# ALASKA HYDROELECTRIC PROJECTS AND CLIMATE

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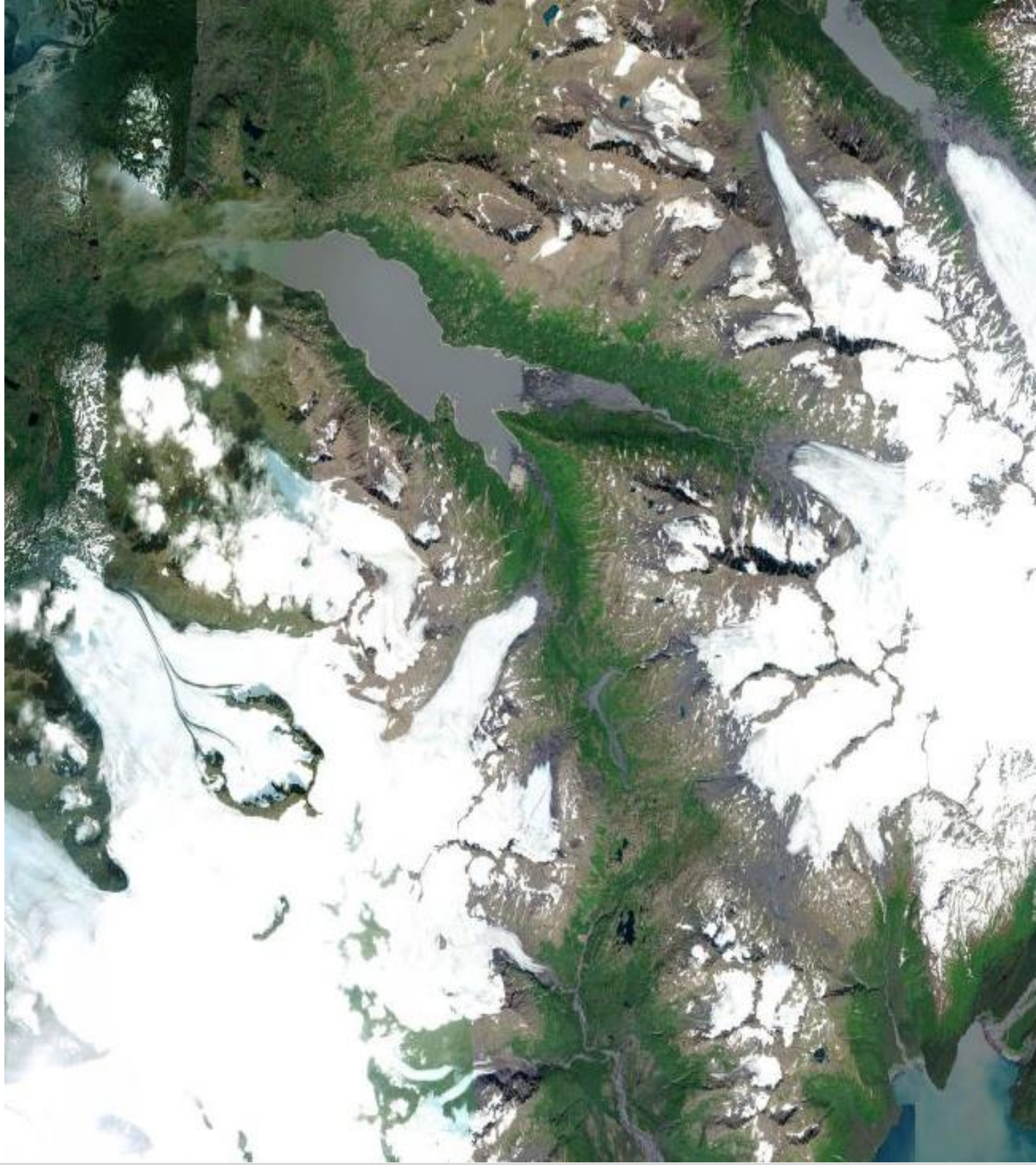
ALASKA
ENERGY
AUTHORITY

