Catawba Integrated Water Resources Plan Viewer

Quick Start Guide

Prepared by

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Prepared for

Catawba-Wateree Water Management Group

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RTI INTERNATIONAL

1 Overview

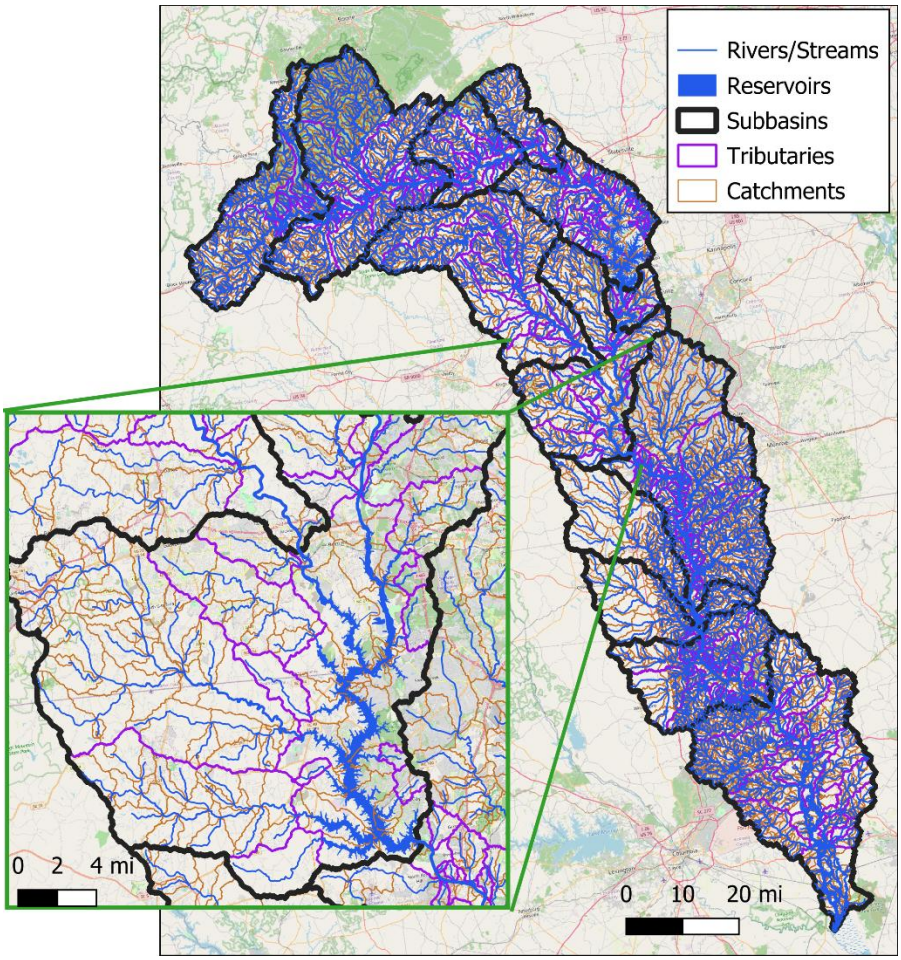
1.1 Integrated Water Resources Plan (IWRP)

The Catawba IWRP Viewer displays the data underlying the watershed water quantity and quality assessments included in the 2026 Catawba-Wateree Integrated Water Resources Plan developed for the Catawba-Wateree Water Management Group (CWWMG). As part of a team led by HDR, RTI International (RTI) completed watershed modeling for current, projected future, and potential management scenarios using RTI's Watershed Flow and Allocation model (WaterFALL®) for the entire Catawba-Wateree Basin. The results of these watershed assessments are included throughout the IWRP to demonstrate current conditions and draw conclusions around potential future changes and the ability of management efforts to adapt to/mitigate these changes. Because the data produced from the watershed modeling effort are extensive, the CWWMG initiated the creation of the IWRM Viewer to provide access to the data that is summarized within the Plan document. The IWRP Viewer is intended to provide a foundational decision-support tool for Basin-wide data exploration, enabling users to identify risks, evaluate opportunities, and link model results to potential management and mitigation strategies.

1.2 IWRP Data

The data provided within the IWRP Viewer span three geographic scales based on the hydrologic network: Reservoir Subbasins, Tributaries, and individual Catchments as shown in the figure below. The data include descriptive elements (i.e., municipalities within a subbasin), summary tabular data (i.e., area within a subbasin; number of stream miles), and quantitative metrics (i.e., hydrologic and water quality numeric results) displayed through charts and maps. All data correspond to results included within the IWRP document; where applicable, the document table numbers are provided for reference. As this interface is intended as a way to view the data, users should reference the IWRP document for further information on and conclusions drawn from the data displayed.

Throughout the IWRP Viewer, where the various simulation scenarios are included, the same color gradient is used to display Current (yellow), Future Land Use (orange), Future Land Use and a Hot/Dry Climate (red), and Future Land Use and a Warm/Wet Climate (blue) graphical results to help with comparisons.



