

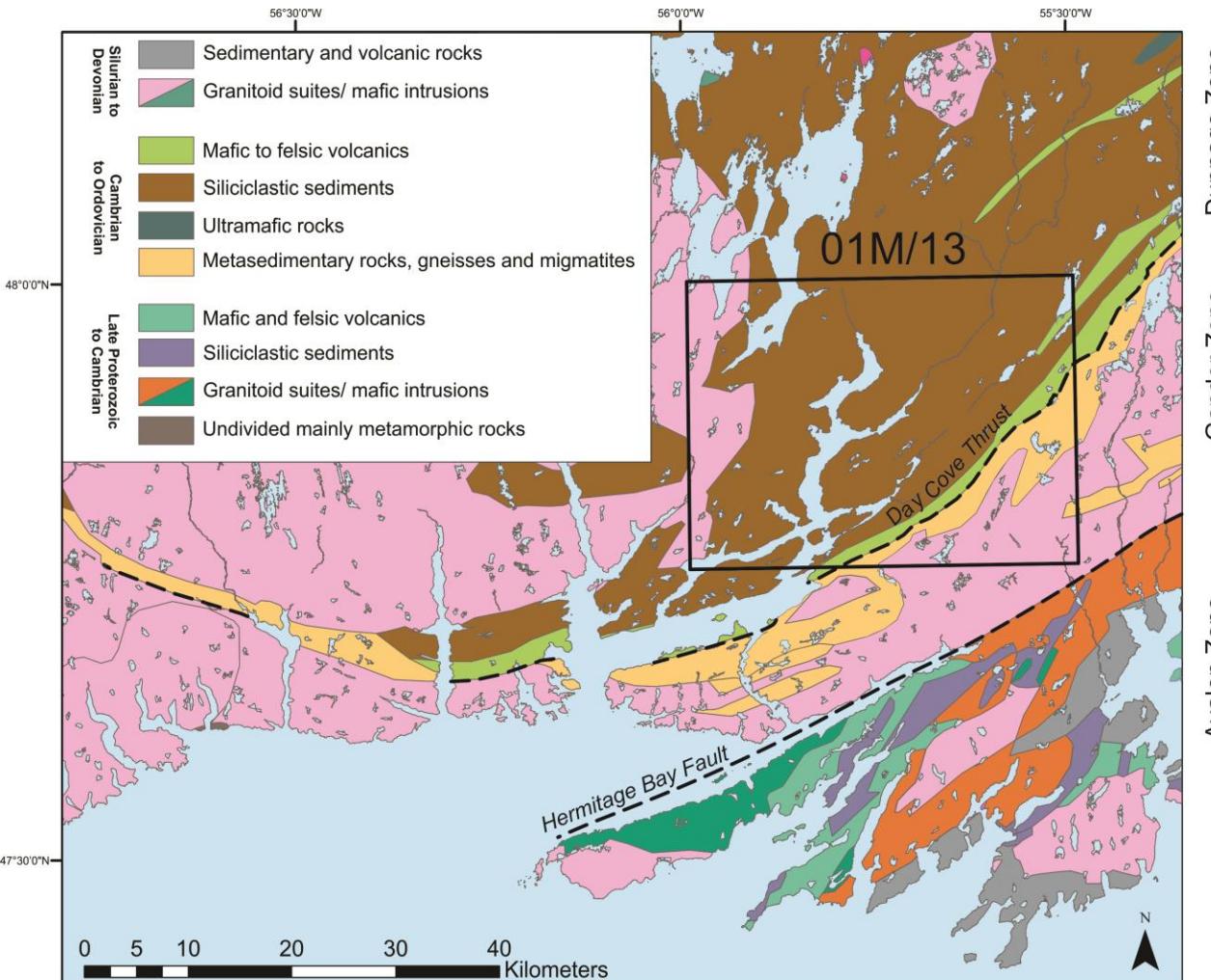


Newfoundland Labrador



**Geology, Geophysics & Gold in
the St. Alban's map area
01M/13**

Regional Geology south coast of Newfoundland



Avalon Zone

Avalonia microcontinent, dominant late Proterozoic

Gander Zone

Ganderia, Proterozoic or Early Paleozoic basement?

Dunnage Zone (Exploits)

