Supplement of

Brief Communication: Updated GAMDAM Glacier Inventory over the High Mountain Asia

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Table S1. List of Landsat scenes used to delineate glacier outlines, and each quality of images. attached ' TableS1_gamdam.xls'

Table S2. Summary of total glacier area in each region of the GGI18 and RGI6.0. The column 'GGI18-RGI6.0' indicates the ratio of the difference between the GGI18 and RGI6.0 to total glacier area of RGI6.0 in each region.

	GGI18 (km^2)		RGI6.0 (km^2)	Difference (GGI18-RGI6.0) (%)
CentralAsia	50,519	± 7,578	49,302	2.5
SouthAsiaEast	15,895	± 2,384	14,734	7.9
SouthAsiaWest	33,034	± 4,955	33,568	-1.6
NorthAsia*	1,244	± 187	1,163	7.0
Total	100,693	± 15,104	98,767	2.0

*: Only Altay and Sayan

Table S3. Area comparison between the GGI18 limited to the NM18 domain and NM18 and the overlapping area.

Name of inventory	GGI18 (NM18 domain)	NM18
Total area (km^2)	33,019±4,953	35,287±1,209
Overlapping area (km^2)	30,739	
Overlapping area ratio (%)	93 to total area of GGI18 limited at NM18 domain (= 33,019 km^2)	87 to total area of NM18 (= 35,287 km^2)

