

Wiser about Water Use

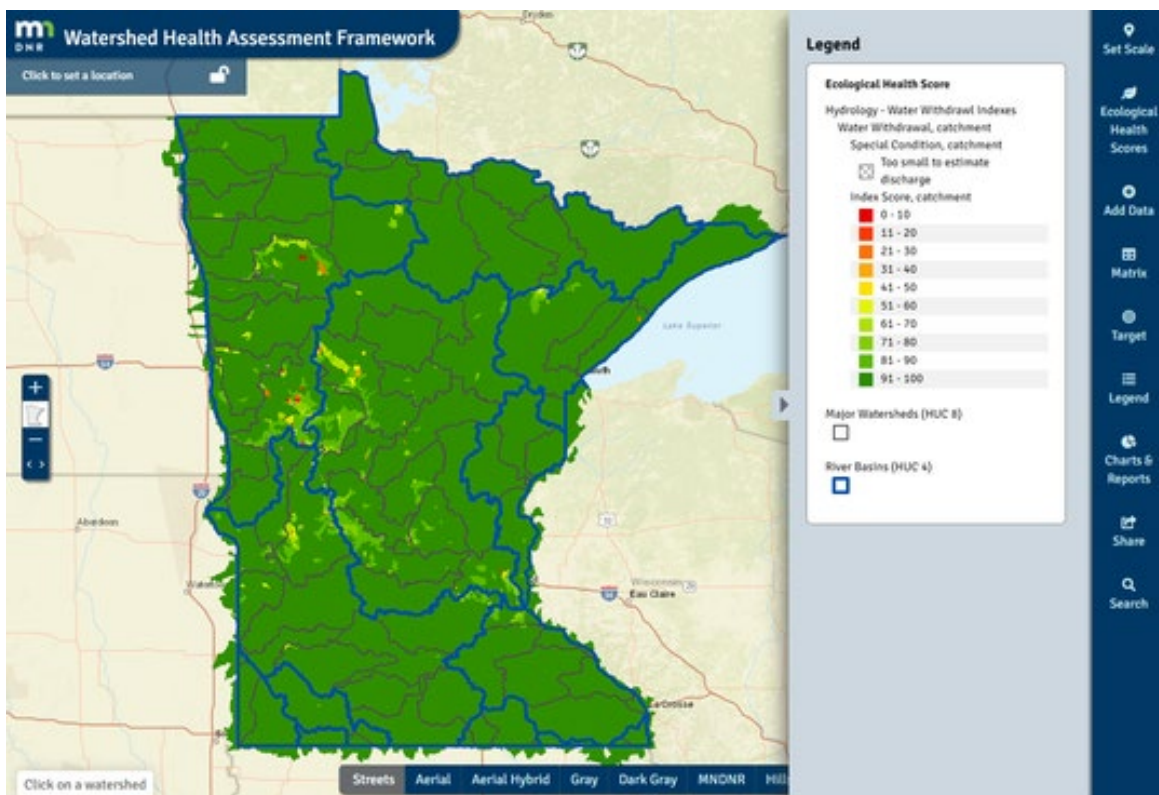
Water is fundamental to life. While we are fortunate to have an abundant water supply in Minnesota, careful management is necessary to ensure a sustainable use of the resource. The **Water Withdrawal Index** helps identify areas that may experience stress to the water supply from recent use. The WHAF Team recently updated this index so the map now reflects the most recent available years of data (2014 - 2019).

The index compares stream discharge and reported water use within each watershed. Stream discharge is estimated with a model of rainfall, temperature, geology, watershed location and size. Reported water use is calculated from reports submitted by DNR Water Appropriations Permit holders. By comparing these values, we see where reported water use is high relative to discharge, a scenario that stresses available water supply with impacts to watershed health and resilience.