Remnants of Iapetus Ocean

Cambrian-Ordovician metasediments and volcanic rocks

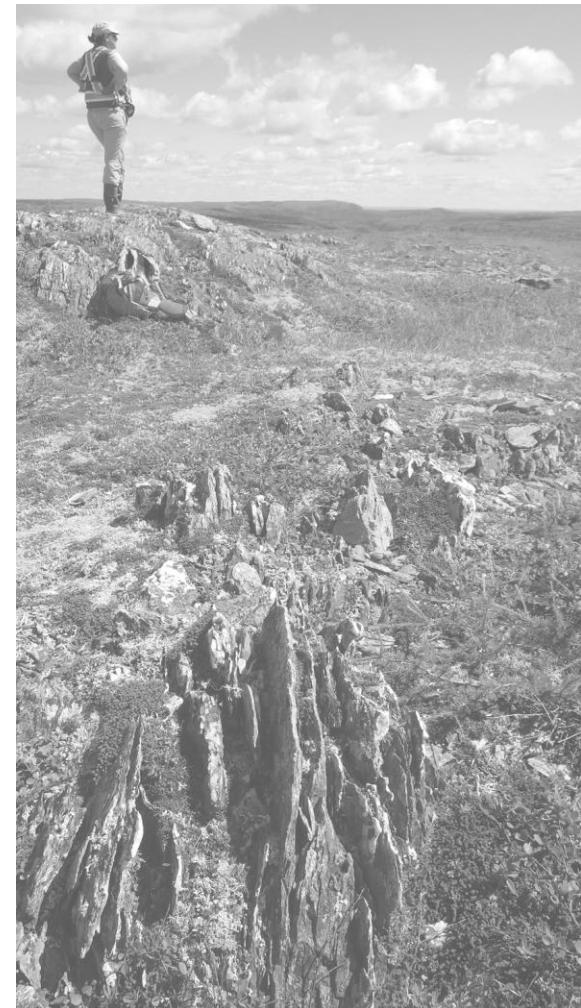
Orogenic Events



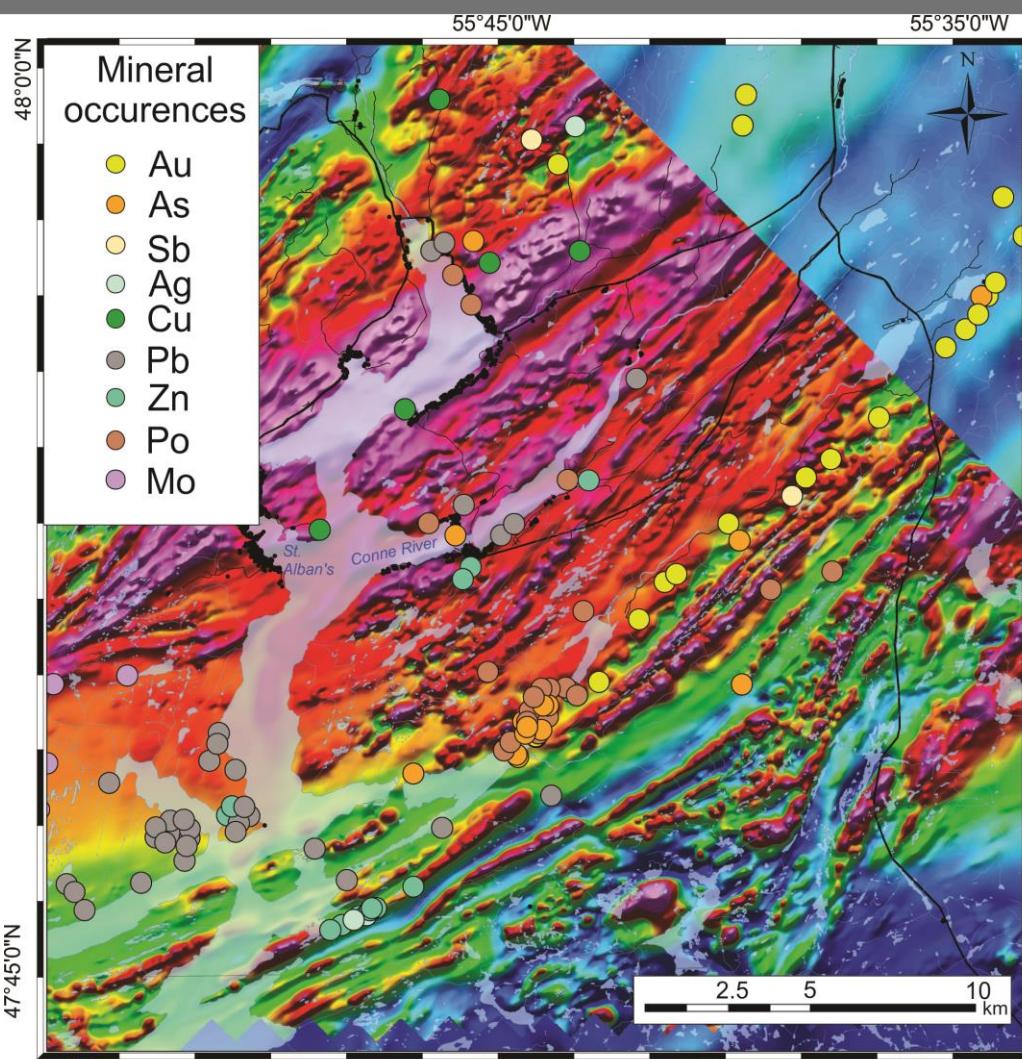
- Penobscot Orogeny (Early Ordovician): ophiolite obduction
- Back-arc rifting + sedimentation
- Salinic Orogeny (Late Ordovician to Early Silurian): closure of Exploits back-arc basin, accretion of Ganderia to Laurentia
- Acadian orogeny (Early Devonian): collision of Ganderia and Avalonia

St. Alban's map area

- new bedrock mapping project
- based on detailed geophysics
- geochemistry
- isotope geochemistry and geochronology (not yet...)
- mineral potential
 - Some exciting Au values



01M/13 – East and Central Residual magnetic field & MODS



Dunnage Zone

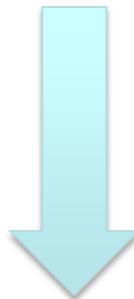
metasedimentary layering
well visible
magnetic highs often
graphitic schist/black shale
known Au showings align
along Little River area

Gander Zone

complex relationship
between gneiss (rel. high)
and intrusion (rel. low) visible
in geophysical signature

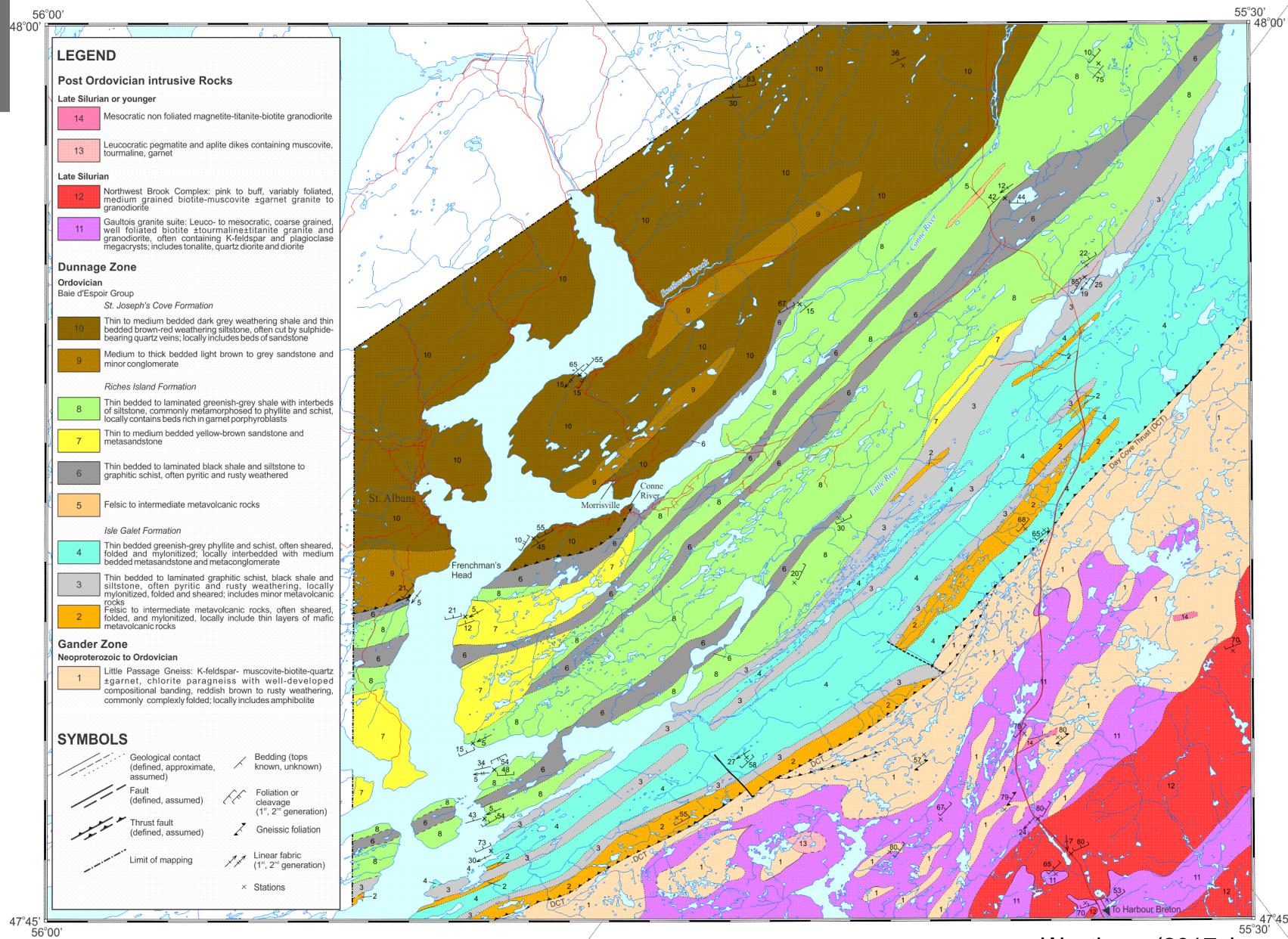
Overview of geological units



- Little Passage Gneiss, Neoproterozoic to Ordovician (Gander) amphibolite facies
- Baie d'Espoir Group, Ordovician (Dunnage)
 - Salmon River Dam Fm.
 - St. Joseph's Cove Fm.
 - Riches Island Fm.
 - Isle Galet Fm.
- Intrusive rocks, post Ordovician

