



# 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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## **Meadow 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 Meadow Creek through this collaborative effort.



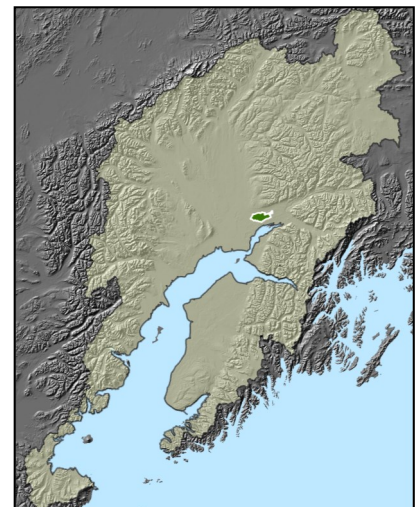
**Water temperature monitoring site is located below the Beaver Lakes Road crossing.** Photo by Mike Gracz

**Latitude (N) 61.56300; Longitude (W) -149.82400**

## **Watershed facts**

The Meadow Creek watershed (highlighted in green on map) is located in the Mat-Su basin and flows into Big Lake.

Watershed size	42,004 acres
Maximum elevation	542 feet
Mean elevation	309 feet
Percent wetlands	16.6 %
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>

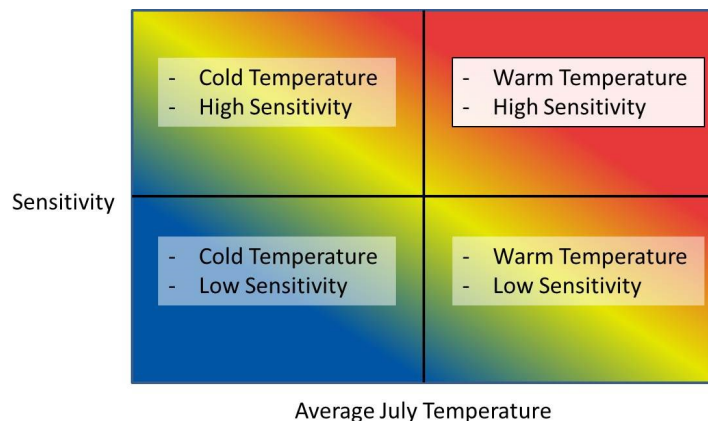
## Meadow Creek Temperature Summary

Below is a summary of Meadow Creek water temperature data from 2008-2011.

Maximum temperature recorded	22.7°C (72.8°F)
June average temperature	13.9°C (57.1°F)
July average temperature	14.9°C (58.7°F)
August average temperature	13.0°C (55.4°F)
Maximum 7-day average temperature	16.4°C (61.5°F)
Maximum 7-day maximum temperature	19.0°C (66.2°F)
# of days/year temperature exceeds 13°C (55°F)	71
# of days/year temperature exceeds 15°C (59°F)	41

## 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:



Meadow Creek falls in the "warm, high sensitivity" category, which indicates that July stream temperatures will likely increase by at least 2°C (3.6°F) in the decades ahead resulting in significant thermal stress for both spawning and 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.**