Scales of Data Presented in the IWRP Data Viewer

1.3 About the Catawba IWRP Viewer

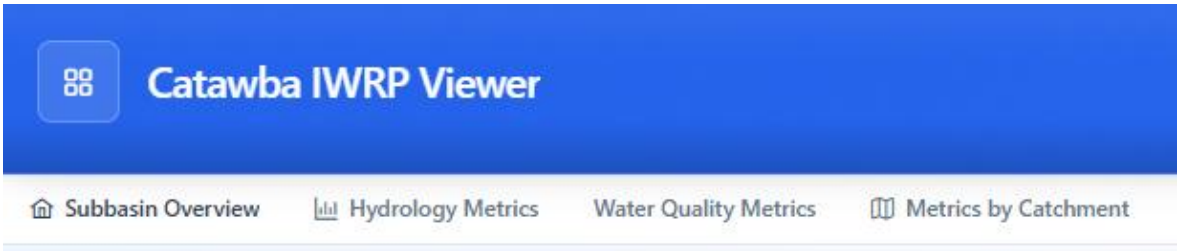
The IWRP Viewer was created and is hosted within RTI Interface™, which is an AI-enabled platform for creating interactive dashboards and web-based project reports for work completed by RTI. This platform enables RTI technical teams to transform complex datasets and model outputs into accessible visualizations for clients and stakeholders. For questions on the IWRP Viewer, users can send inquiries to waterfall@rti.org.

2 Navigating the Catawba IWRP Viewer

2.1 Viewer Tabs

The data are divided into four tabs: Subbasin Overview, Hydrology Metrics, Water Quality Metrics, and Metrics by Subbasin. Users can first select a subbasin using the subbasin filter, which updates the Subbasin Overview, Hydrology Metrics, and Water Quality Metrics

tabs to display results for the selected area. These tabs provide summary information and key hydrologic and water quality findings for the subbasin. The Metrics by Catchment tab allows users to explore the numeric results for a selected metric within the selected subbasin. Each tab is further described below.

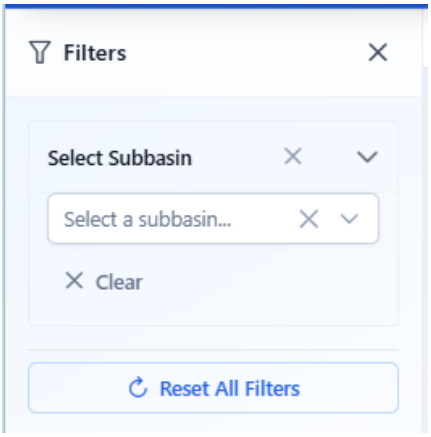


2.2 Filter by Subbasin

The IWRP Viewer is set up to provide data at a subbasin level. Changing the selected subbasin changes all the data in the IWRP Data Viewer to reflect the data for the newly selected subbasin. Users may only select one subbasin at a time. There are two ways in which a user may select their subbasin of interest.

First, users can filter by subbasin using the filter button in the top right corner of the page. This opens the 'Filters' panel where you can select the subbasin using the 'Select Subbasin' drop-down menu. Click the 'X' next to 'Filters' to close the side panel.



