9. Supplementary Information

Image ID/ description and spatial resolution	Image Date	Cloud Coverage (%)
World ASTER DEM 30m	17/10/2011	N/A
Sentinel-2A	28/12/2015	32
	13/04/2016	21
	18/04/2017	31
	23/04/2018	27

TABLE 1: SPATIAL AND TEMPORAL COVERAGE OF IMAGERY USED IN THIS STUDY, AND PERCENTAGE CLOUD COVERAGE FOR EACH SENTINEL-2 IMAGE USED. AD-AMA DABLAM GLACIER, I-IMJA GLACIER, K-KHUMBU GLACIER, N-NGOZUMPA GLACIER, NU-NUPTSE GLACIER, L-LHOTSE GLACIER, LN-LHOTSE NUP GLACIER, LS-LHOTSE SHAR GLACIER, P-PANGBUNG GLACIER, S-SUMNA GLACIER.

Glacier	Image Date	Supraglacial Ponds				
		Number	Area (m^2)	% With Ice Cliffs	% Glacier Surface	Rate of Growth (% a^{-1})
Ama Dablam (AD)	2015	38	81,074	2.59	3.81	12.0
	2016	35	61,549	1.30	2.89	
	2017	66	113,737	3.04	5.34	
	2018	67	120,032	3.30	5.63	
Imja (I)	2015	46	32,939	2.20	3.05	7.3
	2016	71	48,943	3.47	4.53	
	2017	29	38,961	2.76	3.58	
	2018	28	42,603	1.80	3.94	
Khumbu (K)	2015	223	311,659	3.03	4.69	10.7
	2016	165	369,168	3.74	5.56	
	2017	225	427,386	4.50	6.44	
	2018	220	445,958	1.80	6.71	
Lhotse (L)	2015	225	174,150	2.45	3.03	17.2
	2016	134	204,889,	2.55	3.57	
	2017	230	289,956	3.65	5.05	
	2018	223	294,312	2.50	5.13	
Lhotse Nup (LN)	2015	86	45,779	1.83	3.32	27.0
	2016	48	63,624	2.67	4.61	
	2017	79	95,575	4.07	6.96	
	2018	70	95,260	3.90	6.90	
Lhotse Shar (LS)	2015	133	97,354	2.48	3.26	9.8
	2016	79	102,630	2.50	3.42	
	2017	101	122,177	2.77	4.07	
	2018	96	135,420	2.50	4.51	
Ngozumpa (N)	2015	503	768,638	3.46	5.09	8.3
	2016	470	970,846	4.54	6.43	
	2017	437	1,002,420	4.85	6.64	
	2018	443	1,024,487	4.30	6.78	

Nuptse (Nu)	2015	131	88,986	1.48	2.84	22.6
	2016	133	100,430	1.67	3.18	
	2017	96	168,118	2.94	5.49	
	2018	97	169,672	2.90	5.54	
Pangbung (P)	2015	196	528,998	2.42	4.66	9.1
	2016	468	612,690	2.66	5.40	
	2017	215	709,837	3.46	6.26	
	2018	200	720,834	3.35	6.36	
Sumna (S)	2015	78	115,227	0.82	2.16	3.4
	2016	182	124,837	0.80	2.34	
	2017	114	260,076	2.07	4.87	
	2018	53	130,853	0.70	2.45	

