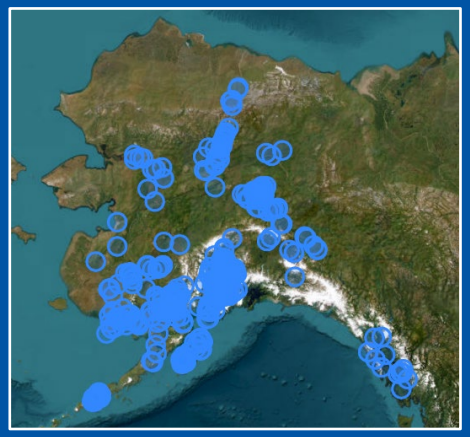


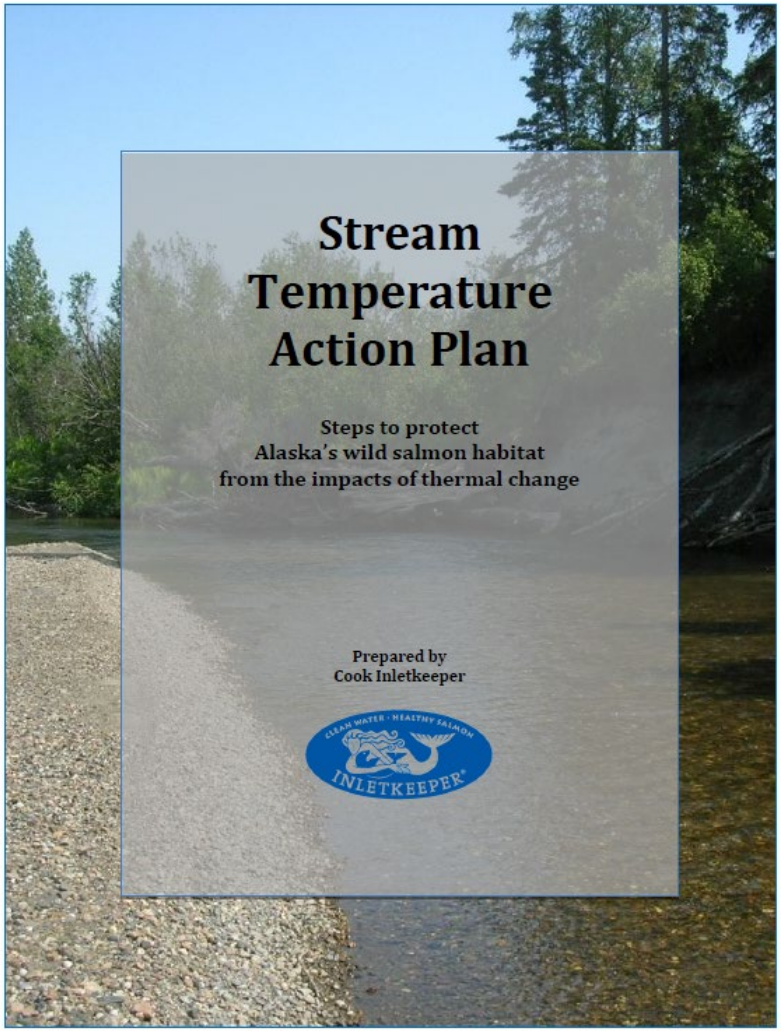
The Next Water Temperature Action Plan

Building on a Decade of Collaboration and Strategic Actions

November 19, 2024

CLEAN WATER · HEALTHY SALMON
INLETKEEPER®

The Action Plan

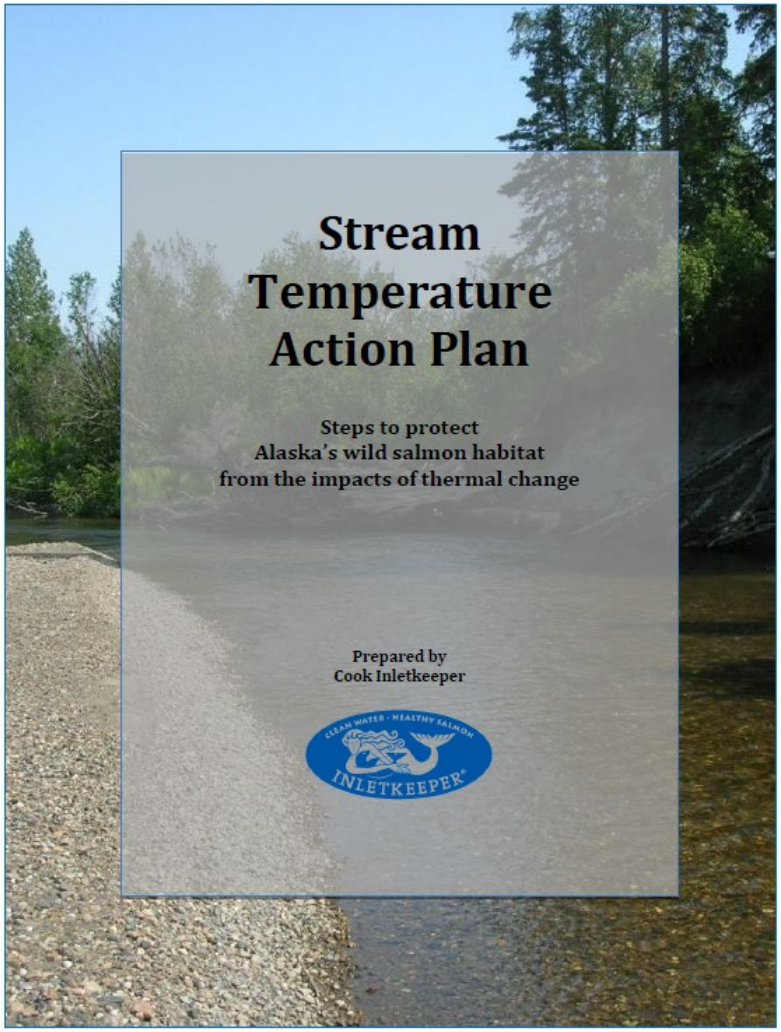


Developed with working group input in 2012

Purpose: to identify highest priority actions for the next 5-10 years that will lead to greater protection of Alaska's salmon habitat as thermal change continues

How: to be accomplished through collaboration and coordinated discussion!

