



Subduction Complex Provenance redefined: modern sands from the Indo-Burman-Andaman-Nicobar Ridge and Barbados Island

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Subduction complexes large enough to be exposed subaerially and to become significant sources of terrigenous detritus are formed by tectonic accretion above trenches choked with thick sections of remnant-ocean turbidites. They thus need to be connected along strike to a large Alpine-type or Andean-type orogen, where huge volumes of orogenic detritus are produced and conveyed via a major fluvio-deltaic system to the deep sea (Ingersoll et al., 2003).

We investigated sediment generation and recycling in the Indo-Burman-Andaman-Nicobar subduction complex, representing the archetype of such settings in the eastern prolongation of the Himalayan collisional system. “Subduction Complex Provenance” is composite, and chiefly consists of detritus recycled from largely turbiditic parent rocks (Recycled Clastic Provenance), with local supply from ultramafic and mafic rocks of forearc lithosphere (Ophiolite Provenance) or recycled paleovolcanic to neovolcanic sources (Volcanic Arc Provenance; Garzanti et al., 2007). In order to specifically investigate the effect of recycling, we characterized the diverse detrital signatures of Cenozoic sandstones deposited during subsequent stages of “soft” and “hard” Himalayan collision and exposed from Bangladesh to the Andaman Islands, and discuss the reasons for compositional discrepancies between parent sandstones and their recycled daughter sands.

A companion study was carried out with the same methodologies, rationale and goals on Barbados Island, one of the few other places where a large accretionary prism is subaerially exposed. Also modern Barbados sands are largely multicyclic, reflecting mixing in various proportions of detritus from the basal Scotland Formation (sandstones and mudrocks), their stratigraphic and tectonic cover, the Oceanic Formation (quartzose turbidites and deep-water biogenic oozes including radiolarite), and from the Pleistocene calcarenite and reefal cap, as well as from volcanic layers ultimately derived from the Lesser Antilles. Mixing of detritus recycled from orogen-derived turbidites transported long distance with detritus from oceanic mélange, pelagic sediments and younger calcareous cap rocks and in addition volcanoclastic products thus redefines the diagnostic mark of Subduction Complex Provenance as quite distinct from the original definition by Dickinson and Suczek (1979).

REFERENCES

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