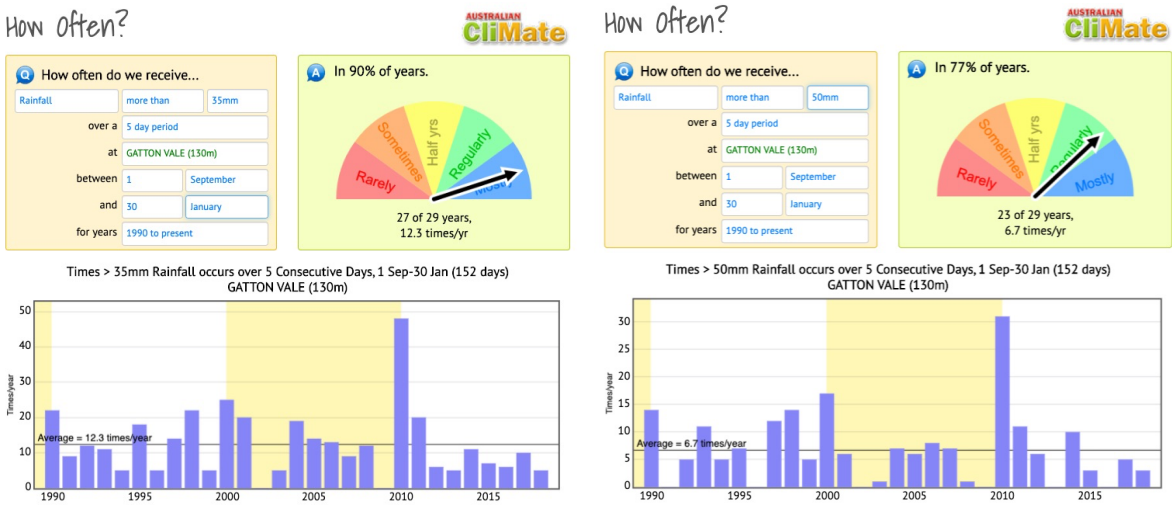
“Green date” in Australian CliMate

The Australian CliMate team have received requests around the concept of a “green date” or “key date”, a probabilistic estimate of when a season breaks or when a certain amount of grass production is likely. Typically, “green date” is phased as the date by when there is a specified chance of receiving >50 mm of rain over 3 days (after 1st September). Could this index be added to CliMate, similar to the RainMan analysis?

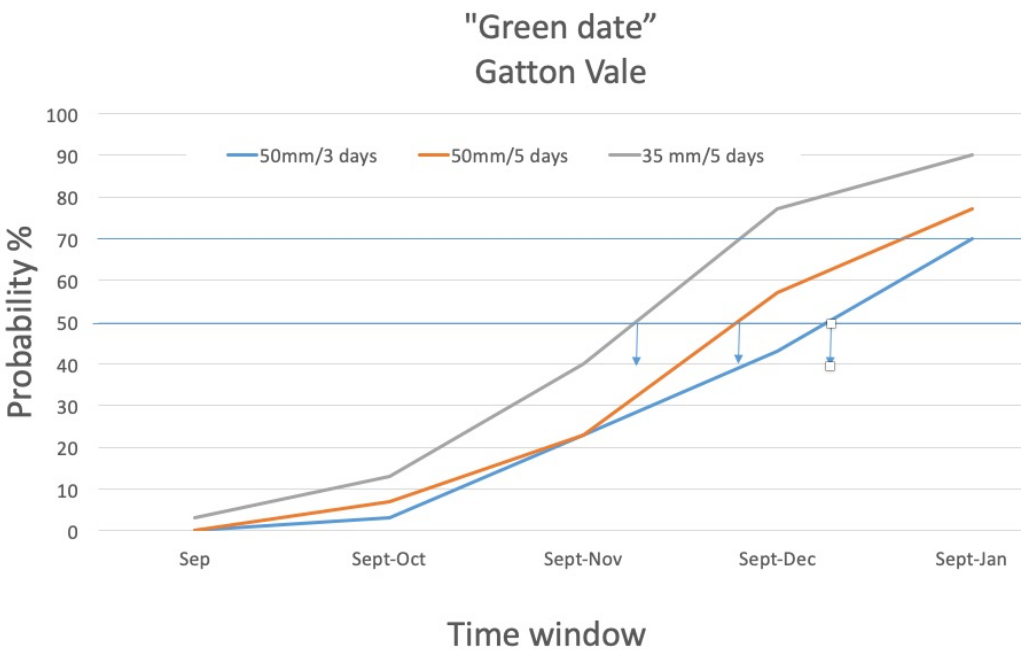
This note proposes this is not be necessary.

