USER GUIDE

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Domain: https://cdphe-wrap.erams.com/

WRAP

Watershed Rapid Assessment Program

A Watershed-Based Planning Tool and more

CATENA ANALYTICS

One Water Solutions Institute

Colorado State University

CONTENTS

INTRODUCTION

Watershed protection programs aim to maintain or restore the physical, chemical, and biological integrity of waterbodies. Developing and implementing effective nonpoint source watershed-based plans requires analyzing watershed conditions that vary across both space and time. Therefore, assessing current and historic data is essential for keeping management strategies up to date with changing land use, climate, and watershed conditions.

The Watershed Rapid Assessment Program (WRAP), part of the eRAMS platform, is a powerful summary tool that streamlines the process of gathering, organizing, and analyzing data and information at multiple watershed scales, including HUC 12, HUC 10, and HUC 8 levels. WRAP combines available data to evaluate the status of water quality and watershed health and conditions that may be affecting water quality, helping inform decision-making and prioritize actions.

By leveraging WRAP's data outputs, users can efficiently develop nonpoint source watershed-based plans. These plans form the foundation for nonpoint source pollution control efforts and guide funding decisions to ensure strategic and effective watershed protection and restoration.

Catena Analytics offers powerful platforms for building accessible, scalable analytical tools and simulation models. Our services support strategic and tactical decision-making for the sustainable management of land, water, and energy resources. Thank you for choosing Catena Analytics and the eRAMS platform to support your data, modeling, analysis, and geospatial needs.

WHO WRAP IS FOR?

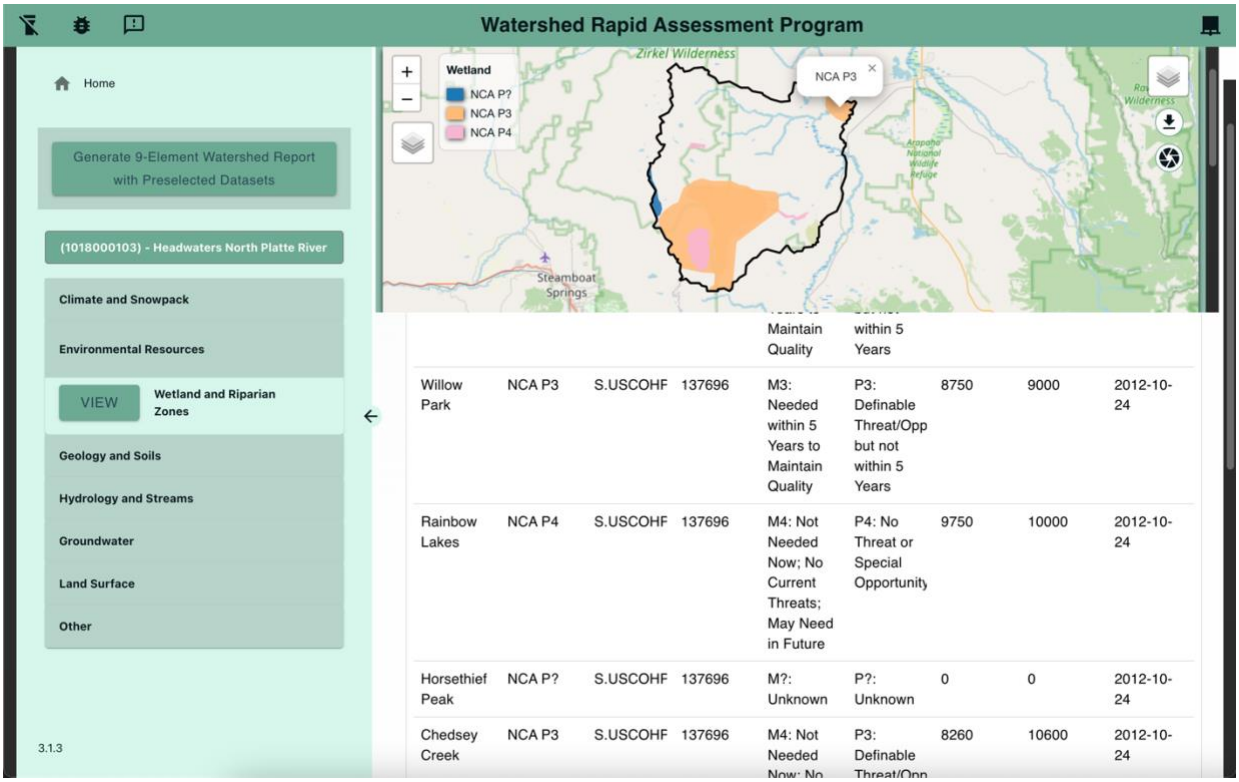
This tool is designed for water quality planners, water resource managers, researchers, regulatory agencies, consultants, watershed groups, academic groups, and decision-makers at the state, local and federal levels. It supports anyone involved in planning for the future of water quality and sustainable watershed management.

