



MEETING MINUTES

Water Quality Task Force

December 5, 2019
9:30-11:30
195 North 1950 West,
Red Rocks Conference Room

PRESENT:

Jim Bowcutt	DEQ/DWQ
Jodi Gardberg	DEQ/DWQ
Leila Ahmadi	DWRe
Jim Harris	DEQ/DWQ
Wally Dodds	UDAF
Jay Olsen	UDAF
John Hilbert	JVWCD
Rachel Shilton	DWRe
Jason Kim	WBWCD
Paul Dremann	Trout Unlimited
Tyler Thompson	DNR
Bill Zannotti	UDFFSL
Melissa Noble	UDDW
Jay Kalafatis	USBR
Nancy Mesner	USU Extension
Rhonda Miller	USU
Mark Muir	U.S. Forest Service
Gary Kleeman	EPA
Ben Abbott	BYU
Kristy Davis	UACD

I. DISCUSSION

Ben Abbott (Brigham Young University)- Ecological Monitoring of the Nebo Megafire Complex (see presentation)

- This study was a culmination of efforts from several different entities. DNR provided the funding, a citizen science monitoring program developed by BYU was heavily utilized, and the study was developed and managed by Brigham Young University (BYU)
- 24 high frequency stations were installed in an area that was burned as well as sections of the watershed that were not.
- Runoff in burn areas proved to make monitoring difficult. High flows and high sediment loads would cause equipment to be moved, or covered with sediment during high precipitation events.
- One of the major questions that they are looking at answering is how long will it take for cutthroat trout to be present in the system again. BYU is asking any partners that may have any fish data in the area to get in touch with Ben to share that data if possible.
- One of the things that was found in the study is that the nutrient loading in the watershed is coming from people, not the fires. Nitrate did go up slightly, turbidity went through the roof, but only until vegetation was established, and only during storm events. There was also a decrease in pH in the burn area.
- In-stream habitat can actually improve in the years following a fire.
- There is earlier snow melt in burn areas, but the peak flows are not any higher than watersheds that were not burned.

Rachel Shilton (Division of Water Resources) The State Water Plan (See handout)

- There were 25-30 people that were involved in the drafting of this revision of the State Water Plan, and information was gathered from preexisting documents developed by other state and federal agencies.
- The Plan uses growth projections out to 2060.
- It was acknowledged that there may be unknown/unidentified water sources that the plan does not account for.
- Water re-use is definitely gaining in popularity and may be addressed in future plans, but it will not be included in this plan.

- The plan has not been updated for 20 years, but it will not take 20 years for the next update. They will not wait to continue with this update until the 2020 census data comes out. They would like to have it finalized sooner than that.
- Certain sections of the plan will be updated as data becomes available. It will be a living document that can be changes as needed.
- The Division of Water Rights does not support individual projects, they support entities that install water projects around the state. One exception may be water quality modeling that can help them with their understanding of water resources.
- Water conservation and water use will be addressed in urban areas, but they will look at industrial.
- Water Rights is trying to develop a mechanism that will help watershed groups in local areas and across the state to work together.
- Sedimentation is a big concern for DRWe. This can cause loss in storage in reservoirs, and cost a lot of money.
- The first draft of the plan will be coming out the first quarter of next year. Comments and questions can be sent to Rachel Shilton rachelshilton@utah.gov
- Three regional plans will be completed by 2022 as well
 - Sevier River
 - Kanab diversion
 - SE Colorado

Wally Dodds (Utah Department of Agriculture and Food) Upper Sevier Project Implementation) (See presentation)

- Streambank projects are often paired with irrigation type projects. This way the landowner stands to gain from the project by improving their irrigation systems, while improving water quality.
- Two National Water Quality Initiative (NWQI) watersheds are located in the Upper Sevier watershed. This is a NRCS program focused on implementing projects that will improve water quality. The local watershed coordinator does the planning on these projects.
- Two watershed plans were completed for the NWQI watersheds this year.
- The watershed coordinator has had great luck implementing projects that convert flood irrigated pastures to sprinkler irrigation. He has been using several innovative approaches.

II. ADDITIONAL ITEMS

- USU Water Quality Extension is getting ready to roll out an outreach campaign focused on small farms and water quality.
- The Division of Water Quality is trying to focus on nutrient management in the near future. This will include the development of incentives for landowners that are willing to develop and follow a nutrient management plan.
- Next meeting will be March 4th. This will be the Annual Nonpoint Source Agency Coordination Meeting .



Ecohydrological Monitoring of the Nebo Megafire Complex

Ben Abbott, Sam St Clair, Leika Patch, Trevor Crandall, Erin Jones, Brian Brown, Sam Bratsman, Adam Norris, Zach Aanderud, Devri Adams, Kordan Kildew



UTAH'S WATERSHED RESTORATION INITIATIVE

benabbott@byu.edu, stclair@byu.edu





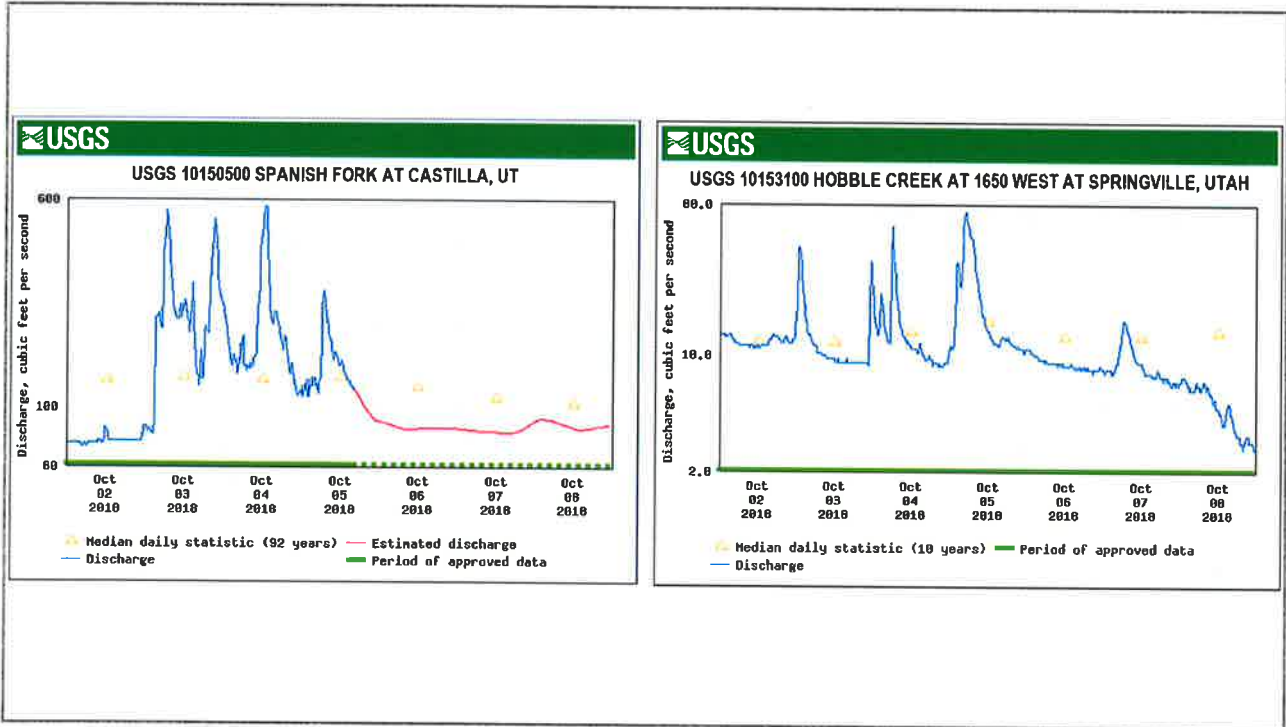
Summer and Fall of 2018

- 610 km² (>150,000 acres) burned near Mount Nebo
 - Coal Hollow
 - Pole Creek
 - Bald Mountain
- Long-term evacuation of ~10,000 residents
- Affected many areas with critical habitat for native fish and several water bodies with nutrient impairment (Utah Lake)



Hurricane Rosa

- Landfall on October 2nd in Baja California
- Caused flash flooding throughout southwest
- Flood damage was over \$50 million



