The background of the entire page is a light gray gradient. Scattered across this background are numerous water droplets of various sizes. Some are large and prominent, while others are small and subtle. The droplets have a realistic appearance with highlights and shadows, suggesting they are on a smooth surface.

# **BASELINE WATER QUALITY STUDIES ON SOUTHEAST ALASKA TRANSBOUNDARY RIVERS**

MARCH 2019

CENTRAL COUNCIL TLINGIT & HAIDA INDIAN TRIBES OF ALASKA

# PRESENTATION OUTLINE

- TRANSBOUNDARY OVERVIEW
  - CULTURAL BACKGROUND OF THE REGION
  - WHAT ARE WATER QUALITY CONCERNS (WHY?)
- CENTRAL COUNCIL'S BASELINE WATER QUALITY STUDIES
  - WHO, WHAT, WHERE FOR PHYSICAL/CHEMICAL DATA COLLECTION
  - NEXT STEPS

# TLINGIT & HAIDA NATIONS

- ANCESTRAL TERRITORIES INCLUDE SOUTHEAST ALASKA AND PART OF BRITISH COLUMBIA AND THE YUKON TERRITORIES
- “TRANSBOUNDARY” IMPLIES HISTORY AND IMPACTS OF COLONIALISM
- MIXED ECONOMIES: CUSTOMARY/TRADITIONAL USE OR “SUBSISTENCE” AND CASH BASED.



# CULTURAL WAYS OF LIFE AND LIVELIHOODS

- Customary and Traditional use, commercial, and sport fishing
- Multi-billion dollar fishing industry
- Tourism
- Recreation



