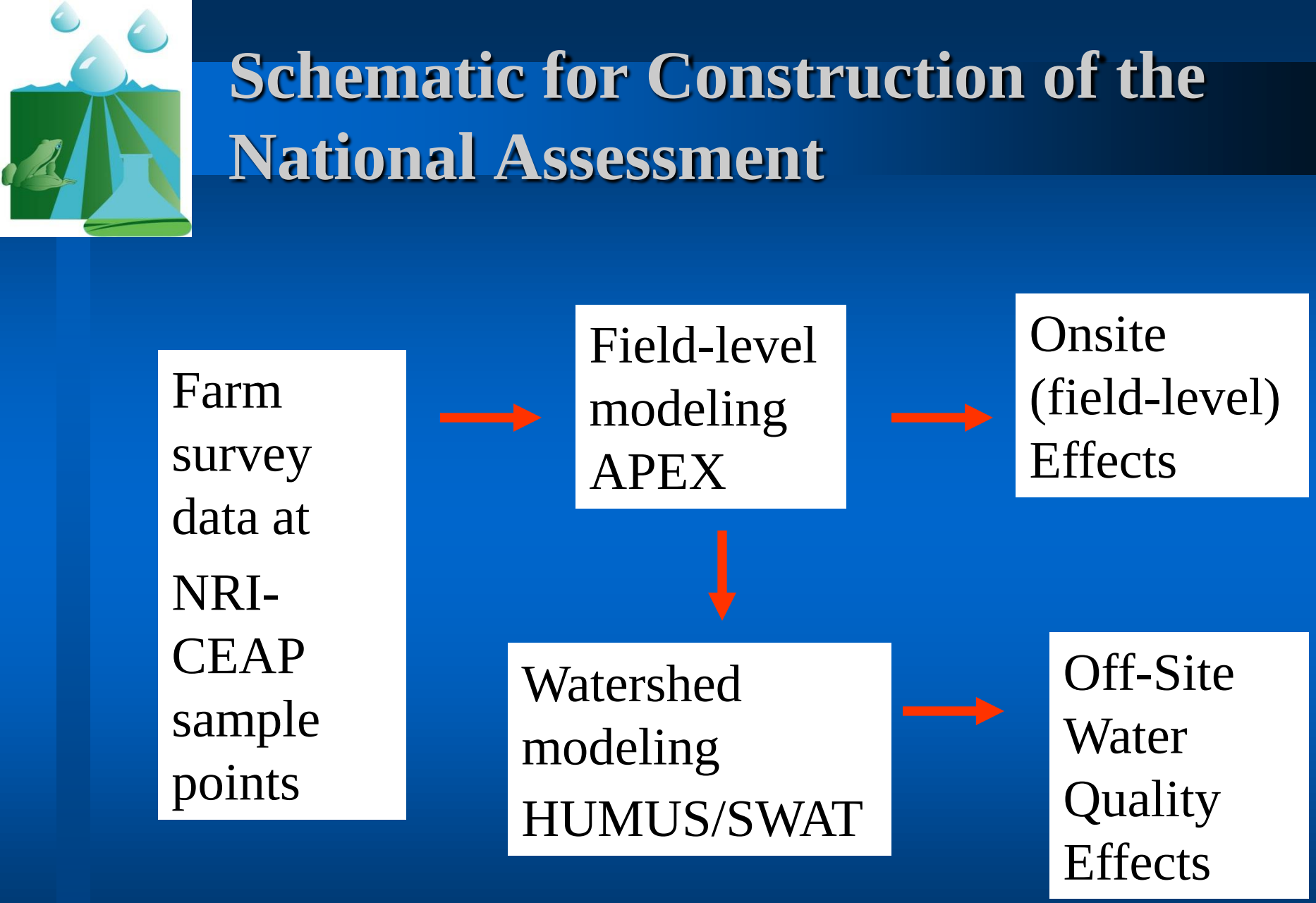
Cropland National Assessment--Goals

1. Estimate the benefits of conservation practices **currently present** on the landscape

2. Estimate the **need** for conservation practices and the benefits that could be realized under "full treatment"

3. Simulate **alternative options** for implementing conservation programs on cropland

Schematic for Construction of the National Assessment



NRI-CEAP Cropland Survey

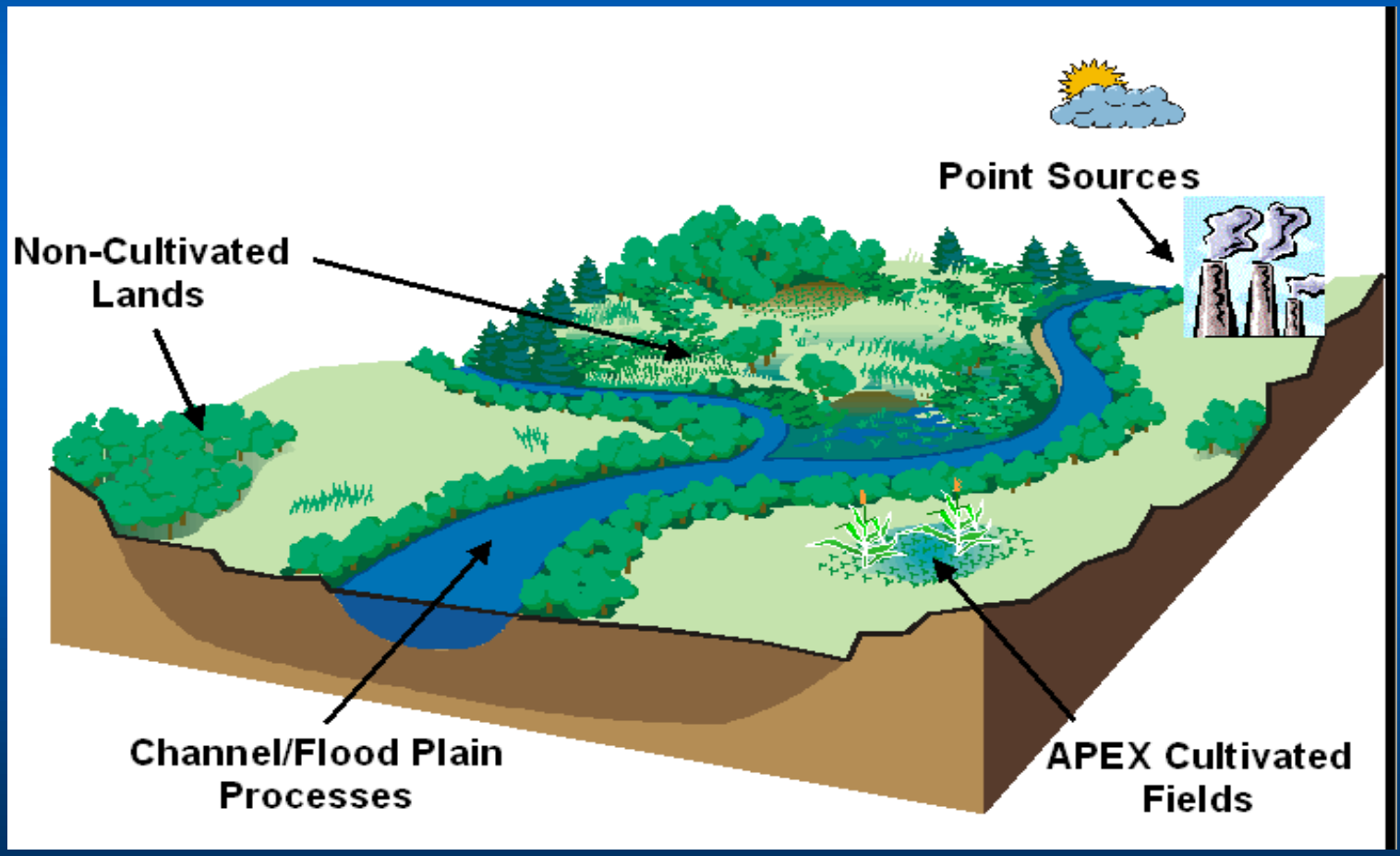
The survey obtains for each sample point:

- **Three years of crop and cropping practice information**
  - **Crops grown, seeding rates, etc.**
  - **Nutrient applications, including manure**
  - **Pesticide applications and pest management practices**
  - **Field operations, including tillage**
  - **Irrigation practices**
- **Conservation practices**
- **Conservation Program participation**

APEX Model

- Daily weather—47-year simulation using actual weather for 1960-2006.
- Hydrology
- Erosion
- Nutrient cycling
- Carbon cycling
- Pesticide fate
- Soil characteristics (temperature, bulk density, etc.)
- Crop growth
- Tillage and management operations
- Field-to-field routing used to simulate field borders, buffer strips