Geological map – East & Centre

Newfoundland



St. Joseph's Cove Fm.



dominantly interbedded shale
and siltstone (turbidite)

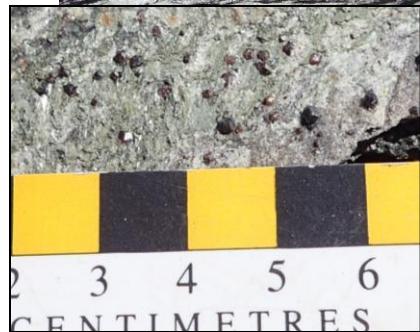
two generations of cleavage and
related folding

large recumbant folds (F_2)

few sandstone channels



Riches Island Fm.



shales & siltstone, phyllite and schists

garnet-rich layers

black shales and graphitic schists

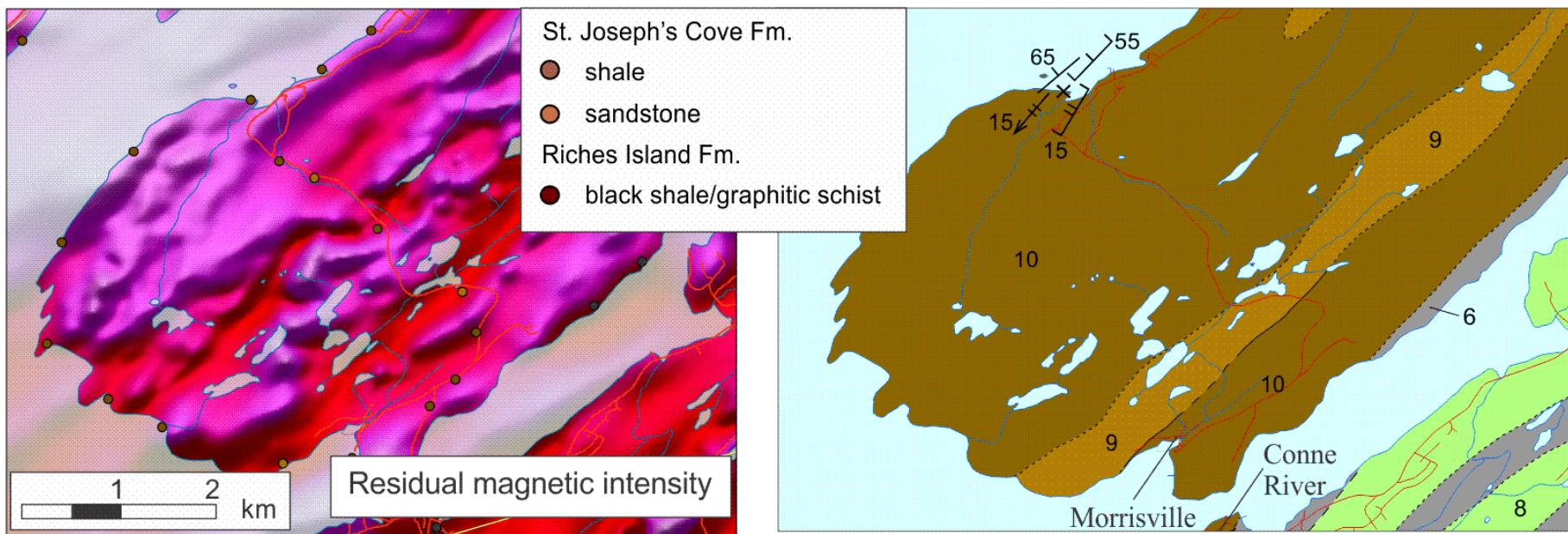
few intermediate volcanic layers

Isle Galet Fm.



mostly schists, strongly deformed
metavolcanic layers common,
felsic composition dominant
graphitic schists as marker horizons

St. Joseph's Cove Formation



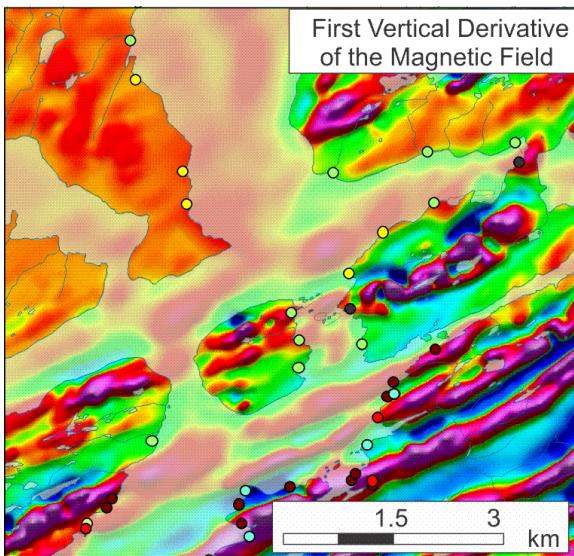
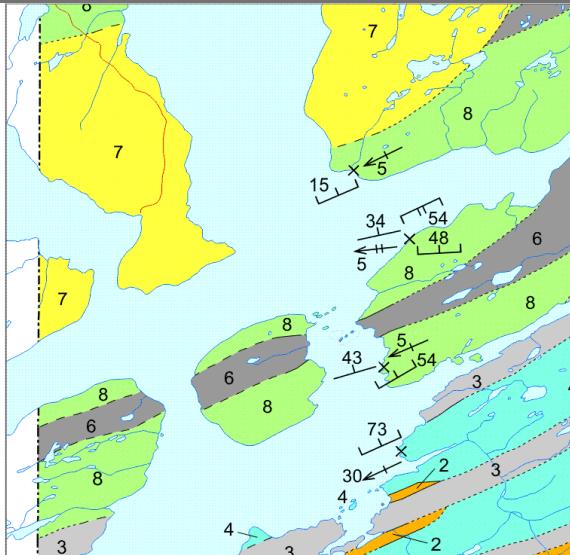
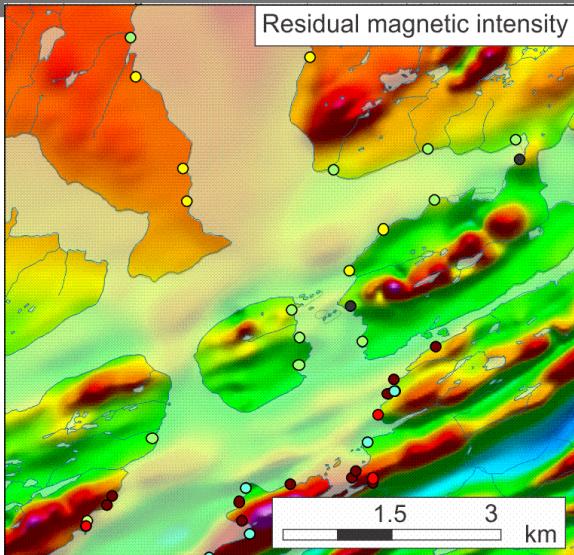
shale + siltstone

sandstone

high residual magnetic intensity

intermediate magnetic intensity

Riches Island & Isle Galet formations



black shales and graphitic schists:

