

Indiana Water Quality Monitors (2004)

A. Background Information

1. Almost all (5) of the respondents indicated that they expected to learn about *E. coli* during the program.
2. Three of the respondents indicated that they were interested in participating in this project due to the information that they could learn from it. Two respondents said that they were interested in developing their data collection in the field. While one respondent was interested in developing testing skills for a local watershed project.
3. Most (4) of the respondents indicated that they planned to incorporate the data that they collected into their watershed planning activities. One respondent intended to “teach youth of the county and learn if the water is safe for river activities.”
4. Additionally, two respondents would like to see statewide levels of *E. coli* published. Another respondent thought that the data could be used to educate landowners. One respondent would like to see the data used to “reform water quality laws and information.”
5. All of the respondents had water monitor training prior to the program. All were trained as part of the Hoosier River Watch.
6. A majority of the respondents (66%) indicated that they had sampled water 10 – 100 times before the program.
7. All of the respondents indicated that they had experience in water quality monitoring in the major categories listed (i.e. macroinvertebrates, stream habitat, stream flow, turbidity, *E. coli* bacteria, nutrients, and dissolved oxygen).
8. Nearly half (49%) of the respondents were between the ages of 25 – 34.
9. Both genders were represented equally among the respondents.
10. Half (50%) of the respondents had earned a bachelors degree, while a third (33%) had earned a graduate or professional degree.
11. Four respondents indicated that they earned their living through a management position. Three respondents were educators, while service, industry, and retirement were the other occupations.
12. None of the respondents indicated color impairment.

B. Background Information and Participant Knowledge

Although it is impossible to draw conclusions about the effects of the WQM program due to the low number of responses, it is possible to suggest trends in the responses. Below are trends observed in the responses.

It seems that participant knowledge was related to water monitoring experience. The two participants with the highest scores on the “Current Knowledge” section had sampled water 51 or more times prior to the program. While the participant with the lowest score on the “Current Knowledge” section was the only participant who had sampled fewer than 10 times prior to the program.

Education, in the formal sense (i.e. years of schooling), did not seem to play a part in participant knowledge. The participant with the lowest level of schooling, “some college,” had a nearly identical score to those who finished college. This participant had sampled water over 51 times prior to the program. What’s more, this respondent scored much higher than a participant who had completed a graduate or professional degree— further suggesting that experience in water quality monitoring matters more than formal education.

Table 1. Participant knowledge found in columns 2-4. Participant background information found in columns 5-11.

1	2	3	4	5	6	7	8	9	10	11
ID	Know Index	Before%	After%	Prior Training	Sampling Experience	V or P	Age	Gender	Ed.	Color Impair
IN0401	11	70%	90%	2	3	V	5	2	3	1
IN0402	13	80%	70%	2	2	V	4	1	6	1
IN0403	13	50%	70%	2	1	V	3	2	7	1
IN0404	17	90%	90%	2	4	P	6	1	7	1
IN0405	14	80%	100%	2	3	V	3	2	6	1
IN0406	13	70%	70%	2	2	V	3	1	6	1

Know Index = (Prior Training x 2) + Sampling Experience + [V x 1; P x 2] + Ed.

Before % = Percent of “Current Knowledge” questions answered correctly before program

After % = Percent of “Current Knowledge” questions answered correctly after program

Prior Training: 1 = No; 2 = Yes

Sampling Experience (Number of samples drawn):	1 = Less than 10
	2 = 10 – 50
	3 = 51 – 100
	4 = 101 or more

V or P: V = Majority of responses to Q7 indicate Volunteer experience;
P = Professional

Gender: 1 = male; 2 = female

Age:	1 = 18 or under
	2 = 19 – 24
	3 = 25 – 34
	4 = 35 – 44
	5 = 45 – 54
	6 = 55 – 64
	7 = 65 – 74
	8 = 75 or over

Education:	1 = Some High School
	2 = High School or equivalent
	3 = Some College
	4 = Technical Degree
	5 = Associate Degree
	6 = Bachelor Degree
	7 = Graduate or Professional Degree

