



Outcomes Report

for

Fiscal Year 2016-2017

(July 1, 2016 - June 30, 2017)

presented by

Phyllis Baker





During the period from July 1, 2016 through June 30, 2017, the Mid Rio Grande Stormwater Quality Team (MRGSQT) continued its educational partnerships with the Bosque Ecosystem Monitoring Program (B.E.M.P.) and RiverXchange. The team continued to post relevant information to its website and Facebook page, and also participated in a number of high-profile community events, including the KOB TV Health & Wellness Fair in January 2017. The team moved its interactive kiosk to Rio Rancho's Loma Colorado Public Library at the beginning of 2017 and held a news conference there in June in conjunction with the onset of the beginning of the monsoon season in July. Several team members were booked on morning radio and TV talk shows to discuss stormwater quality and ways to keep pollutants out of the Rio Grande. The team decided to concentrate on educating contractors and people in the construction field about the new 2017 Construction General Permit changes and additions by creating a presentation and holding an educational breakfast seminar at the end of June.

Team partners and supporters disseminated information on stormwater through municipal water quality reports to stakeholders. Specialty advertising giveaways relating to stormwater quality awareness were ordered/reordered for use at public events. The overall budget spent on these activities, excluding donated hours by team members and RiverXchange and B.E.M.P., was \$44,555.98. The contractor, CWA Strategic Communications, donated \$3,399.04 in services during the 12-month period. We have summarized the activities below and on the following pages:

WEBSITE (www.Keeptheriogrand.org)

New visitors accounted for 77% of the total 1,675 website visitors. A majority of visitors continue to access the website using their desktop computers but mobile access continues to increase: out of 254 sessions, 199 sessions were conducted via mobile devices.

A detailed Google Analytics Report is included as an attachment to this report, labeled Exhibit 1.

Estimated number of individuals reached by this activity: 1,675

Permit Reference(s): General SWP, Construction, Pet Waste, Household Hazardous Waste

Audience(s): Children, Adults

FACEBOOK PAGE

In conjunction with the SQT website, a Facebook page contains posts and updated information at: (<https://www.facebook.com/Keeptheriogrand>). Total "likes" for the page increased from 134 in the last year to 141 during this year, a 1 percent increase.

A detailed report is included as an attachment to this report, labeled Exhibit 2.

Estimated number of individuals reached by this activity: 141

Permit Reference(s): General SWP, Construction, Pet Waste

Audience(s): Children, Adults

EVENTS

Between July 1, 2016 and June 30, 2017, MRGSQT members and their partner agencies reported participating in a total of 68 community outreach/educational events and reaching 14,084 adults and children. ***Details can be found in Exhibit 3 at the end of this report.***

Estimated number of individuals reached by these community outreach/education events (with duplications): 14,084

Permit Reference(s): General SWP, Construction, Pet Waste, Construction, Household Hazardous Waste, Illicit Discharge and Animal Sources

Audience(s): Children, Adults

GENERAL MATERIALS DISTRIBUTION

As appropriate, team members distribute materials at events. While the MRGSQT is focusing less on printed collateral pieces and more on community outreach through partnerships and participation in community events, we have included inventories of materials on hand as of July 1, 2016 through June 30, 2017.

Total estimated number of people reached by these activities: 6,738

Cost per person reached (may be some duplication): \$1.38

Permit Reference(s): General SWP, Pet Waste, Household Hazardous Waste

Audience(s): Children, Adults

EDUCATIONAL ACTIVITIES

Educational Kiosk at the Children's Library at the Main Albuquerque Public Library Albuquerque and Rio Rancho's Main Loma Colorado Library.

STORMWATER QUALITY TEAM Inventory				
Item	Starting Qty as of 7/1/2016	Distributed	Ending Quantity as of 6/30/2017	Cost of Materials Distributed
"Keep the Rio Grand" Bumper Stickers	1228	430	798	\$167.58
"Reduce Stormwater Pollution at Home" brochure	811	641	170	\$224.35
SQT Brochure - "New Dog or Cat"	2740	680	2620	\$204.00
Dog-shaped Poop Bag Dispensers	1496	1070	426	\$426.00
"Don't Contaminate the River" stickers	3000	1960	1040	\$1,040.00
Poo Emoji Squeezies (added 2/14/17)	5000	430	4570	\$4,570.00
"Scoop the Poop" Rack Card	244	244	0	\$-
"Yard Mess" Brochure	513	513	0	\$-
Morphing Fish Bags	957	770	187	\$2,664.20
		6,738		\$9,296.13

On January 2, 2017, the Mid Rio Grande Stormwater Quality Team moved its educational kiosk from the Albuquerque main library to the Loma Colorado Library in Rio Rancho. A news conference was held on June 14, just before the beginning of the area's monsoon season, to introduce the kiosk to the community and educate citizens about stormwater issues. The kiosk features:

- An interactive stormwater system map where children can press various points to learn the roles arroyos and channels play in the stormwater system and how to keep from polluting that system. The system stretches from Bernalillo on the north through Rio Rancho and into Albuquerque.
- A "Scoop the Poop" game that lets children choose one of three dogs and learn how to properly pick up after that dog. This is important, according to the MRGSQT, because pet waste is a major source of E coli contamination in the Rio Grande.
- An educational panel on common types of trash, debris and chemicals that pollute the Rio Grande including appliances and electronics, automotive products such as oil, batteries and gasoline, glass and cement, household cleaners, yard waste, prescription and over-the-counter medicines.
- A touch screen that includes facts about each arroyo and the Rio Grande.

Total number of children and adults viewing the kiosk from January 2 through June 31, 2017 is broken down on the right:

JAN	15,999
FEB	18,181
MAR	17,955
APR	16,509
MAY	16,546
JUN	19,777
TOTAL	104,967

STUDENTS AND TEACHERS REACHED THROUGH PARTNER EDUCATIONAL PROGRAMS – RIVERXCHANGE AND BOSQUE ECOSYSTEM MONITORING PROGRAM (B.E.M.P.)

RiverXchange

RiverXchange is an innovative, long-term outreach program that integrates water resource topics with computer technology, student writing, and a hands-on curriculum to meet specific, measurable outcomes.

Since 2007, the program has enabled upper elementary classes from New Mexico to become “high tech pen pals” with a class outside the state to share what they learn about the geography, culture, and ecology of their local river and watershed. Including these partner classes, the program has served over 14,000 students. Each student spends about 25 hours engaged with the program over the course of the school year. The curriculum incorporates hands-on activities, multiple classroom presentations by local water resources. During the 2016-2017 season, there were 42 classes in New Mexico, 23 of which were Title I schools. RiverXchange conducted:

- 19 classes in the Albuquerque Public School System
- 18 classes in the Rio Rancho Public School System
- 5 classes in the Bernalillo Public School System
- 32 “Watershed on Wheels” (WOW) offerings (National Fish and Wildlife Foundation)

For more information, see Exhibit 4, RiverXchange’s 2016-2017 report to the Mid Rio Grande Stormwater Quality Team.

B.E.M.P.

The main objective of the *Stormwater Science* outreach education program of the Bosque Ecosystem Monitoring Program (B.E.M.P.) is to teach students that the health of the Rio Grande is directly related to the health of the surrounding watershed. The Stormwater Science program includes a one and one-half hour classroom activity, and a 4-5 hour study trip to the Rio Grande. During the 2016-2017 school year 1,775 students AND teachers participated in *Stormwater Science* activities in their classrooms, in the field or both. The one and one-half hour classroom program was delivered to 1,269 students in 32 classrooms in 19 different schools in Bernalillo, Rio Rancho, Albuquerque, Los Lunas and Belen.



See **Exhibit 5** for the BEMP Report on the 2016-2017 school year and its *Stormwater Science* report.

Total estimated number of people reached by these educational activities: 108,011

Permit Reference(s): General SWP, Pet Waste, Animal Sources, Household Hazardous Waste, Illicit Discharges
Audience(s): Children, Adults

Construction General Permit (CGP) Seminar

The Stormwater Team realized the importance of outreach to contractors and construction professionals about the changes and adjustments to the 2017 CGP. They planned a seminar and invited members of those groups to attend. The breakfast seminar was held at the NM Department of Transportation District 3 Auditorium. Fifty-three attendees (16 contractors and 37 government employees) learned about the updates to the 2017 CGP. Response to the seminar was very positive.

Total estimated number of people reached by these educational activities: 53

Permit Reference(s): General SWP, Illicit Discharges
Audience(s): Adults

Kids learn about stormwater

BY GARY HERRON
Assistant Editor

Sure, you can understand that the Southern Sandoval County Arroyo Control Authority (SSCAFCA) has a valid interest in the Rio Grande — what's flowing into it, what's flowing out of it — and the Mid Rio Grande Stormwater Quality Team members showing up at Loma Colorado Main Library on June 14 to talk about facets of stormwater and more.

It turns out we're all in this together.

The MRGSQT, a multi-agency team formed in 2004 to educate individuals and businesses on reducing stormwater pollution by keeping trash, chemicals and other debris out of our stormwater system to protect the Rio Grande, took the lead here. SSCAFCA and the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) are on that team, as are Rio Rancho, Corrales and Bernalillo.

A couple dozen youngsters being entertained at The MAC, a short walk away, sat on the floor and listened as Catherine Conran, the education outreach director, talked about the team's goals.

A few steps away, youngsters could play an interactive — and quite popular, wouldn't you know — game called "Scoop the Poop." Using their fingers on a screen, they could "scoop" doggy do-do into bags, keeping it from ending up in a drain and, ultimately, the Rio Grande.

Hence, "Keep the Rio Grand" is great slogan.

To get thing started, MRGSQT partnered with the Bosque Ecosystem Monitoring Program (BEMP) to monitor four sites on the Rio Grande and to provide educational activities on water quality relating to watershed management in Bernalillo and Sandoval counties. Those monitoring sites are



GARY HERRON/Observer
A group of youngsters from The MAC, a short walk from Loma Colorado Main Library, listen to Catherine Conran.

located along the Rio Grande in Bernalillo and Sandoval counties adjacent to existing BEMP site.

Sites included were at the US 550 bridge in Bernalillo, the Alameda and Montano bridges within Albuquerque, and south of Tijeras Arroyo and north of Isleta Pueblo in Albuquerque. Weekly monitoring measured levels of the bacteria known as *Escherichia coli* (*E. coli*) in the river.

Although the bacteria occurs naturally in the Rio Grande, levels can also be temporarily elevated after a storm if animal wastes are washed into the river. For example, storm sewers in the Albuquerque and Rio Rancho areas can potentially carry *E. coli* from rain contact with wastes from domestic animals, wildlife, birds, pets — and even humans — into the Rio Grande.

The area's stormwater system contains approximately 16,100 storm inlets leading to 722 miles of storm pipes leading to the Rio Grande. As the area grows, more waste is created. For example, there are at least 43,000 licensed dogs in Albuquerque alone, creating more than 20 tons of dog waste a day. That waste can end up in the river if it's left in a yard or not disposed of properly in household trash containers.

