COLORADO
Department of Public Health & Environment

Overview of CDPHE's WRAP Tool Innovation and Technology Session

August 14, 2025
Association of Clean Water Administrators Annual Meeting

CDPHE Innovative Technology Example

CDPHE and Colorado State University have developed several mapping and data analysis tools to improve operational efficiency and better serve our stakeholders.

One example is the Watershed Rapid Assessment Program online mapping tool
https://cdphe-wrap.erams.com/

WRAP
Watershed Rapid Assessment Program
A Watershed-Based Planning Tool and more

One Water Solutions Institute
Colorado State University

CATENA ANALYTICS

Purpose

The WRAP tool was designed to support CDPHE's 319 Program project sponsors and stakeholders.

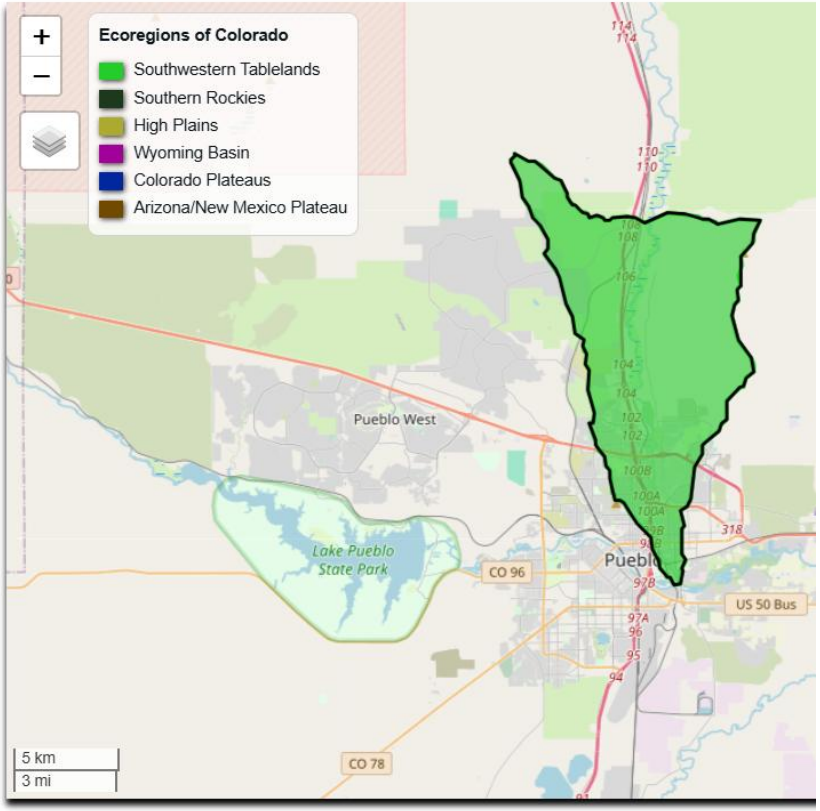
What does the WRAP tool do?