# TRANSBOUNDARY REGION: STIKINE AND THE TAKU RIVERS

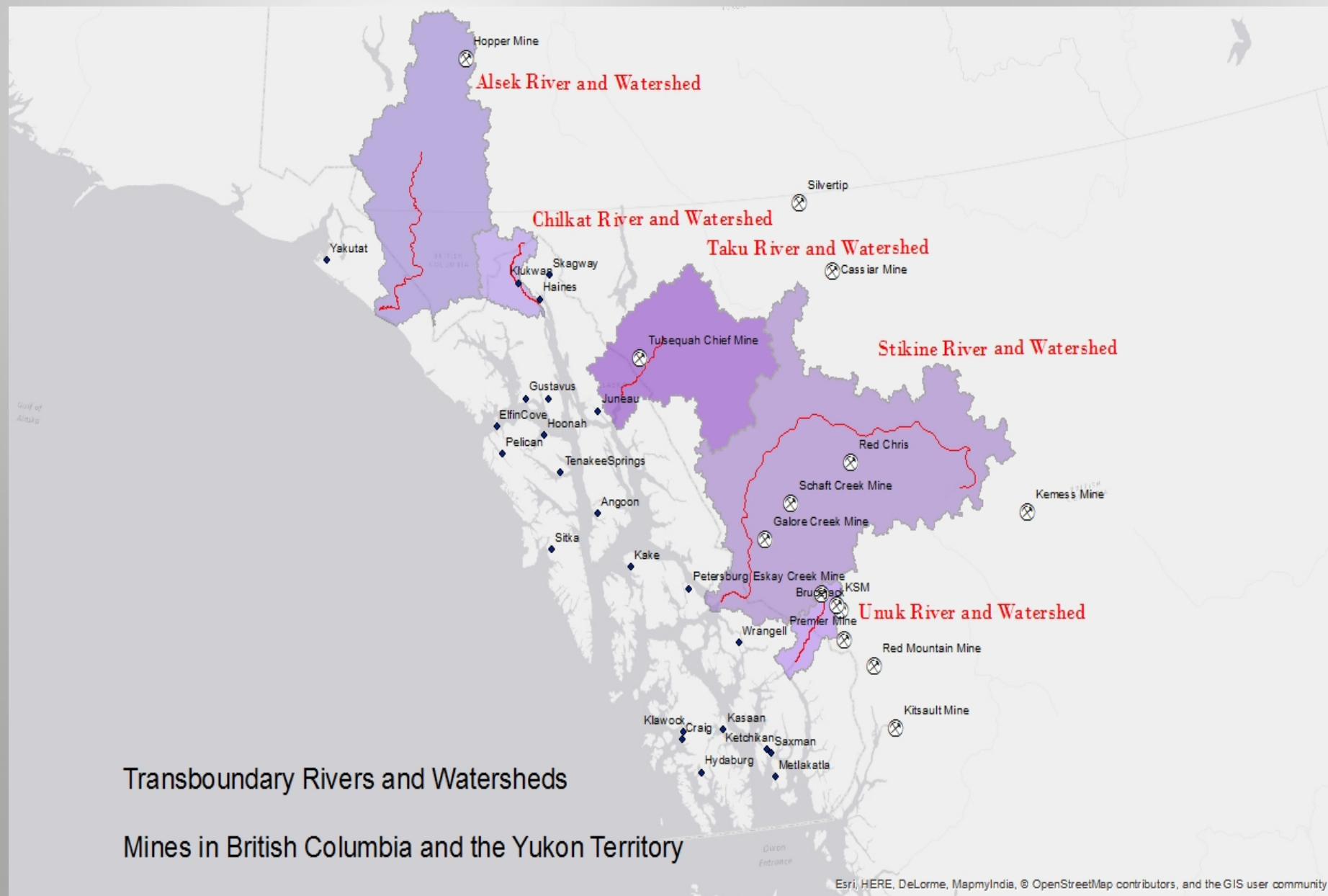


# TRANSBOUNDARY REGION: ALSEK, CHILKAT, AND UNUK RIVERS



# MINING ACTIVITY IN CANADA

- “Sacred Headwaters” versus the “Golden Triangle”
- Approx. a dozen proposed or operating mines in headwaters and tributaries of rivers that flow out of Canada and into Southeast Alaska



# EXAMPLES OF DOWNSTREAM CONCERNS

- TULSEQUAH CHIEF MINE (TAKU RIVER WATERSHED) LEAKING ACID SINCE 1957
- RED CHRIS MINE (STIKINE RIVER WATERSHED) ELEVATED SELENIUM LEVELS NEAR MINE
- ESTIMATED LIFE OF MINE IS BETWEEN 9-52 YEARS
- SHORTCOMINGS IN B.C. ENVIRONMENTAL REGULATORY REGIME
- WATER TREATMENT IS ESTIMATED 200+ YEARS TO IN-PERPETUITY



# MOUNT POLLEY MINE DISASTER

## TAILINGS POND BREACH – AUGUST 4 2014

- A release of 10 million cubic meters of water and 4.5 million cubic meters of slurry
- Spilled into Polley Lake, Hazeltine Creek, Quensnel Lake, and Cariboo River.



# RED CHRIS MINE TAILINGS DAM



# **SOUTHEAST BASELINE WATER QUALITY STUDIES: PROJECT HISTORY AND BACKGROUND**

- U.S. BUREAU OF INDIAN AFFAIRS (BIA) FIRST LEARNED ABOUT TRANSBOUNDARY MINING ISSUES AT THE 2014 BIA PROVIDERS CONFERENCE
- JULY 2015, TLINGIT & HAIDA RECEIVED FUNDING FROM THE BIA TO CONDUCT BASELINE PHYSICAL/CHEMICAL STUDIES ON THE TAKU, STIKINE, AND UNUK RIVERS
- AUGUST 2015 A CONTRACT WAS AWARDED TO KAI ENVIRONMENTAL TO ASSIST IN THE TRANBOUNDARY PROJECT
- OCTOBER 2015, QUALITY ASSURANCE PROJECT PLAN (QAPP) APPROVED
- NOVEMBER 2015, SAMPLING STARTED ON THE STIKINE AND TAKU RIVERS
- SEPTEMBER 2017, FUNDS INCLUDED FOR ALSEK RIVER AND COLLABORATING WITH THE YAKUTAT TLINGIT TRIBE
- FEBRUARY 26, 2019 SAMPLING STARTED ON THE CHILKAT & KLEHINI RIVERS
- TO DATE: 26 STIKINE, 24 TAKU, 4 ALSEK, AND 1 CHILKAT & KLEHINI RIVER WATER QUALITY SAMPLES HAVE BEEN COLLECTED

