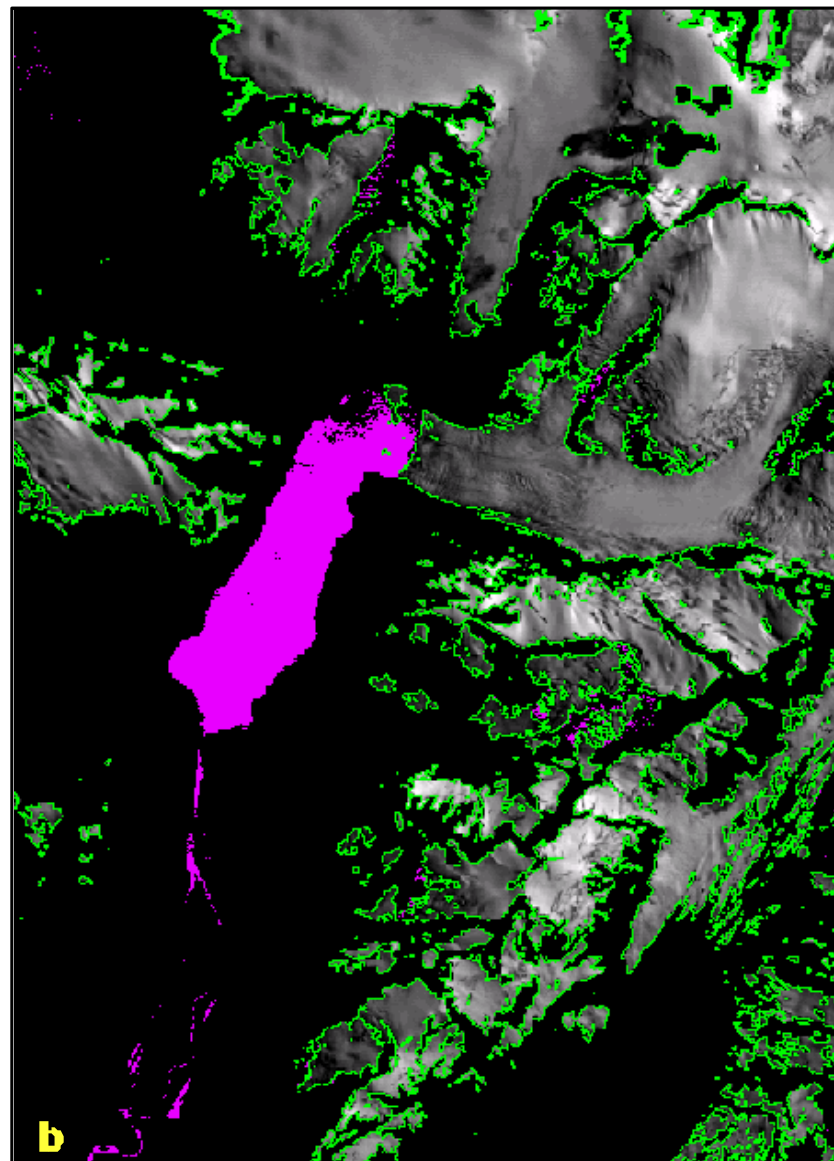# HIGH ICE, Continuation

Some glacier image analysis capabilities

Glacier mapping using simple ratios of ASTER
band 7 (2.25) / band 1 (0.56) - 0.25 threshold (Water mapped with NDWI)

