

March 6-7, 2018

# Montana Water Summit

FINAL REPORT



## The Inaugural Montana Water Summit

In March 2018, Montana convened its first statewide Water Summit, a two-day event examining the forces shaping Montana's water resources now and into the future. The Summit theme, *Water in a Changing West*, highlighted the impacts of climate change, economic development and population growth on Montana's water quantity and quality.

The goal of the Montana Water Summit was to convene a diverse cross-section of Montanans and foster an exchange of knowledge and ideas that will help the state meet challenges with water management, policy, quality, quantity and demand.

The Summit grew from a cooperative planning effort between the Montana Departments of Natural Resources and Conservation (DNRC), Environmental Quality (DEQ), and Fish, Wildlife and Parks (DFWP), the Montana Water Center and the Montana Bureau of Mines and Geology.

## Why the Water Summit?

As a headwaters state, Montana enjoys an abundance of clean, cold water – most of which originates within or near the state's borders as mountain snowpack. Clean water is foundational to Montanans' quality of life,

essential to industries like agriculture, recreation, tourism and a key contributor to ecosystem function, public health and community livability.

As Montana’s population and economy grow, largely in select counties and urban areas, so too does water demand. And, as Montana’s first-ever Climate Assessment illustrates, the state’s water resources are changing. Snowpack is declining and melting sooner, streamflow is lower in late summer, and severe droughts – like the “exceptional” flash drought of 2017 – will increase in frequency and duration in the future.

With unprecedented pressures on Montana’s water from population growth and climate change, it is critical to expect and prepare for future challenges.

**[Montana should] “Invest in the capacity to identify and evaluate the opportunities and challenges posed by large scale forces that will influence water supply and demand over the next twenty years.**

**Examples of large scale forces include but are not limited to: energy development, demographic shifts, climate variability, the operation of federal dams and reservoirs within Montana and downstream states, treaties and compacts with neighboring states and Canada, and federal actions related to threatened and endangered species.**

- Montana State Water Plan

How will a longer growing season impact agricultural crops? What will be the cumulative impact of multi-year drought and wildland fire on rivers, forests, rangelands and wildlife? How will cities like Bozeman, Billings, and Missoula supply water to populations growing faster than the national average? What are the water quality implications of exurban growth and loss of millions of acres of open spaces and agricultural lands over the past three decades?

The Montana Water Summit introduced and analyzed these challenges through dynamic presentations and small group discussions with scientists, policymakers, attorneys, tribal members, economists, natural resource managers, irrigators, anglers, watershed coordinators, educators and more. The Summit continued the critical conversations initiated during Montana’s statewide water planning in 2014 that convened regional basin advisory councils to address these issues.

For recommendations to meet Montana’s current and future water demands, please see the [Montana State Water Plan](#), adopted by the legislature in 2015.

Watch a short video inspired by the Montana Water Summit on DNRC’s YouTube Channel entitled “[Montana’s Water Future](#).”

Most importantly, plan to join the 2020 Montana Water Summit in Helena.

## Who was there?

Over three-hundred Montanans joined the conversation at the inaugural Montana Water Summit.

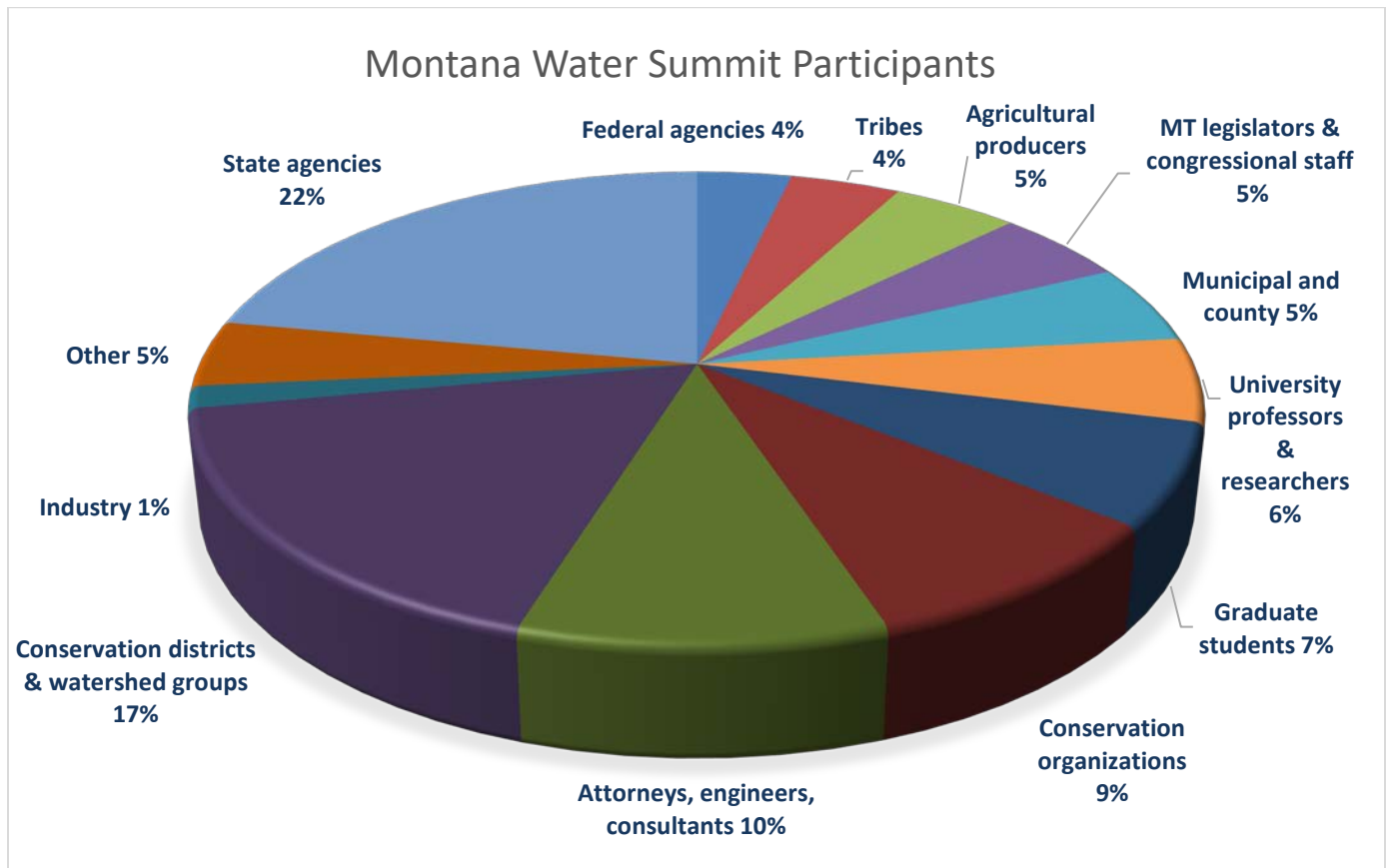


*The audience included scientists, landowners, irrigators, legislators, city officials, state and federal natural resource managers, business owners, conservationists, tribal members, watershed coordinators, conservation district representatives and more.*

Figure 1 depicts participants' general affiliations.

- Approximately 17% of Montana Water Summit attendees represented **community-based watershed groups and conservation districts**.
- **Conservation organizations, attorneys, and engineers** made up 19% of the group.
- **State agency staff** accounted for 22% of participants and **federal agencies** for 3.6%.
- **University professors, researchers and graduate students** made up nearly 13% of the audience. **Agricultural producers, county and municipal representatives and policymakers** all represented 5% of the demographic, respectively.
- **Tribal members** accounted for 4%.

Figure 1: Montana Water Summit Participants



## Speakers' Main Messages

### WELCOME AND OPENING REMARKS

#### Lieutenant Governor Mike Cooney

*State of Montana*

**“Whether you’re a private landowner or affiliated with a municipality or watershed group, all Montanans need to come together to have reasonable discussions about the future of water in our state.”**

– Lieutenant Governor Mike Cooney

**Montana is seeing longer fire seasons**, reduced snowpack, earlier snowmelt and runoff, increased frequency and duration of drought. Remember the drought of 2017 – even in the face of good snowpack – much of the state struggled.

**Our climate will continue to change** and to impact Montana’s water resources – as will changing land use and urban growth.

**Every community needs to put in place an aggressive plan** to address water shortages. We should focus on long-term adaptation strategies.

