

**Sample it once, Use it Twice. The integration of NARS surveys with state and volunteer data for water resource management decisions in Iowa.**

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# Problem:

# Perception = Reality



**Public Perception:  
Duplication of Monitoring  
(Wasted Resources, Lack  
of Coordination, Lack of  
Data Sharing)**

# The Iowa DNR Water Monitoring Program Example



# Agency Perception: “I Can’t Use *Your* Data”

NARS, NRSA, Volunteer,  
Municipal, University



**IOWATER**

Volunteer Water Quality Monitoring

**Example**

## The IOWATER Program

### Introductory Workshop - 8hrs (streams or standing waters)

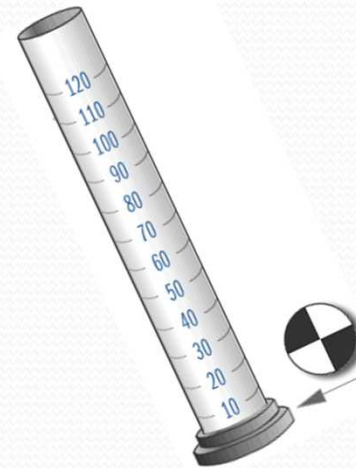
- Chemical (field kits)
- Physical
- Habitat



*Photo from University of Iowa Hygienic Lab*

### Biological Workshop - 8hrs

- Benthic Macroinverts
- Habitat



### Advanced Monitoring Workshops

- Bacteria
- Benthic Macroinvertebrates





**IOWATER**

Volunteer Water Quality Monitoring

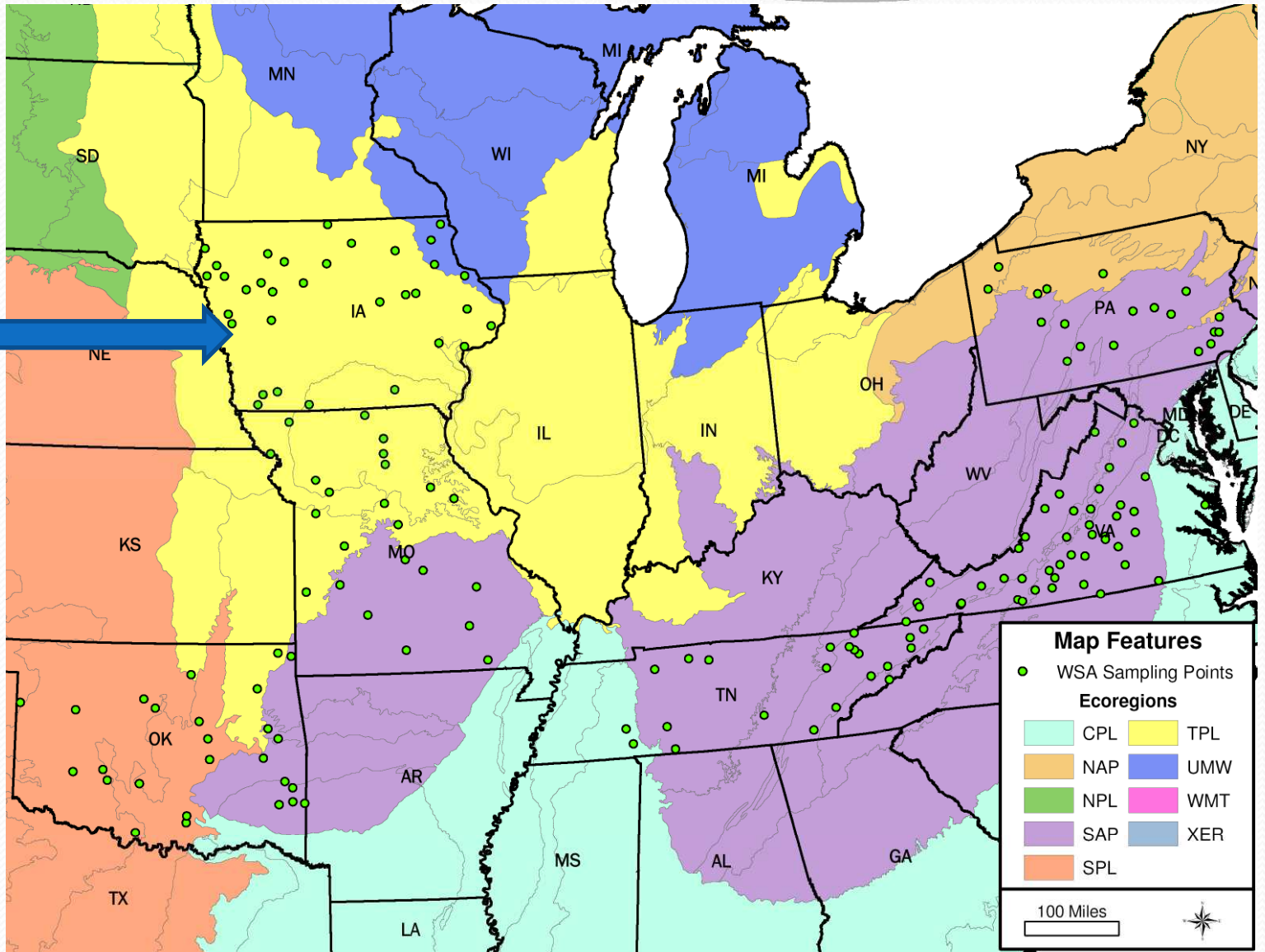
**&**

**Iowa's Credible Data Law**



# WSA Comparability Sites

$R^2 = .12$



**Reluctance to Use Volunteer,  
NARS Data for 305b/303d  
since they don't meet listing  
protocols:**

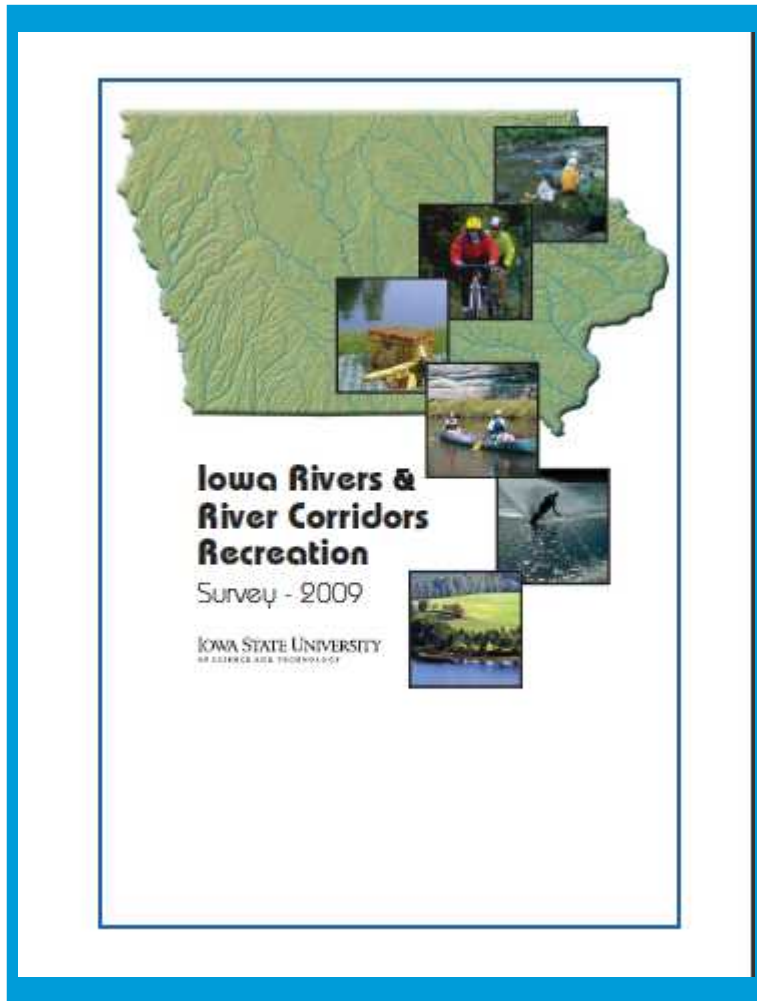
- 1. Precision**
- 2. Frequency**
- 3. Require Two IBI scores**

# Solution?

1. Admit that sometimes the data are incompatible for a specific purpose. (and that's ok.....)
2. Find New Ways to Leverage Data (value added data).



