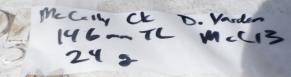
Mercury Concentrations in Fish of the Middle Kuskokwim River Region











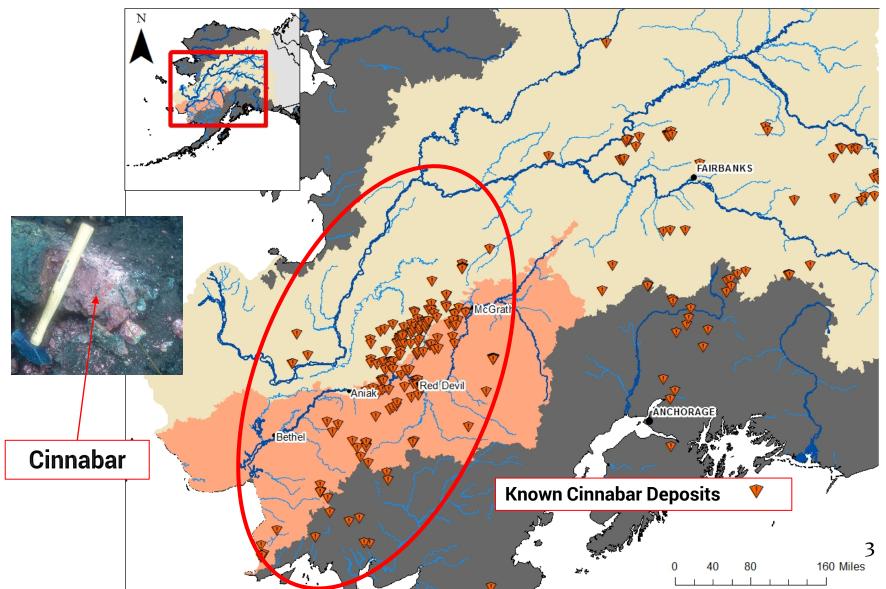
Matthew Varner - Fisheries Biologist Bureau of Land Management

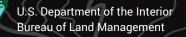


Outline

- Mercury in the Environment
- Mercury in the Food Web
- BLM's Fish Tissue Study (2010-14) Results

Mercury and Western Alaska

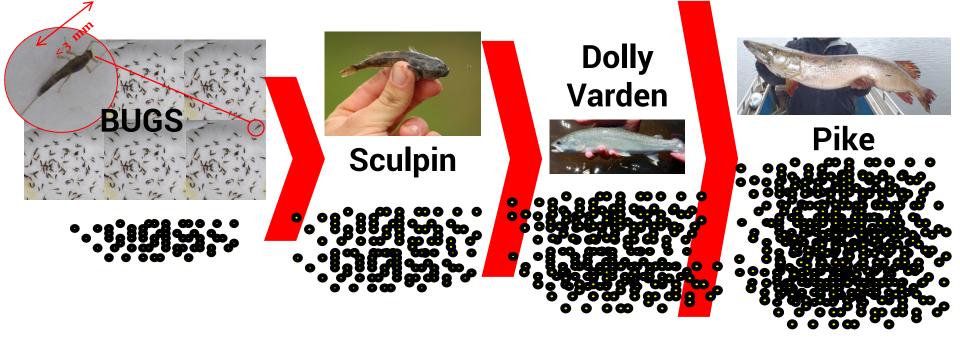




Potential Mercury Sources

Natural Geology (mercury belt)
Land Use
Permafrost
Atmospheric Deposition

Mercury in the Food Web



- Methylmercury most often results from bacterial activity in swampy areas
- This form of mercury presents the greatest risk to human health compared to other forms of mercury
- An organism gets methylmercury only through food
- Methylmercury is stored in fish tissues and is the only form of mercury that biomagnifies in aquatic food webs.