## Chief Earl Old Person

*Blackfeet Tribe*

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*Chief Earl Old Person of the Blackfeet Nation reminded people to work together to protect water for our shared future.*

**Water is sacred to the Blackfeet.** The future of water is very important.

**We need to realize that we’re all together.** We’re all here for the good of the people. Consider the next generation. We’re not going to take the water with us. We need to protect it for the next generation until it is their responsibility to protect it and so on.

Sang the “Coming Together” song.

**“Water is life. That is why I’m here.”** – Chief Earl Old Person



## WATER IN THE WEST

### Leon Szeptycki

*Stanford University - Water in the West Program*

**There is a false dichotomy in the idea that we must choose between having enough water for fish or for people.** It is possible – if we manage water well – to have enough water for both. It is critical, however, to plan and act now.

This concept is illustrated through the example of California’s water woes:

California faces myriad water challenges due to a population of nearly 40 million people, nine million acres of irrigated agriculture, extreme weather, and an antiquated legal structure (i.e. riparian surface water rights plus appropriative rights; groundwater managed separately from surface water; lack of a statewide framework until recently for groundwater pumping).

**“What we’re starting to realize in California is that cool weather is a thing of the past. Drought frequency will go up due to increasing air temperature as a driver.”**

– Leon Szeptycki

California just came out of a 5-year drought from 2012 – 2017 (worst drought in state’s history). The drought was driven by hot air temperatures. Illustrated by Lake Oroville. Large storage projects can really help in the first 2-3 years of a drought. During longer droughts, you end up having a lot of empty storage space.

The wettest year in California’s period of record was 2016, which was followed by 2017 – the hottest year in the state’s history. Despite having the worst drought in modern history in 2017, California made it through due to:

- 1) Pumping “huge” amounts of groundwater for agriculture. Central Valley groundwater levels plummeted.
- 2) Increased water use efficiency in cities through more wastewater recycling, use of reclaimed wastewater for irrigation, aquifer recharge, and even through exploration of direct potable reuse.

The environment, however, “got crushed” during the drought. Salmon and steelhead populations declined. Only 18% of CA native fish species have stable populations. The state canceled its commercial salmon fishing season.

#### **Key lessons learned from the California Drought of 2017 and illustrated through case studies of the Russian and Yuba Rivers:**

- 1) **Good data is critically important** - To make the right decisions about water use during drought and balancing wet years with dry years, you must have good data about water use and streamflow.
- 2) **Planning is necessary** - Decide what your objectives are during a drought and come up with specific actions to meet those objectives. Don’t wait until the drought begins.
- 3) **Explore conjunctive water use** – Local groundwater storage is an incredibly powerful water management tool during drought (especially when paired with managed aquifer recharge during wetter years).
- 4) **Water transfers can play a key role** - Water markets can play a role in transferring water to where it’s needed during drought.

**Further Reading:** <http://waterinthewest.stanford.edu/news-events/news-insights/false-choice-between-fish-and-people>

## Marco Maneta

*The University of Montana*

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**Introduced the Montana Climate Assessment (MCA)** – released in 2017. The MCA was driven by the needs of stakeholders to help make decisions related to climate and its impacts on agriculture, forests and water in Montana. Available at <https://montanaclimate.org>.

**Western Montana and Eastern Montana differ in terms of climatic influences** (e.g. oceanic vs. continental influences). Winters are colder in eastern Montana, summers are hotter and there is less annual precipitation.

**“This is not modeling - this is what the data say. This is what we’re observing from measurements.”** – Marco Maneta re: observed temperature and precipitation changes over the past several decades

**Observations** (observed trends for the period of record)

- Average annual air temperatures are increasing, but not consistently throughout the year. Summers are getting warmer.

**Projections** (modeled trends using different carbon emission scenarios)

- Average summer temperature will continue to increase.
- Consecutive days without wetting rains will increase.
- Precipitation will likely increase in spring and decrease in summer.

**Crop yields in Montana have generally increased**, but there is variability among counties. Agricultural yields remain strong fueled by good practices and technologies.

Described ongoing research to evaluate crop sensitivities to the changing climate. It takes about 10 months of precipitation anomaly before farmers begin making changes in production (e.g. types of crops planted, amount of acreage planted).

**Eastern Montana has a clear pattern of sensitivity to climate.** The pattern disappears in Western MT. Farmers in Western Montana are not as tied to precipitation cycles as farmers in eastern Montana. Western Montana farmers are much more resilient.

Described a **new, remote-sensing hydro economic tool** that will allow further insight to gain insight on impacts of climate change and agricultural. This involves modeling to anticipate how climate variability, changes in agricultural markets, and changes in water policy are impacting water resources in Montana and anticipate how farmers are going to react to those changes. The model considers streamflow, SnoTel, evapotranspiration and simulates how farmers may allocate land and water.

**Further Reading:** [Montana Climate Assessment](#)

## Patty Gude

*Headwaters Economics*

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### **Montana's Economy is growing at a rate faster than the U.S. average.**

Montana's services economy is growing and so is personal income from non-labor and services. This is largely due to Montana's aging population.

- By 2020, one-quarter of Montana's workforce will be older than 55 yrs.
- This generation (baby boomers) hold 80% of financial assets in the United States and only 20% of them have currently retired.

In Montana only 60% of personal income is from wages – from jobs. The other 40% is from non-labor sources of income such as money made from investments.

**“For every dollar made from jobs in our natural resource industries, there are four dollars in our economy just from investment income.”**

– Patty Gude

**Personal income from non-service industries since 1970s has remained relatively flat.** This is driving the market in interesting ways. The industries that have added the most jobs in the past decades are health care and real estate. This is driven by the demographic changes we've seen in Montana (aging population and population growth).



*Urban growth near Helena as shown in “Montana’s Water Future.”*



**Growth in Montana’s economy is uneven – and mostly in cities.** In some ways, the west is more metropolitan than the rest of the country (89% of Westerners live in cities).

- Two-thirds of the jobs in Montana are in just a handful of counties.
- 53% of Montana’s new home construction from 2000 - 2016 occurred in **Missoula, Yellowstone, Flathead and Gallatin counties.**

**“Whereas our economic growth and population growth has been really concentrated in just a handful of counties, we are seeing incredible sprawl in our residential development patterns and that’s having major impacts on the rest of Montana.”**

– Patty Gude

### **New Home Construction**

- Homes built on large lots are declining
- 60% of homes built on 10-14 acre lots.
- Since 1990, 1.3 million acres of working lands and open space has been converted to housing. This is nearly the size of the Bob Marshall Wilderness Complex.

**“If we can understand the economic and demographic changes that are unfolding, it puts us in a better position to find solutions together.”**

– Patty Gude

Further Resources: <https://headwaterseconomics.org/>

## **John Tubbs**

*Montana Department of Natural Resources and Conservation*

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### **Montana has advantages over other states:**

- Montana is a headwaters state with a relatively low population.
- We still have the chance to learn lessons from other places – like California.
- Montana manages surface water and groundwater as a single resource (based on 2005 lawsuit).

**“We’re facing dramatic changes in climate and how we respond to those changes with policy is going to be critical over the next decades.”**

– John Tubbs

## The Case for Good Data

In 2008, seven leading scientists concluded that “stationarity is dead.” This is the “period of record, average or mean.” If that underpinning is changing in a dynamic way, then how we manage must change in a more dynamic way. We can’t always use the past as a predictor of the future.

DNRC and the Department of Fish, Wildlife & Parks have reduced in-kind funding for USGS stream (about 12 gages recently). Both agencies have suffered budget cuts.

Funding for SnoTel sites is also reduced. And, in Montana, we have a lack of soil moisture data. All data collection sources are being pressed.

**“When you have less money, you have less money to collect data.”**

– John Tubbs

In the future, we’ll have data from NASA satellites that will illuminate water resources in a way we have not yet seen. The capacity to understand water resources in this world is increasing dramatically, but we’ll still need good ground-truthing.

**Changing averages** – Average streamflow and snowpack data changes. Data is reported in 10 – 30-year increments. For instance, the average temperature is increasing, average water supply is decreasing, but we’re reporting these averages in smaller segments of time than period of record.

**Tree rings** can be helpful in examining historic climate and water supply. This helps us understand climate variability over longer periods.

**Population Growth and Water** - Montana is growing and replacing agriculture with people.

One of the hopes of establishing water markets is that they will increase the value of water so that it’s equally valuable to the land. Currently, however, we give away water in Montana through exempt wells.

