



The sedimentology of a palaeo ice stream bed: an in-depth analysis of the Wielkopolska (Poland) MSGL field

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Ice streams are fast flowing (up to 1000s m per year) corridors of ice within ice sheets. They are the main arteries through which ice sheets lose mass, accounting for up to 90% of Antarctic discharge. Ice streams are also dynamic and can widen, migrate or shut down on decadal timescales. One of the key controlling factors on ice stream behaviour is the interaction with a soft sedimentary bed, but the exact mechanism of this interaction is far from known or well understood. Studies on the sedimentology of ice stream bed are challenging in present-day glaciated regions or in offshore palaeo-settings. However, some good examples of onshore and 'relatively' easy-to-access palaeo ice stream beds do exist. In Europe, one of these settings is in Poland, near the town of Poznan, in the Wielkopolska region. Mega-Scale Glacial Lineations (MSGs), the characterising landform signature of ice stream beds, have been investigated using state of the art sedimentological techniques. These include, extensive investigation of multiple trenches excavated along the crests and flanks of MSG and ground penetrating radar profiling of large sections of the MSG field. Micro-sedimentological characterisation via thin sections, AMS and CT scans, as well as various lab analyses, including granulometry and mineralogy were also undertaken. Results indicate a homogeneous facies (to >3m), across all depths and locations within the palaeo ice stream bed. This has profound implications on the formation of MSGs and the dynamics of ice stream flow.