Appendices

Tables and Protocols

Appendix I

DATES AND DAY NUMBERS

Use day numbers (Julian dates) throughout in all ITEX reports (climate stations, snow, ice, plant response variables). The numbers provided below are for the field season during normal years; for leap years, add 1 to all day numbers.

Date	Day Number	Date	Day Number
1 May	121	1 July	182
5 May	125	5 July	186
10 May	130	10 July	191
15 May	135	15 July	196
20 May	140	20 July	201
25 May	145	25 July	206
30 May	150	30 July	211
31 May	151	31 July	212
1 June	152	1 August	213
5 June	156	5 August	217
10 June	161	10 August	222
15 June	166	15 August	227
20 June	171	20 August	232
25 June	176	25 August	237
30 June	181	30 August	242
		31 August	243
		1 September	244

ITEX Climate Stations
Field Record Form (Manual or manual/automatic station)

Date: / **Year:** **Day number**: .....

0700 hours normal time **Cloudiness** (0/8 – 8/8)**:** .... /8 **Type**: .....
Precipitation (0700–0700 hrs): ..... mm***** Type of precipitation: ..... Reset!

Max.temp: ..... °C **Min.temp**: ..... °C (Do not reset!)
Min. thermometer **actual temp**.: ..... °C

THG: Actual temperature: ..... °C RH: ..... % (Set marks on recorder chart!)

Psychrometer; dry bulb: ..... °C; wet bulb: ..... °C

Signature: .....

1900 hours normal time **Cloudiness** (0/8 – 8/8)**:** .... /8 **Type**: .....

Max.temp: ..... °C **Min.temp**: ..... °C Now reset both!

Max. and min. thermometers after **reset**: ..... °C (=actual temp.)

THG: Actual temperature: ..... °C RH: ..... % (Set marks on recorder chart!)

Psychrometer; dry bulb: ..... °C; wet bulb: ..... °C

Signature: .....

To be **transferred** to the monthly ITEX Climate Station Report:

Precipitiation (0700 – 0700 hours): ..... mm

Highest and lowest temperature records, **Tmax**: ..... °C, **Tmin**: ..... °C

Daily mean temperature, **m**: ..... °C
Calculate m as mean of hour temperature means (datalogger) or from max/min data as
m = (Tmax + Tmin) / 2

Daily heat accumulation, **H**: ..... degrees > 0°C TDD; ..... degrees > 5°C GDD
If Tmin > 0°C (or 5°C for GDD) then H = m for TDD and GDD
If Tmax < 0°C/5°C then H = 0
If Tmin < 0°C/5°C but Tmax > 0°C/5°C, calculate H from the sum of hour means above the threshold divided by 24, or with Watanabe's formula

From automatic station also:

Maximum wind speed: ..... m/s Mean wind speed: ..... m/s

Global solar radiation, **Rmax**: ..... W/m^2, **Rmean**; ..... W/m^2

Integrated global solar radiation, **R** : ..... MJ/m^2
R = (mean of hour means of global radiation 0000 – 2400 hours) x 0.0864
If too many values are missing, R ≈ 0.0864 (Rmax) / 3

***** No precipitation: – Some, but unmeasurable (< 0.05 mm): 0.0

Monthly Report form **ITEX Climate Station**

Site: ..... Country: ..... Year: 19..... Month: .....

Recording of precipitation (man/aut): ..... Max and min temperatures (man/aut): .....

Calculations of daily mean temp, TDD, and GDD

(from max-min amplitude [ampl] or hour means of logged data [integr]): .....

Date	Day No.	Precipi-tation (mm)*	Tmax °C	Tmin °C	Mean temp °C	TDD	GDD	Wind max m/s	Wind mean m/s	Max rad. W/m²	Accum. radiation **R** (MJ/m²)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
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28											
29											
30											
31											

* NB! Precipitation (manual) recorded at 0700 hours on the next day; h = hail, r = rain, s = snow.

Notes:

Month totals. **Precipitation:** ..... mm **Global radiation** ∑R: .....MJ/m²

Temperature: max: ..... °C min: ..... °C mean : ..... °C

∑TDD: ..... degree days > 0°C ∑GDD: ..... degree days > 5°C

Report form ITEX Climate Station

Site: **Latnjajaure** Country: **Sweden** Year: **1992** Month: **April**

Recording of precipitation (man/aut): — Max and min temperatures (man/aut): aut
Calculations of daily mean temp, TDD, and GDD
(from max-min amplitude [ampl] or hour means of logged data [integr]): ampl day 92–109, integr 110–

