



Weathering and soil erosion at watershed scale in St. John, US Virgin Islands.

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Human activities may increase soil erosion and the delivery of land-based sediment into coastal waters from steep sub-tropical islands. These changes may also affect water-rock interaction, which alters the geochemistry of storm-water and the clay mineralogy of eroded sediments. The purpose of this analysis is to compare storm-water, sediment geochemistry and modeled erosion rates between developed and undeveloped watersheds on Saint John, United States Virgin Islands (USVI). The saturation index was calculated by “The Geochemist’s Workbench”, supported by X-Ray diffraction on clay minerals. The Revised and Modified Universal Soil Loss Equations were used to estimate both annual mean (2010) and storm-event (Hurricane Otto) based erosion rates. Relative concentration of illite was higher in Coral Bay. Calculated RUSLE/MUSLE-based erosion rates were higher for the developed compared to the undeveloped watersheds. Results of this investigation suggest that rural/urban development of watersheds may increase the weathering, soil erosion and coastal sedimentation causing a negative effect on the marine ecosystem in St. John USVI.