Referenced “A Ditch in Time” by Patricia Limerick, University of Colorado Professor. Director Tubbs interpreted several “Mistaken Assumptions” about water that Limerick lays out and translated them into a Montana context. **Key points:**

- Water is only one factor of population growth and not always the most important one.
- In Montana, demonizing agriculture or Native American tribes who hold early priority dates and reserved water rights, respectively, is not an effective way to look at solving water issues.
  - For instance, Gallatin Valley irrigators are working to keep water in the Gallatin River. It’s their right to dry it up every year, but they choose not to. It’s out of an ethic of conservation in addition to pressure from various stakeholders in the area.
- Watershed Groups and collaborative efforts make a difference. They provide for critical conversations that bring together agricultural, municipal and environmental interests to plan for drought, for instance.

- Conversion to pivot irrigation caused changes to water resources in valleys that used to see flood irrigation. While center pivots have provided significant improvements in crop production, perhaps we should examine “efficiency” at a basin level rather than only on-farm.

**“In the alluvial valleys of Montana, inefficient on-farm use of water has resulted in cooler and greater flows in August – that’s just a fact. So, what happens when you turn it all into high efficiency center pivots?”**

– John Tubbs

**Storage** - The era of building dams is likely over. Existing reservoir evaporation constitutes the highest consumptive water use in the state.

From a policy perspective, Montana should build in flexibility where stored water can be used. Currently, stored water is tied to a place of use and the process to change that is rigorous. Montana should build flexibility into use of stored water so it can go to any place we can use it. Currently, downstream water users have a right to return flows and can object if that changes.

**Further Resources:** <http://dnrc.mt.gov/divisions/water/management/state-water-plan>

## Q&A and Discussion with Presenters

**How do we prioritize what questions to ask and data to collect?**

- It is hard to make a blanket statement; How much water is being used and where it is going to create a good baseline. This data will help us know the effects of future decisions we make around water management.

**How do we bring people together to address changes (to resources) seen around the state? What questions should we be asking at the statewide level, and what questions are more appropriate for the watershed level?**

- At the watershed level, we should be asking what information is most important to that group. Allowing different groups to define drought and what it means to them.
- At the statewide level, consumptive use, stream flow and other basic data can help in good decision making. Consumptive use being a top priority, because it can be moved/re-allocated.
- There is concern that many rural communities are not seeing the same opportunities. We need to help build resiliency in those communities and ensure that money is coming to them from the state level.
- At the watershed level, we need to manage resources in a way that create opportunity and protect (community) way of life.
- Management and policy, not science, create the difficulty. We need to find a balance between supply and demand, asking, *what do we want to manage for?* There will be different solutions for different objectives, with different levels of risk.

**Without state funding, how can people help DNRC move forward? How do we harness the energy at a basin wide level with watershed groups to support the agencies?**

- (This) Montana Water Summit is one way we harness that energy and reengage Basin Advisory Councils. We need to look to the watershed groups for the future – they’re more powerful than government-appointed models. Local watershed efforts are sustainable, and stakeholders are willing to engage at that level.

**What options are there for growth and opportunities in rural communities?**

- Regarding water, there is opportunity in restoration, but that needs to be sustained by state or federal funding. A pre-requisite for growth is investing in quality of life, through things like broadband internet, clean air, livable communities, etc.

**What is driving certain farmers’ ‘quicker’ response to drought?**

- In Eastern Montana, farmers react sooner because they see a change sooner. It takes longer for farmers to see a change in Western Montana from a precipitation anomaly (usually buffered by irrigation practices), so their reaction time is longer.



*Potato farmer near Toston, MT. “How will Montana’s five-billion-dollar agriculture industry fare in a warmer, more volatile climate? Scientists say it’s risky to generalize too much. Some crops may benefit, but others of great importance to Montana, including potatoes, sugar beets and hay are likely to be significantly challenged as snowpack and streamflow decrease, making irrigation less reliable.” – Montana’s Water Future video*

**What are strategies to recharge groundwater? Regarding the coupling of land-use planning and water management, how do we convince counties to make plans that complement each other?**

- In agriculture, we are looking at what crops can be flood irrigated, which helps with groundwater recharge. Also using natural features like wetlands to manage storm run-off.

- Land-use planners need to talk with water planners. Water supply can limit a city’s growth and creating links between the planners (in different fields, at different levels) is the first step to help with that.
- The subsidence within the San Joaquin Valley is significant. The ground surface has sunk 27 feet because of groundwater use and drought. We need to learn from examples like this and build connection between county planning and water resources.

**How do we become more proactive? What specific advice or tactics do you have for the audience?**

- Agencies did a great job with limited data from the past. We need to build predictive tools to support decision making and help water managers ask, ‘what if?’ Academia needs to link up with policy makers to inform decisions.
- We need to evolve so that everyone is at the table, and that we understand who we are managing for/responding to. We should look for solutions from collaborative watershed groups.
- The next generation is important for evolving ideas. We need to get people talking to other people at a local level. Ecosystem services are important, and the environment will be heavily affected if we don’t pay attention. We need to rid ourselves of the notion of ‘water wars.’ We are in this together, and this is where we need to put our efforts.
- Watershed scale is so important. If we better understand local goals, then we can create a pathway to them. We need to implement planning and frameworks so that our goals hold up against an uncertain future.

**WATER POLICY DEEP DIVE**

**Policy Panel 1: Former Montana Legislators Recount their Roles in Shaping Montana Water Policy and Provide a Vision of the Future**

**Holly Franz**

*Franz & Driscoll, PLLP*

**There are two basic sayings that inform Montana Water Law:**

- 1) **First in Time is First in Right (Prior Appropriation Doctrine):** A person with the earliest water right priority date gets to use water before anyone else does. Purpose of use does not matter.
- 2) **Use it or lose it** – A water right is the right to use water – you don’t own the water – but you have a protectable property right in the use of the water. This concept suggests water is too important to just let it lie around, so if you’re not using it, it can be considered “abandoned.”

**Modern Phase of Water Policy**

1972 – MT Constitutional Convention

1973 – Montana Water Use Act

- Approval from DNRC required for new water use
- Prior to 1973 – you could just put water to use
- Set up an adjudication process for pre-1973 water rights
- Set up a central water right recording process





*Moderator Holly Franz (standing) and Panelists (left to right, including Dorothy Bradley (D – Clyde Park), Steve Doherty (D – Missoula), Lorents Grosfield (R – Big Timber), Chas Vincent (R – Libby)*

## Dorothy Bradley

*Former Montana Legislator (1970s)*

The 1970s marked the “Golden Era of Environmental Legislation,” also known as the Earth Decade, which was all about water. The Montana Legislature was considering the needs of the next generation and holding themselves accountable. That was new.

**“If you ever think it was easy back then, it was not. People worked into the dark of night to make these good things happen. It’s different today because of them – and I want you to be inspired by that. What we all do truly makes a difference.”**

– Dorothy Bradley re: the “Golden Era” of Environmental Legislation in Montana in the 1970s

How did the golden era happen? How did it end? Back then, the stars lined up. There was a vision in that decade that carried forward in the Montana State Constitution. Not many other state constitutions use terms like “grandeur” and “vastness” and “quiet beauty” and then give people the right and responsibility to a clean and healthy environment.

### The Stars that lined up in the 1970s:

- **Philosophy** and ethic of conservation driven by writers like Wallace Stegner and Aldo Leopold.
- **History** – Ross Toole, Richard Rader helped all of us understand why the West has a unique relationship with the federal government and a unique relationship with business.

- **Sticker Shock** – The North Central Power Study and the MT-WY Aqueduct Study highlighted what Montana’s northern plains would become – a “national sacrifice area” with 30+ coal plants, aqueducts, dams on the Yellowstone River.
- **People** – People who talked about institutionalizing the right to know (MT Environmental Policy Act), instream flow, habitat and water quality regulations.
- **Identity** – The Westerner and Montanan identity ran deep.
- **Trust** – Trust in the 1970s was higher than it is now.

**“It has always been clear to me that science is not something that we listen to. I don’t think we yet have a platform for our scientists. I don’t think we are yet forced to listen to our scientists.”**

– Dorothy Bradley

## Steve Doherty

*Former Montana Legislator (1990s)*

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One big issue in that era was the debate over the coal tax. Could the Legislature pass a coal tax today in Montana?

**One of the earmarks of the 1990s legislatures was that they took it upon themselves to “micromanage the managers.”** The legislature decided to “do science.” Legislators are not any smarter than the rest of the world and may not be smarter than scientists and managers who work at their jobs in good faith.

The Legislatures micromanaged water. They determined mixing zones, nutrient levels. They determined what you could or couldn’t say in NEPA. The Legislature set arsenic levels. They deregulated electricity in Montana.

