



# Salmon Stream Temperature Fact Sheet

## **Why temperature?**

*Water temperature affects all phases of the salmon lifecycle, including :*

- \* *timing of migration*
- \* *survivorship of eggs*
- \* *respiration*
- \* *metabolism*
- \* *availability of O<sub>2</sub>*

*Warm water temperature induces stress in salmon and makes them more vulnerable to pollution, predation and disease.*

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## **Byers Creek**

Cook Inletkeeper coordinates a Stream Temperature Monitoring Network across key salmon-bearing systems of the Cook Inlet basin. Our goal is to describe water temperature profiles and identify watershed characteristics that make specific streams more sensitive to climate change impacts. This fact sheet provides a summary of data collected on Byers Creek through this collaborative effort.



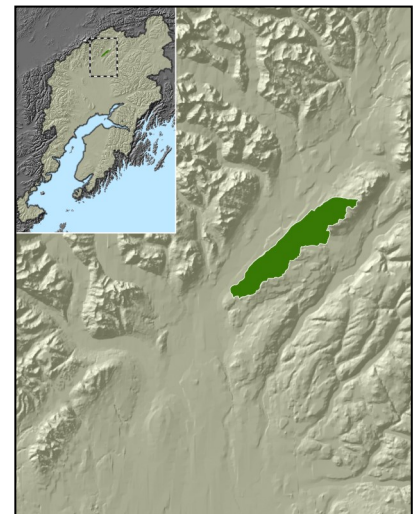
**Water temperature monitoring site is located upstream from the Parks Highway.**

**Latitude (N) 62.71158; Longitude (W) -150.20407**

## **Watershed facts**

The Byers Creek watershed (highlighted in green on map) is located in the Mat-Su basin. Byers Creek flows into the Chulitna River which joins the Susitna River at Talkeetna.

Watershed size	30,676 acres
Maximum elevation	4,390 feet
Mean elevation	1,819 feet
Percent wetlands	3.3 %
Connected lakes	Yes



Adult salmon returning to freshwater streams to spawn are stressed by temperatures above 15°C (59°F), while juvenile salmon are affected by temperatures above 13°C (55°F).



In 2013, we completed a synthesis report of the stream temperature data collected from 2008-2012 to establish current water temperature conditions in 48 salmon streams and stream-specific sensitivity to climate change impacts. You can read the full report at: <http://inletkeeper.org/resources/contents/stream-temperature-synthesis-report>

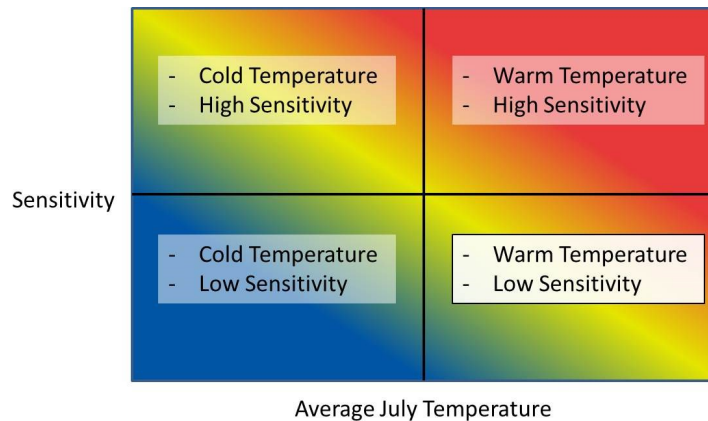
## Byers Creek Temperature Summary

Below is a summary of Byers Creek water temperature data from 2008-2012.

Maximum temperature recorded	22.8°C (73.0°F)
June average temperature	11.7°C (53.0°F)
July average temperature	14.9°C (58.8°F)
August average temperature	13.3°C (56.0°F)
Maximum 7-day average temperature	15.9°C (60.7°F)
Maximum 7-day maximum temperature	18.8°C (65.9°F)
# of days/year temperature exceeds 13°C (55°F)	74
# of days/year temperature exceeds 15°C (59°F)	44

## Climate Change Vulnerability

We can use our current knowledge of the relationship between air and water temperature to develop stream-specific predictions for future water temperature. "Sensitivity" is a term used to describe how much a stream's water temperature will change with a 1°C (1.8°F) change in air temperature. A stream with a higher sensitivity (>0.75) will increase faster as air temperatures increase in the years ahead. And we can use a salmon-relevant threshold value of 13°C (55°F) for average July temperature to describe a stream as "cold" or "warm" to create a framework for assessing climate change vulnerability:



Byers Creek falls in the "warm, low sensitivity" category, which indicates that stream temperatures will likely increase only moderately in the decades ahead, but will continue to exceed 13°C (55°F) resulting in more thermal stress for juvenile salmon.

**This baseline data set and our understanding of stream-specific sensitivity can guide future monitoring efforts to track climate change impacts and can help fisheries and land managers prioritize streams for research and protection efforts to ensure Cook Inlet wild salmon endure as thermal change continues.**