Conran said analysis of the *E. coli*'s "DNA" revealed 22 percent of it came from dog waste.

Youngsters listening to Conran didn't need to know all that, of course. She said the team takes this approach — having children "teach," or remind — the adults when the time comes. They were more interested in the interactive three-sided kiosk that included games, videos and touch-screen maps to engage and teach them about our area's stormwater drainage system and what they can do to prevent stormwater pollution.

Stormwater, the leading source of pollution in the Rio Grande and that pollution is largely human-caused. There are no filters to keep trash, debris and chemicals dumped into our area's nearly 1,000 miles of stormwater pipelines, lined channels and unlined arroyos from flowing into and polluting the Rio Grande.

There was a lot to be learned in a little time, with the main message being for pet owners to pick up after their dogs.

The kiosk will remain at Loma Colorado Main Library for about six months, then moved — probably to Bernalillo — where its important messages can be repeated.

EARNED MEDIA

• Rio Rancho's local newspaper, *The Observer*, did a story on the kiosk that appeared in the state's largest newspaper the next day.

Total number of estimated readers for article on the kiosk in the *The Observer*: 23,500

Permit Reference(s): General SWP, Pet Waste, Household Hazardous Waste
Audience(s): Adults

• The local CBS-affiliate KRQE also attended the news conference and subsequently ran a story which was also posted on the station's website.

• Stormwater Team members Steve Glass (Ciudad SWCD), Dave Gatterman (SSCAFCA), Fred Marquez (Sandoval County) and Tim McDonough (Village of Los Ranchos) were booked on several morning talk shows (TV and radio) to talk about the SQT and best practices to follow during the upcoming monsoon season:

• **Cumulus Media: Pat Allen's public affairs show:** 4,200 listeners were reached through traditional radio broadcast throughout the local Cumulus media system: (KBZU-FM 96.3 NASH ICON - Country, KKOB-AM 770 News Talk Radio (The Talk Monster), KMGA-FM 99.5 Magic FM (Magic's Best Mix of Yesterday and Today), KBZU-FM 96.3 (Country), KNML-AM 610 (The Sports Animal), KKOB-FM 93.3 KOB-FM (Albuquerque's #1 Hit Music Station), KRST-FM NASH FM 92.3 KRST (Country), and KTBL-AM 1050 (News andTalk).

There are no specific streaming numbers for Pat Allen's show, but we know that 59,413 people listen to KKOB 770-AM via streaming each month.

• **iheart media: Donnie Chase Show** 10,100 listeners throughout the local

iheart media stations: 100.3 The Peak (Mix and variety), Big I 107.9 (Country), 94 Rock, The Edge 104.1 (Alternative), 104.7 KABQ (Mix and Variety), 98.1 The Bull (Country), Hot 95.1 (Old School Hip Hop and R&B), AM1350 (News and Talk), and 100.9 The Beat (Hip Hop and R&B).

- **KOB-4: Good Day New Mexico**

Show has a 1.1-1.3 HH rating and audience averaged about 38,737

- **KRQE-13: This Morning**

7am --- rtg: 0.6 shr: 8,568

8am --- rtg: 0.8 shr: 11,424

9am --- rtg: 0.8 shr: 11,424

A total of 163,166 listeners were reached through these articles and interviews.



PUBLIC EDUCATION CAMPAIGNS ON PROPER DISPOSAL OF FATS, OILS & GREASE

In November and December 2016, the City of Rio Rancho and the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) planned and implemented public education campaigns on how to dispose of cooking grease properly. The



campaigns were timed to coincide with the holiday cooking season (Thanksgiving through Christmas). The City of Rio Rancho campaign included:

Print Ads – Quarter Page (4 col. x 8”) full-color ad in The Observer, running 2 Sundays in November (11/20 & 11/27) and 2 Sundays in December (12/18 & 12/25), reaching 94,000 readers (with duplication).

Digital Outdoor Boards – 7 digital outdoor boards running in November (11/21-11/27) and 7 boards running in December (12/19-12/25) reaching an estimated audience of 501,897 adults (18 years of age and older) with duplication

Movie Theaters – One 15-second spot running in Rio Rancho's 14-plex Premiere Theater for one week in November and one week in December, reaching approximately 40,000 people with duplications.

Total number of estimated people reached (with duplications): 635,897

In addition, in November and December 2016, the ABCWUA (a Stormwater Team supporter) planned and implemented public education campaigns on how to dispose of cooking grease properly. The campaigns were timed to coincide with the holiday cooking season (Thanksgiving through Christmas). The Water Authority's campaign included:

Digital Outdoor Boards – 7 digital outdoor boards running in November and December (4 in November; 3 in December) reaching an estimated audience of 491,451 adults (18 years of age and older) with duplication

Television – A total of 646 30-second television spots reaching an estimated audience of 2,259,978 with duplications.

Bill inserts – Three bill inserts for Water Authority utility bills reaching an estimated audience of 210,000 with duplication

Movie Theaters – One 30-second spot running in five of the Albuquerque metropolitan area's most popular theaters reaching an estimated 329,036 people with duplications.

Point of Purchase – 53 Johnny Boards (billboards in public restrooms) reaching an estimated 51,638 people with duplications

Total number of estimated people reached (with duplications): 3,342,103



DONATIONS

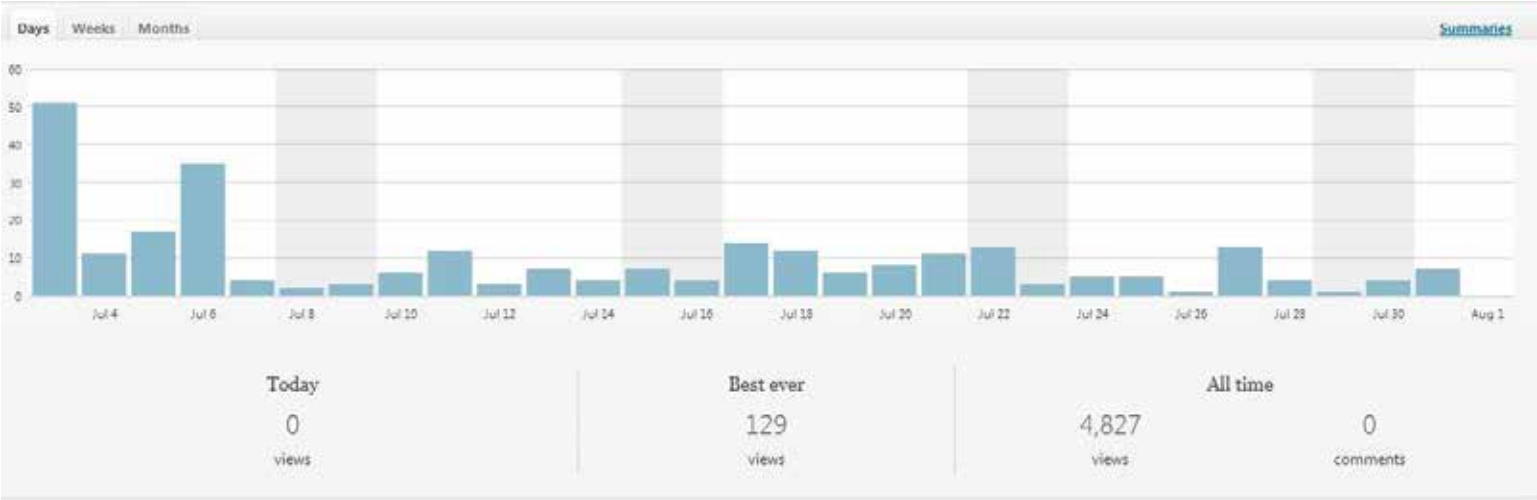
The City Of Albuquerque donated \$85,000 to The Nature Conservancy, RiverXchange and EarthForce for additional educational programs that reached 649 people (571 children and 78 adults). ***See Exhibits 5 and 6 for reports from The Nature Conservancy and Earth Force.***

TOTAL NUMBER OF PEOPLE REACHED THROUGH ALL ADVERTISING, EDUCATIONAL AND PUBLIC OUTREACH ACTIVITIES DURING 2016-2017:

Obviously, some people were reached by more than one activity, but in gross numbers an estimated **4,244,484** people were reached with a stormwater quality/stormwater pollution prevention message during the 2016-2017 fiscal year.

Exhibit 1 - Website Analytics

DAILY Direct Website Traffic



MONTHLY Direct Website Traffic



Browser & OS

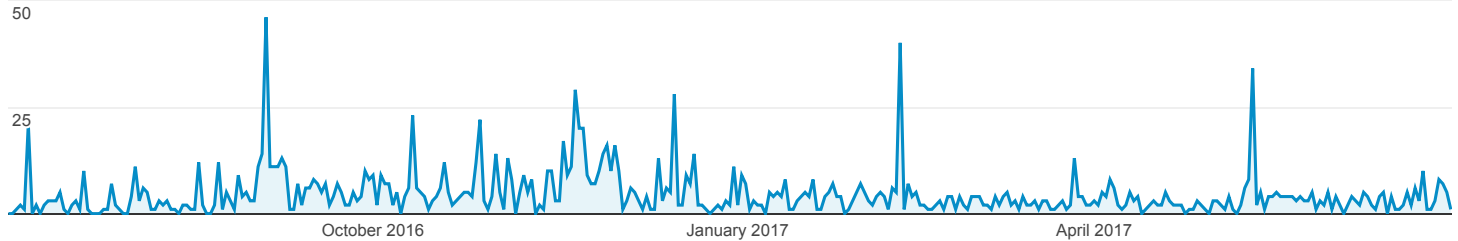
Jul 1, 2016 - Jun 30, 2017

All Users
100.00% Sessions

Explorer

Summary

Sessions



Browser	Acquisition			Behavior			Conversions		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	1,675 % of Total: 100.00% (1,675)	76.96% Avg for View: 76.96% (0.00%)	1,289 % of Total: 100.00% (1,289)	49.13% Avg for View: 49.13% (0.00%)	2.12 Avg for View: 2.12 (0.00%)	00:01:44 Avg for View: 00:01:44 (0.00%)	0.00% Avg for View: 0.00% (0.00%)	0 % of Total: 0.00% (0)	\$0.00 % of Total: 0.00% (\$0.00)
1. Chrome	883 (52.72%)	91.17%	805 (62.45%)	45.75%	2.10	00:00:48	0.00%	0 (0.00%)	\$0.00 (0.00%)
2. Safari	239 (14.27%)	62.76%	150 (11.64%)	56.07%	1.70	00:02:16	0.00%	0 (0.00%)	\$0.00 (0.00%)
3. Internet Explorer	220 (13.13%)	60.91%	134 (10.40%)	50.91%	2.45	00:02:26	0.00%	0 (0.00%)	\$0.00 (0.00%)
4. Firefox	215 (12.84%)	67.91%	146 (11.33%)	59.07%	2.53	00:03:10	0.00%	0 (0.00%)	\$0.00 (0.00%)
5. google.com	57 (3.40%)	3.51%	2 (0.16%)	3.51%	1.96	00:06:18	0.00%	0 (0.00%)	\$0.00 (0.00%)
6. Edge	27 (1.61%)	74.07%	20 (1.55%)	55.56%	2.26	00:03:06	0.00%	0 (0.00%)	\$0.00 (0.00%)
7. Mozilla Compatible Agent	12 (0.72%)	100.00%	12 (0.93%)	100.00%	1.00	00:00:00	0.00%	0 (0.00%)	\$0.00 (0.00%)
8. Mozilla	6 (0.36%)	100.00%	6 (0.47%)	100.00%	1.00	00:00:00	0.00%	0 (0.00%)	\$0.00 (0.00%)
9. Opera	4 (0.24%)	75.00%	3 (0.23%)	50.00%	1.50	00:00:30	0.00%	0 (0.00%)	\$0.00 (0.00%)
10. Safari (in-app)	4 (0.24%)	100.00%	4 (0.31%)	75.00%	1.25	00:01:04	0.00%	0 (0.00%)	\$0.00 (0.00%)

