

**ANIMAS RIVER COMMUNITY FORUM**  
**MONITORING GAPS ANALYSIS SURVEY REPORT**

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**Durango, CO**

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**Executive Summary**

This Animas River Community Forum (ARCF) is a stakeholder group whose purpose is to promote communication, coordination and collaborative action; foster public confidence; and enhance planning, improved public safety and health for the future; while honoring the institutional authorities and decision making of governmental and community organizations ([animasrivercommunity.org](http://animasrivercommunity.org)). This report summarizes responses of the ARCF Monitoring Gaps Analysis Team survey designed to identify monitoring questions that address top river related concerns of community members. Survey questions focused on perceptions of Animas River health or resilience, public health concerns, and any other concerns. The survey also included questions regarding how individuals use the river and how respondents would prefer to access information about these topics. La Plata County disseminated the survey electronically, and 188 responses were received and analyzed.

Respondents were fairly evenly split between male (59%) and female (41%), and among age groups. Most respondents were from La Plata County, with the remainder representing San Juan County, New Mexico, San Juan County, Colorado, and other counties. When asked which river segment they were concerned about (check all that apply), greater than 50% were concerned with all sections of the river in Colorado, and more than 40% were concerned about river sections in New Mexico. Greatest concern was voiced for the section within the city of Durango. Respondents self-affiliated primarily as community members and river recreationists. In response to the question of how they used the river, 76% are involved in some sort of boating activity (rafting, tubing, kayaking or paddle boarding), 49% are anglers, and <2% are pedestrian users of the river.

The top concerns regarding public health, health or resilience of the river and other concerns was pollution – from mining, sewage contamination (municipal, septic systems, and recreation), and agriculture – accounting for almost 37% of all expressed concerns. Trust issues were often included in comments about pollution, and framed as responsibility, accountability, multiple messages, lay terms for understanding, and clear messaging. Lack of trust was expressed as needing ‘honesty in reporting of conditions’, veracity of data reporting, and perceptions of mishandling of mine and sewage pollution incidents. Other top concerns included negative impact on fish populations, negative impact on wildlife, loss of system resilience, too much

recreation, and issues of trust regarding honesty of water quality reporting and health assurances. Themes that emerged from the responses to the river health and resilience question included: 1) the river system is at or near a critical threshold as a resilient system or its ability to withstand more abuse from mining and other human impact; 2) action needs to be taken to ensure continued river health; and 3) mention of ‘system interactions’.

This survey did not capture detailed suggestions as to the type of monitoring data that should be collected. There was emphasis on timely and long-term data measurements. As monitoring data provides the basis for decision making efforts and action regarding the river, top monitoring priorities identified include:

1. Monitoring data should serve various purposes such as river use (daily and weekly); river health (quarterly or yearly); and agricultural use (quarterly).
2. Short term priority: Is the river safe? Monitoring efforts should facilitate addressing safety for river users in real time.
3. Long term priority: Is the river healthy? Monitoring efforts should address the overall health of the river regarding physical and biological parameters
4. Trends regarding river health. Monitoring efforts should address changes in the river over longer periods of time (e.g. decades).
5. Quality of life questions should be addressed through monitoring.

Communication should use language that is understandable to the lay public, and that focuses on the river as a system. Communication Priorities:

1. Data Sharing: Cooperative data sharing should occur. This would involve efforts from groups reporting data in similar forms from multiple sites in the watershed.
2. Transparency: of monitoring methods, from multiple sources, providing reliable data, and communicated in easy to understand language, with feedback or question availability.
3. Accessibility: data should be accessible online and through the newspaper, and in language that is understandable regardless of level of expertise.
4. Usefulness: what do the data mean in terms of people’s use and enjoyment of the river?

## **Background**

This Animas River Community Forum (ARCF) is a stakeholder group formed in response to the Gold King Mine spill incident of August 2015. The Forum's purpose is to promote communication, coordination and collaborative action; foster public confidence; and enhance planning, improved public safety and health for the future; while honoring the institutional authorities and decision making of governmental and community organizations (animasrivercommunity.org). A community that is able to respond to disasters that impact the environment, economy and quality of life needs to have relevant data and be able to translate that data into timely, useful, accessible information for decision makers and the public. The ARCF Monitoring Gaps Analysis Team (hereafter referred to as the Gaps Analysis Team) was formed to analyze data gaps regarding the Animas River within the Forum goals (members listed in Appendix I). The survey discussed in this report was designed by the Gaps Analysis Team to identify monitoring questions that address top river related concerns of community members. Survey questions (see Appendix II) focused on perceptions of Animas River health or resilience, river use, public health concerns, river health or resilience concerns, and general concerns. The survey also included demographic questions about who responded to the survey, river sections of concern, and questions about how respondents would prefer to access information.

