



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

# Risk Assessment for Mercury Releases to the Kuskokwim River from the BLM Red Devil Mine

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# Presentation Organization

- PART 1: Site setting and the Kuskokwim River
  - History of mercury mining activities
- Summary of Relevant Site Investigations
  
- PART 2: Fish telemetry and tissue study
  - *(Presented by Dr. Angela Matz)*
  
- PART 3: Human health Risk Assessment Issues
  - Multiple lines of evidence
  - Supplemental RI risk assessment approaches
  - Overview of findings



# Introduction and Project Overview

- Mercury and other chemicals from Red Devil Mine and regional mineralized zones are present in Kuskokwim River sediment and biota
- The methylation of mercury and food chain biomagnification can impact upper food chain organisms, such as pike and burbot
  - Concerns about human health risk (esp. subsistence) from consumption of contaminated fish
- This presentation describes a “**Multiple Lines of Evidence**” approach to integrate a number of relevant findings into risk management decision making

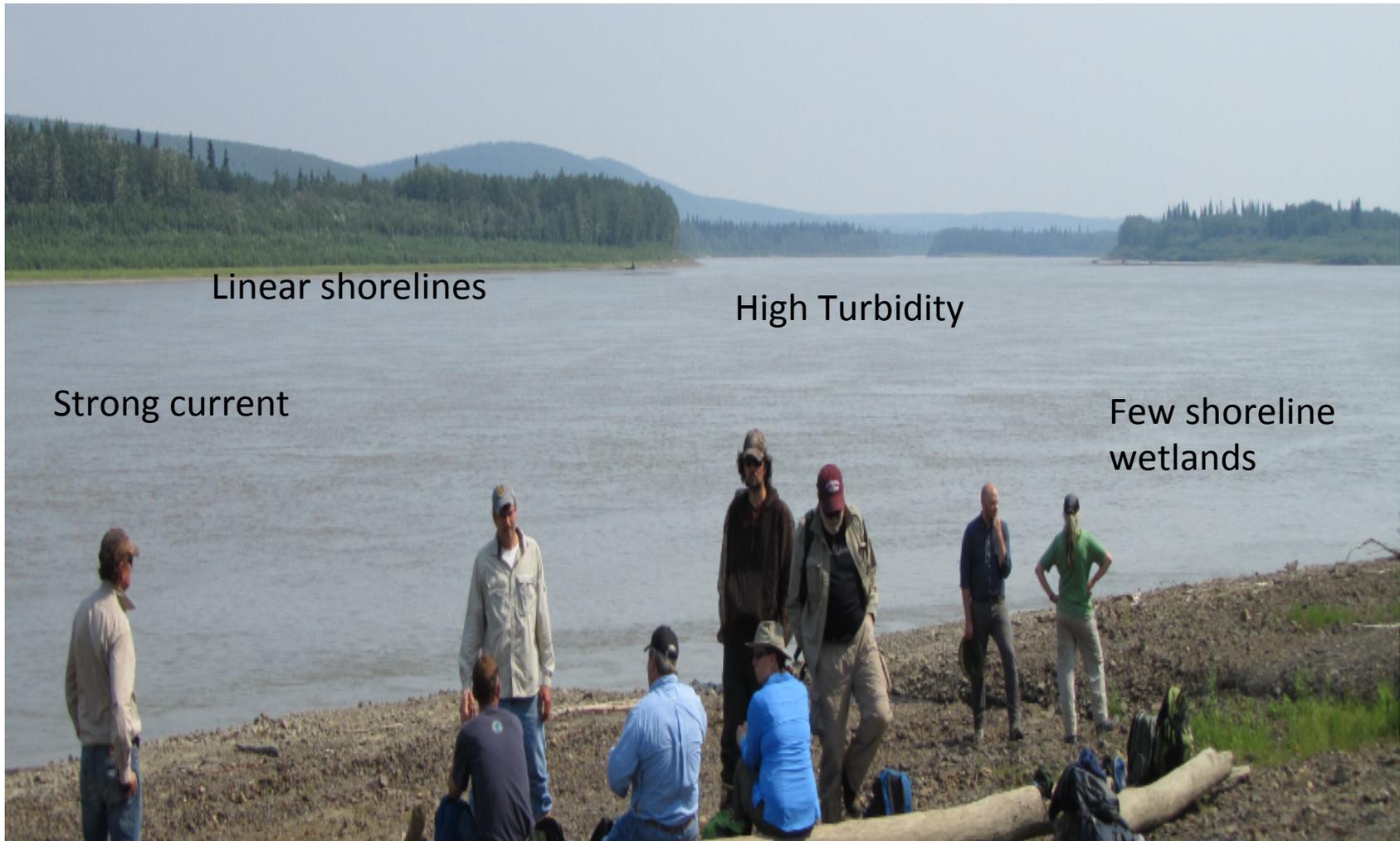
# Kuskokwim River

- Drains much of southwest AK
- Ninth largest river in North America
- Average discharge is 67,000 cfs
- Multiple large tributaries





