

AGRICULTURAL WATER QUALITY PROGRAM INTERN (LARIMER/ROUTT COUNTY)

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PROJECT INTRODUCTION

The Agricultural Water Quality Program at CSU focuses on researching agricultural best management practices (BMPs) that improve and maintain the quality of Colorado's waters.

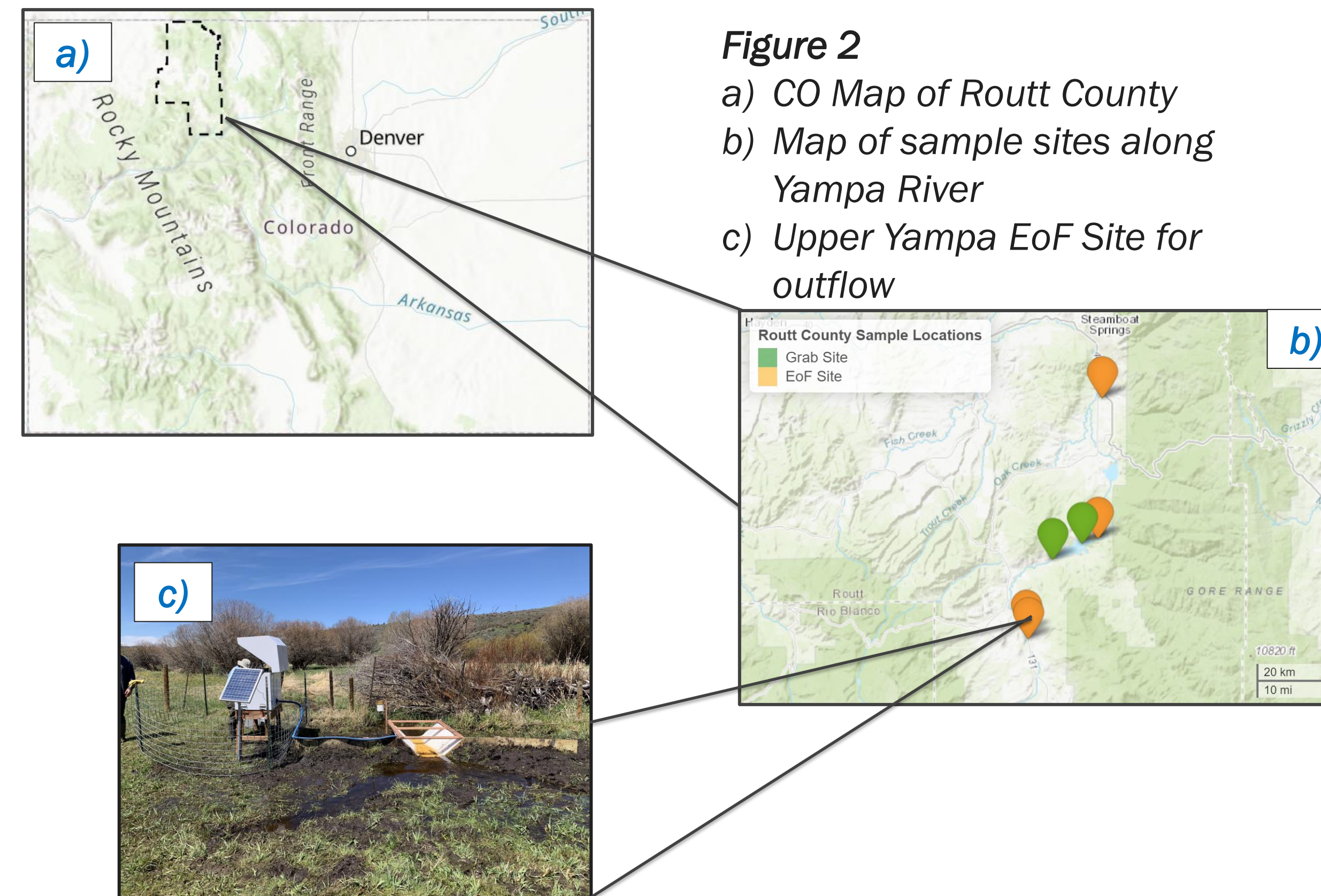
This internship focused on establishing baseline water quality data at several locations along the Yampa River in Routt County, Colorado. The purpose will enable future changes in water quality impacts of BMPs to be observed.



INTERNSHIP GOALS

- Establish baseline a water quality status of several farms along the Yampa River
- Gain experience and understanding in the realm of CSU Extension and research.
- To gain knowledge of soil/water health environmental research.
 - Conduct soil fertility sampling and water quality sampling in the field
 - Analyze Total Suspended Solids (TSS) samples in the laboratory
 - Collect samples from low-cost and ISCO water sampler
 - Run experiments to determine soil infiltration, bulk density and soil moisture

WATER QUALITY ANALYSIS IN ROUTT COUNTY



Surface water samples were collected from three AWQP Edge of Field (EoF) sites and three grab sample sites both upstream and downstream of stagecoach reservoir.

EoF sites use an automated water sampler to collect regular, composite water samples near a water body, such as a field inlet/outlet (Figure 2c).

Grab sample sites involved using a swing sampler to collect point water samples in various bodies of water along the river/reservoir (Figure 1)

All samples collected were taken to a third-party lab to be tested for Selenium, Total Phosphorus, Nitrite, Nitrate, Total Kjeldahl Nitrogen (TKN), and Orthophosphate. Samples are split to analyze for total suspended solids (TSS) in the AWQP lab on campus.