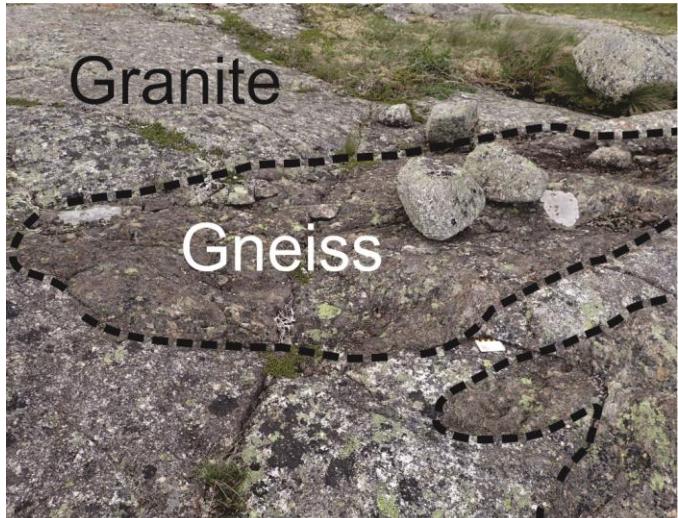
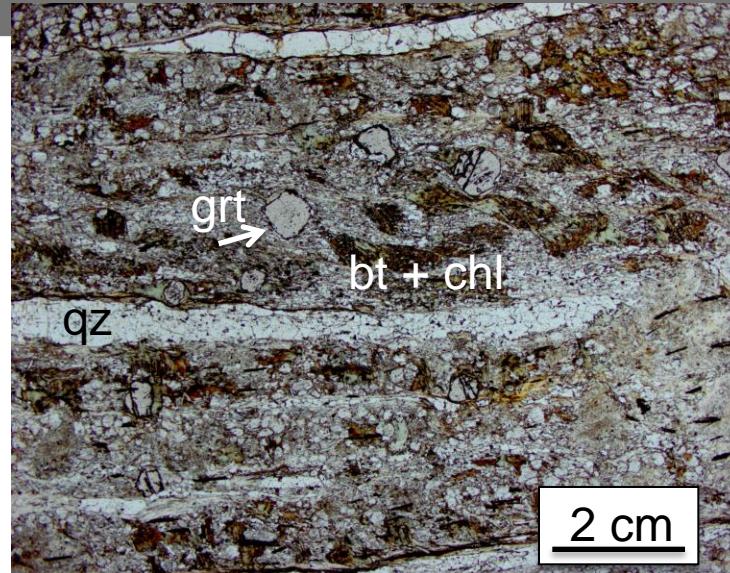
high magnetic intensity

shale, sandstone, metavolcanic rocks:

medium to low magnetic intensity

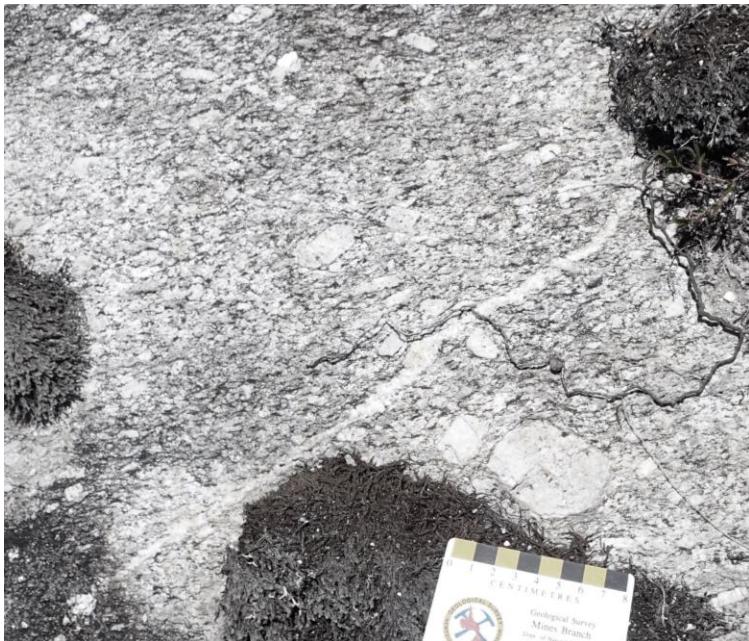
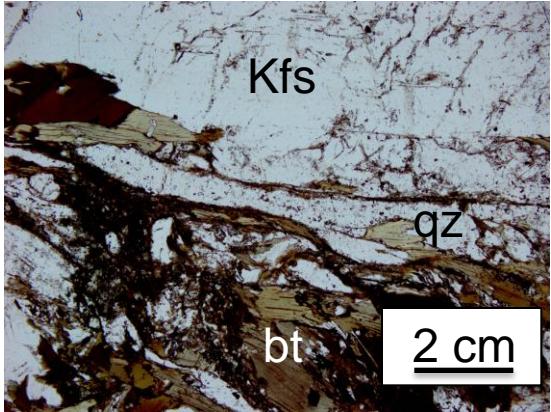
- Little Passage Gneiss
 - mainly paragneiss in St. Alban's map area
 - metamorphic peak at 423 Ma, protolith ?
- Gaultois Granite
 - mainly intermediate composition
 - intrusive age 421 Ma (syntectonic, Salinic Orogeny)
- Northwest Brook Complex
- Pegmatite and aplite

Little Passage Gneiss



semipelitic to psammitic paragneiss
Kfs-msc-bt(chl)-qz \pm grt
compositional layering on macro- and microscale
characteristic rusty weathering

