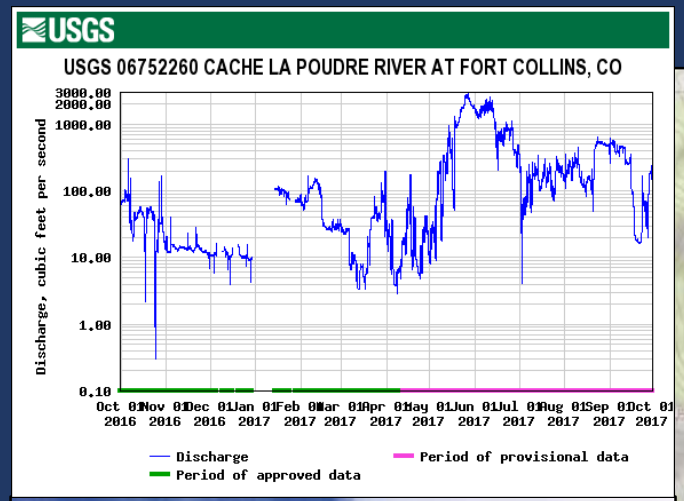
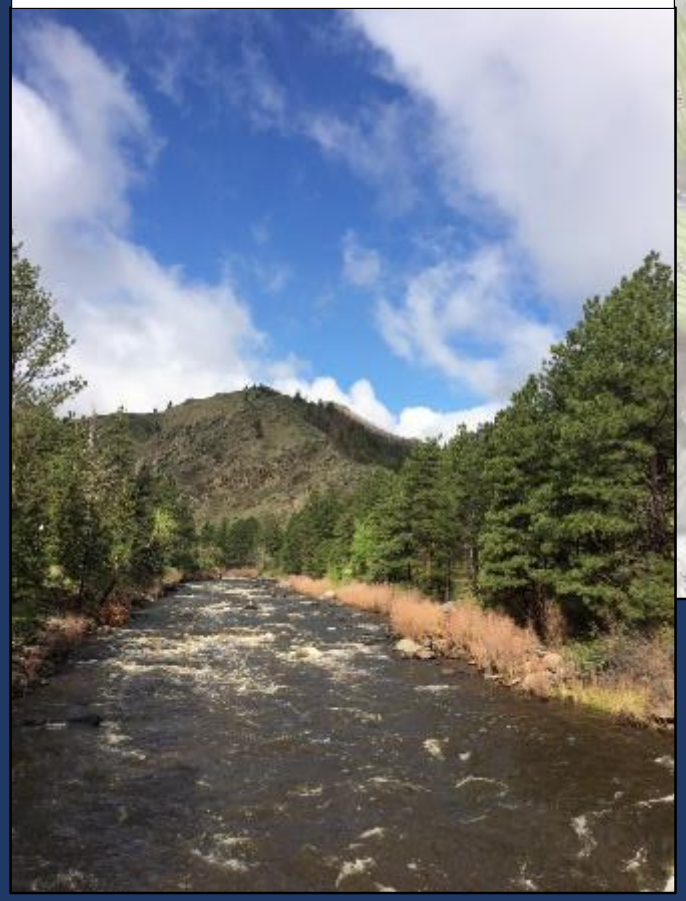
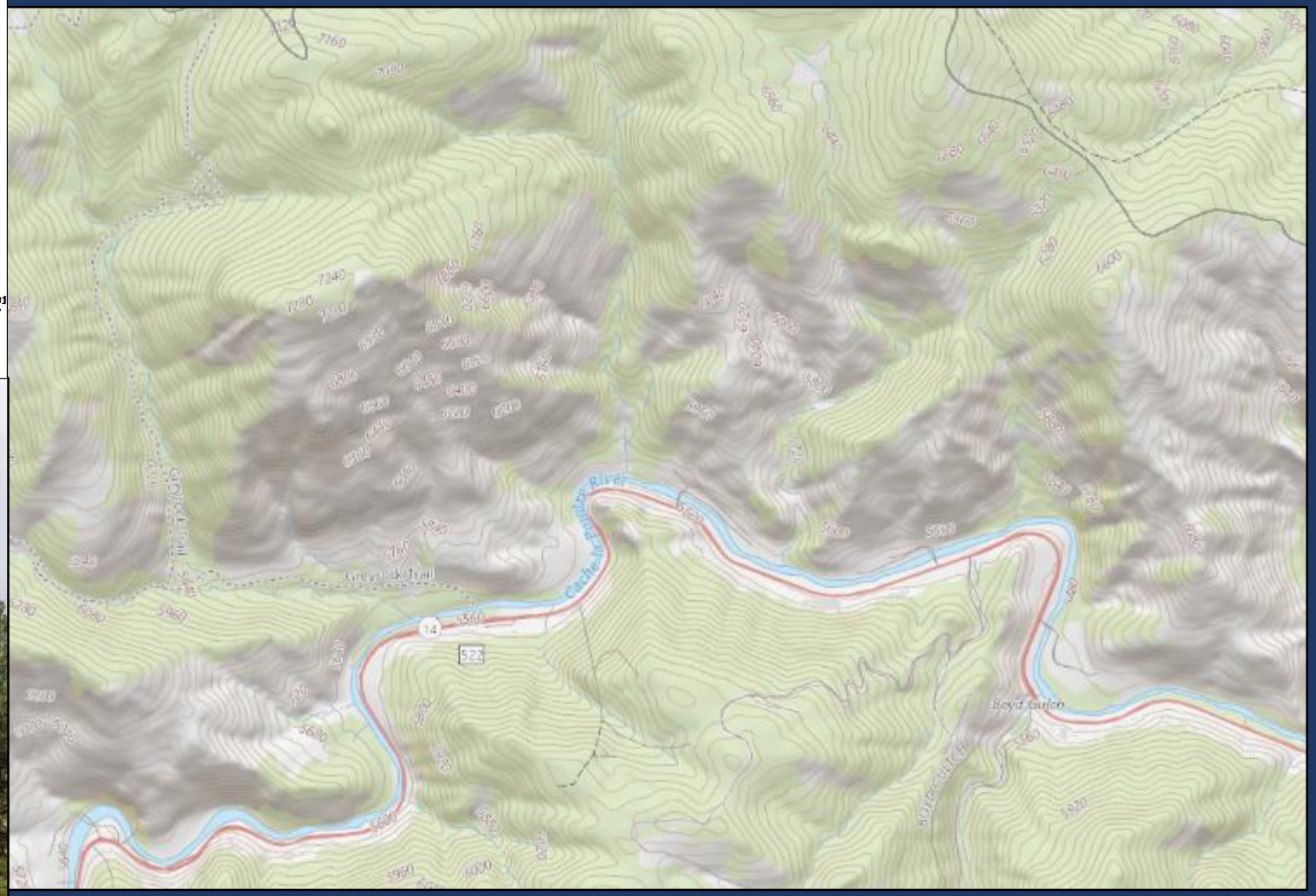
Connecting through crowdsourcing data- the Stream Tracker Project