Rows 1 - 10 of 17



Devices

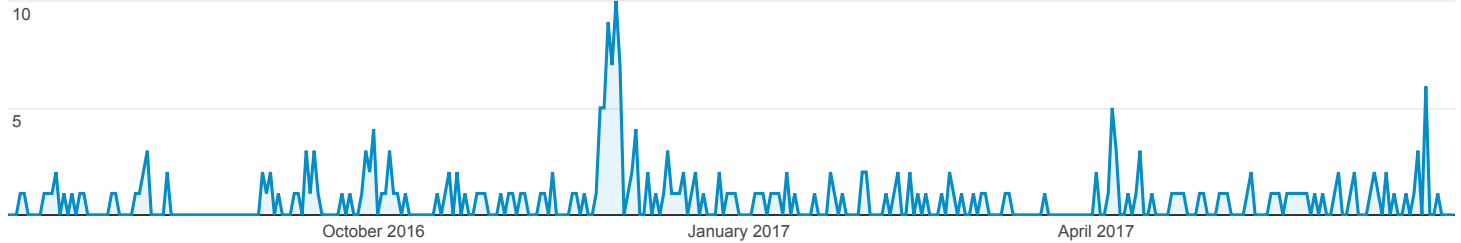
Jul 1, 2016 - Jun 30, 2017

All Users
15.16% Sessions

Explorer

Summary

Sessions



Mobile Device Info	Acquisition			Behavior			Conversions		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	254 % of Total: 15.16% (1,675)	72.44% Avg for View: 76.96% (-5.87%)	184 % of Total: 14.27% (1,289)	55.91% Avg for View: 49.13% (13.78%)	1.59 Avg for View: 2.12 (-25.29%)	00:01:38 Avg for View: 00:01:44 (-6.21%)	0.00% Avg for View: 0.00% (0.00%)	0 % of Total: 0.00% (0)	\$0.00 % of Total: 0.00% (\$0.00)
1. Apple iPhone	148 (58.27%)	57.43%	85 (46.20%)	52.03%	1.53	00:02:17	0.00%	0 (0.00%)	\$0.00 (0.00%)
2. Apple iPad	21 (8.27%)	95.24%	20 (10.87%)	61.90%	1.62	00:00:26	0.00%	0 (0.00%)	\$0.00 (0.00%)
3. Microsoft Xbox One	5 (1.97%)	80.00%	4 (2.17%)	60.00%	2.00	00:00:48	0.00%	0 (0.00%)	\$0.00 (0.00%)
4. LG K330 Tribute 5	4 (1.57%)	75.00%	3 (1.63%)	0.00%	3.25	00:03:49	0.00%	0 (0.00%)	\$0.00 (0.00%)
5. Samsung SCH i545 Galaxy S4	4 (1.57%)	100.00%	4 (2.17%)	50.00%	1.75	00:01:36	0.00%	0 (0.00%)	\$0.00 (0.00%)
6. Samsung SM-N920V Galaxy Note 5	4 (1.57%)	100.00%	4 (2.17%)	50.00%	1.50	00:00:09	0.00%	0 (0.00%)	\$0.00 (0.00%)
7. (not set)	3 (1.18%)	100.00%	3 (1.63%)	33.33%	2.33	00:01:54	0.00%	0 (0.00%)	\$0.00 (0.00%)
8. Motorola XT1254 Droid Turbo	3 (1.18%)	66.67%	2 (1.09%)	100.00%	1.00	00:00:00	0.00%	0 (0.00%)	\$0.00 (0.00%)
9. Samsung SM-G930T Galaxy S7	3 (1.18%)	100.00%	3 (1.63%)	100.00%	1.00	00:00:00	0.00%	0 (0.00%)	\$0.00 (0.00%)
10. Samsung SM-G930V Galaxy S7	3 (1.18%)	100.00%	3 (1.63%)	66.67%	2.67	00:02:08	0.00%	0 (0.00%)	\$0.00 (0.00%)

Rows 1 - 10 of 55

New vs Returning

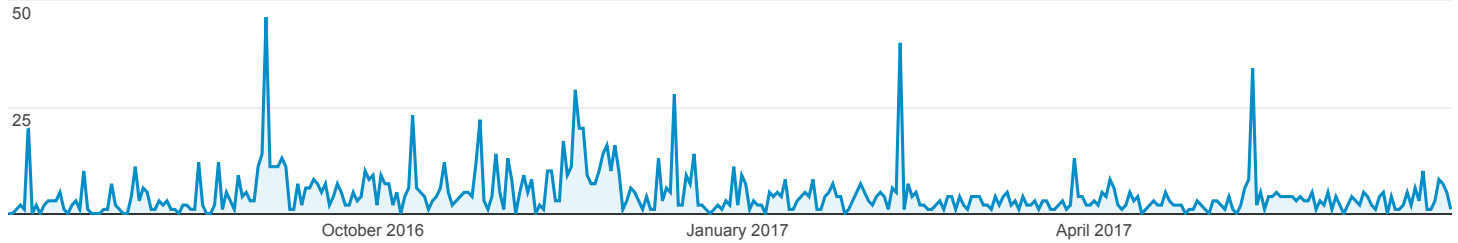
Jul 1, 2016 - Jun 30, 2017

All Users
100.00% Sessions

Explorer

Summary

Sessions

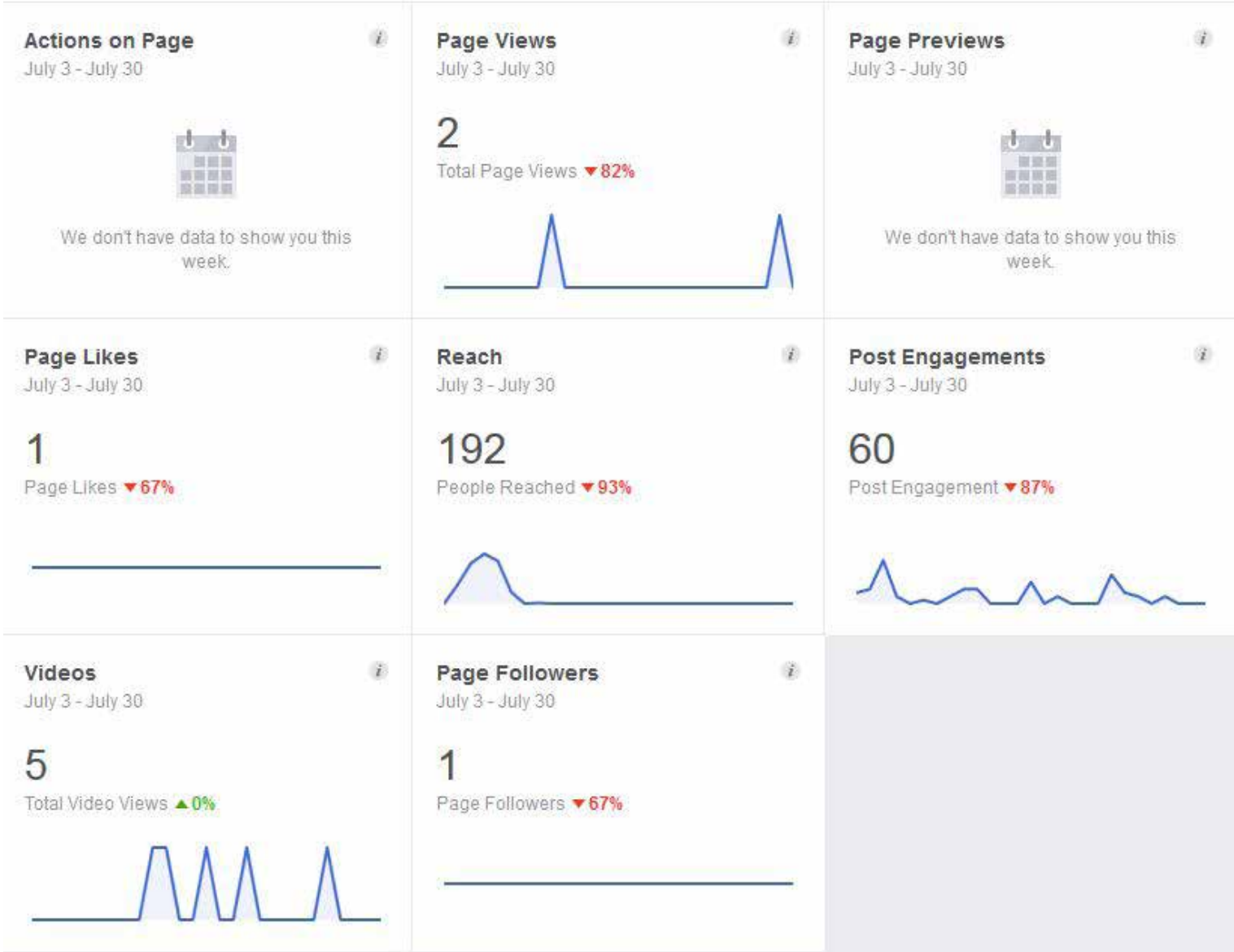


User Type	Acquisition			Behavior			Conversions		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	1,675 % of Total: 100.00% (1,675)	76.96% Avg for View: 76.96% (0.00%)	1,289 % of Total: 100.00% (1,289)	49.13% Avg for View: 49.13% (0.00%)	2.12 Avg for View: 2.12 (0.00%)	00:01:44 Avg for View: 00:01:44 (0.00%)	0.00% Avg for View: 0.00% (0.00%)	0 % of Total: 0.00% (0)	\$0.00 % of Total: 0.00% (\$0.00)
1. New Visitor	1,289 (76.96%)	100.00%	1,289 (100.00%)	53.92%	1.94	00:00:56	0.00%	0 (0.00%)	\$0.00 (0.00%)
2. Returning Visitor	386 (23.04%)	0.00%	0 (0.00%)	33.16%	2.72	00:04:27	0.00%	0 (0.00%)	\$0.00 (0.00%)

