A Community Approach to Environmental Challenges

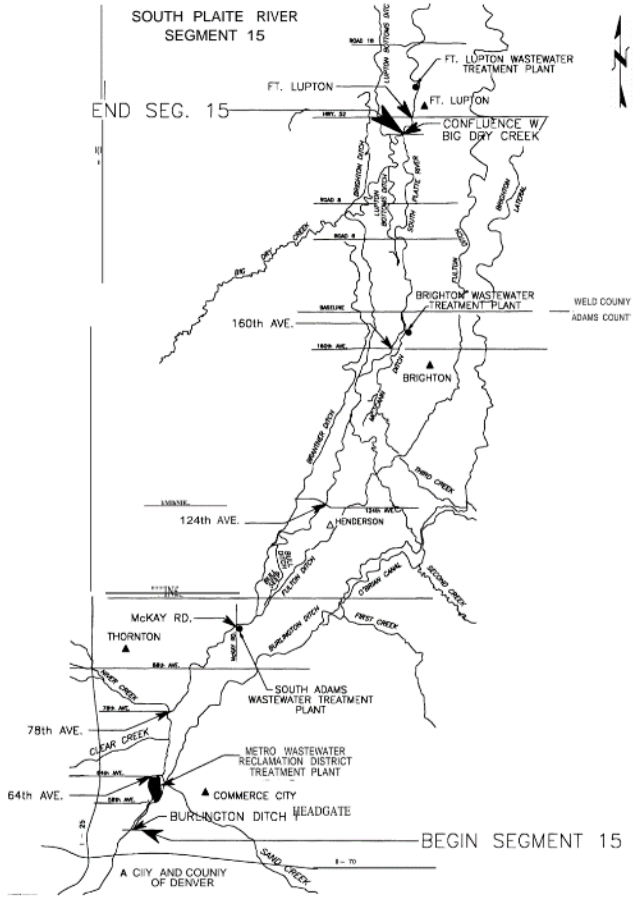
Overview

- Introduction
  - Goal
  - NPS 2021 Plan
- Stakeholders
- Procedure/protocol for community
  - Hot spot identification
  - Source tracking implementation
- Activities & Education
  - Pilot program for control measure component
  - Community evaluation
- Why Important

Hellmund Associates

Introduction

- Funded by the CDPHE
- Implement BMPs
- Develop a community based non-point source pollution reduction action plan for E. coli in Segment 15 of South Platte River
  - Burlington Ditch diversion to Big Dry Creek Confluence
- Land uses range from urban to rural and, industrial to agricultural



