

# Social Indicators for Nonpoint Source Management

An aerial photograph of a rural landscape. The foreground and middle ground are dominated by terraced fields, likely corn, with a mix of green and brown colors. A winding road or path cuts through the fields. In the background, there are more fields, some trees, and a few buildings, possibly a farm or small village. The overall scene is a typical agricultural landscape.

**13<sup>th</sup> Biennial Governor's Conference on the Management of  
the Illinois River System  
Peoria, IL, October 6, 2011**

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# Overview

- Background – social indicators and Ag NPS
- An example application
- A Tool for using in the IL River Watershed
- Discussion

An aerial photograph of a wetland landscape. The terrain is a mix of green and brown, indicating different types of vegetation and water levels. A prominent, dark, irregularly shaped water body is located in the center of the image. A blue rectangular box with white text is overlaid on the image, centered horizontally and vertically. The text inside the box reads "Background".

# Background

# NPS Challenges

- The major cause of water quality impairment
- Limited regulatory options
- Addressed mainly through persuasion and voluntary practices
  - Financial incentives
  - Technical support
  - Outreach & education
- Measurement problems
  - Response lag for environmental change
  - Upstream impacts can mask local improvements



# More Challenges

- Where and how to focus resources?
- How to know if making a difference?
- Administrative Environment:
  - Increasing competition/decreasing resources
  - Accountability demands
  - Resources for staff?

# For Many NPS projects

- Watershed based – restoration and protection
- Goals are reduction oriented
  - Total load (modeled)
- Voluntary involvement
- Technical and \$\$ assistance not targeted
  - Multiple sources (programs)
  - First-come basis
- Reporting
  - Administrative indicators
  - Environmental indicators



# USEPA Region 5 States: Add “social indicators” to NPS

## Traditional Uses

- Human health
- Housing
- Education
- Social equity

## Other desirable data

- Economic impact
- Resource use and value

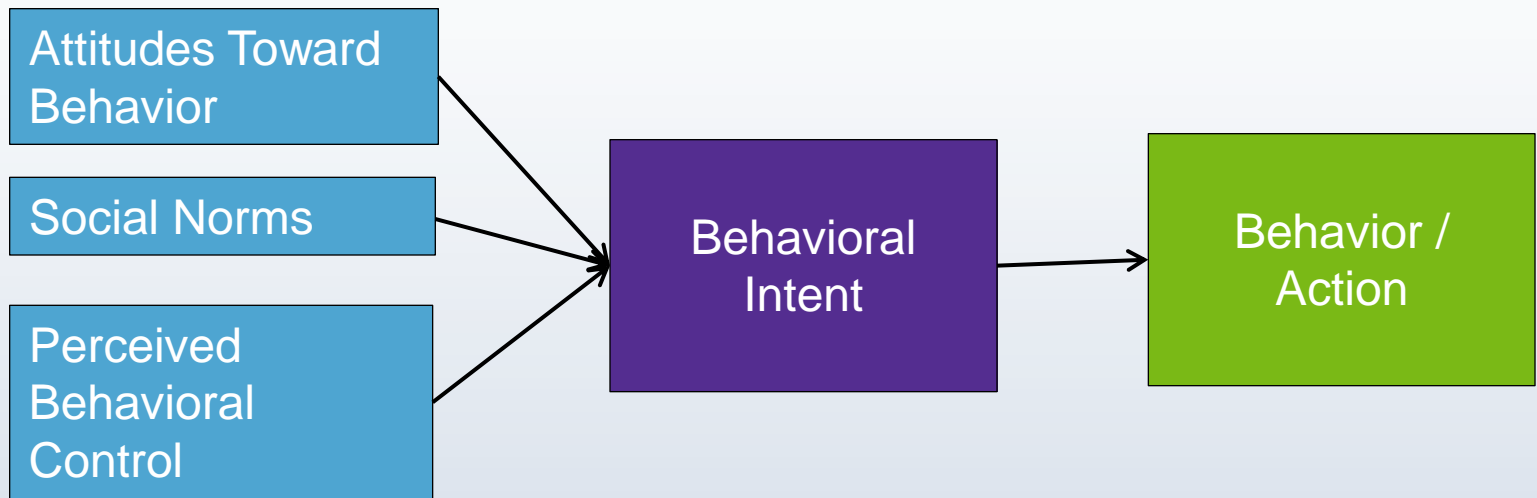
## ■ Our needs:

- Complement Admin and Environ
- Interim, relevant for management
- Progress toward use and adoption



# Theories of Behavior Change

- Theory of Planned Behavior (Ajzen)



- Diffusion of Innovations (Rogers)





# Reduction

- Is it worth it? -- Motivation
- Can I do it? -- Ability

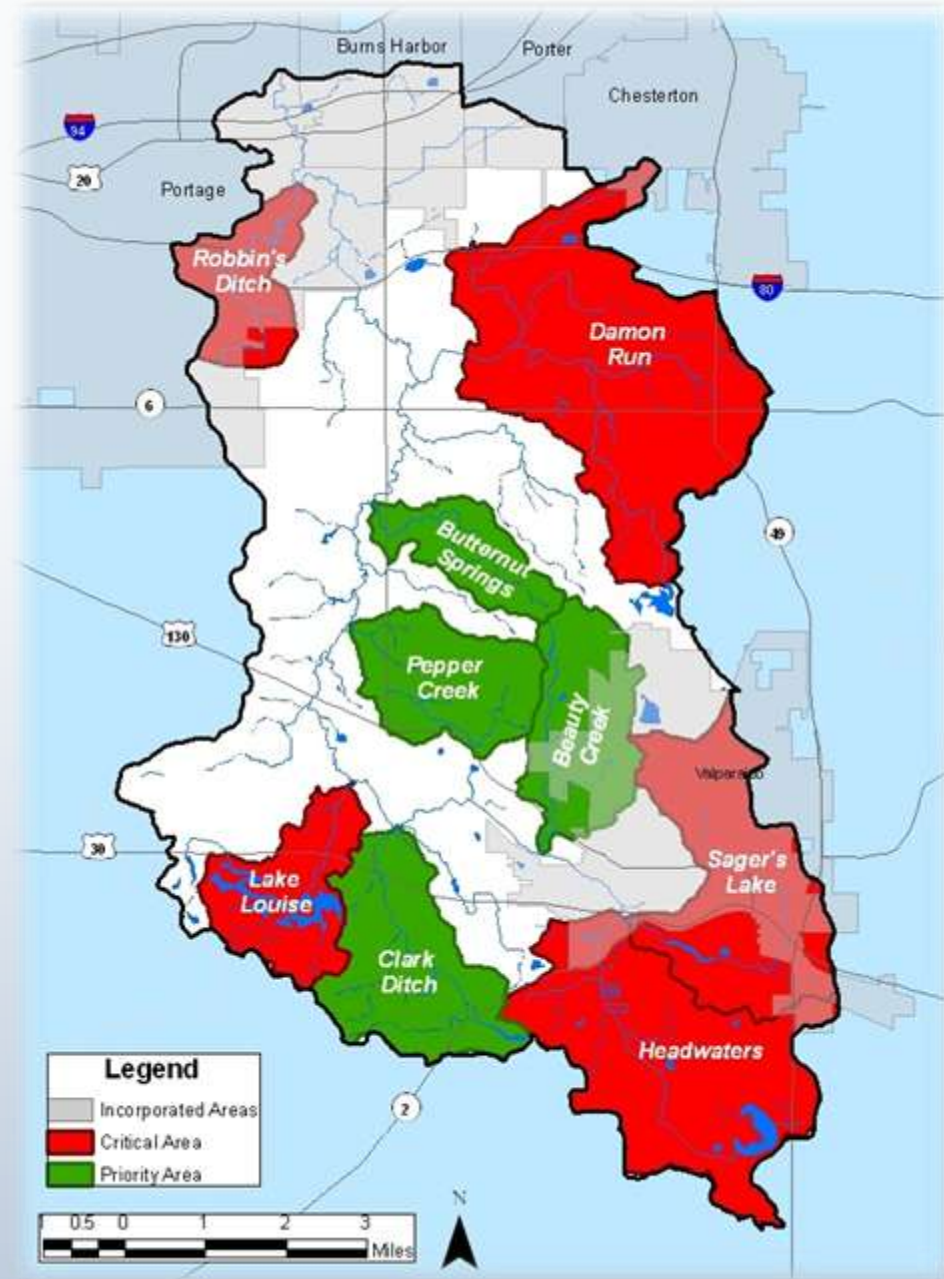
Patterson et al 2008. Influencer.