# Kuskokwim River Adjacent to Red Devil June 2015



Linear shorelines

High Turbidity

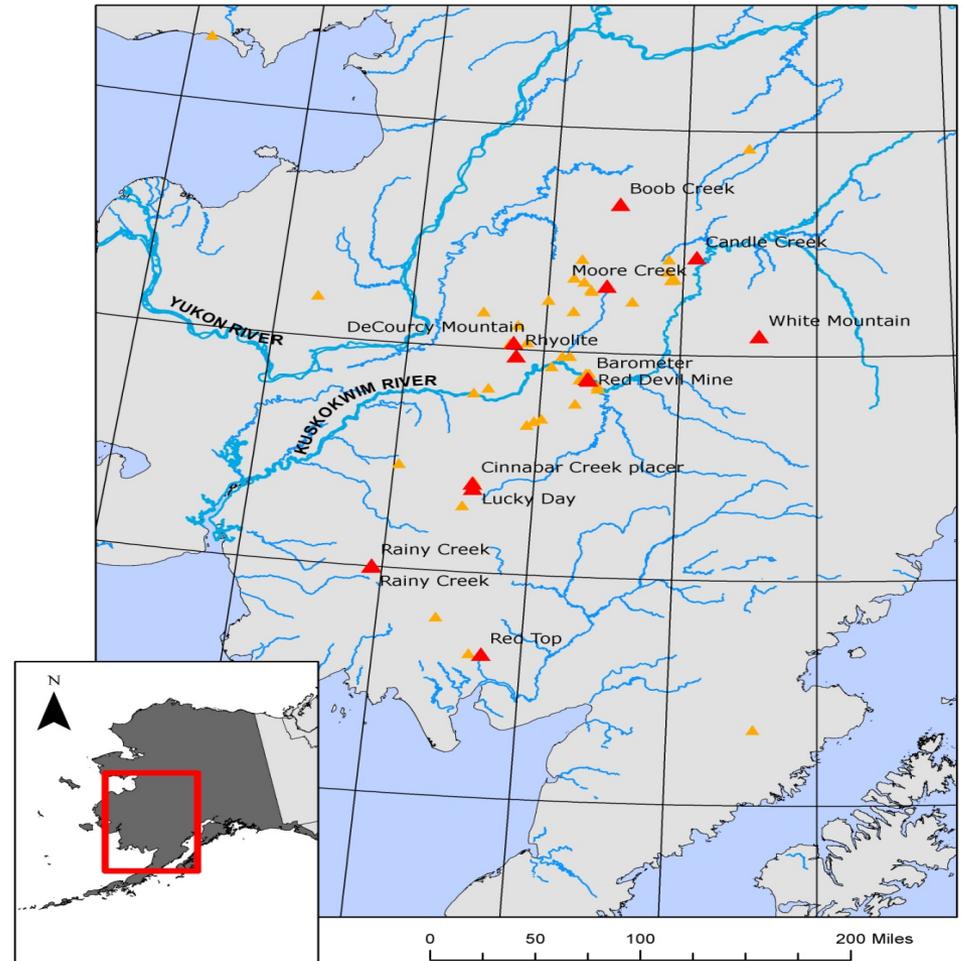
Strong current

Few shoreline  
wetlands



# Important Site Issues Related to RDM and the Kuskokwim River

- Numerous mercury deposits and mines across region
- Elevated background mercury in mineralized zone
- Fish are important local source of protein for subsistence peoples
- Mercury detected in resident fish across region and Kusko watershed



