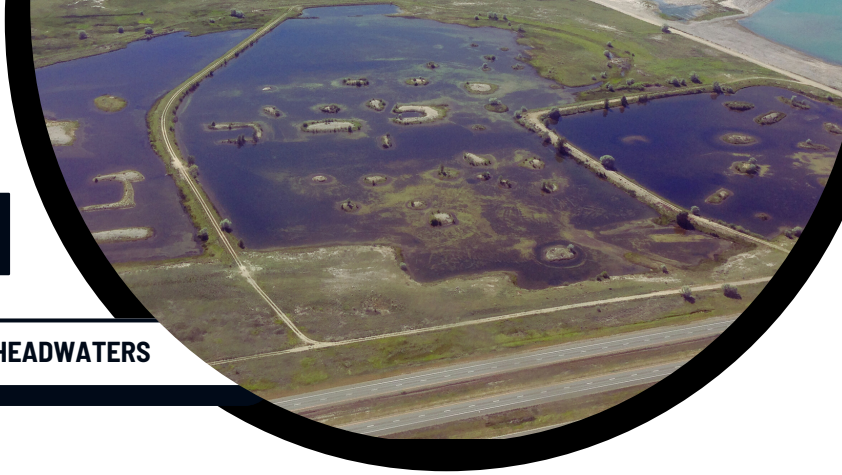


CLARK FORK SCIENCE FORUM

GENERATING HYPOTHESES AND EXPLORING DATA GAPS AT THE HEADWATERS



APRIL 24TH, 2024

8:15 AM

CHECK-IN WITH MORNING BEVERAGES

9:00 AM

WELCOME AND INTRODUCTIONS

9:15 AM

KEYNOTE

Douglas Martin, NRDP

10:00 AM

BREAK

10:15 AM - 12:15 PM

SESSION 1: ABOVE THE WARM SPRINGS PONDS

Marty Sutherland, Moderator

Mark Thompson, Montana Resources 10:15
Berkeley Pit Water Treatment and Discharge Pilot Project

Gary Icopini, MBMG 10:30
Water Quality Changes in the Berkeley Pit, Butte MT

Caleb Uerling, MTFWP 10:45
Trout movement patterns and use of Silver Bow Creek and tributaries: an unfinished success story

Q&A 11:00

Break 11:15

Panel discussion on hypotheses & data gaps 11:30

12:15 PM

LUNCH

1:30 PM - 3:00 PM

LIGHTNING TALK SESSION

3:00 PM

BREAK

3:15 PM

LANDOWNER PROJECT NARRATIVES AND
STORYTELLING

4:30 PM

TRAVEL TO THE FINLEN

5:00 PM - 7:30 PM

POSTER SESSION AND SOCIAL

THANK YOU TO OUR SPONSORS:



WESTERN MONTANA
Conservation
Commission



HALEY
ALDRICH



To bring disciplinary scientists together to achieve interdisciplinary synthesis and identify critical hypotheses and data gaps to pursue through future research and collaboration.

CLARK FORK SCIENCE FORUM

GENERATING HYPOTHESES AND EXPLORING DATA GAPS AT THE HEADWATERS



APRIL 25TH, 2024

8:30 AM

WELCOME AND INTRODUCTIONS

8:45 AM

KEYNOTE

Tom Parker, Geum Consulting

9:30 AM

BREAK

9:45 AM-12:00 PM

SESSION 2: THE WARM SPRINGS PONDS

Melissa Schaar, Moderator

Chris Gammons, Montana Technological University 9:45
Geochemical processes in the Warm Springs Ponds

Morgan Case, Trout Unlimited 10:00
Streamflow Impacts of the Warm Springs Ponds: A shallow dive.

