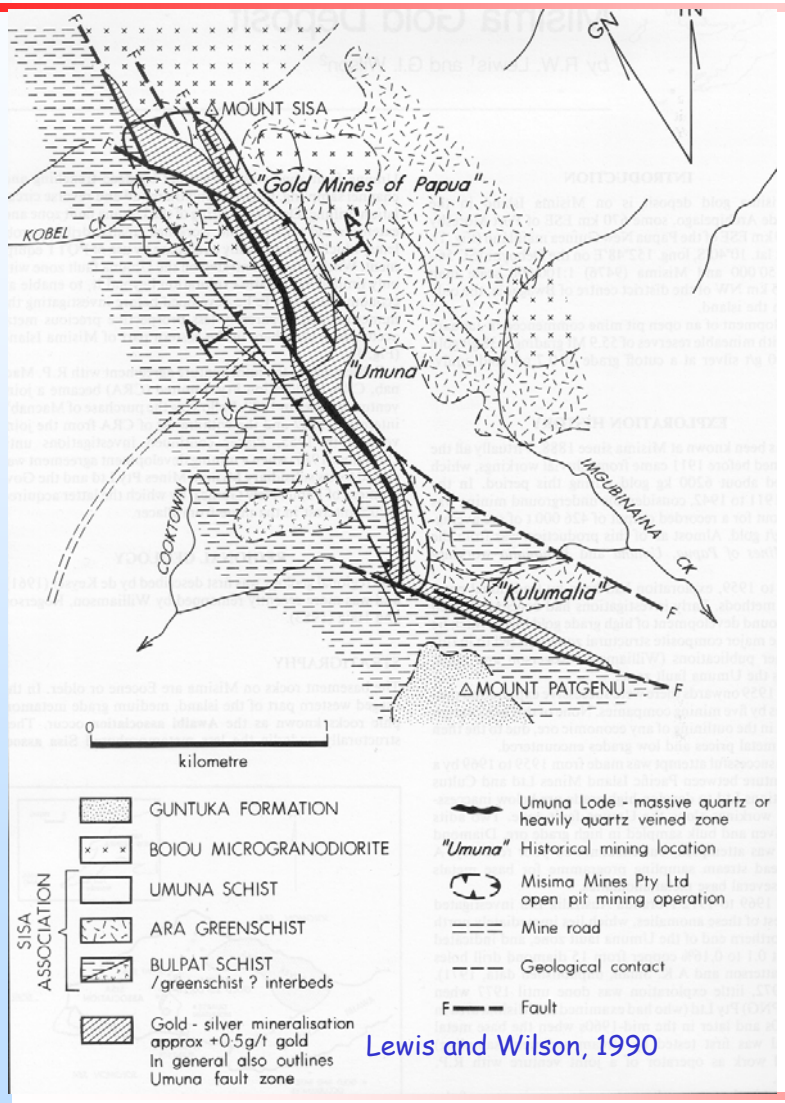
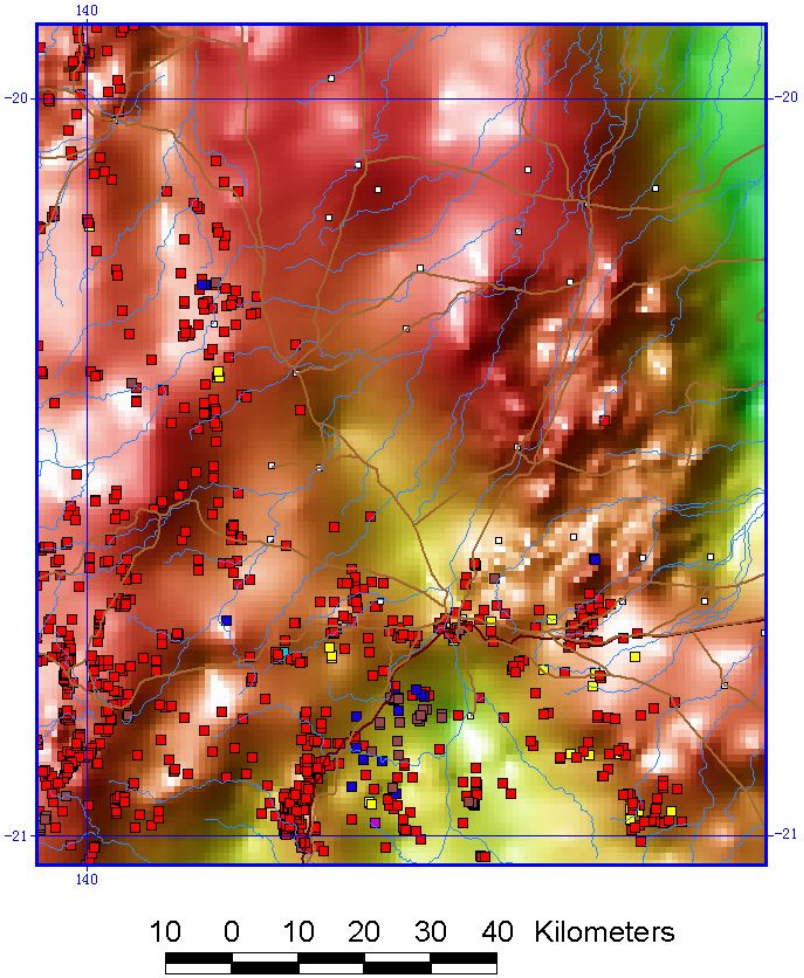


Lewis and Wilson, 1990

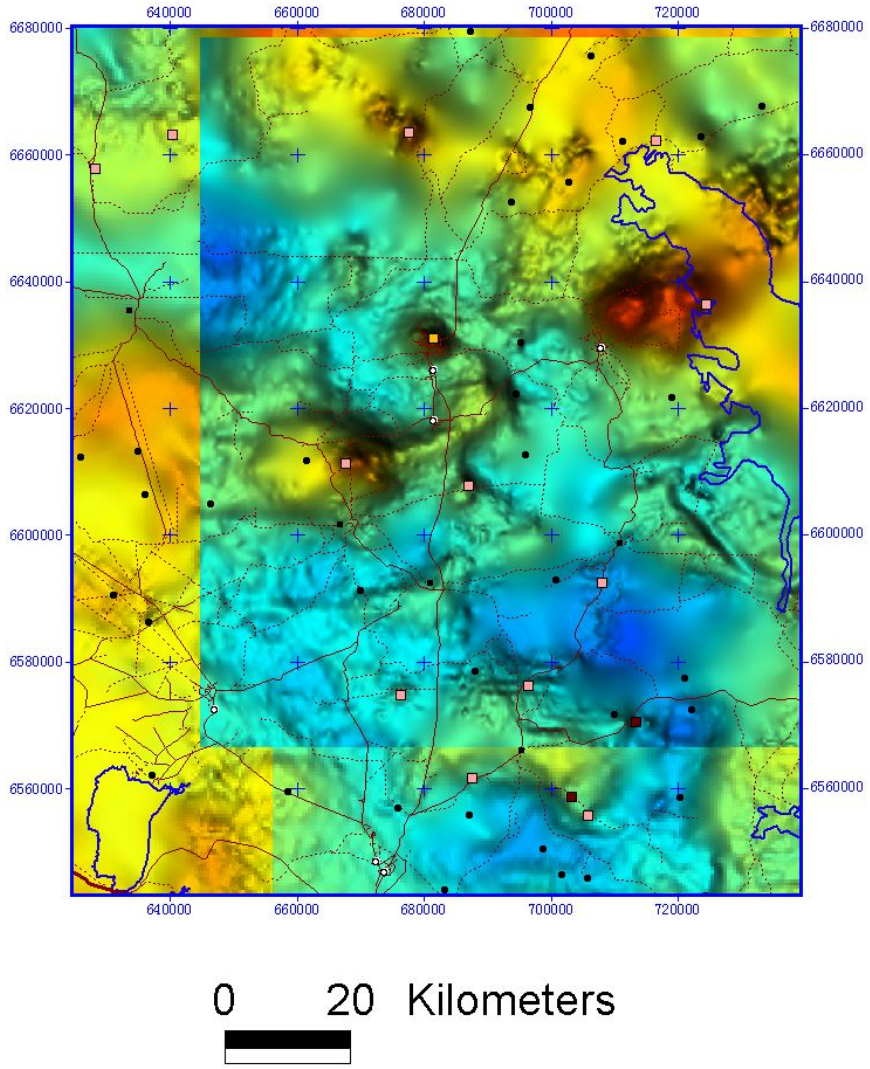
Misima, PNG

- Other IAG
  - SW Pacific Arcs,
  - Alaska Gold Belt,
  - Archaean Gold ……..