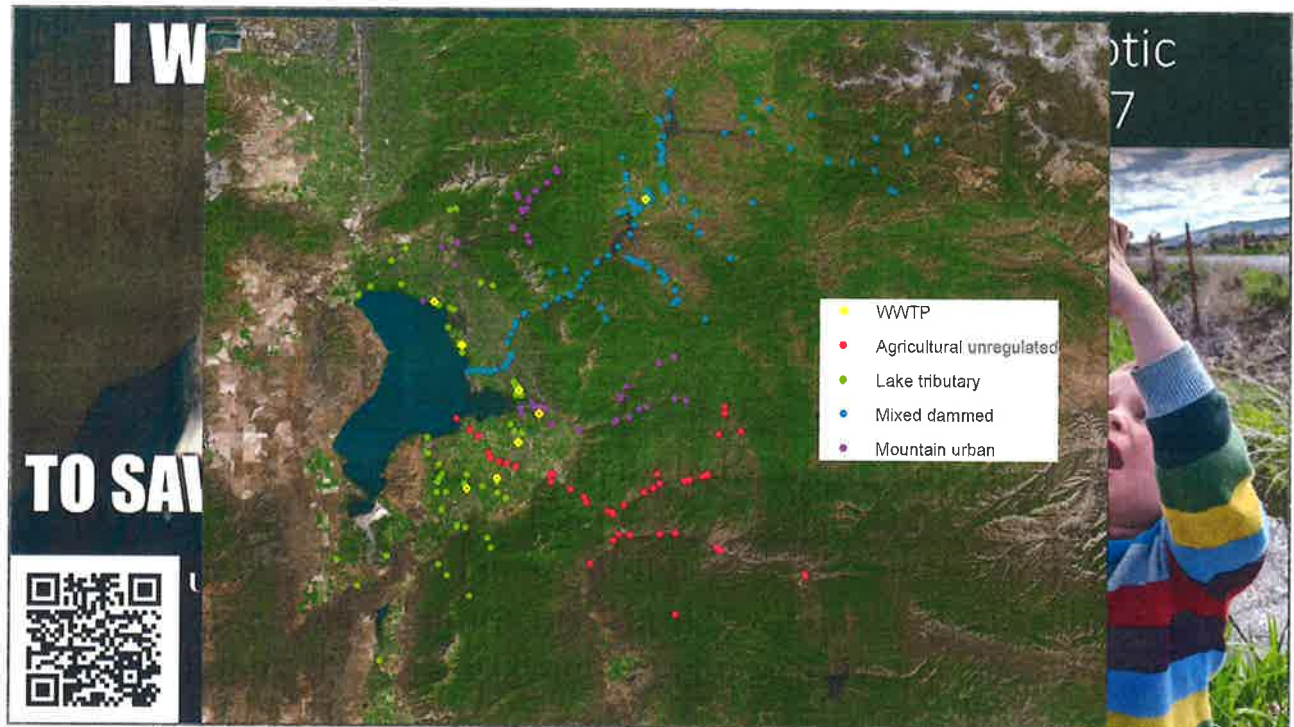


Since early 2018, we had high frequency measurements in the Spanish Fork River

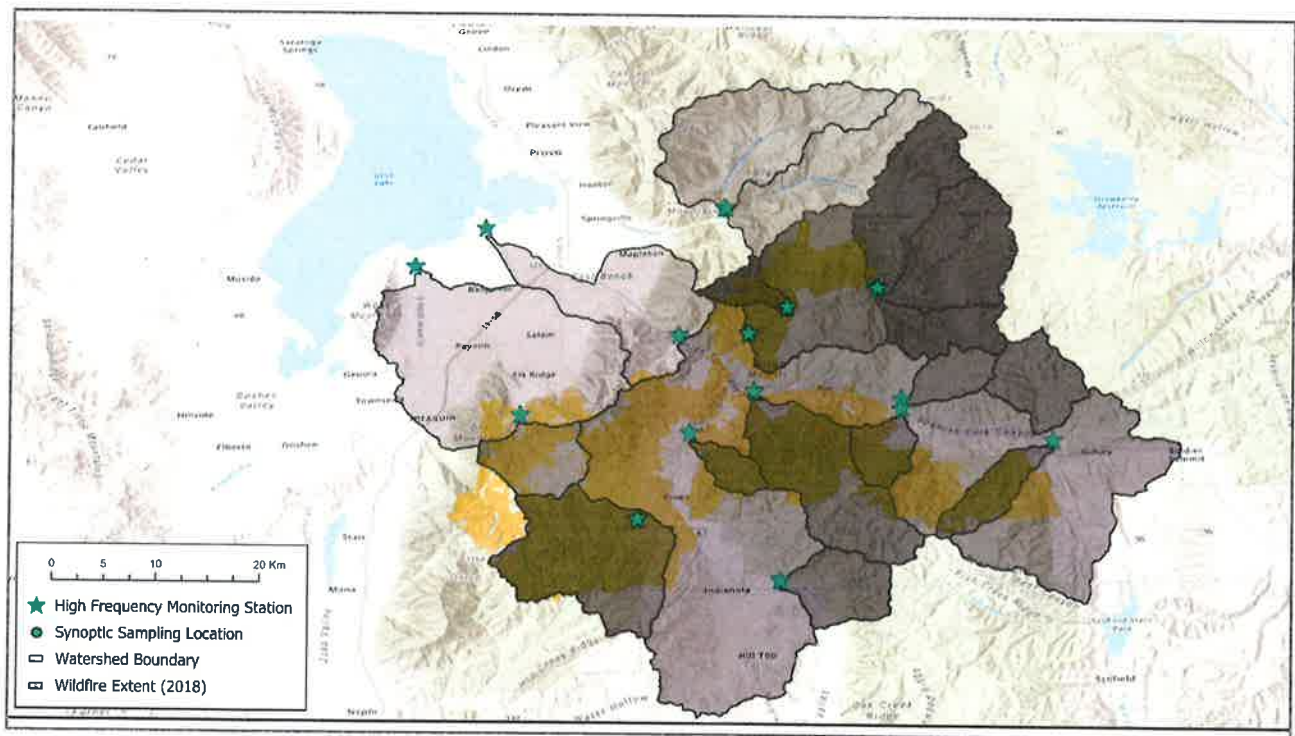
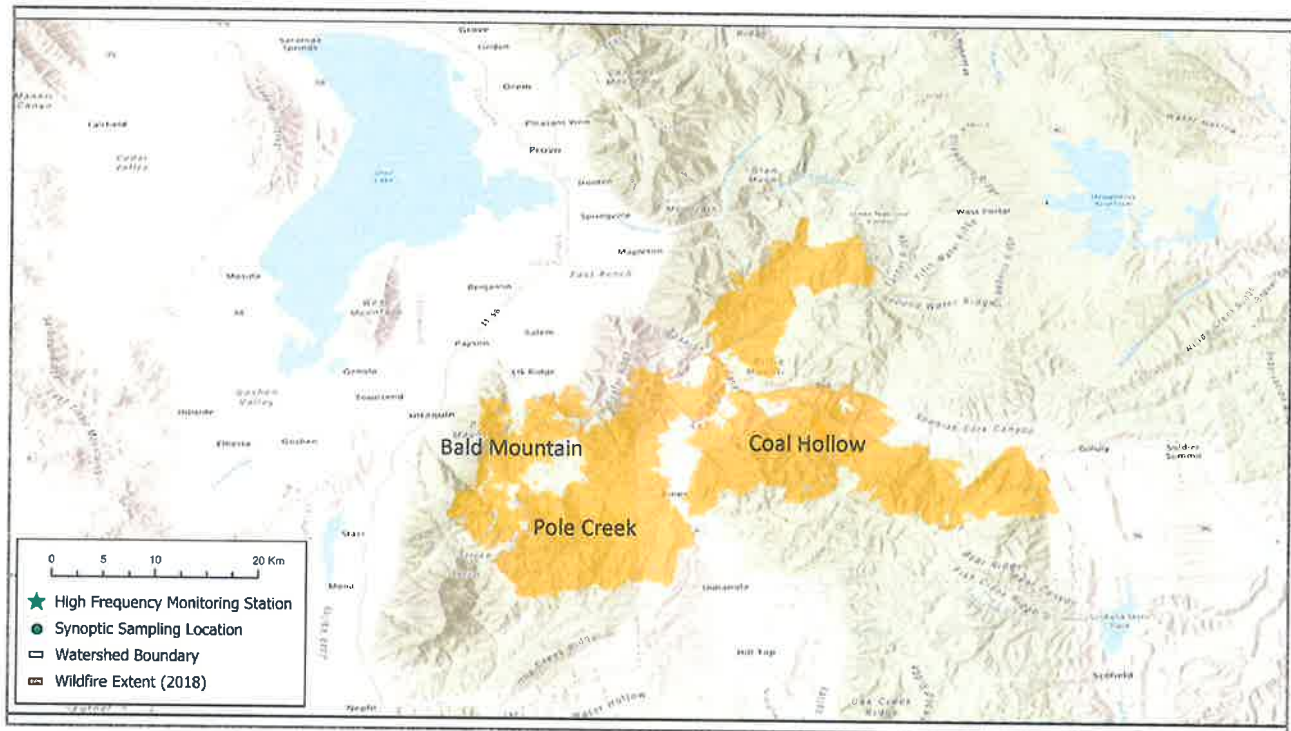
• **Uv-Vis sensor (s::can)**

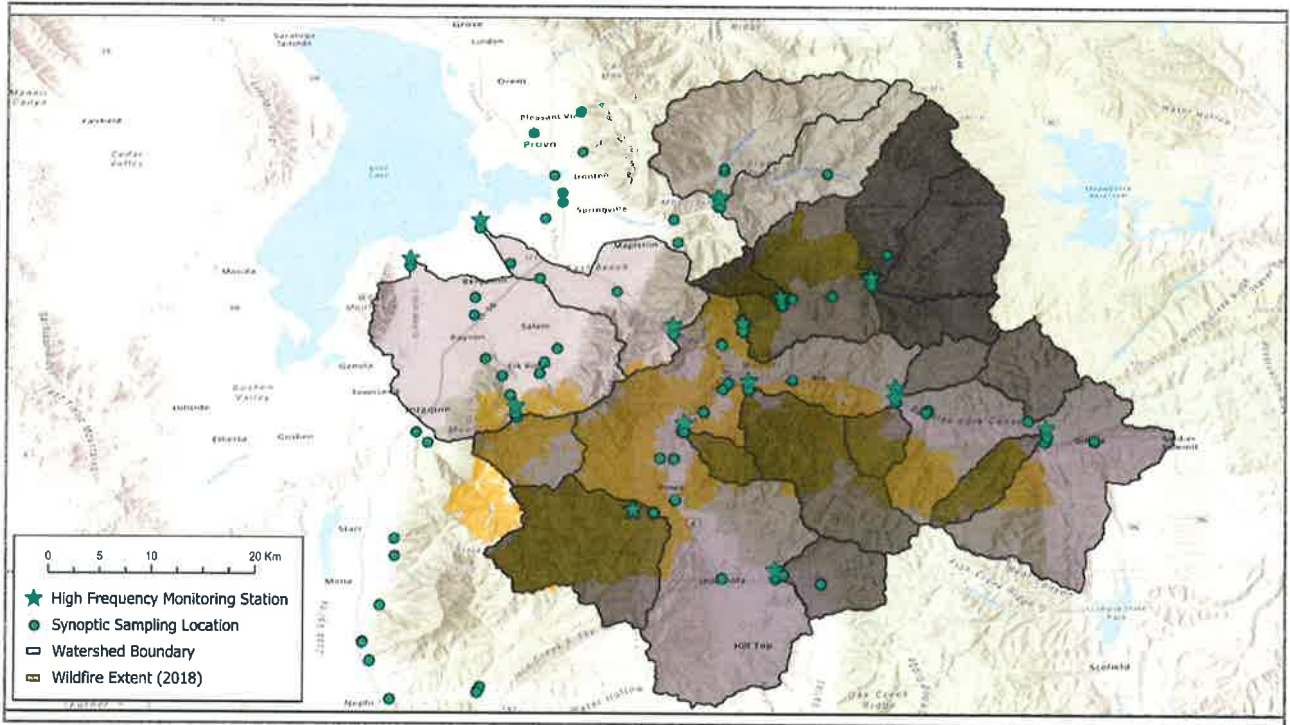
- NO_3^-
- DOC
- Turbidity
- Spectral Ratio (molecular weight): ratio of the slope of the shorter wavelength region (275–295 nm) to that of the longer wavelength region (350–400 nm)
- SUVA (aromaticity): absorbance at 254nm





1. As wildfires become larger and more frequent, how does the nature of disturbance (e.g. burn size and severity) interact with ecosystem type and post-fire management (i.e. livestock and wildlife management and hunting pressure) to influence the likelihood of state changes in terrestrial and aquatic ecosystems?
2. How do megafires affect lateral fluxes of water, carbon, nutrients, and sediment from burned catchments in semi-arid regions and how do these terrestrial subsidies influence stream and lake habitats already impaired by chronic, anthropogenic nutrient loading?





24 high-frequency flow and chemistry stations

- 15-minute sensor data
 - Discharge
 - Temperature
 - Conductivity
 - pH
 - Dissolved oxygen
 - Redox potential
 - Turbidity (subset of 7 stations)



