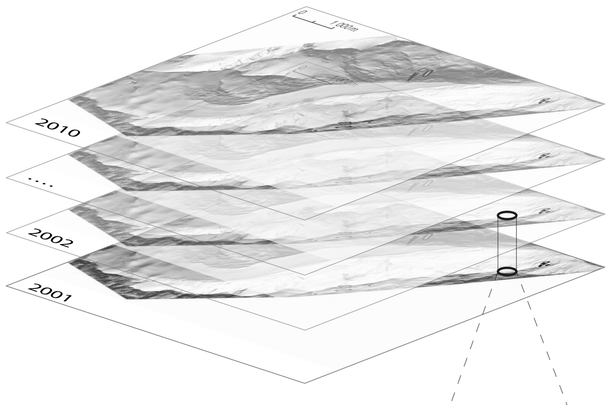
Quantification of morphodynamic processes in glaciated and recently deglaciated terrain

GEOGRAPHIE INNSBRUCK



This poster shows the ability of airborne LiDAR techniques to detect, map and quantify specific geo- morphological entities in selected high alpine catchments. Since 2001 airborne LiDAR measurements have been carried out regularly in the Hintereisferner region (Ötztal Alps, Tyrol, Austria). This results in a worldwide unique consistent data record assembling 18 LiDAR campaigns. The focus is on glaciated and recently deglaciated (periglacial) terrain and in particular on:

- dead-ice
- small landslides
- rock-fall
- fluvial erosion / accumulation and
- permafrost features.

In order to preserve the high accuracy of the original data the methods concentrate on the analysis of vector point data (LiDAR point cloud) to demonstrate trends of geomorphodynamic induced topographic changes in different temporal dimensions (i.e. from months to years).

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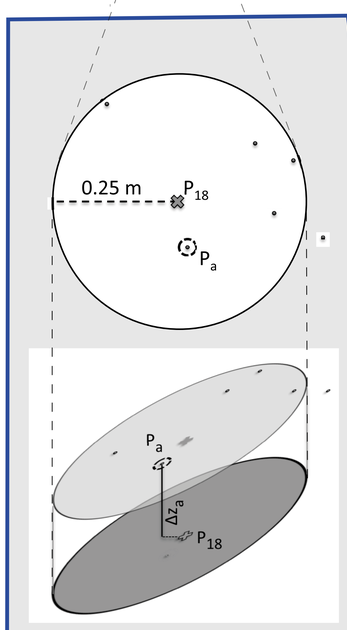
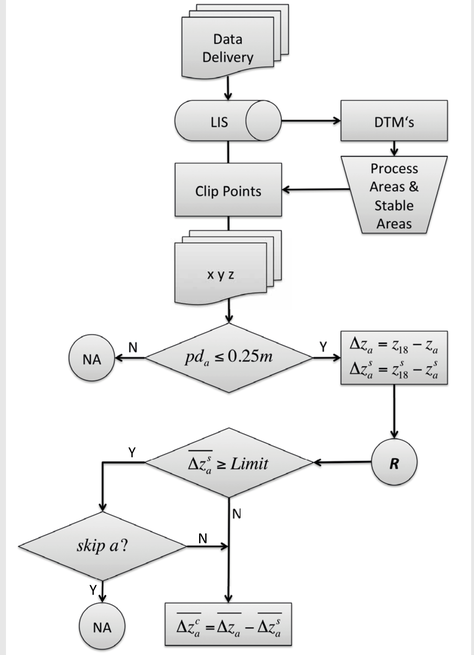
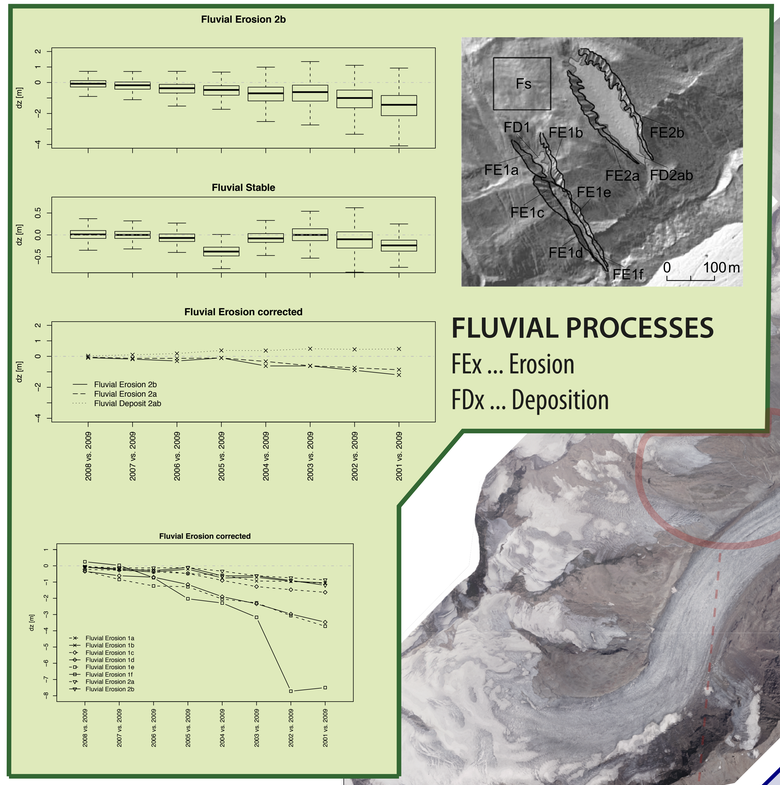
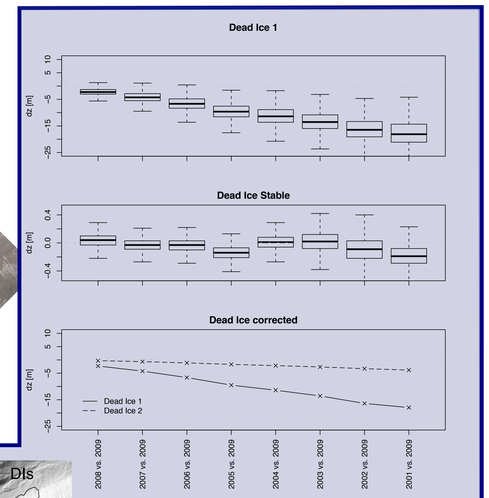


