



Regional and temporal variations in the formation of supraglacial melt ponds on the Greenland Ice Sheet

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Surface melt ponds form seasonally in the ablation zone of the Greenland Ice Sheet and they have been shown to provide the sites for the hydrofracture initiation of the moulines required for supraglacial meltwater to reach the bed of the Greenland Ice Sheet (Das et al., 2008). Studies to date have been restricted to a region of large surface lakes surrounding the Jakobshavn Isbrae catchment area (Box and Ski, 2007). However, large surface lakes also develop seasonally in other areas of the ice sheet, especially in the northern regions. We have developed a high temporal resolution dataset of lake evolution and drainage in all of the regions of the Greenland Ice Sheet where large surface lakes develop during summer. This study spans the period 2001-2008 using approximately 200 MODIS scenes per melt season per region. We show that there are significant regional differences in the supraglacial hydrology of the ice sheet, which could cause spatial variations in the role of melt water in ice dynamics across Greenland as it responds to the warming climate.

Das, S., Joughin, M., Behn, M., Howat, I., King, M., Lizarralde, D., Bhatia, M., 2008. Fracture propagation to the base of the Greenland Ice Sheet during supra-glacial lake drainage, *Science*, 5877, p.778-781.

Box, J., and Ski, K., 2007. Remote sounding of Greenland supraglacial melt lakes: implications for subglacial hydraulics. *J. Glaciol.*, 53(181), p. 257-265.