- Focus on key/ "vital" behaviors
- Message AND messenger
- More than words

# Targeting

- Dis-proportionate effects
- Focus for greatest impact

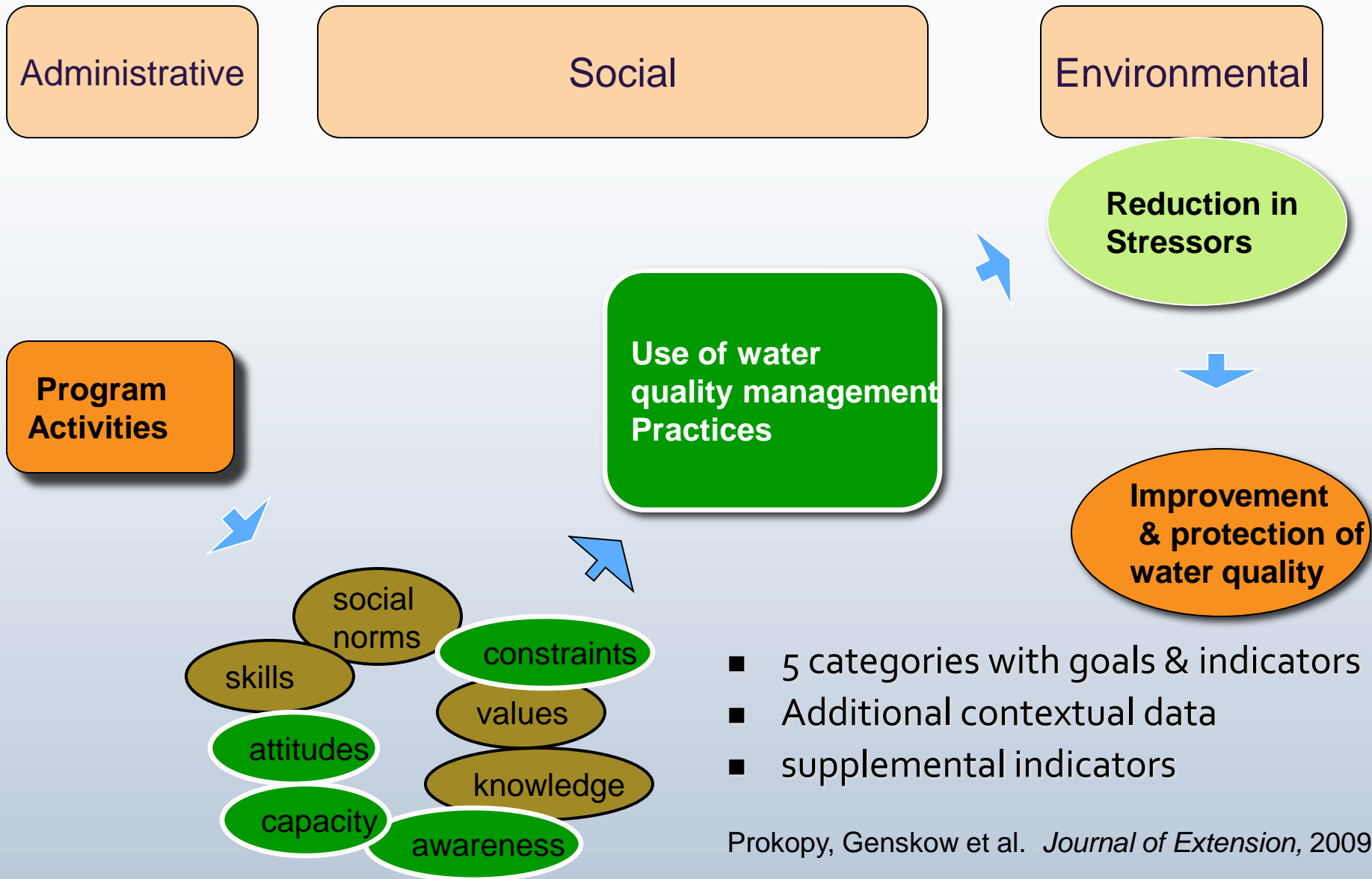
Salt Creek  
Watershed, IN



# Conceptual Model

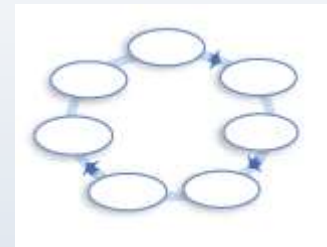


# Conceptual Model



# Social Indicators for Planning & Evaluation System (SIPES)

- Critical areas & target audiences
- Scale is project level
- Consistent survey questions and data collection protocols
  - Used across projects
  - Compared over time
  - Compared across projects



An aerial photograph of a river winding through a lush, green, hilly landscape. The river is dark blue and flows from the top center towards the bottom left. The surrounding terrain is covered in dense green vegetation, with some brown patches indicating cleared areas or different types of plants. The overall scene is a natural, scenic view of a river valley.

# Upper Rock River Watershed Survey

# Survey Administration

- Spring 2010
- Target Audience: Farmers in sub-watersheds
- Mailed survey: multiple contacts
- 66% response (463 complete); individual Q response varies



# Survey Content

- Awareness:
  - water quality pollutants and sources
  - Management practices
- Attitudes toward water quality issues
- Use of practices
- Constraints to Practices
- Sources of information

## Your Views on Local Water Resources



University of Wisconsin Cooperative Extension is conducting this survey in coordination with water and land conservation partners in order to identify the needs and interests of agricultural producers regarding water quality for the upper portions of the Rock River Basin.

We ask that this survey be completed by the person in your household that makes most of the farming decisions and is at least 18 years old. Your participation in this survey is completely voluntary. Your answers will be kept confidential and will be released only as summaries where individual answers cannot be identified.

Unless otherwise instructed, **please check the circle associated with the answer you are providing.** The survey should take approximately 20-25 minutes to complete. Please read each question carefully. If you have any questions or concerns, please contact Jake Blasczyk, UW-Extension, 608-890-0718 or jblasczy@wisc.edu. Thank you for your time.