Date	Day no.	Precip. mm*	Tmax °C	Tmin °C	Mean temp.	TDD	GDD	Wind max m/s	Wind mean m/s	Max. rad. W/m^2	Accum. rad. (R) MJ/m^2
1	92		*–8.2*	*–11.0*	*–9.6*	*0.00*	*0.00*				
2	93		*–7.6*	*–12.2*	*–9.9*	*0.00*	*0.00*				
3	94		*–8.4*	*–17.4*	*–12.9*	*0.00*	*0.00*				
4	95		*–7.3*	*–15.4*	*–11.4*	*0.00*	*0.00*				
5	96		*–7.6*	*–15.4*	*–11.5*	*0.00*	*0.00*				
6	97		*–6.1*	*–15.5*	*–10.8*	*0.00*	*0.00*				
7	98		*–3.3*	*–13.7*	*–8.5*	*0.00*	*0.00*				
8	99		*–1.8*	*–9.8*	*–5.8*	*0.00*	*0.00*				
9	100		*–1.1*	*–8.4*	*–4.8*	*0.00*	*0.00*				
10	101		*–0.5*	*–12.5*	*–6.5*	*0.00*	*0.00*				
11	102		*+0.9*	*–4.4*	*–1.8*	*0.16*	*0.00*				
12	103		*–1.2*	*–9.8*	*–5.5*	*0.00*	*0.00*				
13	104		*–3.3*	*–10.4*	*–6.9*	*0.00*	*0.00*				
14	105		*–3.5*	*–9.6*	*–6.6*	*0.00*	*0.00*				
15	106		*–5.5*	*–14.9*	*–10.2*	*0.00*	*0.00*				
16	107		*–3.7*	*–19.0*	*–11.4*	*0.00*	*0.00*				
17	108		*–3.3*	*–9.8*	*–6.6*	*0.00*	*0.00*				
18	109		*–0.8*	*–6.3*	*–3.6*	*0.00*	*0.00*				
19	110		+0.3	–12.8	–6.19	0.00	0.00				9.08
20	111		+0.1	–8.8	–4.49	0.00	0.00				1.41
21	112		–3.4	–9.1	–6.04	0.00	0.00				3.06
22	113		+1.1	–14.1	–7.73	0.32	0.00				5.91
23	114		–4.9	–12.5	–8.68	0.00	0.00				16.27
24	115		–5.0	–11.7	–9.46	0.00	0.00				14.07
25	116		–3.9	–10.0	–6.04	0.00	0.00				13.65
26	117		+6.0	–6.1	–2.33	1.94	0.12				16.76
27	118		+4.9	–5.4	–1.12	1.43	0.00				7.95
28	119		+8.3	–2.6	+0.80	3.38	0.76				21.58
29	120		+3.9	–4.7	+0.81	1.11	0.00				11.93
30	121		+7.3	+0.9	+1.93	1.93	0.64				12.39

* NB! Precipitation (manual) recorded at 0700 hours on the next day; h = hail, r = rain, s = snow.
Notes: *Italics = Regression from Abisko data*

Month totals. **Precipitation:** .... ? ... mm **Global radiation** ∑R: ..... ? ....MJ/m^2
Temperature: max: + 8.3 °C min: – 19.0 °C mean : **– 6.26** ± 4.12 (SD) °C
∑TDD: 10.27 degree days > 0°C ∑GDD: 1.52 degree days > 5°C

Report form ITEX Climate Station

Site: **Latnjajaure** Country: **Sweden** Year: **1992** Month: **May**

Recording of precipitation (man/aut): man. (day 137–) Max and min temperatures (man/aut): aut.
Calculations of daily mean temp, TDD, and GDD
(from max-min amplitude [ampl] or hour means of logged data [integr]): integr.

Date	Day no.	Precip. mm*	Tmax °C	Tmin °C	Mean temp.	TDD	GDD	Wind max m/s	Wind mean m/s	Max. rad. W/m^2	Accum. rad. (R) MJ/m^2
1	122		+6.6	–2.0	+0.92	2.66	0.26				7.24
2	123		+6.3	–8.9	+0.53	1.82	0.15				8.27
3	124		+9.6	–1.6	+2.47	4.23	1.34				6.75
4	125		–1.8	–5.3	–3.78	0.00	0.00				11.64
5	126		+5.9	–4.0	+1.52	2.06	0.10				12.39
6	127		+8.5	+0.6	+2.96	2.96	1.03				9.47
7	128		+7.8	–5.6	+0.04	2.68	0.54				8.95
8	129		+2.5	–8.5	–3.15	0.55	0.00				19.15
9	130		+3.8	–5.6	–2.79	1.03	0.00				25.02
10	131		–1.6	–5.2	–3.36	0.00	0.00				19.45
11	132		+6.5	–6.4	+0.12	2.06	0.26				22.33
12	133		+5.9	–7.7	–3.00	1.77	0.14				21.88
13	134		+3.4	–8.4	–1.41	0.83	0.00				26.34
14	135		+6.4	–4.9	–1.41	2.15	0.23				18.15
15	136		+8.5	–1.7	+4.10	3.68	0.92				19.80
16	137	s 0.6	+9.1	–5.2	+3.81	3.43	1.00	16	8		11.93
17	138	s 8.5	+1.8	–5.0	–2.86	0.41	0.00	22	6		22.43
18	139	s 3.6	+1.7	–2.1	+1.65	0.49	0.00	17	3		16.07
19	140	s 2.6	+2.6	–0.8	+0.84	1.09	0.00	23	10		18.21
20	141	sr 8.4	+2.6	–4.0	+0.13	0.73	0.00	7	3		13.09
21	142	-	+4.4	+0.6	+2.90	2.90	0.00	7	2		10.91
22	143	-	+5.1	+1.2	+3.86	3.86	0.00	7	1		11.49
23	144	-	+10.8	+0.4	+4.04	4.04	1.98	4	1		25.92
24	145	s 0.1	+7.2	+0.5	+3.85	3.85	0.54	15	6		29.32
25	146	-	+6.0	–2.9	+2.06	2.23	0.18	5	1	1002	26.47
26	147	-	+10.5	+2.1	+5.72	5.72	0.92	9	4	999	27.98
27	148	-	+10.6	+3.0	+8.07	8.07	3.07	9	4	971	26.83
28	149	-	+13.3	+5.9	+9.22	9.22	4.22	10	3	959	26.66
29	150	-	+11.7	+5.5	+8.36	8.36	3.36	9	4	958	27.46
30	151	r 0.1	+11.4	+4.8	+8.15	8.15	3.15	7	1	923	25.31
31	152	r 0.0	+8.8	+1.2	+5.54	5.54	1.11	12	6	505	13.51

* NB! Precipitation (manual) recorded at 0700 hours on the next day; h = hail, r = rain, s = snow.

