

Establishment of Stream Gauge Oversight Work Group Montana Code Annotated 2019

TITLE 2. GOVERNMENT STRUCTURE AND ADMINISTRATION
CHAPTER 15. EXECUTIVE BRANCH OFFICERS AND AGENCIES
Part 33. Department of Natural Resources and Conservation

Drought And Water Supply Advisory Committee -- **Stream Gauge Oversight Work Group**

2-15-3308. *(Temporary)* **Drought and water supply advisory committee -- stream gauge oversight work group.** (1) There is a drought and water supply advisory committee in the department of natural resources and conservation.

(2) The drought and water supply advisory committee is chaired by a representative of the governor and consists of representatives of the departments of natural resources and conservation; agriculture; commerce; fish, wildlife, and parks; military affairs; environmental quality; and livestock. The governor's representative must be appointed by the governor, and the representative of each department must be appointed by the head of that department. Additional, nonvoting members who represent federal and local government agencies and public and private interests affected by drought, flooding, or water supply may also be appointed by the governor.

(3) The drought and water supply advisory committee shall:

(a) with the approval of the governor, develop and implement a state plan that considers drought and flooding, mitigation, and response;

(b) review and report drought and water supply monitoring information to the public;

(c) coordinate timely drought and flooding impact assessments and maintain regular communication with the United States drought monitor, the national drought mitigation center, the division of disaster and emergency services, the national weather service, and other appropriate local, state, tribal, and federal partners;

(d) identify areas of the state with a high probability of drought or flooding and target reporting and assistance efforts to those areas in coordination with local, state, tribal, and federal agencies;

(e) upon request, assist in organizing local advisory committees for the areas identified under subsection (3)(d);

(f) request state agency staff to provide technical assistance to local advisory committees;

(g) promote ideas and activities for groups and individuals to consider that may reduce vulnerability to drought or flooding and improve seasonal forecasting of water supply; and

(h) select members of the committee to serve on a stream gauge oversight work group.

(4) The drought and water supply advisory committee shall meet, at a minimum, on or around October 15 and March 15 of each year to assess moisture conditions and forecasts and, as appropriate, begin preparations for drought or flood mitigation.

(5) By April 15 of each year, the drought and water supply advisory committee shall submit a report to the governor's office that, to the extent possible, describes the potential for drought or flooding in the coming year, describes the current water supply conditions of the state, taking into consideration winter precipitation, and provides an assessment of the cumulative water supply status.

(6) By July 1 of each year, the drought and water supply advisory committee shall submit a report to the governor's office evaluating the potential for drought for the remainder of the calendar year. If the report identifies a potential for drought that is likely to cause adverse impacts to human health and safety, environmental quality, or both, the committee shall notify the division of disaster and emergency services and county commissioners, tribal governments, conservation districts, and local watershed groups in the geographic location potentially impacted by drought and the types of impacts likely to occur.

(7) (a) The stream gauge oversight work group shall meet at least semiannually to review:

(i) locations, uses, and funding arrangements for the stream gauge network of the U.S. geological survey; and

(ii) priorities, needs, and expectations of those funding the maintenance and operations of these stream gauges and those using data measured by these stream gauges.

(b) The work group shall create annually a stream gauge infrastructure work plan, which may include:

(i) a comprehensive overview of the existing stream gauge network;

(ii) a review of options for funding the maintenance and operations of the stream gauge network, including use of private funds, consolidated agreements, or multipayer payments;

(iii) a proposal for stream gauge priorities;

(iv) cost-effective and reasonable alternatives to stream gauges, including gauges that are not part of the U.S. geological survey's stream gauge network, if applicable;

(v) oversight of recommendations and activities related to any legislative study of stream gauges; and

(vi) coordination of information regarding stream gauge funding recommendations and requests from state and federal agencies.

(c) The work group shall report to the water policy interim committee established in **5-5-231**.

(8) Nothing in this section is intended to remove or interfere with the duties and responsibilities of the governor or the division of disaster and emergency services for disaster coordination and emergency response, as provided in Title 10, chapter 3, part 1. The duties and responsibilities of the drought and water supply advisory committee supplement and are consistent with those of the division of disaster and emergency services for drought or flood planning, preparation, coordination, and mitigation. (*Terminates June 30, 2023--sec. 7, Ch. 298, L. 2019.*)

2-15-3308. (*Effective July 1, 2023*) **Drought and water supply advisory committee.** (1) There is a drought and water supply advisory committee in the department of natural resources and conservation.

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(d) identify areas of the state with a high probability of drought or flooding and target reporting and assistance efforts to those areas in coordination with local, state, tribal, and federal agencies;

(e) upon request, assist in organizing local advisory committees for the areas identified under subsection (3)(d);

(f) request state agency staff to provide technical assistance to local advisory committees; and

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(7) Nothing in this section is intended to remove or interfere with the duties and responsibilities of the governor or the division of disaster and emergency services for disaster coordination and emergency response, as provided in Title 10, chapter 3, part 1. The duties and responsibilities of the drought and water supply advisory committee supplement and are consistent with those of the division of disaster and emergency services for drought or flood planning, preparation, coordination, and mitigation.

History: En. Sec. 1, Ch. 209, L. 1991; amd. Sec. 19, Ch. 418, L. 1995; amd. Sec. 1, Ch. 17, L. 1999; amd. Sec. 1, Ch. 84, L. 2013; amd. Sec. 1, Ch. 81, L. 2019; amd. Sec. 3, Ch. 298, L. 2019.

TITLE 85. WATER USE
CHAPTER 2. SURFACE WATER AND GROUND WATER
Part 1. General Provisions

Policy Considerations

85-2-154. (Temporary) Policy considerations. (1) Article IX, section 3(3), of the Montana constitution declares that all surface, underground, flood, and atmospheric waters within the boundaries of the state are the property of the state for the use of its people and are subject to appropriation for beneficial uses as provided by law.

(2) The legal appropriation of water requires that the water be legally and physically available for appropriation.

(3) Measurement and monitoring of streamflow supports the state's ability to determine when water is physically and legally available to meet new demands while protecting existing water rights.

(4) The effective management and distribution of water depends on accurate real-time measurement of streamflow. (*Terminates June 30, 2023--sec. 7, Ch. 298, L. 2019.*)

History: En. Sec. 1, Ch. 298, L. 2019.

Intent

85-2-155. (Temporary) Intent. (1) The 2015 state water plan recognizes that improving Montana's water supply and distribution monitoring network will improve the ability of water managers and water users to adjust to seasonal supply and demand imbalances as well as plan for longer term imbalances associated with climate variability.

(2) It is the intent of the legislature to support local, state, and federal efforts and programs to collect and distribute timely and accurate information on Montana streamflows.

(3) The legislature recognizes that streamflow information is collected by numerous state and federal agencies and tribes to meet their statutory responsibilities.

(4) The legislature recognizes that streamflow information collected by state, tribal, and federal entities is critical to administration of the Montana Water Use Act, distribution of water by decree, water supply planning for municipalities, and implementation of plans and agreements that address locally developed drought, fish habitat, or water supply objectives.

(5) The legislature recognizes it is in the public interest to support and encourage coordination in the collection and distribution of streamflow information. (*Terminates June 30, 2023--sec. 7, Ch. 298, L. 2019.*)

History: En. Sec. 2, Ch. 298, L. 2019.

Appendix B

State of Montana and U.S. Geological Survey Stream Gage Notification Plan Approved May 19, 2022

Background

This plan lays out the steps and processes the U.S. Geological Survey Wyoming-Montana Water Science Center (USGS) and the state of Montana will take to ensure the timely exchange of information regarding funding or program changes with the potential to impact the ongoing operation of the USGS stream gage network positively, or negatively in Montana. The end goal is minimizing network disruptions by exchanging information far enough in advance that it can be acted on.

State of Montana interests in participating in this plan.

- The 2015 State Water Plan recognizes that improving Montana's water supply and distribution monitoring network will improve the ability of water managers and water users to adjust to seasonal supply and demand imbalances as well as plan for longer term imbalances associated with climate variability.
- Streamflow information collected by the USGS is critical to administration of the Montana Water Use Act, distribution of water by decree, water supply planning for municipalities, flood forecasting, and implementation of plans and agreements that address locally developed drought, fish habitat, or water supply objectives.
- It is in the public interest to support and encourage coordination in the collection and distribution of streamflow information.

USGS interests in participating in this plan.

- Greater efficiency in communicating network changes to a broader cross-section of stakeholders.
- Discovering previously unknown stakeholders and how best to communicate with them.
- Capitalizing on communications to educate more stakeholders on all aspects of USGS monitoring.

Implementation of this plan is voluntary. It does not commit either party to expend time, funding, or other resources beyond that needed to coordinate in good faith. This plan does not limit or constrain either the USGS's or state of Montana's ability to coordinate and exchange information with their respective stakeholders.

Intent of Notification

Funding for the operation and maintenance (O&M) of the USGS stream gage network is provided by federal, state, tribal, private, and local partners. The primary concern for the state of Montana and Montana stakeholders is the termination of a stream gage due to lack of partner funding or change in a partner's stream monitoring priorities. Early notification of the potential for USGS to cease operation of a stream gage allows the state of Montana and interested stakeholders to assess possible impacts and develop alternative plans. While the burden is on USGS to find O&M funding, it is in the State's and Montana stakeholder's interest to maintain a stable stream gage network. Early notification opens the possibility for the State to work with impacted stakeholders and USGS to secure O&M funding.

Method of Notification

- Representatives from the state of Montana's Stream Gage Oversight Work Group (Work Group), USGS, Tribal water resource agencies, and Montana stakeholder groups will meet semiannually to review funding status and foreseeable potential changes to the ongoing operation of the USGS stream gage network in Montana.
- Between semiannual meetings, the USGS will notify the Stream Gage Oversight Work Group's Point of Contact (PoC) of any developments with the potential to disrupt the collection of stream flow information. Method of notification will be by phone call, video conference, and/or email.
- The notification will include USGS stream gage identification number, location, and period of record, anticipated change, and the expected date of change. Multiple gages may be included in one notification.
- The Work Group's PoC will pass the notification on to interested state and tribal agencies and the PoC's for interested stakeholder groups. See Figure 1.
- Notification to interested state and tribal agencies and stakeholder groups will be by email formatted as shown in Figure 2.

Steps After Notification

- Since not every notification will require an immediate response, the Work Group's PoC will monitor ongoing developments through communication of with USGS. The Work Group's PoC will provide updates to interested state and tribal agencies, and the PoC's for interested stakeholder groups.
- It is up to each state and tribal agency, and stakeholder group to determine potential impacts to their interests and management objectives.

- When loss of a stream gage will impact the interests and management objectives of the State of Montana, Tribal Nation, or stakeholder group, the State will attempt to work with impacted stakeholders and USGS to secure O&M funding.
- The Work Group’s PoC will continue to monitor developments and notify interested state and tribal agencies, and the PoC’s for interested stakeholder groups of the final resolution.

Figure 1. Notification Flow Diagram

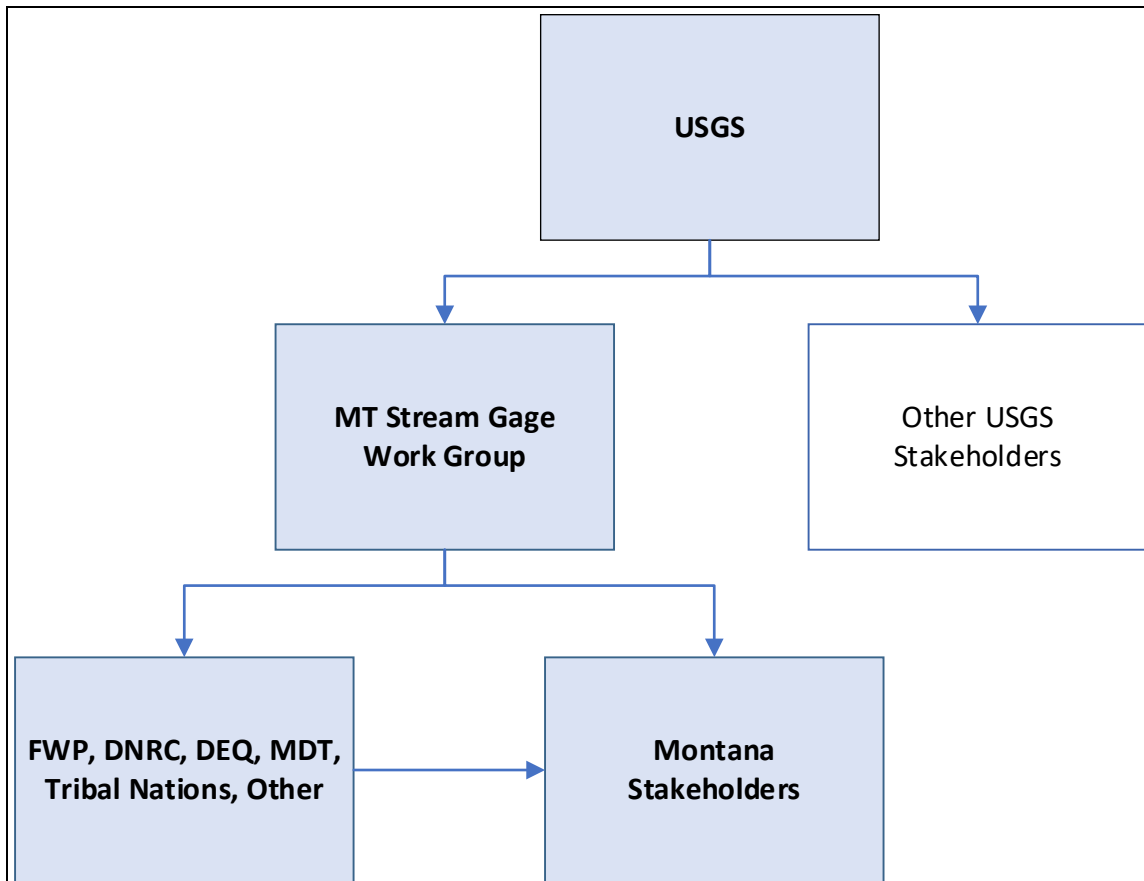


Figure 2. Example of Email Notification

You are receiving this email because you have expressed an interest in being notified of potential changes to the U.S. Geological Survey Stream Gage Monitoring Network in Montana.

