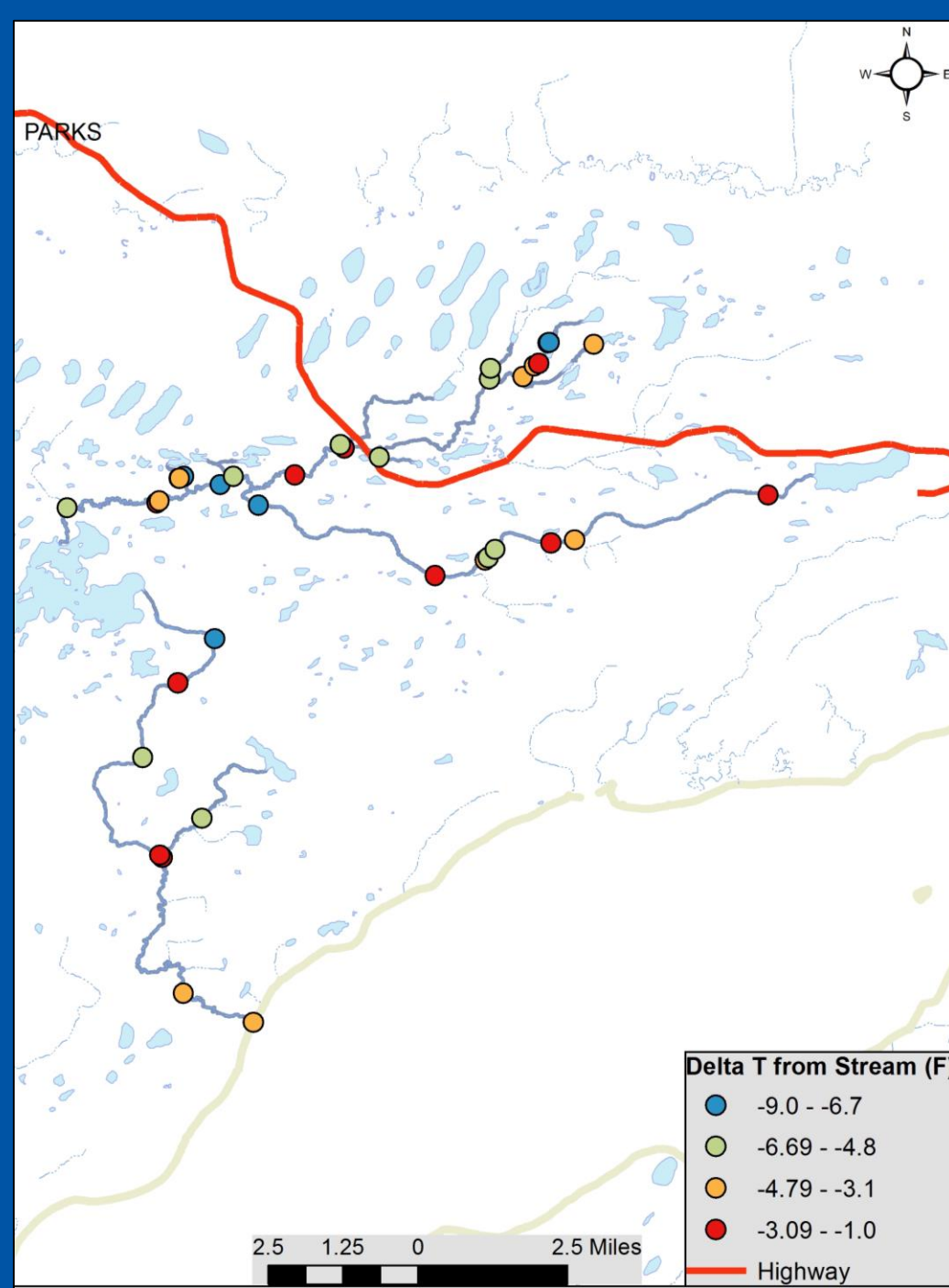


## Cold water habitat use by juvenile salmon in the Big Lake basin

Heather Leba, Cook Inletkeeper  
Jon Gerken, U.S. Fish and Wildlife Service  
Sue Mauger, Cook Inletkeeper





Using thermal infrared imagery, we identified 36 significant cold water inputs that may act as “thermal refugia” for migrating adults and rearing juvenile salmon



# Objectives for juvenile study

- 1) Determine the influence of cold water inputs to stream water temperature at three sites.
- 2) Determine if juvenile Coho salmon preferentially select habitats influenced by cold water inputs for summer rearing as measured by relative abundance.