Study Goal

Bureau of Land Management U.S. Department of the Interior

Alaska State Office Division of Resources, Minerals, and Planning 222 West 7th Avenue, #13 Anchorage Alaska 99513-7599

Final Operations Plan - 2010

Quantification of potential contam mercury in fish and aquatic macroi River, Alaska.



Bureau of Land Management U.S. Department of the Interior

Alaska State Office Division of Resources, Minerals, and Planning 222 West 7th Avenue, #13 Anchorage Alaska 99513-7599

Final Operations Plan - 2011

Kuskokwim River, Alaska

Quantification of fish and aquatic inse

U.S. Department of the Interior Alaska State Office

Bureau of Land Management

Division of Resources, Minerals, and Planning 222 West 7th Avenue, #13 Anchorage Alaska 99513-7599

Final Operations Plan - 2012 Quantification of fish and aquation Kuskokwim River, Alaska



Technical Report #61

Mercury, Arsenic, and Antimony in Aquatic Biota from the Middle Kuskokwim River Region, Alaska, 2010-2014



To understand the existing levels of mercury and other contaminants in the aquatic community (fish and insects) of the Kuskokwim River and select tributaries.

Angela Matz Matthew Varner Matthew Albert **Klaus Wuttig**



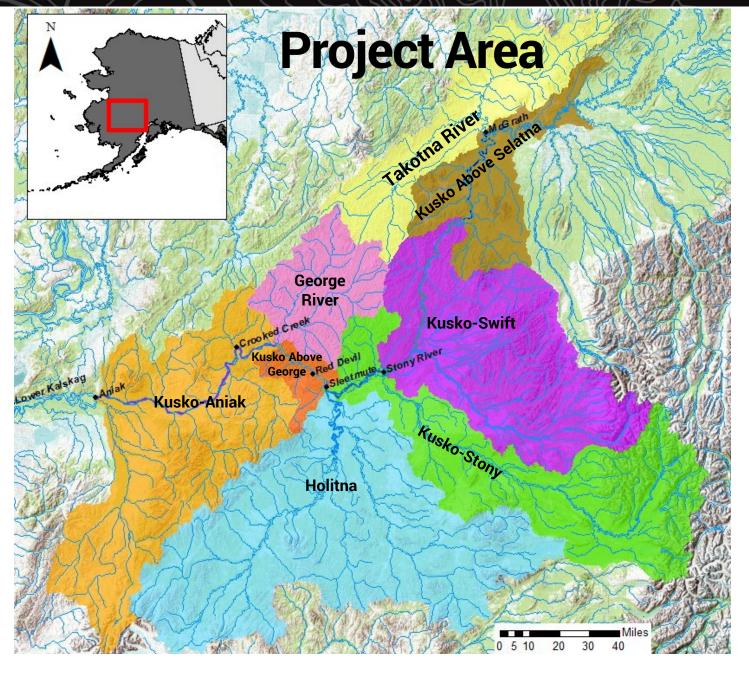




6

Key Conclusions

- Fish and insects in Red Devil Creek had elevated levels of mercury.
- Pike sampled from the Kuskokwim River near Red Devil
 Creek had some of the lowest concentrations of mercury of all pike sampled in the region.
- Concentrations of mercury in burbot varied within the Kuskokwim with no discernable pattern and was lower than concentrations measured in pike.





Tributary Sampling Results

Sampled nine small streams within the middle Kuskokwim Basin, as well as one small stream in the headwaters of the Holitna River.