NPS 2021 Plan

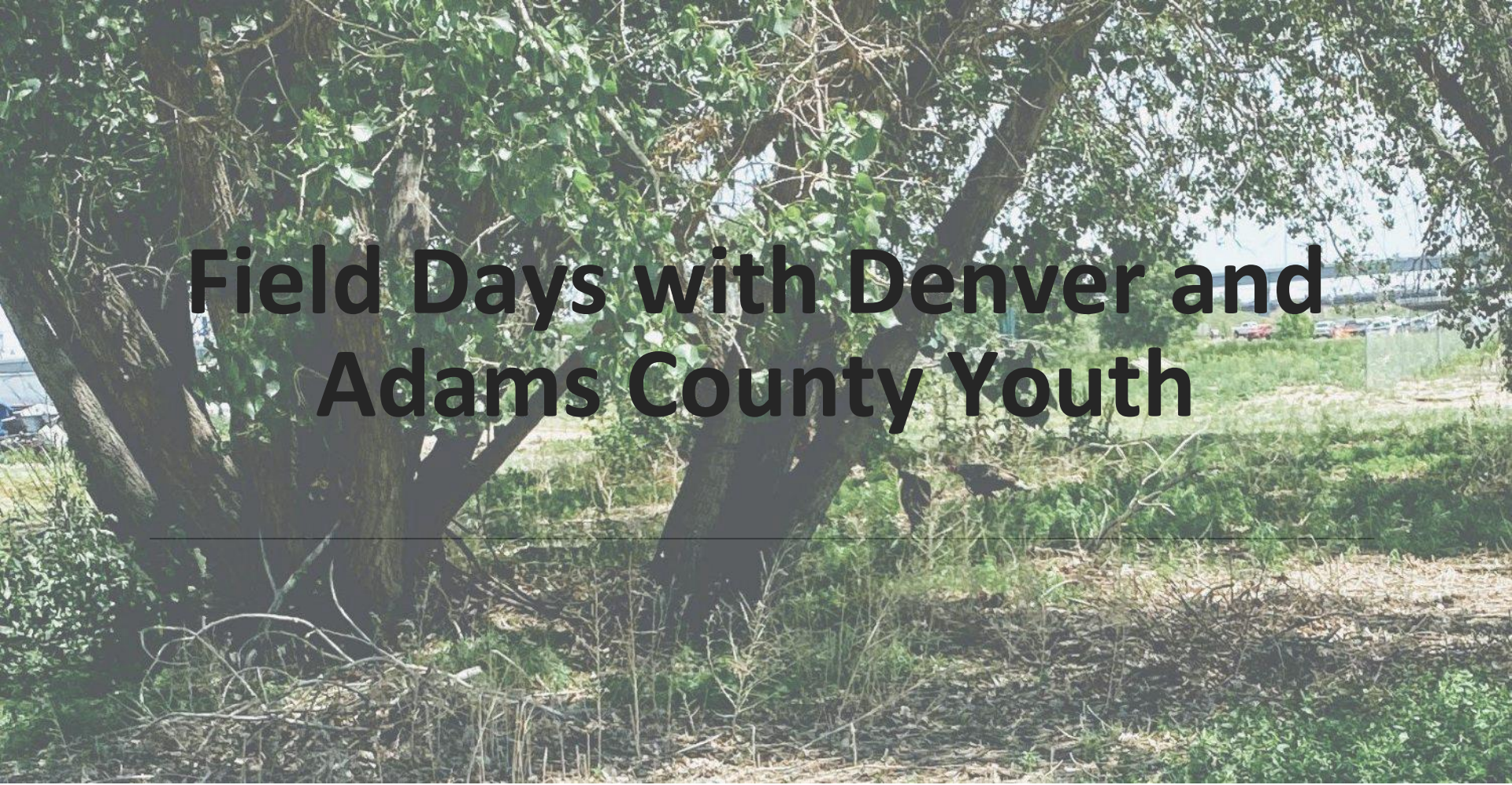
- Uses a co-creative approach with community and youth to evaluate and select solution alternatives.
- Focus on implementation in areas outside of an MS4 area including part of Adams County and Commerce City.

E. Coli "Hotspot" Analysis & Source Tracking

- Analyzed biweekly E.Coli data
- Since 2011 (2006 - 2011 analyzed in 2015 TMDL) from the Colorado Data Sharing Network (CDSN) and EPA STORET
  - Evaluate potential sources of E. coli
  - Aerial and mapping review Used to inform sites for source tracking efforts and as a factor in prioritizing solution alternatives
  - Designed pilot program with youth
    - Review these potential sources (E. coli) as a part of the 2021 NPS pollution reduction action plan

TMDL Impairment Information	Description
State	Colorado
Watershed	South Platte
Counties	Adams and Weld
Waterbody ID	COSPUS15
Constituent of Concern	*Escherichia coli* (*E. coli*)
Segment Description	Mainstem of the South Platte River from the Burlington Ditch diversion in Denver, Colorado, to a point immediately below the confluence with Big Dry Creek.
Affected Portion of Segment	All
Description of Segment 15 Reaches	*Reach 1*: Burlington Ditch diversion to 64th Avenue *Reach 2*: 64th Avenue to 124th Avenue *Reach 3*: 124th Avenue to confluence with Big Dry Creek
Assessment Locations	*Reach 1*: at 64th Avenue *Reach 2*: at 124th Avenue *Reach 3*: at Weld County Road 8
Designated Uses and Impairment Status	Aquatic Life Warm 2: Not impaired **Recreation E: Impaired** Water Supply: Not impaired Agriculture: Not impaired
State Priority Ranking	High
National Hydrography Dataset Identification	10190003
Size of Watershed	4,900 square miles
Land use/cover	Various, including urban, semi-urban, and agricultural
Water Quality Goal	Protection of recreational classified use
Water Quality Target	Attainment of two month geometric mean *E. coli* water quality standard of 126 colony forming units of bacteria per 100 milliliters of water.

