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## A study of soil formation rates using $^{10}\text{Be}$ in the wet-dry tropics of northern Australia

R. Lai<sup>1</sup>, L. K. Fifield<sup>1</sup>, S.G. Tims<sup>1</sup>, R.J. Wasson<sup>2</sup> and D. Howe<sup>3</sup>
<sup>1</sup> Department of Nuclear Physics, The Australian National University, ACT 0200, Australia

<sup>2</sup> Department of Geography, National University of Singapore AS2, #04-321 Arts Link, Singapore 117570

<sup>3</sup> Charles Darwin University, Darwin, NT, 0810, Australia

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### Abstract

A catchment level study to obtain soil formation rates using beryllium-10 ( $^{10}\text{Be}$ ) tracers has been undertaken in the Daly River Basin in the wet-dry tropics of northern Australia. Three soil cores have been collected to bedrock, with depths ranging from ~1-3.5 m. Due to agricultural practices, modern soil loss rates can be significantly higher than long-term soil formation rates, but establishing soil formation rates has proved to be a difficult problem. At long-term equilibrium, however, soil formation from the underlying rock is balanced by soil loss from the surface. This long-term rate at which soil is being lost can be determined using the cosmogenic tracer  $^{10}\text{Be}$ , created in spallation of atmospheric nitrogen and oxygen by cosmic rays. Since the annual fallout rate of  $^{10}\text{Be}$  is known, the complete  $^{10}\text{Be}$  inventory over the depth of the top soil can be used to establish the soil formation rates.

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