
# DATA QUALITY AND SUMMARY STATISTICS

# FLUME DATA

# Annual Report 2017

*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 flume data.*

**Data Version: 3**

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# Table of Contents

## List of Tables



## List of Figures

# 1 15 MINUTE DATA

- Catchments arranged from largest to smallest across tables (left to right) for each farmlet.
- Where PLC switch = 0, this refers to timesteps when flume flow was <0.2 l/s (flow conditions not met) and so the pump is not activated to fill the by-pass flow cell. Therefore, flume data are considered invalid and are classified as missing values ('NA') in the quality control process.
- Where PLC switch = 1, flume flow is >0.2 l/s (flow conditions met) and so the pump is activated to fill the by-pass flow cell.
- For further explanation, refer to Sections 3.3 & 7.1.2 in the 'User Guide to 15 Minute Data' (FP_UG.Doc.002_15MinData) available on the Farm Platform website: http://resources.rothamsted.ac.uk/farm-platform-national-capability/data-portal-guides-and-information

## 1.1 Counts of PLC switch settings

| | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| PLC Switch = NA (missing) | 2421 | 1084 | 1471 | 582 | 664 | 488 | 1023 | 732 | 572 | 1093 | 875 | 1320 | 7436 | 1050 | 969 |
| PLC Switch = 0 (no flow) | 17581 | 21243 | 28424 | 32790 | 32217 | 26596 | 23414 | 25383 | 31951 | 30952 | 24871 | 18064 | 10831 | 30046 | 27839 |
| PLC Switch = 1 (flow) | 15037 | 12712 | 5144 | 1667 | 2158 | 7955 | 10602 | 8924 | 2516 | 2994 | 9293 | 15655 | 16772 | 3943 | 6231 |

**Table 1:** Counts of PLC switch settings - missing data, no flow, flow

## 1.2 Zero values

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Flow | l/s | 29399 | 31909 | 33175 | 33628 | 33100 | 33169 | 32241 | 32170 | 33718 | 32886 | 31667 | 31442 | 30300 | 33346 | 32749 |
| Nitrate+nitrite | mg/l | 1046 | 146 | 305 | 66 | 554 | 590 | 1347 | 1133 | 342 | 367 | 1124 | 332 | 2158 | 91 | 143 |
| Ammonia | mg/l | 15008 | 12705 | 5140 | 1667 | 2158 | 7950 | 10485 | 8916 | 2514 | 2994 | 9289 | 15615 | 16756 | 3941 | 6227 |
| Ammonium | mg/l | 14255 | 12016 | 4827 | 1480 | 2108 | 7302 | 7791 | 8810 | 2388 | 2754 | 7255 | 14296 | 16583 | 3418 | 5284 |
| Conductivity | uS/cm | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dissolved oxygen | % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| pH | unitless | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Flow cell water temperature | °C | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turbidity | FNU | 2813 | 318 | 239 | 19 | 0 | 733 | 1095 | 2 | 6 | 0 | 694 | 1102 | 1548 | 431 | 52 |
| Total phosphorus | mg/l | NA | 8560 | NA | NA | NA | NA | 7551 | NA | NA | NA | 7038 | 1434 | NA | NA | NA |
| Dissolved organic matter | ug/l QSU | 8 | 1 | 2 | 0 | 0 | 1 | 1 | 17 | 5 | 40 | 0 | 1 | 1 | 1 | 75 |
| Ortho-phosphorus | mg/l | NA | 8562 | NA | NA | NA | NA | 7556 | NA | NA | NA | 7038 | 1442 | NA | NA | NA |

**Table 2:** Number of zero values (out of 35039)

## 1.3 Missing values

### 1.3.1 Total number of missing values

| Variable | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Green | | | | | Blue | | | | | Red | | | | |
| | 4 | 5 | 6 | 12 | 13 | 9 | 8 | 7 | 11 | 14 | 2 | 3 | 1 | 10 | 15 |
| Flow | 2065 | 1072 | 978 | 1024 | 1337 | 488 | 520 | 921 | 816 | 1312 | 1544 | 1016 | 1122 | 1294 | 1243 |
| Nitrate+nitrite | 21064 | 23693 | 29975 | 33687 | 32909 | 27170 | 24597 | 26212 | 32566 | 32079 | 25842 | 19548 | 18459 | 31418 | 28911 |
| Ammonia | 20009 | 22333 | 29899 | 33372 | 32881 | 27089 | 24554 | 26123 | 32525 | 32045 | 25750 | 19424 | 18283 | 31098 | 28812 |
| Ammonium | 20152 | 22334 | 29914 | 33372 | 32881 | 27089 | 24607 | 26125 | 32526 | 32045 | 25750 | 19387 | 18285 | 31120 | 28816 |
| Conductivity | 20352 | 22333 | 29901 | 33372 | 32881 | 27090 | 24445 | 26124 | 32530 | 32045 | 25750 | 19388 | 18285 | 31112 | 28814 |
| Dissolved oxygen | 20013 | 22333 | 32781 | 33372 | 32882 | 27089 | 24445 | 26125 | 32530 | 32045 | 25750 | 19388 | 18284 | 31098 | 28812 |
| pH | 20013 | 22333 | 29899 | 33372 | 32882 | 27090 | 24445 | 26124 | 32530 | 32045 | 25751 | 19387 | 18285 | 31098 | 28813 |
| Flow cell water temperature | 20009 | 22333 | 29899 | 33372 | 32881 | 27089 | 24445 | 26123 | 32525 | 32045 | 25750 | 19387 | 18283 | 31098 | 28812 |
| Turbidity | 20234 | 22419 | 30008 | 33372 | 32881 | 27089 | 24983 | 26123 | 32525 | 32045 | 26036 | 19391 | 18284 | 31098 | 28812 |
| Total phosphorus | 35039 | 26477 | 35039 | 35039 | 35039 | 35039 | 27483 | 35039 | 35039 | 35039 | 28001 | 33597 | 35039 | 35039 | 35039 |
| Dissolved organic matter | 20015 | 22333 | 29899 | 33372 | 32881 | 27089 | 24445 | 26166 | 32525 | 32108 | 25750 | 19387 | 18284 | 31098 | 28892 |
| Ortho-phosphorus | 35039 | 26477 | 35039 | 35039 | 35039 | 35039 | 27483 | 35039 | 35039 | 35039 | 28001 | 33597 | 35039 | 35039 | 35039 |

**Table 3:** Total number of missing values (out of 35039)

### 1.3.2 Total number of missing values as a percentage

| Variable | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Green | | | | | Blue | | | | | Red | | | | |
| | 4 | 5 | 6 | 12 | 13 | 9 | 8 | 7 | 11 | 14 | 2 | 3 | 1 | 10 | 15 |
| Flow | 6 | 3 | 3 | 3 | 4 | 1 | 1 | 3 | 2 | 4 | 4 | 3 | 3 | 4 | 4 |
| PLC Switch | 7 | 3 | 4 | 2 | 2 | 1 | 3 | 2 | 2 | 3 | 2 | 4 | 21 | 3 | 3 |
| Nitrate+nitrite | 60 | 68 | 86 | 96 | 94 | 78 | 70 | 75 | 93 | 92 | 74 | 56 | 53 | 90 | 83 |
| Ammonia | 57 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |
| Ammonium | 58 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |
| Conductivity | 58 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |
| Dissolved oxygen | 57 | 64 | 94 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |
| pH | 57 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |
| Flow cell water temperature | 57 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |
| Turbidity | 58 | 64 | 86 | 95 | 94 | 77 | 71 | 75 | 93 | 91 | 74 | 55 | 52 | 89 | 82 |
| Total phosphorus | 100 | 76 | 100 | 100 | 100 | 100 | 78 | 100 | 100 | 100 | 80 | 96 | 100 | 100 | 100 |
| Dissolved organic matter | 57 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 92 | 73 | 55 | 52 | 89 | 82 |
| Ortho-phosphorus | 100 | 76 | 100 | 100 | 100 | 100 | 78 | 100 | 100 | 100 | 80 | 96 | 100 | 100 | 100 |

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

### 1.3.3 Total number of missing values when PLC switch = 1

| Variable | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Green | | | | | Blue | | | | | Red | | | | |
| | 4 | 5 | 6 | 12 | 13 | 9 | 8 | 7 | 11 | 14 | 2 | 3 | 1 | 10 | 15 |
| Flow | 438 | 146 | 0 | 16 | 94 | 0 | 3 | 42 | 1 | 2 | 161 | 235 | 171 | 0 | 35 |
| Nitrate+nitrite | 1062 | 1366 | 80 | 315 | 28 | 86 | 160 | 97 | 43 | 34 | 96 | 164 | 192 | 322 | 103 |
| Ammonia | 7 | 6 | 4 | 0 | 0 | 5 | 117 | 8 | 2 | 0 | 4 | 40 | 16 | 2 | 4 |
| Ammonium | 150 | 7 | 19 | 0 | 0 | 5 | 170 | 10 | 3 | 0 | 4 | 3 | 18 | 24 | 8 |
| Conductivity | 350 | 6 | 6 | 0 | 0 | 6 | 8 | 9 | 7 | 0 | 4 | 4 | 18 | 16 | 6 |
| Dissolved oxygen | 11 | 6 | 2886 | 0 | 1 | 5 | 8 | 10 | 7 | 0 | 4 | 4 | 17 | 2 | 4 |
| pH | 11 | 6 | 4 | 0 | 1 | 6 | 8 | 9 | 7 | 0 | 5 | 3 | 18 | 2 | 5 |
| Flow cell water temperature | 7 | 6 | 4 | 0 | 0 | 5 | 8 | 8 | 2 | 0 | 4 | 3 | 16 | 2 | 4 |
| Turbidity | 232 | 92 | 113 | 0 | 0 | 5 | 546 | 8 | 2 | 0 | 290 | 7 | 17 | 2 | 4 |
| Dissolved organic matter | 13 | 6 | 4 | 0 | 0 | 5 | 8 | 51 | 2 | 63 | 4 | 3 | 17 | 2 | 84 |
| Ortho-phosphorus | 15037 | 4773 | 5144 | 1667 | 2158 | 7955 | 4793 | 8924 | 2516 | 2994 | 3886 | 14634 | 16772 | 3943 | 6231 |

**Table 5:** Total number of missing values when PLC switch = 1 (flow >0.2 l/s)

### 1.3.4 Total number of measured values in flume data as a percentage of possible values when PLC switch = 1

| Variable | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Green | | | | | Blue | | | | | Red | | | | |
| | 4 | 5 | 6 | 12 | 13 | 9 | 8 | 7 | 11 | 14 | 2 | 3 | 1 | 10 | 15 |
| Flow | 219 | 267 | 662 | 2040 | 1562 | 434 | 326 | 382 | 1360 | 1126 | 360 | 217 | 202 | 856 | 542 |
| Nitrate+nitrite | 93 | 89 | 98 | 81 | 99 | 99 | 98 | 99 | 98 | 99 | 99 | 99 | 99 | 92 | 98 |
| Ammonia | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Ammonium | 99 | 100 | 100 | 100 | 100 | 100 | 98 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 |
| Conductivity | 98 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Dissolved oxygen | 100 | 100 | 44 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| pH | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Flow cell water temperature | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Turbidity | 98 | 99 | 98 | 100 | 100 | 100 | 95 | 100 | 100 | 100 | 97 | 100 | 100 | 100 | 100 |
| Dissolved organic matter | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 98 | 100 | 100 | 100 | 100 | 99 |
| Ortho-phosphorus | 0 | 67 | 0 | 0 | 0 | 0 | 71 | 0 | 0 | 0 | 76 | 9 | 0 | 0 | 0 |

**Table 6:** Total number of measured values in flume data as a percentage of possible values when PLC switch = 1 (flow >0.2 l/s)

### 1.3.5 Timesteps of missing 15 minute data when PLC switch = 1 (flow >0.2 l/s)

- Data are in farmlet/catchment/triplet order with catchments arranged from largest to smallest down the page.
- Colour bars represent missing 15 minute timestep water quality data for each farmlet when flow >0.2 l/s and may reflect data loss due to sensor downtime or where data failed the quality control process.
- NB. Total phosphorus, ortho-phosphorus and flume temperature not included as sampling and measurement are not influenced by the PLC switch values.

