Rothamsted Research
Harpenden, Herts, AL5 2JQ

Telephone: +44 (0)1582 763133
Web: http://www.rothamsted.ac.uk/

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NWFP_Daily_Data_QC_MV_Adjusted_Summary_Report_2012-01-01-2023-12-31. Rothamsted Research Rothamsted Research.

North Wyke Farm Platform

DATA QUALITY AND SUMMARY STATISTICS

SUMMARY OF DAILY STATISTICS - QC and MV ADJUSTED DATA

Data Range: 2012-01-01 to 2023-12-31

This report complements the daily means data set published on the Rothamsted Research data repository

Data Version: 3

Report produced on: 12 May 2025
Compiled by: Jane Hawkins using R version 4.2.1 (2022-06-23 ucrt)

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1 Introduction

This report includes tables and graphics of summary statistics of the daily means data set 'Daily_Means_QCadjusted_MissValsadjusted_2012-01-01_2023-12-31.csv' published on the Rothamsted Research data repository, hosted on CKAN. The published data set was calculated from yearly csv files (2012-2023) of 15 minute time steps for the variables given in Table 1 that were downloaded from the North Wyke Farm Platform Data Portal. The 15 minute data were first screened based on the Quality Control (QC) flag that was assigned to the value at each time step. Values that did not have 'Good', 'Acceptable' and 'Outlier' QC flags were set to 'NA'. The types of QC flag and their description are given in the Appendix.

The daily means of each variable in the data set were calculated alongside an accompanying daily missing values count (up to 96). The number of within day missing values impacts the reliability of the statistic and the influence of 'missingness' varies according to the variable and its volatility throughout the day. The count of daily missing values can therefore be used as a quality index for the data. The acceptable threshold for number of daily missing values for each variable were derived from expert opinion following examination of the data and are included in Table 2. For each variable, Where daily missing values exceeded its acceptable threshold, the daily mean was set to 'NA'. A full explanation and the R code used to perform the calculations are published as an RPubs document.

Table 1 lists the variable names as they appear in the published means data set, the corresponding display names used in this report, and variable units. The daily means data set includes 2 variables that are not available from the data portal. These are the daily mean of total oxidisable N (ToTN_mg_l), calculated as the sum of Nitrite_and_Nitrate_mg_l, Ammonium_mg_l and Ammonia_mg_l, and total daily precipitation (Total_Precipitation_mm) as this is likely to be a more meaningful statistic than the daily mean Precipitation_mm (Table 2).

The summary statistics in this report are for data that have been adjusted with regards to QC flag and acceptable daily missing value threshold.

2 Variable Details

CSV Variable Name	Display Name	Units	Missing Value Threshold (≤)
Flow_l_s	Flow	L/s	75
Water_Temperature_Flume_oC	Water_Temperature_Flume	°C	75
Nitrite_and_Nitrate_mg_l	Nitrite_and_Nitrate	mg/L	50
Ammonia_mg_l	Ammonia	mg/L	10
Ammonium_mg_l	Ammonium	mg/L	10
Conductivity_uS_cm	Conductivity	uS/cm	75
Dissolved_Oxygen	DO	%	75
pH	pH	NA	75
Water_Temperature_Flow_cell_oC	Water_Temperature_Flow_cell	°C	75
Turbidity_FNU	Turbidity	FNU	50
Total_Phosphorus_mg_l	Total_Phosphorus	mg/L	10
Ortho_Phosphorus_mg_l	Ortho_Phosphorus	mg/L	10
Fluorescent_Dissolved_Organic_Matter_ug_l_QSU	FDOM	ug/L QSU	50
Precipitation_mm	Precipitation	mm	50
Soil_Temperature_15cm_Depth_oC	Soil_Temperature	°C	50
Soil_Moisture_10cm_Depth	Soil_Moisture	%	50

Table 1: *Variable names, units and missing value thresholds*

Derived Variable Name	Display Name	Units	Missing Value Threshold (≤)
TotN_mg_l	TotN	mg/L	50
Total_Precipitation_mm	Total_Precipitation	mm	50

Table 2: *Derived variable names, units and missing value thresholds*

3 Missing Values

3.1 Total number of missing values

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	140136	94467	91302	138958	94001	88866	90229	98286	85004	84846	142550	97824	96297	88552	108358
Water_Temperature_Flume	249775	210457	206039	240245	204306	205595	206615	202110	201867	201550	255762	207545	211202	204039	214046
Nitrite_and_Nitrate	285096	267625	302298	385959	363289	286888	297990	305103	361483	361184	287582	265634	277791	335384	321161
Ammonia	260850	284784	299723	384155	365104	292115	307990	302989	356359	356474	281637	255560	256133	344604	313542
Ammonium	263745	283057	298225	384039	364280	292117	310636	302217	356123	355662	285270	254867	258220	344626	312784
Conductivity	251099	273093	296665	383023	358762	286408	308040	298538	351635	353857	284380	252954	257939	336512	305277
DO	261343	271029	303948	382487	360007	282160	289184	298863	352027	354606	272264	253920	254651	335669	305977
pH	250424	271958	296951	383352	359300	285753	291546	299970	353098	354424	277739	256130	253030	336355	307630
Water_Temperature_Flow_cell	249829	273022	296406	383019	358597	285815	307864	298492	351569	353533	281663	252262	257688	336528	305236
Turbidity	257382	272148	298117	384134	358866	285730	295745	311223	351755	354636	283989	256741	255551	345927	309050
Total_Phosphorus	410016	332445	410016	410016	410016	410016	360142	410016	410016	410016	353266	376331	410016	410016	410016
Ortho_Phosphorus	410016	358896	410016	410016	410016	410016	380867	410016	410016	410016	379221	379180	410016	410016	410016
FDOM	317470	316685	340523	393700	375913	331473	331339	337656	370926	374405	325738	316438	323754	368696	352266
Precipitation	139553	21154	33567	27795	15292	96906	12067	18661	23469	33744	40388	67504	128988	124743	103064
Soil_Temperature	190288	26636	33352	23308	13470	73180	12043	30791	16016	37023	48535	85157	144031	112713	117192
Soil_Moisture	191453	27392	33776	23862	13756	80927	12364	31016	16423	44993	53942	78564	144017	113819	117899
TotN	285064	267607	302140	385958	363274	286888	297960	305095	361480	361177	286132	265553	277525	335384	321145
Total_Precipitation	139553	21154	33567	27795	15292	96906	12067	18661	23469	33744	40388	67504	128988	124743	103064

* values in red are derived variables

Table 3: *Total number of missing values (out of 410016)*

3.2 Total number of missing values as a percentage of observed values

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	34	23	22	34	23	22	22	24	21	21	35	24	23	22	26
Water_Temperature_Flume	61	51	50	59	50	50	50	49	49	49	62	51	52	50	52
Nitrite_and_Nitrate	70	65	74	94	89	70	73	74	88	88	70	65	68	82	78
Ammonia	64	69	73	94	89	71	75	74	87	87	69	62	62	84	76
Ammonium	64	69	73	94	89	71	76	74	87	87	70	62	63	84	76
Conductivity	61	67	72	93	87	70	75	73	86	86	69	62	63	82	74
DO	64	66	74	93	88	69	71	73	86	86	66	62	62	82	75
pH	61	66	72	93	88	70	71	73	86	86	68	62	62	82	75
Water_Temperature_Flow_cell	61	67	72	93	87	70	75	73	86	86	69	62	63	82	74
Turbidity	63	66	73	94	88	70	72	76	86	86	69	63	62	84	75
Total_Phosphorus	100	81	100	100	100	100	88	100	100	100	86	92	100	100	100
Ortho_Phosphorus	100	88	100	100	100	100	93	100	100	100	92	92	100	100	100
FDOM	77	77	83	96	92	81	81	82	90	91	79	77	79	90	86
Precipitation	34	5	8	7	4	24	3	5	6	8	10	16	31	30	25
Soil_Temperature	46	6	8	6	3	18	3	8	4	9	12	21	35	27	29
Soil_Moisture	47	7	8	6	3	20	3	8	4	11	13	19	35	28	29
TotN	70	65	74	94	89	70	73	74	88	88	70	65	68	82	78
Total_Precipitation	34	5	8	7	4	24	3	5	6	8	10	16	31	30	25

* values in red are derived variables

Table 4: *Total number of missing values as a percentage*

4 Means

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	1.60	1.05	0.47	0.14	0.19	0.82	1.06	0.42	0.19	0.26	1.01	1.13	0.96	0.22	0.35
Water_Temperature_Flume	10.33	10.15	10.69	10.06	10.89	10.69	10.60	10.51	10.49	11.04	10.32	10.77	10.63	10.88	10.54
Nitrite_and_Nitrate	1.65	2.91	2.05	1.90	1.69	2.52	1.41	1.81	2.84	1.55	3.52	3.47	3.41	5.72	5.02
Ammonia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonium	0.25	0.23	0.16	0.37	0.24	0.21	0.80	0.23	0.18	0.30	0.91	0.40	0.32	0.25	0.31
Conductivity	209.59	191.68	171.40	171.57	154.27	203.69	201.74	169.51	198.23	189.94	270.85	292.03	256.05	233.25	255.83
DO	96.40	93.08	93.44	98.35	93.37	88.77	94.62	88.74	97.60	95.32	90.06	92.41	83.88	93.90	90.71
pH	6.83	6.55	6.51	6.38	6.85	6.53	6.61	6.23	6.84	7.10	6.60	6.85	6.50	6.74	6.47
Water_Temperature_Flow_cell	9.19	9.12	9.56	9.09	8.80	9.28	8.86	9.47	8.84	8.62	9.27	9.32	9.48	8.93	9.00
Turbidity	7.62	13.45	9.16	16.16	24.74	13.44	20.70	26.14	15.73	49.35	37.25	28.08	24.60	22.09	42.19
Total_Phosphorus	NaN	0.06	NaN	NaN	NaN	NaN	0.06	NaN	NaN	NaN	0.08	0.09	NaN	NaN	NaN
Ortho_Phosphorus	NaN	0.02	NaN	NaN	NaN	NaN	0.02	NaN	NaN	NaN	0.03	0.02	NaN	NaN	NaN
FDOM	117.82	149.68	107.25	85.08	222.15	124.35	142.90	128.18	126.32	192.45	123.81	172.42	131.55	148.93	88.65
Precipitation	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03
Soil_Temperature	10.54	10.69	10.91	10.87	11.24	10.64	10.27	10.44	10.95	11.08	10.12	10.25	10.17	10.57	10.55
Soil_Moisture	35.13	35.12	34.96	36.66	35.14	33.33	34.43	35.16	33.36	34.76	34.97	34.04	36.41	33.24	34.56
TotN	1.90	3.12	2.25	2.15	1.90	2.72	2.17	2.12	3.04	1.86	4.33	3.87	3.71	5.92	5.32
Total_Precipitation	2.53	2.39	2.47	2.70	2.57	2.63	2.73	2.79	2.33	2.73	2.59	2.74	2.54	2.66	2.74