6 **TABLE 2: SUPRAGLACIAL POND DYNAMICS 2015-2018 FOR 10 GLACIERS IN THE EVEREST REGION.**

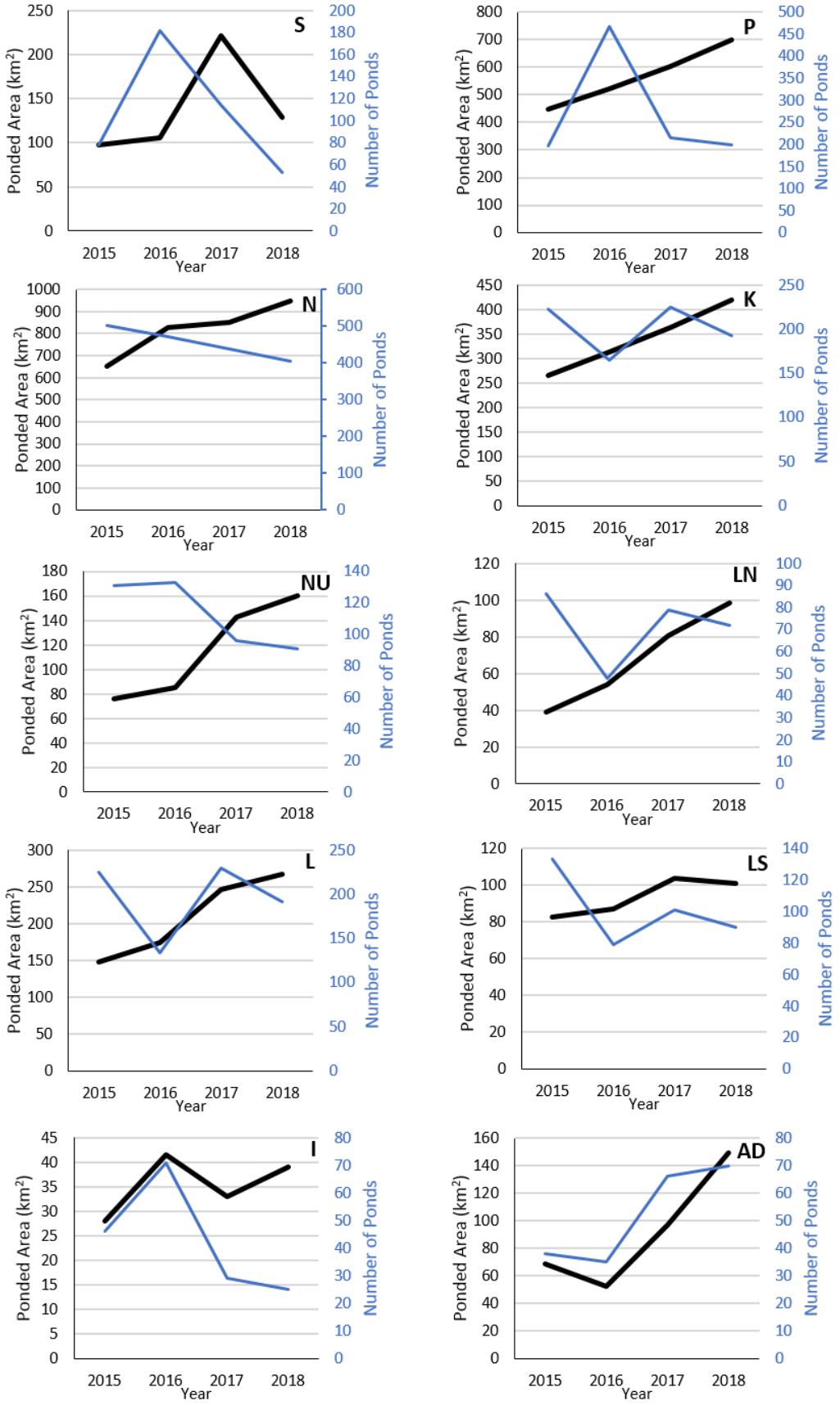


FIGURE 1: CHANGES IN THE NUMBER OF SUPRAGLACIAL PONDS AND AREA OF SUPRAGLACIAL PONDS OBSERVED ON ALL 10 GLACIERS MARCH 2015- APRIL 2018. AD-AMA DABLAM GLACIER, I-IMJA GLACIER, K-KHUMBU GLACIER, N-NGOZUMPA GLACIER, NU-NUPTSE GLACIER, L-LHOTSE GLACIER, LN-LHOTSE NUP GLACIER, LS-LHOTSE SHAR GLACIER, P-PANGBUNG GLACIER, S-SUMNA GLACIER