HUMUS SWAT


Point Sources
Non-Cultivated Lands
Channel/Flood Plain Processes
APEX Cultivated Fields

Selected Data Sources

- SWAT
  - Landuse: NLCD
  - Cultivated Cropland: Apex
  - Non-Cultivated:
  - Pasture/hayland: Ag Census, refereed Literature (Similar to Sparrow)
  - Non-point Non Ag: USGS (Similar to Sparrow)
  - Point source: USGS (Similar to Sparrow)

Harmonizing Landuse

CHESAPEAKE BAY (Total)			
Land Use	NRI	CEAP (NLCD)	CBP
Cultivated Cropland	4,320.1	4,392.4	3,988.6
	376.5		
Non-Cultivated Cropland	2,509.6	2,610.1	2,734.7
	301.4		
Total Cropland	6,829.7	7,002.4	6,723.3
	453.3		
Pastureland	3,717.7	(5,137.9)	(2,798.1)
	354.0		
Rangeland		409.5	
Forest Land	20,826.8	(24,333.5)	(28,273.9)
	730.7		
Other rural land	1,222.3	(1,522.4)	
	152.7		
Total Developed land	5,668.8	(3,609.3)	(2,697.3)
Total	44,126.4	(43,090.2)	(40,912.4)
	971.2		