# BRADLEY LAKE HYDROELECTRIC PROJECT AT-A-GLANCE

- Northeast of Homer, Alaska~27 miles.
- Commercial operation 1991
- Dam Height – 125 feet
- Installed Capacity – 120 MW
- Drainage Area  - 80 square miles (including two large glaciers)

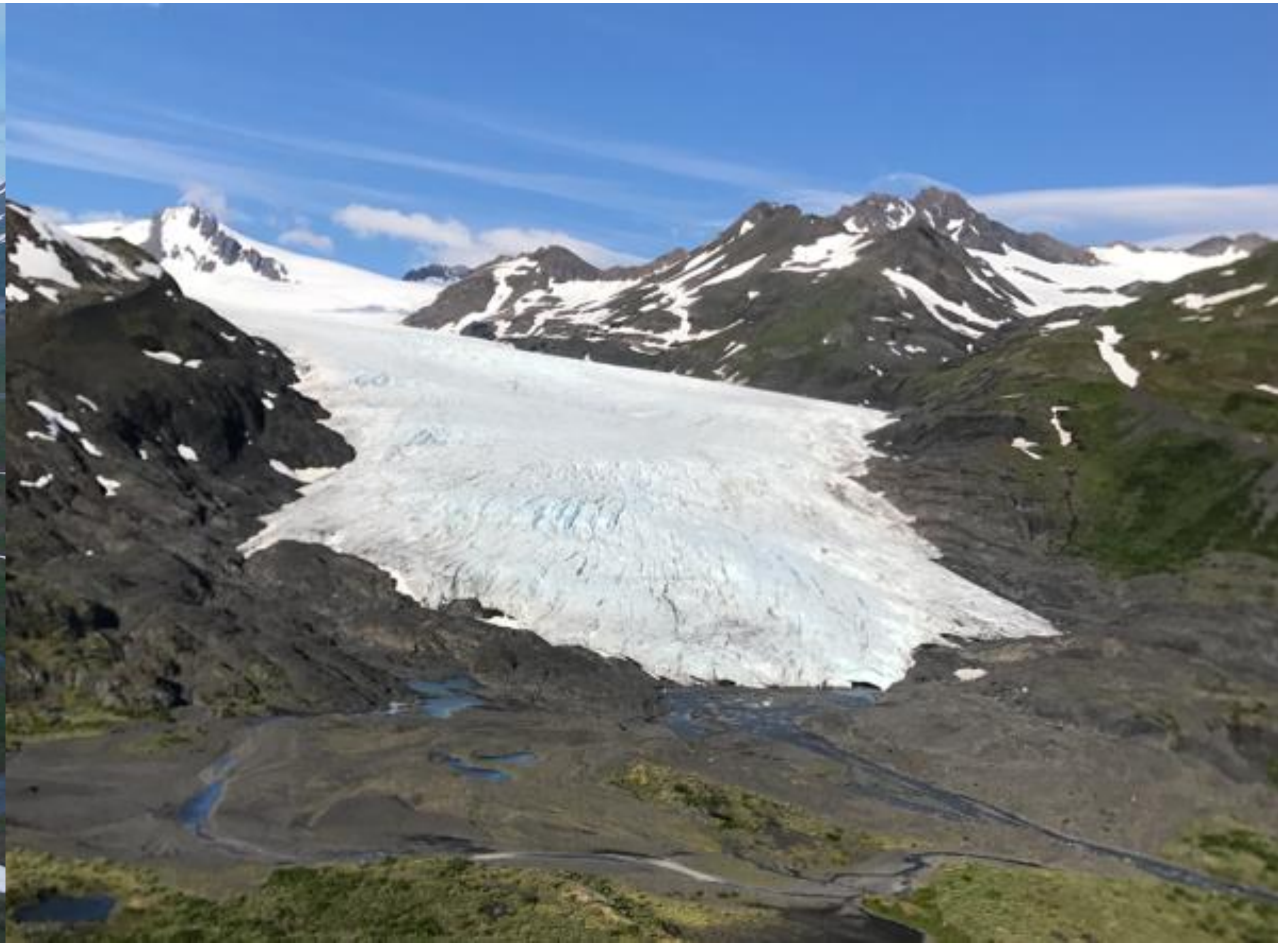


# UPPER MIDDLE FORK BRADLEY RIVER

- Stream and precipitation gauge at Upper Middle Fork Bradley River.
- Drainage are ~8 square miles.
- ~65% of drainage area Nuka Glacier.
- Comparison of data of first 10 years of project (1991-2000) and last (10 years (2011-2020).