**Another historically significant marker of the 1990s:** When the legislature failed to act, there were citizen initiatives. There was one to ban arsenic that passed. A challenge is that Citizen’s United means you can pour all kind of money into Montana so Citizens’ initiatives often get defeated.

In the future, the MT Supreme Court will likely tell the legislature “what don’t you get?” about exempt water rights.

### **Big picture items to think about regarding Montana’s water future**

- **The Columbia River Treaty** and recognizing that the extra cost for the U.S. and Montana of salmon mitigation will have to be accounted for at some point.
- **Aquatic Invasive Species** – This issue wasn’t high priority in the 1990s. The response of Montana to the threat of AIS (mussels, recently) has been “superlative.” There has been cooperation. Everybody realizes that this is an issue that must be dealt with. The societal consequences of mussel invasion are “incalculable.”

- **Climate** – Higher temperatures, faster runoff, more precipitation in spring, At the end of the day, those are realities.

**“You’d better vote.  
You’d better tell your friends and family to vote...  
Tell them to vote for people who care about rural areas in Montana  
and who do something beyond ‘say’ they care. They might actually  
need to put their money where their mouth is.”**

– Steve Doherty

## **Lorents Grosfield**

*Former Montana Legislator (1990-2001)*

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**Highlighted two water bills during that era.**

### **1) Water leasing for instream flow**

The bill was killed in the 1989 session. MT Stockgrowers and Farm Bureau Federation did not support the bill.

According to Rep. Grosfield, the Yellowstone River had “way too much water” for water quality and instream flows. At the time, the average outflow of the Yellowstone into North Dakota was 9.9 million acre-feet of water. FWP had applied for 8.8 million acre-feet for instream flow. DNRC recommended a reduction to 3.3 million acre-feet. The Board of Natural Resources spent three years working on this issue and granted 5.5 million acre-feet in 1978.

**“I don’t think anybody at the time realized it, but the water reservation process on the Yellowstone River ended up allocating almost all of the Yellowstone River for all time...It didn’t take care of any spawning tributaries because they were largely fully appropriated – and that’s where the water leasing bill went a long way toward helping.”**

– Lorents Grosfield

The water leasing bill provided for instream flow to protect fishery resources. Any lease had to go through the change process. No lease was approved until all objections were resolved. Full amount to be protected could only be amount previously consumed vs. diverted.

- 2) **Water salvage bill** – This bill became a tool for water leasing. If a water permit holder improved his irrigation system or changed his use to be more efficient, that saved water – the salvaged water could be leased to

someone else if it didn't expand the place of use. The act helped implement a water leasing statute. FWP used it several times.

E.g. Mill Creek in the Paradise Valley. Mill Creek water and sewer district upgraded to pipelines. They could then implement two water leases after they did this. FWP leased 6 cfs of water. Another one on Mill Creek – FWP paid the water and sewer district to shut off their irrigation system for 48-60 hours once/year at the right time according to biologists. This allowed for fry in the tributary to flush down to the Yellowstone River and it worked well to support the fishery.

The agricultural community is fairly comfortable with the water leasing process. They're very interested in knowing exactly how a lease is going to be enforced.

Most water leasing has been in spawning-type situations to flush fry down or increase water in spawning tributaries. There are over 10 active leases statewide and several others in negotiation.

## Chas Vincent

*Former Montana Legislator (2007 – 2017)*

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In trying to understand where we should be going with water policy, first we must understand where we've been. One relatively recent pivotal piece of legislation in Montana was Representative Walt McNutt's 2007 bill – House Bill 831. This was a result of a 2006 Supreme Court Case "TU vs. DNRC" recognizing the connection between surface water and groundwater.

Science is important in water policy and should be leading in discussions. We need to "prop up" and support organizations that are focused on providing good data.

### Water Quality

Point source discharges are under the microscope right now. Professionals are trying to find treatment technologies that can keep up with stringent water quality standards. Much stream pollution (e.g. sediment) is from nonpoint sources.

**"[Nonpoint source water quality] standards are going to be here soon... I'm a fourth-generation logger, so it hits me just like it hits anybody with a disc and a plow. We'd better be finding a way through this discussion because it's going to be happening and it's going to be led by the Clean Water Act and the EPA."**

– Chas Vincent

### Exempt Wells

The discussion will be ongoing, but it's something Montana needs to solve. Exempt wells should be allowed, but where they're allowed should be informed by science. Establishing stream depletion zones can be helpful in regulating exempt wells.

In much of Montana, exempt wells are not an issue. We all must remember that under Prior Appropriation, water rights are property rights. How we implement regulatory policies to protect those water rights is critical. The public at large do not believe that exempt wells are an issue facing water in the state. We're going to have a hard time ratcheting that sentiment down unless we are surgical with policies moving forward with exempt wells.

#### **Adjudication and the Montana Water Court**

Montana is almost to preliminary decrees after the adjudication process stalled out in the 1980s. We're now slated to have final decrees by 2028. Yet – we will find ourselves faced with having to update “stale decrees” by that point to reflect changes that have occurred.

We should consider the role of the water court into the future. It's important to have this conversation now.

**“When you start talking to somebody who has never even driven through the Flathead Reservation in their life having to re-adjudicate their entire ranch because of a bill negotiation? The Compact and the CSKT negotiation will be considered one of the greatest failures in Montana’s history if it is not completed in Congress.”**

– Chas Vincent

#### **The Confederated Salish and Kootenai (CSKT) Water Compact**

People are not as informed as they should be about this. Water conversations are not easy to maintain, but they're critical. We need to be talking to each other about this. Senator Vincent was one of the people on the other side of the Compact for a long time, even leading the opposition.

According to Senator Vincent, it's easy to be on the “wrong” side of this issue. It's important not to judge people as many people don't fully understand the issue.

There are 85 basins in Montana, many with decrees that will be ready soon. Two-thirds of these could be reopened if we decide to not ratify the CSKT Compact in Congress and we choose to adjudicate individual water rights in our water court.

People have mortgaged their homes to get through the existing water right process. They would have to go back and do it again if the compact is not ratified.



## Policy Panel 2: Bridging the Divide Between Water Quantity and Quality

### Sarah Bates

*National Wildlife Federation*

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*Sarah Bates of the National Wildlife Federation converses at the Montana Water Summit. Ms. Bates introduced and moderated the water policy panel “Bridging the Divide between water quantity and quality.”*

The systems for regulating water quantity and water quality have developed separately. There is a regulatory and administrative disconnect that poses challenges for states. There is current interest in finding ways to bridge this divide and address the resource more comprehensively.

#### **Water Quantity Regulation**

Early water law focused on the right to divert water from streams to put it to beneficial use. The states assumed the lead and remained in the lead.

#### **Water Quality Regulation**

Water quality concerns arose later and arose as growth and development occurred. Mining waste, industrial waste, sewage and domestic waste. These were originally dealt with locally and inefficacy led to federal regulations, Clean Water Act. Most Clean Water Act provisions are implemented by the state. Parameters have been set by federal law.

**Further Resources:** Net Blue – Water Neutral Growth <http://www.allianceforwaterefficiency.org/Net-Blue-toolkit.aspx>

### Tim Davis

*Montana Department of Environmental Quality*

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### **Policy similarities between water quality and quantity:**

Both water quantity and quality are acknowledged in the Montana Constitution.

- **Quantity:** Prior Appropriation Doctrine leading to the Montana Water Use Act
- **Quality:** “Right to a clean and healthful environment” leading to the Montana Water Quality Act and Sanitation and Subdivisions Act.

### **Policy differences between water quality and quantity**

**Quantity:** Montana is primarily a claims-based system. There is no requirement for water measurement. A small number of water rights have measurement requirements.

**DNRC** does not consider water quality when going through the change process. Only when there’s an objection that says that there’s a water quality impact. This results in developers getting mixed messages from DEQ and DNRC regarding whether projects can go forward.

**Quality:** State has authority under Clean Water Act and Safe Drinking Water Act – carry certain requirements for measurement that feed into federal databases. EPA retains continued oversight for DEQ’s work including establishing new water quality standards, TMDLs or water quality planning. Definitions of beneficial use differs depending upon whether it’s used in a water quality or quantity context.

**DEQ** does not look at beneficial uses (quantity) on a stream to consider what uses need to be protected.

### **Late-season flows**

- DEQ looks at lowest flow scenario when calculating standards for a permit. This is the time when the assimilative capacity of the stream is at its lowest. This is also when water rights are at their peak demand for over-appropriated streams. This is also when impacts are greatest on aquatic life. These aren’t tied together even though we use some of the same analyses or “pinch points.”