Notes: Manual weather station opened 16 May. Electronic hand anemometer used.

Month totals. **Precipitation** (day 137–) 22.9 mm **Global radiation** ∑R: 570.42 MJ/m^2
Temperature: max: + 13.3 °C min: – 8.9 °C mean : **+ 1.91** ± 3.71 (SD) °C
∑TDD: 96.04 degree days > 0°C ∑GDD: 24.50 degree days > 5°C

Report form ITEX Climate Station

Site: **Latnjajaure** Country:**Sweden** Year: **1992** Month: **June**

Recording of precipitation (man/aut): man. Max and min temperatures (man/aut): aut.
Calculations of daily mean temp, TDD, and GDD
(from max-min amplitude [ampl] or hour means of logged data [integr]): integr.

Date	Day no.	Precip. mm*	Tmax ℃	Tmin ℃	Mean temp.	TDD	GDD	Wind max m/s	Wind mean m/s	Max. rad. W/m^2	Accum. rad. (R) MJ/m^2
1	153	-	+9.5	±0.0	+4.56	4.56	1.23	1	0	1043	29.02
2	154	-	+11.6	+1.0	+7.13	7.13	2.77	1	0	1034	28.43
3	155	-	+12.8	+3.7	+8.62	8.62	3.72	6	1	1006	27.88
4	156	r 0.0	+15.2	+3.9	+8.82	8.82	4.63	1	0	1040	28.57
5	157	-	+11.8	+2.3	+5.29	5.29	0.97	12.5	4.02	851	27.49
6	158	rs 0.4	+9.9	+2.4	+5.52	5.52	0.74	14.8	4.41	1001	18.17
7	159	r 0.9	+4.8	+0.2	+2.42	2.42	0.00	19.5	8.53	1263	27.06
8	160	-	+13.2	+0.3	+7.10	7.10	2.86	3.2	0.65	756	27.58
9	161	-	+16.3	+5.6	+10.59	10.59	5.59	1.8	0.61	769	28.14
10	162	-	+17.1	+7.7	+12.38	12.38	7.38	4.1	0.98	752	27.53
11	163	-	+15.7	+7.5	+11.88	11.88	6.88	4.0	0.89	745	27.48
12	164	-	+18.4	+7.5	+12.92	12.92	7.92	4.5	1.22	852	27.06
13	165	-	+16.4	+7.1	+12.41	12.41	7.41	8.0	2.23	829	26.79
14	166	r 2.7	+16.0	+4.7	+10.11	10.11	5.11	11.4	3.36	968	16.52
15	167	rs 0.1	+6.6	+3.6	+4.90	4.90	0.13	7.6	3.24	1147	15.63
16	168	s 0.8	+4.0	–2.6	–0.04	0.43	0.00	16.9	9.02	1053	16.96
17	169	-	+3.1	–2.9	–0.53	0.36	0.00	16.1	6.18	1070	23.08
18	170	s 0.0	+4.9	–0.5	+1.78	1.79	0.00	7.7	2.24	1047	23.33
19	171	-	+8.2	–1.1	+4.21	4.24	0.87	7.9	3.20	867	25.40
20	172	rs 3.1	+8.2	+0.1	+4.78	4.78	0.57	13.5	6.62	555	9.61
21	173	s 0.6	+0.8	–3.6	–1.16	0.00	0.00	12.6	5.54	1108	19.74
22	174	s 0.1	+1.4	–3.8	–1.54	0.01	0.00	10.2	4.94	1125	24.32
23	175	-	+1.8	–2.4	–0.26	0.47	0.00	13.4	7.70	1140	20.31
24	176	-	+9.6	–1.8	+3.88	4.05	0.91	5.1	1.65	776	28.54
25	177	-	+10.3	+1.8	+6.44	6.44	1.97	6.8	2.33	792	28.33
26	178	r 0.0	+15.3	+2.9	+9.39	9.39	4.56	4.7	0.95	762	25.87
27	179	r 17.0	+14.2	+3.4	+8.68	8.68	3.76	12.1	2.49	719	14.15
28	180	sr 0.9	+4.9	+1.1	+3.26	3.26	0.00	11.4	4.88	1160	22.52
29	181	-	+7.6	+1.0	+3.77	3.77	0.27	6.1	2.43	1006	26.07
30	182	sr 1.0	+6.8	+0.5	+3.28	3.28	0.05	7.0	2.86	1016	18.06

* NB! Precipitation (manual) recorded at 0700 hours on the next day; h = hail, r = rain, s = snow.

Notes: Logging anemometer installed 4 June.

Month totals. **Precipitation** 27.8 mm **Global radiation** ∑R: 709.64 MJ/m^2
Temperature: max: + 18.4 °C min: – 3.8 °C mean : **+ 5.69** ± 4.26 (SD) °C

∑T**Report form** **ITEX Climate Station**

Site: **Latnjajaure** Country: **Sweden.....** Year: **1992** Month: **July**

Report form ITEX Climate Station

Site: **Latnjajaure** Country: **Sweden** Year: **1992** Month: **July**

Recording of precipitation (man/aut): man. Max and min temperatures (man/aut): aut.
Calculations of daily mean temp, TDD, and GDD
(from max-min amplitude [ampl] or hour means of logged data [integr]): integr.

