

TABLE 3.2.1: DISTRIBUTION OF ACTIVE MSC, MOT AND BCFS CLIMATE STATIONS AND PROVINCIAL GOVERNMENT SNOW MONITORING SITES

ZONE	NAME OF ZONE	Climate Stations	Surface Weather Stations	RCS	T P Scenario Stations	MOT	BCFS/MOF	Combined Climate/MOT/BCFS	Snow Course	Snow Pillows
1	Northern Coast Mountains	4			2	6	8	18	4	2
2	Stikine Plateau	5	3	1	1	4	3	12	5	
3	Northern Rocky Mountains	1	1	1	1		12	13	15	4
4	Northern Interior Plains	2	2	1		1	5	8	1	
5	Northern Central Uplands	0			1	1	2	3	4	4
6	Southern Interior Plains	6	3	1		2	5	13	2	
7	Southern Rocky Mountain Foothills	7	2		2	5	5	17	6	1
8	Nechako Plateau	19	3	6	7	9	22	50	20	3
9	Southern Hazelton Mountains	0					2	2	4	2
10	Central Coast Mountains	28	13	6	9	7	4	39	3	1
11	Queen Charlotte Islands	3						3		
12	McGregor Basin	0				2	4	6	8	1
13	Upper Fraser Basin	5			1	2	6	13	7	2
14	Northern Columbia Mountains	11	3	2	2	8	25	44	17	7
15	Fraser Plateau	43	8	4	10	20	32	95	24	3
16	Southern Quesnel Highland	2			1	1	5	8	2	1
17	Northern Thompson Plateau	2			2	3	4	9	2	
18	Upper Columbia Basin	10	1	1	1	6	9	25	11	2
19	Upper Kootenay Basin	1				1	5	7	2	
20	Central Kootenay Basin	12	3	1	3	4	5	21	6	1
21	Lower Kootenay Basin	7	1	2	1	5	4	16	8	2
22	Lower Columbia Basin	15	5	2	1	13	14	42	17	2
23	Okanagan Highland	9	1	1	4	5	6	20	8	3
24	Southern Thompson Plateau	20	4	2	4	6	7	33	12	1
25	Eastern South Coast Mountains	7	2		2	9	8	24	12	4
26	Central South Coast Mountains	13	7	2	4	3	5	21	12	5
27	Western South Coast Mountains	64	10	1	15	3	2	69	6	3
28	Eastern Vancouver Island	65	20	4	13	8	6	79	7	1
29	Western Vancouver Island	28	6	2	10	2	4	34	4	1
TOTAL		389	98	40	97	136	219	744	229	56

TABLE 3.2.2: DISTRIBUTION OF PARAMETERS REPORTED AT ACTIVE MSC CLIMATE STATIONS

ZONE	NAME OF ZONE	SYNOPTIC	HOURLY	TEMP.	PRECIP.	RATE OF PRECIP	WIND	SOIL TEMP.	EVAP.	SUNSHINE	RADIATION	OZONE	UPPER AIR	SNOW SURVEY
1	Northern Coast Mountains			4	4	1				1				
2	Stikine Plateau	2	2	5	5	2	1			1				1
3	Northern Rocky Mountains		1	1	1	1								
4	Northern Interior Plains	1	1	2	2	2				1			1	
5	Northern Central Uplands													
6	Southern Interior Plains	1	3	4	6	3				1				1
7	Southern Rocky Mountain Foothills	1	2	6	7	2				2				
8	Nechako Plateau	3	4	19	19	4	10		1	6	1		1	1
9	Southern Hazelton Mountains													
10	Central Coast Mountains	14	21	25	26	7				6	1			
11	Queen Charlotte Islands													
12	McGregor Basin													
13	Upper Fraser Basin			5	5	1				1				
14	Northern Columbia Mountains	1	3	10	10	2	2		1	2				
15	Fraser Plateau	5	8	40	41	5	2		1	3			1	
16	Southern Quesnel Highland			2	2									
17	Northern Thompson Plateau			2	2									
18	Upper Columbia Basin	1	2	10	10	1	1			1				
19	Upper Kootenay Basin			1	1									
20	Central Kootenay Basin	2	3	12	19	3	1		1	2				
21	Lower Kootenay Basin	1	1	7	7	2	2			1				
22	Lower Columbia Basin	3	4	14	14	3	1			1				
23	Okanagan Highland	1	1	9	9		1			1				
24	Southern Thompson Plateau	4	6	18	19	6	2	1		3				
25	Eastern South Coast Mountains	2	2	4	6		1							
26	Central South Coast Mountains	4	5	11	11	3	2	1	1	3				
27	Western South Coast Mountains	9	13	43	62	13	10			4				
28	Eastern Vancouver Island	13	18	51	61	10	15	1	2	4	1	1	1	
29	Western Vancouver Island	4	7	19	23	3	3			3				
TOTAL		72	107	324	372	74	54	3	7	47	3	1	4	3

TABLE 3.2.3: DISTRIBUTION OF WSD HYDROMETRIC AND SEDIMENT TRANSPORT STATIONS

ZONE	NAME OF ZONE	HYDROMETRIC STATIONS				REFERENCE HYDROMETRIC BASIN NETWORK	SEDIMENT TRANSPORT STATIONS	
		ACTIVE	DISCONTINUED	ACTIVE NATURAL	ACTIVE REGULATED		FULL PRGRAM	TARGETED
1	Northern Coast Mountains	10	37	10		2		1
2	Stikine Plateau	7	23	7		5		
3	Northern Rocky Mountains	12	33	10	2	2		
4	Northern Interior Plains	6	12	6		1		
5	Northern Central Uplands	1	10	1				
6	Southern Interior Plains	11	23	8	3	2		
7	Southern Rocky Mountain Foothills	9	18	8	1	1		
8	Nechako Plateau	39	117	28	11	4		1
9	Southern Hazelton Mountains	9	21	9		1	1	
10	Central Coast Mountains	9	39	7	2			1
11	Queen Charlotte Islands	5	9	5		1		
12	McGregor Basin	4	6	4				1
13	Upper Fraser Basin	6	13	6		2		
14	Northern Columbia Mountains	21	24	14	7	1		
15	Fraser Plateau	39	354	27	12	4		
16	Southern Quesnel Highland	10	42	8	2	1		
17	Northern Thompson Plateau	10	88	4	6			
18	Upper Columbia Basin	12	72	8	4	2		
19	Upper Kootenay Basin	3	29	3				
20	Central Kootenay Basin	8	96	7	1			
21	Lower Kootenay Basin	18	167	12	6	7		
22	Lower Columbia Basin	22	242	12	10	3		
23	Okanagan Highland	12	63	8	4	1		
24	Southern Thompson Plateau	29	163	16	13	3		
25	Eastern South Coast Mountains	17	66	13	4	2		
26	Central South Coast Mountains	17	86	14	3	1		
27	Western South Coast Mountains	45	206	25	20	3	6	1
28	Eastern Vancouver Island	47	155	22	25	5		
29	Western Vancouver Island	20	62	16	4	2		
TOTAL		458	2276	318	140	56	7	5