* values in red are derived variables

Table 5: *Means*

5 Standard Deviations

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	4.30	3.33	1.44	0.89	0.77	2.96	3.60	1.31	0.84	1.00	3.09	3.37	2.23	0.72	0.91
Water_Temperature_Flume	0.25	0.29	0.37	0.49	0.35	0.29	0.25	0.44	0.53	0.47	0.32	0.25	0.41	0.34	0.45
Nitrite_and_Nitrate	0.24	0.39	0.28	0.28	0.48	0.61	0.36	0.48	0.66	0.58	0.97	0.83	1.01	1.00	1.16
Ammonia	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.00	0.00
Ammonium	0.42	0.14	0.44	0.21	0.05	0.09	0.84	0.05	0.04	0.17	0.86	0.26	0.36	0.15	0.12
Conductivity	20.64	10.64	16.46	24.27	10.59	12.72	39.32	13.60	20.64	13.80	22.63	20.56	19.78	17.82	20.28
DO	0.47	0.98	0.69	0.54	0.56	1.43	0.59	1.27	0.40	0.65	1.61	0.94	2.03	0.55	1.06
pH	0.12	0.09	0.09	0.19	0.08	0.10	0.12	0.13	0.12	0.10	0.12	0.12	0.10	0.10	0.08
Water_Temperature_Flow_cell	0.28	0.31	0.26	0.22	0.27	0.31	0.33	0.32	0.31	0.36	0.38	0.33	0.32	0.23	0.34
Turbidity	12.52	41.83	17.21	16.18	20.80	27.05	34.06	37.24	26.06	50.38	124.84	97.51	83.48	65.77	85.80
Total_Phosphorus	NA	0.04	NA	NA	NA	NA	0.05	NA	NA	NA	0.16	0.21	NA	NA	NA
Ortho_Phosphorus	NA	0.00	NA	NA	NA	NA	0.01	NA	NA	NA	0.06	0.04	NA	NA	NA
FDOM	14.37	17.87	16.82	10.81	11.32	19.43	15.11	9.97	11.56	13.71	16.59	22.17	14.40	15.18	11.36
Precipitation	0.12	0.11	0.11	0.12	0.11	0.11	0.11	0.12	0.11	0.12	0.11	0.11	0.11	0.11	0.11
Soil_Temperature	0.13	0.17	0.19	0.16	0.19	0.17	0.16	0.16	0.20	0.22	0.17	0.27	0.25	0.22	0.26
Soil_Moisture	0.31	0.27	0.31	0.28	0.32	0.29	0.26	0.30	0.26	0.33	0.43	0.36	0.39	0.35	0.43
TotN	1.01	0.47	1.09	0.29	0.48	0.64	2.16	1.34	0.68	0.57	1.36	1.30	1.15	1.00	1.23
Total_Precipitation	0.12	0.11	0.11	0.12	0.11	0.11	0.11	0.12	0.11	0.12	0.11	0.11	0.11	0.11	0.11

* values in red are derived variables

Table 6: *Standard Deviations*

6 Medians

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	0.35	0.16	0.06	0.01	0.01	0.06	0.06	0.08	0.02	0.01	0.11	0.17	0.24	0.02	0.07
Water_Temperature_Flume	9.69	9.60	10.20	9.60	10.10	10.00	10.10	10.00	9.80	10.39	9.65	10.30	9.80	10.00	9.75
Nitrite_and_Nitrate	1.29	2.73	2.19	1.52	1.17	1.92	1.01	1.50	2.43	0.96	1.98	2.18	1.82	4.43	3.92
Ammonia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonium	0.14	0.12	0.05	0.21	0.18	0.14	0.25	0.16	0.13	0.14	0.32	0.30	0.18	0.17	0.20
Conductivity	198.00	192.50	174.10	154.62	150.60	202.02	183.95	158.20	196.98	179.50	261.50	283.28	242.38	224.10	259.00
DO	96.50	93.40	93.20	98.74	93.03	88.36	95.27	88.47	97.42	95.38	90.25	92.93	84.16	93.50	90.80
pH	6.88	6.52	6.48	6.78	6.95	6.48	6.70	6.28	6.94	7.24	6.56	6.89	6.53	6.69	6.42
Water_Temperature_Flow_cell	8.62	8.74	9.14	8.65	8.32	8.80	8.53	8.99	8.35	8.26	8.68	8.76	9.00	8.54	8.53
Turbidity	3.50	5.33	3.36	8.56	16.50	4.84	9.60	11.42	6.90	27.59	8.86	5.74	6.12	6.35	10.35
Total_Phosphorus	NA	0.04	NA	NA	NA	NA	0.04	NA	NA	NA	0.05	0.04	NA	NA	NA
Ortho_Phosphorus	NA	0.03	NA	NA	NA	NA	0.02	NA	NA	NA	0.02	0.02	NA	NA	NA
FDOM	109.88	141.34	98.39	85.66	215.34	115.88	136.99	120.83	124.47	191.82	130.57	170.63	131.45	147.70	91.44
Precipitation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Soil_Temperature	10.17	10.07	10.38	10.50	10.88	9.94	9.75	9.88	10.53	10.56	9.56	9.62	9.56	10.19	9.88
Soil_Moisture	37.94	37.56	37.10	37.44	38.28	35.51	35.94	37.42	35.62	38.30	38.40	37.56	38.72	35.92	36.93
TotN	1.48	2.91	2.27	1.73	1.44	2.13	1.27	1.67	2.66	1.18	2.42	2.56	2.06	4.56	4.14
Total_Precipitation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* values in red are derived variables

Table 7: *Medians*

7 Minimums

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Water_Temperature_Flume	1.8	1.40	0.5	-0.20	1.60	1.30	0.80	0.2	0.0	0.70	0.90	1.40	0.90	1.60	0.10
Nitrite_and_Nitrate	0.0	0.00	0.0	0.00	0.01	0.00	0.01	0.0	0.0	0.00	0.01	0.00	0.00	0.00	0.00
Ammonia	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Ammonium	0.0	0.00	0.0	0.02	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.02	0.00	0.00
Conductivity	10.0	45.20	10.7	29.30	10.00	12.10	11.70	11.6	42.0	10.00	10.00	10.00	10.30	44.00	42.00
DO	13.6	75.10	26.5	69.43	71.81	74.70	60.39	8.1	79.5	55.08	5.80	50.84	45.60	72.00	64.30
pH	2.9	4.16	3.1	3.14	3.70	3.89	2.88	3.1	3.3	4.08	3.05	3.47	3.18	3.85	4.49
Water_Temperature_Flow_cell	0.0	0.00	0.0	0.78	0.00	0.00	0.57	0.0	0.0	0.00	0.00	0.00	0.41	0.00	0.00
Turbidity	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Total_Phosphorus	NA	0.00	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	NA	NA	NA
Ortho_Phosphorus	NA	0.00	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	NA	NA	NA
FDOM	0.0	0.00	0.0	0.16	0.00	0.00	0.57	0.0	0.0	0.00	0.00	0.00	0.03	0.00	0.00
Precipitation	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Soil_Temperature	1.6	1.44	1.6	1.38	1.88	0.50	0.62	1.2	1.1	1.06	1.00	0.69	0.88	1.25	0.88
Soil_Moisture	17.1	8.52	12.9	15.56	9.26	6.75	17.20	16.1	10.3	12.35	10.39	4.98	12.62	6.92	14.55
TotN	0.0	0.02	0.0	0.00	0.07	0.04	0.00	0.0	0.0	0.01	0.00	0.01	0.00	0.08	0.04
Total_Precipitation	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00

* values in red are derived variables

Table 8: *Minimums*

8 Maximums

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	234.4	164.76	98.93	67.68	61.11	153.20	179.30	69.74	97.2	139.34	168.12	180.2	106.14	54.31	69.78
Water_Temperature_Flume	19.5	19.00	22.39	21.30	22.60	22.50	19.00	21.50	23.7	23.90	20.20	19.8	22.20	22.60	21.80
Nitrite_and_Nitrate	11.3	25.56	16.40	9.12	25.57	39.55	25.42	41.27	35.5	33.11	47.06	45.7	45.27	48.48	47.33
Ammonia	1.2	0.01	0.09	0.06	0.01	0.05	0.49	0.01	0.0	0.07	0.55	8.5	0.45	0.18	0.08
Ammonium	49.1	12.55	59.97	11.63	2.61	5.16	125.97	7.01	2.5	37.88	67.33	72.5	40.07	20.03	12.85
Conductivity	1964.0	697.00	1656.00	944.00	709.00	588.00	2515.90	1024.00	900.0	768.00	1380.00	1056.1	1401.00	949.00	1033.00
DO	105.7	103.60	103.29	107.87	109.03	105.49	104.40	105.40	119.7	108.66	113.50	107.6	113.30	109.38	105.44
pH	8.0	7.72	8.72	7.83	8.15	8.00	7.99	13.90	8.5	9.05	8.25	9.6	8.00	9.71	8.42
Water_Temperature_Flow_cell	20.0	18.86	20.19	20.09	20.66	22.64	24.06	20.07	20.0	20.59	22.32	22.3	25.67	19.05	18.27
Turbidity	980.5	4226.72	894.38	895.30	991.30	1443.06	2169.92	999.90	991.1	2445.04	4931.33	4861.0	4852.08	3504.98	4931.88
Total_Phosphorus	NA	1.80	NA	NA	NA	NA	2.59	NA	NA	NA	4.96	5.0	NA	NA	NA
Ortho_Phosphorus	NA	0.10	NA	NA	NA	NA	0.28	NA	NA	NA	1.98	2.0	NA	NA	NA
FDOM	393.3	493.24	419.58	187.22	392.69	499.50	448.65	474.57	256.6	435.94	336.55	394.7	356.36	297.42	495.72
Precipitation	17.2	12.80	11.00	10.00	15.60	8.20	10.40	11.40	9.2	16.60	17.40	10.0	9.00	9.00	7.00
Soil_Temperature	20.0	21.00	25.62	21.31	21.80	21.90	20.88	20.88	23.4	22.25	21.31	22.8	20.19	23.69	24.00
Soil_Moisture	43.0	40.87	40.84	55.91	43.28	54.44	40.61	41.75	40.8	48.46	46.26	43.9	43.95	41.24	56.45
TotN	104.0	37.70	101.43	10.48	26.51	41.74	127.28	94.41	35.5	57.45	78.24	199.0	56.38	48.71	67.23
Total_Precipitation	17.2	12.80	11.00	10.00	15.60	8.20	10.40	11.40	9.2	16.60	17.40	10.0	9.00	9.00	7.00