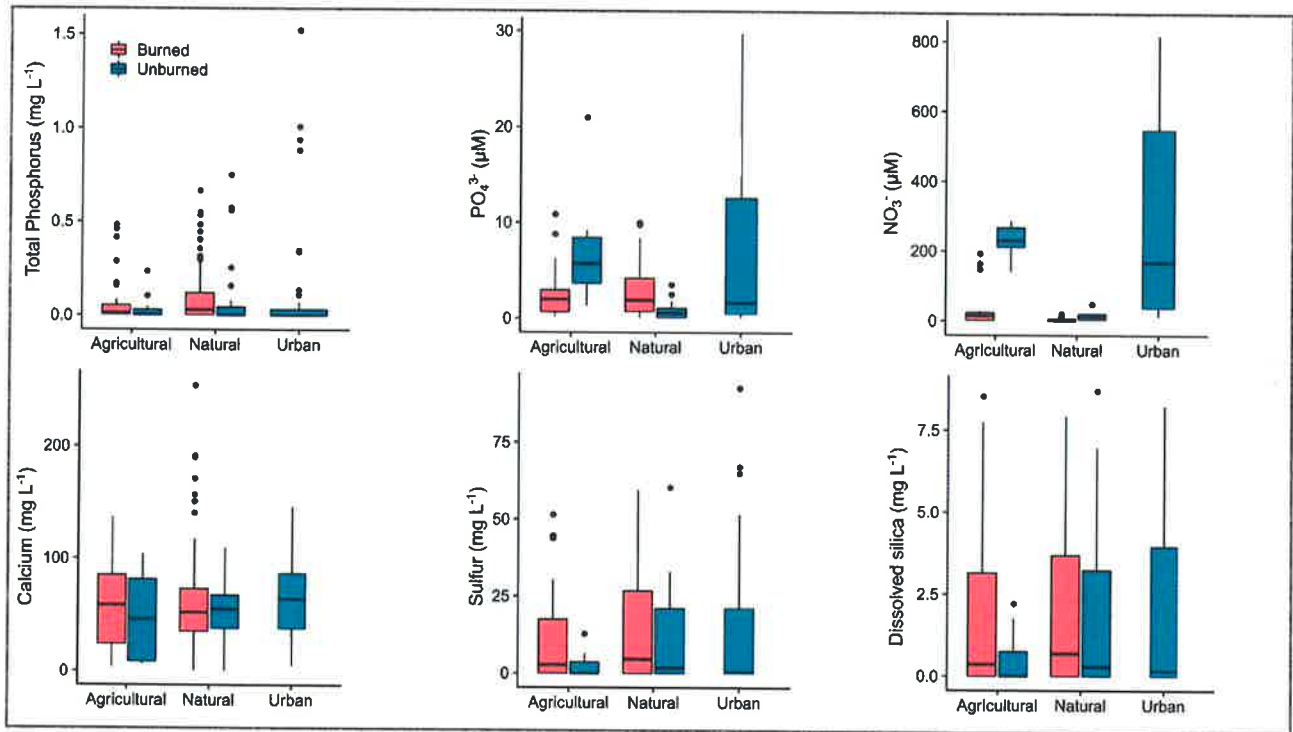
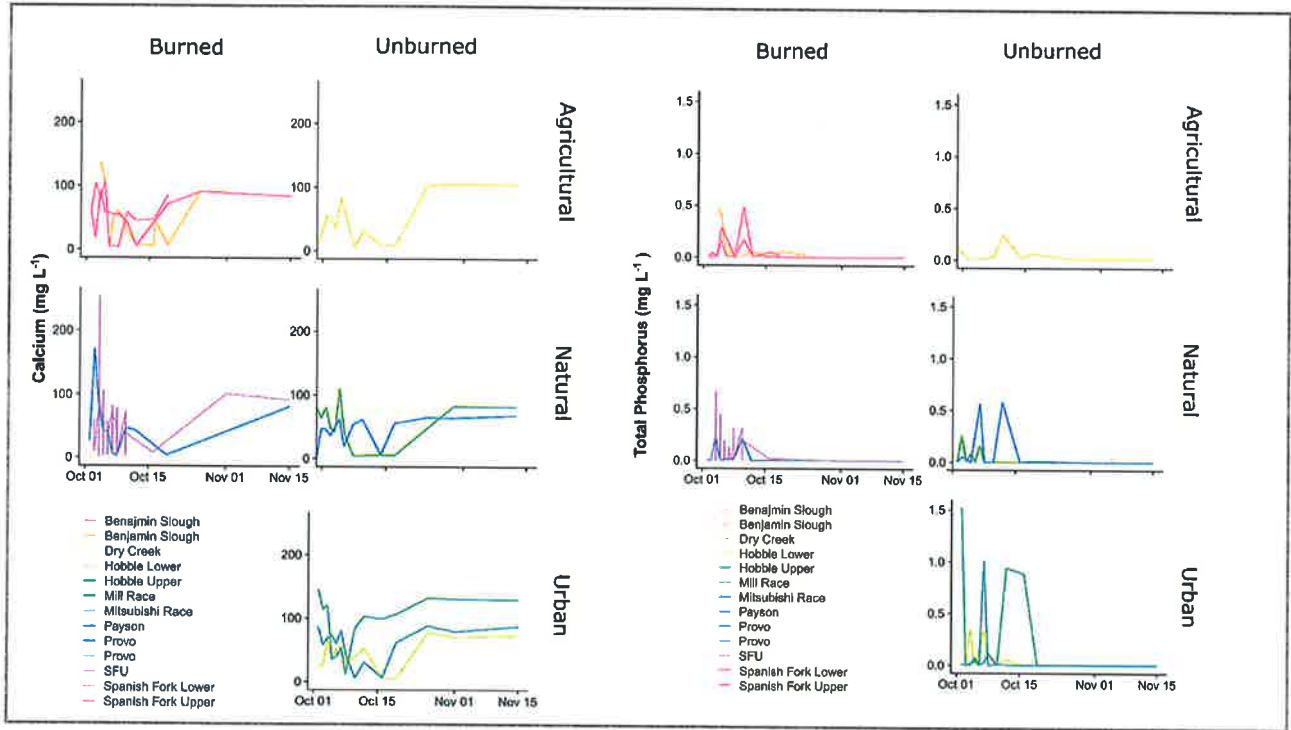
Water and invertebrate sampling

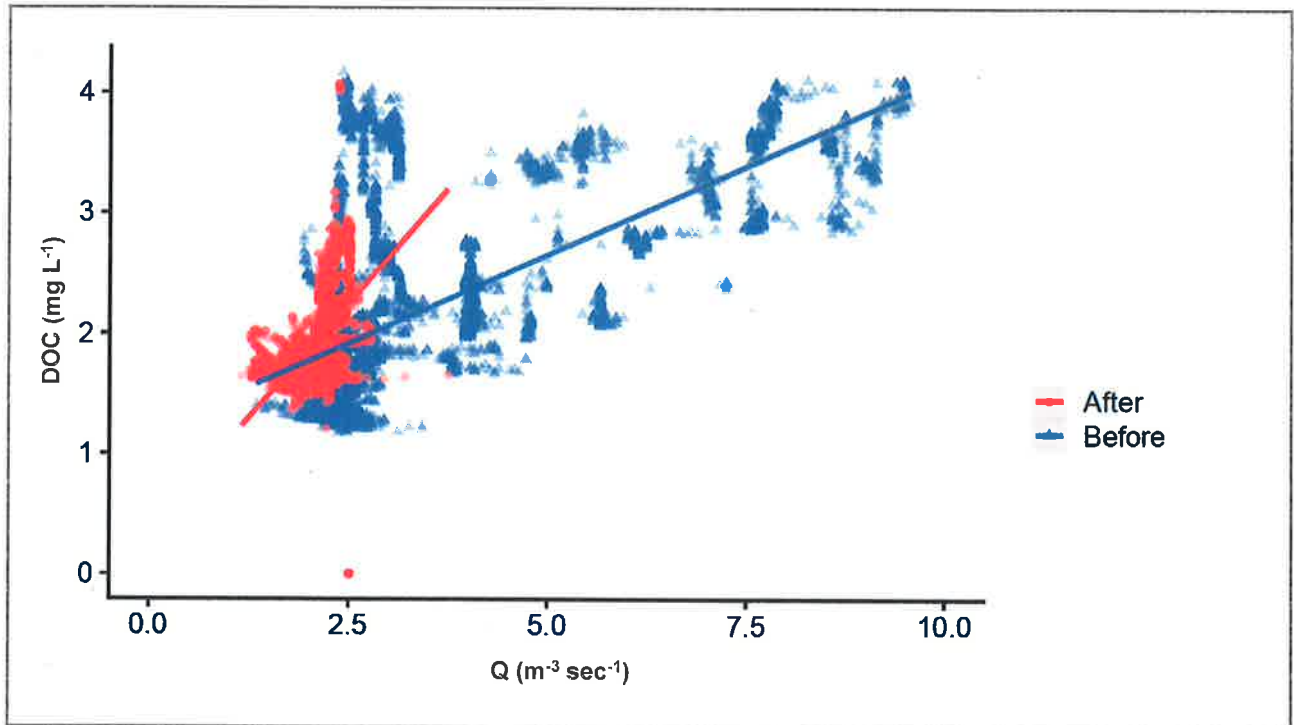
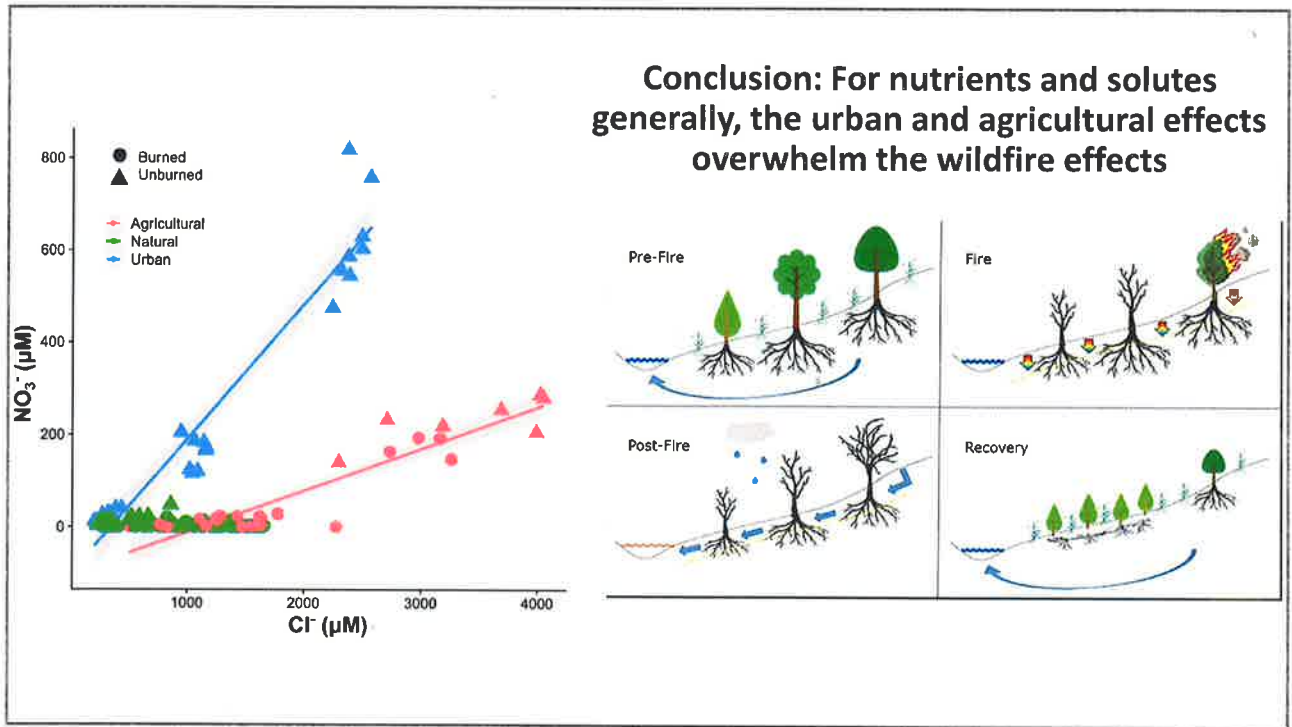
- Weekly grab samples at the 24 station sites
- Monthly grab samples at ~90 synoptic sites
- Weekly (spring/summer) to bi-weekly (fall/winter)
- Carbon (DOC, DIC, optical properties: fluorescence and absorbance)
- Nutrients (Organic nitrogen and phosphorus, Inorganic nitrogen (NO₃ and NH₄) and phosphorus (PO₄), Silica, iron, and trace nutrients)
- Ions and other parameters (Major anions and cations, Trace metals)
- Invertebrate kick sampling
- eDNA as an integrative signal of all upstream eukaryotes