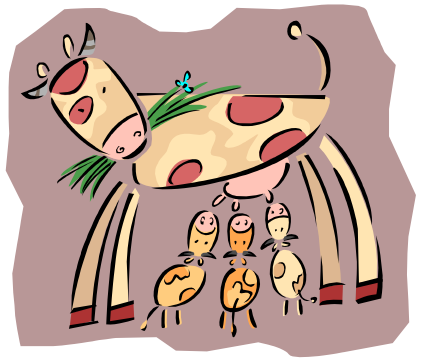
- Intrusives Association
  - For IOCG and IAC
    - IOCG: No consistent LOCAL relations
    - IOCG: Small and Lage, Felsic to Mafic
    - IOCG: No evidence in gravimetric data!
    - IAC: EDGES of subjacent plutons !!!!!

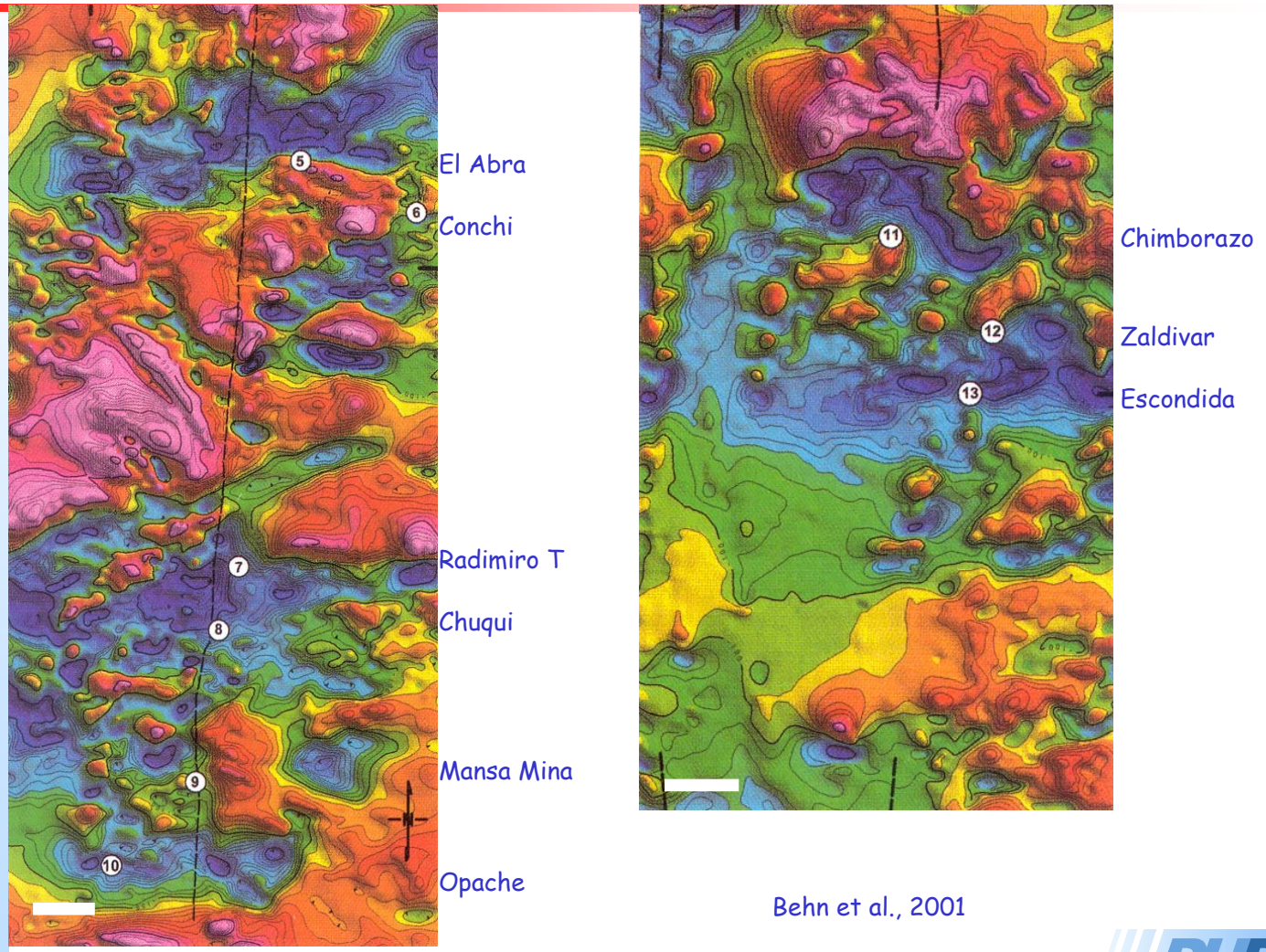


Ernest Henry
Bouguer Gravity
Signature

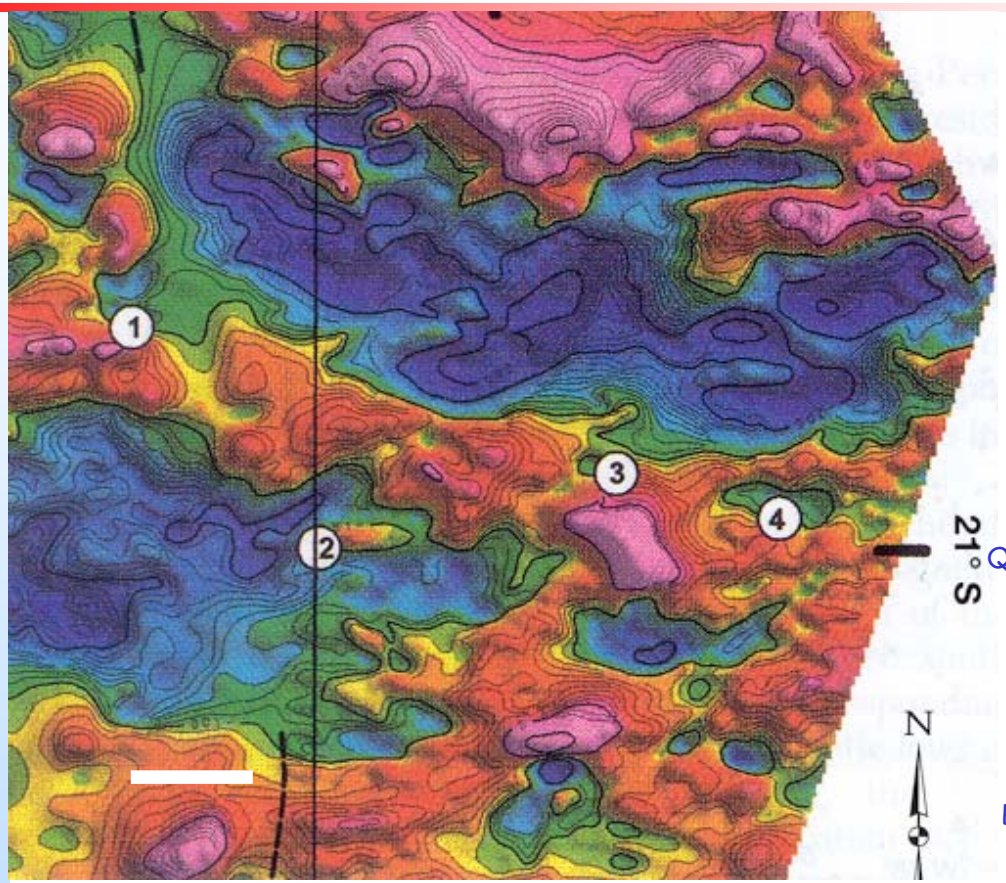


Olympic Dam
Bouguer Gravity
Signature





Behn et al., 2001



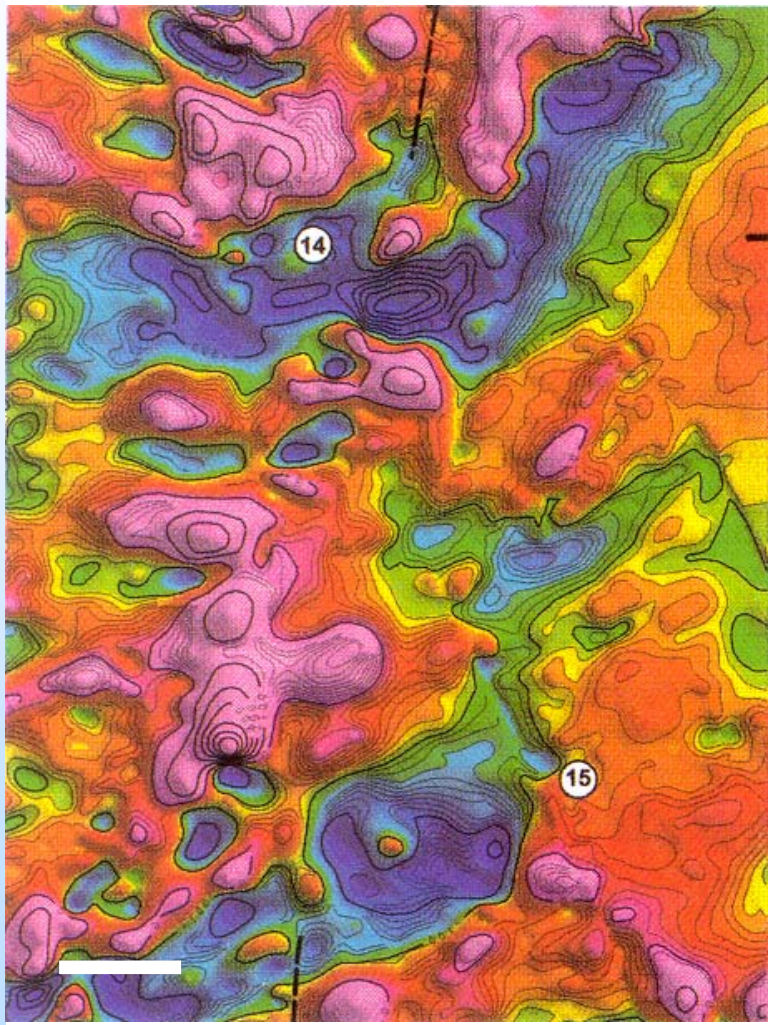
Copaguiri

Collahuasi

Ujina

Quebrada Blanca

Behn et al., 2001



El Salvador

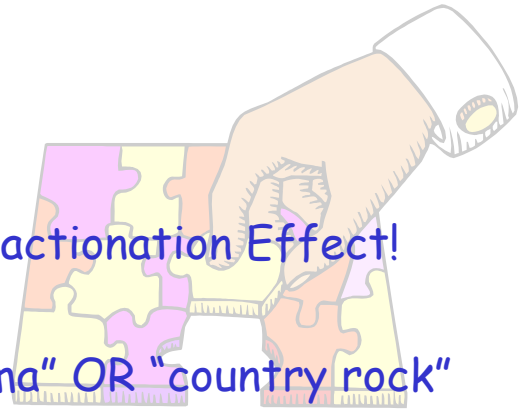
Potrerillos

Behn et al., 2001

- Geochemistry and Isotope Signatures
  - For IOCG and IAC
    - IOCG: Geochemistry: Mixed Provenance
    - IOCG: Positive Eu
    - IAC: Re/Os: Grasberg: Cu, Au source is intrusive, and crustal sources. (Mathur et al., 2002)