Goals



1. Improve our understanding of current thermal regimes in Alaska's salmon streams.

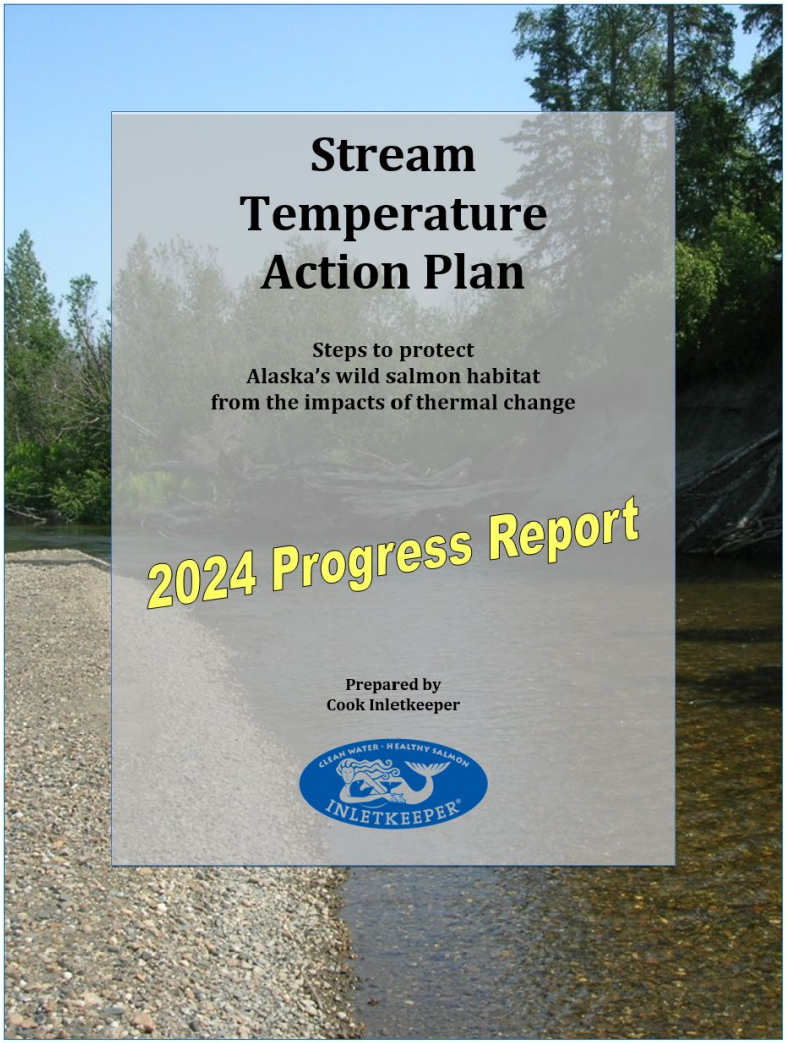
2. Refine data collection for fisheries management and modeling applications.

3. Target cold water habitat protection efforts.

4. Fill stream network data gaps.

5. Direct relevant fisheries and habitat research.

Goals



How are we doing?

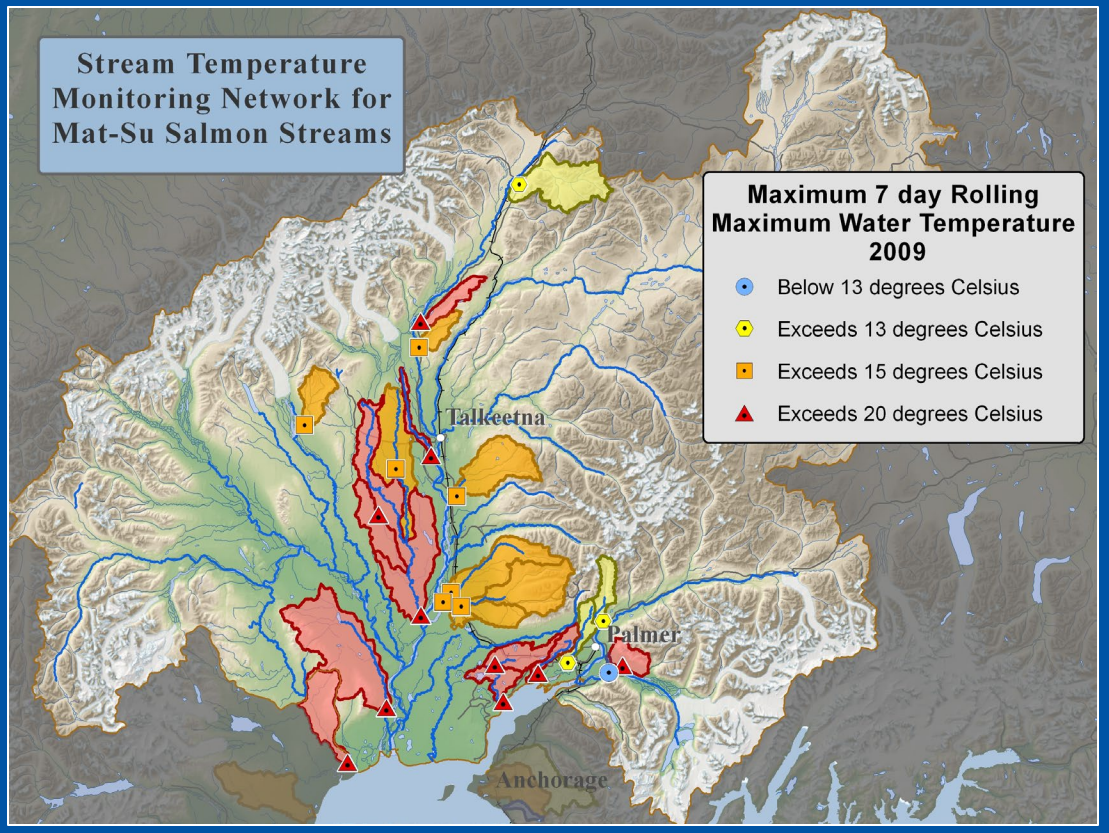
What still needs to be done?