Color Impairment: 1 = No; 2 = Yes

C. Overall Impressions of Training

- All of the participants rated the training as either “Good” (67%) or “Very Good” (33%).
- All of the participants rated the quality of the educational materials used during the training as either “Good” (67%) or “Very Good” (33%).
- Half of the participants indicated that the provided materials were “Very Good.” The other half of the participants felt that the materials were “Good.”
- Again, half of the participants felt that the quality of instruction was “Very Good,” while the other half felt that the instruction was “Good.”
- A third of the participants felt that the training time was “Too Short.” Another third felt the time was “Just Right,” and the other third felt it was “Too Long.”
- Half of the participants indicated that they had heard about volunteer opportunities in water quality monitoring through Hoosier Riverwatch.
- Two-thirds of the participants “strongly agreed” with the statement: “the training met my expectations.”
- Half of the participants “agreed” with the statement: “I am satisfied with the training that I have received.” A third of the participants “disagreed” with this statement, while 17% “strongly agreed” with it.
- Half of the participants “strongly agreed” with the statement: “I would recommend the training to other volunteers.” The other half of the participants “agreed” with this statement.
- Two-thirds of the participants “strongly agreed” with the statement: “I look forward to putting my new knowledge to use in monitoring *E. coli* bacteria.” The other third “agreed” with this statement.

D. Background Information for Volunteer Water Quality Monitors

1. What do you expect to learn from the water monitoring training?

ID	Response
IN0401	Proper procedure to conduct the different tests. How I am expected to record and report results.
IN0402	Proper techniques and methods for recording information.
IN0403	To make sure we are doing the testing correctly; learn how to count <i>E. coli</i> correctly and answer any questions.
IN0404	How to properly use all equipment; local reading on streams and rivers.
IN0405	How to better use different <i>E. coli</i> testing equipment; how to use these methods to ensure QA/QC.
IN0406	Become fluent in <i>E. coli</i> monitoring testing and narrow down to best test between 3.

2. Briefly describe why you are interested in participating in this project.

ID	Response
IN0401	Long time interest in Stream monitoring, sharing knowledge, learning more, and working with Lyn and Jan and crew.
IN0402	Learn more about water quality of area rivers.
IN0403	Our SWCD is interested in gathering <i>E. coli</i> data in our county to learn more about what conservation practices are needed on the ground.
IN0404	Interest in training in the field; concern about local water quality.
IN0405	To better survey <i>E. coli</i> in priority streams in Tippecanoe County and find easiest and best method for volunteers and still get accurate results.
IN0406	Involved in a watershed project and water quality is directly related.

3. What do you intend to do with the data that you collect?

ID	Response
IN0401	Report accurately to the project, report to Hoosier River Watch, assist with LARE project watershed planning, share with others who are interested...
IN0402	Use it to help teach the youth of the county and learn if the water is safe for river activities.
IN0403	Help back up what conservation practices are needed on the land. Use it to help justify concerns in our watershed.
IN0404	Compilation and look for trends.
IN0405	Utilize with the rest of the <i>E. coli</i> data we have from our own surveys and tests.
IN0406	Use as info for management activities to protect the watershed.

4. What else would you like to see done with the data?

ID	Response
IN0401	Whatever you need!
IN0402	Use it to help reform water quality laws and information.
IN0403	Comparison / graph the info from all data collected; correlate with potential problems...
IN0404	Publish statewide data.
IN0405	Help other volunteer groups find best method to test <i>E. coli</i> ; use to compare statewide levels of <i>E. coli</i> ?
IN0406	Educational purposes with landowners interested in keeping their streams clean.

