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The GLIMS geospatial glacier database: A new tool for studying glacier change ☆

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Abstract

The Global Land Ice Measurement from Space (GLIMS) project is a cooperative effort of over sixty institutions world-wide with the goal of inventorying a majority of the world's estimated 160 000 glaciers. Each institution (called a Regional Center, or RC) oversees the analysis of satellite imagery for a particular region containing glacier ice. Data received by the GLIMS team at the National Snow and Ice Data Center (NSIDC) in Boulder, Colorado are ingested into a spatially-enabled database (PostGIS) and made available via a website featuring an interactive map, and a Web-Mapping Service (WMS). The WMS, an Open Geospatial Consortium (OGC)-compliant web interface, makes GLIMS glacier data available to other data servers.

The GLIMS Glacier Database is accessible on the World Wide Web at "http://nsidc.org/glims/". There, users can browse custom maps, display various data layers, query information within the GLIMS database, and download query results in different GIS-compatible formats. Map layers include glacier outlines, footprints of ASTER satellite optical images acquired over glaciers, and Regional Center information. The glacier and ASTER footprint layers may be queried for scalar attribute data, such as analyst name and date of contribution for glacier data, and acquisition time and browse imagery for the ASTER footprint layer.

We present an example analysis of change in Cordillera Blanca glaciers, as determined by comparing data in the GLIMS Glacier Database to historical data. Results show marked changes in that system over the last 30 years, but also point out the need for establishing clear protocols for glacier monitoring from remote-sensing data.