February 2024

Goal 1: Describe thermal regimes

OBJECTIVE #1:

Monitor temperatures across the full range of the most important environmental gradients that affect thermal regimes to understand current variation among streams.



Goal 1: Describe thermal regimes

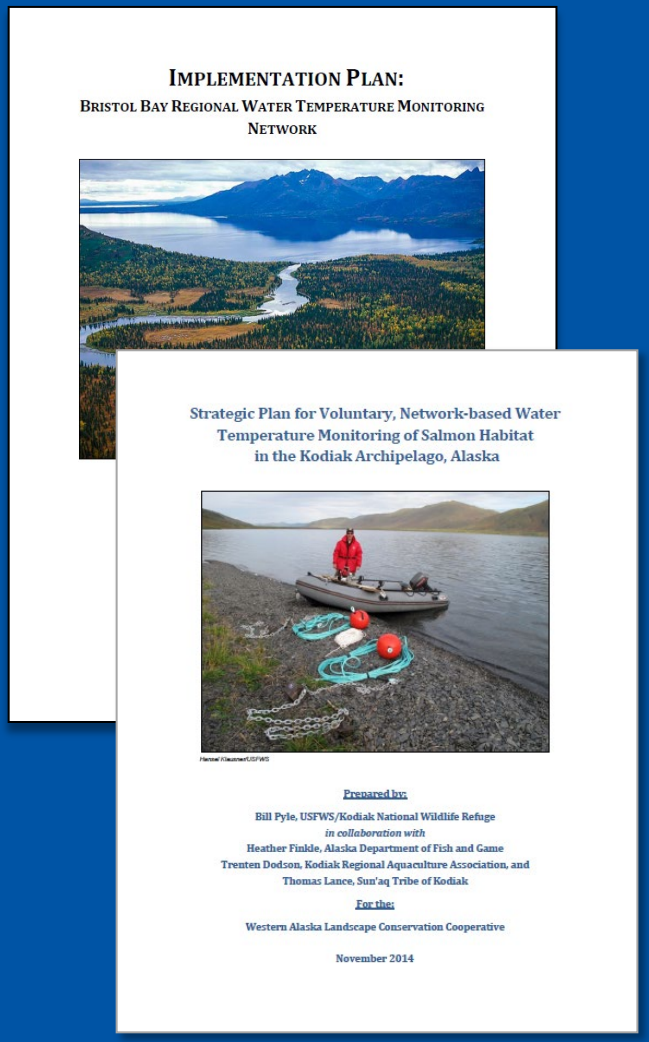
OBJECTIVE #1 PROGRESS:

Completed/published regional analyses

- Cook Inlet, Mat-Su

Regional networks implemented

- Bristol Bay
- Kodiak Archipelago
- Southeast AK
- Copper River



IMPLEMENTATION PLAN:
BRISTOL BAY REGIONAL WATER TEMPERATURE MONITORING NETWORK

Strategic Plan for Voluntary, Network-based Water Temperature Monitoring of Salmon Habitat in the Kodiak Archipelago, Alaska

Prepared by:

Bill Pyle, USFWS/Kodiak National Wildlife Refuge
in collaboration with
Heather Finkle, Alaska Department of Fish and Game
Trenten Dodson, Kodiak Regional Aquaculture Association, and
Thomas Lance, Sun'aq Tribe of Kodiak

For the:

Western Alaska Landscape Conservation Cooperative

November 2014

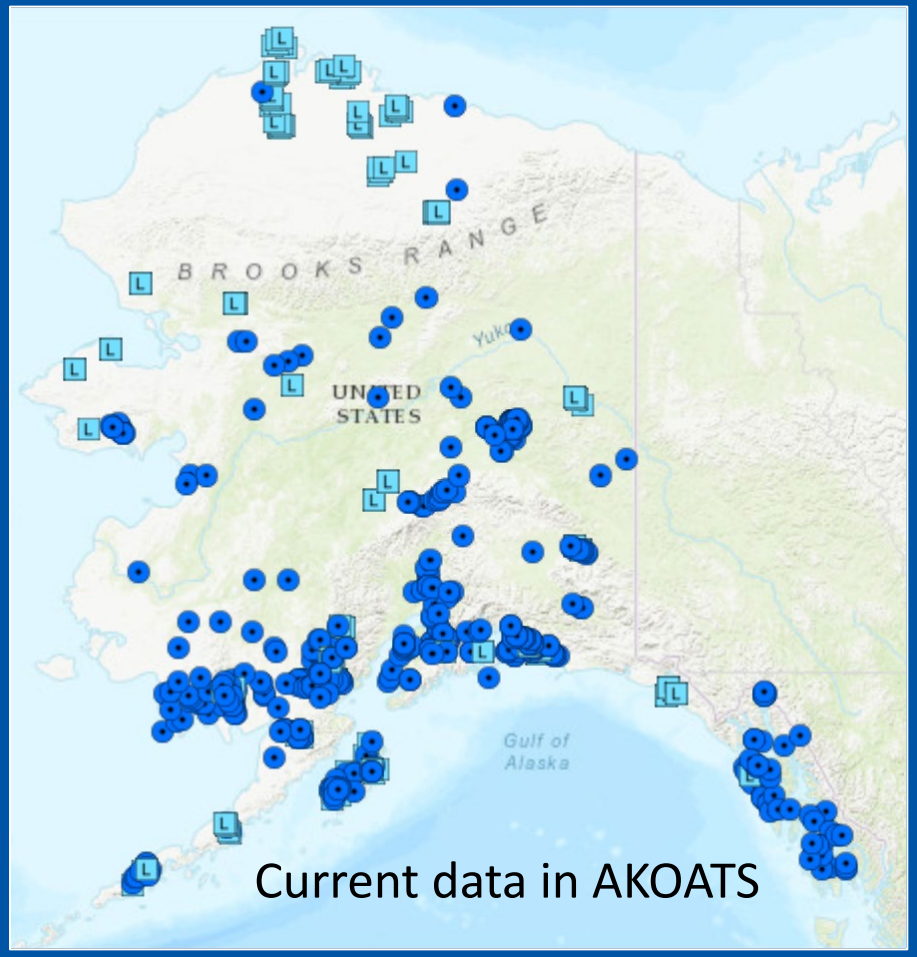
Goal 1: Describe thermal regimes

FUTURE NEEDS:

Complete regional analyses when 5-year data collection goals are met.

Regional priorities for coordinated network:

- Yukon
- Kuskokwim



Current data in AKOATS

Goal 1: Describe thermal regimes

OBJECTIVE #2:

Develop minimum standards to ensure sufficient data quality and facilitate more data sharing among agencies and organizations.

Goal 1: Describe thermal regimes

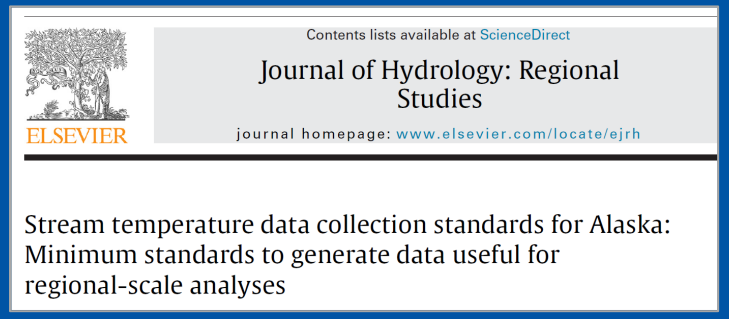
OBJECTIVE #2 PROGRESS:

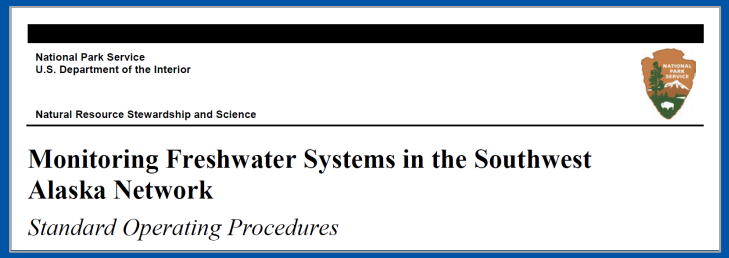
Minimum data standards for Alaska

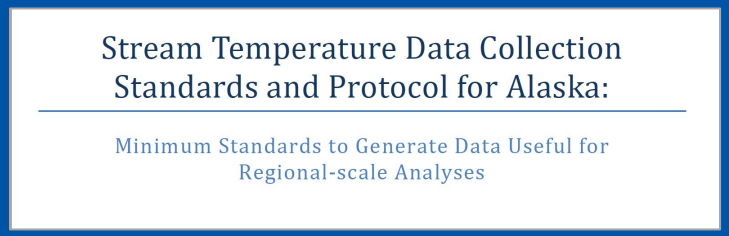
- Mauger et al. 2015

New Alaska protocols available

- NPS; Shearer et al. 2015
- USGS/USFWS; Toohey et al. 2014
- Guidance for placement, maintenance, and retrieval of loggers; Mauger et al. 2014