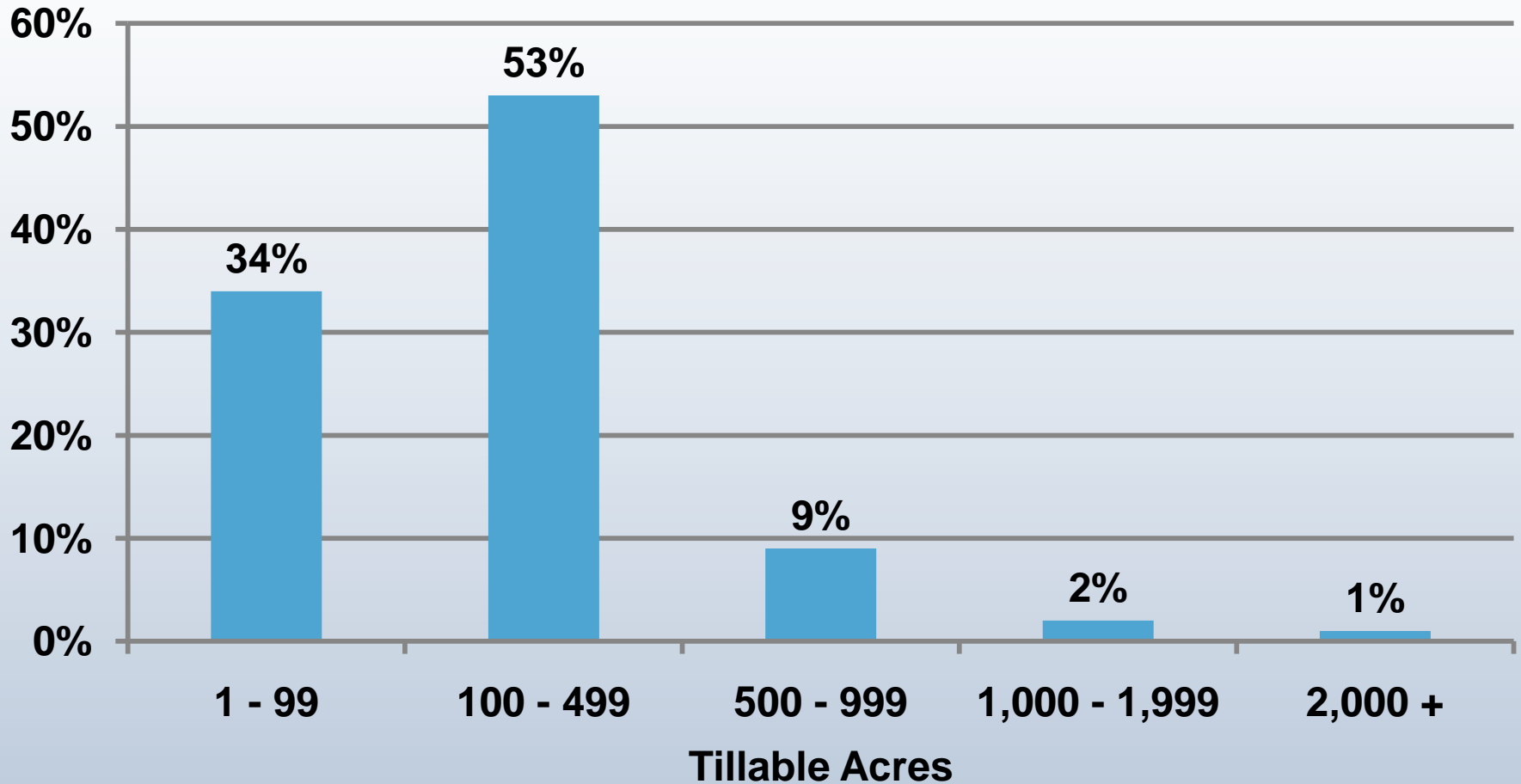


# Farmer Characteristics

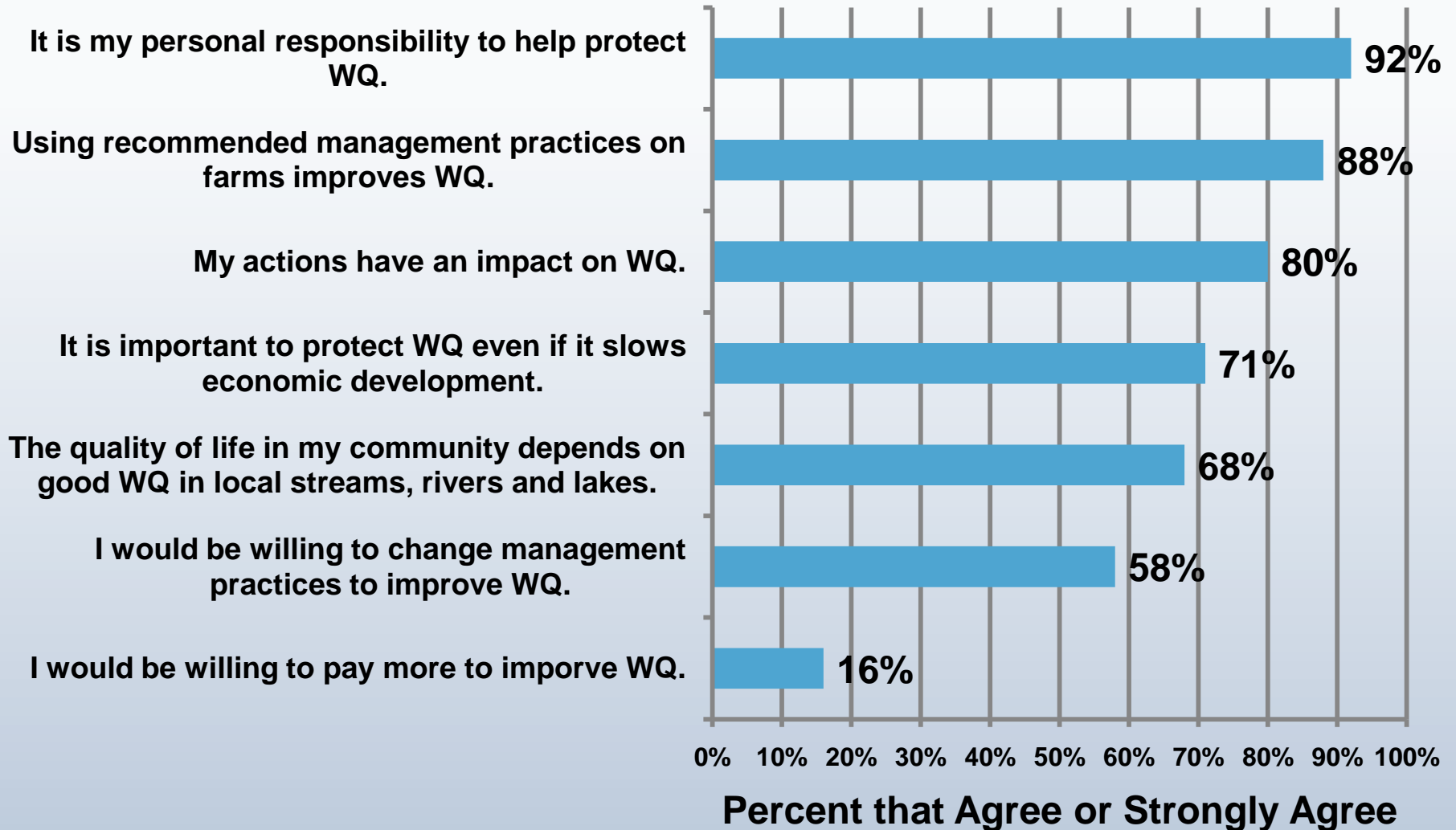
- Male (91%)
- Operating alone or with spouse (49%)
- Operating with other family partners (33%)
- Family member likely to continue farm (44%)
- Operation < 500 acres (87%)

# Farm Acreage

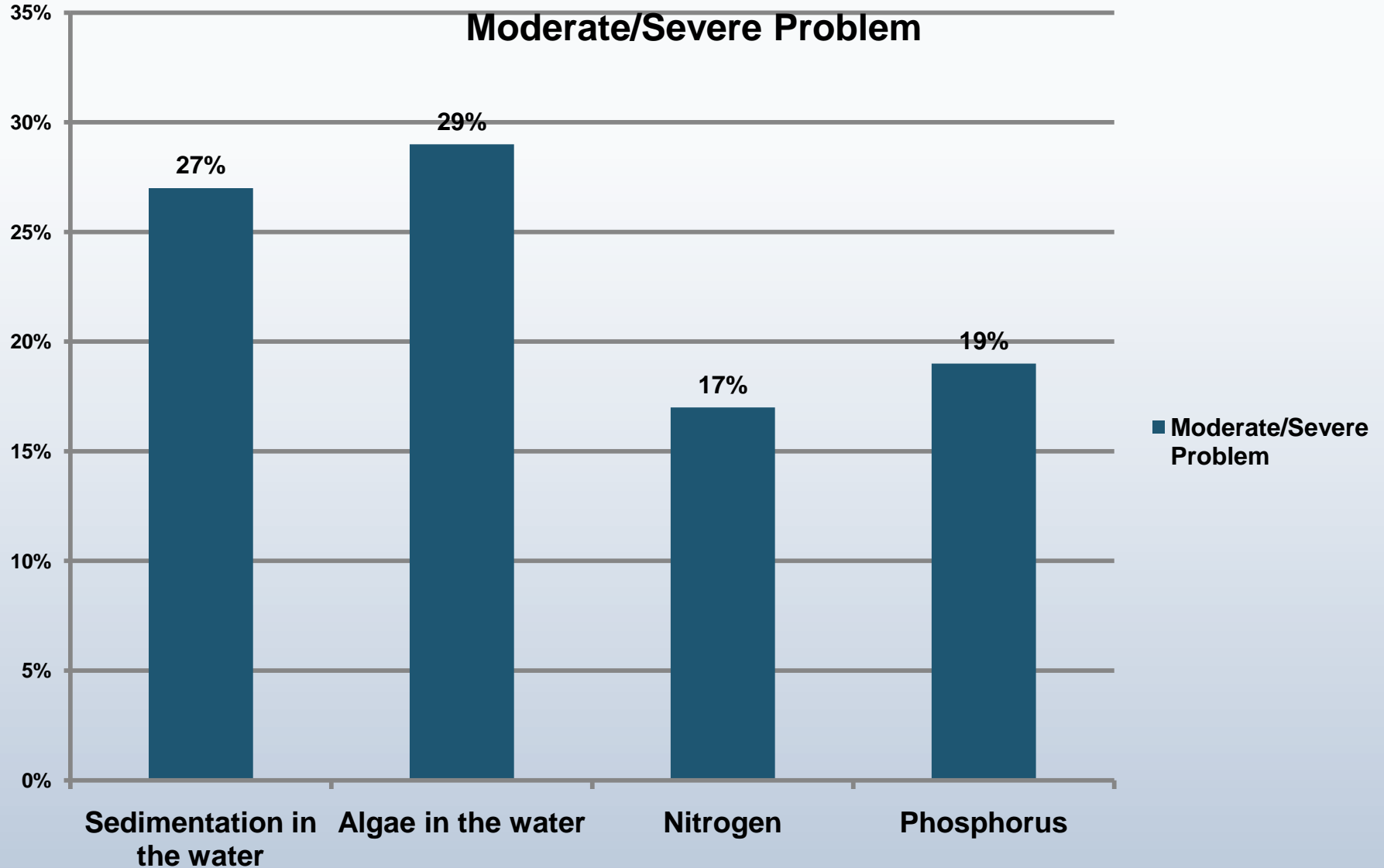
## Total Tillable Acreage (N=433)