    - ALL: S isotopes: sulphur sources are various rocks, incl "country rocks". O and H isotopes either magma or hot, sub-solidus "magma" under high R/W.

- Geochemistry and Isotope Signatures
  - For IOCG
    - Ag, As, Au, B, Ba, Bi, Ca, Co, Cu, Eu, F, Fe, Hg, K, LREE, Mn, Mo, O, P, Pb, S, Se, Si, Te, Th, U, W, Zn
    - No Zr, Nb. Low: Mg.

- Geochemistry and Isotope Signatures
  - For IOCG and IAC
    - Sulphur Isotopes:
      - Limited Reduced S Reservoir
      - $\Sigma M \gg \Sigma S$--
      - No or Little Fractionation Effect!
      - Reflects "magma" OR "country rock"



Reduced Sulphur Deficit

Redox: IOCG

$SO_4^{--} + 8H2O + 8Fe^{++} \rightarrow$

$4Fe2O3 + 14H^{+} + H2S$

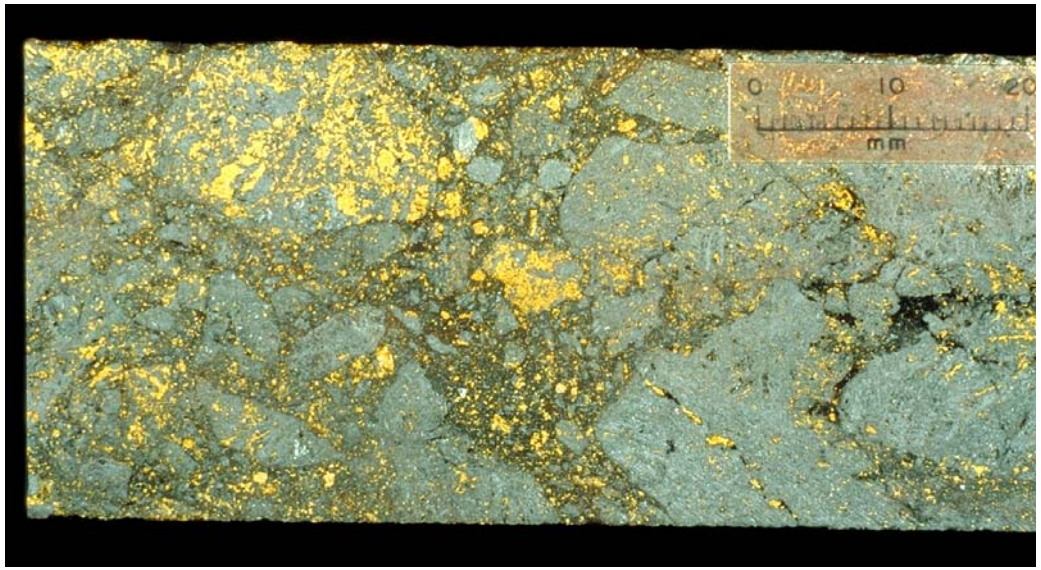
Disproportionation: IAC

$4SO2 + 4H2O \rightarrow$

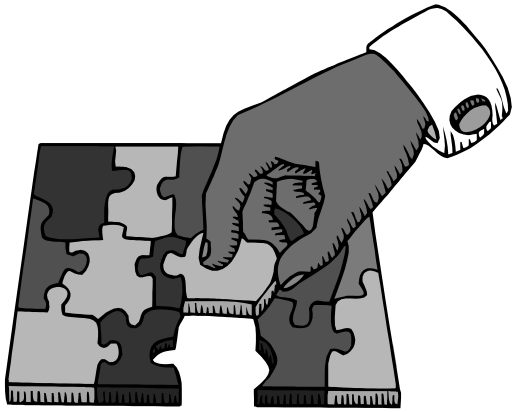
$H2S + 3H^{+} + 3HSO4-$

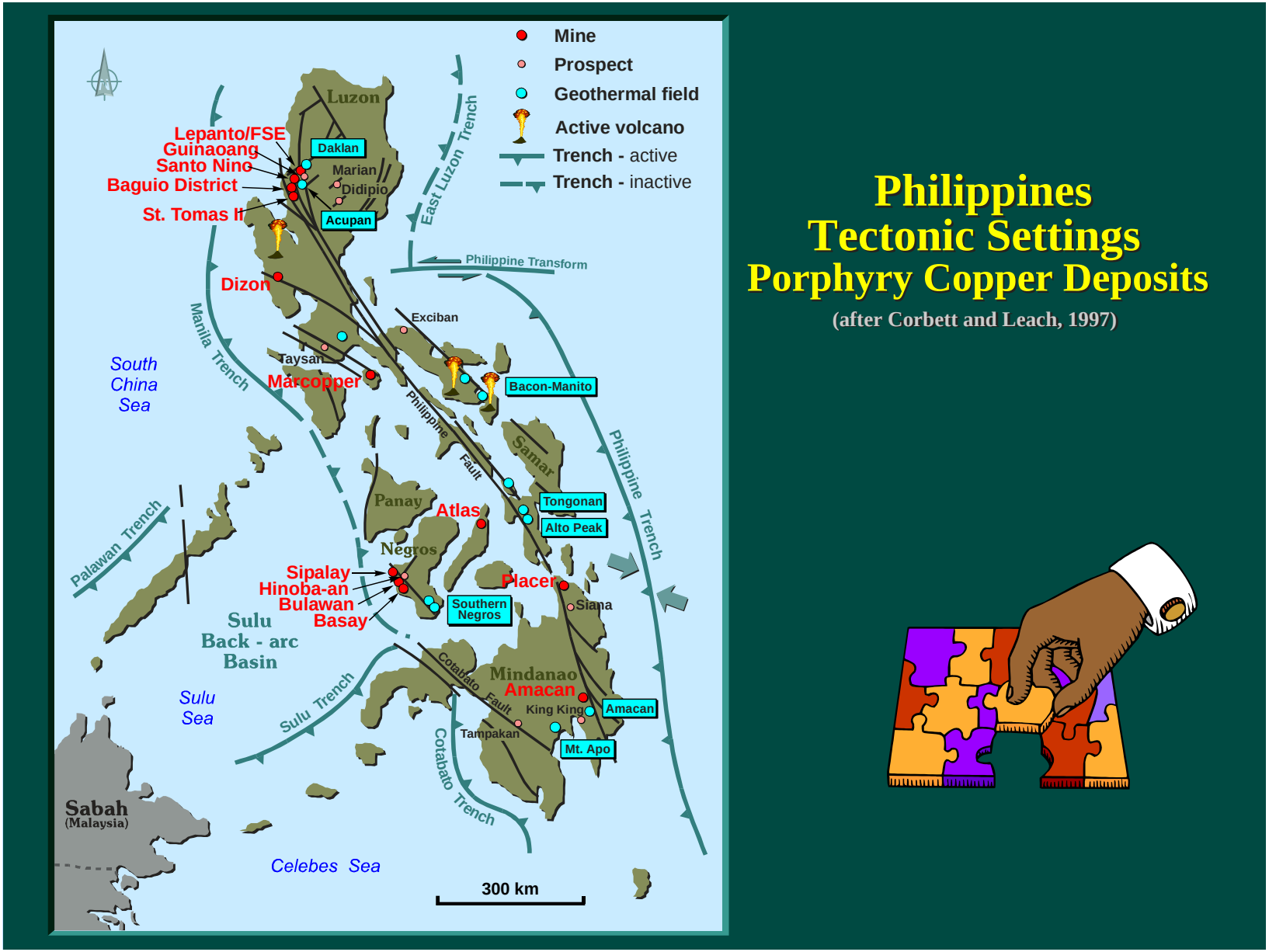
If $\Sigma M >> \Sigma S--$,
little fractionation in fluid flow path (~ 14 per mill at 300C in El Salvador)