Table ES-1. Summary of TMDL Information for *E. coli* in Upper South Platte Segment 15



Field Days with Denver and Adams County Youth

Placing Storm Drain Markers and Hang Tags

- Youth learned about the direct connection between where stormwater flows into a storm drain and nearby streams.
- Teams placed markers on storm drains, put hang tags on doors, saw where the drains dump into nearby Clear Creek, and learned about stormwater management.
- Youth also stopped at a hydrodynamic separator and a rain garden.
- The team took a water sample at the creek to be taken to a lab for basic water quality parameters.

Bike the South Platte in Adams County

- Youth were not greatly familiar with the South Platte River; biking along the stretch of the river aimed to cultivate a relationship between community and the South Platte.
- Different features along the corridor were discussed.
- Youth took water sample at different points testing temp, pH, turbidity, and DO to make comparisons along the reach

Stormwater Control Measure Evaluation

- Youth used the phone app he and his team developed to evaluate stormwater control measures (SCMs).
- Concepts including infiltration, retention ponds, inlets and outlets, and an introduction to E. Coli were discussed.
- Field work included collecting data on existing SCMs and learning how to evaluate the systems, how they work, and why they are important.
- In the future, the app with be used by the public, as an open source, to collect data on SCMs.

Coors’ Water System Field Trip

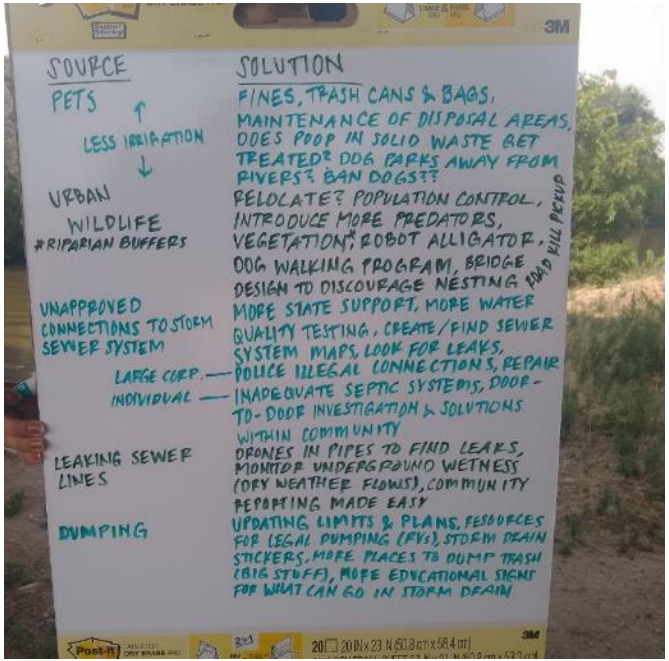
- Youth learned about Coors’ complex water system, water rights, how water gets diverted away from the rivers and streams, and its wide range of uses.
- The teams met with water experts to understand their perspective on a crucial aspect of Colorado's history and future: the legal right to use water.
- The day ended with floating on Clear Creek to understand the recreational resource it is to the community.

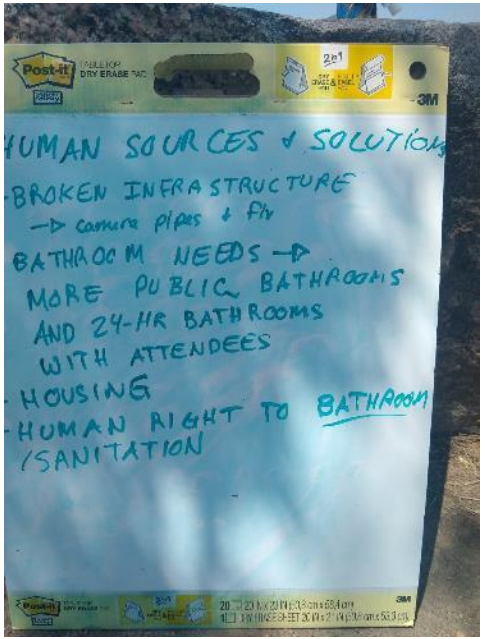
Water Quality Testing and Drone Monitoring

- In Berthoud, youth examined the monitoring system developed by Colorado State University and evaluated the potential usefulness of a low-cost version for communities to use.
- The team worked with Mr. Deleon and Ms. Welch to understand how water quality can be measured automatically and how that can benefit communities along the South Platte River.
- Youth also learned to fly drones and explored options for using drones in understanding and monitoring the South Platte River in Adams County.