# Economic Valuation Study

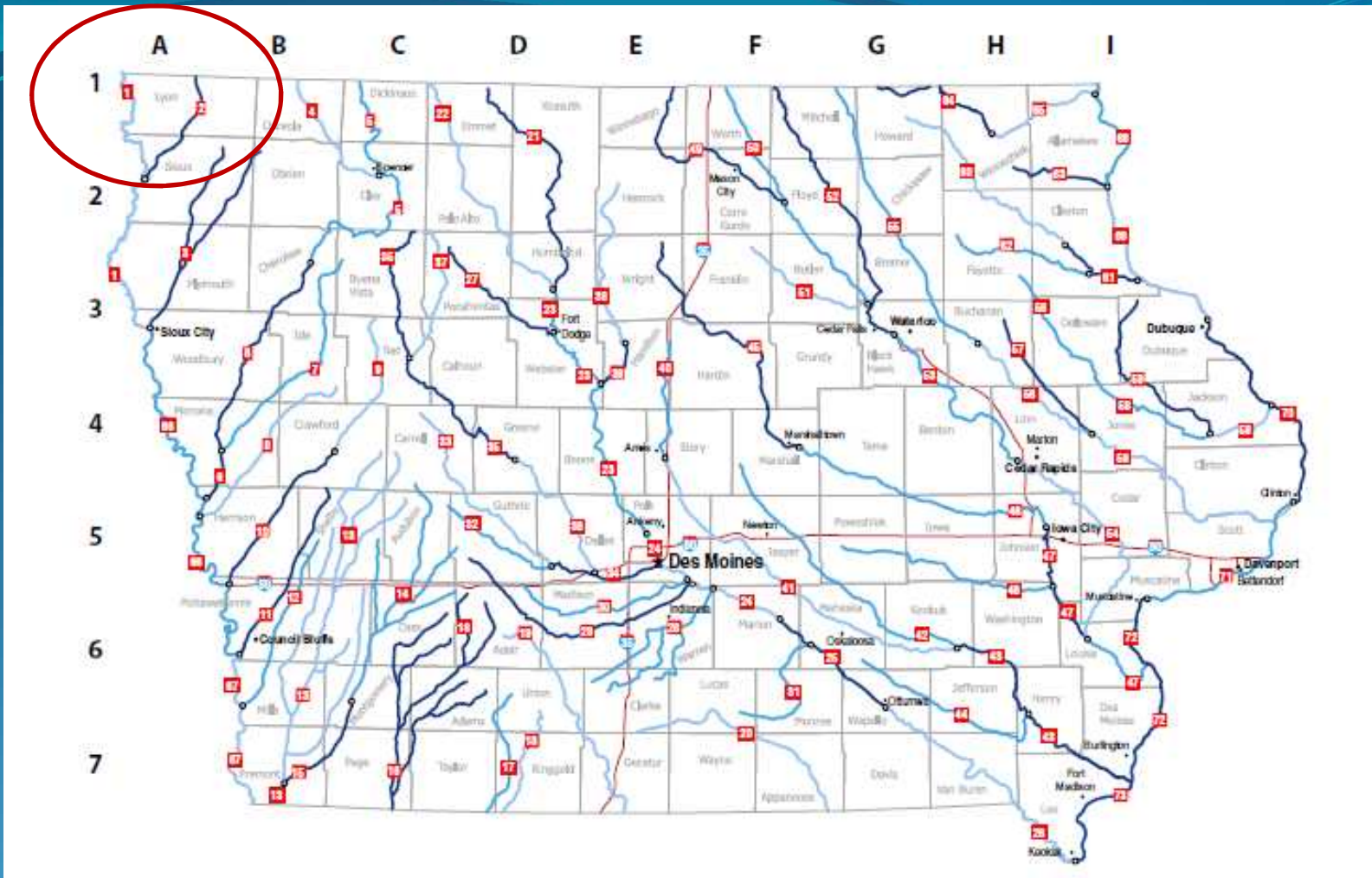


*“In order to make sound decisions concerning the future of Iowa rivers and streams, it is important to understand how the rivers and streams are used, as well as what factors influence your selection of rivers and streams to visit.*

*The answers you give to the questions in this survey may be important in determining where investments may be made to protect, develop or restore rivers and streams. Even if you have not visited any rivers and streams in Iowa, please complete and return the questionnaire. It is critical to understand the characteristics and views of both those who use and those who do not use the rivers and streams.”*

# Section 1: *Where Do You Recreate and What Activities Do You Engage In??*





Reference Map for Participants

# Iowa Rivers

(Table shows the river segment ID number, the coordinates

River segment ID	Map coordinates	Major river or tributary label
1	1-A	Big Sioux
2	1-A	Rock
3	2-A	Floyd
4	2-B	Ocheyedan
5	1-C	Little Sioux (above Cherokee)
6	3-B	Little Sioux (below Cherokee)
7	4-B	Maple
8	4-B	Soldier
9	4-C	Boyer (above Denison)
10	5-B	Boyer (below Denison)
11	6-B	Mosquito Creek

## Section 2: *What Impacts Your Attitude/Decision-making?*

5. What was most important to you when **SELECTING** the rivers and/or streams you have visited this past year? In particular, if you were given 100 points to distribute according to what is most important for choosing a river or stream to visit, how would you distribute them? To indicate one item is more important to you than another, you should allocate more points to it. You do not need to give points to all of the items, but remember that the total needs to equal 100.

- \_\_\_\_\_ Proximity to home
- \_\_\_\_\_ Water quality and habitat
- \_\_\_\_\_ A convenient location to meet friends/relatives
- \_\_\_\_\_ Available recreational activities (i.e., kayaking, biking, etc.)
- \_\_\_\_\_ Available facilities (i.e., bathrooms, trails, boat ramps, etc.)
- \_\_\_\_\_ Other (describe \_\_\_\_\_)

100 pts.