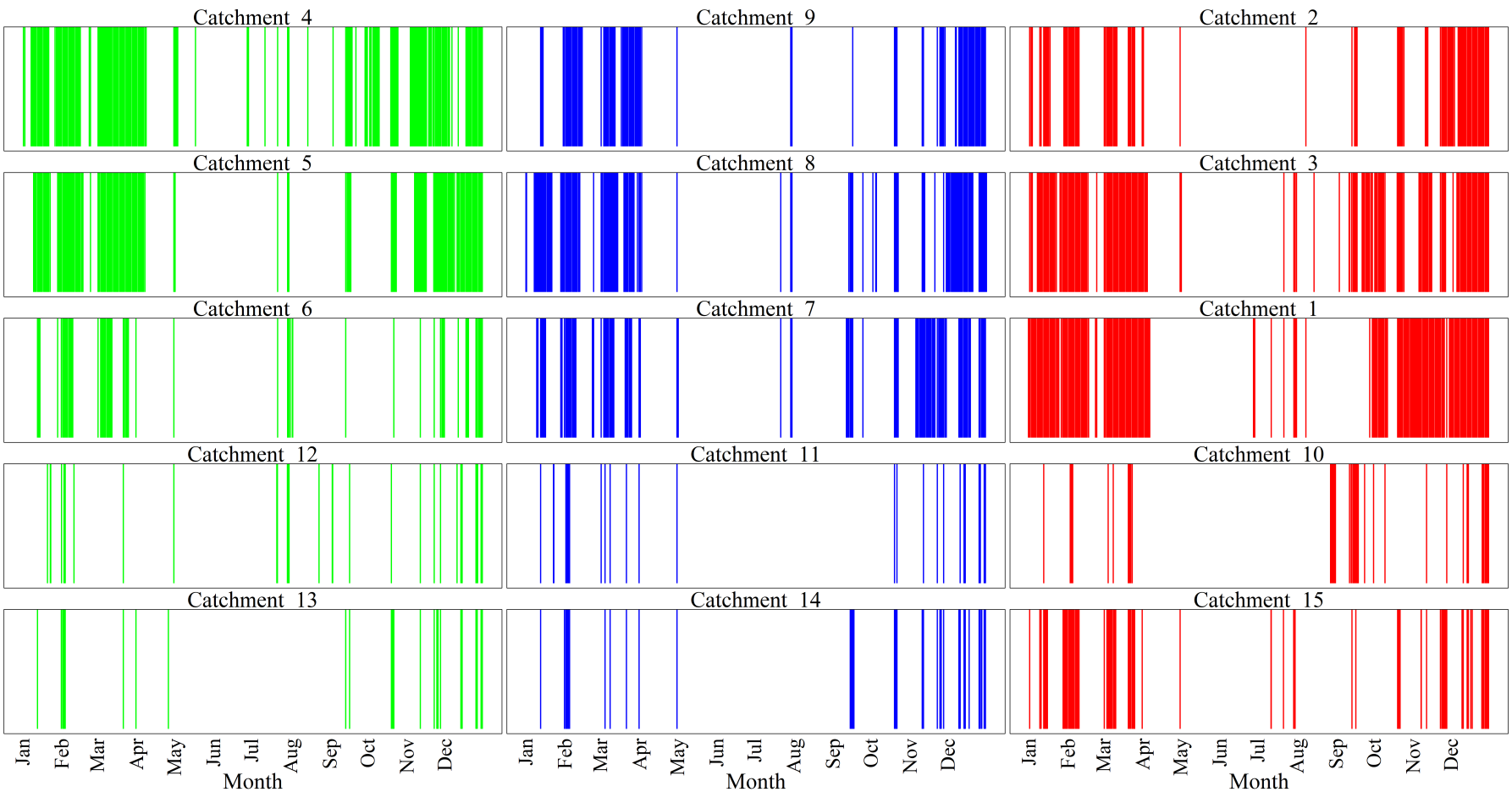



**Figure 1:** Timesteps of missing nitrate+nitrite data

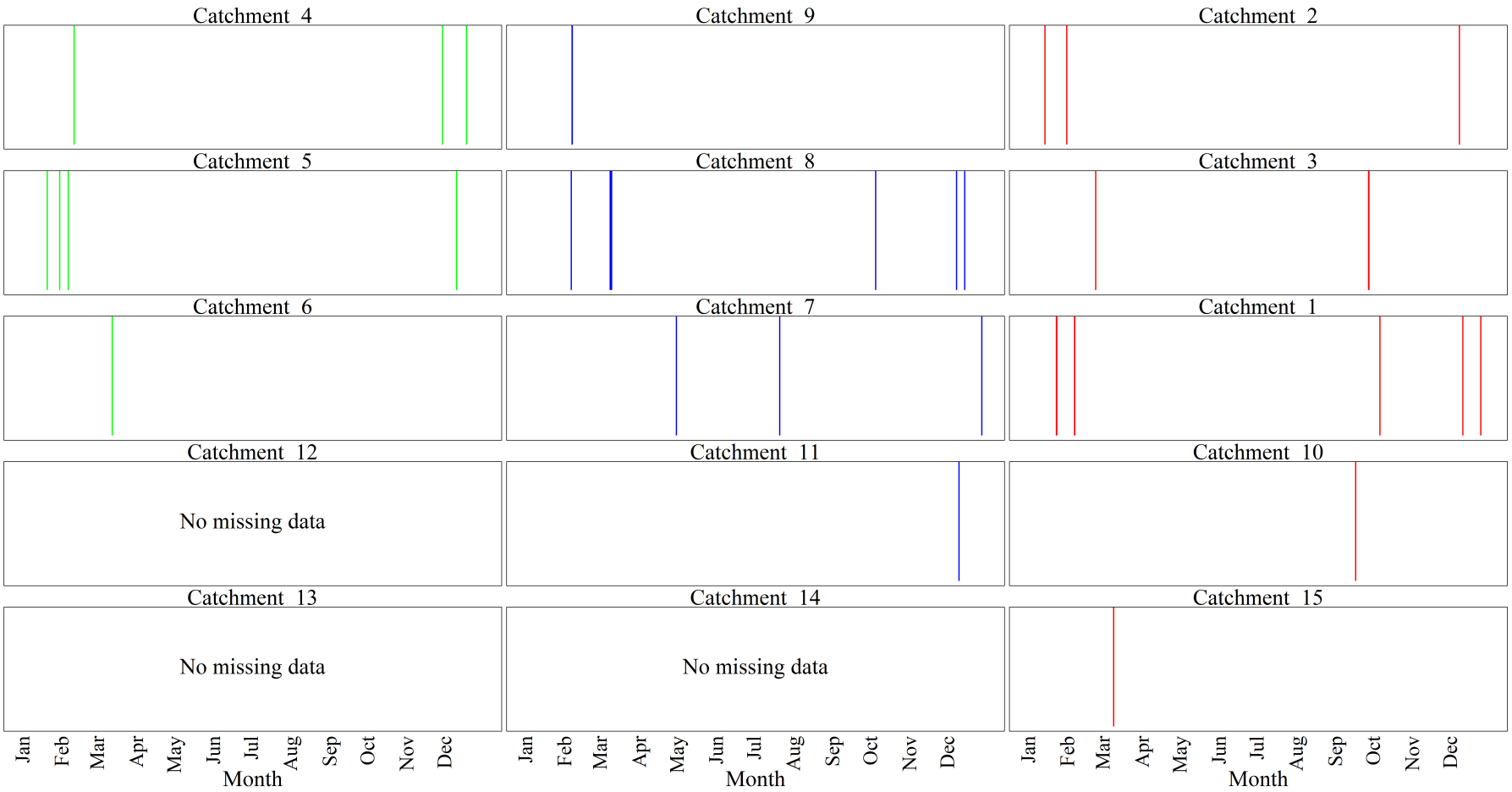



**Figure 2:** Timesteps of missing ammonia data

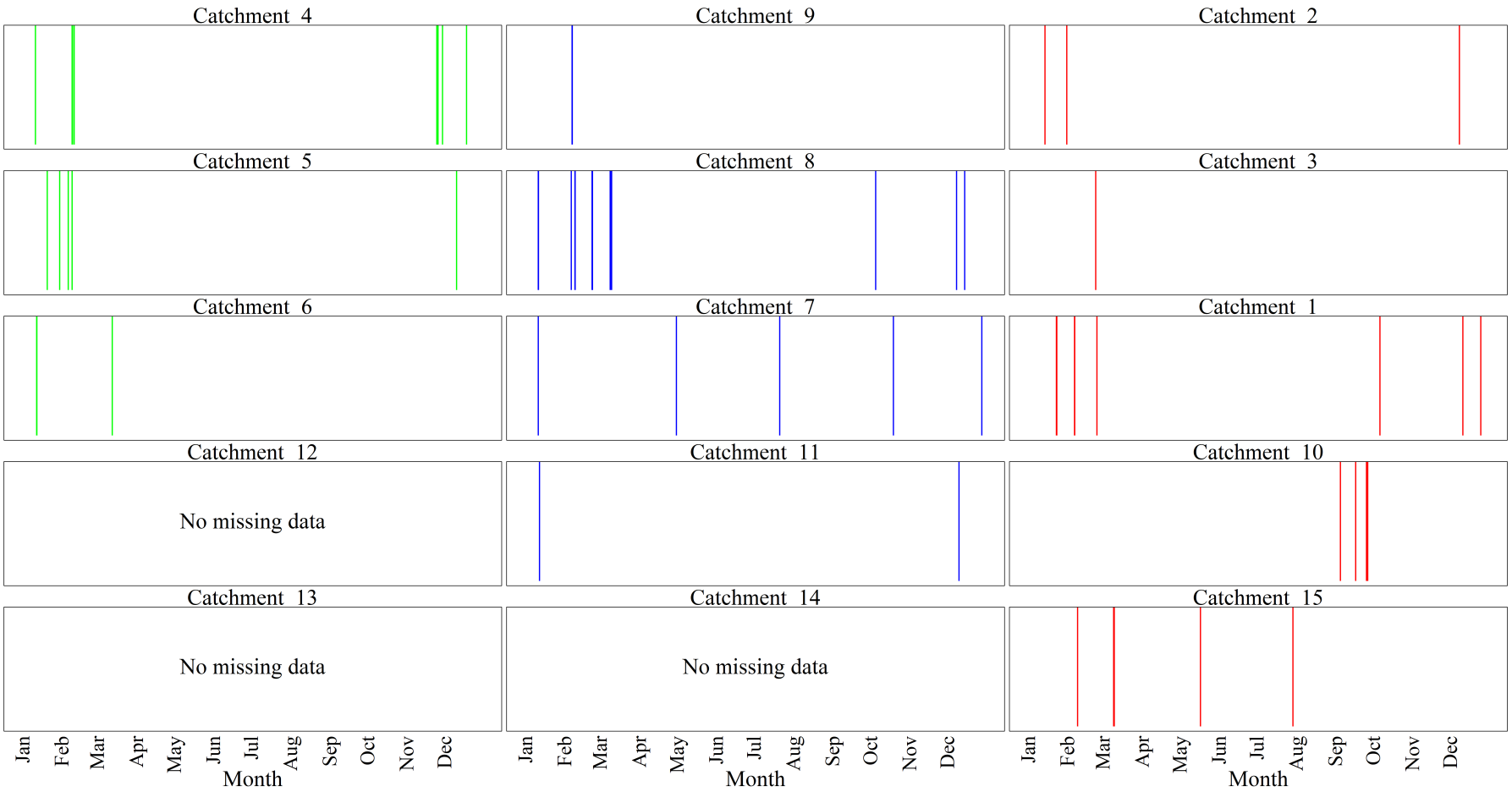



**Figure 3:** Timesteps of missing ammonium data

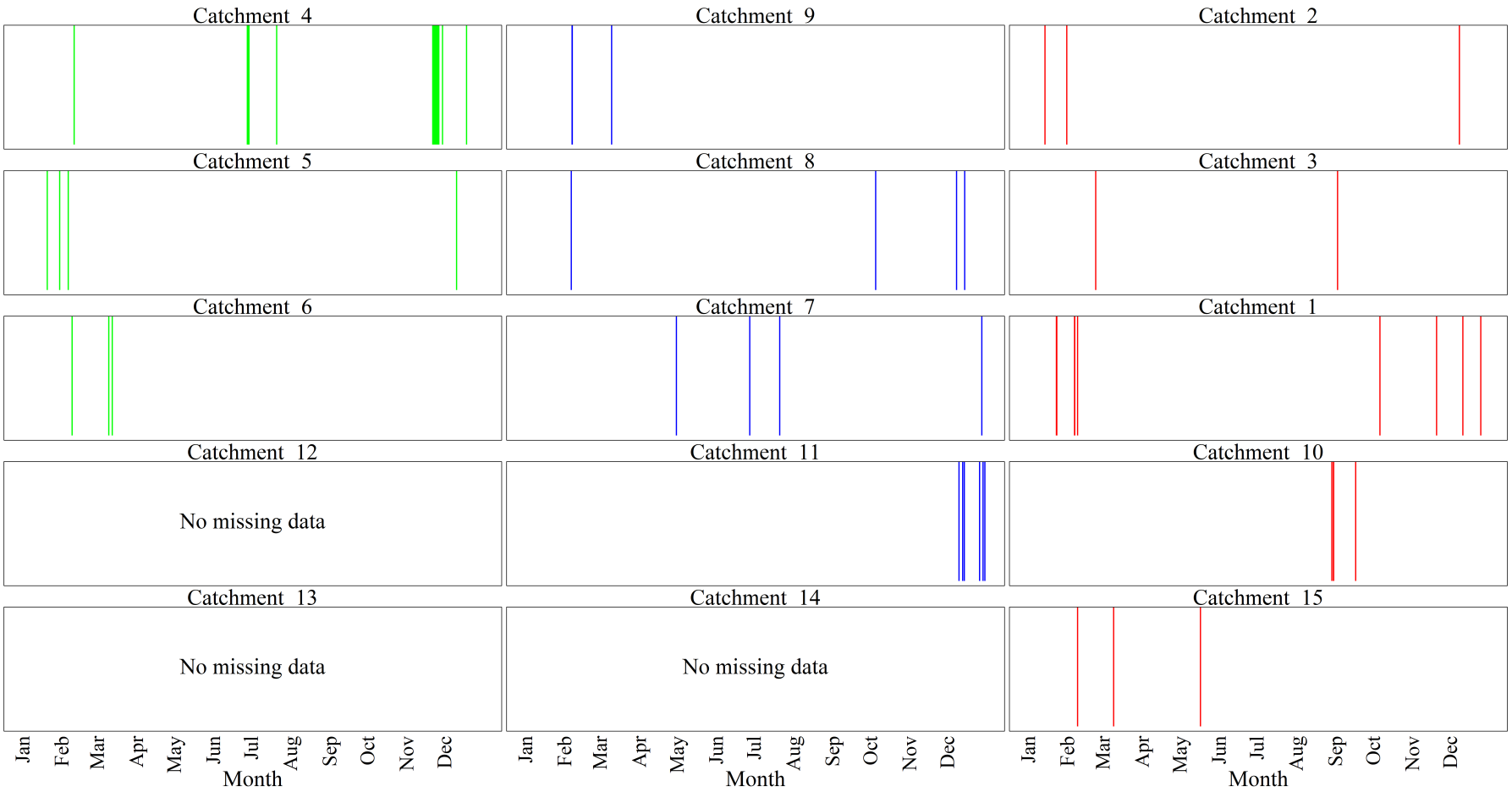



**Figure 4:** Timesteps of missing conductivity data

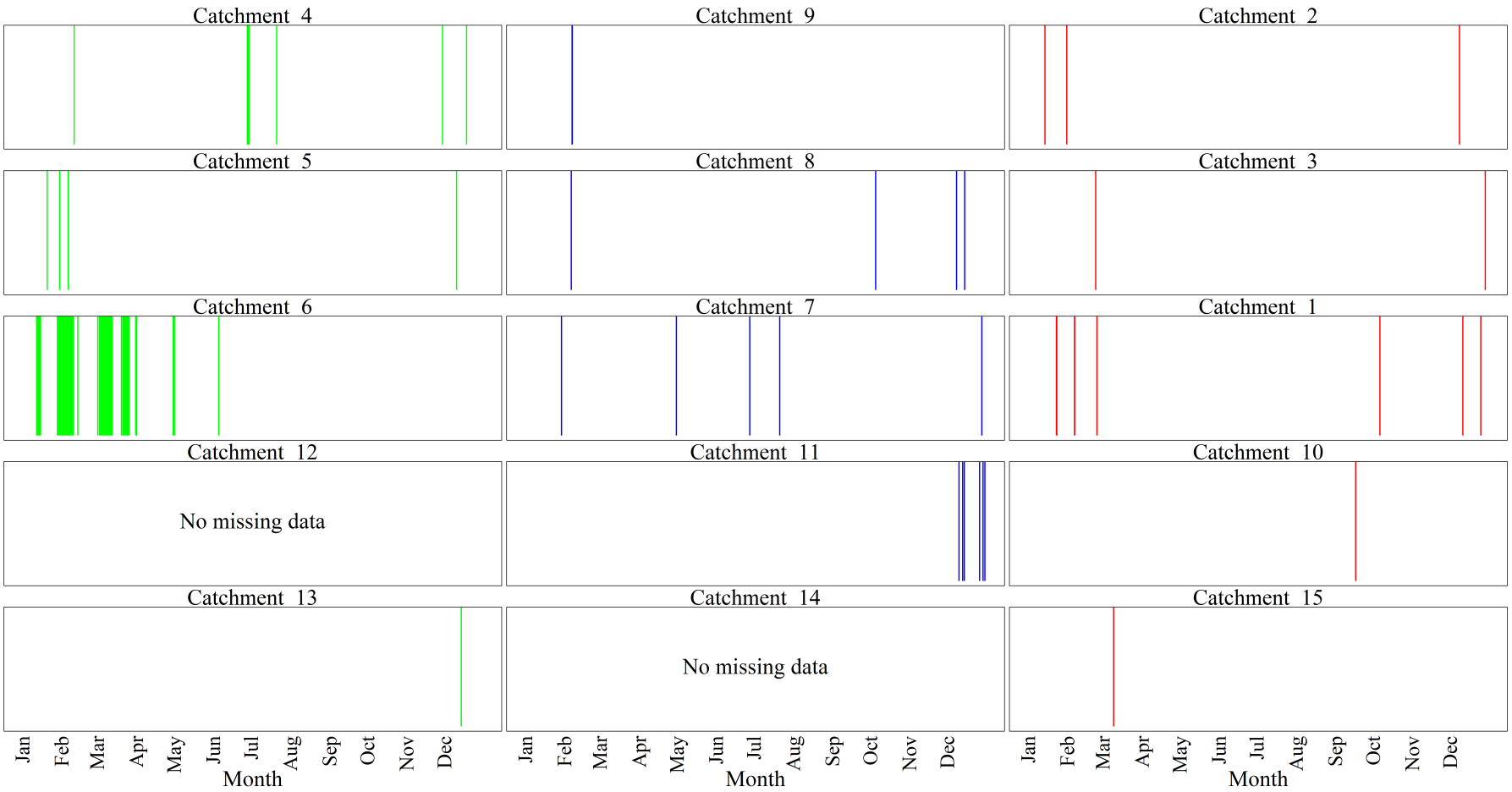



**Figure 5:** Timesteps of missing dissolved oxygen data

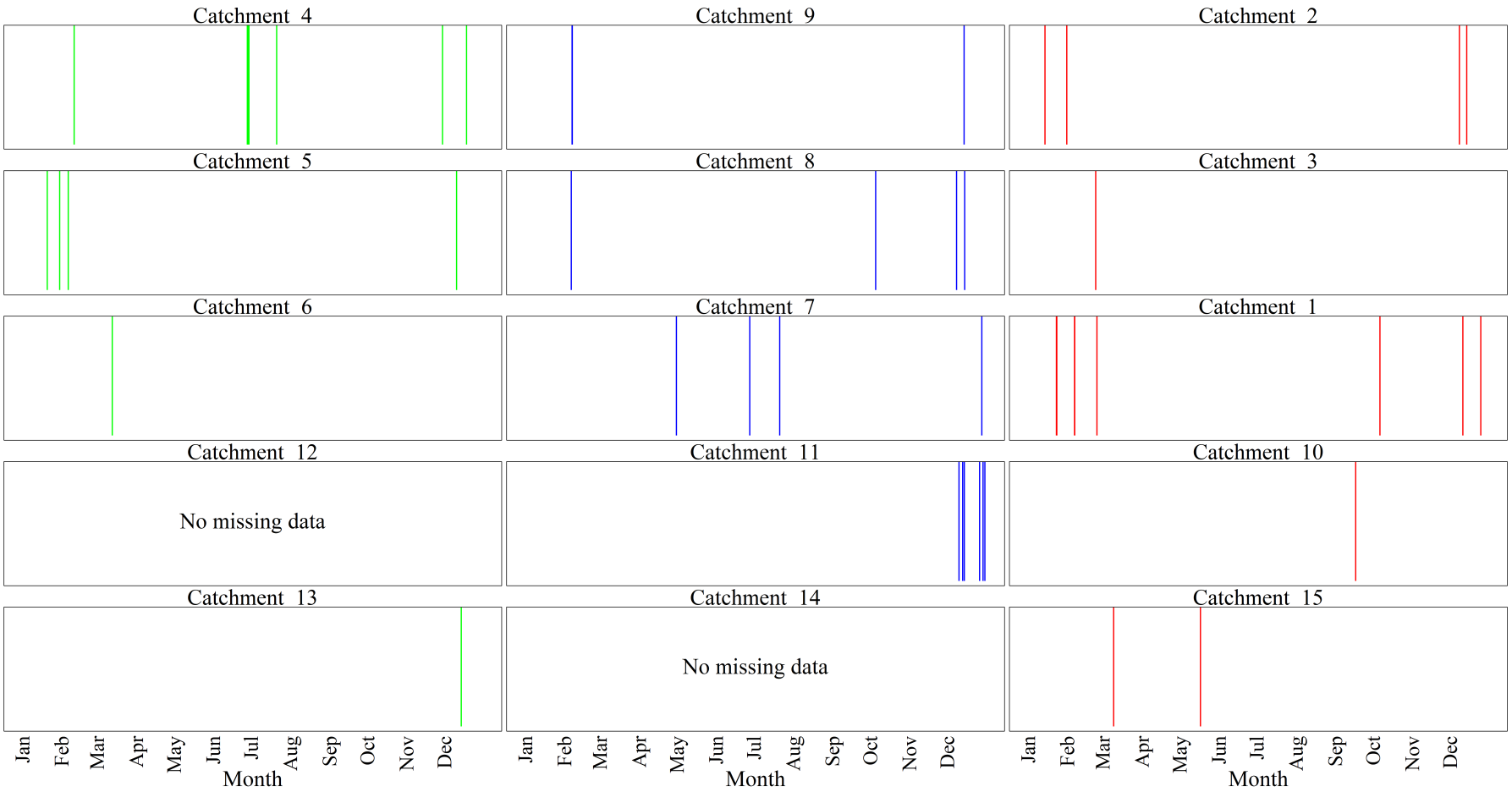



**Figure 6:** Timesteps of missing pH data

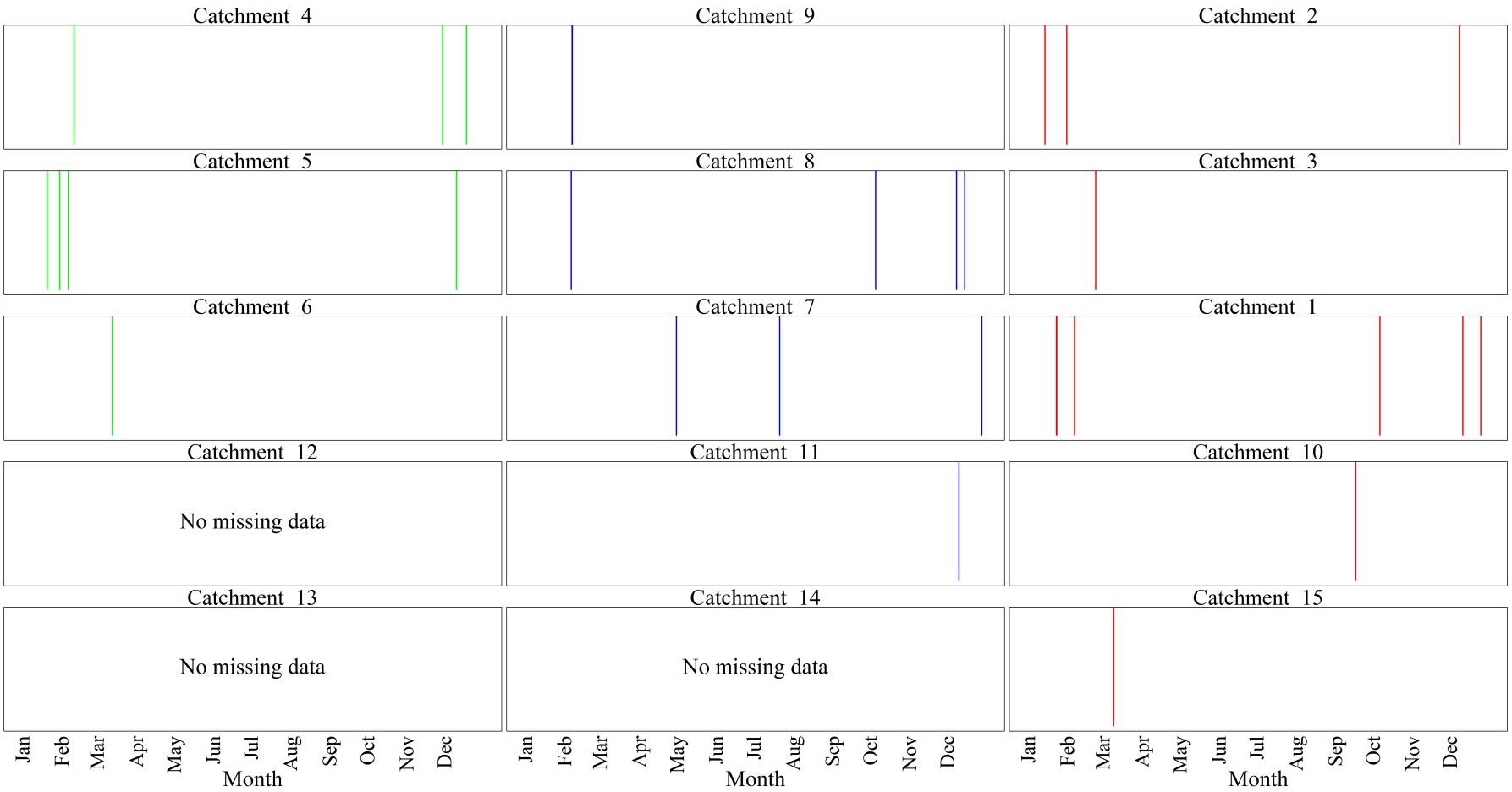



**Figure 7:** Timesteps of missing flow cell water temperature data

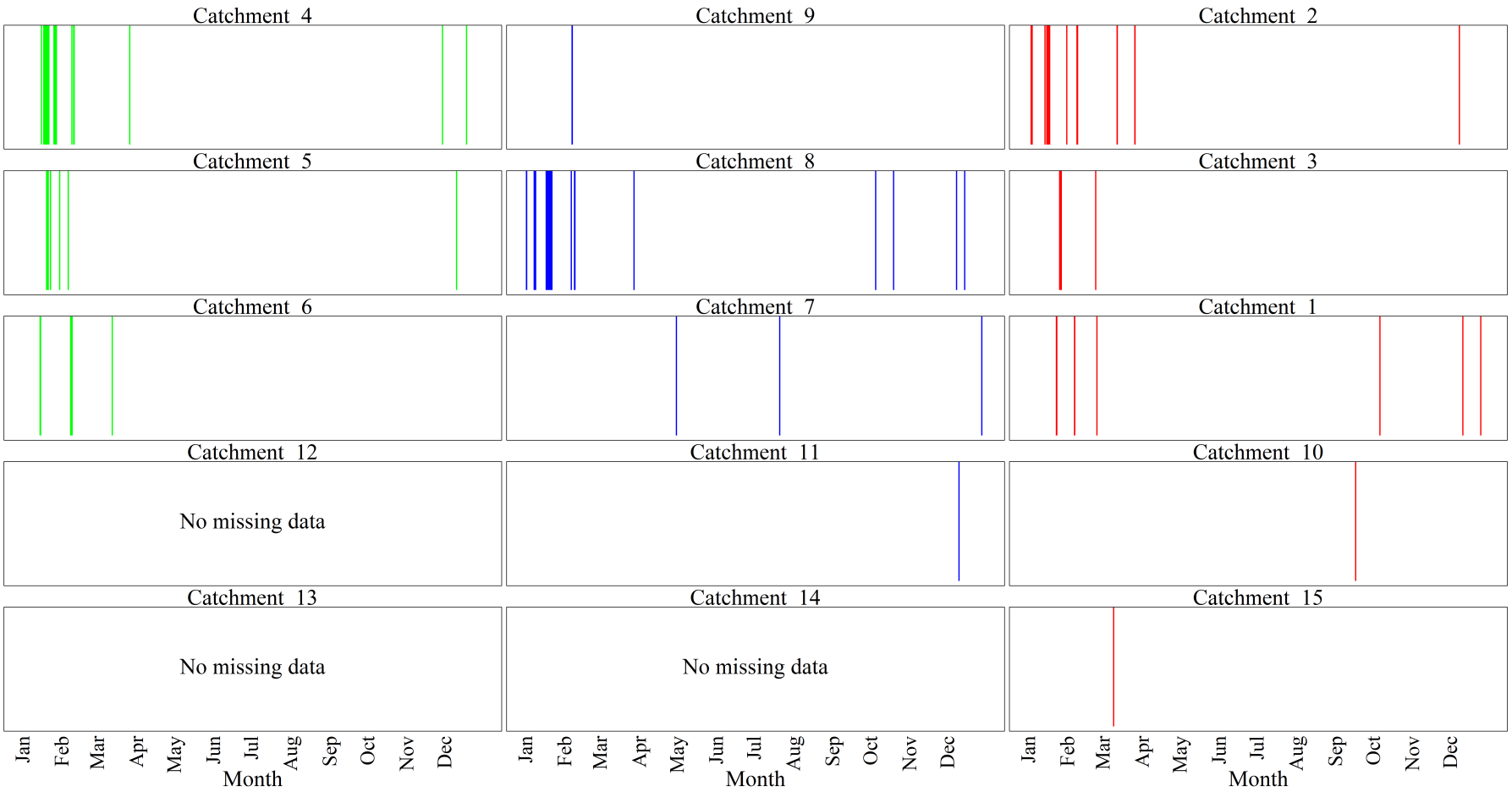



**Figure 8:** Timesteps of missing turbidity data

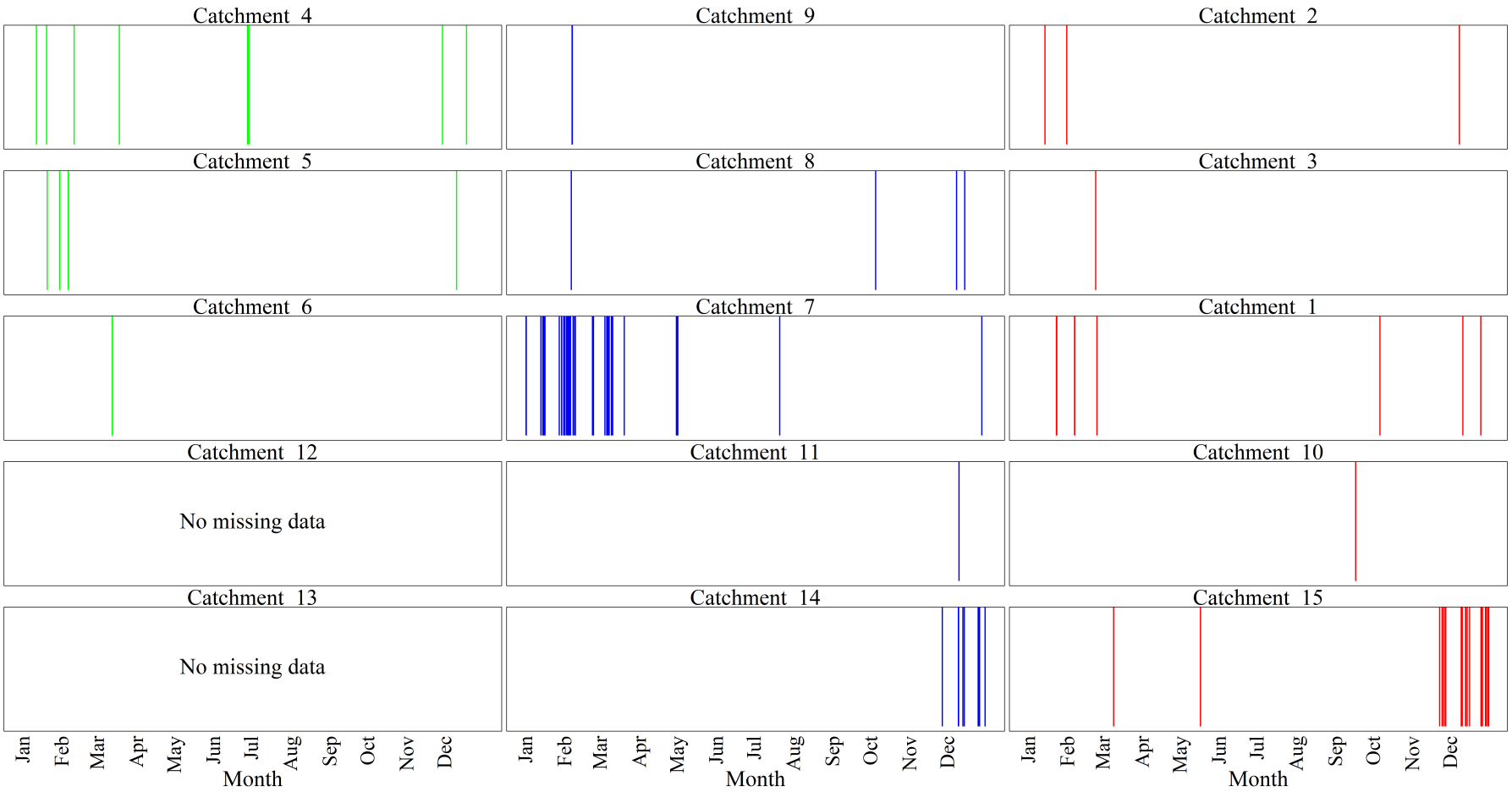



**Figure 9:** Timesteps of missing dissolved organic matter data

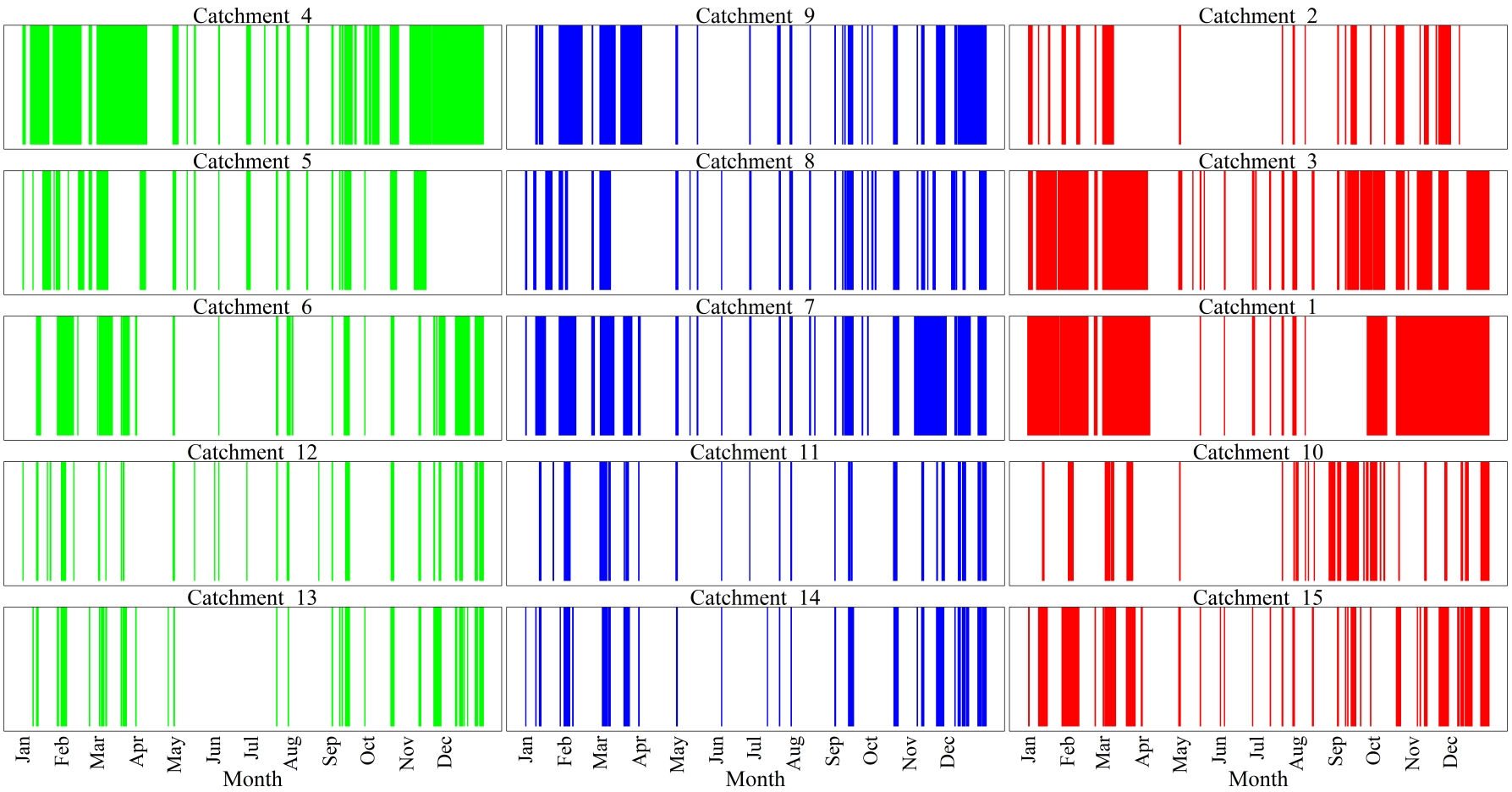



**Figure 10:** Timesteps of missing ortho-phosphorus data

## 1.4 Histograms of 15 minute data distribution

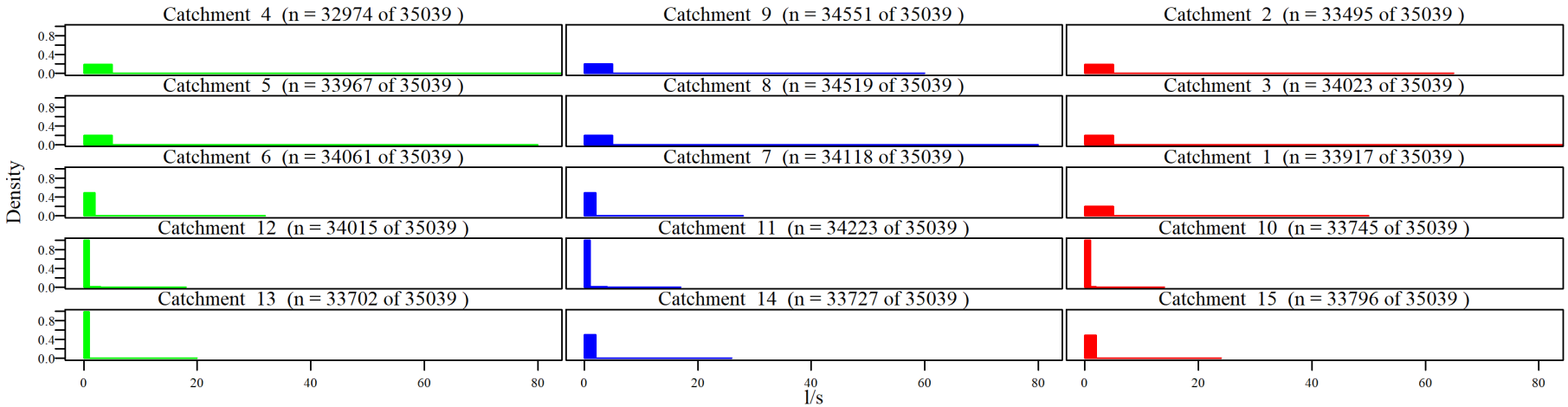



**Figure 11:** Distribution of data - flow

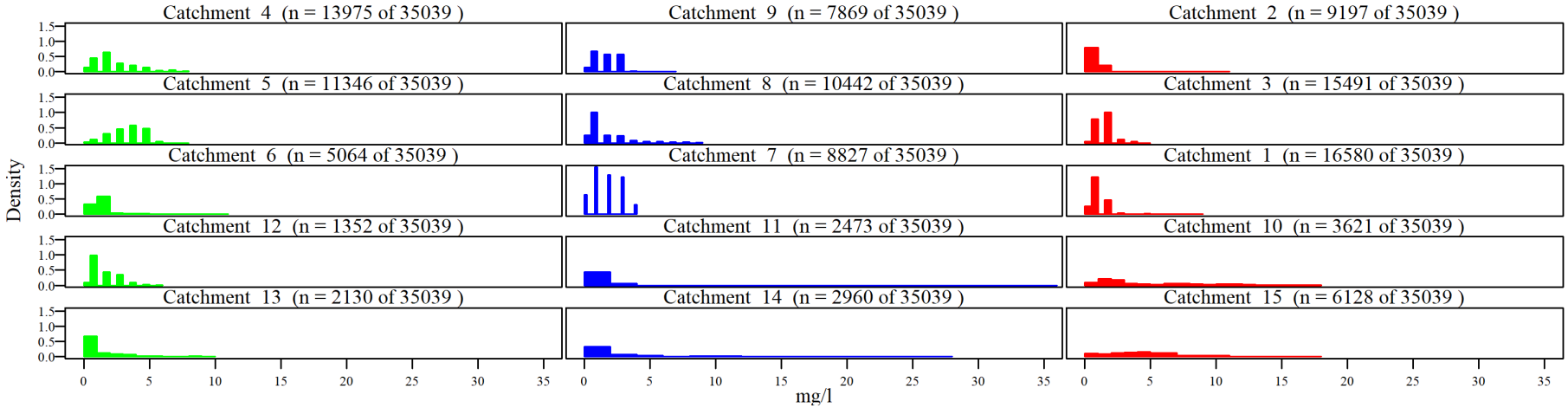



**Figure 12:** Distribution of data - nitrate+nitrite

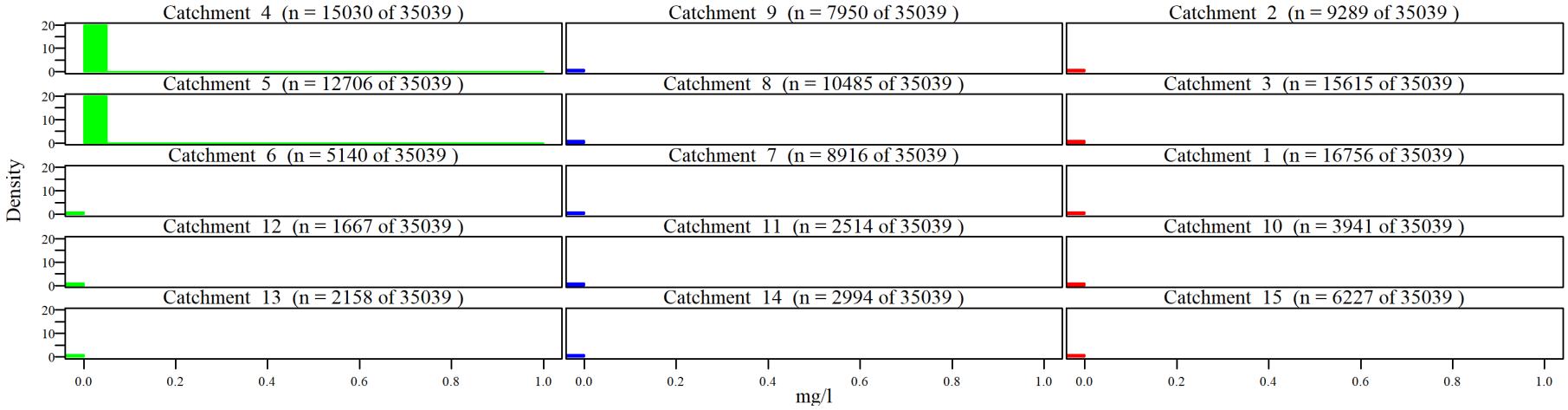



**Figure 13:** Distribution of data - ammonia

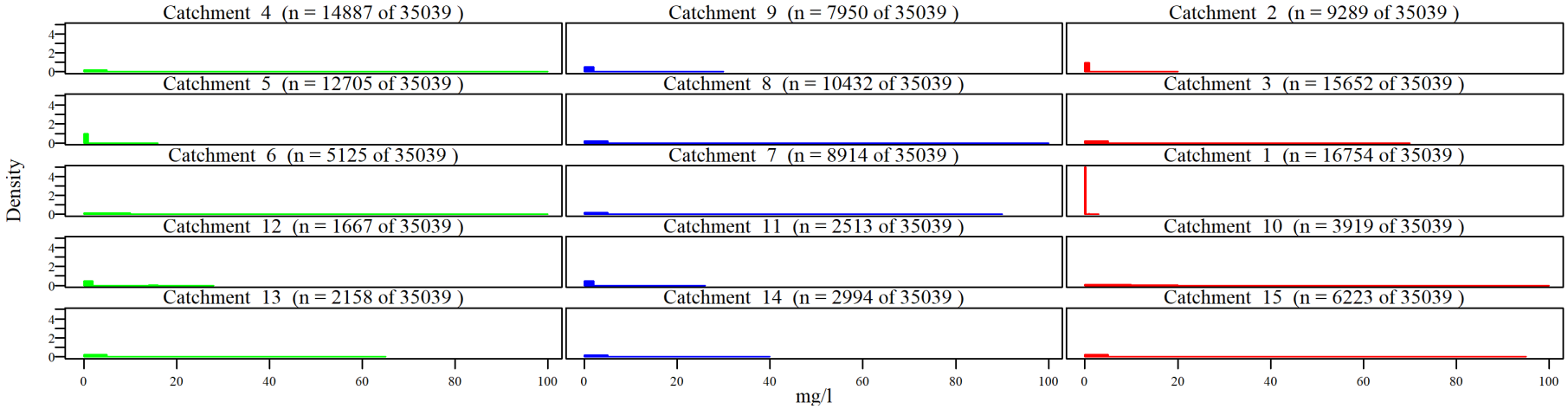



**Figure 14:** Distribution of data - ammonium

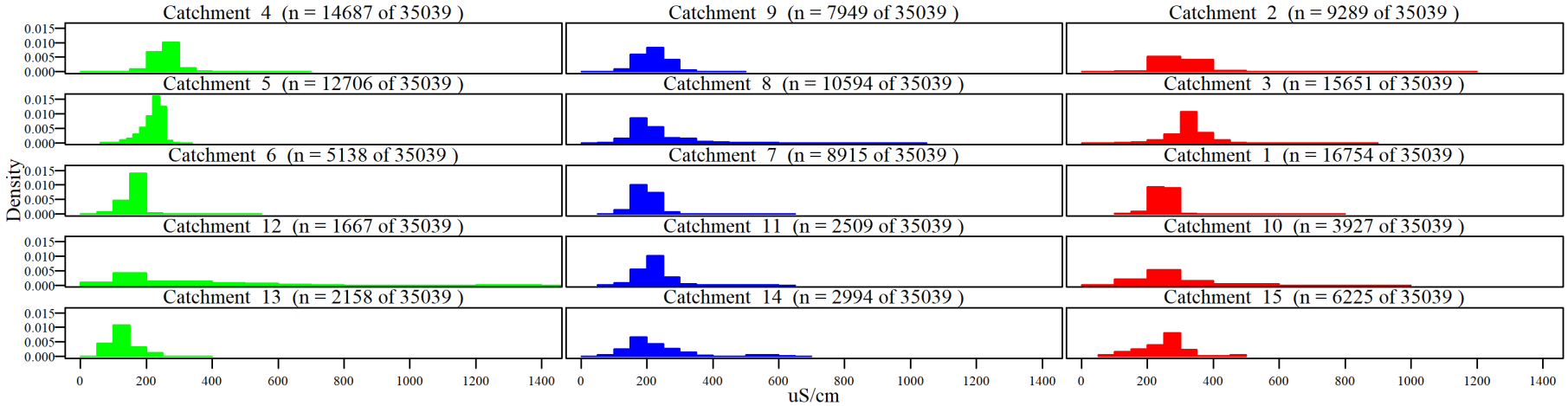



**Figure 15:** Distribution of data - conductivity

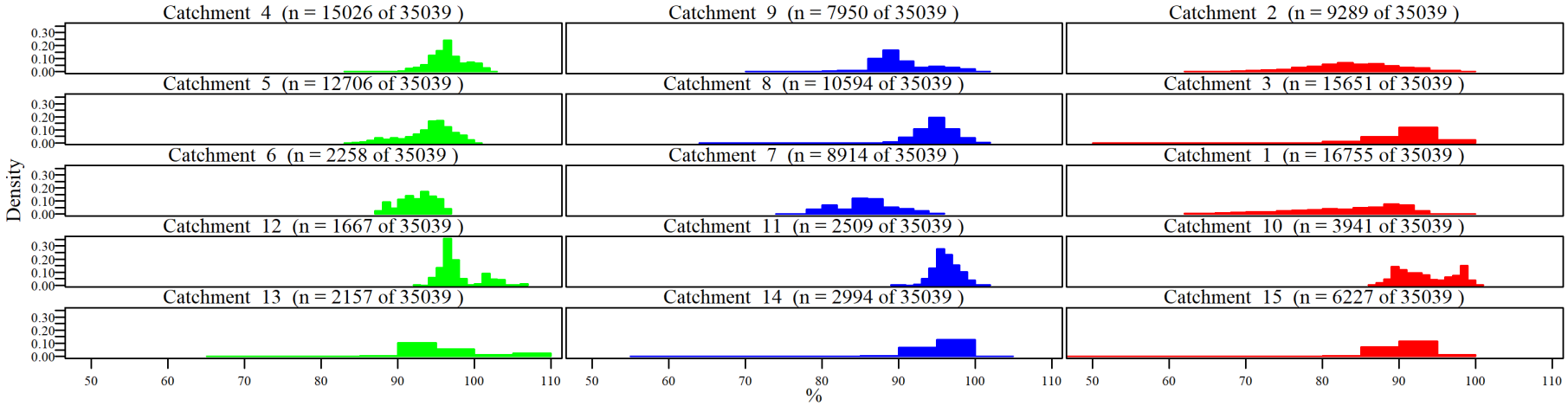



**Figure 16:** Distribution of data - dissolved oxygen

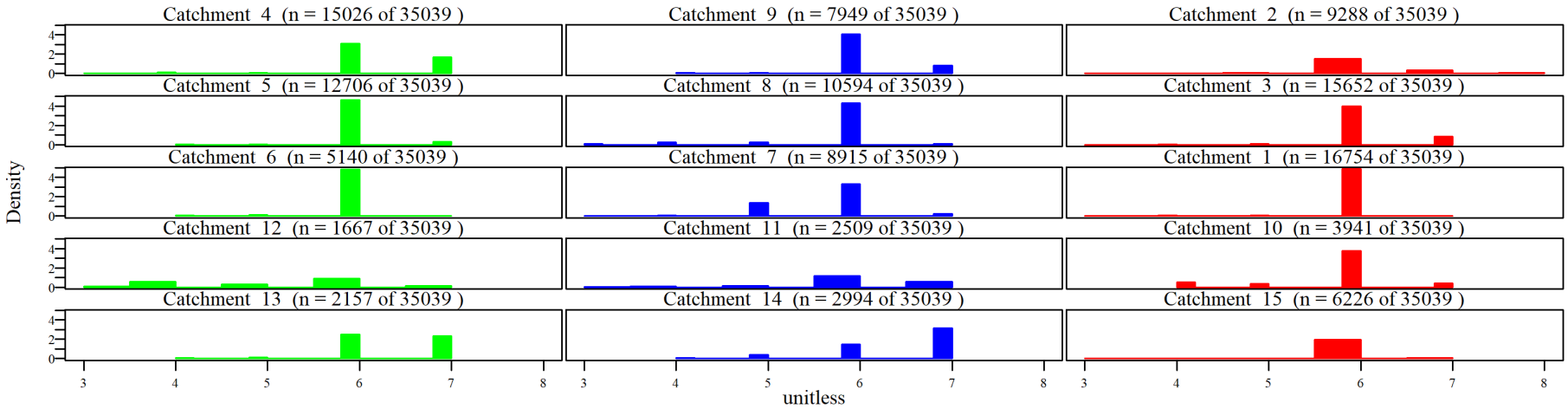



**Figure 17:** Distribution of data - pH

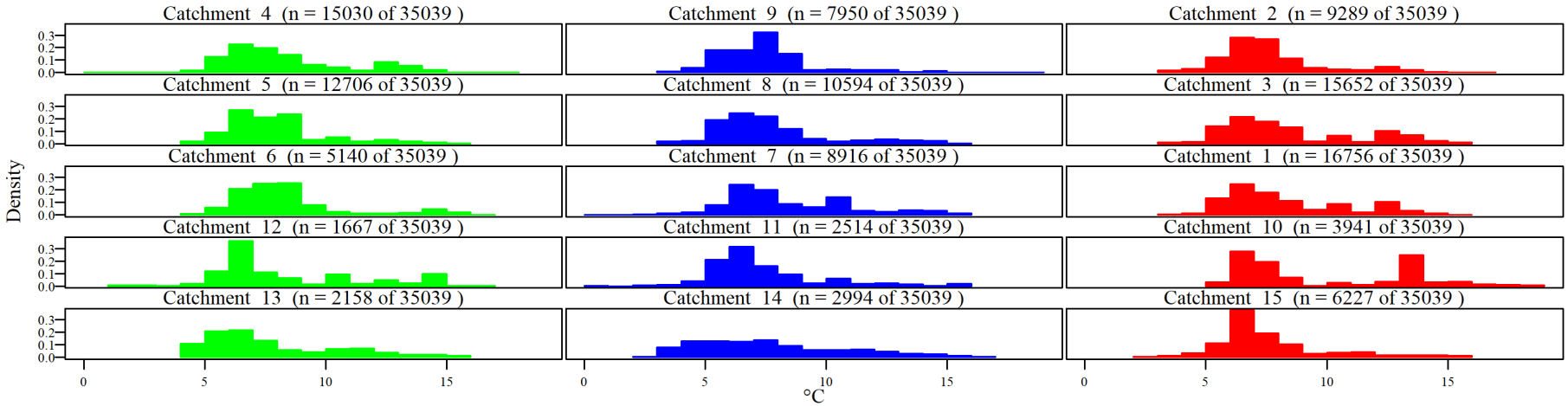



**Figure 18:** Distribution of data - flow cell water temperature

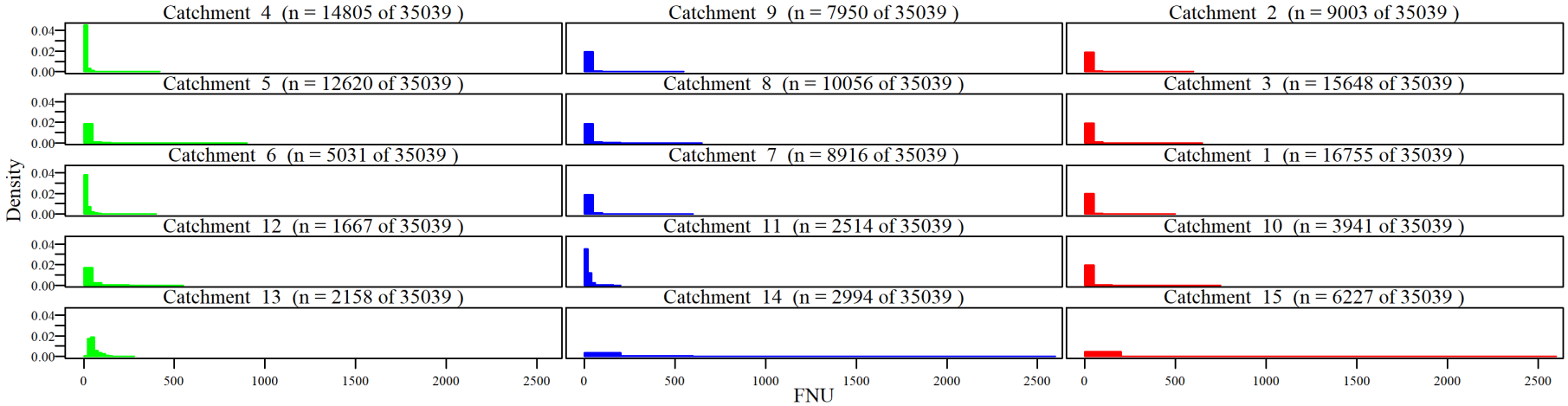



**Figure 19:** Distribution of data - turbidity

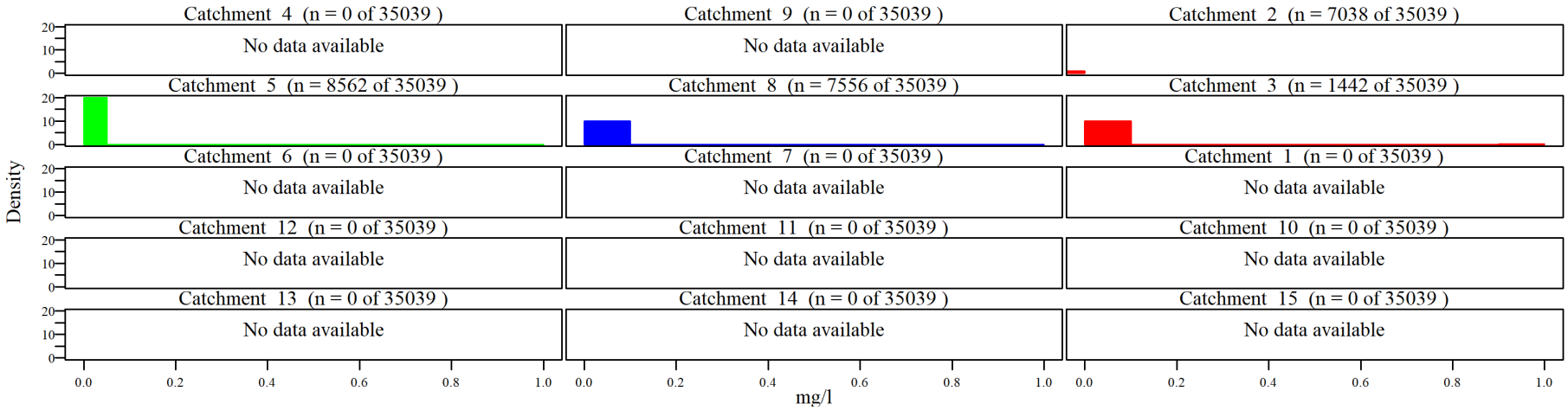



**Figure 20:** Distribution of data - total phosphorus

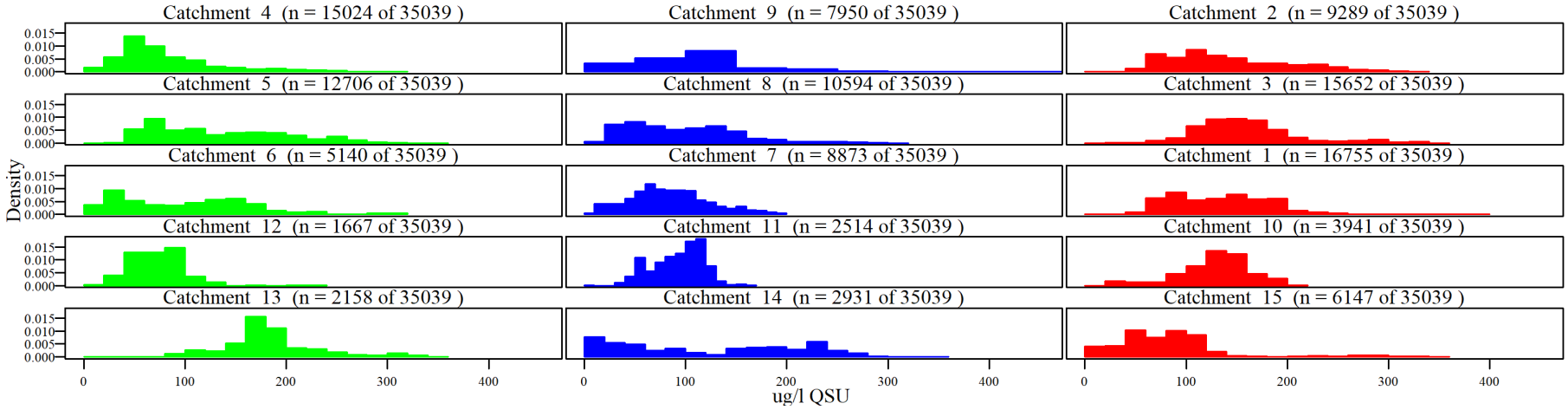



**Figure 21:** Distribution of data - dissolved organic matter

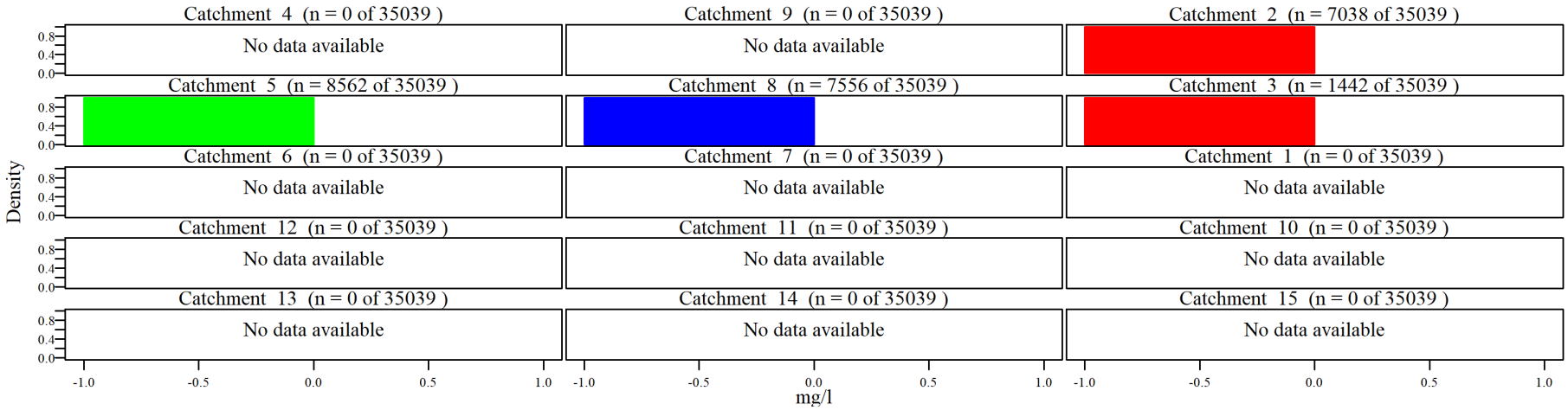