In accordance with the USGS & State of Montana Stream Gage Notification Plan, USGS has notified the Department of Natural Resources and Conservation and Fish Wildlife & Parks of the potential loss of USGS Gage [enter gage # and name].

Date of Notice: [enter date]

Gage #: [enter gage #]

Gage Name: [enter gage name]

Years of Record: [enter years]

Location Map: [enter link to map]

Anticipated Change: [enter information]

Expected Date of Change: [enter date]

O&M Funding Provided by: [enter funding source]

Contact: [enter contact information]

Additional Information: [enter additional clarify information if available]

Actions Taken

-

Please share this information with other interested parties

Send an email to [enter point contact]

- If you are no longer interested in receiving notifications **OR**
- If you would like to be included in future notifications.

Appendix C

Drought and Water Supply Committee

Stream Gage Oversight Work Group

Terms of Reference

Approved February 21, 2020

Terms of reference define the purpose and structures of a project, committee, meeting, negotiation, or any similar collection of people who have agreed to work together to accomplish a shared goal.

Source: https://en.wikipedia.org/wiki/Terms_of_reference

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1. Introduction

Access to accurate, publicly available, real-time stream flow information supports decision making by water managers, water users, recreationists and the public as they adjust to seasonal supply and demand imbalances. Local governments, state, tribal and federal agencies also rely on stream flow information for emergency planning and notification as well as longer-term water supply planning. The primary source of this information in Montana is a network of approximately 232 stream gages operated by the U.S. Geological Survey (USGS). and financially supported by an array of federal, state, tribal, local, and private funding sources.

The Stream Gage Oversight Work Group was created in 2019 by the 66th Montana Legislature in response to stakeholders' concerns over the shutdown of 10 USGS stream gages due to a lack of funding to support operation and maintenance (O&M). The loss of these gages came with little warning to the water user communities who depended on them for monitoring and cooperatively managing local water resource plans. The event revealed that as demand for water continues to grow, the continuity of Montana's stream gaging network is threatened by declining funding support. It also highlighted the disconnect between those entities that operate and/or fund the system and those entities or individuals who rely on it daily for real-time stream information, local planning and response.

2. Term

This Terms of Reference is intended to guide the work of the Stream Gage Oversight Work Group up through the delivery of the first stream gage infrastructure work plan.

3. Purpose

The purpose of the Work Group is to engage with stakeholders in a review of the USGS stream gage network in Montana and develop recommendations to minimize the vulnerability of the network to disruptions in O&M funding.

4. Scope

The scope of the Work Group's efforts is defined by its founding legislation (§ 2-15-3308, MCA). The following items are within the scope Work Group activities:

1. Reviewing the locations, uses, and funding arrangements for the stream gage network of the U.S. Geological Survey;
2. Reviewing the priorities, needs, and expectations of those funding the maintenance and operations of these stream gages and those using data measured by these stream gages;
3. Creating a stream gage infrastructure work plan;
4. Reviewing options for funding the maintenance and operations of the stream gage network, including use of private funds, consolidated agreements, or multipayer payments;
5. Developing a proposal for stream gage priorities;
6. Reviewing cost-effective and reasonable alternatives to stream gages, including gages that are not part of the USGS' survey's stream gage network, if applicable;

7. Oversight of recommendations and activities related to any legislative study of stream gages; and
8. Coordination of information regarding stream gage funding recommendations and requests from state and federal agencies.

Out of Scope

While the State’s snowpack (SNOTEL) and soil moisture monitoring networks are important to understanding state-wide moisture conditions, these networks are beyond the scope of the Work Group’s current efforts. Flow monitoring devices placed at head gates or within ditches and canals are also beyond the scope of this effort.

5. Membership

Stream Gage Work Group members represent the seven state agencies that are voting members of the Drought and Water Supply Advisory Committee (§2-15-3308, MCA).

Representing	Name
Dept of Natural Resources and Conservation	Paul Azevedo – Co-Chair
Dept of Fish Wildlife & Parks	Stephen Begley – Co-Chair
Dept of Livestock	Mike Honeycutt
Dept of Agriculture	Jon Peterson
Dept of Emergency Services/Military Affairs	Andrew Long
Dept of Commerce	Wayne Johnston
Dept of Environmental Quality	Darin Kron

Additional Participants

There are other individuals and organizations that are necessary to either support the Work Group or that must be communicated with and made aware of it. They include technical support personnel, direct stakeholders, and those who will receive communication notices.

Participant Type	Individual or Organization
Technical Support	<ul style="list-style-type: none"> • Dept of Natural Resources • US Geological Survey – WY-MT Science Center • MT Bureau of Mines and Geology
Direct Stakeholders	<ul style="list-style-type: none"> • Conservation Districts • MT Watershed Coordination Council and other Watershed Groups who have expressed interest • Tribal governments • Conservation Groups, Irrigator Groups, Water Commissioners • Recreation, fishing and guiding interests • Municipalities,

	<ul style="list-style-type: none"> • Current funders of USGS stream gages, including: Northwest Energy, BPA, Energy Keepers, Avista Corp, Talen Energy, East Bench ID, tribal groups, other state and federal agencies.
Communication Notice	<ul style="list-style-type: none"> • Drought and Water Supply Advisory Committee • Water Policy Interim Committee • Leadership of Departments represented on the Work Group

6. Procedures, Responsibilities and Expectations

Quorum

All meetings must have a quorum of participants to proceed. A quorum is a minimum of four (4) members present.

Procedures for Finding Agreement

The Stream Gage Oversight Work Group will seek consensus on all decisions and recommendations. When participants disagree with a recommendation, proposal, or action they should articulate their concern to the larger group and provide a constructive alternative(s) that seeks to accommodate the interests of all participants.

The Stream Gage Oversight Work Group will continue with this procedure until consensus is achieved or the group decides to disagree.

Procedures in the Event of Not Reaching Consensus

If the Stream Gage Oversight Work Group has tried in good faith but is unable to reach consensus, and wants to move forward on the recommendation, proposal, or action at hand, they may use the following fallback mechanisms:

- Define the issue (issue: a subject of discussion, negotiation or problem solving – the what, the problem to be solved)
- Identify interests (interest: one party’s concerns, needs or desires underlying the issue – why the issue is being raised [interests may be mutual or separate]. This is the motivation to solve the problem.)
- Brainstorm options for moving ahead (option: potential – often partial – solutions to meet one or more interests – how the problem might be solved)
- Identify standards (standard: agreed upon qualities of an acceptable solution – that is – how well an option solves the problem)
- Evaluate options
- Choose an option

If the Work Group is unable to reach agreement on an issue, further follow-up may be assigned to a task group. The task group will attempt to develop additional proposals or actions to resolve the issue and report its recommendations to the Work Group.

When appropriate, external resources may be engaged to provide an independent opinion.

If none of the above helps the Work Group make progress, the members will seek further direction from the Drought and Water Supply Advisory Committee.

Responsibilities

Members are expected to:

- Attend and participate in all meetings.
- Review relevant information and be prepared to fully participate in meetings.
- Seek areas of agreement and uphold agreements that are reached.
- Explore all options and make recommendations.
- Seek the advice of their constituency throughout the process.
- Make every effort to represent and speak for their constituency.
- Keep their respective hierarchy of decision-makers informed on progress and seek direction as required to support upcoming decisions and recommendations.

Expectations

All participants are encouraged to contribute openly and professionally to discussions, share relevant information regarding the issues under consideration, and to support a transparent and collaborative process.

7. Oversight and Reporting

The Work Group is a subcommittee of the Drought and Water Supply Advisory Committee. The Work Group will report to both the Drought and Water Supply Committee and the Water Policy Interim Committee.

8. Budget

The budget for this initiative falls within the operational budget of each agency represented on the Work Group.

9. Updates and Amendments

This Terms of Reference can be updated and amended by consensus of Work Group members.

Appendix D

Comparison of “Traditional” Stream Monitoring Methods

Monitoring Method	Information Generated	Typical Uses	Required Infrastructure	Cost
Continuous Discharge AKA – Stream gage or streamflow-gaging station	Continuous record of discharge (streamflow) and stage (gage height).	<ul style="list-style-type: none"> • Planning, forecasting, and warning about floods and droughts • Administration of water rights • Water distribution by Water Commissioners • Determining if stream/rivers are safe for recreational activities. • Regulating pollutant discharges 	<ul style="list-style-type: none"> • Instrumentation <ul style="list-style-type: none"> ○ Stage sensor ○ Data logger (recorder) ○ Telemetry to transmit data in real-time • Discharge measuring infrastructure such as a bridge or cableway for non-wadable streams 	<p>O&M - \$17,000 - \$19,000 per site per year.</p> <p>Installation - \$7,800 average but vary widely based on accessibility.</p>
Continuous Stage AKA – Stage-only station	Continuous stage (gage height)	<ul style="list-style-type: none"> • Planning, forecasting, and warning about floods and droughts 	<ul style="list-style-type: none"> • Instrumentation <ul style="list-style-type: none"> ○ Stage sensor ○ Data logger (recorder) ○ Telemetry to transmit data in real-time 	O&M - \$5,000 - \$6,000 per site per year.
Annual Maximum Discharge AKA – Crest-stage gage	Annual max discharge (stream flow)	<ul style="list-style-type: none"> • Annual maximum discharge over a period of time to estimate flood frequency. 	<ul style="list-style-type: none"> • Crest-stage gage 	<ul style="list-style-type: none"> • O&M - \$1,500 - \$2,000 per site, per year. Varies depending on site conditions and number of measurements per year.
Discharge Rating Only AKA Staff-gage, rating only site.	<ul style="list-style-type: none"> • Stage-discharge relationship (rating curve) 	<ul style="list-style-type: none"> • Determining stream flow from periodic observations. 	<ul style="list-style-type: none"> • Staff gage. 	<ul style="list-style-type: none"> • O&M - \$1,500 - \$2,000 per site, per year. Varies depending on site conditions and number of measurements per year.
Periodic Discharge Measurements	Discrete discharge (stream flow) measurements	<ul style="list-style-type: none"> • Periodic stream flow 	<ul style="list-style-type: none"> • None • Exception – Discharge measuring infrastructure if stream flows are non-wadable. 	<ul style="list-style-type: none"> • Varies depending on site conditions and number of measurements per year.

Appendix D

Comparison of “Alternative” Stream Monitoring Methods

Monitoring Method	How it works	Comments	Cost
Large-Scale Particle-Image Velocimetry (LSPIV)	<ul style="list-style-type: none"> • Uses video to capture particles on the surface of stream. • Surface velocity is calculated based on the time it takes for particles to flow pass 4 known points in the video frame. • Discharge (volume/time) can be estimated if you know the relationship between channel discharge and surface velocity i.e. Velocity-Discharge curve. 	<ul style="list-style-type: none"> • WY-MT USGS office is testing this method in several locations. • Results seem to provide a reliable <u>estimate</u> of discharge. • Must maintain viability of Velocity-Discharge curve by taking periodic discharge measurements. • Currently cannot monitor surface velocity on a continuous basis because the video files are too large to transmit in real-time. • Method does not work at night. 	Difficult to estimate right now because technology is still being developed and method is not widely used.
Pulsed radar	<ul style="list-style-type: none"> • Surface velocity is measured with a device very similar to a radar speed gun. • Discharge (volume/time) can be estimated if you know the relationship between channel discharge and surface velocity i.e. Velocity-Discharge curve. 	<ul style="list-style-type: none"> • WY-MT USGS office has not tested this method. • Can monitor surface velocity on continual basis because data files (surface velocity) are small enough to transmit in real-time. 	Difficult to estimate right now because technology is still being developed.
Statistical Models	<ul style="list-style-type: none"> • Estimates of stream flow characteristics are based on statistical correlation between observed basin or environmental characteristics. 	<ul style="list-style-type: none"> • Model accuracy depends on ability to correctly identify the underlying correlation. • Allows you to develop an estimate of discharge at locations where you do not have any monitoring data. • Estimates may be off by 50% - 100%. This may be perfectly acceptable to meet data objectives. 	Cost is entirely dependent on the scope of the modeling effort.
Deterministic Models	<ul style="list-style-type: none"> • Estimates of stream flow characteristics are based on known hydrologic and hydraulic process. 	<ul style="list-style-type: none"> • Model accuracy depends on ability to correctly identify the underlying hydrologic process. • Allows you to develop an estimate of discharge at locations where you do not have any monitoring data. • Estimates may be off by 50% - 100%. This may be perfectly acceptable to meet data objectives. 	Cost is entirely dependent on the scope of the modeling effort.