PURPOSE

WRAP is designed to support the characterization of water quality and watershed conditions that may be affecting water quality. This tool can also be used to compare different watersheds across Colorado. It enables users to perform a wide range of analyses, from basic watershed data summaries to development of comprehensive nonpoint source watershed-based plans.

Need Help?

If any further assistance is needed after reviewing the guide, we are here to help! If a user encounters any challenges using the tool or notice missing information in this guide, please reach out. An eRAMS expert will be happy to support you. Contact us at: info@erams.com.



Software Availability

Domain

https://cdphe-wrap.erams.com/

Publication/Citation

Arabi, M, T. Wible, and M. Smith. 2015. Watershed Rapid Assessment Program (WRAP) Presentation. 2015 Colorado Watershed Assembly Conference.

System Requirements

A modern web-browser is required to connect and run the WRAP. Examples include Chrome v.135, Firefox v.135, Edge v.133, or Safari v18.3.

Versioning

As a cloud-based software tool, WRAP is continuously evolving – features may be added, removed, or updated over time. However, no changes are expected for the datasets used in this tool and the products produced from the tool.

Authorized Use Permission

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INTERFACE

First, a quick overview of the interface.

BANNER

The header shown in Figure 1 has three important buttons.

1.  **Bug Report** WRAP is a continually evolving tool with many complex interactions, so reporting any issues or anomalies is greatly appreciated and helps us improve the platform.
2.  **Feedback Survey** This link takes users to a brief, two-page feedback survey where a user can share impressions of the tool and provide suggestions for future improvement. The second page of the survey is optional and provides space to describe any issues that may be encountered in more detail. All feedback is welcome and appreciated.
3.  **Map State** This button toggles the map between three positions, allowing users to fully explore the datasets. It is *essential* for getting the most out of viewing datasets. By default, the map starts in the 'hidden' position, meaning users will not see *any* maps until they click this button to reveal them. The first click opens the map, allowing users to view it. The second click expands the map to its full size, giving users a better view of the data. The third click closes the map again. This three-step toggle gives the user control over how they interact with the map.

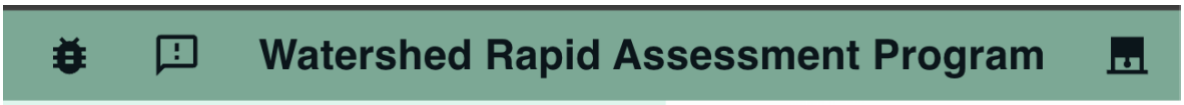

Figure 1 - Bug Report, Feedback Survey, WRAP Title, and Map State

SIDE PANEL

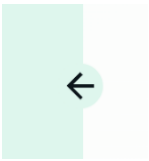

Figure 2 - Hide or Reveal Panel

The side panel docking arrow allows users to select areas and datasets for viewing. Users can hide or reveal the panel by clicking the small 'arrow' button located about halfway down, as shown in Figure 2.

In the bottom-left corner of the side panel, the user will find the current version of the application.

A. Using the TOOL

At its simplest, using WRAP is a two-step process. It can be used either to generate a watershed report template, or to browse a wider selection of datasets. Either way, begin by defining your area of interest.

