The application of high-resolution laser altimetry to deglaciation dynamics: Bridgetown, Nova Scotia

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The application of high resolution laser altimetry, using light detection and ranging (LiDAR), is a new technique used to study glacial landforms on the North Mountain and in the Annapolis Valley of Nova Scotia. Small scale glacial landforms such as esker flank fans are difficult to identify using traditional methods and may hold clues to the deglaciation dynamics of the project area. High resolution, "bald earth", digital elevation models (DEM's) are produced from LiDAR data and used to identify numerous surficial and glacial landforms that were not detected with previous mapping methods. Manipulation of digital topography data highlights these features, allowing spatial models to be developed of their occurrence and relation to other surficial features. An esker system north of Bridgetown and striae in the Annapolis Valley confirm previous movement of active ice across the North Mountain towards the Bay of Fundy. Numerous wave-cut terraces which have truncated the lower elevations of the esker system north of Bridgetown during late glacial sea-level rise (12–14 ka) are visible on the high resolution DEM's. The presence of wave-cut terraces and the esker system may confirm that the glacial margins were subject to calving and decreased stability allowing more ice to flow towards the Bay of Fundy. LiDAR data provides significant improvements and quality benefits when mapping surficial deposits and landforms that are otherwise undetectable using previous methods. The ability to detect subtle glacial landforms greatly enhances the understanding of deglaciation.