DATA ANALYSIS

Lab analysis results were compiled and processed using R studio. Coding scripts were generated to 1) present analyte concentration results, and 2) to create an interactive map of location sites (scan QR code to view).



WHAT YOU LEARNED

Throughout my internship, my day-to-day activities included, visiting field sites, taking water and soil samples, setting up lab equipment, lab work, and using R studio to visualize data. However, my main project included visiting sites in Routt County and using R coding language to visualize the preliminary results.

This experience allowed me to understand the intricacies of the field and lab work needed to analyze water samples and the data processing needed to visualize results to gain insight. Furthermore, I was able to gain a better understanding of agriculture in Colorado by visiting a variety of different operations.

As a student who is a watershed science major with an interest in data science, I found myself preferring the lab and data analysis aspects of the internship. The work I completed allowed me to gain experience that will help me through the rest of my professional career.

RESULTS

Presented results compare inflow and outflow phosphorous levels for the Legacy Ranch and the Upper Yampa EoF sites. The Legacy Ranch is a AWQP EoF site managed by CSU Extension. The Upper Yampa is a private farm which serves as one of the AWQP EoF sites.

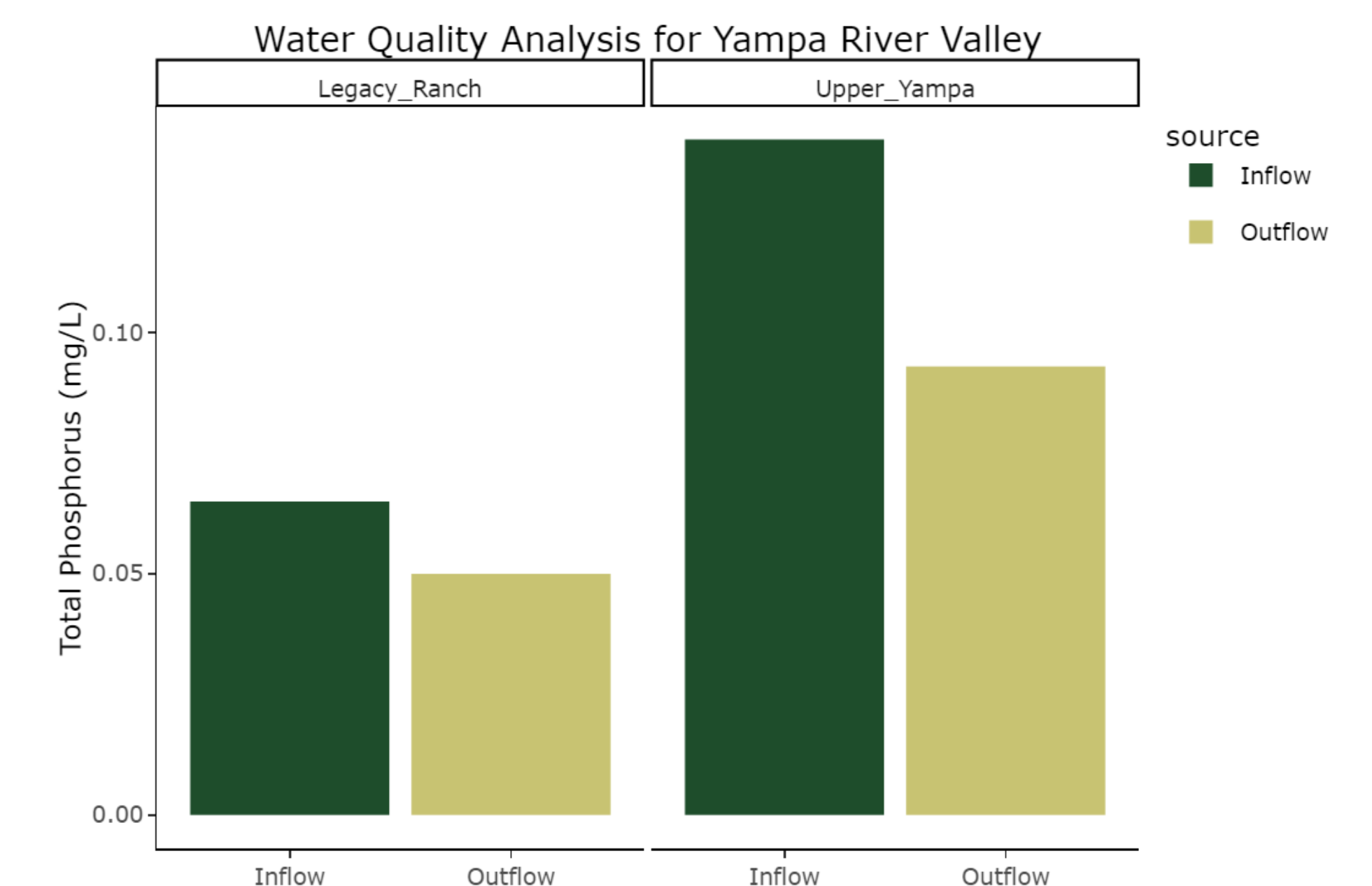


Figure 3 Comparison of total phosphorus on inflow and outflow water sources for Legacy Ranch and Upper Yampa study sites.

NEXT STEPS

- Collect additional samples to better analyze the Yampa river basin.
- Preform QA/QC on collected data from this season and merge with last season's collected data.
- Create data insights and share with stakeholders such as farmers and other research groups interested in the region.