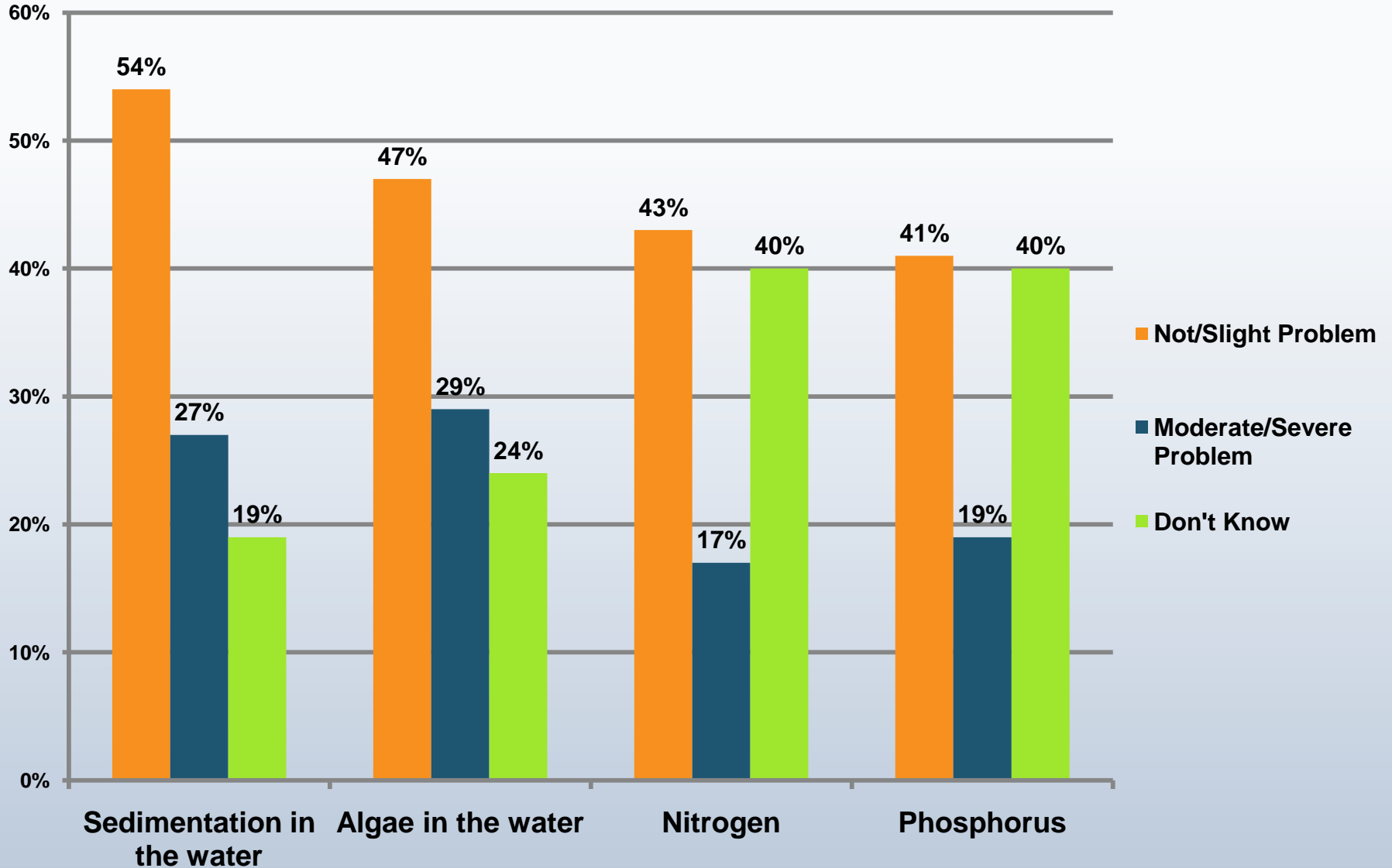
# Attitudes toward Water Quality Issues



# Water Impairments

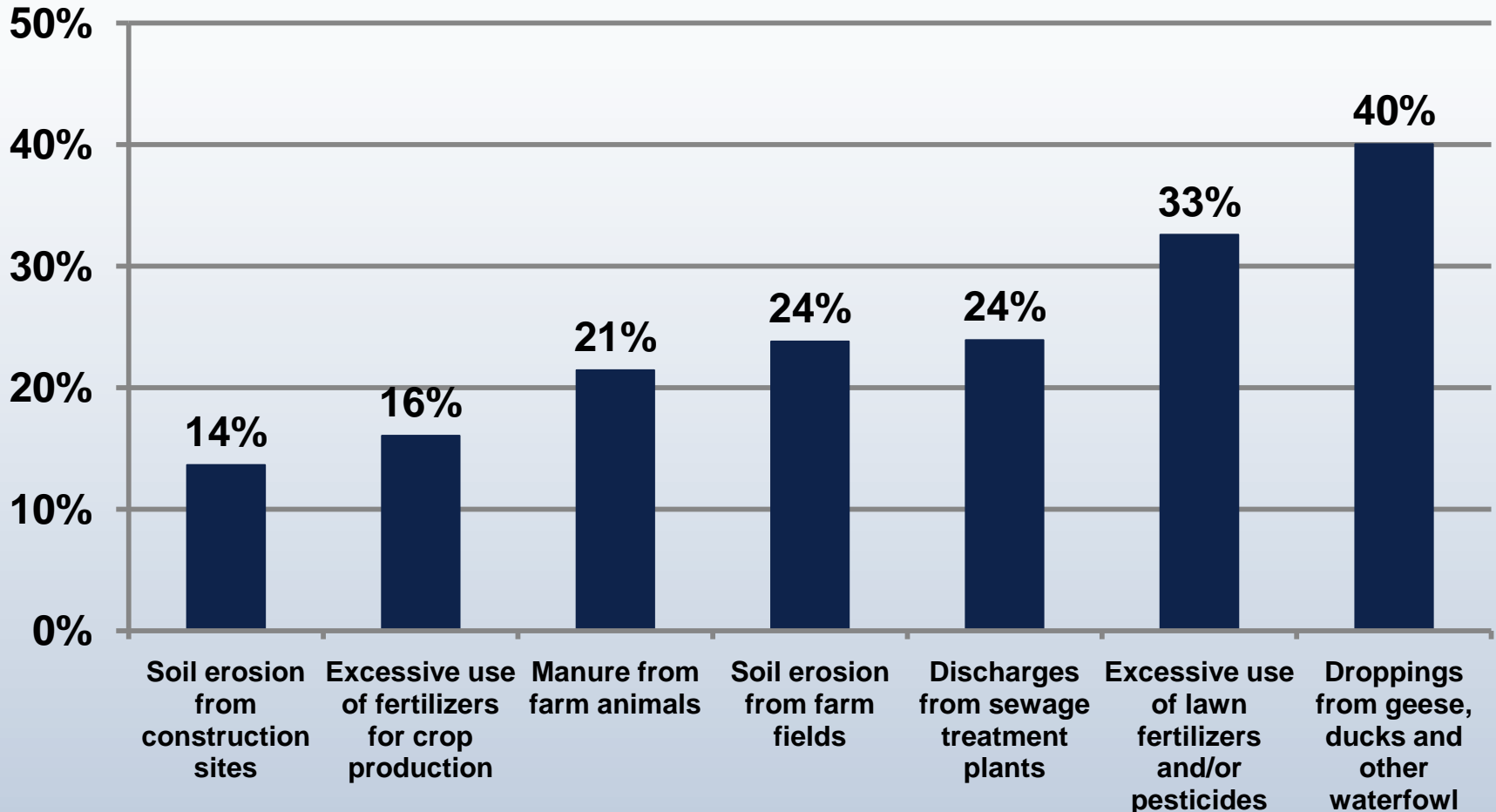


# Water Impairments



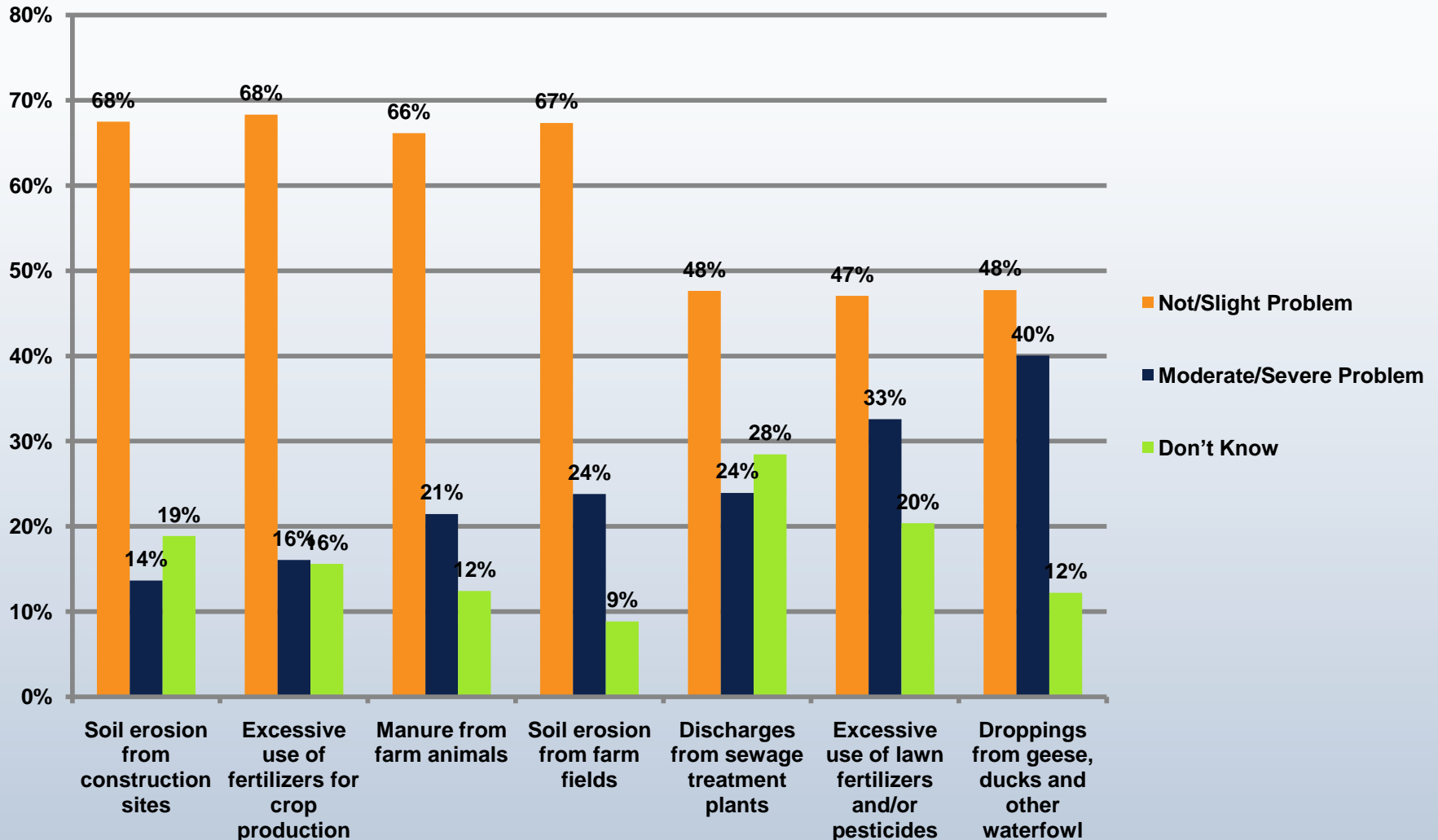
# Sources of Pollutants

## Farmers' Perceived Moderate or Severe Pollution Sources



# Sources of Pollutants