TABLE 3.2.4: DISTRIBUTION OF STREAM GAUGING STATIONS AS A FUNCTION OF BASIN AREA

ZONE	NAME OF ZONE	NUMBER OF STREAM GAUGING STATIONS ON WATERSHEDS OF VARIOUS SIZES (km ²)											TOTAL NUMBER OF STATIONS
		0-5	>5-10	>10-100	>100-500	>500-1,000	>1,000-5,000	>5,000-10,000	>10,000-50,000	>50,000-100,000	>100,000-200,000	>200,000	
1	Northern Coast Mountains		2	4	1			1	2				10
2	Stikine Plateau					2	2	1	1				6
3	Northern Rocky Mountains				1		7		1		1		10
4	Northern Interior Plains				3			1	2				6
5	Northern Central Uplands						1						1
6	Southern Interior Plains				1		5	1	1	2	1		11
7	Southern Rocky Mountain Foothills			2		1	3	1	1	1			9
8	Nechako Plateau	1	1	2	7	3	6	6	5	1			32
9	Southern Hazelton Mountains	1	2	1	1	1	2						8
10	Central Coast Mountains	1		1	4	1	1						8
11	Queen Charlotte Islands	1		3	1								5
12	McGregor Basin				1		2		1				4
13	Upper Fraser Basin				3		1	1					5
14	Northern Columbia Mountains	1		2	3	3	5	1					15
15	Fraser Plateau			6	9	4	9	1	6		1		36
16	Southern Quesnel Highland			1	3	3	2		1				10
17	Northern Thompson Plateau			3		1	2	2		1	1		10
18	Upper Columbia Basin			1	2	1	3	2					9
19	Upper Kootenay Basin				1	1	1						3
20	Central Kootenay Basin		1	1	3		2		1				8
21	Lower Kootenay Basin		2	6	4		3						15
22	Lower Columbia Basin			5	4	1	3		2	1			16
23	Okanagan Highland			4	5		3						12
24	Southern Thompson Plateau	3		4	7	2	4	4					24
25	Eastern South Coast Mountains			2	3	3	5						13
26	Central South Coast Mountains			1	5	2	3	3				1	15
27	Western South Coast Mountains	2		18	10		3	1				2	36
28	Eastern Vancouver Island	1	2	13	16	6	3						41
29	Western Vancouver Island	2	1	8	5	1	2						19
TOTAL		13	11	88	103	36	83	26	24	6	4	3	397

NOTE: Basin areas are not available for approximately 62 sites

TABLE 3.2.5: PERCENTAGE OF STREAM GAUGING STATIONS IN WATERSHEDS OF VARIOUS BASIN AREA

ZONE	NAME OF ZONE	TOTAL NUMBER OF STATIONS	PERCENTAGE OF STREAM GAUGING STATIONS ON WATERSHEDS OF VARIOUS SIZES (km ²)										
			0-5	>5-10	>10-100	>100-500	>500-1,000	>1,000-5,000	>5,000-10,000	>10,000-50,000	>50,000-100,000	>100,000-200,000	>200,000
1	Northern Coast Mountains	10	0	20	40	10	0	0	10	20	0	0	0
2	Stikine Plateau	6	0	0	0	0	33	33	17	17	0	0	0
3	Northern Rocky Mountains	10	0	0	0	10	0	70	0	10	0	10	0
4	Northern Interior Plains	6	0	0	0	50	0	0	17	33	0	0	0
5	Northern Central Uplands	1	0	0	0	0	0	100	0	0	0	0	0
6	Southern Interior Plains	11	0	0	0	9	0	45	9	9	18	9	0
7	Southern Rocky Mountain Foothills	9	0	0	22	0	11	33	11	11	11	0	0
8	Nechako Plateau	32	3	3	6	22	9	19	19	16	3	0	0
9	Southern Hazelton Mountains	8	13	25	13	13	13	25	0	0	0	0	0
10	Central Coast Mountains	8	13	0	13	50	13	13	0	0	0	0	0
11	Queen Charlotte Islands	5	20	0	60	20	0	0	0	0	0	0	0
12	McGregor Basin	4	0	0	0	25	0	50	0	25	0	0	0
13	Upper Fraser Basin	5	0	0	0	60	0	20	20	0	0	0	0
14	Northern Columbia Mountains	15	7	0	13	20	20	33	7	0	0	0	0
15	Fraser Plateau	36	0	0	17	25	11	25	3	17	0	3	0
16	Southern Quesnel Highland	10	0	0	10	30	30	20	0	10	0	0	0
17	Northern Thompson Plateau	10	0	0	30	0	10	20	20	0	10	10	0
18	Upper Columbia Basin	9	0	0	11	22	11	33	22	0	0	0	0
19	Upper Kootenay Basin	3	0	0	0	33	33	33	0	0	0	0	0
20	Central Kootenay Basin	8	0	13	13	38	0	25	0	13	0	0	0
21	Lower Kootenay Basin	15	0	13	40	27	0	20	0	0	0	0	0
22	Lower Columbia Basin	16	0	0	31	25	6	19	0	13	6	0	0
23	Okanagan Highland	12	0	0	33	42	0	25	0	0	0	0	0
24	Southern Thompson Plateau	24	13	0	17	29	8	17	17	0	0	0	0
25	Eastern South Coast Mountains	13	0	0	15	23	23	38	0	0	0	0	0
26	Central South Coast Mountains	15	0	0	7	33	13	20	20	0	0	0	7
27	Western South Coast Mountains	36	6	0	50	28	0	8	3	0	0	0	6
28	Eastern Vancouver Island	41	2	5	32	39	15	7	0	0	0	0	0
29	Western Vancouver Island	19	11	5	42	26	5	11	0	0	0	0	0
TOTAL		397	3	3	22	26	9	21	7	6	2	1	1