Kira Puntenney-Desmond info@streamtracker.org www.streamtracker.org

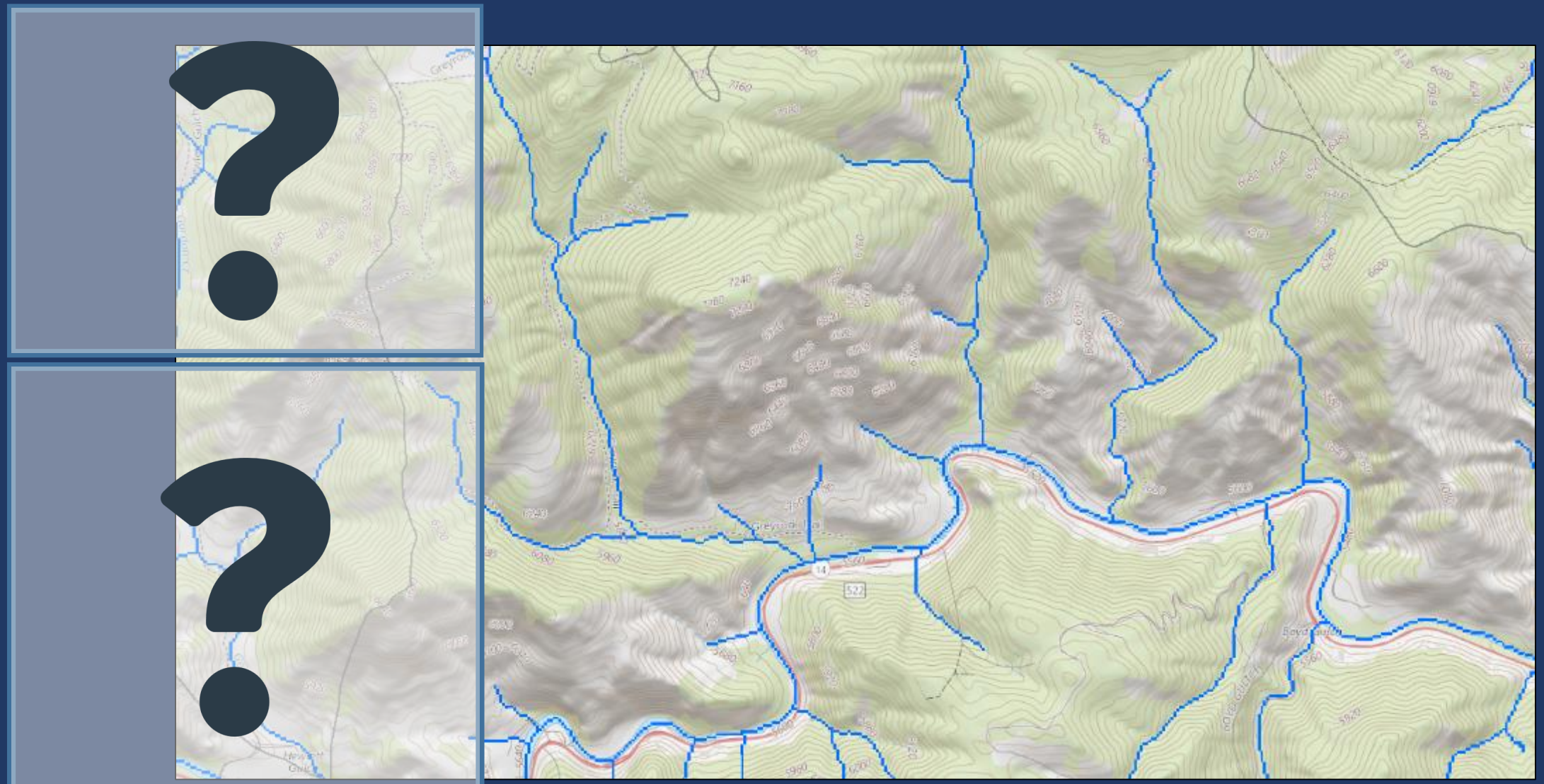






PERENNIAL

Flows year round



INTERMITTENT

Flows seasonally or only part of the year

CROWDSOURCING

STREAMFLOW PRESENCE/ABSENCE OBSERVATIONS

STREAMTRACKER

Community Powered Stream Monitoring

Improve the **mapping and monitoring** of flow condition of smaller, **intermittent streams** through **crowdsourced observations** of **streamflow presence and absence**

NATION-WIDE

700+ VOLUNTEERS

8000+ OBSERVATIONS

THE BASICS

JOIN

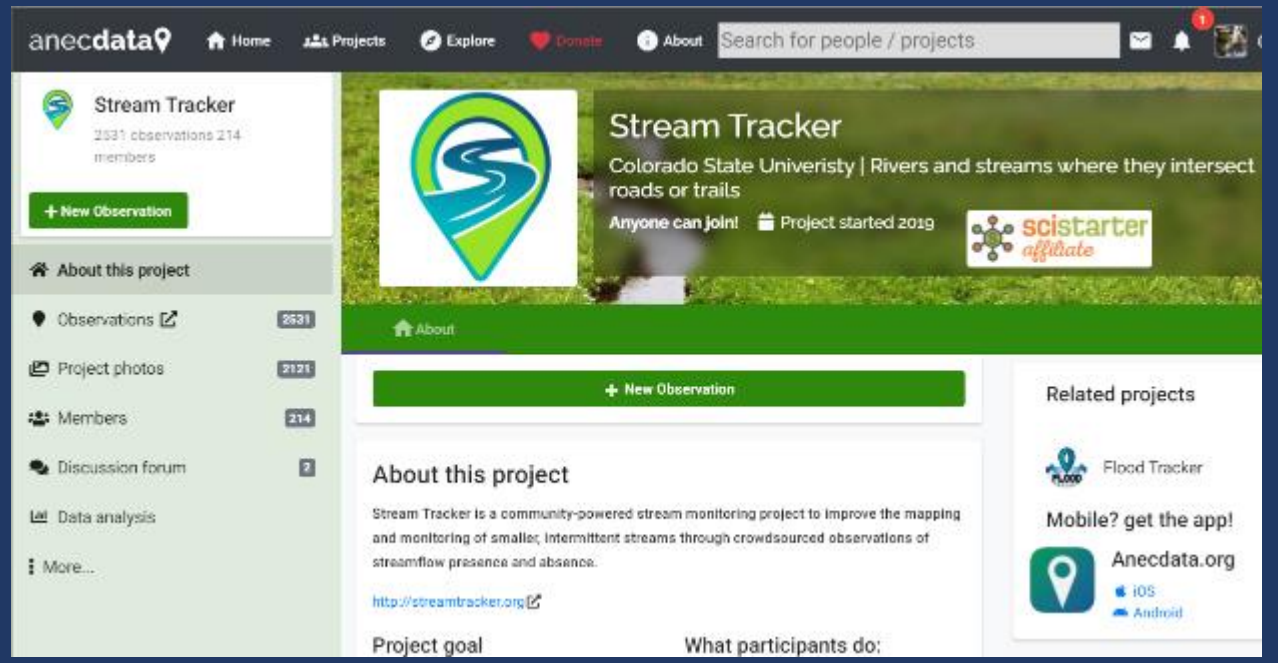
FIND

RECORD

ANALYZE

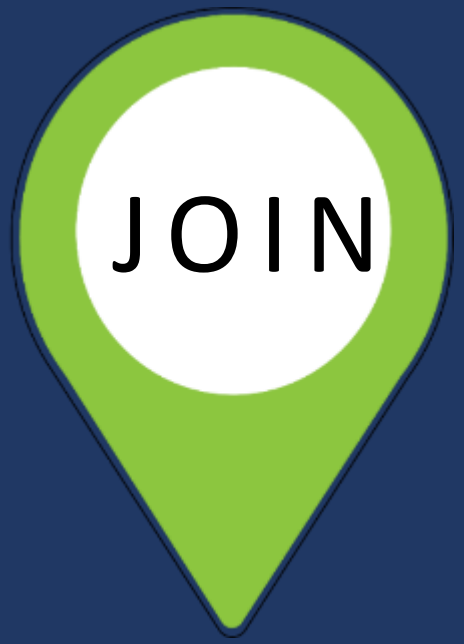
JOIN

anecdata



CitSci.org

CITIZEN SCIENCE SUPPORT PLATFORMS



CITIZEN SCIENCE SUPPORT PLATFORMS

anecdata

CitSci.org

- Project home page
- Customizable datasheets
- Volunteer management tools
- Mobile application
- Data visualization
- Downloadable database
- Citizen science network and community
- FREE
- Support

FIND

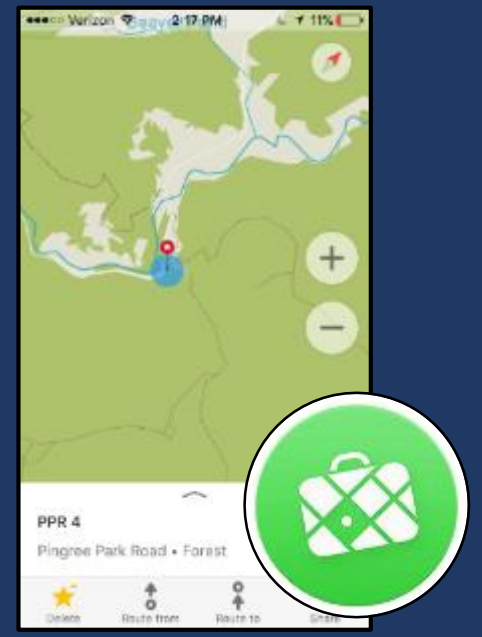
ROADS

TRAILS

NEW SITES

ESTABLISHED SITES (hotspots)

