



North Wyke Farm Platform

DATA QUALITY AND SUMMARY STATISTICS

SOIL MOISTURE STATION DATA

Annual Report 2015

This report complements the data available on the data portal and is designed to help users by giving an overview of the quality and key statistics of the soil moisture station data.

Data Version: 3

Release date: 14 November 2018

Report produced on: 13 October 2020
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1 15 MINUTE DATA

1.1 Missing values

Catchments arranged from largest to smallest across the table (left to right) for each farmlet.

Variable	Catchment Number														
	Green					Blue					Red				
	4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Precipitation	3264	1388	2829	3081	0	180	939	6114	8562	0	0	0	4622	3944	0
Soil temperature (15cm)	4220	1452	2478	557	17	1093	256	6218	4966	9077	900	6401	4968	4980	1231
Soil moisture (10cm)	3265	1439	2462	810	4	1043	275	6194	3955	6531	930	0	4623	4478	1918

Table 1: Total number of missing values (out of 35039)

Variable	Catchment Number														
	Green					Blue					Red				
	4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Precipitation	9.3	4.0	8.1	8.8	0.0	0.5	2.7	17.4	24.4	0.0	0.0	0.0	13.2	11.3	0.0
Soil temperature (15cm)	12.0	4.1	7.1	1.6	0.0	3.1	0.7	17.7	14.2	25.9	2.6	18.3	14.2	14.2	3.5
Soil moisture (10cm)	9.3	4.1	7.0	2.3	0.0	3.0	0.8	17.7	11.3	18.6	2.7	0.0	13.2	12.8	5.5

Table 2: Total number of missing values as a percentage

1.1.1 Timesteps of missing 15 minute data

Data are in farmlet/catchment/triplet order with catchments arranged from largest to smallest down the page. Colour bars represent missing data.

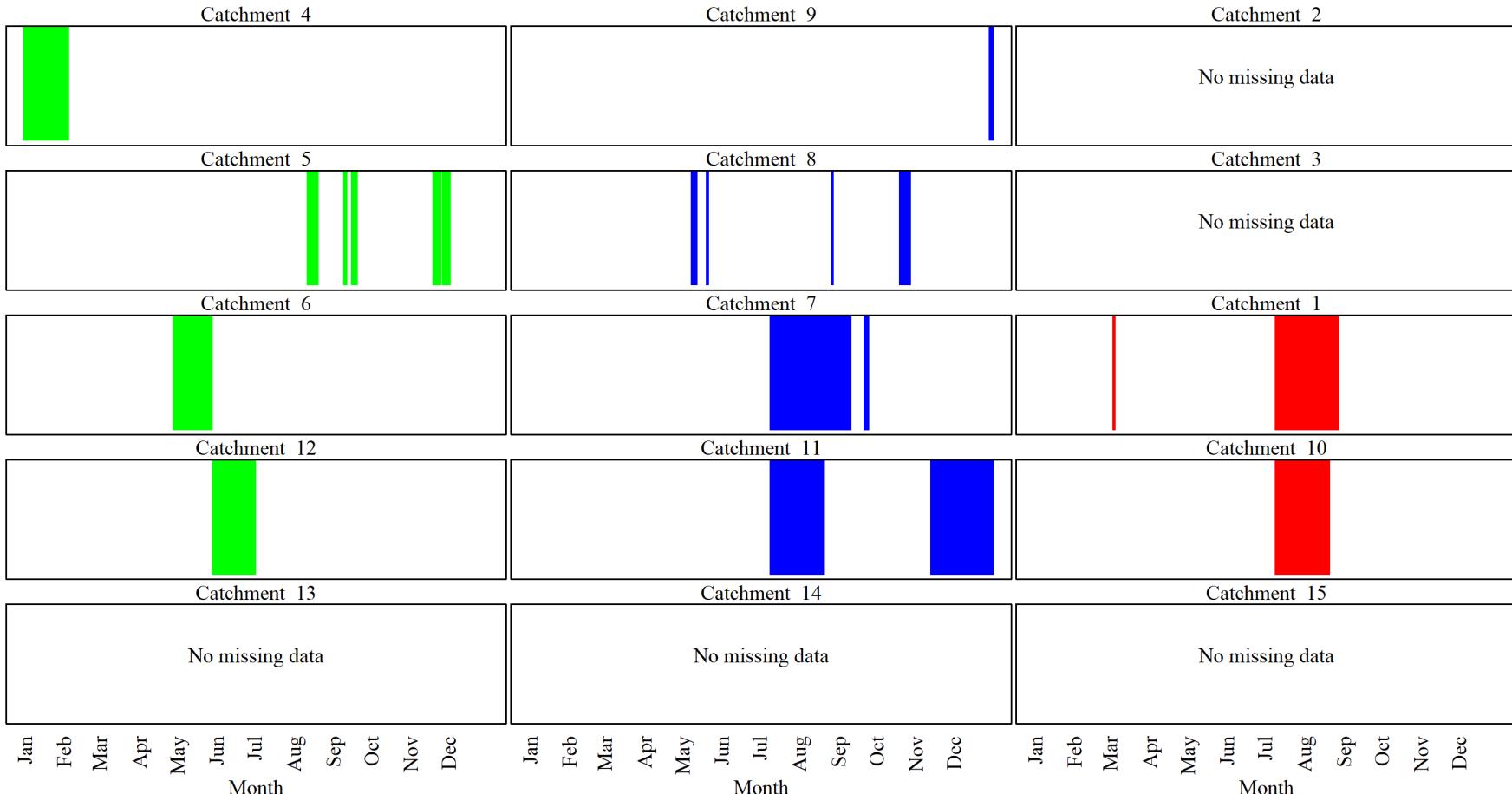
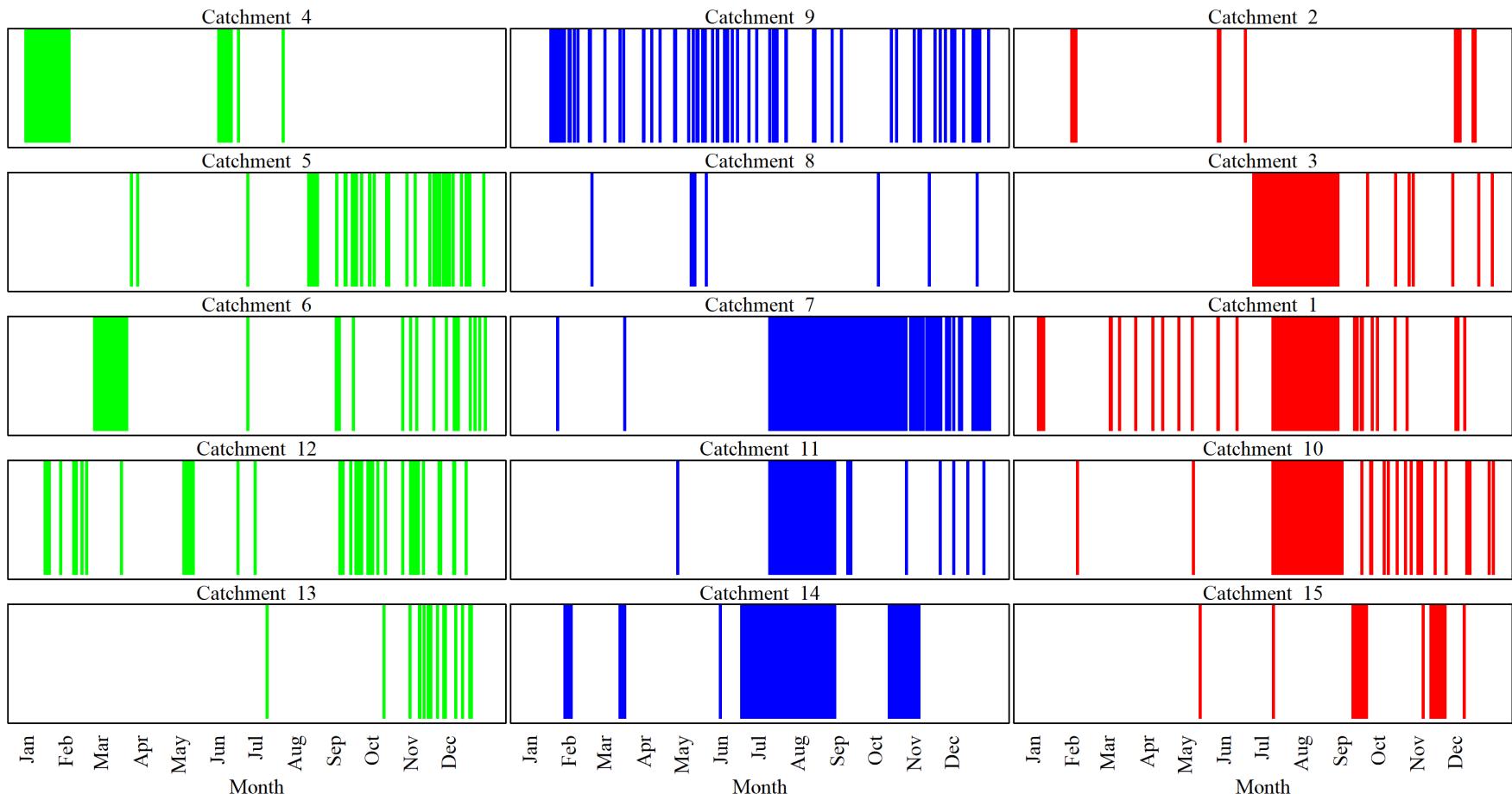
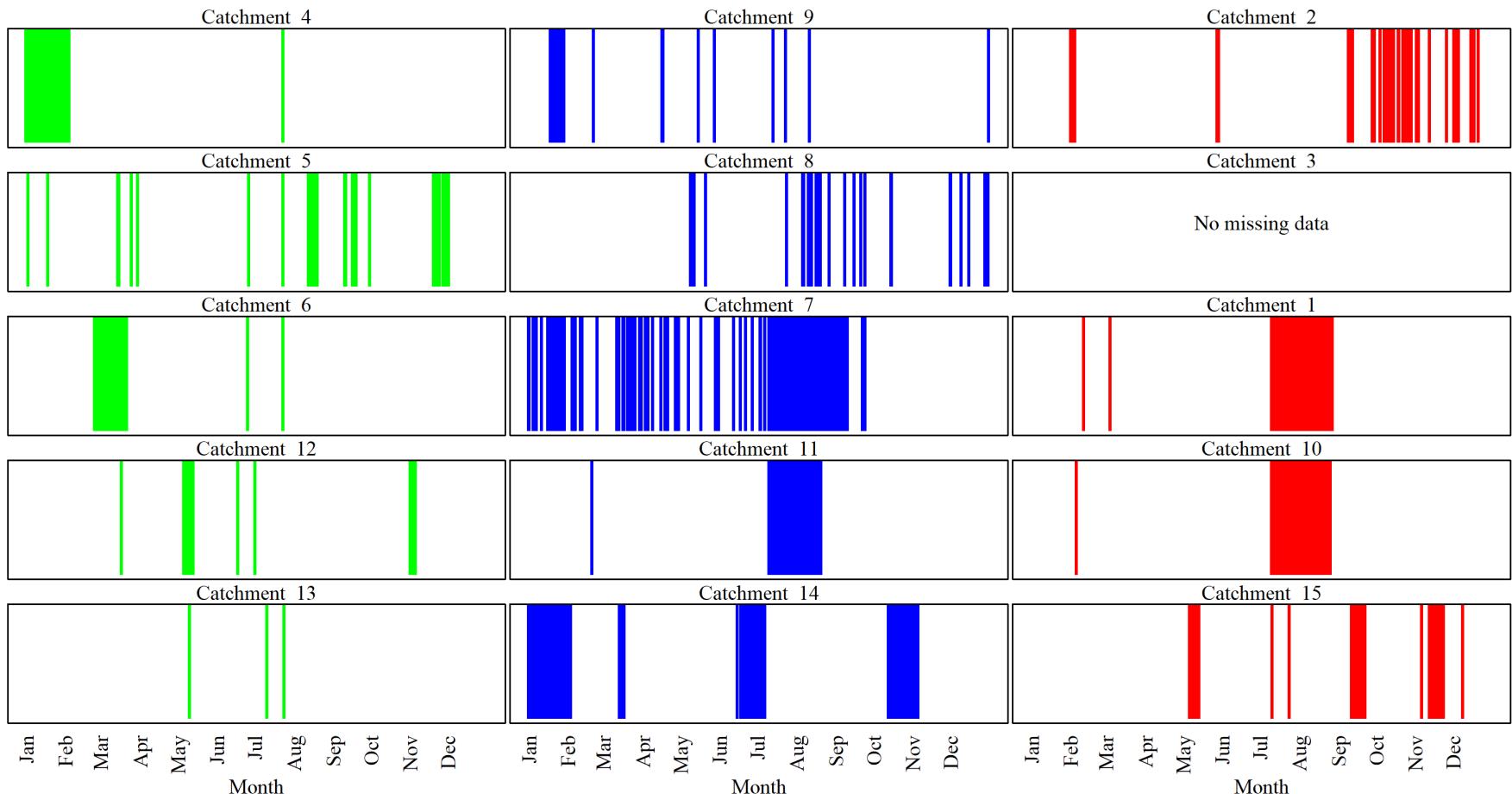