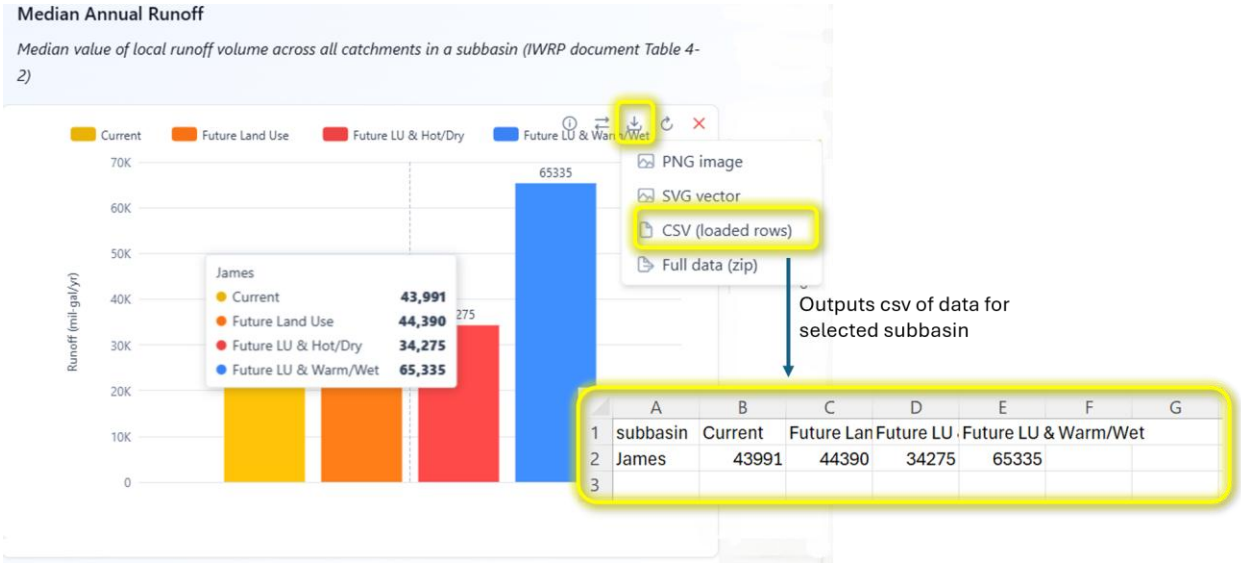


Alternatively, the selected subbasin can be changed using the "Select Subbasin" ribbon at the top of the page. Through the ribbon, users can simply click on the name of the subbasin for which they'd like to view data.



2.3 Extracting Data from the Viewer

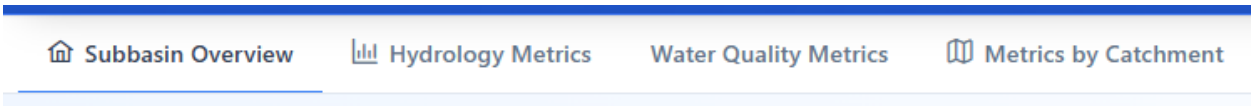
Users may download summary graphics and underlying data from the IWRP Viewer using the button that is shown or appears when hovering at the top right of the charts, maps, and tables. Depending on the type of data being examined, the data will either directly download, or users will be presented with options. Maps directly download in .png format with users only able to select the file name and location. Charts present users the option to download in different image formats or to download a .csv file of the subbasin or full Basin tabular data. Tables also present users the option to download either the subbasin specific or full Basin tabular data.



3 Using the Viewer Tabs

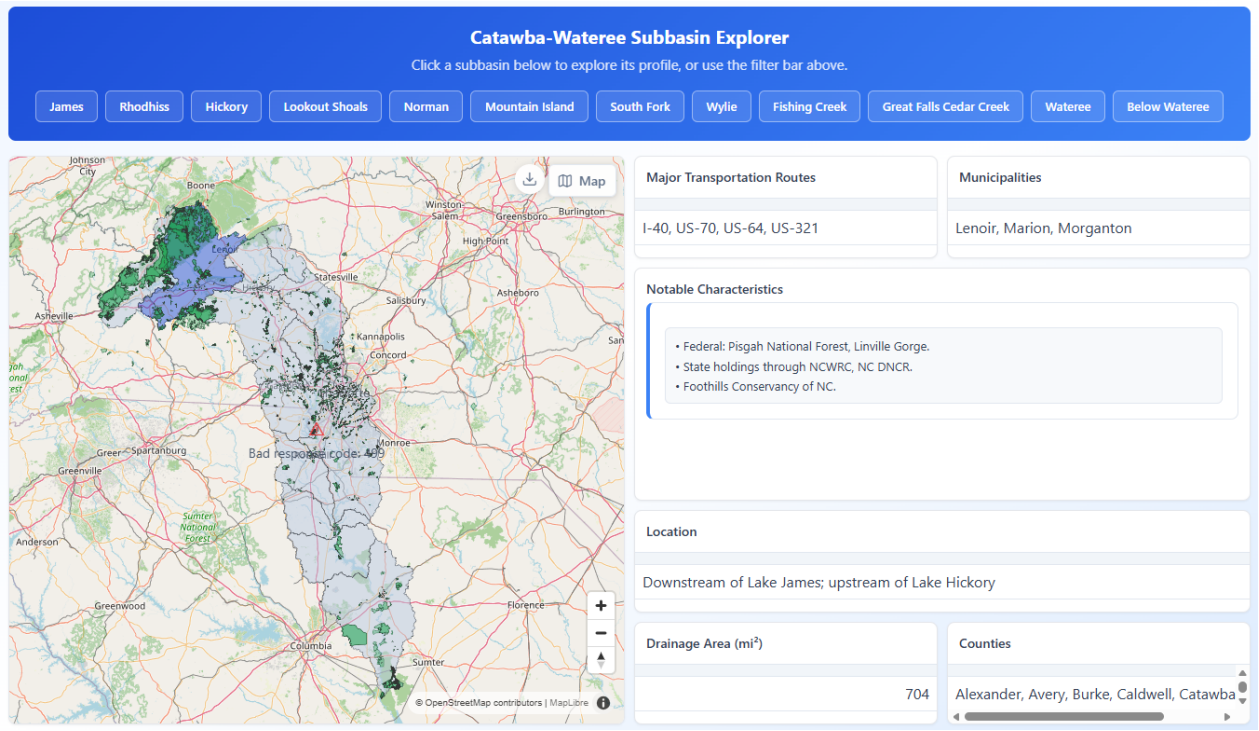
This section provides an overview of the information available in each viewer tab and explains how to navigate and interpret the results displayed.

