Supplementary Material

Kinematics of the exceptionally-short surge cycles of Sít' Kusá (Turner Glacier), Alaska, from 1983 to 2013

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Method	Dataset
Terminus Delineation	Landsat 2 MSS (4), Landsat 3 MSS (1), Landsat 4 MSS (7), Landsat 4 TM (1), Landsat 5 TM (163), Landsat 7 ETM+(178), and Landsat 8 OLI (78)
Velocity Mapping	Landsat 5 TM (20), Landsat 7 ETM+(7), and Landsat 8 OLI (4)
DEMs	ASTER (4), SPOT5 (1), IFSAR-Alaska (1), and WV-1 (2)

Table S1. Dataset overview for the three methods used in our analysis. The number within parentheses is the number of scenes from each sensor used for the respective method. For the Landsat missions: MSS is multi spectral scanner, TM is thematic mapper, ETM+ is enhanced thematic mapper +, and OLI is operational land imager. For the DEMs: ASTER is Advanced Spaceborne Thermal Emission and Reflection Radiometer, SPOT5 is Satellite Pour l'Observation de la Terre 5, IFSAR-Alaska is Interferometric Synthetic Aperture Radar Alaska, and WV-1 is Digital Globe's WorldView-1.
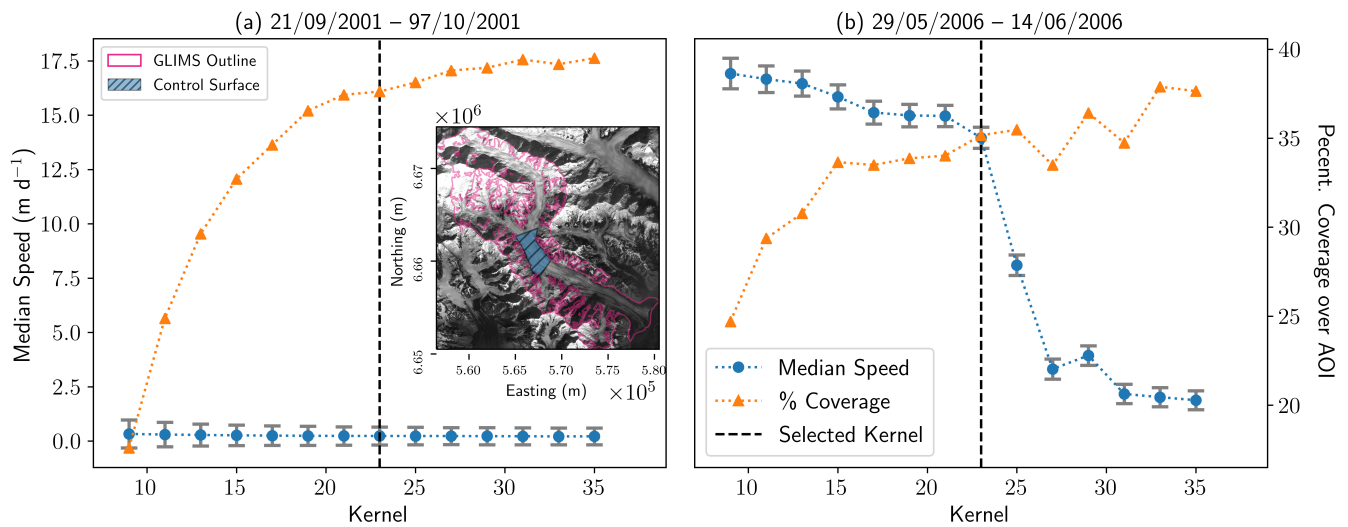