Appendix E
Survey of federal, state and tribal agencies contributing
operation and maintenance funding to the USGS network in Montana

Survey of federal agencies contributing operation and maintenance funding to the USGS network in Montana

The Stream Gage Oversight Work Group collaborated with the USGS WY-MT Science Center to conduct a survey of federal agencies contributing O&M funding to the USGS network in Montana. In addition to providing contact information, the USGS notified each agency in advance encouraging them to respond to the Work Group survey. Six of the nine agencies contacted responded to the Work Group's survey.

Federal agencies contacted:

1. US Fish and Wildlife Service - Mountain-Prairie Region, Denver
2. US Bureau of Reclamation – Columbia-Pacific NW Region, Seattle
3. US Bureau of Reclamation – Montana Area Office, Missouri Basin Region, Billings
4. US Army Corps of Engineers – Seattle District
5. US Army Corps of Engineers – Omaha District
6. US Environmental Protection Agency
7. National Park Service, Yellowstone National Park
8. Bonneville Power Administration
9. International Joint Commission

Example email

My name is Paul Azevedo with the Montana Department of Natural Resources and Conservation (DNRC). This email is a follow-up to Brian Loving's (USGS WY-MT Science Center) email of February 1st.

On behalf of the Montana Stream Gage Oversight Work Group, DNRC is gathering information on the USGS real-time stream gage network in Montana. As a provider of funding to the USGS network, the USFWS plays a key role in keeping the network operational across our state.

Background

The Stream Gage Oversight Work Group was created in 2019 by the 66th Montana Legislature in response to stakeholders' concerns over the shutdown of 10 USGS stream gages due to a lack of funding to support operation and maintenance. The Work Group is to report back to the Legislature with recommendations on steps the State can take to support the USGS stream gage network in Montana.

Information Request

There are numerous reasons why government agencies contribute funding to the USGS network. One of the Working Group's knowledge gaps concerns the priorities, needs, and expectations of the federal agencies who support USGS stream gages in Montana.

We would like to close that knowledge gap, so our report to the Montana Legislature accurately reflects why USFWS believes it is important to fund USGS gages in Montana. You can assist us by responding to the 3 questions below.

According to the information Brian shared with me, USFWS Denver Office funds the following two USGS gages.

	Station No	Site Name	Record
1	06006000	Red Rock Cr ab Lakes nr Lakeview MT	Discharge
2	06166000	Beaver Cr bl Guston Coulee nr Saco MT	Discharge

1. What are USFWS's primary management objectives for funding these two USGS gages in Montana?
2. Does USFWS rely on information generated from USGS gages other than the two listed above? Please identify the station number and location of these other gages.
3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

Your response by Thursday February 10th will be greatly appreciated.

Thank you for your cooperation.

Responses

US Fish and Wildlife Service Mountain-Prairie Region, Denver

USGS gages in Montana funded by the USFWS Denver Office.

	Station No	Site Name	Record
1	06006000	Red Rock Cr ab Lakes nr Lakeview MT	Discharge
2	06166000	Beaver Cr bl Guston Coulee nr Saco MT	Discharge

Responses provided by:

- Carrie Cordova, Water Rights Specialist, Denver
- Kyle Cutting, Red Rock Lakes NWR
- Jaron Andrews, Hydrologist, Denver

1. What are USFWS’s primary management objectives for funding these two USGS gages in Montana?

A: USFWS funds the 2 gages to adhere to conditions in the Federal Reserved Water Right Compacts for Red Rock Lakes and Bowdoin National Wildlife Refuges.

2. Does USFWS rely on information generated from USGS gages other than the two listed above? Please identify the station number and location of these other gages.

	Gage	Reason
1	Red Rock Creek gauging station (06006000).	Red Rock Lakes NWR relies on information from the Red Rock Creek gauging station (06006000). Another historic USGS gauging station located on Odell Creek (also on Red Rock Lakes NWR) was discontinued. The Odell Creek (443533111471601) station would allow us to better manage water resources if this was in operation.
2	Gage No. 06183450 – Big Muddy Creek near Antelope MT (discharge)	Medicine Lake National Wildlife Refuge and the Fort Peck Tribes entered into an agreement and the parties rely on Gage No. 06183450 – Big Muddy Creek near Antelope MT (discharge) to determine releases that USFWS agreed to make from Big Muddy Creek. The Agreement is associated with Adjudication Case Nos. 40R-6, 40R-7, 40R-8 and 40R-141
3	<i>Site Number: 06130500, Site Name: Musselshell River at Mosby MT</i>	The 2015 Charles M. Russell National Wildlife Refuge (NWR) Water Rights Compact specifies a 70 cfs instream flow right from March 1 to June 30 and I believe this is the closest gage to measure the instream flow)
4	<i>Site Number: 12370000, Site Name: 'Swan River near Bigfork, MT</i>	(General situational awareness regarding the discharge rates - the Swan River 5NWR is located upstream and the river runs through the Refuge.)
5	<i>Site Number: 06155500, Site Name: Milk River at Malta MT</i>	(Water Management and water rights associated with the Bowdoin NWR)

	Gage	Reason
6	<i>Site Number: 06166000, Site Name: Beaver Cr bl Guston Coulee nr Saco MT</i>	Water Management and water rights associated with the Bowdoin NWR and 2014 Water Rights Compact)
7	<i>Site Number: 06088500, Site Name: Muddy Creek at Vaughn MT</i>	Water management and water rights associated with the Benton Lake NWR and the ability of others to divert water)

3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial
- A: I communicated with USFWS Montana project leaders and for the most part the answer is no. There is a non-functioning gage on Willow Creek near Lake Mason National Wildlife Refuge; however, refuge and USFWS Water Resources Division staff have installed our own monitoring equipment to satisfy a Stipulation with the Lake Mason Grazing Association, and Anita and Loren P. Rech Trust. The Stipulation is associated with Adjudication Case Nos. 40C-54, 40C-7 and 40C-9.
 - A: I advocate for the reinstalment of the Odell Creek gauging station (443533111471601). This would allow us to better manage both the water and fishery resources including the arctic grayling.
 - A: *Mill Creek near Creston National Fish Hatchery* - the DNRC currently has a gage at this site: [https://gis.dnrc.mt.gov/apps/stage/gage-report/location/6b67bcd1b83043d5bea8e8fac0815294\[gcc02.safelinks.protection.outlook.com\]](https://gis.dnrc.mt.gov/apps/stage/gage-report/location/6b67bcd1b83043d5bea8e8fac0815294[gcc02.safelinks.protection.outlook.com]) but I am unsure of future operation plans. (This site measures the total spring discharge into Jessup Mill Pond (minus Hatchery well inputs) and is an important indicator of total spring discharge.

US Bureau of Reclamation – Columbia-Pacific Northwest Region, Seattle

USGS gages in Montana funded by the USBR CPNW, Seattle.

	Station No	Site Name	Record
1	12359800	S F Flathead R ab Twin C nr Hungry Horse MT	Discharge
2	12362500	S F Flathead River nr Columbia Falls MT	Discharge

Response provided by Joel Fenolio, Water Management - Operations Team Supervisor

1. What is USBR’s primary management objectives for funding these two gages in Montana?

The S F Flathead R ab Twin C nr Hungry Horse MT gage is a key indicator for Hungry Horse Dam and Reservoir’s inflow and used for operations of the Dam.

The S F Flathead River nr Columbia Falls MT is used to measure the discharge from Hungry Horse Dam and is used for real time operations as well as for developing water supply forecasts that inform both fisheries and flood risk operations for the Dam. This is a very important gage for the operation of the dam.

2. Does USBR rely on information generated from USGS gages other than the two listed above? Please identify the station number and location of these other gages.

Yes we rely on the following gages:

	Station No	Site Name
1	12355000	Flathead River at Flathead British Columbia
2	12355500	N F Flathead River nr Columbia Falls MT
3	12358500	M F Flathead River near West Glacier MT
4	12355000	Flathead River at Flathead British Columbia
5	12363000	Flathead River at Columbia Falls MT
6	12363500	Flathead River near Kalispell, MT
7	12365700	Stillwater River at Lawrence Park, at Kalispell
8	12366000	Whitefish River near Kalispell MT
9	12370000	Swan River near Bigfork, MT
10	12372000	Flathead River near Polson MT
11	12388700	Flathead River at Perma MT
12	12389000	Clark Fork near Plains MT
13	12389500	Thompson River near Thompson Falls MT
14	12344000	Bitterroot River near Darby MT
15	12350250	Bitterroot River at Bell Crossing nr Victor MT
16	12352500	Bitterroot River near Missoula MT

I'll probably come up with 10 more in the next few days and email you them if I think of any more.

3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.
I cannot think of any data gaps at the moment.

US Bureau of Reclamation – MT Area Office, Billings

USGS gages funded by the USBR MATO

	Station No	Site Name	Record
1	05018000	St. Mary Canal at intake near Babb MT	Discharge
2	06012500	Red Rock R bl Lima Reservoir nr Monida MT	Discharge
3	06016000	Beaverhead River at Barretts MT	Discharge
4	06079000	South Fork Sun River near Augusta MT	Discharge
5	06080900	Sun River bl Diversion Dam nr Augusta MT	Discharge
6	06082200	Sun River bl Willow Cr nr Augusta MT	Discharge
7	06091700	Two Medicine River bl South Fork nr Browning MT	Discharge
8	06093200	Badger Cr bl Four Horns Canal nr Browning MT	Discharge
9	06101500	Marias River near Chester MT	Discharge
10	06139500	Big Sandy Creek near Havre MT	Discharge
11	06142400	Clear Creek near Chinook MT	Discharge
12	06151500	Battle Creek near Chinook MT	Discharge
13	06154100	Milk River near Harlem MT	Discharge
14	06155030	Milk River near Dodson MT	Discharge
15	06167500	Beaver Creek near Hinsdale MT	Discharge
16	06286490	Big Horn Canal near St. Xavier MT	Discharge
17	06287000	Bighorn River near St. Xavier, MT	Discharge
18	06287800	Bighorn River at bridge, at St. Xavier, MT	Discharge
19	06288400	Bighorn River at Two Leggins Bridge, near Hardin	Discharge

Response provided by – Clayton Jordan, Supervisor

1. What is the MT Area Office’s primary management objectives for funding these 19 USGS stream gages in Montana?

Reclamation’s Montana Area Office (MTAO) requires streamflow data for the operation of reservoirs in the State of Montana and delivery of irrigation water to federal irrigation projects. Planning and performance of projects is enhanced with the collection of real time hydrologic data.

MTAO in conjunction with the U.S. Army Corps of Engineers use streamflow data downstream of MTAO’s dams at select sites for flood control operations. Streamflow data at locations upstream of

reservoir sites along with known streamflow travel times is used to plan for snowmelt runoff or runoff from rain events.

2. Does the MT Area Office's rely on information generated from USGS gages other than the 19 you currently support? Please identify the station number and location of these other gages.