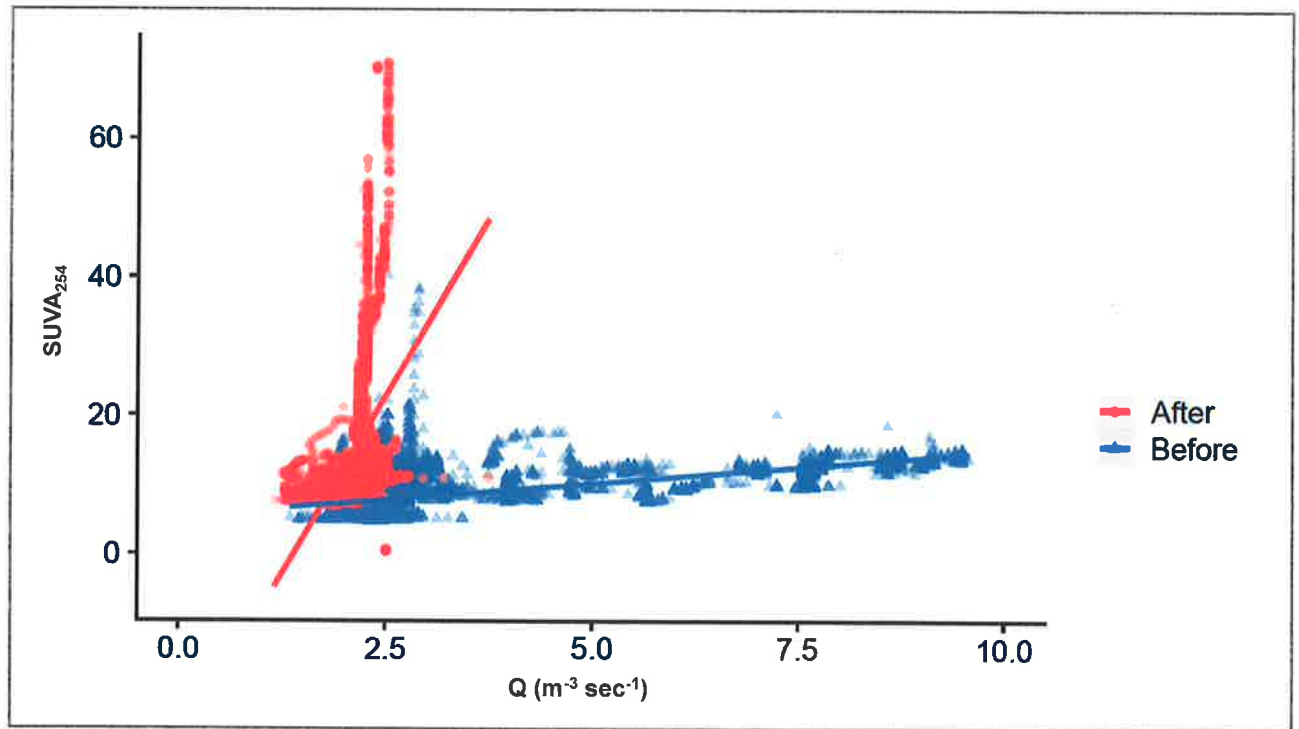
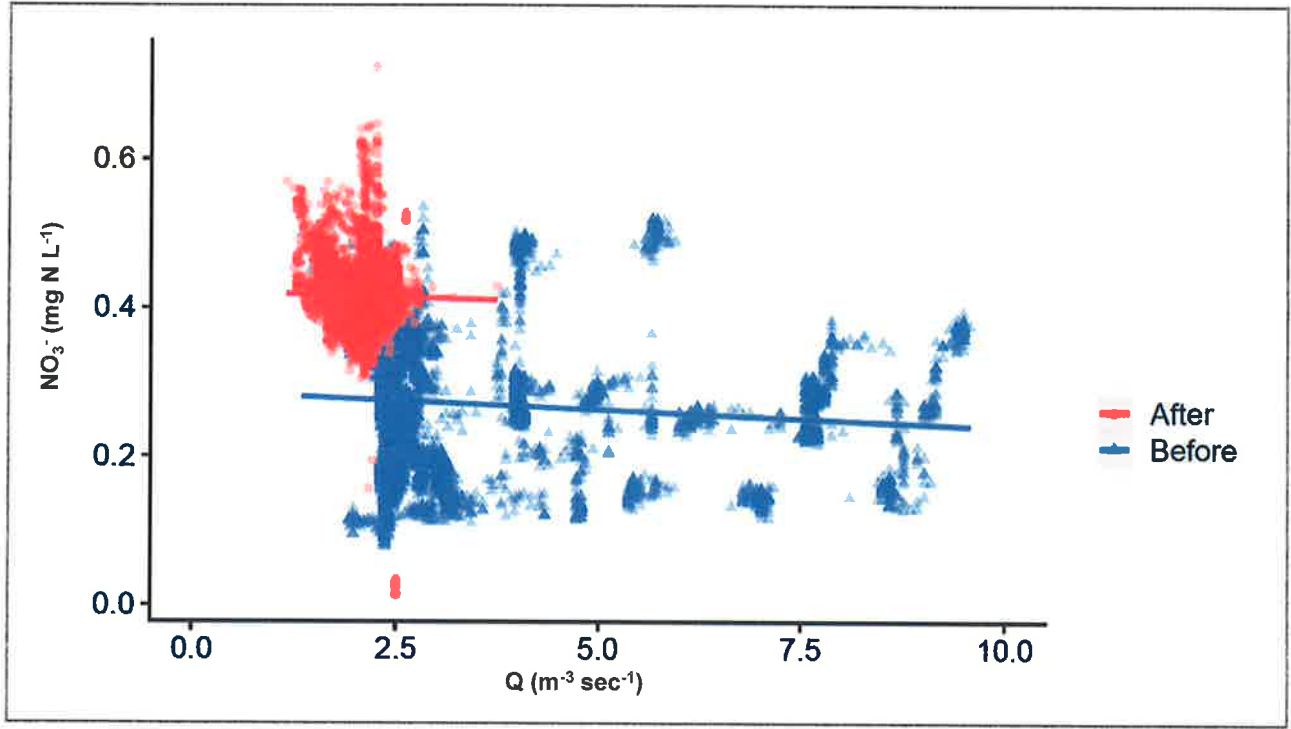


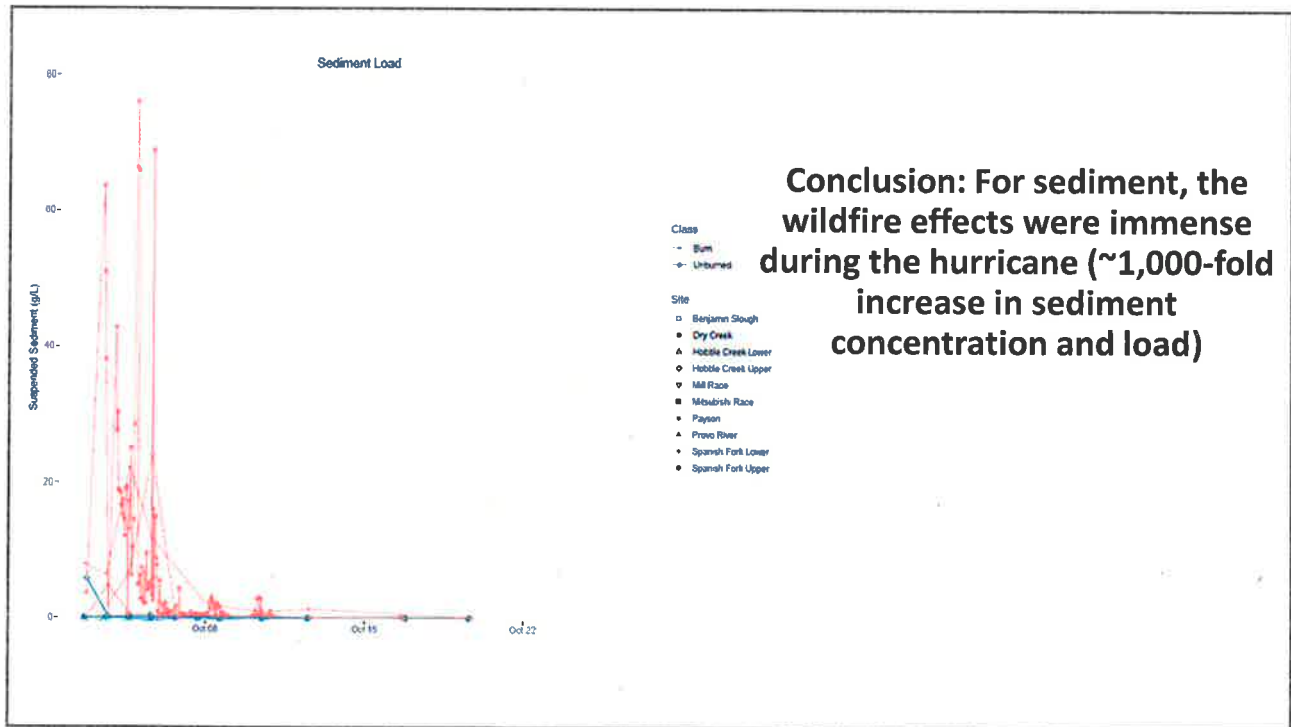
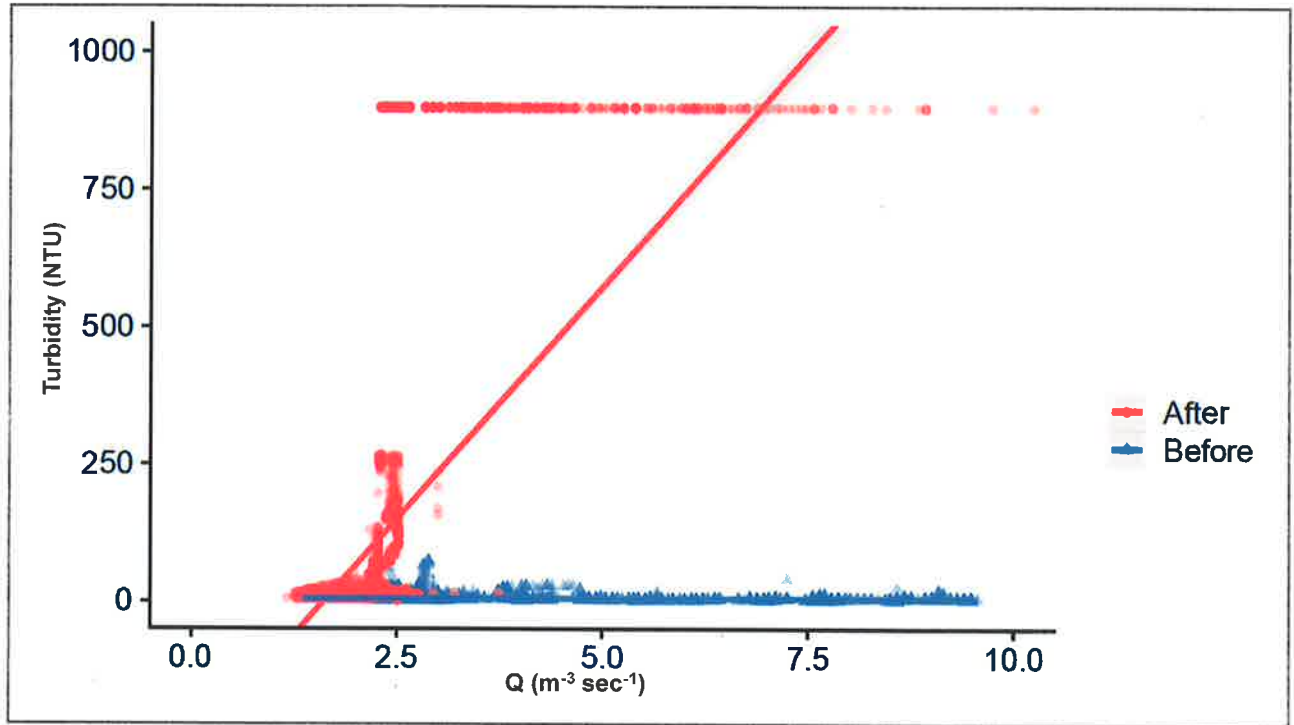
Immediately after the burn