3.1 Subbasin Overview

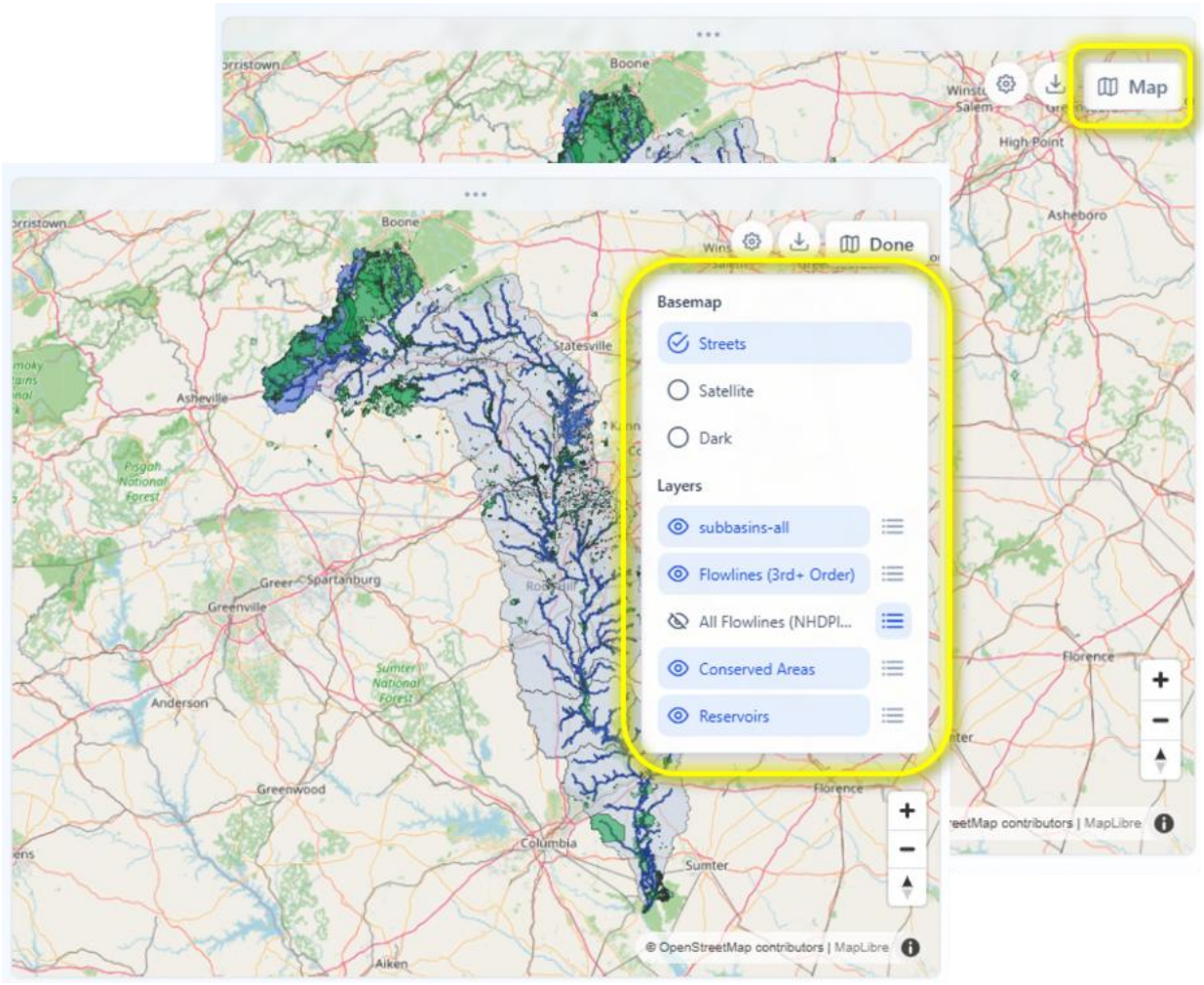


The Subbasin Overview tab provides a high-level summary of the selected subbasin, including its location, key characteristics, management considerations, and supporting data from the IWRP. The top section of the tab provides general information about the selected subbasin, including:

- Subbasin map showing the geographic extent and location of the subbasin within the Catawba-Wateree Basin.
- Location information, including the subbasin's position within the Basin.
- Drainage area, counties, municipalities, and major transportation routes.
- Notable characteristics that describe important natural, recreational, or water resource features within the subbasin.



Users can modify the map layers by using the map button in the top right corner of the map. A pop-up menu appears giving users the option to change the basemap (i.e., streets, satellite, or dark mode) or reference layers (i.e., subbasins and flowlines).



Findings

This section summarizes key findings from the IWRP analysis for the selected subbasin.

- **The Narrative Summary** provides an overview of the subbasin's current and projected conditions, highlighting important hydrologic, water quality, land use, or resource management considerations.
- **Recommendations** summarize potential management strategies and planning opportunities identified through the IWRP process including the suggested tiered

status for addressing issues within the Basin, where Tier 1 sites are suggested for highest priority and Tier 3 sites have fewer issues requiring priority for action.