Herkimer Creek

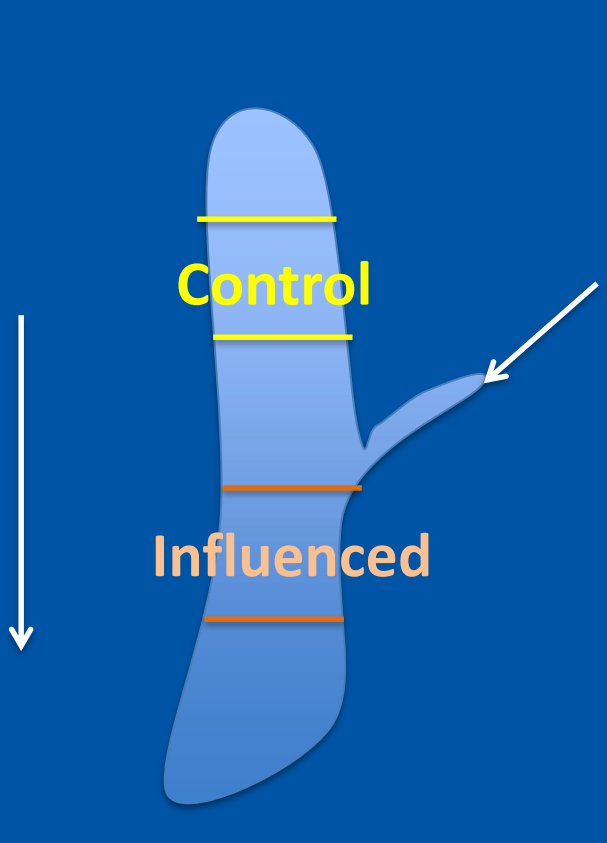


Lucille Creek

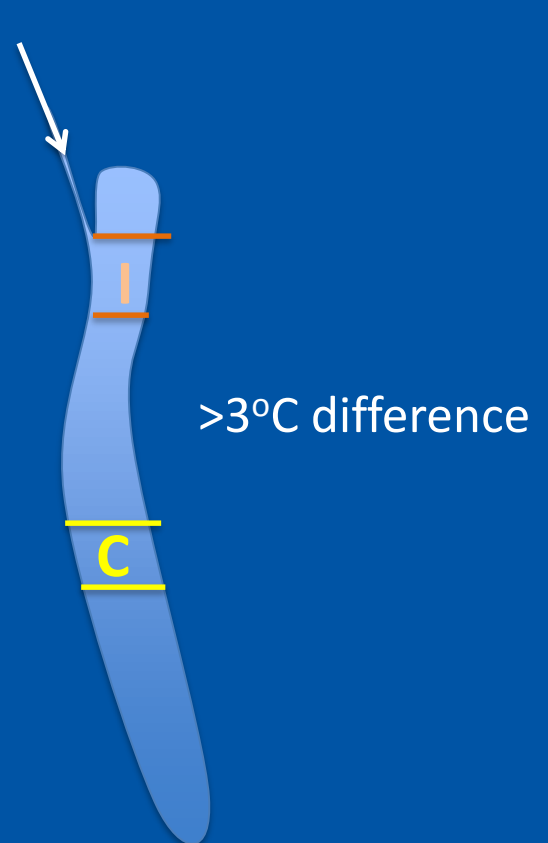


Fish Creek

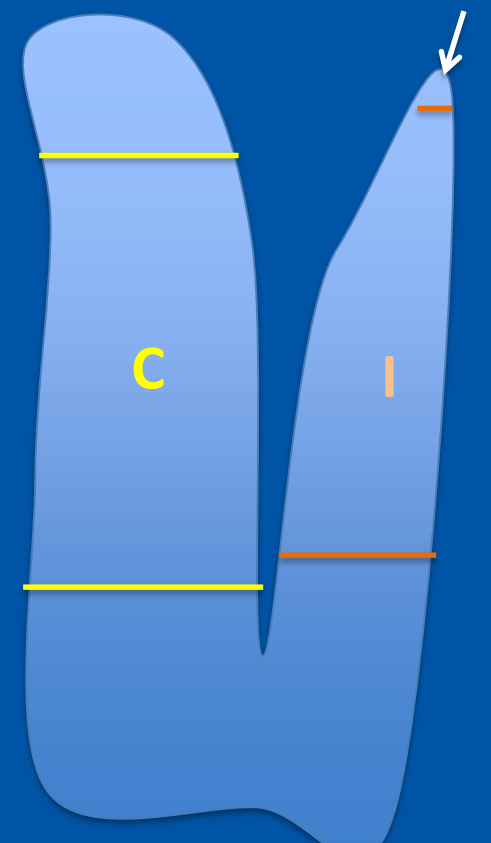




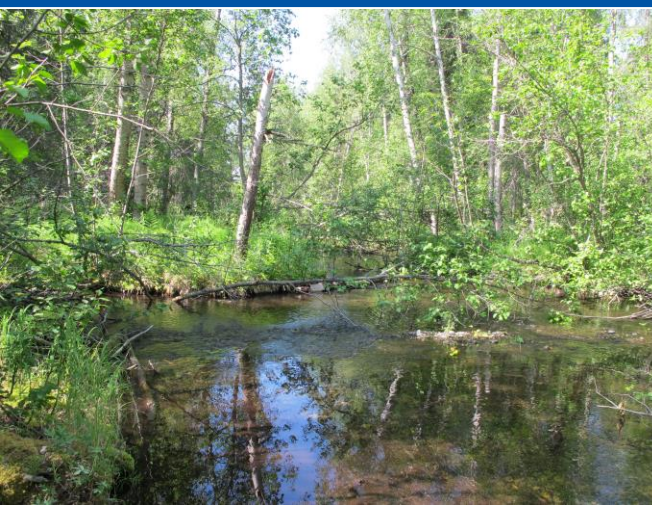
Herkimer Creek