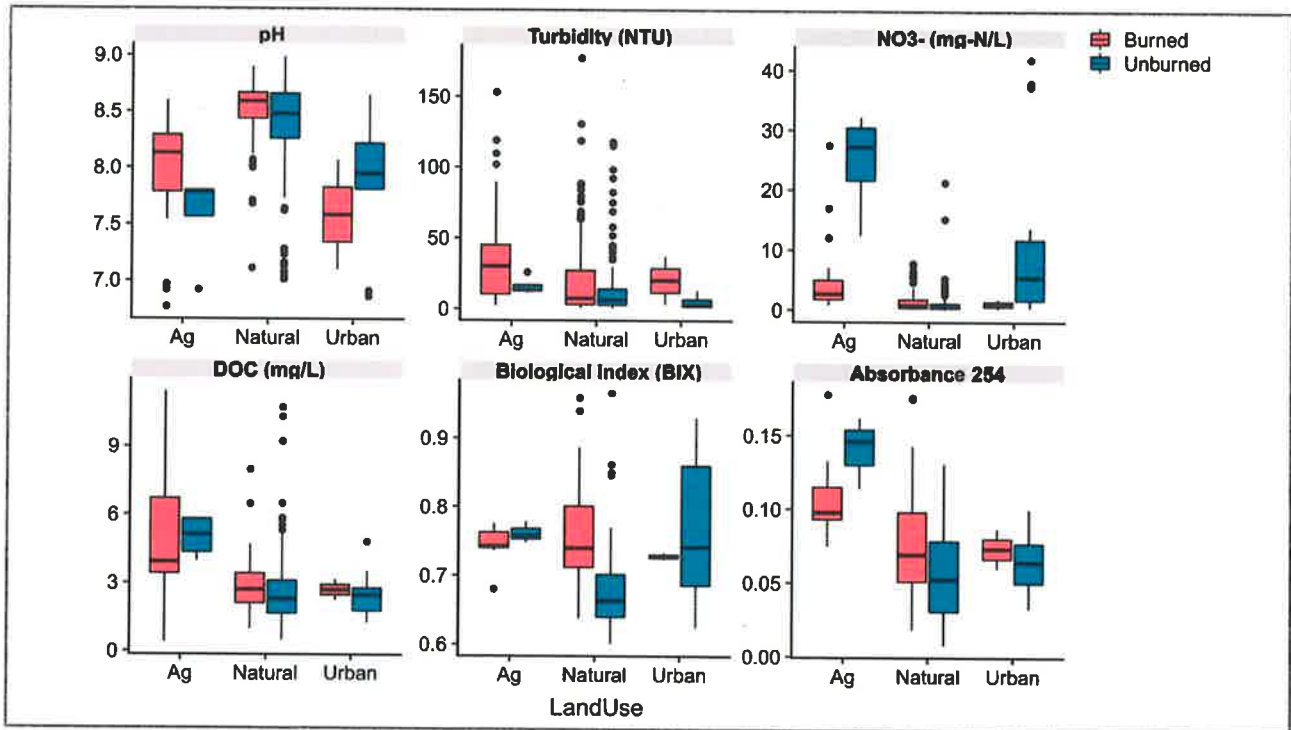


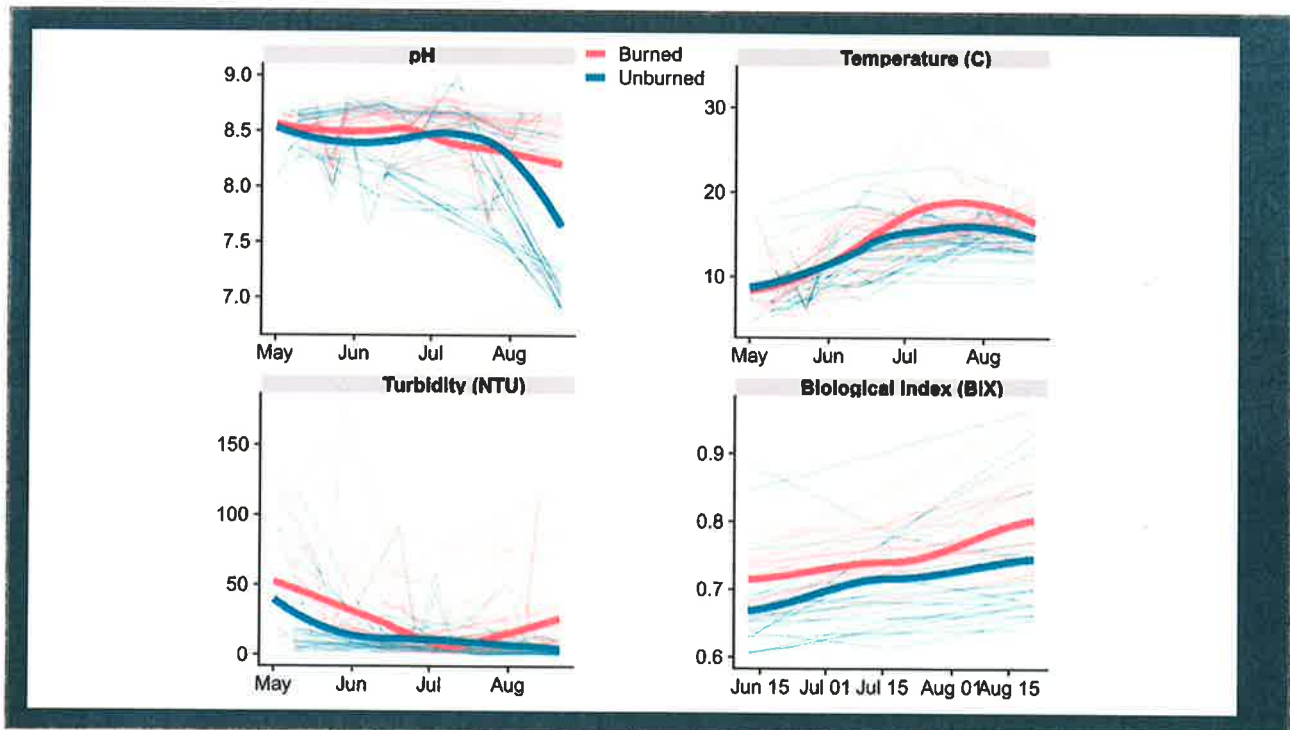
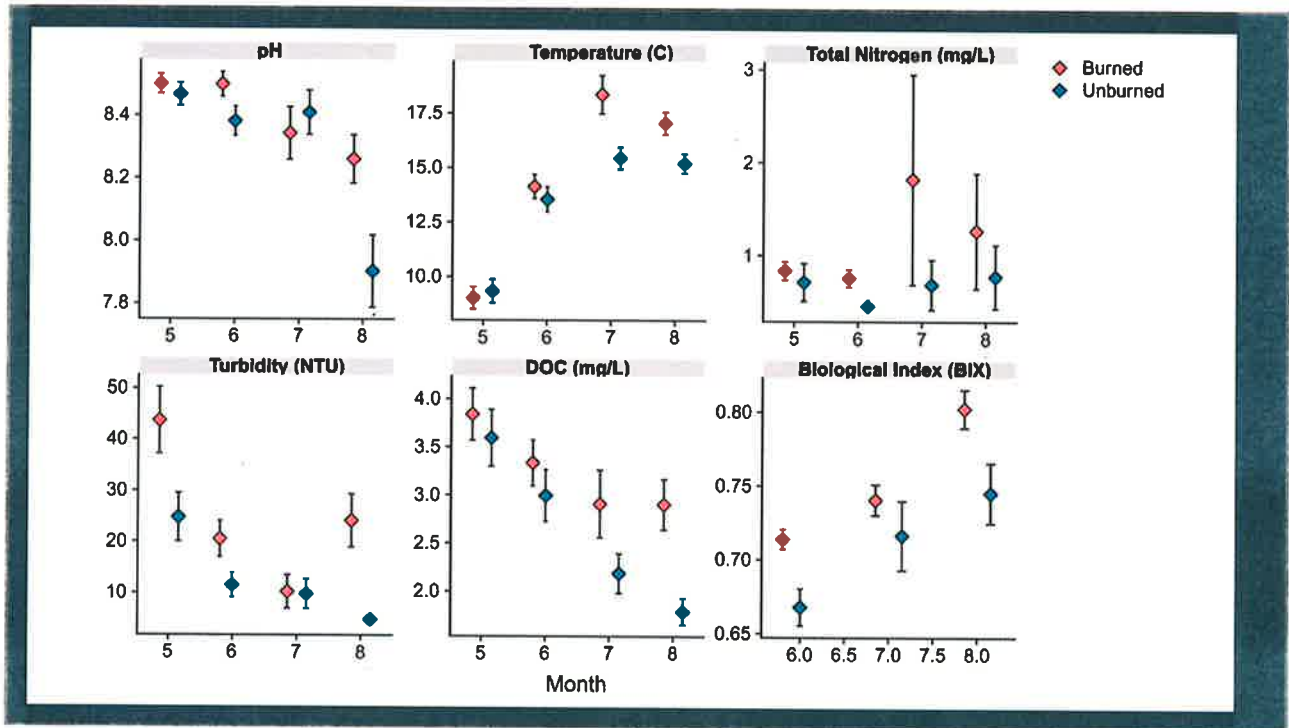


