

INTRODUCTION:

The Hüttwinkl Valley north of the summit of Sonnblick (Salzburg/Austria) has outstanding glacial and periglacial features which have the potential to reconstruct the landscape evolution of the last 21 kyr. Several remnants of lateral moraines documenting glacial stadials in the front of the historically well known 1850 ("Little Ice age", LIA) moraine are preserved. In addition a giant landslide is underlying the last glacial deposits in the valley around Kolm-Saigurn which are itself being topped by a smaller landslide. Therefore a robust timeframe and relative cronology of these events has been established in the field.

Eventually the results should help to compare and to improve the glacial stratigraphy of the Alps and its linkage to palaeoclimatic archives in the Northern Atlantic. Especially the effects of the cold spells of the Younger Dryas (12.7-11.6 ka BP) and of the "8,2 ka event" are of interest.

Herewith the first results of our still ongoing study are presented

METHODS and WORKING PROGRESS:

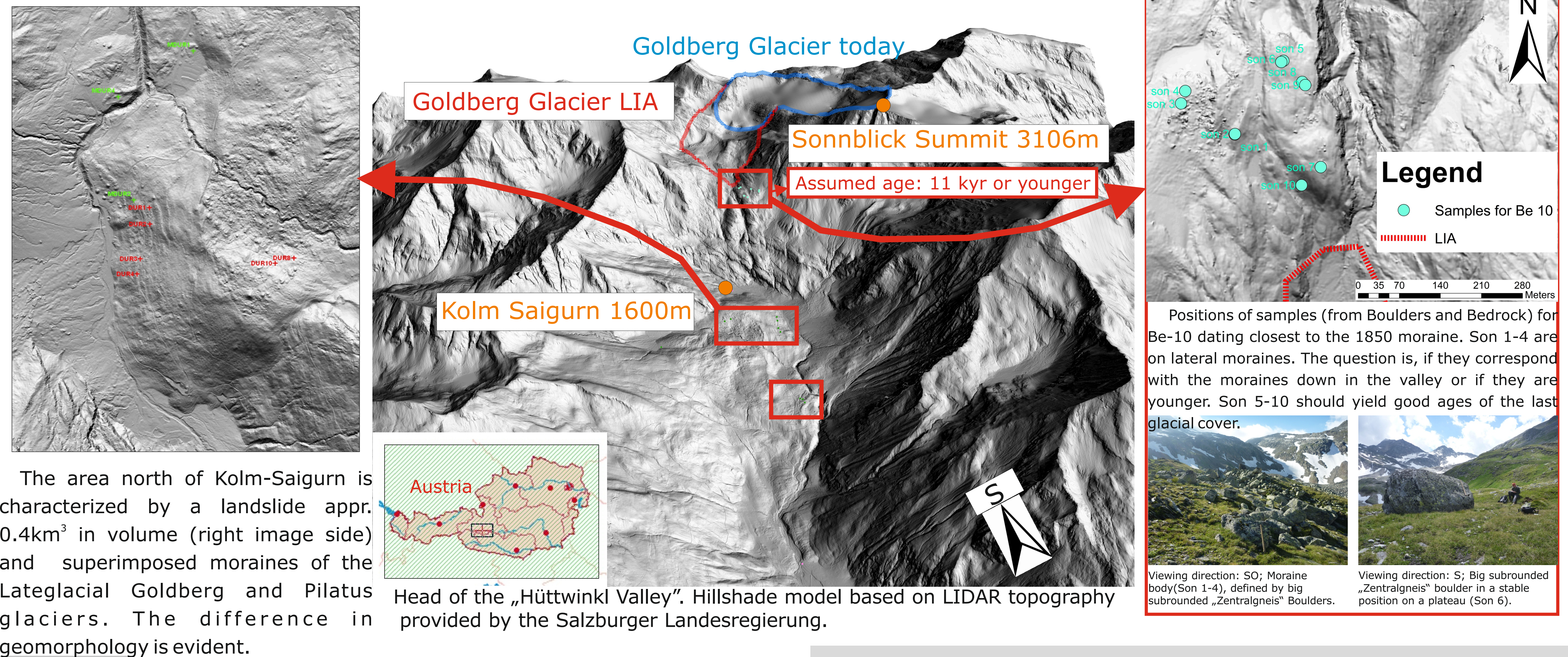
→ A detailed geological and geomorphological map, based on LIDAR and field data should provide reliable cross-cutting relationships of the various landforms and sedimentary units (final results expected for summer 2012).

→ For absolute chronology we took samples for Be-10 exposure age dating from glacially polished bedrock, from boulders on moraines ridge and from stable positions on a plateau as well as from the landslides. Preparation and measurement at the ETH Zürich is finished and we are currently interpreting the data.

→ To control and frame our exposure ages we are going to take samples from peatbogs which are associated with stadial moraines and landslides. C-14 Dating of organic material from the base layer will yield a minimum age of the associated events. Supplementary palynology methods will be used to get a better picture of the palaeoenvironment (results expected for 2012).

→ With all the data in place, we will calculate and model the extent and retreat of the Goldberg and Pilatus glaciers as well as constrain the timing of landslides. The final model of landscape evolution since the LGM will than be compared to palaeoclimatic archives (need to be finished winter 2012/2013).

LANDSCAPE EVOLUTION (BASED ON CROSSCUTTING RELATIONSSHIPS):



The Durchgangswald Landslide:



Photograph from the Durchgangswald landslide mass looking west to the scarp (approx 0.4km³ volume and 4km² area) of the Grieswies-Schwarzkogel (3116m). The landslide occurred before the last glacial advance during the Younger Dryas (YD). Subsequent smaller landslides today overlay these glacier sediments and document a detailed chronology after the YD.

OUTLOOK:

→ The area around Kolm-Saigurn offers a unique geological setting in the Eastern Alps, where glacial sediments and landslide masses show a detailed chronology of the events starting with the phase shortly before the Younger Dryas.

→ The Egesen stadials are documented as moraines up on a plateau in the forefront of the 1850 margin of the Goldberg glacier. In addition, the recession of the glacier to the 1850 moraine (or even further) is documented by boulders on these plateaux.

→ The data from our samples will further help to characterize and improve the chronology of Holocene glaciation in the Eastern Alps.

→ Our findings, together with data on the glaciology of the recent Goldberg glacier (from the ZAMG), will lead to a more detailed understanding of climate change in the Eastern Alps.