Supplement

Table S1. Vertical accuracy statistics[a] of Hexagon DEMs relative to the 2006 ASTER DEM (meters)

ID	Lon	Lat[b]	$RMSE_z$	Mean	Median	NMAD[c]	STD	68.3%Q	95%Q	i_h[d]
1	90.05	28.25	8.1	0.5	0.7	6.4	8.1	6.8	15.9	0.9
2	90.26	28.24	8.6	1.2	1.3	7.3	8.5	7.5	15.6	0.4
3	89.97	28.09	11.5	1.4	1.4	8.7	11.5	9.4	22.5	1.8
4	90.12	28.10	11.6	0.7	0.8	9.2	11.6	9.8	21.9	0.2
5	90.27	28.08	12.8	0.6	1.0	8.7	12.8	9.4	24.4	1.4
6	90.42	28.14	14.9	1.6	1.5	11.6	14.8	12.7	30.3	1.4
7	90.73	28.05	8.9	0.1	0.6	6.6	8.9	7.0	17.8	0.6
8	90.66	28.25	11.8	0.4	1.1	8.9	11.8	9.5	22.5	0.4

[a] Over assumed stable terrain (i.e. excluding glaciers). [b] Center of each Hexagon DEM region.
[c] Normalized median absolute deviation. [d] Hole interpolation max area (km^2).

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Table S2. Glacier Change Statistics

Glacier ID	a	b	c	d	e	f	g
Longitude (deg)	89.99	90.04	90.25	89.99	90.07	90.15	90.21
Latitude (deg)	28.21	28.18	28.19	28.16	28.14	28.16	28.13
Mean Elevation (m)	5728	5729	6184	5175	5061	4971	5613
1974 Area (km^2)	14	31	88	30	13	35	9
ΔV (km^3)	-0.06 ± 0.02	-0.25 ± 0.15	-0.05 ± 0.51	-0.19 ± 0.18	-0.11 ± 0.11	-0.13 ± 0.24	-0.04 ± 0.08
ΔV_d (km^3)	-0.07 ± 0.02	-0.27 ± 0.03	-0.19 ± 0.04	-0.11 ± 0.03	-0.09 ± 0.03	-0.06 ± 0.04	-0.02 ± 0.02
$\bar{h}$ (m)	-4.2 ± 1.8	-8.2 ± 4.9	-0.6 ± 5.8	-6.3 ± 6.0	-8.4 ± 8.1	-3.8 ± 6.8	-4.1 ± 8.4
$b\dot{}$ (m.w.e.)	-3.6 ± 1.5	-7.0 ± 4.2	-0.5 ± 4.9	-5.3 ± 5.1	-7.1 ± 6.9	-3.2 ± 5.8	-3.5 ± 7.2
Area Captured (%)	37	44	29	35	54	47	34
Debris Area (% total)	1	6	3	41	37	44	16
Calving (y/n)	n	y	n	n	n	n	y

	h	i	j	k	l	m	n
	90.27	90.32	90.35	90.39	90.47	90.7	90.75
	28.13	28.11	28.09	28.10	28.08	28.06	28.04
	5487	5171	5286	5800	6161	5507	5474
	14	6	7	57	32	6	10
	-0.12 ± 0.15	-0.12 ± 0.02	-0.07 ± 0.02	-0.41 ± 0.14	-0.02 ± 0.19	-0.03 ± 0.01	-0.10 ± 0.02
	-0.12 ± 0.02	-0.10 ± 0.02	-0.04 ± 0.02	-0.43 ± 0.06	-0.05 ± 0.04	-0.02 ± 0.01	-0.09 ± 0.02

-8.9 ± 11.0	-20.2 ± 5.2	-9.4 ± 8.7	-7.2 ± 2.4	-0.5 ± 6.0	-5.0 ± 2.0	-11.1 ± 2.6
-7.5 ± 9.4	-17.2 ± 4.6	-8.0 ± 7.4	-6.1 ± 2.1	-0.5 ± 5.1	-4.3 ± 1.7	-9.4 ± 2.3
36	80	53	38	27	31	48
17	11	10	11	14	< 1	1
y	y	n	n	n	n	y

o	p	q	r	s	t	u
90.79	90.78	90.62	90.66	90.68	90.63	90.67
28.03	28.06	28.21	28.24	28.26	28.25	28.29
5247	5544	5677	5189	5324	6141	5638
6	9	4	13	7	12	12
-0.06 ± 0.01	-0.11 ± 0.03	-0.03 ± 0.05	-0.07 ± 0.06	-0.02 ± 0.02	-0.01 ± 0.06	-0.05 ± 0.03
-0.03 ± 0.01	-0.08 ± 0.02	-0.03 ± 0.02	-0.06 ± 0.03	-0.01 ± 0.02	-0.02 ± 0.02	-0.04 ± 0.03
-9.1 ± 2.2	-12.2 ± 3.3	-7.5 ± 11.6	-5.2 ± 4.4	-3.2 ± 3.4	-0.5 ± 4.8	-3.9 ± 2.4
-7.7 ± 2.0	-10.3 ± 2.9	-6.3 ± 9.8	-4.5 ± 3.8	-2.7 ± 2.9	-0.4 ± 4.1	-3.3 ± 2.1
49	54	60	77	79	43	60
8	1	42	39	1	19	9
n	y	n	n	n	n	n

ΔV is ice volume change after extrapolation (using regional glacier profile means to fill missing data), ΔV_d is ice volume change without extrapolation (volume change measured directly from the elevation change maps only), $\overline{h}$ is the spatially-averaged elevation change of the glacier (after extrapolation), and $\dot{b}$ is the geodetic mass balance for each glacier over the 32-year timespan (after extrapolation).