* values in red are derived variables

Table 9: *Maximums*

9 Coefficients of Variation

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	1.97	1.76	1.79	1.38	1.45	1.57	1.44	1.84	1.56	1.28	1.49	1.46	2.05	1.70	1.66
Water_Temperature_Flume	0.80	0.80	0.79	2.67	0.74	0.78	0.81	0.89	0.85	0.75	0.78	0.87	0.87	0.69	0.87
Nitrite_and_Nitrate	1.38	1.28	1.27	0.75	0.56	0.99	1.19	1.08	0.75	1.08	1.01	1.08	2.04	1.38	0.77
Ammonia	1.00	0.55	0.73	1.41	NA	0.62	1.47	0.92	NA	0.48	1.51	0.87	0.68	1.09	0.54
Ammonium	1.75	1.19	1.33	0.69	0.80	1.24	1.55	1.13	0.86	1.22	1.44	1.74	2.18	1.08	1.20
Conductivity	1.49	1.30	1.33	0.87	0.78	1.15	1.15	1.11	0.81	0.83	1.36	1.30	1.51	1.05	0.98
DO	0.88	0.91	0.95	1.15	0.71	1.04	0.90	0.87	0.58	0.62	0.86	0.89	1.04	0.68	0.71
pH	1.80	1.03	1.28	0.98	1.33	1.27	1.39	1.04	1.19	1.48	0.94	1.51	1.51	1.44	0.89
Water_Temperature_Flow_cell	1.35	1.35	1.30	1.14	0.94	1.28	1.11	1.26	1.05	0.83	1.17	1.33	1.67	1.22	1.25
Turbidity	0.96	0.97	0.92	0.85	0.78	1.01	0.79	0.86	0.72	0.69	0.92	1.05	1.10	0.82	0.71
Total_Phosphorus	NA	1.01	NA	NA	NA	NA	0.91	NA	NA	NA	1.02	1.07	NA	NA	NA
Ortho_Phosphorus	NA	1.74	NA	NA	NA	NA	0.62	NA	NA	NA	1.51	2.17	NA	NA	NA
FDOM	1.04	0.85	0.76	0.70	0.81	0.80	0.79	0.69	0.63	0.94	1.88	1.48	1.45	0.92	0.75
Precipitation	0.55	0.54	0.55	0.56	0.55	0.56	0.56	0.56	0.54	0.56	0.55	0.56	0.55	0.55	0.56
Soil_Temperature	0.66	0.70	0.78	0.71	0.69	0.81	0.78	0.74	0.74	0.71	0.75	0.85	1.02	0.71	0.80
Soil_Moisture	1.73	1.91	1.81	1.61	1.79	2.82	1.53	1.87	1.83	1.84	2.12	2.18	2.11	1.80	1.92
TotN	1.41	1.17	1.26	0.67	0.52	1.01	1.27	1.04	0.71	1.14	1.37	1.14	1.63	0.78	0.75
Total_Precipitation	0.55	0.54	0.55	0.56	0.55	0.56	0.56	0.56	0.54	0.56	0.55	0.56	0.55	0.55	0.56

* values in red are derived variables

Table 10: *Coefficients of Variation*

10 Inter Quartile Ranges

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

	Catchment Number														
	Green Farmlet					Blue Farmlet					Red Farmlet				
Variables	**4**	**5**	**6**	**12**	**13**	**9**	**8**	**7**	**11**	**14**	**2**	**3**	**1**	**10**	**15**
Flow	0.37	0.22	0.08	0.03	0.05	0.14	0.24	0.10	0.03	0.05	0.41	0.30	0.23	0.05	0.10
Water_Temperature_Flume	0.52	0.70	0.97	1.32	0.81	0.63	0.60	1.02	1.42	0.97	0.80	0.52	0.93	0.90	1.09
Nitrite_and_Nitrate	0.21	0.56	0.43	0.52	0.34	0.58	0.30	0.39	1.11	0.39	0.51	0.60	0.27	1.32	1.68
Ammonia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonium	0.05	0.05	0.01	0.06	0.03	0.04	0.10	0.05	0.03	0.03	0.08	0.05	0.03	0.03	0.03
Conductivity	12.25	14.92	15.70	30.75	15.11	20.84	29.04	17.15	38.32	23.95	25.62	28.82	17.39	26.46	41.33
DO	0.73	1.58	0.81	0.42	1.04	2.13	0.93	2.56	0.87	1.27	3.00	1.57	3.20	0.99	2.13
pH	0.06	0.13	0.09	0.30	0.07	0.13	0.15	0.22	0.11	0.06	0.23	0.08	0.08	0.08	0.12
Water_Temperature_Flow_cell	0.23	0.32	0.37	0.35	0.50	0.48	0.68	0.50	0.49	0.71	0.71	0.58	0.28	0.31	0.50
Turbidity	5.16	7.15	5.23	10.05	7.32	7.70	13.72	11.47	8.42	20.74	16.33	13.57	8.69	13.20	32.38
Total_Phosphorus	NA	0.04	NA	NA	NA	NA	0.04	NA	NA	NA	0.03	0.04	NA	NA	NA
Ortho_Phosphorus	NA	0.01	NA	NA	NA	NA	0.01	NA	NA	NA	0.01	0.01	NA	NA	NA
FDOM	26.05	34.78	38.96	25.00	12.40	27.40	28.42	16.35	14.91	23.83	23.73	23.75	12.55	19.20	19.49
Precipitation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Soil_Temperature	0.27	0.40	0.32	0.38	0.44	0.41	0.36	0.38	0.49	0.51	0.38	0.60	0.44	0.50	0.58
Soil_Moisture	0.29	0.25	0.32	0.22	0.27	0.23	0.26	0.24	0.23	0.29	0.28	0.28	0.26	0.29	0.23
TotN	0.21	0.53	0.42	0.52	0.33	0.56	0.33	0.37	1.11	0.41	0.51	0.57	0.30	1.31	1.73
Total_Precipitation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* values in red are derived variables

Table 11: *Interquartile Ranges*

11 Correlations

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

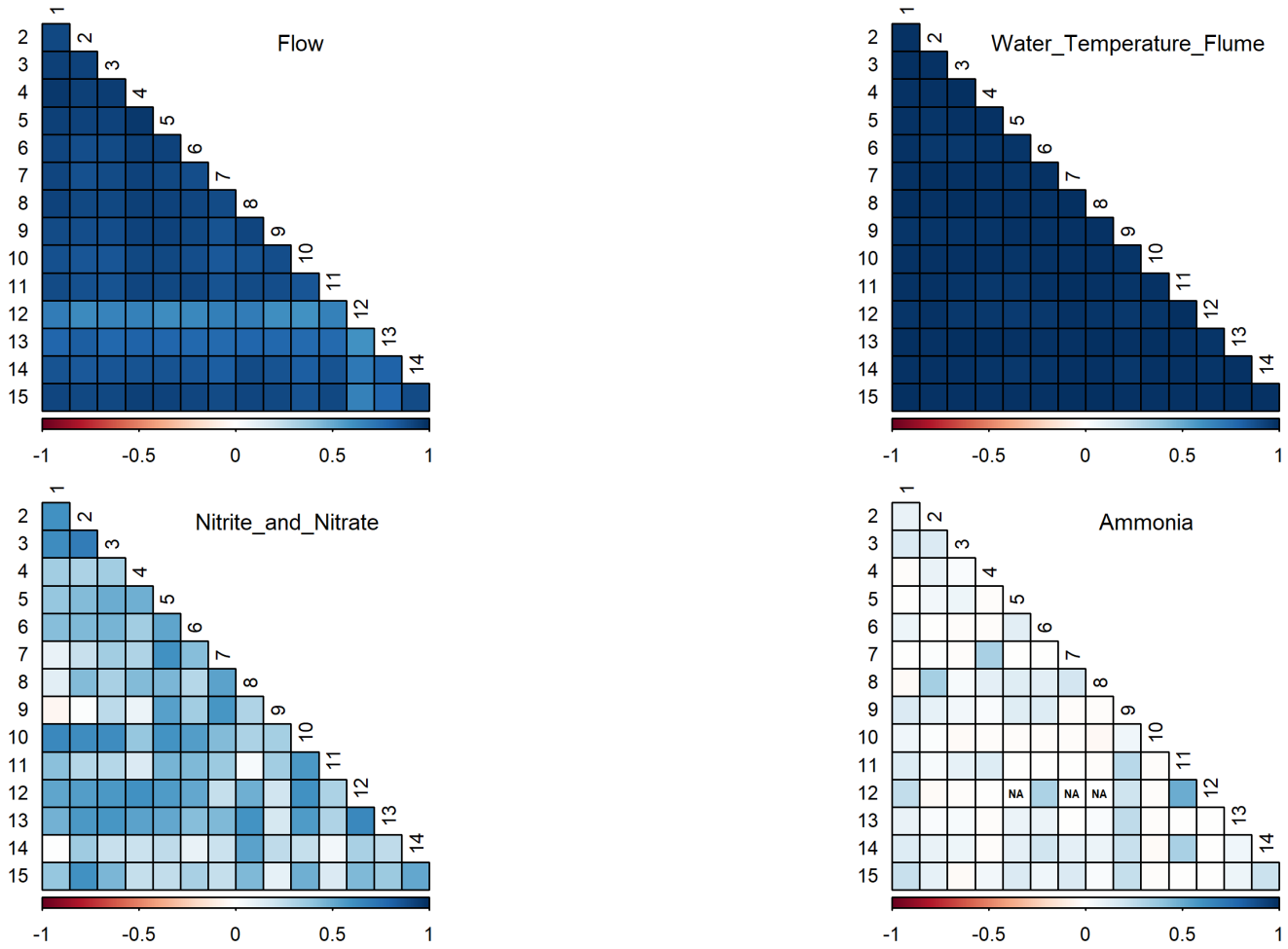

Figure 1: *Correlations between catchments: flow, water temperature flume, nitrite+nitrate, ammonia*