Rows 1 - 2 of 2

Exhibit 2 - Facebook Analytics

Facebook Engagement



Facebook Engagement by Posts

07/06/2017 3:00 pm		Last week we came together to discuss how local construction p			174		2 4		Boost Post
07/05/2017 1:26 pm		Our talk show tour continued this week when we sat down with KR			35		1 4		Boost Post
06/30/2017 1:18 pm		A HUGE thank you to Good Day New Mexico for having us on to d			126		7 12		Boost Post
06/15/2017 1:51 pm		Yesterday, we unveiled our interactive kiosk that teaches children			171		10 12		Boost Post
06/09/2017 1:43 pm		Join us Wednesday, June 14th at Rio Rancho's Loma Colorado L			2.5K		36 25		View Results Boosted: \$35.00
05/17/2017 3:12 pm		This free breakfast/seminar is for construction professionals so t			0		0 0		
05/17/2017 3:06 pm		Calling all construction professionals! If you're wondering how th			100		5 4		Boost Post
11/10/2016 4:41 pm		New post (MRGSQT Doggie Dash & Dawdle Signs) has been pu			16		0 0		Boost Post
11/08/2016 5:13 pm		We had a terrific time at the Doggie Dash 'N Dawdle! We'd like to			26		14 3		Boost Post
11/04/2016 1:01 pm		Looking for something fun to do this Sunday? Stop by our booth in			95		0 0		Boost Post
08/10/2016 5:30 pm		Members of the Stormwater Quality Team met with EPA Region 6			354		57 15		Boost Post

The success of different post types based on average reach and engagement.

Show All Posts ▼		Reach Post Clicks Reactions, Comments & Shares		
Type	Average Reach		Average Engagement	
Photo	913		14 11	
Link	111		6 9	
Status	0		0 0	

Exhibit 3 - Event Participation

PROGRAM/EVENT	EVENT DATE	PRESENTER/ REPORTED BY	TYPE OF AUDIENCE	ATTENDEES	TOTAL PARTICIPANTS	PERMIT REFERENCE	NOTES
2016							
Isleta Pueblo Environmental Fair	7/16/16	Steve Glass, Tom Allen			N/A	PW, SWP	
Tijeras Watershed Education Project (Vista Grande CC)	7/20/16	Jennifer Moss			80	AS, PW, SWP	
Santa Ana Environmental Fair	8/13/16	Steve Glass			N/A	AS, SWP	
Toss No Mas	9/12/16	Catherine Conran	Mixed		280	PW,SWP	
Open Space Visitor's Center	9/17/16	Steve Glass			N/A	AS, SWP	
Valle de Oro NWR 4th Birthday Bash	9/24/16	Steve Glass			N/A	AS, SWP	
East Mountain Celebration (BCOS)	9/25/16	Jennifer Moss			100	PW, SWP	
RR Children's Water Festival	10/24/16	Steve Glass, Jennifer Moss			150	PW, SWP	
RR Children's Water Festival	10/25/16	Steve Glass, Jennifer Moss			150	PW, SWP	
Animal Humane NM Doggie Dash 'n Dawdle	11/2/16	Patti Watson (CWA Strategic)	Adults and Children		290	PW, SWP	Annual event featuring a race and booths for pet lovers and friends. SQT hosted a booth to educate attendees on proper disposal of pet waste. 290 surveys administered; talked w/people about pet waste as a major polluter of the Rio Grande.
20-Year SOILebration	11/12/16	Tom Allen			N/A	PW, SWP	
Rio Rancho and Bernalillo teacher 4th grade packets	11/24/16	Catherine Conran	4th-grade Students		82	PW, SWP	
Children's Water Festival	11/24-11/25 2016	Catherine Conran	4th-grade Students	Classes from Town of Bernalillo and City of Rio Rancho	1,487	PW, SWP	
Bernalillo County Holiday Mercado	12/2/16	Jennifer Moss			100	SWP	
2017							
NMDOT Paving Conference	1/4-1/5 2017	Catherine Conran	Adults	Professionals	100	CO, ID, SWP	
KOB 4 Health & Wellness Fair	1/23-1/24 2017	SQT members	Adults and children	Community Members	8,000	HHW, PW, SWP	Annual event focusing on wellness; handed out giveaways, 290 surveys were filled out
Classroom Presentations (Sandia Vista Elementary)	2/16/17	RMYC	Elementary School Children		60	PW, SWP	
ARID LID preconference event field trip	2/22/17	Catherine Conran	Adults	Community Members	29	ID, SWP	
Classroom Presentations (Osuna Elementary)	3/2/17	RMYC	Elementary School Children		80	PW, SWP	
Classroom Presentations (Cochiti Elementary)	3/3/17	RMYC	Elementary School Children		65	PW, SWP	

AS: Animal Sources

CON: Construction

HHW: Household Hazardous Waste

ID: Illicit Discharges

PW: Pet Waste

SSS: Septic & Sanitary Sewer Systems

SWP: General Stormwater Pollution Prevention

PROGRAM/EVENT	EVENT DATE	PRESENTER/REPORTED BY	TYPE OF AUDIENCE	ATTENDEES	TOTAL PARTICIPANTS	PERMIT REFERENCE	NOTES
Classroom Presentations (Rio Rancho Elementary)	3/6/17	RMYC	Elementary School		100	PW, SWP	
Classroom Presentations (Georgia O'Keefe)	3/7/17	RMYC	Elementary School Children		85	PW, SWP	
Classroom Presentations (Zia Elementary)	3/15/17	RMYC	Elementary School Children		50	PW, SWP	
Route 66 Cleanup	3/25/17	City of Albuquerque	Adults and Children	Community Members	20	HHW, SWP	Picked up: 85 bags of trash and 2 tires; 5 bags mixed recycling; 5 5-gal. buckets and 2 bags of broken glass; 4 bags aluminum cans, 1 box spring, 1 shopping cart, variety of large metal objects, variety of lumber, cleaned up at least 6 illegal campsites including tents, sleeping bags and clothing.
Classroom Presentations (Lew Wallace Elementary)	3/28/17	RMYC	Elementary School Children		25	PW, SWP	
Classroom Presentations (Colinas del Norte)	3/30/17	RMYC	Elementary School Children		100	PW, SWP	
Classroom Presentations (Mountain View Elementary)	4/5/17	RMYC	Elementary School Children		60	SWP	
Indian School Cleanup	4/9/17	City of Albuquerque	Adults and Children	Community Members	74	PW, SWP	Picked up: 40 lbs. of dog poop; 7 bags of trash; 3 bags mixed recycling; 7 buckets of broken glass; 1 bucket of aluminum cans.
4 Trail crews performed trail maintenance on approx. 1.7 miles of trail.					20	HHW, PW, SWP	
100s pf cactus cuttings were planted on shortcut trails as a deterrent.					N/A	SWP	
Menaul Cleanup	4/15/17	City of Albuquerque	Adults and Children	Community Members	40	PW, SWP	Picked up: 30 lbs. of dog poop; 3 bags of trash; 3 bags mixed recycling; 1 5-gal. bucket of broken glass; 1/2 bag of aluminum cans.
6 Trail crews performed trail maintenance on several different trails.					30	PW, SWP	
Classroom Presentations (Bandelier Elementary)	4/18/17	RMYC	Elementary School Children		50	PW, SWP	
Science in the Community Day (Wilson Mid School)	4/19/17	Steve Glass, Tom Allen	Elementary School Children		200	AS, SWP	
Earth Day Puesta Del Sol Elementary	4/20/17	Catherine Conran	Children	Elementary School Children	600	PW, SWP	
Rotary Club in Albuquerque	4/20/17	Catherine Conran	Adults		40	SWP	
Earth Day (Manzano Day School)	4/20/17	Steve Glass	Elementary School Children		100	PW, SWP	
CORR tree give away	4/22/17	Catherine Conran	Adults	Community Members	N/A	SWP	

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SWP: General Stormwater Pollution Prevention

PROGRAM/EVENT	EVENT DATE	PRESENTER/ REPORTED BY	TYPE OF AUDIENCE	ATTENDEES	TOTAL PARTICIPANTS	PERMIT REFERENCE	NOTES
Earth Day- CORR	4/22/17	Catherine Conran	Adults and Children	Mixed Audience, Mostly Adults	300	SWP	
Great American Cleanup	4/22/17	Catherine Conran	Mixed	Community Members	1200	HHW, SWP	
Great American Cleanup Campus Contests	4/22/17	Catherine Conran	Adults	School-based Clean Up Events for GAC	3384	SWP	
Earth Day Piedra Lisa Cleanup	4/22/17	City of Albuquerque	Adults and Children	Community Members	55	CON, PW, SWP	Picked up: 18 lbs. of dog poop; 3 bags of trash; 2 bags mixed recycling; 2.5 5-gal. bucket of broken glass; 1 5-gal. bucket of rusty metal; 1 bag aluminum cans.
6 Trail crews performed trail maintenance on several different trails.					30	PW, SWP	
Environmental Justice Fair (Valle de Oro NWR)	4/22/17	Jessica Allen			40	HHW, SWP	
NMWC Rio Grande Water Festival (Sawmill Lofts)	4/22/17	Steve Glass			100	AS, SWP	
American Public Works Association New Mexico Spring Conference	4/27/17	Catherine Conran	Adults		30	CON, ID, SWP	
BEMP Student Congress at Bosque School	4/28/17	Steve Glass	Elementary School Children		100	AS, PW, SWP	
Recycled Art Fair at Open Space Visitors Center	4/30/17	Steve Glass			75	AS, SWP	
Rio Grande Report (Tierra Antigua Elementary)	5/5/17	Logan Moss (Jennifer Moss)	Elementary School Children		45	PW, SWP	
Classroom Presentations (Bernalillo Elementary)	5/8/17	Rocky Mountain Youth Corp	Elementary School Children		45	PW, SWP	
River Cleanup	5/13/17	City of Albuquerque	Adults and Children	Community Members	57	PW, SWP	Picked up: 18 lbs. of dog poop; 250 cubic yds. (54 bags of trash and 9 tires); 11 bags mixed recycling; 4 bags of broken glass; 2 bags aluminum cans. Crews hit all 4 corners of Central Bridge, west side of Bridge, west side of Rio Bravo, a remote location on westside, north of Central and Pat Baca Open Space. Also had 2 rafts, 2 canoes and 2 kayaks on River cleaning from Montano to Central.
Ravena Grass Removal	5/13/17	City of Albuquerque	Adults and Children	Community Members	50	SWP	Crew in Tingley area working on Ravena grass removal.
Tree Stewards Trainings	5/14,21,28 2016	Catherine Conran	Adults	Over 2262 Hours Volunteered for Trees	N/A	SWP	
Cielo Azul Elementary School field day presentation	5/18/17	Steve Glass	Elementary School Children		60	AS, PW, SWP	