Table S4. Area comparison between the GGI18 limited to the CGI2 domain and CGI2 and the overlapping area and overlapping ratios. **: This value includes glaciers of the first Chinese glacier inventory, where we have no glacier polygon in CGI2.

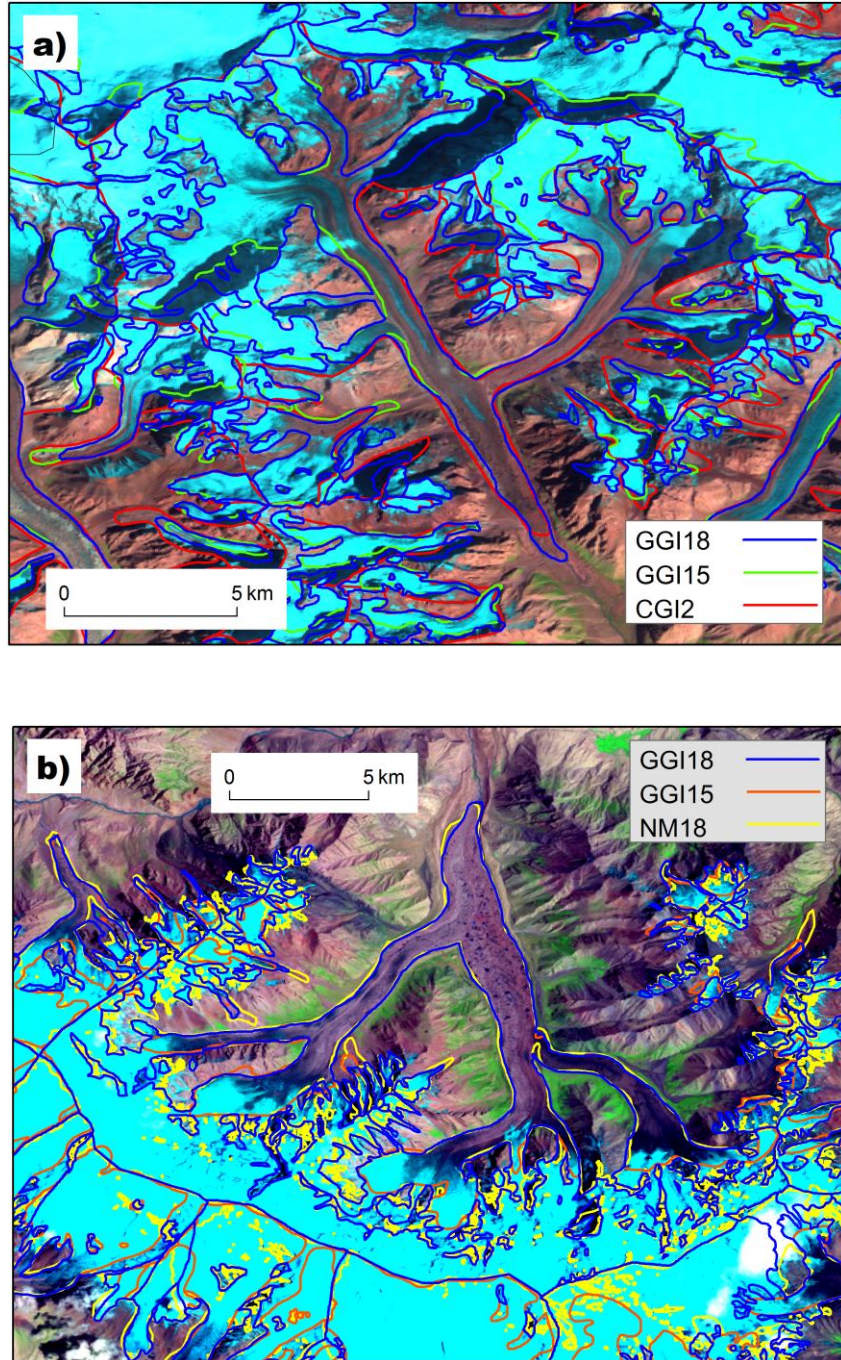| Name of inventory	GGI18 (CGI2 domain)	CGI2
Total area (km^2)	48,100±7,215	50563**
Overlapping area (km^2)	43,516	
Overlapping area ratio (%)	90 to total area of GGI18 limited at CGI2 domain (= 48,100 km^2)	86 to total area of CGI2 (= 50,563 km^2)

Figure S1: Comparison of the glacier outlines of each glacier inventory, GGI15, GGI18, and CGI2, at 75°17'11"E, 38°39'54"N (path149 row33 of WRS2) a). And comparison of GGI15, GGI18, and NM18, at 80°21'36"E, 42°2'23"N (path147 row31 of WRS2) b). The backgrounds are false colour (bands 7, 4, and 2 as RGB) composite Landsat images taken on 10 September 1996 (a), and 11 July 1994 (b), respectively.
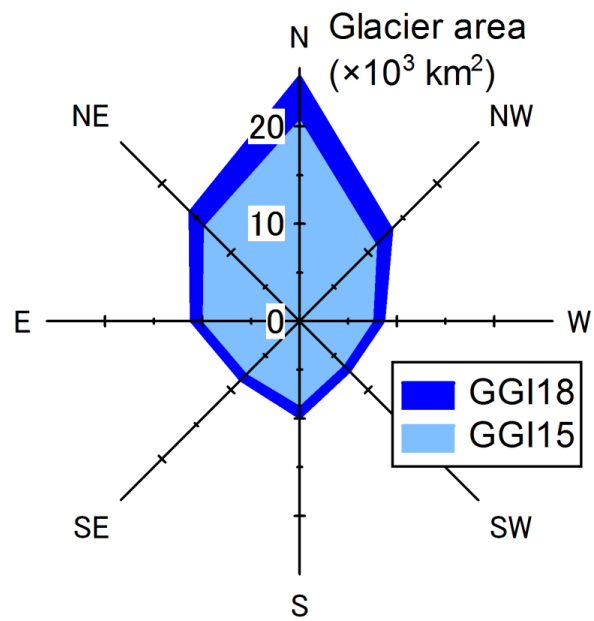
Figure S2: Glacier area distribution from different aspects with an interval of 45 degrees (eight azimuths). Blue and light blue colours indicate the GGI18 and GGI15, respectively.
