# 2022 State of Salmon
# Water Analysis Project

# #3 -- Water Temperature (°F)

# Analysis Methods

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Content and methods for 2022 State of Salmon Water Analysis Project were developed and uploaded (here) under RCO contract #22-1587 with SBGH-Partners, dated April 18, 2022.


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## WATER TEMPERATURE

Most water gauge datasets containing substantial timelines shared the characteristic of daily summer water temperature data reliably collected for the entirety of August for each year. Thus, August was chosen as the annual timeframe from which to assess water temperature data. The Washington State Department of Ecology proved to have the most consistent data in terms of water temperature measurements over time.

### Methodology For Analyzing Water Temperature Data

For temperature data, we calculated the following:

- Average daily maximum water temperature for August of each year

1. From the dataset, filter the data for the pre-determined, seasonal temporal range being assessed (Aug 1 - Aug 31) of the current year being analyzed.

2. From the water temperature field, calculate the maximum temperature value for each day within the temporal range being assessed.

3. Average the values calculated in step 2 for each day assessed. The result is the average daily maximum summer water temperature for the year being analyzed.

4. Repeat all steps for each year in the dataset.

## FINDING CHANGE OVER TIME FOR DAILY MAXIMUM SUMMER WATER TEMPERATURE

1. Calculate a linear regression for the water temperature of each year's average daily maximum summer water temperature for the dataset.

2. Input the dataset's first year analyzed into the equation for the resulting linear regression, then, separately input the dataset's last year analyzed into the same equation.

3. Calculate the change between the equation's solution for the first and last year. The result will represent the change in the average daily maximum summer water temperature for the dataset.