

2014-2015

Rouge Education Project: Student Survey Results



**Friends
of the
ROUGE**

Friends of the Rouge

Dearborn, Michigan

www.therouge.org

Contents

Introduction	3
How Data are Used	3
Fall Monitoring 2014 Results	4
All Grades	4
Pollution in the Rouge.....	5
Technical scientific questions (grades 7th-12th)	6
Feelings regarding the Rouge Education Project	6
4 th -6 th grade responses	7
7 th -12 th grade responses	7
Open-ended Responses	13
Spring Monitoring 2015 Results.....	17
All Grades	17
Pollution in the Rouge.....	18
Technical scientific questions (grades 7th-12th)	19
Feelings regarding the Rouge Education Project.....	19
4 th -6 th grade responses	20
7 th -12 th grade responses	20
Open-ended Responses	26
Notable Results & Discussion.....	34
Fall Monitoring 2014.....	34
Spring Monitoring 2015	35
Overall Summary & Conclusion	36

Introduction

Pre- and post-Rouge Education Project (REP) student evaluations, designed to reflect the program's impact, are distributed to each participating teacher and are written for different grade level groups: 4-6, and 7-12. Schools in the program that have numerous grade levels participating are given the appropriate mix so that each student has the ability to take the proper survey. Pre-REP surveys that do not have a matching post-REP survey (and vice-versa) are enumerated separately, but are not included in overall calculations. This ensures that the assessments are balanced and accurate, though it also can mean some schools' data reflect more/less students who actually participated in the program than in the surveys because they missed either the sampling day or the survey distribution. Below is the compiled assessment of the survey for both fall & spring monitoring.

As of fall 2013, REP pre- and post-sampling surveys have been modified and are adapted (with permission) from similar surveys created and distributed by Friends of the Chicago River.

How Data are Used

Survey results are used in program development and grant writing to estimate a measurable impact from those students that participate. Quantitatively, the program will be considered a success for 2014-2015 the following are observed from student pre- and post- surveys:

- An increase in the percentage of students correctly answering multiple choice questions based on general watershed science and/or the Rouge River specifically
- An increase in the percentage of students who can identify specific water quality issues in the Rouge River
- An increase in the percentage of students who can correctly identify potential solutions to local and/or regional water quality issues

Fall Monitoring 2014 Results

All Grades

Sample Size	
4 th	0
5 th	55
6 th	53
subtotal	108
7 th	1
8 th	5
9 th	7
10 th	145
11 th	41
12 th	57
subtotal	256
TOTAL	364

Have you ever been to the Rouge River?

No. of times to the Rouge River	4th-6th		7th-12th	
	Pre	Post	Pre	Post
Never	30	5	200	99
Once before	22	37	43	133
Twice before	32	23	4	13
Three times before	2	15	1	2
Four times before	1	3	2	0
Five times before	1	2	0	4
More than five times before	20	21	6	5

63% of participants had never been to the Rouge River before.

Interest in science

There was a 5.35% increase in the number of students very interested in science.

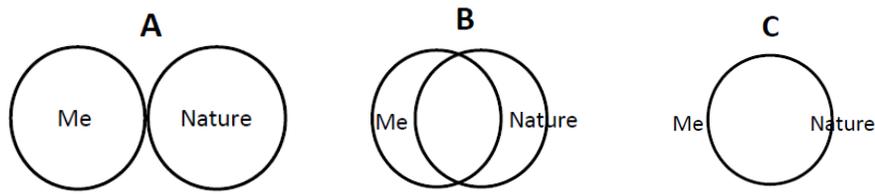
Interest in nature

There was an 8.96% increase in the number of students very interested in nature.

Interest in school

There was a 6.43% increase in the number of students very interested in school.

Relationship with nature



There was a 3.17% decrease in the number of students that chose “A”, a 0.83% increase in the number of students that chose “B” and a 2.35% increase in the number of students that chose “C” to represent their connection to nature.

Q: All macroinvertebrates are equally tolerant of pollution

There was a 7.53% increase in the number of students indicating the correct answer (*false*).

Number of students correctly identifying ALL macroinvertebrates from list (i.e., insects, mammals, crustaceans, molluscs (snails, clams, etc.), birds, fish)

There was a 19.23% increase in the number of students able to correctly identify these macroinvertebrates (from 76 students to 146 students).

Pollution in the Rouge

Number of students (4th-6th) able to list a source of pollution in the Rouge

There was an 11.31% increase.

Number of students (7th-12th) able to list a problem affecting the Rouge

There was a 7.03% increase.

Number of students able to list a corrective action to limit pollution

There was a 2.23% increase (314 students to 323 students).

Number of students (4th-6th) that know where to look to find out more about the pollution problem they listed

There was a 14.67% increase in the number of students able to find out more about the pollution problem they listed.

Number of students (7th-12th) that know where to look to find resources to fix the problem

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Pre	34	89	89	33	5
Post	74	107	53	15	3

There was a 15.77% increase in the number of students that “strongly agreed” with this statement, and a 6.86% increase in the number of students that “agreed”.

Students (7th-12th) able to research the problem listed

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Pre	70	140	31	6	3
Post	101	123	20	7	3

There was an 11.76% increase in students that “strongly agreed” with this statement.

Students (7th-12th) able to explain the problem listed

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Pre	69	125	43	9	4
Post	104	117	26	6	1

There was a 13.34% increase in students that “strongly agreed” with this statement.

Technical scientific questions (grades 7th-12th)

Q: Imagine you are at the river testing for the presence of dissolved oxygen in the water. If you want to get the most accurate result, you should repeat the test more than once.

97.24% of students answered this question correctly in the pre-survey (*true*), and 97.65% of students got answered correctly in the post-survey.

Students able to list a source of high nitrates in the Rouge

There was a 33.20% increase in the number of students able to list a source of high nitrates in the Rouge (78 students to 163 students). Answers that were left blank were considered incorrect.

Students able to list a corrective action to limit nitrates

There was a 33.98% increase in the number of students able to list a corrective action to limit nitrates (58 students to 145 students). Answers that were left blank were considered incorrect.

Feelings regarding the Rouge Education Project

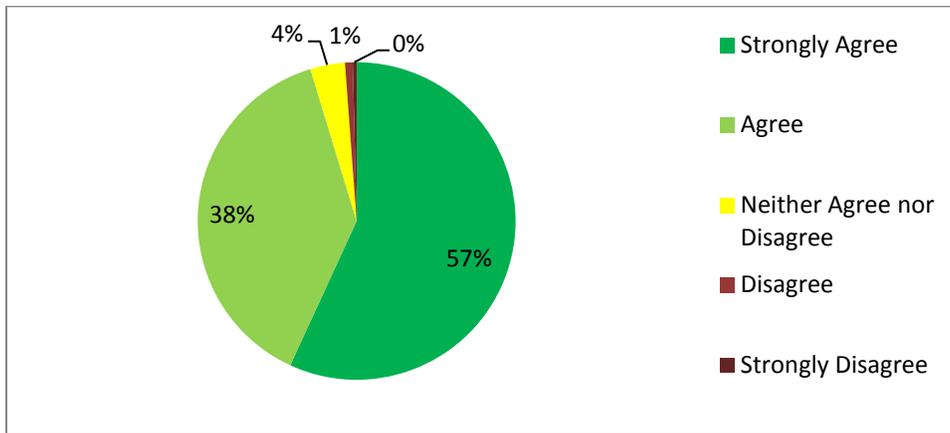
94% of all students were able to list a way participating in the Rouge Education Project helps the Rouge River.

4th-6th grade responses

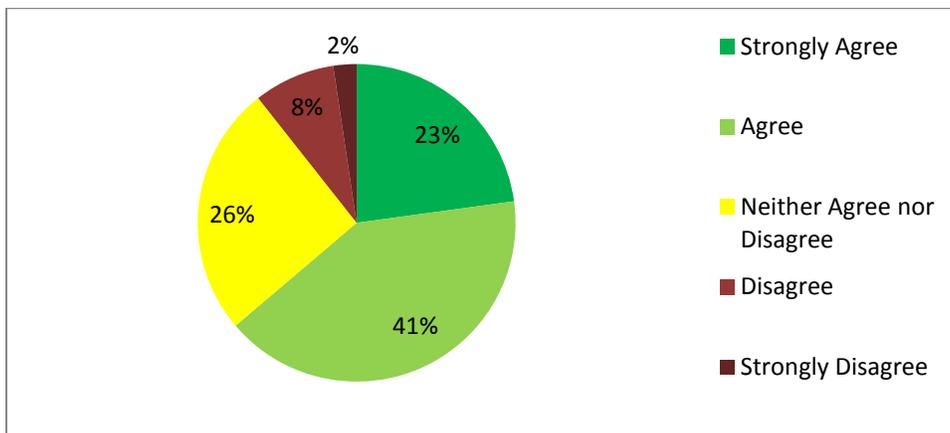
Question	Percent of students
Learned how to make the Rouge healthier	94%
Learned something new about the Rouge	89%
Participating in the REP made me feel like I could make a difference in protecting the environment	84%
Participating in the REP helped me to think like a scientist	78%
Participating in the REP helped me understand classroom material better	74%
Plan to talk to family/friends about the REP	72%

7th-12th grade responses

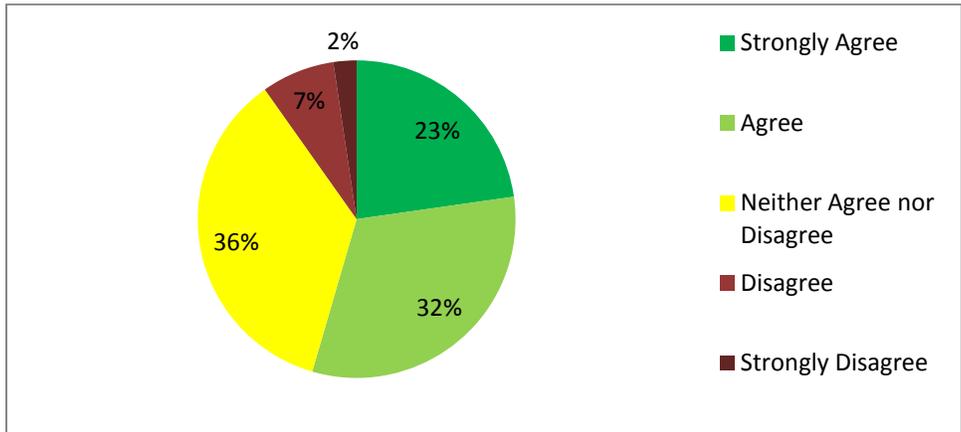
I learned something new about the Rouge River.



