

MINISTRY OF TRANSPORT



NEW ZEALAND METEOROLOGICAL SERVICE

SUPPLEMENT ONE

TO

# Rainfall Normals for New Zealand 1941 to 1970

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THE COOK GROUP, PITCAIRN ISLAND, NIUE ISLAND  
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## SUPPLEMENT ONE

### RAINFALL NORMALS FOR NEW ZEALAND

1941 to 1970

#### Introduction

This publication is a supplement to N.Z. Met. S. Misc. Pub. 145 "Rainfall Normals for New Zealand 1941 to 1970". It contains rainfall normals for 160 stations. These stations are of two sorts; firstly those which record rainfall in octapent storage gauges which are read at intervals of several weeks, and secondly, ordinary daily rainfall stations which had less than five years of records at December 1970 but had reached five years by December 1973.

#### Computational Method

The normals were computed in a similar manner to those in the original publication and the same set of 341 base stations was used for estimating the 1941 to 1970 average rainfalls. However, in this case the comparisons were made by simple regressions between appropriate base stations and the stations whose normals were to be computed. Each station was compared with a number of base stations in this way, and the comparison having the lowest standard error of the estimate was used provided the corresponding 90% confidence interval about the estimate was less than  $\pm 10\%$  of the estimate. In a few of the cases with octapent stations this criteria had to be relaxed slightly because the isolated nature of the stations made it impossible to find 'good' base stations for the comparisons.

#### Interpretation of the Normals

The normals in this publication are all estimates and are based on a minimum of five years records from each station. In all cases all available records were used. Apart from the octapent stations the stations are generally fairly new ones with relatively short periods of accumulated records and are all either Type 2 or Type 3. The interpretation of these Types is the same as in the original publication.

To identify the octapent stations they have been classified as Type 5. Monthly estimated normals are not available for these stations because of the irregular intervals at which the gauges are read. At some of these stations this irregular reading also makes total annual rainfalls difficult to estimate. This introduces an unknown, though probably less than 2%, error into their estimated normals. Though their normals are given to the nearest millimetre it is recommended that for most purposes normals below 1000 mm be rounded to the nearest 10 mm, those from 1000 mm to 2000 mm be rounded to the nearest 20 mm and those over 2000 mm be rounded to the nearest 50 mm. Such rounding will also make some allowance for the difficulty of finding good comparisons in high rainfall mountainous areas.

All the annual normals in the original publication and in this supplement have been incorporated in draft isohyetal maps of New Zealand on a scale of 1:500,000. Though this has been done as part of the checking routine following the computations, the maps will shortly be redrafted and copies will be available on this scale for sections of the country or on a much smaller scale for the whole country.

#### Amended Rainfall Normals

The original publication of 1850 normals did contain some poor estimates and these are amended in this supplement. Station D87181 Mount Arowhana, D97003 Glenfarg Station and H31592 Woodlands are the ones concerned.

#### Acknowledgement

This supplement was prepared under the direction of Mr A. I. Tomlinson. The computer programs were written by members of the E. D. P. Section of the Climatology Branch.

KEY TO SYMBOLS USED IN TABLES

- \* - Signifies a climatological station
- Closed - Signifies a station closed prior to December 1970
- Type 1 - A station with a complete good quality record from 1941 to 1970
- Type 2 - A station with an incomplete record but high confidence in the estimated values given.
- Type 3 - A station with an incomplete record and only medium confidence in the estimated values given.
- Type 4 - A station with an incomplete record and low confidence in the estimated values given.
- Type 5 - A station with an octapent storage raingauge.

