



North Wyke Farm Platform

DATA QUALITY AND SUMMARY STATISTICS

SOIL MOISTURE STATION DATA

Annual Report 2013

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.

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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	35039	1	1	2	1454	1	4034	1	1	4514	4035	1	11538	1	8914
Soil temperature (15cm)	35039	12014	4	24	8	4	4134	11441	3	4518	5849	170	25120	3	13386
Soil moisture (10cm)	35039	12016	608	118	406	4	4132	11457	1045	4519	5846	169	25105	2	13395

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	100.0	0.0	0.0	0.0	4.1	0.0	11.5	0.0	0.0	12.9	11.5	0.0	32.9	0.0	25.4
Soil temperature (15cm)	100.0	34.3	0.0	0.1	0.0	0.0	11.8	32.7	0.0	12.9	16.7	0.5	71.7	0.0	38.2
Soil moisture (10cm)	100.0	34.3	1.7	0.3	1.2	0.0	11.8	32.7	3.0	12.9	16.7	0.5	71.6	0.0	38.2

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.

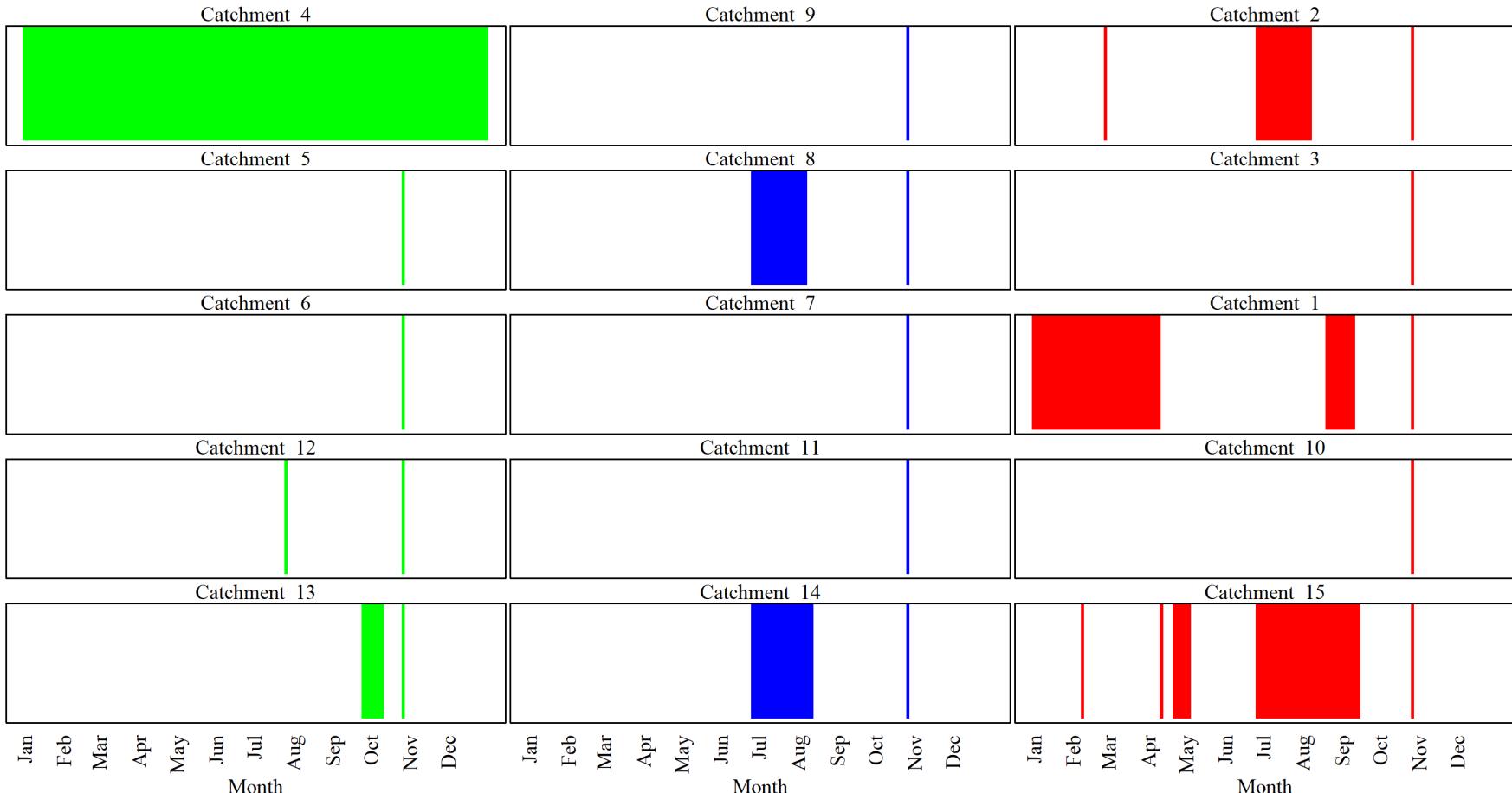
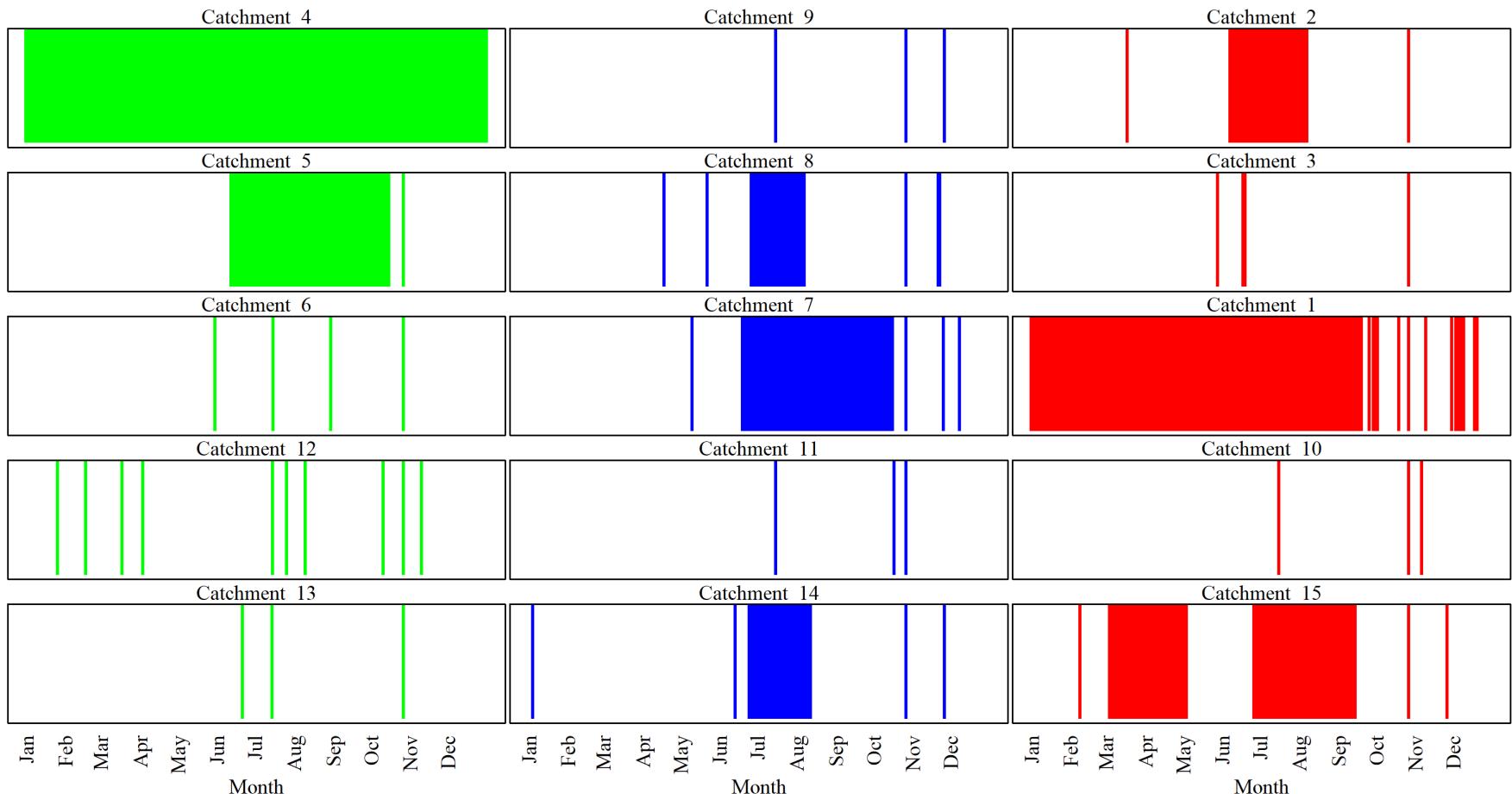
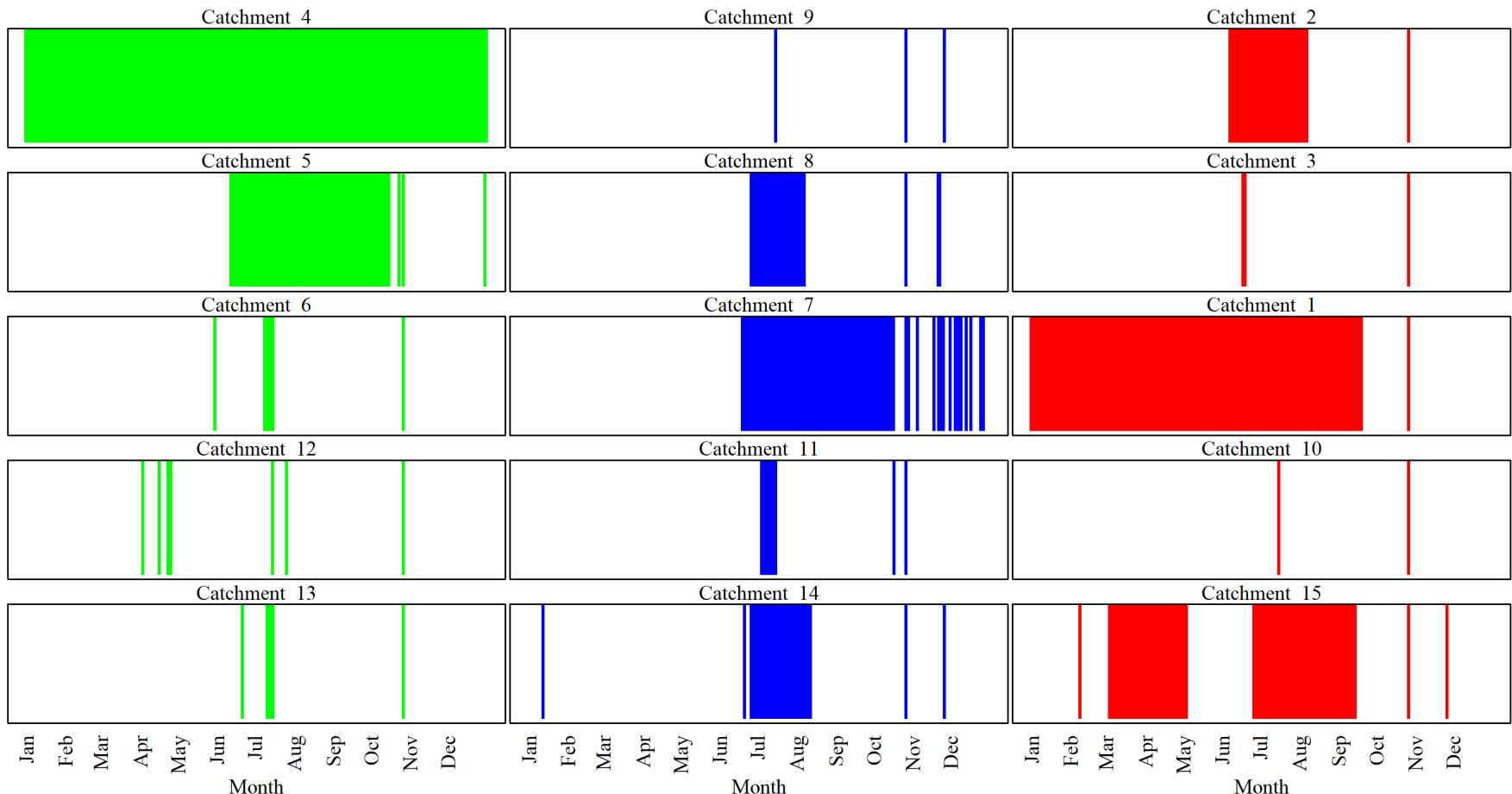