Johanna Blake, Madison Foster, USGS 10:15
Overview of historic/present Ponds water quality

Q&A 10:30

Break 10:45

University of Montana Graduate Student Presentation 11:00
Social-Ecological Characterization of the Warm Springs Ponds

Panel discussion on hypotheses & data gaps 11:15

12:00 PM

LUNCH

1:30 PM - 3:30 PM

SESSION 3: BELOW THE WARM SPRINGS PONDS

Nathan Cook, moderator

Chloe Zampetti, University of Connecticut 1:30
Spiders as sentinels of mining contamination in the Clark Fork River, MT

Travis Schmidt, USGS 1:45
The Ecological Health of the Clark Fork River, 30-year retrospective

Trevor Selch, FWP 2:00
Quantifying Toxins to inform Fish Consumption and identifying sources of pollutants in the Upper Columbia River Basin

Q&A 2:15

Break 2:30

Panel discussion on hypotheses & data gaps 2:45

3:30 PM

FACILITATED GROUP DISCUSSION ON HYPOTHESES, DATA GAPS , AND NEXT STEPS

4:00 PM

WRAP-UP

THANK YOU TO OUR SPONSORS:



WESTERN MONTANA Conservation Commission



HALEY ALDRICH



To bring disciplinary scientists together to achieve interdisciplinary synthesis and identify critical hypotheses and data gaps to pursue through future research and collaboration.

2024 CLARK FORK SCIENCE FORUM SPEAKERS

April 24 – 25, 2024

KEYNOTE SPEAKERS

April 24th Keynote Speaker

DOUG MARTIN



Restoration Program Chief
Montana NRDP

Doug Martin has been with Montana Department of Justice Natural Resource Damage Program (NRDP) since 2001 and the Restoration Program Chief since 2014. As Restoration Program Chief Doug has been involved with the restoration plan development for the Clark Fork River OU, the 2011 Exxon Oil Spill on the Yellowstone River restoration plan, and the Upper Clark Fork River Aquatic and Terrestrial restoration plans and oversees the implementation of the restoration actions associated with plans. He believes strongly that the successful restoration projects are “WE” projects as it takes everyone: the high-level bureaucrats, the agencies, the engineers and scientists, the equipment operators, the project neighbors, and the public.

April 25th Keynote Speaker

TOM PARKER



President and Principal Ecologist
Geum Environmental Consulting, Inc.

Tom Parker is the President and Principal Ecologist of Geum Environmental Consulting, Inc. based in Hamilton, Montana and founded in 2003. Since the mid-1990's, Tom's professional work has emphasized ecological restoration design, planning, and project implementation in river and wetland ecosystems. Tom and his firm have worked for Montana DEQ and NRDP on aspects of upper Clark Fork River restoration and remediation since 2009 and were part of the design team for restoration work associated with Milltown Dam prior to that. Tom enjoys supporting efforts linking research and management by helping to facilitate and coordinate interdisciplinary teams of scientists, engineers and ecological designers.

SESSION 1: ABOVE THE WARM SPRINGS PONDS

Berkeley Pit Water Treatment and Discharge Pilot Project

MARK THOMPSON



Vice President of Environmental Affairs
Montana Resources, LLC, Butte, MT

Mark Thompson earned an MS in Environmental Engineering from Montana Tech in 1996. Mark has worked at the Red Dog Mine in Alaska, the Golden Sunlight Mine in Whitehall, MT and currently is the Vice President of Environmental Affairs at Montana Resources in Butte, MT. Mark has been very active with the Montana Mining Association and served five years as President of that organization. He is currently the Immediate Past President of MMA.

Water Quality Changes in the Berkeley Pit, Butte MT

GARY ICOPINI



Professor
Montana Bureau of Mines and Geology

Dr. Icopini is a professor with the Montana Bureau of Mines and Geology and has worked at the MBMG since 2005. He grew up in eastern Montana and earned a BA in Geology from the University of Montana. He has an M.S. in Geosciences from University of Nevada, Las Vegas, and a Ph.D. in Geological Sciences from Michigan State University. He also spent five years as a post-doctoral researcher at Pennsylvania State University and Los Alamos National Laboratory. Gary has over 30 years' experience on projects dealing with environmental geochemistry, biogeochemistry, and hydrogeology. At the MBMG, he has primarily worked on metal-contaminated and/or abandoned mine sites.