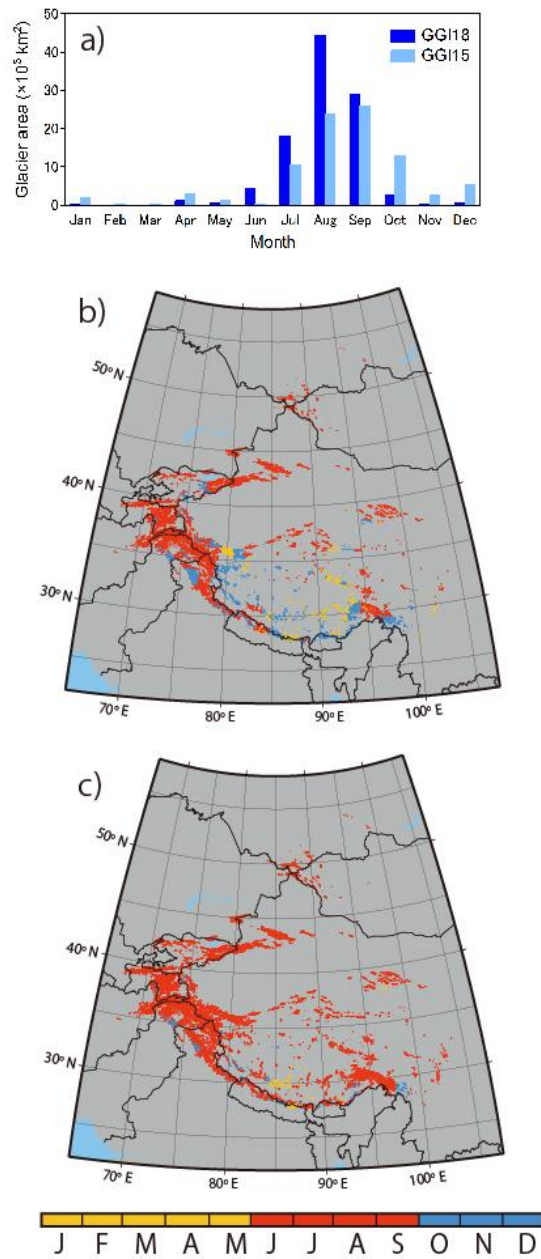
Figure S3: Frequency distribution of the acquisition month of the Landsat scenes used to delineate the glaciers in the GGI15 and GGI18 by glacierised area (a). Distribution of glacier area centre coloured by acquisition month in the GGI15 (b) and in the GGI18 (c).
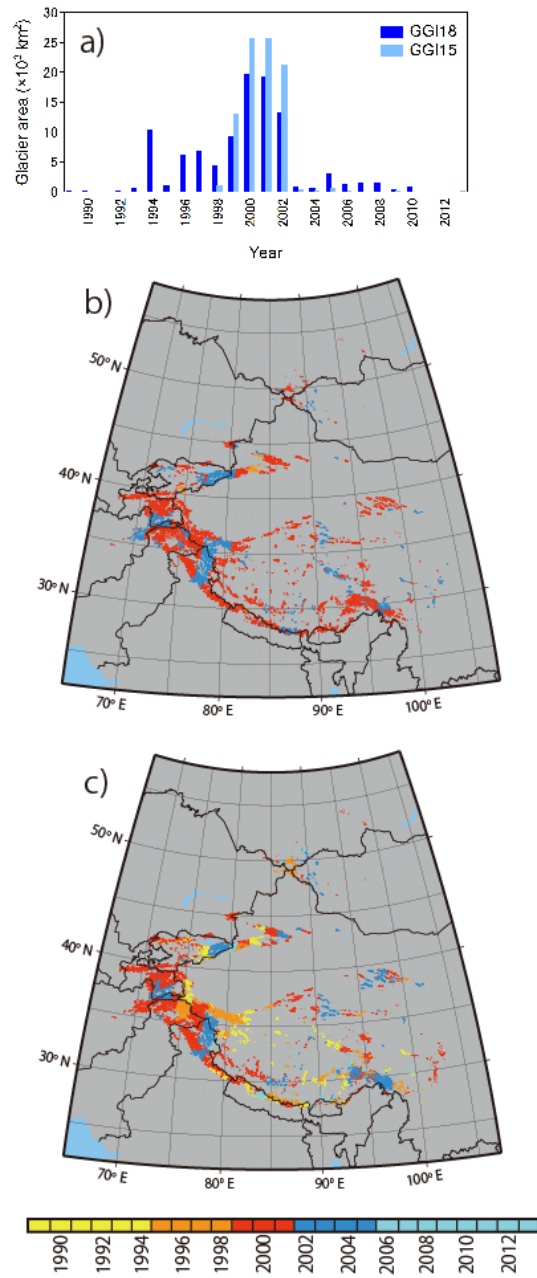
Figure S4: Frequency distribution of the acquisition year of the Landsat scenes used to delineate the glaciers in the GGI15 and GGI18 by glacierised area (a). Distribution of glacier area centre coloured by acquisition year in the GGI15 b) and in the GGI18 c).