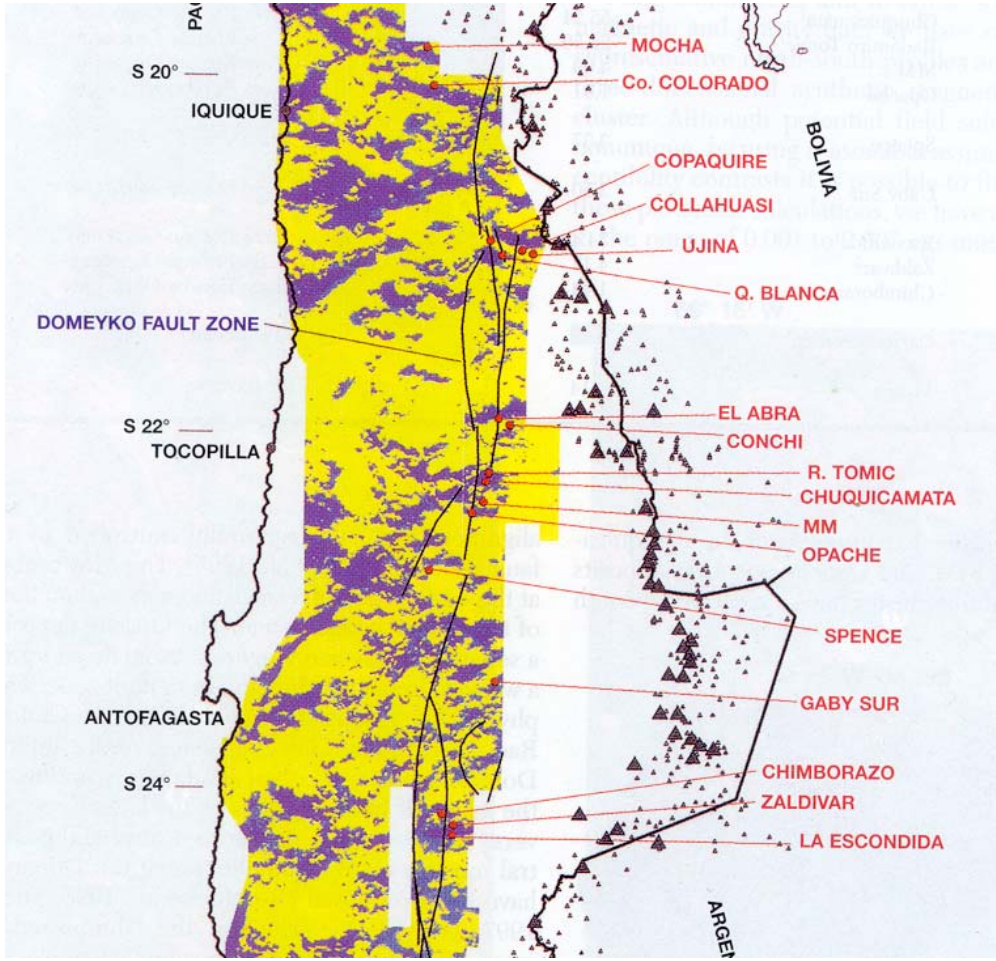
Reduced Sulphur Deficit



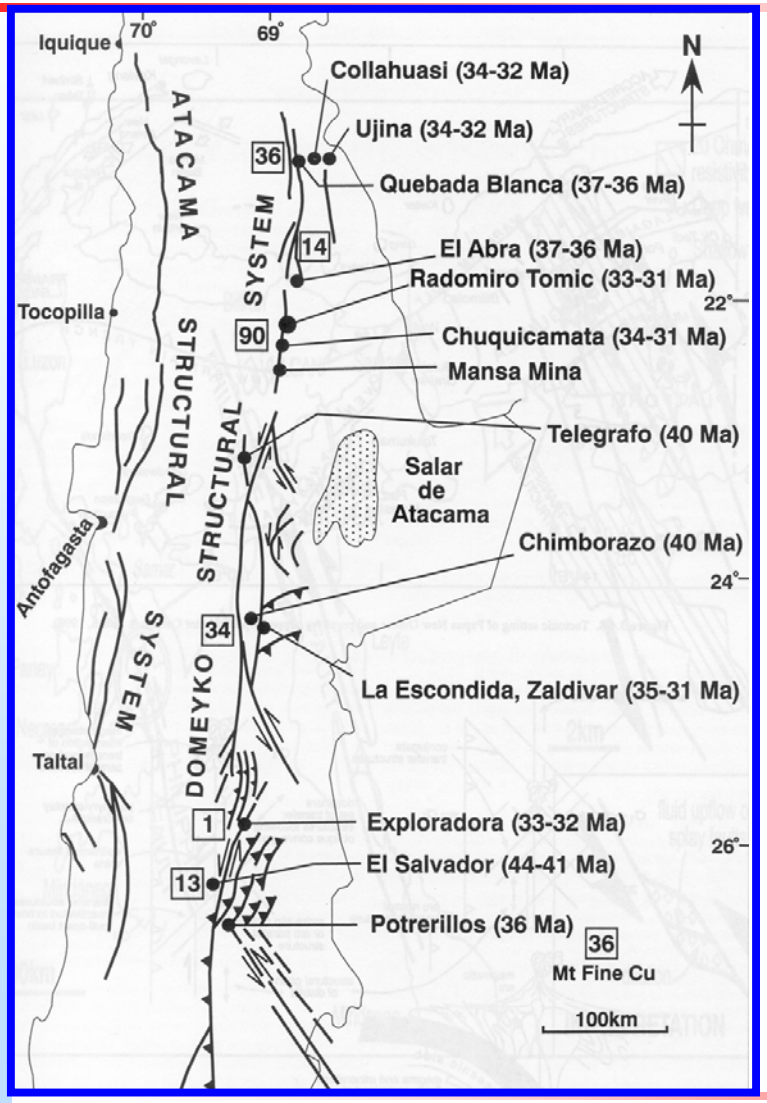
- Structural Association
  - For IOCG, IACG, and IAG
    - Regional Scale Faults and Associated fault sets
    - Demonstrated for IAC and IAG, less so for IOCG