Figure 1: Timesteps of missing precipitation data

**Figure 2:** Timesteps of missing soil temperature (15cm) data

**Figure 3:** Timesteps of missing soil moisture (10cm) data

1.2 Histograms of 15 minute data distribution

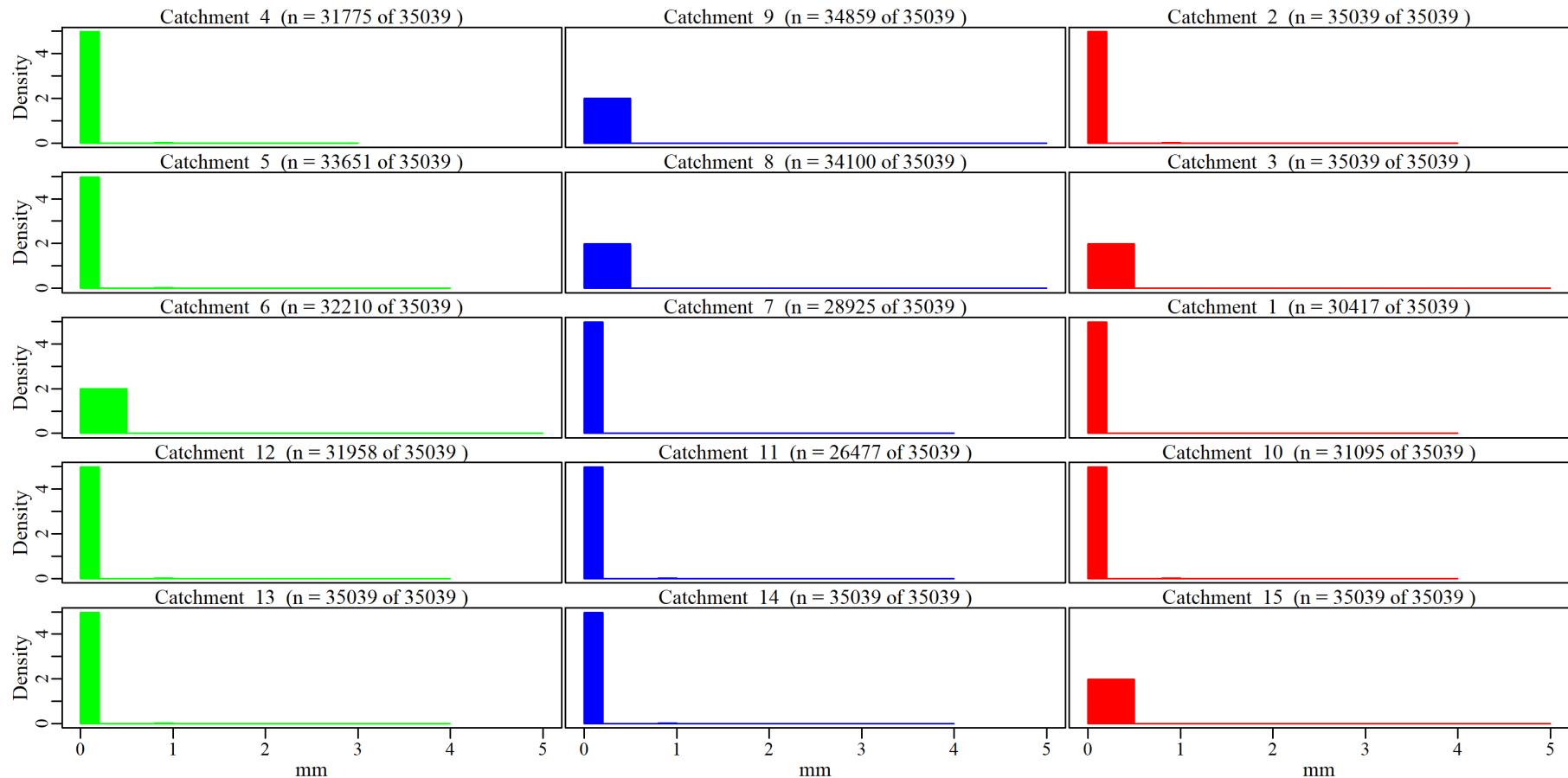


Figure 4: Distribution of precipitation data

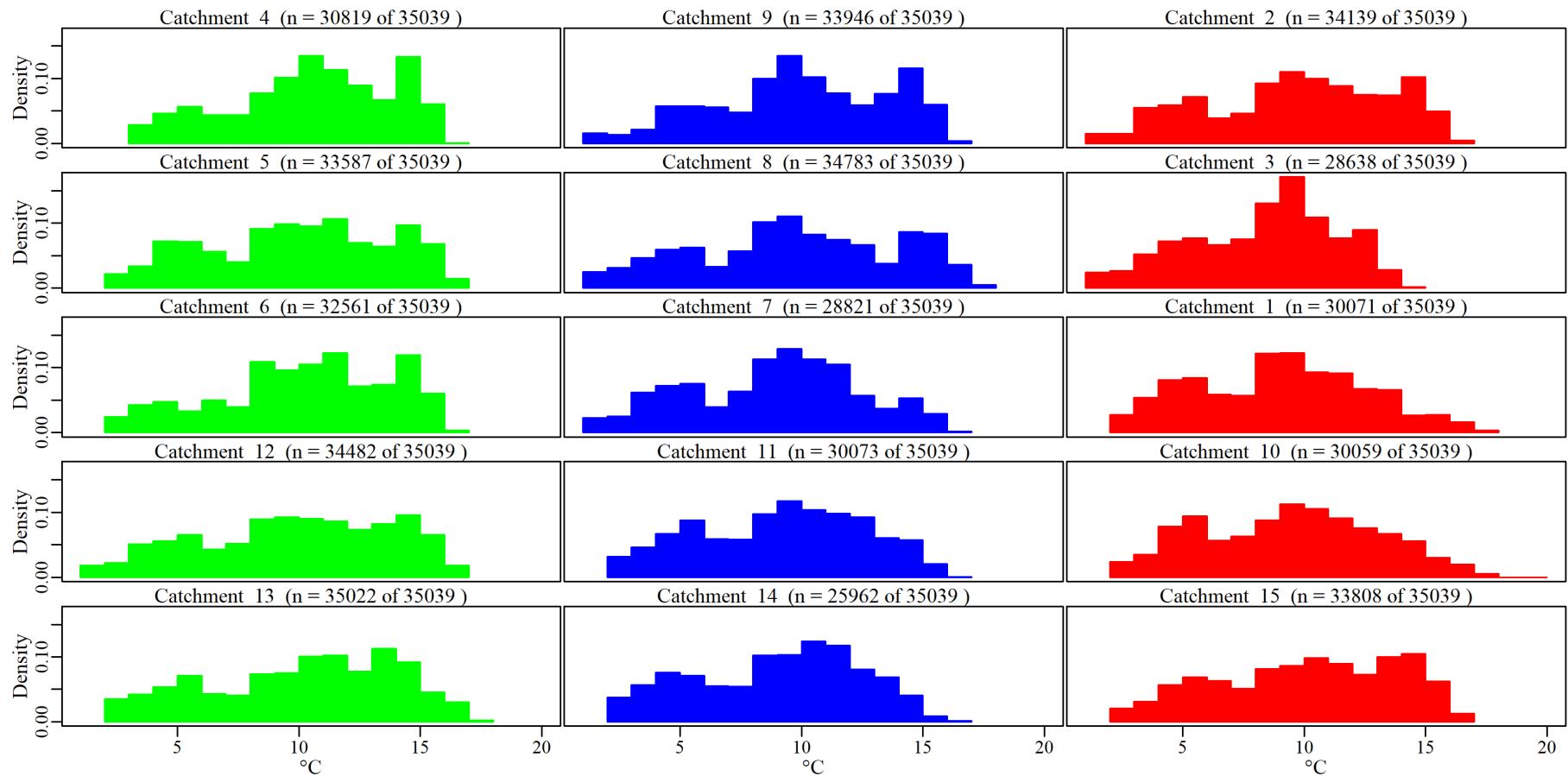


Figure 5: Distribution of soil temperature (15cm) data

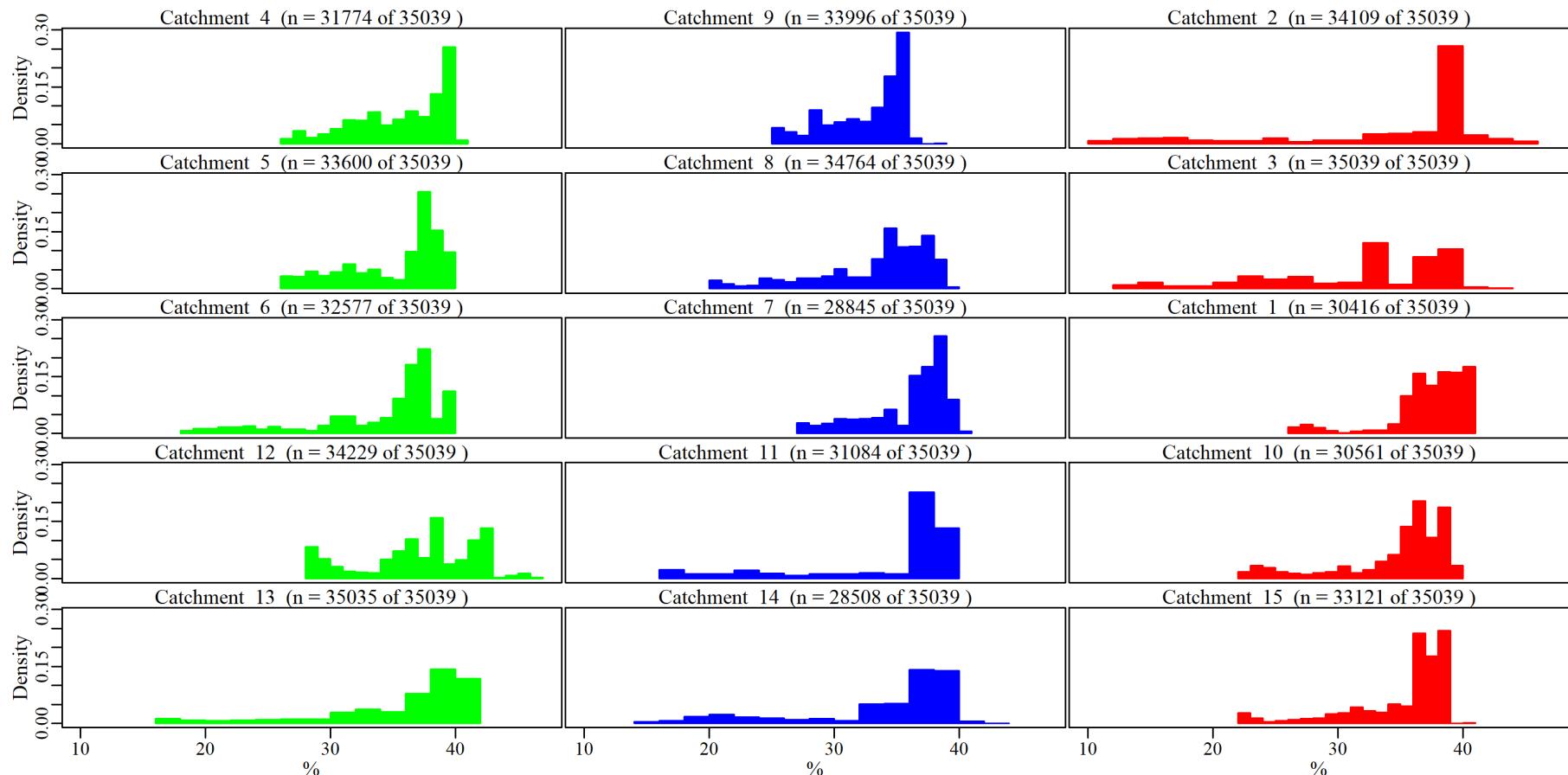


Figure 6: Distribution of soil moisture (10cm) data