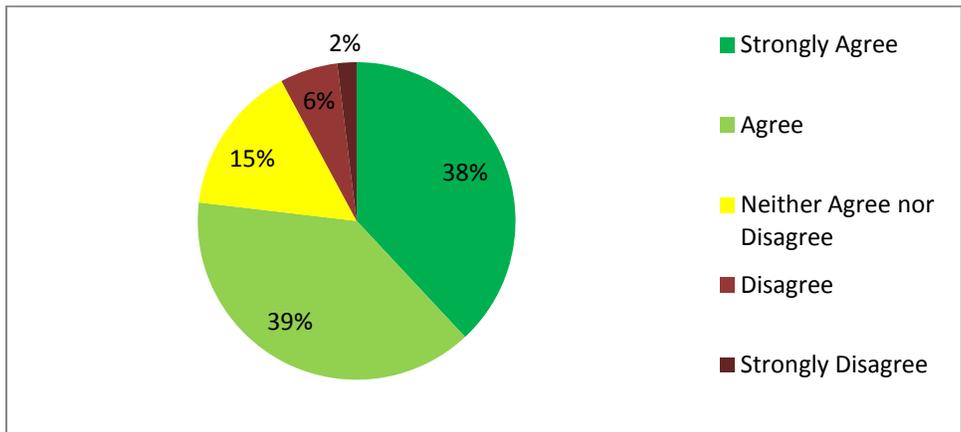
I plan to talk to family and/or friends about the information I learned.



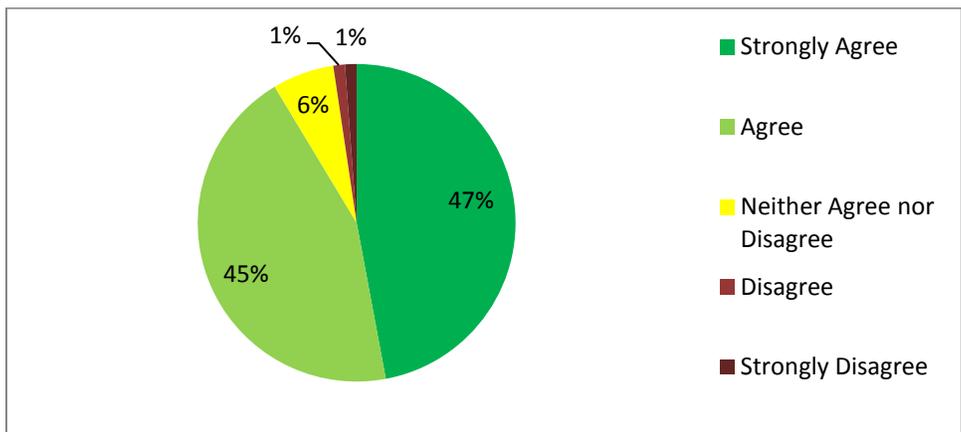
I experienced a feeling of connectedness to the Rouge River.



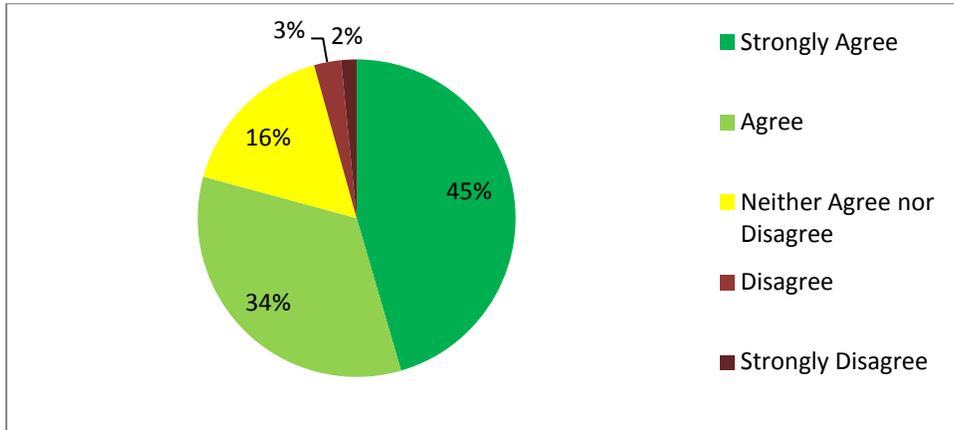
I found myself reflecting on new ideas about how my actions affect the river.



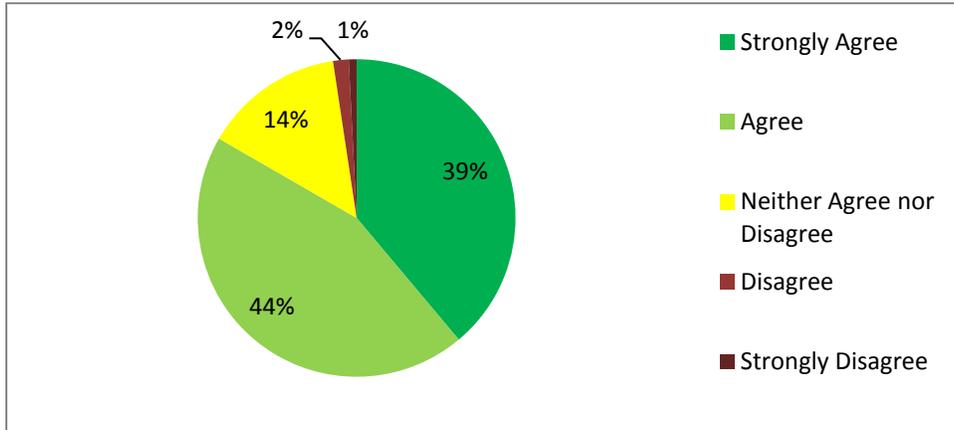
I learned about actions I could take to make the Rouge River healthier.



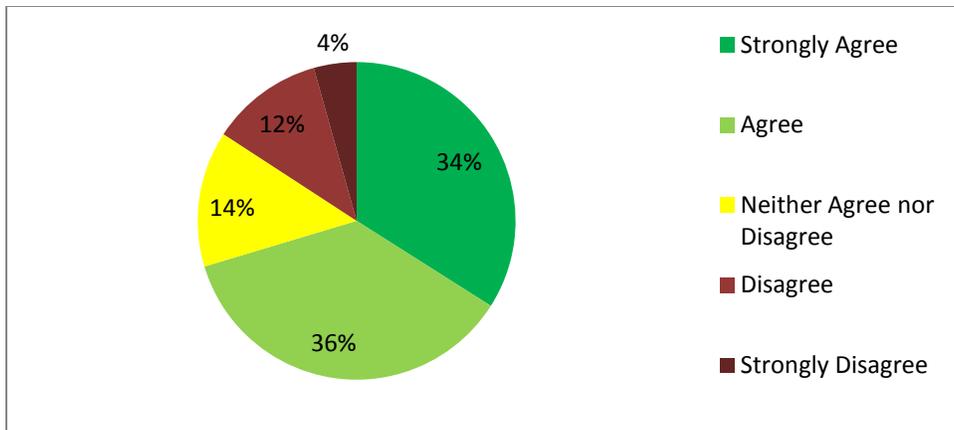
If given the opportunity, I would choose to participate in more projects that would help the Rouge River.



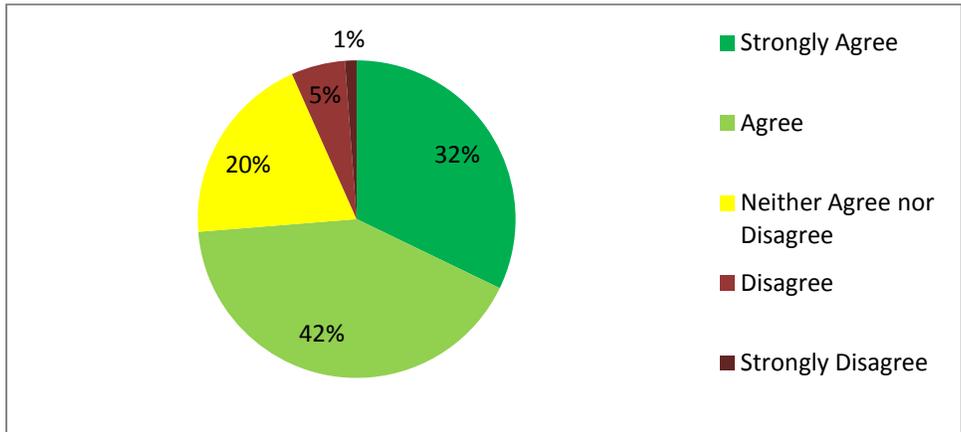
Our class' REP river monitoring made (or could make) a difference in the health of the Rouge River.



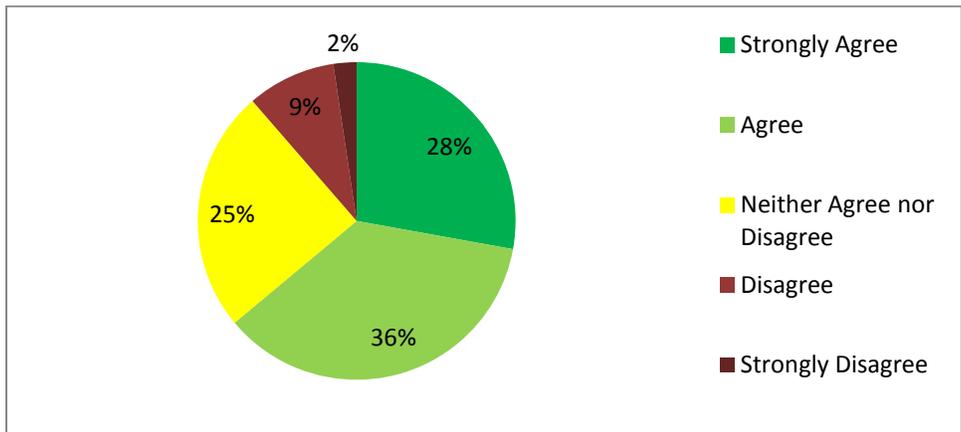
Our class' REP river monitoring involved people and/or organizations from the community (other than school staff/faculty.)