Lucille Creek



Fish Creek



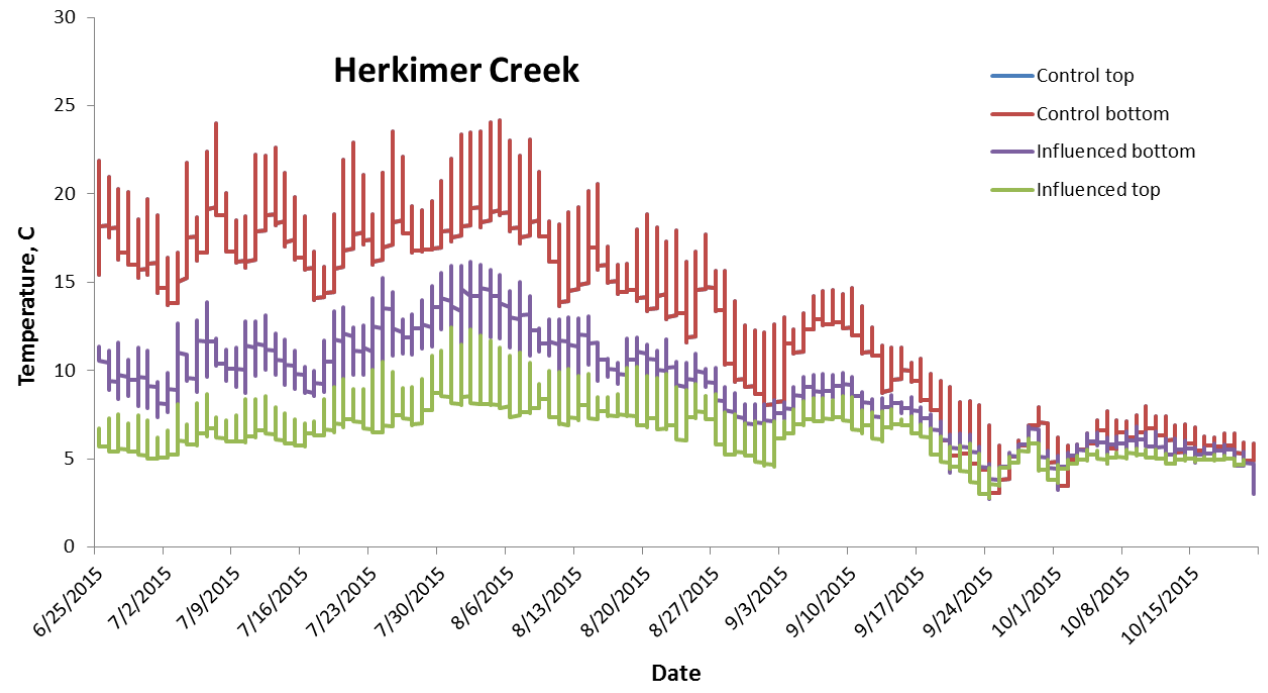
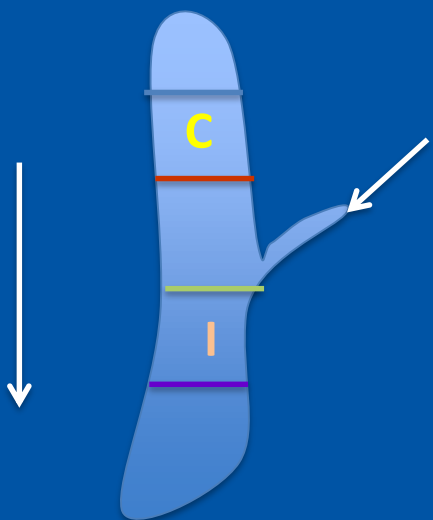
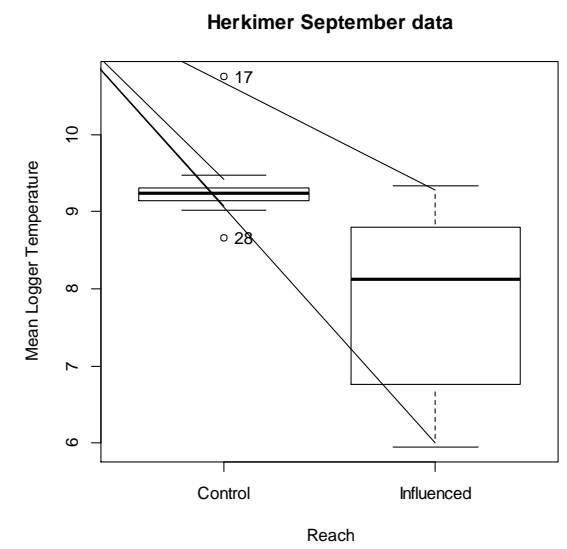
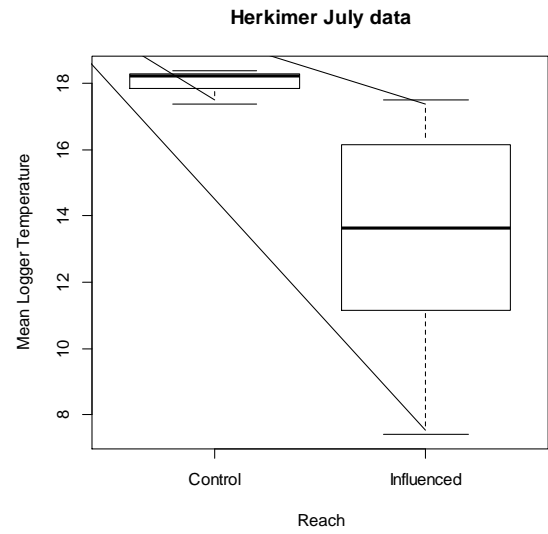
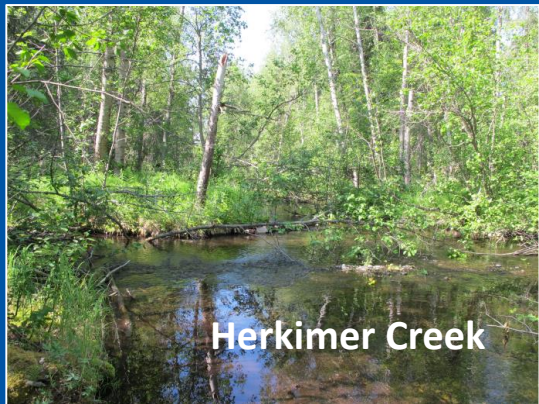