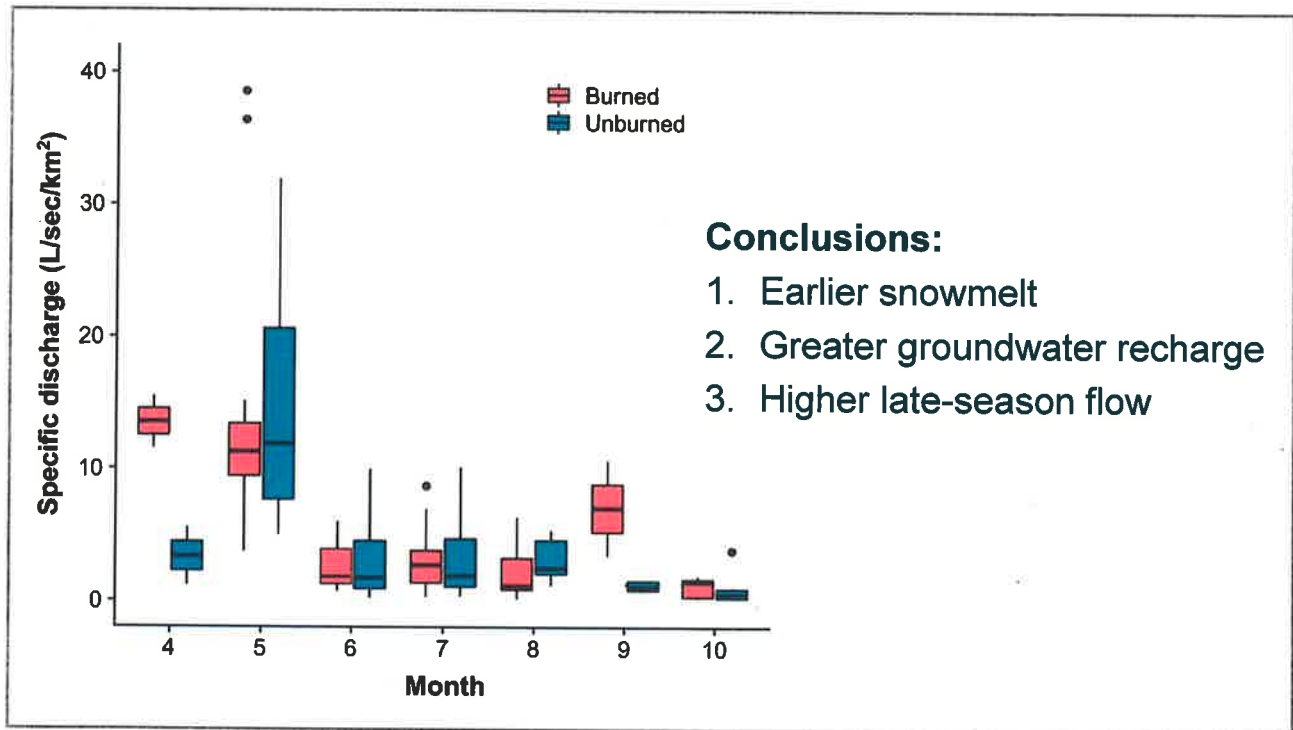
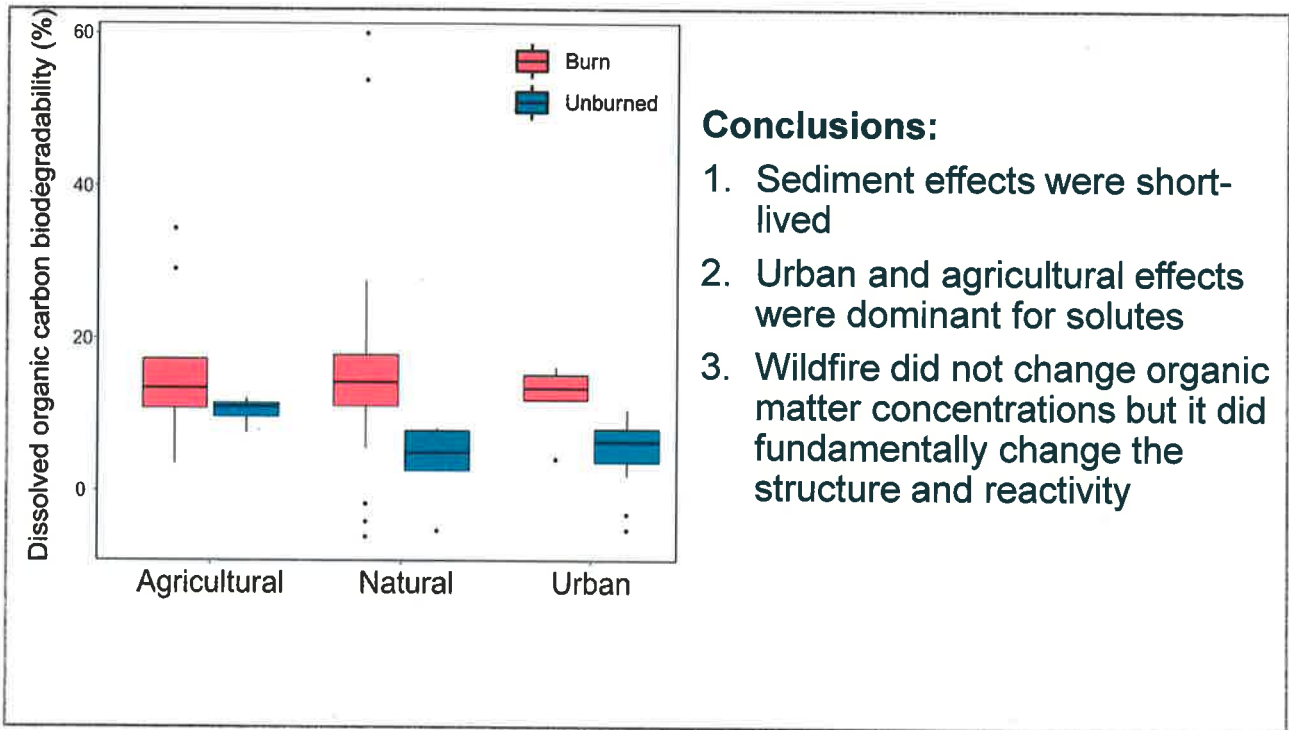










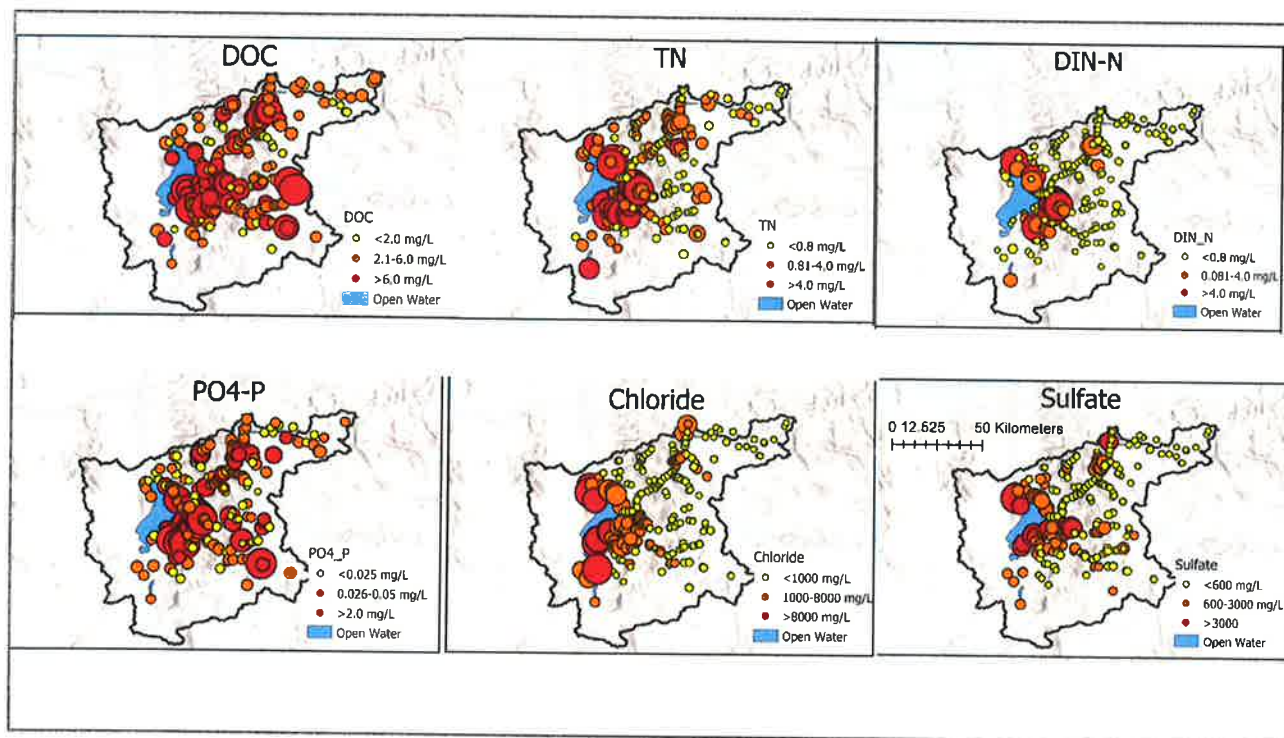
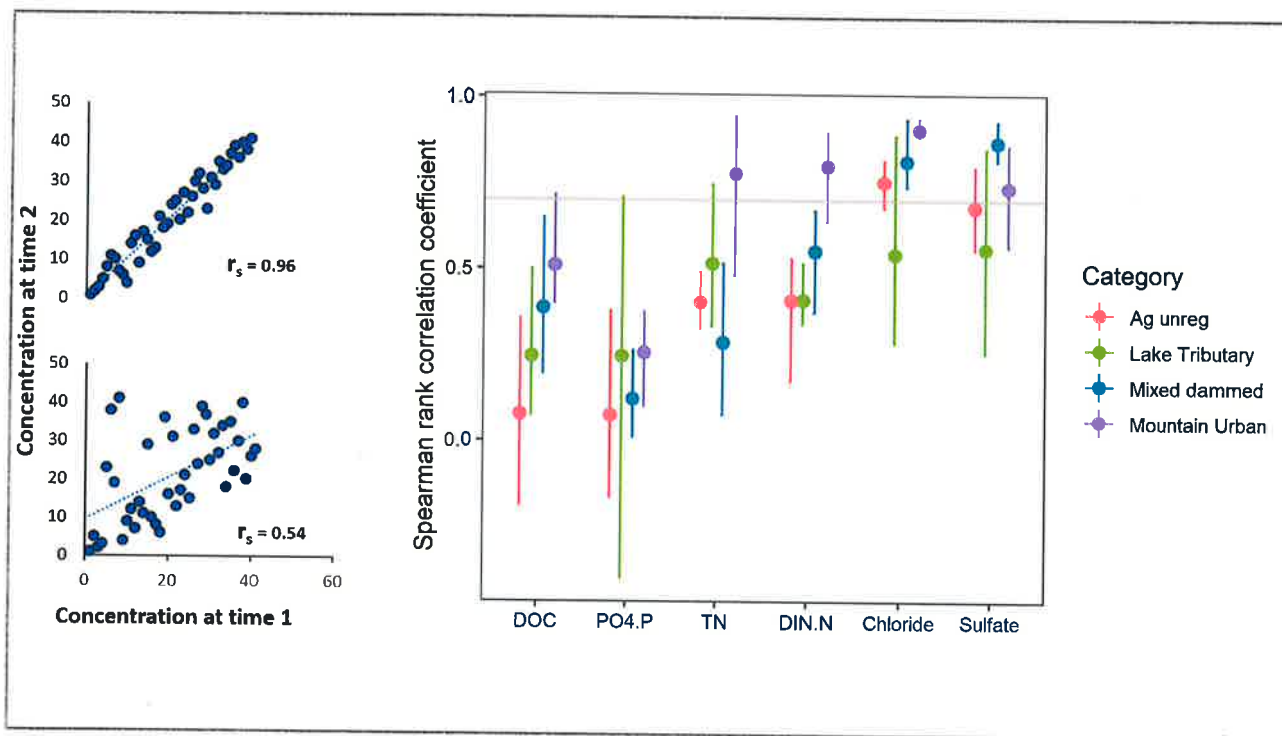


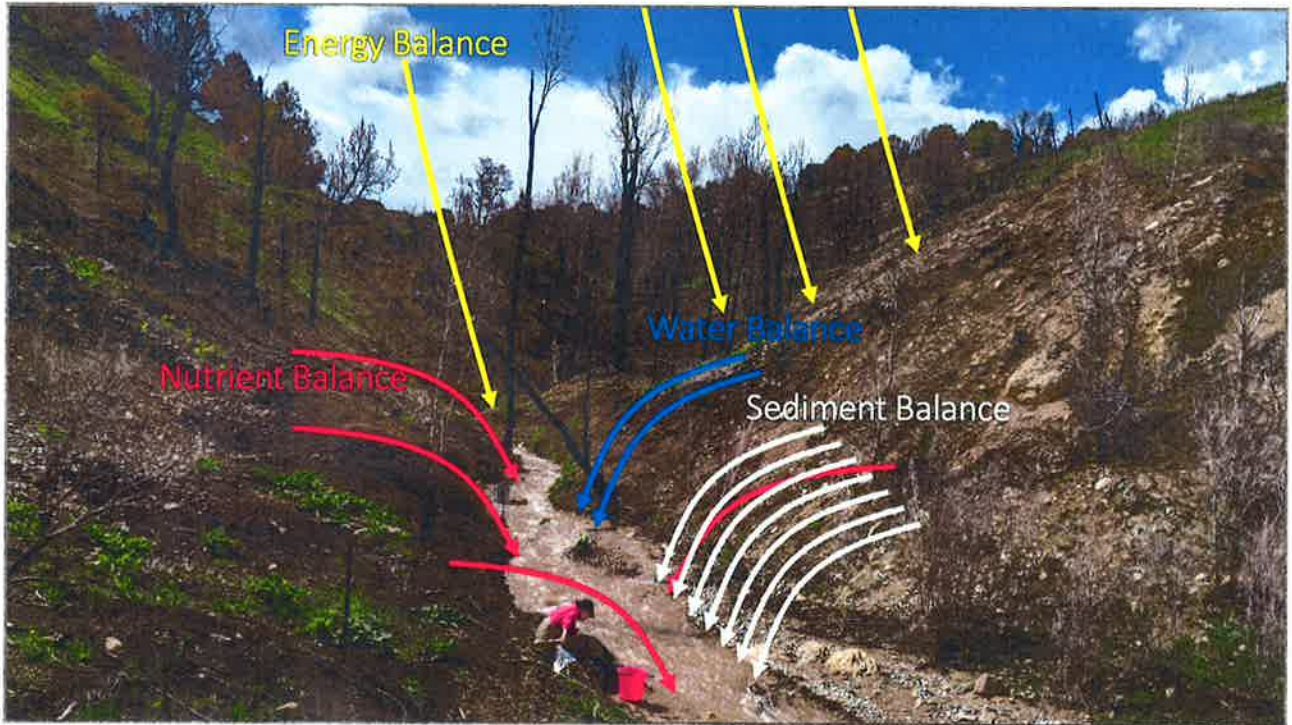
Scale dependence of flow response

- Link between wildfire and discharge is scale dependent
- In small watersheds (<1,000 km²), response depends strongly on topography, vegetation, and energy balance
- In large watersheds (several thousand km²), 5-20% increases in discharge are expected for for 3-5 years, associated with greater groundwater recharge, less transpiration, and averaging out of smaller-scale effects

