

Forests to Faucets: My Water Comes from the San Juan Mountains 2016 Teacher Workshop

*Final Report to Southwestern Water Conservation District (SWCD)
April 3, 2017*



SAN JUAN
MOUNTAINS
ASSOCIATION

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Mountain Studies Institute
SAN JUAN MOUNTAINS, COLORADO



I: Introduction & Goals

San Juan Mountains Association (SJMA), in partnership with Mountain Studies Institute (MSI) and the Water Information Program (WIP), was generously awarded \$9,648 from SWCD in education funding to support the fourth annual teacher training workshop – *Forests to Faucets: My Water Comes from the San Juan Mountains*. The design team included partners from MSI, Water Information Program (WIP) and San Juan Mountains Association (SJMA). Aurora’s Forests to Faucets teacher training program provided the framework for the traveling workshop and the *My Water Comes from the San Juan Mountains* book, teacher kit, and guide (also previously funded by SWCD), were selected as the principal tools around which the workshop’s content was focused. While the teacher kits have already been distributed to elementary schools throughout the region, due to teacher attrition and other administrative changes over time, there existed a real need to provide training on and support for this great resource. The goals of the workshop were to: (1) outreach to and expand the geographic network of new teachers trained with *My Water* resources, (2) educate teachers on water, watershed science, water resources, impacts of the region’s mining legacy, and municipal water infrastructure (3) prepare teachers to implement the *My Water* interactive curriculum in their own classrooms, (4) supply participating teachers with new kits for their schools, (5) evaluate the impact of the *My Water* kit and workshop, and (6) host a *Using Data in the Classroom Training* for secondary teachers in the fall of 2016.

II. Animas Watershed Teacher Workshop

The two-day workshop (June 22-23, 2016) was offered free of charge to educators. There were 16 registrants for the workshop, but due to last minute health issues one person was unable to attend. The workshop provided the opportunity for teachers to receive one graduate credit from Adams State University as well as 15 contact hours for teacher recertification. Participants traveled in two vans throughout the Durango and Silverton areas to gain first-hand experiences and knowledge about the places they will be teaching their students. Along the way, teachers wore the “student hat” while instructors demonstrated teaching activities from the *My Water* guide. The group also met with water resource experts and scientists who covered topics ranging from the importance of water quality and quantity, to touring the pump station for Lake Nighthorse, the post-fire restoration efforts at Lemon Reservoir, and the water treatment facilities for the City of Durango, to the “how to” of implementing watershed service learning initiatives. Appendix A provides the full 2016 workshop agenda and Appendix B presents workshop photos.

III: Using Data in the Classroom Training for secondary teachers

In 2016, we expanded our program to reach high school teachers, through an additional half-day workshop for advanced grades to demonstrate the use of real-world river data as a teaching tool in the classroom. The workshop, *Using Data in the Classroom*, was attended by 15 area educators, including teachers from the 9R school district, from Durango charter and private schools (Animas High School and Columbine Christian School), Silverton School, Fort Lewis College, and educators from local non-profits. This portion of our project was built on the post-Gold King Mine spill outreach work and Alpine Hydrology Training, both performed in 2015. MSI worked with Animas High School’s chemistry students to use real Animas River data.

Professionals from the University of Colorado’s STEM Literacy through Infographics Project conducted the three-hour evening workshop. The presented on the following topics related to using infographics in the classroom to make “real-world” data accessible to students:

- Science communication through visualization of data
- Elements of design
- Helping students to relate to issues in their communities through data
- Infographics-based journalism

- Using real world data in your classroom to engage students
- Available software to organize data and create infographics

IV: Participants

We were very pleased to fill our workshop with area teachers. Educators from across the region were informed of and attracted to the program. We estimate that these teachers will bring watershed science to an additional 300-450 students per year! The following table outlines the teachers that participated in the 2016 workshop.

2016 Forests to Faucets Teacher Workshop Participants

School	City	Grades	Number of Teachers Participated
Cortez Middle School	Cortez	6 th	1
Dolores Elementary	Dolores	K-2 nd , 5 th	3
Lewis-Arriola Elementary	Dolores	5 th	1
Mancos Elementary	Mancos	5 th	1
Montezuma-Cortez High School	Cortez	9 th – 12 th	2
Needham Elementary	Durango	9 th , 10 th	1
Park Elementary	Durango	2 nd - 3 rd	2
Southern Ute Indian Montessori Academy	Ignacio	K – 6 th	3
Seeking Employment (recent FLC graduate)	Durango		1
TOTAL			15

An additional 15 educators attended our fall workshop. Participants are outlined in the table below.