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Table S3

	Excluding glacier c						Including glacier c					
	$\dot{b}$	Area		ΔV			$\dot{b}$	Area		ΔV		
	m.w.e. yr^{-1}	km^2	%	km^3	%		m.w.e. yr^{-1}	km^2	%	km^3	%	
clean	-0.12 ± 0.06	152 ± 15	47	-0.71 ± 0.33	36		-0.09 ± 0.08	240 ± 24	58	-0.76 ± 0.60	38	
debris	-0.15 ± 0.11	96 ± 10	29	-0.53 ± 0.40	27		-0.15 ± 0.11	96 ± 10	23	-0.53 ± 0.40	26	
calving	-0.25 ± 0.10	79 ± 8	24	-0.74 ± 0.28	37		-0.25 ± 0.10	79 ± 8	19	-0.74 ± 0.28	36	
combined	-0.16 ± 0.05	327 ± 32		-1.98 ± 0.58			-0.13 ± 0.05	415 ± 41		-2.03 ± 0.77		
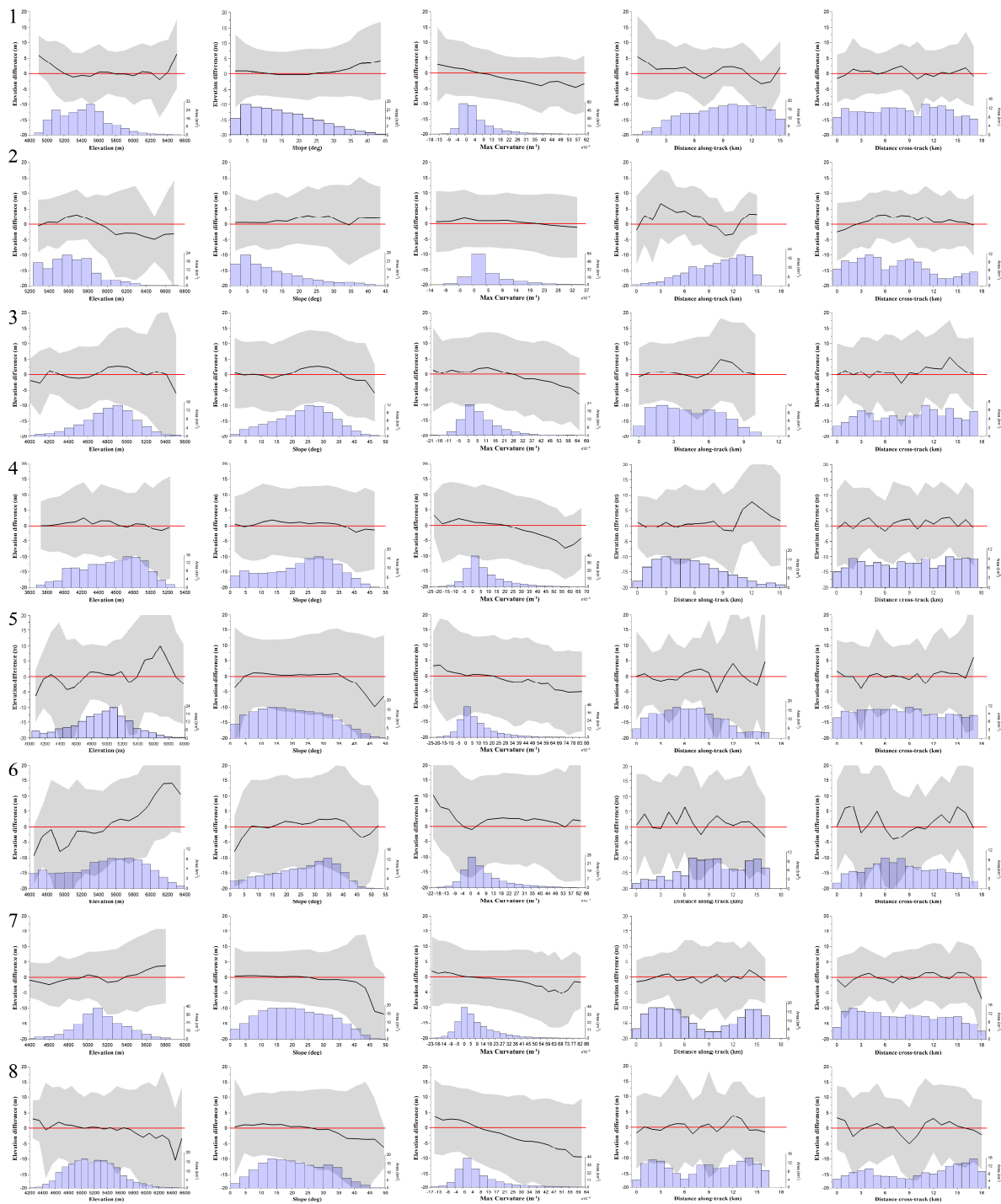
Figure S1. Plots of elevation change vs. elevation, slope, maximum curvature, and ASTER along-track and cross-track directions for assumed stable terrain in each of the 8 Hexagon DEM regions given in Table S1. Black curves and grey shaded regions indicate the mean and standard deviation of each bin, respectively. The area (km^2) contained in each bin is indicated by the blue histogram bars, calculated as the number of pixels per bin * pixel resolution^2.