NOTE: Basin areas are not available for approximately 62 sites

TABLE 3.2.6: DISTRIBUTION OF STREAM DISCHARGE STATIONS AS A FUNCTION OF YEARS OF RECORD

ZONE	NAME OF ZONE	NUMBER OF WSC SATIONS RECORDING DISCHARGE SORTED BY YEARS OF RECORD								TOTAL NUMBER OF STATIONS
		0-5	6-7	8-14	15-20	21-40	41-60	61-80	>81	
1	Northern Coast Mountains		5	1		1	1	2		10
2	Stikine Plateau					1	5			6
3	Northern Rocky Mountains				2	6	2			10
4	Northern Interior Plains			1	1	3	1			6
5	Northern Central Uplands					1				1
6	Southern Interior Plains	1		1	2	4	4			12
7	Southern Rocky Mountain Foothills	1				7	2			10
8	Nechako Plateau	2	1			16	9	2		30
9	Southern Hazelton Mountains	1	2			4	1			8
10	Central Coast Mountains		2			5	2			9
11	Queen Charlotte Islands			1	1	3				5
12	McGregor Basin					2	2			4
13	Upper Fraser Basin	1				2	3			6
14	Northern Columbia Mountains	2		1	1	6	3	3	1	17
15	Fraser Plateau	3	2	1	4	14	7	6		37
16	Southern Quesnel Highland	1				5	2	2		10
17	Northern Thompson Plateau	2			1	2	4			9
18	Upper Columbia Basin				2	3	3	1	1	10
19	Upper Kootenay Basin					2	1			3
20	Central Kootenay Basin					7			1	8
21	Lower Kootenay Basin			1	1	7	5			14
22	Lower Columbia Basin	1				6	6	3		16
23	Okanagan Highland	1				8	3			12
24	Southern Thompson Plateau	1			4	10	5	3	2	25
25	Eastern South Coast Mountains	1	2		2	7	2		1	15
26	Central South Coast Mountains	1		2	1	5	5	1	1	16
27	Western South Coast Mountains	5	1	6	6	6	8	2	1	35
28	Eastern Vancouver Island	4	5	9	1	11	11	1		42
29	Western Vancouver Island	6	3	2		1	7		1	20
TOTAL		34	23	26	29	155	104	26	9	406

NOTE: Approximately 53 water level only stations are not included.

TABLE 3.2.7: PERCENTAGE OF STREAM DISCHARGE STATIONS SORTED BY LENGTH OF RECORD

ZONE	NAME OF ZONE	TOTAL NUMBER OF STATIONS	PERCENTAGE OF RECORD LENGTH IN WATERSHEDS WITH VARYING RECORDS (yrs)							
			0-5	6-7	8-14	15-20	21-40	41-60	61-80	>81
1	Northern Coast Mountains	10	0	50	10	0	10	10	20	0
2	Stikine Plateau	6	0	0	0	0	17	83	0	0
3	Northern Rocky Mountains	10	0	0	0	20	60	20	0	0
4	Northern Interior Plains	6	0	0	17	17	50	17	0	0
5	Northern Central Uplands	1	0	0	0	0	100	0	0	0
6	Southern Interior Plains	12	8	0	8	17	33	33	0	0
7	Southern Rocky Mountain Foothills	10	10	0	0	0	70	20	0	0
8	Nechako Plateau	30	7	3	0	0	53	30	7	0
9	Southern Hazelton Mountains	8	13	25	0	0	50	13	0	0
10	Central Coast Mountains	9	0	22	0	0	56	22	0	0
11	Queen Charlotte Islands	5	0	0	20	20	60	0	0	0
12	McGregor Basin	4	0	0	0	0	50	50	0	0
13	Upper Fraser Basin	6	17	0	0	0	33	50	0	0
14	Northern Columbia Mountains	17	12	0	6	6	35	18	18	6
15	Fraser Plateau	37	8	5	3	11	38	19	16	0
16	Southern Quesnel Highland	10	10	0	0	0	50	20	20	0
17	Northern Thompson Plateau	9	22	0	0	11	22	44	0	0
18	Upper Columbia Basin	10	0	0	0	20	30	30	10	10
19	Upper Kootenay Basin	3	0	0	0	0	67	33	0	0
20	Central Kootenay Basin	8	0	0	0	0	88	0	0	13
21	Lower Kootenay Basin	14	0	0	7	7	50	36	0	0
22	Lower Columbia Basin	16	6	0	0	0	38	38	19	0
23	Okanagan Highland	12	8	0	0	0	67	25	0	0
24	Southern Thompson Plateau	25	4	0	0	16	40	20	12	8
25	Eastern South Coast Mountains	15	7	13	0	13	47	13	0	7
26	Central South Coast Mountains	16	6	0	13	6	31	31	6	6
27	Western South Coast Mountains	35	14	3	17	17	17	23	6	3
28	Eastern Vancouver Island	42	10	12	21	2	26	26	2	0
29	Western Vancouver Island	20	30	15	10	0	5	35	0	5
TOTAL		406	8	6	6	7	38	26	6	2

NOTE: Approximately 53 water level only stations are not included.

TABLE 3.2.8: DISTRIBUTION OF WELLS, PERMAFROST, GLACIER MASS BALANCE, SEA SURFACE TEMPERATURE, BUOYS AND TIDAL STATIONS

ZONE	NAME OF ZONE	GROUND WATER WELLS		GROUND TEMPERATURE (PERMAFROST)		GLACIER MASS BALANCE		SEA SURFACE TEMP & SALINITY		BUOYS	TIDES AND WATER LEVELS
		ACTIVE	INACTIVE	ACTIVE	INACTIVE	ACTIVE	INACTIVE	ACTIVE	INACTIVE		
1	Northern Coast Mountains				1		9				
2	Stikine Plateau	1			6						
3	Northern Rocky Mountains										
4	Northern Interior Plains			1	4						
5	Northern Central Uplands										
6	Southern Interior Plains	1									
7	Southern Rocky Mountain Foothills	2									
8	Nechako Plateau	4									
9	Southern Hazelton Mountains										
10	Central Coast Mountains							3	3	3	2
11	Queen Charlotte Islands							1	5		1
12	McGregor Basin										
13	Upper Fraser Basin			1							
14	Northern Columbia Mountains	9									
15	Fraser Plateau	21									
16	Southern Quesnel Highland										
17	Northern Thompson Plateau	1									
18	Upper Columbia Basin	2									
19	Upper Kootenay Basin										
20	Central Kootenay Basin	2									
21	Lower Kootenay Basin										
22	Lower Columbia Basin	2					1				
23	Okanagan Highland	6									
24	Southern Thompson Plateau	21									
25	Eastern South Coast Mountains	1				1	4				
26	Central South Coast Mountains					1	4				
27	Western South Coast Mountains	23						1	4	4	3
28	Eastern Vancouver Island	65						7	6		4
29	Western Vancouver Island	1						4	2	2	3
TOTAL		162		2	11	2	18	16	20	9	13

