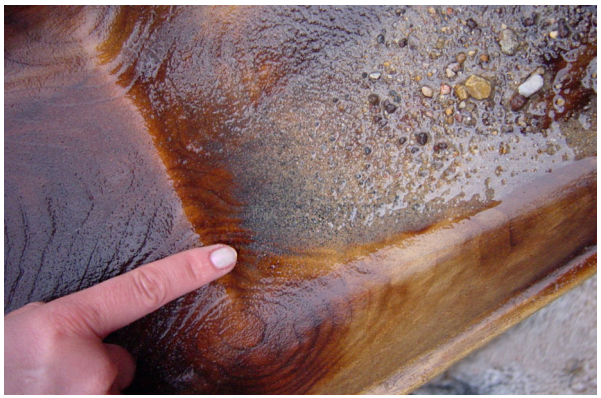
Geochemical remote-sensing of vast or inaccessible areas

Nature does the heavy lifting - erosion samples the drainage area



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gemoc.mq.edu.au/TerraneChron.html

TerraneChron®

A powerful methodology for analysing crustal evolution and evaluating the metallogenic potential of terranes

Australian Research Council
Centre of Excellence for
Core to Crust Fluid Systems

GEMOC ARC National Key Centre

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Macquarie University's *TerraneChron®* Facility is a node of the AuScope '*Earth Composition and Evolution*' Program.

www.auscope.org.au/earth-composition-and-evolution/

Geochemical remote-sensing

- Based on zircon analyses
- Efficient and cost effective
- Identifies regional tectonic events
- Dates magmatic episodes
- Fingerprints crust reworking and mantle input (fertility)

What is TerraneChron®?

TerraneChron® was developed by CCFS/GEMOC to provide rapid, cost-effective characterisation of crustal history on regional scales (10-1000 km^2). It uses U-Pb, Hf-isotope and trace-element analysis of single zircon grains.
This multi-instrument approach:

- Provides U-Pb ages, with a precision equivalent to SHRIMP
- Uses Hf isotopes to trace magma sources (crustal vs juvenile mantle input)
- Identifies parental rock types of detrital zircons using trace elements

What kind of samples?

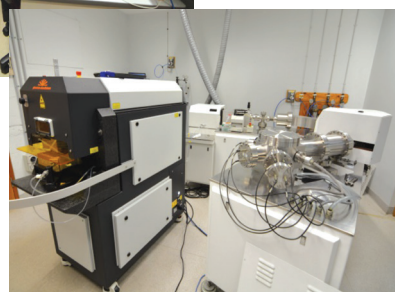
- Regional heavy-mineral sampling (modern drainages: terrane analysis)
- Sedimentary rocks (basin analysis)
- Igneous rocks (dating, specialised genetic studies)

Mineral Exploration

TerraneChron®

- Pinpoints time of mineralisation
- Provides regional tectonic history
- Samples poorly mapped and remote areas
- Allows better prioritisation of exploration target areas
- Can identify the presence/absence of key rock types e.g. Cu/Au porphyries

Multi - instrument integration of geochemical data



Provides detailed reports with contextual information

Rapid & cost effective

***TerraneChron®* is a cost-effective tool for rapid regional exploration of mineral and energy resources**

Macquarie GeoAnalytical provides access to an extensive GEMOC/CCFS database of over 70,000 U-Pb and 30,000 Hf-isotope zircon analyses.

Oil and Gas Exploration

TerraneChron®

- Can reveal changes in direction of basin filling, regional tilting, rates of subsidence, styles of sedimentation and sedimentation source
- Provides stratigraphic markers in thick non-fossiliferous sediment
- Provides geological history of sediment source areas