## NZ METEOROLOGICAL SERVICE RAINFALL NORMALS 1941-70. MILLIMETRES.

STATION	NUMBER	LAT S.	LONG	HT M.	TYPE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
NGATAKI CAPE VIEW	A43701	34 42	173 2E	37	2	60	66	62	86	117	156	157	156	99	105	68	56	1188
AUPOURI FOREST	*A53024	35 1	173 12E	69	2	61	88	79	116	135	155	150	138	103	133	92	80	1330
ORUAITI 2	A53062	35 1	173 36E	15	2	114	121	109	157	186	185	187	210	154	137	93	116	1769
KAITAIA	*A53123	35 7	173 16E	8	2	77	93	96	124	150	152	153	166	124	105	100	78	1418
MAUNGATANIWA	A53152	35 10	173 31E	572	5													2132
MT HIKURANGI	A53592	35 32	173 55E	623	5													1740
HOROKAKA	A54812	35 52	174 8E	536	5													1764
CLAREN BRAE RUAWAI	A64112	36 8	174 7E	70	2	113	76	85	104	129	127	134	131	86	96	93	72	1246
PAKIRI SCHOOL	A64271	36 16	174 44E	6	2	77	109	130	85	132	166	156	176	116	94	82	74	1397
LEIGH	*A64282	36 16	174 48E	27	2	60	94	94	99	107	143	125	136	100	90	74	66	1188
ALBANY	A66772	36 45	174 43E	44	2	59	94	89	139	129	148	137	143	113	104	86	84	1325
HOBSONVILLE	A64864	36 48	174 40E	13	3	80	120	80	140	140	160	130	140	120	100	70	110	1390
STONY BAY	B65542	36 31	175 25E	5	2	135	119	163	211	157	221	162	182	145	198	108	100	1901
KOPU-HIKUAI ROAD	B75163	37 9	175 40E	369	5													2853
WHAREKAWA	*B75181	37 9	175 51E	15	2	109	113	150	177	182	188	180	189	153	131	104	122	1798
CLOSED																		
GOLDEN CROSS	B75372	37 20	175 47E	305	2	165	201	258	255	309	298	354	333	263	265	166	184	3051
TEN OAKS MANGAITI	B75462	37 29	175 40E	16	2	80	84	97	121	122	127	141	151	114	108	99	106	1350
WAIHI	B75481	37 28	175 52E	213	2	144	127	163	180	261	217	183	241	208	157	151	175	2207
TE ARIKI FALLS	B75782	37 45	175 53E	253	2	142	182	239	173	223	206	201	276	213	170	132	141	2298
MATAMATA NO2	B75873	37 49	175 46E	61	2	63	107	101	132	129	153	118	123	109	102	105	101	1343
TE PUNA	B76602	37 40	174 4E	27	2	95	94	136	136	168	137	144	147	117	118	99	115	1506
KAIATE FALLS	B76721	37 46	176 14E	229	2	128	129	162	127	183	160	124	187	135	137	116	159	1747
MCLAREN FALLS	B76802	37 48	176 2E	122	2	95	126	133	204	243	196	237	211	176	156	132	154	2063
OMANAHA	B76803	37 51	176 4E	274	2	100	116	139	190	236	194	285	236	184	216	151	185	2232
OROPI	B76811	37 49	176 11E	274	2	115	109	173	109	213	238	191	249	202	117	152	182	2050
TE PUKE MASSEYS REEF	B76823	37 50	176 15E	314	2	98	144	192	158	268	225	212	251	164	230	116	181	2239
RANGIURU RD.	B76834	37 53	176 18E	268	2	84	132	137	215	182	169	275	230	185	186	132	177	2104
PIKOWAI	B76861	37 52	176 39E	61	2	117	113	132	137	165	140	94	141	120	125	103	123	1510
MANGATOI ROAD TE PUKE	B76923	37 54	176 14E	366	2	110	147	151	178	337	219	341	245	203	248	168	194	2541
KAHAROA	B76932	37 58	176 19E	274	2	104	139	140	236	216	203	289	254	182	190	146	166	2265
TOKERAU	B76941	37 58	176 26E	259	2	111	134	161	154	245	142	153	203	154	139	129	163	1888
TE KAHA SCHOOL	B77764	37 44	177 41E	15	3	90	90	120	110	160	130	120	150	100	90	100	130	1390