IN or OUT OF CELL RANGE



RECORD

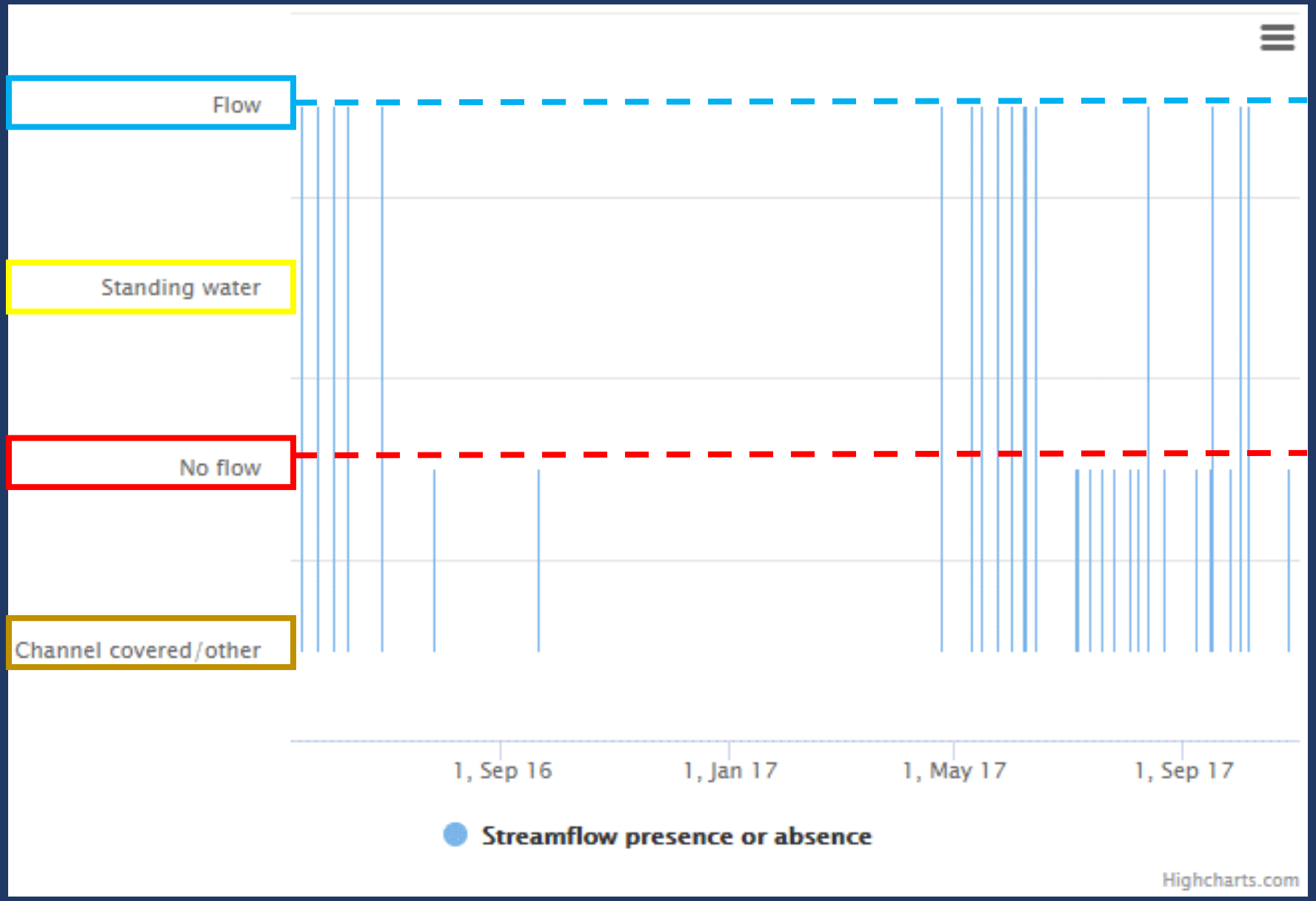
FLOW

NO FLOW

STANDING WATER

CHANNEL COVERED/ OTHER

POWER OF THE CROWD = DATA



WHO PARTICIPATES

ANYONE!

Recreators
School groups

Homeowners

Experts
Students

Volunteers and Organizations

Forest Service U.S. Department of Agriculture

Rocky Mountain Flycasters Trout Unlimited

City of Fort Collins Natural Areas

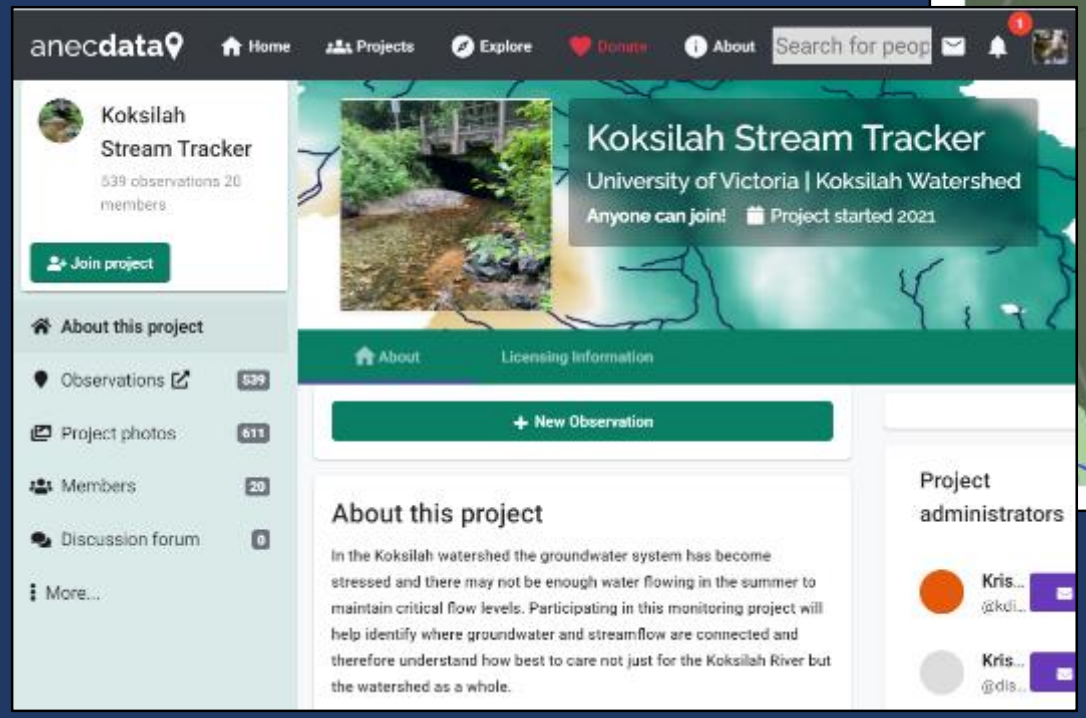
Poudre Wilderness Volunteers
Caring For Northern Colorado Wilderness

