

Rapid weathering and erosion mechanisms of mudstone in a badland under the humid, subtropical climate: A case study in a

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The badlands of Plio-Pleistocene mudstone in southwest Taiwan are characterized by sharp ridges and gullies and are located in humid subtropical area that experiences contrasting dry and rainy seasons. Erosion depths measured using erosion pins over a period of 4 years, averaged up to 9 cm/y. Mudstone sample cores recovered from slope surfaces in the dry season (April) and early rainy season (July), prior to the extensive erosion that occurs later in the rainy season, and monitoring dataset of salinity and water content near the slope surface through one and half year, suggested the following weathering and erosion mechanisms. Near surface layers (<10 cm depth) would become rich in salts with little change in physical properties of rock during dry season, and then decrease its bulk densities and increase its larger void ratios during the early rainy season. Thus deteriorated near surface layers are rapidly removed by slaking and erosion during intense precipitation in the main rainy season.

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