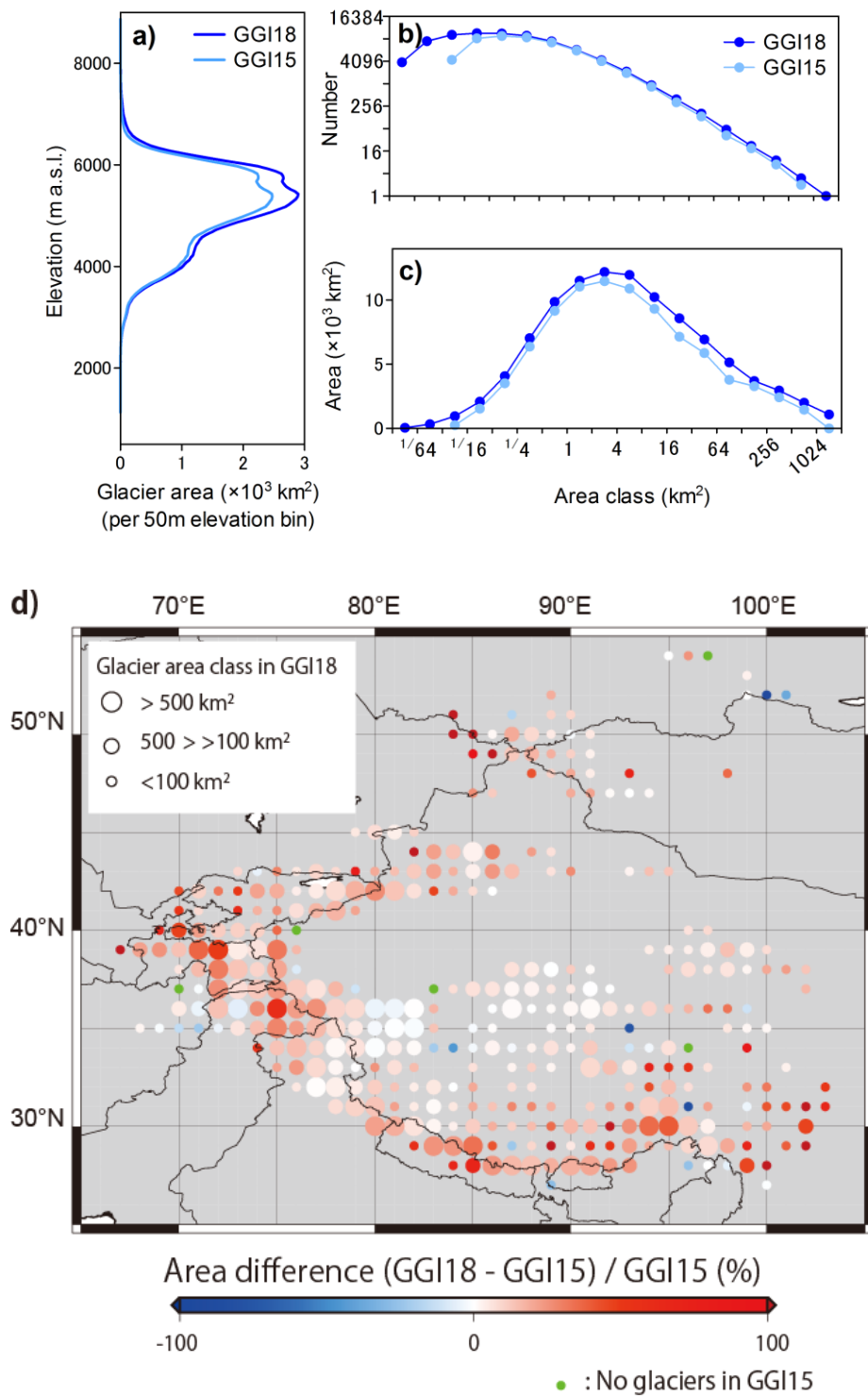
Figure S5: Comparison between the GGI15 and the GGI18. Each glacier hypsography a) at every 50-m elevation bin. Glacier number b) and total area c) at each area class. There is no data in the area class from 0.01 to 0.05 km^2 in the GGI15, because the minimum glacier area was set at 0.05 km^2. Are difference between GGI15 and GGI18 at each 1 degree grid cell d).