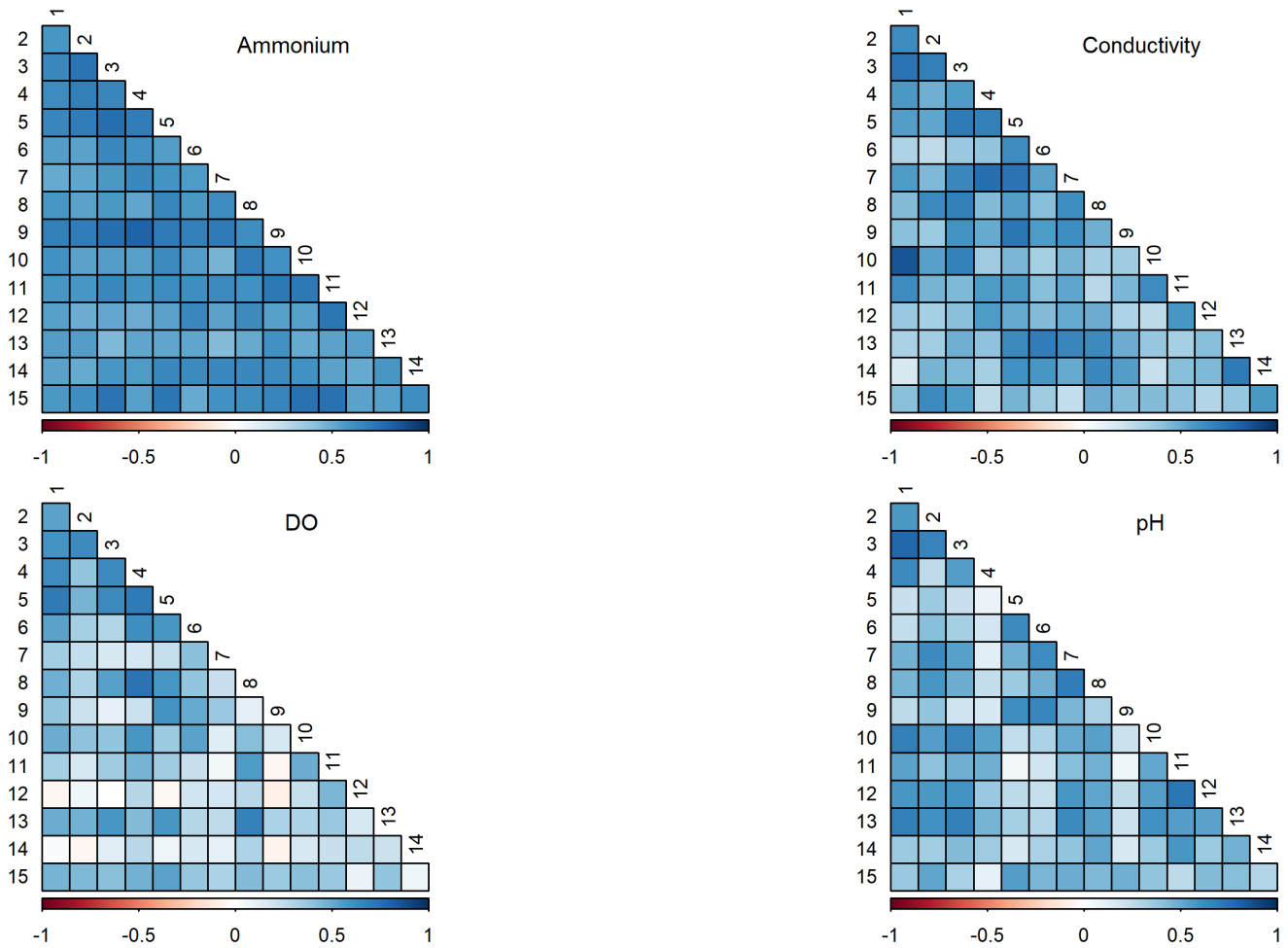

Figure 2: *Correlations between catchments: ammonium, conductivity, dissolved oxygen, ph*

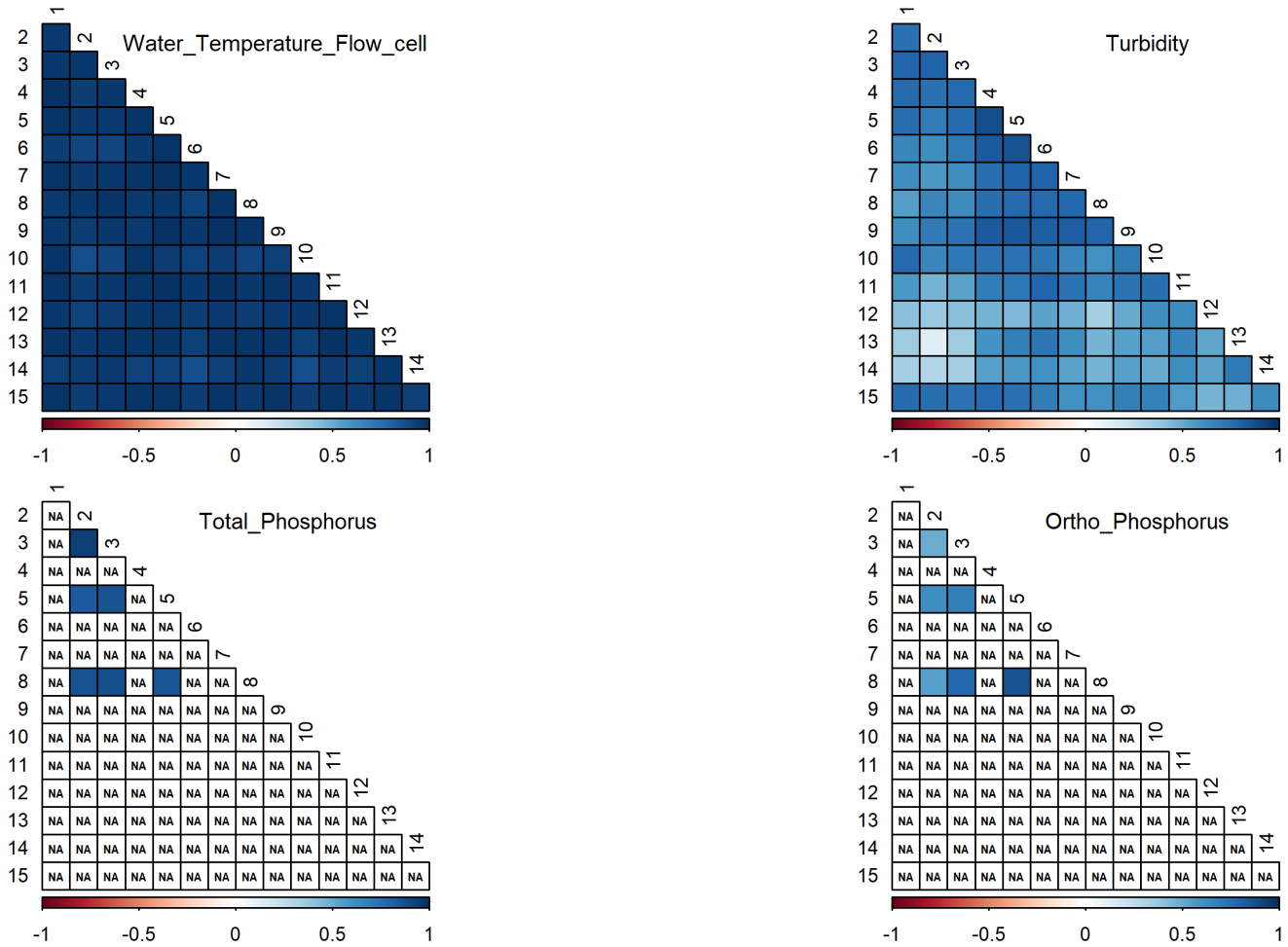

Figure 3: *Correlations between catchments: water temperature flow cell, turbidity, total phosphorus, ortho-phosphorus*

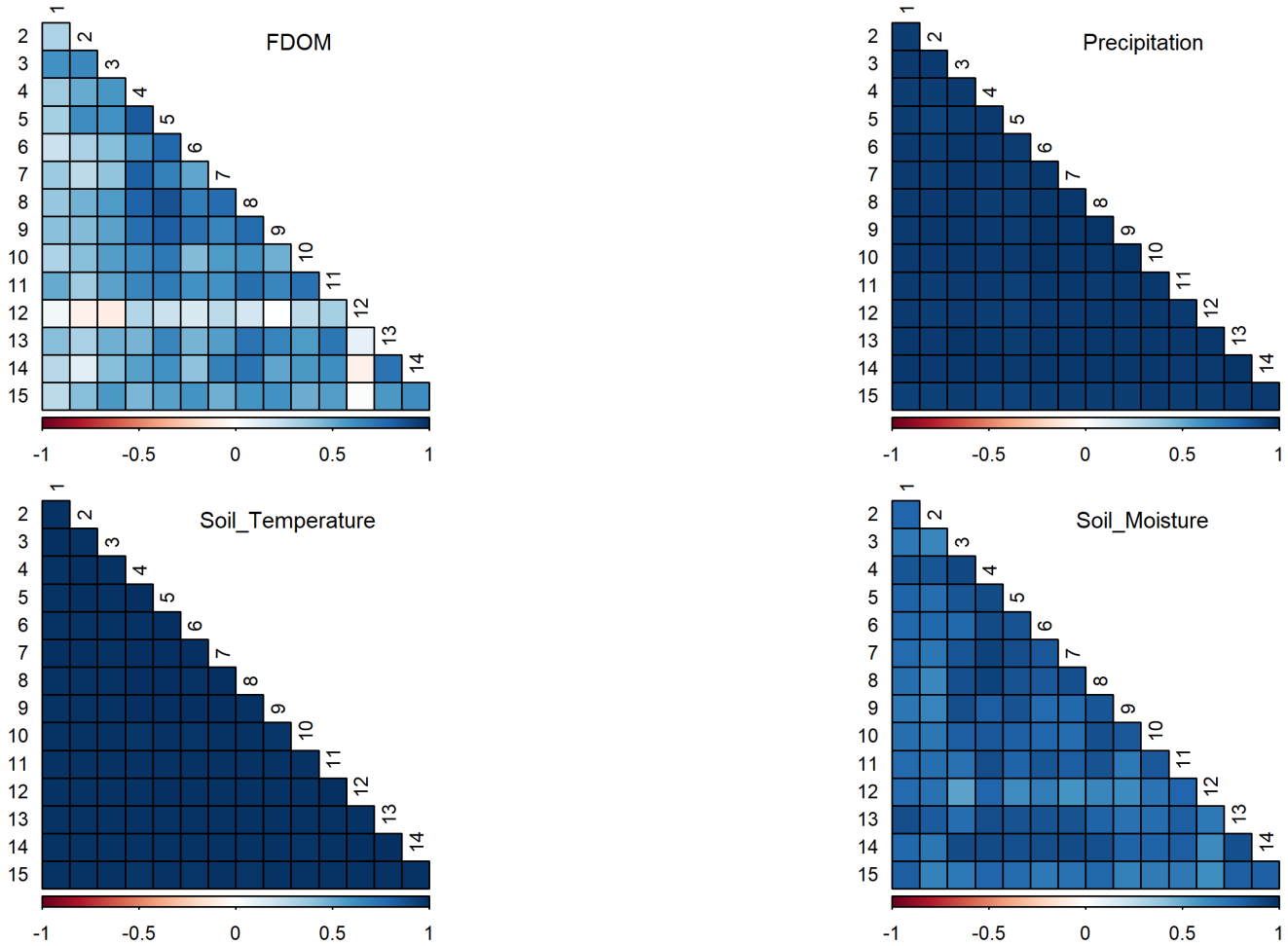

Figure 4: *Correlations between catchments: dissolved organic matter, precipitation, soil temperature, soil moisture*