Fig. S1. Median speeds ($\mathrm{m\,d^{-1}}$) and percent coverage over sampling area of interest shown on the inset map of (a). Results for quiescent (a) and active (b) phase scene pairs are both shown. Grey vertical lines represent uncertainties and the dashed black line is the selected kernel size.
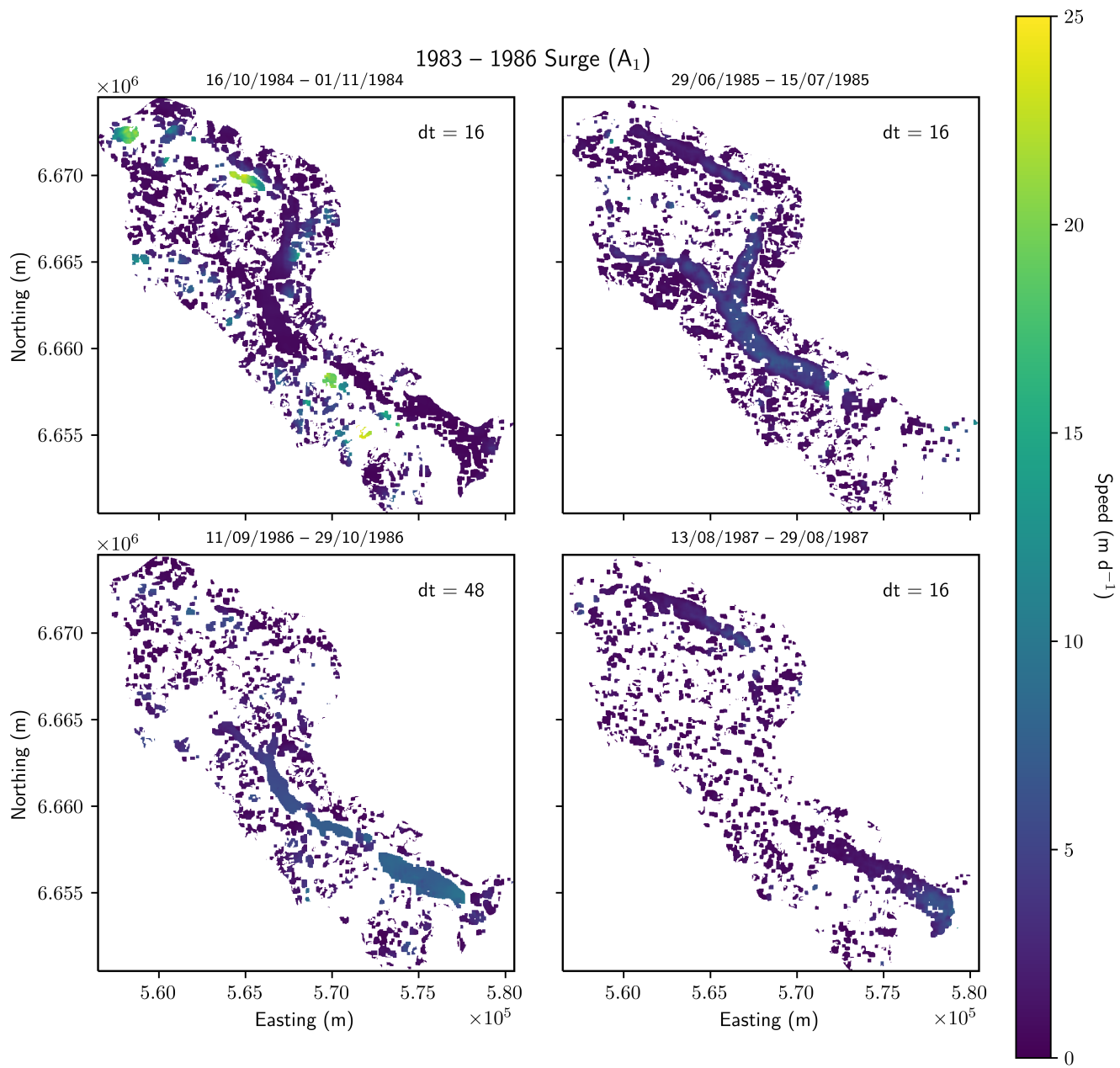
Fig. S2. 1983–1986 surge speed observations projected on a UTM 7N grid. The title of each subplot is the dates of image pair plotted, where dt is separation between scenes in days.

Satellite/Sensor	Granule Name	Acquisition Date
ASTER	AST_L1A_00304052001205827	20010405
	AST_L1A_00305202003205451	20030520
	AST_L1A_00303022006204725	20060302
	AST_L1A_00307172012204209	20120717
WorldView-1	SETSM_WV01_20130526_1020010023316100_1020010024AFB800_seg1	20130526
	SETSM_WV01_20131207_1020010028A0CD00_1020010027DDD800_seg1	20131207
SPOT5	GES_08029	20070903

