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Potential Morphologic Responses of Tropical River Deltas in Colombia to Future Sediment Supply Scenarios

Juan F. Paniagua-Arroyave^{1,2,3}, Jaap H. Nienhuis⁴, and Frances E. Dunn⁴

¹EAFIT University, Grupo de Ciencias del Mar, Department of Earth Sciences, Colombia

²Department of Earth, Ocean and Atmospheric Science, Florida State University, USA

³INSTAAR, University of Colorado Boulder, USA

⁴Faculty of Geosciences, Utrecht University, The Netherlands

Riverine sediment yield changes by human-induced catchment alterations can have important implications for river delta morphology. Here, we assess the potential response of 99 tropical deltas along the Caribbean and Pacific coasts of Colombia to projected human land use intensifications by deforestation and river damming. We assess delta morphology through the balance of wave, tidal, and (modern and future) river sediment transport processes at their mouths. We find that most Colombian deltas along the Caribbean coast are wave-dominated, except for large catchments with high riverine sediment load, which are river-dominated. Most deltas are wave-river dominated along the Pacific coast, with few examples of river-tide and wave-tide dominance. We predict Colombian deltas to become more wave and tide-dominated under river damming scenarios. In contrast, deforestation scenarios suggested virtually no future morphological changes.