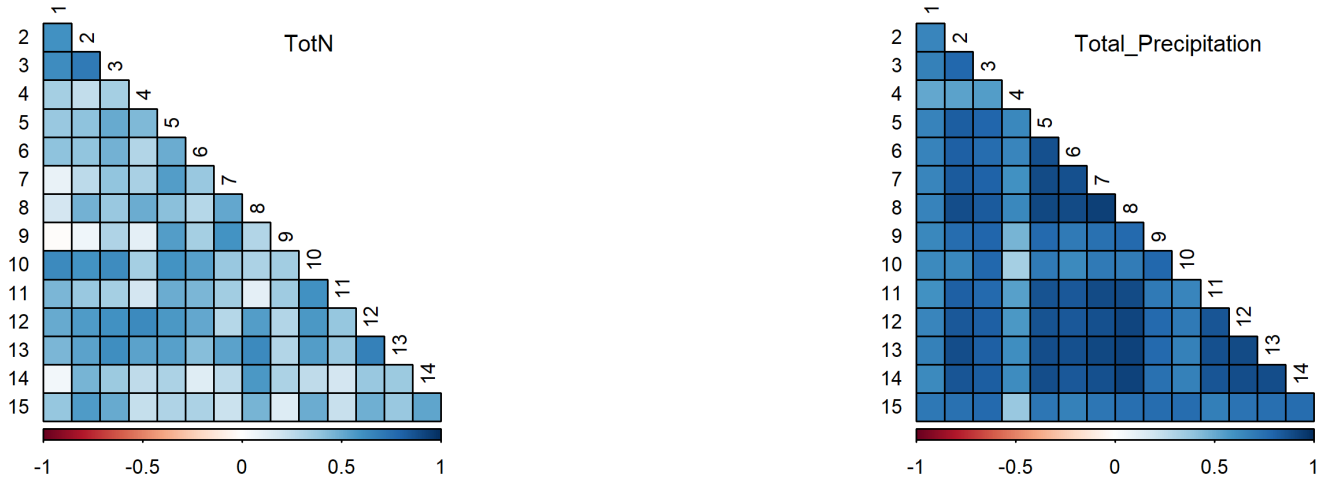

Figure 5: *Correlations between catchments: total oxidisable nitrogen, total precipitation*