1) Streamlines the process of gathering, organizing, and analyzing data

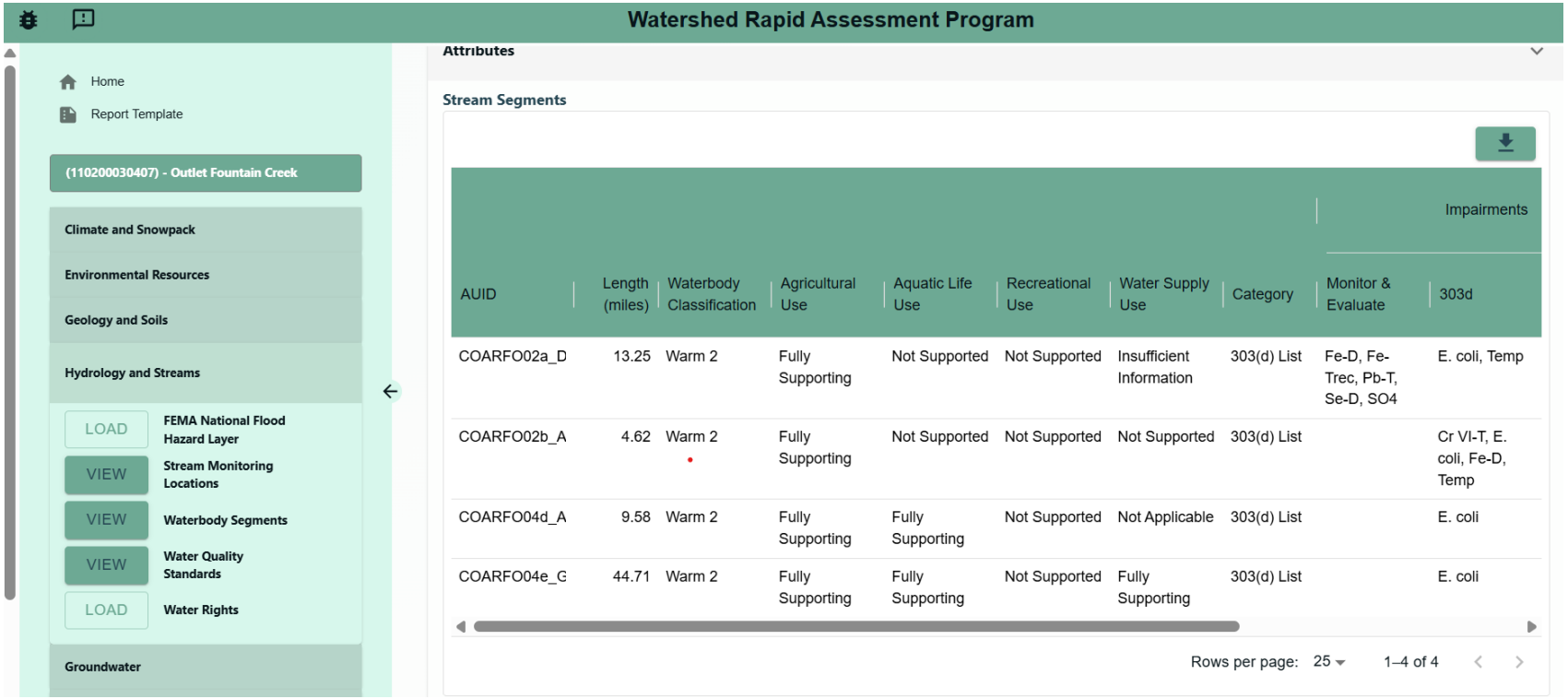
2) Quickly generates maps and graphs on many watershed characteristics

3) Generates a 9-element watershed plan template populated with watershed-specific maps and tables.

