CENTRE FOR FRESHWATER ECOSYSTEMS (CFE)
School of Agriculture, Biomedicine and Environment

CENTRE FOR FRESHWATER ECOSYSTEMS (CFE)

River Murray Water Quality Monitoring Program (RMWQMP) Data trend Analysis 2021

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APPENDICES

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Appendix A – Data availability

Figure A1. RMWQMP Spot data availability – Discharge (datapoints/month)

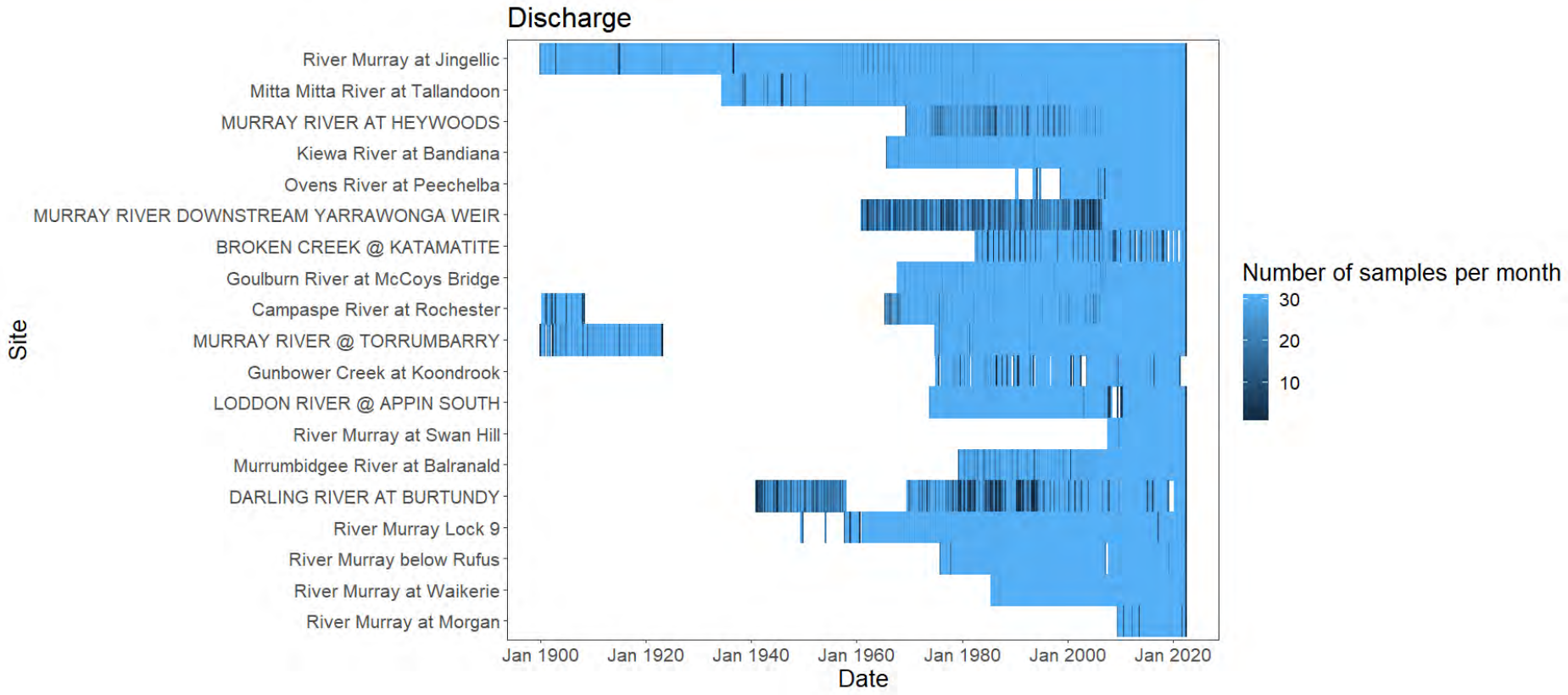


Figure A2. RMWQMP Spot data availability – Field pH (datapoints/month)

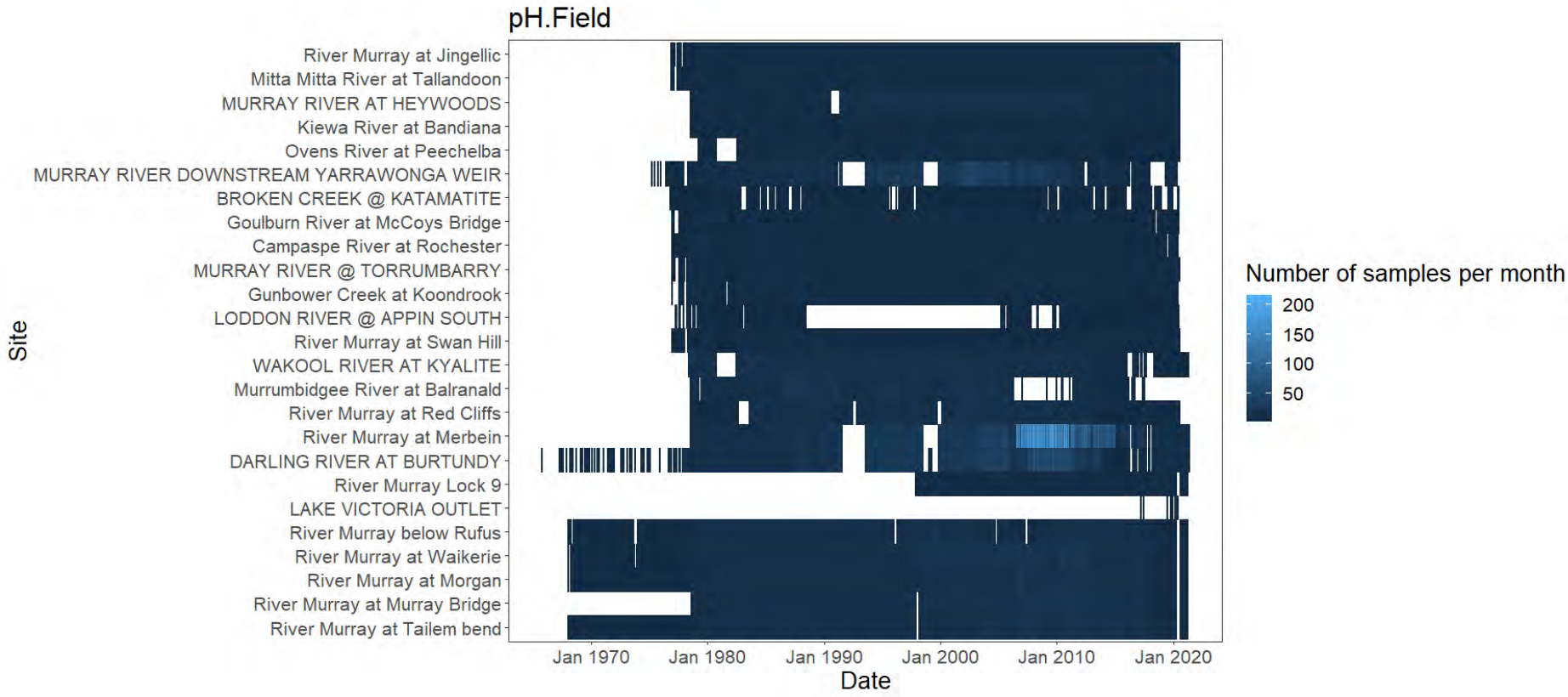


Figure A3. RMWQMP Spot data availability – Water temperature (datapoints/month)

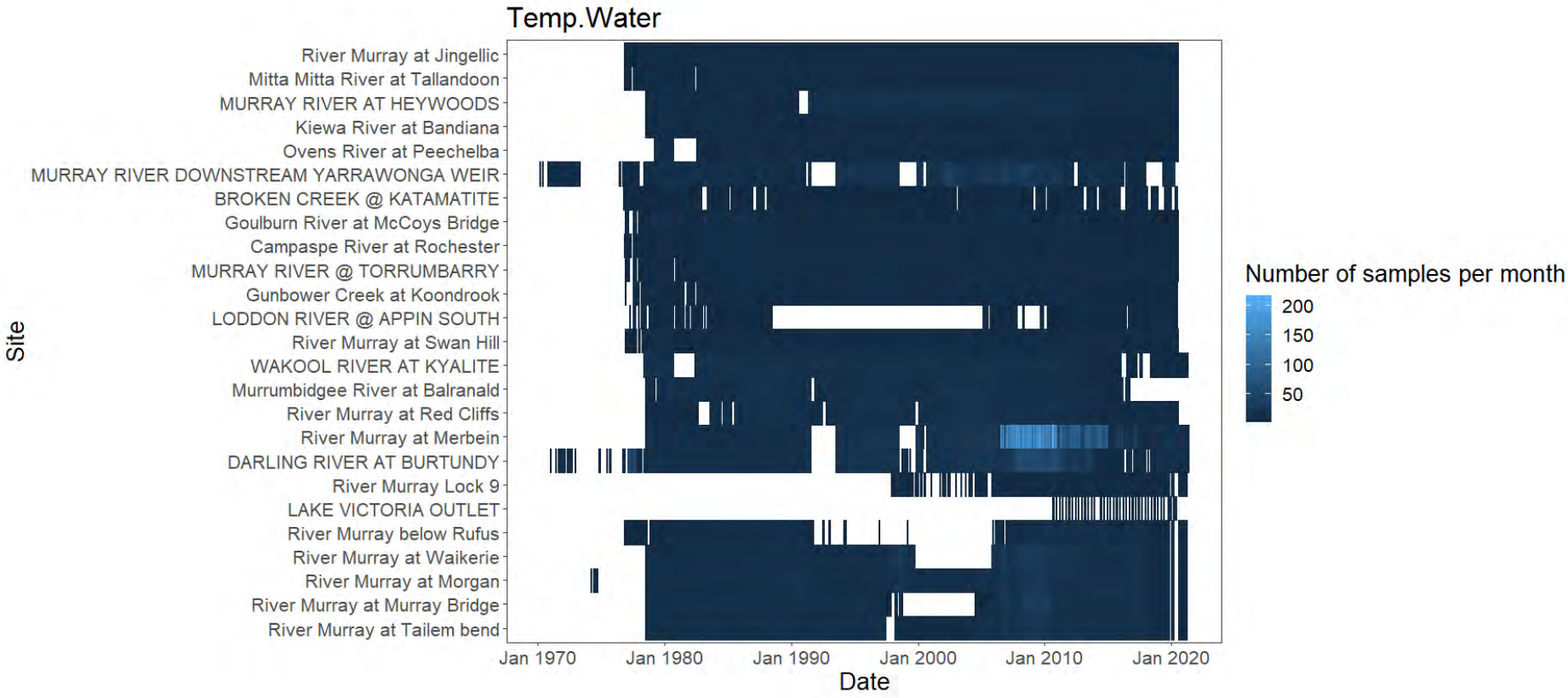


Figure A4. RMWQMP Spot data availability – Dissolved Oxygen Concentration (datapoints/month)

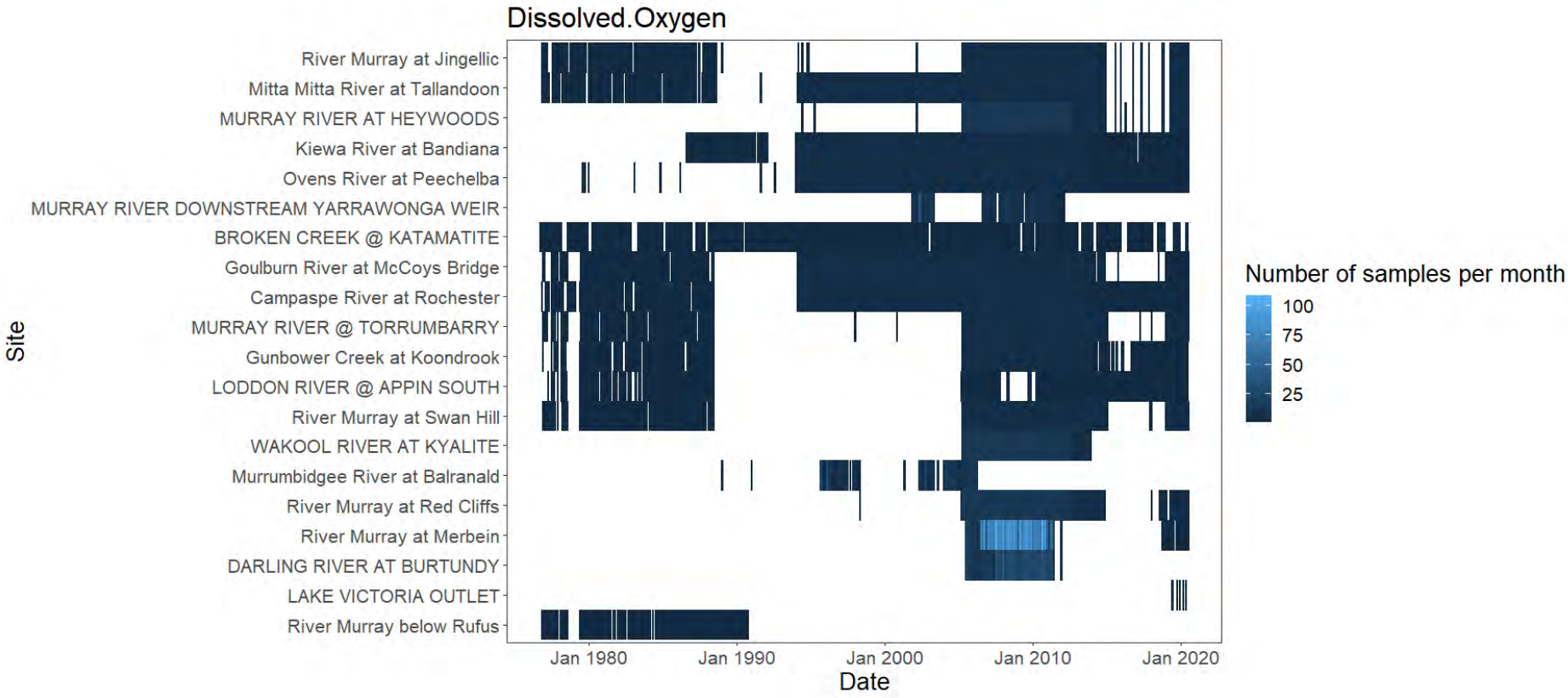


Figure A5. RMWQMP Spot data availability – Electrical conductivity at 25 °C (datapoints/month)

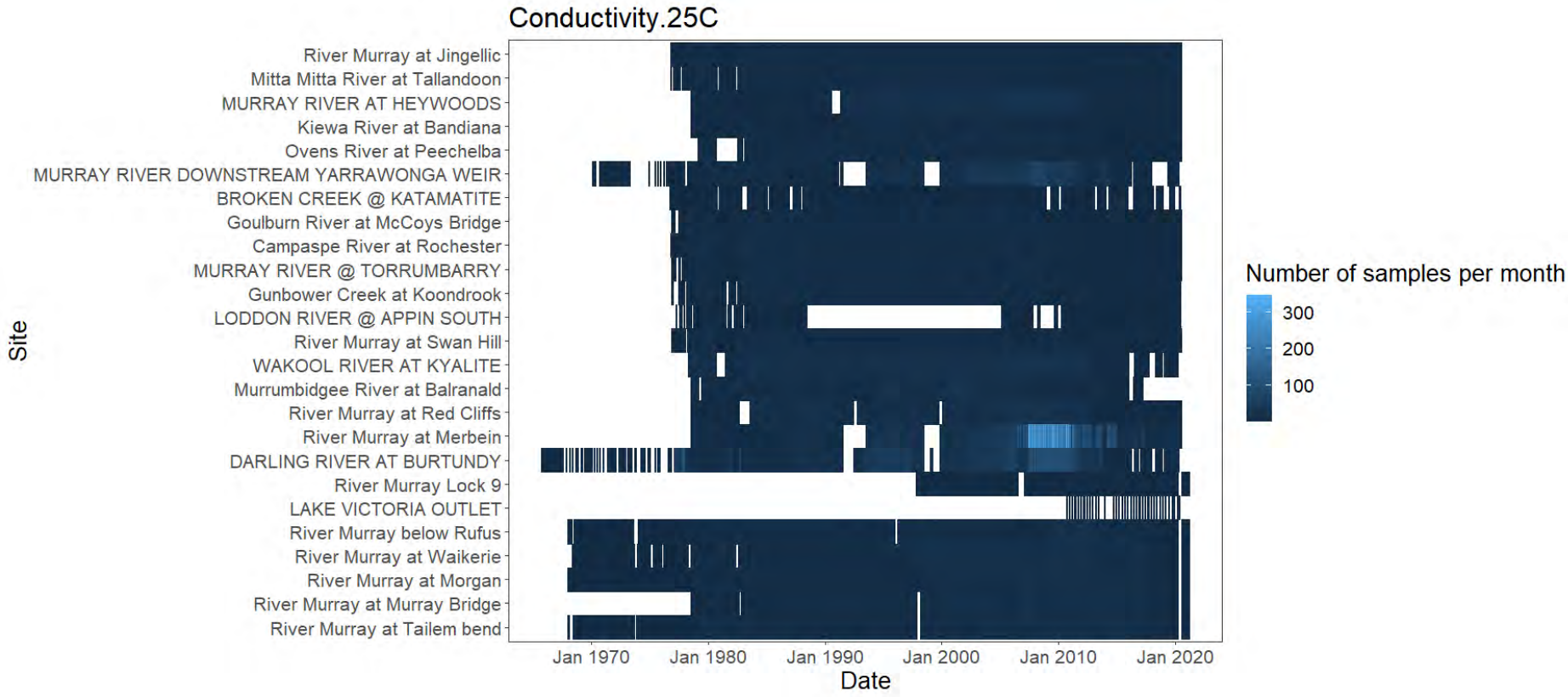


Figure A6. RMWQMP Spot data availability – Turbidity (datapoints/month)