**Figure 22:** Distribution of data - ortho-phosphorus

## 1.5 Time series

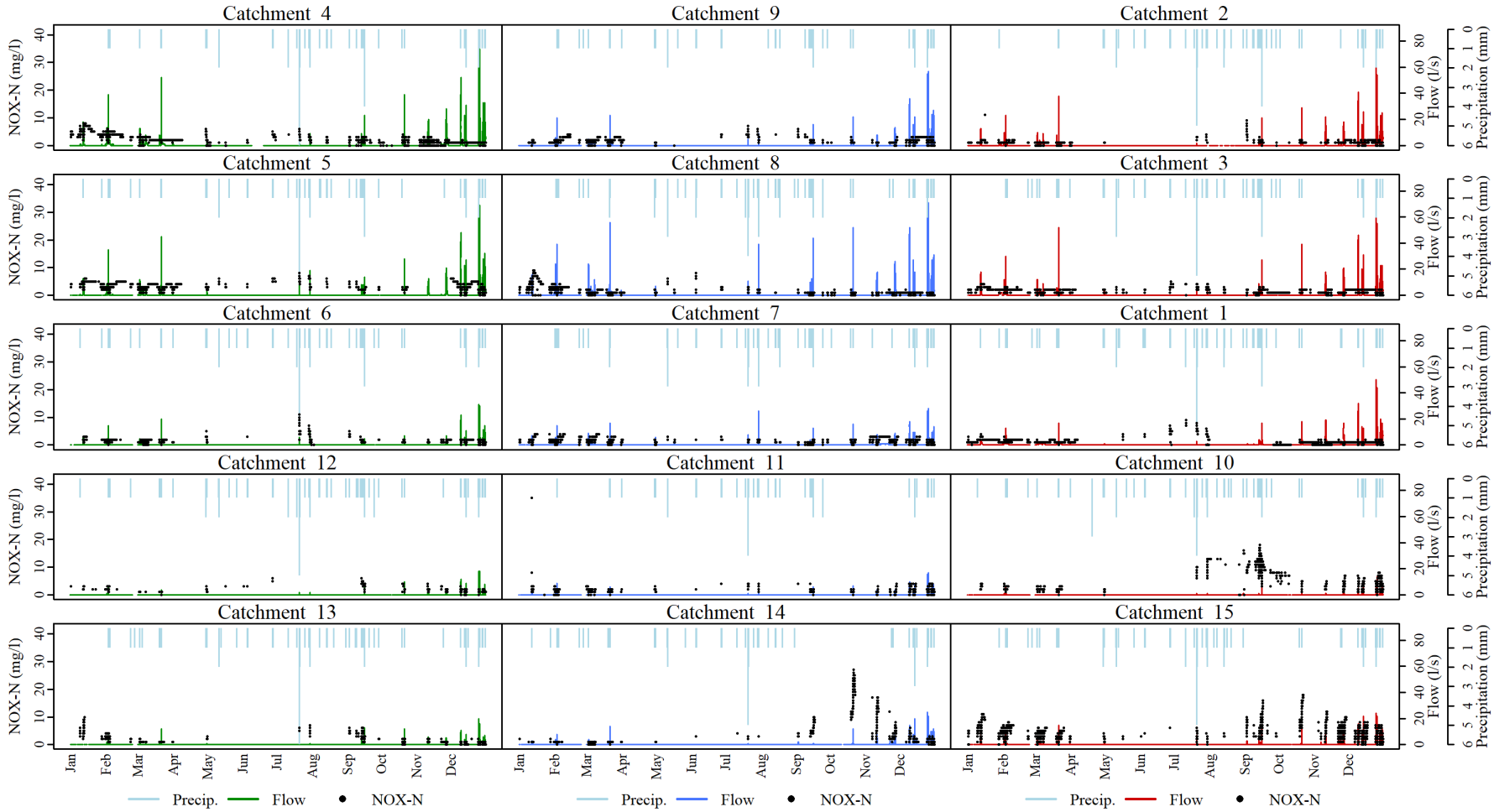



**Figure 23:** Time series of precipitation, flow and nitrate+nitrite (NOX-N)

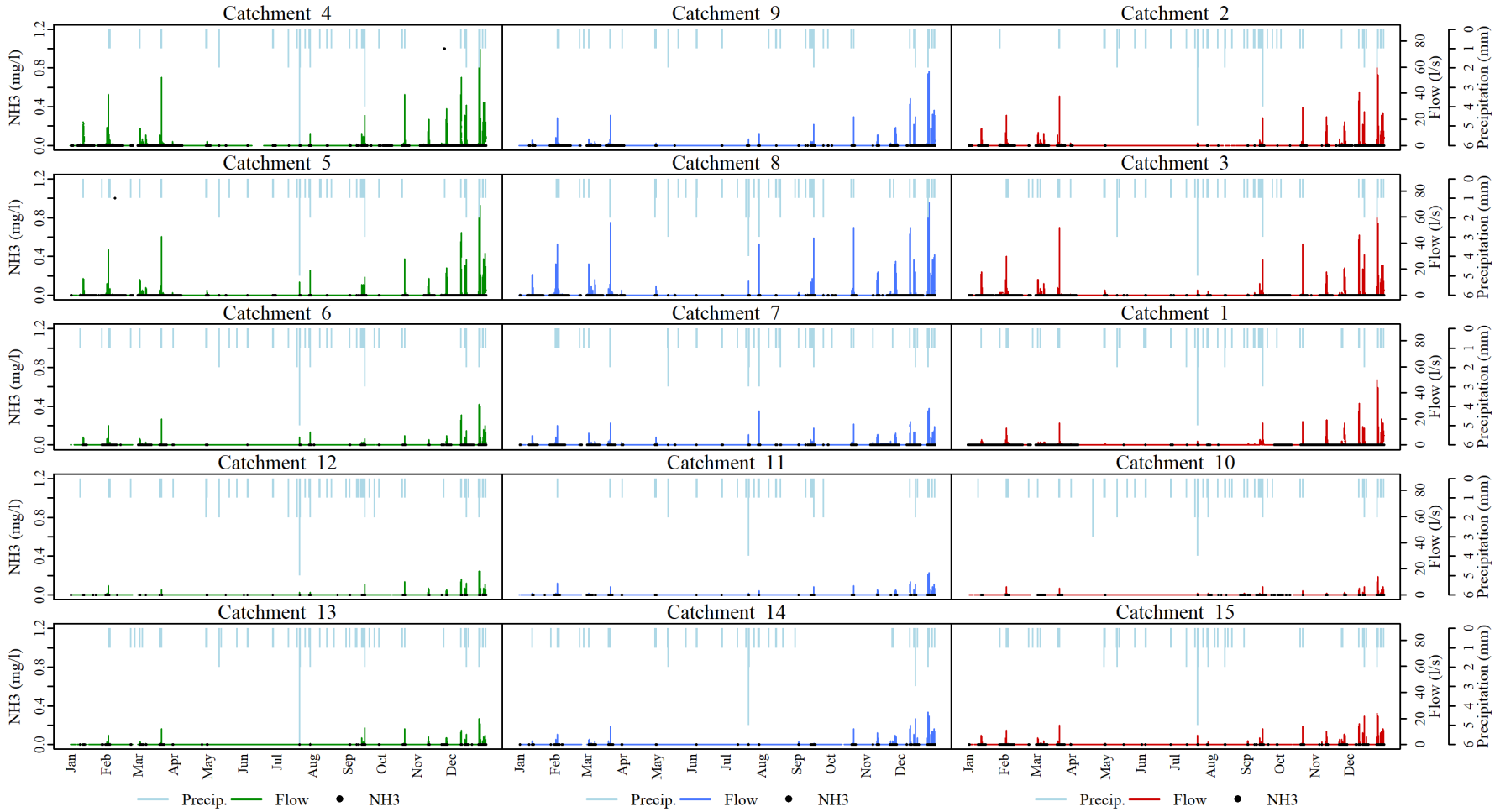



**Figure 24:** Time series of precipitation, flow and ammonia (NH3)

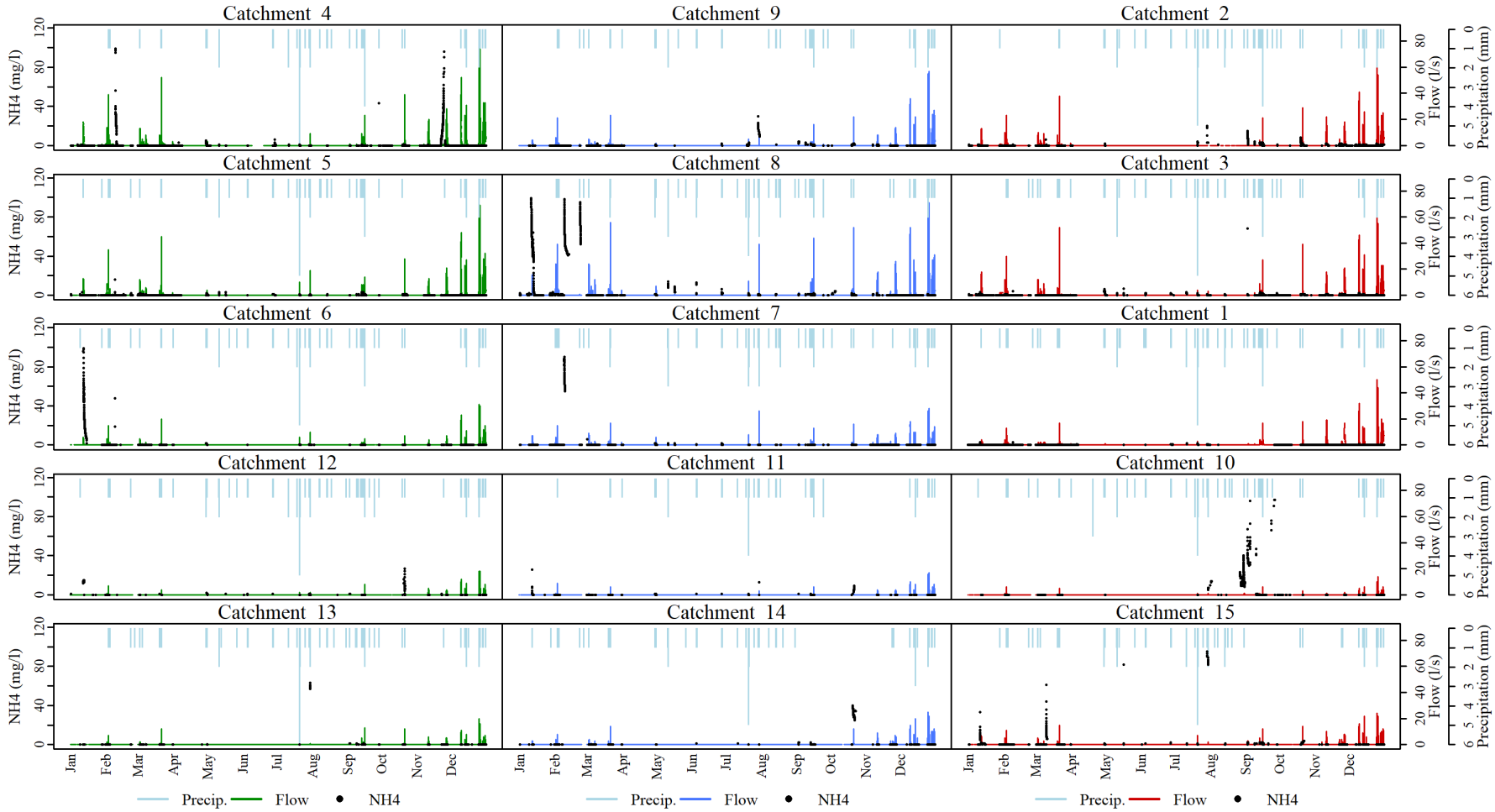



**Figure 25:** Time series of precipitation, flow and ammonium (NH4)

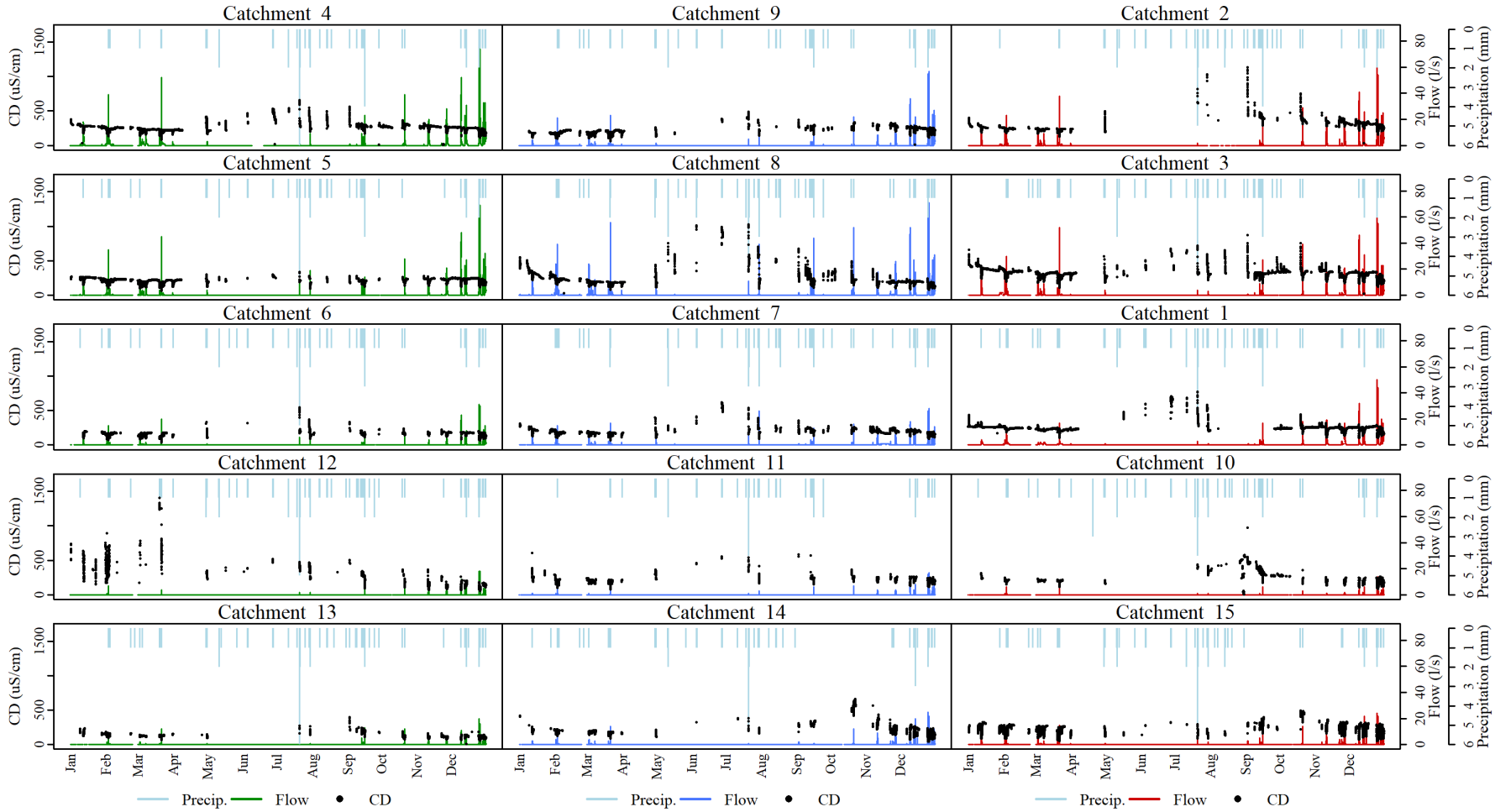



**Figure 26:** Time series of precipitation, flow and conductivity (CD)

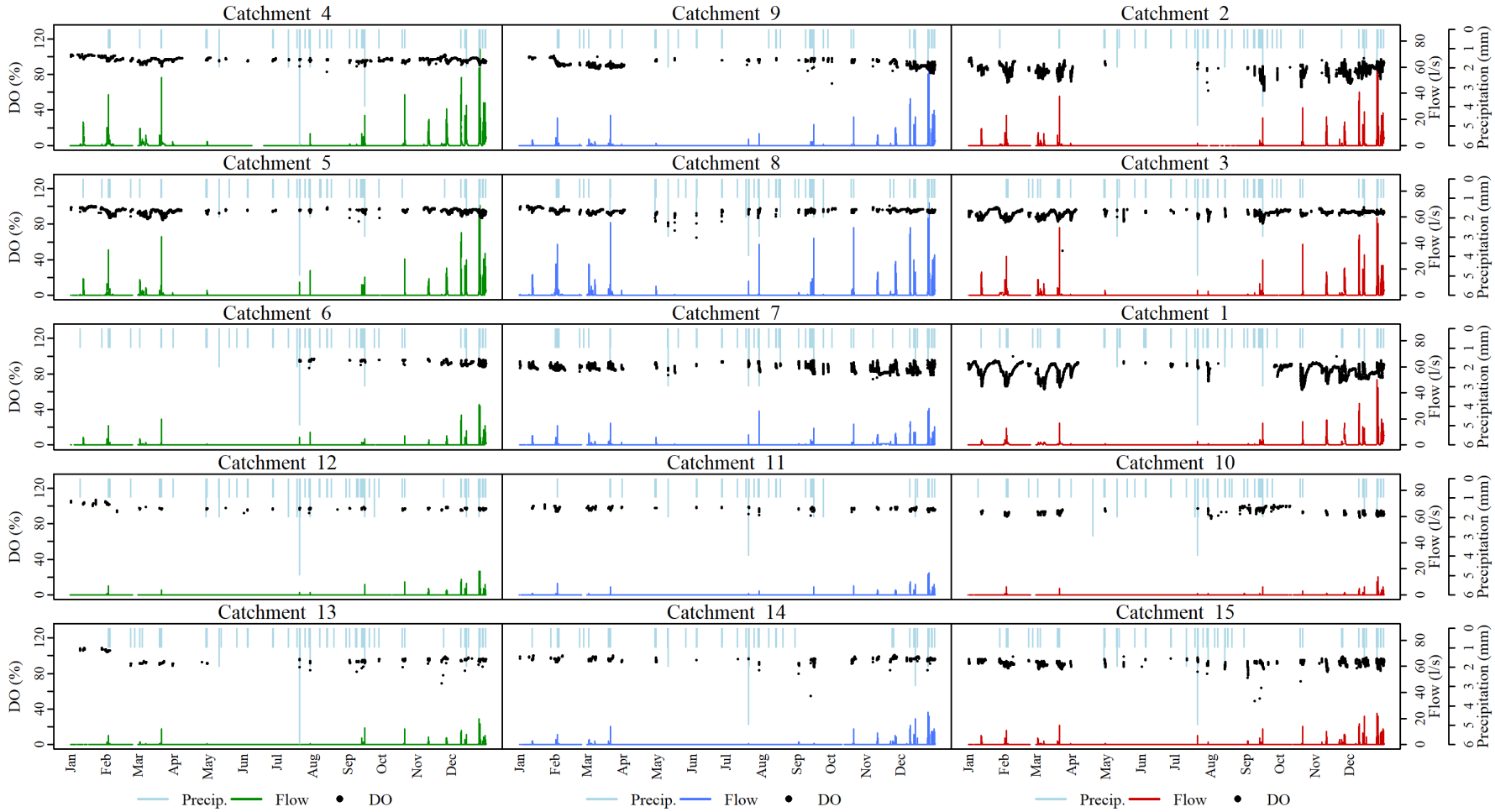



**Figure 27:** Time series of precipitation, flow and dissolved oxygen (DO)

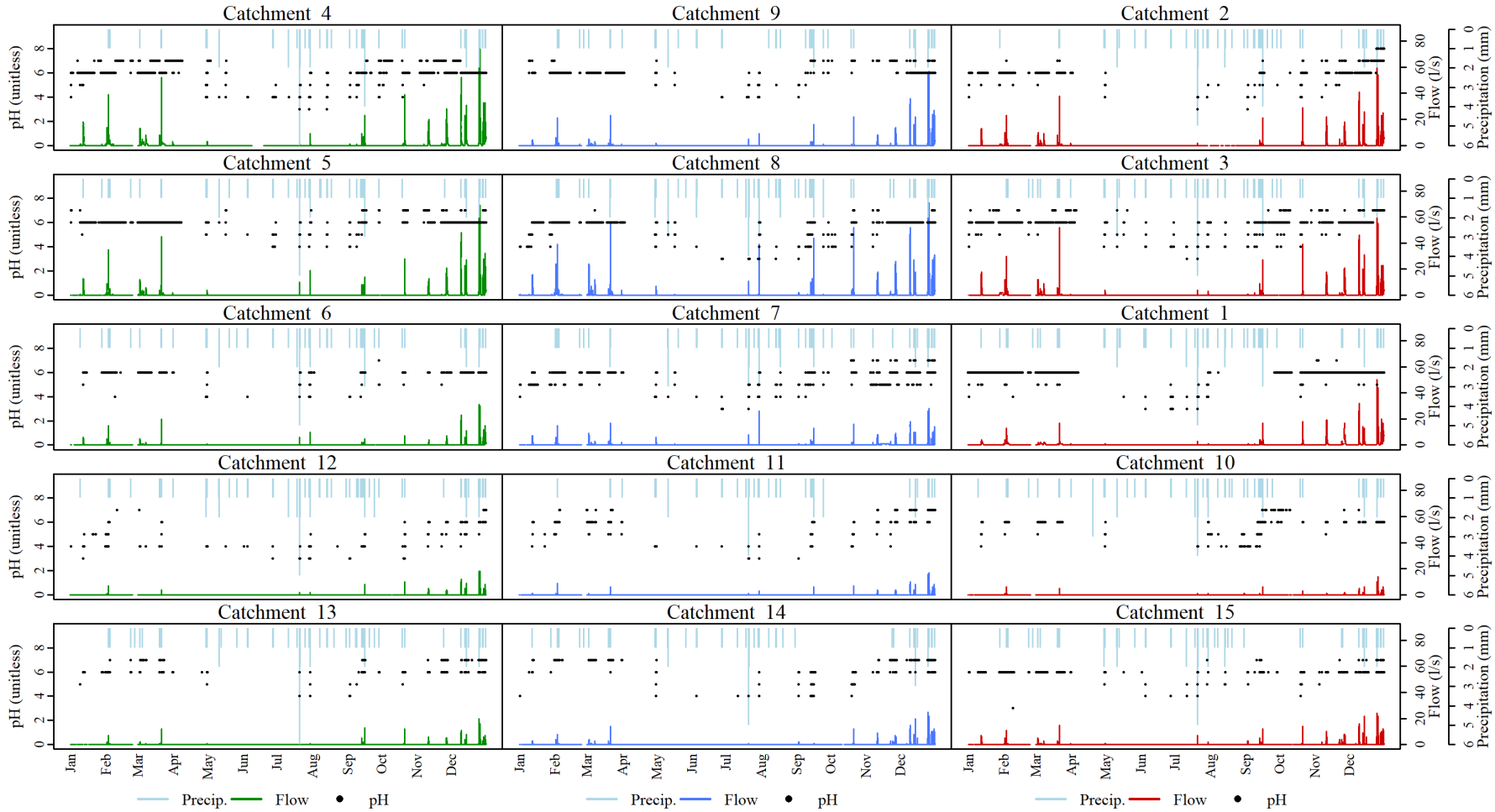



**Figure 28:** Time series of precipitation, flow and pH (pH)

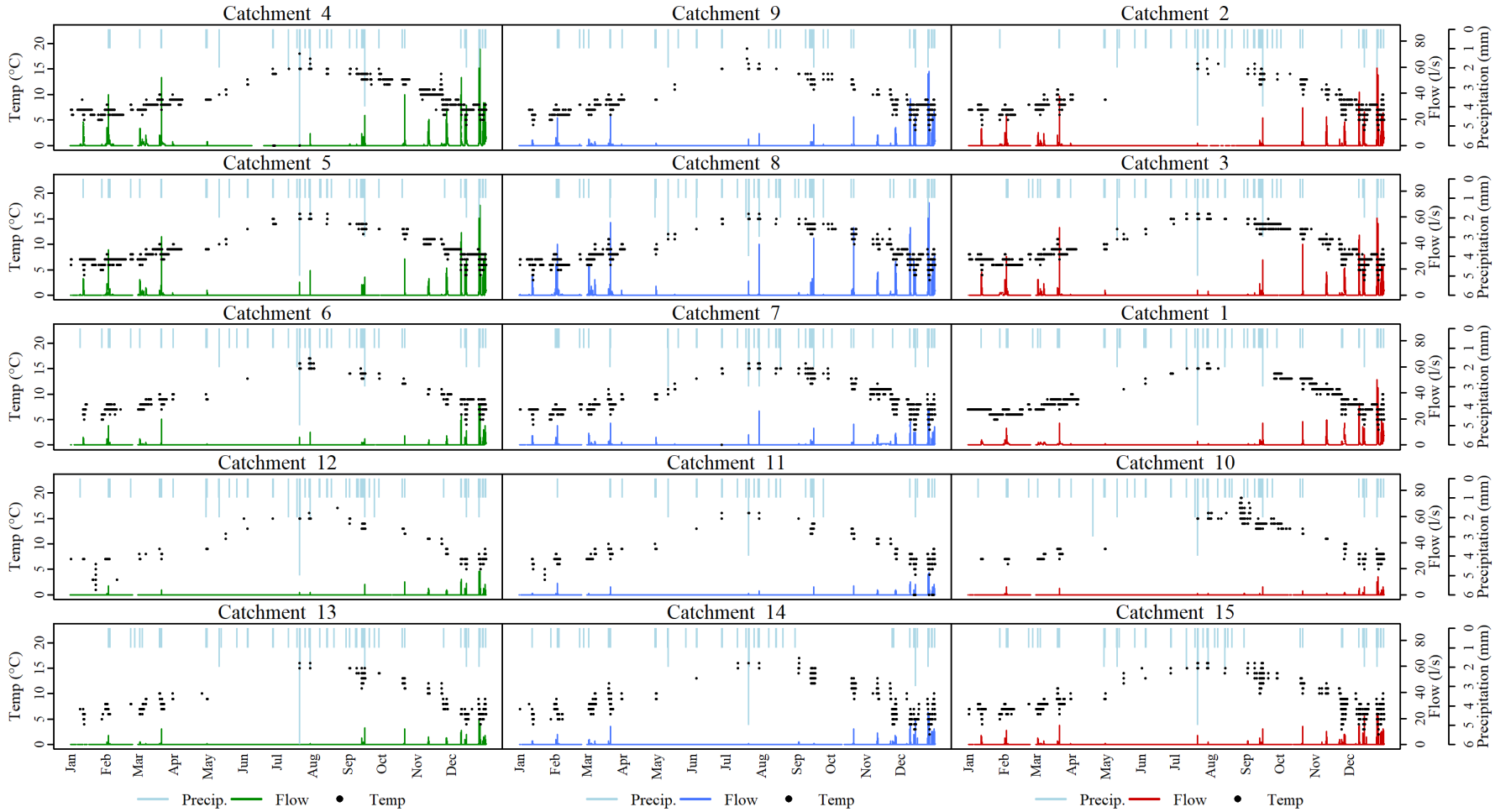



**Figure 29:** Time series of precipitation, flow and flow cell water temperature (Temp)

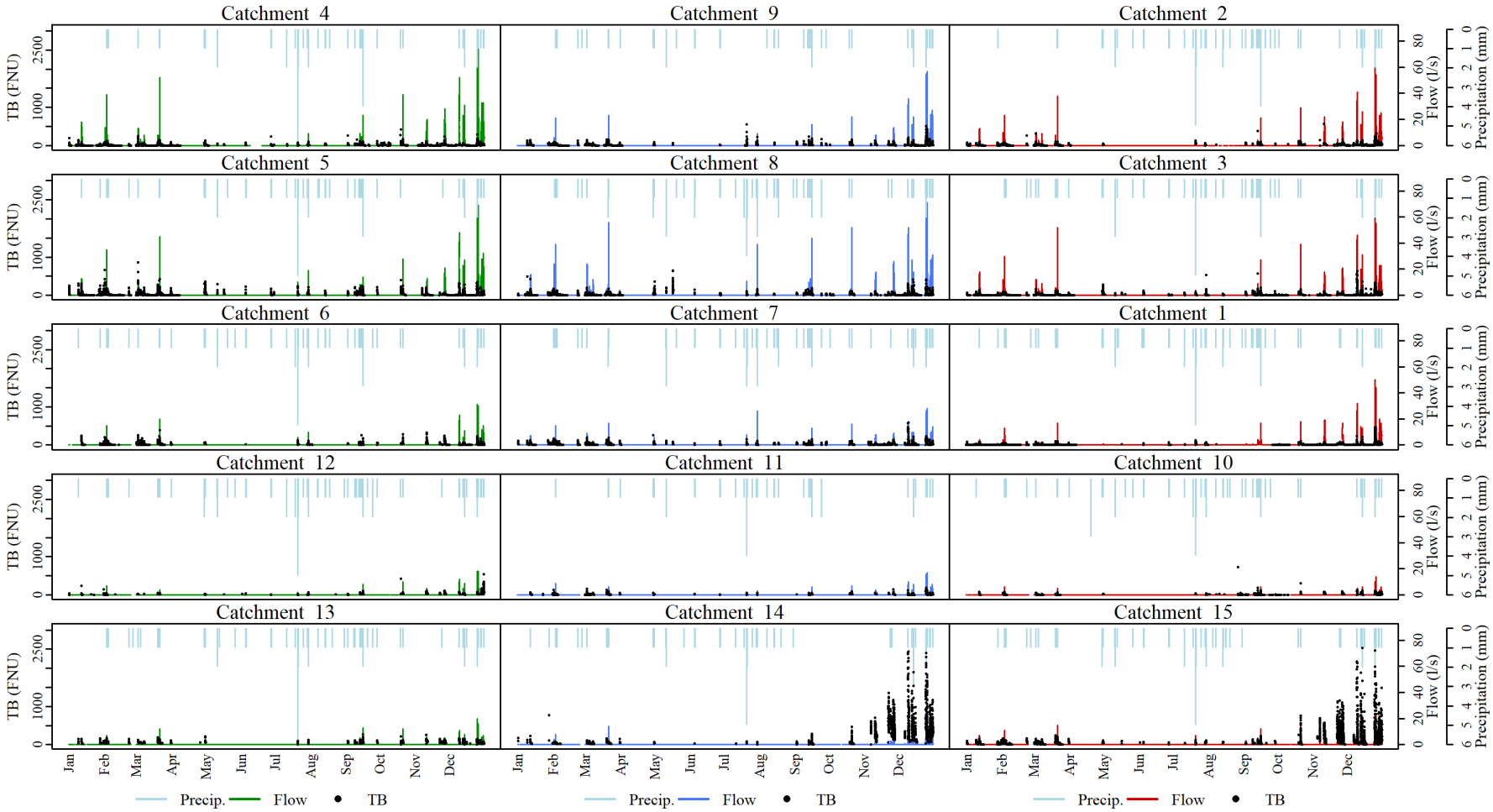



**Figure 30:** Time series of precipitation, flow and turbidity (TB)

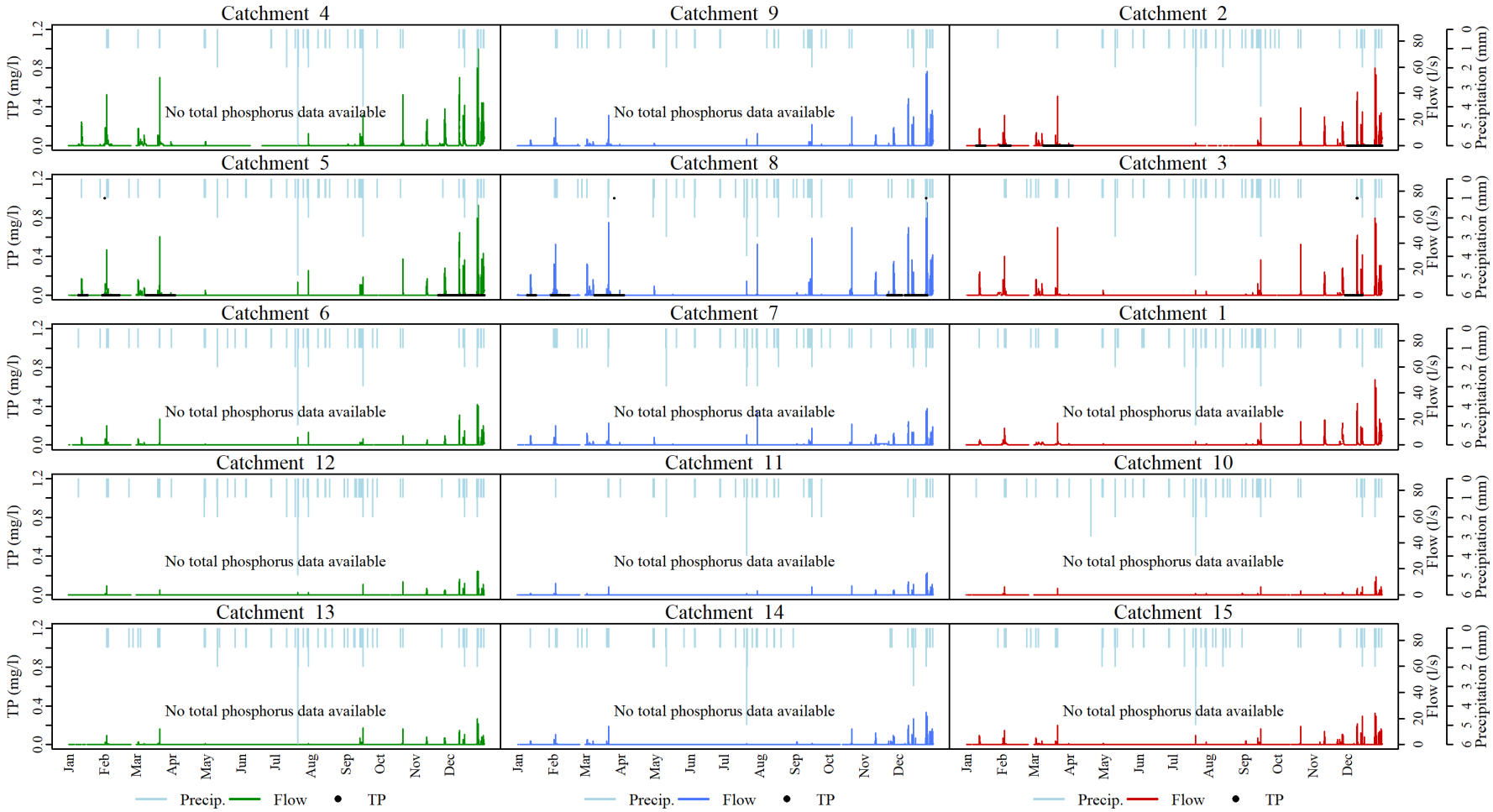



**Figure 31:** Time series of precipitation, flow and total phosphorus (TP)

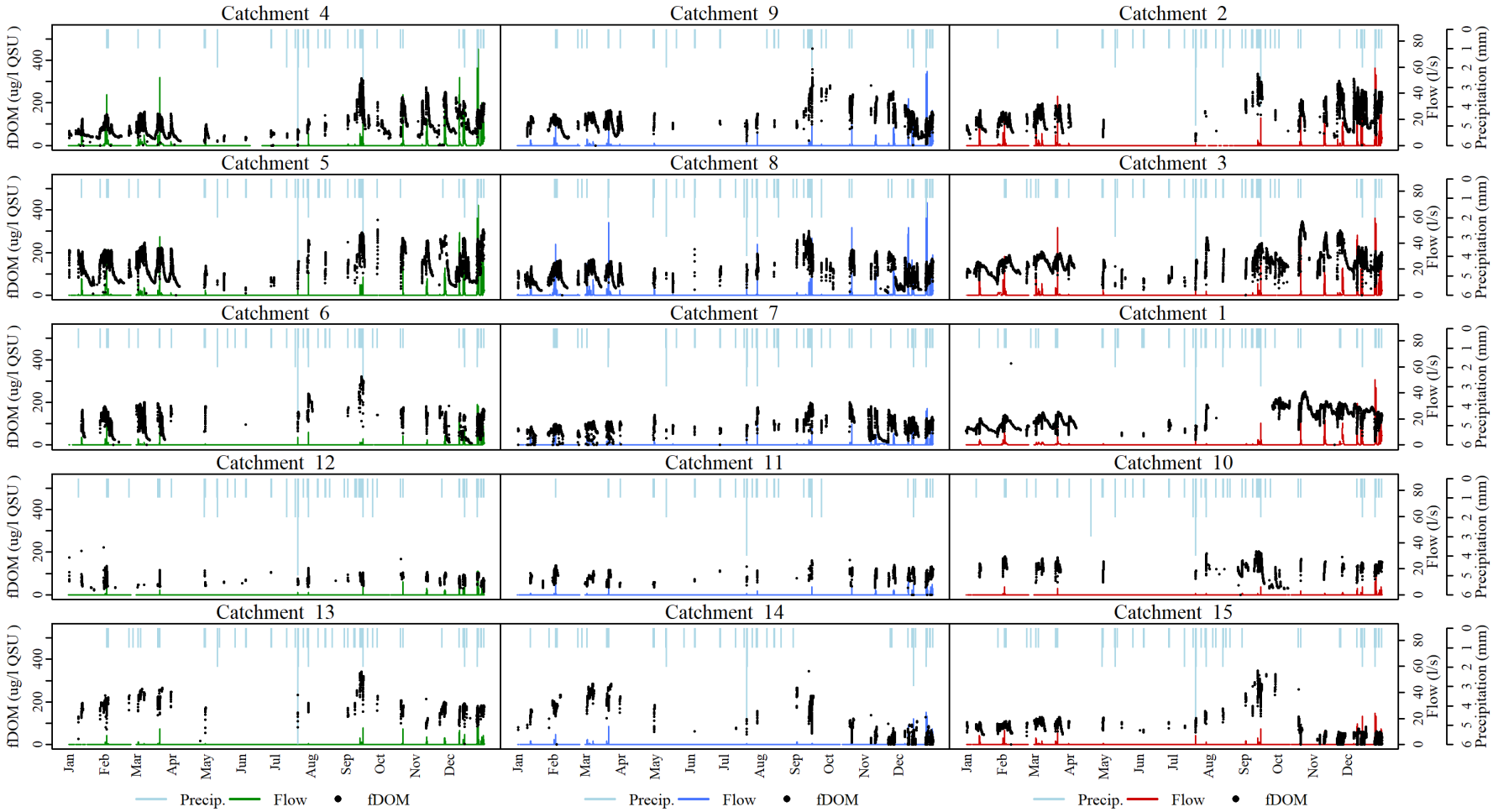



**Figure 32:** Time series of precipitation, flow and dissolved organic matter (fDOM)

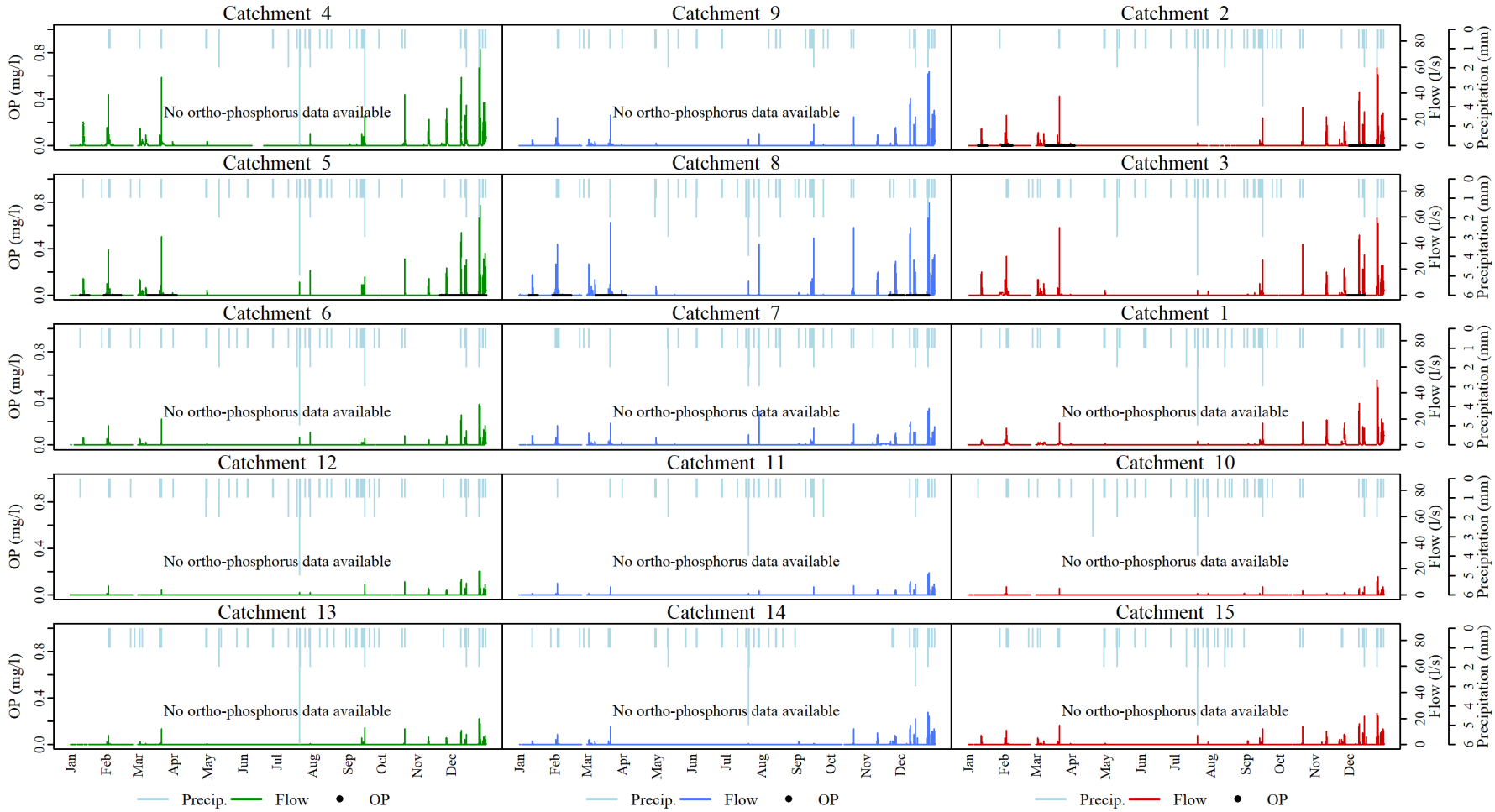



**Figure 33:** Time series of precipitation, flow and ortho-phosphorus (OP)

## 1.6 Correlations

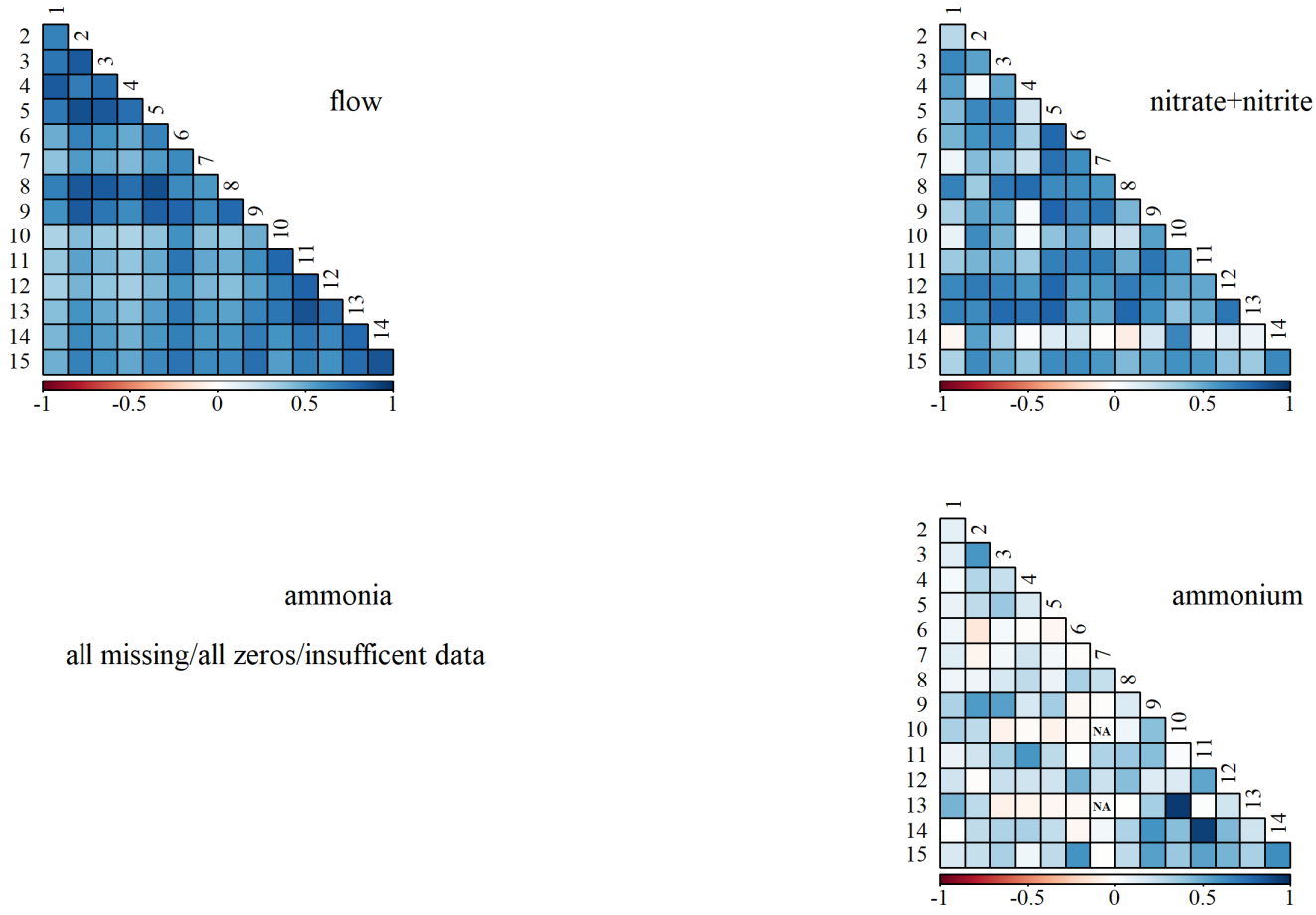



**Figure 34:** Correlations between catchments - flow, nitrate+nitrite, ammonia, ammonium

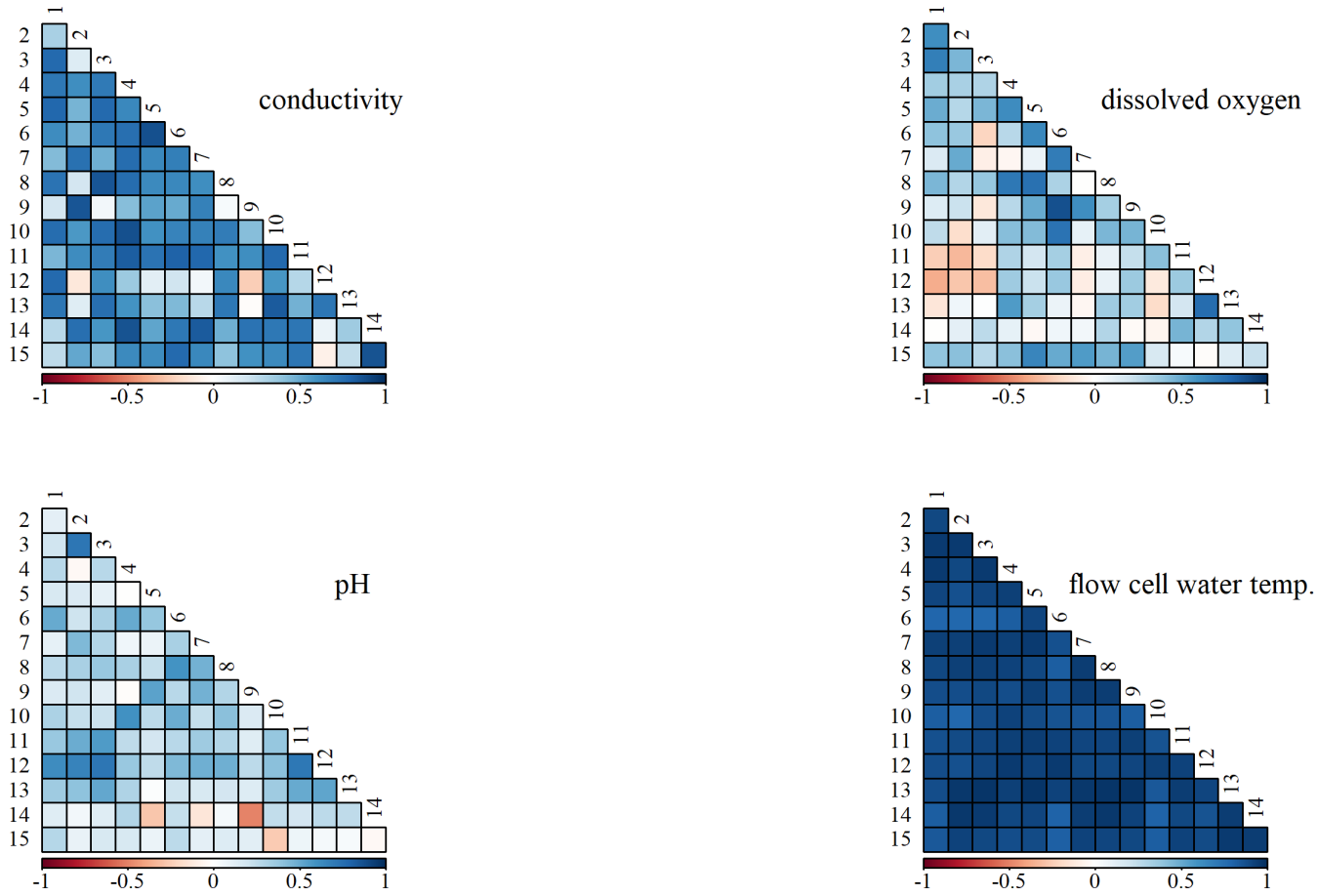
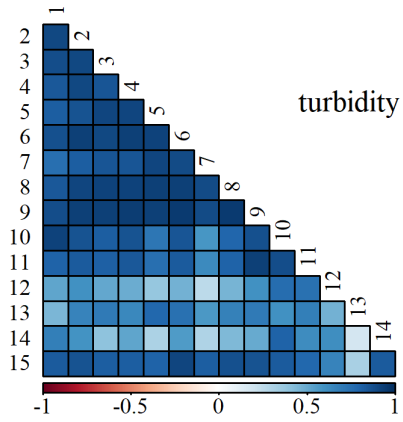
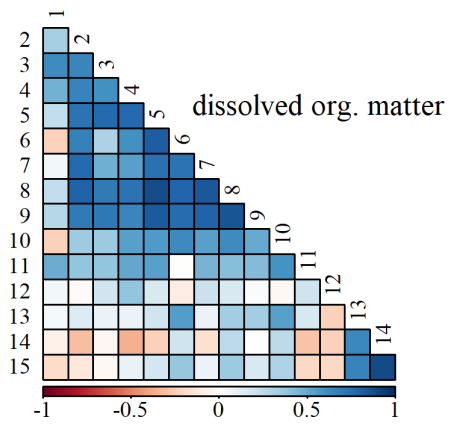



**Figure 35:** Correlations between catchments - conductivity, dissolved oxygen, pH, flow cell water temperature




total phosphorus

all missing/all zeros/insufficent data




ortho-phosphorus

all missing/all zeros/insufficent data

**Figure 36:** Correlations between catchments - turbidity, total phosphorus, dissolved organic matter, ortho-phosphorus

# 2 MONTHLY

## 2.1 Flow duration curves

Data are in triplet/catchment order with catchments arranged from largest to smallest across the page. NB. Data may include missing values.

