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Moraine formation at advancing temperate maritime glaciers: Fox and Franz Josef Glaciers, Southern Alps, New Zealand

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Only a relatively limited number of studies on recent moraine formation at advancing mountain glaciers can be found in the literature. Fox and Franz Josef Glacier in Westland National Park, Southern Alps, New Zealand, provide an opportunity to observe and study such moraine formation processes. Alongside few glaciers worldwide, e.g. glaciers in maritime South Norway, they advanced recently during the 1990s (starting in the mid-1980s), and again since 2005. Both glaciers experienced a terminal moraine formation during these advances. Whereas the glaciological and climatological causes of the recent advance have been indentified, no attention has yet been drawn to the mechanisms of terminal moraine formation and their compatibility to recent moraine formation reported from elsewhere.

Owing to the strong maritime climatological environment and the absence of permafrost (or even strong winter frost conditions) at the margins of the advancing temperate/wet-based Fox and Franz Josef Glaciers, many of the abovementioned studies on recent moraine formation are not representative for the New Zealand situation. However, studies undertaken during recent glacier advances in West Norway are an exception as some, but not all, environmental conditions are similar. On a regional basis, almost no attention has yet been drawn to the field of research on Holocene moraine formation in New Zealand, although they are frequently used for reconstructing the Holocene glacier chronology. Nonetheless the controversial discussion on the origin of the famous Late-Glacial Waiho Loop clearly reveals the need for future studies on moraine formation, morphology, and sedimentology in the Southern Alps of New Zealand.

We will describe the processes of recent terminal moraine formation at Fox and Franz Josef Glaciers and present related morphological/sedimentological data. Furthermore, we will compare those findings with existing studies from West Norway in order to outline and interpret similarities and differences. At last, we will try to give some preliminary conclusions regarding the palaeoclimatological potential of these frontal moraines.