GLIMS: Progress in Mapping the World's glaciers

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The Global Land Ice Measurements from Space (GLIMS) initiative has built a database of glacier outlines and related attributes, derived primarily from satellite imagery, such as from ASTER and Landsat. Each snapshot of a glacier is from a specific time, and the database is designed to store multiple snapshots representative of different times.

The database currently contains outlines for approximately 83,000 glaciers. Of these, 549 glaciers have outlines from more than one time, which can be studied for change. The glacier-by-glacier area-change signal over large areas tends to be noisy, but the mode of the distribution of area change for these 549 glaciers is -5%.

We have implemented two web-based interfaces to the database. One enables exploration of the data via interactive maps (Web map server), while the other allows searches based on text-field constraints. The Web map server creates interactive maps on our Web site, www.glims.org, and can also supply glacier layers to other servers over the Internet.

As a service to the GLIMS community, the database contains metadata on all ASTER imagery (approximately 200,000 images) acquired over glacierized terrain. Reduced-resolution images can be viewed either as a layer in the MapServer application, or overlaid on the virtual globe within Google Earth.

The system allows users to download their selected glacier data in a choice of formats. The results of a query based on spatial selection (using a mouse) or text-field constraints can be downloaded in any of these formats: ESRI shapefiles, KML (Google Earth), MapInfo, GML (Geography Markup Language) and GMT (Generic Mapping Tools). This "clip-and-ship" function allows users to download only the data they are interested in.

In this presentation we describe our flexible Web interfaces to the database, which includes various ancillary layers, facilitates enhanced analysis of glacier systems, their distribution, and their impacts on other Earth systems.