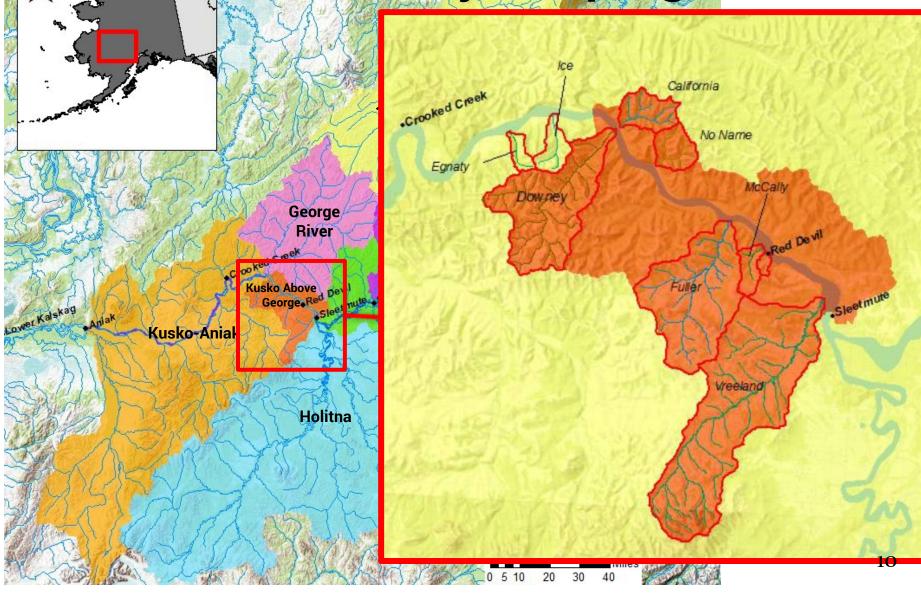




sculpin

stream insects

Tributary Sampling

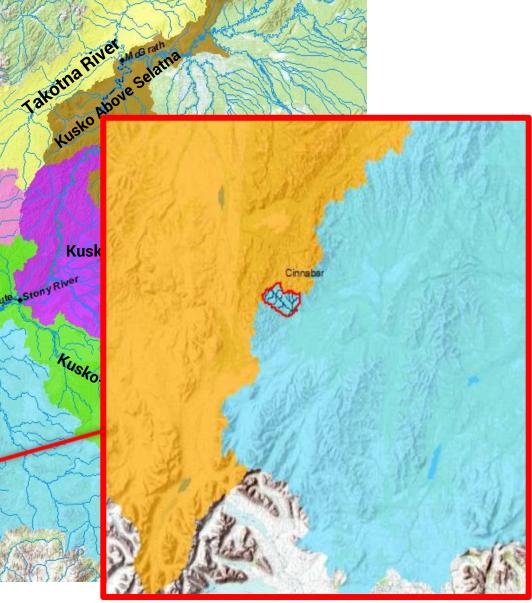


Lower Kalskag

Tributary Sampling

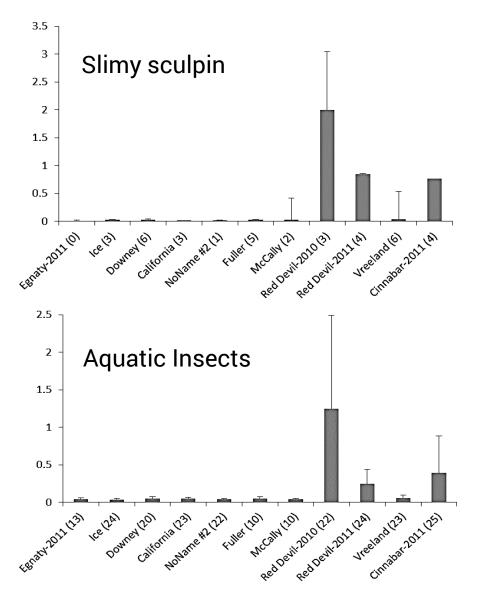


Holitna



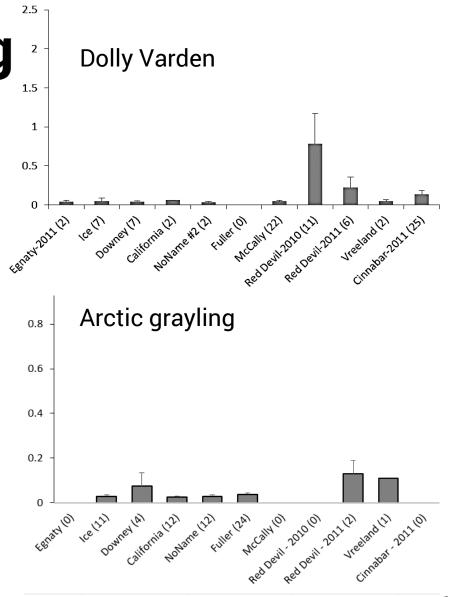
Tributary Sampling Results

<u>**Total mercury</u>** (ppm, ww) in whole body samples from the small tributaries of the middle Kuskokwim, Alaska, 2010-11.</u>