TABLE 4.1.1: DENSITY OF ACTIVE CLIMATE STATIONS COMPARED TO WMO (1981) NETWORK CRITERIA FOR PRECIPITATION

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	1 STATION PER 250 km ²	1 STATION PER 100 km ²	1 STATION PER 250 km ²	1 STATION PER 100 km ²
1	Northern Coast Mountains	4	61,151	15,288	245	612	2	1
2	Stikine Plateau	5	55,219	11,044	221	552	2	1
3	Northern Rocky Mountains	1	112,548	112,548	450	1125	0	0
4	Northern Interior Plains	2	79,107	39,554	316	791	1	0
5	Northern Central Uplands	0	31,312		125	313	0	0
6	Southern Interior Plains	6	34,995	5,833	140	350	4	2
7	Southern Rocky Mountain Foothills	7	23,032	3,290	92	230	8	3
8	Nechako Plateau	19	82,900	4,363	332	829	6	2
9	Southern Hazelton Mountains	0	15,437		62	154	0	0
10	Central Coast Mountains	28	52,058	1,859	208	521	13	5
11	Queen Charlotte Islands	3	10,860	3,620	43	109	7	3
12	McGregor Basin	0	14,960		60	150	0	0
13	Upper Fraser Basin	5	14,637	2,927	59	146	9	3
14	Northern Columbia Mountains	11	43,550	3,959	174	436	6	3
15	Fraser Plateau	43	83,121	1,933	332	831	13	5
16	Southern Quesnel Highland	2	8,599	4,300	34	86	6	2
17	Northern Thompson Plateau	2	6,739	3,370	27	67	7	3
18	Upper Columbia Basin	10	18,258	1,826	73	183	14	5
19	Upper Kootenay Basin	1	10,221	10,221	41	102	2	1
20	Central Kootenay Basin	12	13,038	1,087	52	130	23	9
21	Lower Kootenay Basin	7	10,276	1,468	41	103	17	7
22	Lower Columbia Basin	15	20,694	1,380	83	207	18	7
23	Okanagan Highland	9	9,941	1,105	40	99	23	9
24	Southern Thompson Plateau	20	12,621	631	50	126	40	16
25	Eastern South Coast Mountains	7	29,222	4,175	117	292	6	2
26	Central South Coast Mountains	13	39,857	3,066	159	399	8	3
27	Western South Coast Mountains	64	29,479	461	118	295	54	22
28	Eastern Vancouver Island	65	16,337	251	65	163	99	40
29	Western Vancouver Island	28	18,504	661	74	185	38	15
TOTAL		389	958,673	2,464	3,835	9,587	10	4

TABLE 4.1.2: DENSITY OF ACTIVE SNOW SURVEY SITES COMPARED TO WMO (1981) NETWORK CRITERIA FOR SNOW SURVEY

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	1 STATION PER 3000 km ²	1 STATION PER 2000 km ²	1 STATION PER 3000 km ²	1 STATION PER 2000 km ²
1	Northern Coast Mountains	4	61,151	15,288	20	31	20	13
2	Stikine Plateau	5	55,219	11,044	18	28	27	18
3	Northern Rocky Mountains	15	112,548	7,503	38	56	40	27
4	Northern Interior Plains	1	79,107	79,107	26	40	4	3
5	Northern Central Uplands	4	31,312	7,828	10	16	38	26
6	Southern Interior Plains	2	34,995	17,498	12	17	17	11
7	Southern Rocky Mountain Foothills	6	23,032	3,839	8	12	78	52
8	Nechako Plateau	20	82,900	4,145	28	41	72	48
9	Southern Hazelton Mountains	4	15,437	3,859	5	8	78	52
10	Central Coast Mountains	3	52,058	17,353	17	26	17	12
11	Queen Charlotte Islands	0	10,860		4	5	0	0
12	McGregor Basin	8	14,960	1,870	5	7	160	107
13	Upper Fraser Basin	7	14,637	2,091	5	7	143	96
14	Northern Columbia Mountains	17	43,550	2,562	15	22	117	78
15	Fraser Plateau	24	83,121	3,463	28	42	87	58
16	Southern Quesnel Highland	2	8,599	4,300	3	4	70	47
17	Northern Thompson Plateau	2	6,739	3,370	2	3	89	59
18	Upper Columbia Basin	11	18,258	1,660	6	9	181	120
19	Upper Kootenay Basin	2	10,221	5,111	3	5	59	39
20	Central Kootenay Basin	6	13,038	2,173	4	7	138	92
21	Lower Kootenay Basin	8	10,276	1,285	3	5	234	156
22	Lower Columbia Basin	17	20,694	1,217	7	10	246	164
23	Okanagan Highland	8	9,941	1,243	3	5	241	161
24	Southern Thompson Plateau	12	12,621	1,052	4	6	285	190
25	Eastern South Coast Mountains	12	29,222	2,435	10	15	123	82
26	Central South Coast Mountains	12	39,857	3,321	13	20	90	60
27	Western South Coast Mountains	6	29,479	4,913	10	15	61	41
28	Eastern Vancouver Island	7	16,337	2,334	5	8	129	86
29	Western Vancouver Island	4	18,504	4,626	6	9	65	43
	TOTAL	229	958,673	4,186	320	479	72	48

TABLE 4.1.3: DENSITY OF ACTIVE SNOW PILLOW SITES COMPARED TO WMO (1981) NETWORK CRITERIA FOR SNOW SURVEY

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	1 STATION PER 3000 km ²	1 STATION PER 2000 km ²	1 STATION PER 3000 km ²	1 STATION PER 2000 km ²
1	Northern Coast Mountains	2	61,151	30,576	20	31	10	7
2	Stikine Plateau		55,219		18	28	0	0
3	Northern Rocky Mountains	4	112,548	28,137	38	56	11	7
4	Northern Interior Plains		79,107		26	40	0	0
5	Northern Central Uplands	4	31,312	7,828	10	16	38	26
6	Southern Interior Plains		34,995		12	17	0	0
7	Southern Rocky Mountain Foothills	1	23,032	23,032	8	12	13	9
8	Nechako Plateau	3	82,900	27,633	28	41	11	7
9	Southern Hazelton Mountains	2	15,437	7,719	5	8	39	26
10	Central Coast Mountains	1	52,058	52,058	17	26	6	4
11	Queen Charlotte Islands		10,860		4	5	0	0
12	McGregor Basin	1	14,960	14,960	5	7	20	13
13	Upper Fraser Basin	2	14,637	7,319	5	7	41	27
14	Northern Columbia Mountains	7	43,550	6,221	15	22	48	32
15	Fraser Plateau	3	83,121	27,707	28	42	11	7
16	Southern Quesnel Highland	1	8,599	8,599	3	4	35	23
17	Northern Thompson Plateau		6,739		2	3	0	0
18	Upper Columbia Basin	2	18,258	9,129	6	9	33	22
19	Upper Kootenay Basin		10,221		3	5	0	0
20	Central Kootenay Basin	1	13,038	13,038	4	7	23	15
21	Lower Kootenay Basin	2	10,276	5,138	3	5	58	39
22	Lower Columbia Basin	2	20,694	10,347	7	10	29	19
23	Okanagan Highland	3	9,941	3,314	3	5	91	60
24	Southern Thompson Plateau	1	12,621	12,621	4	6	24	16
25	Eastern South Coast Mountains	4	29,222	7,306	10	15	41	27
26	Central South Coast Mountains	5	39,857	7,971	13	20	38	25
27	Western South Coast Mountains	3	29,479	9,826	10	15	31	20
28	Eastern Vancouver Island	1	16,337	16,337	5	8	18	12
29	Western Vancouver Island	1	18,504	18,504	6	9	16	11
	TOTAL	56	958,673	17,119	320	479	18	12