Figure 1: Timesteps of missing precipitation data

**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

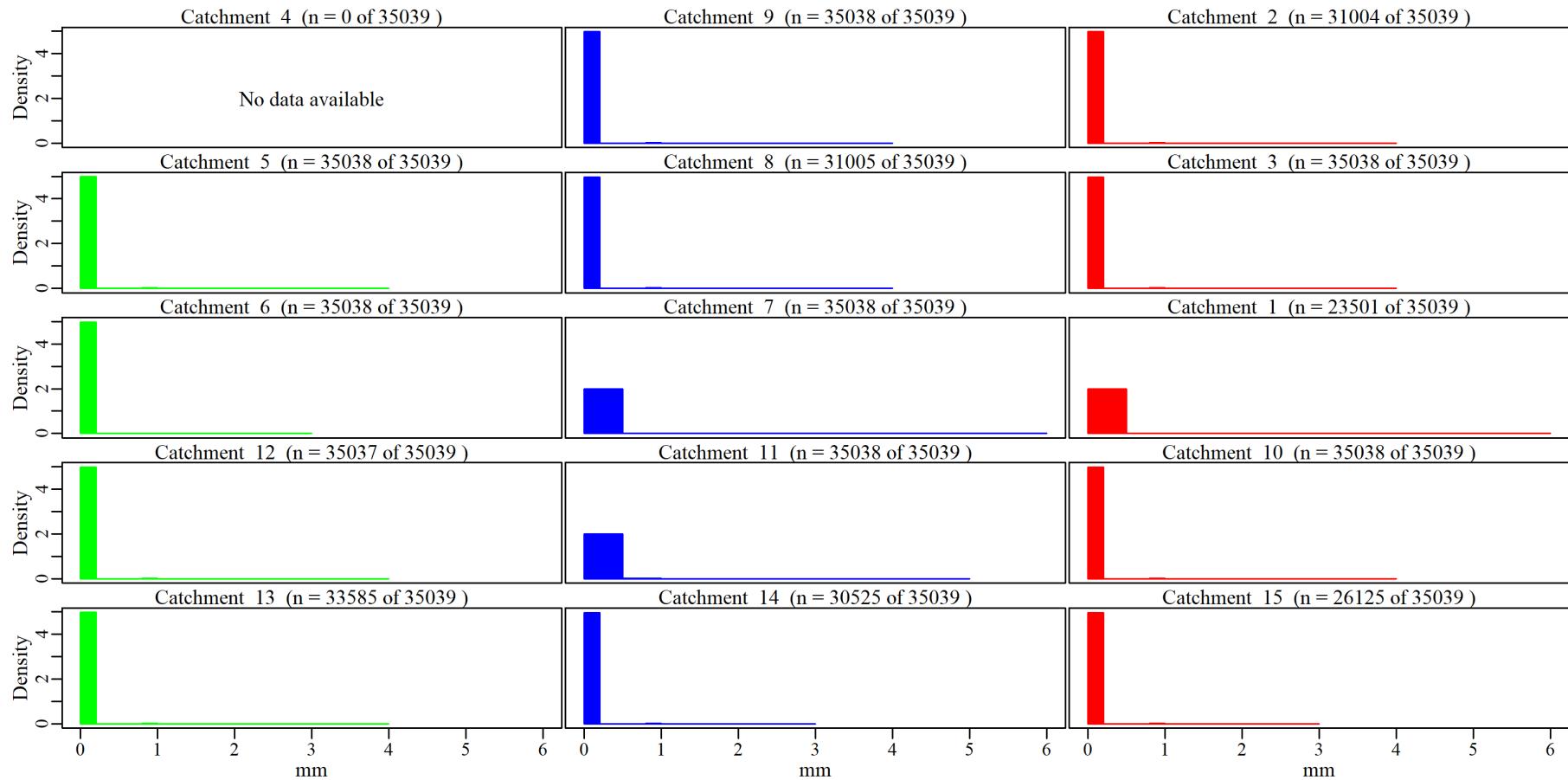


Figure 4: Distribution of precipitation data

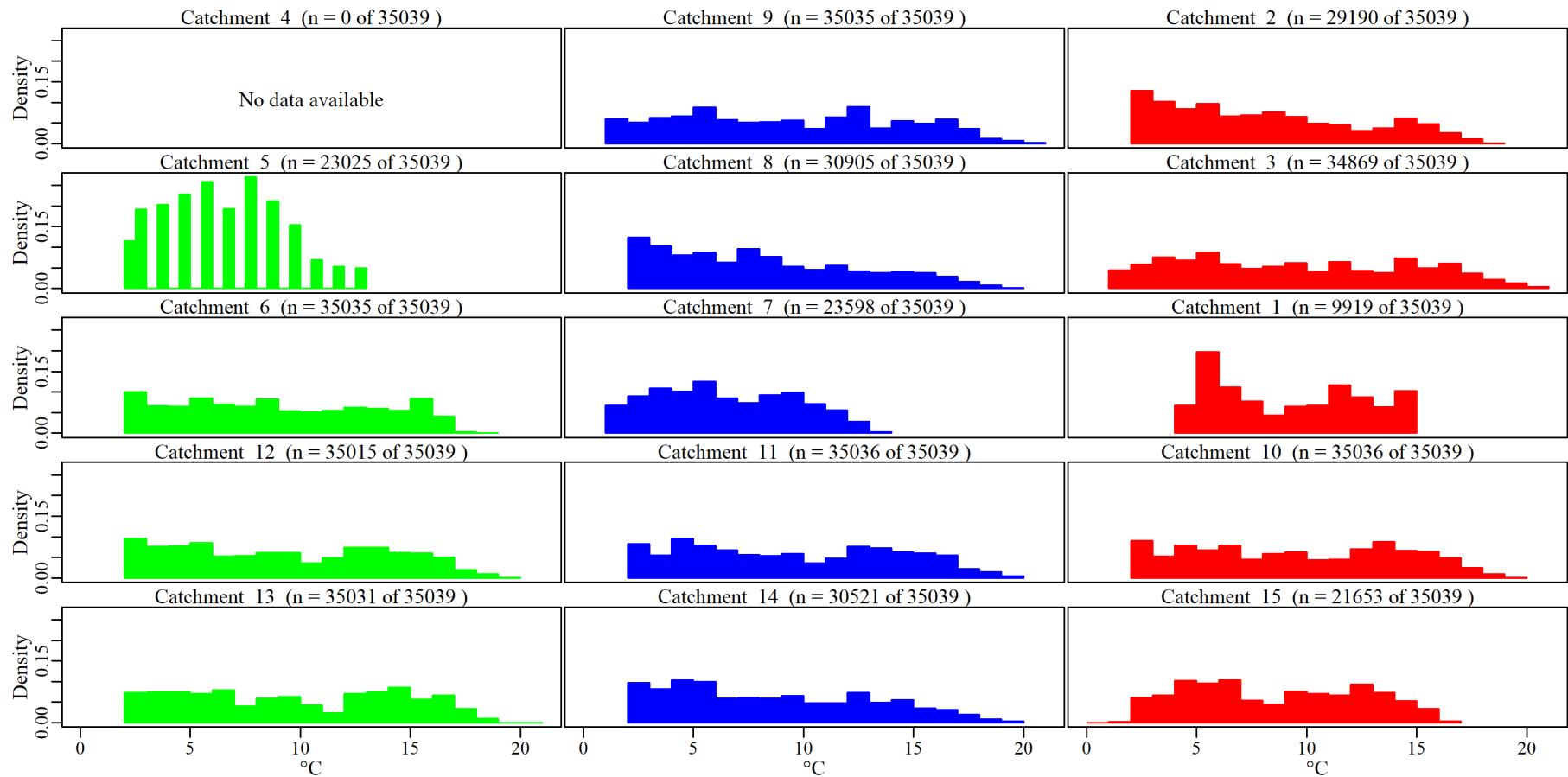
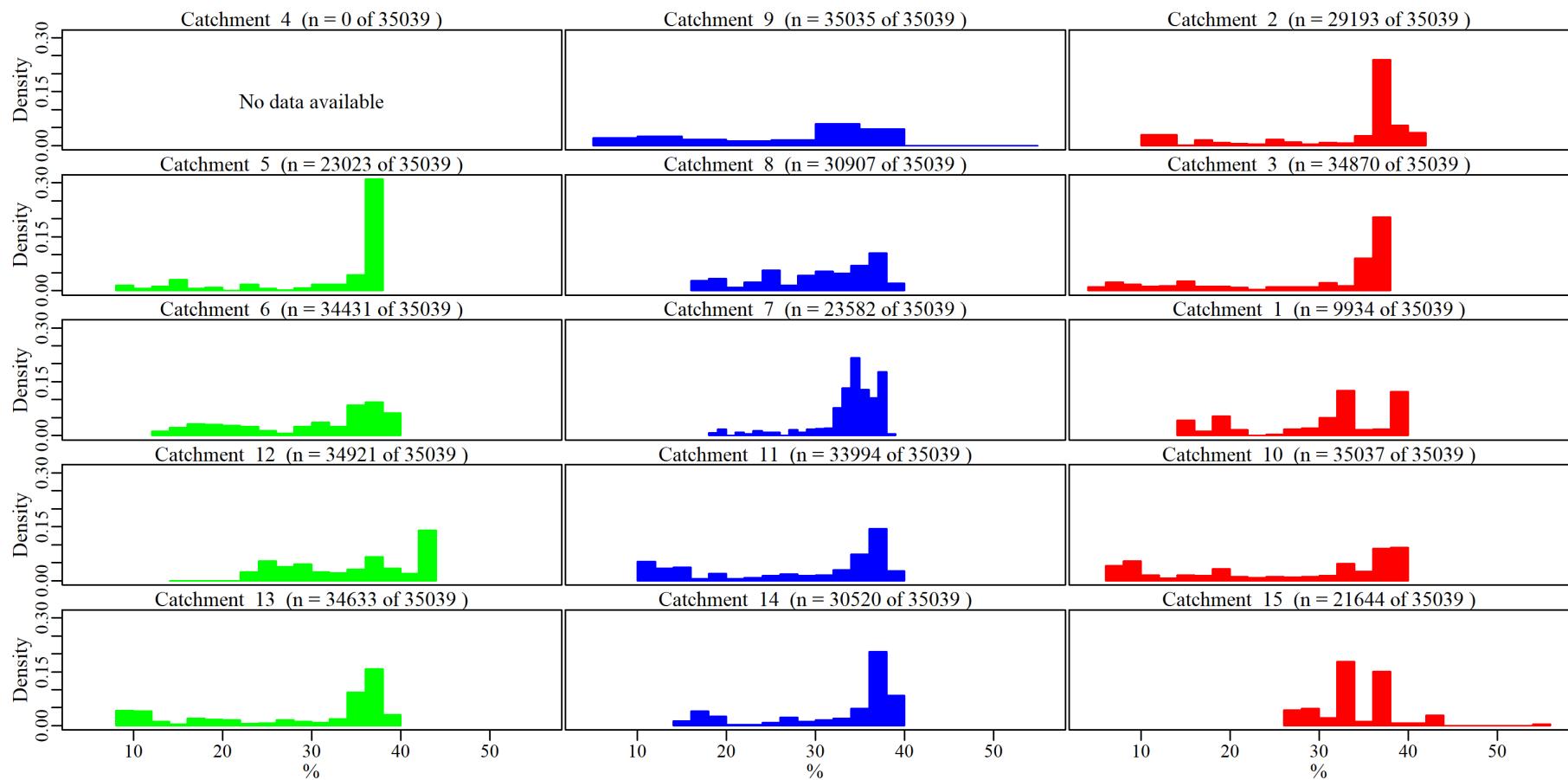


