Supplement of The Cryosphere, 12, 577–594, 2018
https://doi.org/10.5194/tc-12-577-2018-supplement

The Cryosphere Open Access EGU

Supplement of

Changes in glacier dynamics in the northern Antarctic Peninsula since 1985

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Overview:

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S1: Velocity change measurements

Two approaches to measure and analyze the temporal changes in flow velocities of the studied glaciers are evaluated. For the first approach, the flow velocities are extracted at across glacier profiles, defined for each basin close to the terminus, considering the maximum frontal retreat state (see Fig. 1 in the manuscript), and the median values along the profiles are then calculated (see also Section 3.2 in the manuscript). For the second approach, the flow velocities are measured at the location of maximum ice thickness at the respective across glacier terminus profile (same as for the first approach). The ice thickness information is taken from the Huss and Farinotti (2014) ice thickness reconstruction dataset of the Antarctic Peninsula. The temporal evolution of the ice velocities of all observed glaciers is plotted in Fig. S1-S74 (for the first approach) and Fig. S75-S148 (for the second approach).

For the first approach, velocity profiles with partial profile coverage (for glaciers located at the border of a velocity field) or large data gaps are sorted out. Data voids usually occur towards the lateral parts of the glacier (e.g. regions affected by SAR shadow, caused by the valley side walls), whereas the maximum ice thickness is usually found towards the center of the terminus. Therefore, some more velocity measurements are obtained using the second approach (2256 measurements for the first approach; 2736 measurements for the second approach; see Table S1 and S2).

The temporal changes in the flow speed of all studied glaciers are categorized according to Table 3 (manuscript) for both approaches (see Table S1 and S2). The same categories are used for 50 glaciers (68%) by both approaches. Taking the first approach as a reference, the largest mismatch (9 glaciers) between both approaches is found for the category “stable”. However, most of these “mismatched” glaciers are categorized as “fluctuating” glaciers, using measurements obtained by the second approach (note: this mismatch does not influence the subsequent cluster analysis since both velocity change categories have the same numerical rating, see manuscript Section 3.4 and Table 3). For both approaches, the same threshold of 0.25 m/d for the temporal variability of the measurements is applied for the category “stable” in order to carry out a comparable analysis. However, the comparison of Fig. S1-S74 and S75-S148 shows that the magnitude of the temporal variability of the flow speed is typically higher for the second approach, since the values obtained using the first approach are smoothed by averaging along the profiles.

Small differences in the mean velocity change rate (*dv* in %) in the observation period are found for Sector “East” (-58.0% for the first approach, -69% for the second approach) and “West” (+41.3% for the first approach, +44.5% for the second approach). At sector “EastIS”, an average increase in flow speed by +26.5% for the first approach and +41.0% for the second approach is obtained. This divergence can be explained by the different forcing at sector “EastIS”. The glaciers were buttressed by the Larsen-A and Prince Gustav ice shelves until they broke up in 1995. The subsequent acceleration of the glaciers led to changes in the across glacier velocity profiles (see Fig. S149). The highest acceleration is found towards the center of the glacier terminus (where usually the ice thickness is the greatest). Thus, the change in glacier type from ice shelf terminating to tide water glaciers differently affects both velocity measuring methods and leads to the observed deviations. However, a general acceleration is revealed by both approaches.

The impact of the velocity measuring approach on the cluster analysis (Section 3.4, manuscript) is small. The results of the cluster analysis (boxplots, dendrogram and the spatial distribution of the glacier groups) using the first velocity measuring approach are presented in the manuscript and the results using the second velocity measuring approach are shown in Fig. S162-S164. Most of the glaciers, 42 out of 48, are assorted to equal groups. Compared to the grouping based on the first velocity measuring approach, group 2 lost 6 glaciers using the second velocity measuring approach. Two glaciers are attributed to group 1 and four glaciers to group 3. Hence, these glaciers are only assorted to neighboring groups, which have the greatest similarity to the original group.

To sum it up, both velocity measuring approaches reveal comparable results at our study region. The results of both approaches are provided in this supplement to facilitate a better comparison with results from other studies. As discussed above, the shape of the across glacier velocity profiles can change over time and the peak position as well (see Fig. S149-S156). Moreover, the maximum ice thickness does not necessarily overlap with the peak in the velocity profiles, since estimates of the former also have significant uncertainties. These cases can impact on the observed temporal evolution of the flow speed using a fixed position to measure the velocities, as performed by applying the second velocity measuring approach (at maximum ice thickness at the terminus profile) or by other studies using manually defined measuring positions. Therefore, we decided to use the results of the first approach for the detailed analysis and discussion in the manuscript since it takes into account the changes in flow speed across the whole glacier terminus and, in our opinion, this method is more representative for the changes in ice dynamics and ice discharge of a glacier system.

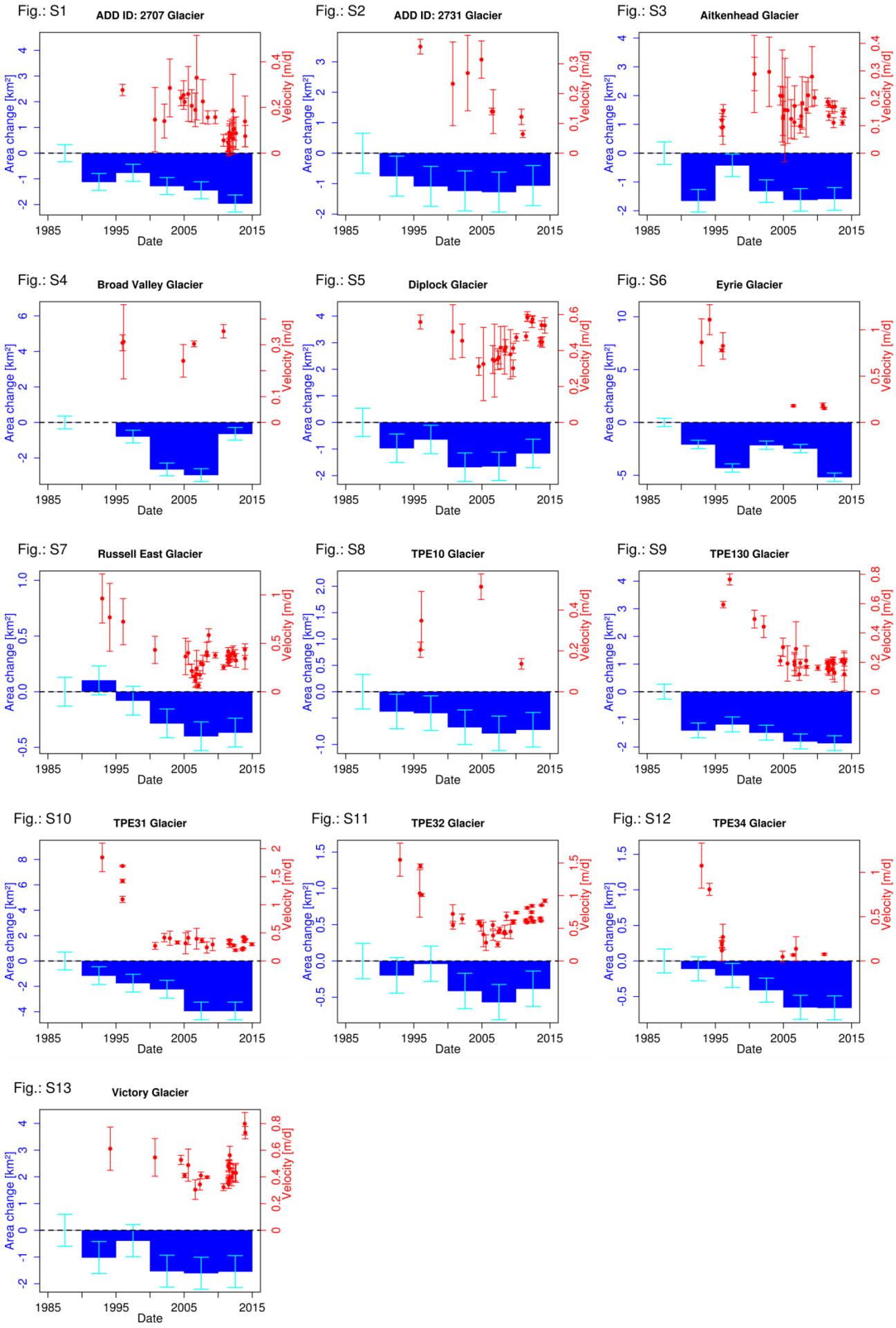

Figure S1-S13. Temporal changes of surface velocity (median values of measurements along terminus profiles) (red) and area (blue) changes of glaciers in sector "East".

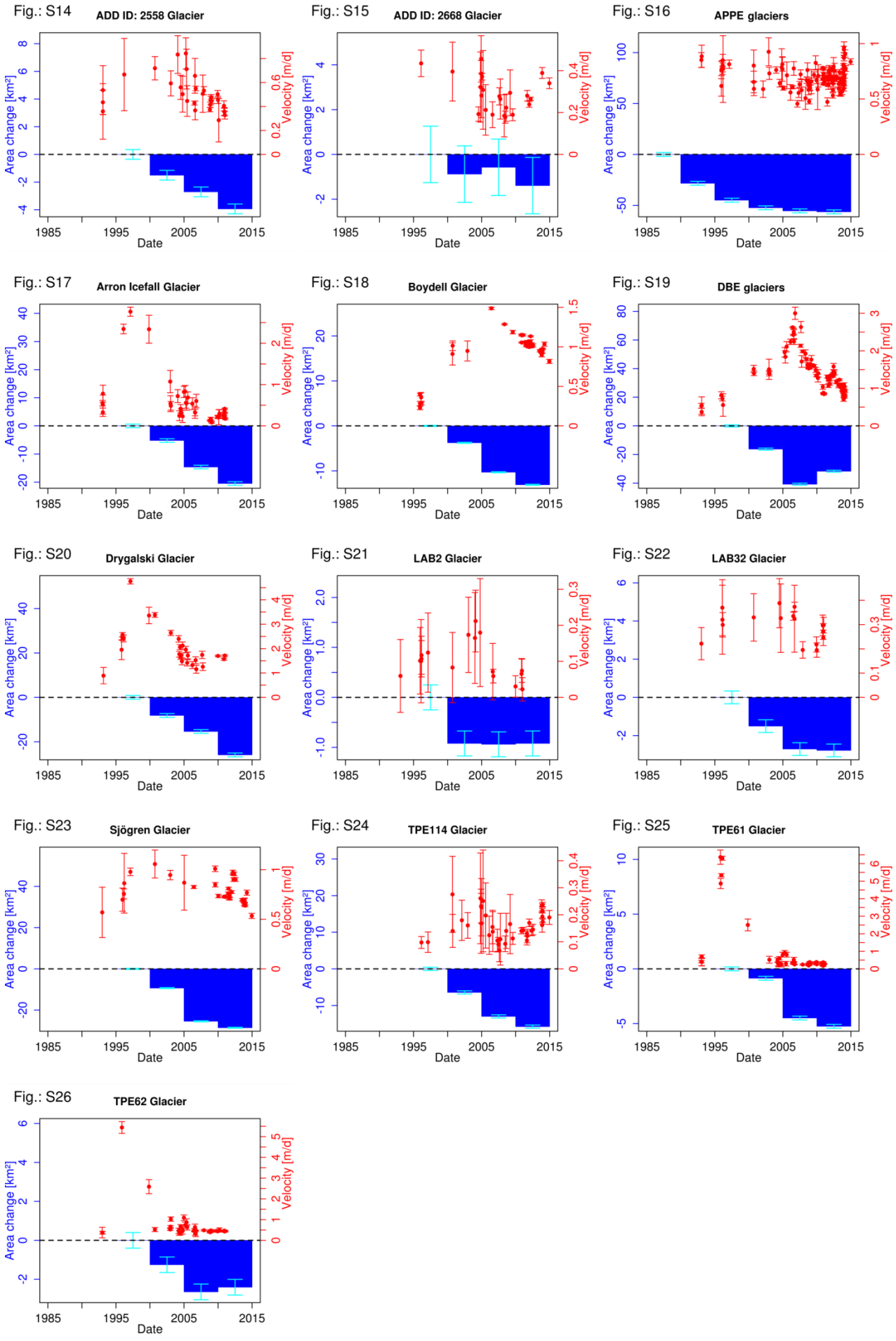

Figure S14-S26. Temporal changes of surface velocity (median values of measurements along terminus profiles) (red) and area (blue) changes of glaciers in sector "East-Ice-Shelf".

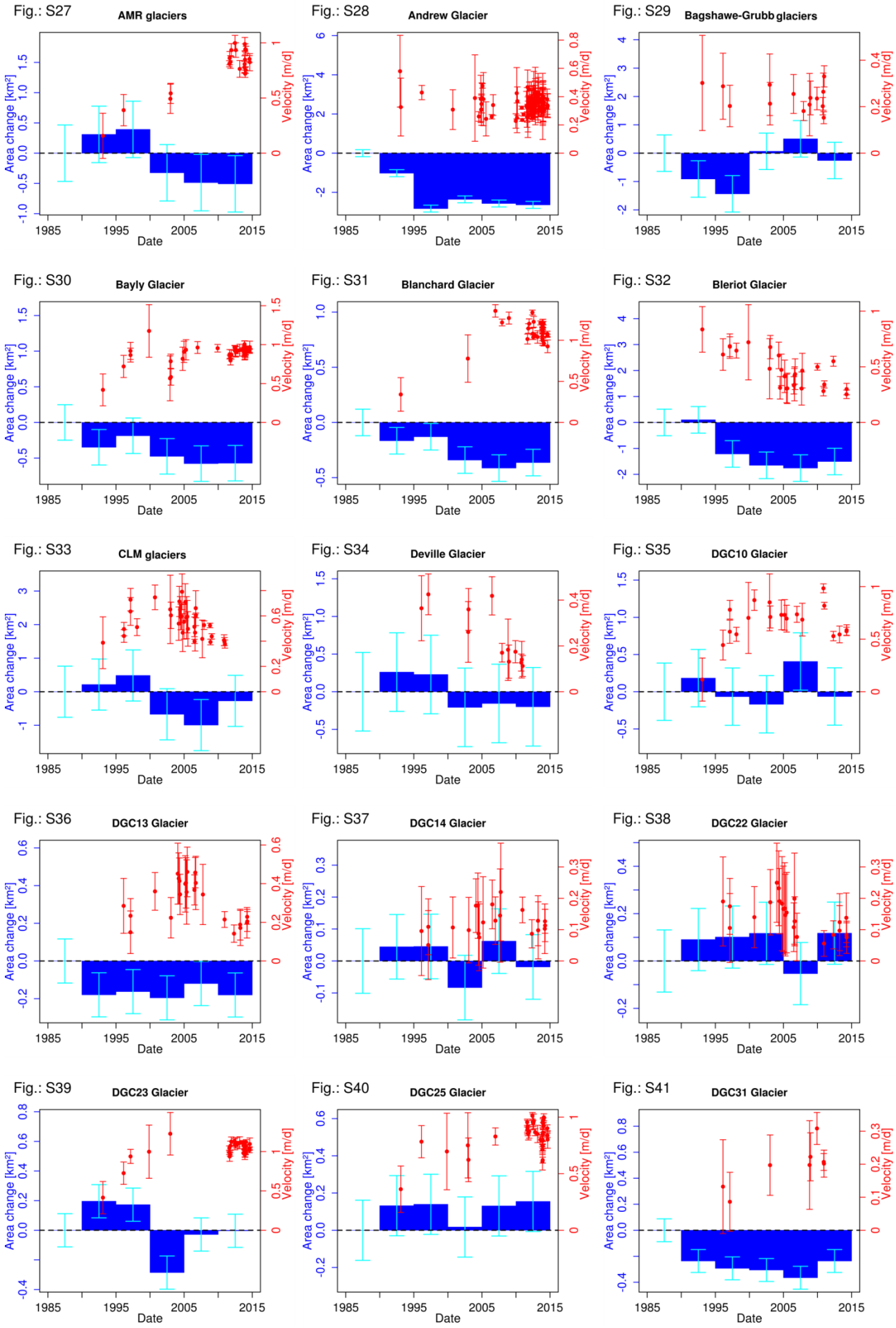

Figure S27-S41. Temporal changes of surface velocity (median values of measurements along terminus profiles) (red) and area (blue) changes of glaciers in sector "West".

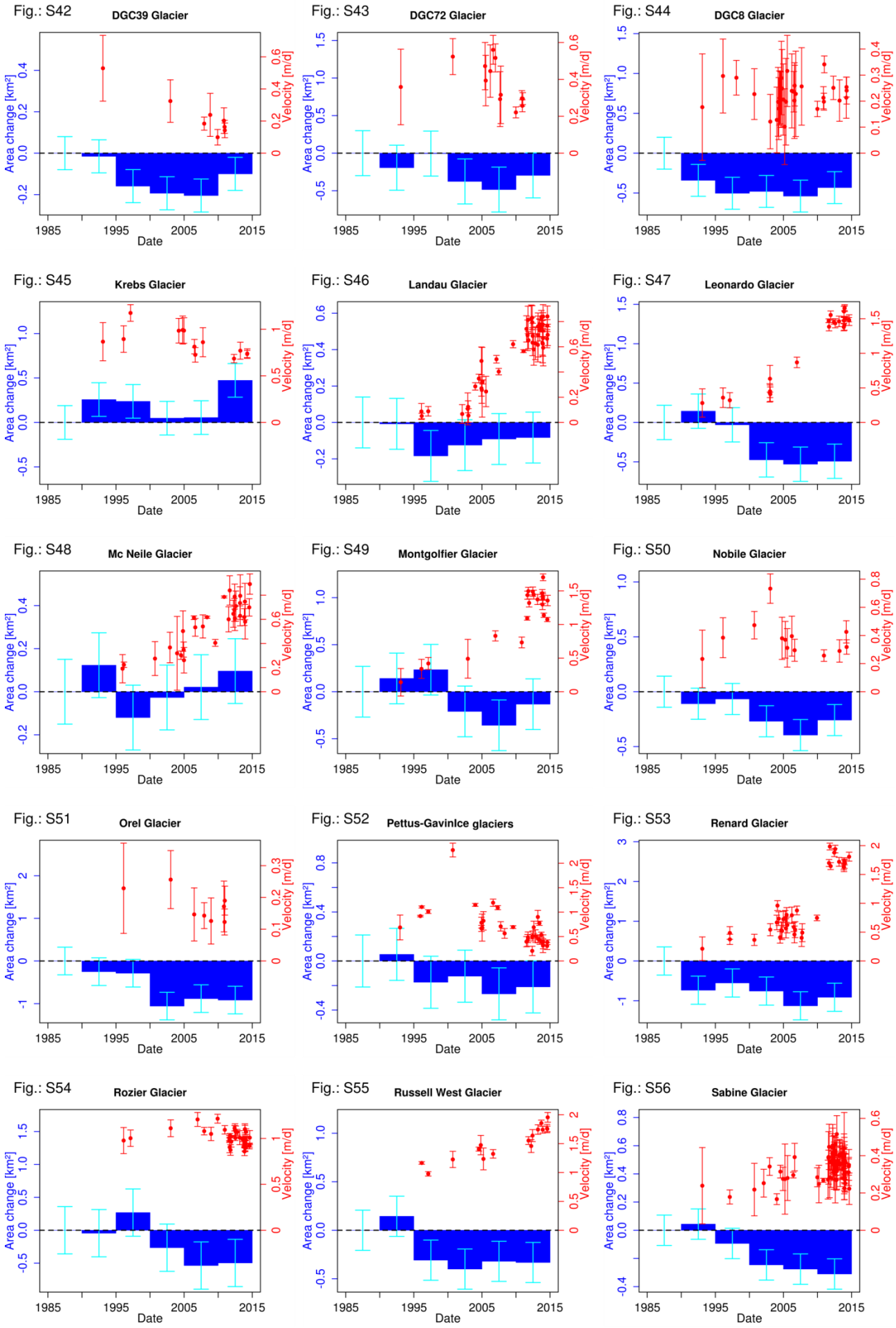

Figure S42-S56. Temporal changes of surface velocity (median values of measurements along terminus profiles) (red) and area (blue) changes of glaciers in sector "West".