TABLE 4.1.4: DENSITY OF ACTIVE EVAPORATION SITES COMPARED TO WMO (1981) CRITERIA FOR EVAPORATION

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	1 STATION PER 50000 km ²		1 STATION PER 50000 km ²	
1	Northern Coast Mountains		61,151		1		0	
2	Stikine Plateau		55,219		1		0	
3	Northern Rocky Mountains		112,548		2		0	
4	Northern Interior Plains		79,107		2		0	
5	Northern Central Uplands		31,312		1		0	
6	Southern Interior Plains		34,995		1		0	
7	Southern Rocky Mountain Foothills		23,032		0		0	
8	Nechako Plateau	1	82,900	82,900	2		60	
9	Southern Hazelton Mountains		15,437		0		0	
10	Central Coast Mountains		52,058		1		0	
11	Queen Charlotte Islands		10,860		0		0	
12	McGregor Basin		14,960		0		0	
13	Upper Fraser Basin		14,637		0		0	
14	Northern Columbia Mountains	1	43,550	43,550	1		115	
15	Fraser Plateau	1	83,121	83,121	2		60	
16	Southern Quesnel Highland		8,599		0		0	
17	Northern Thompson Plateau		6,739		0		0	
18	Upper Columbia Basin		18,258		0		0	
19	Upper Kootenay Basin		10,221		0		0	
20	Central Kootenay Basin	1	13,038	13,038	0		383	
21	Lower Kootenay Basin		10,276		0		0	
22	Lower Columbia Basin		20,694		0		0	
23	Okanagan Highland		9,941		0		0	
24	Southern Thompson Plateau		12,621		0		0	
25	Eastern South Coast Mountains		29,222		1		0	
26	Central South Coast Mountains	1	39,857	39,857	1		125	
27	Western South Coast Mountains		29,479		1		0	
28	Eastern Vancouver Island	2	16,337	8,169	0		612	
29	Western Vancouver Island		18,504		0		0	
	TOTAL	7	958,673	136,953	19		37	

TABLE 4.1.5: DENSITY OF ACTIVE HYDROMETRIC STATIONS COMPARED TO WMO (1981) NETWORK CRITERIA FOR STREAMFLOW GAUGING STATIONS

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	1 STATION PER 1,000 km ²	1 STATION PER 300 km ²	1 STATION PER 1,000 km ²	1 STATION PER 300 km ²
1	Northern Coast Mountains	10	61,151	6,115	61	204	16	5
2	Stikine Plateau	7	55,219	7,888	55	184	13	4
3	Northern Rocky Mountains	12	112,548	9,379	113	375	11	3
4	Northern Interior Plains	6	79,107	13,185	79	264	8	2
5	Northern Central Uplands	1	31,312	31,312	31	104	3	1
6	Southern Interior Plains	11	34,995	3,181	35	117	31	9
7	Southern Rocky Mountain Foothills	9	23,032	2,559	23	77	39	12
8	Nechako Plateau	39	82,900	2,126	83	276	47	14
9	Southern Hazelton Mountains	9	15,437	1,715	15	51	58	17
10	Central Coast Mountains	9	52,058	5,784	52	174	17	5
11	Queen Charlotte Islands	5	10,860	2,172	11	36	46	14
12	McGregor Basin	4	14,960	3,740	15	50	27	8
13	Upper Fraser Basin	6	14,637	2,440	15	49	41	12
14	Northern Columbia Mountains	21	43,550	2,074	44	145	48	14
15	Fraser Plateau	39	83,121	2,131	83	277	47	14
16	Southern Quesnel Highland	10	8,599	860	9	29	116	35
17	Northern Thompson Plateau	10	6,739	674	7	22	148	45
18	Upper Columbia Basin	12	18,258	1,522	18	61	66	20
19	Upper Kootenay Basin	3	10,221	3,407	10	34	29	9
20	Central Kootenay Basin	8	13,038	1,630	13	43	61	18
21	Lower Kootenay Basin	18	10,276	571	10	34	175	53
22	Lower Columbia Basin	22	20,694	941	21	69	106	32
23	Okanagan Highland	12	9,941	828	10	33	121	36
24	Southern Thompson Plateau	29	12,621	435	13	42	230	69
25	Eastern South Coast Mountains	17	29,222	1,719	29	97	58	17
26	Central South Coast Mountains	18	39,857	2,214	40	133	45	14
27	Western South Coast Mountains	45	29,479	655	29	98	153	46
28	Eastern Vancouver Island	47	16,337	348	16	54	288	86
29	Western Vancouver Island	20	18,504	925	19	62	108	32
	TOTAL	459	958,673	2,089	959	3,196	48	14

TABLE 4.1.6: DENSITY OF SEDIMENT DISCHARGE SITES COMPARED TO WMO (1981) NETWORK CRITERIA FOR SEDIMENT DISCHARGE

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF 15% OF STREAM GAUGING NETWORK		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	1 STATION PER 6,700 km ²	1 STATION PER 2,000 km ²	1 STATION PER 6,700 km ²	1 STATION PER 2,000 km ²
1	Northern Coast Mountains	1	61,151	61,151	9	31	11	3
2	Stikine Plateau		55,219		8	28	0	0
3	Northern Rocky Mountains		112,548		17	56	0	0
4	Northern Interior Plains		79,107		12	40	0	0
5	Northern Central Uplands		31,312		5	16	0	0
6	Southern Interior Plains		34,995		5	17	0	0
7	Southern Rocky Mountain Foothills		23,032		3	12	0	0
8	Nechako Plateau	1	82,900	82,900	12	41	8	2
9	Southern Hazelton Mountains	1	15,437	15,437	2	8	43	13
10	Central Coast Mountains	1	52,058	52,058	8	26	13	4
11	Queen Charlotte Islands		10,860		2	5	0	0
12	McGregor Basin	1	14,960	14,960	2	7	45	13
13	Upper Fraser Basin		14,637		2	7	0	0
14	Northern Columbia Mountains		43,550		7	22	0	0
15	Fraser Plateau		83,121		12	42	0	0
16	Southern Quesnel Highland		8,599		1	4	0	0
17	Northern Thompson Plateau		6,739		1	3	0	0
18	Upper Columbia Basin		18,258		3	9	0	0
19	Upper Kootenay Basin		10,221		2	5	0	0
20	Central Kootenay Basin		13,038		2	7	0	0
21	Lower Kootenay Basin		10,276		2	5	0	0
22	Lower Columbia Basin		20,694		3	10	0	0
23	Okanagan Highland		9,941		1	5	0	0
24	Southern Thompson Plateau		12,621		2	6	0	0
25	Eastern South Coast Mountains		29,222		4	15	0	0
26	Central South Coast Mountains		39,857		6	20	0	0
27	Western South Coast Mountains	7	29,479	4,211	4	15	159	47
28	Eastern Vancouver Island		16,337		2	8	0	0
29	Western Vancouver Island		18,504		3	9	0	0
	TOTAL	12	958,673	79,889	143	479	8	3

TABLE 4.1.7: DENSITY OF COMBINED MSC, MOT AND BCFS CLIMATE STATIONS COMPARED TO WMO (1981) NETWORK CRITERIA FOR PRECIPITATION

