

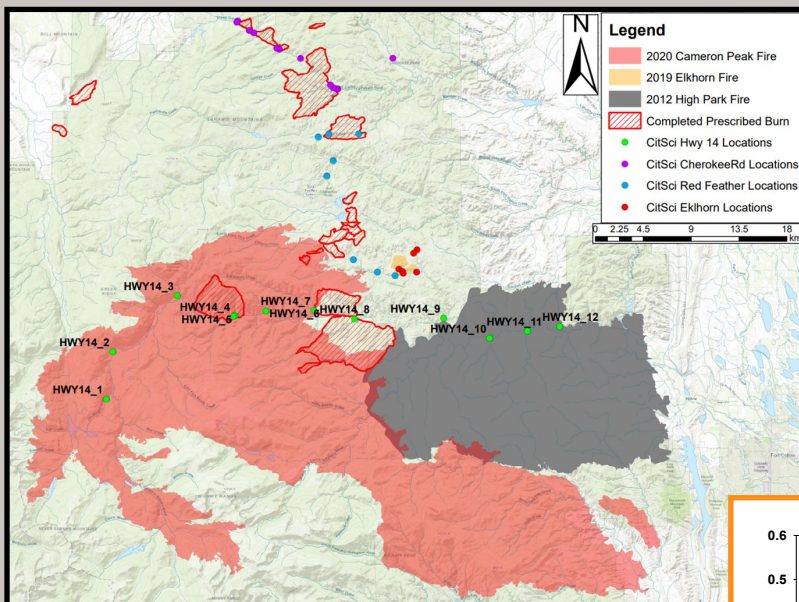


COALITION FOR THE POUDE RIVER WATERSHED

US FOREST SERVICE ROCKY MOUNTAIN RESEARCH STATION



CITIZEN SCIENTIST WATER QUALITY MONITORING PROGRAM - 2023



BRIEF BACKGROUND

Initiated after High Pk Fire with USFS Fire Plan funds.

- 2018: Established sites, pilot sampling
- 2019: 1st volunteer sampling
- 2020: COVID & Cameron Pk Fire pause
- 2021, 2022: Back on-line

Volunteers: 5-6 / yr
 Sample Sites: 15-20
 Water samples: 750 total to date

Cameron Peak Fire Effects

Pre-fire data collected by Citizen Scientists have provided a unique opportunity to determine how wildfire impacts surface water.

Nutrients and other compounds derived from wildfire ash have been significantly higher since the fire, though responses vary by parameter and season (Fig. 1). Dissolved forms of nitrogen (N) were elevated during as snowmelt flushed excess N from burned hillslopes. Summer rainstorms mobilizes ash that is rich in potassium, alkalinity (ANC) and other compounds and created black water events with partially charred organic matter. We also observed a transient increase in P and N in Roaring Ck after retardant was applied within the stream riparian zone. Enrichment of surface water by N and phosphorus (P) compounds threaten to promote algal blooms and alter downstream aquatic habitat and food webs. Associated storm event sampling documented increased nutrients downstream in the mainstem CLP during 2021 and 2022.

We are currently using these data in a manuscript that will document the 2-Yr response to Colorado's largest wildfire.

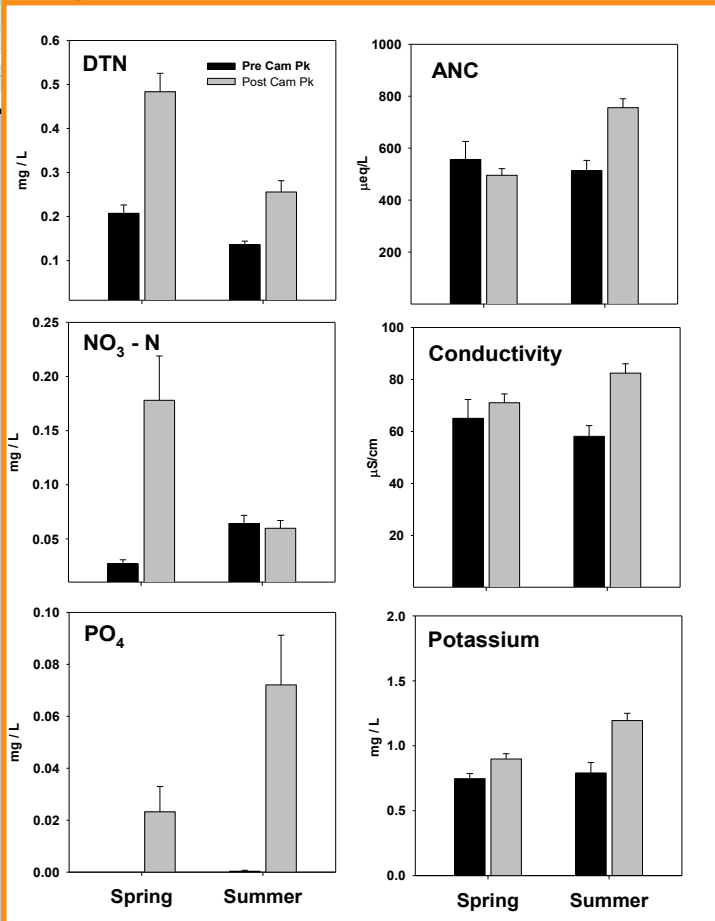
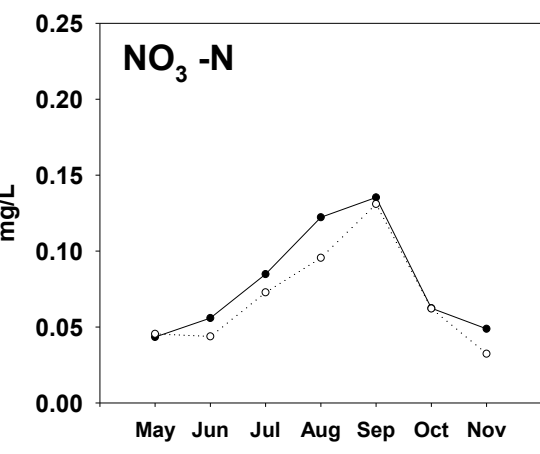
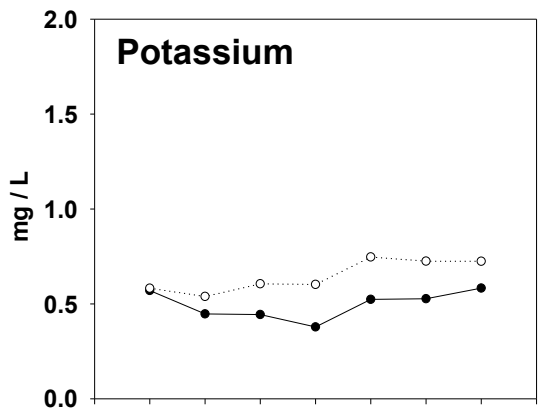
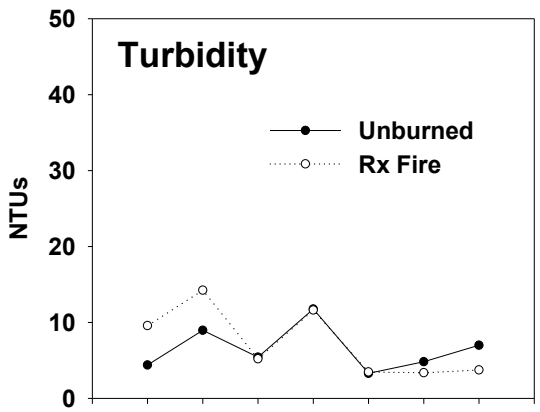