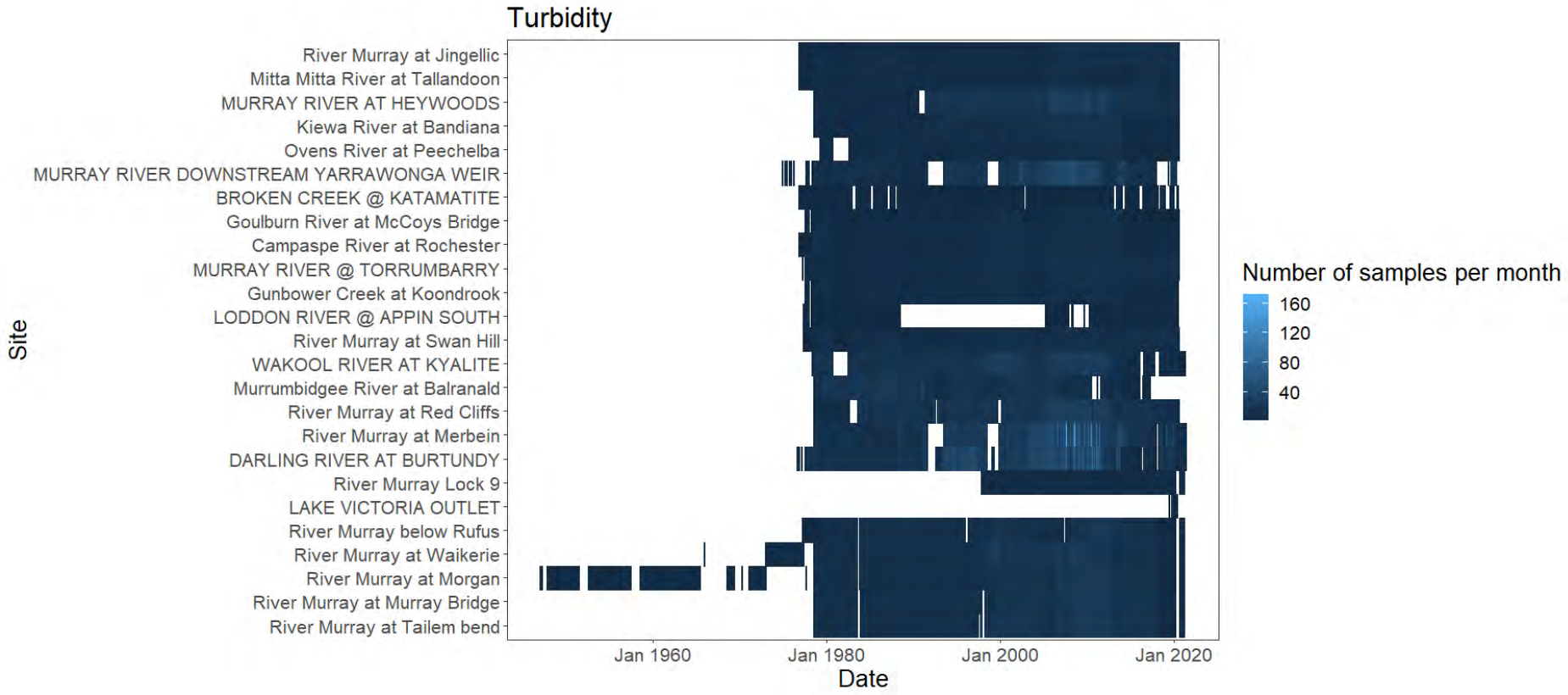


Figure A7. RMWQMP Spot data availability – Alkalinity (datapoints/month)

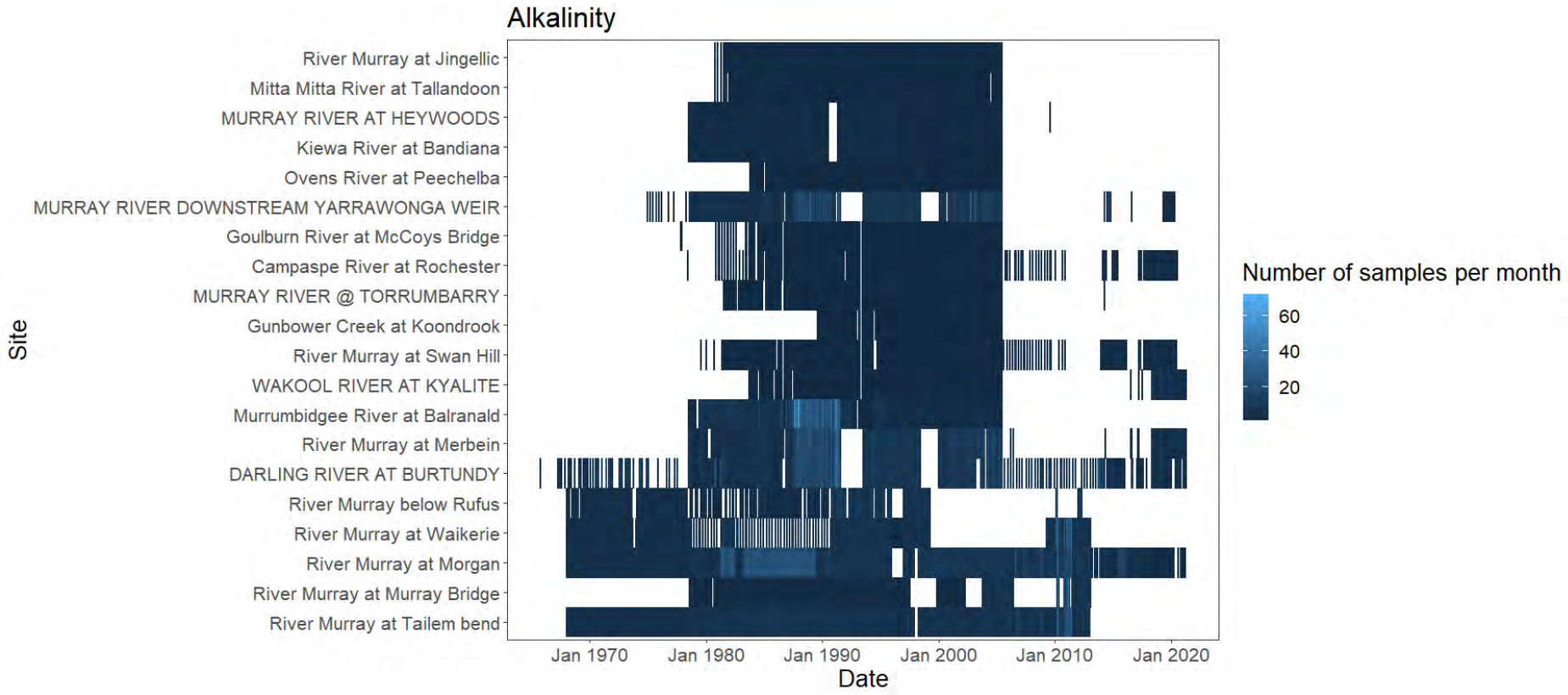


Figure A8. RMWQMP Spot data availability – Dissolved Organic Carbon (DOC) (datapoints/month)

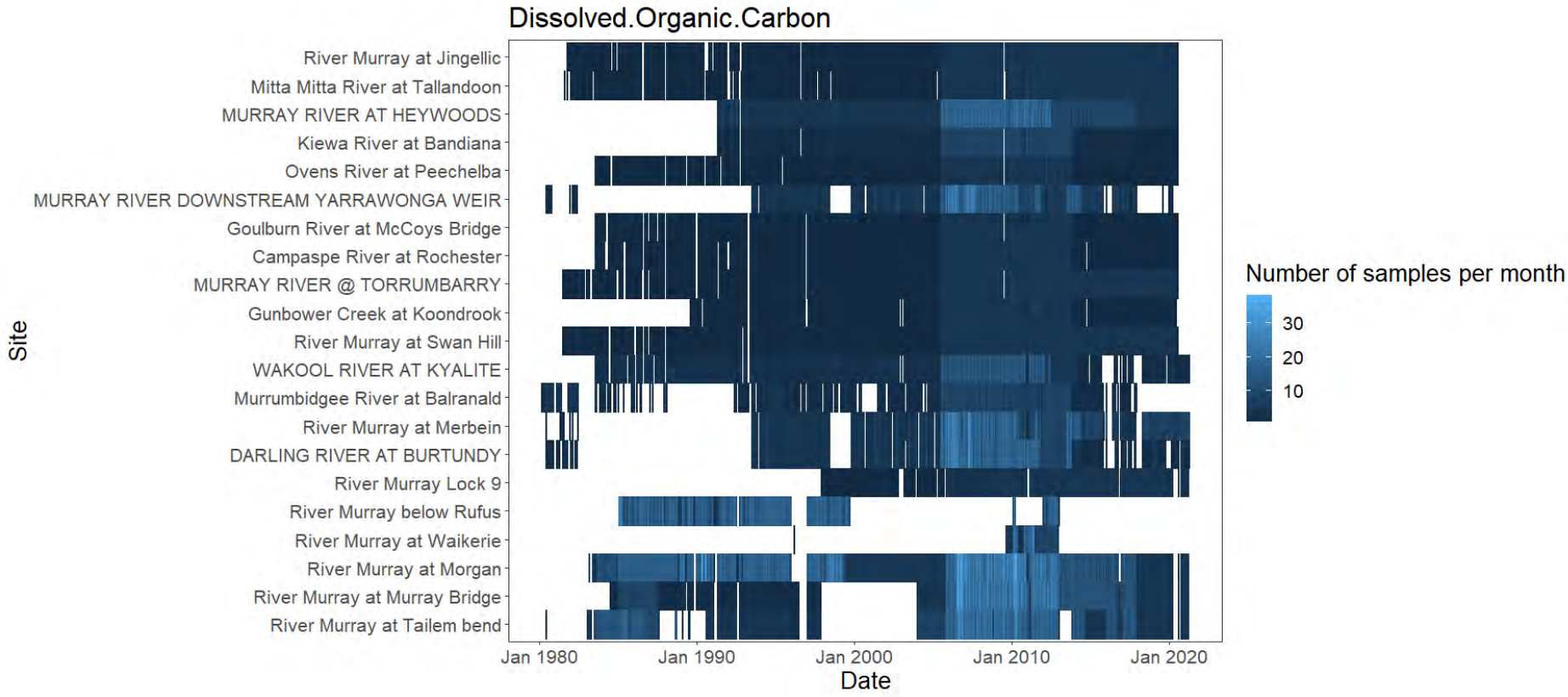


Figure A9. RMWQMP Spot data availability – Total Kjeldahl Nitrogen (TKN) (datapoints/month)

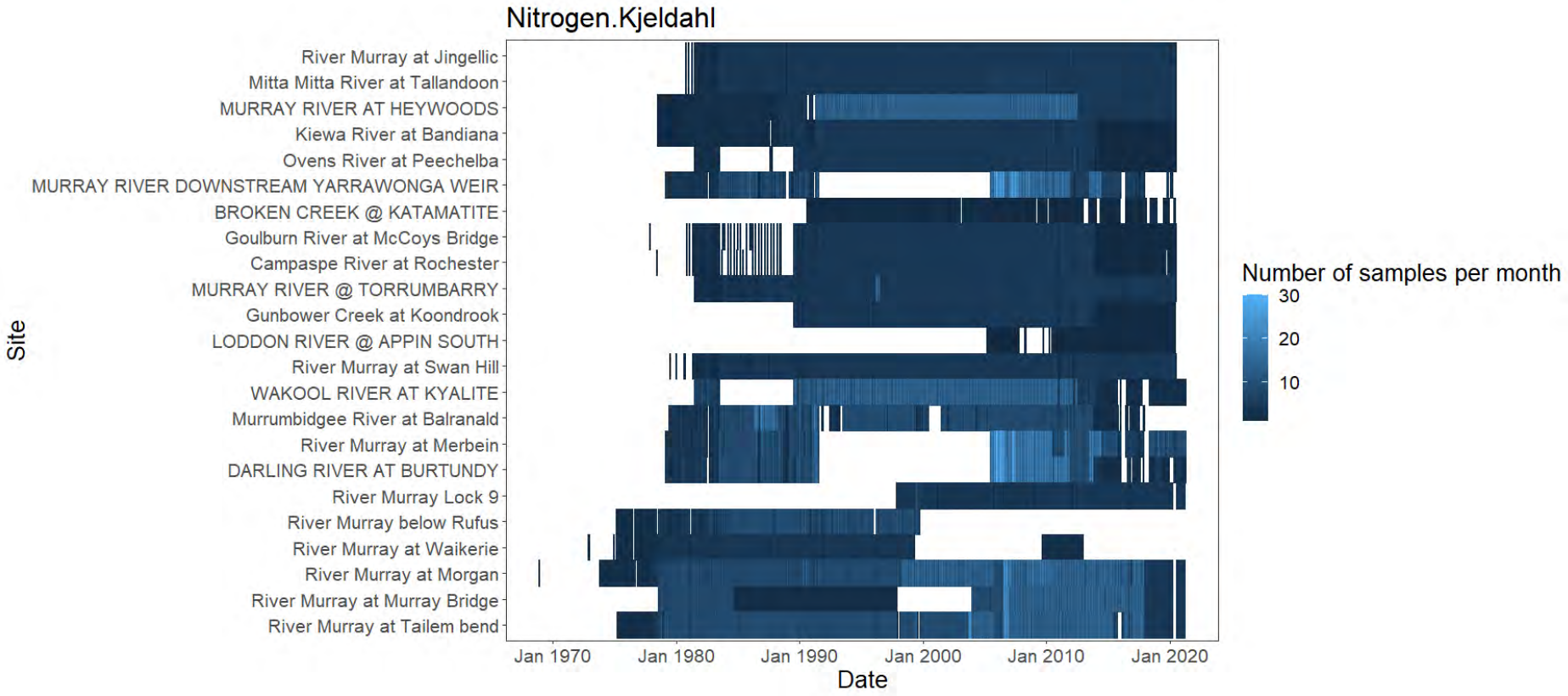


Figure A10. RMWQMP Spot data availability – Nitrogen oxides (NOx; NO3- + NO2-) (datapoints/month)

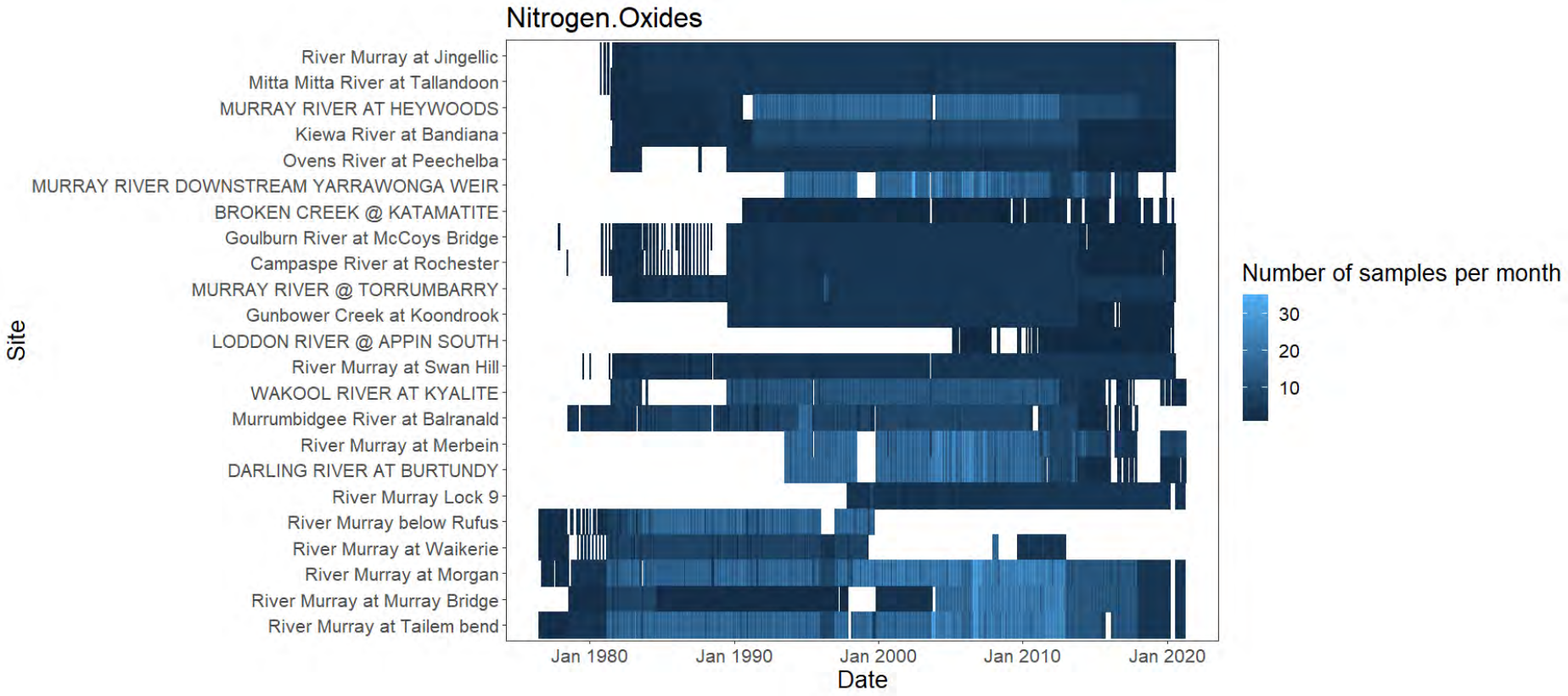


Figure A11. RMWQMP Spot data availability – Total Phosphorus (datapoints/month)