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	1 STATION PER 250 km ²	1 STATION PER 100 km ²	1 STATION PER 250 km ²	1 STATION PER 100 km ²
1	Northern Coast Mountains	18	61,151	3,397	245	612	7	3
2	Stikine Plateau	12	55,219	4,602	221	552	5	2
3	Northern Rocky Mountains	13	112,548	8,658	450	1125	3	1
4	Northern Interior Plains	8	79,107	9,888	316	791	3	1
5	Northern Central Uplands	3	31,312	10,437	125	313	2	1
6	Southern Interior Plains	13	34,995	2,692	140	350	9	4
7	Southern Rocky Mountain Foothills	17	23,032	1,355	92	230	18	7
8	Nechako Plateau	50	82,900	1,658	332	829	15	6
9	Southern Hazelton Mountains	2	15,437	7,719	62	154	3	1
10	Central Coast Mountains	39	52,058	1,335	208	521	19	7
11	Queen Charlotte Islands	3	10,860	3,620	43	109	7	3
12	McGregor Basin	6	14,960	2,493	60	150	10	4
13	Upper Fraser Basin	13	14,637	1,126	59	146	22	9
14	Northern Columbia Mountains	44	43,550	990	174	436	25	10
15	Fraser Plateau	95	83,121	875	332	831	29	11
16	Southern Quesnel Highland	8	8,599	1,075	34	86	23	9
17	Northern Thompson Plateau	9	6,739	749	27	67	33	13
18	Upper Columbia Basin	25	18,258	730	73	183	34	14
19	Upper Kootenay Basin	7	10,221	1,460	41	102	17	7
20	Central Kootenay Basin	21	13,038	621	52	130	40	16
21	Lower Kootenay Basin	16	10,276	642	41	103	39	16
22	Lower Columbia Basin	42	20,694	493	83	207	51	20
23	Okanagan Highland	20	9,941	497	40	99	50	20
24	Southern Thompson Plateau	33	12,621	382	50	126	65	26
25	Eastern South Coast Mountains	24	29,222	1,218	117	292	21	8
26	Central South Coast Mountains	21	39,857	1,898	159	399	13	5
27	Western South Coast Mountains	69	29,479	427	118	295	59	23
28	Eastern Vancouver Island	79	16,337	207	65	163	121	48
29	Western Vancouver Island	34	18,504	544	74	185	46	18
TOTAL		744	958,673	1,289	3,835	9,587	19	8

TABLE 4.1.8: STATION DENSITY SUMMARY AS A PERCENTAGE OF RECOMMENDED WMO (1981) NETWORK CRITERIA

ZONE	NAME OF ZONE	NUMBER OF STATIONS AS A PERCENTAGE OF WMO CRITERIA												
		Climate Stations		Snow Course		Snow Pillows		Evaporation	Active Hydrometric		Sediment Discharge		MSC, MOF & MOT Climate Stations	
		A	B	A	B	A	B	A	A	B	A	B	A	B
1	Northern Coast Mountains	1	2	13	20	7	10	0	5	16	3	11	3	7
2	Stikine Plateau	1	2	18	27	0	0	0	4	13	0	0	2	5
3	Northern Rocky Mountains	0	0	27	40	7	11	0	3	11	0	0	1	3
4	Northern Interior Plains	0	1	3	4	0	0	0	2	8	0	0	1	3
5	Northern Central Uplands	0	0	26	38	26	38	0	1	3	0	0	1	2
6	Southern Interior Plains	2	4	11	17	0	0	0	9	31	0	0	4	9
7	Southern Rocky Mountain Foothills	3	8	52	78	9	13	0	12	39	0	0	7	18
8	Nechako Plateau	2	6	48	72	7	11	60	14	47	2	8	6	15
9	Southern Hazelton Mountains	0	0	52	78	26	39	0	17	58	13	43	1	3
10	Central Coast Mountains	5	13	12	17	4	6	0	5	17	4	13	7	19
11	Queen Charlotte Islands	3	7	0	0	0	0	0	14	46	0	0	3	7
12	McGregor Basin	0	0	107	160	13	20	0	8	27	13	45	4	10
13	Upper Fraser Basin	3	9	96	143	27	41	0	12	41	0	0	9	22
14	Northern Columbia Mountains	3	6	78	117	32	48	115	14	48	0	0	10	25
15	Fraser Plateau	5	13	58	87	7	11	60	14	47	0	0	11	29
16	Southern Quesnel Highland	2	6	47	70	23	35	0	35	116	0	0	9	23
17	Northern Thompson Plateau	3	7	59	89	0	0	0	45	148	0	0	13	33
18	Upper Columbia Basin	5	14	120	181	22	33	0	20	66	0	0	14	34
19	Upper Kootenay Basin	1	2	39	59	0	0	0	9	29	0	0	7	17
20	Central Kootenay Basin	9	23	92	138	15	23	383	18	61	0	0	16	40
21	Lower Kootenay Basin	7	17	156	234	39	58	0	53	175	0	0	16	39
22	Lower Columbia Basin	7	18	164	246	19	29	0	32	106	0	0	20	51
23	Okanagan Highland	9	23	161	241	60	91	0	36	121	0	0	20	50
24	Southern Thompson Plateau	16	40	190	285	16	24	0	69	230	0	0	26	65
25	Eastern South Coast Mountains	2	6	82	123	27	41	0	17	58	0	0	8	21
26	Central South Coast Mountains	3	8	60	90	25	38	125	14	45	0	0	5	13
27	Western South Coast Mountains	22	54	41	61	20	31	0	46	153	47	159	23	59
28	Eastern Vancouver Island	40	99	86	129	12	18	612	86	288	0	0	48	121
29	Western Vancouver Island	15	38	43	65	11	16	0	32	108	0	0	18	46
All British Columbia		4	10	48	72	12	18	37	14	48	3	8	8	19

A - based on WMO's higher station density criteria - see Section 4.1 text. **B** - based on WMO's lower station density criteria - see Section 4.1 text.

Percentage of WMO's more lenient station density criterion:

 <10%

 10 to <25%

 25 to <50%

 ≥50%

TABLE 4.2.1: DENSITY OF MSC REFERENCE CLIMATOLOGICAL STATIONS COMPARED TO WMO (1996) CRITERIA FOR REFERENCE CLIMATOLOGICAL STATIONS MEASURING TEMPERATURE & PRECIPITATION

