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Editorial

Introduction: Aeolian sediments and environments (IAS Meeting, Schladming, Austria, 2012)

This special issue includes papers originally presented as part of the Scientific Session "Aeolian Sediments and Environments" during the 29th IAS Meeting of Sedimentology, September 10–13th, 2012 in Schladming, Austria. This scientific session was attended by an international community of geologists with interest in aeolian processes, environments and their complex depositional systems. Contributions dealing with multidisciplinary approaches to gaining an improved understanding of the controls operating on aeolian systems from both modern and ancient settings were received.

The papers contained in this special issue of Aeolian Research describe the dynamic of fine-grained, wind-blown dust, the exceptional preservation of aeolian sands in insular karst depressions, the geomorphology of a large modern erg system, and the sedimentology and stratigraphy of an ancient depositional erg system.

Banak et al. present a paper entitled "Sedimentary characteristics and source of loess in Baranja (eastern Croatia)", which examines the sedimentology of Late Pleistocene loess deposits in the southern Pannonian Basin, between the Danube and the Drava rivers. The authors use a multidisciplinary approach, including field descriptions, grain size analysis and SEM images to determine the range of controls on wind-blown dust transport, accumulation and preservation. The study of heavy mineral assemblages indicates that the loess deposits have multiple source areas including the Danube flood plain and the Western Carpathians and/or the Slavonian Mountains. SEM images of aeolian grains indicate a complex transport history including via glacial and fluvial processes. The paper emphasizes that the wind regime responsible for transporting the silt material during Early and Late Pleniglacial blew from north and northwest contrasting in part to other loess deposits of the Pannonian Basin, transport of which were dominated by westerly winds.

Babić et al. present a paper entitled "Preservation of hanging aeolian deposits in insular karst depressions: sediment sources and implications for the Pleistocene palaeogeography of the SE Adriatic archipelago", which is based on the study of exceptional outcrops of Late Pleistocene aeolian sands of the South-eastern Adriatic islands. The accumulation and preservation of these deposits occurred at different elevations above present-day sea level. Some of the karst depressions are aligned in an orientation parallel to the strike of major faults within the insular carbonate rocks. The authors describe facies associations of both aeolian and water-lain origin and identify a complex series of interactions that operated between aeolian and aqueous processes in the karst depressions. The authors implemented a detailed analysis of provenance, which included the analysis of heavy mineral associations and bioclasts contained in the aeolian sands, and which allowed for determination of the origin of aeolian deposits and consideration of palaeogeographic implications. The accumulation of aeolian sands in insular karst depressions was influenced by two strong palaeowinds: one operating over a major part of the South-eastern Adriatic archipelago (similar to the present-day Sirocco), and a second which is locally important in the close vicinity to the mainland mountains (resembling today's Bora wind). The authors indicate that the sand was mainly transported along the coasts and funnelled along the low inter-island areas; from these areas, aeolian processes transported and deposited sand over the present-day island, with accumulation and preservation occurring in the insular karst depressions.

The paper of Al-Masrahy and Mountney entitled "Remote sensing of spatial variability in aeolian dune and interdune morphology in the Rub' Al-Khali, Saudi Arabia" comprises a detailed remote-sensing study of major aeolian dune fields in the large Rub' Al-Khali erg using Google Earth Pro software. This study records spatial changes in a variety of morphological parameters relating to dunes, including bedform height, spacing, wavelength, parent morphological type, bedform orientation, lee-slope expression, and plan-form amplitude and wavelength of along-crest sinuosities. Additionally, morphological parameters relating to interdunes are also recorded and include interdune size (long- and short-axis dimensions), orientation, and style of connectivity. The study includes an analysis of geomorphic relationships between dune and interdune sub-environments within 4 regions of the desert and results reveal predictable spatial changes in dune and interdune morphology, scale and orientation from the centre to the outer margins of dune fields. The authors discuss the spatial rate of change of morphology of aeolian sub-environments, characterizing and describing them through a series of predictive, empirical relationships.

This paper emphasizes the implications of this study for developing an improved understanding of controls on the sedimentary architecture of preserved aeolian successions and serves as an important step in the development of predictive models for the characterisation of heterogeneity in preserved aeolian successions.

The paper of Rodríguez-López et al. entitled "Spatial variability of multi-controlled aeolian supersurfaces in central-erg and marine-erg-margin systems" demonstrates the complex stratigraphic architecture present in a syntectonic Cretaceous erg system in which different allocyclic controls controlled the accumulation and preservation of erg sequences and their bounding supersurfaces. The interplay of different controls, such as synsedimentary tectonics, progressive compaction of an underlying coal-bearing unit, eustatic sea-level variations, climate modulation, together with the autodynamics of the different sedimentary sub-environ-

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ments, acted to determine the character of major bounding surfaces, which separate four erg sequences. These bounding surfaces, or supersurfaces, display different sedimentary expressions in adjacent areas. The authors highlight the importance of determining stratigraphic architecture in detail when correlating different erg palaeogeographic settings of ancient desert basins (e.g. erg-centre versus erg-margin areas). The authors propose a new and readily applicable supersurface nomenclature that reflects the main allocyclic controls that governed supersurface generation in basins in which the relative role of allocyclic controls change spatially through the desert basin. The paper also identifies key architectural and sedimentological features that serve as useful indicators for discerning between the sedimentary imprint of different controls on erg sedimentary record.

Collectively, these papers address dynamic aspects of sedimentology and geomorphology and constitute detailed examples of complex and multidisciplinary studies which aim to improve our understanding of modern and ancient aeolian systems.

Finally, the Guest Editors wish to thank the continuous help and support of Chief Editors Jeff Lee and Ted Zobeck, the support of the Elsevier scientific support team and the invaluable help of the independent reviewers.

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