# PROJECT GOALS

- PRODUCE COMPREHENSIVE, STATISTICALLY VALID, DEFENSIBLE CURRENT BASELINE WATER QUALITY DATA FOR THE STIKINE, TAKU, ALSEK, UNUK, CHILKAT , AND KLEHINI RIVERS PRIOR TO SCHEDULED AND PROPOSED DEVELOPMENT
- THIS DATA WILL INFORM REGULATORY AGENCIES ON THE IMPACTS FROM UPSTREAM DEVELOPMENT IN NORTHERN BRITISH COLUMBIA TO IMPLEMENT WATERSHED MANAGEMENT PLANS
- IMPROVE UNDERSTANDING OF THESE RIVERS AND AID IN THE MANAGEMENT TO ASSURE THE PROTECTION OF DOWNSTREAM COMMUNITIES
- ESTABLISH FUTURE MONITORING PROGRAMS TO ASSESS AND DETECT THE IMPACT OF HUMAN ACTIVITIES TO SALMON HABITAT IN THESE RIVERS

# PROJECT OBJECTIVES

- COLLECT MONTHLY SAMPLES ON THE TAKU AND STIKINE RIVERS, AND BEGIN SAMPLING ON THE UNUK AND ALSEK RIVERS
- SHARE DATA SET WITH STATE, FEDERAL, TRIBAL, AND PROVINCIAL GOVERNMENTS AND REGULATORY AGENCIES ON BOTH SIDES OF THE BORDER
- USE DATA TO COMPLIMENT TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK) AND OTHER TRANSBOUNDARY STUDIES THAT WILL INFORM PROPER MANAGEMENT DECISIONS
- USE DATA TO APPLY FOR INSTREAM WATER RESERVATIONS UNDER AS 46.15.145

## Dissolved Metals

Aluminum  
Antimony  
Arsenic  
Barium  
Beryllium  
Cadmium  
Calcium  
Chromium  
Cobalt  
Copper  
Iron  
Lead  
Magnesium  
Manganese  
Mercury/Methyl Mercury  
Molybdenum  
Nickel  
Phosphorus  
Potassium  
Selenium  
Silver  
Silicon  
Sodium  
Thallium  
Tin  
Titanium  
Vanadium  
Zinc

# FIELD MEASUREMENTS OR “WHAT WE’RE TESTING FOR”

## Physical parameters:

pH

Conductivity

Salinity

Dissolved Oxygen

Temperature

Turbidity

## Organics and other parameters:

Polynuclear aromatic hydrocarbons (PAH)

