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Towards method development in mapping meltwater features from remotely sensed and digital elevation data

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The use of satellite data has revolutionized glacial geomorphological mapping. However, the focus has often been on mapping features such as glacial lineations and ribbed moraines, leaving the meltwater system largely unexplored. Hence, we are currently in the need to perform a methods development necessary for a full transformation from air-photo based approaches in meltwater landform mapping to a fully integrated use of satellite imagery and DTM's in a GIS environment. We will target the method development objective by exploration of a range of diverse data with different spatial and spectral resolutions. The meltwater system is known to play a vital role in paleoglaciology in reconstructing ice marginal retreat patterns in areas previously covered by cold-based ice for basically three reasons: (1) During cold-based deglaciation, meltwater features are the only landforms formed and used for reconstructions of ice marginal retreat. (2) Meltwater features play a fundamental role in the separation of young imprints from older ice-flow events preserved in the landform record. (3) The spatial and temporal distribution of meltwater is known to have had a profound role on its environment and it is therefore important topic of study. Methods developed as part of this project will be used to perform paleoglaciological reconstructions of the deglacial environment in Glen Urquhart, Scotland and in northern Sweden. These areas are chosen because of their stunning landforms examples and the, at least on the local scale, particularly well-known glacial history.