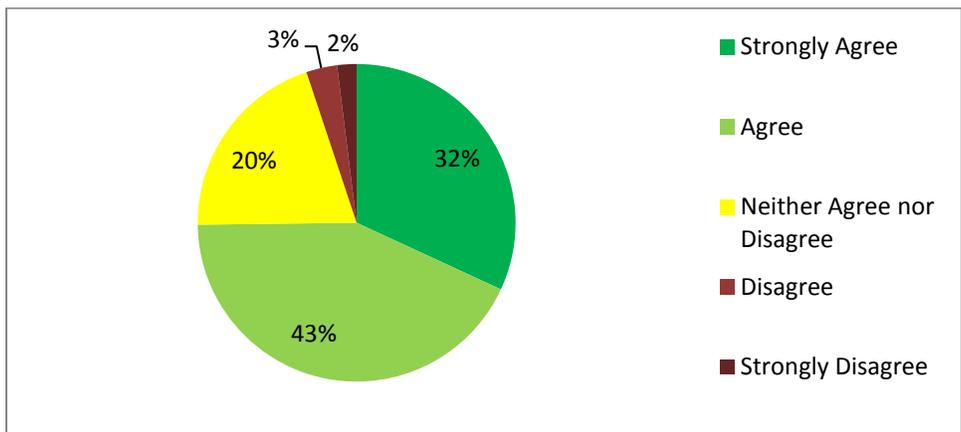
The REP helped me feel that I could make a difference in society.



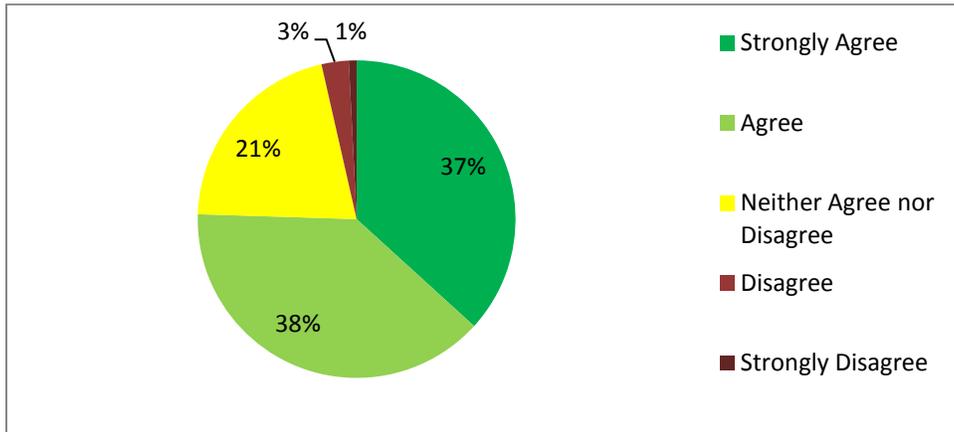
I met people/encountered things I normally wouldn't have during the REP.



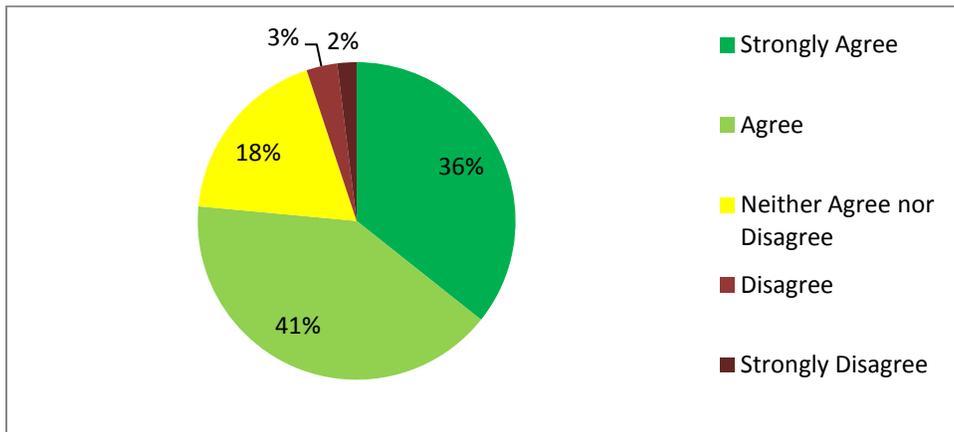
The REP challenged me to think like a scientist.



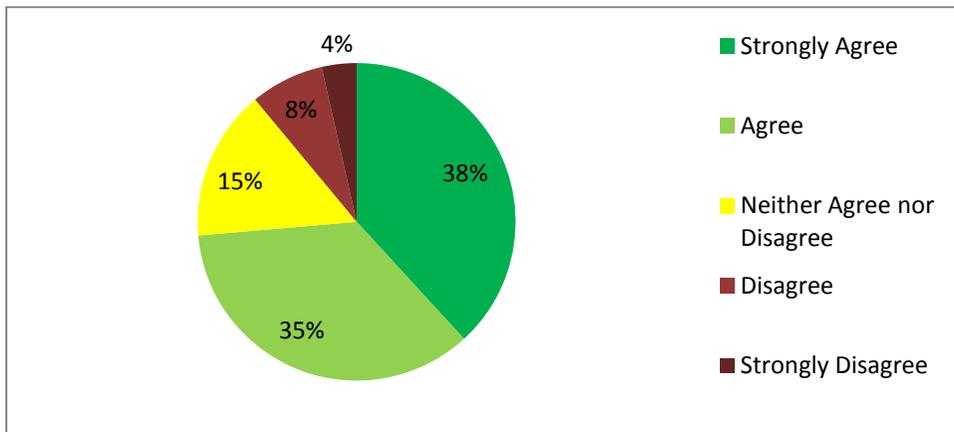
The REP was directly related to my classroom work.



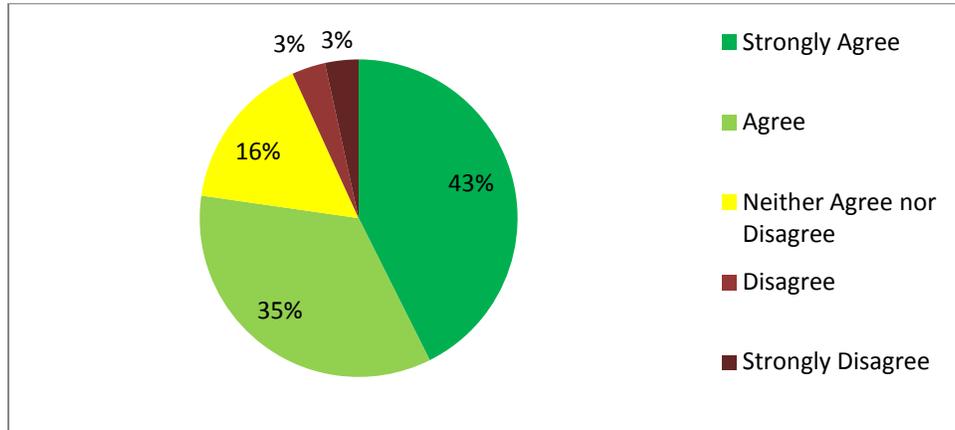
The REP helped me understand the classroom material better.



I had the opportunity to participate in river-related discussions and/or activities before our river field trip.



I had the opportunity to participate in river-related discussions and/or activities after our river field trip.*



*There were a large number of "blank" entries (80 out of 256 respondents) for this particular question; the sample size may not reflect actual numbers.

Open-ended Responses

When you think about the Rouge River, what is the first word that comes to mind?

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
Adventurous	Adventure	A watershed	Abandoned
Awesomeness	Awesome (x2)	Apples	Algae
Dirty	Beautiful	Big river	Anthropogenic pollution
Dirty ground	Brown	big river, watersheds	APES
Fascinating	Bugs	Bridge	Aquatic ecosystem
Forest	Catfish	brown	Aquatic organisms
Fun	Crayfish (x3)	Brownish-red water	Beautiful
Helping environment	Detroit River	Buetiful water	Beavers
I don't know	Dirty (x2)	Clean	big
I wide, powerful river sustaining life	Fish/water	Close	Brentwood
Interesting	Ford	Cold	Brown (x3)
Leeches	Forest (x2)	Detroit (x3)	Clean
Life in water, bountiful place	Fun	Dirt, river	Cleaner
Messy, gross, icky, fun, river, nature.	Gross, river, fun-ish	Dirty (x26)	Clear
Nature (x4)	Home to many creatures and insects	Dirty river with trash in it	Cold
Our watershed cool and fun	hot sauce(Its accually true!)	Dirty water	Contaminated
Outdoor, learning, nature	I don't know	Ducks, insects, fish	Coolidge/pond
Park	Important to keep it clean	Environment	Crawfish
Pollution or Polluted (x7)	Interesting (x2)	Fieldtrip	Crayfish
Rainy	Life	Filthy	Dead leaves
red	Making life cleaner for animals	Firefighter Park	Dearborn Heights
Red river tributary in backyard	Nature (x6)	Fish (x2)	Decreasing water pollution
River (x24)	Organisms	Fishy	Destruction
River (long)	Park	Flooding	Detroit
River and a forest	Pollution or Polluted (x7)	Ford	Dirt (x2)
River and water	River (x15)	Ford Rouge Plant	Dirty (x17)
river trees	River that is procted	France	Dirty water
River. other than that, Water	River that was not polluted but now is and we are trying the best that we can to keep it clean.	Fun	Dissolved oxygen & pollution
Rivers, school and bugs	Rivers and school	Great water	Dissolved oxygen (x3)
Rouge	Rouge, and then following river	Gross water	Ecosystem
test (what we will test)	testing	Help	Environmental AP class
testing	The river	Henry Ford	Factory
Water (x28)	Woods because they are right by the	Hillcrest Elementary School	Fecal coliform (x7)