Date	Day no.	Precip. mm*	Tmax °C	Tmin °C	Mean temp.	TDD	GDD	Wind max m/s	Wind mean m/s	Max. rad. W/m^2	Accum. rad. (R) MJ/m^2
1	183	s 1.2	+3.1	+1.0	+1.75	1.75	0.00	7.6	4.99	973	15.93
2	184	sr 0.6	+4.2	+0.5	+1.86	1.86	0.00	8.9	3.60	1125	21.13
3	185	s 1.1	+1.9	–0.8	+0.44	0.54	0.00	17.7	8.88	812	15.70
4	186	r 0.0	+7.0	+0.5	+3.51	3.51	0.12	18.6	8.39	1062	21.62
5	187	s 0.6	+7.6	+1.9	+4.85	4.85	0.61	9.0	4.89	775	28.25
6	188	s 3.2	+2.5	+0.2	+1.23	1.23	0.00	12.0	6.56	989	14.80
7	189	sr 0.5	+3.1	+0.1	+1.31	1.31	0.00	13.6	6.99	1060	24.09
8	190	r 7.7	+6.1	+1.2	+3.86	3.86	0.08	5.9	2.80	205	4.98
9	191	r 0.5	+5.0	+2.3	+3.56	3.56	0.00	9.3	3.53	836	9.16
10	192	r 0.0	+8.3	+2.4	+4.56	4.56	0.47	6.5	2.67	966	17.50
11	193	r 2.6	+7.7	+2.3	+4.17	4.17	0.24	11.0	3.52	1106	17.92
12	194	r 0.1	+10.6	+1.7	+5.82	5.82	1.88	9.1	3.01	987	24.69
13	195	r 0.2	+13.4	+6.5	+9.61	9.61	4.61	10.4	3.27	918	14.16
14	196	r 4.0	+11.2	+3.5	+8.16	8.16	3.19	4.9	1.51	832	14.44
15	197	r 43.1	+8.6	+4.3	+7.03	7.03	2.03	8.7	2.74	278	6.84
16	198	r 10.1	+7.2	+1.9	+4.80	4.80	0.44	12.9	6.42	331	8.01
17	199	s 0.3	+2.7	–0.1	+1.26	1.26	0.00	13.5	7.54	780	12.71
18	200	-	+10.5	–1.0	+4.93	5.08	1.72	5.2	1.73	796	25.70
19	201	-	+13.4	+3.5	+8.68	8.68	3.70	5.6	1.40	898	23.70
20	202	r 1.9	+12.4	+4.0	+8.49	8.49	3.50	5.6	1.65	929	15.11
21	203	r 0.2	+12.0	+6.2	+9.01	9.01	4.01	5.2	1.50	920	16.98
22	204	r 1.1	+11.2	+7.2	+9.92	9.92	4.92	11.9	4.12	289	4.80
23	205	r 17.5	+8.3	+2.0	+5.42	5.42	1.02	15.4	8.19	665	7.14
24	206	r 1.1	+10.0	+2.1	+5.90	5.90	1.57	11.6	3.34	930	14.50
25	207	r 0.4	+9.4	+5.2	+7.39	7.39	2.39	9.2	2.16	639	8.31
26	208	r 0.6	+14.0	+3.8	+8.80	8.80	3.93	6.0	2.18	886	15.76
27	209	r 9.2	+10.7	+6.5	+9.09	9.09	4.09	7.6	1.99	332	5.35
28	210	r 0.3	+8.8	+4.6	+6.16	6.16	1.16	10.3	4.01	962	12.56
29	211	r 0.4	+6.9	+3.9	+5.28	5.28	0.35	10.1	4.02	919	13.71
30	212	r 11.1	+9.7	+4.2	+6.99	6.99	2.04	5.3	1.94	926	12.09
31	213	rs 3.4	+6.7	+2.6	+4.54	4.54	0.10	10.5	4.89	240	6.94

* NB! Precipitation (manual) recorded at 0700 hours on the next day; h = hail, r = rain, s = snow.

Notes:

Month totals. **Precipitation** 133.0 mm ! **Global radiation** ∑R: 454.62 MJ/m^2
Temperature: max: + 14.0 °C min: – 1.0 °C mean : **+ 5.43** ± 2.77 (SD) °C
∑TDD: 169.33 degree days > 0°C ∑GDD: 48.17 degree days > 5°C

Report form ITEX Climate Station

Site: **Latnjajaure** Country: **Sweden** Year: **1992** Month: **August**

Recording of precipitation (man/aut): man. Max and min temperatures (man/aut): aut.
Calculations of daily mean temp, TDD, and GDD
(from max-min amplitude [ampl] or hour means of logged data [integr]): integr.

