# The Santa Quitéria Batholith, NE Brazil: A mantle–crust interaction

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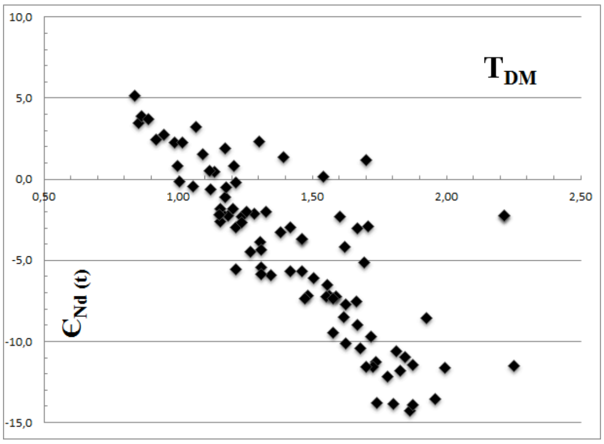
Granitoid magmatism is an important tool for the characterization of mantle-crust interaction, a process which extremes are represented by M- type (mantelic) and S- type (crustal) granites. The huge (~15.000km$^2$) Brasiliano Santa Quitéria batholith (SQB) from the Borborema Province, state of Ceará, NE Brazil, comprises mainly high-K/shoshonitic megaporphyritic/evengrained monzodiorites, monzogranites and granites. Its long lasting (650-470 Ma.) magmatic evolution reflects part of the closure of the Pharusian Ocean and the collision between the Amazonas, São Luiz, São Francisco and West Congo cratons. 90 Sm-Nd data for SQB rocks [1-4] show that their parent magma represents an isotopic mixture of a juvenile mantelic component with older, mainly Paleoproterozoic, crustal rocks. The geological, petrographic and geochemical evidences for the mixture change from the syncolissional, via the syntranscurrent, to the late magmatic stage of the batholith, the last one related to the regional relaxing and collapsing of the orogen.




[1] Fetter (1999) Ph.D. thesis, Kansas University, USA, 164p.
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[4] Santos *et al*. *unpublished*.

# Probing the silicon isotope signature of supply limited chemical weathering in the Cordillera Central of Costa Rica

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The fractionation of silicon isotopes during tropical, supply-limited weathering remains incompletely understood, a key missing link in being able to use the Si isotope system to infer the rates and character either of primary mineral weathering, or of biogeochemical cycling of Si. Samples of rock, soil, vegetation, and water from La Selva Biological Preserve, on the flanks of Volcan Barva in the Cordillera Central of Costa Rica, provide the opportunity to (i) better constrain the isotopic signature of dissolved Si associated with supply-limited weathering, and (ii) understand the mechanisms generating the observed isotopic characteristics in these settings. We collected samples from La Selva and analysed these samples for $\delta^{30}Si$ by MC-ICP-MS. Si-isotope analyses of samples from La Selva confirm that weathering in tropical, supply-limited environments generates the isotopically lightest dissolved Si that has been observed in stream and river waters measured globally. Streams with significant groundwater contribution, with flowpaths through less altered volcanic bedrock, have significantly higher isotopic compositions, reflecting primary mineral weathering. Analysis of bedrock and soils, including clay separates from soils, indicates that this light isotopic composition of dissolved Si is a consequence of the dissolution of clay minerals formed during previous weathering cycles. Contemporary weathering processes in the soil at La Selva are associated with precipitation of even lighter neo-formed clays, driving the bulk soil to increasingly light Si isotope ratios. Weathering of secondary minerals in such locations, as confirmed in this study, may complicate interpretation of the variability in dissolved riverine Si isotopes over large spatial scales and long temporal scales.