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
	Rouge River.		
water and animals	To help the rouge	Historic	Field trip
Water and river	Water (x28)	Home	Fish
Water and wildlife	Water and wildlife	Huge water source	Fishing
Water flowing in the river	Water testing	Hydrogen	France
Water quality	Water; bugs,dirt,deep,cold	I think of sewage.	Fun
Water Source	Waterfall	industrial	Going on the last field trip when I was younger.
Watershed (x2)	Watershed (x2)	Its a river	Good water and healthy place for macro invertebrates to live.
Wet (x3)	Wet (x3)	It's a river near Hillcrest.	Gross
wet, fun	Wet fun	Lake	Help (x2)
When I go hiking by it	What will I test	melo	Henry Ford/Brown water
Woods because they are by the Rouge River.	When I go hiking in my backyard and it leads to the Rouge River	Murky (x2)	Hines
	Wildlife	Nasty (x2)	Home
		Nasty odor	Human waste
		Nature (x7)	I think of Redford Mi
		Nissan	Impoundment
		Nothing	Improved - as in there was a lot of improvement in the Rouge River.
		Park	Improvement (x2)
		Polluted body of water	improving
		Polluted river.	industrial.
		Pollution	Insects (x2)
		Pollution in water	Interesting
		Pollution or Polluted (x29)	just a river
		Preventing pollution	life
		Red (x4)	Local
		Red river	Long
		River (x17)	Macroinvertebrates
		River going through the woods	Making a come back
		River rouge	Man made
		River that has been polluted	Medium
		Riverside	Michigan (x2)
		Rock	Muddy
		Rouge River	Murky
		Sewage (x2)	Nasty (x2)
		Sewage waste	Nature (x2)

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
		Small	nature resource
		Steel factory	Nature, water
		That it needs help	Nature.
		The inhabitants of the river.	Nitrates, dissolved oxygen
		The marvel x-men hero, Rouge.	Not clean, needs attention.
		Trees	On long lake a collige
		Unclean	organic waste or fertilizer
		Untreated	Organisms
		Very polluted	Park (x2)
		Water (x80)	Pollutants - the pollutants killing the organisms & affecting water quality.
		Water pollution	Polluted (x22)
		Water quality	Polluted area that has changed over time to be a safe place for wildlife habitats
		Water, fish	Polluted. As we tested in total solids, fecal coliform, phosphates and nitrates that grow algae, heat pollution that brings heat to the water making it available for us to see all the bacteria the river has was extremely interesting.
		Water, river	Polluted/unclean
		Watershed	Pollution & phosphate/nitrate
		Ways of helping the environment	Pollution from fecal coliform and overall medium water qualities.
		wet	Pollution, a long polluted river
		When I think about it, the first word is pollution.	Pond
		Where is it?	Problems
			Red (x4)
			Resource.
			River (x7)
			River filled with different types of organisms
			River in a isolated area.
			River in Redford
			River rouge
			River water
			Rocks
			Rouge
			Rouge plant

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
			Runoff (x4)
			Safe
			Safety
			Sewage because it used to suffer from a combined sanitary and sewer system.
			Sewer water
			Stream
			Teamwork
			Terrible stench
			That it has a beautiful tree near it in the fall.
			The aquatic life in them.
			The bridge on it
			The first thing that comes to mind is the aquatic ecosystem and all of the organisms living there.
			The first word that comes to mind is help.
			The Rouge River T-Shirt design
			Trees and water
			Turbid
			Turbid water
			Turbidity (x2)
			Turbidity, total solids, waste, thermal pollution, fecal coliform.
			Unclean
			Unsanitary (x2)
			Untreated sewage
			Very dirty now
			Water (x51)
			Water flow
			Water pollution (x3)
			Water quality (x4)
			water sample
			Water sampling
			Watershed (x3)
			Wet

Spring Monitoring 2015 Results

All Grades

Sample Size	
4 th	117
5 th	187
6 th	180
subtotal	484
6 th *	1
7 th	88
8 th	124
9 th	43
10 th	6
11 th	5
12 th	31
subtotal	298
TOTAL	782

*One student from Smith Middle School completed both the pre- and post- survey geared for 7th-12th graders.

Have you ever been to the Rouge River?

No. of times to the Rouge River	4th-6th		7th-12th	
	Pre	Post	Pre	Post
Never	229	96	184	115
Once before	115	163	43	93
Twice before	44	85	28	49
Three times before	26	31	13	14
Four times before	8	16	6	7
Five times before	4	7	2	5
More than five times before	53	84	21	15

53% of participants had never been to the Rouge River before.

Interest in science

There was a 0.51% decrease in students not interested in science, a 2.65% increase in students moderately interested in science, and a 3.16% decrease in students very interested in science.

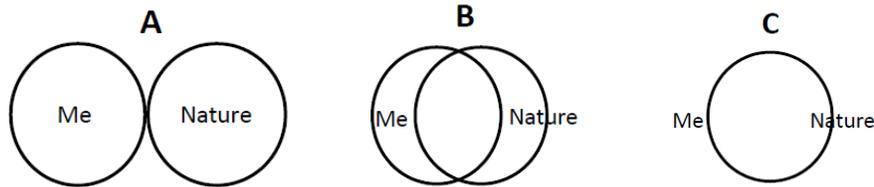
Interest in nature

There was a 0.64% increase in students not interested in nature, a 2.04% increase in students moderately interested in nature, and a 2.68% decrease in students very interested in nature.

Interest in school

There was a 0.62% increase in students not interested in school, a 0.98% increase in students moderately interested in school, and a 1.60% decrease in students very interested in nature.

Relationship with nature



There was a 2.5% decrease in the number of students that chose “A”, a 1.30% increase in the number of students that chose “B” and a 1.20% increase in the number of students that chose “C” to represent their connection to nature.

Q: All macroinvertebrates are equally tolerant of pollution

There was a 3.51% increase in the number of students indicating the correct answer (*false*) (from 604 students to 648 students).

Number of students correctly identifying ALL macroinvertebrates from list (i.e., insects, mammals, crustaceans, molluscs (snails, clams, etc.), birds, fish)

There was a 9.21% increase in the number of students able to correctly identify these macroinvertebrates (from 177 students to 249 students).

Pollution in the Rouge

Number of students (4th-6th) able to list a source of pollution in the Rouge

There was an 11.70% increase (303 students to 358 students).

Number of students (7th-12th) able to list a problem affecting the Rouge

There was an 18.56% increase (228 students to 288 students).

Number of students able to list a corrective action to limit pollution

There was a 10.87% increase (615 students to 717 students).

Number of students (4th-6th) that know where to look to find out more about the pollution problem they listed

There was an 8.93% increase in the number of students able to find out more about the pollution problem they listed.

Number of students (7th-12th) that know where to look to find resources to fix the problem

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Pre	57	103	87	36	6
Post	63	124	79	20	7

There was a 1.85% increase in the number of students that “strongly agreed” with this statement, and a 6.8% increase in the number of students that “agreed”.

Students (7th-12th) able to research the problem listed

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Pre	93	140	45	11	1
Post	93	157	34	8	2

There was a 5.13% increase in students that “agreed” with this statement.

Students (7th-12th) able to explain the problem listed

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Pre	86	140	53	9	2
Post	111	136	39	5	2

There was an 8.23% increase in students that “strongly agreed” with this statement.

Technical scientific questions (grades 7th-12th)

Q: Imagine you are at the river testing for the presence of dissolved oxygen in the water. If you want to get the most accurate result, you should repeat the test more than once.

96.86% of students answered this question correctly in the pre-survey (*true*), and 97.63% of students got answered correctly in the post-survey.

Students able to list a source of high nitrates in the Rouge

There was a 21.81% increase in the number of students able to list a source of high nitrates in the Rouge (30 students to 95 students). Answers that were left blank were considered incorrect.

Students able to list a corrective action to limit nitrates

There was a 27.52% increase in the number of students able to list a corrective action to limit nitrates (46 students to 128 students). Answers that were left blank were considered incorrect.

Feelings regarding the Rouge Education Project

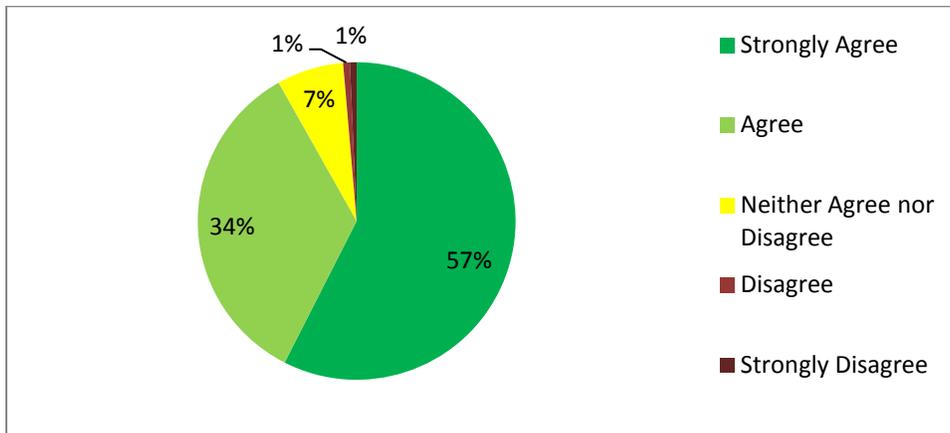
88% of all students were able to list a way participating in the Rouge Education Project helps the Rouge River.