Date	Day no.	Precip. mm*	Tmax °C	Tmin °C	Mean temp.	TDD	GDD	Wind max m/s	Wind mean m/s	Max. rad. W/m^2	Accum. rad. (R) MJ/m^2
1	214	rs 4.9	+4.7	+2.2	+3.28	3.28	0.00	14.4	7.40	883	11.86
2	215	r 0.3	+9.3	+1.7	+5.67	5.67	1.55	7.4	2.14	498	9.16
3	216	r 0.3	+11.0	+6.2	+8.37	8.37	3.37	4.4	1.23	851	7.86
4	217	r 11.5	+11.0	+5.6	+8.47	8.47	3.47	10.2	2.99	715	9.29
5	218	r 1.0	+8.3	+5.5	+6.81	6.81	1.81	12.9	5.14	701	8.86
6	219	r 0.9	+10.0	+4.7	+7.16	7.16	2.16	5.2	1.62	865	11.77
7	220	r 0.8	+7.2	+3.0	+5.27	5.27	0.57	12.2	3.90	818	10.32
8	221	s10.4	+5.4	–0.6	+2.06	2.09	0.00	15.5	5.69	888	10.97
9	222	s 2.3	+1.6	–1.1	+0.09	0.22	0.00	14.1	5.66	951	14.06
10	223	r 3.5	+8.6	–0.9	+4.27	4.36	1.01	5.9	1.90	793	13.35
11	224	r 7.6	+7.7	+4.1	+5.66	5.66	0.80	6.0	1.93	260	5.10
12	225	r 0.4	+5.1	+0.5	+3.25	3.25	0.00	8.6	4.82	322	4.41
13	226	r 1.6	+6.3	–0.2	+2.57	2.57	0.03	5.3	2.21	776	10.24
14	227	r 0.6	+8.1	+1.8	+4.18	4.18	0.30	5.5	1.78	826	12.17
15	228	-	+9.9	+2.9	+5.50	5.50	1.13	4.1	1.49	905	12.70
16	229	r 1.0	+7.6	+1.8	+5.84	5.84	1.23	6.4	2.69	466	6.03
17	230	r 3.5	+9.6	+5.2	+6.52	6.52	1.52	4.4	1.35	880	8.59
18	231	r 0.8	+10.0	+5.2	+6.73	6.73	1.73	4.7	1.22	727	9.20
19	232	r 0.1	+8.9	+4.7	+6.94	6.94	1.94	4.1	1.12	428	9.25
20	233	r 0.6	+8.6	+5.2	+6.77	6.77	1.77	5.0	1.26	323	6.64
21	234	-	+10.6	+4.3	+6.77	6.77	1.83	5.1	1.45	766	15.44
22	235	-	+12.4	+4.2	+7.73	7.73	2.79	4.5	1.40	606	14.46
23	236	-	+11.4	+3.6	+7.19	7.19	2.25	6.7	2.38	716	15.34
24	237	-	+9.5	+2.5	+5.45	5.45	0.98	5.6	2.15	605	9.38
25	238	-	+10.0	+2.9	+5.64	5.64	1.06	5.1	2.07	559	10.21
26	239	-	+8.1	+3.4	+5.56	5.56	0.86	5.4	2.21	517	9.13
27	240	r 0.0	+8.8	+2.3	+5.18	5.18	0.86	4.8	1.77	478	8.58
28	241	r 0.4	+7.3	+3.9	+5.57	5.57	0.73	6.3	2.97	381	7.09
29	242	r 0.2	+7.8	+5.0	+6.12	6.12	1.12	7.5	2.42	478	6.57
30	243	r 0.1	+9.3	+4.9	+6.44	6.44	1.44	6.7	2.12	497	9.06
31	244	r 0.6	+8.9	+4.4	+6.67	6.67	1.67	5.8	3.16	664	10.22

* NB! Precipitation (manual) recorded at 0700 hours on the next day; h = hail, r = rain, s = snow.

Notes: Manual weather station closed 1 September.

Month totals. **Precipitation** 52.0 mm **Global radiation** ∑R: 307.31 MJ/m^2
Temperature: max: + 12.4 °C min: – 1.1 °C mean : **+ 5.60** ± 1.88 (SD) °C
∑TDD: 173.90 degree days > 0°C ∑GDD: 39.98 degree days > 5°C

ITEX **Snow depth transect form**

Site:..... **Transect no./name:……**

Year: 19..... **Date:**...../..... **Day number:** .....

Point on transect	Probe 1 (cm)	Probe 2 (cm)	Probe 3 (cm)	Probe 4 (cm)	Probe 5 (cm)	Mean depth (cm)	± SD
0 m							
5 m							
10 m							
15 m							
20 m							
25 m							
30 m							
35 m							
40 m							
45 m							
50 m							
55 m							
60 m							
65 m							
70 m							
75 m							
80 m							
85 m							
90 m							
95 m							
100 m							