Goal 1: Describe thermal regimes

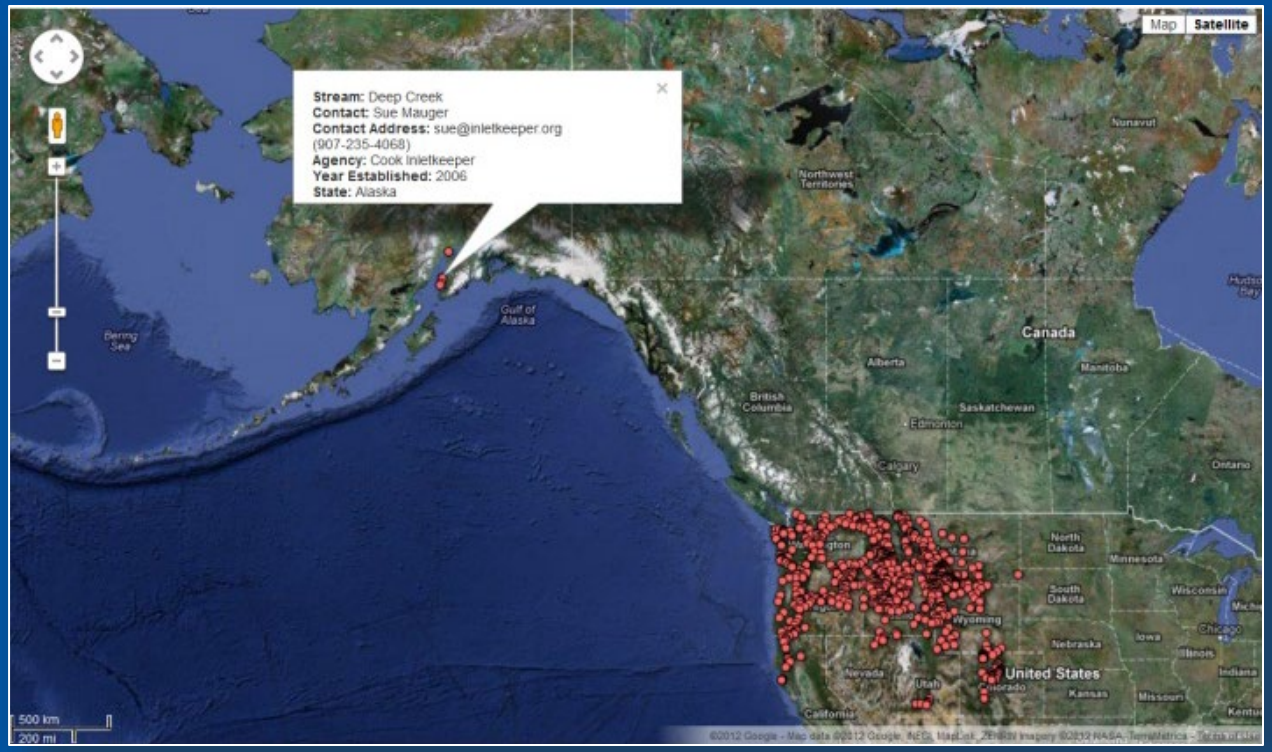
FUTURE NEEDS:

Generate recommendations for effective deployment methods, sampling designs, and analysis tools to facilitate successful monitoring networks.

Goal 1: Describe thermal regimes

OBJECTIVE #3:

Create a state-wide online resource to identify where temperature data are available.



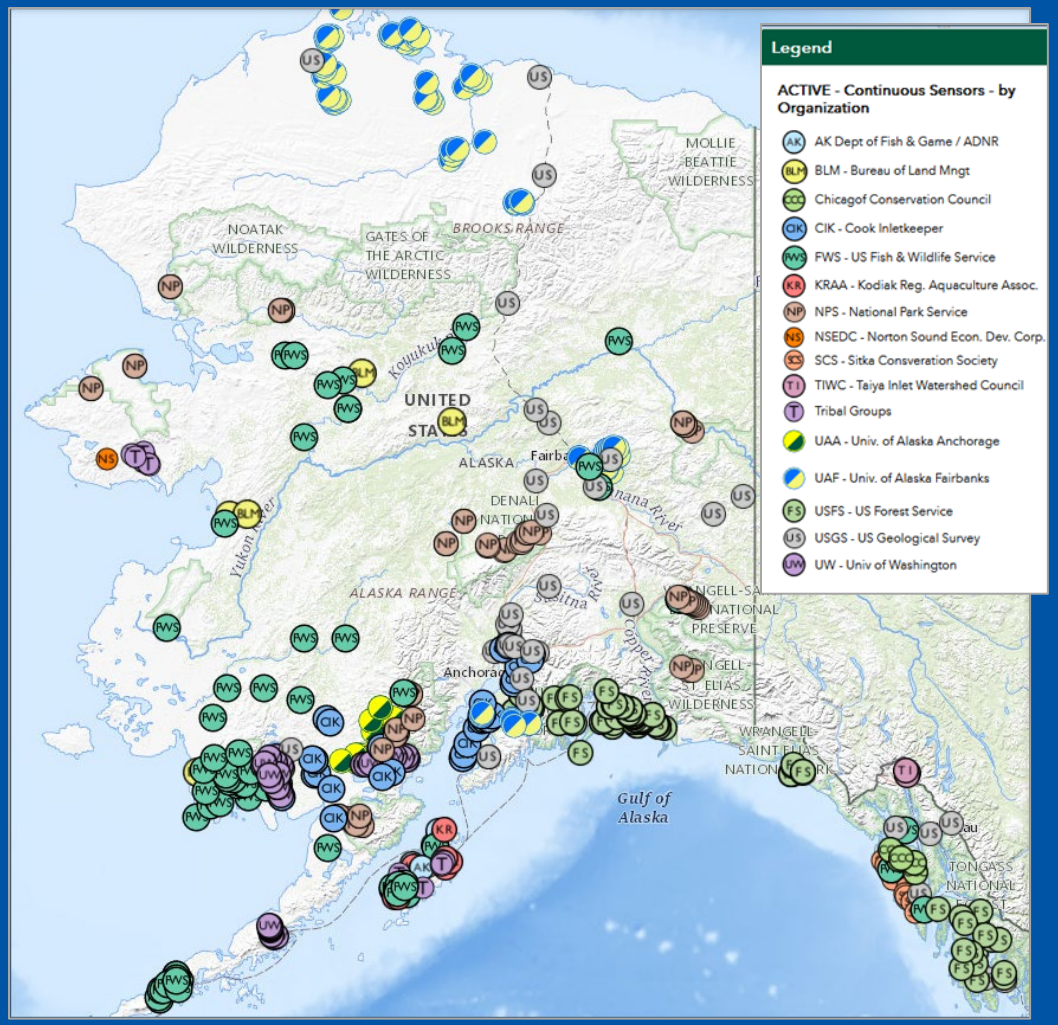
Example of a Google-map interface developed by the Rocky Mountain Research Station – Boise Aquatics Sciences Lab to identify full-year stream temperature monitoring sites.