### **Economics**

The economics of wastewater treatment can make it too expensive to discharge even though that would benefit late-season flows. DEQ does not tell people how to treat water – they just provide standards. A discharger will often use cheapest, easiest ways to meet standards. This may result in land application of water compared to discharge to a surface water source, which can have negative streamflow implications.

**Further Resources:** <http://deq.mt.gov/Water>

## **Adam Schempp**

*Environmental Law Institute*

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### **Pressure Points**

**Wallop Amendment** – Added to the Clean Water Act (CWA) in 1977. The CWA cannot supersede state authority over water quantity allocation and water rights. Yet, the Wallop Amendment has been interpreted as more protective of state authority to allocate water vs. individual water rights and some amount of interference with individual water rights is acceptable to protect water quality.

Montana Code Annotated §75-5-705 reads “Nothing in [the Water Quality Assessment] part [of the water quality statute] may be construed to divest, impair, or diminish any water right recognized pursuant to Title 85.”

**Further Resources:** <https://www.eli.org/research-report/confluence-clean-water-act-and-prior-appropriation-challenge-and-ways-forward>

## ADAPTATION AND THE WAY FORWARD

### Shawn Johnson

*University of Montana Center for Natural Resources and Environmental Policy*

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#### **Recapped Day 1 of the Montana Water Summit.**

On Day 1, we:

- Examined how climate change and a growing economy are shaping our future.
- Considered how predictive modeling can stress test the State Water Plan against an uncertain future
- Revisited the breadth and depth of Montana water policy including mixing zones, exempt wells, water compacts, exempt wells...exempt wells...
- Challenged assumptions (i.e. appreciated the complexity of water management).
- Explored opportunities to connect conversation across the water quality/quantity divide.

Over 300 people (water users, managers, researchers, students, agricultural producers) are in attendance. Connecting people and building knowledge - That's how good things get done. It will take all of us being involved with our creativity and experience.

#### **An appropriation of Dorothy Bradley's "Stars" Concept from Day 1:**

- **Identity** - Montanans, westerners. That identity is important in shaping our role.
- **Connection** – a shared philosophy. What is our land/water ethic today? What are the underpinning values in the way we think about the land and water we depend upon and how we relate to it?
- **History** – Looking back on milestones and key events in Montana's history. Understanding the past is critical to navigating the future.
- **People** – Having the right people involved – the people with vision and leadership. Connecting across generations is important.
- **Science** - We need to find a way to integrate science, information, tools, innovation to help inform our decisions in a way that matches our values and helps us make comprehensive decisions.
- **Trust** – Especially when we disagree. To have great debate. To find the path forward.

### Lara Hansen

*EcoAdapt*

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"There is no box." – Amory Lovins

"The future ain't what it used to be." – Yogi Berra

With stationarity being dead, there really was no box. Stationarity is dead, yet this provides an opportunity for creativity.

**“The way you think about water systems in Montana - a lot of the assumptions that were part of how models were created, how management was designed really aren’t true anymore - if they ever were.” – Lara Hansen**

We really need to start thinking about how we engage in management decisions, policy decisions, personal decisions with the understanding that “there is no box.”

**Mitigation** – Reducing causes of climate change.

**Adaptation** – Responding to, preparing for and when possible, reducing the effects of climate change.

## Panel: Montana Adaptation Vignettes

### Mike Gaffke

*Association of Gallatin Agricultural Irrigators (AGAI)*

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*Mike Gaffke – as profiled in the Water Summit follow-up video “Montana’s Water Future” - discussing water as a critical community resource – especially in the rapidly changing Gallatin Valley.*

The Gaffke Ranch sits in the “Bozeman Triangle” in the middle of Bozeman, Belgrade and Four Corners.

Mike is the Director of Lower Middle Creek Supply Ditch Company that fulfills water rights with an 1872 priority date. The Ditch Company used to have a quorum at a local cafe on Saturday morning because ditch company membership was 10-12 ranchers. Now, it’s golf courses, developments, LLCs, subdivisions. This has been a tremendous change. For example, formerly flood irrigated agricultural lands have been converted to 100-house subdivisions with either exempt wells or service from canal companies for irrigating landscaping and lawns. This has changed the hydrology of the area – in addition to how the ditch company operates.

**“If I think of water as a ‘community commodity,’ then all of a sudden, change is a little bit less scary. If I have a diverse community working with me and for me, then I’m a little bit less apprehensive of what change might mean in the future.”**

– Mike Gaffke

Water is a “community commodity” in that the whole community has a shared interest in what happens with water. A community is a group of people with a common interest – water is a common interest among everyone in the Gallatin Valley and provides a common link between diverse groups (e.g. anglers, ranchers, municipal residents). There is common interest among community members in viability, sustainability, which brings everyone together.

In the Gallatin, it’s important to understanding the history of water development – the water infrastructure was created to support agriculture. The hydrogeology of the valley is unique. There’s essentially a big “gravel bathtub” surrounded by snow-covered mountains. Water is “perishable” as there’s not much storage in the valley. Irrigators work proactively to keep the Gallatin River “wet.”

Water marketing is a concept they’re exploring in the Gallatin.

**Further Resources:** <https://www.agaimt.com/>

## Kevin Hyde

*Montana Mesonet*

Montana Climate office was established 15 years ago. Realization that Montana needed a more intentional focus on climate science. In 2016, the Climate Office started to build out the Montana Mesonet with seed money.

The Mesonet addresses a need for soil moisture data. It’s a cooperative, partner-driven climate observation system with five components: stations, the network of stations, the data, data analysis, integration and dissemination of data through tools (e.g. crop demand information), a education.

Montana is so climatically diverse that we need a high density of observation stations. It’s not enough to rely on National Weather Service reports which provide core regional climate information. The idea of the Mesonet is to fill in the data gaps.

In 2016, there were 12 stations. There is funding for 30 more in 2018.



The goal is to have 150 stations across the state representing different biophysical regions in each major watershed. To deliver data, there are web-based tools reporting information from the 23 currently active, Mesonet stations that have internet connectivity.

**“A critical education component for us is learning what it means to unpack all these (Mesonet) data we haven’t had before. What does it mean to teach how we interpret these data...and give you sensible information on which you can make decisions?”**

– Kevin Hyde

Mesonet stations collect data on **atmosphere** (rain, solar intensity, windspeed, temperature, relative humidity, barometric pressure, lightning strikes), **soil information** (volumetric water content, temperature, electrical conductivity at four different depths), **vegetation** NDVI sensors).

So far, the program has been funded opportunistically, but it will be carried forward not by top-down funding, but by partnerships.

**Further Resources:** <http://climate.umt.edu/mesonet/>

## Germaine White

*Confederated Salish and Kootenai Tribes (CSKT)*



*Germaine White – as profiled in the video “Montana’s Water Future” - discussing the importance of knowing where our water comes from and coming together to take action.*

**Tribal history** – The CSKT are bands of Salish-speaking people and one band of Kootenai people on the Flathead Reservation in NW Montana. These people have lived 12,000 years in one place – for 36 or more generations.

CSKT negotiated the Treaty of Hellgate in 1855 in which tribes reserved lands for themselves, which reflects their sovereignty. The tribe entered into a consent decree with Atlantic Richfield Company for damages to Silverbow Creek in the Upper Clark Fork – part of their original territory.

With the damage settlement, the Tribe decided to actively and passively restore the Jocko River on the Flathead Reservation to benefit native Bull Trout. A feasibility analysis examined where the Jocko had been injured by infrastructure, livestock grazing, timber harvest, commercial development, etc. and informed the project.

The project also included an important education component called “Explore the River.”

**“This project...is all about reciprocity and the fundamental relationship that we (CSKT) have with the natural world. It’s different than sustainability, that notion that you develop or extract while enough of the resource remains for future generations. This is about the resource really being the source and the gift.”**

– Germaine White

**The Explore the River education project included:**

- A children’s storybook called “Bull Trout’s Gift” focused on bull trout and their need for cold, clean, connected, complex waters.
- A DVD that is being transferred to the web. It’s a science primer discussing history, culture, habitat, fish, hydrology over a century of change. The education program is framed by the tribe’s cultural values (e.g. reciprocity, which is a fundamental relationship the tribe has for the natural world).
- A field journal to encourage direct observation.