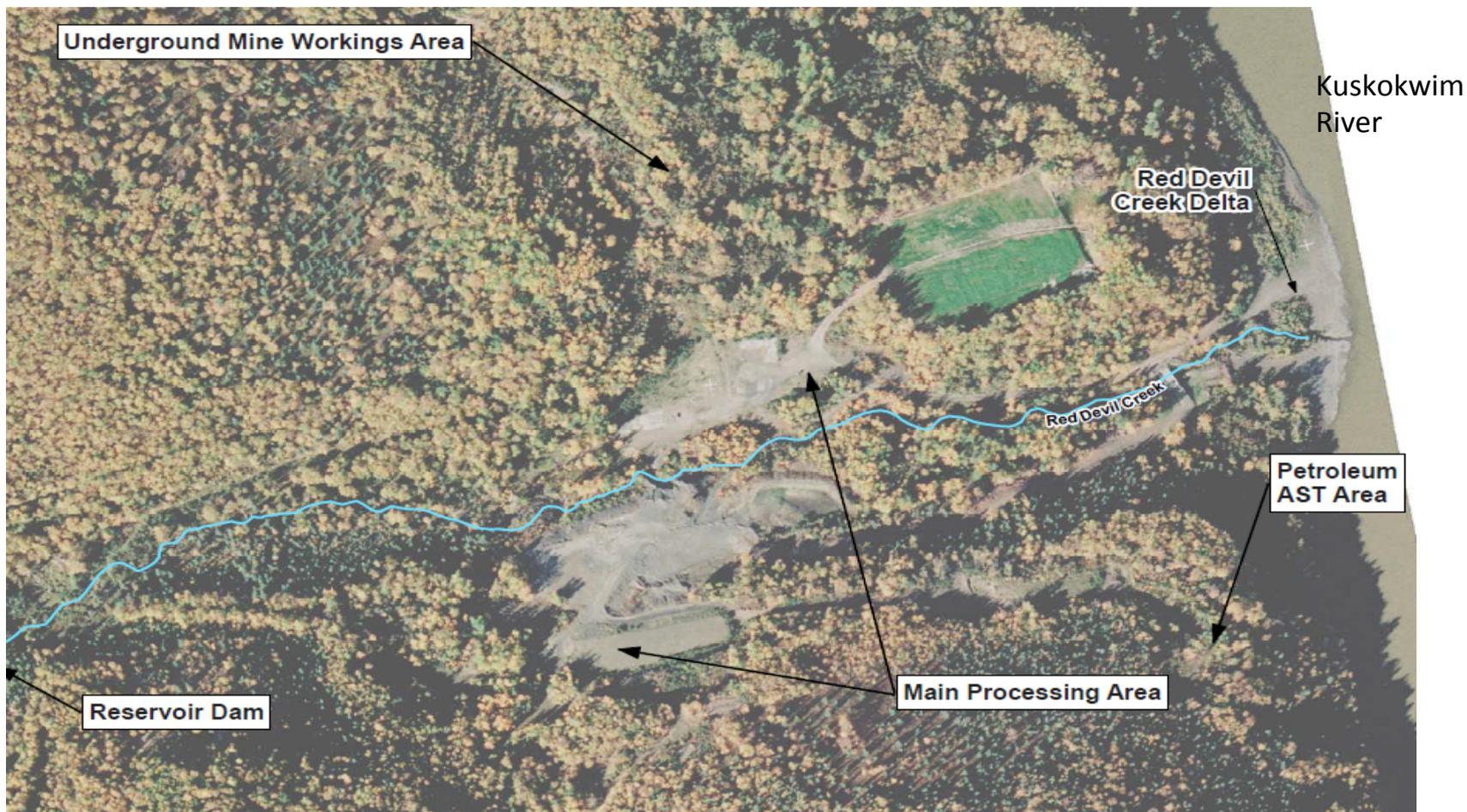


## Brief Operational History of Red Devil Mine

- Mercury mine (cinnabar ore) operated intermittently from 1933-1971, depending on market price
- Red Devil Mine produced nearly 87% of all mercury from Alaska (1,330 Tons)
- Most of the mining was underground, with later phases including open pit mining
- Mining, milling, retorting, chemical storage, and waste disposal all done on-site
- Tailings and retort waste disposed of on-site, used as fill, and dumped in Red Devil Creek
  - Pushed out into the Kuskokwim River



# Historic Ore Processing Area, Red Devil Mine (buildings already removed)





# Red Devil Creek Setting





# Current Status of Red Devil Mine Site

- Site is abandoned, leaving BLM to conduct investigation and cleanup activities
- Viable Potentially Responsible Party (PRP) not identified
- BLM demolished buildings, removed fuel tanks, and buried materials in on-site monofills in early 2000s
- Red Devil village nearby; no other industrial facilities in the area



# Current Status of Red Devil Mine Site

- BLM initiated RI/FS in 2009; RI completed in 2014
  - Focused on groundwater and upland setting
  - Did not fully address Kuskokwim River
- Supplemental RI currently underway
  - Additional Kuskokwim River data collected
- Supplemental Human Health and Ecological Risk Assessment in development
  - *Ecological risk not a topic of today's presentation*



# Early Action at Red Devil Mine Monofills, Tailings Stabilization

1960's



2014





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