

## **A high-resolution $^{14}\text{C}$ chronology from the Cormor alluvial megafan (Tagliamento glacier, NE Italy) for the reconstruction of Alpine glacier activity during 50-20 ka BP**

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During the Last Glacial Maximum (LGM), the Cormor alluvial megafan was delivering large amounts of glacial sediment from the Alpine Tagliamento glacier onto the southern Alpine foreland basin. Rate and character of sedimentation were primarily controlled by the glacier activity and, thus, by variations in climate. To gain a better understanding of the late-Pleistocene sedimentary processes in the Alpine foreland alluvial megafans and their response to climate changes, we have performed high-resolution radiocarbon dating of a drilling core (PNC1, 65 m deep) located in the distal sector of the Cormor alluvial megafan, near the Marano Lagoon [1]. The stratigraphic sequence of the core is characterized by an alternation of silt and clay deposits with the intercalation of several peaty and humic horizons. These organic layers (5-40 cm thick) correspond to phases of locally inactive fluvio-glacial sedimentation, allowing plant remains to be accumulated at the surface.

A series of about 55 peat samples between 33 to 4 m of depth with sample distances of few cm-dm were dated with radiocarbon. Half of these samples were separated into various fractions in order to check for systematic age differences with regard to the size and/or type of the organic particles. Additionally, the influence of sample pre-treatment was evaluated by using the ABA treatment as well as two different ABOX treatment protocols for each sample fraction. While no systematic age differences with size and/or type of the organic particles was observed, some samples indicate a shift towards younger ages after ABOX treatment. Moreover, deposits containing old carbon (too old ages) were observed suggesting that a careful approach and high-resolution sampling is an imperative in obtaining accurate chronologies.

Radiocarbon ages obtained for the PNC1 record range from  $\sim$ 50-20 cal ka BP and provide a detailed chronology of the pre-LGM and LGM fluvio-glacial sequence. Due to the immediate connection of the Cormor megafan with the Tagliamento glacier, these data allow to directly infer glacier activity and, thus, represent a unique record of glacier advance and withdrawal with a chronological precision not yet available in the Alps.

### References:

[1] Fontana et al. (2014), *Geomorphology* 204, 136-153.