1. A “green date” analysis is already available in CliMate, but, the user needs to iteratively adjust start and end dates to approach an answer similar to that found in Rainman;
2. In this iterative search, the user will get a feel for the sensitivity of rules in the green date calculation (amount of rain in x days? probability) on the answer.
   It is unlikely a single “date” for a 70% chance of 50 mm over 3 days suits all years, soil types and risk profiles of decision makers?
   A recent evaluation of CliMate (Starasts 2018) found “*CliMate’s strength is its simplicity of use, its portability … enables users to interrogate historic and current seasonal weather data in relation to their own location … undertake their own risk assessments … contribute to and facilitate discussions and decisions making among farming businesses, between advisor and farmer and within farmer groups*”;
3. The current How Often? analysis allows exploration of rainfall probabilities in a flexible and efficient manner and provides a rich picture of how rain has fallen in the past, and sensitivity to the “green date” rules. By adjusting inputs, the user explores history and is better placed to understand the odds (probabilities) of a specified scenario. This all leads to a more thoughtful and interactive exploration of risk and can also be valuable in facilitating discussions.



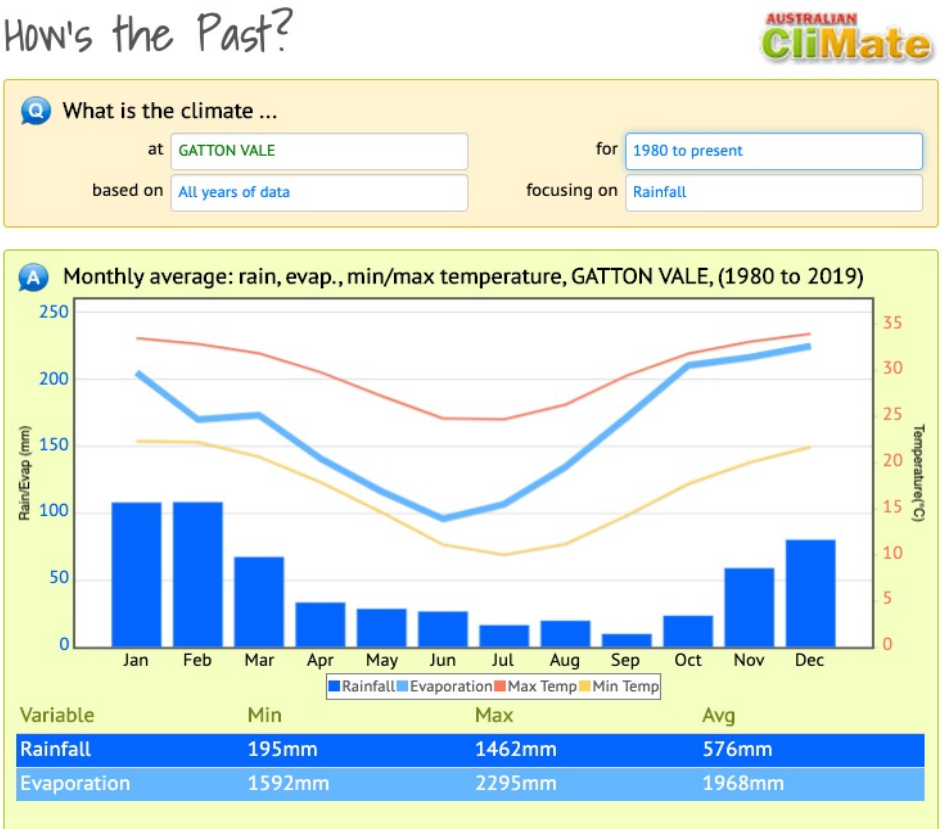
Output from two How Often? analyses (>35 mm in 5 days, 50 mm in 5 days) for Gatton Vale in Central Queensland

These analyses can be generalised for a location by plotting results from a series of How Often? analyses (see below).



