The Cryosphere

Supplement of

Glacier extraction based on high-spatial-resolution remote-sensing images using a deep-learning approach with attention mechanism

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Table S1: List of Gaofen-6 PMS images used for training, validation and testing the method.

ID	Date	Resolution(m)	Utilization
Gaofen6_PMS_E90.9_N35.8	2020-09-21		
Gaofen6_PMS_E91.1_N36.5	2020-09-21		
Gaofen6_PMS_E91.5_N35.8	2020-09-25		Training and validation
Gaofen6_PMS_E91.7_N36.5	2020-09-25		
Gaofen6_PMS_E91.5_N35.8	2020-11-05		
Gaofen6_PMS_E91.0_N33.6	2020-12-16		
Gaofen6_PMS_E91.4_N32.8	2020-12-20		
Gaofen6_PMS_E97.3_N38.7	2019-09-13	2	
Gaofen6_PMS_E92.5_N32.8	2020-07-25		
Gaofen6_PMS_E91.9_N32.8	2020-08-19		
Gaofen6_PMS_E92.1_N35.8	2020-09-29		
Gaofen6_PMS_E92.4_N32.8	2020-10-07		Testing
Gaofen6_PMS_E93.2_N35.8	2020-10-07		
Gaofen6_PMS_E93.8_N35.8	2020-10-11		
Gaofen6_PMS_E91.6_N33.6	2020-12-20		
Gaofen6_PMS_E92.6_N32.8	2020-12-28		

Table S2: Results of each method in different test areas.

Regional centroid coordinates	Time	Evaluation metrics	SBTM	RF	FCN	U-Net	DeepLab V3+	Attention DeepLab V3+ with TTA
91.54° E, 33.40° N	2020-10-20	Kappa	0.8892	0.9755	0.9779	0.9903	0.9937	0.9950
		MIoU	0.8960	0.9759	0.9781	0.9903	0.9937	0.9950
		F1	0.9205	0.9827	0.9844	0.9931	0.9955	0.9964
		ASD	324.7753	143.6025	20.9975	25.4124	8.8409	2.6390
91.81° E, 32.96° N	2020-08-19	Kappa	0.9565	0.9730	0.9678	0.9739	0.9761	0.9800
		MIoU	0.9577	0.9735	0.9684	0.9743	0.9765	0.9802
		F1	0.9660	0.9790	0.9749	0.9797	0.9814	0.9844
		ASD	75.5751	38.9206	32.3906	120.5889	101.4194	82.2209
91.95° E, 35.83° N	2020-09-29	Kappa	0.9790	0.9807	0.9761	0.9866	0.9885	0.9897
		MIoU	0.9792	0.9809	0.9764	0.9867	0.9885	0.9898
		F1	0.9857	0.9869	0.9838	0.9909	0.9921	0.9930
		ASD	27.4711	31.3941	27.2212	28.2873	43.2248	7.3042
92.08° E, 33.11° N	2020-08-19	Kappa	0.9453	0.9669	0.9592	0.9692	0.9694	0.9746
		MIoU	0.9471	0.9676	0.9602	0.9698	0.9700	0.9750
		F1	0.9606	0.9761	0.9706	0.9778	0.9779	0.9817
		ASD	55.8389	39.7680	24.4735	74.9717	74.2903	41.05
92.27° E, 32.96° N	2020-10-07	Kappa	0.8699	0.8861	0.9516	0.9448	0.9585	0.9601
		MIoU	0.8808	0.8940	0.9531	0.9468	0.9597	0.9612
		F1	0.8916	0.9085	0.9606	0.9552	0.9663	0.9675
		ASD	65.0882	105.3618	26.5124	56.2230	45.9240	28.1458
92.27° E, 32.96° N	2020-07-25	Kappa	0.9408	0.9453	0.9767	0.9742	0.9819	0.9916
		MIoU	0.9431	0.9473	0.9771	0.9747	0.9821	0.9916
		F1	0.9521	0.9557	0.9810	0.9790	0.9852	0.9931
		ASD	69.5710	42.7818	7.6966	58.2140	13.9026	3.8659
92.27° E, 32.96° N	2020-12-28	Kappa	0.7460	0.9504	0.9674	0.9870	0.9866	0.9872
		MIoU	0.7841	0.9520	0.9681	0.9872	0.9867	0.9873
		F1	0.7913	0.9595	0.9734	0.9894	0.9890	0.9895
		ASD	278.6174	103.1949	11.8665	10.7183	6.9738	3.4854

93.40° E, 35.79° N	2020-10-07	Kappa	0.9299	0.9617	0.9655	0.9786	0.9807	0.9818
		MIoU	0.9332	0.9627	0.9664	0.9789	0.9810	0.9821
		F1	0.9410	0.9676	0.9709	0.9819	0.9837	0.9846
		ASD	160.3477	62.7534	14.3601	53.0317	9.3329	10.5393
93.66° E, 35.78° N	2020-10-11	Kappa	0.9203	0.9416	0.9442	0.9577	0.9669	0.9671
		MIoU	0.9249	0.9440	0.9465	0.9590	0.9677	0.9679
		F1	0.9314	0.9501	0.9524	0.9637	0.9717	0.9718
		ASD	55.4797	101.6829	81.4872	172.2861	85.5861	30.2161
97.25° E, 38.69° N	2019-09-13	Kappa	0.9698	0.9739	0.9803	0.9826	0.9849	0.9904
		MIoU	0.9704	0.9744	0.9805	0.9829	0.9851	0.9905
		F1	0.9754	0.9788	0.9839	0.9859	0.9877	0.9922
		ASD	55.4721	35.9832	24.0894	17.6056	12.2884	6.2285
Total		Kappa	0.9147	0.9555	0.9667	0.9745	0.9787	0.9818
		MIoU	0.9217	0.9572	0.9675	0.9751	0.9791	0.9821
		F1	0.9316	0.9645	0.9736	0.9797	0.9830	0.9854
		ASD	116.8237	70.5443	27.1095	61.734	40.1783	21.5695