Step 1 – Define Area of Interest

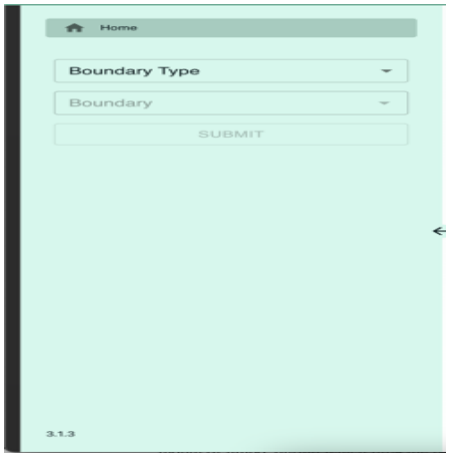

Figure 4 - Area of Interest Panel (software version in lower-left corner)

When the user first opens WRAP, the left-hand panel displays two dropdown menus to help the user select their area of interest (Figure 3).

If the panel is hidden, the user can restore it by clicking the docking arrow on the left side, pictured to the right (Figure 4).

Figure 3 - Docking Arrow

If the panel is showing different content, simply click the 'Home' page button to access the 'Area of Interest' selection controls.

Select Boundary Type

The user can choose from a variety of boundary types, ranging from small HUC 12s to entire counties. Once a boundary type is selected, the next dropdown will be enabled, allowing the user to choose a specific area within that boundary.

Select Watershed Boundary

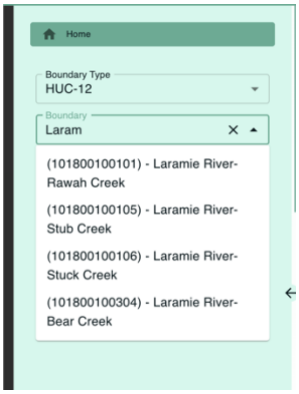

Figure 5 - Partial Text Match on "Laram"

Once the user selects a Boundary Type, all known divisions of that type will appear in the next dropdown menu. The user can scroll through the list to find their desired area or start typing in the box to quickly filter the options using a partial text or number match (Figure 5).

To use this tool efficiently, the user should know the name or number for their HUC. For more information on HUCS:

What is a HUC?
How can I find a HUC?

Submit Choices

After the user selects their area, click the 'Select' button.

In some cases, there may be a short delay before the button becomes active. During this time, the system is verifying the user's selections. Once ready, the button will appear green and fully visible. This step will load user's watershed of interest, which serves as the basis for developing a nonpoint source watershed-based plan template or downloading data for other purposes.

Step 2 A. – Generate 9-Element Watershed Report with Preselected Datasets

After choosing the 'Select' button, the user can **Generate 9-Element Watershed Report with Preselected Datasets.** This option creates a nonpoint source watershed-based plan template tailored to the user's selected area of interest. All relevant datasets are automatically selected to support the planning process, giving the user a strong foundation for a 9-element watershed-based plan. After clicking the button to download the watershed-based plan template, a user can also choose to explore the datasets independently if they'd like to dig deeper or focus on the specific details in the WRAP tool dashboard, but all the data and maps remain in the generated plan template.

I. Purpose

The WRAP tool can assist in preparing a template for writing a nonpoint source watershed-based plan in .docx format.

While the template provides a helpful layout and automatically populates many of the key tables and images based on the user's selected area of interest, the user still needs to personalize the plan by adding on-the-ground knowledge, additional information, priorities, and conclusions.

II. Generating Report

Once the area of interest is selected, a new menu will appear. From this menu, choose the "Generate 9-Element Watershed Report with Preselected Datasets" button as seen in Figure 6. The datasets for the 9-element watershed-based plan are preselected based on the required components of a 9-element watershed-based plan. The only information the user needs to manually add is the load reduction calculations to complete the plan.

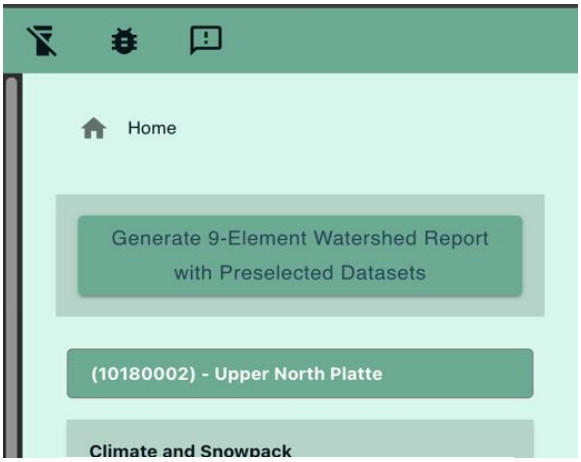

Figure 6 – 'Generate' Button

Clicking this button starts the process of loading any missing data and verifying pre-loaded data. This process can take several minutes, so it is highly recommended that the user avoids switching to another tab or window during this time, as it can cause map generation to fail in some browsers. The user will be able to monitor the progress of dataset loading (Figure 7) and observe both map generation and watershed-based plan development.