2016 Using Infographics in the Classroom Workshop Participants

School	City	Grades	Number of Teachers Participated
Escalante Middle School	Durango	6 th	1
Durango High School	Durango	10-12	3
Silverton School	Silverton	5 th	1
Animas High Scholl	Durango	10 th – 12 th	4
Columbine Christian School	Durango	3 rd – 8 th	1
Fort Lewis College	Durango		1
San Juan Mountains Assocation	Durango		1
Mountain Studies Institute	Duranog		3
TOTAL			15

V: Evaluations

Evaluations were given to teachers that participated in the summer workshop. These included five point Likert-type questions (e.g. very likely to not sure) and open-ended written response questions about the the My Water kit, as well as about the material and instructors in the workshop – and the likelihood of the teacher using the kit and curriculum guide in the future. Overall we received very positive feedback on the kits, lessons, and their likelihood of use in the future. Comments included:

- “Amazing group of instructors”
- “Well-versed and extremely knowledgeable”
- “Great content and very thorough”
- “Guest speakers at every location were awesome”
- “Appreciated discussions on how to adapt to different levels/areas”
- “nice variety of information that will be very helpful”
- “gave good background knowledge to make me feel more comfortable teaching it”

See Appendices C and D for a detailed summary of all evaluations received.

This is the fifth year that the three partners, MSI, WIP and SJMA, have collaborated on some aspects of the My Water project. Having three strong partners enabled the teacher outreach to be a real success in carrying out what would have been an overwhelming task for any one organization. We were able to draw upon our diverse teacher and school contacts to make this outreach successful.

The far-reaching impact of these workshops and trainings would not be possible without the financial support of the Southwestern Water Conservation District, Durango Education Foundation, Trout Unlimited, and private donors. Mountain Studies Institute, San Juan Mountains Association, and the Water Information Program are extremely grateful for the opportunity to continue to share the wealth of information in the *My Water Comes from the San Juan Mountains* book and teacher kit.

Appendix A: 2016 Agenda

Forests to Faucets: My Water Comes from the San Juan Mountains Teacher Training Workshop

Sponsored By:

Mountain Studies Institute
San Juan Mountains Association
Southwestern Water Conservation District
Water Information Program
Durango Education Foundation
Trout Unlimited

Agenda

June 22-23, 2016

Wednesday, June 22, 2016

8:00 – 8:15 am	Registration in Durango at San Juan Public Lands Center	
8:15 – 8:45 am	Training Overview and Introductions Amanda Kuenzi & Marcie Bidwell, Mountain Studies Institute Gabi Morey and MK Gunn, San Juan Mountains Association Denise Rue-Pastin, Water Information Program Kay Phelps, Fort Lewis College	
8:45 – 9:30 am	What Watershed Do You Live In? Activity: <i>Map Your Shed</i>	MK
9:30 – 10:00 am	Life Zones & SJ Mountains Cornucopia Introduction	Gabi
10:00 – 11:30 am	Drive to Cunningham Creek Activity in vans – San Juan Mountains Cornucopia	
11:30 – 12:00 pm	Lunch Discussion: <i>Changes to Landscape by Beavers</i>	Marcie
12:00 – 12:45	Cunningham Creek, How Healthy is Our Watershed? Activity: <i>Macroinvertebrate Mania</i>	MK
12:45 – 2:00	Drive to Acid Mine Drainage Water Treatment Plant Discussion: <i>Mining and Reclamation</i>	Helen Mary Johnson, BLM Peter Butler, Animas River Stakeholders Group
2:00 – 2:45	Drive to the confluence of Animas River and Cement Creek Discussion: <i>Mining and Changes in Water Quality in our Watershed</i>	Helen Mary Johnson Peter Butler
2:45 – 3:00	Drive to Silverton School	
3:00 – 3:45	Changing Water Properties Activity: <i>5 W's, an H and pH</i>	Amanda

3:45 – 4:15 pm	Explore the My Water Guides & Kits	Gabi
4:15 - 5:15 pm	Return to San Juan Public Lands Center Discussion in van – <i>Top 3 things found in guides/kits that you can use in your classroom</i> – discuss tomorrow	

Thursday, June 23, 2016

8:00 am	Convene at San Juan Public Lands Center Discussion – <i>What were the top 3 things in guides/kits you will use in your classroom?</i>	Gabi
8:30 – 9:00 am	The Water Cycle Activity: <i>The Incredible Journey</i>	Kay
9:00 – 9:30 am	How Much Water on Earth is Usable? Activity: <i>A Drop in the Bucket</i>	Denise
9:30 – 10:00 am	Drive to Lemon Reservoir Discussion in vans: <i>History/overview of fires</i>	
10:00 – 11:00 am	Tour of Fire Site(s)	John Eye, Florida Water Conservancy District
11:00 – 12:00 pm	Drive to Rainbow Ranch & Discussion of Durango Water Supply	Dave Ferguson, City of Durango
12:00 – 1:00 pm	Drive to & Lunch at Water Treatment Plant or FLC Discussion: <i>What's in Our Water</i>	Ann Oliver, Animas Watershed Partnership
1:00 – 2:00 pm	Durango Water Treatment Plant Tour	Dave Ferguson, City of Durango
2:00 – 4:00 pm	Drive to Lake Nighthorse & Tour	Russ Howard, Animas-La Plata Operations, Maintenance, and Replacement Association
4:00 – 4:15 pm	Drive Back to San Juan Public Lands Center	
4:15 – 5:00 pm	Closing: Summary, Q & A, Evaluations, and Certificates	Denise

