

Quantifying proglacial responses to climate variability and glacier retreat in glaciated Westland, New Zealand

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Outline

BSG funding was used to initiate a research project that will assess proglacial valley responses to rapid glacier retreat and associated sediment dynamics over annual-decadal timescales. The project is using high resolution SfM photogrammetry to generate DEMs of both the Fox and Franz Josef Glacier valley floors extending ~3 km downvalley from the glacier terminus in each system (Fig. 1). SfM photogrammetry is being acquired using both helicopter and UAV platforms, with a view to making a comparison between the models generated, both in terms of accuracy and resolution. Initial data have been collected using funding provided. In addition recent (2016) acquisition of LiDAR in the Waiho River (draining from the Franz Josef Glacier), will enable comparison of SfM with this platform. The intention of this ongoing research is to generate annual DoDs from paired DEMs to quantify the nature and magnitude of geomorphic change in these proglacial valleys, from which sediment transfer volumes can be derived, and linked to key geomorphic processes operating in these systems, which are currently subject to rapid glacier retreat.

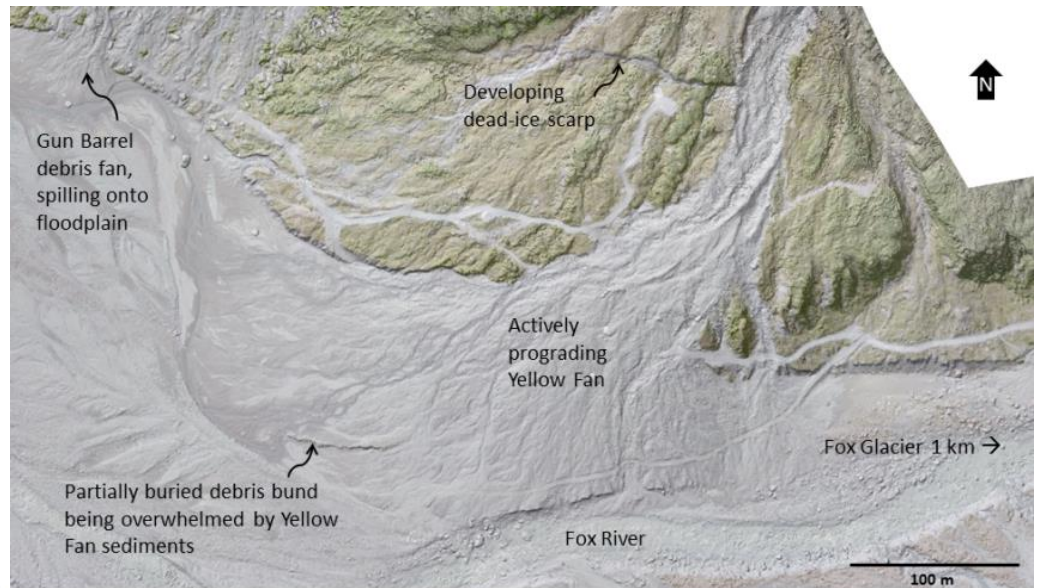
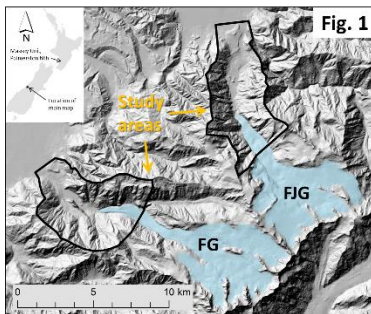


Figure 1. Location Map

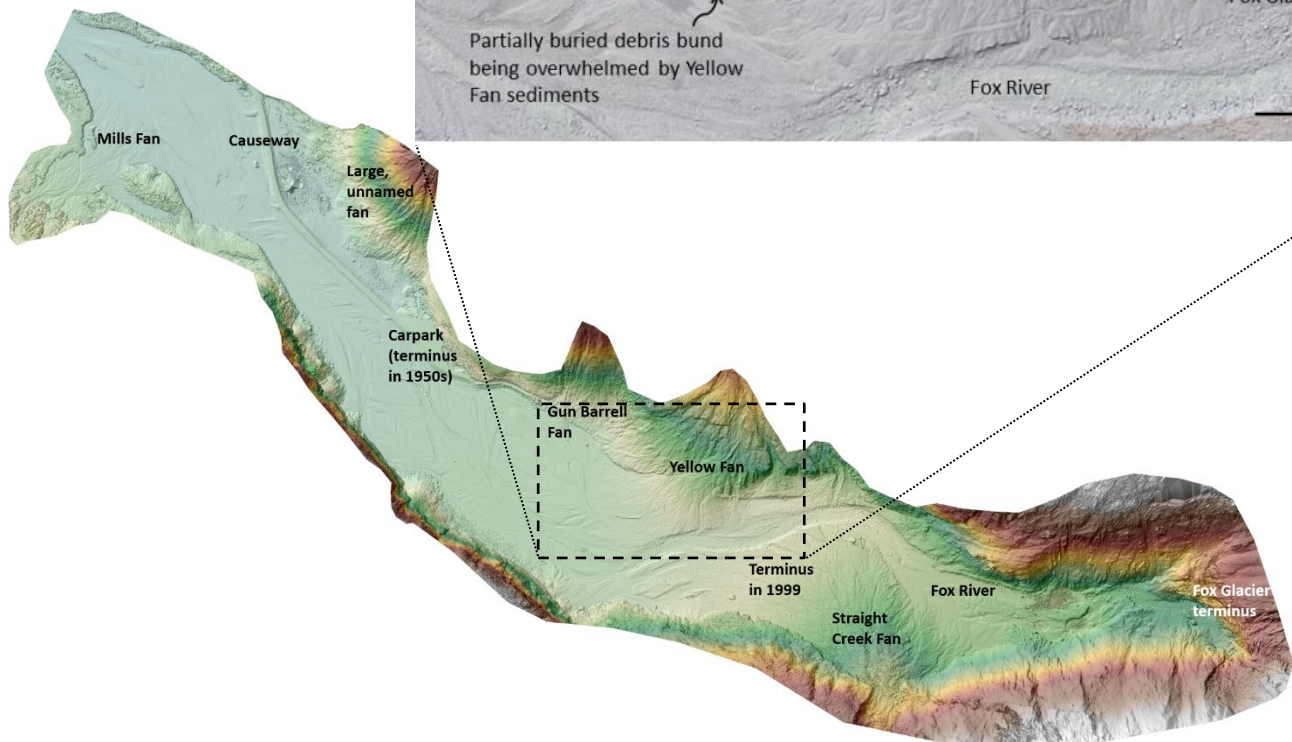


Figure 2. UAV-derived 0.1 m DEM and hillshade model, Fox Glacier, November 2015. Inset: Ortho photo draped over hillside model, showing detail of valley floor geomorphology in the vicinity of Yellow Fan, with key relief features labelled.