# Rank 30 Factors on a 5-Point Scale



## Section 3: *Demographics*

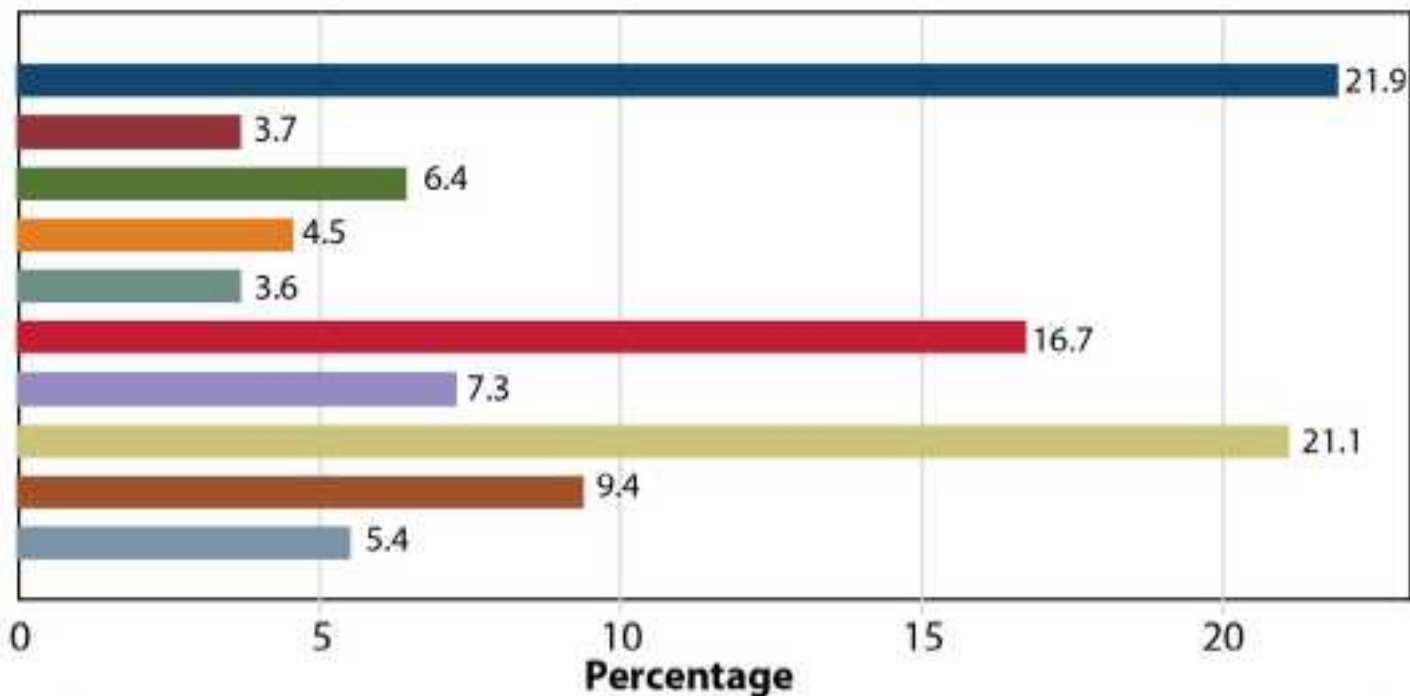
- Age Categories
- Income Categories
- Education Categories
- Gender



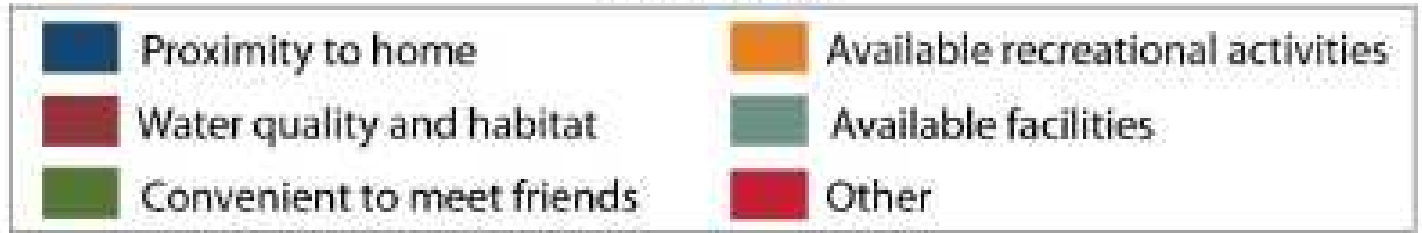
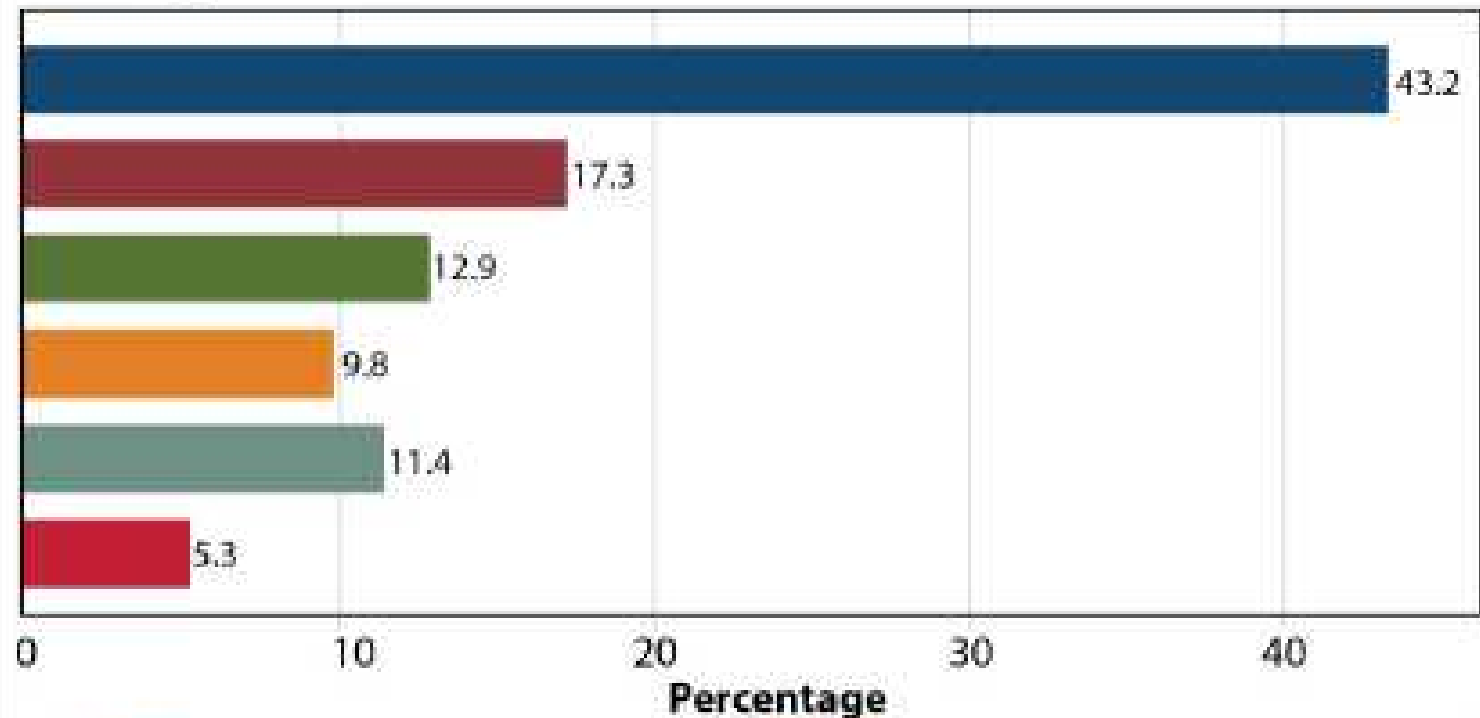
✓ 49% of the 10,000 mailed Surveys were completed and returned