Appendix B: 2016 Workshop Photos



Appendix C: 2016 “My Water” Teacher Evaluations Summary

Appendix C: Workshop Evaluation Summary

Forests-to-Faucets Teacher Training Workshop Evaluation
June 22-23, 2016

Name (optional):

1. I received sufficient information to teach water-related activities in my classroom.

- Strongly agree -10 72%
- Agree- 3 21%
- Somewhat agree-1 7%
- Disagree
- Strongly disagree

“Great activities and outstanding material”; “activities will be easy to adapt for different levels”

2. How would you rate the overall Forests-to-Faucets Workshop experience with 5 being the highest (locations, vans, meals)?

1 2 3 4- 4: 29% 5- 10: 71%

“Loved the speakers and field trips”; “Very impressed”; “Really well organized”

“Less time driving”; “more time in certain locations”

3. The content and topics of the Workshop suited my needs and will be helpful in the classroom.

- Strongly agree -5 36%
- Agree -7 50%
- Somewhat agree -2 14%
- Disagree
- Strongly disagree

“Appreciated discussions on how to adapt to different levels/areas”; “nice variety of information that will be very helpful”; “gave good background knowledge to make me feel more comfortable teaching it”

4. How would you rate the passion and content delivery of the Forests-to-Faucets instructors on the subject matter with 5 being the highest?

1 2 3 4- 1: 7% 5- 13: 93%

“Amazing group of instructors”; “Well-versed and extremely knowledgeable”; “Great content and very thorough”; “Guest speakers at every location were awesome”

5. Was the material presented engaging and interesting to you?

- Yes – 14 100%
- No

“Especially the guest speakers”; “Yes, but wouldn’t have been as interesting if we didn’t do the activities”;

“Time went so fast because it was so interesting”; “Mapping, cube activity highlights”

6. Do you think the Forests-to-Faucets Workshop has increased your understanding of how to present and teach water-related topics to your students?

- Absolutely – 10 71%
- Somewhat – 4 29%
- Not really

It has increased knowledge of available resources in the area and subject but not necessarily how to present or teach it

7. What were your reasons for attending the Forests-to-Faucets workshop and/or what benefits of the program influenced you to attend?

College credit; Local applicability; 5th Grade Science Standards;

Needed hours- it far exceeded my expectations of information, instruction and interest;

New ideas and materials; To learn more about our watershed

8. If you could change the Forests-to-Faucets Workshop in any way, what would you change?

Make it over three days to allow for “catch up time” so we don’t miss out on activities;

Less sitting and more moving; More time in Silverton at the mines; Coffee;

Hard to communicate and hear in the van during discussions;

Be more educated when discussing Southern Ute and Ute Mountain Tribes water usage in regards to Lake Nighthorse and the culture

9. The greatest value of the Forests-to-Faucets Workshop was:

Visiting the sites and engaging with presenters; New knowledge and awareness of sites;

The info I can take back to the school and use with students; The unbiased perspectives presented based on science;

Materials provided; Networking with other teachers; Hands-on experience

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The info I can take back to the school and use with students; The unbiased perspectives presented based on science;

Materials provided; Networking with other teachers; Hands-on experience

Appendix D: 2016 “Using Data in the Classroom Training for secondary teachers” Teacher Evaluations Summary

1. I teach the following ages/grades: Elementary Middle School High School Informal/After School
2. I received sufficient information to use data and infographics-based activities in my classroom.
- Strongly agree **3**
 - Agree **6**
 - Somewhat agree **2**
 - Disagree
 - Strongly disagree

Comments: I want to know more

Great information, but presentation felt rushed.

3. The greatest value of the Data/Infographics Workshop was:

“Exposure to a “new” way to think about/analyze data in a more accessible way.”

“Learning about websites to use for infographics. Passing info on to teachers who couldn’t attend.”

“Multiple ways to introduce and engage students with this topic.”

4. The information was presented in a manner that was clear and easy to understand.
- Strongly agree **3**
 - Agree **5**
 - Somewhat agree **3**
 - Disagree
 - Strongly disagree

Comments:

“The workshop was rushed.” “The presenters were very clear and approachable.”