1.3 Time series

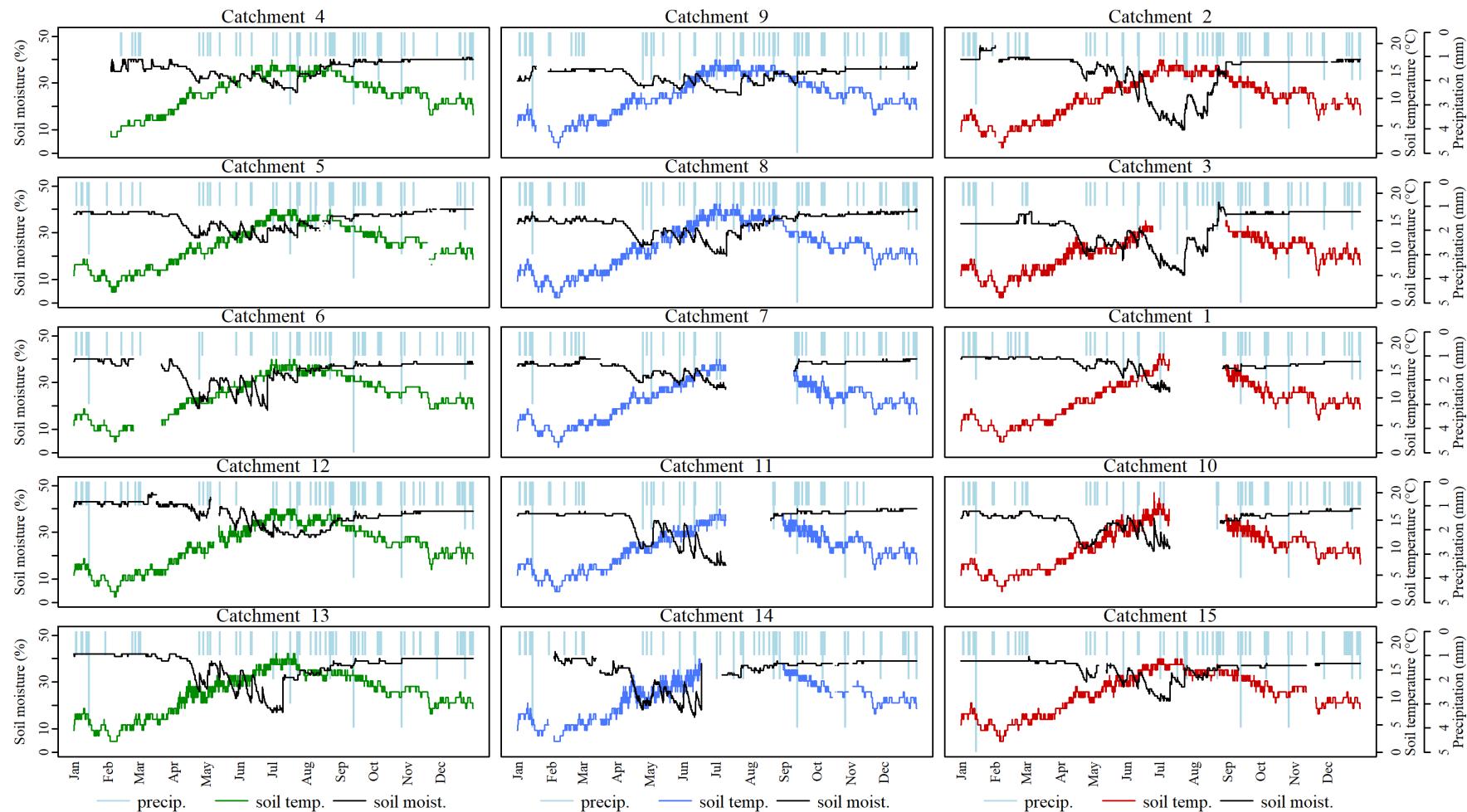


Figure 7: Time series for precipitation, soil temperature (15cm) and soil moisture (10cm)

1.4 Correlations

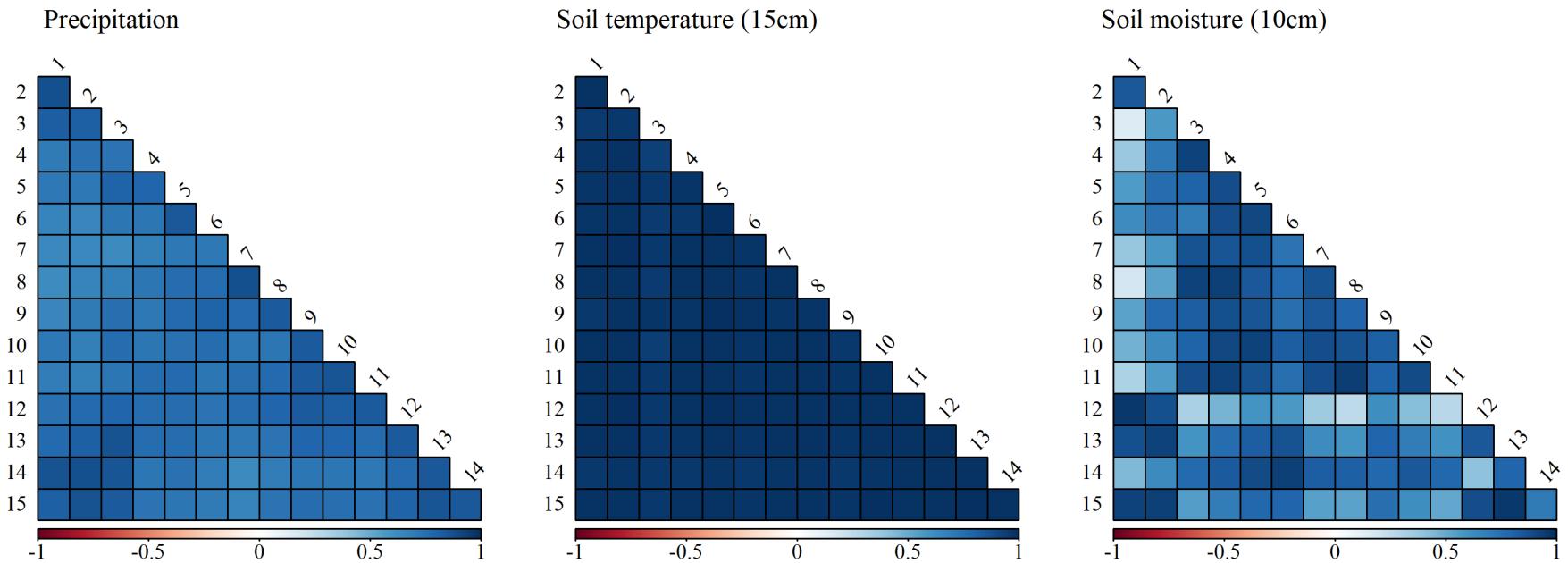


Figure 8: Correlations between catchments

2 MONTHLY SUMMARY

2.1 Means

Please be aware that the means are based on data that may contain missing values. Full data summaries are available on request.

Vertical lines = positive standard error of the mean. Values above bars = number of observations.