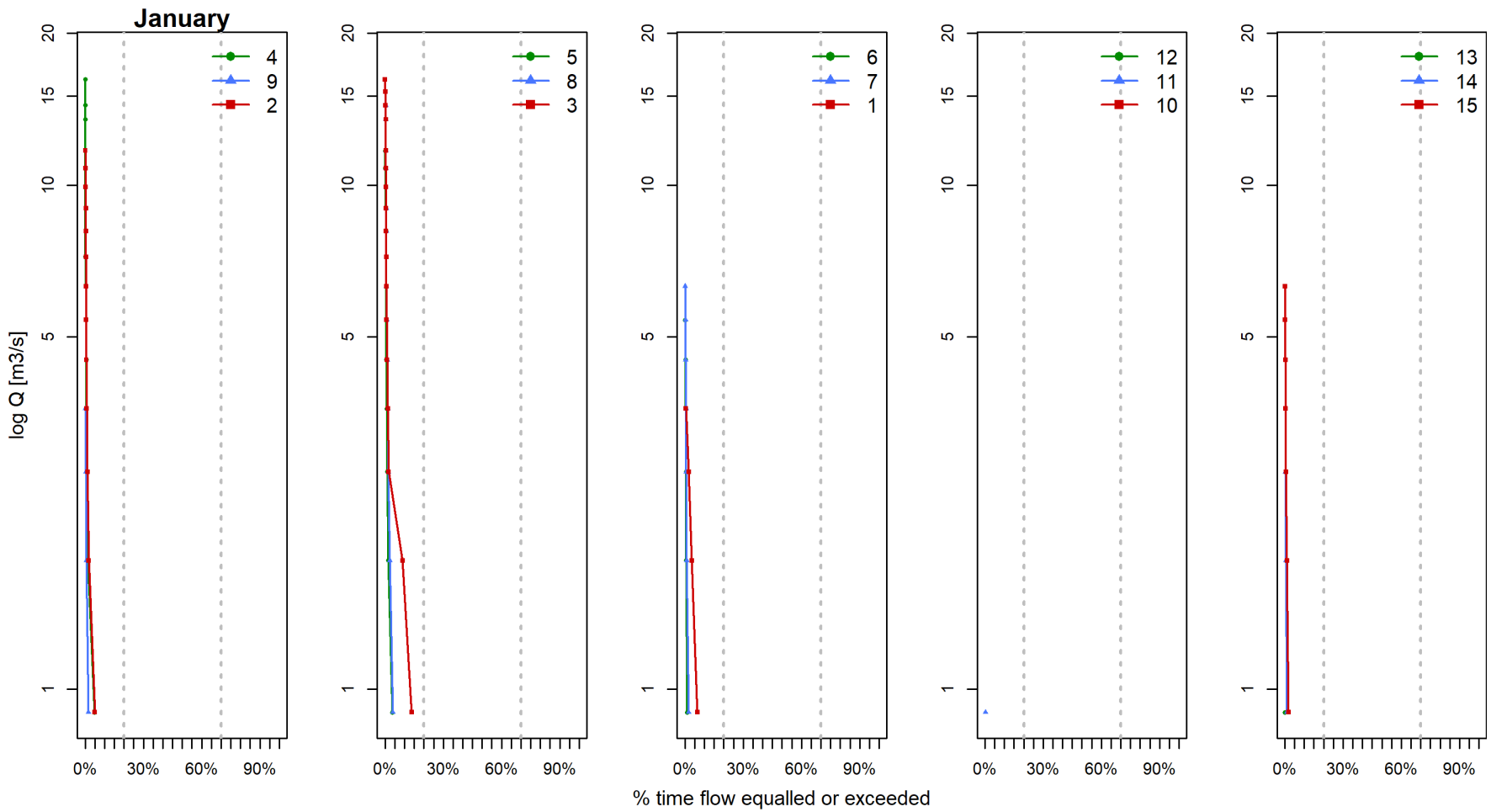



**Figure 37:** Flow duration curves for January

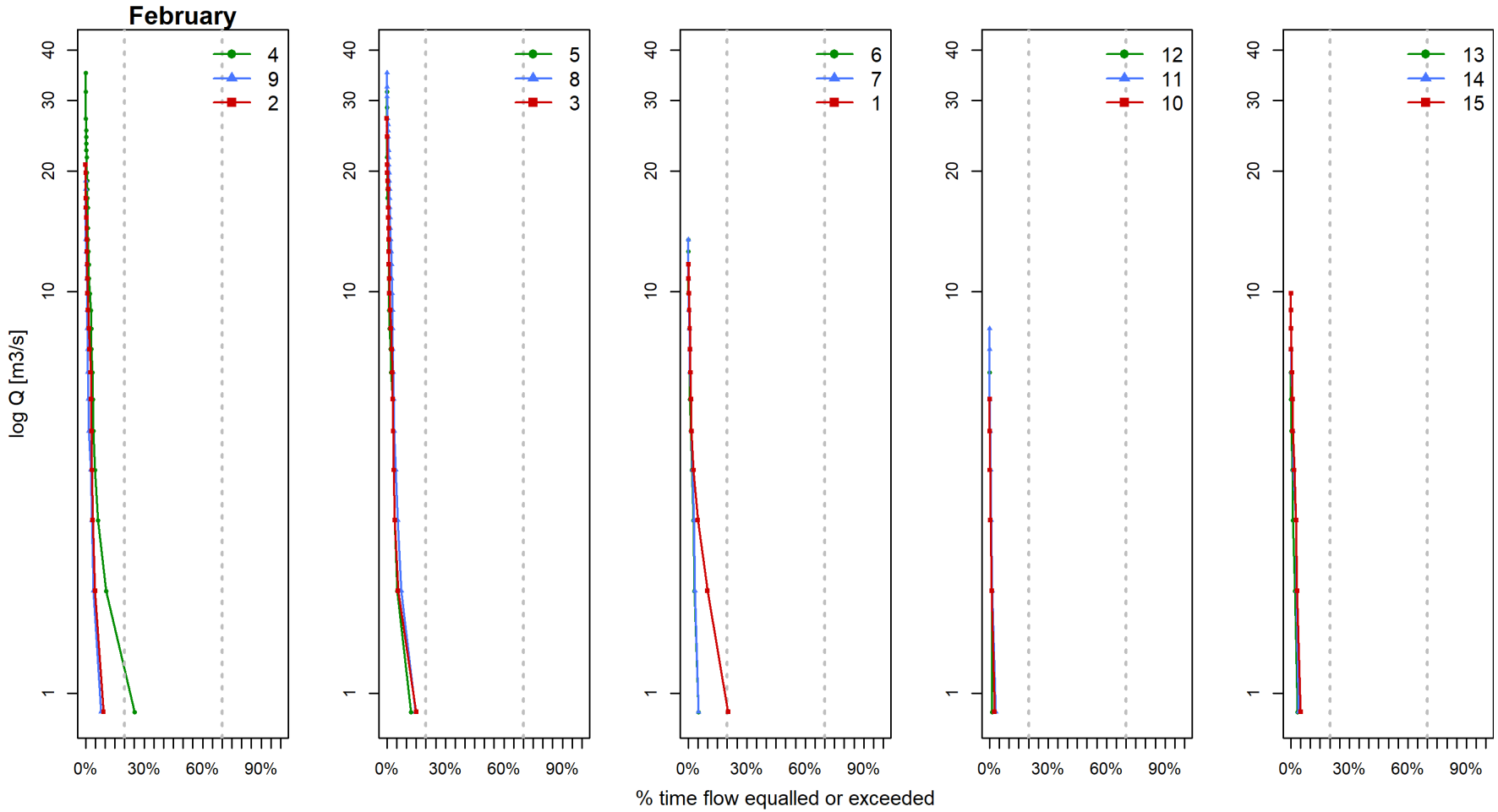



**Figure 38:** Flow duration curves for February

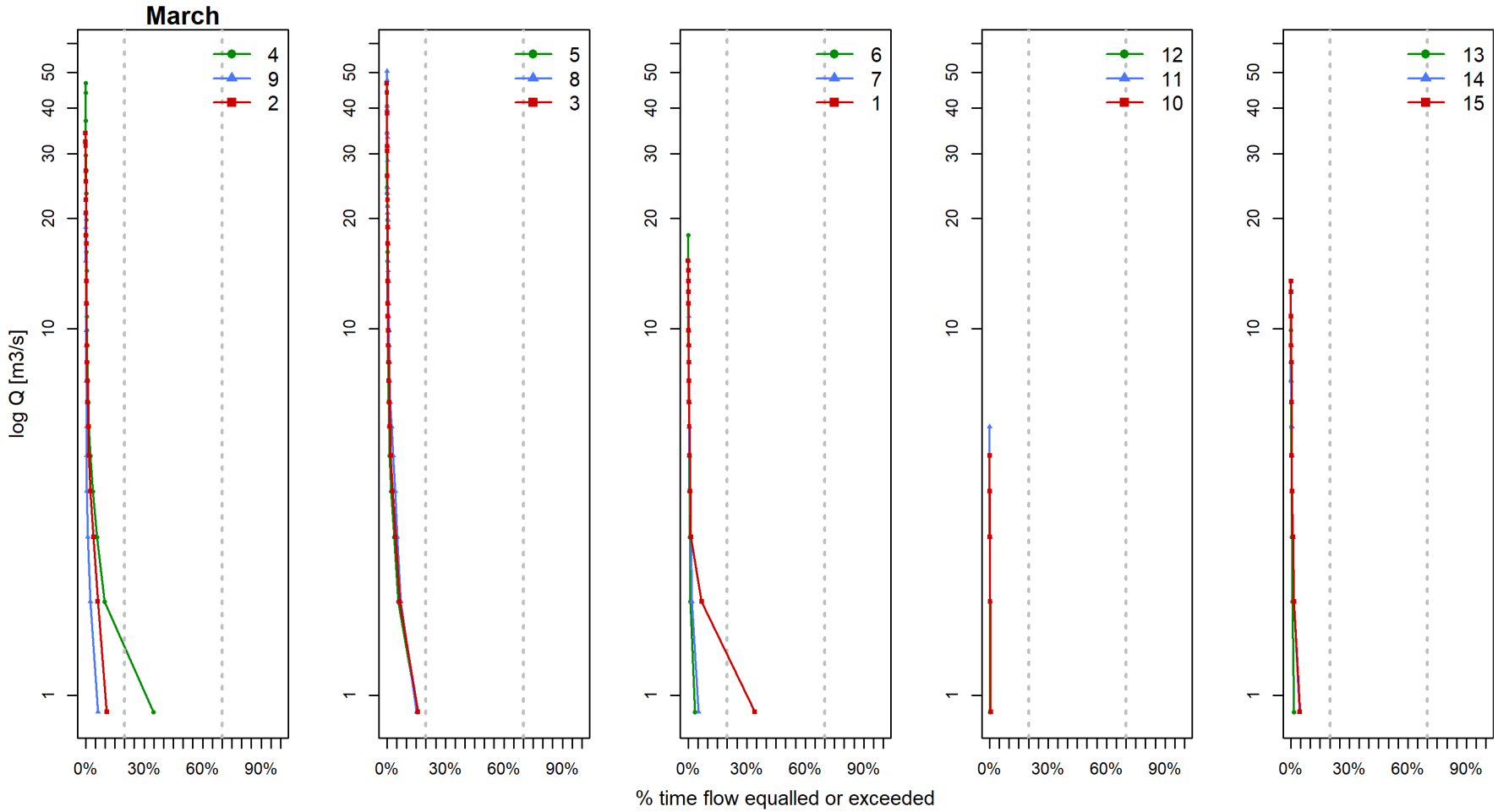



**Figure 39:** Flow duration curves for March

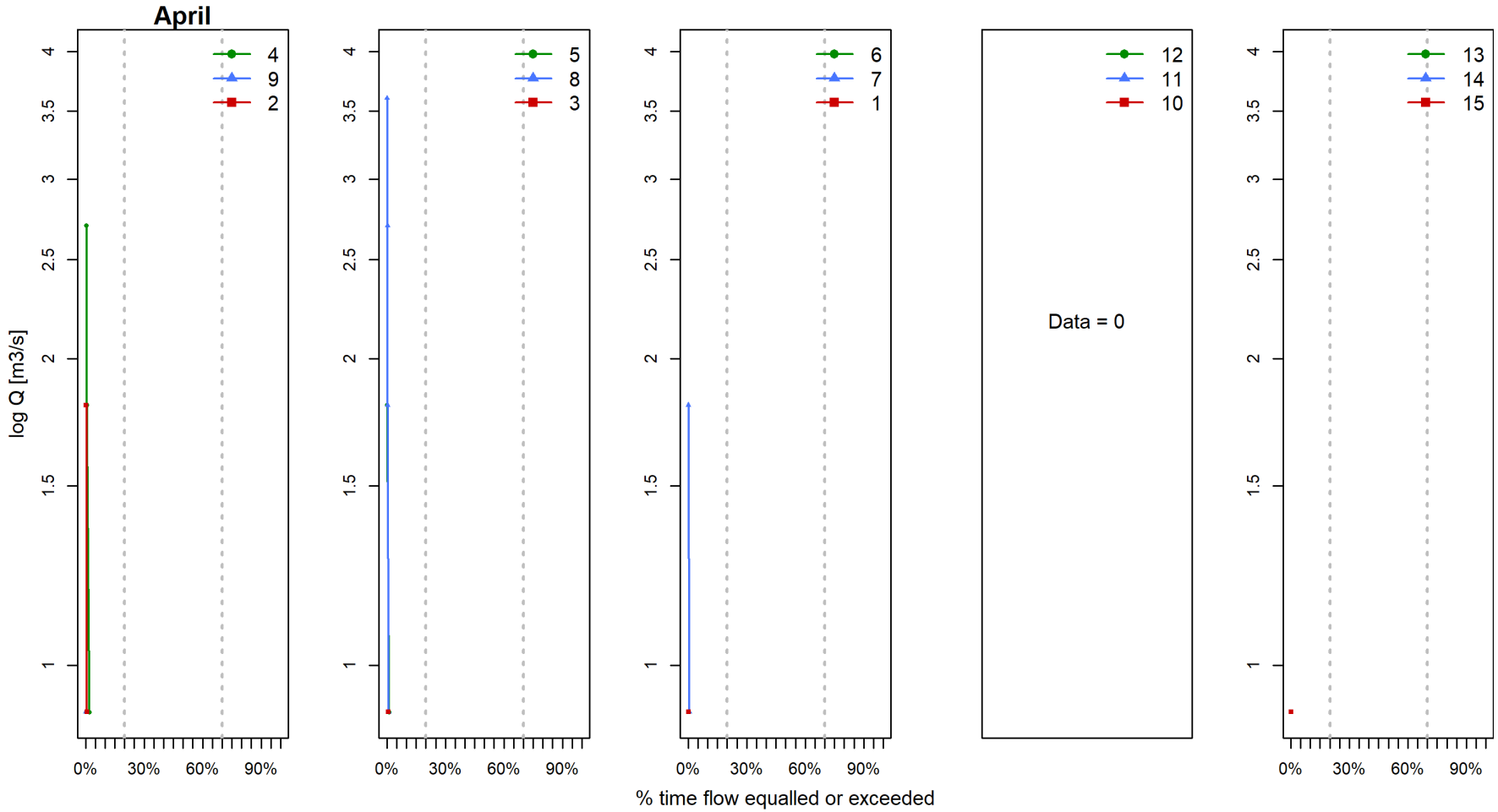



**Figure 40:** Flow duration curves for April

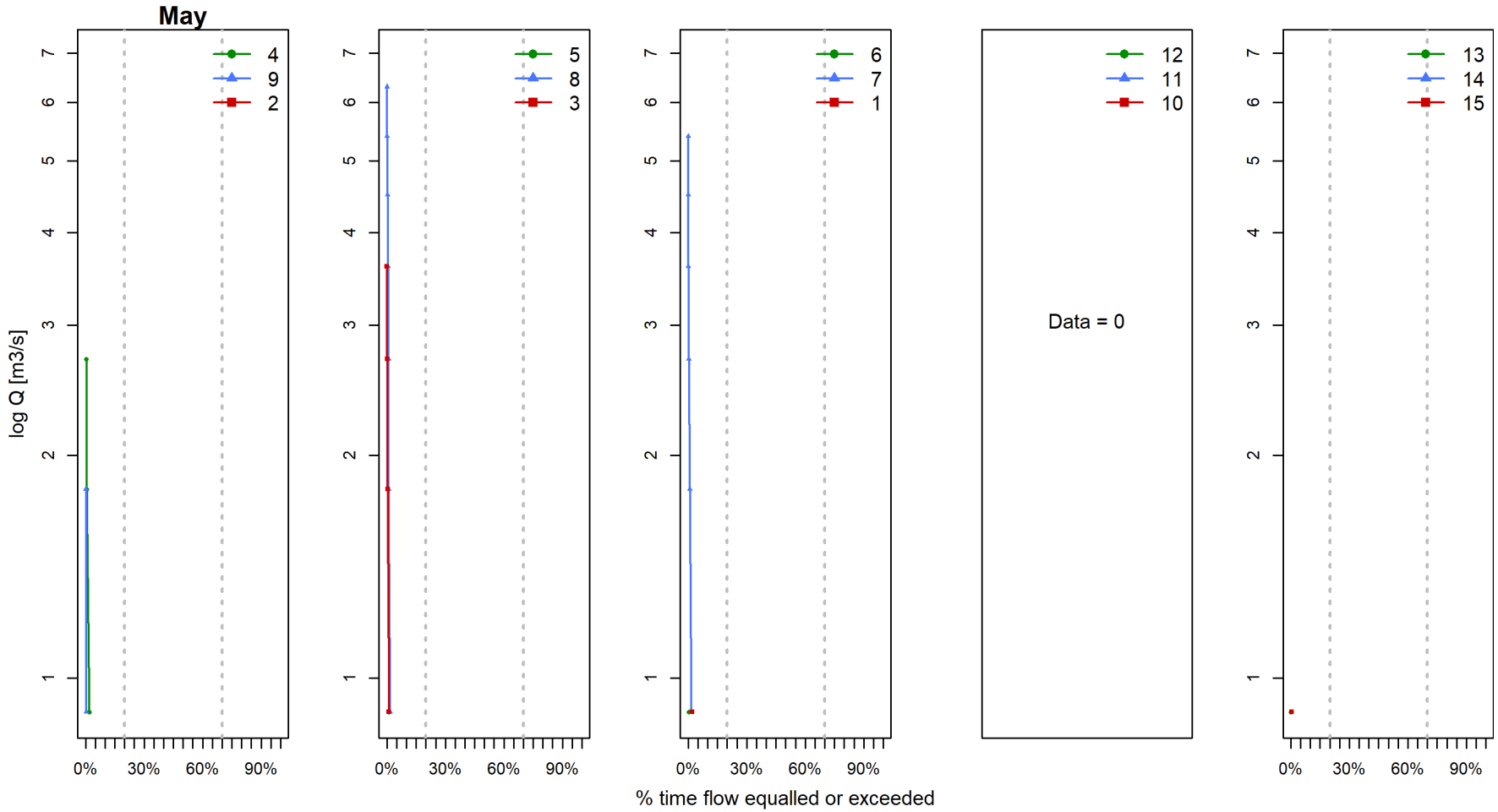



**Figure 41:** Flow duration curves for May

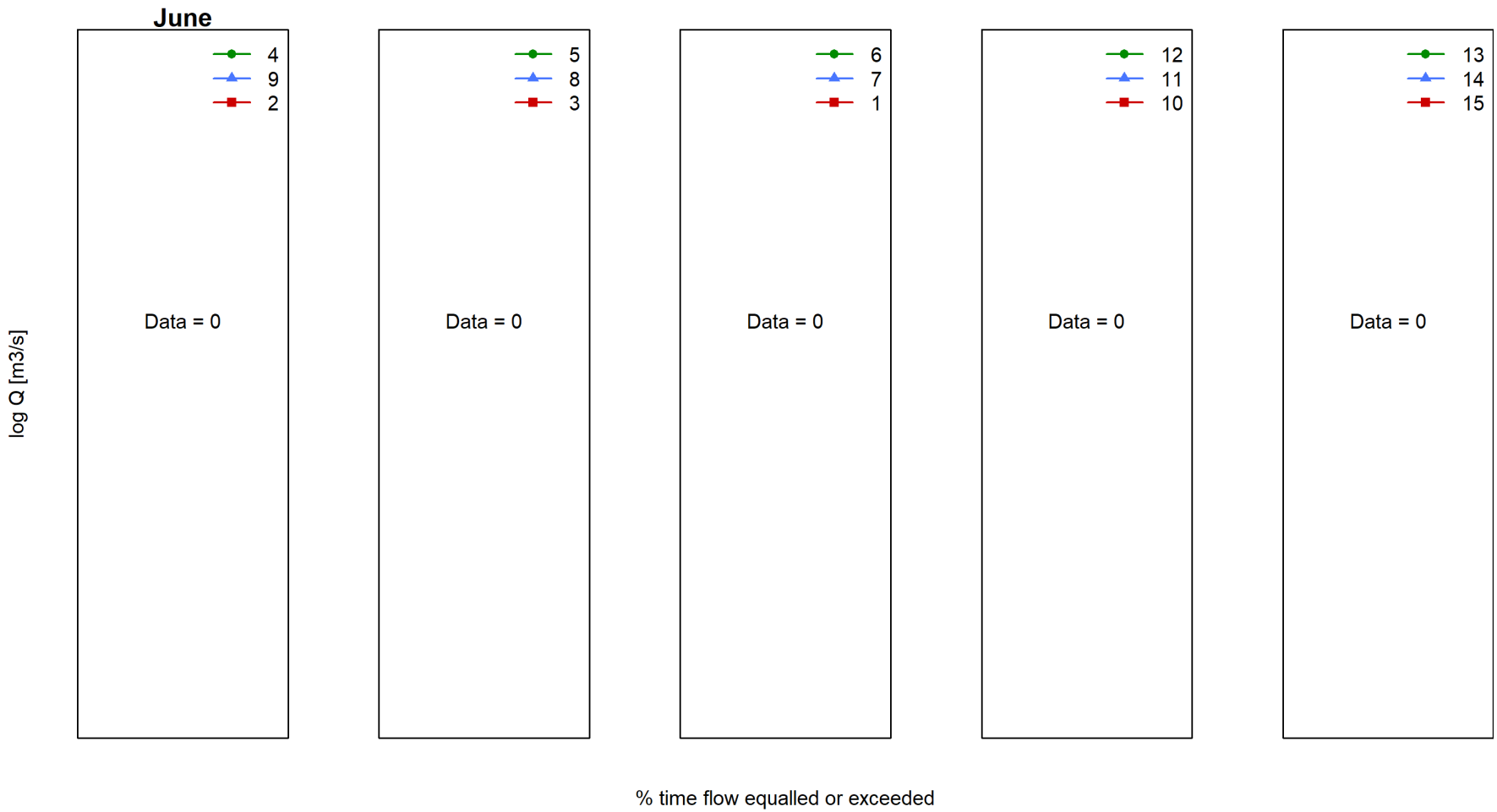



**Figure 42:** Flow duration curves for June

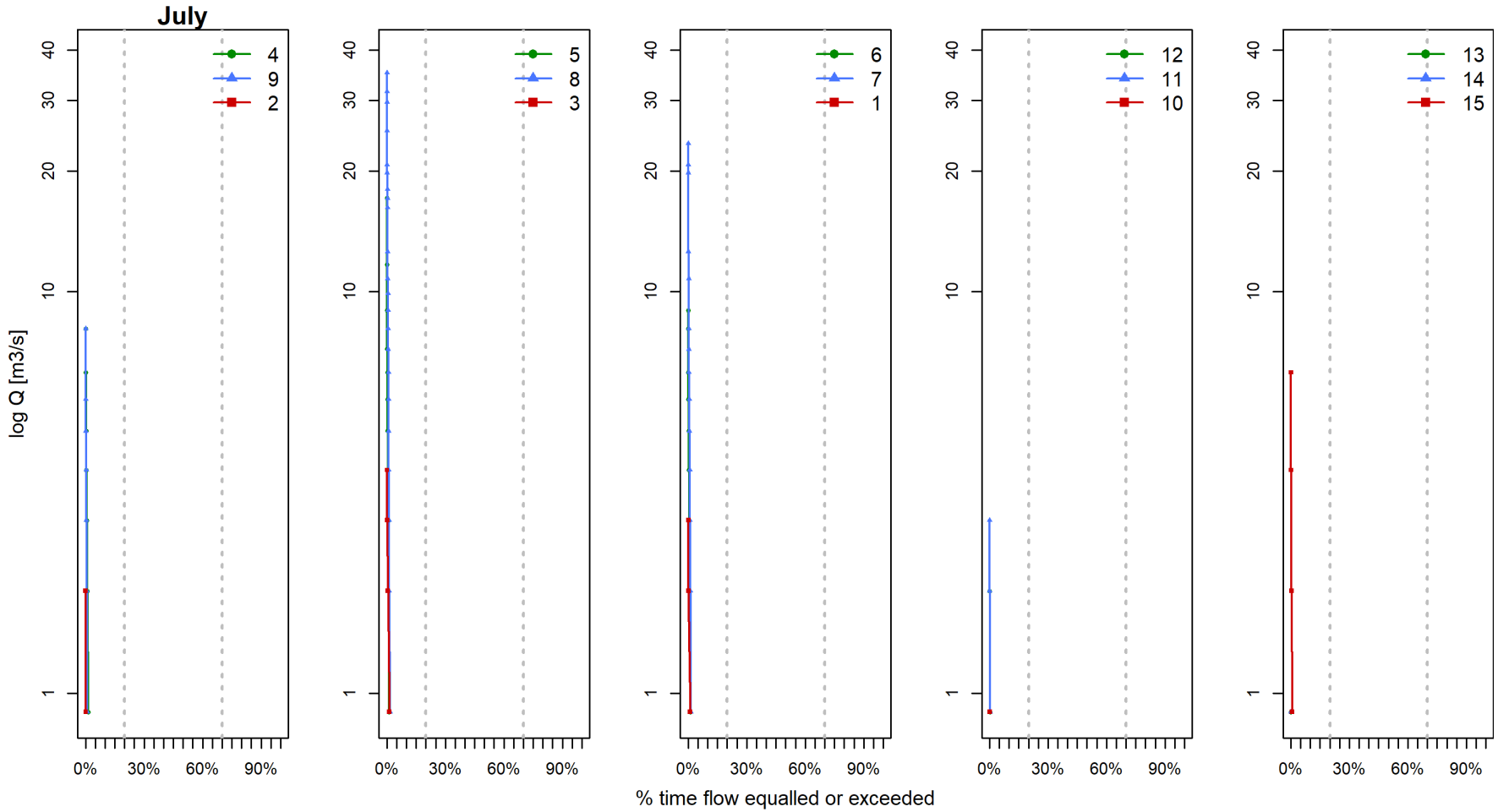



**Figure 43:** Flow duration curves for July

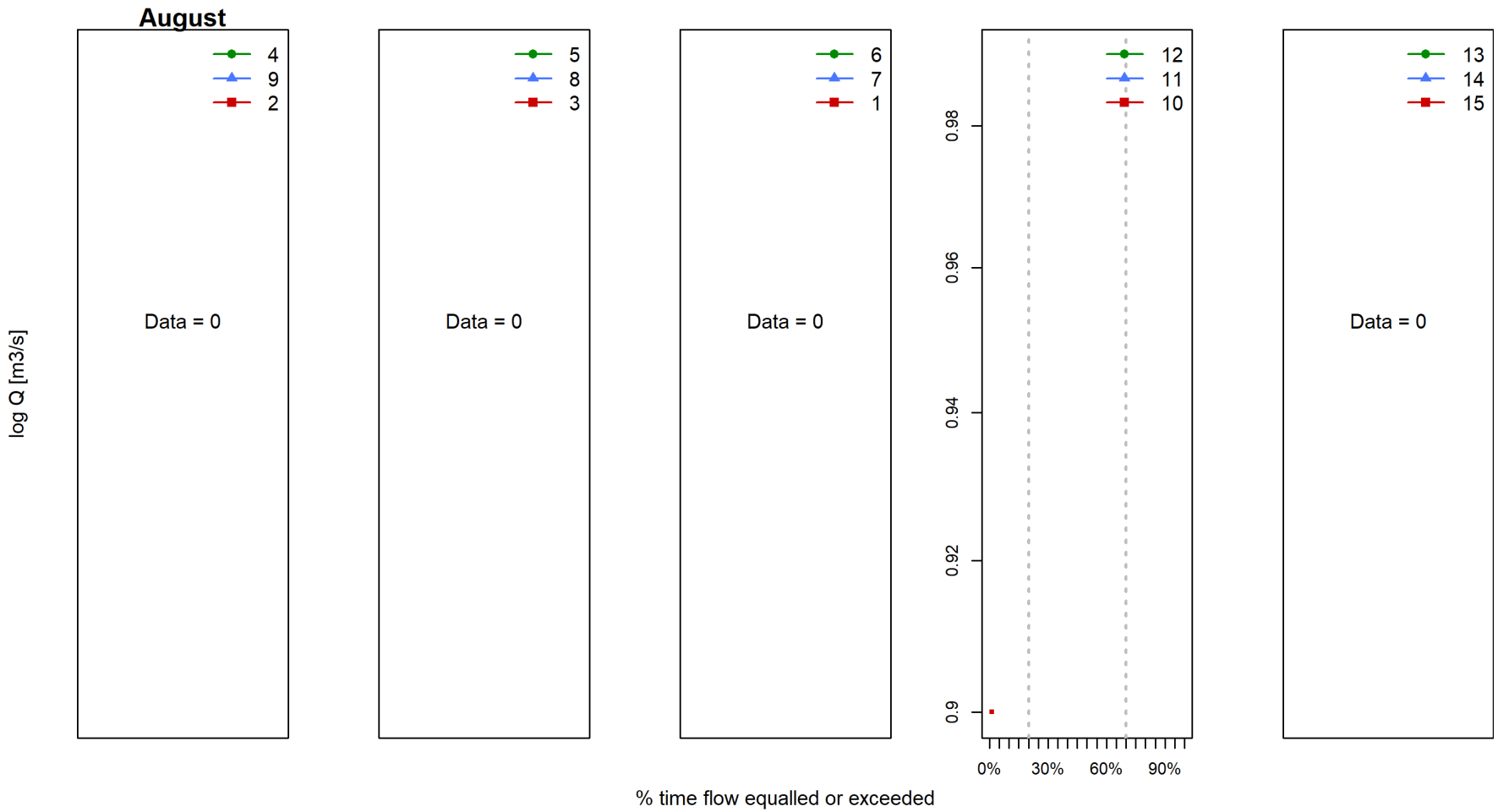



**Figure 44:** Flow duration curves for August

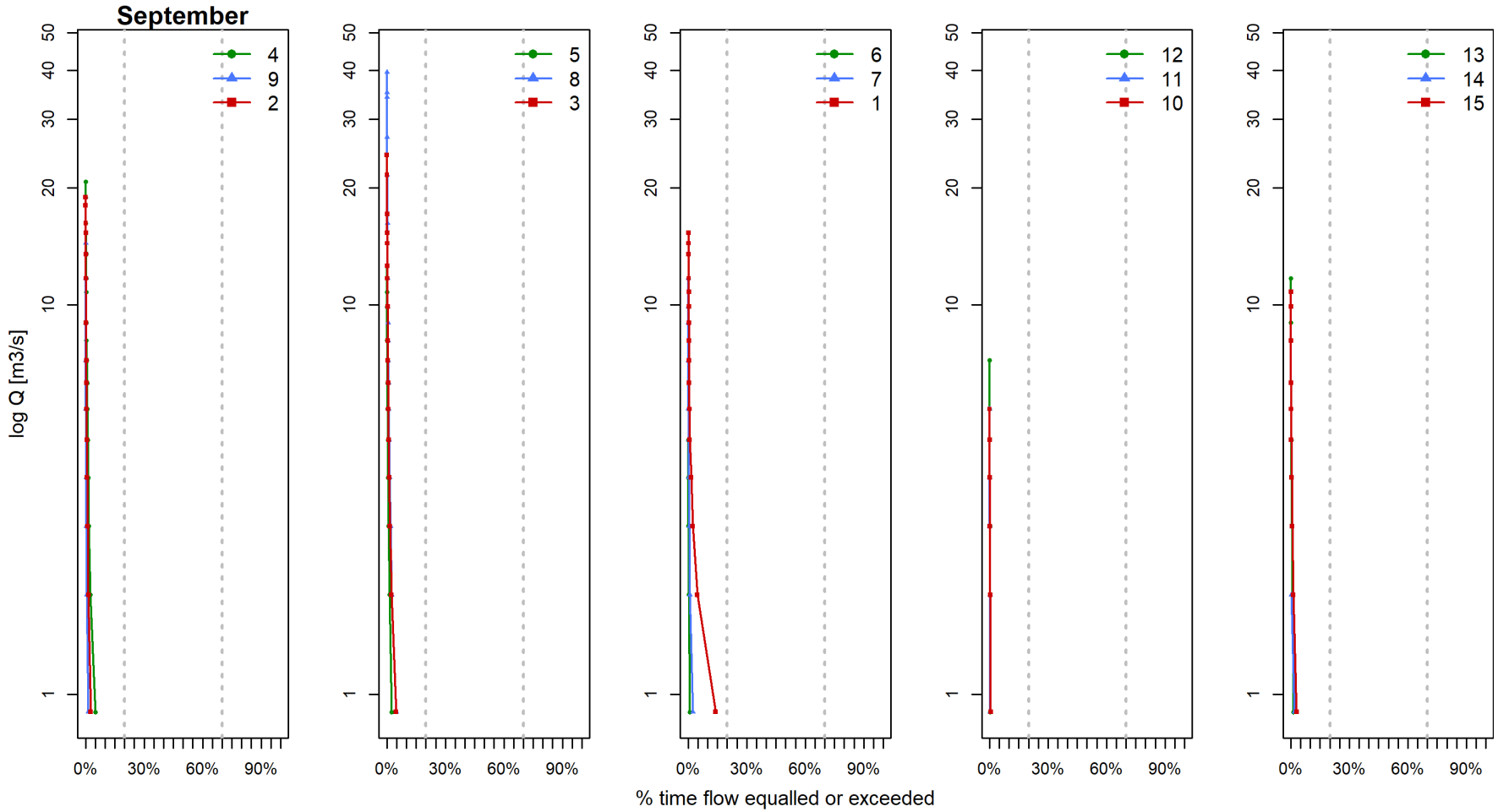



**Figure 45:** Flow duration curves for September

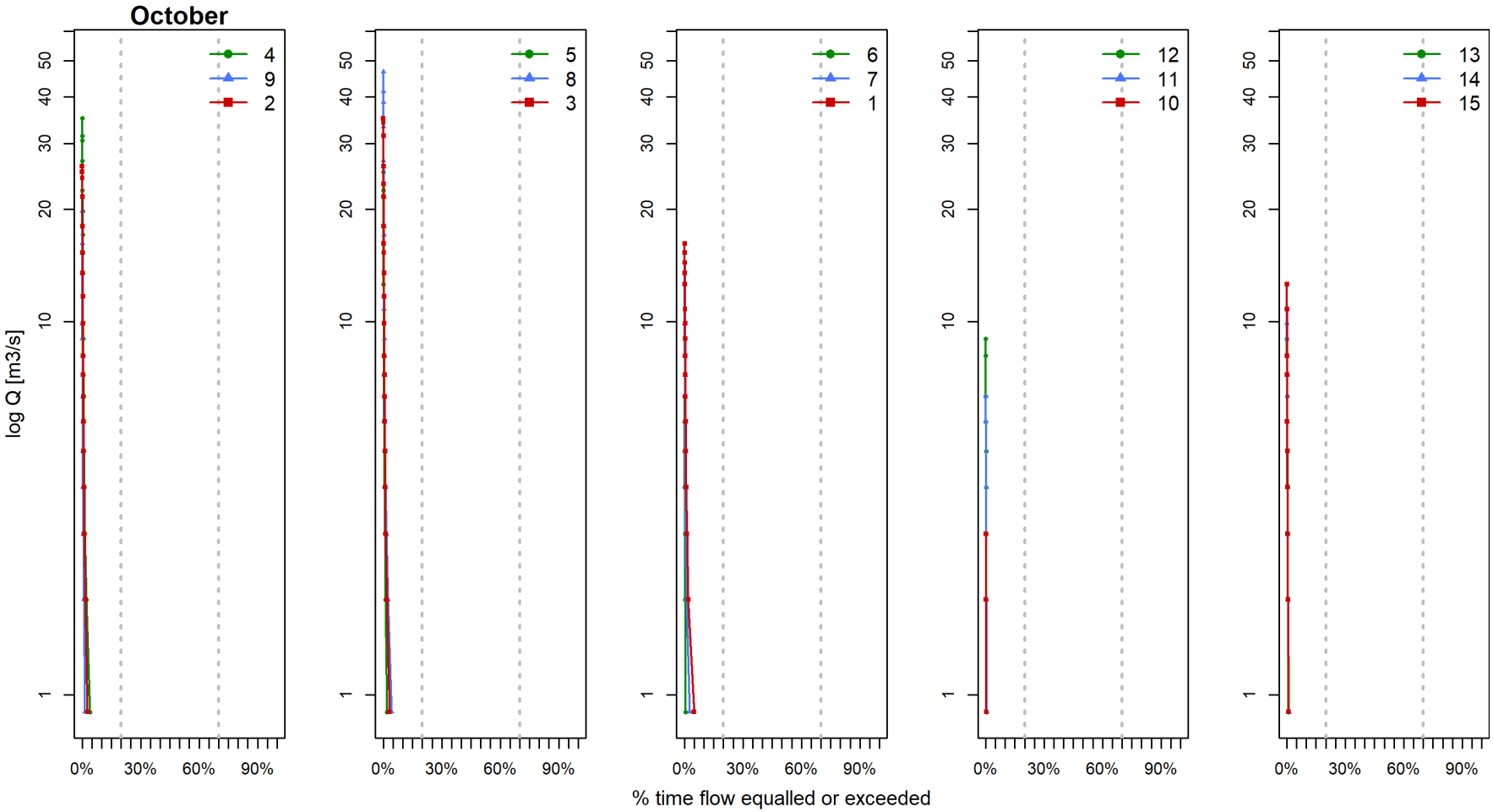



**Figure 46:** Flow duration curves for October

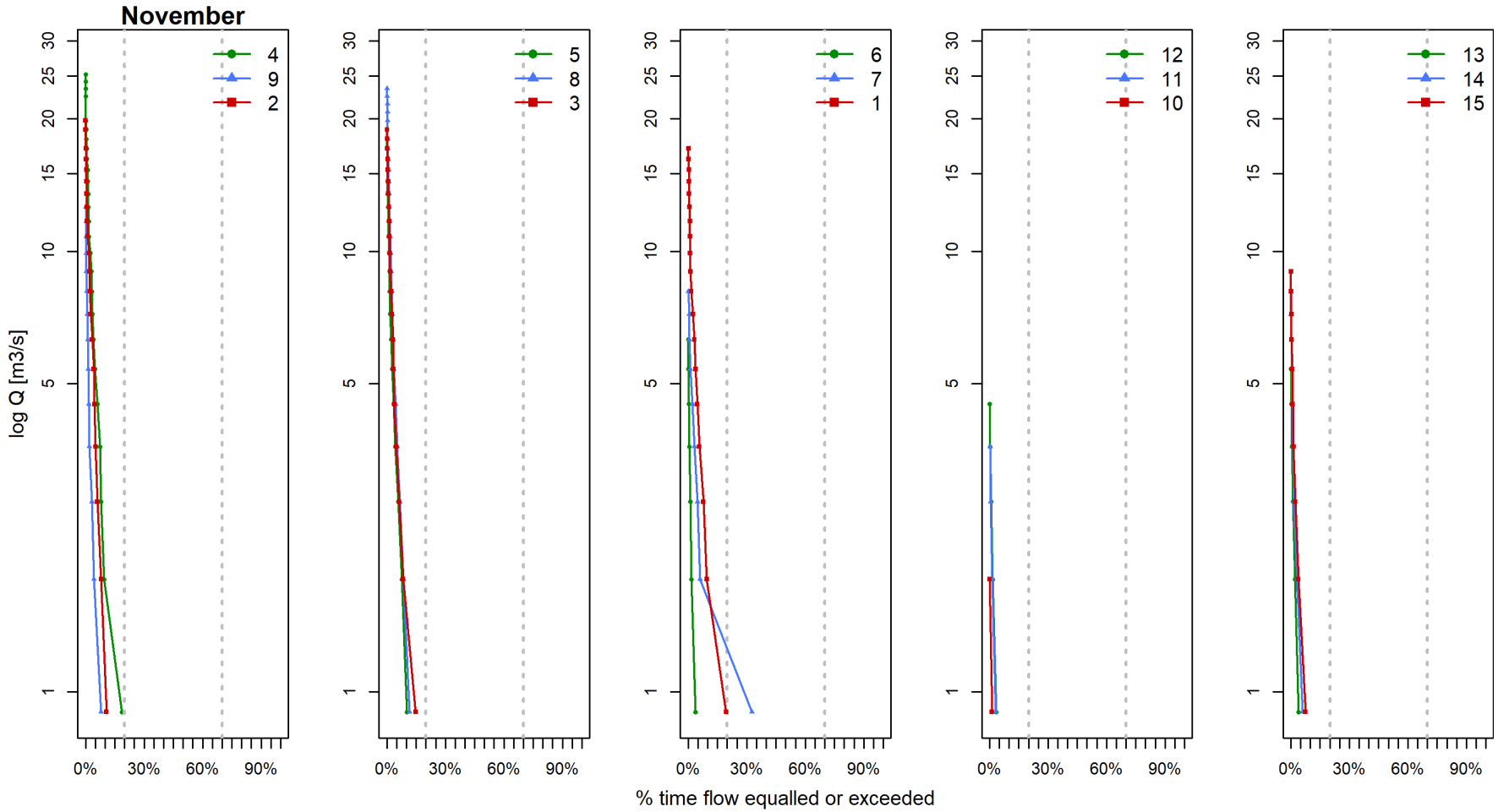



**Figure 47:** Flow duration curves for November

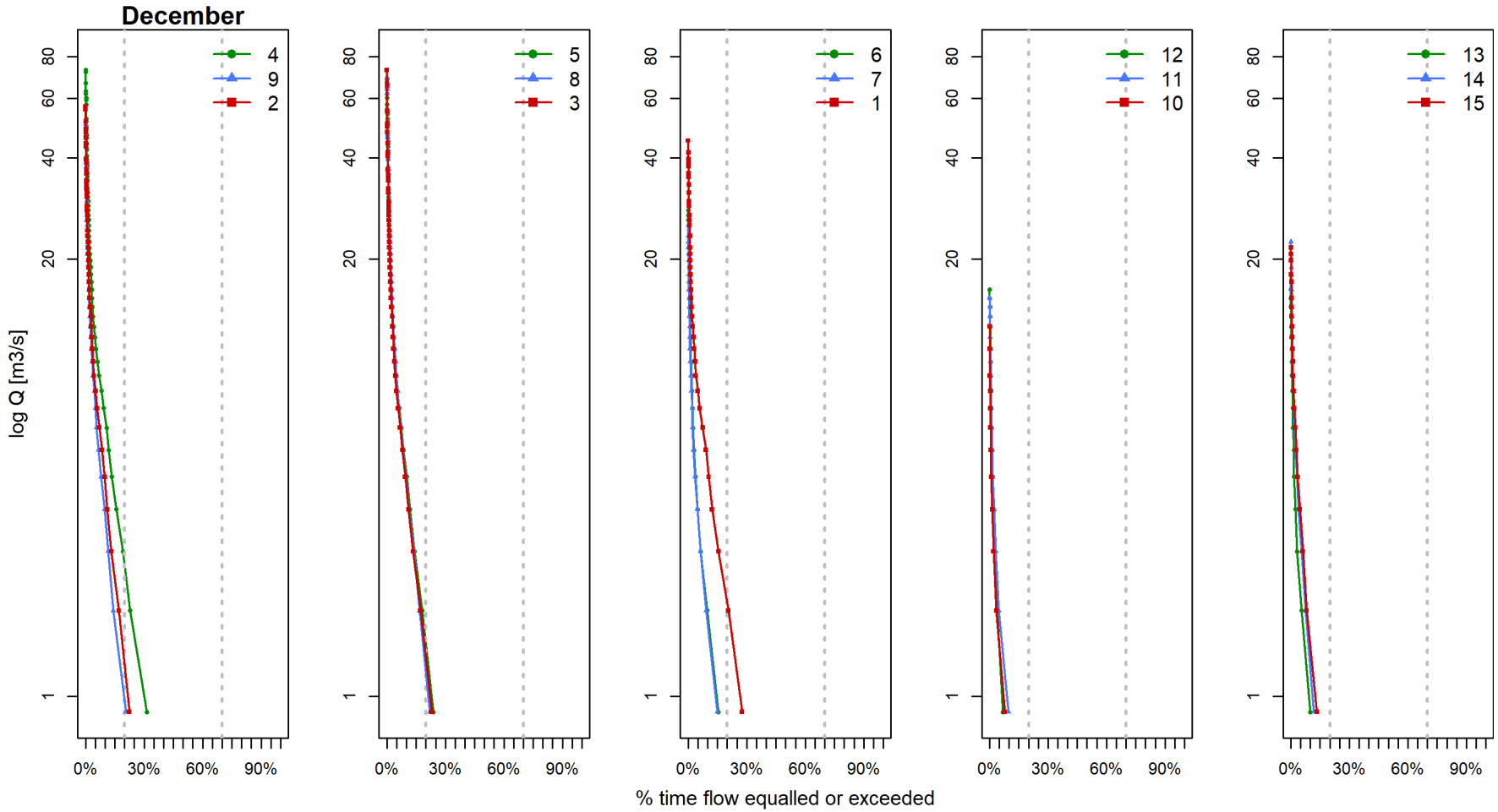



**Figure 48:** Flow duration curves for December

## 2.2 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.*

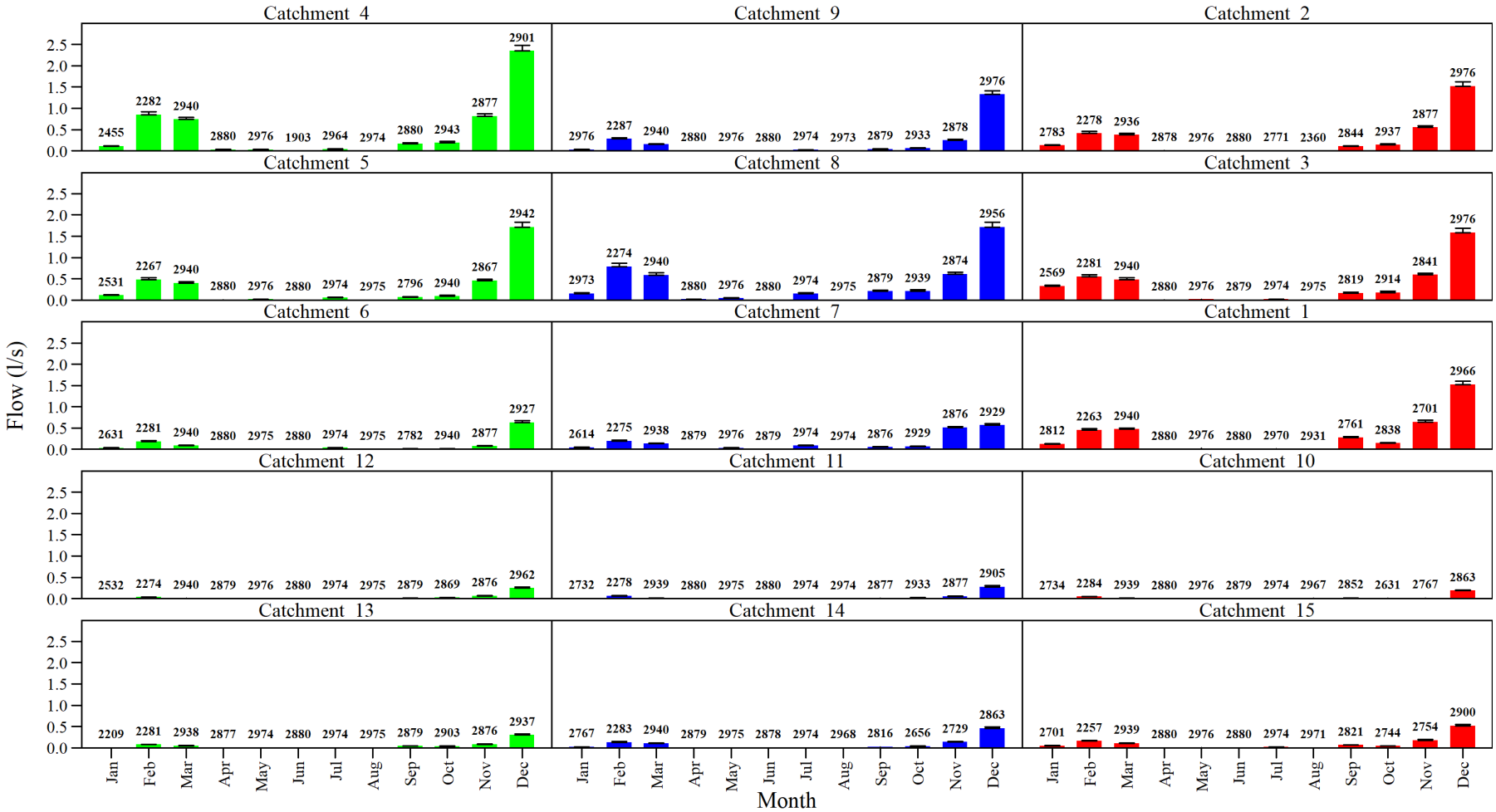



**Figure 49:** Monthly means for flow

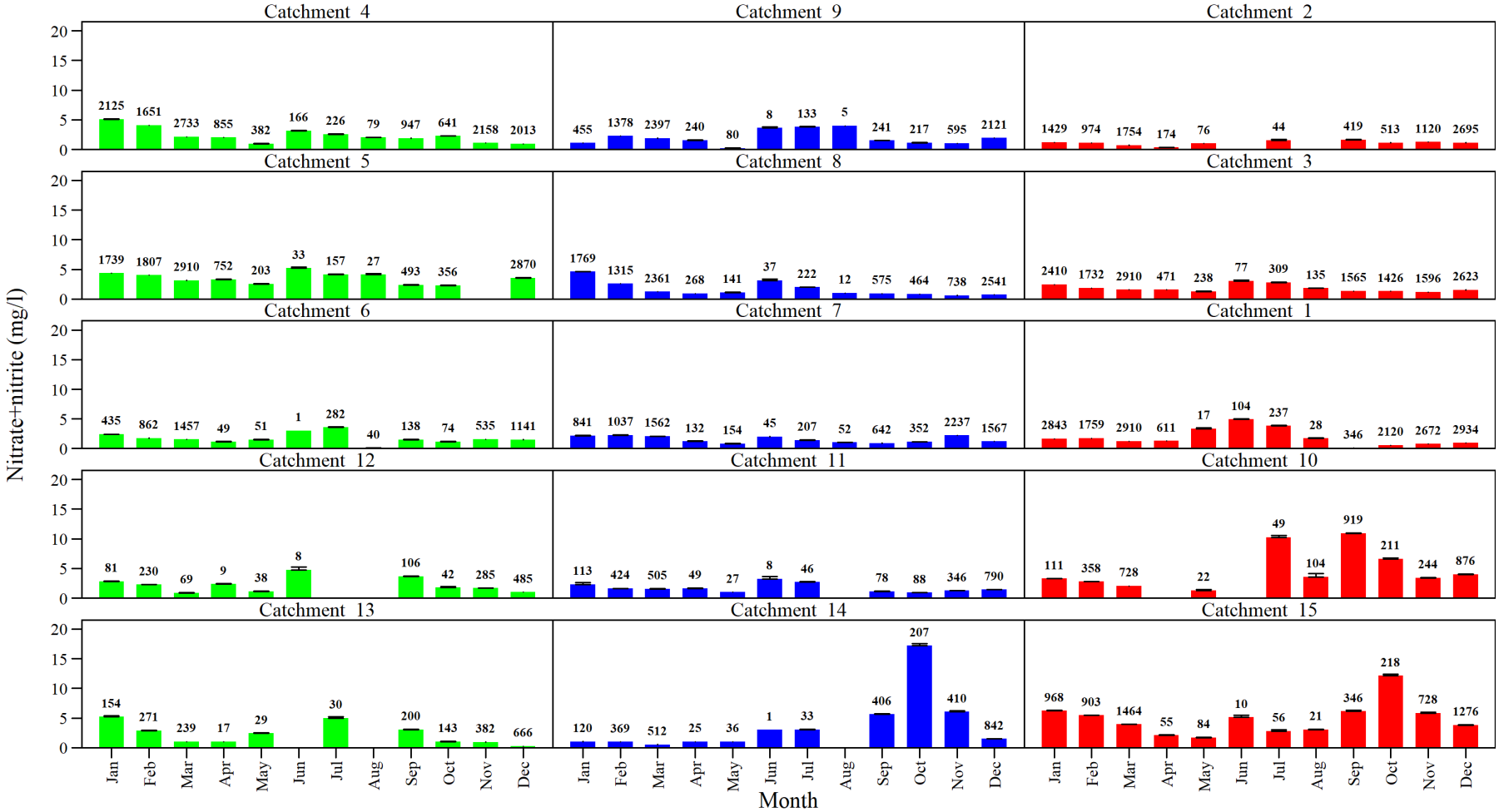



**Figure 50:** Monthly means for nitrate+nitrite

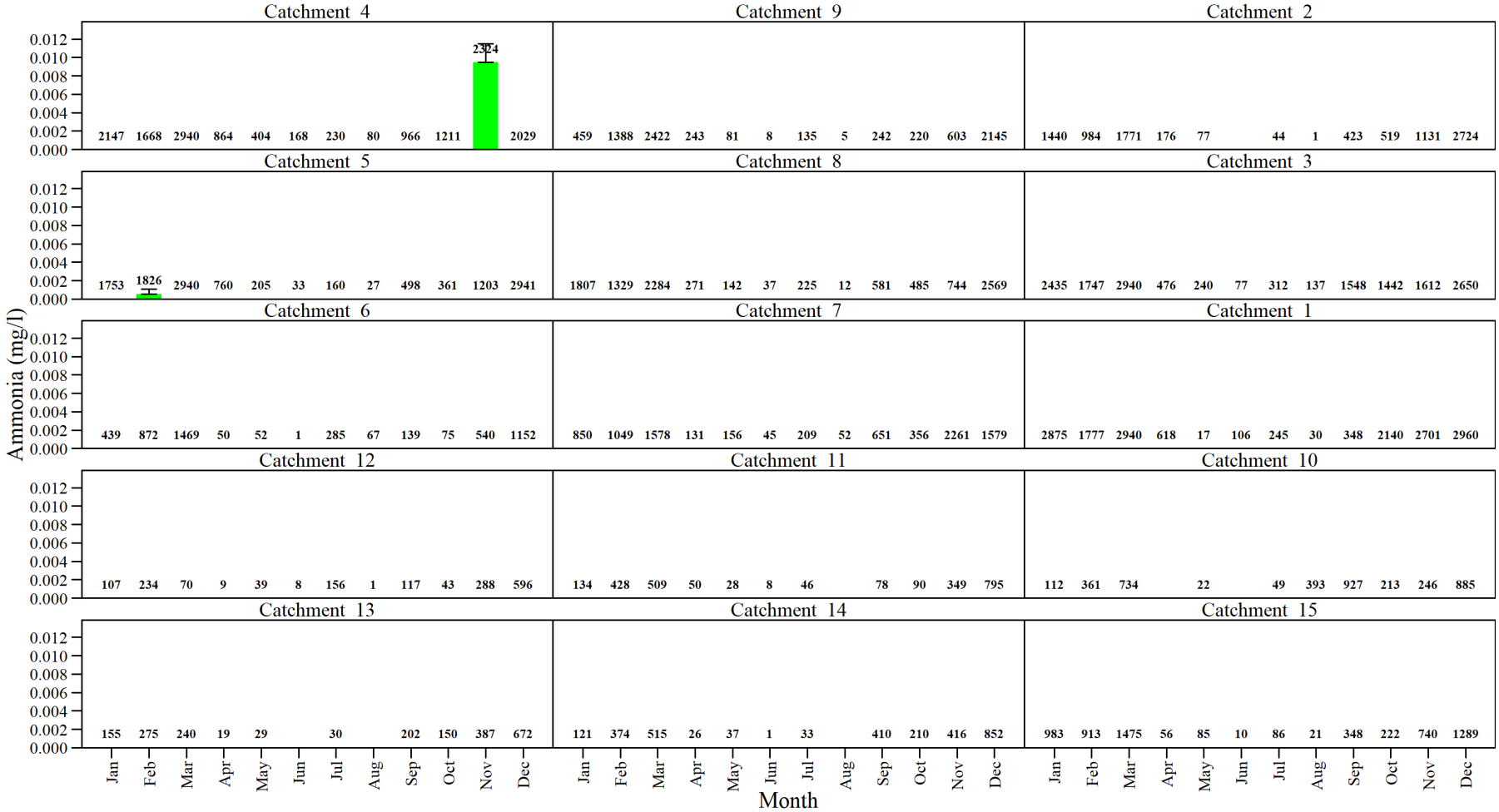



**Figure 51:** Monthly means for ammonia

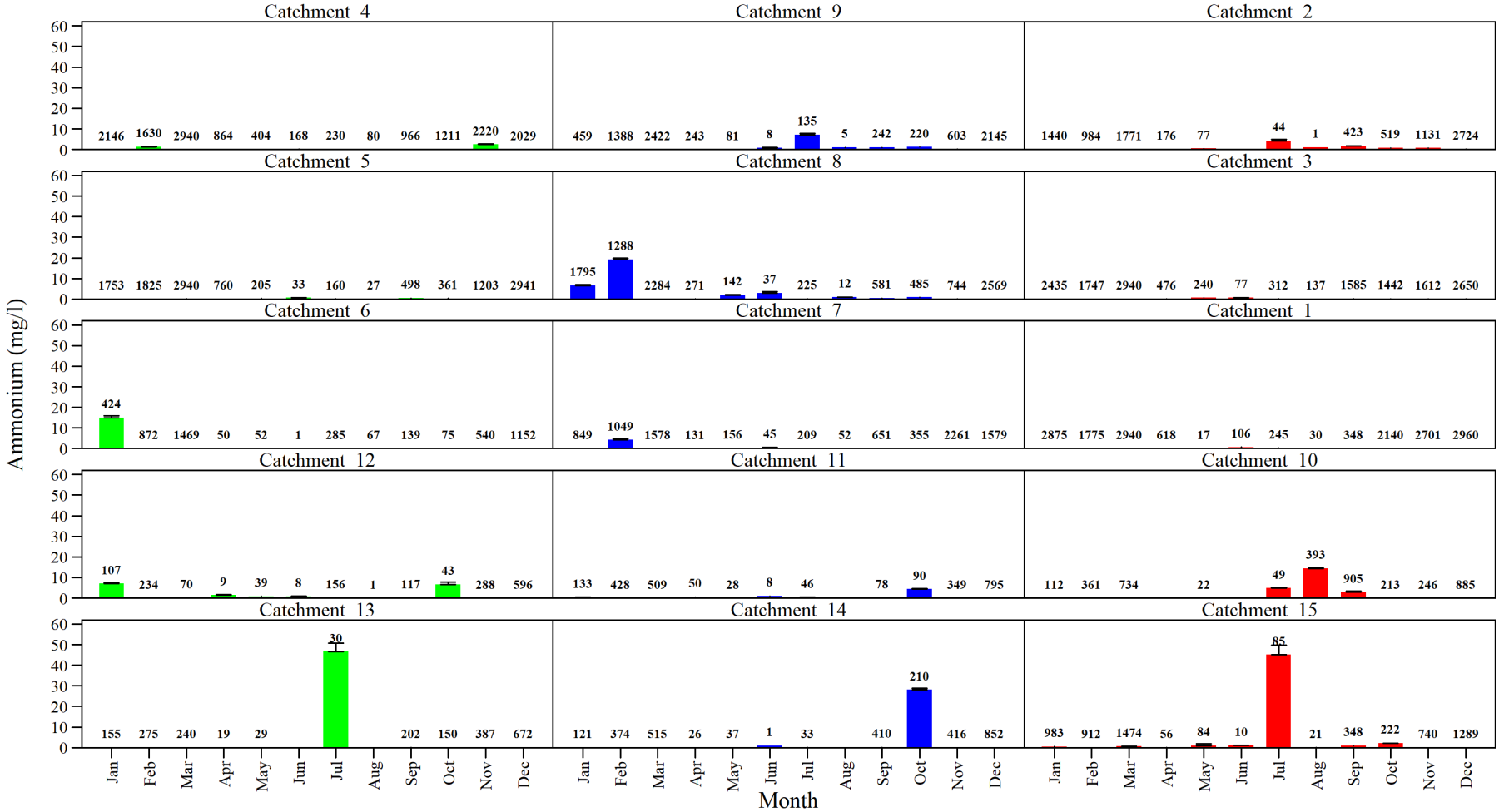



**Figure 52:** Monthly means for ammonium

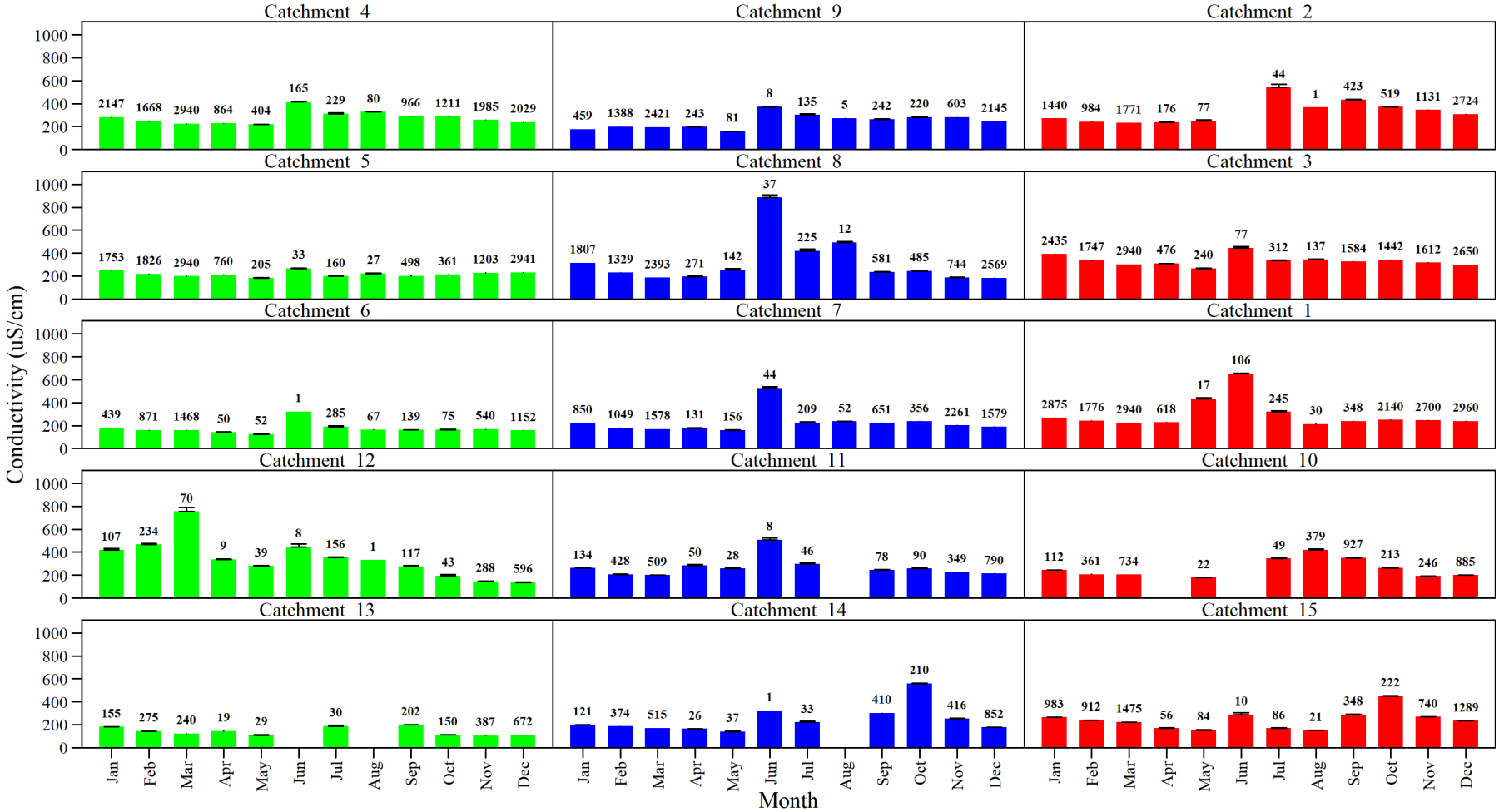



**Figure 53:** Monthly means for conductivity

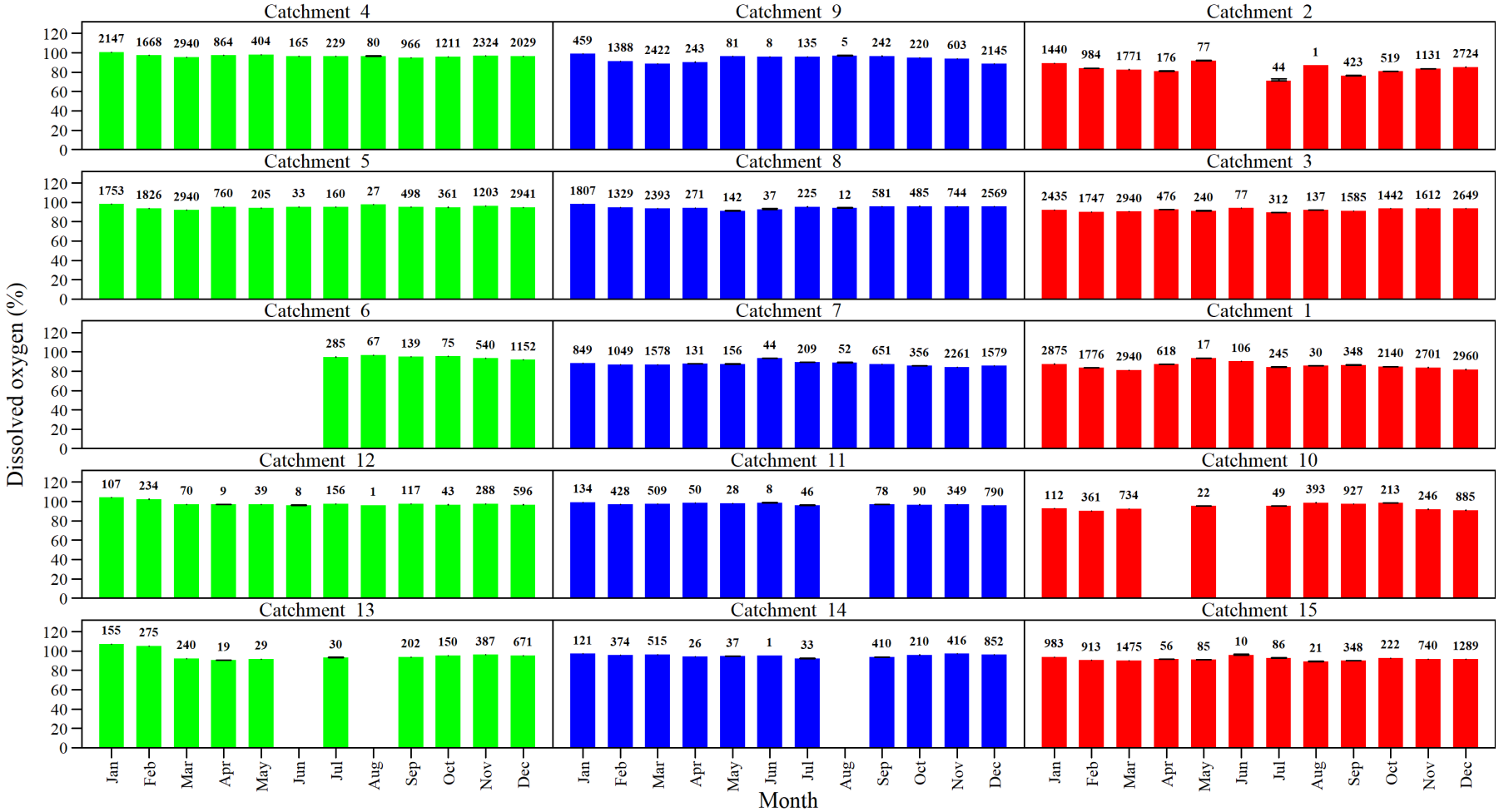



**Figure 54:** Monthly means for dissolved oxygen

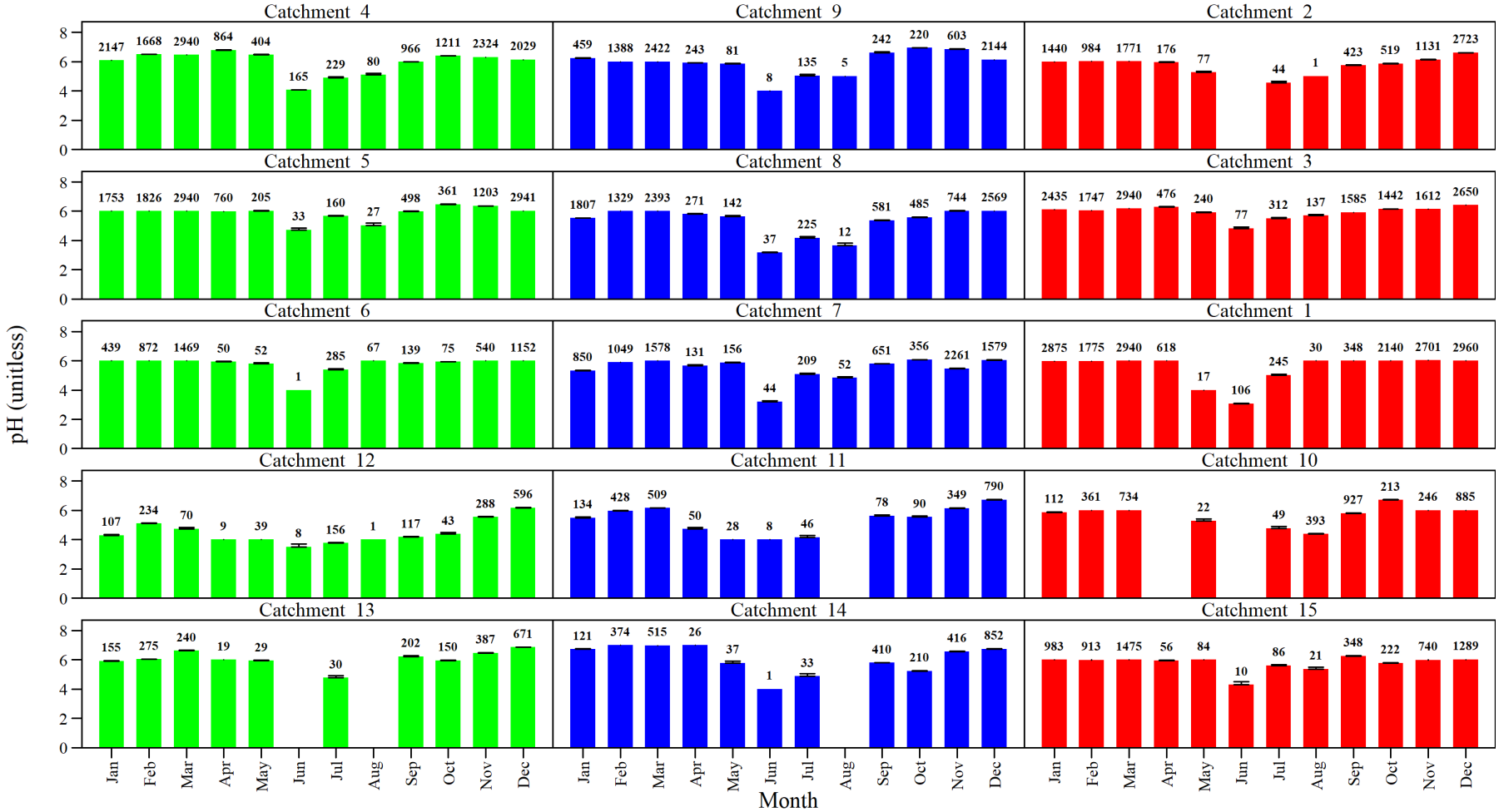



**Figure 55:** Monthly means for pH

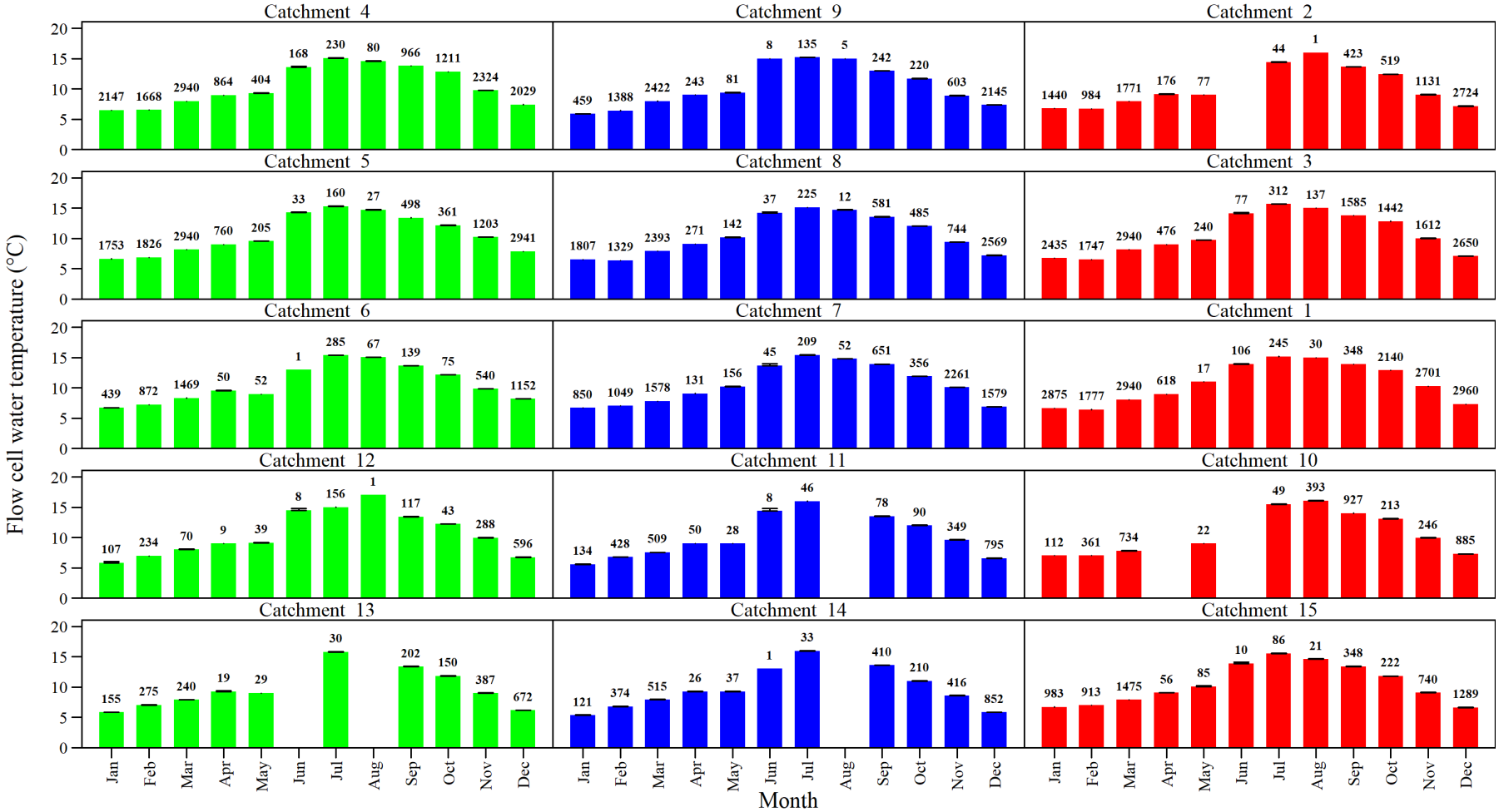



**Figure 56:** Monthly means for flow cell water temperature

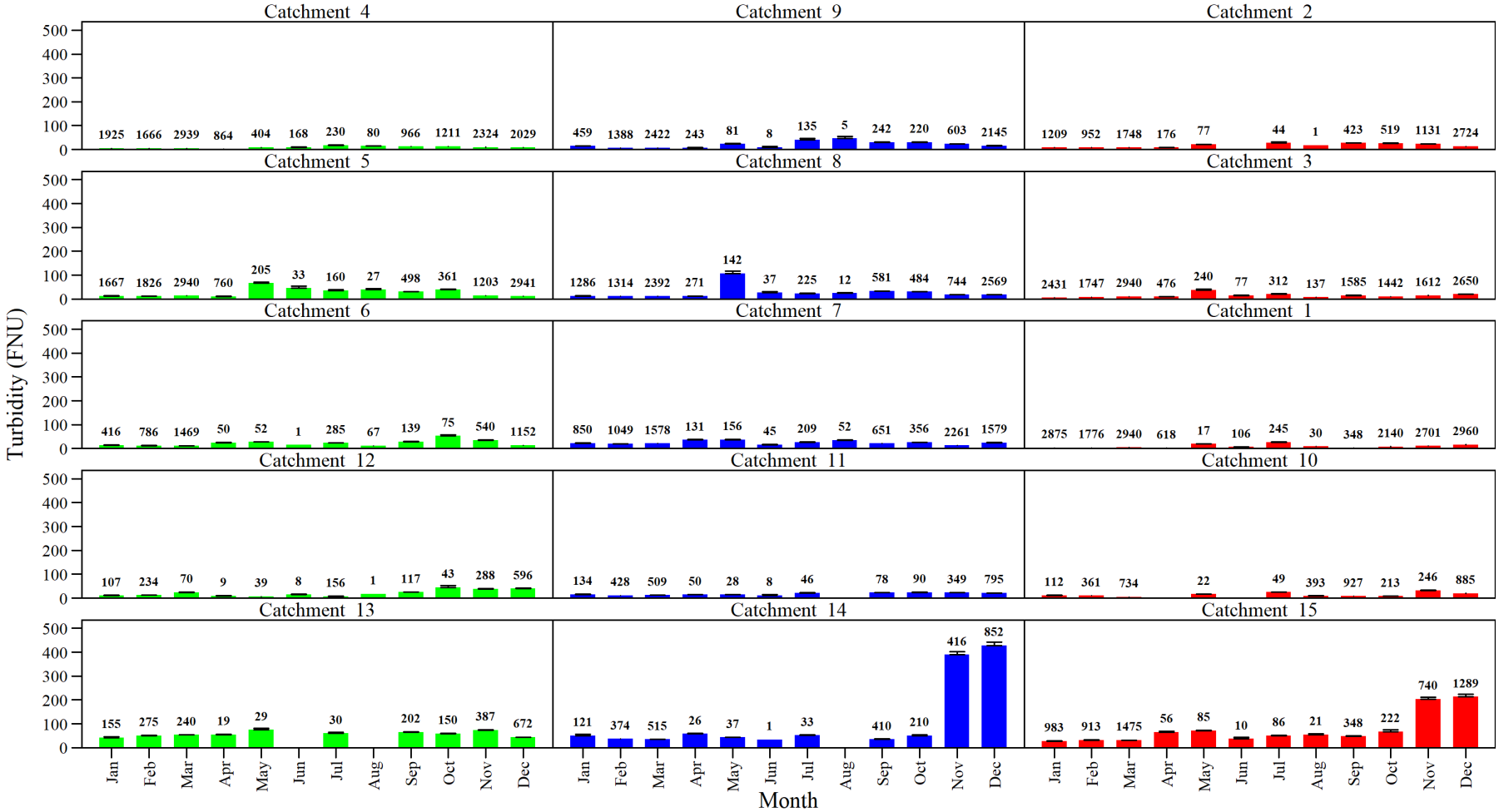



**Figure 57:** Monthly means for turbidity

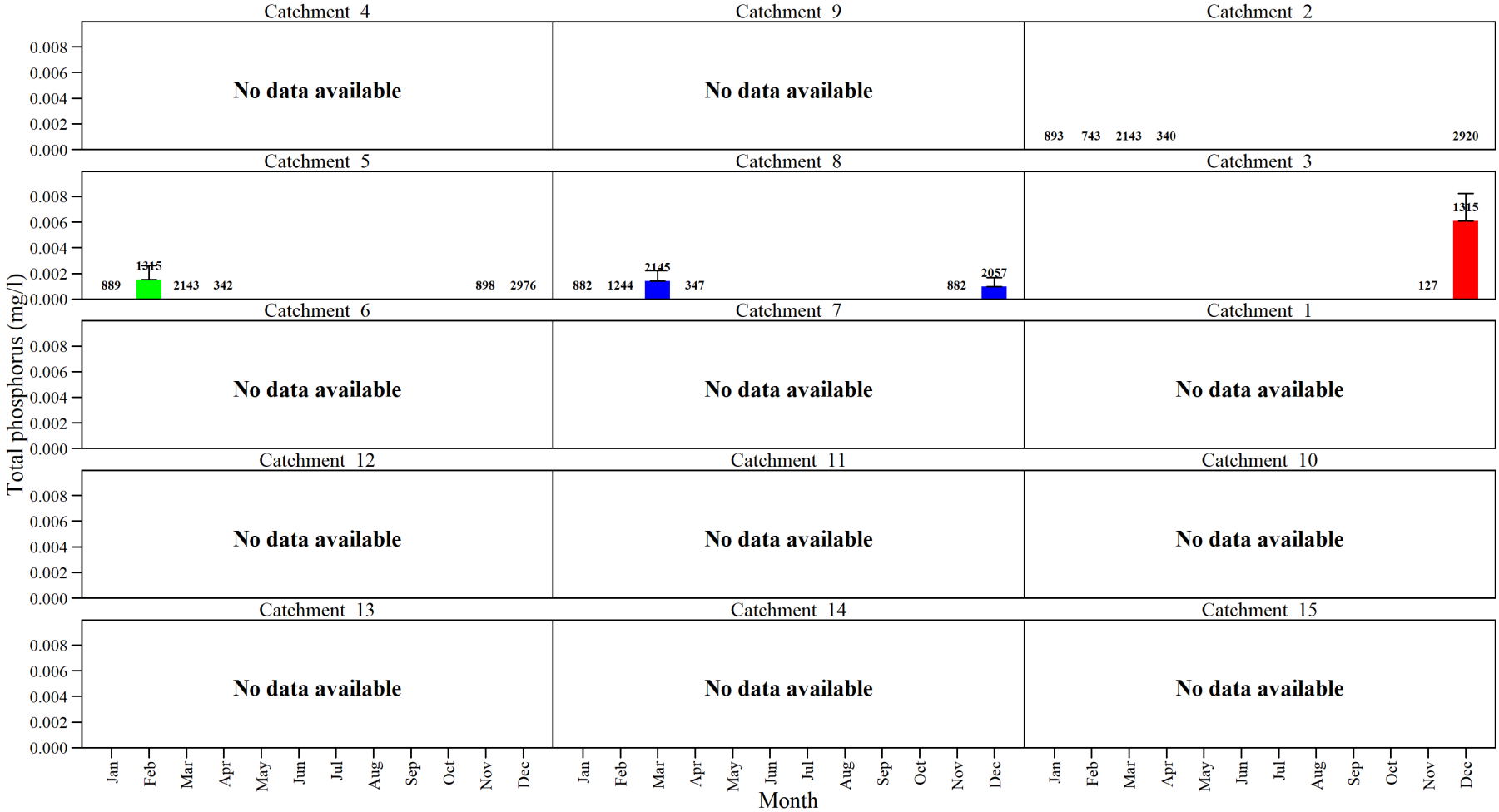



**Figure 58:** Monthly means for total phosphorus

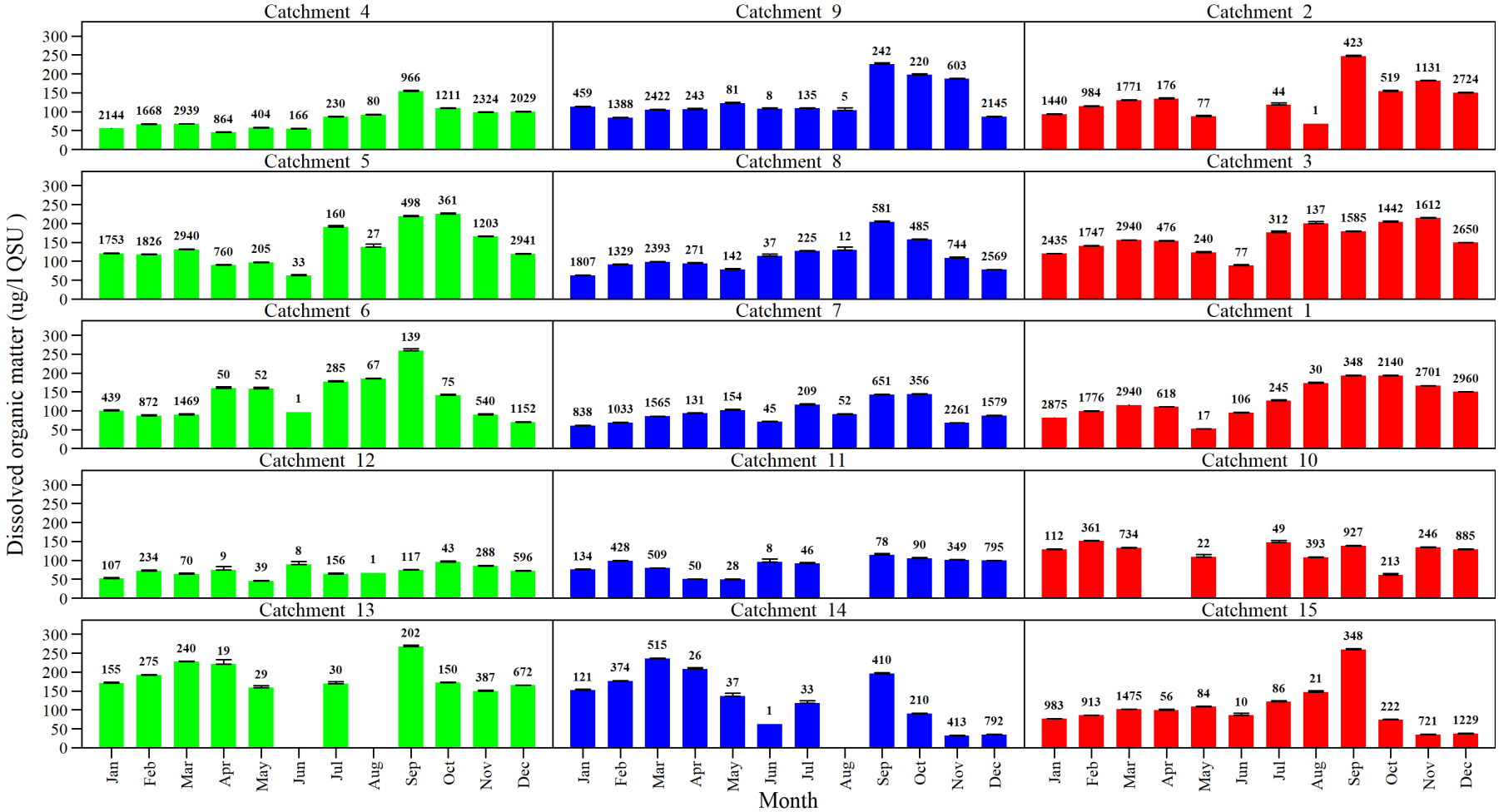



**Figure 59:** Monthly means for dissolved organic matter

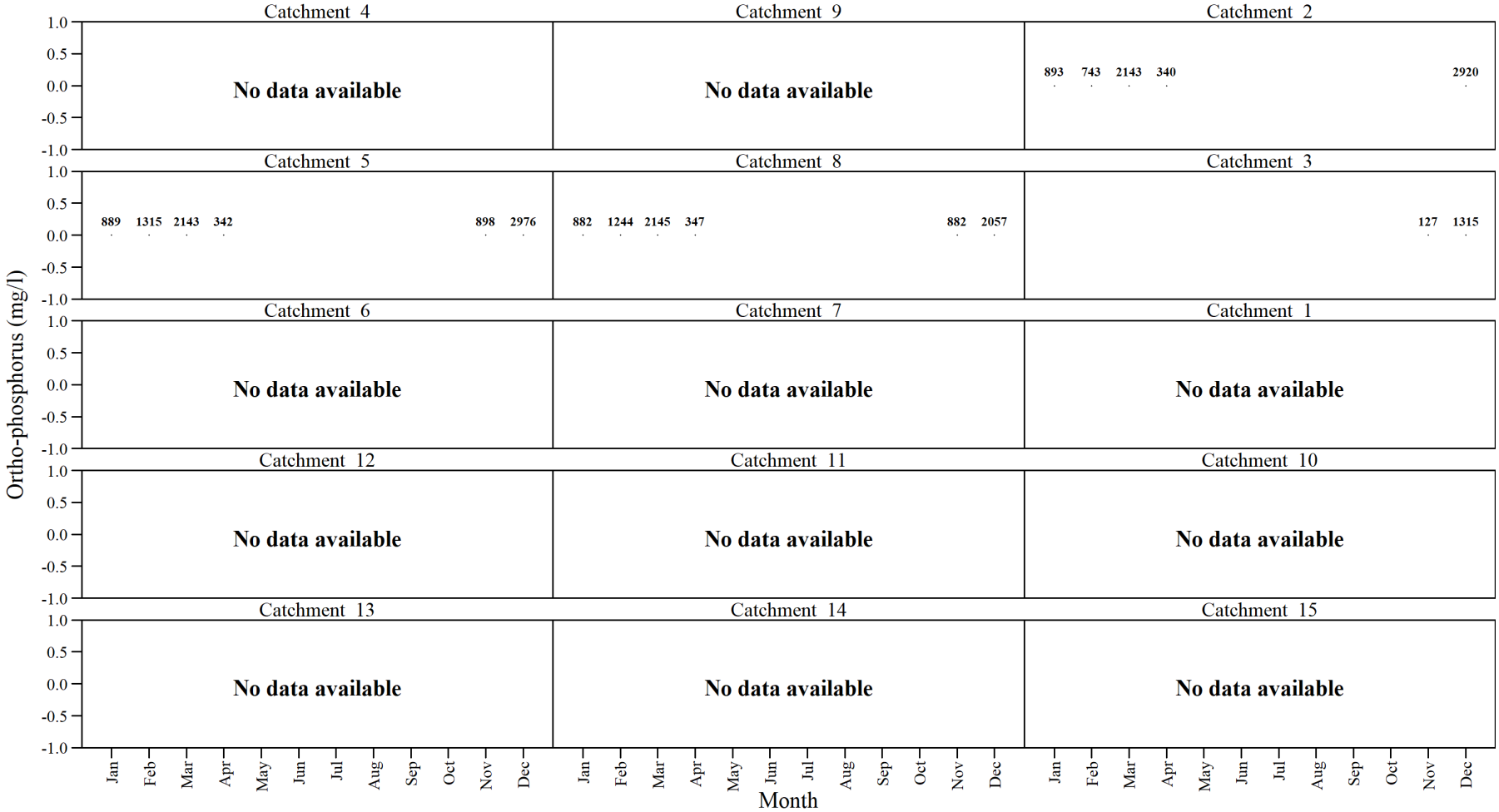



**Figure 60:** Monthly means for ortho-phosphorus

## 2.3 Chloropleth maps of means

*Grey areas represent missing data*

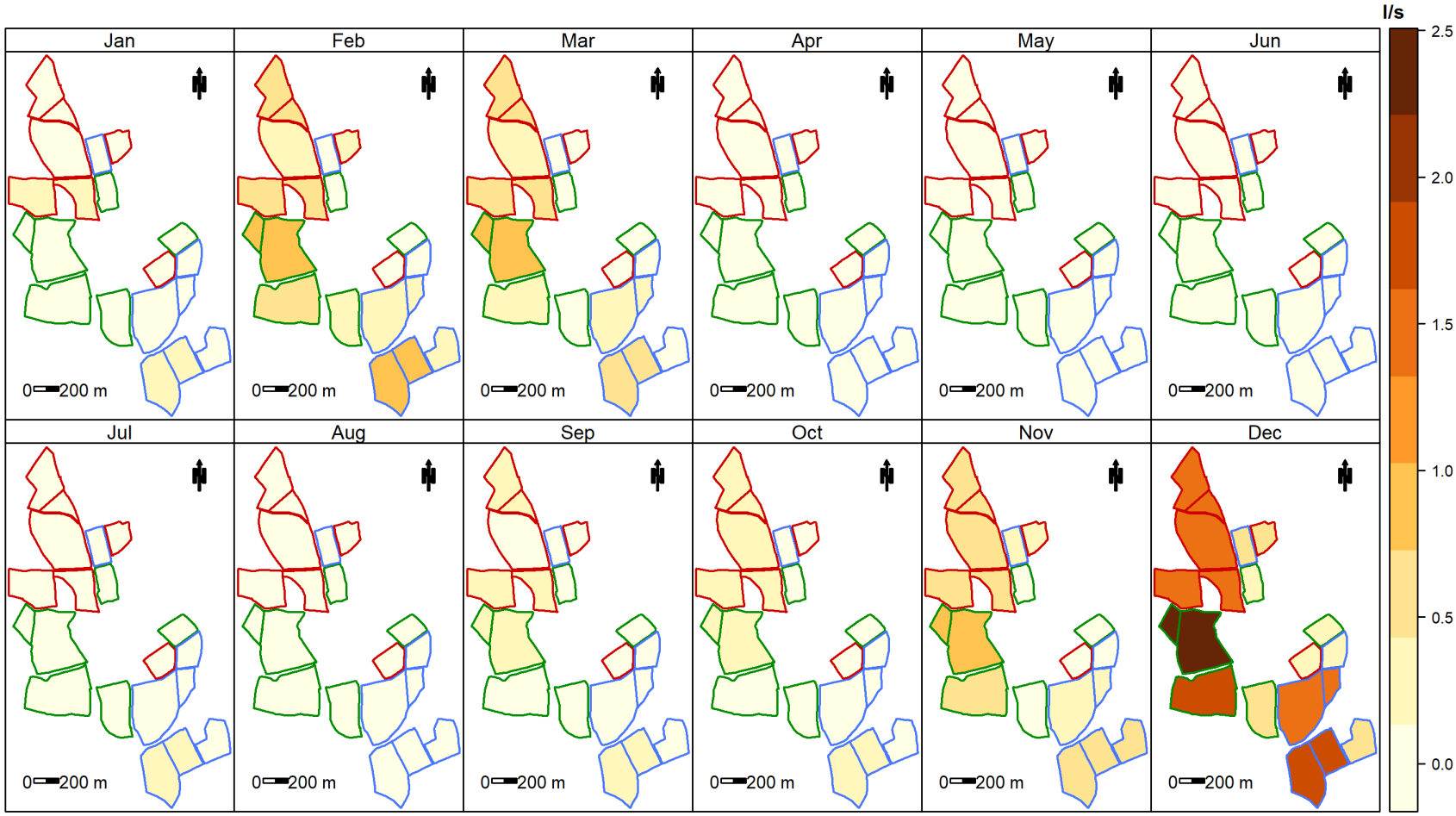



**Figure 61:** Mapped means for flow

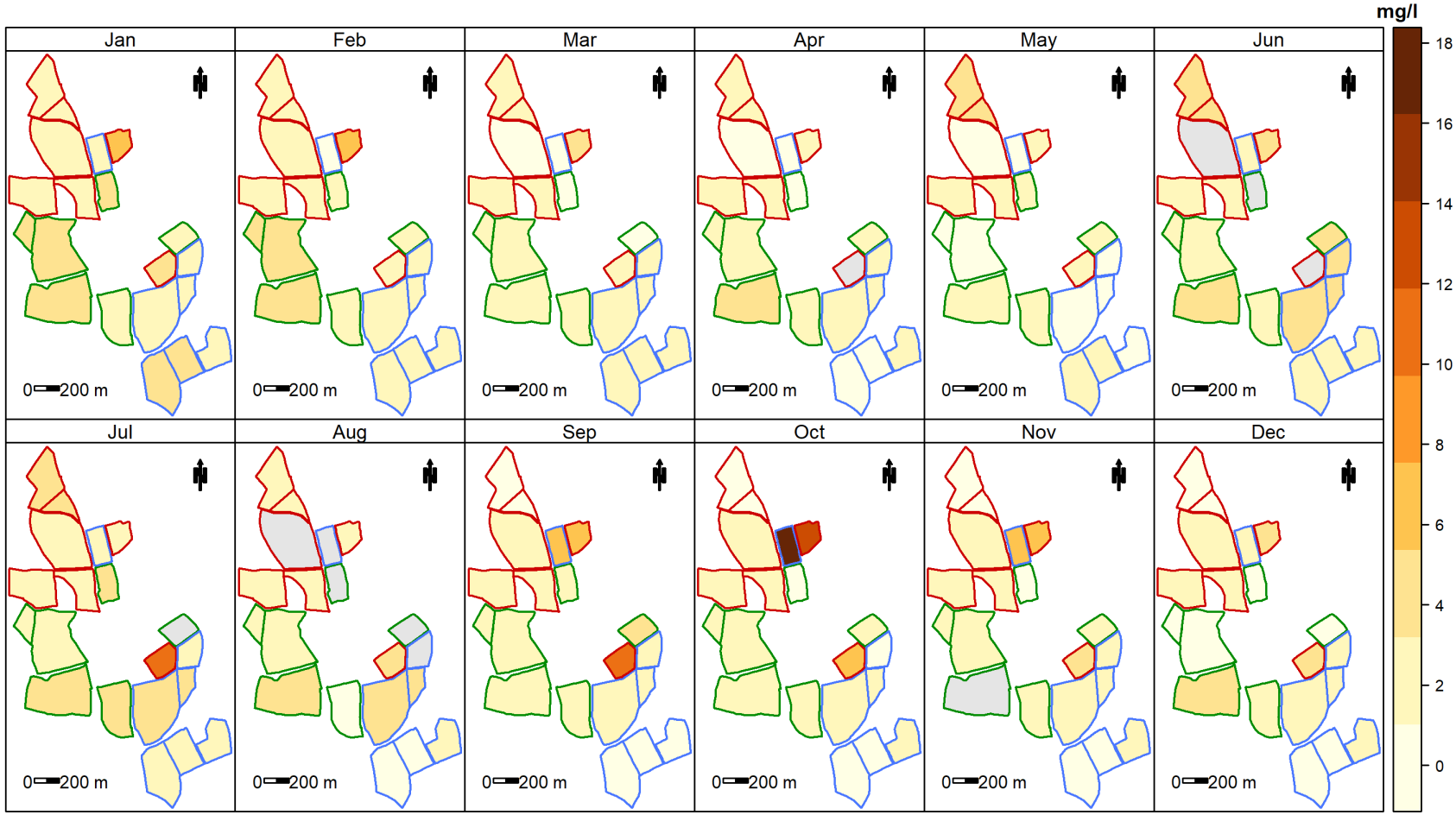



**Figure 62:** Mapped means for nitrate+nitrite

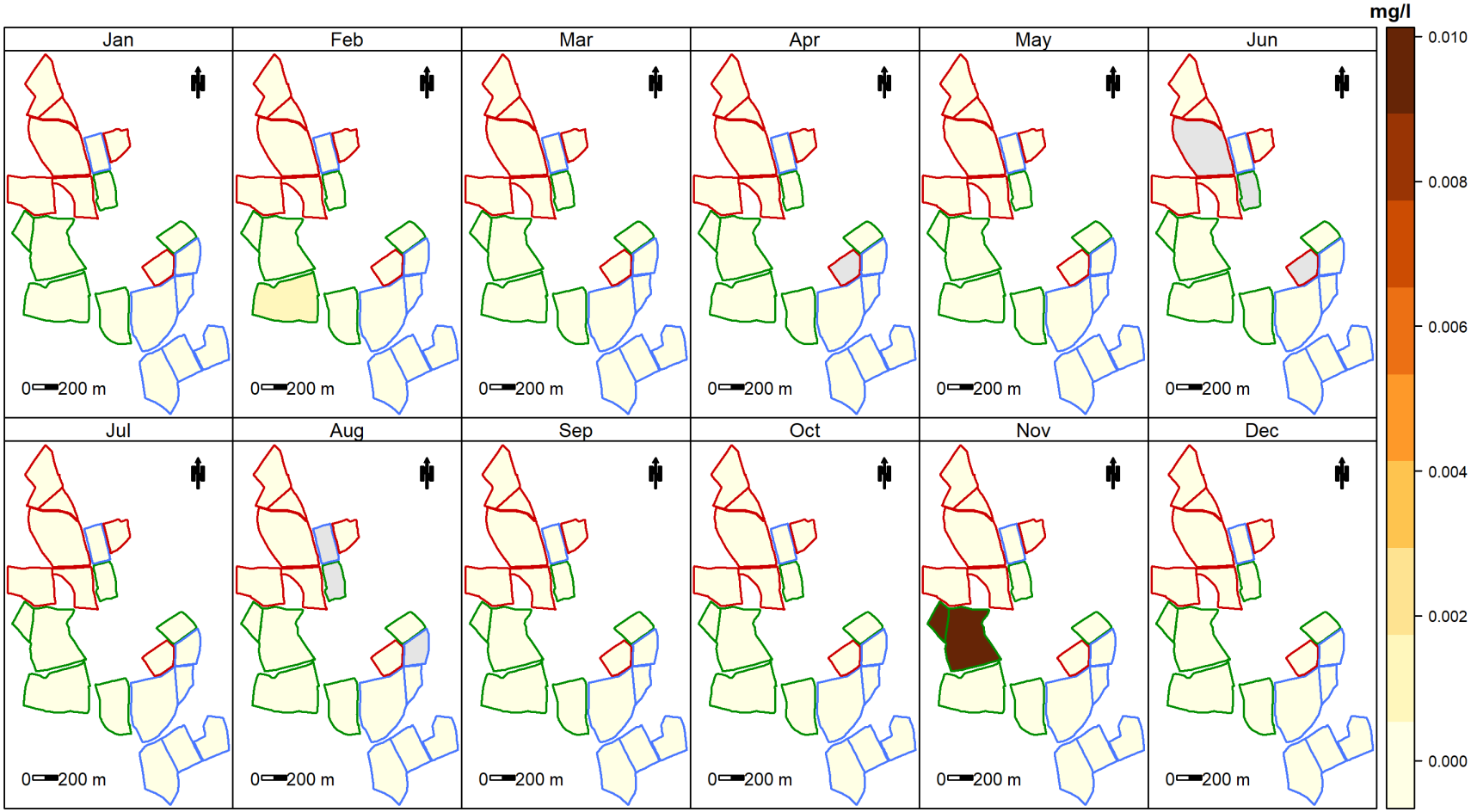



**Figure 63:** Mapped means for ammonia

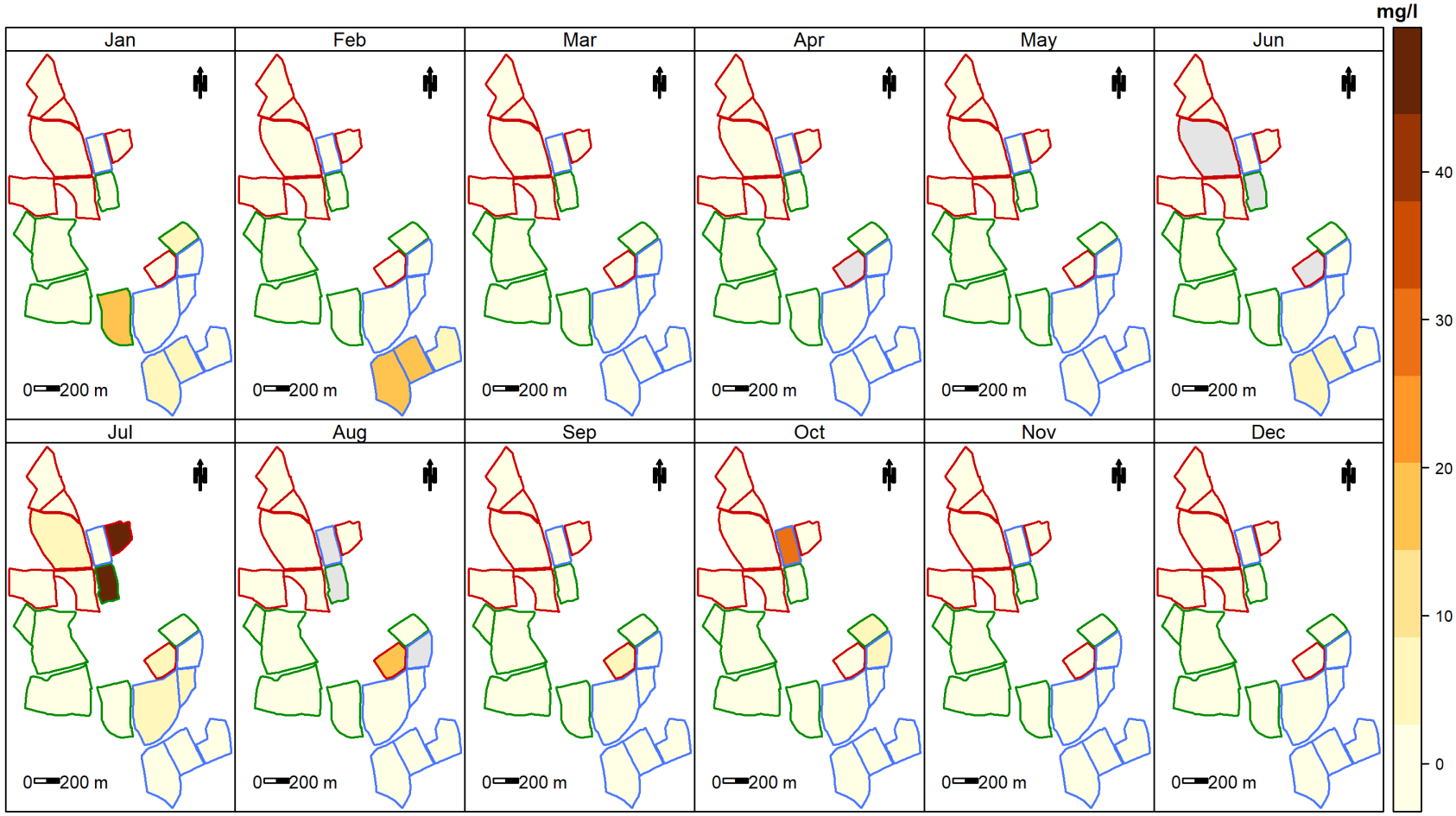



**Figure 64:** Mapped means for ammonium

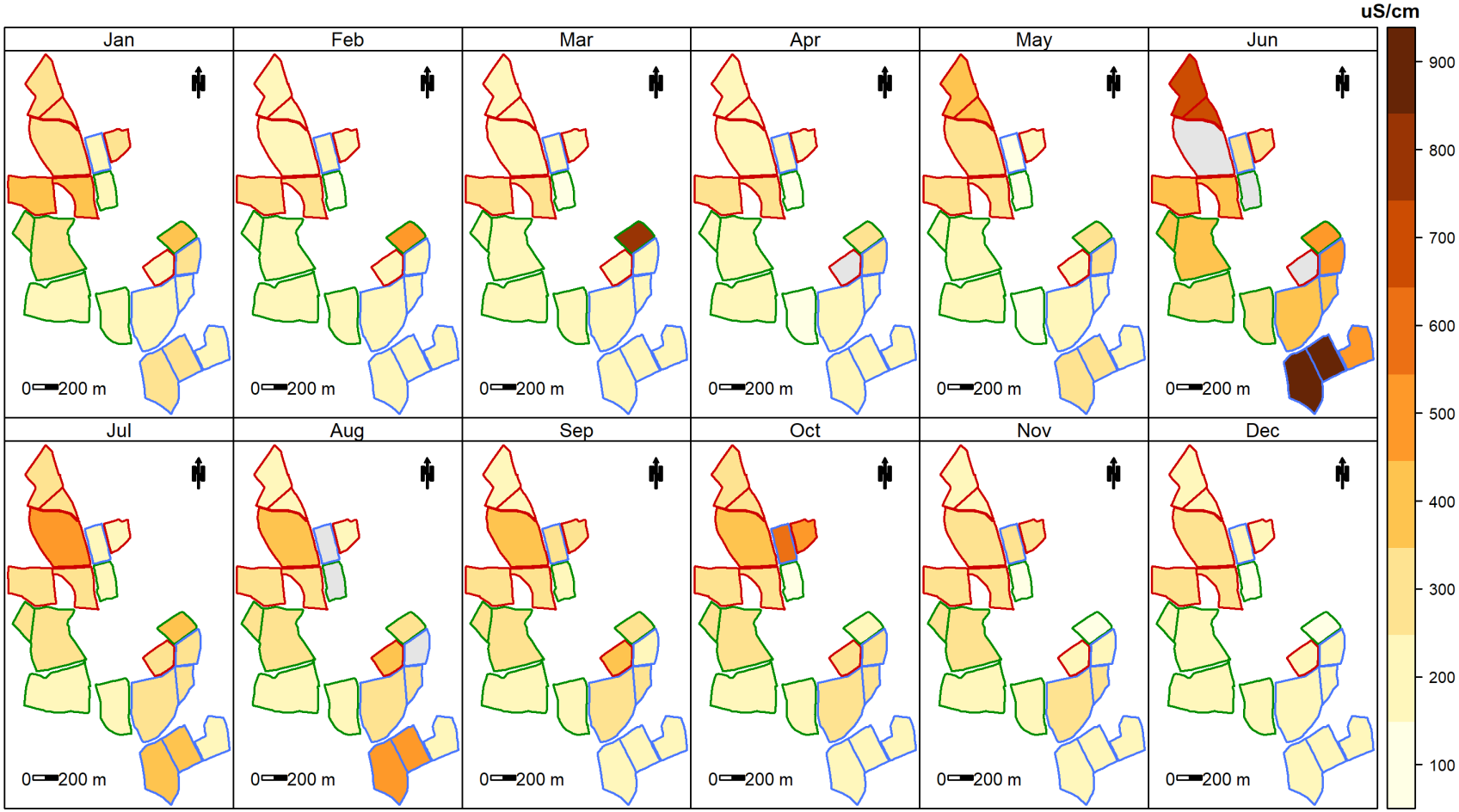



**Figure 65:** Mapped means for conductivity

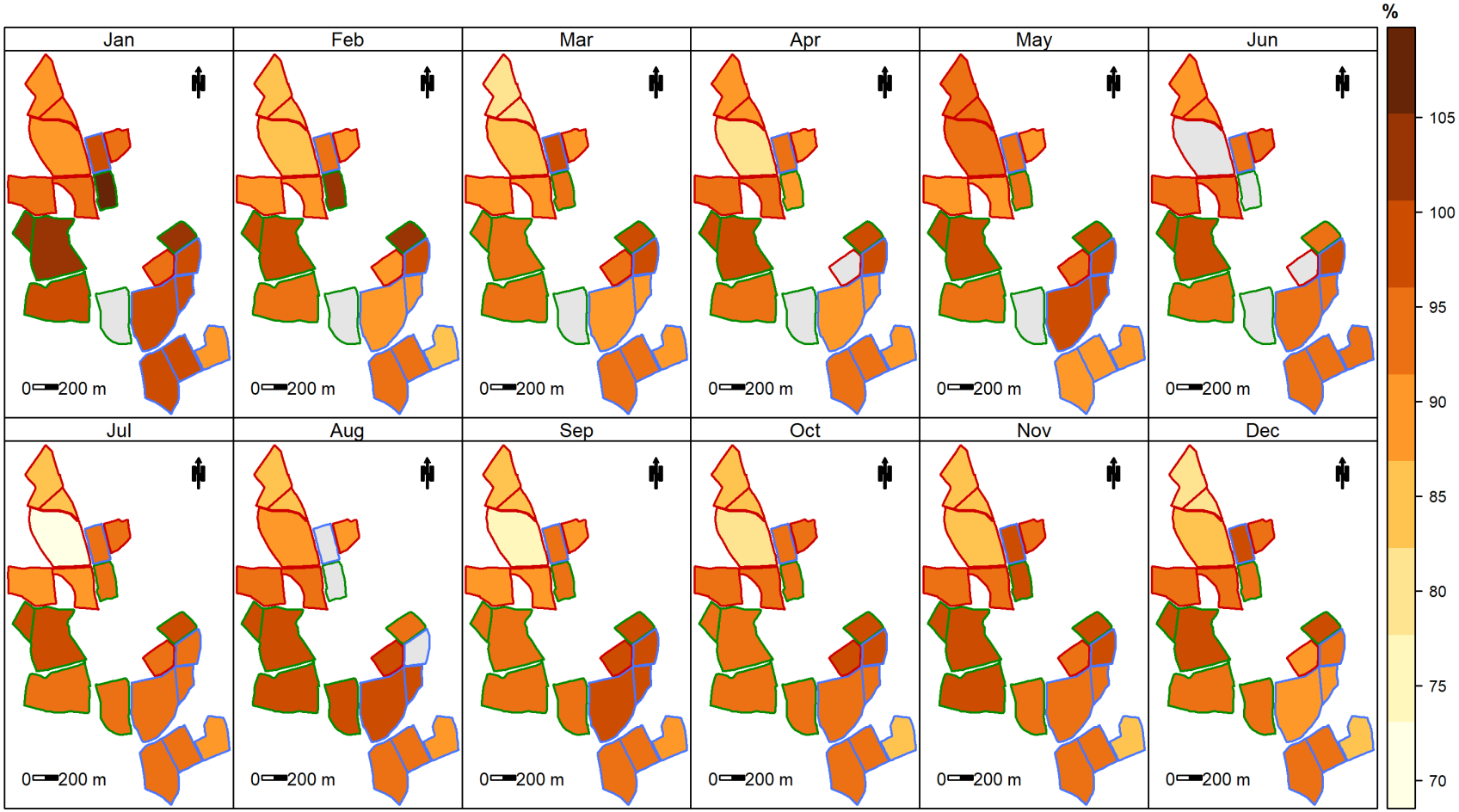



**Figure 66:** Mapped means for dissolved oxygen

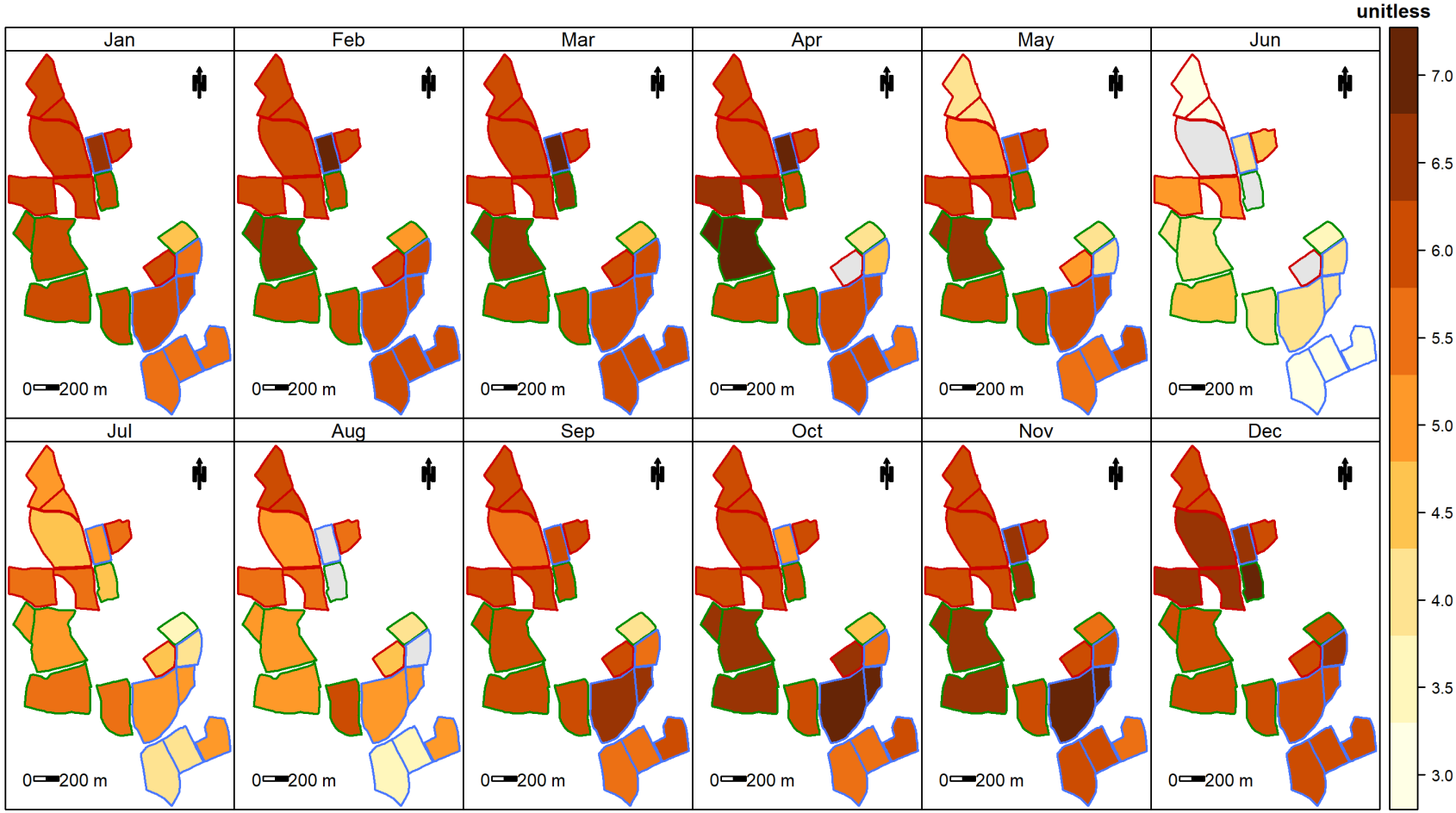



**Figure 67:** Mapped means for pH

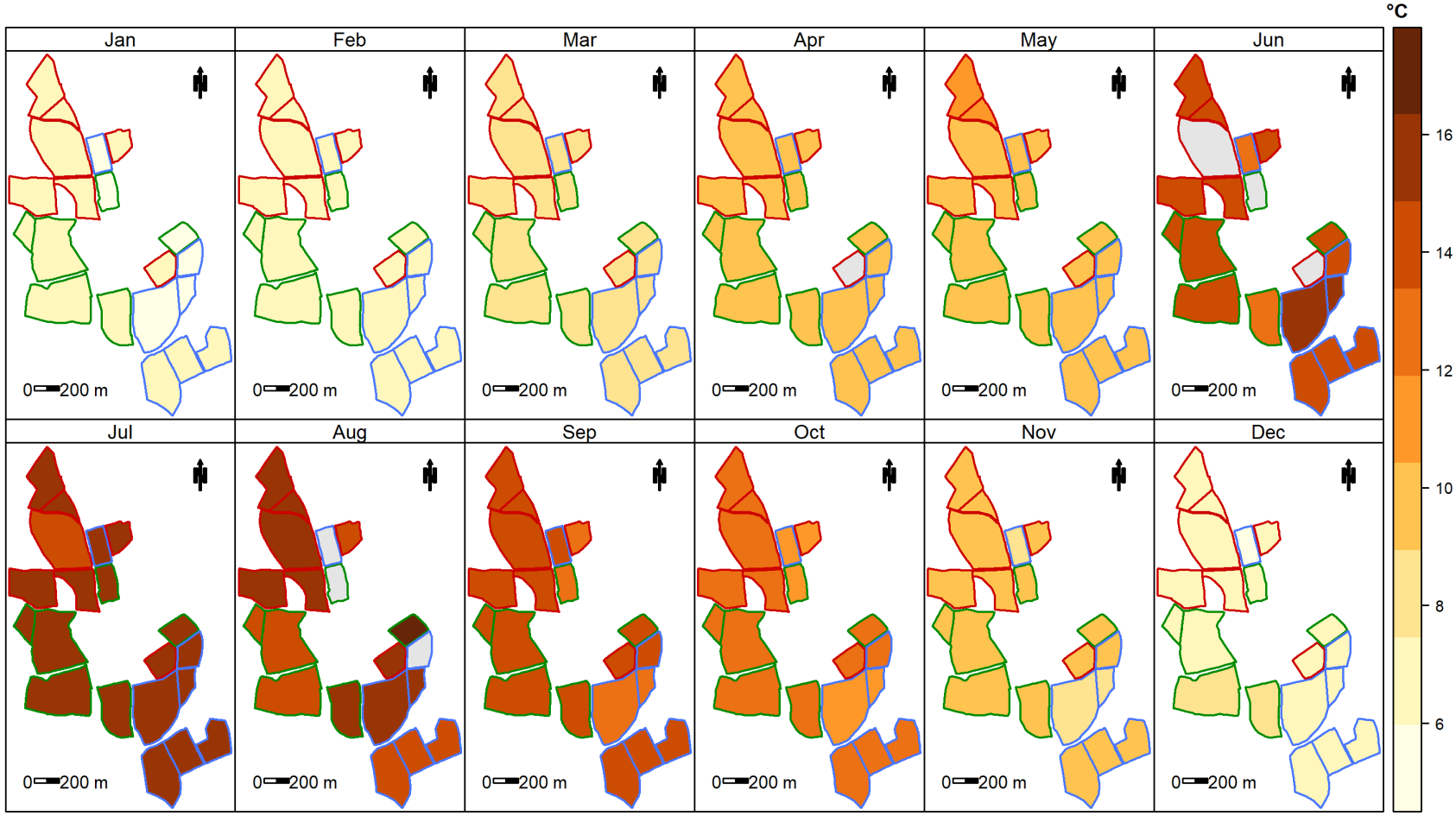



**Figure 68:** Mapped means for flow cell water temperature

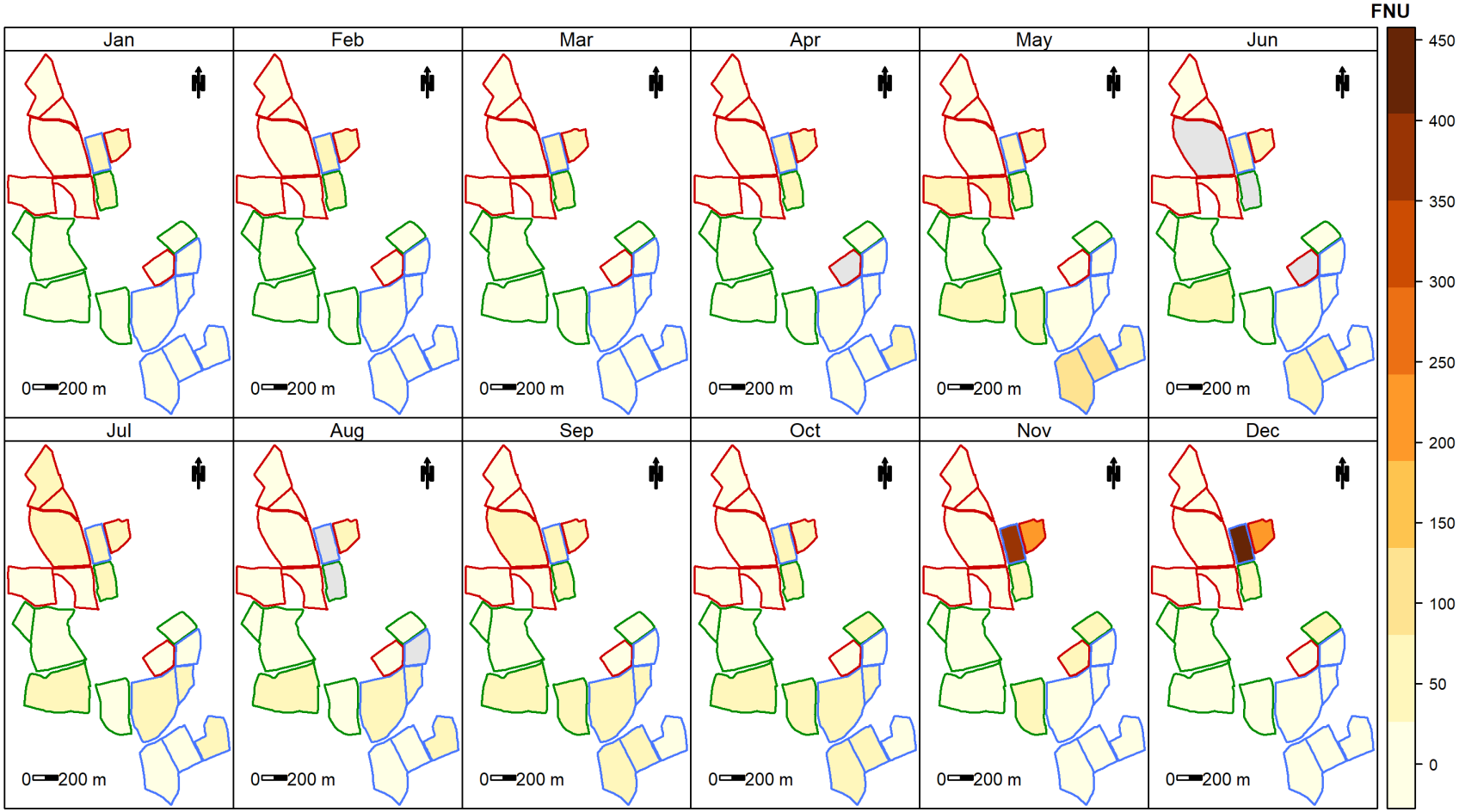



**Figure 69:** Mapped means for turbidity

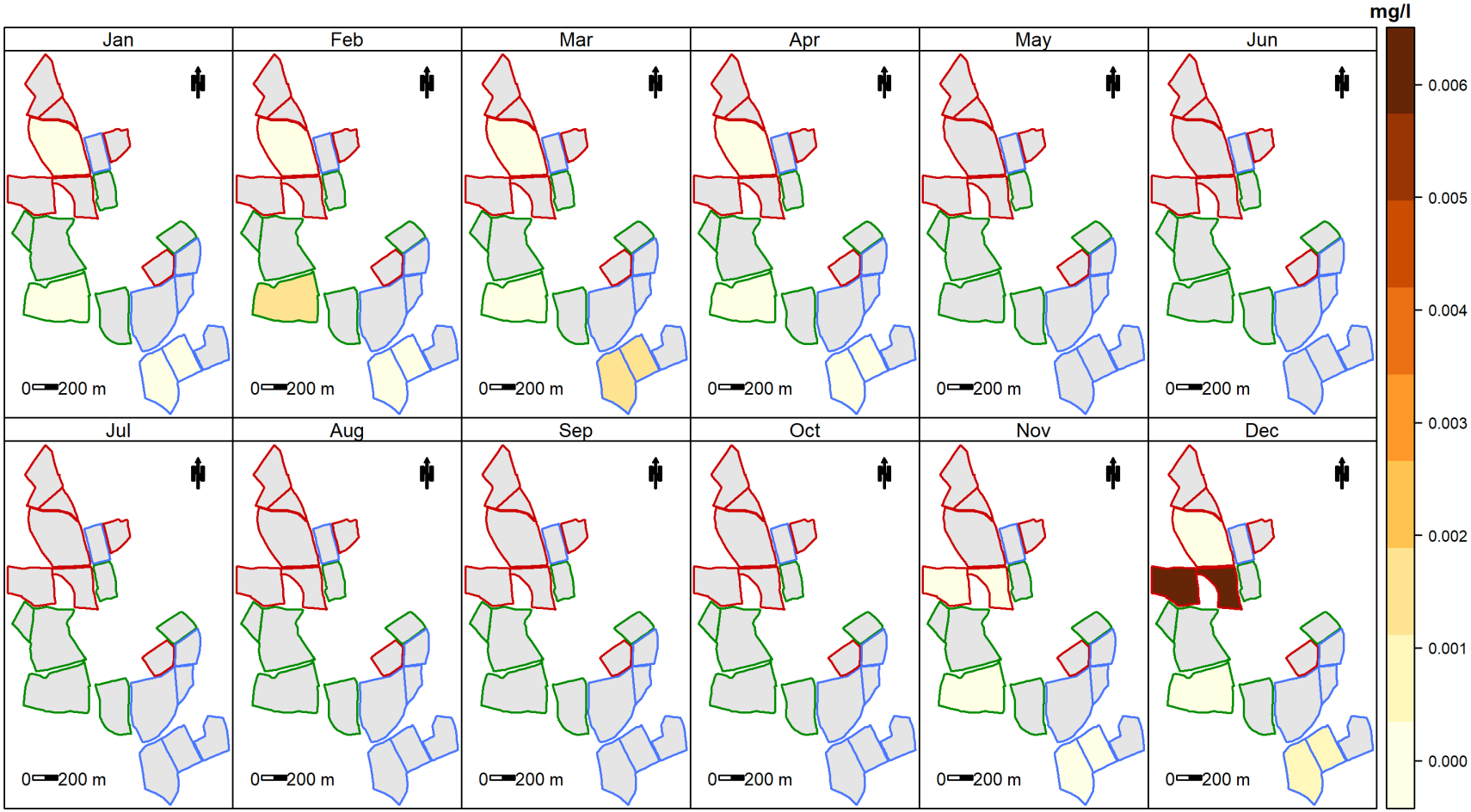



**Figure 70:** Mapped means for total phosphorus

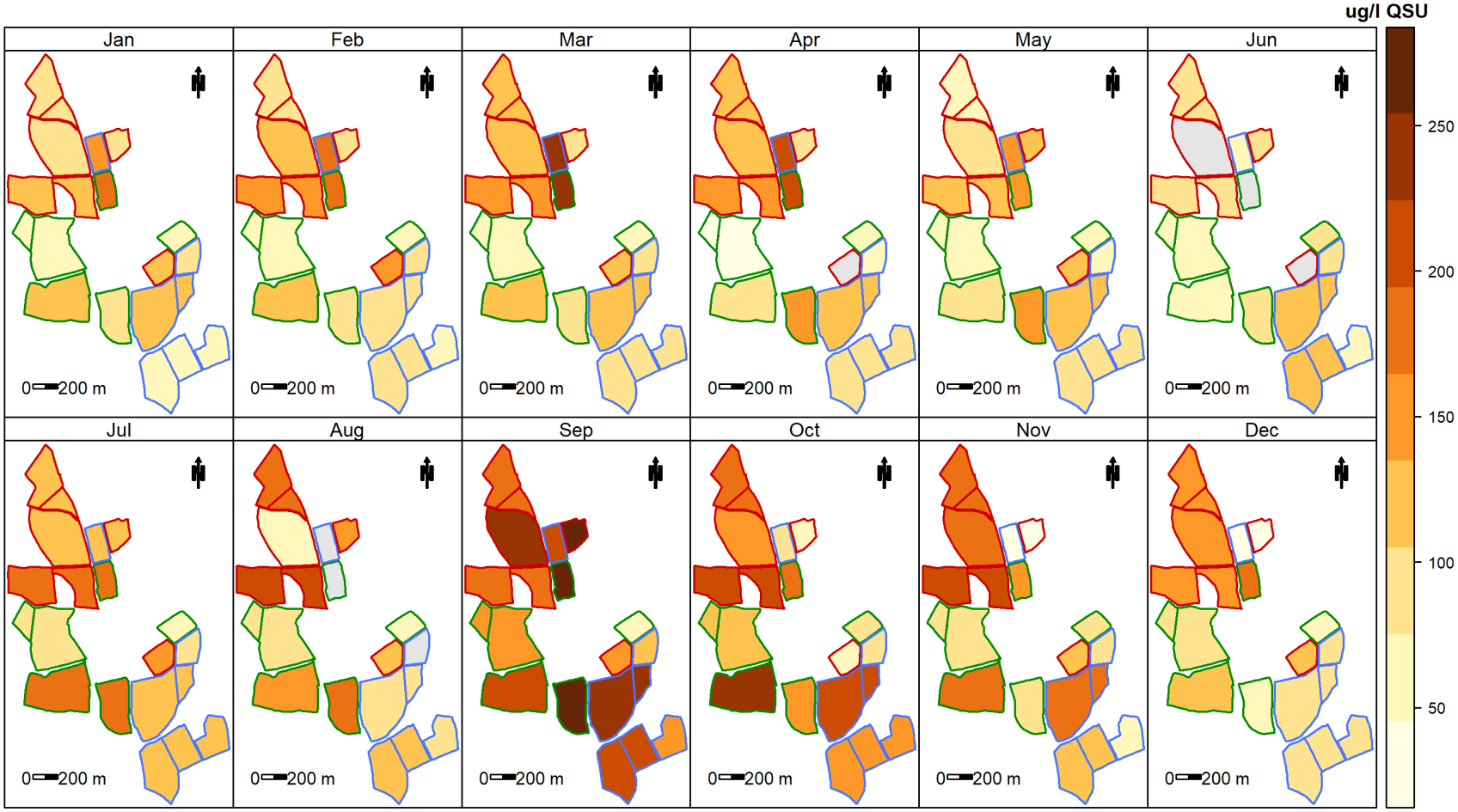



**Figure 71:** Mapped means for dissolved organic matter

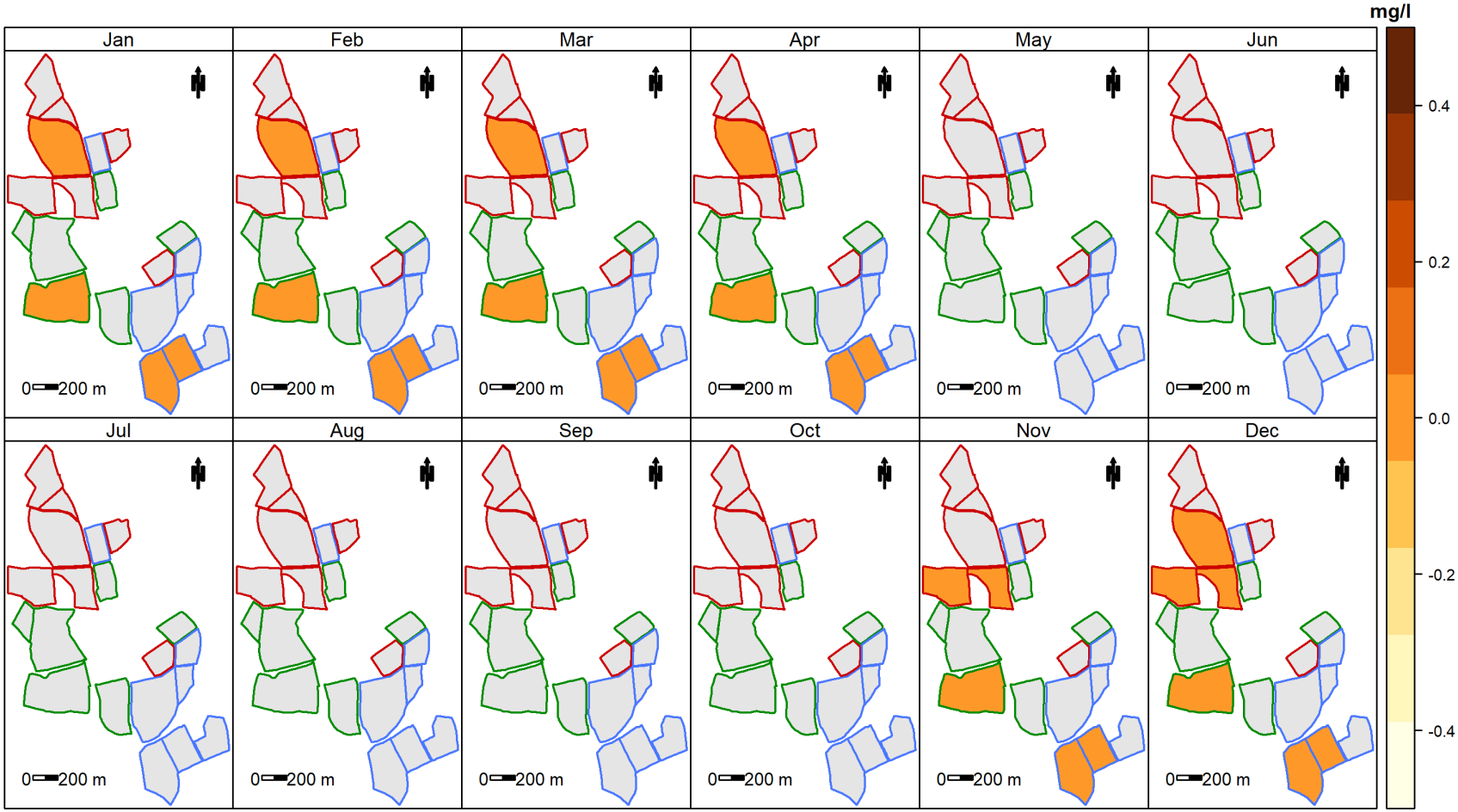



**Figure 72:** Mapped means for ortho-phosphorus

## 2.4 Chloropleth maps of standard deviations

*Grey areas represent missing data*