## Farmers' Perceived Pollution Sources



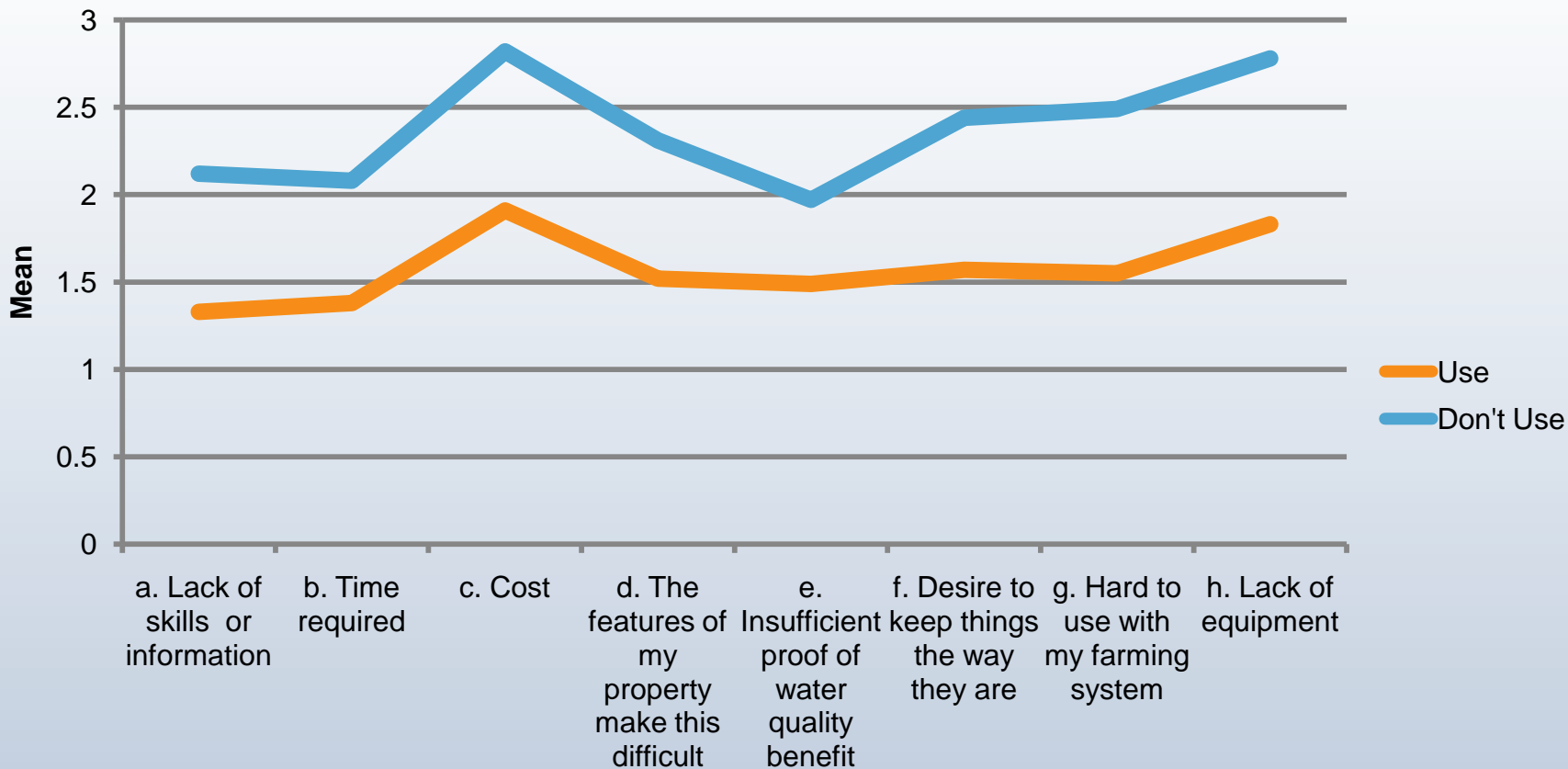
# Use of Practices

	<b>"Yes" or "Maybe" willing to use</b>	<b>Currently using</b>
Conservation Tillage	<b>90%</b>	<b>74%</b>
Cover Crops	<b>91%</b>	<b>62%</b>
Filter Strips	<b>79%</b>	<b>44%</b>
CNMP or MMP	<b>72%</b>	<b>36%</b>



