ABSTRACT

Global Land Survey (GLS) data encompassing Landsat Multispectral Scanner (MSS) Landsat 5's Thematic Mapper (TM) and Landsat 7's Enhanced Thematic Mapper Plus (ETM+) were used to determine the terminus locations of Baird, Patterson, LeConte, and Shakes Glaciers in Alaska and investigate the movement rates of these glaciers with respect to specific physical and environmental conditions.GLS data from 1974, 1989, 1999, 2005, and 2009 in false-color composite images enhancing ice-snow differentiation and Iterative Self-Organizing (ISO) Data Cluster Unsupervised Classifications were used to 1) quantify the movement rates of Baird, Patterson, LeConte, and Shakes Glaciers; 2) analyze the movement rates for glaciers with *similar* terminal terrain conditions and; 3) analyze the movement rates for glaciers with *dissimilar* terminal terrain conditions. From the established sequence of terminus locations, movement distances were quantified between the glacier locations. Movement distances were then compared to see if any correlation existed between glaciers with similar or dissimilar terminal terrain conditions. The Global Land Ice Measurement from Space (GLIMS) data was used as a starting point from which glacier movement was measured for Baird, Patterson, and LeConte Glaciers only as the Shakes Glacier is currently not included in the GLIMS database. Results show that glaciers with similar terminal terrain conditions (Patterson and Shakes Glaciers) and glaciers with dissimilar terminal terrain conditions (Baird, Patterson, and LeConte Glaciers) did not exhibit similar movement rates. Glacier movement rates were greatest for glaciers whose terminuses were in fresh water (Patterson and Shakes Glaciers), less for those with terminuses in salt water (LeConte Glacier), and least for glaciers with terminuses on dry land (Baird Glacier).