The Management Opportunities section highlights potential conservation, agricultural, and buffer restoration opportunities identified within the subbasin. Visualizations include:

- A chart summarizing the estimated acreage of identified management opportunities.
- A chart showing the distribution of identified agricultural conservation practices within the subbasin.

These summaries provide insight into where there is the greatest opportunity to take management actions for water resource protection and watershed resilience.

Supporting Data

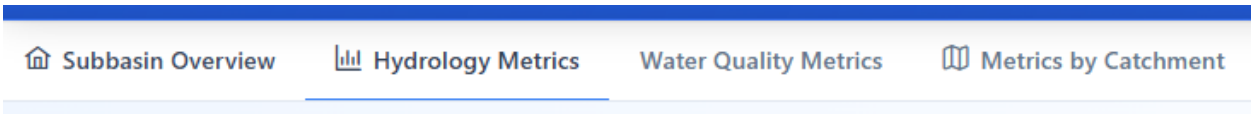
The bottom section of the tab provides supporting information that helps place model results and management recommendations into context.

This section includes:

- **Projected Future Land Use Change** summarizing expected changes in altered (developed) and natural land cover conditions. Natural lands are divided into the categories of Vegetated, where there is a majority of vegetation cover but it is interspersed with human activity, and Pristine, where vegetation is undisturbed.
- **Climate Scenario Information** showing projected precipitation and temperature changes (averaged across months) represented by the climate scenarios evaluated in the IWRP.

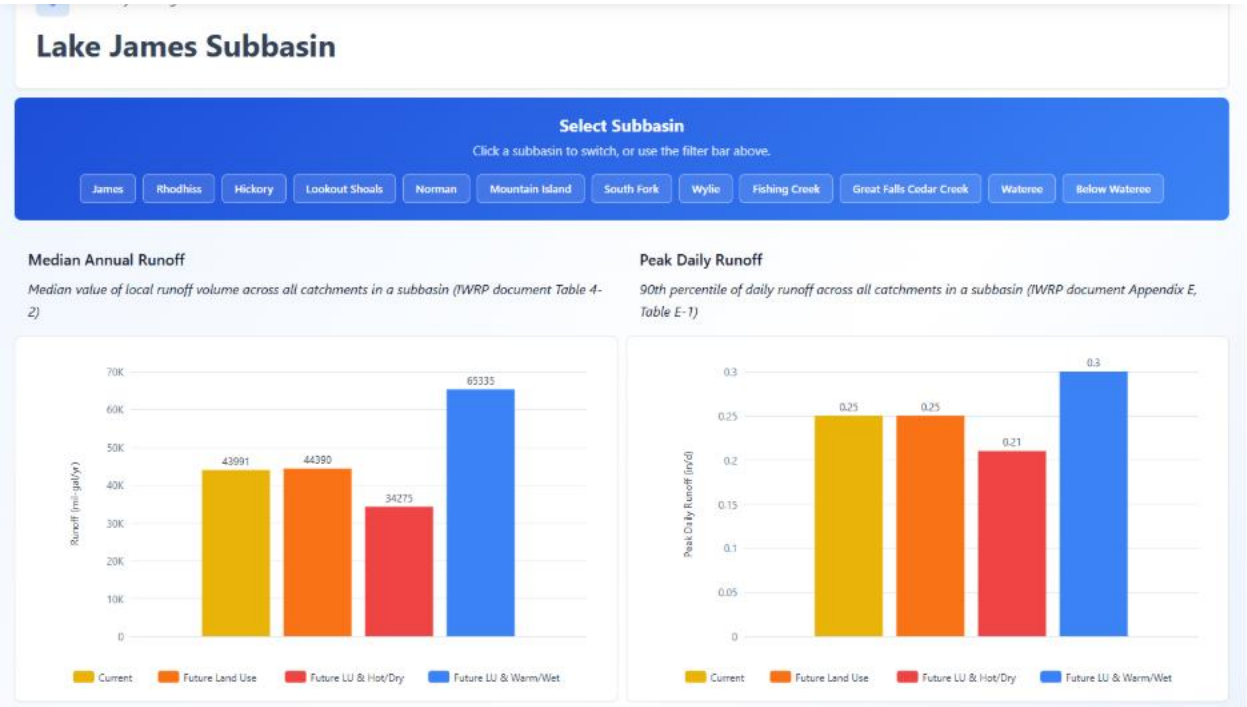
Together, these supporting datasets provide important context for understanding future watershed conditions and interpreting the hydrologic and water quality results presented throughout the IWRP Viewer.