✓ Follow-up Calls To Determine Bias

**Question 4:** What percentage of your time do you spend on the following activities?



**Question 5:** What was the most important consideration to you when selecting the rivers?



## Most Positive Perceptions:

- water quality
- natural setting dominates (forest, prairie, etc.)
- stream with abundant game fish

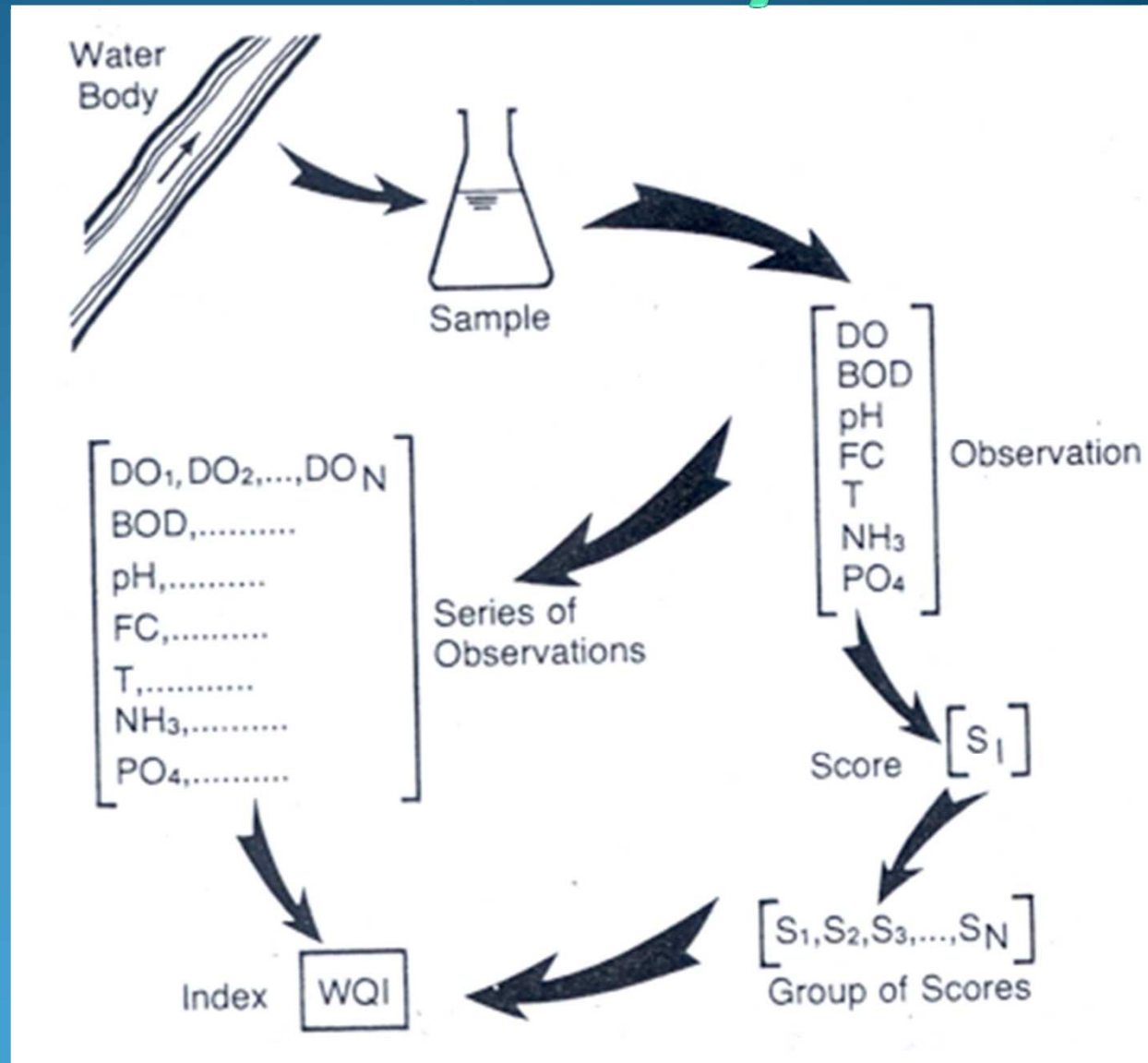
## Most Negative Perceptions:

- riverbanks lined with trash
- stream section with possible bacterial contamination
- stream section where the river smells unpleasant

# Need to Examine What “Water Quality” Means To the Public

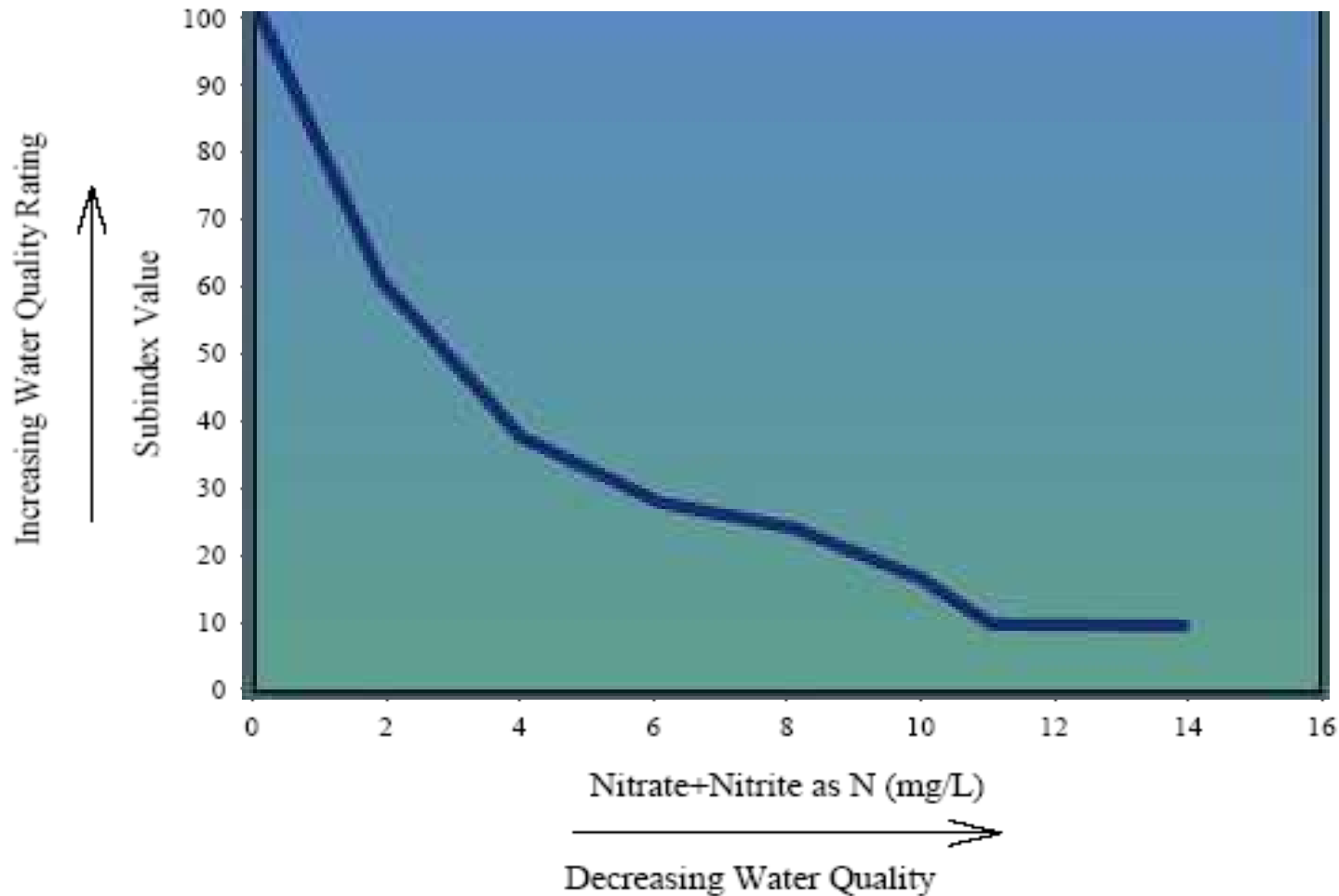
# Iowa's Water Quality Index

- pH
- BOD
- TDS
- TSS
- E. coli
- Dissolved Oxygen
- Total Pesticides
- Nitrate + Nitrite
- Total Phosphate