Gaultois Granite



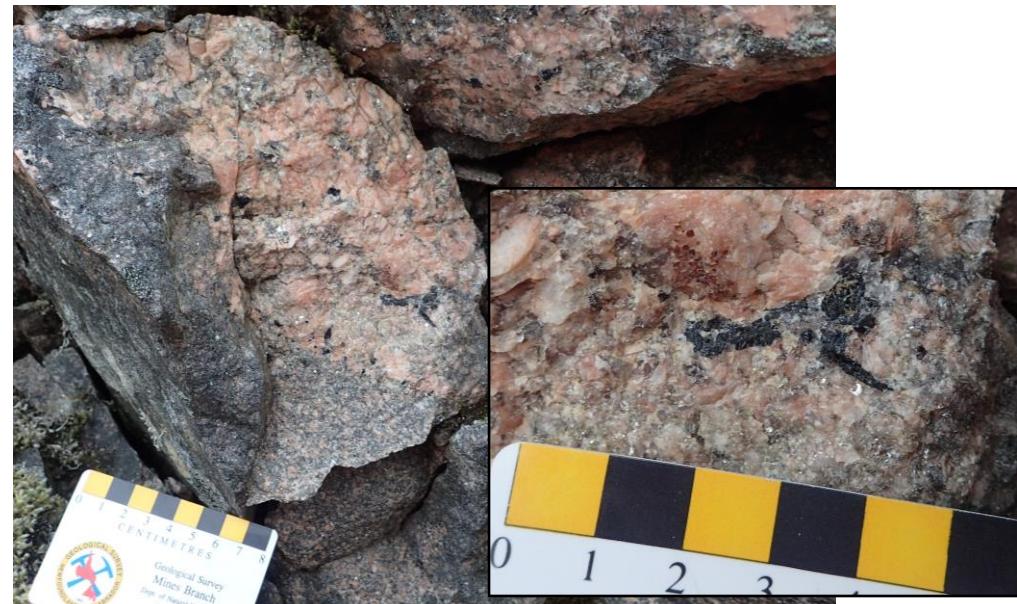
feldspar-megacrystic, lineated and foliated intrusions
granodiorite, monzodiorite, tonalite
rare diorite + gabbro
alignment of bt, elongated qz
define regional SW foliation

Northwest Brook Granite + pegmatite/aplite

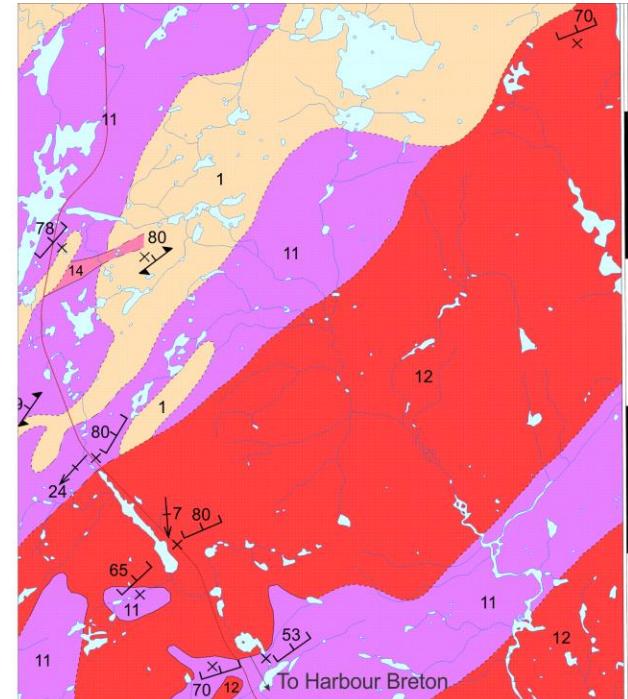
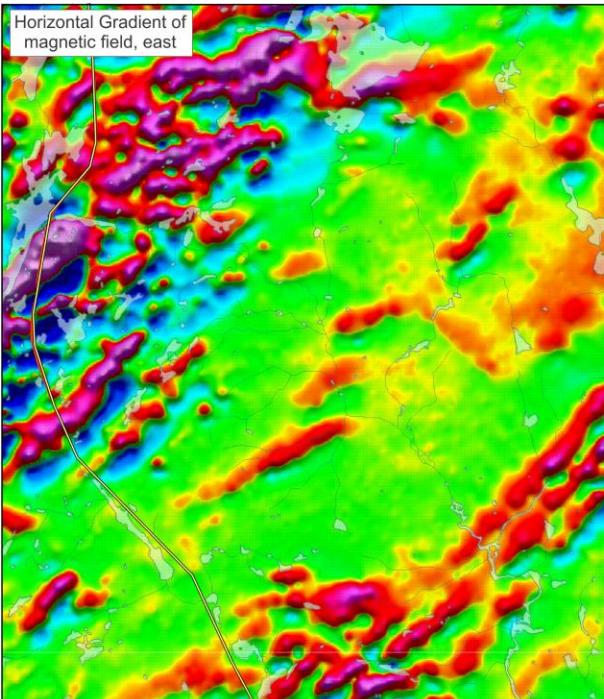
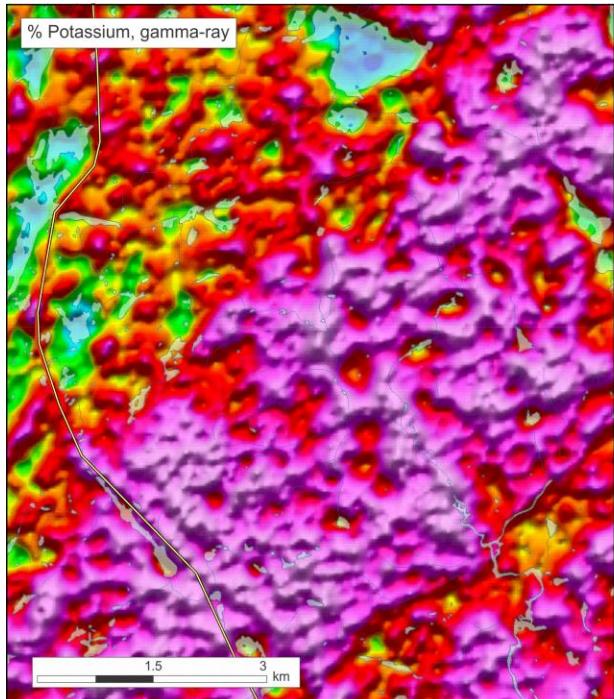


tourmaline-garnet bearing
granitic pegmatite + aplite
locally up to 150 m wide
dykes

Northwest Brook Granite:
two-mica granite to syenite weakly
foliated intrusions
regional SW foliation, subparallel
to Gaultois Granite