MTAO does rely on information generated from USGS gages other than the 19 gage presently funded by MTAO. Other stations of various levels of importance to the MTAO are:

St. Mary River Basin

- Swift Current Creek at Many Glacier (05014500)
- St Mary River near Babb (05017500)
- St Mary Canal at St Mary Crossing near Babb (05018500)
- St Mary River at Boundary (05020500)

Milk River Basin

- North Fork Milk River above Canal near Browning (06133500)
- Milk River at Eastern Crossing of International Boundary (06135000)
- Milk River at Havre (06140500)
- Milk River at Juneberg Bride near Saco (06164510)
- Milk River at Tampico (06172310)

Marias River Basin

- Marias River near Shelby (06099500)
- Marias River near Loma (06102050)
- Teton River at Loma (06108800)

Upper Missouri River Basin

- Ruby River below reservoir near Alder (06020600)
- Big Hole near Melrose (06025500)
- Jefferson near Three Forks (06036650)
- Madison below Hebgen (06038500)
- Madison below Ennis Lake (06041000)
- Gallatin River at Logan (06052500)
- Missouri River at Toston (06054500)
- Missouri River below Hauser (06065500)
- Missouri River below Holter (06066500)
- Dearborn near Craig (06073500)
- Smith River near Eden (06077500)
- Missouri River at Cascade (06074000)
- Missouri River near Ulm (06078200)
- Missouri River at Fort Benton (06090800)

Sun River Basin

- North Fork Sun River near Augusta (06078500)
- Sun River at Simms (06085800)

Yellowstone River Basin

- Little Bighorn River near Hardin (06294000)
- Bighorn River above Tullock Creek near Bighorn (06294500)
- Yellowstone River at Forsyth (06295000)
- Yellowstone River at Miles City (06308500)
- Yellowstone River at Glendive (06327500)
- Yellowstone River near Sidney (06329610)

3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

Currently, MTAO is not aware of any streamflow data gaps.

US Army Corps of Engineers – Seattle District

USGS Gages funded by the US Army Corps of Engineers – Seattle District

	Station No	Site Name	Record
1	12301933	Kootenai R bel Libby Dam nr Libby MT	Discharge
2	12302055	Fisher R nr Libby MT	Discharge
3	12304500	Yaak R nr Troy MT	Discharge
4	12353000	Clark Fork below Missoula MT	Discharge
5	12363500	Flathead River near Kalispell, MT	Discharge

Response provided by: Brian Bell, Water Management Section - Hydrology, Hydraulics and Coastal Engineering Branch, Engineering Division

4. What is the USACE Seattle Region's primary management objectives for funding these 5 USGS stream gages in Montana?

Those gages are used to support reservoir regulation for Albeni Falls and Libby dams. Additionally, they are used to support Corps emergency management and flood plain services work.

5. Does your office rely on information generated from USGS gages other than the 5 listed above? Please identify the station number and location of these other gages.

The ones we pay for are critical for reservoir regulation. All the other gages in those basins (Pend Oreille and Kootenai) we may use occasionally and have potential use for supplementary information.

6. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

Since the Flathead near Kalispell has come back on line we have not seen data gaps.

US Army Corps of Engineers – Omaha District

USGS Gages funded by the US Army Corps of Engineers – Omaha District

	Station No	Site Name	Record
1	06052500	Gallatin River at Logan MT	Discharge
2	06074000	Missouri River at Cascade MT	Discharge
3	06078200	Missouri River near Ulm MT	Discharge
4	06101200	Willow Creek near Galata, MT	Discharge
5	06109500	Missouri River at Virgelle MT	Discharge
6	06115200	Missouri River near Landusky MT	Discharge / Water Temp
7	06174500	Milk River at Nashua MT	Discharge
8	06177000	Missouri River near Wolf Point MT	Discharge
9	06185500	Missouri River near Culbertson MT	Discharge
10	06214500	Yellowstone River at Billings MT	Discharge
11	06309000	Yellowstone River at Miles City, MT	Discharge
12	06329500	Yellowstone River near Sidney MT	Discharge

Response provided by: Alex Flanigan, P.E. Water Control & Water Quality Section. USACE Omaha District

1. What is the USACE Omaha Region’s primary management objectives for funding these 12 USGS stream gages in Montana?

Our primary objective for funding these gages is for flood control operation of Fort Peck, Garrison, Canyon Ferry, Tiber, and Yellowtail. These gages are either a downstream flow target specified in our water control manual or a major tributary inflow used in predicting reservoir inflow.

2. Does your office rely on information generated from USGS gages other than the 12 your currently fund? Please identify the station number and location of these other gages.

Yes we rely on numerous other USGS and state gages for the flood control operation of Fort Peck, Garrison, Clark Canyon, Canyon Ferry, Tiber, Boysen, and Yellowtail. The gages we use are listed below. They have varying levels of importance we can discuss in more detail if needed.

	Station No	Site Name
1.	6006000	Red Rock Cr ab Lakes, nr Lakeview, MT
2.	6012500	Red Rock R bl Lima Reservoir nr Monida MT
3.	6016000	Beaverhead River at Barretts MT
4.	6017000	Beaverhead River at Dillon MT
5.	6018500	Beaverhead River near Twin Bridges MT

	Station No	Site Name
6.	6019500	Ruby River above reservoir near Alder, MT
7.	6020600	Ruby River below reservoir near Alder, MT
8.	6023000	Ruby River near Twin Bridges MT
9.	6023100	Beaverhead River at Twin Bridges, MT
10.	6024450	Big Hole River bl Big Lake Cr at Wisdom MT
11.	6024540	Big Hole River bl Mudd Cr nr Wisdom MT
12.	6025250	Big Hole River at Maiden Rock nr Divide MT
13.	6025500	Big Hole River near Melrose MT
14.	6026210	Big Hole River near Glen MT
15.	6026500	Jefferson River near Twin Bridges MT
16.	6027600	Jefferson River at Parsons Bdg nr Silver Star, MT
17.	6033000	Boulder River near Boulder MT
18.	6035000	Willow Creek near Harrison MT
19.	6036650	Jefferson River near Three Forks MT
20.	6036905	Firehole River near West Yellowstone MT
21.	6037100	Gibbon River at Madison Jct, YNP
22.	6038500	Madison River bl Hebgen Lake nr Grayling MT
23.	6038800	Madison River at Kirby Ranch nr Cameron MT
24.	6040000	Madison River near Cameron MT
25.	6040800	Madison River ab powerplant nr McAllister MT
26.	6041000	Madison River bl Ennis Lake nr McAllister MT
27.	6043500	Gallatin River near Gallatin Gateway, MT
28.	6048650	E Gallatin R ab Water Reclamation Fa nr Bozeman MT
29.	6052500	Gallatin River at Logan MT
30.	6054500	Missouri River at Toston MT
31.	6061500	Prickly Pear Creek near Clancy MT
32.	6063000	Tenmile Creek near Helena MT
33.	6065500	Missouri River bl Hauser Dam near Helena MT
34.	6066500	Missouri River bl Holter Dam nr Wolf Cr MT
35.	6073500	Dearborn River near Craig MT
36.	6074000	Missouri River at Cascade MT
37.	6076690	Smith River near Ft Logan MT
38.	6077500	Smith River near Eden MT
39.	6078200	Missouri River near Ulm MT
40.	6078500	North Fork Sun River near Augusta MT
41.	6079000	South Fork Sun River near Augusta MT
42.	6080900	Sun River bl Diversion Dam nr Augusta MT
43.	6082200	Sun River bl Willow Cr nr Augusta MT
44.	6085800	Sun River at Simms MT
45.	6088500	Muddy Creek at Vaughn MT

	Station No	Site Name
46.	6089000	Sun River near Vaughn MT
47.	6090000	Missouri River at Great Falls MT
48.	6090800	Missouri River at Fort Benton MT
49.	6091700	Two Medicine River bl South Fork nr Browning MT
50.	6092020	Two Medicine River ab Badger Cr, nr Piegan, MT
51.	6093200	Badger Cr bl Four Horns Canal nr Browning MT
52.	6094900	Birch Cr bl Heart Butte Road, nr Heart Butte, MT
53.	6098120	Birch Creek at Bullhead Bridge, nr Valier, MT
54.	6098800	Cut Bank Cr ab Gillam Coulee, nr Sundance, MT
55.	6099000	Cut Bank Creek at Cut Bank MT
56.	6099500	Marias River near Shelby MT
57.	6101200	Willow Creek near Galata, MT
58.	6101500	Marias River near Chester MT
59.	6101630	Marias River at Highway 223 bridge near Chester, MT
60.	6102050	Marias River near Loma MT
61.	6102500	Teton River bl South Fork nr Choteau MT
62.	6108000	Teton River near Dutton MT
63.	6108800	Teton River at Loma MT
64.	6109500	Missouri River at Virgelle MT
65.	6110020	Judith River above Carr Creek near Utica MT
66.	6114700	Judith River nr mouth, nr Winifred MT
67.	6115200	Missouri River near Landusky MT
68.	6120500	Musselshell River at Harlowton MT
69.	6123030	Musselshell River ab Mud Cr nr Shawmut MT
70.	6126500	Musselshell River near Roundup MT
71.	6127500	Musselshell River at Musselshell MT
72.	6130500	Musselshell River at Mosby MT
73.	6132000	Missouri River below Fort Peck Dam MT
74.	6140500	Milk River at Havre MT
75.	6154100	Milk River near Harlem MT
76.	6155500	Milk River at Malta MT
77.	6164510	Milk River at Juneberg Bridge nr Saco MT
78.	6166000	Beaver Cr bl Guston Coulee nr Saco MT
79.	6167500	Beaver Creek near Hinsdale MT
80.	6172310	Milk River at Tampico MT
81.	6174500	Milk River at Nashua MT
82.	6175100	Missouri R at W Frazer Pump Plant nr Frazer MT
83.	6175510	Missouri R at E Frazer Pump Plant nr Frazer MT
84.	6177000	Missouri River near Wolf Point MT
85.	6181000	Poplar River near Poplar MT

	Station No	Site Name
86.	6185110	Big Muddy Creek nr mouth nr Culbertson MT
87.	6185500	Missouri River near Culbertson MT
88.	6191500	Yellowstone River at Corwin Springs MT
89.	6192500	Yellowstone River near Livingston, MT
90.	6195600	Shields River nr Livingston MT
91.	6200000	Boulder River at Big Timber MT
92.	6205000	Stillwater River near Absarokee MT
93.	6207500	Clarks Fork Yellowstone River nr Belfry MT
94.	6208500	Clarks Fork Yellowstone River at Edgar MT
95.	6214500	Yellowstone River at Billings MT
96.	6286490	Big Horn Canal near St. Xavier MT
97.	6287000	Bighorn River near St. Xavier, MT
98.	6287800	Bighorn River at bridge, at St. Xavier, MT
99.	6288400	Bighorn River at Two Leggins Bridge, near Hardin
100.	6289000	Little Bighorn River at State Line nr Wyola MT
101.	6294000	Little Bighorn River near Hardin MT
102.	6294500	Bighorn River ab Tullock Cr nr Bighorn MT
103.	6295000	Yellowstone River at Forsyth MT
104.	6307616	Tongue R at Birney Day School Br nr Birney MT
105.	6308500	Tongue River at Miles City, MT
106.	6309000	Yellowstone River at Miles City, MT
107.	6324500	Powder River at Moorhead MT
108.	6326500	Powder River near Locate MT
109.	6327500	Yellowstone River at Glendive, MT
110.	6329500	Yellowstone River near Sidney MT

3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

Either of the Beaverhead tribs above Dillon or a gage near the end of Boulder Creek could be helpful in flood operations at Clark Canyon or Canyon Ferry.

US Environmental Protection Agency

USGS Gages Funded by the US Environmental Protection Agency

	Station No	Site Name	Record
1	12323600	Silver Bow Creek at Opportunity MT	Discharge
2	12323670	Mill Creek nr Anaconda, MT	Discharge
3	12323700	Mill Creek at Opportunity, MT	Discharge
4	12323710	Willow Creek nr Anaconda, MT	Discharge
5	12323720	Willow Creek at Opportunity, MT	Discharge
6	12323750	Silver Bow Creek at Warm Springs MT	Discharge
7	12323760	Warm Springs Creek near Anaconda MT	Discharge
8	12323770	Warm Springs Creek at Warm Springs MT	Discharge / Water Temp
10	12323800	Clark Fork near Galen MT	Discharge
11	12323840	Lost Creek near Anaconda MT	Discharge
12	12323850	Lost Creek near Galen, MT	Discharge
13	12324200	Clark Fork at Deer Lodge MT	Discharge
14	12324400	Clark Fork ab Little Blackfoot R nr Garrison MT	Discharge
15	12331800	Clark Fork near Drummond MT	Discharge
16	12334550	Clark Fork at Turah Bridge nr Bonner MT	Discharge
17	12340500	Clark Fork above Missoula MT	Discharge

Response provided by: Melissa Schaar, Groundwater and Water Quality Studies Chief, USGS

1. What is the EPA's primary management objectives for funding USGS stream gages in Montana?
EPA primary Management objective is monitoring post-mining water quality in the Clark Fork Basin.
EPA is responsible for water quality monitoring.
2. Does EPA rely on information generated from USGS gages other than the ones you currently support? Please identify the station number and location of these other gages.
No
3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.
EPA could not identify any data gaps.