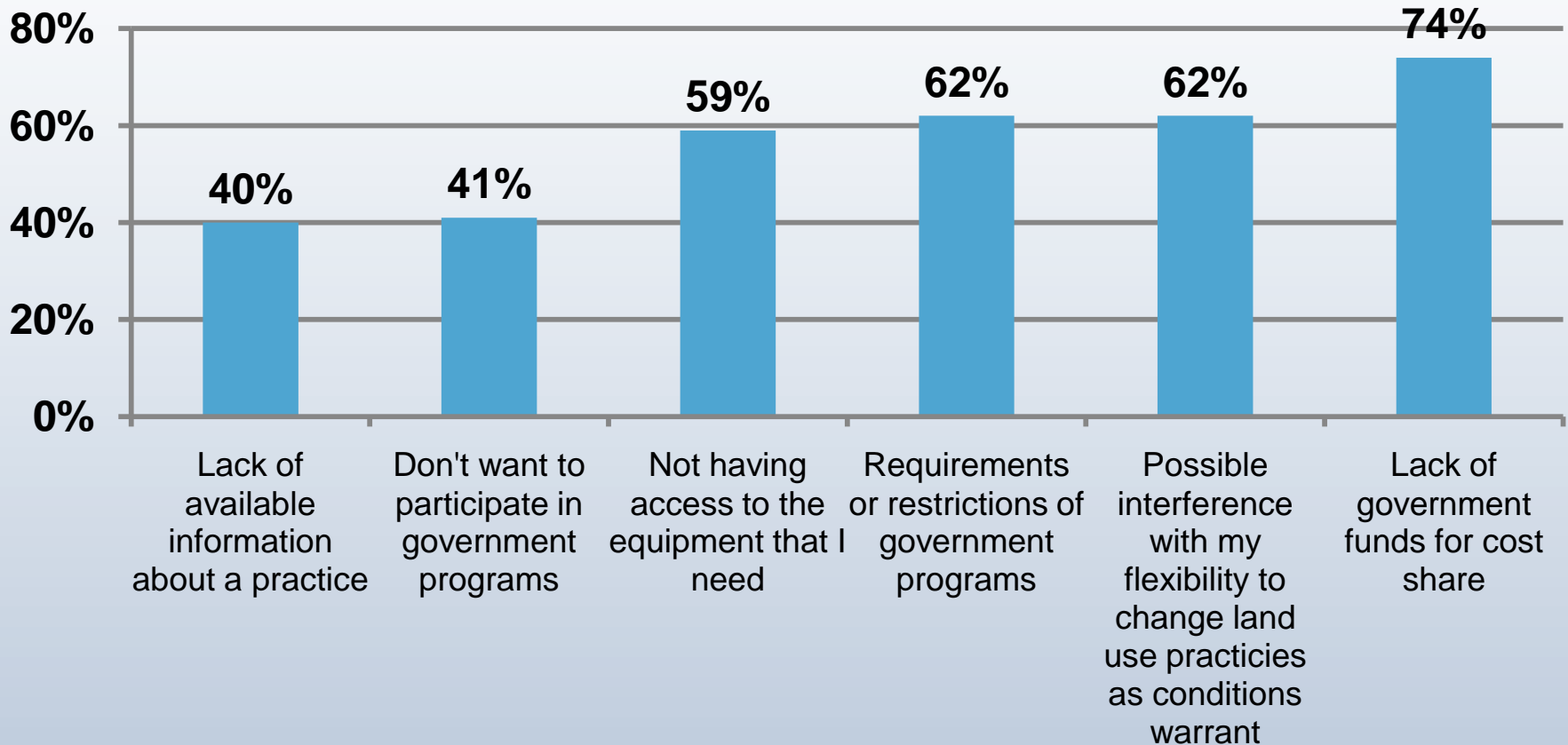
# Conservation Tillage

## (Users of Practice vs. Nonusers)



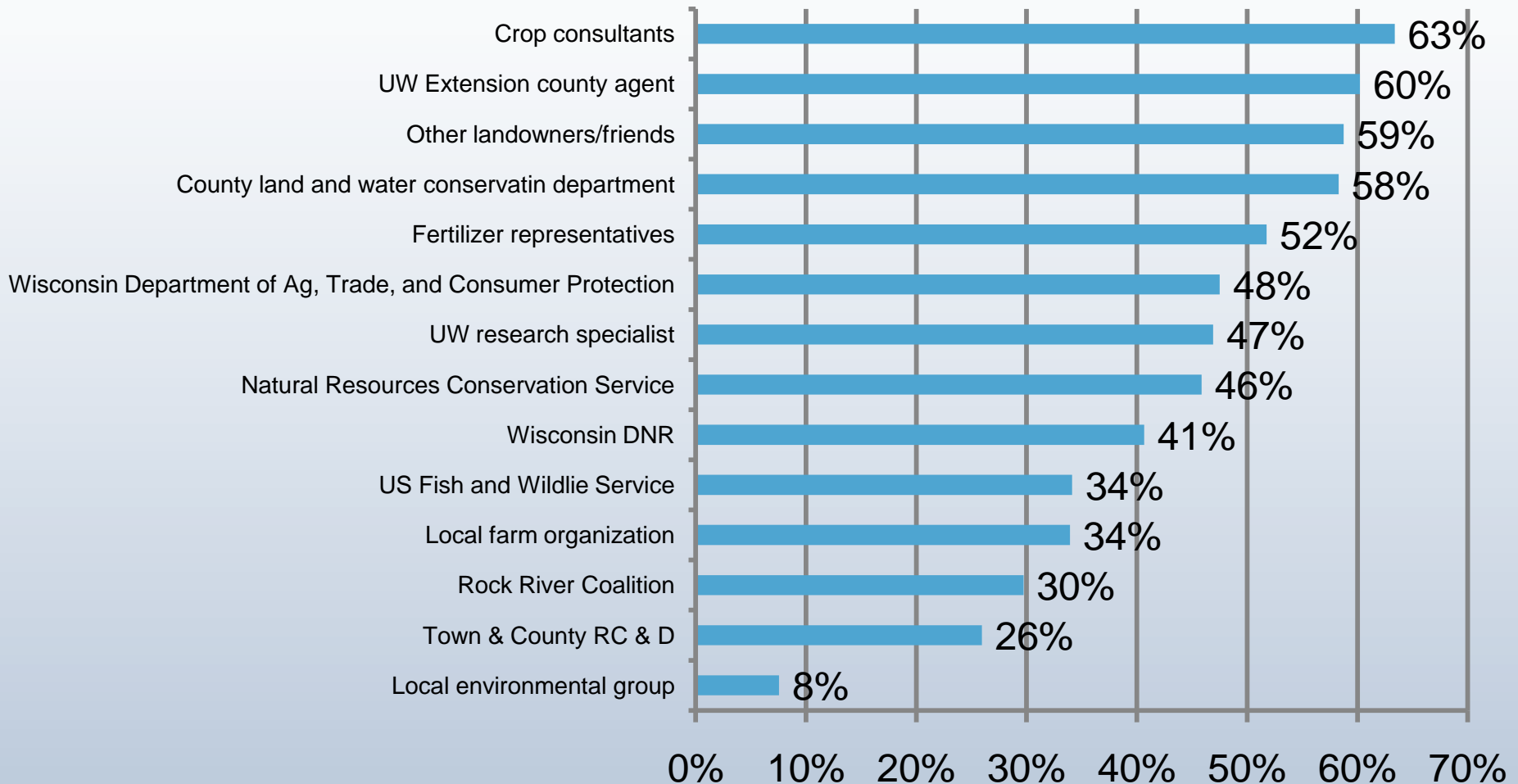
# Constraints to Change Agricultural Management

Percent of Farmers Constrained 'Some' or 'A lot'