4th-6th grade responses

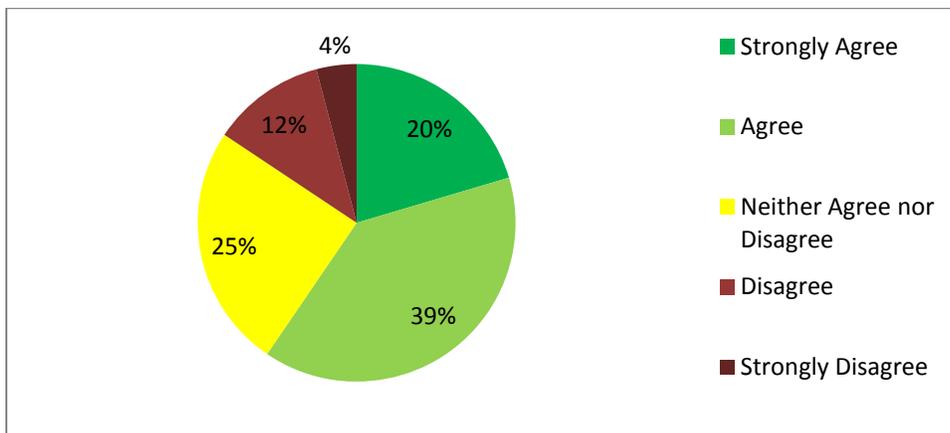
Question	Percent of students
Learned how to make the Rouge healthier	90%
Learned something new about the Rouge	89%
Participating in the REP made me feel like I could make a difference in protecting the environment	86%
Participating in the REP helped me to think like a scientist	80%
Plan to talk to family/friends about the REP	77%
Participating in the REP helped me understand classroom material better	72%

7th-12th grade responses

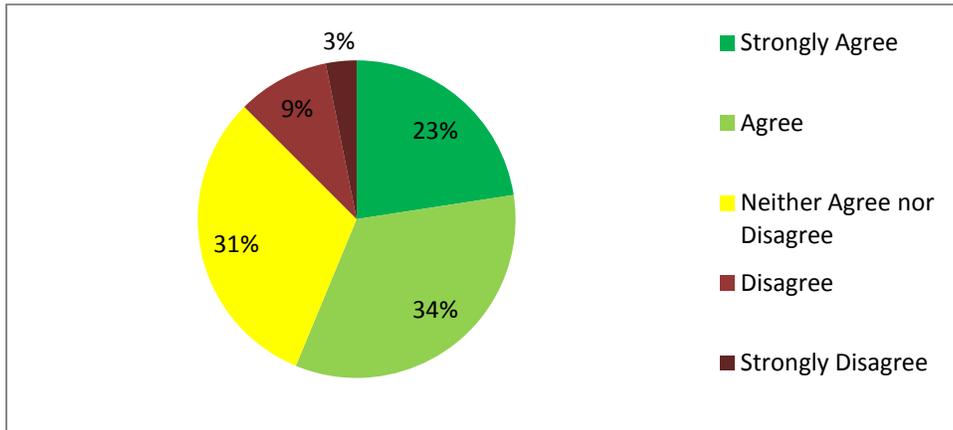
I learned something new about the Rouge River.



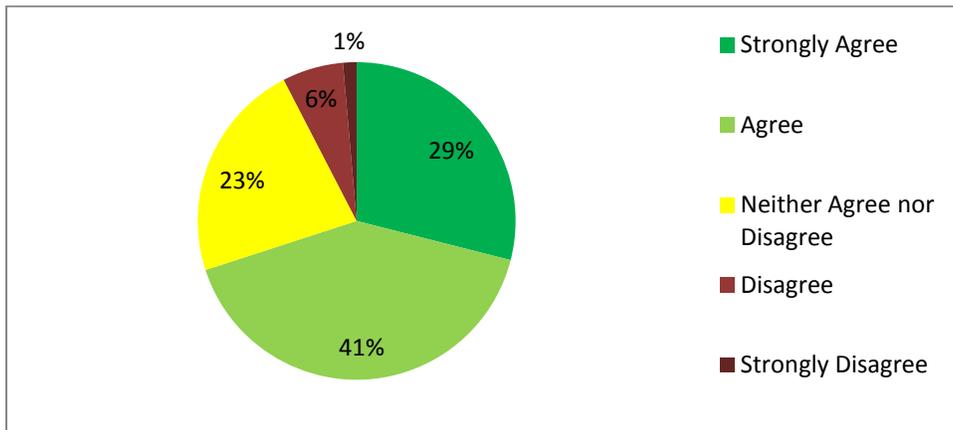
I plan to talk to family and/or friends about the information I learned.



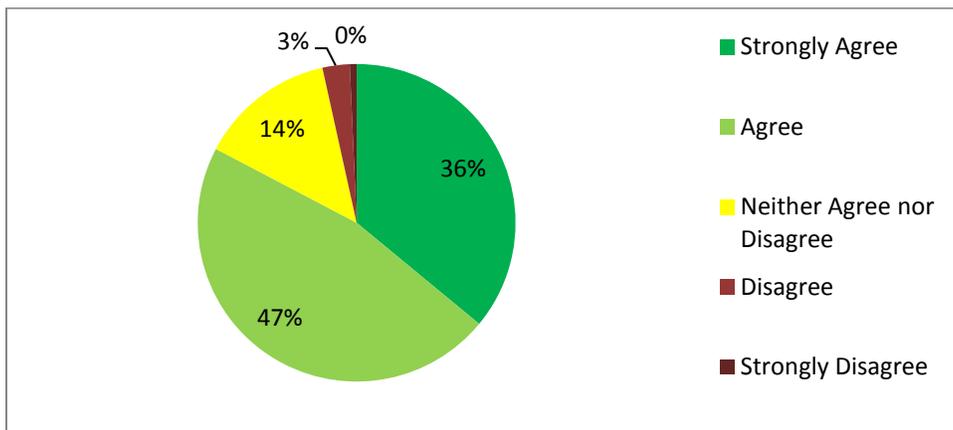
I experienced a feeling of connectedness to the Rouge River.



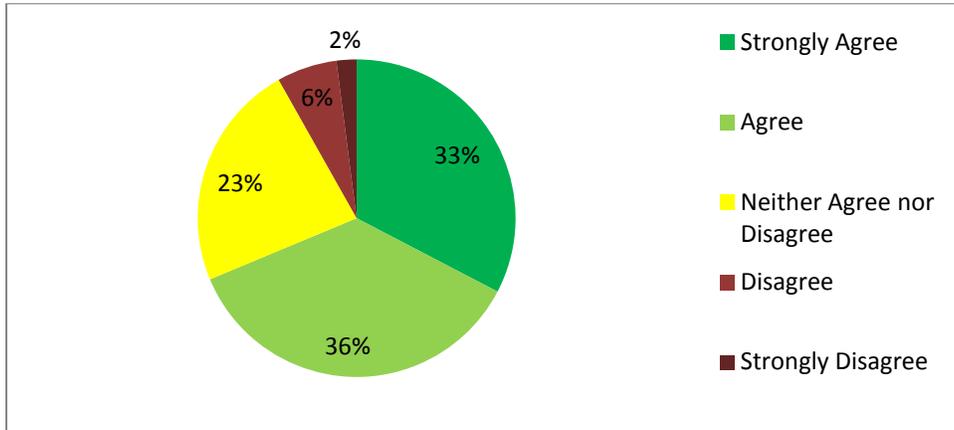
I found myself reflecting on new ideas about how my actions affect the river.



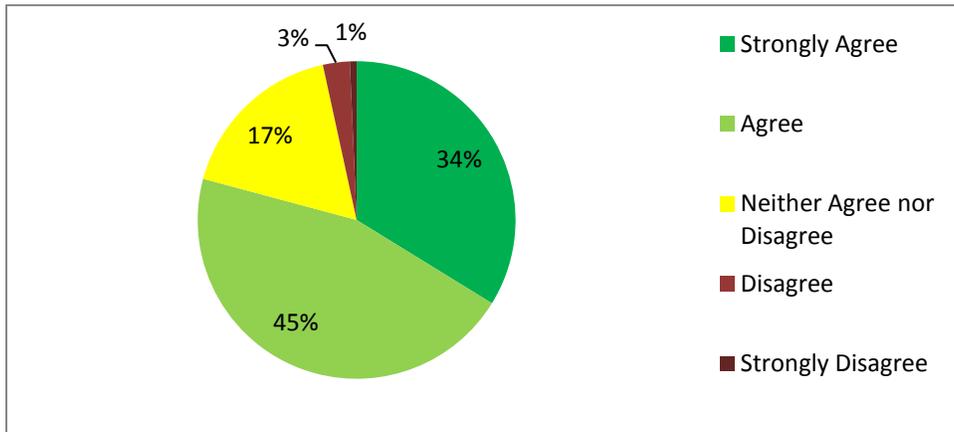
I learned about actions I could take to make the Rouge River healthier.



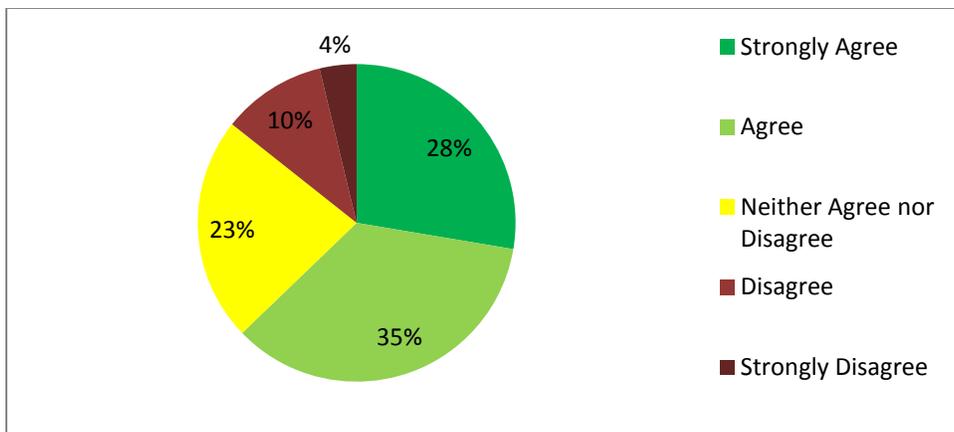
If given the opportunity, I would choose to participate in more projects that would help the Rouge River.