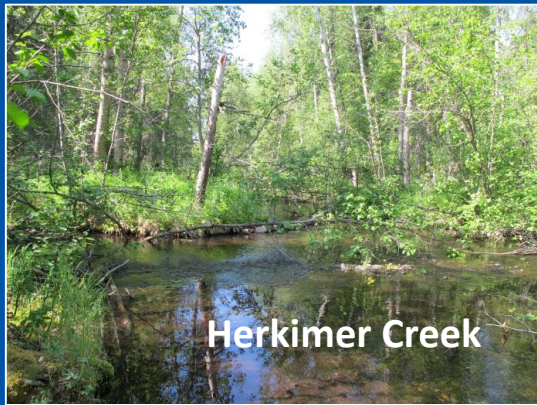
# Sampling plan:

monthly sampling events from July – October, 2015

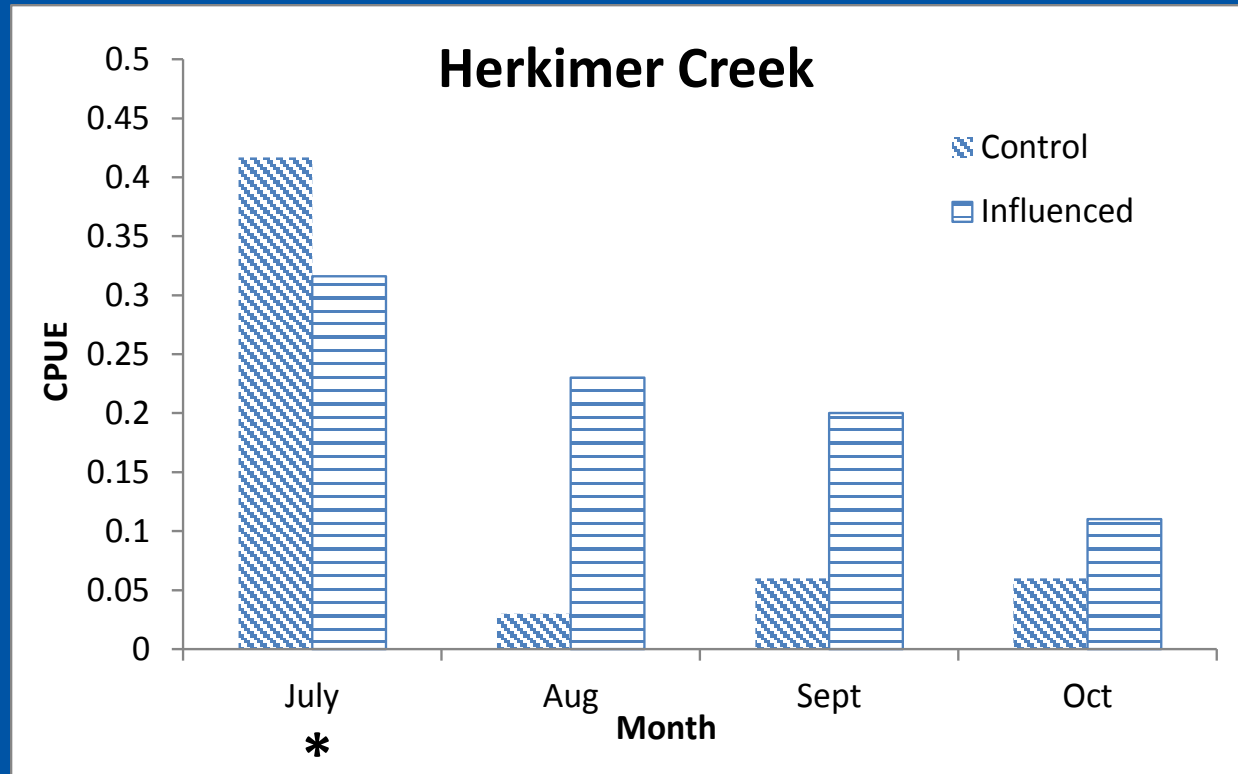
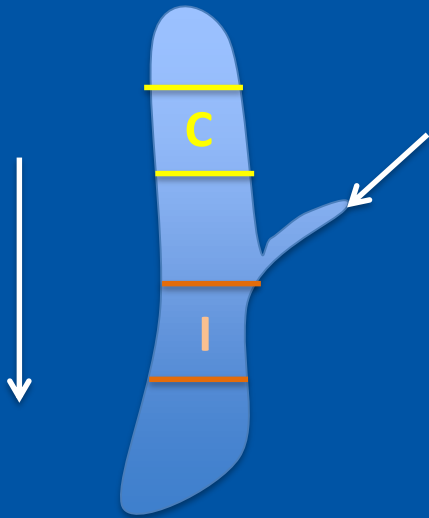
- fish sampling: electrofishing, minnow traps
- macroinvertebrate sampling
- habitat assessments
- water velocity
- temperature surveys