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PROGRAM/EVENT	EVENT DATE	PRESENTER/ REPORTED BY	TYPE OF AUDIENCE	ATTENDEES	TOTAL PARTICIPANTS	PERMIT REFERENCE	NOTES
Monte Vista Elementary School	5/23/17	Steve Glass			60	AS, PW, SWP	
Albuquerque Country Club Summer Program	6/20/17	Astrid Hueglin			24	HHW, SWP	
Moms Group at Tijeras Creek Restoration Project	7/11/17	Steve Glass, Connie Crandall, Jennifer Moss, Melissa McLamb			20	AS, SWP	
Isleta Pueblo Enviromental Fair	7/15/17	Steve Glass, Amelia Symonds			50	AS, SWP	
Water Day at Railyards Market	7/16/17	Tom Allen, TTYL				SWP	
Copper Cleanup		City of Albuquerque	Adults and Children	Community Members	35	PW, SWP	Picked up: 60 lbs. of dog poop; 2 bags of trash; 1 bags mixed recycling; 1/2 bucket of broken glass; 1/2 bag of aluminum cans.
3 Trail crews performed trail maintenance on approx. 1.7 miles of trail.					15	PW, SWP	
Arid LID Conference	2/23-2/24/2017	Catherine Conran	Adults	Community Members, Students, University Students and Industry	189	ID, SWP	
Elementary School Students Achieve For Excellence (S.A.F.E.) program	2016-2017	Catherine Conran	1st-5th-grade Students	Mixed Grades and Size of Program Ranged from 50 to 100 Students	250	PW, SWP	
Bosque Ecosystem Monitoring Project (BEMP)-MRGSWQT	2016-2017	Catherine Conran	Elementary School Children	472 Students in 18 Classes w/18 Teachers and 1-day Event for "Dia Del Rio" 17 Classes	492	AS, PW, SWP	
Bosque Ecosystem Monitoring Project (BEMP)-MRGSWQT	2016-2017	Catherine Conran	Mid-high School	610 with 25 Teachers	635	PW, SWP	
RiverXchange	2016-2017	Catherine Conran	5th-grade Students	1,200 Students and 53 Teachers	1253	PW, SWP	
SSCAFCA's Arroyo Classroom Program	2016-2017	Catherine Conran	3rd-grade Students	700 Students 28 Teachers	728	PW, SWP	
CORR animal control educational materials Scoop the poop	As needed	Catherine Conran	Adults and Children	Mixed Audience, Mostly Adults	100	PW	
NMDOT Paving Conference	1/7/16	Catherine Conran	Adults		100	CON, ID	
Rio Rancho Recycles Day		Catherine Conran	Mixed		200	SWP	
Tree Stewards Program	2016-2017	Catherine Conran	Adults	42 Trees Planted, 64 Plantings, 2 Edible Gardens	N/A	SWP	
Watermelon Ranch Educational Materials Scoop the Poop	As needed	Catherine Conran	Adults and Children	Mixed Audience, Mostly Adults	100	PW, SWP	

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Donations

MEMBER	AMOUNT DONATED	RECIPIENT	PURPOSE
City of Albuquerque	\$20,000	The Nature Conservancy	For Education and Outreach
“	\$45,000	RiverXchange	For Education and Outreach
“	\$20,000	Earth Force	For Education and Outreach

Exhibit 4 - RiverXchange 2016-17



Presented by: Melissa McLamb



What is RiverXchange?

- A year-long program connecting students around the world to learn about water resources
- Hands-on, multidisciplinary curriculum
 - Lessons incorporate science, social studies, and math to teach about major water issues
 - Informational texts and writing/communication projects help teachers teach Common Core Language Arts Standards
- Each New Mexico 5th grade class receives:
 - Teacher workshop
 - 4 guest speakers – local water management professionals
 - Service-learning field trip to the Rio Grande
 - Partnership matching and private web sharing platform
 - Support throughout the school year



Why RiverXchange?

- Students gain a broad understanding of how our community's water issues fit together
- Long-term engagement with the topic reinforces learning
- Writing to a real audience reinforces learning, and helps teachers meet their goals (Common Core Standards)
- There are many resources available, but often teachers don't take advantage of them – RiverXchange provides a framework and a purpose.
- **Each student spends ~25 hours engaged with the program throughout the school year!**



Multidisciplinary Curriculum

Through classroom activities, guest speakers and field trips, students study and explore the following themes throughout the year:

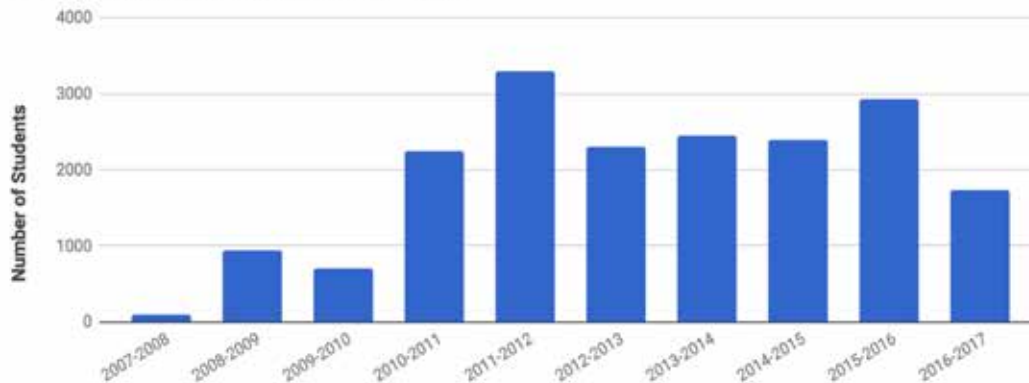
1. Understanding a Watershed
2. Water in Our Society
3. The River Ecosystem



2016-2017 Totals

- 42 New Mexico classes
- 19 classes Albuquerque Public Schools
- 18 classes Rio Rancho Public Schools
- 5 classes Bernalillo Public Schools
- 1,058 total New Mexico students
- 32 WOW offerings (NFWF)
- 23 classes (55%) are Title I schools
- 25 out-of-state partner classes, 675 students

RiverXchange Has Served Over 16,000 Students!



Online Learning

K RX2017-Stream New Post + RiverXchange

RX2017-STREAM
Exploring watersheds through global collabo...
Settings | Follow | [Icons]

Posts **Comments** 1

filters: Posts with status: **Published** Review Draft Show Filters

Search posts Search

★ **Welcome to RiverXchange**

55 [Comments]

RiverXchange
Dec 18, 2016, 8:57pm
Connections

★ **Introduction of West Branch Creek**

4 [Comments]

Kathy Sinn
Dec 13, 2016, 3:44pm
Connections

our fildtrip to tingle beach

2 [Comments]

ALLISON HAWKS
Apr 7, 2017, 8:12am
Class Members

Members

Search Members...

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Why Blogging Partnerships?

- Writing solidifies concepts in students' minds
- Learning about other rivers gives students perspective on their local situation and enhances understanding of larger water related issues
- Reflection groups and multi-class partner matching provides an authentic audience that motivates students to write and promotes collaboration both within and between classes
- Creative sharing develops 21st Century Skills!
- Private website provides a safe environment to teach internet safety skills

Students Talk!



Hello, we are The Rodriguez tutus, again and we have tested the water quality of our stream to show you. Water quality is the condition of the water, like the amount of pollution in it. It is important because without clean water, all life would perish and no animals, plants, or people can live. Earth would be lifeless. We tested for water pH and reasearched that a common pH for streams is between 6.5 to 8.5 in order for aquatic life to take place, and our stream has a pH of 8. Since our pH is of 8 it can sopport aquatic life and can be used for plant irrigation, to bath, sports and enjoyment. --Rodriguez (El Rio de Bayamón ,Puerto Rico)



As part of a local conservation effort, our class is raising native Rio Grande fish from January through May. It is our responsibility to keep the fish happy and healthy. In May, we will return the fish to the Rio Grande river. There are a large number of factors that we have to consider when raising our fish.
-OlsonErosion, NM

I think that it is very neat that you guys raised fish and planned to return them to the Rio Grande River. We also raised mosquito fish and snails in our Eco-columns...part terrarium and part aquarium. They were a closed system where we could observe not only energy transfer within a food chain but also the water cycle...-OverbyErosion, NC



A creek with a very similar ecosystem as Beaver Creek in Alaska.

Hi! Thank you for responding to our post! We live in Homer Alaska and go to McNeil Canyon elementary. It sounds like your river is HUGE compared to our tiny creek. We have many types of animals, birds and fish. Is it sunny in Connecticut or is it rainy, snowy and cold? Does your river have a beach or rocks that slope into your water. Do you have wild boars in Connecticut around your river? Our creek has small rocks, pebbles and some small boulders that make a small slope into our river. Do you have a gigantic mountain that has a water flow that goes into your river? Where does your river originate from? How long is your river? Our creek flows from Bald Mountain and flows into the anchor river and then eventually into the Pacific ocean. Thank you for being amazing buddies! Sincerely: GreenWaterOtters. AK

Guest Speakers

Students learn from local resource professionals



RIVERXchange™

Agriculture

Irrigation can be wasteful and helpful. There are different kinds of irrigation, the one you probably know most about is sprinkling and, as you guessed, it uses sprinklers, its not the most efficient way of irrigation but, it also isn't most inefficient way of irrigation.

The most inefficient way of irrigation is probably surface irrigation. Surface irrigation is basically near flooding plants in water, there are many disadvantages that come with surface irrigation such as: seeds washing away, plants getting over-watered and dying, and losing soil. Yet, surface irrigation is the most popular way of irrigation. Last but not least, the most efficient way of irrigation is drip irrigation...Drip irrigation...is a form of irrigation that lets water drip slowly into the roots of plants, it conserves water and soil. ... ~Elizabeth, MirabalOnline,NM

Drinking Water

Hello we are the Torres Owls and we are going to tell you about what happens when you have a leaky faucet. A leaky faucet is a faucet that drips even when the water is fully turned off. Over 3,000 gallons of water are wasted from one leaky faucet a year. That is a lot of water that is being wasted! A leaky faucet should be fixed by a plumber as soon as possible or a lot of water is wasted. Thank you for reading, I hope you enjoyed.

-TorresOwls, NM

Stormwater

How can we protect our local water? Don't throw plastic bags or let them fly away into the river. Pick up your dog's ecoli.