The survey was disseminated electronically by La Plata County using Survey Monkey. An introductory email with the survey link was sent to all forum members to forward to their membership and was highlighted in several community forums during a 4-week period. A total of 188 responses were received and analyzed.

## **Analysis Methods**

I used NVIVO 11 qualitative analysis software (QSR International) to thematically review all responses in the survey. The first step involved running a word frequency query for each set of question responses. The search criteria included a minimum of 3 letters per word and grouped synonyms as a single category (e.g., talk, talking, and speak would comprise a single category). Building on the themes that emerged from the word frequency queries, I coded responses into identified and emergent thematic categories. This report reflects this theme overlap across questions, but is a first pass – in other words, I have duplications of themes such as resilience that emerged as responses to river health, public health concerns, and health and resilience of the Animas River as a system questions. In future analysis, I would go back and coalesce the themes to delve deeper into the overlap of rich information gathered by this survey. Coding was done on the level of the phrase, rather than the entire response, inflating the total possible responses to a number greater than the total number of surveys received.

Survey questions are included at the end of the report for reference (Appendix II).

## **Demographics of Survey Respondents**

Respondents were fairly evenly split between male (59%) and female (41%), and among age groups (Figure 1). Seventy-eight percent of respondents were from La Plata County, with the remainder representing San Juan County, New Mexico (10.7%), San Juan County, Colorado

(4.5%), and other counties (6.8%). When asked which river segment they were concerned about (check all that apply), greater than 50% were concerned with all sections of the river in Colorado, and more than 40% were concerned about river sections in New Mexico. Greatest concern was voiced within the city of Durango (75%) (Figure 2).

Respondents self-affiliated primarily as community members and river recreationists (Figure 3). In response to the question of “How do you use the Animas River in your living and working life?” 49% identified fishing in their use of the Animas River. This high percentage of anglers should be kept in mind in light of numerous survey responses regarding fish health, fish population status, fish monitoring, and regulatory action regarding fish stocks in the Animas River. In 2008 in the state of Colorado, 82% of state revenues (estimate of \$1.8 billion) from fishing were estimated to derive from residents (The Economic Impacts of Hunting, Fishing and Wildlife Watching in Colorado. Sept. 26, 2008, Colorado Division of Wildlife). Despite the importance of fishing, it seems more likely that the survey received greater response from fishing groups such as Trout Unlimited, rather than almost half of the local population fishing the Animas River. Responses to this question also revealed that 76% of river users are involved in some sort of boating activity: rafting, tubing, kayaking or paddle boarding. Again, this may reflect a bias in the population of survey respondents. There was surprisingly low response (<2%) from pedestrian users of the river, such as those who walk the Animas River Trail.

Figure 1. Age Range of respondents (97.8% response rate).