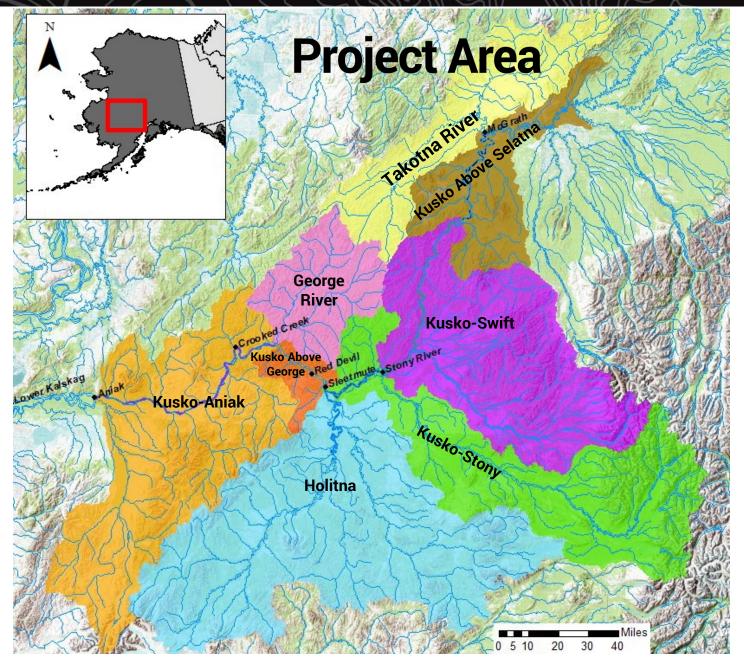
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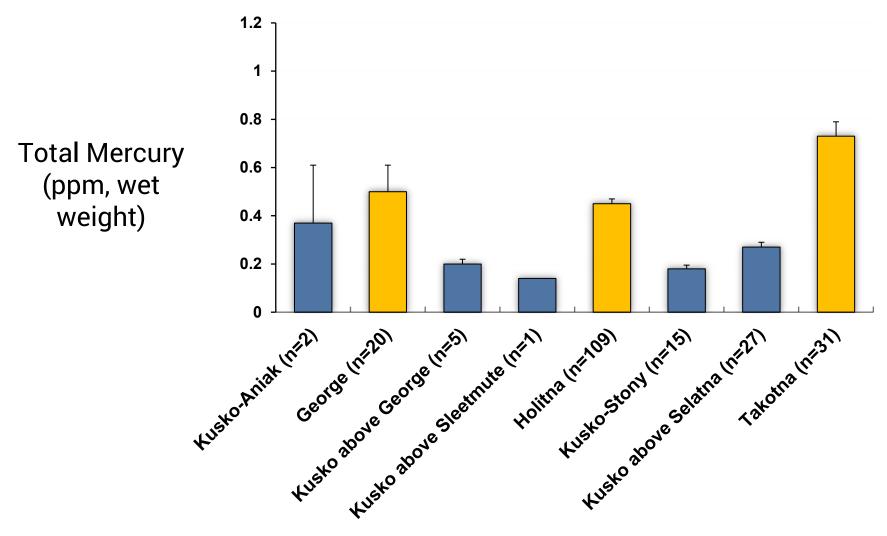