Note: excluding eight digit hydrologic units 02060010 and 02080110

United States Department of Agriculture
Natural Resources Conservation Service

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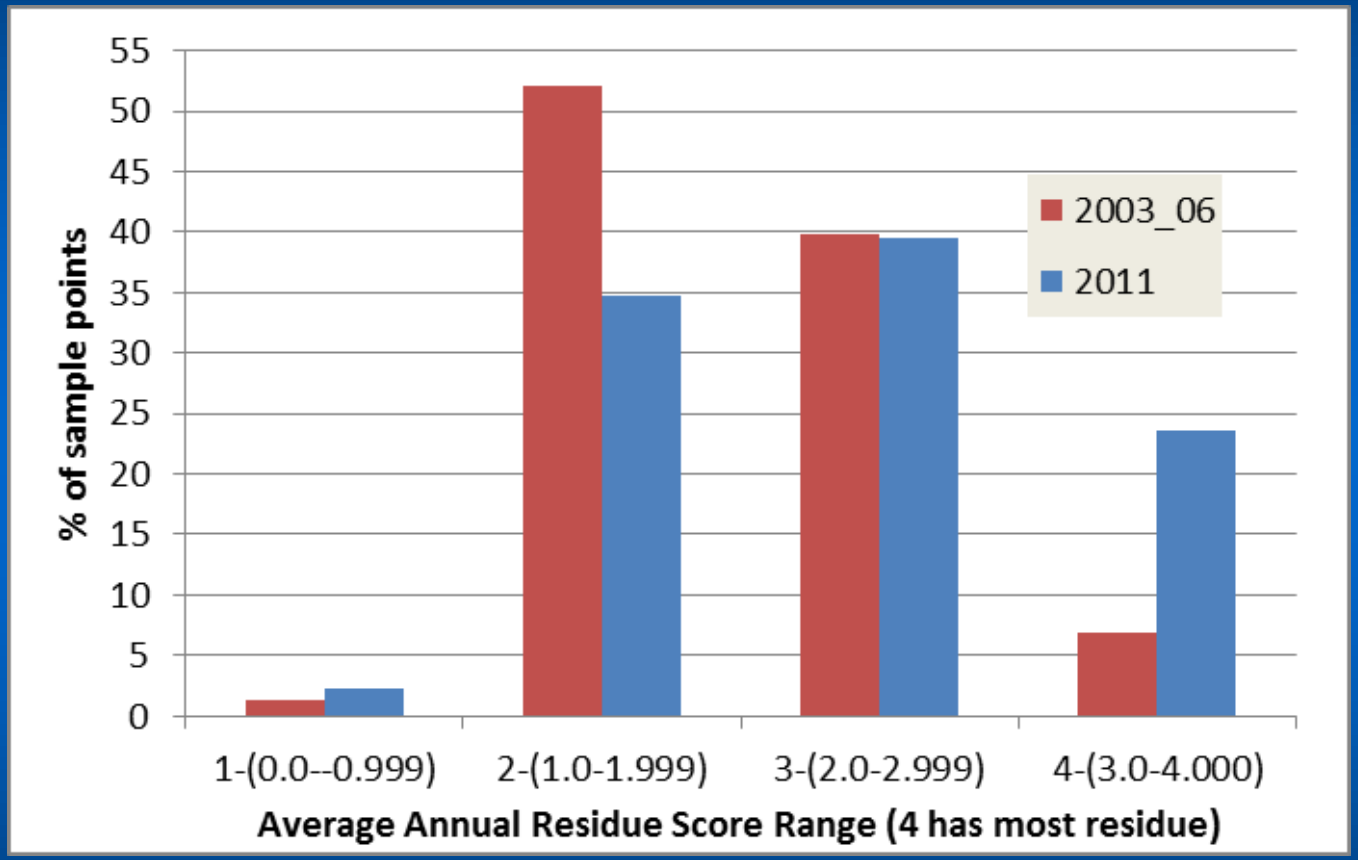
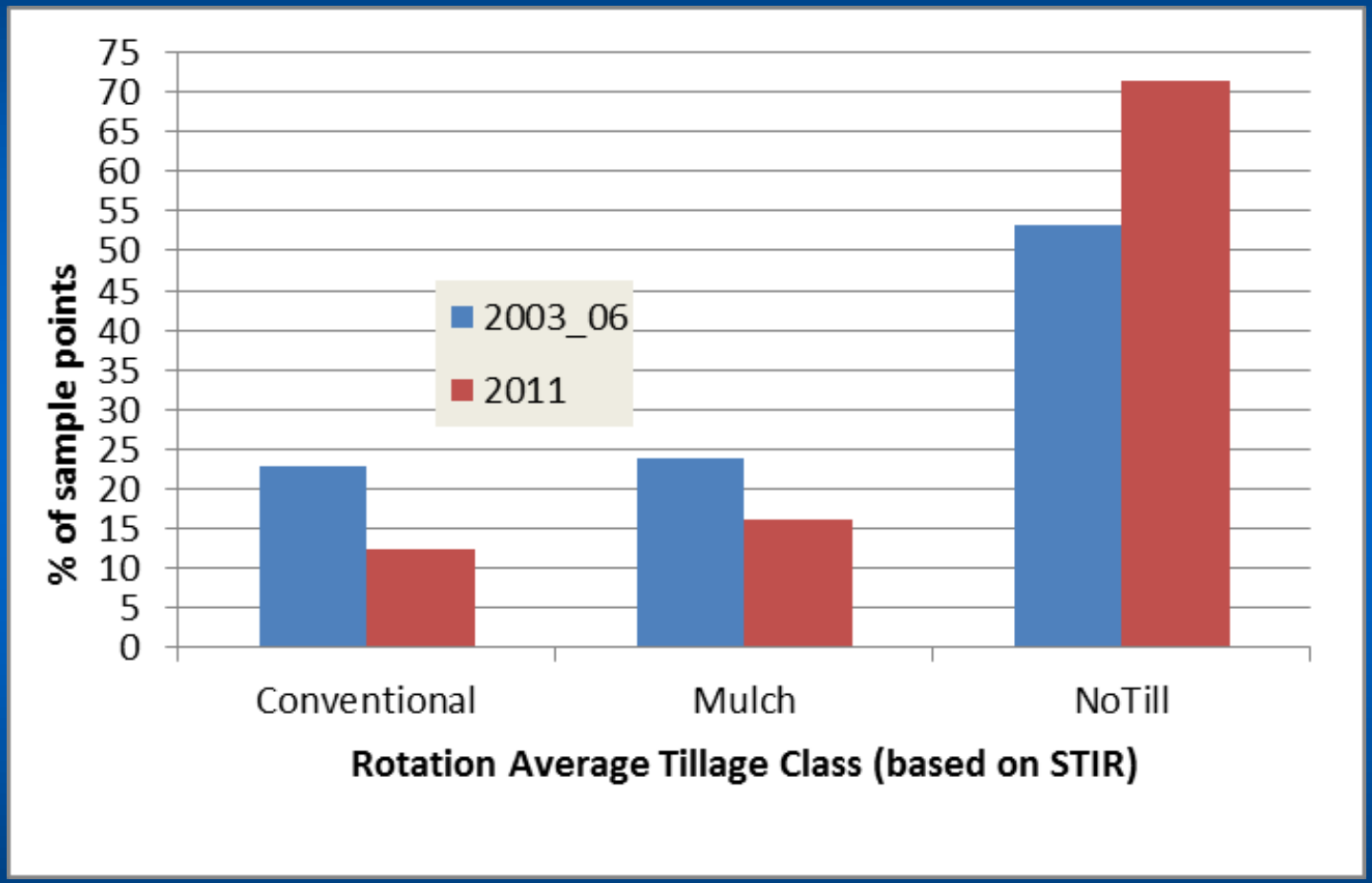
Practice Adoption In the Chesapeake Bay