Wine and Cadol 2016; Environmental Research Letters





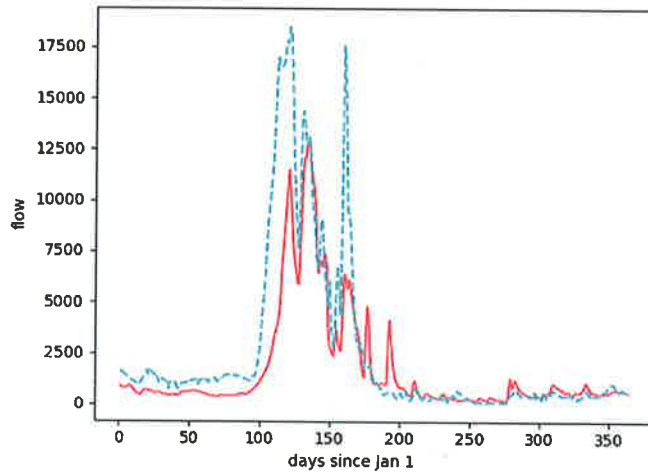


Plans

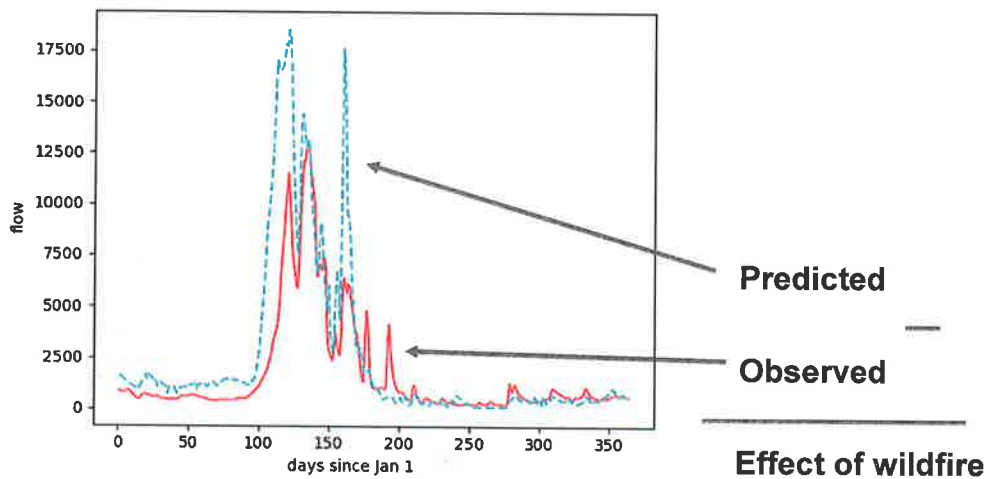
1. Invertebrate analysis and habitat assessment
2. eDNA analysis (succession)
3. Stream metabolism
4. Longer-term flow and chemistry response

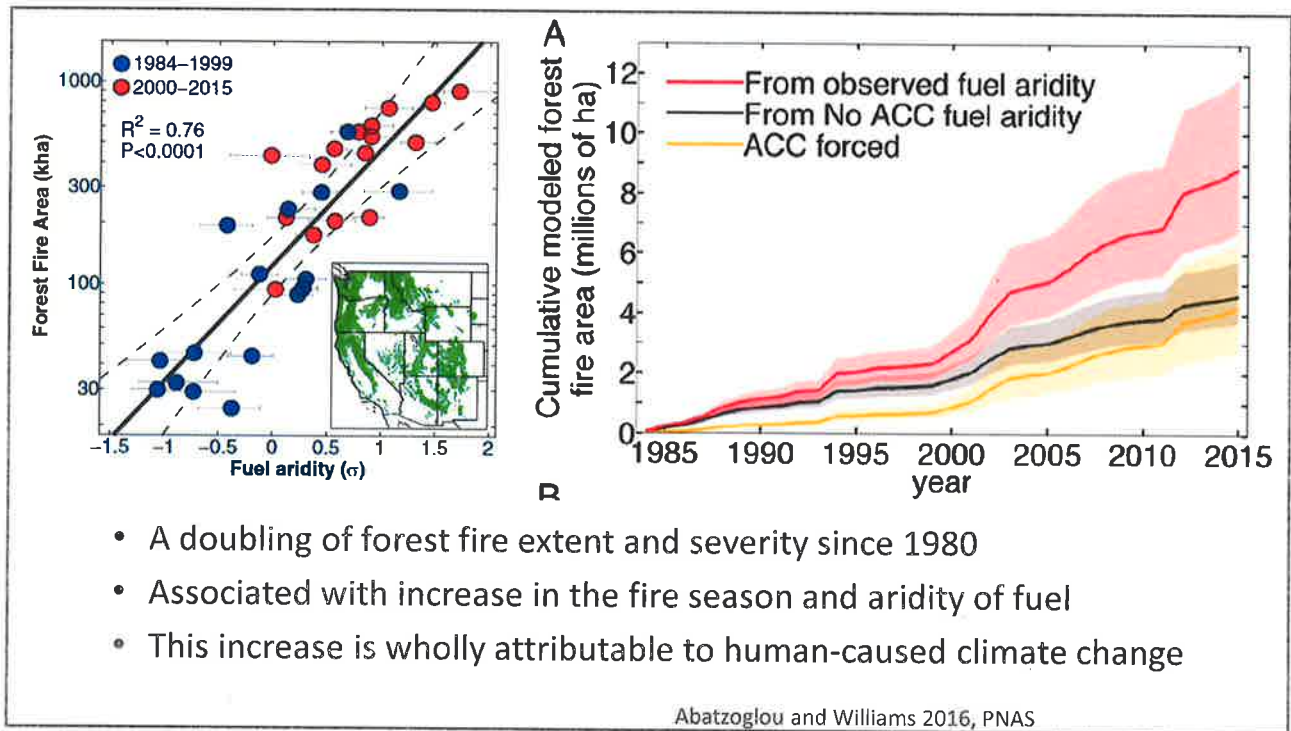
A photograph of a snowy mountain landscape with evergreen trees in the foreground and a valley in the distance. The bottom half of the image is overlaid with a semi-transparent white box containing a list of plans.

The Goal - Predict hydrographs for unburned catchments



The Goal - Predict hydrographs for unburned catchments

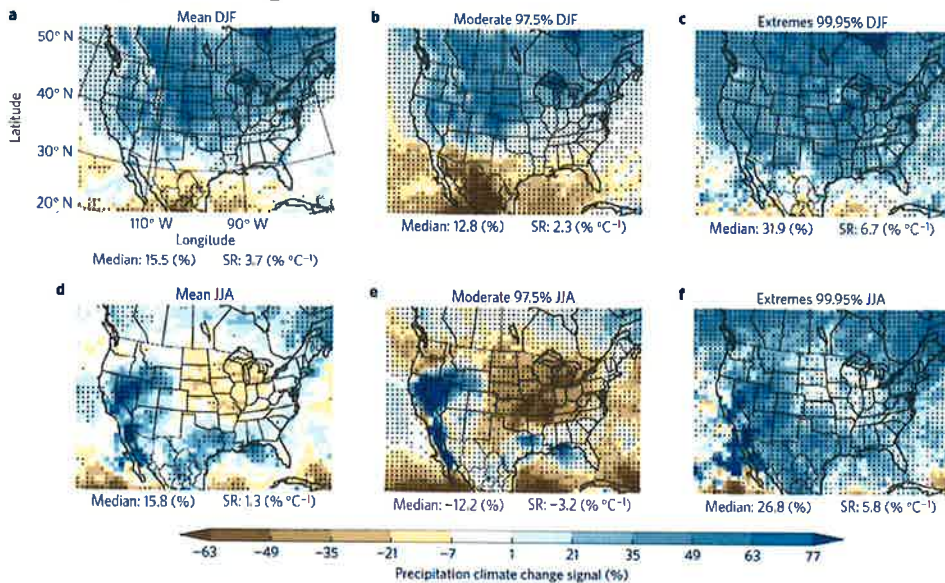


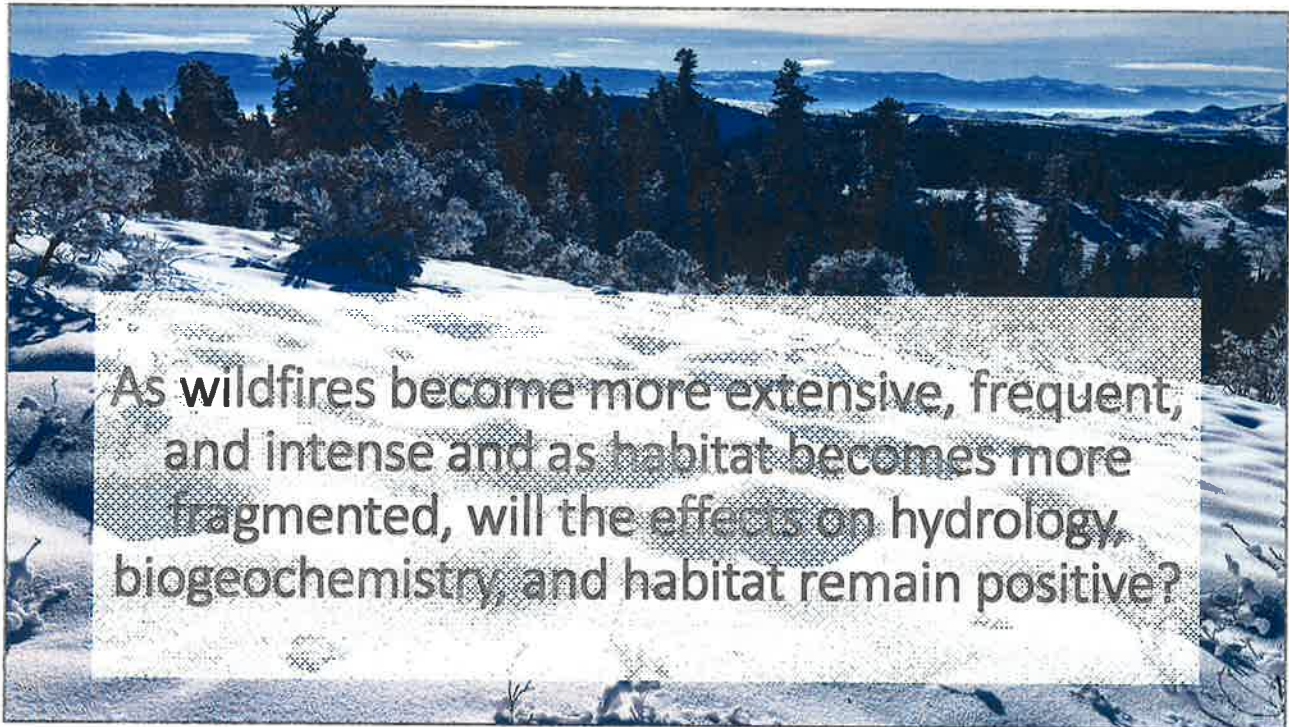


- A doubling of forest fire extent and severity since 1980
- Associated with increase in the fire season and aridity of fuel
- This increase is wholly attributable to human-caused climate change