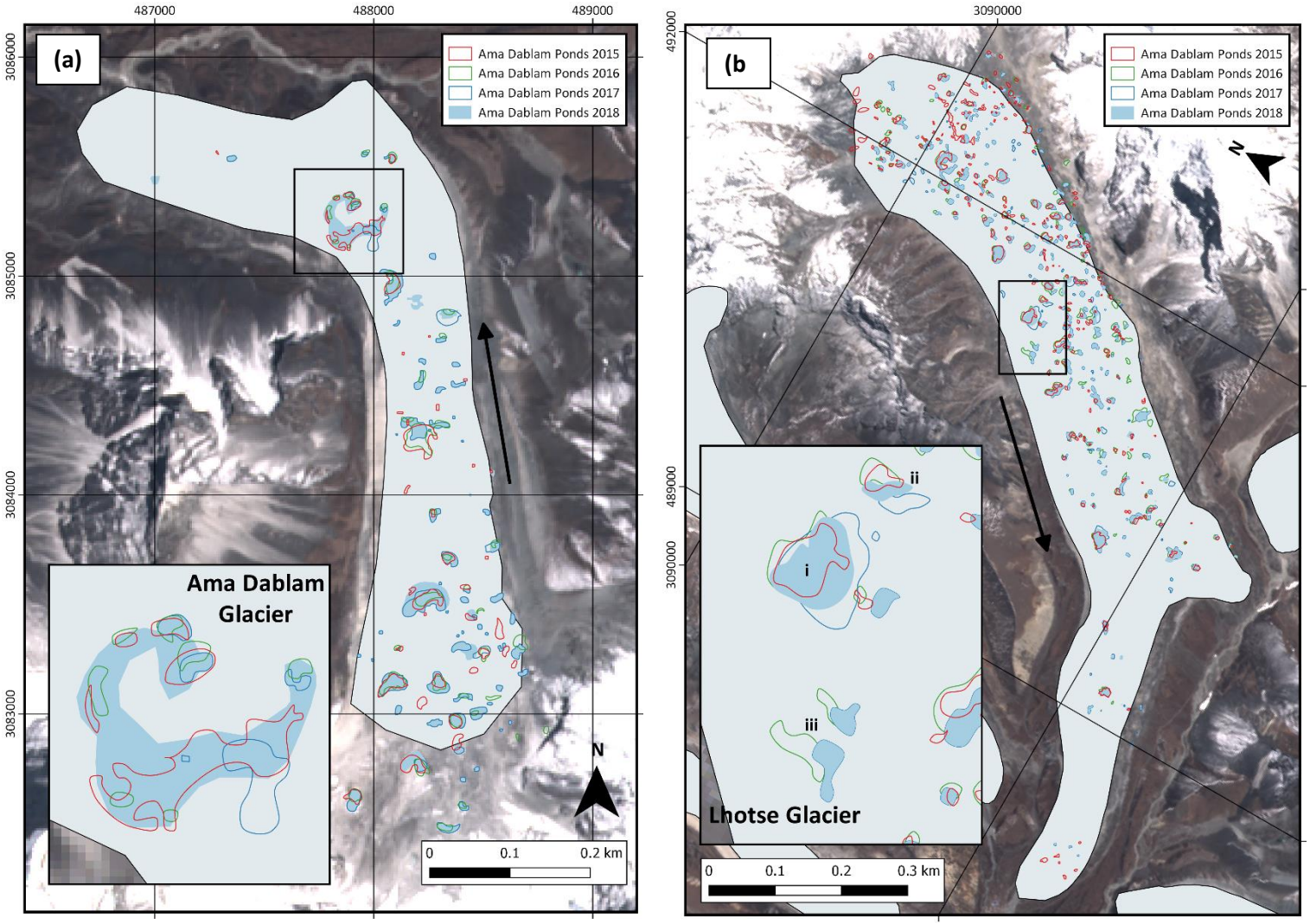
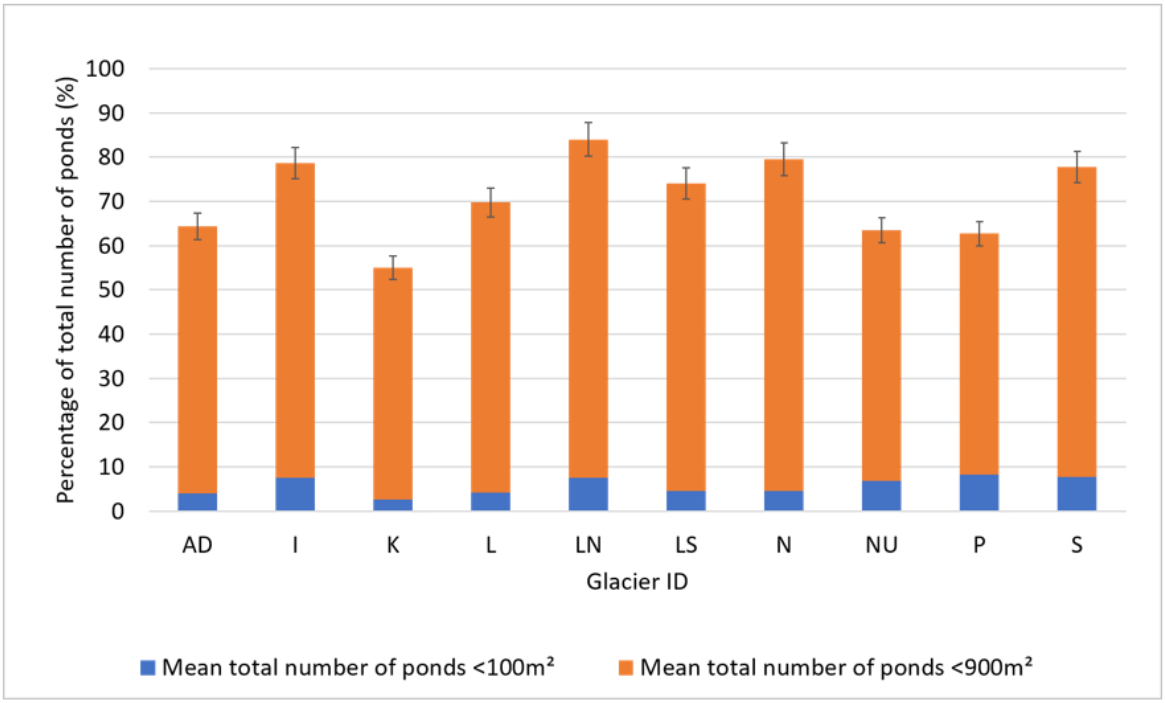


