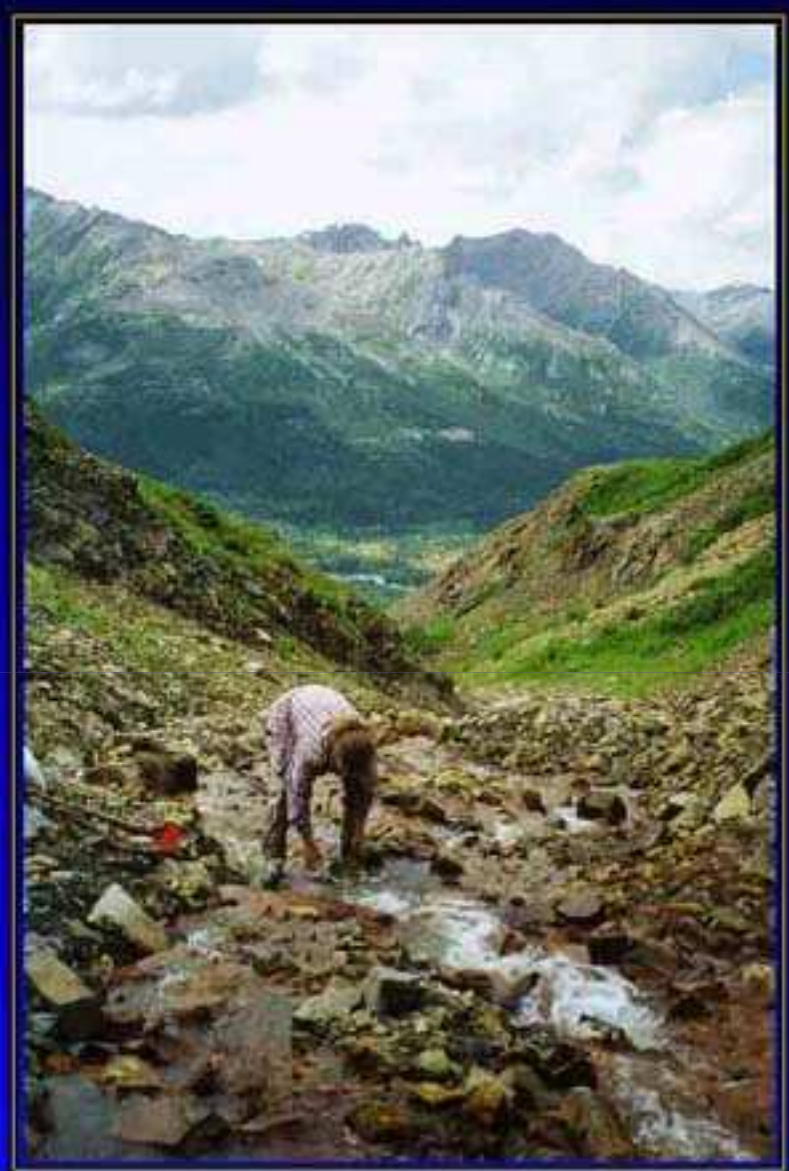




# Exploration

## Methods & Challenges

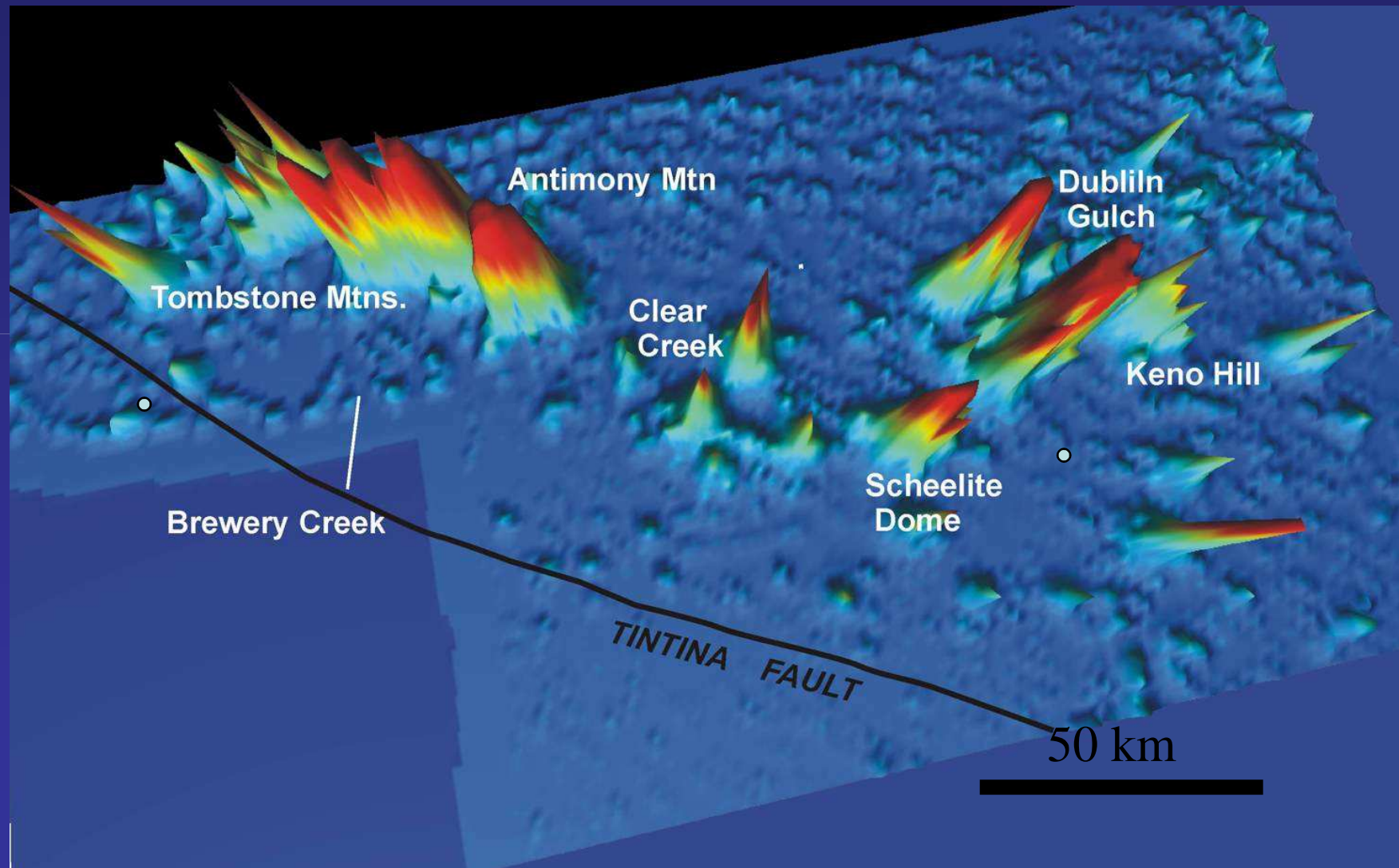