Ecoregions



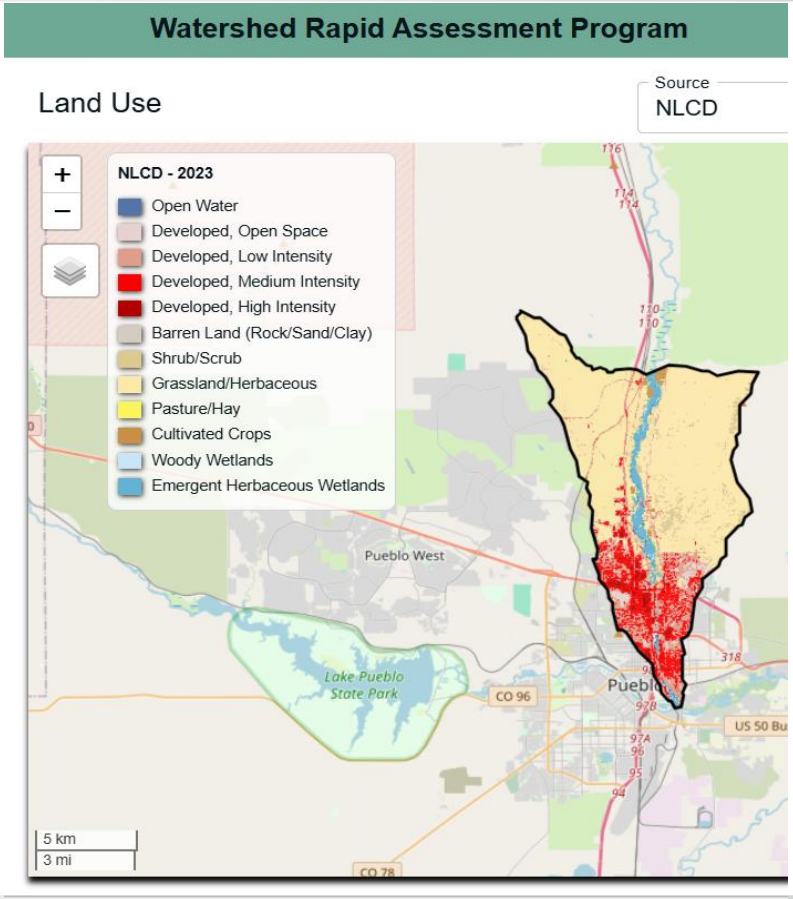
WRAP Dashboard Example



How it Works

User Steps

1. Define Area of Interest
2. Select Watershed Boundary: Watershed scale options include HUC 12, HUC 10, and HUC 8 levels
3. Generate 9-Element Watershed Report With Preselected Datasets



What does the 9-Element Report Template Include?

9-Element Report Template Example

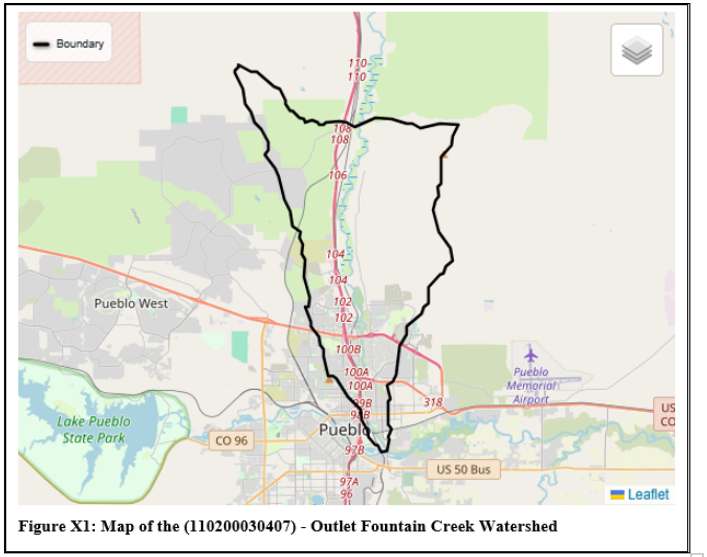


Figure X1: Map of the (110200030407) - Outlet Fountain Creek Watershed

The Watershed Based Plan focuses on the (110200030407) - Outlet Fountain Creek watershed, Figure X1, and includes the following 12-digit HUC sub-watersheds (Table X4).

Table X4: HUC-12 Sub-watersheds in the (110200030407) - Outlet Fountain Creek Watershed

HUC12	Name	Included Area (sq miles)
110200030407	Outlet Fountain Creek	40.05

1.0 Introduction

1.1 Background

This section should provide an overview of the watershed, including its geographic location, size, and boundaries. A map of the watershed should be included (use the map provided below or create your own), as well as information about the major waterways and other features within the watershed.

Provide a brief history of the watershed, including any significant events or activities that have impacted its water quality and habitat.

ONLY If this is a WBP **update** or **addendum**, please answer the questions below:

- Why is the plan being updated at this time (timeliness, change in scope, addendum, additional parameters of concern, more holistic, new partnerships or interests, standard/policy/protocol change, large event such as flood or wildfire, etc.)?
- Were any of the EPA nine elements in the previous plan underdeveloped and now being updated?
- What did/didn't the plan investigate in its previous iteration?
- Have there been any changes, improvements, downward trends, new listings, or progress in water quality since the last plan?
- What project(s) or occurrences might have led to these changes?
- What are the lessons learned from the older plan?

1.2 Purpose and Objectives

A brief overview of the WBP and its purpose: This section should provide a high-level description of the WBP and its purpose, which is typically to summarize existing conditions, identify and prioritize water quality problems, and to develop implementation strategies to address them.