Finally, the user will be prompted to save the report template somewhere on their computer's hard drive. In some cases, the file may be saved directly to the user's 'downloads' folder, depending on their browser settings.

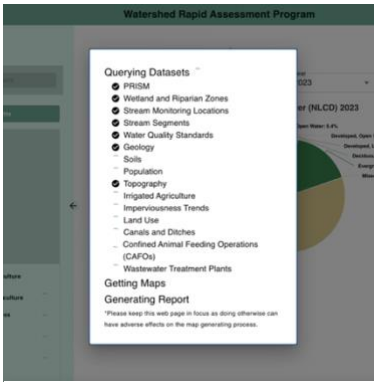

Figure 7 - Report Generation

III. Using the Template

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 are automatically populated with data specific to the selected area of interest. While their use is optional, they allow users to gather relevant data for the plan without requiring intensive work to find and summarize the datasets.

Most maps are included in the appendix and are numbered to correspond with the references in the main text. If additional maps are added or existing ones removed, numbering should be updated to maintain consistency. Maps should only be moved into the main body of the report after all text has been finalized to ensure proper formatting and placement.

Step 2 B. Watershed Characterization with Specific Dataset(s)

Alternatively, the user can browse and load individual datasets based on their specific question or need. This flexible approach allows the user to focus only on the data most relevant to their particular analysis.

I. Purpose

Each time a user loads data into WRAP by selecting an area of interest, the data is fetched and processed from live sources, ensuring the user receives the most current and accurate information available. Automatically loading more than 20 datasets from various sources would be slow and inefficient. Instead, WRAP lets users choose only the datasets they need, making the process faster and more focused.

II. Selecting Datasets

Select Category

Start by selecting a general category to browse the available datasets within it. Only one category is shown at a time to keep things organized, but all the user's previous selections and any ongoing data processing will continue in the background. Users can safely switch between categories at any time.

Load Dataset

Click 'Load' button next to any dataset user wants to include. WRAP will begin gathering and processing the data in the background. Multiple datasets can be loaded at once (Figure 8).

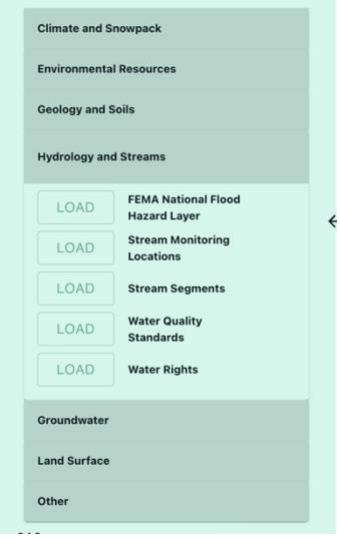

Figure 8 - The Hydrology Category has Five Datasets

View Dataset

Once processing is complete, the 'Load' button will change to a green 'View' button. Click 'View' to explore the results for that dataset (Figure 9).

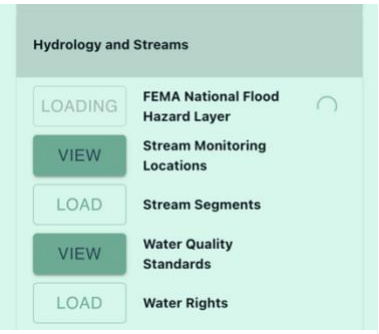

Figure 9 - Two Datasets Are Ready to View

B. Operating the Tool

What can I do safely?

Most things that users can do in the side panel are nondestructive and 'forgiving.'

What if I accidentally close a category I was using?

That's **safe.** Anything processing will continue processing at the same speed. Anything loaded will remain fully loaded. Just click the previous category to go back to it.

What if I want to go back to a dataset I already viewed?

That's **safe**. Anything loaded will remain loaded until the webpage is manually refreshed, or until the area of interest is cleared. Click between individual datasets as much as desired.

