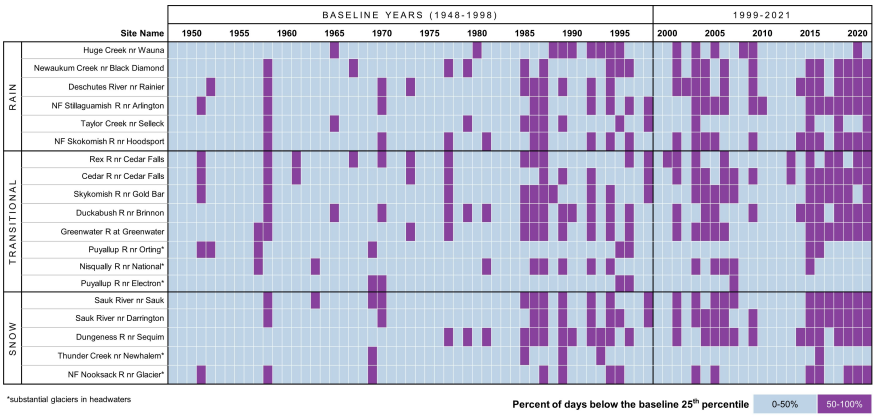
PUGET SOUND
VITAL SIGNS

INDICATOR
SUMMER LOW FLOW IN STREAMS AND RIVERS

The summer low flow indicator measures current conditions and long-term trends in stream flows that occur during summer months when there is less rain and temperatures are warmer. The indicator tells us how often summer flows are below normal, relative to a 50-year baseline, in unregulated streams and rivers across Puget Sound. When flows are below normal, less water is available for people and wildlife to use, less habitat is available for salmon and it can contribute to increased water temperatures and lower water quality.



Status of annual summer low flow at indicator streamgages. Each cell is color coded for a category of frequency of below normal flow. Categories are based on the percent of days each year between July 15th and September 15th where the mean daily flow was below normal (i.e., below the 1948-1998 baseline 25th percentile). When most days (50% or more) were below normal, the cell is shaded purple. When fewer than 50% of the days were below normal, the cell is shaded blue. Streamgages are grouped as 1) rain-sourced, 2) transitional (between rain- and snow-sourced), or 3) snow-sourced based on the center of timing date.

Key Vital Sign Indicator Results

- The occurrence of below normal summer flows is increasing in unregulated streams and rivers across Puget Sound. In 2021, summer flows were below normal most of the time at three-quarters of the indicator gages (see Interpretation of Results for more details).
- Consecutive years with below normal summer flows have increased since 1985 and especially since 2015.
- Since 2015, most of the rain, transitional, and snow-sourced systems had below normal summer flows over 75% of the time.
- Accelerated glacial melt may temporarily offset diminishing low flows in some rivers. Substantial glaciers are present around basin headwaters of five of the indicator gages. These systems have generally maintained stable summer streamflows, at levels similar to the 1948-1998 baseline period.
- Daily flows below 1948-1998 baseline minimums were observed at all but one indicator gage (Huge Creek near Wauna) during the 1999-2021 study period and especially since 2015.
- Supporting analysis shows that the timing of streamflow is changing in Puget Sound. Between 1948 and 2021, the center of timing (CT) at most indicator gages regressed to earlier occurrences over time. This means the low flow season in our region is becoming longer as larger fractions of total annual runoff occur progressively earlier in the year (see Interpretation of Results – Changes in Streamflow Timing for more details).

Indicator Progress

GETTING WORSE

Target Status

NO TARGET

Target

No targets are currently set for this indicator.

Data Source

U.S. Geological Survey Groundwater and Streamflow Information Program - Streamgaging Network, compiled by the Streamflow Monitoring Program at the Washington Department of Ecology

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