Table S1. The table gathers the outputs and results obtained from each methodology step carried out for each domain of the two DsGSDs. The table collects the PS coverage expressed in percentage computed on all the available Sentinel 1 datasets, the mean data of aspect and slope, the Data Suitability Ranking cases and the mean, medium and the standard deviation of the ground deformation maps obtained.

Valtournenche DsGSD

Domains	PS coverage (%) V_{LOSa}	V_{LOSd}	V_{ew-v}	V_{slope}	mean aspect (°)	mean slope (°)	DSR case	Results (mm/yr) V_{LOSa} mean	med.	st.dv.	V_{LOSd} mean	med.	st.dv.	V_v mean	med.	st.dv.	V_{ew} mean	med.	st.dv.	V_{slope} mean	med.	st.dv.
A	13.8	40.8	19.0	42.3	275.9	29.6	case 1d	-	-	-	−5.19	−2.85	5.86	N.C	N.C	N.C	N.C	N.C	N.C	−7.36	−3.21	11.21
B	3.6	12.9	4.4	13.7	292.5	16.6	N.C.	-	-	-	N.C	N.C	N.C	N.C	N.C	N.C	N.C	N.C	N.C	N.C	N.C	N.C
C	37.7	51	53.4	52.2	257.1	19.7	case 1d	-	-	-	−8.03	−7.81	1.52	−2.42	−2.54	0.80	−11.4	−10.9	2.36	−12.9	−12.8	2.86
D	43.1	51	55.3	54.9	266.5	15.9	case 1d	-	-	-	−3.55	−3.45	1.38	−0.87	−0.77	0.68	−5.29	−5.28	2.01	−6.17	−6.07	2.55

Croix de Fana DsGSD

Domains	PS coverage (%) V_{LOSa}	V_{LOSd}	V_{ew-v}	V_{slope}	mean aspect (°)	mean slope (°)	DSR case	Results (mm/yr) V_{LOSa} mean	med.	st.dv.	V_{LOSd} mean	med.	st.dv.	V_v mean	med.	st.dv.	V_{ew} mean	med.	st.dv.	V_{slope} mean	med.	st.dv.
A	55.2	53.5	51.0	54.7	178.4	22.6	case 3	-	-	-	-	-	-	−4.44	−4.69	1.55	−0.24	−0.22	1.66	−11.7	−12.0	4.44
B	50.1	45.1	40.5	42.9	167.6	20.3	case 3	-	-	-	-	-	-	−3.22	−3.15	0.72	−0.08	−0.28	1.57	−8.16	−8.14	2.40
C	49.5	47.8	46.7	41.8	190.1	23.7	case 3	-	-	-	-	-	-	−0.91	−0.71	1.05	−1.51	−1.51	0.63	−4.11	−3.73	1.99
D	82.7	84.7	81.9	88.6	189.1	31.8	case 3	-	-	-	-	-	-	−3.10	−3.02	0.36	−1.36	−1.35	0.24	−7.53	−7.58	0.75
E	95.7	76.9	76.9	76.9	192.3	30.3	case 3	-	-	-	-	-	-	−3.48	−3.55	0.33	−1.61	−1.56	0.27	−9.10	−9.35	0.91
F	46.2	38	37.1	44.2	145.6	24.3	case 3	-	-	-	-	-	-	−1.16	−1.02	0.86	0.90	0.20	1.76	−3.49	−3.16	2.13

Table S2. Comparison of interpolation results of VLOSd, Vv, Vew and Vslope datasets of Valtouranche domain A considering and excluding landslide L1.