Get your car fixed so it won't leak oil everywhere. When you're camping don't throw your trash in the river. -

AckermanStormwater,NM



"Storm water is water from rain,snow,hail,and sleet. After storm water falls and melts, it runs into the gutters, then it goes into the river. The water doesn't get cleaned. The water can have fertilizer,pesticides,trash,and animal waste. It then can harm animals. People can reduce pollution by not littering,being careful when using fertilizer and pesticides,and picking up after your animals. What is your storm water like?" -TorresRivulet, NM



Wastewater

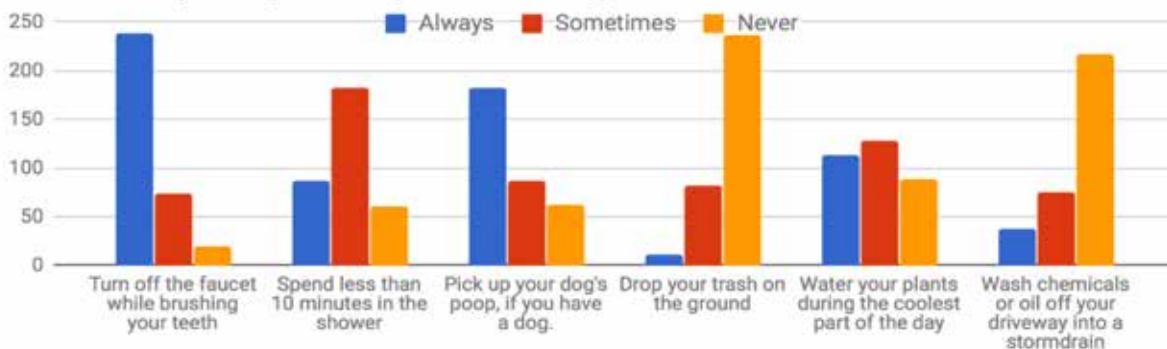
"I learned that wastewater can be recycled into drinking water. I also learned that all the sludge goes into public parks. I learned that the things that should go in the toilet are: poop, pee, vomit and toilet paper. I was surprised that waster water turned into drinking water. Whenever wipes say "flushable" they are really not flushable." -ShaferRainforest, NM



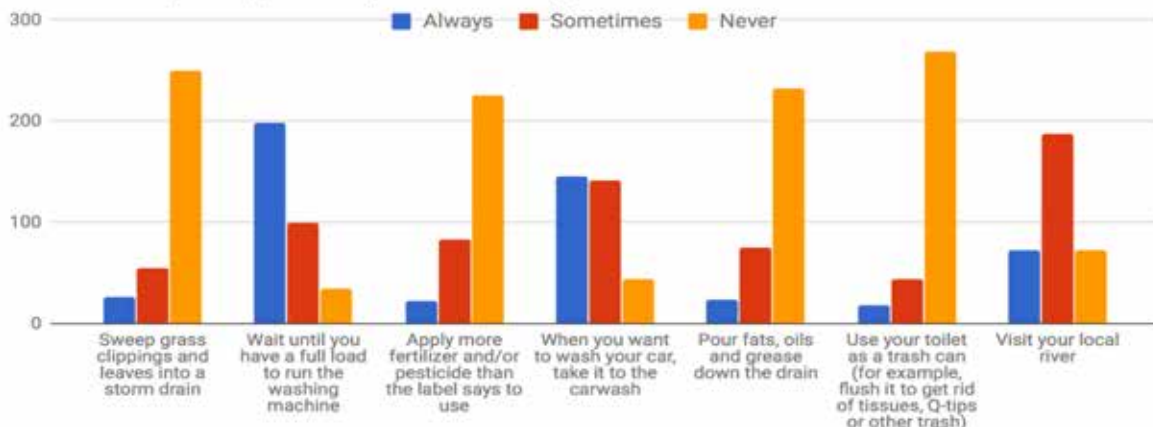
"...We learned what happens when you flush something down the toilet that is not meant to be flushed like, plastic soldiers, phones, glass, and garbage. These are some ways that water can be wasted, taking more than 5 minute showers, running the water while brushing your teeth, and flushing the toilet more than is necessary. ...we learned how much water we waste in a year or a day..." - MallettBrook, NM

Our class visited one of the three water treatment plants in our city, Winston-Salem, NC and learned how water taken from the Yadkin River is made safe for us to drink. -OverbyRiparian

How often do you or your family do the following..? POSTSURVEY



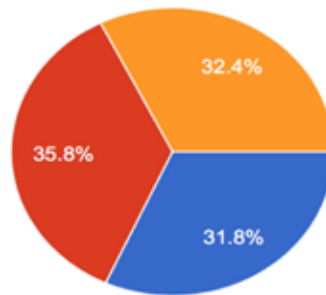
How often do you or your family do the following..? POSTSURVEY



When it rains, where does your community's stormwater go?

692 responses

PRE-Survey

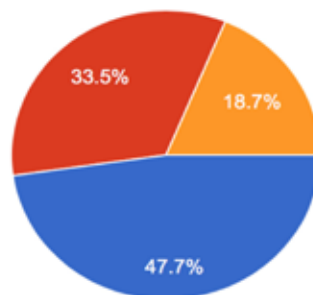


- It goes through storm drains or arroyos into a river, lake, bay or ocean without being cleaned.
- It goes through a sewer to a wastewater treatment plant to be cleaned.
- I don't know.

When it rains, where does your community's stormwater go?

331 responses

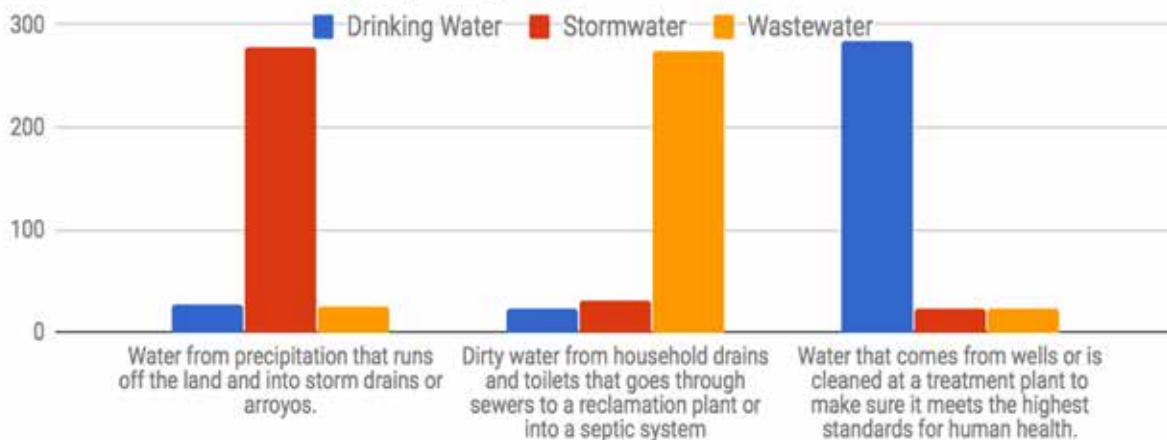
POST-Survey



- It goes through storm drains or arroyos into a river, lake, bay or ocean without being cleaned.
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- I don't know.

POST-Survey

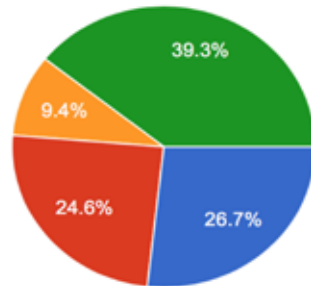
Match the definitions for drinking water, stormwater and wastewater.



What is a Watershed (also known as a catchment or drainage basin)?

692 responses

PRE-Survey

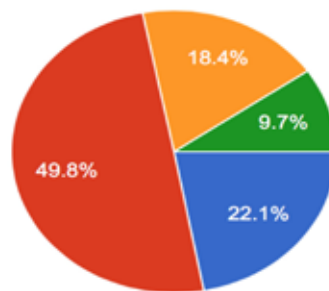


- It is a building where we store water.
- It is an area of land that drains to a river, lake, bay or ocean.
- It is a water-body such as a river, lake, bay or ocean.
- I don't know.

What is a Watershed (also known as a catchment or drainage basin)?

331 responses

POST-Survey



- It is a building where we store water.
- It is an area of land that drains to a river, lake, bay or ocean.
- It is a water-body such as a river, lake, bay or ocean.
- I don't know.

Tree Planting Field Trips



This year, RiverXchange students helped restore 4 acres of riparian habitat!

With the help of participating parents and teachers, we planted 245 cottonwood trees, 16 black willows, 191 willow whips and 26 baccharis shrubs!



What we learned about the Rio Grande is that we have not taken care of the river. It is impacting the Cottonwood trees in the area by giving them a worse chance to survive. Some common invasive species can be humans, tumbleweed, and Russian Olives. The invasive species impact the Bosque by littering and taking away water for the plants. Now let's talk about the process of planting trees. First you dig a hole with an auger, then you put the tree in the hole and push it down until it can't go any further. After you do that, you need to start putting dirt in the hole and pack it down until dirt fills the top. Then you do the happy dance because you are done. We plant trees in the winter because they are dormant, which means the tree is asleep.

After this field trip we do understand and see the Bosque differently by helping it maintain itself. We can apply what we learned on this field trip to use less water at home and at school.

SandiaStreamers5 -Arroyo



Water Testing Field Trips

Students conduct water testing of the Rio Grande and Tingley Wetlands. Outcomes help teach about:

- The importance of water quality
- Consequences of human actions and development
- Identifying causes of pollutants and imbalances in water quality
- Finding solutions to prevent pollution and improve existing conditions



What are the greatest learning outcomes for your class as participants in RiverXchange?

What Teachers Have to Say

RiverXchange is a great program that gives students from our Title 1 school the opportunity to learn about the river and environments that are near the Rio Grande. The guest speakers and field trip expand their minds and understanding of the world that is around them and not just simply in their back yard or neighborhood. They simply cannot afford or simply don't know what is out there. ...Educating them about their relationship with it (the river) will help open their minds to how they are connected with many people, places, and things that they might not even imagine. - Cindy Shafer, RRPS (returning teacher)

I have been working with RiverXchange since it was in the pilot program stage. I love the way it gives students an authentic audience to connect with about their learning. -Lara Overby, NC (10th year participating)

This is a wonderful program and it teaches students so many different aspects about water and the many ways we here in New Mexico can learn to be better with how we use and treat water. - Andrew Vigil, APS (3rd year participating)

This program has been a pleasure and learning experience for all and I am truly amazed by how much students learn about their own environment. - Debbie Beer, APS (7th year participating)

How RiverXchange serves MRGSQT

- Total cost of program this year: \$42,065.89
-with 1,058 participating students, that's \$39.76/student
- In Kind Match to date - \$179,953.92, meaning \$170.09 was invested in each student.
-In Kind Match promised for FY2017 - \$26,571.89
- 55% of our participating schools are Title I
- Strong learning outcomes for participants
- Collaborative work in our community benefits our watershed
- This year we met together with BEMP and NM Water Collaborative to develop coordination between programs to create a long term educational experience around watershed health and stormwater pollution prevention..

MRGSQT Programs:

Pet Waste, Household Hazardous Waste, General SWP, Septic, Illicit Discharges, Construction

Our educational presentations and curriculum excel at meeting most of these funding goals!