Total sulfate

Total alkalinity

Total Suspended Solids

Total Organic Carbon

Ammonia

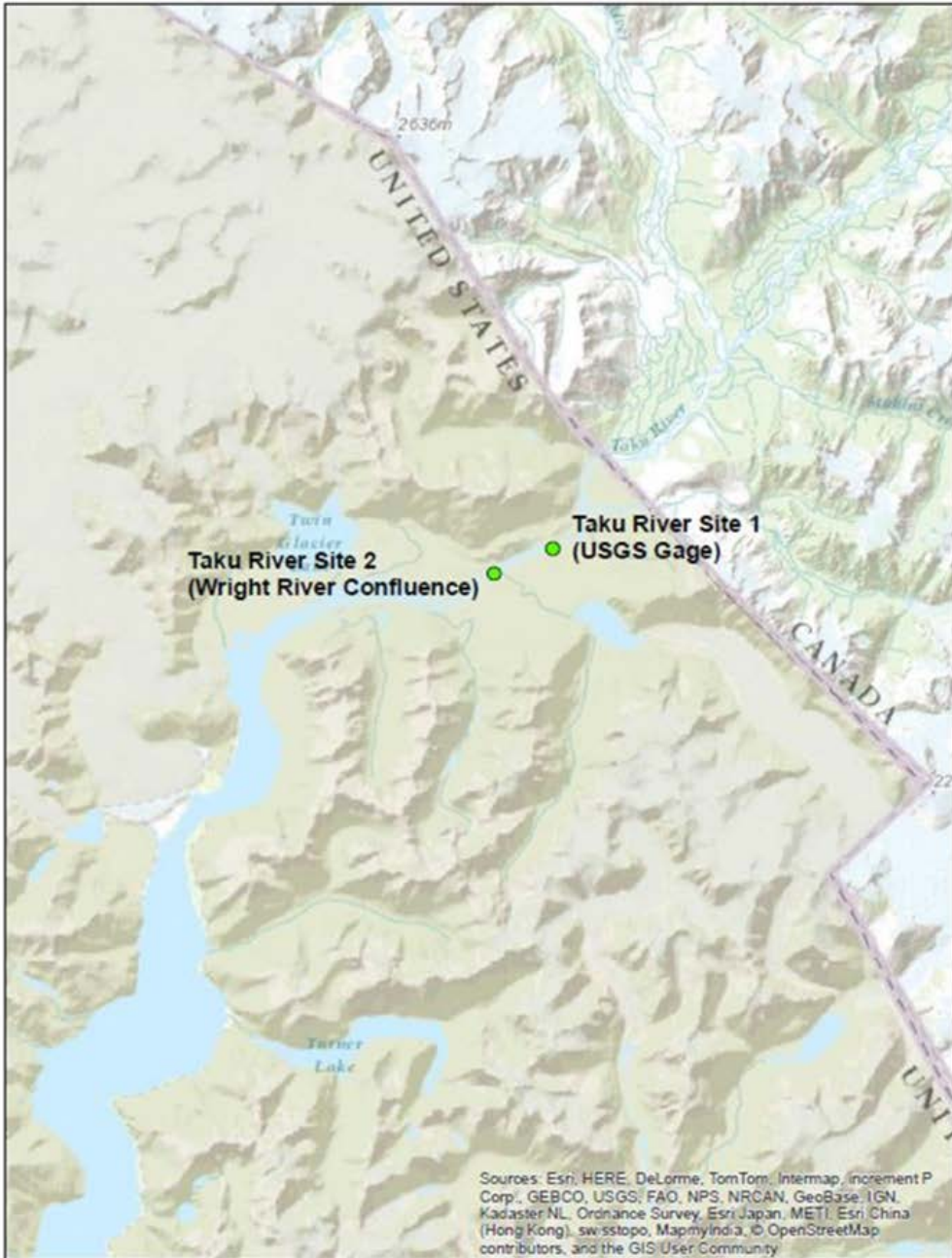
# WHERE AND HOW:

- Two sites on each river based on historic data and accessibility
- Grab samples: surface level, five feet, and ten feet in depth
- Physical parameters with a YSI meter and turbidity meter
- Samples sent to certified lab for analysis