Investigate Water Use

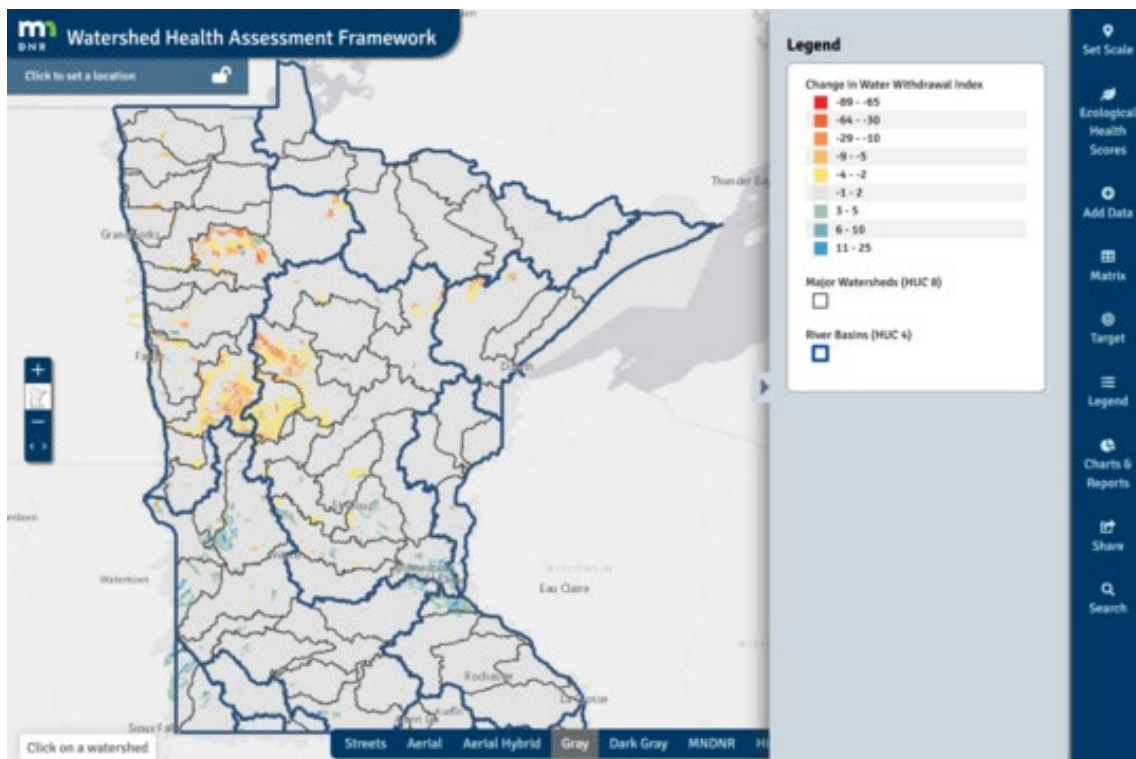
WHAF provides **three products** based on the water withdrawal index that can help you investigate water use at statewide and local scales.

1. **The Water Withdrawal Index map** depicts the percent of discharge used by permit holders over the last 5 years (2014-2019). This helps identify which watersheds may be experiencing stress, and target those areas for closer investigation. In some situations, water use can impact stream and lake levels, the quality of aquatic habitats or groundwater reserves.



This is a statewide view of the updated Water Withdrawal Health Score. [View map in browser.](#)

- The **Change in Water Withdrawal map** compares index score values from the most recent 5-years to the entire data record. With this approach, a positive value reflects areas with a decreasing level of stress to the water supply, and a negative value reflects areas with an increasing level of stress. This map is useful for identifying areas of emerging concern.



This statewide map shows the Change in Water Withdrawal Index. It is important to note that the index compares permitted water use to runoff. The runoff model incorporates increasing or decreasing precipitation and temperature, so changing climate may also play a role in where the index shows a change in water stress. [View map in browser](#)

- The **Water Withdrawal summary charts** provide a chart and table view of the derived values used to calculate the index score. These products provide access to the entire record of available data, summarized for each catchment's contributing watershed. The data includes annual values for: total precipitation, reported water use, estimated discharge, and the water withdrawal index (i.e., reported water use as a percent of estimated discharge).

The example Water Withdrawal charts (next page) display the entire expanded record (1990 – 2019). These charts are for Catchment 6604100 found in the Clearwater River Watershed of the Red River Basin. This catchment and its upstream watershed have seen a decrease in runoff from lower precipitation levels and an increase in the amount of water use. The model shows nearly 30 percent of available runoff is being consumed for permitted water uses in the most recent 5 years.

You can also [view these charts](#) in WHAF app.

Water Use Index and Inputs Upstream of Catchment 6604100