**Further Resources:** <http://www.csktribes.org/natural-resources>

## Frank Greenhill

City of Bozeman

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*Frank Greenhill (center, in white) interacts during the adaptation workshop. Mr. Greenhill presented on the city of Bozeman’s stormwater management program and drew a laugh when he suggested permeable pavers are “not a new technology.”*

### Drivers of the City of Bozeman’s Stormwater program

#### Manage stormwater quantity and mitigate flood risk through:

- Pipe repair and replacement
- Maintaining aging infrastructure – flushing stormwater mains, cleaning inlet sumps and manholes to ensure proper system function and directing stormwater runoff from the street.
- Regulating development and ensuring new developments use green infrastructure to manage runoff.

#### Improve the quality of stormwater runoff:

- Stormwater picks up sediments, oils, waste, trash – anything on the road winds up in the creek.
- In-line treatment to remove sediment before it is discharged into local waterways.
- Construction site regulations

#### Comply with regulations:

- Stormwater is a point-source discharge and is regulated by MT DEQ under the Clean Water Act.

**Permeable pavers (Concrete interlocking pavers)** – A tool for stormwater management to help manage water quantity, quality and comply with regulations.

#### Permeable pavers are:

- **Simple:** Water falls onto the concrete blocks and flows between them onto a highly engineered, coarse subgrade with a known storage volume. Water is stored temporarily until it infiltrates into native soils.
- **Widely useful:** These can be used anywhere you’d typically use hardscaping (asphalt or concrete) - patios, streets, alleys, parking lots.

- **Good for water quantity:** benefit is they're infiltrating rainfall, snowmelt. There is no runoff. This mitigates flood risk naturally.
- **Good for water quality:** Infiltrates pollutants and improves water quality.
- **Cost effective:** Use of pavers reduces size of stormwater infrastructure (pipes, inlets, retention ponds).
- **Better in winter:** No ponding or freezing of snowmelt on pavers, no need for salt or sand in winter.
- **ADA Compliant and H-20 load rated:** ADA compliant and H-20 weight rated to allow heavy trucks and emergency vehicles to drive on them.
- **Aesthetically pleasing**

**“There are a few barriers we’re trying to break down, just because this is new to Montana even though it’s a 2,500-year-old technology. We’re trying to lead by example... We’ve got great support from our (city) commissioners all the way down and we’re grateful for that.”**

– Frank Greenhill re: permeable paver use in Bozeman

#### **Misconceptions about permeable pavers:**

- **New technology?** Permeable pavers are not a new technology – they’ve been used for thousands of years. (e.g. in ancient Rome). They are just being constructed differently with the engineered subgrade.
- **Expensive?** The installation is a bit more expensive compared to traditional hardscaping, but the cost savings benefit occurs due to reduced stormwater infrastructure (pipes, inlets, retention ponds).
- **Hard to maintain?** Maintenance is not more difficult – just different (shoveling) than the typical use of sand and salt. Once every year or two years, vacuuming is required to clear out joints between pavers.
- **Limited in cold weather applications?** Research shows 99% infiltration rates and no ponding or refreezing of snowmelt.

The city is considering developing a grant funding program that developers could use to help offset the cost of installing permeable pavers.

Visit Bozeman to see the demonstration project at city hall – as well as larger developments in the works.

**Further Resources:** <https://www.bozeman.net/government/stormwater>

## **Danika Holmes**

*Montana Department of Natural Resources and Conservation*

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Human activity is causing a less predictable and warmer climate. For Montana, this is a shift in timing of runoff and more precipitation as rain in late winter/early spring. This is compounded by population growth.

Traditionally, water storage is viewed as concrete or earthen dams/reservoirs. Very important in maintaining manageable streamflows in river systems. They are constructed with people in mind.

**Natural water storage** as defined by the World Resources Institute is “the strategic use of networks of working lands, working landscapes and other open spaces to conserve ecosystem values and functions while providing associated benefits to human populations.”

In Montana, this definition highlights retention of rainwater and earlier snowmelt. Elongating the period. The emphasis here is to extend the availability of water as a means of promoting ecological vitality first, but in a way that also benefits us.



*Musselshell River Basin rancher, Bill Milton, discusses adaptation with the audience and presenters during the “Montana Adaptation Vignettes” discussion.*

**Natural storage locations** - Existing and restored natural systems such as floodplains, riparian areas and wetlands.

**Functions** – These systems act as sponges to absorb excess floodwater, slow high velocity runoff and promote groundwater recharge, and slowly release water as late season return flows when need is greatest.

**“People, of course, are already restoring wetlands and floodplains, but when reframed like this [as natural storage], the storage component of these systems is brought to the forefront – and they can be seen as just another type of reservoir.”**

– Danika Holmes



The crux of this approach is reconceptualizing water storage and water infrastructure as the interplay between complex physical features, landscape dynamics, human water use and the revolving suite of regulations and technological advances in human water use that influence the retention and re-release of water over time.

A great example in Montana is beaver mimicry, which involves creating deformable structures that mimic services provided by beavers, reducing downstream sediment loads.

In incised streams, floodplains are perched above. This results in a decrease in residence time of water in basins that historically had impressive wetlands and beaver populations. Earlier spring snowmelt can seasonally interact with floodplains (water is stored, soaked up and drained later on) in healthy systems.

Natural infrastructure – revives historic wetland and riparian ecosystem, promotes aquifer recharge, floodwater attenuation, late season water availability.

## Brant Oswald

*Fishing Outfitters Association of Montana (FOAM)*

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*Brant Oswald – as profiled in the Water Summit follow-up video “Montana’s Water Future” - discussing impacts to the flyfishing outfitting industry from low flows and higher late season stream temperatures.*

### **Challenges the fly fishing outfitting/guiding industry is facing:**

- Earlier runoff
- Lower peak runoff
- Higher water temps by mid-to-late season



- **Sharing resources with other water users (e.g. agriculture and municipalities and non-fishing recreation) – much more pressure** on the resource from recreation over recent years.
- **Impacts from invasive species** (e.g. PKD on the Yellowstone River that caused a die-off of Mountain Whitefish and river closure in 2016)

**“One thing that has changed in our lives dramatically...is to recognize the number of recreational water users that are out there that don’t have any intention of catching a fish.”**

– Brant Oswald

- **Adaptation in the fly fishing outfitting/guiding industry:**
- **Changes in seasonal scheduling** – the fishing season has changed from what it was 20 years ago. August used to be the most popular month to fish in Montana. Now, guides across the state are booking fewer August trips often due to low flows and hoot owl restrictions. Guides are also booking (and discounting) March/April/May trips because they’re often dealing with rain instead of snow and there is less pressure on the resource.
- **Changes in daily scheduling** – Providing a full-day fishing trip for clients when hoot owl restrictions are in effect, requires getting up very early in the morning. Now, it’s common to start a fishing day at 5 or 6 a.m.
- **Improved and timely communication with clients** – Clients are waiting longer to book trips depending upon what the weather, streamflow and regulatory conditions are in a given month or week. Booking used to be a long process by mail and telephone, now people expect to book guides via smartphone immediately. This requires guides to be more communicative more often.
- **Closely monitoring flows, temperatures to anticipate restrictions and closures** – With marked variability within a season – from flood to drought – guides are now having to pay closer attention to water supply and timing and communicate that information to clients.
- **Diversifying client experiences** – In response to changes in water temperature, flow regimes and increasing use, some guides are trying to diversify the fishing experience through changing their business models. This may involve fewer day trips, moving to private water (e.g. spring creeks), more overnight camping trips, and targeting different species (e.g. smallmouth bass on the Yellowstone River).
- **Educating guides to be stewards of the resource, educators and citizen scientists** – FOAM is working with several partners on the “Guides for Conservation” training program to educate guides and make them better stewards of the resource.



**Figure 3:** Word Cloud of audience responses to “What can you do to improve Montana’s water future?”



**Panel: Does irrigation efficiency equal water conservation? It’s complicated.**

An in-depth look at what we mean when we use the terms irrigation efficiency and water conservation- and how those are considered from different perspectives and at different scales. Panelists included a producer/irrigation district manager describing changes that he has seen on the ground; an experienced field hydrologist to provide insight on the hydrologic considerations of changing from flood to sprinkler irrigation; an FWP biologist and Endangered species coordinator covering the interplay of irrigation systems and fisheries; and a regional water manager discussing the administration of water rights for irrigation, conservation and habitat.

**Allen Martinell**

*Lima Water Users*

**Producer and irrigation district manager account of practical application of different irrigation methodologies**

The Centennial Valley has been historically flood irrigated, which is very important for slowing and storing water in the valley. This stored water provided later season flows into the Red Rock River and down to the Beaverhead. But flood irrigation takes a lot of human labor, which is becoming more difficult to find and hire. Many producers are converting to center pivots for ease of operation and because they often divert less water. Pivots allow for automated systems that you can manage from your smart phone. The precision, accuracy and ability to manage remotely makes it easier to be more “efficient” with water and its delivery. But as more producers are converting to pivots, we have noticed a change in the groundwater and some of the wetlands and wet areas are not as common.