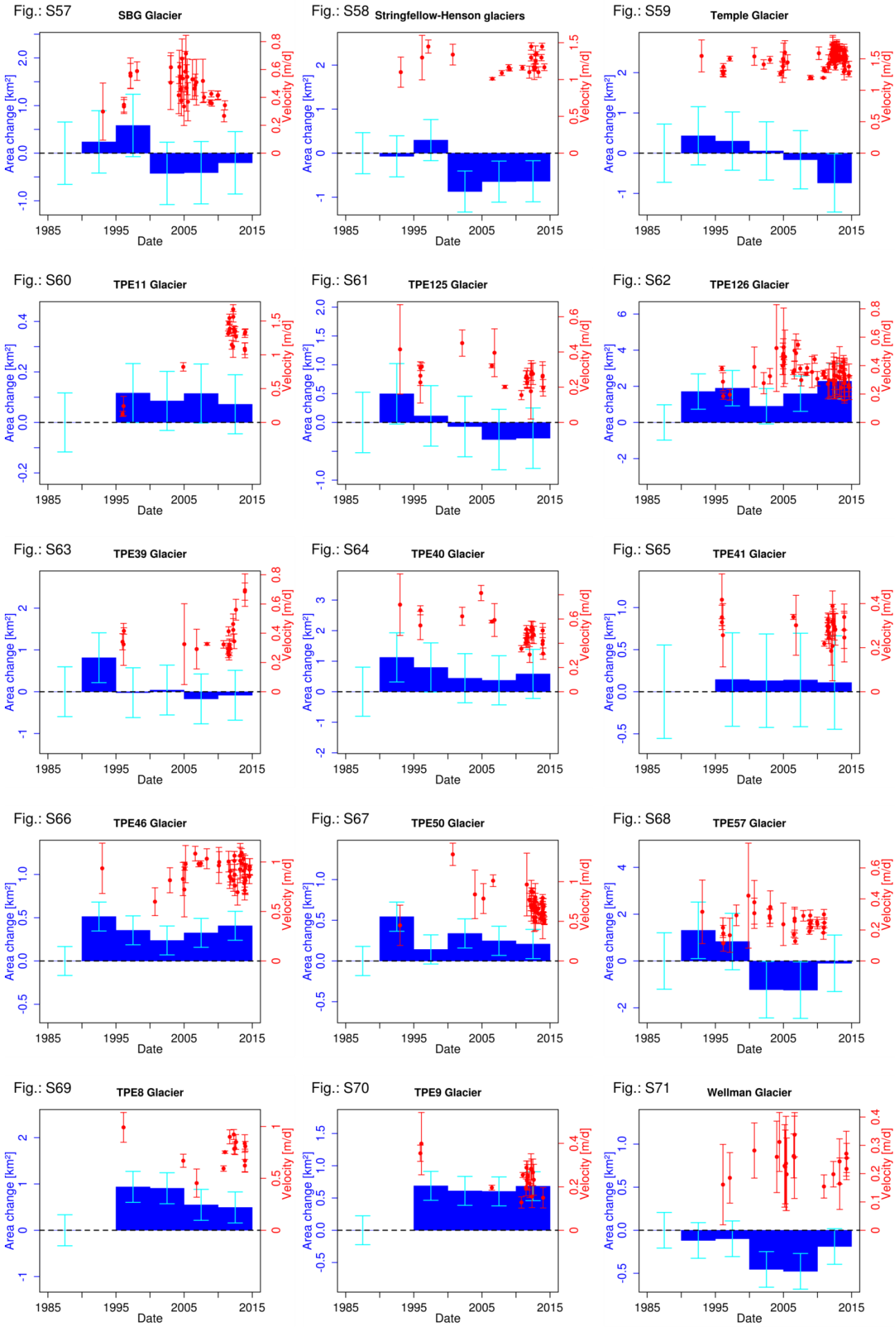

Figure S57-S71. Temporal changes of surface velocity (median values of measurements along terminus profiles) (red) and area (blue) changes of glaciers in sector "West".

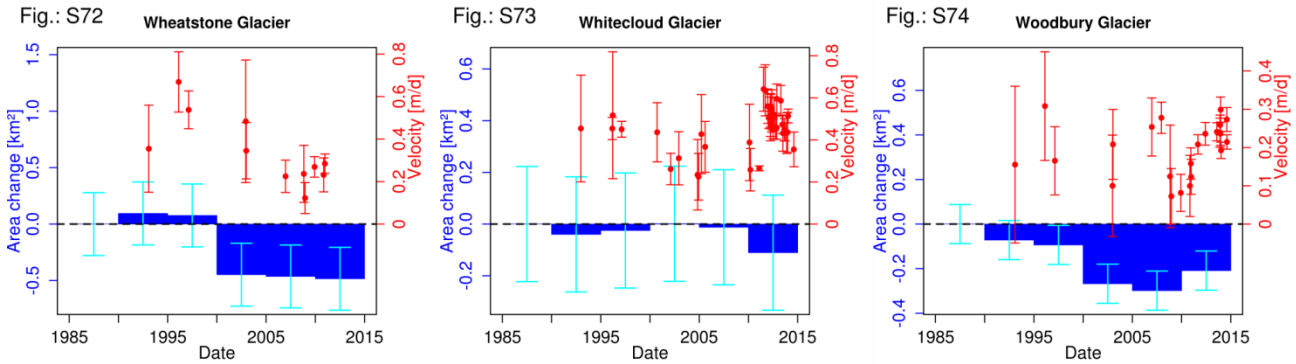

Figure S72-S74. Temporal changes of surface velocity (median values of measurements along terminus profiles) (red) and area (blue) changes of glaciers in sector "West".

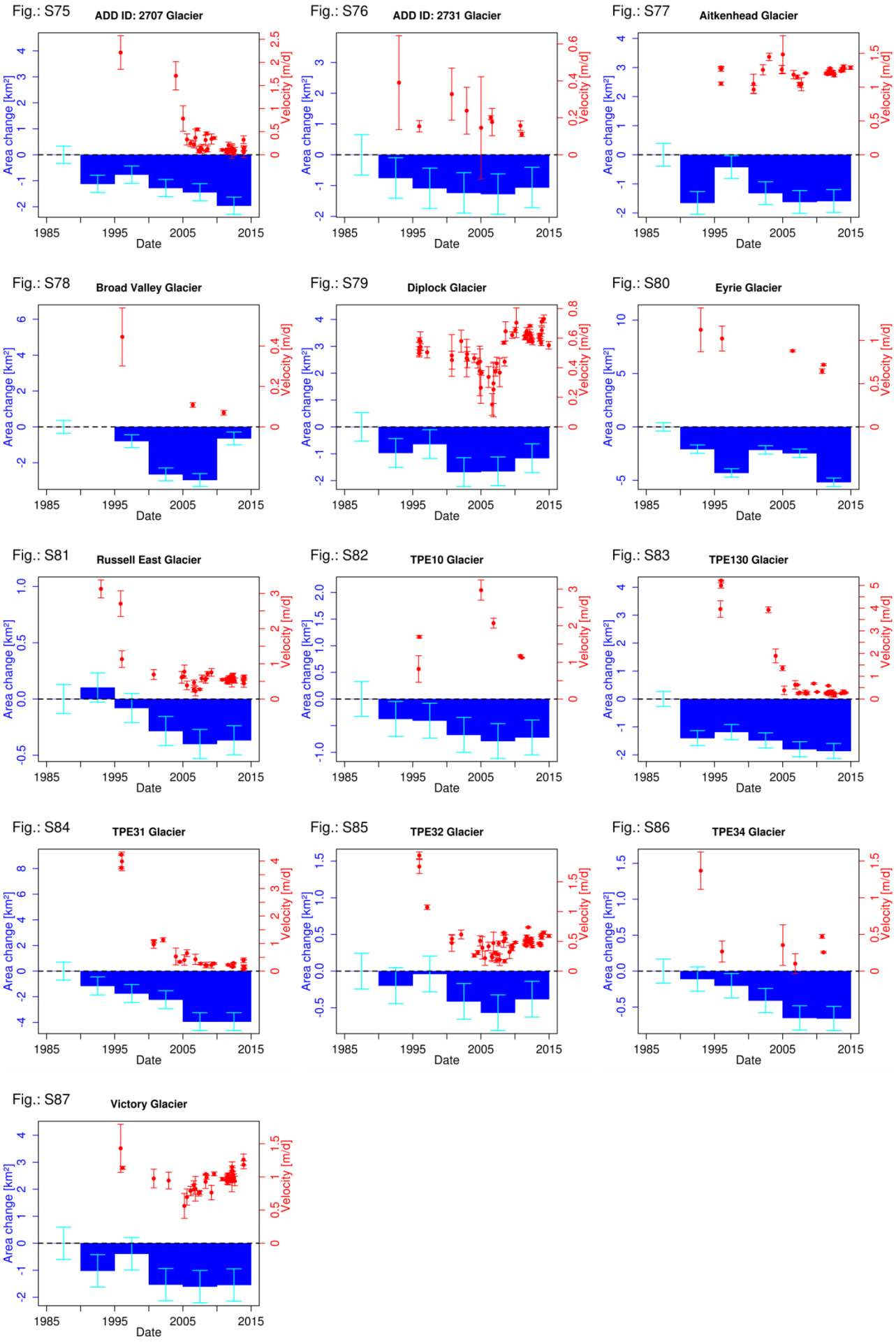

Figure S75-S87. Temporal trend of surface velocity measured at maximum ice thickness at terminus profiles (red) and area (blue) changes of glaciers in sector "East".

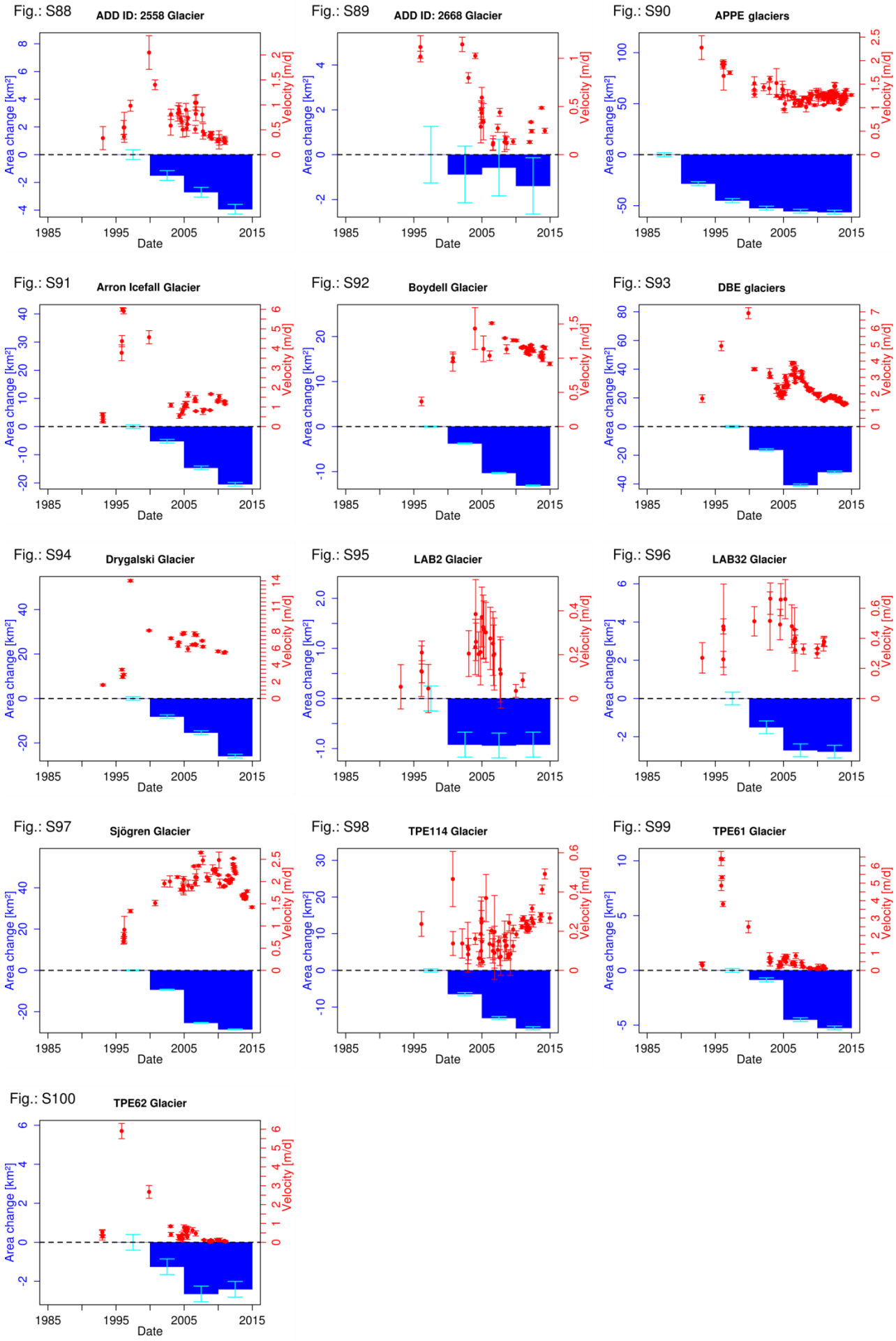

Figure S88-S100. Temporal trend of surface velocity measured at maximum ice thickness at terminus profiles (red) and area (blue) changes of glaciers in sector "EastIS".

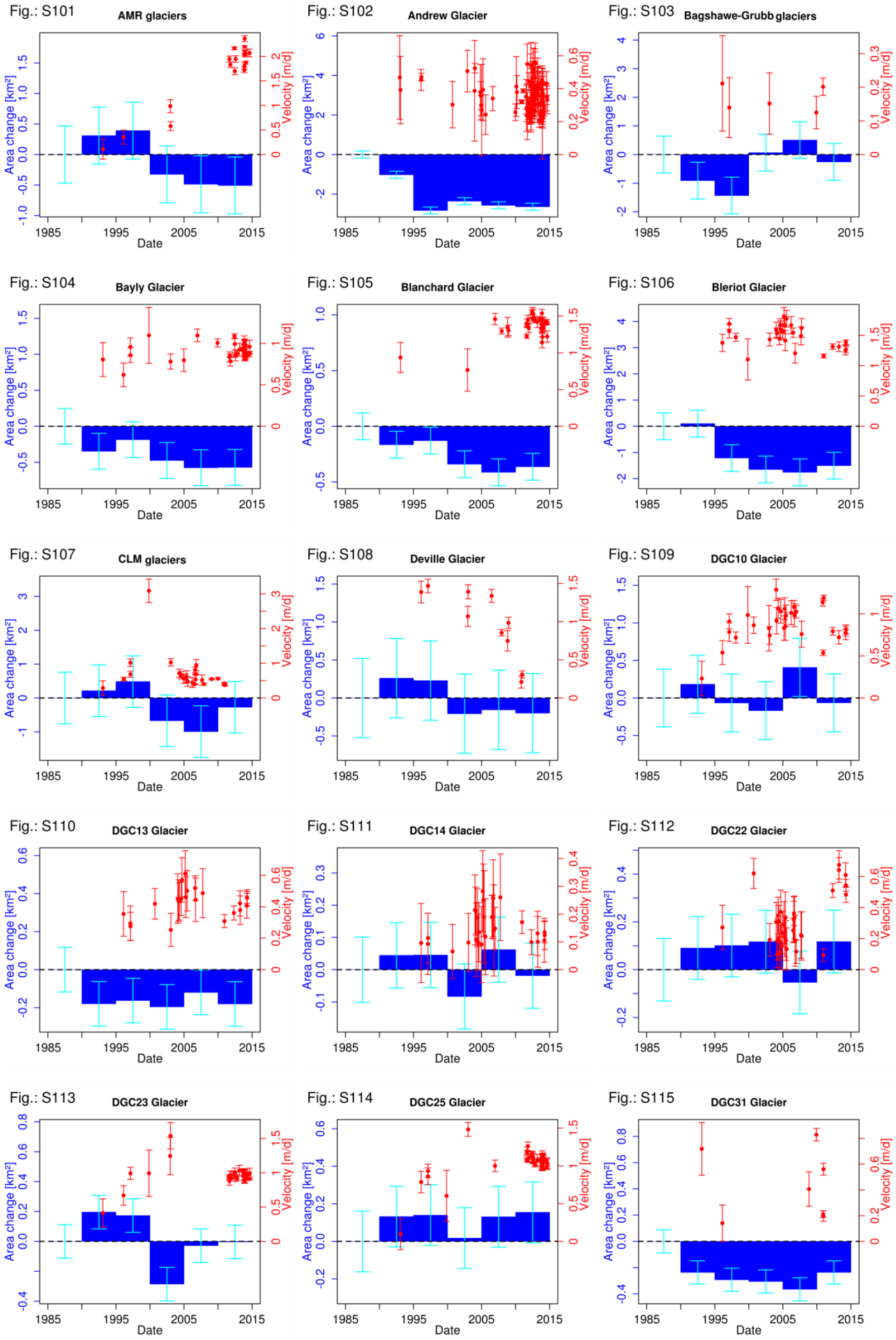

Figure S101-S115. Temporal trend of surface velocity measured at maximum ice thickness at terminus profiles (red) and area (blue) changes of glaciers in sector "West".