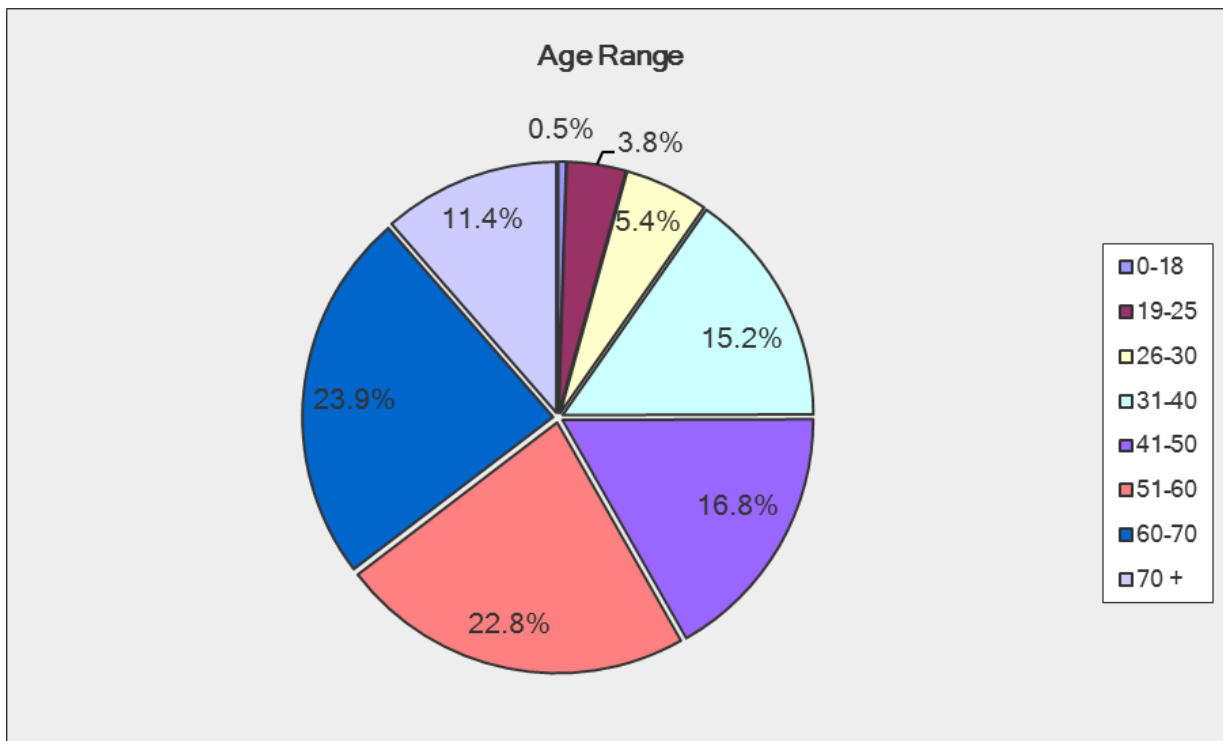


Figure 2. Responses to the question: What segment of the Animas River are you most concerned about (check all that apply)? There is some variation in segments of concern, but all segments are of concern to 40% or more of respondents.

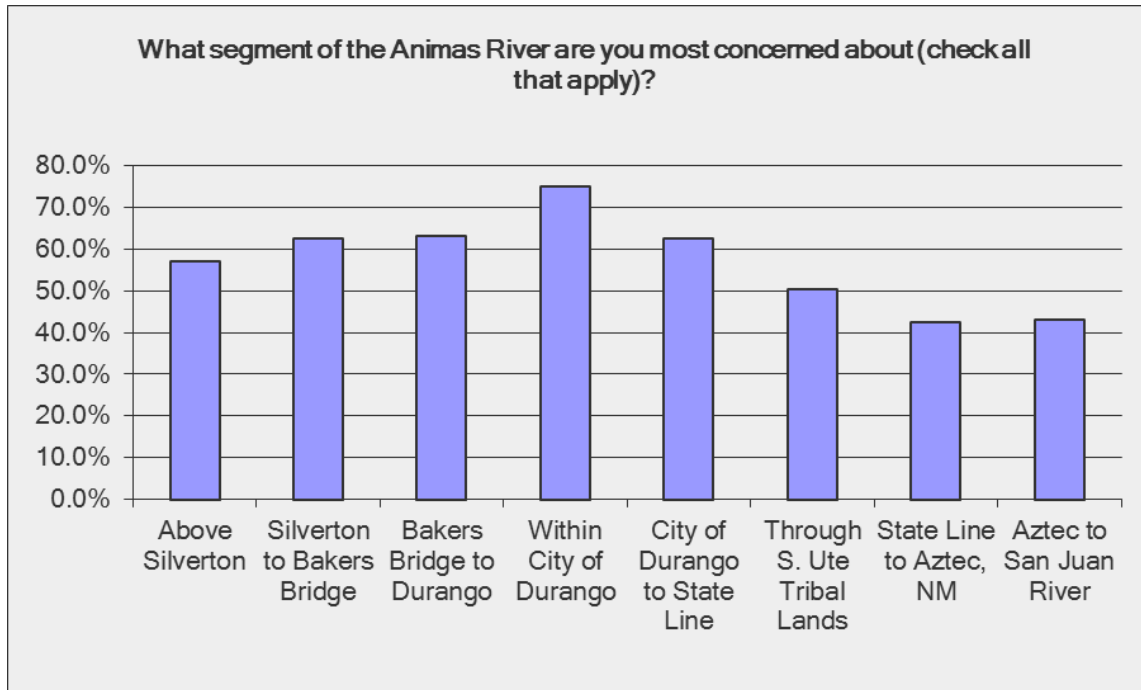
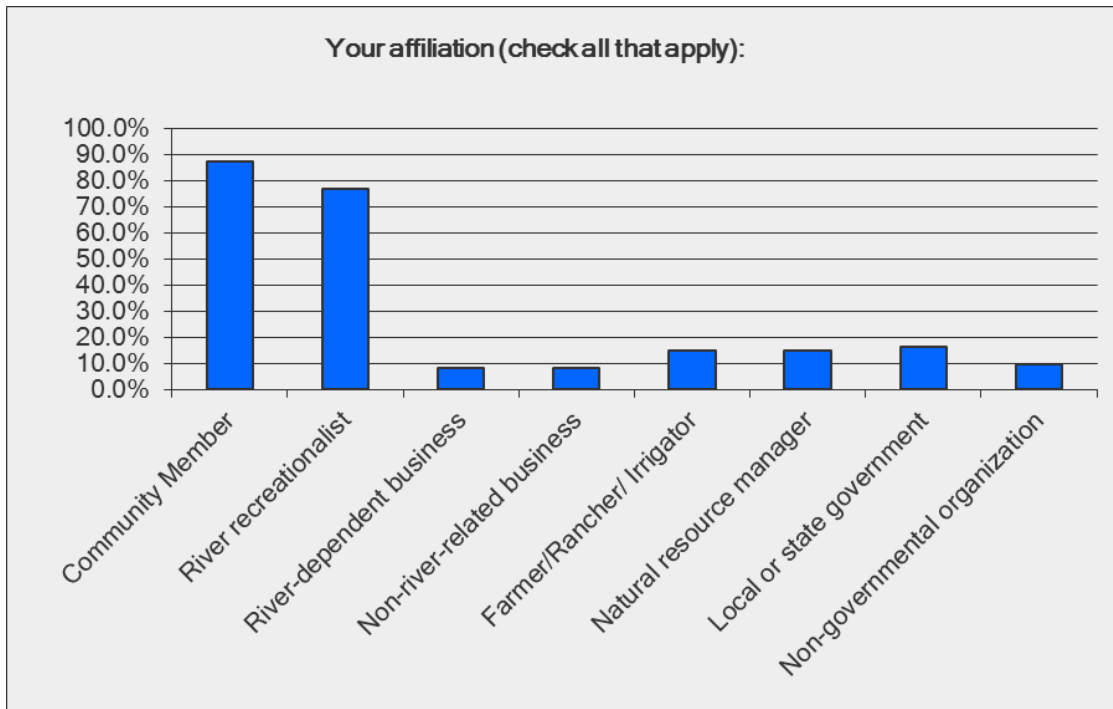


