

Supplementary Materials

Table S1. The acquisition dates of the satellite images that were used for producing the spatial distribution of snow. All selected images were taken on cloud-free conditions.

	Date	Landsat-7	Landsat-8	Sentinel-2A
1	11/10/2016	+		
2	12/10/2016			+
3	16/10/2016			+
4	19/10/2016		+	
5	20/11/2016		+	
6	21/11/2016			+
7	24/11/2016			+
8	28/11/2016	+		
9	01/12/2016			+
10	04/12/2016	+		
11	11/12/2016			+
12	14/12/2016			+
23	15/12/2016	+		
14	22/12/2016		+	
15	30/12/2016	+		
16	03/01/2017			+
17	07/01/2017		+	
18	13/01/2017			+
19	15/01/2017	+		
20	20/01/2017			+
21	23/01/2017		+	
22	31/01/2017	+		
23	08/02/2017		+	
24	09/02/2017			+
25	12/02/2017			+
26	16/02/2017	+		
27	19/02/2017			+
28	22/02/2017			+
29	11/03/2017			+
30	12/03/2017		+	
31	14/03/2017			+
32	20/03/2017	+		
33	28/03/2017		+	
34	31/03/2017			+
35	03/04/2017			+
36	13/04/2017		+	
37	20/04/2017			+
38	29/04/2017		+	
39	07/05/2017	+		
40	23/05/2017	+		

Table S2. The overview of snow field measurements which were conducted on March 1, 2017 and 2018.

Id	Depth (cm)		SWE (mm)		Slope	Land-cover	Altitude (m)
	2016/17	2017/18	2016/17	2017/18			
1	NA	25	NA	30.1	South	Sparse veg.	1281
2	23	24	31.5	30.3	Valley	Grassland	1193
3	26	33	33.1	50.1	North	Forest	1281
4	0	0	-	-	South	Sparse veg.	1393
5	20	17	25.5	22.9	Valley	Shrub	1356
6	22	28	31.2	33.8	North	Sparse forest	1393
7	0	0	-	-	South	Sparse veg.	1558
8	25	30	34.4	39.8	Valley	Grassland	1485
9	21	35	29.9	41	North	Dense forest	1558
10	27	35	35.7	44.7	North	Burned forest	1530
11	0	27	-	31.3	South	Grassland	1612
12	12	45	10.8	62.9	Valley	Shrub	1558
13	25	24	35.7	30.1	North	Sparse forest	1612
Mean	22.3	29.8	29.7	38.7			

