Interactions between subaqueous and aeolian sedimentary systems

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Interaction between subaqueous and aeolian sedimentary systems occurs widely on Earth’s surface, spanning spatial and temporal scales that vary according to global and regional climate, among other factors, and are evident from both modern and ancient settings. The best-studied examples of such connectivity are arguably those from coastal regions, where beach conditions affect sediment supply to aeolian dunes, and from desert playas and dry lake beds that act as aeolian dust sources. Aeolian deposits also can form as wind reworks sediment from alluvial fans and crevasse-splay deposits at river-mouth deltas. Fluvial–aeolian sediment interactions play an important role in many arid and semiarid regions worldwide, though links between rivers and aeolian dunes have received somewhat less attention in scientific literature. Rivers in arid and semiarid lands commonly serve as sources and sinks of aeolian sediment, but because aeolian and fluvial processes traditionally have been studied separately, relatively little is known about their interaction and controlling factors. On Earth, coupling between fluvial sediment supply and aeolian sediment reworking also can affect dryland ecosystems. This presentation will highlight various examples of subaqueous-aeolian sediment interaction on Earth. The author seeks input and discussion on possible analogous linked sedimentary and geomorphic processes from elsewhere in the solar system, with the view that similar sediment-transport connectivity could be important in other settings to a greater degree than has yet been recognized.