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_2*

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

For more details about our methods or data, please contact:

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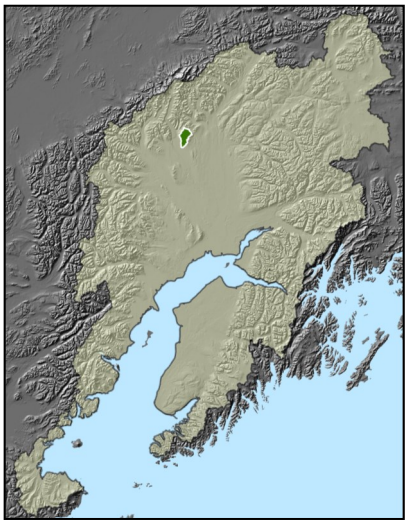
Cache Creek

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 Cache Creek through this collaborative effort.

Water temperature monitoring site is located half mile downstream from east end of landing strip.
Latitude (N) 62.38900; Longitude (W) -151.08100

Watershed facts

The Cache Creek watershed (highlighted in green on map) is located in the Mat-Su basin. The creek is a tributary to the Yentna River, which flows into the Susitna River.



Watershed size	44,228 acres
Maximum elevation	4,417 feet
Mean elevation	2,249 feet
Percent wetlands	1.6 %
Connected lakes	No

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

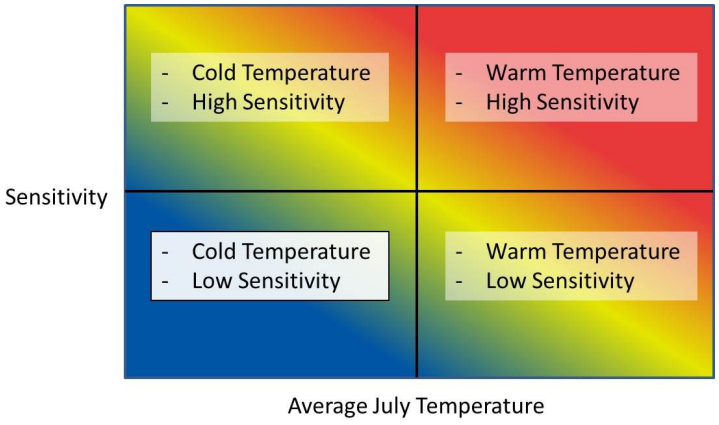
Cache Creek Temperature Summary

Summary of Cache Creek water temperature data from 2008, 2009, 2011, 2012:

Maximum temperature recorded	20.7°C (69.2°F)
June average temperature	8.1°C (46.6°F)
July average temperature	11.0°C (51.7°F)
August average temperature	9.5°C (49.1°F)
Maximum 7-day average temperature	12.3°C (54.2°F)
Maximum 7-day maximum temperature	15.3°C (59.5°F)
# of days/year temperature exceeds 13°C (55°F)	23
# of days/year temperature exceeds 15°C (59°F)	10

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:



Cache Creek falls in the "cold, low sensitivity" category, which indicates that stream temperatures will likely remain favorable for salmon and this system will continue to provide important cold-water habitat in the decades ahead.

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.