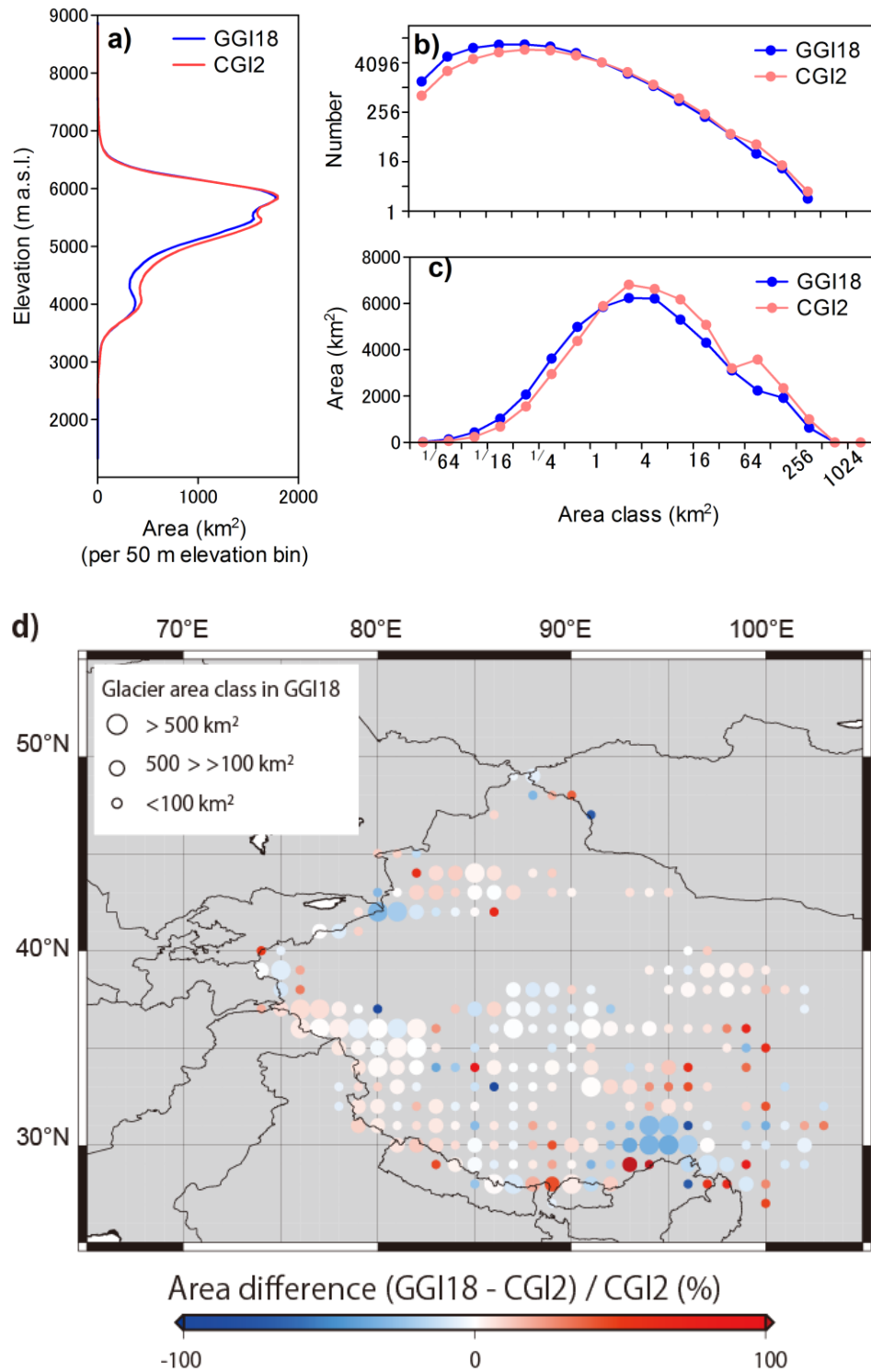
Figure S6: Comparison between the CGI2 and GGI18 limited to the CGI2 domain. Each glacier hypsography a) at every 50-m elevation bin. Glacier number b) and total area c) at each area class. Both inventories include only glaciers > 0.01 km^2 in area. Are difference between CGI2 and GGI18 at each 1 degree grid cell d).