Goal 1: Describe thermal regimes

OBJECTIVE #3 PROGRESS:

AKOATS - Alaska Online Aquatic Temperature Site (meta-database)

- Developed in 2014
- Annual updates managed by Marcus, ACCS-UAA through 2021

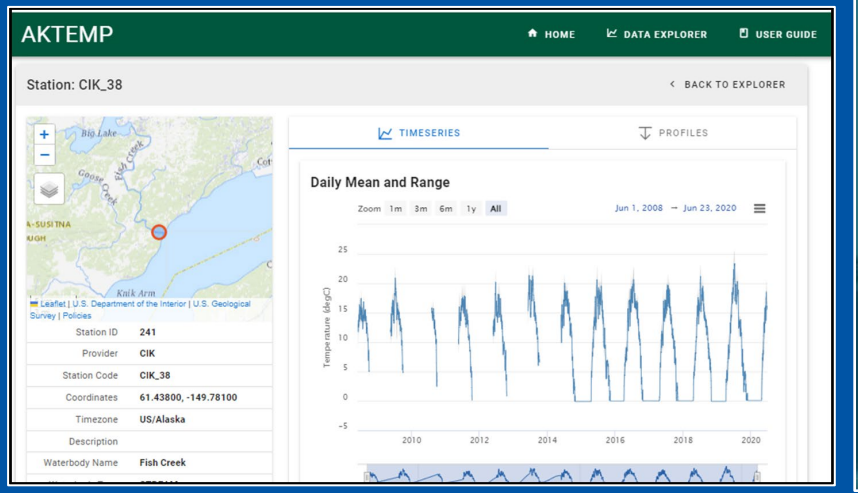


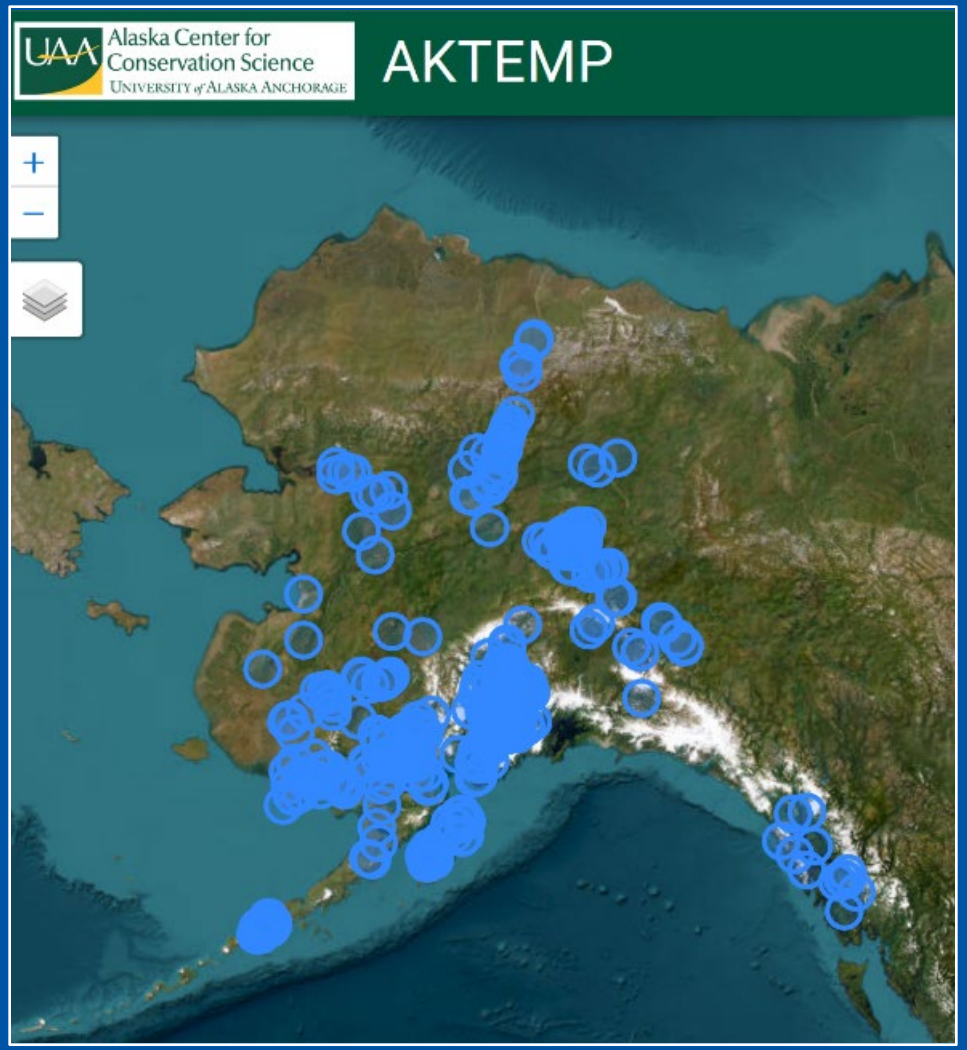
Goal 1: Describe thermal regimes

PROGRESS:

AKTEMP Water Temperature Database

- online in 2023
- public access to data!