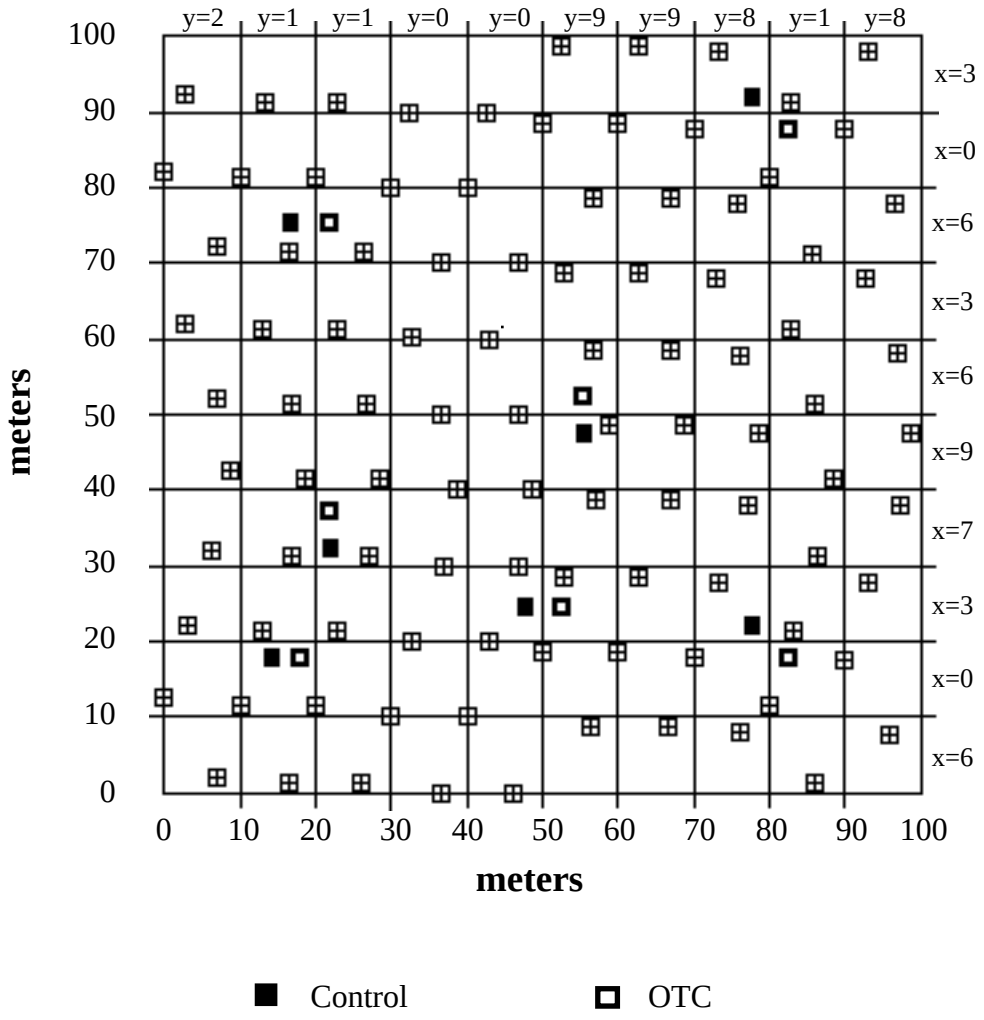
Present position of snow front along transect: ..... m from 0 point.
Repeat sonding every third day until completed snow-melt.
Note flowering fronts for plant species: species front (m from 0 point)

_____ _____ m
_____ _____ m
_____ _____ m
_____ _____ m
_____ _____ m
_____ _____ m
_____ _____ m
_____ _____ m

ITEX-IPA active layer grid form

DATE: (month)_____/(day)_____(year) 19____

LOCATION: (site)_____(country)_____



AVERAGE THAW CALCULATIUON:

A= TOTAL NUMBER POINTS MEASURED:

B= CUMULATIVE SUM OF ALL ACTIVE LAYER THICKNESS (CM):

B/A= AVERAGE THAW:_____

ITEX ACTIVE LAYER/OCT CONTROL FORM

DATE: (month) /(day) /(year) 19

OTC identifer	OTC center	CONTROL POINTS 1	2	3	4	Average	Notes
Average							

Frost Tube: (1)_____(cm); (2) _____(cm)
Date Recorded (m)_____(d)_____(y) 19___

Page _____(use additional forms as necessary)

ITEX Lake Monitoring Protocol

ITEX Site: ..... Country: .....Year: 19..... Month: .....

Lake: ..... Co-ordinates: .....

Altitude: ..... m Surface size: ..... km^2 Depth: ..... m

Date	Day Number	Ice Stage *	Ice Cover (%)	Surface Water Temp. (℃)	Notes
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
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24					
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26					
27					
28					
29					
30					
31					

* **Break-up:** B0 No sign of break-up
B1 Open water on shore
B2 Open water offshore
B3 Ice in movement
B4 Final break-up

Freeze-up: F0 No ice formation
F1 Ice formation on shore
F2 Ice cover on bays
F3 Ice within visible range
F4 Final freeze-up

Species: ***Bistorta vivipara***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

Experiment plants

No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
E 1																	
E 2																	
E 3																	
E 4																	
E 5																	
E 6																	
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C 19																	
C 20																	

Control plants

Phenological dates (day numbers):

P1: Snow-free
P2: First leaf unrolls (original set of plants)
P3: Inflorescence app. between sheath (ochrea; orig. set of plants)
P4: First flower open (original and supplementary plants)
P5: First bulbill shed (drops off when touched; orig. and supp. plants)
P6: First seed dispersal (optional, since rarely obs. sexual reprod.)
P7:
P8:

Quantitative measurements:

Q1: Length of inflorescence stalk (at full flower; in mm)
Q2: Width of largest leaf (in mm)
Q3: Number of leaves per individual
Q4: Number of bulbils per shoot
Q5: Number of flower per shoot
Q6: Relative proportion of bulbils (Q4/Q4+Q5)
Q7: Colour of bulbils
Q8: Mean bulbil weight (mean±SD, in µg); optional

ITEX Plant Response Variables

Species: ***Carex stans***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

Experiment plants

No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
E 1																	
E 2																	
E 3																	
E 4																	
E 5																	
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C 20																	

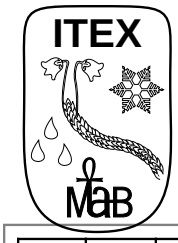
Control plants

Phenological dates (day numbers):

P1: Snow-free
P2: Emergence of first new leaf
P3: First stigmas visible
P4: First anthers exposed
P5: First yellowing of leaves
P6: First seed shed
P7:
P8:

Quantitative measurements:

Q1: Age class of shoot in flower
Q2: Length of flowering stem to base of terminal spike (1 cm)
Q3: Number of green leaves (at full flower)
Q4: Length of longest leaf (accuracy 1mm)
Q5: Total green leaf length per tiller (mm)
Q6: Utricles weight (Acc. 0.1 mg, mean ±SD;optional)
Q7:
Q8:



ITEX Plant Response Variables

Species: ***Cassiope tetragona***

Site: _____ Year: _____

Devices: OTCs / corners Co-ordinates: _____ Altitude (m): _____

Replicates are genets / ramets Observation period (day ##): – _____

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Experiment plants	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
	E 6																	
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Control plants	C 1																	
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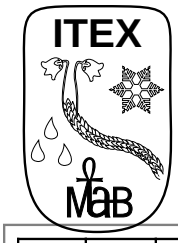
	C 20																	

Phenological dates (day numbers):

P1: Snow-free
P2: First colouring of flower buds (whitish-yellow, protruding)
P3: First elongation of pedicels
P4: First open flower
P5: First corolla drop
P6: First capsule splits open - if possible
P7:
P8:

Quantitative measurements:

Q1: Total number of flowers per ramet
Q2: Total number of developing capsules per ramet
Q3: Fruit:Flower Ratio (Q2 / Q1)
Q4: Annual growth increment (main shoot, acc. 1 mm)
Q5:
Q6:
Q7:
Q8:



ITEX Plant Response Variables

Species: ***Dryas***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

Experiment plants

No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
E 1																	
E 2																	
E 3																	
E 4																	
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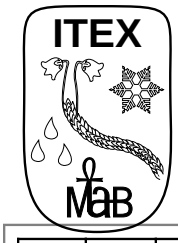
Control plants

Phenological dates (day numbers):

P1: Snow-free
P2: First leaf erected
P3: App. of first colour (white tip) of flower bud (=bud break)
P4: First open flower
P5: Last petal shed (pull gently if needed)
P6: First twisting of maturing styles (or ods. of no. twist at all)
P7: First seed dispersal (pull the elongate, barbed style gentyly)
P8: First yellow or brown leaves (summer-green forms)

Quantitative measurements:

Q1: Dimension of clone or plot
Q2: Total number of flowers (clone/plot)
Q3: Length of longest leaf blade (mm)
Q4: Pedicel length (plot mean ± SD; mm)
Q5: Number of seeds per flower
Q6: Mean seed weight (±SD) in µg (optional)
Q7: Seed yield per flower (Q5 x Q6; optional)
Q8: No. of flowers (of total) destroyed by caterpillars



ITEX Plant Response Variables

Species: ***Eriophorum*** _____

Site: _____ Year: _____

Devices: OTCs / corners Co-ordinates: _____ Altitude (m): _____

Replicates are genets / ramets Observation period (day ##): – _____

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Experiment plants	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
	E 6																	
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Phenological dates (day numbers):

P1: Snow-free
P2: Appearance of first inflorescence bud
P3: First open flower (=first anthers exposed)
P4: First seed shed
P5:
P6:
P7:
P8:

Quantitative measurements:

Q1: Tussock diameter to tips of leaves (cm)
Q2: Number of flowering stalks per tussock
Q3: Mean length of 10 longest leaves (mean ± SD; mm)
Q4: Tiller growth (tot. ann. leaf prod. per tiller, mm opt.)
Q5: Seed: Ovule ratio (optional
Q6: Seed weight (mean±SD; accuarcy 0.01 mg; optional)
Q7:
Q8:

Species: ***Oxyria digyna***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

Experiment plants

No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
E 1																	
E 2																	
E 3																	
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C 20																	

Control plants

Phenological dates (day numbers):

P1: Snow-free
P2: First leaf unrolls
P3: First inflorescence bud
P4: First open flower
P5: First seed dispersal
P6:
P7:
P8:

Quantitative measurements:

Q1: Number of inflorescences per clone (0, 1, 2, ect.)
Q2: Length of inflorescence stalk(s) at full flower (mm)
Q3: Width of largest leaf (mm)
Q4: Number of mature fruits per plant.
Q5: Mean fruit weight (mg)
Q6:
Q7:
Q8:

Species: ***Ranunculus nivalis***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Experiment plants	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
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Control plants	C 1																	
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	C 20																	

Phenological dates (day numbers):

P1: Snow-free
P2: Flower open (attaining bowl-shaped)
P3: Last petal shed
P4: First seed dispersal (NB! Start harvesting nutlets at this point)
P5: First yellowing of leaves
P6:
P7:
P8:

Quantitative measurements:

Q1: Height of flowering shoot (mm)
Q2: Width of largest basal leaf (mm)
Q3: Number of nutlets per flower (harvest in seed bags)
Q4: Mean nutlet weight (µg±SD; optional)
Q5: Seed yield (Q3 x Q4)
Q6: Seed: Ovule Ratio
Q7:
Q8:

ITEX Plant Response Variables

Species: ***Salix*** _____ **females**

Site: _____ Year: _____

Devices: OTCs / corners Co-ordinates: _____ Altitude (m): _____

Replicates are genets / ramets Observation period (day ##): – _____

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Experiment plants	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
	E 6																	
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Control plants	C 1																	
	C 2																	
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	C 18																	
	C 19																	
	C 20																	

Phenological dates (day numbers):

P1: Snow-free
P2: First leaf bud burst
P3: First stigma visible
P4: Onset of seed dispersal
P5: First yellowing of leaves
P6: Last green leaf turning yellow
P7: All leaves shed (optional)
P8: Onset of seed dispersal (Capsules split open, wool visible)

Quantitative measurements:

Q1: Total no. of flowering catkin per monitured branch
Q2: Ann. growth increment (1 cm in *S.arctica*, otherwise 1 mm)
Q3: Length of longest leaf (including petiole) in mm
Q4: Weight of largest leaf (with petiole) in mg
Q5: Total number of mature catkins per branch
Q6: Catkin length *or* Capsule number (mean mm± SD)
Q7: Fruit:Flower Ratio (mean ± SD)
Q8: Seed: Ovule ratio (mean ± SD)