Figure 3. Responses to the question: Your affiliation (check all that apply). (94.7% response rate).



In response to the question “Your affiliation (check all that apply)”, 87% selected the Community Member category and 77% selected River Recreationist, likely reflecting the life roles of survey respondents (Figure 3). Other affiliation categories showed a 8-16% response rate, with lowest numbers for non-governmental organizations.

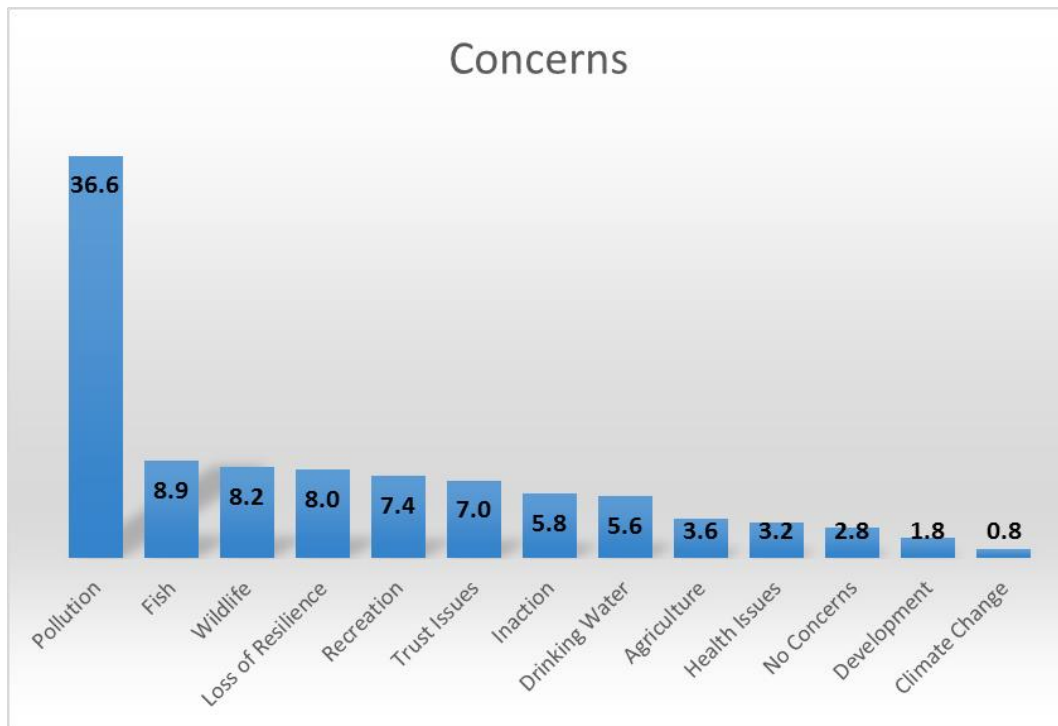
## **Monitoring Priorities**

The Gaps Analysis Team designed this survey to identify monitoring questions that address top river related concerns of community members. The top concern across all questions was pollution – from mining, sewage contamination (municipal, septic systems, and recreation), and agriculture – accounting for almost 37% of all expressed concerns. Other top concerns, all less than 10% of expressed concerns, included negative impact on fish populations, negative impact on wildlife, loss of system resilience, too much recreation, and issues of trust regarding honesty of water quality reporting and health assurances (Figure 4).