a 2.5 km

b

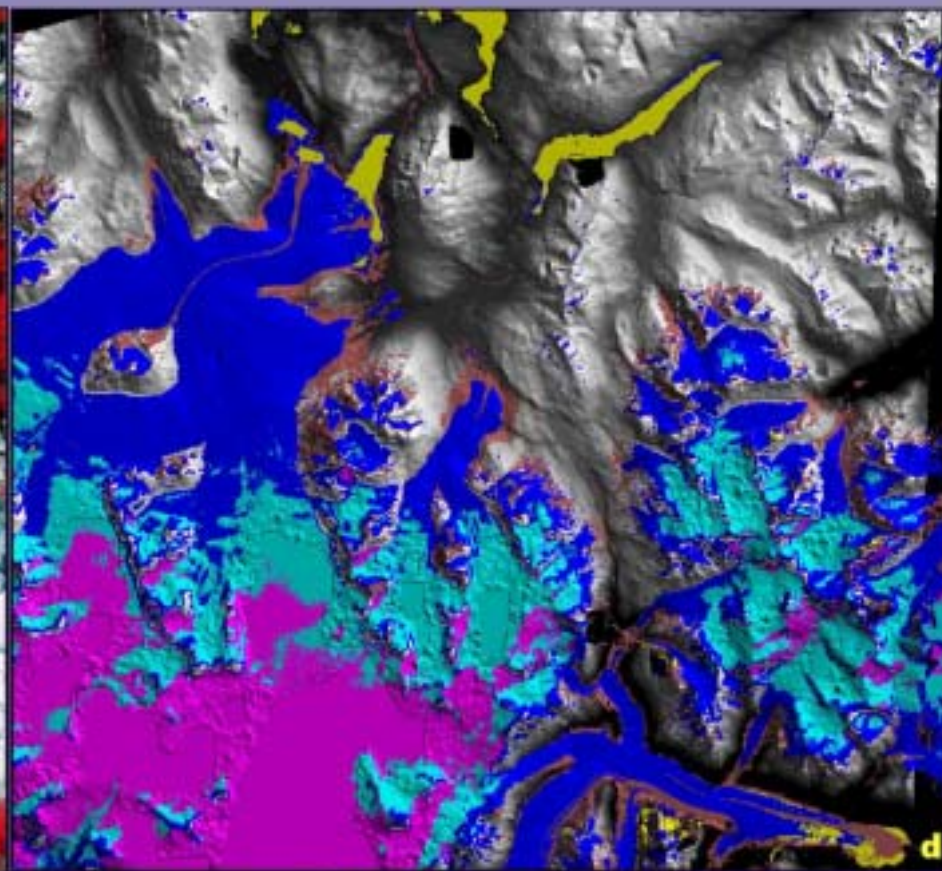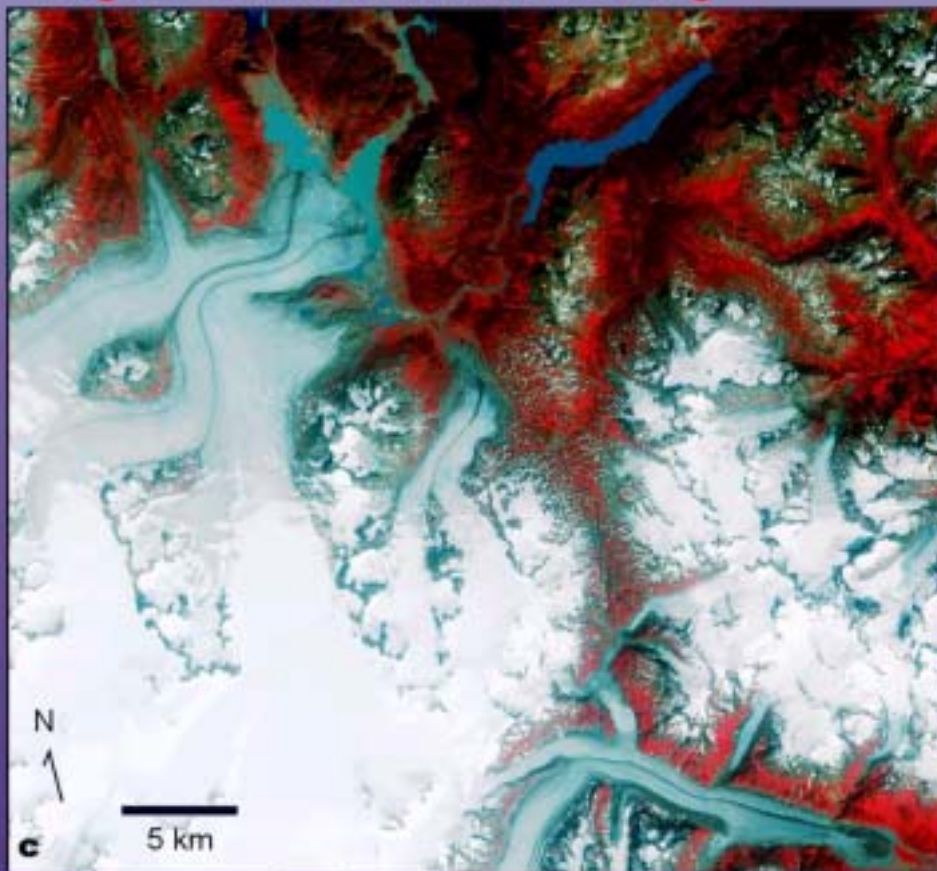**VNIR bands 321 RGB 2001, Sep. 6 -- GLIMS GAINS: 123 LOW, 456789 HIGH**