# NUKA GLACIER

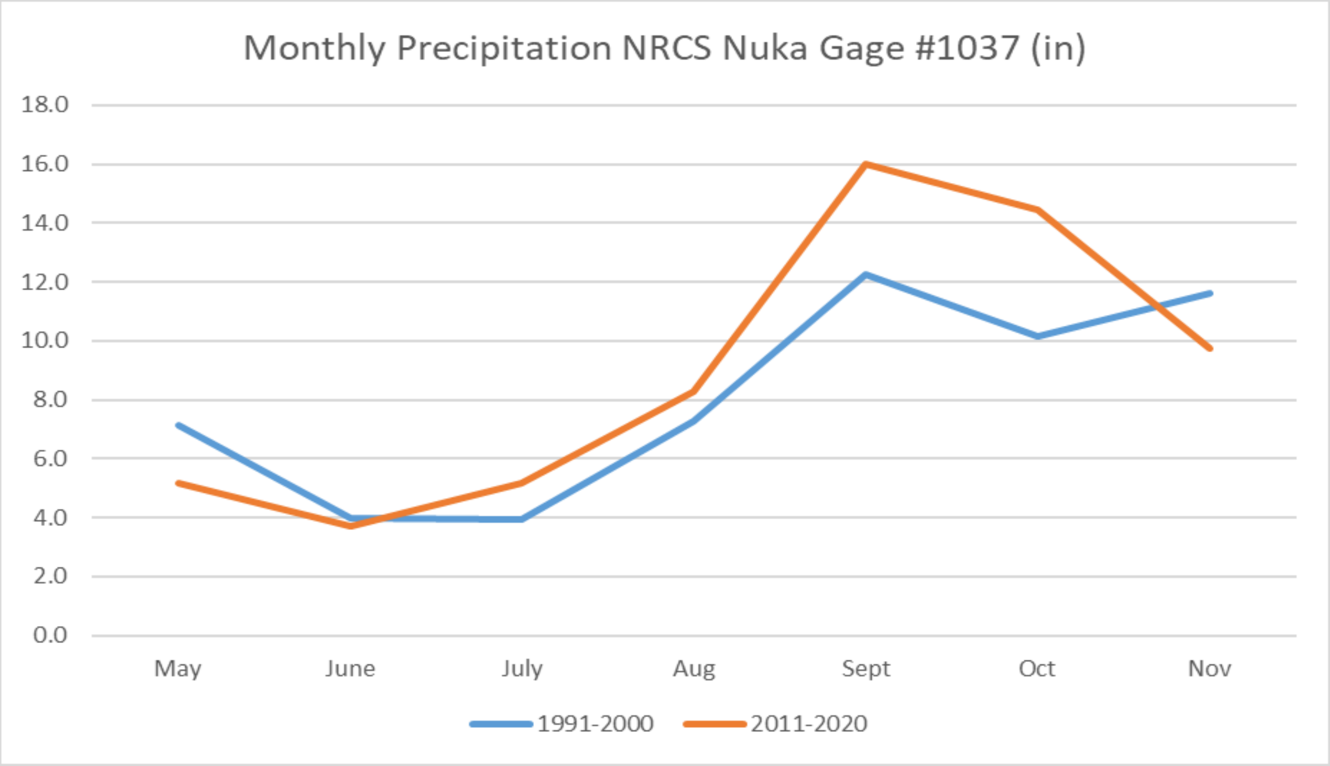
2008



2017

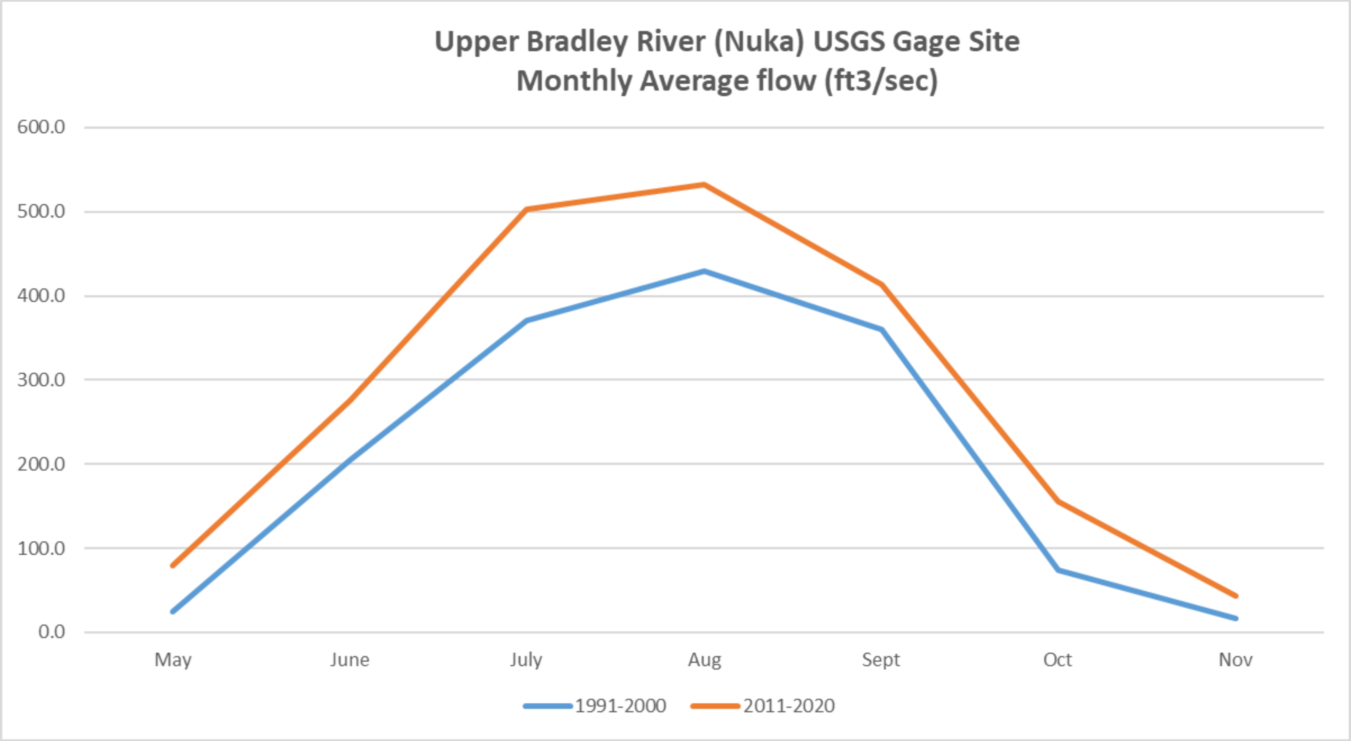
# UPPER MIDDLE FORK BRADLEY RIVER PRECIPITATION

- Precipitation gauge at Upper Middle Fork Bradley River eight to 10 years data.
- Less precipitation in May and June but more in summer. Greatest increase in fall.
- Overall 19% increase.