Pollution concerns were focused in the areas of mine contamination, both in the water and sediment. A number of comments suggested that water flow diluted the heavy metals in the water column, but exposure to the sediment through recreational activities or ingestion of foods from irrigated soils were a potential long-term threat to humans and other organisms. The second prominent pollution or contamination concern centered around sewage from municipal waste in Durango as well as sub-standard septic systems along the Animas waterway. Nutrient loading from agriculture was mentioned a number of times, but was not as high a concern.

With regard to the question on river health and resilience, responses were more often phrased as relationships between pollution (mining or human) and the aquatic system (aquatic life, fish, human consumption). Again, pollution, specifically from mining was cited as the largest concern regarding river health and resilience (51% of responses citing pollution). Respondents questioned whether the system was at a critical threshold as a resilient system or able to withstand much more abuse (mining and other human impact). Fully 95% of the respondents considered the system to be near its threshold for recovery or questioned whether the system was at this threshold. A final factor that emerged from this question was the need for action. Responses about the Animas River as “a resilient system – capable of recovering from human-induced pollution”, included the caveat that action needed to be taken to ensure continued river health. Several comments addressed the degradation of the channel and riparian zone as contributing factors in river resilience and health. This was echoed in responses regarding decreased flow due to increased agricultural and other human demands, as well as changing climate altering flows.

Figure 4. Concern categories across three questions relating to respondent concerns: public health concerns, river health and resilience concerns, and other concerns (question 4 in Appendix II). Numbers in each category are percent of all concerns coded.



A final theme regarding river health and resilience was the need for long-term monitoring of river health and the effects of mining and human pollution on human health through system interactions. This theme of ‘system interactions’ was not as prevalent in responses regarding public health or river status. Framing future river communications in terms of system dynamics provides an opportunity to reinforce systems thinking among a larger audience. Also prevalent in responses to river health and resilience were action words such as ‘protect’, ‘regulate’, and ‘clean-up’. The tone of these comments were ‘If we take action... then things will improve’. Respondents commented they wanted to understand the state of the river as a system in order to make informed decisions as to how to interact with the river, how to protect the river, and how to respond to communications about the river.

Trust issues are a significant part of indicators and concerns, and were often included in comments about pollution. Lack of trust was expressed as needing ‘honesty in reporting of conditions’, veracity of data reporting, and perceptions of mishandling of mine and sewage pollution incidents. Communication strategies have the potential to alleviate lack of trust. Phrases used by respondents that relate to trust include: responsibility, accountability, multiple messages, lay terms for understanding, and clear messaging. Respondents asked for cooperation and agreement between reporting sources: they want to know that sources are trustworthy and consistent. This would suggest that both monitoring and communication of results should be

presented as a cooperative effort of multiple trustworthy sources. There were also several comments regarding the San Juan Basin Health Department tip to river users that “It is always a good public health practice to wash with soap and water after exposure to untreated river water or sediment” ([sjbhd.org/public-health-news/animas-river-health-updates/frequently-asked-questions/](http://sjbhd.org/public-health-news/animas-river-health-updates/frequently-asked-questions/)). This message was perceived as ‘scary’ and confusing. Respondents wanted specifics as to how to wash adults, children, and dogs: after what degree of exposure, and what to do if water was ingested. Citizens want to “be able to make their own decisions for exposure” so communication needs to define “exposure” and what ‘safe’ means.

Impacts to fish were a strong concern. Fish were also prominent in monitoring responses and calls to action for river clean-up. Opinions ranged from fish perceived as a ‘canary in a coal mine’ indicator species to a general concern of anglers. Regardless, anglers are likely to be a strong voice as regards river issues.

This survey did not capture detailed suggestions as to the type of monitoring data that should be collected. Rather, responses reflect general monitoring data categories such as water chemistry, population surveys of fish and invertebrates, water quality monitoring, and flow monitoring. There was emphasis on timely and long-term data measurements. (neither specifically defined). Another theme regarding monitoring was that the data should be used as a basis for action or decisions regarding Animas River policies. This was described as “regulations in place”, “plans for cleanup” and other accountability factors. In other words, data should be used as a means for action implementation.