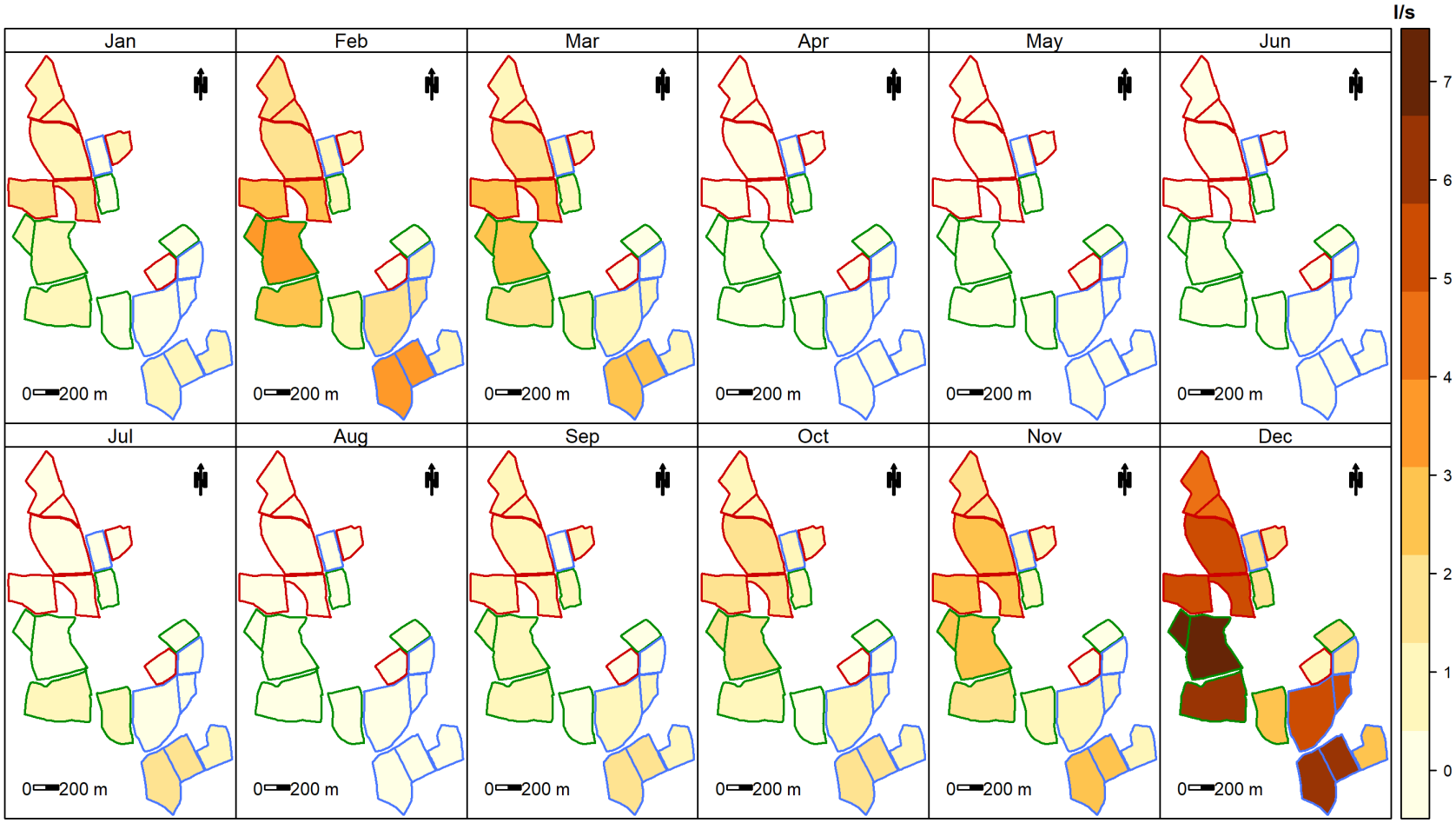



**Figure 73:** Mapped standard deviations for flow

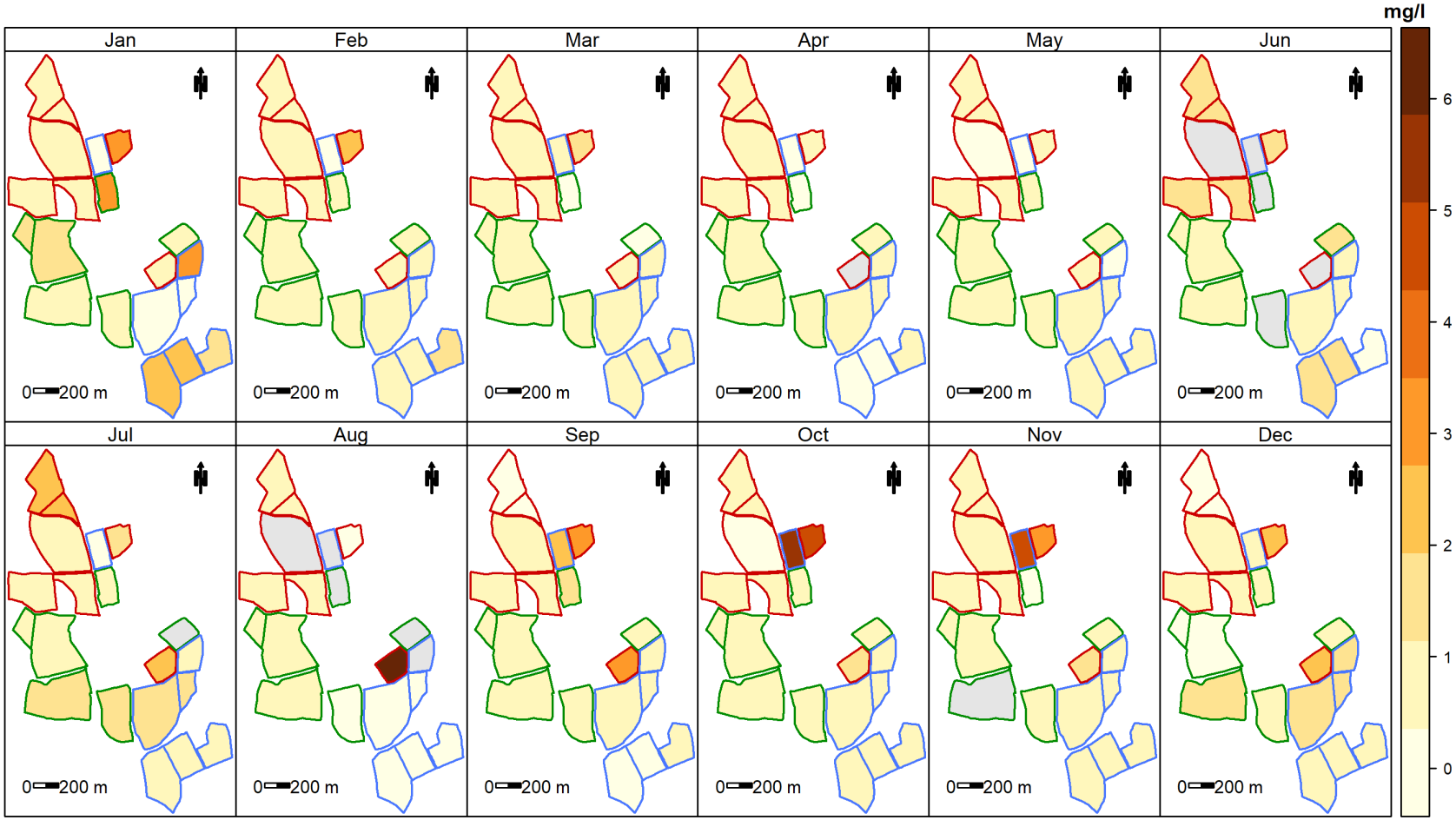



**Figure 74:** Mapped standard deviations for nitrate+nitrite

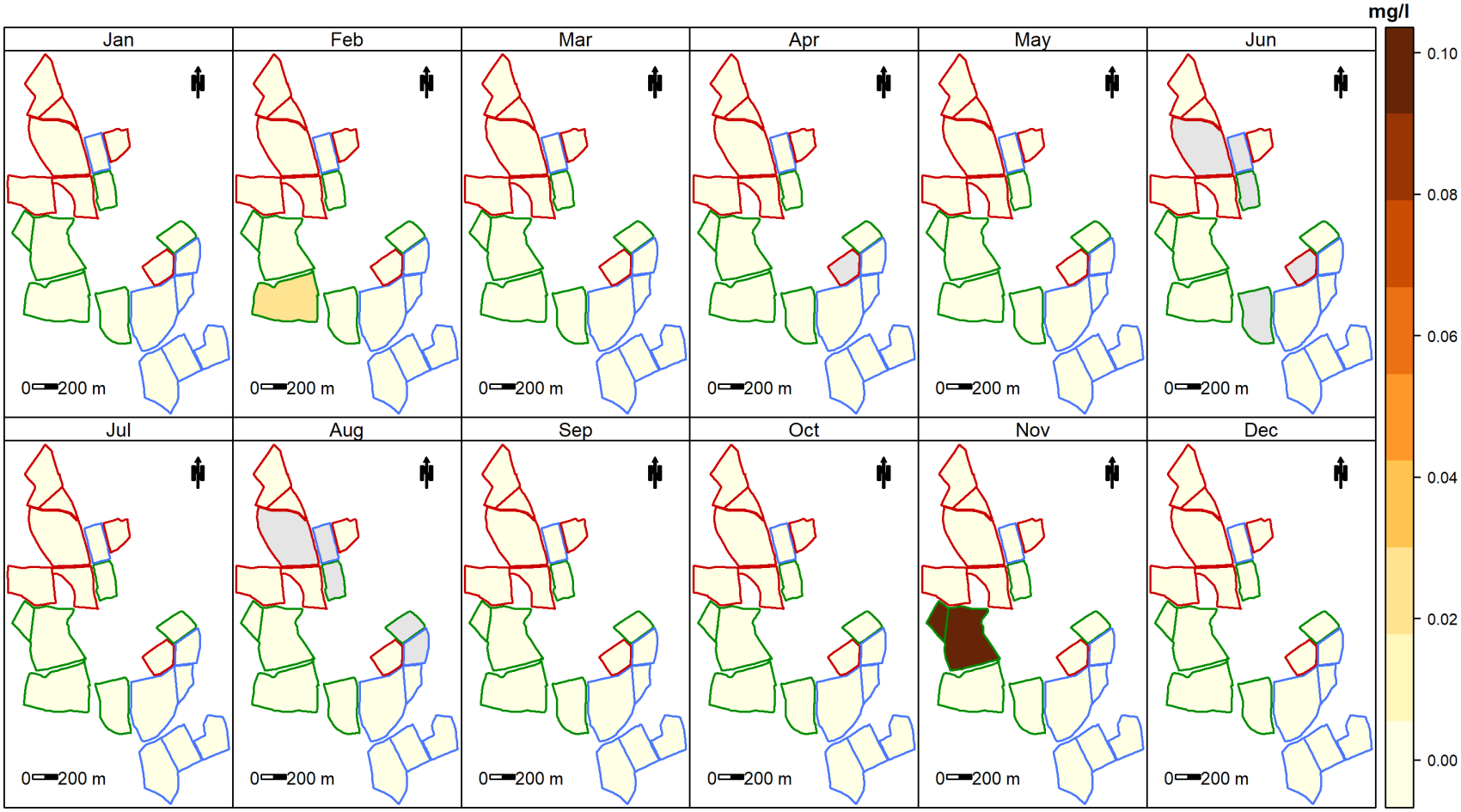



**Figure 75:** Mapped standard deviations for ammonia

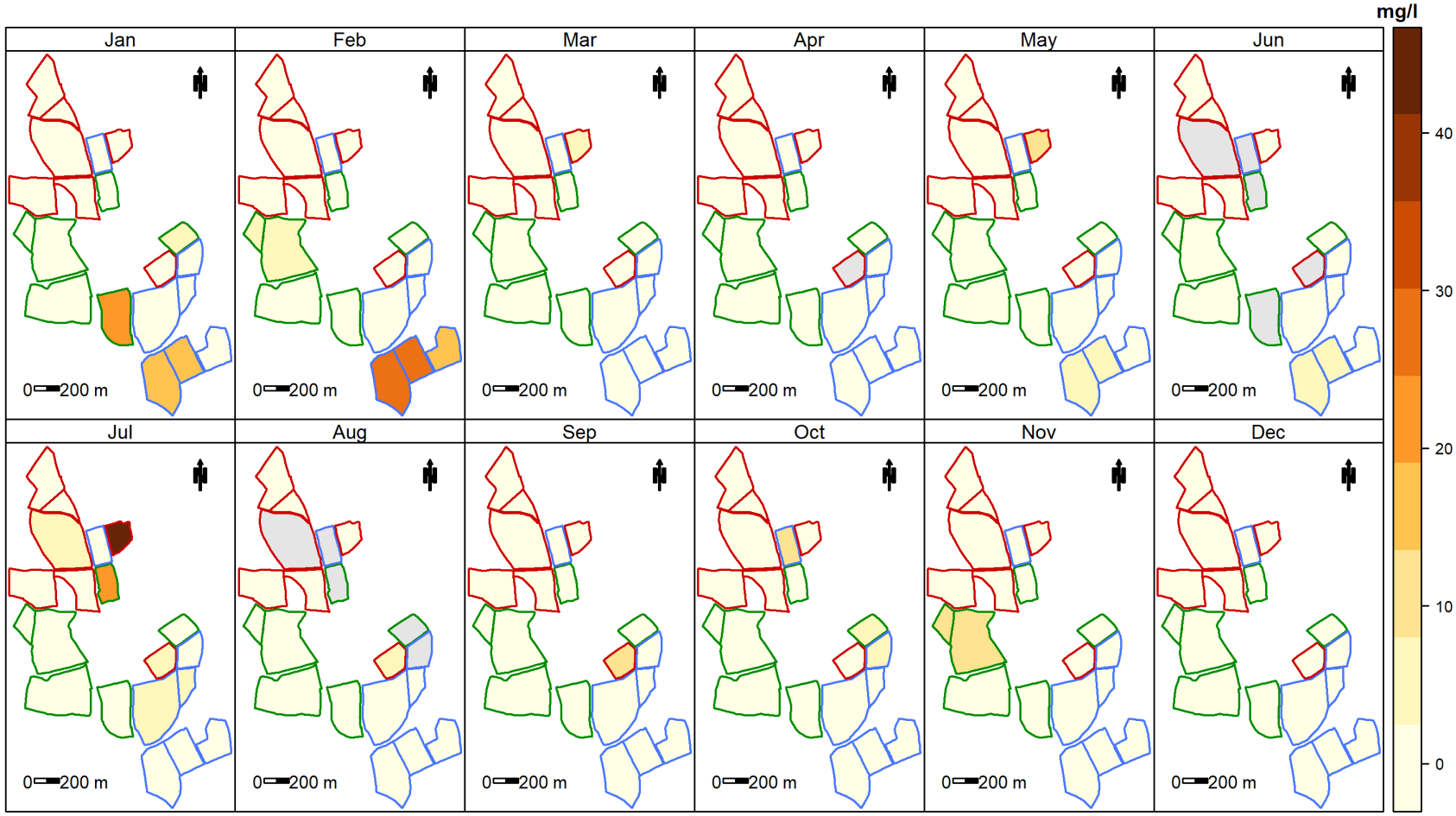



**Figure 76:** Mapped standard deviations for ammonium

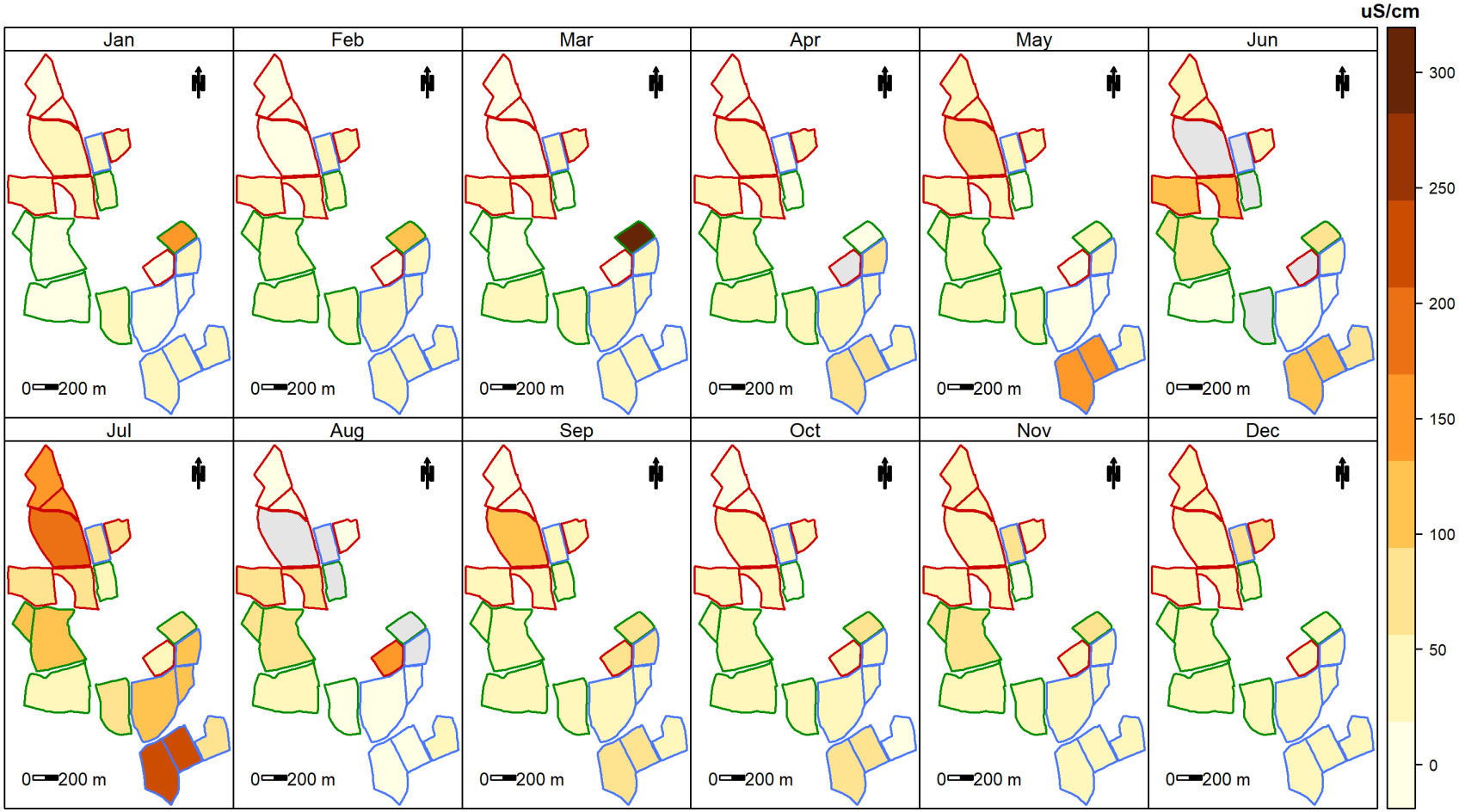



**Figure 77:** Mapped standard deviations for conductivity

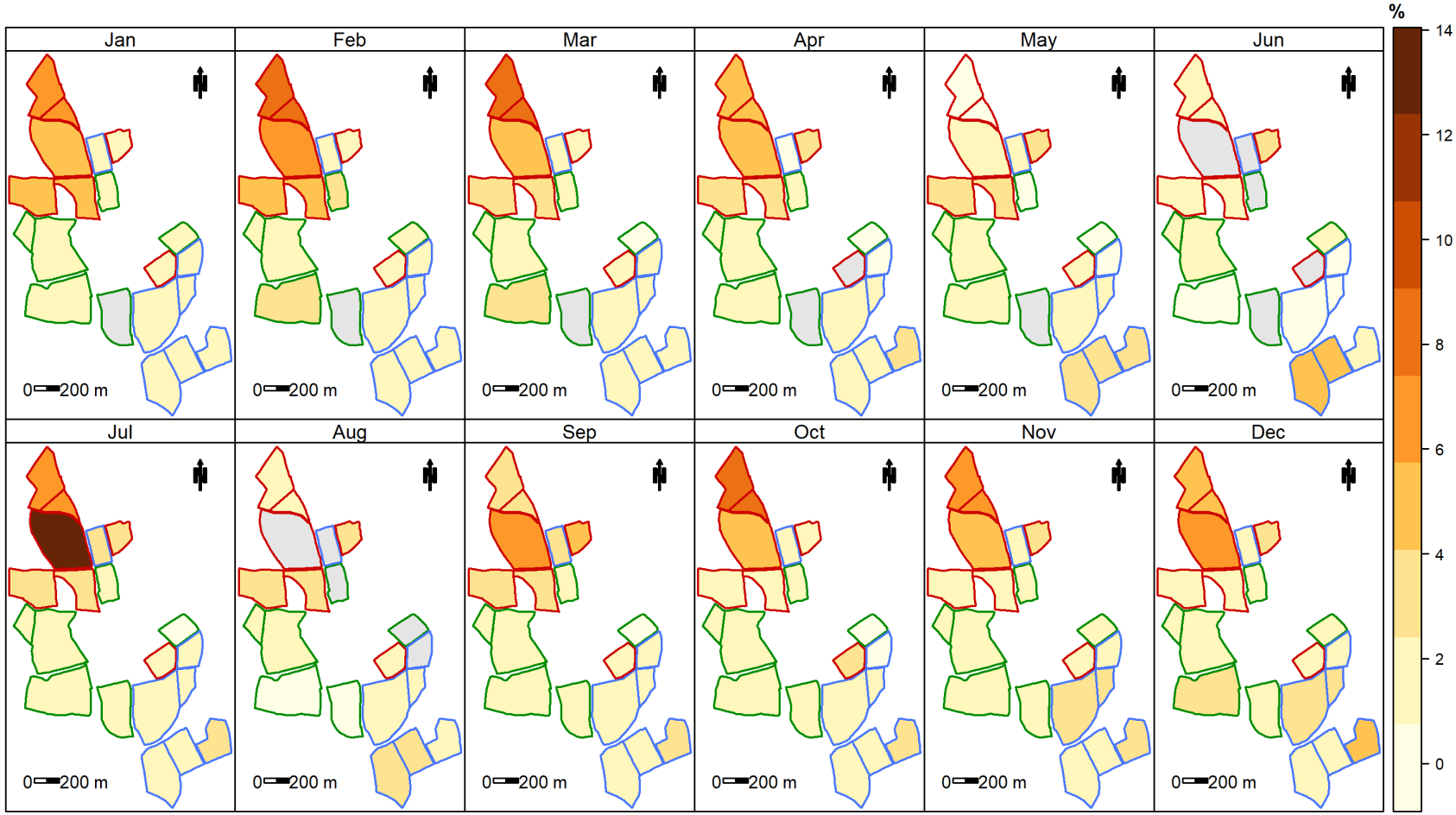



**Figure 78:** Mapped standard deviations for dissolved oxygen

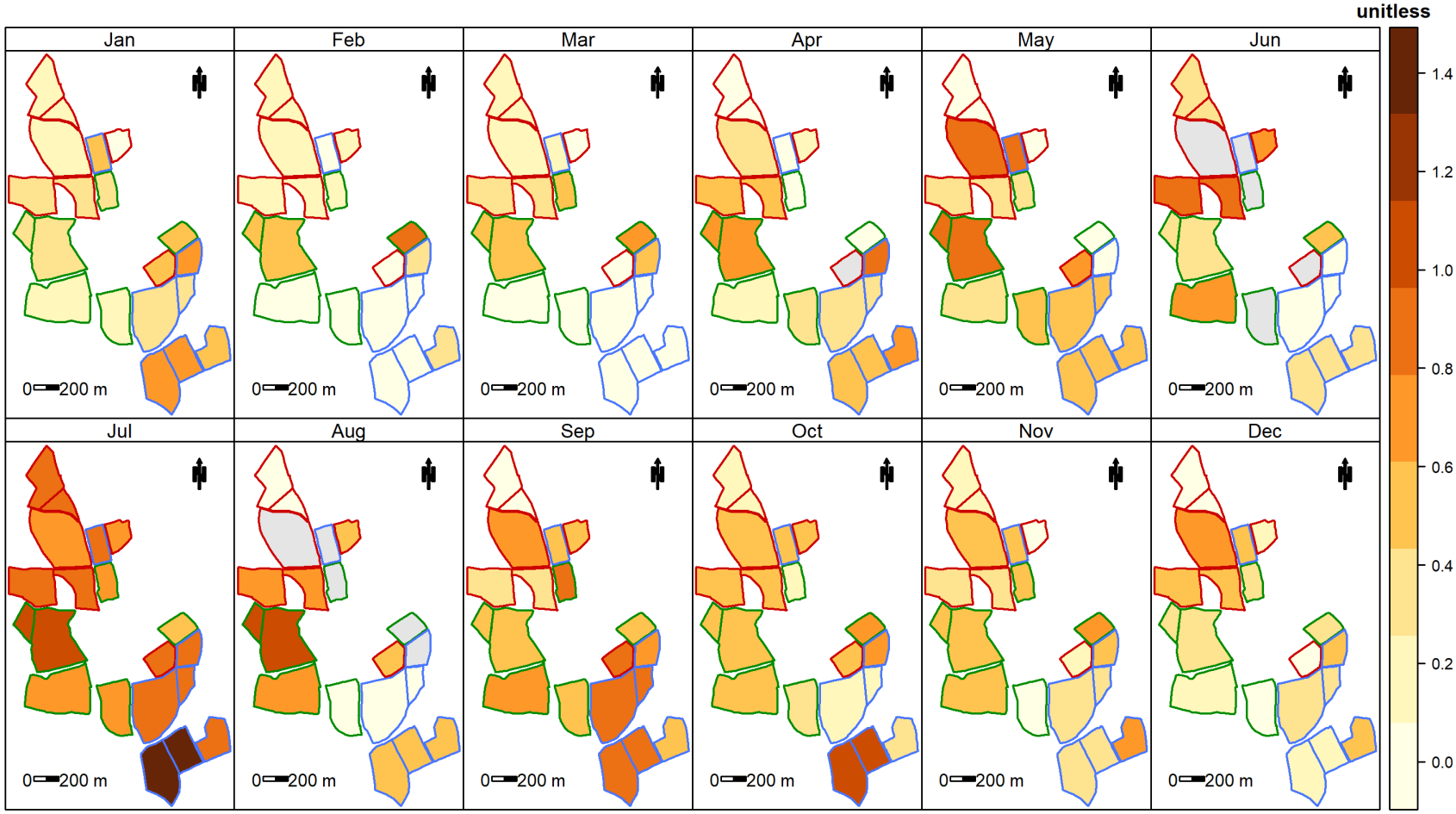



**Figure 79:** Mapped standard deviations for pH

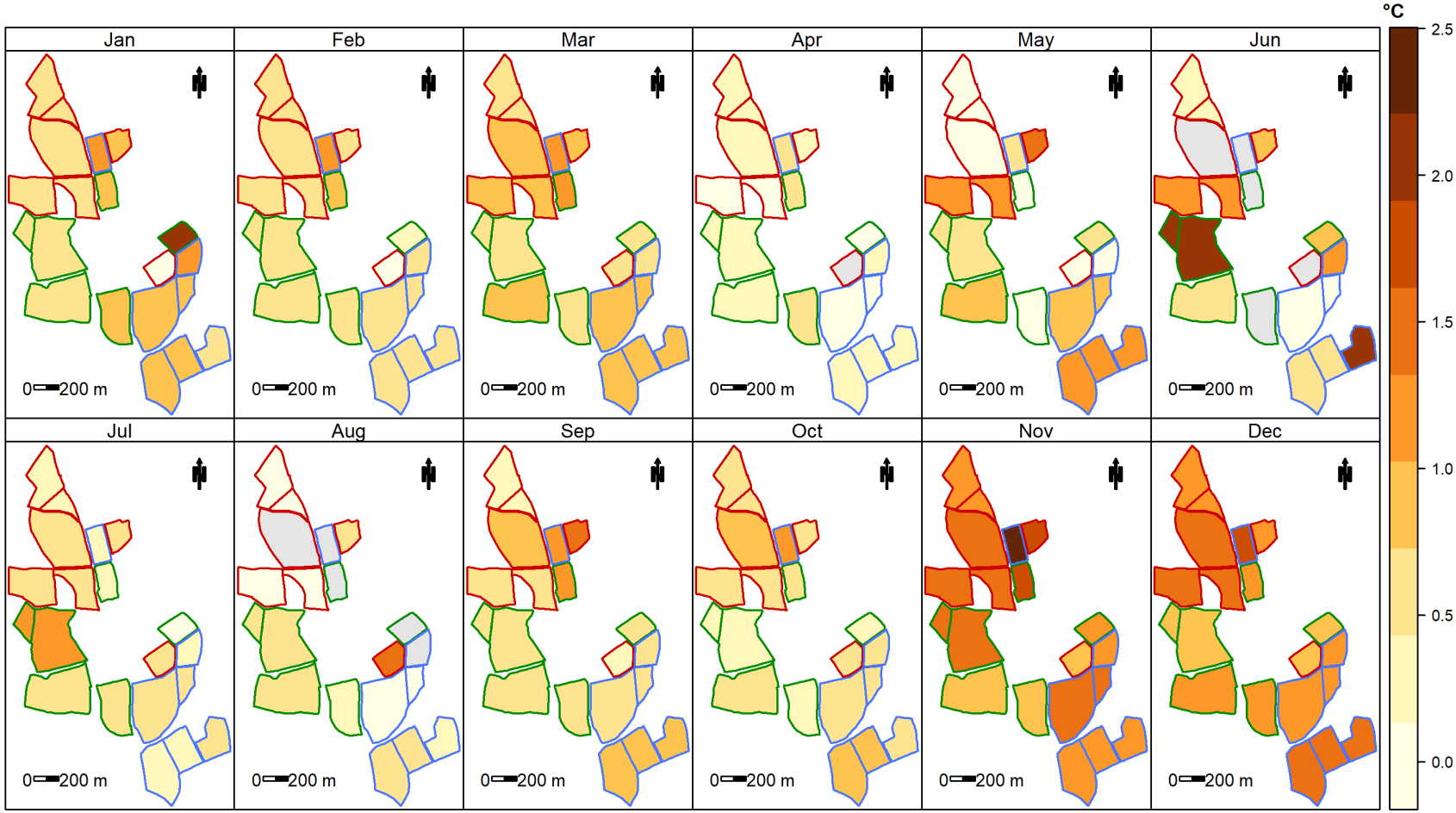



**Figure 80:** Mapped standard deviations for flow cell water temperature

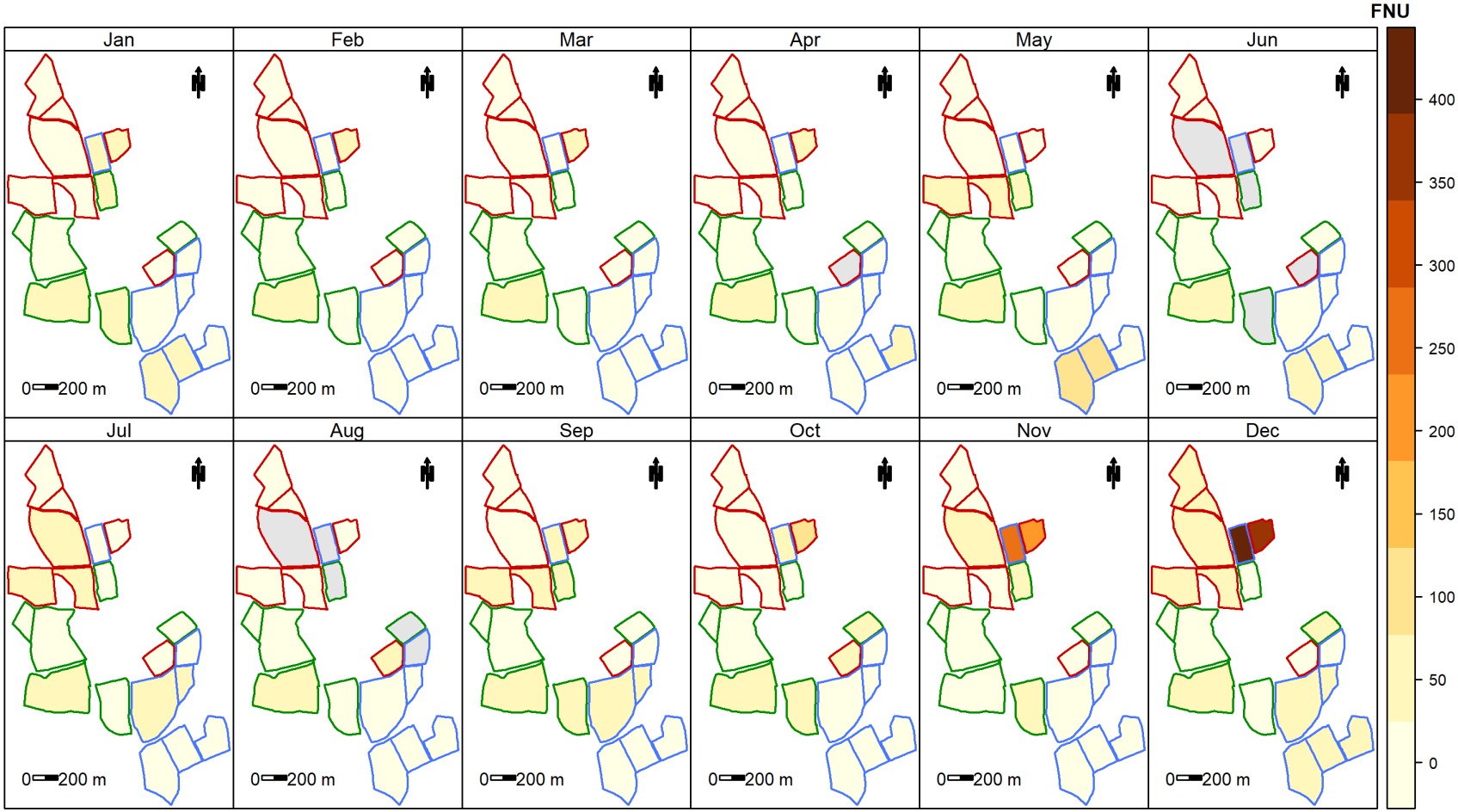



**Figure 81:** Mapped standard deviations for turbidity

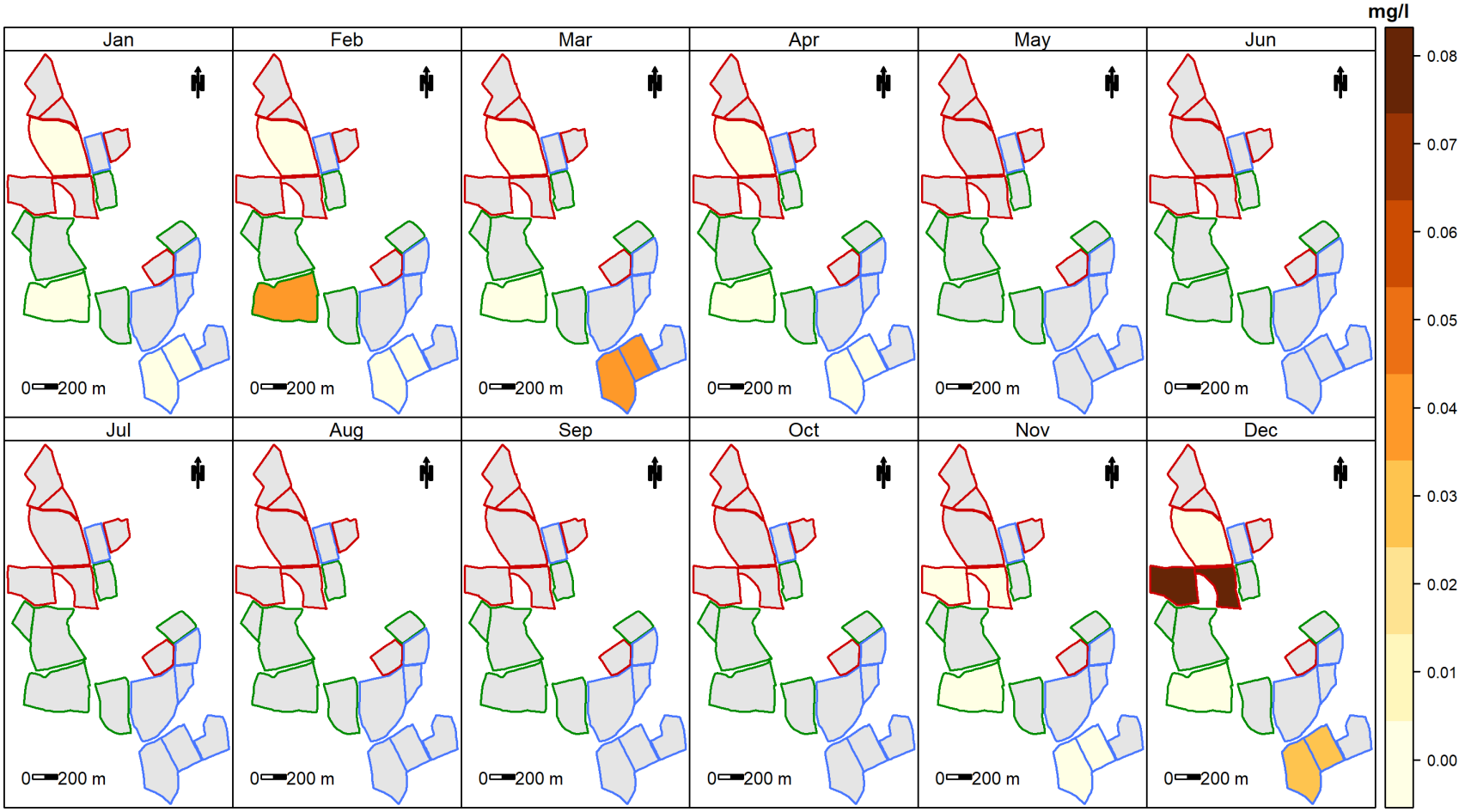



**Figure 82:** Mapped standard deviations for total phosphorus

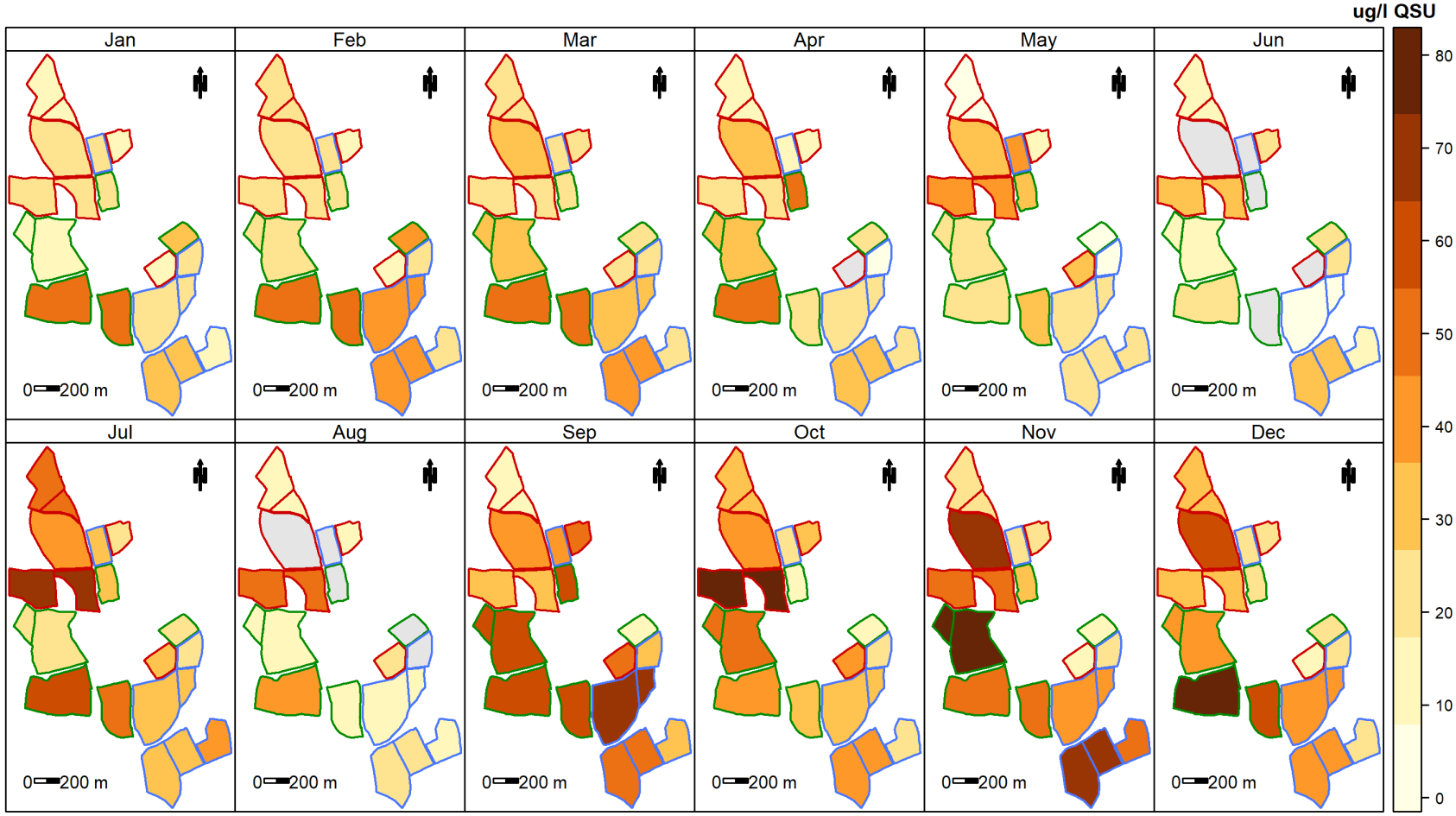



**Figure 83:** Mapped standard deviations for dissolved organic matter

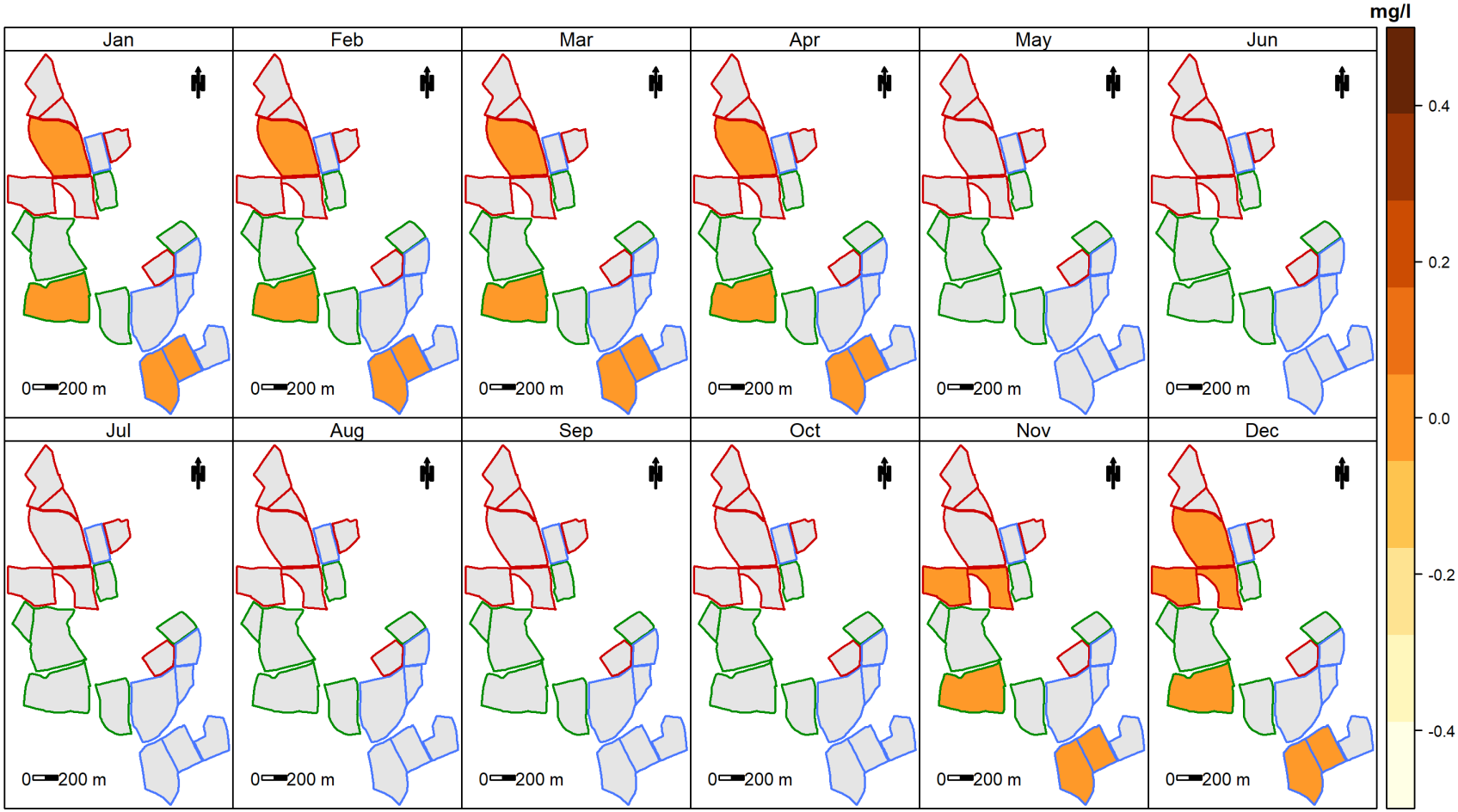



**Figure 84:** Mapped standard deviations for ortho-phosphorus

# 3 ANNUAL

## 3.1 Summary Statistics

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

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | l/s | 0.4 | 0.3 | 0.1 | 0.0 | 0.0 | 0.2 | 0.4 | 0.1 | 0.0 | 0.1 | 0.3 | 0.3 | 0.3 | 0.0 | 0.1 |
| Median | l/s | 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 | l/s | 2.7 | 2.1 | 0.9 | 0.4 | 0.5 | 1.6 | 2.6 | 0.9 | 0.4 | 0.7 | 2.0 | 2.2 | 1.6 | 0.3 | 0.8 |
| Inter-quartile range | l/s | 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 | l/s | 6.0 | 7.6 | 10.0 | 13.7 | 10.7 | 9.1 | 7.0 | 6.7 | 12.0 | 9.4 | 7.2 | 6.9 | 5.4 | 13.2 | 8.4 |
| Minimum | l/s | 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 | l/s | 81.0 | 76.0 | 31.0 | 18.0 | 20.0 | 57.0 | 77.0 | 28.0 | 17.0 | 25.0 | 63.0 | 81.0 | 50.0 | 14.0 | 24.0 |
| Missing values | count | 2065 | 1072 | 978 | 1024 | 1337 | 488 | 520 | 921 | 816 | 1312 | 1544 | 1016 | 1122 | 1294 | 1243 |
| Missing values as a % | % | 6 | 3 | 3 | 3 | 4 | 1 | 1 | 3 | 2 | 4 | 4 | 3 | 3 | 4 | 4 |

**Table 7:** Annual summary statistics for flow

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | mg/l | 2.5 | 3.5 | 1.7 | 1.7 | 1.6 | 1.8 | 1.8 | 1.8 | 1.5 | 3.5 | 1.1 | 1.7 | 1.2 | 5.4 | 5.1 |
| Median | mg/l | 2.0 | 4.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 2.0 | 1.0 | 3.0 | 5.0 |
| Standard deviation | mg/l | 1.7 | 1.3 | 0.9 | 1.1 | 1.8 | 1.0 | 1.7 | 1.1 | 1.2 | 4.9 | 0.6 | 0.7 | 0.8 | 4.1 | 3.0 |
| Inter-quartile range | mg/l | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 3.0 | 0.0 | 1.0 | 1.0 | 6.0 | 4.0 |
| Coefficient of variation | mg/l | 0.7 | 0.4 | 0.5 | 0.6 | 1.1 | 0.5 | 1.0 | 0.6 | 0.8 | 1.4 | 0.6 | 0.4 | 0.7 | 0.8 | 0.6 |
| Minimum | mg/l | 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 | mg/l | 8.0 | 8.0 | 11.0 | 6.0 | 10.0 | 7.0 | 9.0 | 4.0 | 35.0 | 27.0 | 11.0 | 5.0 | 9.0 | 18.0 | 18.0 |
| Missing values | count | 21064 | 23693 | 29975 | 33687 | 32909 | 27170 | 24597 | 26212 | 32566 | 32079 | 25842 | 19548 | 18459 | 31418 | 28911 |
| Missing values as a % | % | 60 | 68 | 86 | 96 | 94 | 78 | 70 | 75 | 93 | 92 | 74 | 56 | 53 | 90 | 83 |