What if I load all the datasets at once?

That's **safe**. Just keep in mind that loading everything at once will be the slowest option, since it pulls a large amount of data from multiple sources.

What if I change my area of interest?

Changing the area of interest will remove all loaded datasets from memory, freeing up necessary space for new data. When the user goes back to a previous area of interest, they will need to load the relevant datasets again. A warning prompt will appear confirming the user wants to reset to a new area of interest. A 'Yes" will remove all loaded datasets.

Restarting

As seen in Figure 10, clicking either the 'Home' button or the name of the selected Area of Interest will give users the option of replacing the current area of interest with a new one. Setting up a new area of interest will unload all datasets from memory, allowing users to start fresh.

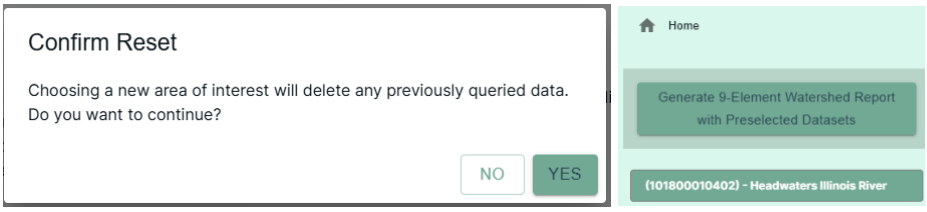

Figure 10 – Warning prompt confirming area of interest change / restarting

Dataset Errors

There are two known situations that may cause a dataset to display as 'Error' (Figure 11).

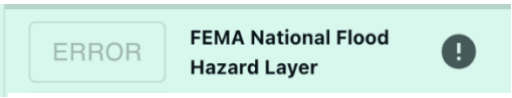

Figure 11 - Temporary Error Connecting to FEMA

1. Unable to connect to the data source.
   This could be due to temporary issues with the external data provider's application programming interface -- or a brief network hiccup. In most cases, simply refreshing the page will resolve the issues and allow the dataset to load properly.

2. Dataset is empty.
   Sometimes, there is no data available for the selected area. Most datasets handle this quietly without showing an error, but a few may still display and 'Error' button. This is a known issue and will be resolved in future updates.

How To See Details Of Data

Subpages

Each dataset initially displays a brief description of its contents. Some datasets also include up to three subpages (may have between zero and three), accessed using buttons just below the dataset title. In the example below, there are three subpage buttons below Confined Animal Feeding Operations (Figure 12).

Figure 12 - A Dataset with Three Subpages

- **Description** – the default view. If no buttons are visible, only this page is available.
- **Attributes** – A table or grid showing raw data values. See the 'Accuracy and Projection' section of this user guide for more context.
- **Analysis** – Visual representations such as graphs or charts that help highlight trends, comparisons, or key insights not easily seen in raw data.

Currently, these are the only available subpage types.

The Map

Each dataset includes a corresponding interactive map that helps visualize the selected information (Figure 13). Some maps offer extra controls to filter or adjust the dataview, depending on the dataset.

Figure 13 - Map Hidden, Partially Visible, and Full Screen

Map Positioning

Map visibility is controlled by the toggle button in the upper-right corner of the screen (Figure 14). Clicking it cycles through three views:

1. Hidden – The map is not visible.
2. Docked – The map takes up approximately 30% of the screen
3. Full Screen – The map expands to 100% to fill the entire workspace.

Figure 14 - Map Position and Visibility Controlled by Button

Map Data Options

Some maps may (or may not) include dropdowns above the map itself (Figure 15). These options allow the user to:

- Filter data by year
- Select a subcategory or variable of interest

Any selections made here update the map immediately, there is no need to press a 'Submit' button.

Figure 15 - Displaying Stations by Type, Reporting Source, or Owner

Other Map Controls

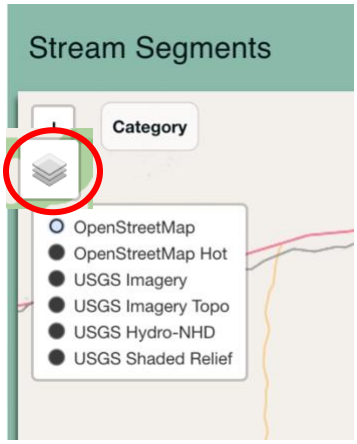

Figure 16 – Lefthand Side: Change Base Map

1. **Basemap Selector (Left Side)**
A square button on the left opens a submenu to change the background map. Options include topographic, aerial, and others (Figure 16).