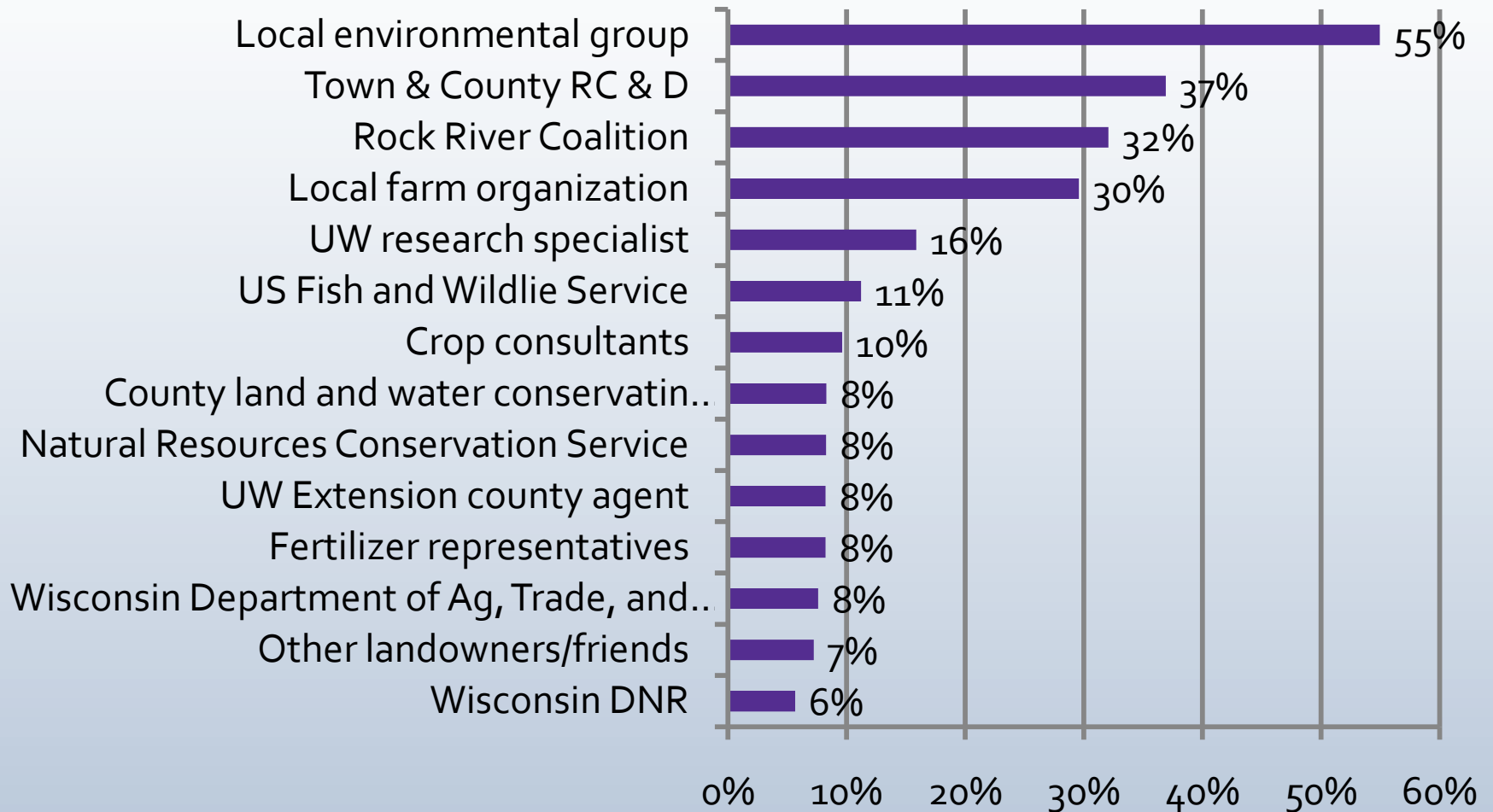
# Information Sources

## Percent that Trust Information Sources Moderately or Very Much



# Information Sources

Percent that are Not Familiar with Information Sources



An aerial photograph of a wetland or marsh area. The central feature is a large, irregularly shaped water body with a dark blue-green hue. This water body is surrounded by a dense network of smaller, interconnected water channels and ponds, creating a complex, maze-like pattern. The surrounding land is covered in lush green vegetation, likely grasses or sedges, interspersed with some bare, brownish patches. The overall scene depicts a natural, undisturbed wetland environment.

# SIDMA Tool

Main Page

# SIDMA

Social Indicators  
Data Management and Analysis Tool



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## Using Social Indicators for Evaluating Nonpoint Source (NPS) Management Efforts

The Social Indicators Data Management and Analysis (SIDMA) tool organizes, analyzes, and visualizes social indicators related to nonpoint source (NPS) management efforts through statistical and spatial relationships.

### Start Using SIDMA

<a href="#">Learn about Social Indicators</a>	<a href="#">Create/Work on a Project</a>
<a href="#">Create an Account</a>	<a href="#">Browse Maps</a>

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Survey Name:

Filter questions by:

## Build a Survey from SIDMA's core questions

### Rating of Water Quality

*This category is strongly encouraged as a collection of warm-up questions. It prompts respondents' thinking about water quality issues and orients them to the subject matter. These questions also measure your target audience's awareness of water quality problems in your watershed.*

	Poor	Okay	Good	Don't Know
<input type="checkbox"/> 1. For canoeing / kayaking / other boating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> 2. For eating locally caught fish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> 3. For swimming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> 4. For picnicking and family activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> 5. For fish habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> 6. For scenic beauty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Your Water Resources

*Like Rating of Water Quality, this category is strongly encouraged. These questions also get respondents thinking about the issue. It will also give you some basic information regarding how familiar your target audience is with the basic concept of a watershed and how familiar they may be about your particular watershed.*

- 1. Of these activities, which is the most important to you?
  - For canoeing / kayaking / other boating
  - For eating locally caught fish
  - For swimming
  - For picnicking and family activities
  - For fish habitat
  - For scenic beauty
  
- 2. Do you know where the rain water goes when it runs off of your property?
  - No
  - Yes
  
- 3. If you answered 'Yes' above, where does your rain water drain to?

## Add Custom Questions

Category Name: Rating of Water Quality

Table Header:	Overall, how would you rate the quality of the water in your area?
Likert Text (' ' delimited):	Poor Okay Good Don't Know
Likert Values (' ' delimited):	1 2 3 9
Questions and audience:	
1.	For canoeing / kayaking / other boating
2.	For eating locally caught fish
3.	For swimming
4.	For picnicking and family activities
5.	For fish habitat
6.	For scenic beauty
<input type="button" value="Delete"/>	7 New question
<input type="button" value="Add Question to Table"/>	

Sub-category	This is a new section of the survey.
Header (optional):	
<input type="button" value="Delete"/>	1 New section question 1
Response type:	<input checked="" type="radio"/> radio <input type="radio"/> checkbox <input type="radio"/> text
Response Elements: (include a carriage return after each element)	Option 1 Option 2 Option 3
Element Values (' ' delimited):	1 2 3
<input type="button" value="Add Question"/>	



# Public Survey Input URL

The screenshot shows a web application interface for managing surveys. A modal dialog box is open, displaying the following text:

Distribute this URL to potential respondents:  
*http://35.8.121.111/sidev/Survey/*  
*/InputSurvey.aspx?SurveyID=42&Passcode=74494b8e-*  
*5018-4afc-9072-51dfd339bd6a*

Below the URL, there is a "Close" button.

The background interface shows a list of surveys. The first survey is "Baseline (ag)", created on 1/1/2011. It has a "Survey Management" section with "- View" and "- Edit" links. Below that is a "Response Actions" section with "- Input Response" and "- View/Edit/Delete Responses" links. The "Results and Analysis" section includes "- View response frequencies", "- View indicator scores", "- Download data", and "- Compare Surveys" links.

The second survey is "Urban Combined (urban)", also created on 1/1/2011. It has a "Survey Management Actions" section with "- View", "- Edit", "- Delete", "- Define Key Variables", and "- View Public Survey URL" links. It also has "Response Actions (0 responses present)" with "- Input Response" and "- View/Edit/Delete Responses" links, and a "Results and Analysis" section with "- View response frequencies", "- View indicator scores", "- Download data", and "- Compare Surveys" links.

At the bottom of the page, it says "Institute of Water Research, All Rights Reserved 2011".