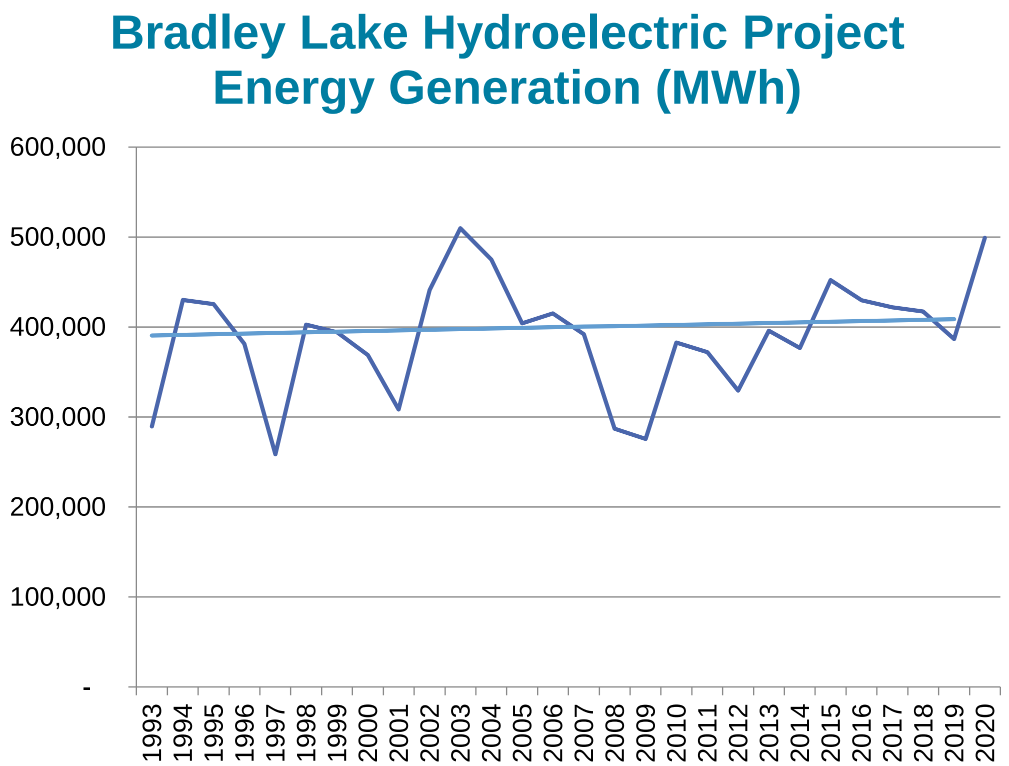


# UPPER MIDDLE FORK BRADLEY RIVER VOLUME

- Stream gauge at Upper Middle Fork Bradley River nine to 10 years data.
- Largest % increase (>100%) in May, October, and November.
- Overall 35% increase.