Probability of rainfall for a series of time windows for Gatton Vale in Central Queensland.

A simpler analysis using monthly rainfall summaries is available in the *How's the past?* analysis. A monthly histogram highlights when the average break in season occurs, while the checkboard graphic shows monthly rainfall over a longer period in an eyeful.



Histogram of monthly rainfall for Gatton Vale in Central Queensland, showing seasonality of rainfall in relation to evaporation potential and minimum and maximum temperatures.

This checkerboard graphic allows for a quick scan over years and seasons to broadly assess hits and misses based on simple rules such as how often is there good rain in October? About 9 years out of 38 (24%) get >50mm by the end of October – not good odds!

Status: Hiding ENSO colouring

Monthly Rainfall Totals for GATTON VALE from 1980 to 2019

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980	195	32	47	18	65	0	11	25	0	17	8	54
1981	106	86	23	102	58	26	3	15	0	35	116	60
1982	78	0	96	15	0	0	0	0	5	0	0	24
1983	121	0	30	138	177	0	8	0	8	19	75	32
1984	110	25	78	0	0	0	78	0	19	55	173	103
1985	72	6	96	29	67	71	57	0	0	197	84	71
1986	46	36	0	27	30	8	27	21	17	25	9	30
1987	148	0	77	0	7	33	20	0	0	15	88	17
1988	90	109	241	45	15	14	43	18	0	0	85	156
1989	38	110	40	197	37	76	48	9	0	15	49	63
1990	0	5	181	79	157	97	18	0	0	8	16	274
1991	303	480	31	0	17	29	0	0	0	0	29	68
1992	65	86	28	0	34	18	0	0	70	7	5	91
1993	69	0	42	0	0	5	10	35	39	0	148	0
1994	91	66	188	0	22	0	0	0	0	5	14	22
1995	111	38	38	0	0	0	0	128	0	48	134	76
1996	66	23	0	7	22	9	0	0	13	5	46	33
1997	36	272	67	0	52	0	5	0	0	1	51	221
1998	17	150	0	2	26	24	0	237	8	73	184	74
1999	109	126	80	51	15	0	0	13	1	0	0	66
2000	33	250	18	67	24	58	0	0	0	93	143	150
2001	83	23	35	0	0	0	0	0	2	12	39	138
2002	162	59	45	0	2	8	0	19	6	0	3	14
2003	25	118	55	61	18	98	0	0	0	40	0	101
2004	52	89	0	16	4	0	7	0	0	29	90	72
2005	176	28	0	0	6	27	30	68	0	18	27	0
2006	157	27	38	94	15	35	16	0	9	0	7	48
2007	172	185	43	0	0	210	0	0	35	7	49	83
2008	249	479	17	0	0	0	104	0	45	0	41	52
2009	127	445	28	22	0	0	0	0	0	0	32	35
2010	90	137	125	16	0	0	0	121	56	38	226	423
2011	174	62	198	30	8	22	0	18	0	0	0	189
2012	156	63	188	81	41	23	88	0	0	0	30	9
2013	218	101	69	41	36	0	0	0	0	10	61	6
2014	108	85	30	17	0	15	0	11	8	0	24	123
2015	138	73	39	35	0	0	0	0	0	0	79	11
2016	71	170	44	0	21	131	52	17	27	34	38	29
2017	66	6	270	0	148	0	0	0	0	52	81	30
2018	56	161	15	25	0	0	0	0	0	44	4	69
2019	123	106	41	103	4	11	16					
Avgs	107.7	108.0	67.0	33.0	28.2	26.2	16.0	19.3	9.5	23.1	58.7	79.9

min:0mm avg:48mm max:480mm

Checkerboard graphic of monthly rainfall for Gatton Vale in Central Queensland. Note that months can be screened using their SOI status (top right).

References

Australian CliMate - climate analysis for decision makers (https://climateapp.net.au/)

Starasts, 2018 "Evaluation of CliMate App 2018 - A report for the Managing Climate Variability Program
https://climateapp.net.au/Uploads/Documents/EvaluationClimate2018.pdf

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