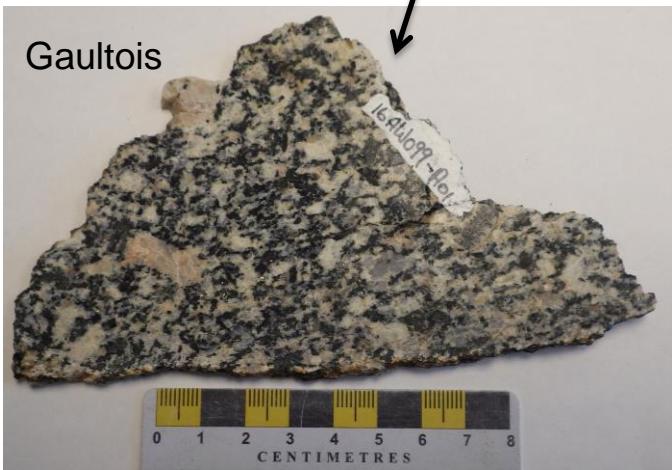
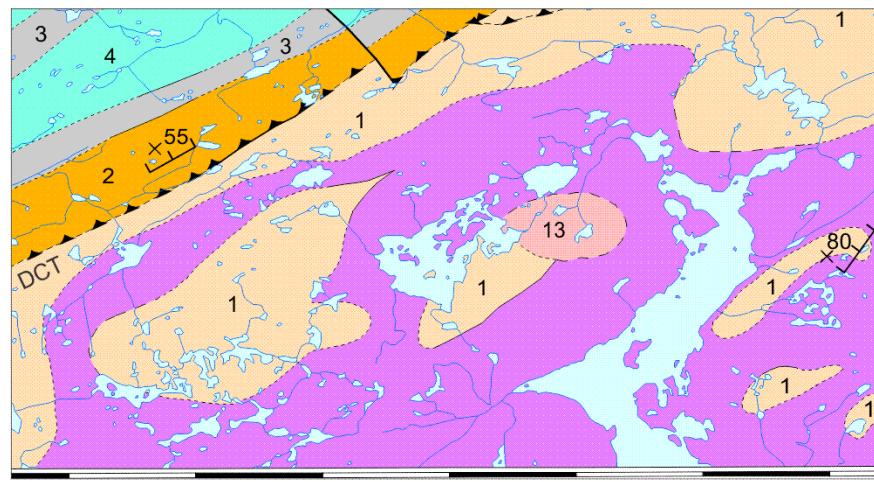
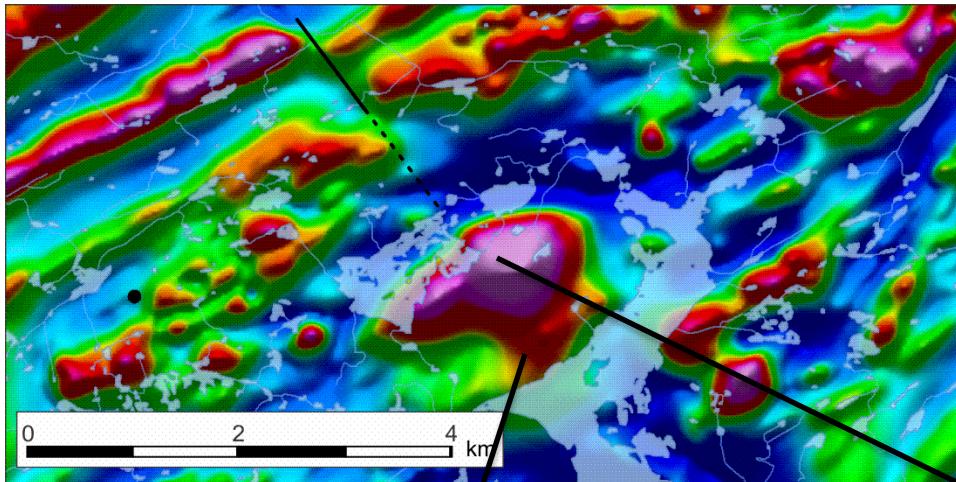
Radiometric and magnetic data



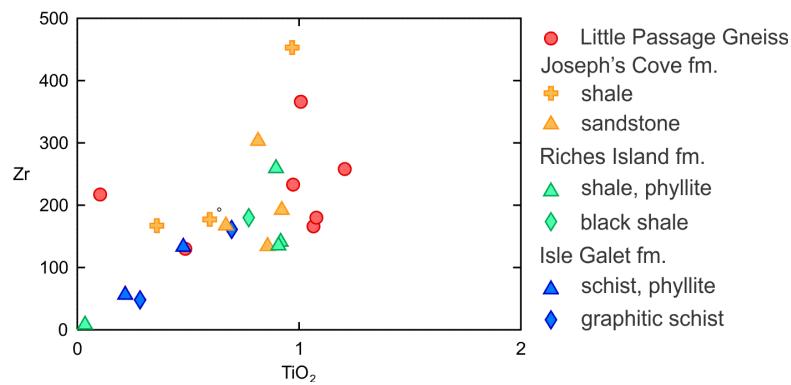
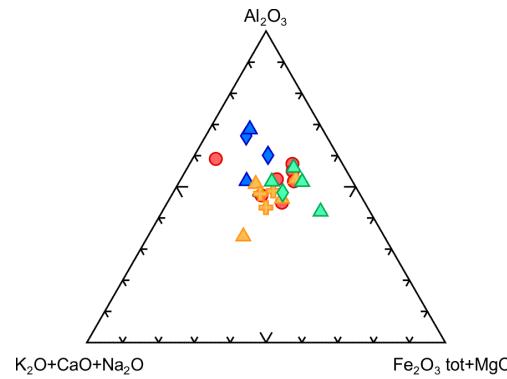
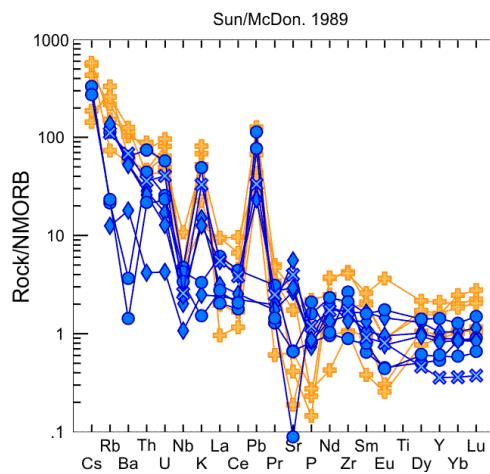
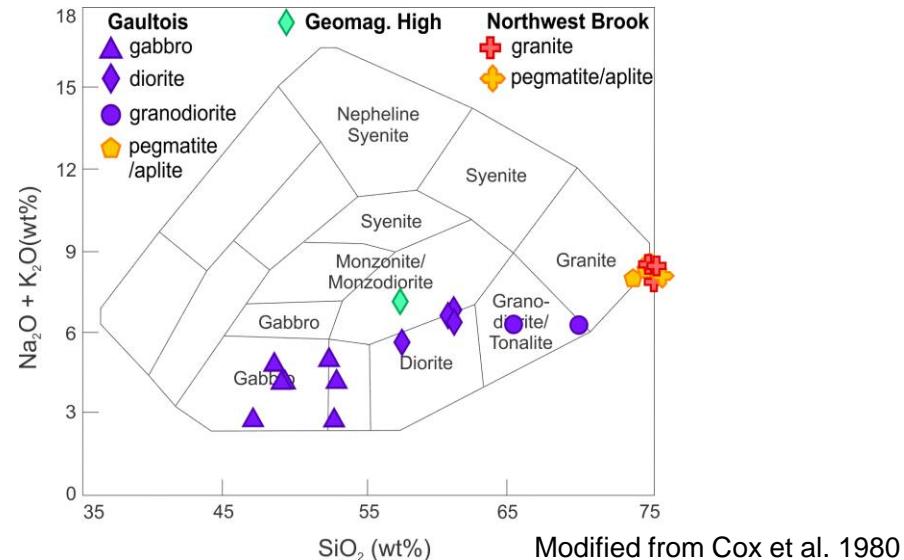
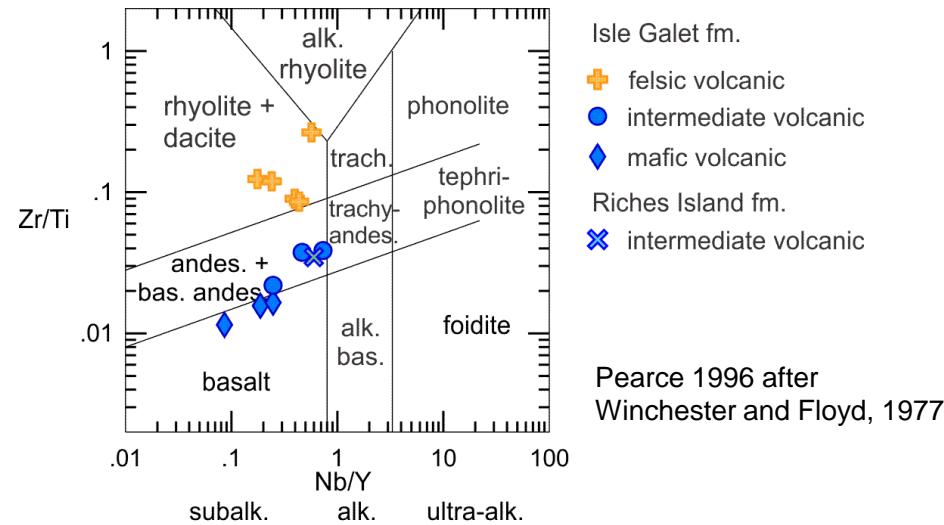
combination helps to separate granitic from intermediate intrusions and gneiss