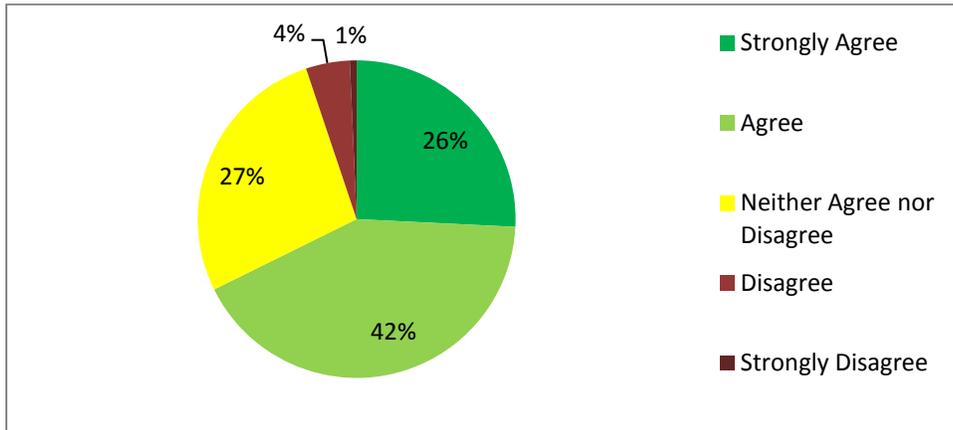
Our class' REP river monitoring made (or could make) a difference in the health of the Rouge River.



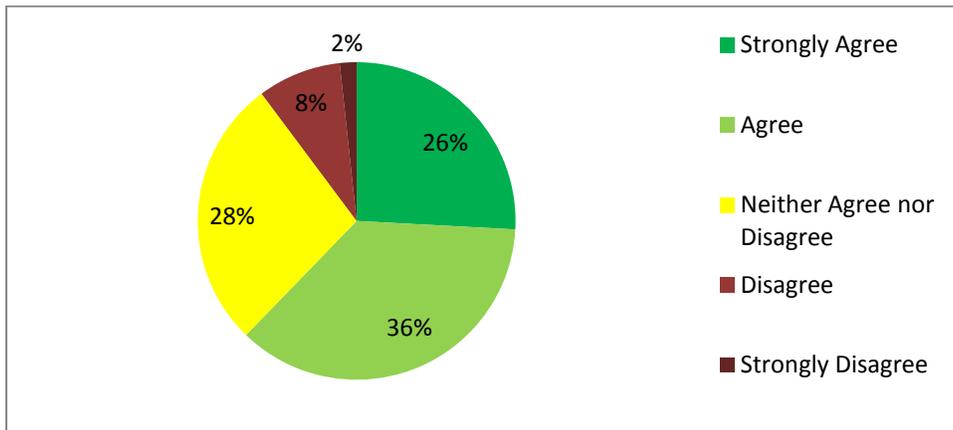
Our class' REP river monitoring involved people and/or organizations from the community (other than school staff/faculty.)



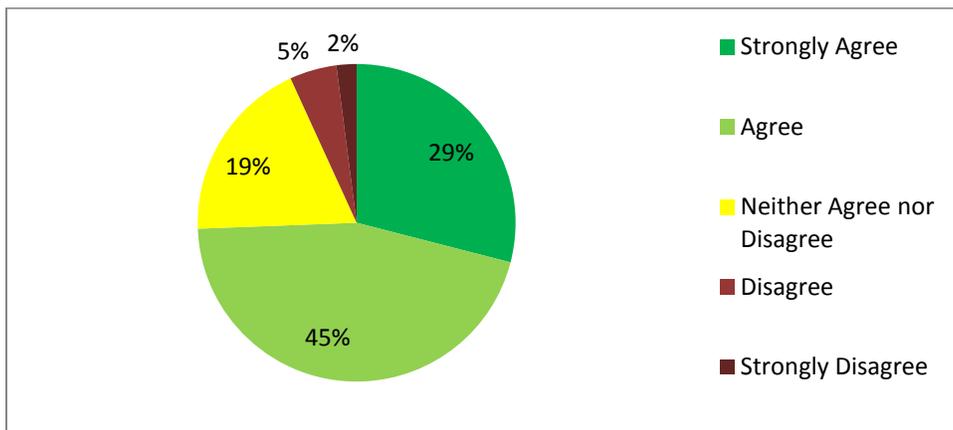
The REP helped me feel that I could make a difference in society.



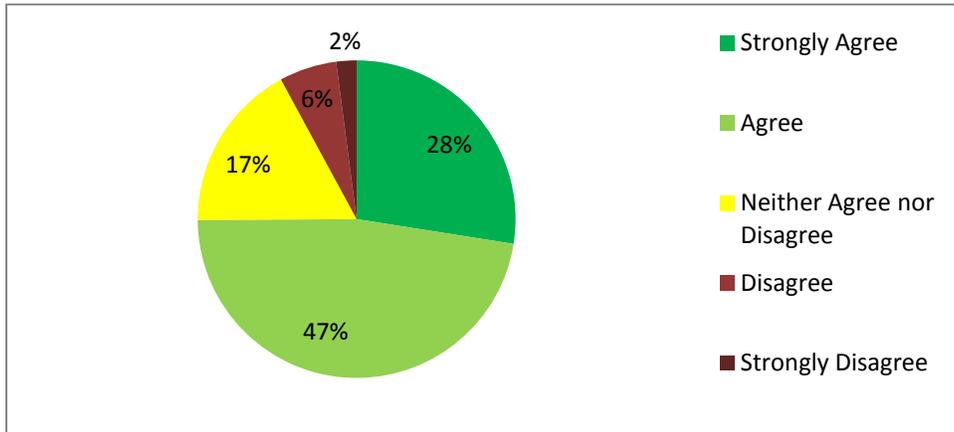
I met people/encountered things I normally wouldn't have during the REP.



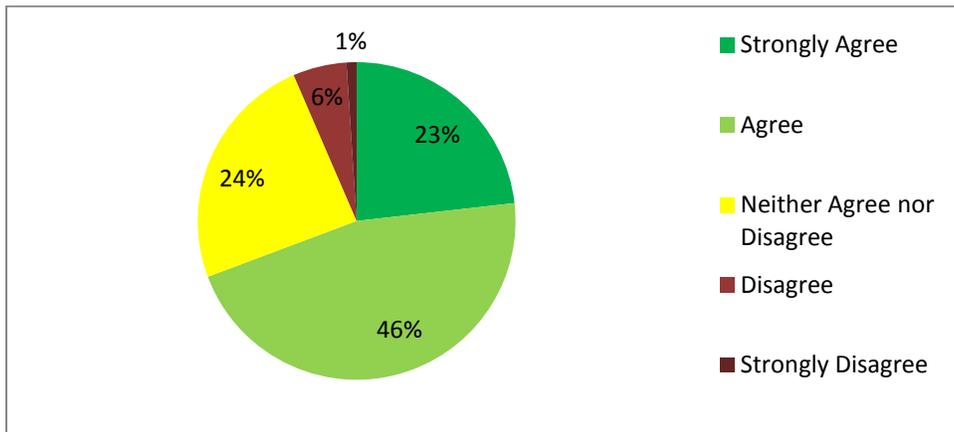
The REP challenged me to think like a scientist.



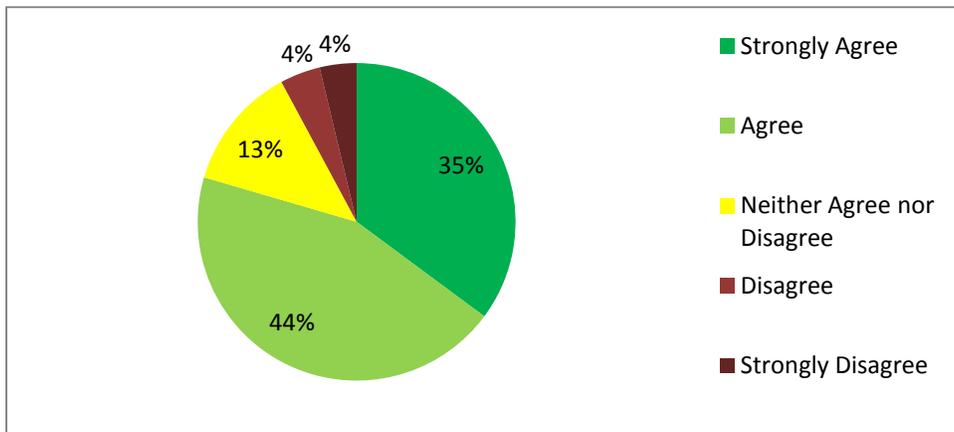
The REP was directly related to my classroom work.



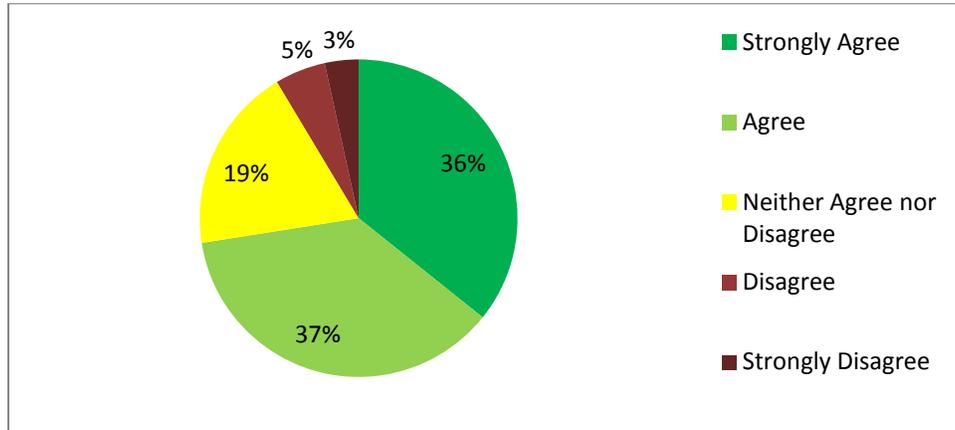
The REP helped me understand the classroom material better.