# Regional Stream Geochemistry



Silt sampling, Hy property  
YUKON

# Regional Geochemistry

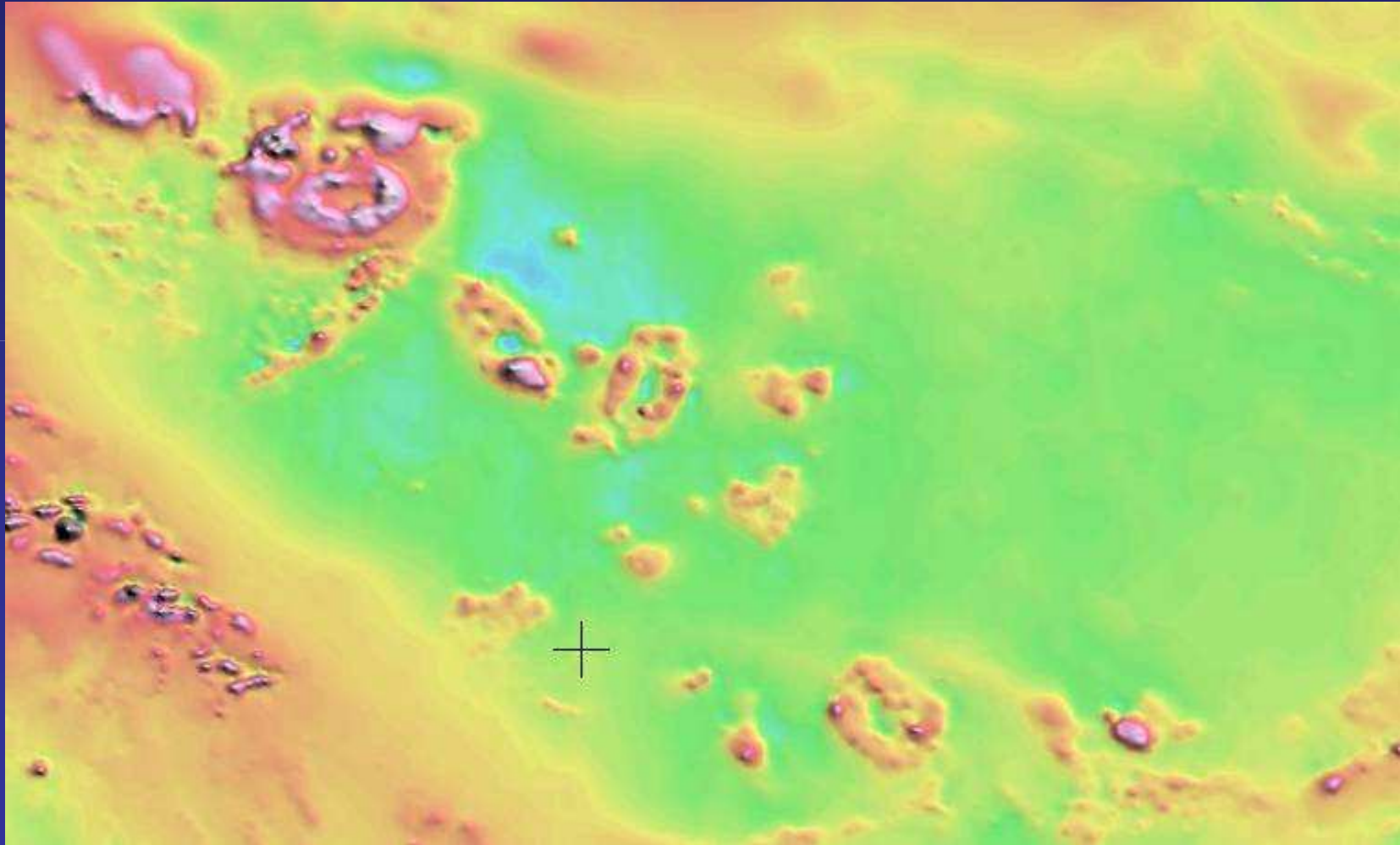