Figure 5: Distribution of soil temperature (15cm) data

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

1.3 Time series

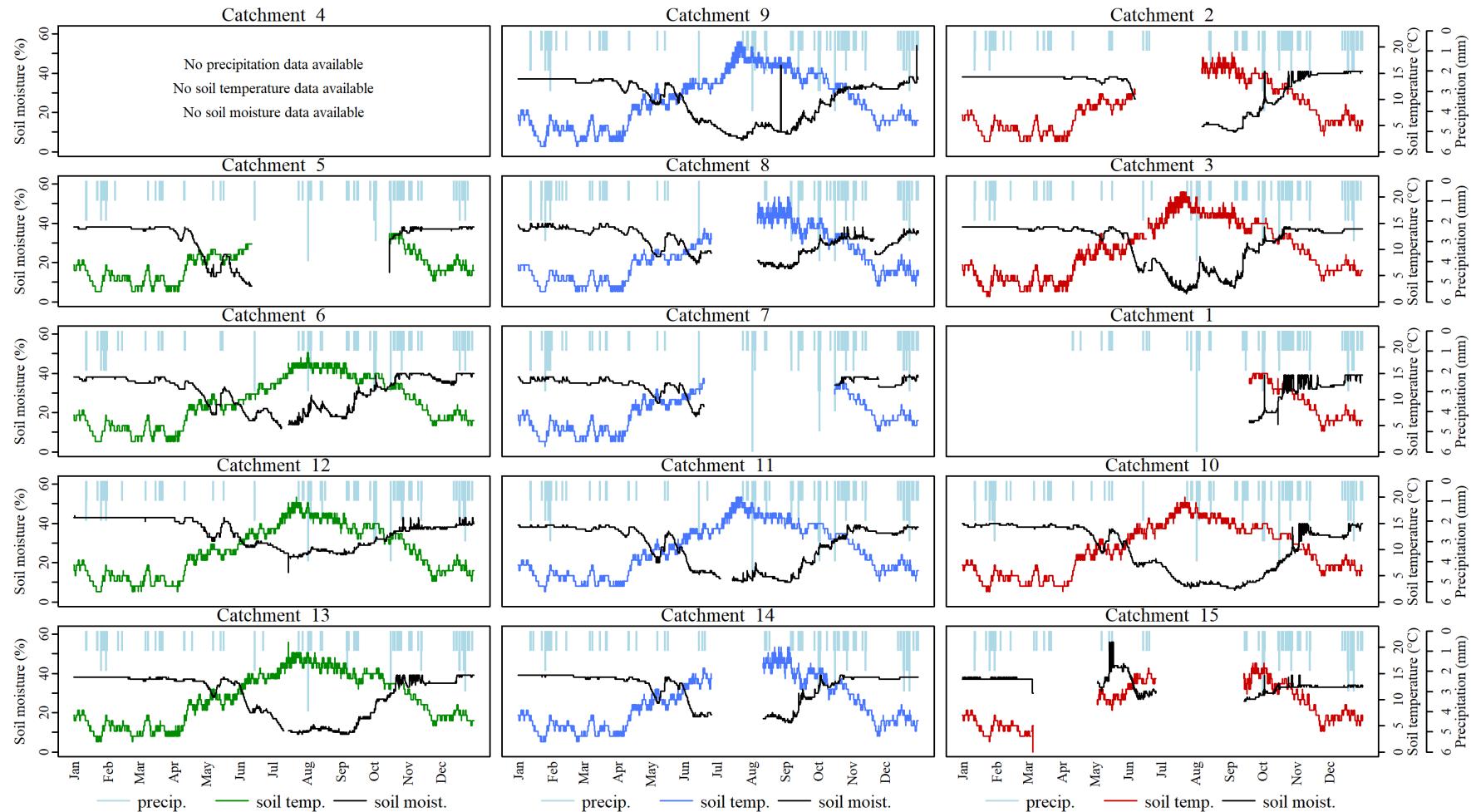


Figure 7: Time series for precipitation, soil temperature (15cm) and soil moisture (10cm)

1.4 Correlations

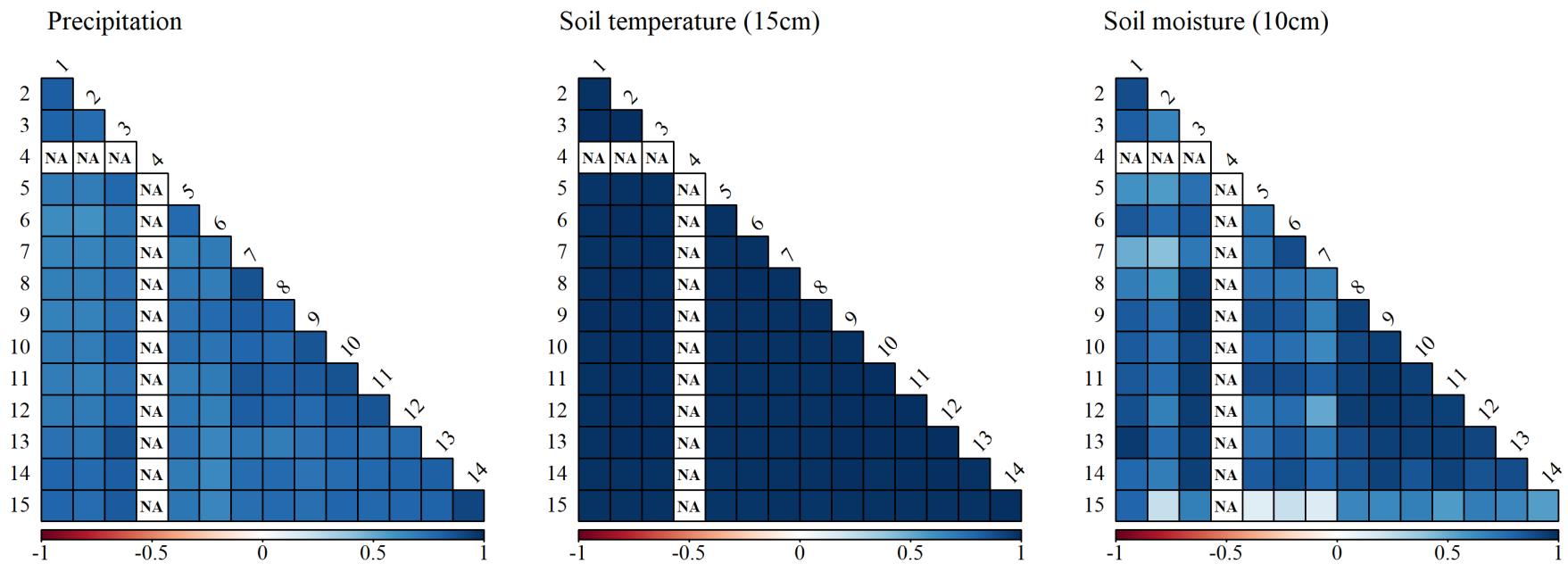


Figure 8: Correlations between catchments

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.