12 Chloropleth maps of means

Grey areas represent missing data

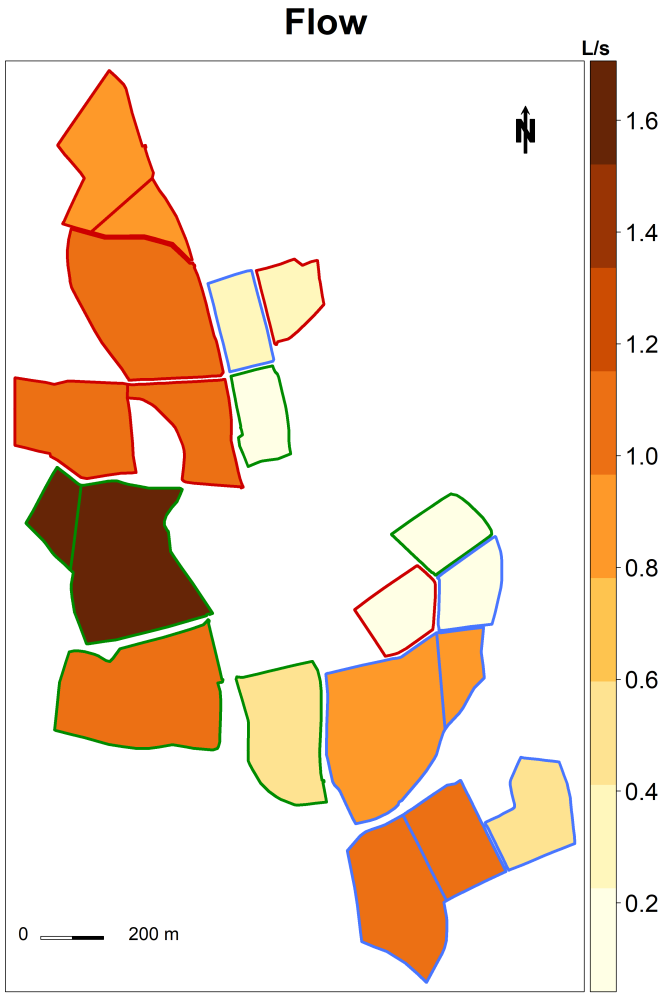

Figure 6: *Mapped means for flow*

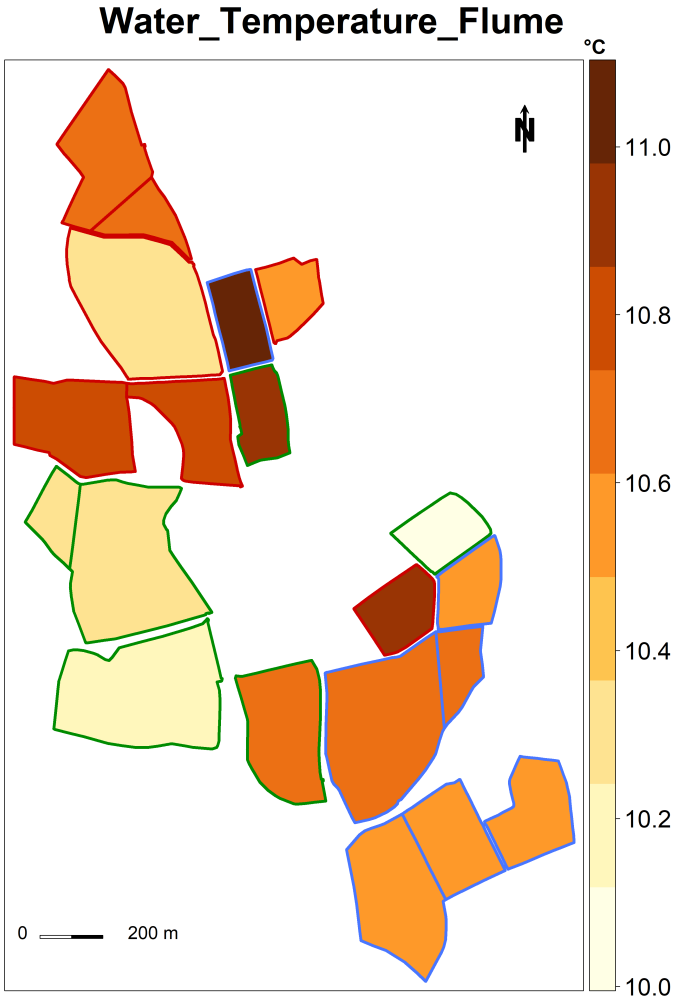

Figure 7: *Mapped means for water temperature flume*

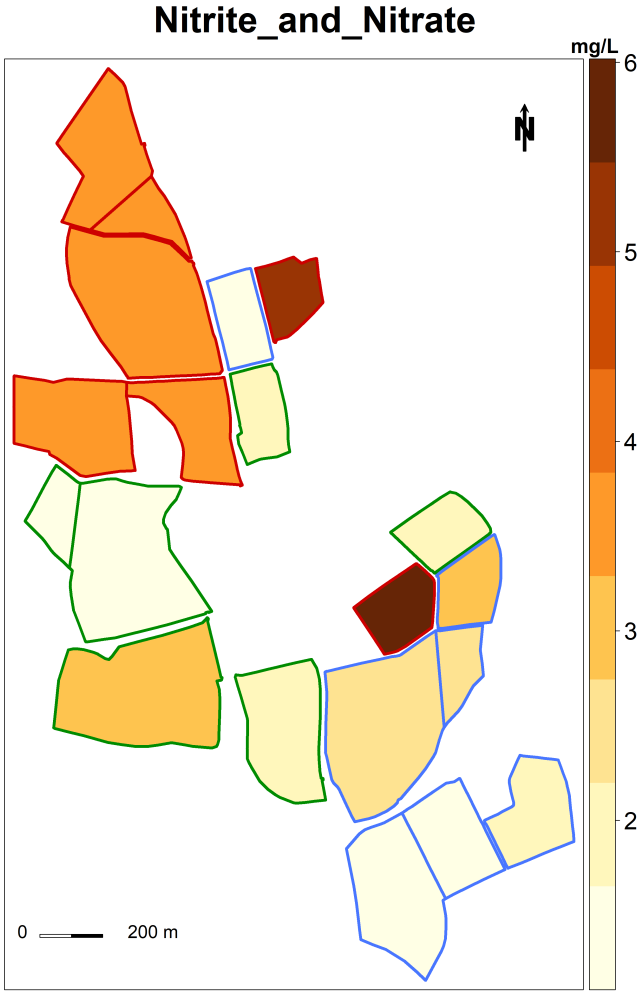

Figure 8: *Mapped means for nitrite+nitrate*

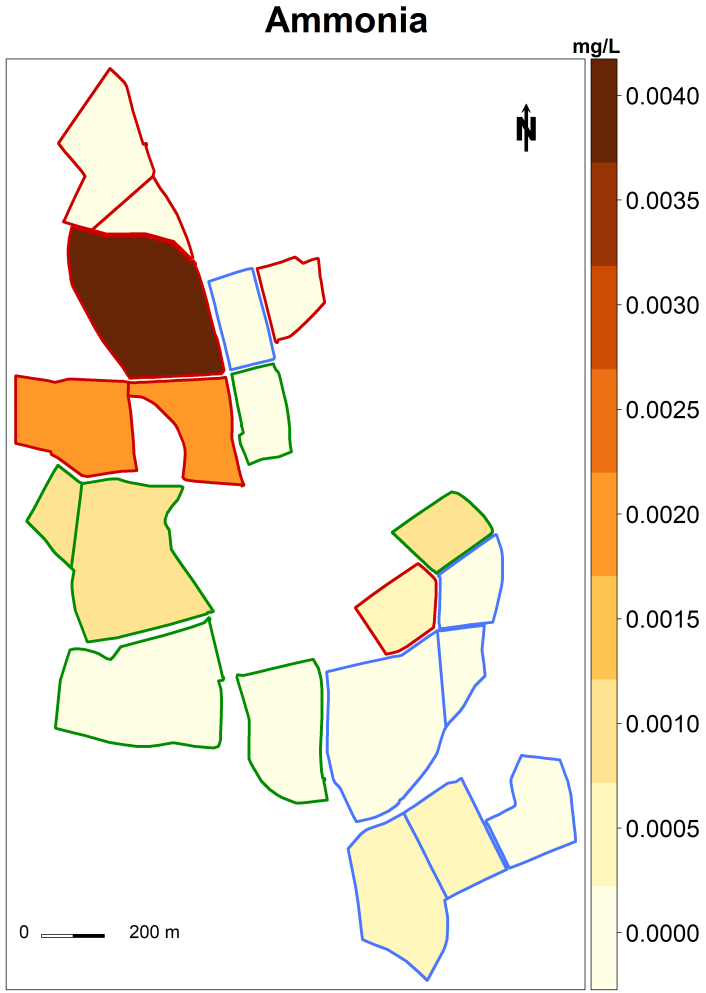

Figure 9: *Mapped means for ammonia*

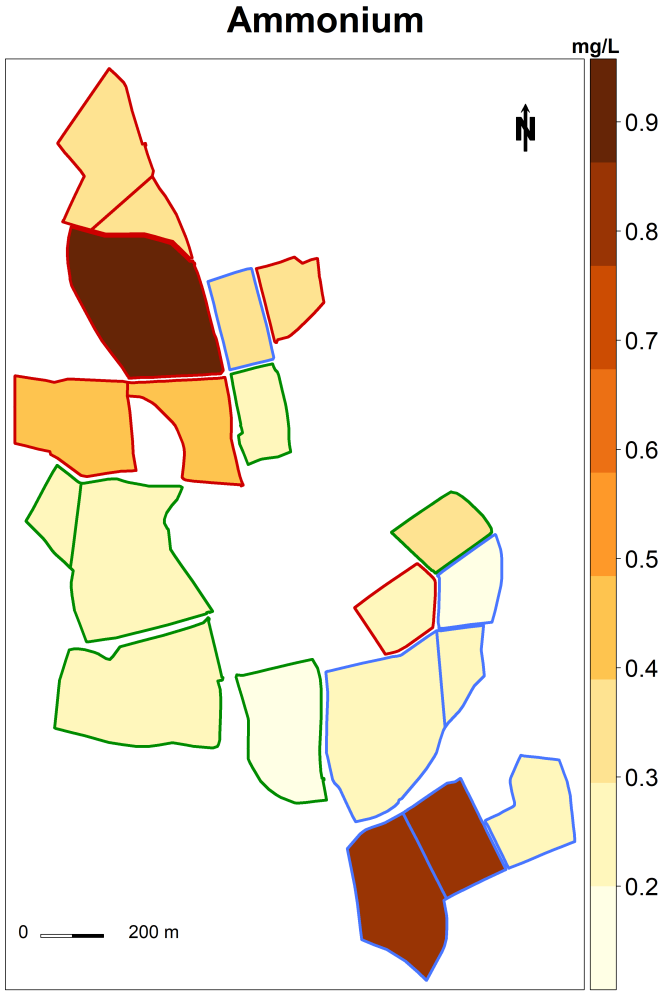

Figure 10: *Mapped means for ammonium*

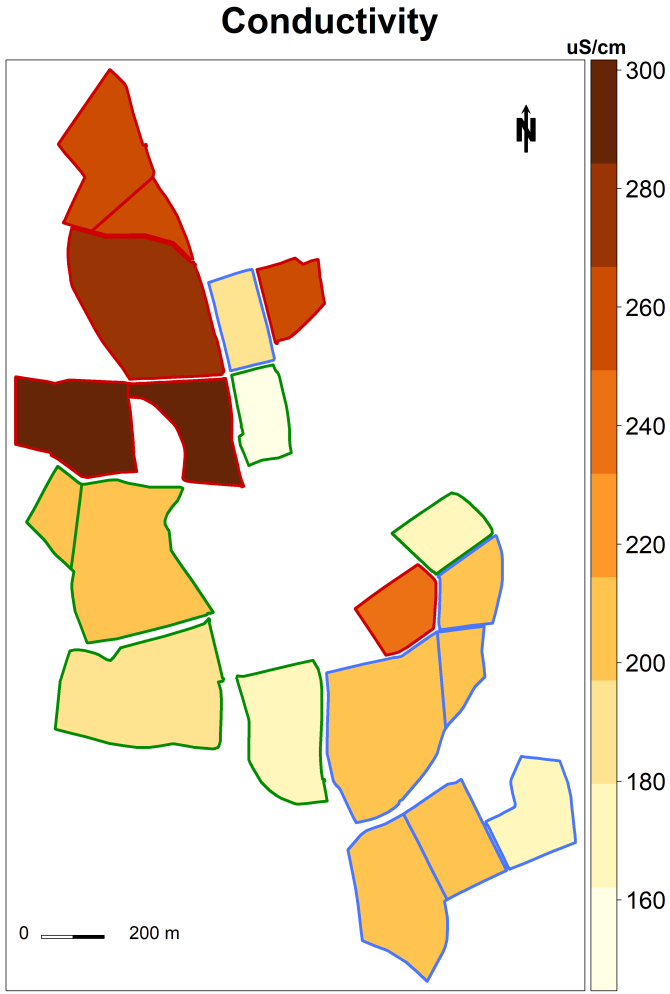

Figure 11: *Mapped means for conductivity*

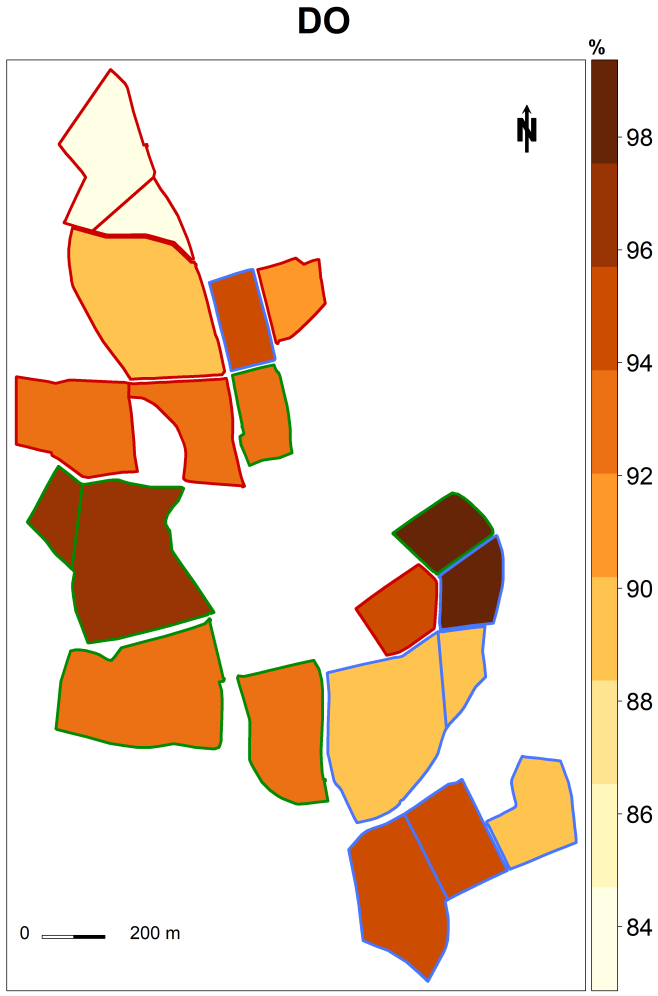

Figure 12: *Mapped means for dissolved oxygen*

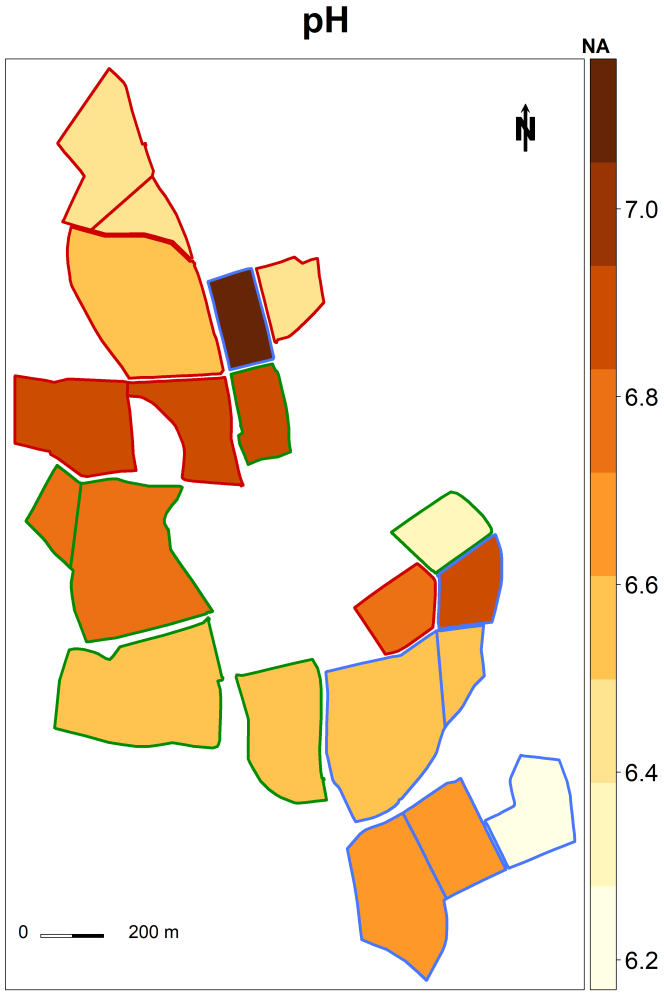

Figure 13: *Mapped means for ph*

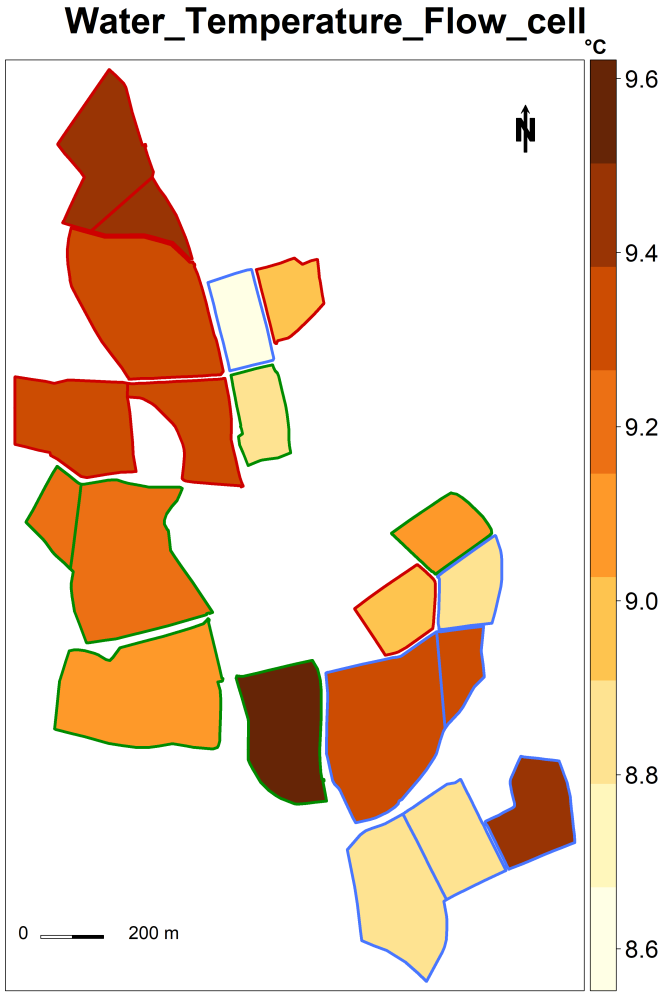

Figure 14: *Mapped means for water temperature flow cell*

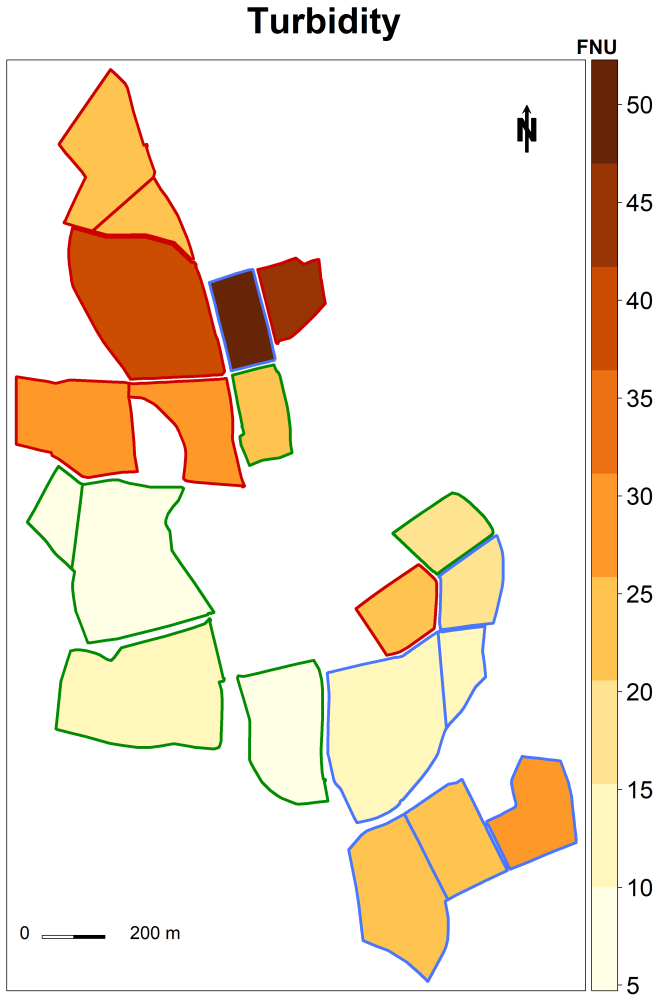

Figure 15: *Mapped means for turbidity*

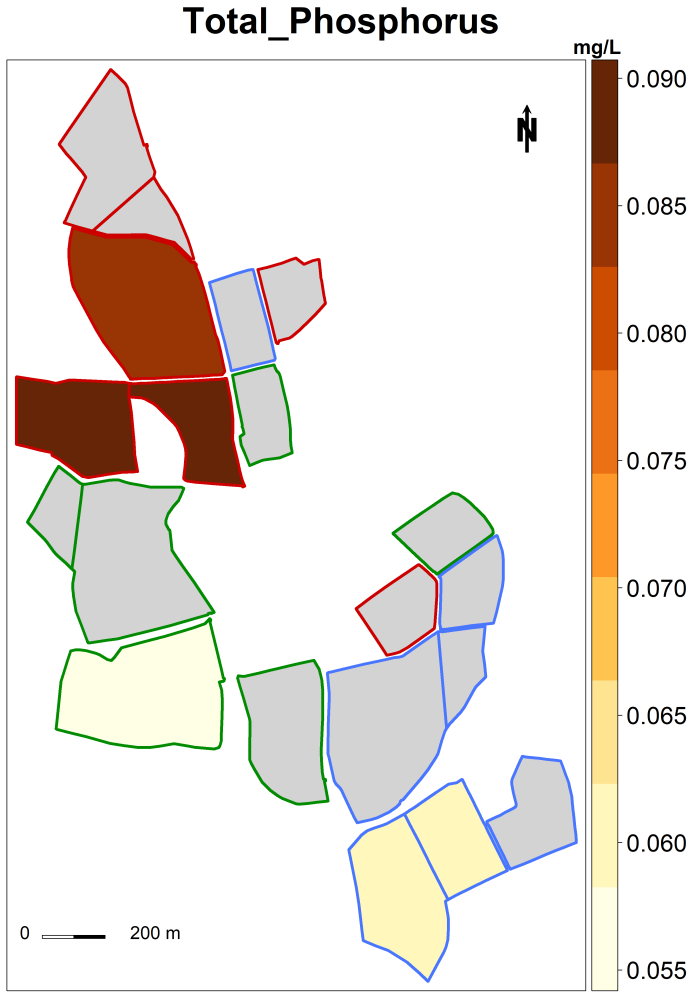