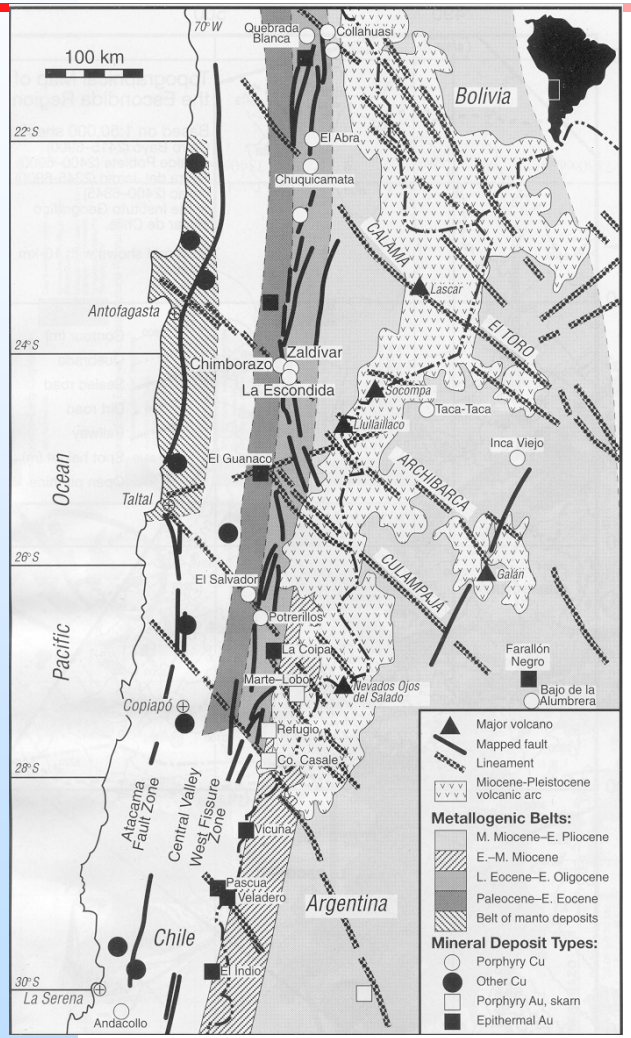


Behn et al., 2001

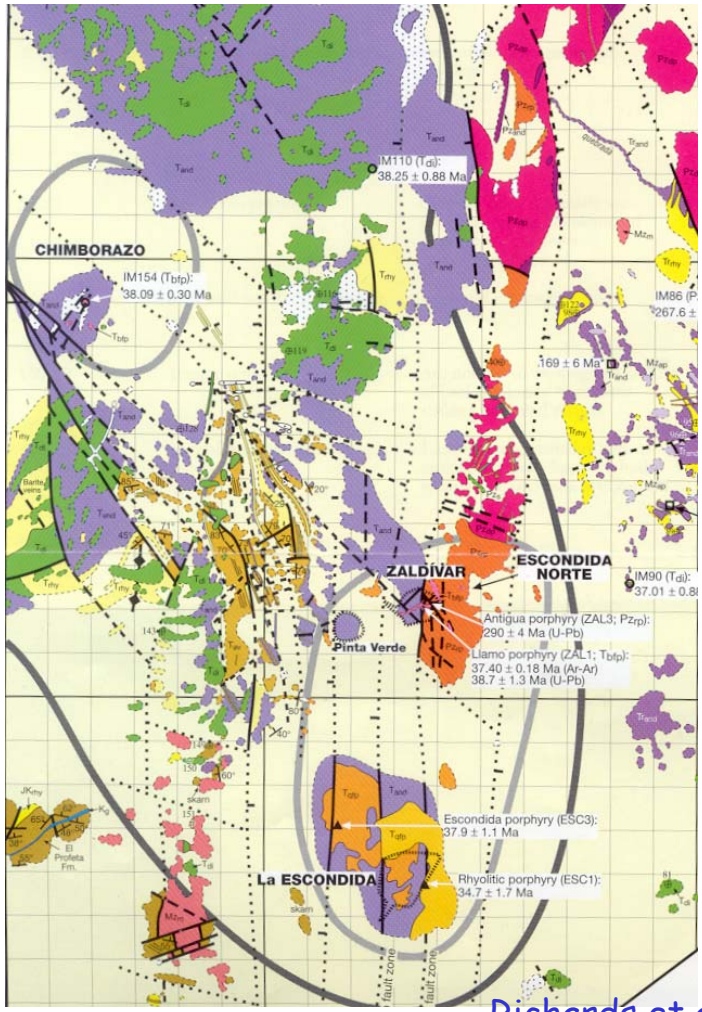


Domeyko Strike Slip Fault System, Chile (after Cornejo et al., 1997)

