

The World's Glaciers: Hazards, Opportunities, and Measures of Global Change

U.S. Geological Survey Contacts

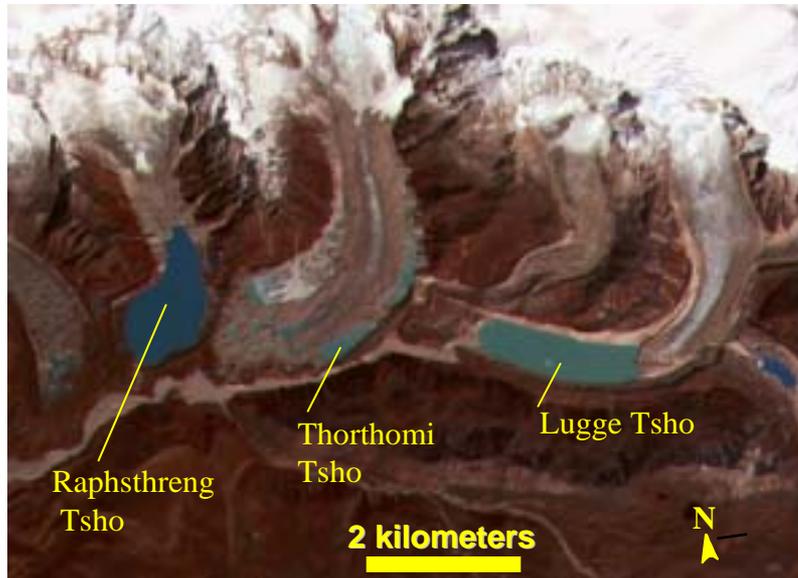
Jeffrey S. Kargel (928)556-7034 jkargel@usgs.gov
Rick L. Wessels (928)556-7022 rwessels@usgs.gov
Hugh H. Kieffer (928)556-7015 hkieffer@usgs.gov



See www.GLIMS.org

GLIMS

Partners: NASA, USGS, NSIDC, EDC and members of the international GLIMS team.



The stagnating termini of glaciers in the Bhutan Himalaya. Glacial lakes have been rapidly forming on the surfaces of debris-covered glaciers worldwide during the last few decades.

Image above is a portion of an uncalibrated ASTER Level 1A VNIR false-color image (321RGB), acquired on November 20, 2001

The global change research community has shown that:

- Most of the world's glaciers are stagnant or in hasty retreat.
- Glaciers are responding to climate change.
- Glacier retreat and other changes will accelerate over next 100 years as climate change accelerates.

We estimate that glacier change directly and severely impacts 500 million people in South Asia alone.

Some impacts and results of glacier change:

- Contributions to sea level rise and coastal flooding
- Changes in glacier meltwater production, storage, and release:
 - Agriculture and food security (THE BIGGEST ISSUE)
 - Hydroelectric power
 - Other nonagricultural industries
 - Drinking, cooking, and sanitation
 - Glacier lake outburst floods
- Loss of glaciers and formation of "new lands"
 - Mining of newly exposed mineral deposits
 - New overland transportation links in alpine regions
 - Tourism and mountain recreation
- Impacts on military security & international relations (esp. High Asia)
 - Political instability related to reduced water resources, other impacts
 - Refugees from drought in lands affected by wasting glaciers.
 - Jockeying for "new land" and claim to water resources in disputed territories (e.g., Kashmir)
 - Refuge of militants among glacier peaks
 - Changing strategic and economic alignments relative to reduced Himalayan barrier and increased trade and human migration
- Ecological impacts
 - New habitat
 - New migration corridors; genetic diffusion across prior barriers
 - Dissection of pristine habitat by development in former glacier valleys

We acknowledge the helpful involvement of Syed I. Hasnain (Jawaharlal Nehru University, New Delhi), Michael Bishop and Jack Shroder (University of Nebraska-Omaha), Andreas Kaeab (University of Zurich), and the GLIMS consortium of regional centers as contributors to several aspects of this work. GLIMS is a NASA Pathfinder funded project (NASA-W19855).