5. Do you have prior training in water monitoring? **100%** Yes No

If yes, briefly describe the training:

IN0401	Water Watchers of Northern Indiana; Hoosier Riverwatch Volunteer
IN0402	Hoosier Riverwatch level I and II
IN0403	Hoosier Riverwatch level I and II
IN0404	Graduate thesis; Clean Lakes; Hoosier River Watch
IN0405	Hoosier Riverwatch – up to instructor
IN0406	Hoosier Riverwatch levels I and II

6. If you have experience in monitoring water quality, approximately how many times have you sampled?

17%	Less than 10
33%	10-50
33%	51-100
17%	101 or more

7. Please check the circles that most closely describe your experience in water quality monitoring.

	Volunteer	Professional
Experience in Monitoring:		
Macroinvertebrates	100%	0%
Stream Habitat	83%	17%
Stream flow	100%	0%
Turbidity	83%	17%
<i>E. coli</i> bacteria	80%	20%
Nutrients	83%	17%
Dissolved Oxygen	83%	17%
Other: Metals	67%	33%

8. What is your age?

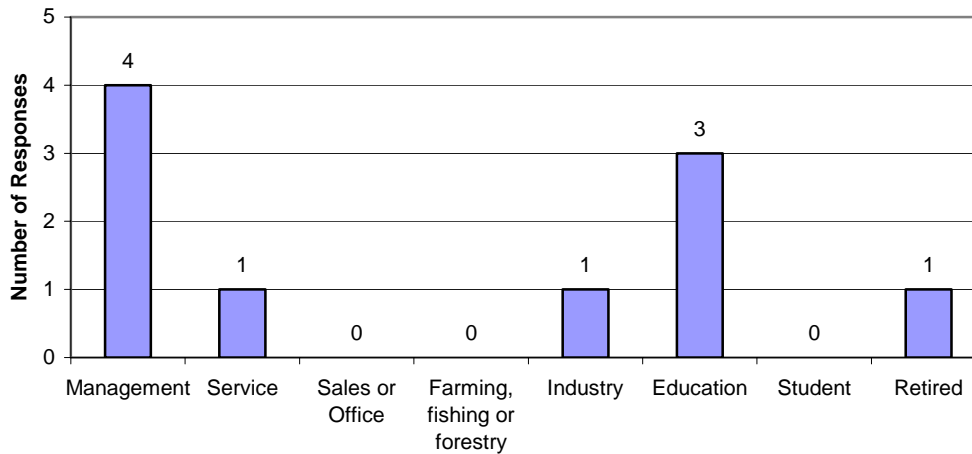
0%	18 or under
0%	19-24
49%	25-34
17%	35-44
17%	45-54
17%	55-64
0%	65-74
0%	75 years or over

9. What is your gender? **50%** Male **50%** Female

10. What is the highest level of education you have completed?

0%	Some High School
0%	High School or equivalent
17%	Some College
0%	Technical Degree
0%	Associate Degree
50%	Bachelor Degree
33%	Graduate or Professional Degree

11. What is your present occupation? (check all that apply)



12. Making bacterial counts requires the ability to interpret color data. To the best of your knowledge, do you have color impairment (also called color blindness)?

0% Yes

100% No

E. Quality and Effectiveness of Training

Overall impressions of the training

Please rate the overall quality of the training.

33%	67%	0%	0%	0%
Very Good	Good	Poor	Very Poor	Don't Know

Please rate the quality of the educational materials used during the training.

33%	67%	0%	0%	0%
Very Good	Good	Poor	Very Poor	Don't Know

Please rate the quality of the materials provided to participants.

50%	50%	0%	0%	0%
Very Good	Good	Poor	Very Poor	Don't Know

Please rate the quality of the instruction.

50%	50%	0%	0%	0%
Very Good	Good	Poor	Very Poor	Don't Know

Please rate the length of time for the training.

33%	33%	33%	0%	0%
Too Short	Just Right	Too Long	Far Too Long	Don't Know

What would be the ideal length of time for this training?

- 6 – 7 hrs.
- 8 hrs.
- 6 hrs.
- 4-5 hrs.
- Difficult to say, each group's knowledge is different

What part of the training was *most* useful or valuable to you?