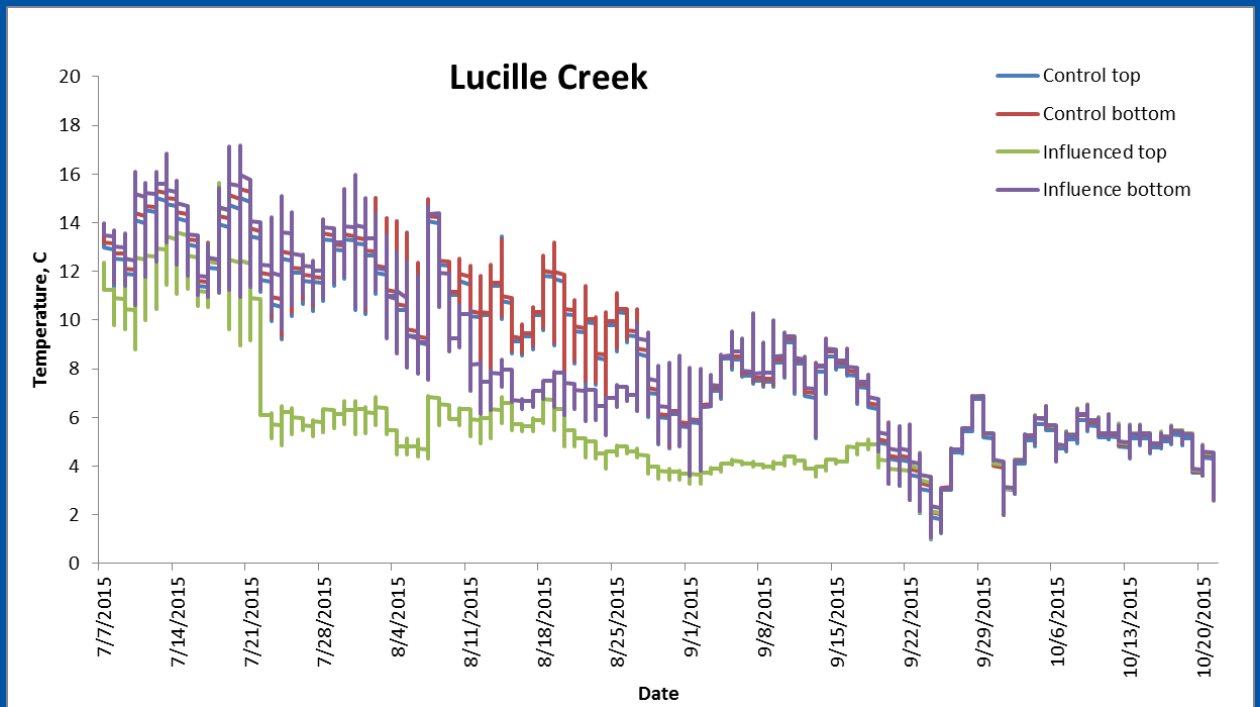
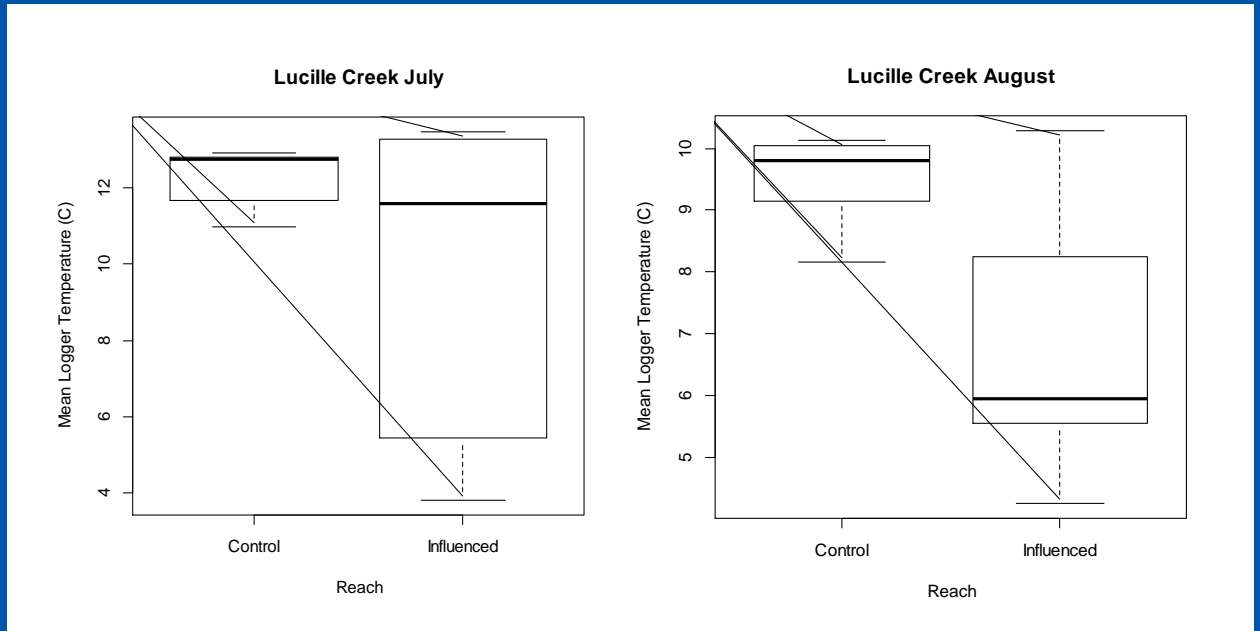






August data	Control	Influenced
mean temperature (C°)	15.8	12.4
discharge (cfs)	3.1	4.6
total invertebrate abundance	3168	168
% EPT	5%	11%
CPUE	0.03	0.23
mean fork length (mm)	58.4	69.5