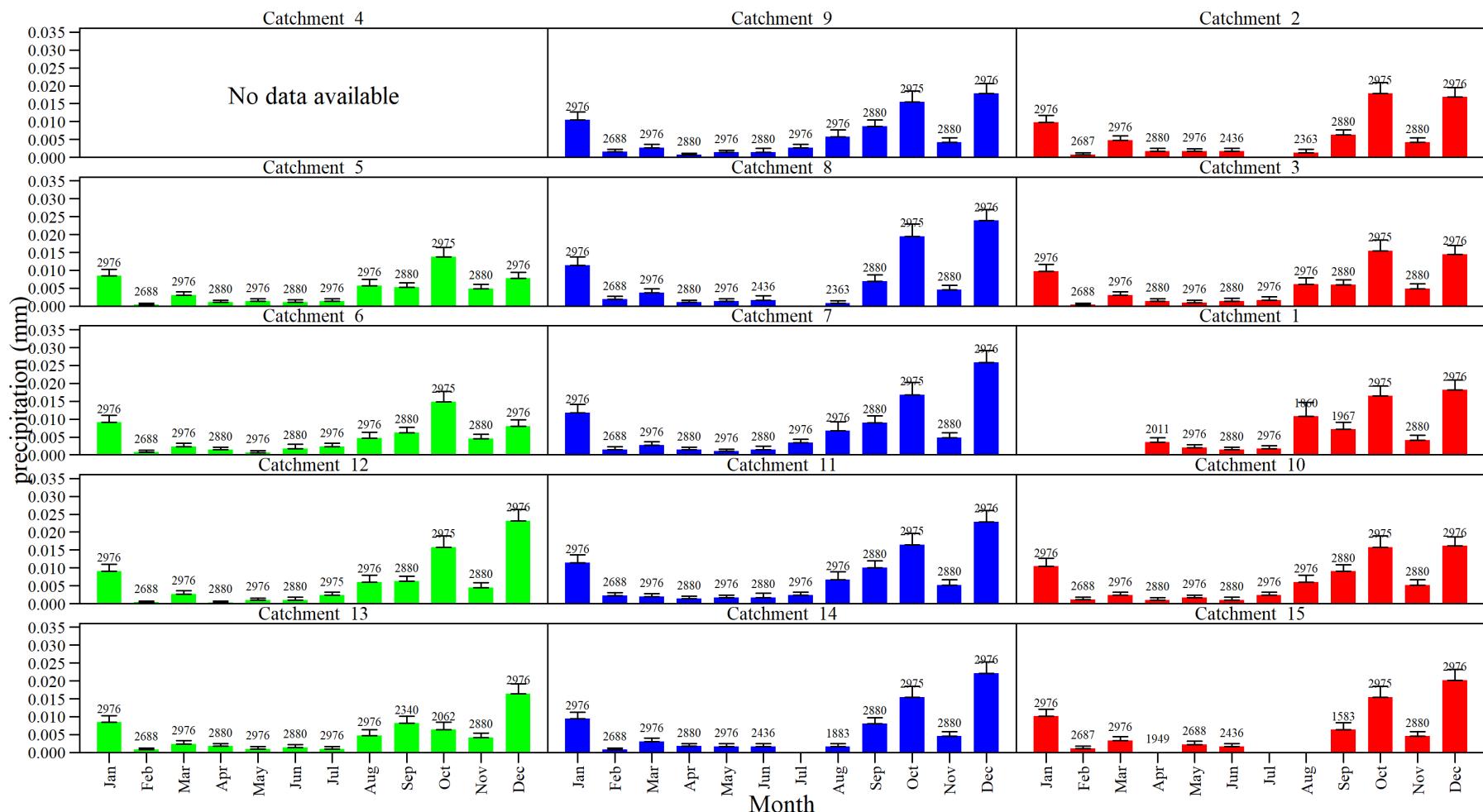
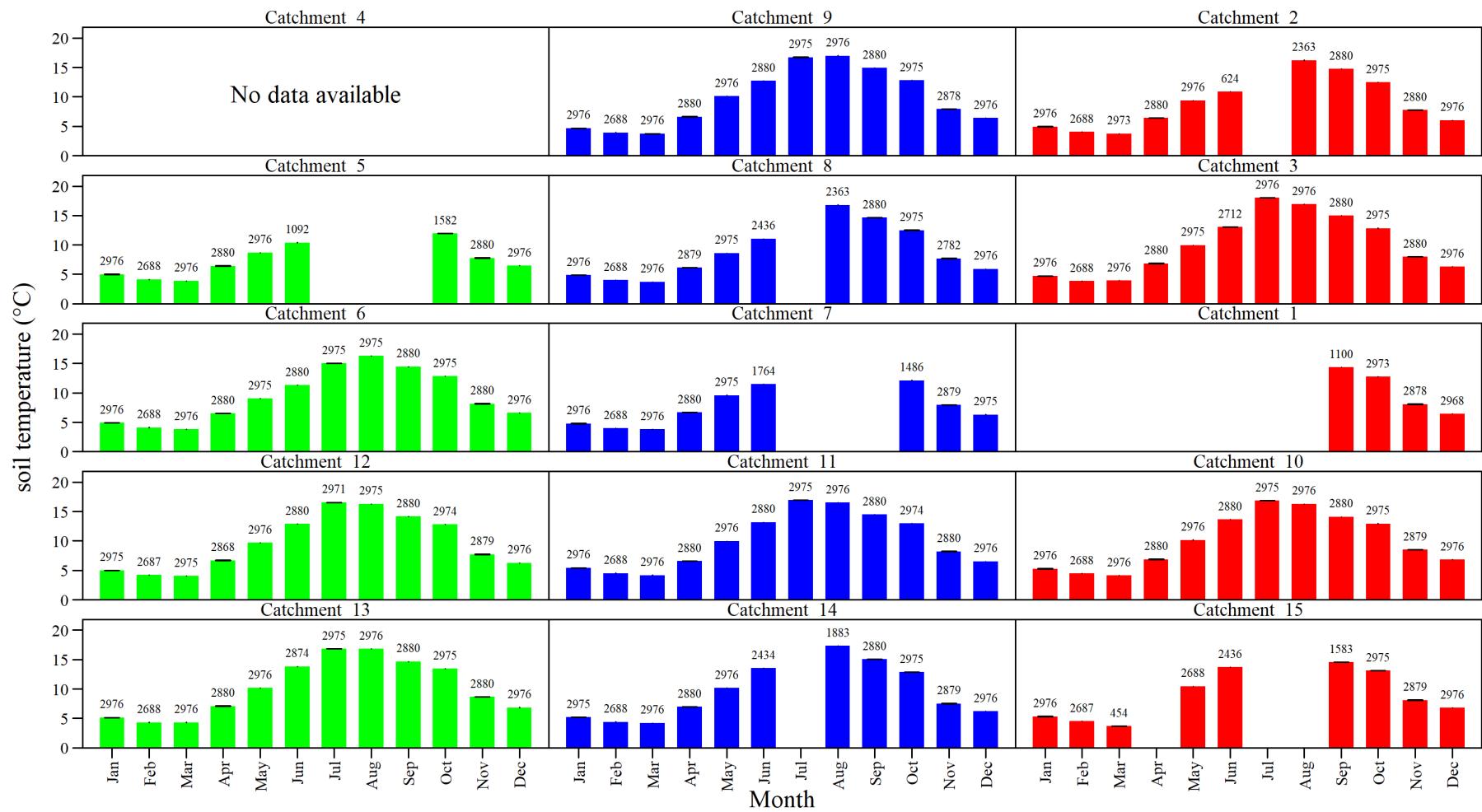
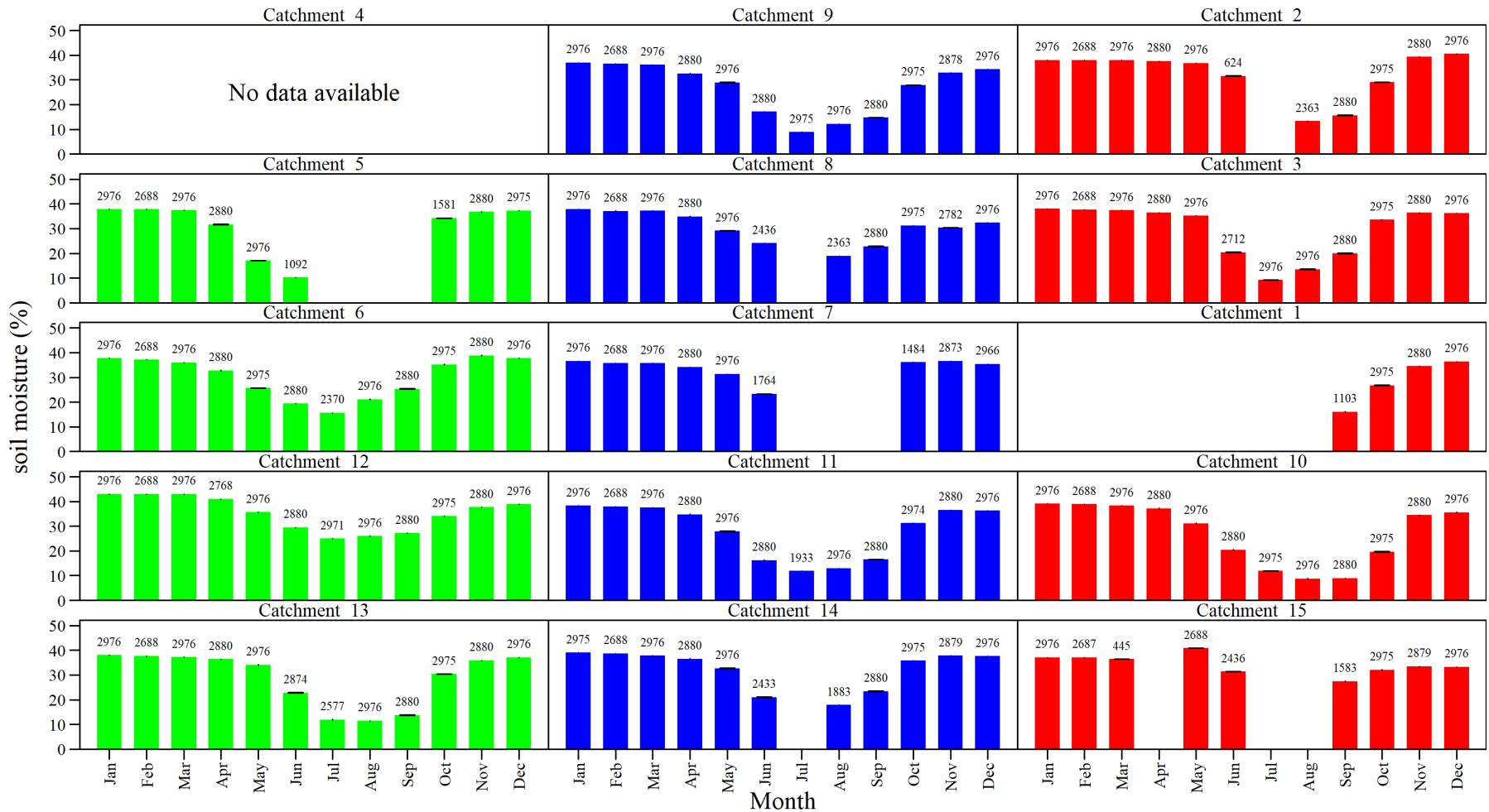