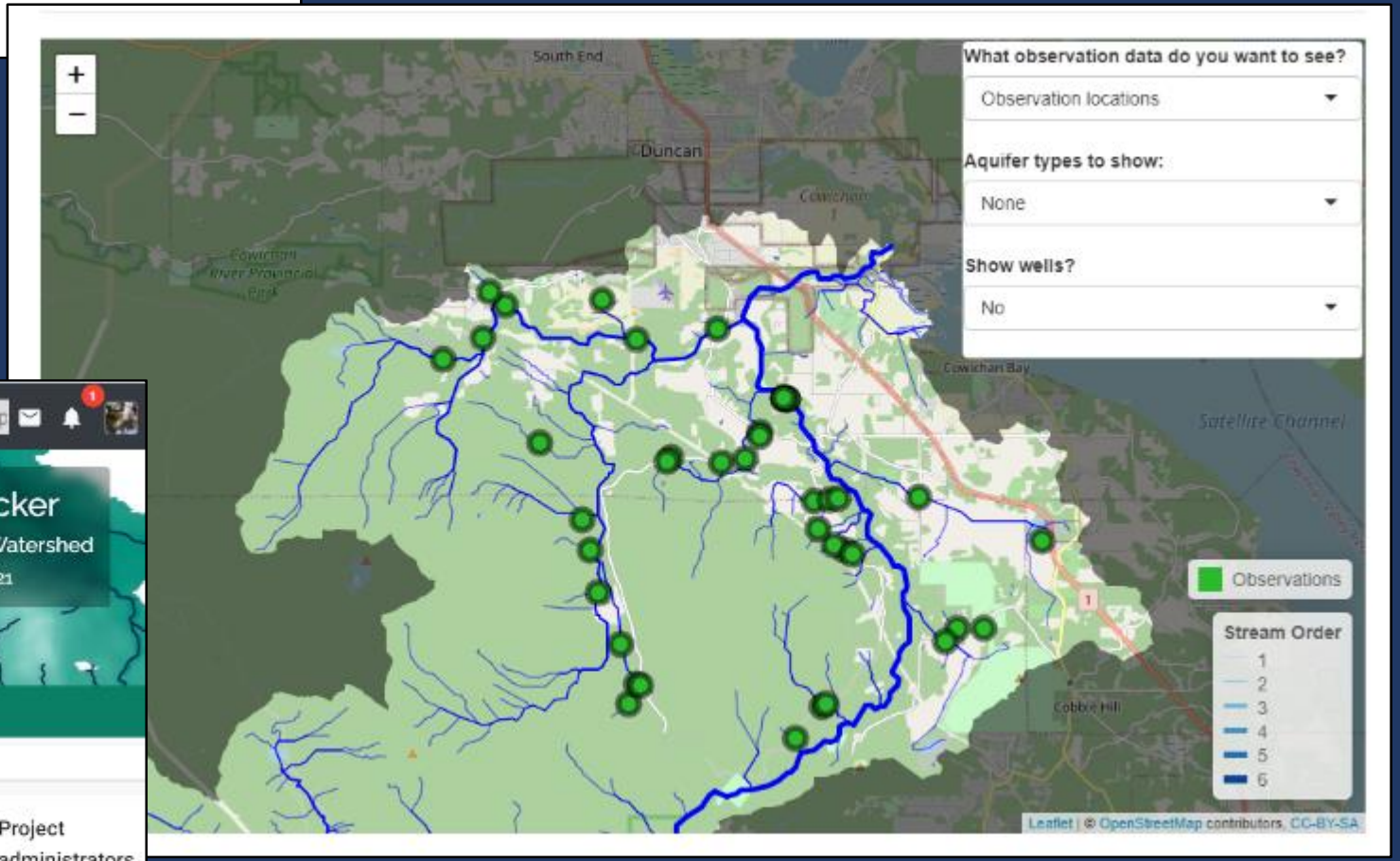
Wildlands Restoration Volunteers

Coalition for the Poudre River Watershed

KOKSILAH CONNECTIONS

Low flow monitoring to understand groundwater-surface water connections while building human connections