ITEX Plant Response Variables

Species: ***Salix*** _____ **males**

Site: _____ Year: _____

Devices: OTCs / corners Co-ordinates: _____ Altitude (m): _____

Replicates are genets / ramets Observation period (day ##): – _____

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Experiment plants	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
	E 6																	
	E 7																	
	E 8																	
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Control plants	C 1																	
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Phenological dates (day numbers):

P1: Snow-free
P2: First leaf bud burst
P3: First pollen shed
P4: All pollen shed
P5: First yellowing of leaves
P6: Last green leaf turning yellow
P7: All leaves shed
P8:

Quantitative measurements:

Q1: Total number of catkin buds
Q2: Annual growth increment (main shoot)
Q3: Length of longest leaf (including petiole) in mm
Q4: Weight of largest leaf (with petiole) in mg
Q5:
Q6:
Q7:
Q8:

Species: ***Saxifraga oppositifolia***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Experiment plants	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
	E 6																	
	E 7																	
	E 8																	
	E 9																	
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	E 14																	
	E 15																	
	E 16																	
	E 17																	
	E 18																	
	E 19																	
	E 20																	
Control plants	C 1																	
	C 2																	
	C 3																	
	C 4																	
	C 5																	
	C 6																	
	C 7																	
	C 8																	
	C 9																	
	C 10																	
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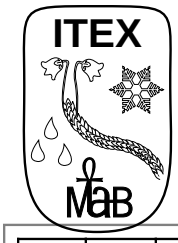
	C 12																	
	C 13																	
	C 14																	
	C 15																	
	C 16																	
	C 17																	
	C 18																	
	C 19																	
	C 20																	

Phenological dates (day numbers):

P1: Snow-free
P2: First open flower (= onset of flowering)
P3: First pollination (orange pollen on stigma)
P4: First open anther dehiscence (orange pollen exposed)
P5: First petal fading
P6: Last petal fading (= end of flowering)
P7: First opening capsule (slit at top)
P8:

Quantitative measurements:

Q1: Vegetative growth (5 shoots/genet,mm; mean ± SD)
Q2: Total number of flower buds (at beginning of season)
Q3: Total number of flowers per individual
Q4: Number of pollinated flowers when 1st anther opens
Q5: Number of mature fruits
Q6: Number of seeds per capsule (mean ± SD)
Q7: Total number of flower per capsules (mean ± SD)
Q8:



ITEX Plant Response Variables

Species: ***Silene acaulis***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Experiment plants	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
	E 6																	
	E 7																	
	E 8																	
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	E 19																	
	E 20																	
Control plants	C 1																	
	C 2																	
	C 3																	
	C 4																	
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	C 20																	

Phenological dates (day numbers):

P1: Snow-free
P2: First open flower
P3: First open anther
P4: First stigma receptive
P5: First capsule cracks open (at top)
P6:
P7:
P8:

Quantitative measurements:

Q1: Size of cushion (accuracy 1 cm)
Q2: Number of flowers
Q3: Number of capsules
Q4: Fruit : Flower Ratio (Q3/Q2)
Q5: Number of seeds per capsule (mean±SD)
Q6: Seed : Ovule Ratio (mean per clone±SD, optional)
Q7: Flowers female (F) or hermaphrodite
Q8:

Group 1B species

ITEX Plant Response Variables

Species:

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are genets / ramets Observation period (day ##): –

Experiment plants

Control plants

No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
E 1																	
E 2																	
E 3																	
E 4																	
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C 19																	
C 20																	

Phenological dates (day numbers):

P1: Snow-free
P2:
P3:
P4:
P5:
P6:
P7:
P8:

Quantitative measurements:

Q1:
Q2:
Q3:
Q4:
Q5:
Q6:
Q7:
Q8:

ITEX Insect **ITEX Plant Response Variables**

Species: ***Gynaephora groenlandica/G. rossii***

Site: Year:

Devices: OTCs / corners Co-ordinates: Altitude (m):

Replicates are individuals Observation period (day ##): –

	No.	P1	P2	P3	P4	P5	P6	P7	P8		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
On experiment plants (*Salix*)	E 1																	
	E 2																	
	E 3																	
	E 4																	
	E 5																	
	E 6																	
	E 7																	
	E 8																	
	E 9																	
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	E 13																	
	E 14																	
	E 15																	
	E 16																	
	E 17																	
	E 18																	
	E 19																	
	E 20																	
On control plants (*Salix*)	C 1																	
	C 2																	
	C 3																	
	C 4																	
	C 5																	
	C 6																	
	C 7																	
	C 8																	
	C 9																	
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	C 14																	
	C 15																	
	C 16																	
	C 17																	
	C 18																	
	C 19																	
	C 20																	

Phenological dates (day numbers):

P1: Snow-free
P2: First Caterpillar
P3: First *S*alix leaf bud burst (male/female)
P4: First flower out (pollen/stigma)
P5: First pupae
P6: First adult (male/female)
P7: First mating
P8: First egg count
Additional observation of parasitism

Quantitative measurements:

Q1: Length of caterpillar, mm (or stage)
Q2: Orientation of basking caterpillar (compass)
Q3: Colour (yellow/brown/black)
Q4: No. of caterpillars feeding on male *Salix*
Q5: No. of caterpillars feeding on female *Salix*
Q6: No. of caterpillars feeding on other plants
Q7: Estimated density of caterpillar/m^2 (or high/low)
Q8: Orientation of pupae (use compass if possible)