Figure 9: Monthly means for precipitation

**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

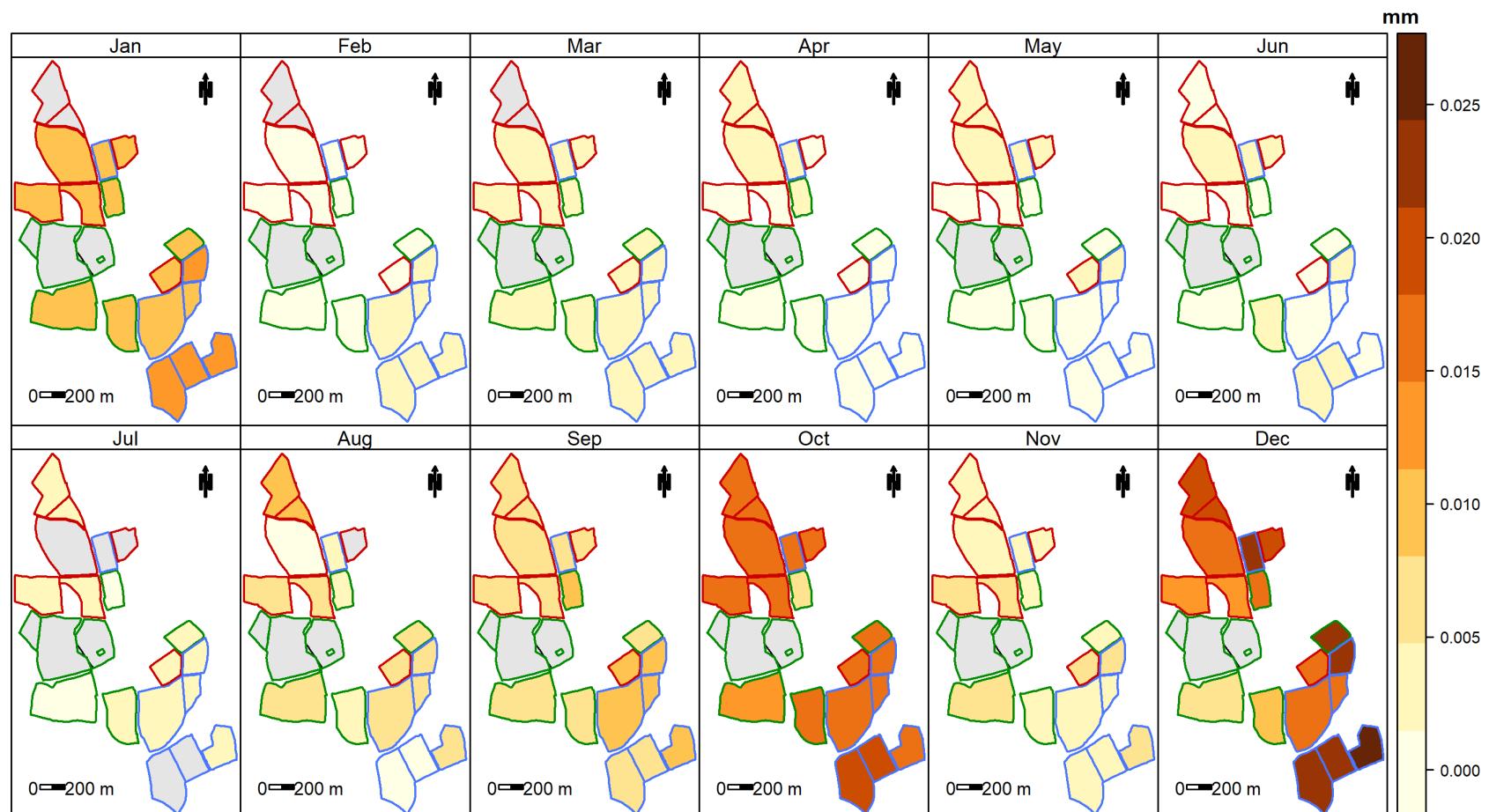
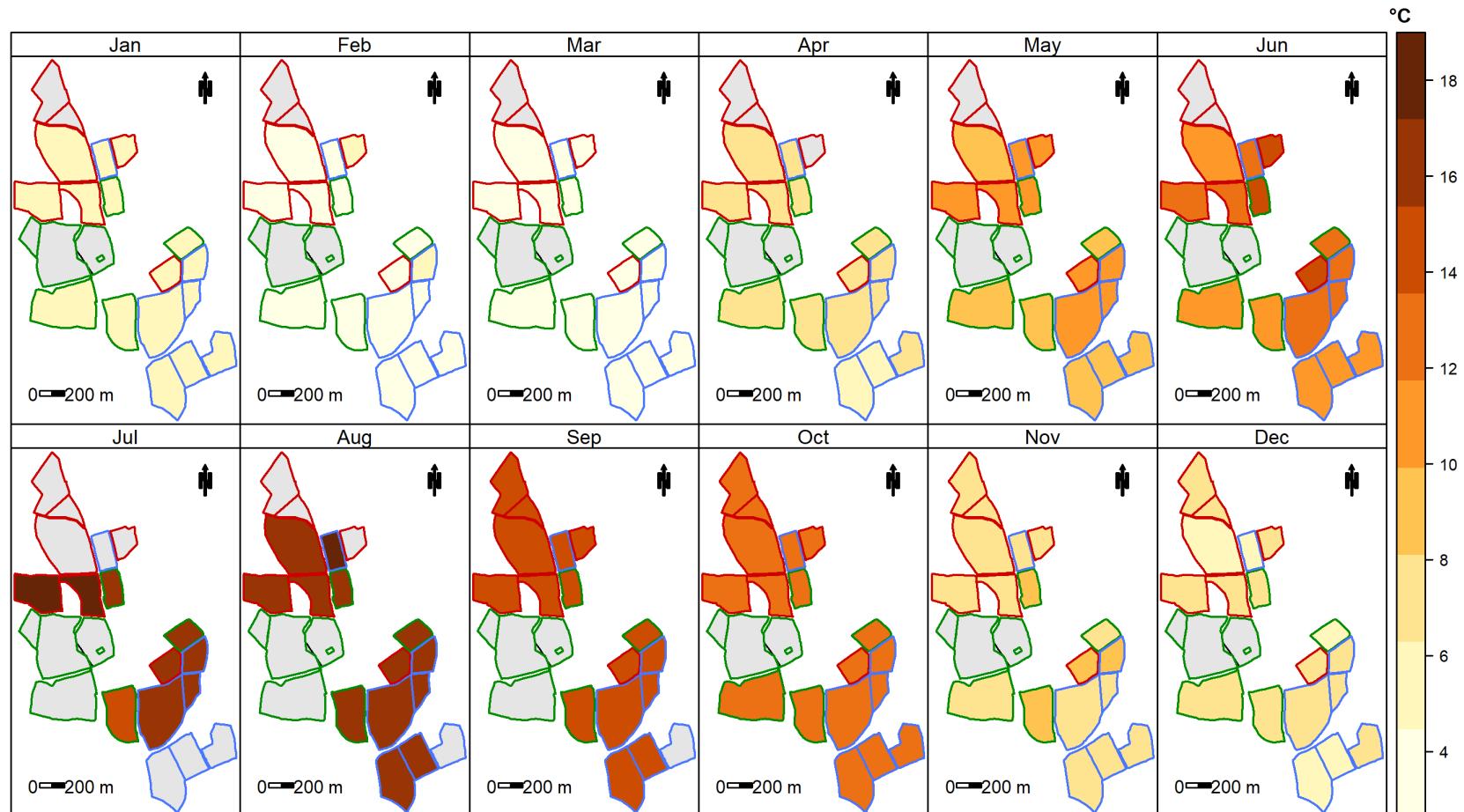
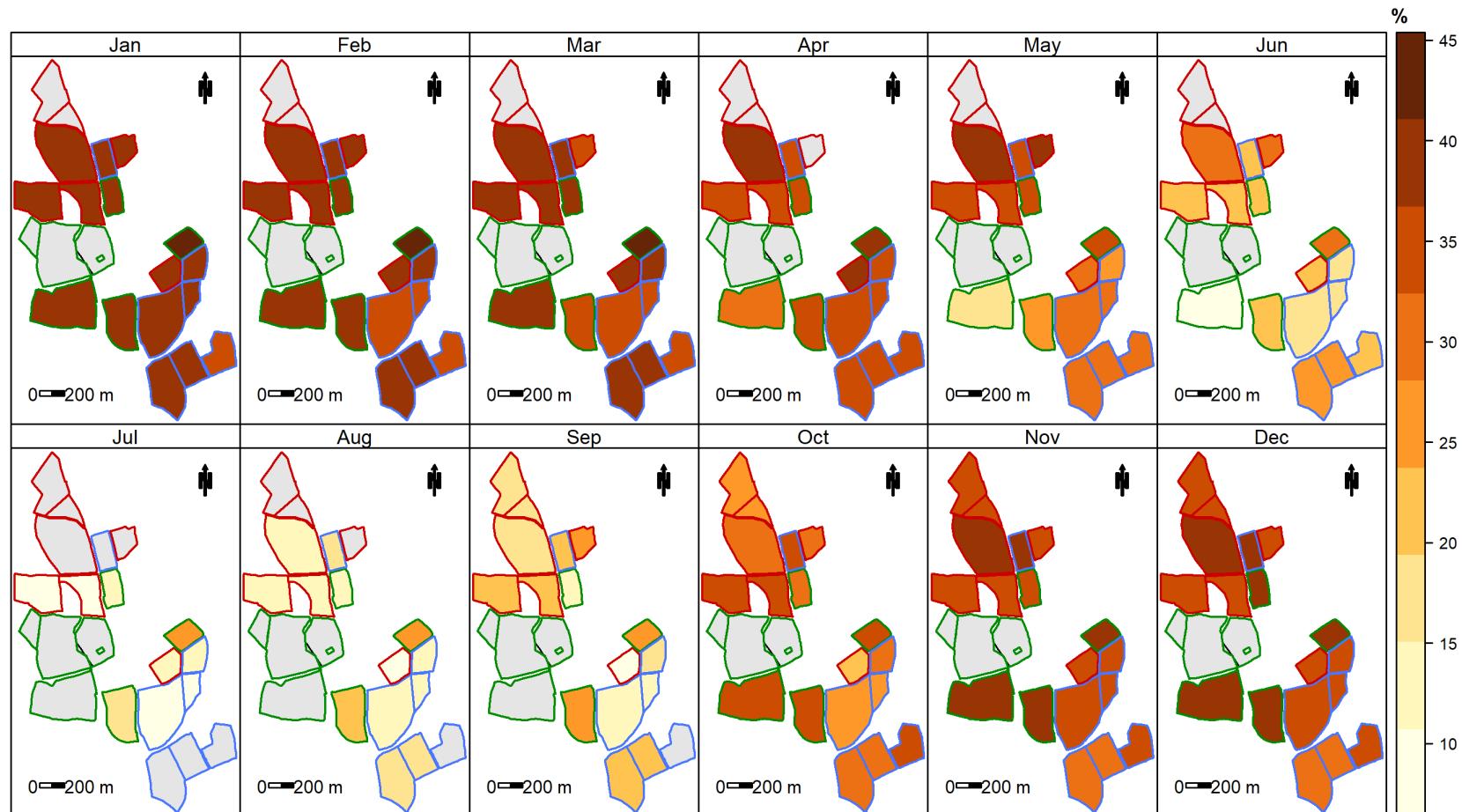