Building a plan from the template

Using the Report Template

- The report structure and table of contents is provided and can be easily updated.
- The template provides instructions, examples and recommendations for writing and completing a 9-element watershed-based management plan in blue text.
- All blue text is only intended to support the planning and drafting process and should be removed from the final report.
- Tables and maps with land use data are automatically populated with data specific to the selected area of interest.
- The template provides water quality data stations for the selected watershed and directions for completing water quality analysis.
- References are automatically included.

4.0 Watershed Assessment

Summary of Findings. What Did We Find? Water Quality Trends and Data Gaps

To evaluate a watershed, it's important to look at hydrologic, physical, biological, and chemical monitoring data (section 2.0) and compare it to the water quality classifications and standards, designated uses, impaired waterbodies, the use or watershed function affected by the impairments, and Total Maximum Daily Loads (TMDLs) affecting the water source (section 3.0). TMDLs (if applicable) can help with identifying sources and associated load reductions needed for section 6.0. The primary purpose of the assessment is to:

- Identify waterbodies with designated use impairments and the pollutants causing the impairment
- Identify waterbodies that are meeting designated uses but with degrading water quality; and the pollutants or causes
- Identify waterbodies with antidegradation protections
- Describe the water quality assessment methods used to evaluate water quality conditions in the watershed, including any monitoring data, modeling results, or other analyses
- Summarize the findings of the water quality assessment, including any impairments or exceedances of water quality standards, and the major sources of pollution
- Identify data gaps

4.1 Emerging Issues and Threats

We recommended including the following topic information and summary within this section if applicable:

Discussion of known issues or threats within the watershed, such as:

- Loss of assimilative capacity
- Invasive species
- Wildfire risk
- Flood risk
- Soil health
- Irrigation infrastructure
- Temperature
- Other pollutants/impairments of concern this plan might not directly address in the outline

4.2 Pollutant Source Identification and Source Assessment

Let's take an example of a watershed with an E. coli impairment to start thinking through tying the characterization process and the relationship of land use and water quality issues. It would be important to know what areas of the watersheds are unsewered as well as the prevalence of pastureland within the watershed. This information is critical to directing the type and location of additional assessments and inventories conducted as part of the planning process. Assets would include attributes that protect water quality from pollutants and impede, or store, overland flow, thereby diminishing the quantity of water entering an aquatic system. Assets would include features like vegetated riparian zones, tree canopy within urban areas, existing best management practices (BMP), wetlands, flood plains and their connectivity to the river channel, or ground water recharge areas. Liabilities would include inherent or human-caused attributes that have the potential to produce a pollutant or spread overland flow. Liabilities may include features like highly erodible soils, areas with high concentration of septic systems, directly connected impervious cover, temperature, total suspended solids, or areas with high slopes. Thought should also be given to the co-occurrence of watershed attributes. For example, urbanized areas with no riparian vegetation, higher slopes and directly connected impervious surfaces or pastureland dominated by Group D soils in areas with a high drainage density, have a greater potential to be problematic.

- Summarize potential point and nonpoint sources that may contribute to the impairments in the watershed
- A helpful resource for source identification and BMP section is: EPA's Critical Source Area Identification and BMP Selection: Supplement to Watershed Planning Handbook

The following may be a good example for how to think through and present source identification per parameter.

Example Table: Summary of Common Parameters, Sources, and Impacts on Waterbodies

Type of Parameter	Parameter	Potential Sources		Impacts on Waterbody Uses
		Point Sources	Nonpoint Sources	
Physical & Biological	E. Coli	• Concentrated Animal Feeding Operations (CAFO) • Municipal Separate Storm Sewer Systems (MS4)	• Animals (domestic, wildlife, livestock) • Agriculture runoff (manure application)	• Human health risks and risks to pets • Risk of illness from ingestion or from contact • Increased cost of treatment of

9-element watershed template examples

The template provides links for downloading water quality data

The template automatically populates tables with AUIDs, 303(d) listed parameters, water quality stations stream gages

The template provides guidance for how to complete watershed characterization

Potential Resources:

- EPA Water Quality Portal
- eRAMS Colorado Watershed Rapid Assessment Program (WRAP) Tool
- Colorado Data Sharing Network (AWQMS)
- U.S. Geological Survey (USGS) NWIS/NAWQA

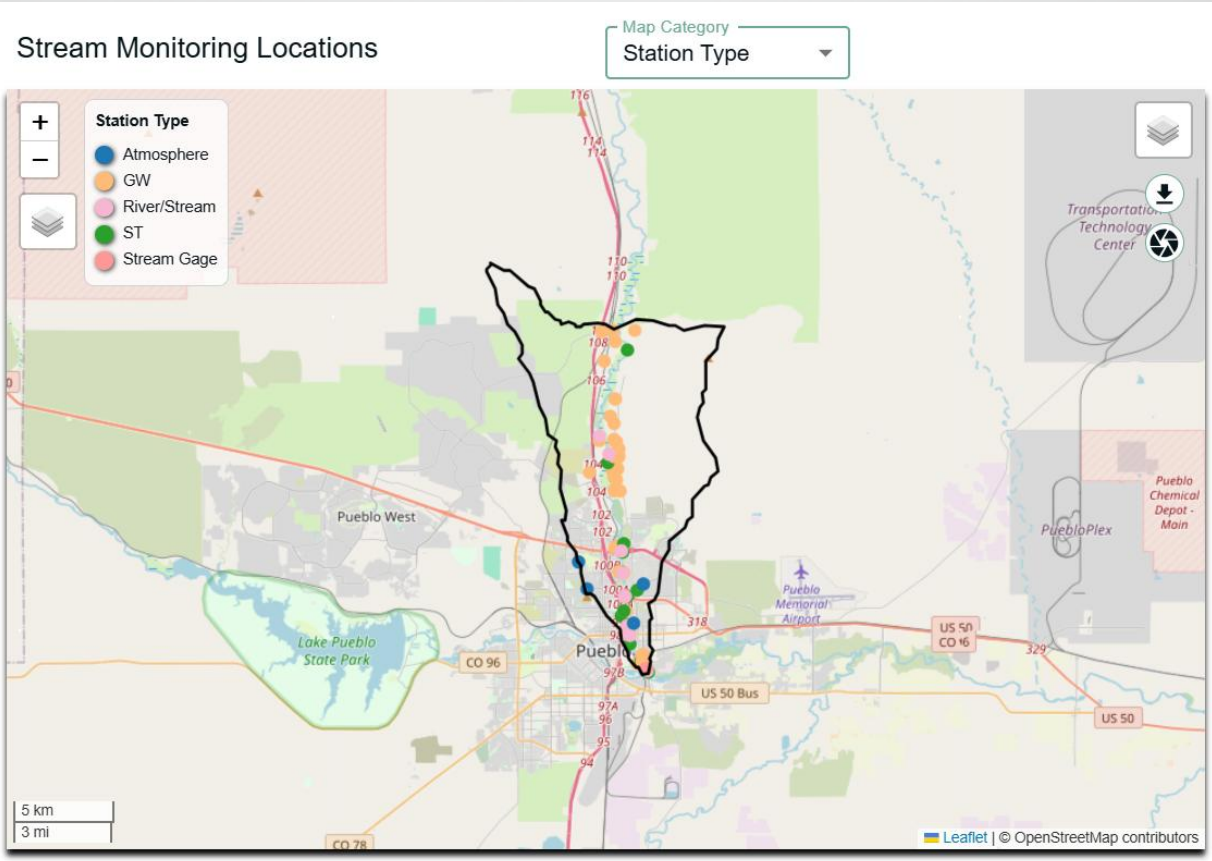
The (110200030407) - Outlet Fountain Creek watershed Watershed-Based Plan (WBP) segments in table X5 (see also figure X2).