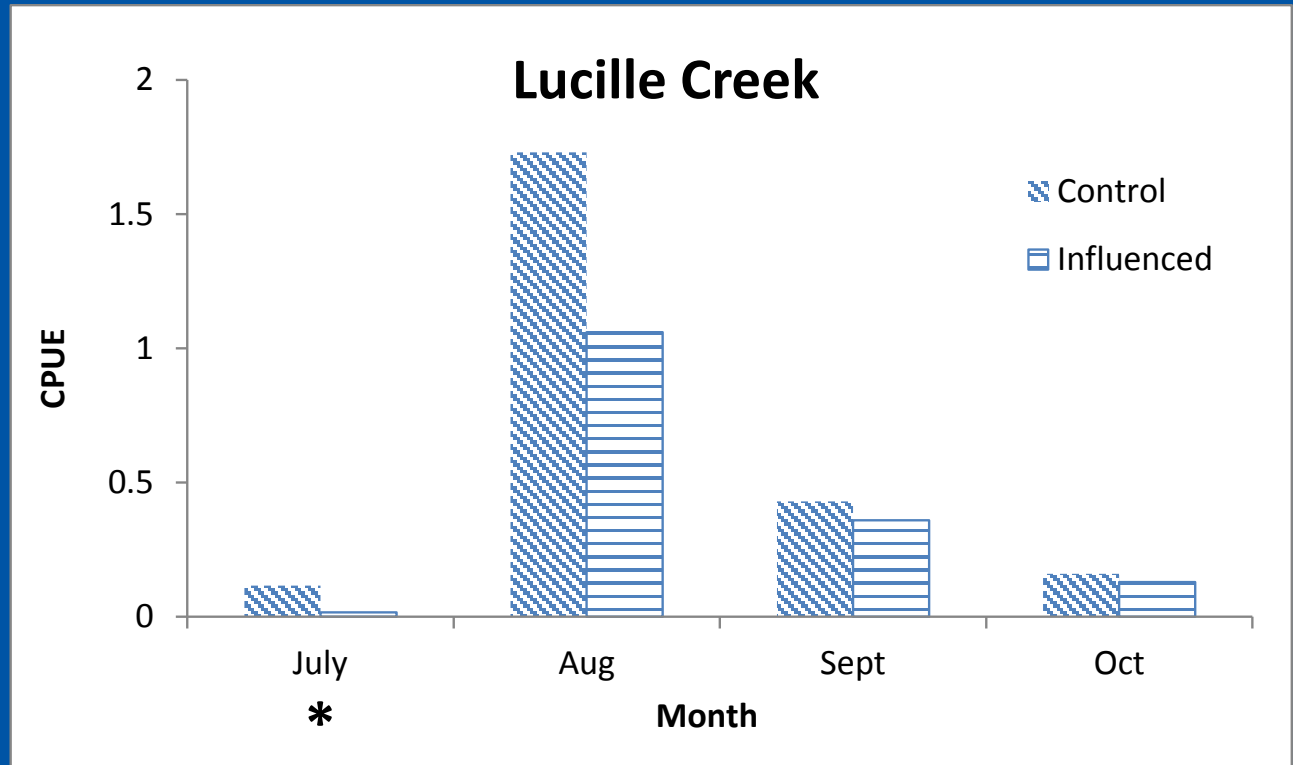
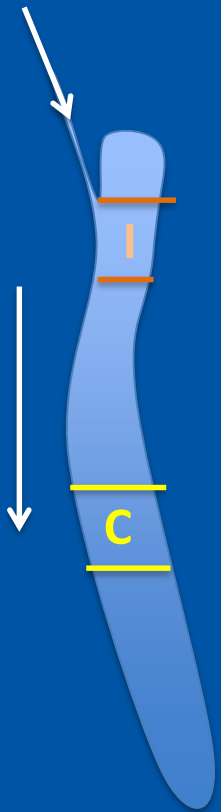


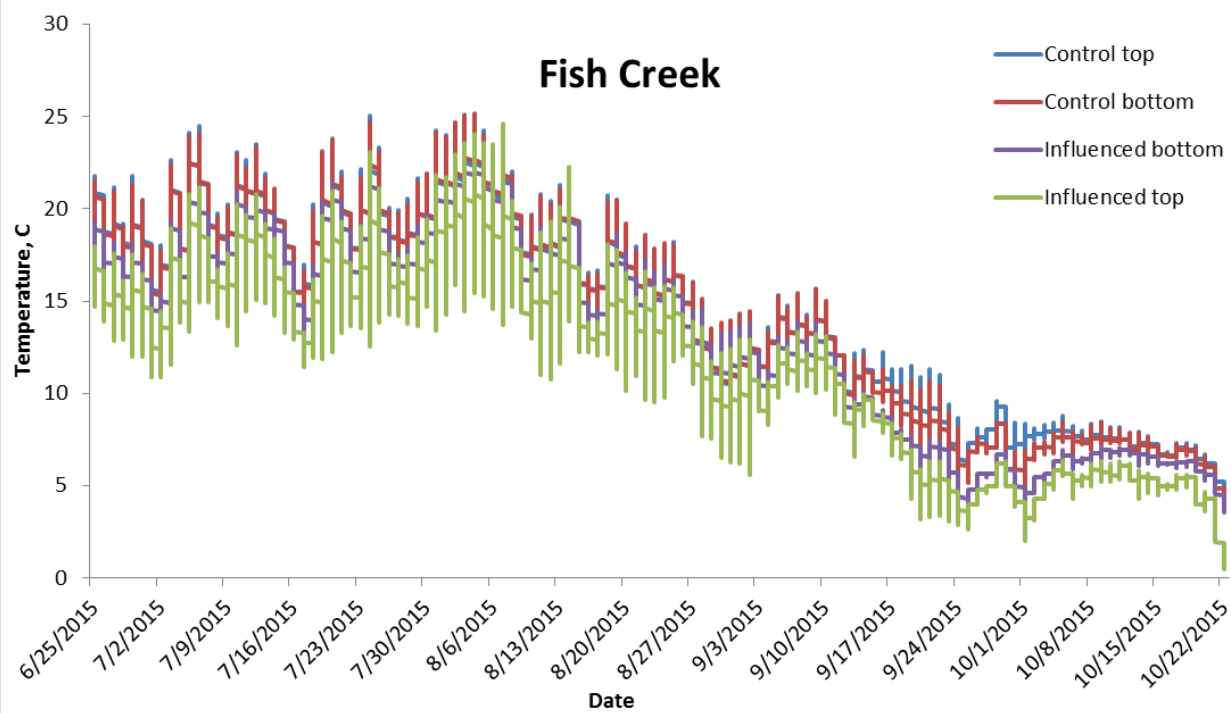
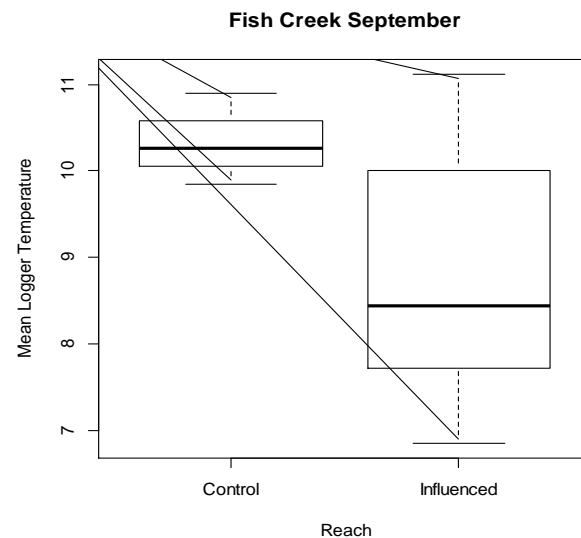
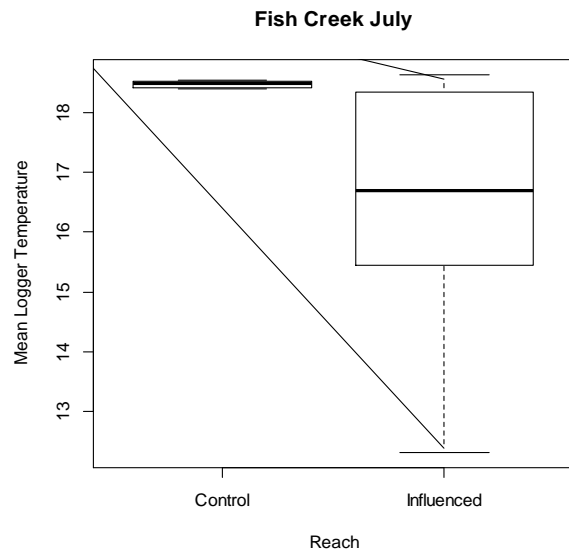
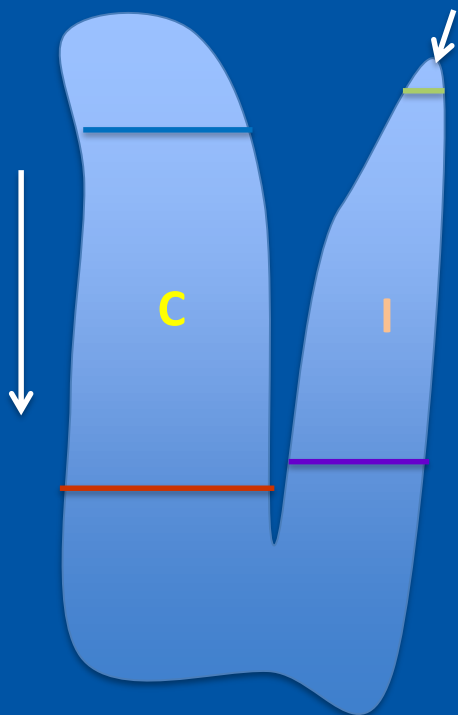