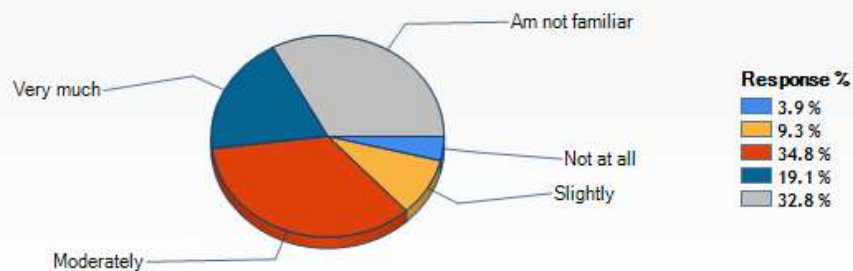
# Response Frequencies and Stats

Sortable tables

Graphical Output

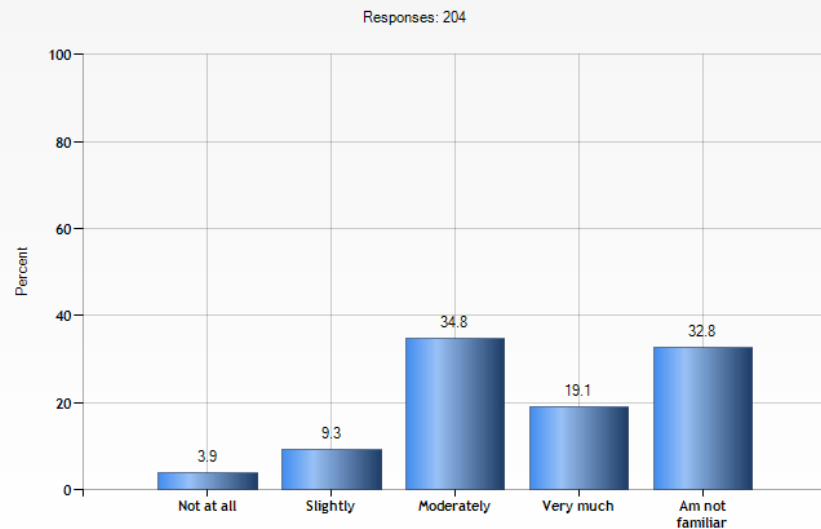
Question # ↓ ↑	Not at all (1) ↓ ↑	Slightly (2) ↓ ↑	Moderately (3) ↓ ↑	Very much (4) ↓ ↑	Am not familiar (9) ↓ ↑	Mean (SD) ↓ ↑	Valid Responses ↓ ↑ / Total Responses ↓ ↑
1. Local watershed project	3.9	9.3	34.8	19.1	32.8	3.03 (0.81)	137 / 204
2. Soil and Water Conservation District	2.9	6.3	34.1	34.6	22	3.29 (0.77)	160 / 205
3. Natural Resources Conservation Service	2.9	6.4	36.3	30.4	24	3.24 (0.77)	155 / 204
4. State agricultural agency	5.4	14.4	36.6	17.8	25.7	2.9 (0.85)	150 / 202
5. Other landowners / friends	7.5	23.1	35.2	15.6	18.6	2.72 (0.88)	162 / 199

Local watershed project



Responses: 204

Local watershed project



# Response Frequencies and Stats

## Text Responses

## Graphical Output and Individual Responses

### 1. What is your gender? (Responses: 212)

79.7% Male

20.3% Female

2. What is your age?  (Mean=56.88; SD = 13.71; Min = 24; Max = 91; Range = 67; n = 207)

### 3. What is the highest grade in school you have completed? (Responses: 209)

1.9% Some formal schooling

43.5% High school diploma/GED

19.1% Some college

7.2% 2 year college degree

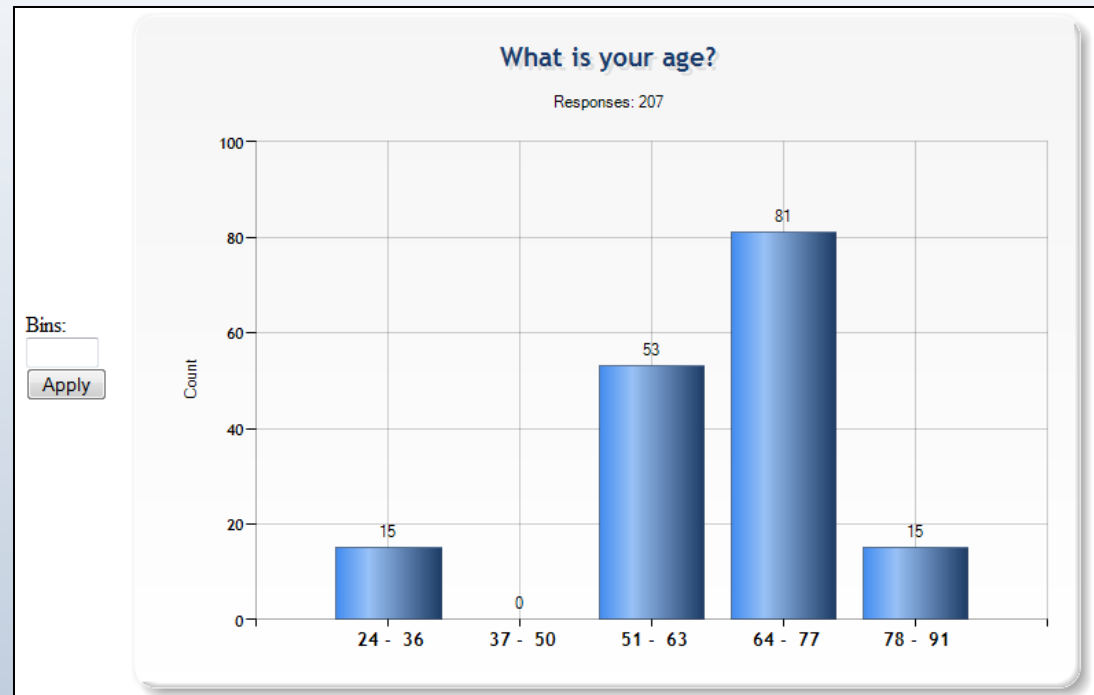
20.1% 4 year college degree

8.1% Post-graduate degree

### What is your age?

[as histogram](#)

	User Responses	Response ID
1	33	CC602
2	79	MR403
3	53	TW21398
4	38	BR2003
5	62	TM810
6	79	JL2509
7	62	TM810
8	62	SB708
9	50	JS20
10	30	AM9
11	54	JH106
12	28	TC312
13	30	CC15376
14	60	DM608
15	55	SM504
16	41	HB704
17	80	RK803
18	91	JB55
19	59	JW4469
20	76	JD405
21	54	PP29287
22	64	MT1015
23	69	FJ195
24	40	JH3275



Compare results between surveys.

## Rating of Water Quality

Overall, how would you rate the quality of the water in your area?

Question # ↓ ↑	Poor (1) ↓ ↑	Okay (2) ↓ ↑	Good (3) ↓ ↑	Don't Know (9) ↓ ↑	Mean ↓ ↑ (SD) ↓ ↑	Valid Responses ↓ ↑ / Total Responses ↓ ↑
1. For canoeing / kayaking / other boating	-10.6	2.1	25	-16.6	0.4 (-0.18)	-16 / -80
2. For eating locally caught fish	-15.3	10.2	25.6	-20.5	0.6 (-0.03)	-1 / -82
3. For swimming	-27.9	23.5	14.1	-9.7	0.6 (0)	-36 / -85
4. For picnicking and family activities	-12	-10.7	32.9	-10.3	0.5 (-0.19)	-38 / -79
5. For fish habitat	-8.2	-0.4	21.8	-13.2	0.4 (-0.08)	-23 / -82
6. For scenic beauty	-4.8	1.5	6.5	-3.2	0.1 (-0.12)	-67 / -84

## Your Water Resources

1. Of these activities, which is the most important to you? (Responses: -109)

0.4% For canoeing / kayaking / other boating

15.6% For eating locally caught fish

1.4% For swimming

19% For picnicking and family activities

2.6% For fish habitat

-38.9% For scenic beauty

2. Do you know where the rain water goes when it runs off of your property? (Responses: -86)

-2.1% No

2.1% Yes

# Acknowledgements

- USEPA Region 5 NPS Program
- Illinois Environmental Protection Agency
- Indiana Department of Environmental Management
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- Ohio Environmental Protection Agency
- Wisconsin Department of Natural Resources
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# Discussion



Background Information about Social Indicators:  
<http://greatlakeswater.uwex.edu/social-indicators>

SIDMA:  
<http://www.iwr.msu.edu/sidma>