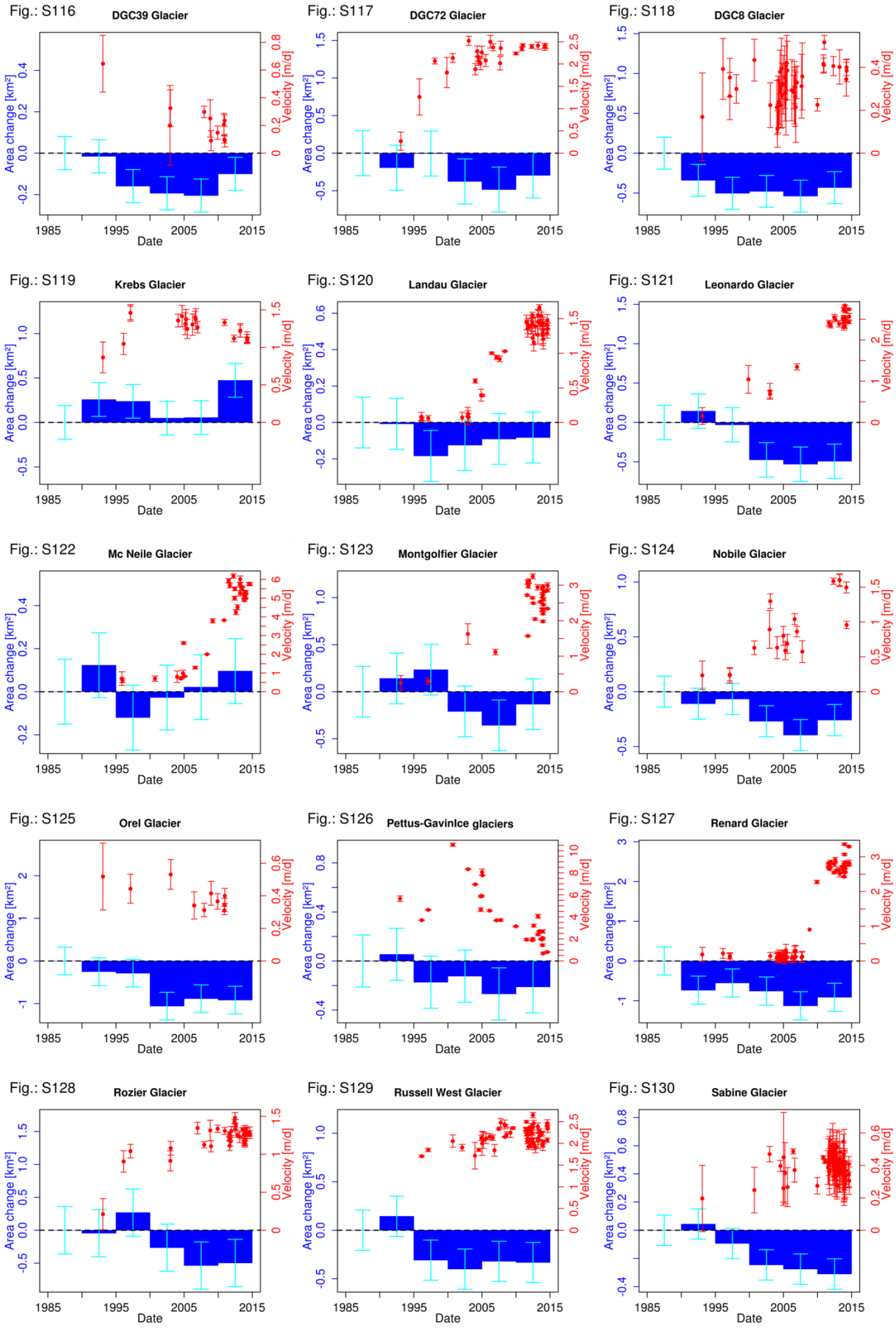

Figure S116-S130. Temporal trend of surface velocity measured at maximum ice thickness at terminus profiles (red) and area (blue) changes of glaciers in sector "West".

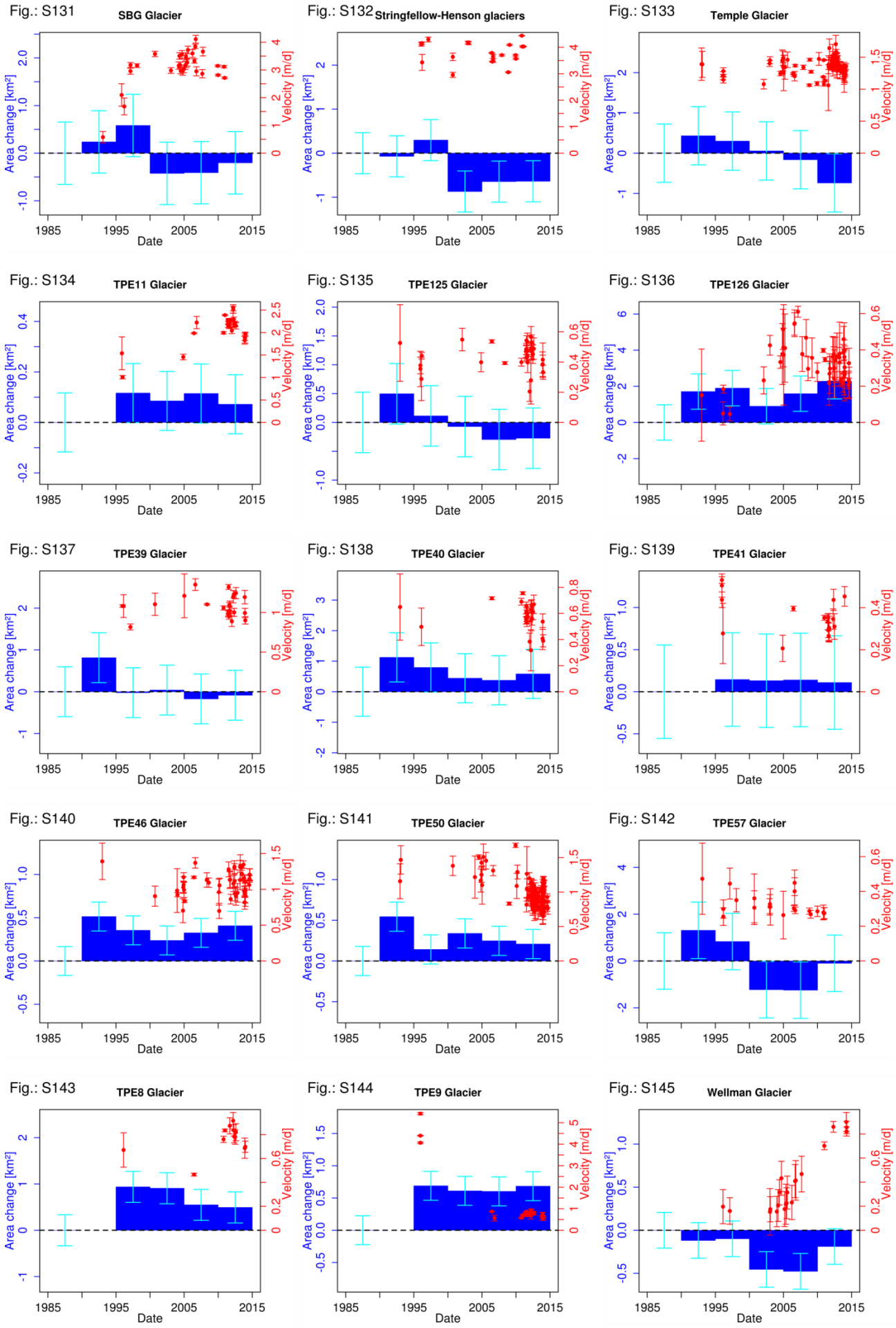

Figure S131-S145. Temporal trend of surface velocity measured at maximum ice thickness at terminus profiles (red) and area (blue) changes of glaciers in sector "West".

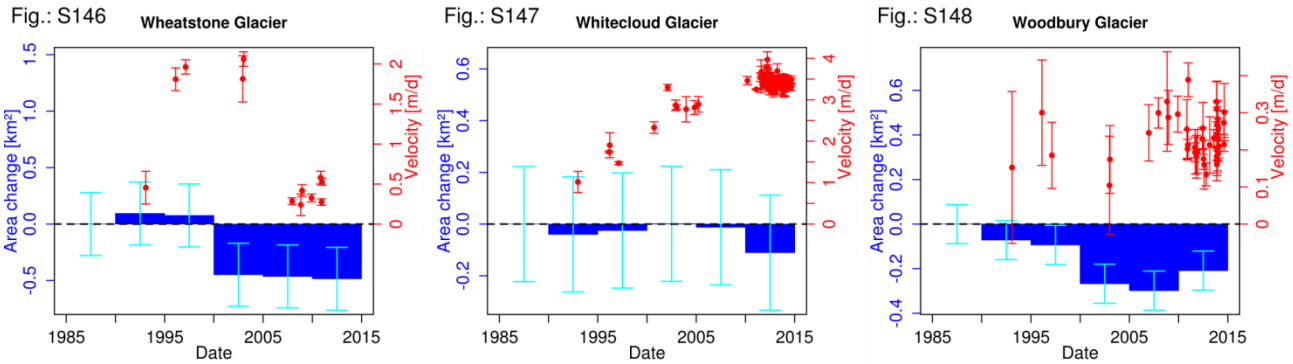

Figure S146-S148. Temporal trend of surface velocity measured at maximum ice thickness at terminus profiles (red) and area (blue) changes of glaciers in sector "West".

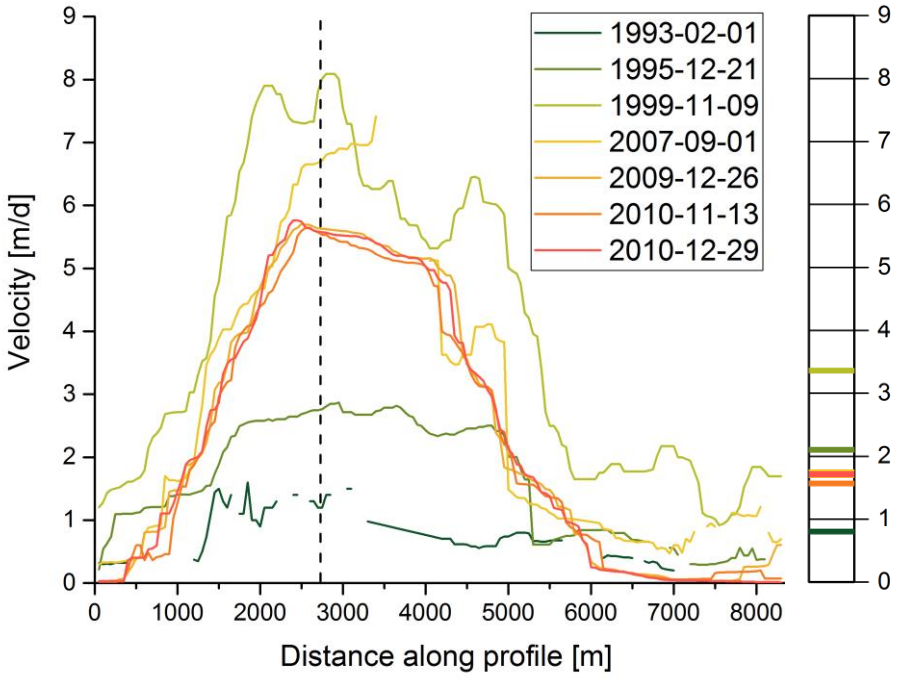

Figure S149. Surface velocity across the terminus of Drygalski Glacier (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

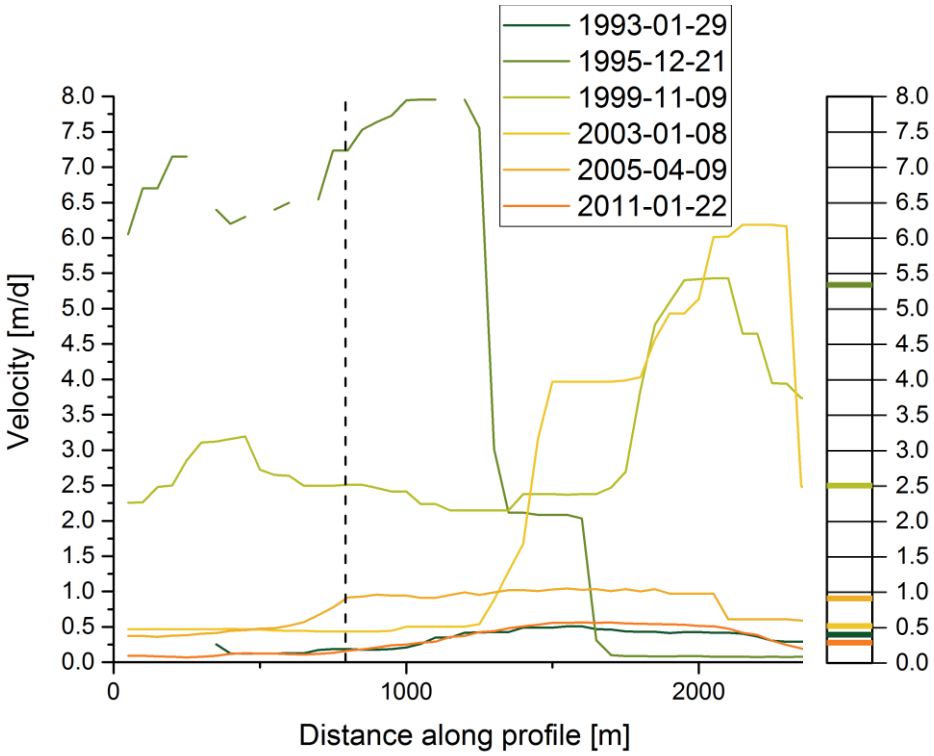

Figure S150. Surface velocity across the terminus of TPE61 Glacier (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

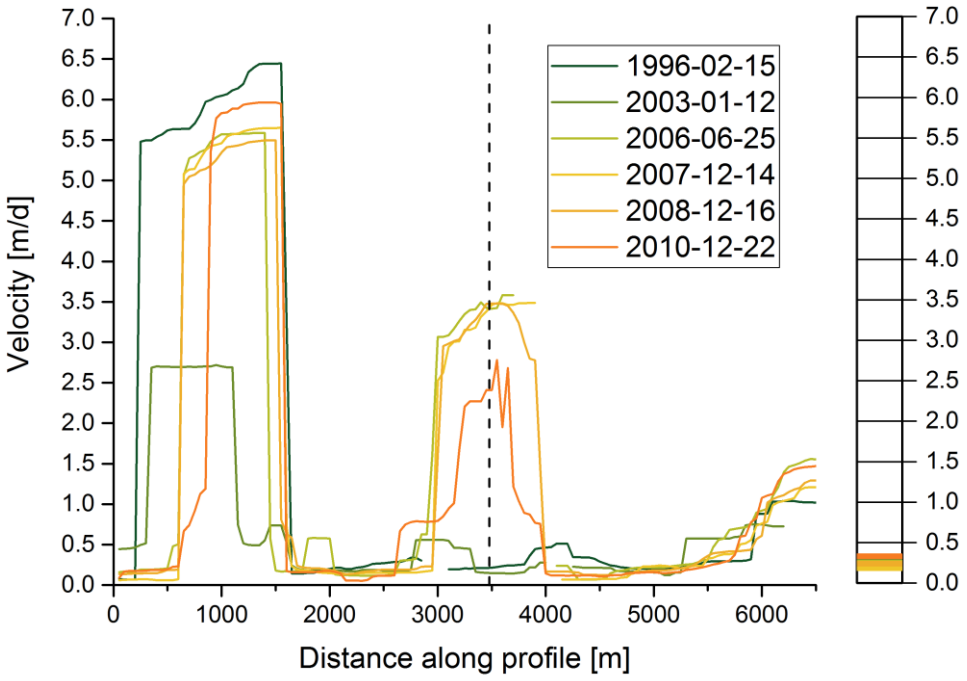

Figure S151. Surface velocity across the terminus of Bagshawe-Grubb glaciers (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

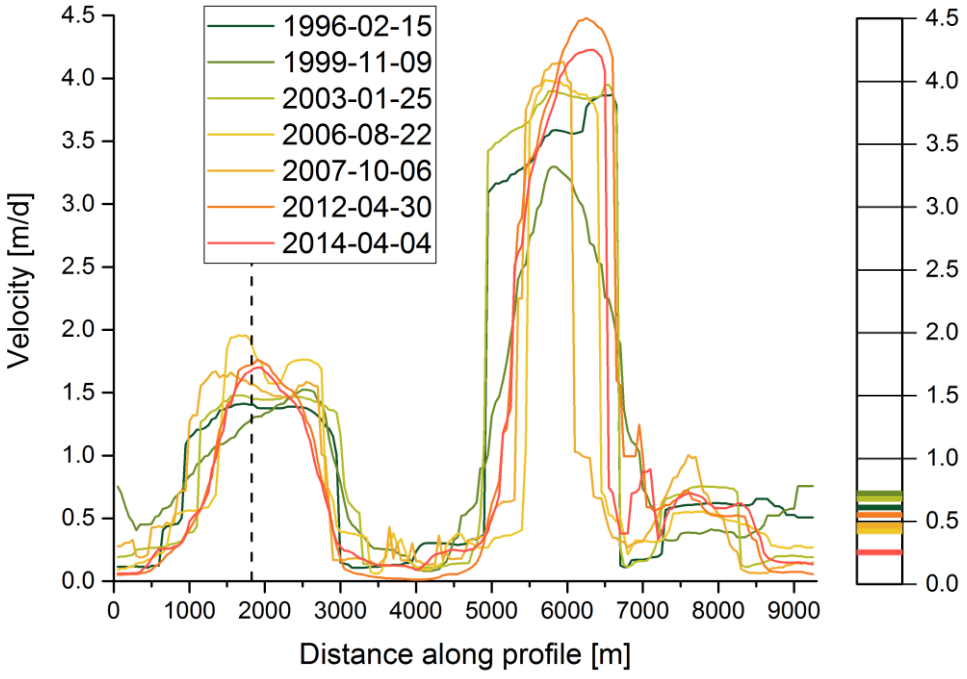

Figure S152. Surface velocity across the terminus of Bleriot Glacier (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