National Park Service - Yellowstone National Park

	Station No	Site Name	Record
1	06037500	Madison River near West Yellowstone, MT	Water Temp
2	06187915	Soda Butte Cr at Park Bndry at Silver Gate	Discharge
3	06191000	Gardner River near Mammoth, YNP	Discharge
4	06191500	Yellowstone River at Corwin Springs MT	Water Temp

1. What is the National Park Service – Yellowstone’s primary management objectives for funding these four USGS stream gages?
2. Does the National Park Service - Yellowstone rely on information generated from USGS gages other than the four listed above? Please identify the station number and location of these other gages.
3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

Bonneville Power Administration – Clark Fork Basin, MT

	Station No	Site Name	Record
1	12354500	Clark Fork at St. Regis MT	Discharge
2	12355500	North Fork Flathead River near Columbia Falls	Discharge
3	12358500	Middle Fork Flathead River near West Glacier	Discharge

1. What is Bonneville Power Administration’s (BPA) primary management objectives for funding these three USGS stream gages?
2. Does BPA rely on information generated from USGS gages other than the three listed above? Please identify the station number and location of these other gages.
3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

International Joint Commission

	Station No	Site Name	Record
1	05017500	St. Mary River near Babb MT	Discharge
2	06133500	N F Milk River ab St. Mary canal nr Browning MT	Discharge
3	06135000	Milk River at Eastern Crossing of Int Bndry	Discharge

1. What is International Joint Commission's (IJC) primary management objectives for funding these three USGS stream gages?
2. Does the IJC rely on information generated from USGS gages other than the three listed above? Please identify the station number and location of these other gages.
3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

Survey of state agencies contributing operation and maintenance funding to the USGS network in Montana

1. What is the source of funding that (state agency) uses to fund _____ gage(s)?

Montana Department of Environmental Quality (MDEQ): The Smith River Gage at Eden Bridge has been funded by a mix of state general fund match to federal EPA clean water act grant(s). 50/50 mix over the past few years. This general fund is matched to federal grant match requirements.

Montana Bureau of Mines and Geology (MBMG): Pass-through funds from US EPA through the Superfund Program.

2. What are (state agency's) primary management objectives for funding USGS stream gages in Montana.

MDEQ: DEQs management objectives are to protect and restore water quality. In particular, to support local water quality studies when gages are not currently present (ex. Smith River Algae and Nutrient Study). These are usually short-term projects needs that move from watershed to watershed. 2. DEQ permitting programs opportunistically use most or all existing and past gage data across the state to implement a statewide report on seasonal low or high flow conditions (example: 7Q10 flows) to ensure permit limits are protective. DEQ uses gage station data for many other daily functions (see next response).

MBMG: Meet contract obligations with Superfund program and ensure Superfund remedies are meeting Consent Decree requirements.

3. Does the (state agency) rely on information generated from USGS gages other than the one you currently support? Please identify the station number and location of these other gages.

MDEQ: DEQ relies on at least a majority of USGS sites and sometimes all available gage data for implementing programs. 1. Water quality monitoring depends on gages located on many medium and large rivers because instantaneous measures in these locations are dangerous and expensive to collect. We design studies to monitor water quality at USGS and DNRC discharge monitoring locations for codependent data. 2. Total Maximum Daily Loads must account for flow calculations. 3. Most water quality modeling requires discharge information. 4. Permitting must understand seasonal flow conditions for setting discharge limits. 5. Remediation of the Clark's Fork River and other stream channel restoration projects must understand baseflow and flood recurrence flows to design appropriate channel size. 6. Emergency Response 7. Staff safety 8. Implementing and tracking border pollutant loading agreements and disputes 9. There may be others as well.

MBMG: Our staff scientists make use of gage data at many locations, depending on our current project list. MBMG monitors surface water at many additional locations, collecting stream flow measurements and establishing gage sites to meet specific project objectives. These records are available to the public here:

<http://www.mbmgt.mtech.edu/WaterEnvironment/SWAMP/main.asp> [mbmgt.mtech.edu]

4. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

MDEQ: If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial. Many of the recent gages that have been lost due to lack of funding or inflationary conditions. Not that this was lost, but Clarks Fork of Yellowstone just above confluence with Yellowstone River.

MBMG: This list is subjectively random, focusing on locations where we have recently worked or expect to work: an additional station on the Yellowstone River near Columbus, MT would help with monitoring and sampling decisions at the Mouat Chromium site in Columbus; the Gallatin River above the Spanish Peaks Fault area, here the Madison FM discharges via springflow to the river. The USGS gage at Deer Creek is below the springs; reestablishing a USGS site on Skalkaho Creek near Hamilton might be useful to stakeholders. The discontinued gage on Otter Creek at Ashland would be useful if Otter Creek Coal Tracts, or coalbed methane development returns to that area; a gage on Ashley Creek (probably near the bypass) in the Flathead Valley.

5. What are MDEQ's expectations with regard to maintaining or enhancing the USGS Stream Gage Network in Montana?

MDEQ: DEQ hopes that no more gages are lost due to inflation or lack of funding and that a subset of the recently discontinued gages could be reinstated.

MBMG: We will continue to support the three stations listed above until the monitoring requirements for Superfund change.

Survey of Tribal governments contributing operation and maintenance funding to the USGS Network in Montana

1. What is the ____Tribe's primary management objectives for funding these __ USGS stream gages in Montana?

Blackfeet Tribe: Our plan on the Blackfeet Nation is to build a reliable Water Measurement regime throughout our nation. We are excited to collaborate with our partners to achieve that objective.

Chippewa Cree Tribe: I think it would be beneficial for you to understand the Tribe's water issues, if you first become familiar with Tribe/State Water compact. The Chippewa Cree Tribe had approved it's Water Compact early this year and is now in the Secretary of Interior's hands for approval. Once approved here, it will become effective 10 days after.

There are a number of drainages that the Tribe must monitor and report uses for each. In addition to this, we must also record irrigation use, and non-irrigation use.

I have attached the Tribe/State Water Compact for your review and would be happy to visit with you more on this and other needs.

The Tribe has been relying on funding provided by BIA to fund the partnership with USGS and would like to continue.

Confederated Salish and Kootenai Tribes (CSKT): The Mission Creek and SF Jocko River stream gages are used as natural stream flow gages and are used in various hydrologic analyses. These include the determination of wet/normal/dry year hydrologic conditions which determine Minimum Enforceable Flows and River Diversion Allowances as called for by the CSKT-MT Compact. These gages are highly important for the success of the CSKT-MT Water Compact and are specifically identified as critical measurement locations in the settlement.

The Flathead River gage is used for a number of different hydrologic analyses. The data is also critical for the operation of Séliš Q'ispé Ksanka Dam.

Fort Peck Tribe: The Fort Peck Tribes Water Resources Office utilizes the stream gauges to help gauge and monitor in-stream flows in relation to the Fort Peck-Montana Water Compact and Tribal Water Code, the lower Big Muddy and Poplar in relation to minimum instream flows and the antelope gauge we use as part of our water right settlement with Medicine Lake refuge in regards to Dam #1 and releases when certain amounts (cfs) are reached at the station etc., we rely on USGS professional knowledge and continuity of the system, we do not have the resources at this level at this time.

Northern Cheyenne Tribe: Objectives is to assure tribal administration and management of Tribe's compact water pursuant to: WATER RIGHTS COMPACT STATE OF MONTANA/NORTHERN CHEYENNE TRIBE/UNITED STATES OF AMERICA approved by the

Montana legislature in 1991, 85-20-301 MCA (1991), 85-20-302 MCA (1993) (technical amendments), and ratified by United States Congress in 1992 PUBLIC LAW 102-374 (1992)

2. Does the ___ Tribe rely on information generated from USGS gages other than the ___ you currently support? Please identify the station number and location of these other gages.

Confederated Salish and Kootenai Tribes (CSKT): SKQ Dam is operated by Energy Keepers Inc. EKI relies heavily on multiple upstream gages on the Flathead River system. They are critical for forecasting purposes.

Fort Peck Tribe: No we do not rely on any at this time.

Northern Cheyenne Tribe: Historically, Northern Cheyenne Tribe relies on hydrologic information related to agricultural, irrigation, industrial uses, etc. The Tribe continues to use discharge information related to flooding and drought conditions. The Tribe has issued water use permits, in the past, to Tongue River Water Users members from Tribe's storage water in Tongue River Reservoir. The Tribe issues water use permits to Tribal members pursuant to direct flow rights and livestock uses.

Update(s): Joint Funding Agreements between United States Geological Survey and Northern Cheyenne Tribe

- A. 06295220 Rosebud Creek Below Lame Deer Creek near Lame Deer, Mt.
- B. 06307616 Tongue River at Birney Day School Bridge near Birney, Mt.
- C. 06307662 Tongue River at Ashland, Mt.
- D. 06307830 Tongue River Below Brandenburg Bridge near Ashland, Mt.

(discontinue partnership)

- E. 06295113 Rosebud C @ Reservation Bndry nr Kirby, Mt (fully funded by USGS)

Currently, the Tribe has not identified new station(s)

3. Do you know of any stream flow data gaps that could be filled if additional USGS gages were installed? If possible, please identify the waterbody and approximate geographic location where an additional USGS gage would be beneficial.

Confederated Salish and Kootenai Tribes (CSKT): CSKT used to have two additional USGS gages but due to funding constraints we were forced to discontinue the funding partnership for those two years ago.

Fort Peck Tribe: Not at this time.

Northern Cheyenne Tribe: Unaware of any stream flow data gaps.

Montana Streamgage User’s Survey Report

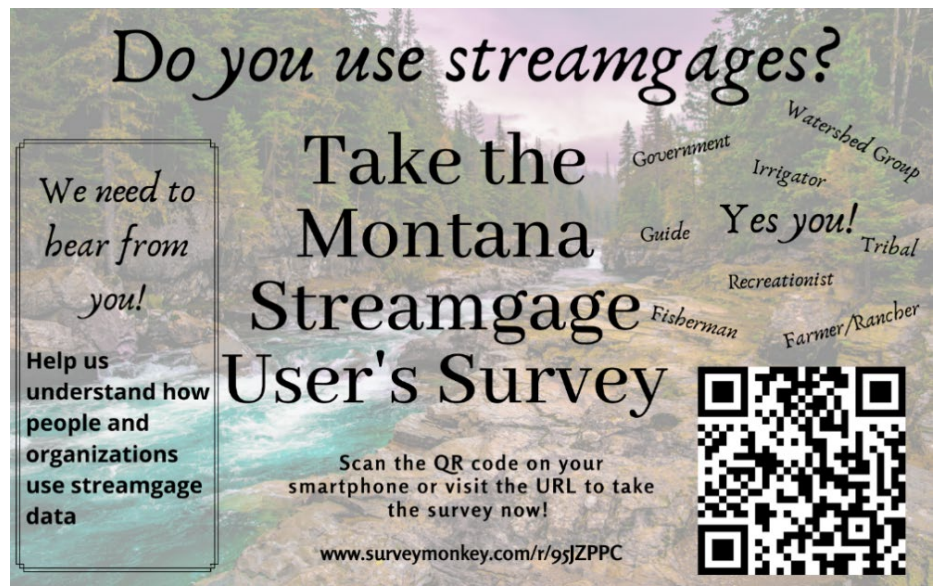
The Streamgage User’s Survey (Survey) was the result of meetings held in Helena and organized by the U.S. Geological Survey (USGS) in 2019 and 2020. Streamgage stakeholders including watershed groups, agricultural organizations, and federal, state, local and tribal agencies met discussing streamgage funding issues.

As discussions progressed it became clear that these committed professionals didn’t know specifically who was accessing and using streamgage data. Funding agencies tend to hear more specifically who views gage data when a gage goes unexpectedly offline from technology issues or when funding has expired. Then, people call or email inquiring about the missing data on the website. While webpage analytics can be used to understand the number of clicks for a specific gage, or which gage site received the most clicks; the origination of the click can be from agency websites that host links to the gage sites, fishing shop websites, and apps developed for recreationists such as Rivercast, RiverApp, and FlyWise.

The Survey was designed to increase understanding about who uses the gage data, how often, during what times of year, and to get a snapshot of the gages that people look at. It was promoted and distributed via newsletters, emails, meetings, social media, listservs and flyers posted in communities. Organizations that assisted in publicizing the survey included federal, state, city, and county agencies; watershed groups; conservation districts; and water related nonprofits. Printed fliers were developed including the survey link address, and QR code (Figure 1). These were distributed to watershed groups, conservation districts, county, state, and federal agencies. The contact person was asked to post on local bulletin boards, and to place copies in local businesses and community organizations. In addition, 31 organizations distributed the Survey information via newsletter, social media accounts, list-serv’s and emails.

Members of the streamgage survey committee:

Nikki Sandve	MT DNRC
Arin Peters	NOAA
Morgan Case	Trout Unlimited
Pedro Marques	Big Hole Watershed Committee
Tracy Wendt	Sun River Watershed Group
Kirk Miller	USGS
Stephen Begley	FWP
Bill Milton	Musselshell Watershed Org.



The Survey had 15 questions and took an average of five minutes to complete. It was open April 23 through October 8, 2020. There were 576 respondents from 92 different zip code areas in Montana and 25 zip codes areas from other states.