## Arsenic in silt



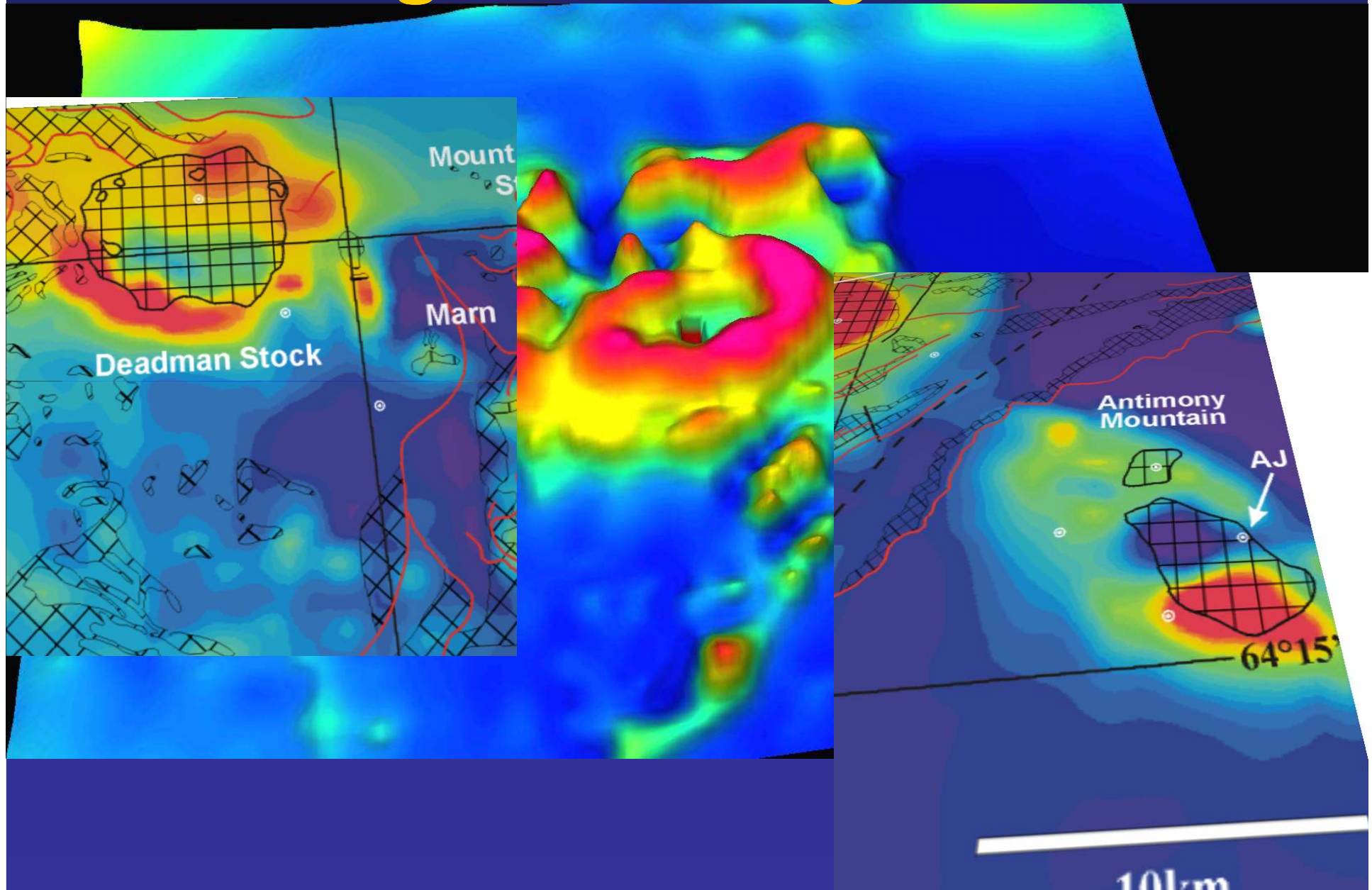
# Geophysics - TFM

- Used mainly to interpret geology, locate faults, which granites are reduced, etc ...
- Few ore related geophysical signatures, some minor IP successes
- Gravity, seismic imaging of granite cupolas