## Communication

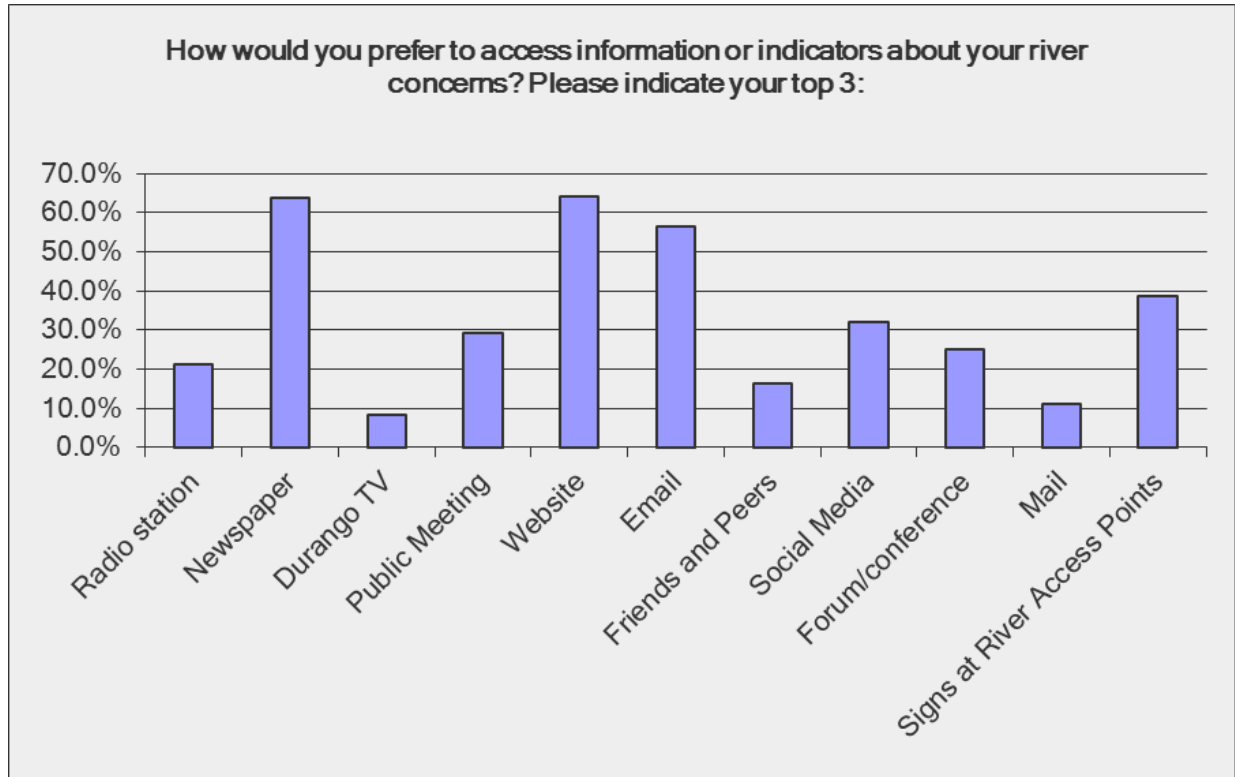
Effective communication in a participatory process involves mutual understanding, continued dialogue, and shared goals. Through this survey, we have a better idea of concerns and motivation of the people who responded. As we move forward with monitoring, careful consideration of who should be involved in collecting data, disseminating results, and sharing information is imperative. Based on responses to the question “Who should be involved in this conversation?”, the clear answer is to be as inclusive and transparent as possible. Responses defined stakeholders as regards the Animas River: government officials, ‘concerned’ individuals, businesses, all affected, - anyone with time. There was overwhelming consensus that inclusivity rather than exclusivity was to be the goal. People – at least the respondents to this survey - want to be involved in the process and not rely on government representatives to make decisions. Another way to interpret these data s as to who should be involved, is to assume is that responses highlighted those that they felt were not involved. Single groups specifically mentioned included government officials, citizens, and youth. Perhaps then, these are audiences that need to be targeted as the Animas River Community Forum moves forward. The few negative comments about involvement suggested that federal government officials, including EPA officials, were not to be trusted as participants moving forward. This is likely due to trust issues that emerged elsewhere in the survey, and should be kept in mind as stakeholder and action groups move forward. In all likelihood, their inclusion may facilitate trust building so long as federal stakeholders are not given greater power within the structure of stakeholder groups.