**Table 8:** Annual summary statistics for nitrate+nitrite

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | mg/l | 0.5 | 0.1 | 1.3 | 0.7 | 0.7 | 0.2 | 3.6 | 0.5 | 0.2 | 2.0 | 0.3 | 0.1 | 0.0 | 2.2 | 1.0 |
| Median | mg/l | 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 | mg/l | 4.2 | 0.3 | 7.0 | 2.9 | 6.1 | 1.3 | 13.2 | 6.0 | 1.2 | 7.7 | 0.8 | 0.6 | 0.1 | 7.6 | 7.5 |
| Inter-quartile range | mg/l | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Coefficient of variation | mg/l | 8.0 | 4.9 | 5.6 | 4.3 | 9.3 | 6.4 | 3.6 | 12.0 | 5.9 | 3.8 | 2.7 | 6.2 | 10.2 | 3.5 | 7.6 |
| Minimum | mg/l | 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 | mg/l | 99.0 | 16.0 | 99.0 | 27.0 | 63.0 | 30.0 | 99.0 | 90.0 | 26.0 | 40.0 | 20.0 | 68.0 | 3.0 | 97.0 | 95.0 |
| Missing values | count | 20152 | 22334 | 29914 | 33372 | 32881 | 27089 | 24607 | 26125 | 32526 | 32045 | 25750 | 19387 | 18285 | 31120 | 28816 |
| Missing values as a % | % | 58 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |

**Table 9:** Annual summary statistics for ammonium

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | uS/cm | 255.1 | 219.4 | 163.3 | 266.0 | 129.1 | 219.7 | 226.8 | 197.1 | 220.3 | 232.0 | 293.0 | 327.3 | 247.1 | 264.4 | 248.7 |
| Median | uS/cm | 258.0 | 225.0 | 172.0 | 190.0 | 120.0 | 218.0 | 200.0 | 191.0 | 216.0 | 202.0 | 287.0 | 330.0 | 248.0 | 226.0 | 260.0 |
| Standard deviation | uS/cm | 46.3 | 30.9 | 33.3 | 190.1 | 38.6 | 45.6 | 87.9 | 42.5 | 48.3 | 110.2 | 66.2 | 53.8 | 47.0 | 101.9 | 71.7 |
| Inter-quartile range | uS/cm | 50.0 | 37.0 | 31.0 | 231.0 | 41.8 | 62.0 | 54.0 | 43.0 | 49.0 | 103.0 | 81.0 | 45.0 | 28.0 | 99.0 | 79.0 |
| Coefficient of variation | uS/cm | 0.2 | 0.1 | 0.2 | 0.7 | 0.3 | 0.2 | 0.4 | 0.2 | 0.2 | 0.5 | 0.2 | 0.2 | 0.2 | 0.4 | 0.3 |
| Minimum | uS/cm | 10.0 | 64.0 | 42.0 | 60.0 | 10.0 | 16.0 | 27.0 | 70.0 | 81.0 | 49.0 | 31.0 | 21.0 | 104.0 | 10.0 | 51.0 |
| Maximum | uS/cm | 660.0 | 340.0 | 543.0 | 1405.0 | 397.0 | 486.0 | 1025.0 | 621.0 | 611.0 | 664.0 | 1131.0 | 875.0 | 773.0 | 976.0 | 491.0 |
| Missing values | count | 20352 | 22333 | 29901 | 33372 | 32881 | 27090 | 24445 | 26124 | 32530 | 32045 | 25750 | 19388 | 18285 | 31112 | 28814 |
| Missing values as a % | % | 58 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |

**Table 10:** Annual summary statistics for conductivity

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | % | 97.0 | 94.6 | 93.0 | 98.2 | 96.8 | 90.8 | 95.4 | 86.2 | 96.8 | 95.8 | 84.3 | 92.0 | 83.9 | 94.0 | 91.3 |
| Median | % | 97.0 | 95.0 | 93.0 | 97.0 | 95.0 | 90.0 | 95.0 | 86.0 | 97.0 | 96.0 | 84.0 | 93.0 | 85.0 | 93.0 | 92.0 |
| Standard deviation | % | 2.4 | 3.2 | 2.4 | 2.6 | 4.9 | 3.7 | 2.2 | 3.7 | 1.6 | 2.1 | 6.3 | 3.5 | 7.1 | 3.6 | 3.0 |
| Inter-quartile range | % | 2.0 | 4.0 | 4.0 | 2.0 | 3.0 | 4.0 | 3.0 | 4.0 | 2.0 | 2.0 | 9.0 | 4.0 | 11.0 | 7.0 | 4.0 |
| Coefficient of variation | % | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 |
| Minimum | % | 83.0 | 83.0 | 87.0 | 92.0 | 69.0 | 70.0 | 65.0 | 74.0 | 89.0 | 55.0 | 62.0 | 50.0 | 62.0 | 86.0 | 49.0 |
| Maximum | % | 103.0 | 101.0 | 97.0 | 107.0 | 109.0 | 101.0 | 101.0 | 96.0 | 102.0 | 101.0 | 99.0 | 99.0 | 100.0 | 101.0 | 99.0 |
| Missing values | count | 20013 | 22333 | 32781 | 33372 | 32882 | 27089 | 24445 | 26125 | 32530 | 32045 | 25750 | 19388 | 18284 | 31098 | 28812 |
| Missing values as a % | % | 57 | 64 | 94 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |

**Table 11:** Annual summary statistics for dissolved oxygen

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | unitless | 6.3 | 6.0 | 6.0 | 5.2 | 6.4 | 6.1 | 5.8 | 5.7 | 6.1 | 6.5 | 6.2 | 6.1 | 6.0 | 5.8 | 6.0 |