Table S2. Satellite/sensor, granule name, and acquisition date (YYYYMMDD) for satellite-based DEMs used in the analysis.
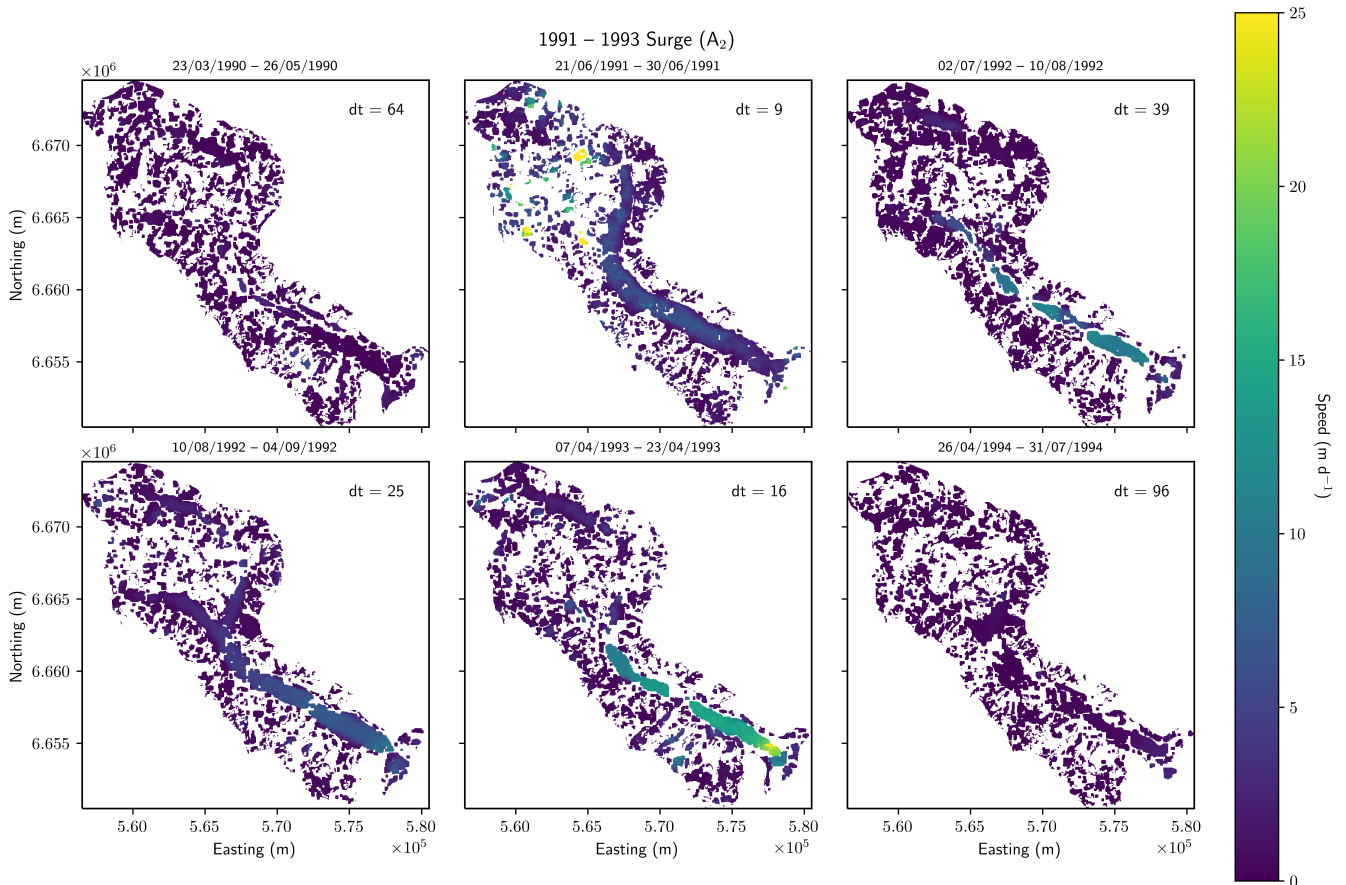