3.2 Hydrology Metrics

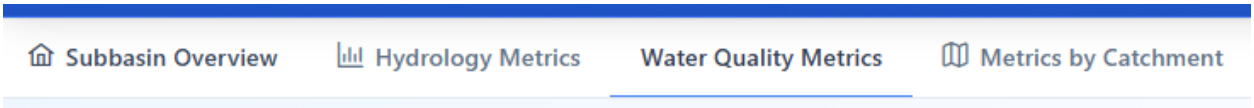


The Hydrology Metrics tab presents a set of representative hydrologic indicators selected to summarize current conditions and how future land use and climate may affect watershed conditions within the selected subbasin (See IWRP Chapter 4). These metrics include median annual runoff (overall runoff generated across the landscape), peak daily

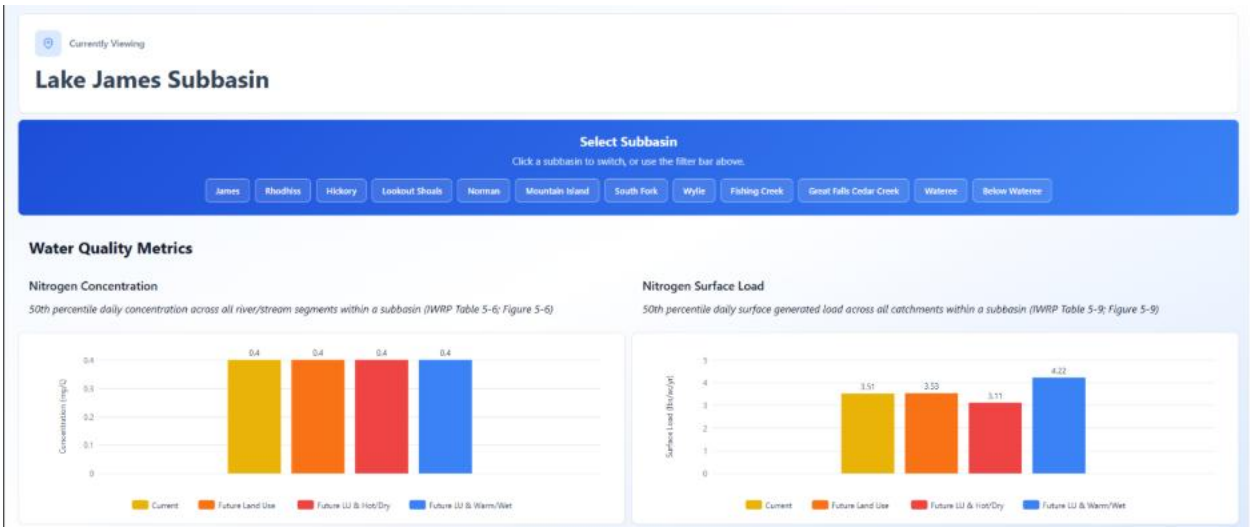
runoff (the magnitude of larger runoff events), peak flow increases and high flow increases (changes in streamflow conditions within major tributaries representing risks for potential flood events), and stream miles with increased low-flow durations (the extent of streams projected to experience longer periods of low flow). The tributary assessment tables provide a subbasin-wide summary of projected changes in high-flow and peak-flow conditions across major tributaries. Results are grouped into categories ranging from no increase to significant increase, allowing users to identify where future hydrologic impacts may be most pronounced.



3.3 Water Quality Metrics



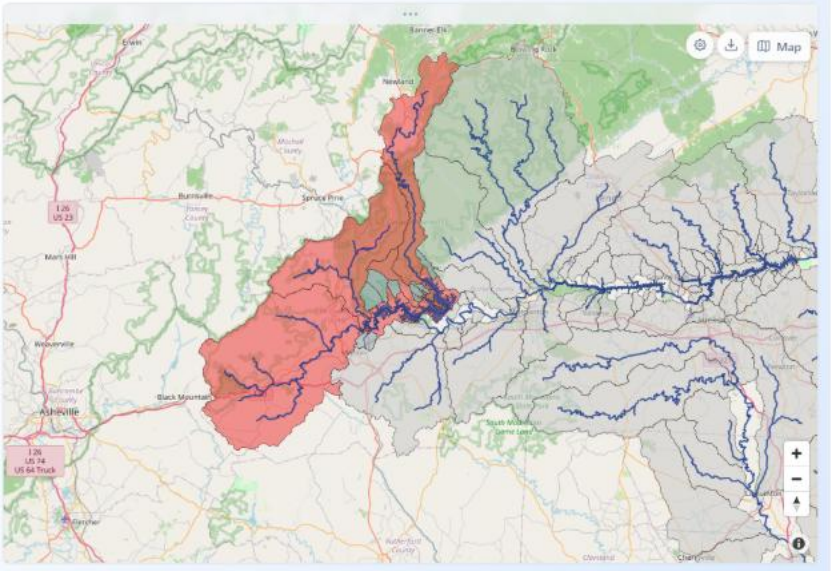
The Water Quality Metrics tab presents a set of representative water quality indicators selected to summarize how future land use and climate may affect water quality conditions within the selected subbasin (See IWRP Chapter 5). These metrics include nitrogen, phosphorus, and sediment concentrations (the mass per unit volume of nutrients and sediment within streams), as well as nitrogen, phosphorus, and sediment surface loads (the mass of nutrients and sediment generated from the landscape and transported to receiving waters).