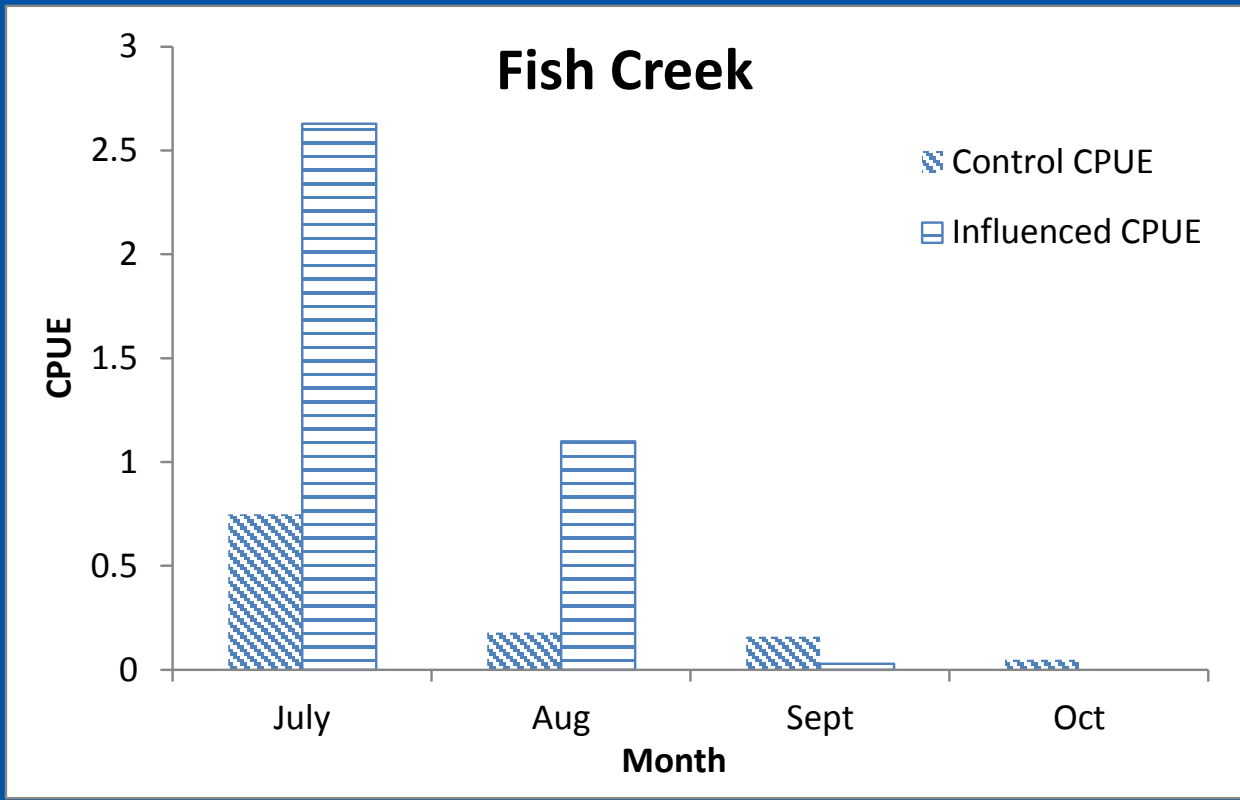
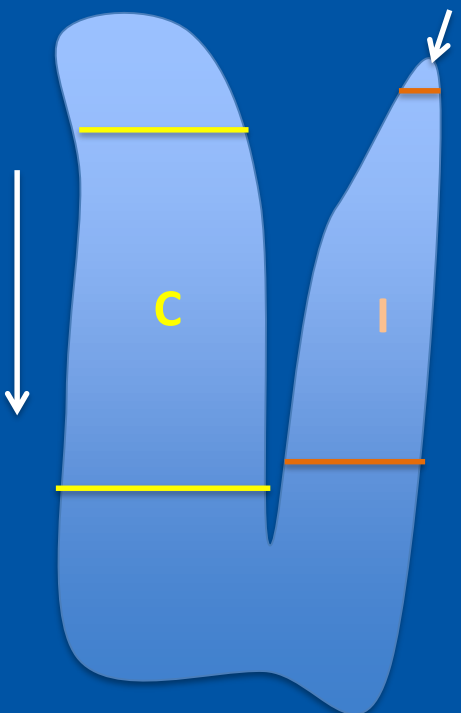
August data	Control	Influenced
mean temperature (C°)	9.6	6.7
discharge (cfs)	1.0	1.2
total invertebrate abundance	384	131
% EPT	2%	0%
CPUE	1.73	1.06
mean fork length (mm)	82.4	80.5