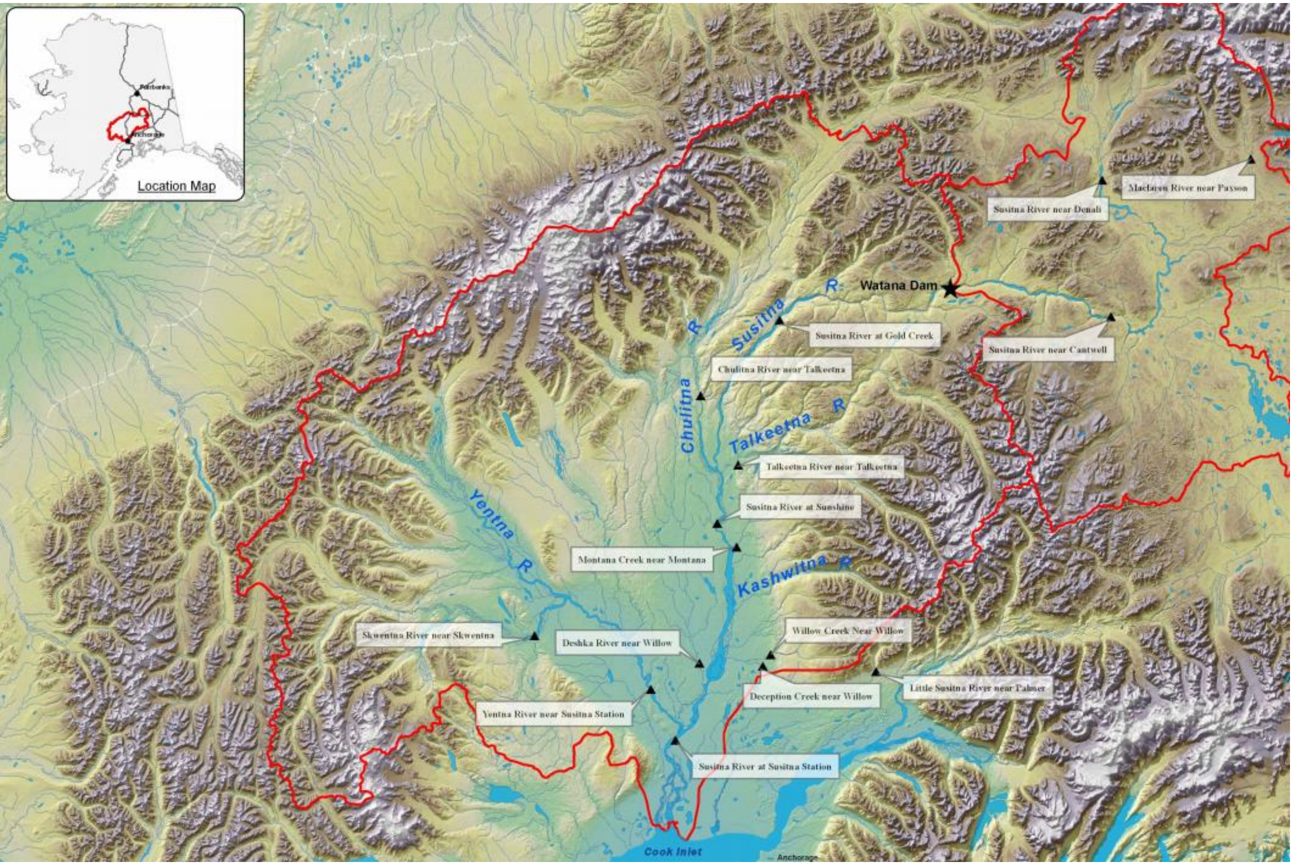


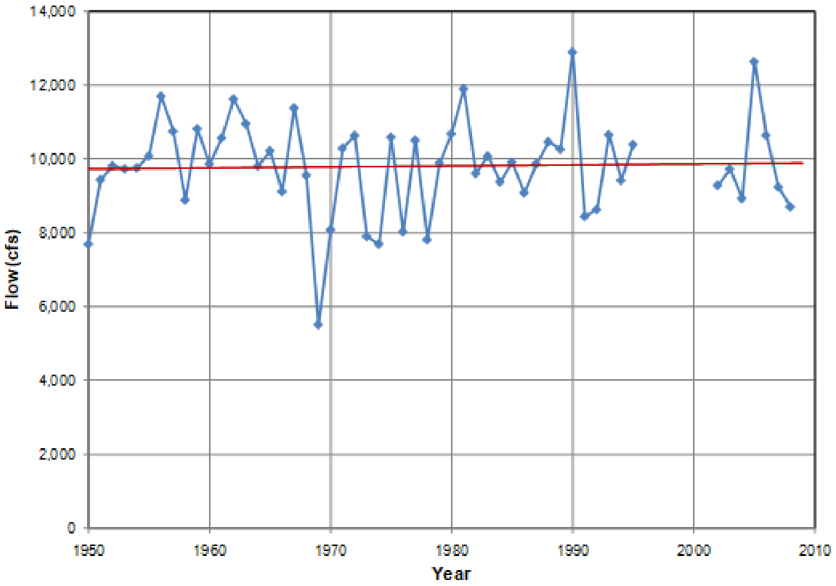
# BRADLEY LAKE PROJECT ENERGY




- First 10 years (1992-2001) mean annual energy 365,000 MWh.
- Last 10 years 2011-2020) mean annual energy 408,000 MWh.
- Overall 12% increase.