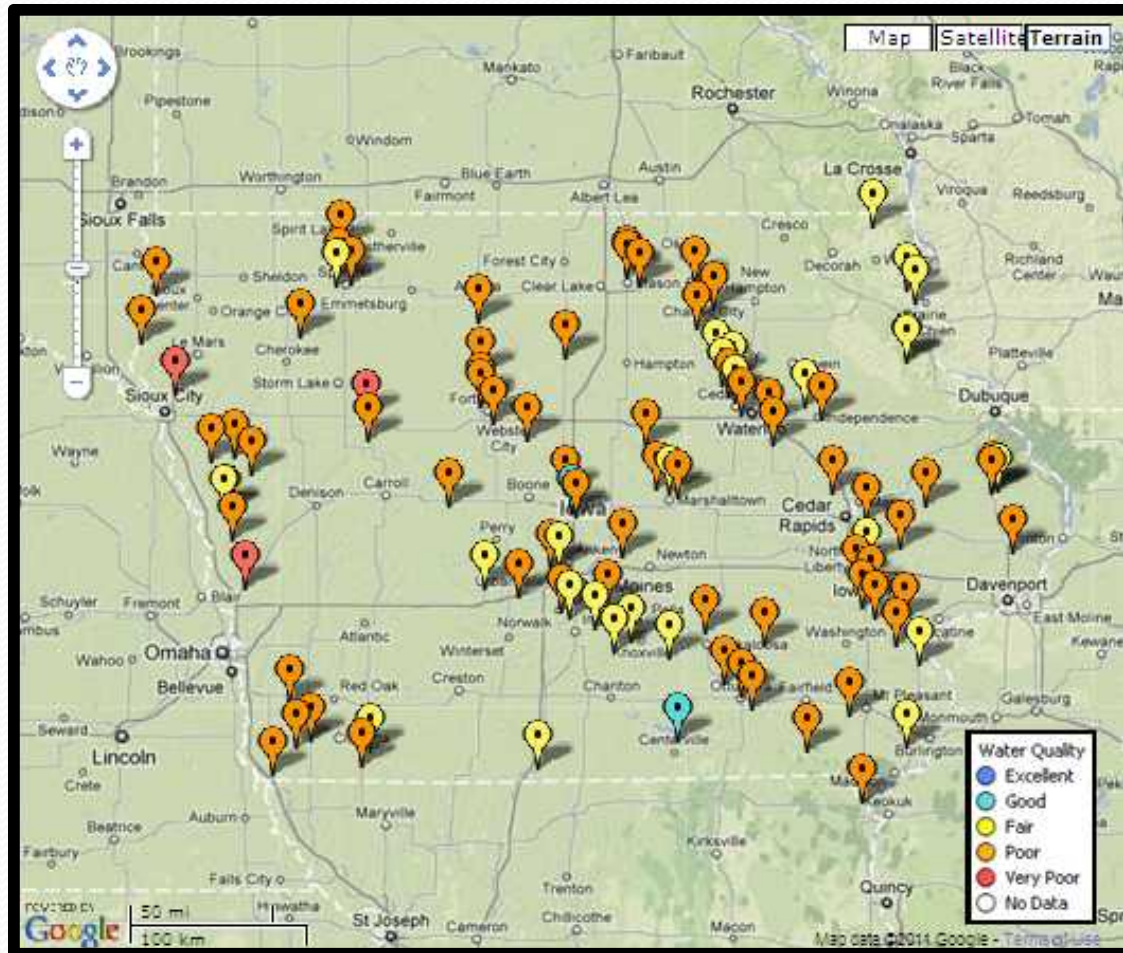
# Example of a Subindex Rating Curve



# Qualitative Rating

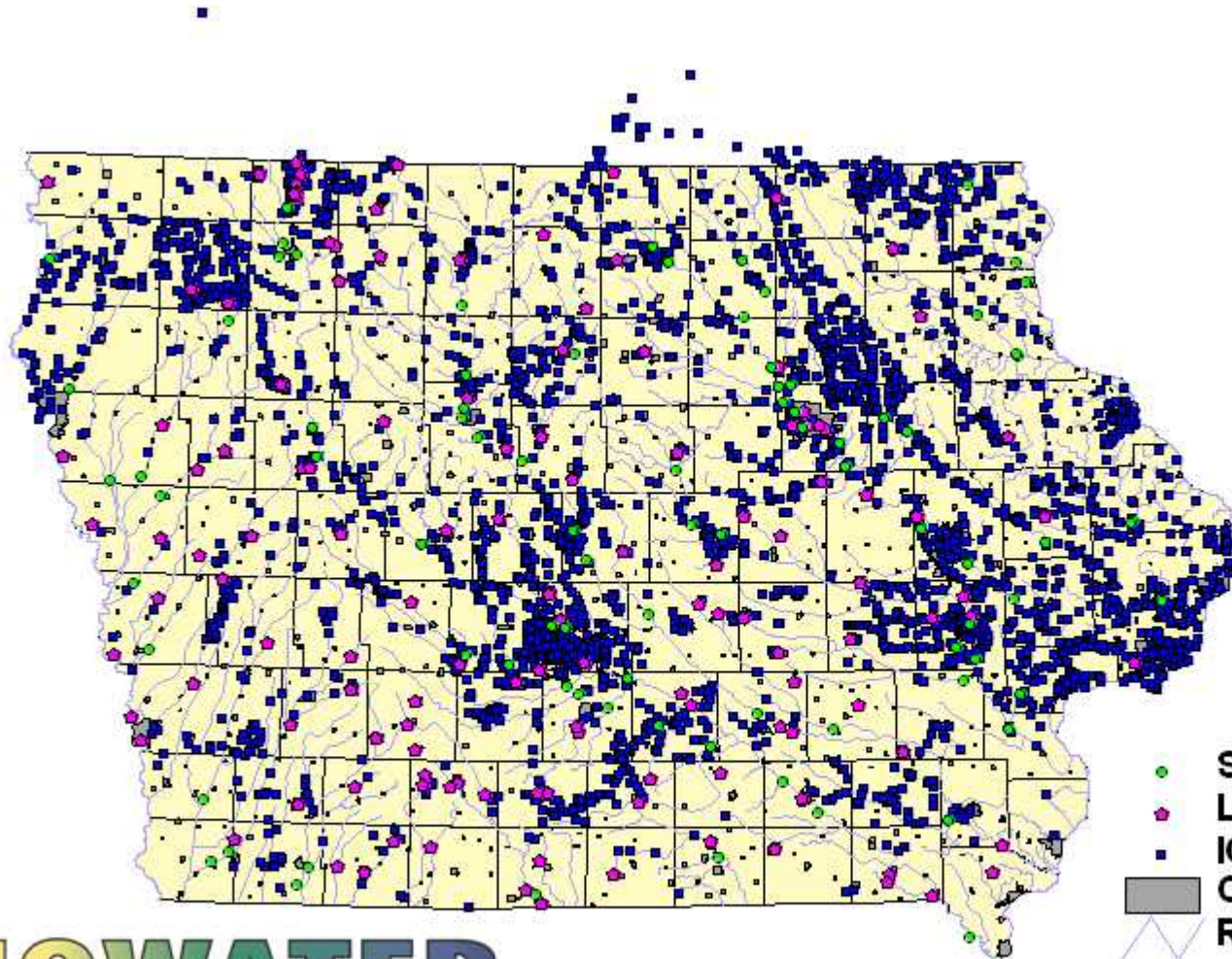
<i>Rating</i>	<i>Index Value</i>
<b>Very Poor</b>	<b>10-25</b>
<b>Poor</b>	<b>25.01-50</b>
<b>Fair</b>	<b>50.01-70</b>
<b>Good</b>	<b>70.01-90</b>
<b>Excellent</b>	<b>90.0-100</b>