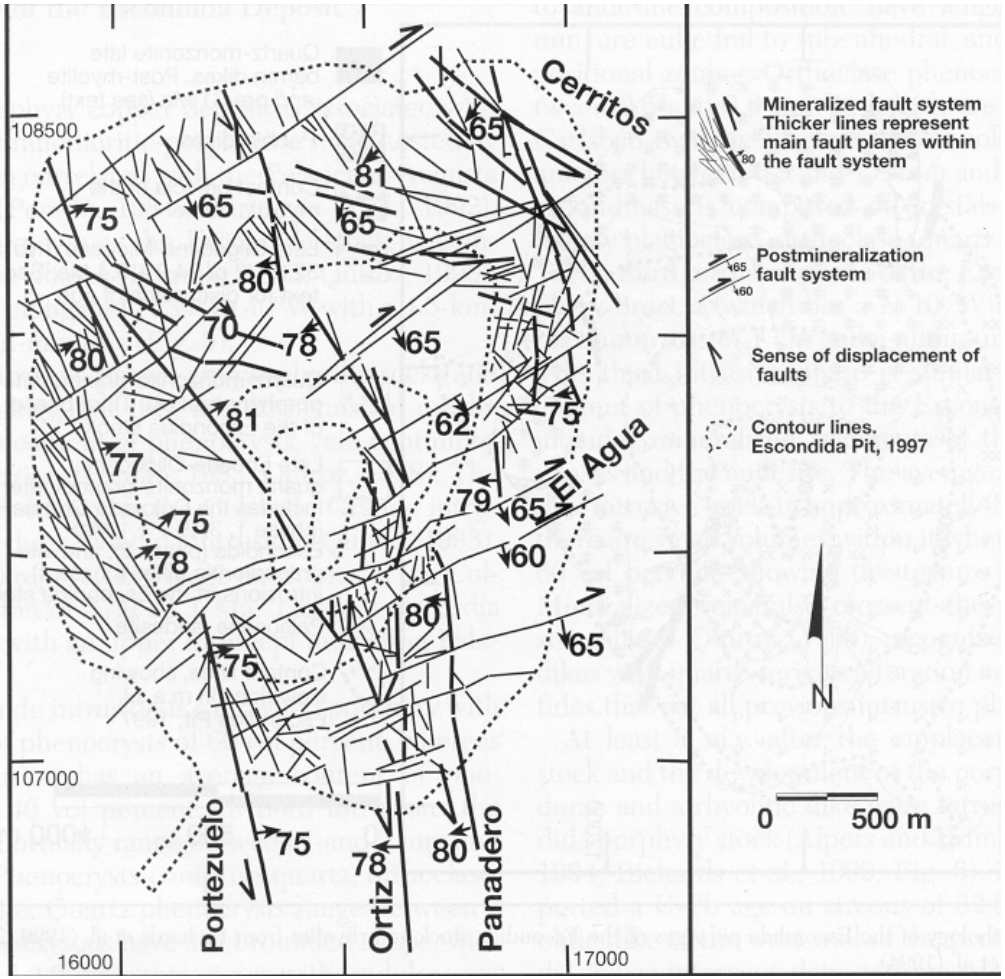
From K McClay, 2003, with permission



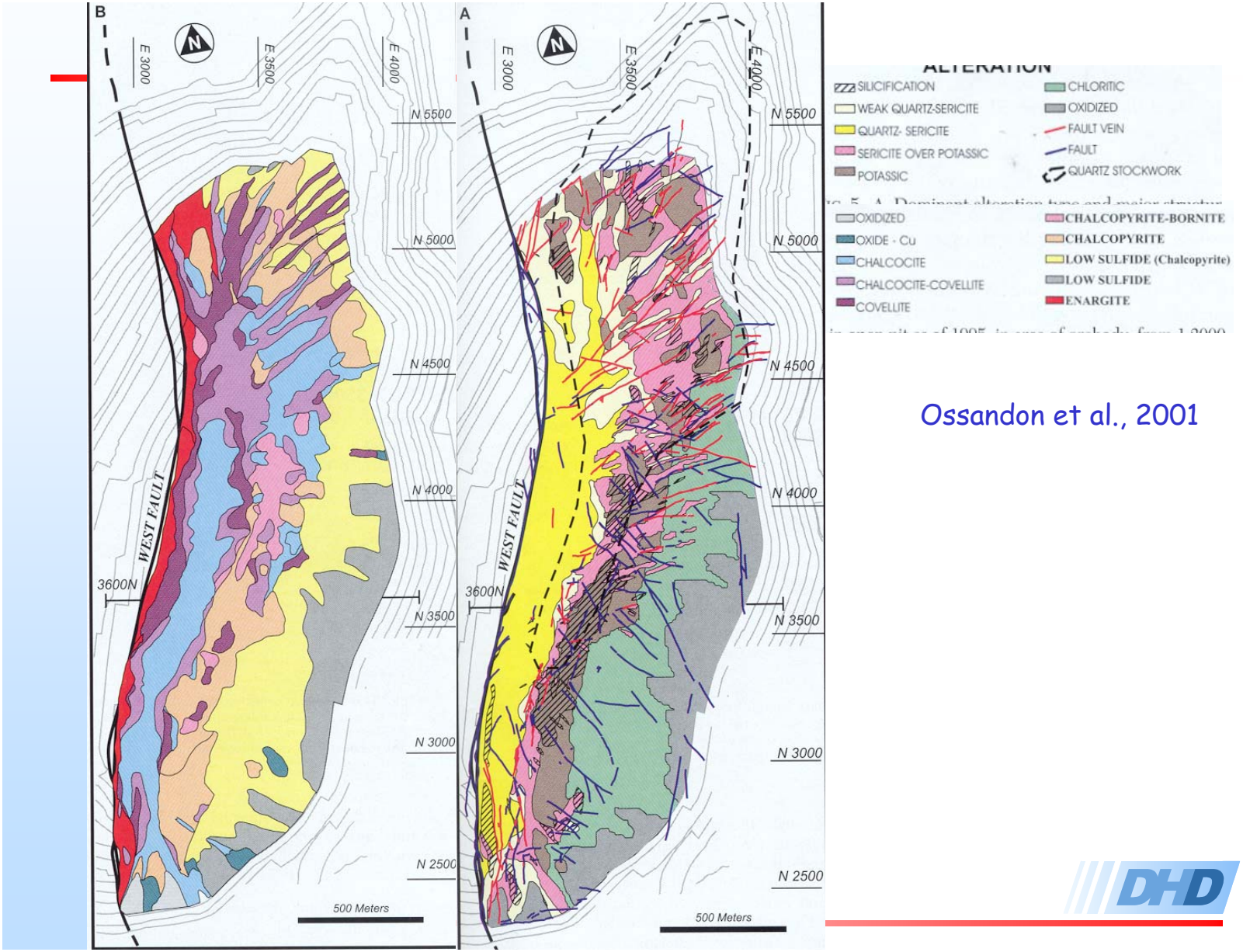
Richards et al., 2001



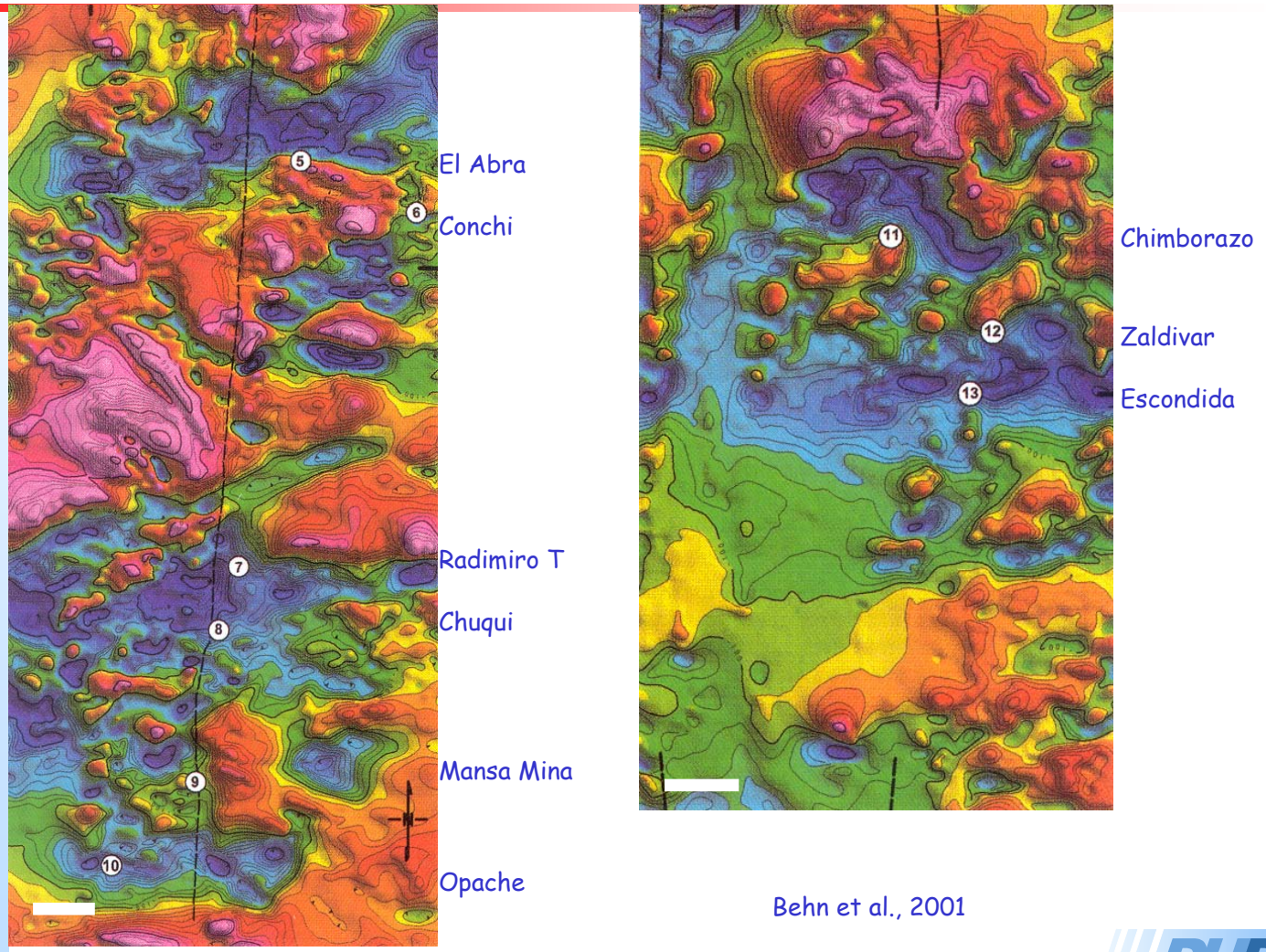
Richards et al., 2001



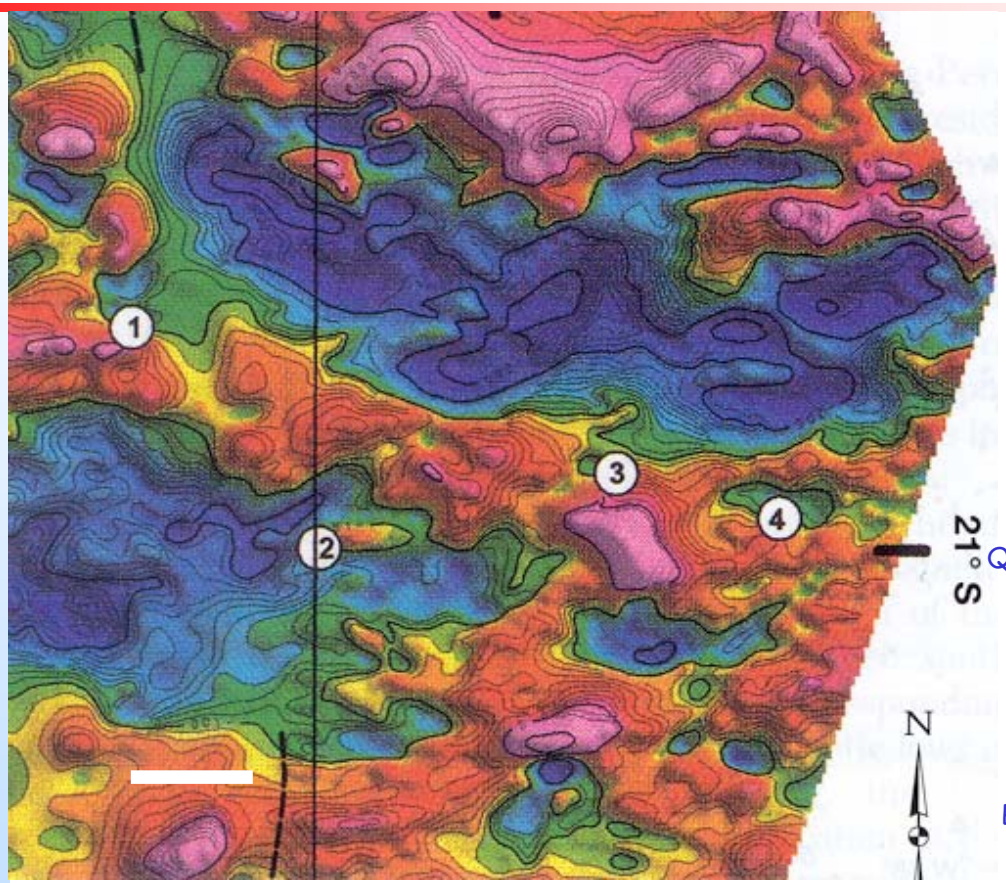
Padilla-Garza et al., 2001



Ossandon et al., 2001



Behn et al., 2001



Copaguiri

