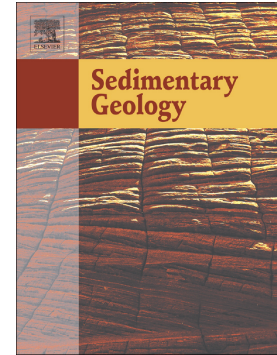


Accepted Manuscript

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PII: S0037-0738(17)30293-2
DOI: <https://doi.org/10.1016/j.sedgeo.2017.12.017>
Reference: SEDGEO 5289

To appear in:

Received date: 5 March 2017
Revised date: 8 December 2017
Accepted date: 14 December 2017

Please cite this article as: A.Y. Annie Lau, James P. Terry, Alan Ziegler, Arti Pratap, Daniel Harris , Boulder emplacement and remobilisation by cyclone and submarine landslide tsunami waves near Suva City, Fiji. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sedgeo(2017), <https://doi.org/10.1016/j.sedgeo.2017.12.017>

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Boulder emplacement and remobilisation by cyclone and submarine landslide tsunami waves near Suva City, Fiji

A.Y. Annie Lau ^{a,*}, James P. Terry ^{b,c}, Alan Ziegler ^d, Arti Pratap ^e, Daniel Harris ^a

^a School of Earth and Environmental Sciences, University of Queensland, Brisbane, QLD 4072, Australia; annie.lau@uq.edu.au

^b College of Natural and Health Sciences, Zayed University, Dubai, United Arab Emirates

^c Steering Group on Natural Hazards and Disaster Risk, International Council for Science, Regional Office for Asia and the Pacific (ICSU ROAP), Kuala Lumpur, Malaysia

^d Department of Geography, National University of Singapore, Singapore

^e School of Geography, Earth Sciences and Environment, The University of the South Pacific, Suva, Fiji

Abstract

The characteristics of a reef-top boulder field created by a local submarine landslide tsunami are presented for the first time. Our examination of large reef-derived boulders deposited by the 1953 tsunami near Suva City, Fiji, revealed that shorter-than-normal-period tsunami waves generated by submarine landslides can create a boulder field resembling a storm boulder field due to relatively short boulder transport distances. The boulder-inferred 1953 tsunami flow velocity is estimated at over 9 m s^{-1} at the reef edge. Subsequent events, for example Cyclone Kina (1993), appear to have remobilised some large boulders. While prior research has demonstrated headward retreat of Suva Canyon in response to the repeated occurrence of earthquakes over the past few millennia, our results highlight the lingering vulnerability of the Fijian coastlines to high-energy waves generated both in the presence (tsunami) and absence (storm) of submarine failures and/or earthquakes. To explain the age discrepancies of U-Th dated coral comprising the deposited boulders, we introduce a conceptual model showing the role of repeated episodes of tsunamigenic submarine landslides in removing reef front sections through collapse. Subsequent high-energy wave events transport boulders from exposed

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