FIGURE 2: REPEAT PONDING AND DRAINAGE EVENTS AS WELL AS COALESCING OF PONDS ON (A) AMA DABLAM GLACIER AND (B) LHOTSE GLACIER, 2015-2018. BACKGROUND IMAGE IS 2018 SENTINEL-2 IMAGERY (FROM USGS AT HTTP://EARTHEXPLORER.USGS.GOV/).



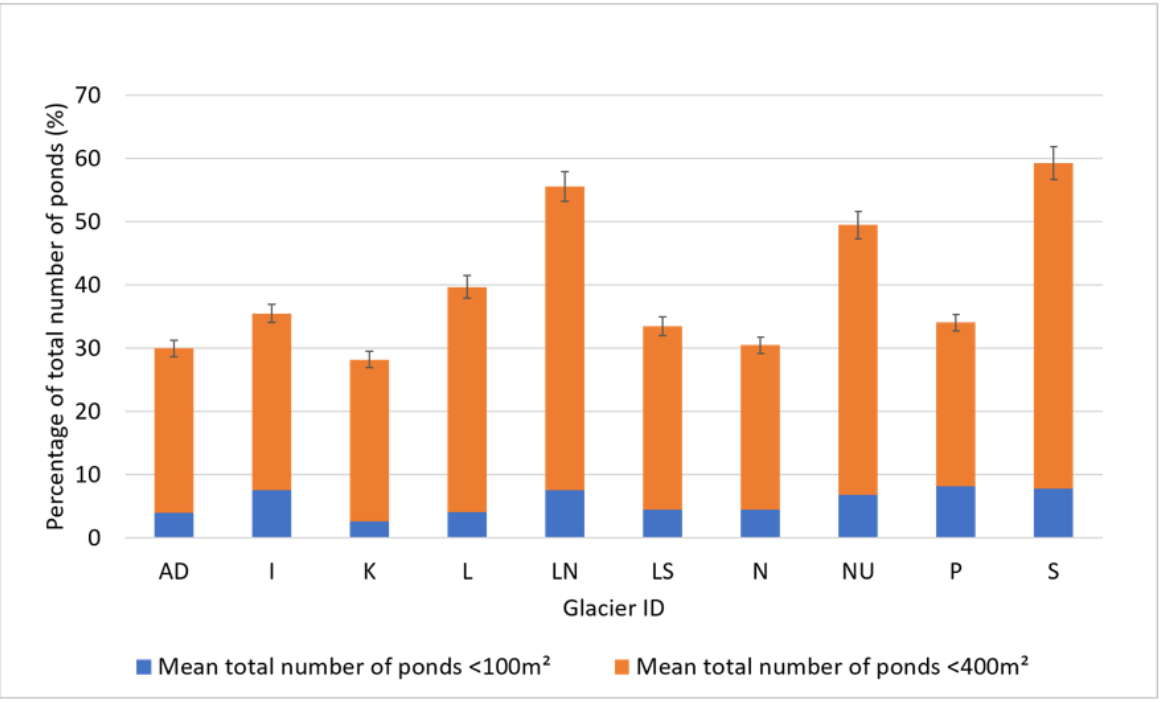


FIGURE 3: MEAN TOTAL NUMBER OF PONDS <100M² AND (A) <900M² (B) <400M². VALUES CHOSEN TO REPRESENT THE AREA OF ONE 30M LANDSAT PIXEL AND FOUR 10M SENTINEL-2A PIXELS. ALTHOUGH PONDS SMALLER THAN 100M² ACCOUNTED FOR A SMALL PERCENTAGE OF THE TOTAL NUMBER OF PONDS MAPPED (LESS THAN 10% ON EACH GLACIER), THE MAJORITY OF PONDS MAPPED ON ALL 10 GLACIERS WERE ON AVERAGE SMALLER THAN 900M², THIS VALUE RISING TO ALMOST 80% ON SOME OF THE SMALLER GLACIERS (E.G. LHOTSE AND IMJA GLACIERS). ADDITIONALLY, PONDS <400M² ACCOUNT FOR ~40% OF THE TOTAL NUMBER OF PONDS MAPPED. HAD A COARSER-RESOLUTION IMAGE BEEN USED FOR THIS STUDY, THE NUMBER OF SMALLER PONDS IDENTIFIED MAY HAVE BEEN SIGNIFICANTLY LOWER AS A RESULT.