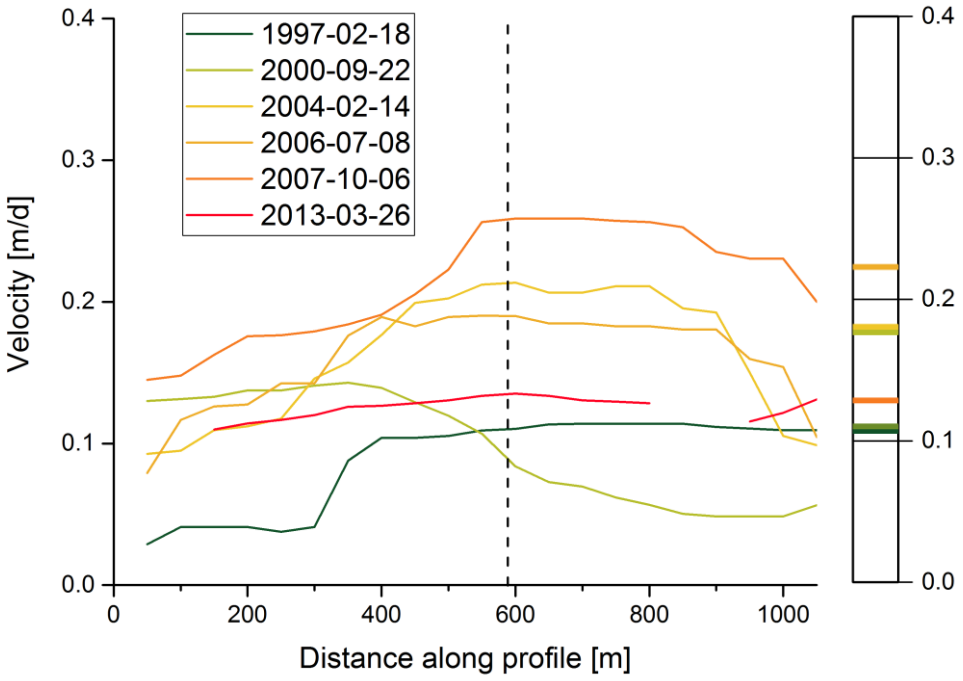

Figure S153. Surface velocity across the terminus of DGC14 Glacier (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

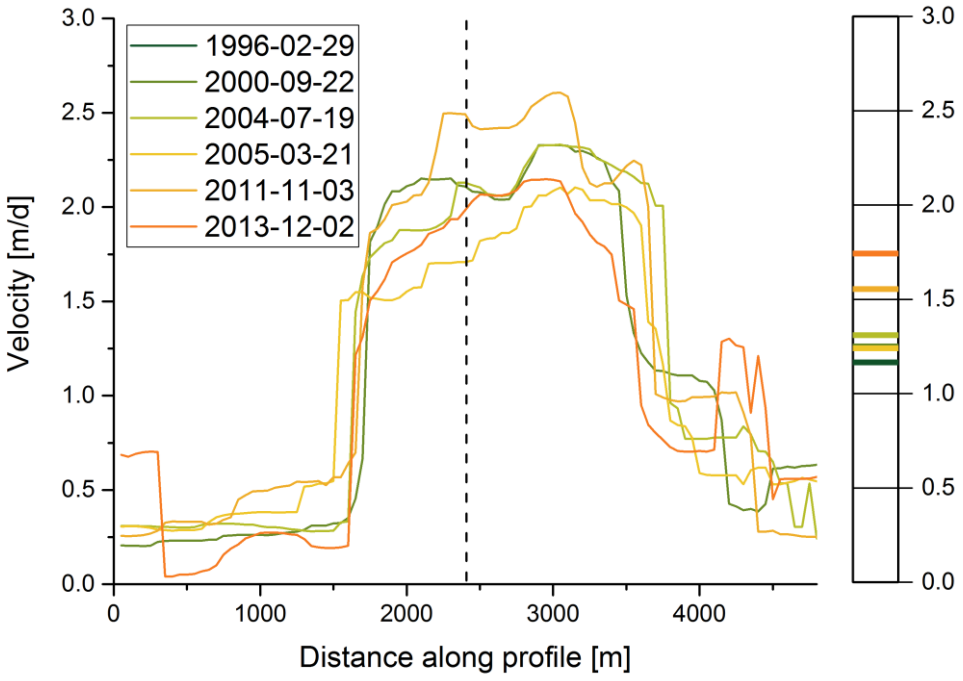

Figure S154. Surface velocity across the terminus of Russell West Glacier (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

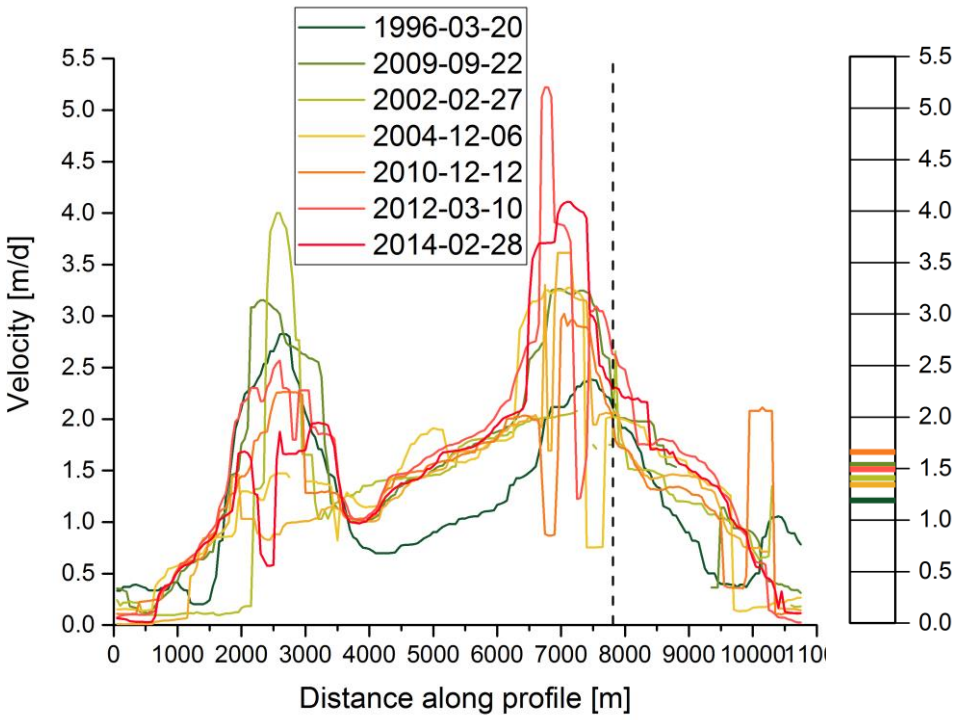

Figure S155. Surface velocity across the terminus of Temple Glacier (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

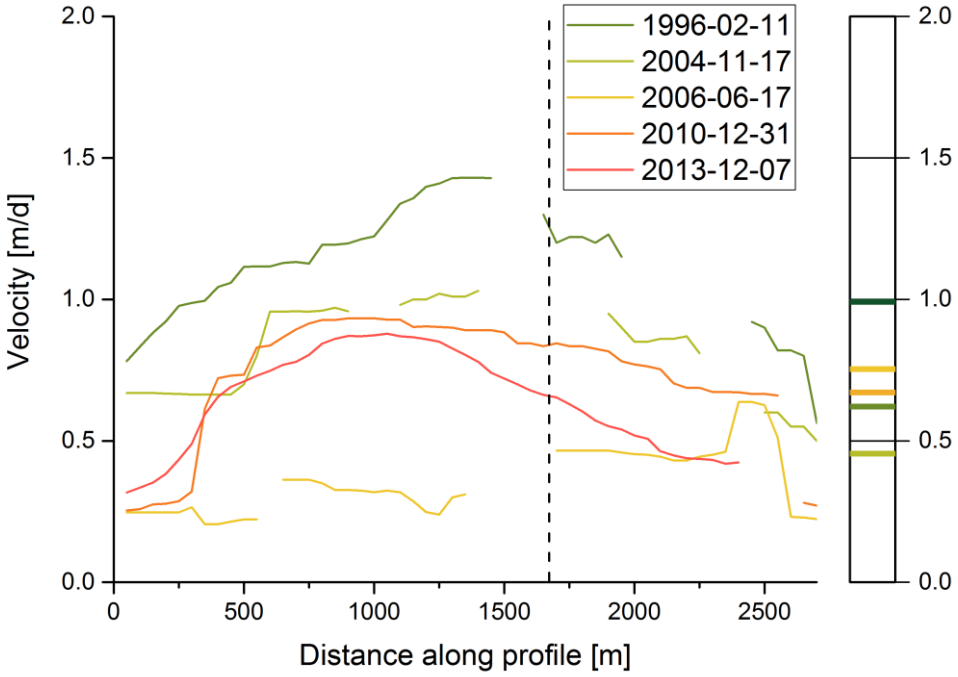

Figure S156. Surface velocity across the terminus of TPE8 Glacier (left) and median values of each profile (right). Dashed line: maximum ice thickness of across glacier profile; Dates in legend: mean dates of SAR acquisitions used to calculate the surface velocity fields.

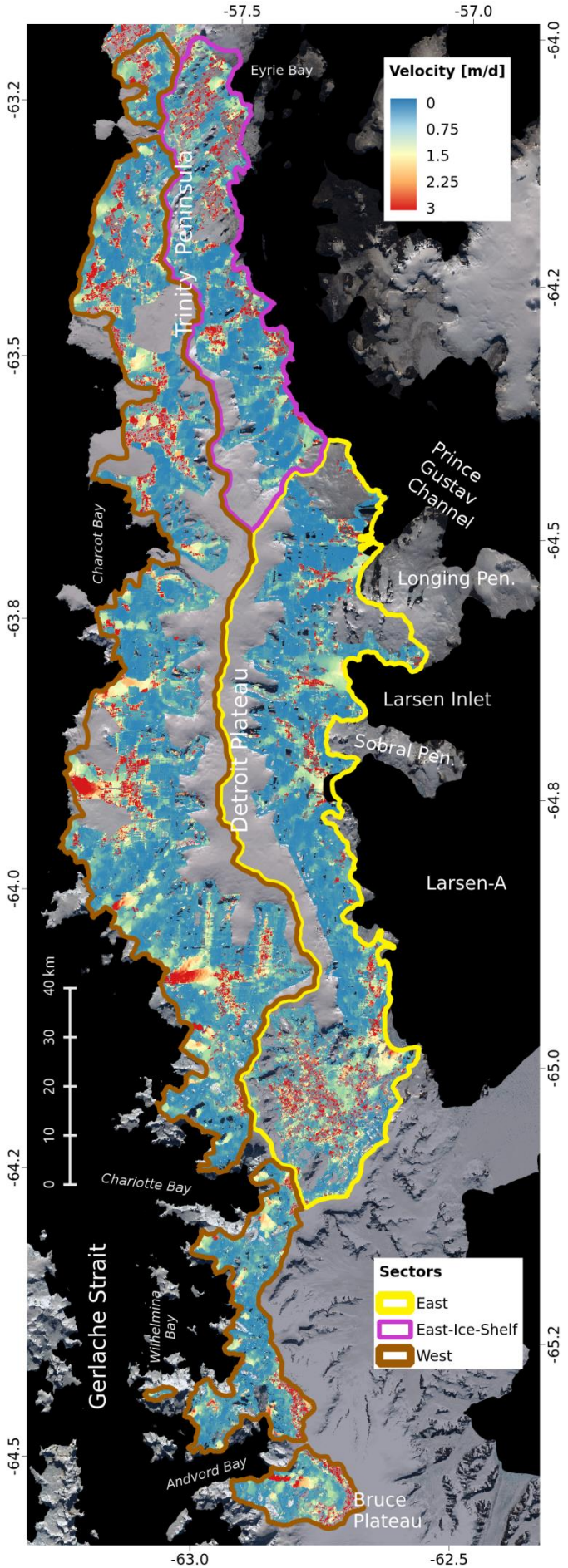

Figure S157. Surface velocity fields of outlet glaciers derived from multiple ERS SAR acquisitions (1996-1997). Background: Landsat LIMA Mosaic USGS, NASA, BAS, NSF. Note: Red speckle patterns indicate erroneous tracking results (noise).

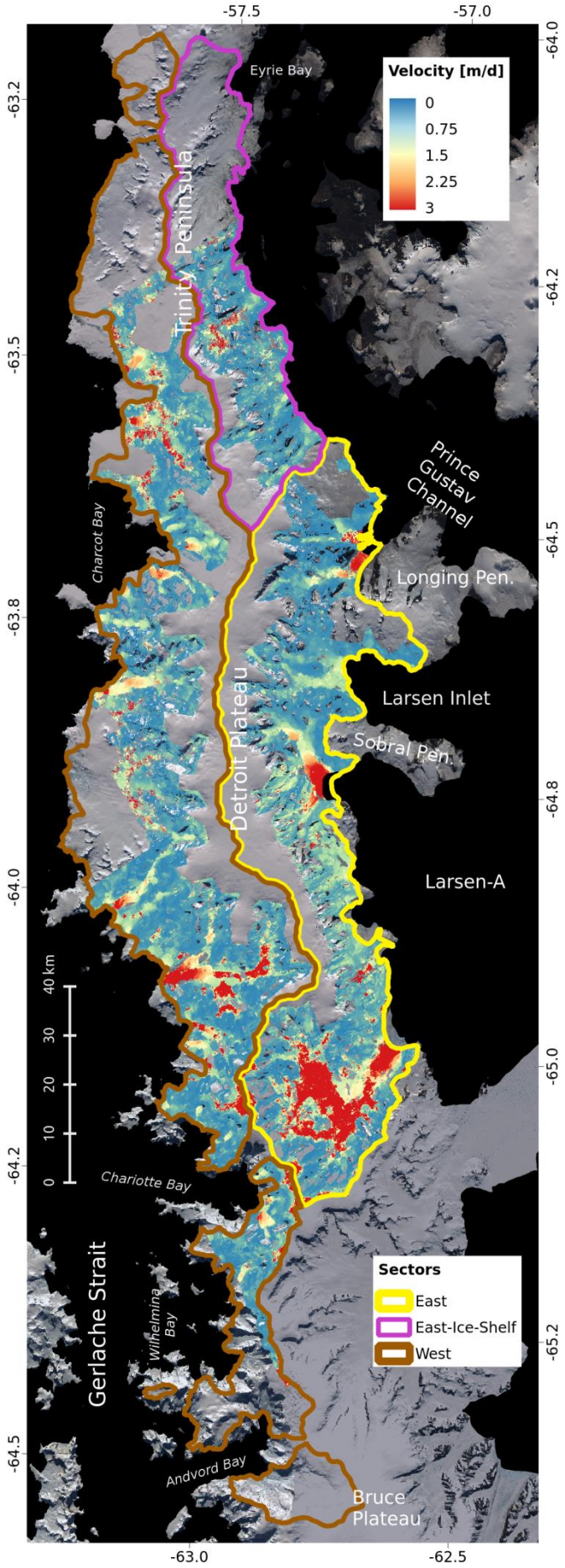

Figure S158. Surface velocity fields of outlet glaciers derived from multiple ENVISAT SAR acquisitions (2005-2006). Background: Landsat LIMA Mosaic USGS, NASA, BAS, NSF. Note: Red speckle patterns indicate erroneous tracking results (noise).

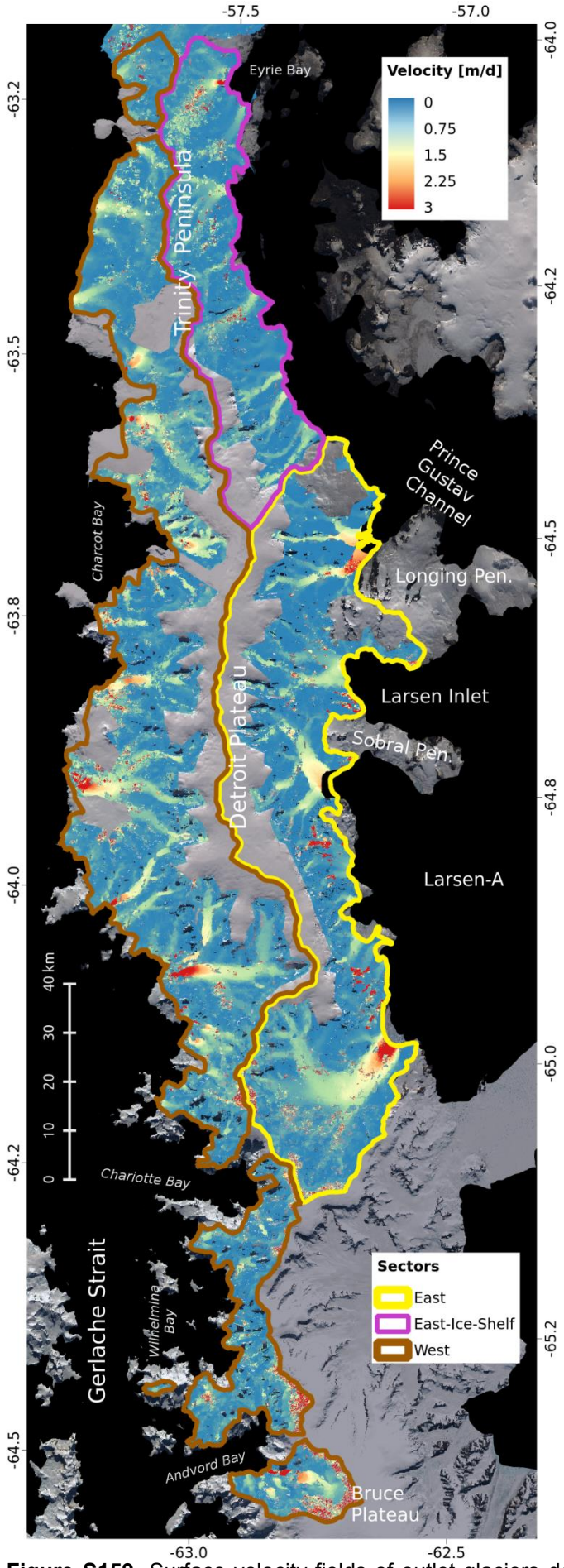

Figure S159. Surface velocity fields of outlet glaciers derived from multiple ALOS PALSAR acquisitions (2008-2010). Background: Landsat LIMA Mosaic USGS, NASA, BAS, NSF. Note: Red speckle patterns indicate erroneous tracking results (noise).

