



## **Erratic boulder trains and cosmogenic exposure dating of former glacial limits: A case-study from Tierra del Fuego, southernmost South America**

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Erratic Boulder Trains (EBTs) are a spectacular yet poorly-understood glacial geomorphological feature. These linear clusters of glacial erratic boulders help to illustrate the flow-lines of former glaciers by pin-pointing the parent rock from which they have originated and are often used as targets for cosmogenic nuclide exposure dating. Consequently, there is a need to understand their geomorphological significance to improve ice-sheet reconstructions and provide important contextual information for dating studies. The EBTs in Tierra del Fuego are some of the finest examples of this feature in the world, and this paper presents the first comprehensive mapping and physical assessment of four boulder trains. Unlike most other examples, they were deposited laterally rather than medially and are tightly clustered, presenting linear features only a few kilometres long that contain hundreds to thousands of huge boulders (often >8 m in diameter). The size and angularity of the boulders strongly supports the hypothesis that they were deposited as a supraglacial rock avalanche. The boulders have been the subject of previous cosmogenic dating, which have yielded anomalously young ages from deposits thought to be hundreds of thousands of years old. Analysis of weathering proxies shows little difference between boulder trains thought to be of radically different ages, with important implications for the timing of glaciations and potentially contradicting previous age constraints on glacial limits in the region.