Fig. S3. 1991–1993 surge speed observations projected on a UTM 7N grid. The title of each subplot is the dates of image pair plotted, where dt is separation between scenes in days.
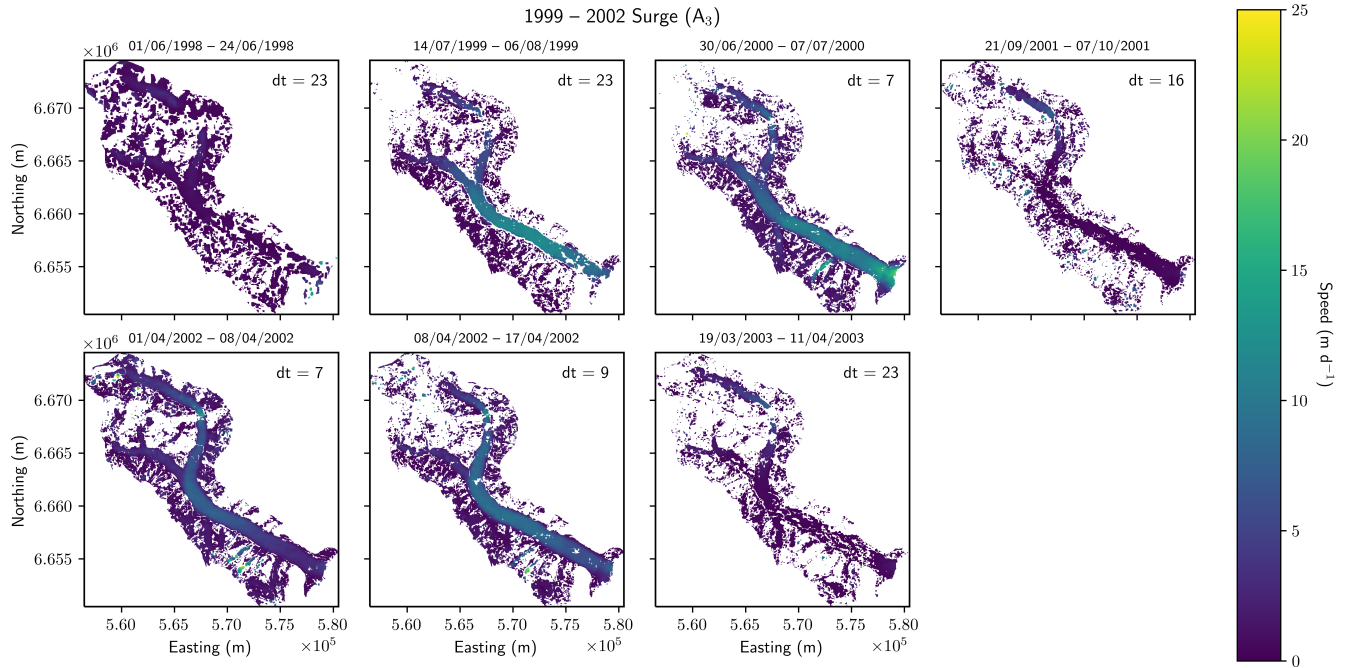
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Fig. S4. 1999–2002 surge speed observations projected on a UTM 7N grid. The title of each subplot is the dates of image pair plotted, where dt is separation between scenes in days.
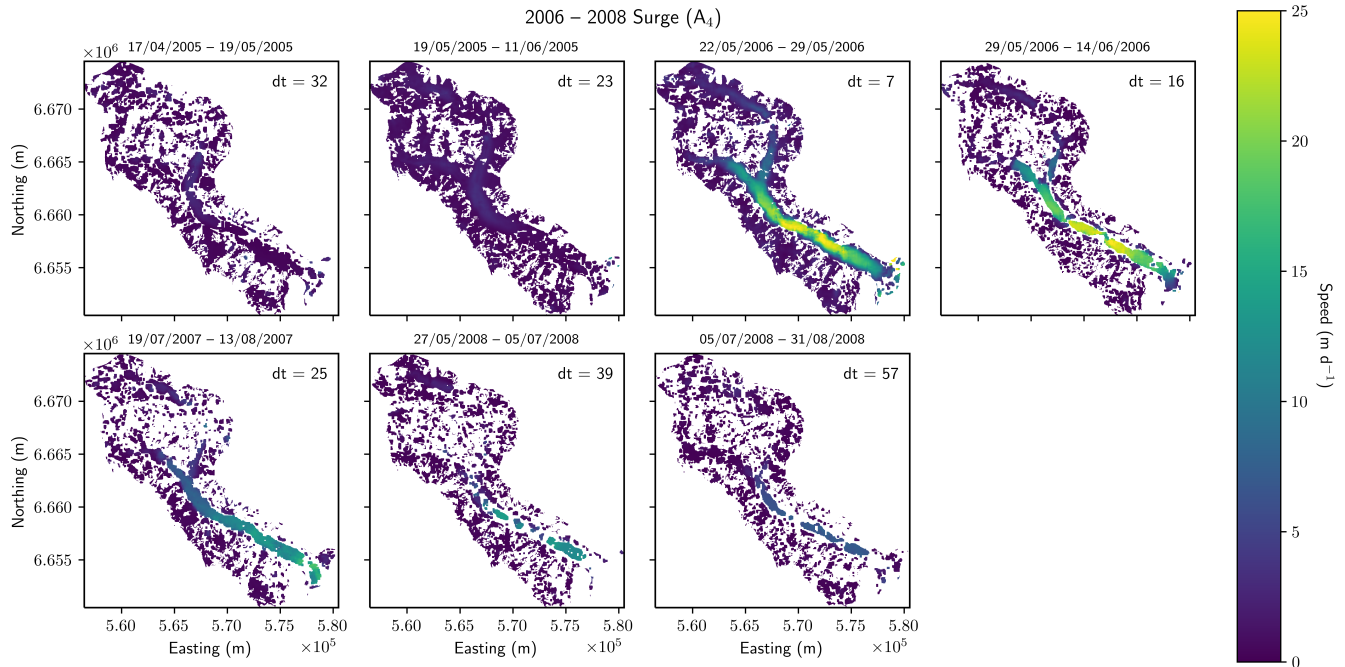

Fig. S5. 2006–2008 surge speed observations projected on a UTM 7N grid. The title of each subplot is the dates of image pair plotted, where dt is separation between scenes in days.

