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Monitoring the Behavior of Selected Afghanistan Glaciers with ASTER Imagery

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As a first step in a nationwide assessment, the recent behavior of selected glaciers from several regions of Afghanistan is being evaluated. VNIR imagery of these glaciers collected by the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) instrument on the Terra spacecraft is being compared and contrasted with resulting supervised classification data, stereo topographic information, and historic map and terminus position data to determine glacier change and recent landscape feature development. Among the glaciers and areas investigated are the large debris-covered, retreating North and South Issik and Zemestan Glaciers of the central Wakhan Pamir; the small retreating cirque and valley glaciers of the Koh-I-Baba range, west of Kabul; the retreating, debris-covered Keshnikhan Glacier and adjacent small debris-covered glaciers at the western end of the Wakhan panhandle; and the retreating, debris-covered valley glaciers of the Panshir Valley region. Ultimately, all of Afghanistan's glacier-covered areas will be investigated. Many recently ice-free cirques have been observed in every area of the country.

In addition to determining glacier extent and recent changes in marginal and terminus positions, parameters mapped include distribution of snow, debris-free ice, debris-covered ice, ice-marginal and supraglacial lakes, vegetation, and bare bedrock and soils. Early Russian topographic map data and published glacier extent and distribution data, especially that of Shroder, are the basis for decadal scale terminus position comparisons. Upon completion, this assessment will summarize the behavior of glaciers throughout Afghanistan. A primary product will be a summary of the location

and size of ice-marginal and supra-glacial lakes that may pose a threat to flooding and landslide generation.