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Drainage Diversion Patterns and Landform Morphology as an Indicator of Deformation Style: Examples from the Zagros Simply Folded Belt, Islamic Republic of Iran (ABSTRACT)

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15) Drainage Diversion Patterns and Landform Morphology as an Indicator of Deformation Style: Examples from the Zagros Simply Folded Belt, Islamic Republic of Iran (ABSTRACT)

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In the NW-SE trending Zagros Simply Folded Belt, landform organisation is shown to be a straightforward response to tectonic forcing processes using remote sensing. Two end-member fold types (detachment folds and fault-bend folds) interact with streams flowing into the Persian Gulf. Using drainage network analysis and geomorphologic methods, the organisation of emergent landform morphologies is mapped and the distribution of different fold types is inferred.

Detachment folds are characterised by symmetric, periclinal geometry and fault-bend folds are characterised by long, linear hinges and marked asymmetry. At a specific point on a detachment fold the uplift rate varies with time and at a particular time the uplift rate varies along the fold hinge. In contrast, the uplift rate of fault-bend folds is approximately uniform along the hinge length.

Stream networks in the Zagros form a trellis pattern where the prominent direction parallels the NW-SE trending fold hinges. Growing folds create characteristic stream diversions, alterations in channel pattern and wind or water gap distributions, controlled by different uplift histories and characterising each fold type. The minor channel network reflects the inherent symmetry of the folds. Landform morphology is classified by hinge length, aspect ratio and symmetry.

Anomalously long, high-aspect ratio folds are marked by lines of wind gaps that transect the folds. These are inferred to be fault-bend folds overlying major thrust faults, which formed sequentially as the defor-

mation front migrated to the SW, causing diversion of stream channels. Movement up a thrust ramp creates these fault-bend folds and as the stresses build up, serial folding develops in the cover rocks to the NE. Eventually continued deformation of the block requires stresses in excess of those required to form a new thrust. The original thrust is abandoned, the footwall collapses and the process repeats, creating a distinct spatial pattern of landforms.