Telemetry Tracking of Sampled Fish

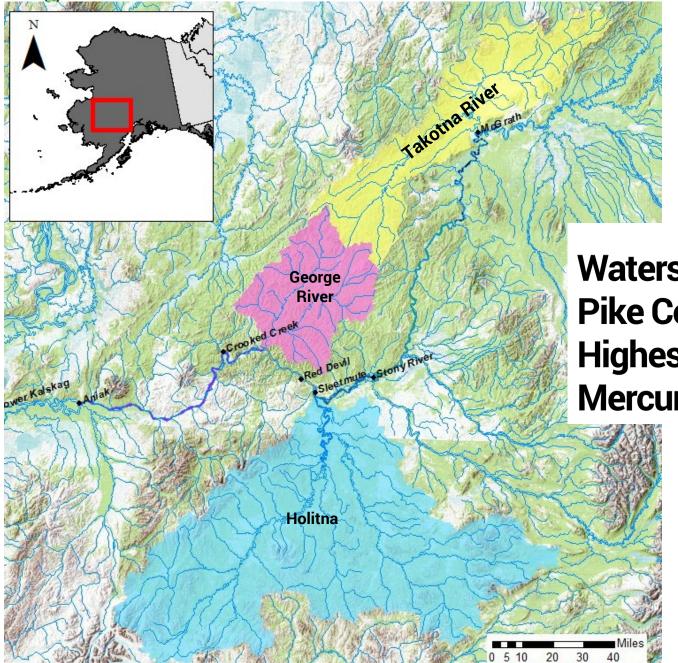
- From 2011-13 the BLM in cooperation with ADF&G tagged burbot, northern pike, and Arctic grayling.
- Telemetry tagging was paired with tissue sampling.
- The tracking data and individual fish contaminant levels provided essential information for understanding potential exposure pathways to mercury in the Kuskokwim Basin.



Fish Movement Results

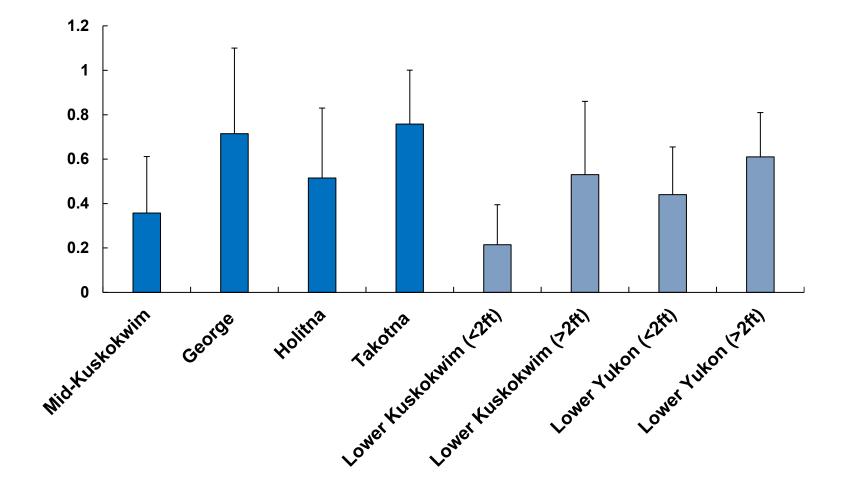






Watersheds with the Pike Containing the Highest Average Mercury Concentrations

Regional Mercury Concentrations in Pike



Key Conclusions

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Technical Report #61

Mercury, Arsenic, and Antimony in Aquatic Biota from the Middle Kuskokwim River Region, Alaska, 2010–2014

Angela Matz Matthew Varner Matthew Albert Klaus Wuttig



Questions?

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Angela Matz 271-2778 angela_matz@fws.gov

Report:

https://www.blm.gov/sites/blm.gov/files/documents/files/PublicRoom_Alaska_2017_MiddleKu skokwim_Fish_Report-TR61.pdf

Fish Consumption Guidelines: http://dhss.alaska.gov/dph/Epi/eph/Pages/fish/default.aspx