- The new instructor sheets, discussing questions
- New testing
- Experiments
- Doing the tests to find out what I do wrong
- Performing tests together
- Clean up technique

What part of the training was the *least* useful or valuable to you?

- The part where we don't know the answers yet
- Some info repeated due to past experiences
- Coliscan
- Nothing
- N/A

What additional topics should be covered?

- Not sure at this point
- None
- Nothing
- Chain of custody

What topics could be emphasized less?

- N/A

Approximately how many miles did you travel to attend this training?

- 90 round trip
- 64 one-way
- 25 – 30 one-way
- 75 one-way
- 120 one-way

How did you first hear about volunteer opportunities in water quality monitoring?

- **Hoosier Riverwatch through SWCD**
- **Lake program (volunteer lake monitoring)**
- **Elkhart Co. Health Dept. in the 80s**
- **Hoosier Riverwatch**
- **Through work (SWCD)**
- **Through Hoosier Riverwatch**

Please identify any obstacles you faced while learning to use each kit.

Coliscan® Easy Gel kit (not incubated):

- **Getting a handle on *E. coli* colors**
- **Differences in colors when interpreting results**
- **None**

Coliscan® Easy Gel kit (incubated):

- **Same as above**
- **Setting the incubator**
- **Getting incubator to stabilize**

3M™ Petrifilm™ kit:

- **Same as above**
- **Gas bubbles need to be present! Storage of materials**
- **Color of the background; no spreader; storage questions**
- **Proper use of spreader**

Coliscan® MF Method kit:

- **Just cleaning between uses**
- **Equipment use, esp. “filter funnel”**
- **Using the filter apparatus**
- **Keeping sterile and cleaning for quick uses**

Your Reactions to the Training

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/ Not Sure
The training met my expectations.	67%	33%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with the training that I have received.	17%	50%	33%	<input type="radio"/>	<input type="radio"/>
I would recommend the training to other volunteers.	50%	50%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I look forward to putting my new knowledge to use in monitoring <i>E. coli</i> bacteria.	67%	33%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional Comments:

- We still have a few questions to answer and figure out, but overall I feel great about the tests after this training!
- Thanks for the training. It's very tough when you are out on the leading edge of a project that is "almost" finalized

**F. Volunteer Assessment of Test Kits
Aggregate Results**

Please rank the kits from 1 to 4 in order of learning, with 1 being the easiest and 4 being the most difficult.

Kit	Mean	Median	Range
Coliscan® Easy Gel kit (not incubated)	2.29	2.00	1-3
Coliscan® Easy Gel kit (incubated)	1.57	2.00	1-2
3M™ Petrifilm™ kit	1.71	1.00	1-3
Coliscan® MF Method kit	3.86	3.86	3-4

Please rank your confidence using the kits from 1 to 4, with 1 next to the kit you have the greatest confidence using and 4 next to the kit you have the least confidence using.

Kit	Mean	Median	Range
Coliscan® Easy Gel kit (not incubated)	1.71	2.00	1-3
Coliscan® Easy Gel kit (incubated)	1.57	2.00	1-2
3M™ Petrifilm™ kit	2.57	3.00	1-4
Coliscan® MF Method kit	2.71	3.00	1-4

Please identify any obstacles you faced while learning to use each kit.

Coliscan® Easy Gel kit (not incubated):

- Understanding the color differences of *E. coli* colonies X 2
- Interpreting blue and green
- My skill at reading results
- Easy
- No problems

Coliscan® Easy Gel kit (incubated)

- Same as incubated
- My skill at reading results
- Easy
- No problems

3M™ Petrifilm™ kit

- Reading only with gas bubbles
- Storage of materials
- Pink background
- Counting @ 24 hr. and then at 48 hr.
- My skill at reading results; unclear instructions
- Easy
- No Problems

Coliscan® MF Method kit

- Cleaning materials
- Keeping sterile
- My skills at reading results; my awkwardness
- More complicated, but easy to use
- Sterilization of upper funnel

