

Detrital zircon, rutile and titanite study of present-day Labrador river drainages: Fingerprinting the Grenvillian front

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A multidisciplinary provenance study, including CC-SEM and U-Pb geochronology of detrital zircon, rutile and titanite, are undertaken on stream sediment samples collected during the summer 2012 and 2013 from major rivers in the eastern part of Labrador, Canada. The purpose is to fingerprint distinct source areas that have delivered material to the reservoir sand units deposited in the offshore sedimentary basins of the Labrador Sea and, in turn, to study the sedimentary pathways in the offshore sedimentary basins. A secondary goal is to study how the relative distribution of detrital zircon, rutile and titanite ages in the sand samples recovered from the drainage systems reflect the regional geology of Labrador, hereunder to compare the ages to on-going geological mapping of the Labrador region. Using detrital titanite and rutile data in addition to detrital zircons has the potential to recognize sediment sources not represented in the zircon population and can provide chronological and petrogenetic insight into the tectonothermal history of the source regions [1] [2]. Zircon, rutile and titanite are extracted from 10 samples selected for U-Pb dating to determine temporal limits for the ages of deposition and provide new data for characterization of the provenance sources, including apparent metamorphic stages that have occurred in the basement terrain. The U-Pb dating are obtained on mounted grains by LA-SF-ICPMS using a 25 µm laser spot size. More than 1500 single grain analyses of zircon, titanite and rutile are acquired. Ages are calculated using the Iolite (v.2.5) [3] VizualAge DRS [4] for zircon and rutile and the UcomPbine DRS [5] for titanite. Common Pb correction is corrected using measured 204Pb. The GJ-1 zircon is used as the bracketing standard for the analyses. The results of this on-going study and implications for the eastern Labrador regional geology are presented at the meeting.

- [1] McAteer et al. (2010) *Precambrian Research* **181**, 21-42.
 [2] McAteer et al. (2014) *Scottish J. Geology* **50**, 2, 143-158.
 [3] Paton et al. (2011) *JAAS* **26**, 2508-2518. [4] Petrus & Kamber (2012) *GGR* **36**, 247-270. [5] Chew et al. (2014) *Chemical Geology* **363**, 185-199