Fig 1. Citizen Science sampling of tributaries to the Cache la Poudre (CLP) burned during the 2020 Cameron Peak Fire. Data are: Pre– (2019 to spring 2020) and post-fire (summer 2020 thru 2022) concentrations in Roaring, Tunnel, Seven-mile, Joe Wright Cks during spring (Mar, Apr, May, Jun) and summer (Jul, Aug, Sep, Oct) seasons.

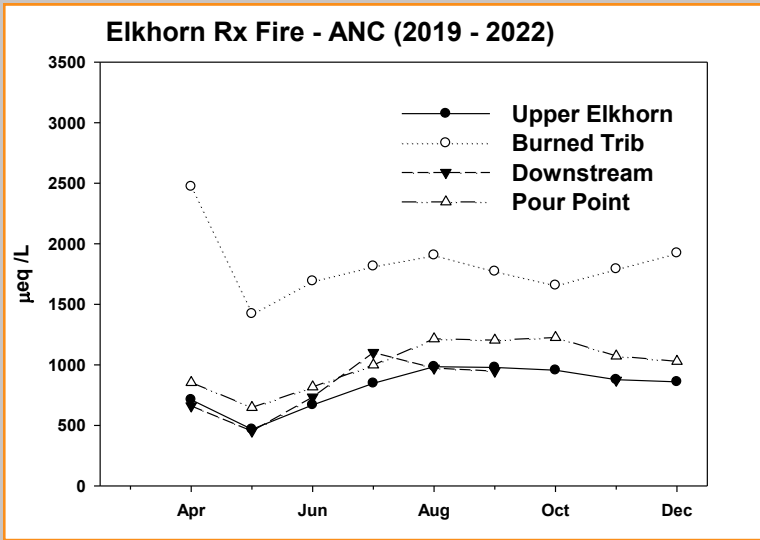
Cherokee Park Sites (2019-2022)



Water Quality Responses to Rx Fire

Citizen Scientists have gathered samples to inform forest and watershed managers about potential impacts of prescribed fire on aquatic resources, relative to those of wildfires and natural sources of variability.

The NoCo Fireshed promotes use of prescribed fire to reduce wildfire risks to local communities and watersheds. The impacts of controlled fire are likely to be less significant than severe wildfires, yet there is no local data to support this assumption and guide expectations and management practice. Prescribed burns conducted near Cherokee Park, Red Feather Lakes and along the Elkhorn provide a unique data set and multiple years of data to address this.



Figs 2 & 3: Cherokee Park & Elkhorn Creek Burns

As expected, the small surface burns in the hillslopes along the N. Fork had little impact on surface water quality. The slight elevations in turbidity and potassium along the burned tributaries are with the range of pre-fire variability and below concentrations in tributaries burned by wildfire. Stream ANC (alkalinity) of the tributary burned by the Elkhorn burn was elevated significantly compared to the upstream portion of Elkhorn Ck. ANC is slightly higher at Elkhorn's confluence with the CLP, but this pattern pre-dated the Rx burn.

Overall, these data along with information from the Bull Burn near Red Feather Lakes helps confirm that most prescribed fires have minimal impacts on water quality relative to nearby wildfire. Samples collected by Citizen Scientists will contribute to a peer-review manuscript

Next Steps : Restoring Post-Fire Watershed Function and Water Quality

Post-fire water quality and watershed recovery tracks the pace of revegetation and can guide restoration priorities