I had the opportunity to participate in river-related discussions and/or activities before our river field trip.



I had the opportunity to participate in river-related discussions and/or activities after our river field trip.



Open-ended Responses

When you think about the Rouge River, what is the first word that comes to mind?

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
4th grade	"Adventure"	a beautiful river	A big land of water
a big river (x3)	4th grade	A big dirty river	A fancy river
A forest and river	A big and fresh river	a body of water	A nice river outside of my school.
a guy wearing black	A big gigantic bright blue clean river that flows fast with rocks.	a lot	A picture of a river, also the main branches
A large river located in Detroit.	a big river	A place I haven't been yet and I'm ready to explore	a steak restaurant
a long river	a butiful river	A rapid running river in the forrest.	animals
a park	a fun time	A real big river	bears
a rapid river	a giant river	river	Beautiful (x3)
a red river (x2)	a huge river	river that's near me that should be taken care of.	Beavers
A red river and a large overgrowth by it	A huge river	Allergies	Better
a rough river	A long river with a lot of history	animals that live in the water and water	Big
a rushing rapidly river	a rapidly rushing, but still calm, river	Aresh	Bugs (x3)
A somewhat dirty river	a really nice river and river testing	Arterie	Chocolate Milk
a stream (long)	A Red River	automobile	Clean (x2)
a swamp & river	A river by birmingham	back yard	Conserve.
Amazing (x2)	a river full of nature	beautiful	Crayfish
amphibians	a rough river	Beautiful river	Crayfish families.
an adventure	a stream	Big	creatures
Animal Habitats	a very big river	Clean up	creek
Animals (x6)	amazin,very fun,nature, and you learn alot.	cleaning	Dangerous
animals in their natural habitat	an adventure	Clear	Dearborn Michigan

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
awesome	Animals (x6)	closet river to my house	Detroit (x5)
Beautiful (x2)	animals and water	Cold (x2)	Dirt (x2)
Beauty	Animals and a river	Cool	Dirty (x16)
big (x2)	Awesome (x2)	Creek	Dirty but cool
Birds	-Basketball -My backyard - Nature -Broom	Current	dirty river
Blue	Beautiful (x3)	Detroit (x5)	Dirty Water (x3)
Boat	Beautiful scenery and a river	Dirty (x8)	Don't drink the water.
Boring	Beauty	Dirty water.	Ducks
Bugs (x5)	beaver	ducks	Earth
bugs, water	Benthic bugs	dynamic equilibrium	Ecosystem
Clean	Benthics (x4)	Earth	Environment
Cold (x2)	Big (x3)	Ecosystem	Eww or we need to clean it out now!
Cool (x3)	Big wide river	Environment	Fire, because of how it caught on fire in the past.
Cool run	bio	evil fish with teeth that will tear you apart (don't ask why)	Firefighters park
Crayfish	Biodiversity	Experiment	Fish
creek	Birmingham	Fire (from the river catching on fire)	Fishing
Crey fish	Blue	Fish (x3)	flowing
Detroit and the French letter "rouge"	boat	fish/help	Ford
Detroit river	boring	fishing	Forest
Detroit, Michigan	Brown Green Water	fishy	Good water that you can drink and it will be safe drinking. Also a lot of animals and fish.
different bugs in the water.	bugs (x10)	Forests	Green
Dirty	bugs and nature	Freshwater	Gross (x3)
drity	Bugs water	Fun (x4)	Hope (x2)
Ducks	Bugs,Birds and Fecal coliform	Gross	huge
Ecosystem	Bushes	Gruet	I don't know why, but I think of the actual rouge that is in makeup.

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
Environment	Chemicals	Help!!	I think about all the organism that live in the river.
exicting	Clean & Fun	i dont know what that is	I think of the part of the river that runs through our school.
Expanding	Clean (x4)	I think about a river.	I think of the river would be dirty
experiment	Cleaner	I think of a little river that has been infected by trash	I think of the river, near the park.
factory	Clear water that you could almost swim in.	I think of the part of the river that is at our school.	Improve
fantastic	cool	Important (x2)	improving
fantastic learningful	cool, and awesome	Important River	Insects (x2)
Fish (x6)	Crawfish	Invasive Species	interesting
fish (tadpoles)	Cray fish	It's a river (x2)	it a river
for rouge factory	creek	It's dirty	It needed to be fixed by cleaning it
ford rouge factory	Detroit (x2)	large river	its a river
forest (x3)	Detroit River	large river	It's dirty but the surroundings was nice
Frogs	Detroit, science, fun	Live (x4)	lake
Fun (x4)	Dirty (x4)	long	Large
garbage	Dirty water (x2)	macro organisms	leg hair
Green Water	Doritos	Metro Detroit	Macroinvertebrates
Hiking	Drity	Michigan (x2)	Meandering
huge	Driving to school.	Most polluted river	michigan
i think it's interesting	Earth	My dad's work	Michigan and river
i think of the animals in the forset	Eco-friendly	My grandmas house	Micro Invertebrates
I'm in to nature and it very fun.	environment	Narrow.	mud
Insects (x3)	fascinating	Nasty	Muddy
insects and animals	Fecal Coliform.	nasty	museum
Interesting (x3)	Fire	Nature (x7)	My Dad's job
It is a river (x3)	Fish (x6)	Nature, love	Nasty (x2)
its cool	Flashy	Northville	Native Americans
it's very interesting	Floods because the Rouge River	organism	Nature (x5)

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
	commonly floods the area around it.		
lake/river	Flows	past	Nature of Life
large	Ford	Pollution or polluted (x11)	Nice
Learning theme	Forest (x3)	Polluted and dirty	not clean
Life (x4)	Forest and Trails	Polluted is the first word that comes to mind when I think of the Rouge River.	Oxygen (x2)
logs	Forest with a big river	Proceed with caution. (I don't really know this area very well so i like to explore but not fall into potentially dirty water.)	palote
Long	France	project	Park
lots of plants	France and rocks	Red (x5)	place where my father learned to swim
mainly dirty	French	Red River	Polluted macroinvertebrates
McClumpha Park (x3)	French word rouge for red	Research	Polluted or pollution (x23)
Michigan	frogs/animals	River or rivers (x22)	polluted water
Moulin Rouge	fun	River Animals	Pollution is the first word that comes to mind when I think of the Rouge River.
Mountain biking trail	Green	River Rouge High School Water	pollution, dirty water.
Mrs. Sparks	gross	Rouge (x2)	project
Mucky waters	Hiking	Rouge plant	Putrid.
Muddy (x2)	Hope	Rouge River	Railroad
My Backyard	Huge river	sad	Recover
My old house because the rouge river went through my backyard	I thought that it was a big river in the middle of know where	school (x2)	Red (x4)
Natural (x3)	important	Science class	red potato
Nature (x32)	Insects (x4)	Sea creatures	red water
-Nature -My backyard - Basketball (Don't even ask why...)	Interesting (x3)	See	Ripped waders
Nature and Fun	Looks nice	sewer	River (x17)
nature and some rivers and	lots of water	Stream	River stream kind of brown. Red

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
animal healthy trees helthy animals			river.
nature or wood	macroinvertebrate benthics	Strong	Rogue
nature,animals	Macroinvertebrates	The river that flow though the park and in the woods	Rouge River
Nature/ Huger	McClumpha Park (x3)	the rouge project which i learned about in 4th grade at Jefferson elementary school	Run off
nature/water	Michigan	Theif	School (x3)
Never	Mississippi River	tourist attraction	science
nissan rouge	Ms.Jac	tree	Science class
nothing (x2)	Muddy (x2)	Walking	Sewage (x4)
Our water	Muddy water (x2)	Waste	Southeast Michigan
paloshin	murk & river	Water (x92)	Stick
park	Nature (x29)	water and fish	Stream
plants and animals	nature and water (x2)	Water and trees	Streams
Pollution or Polluted (x12)	Nature, Probobly Malaria , mosquitos!	Water shed	Testing the Rouge River
pond	nature, wildlife, large amounts of water	Water Stream	that the water is very dirty but it has alot if space
Potato	Nissan Rogue	Water/Nature/Adventure	The bug
rapids shalow running water	No words come to my mind.	Waterpark	The first word i think of is animals.
Really cool	orange	What	The river in my backyard.
Red (x16)	our field trip there in 4th grade	when I think of the rouge river I think of having a fun time in beautiful river and having a nature walk around it.	the water
red because french red and river	outside, nature, bugs		Troy-nature-center
red river	Park (x3)		very dirty or/and pollution
Red River	Pollution or Polluted (x18)		Water (x85)
Red, Polluted	Polywogs		water and bugs
Red.	pretty		Water is the first thing that comes to my mind.
River or Rivers (x78)	really fun		water p

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
river and nature	Red (x7)		Water Pollution
river by mud and testing them	Red river (x4)		Waterland/Marsh
river in Michigan	red river, french red		Watershed (x6)
river in nature	river		Wetland
river in our town	river animals		Wildlife
River near ford that is a small river	river bugs		
river or a bug	River near my school		
river or stream	River or rivers (x65)		
river testing	river river testing		
river that is rouge.	River Rouge Cleanup with my Boy Scout Troop		
river thats has red sand	River study (x2)		
river thats red	River testing (x6)		
river with a big current	river, forest		
river with bugs	river,bugs,animals		
river with water	river/lakes/ocean		
river, nature	riverbanks, trees, and forests		
river, water	rivers, streams, and nature		
River, water, plants, bugs, animals, ecosystems, habitats	Rouge (x3)		
River/Stream	Rouge River		
Rivers that are all around or a river that is called the Rouge river and also i think of it as river that is flowing maybe roughly.	rushing		
Roaring water	rushing water, surrounded by wildlife		
Rouge (x4)	Scenery		
rouge factory	School		
Rouge River (x3)	Science		
Rouge River and nature	Science Class		
rushing water, tall grass, and frogs	Shallow		
sampling	small		