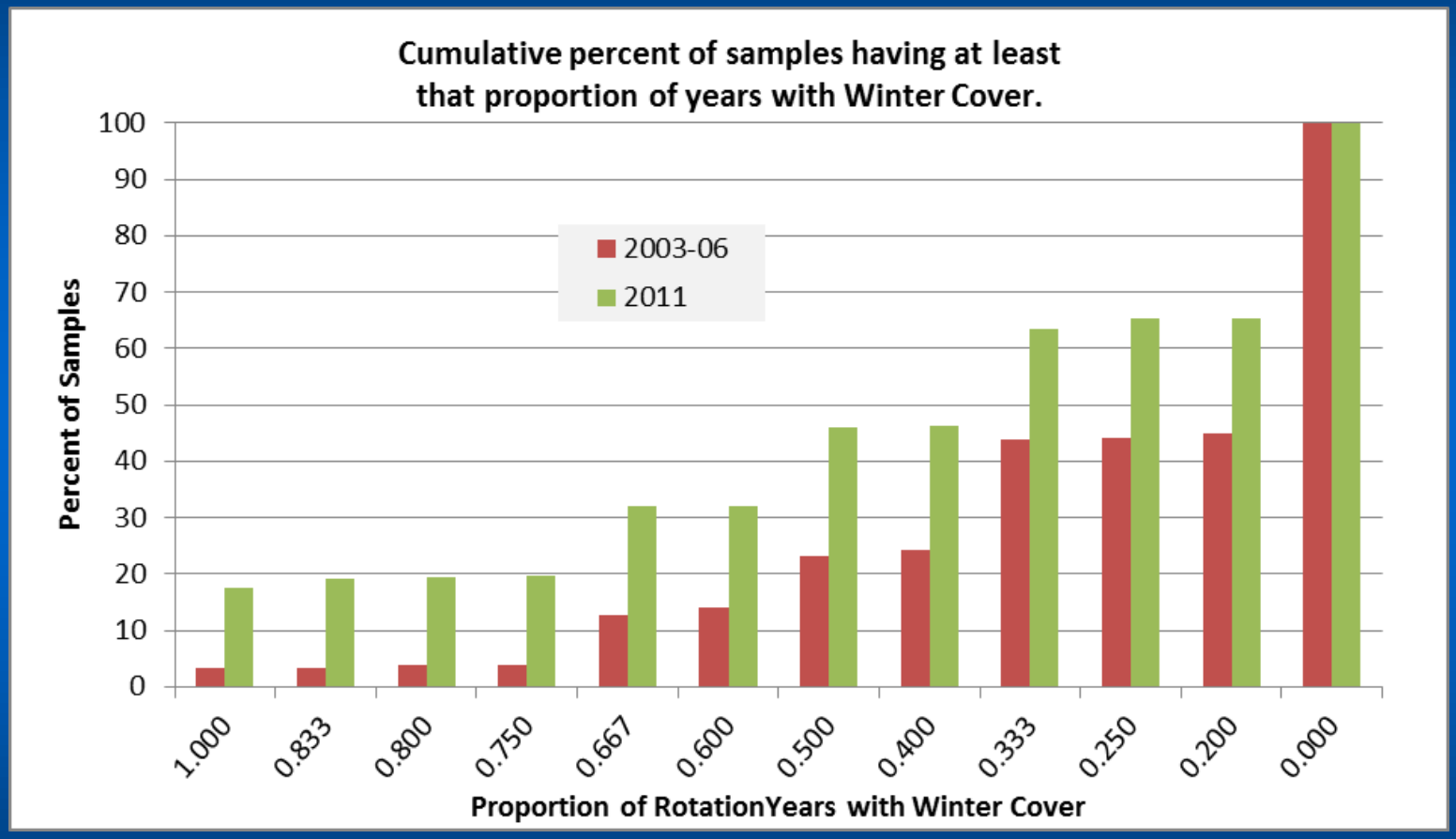
Changes in Cropping Systems



Changes in Tillage



Changes in Winter Cover

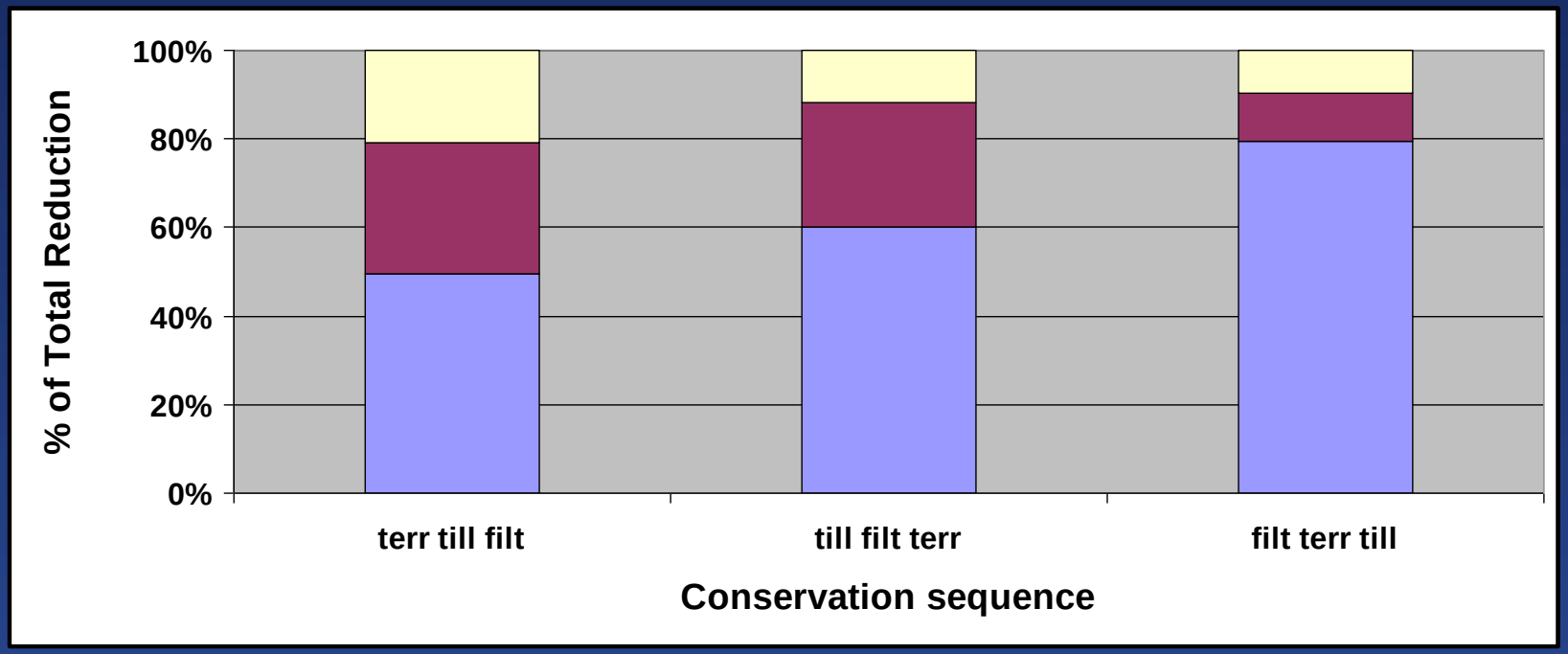


POINT FATE

fate	Not in 03_06	In 03_06	total
final sample point	540	364	904
NASS refusal (p9901=2 or p700=1)	153	53	206
NASS out of scope (p921=13)	200	61	261
drop: crops not modelable		1	1
drop: missing/bad data	3		3
drop: all per hay or fW-id	3	2	5
drop:all per hay or fW-id	1		1
NASS inaccessible or office hold	94	40	134
total	994	521	1515

Practice Efficiency

Effect of Multiple Practices and Application Sequence on % Sediment Reduction



Soil Type And Management Effect on Loss Estimates (kg/ha)

Soil Type	Nitrogen Management Rating		
Leaching Potential	Low	Moderate	High
Low	89	34	14
Moderate	138	33	22
Moderately High	NA	48	22
High	155	52	24

Soil Type And Management Effect on Loss Estimates (kg/ha)

Soil Type	Nitrogen Management Rating		
Runoff Potential	Low	Moderate	High
Low	8	5	3
Moderate	9	8	6
Moderately High	15	10	9
High	26	17	19

Thank you.