ZONE	NAME OF ZONE	NUMBER OF STATIONS	BASIN AREA (km ²)	STATION DENSITY	NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF		PRESENT STATION DENSITY AS % OF RECOMMENDED WMO STATION DENSITY	
				(km ² /STATION)	2 STATIONS PER 250,000 km ²	10 STATIONS PER 250,000 km ²	2 STATIONS PER 250,000 km ²	10 STATIONS PER 250,000 km ²
1	Northern Coast Mountains	0	61,151		0.5	2.4	0	0
2	Stikine Plateau	1	55,219	55,219	0.4	2.2	226	45
3	Northern Rocky Mountains	1	112,548	112,548	0.9	4.5	111	22
4	Northern Interior Plains	1	79,107	79,107	0.6	3.2	158	32
5	Northern Central Uplands	0	31,312		0.3	1.3	0	0
6	Southern Interior Plains	1	34,995	34,995	0.3	1.4	357	71
7	Southern Rocky Mountain Foothills	0	23,032		0.2	0.9	0	0
8	Nechako Plateau	6	82,900	13,817	0.7	3.3	905	181
9	Southern Hazelton Mountains	0	15,437		0.1	0.6	0	0
10	Central Coast Mountains	6	52,058	8,676	0.4	2.1	1,441	288
11	Queen Charlotte Islands	0	10,860		0.1	0.4	0	0
12	McGregor Basin	0	14,960		0.1	0.6	0	0
13	Upper Fraser Basin	0	14,637		0.1	0.6	0	0
14	Northern Columbia Mountains	2	43,550	21,775	0.3	1.7	574	115
15	Fraser Plateau	4	83,121	20,780	0.7	3.3	602	120
16	Southern Quesnel Highland	0	8,599		0.1	0.3	0	0
17	Northern Thompson Plateau	0	6,739		0.1	0.3	0	0
18	Upper Columbia Basin	1	18,258	18,258	0.1	0.7	685	137
19	Upper Kootenay Basin	0	10,221		0.1	0.4	0	0
20	Central Kootenay Basin	1	13,038	13,038	0.1	0.5	959	192
21	Lower Kootenay Basin	2	10,276	5,138	0.1	0.4	2,433	487
22	Lower Columbia Basin	2	20,694	10,347	0.2	0.8	1,208	242
23	Okanagan Highland	1	9,941	9,941	0.1	0.4	1,257	251
24	Southern Thompson Plateau	2	12,621	6,311	0.1	0.5	1,981	396
25	Eastern South Coast Mountains	0	29,222		0.2	1.2	0	0
26	Central South Coast Mountains	2	39,857	19,929	0.3	1.6	627	125
27	Western South Coast Mountains	1	29,479	29,479	0.2	1.2	424	85
28	Eastern Vancouver Island	4	16,337	4,084	0.1	0.7	3,061	612
29	Western Vancouver Island	2	18,504	9,252	0.1	0.7	1,351	270
	TOTAL	40	958,673	23,967	8	38	522	104

TABLE 4.3.1: DENSITY OF COMBINED MSC CLIMATE TEMPERATURE AND PRECIPITATION STATIONS IN COMPARISON TO PROPOSED STATION DENSITIES NEEDED TO VERIFY GLOBAL AND REGIONAL CLIMATE MODELS

ZONE	NAME OF ZONE	PRESENT NUMBER OF STATIONS		BASIN AREA (km ²)	STATION DENSITY		NUMBER OF REQUIRED STATIONS TO MEET WMO STANDARD OF	PRESENT STATION DENSITY AS % OF CLIMATE MODEL CRITERIA	
		CLIMATE	TEMP. & PRECIP.		(km ² /STATION)			1 STATION PER 200 km ²	CLIMATE
					CLIMATE	TEMP. & PRECIP.			
1	Northern Coast Mountains	4	2	61,151	15,288	30,576	306	1	1
2	Stikine Plateau	5	1	55,219	11,044	55,219	276	2	0
3	Northern Rocky Mountains	1	1	112,548	112,548	112,548	563	0	0
4	Northern Interior Plains	2		79,107	39,554		396	1	0
5	Northern Central Uplands	0	1	31,312		31,312	157	0	1
6	Southern Interior Plains	6		34,995	5,833		175	3	0
7	Southern Rocky Mountain Foothills	7	2	23,032	3,290	11,516	115	6	2
8	Nechako Plateau	19	7	82,900	4,363	11,843	415	5	2
9	Southern Hazelton Mountains	0		15,437			77	0	0
10	Central Coast Mountains	28	9	52,058	1,859	5,784	260	11	3
11	Queen Charlotte Islands	3		10,860	3,620		54	6	0
12	McGregor Basin	0		14,960			75	0	0
13	Upper Fraser Basin	5	1	14,637	2,927	14,637	73	7	1
14	Northern Columbia Mountains	11	2	43,550	3,959	21,775	218	5	1
15	Fraser Plateau	43	10	83,121	1,933	8,312	416	10	2
16	Southern Quesnel Highland	2	1	8,599	4,300	8,599	43	5	2
17	Northern Thompson Plateau	2	2	6,739	3,370	3,370	34	6	6
18	Upper Columbia Basin	10	1	18,258	1,826	18,258	91	11	1
19	Upper Kootenay Basin	1		10,221	10,221		51	2	0
20	Central Kootenay Basin	12	3	13,038	1,087	4,346	65	18	5
21	Lower Kootenay Basin	7	1	10,276	1,468	10,276	51	14	2
22	Lower Columbia Basin	15	1	20,694	1,380	20,694	103	14	1
23	Okanagan Highland	9	4	9,941	1,105	2,485	50	18	8
24	Southern Thompson Plateau	20	4	12,621	631	3,155	63	32	6
25	Eastern South Coast Mountains	7	2	29,222	4,175	14,611	146	5	1
26	Central South Coast Mountains	13	4	39,857	3,066	9,964	199	7	2
27	Western South Coast Mountains	64	15	29,479	461	1,965	147	43	10
28	Eastern Vancouver Island	65	13	16,337	251	1,257	82	80	16
29	Western Vancouver Island	28	10	18,504	661	1,850	93	30	11
TOTAL		389	97	958,673	06/26	9,883	4,793	8	2

TABLE 4.5.1: GCOS PROPOSED PARAMETERS FOR A GLOBAL HIERARCHICAL OBSERVING STRATEGY

PROPOSED CLIMATE-RELATED VARIABLES		
VEGETATION	RADIATION	CRYOSPHERIC PROPERTIES
Leaf Area Index (2, 3, 5)	Aerosol Thickness (2)	Glaciers and Ice Caps (3, 4)
Net Primary Productivity (2, 3)	Incoming Total Short-wave Radiation(2, 3)	Ice Sheet Mass Balance (3, 5)
Net Ecosystem Productivity (2)	Reflected Short-wave Radiation (2, 3)	Ice Sheet Surface Balance (3)
Above-ground Biomass (3)	Photosynthetically Active Radiation (2, 3)	Topography (3, 4, 5)
Below-ground Biomass (3)	Outgoing Long-wave Radiation (2, 3)	Permafrost Active Layer-Thickness (2, 3, 4)
Necromass (3)	Cloud Cover (3)	Permafrost Thermal State (3, 4)
Surface Roughness (2,3)	Tropospheric Ozone Thickness (2)	Sea Ice Concentration (5)
Spectral Vegetation Greenness Index (5)	HYDROLOGY	Sea Ice Motion (5)
Plant N, P and S Content (3,4)	Air Temperature (2, 3)	Sea Ice Extent (5)
Maximum Stomatal Conductance (2,3)	Vapour Pressure Deficit (2, 3)	Sea Ice Thickness (4)
SOIL PROPERTIES	Wind Speed (2, 3)	Snow Depth (2, 3)
Moisture Content (2, 3)	Evapotranspiration (2, 3)	Snow Water Equivalent (2, 3, 4)
Organic C, N, P and S (3, 4)	Discharge (2, 3)	Snowfall (3)
Total C, N, P and S (3, 4)	Surface Water Storage Fluxes (2, 3)	Snow Cover Area (5)
Bulk Density (3, 4)	Ground Water Storage Fluxes (2, 3)	Time of Lake and River Freeze and Thaw(3)
Particle Size Distribution (3, 4)	Precipitation (2, 3)	LAND COVER/USE AND DISTURBANCE
Surface State (3, 4)	Runoff to the Ocean (1, 2, 3)	Fire (5)
95% Rooting Depth Available P (3, 4)	BIOGEOCHEMISTRY	Land Cover (5)
Cation Exchange Capacity (3, 4)	Rain Chemistry (2, 3)	Land Use (4)
pH (3, 4)	Dissolved Organic C, N & P in Water (2, 3)	
TRACE GASES	Leaf Biomass BNF Plants (2, 3)	
Methane Fluxes (2)	Volcanic S Emissionsc (2)	
Carbon Dioxide Fluxes (2)	Fossil Fuel CO ₂ , N and S (2)	
	N & P Fertiliser Use (2)	