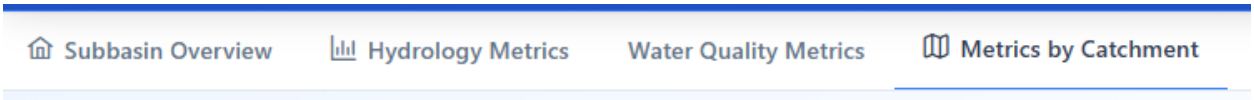
The Top Tributaries Contributing Water Quality Loads table identifies the tributaries that contribute the greatest nutrient and sediment loads within the selected subbasin. The accompanying map highlights the locations of these tributaries (or shoreline), helping users understand where water quality impacts are concentrated and where management or conservation actions may have the greatest benefit. Users can click on the map to see the name of each highlighted tributary. Within the table, the letters in parentheses identify whether the tributary was listed as one of the top four for sediment (S), nitrogen (N), or phosphorus (P).

Top 4 Tributaries Contributing Water Quality Loads

Subbasin	
James	Catawba River (S, N, P)
James	Linville River (S, N, P)
James	North Fork Catawba River (S, N, P)
James	Paddy Creek (S)
James	Shoreline (N, P)



3.4 Metrics by Catchment



The Metrics by Catchment tab provides a more detailed, spatially explicit view of model results within the selected subbasin. Unlike the summary metrics presented in the Hydrology Metrics and Water Quality Metrics tabs, this tab allows users to explore individual hydrologic and water quality metrics at the catchment level and compare results across baseline (i.e., Current), land use, and climate scenarios.

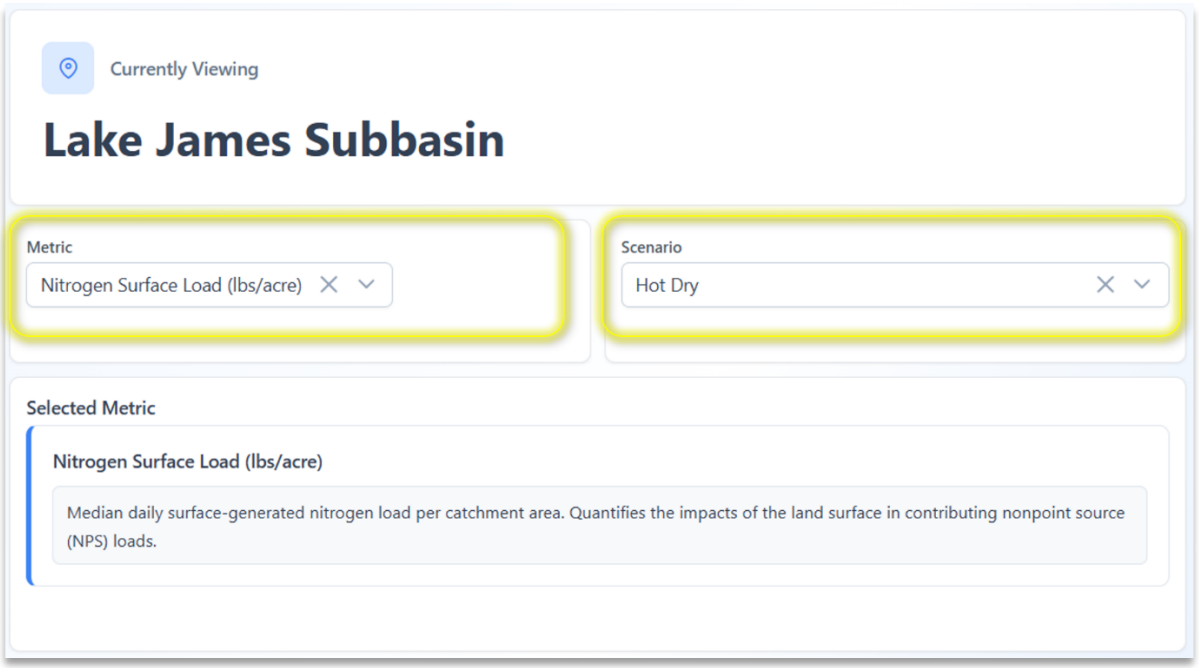
Users can select a subbasin, metric, and scenario using the filters at the top of the page. Available metrics include the representative hydrologic and water quality indicators summarized on the other tabs in the IWRP Viewer, while available scenarios include the range of future scenarios evaluated as part of the IWRP.