Rick Wessels 12/01

Automated feature extraction

GLIMS
Flagstaff Center for Remote Sensing

N
5 km
c
d

snow (accumulation)   firn / wet snow   bare ice (ablation)   moraine/debris covered ice   water

Llewellyn and Tulsequah glaciers, British Columbia
ASTER 321 RGB
2001 September 13,
ASTER VNIR gains= LOW and SWIR = HGH.

Water and glacier feature map from enhanced maximum likelihood supervised classification of three derivative bands (After Sidjak and Wheate, 1999)
ASTER DEM in shaded relief base image.
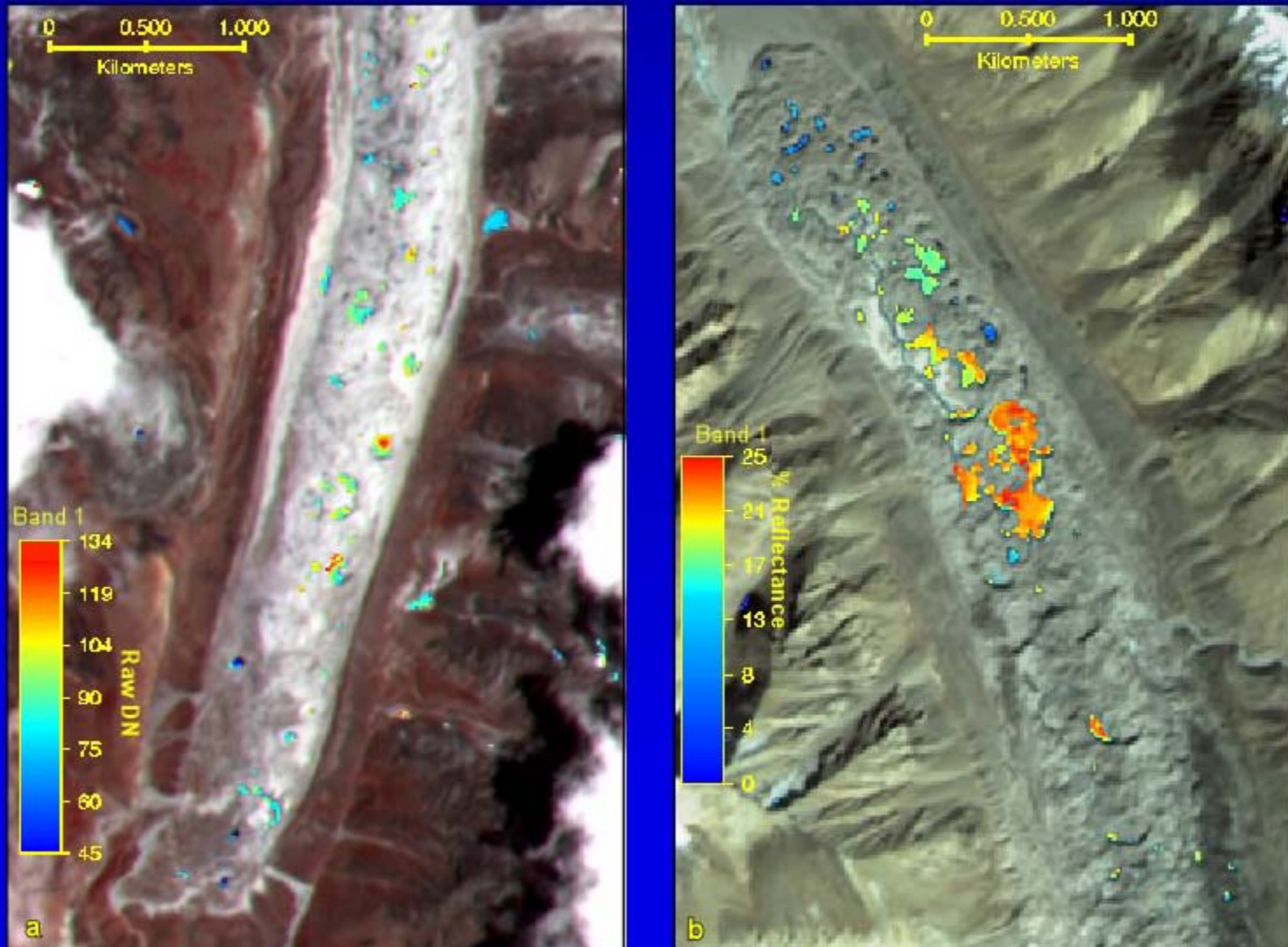(Areas of no visible relief = null areas in standard ASTER DEM product).