Figure 12: Monthly means for precipitation

**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

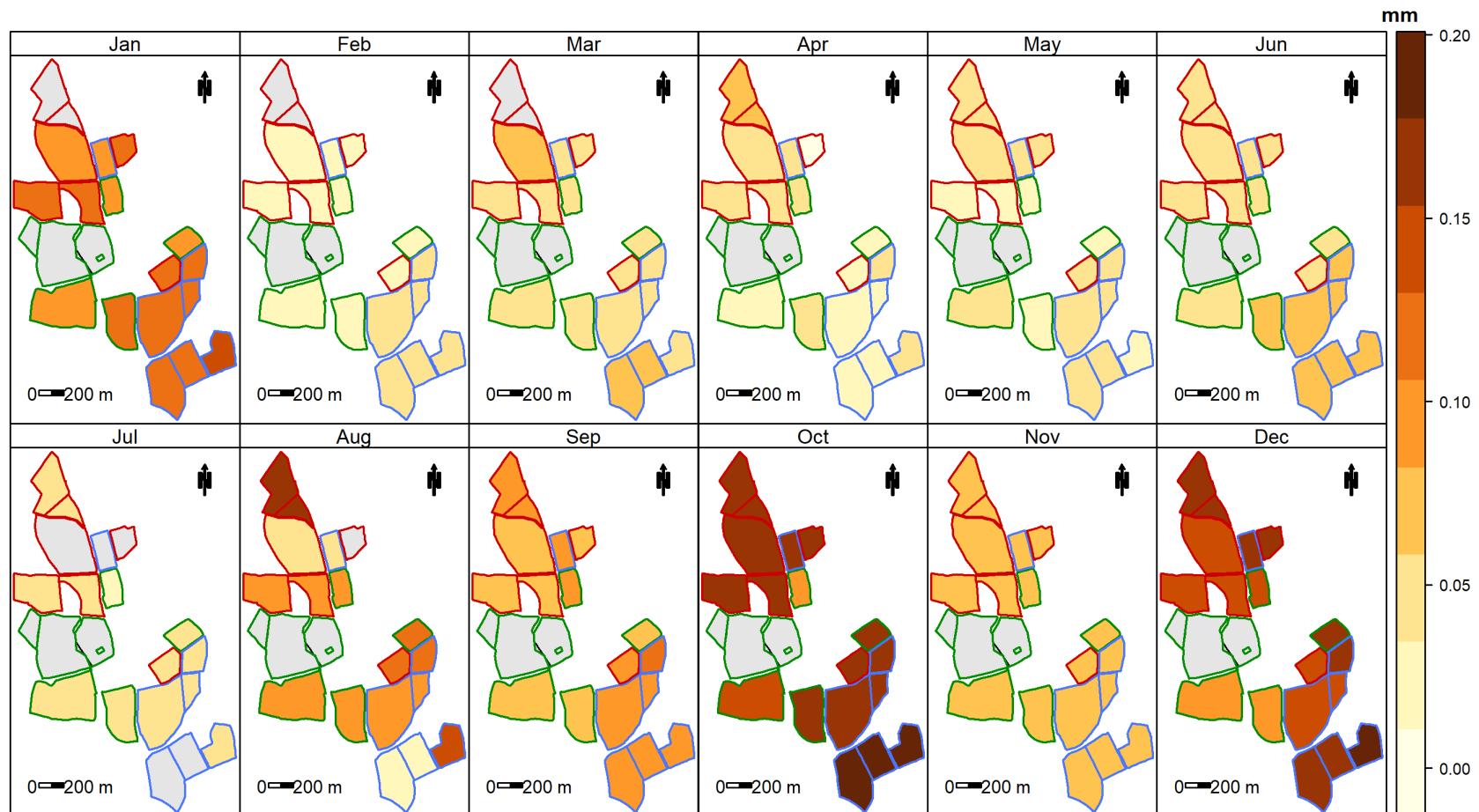


Figure 15: Monthly standard deviations for precipitation

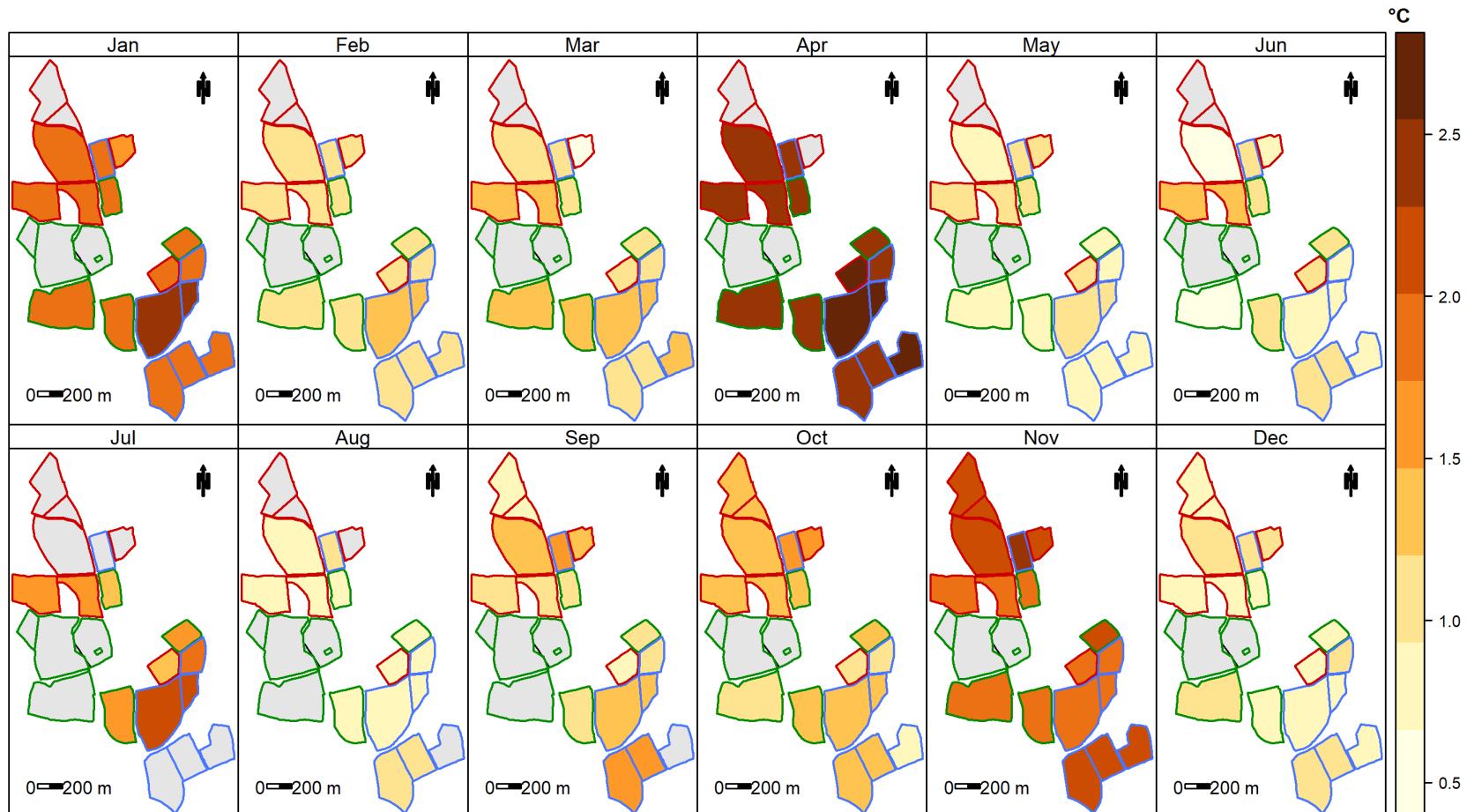
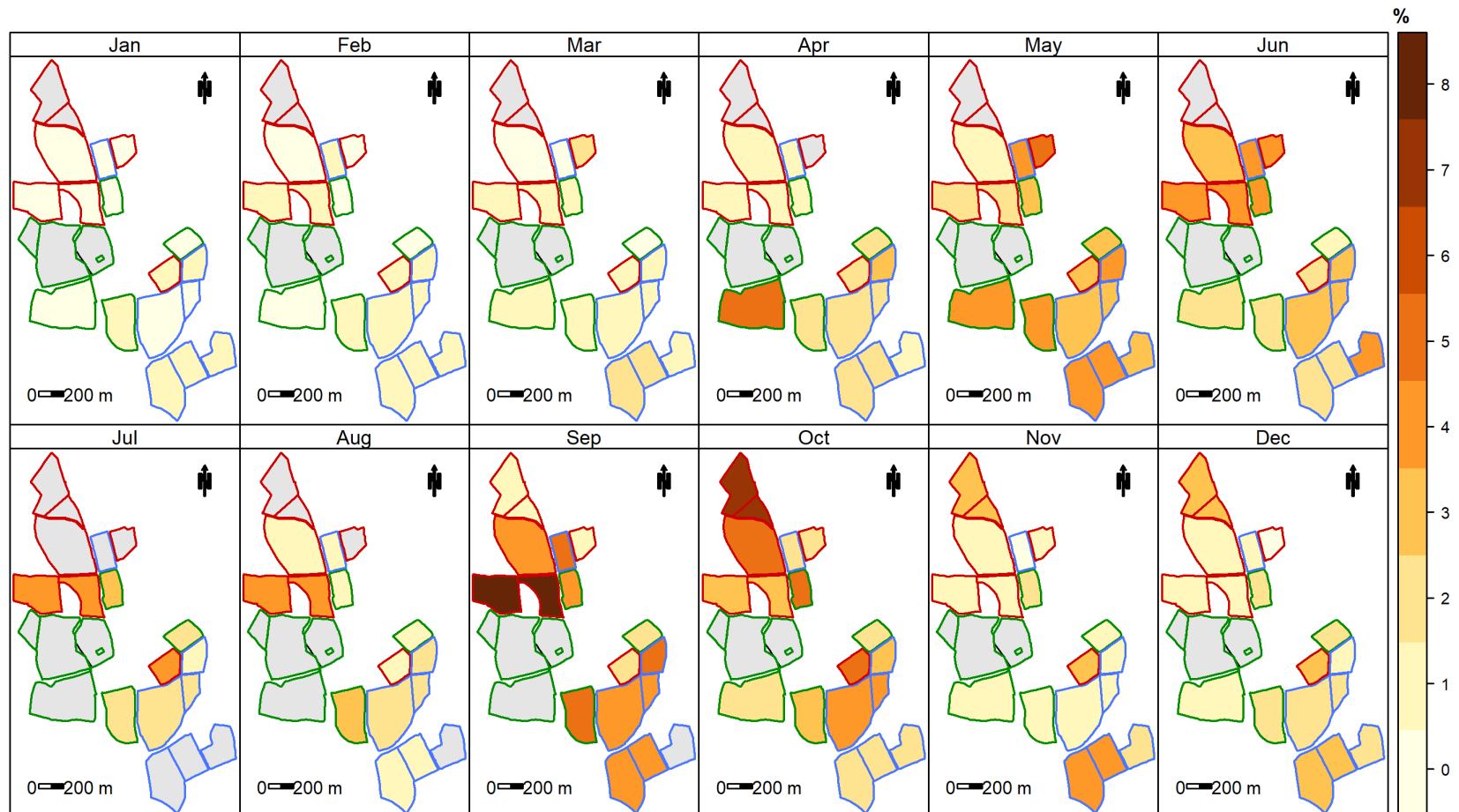


Figure 16: Monthly standard deviations for soil temperature (15cm)

**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				
	units	4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Total	mm	0.0	159.0	167.0	215.0	156.0	214.0	225.0	255.0	248.0	204.0	195.0	193.0	171.0	213.0	182.0
Mean	mm	NA	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	NA	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	NA	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	NA	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	NA	16.9	16.9	15.1	16.6	15.3	14.0	14.4	14.3	14.1	14.2	15.8	14.2	15.1	14.0
Minimum	mm	NA	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	NA	4.0	3.0	4.0	4.0	4.0	4.0	6.0	5.0	3.0	4.0	4.0	6.0	4.0	3.0
Missing values	count	35039	1	1	2	1454	1	4034	1	1	4514	4035	1	11538	1	8914
Missing values as a %	%	100	0	0	0	4	0	12	0	0	13	12	0	33	0	25

Table 3: Annual summary statistics for precipitation

Variable	units	Catchment Number														
		Green					Blue					Red				
	units	4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Mean	°C	NA	6.7	9.5	9.7	10.2	9.8	8.5	6.9	10.0	9.1	8.5	10.0	9.7	10.0	9.1
Median	°C	NA	7.0	9.0	9.0	10.0	10.0	8.0	7.0	10.0	8.0	8.0	10.0	10.0	10.0	9.0