Figure 16: *Mapped means for total phosphorus*

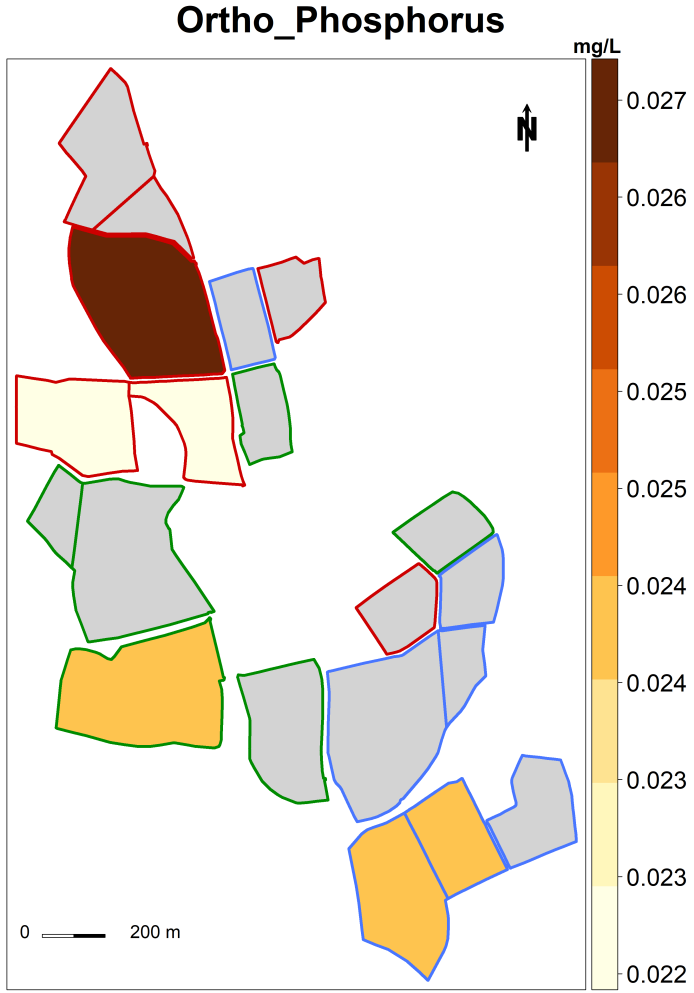

Figure 17: *Mapped means for ortho-phosphorus*

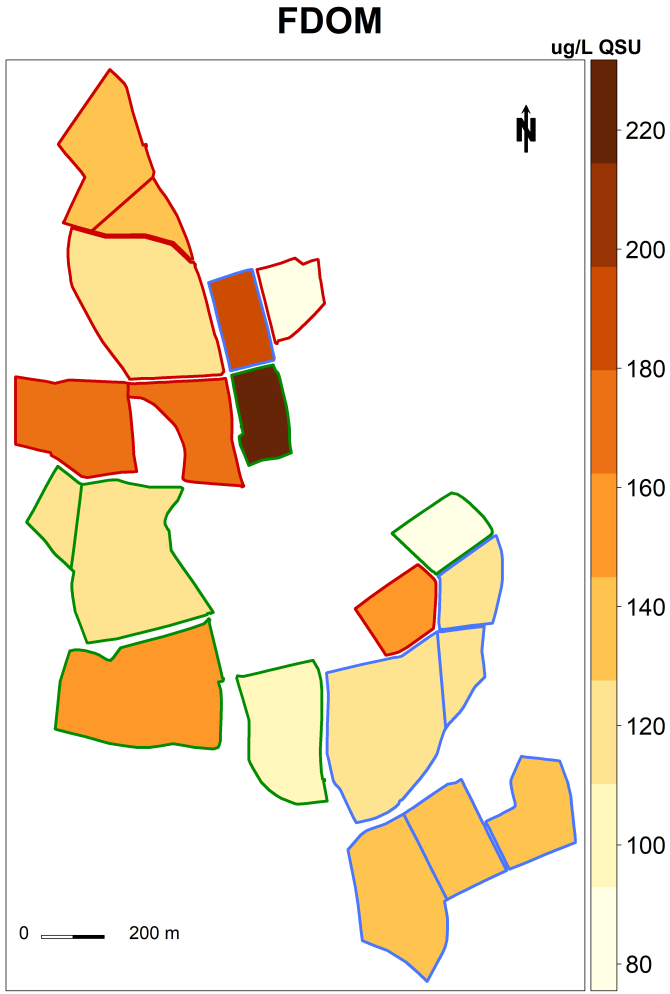

Figure 18: *Mapped means for dissolved organic matter*

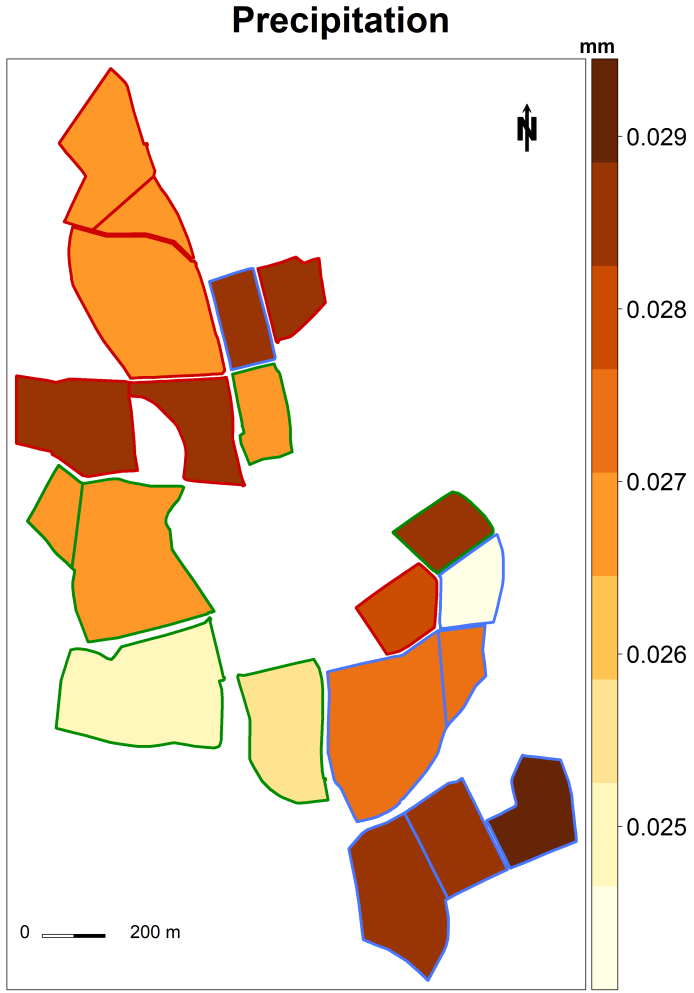

Figure 19: *Mapped means for precipitation*

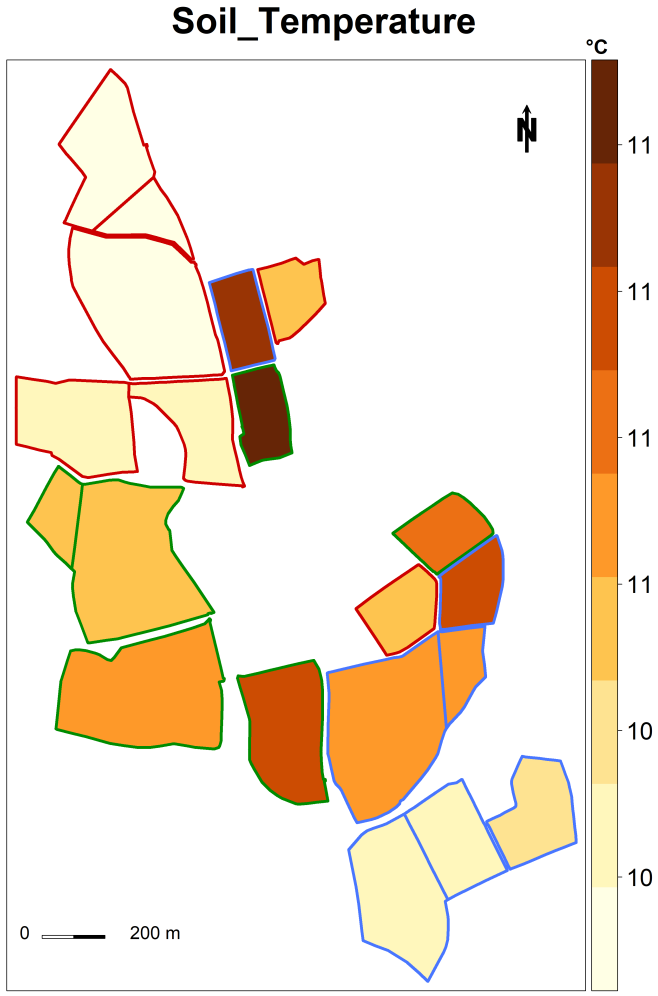

Figure 20: *Mapped means for soil temperature*

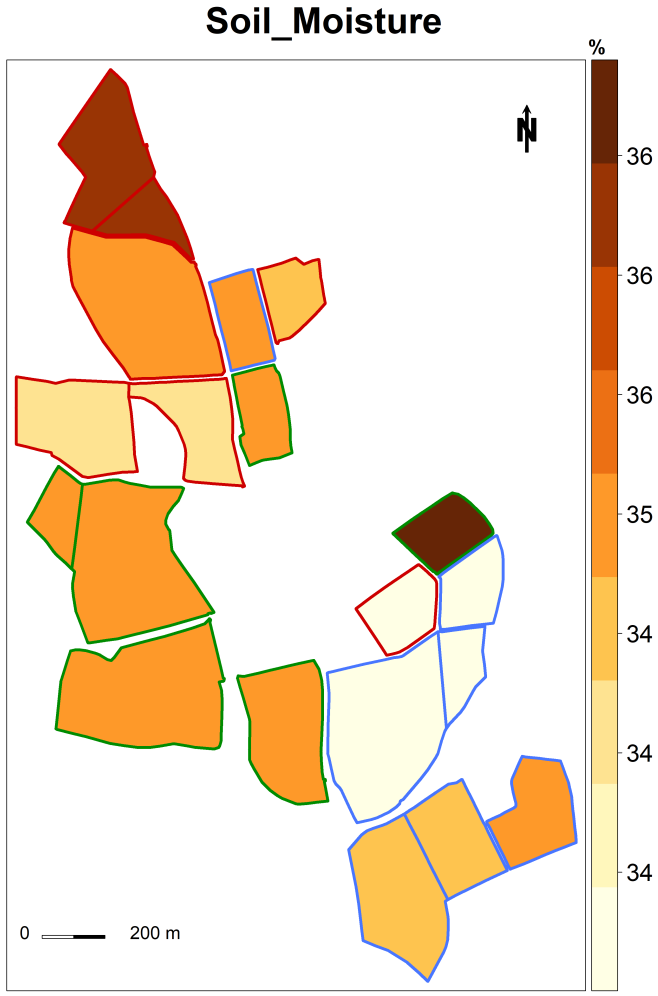

Figure 21: *Mapped means for soil moisture*

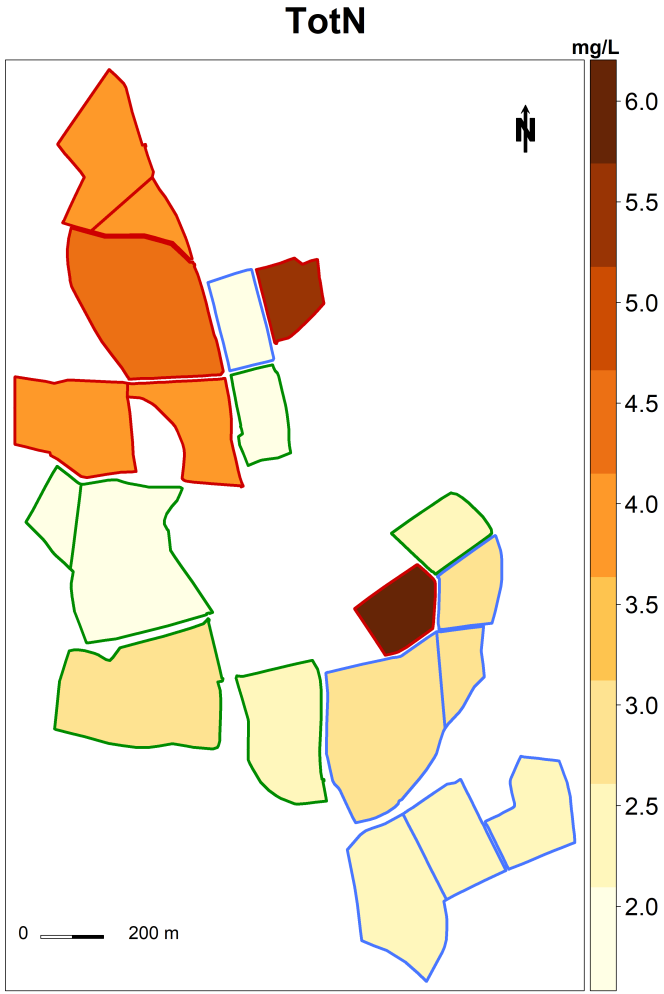

Figure 22: *Mapped means for total oxidisable nitrogen*

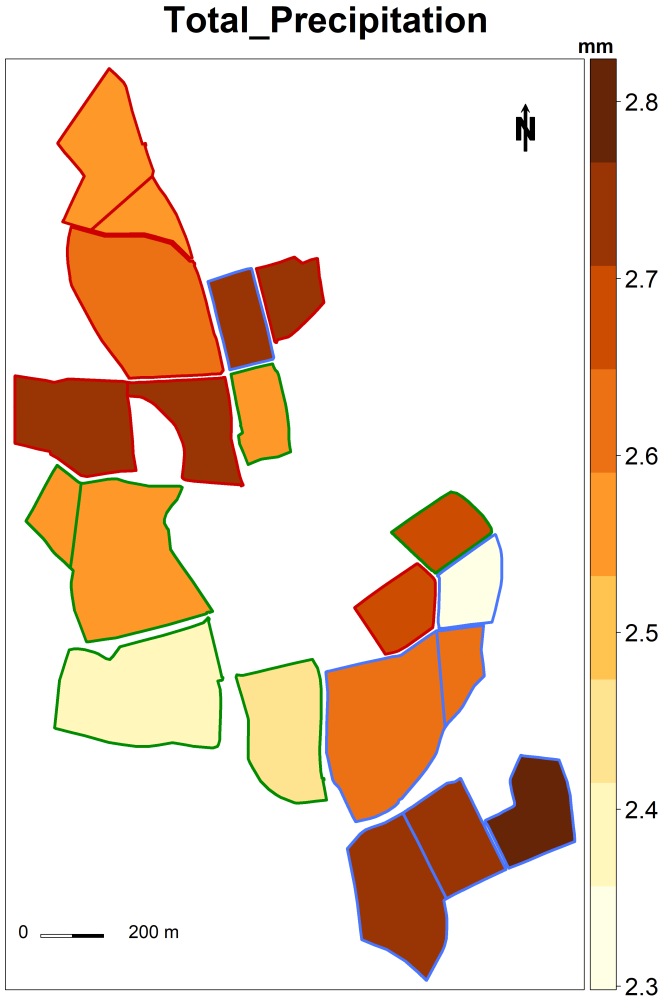

Figure 23: *Mapped means for total precipitation*

13 Appendix

13.1 Quality Control Flags

Flag	Description
Not set	No information on quality available
Good	Data were checked and deemed good
Acceptable	Data were checked and no issues were found
Suspicious	Data were checked and might have been affected by an event
Highly Suspicious	Data were checked and have definitely been affected by an event
Reject	Data were rejected
High Sensor Drift	Instrument calibration values were high over the time period
Missing Sensor Drift	Missing instrument calibration information and level of instrument drift during the period is unknown
Outlier	The value falls outside 'regular' limits but within the extreme limits and therefore could still be fine
Level Reset	Level pressure sensors were reset indicating this could result in a step in flow
Calibration	Calibration 'Datetime' of the instrument

Table 12: *Quality control flags and description*

13.2 Hydrological areas - Catchments

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

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

13.3 Hydrological areas - Farmlets

	Farmlet		
	Green	Blue	Red
pre-13/08/2013	26	22	22
post-13/08/2013	22	22	22

Table 14: *Farmlet hydrological areas (ha) pre- and post- change to area of Catchment 4 on 13th August 2013*