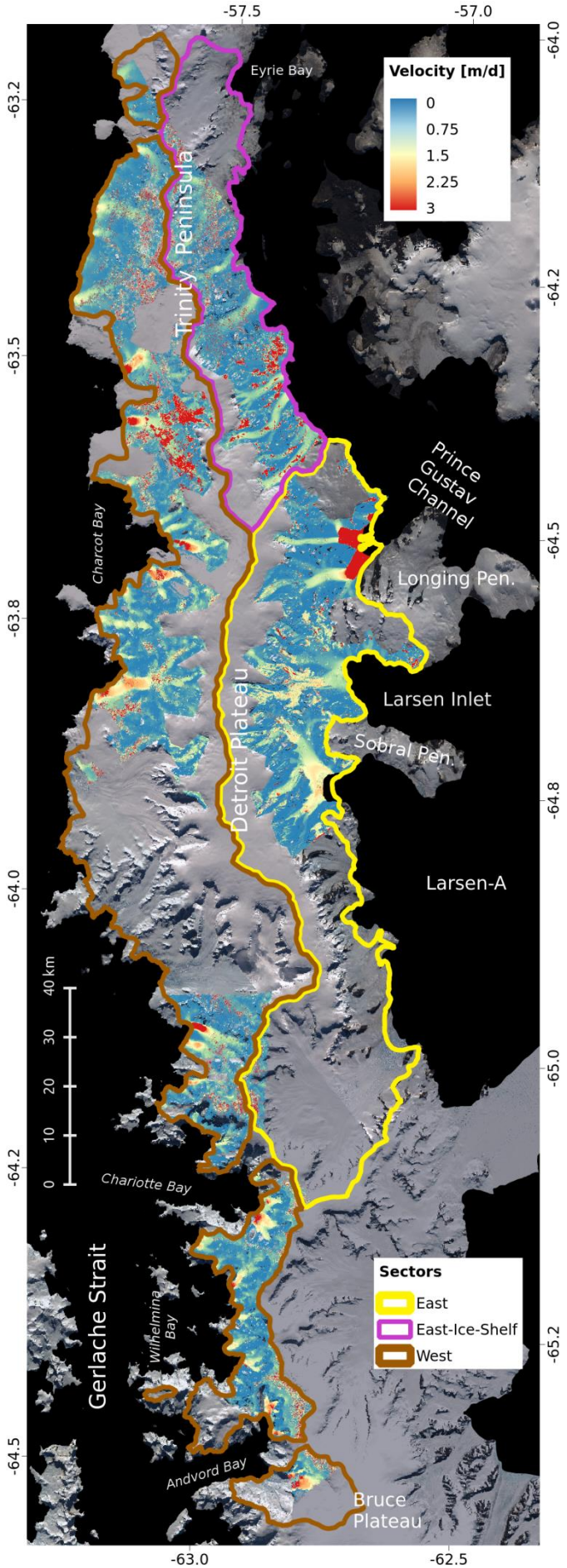

Figure S160. Surface velocity fields of outlet glaciers derived from multiple TerraSAR/TanDEM-X SAR acquisitions (2011-2012). Background: Landsat LIMA Mosaic USGS, NASA, BAS, NSF. Note: Red speckle patterns indicate erroneous tracking results (noise).

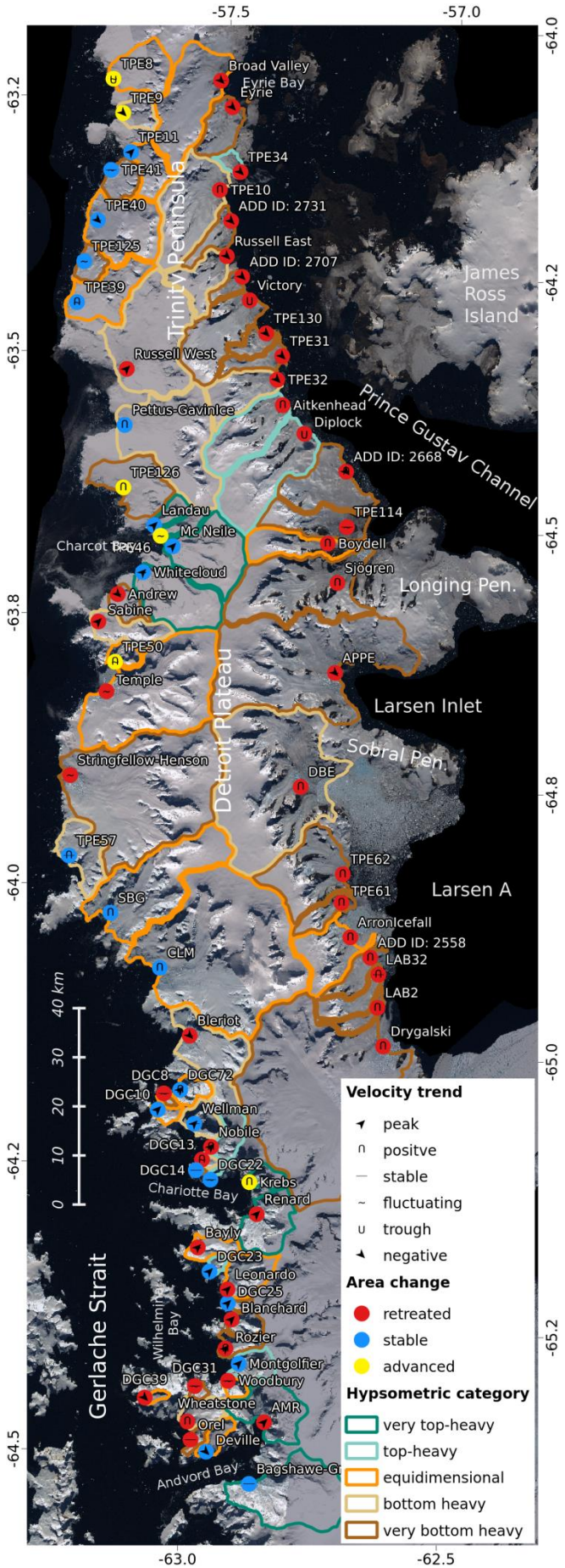

Figure S161. Categorizations of glaciers based on the temporal variations of area changes (dots) and flow velocities measured at maximum ice thickness at the terminus profiles (symbols). Colors of catchment delineation indicate Hypsometric categories according to Jiskoot et al. (2009). Background: Landsat LIMA Mosaic USGS, NASA, BAS, NSF

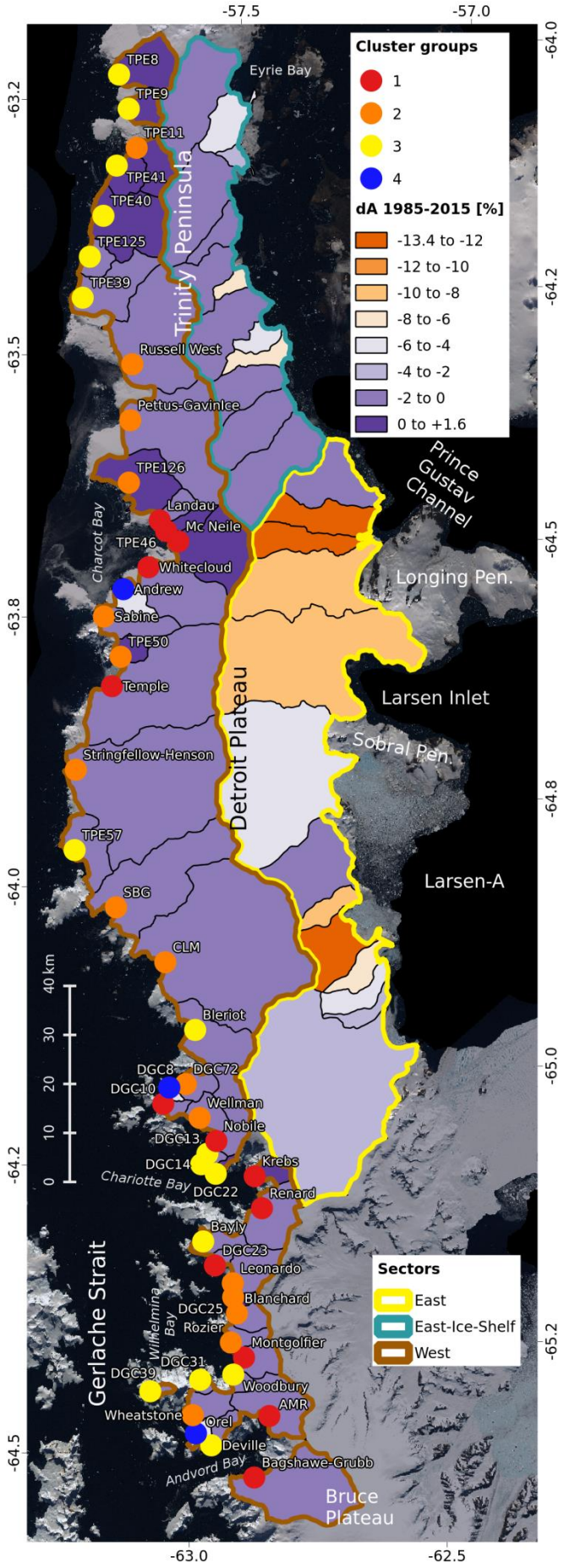

Figure S162. Spatial distribution of glacier types along the west coast (based on velocity measurements at maximum ice thickness at the terminus profiles). Glaciers are group based on a hierarchical cluster analysis (dots). Individual glacier catchment colors: relative area change in the period 1985-2015. Colored polygon outlines: Boundaries of the three sectors. Background: Landsat LIMA Mosaic USGS, NASA, BAS, NSF

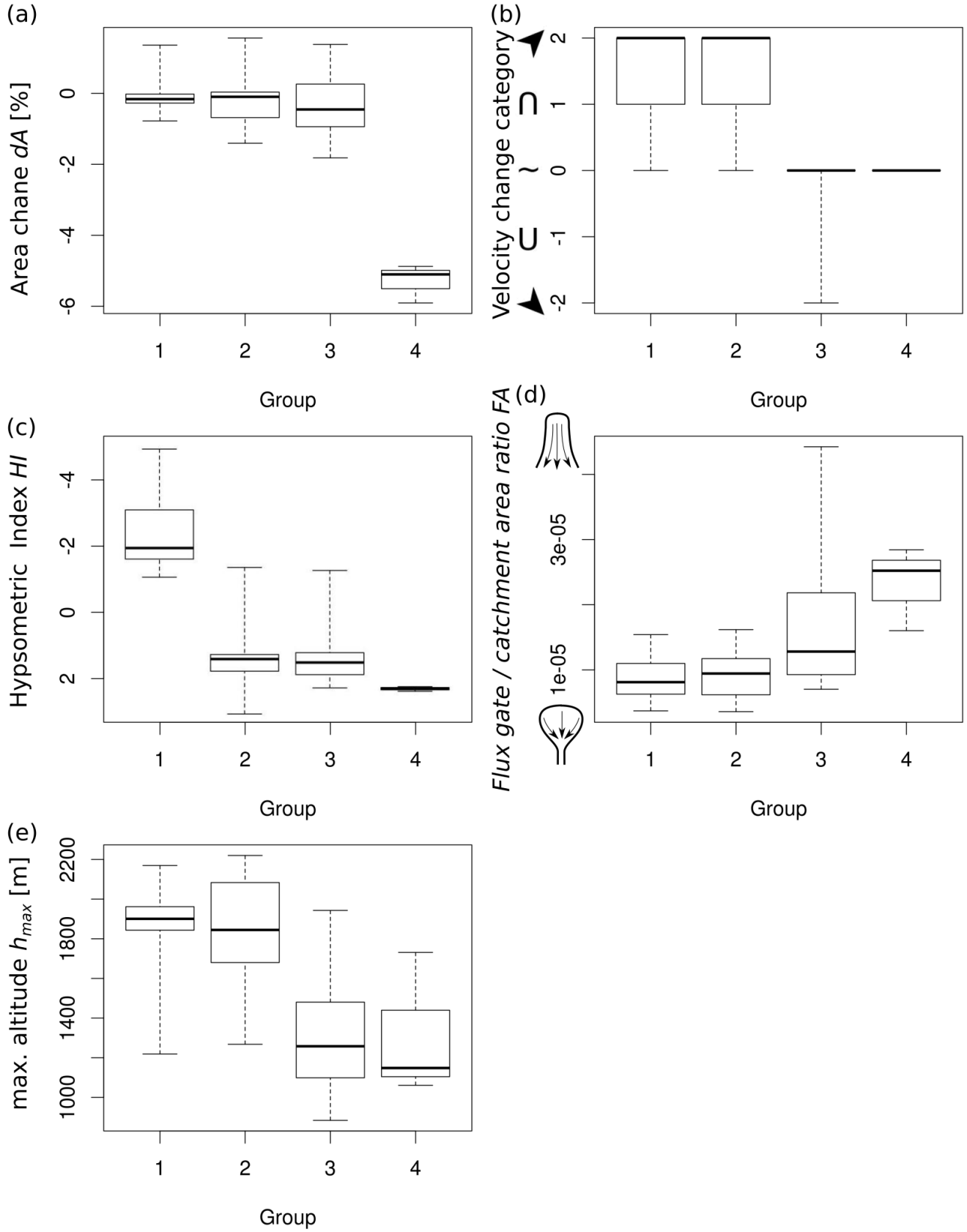

Figure S163. Boxplots of cluster analysis input variables (Sector “West”) for each group. Whiskers extend to the most extreme data points. Velocities were measured at maximum ice thickness at the terminus profiles. Panel **(b)**: The symbols used for the velocity change categories (see Table 3) are the same as in Fig. 3. Panel **(d)**: The pictograms illustrate the catchment shape (see Section 3.3).

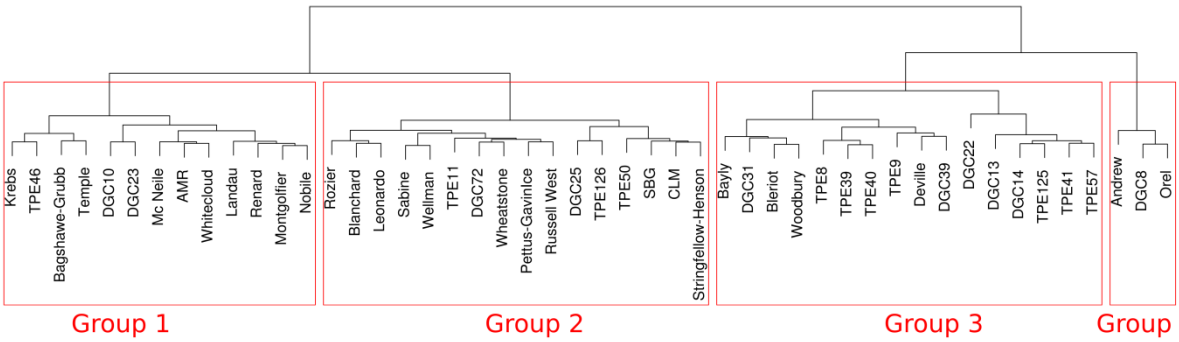

Figure S164. Dendrogram of hierarchical cluster analysis of glaciers in sector "West" coast (based on velocity measurements at maximum ice thickness at the terminus profiles). The glaciers are assorted in four groups (red rectangles). See also Section 5.3.

Table S1: Observed parameters of the individual glaciers (median velocities measured along terminus profiles). Table continues next page.