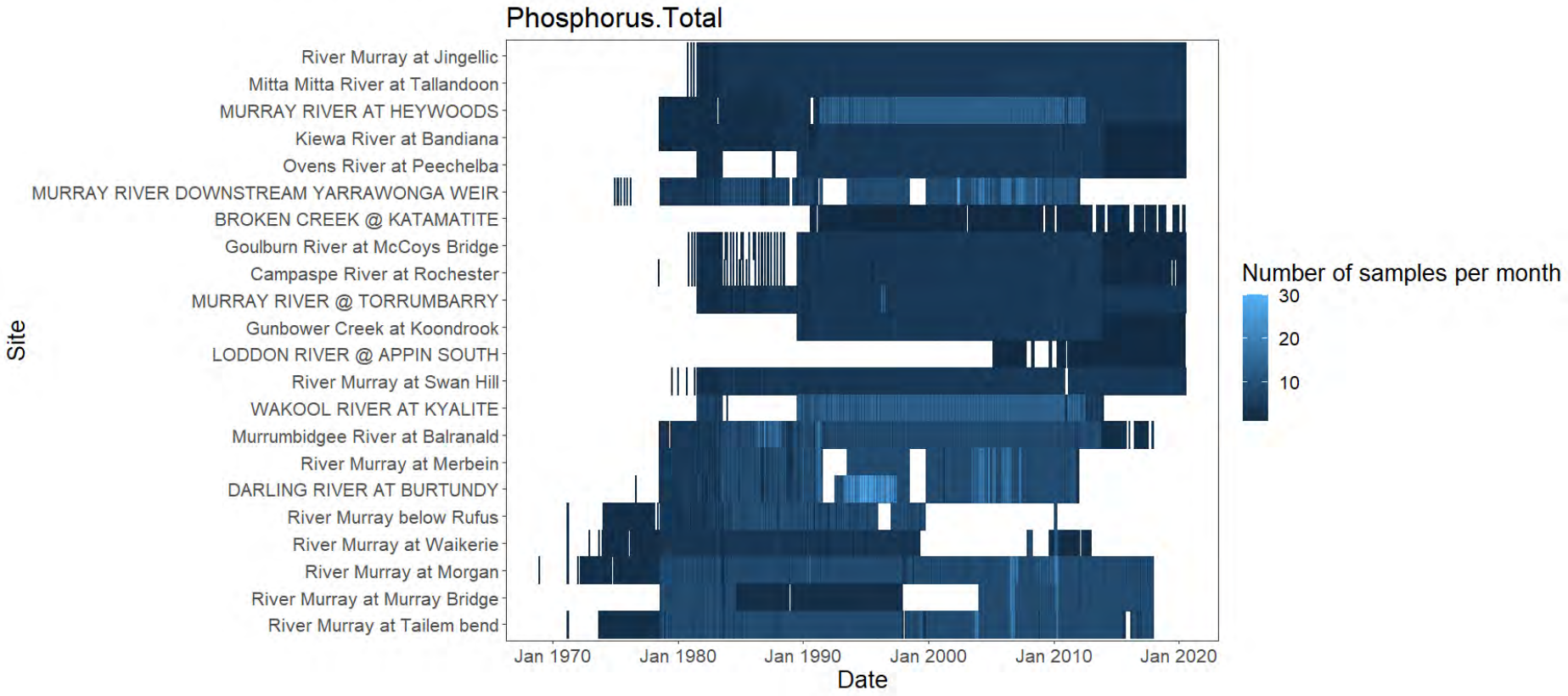


Figure A12. RMWQMP Spot data availability – Soluble Reactive phosphorus (SRP) (datapoints/month)

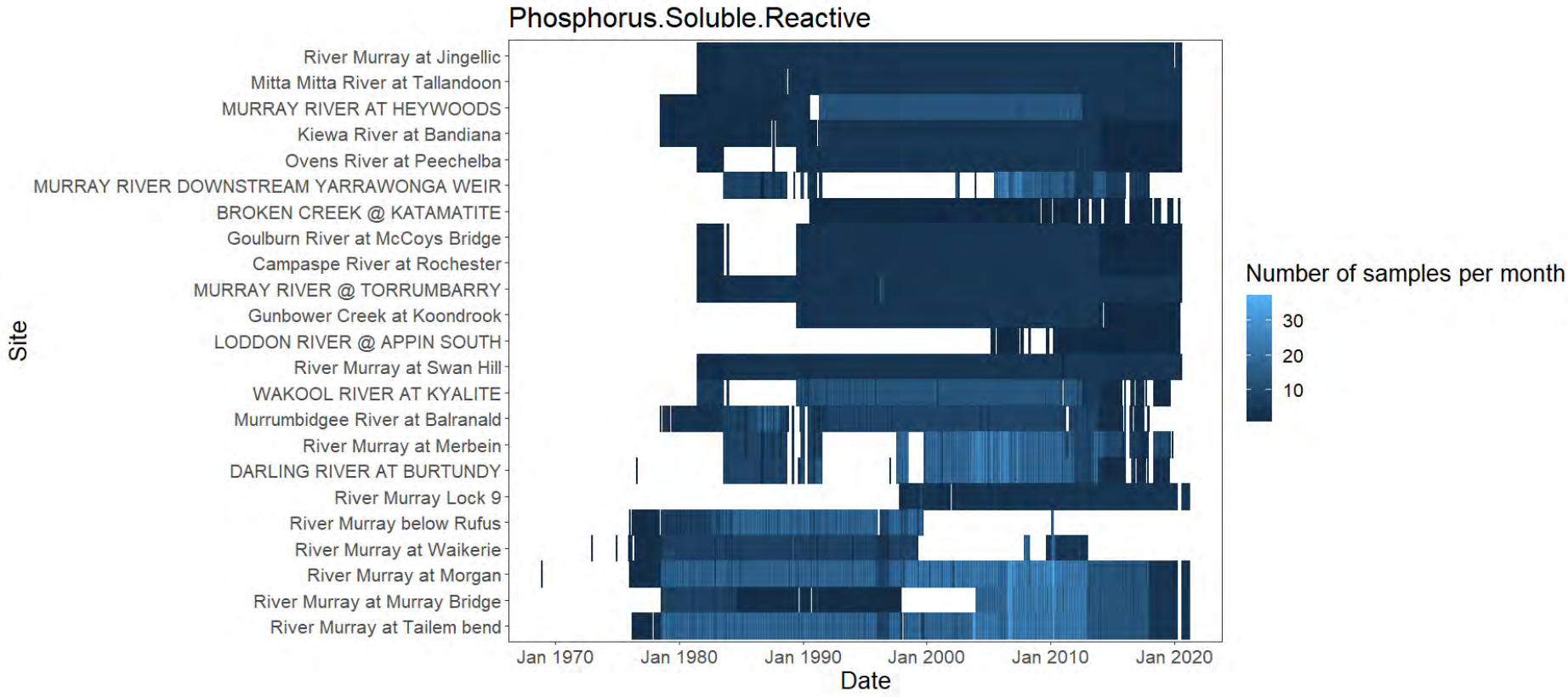
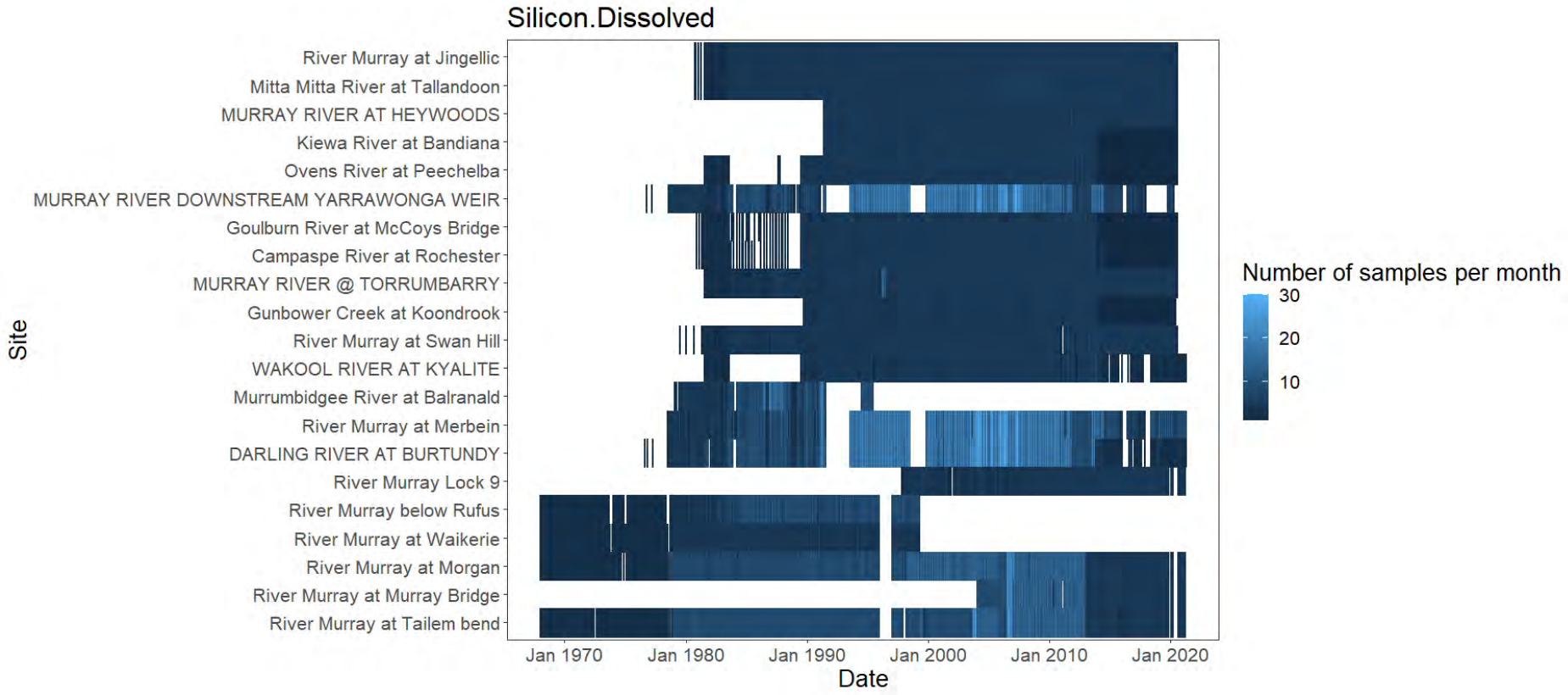


Figure A13. RMWQMP Spot data availability – Dissolved Silicon (datapoints/month)



Appendix B – Data resolution

Figure B1. RMWQMP Spot data resolution – Discharge (decimal places)

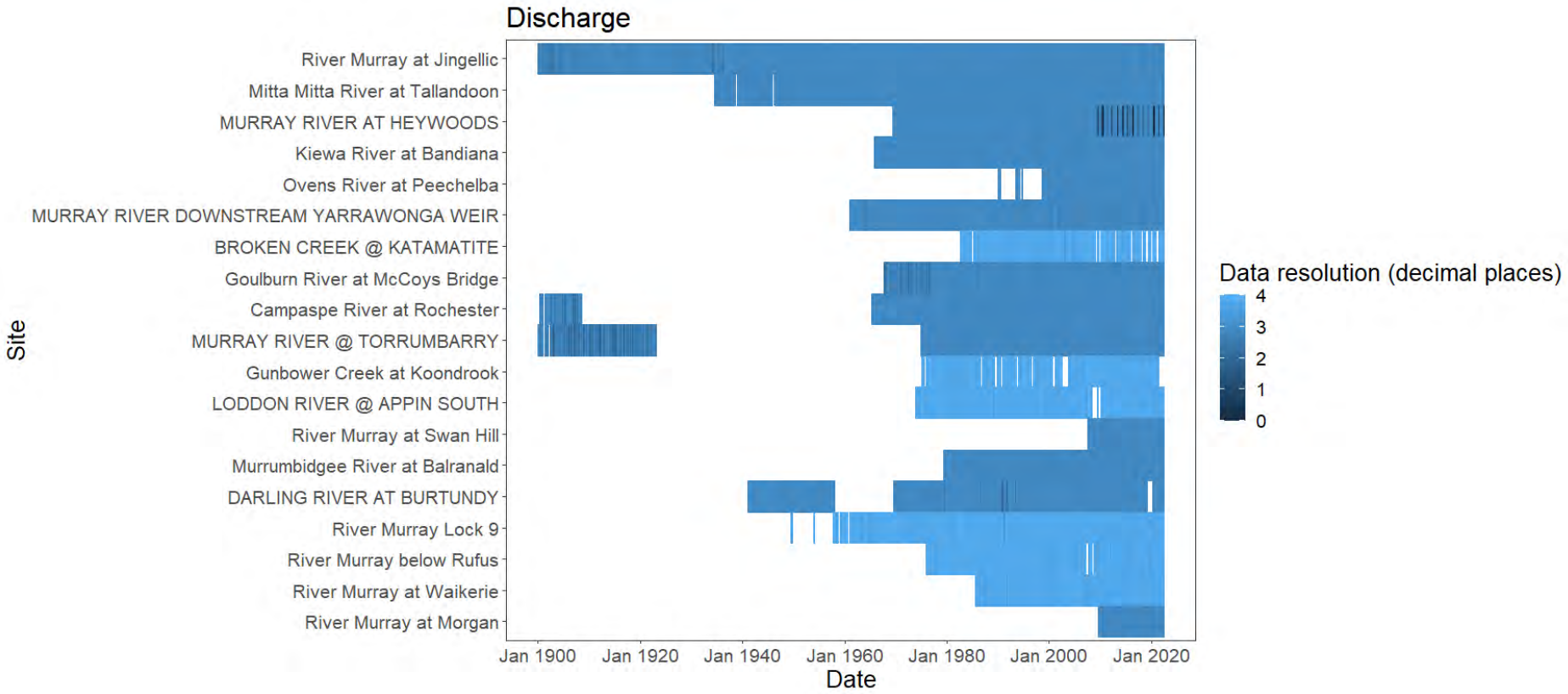


Figure B2. RMWQMP Spot data resolution – Field pH (decimal places)