Standard deviation	°C	NA	2.8	4.5	4.7	4.8	5.0	4.4	3.1	4.7	4.5	4.4	5.1	3.3	4.6	3.9
Inter-quartile range	°C	NA	5.0	7.0	8.0	9.0	8.0	7.0	6.0	8.0	8.0	7.0	9.0	7.0	8.0	7.0
Coefficient of variation	°C	NA	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.3	0.5	0.4
Minimum	°C	NA	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	1.0	4.0	2.0	0.0
Maximum	°C	NA	13.0	19.0	20.0	21.0	21.0	20.0	14.0	20.0	20.0	19.0	21.0	15.0	20.0	17.0
Missing values	count	35039	12014	4	24	8	4	4134	11441	3	4518	5849	170	25120	3	13386
Missing values as a %	%	100	34	0	0	0	0	12	33	0	13	17	0	72	0	38

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

Variable	units	Catchment Number														
		Green					Blue					Red				
		4	5	6	12	13	9	8	7	11	14	2	3	1	10	15
Mean	%	NA	32.6	30.4	35.2	29.0	26.5	30.8	34.3	28.6	33.2	32.9	29.5	30.7	26.9	34.5
Median	%	NA	37.0	34.0	37.0	35.0	32.0	32.0	35.0	34.0	37.0	38.0	36.0	33.0	33.0	34.0
Standard deviation	%	NA	8.7	8.3	6.8	10.6	10.3	6.5	4.1	10.3	7.4	9.4	10.7	7.8	12.0	4.3
Inter-quartile range	%	NA	6.0	16.0	14.0	17.0	19.0	11.0	3.0	21.0	8.0	8.0	17.0	16.0	22.0	4.0
Coefficient of variation	%	NA	0.3	0.3	0.2	0.4	0.4	0.2	0.1	0.4	0.2	0.3	0.4	0.3	0.4	0.1
Minimum	%	NA	8.0	12.0	15.0	9.0	6.0	17.0	18.0	10.0	15.0	10.0	4.0	14.0	6.0	26.0
Maximum	%	NA	38.0	40.0	44.0	39.0	54.0	40.0	39.0	39.0	39.0	41.0	38.0	39.0	40.0	56.0
Missing values	count	35039	12016	608	118	406	4	4132	11457	1045	4519	5846	169	25105	2	13395
Missing values as a %	%	100	34	2	0	1	0	12	33	3	13	17	0	72	0	38

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