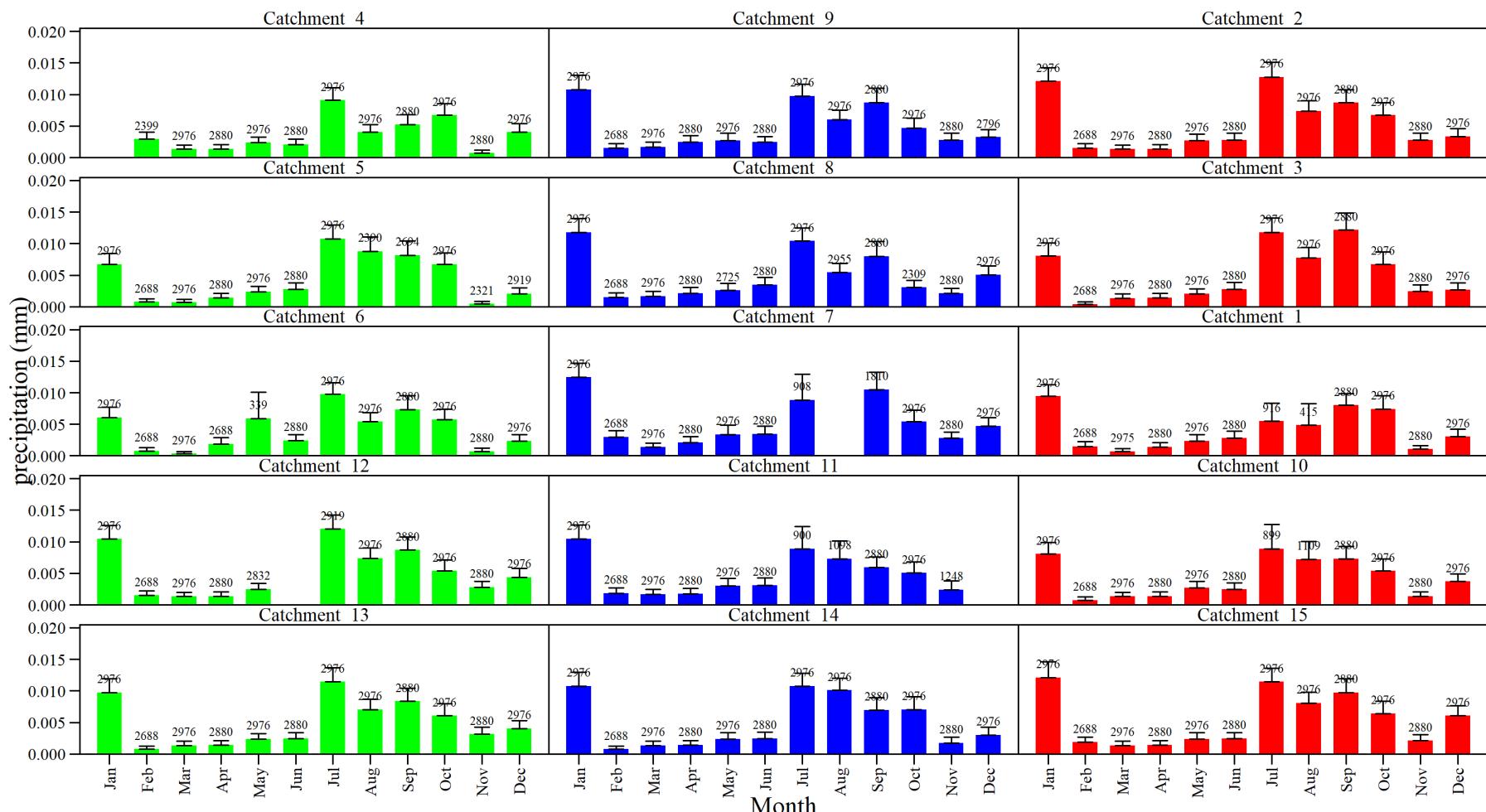
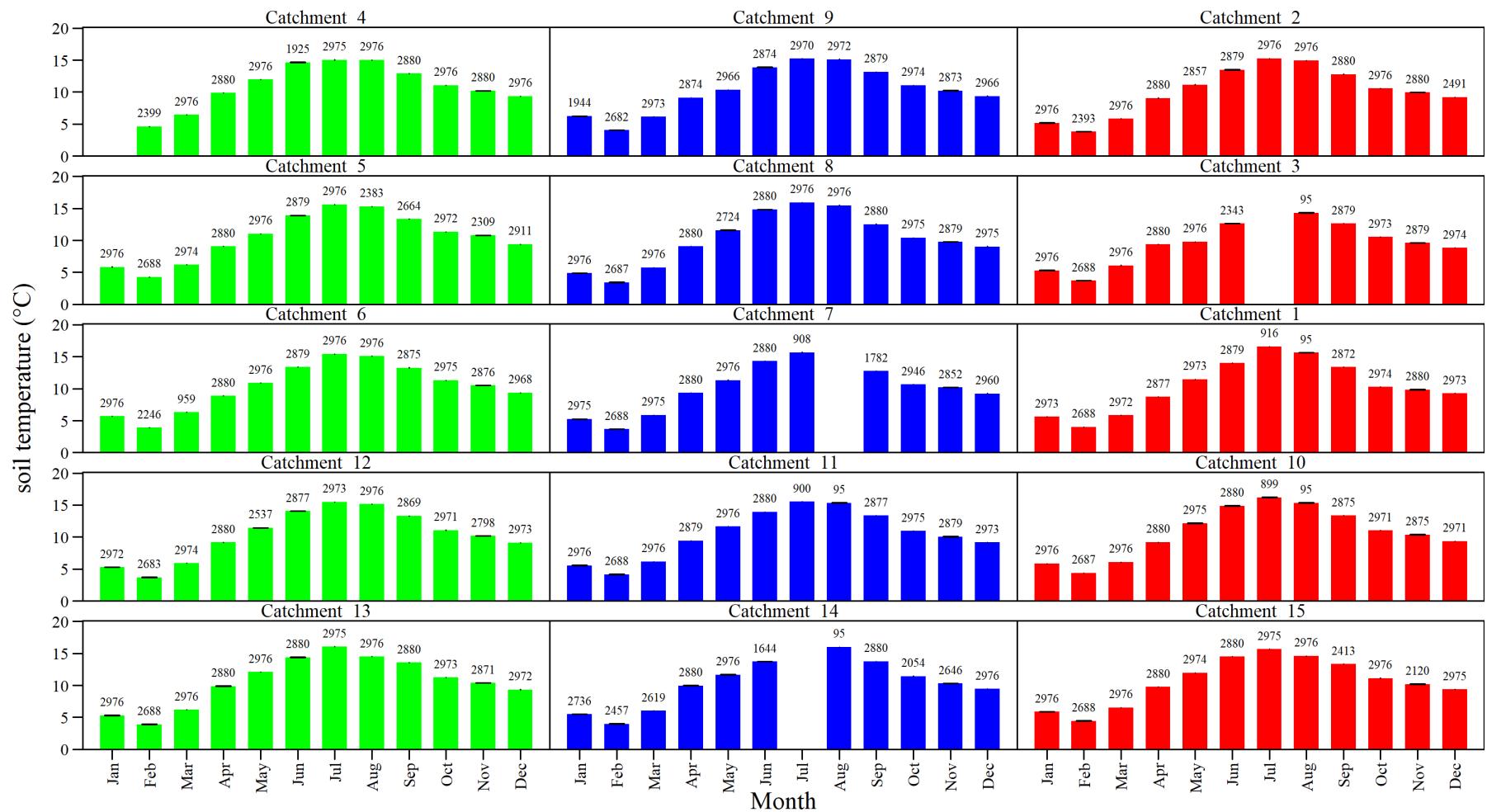
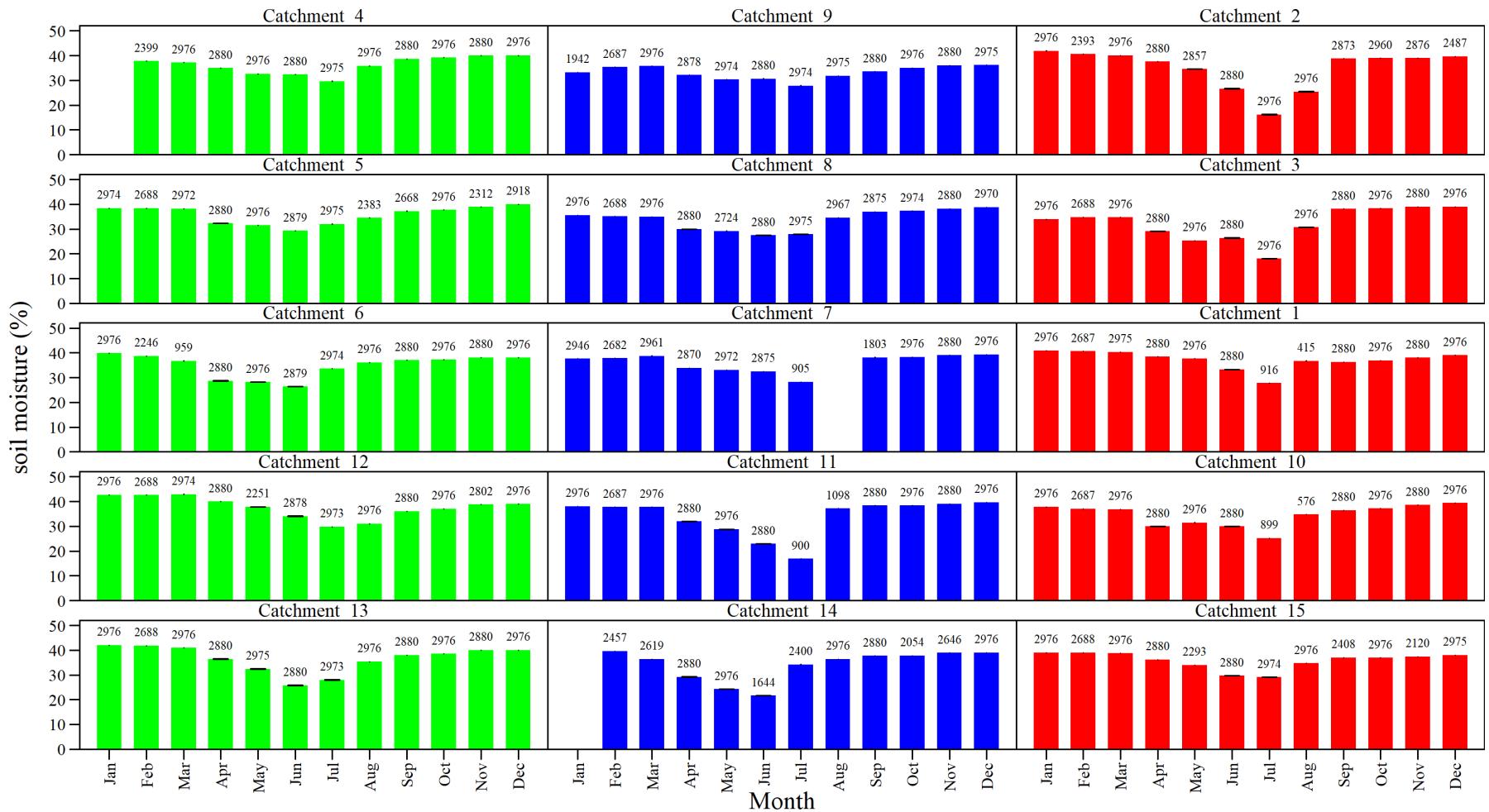