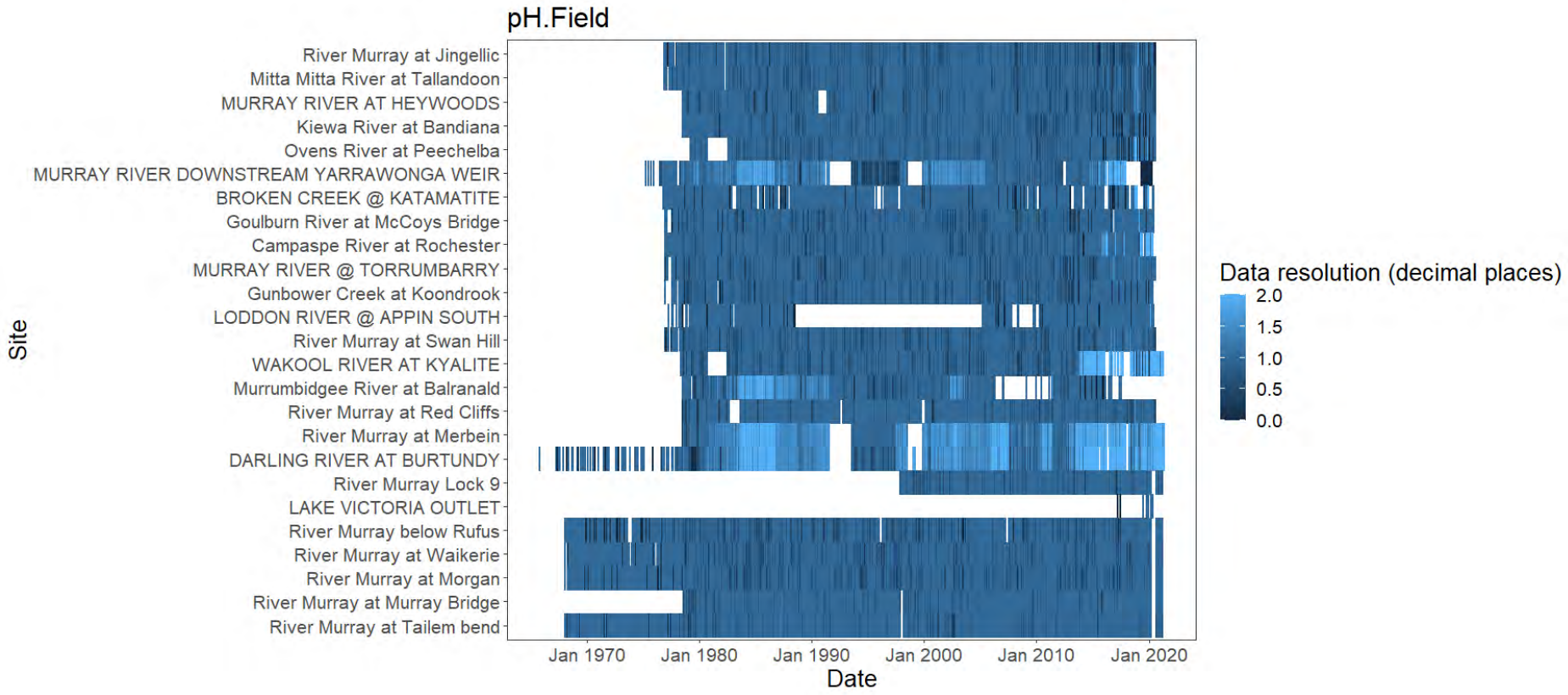


Figure B3. RMWQMP Spot data resolution – Water temperature (decimal places)

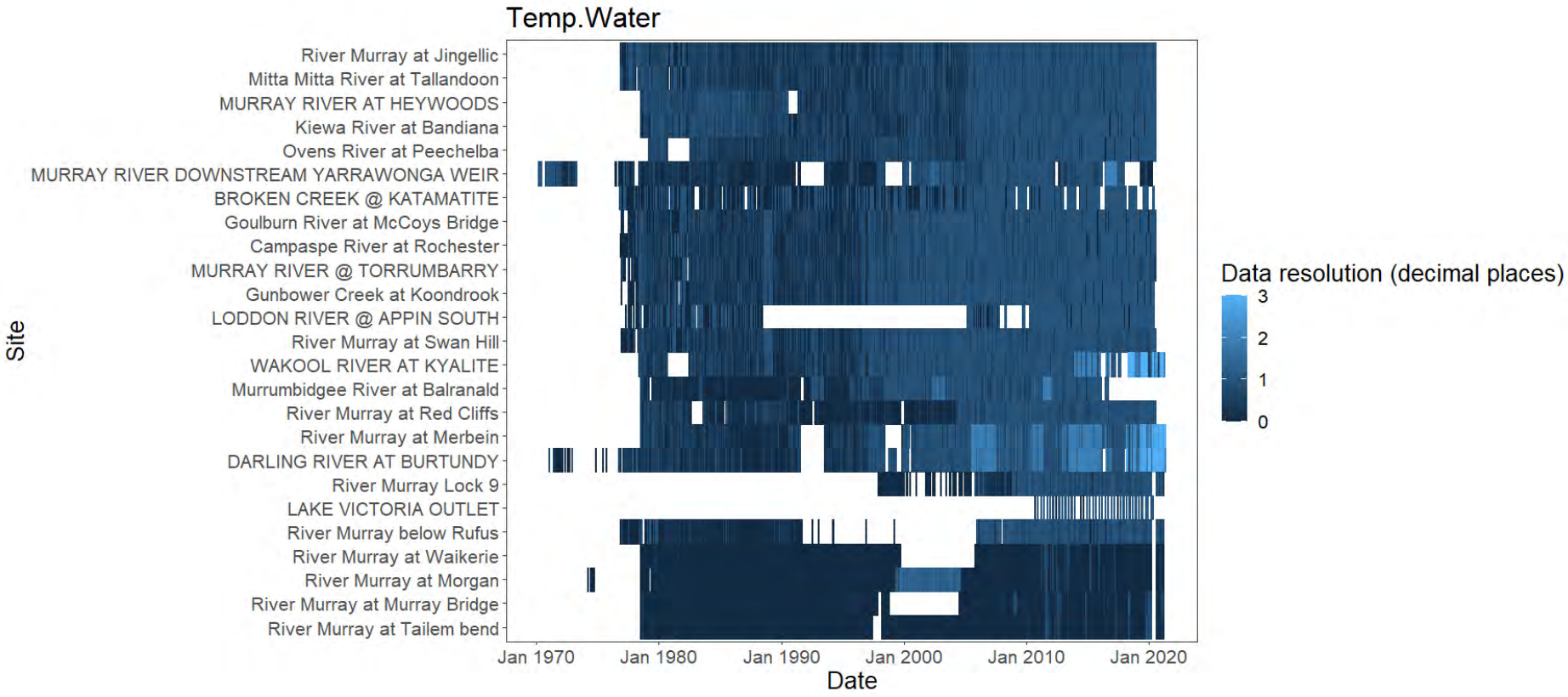


Figure B4. RMWQMP Spot data resolution – Dissolved Oxygen Concentration (decimal places)

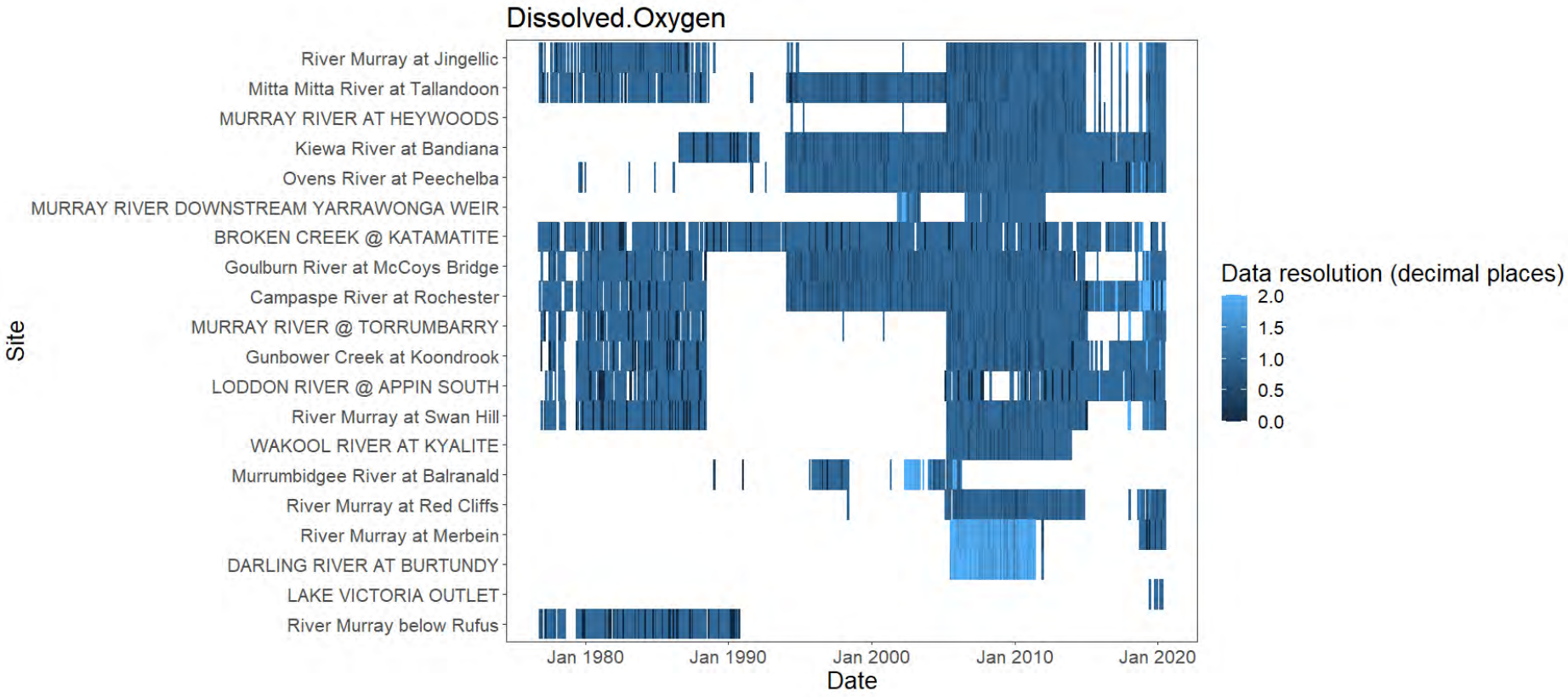


Figure B5. RMWQMP Spot data resolution – Electrical conductivity at 25 °C (decimal places)

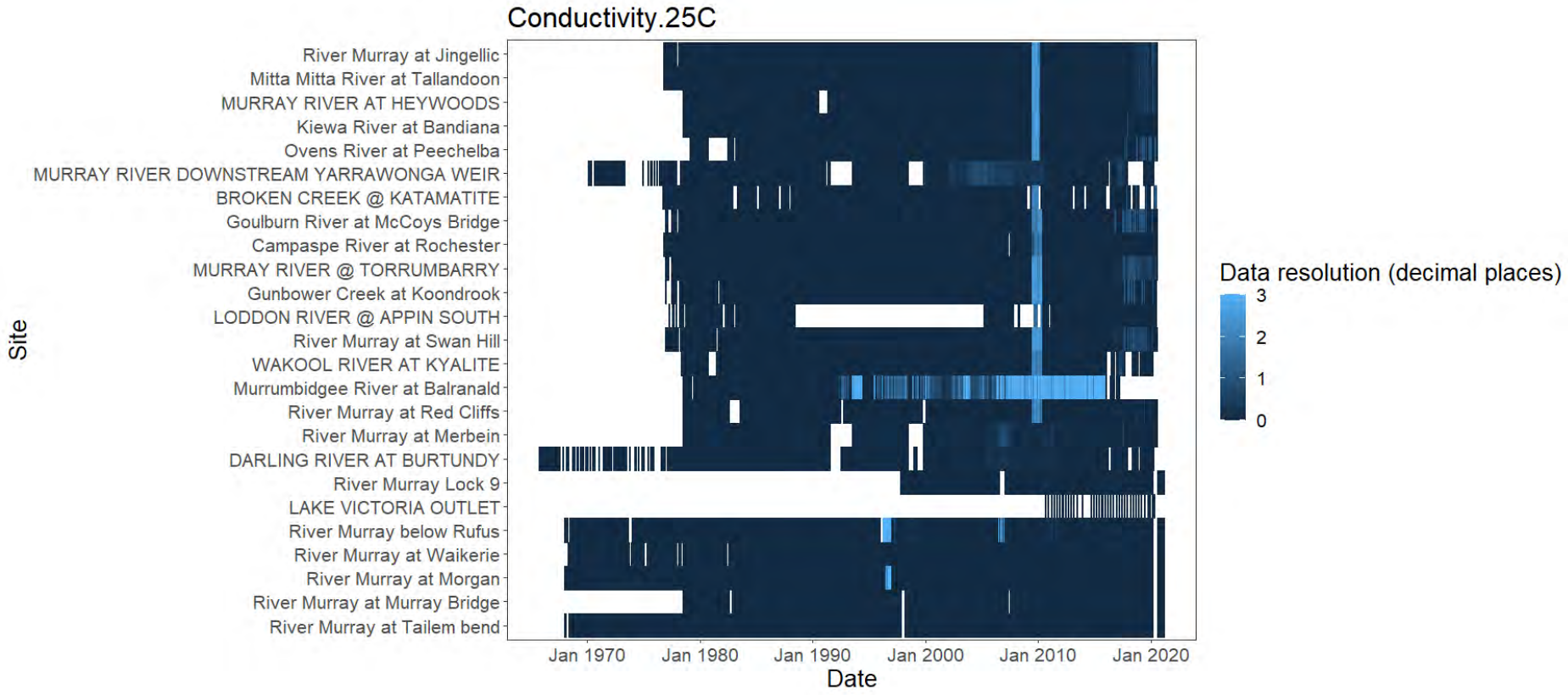


Figure B6. RMWQMP Spot data resolution – Turbidity (decimal places)

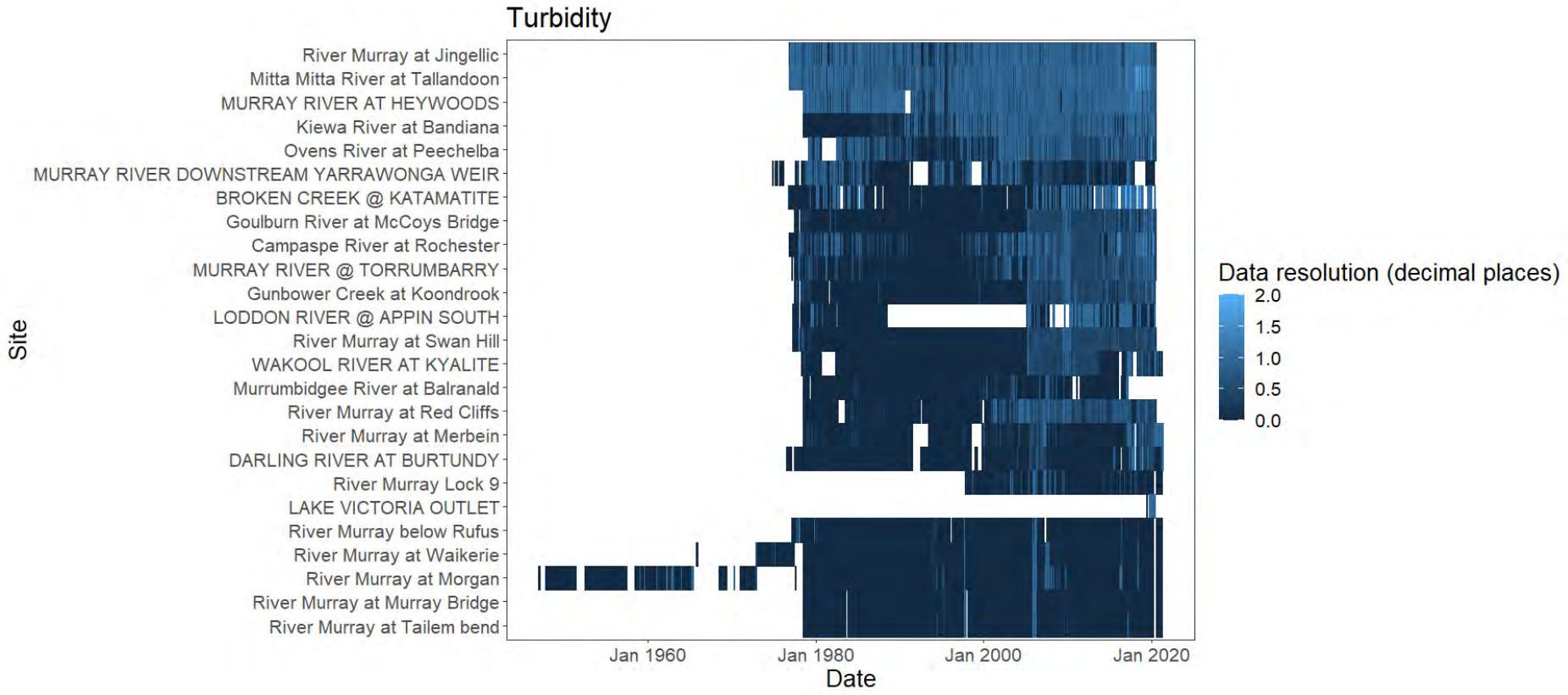


Figure B7. RMWQMP Spot data resolution – Alkalinity (decimal places)