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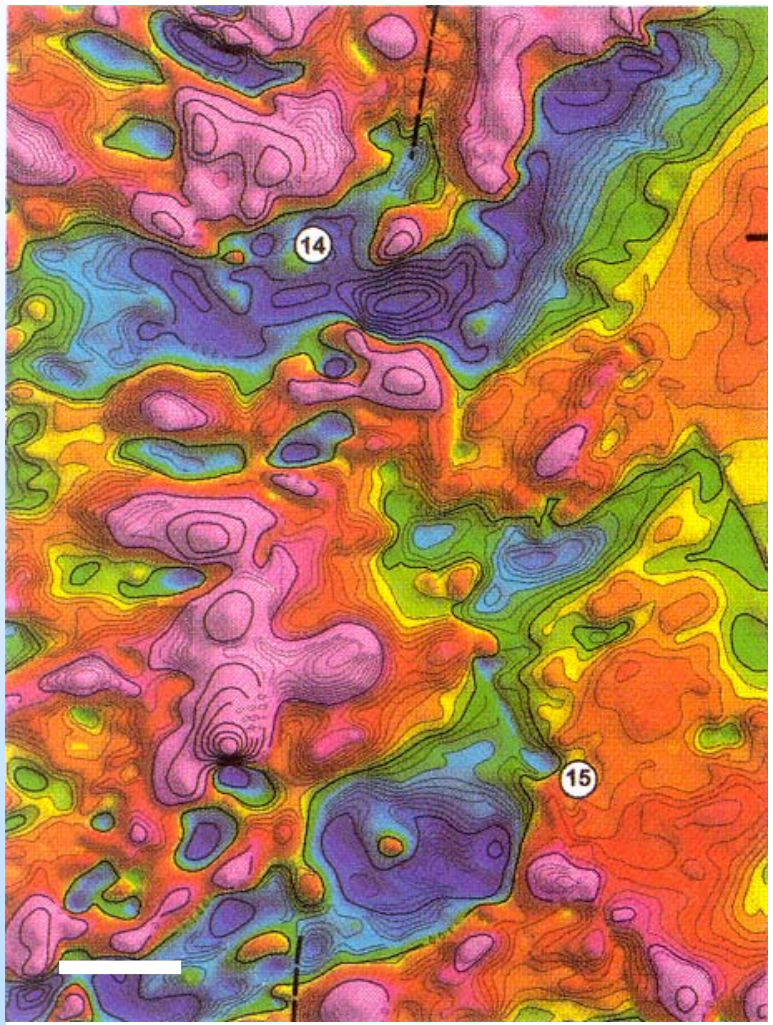
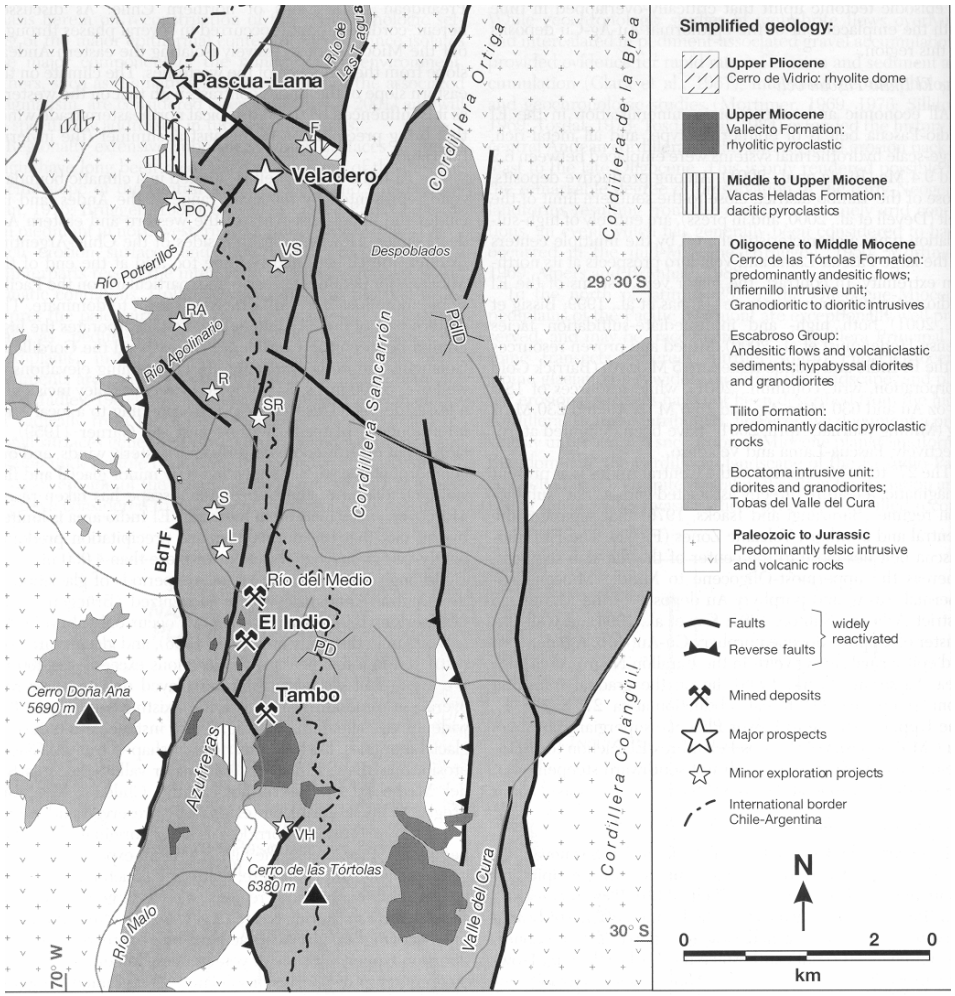
Behn et al., 2001



El Salvador

Potrerillos

Behn et al., 2001



Ishihara Granites Symposium July, 2003

Porgera, PNG

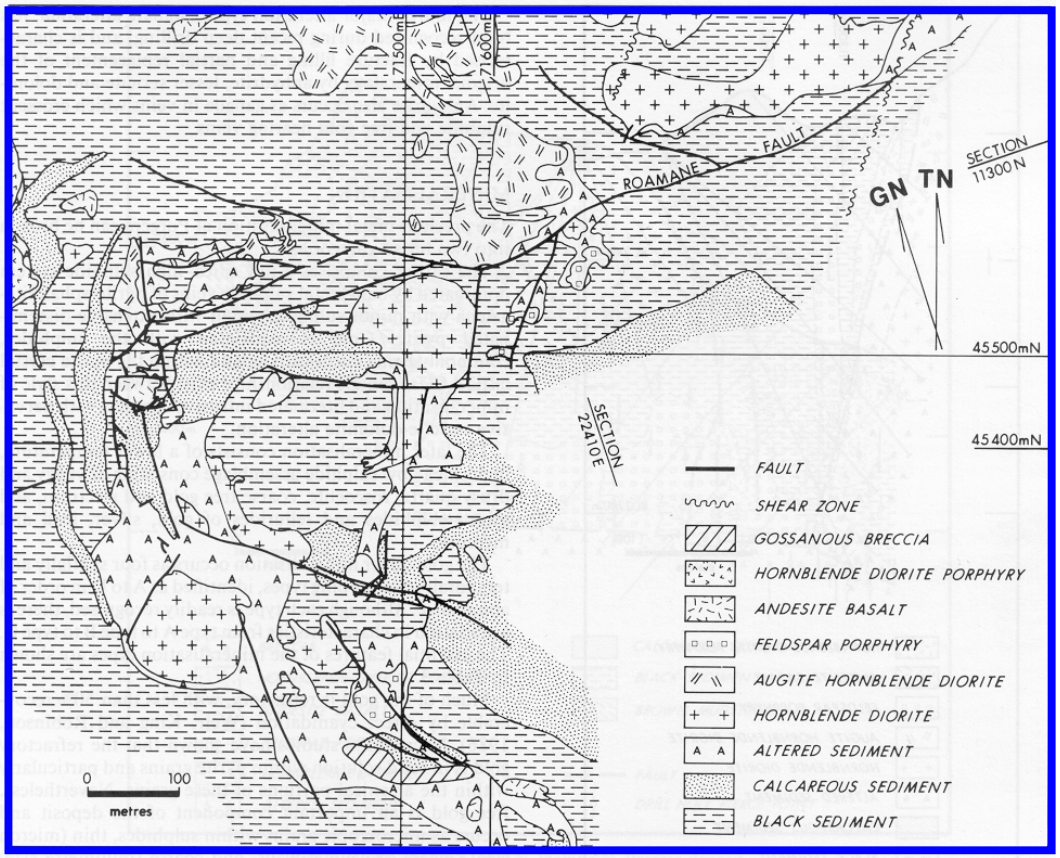
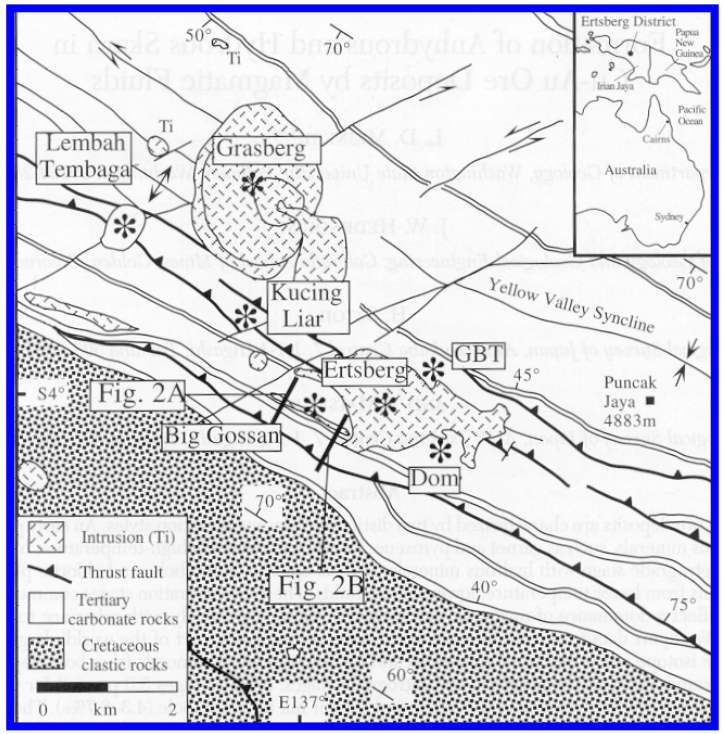
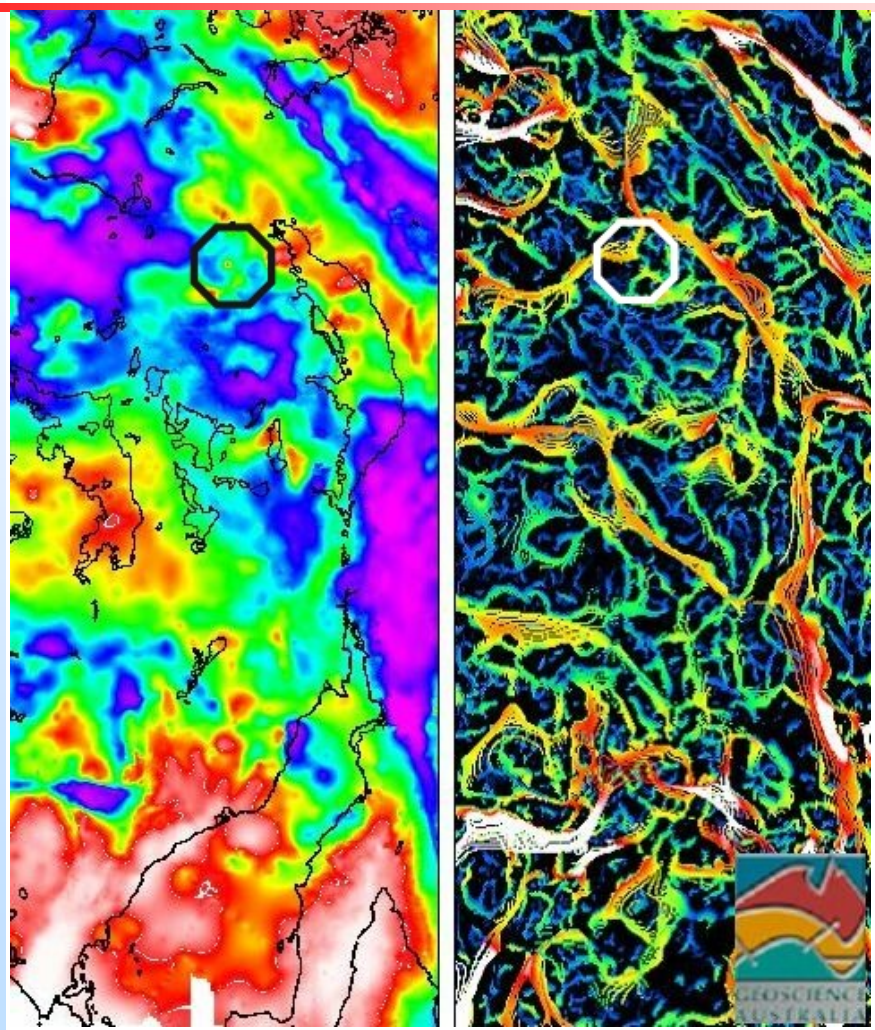