Younger (?) Intrusion – magnetic high

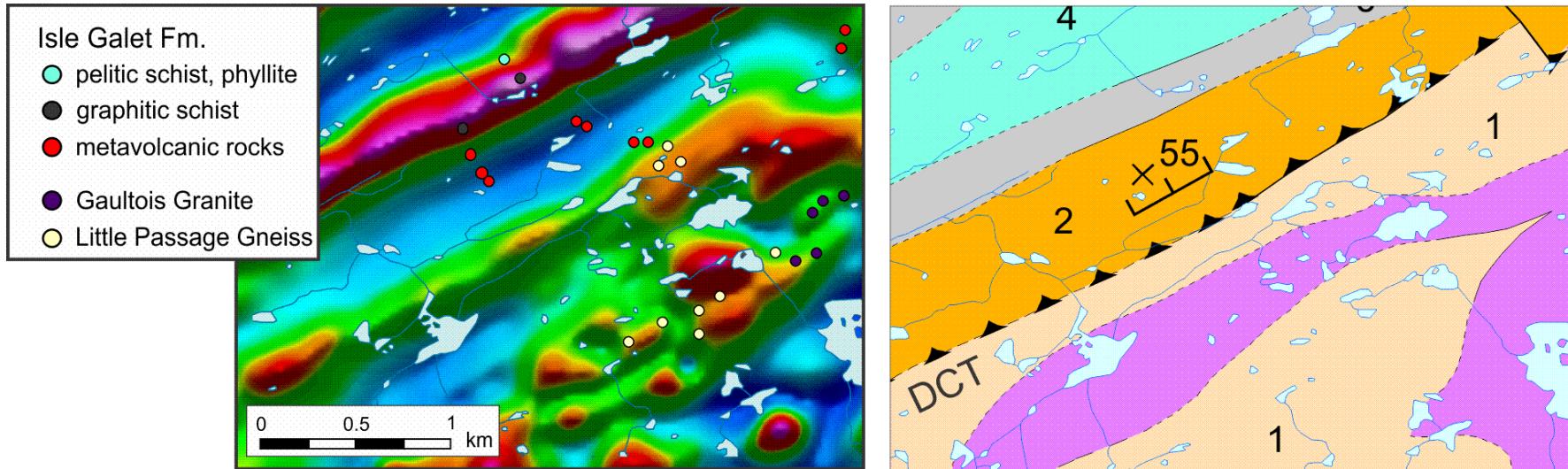
Newfoundland
Labrador



Preliminary geochemistry



Day Cove Thrust – Zone boundary in southern NL



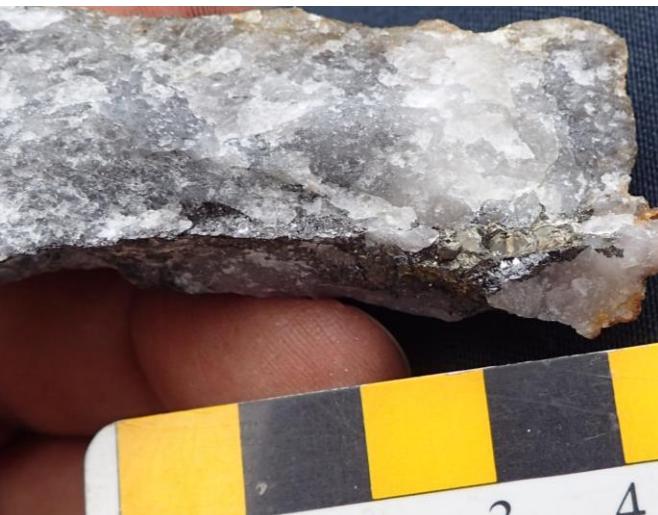
Contrast in magnetic intensity along thrust & detailed documentation of mylonite (Piasecki, 1988)

➤ argue for a major shear zone/thrust

Different intrusions in Gander (Silurian Gaultois, NWB) *vs.* Dunnage zone (Devonian North Bay Suite?)

➤ separate histories until Salinic orogeny?