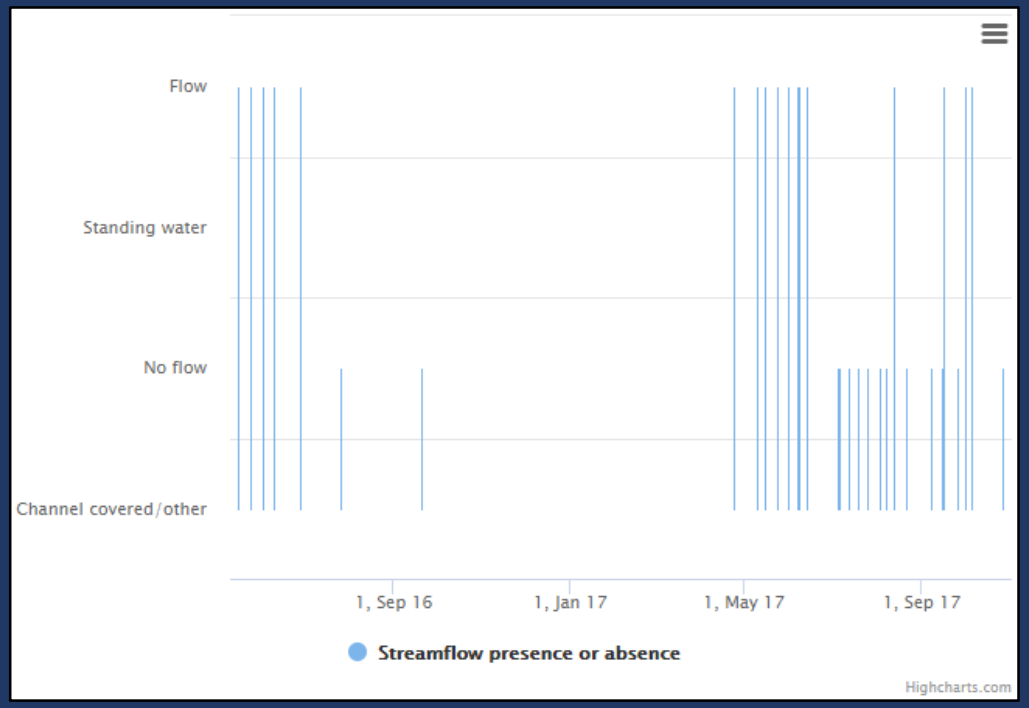
https://koksilahconnections.weebly.com/

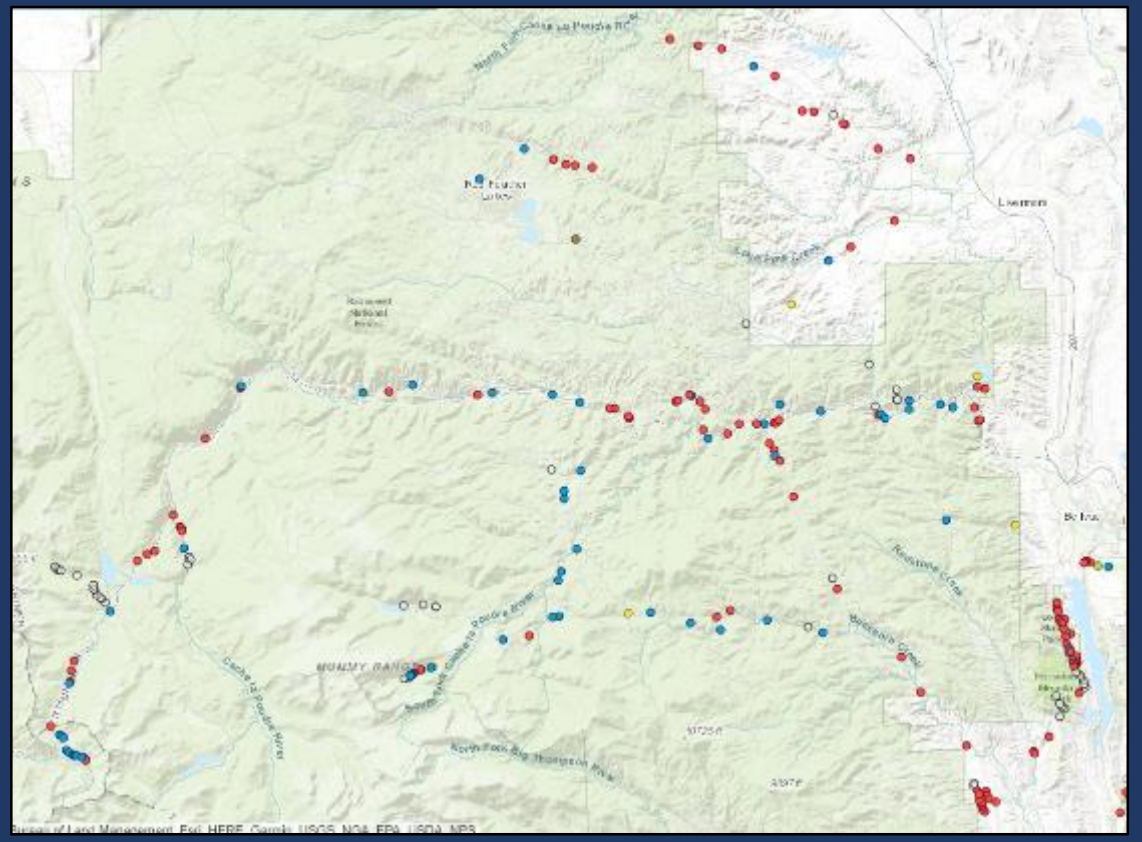
ANALYZE

Intermittent streams are variable in both

SPACE

TIME





September Stream Track-a-thon

Flow No flow Standing water Other

SEASONAL CONDITIONS

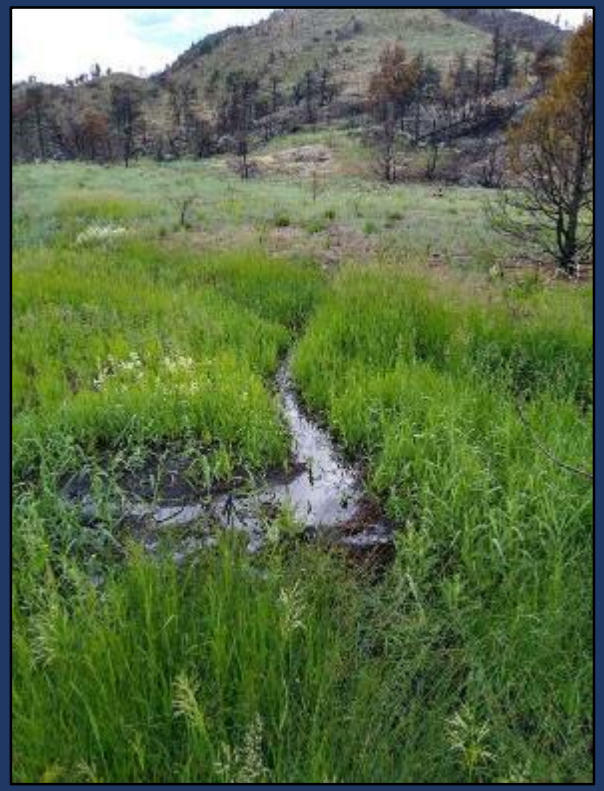
STORMS

MAJOR EVENTS

POST-FIRE

POST-FIRE

May 6



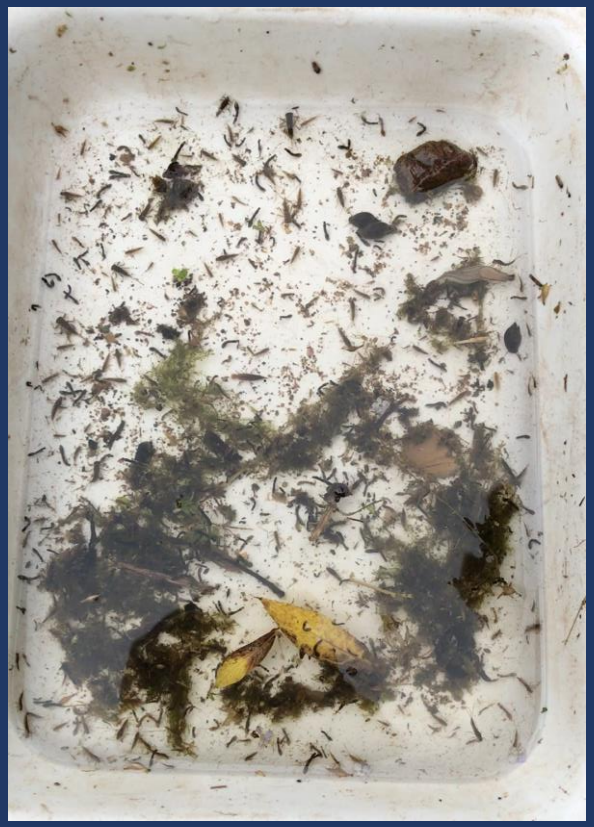
June 28

July 26

September 2

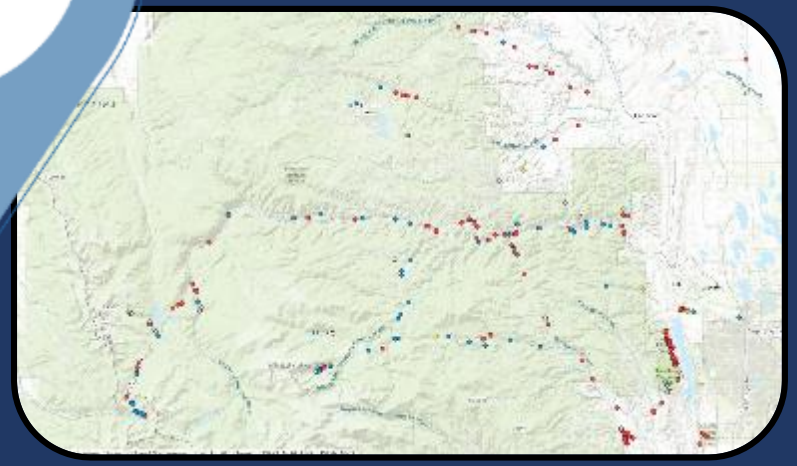