Sector	Basin	l_f [m]	$A_{1985\text{-}1990}$ [km²]	$A_{2010\text{-}2015}$ [km²]	dA [km²]	Area change category	Date v_s [yyyy-mm-dd]	Date v_E [yyyy-mm-dd]	dt [a]	v_S [m d^{-1}]	v_E [m d^{-1}]	dv [m d^{-1}]	dv [%]	n_v	Vel. change category	h_{max} [m a.s.l.]	HI	Hypsometric category	FA	Group
East	ADD ID: 2707	5535	28.78	26.82	-1.96	retreated	1995-12-18	2013-12-24	18.03	0.276	0.107	-0.170	-61.375	31	decreased	1278	5.14	very bottom-heavy	0.0056	
	ADD ID: 2731	10955	56.92	55.85	-1.06	retreated	1995-12-18	2010-12-31	15.05	0.358	0.093	-0.265	-73.985	8	decreased	1327	2.93	very bottom-heavy	0.0055	
	Aitkenhead	6532	156.70	155.11	-1.59	retreated	1995-12-18	2013-11-04	17.89	0.108	0.145	0.037	34.679	32	peak	1746	-1.23	top-heavy	0.0024	
	Broad Valley	5948	246.73	246.08	-0.64	retreated	1995-12-18	2010-10-17	14.84	0.310	0.353	0.043	13.815	5	stable	1118	-1.02	equidimensional	0.0005	
	Diplock	8916	235.30	234.14	-1.16	retreated	1995-12-18	2014-03-27	18.28	0.559	0.449	-0.110	-19.743	27	trough	1845	-1.44	top-heavy	0.0017	
	Eyrie	6570	89.53	84.35	-5.18	retreated	1992-12-25	2010-12-31	18.03	0.865	0.169	-0.696	-80.499	7	decreased	1076	2.39	very bottom-heavy	0.0035	
	Russell East	2156	93.75	93.38	-0.37	retreated	1992-12-25	2013-12-07	20.96	0.963	0.389	-0.573	-59.559	34	decreased	1370	1.48	bottom-heavy	0.0035	
	TPE10	5465	225.96	225.24	-0.72	retreated	1995-12-20	2010-10-17	14.84	0.277	0.137	-0.140	-50.635	4	peak	1386	1.43	bottom-heavy	0.0033	
	TPE130	4493	40.58	38.72	-1.86	retreated	1996-02-29	2013-12-24	17.83	0.680	0.201	-0.479	-70.498	33	peak	983	2.07	very bottom-heavy	0.0076	
	TPE31	11684	52.70	48.76	-3.94	retreated	1992-12-25	2014-12-16	21.99	1.844	0.344	-1.500	-81.352	25	decreased	1490	3.50	very bottom-heavy	0.0076	
	TPE32	4071	108.63	108.24	-0.38	retreated	1992-12-25	2014-03-27	21.27	1.549	0.755	-0.794	-51.271	36	decreased	1646	1.46	bottom-heavy	0.0037	
	TPE34	2814	22.91	22.25	-0.66	retreated	1992-12-25	2010-12-31	18.03	1.076	0.076	-1.000	-92.937	10	decreased	500	-1.37	top-heavy	0.0023	
	Victory	9975	180.30	178.75	-1.55	retreated	1994-02-28	2013-12-24	19.83	0.612	0.765	0.153	25.078	25	trough	1645	2.11	very bottom-heavy	0.0041	
Summary	mean								18.22	0.729	0.306	-0.423	-57.983			1339				
East	sum	85114	1538.78	1517.71	-21.07									277						
East-Ice-Shelf	ADD ID: 2558	5890	60.2433	56.31	-3.94	retreated	1993-01-29	2010-12-29	17.93	0.435	0.353	-0.082	-18.758	30	peak	1840	9.08	very bottom-heavy	0.0067	
	ADD ID: 2668	20996	162.324	160.93	-1.39	retreated	1996-02-13	2014-12-16	18.85	0.435	0.340	-0.095	-21.821	23	peak	1342	2.88	very bottom-heavy	0.0041	
	APPE	31872	696.24	639.85	-56.39	retreated	1993-01-12	2014-12-16	21.94	0.869	0.853	-0.015	-1.766	114	fluctuating	1964	1.82	very bottom-heavy	0.0003	
	Arron Icefall	10557	152.356	131.88	-20.48	retreated	1993-01-12	2011-01-22	18.04	0.532	0.288	-0.244	-45.793	39	peak	1979	-1.08	equidimensional	0.0061	
	Boydell	1954	108.039	94.95	-13.09	retreated	1995-12-18	2014-12-16	19.01	0.290	0.975	0.685	236.007	37	peak	1842	-1.07	equidimensional	0.0009	
	DBE	12140	658.91	627.24	-31.67	retreated	1993-01-12	2014-02-27	21.14	0.535	0.950	0.415	77.569	85	peak	2167	1.37	bottom-heavy	0.0011	
	Drygalski	14018	990.41	964.49	-25.92	retreated	1993-01-29	2010-12-29	17.93	0.951	1.641	0.219	72.572	29	peak	2043	1.60	very bottom-heavy	0.0003	
	LAB2	4157	38.3889	37.47	-0.92	retreated	1993-01-29	2010-12-29	17.93	0.060	0.065	0.006	9.726	17	peak	1779	3.76	very bottom-heavy	0.0046	
	LAB32	5534	66.3816	63.60	-2.78	retreated	1993-01-12	2010-12-29	17.97	0.221	0.284	0.063	28.300	17	stable	1841	3.21	very bottom-heavy	0.0046	
	Sjögren	3838	329.298	300.73	-28.57	retreated	1992-12-25	2014-12-16	21.99	0.570	0.638	0.068	11.897	36	peak	1926	1.97	very bottom-heavy	0.0014	
	TPE114	7310	126.385	110.61	-15.78	retreated	1996-02-29	2014-12-16	18.81	0.098	0.190	0.092	93.627	39	stable	1759	2.96	very bottom-heavy	0.0014	
	TPE61	2943	54.3413	49.09	-5.25	retreated	1993-01-12	2011-01-22	18.04	0.406	0.276	-0.130	-31.942	42	peak	1981	2.78	very bottom-heavy	0.0022	
	TPE62	6700	211.811	209.40	-2.41	retreated	1992-12-25	2011-01-22	18.09	0.372	0.448	0.076	20.424	42	peak	2118	2.43	very bottom-heavy	0.0013	
Summary	mean								19.05	0.444	0.562	0.118	26.480			1891				
East-Ice-Shelf	sum	127909	3655.13	3446.54	-208.59									550						
West	AMR	7773	137.24	136.73	-0.51	retreated	1993-02-01	2014-08-22	21.57	0.157	0.837	0.679	431.515	21	increased	1884	-3.82	very top-heavy	0.0021	1
	Andrew	2951	47.05	44.41	-2.64	retreated	1992-12-25	2014-08-27	21.68	0.453	0.358	-0.095	-21.030	107	decreased	1731	1.99	very bottom-heavy	0.0057	4
	Bagshawe-Grubb	10720	280.43	280.17	-0.26	stable	1993-02-01	2010-12-22	17.90	0.302	0.233	-0.069	-22.782	14	stable	2169	-2.88	very top-heavy	0.0019	1
	Bayly	4149	47.89	47.32	-0.57	retreated	1993-02-01	2014-08-22	21.57	0.419	0.912	0.493	117.584	42	increased	1529	-1.06	equidimensional	0.0027	2
	Blanchard	2005	38.00	37.63	-0.36	retreated	1993-02-01	2014-08-22	21.57	0.341	1.084	0.744	218.153	30	increased	2060	1.53	very bottom-heavy	0.0025	2
	Bleriot	8527	182.20	180.69	-1.50	retreated	1993-02-01	2014-04-10	21.20	0.836	0.300	-0.536	-64.134	25	decreased	1943	1.28	bottom-heavy	0.0019	3
	CLM	12682	809.85	809.58	-0.27	stable	1993-02-01	2010-12-29	17.92	0.388	0.396	0.008	2.157	34	peak	2191	1.13	equidimensional	0.0016	2
	Deville	8699	34.99	34.79	-0.20	stable	1996-02-15	2010-12-22	14.86	0.364	0.127	-0.237	-65.116	12	decreased	1389	-1.19	equidimensional	0.0025	3
	DGC10	6423	23.47	23.40	-0.06	stable	1993-02-01	2014-04-10	21.20	0.116	0.580	0.465	401.477	20	increased	1219	-1.10	equidimensional	0.0064	2
	DGC13	1950	10.95	10.76	-0.18	retreated	1996-02-15	2014-04-10	18.16	0.285	0.205	-0.081	-28.256	24	peak	901	1.28	bottom-heavy	0.0071	3
	DGC14	1684	5.66	5.64	-0.02	stable	1996-02-15	2014-04-10	18.16	0.096	0.113	0.018	18.626	20	stable	884	1.90	very bottom-heavy	0.0109	3
	DGC22	2188	8.98	9.10	0.12	stable	1996-02-15	2014-04-10	18.16	0.190	0.084	-0.106	-55.993	24	stable	1113	-1.24	top-heavy	0.0148	3
	DGC23	1868	15.92	15.91	0.00	stable	1993-02-01	2014-08-22	21.57	0.414	1.025	0.611	147.314	36	increased	1379	-1.33	top-heavy	0.0023	2
	DGC25	2693	14.12	14.27	0.15	stable	1993-02-01	2014-08-22	21.57	0.363	0.820	0.457	125.807	37	increased	1850	1.52	very bottom-heavy	0.0028	2
	DGC31	1466	13.30	13.06	-0.24	retreated	1996-02-15	2010-12-11	14.83	0.132	0.204	0.072	54.579	8	stable	1488	1.86	very bottom-heavy	0.0029	2
	DGC39	1331	15.07	14.97	-0.10	retreated	1993-02-01	2010-12-22	17.90	0.529	0.164	-0.365	-69.044	8	decreased	1472	1.02	equidimensional	0.0040	3
	DGC72	4990	38.39	38.09	-0.30	stable	1993-02-01	2010-12-29	17.92	0.359	0.695	0.336	93.651	13	peak	1706	1.17	equidimensional	0.0027	2
	DGC8	3340	9.34	8.91	-0.43	retreated	1993-02-01	2014-04-10	21.20	0.177	0.241	0.064	36.012	32	stable	1061	2.07	very bottom-heavy	0.0094	4
	Krebs	3152	34.80	35.27	0.47	advanced	1993-02-01	2014-04-10	21.20	0.866	0.738	-0.128	-14.780	13	peak	2029	-2.00	very top-heavy	0.0006	1
	Landau	2330	33.99	33.90	-0.08	stable	1996-02-13	2014-08-27	18.55	0.069	0.727	0.658	954.866	48	increased	1747	-1.79	very top-heavy	0.0027	1
	Leonardo	3632	84.22	83.72	-0.49	retreated	1993-02-01	2014-08-22	21.57	0.281	1.493	1.212	431.732	24	increased	2106	1.06	equidimensional	0.0009	2
	Mc Neile	2507	184.56	184.66	0.10	stable	1995-12-19	2014-08-27	18.70	0.207	0.699	0.492	237.738	30	increased	1882	-4.58	very top-heavy	0.0006	1
	Montgolfier	4486	55.20	55.06	-0.13	stable	1993-02-01	2014-08-22	21.57	0.141	1.371	1.230	872.806	21	increased	1929	-1.32	top-heavy	0.0022	1
	Nobile	2361	57.04	56.78	-0.26	retreated	1993-02-01	2014-04-10	21.20	0.233	0.372	0.139	59.586	13	peak	1901	-1.28	top-heavy	0.0018	1
	Orel	5399	19.02	18.11	-0.92	retreated	1996-02-15	2010-12-22	14.86	0.229	0.172	-0.057	-25.010	8	stable	1148	1.95	very bottom-heavy	0.0066	4
	Pettus-GavinIce	3535	330.88	330.67	-0.21	stable	1992-12-25	2014-08-05	21.62	0.686	0.385	-0.301	-43.827	33	peak	1846	1.24	bottom-heavy	0.0030	2

Sector	Basin	l_f [m]	$A_{1985-1990}$ [km²]	$A_{2010-2015}$ [km²]	dA [km²]	Area change category	Date vs [yyyy-mm-dd]	Date vE [yyyy-mm-dd]	dt [a]	vS [m d-1]	vE [m d-1]	dv [m d-1]	dv [%]	nv	Vel. change category	h_{max} [m a.s.l.]	*HI*	Hypsometric category	*FA*	Group
	Renard	5904	118.15	117.24	-0.91	retreated	1993-02-01	2014-08-22	21.57	0.212	1.698	1.486	699.238	36	increased	2043	-1.82	very top-heavy	0.0011	1
	Rozier	5984	35.57	35.07	-0.50	retreated	1996-02-15	2014-08-22	18.53	0.977	0.944	-0.033	-3.420	38	peak	2061	2.70	very bottom-heavy	0.0036	2
	Russell West	3450	329.28	328.95	-0.33	retreated	1996-02-29	2014-08-27	18.50	1.072	1.759	0.687	64.111	16	increased	1645	1.44	bottom-heavy	0.0028	2
	Sabine	1795	83.09	82.78	-0.31	retreated	1993-02-01	2014-08-27	21.58	0.239	0.348	0.109	45.520	82	increased	1843	1.21	bottom-heavy	0.0070	2
	SBG	10917	327.95	327.75	-0.20	stable	1993-02-01	2010-12-29	17.92	0.298	0.306	0.007	2.395	34	peak	2220	1.08	equidimensional	0.0047	2
	Stringfellow-Henson	7775	670.38	669.74	-0.64	retreated	1993-02-01	2014-02-28	21.09	1.100	1.233	0.132	12.029	22	fluctuating	2167	1.55	very bottom-heavy	0.0026	2
	Temple	12056	453.96	453.22	-0.74	retreated	1992-12-25	2014-08-11	21.64	1.544	1.516	-0.028	-1.821	90	fluctuating	1962	-1.06	equidimensional	0.0031	1
	TPE11	1947	70.06	70.13	0.07	stable	1995-12-20	2013-12-24	18.02	0.184	1.203	1.018	552.655	20	increased	1268	1.05	equidimensional	0.0028	2
	TPE125	8741	40.41	40.13	-0.27	stable	1992-12-25	2013-12-24	21.01	0.415	0.260	-0.155	-37.319	22	fluctuating	1104	1.82	very bottom-heavy	0.0116	3
	TPE126	16295	145.52	147.80	2.28	advanced	1995-12-19	2014-08-27	18.70	0.287	0.306	0.019	6.542	58	peak	1655	2.20	very bottom-heavy	0.0060	2
	TPE39	9931	139.49	139.40	-0.08	stable	1995-12-19	2013-12-07	17.98	0.341	0.690	0.348	102.092	21	peak	1384	1.13	equidimensional	0.0051	2
	TPE40	13405	184.11	184.69	0.58	stable	1992-12-25	2013-12-24	21.01	0.718	0.406	-0.312	-43.414	27	decreased	1386	1.01	equidimensional	0.0059	3
	TPE41	9256	53.13	53.24	0.11	stable	1995-12-19	2013-12-07	17.98	0.326	0.281	-0.046	-13.987	26	stable	1094	1.98	very bottom-heavy	0.0107	3
	TPE46	2785	33.94	34.34	0.41	advanced	1992-12-25	2014-08-27	21.68	0.935	0.881	-0.054	-5.756	42	fluctuating	1843	-1.86	very top-heavy	0.0026	1
	TPE50	2987	31.32	31.53	0.21	advanced	1992-12-25	2014-02-28	21.19	0.450	0.517	0.067	14.899	46	peak	1839	1.13	equidimensional	0.0023	2
	TPE57	20111	100.43	100.34	-0.10	stable	1993-02-01	2010-12-29	17.92	0.317	0.230	-0.087	-27.382	29	peak	1132	1.31	bottom-heavy	0.0090	3
	TPE8	5582	111.74	112.24	0.49	advanced	1996-02-11	2013-12-24	17.88	0.991	0.739	-0.252	-25.395	14	trough	1104	1.19	equidimensional	0.0035	3
	TPE9	3735	48.96	49.64	0.68	advanced	1995-12-20	2013-12-24	18.02	0.377	0.150	-0.227	-60.233	17	decreased	1085	1.41	bottom-heavy	0.0057	3
	Wellman	3449	48.67	48.48	-0.19	stable	1996-02-15	2014-04-10	18.16	0.161	0.255	0.094	58.300	19	stable	1772	1.47	bottom-heavy	0.0037	2
	Wheatstone	4642	52.66	52.18	-0.48	retreated	1993-02-01	2010-12-22	17.90	0.355	0.258	-0.097	-27.262	11	peak	1569	1.21	bottom-heavy	0.0029	2
	Whitecloud	3711	177.77	177.66	-0.11	stable	1992-12-25	2014-08-11	21.64	0.454	0.481	0.027	5.848	39	fluctuating	1950	-2.94	very top-heavy	0.0013	1
	Woodbury	1464	20.24	20.03	-0.21	retreated	1993-02-01	2014-08-11	21.54	0.155	0.239	0.084	53.784	23	stable	1862	1.02	equidimensional	0.0024	2
Summary	mean								19.58	0.428	0.605	0.177	41.334			1636				
West	sum	268763	5809.33	5800.18	-9.14									1429						
Summary	mean								19.25	0.484	0.545	0.061	12.646			1629				
all glaciers	sum	481786	11003.23	10764.42	-238.81									2256						

l_f – length of ice front

A – glacier area in the respective period*

dA – change in glacier area between 1985 and 2015*

Area change category – see definition in Section 4.1

Date v_S - date of first velocity measurement

Date v_E – date of last velocity measurement

dt - mean time period of velocity measurements

v_S – mean of earliest velocity measurements (1992-1996)

v_E – mean of latest velocity measurements (2010-2014)

dv – mean velocity change

n_v – sum of velocity measurements in the observation period (dt)

Velocity change category – see definition in Table 3

h_{max} – average maximum altitude of individual basins

HI – Hypsometric Index of the basin

Hypsometric category – see Table 4

FA – flux gate to catchment size ratio

Group – classification of glaciers in sector “West” according to the hierarchical cluster analysis in Section 4.4.

*since 1995 for the former Larsen-A and Prince Gustav Ice Shelf tributaries (see Section 5.2)

Table S2: Observed parameters of the individual glaciers derived from velocity data measured at maximum ice thickness at the terminus profiles. Table continues next page.

Sector	Basin	Date v_s [yyyy-mm-dd]	Date v_E [yyyy-mm-dd]	dt [a]	v_S [m d^{-1}]	v_E [m d^{-1}]	dv [m d^{-1}]	dv [%]	n_v	Vel. change category	Longitude [°]	Latitude [°]	Group
East	ADD ID: 2707	1995-11-14	2013-12-24	18.12	2.212	0.140	-2.072	-93.676	40	decreased	-58.3480	-63.7806	
	ADD ID: 2731	1992-12-25	2010-12-31	18.03	0.391	0.134	-0.256	-65.654	9	decreased	-58.1603	-63.6990	
	Aitkenhead	1995-12-18	2014-12-16	19.01	1.266	1.280	0.014	1.134	34	peak	-58.6712	-63.9561	
	Broad Valley	1996-02-11	2010-12-31	14.90	0.445	0.070	-0.375	-84.243	3	decreased	-57.6730	-63.5434	
	Diplock	1995-12-18	2014-12-16	19.01	0.538	0.641	0.103	19.140	52	trough	-58.7446	-64.0382	
	Eyrie	1992-12-25	2010-12-31	18.03	1.123	0.682	-0.442	-39.311	5	decreased	-57.7725	-63.5999	
	Russell East	1992-12-25	2013-12-24	21.01	3.127	0.552	-2.575	-82.350	39	decreased	-58.2950	-63.7328	
	TPE10	1995-11-14	2010-12-31	15.14	1.258	1.154	-0.105	-8.327	6	peak	-58.0911	-63.6559	
	TPE130	1995-11-14	2014-03-27	18.38	4.998	0.273	-4.725	-94.540	50	decreased	-58.4762	-63.8652	
	TPE31	1995-12-18	2013-12-24	18.03	3.986	0.169	-3.816	-95.756	25	decreased	-58.5084	-63.9136	
	TPE32	1995-12-19	2014-12-16	19.01	1.848	0.625	-1.223	-66.185	49	decreased	-58.5985	-63.9253	
	TPE34	1992-12-25	2010-12-31	18.03	1.369	0.365	-1.004	-73.345	6	decreased	-57.9752	-63.6675	
	Victory	1995-11-14	2013-12-02	18.06	1.284	1.222	-0.062	-4.852	37	trough	-58.3952	-63.8057	
Summary	mean			18.06	1.834	0.562	-1.272	-69.360					
East	sum								355				
East-Ice-Shelf	ADD ID: 2558	1993-01-29	2010-12-29	17.93	0.332	0.297	-0.035	-10.600	39	peak	-60.4713	-64.6331	
	ADD ID: 2668	1995-12-19	2014-03-27	18.28	1.068	0.367	-0.701	-65.626	24	decreased	-58.7338	-64.0949	
	APPE	1992-12-25	2014-12-16	21.99	2.276	1.230	-1.046	-45.972	126	decreased	-59.5048	-64.3030	
	Arron Icefall	1993-01-12	2010-12-29	17.97	0.479	1.298	0.819	170.781	30	peak	-60.4392	-64.5916	
	Boydell	1996-02-13	2014-12-16	18.85	0.367	1.149	0.782	213.226	37	peak	-59.0689	-64.1694	
	DBE	1993-01-29	2014-02-27	21.09	1.710	1.392	-0.318	-18.603	115	peak	-59.9281	-64.3595	
	Drygalski	1993-01-29	2010-12-29	17.93	1.610	5.490	3.879	240.893	22	peak	-60.7602	-64.7437	
	LAB2	1993-01-29	2010-12-29	17.93	0.053	0.084	0.030	56.272	23	peak	-60.6258	-64.6894	
	LAB32	1993-01-29	2010-12-29	17.93	0.270	0.378	0.108	39.865	23	peak	-60.5046	-64.6596	
	Sjögren	1996-02-13	2014-12-16	18.85	0.758	1.661	0.904	119.255	61	peak	-59.1731	-64.2164	
	TPE114	1996-02-13	2014-12-16	18.85	0.237	0.379	0.143	60.225	55	fluctuating	-58.9343	-64.1937	
	TPE61	1993-01-12	2011-01-22	18.04	0.343	0.136	-0.207	-60.310	44	peak	-60.3090	-64.5320	
	TPE62	1992-12-25	2011-01-22	18.09	0.374	0.067	-0.308	-82.175	40	peak	-60.1646	-64.5031	
Summary	mean			18.75	0.760	1.071	0.312	41.000					
East-Ice-Shelf	sum								639				
West	AMR	1993-02-01	2014-08-22	21.57	0.112	2.065	1.954	1750.085	18	increased	-62.3704	-64.8692	1
	Andrew	1992-12-25	2014-08-27	21.68	0.430	0.339	-0.091	-21.211	112	fluctuating	-59.7202	-63.8728	4
	Bagshawe-Grubb	1996-02-15	2010-11-29	14.80	0.211	0.163	-0.048	-22.789	5	stable	-62.6231	-64.9147	1
	Bayly	1993-02-01	2014-08-22	21.57	0.806	0.886	0.080	9.931	37	fluctuating	-61.8628	-64.6094	3
	Blanchard	1993-02-01	2014-08-22	21.57	0.937	1.390	0.453	48.342	37	increased	-62.0656	-64.7283	2
	Bleriot	1996-02-15	2014-04-10	18.16	1.375	1.267	-0.107	-7.793	27	fluctuating	-61.1699	-64.4075	3
	CLM	1993-02-01	2010-12-29	17.92	0.288	0.394	0.106	36.932	24	peak	-60.9489	-64.3093	2
	Deville	1996-02-15	2010-12-22	14.86	1.386	0.259	-1.127	-81.322	10	decreased	-62.5725	-64.8107	3
	DGC10	1993-02-01	2014-04-10	21.20	0.232	0.774	0.542	234.115	30	increased	-61.4458	-64.4220	1
	DGC13	1996-02-15	2014-04-10	18.16	0.354	0.457	0.102	28.864	23	fluctuating	-61.5345	-64.5383	3
	DGC14	1996-02-15	2014-04-10	18.16	0.096	0.124	0.028	28.973	29	stable	-61.5777	-64.5362	3
	DGC22	1996-02-15	2014-04-10	18.16	0.272	0.543	0.271	99.864	33	fluctuating	-61.5535	-64.5763	3
	DGC23	1993-02-01	2014-08-22	21.57	0.414	0.960	0.545	131.621	37	increased	-61.9237	-64.6491	1
	DGC25	1993-02-01	2014-08-22	21.57	0.096	1.049	0.953	994.935	38	increased	-62.0029	-64.7076	2
	DGC31	1993-02-01	2010-12-22	17.90	0.719	0.211	-0.509	-70.700	7	fluctuating	-62.3808	-64.7243	3
	DGC39	1993-02-01	2010-12-22	17.90	0.645	0.153	-0.493	-76.339	11	decreased	-62.5177	-64.6534	3
	DGC72	1993-02-01	2014-04-10	21.20	0.269	2.387	2.118	787.360	25	increased	-61.3022	-64.4380	2
	DGC8	1993-02-01	2014-04-10	21.20	0.169	0.384	0.215	127.060	40	fluctuating	-61.3651	-64.4162	4
	Krebs	1993-02-01	2014-04-10	21.20	0.866	1.119	0.253	29.203	20	peak	-61.5201	-64.6377	1
	Landau	1996-02-13	2014-08-27	18.55	0.068	1.349	1.281	1876.773	43	increased	-59.3685	-63.8722	1
	Leonardo	1993-02-01	2014-08-22	21.57	0.155	2.523	2.368	1525.056	28	increased	-61.9568	-64.6961	2
	Mc Neile	1995-11-14	2014-08-27	18.80	0.650	5.146	4.496	691.683	33	increased	-59.4035	-63.9233	1
	Montgolfier	1993-02-01	2014-08-22	21.57	0.250	2.624	2.374	949.476	31	increased	-62.2203	-64.7800	1
	Nobile	1993-02-01	2014-04-10	21.20	0.235	1.226	0.991	421.633	18	increased	-61.4705	-64.5422	1
	Orel	1993-02-01	2010-12-22	17.90	0.519	0.344	-0.174	-33.577	10	stable	-62.5638	-64.7635	4
	Pettus-GavinIce	1992-12-25	2014-08-05	21.62	5.651	1.951	-3.700	-65.473	29	peak	-59.1464	-63.7450	2