Note: Number in brackets refer to the tier where the variable would be measured (see text SECTION 4.5.1).

TABLE 4.6.1: PROBABILITY OF EXCEEDING DESIGN CRITERIA AS A FUNCTION OF PROJECT LIFESPAN

DESIGN CRITERIA	PROBABILITY OF EXCEEDING DESIGN CRITERIA (%)																
	ANTICIPATED PROJECT LIFESPAN (years)																
(average return period in years)	2	5	8	10	15	20	25	30	40	50	60	70	80	90	100	150	200
2	75	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
5	36	67	83	89	96	99	100	100	100	100	100	100	100	100	100	100	100
10	19	41	57	65	79	88	93	96	99	99	100	100	100	100	100	100	100
20	10	23	34	40	54	64	72	79	87	92	95	97	98	99	99	100	100
30	7	16	24	29	40	49	57	64	74	82	87	91	93	95	97	99	100
40	5	12	18	22	32	40	47	53	64	72	78	83	87	90	92	98	99
50	4	10	15	18	26	33	40	45	55	64	70	76	80	84	87	95	98
60	3	8	13	15	22	29	34	40	49	57	64	69	74	78	81	92	97
100	2	5	8	10	14	18	22	26	33	39	45	51	55	60	63	78	87
200	1.0	2	4	5	7	10	12	14	18	22	26	30	33	36	39	53	63
500	0.4	1.0	1.6	2	3	4	5	6	8	10	11	13	15	16	18	26	33
1000	0.2	0.5	0.8	1.0	1.5	2	2	3	4	5	6	7	8	9	10	14	18
1500	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2	3	3	4	5	5	6	6	10	12
2000	0.1	0.2	0.4	0.5	0.7	1.0	1.2	1.5	2	2	3	3	4	4	5	7	10

TABLE 5.1.1: ESSENTIAL CLIMATE VARIABLES, UN FRAMEWORK CONVENTION ON CLIMATE CHANGE (from http://www.wmo.ch/web/gcos/adequacy/Draft_Adequacy_Report.doc)

1. ATMOSPHERIC VARIABLES The following essential atmospheric variables are required over land, ice and sea	
1.1 Surface	1.2 Upper Atmosphere
Air temperature	Upper air temperature
Precipitation	Wind speed and direction
Air pressure	Humidity
Wind speed and direction	Clouds
Humidity	Earth radiation budget
Radiation	Solar Irradiance
1.3 Atmospheric Composition	
Carbon dioxide	
Methane	
Ozone	
Other long-lived greenhouse gases *1	
Aerosols	

*1 Including nitrous oxide (N₂O), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), sulfur hexafluoride (SF₆), and perfluorocarbons (PFCs).

2. OCEAN VARIABLES	
2.1 Surface	2.2 Sub-surface
Sea-surface temperature	Temperature
Sea-surface salinity	Salinity
Sea-level	Circulation
Wave characteristics	Nutrients
Sea ice	Carbon
Circulation	Ocean tracers
Ocean colour (for biological activity)	Phytoplankton
Air/sea exchange (fluxes) of water, momentum, heat and gases especially carbon dioxide	

3. TERRESTRIAL	
Snow-cover	Albedo
Glaciers and ice caps	Fraction of absorbed photosynthetically active radiation
Permafrost layer	Leaf Area Index
River discharge	Surface temperature
Water use	Fire disturbance
Ground water	Land cover
Lake levels	Biomass

TABLE 5.1.2: GCOS CLIMATE MONITORING PRINCIPLES

Effective monitoring systems for climate should adhere to the following principles: *1	
1	The impact of new systems or changes to existing systems should be assess prior to implementation.
2	A suitable period of overlap for new and old observing systems is required.
3	The details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data (i.e. metadata) should be documented and treated with the same care as the data themselves.
4	The quality and homogeneity of data should be regularly assessed as a part of routine operations.
5	Consideration of the needs for environmental and climate-monitoring products and assessments, such as IPCC assessments, should be integrated into national, regional and global observing priorities.
6	Operation of historically-uninterrupted stations and observing systems should be maintained.
7	High priority for additional observations should be focussed on data-poor regions, poorly-observed parameters, regions sensitive to change, and key measurements with inadequate temporal resolution.
8	Long-term requirements should be specified to network designers, operations and instrument engineers at the outset of system design and implementation.
9	The conversion of research observing systems to long-term operations in a carefully-planned manner should be promoted.
10	Data management systems that facilitate access, use and interpretation of data and products should be included as essential elements of climate monitoring systems.
Furthermore, satellite systems for monitoring climate should adhere to the following specific principles:	
11	Rigorous stations-keeping should be maintained to minimize orbital drift.
12	Overlapping observations should be ensured for a period sufficient to determine inter-satellite biases.
13	Satellites should be replaced within their projected operational lifetime (rather than on failure) to ensure continuity (or in-orbit replacements should be maintained).
14	Rigorous pre-launch instrument characterization and calibration should be ensured.
15	Adequate on-board calibration and means to monitor instrument characteristics in space should be considered.
16	Development and operational production of priority climate products should be ensured.
17	Systems needed to facilitate user access to climate products, metadata and raw data, including key data for delayed-mode analysis, should be established and maintained.
18	Continuing use of still-functioning baseline instruments on otherwise de-commissioned satellites should be considered.
19	The need for complementary in-situ baseline observations for satellite measurements should be appropriately recognized.
20	Network performance monitoring systems to identify both random errors and time-dependent biases in satellite observations should be established.

1 The ten basic principles were adopted (in paraphrased form) by the Conference of the Parties to the UN Framework Convention on Climate Change through Decision 5/CP.5 of COP-5 at Bonn in November, 1999. The entire set was endorsed by WMO EC-LIV and is undergoing final review prior to submission to WMO Congress in May 2003.