2. Borders Layer Toggle (Right Side)

A square button on the right lets the user turn the map's 'border' layer on or off (Figure 17).

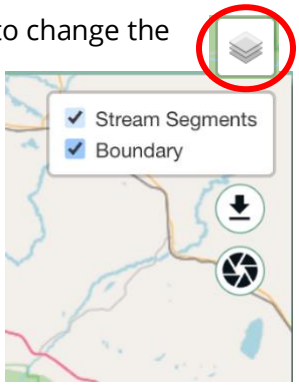

Figure 17 – Right hand Side: Boundary, Download, and Screenshot

3. Export Options (Right Side, Below Borders Button)

Below that is a button to download the current map (with currently selected options) in a GIS format, and a button to take a screenshot of the current map view that will automatically download.

C. Additional Features and Buttons

- **Exporting Tables**
  All data grids or tables include an 'Export' button in the upper-left corner (Figure 18). This allows users to download the table contents as a CSV file format for further use.
- **Downloading Charts and Graphs**
  Charts and graphs include a pop-out menu in the upper-right corner that allows users to download them in multiple formats, such as PDF, PNG, or CSV (Figure 19).

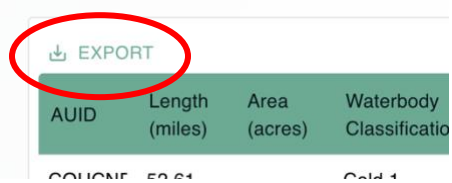

Figure 18 - Export Button

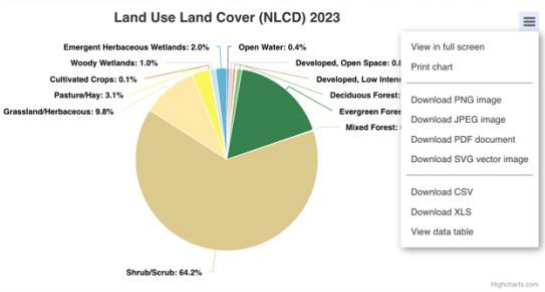

Figure 19 - Download Options

- **Interactive Map Features**
  Most maps include hover-based popups that display additional information, such as color-coded legend details or relevant data, when the cursor is placed over a map element (Figure 20).

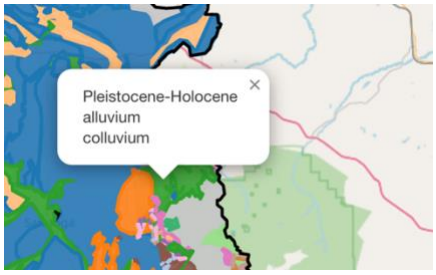

Figure 20 – Information popups by hovering

- **Touchscreen Support**
  On mobile devices, tapping on map features provides the same information. Due to touch sensitivity, zooming in is often helpful for greater accuracy and easier interaction.

ACCURACY AND PROCESSING DATA

WRAP uses data from many trusted sources, including FEMA, the United States Geological Survey, the Colorado Natural Heritage Program, and others. However, the numbers and results users see in WRAP might not always match exactly what those organizations report.

There are two main reasons for this:

1. Custom Areas and Estimated Values
   WRAP lets users pick from thousands of potential areas of interest across Colorado, and sometimes those areas do not line up perfectly with how the original data was grouped. For example, a user might select part of a watershed that only covers half of a census region.

   To handle this, WRAP uses smart methods to estimate values in a reasonable way. For instance, when estimating a population in a partial area, WRAP combines that data with maps showing impervious surfaces (like pavement) to figure out where most people likely live. This helps produce reasonable estimates, even when working with custom boundaries.

2. Map Shapes and Measurement Differences
   Most of the data WRAP uses comes in a map format that measures things using degrees, which is not the best way to calculate area or distance. To improve accuracy, WRAP converts these shapes into a format that is better suited for measuring land in Colorado. It automatically picks the best option based on where the selected area is located in the state. In some cases, this is a higher level of projection accuracy than the original projections accounted for.