Figure 9: Monthly means for precipitation

**Figure 10:** Monthly means for soil temperature (15cm)

**Figure 11:** Monthly means for soil moisture (10cm)

2.2 Chloropleth maps of means

Grey areas represent missing data

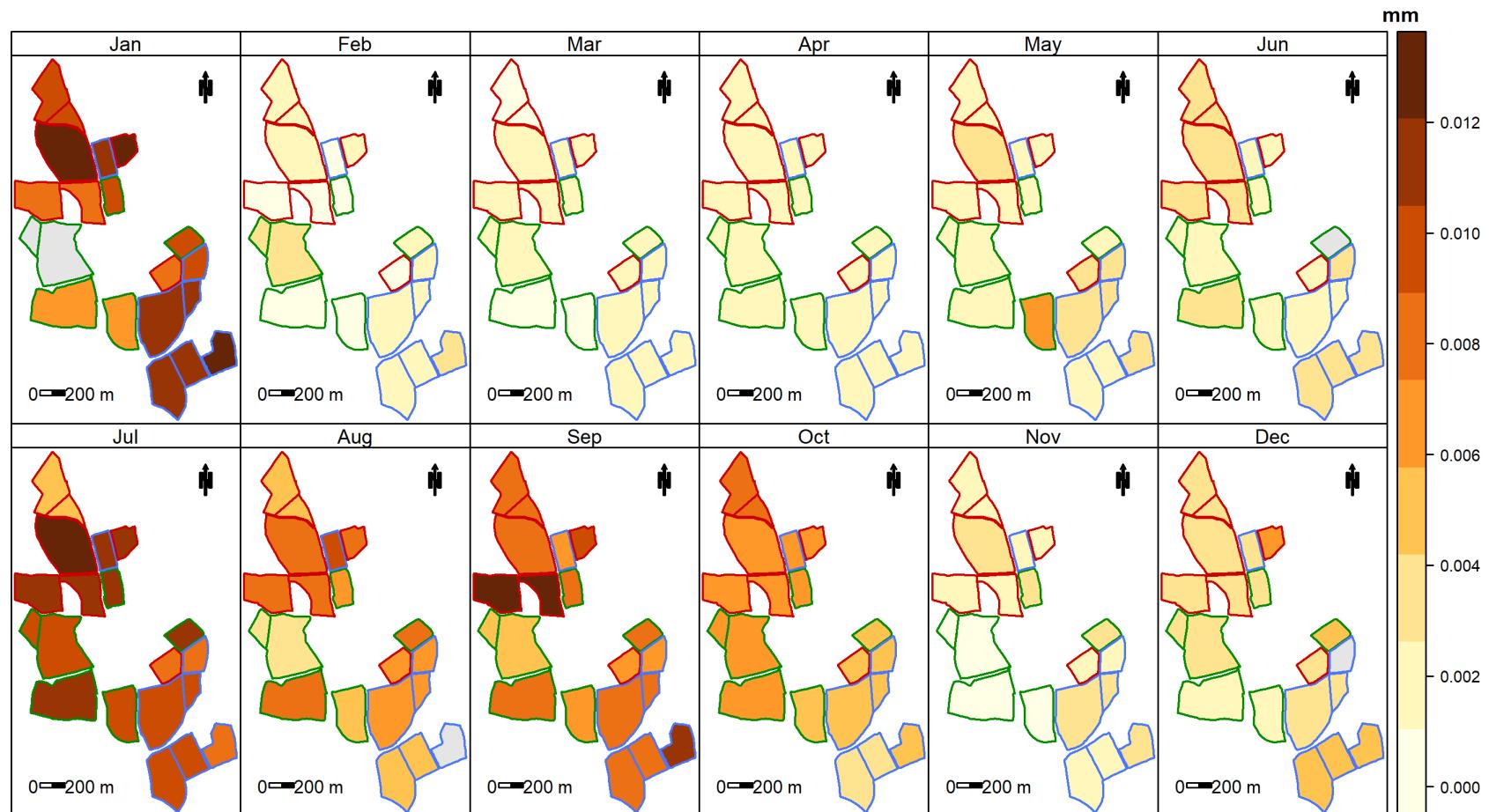


Figure 12: Monthly means for precipitation

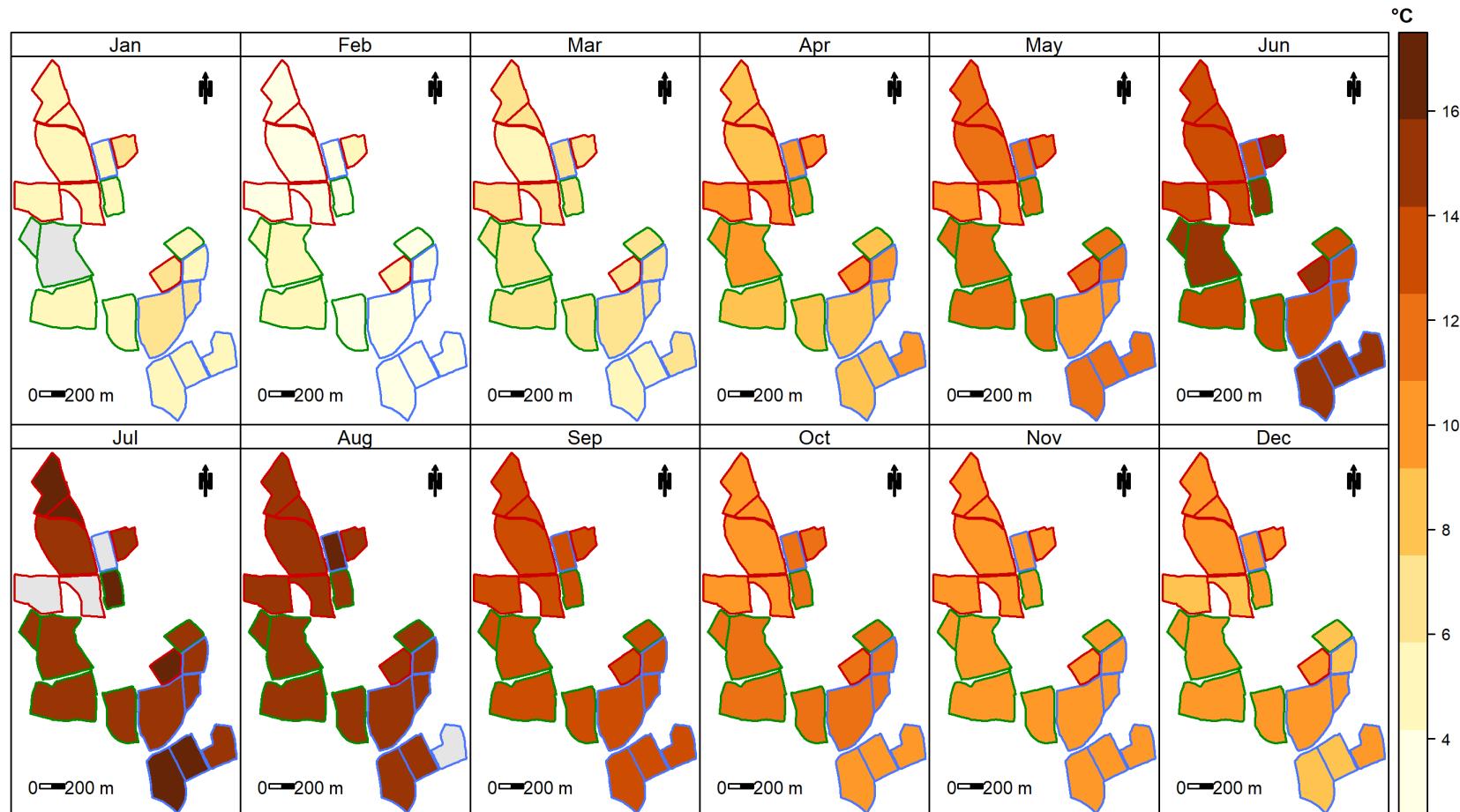
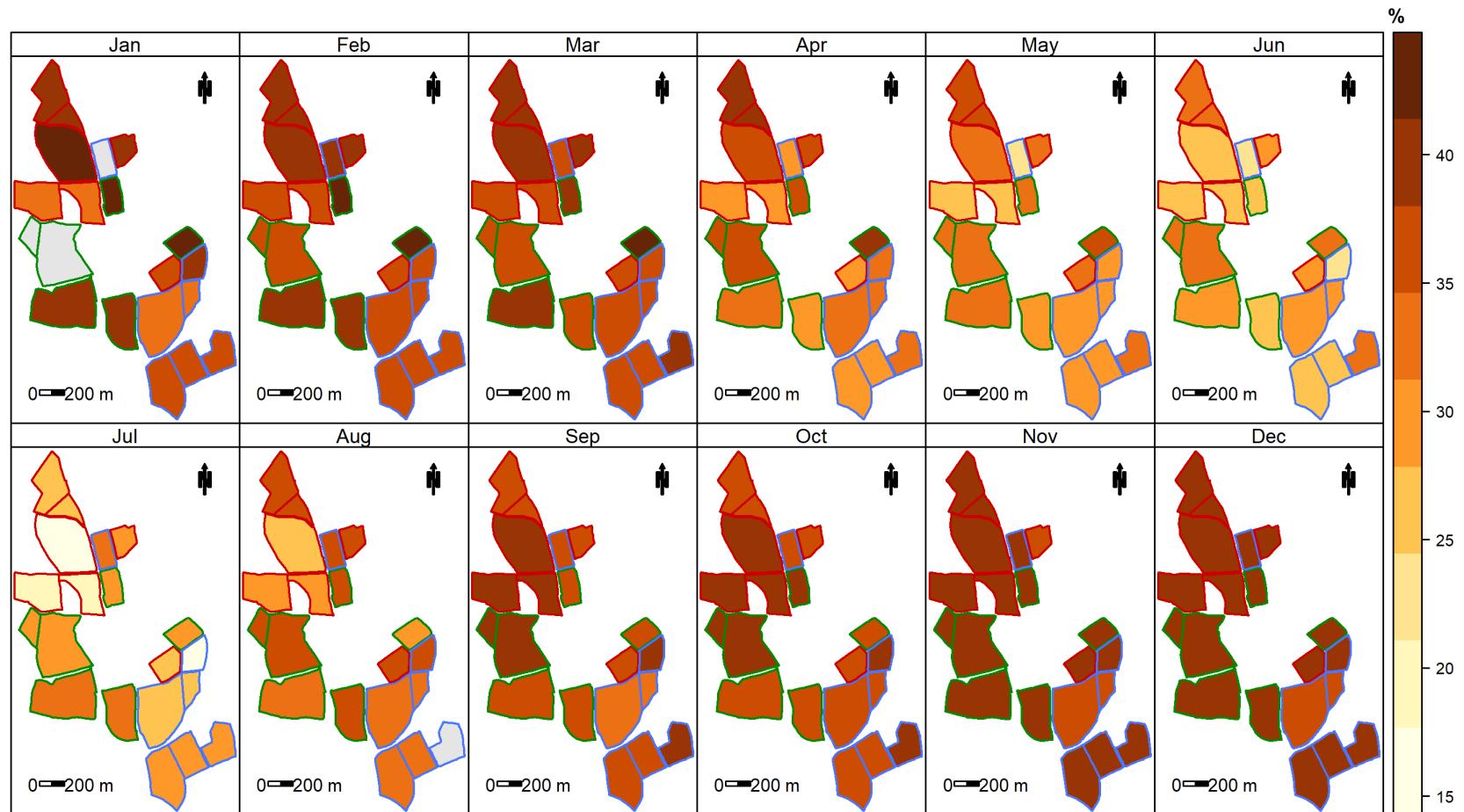