## Taku River Water Quality Sampling Sites

# TAKU RIVER

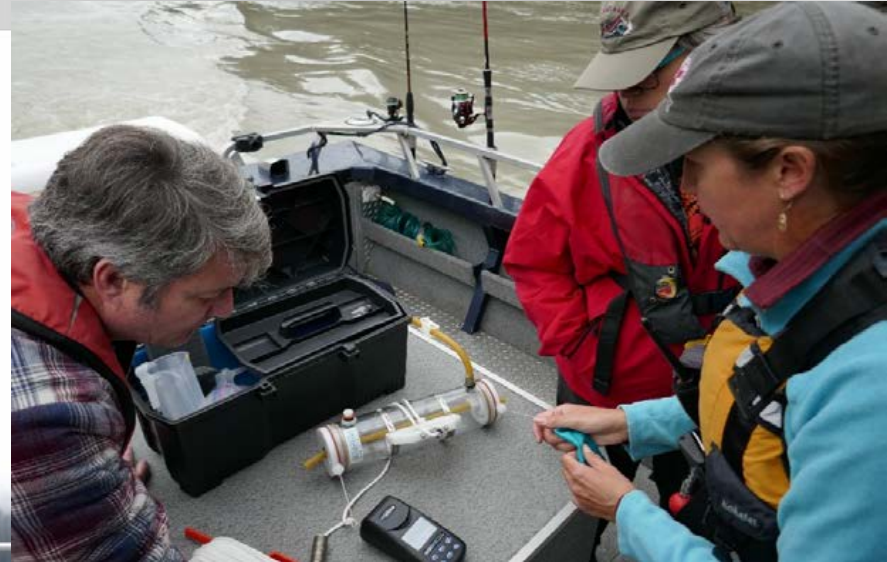
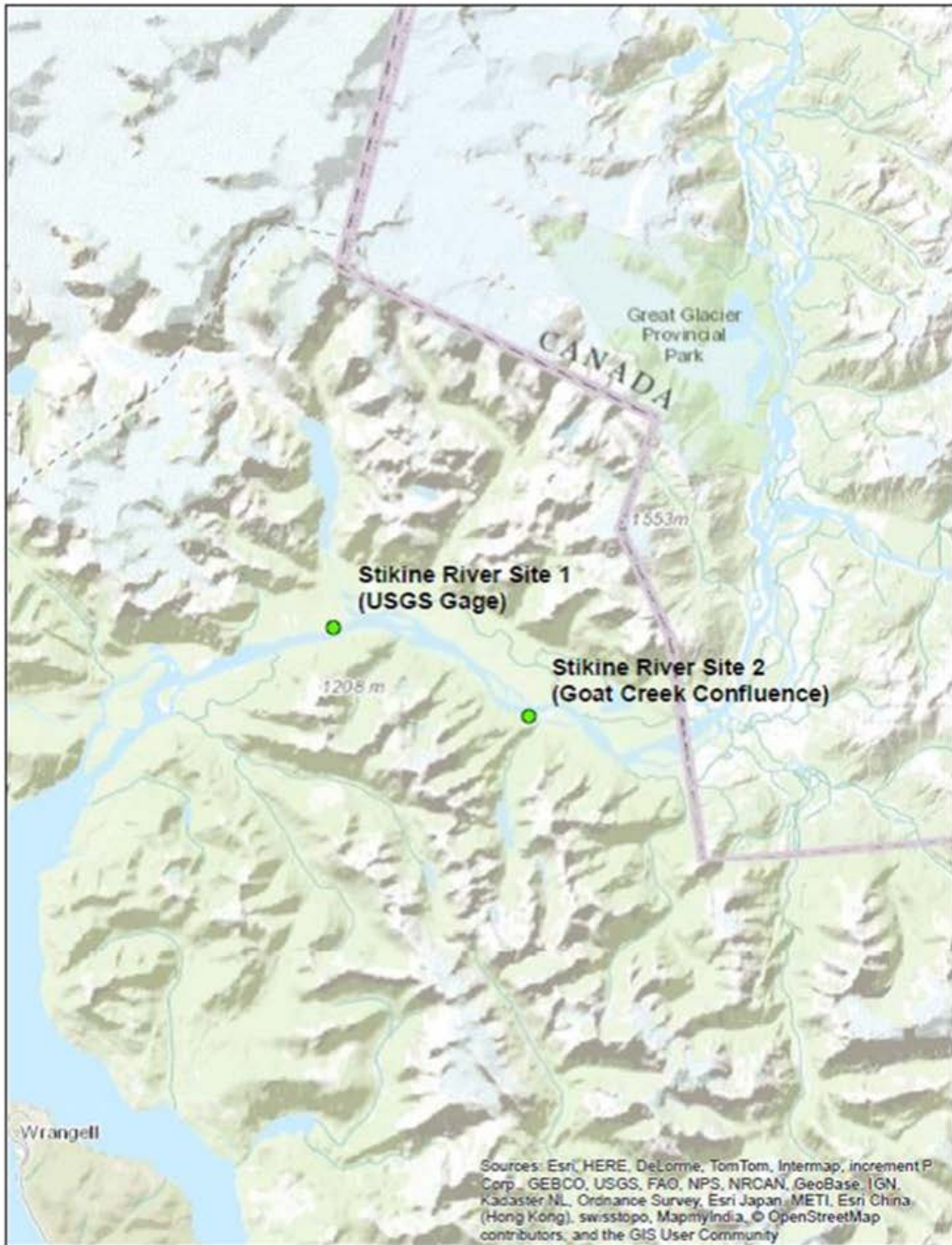


Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

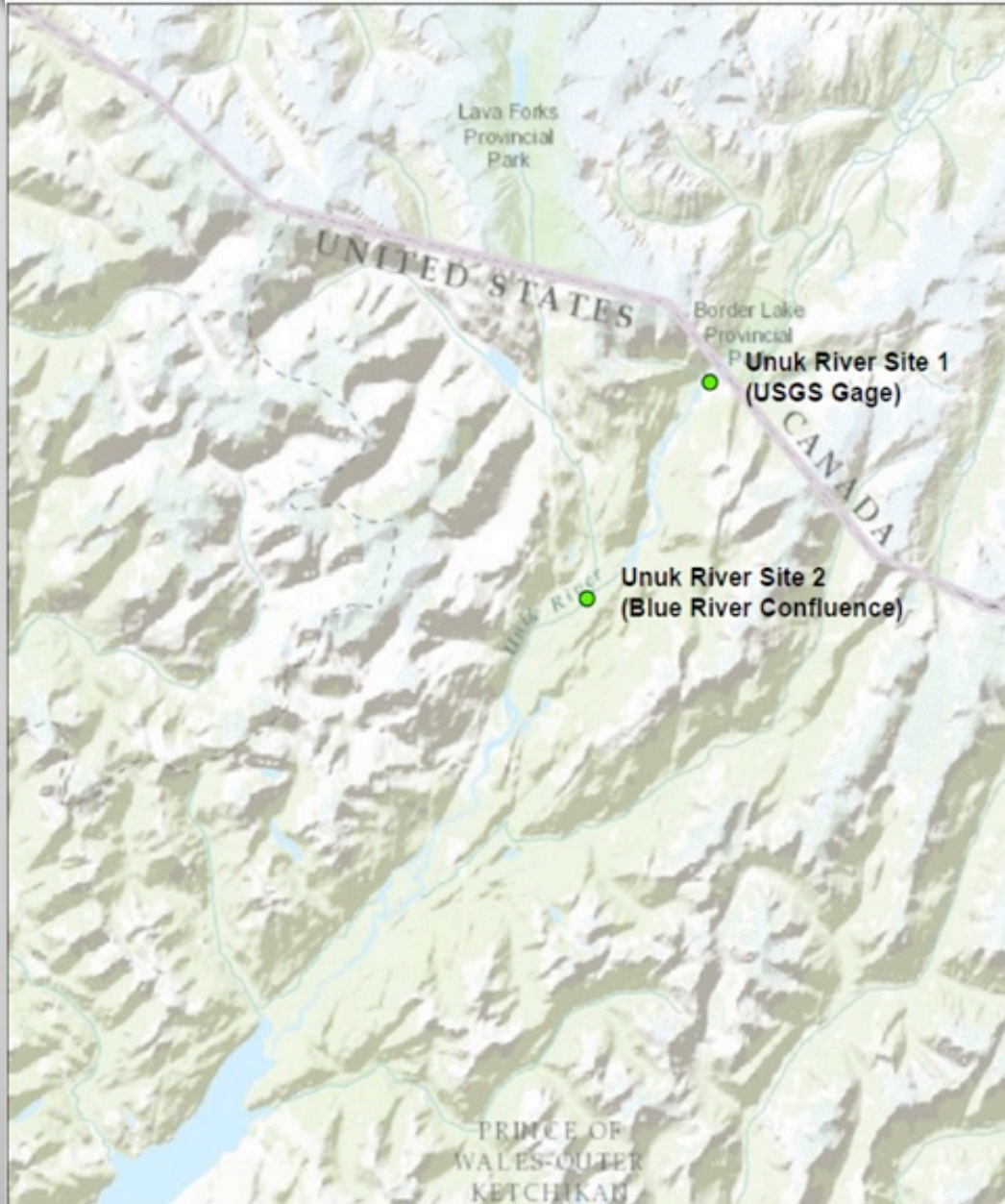


# Stikine River Water Quality Sampling Sites

# STIKINE RIVER