Trout movement patterns and use of Silver Bow Creek and tributaries: an unfinished success story

CALEB URELING



Fisheries Biologist – Upper Clark Fork
Montana Fish, Wildlife & Parks

Caleb Uerling is the Fisheries Biologist for the Upper Clark Fork River with Montana Fish, Wildlife and Parks. Caleb has been living in Butte and working in the Upper Clark Fork since 2019. Caleb has enjoyed working in the Upper Clark Fork and taking advantage of all the recreation and outdoor opportunities in the area. Prior to working in the Upper Clark Fork, Caleb worked as a fisheries technician in Missoula for three years after receiving a master's degree in Natural Resource Sciences from the University of Nebraska.

SESSION 2: AT THE WARM SPRINGS PONDS

Geochemical processes in the Warm Springs Ponds

CHRIS GAMMONS



Professor in Geological Engineering
Montana Technological University

Chris Gammons is a Professor in the Geological Engineering Department at Montana Tech, where he has been since 1997. He has a Ph.D. in Geochemistry from Penn State, and a B.S. in Geology from Bates College. Dr. Gammons' main research interests are twofold: 1) environmental geochemistry; and 2) geochemistry of critical mineral deposits. He has supervised more than 70 graduate students at Montana Tech, including 4 who did work on the geochemistry of arsenic in Warm Springs Ponds.

Overview of historic/present Ponds water quality

MADISON FOSTER



Hydrologist
USGS Wyoming-Montana Water Science Center

Madison Foster is a Hydrologist at the USGS Wyoming-Montana Water Science Center in Helena, Montana. She recently graduated from Montana State with a M.S. in Land Resources and Environmental Sciences with a focus on water quality in agricultural streams. At USGS she aims to better understand the fate and transport of solutes introduced through historic and current mining operations and implications for water quality.

Overview of historic/present Ponds water quality

Continued

JOHANNA BLAKE



Research Hydrologist (geochemist)
USGS Wyoming-Montana Water Science Center

Dr. Johanna Blake is a Research Hydrologist (geochemist) with the U.S. Geological Survey. She earned a B.S. in Earth and Planetary Sciences from the University of New Mexico (UNM), and a M.S. and PhD in Earth and Environmental Sciences from Lehigh University. Dr. Blake was a post-doctoral fellow with the EPSCoR program at UNM where she studied uranium geochemistry on tribal lands. While with the USGS, she has continued to work on uranium geochemistry issues, tracking the source of metals through geochemical fingerprinting, evaluating the geochemistry of metals in reservoirs, and watershed dynamics related to metals cycling.

Streamflow Impacts of the Warm Springs Ponds: A shallow dive.

MORGAN CASE



Instream Flow Specialist
Trout Unlimited

Morgan Case is an instream flow specialist for Trout Unlimited. She works with water users in Western Montana to protect, restore, and enhance stream flow to benefit cold-water fisheries. Prior to working at Trout Unlimited, Morgan worked briefly in the Adjudication Bureau of DNRC and spent over a decade with the Idaho Department of Water Resources working on flow restoration in the Upper Salmon River Basin. Ms. Case holds a B.S in Biology from Grand Valley State University in Allendale, MI and a M.S. in Environmental Science from Minnesota State University, Mankato.

SESSION 3: BELOW THE WARM SPRINGS PONDS

Spiders as sentinels of mining contamination in the Clark Fork River, MT

CHLOÉ ZAMPETTI



Graduate Research Assistant Brandt Lab
University of Connecticut

Chloé Zampetti is a second-year master's student in the Brandt Ecosystem Contaminants Lab at the University of Connecticut. Chloé is currently developing her thesis on the use of spiders as sentinels of mining contamination in the Clark Fork River as part of a larger USGS food web study. She began working with USGS in 2022 to investigate how representative spiders in the Clark Fork are of the fate and flux of mining metals through aquatic-terrestrial linkages, and what risk they may pose to Clark Fork predators, namely songbirds. When Chloé is not in the lab or in a pair of waders, you can find her reading a book or planning her next trip!