2021 following Cameron Peak fire

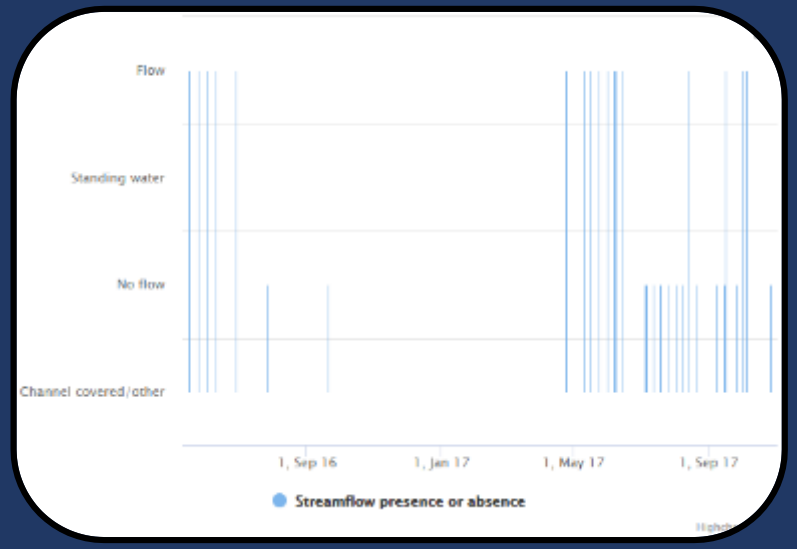
DRY/WET CYCLES



STREAM TRACKER OBSERVATIONS → MAP OF STREAM TYPES

ANALYZE





1. Predict flow or no flow on a day with many observations

2. Convert observations to channel type

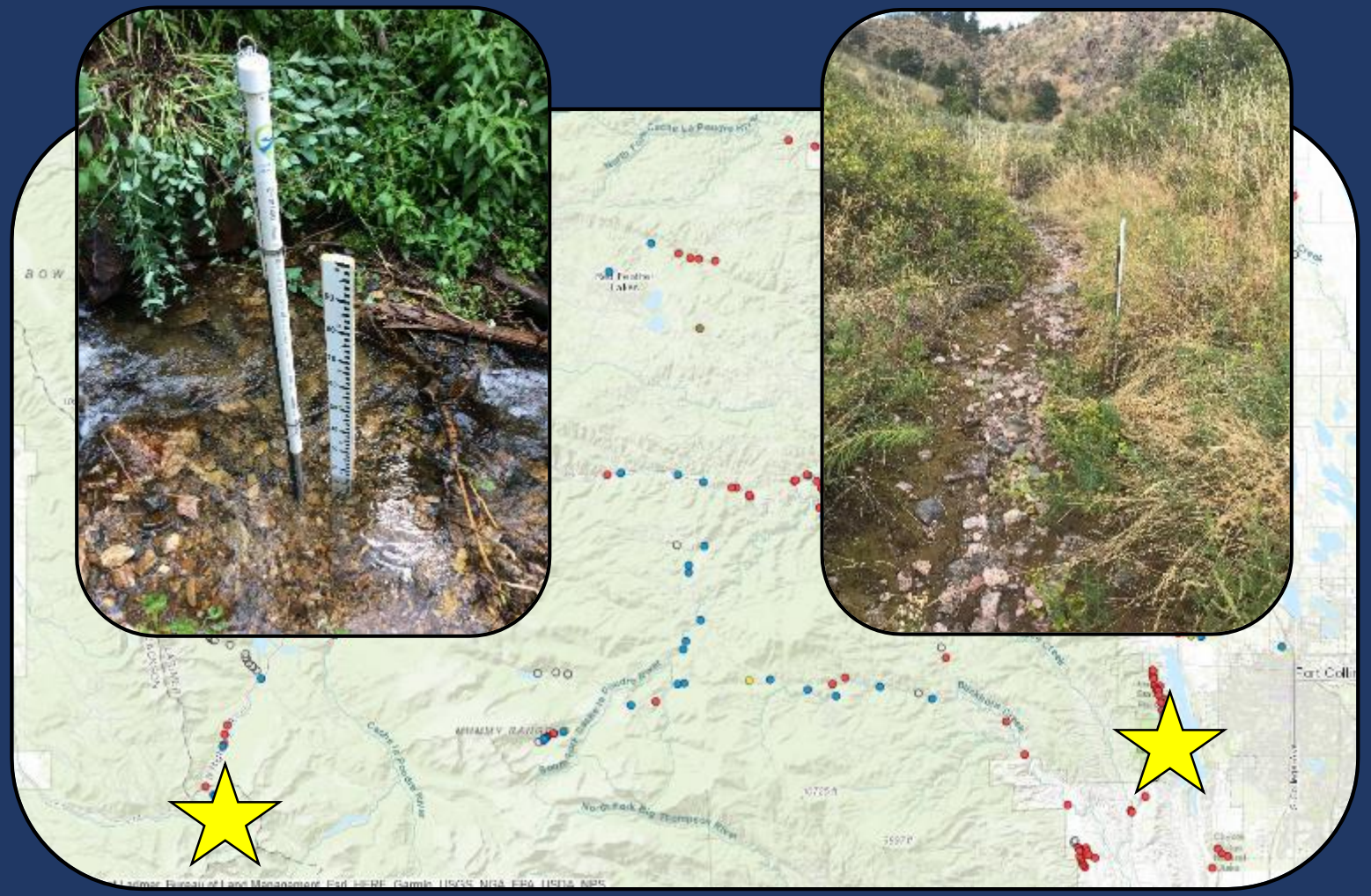
If no flow observed AND some observations were in wet time of year → **Ephemeral** / rare flow

If only flow observed AND some observations were in dry time of year → **Perennial**