**Mike Roberts**

*Montana Department of Natural Resources and Conservation*

To frame the discussion, it is important to understand many of the terms that are commonly used or misused in conversations regarding irrigation efficiency and water conservation.

**Consumptive Use:** Water used by a crop through evapotranspiration

**Evapotranspiration:** Loss of water from soil evaporation and transpiration of plants, i.e. plant use

**Irrecoverable Losses:** Direct evaporation from static water, wind drift, etc.

**Return Flow:** Diverted water applied to the field that seeps into ground and returns to the source

**Seepage:** Diverted water that leaks through the bottom of the ditch.

**Tail Water:** Diverted water that is not consumed and returns to a surface source.

**System Efficiency:** Water Consumed by the Crop/Diverted Amount

**Water Conservation:** Sustainable management of water to meet current and future demands, preservation and protection of water, consuming less water.

**Summary:**

Increased efficiency can lead to: Increased consumptive use, decreased return flows and decreased diverted amounts. Diverted amount is not the same as consumed amount and water rights are based on historic consumptive use. Thus, we must consider the management objective and the temporal and spatial implications.

## Travis Horton

*Montana Department of Fish, Wildlife & Parks*

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### Irrigation Practices and effects on fisheries

**Several examples:**

- **Bean Lake**-Stocked and managed for trophy rainbow trout, augmented by leaky irrigation ditch, but changing irrigation system lowered the lake, becoming too low to support fish.
- **Prickly Pear Creek**-Important spawning tributary to the Missouri River. Diversions for flood irrigation of 130 acres dewatered the lower creek, impacting fish populations. Converted irrigation to pivots, reducing diversion requirements and decreasing the dewatering.
- **Poindexter Slough restoration project**- goal was to improve flows and increase habitat. Historic side channel of the Beaverhead River supporting former flood irrigated system. Many producers had converted to sprinklers, decreasing the return flows and increasing temperatures. Multi-partner community project restored channel width and depth to increase flows and decrease temperatures.

**Summary**--There is no one-size fits all with water conservation. It is possible to improve irrigation and habitat simultaneously if we all work together to develop creative solutions.

## Bryan Gartland

*Montana Department of Natural Resource and Conservation*

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### Water rights and Policy Overview:

- Good scientific and first-hand accounts, but what do the rules and law say?
- Water Law vs. Hydrology / Water Science
- "Stationarity is dead" - Tubbs
- Scale of observation and consideration
- Diversion vs. Consumption
- Conservation vs. Efficiency

DNRC implementation of Montana Water Use Act – ***“protect existing uses and promote adequate future supplies of water.”***

**Change process fundamentals:**

Montana Water Court adjudicates pre-1973 water use claims

DNRC reviews new water right and change applications:

- Water right elements (MCA) that require a change application
  - Change in place of diversion and place of use, period and beneficial use
  - Does not include a change in irrigation method
  - Statutory law and ***pertinent*** case law
  - Diverted volume vs. consumptive volume
- Historic Use: considered the amount of water historically consumed
  - Pre-1973 snapshot – most pivots were installed more recently
  - “Haircut” concept – beneficial use is the ***“basis, measure and limit of a water right”***
- Support from DNRC Hydro Sciences, MBMG, USGS
- ***Changes cannot have an ADVERSE EFFECT on other water users***

**Challenges:**

- Senator Vincent’s comments on the change process were spot on
- ***Paradox*** - Water Use Act allows for an increase in consumption, and requires DNRC to consider adverse effect
- Water Law vs. Water Science

**Summary:**

Center pivots are a great water management tool. However, we must use a holistic approach and be mindful of the basin-scale implications when changing irrigation methods and efficiencies, as well as considering the adverse effect to property rights and public resources.

**CLOSING REMARKS**

**Bill Yellowtail**

*Rancher, Former State Senator*

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- We need to plan for change
- We cannot build a plan that allows us to declare victory, ever
- We all need to be at the table for the long term
- What does “community commodity” mean when we have water rights that are private property?
- In Montana we are experiencing changing demographics. Younger generation should be informed by history, not constrained by it.
- Be innovative, it is your creativity that we are counting on, it is our most powerful tool.

**Participant Survey Results**

The following summarizes feedback to open-ended questions from an online survey sent via email to all 300 Montana Water Summit participants approximately two weeks after the Summit. The survey response rate was around 27%. Responses were aggregated by category (bold) with specific feedback bulleted. Quotes are as they appeared on the survey.

**Post-Summit Survey Question:** What is **one significant next-step action** you'd like to see at the state (executive, legislative) or community level to address the water-related challenges (growth, development, climate change) presented at the Montana Water Summit?

## Climate Action and Adaptation

**“I think more communities need to discuss climate action plans or water storage plans – not just the biggest cities in the state. They know they depend on water as well.”**

– Montana Water Summit Participant

- **Create** a state climate change adaptation plan.
- **Consider** climate change mitigation when regulating growth and development (e.g. a tax associated with homes greater than \$0.5 million to support mitigation efforts).
- **Establish** a funding program (legislatively) for projects that address climate change resilience for our water supply and quality.
- **Develop** fishing adaptation strategies from outfitters for local angler groups.
- **Fund** the State Water Plan
- **Advance** education at the community level about climate change, snowpack, water threats, adaptation and opportunities.
- **Craft** a training, document or website (or all three) to explain best management practices for drought resiliency with practical advice for implementing and funding those practices; a how-to guide.

## Collaboration

**“I would like to see a more cohesive approach between city and county governments in terms of water saving programs. Water doesn't care about civic boundaries.”** – Montana Water Summit Participant

- **Encourage** policymakers to incorporate feedback from the scientific community.
- **Educate** water users related to the complexity in water management.
- **Collaborate** with watershed communities as an answer to climate change.
- **Bring** more communities together to address issues collectively, rather than continuing to see different uses and users as “other.”
- **Improve** interaction between conservation districts, agencies and landowners in initiating water conservation projects
- **Bring** the agricultural community together with tourism and fishing industries to work cooperatively on water issues.
- **Encourage** state agencies to work more closely with Tribes to address challenges that all our governments face.



- **Enhance** involvement with Montana tribes.
- **Coordinate** a conservation effort showing how everyone in a basin is connected and how each participant can help conserve this most crucial of resources (tribal, ag, municipal, private, etc.)

## **Community Engagement, Watershed Groups and Capacity-Building**

“To ensure the capacity to be engaged in the ‘water game’ in an effective and sustained manner, **watershed groups need strong, well-trained, motivated and well-funded coordinators and staff.**” – Montana Water Summit Participant

- **Direct** more state funding toward watershed groups.
- **Keep talking** and listening to landowners so their input is given as much or more consideration as the environmentalists
- Increase community engagement and connections made at a personal level.
- **Reconvene** Basin Advisory Councils
- **Initiate** focus groups - made up of a cross-section of individuals like those in attendance at the Summit - to provide legislators information on water-related challenges and solutions.
- **Transition** younger people into water-related jobs in agencies as older people with institutional and on-the-ground knowledge are leaving.

## **Data Collection, Stream Gaging and Monitoring**

“**More data! Data-driven decision-making is key to effectively managing our water resources,** but funding for data collection seem to get cut often, indicating that the importance of data collection is not prioritized as it should be at the state level.” – Montana Water Summit Participant

- **Collect** good baseline data.
- **Legislate** funding for stream gages, SnoTel sites, weather stations and other information systems.
- **Secure** and sustain funding for a targeted gaging station infrastructure for the state.
- **Study** and update evapotranspiration rates for various plant communities
- **Tax** recreation or resort cities and towns to gain revenue from the millions of visitors Montana receives each year.

## **Exempt Wells, Land Use Planning and Growth**

“With so many new landowners and developers salivating to dip their straws in the exempt well option, **I’m worried Montana will find water has been overallocated,** leading to further legislative and judicial wrangling.” – Montana Water Summit Participant

- **Address** the subdivision/exempt well problem; dig fewer wells.
- **Allow** local planning boards more regulatory authority with exempt well approval
- **Encourage** communities to gather information on exempt wells
- **Examine** number of wells and withdrawal estimates for exempt wells

- **Institute** a compliance department at DNRC for exempt wells, provide standards for measurement, and review exempt wells yearly.
- **Give** local planning boards “more teeth” in regulating exempt wells.
- **Merge** land use development with water use at the state level (similar to Q6).
- **Slow** urban growth
- **Inhibit** growth through more zoning.
- **Enforce** stronger connections with local land use and water planning, including zoning and enforcement.
- **Include** water availability as a rule in growth planning.
- **Enable** communities to legally further restrict growth to address water limits.
- **Legislate** that development does not out-pace water resources.