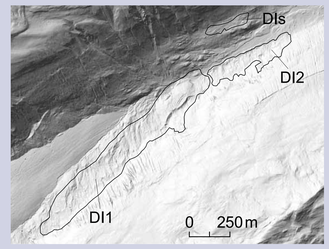
ALS
(Airborne Laser Scanning)
Point Cloud Manipulation





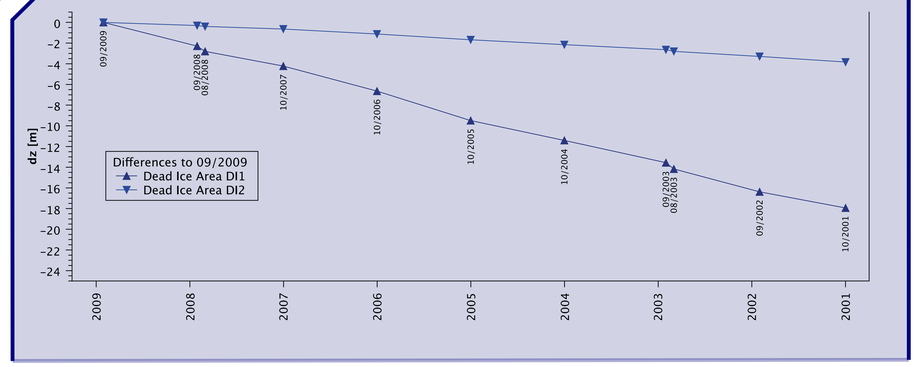
FLUVIAL PROCESSES
FEx ... Erosion
FDx ... Deposition





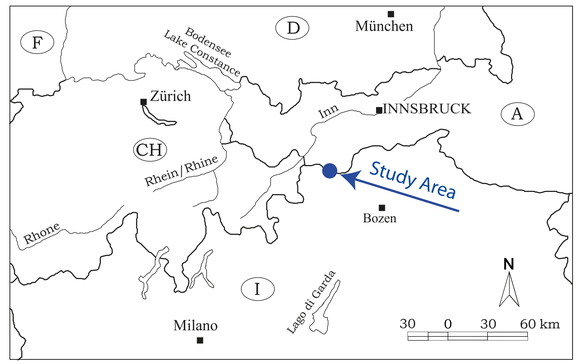
DEAD ICE MELTING
DI2 ... ‚older' Dead Ice Body
DI1 ... ‚younger' Dead Ice Body

even monthly melting rates are visible



PROCESS CASCADE
(Example)

glacier retreat (cirque glacier)
v
fluvial erosion / deposition
v
glacial transport (valley glacier)
v
again fluvail redistribution



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