X5: All Waterbody Segments in the (110200030407) - Outlet Fountain Creek Watershed

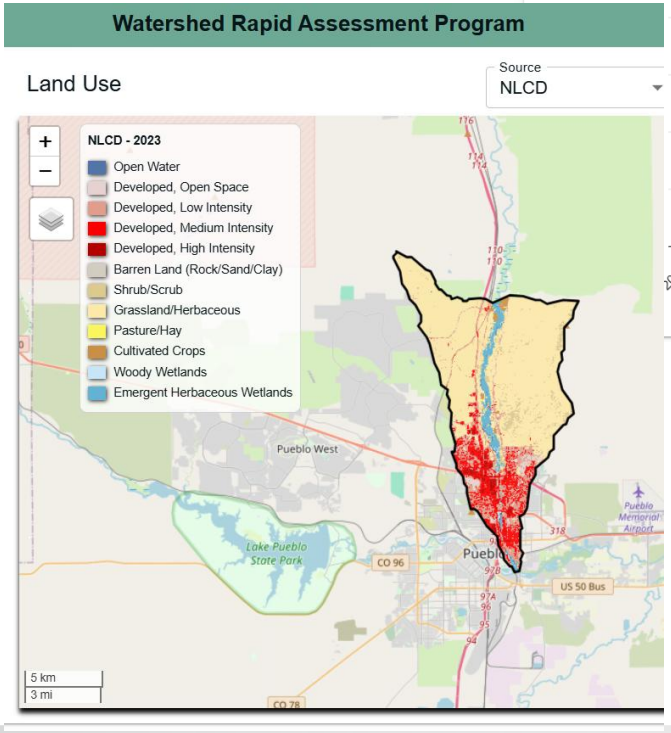
AUID	Agriculture	Aquatic Life	Recreation	Water Supply	Area (acres)	Length (miles)
COARFO02a_D	Fully Supporting	Not Supported	Not Supported	Insufficient Information		13.25
COARFO02b_A	Fully Supporting	Not Supported	Not Supported	Not Supported		4.62
COARFO04d_A	Fully Supporting	Fully Supporting	Not Supported	Not Applicable		9.58
COARFO04e_G	Fully Supporting	Fully Supporting	Not Supported	Fully Supporting		44.71
COARFO11_A	Fully Supporting	Fully Supporting	Fully Supporting	Fully Supporting	7.12	

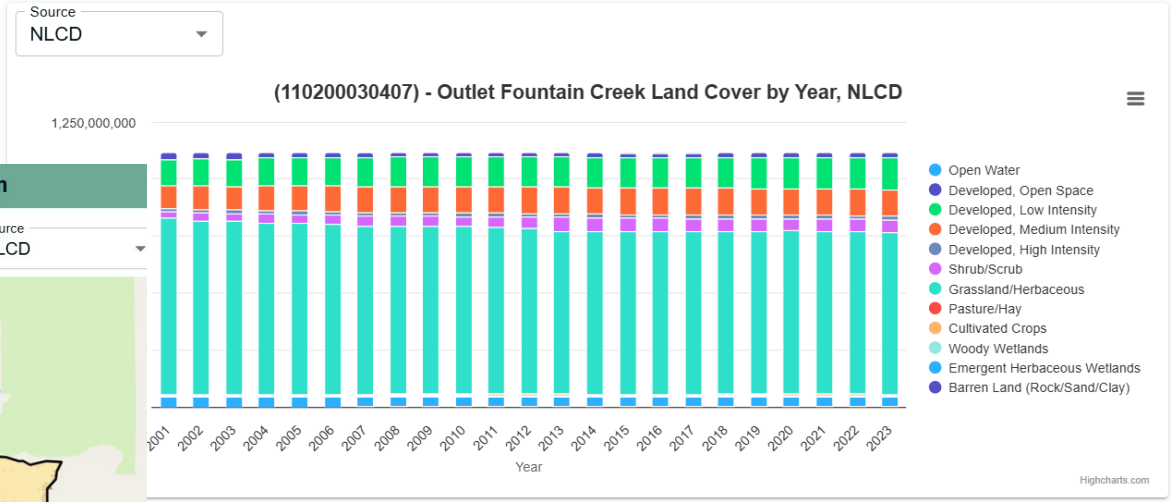
This section of your plan should tie to the Section 3.0 Watershed Characterization information and combine to help provide insight into the sources of NPS pollutants, impairment causes, and inform the type and locations of future water quality sampling to cover data gaps (sections 4.2

Example Maps



Example Maps and Graphs





Example Maps and Graphs