| Median | unitless | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 7.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Standard deviation | unitless | 0.6 | 0.3 | 0.3 | 1.1 | 0.6 | 0.4 | 0.6 | 0.6 | 0.8 | 0.7 | 0.5 | 0.5 | 0.3 | 0.7 | 0.2 |
| Inter-quartile range | unitless | 1.0 | 0.0 | 0.0 | 2.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Coefficient of variation | unitless | 0.1 | 0.0 | 0.0 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 |
| Minimum | unitless | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 | 3.0 | 3.0 | 3.0 | 4.0 | 3.0 | 3.0 | 3.0 | 4.0 | 3.0 |
| Maximum | unitless | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 8.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Missing values | count | 20013 | 22333 | 29899 | 33372 | 32882 | 27090 | 24445 | 26124 | 32530 | 32045 | 25751 | 19387 | 18285 | 31098 | 28813 |
| Missing values as a % | % | 57 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |

**Table 12:** Annual summary statistics for pH

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | °C | 8.9 | 8.4 | 8.8 | 8.8 | 8.2 | 7.9 | 8.1 | 8.9 | 7.8 | 8.3 | 8.1 | 9.0 | 8.8 | 10.4 | 8.1 |
| Median | °C | 8.0 | 8.0 | 8.0 | 7.0 | 7.0 | 8.0 | 8.0 | 8.0 | 7.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 7.0 |
| Standard deviation | °C | 2.6 | 2.0 | 2.3 | 3.0 | 2.7 | 2.0 | 2.4 | 2.6 | 2.3 | 3.1 | 2.2 | 2.9 | 2.5 | 3.5 | 2.3 |
| Inter-quartile range | °C | 3.0 | 2.0 | 2.0 | 4.0 | 4.0 | 2.0 | 2.0 | 4.0 | 3.0 | 4.0 | 2.0 | 4.0 | 4.0 | 7.0 | 2.0 |
| Coefficient of variation | °C | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Minimum | °C | 0.0 | 4.0 | 4.0 | 1.0 | 4.0 | 3.0 | 3.0 | 0.0 | 0.0 | 2.0 | 3.0 | 3.0 | 3.0 | 5.0 | 2.0 |
| Maximum | °C | 18.0 | 16.0 | 17.0 | 17.0 | 16.0 | 19.0 | 16.0 | 16.0 | 16.0 | 17.0 | 17.0 | 16.0 | 16.0 | 19.0 | 16.0 |
| Missing values | count | 20009 | 22333 | 29899 | 33372 | 32881 | 27089 | 24445 | 26123 | 32525 | 32045 | 25750 | 19387 | 18283 | 31098 | 28812 |
| Missing values as a % | % | 57 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 91 | 73 | 55 | 52 | 89 | 82 |

**Table 13:** Annual summary statistics for flow cell water temperature

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | FNU | 7.4 | 15.3 | 16.8 | 28.1 | 54.6 | 12.8 | 17.7 | 20.5 | 17.4 | 198.5 | 13.8 | 12.7 | 8.2 | 12.0 | 92.0 |
| Median | FNU | 2.0 | 5.0 | 7.0 | 19.0 | 47.0 | 4.0 | 7.0 | 14.0 | 13.0 | 53.0 | 7.0 | 5.0 | 3.0 | 6.0 | 34.0 |
| Standard deviation | FNU | 14.5 | 32.2 | 27.6 | 36.3 | 28.4 | 27.2 | 31.3 | 26.0 | 16.9 | 306.3 | 20.6 | 26.0 | 17.5 | 19.5 | 198.8 |
| Inter-quartile range | FNU | 7.0 | 14.0 | 18.0 | 26.0 | 26.0 | 12.0 | 23.0 | 21.0 | 16.0 | 212.8 | 16.0 | 11.0 | 5.0 | 15.0 | 63.0 |
| Coefficient of variation | FNU | 2.0 | 2.1 | 1.6 | 1.3 | 0.5 | 2.1 | 1.8 | 1.3 | 1.0 | 1.5 | 1.5 | 2.0 | 2.1 | 1.6 | 2.2 |
| Minimum | FNU | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Maximum | FNU | 418.0 | 861.0 | 390.0 | 537.0 | 271.0 | 547.0 | 650.0 | 594.0 | 185.0 | 2445.0 | 560.0 | 640.0 | 465.0 | 732.0 | 2536.0 |
| Missing values | count | 20234 | 22419 | 30008 | 33372 | 32881 | 27089 | 24983 | 26123 | 32525 | 32045 | 26036 | 19391 | 18284 | 31098 | 28812 |
| Missing values as a % | % | 58 | 64 | 86 | 95 | 94 | 77 | 71 | 75 | 93 | 91 | 74 | 55 | 52 | 89 | 82 |

