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Theme

Sub-Theme 1: The need for the Observing System

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Poster title (brief)

Need of monitoring glacier facies of Arctic glaciers using high resolution remote sensing data

Abstract - text box

Glaciers can be called keyholes to the climate. A glacier responds to its climate by undergoing changes, which are studied for several purposes including climate change, hydropower production, and natural hazard forecasting. Mass balance models are the idealized methods for studying such glaciological changes. However, these studies often rely on measurements such as in situ discharge data or measured mass balance. These measurements neglect the spatial small-scale variability on a glacier and thus, are insufficient for calibration and validation of distributed mass balance models. An analysis of glacier facies presents an opportunity to include small-scale spatial variability into these models. Facies are direct representatives of the state of a glacier and an assessment of the number, kind and volume of available facies can be translated to the overall health of the glacier. Remote sensing presents an opportunity for studying glaciers that provide little to no access. Very high-resolution satellites allow detection of minute spatial differences resulting in precise facies delineation and thus, can generate data for void sites of distributed mass balance models. The Arctic contains several physically monitored glaciers

but a large number of small and large glaciers remain unaccessed. Continuous operational monitoring of these glaciers using very high-resolution sensors will create a database that can be used to accurately calibrate distributed mass balance models. These models can then be paired with meteorological data to determine the climatic variation. Such a monitoring system will boost current Arctic glaciological studies as well as enable improvement of current study models.