# SUSITNA RIVER HISTORICAL HYDROLOGY



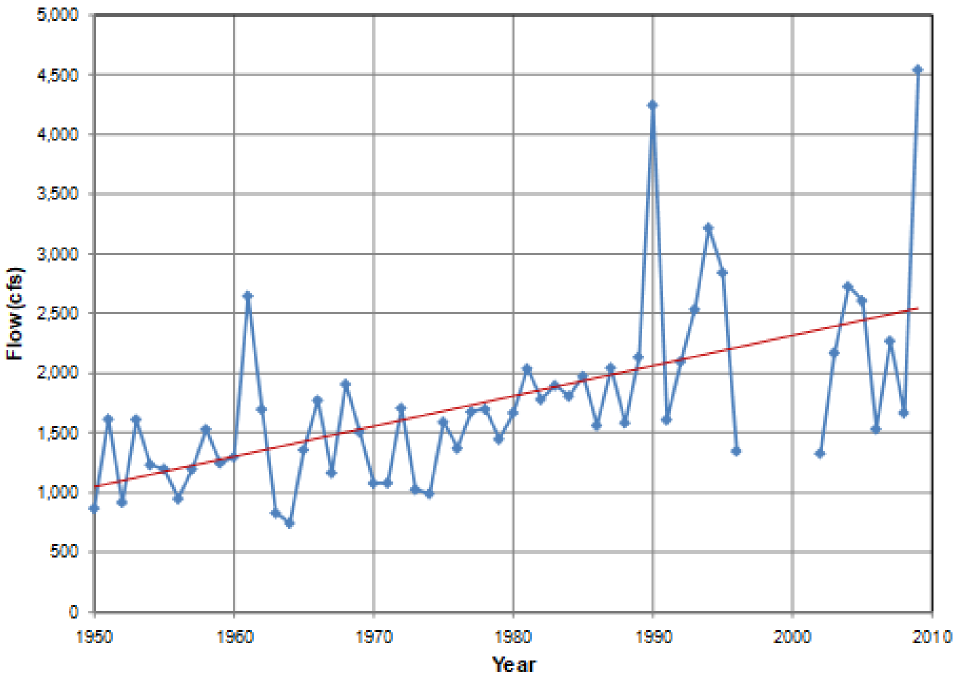




Average Annual Flow

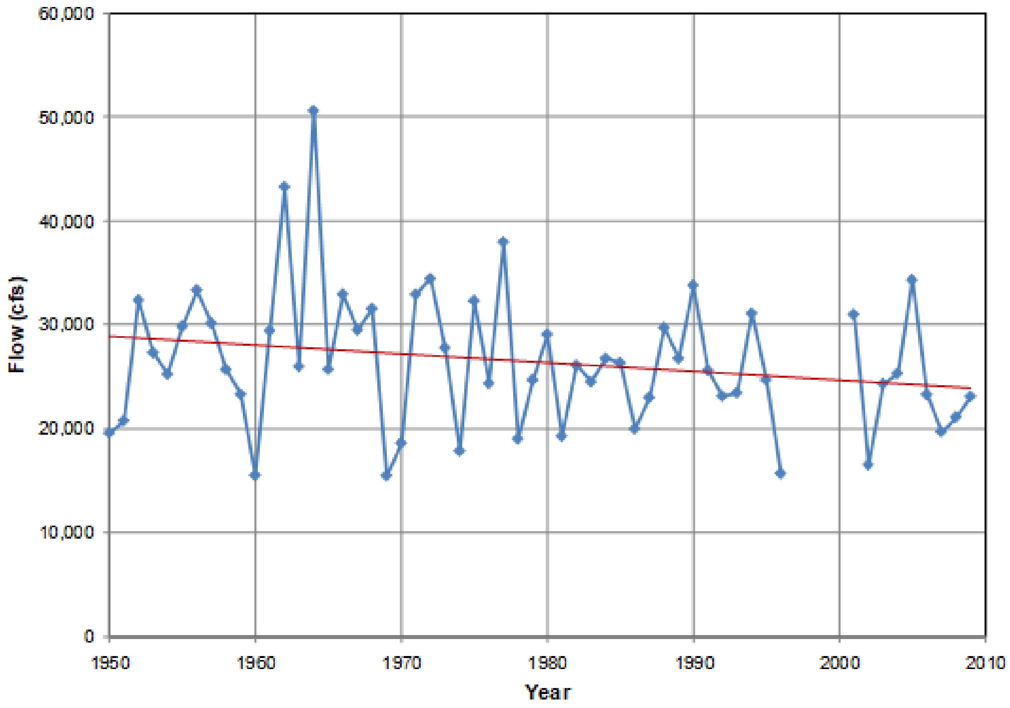
- Basin area at Gold Creek 6,160 square miles.
- More than 50 years of data.
- Average annual flow slightly increasing.

# SUSITNA RIVER HISTORICAL HYDROLOGY

- Significant increases in early spring flows at Gold Creek.
- Decrease in summer flows at Gold Creek.

