Mapping and Monitoring Sand Dune Patterns in Northwest Kuwait Using Landsat TM Images

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Satellite images of northwest Kuwait reveal an interesting interference pattern of two distinct landforms: a fan-shaped pattern of northeast-southwest trending escarpments and ridges is crisscrossed by a prominent northwest-southeast-trending sand dune corridor. The elongated sand dune field, which originates in southern Iraq, follows the prevailing northwesterly wind direction.

This paper examines the interplay between the fluvial and eolian features. Where the sand dune corridor intersects the linear pattern of subparallel ridges and depressions a change in dune shape pattern is observed as a result of a change in topography as the sand dunes pass through a rugged terrain. Diverse image enhancement techniques were utilized to delineate these features, including edge enhancement filters and contrast stretches. In addition, a set of multi-date Landsat TM images was co-registered and used for monitoring temporal and spatial changes in the sand dune pattern.