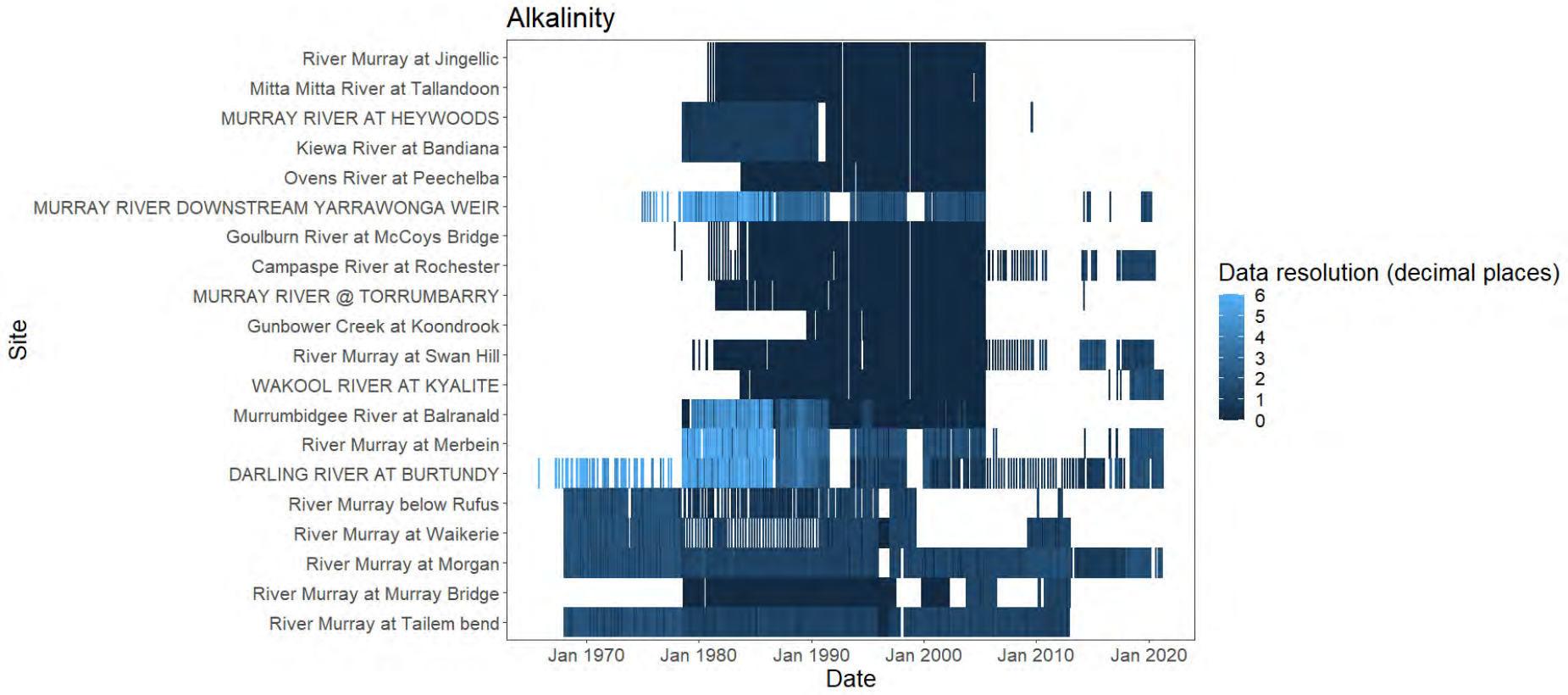


Figure B8. RMWQMP Spot data resolution – Dissolved Organic Carbon (DOC) (decimal places)

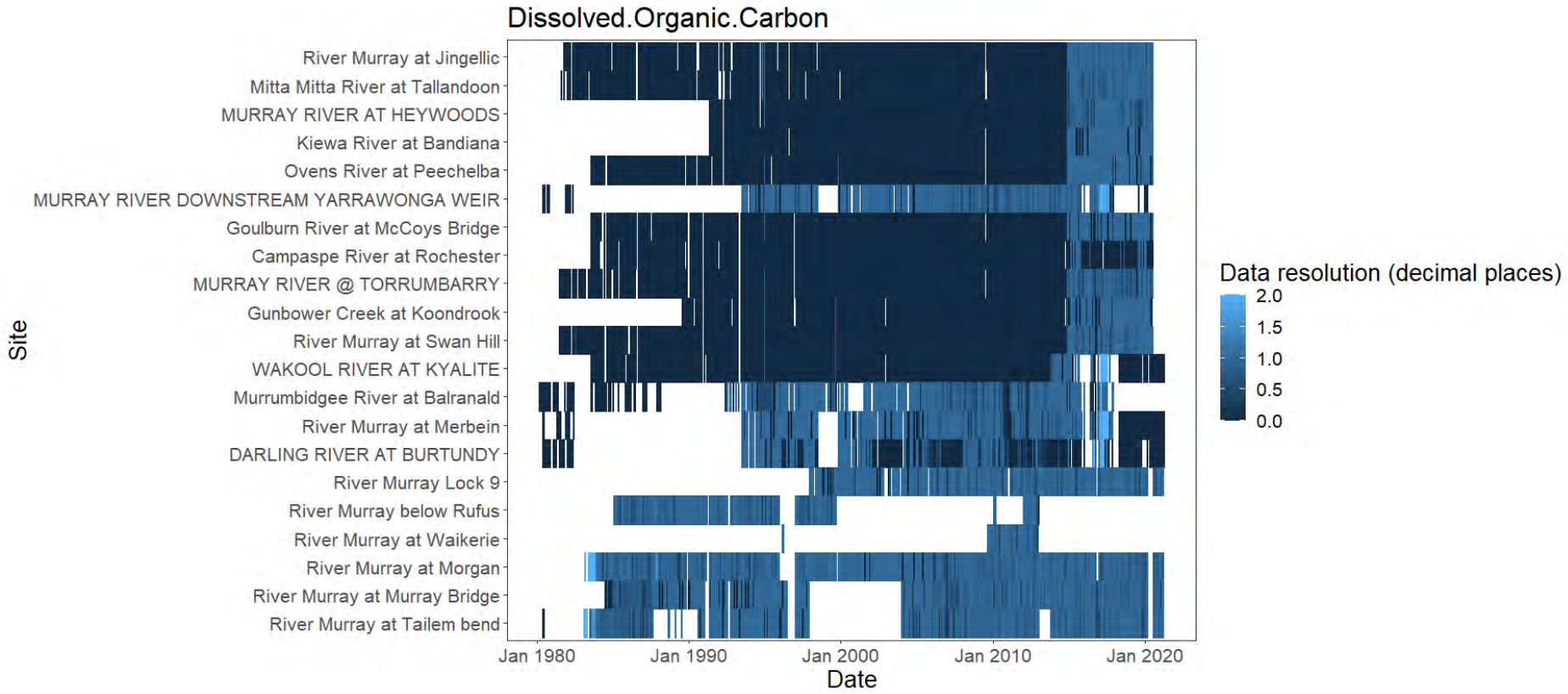


Figure B9. RMWQMP Spot data resolution – Total Kjeldahl Nitrogen (TKN) (decimal places)

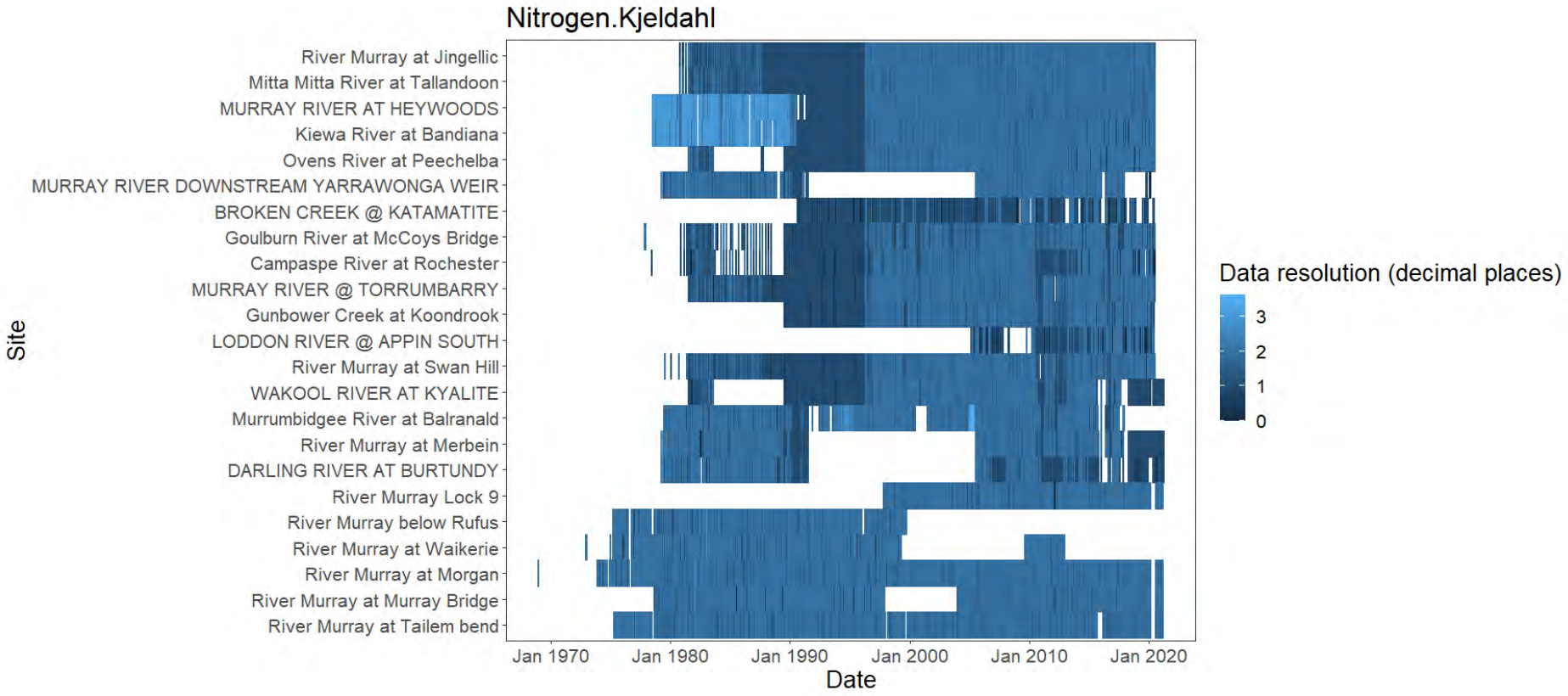


Figure B10. RMWQMP Spot data resolution – Nitrogen oxides (NOx; NO3- + NO2-) (decimal places)

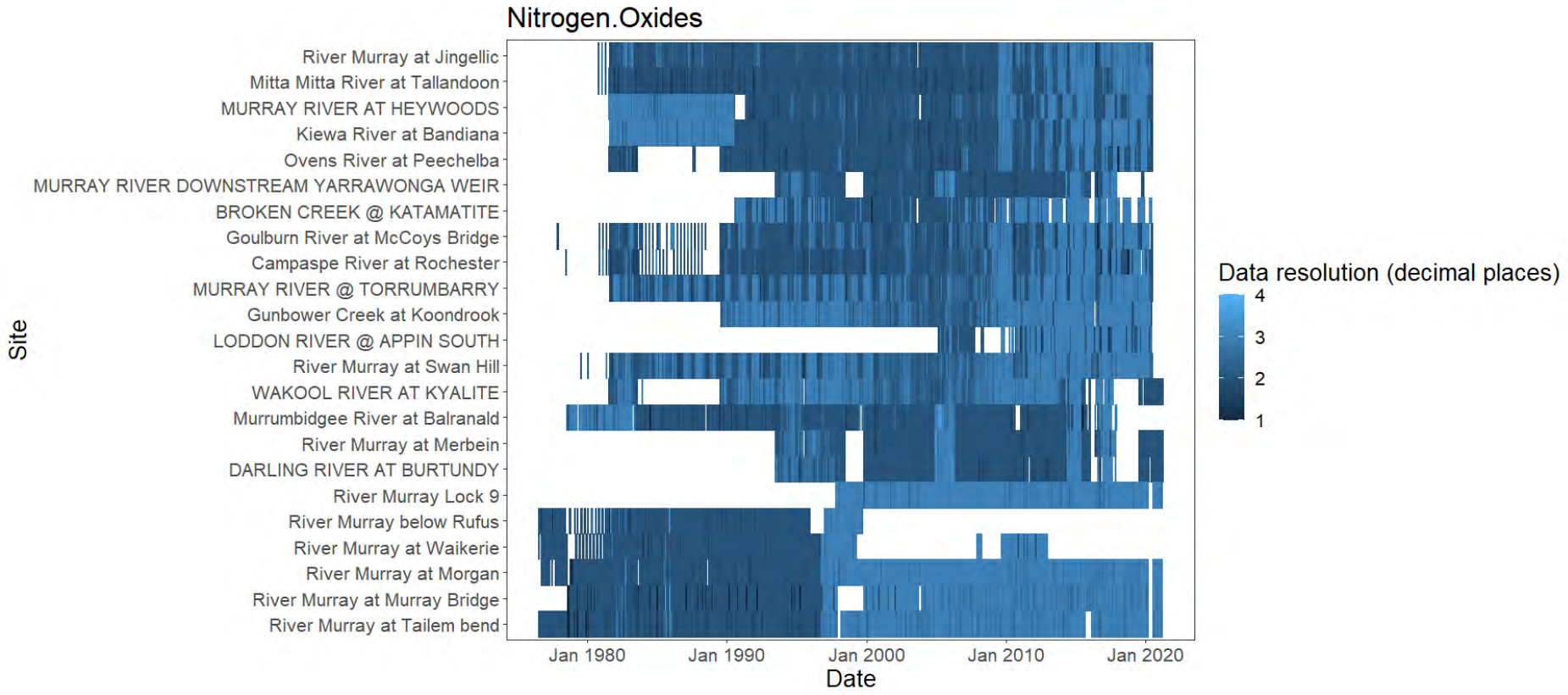


Figure B11. RMWQMP Spot data resolution – Total Phosphorus (decimal places)

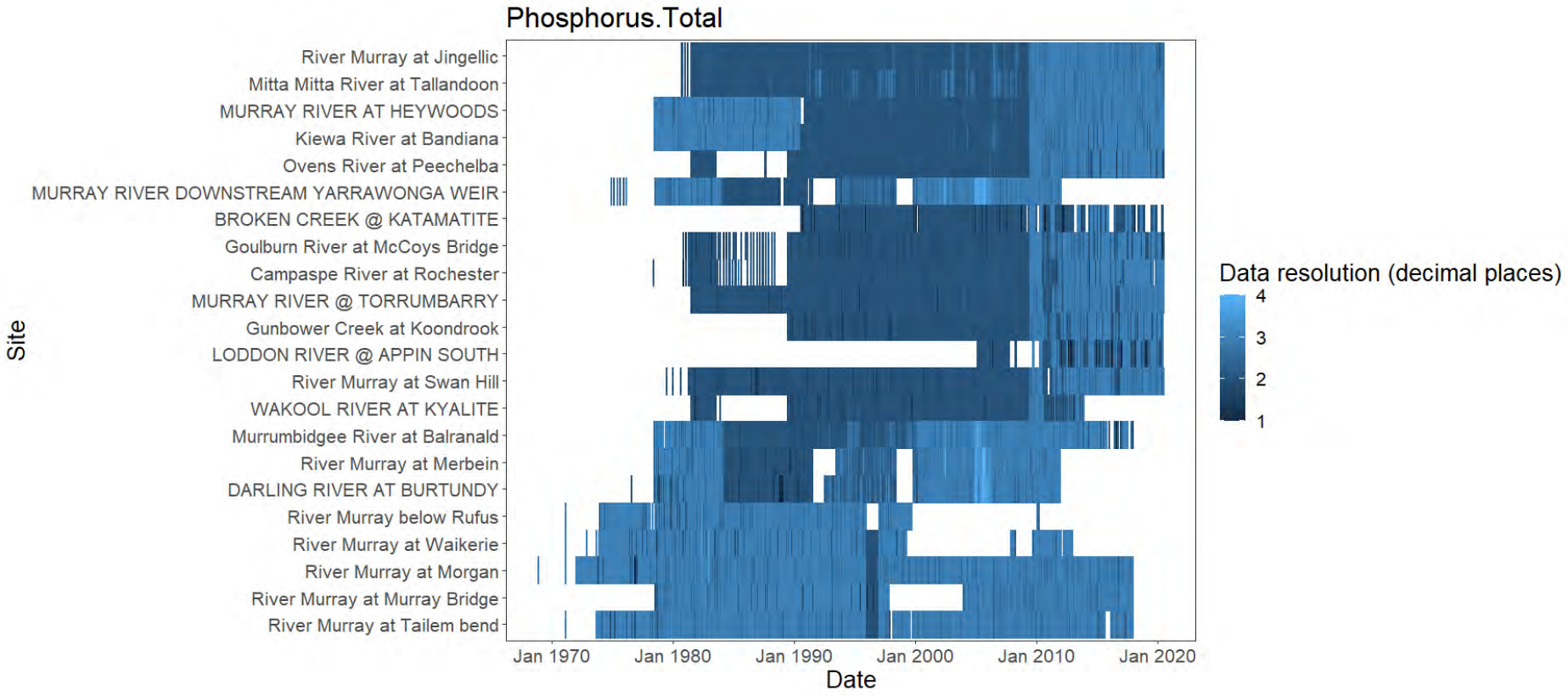


Figure B12. RMWQMP Spot data resolution – Soluble Reactive phosphorus (SRP) (decimal places)