## Unuk River Water Quality Sampling Sites



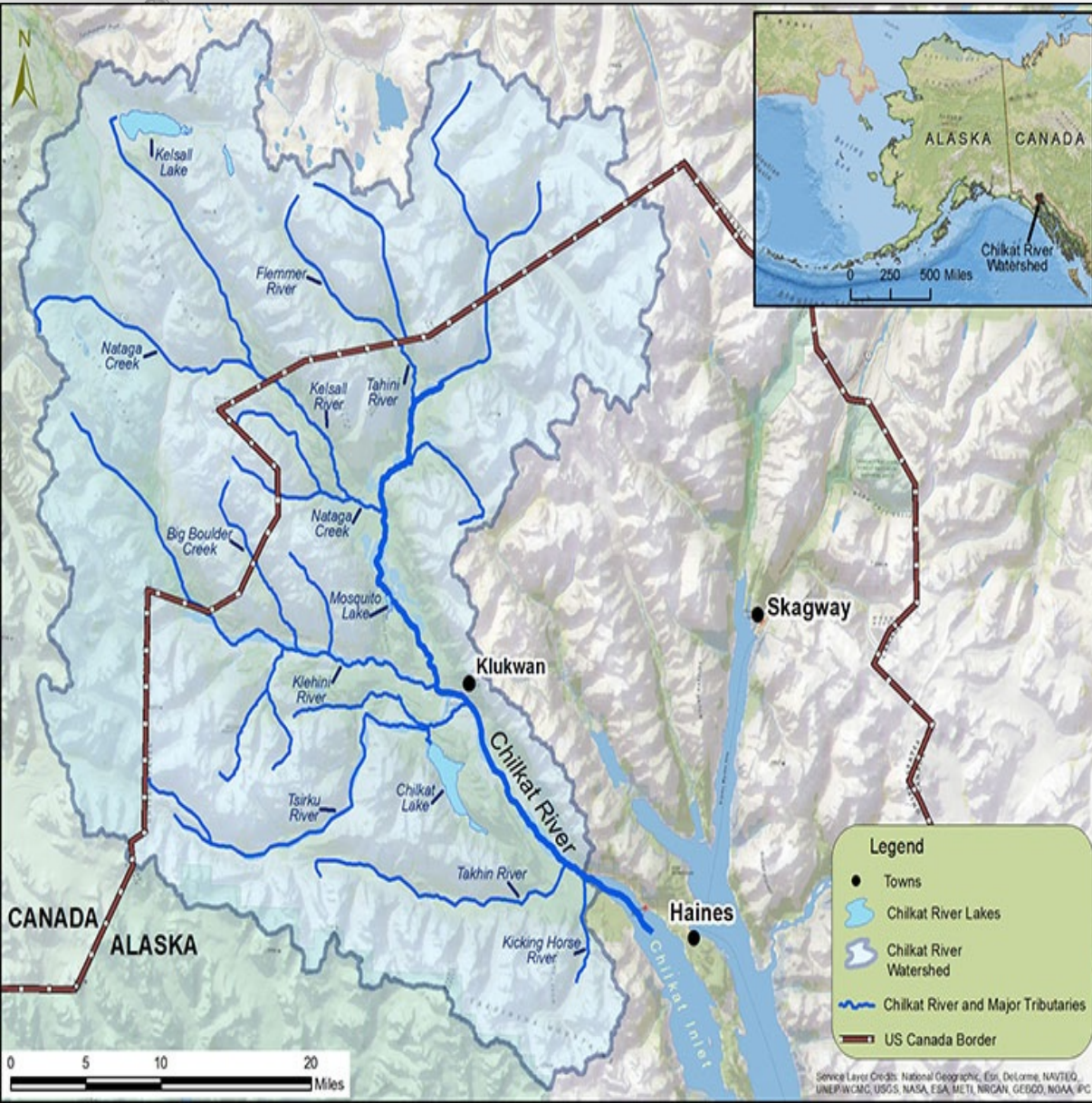
# UNUK RIVER: COLLABORATING WITH THE U.S. FOREST SERVICE AND THE U.S.G.S.