Figure 13: Monthly means for soil temperature (15cm)

**Figure 14:** Monthly means for soil moisture (10cm)

2.3 Chloropleth maps of standard deviations

Grey areas represent missing data

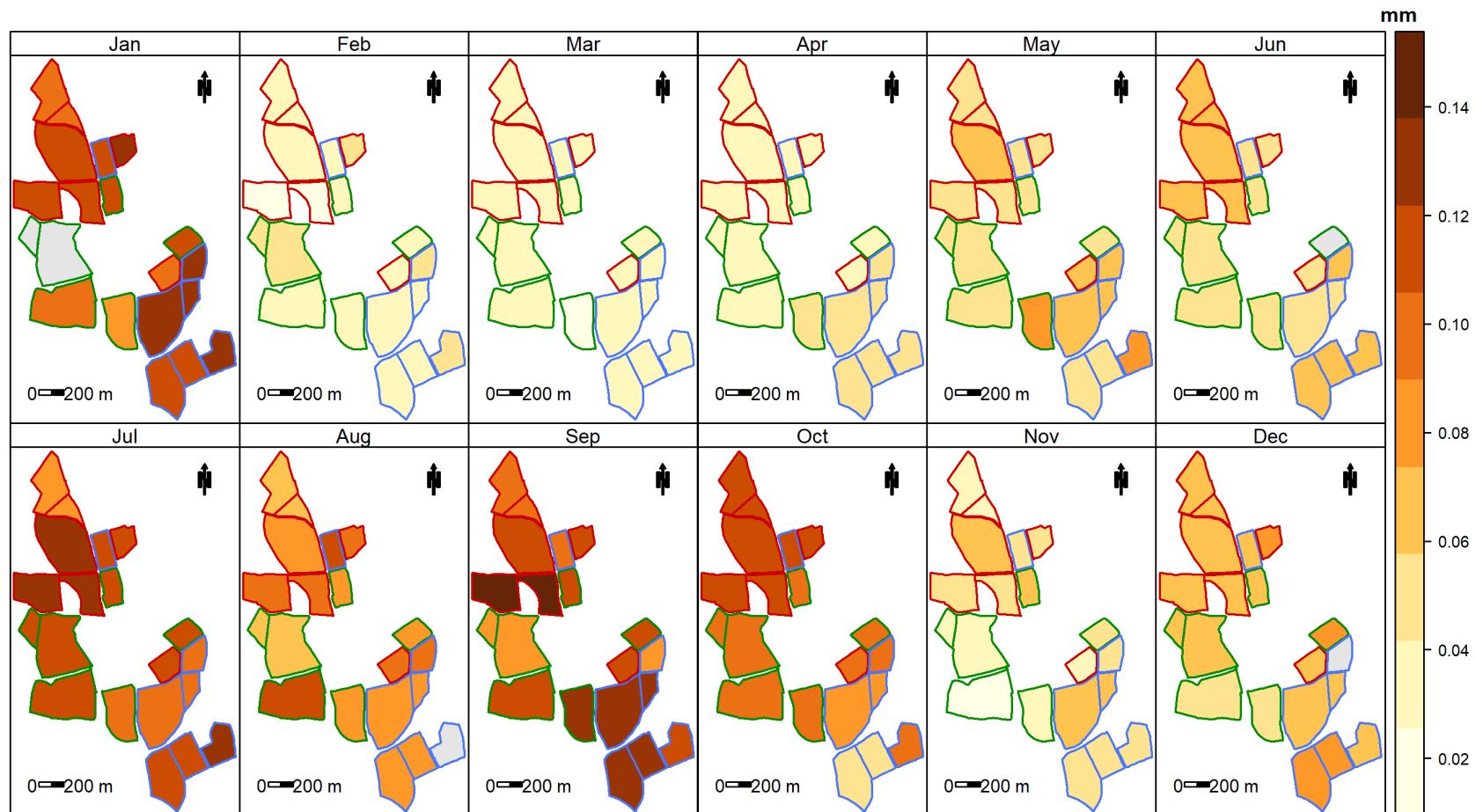
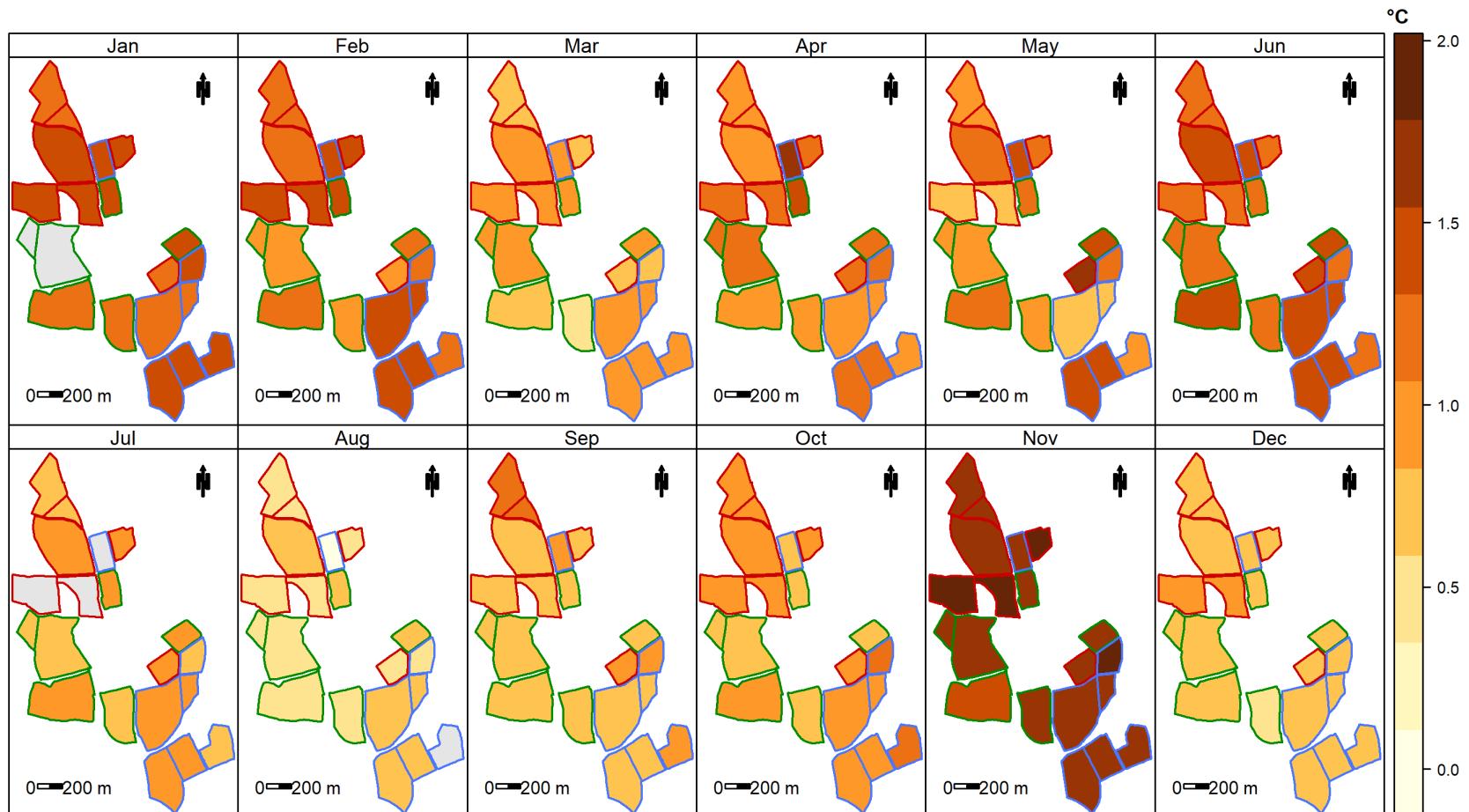
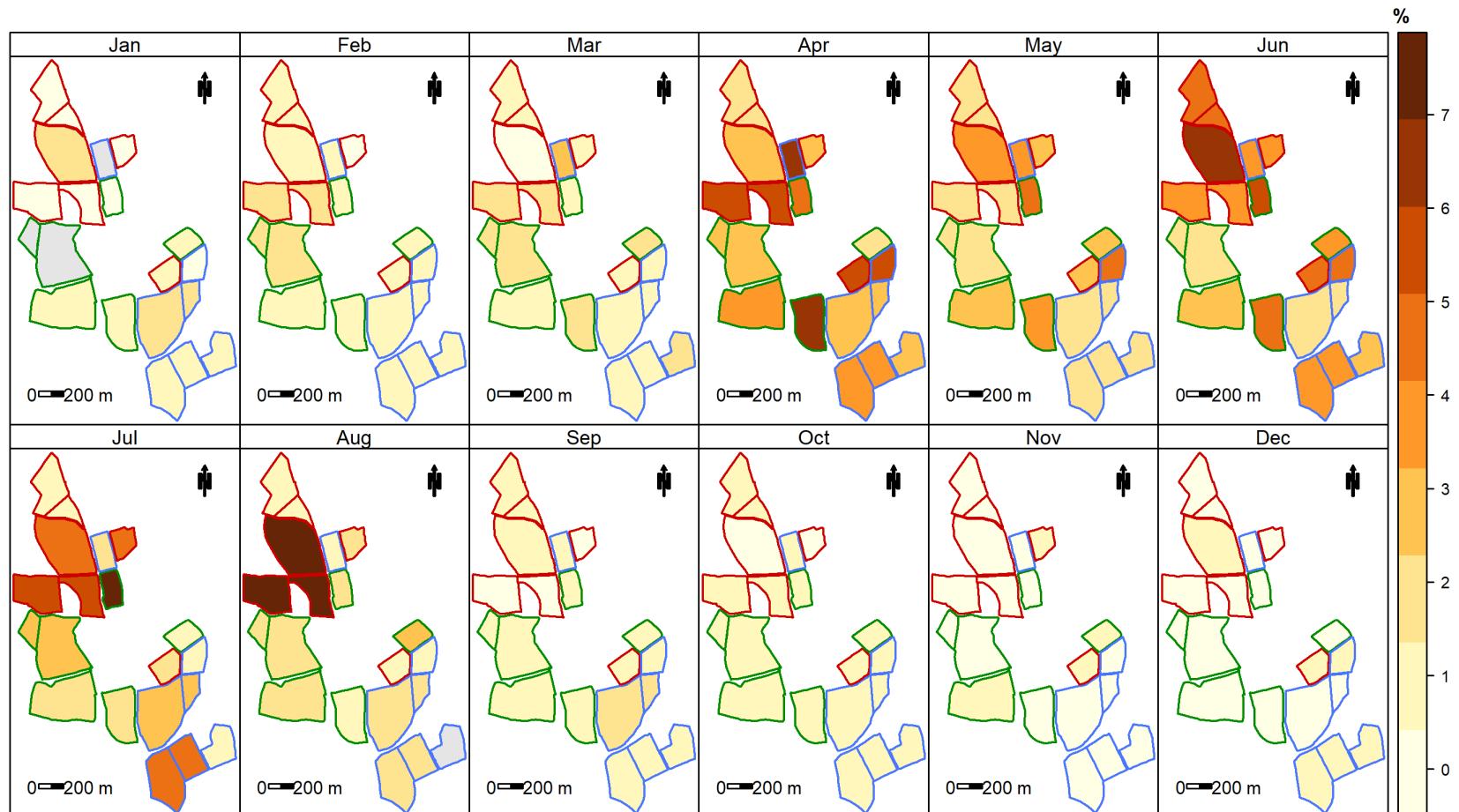