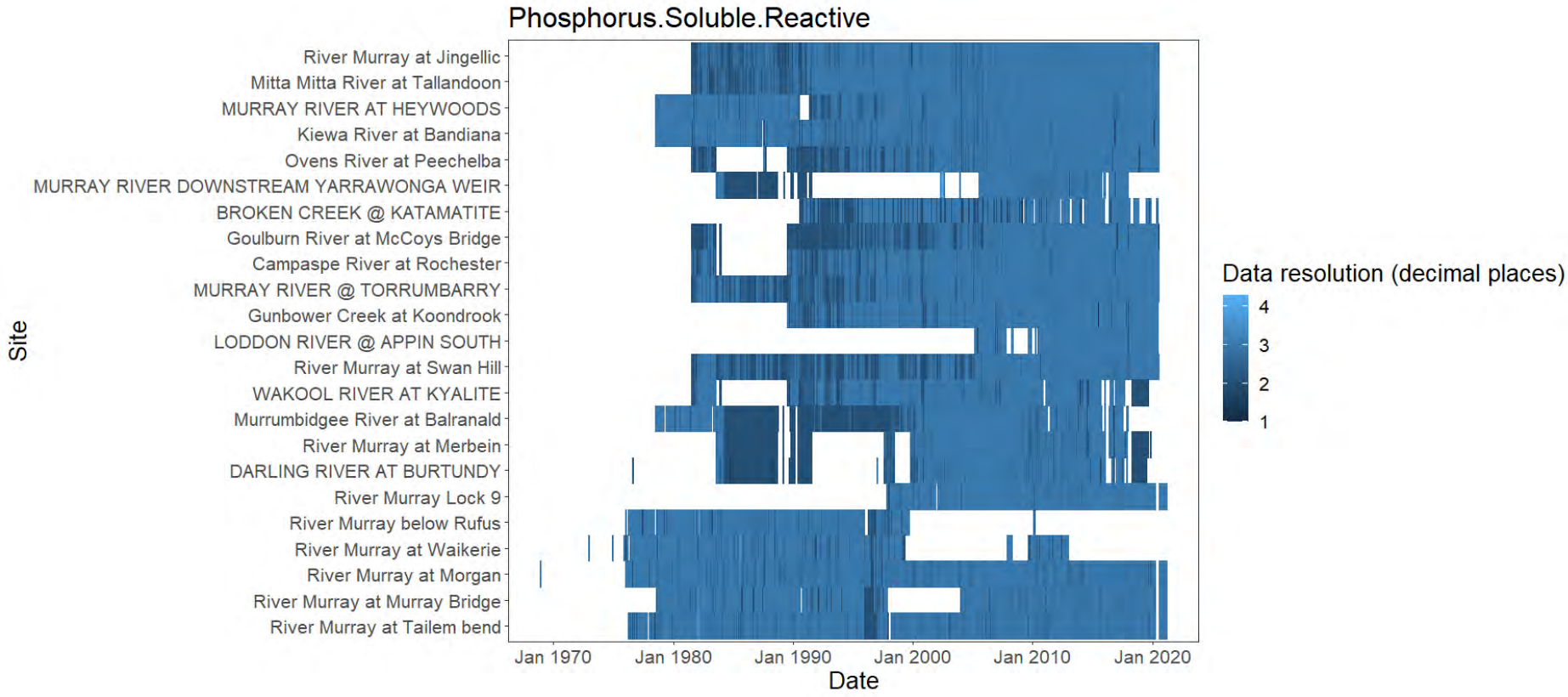
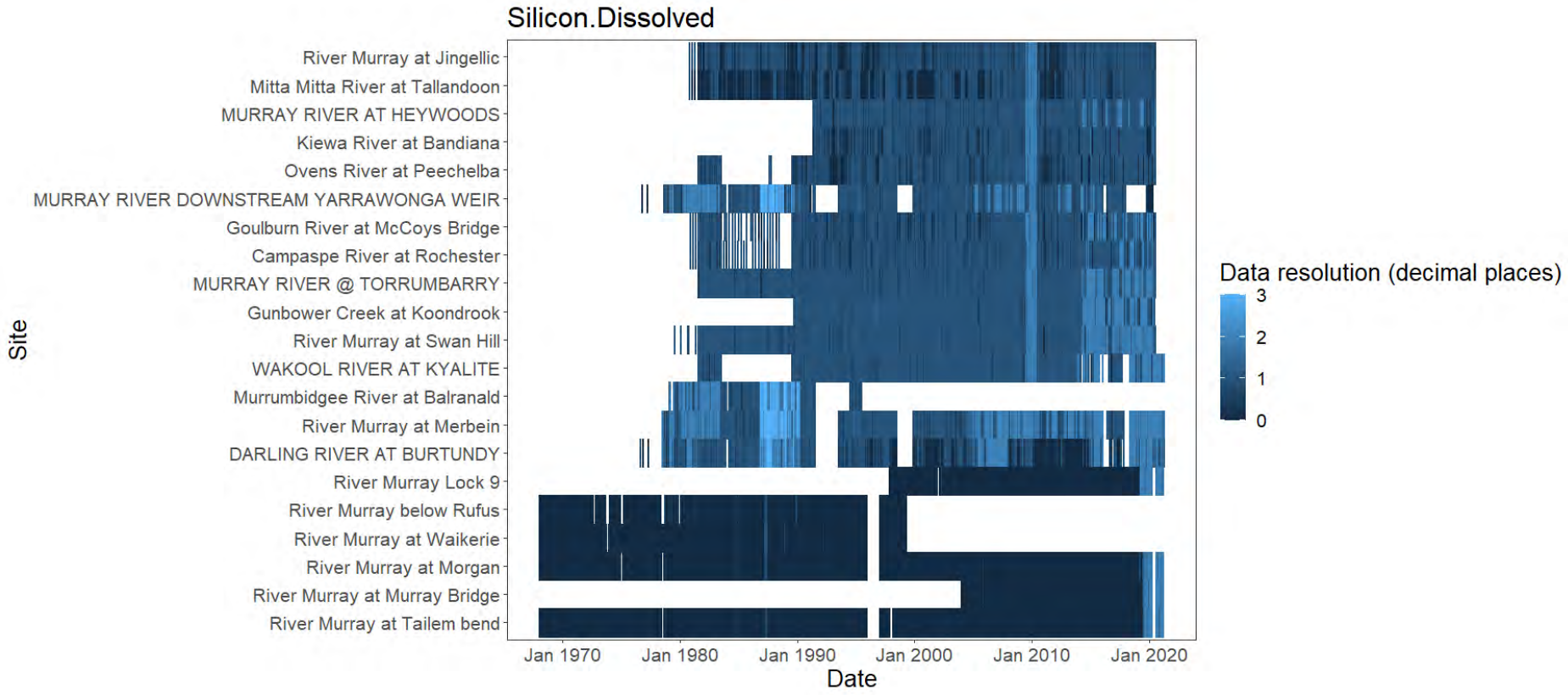
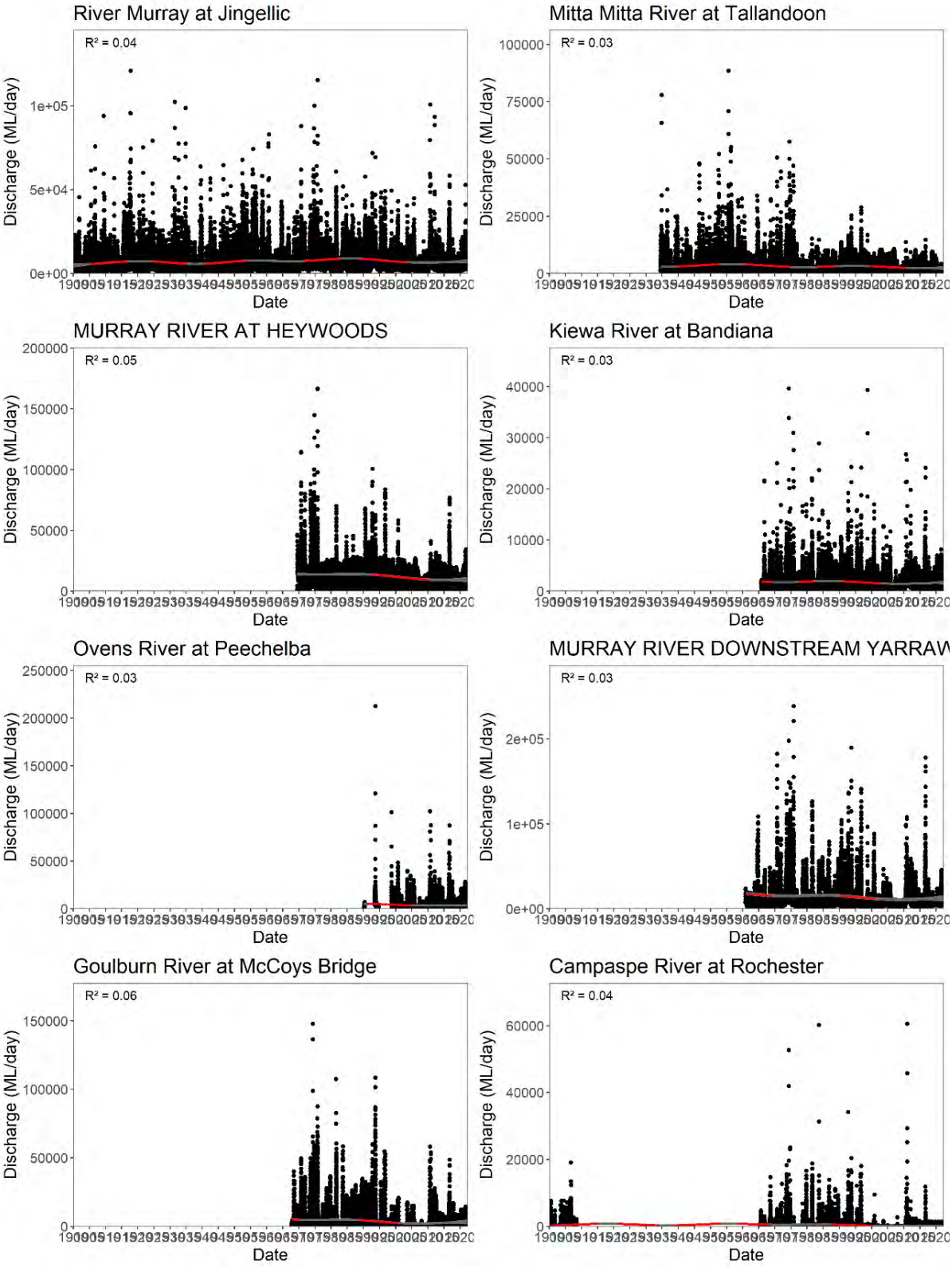


Figure B13. RMWQMP Spot data resolution – Dissolved Silicon (decimal places)



Appendix C – GAMs

Figure C1. RMWQMP Spot data GAMS – Discharge



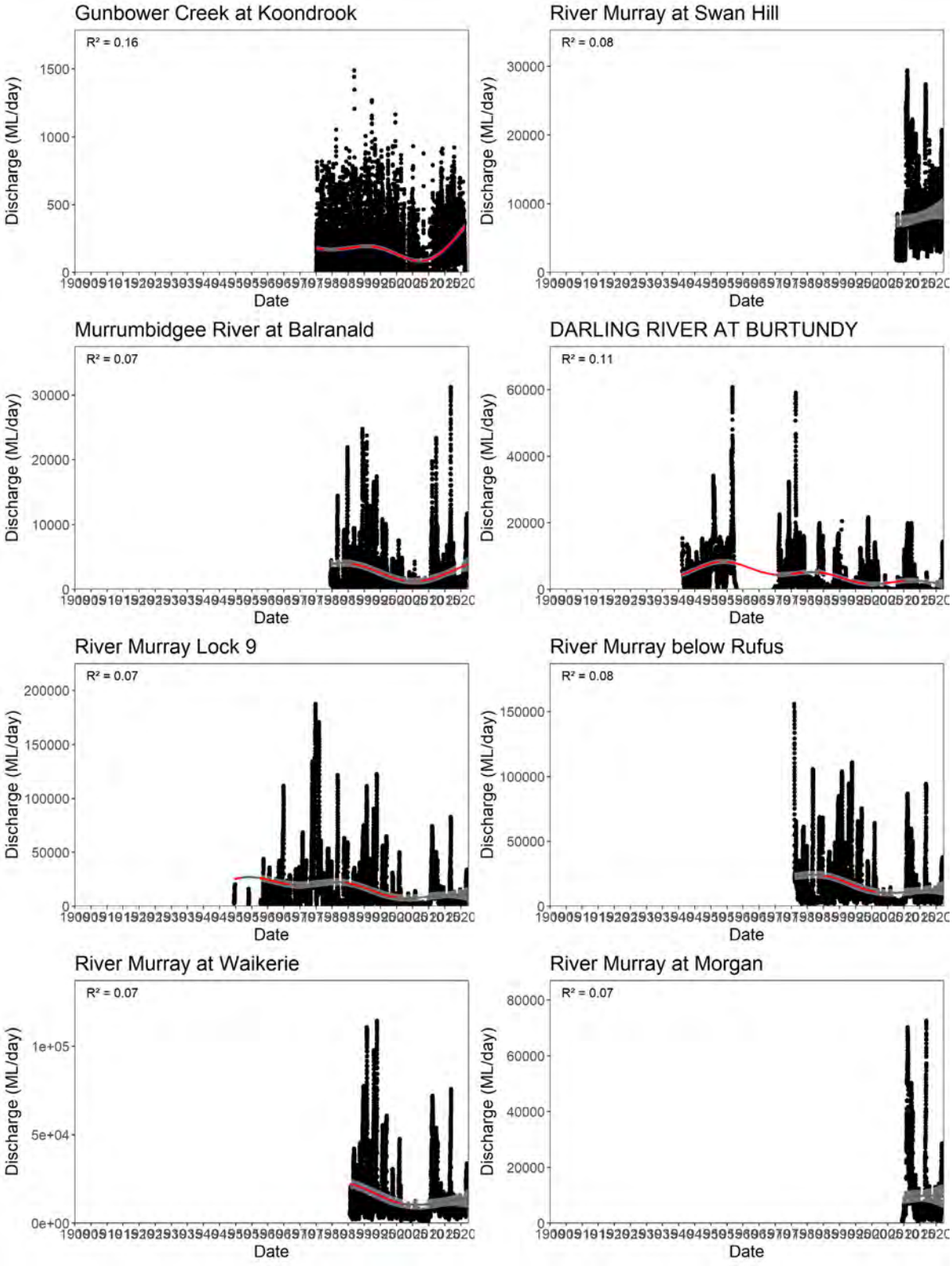
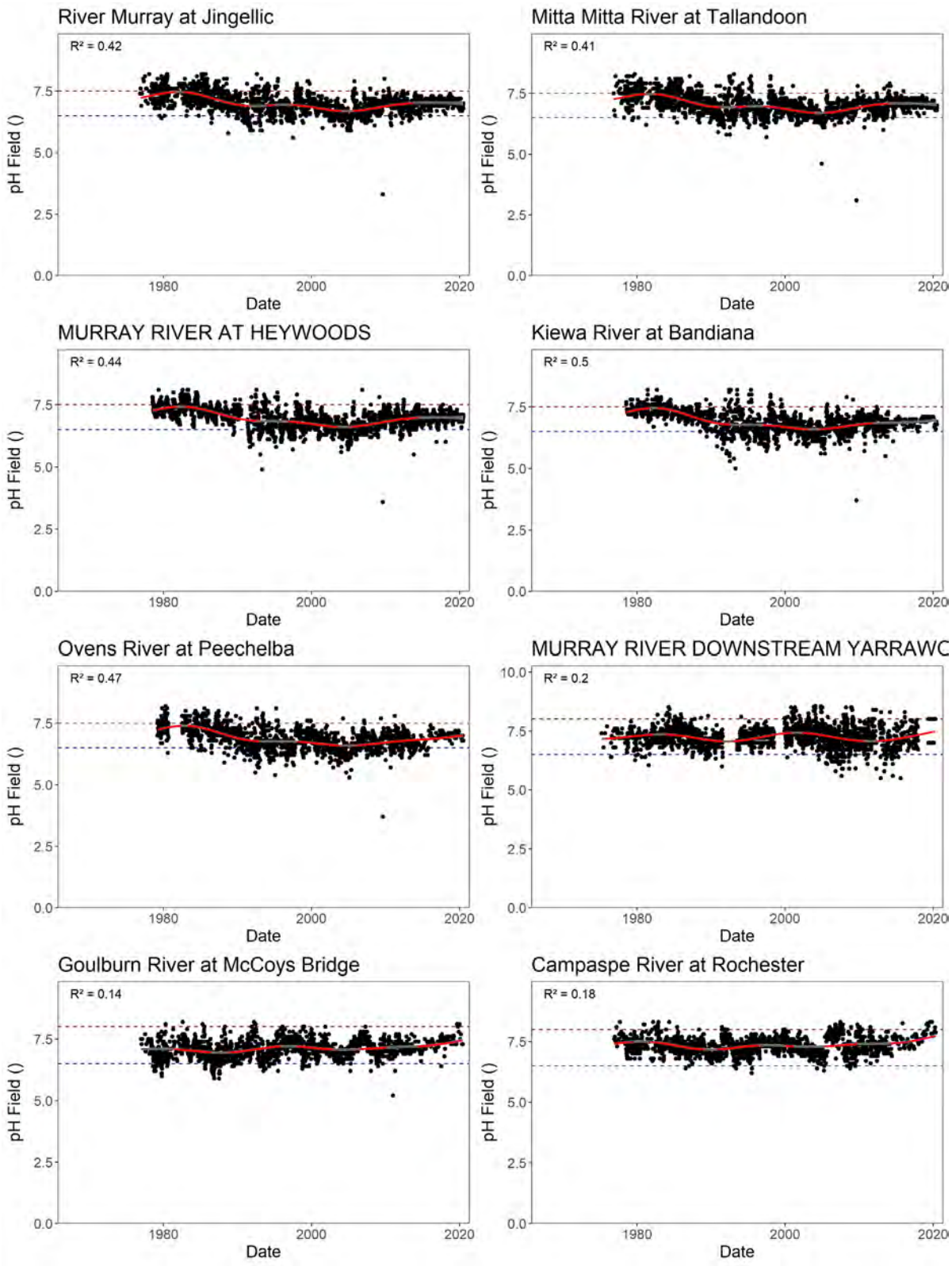
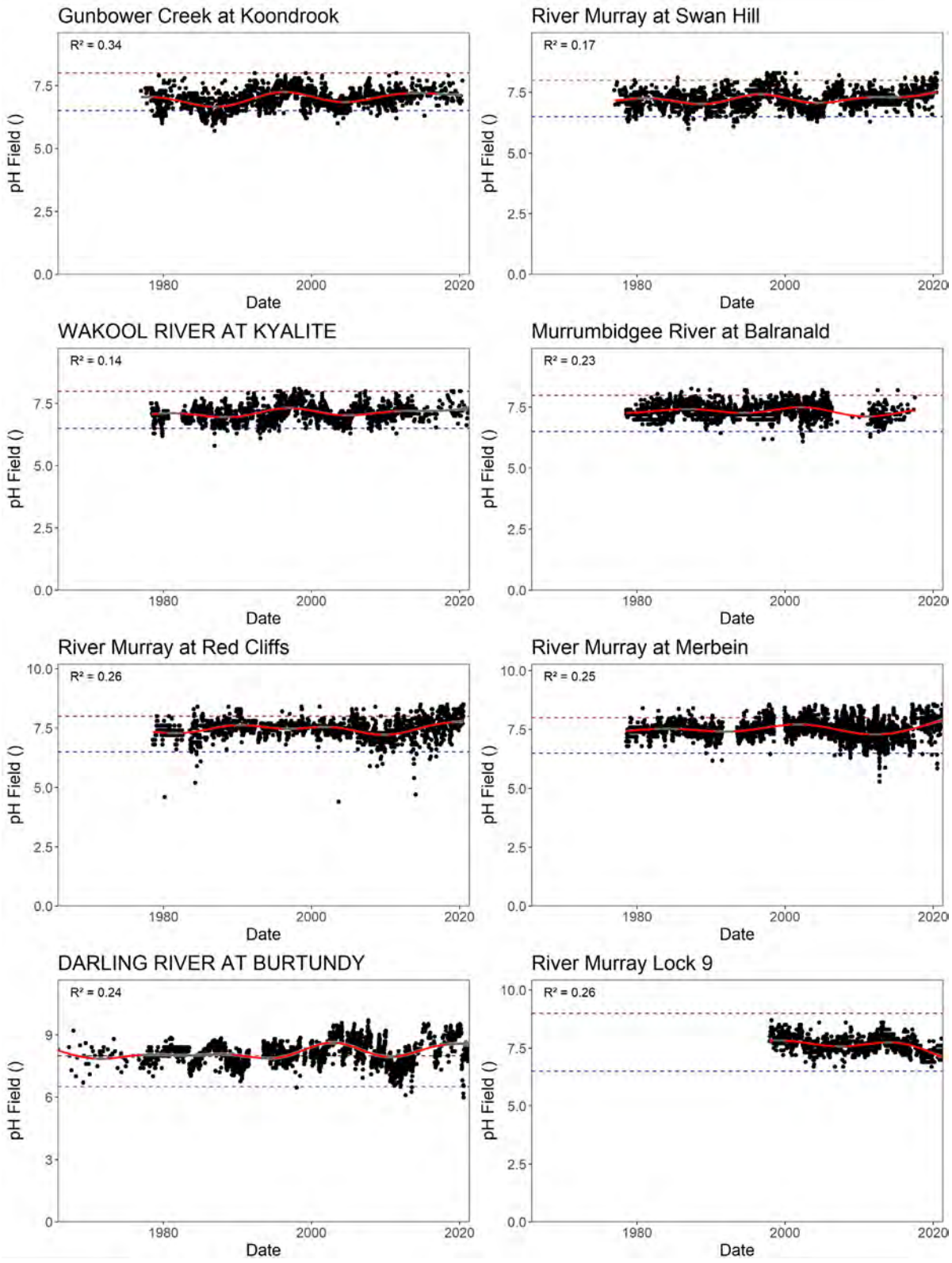
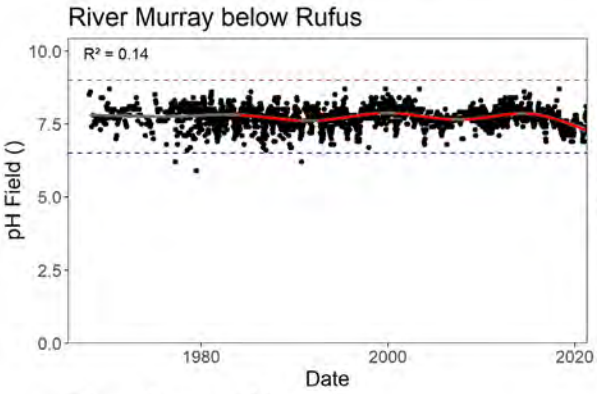
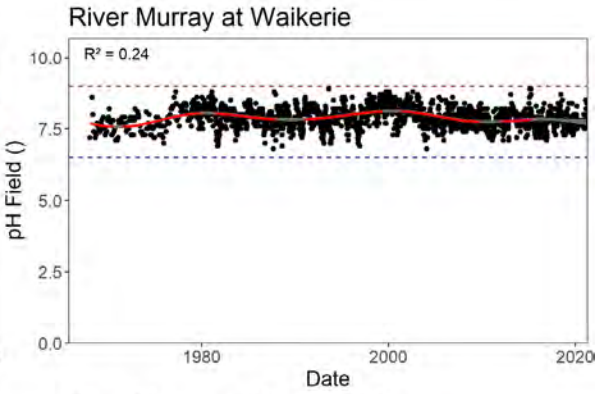