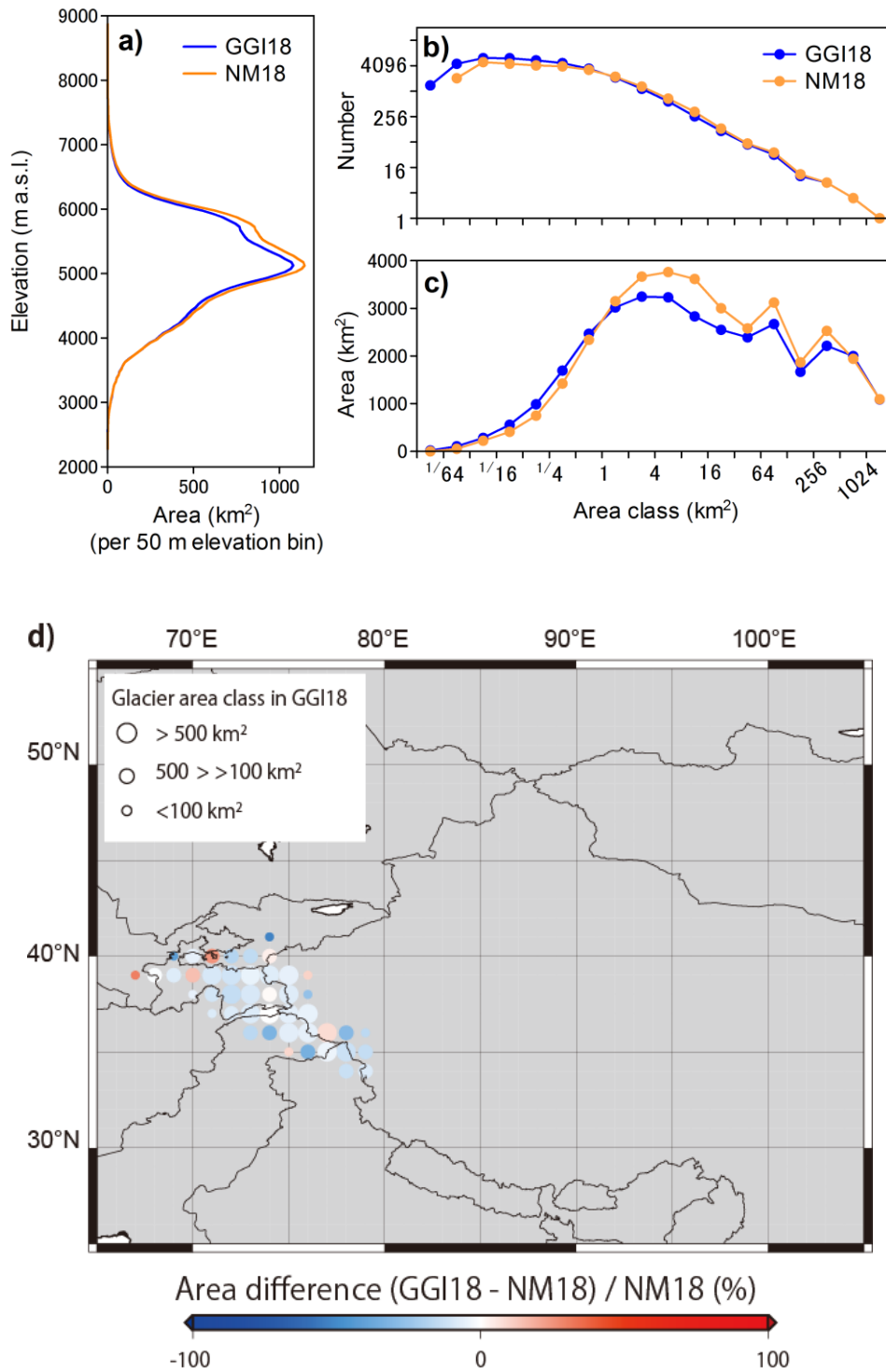
Figure S7: Comparison between the NM18 and GGI18 limited to the NM18 domain. Each glacier hypsography a) at every 50-m elevation bin. Glacier number b) and total area c) at each area class. There is no data in the area class from 0.01 to 0.02 km^2 in NM18 because only glaciers > 0.02 km^2 in the area were included. Are difference between NM18 and GGI18 at each 1 degree grid cell d).
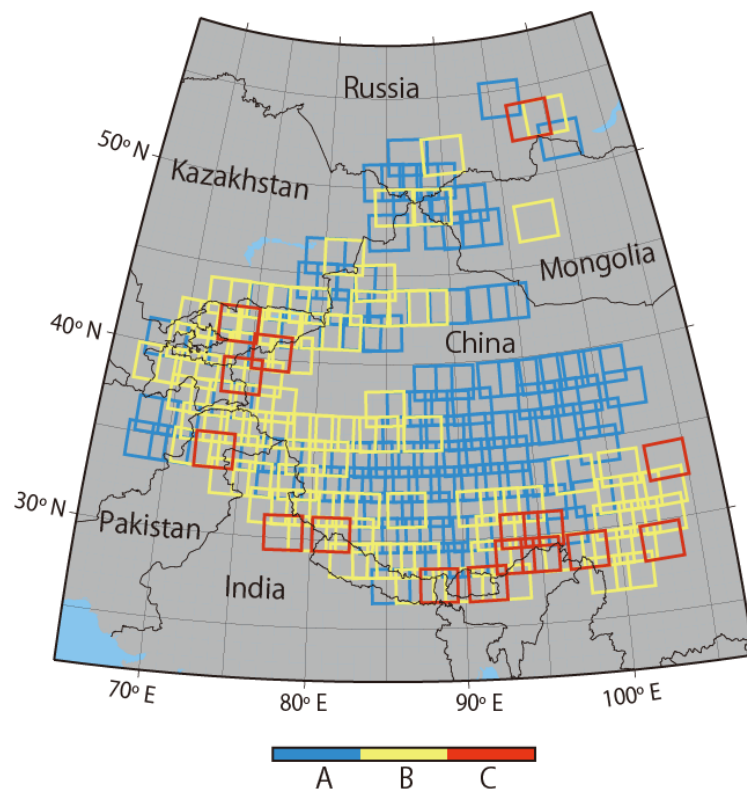
Figure S8: Subjective quality of each path-row scene. Quality is good for path-row scenes rated 'A'; medium for those rated 'B', and those rated 'C' have the lowest quality of Landsat images.