Fig. S6. 2012–2013 surge speed observations projected on a UTM 7N grid. The title of each subplot is the dates of image pa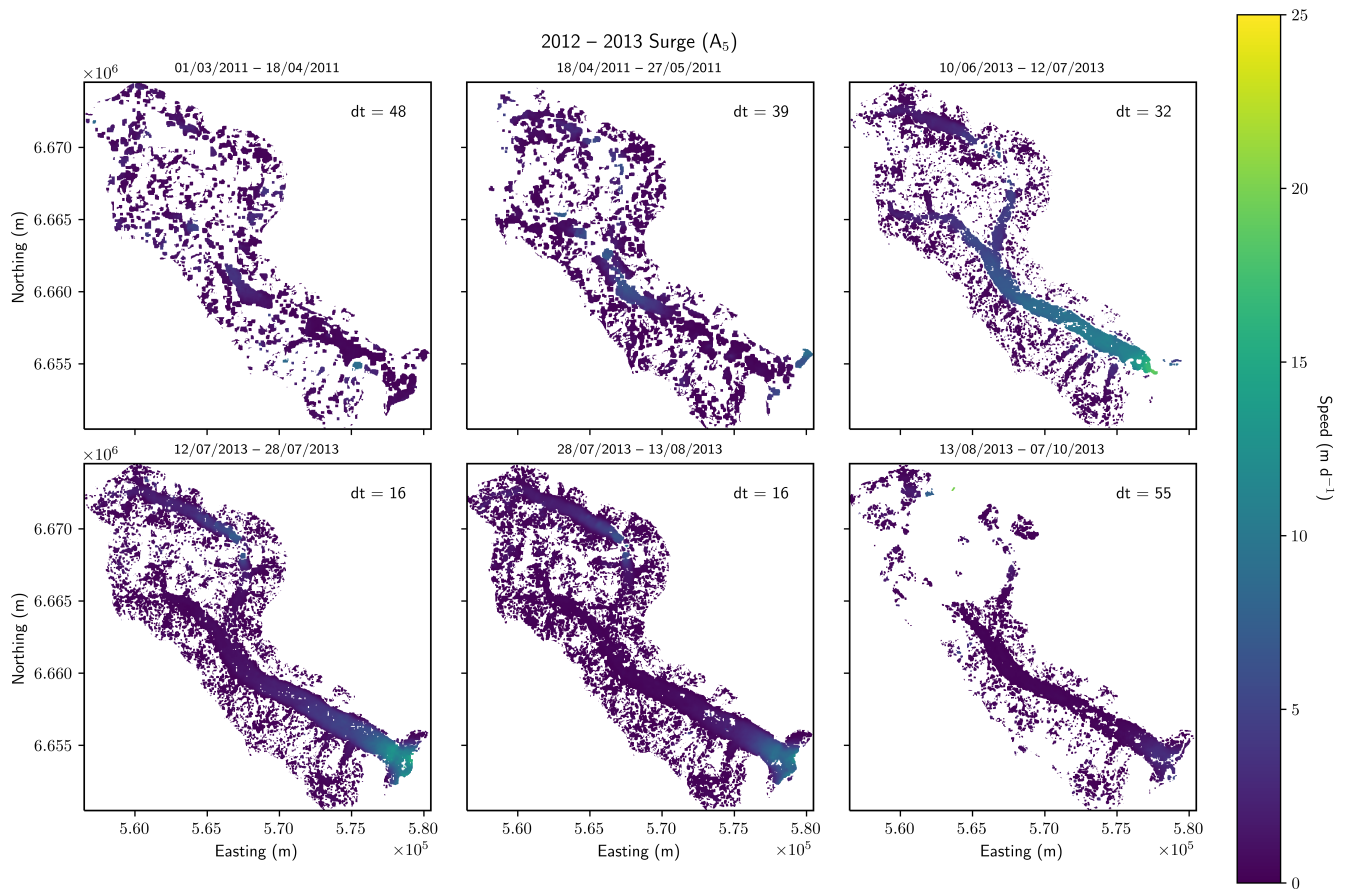ir plotted, where dt is separation between scenes in days.