**Table 14:** Annual summary statistics for turbidity

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Median | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Standard deviation | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.1 | NA | NA | NA |
| Inter-quartile range | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Coefficient of variation | mg/l | NA | 65.4 | NA | NA | NA | NA | 38.9 | NA | NA | NA | NA | 13.4 | NA | NA | NA |
| Minimum | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Maximum | mg/l | NA | 1.0 | NA | NA | NA | NA | 1.0 | NA | NA | NA | 0.0 | 1.0 | NA | NA | NA |
| Missing values | count | 35039 | 26477 | 35039 | 35039 | 35039 | 35039 | 27483 | 35039 | 35039 | 35039 | 28001 | 33597 | 35039 | 35039 | 35039 |
| Missing values as a % | % | 100 | 76 | 100 | 100 | 100 | 100 | 78 | 100 | 100 | 100 | 80 | 96 | 100 | 100 | 100 |

**Table 15:** Annual summary statistics for total phosphorus

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | ug/l QSU | 82.3 | 131.8 | 98.6 | 72.1 | 183.6 | 109.6 | 95.8 | 84.5 | 92.8 | 122.8 | 141.1 | 160.0 | 133.4 | 128.7 | 82.7 |
| Median | ug/l QSU | 66.0 | 117.0 | 97.0 | 72.0 | 178.0 | 109.0 | 88.0 | 81.0 | 97.0 | 117.0 | 129.0 | 153.0 | 134.0 | 134.0 | 78.0 |
| Standard deviation | ug/l QSU | 52.2 | 65.2 | 64.2 | 24.2 | 46.7 | 52.3 | 53.4 | 39.0 | 24.9 | 87.4 | 59.2 | 50.3 | 44.6 | 35.5 | 55.3 |
| Inter-quartile range | ug/l QSU | 54.0 | 109.0 | 108.0 | 38.0 | 33.0 | 68.0 | 80.0 | 49.0 | 35.0 | 167.0 | 87.0 | 54.0 | 75.0 | 38.0 | 52.0 |
| Coefficient of variation | ug/l QSU | 0.6 | 0.5 | 0.7 | 0.3 | 0.3 | 0.5 | 0.6 | 0.5 | 0.3 | 0.7 | 0.4 | 0.3 | 0.3 | 0.3 | 0.7 |
| Minimum | ug/l QSU | 0.0 | 0.0 | 0.0 | 13.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Maximum | ug/l QSU | 314.0 | 352.0 | 320.0 | 223.0 | 341.0 | 454.0 | 301.0 | 200.0 | 163.0 | 344.0 | 336.0 | 345.0 | 382.0 | 204.0 | 347.0 |
| Missing values | count | 20015 | 22333 | 29899 | 33372 | 32881 | 27089 | 24445 | 26166 | 32525 | 32108 | 25750 | 19387 | 18284 | 31098 | 28892 |
| Missing values as a % | % | 57 | 64 | 85 | 95 | 94 | 77 | 70 | 75 | 93 | 92 | 73 | 55 | 52 | 89 | 82 |

**Table 16:** Annual summary statistics for dissolved organic matter

| | | Catchment Number | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | | **Green** | | | | | **Blue** | | | | | **Red** | | | | |
| | **units** | **4** | **5** | **6** | **12** | **13** | **9** | **8** | **7** | **11** | **14** | **2** | **3** | **1** | **10** | **15** |
| Mean | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Median | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Standard deviation | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Inter-quartile range | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Coefficient of variation | mg/l | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Minimum | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Maximum | mg/l | NA | 0.0 | NA | NA | NA | NA | 0.0 | NA | NA | NA | 0.0 | 0.0 | NA | NA | NA |
| Missing values | count | 35039 | 26477 | 35039 | 35039 | 35039 | 35039 | 27483 | 35039 | 35039 | 35039 | 28001 | 33597 | 35039 | 35039 | 35039 |
| Missing values as a % | % | 100 | 76 | 100 | 100 | 100 | 100 | 78 | 100 | 100 | 100 | 80 | 96 | 100 | 100 | 100 |

**Table 17:** Annual summary statistics for ortho-phosphorus

# 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 18:** 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 19:** Farmlet hydrological areas (ha) pre- and post- change to area of Catchment 4 on 13th August 2013