Supraglacial Lakes

Figure 3. Kumbu Glacier, Nepal (a) and Rongpu Glacier, Tibet (b). The base images for both figures are false color composites of ASTER bands 321 in RGB. Band 1 values for supra-glacial ponds are represented by the pseudocolor scales shown in the left of each image.

Monitoring Supraglacial and Proglacial Lakes

Ngozumpa Glacier, Nepal

Use ASTER data for:

> **Measure lake turbidity**

> **Measure temperature for larger lakes**

> **Monitor changes in lake location and size**
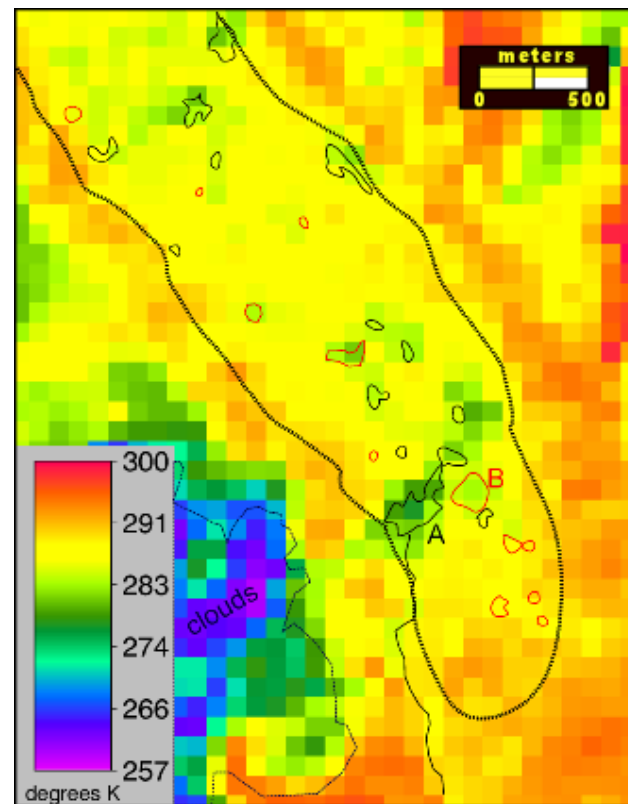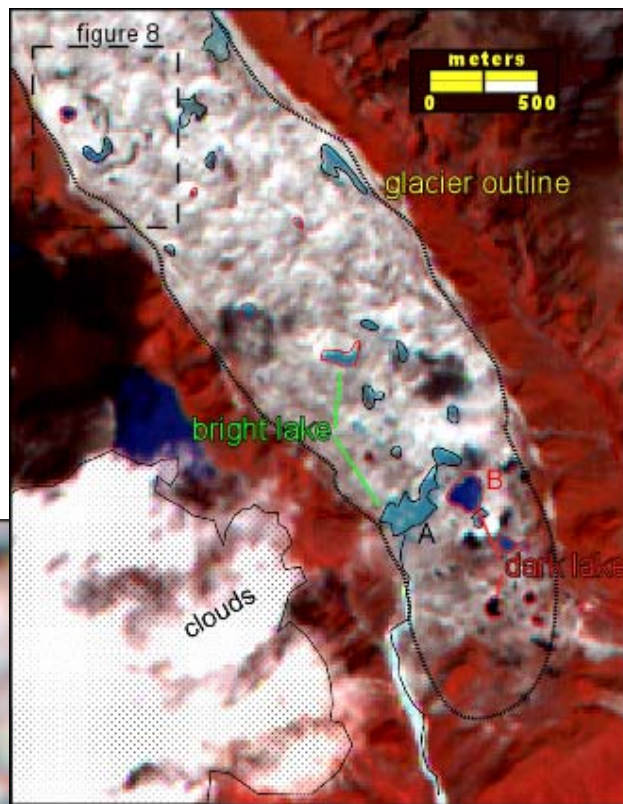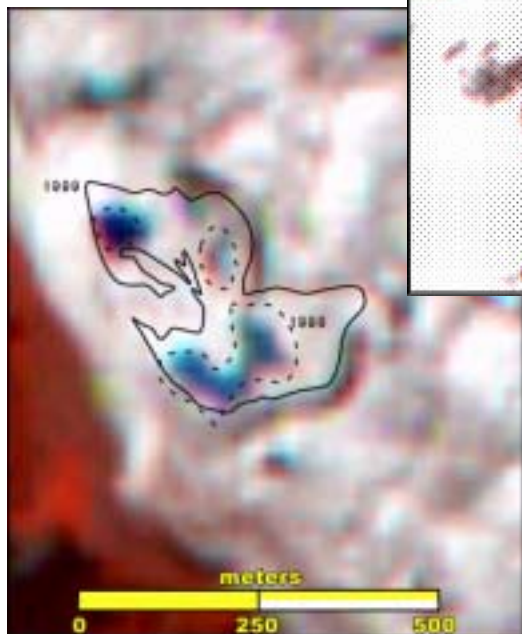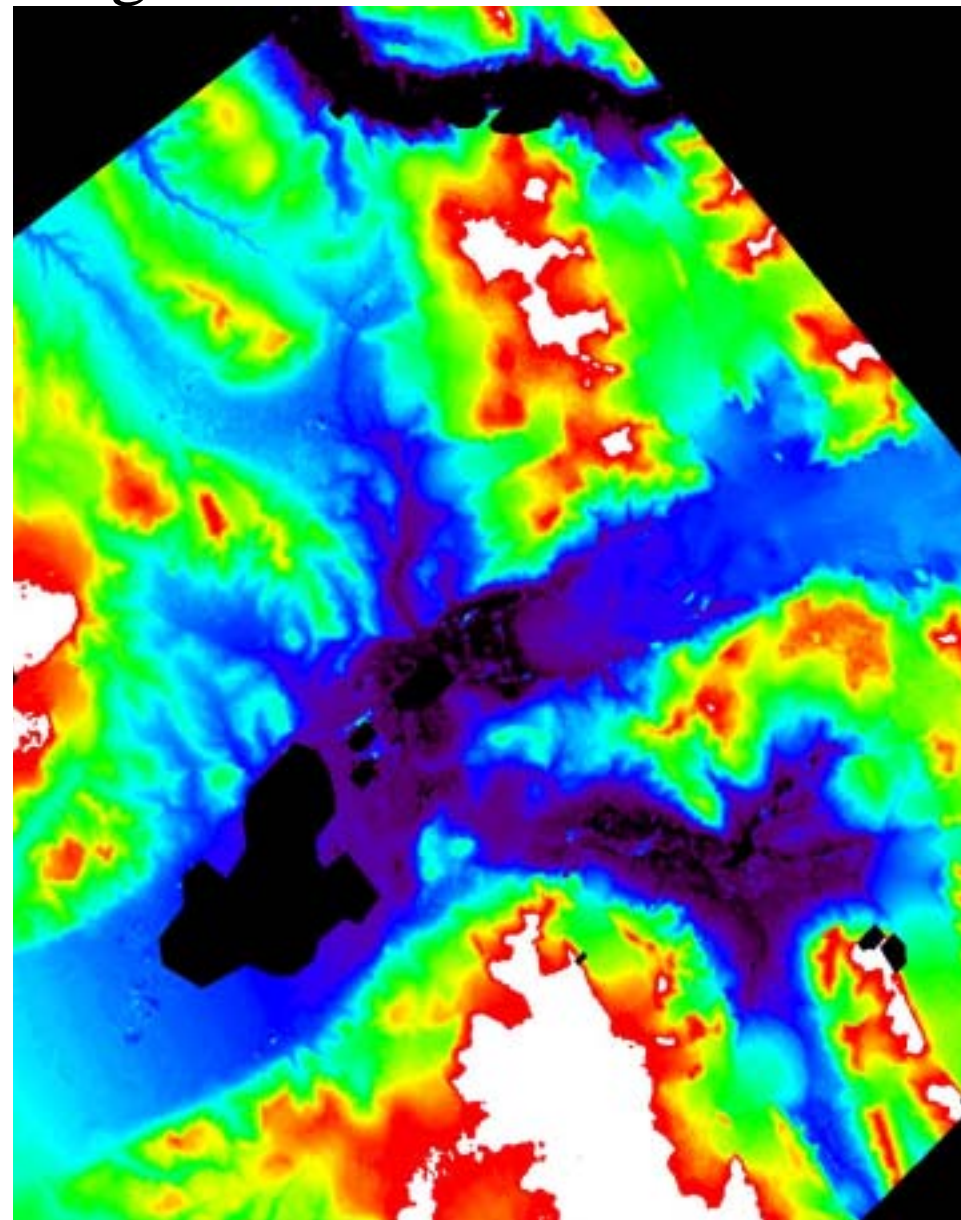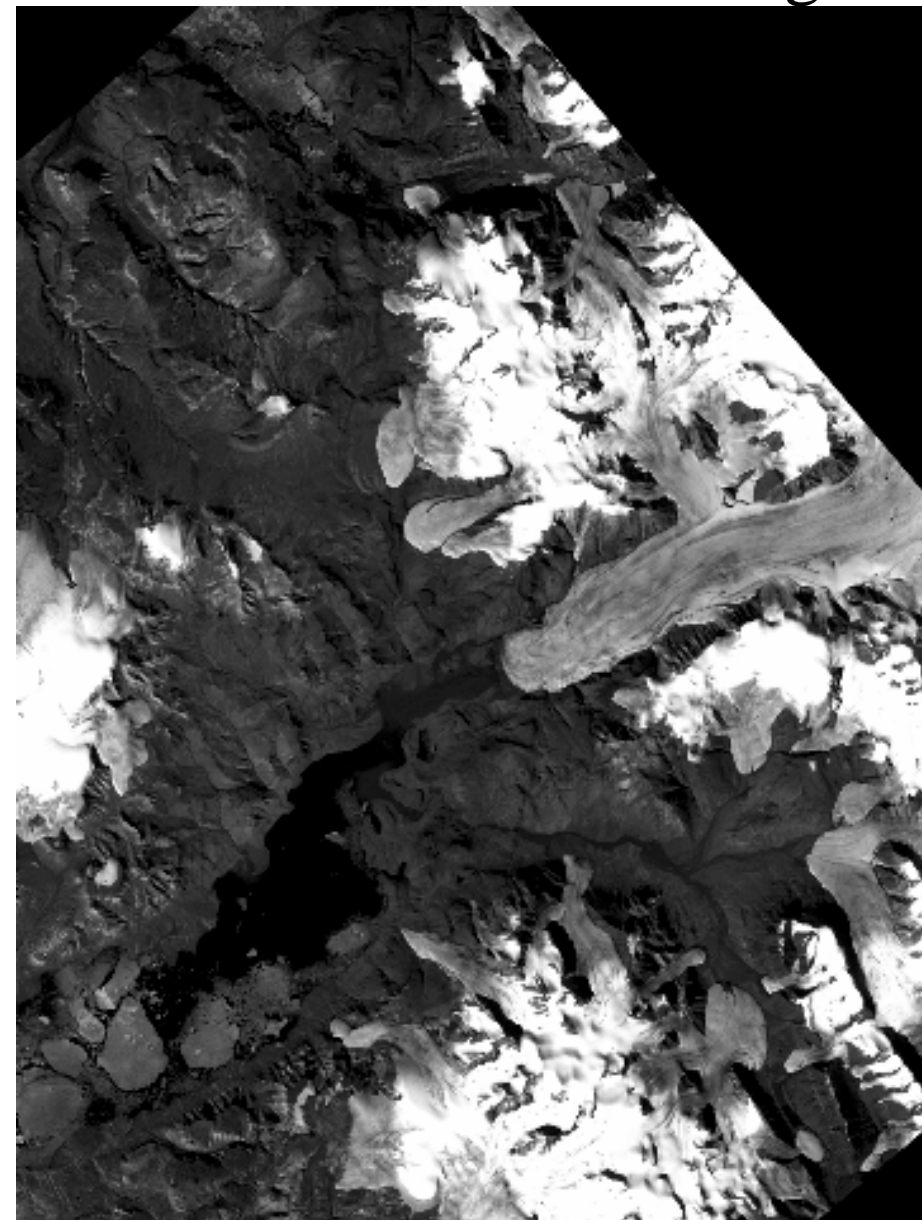