Figure 1 – Streamgage User’s Survey Flier

Survey Results

A majority of the Survey participants accessed streamgage data either daily or weekly (Figure 2) and 79% of the participants had been doing this for over seven years. Streamgage data was accessed the most between March and August (Figure 3).

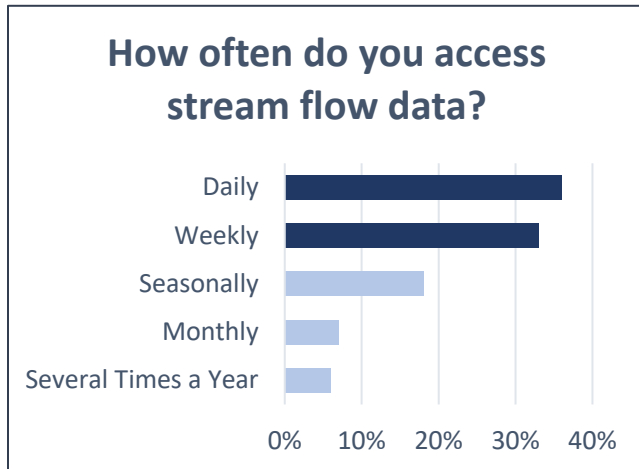


Figure 2

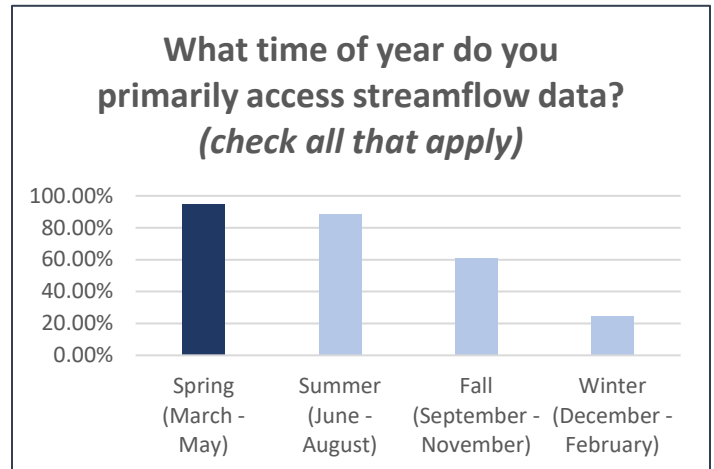
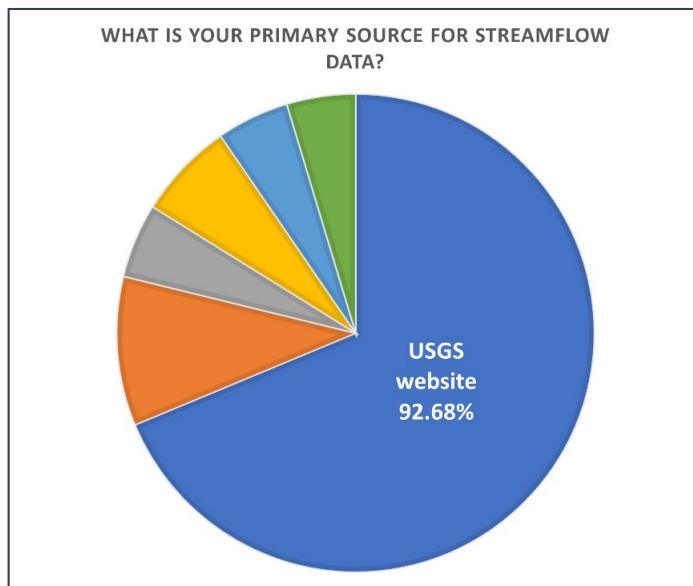


Figure 3

Participants reported that the USGS website was their primary source for accessing streamgage data.



USGS website – waterdata.usgs.gov
MBMG/DNRC's Surface Water Assessment and Monitoring Program (SWAMP)
Third-party Mobile App - such as Rivercast , RiverApp , FlyWise , etc.
National Weather Service AHPs Page - waterweather.gov
A Watershed Group or other third-party website.
Other (please specify)

The Survey was created to understand who was accessing the gage data and for what reasons. The primary and secondary interests that participants reported are shown in Figure 4. Some “Other” responses aligned directly with options that were listed. A surprising result for the Interests was that personal/recreation was the top interest in accessing streamflow data.

Primary and Secondary Interest for Accessing Streamflow Data

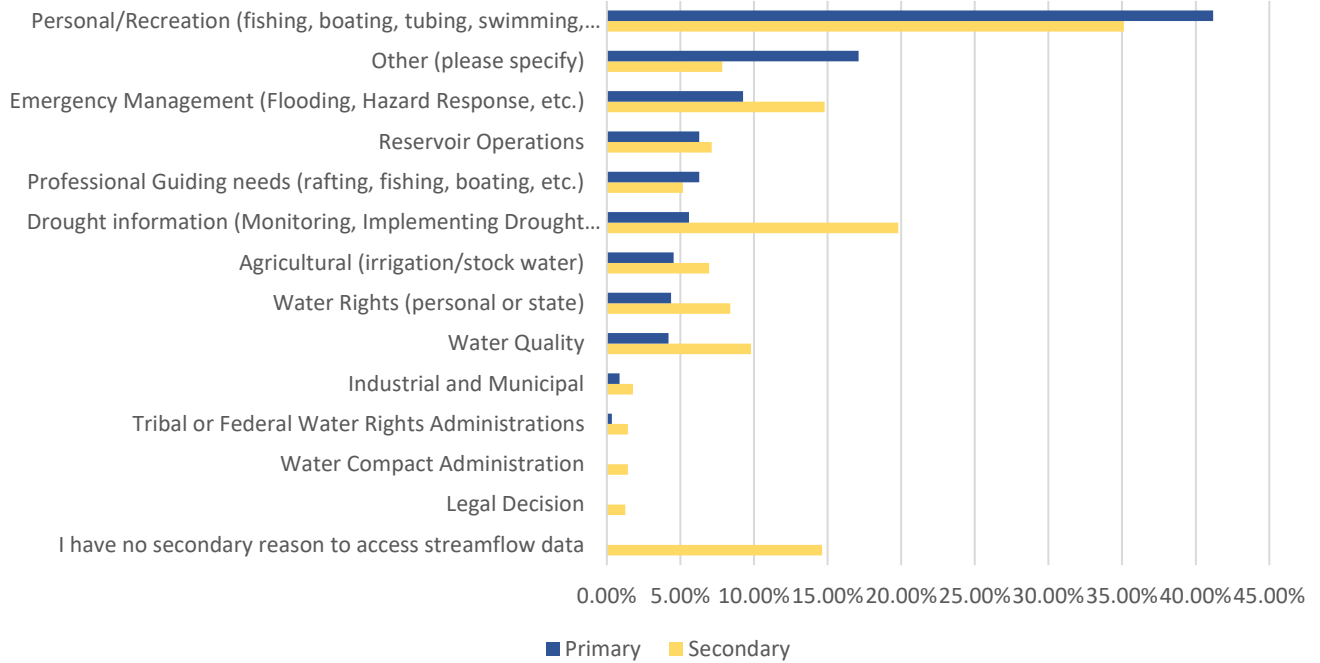


Figure 4

Participants accessed streamgauge data from the three major western watersheds (Figure 5)

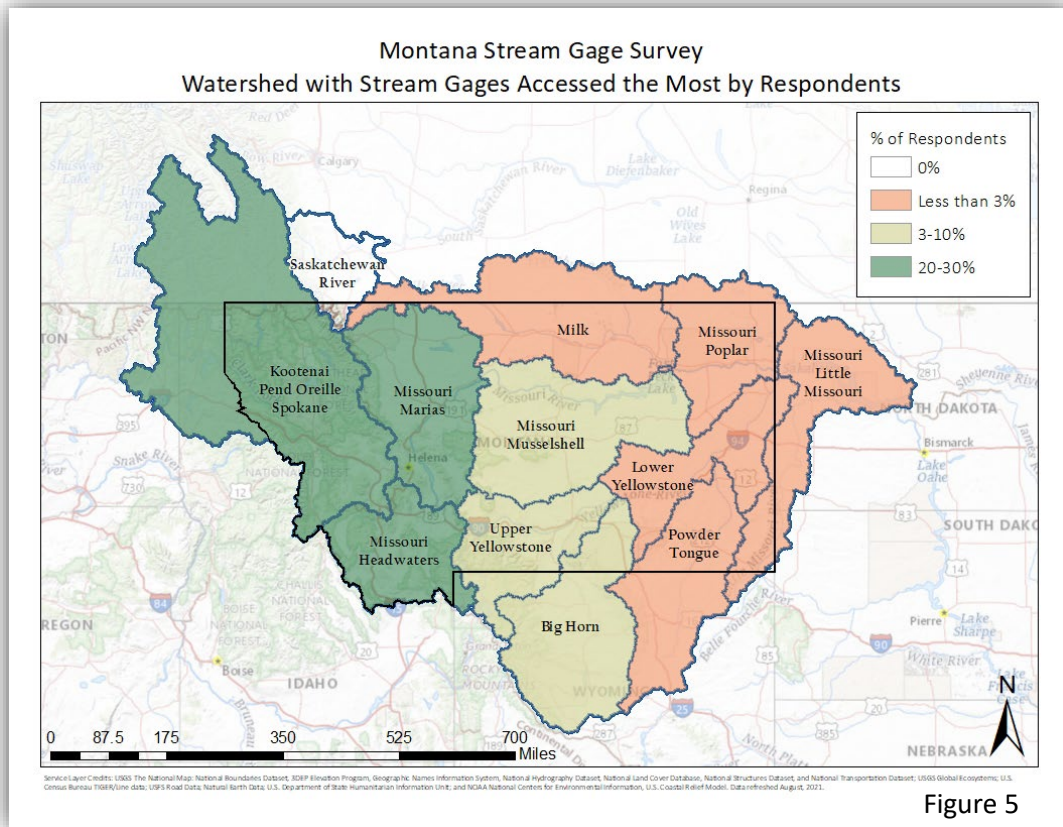
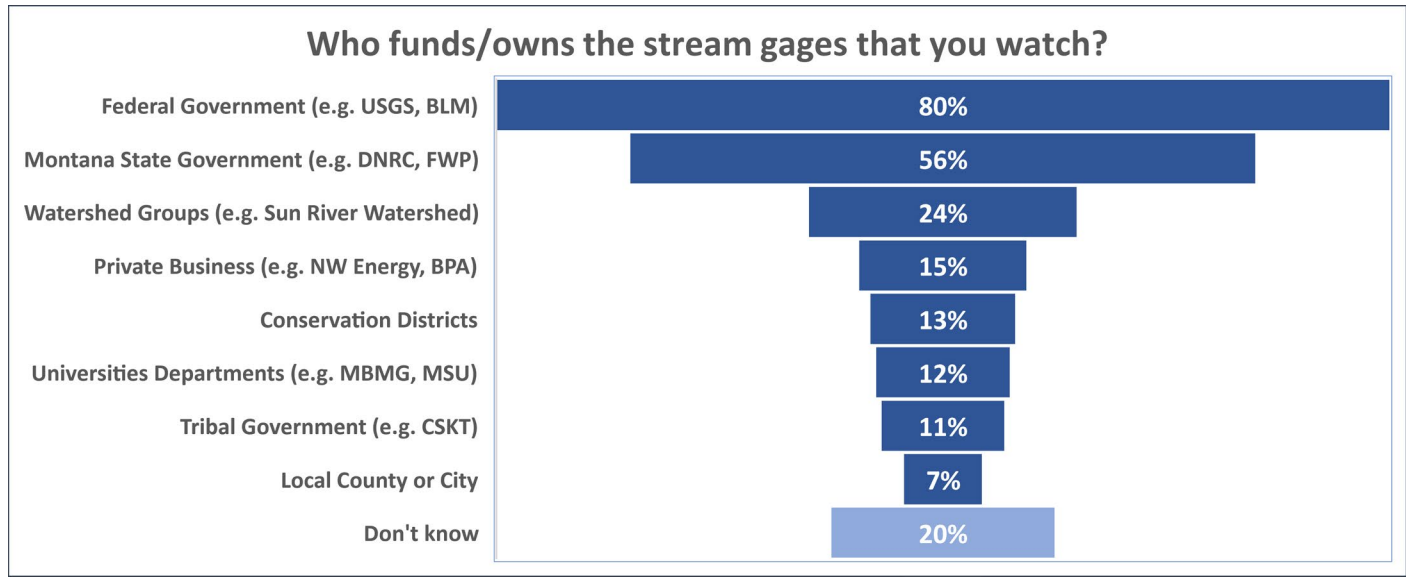


Figure 5

The survey also asked, “Which gages do you check most often?” Participants were to specify the gage by the river system, gage name, and/or USGS gage number. The wide variety of ways that gages were named and listed, makes data for this question challenging to parse out.