A substantial theme that emerged from the question regarding Animas River use concerned quality of life factors (28% of respondents cited quality of life factors in their responses). This theme acknowledged the Animas River as contributing to overall quality of life, aesthetic value, cultural value, heritage value, the natural environment, and the ability to enjoy the river on a daily basis by living and working near the river. Keep in mind that all other factors, including recreation, tourism livelihood, and the river as a water source all contribute to quality of life. In making decisions, groups often weigh economic or other factors, but quality of life brings commitment and passion to the table.

Based on responses to the question of preferred methods to access information or indicators about your river concerns, the most frequent responses were newspaper, websites, and email (Figure 5). Respondents mentioned multiple websites as access points, all giving similar information. This suggests an opportunity for a single group, such as the Animas River Community Forum, to serve as a clearinghouse linking to other, more focused information sources. As an example, a clearinghouse website might have shorter versions of updates on metal content, flow, water quality, and exposure responses, but provide links to other websites (USGS, Trout Unlimited, Tribal websites, Mountain Studies Institute, and San Juan Basin Health Department) for greater detail. Responses also mentioned the ability to comment on the veracity of the facts through a phone app or feedback mechanism within the website. This format might allow monitoring for reliability and transparency (where comments can be seen by all). Respondents expressed the desire to learn more through access to online information, and they also want to be heard.

What respondents want to know more about, emerged from the question “What information or data would help you evaluate your concerns?” Responses mirrored concerns, but specified that information be in the form of fact sheets on specific topics in understandable (i.e., lay terms), and accessible online or using mobile phone apps. The current Mountain Studies Institute fact sheets were mentioned as a desirable format.

Figure 5. Coded themes in response to the question regarding preferred types of communication methods (as a percentage of all coded responses). Because each person was instructed to choose their top 3 choices, percentages exceed 100%.



## **Recommendations:**

After review of the survey data, the Gaps Analysis Team identified monitoring and communication priorities to be used as the team moves forward in the process of forming a monitoring data collaboration that has the ability to generate relevant data and turn it into useful information for decision makers and the public.

### Monitoring Priorities:

1. Daily and weekly (described in responses as ‘real time’), quarterly, and yearly data should be gathered to serve various purposes. This might include data useful for river use (daily and weekly) such as metal loading, flow, water quality; river health (quarterly or yearly) factors such as invertebrate and fish populations; and agricultural use (quarterly) factors such as bacterial loading and metals present in soil samples.
2. Short term priority: Is the river safe? Monitoring efforts should facilitate addressing safety for river users in real time.
3. Long term priority: Is the river healthy? Monitoring efforts should address the overall health of the river regarding physical and biological parameters
4. Trends regarding river health. Monitoring efforts should address changes in the river over longer periods of time (e.g. decades). For example, how do water quality and biological indicators (fish, macro-invertebrates) now compare to data collected 10 or 20 years ago.
5. Quality of life questions should be addressed through monitoring.

Monitoring efforts provide the basis for decision making efforts and action regarding the river. As such, monitoring data will be used to identify stressors and sources of impact to the system.

### Communication Priorities:

1. Data Sharing: Cooperative data sharing should occur. For example, pH and metals loading at multiple locations should be available from a single web portal. This would involve efforts from groups reporting data in similar forms from multiple sites in the watershed.
2. Transparency: of monitoring methods, from multiple sources, providing reliable data, and communicated in easy to understand language, with feedback or question availability.
3. Accessibility: data should be accessible online and through the newspaper, and in language that is understandable regardless of level of expertise.
4. Usefulness: what do the data mean in terms of people’s use and enjoyment of the river? This ‘implementation’ factor is a critical piece of monitoring efforts.

Specifically, communication should use language that is understandable to the lay public, and that focuses on the river as a system. This eventually places the human population within the context of protection and responsible action and decisions. Messages issued by stakeholder and public health groups should address the five points of monitoring priorities, namely timely data, short-term, long-term, trends, and quality of life issues.

Responses requested weekly reports on metals and biologicals during the summer high-use season. There were requests for specific recommendations based on these reports as to how to wash children, dogs, and equipment. Respondents also requested quarterly updates on sewage, well-water tests, septic violations, and other measures that reflect overall river health or human health impacts. Yearly reports were requested on river fisheries and wildlife (fish, macroinvertebrates, dippers, etc.) with short reminders of how this fits into historical trends. Several respondents requested that reports regarding fish contamination and regulations for catch and release or other fishing use be widely publicized.