MARAENUI SCHOOL	B77851	37 52	177 35E	46	2	67	131	118	124	147	159	91	144	94	133	90	98	1396
KINLEITH	*B85285	38 17	175 53E	383	2	104	123	93	98	146	193	120	131	137	152	134	121	1552
MAMAKU AIRSTRIP	B86002	38 2	176 0E	518	2	103	136	170	148	188	202	196	195	156	153	139	159	1945
LAKE ROTOITI	B86041	38 2	176 29E	280	2	149	174	165	136	189	237	222	214	181	207	143	190	2207
PARADISE VALLEY	B86112	38 8	176 9E	366	2	110	115	162	153	168	187	173	185	149	167	132	156	1857
LAKE OKAREKA	B86132	38 10	176 21E	354	5													1448
MATAHINA POWER STN	B86182	38 7	176 49E	15	2	100	131	140	141	180	158	195	191	129	165	113	157	1800
WAIOMAU	B86282	38 13	176 51E	91	2	104	120	143	130	176	159	200	182	158	113	103	128	1716
OHAKURI POWER STN	B86402	38 25	176 5E	295	2	78	80	103	98	121	139	127	124	116	123	117	126	1352
ATIAMURI POWER STN	*B86403	38 24	176 1E	253	2	81	83	93	107	128	141	122	128	115	125	125	122	1370
NGAHERIMAI HUT	B86591	38 30	176 58E	229	5													1813
TUTAEPUKEPUKE	B86592	38 32	176 54E	686	5													1856
TARAPUNAMU	B86681	38 37	176 52E	777	2	133	113	99	132	185	152	172	152	153	158	113	138	1700
RANGITAIKI	B86942	38 54	176 25E	610	3	120	190	110	150	160	190	230	170	160	170	170	220	2040
TAKAPUTAHU CAMP	B87151	38 6	177 34E	366	5													2714
OTIPI	B87161	38 7	177 37E	771	5													2882
WAIKATA	B87331	38 19	177 20E	213	2	160	72	136	116	206	173	157	193	164	248	140	164	1929
HUIARAU	B87601	38 38	177 3E	1097	5													2352
CAIES MARAMARUA 2	C75332	37 18	175 18E	61	2	113	116	73	129	137	152	130	142	121	126	96	120	1455
MANGAKAHU VALLEY	C85741	38 45	175 25E	366	5													1259
MOTUROA	C95172	39 7	175 47E	732	5													2558
RUATITI	C95211	39 14	175 10E	335	5													1779
RUAPEHU SKI LIFT	C95252	39 15	175 34E	1753	5													4199
MANGATOETOE	C95271	39 13	175 47E	933	5													2497
MT DUNDAS	D05742	40 44	175 27E	1280	5													3644
ARETE HUT	D05743	40 46	175 27E		5													6069
CREEK JUNCTION HUT	D05744	40 47	175 29E		5													5515
CATTLE RIDGE	D05752	40 44	175 30E	1128	5													5807
NICHOLS HUT	D05831	40 49	175 23E	1128	5													4049
DORSET RIDGE	D05842	40 48	175 25E	1128	5													4347
MT HOLDSWORTH LODGE	D05944	40 54	175 29E	314	2	175	71	218	310	293	448	331	295	241	245	179	183	2989
SAYERS HUT	D05946	40 57	175 24E		5													2216
APIITI TRACK	D06011	40 5	176 7E	533	5													1875
ROTOWAI	D06072	40 0	176 43E	168	2	53	78	64	96	113	124	105	115	52	69	56	80	1007
WAIAWA STN, WHAREOMA	D06903	40 56	176 3E	24	2	48	47	68	79	127	117	114	123	73	70	56	70	992
KAIWAKA STN HOMEBURN	D15532	41 31	175 23E	107	2	90	98	160	143	203	214	188	211	99	94	94	83	1677
MOUNT AROMHANA	D87181	38 10	177 52E	732	2	118	100	127	183	217	215	231	258	198	167	158	152	2124
TUTAMOE STN	D87291	38 15	177 59E	678	2	108	178	215	156	211	160	218	205	131	113	116	138	1949
MAKAHU SADDLE	*D96241	39 17	176 24E	974	2	179	159	204	212	278	263	282	299	188	169	179	194	2608