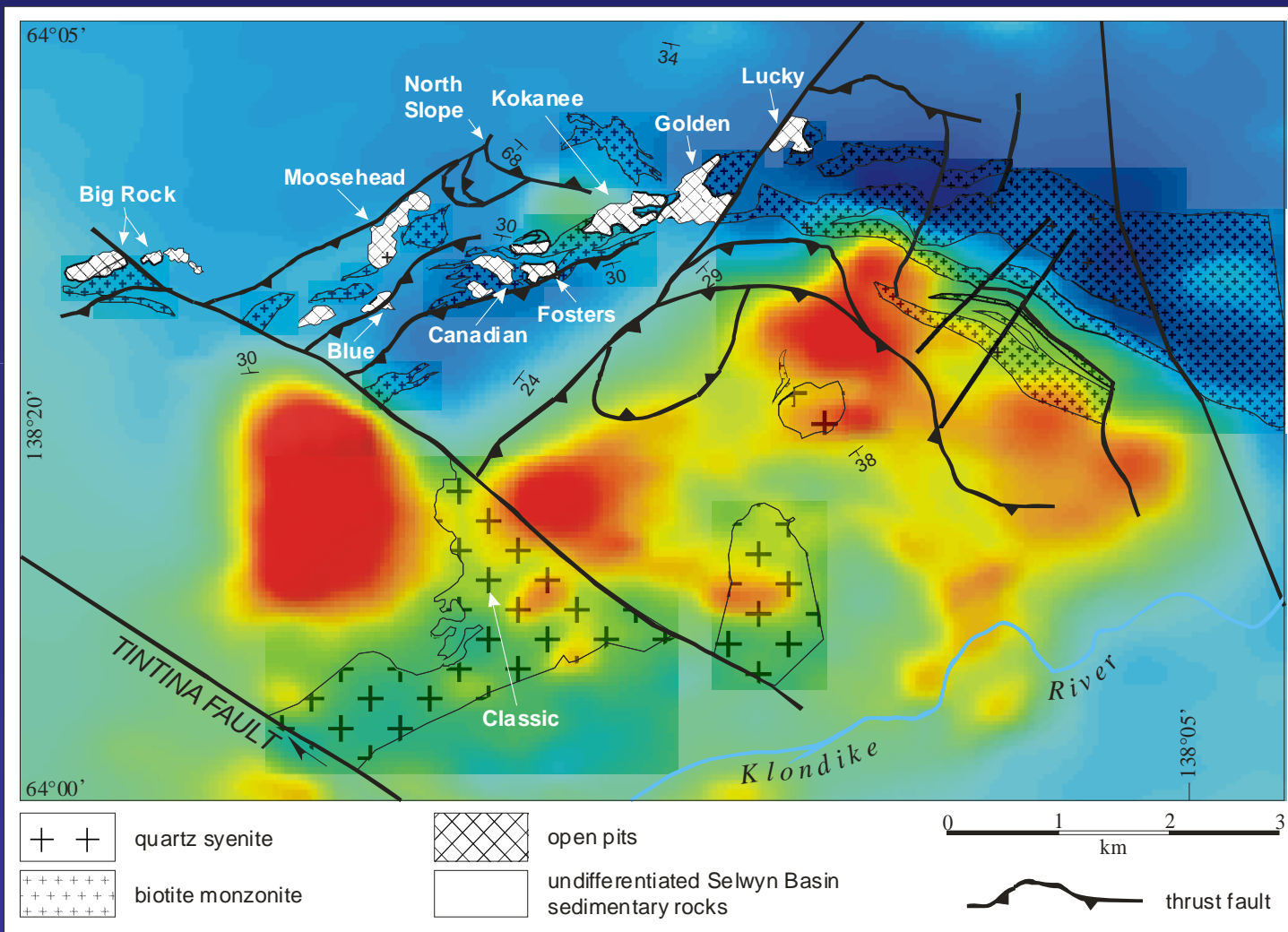
# Geophysics - TFM



# Magnetic Doughnuts



# TFM – Brewery Creek



# Airborne Magnetics

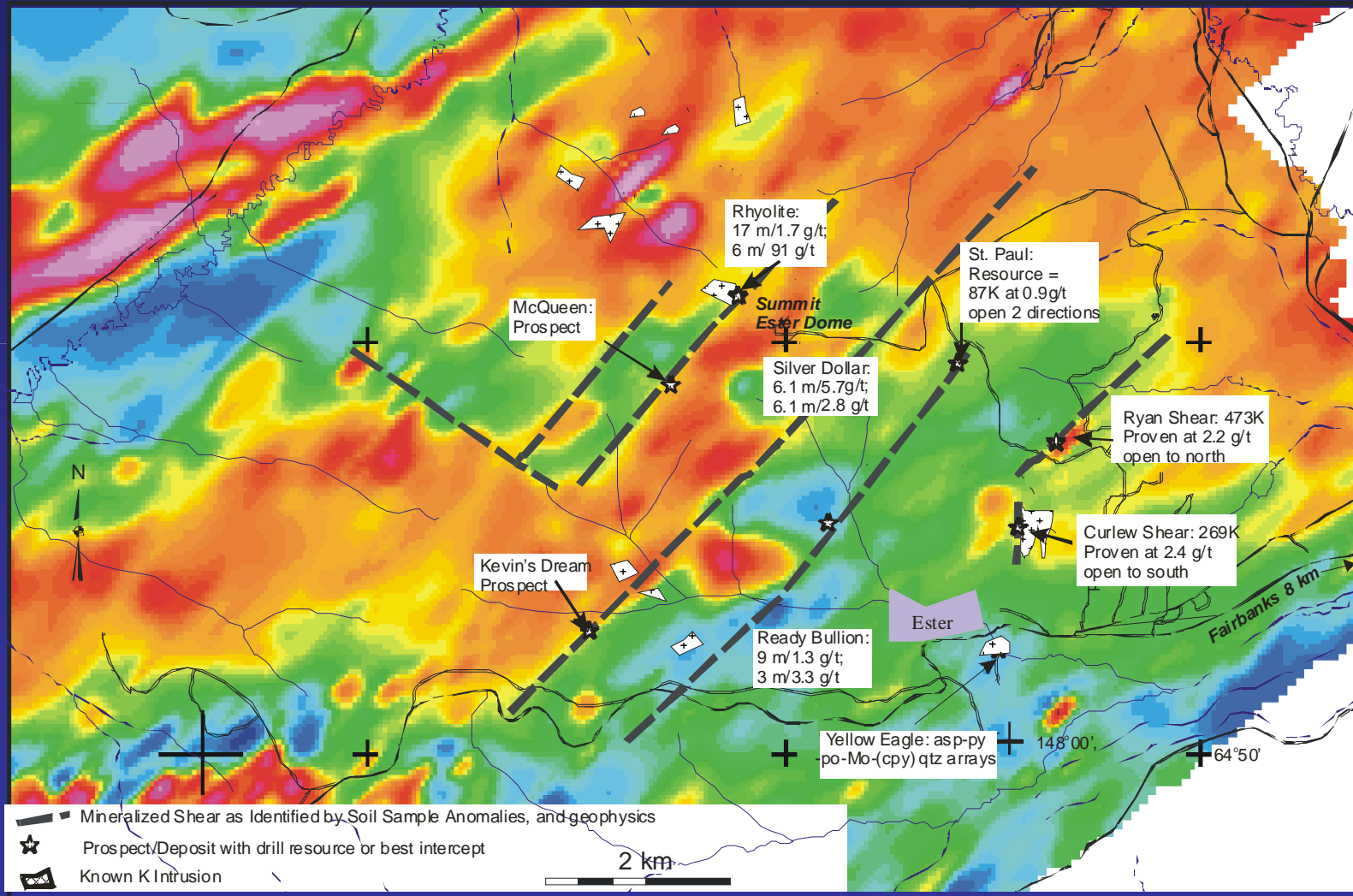
## Ester Dome Shear Zones



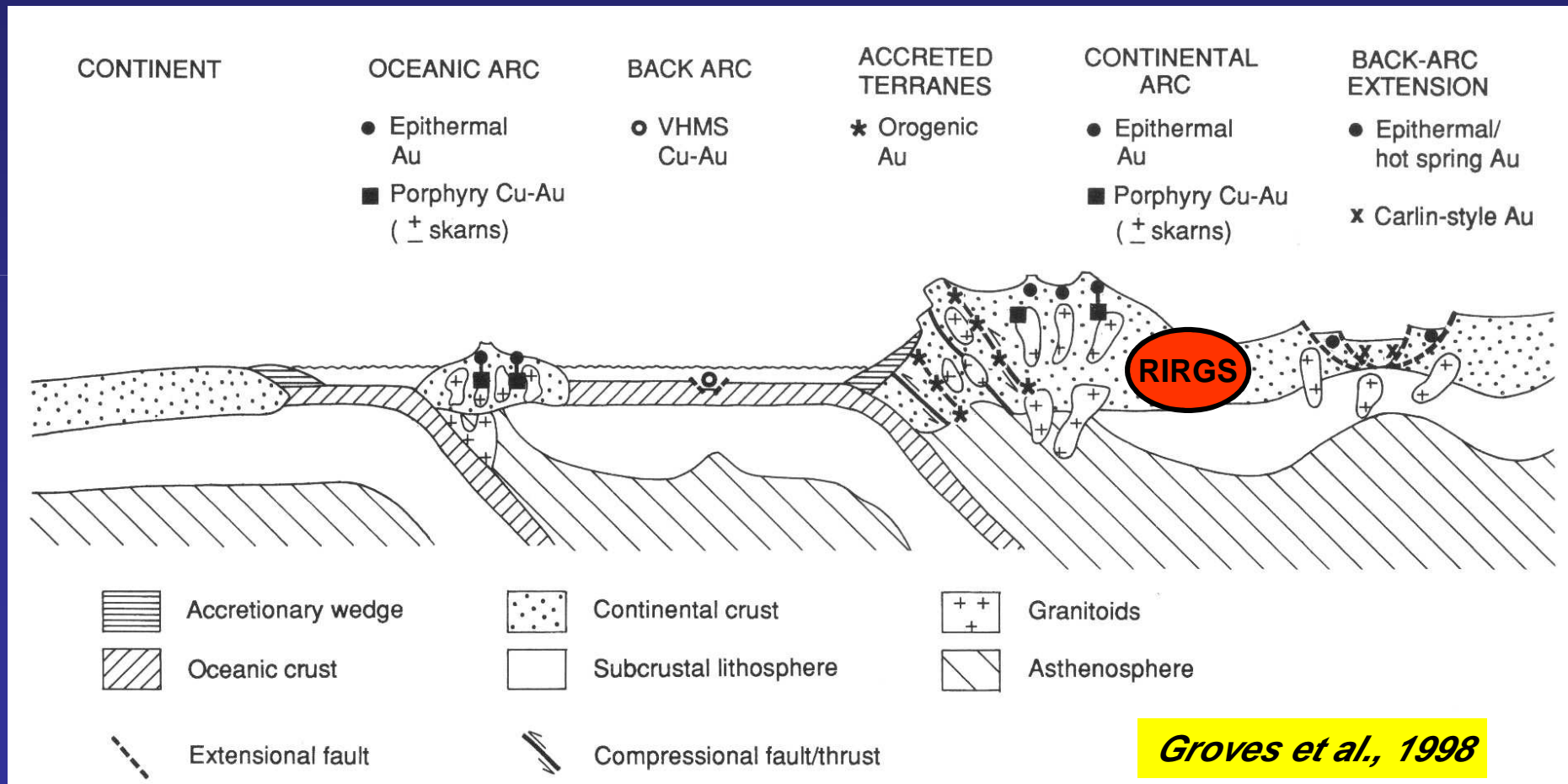


# Airborne Magnetics

## Ester Dome Shear Zones



# Comparisons to Other Gold Deposit Types



# Key Features of Reduced Intrusion-Related Gold Systems

- **Setting:** continental margin – inboard of magmatic arc
- **Timing:** post collisional, transitional regime, commonly follows a cessation of subduction
- **Magmatism:** subalkalic – alkalic, substantial crustal component with mafic input
- **Hydrothermal activity:** focused around cooling magmatic centres (convective flow)
- **Diversity** of mineralisation styles within individual systems