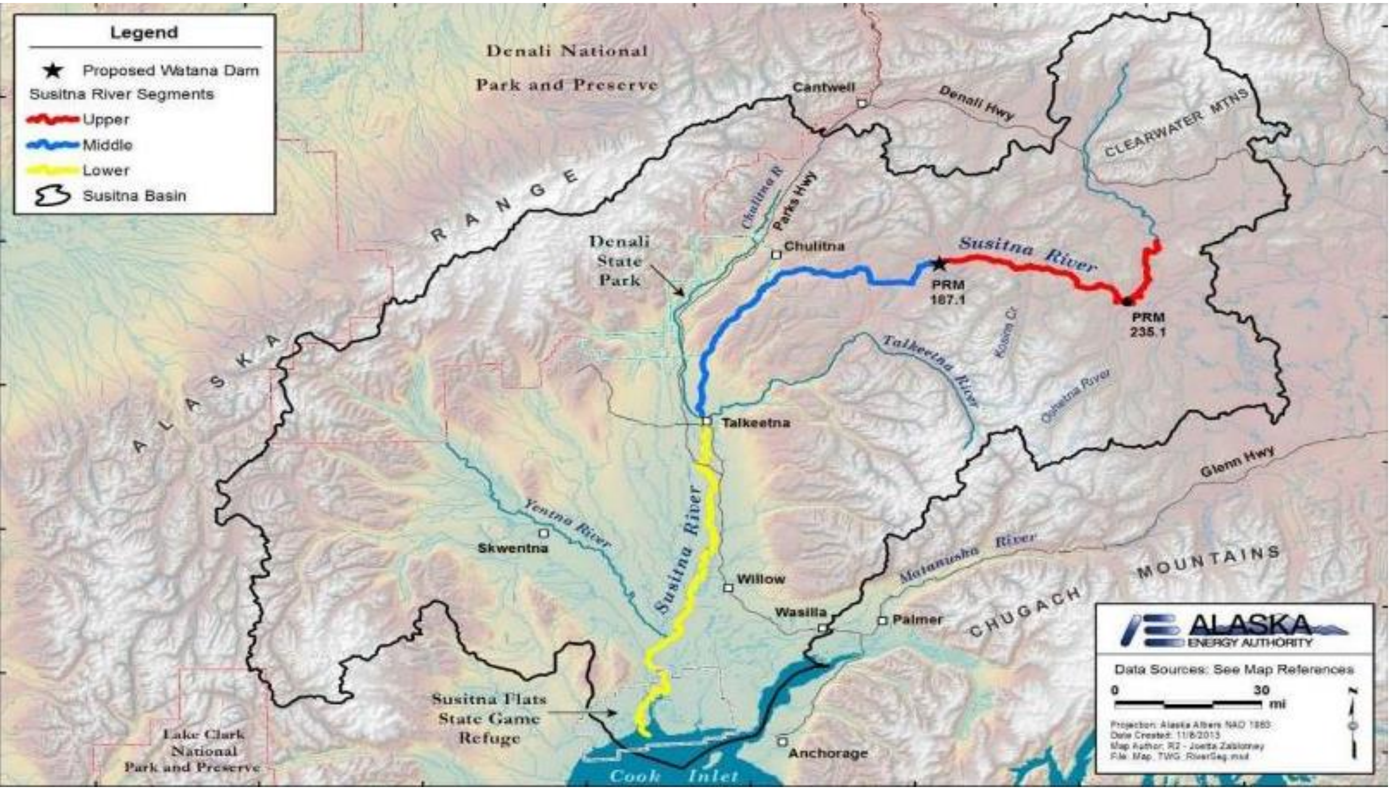



April Flows




June Flows

# SUSITNA-WATANA PROJECT RUNOFF CHANGES




- Susitna-Watana Hydroelectric Project Glacier and Runoff Changes Study Report.
- Increase in basin wide temperature.
- Total precipitation will rise slightly with a decrease in snowfall and increase in rainfall.
- Runoff at dam site would initially increase slightly followed by reduction.
- Peak spring runoff occurs earlier.

AEA provides **energy solutions** to meet the unique needs and opportunities of Alaska's rural and urban communities.

ALASKA ENERGY AUTHORITY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