## Restoration

- **Promote** policy and financial support for beaver relocation as a restoration tool
- **Close** trapping temporarily in watersheds to allow large, stable colonies of beavers to develop and expand

## Water Management and Use

“I would like to see our leading cities take on conservation in real, meaningful ways. There are lots of lessons from larger states that can be implemented here before bigger problems occur.” – Montana Water Summit Participant

- **Engage** urban land managers in soil health and water management.
- **Encourage** municipalities to implement payment for ecosystem services (such as a small added fee on a water bill) to pay for protection and restoration of water sources
- **Educate** people about water efficiency so they understand that 1) one cannot increase consumptive use of their water right and 2) we are dealing with a limited resource that is owned by the state of Montana.
- **Develop** local drought response plans and county stream and lake development buffers.

## Water Measurement

“Montana needs to join the 21<sup>st</sup> Century and start measuring water. We’ve got to overcome the cultural resistance to it.” – Montana Water Summit Participant

- **Require** all public water systems to install meters in ten years.
- **Require** water measurement for all diversions
- **Reduce** the timeframe for review and approval of water rights changes to 60 days or less.

## Water Rights and Water Policy

“Growth planning must include water availability and **no water rights should be exempt from filing**. All water users should file on water they use.” – Montana Water Summit Participant

- **Address** water rights considering earlier release of snowpack.

- **Allow** more flexibility in water law, such as mobile appropriation periods.
- **Remove/separate** water rights when agricultural land is converted to subdivisions
- **Streamline** the water right change process.
- **Uncover** opportunities on private lands to use water for public benefit (e.g. fish and wildlife, wetlands, storage).
- **Recognize** that statute and/or policy may negate what is trying to be accomplished
- **Update** water rights policy to address realistic needs (e.g. floods requiring changes to points of diversion, ability to change beneficial use for natural water storage)
- **Amend** water rights so they align with amount of water available and not an absolute volume.
- **Discuss/establish** a water bank/trading system.

## Water Storage

- **Create** a statewide water storage plan
- **Promote** natural water storage (e.g. increased infiltration, hyporheic storage, etc.) through legislation.
- **Explore** recharge methods for groundwater.
- **Encourage** permeable surfaces and on-site natural storage methods in cities.
- **Make** good use of what water we have and make people aware of the true water problems in the West.
- **Invest** in providing hydroelectric power from non-powered dams across the state.

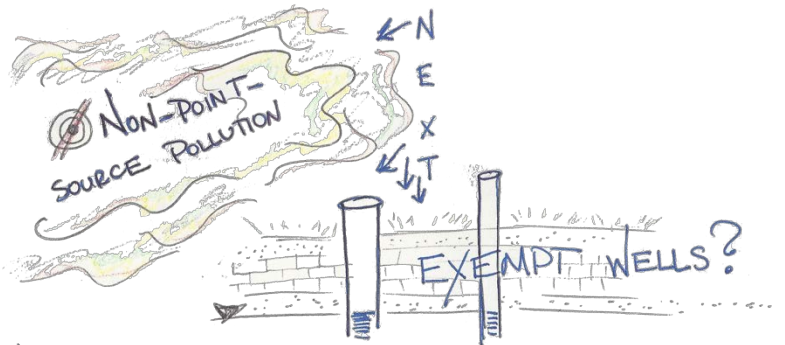
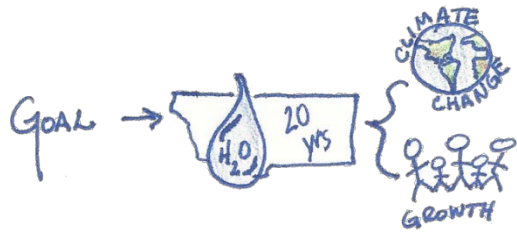
## Water Quality and Integration with Water Quantity

**“I would like to see water quantity AND quality addressed in the same legislation.**

Separating the two only leads to frustration on the ground and a mixed message from the departments charged dually with water conservation at the state level.” – Montana Water Summit Participant

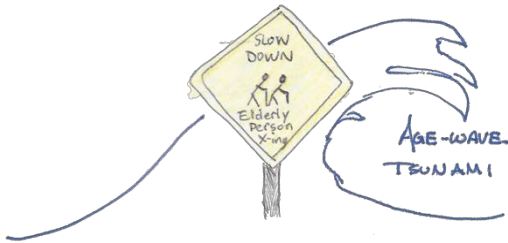
- **Include** water quality as a beneficial use.
- **Revise** water rights change procedures to streamline the process and stop discouraging users from filing changes (e.g. don’t open up their entire water right to objection for simply moving a point of diversion).
- **Create** a stronger coupling between water quantity and water quality policy and administration.
- **Require** recipients of grants and loans for projects that include water conservation and/or water quality improvement measures to monitor, document and report the efficacy of those improvements (e.g. how much water has been returned to Montana’s rivers by water conservation projects funded by DNRC?)
- **Compel** the executive and legislative branches to direct state agencies (DNRC, DEQ & DFWP) to co-manage for water quality and water quantity.
- **Encourage** planning and projects that address water quality and water quantity together.
- **Address** non-point source pollution through funding and legislation
- **Encourage** water recycling/purification plans. There isn’t a town of any size in Montana that hasn’t had a drinking water “problem” over the past generation.
- **Put** everyone on the same playing field regarding MS4 permitting.
- **Make** progress on addressing non-point source pollution.

The Montana Water Summit— sketches from a graduate student's notebook:  
 Sketches by Chelsea Leven, University of Montana



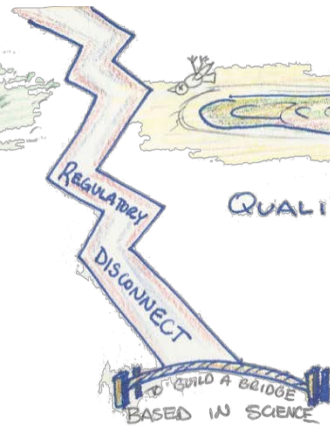
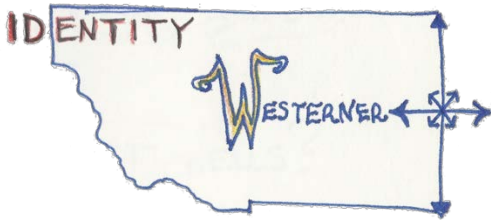
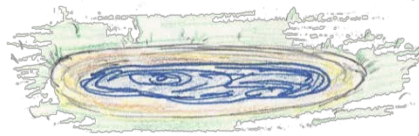
"WATER IS SACRED"  
 "WATER IS LIFE"

GROWTH IS UNEVEN



- #1 Healthcare
- #2 Real Estate

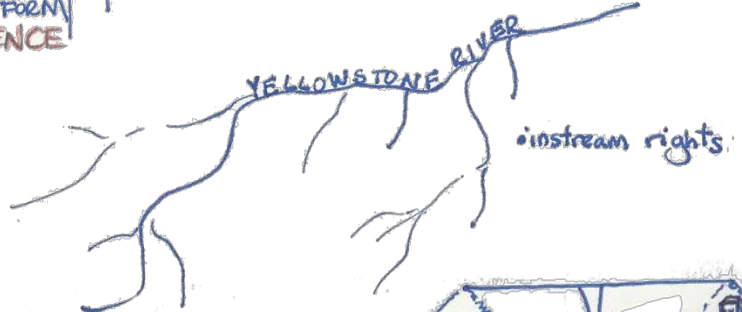
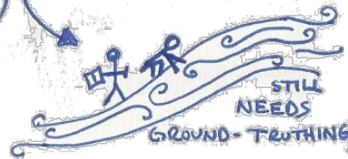
Legislature  
 Micro-Managed  
**SCIENCE**



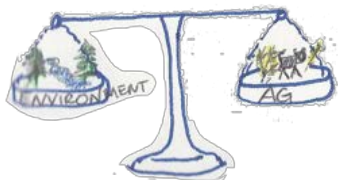
DATA  
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MORE & BETTER than EVER IN HISTORY



Water Court?



\*improve flexibility in how we use stored water



INITIATION to WATER Policy:...



TURN OUR IDEAS INTO SOLUTIONS