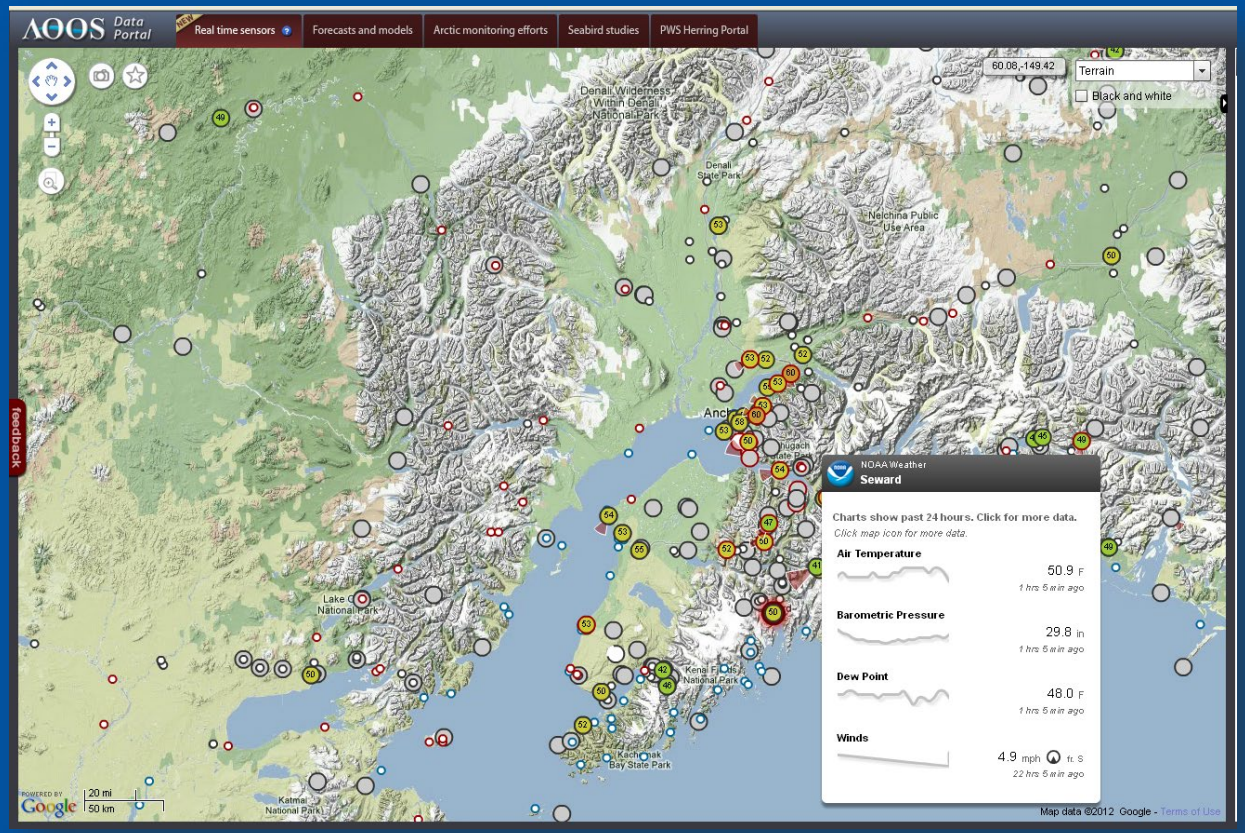




Goal 2: Refine data collection

OBJECTIVE #2:

Provide long-term datasets for climate and hydrologic modeling applications.



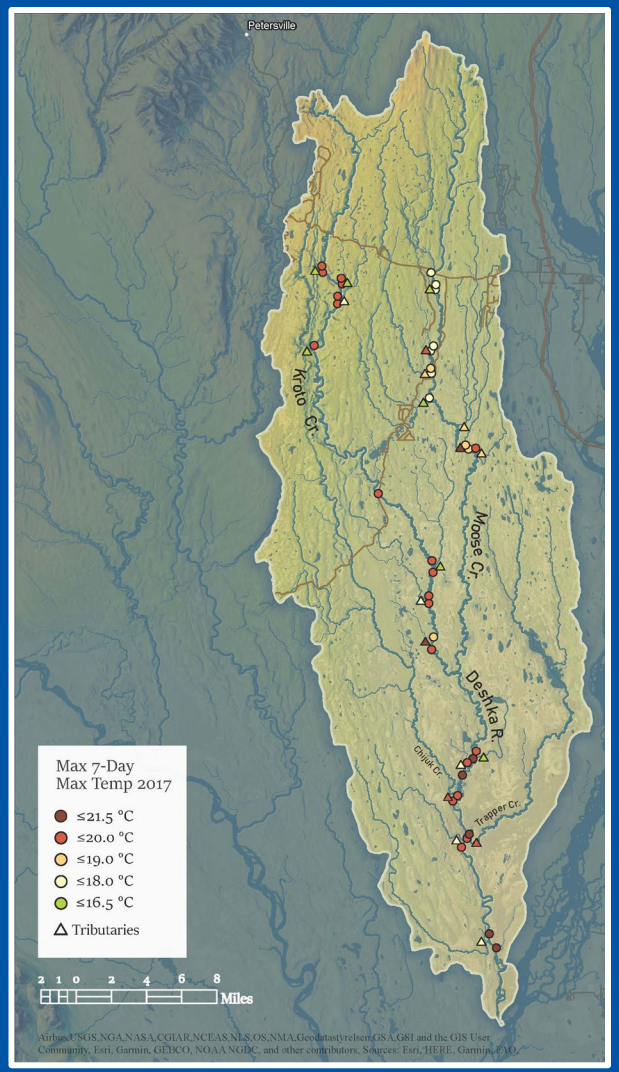
Example of the AOOS online data portal with real time sensors (shown) and forecast and model output maps.