Fig. 2—Local geological map, Porgera deposit.

Grasberg, IJ

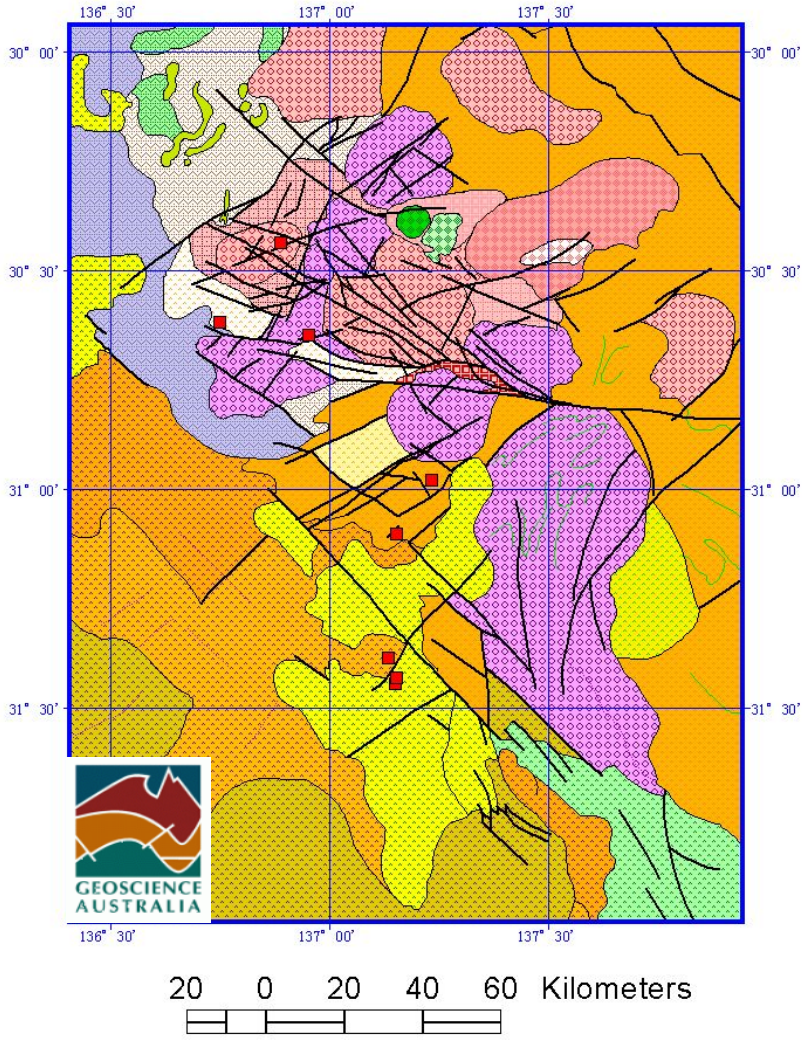


From Meinert et al., 2003

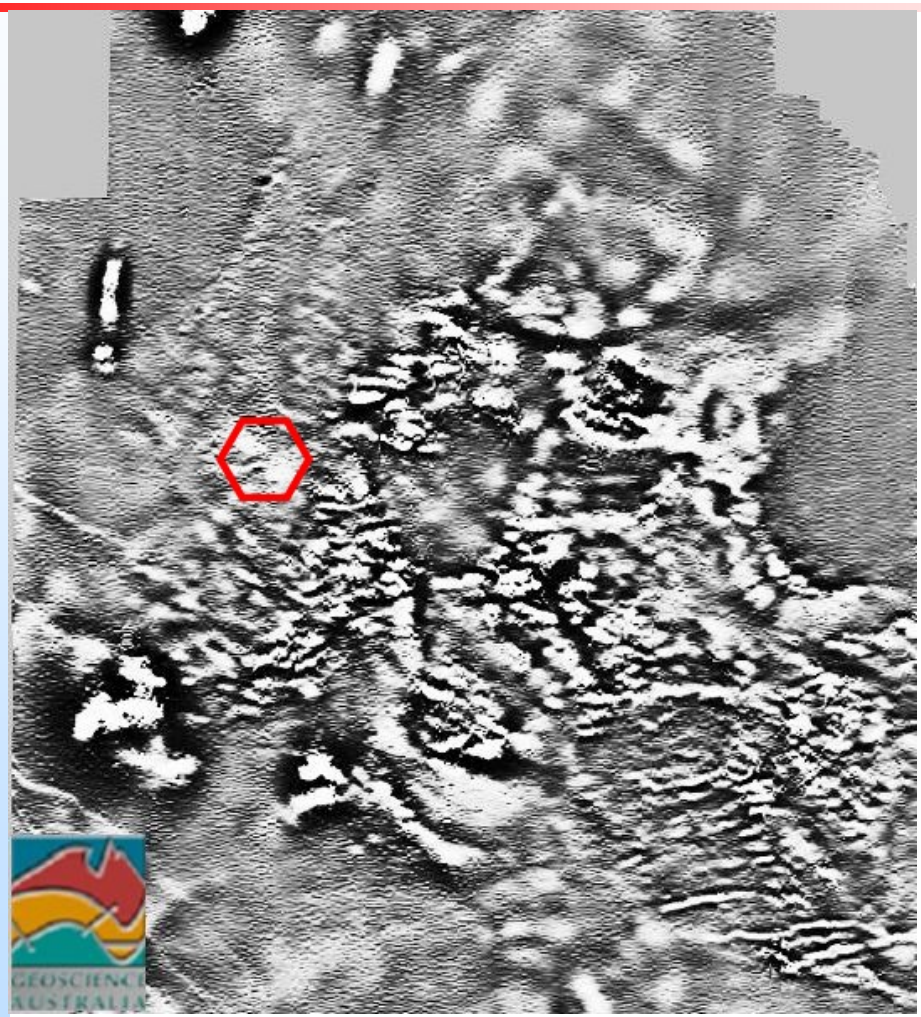


Olympic Dam
Regional Major
Faults

Courtesy:
R Skirrow
N Direen



Olympic Dam
Interpreted
Major Faults



Olympic Dam
Detailed 1VD
Magnetic
Signature

Courtesy:
R Skirrow
N Direen