## N2 METEOROLOGICAL SERVICE RAINFALL NORMALS 1941-70, MILLIMETRES

STATION	NUMBER	LAT S.	LONG	HT M.	TYPE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
SMITHS FARM	E05907	40 58	175 5E	351	5													2393
RENATA	E05911	40 58	175 10E	777	5													3161
PORIRUA	*E14185	41 8	174 51E	18	2	90	74	89	43	139	141	113	118	99	97	72	71	1166
PAUATANUI	*E14197	41 7	174 54E	30	2	89	84	86	64	159	154	114	108	92	94	82	70	1196
KARDRI, WELLINGTON	E14279	41 17	174 44E	152	2	83	108	110	116	159	157	166	162	117	132	98	91	1499
UPPER KARORI	E14373	41 18	174 44E	285	5													1525
UPPER WAKATIKEI	E15002	41 1	175 0E	245	5													1767
HUKINGA NO 1	E15004	41 3	175 3E	204	5													2030
SILVERSTREAM	E15108	41 9	175 0E	49	2	88	82	98	98	138	141	123	115	102	114	92	95	1286
MOUNT CLIMIE	E15113	41 9	175 9E	829	5													2371
LADLE BEND	E15121	41 8	175 12E	294	5													2244
SKULL GULLY	E15201	41 15	175 1E	162	5													2039
MT. MISTY	E15202	41 13	175 2E	625	5													1954
DEVINE	E15203	41 13	175 2E	610	5													1920
WHITEMANS VALLEY 2	E15204	41 12	175 1E	229	2	94	159	116	91	176	157	141	158	106	129	94	96	1517
ROMAN	E94412	39 24	174 6E	375	2	119	148	129	164	247	294	232	276	211	193	164	157	2334
NIKUHAU	E94661	39 36	174 40E	442	2	125	135	117	156	170	219	170	141	149	135	132	169	1818
PATBA	*E94743	39 43	174 28E	43	2	83	52	77	93	52	246	94	63	83	110	88	107	1148
WAVERLEY	E94751	39 46	174 35E	70	2	87	62	73	97	162	146	87	64	88	95	121	112	1194
TUFA KARIOI	E95361	39 20	175 39E	1135	5													2090
DESERT ROAD SUMMIT	E95371	39 18	175 44E	1052	5													2301
BURMA ROAD	E95372	39 19	175 47E	1323	5													2307
MOAHANGO NORTH	E95472	39 24	175 44E	959	5													1315
UTIKU SLIP	E95782	39 44	175 50E	366	5													1132
TE MANU	E95863	39 50	175 36E	418	5													1036
POUKIORE	E95864	39 52	175 37E	320	2	79	66	70	70	112	118	98	93	74	89	99	99	1067
MUNTERVILLE	E95933	39 54	175 32E	122	2	67	57	64	89	107	110	104	89	75	104	84	113	1063
PAKIHUKURA	E95971	39 58	175 44E	335	2	79	71	76	77	90	108	97	89	68	86	84	89	1014
LAKE SYLVESTER	F12161	41 6	172 37E	1320	5													2543
HOKITIKA GORGE	F21902	42 59	171 0E	82	5													6588
UPPER KOKATAHI	F21911	42 54	171 11E		5													4886
POX GLACIER	*F30402	43 28	170 1E	152	2	405	445	428	392	397	317	314	374	428	432	460	388	4780
CLARKE BLUFF	F39933	43 58	169 23E	76	5													3709
DEEP COVE	F57412	45 28	167 10E	9	5													4877
BRIGHTLANDS BAY	*G13081	41 4	173 51E	15	2	88	156	156	123	145	152	184	157	134	140	122	125	1682
POKOKINI	G13193	41 6	173 56E	30	2	114	158	132	146	158	141	165	156	150	150	159	133	1762