BOTH flow and no flow → **Intermittent**

Encompasses mostly dry to mostly wet

PREDICT FLOW DURATION FROM SENSORS

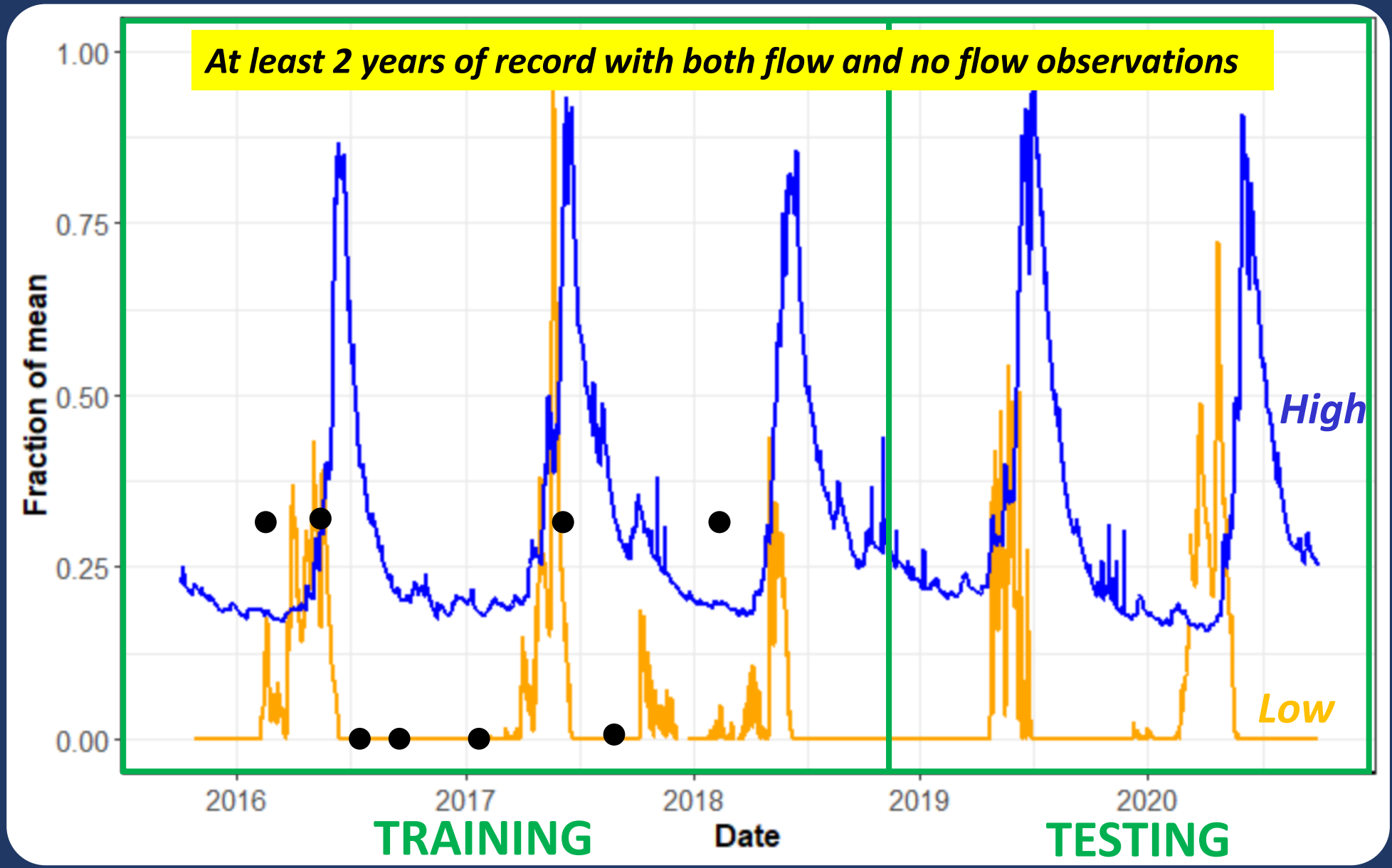


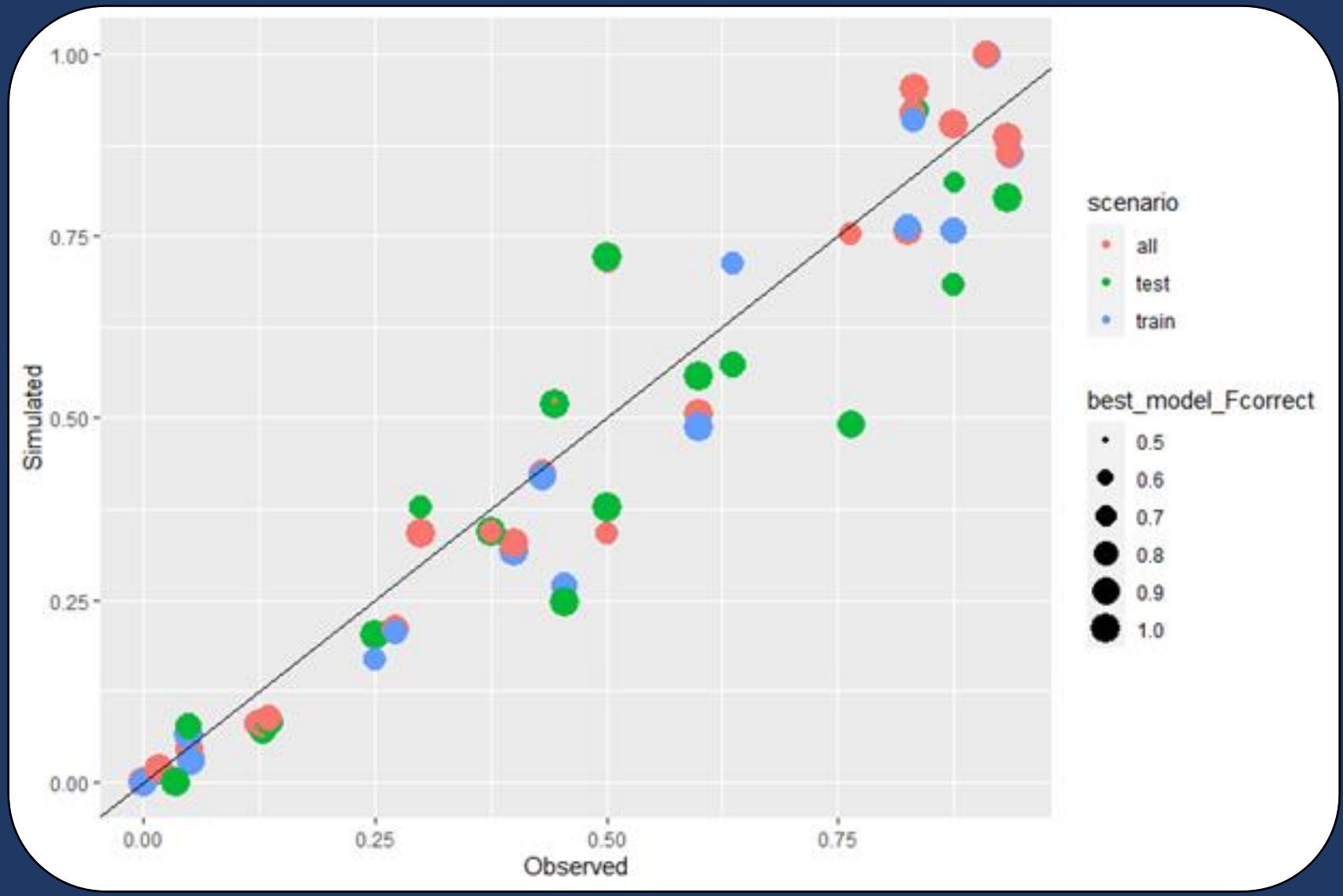
Variable predicted = April-September fraction of time with flow