Our RiverXchange Vision for 2017-2018

With your continued support, we strive to help create a new generation of citizen scientists and stewards who are invested in the health of their local watershed here in the Middle Rio Grande Valley.

- Provide regular blog announcements and notices of excellent work with all teachers to encourage blog entries and responsiveness to partners
- Encourage classes to implement creative projects and/or create an end-of-year Storm Water Quality project to be presented to a broader audience, including MRGSQT
- Offer an additional Storm Water Quality field trip as a class incentive (Sanchez Farm, Valle de Oro)
- Provide technology incentives to returning classes who excel in their RiverXchange related writing and work



Thanks So Much to Our Sponsors!



Funding Request for 2017-2018

The cost, per class, to continue improving our program, and to better-serve your permit requirements is \$1,500.

We hope you can continue to support our efforts for 2017-2018!

Thank you!



Exhibit 4 - B.E.M.P. 2016-17



BOSQUE SCHOOL



scholarship • community • integrity

BEMP Education Office
4000 Bosque School Road NW
Albuquerque, NM 87120
505.898.6388

Bosque Ecosystem Monitoring Program (BEMP) 2016-2017 Stormwater Science Education Overview

The main objective of the *Stormwater Science* outreach education program is to teach students that the health of the Rio Grande is directly related to the health of the surrounding watershed. The *Stormwater Science* program includes a one and one-half hour classroom activity, a four to five hour study trip to the Rio Grande and a water chemistry lab. **During the 2016-2017 school-year 1775 students participated in *Stormwater Science* activities in their classrooms, in the field or both. The one and one-half hour classroom program was delivered to 1269 students in 32 classrooms at 19 different schools in Bernalillo, Rio Rancho, Albuquerque, Los Lunas, and Belen.**

During the 2016-2017 school-year Stormwater Science programing was focused on middle school and high school students emphasizing reaching students in multiple formats. BEMP has observed that it is often difficult for middle and high school teachers to take students into the field because they are only able to take a subset of their students out at a time. In an effort to simplify BEMP's practice of reaching students in multiple ways, we piloted a water chemistry lab class with middle school students this year. Teachers were given the choice to follow up their classroom lesson with either a study trip to the river or a water chemistry lab. Four hundred twenty six (**426**) students took part in a lab or study trip, which more than doubles the number of students who took part in study trips this year, as compared to last year. Both the study trip and water chemistry lab build upon the themes of the classroom presentation and provide a hands-on experience in water quality testing.

The classroom portion of the program demonstrates that runoff carries contamination to the Rio Grande. Students construct a model of the Rio Grande Watershed (see Page 6). The model watershed has five different communities along the river: a cattle ranch, up-and-downstream eco-friendly towns, an urban city, and agricultural fields. Students add different 'runoff cards' to the river downstream of the community where the runoff constituents originate. Some of the runoff is naturally occurring (turbidity), and others are human caused (pesticides, oil, etc.). The model runs through two different scenarios: (1) a *before-the-storm* and (2) an *after-the-storm* river. These two versions of a watershed demonstrate the harmful effects storm water contamination can have on aquatic organisms and downstream communities.

The classroom program then encourages students to observe their daily behavior and think about ways they can help to keep their watershed clean in alignment with the MRGSQT educational messaging. BEMP used the matrix provided by MRGSQT as a guideline to crafting the Stormwater Science messaging. Educators provide opportunities for students to come up with

their own suggestions for improving watershed health and provide a few suggestions students can do individually. The handout to accompany this activity is available to students in both English and Spanish; the classroom handout is included on Page 3 of this document.

The field portion of the program is a four to five hour trip to the Rio Grande during which students investigate how stormwater moves through the city. Students also collect and interpret water quality data. The program starts with a trail/arroyo survey which examines and categorizes the amount of visible pollutants (plastics, paper, dog poop, animal scat, etc.) in the San Antonio arroyo in Albuquerque which empties into the bosque. In the arroyo students survey for several types of litter and test water quality using a LaMotte water quality monitoring kit (see Page 6). When the students arrive at the bank of the Rio Grande, they do additional water quality testing and search for macro-invertebrates. Students then collectively share their results, compare them to results gathered by students in the past and to the data they gathered in the arroyo, and discuss what the data could mean in terms of river health.

During the water chemistry lab, students are in their own classroom and they perform water quality tests on river water, tap water, and water from school fish tanks or ponds (if available). Students learn what factors affect water quality, discuss the differences between the water in the river and the water they drink, and understand what makes a good freshwater habitat vs. what makes good drinking water. If time permits, students go outside their school to look for the paths stormwater takes when it falls on their school's campus.


In the 2016-2017 proposal, we proposed to develop a new Stormwater Science program to be delivered at BEMP monitoring sites along the bosque during BEMP's monthly monitoring/data collection for students in grades 2-12. Some activities were piloted during monthly monitoring this year with 2nd graders from Rio Grande Elementary at the Belen site and 4th graders from The International School at Mesa del Sol near Valle de Oro National Wildlife Refuge. Work on the monthly monitoring curriculum continues and BEMP educators plan to refine stormwater science activities during monthly monitoring field trips for elementary, middle and high school students to be delivered in the Spring of 2018.


Hundreds of students also took part in *Stormwater Science* related field activities at two BEMP events this year. The BEMP Student Congresses (~300 students, ~55 teachers/chaperones), was where BEMP students had the chance to share their research and experiences in the bosque, including watershed health observations, and BEMP's Otter Day (~125 students, ~25 teachers/chaperones), an event for first graders, hosted by high school students to teach about endangered animals in New Mexico (see Page 7).

During BEMP's monthly water chemistry testing for the MRGSQRT, which commenced in January 2017, BEMP scientists provide in-depth explanations of E. coli testing and abiotic parameter testing to a select group of high school and college students who assist with this dataset.

Classroom Handout – Mid/High School

Hydrologist: _____ Date: _____





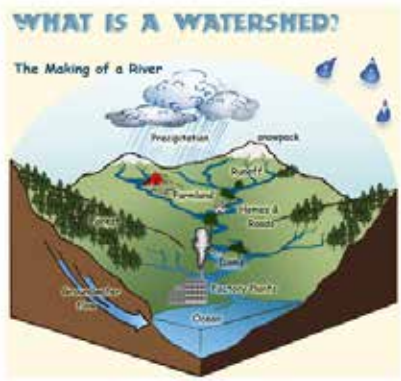
stormwater Science


What 2 sources can New Mexicans get their drinking water from?

1. _____

2. _____

Where does water go after we use it?






A watershed is an area of land where all of the water that falls on it, or that is under it, drains to the lowest point.


Draw a line from the word to its definition

<p>Turbidity</p> <p>Nonpoint source pollution</p> <p><i>E. coli</i></p> <p>Point source pollution</p> <p>Nitrates and phosphates</p> <p>Tributary</p> <p>Macro-invertebrates</p>	<p>◆ A stream or arroyo that brings water to the main channel of the river</p> <p>◆ Types of nutrients found in fertilizers that can lead to excess algae growth</p> <p>◆ A single location where pollution is being leaked into the environment</p> <p>◆ A type of bacteria found in warm blooded animal's intestines that can make people sick</p> <p>◆ Tiny 'water bugs' whose species are an indication of water quality</p> <p>◆ Any type of pollution that comes from many different sources</p> <p>◆ A measure of water clarity based on the amount of suspended solids</p>
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Page 1


Cattle Ranch

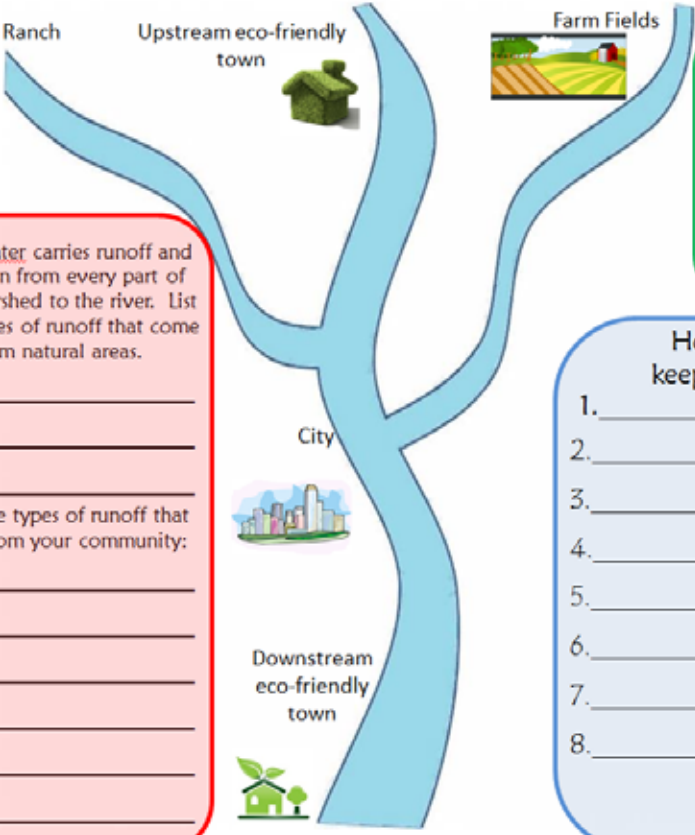


Upstream eco-friendly town



Farm Fields





Stormwater carries runoff and pollution from every part of the watershed to the river. List some types of runoff that come from natural areas.

List some types of runoff that come from your community:

How do the living things in the river ecosystem react to the stormwater?

How can **YOU** help to keep our watershed clean?

1. _____

2. _____

3. _____

4. _____


5. _____

6. _____


7. _____


8. _____

City



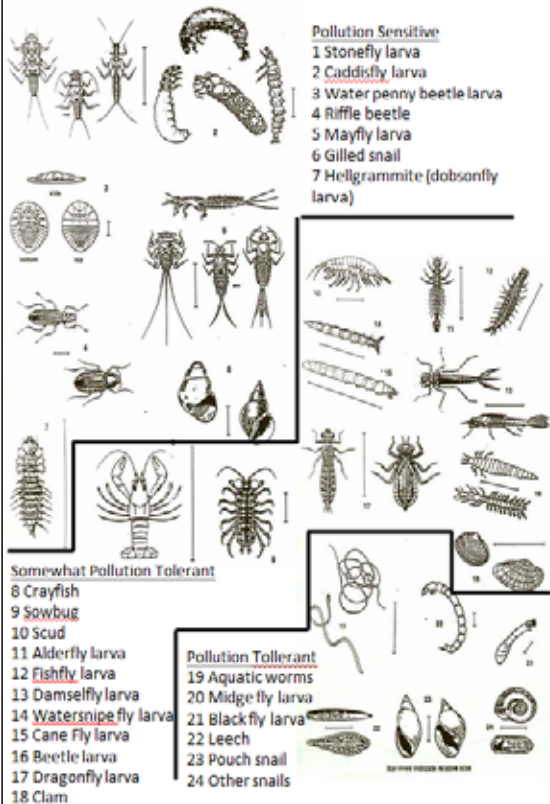
Downstream eco-friendly town





Page 2

Macro-invertebrates: Ecosystem Indicators



Litter Survey

The San Antonio Arroyo collects runoff from all over the west side of Albuquerque, anything on the streets can end up in the arroyo. Record the litter you find throughout the day here.

