Visualisation of changes in alpine glaciers in western Canada
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Mt. Sir MacDonald and Illecillewaet Glacier, 1902 (~end of Little Ice Age (LIA))
Thompson Glacier, Axel Heiberg Island, 1965
Glaciers viewed as constant in 1960s-70s
1981 Columbia Icefield
elevation data are not updated: roads, glaciers from 1980; contours from 1960
Western Canada (BC / Alberta)

~15,000 glaciers

BC ~25,000 km²

Alberta: 1,000 km²
Mt. Edziza

1965 yellow
1982 red
(from air photo mapping)

2005 white
(Landsat)

accumulation area - black
Robson Glacier

1911 Photo: Whyte Museum of the Canadian Rockies (V263/NA 6345. Byron Harmon)

2011 Photo: Roger Wheate
1923 British Columbia-Alberta boundary commission map
Cambrian Icefield, Coast Mountains
Maligne Lake glaciers, Jasper NP

Maligne Lake area 1930-2010: total loss of 33.07 km² (from 79.5 km²) or -0.52% per year. Between 2000 and 2010, the rate increased to 2.23% per year
Thinning

*Changes in Glacier Thickness*

Sources: map contours, stereo photography, spaceborne DEMs: e.g. SRTM, ASTER GDEM

Current changes ~ -5m/year

Retreat

*Changes in Glacier Area*

Today

Yesterday

Sources: maps, air photos, satellite images

Current changes ~ -20m/year
Techniques for showing elevation change
(DEM subtraction: Haeberli and Paul, 2009)
Hoodoo Mountain area: Landsat TM 2010
Hoodoo Glacier: extents 1965 to 2005 (overlain on Landsat TM 2010)
1965, 1982 from aerial photos, 1999 and 2005 from Landsat
NTDB 1965: DEM from contours; geogratis.ca
BC 'TRIM' mapping 1982: digital stereophotography; geobase.ca
Shuttle Radar Topography Mission (SRTM) 1999 (spaceborne)
SRTM 1999
ASTER 2004
DEM subtraction
NTDB - ASTER

0-230m (unclassed)
Final map product
Severnaya Zemlya: Glacier changes in 1980-2000s
Final slide

* Visualisation images to be displayed at: glacierchange.org (public input website run by Ph.D student Matt Beedle)

* New millennium global glacier extents: glims.org/RGI/randolph.html

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