Predictors = day of year, normalized stream stage from sensors

Method = flexible discriminant analysis

DATA NEEDS FOR FLOW DURATION PREDICTION

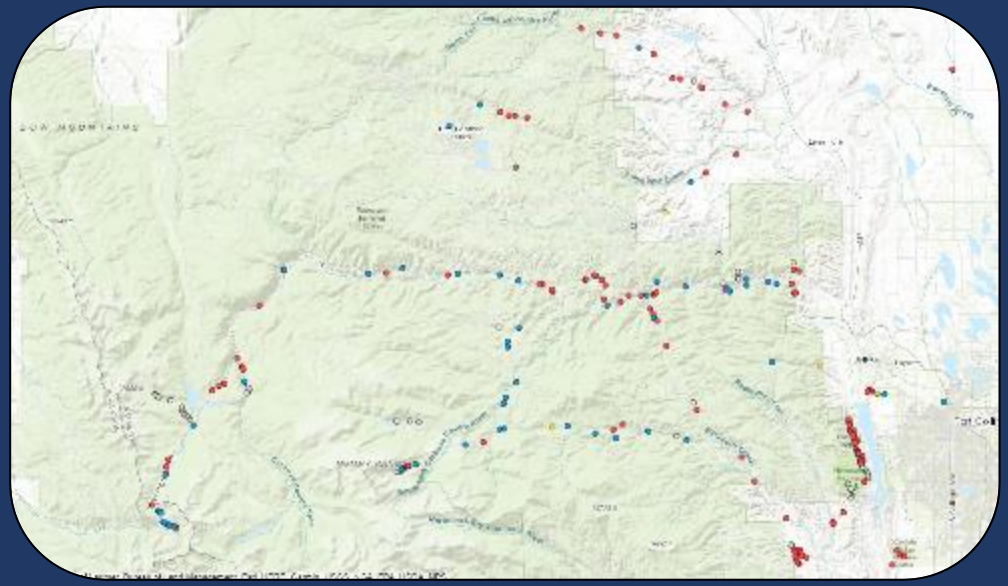


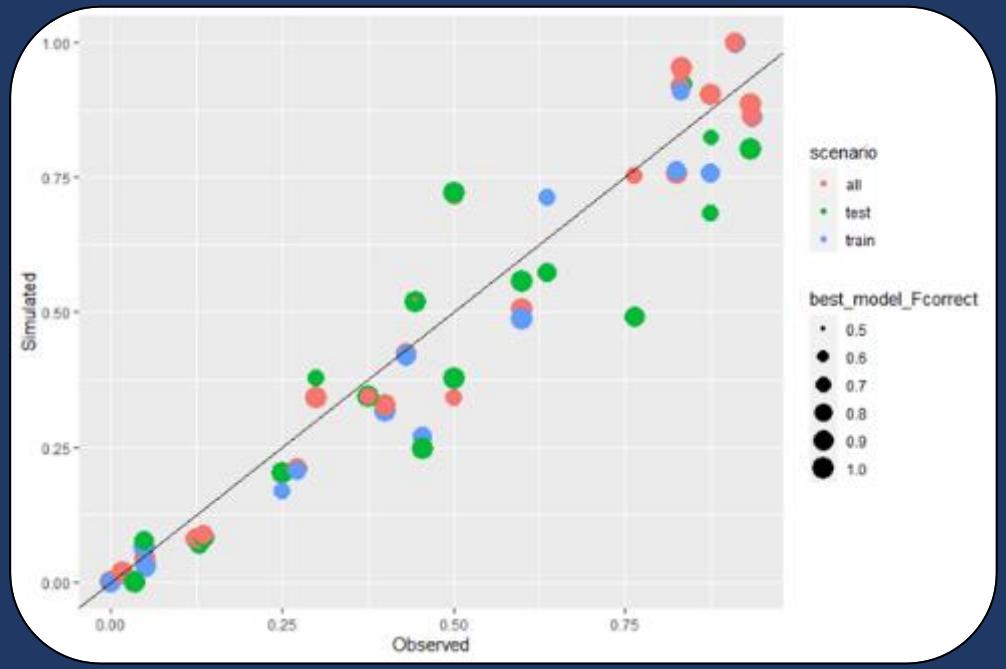


Observed = fraction of time with flow, Stream Tracker only

Simulated = modeled fraction of time with flow

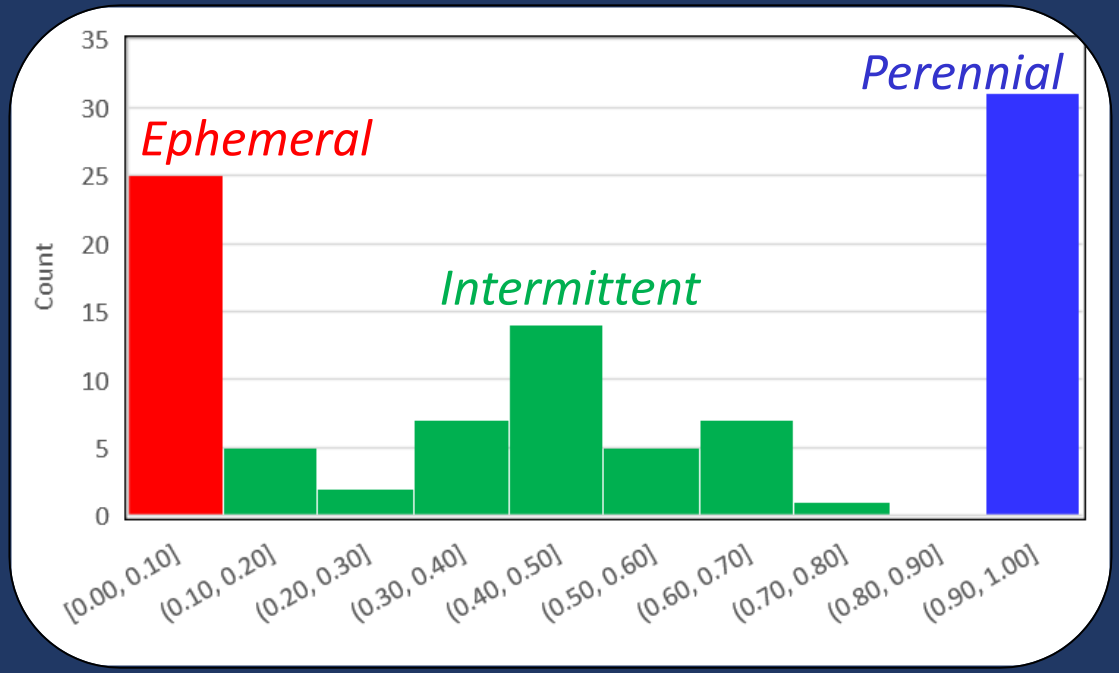
SNAPSHOT IN TIME





CATEGORICAL

ephemeral, intermittent, perennial

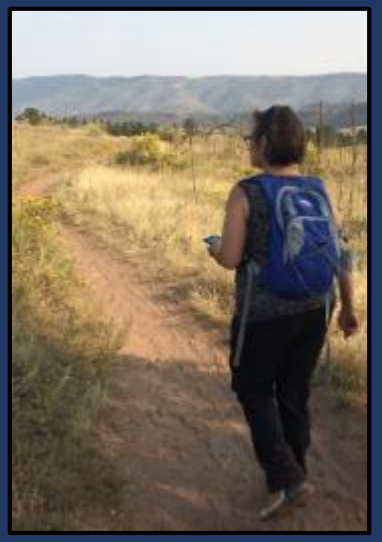


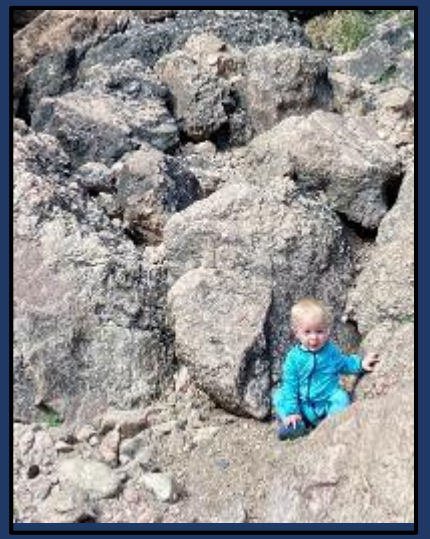
Fraction of time with flow

CONTINUOUS

fraction of time with flow, varies by year

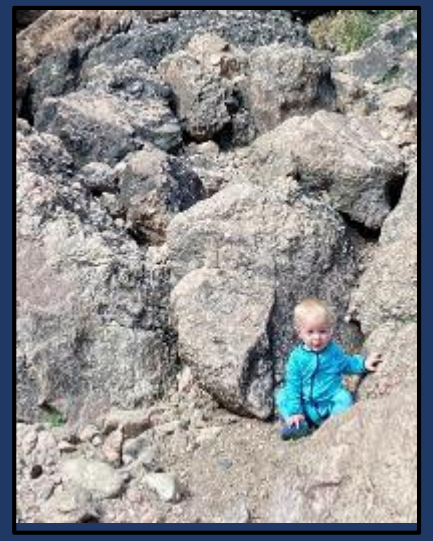
THE VALUE OF THE NETWORK COMMUNITY





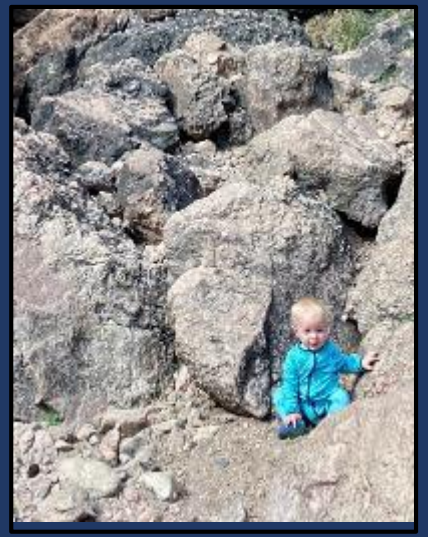
THE VALUE OF THE NETWORK

AWARENESS



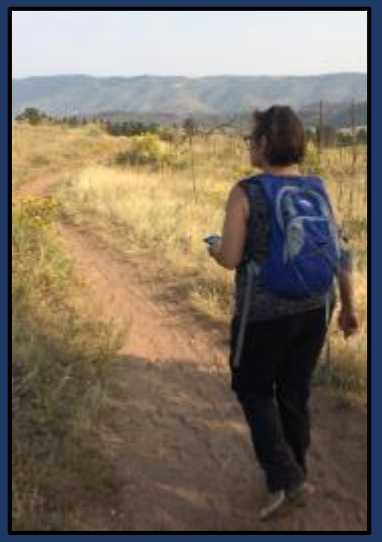
THE VALUE OF THE NETWORK

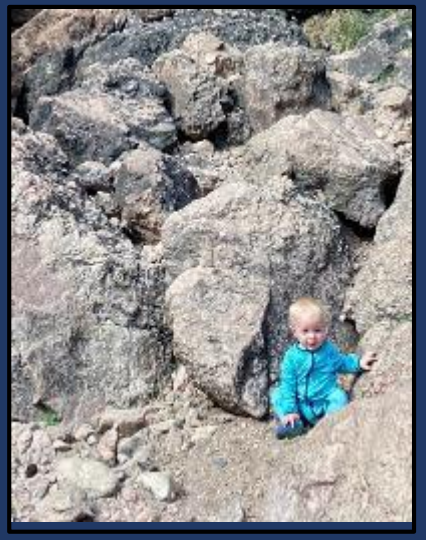
ADAPTABILITY



THE VALUE OF THE NETWORK

SCIENCE

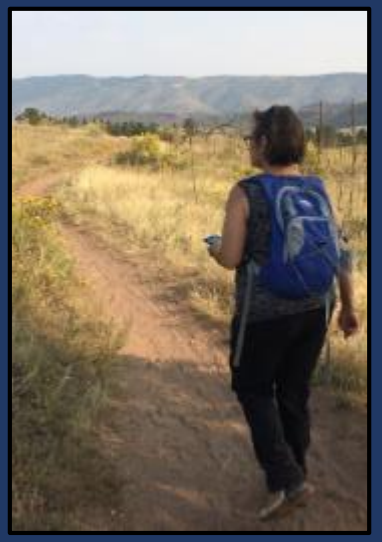


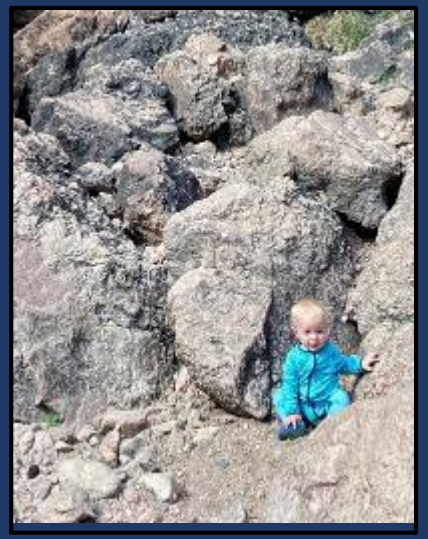


THE VALUE OF THE NETWORK

YOU CAN JOIN STREAM TRACKER!

FUN!





STREAMTRACKER

Community Powered Stream Monitoring

Visit www.streamtracker.org to get started!

Thank you to Stephanie Kampf, NASA Citizen Science for Earth Systems Program, USFS Citizen Science Fund, Matt Fairchild & Arapaho & Roosevelt National Forests, the many other wonderful people who have helped develop Stream Tracker, and of course all of the Stream Trackers who have contributed observations