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
science	Spiders, and other tiny animals and other like thoses.		
Small	Splash		
Smells bad.	stream		
Smelly	Testing		
swimming	THAT it has something to do with animals and nature and that i will love to go back there one day.		
testing	that it is fun		
That we are going into water	that it was fun and cool and a good experience		
That we will go into water	The color red		
The first thing that comes into my mind is that there is a river and all about nature	The ford factory		
The first thing that comes to mind is the Tonda Creek	the forest		
the river next to niagra falls	the organisms		
the river.	the river (x3)		
the rouge tour	the sound of moving water		
The time I went to the Rouge River clean up	this is a forest		
Trees	Trails		
Trees	Trash		
Water (x106)	trees (x2)		
water and bugs	Tributaries (x2)		
Water and elegant	water & fish		
Water and the blue sign	Water (x113)		
Water Pollution	Water and bugs (x2)		
water samples	water and river		
water study (x3)	water fall		
Watershed	water river		
watersystem	Water Source		
Wet (x2)	water study		

4th-6th Pre-	4th-6th Post-	7th-12th Pre-	7th-12th Post-
Wet/muddy	water that is rouge		
what animals live there?	water, bugs, dirt, river testing		
When i think of the Rouge River I think of a river.	Water, muddy, clear full of life.		
When I think of the Rouge River, I think of a shallow river that spreads along many countries.	water, river		
When I think of the rouge. I think of going in the river and observe the things around me.	water, river testing, insects		
wide	water, trees,frogs,flowing river		
Wild Animals	water/river		
Wonderful	Wet (x3)		
	wild		
	Wildlife (x2)		

Notable Results & Discussion

Fall Monitoring 2014

Matching pre- and post- surveys were found for 364 students out of the 488 reported students that participated, accounting for almost 75% of students.

Schools that submitted pre- and post- survey data include: Birmingham Covington School, Chandler Park Academy High School, Crestwood High School, Inter-City Baptist High School, Oakland Schools Technical Campus SE, Steppingstone School, and Troy High School. This included all of the schools that participated in fall monitoring.

There was a large subsection of students that indicated they had never been on a Rouge River field trip, even in the post-survey. This may be due to the large number of students at Crestwood High School (150) that completed a Rouge River unit in the classroom, but only a small number of students (30) visited the river to conduct sampling.

While over half of the students had never been to the Rouge River before, the large number of students that had attended a field trip previously was likely due to 6th graders at Birmingham Covington School that went to the river the previous year (they take both 5th and 6th graders, and could have attended the monitoring event that previous spring). Another exception was Steppingstone School, who took all of their students to the river and continues to each year.

Analyzing a student's interest in science, nature, and school, is to gauge the receptiveness of that student to a project like the REP. An increase in student interest in any of these fields throughout the Rouge Education Project is not a goal, but could be an added benefit to project-based learning. Students that left this section blank were not included in overall calculations.

The survey question referring to conducting multiple trials of the same test to get the most accurate result may be too "easy" for students in grades 7th-12th. This must be a concept covered heavily in science classes before students reach that grade.

Most students (7th-12th) agreed with the statement that they learned something new about the Rouge River. Over a third of students in 7th-12th grade did not plan to talk to their friends or family about what they learned. There was also an increase in the number of students that felt connected to *nature*, but almost half of students (7th-12th) would not say they experienced a feeling of connectedness with the Rouge River. This could also have been due to the high number of students that did not go on the Rouge River field trip at Crestwood High School.

Almost a quarter of students did not take the time to reflect on new ideas about how their personal actions affected the river, but most students (92%) would agree they learned about actions that would help the river. A little over a quarter of students did not feel like participating in the project would make a difference in society.

The 16% of students that didn't feel their project involved people from the community likely were not familiar with the school's involvement with Friends of the Rouge. Often, students don't know their "school project" is part of a bigger-picture sampling event due to the lack of direct involvement with REP staff.

Open-ended questions such as "When you think about the Rouge River, what is the first word that comes to mind?" rendered responses that fell within a few categories: most mentioned "river" or "water," while the remaining may have noted pollution or that the river was dirty, testing, nature/woods, and a few miscellaneous others. Older students included some responses noting their testing site or park, "improved", or specific testing parameters. This question did not provide any meaningful trends as originally anticipated.

Spring Monitoring 2015

Matching pre- and post- surveys were found for 782 individuals out of the approximately 1251 reported "new" students that participated, accounting for almost 63% of students.

Schools that submitted pre- and post- survey data include: Achieve Charter Academy, Clippert Academy, Crescent Academy International, Detroit Academy of Arts & Sciences, Detroit County Day Middle School, Garden City High School, Huron Valley Lutheran High School, Mary Helen Guest Elementary School, Niles Community High School, Oakland Schools Technical Campus SE, Pierce Middle School, Plymouth High School, Roosevelt High School, Salem Elementary School, Smith Middle School, Steppingstone School, and Tonda Elementary School. Schools that distributed pre- and post- surveys in the fall who worked with the same group of students were instructed not to submit results in the spring. No post- surveys were received from Ronald Brown Academy, St. Valentine Catholic School, or West Maple Elementary School, therefore they are not represented in these results.

There was a large subsection of students (211) that indicated they had never been on a Rouge River field trip in the post-survey. Many of these students (83) were from the Detroit Academy of Arts & Sciences. The reasoning for this is unknown; all students that completed the survey should have gone on the field trip to the river. Perhaps those students were not familiar with the branches of the Rouge River and the names of its tributaries, although they would have sampled on the Middle Rouge River. Achieve Charter Academy also had a large group of students that had gone to the river in a previous grade. This year marked the first that Achieve Charter Academy expanded its program to multiple grade levels.

Many students left portions of the "interest in science, nature, and school" questions blank, results may not represent all of the students as a whole and did not change much from the pre- to the post- survey. Student feelings about science hovered around 4% "not interested", 34% "moderately interested" and 62% "very interested". Student feelings about nature hovered around 3% "not interested", 36% "moderately interested", and 61% "very interested". Student feelings about school hovered around 15% "not interested", 47% "moderately interested", and 38% "very interested".

There wasn't a large increase in the *number* of students that could identify a source of nitrates in the Rouge, or that were able to list a corrective action that would limit nitrates.

As with the fall survey, the question regarding testing for the presence of dissolved oxygen in water may have been too easy for that age group.

Most students (7th-12th) agreed with the statement that they learned something new about the Rouge River. Over a third of students in 7th-12th grade did not plan to talk to their friends or family about what they learned. There was also a small increase in the number of students that felt connected to *nature*, but almost half of students (7th-12th) would not say they experienced a feeling of connectedness with the Rouge River. This could be due to the high number of students that noted they did not take a trip to the Rouge River.

Over a quarter of students did not take the time to reflect on new ideas about how their personal actions affected the river, but most students (83%) would agree they learned about actions that would help the river. Almost a third of students did not feel like their participation in the Rouge Education Project would make a difference in society (32%).

The 37% of students that didn't feel their project involved people from the community likely were not familiar with the school's involvement with Friends of the Rouge. Often, students don't know their "school project" is part of a bigger-picture sampling event due to the lack of direct involvement with REP staff. A quarter of students did not feel like the project was directly related to classroom work, and 31% of students didn't think the project helped them understand their classroom material better.

Similar to fall sampling, the most common responses to the first word the student thought of when he/she heard "Rouge River" was "water" and "river".

Overall Summary & Conclusion

Previous survey evaluations were analyzed by grade level. In an attempt to conduct meaningful analysis of the project's impact overall (rather than by grade level), some questions included all student responses to provide a larger sample size.

Pre- and post- survey analysis rendered the program a success based on the following criteria: an increase in the percentage of students correctly answering multiple choice questions based on general watershed science and/or the Rouge River specifically, an increase in the percentage of students who could identify specific water quality issues in the Rouge River, and an increase in the percentage of students who could identify potential solutions to local and/or regional water quality issues.

Evaluations clearly illustrated a positive impact on the students participating, but also highlighted areas with opportunity for improvement. This long withstanding program will continue to operate with the same program framework that has proved successful since 1987, although survey results will help to shape modifications to the program moving forward. This will ensure that the Rouge Education Project remains relevant and meaningful to its participants.

With alterations to the program in mind, there was difficulty in the distribution and assessment of the pre- and post- surveys. REP staff had no degree of control over who received the survey and when they

were distributed, and no direct in-classroom involvement in the presentation of Rouge River related material to the students. Teachers were provided resources and developed their own lesson plans and projects that most appropriately fit the curriculum needs of their classroom. The REP did not receive a pre- and post- student survey from every student participating in the program. In addition, students that already participated in the REP may have received this survey multiple times. Ensuring the surveys are only given to those students that participate in the full program (including the field trip) and are not given repeat surveys year after year may help to give a more accurate picture of the student's first exposure to the Rouge Education Project and field science.

Corrective actions to limit pollution may need to be a greater topic of focus in the classroom. This could be enhanced by having students complete more service-learning projects such as restoration activities (i.e. invasive species removal, rain garden or native garden plantings, etc.) and/or participation in river clean-up events. Students are learning about the Rouge River, but not necessarily ways they personally can keep it healthier. Having students reflect more about how their personal actions affect the river could be done through a writing assignment as part of a service learning project. Through this, students will hopefully feel a greater connection and sense of ownership of the Rouge River and tributaries.

Service learning opportunities would increase with community involvement. Many schools did not request corporate or other trained volunteers to help with their project and worked completely independently. Establishing a greater connection to their collection of data and submission to Friends of the Rouge/the Rouge Education Project should be explored. The REP should also work with local communities to identify potential project areas (such as parks or city land) the students could restore. An increase in excitement and enthusiasm may also help to increase the number of students that plan to talk to their family and friends about the project. This could be done through a greater social media presence and media coverage of the event.

Utilizing technology able to increase staff "presence" in the classroom and exploring the use of online course-building software may help teachers bridge the gap between the REP and students. Facilitating more service learning projects and on-the-ground restoration work will continue to empower students to take action and help shape them into the next generation of environmental stewards. These two areas (service learning and technology) will be major focus areas of development for the REP in 2015-2016.