More extreme precipitation can increase hydrological and chemical variation

Prein et al. 2017; Nature Climate Change





benabbott@byu.edu, stclair@byu.edu



Water Quality Presentation on State Water Plan

Dec. 5, 2019 9:30 AM – 12:00 PM

Chapter 8 Watershed Management

Competing Interests

Land Management

Improve Water Yield

Surface Water and Springs

Instream Flow Maintenance

Natural Uses

Riparian Areas

Wildlife

Instream Water Rights

Reservoirs

Sedimentation

Canal Safety

Flooding

Sedimentation

Groundwater Management

Recharge Area Protection

Declining Groundwater Levels

Groundwater Mining

Land Subsidence

Conjunctive Management

Aquifer Storage and Recovery (ASR)

Chapter 1 About Water Resources in Utah

Purpose

Authority

Governor Herbert's Water Initiative

Utah Open Water Data Portal

Process

Legislative Audit

Collaboration

State water Plan Advisory Committee

Public Input

Looking Forward

Chapter 2 Population and Municipal Water Use

County Level Population Trends and Projections

Kem C. Gardner Policy Institute

2015 Public System Water Municipal and Industrial Use Report

2015 Self-Supplied Industry Use

Chapter 4 Projected Municipal Water Use

Municipal Population Estimates

DOT, GMOs, DWRe

Water Demand Model

Inputs

Results

Recommendations

Oil Shale and Tar Sands - Potential Water Needs

Recommendations

Chapter 3 Trends and Projections

Municipal Population Estimates

Demand Model

Inputs

Projected Water Needs

Chapter 6 Water Education and Conservation

Water Education

Water Conservation

Utah Weekly Lawn Watering Guide

Water Partnerships

Municipal and Industrial Conservation Goals

Progress

Regional Goals

Reaching Regional Goals

Recommendations

Metering

Transparent Billing

Ordinances

Water Conservation Plans

Tiered Pricing (statute citation)

Water System Loss Audits

American Water Works Association Audit Method)

Universal Metering

Potable Water Metering

Secondary Water Metering

Upper Sevier River Restoration Projects

Wallace S. Dodds
Zone 5 Watershed Coordinator

National Water Quality Initiative

- Sevier River is listed as impaired for sediment.
- Garkane Team has been administering NWQI since 2014
 - Worked with every eligible land owner in the Hillside Watershed and the Peterson Wash Watershed. We have written watershed assessments for the East Bench and West Ditch Watersheds. Proposed to add both Watersheds for 2020.
- 10 contracts
- \$977,143.12 in contract funding from NRCS in conjunction with NPS funds

Contracted Practices

- Irrigation Pipeline-9,469'
- Structure for Water Control-15 Ea.
- Sprinkler System-30 ac.
- Irrigation Reservoir- 2 ac-ft
- Stream Habitat Improvement and Management-5 ac.
- Riparian Forest Buffer-1 ac.
- Streambank and shoreline protection:
 - Structural-10,145'
 - Vegetative/ Bioengineered-5,960'
- Fence-23,853'

NWQI Watersheds 2020



Two NWQI Projects completed 2017

Completed projects include:

- Vinnie Salvado pipe and riparian restoration project
- Richard Briggs River Screen and riparian restoration project

Vinnie Salvado project

- Installed over 200' of 15" Pipe/750' Riparian



Vinnie Salvado project



River screen; two winches; sprinkler



Willow planting



Completed NWQI Projects 2018

- JYS Properties K-line and Riparian Restoration
- Craig Wolfley Riparian Restoration
- Frank Myers Riparian Restoration Phase II
- Mike Wagner Riparian Restoration

Frank Myers





Frank Myers Phase II



Craig Wolfley



Wolfley during construction



Planting finished projects



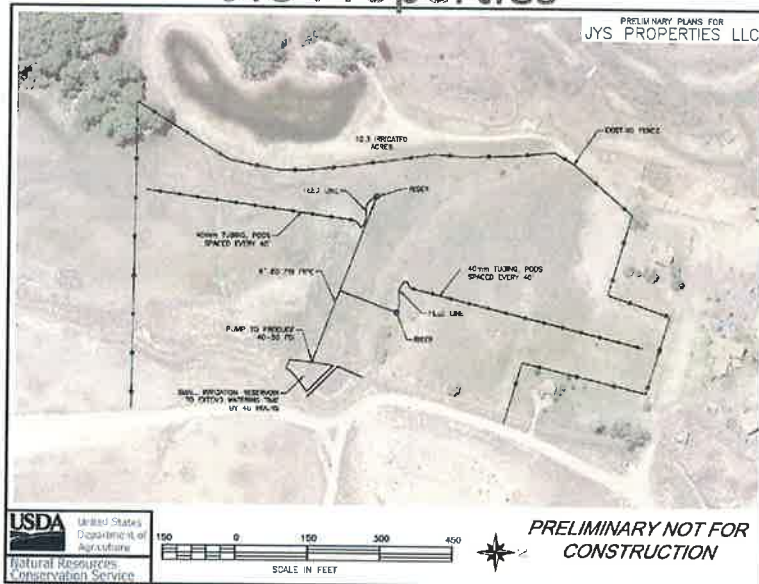
One year post construction

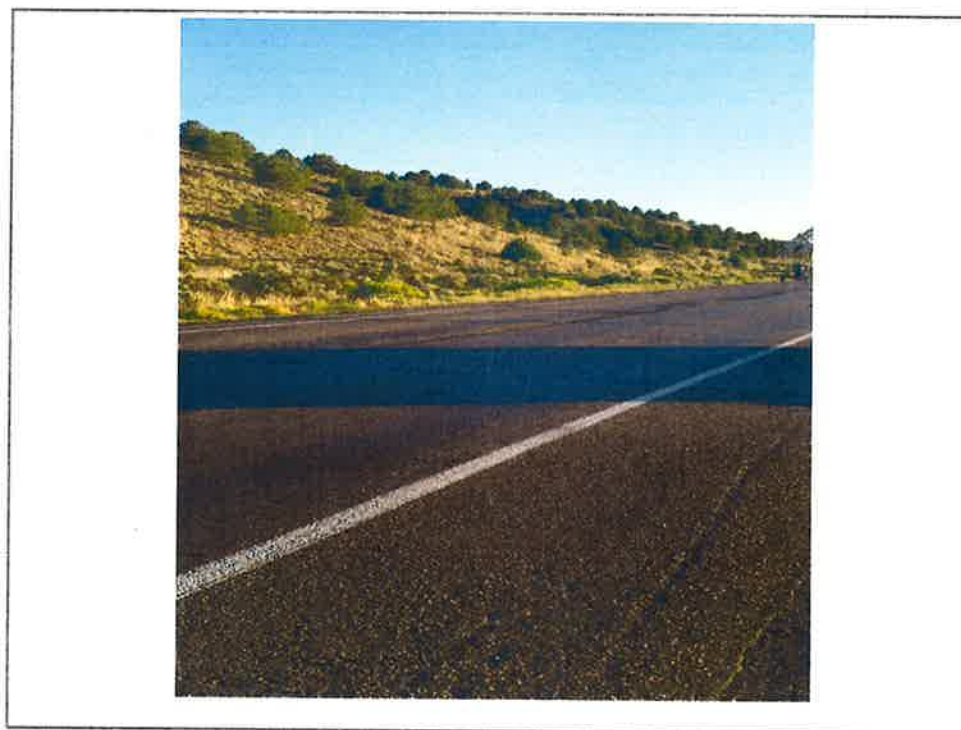


Mike Wagner



JYS Properties







Installed K-lines



Underground drain



Four projects under construction 2019
Total NWQI funds \$315,516.00

- Oron
- Burningham
- Hepworth
- Prince

Pinto Creek WRI Project



NPS funds 125,000.00. NRCS funds
117,500.00 for riparian work.



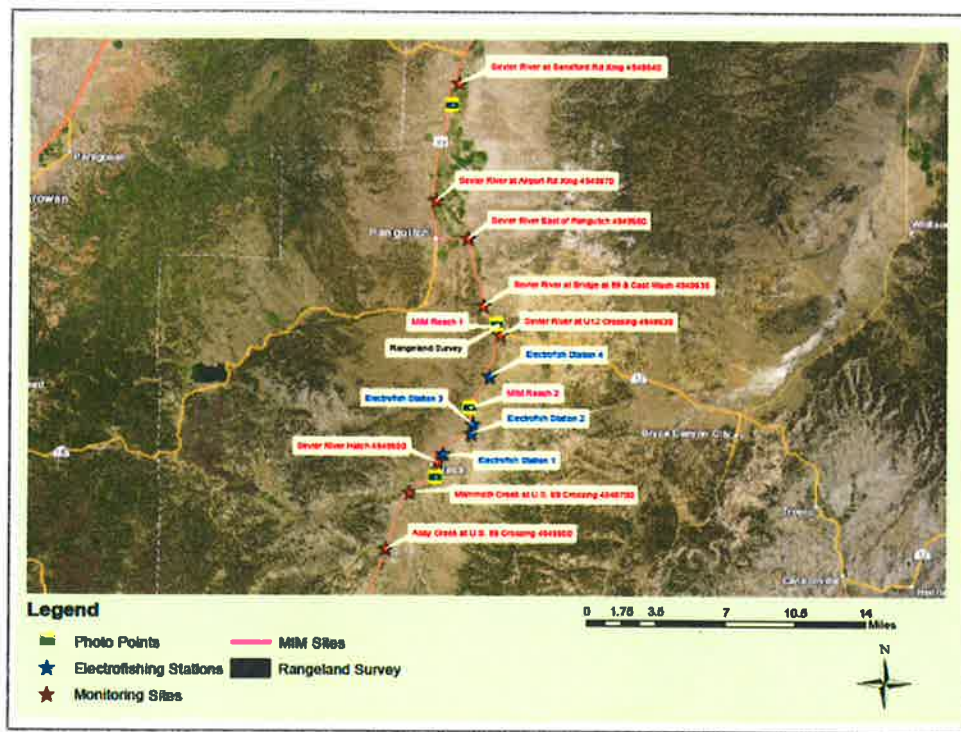
Pinto Creek Check Dam



Cement Barrier Check Dams



Finished Check Dams



Routine Monitoring Run



Routine Monitoring Run



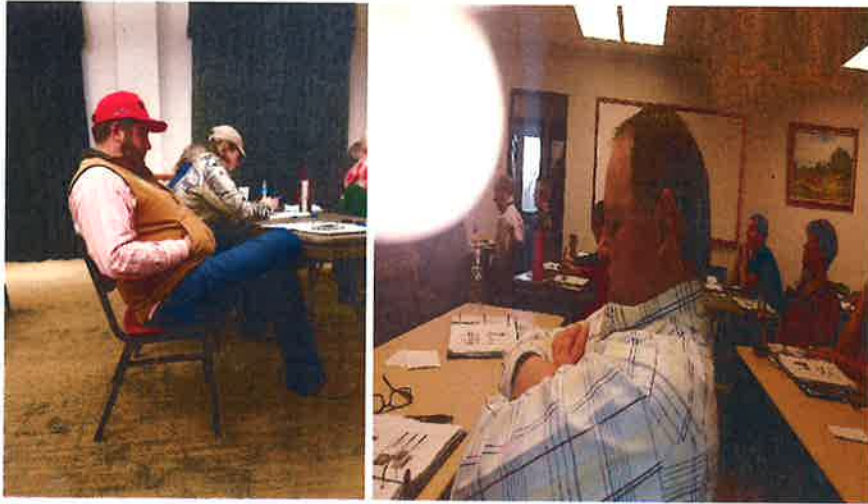
Winter Monitoring



Electrofishing



Another boring presentation



Awake??? Questions??