Sector	Basin	Date vs [yyyy-mm-dd]	Date vE [yyyy-mm-dd]	dt [a]	vS [m d-1]	vE [m d-1]	dv [m d-1]	dv [%]	nv	Vel. change category			Group
	Renard	1993-02-01	2014-08-22	21.57	0.213	1.273	1.060	498.781	42	increased	-61.6438	-64.6709	2
	Rozier	1996-02-29	2014-08-27	21.57	1.777	2.210	0.433	24.342	59	increased	-62.1835	-64.7457	2
	Russell West	1993-02-01	2014-08-27	18.50	0.196	0.341	0.145	73.631	105	increased	-58.8902	-63.6830	2
	Sabine	1993-02-01	2010-12-12	21.58	0.577	2.814	2.238	388.165	31	peak	-59.8056	-63.8741	2
	SBG	1996-02-13	2011-02-08	17.87	4.106	4.029	-0.077	-1.885	20	fluctuating	-60.8223	-64.1623	2
	Stringfellow-Henson	1992-12-25	2014-02-28	15.00	1.390	1.283	-0.106	-7.660	98	fluctuating	-60.4311	-63.9752	1
	Temple	1995-11-14	2013-12-24	21.19	1.272	1.881	0.609	47.843	28	increased	-60.1247	-63.9419	2
	TPE11	1992-12-25	2013-12-24	18.12	0.526	0.384	-0.142	-26.927	31	fluctuating	-58.1397	-63.4734	3
	TPE125	1992-12-25	2014-08-27	21.01	0.150	0.277	0.127	84.605	50	peak	-58.6190	-63.5057	2
	TPE126	1995-12-19	2013-12-24	21.68	1.081	0.993	-0.088	-8.144	25	fluctuating	-59.3057	-63.7796	3
	TPE39	1992-12-25	2013-12-24	18.03	0.649	0.408	-0.241	-37.191	25	fluctuating	-58.7693	-63.5361	3
	TPE40	1995-12-19	2013-12-24	21.01	0.472	0.454	-0.018	-3.798	17	fluctuating	-58.3804	-63.4791	3
	TPE41	1992-12-25	2014-08-27	18.03	1.390	1.025	-0.365	-26.229	47	fluctuating	-58.2347	-63.4585	1
	TPE46	1992-12-25	2014-08-27	21.68	1.312	0.852	-0.459	-35.021	113	fluctuating	-59.3930	-63.8914	2
	TPE50	1993-02-01	2010-12-29	21.68	0.473	0.275	-0.198	-41.828	22	stable	-59.9269	-63.9387	3
	TPE57	1996-02-11	2013-12-24	17.92	0.671	0.692	0.021	3.134	12	fluctuating	-60.6700	-64.0238	3
	TPE8	1995-12-19	2013-12-24	17.88	4.396	0.605	-3.791	-86.236	24	decreased	-57.9284	-63.3700	3
	TPE9	1996-02-15	2014-04-10	18.03	0.196	0.855	0.658	335.252	21	increased	-58.0371	-63.4244	2
	Wellman	1993-02-01	2010-12-22	18.16	0.455	0.530	0.075	16.501	12	peak	-61.4298	-64.4846	2
	Wheatstone	1992-12-25	2014-08-27	17.90	1.017	3.375	2.359	232.018	99	increased	-62.5189	-64.7362	1
	Whitecloud	1993-02-01	2014-08-22	21.68	0.153	0.237	0.085	55.585	44	fluctuating	-59.5585	-63.9000	3
	Woodbury	1993-02-01	2014-08-22	21.57	0.213	1.273	1.060	498.781	42	increased	-62.3053	-64.7749	2
Summary	mean			19.65	0.831	1.200	0.369	44.461					
West	sum								1742				
Summary	mean			19.21	0.994	1.065	0.071	7.143					
all glaciers	sum								2736				

Date v_s - date of first velocity measurement

Date v_E – date of last velocity measurement

dt - mean time period of velocity measurements

v_s – mean of earliest velocity measurements (1992-1996)

v_E – mean of latest velocity measurements (2010-2014)

dv – mean velocity change

n_v – sum of velocity measurements in the observation period (*dt*)

Velocity change category – see definition in Table 3

Latitude/Longitude – position of velocity measurements (maximum ice thickness at terminus profiles)

Group – classification of glaciers in sector “West” according to the hierarchical cluster analysis in Section 4.4.

Table S3: Uncertainty σ_v of intensity tracking results. Table continues next pages.

Date [yyyy-mm-dd]	Satellite	*dt* [d]	σ_v^C [m d^{-1}]	*n*	σ_v^I [m d^{-1}]	σ_v [m d^{-1}]
1992-12-25	ERS	35	0.13	9721	0.05	0.14
1992-12-25	ERS	35	0.25	23678	0.05	0.26
1993-01-12	ERS	70	0.07	9880	0.02	0.07
1993-01-29	ERS	35	0.10	6090	0.05	0.11
1993-01-29	ERS	35	0.23	4533	0.05	0.24
1993-02-01	ERS	35	0.20	6321	0.05	0.21
1994-02-01	ERS	21	0.35	22007	0.08	0.36
1994-02-18	ERS	54	0.07	28834	0.03	0.08
1994-02-28	ERS	33	0.16	26276	0.05	0.17
1995-10-31	ERS	1*	0.41	150	1.60	0.41
1995-11-14	ERS	1*	0.36	1961	1.60	0.36
1995-11-16	ERS	1*	0.29	448	1.60	0.29
1995-12-18	ERS	71	0.02	68711	0.02	0.03
1995-12-18	ERS	70	0.03	77246	0.02	0.04
1995-12-19	ERS	71	0.02	70974	0.02	0.03
1995-12-19	ERS	70	0.06	67287	0.02	0.06
1995-12-19	ERS	69	0.12	66877	0.02	0.12
1995-12-20	ERS	70	0.04	70897	0.02	0.04
1995-12-21	ERS	70	0.08	10755	0.02	0.08
1995-12-21	ERS	69	0.09	9000	0.02	0.10
1996-01-22	ERS	1*	0.24	49973	1.60	0.24
1996-01-23	ERS	1*	0.34	546	1.60	0.34
1996-02-11	ERS	35	0.12	10215	0.05	0.12
1996-02-11	ERS	35	0.14	8164	0.05	0.15
1996-02-13	ERS	35	0.06	23882	0.05	0.08
1996-02-15	ERS	35	0.14	9379	0.05	0.15
1996-02-29	ERS	35	0.02	39573	0.05	0.05
1996-03-03	ERS	34	0.05	18324	0.05	0.07
1996-03-03	ERS	35	0.05	18395	0.05	0.07
1996-03-20	ERS	1*	0.30	9049	1.60	0.30
1997-02-13	ERS	35	0.04	44246	0.05	0.06
1997-02-15	ERS	35	0.11	14969	0.05	0.12
1997-02-18	ERS	35	0.09	6705	0.05	0.10
1998-02-03	ERS	35	0.07	3176	0.05	0.08
1999-11-09	ERS	1*	0.34	4022	1.60	0.34
2002-02-07	ERS	35	0.07	9893	0.05	0.09
2002-11-29	ERS	35	0.13	61073	0.05	0.13
2002-12-03	ERS	35	0.13	19079	0.05	0.13
2002-12-08	ERS	35	0.29	1965	0.05	0.29
2002-12-21	ERS	70	0.05	21331	0.02	0.05
2002-12-21	ERS	35	0.27	3396	0.05	0.27
2002-12-26	ERS	70	0.13	2437	0.02	0.13
2003-01-07	ERS	35	0.05	24658	0.05	0.07
2003-01-08	ERS	70	0.19	4794	0.02	0.19
2003-01-12	ERS	35	0.09	2548	0.05	0.10
2003-01-25	ERS	35	0.10	14207	0.05	0.11
2004-11-01	ERS	35	0.17	30346	0.05	0.17
2004-11-17	ERS	70	0.06	71277	0.02	0.07
2004-11-19	ERS	70	0.08	32153	0.02	0.09
2004-12-06	ERS	35	0.11	33520	0.05	0.12
2004-12-24	ERS	70	0.11	34409	0.02	0.11
2004-12-25	ERS	35	0.14	12592	0.05	0.14
2005-01-10	ERS	35	0.28	23466	0.05	0.28

Date [yyyy-mm-dd]	Satellite	*dt* [d]	σ_v^C [m d^{-1}]	*n*	σ_v^I [m d^{-1}]	σ_v [m d^{-1}]
2006-11-03	ERS	35	0.19	56628	0.05	0.19
2006-11-04	ERS	35	0.14	70277	0.05	0.14
2008-10-29	ERS	35	0.07	9881	0.05	0.08
2010-02-08	ERS	35	0.18	18041	0.05	0.19
2010-02-26	ERS	70	0.11	19172	0.02	0.11
2010-03-15	ERS	35	0.10	23486	0.05	0.11
2000-09-22	R1	24	0.10	20810	0.06	0.12
2000-09-22	R1	24	0.14	33870	0.06	0.15
2000-10-01	R1	24	0.06	30397	0.06	0.09
2006-08-22	R1	24	0.07	57259	0.06	0.10
2006-08-22	R1	24	0.08	21635	0.06	0.10
2003-12-22	ENVISAT	35	0.31	38866	0.05	0.31
2004-01-09	ENVISAT	70	0.03	61495	0.02	0.04
2004-01-10	ENVISAT	35	0.13	1790	0.05	0.13
2004-01-28	ENVISAT	70	0.16	1510	0.02	0.16
2004-02-14	ENVISAT	35	0.09	1898	0.05	0.10
2004-03-20	ENVISAT	35	0.13	3299	0.05	0.14
2004-04-24	ENVISAT	35	0.12	3505	0.05	0.13
2004-05-29	ENVISAT	35	0.10	3623	0.05	0.11
2004-07-03	ENVISAT	35	0.10	3546	0.05	0.11
2004-07-19	ENVISAT	35	0.03	60612	0.05	0.06
2004-08-07	ENVISAT	35	0.11	3418	0.05	0.12
2004-09-11	ENVISAT	35	0.14	3400	0.05	0.15
2004-10-16	ENVISAT	35	0.15	3449	0.05	0.16
2004-12-06	ENVISAT	35	0.06	63965	0.05	0.08
2005-01-28	ENVISAT	70	0.02	62239	0.02	0.03
2005-03-05	ENVISAT	35	0.15	2744	0.05	0.15
2005-03-21	ENVISAT	35	0.19	64254	0.05	0.19
2005-04-09	ENVISAT	35	0.13	2904	0.05	0.14
2005-05-14	ENVISAT	35	0.17	3016	0.05	0.17
2005-06-18	ENVISAT	35	0.13	3631	0.05	0.14
2005-07-23	ENVISAT	35	0.14	2943	0.05	0.14
2005-08-08	ENVISAT	35	0.12	68061	0.05	0.13
2006-02-15	ENVISAT	35	0.07	61205	0.05	0.08
2006-03-25	ENVISAT	35	0.14	2755	0.05	0.15
2006-07-08	ENVISAT	35	0.08	3488	0.05	0.09
2006-08-09	ENVISAT	35	0.06	60954	0.05	0.08
2006-08-12	ENVISAT	35	0.15	3302	0.05	0.15
2006-09-16	ENVISAT	35	0.14	3295	0.05	0.15
2006-10-21	ENVISAT	35	0.16	2741	0.05	0.17
2007-02-18	ENVISAT	70	0.03	71538	0.02	0.04
2007-04-29	ENVISAT	70	0.04	65692	0.02	0.05
2007-06-20	ENVISAT	35	0.03	63862	0.05	0.05
2007-08-12	ENVISAT	70	0.04	61079	0.02	0.05
2007-09-01	ENVISAT	35	0.15	3391	0.05	0.16
2007-10-03	ENVISAT	35	0.10	61336	0.05	0.11
2007-10-06	ENVISAT	35	0.16	3255	0.05	0.16
2008-04-30	ENVISAT	35	0.10	63576	0.05	0.11
2008-06-22	ENVISAT	70	0.03	57922	0.02	0.04
2008-08-13	ENVISAT	35	0.07	60539	0.05	0.08
2009-03-11	ENVISAT	35	0.11	64638	0.05	0.12
2009-07-29	ENVISAT	35	0.03	61130	0.05	0.05
2006-06-10	ALOS	46	0.02	15503	0.02	0.02
2006-06-17	ALOS	46	0.01	61958	0.02	0.02
2006-06-25	ALOS	46	0.08	581	0.02	0.09
2006-07-14	ALOS	46	0.02	9476	0.02	0.02
2006-09-21	ALOS	92	0.02	9912	0.01	0.02

Date [yyyy-mm-dd]	Satellite	*dt* [d]	σ_v^C [m d^{-1}]	*n*	σ_v^I [m d^{-1}]	σ_v [m d^{-1}]
2006-12-23	ALOS	46	0.08	5135	0.02	0.08
2007-12-04	ALOS	46	0.03	10220	0.02	0.04
2007-12-14	ALOS	46	0.04	2193	0.02	0.04
2008-05-14	ALOS	46	0.01	43889	0.02	0.02
2008-10-21	ALOS	46	0.02	10711	0.02	0.02
2008-10-31	ALOS	46	0.13	2461	0.02	0.13
2008-11-13	ALOS	92	0.02	10861	0.01	0.02
2008-11-14	ALOS	46	0.02	33136	0.02	0.02
2008-12-06	ALOS	46	0.04	10213	0.02	0.04
2008-12-07	ALOS	92	0.02	36230	0.01	0.02
2008-12-16	ALOS	46	0.07	2291	0.02	0.07
2008-12-29	ALOS	92	0.02	10998	0.01	0.02
2008-12-30	ALOS	46	0.04	37661	0.02	0.04
2009-01-21	ALOS	46	0.02	10677	0.02	0.03
2009-12-02	ALOS	46	0.05	3484	0.02	0.05
2009-12-09	ALOS	46	0.03	9707	0.02	0.03
2009-12-21	ALOS	46	0.05	2455	0.02	0.05
2009-12-26	ALOS	46	0.03	9385	0.02	0.03
2010-01-19	ALOS	46	0.02	15505	0.02	0.02
2010-10-08	ALOS	46	0.04	620	0.02	0.04
2010-10-17	ALOS	46	0.03	79294	0.02	0.03
2010-11-06	ALOS	46	0.08	2212	0.02	0.08
2010-11-08	ALOS	46	0.01	16076	0.02	0.02
2010-11-10	ALOS	46	0.02	422	0.02	0.03
2010-11-13	ALOS	46	0.04	9956	0.02	0.05
2010-11-29	ALOS	92	0.03	2069	0.01	0.03
2010-12-01	ALOS	92	0.01	18027	0.01	0.01
2010-12-03	ALOS	92	0.40	426	0.01	0.40
2010-12-06	ALOS	92	0.03	10352	0.01	0.03
2010-12-11	ALOS	92	0.04	4683	0.01	0.04
2010-12-12	ALOS	46	0.03	9480	0.02	0.04
2010-12-22	ALOS	46	0.05	1992	0.02	0.05
2010-12-26	ALOS	46	0.02	411	0.02	0.03
2010-12-29	ALOS	46	0.03	10478	0.02	0.04
2010-12-31	ALOS	46	0.01	46824	0.02	0.02
2011-01-18	ALOS	92	0.16	430	0.01	0.16
2011-02-08	ALOS	46	0.01	17569	0.02	0.02
2011-02-10	ALOS	46	0.01	394	0.02	0.02
2008-10-19	TSX/TDX	11	0.05	4560	0.02	0.05
2008-10-25	TSX/TDX	22	0.02	4362	0.01	0.02
2008-10-30	TSX/TDX	11	0.03	4507	0.02	0.04
2009-08-01	TSX/TDX	11	0.02	11170	0.02	0.03
2009-10-28	TSX/TDX	11	0.06	4220	0.02	0.07
2010-10-26	TSX/TDX	33	0.02	2678	0.01	0.02
2010-11-01	TSX/TDX	44	0.02	3442	0.01	0.02
2010-11-17	TSX/TDX	22	0.01	5995	0.01	0.01
2010-11-17	TSX/TDX	11	0.06	3599	0.02	0.07
2010-11-28	TSX/TDX	99	0.01	3063	0.00	0.01
2010-12-15	TSX/TDX	66	0.02	3476	0.00	0.02
2010-12-20	TSX/TDX	77	0.01	3524	0.00	0.01
2010-12-20	TSX/TDX	55	0.01	4297	0.00	0.02
2010-12-26	TSX/TDX	66	0.01	4341	0.00	0.01
2011-01-22	TSX/TDX	11	0.02	4722	0.02	0.03
2011-06-25	TSX/TDX	22	0.01	15556	0.01	0.02
2011-06-25	TSX/TDX	22	0.04	9886	0.01	0.04
2011-07-06	TSX/TDX	44	0.04	10380	0.01	0.04
2011-07-16	TSX/TDX	22	0.04	3582	0.01	0.04