August data	Control	Influenced
mean temperature (C°)	16.7	15.0
discharge (cfs)	7.5	0.6
total invertebrate abundance	5,263	2,398
% EPT	23%	13%
CPUE	0.18	1.10
mean fork length (mm)	65.3	64.4





## Herkimer Creek

- significant cold water inflow in warm system
- variable benthic invert abundance
- larger fork lengths in colder water

Important cold water refugia

## Lucille Creek

- variable cold water inflow in cool system
- low benthic invert abundance (good drift?)
- largest fork lengths in both reaches

Overall tributary important rearing habitat

## Fish Creek

- moderate cold water inflow in warm system
- high benthic invert abundance
- variable flow
- significant adult migratory corridor

Important off-channel habitat



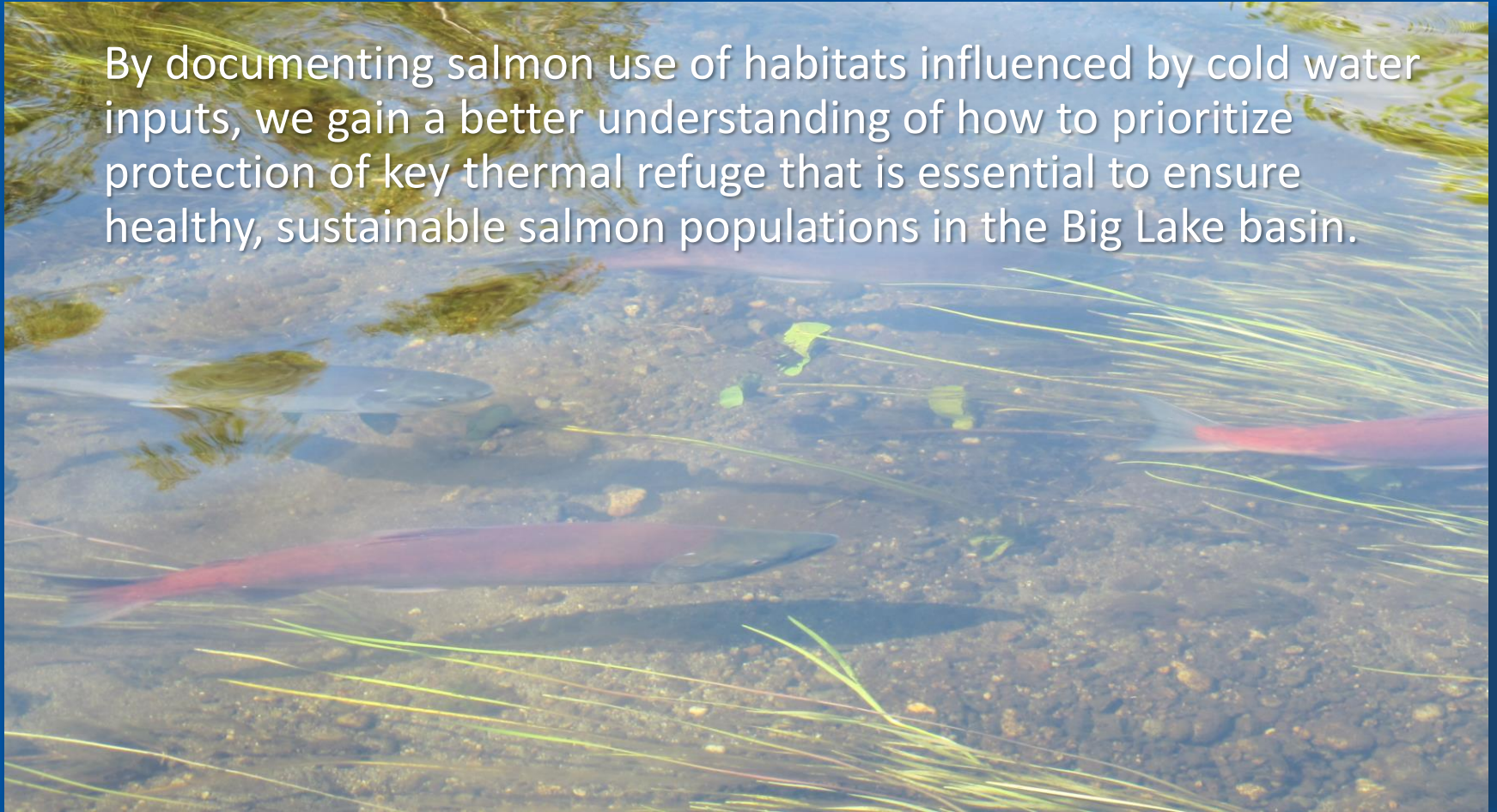




## Conclusion



By documenting salmon use of habitats influenced by cold water inputs, we gain a better understanding of how to prioritize protection of key thermal refuge that is essential to ensure healthy, sustainable salmon populations in the Big Lake basin.



## Thanks to

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Photo credit: USFWS/Katrina Mueller