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A review of the chronologies and geomorphology of the aeolian landforms in the northwestern Negev dunefield (Israel)

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The northwestern (NW) Negev Desert dunefield covering an area of only 1,300 km2, comprises the eastern end of the northern Sinai Peninsula – NW Negev erg and is probably the most densely dated dune body in the INQUA Dunes Atlas chronologic database. Over 230 luminescence ages (TL, IRSL, and mainly OSL) and radiocarbon dates have been retrieved over the past course of 20 years from calcic and sandy palaeosols serving as dune substrates, sand sheets, vegetated linear dunes (VLDs), fluvial deposits, and archaeological sites. Despite being from different deposit types and aeolian morphologies, and based on different methodologies, the chronologies usually show good compatibility. By reviewing and reassessing the significance of the Eastern Mediterranean INQUA Dunes Atlas chronologies, along with detailed stratigraphic, structural and geomorphologic data and understandings, the major, and possibly extreme, episodes of aeolian activity and stability are outlined. Repetitive chronostratigraphic sequences in VLDs indicate that this dune type, at least in the Negev, comprises a reliable recorder of main dune mobilization periods.

This presentation demonstrates that certain combinations of research finds, using different OSL dating strategies and other regional and local late Quaternary records and in particular aeolian ones, are required assets for providing for acceptable local and regional palaeoclimatic interpretations. The distribution of the VLD chronologies points to rapid mobilization during the Heinrich 1 and Younger Dryas, characterized by powerful winds, though VLDs also form in late Holocene palaeoenvironments. Time slices illustrate the different sensitivities of the studied aeolian landforms to the source, availability, and supply of sediment; long- and short-term climate change, local human-induced environmental changes and also their joint effects, that enable evaluation of aeolian responses to future environmental and climate changes.