Goal 2: Refine data collection

OBJECTIVE #2 PROGRESS:

Dense monitoring design in the Deshka, Little Su and Gulkana to allow modeling of thermal networks

Many 10-20 year datasets across the state



Goal 2: Refine data collection

FUTURE NEEDS:

Convene meetings between data collectors and large-scale physical modelers of water temperature to discuss (a) their data products, (b) how our products are being used for ground-truthing, (c) where they see data gaps that need filling, and (d) where we see gaps in modeling products.

SUMMARY OF JUSTIFICATIONS FOR A REGIONAL WATER TEMPERATURE NETWORK

MANAGEMENT APPLICATION	JUSTIFICATION
Regional planning	Tool for setting conservation and restoration goals and planning for changing thermal patterns and the implications for freshwater resources
Regulatory context	Provides regulators, permit applicants, and the public with better information for decision-making during project design and the permitting process
Invasive species	Understanding the thermal landscape will help managers prioritize where rapid eradication actions are needed and where containing an infestation's distribution is more realistic
Riparian condition	Tool for assessing if riparian protection and/or restoration activities can mitigate future temperature increases in sensitive streams
Timing windows	Valuable for tracking whether shifts in salmon migration timing require that adjustments be made to the traditional timing windows for instream restoration or construction work
Fish passage	Improving fish passage to colder upstream habitat could be a key metric for prioritizing restoration projects or designing new stream crossings
Fisheries	Annual variation of instream temperatures may be a valuable parameter to model trends in freshwater survival of rearing and out-migrating fish as well as subsequent adult return years
Conservation	Protecting groundwater connections, which support cold-water refugia and overwintering habitat, can increase resilience to changing temperature patterns

Goal 5: Direct research

OBJECTIVE #2:

Encourage more watershed-based research on salmon productivity to better understand freshwater survival versus marine survival.

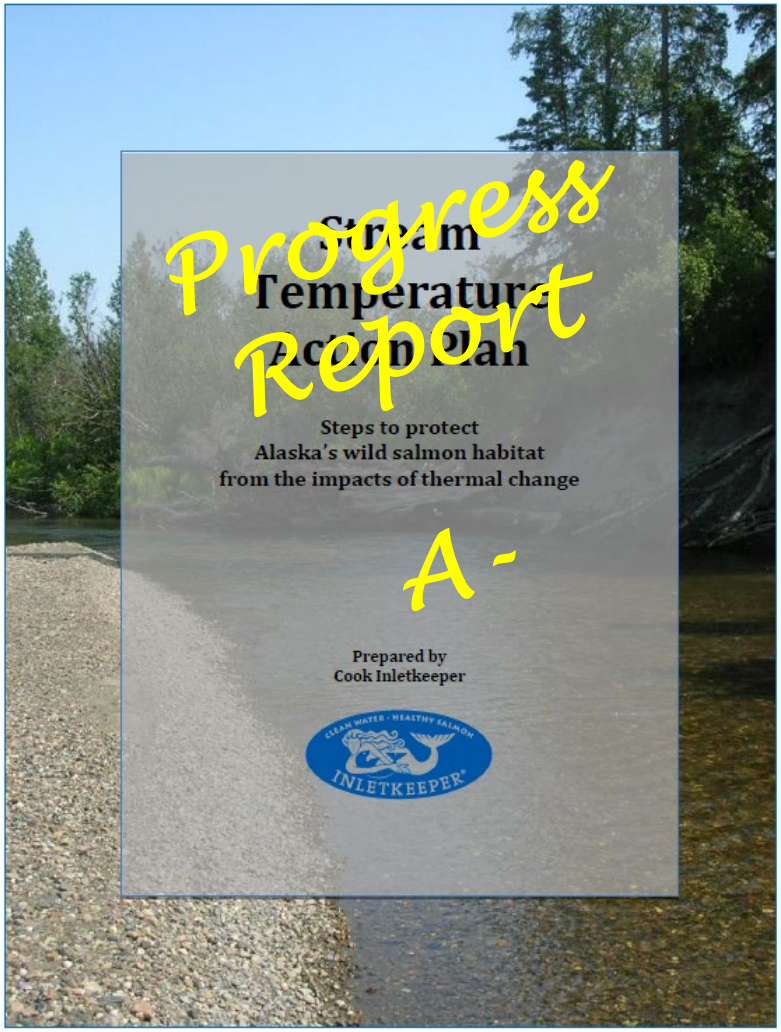
Goal 5: Direct research

OBJECTIVE #2 Progress:

Significant volume of newly published literature linking temperature and salmon in Alaska

- Juvenile growth: Wood River System
- Intensive monitoring and modeling: Deshka, Little Su, Gulkana
- Heat shock proteins: Yukon, Ninilchik
- Chinook & chum declines: Cook Inlet, Yukon
- Retreating glaciers and habitat availability: Southeast
- Overwintering habitat: Big Lake Basin, Anchor River

Goals



1. Improve our understanding of current thermal regimes in Alaska's salmon streams.

2. Refine data collection for fisheries management and modeling applications.

3. Target cold water habitat protection efforts.

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Onward!


The next Water Temperature Action Plan will be released before the end of the year and will set the stage for more successful collaboration and strategic action!