Date [yyyy-mm-dd]	Satellite	*dt* [d]	σ_v^C [m d^{-1}]	*n*	σ_v^I [m d^{-1}]	σ_v [m d^{-1}]
2011-07-17	TSX/TDX	22	0.01	15712	0.01	0.02
2011-07-16	TSX/TDX	22	0.10	1421	0.01	0.10
2011-07-17	TSX/TDX	22	0.03	10450	0.01	0.03
2011-07-28	TSX/TDX	44	0.02	10607	0.01	0.02
2011-08-03	TSX/TDX	22	0.40	614	0.01	0.40
2011-08-08	TSX/TDX	22	0.03	10394	0.01	0.04
2011-08-14	TSX/TDX	44	0.14	1556	0.01	0.14
2011-08-19	TSX/TDX	44	0.03	10054	0.01	0.03
2011-08-19	TSX/TDX	55	0.04	2385	0.00	0.04
2011-08-24	TSX/TDX	22	0.03	1894	0.01	0.03
2011-08-24	TSX/TDX	55	0.03	10578	0.00	0.03
2011-08-29	TSX/TDX	33	0.03	1856	0.01	0.03
2011-08-30	TSX/TDX	22	0.02	15605	0.01	0.02
2011-08-30	TSX/TDX	22	0.06	7157	0.01	0.06
2011-09-04	TSX/TDX	33	0.01	15878	0.01	0.01
2011-09-09	TSX/TDX	11	0.06	2325	0.02	0.06
2011-09-14	TSX/TDX	11	0.05	3667	0.02	0.05
2011-09-14	TSX/TDX	11	0.12	1279	0.02	0.12
2011-09-15	TSX/TDX	11	0.03	15546	0.02	0.03
2011-09-15	TSX/TDX	11	0.07	7819	0.02	0.07
2011-09-27	TSX/TDX	44	0.14	2001	0.01	0.14
2011-10-01	TSX/TDX	33	0.02	1956	0.01	0.02
2011-10-01	TSX/TDX	44	0.04	3582	0.01	0.04
2011-10-06	TSX/TDX	33	0.04	3602	0.01	0.05
2011-10-06	TSX/TDX	33	0.11	1353	0.01	0.11
2011-10-12	TSX/TDX	66	0.02	3453	0.00	0.02
2011-10-17	TSX/TDX	55	0.03	3541	0.00	0.03
2011-10-23	TSX/TDX	11	0.06	2018	0.02	0.06
2011-11-03	TSX/TDX	22	0.05	3533	0.01	0.05
2011-11-03	TSX/TDX	22	0.07	1209	0.01	0.07
2011-11-25	TSX/TDX	22	0.03	3507	0.01	0.03
2011-12-06	TSX/TDX	11	0.06	2432	0.02	0.06
2011-12-12	TSX/TDX	33	0.01	13467	0.01	0.01
2011-12-13	TSX/TDX	44	0.05	2328	0.01	0.05
2011-12-17	TSX/TDX	22	0.01	4172	0.01	0.02
2011-12-18	TSX/TDX	33	0.08	2365	0.01	0.08
2012-01-03	TSX/TDX	11	0.01	16220	0.02	0.03
2012-01-03	TSX/TDX	11	0.07	8576	0.02	0.07
2012-01-31	TSX/TDX	55	0.05	2338	0.00	0.05
2012-03-09	TSX/TDX	11	0.02	13279	0.02	0.03
2012-03-09	TSX/TDX	11	0.16	7483	0.02	0.16
2012-03-10	TSX/TDX	22	0.07	2343	0.01	0.07
2012-03-15	TSX/TDX	22	0.01	15451	0.01	0.01
2012-03-15	TSX/TDX	33	0.05	2290	0.01	0.05
2012-03-15	TSX/TDX	22	0.07	7142	0.01	0.07
2012-03-20	TSX/TDX	11	0.08	6422	0.02	0.08
2012-03-21	TSX/TDX	44	0.05	2265	0.01	0.05
2012-03-25	TSX/TDX	22	0.11	1258	0.01	0.11
2012-03-26	TSX/TDX	55	0.05	2143	0.00	0.05
2012-03-26	TSX/TDX	11	0.19	2259	0.02	0.19
2012-04-01	TSX/TDX	22	0.14	2362	0.01	0.14
2012-04-06	TSX/TDX	33	0.06	2248	0.01	0.06
2012-04-06	TSX/TDX	11	0.10	2316	0.02	0.10
2012-04-12	TSX/TDX	22	0.05	2100	0.01	0.05
2012-04-17	TSX/TDX	22	0.02	15486	0.01	0.02
2012-04-17	TSX/TDX	22	0.05	7244	0.01	0.05
2012-04-30	TSX/TDX	11	0.04	1747	0.02	0.05

Date [yyyy-mm-dd]	Satellite	*dt* [d]	σ_v^C [m d^{-1}]	*n*	σ_v^T [m d^{-1}]	σ_v [m d^{-1}]
2012-05-08	TSX/TDX	66	0.02	3381	0.00	0.02
2012-05-09	TSX/TDX	22	0.02	15305	0.01	0.02
2012-05-09	TSX/TDX	55	0.04	2344	0.00	0.04
2012-05-09	TSX/TDX	22	0.05	6241	0.01	0.05
2012-05-13	TSX/TDX	77	0.02	3656	0.00	0.02
2012-05-15	TSX/TDX	44	0.04	2221	0.01	0.04
2012-05-19	TSX/TDX	22	0.03	3672	0.01	0.03
2012-05-19	TSX/TDX	22	0.10	1275	0.01	0.10
2012-05-20	TSX/TDX	55	0.04	2375	0.00	0.04
2012-05-24	TSX/TDX	33	0.04	1210	0.01	0.04
2012-05-30	TSX/TDX	33	0.03	2544	0.01	0.03
2012-06-04	TSX/TDX	11	0.05	3532	0.02	0.06
2012-06-04	TSX/TDX	11	0.10	1351	0.02	0.11
2012-06-05	TSX/TDX	33	0.01	15558	0.01	0.01
2012-06-11	TSX/TDX	11	0.09	2222	0.02	0.09
2012-06-15	TSX/TDX	11	0.08	3328	0.02	0.09
2012-06-15	TSX/TDX	11	0.10	1280	0.02	0.10
2012-06-21	TSX/TDX	11	0.07	2621	0.02	0.07
2012-06-27	TSX/TDX	11	0.06	7647	0.02	0.06
2012-06-28	TSX/TDX	44	0.04	2293	0.01	0.04
2012-07-03	TSX/TDX	55	0.04	2350	0.00	0.04
2012-07-03	TSX/TDX	33	0.05	2292	0.01	0.05
2012-07-09	TSX/TDX	44	0.04	2389	0.01	0.04
2012-07-13	TSX/TDX	33	0.03	2765	0.01	0.03
2012-07-19	TSX/TDX	33	0.02	15662	0.01	0.02
2012-07-25	TSX/TDX	11	0.09	2122	0.02	0.09
2012-08-04	TSX/TDX	11	0.07	2545	0.02	0.07
2012-08-09	TSX/TDX	11	0.07	3577	0.02	0.07
2012-08-09	TSX/TDX	11	0.12	1204	0.02	0.13
2012-08-10	TSX/TDX	11	0.07	7151	0.02	0.07
2012-08-11	TSX/TDX	44	0.08	2444	0.01	0.08
2012-08-16	TSX/TDX	55	0.04	2374	0.00	0.04
2012-08-22	TSX/TDX	44	0.04	2230	0.01	0.04
2012-09-07	TSX/TDX	11	0.14	1690	0.02	0.14
2012-09-23	TSX/TDX	33	0.05	1078	0.01	0.05
2012-09-29	TSX/TDX	55	0.04	1597	0.00	0.04
2012-09-29	TSX/TDX	33	0.06	2397	0.01	0.06
2012-10-05	TSX/TDX	44	0.08	2401	0.01	0.08
2012-10-10	TSX/TDX	55	0.05	2372	0.00	0.05
2012-10-20	TSX/TDX	33	0.03	2520	0.01	0.03
2012-10-21	TSX/TDX	11	0.09	2179	0.02	0.09
2012-10-27	TSX/TDX	22	0.08	2296	0.01	0.08
2012-11-01	TSX/TDX	11	0.10	2327	0.02	0.10
2012-11-01	TSX/TDX	33	0.17	1923	0.01	0.17
2012-11-05	TSX/TDX	11	0.05	3446	0.02	0.05
2012-11-05	TSX/TDX	11	0.13	1186	0.02	0.13
2012-11-07	TSX/TDX	44	0.05	2312	0.01	0.05
2012-11-12	TSX/TDX	33	0.05	2364	0.01	0.06
2012-11-12	TSX/TDX	11	0.12	2354	0.02	0.12
2012-11-18	TSX/TDX	22	0.07	2419	0.01	0.07
2012-11-23	TSX/TDX	11	0.08	2204	0.02	0.09
2012-12-26	TSX/TDX	55	0.03	2141	0.00	0.03
2013-02-23	TSX/TDX	77	0.01	3503	0.00	0.01
2013-03-01	TSX/TDX	11	0.08	2802	0.02	0.08
2013-03-17	TSX/TDX	11	0.06	3749	0.02	0.07
2013-03-17	TSX/TDX	11	0.14	1255	0.02	0.14
2013-03-23	TSX/TDX	22	0.03	3632	0.01	0.03

Date [yyyy-mm-dd]	Satellite	*dt* [d]	σ_v^C [m d^{-1}]	*n*	σ_v^T [m d^{-1}]	σ_v [m d^{-1}]
2013-03-23	TSX/TDX	22	0.08	1196	0.01	0.08
2013-03-26	TSX/TDX	11	0.08	1992	0.02	0.08
2013-03-28	TSX/TDX	11	0.17	1347	0.02	0.18
2013-03-29	TSX/TDX	33	0.05	1148	0.01	0.05
2013-04-03	TSX/TDX	33	0.09	2117	0.01	0.09
2013-04-10	TSX/TDX	22	0.06	2172	0.01	0.07
2013-04-15	TSX/TDX	33	0.07	2237	0.01	0.07
2013-04-26	TSX/TDX	55	0.05	2275	0.00	0.05
2013-04-26	TSX/TDX	11	0.12	2379	0.02	0.13
2013-04-30	TSX/TDX	55	0.02	3261	0.00	0.03
2013-06-08	TSX/TDX	22	0.03	3820	0.01	0.03
2013-06-08	TSX/TDX	22	0.04	1021	0.01	0.04
2013-06-19	TSX/TDX	44	0.02	3719	0.01	0.02
2013-06-30	TSX/TDX	22	0.03	3813	0.01	0.03
2013-06-30	TSX/TDX	22	0.09	1258	0.01	0.09
2013-07-28	TSX/TDX	33	0.01	15233	0.01	0.02
2013-08-02	TSX/TDX	33	0.02	2763	0.01	0.02
2013-08-25	TSX/TDX	33	0.05	2311	0.01	0.05
2013-08-30	TSX/TDX	33	0.01	15399	0.01	0.01
2013-09-20	TSX/TDX	33	0.03	3602	0.01	0.03
2013-09-20	TSX/TDX	33	0.05	1292	0.01	0.05
2013-09-27	TSX/TDX	33	0.04	2235	0.01	0.04
2013-10-02	TSX/TDX	33	0.01	15262	0.01	0.01
2013-10-23	TSX/TDX	33	0.02	3578	0.01	0.02
2013-10-23	TSX/TDX	33	0.05	1283	0.01	0.05
2013-10-30	TSX/TDX	33	0.05	2317	0.01	0.05
2013-11-02	TSX/TDX	11	0.02	9090	0.02	0.03
2013-11-02	TSX/TDX	11	0.07	484	0.02	0.07
2013-11-04	TSX/TDX	33	0.02	15102	0.01	0.02
2013-11-09	TSX/TDX	11	0.05	2652	0.02	0.06
2013-11-10	TSX/TDX	55	0.04	2294	0.00	0.04
2013-11-15	TSX/TDX	22	0.04	2878	0.01	0.05
2013-11-20	TSX/TDX	22	0.03	3538	0.01	0.04
2013-11-20	TSX/TDX	33	0.04	2955	0.01	0.04
2013-11-20	TSX/TDX	11	0.08	2846	0.02	0.08
2013-11-20	TSX/TDX	22	0.10	1321	0.01	0.10
2013-11-21	TSX/TDX	11	0.08	2180	0.02	0.08
2013-11-25	TSX/TDX	33	0.02	3312	0.01	0.02
2013-11-25	TSX/TDX	33	0.05	1125	0.01	0.05
2013-11-26	TSX/TDX	11	0.03	15060	0.02	0.03
2013-11-26	TSX/TDX	22	0.04	2825	0.01	0.04
2013-11-26	TSX/TDX	11	0.08	6708	0.02	0.09
2013-11-27	TSX/TDX	22	0.08	2346	0.01	0.09
2013-11-30	TSX/TDX	44	0.00	8207	0.01	0.01
2013-12-01	TSX/TDX	44	0.02	3438	0.01	0.02
2013-12-01	TSX/TDX	33	0.03	2670	0.01	0.03
2013-12-01	TSX/TDX	11	0.06	2893	0.02	0.06
2013-12-02	TSX/TDX	22	0.01	14680	0.01	0.01
2013-12-02	TSX/TDX	33	0.04	2079	0.01	0.04
2013-12-02	TSX/TDX	22	0.06	6620	0.01	0.06
2013-12-02	TSX/TDX	11	0.23	1957	0.02	0.24
2013-12-06	TSX/TDX	11	0.05	3548	0.02	0.06
2013-12-06	TSX/TDX	11	0.15	1322	0.02	0.15
2013-12-07	TSX/TDX	11	0.02	14924	0.02	0.03
2013-12-07	TSX/TDX	22	0.04	2905	0.01	0.04
2013-12-07	TSX/TDX	11	0.11	8347	0.02	0.11
2013-12-08	TSX/TDX	22	0.08	2021	0.01	0.08

Date [yyyy-mm-dd]	Satellite	*dt* [d]	σ_v^C [m d^{-1}]	*n*	σ_v^T [m d^{-1}]	σ_v [m d^{-1}]
2013-12-12	TSX/TDX	22	0.03	3508	0.01	0.03
2013-12-12	TSX/TDX	33	0.03	2814	0.01	0.03
2013-12-12	TSX/TDX	11	0.07	3039	0.02	0.08
2013-12-12	TSX/TDX	22	0.09	1242	0.01	0.09
2013-12-13	TSX/TDX	33	0.06	2306	0.01	0.06
2013-12-13	TSX/TDX	11	0.07	2024	0.02	0.08
2013-12-17	TSX/TDX	11	0.02	3978	0.02	0.03
2013-12-17	TSX/TDX	33	0.03	3323	0.01	0.03
2013-12-17	TSX/TDX	11	0.14	1290	0.02	0.14
2013-12-18	TSX/TDX	33	0.01	13920	0.01	0.01
2013-12-18	TSX/TDX	22	0.03	2741	0.01	0.04
2013-12-23	TSX/TDX	22	0.03	3725	0.01	0.03
2013-12-23	TSX/TDX	11	0.05	2877	0.02	0.06
2013-12-23	TSX/TDX	22	0.09	1118	0.01	0.10
2013-12-24	TSX/TDX	22	0.01	14893	0.01	0.01
2013-12-24	TSX/TDX	22	0.05	7587	0.01	0.05
2013-12-24	TSX/TDX	11	0.09	2342	0.02	0.09
2013-12-28	TSX/TDX	11	0.05	3475	0.02	0.05
2013-12-28	TSX/TDX	11	0.14	1096	0.02	0.15
2013-12-30	TSX/TDX	44	0.03	2034	0.01	0.03
2014-01-03	TSX/TDX	33	0.02	2819	0.01	0.02
2014-01-04	TSX/TDX	55	0.04	2128	0.00	0.04
2014-01-04	TSX/TDX	33	0.05	1939	0.01	0.05
2014-01-09	TSX/TDX	22	0.03	2828	0.01	0.03
2014-01-10	TSX/TDX	44	0.03	2083	0.01	0.03
2014-01-10	TSX/TDX	22	0.10	2104	0.01	0.10
2014-01-14	TSX/TDX	44	0.01	3685	0.01	0.01
2014-01-15	TSX/TDX	33	0.05	2236	0.01	0.05
2014-01-19	TSX/TDX	33	0.02	3652	0.01	0.02
2014-01-31	TSX/TDX	22	0.03	2647	0.01	0.03
2014-02-27	TSX/TDX	44	0.03	3163	0.01	0.03
2014-02-28	TSX/TDX	55	0.05	2235	0.00	0.05
2014-03-24	TSX/TDX	11	0.08	1958	0.02	0.08
2014-03-27	TSX/TDX	11	0.03	15610	0.02	0.03
2014-04-04	TSX/TDX	33	0.04	1921	0.01	0.04
2014-04-10	TSX/TDX	22	0.05	1895	0.01	0.05
2014-07-25	TSX/TDX	11	0.07	1184	0.02	0.08
2014-08-05	TSX/TDX	33	0.05	1130	0.01	0.05
2014-08-06	TSX/TDX	22	0.03	2495	0.01	0.03
2014-08-11	TSX/TDX	33	0.02	2649	0.01	0.02
2014-08-11	TSX/TDX	22	0.08	1340	0.01	0.08
2014-08-22	TSX/TDX	11	0.08	3049	0.02	0.08
2014-08-27	TSX/TDX	11	0.08	1215	0.02	0.09
2014-12-16	TSX/TDX	11	0.03	15265	0.02	0.03
datasets	Mean values:					
382	All		0.07	11717	0.05	0.08
59	ERS		0.14	26475	0.04	0.15
5	R1		0.09	32794	0.06	0.11
41	ENVISAT		0.11	30240	0.04	0.12
43	ALOS		0.05	13868	0.01	0.05
234	TSX/TDX		0.06	4414	0.01	0.06

Date - mean date of SAR acquisitions

dt - time interval in days between consecutive SAR acquisitions

σ_v^C - uncertainty of image coregistration

σ_v^T - uncertainty of intensity tracking process

* if *dt* = 1d -> $\sigma_v = \sigma_v^C$ see manuscript Section 4.2