Figure 15: Monthly standard deviations for precipitation

**Figure 16:** Monthly standard deviations for soil temperature (15cm)

**Figure 17:** Monthly standard deviations for soil moisture (10cm)

3 ANNUAL SUMMARY STATISTICS

Please be aware that statistics are based on data that may contain missing values. Full data summaries are available on request.

Variable	units	Catchment Number														
		Green				Blue				Red						
		4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Total	mm	116.0	145.0	127.0	169.0	171.0	166.0	165.0	140.0	115.0	173.0	187.0	175.0	117.0	117.0	192.0
Mean	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Median	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Standard deviation	mm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Inter-quartile range	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coefficient of variation	mm	18.4	17.6	18.5	15.6	16.4	16.8	16.4	16.7	17.8	16.5	15.6	16.8	18.4	19.2	15.6
Minimum	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum	mm	3.0	4.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0
Missing values	count	3264	1388	2829	3081	0	180	939	6114	8562	0	0	0	4622	3944	0
Missing values as a %	%	9	4	8	9	0	1	3	17	24	0	0	0	13	11	0

Table 3: Annual summary statistics for precipitation

Variable	units	Catchment Number														
		Green				Blue				Red						
		4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Mean	°C	11.0	10.4	10.7	10.3	10.6	10.5	10.2	9.3	9.6	9.5	10.2	8.8	9.5	9.9	10.6
Median	°C	11.0	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.0	10.0	10.0	9.0	10.0	10.0	11.0
Standard deviation	°C	3.3	3.7	3.5	3.9	3.9	3.6	4.1	3.5	3.4	3.4	3.7	3.0	3.5	3.6	3.7
Inter-quartile range	°C	5.0	6.0	5.0	7.0	6.0	6.0	6.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0	6.0
Coefficient of variation	°C	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3
Minimum	°C	3.0	2.0	2.0	1.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0
Maximum	°C	17.0	17.0	17.0	17.0	18.0	17.0	18.0	17.0	17.0	17.0	17.0	15.0	18.0	20.0	17.0
Missing values	count	4220	1452	2478	557	17	1093	256	6218	4966	9077	900	6401	4968	4980	1231
Missing values as a %	%	12	4	7	2	0	3	1	18	14	26	3	18	14	14	4

Table 4: Annual summary statistics for soil temperature (15cm)

Variable	units	Catchment Number														
		Green					Blue					Red				
	units	4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Mean	%	36.2	35.6	34.7	37.6	36.6	33.1	33.8	36.5	34.8	34.4	34.8	32.2	37.8	35.2	35.7
Median	%	37.0	38.0	37.0	39.0	39.0	34.0	35.0	38.0	38.0	37.0	39.0	34.0	38.0	37.0	37.0
Standard deviation	%	3.7	3.9	5.2	4.6	6.1	3.1	4.5	3.2	6.6	6.3	8.5	7.1	3.2	4.4	4.0
Inter-quartile range	%	7.0	6.0	6.0	7.0	6.0	5.0	6.0	4.0	5.0	6.0	7.0	11.0	3.0	4.0	3.0
Coefficient of variation	%	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Minimum	%	26.0	26.0	18.0	28.0	17.0	25.0	20.0	27.0	16.0	15.0	10.0	12.0	26.0	22.0	22.0
Maximum	%	41.0	40.0	40.0	47.0	42.0	39.0	40.0	41.0	40.0	43.0	46.0	43.0	41.0	40.0	41.0
Missing values	count	3265	1439	2462	810	4	1043	275	6194	3955	6531	930	0	4623	4478	1918
Missing values as a %	%	9	4	7	2	0	3	1	18	11	19	3	0	13	13	5

Table 5: Annual summary statistics for soil moisture (10cm)

4 APPENDIX

4.1 Hydrological areas - Catchments

	Catchment Number														
	Green					Blue					Red				
	4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
pre-13/08/2013	11.6	6.7	4.0	1.9	1.8	7.9	7.3	2.7	1.8	1.8	6.8	6.8	5.0	1.9	1.6
post-13/08/2013	8.1	6.7	4.0	1.9	1.8	7.9	7.3	2.7	1.8	1.8	6.8	6.8	5.0	1.9	1.6

Table 6: Catchment hydrological areas (ha) pre- and post- change to area of catchment 4 on 13th August 2013

4.2 Hydrological areas - Farmlets

	Green	Blue	Red
pre-13/08/2013	25.9	21.6	22.2
post-13/08/2013	22.4	21.6	22.2

Table 7: Farmlet hydrological areas (ha) pre- and post- change to area of catchment 4 on 13th August 2013