The Survey asked if participants knew who funds/owns streamgages. While participants could check all that apply, almost 20% didn’t know what agencies and organizations ensured they had accurate and free data.



The design team wanted to provide some gage funding information to determine what participants understood about the costs to install and maintain these vital networks. A majority of participants understood what the general cost was for installation of a gage but underestimated what it costs to maintain these gages each year.

<p>Installation of a gage that measures streamflow and is installed where there is existing infrastructure costs an average of \$5,000. Is this amount -</p>	<p>The average yearly costs of operation, maintenance, and calibration of a streamflow gage is \$11,840 (for a 6-month streamflow gage) to \$18,360 (for a year-round streamflow gage). Is this amount -</p>
<p>More than you thought it costs. 24%</p>	<p>More than you thought it costs. 63%</p>
<p>About what you thought it costs. 62%</p>	<p>About what you thought it costs. 35%</p>
<p>Less than you thought it costs. 14%</p>	<p>Less than you thought it costs. 2%</p>

Participants primary residence were in 122 zip codes areas from 39 counties in Montana and nine other states. Each county/state reported is shown in Figure 6. The size of the font is determined by the number of responses for that county. As a size reference, Lewis and Clark County had 93 responses and Jefferson County had 14 responses.



Figure 6

Almost 60% of the participants wanted to be notified if a gage might be shut down because of lack of funding. Forty percent of overall participants were affiliated with organization that were funding or had funded at least one streamgage, but 32% of the participant didn't know that information.

Participants were asked if they would be willing to be contacted with additional questions. Two hundred and forty-seven emails addresses were submitted. At this time the survey design team has not conducted any follow-up questioning.

SUMMARY

There is a strong interest in using streamgage data to support multiple water needs and uses across the state. While most survey participants have been accessing gage data frequently for over seven years, they did not have a accurate understanding of the costs involved in ongoing maintenance of streamgages. There appears to be a concentrated interest in the gages located in the western Montana watersheds, this could be because of the population and number of gages in those areas. Additional outreach and education may be needed to inform users about the needs of ongoing operation and maintenance that gages require and the associated costs.

Appendix G

Public Comments received through Survey Monkey on Draft Report to the 2022 Montana Water Policy Interim Committee on Stream Gaging in Montana.

July 14 – August 12, 2022

Name:	Email:	Comments (2000 characters allowed):
Open-Ended Response	Open-Ended Response	Open-Ended Response
Ross Salmond	rosssal@3rivers.net	The USGS and DNRC stream gages are very much needed from a Agricultural Irrigation standpoint. The Water Commissioners on the Teton River Basin use these daily top manage the flows in the Teton River. It is of the utmost importance that we keep the gages that we currently have. Please keep the funding that we currently have in place.
Jim Hagenbarth	hagenbarthj@msn.com	Water is the life blood of the West and its value will escalate to unimaginable figures. Montana is a headwater state and most of its water flows off watersheds in federal ownership. It is paramount that Montana quantifies and manages the flows it has to best utilize its beneficial uses and understand the flows of our water courses be it in drought or flood. The only way to do this is to have adequate gaging. During floods it allows us to determine how best to use our storage for future use and in drought it enables us to make the most of what little we have. Post adjudication gaging becomes extremely important to assist water commissioners in delivering water water in designated reaches. If you do not know how much you have, how does one know how much to deliver. These past dry years has focused everyone's attention on competition between uses for the water flowing in our rivers, rather than how we can increase these flows by wise water management strategies that can be managed with adequate gaging. Cloud seeding can increase the amount of high mountain snowpack by 15%. Manipulating vegetation in our watersheds to decrease evapotranspiration has the greatest potential to increase water flows. Off stream storage and ground water storage has huge potential to take advantage of off season and runoff flows so they can be used to mitigate water demands. All these strategies need gaging to determine their benefits. With the huge demand for water in the years ahead Montana must quantify its water so we an enhance its use along with solidifying our rights against downstream and/or adjacent river basins who have more money and votes than Montanans' have. Gages are important and need to be supported by the public agencies that manage and use the waters of Montana. User groups should not be left out of the funding equation either. You might think it is expensive to support water gaging until you have lost your water. Thanks for all the work that has bone into this issue.
Allen Martinell	Allenmartinell@gmail.com	I am a rancher and live in the Red Rock River valley and receive irrigation and stock water from the Red Rock River and Lima Dam. I am chairman of the board of Red Rock River Water and Sewer District that owns Lima Dam. Maintain streamgages on our streams and rivers is vital to water management in our state. I fully support funding for establishing, maintaining, and monitoring stream gages. On the Red Rock there is a USGS stream gage upstream from Lima Dam that has been abandoned for years. If this gage could be reestablished and monitored it would provide vital information about inflows into Lima Dam. Approximately 30 miles downstream another abandoned USGS stream gage was turned over to the water users that rehabilitated the structure, but lack the funds or the staff to monitor and disseminate the data. The water users have established 5 temporary stream gages from Lima to Clark Canyon Dam and use them to monitor streamflows during the irrigation season. These gages may need to be reinstalled every year due to damage by ice or high water. Maintenance and labor cost are the major reasons that prevent an accurate measurement and recording of the data. These are some of the reasons that I would support funding for stream gages. Thank you for the opportunity to comment.
Keith Goodhart	sweetgrasswaterusers@gmail.com	My name is Keith Goodhart and I live along Sweet Grass creek near Big Timber. For 16 years I, along with DNRC hydrologists have been measuring flow on the creek in response to water disputes arising in 2006. We have collected flow rate data during irrigation season (April - November) at four different sites, from Melville, to the mouth of the Sweet Grass at the Yellowstone river. All data is on record at the DNRC, as well as the Sweet Grass conservation service. Water users on the creek have found our information invaluable in resolving disputes, as well as planning strategically for future water use. Comparing USGS data collected on The Sweet Grass creek for 75 years, with newly collected data shows trends of diminishing snowpack and flow rates. We feel it is imperative to keep funding USGS water gauging on rivers as well as small streams to help provide water users with the information they need to plan for hotter , drier summers. Please continue to fund gauging throughout the state.
Mark Rozman	rozmanm@comcast.net	If you want solutions to your water issues please contact me for a copy of my book, The Book of Water Volume One, supply and demand Concepts. Thanks, Mark
Brian Mischel	bmischel@bighorncountymt.gov	To Whom It May Concern, When making data-driven decisions that have an impact on the ecology and balance of Montana's pristine water resource, quantitative data is very beneficial. With stream gauges, data is more dependent. We must invest more in these programs if we want to maintain our amazing resource for tourism and daily life.

Appendix G

Public Comments received through Survey Monkey on Draft Report to the 2022 Montana Water Policy Interim Committee on Stream Gaging in Montana.

July 14 – August 12, 2022

Rochelle	rmg13@hotmail.com	The State of Montana should work with its elected representatives in Washington D.C. to encourage a significant and sustained federal investment in the nation's stream gage network. The Montana Legislature should consider an increase in state funding to maintain its current level of support to the USGS network in Montana. The Montana Legislature should consider appropriating additional funding to complete the build-out of the DNRC state-based stream gage network called for in the 2015 State Water Plan.
Laura	lhann@localbounti.com	A personal comment, not related to work. The daily text messages of water rates were excellent - if able to be continued that is great. If there was an app that you could do some downloading of data to access when your out of cell service that would be a good resource for fishing and other remote water activities. Thanks for opening this up for community feedback. -Laura
Mike Geary	Hwldogemt@gmail.com	Gauges and monitoring assist in making sure water gets distributed in the correct and legal amounts to water users. Gauges and monitoring create transparency which is a benefit to all users.
Robert Crooks	rjcrooks@msn.com	I too am concerned with the elimination of stream gauges, many of which have been in service for decades. I support additional funding to keep these gauges operating with the information available to the public. While more gauges would be nice, at very least we should keep the current ones operating.
Valerie Kurth	vkurth@mt.gov	Update to my previous comments: Brian Loving from USGS shared some additional information about the different types of gages and the amount of cooperater engagement. The Flathead River gage at Foys Bend is the only stage-only gage in the state that had a local cooperater (local farmers depend on it to assess flooding probabilities in the Lower Valley area, so it's a priority for the CD). I'll paste his exact words below for additional context. Thank you. From Brian Loving: There are no other gages in Montana that have local entity support but only report stage, except for one without telemetry (no real-time data) funded by the Fort Peck Reservation Water Resource Office. We do vary the amount of cost share by the type of data being collected and it's value to USGS's mission. Stage-only gages generally do not receive matching funds because the value of the data is very local and immediate (few if any long-term benefits to having it). The added cost to report discharge at an annually-operated stage gage is \$11,500, and to add water temperature is \$2,940. Annual records of discharge and water temperature are generally matched by USGS at the rate of about 40% (cooperater would pay 60%. So... a stage gage costs the cooperater \$6,610 (full cost), but a discharge gage costs the cooperater \$10,860 (60% of cost), because USGS share in the cost. One more complication here is that some sites aren't suited for computing discharge, like Foys Bend, because they have variable "backwater [en.wikipedia.org]".
Joseph M Cleary	josephmcleary@gmail.com	With the climate variability caused by global warming, river flow monitoring is an essential and critical data set for making good policy decisions for SUSTAINABLE river usage by ranchers, anglers, hikers and other nature enthusiasts. Funding for gage maintenance and upkeep on all Montana rivers, to acquire that indispensable data, also must become SUSTAINABLE. This requires long term guaranteed funding from the federal, state, county, regional, local and community stakeholders, and financial support by all stakeholders, specifically the users of Montana's rivers. I support every approach discussed in the Report to the 2022 Montana Water Policy Interim Committee on Stream Gaging in MT that will meet that goal

Appendix G

Public Comments received through Survey Monkey on Draft Report to the 2022 Montana Water Policy Interim Committee on Stream Gaging in Montana.

July 14 – August 12, 2022

Valerie Kurth	vkurth@mt.gov	<p>Local funders (pg 13) I was surprised to see that Flathead CD was not listed as a supporting local entity because it provides support for the gage at Foys Bend. I contacted Aaron F and then Brian Loving at USGS. Brian verified that the list was only for gages that report discharge and temperature, not stage-only (Foys gage reports stage only). The support cost is less for Foys, but it still seems to me that the CD should receive credit for its ongoing support. I followed up with Brian to ask how many other stage-only gages were supported by local entities, but he did not respond, so I don't know how much this would add if stage-only gages were included. Some conservation districts, such as Madison and Flathead, operate independently from the county. These CDs do not have the word "county" in their title. The text says that sixteen gages are supported by local entities, but only 14 entities are listed. Presumably, 1-2 support 1-2 gages, but I think this should be clarified. Recommendations (pg 29-30) The recommendations seem centered around requesting more funds from above (federal government or state legislature), but I think it could also be helpful to build a stronger network through local cost-sharing. The DNRC Water Management Bureau lacks authorization to charge a flat fee for a cost-sharing agreement with a local entity; instead, the bureau negotiates a cost range for the MOU and then does detailed billing. This is inefficient for all. If the legislature could change that authorization for stream gage support, it would be easier to develop a cost-sharing program for the DNRC network. I understand not wanting to put additional burdens on local organizations, but I can also see a benefit in increasing the general outreach and education about the state's excellent stream gage network. This would also show some local buy-in, which might be compelling to government decision-makers. General Pg 8 – complimented should be complemented Throughout: tribal and tribe are only capitalized when referring to specific tribe (e.g., I work with Salish and Kootenai Tribes and "... a diversity of federal, state, tribal, and local sources." (latter case – tribal is capitalized on page 8 and elsewhere in report (pg. 12, 13, 18 and so on). Helpful resource: https://www.bia.gov/guide/editorial-guide#:~:text=Alaskan%20Native%20is%20an%20incorrect,the%20term%20E2%80</p>
Kyle Mace	kmace@wgmgrou.com	<p>This stream gaging report outlines the crucial role that stream flow data plays in Montana. It makes clear that government agencies, private citizens, and court-appointed commissioners require this data in order to respond to drought conditions, variable snowpack, and unpredictable weather patterns. Without this data, it will become more and more difficult to obtain new water rights or change existing water rights for the benefit of agriculture, fisheries, municipal or industrial users. Continued and increased funding of this program is of utmost importance.</p>
WILLIAM EARL BERGIN,SR.	bllltd@hotmail.com	<p>WATER IS EXTREMELY IMPORTANT IN THE MUSSELSHELL BASIN. SINCE 2000,THE RIVER HAS ONLY GONE DRY FOR 4 DRY FOR 4 DAYS WHEN WE HAD A NEW HEAD WATER COMMISSIONER. THE STREAM GUAGES ARE THE TOOL WHICH THE COMISSIONERS ARE ABLE TO SET PRIORITY DATES AND KEEP THE RIVER FLOWING. THIS EXPEDITES A FAIR AND EQUITABLE DISTRIBUTION OF WATER. IN FUTURE YEARS MONTANA WILL BE ABLE TO PROTECT OUR RIGHTS AS WE HAVE SHOWN THAT WE USED OUR WATER IN A BENEFICIAL WAY.</p>

From: [Hedstrom, David](#)
To: [DNR WRD Drought Plan](#)
Cc: [Compton, Annette](#); [Johnson, Jen](#)
Subject: FW: Stream Gage Oversight Work Group Seeks Your Feedback
Date: Thursday, August 4, 2022 10:59:15 AM
Attachments: [image001.png](#)

Hello

I reviewed the draft Stream Gage Report and wanted to provide some additional information with regard to the Montana Department of Transportation's use of stream gage data and the funding agreements and research projects that we have in place with the USGS.