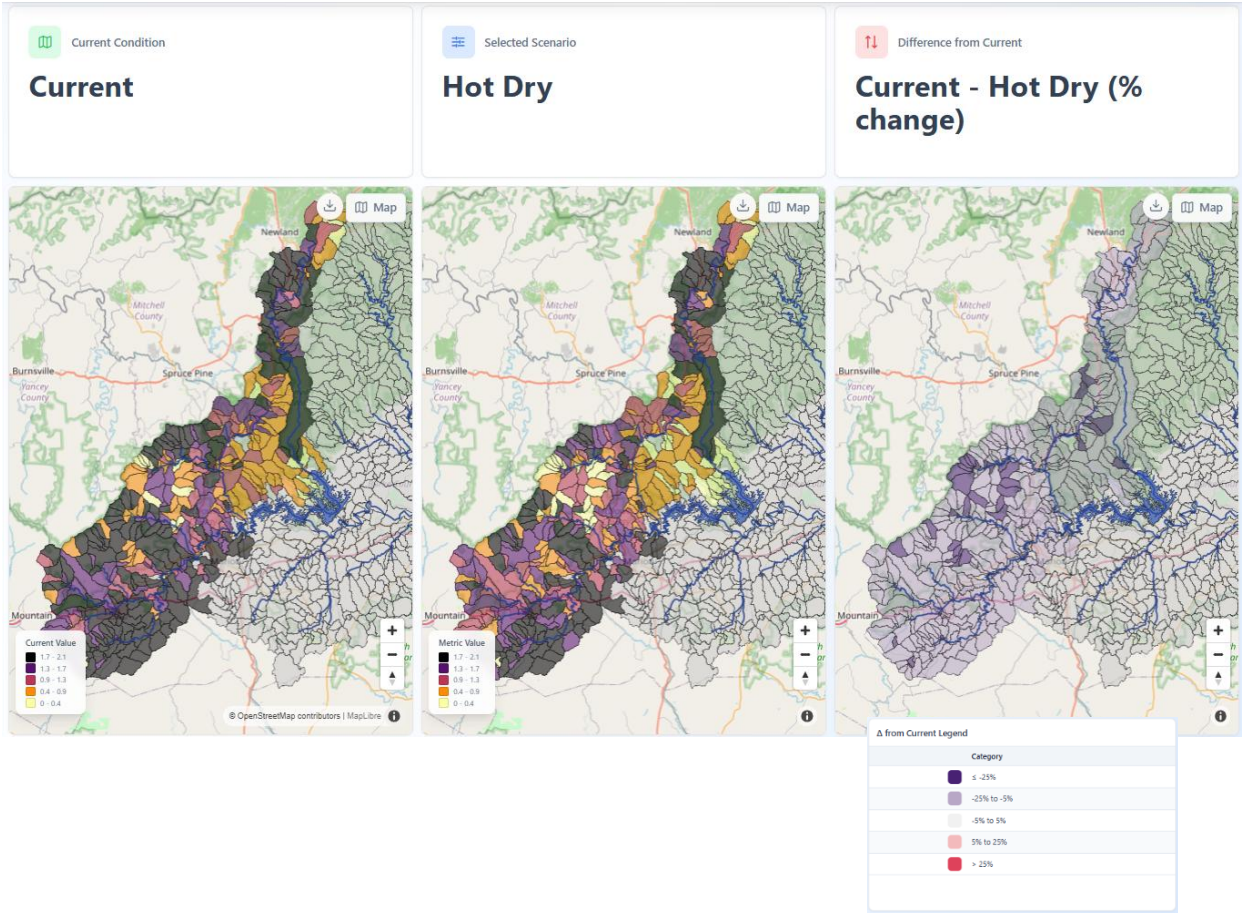
The map displays results for three conditions:

- Current Condition (left): Shows modeled conditions under the baseline scenario.
- Selected Scenario (middle): Displays modeled results for the chosen future scenario.
- Difference from Current (right): Illustrates the magnitude and spatial distribution of change between the selected scenario and current conditions. Users should note the unit of change presented for the selected metric in this map heading. Depending on the metric, differences may be presented as absolute or percent changes. The legend for the difference map appears below the map. Differences are categorized as they were presented in the IWRP document.

The Selected Metric panel provides a brief description of the selected metric and its units to aid interpretation. Users may click on any catchment in these maps to obtain the value mapped. The color gradations used to map values and differences are determined for the metric values across the entire Basin for all scenarios. As such, some subbasins may display little variation in modeled results by scenario. But with these set gradations users switching between subbasins and/or scenarios can more readily discern differences in values from one location or one scenario to another.

Together, the side-by-side maps allow users to identify where projected changes are occurring within the subbasin, compare the relative magnitude of impacts across catchments, and explore how future changes actions may influence watershed conditions at a finer spatial scale.


Currently Viewing
Lake James Subbasin
Metric
Nitrogen Surface Load (lbs/acre)
Scenario
Hot Dry
Selected Metric
Nitrogen Surface Load (lbs/acre)
Median daily surface-generated nitrogen load per catchment area. Quantifies the impacts of the land surface in contributing nonpoint source (NPS) loads.


Current Condition
Current
Selected Scenario
Hot Dry
Difference from Current
Current - Hot Dry (% change)
Map
Newland
Mitchell County
Burnsville
Yancey County
Spruce Pine
Mountain
Current Value
Metric Value
© OpenStreetMap contributors | MapLibre
Δ from Current Legend
Category
≤ -25%
-25% to -5%
-5% to 5%
5% to 25%
> 25%