Gunbower Creek at Koondrook
R² = 0.16
Discharge (ML/day)
Date
River Murray at Swan Hill
R² = 0.08
Discharge (ML/day)
Date
Murrumbidgee River at Balranald
R² = 0.07
Discharge (ML/day)
Date
DARLING RIVER AT BURTUNDY
R² = 0.11
Discharge (ML/day)
Date
River Murray Lock 9
R² = 0.07
Discharge (ML/day)
Date
River Murray below Rufus
R² = 0.08
Discharge (ML/day)
Date
River Murray at Waikerie
R² = 0.07
Discharge (ML/day)
Date
River Murray at Morgan
R² = 0.07
Discharge (ML/day)
Date

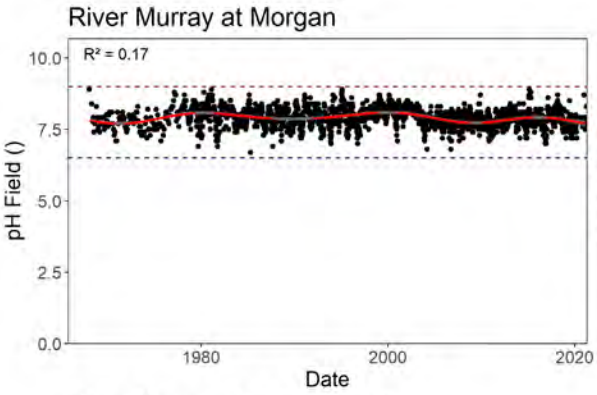
Figure C2. RMWQMP Spot data GAMS – Field pH. Note the dashed lines represent the default ANZG trigger values for pH for that region

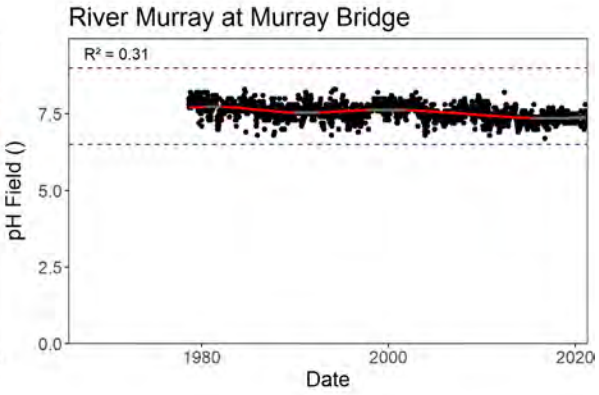



Gunbower Creek at Koondrook
R² = 0.34
River Murray at Swan Hill
R² = 0.17
WAKOOL RIVER AT KYALITE
R² = 0.14
Murrumbidgee River at Balranald
R² = 0.23
River Murray at Red Cliffs
R² = 0.26
River Murray at Merbein
R² = 0.25
DARLING RIVER AT BURTUNDY
R² = 0.24
River Murray Lock 9
R² = 0.26
pH Field ()
Date
1980
2000
2020


River Murray below Rufus
R² = 0.14
pH Field ()
Date
10.0
7.5
5.0
2.5
0.0
1980
2000
2020


River Murray at Waikerie
R² = 0.24
pH Field ()
Date
10.0
7.5
5.0
2.5
0.0
1980
2000
2020


River Murray at Morgan
R² = 0.17
pH Field ()
Date
10.0
7.5
5.0
2.5
0.0
1980
2000
2020


River Murray at Murray Bridge
R² = 0.31
pH Field ()
Date
7.5
5.0
2.5
0.0
1980
2000
2020

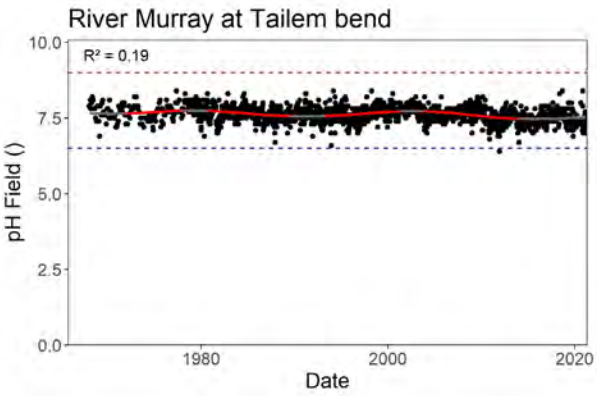
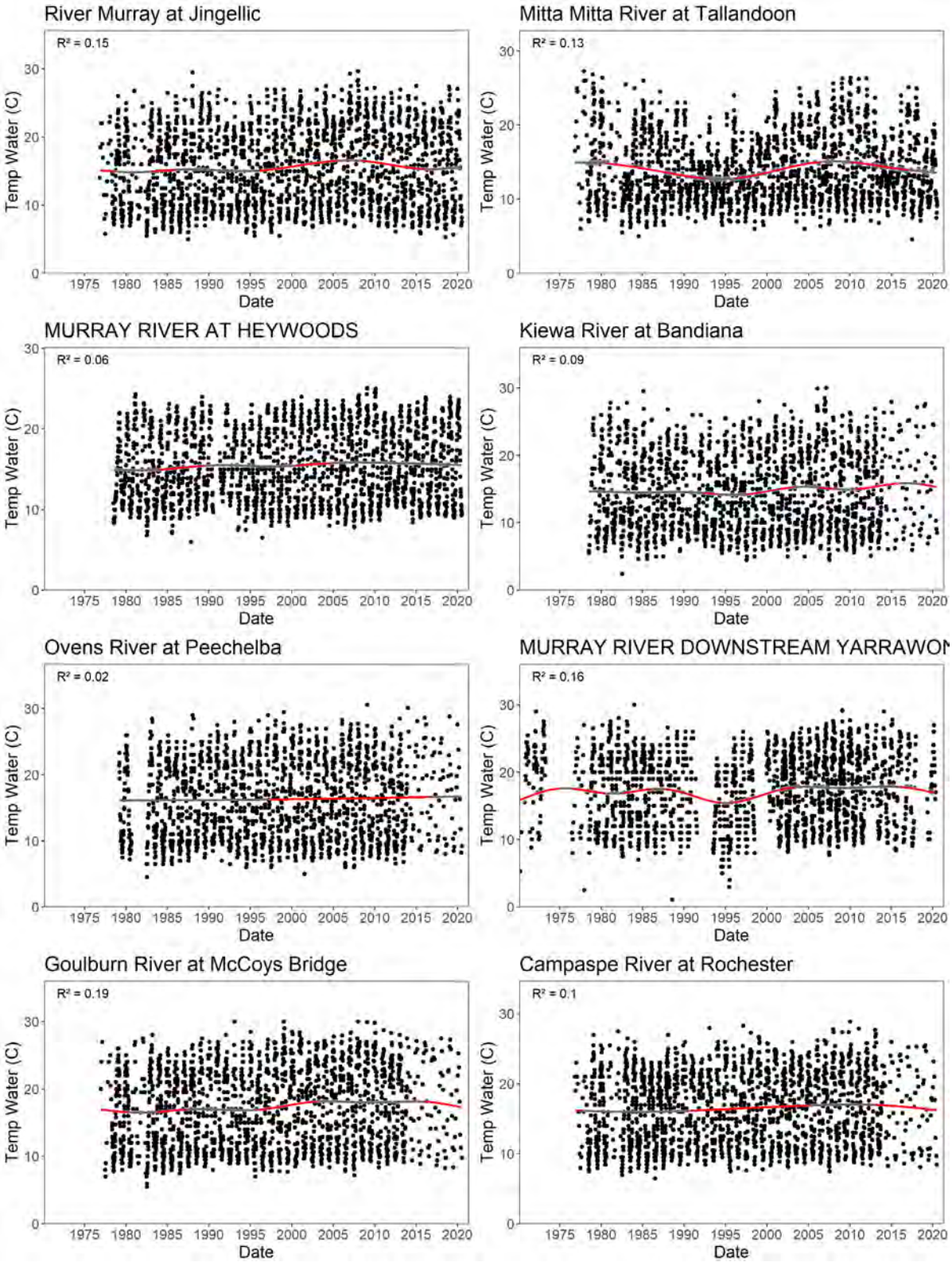
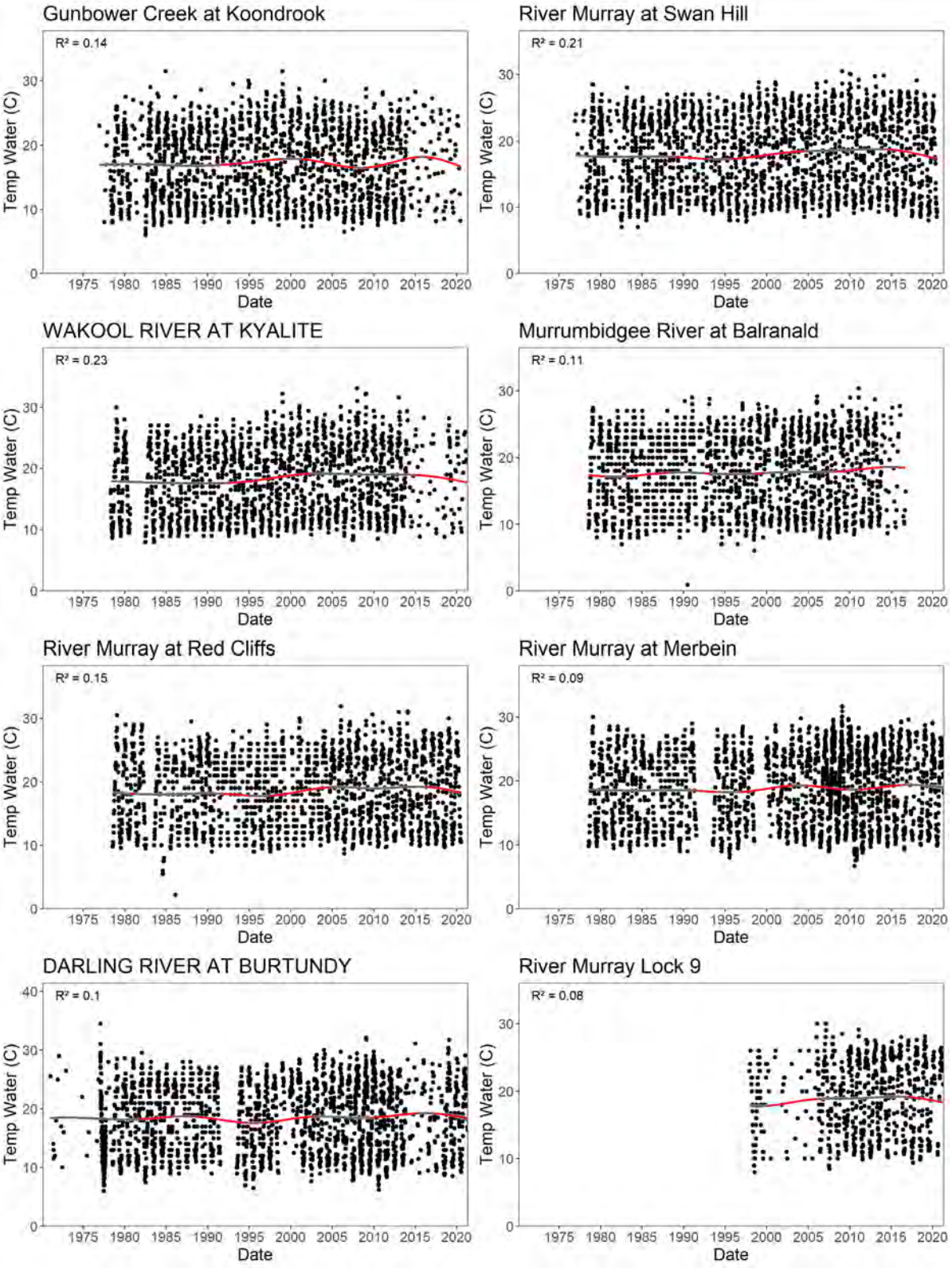