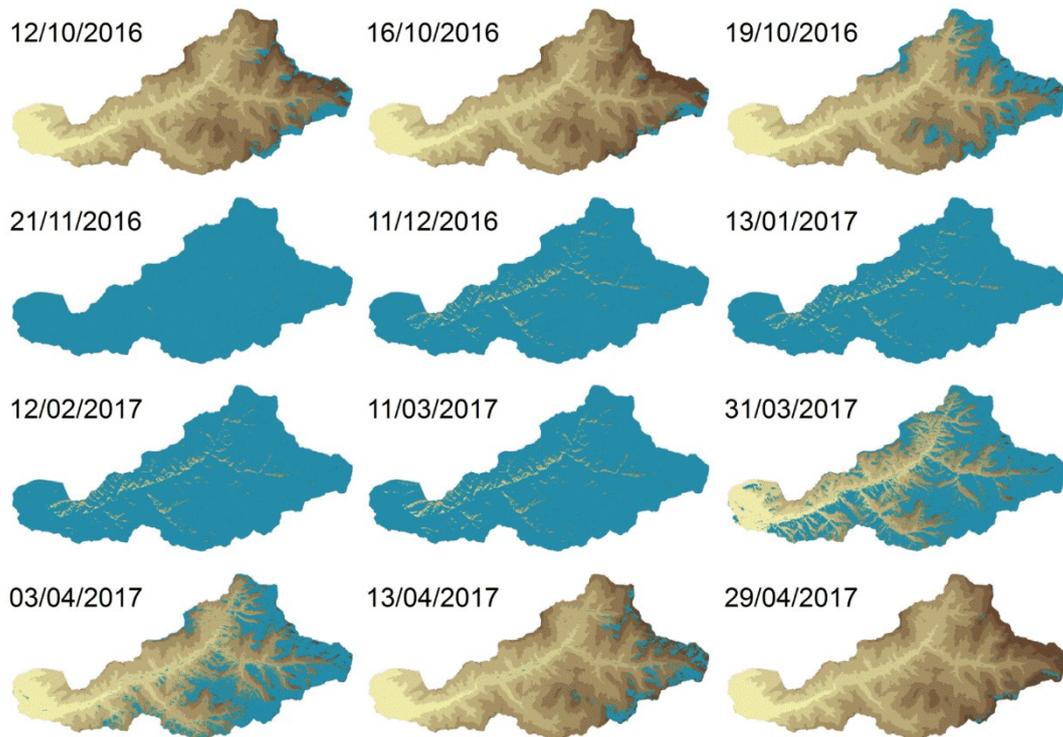


Figure S1. Development of SCA for winter 2016-2017 from the combination of Landsat and Sentinel retrievals. The light-blue color indicates snow cover.



Figure S2. Typical snow distribution in the Sugnugur catchment during the end of seasonal persistent snow cover period. Photographs were taken using a normal digital camera with automatic time-lapse setting.

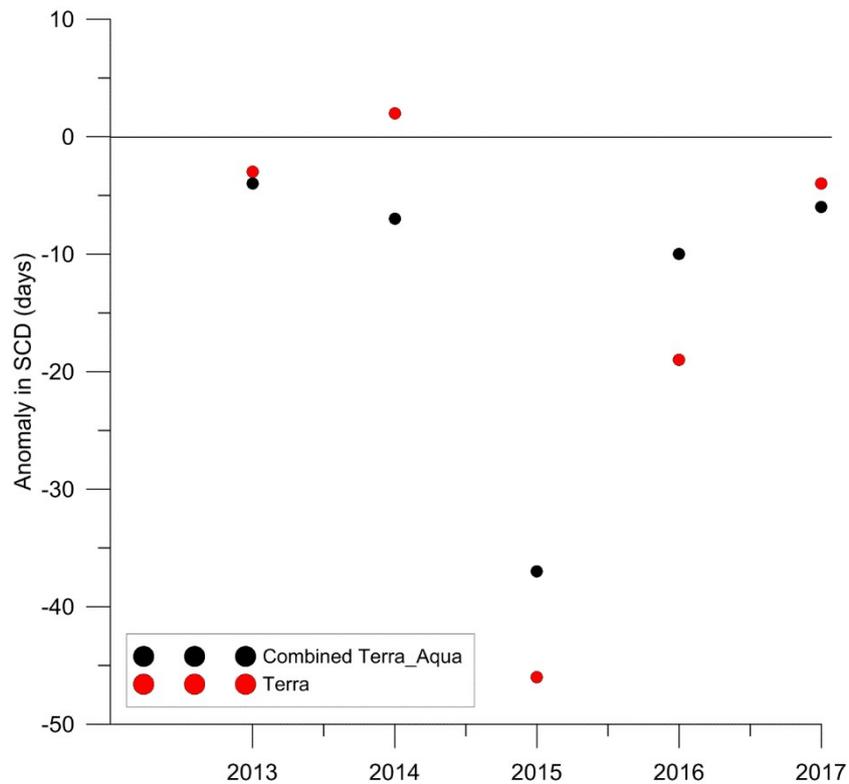


Figure S3. Anomalies of the estimated SCD for Terra and the combined version compared to the observed total SCD at the hydro-climatic station site for winters 2012/2013 to 2016/2017.



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