	V_{LOSd}			V_v			V_{ew}			V_{slope}		
	mean	median	stdev	mean	median	stdev	mean	median	stdev	mean	median	stdev
Domain A **considering the L1**	−3.08	−2.09	3.06	−1.45	−0.94	1.45	−1.36	−0.41	1.96	−3.63	−2.35	4.18
Domain A **excluding the L1**	−5.19	−2.85	5.86	−5.56	−2.06	7.87	−3.29	−1.62	3.55	−7.36	−3.21	11.21

Figure S1. Computing of PS density related to the V_v and V_{ew} dataset on the Valtorunenche DsGSD. a) Map of PSs density that shows the valid cells (PSs density ≥ PSs/Km²) and the discarded cells (PSs density < PSs/Km²). b) Map that shows the C_{PS} for each domains of the DsGSD of Valtournenche.
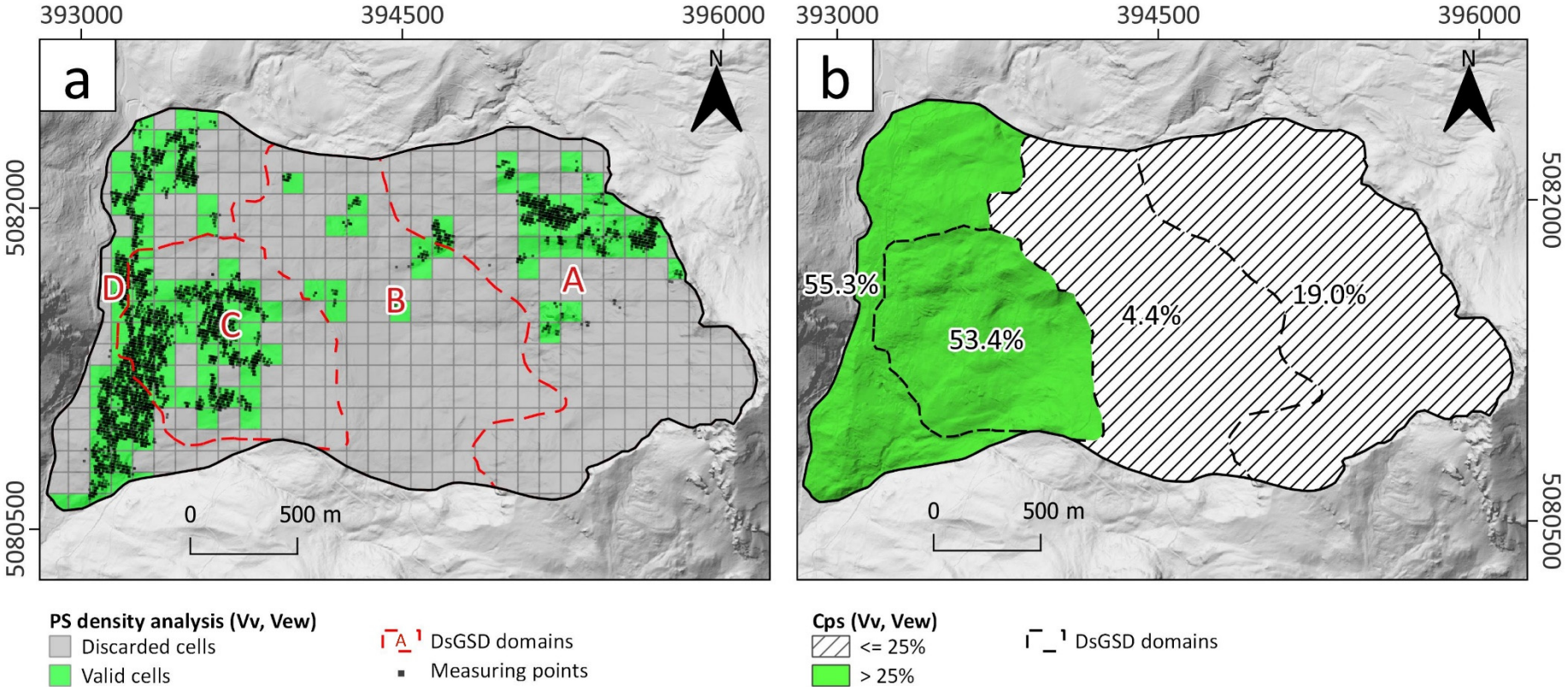
Figure S2. DSR matrix associated to the most suitable velocity component, depending on each couple of slope/aspect and the position occupied by both the DsGSD of interest.