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Colorado Water Conservation Board  
Durango, CO

Respectfully submitted:

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July 29, 2016

## **APPENDIX I**

### **Animas River Community Forum Monitoring Gaps Analysis Team**

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Scott Roberts, Mountain Studies Institute

Heidi Stelzer, Fort Lewis College

## APPENDIX II

### Survey (as presented online)

Do you care about the Animas River? Want to help the river? Please take a few minutes and complete the survey <https://www.surveymonkey.com/r/AnimasRiverCommunity> to help us provide information that enables you to make informed, confident decisions about your use of the Animas River and its contributions to our quality of life.

Thank you for taking the time to help us help you and the Animas River!

The Animas River Community Forum, [www.animasrivercommunity.org](http://www.animasrivercommunity.org), is a diverse group of community members who recognize that there is a gap between information generated and information delivered about the health and condition of the Animas River. To better bridge the Animas River information gap, we need to understand your concerns.

All survey responses will be kept private. No identifiers linking you to this survey will be included in any information published or shared with others. A summary of the findings will be provided on the Forum's website [www.animasrivercommunity.org](http://www.animasrivercommunity.org) and will be used to develop a long-term data and information dissemination plan for the public. How do you use the Animas River in your *living* and *working* life?

Your experience *living* and *working* in the watershed is valuable, and we hope you will share it with us.

1. How do you use the Animas River in your *living* and *working* life?
  
2. What segment of the Animas River are you most concerned about (check all that apply)?  

<input type="checkbox"/> Above Silverton	<input type="checkbox"/> City of Durango to State Line
<input type="checkbox"/> Silverton to Bakers Bridge	<input type="checkbox"/> Through S. Ute Tribal Lands
<input type="checkbox"/> Bakers Bridge to Durango	<input type="checkbox"/> State Line to Aztec, NM
<input type="checkbox"/> Within City of Durango	<input type="checkbox"/> Aztec to San Juan River
  
3. How would you rate the health or resilience of the Animas River on a scale from 1-10 (where 10 is most healthy/resilient and 1 is least healthy/resilient)?

Why did you rate the river in this way?

What river qualities would indicate a rating of 10?

4. The following questions relate to your concerns about the Animas River in your *living* and *working* life:
  - a) What public health concerns do you have regarding the Animas River?

What information or data would help you to evaluate your concerns?

- b) What concerns do you have about the health or resilience of the Animas River as a natural system?

What information or data would help you to evaluate your concerns?

- c) What other concerns do you have about the Animas River?

What information or data would help you to evaluate your concerns?

5. How would you prefer to access information or indicators about your river concerns?

Please indicate *your top 3*:

- |  |   |
|--|---|
| <input type="checkbox"/> Radio (station _____) | <input type="checkbox"/> Social Media (facebook _____ |
| <input type="checkbox"/> Newspaper _____       | twitter____ other_____)                               |
| <input type="checkbox"/> Durango TV            | <input type="checkbox"/> Forum/conference             |
| <input type="checkbox"/> Public Meeting        | <input type="checkbox"/> Mail                         |
| <input type="checkbox"/> Website (_____)       | <input type="checkbox"/> Signs at River Access Points |
| <input type="checkbox"/> Email                 | <input type="checkbox"/> Other _____                  |
| <input type="checkbox"/> Friends and Peers     |   |
| <input type="checkbox"/> Newsletter _____      |   |

6. Who should be included in this conversation?

7. Your responses to the following questions will help us understand the community represented by this survey:

Gender: \_\_\_\_\_

Age: \_\_\_\_\_

What county do you live in?  San Juan Cty, CO  La Plata County  San Juan Cty, NM  
 Other

Your affiliation (check all that apply):

- |   |  |
|---|--|
| <input type="checkbox"/> Community Member _____           | <input type="checkbox"/> Farmer/Rancher/Irrigator_____       |
| <input type="checkbox"/> River recreationalist _____      | <input type="checkbox"/> Natural resource manager _____      |
| <input type="checkbox"/> River-dependent business _____   | <input type="checkbox"/> Local or state government _____     |
| <input type="checkbox"/> Non-river-related business _____ | <input type="checkbox"/> Non-governmental organization _____ |
|   | <input type="checkbox"/> Other (specify) _____               |

Thanks!

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The results of this survey will be summarized and available at the Animas River Community Forum website [www.animasrivercommunity.org](http://www.animasrivercommunity.org).

The Animas River Community Forum is represented by all sectors in the community (health, recreation, agriculture, environmental, etc.) and was formed to:

- \* Promote communication, coordination and collaborative action'
- \* Foster public confidence
- \* Support resiliency in our communities; and
- \* Enhance planning, improved public safety and health for the future all while honoring the institutional authorities and decision making of governmental and community organizations.

For more information regarding this survey, contact Monitoring Gaps Analysis Team coordinators:

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