HEADWALL INITIATION OF ICE STREAM AND OUTLET GLACIER ONSETS: EVIDENCE FROM SATELLITE IMAGERY

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Ice streams and outlet glaciers are the most efficient means of draining mass from ice sheet interiors to the ocean. Any change in the extent and configuration of these features will have significant impacts on ice sheet mass balance and sea level. An analysis of high-resolution satellite imagery shows that the onset regions of enhanced flow appear to be geologically controlled. A characteristic feature is the presence of a "headwall", immediately downstream of which flow stripes and crevasses are observed. Examples will be presented from Antarctica and Greenland. If this geological control is correct, it implies that inward migration of enhanced flow will be difficult to achieve. In that case, lateral migration of unconstrained flow margins is likely to be the dominant cause of changes in ice stream and outlet glacier configuration.