MDT relies on stream gage data and regression equations developed from stream gage data almost exclusively for the design of the State's transportation infrastructure. The use of stream gage data for the design of infrastructure is not included in the report and it may strengthen the argument that a reliable stream gage network is critical and that a long term funding commitment is necessary.

Additionally, the following MDT sponsored funding agreements and research projects may provide relevant information for the Draft Stream Gage Report:

1. The MDT has an joint funding agreement with the USGS to operate and maintain the Crest Stage Program (CSG). MDT contributes approximately \$50,000 annually to the USGS to maintain and operate the CSG network. The funding agreement is a 60/40 split and the annual cost of the program is about \$85,000. There are currently 61 gages in the program at a cost of \$1,430 each annually. Here is a link to the CSG webpage for more information:
https://www.usgs.gov/centers/wyoming-montana-water-science-center/science/montana-crest-stage-gage-network?items_per_page=6
2. As part of the Peak Flow Channel Width Regression Equations research project, MDT partnered with the USGS to develop an analysis of the CSG network to allow for better decision making in the management of the network. Additional information on the analysis and a link to the publication is available at the following link:
<https://pubs.er.usgs.gov/publication/sir20215063>
3. MDT and the USGS also cooperatively completed a research project on the use of LSPIV technology. More information and the project Fact Sheet can be found at the following website: <https://www.mdt.mt.gov/research/projects/hyd/streamflow.aspx>

MDT has provided funding for the CSG network since the 1970's. These are State funds that are limited and unfortunately the funding for this agreement MDT has been capped at \$50,000 for at least the past 18 years. Consequently, the number of gages in the network has been continuously reduced which spurred the need to the network analysis report.

MDT does have the ability to leverage funding from FHWA but there has to be a research component to the project to use these funds. Which is how the CSG gage network analysis and the LSPIV projects were funded. MDT also provided FHWA research funds to the USGS for the

development of StreamStats and the Rural Regression Equations. Unfortunately, funding from FHWA to directly support stream gages isn't possible.

A separate item that may be of interest to this group is that MDT, in cooperation with FHWA, is funding the NOAA Atlas 14 precipitation update for Montana. The project is pooled fund and includes Montana, Idaho, and Wyoming. The peer review phase of the project is coming up in January and will allow all of the stakeholders to comment on the preliminary estimates. The most recent project status report can be found at the following link: https://hdsc.nws.noaa.gov/hdsc/files25/202207_HDSC_PR.pdf [hdsc.nws.noaa.gov]. Note on the last page of the report, that NOAA received funding from the most recent congressional Infrastructure Bill to develop non-stationarity precipitation estimates for the entire nation. Perhaps something similar could be developed or is already in the works for the stream gage network.

MDT is supportive of the Stream Gage Oversight Work Group and agrees with the conclusions and recommendations made the Draft Report.

Please feel free to contact me with any questions or additional information.

Thank you for the opportunity to comment.

David Hedstrom, PE

State Hydraulic Engineer

Montana Department of Transportation

406-444-7961

From: Urban, Lawrence <lurban@mt.gov>

Sent: Tuesday, July 19, 2022 1:26 PM

To: Hedstrom, David <dhedstrom@mt.gov>; Compton, Annette <ancompton@mt.gov>

Subject: FW: Stream Gage Oversight Work Group Seeks Your Feedback

Thought you folks might be interested in this report.

From: Sandve, Nikki <NSandve2@mt.gov>

Sent: Tuesday, July 19, 2022 12:48 PM

To: Sandve, Nikki <NSandve2@mt.gov>

Subject: Stream Gage Oversight Work Group Seeks Your Feedback

You are receiving this email because you have expressed an interest being contacted with addition questions about stream gages and the work of the Stream Gage Oversight Working Group.

Stream Gage Oversight Work Group Seeks Your Feedback

The Stream Gage Oversight Work Group (Work Group) was created by the 66th Montana Legislature in response to stakeholders' concerns over the shutdown of 10 USGS stream gages in Montana. The Work Group conducted a review of the USGS network and developed recommendations to improve network resilience and continuity considering decreased funding. The Work Group is seeking public feedback on the draft *Report to the 2022 Montana Water Policy Interim Committee on Stream Gaging in Montana*.

Related Documents

[DRAFT Report to the 2022 Montana Water Policy Interim Committee on Stream Gaging in Montana](#) (4MB)

Public Comment Opportunity

Deadline:

Comments will be accepted until 5 p.m. August 12, 2022

Electronic Submittal (Survey Monkey)

[Submit Online Comments Here](#)

Or mail to:

Montana DNRC

Attn: Paul Azevedo

PO Box 201601

Helena, Montana 59620-1601

Or email:

Do you need to send an attachment? Have more to say than 2,000 characters? Email your comments to [dnrcdroughtplan@mt.gov](mailto:dnrcredroughtplan@mt.gov).

Please share this information with other interested parties.

Paul Azevedo

Bureau Chief, Water Management

[Montana Department of Natural Resources and Conservation](#)

1424 Ninth Avenue

PO Box 201601

Helena, MT 59620-1601

Ph: 406-444-6635



The Montana Department of
**Natural Resources
& Conservation**



August 12, 2022

Montana Trout Unlimited
312 North Higgins, Suite 200
P.O. Box 7186
Missoula, Montana 59807

Montana Department of Natural Resources and Conservation
ATTN: Paul Azevedo
P.O. Box 201601
Helena, Montana 59620-0601

Re: Draft Report to the 2021-2022 Water Policy Interim Committee on Stream Gaging in Montana

Submitted via email to [dnrcdroughtplan@mt.gov](mailto:dnrcredroughtplan@mt.gov)

To Whom It May Concern:

Thank you for the opportunity to provide written comments on the draft Report to the 2021-2022 Montana Water Policy Interim Committee (WPIC) on Stream Gaging in Montana (Report). We have reviewed the draft Report and have worked closely with the Stream Gage Oversight Work Group (Work Group), the staff in the Water Resource Division of the Department of Natural Resources and Conservation (Department), along with other partners, in its drafting over the last year. As such, we wish to go on record strongly supporting the findings in the Report, as well as the tremendous resource of background information on stream gaging that the document provides for current and future policymakers in Montana.

Founded in 1964, Montana Trout Unlimited (MTU) is the only statewide grassroots organization dedicated solely to conserving, protecting, and restoring Montana's coldwater fisheries. MTU is comprised of 13 chapters across the state and represents approximately 5,000 members and friends. Many of our members are conservation-minded anglers who have an active interest in the health and recreational values of our state's rivers and streams and are active users of the stream gage network in conservation and recreational pursuits. MTU and our chapters have been an active supporter of the stream gage network in various decision-making venues from the Montana Legislature to the United States Congress through the years, in addition to contributing financially for several gages within the Montana network.

As the Report reflects, the value of Montana's stream gage network is broad and deep. Whether you are an irrigator, a state agency, a hydropower operator, disaster response

manager, conservationist, or recreationalist, the uses of datasets offered by the entire stream gage network are often critical in making decisions related to water management. Further, it is evident that no individual gage stands alone in offering that value; it is truly the network that works together to provide the value to users. In the face of much uncertainty about the future of Montana's stream gages, now is the time to ensure that investment is tended to wisely. Within the Report's draft findings, we want to be on record explicitly supporting the following:

- *Advocate for increase in federal funding for the stream gage funding:* The most significant challenge facing the diverse stream gage user community who rely on the network has been static funding for the United States Geological Survey (USGS) federal priorities and cooperative matching funds stream gage programs. As the costs have increased due to inflation and other causes, the funding has remained flat. In that scenario the only outcome has been gages in Montana shutting down because of lack of resources. In many of those cases, local and state funding partners, including MTU and our local chapters, have stepped in to address short-term solutions to keep many gages operational; however, that is not a long-term sustainable model. We support the recommendation that the Executive and Legislative branches of State Government should communicate to federal appropriators the need for increases in the USGS budget to support the network and sustain those increases over time to reflect the actual costs of doing business.
- *Address state funding needs of the stream gage network:* In the case Congress does not address the federal funding shortfalls, we support the recommendation within the Report to increase the state funding of the network. There are two ways that the legislature should consider increasing funding, including to help shore up costs of the existing network and working with other funding partners to prevent additional gage losses within Montana's existing network, and to increase funding to build out the DNRC state-based stream gage network called for in the 2015 State Water Plan. We support both recommendations as necessary steps currently.
- *Ensure implementation of the notification plan developed by the Work Group:* One of the most valuable components of the Stream Gage Work Group's workplan was developing and implementing a notification plan whereby the user community can have more upfront information about plans for potential lapses in funding that result in a gage being shut down. That notification plan has helped many local groups, along with state government agencies, in making appropriate plans to help sustain a gage facing closure. Moving forward, we support the recommendation of having a permanent group tasked with the implementation of the notification plan into the future. We agree with the recommendation that the Governor's Drought and Water Supply Advisory Committee is the most logical fit, and we would urge WPIC to draft legislation for pre-introduction to assign the implementation of the notification plan to that body in the long term.

Beyond the recommendations, the body of research found in this Report is of tremendous value for current and future policymakers. We appreciated being part of the process in compiling the information that is found in this document, and we are grateful to the team of agency staff that have done the hard work of developing a thorough and easy to approach resource, although we would support the inclusion of an executive summary that helps advocates of the network in disseminating the Report in future policy making venues like the upcoming legislative session. MTU believes that this report will serve the needs of the stream gage user community as well as decisionmakers for years to come.

Please do not hesitate to contact us with any questions, or if you need additional information regarding the comments that we have submitted (via email at clayton@montanatu.org or by phone at 406-543-0054). Again, we thank you for the opportunity to provide public comment on this important topic.

Respectfully,



Clayton Elliott
Conservation and Government Relations Director
Montana Trout Unlimited

From: [Sandve, Nikki](#) on behalf of [DNR WRD Drought Plan](#)
To: [Sandve, Nikki](#); [Azevedo, Paul](#)
Subject: Gage Report comment - FW: comments on report to WPIC on stream gaging
Date: Thursday, August 18, 2022 3:11:39 PM

Hi Paul –

I forgot to check the comment email box that I have. This still was submitted past our comment period, but maybe has some useful suggestions.

Nikki

Nikki Sandve, Water Education Coordinator | Department of Natural Resources and Conservation (DNRC) – Water Management Bureau | (406) 556-4505 | 2273 Boot Hill Court, Ste 110, Bozeman, MT 59715-7249 | dnrc.mt.gov

From: Gotkowitz, Madeline <mgotkowitz@mttech.edu>
Sent: Tuesday, August 16, 2022 10:21 AM
To: DNR WRD Drought Plan <DNRCDroughtPlan@mt.gov>
Subject: [EXTERNAL] comments on report to WPIC on stream gaging

Hi Paul and others,

Your report reads really well! Consider adding an executive summary; the report needs to contain all of the detail that you have packed into it, but not everyone will want to wade through.

On page 5, the bullet list of specific uses explains how gage data is used in a general sense. Providing specific examples from Montana for each bullet will help convince those less familiar with water management of the importance of gages. For example, “planning, forecasting, and warning about floods and droughts” – give an example. Something like, “During the June 2022 flooding on Rock Creek, Gage XXYZ data informed emergency managers in Red Lodge prior to flood stage etc.” Or – “Gardiner evacuation efforts started XX hours earlier due to monitoring upstream conditions at XYZ gage”

“Monitoring environmental conditions to protect aquatic habitats” will be vague and borderline incomprehensible to many readers. Here an example might be something like: “Hoot owl fishing restrictions on the Big Hole River are implemented based on the daily stage and temperature readings at gages YQZ and PRX near the communities of Melrose and Glen. Managing sport fishing opportunities on this stretch of river is estimated to generate \$X.Y million annually within the local economy.” “Determining if streams are safe for recreational activities”? What’s an example of this? Swimming and algal blooms, or kayaking with too much or too little flow? I’d suggest coming up with an example or two that demonstrates an economic boost through tourism or agriculture to local communities.

Hope these comments are helpful—the report represents a lot of work and a few tweaks might make it all the more effective in making the case for stable funding.

Best,
Madeline

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