E. Coli Source and Reduction Solutions

- Youth met at E. Coli hotspots to learn more about sources and transport.
- The team brainstormed solutions for reduced E. Coli loading to the river.
  - Some sources identified include pets, urban wildlife, human sources, leaking sewer lines, and dumping





Contributing to New Bridge Art Installation

- Artist David Garcia is constructing art installations for two bridges over the South Platte River. Youth traced their hands to contribute to the “tree” sculptures.
- The activity provided an intersection of art and engineering while further connecting the community to the river.

Website: Youth River Action

Contents:

- Synopsis of the Youth River Action program goals and overview of what youth will hopefully gain
- Description of activities, contacts, and location Link to activity evaluation form
- Functions as a living document

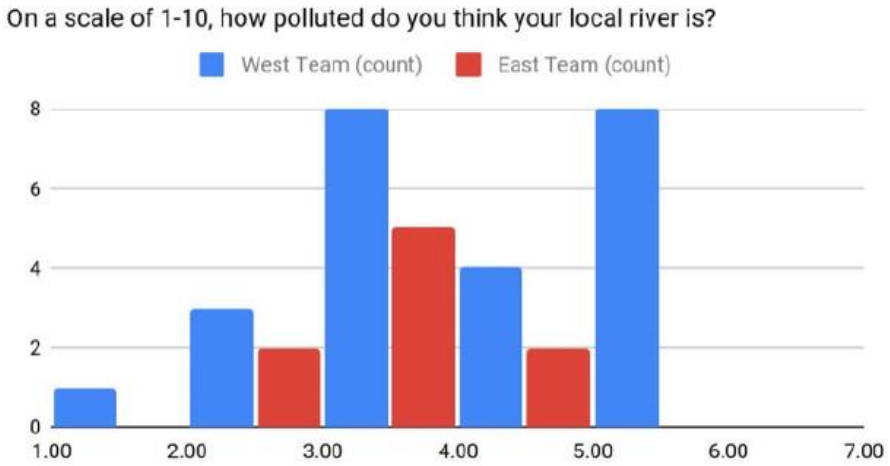
Ways to Improve:

- More youth interaction
- Utilize other social media

LINK: https://sites.google.com/view/riverhealers2021/home

Surveys

- Youth completed a survey before beginning any activities. Questions included asking how polluted the student thinks their local river is, how confident they feel in their ability to address local threats to the river, and how important they think water is to their community.
- Many of the Adams County youth indicated that they were not familiar with the South Platte River at all.
- Surveys were also completed after each day's activities.



Why is this important?

E. coli Challenges

- Emerging research from CSU demonstrate high correlation between E. coli levels in local rivers, streams, and socioeconomic status
- Challenges in urban environments
  - Use traditional engineering
  - Government regulatory approach
- Elusive nature of the pollutant
  - Environmental injustices
    - Led us to a community collaborative approach in environmental management

Community Co-Creative Approach

- Environmental Justice Initiative
  - Youth and community members voices in decision making
  - Emphasize connection with river as the basis for preserving this community resource
  - Community will always be the biggest stakeholder
  - Should reflect environmental policy
  - Partnership with community grassroots organizations

South Platte River Advisory Youth Council

- Addresses:
  - Climate Action and Responsibility, Health of the River, Diverse Voices & Communities, Authentic Partnerships
- Members include youth involved in the summer program; actively recruiting
  - Paid
- Council members listen to pitches from organizations and evaluate
  - Possible implementation in 2022

Creation of Pollution Reduction Action Plan Protocol

- Developed from summer research
  - Further explains processes conducted to compile a reduction action plan
- Modified to be applicable to any water body pollutant
- Will be presented to youth council to consider integration by youth and community in 2022

Challenges

- Youth participation
- Understating diverse backgrounds and interests
  - Middle school to college age participants
  - Social justice to biology to environmental policy
- Communication
  - Lots of stakeholders from lots of places!

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Questions?

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