2000 Sept. 28 ASTER L1B

Image shows that lake has receded back to 1998 levels in year 2000.

Lower brightness temperatures over lakes with higher turbidity

Small lakes prone to temp error because of large TIR pixel size.

Pre-2000 lake outlines from Benn and others, 2000

ASTER Level 2 relative DEM over western Axel Heiberg Island glaciers

ASTER 3N

Western British Columbia - ASTER RGB draped over ASTER derived DEM

View from top of
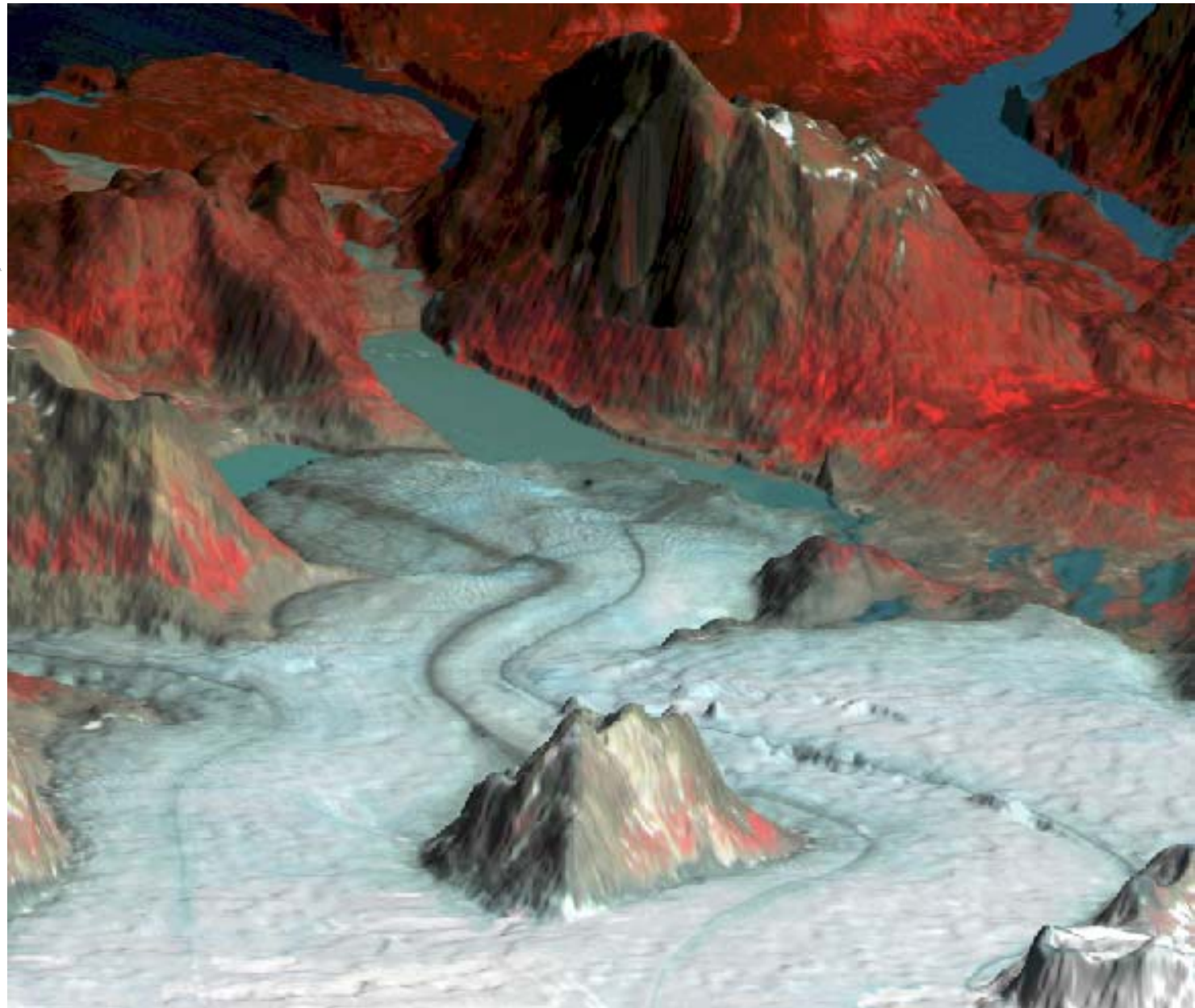
Llewellyn Glacier

Destriped ASTER L1A

version 2

VNIR bands 321 RGB

August 8, 2001

GLIMS GAINS:
123 LOW,
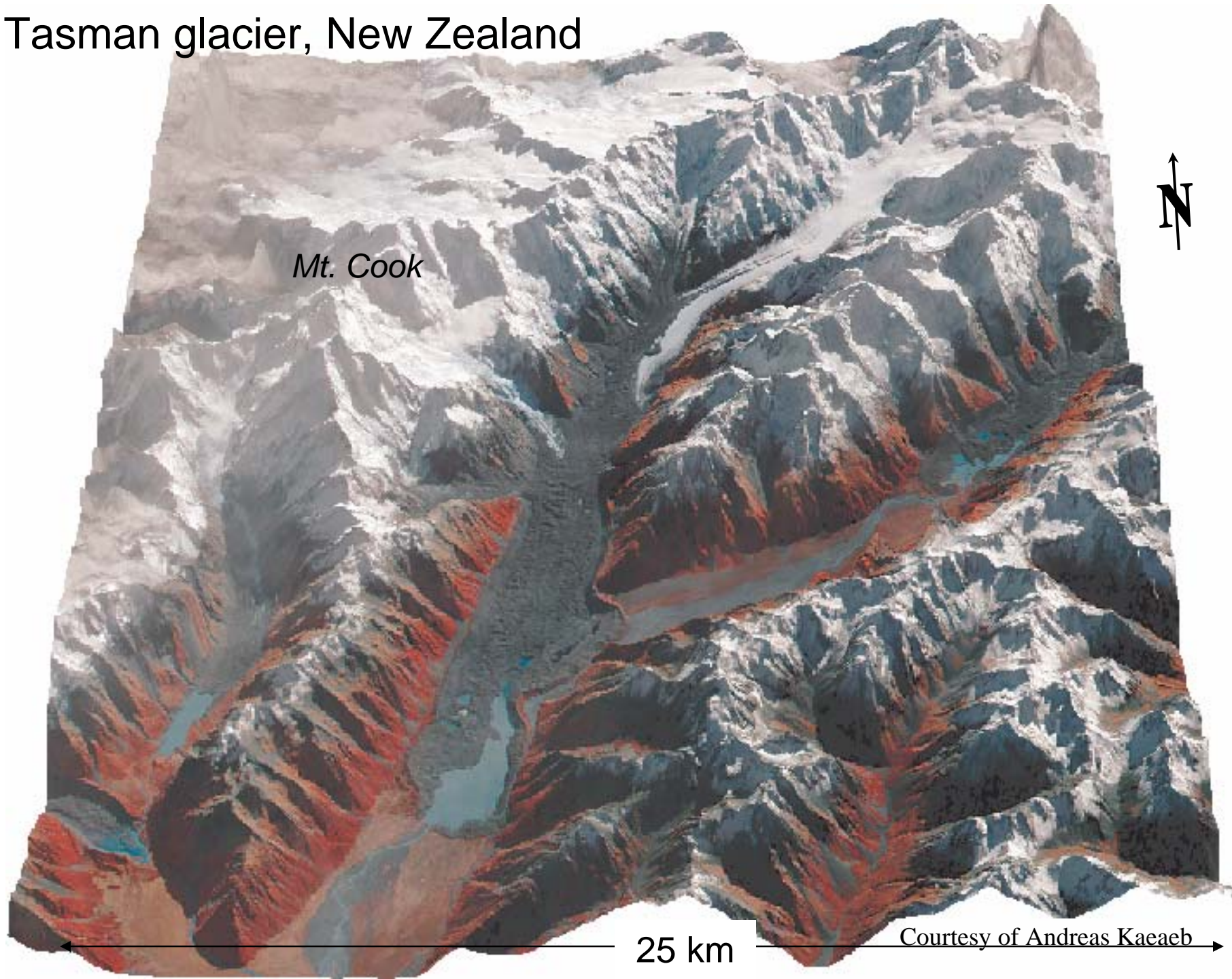**456789 HIGH**

www.GLIMS.org

Rick Wessels 10/01

Tasman glacier, New Zealand

Mt. Cook

N

25 km

Courtesy of Andreas Kaeaeb

Baltoro Glacier, Pakistan