

CHARACTERIZATION FOR SPATIAL DERIVATIVES OF SRTM DATA TO INVESTIGATE CONTROLS ON EROSION

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Erosion of bedrock is controlled by the erodibility of the given rock unit, the local slope, and the available capacity of water flow to transport sediments. The local slope and river network topology can be derived from digital topographic data, such as that from the Shuttle Radar Topography Mission (SRTM). The SRTM elevations have a larger noise level (small spatial frequency height errors) compared to some other topographic datasets that affects the calculation of derivatives including slopes and drainage networks. The preliminary SRTM products from the "PI processor" have the additional problem of data gaps or voids. Before beginning the analysis of SRTM data in areas with little existing topographic data, it is useful to validate the SRTM data derivatives in areas of the USA, where the full resolution SRTM data is released and other high-resolution topographic data are also available. In some areas including the Transverse Ranges of southern California, USA, data from the TOPSAR airborne interferometric SAR has much higher spatial resolution and smaller noise levels than SRTM. The USGS National Elevation Database covers the contiguous USA at 30-m post spacing. Characterization of the accuracy of slopes and river networks derived from SRTM data in the USA will improve the understanding of these spatial derivatives in other areas such as the Himalaya and Tibet when the SRTM data are available.