YEAL VALLEY	G13242	41 15	173 24E	91	2	101	129	127	145	147	132	144	164	132	127	124	107	1579
BRIGHTWATER	G13312	41 23	173 8E	46	2	76	84	92	104	105	94	101	101	84	95	79	79	1094
WAIROA GORGE NO3	G13406	41 27	173 5E	91	2	115	96	97	115	119	103	112	119	94	103	87	106	1266
TOP VALLEY	G13531	41 34	173 22E	1036	5													1546
BIRCH HILL	G13621	41 39	173 17E	290	2	82	83	85	109	122	84	103	109	93	84	94	88	1136
TAYLOR PASS	G13691	41 38	173 57E	631	5													685
MOUNT NOBLE	G13722	41 43	173 16E	1292	5													1001
BLACK BIRCH LOWER	G13784	41 44	173 48E	1067	5													1251
PICTON	G14204	41 17	174 1E	30	2	120	78	94	100	156	137	122	140	99	137	80	93	1356
TARNDALE	G22191	42 11	172 56E	991	5													848
WAIROA GORGE	G22193	42 6	172 55E	1036	5													1448
LAKE TENNYSON	G22271	42 13	172 45E	1109	5													1273
CLARENCE ACC HOUSE	G22391	42 23	172 58E	732	5													857
NGAIO-DOWNS	G23092	42 4	173 57E	24	2	87	44	55	66	87	69	75	61	51	55	54	70	774
REDGATE	G23101	42 8	173 3E	887	5													681
IMPHAL	G23182	42 6	173 51E	85	2	56	30	73	74	106	77	86	88	68	56	55	72	841
BIRCH HILL AIRSTRIP	H30712	43 47	170 8E	619	5													2118
SOUTH OPUHA	H30971	43 55	170 43E	762	5													1272
GLENARIFFE	H31331	43 19	171 22E	457	2	57	66	72	78	67	73	79	98	75	84	92	74	915
TAYLORS STREAM	H31541	43 34	171 26E	732	5													1601
WOODLANDS	H31592	43 32	171 58E	366	3	76	69	75	78	69	56	68	69	60	70	77	82	849
LAKE CLEARWATER	H31601	43 36	171 3E	686	5													872
WOOLSHED CREEK	H31631	43 36	171 19E	762	5													1193
LOCHARTS CREEK	H40261	44 14	170 38E	610	5													962
MT STUDHOLME	H40691	44 39	170 55E	1067	5													1160
SEADOWN	H41321	44 18	171 16E	11	2	56	51	51	45	47	31	39	36	36	44	53	64	553
TIMARU HARBOUR	*H41422	44 24	171 15E	17	2	58	61	57	49	49	36	42	40	41	47	56	67	603
DANSEY PASS	I40931	44 57	170 22E	935	5													745
GLADE HOUSE	I47992	44 56	167 56E	244	5													3005
GLEN FINNAN	I48581	44 30	168 50E	341	2	107	163	204	147	148	173	145	160	209	194	185	142	1977
KNOBS FLAT	I48903	44 58	168 2E	360	5													2433
CASCADE CREEK	I48904	44 54	168 5E	485	5													2747
HERBERT FOREST	*I50272	45 15	170 46E	61	2	64	52	78	56	53	40	62	43	51	52	87	66	704
HINDON FARM	*I50721	45 45	170 12E	455	2	68	46	64	66	43	35	28	38	35	48	57	61	589
WARRINGTON	I50761	45 43	170 36E	15	2	67	50	55	53	55	54	47	37	33	52	63	55	621
MT. CARGILL	I50858	45 49	170 33E	676	5													974
HIGHCLIFF	I50863	45 53	170 36E	322	2	89	70	92	87	86	80	71	55	57	59	79	83	908
GREEN ISLAND	I50943	45 54	170 25E	18	2	75	54	74	66	62	60	50	49	56	56	78	72	752
TE ANAU GLOW WORM CAVE	I5737A	45 18	167 44E	213	5													1809

CLOSED