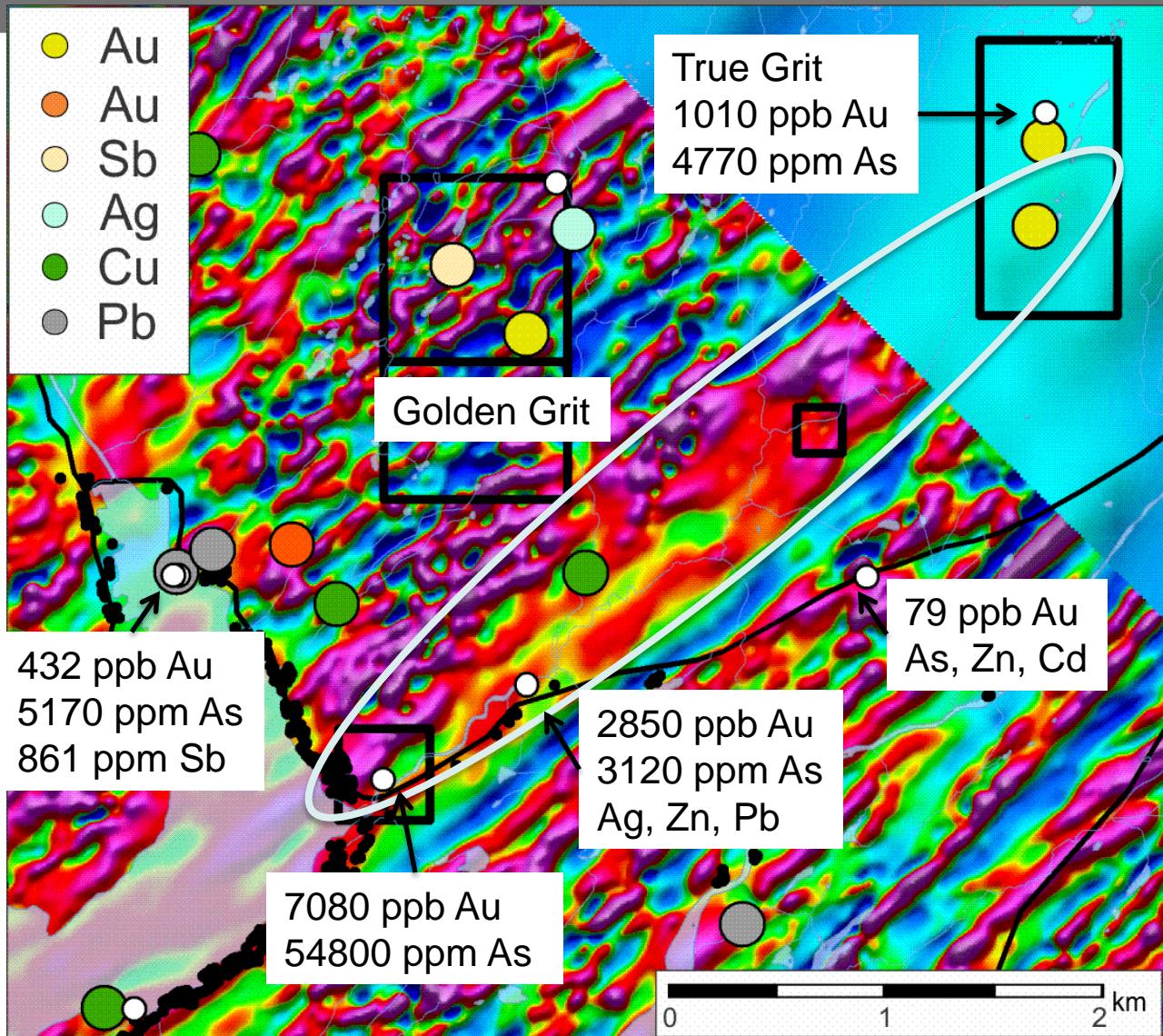
Mineralization



See Westhues (2017) Open File 001M/13/0872 for locations of assays

High Au in St. Joseph's Cove fm.

Newfoundland
Labrador

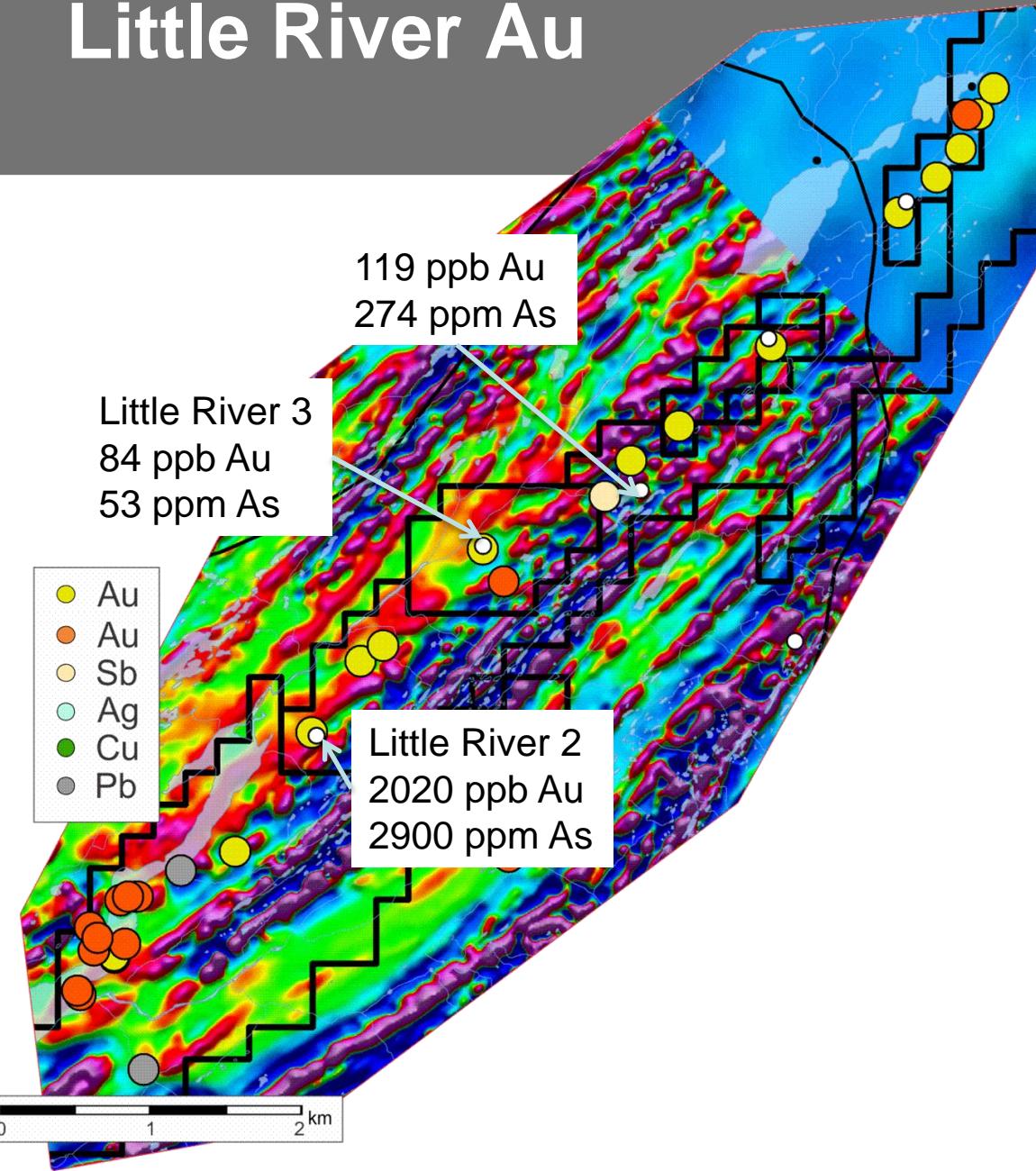


Trend between
True Grit and
Southeast Brook!

lower magnetic
intensity

➤ sandstone:
easier pathway
for metal-
bearing fluids?

Little River Au



linear trend within
Isle Galet
formation

mostly staked,
drilled in several
places

Au related to
lower magnetic
intensities
(volcanic rocks
and phyllites)

Future work



- Continue mapping – west half of map sheet
 - North Bay granite
 - Salmon River Dam formation
- Follow up some mineralisation trends
- Detailed petrography
- Incorporate 3D visualization into mapping?
- Geochronology (volcanic units, intrusions)
- Sm-Nd isotope geochemistry

Thank you!!!!

Newfoundland
Labrador