# ALSEK RIVER: IN 2018 WQS BEGAN IN COLLABORATION WITH THE YAKUTAT TLINGIT TRIBE



# CHILKAT RIVER: IN COLLABORATION WITH CHILKOOT INDIAN ASSOCIATION AND CHILKAT INDIAN VILLAGE BEGAN FEBRUARY 26, 2019



# WHOM AND WHEN:

RAYMOND PADDOCK III, ENVIRONMENTAL COORDINATOR - ASSISTANT SAMPLER

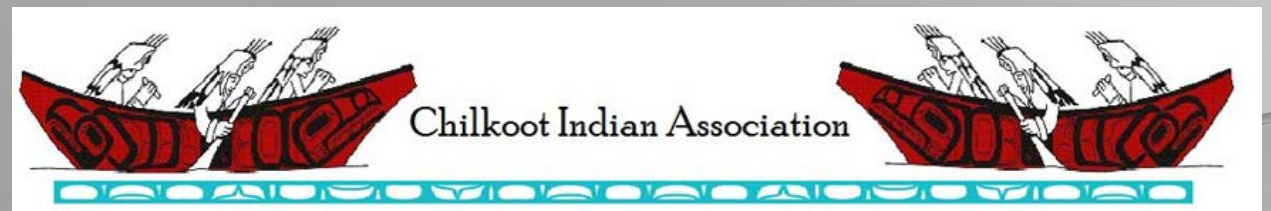
CER SCOTT, ENVIRONMENTAL SPECIALIST - ASSISTANT SAMPLER

KENNETH WEITZEL, NATURAL RESOURCE SPECIALIST - ASSISTANT SAMPLER

LINDSEY PIERCE, ENVIRONMENTAL TECHNICIAN - ASSISTANT SAMPLER

CATHY NEEDHAM, KAI ENVIRONMENTAL CONSULTING SERVICES, QUALITY SERVICES OFFICER - MAIN SAMPLER

MONTHLY BASIS FOR A MINIMUM OF THREE YEARS



# NEXT STEPS

- DATA VALIDATION: REVIEW LAB RESULTS TO ASSURE ACCURACY
- SHARING PRELIMINARY DATA WITH REGULATORY AGENCIES
- EXPANDING GEOGRAPHIC SCOPE TO INCLUDE THE UNUK RIVER
- USE INFORMATION TO COMPLIMENT TEK AND OTHER RELATED STUDIES
- REVISE THE QAPP TO INCLUDE UNUK RIVER AND ADD SEDIMENT SAMPLING

# **GUNALCHEESH/HAW'AA/THANK YOU!**

- DESIREE DUNCAN – NATIVE LANDS AND RESOURCES MANAGER
- RAYMOND PADDOCK III – ENVIRONMENTAL COORDINATOR
- CER SCOTT – ENVIRONMENTAL SPECIALIST
- KENNETH WEITZEL – NATURAL RESOURCE SPECIALIST
- LINDSEY PIERCE – ENVIRONMENTAL TECHNICIAN

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