Quantifying Toxins to inform Fish Consumption and identifying sources of pollutants in the Upper Columbia River Basin

TREVOR SELCH



Fisheries Pollution Biologist MTFWP
Montana Fish, Wildlife & Parks

Trevor Selch grew up in Canada. He has a PhD in Fisheries Management from South Dakota State University. He currently studies factors affecting Hg accumulation in fish and has been working for FWP since 2007 as a Fisheries Pollution Biologist based in Helena.

The Ecological Health of the Clark Fork River, 30-year retrospective.

TRAVIS SCHMIDT



Research Ecologist
US Geological Survey; Wyoming-Montana Water Science Center

Travis' aims are to better understand how ecosystems respond to natural and human cause disturbances. He researches the effects of metals, pesticides, and other contaminants on aquatic and riparian ecological communities.

LIGHTNING TALKS

PRESENTER	TITLE
LAURA BLUMENSAADT	Metal health matters: Assessing evolutionary response to heavy metal contamination in riparian deer mice
LOGAN BRAUER	A social-ecological approach to evaluating short-term leasing for streamflow conservation in the Upper Clark Fork River Basin
BRIDGER CREEL	Elevated selenium, lead and arsenic in songbird blood in the upper Clark Fork: patterns from rocker to deer lodge and the role of remediation
BENJAMIN COLMAN	The roles that metal nanoparticles play in the fate, transport, and bioavailability of metals and metalloids in the Clark Fork River
ALYSIA COX	Biogeochemical impacts of increased treated mining discharge on a recovering ecosystem
SARA ELDRIDGE	Understanding micro/macro biomes in the upper Clark Fork using DNA-based monitoring tools.
ELENA EVANS	Smurfit Stone
MIKE HATTEN	Clark Fork River Design and Construction of Brush Matrix Streambank Treatments
PAUL HELFRICH	Microbial biogeochemistry of Silver Bow Creek
MARK MARIANO	The Good, the Bad, and the Ugly: Understanding Waterfowl Habitat in the Upper Clark Fork Valley
JENNIFER MICKELSON	Selective Fish Passage on Warm Springs Creek A collaborative effort to restore fish passage at 6 diversion sites on Warm Springs Creek
DYLAN WHITE	Does Size Matter? The Influence of Colloids in Trace Metal Accumulation in Benthic Biofilms and Macroinvertebrates

POSTER PRESENTATIONS

PRESENTER	TITLE
HANNAH ADKINS; VICKI WATSON	Long term trends in nutrients and attached algae in the Clark Fork River – and implications of new nutrient standards.
BRIAN BALMER	Using tree swallows (<i>Tachycineta bicolor</i>) as sentinels for ecosystem health and contaminant exposure in the Clark Fork and Bitterroot River Basins of Montana
SAM CARLSON	Concentration - Discharge Relationships of Solutes Across the Upper Clark Fork Basin Indicate Source, Transport, and Retention Dynamics
NATHAN COOK	Where are The Fish? Planning a Comprehensive Investigation of Factors Limiting the Upper Clark Fork River Fishery
MICHELLE FILLION	Beaver dam analogs influence macroinvertebrate communities and subsidy fluxes between aquatic and terrestrial ecosystems in headwater streams of western Montana, USA
PAYTON GARDNER	Estimating Groundwater Contribution, Age and Provenance Using Environmental Tracers Sampled in Stream Water
JOE GRIFFIN	Superfund at the confluence: water quality standards vs biological integrity
LINDSEY KING	Application of Surrogate Technology to Predict Real-Time Metallic-Contaminant Concentrations and Loads in the Upper Clark Fork and Select Tributaries
JOE NAUGHTON	Silver Bow Creek Water Quality Trends
MEGGIE OLSON	Thermal Remote Sensing of UCFR Phase 7 Reaches
TOM PARKER	Upper Clark Fork River GIS Maps
AMIRHOSEIN RIAHI	
MARISA SOWLES	Upper Clark Fork River Geomorphic Change Analysis

2024 Clark Fork Science Forum

PRESENTER	TITLE
MATTHEW SWARR	TBD
KIERAN THARP	Radon-222 as a Tracer of Groundwater Flux into the Upper Clark Fork River in Southwest Montana