# Ambient Stream Monitoring



Can we fill the data gaps  
by including other  
programs?

Index Dampens Issues  
with Precision, Method



- Stream Sites
- ★ Lake Sites
- IOWATER Sites
- Cities
- ∩ Rivers

**IOWATER**  
Volunteer Water Quality Monitoring

# Results

- ✓ No Significant Relationship Between IWQI and Overall Site Preference
- ✓ Weak, Inverse Relationship with Turbidity

# Why?

- ✓ Preference Cues are Largely Visual (turbidity, algae) whereas IWQI includes parameters that don't impact aesthetics.



# Potential Improvements

- ✓ Subsample IWQI results only during likely recreation times (remove impact of spring events with low IWQI scores)
- ✓ Remove Subindex values that can not be perceived by the public (pH, TDS, pesticides, etc.)
- ✓ Include wildlife/habitat information
- ✓ Focused Survey on Volunteers





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**Table 2. Most Popular River Segments by Visitation and Quality**

<b>Rank by Visitation</b>	<i>Rank by Quality</i>	<b>Rank by Quality</b>	<i>Rank by Visitation</i>
1. Mississippi (Clinton to Muscatine) [71]	5	1. Mississippi (Minnesota to MacGregor) [68]	13
2. Mississippi (Dubuque to Clinton) [70]	4	2. Mississippi (MacGregor to Dubuque) [69]	4
3. Des Moines (Saylorville Dam to Red Rock Dam) [24]	12	3. Mississippi (Burlington to Keokuk) [73]	11
4. Mississippi (MacGregor to Dubuque) [69]	2	4. Mississippi (Dubuque to Clinton) [70]	2
5. Cedar (above Waterloo) [52]	13	5. Mississippi (Clinton to Muscatine) [71]	1
6. Des Moines (Humbolt to Saylorville Dam) [23]	20	6. Rock [2]	31
7. Missouri (Sioux City to Council Bluffs) [66]	11	7. Des Moines (Red Rock Dam to Ottumwa) [25]	14
8. Cedar (Waterloo to Cedar Rapids) [53]	19	8. Upper Iowa (below Decorah) [65]	37
9. Iowa (Marshalltown to Coralville Dam) [46]	32	9. Mississippi (Muscatine to Burlington) [72]	18
10. Wapsipinicon (below Independence) [56]	33	10. Upper Iowa (above Decorah) [64]	25

**Table 3. Least Popular River Segments by Visitation and Quality**

<b>Rank by Visitation</b>	<i>Rank by Quality</i>	<b>Rank by Quality</b>	<i>Rank by Visitation</i>
64. Grand [18]	39	64. North Fork Maquoketa [59]	57
65. Boyer (above Denison) [9]	58	65. North Skunk [42]	51
66. Grand (Thompson) [19]	71	66. Maple [7]	68
67. Cedar Creek [31]	62	67. Keg Creek [12]	69
68. Maple [7]	66	68. Big Cedar Creek [37]	73
69. Keg Creek [12]	67	69. Platte [17]	71
70. Big Cedar Creek [44]	73	70. Soldier [8]	72
71. Platte [17]	69	71. Grand (Thompson) [19]	66
72. Soldier [8]	70	72. North [30]	54
73. Big Cedar Creek [37]	68	73. Big Cedar Creek [44]	67