- **Aqueous-carbonic**, low salinity fluids (*high level systems have less CO<sub>2</sub>, higher salinity*), variable oxidation state within systems

# Comparisons to Other Gold Deposit Types

- *Cu-Au porphyry systems*
  - Convergent margin, subduction-related calc-alkaline magmatic arc **vs inboard of cont. mag arc**
  - Highly oxidised magmas, Cl-rich (*altered oceanic crust contribution*)
  - Cu rich,  $\pm$  Au, Mo **vs Au-Bi-Te-W-As-Sb**
  - Oxidised ore assemblage **vs Py, Po, Asp, sulphosalts**
  - Brines
  - Form at very high crustal levels

# Gold Deposits Related to Alkaline Magmatism

- Examples: Cripple Creek – Colorado Mineral Belt, Porgera – New Guinea
- Cripple Creek – located inboard of continental margin in Cordilleran Orogen
- Timing: Post subduction-related collision, pre continental rifting
- Associated with intermediate to mafic alkaline (lamprophyric) magmatism
- Enriched in Au-Te and base metals (Cu poor)

Less crustal component in magmas than TPS

Lack of lithophile metal association

Gold hosted in veins, breccias, and disseminations in diatremes (epithermal environment)

# Orogenic Gold Deposits

- ***Settings:*** Accretionary and collisional orogens
  - Collisional orogens have greater overlap with RIRGS
- ***Deposits*** associated with regional-scale processes
  - Regional hydrothermal activity controlled by fault network vs local hydrothermal cells set up around cooling magmatic centres
- ***Hydrothermal*** assemblages are in thermal equilibrium with host rocks
- ***Relatively*** consistent ore assemblage throughout deposit
- ***Aqueous-carbonic***, low-salinity fluids