5. I would be interested in attending future workshops about STEM literacy in the future.
- Strongly agree **5**
 - Agree **4**
 - Somewhat agree **2**
 - Disagree
 - Strongly disagree

Please list workshop topics that may interest you:

Development of critical analysis and discussion for observable phenomenon.

6. The best time for workshops for me would be (*if more than one, please rank 1-5*):
- After school **7**
 - In- service days **2**
 - Weekends **2**
 - Summer **4**
 - Doesn’t matter- if I like the topic, I will make it work **4**

7. Was the material that was presented engaging and interesting to you? YES **9** PARTIALLY **2** NO **0**
8. Do you think the Data/Infographics Workshop has increased your understanding of how to present and teach real-world topics to your students?
- Absolutely **6**
 - Somewhat **5**
 - Not really

Comments:

"It gave me another way to connect the information for students..."

9. What were your reasons for attending the Data/Infographics Workshop and/or what benefits of the program influenced you to attend?

"Wanted to find out exactly what "infographics" was and how to incorporate it into my science classroom."

"I'm planning to have my students create infographics in the next two weeks." "To get ideas to enhance science lessons"

"I want students to have more than one way to present information and thinking" "To network with other science teachers"

10. If you could change the Data/Infographics Workshop in any way, what would you change?

More time

11. Other comments:

Thank you so much for your participation!

Appendix E: Budget Actual (*denotes addition/change from proposed budget)

CATEGORY	SWCD Funds Requested	Matching Cash Contributions Requested	DEF Funds	TU and Other Donations	Matching In-Kind Contributions	Matching Source	Budget Actual	In-Kind Actual
STAFFING								
<i>Project Management</i>								
MSI Community Science Director (15 days @ \$300/day)	\$ 3,300.00	\$ 900.00	\$ 900.00		\$ 300.00	MSI - in kind	\$ 4,200.00	\$ 300.00
SJMA Education Coordinators (13 days @ \$280/day)	\$ 2,640.00				\$ 1,000.00	SJMA	\$ 2,640.00	\$ 1,000.00
WIP Coordinator (10 days @ \$256/day)					\$ 2,560.00	WIP	\$ -	\$ 2,560.00
MSI Executive Director (3 days @ \$336/day)		\$ 336.00	\$ 336.00		\$ 672.00	MSI - in kind	\$ 336.00	\$ 672.00
MSI Intern (10 Days @ \$160/day)	\$ 1,600.00					MSI	\$ 1,600.00	\$ -
AWP VISTA Volunteer (10 days, vol \$23.07 per hr)					\$2,768.40	AWP	\$ -	\$ 2,768.40
Education Consultant (honorarium)	\$ 500.00				\$ 1,170.00	MSI - in kind	\$ 500.00	\$ 1,170.00
Expert guest speakers					\$ 5,200.00	USFS, Florida Water Conservancy District, City of Durango, State of CO, Bureau of Reclamation, Dept of Mining, Reclamation, Animas River Stateholders Group)	\$ -	\$ 5,200.00
FOOD								
Meals (2 lunches & snacks X \$20 X 18 participants/instructors)		\$ 450.00				WIP	\$ 450.00	\$ -
TRANSPORTATION								
Vans (2 vehicles for 3 days)		\$ 720.00	\$ 720.00			DEF	\$ 720.00	\$ -

Gasoline for Workshop		\$ 300.00	\$ 300.00			DEF	\$ 300.00	\$ -
Vehicle and Gasoline for Field Planning					\$ 150.00	SJMA	\$ -	\$ 150.00
MEETING ROOM								
Public Lands Center, Silverton Sch (2 days)					\$ 400.00	PLC, Silverton School		\$ 400.00
MATERIALS								
15 My Water Teacher Guides		\$ 375.00				WIP	\$ 375.00	\$ -
Workshop Supplies		\$ 30.00				WIP	\$ 30.00	\$ -
7 My Water Teacher Kits		\$ 1,400.00	\$ 744.00	\$ 308.00		DEF, TU, private donations	\$ 1,052.00	\$ -
Field Guides & Equipment		\$ 800.00				MSI & SJMA	\$ 800.00	\$ -
SUB TOTAL	\$ 8,040.00	\$ 5,311.00	\$ 3,000.00	\$ 308.00	\$ 14,220.40			
Indirect Expenses (Insurance and incidentals)	\$ 1,608.00	\$ 1,433.97		\$ 500.00	\$ 562.80	MSI offers a portion of regular indirect rate (7%) as in-kind	\$ 500.00	\$ 562.80
TOTAL	\$ 9,648.00	\$ 6,744.97	\$ 3,000.00	\$ 808.00	\$ 14,783.20			\$14,783.20
Total Budget Requested	\$ 16,392.97							
Total Cash Budget Received	\$ 13,456.00							
Total Actual Budget (Cash + In-Kind)	\$ 28,239.20							