Litter type	Arroyo	Bosque
Plastic		
Paper		
Glass		
Metal		
Cigarette butts		
Dog poop		
Animal scat		
Evidence of chemicals		
Other trash		

Who is responsible?

Point source pollution- comes from a specific place

Non-point source pollution- comes from many places and people

3

Page 3

How long will it take?

Every piece of trash has a face... where and WHO did it come from? It takes just a moment for an item to be carelessly discarded where it can be washed into a river or blown in by wind, but it can take many, many years for it to completely decompose. Test your knowledge about decomposition times below by drawing a line from the item to its decomposition time.

Banana peel	1 million years
Cigarette butt	600 years
Fishing line	450 years
Styrofoam cup	200 years
Milk carton	50 years
Plastic bottle	20 years
Aluminum can	5 years
Glass bottle	3 months
Plastic bag	4 weeks

Which of these things can be reused or recycled?

4

Weather Report

1. Time: _____ am or pm

2. Today's

Weather:



3. Cloud Cover: _____ %

4. Wind: Speed: _____ Direction: _____
km/hr OR mph



5. Humidity: _____ %

6. Temp: It feels like: _____ °F It actually is: _____ °F

Journal Space

5

Page 4

Middle school students at Harrison Middle School (right) and Albuquerque Institute of Math and Science (below) discuss runoff while they build a watershed model.



Jimmy Carter Middle School students test for dissolved oxygen in water in the San Antonio Arroyo





1st grade students build a puzzle to discover the “secret message” telling them how to keep the river clean and protect wildlife habitat during Otter Day 2017.

BEMP staff and students collecting water quality data in Jan. 2017



Exhibit 5 - Nature Conservancy 2016-17



New Mexico
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Fax (505) 988-4095

The Nature Conservancy in New Mexico
Rio Grande Watershed Educational Programs
Final Report to the City of Albuquerque: June 2017

Education Programs:

Between April and May 2017, The Nature Conservancy and project partners conducted a three-part series for 8 classes of 4th and 5th graders from Duranes and Whittier Elementary Schools. Approximately 160 students participated in hands-on activities exploring watershed health, forest health, and surface to groundwater interactions. There were also 67 adults that participated in the field trips to the top of the Sandias, providing a unique experience for underserved children and some of their family members. Topics included storm water management, water quality, watershed connections, the importance of forests and mountains as water towers, drinking water sources, impacts of drought, and ecological consequences of river management.

Part I: The In-Class Watershed Model Activity

Students received background information about the Rio Grande rift, the uplift of the Sandia Mountains, and how rocks from a 300 million-year-old ocean are up on top of Sandia Peak. Working with a model of the watershed made of wood, foil, nails for tree trunks and cotton balls for trees, the students watched where the water flows when it rains or snow melts from the mountain top. They then saw what happens if people add dog poop (chocolate sprinkles), trash (cut up straws), oil spots from cars (olive oil), fertilizer (green food coloring), and pesticides (red food coloring). Students then took off the cotton ball trees to represent a too-hot fire in an unhealthy forest habitat, and replaced the trees with chocolate powder to represent ashes. They learned about the Jemez fire and how it impacted the Rio Grande ecosystem and our ability to use river water for three months following the fire.



This river has been polluted with trash, dog poop, oil, fertilizer and pesticides.



This river has been choked with ashes from a fire that burned too because the forest was unhealthy.

Part II: Ride to See the Rio Grande Watershed

The Tram Field Trip was connected to Next Gen Science Standards stating that four earth systems work together: Hydrosphere, Geosphere, Atmosphere, and Biosphere (we considered only plants). Students predicted what they would observe at the initial in-class meeting. Students were divided into small groups of 3 – 4 students and used the following materials to make observations. A notebook was provided with maps and information, as well as their lab sheet to collect observations.



A notebook was provided with maps and information, as well as their lab sheet to collect observations.

1. a soil sifter that separated soil into rocks, gravel, sand, clay, and silt and magnets to collect iron
2. a tree density gauge to measure how many big trees on top and bottom of mountain
3. a soil-water gauge
4. a water bottle to measure effects of air density

Students compared the amounts of soil types at school, the tram dock, and the crest. They found more rocks at the top, more gravel at the tram dock, and more sand at their school. Magnets at the tram dock collected

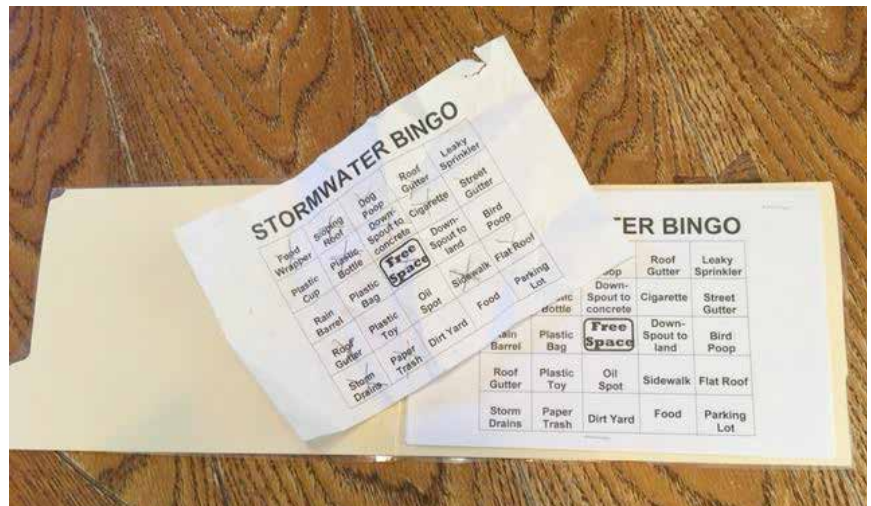
TONS of iron whereas the dirt at the top had very little. They learned that this is because water weathers and erodes rock, shaping the watershed and the soil in it.

Students compared the number of big trees at the tram dock and mountaintop. They learned that there are more big trees on top of the mountain and more cactus at the bottom tram dock. Students compared water in the soil and learned that there is more water in the soil at the top of the mountain. They also learned that the crest gets about 100 inches of snow each year compared to 7.8 inches of snow in town.

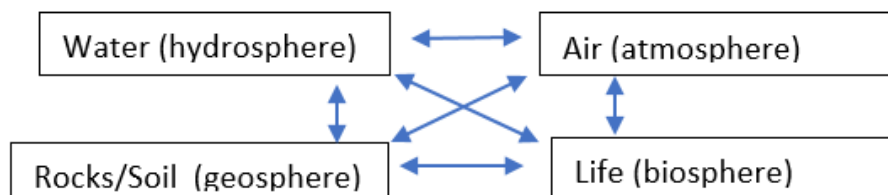
Students heard the air escape from the water bottle when air from the tram dock was brought to the top. They saw how the bottle became squashed by denser surrounding it when air from the top was brought down to the tram dock. They learned that rock, the mountain, effects the air density and the weather.

Part III - The Storm Water Bingo Walk and Art Project Wrap Up

Students went on a walk in the neighborhood or around their school campus to look for evidence of the storm water system and some of the bad things that get washed into the river. Bingo seems to be a VERY popular activity. They learned how hard surfaces shed the water into the storm drains that run into the river taking with it all the trash and dog poop that we leave behind.



Students discussed the connections between the four earth systems.



Afterwards, students returned to the classroom to write haikus and make pictures that completed the sentence: "I am from the Rio Grande Watershed where . . ."



Students and teachers enjoyed this program. They learned about the watershed, storm water and had the opportunity to see the enormity of the Rio Grande watershed. From Mt. Taylor and Santa Fe, it looks immense from the crest, and it is only a small part of the Rio Grande Watershed. Students could feel connected to the watershed and see how water connects us all.

Partnering organizations for the program included: Sandia Mountain Natural History Center and the Cibola National Forest.

Marketing Services:

During the time of the Conservancy's contract with the city, we disseminated a media advisory about water fund educational outreach activities, which was pitched to regional media outlets. Two local news stations, KQRE and KOAT filmed the student's visit to the Sandias including the tram ride, but only KQRE aired the film. As well, all media coverage and releases are highlighted on the Conservancy's website and Facebook page. These educational programs will also be featured in the Rio Grande Water Fund Annual Report, which will be published in the fall 2017.

Exhibit 6 - Earth Force 2016-17

1. What are the goals you hoped to achieve and how did you meet the stated goals?
 - a. The goal of this project was to leverage an urgent community need - stormwater management - to give young people a hands-on STEM experience. Participating classes collected water quality data, conducted a stormwater assessment and learned how Albuquerque manages stormwater. Students then developed a project that improves stormwater management at both the point of origin (their school) and at the point where it re-enters the natural environment (the refuge). Earth Force supported 11 educators in the Community Action & Problem-Solving Process, helping the educators gain the skills needed to implement the project-based learning approach. These educators guided students to create 7 projects.
2. What activities have occurred to date as a result of the City of Albuquerque contribution? Are there activities yet to get underway?
 - a. 411 students participated in the six-step Community Action & Problem-Solving Process and developed 7 total projects that addressed stormwater in the Middle Rio Grande.
 - b. Eighty students shared their environmental projects with peers and stakeholders from the community at the Youth Summit on May 12, 2017. All of the students created and shared presentations about their projects, including a remarkable presentation from students at the Native American Community Academy who made their presentations in at three different native languages. Their projects focussed around pollinator gardens and pollinator water ecosystems. Emerson Elementary School investigated their school's drinking water, as it was coming out of the faucets and drinking fountains brown. They tested their water and brought their results to the principle to fix the issue. Truman Middle School created a rain garden and mural at the Valle de Oro National Wildlife Refuge. The space will be utilized as an outdoor education space.
3. How many youth were impacted by Lockheed Martin/Sandia National Laboratories funding this request?
 - a. # youth: 411
 - b. # adults: 11
4. If your program is educational, how is it addressing the community's need for a future workforce and what is it doing to encourage students to achieve their highest potential?
 - a. Young people in Earth Force programs design and implement projects that reflect issues they care about and their desire to address a local environmental issue, gaining hands-on experience by applying what they have learned in the classroom to real-world situations. Our program focuses on civic engagement, which helps students to become active participants in their communities by conducting balanced research, building strong community partnerships, and making decisions as a democratic group. These skills are vital for lifelong environmental citizenry and workforce development. Earth Force uses its Community Action & Problem-Solving Process, which helps students to gain workplace STEM skills such as using scientific tools to generate data, using data to problem-solve, and developing policies through the application of data.