River Murray at Tailem bend
R² = 0.19
pH Field ()
Date
10.0
7.5
5.0
2.5
0.0
1980
2000
2020

Figure C3. RMWQMP Spot data GAMS – Water temperature




Gunbower Creek at Koondrook
R² = 0.14
River Murray at Swan Hill
R² = 0.21
WAKOOL RIVER AT KYALITE
R² = 0.23
Murrumbidgee River at Balranald
R² = 0.11
River Murray at Red Cliffs
R² = 0.15
River Murray at Merbein
R² = 0.09
DARLING RIVER AT BURTUNDY
R² = 0.1
River Murray Lock 9
R² = 0.08
Temp Water (C)
Date
0
10
20
30
40
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020

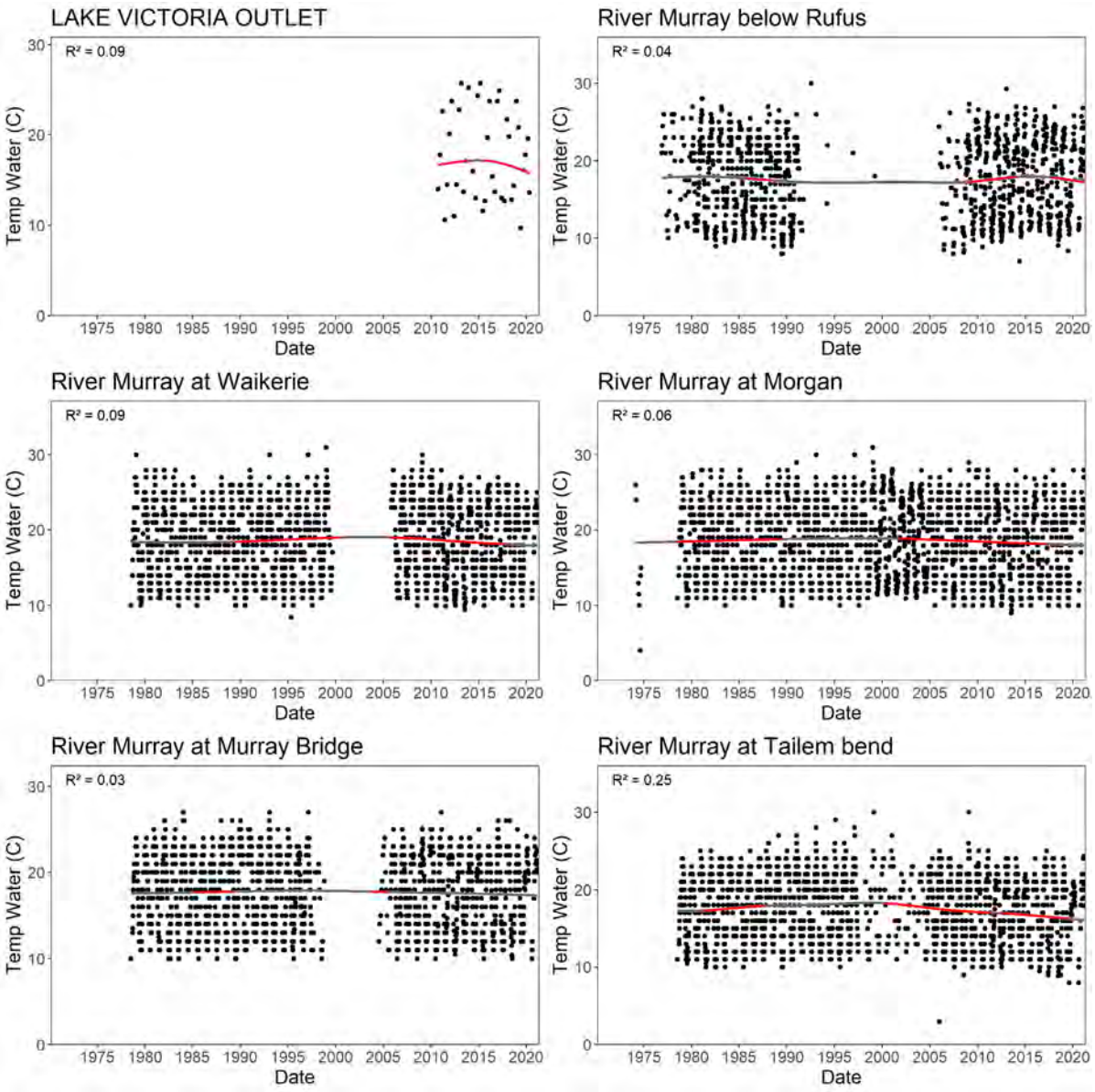
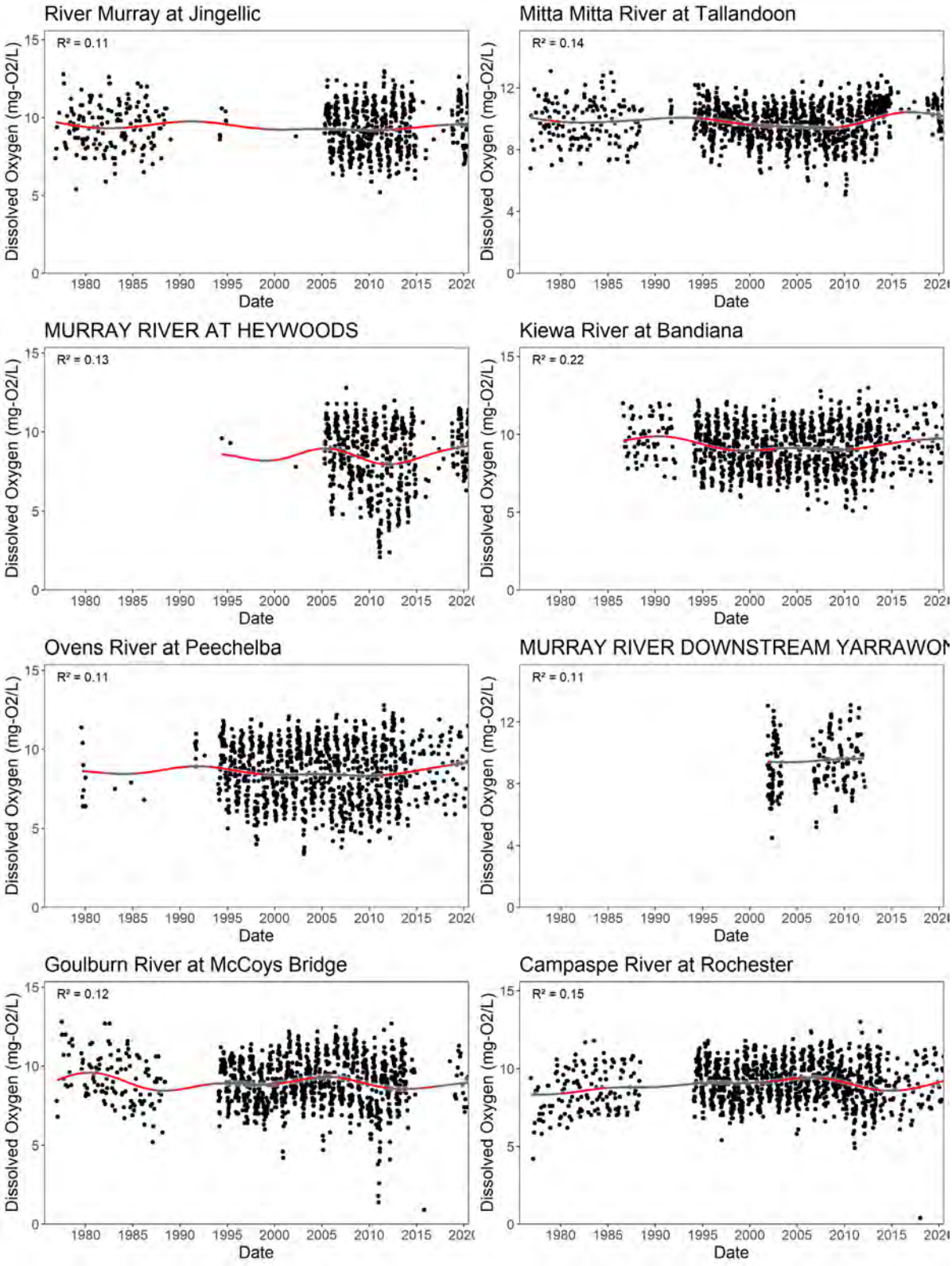

LAKE VICTORIA OUTLET
R² = 0.09
River Murray below Rufus
R² = 0.04
River Murray at Waikerie
R² = 0.09
River Murray at Morgan
R² = 0.06
River Murray at Murray Bridge
R² = 0.03
River Murray at Tailem bend
R² = 0.25
Temp Water (C)
Date
0
10
20
30
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020

Figure C4. RMWQMP Spot data GAMS – Dissolved oxygen



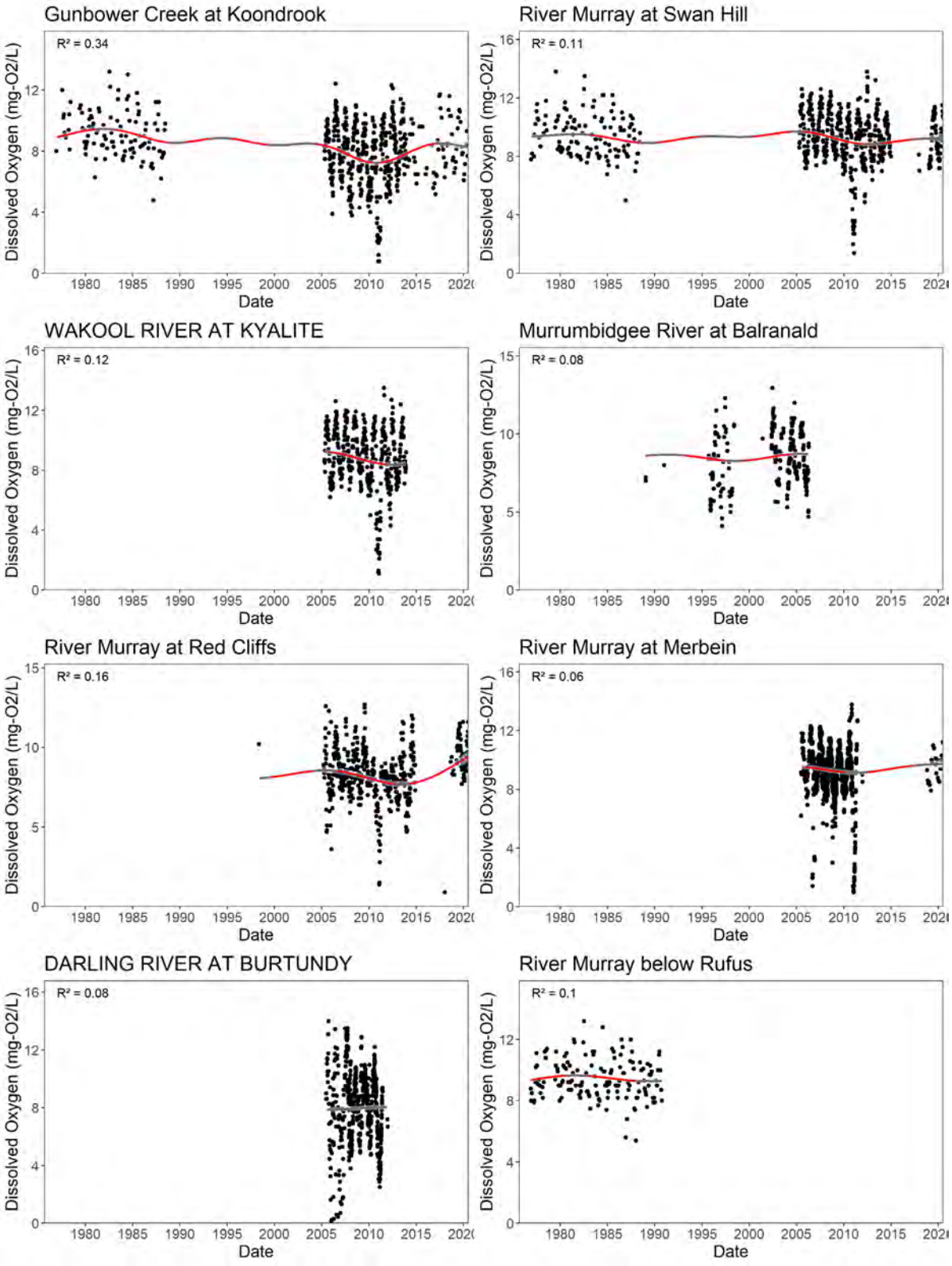
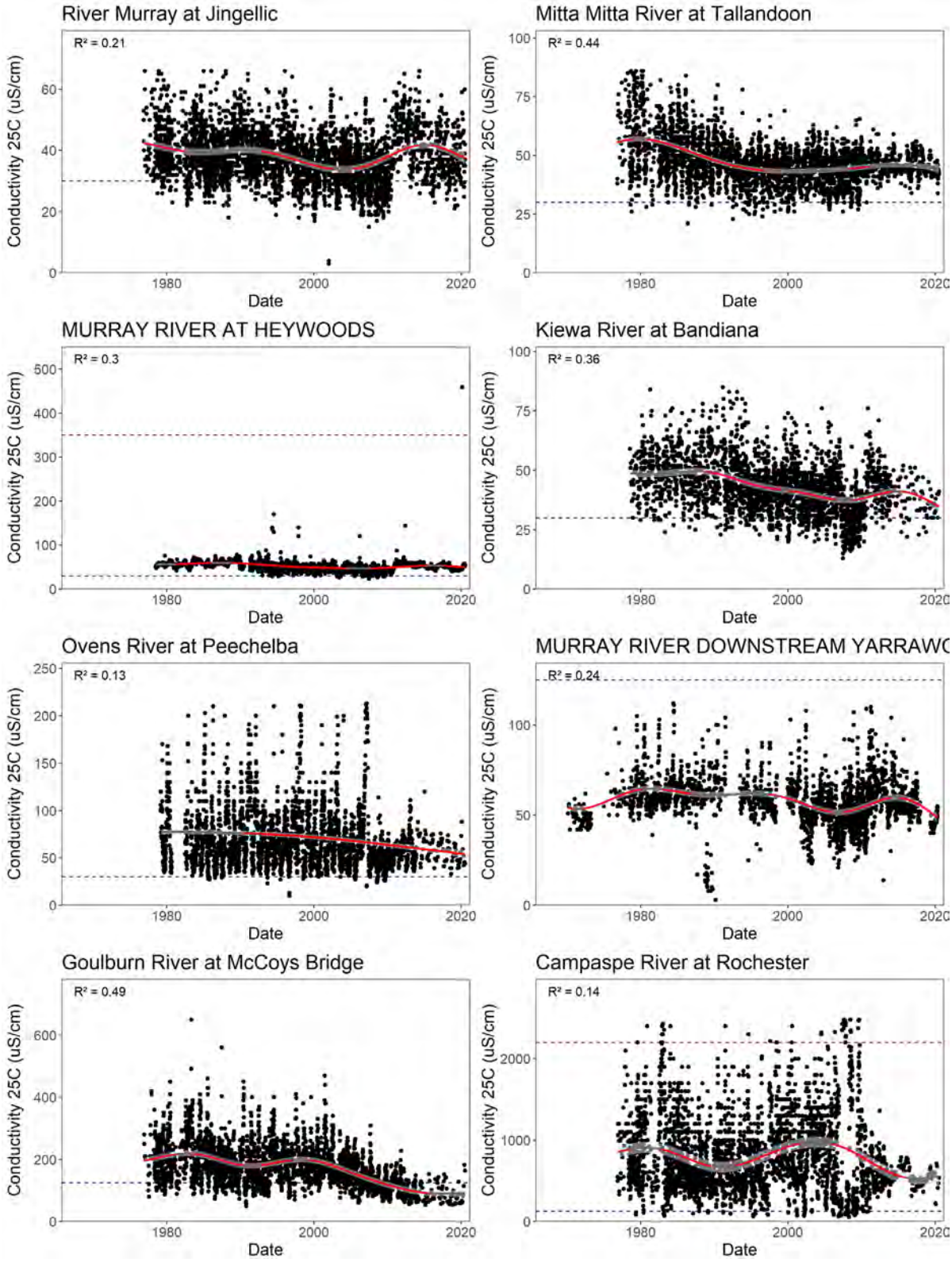
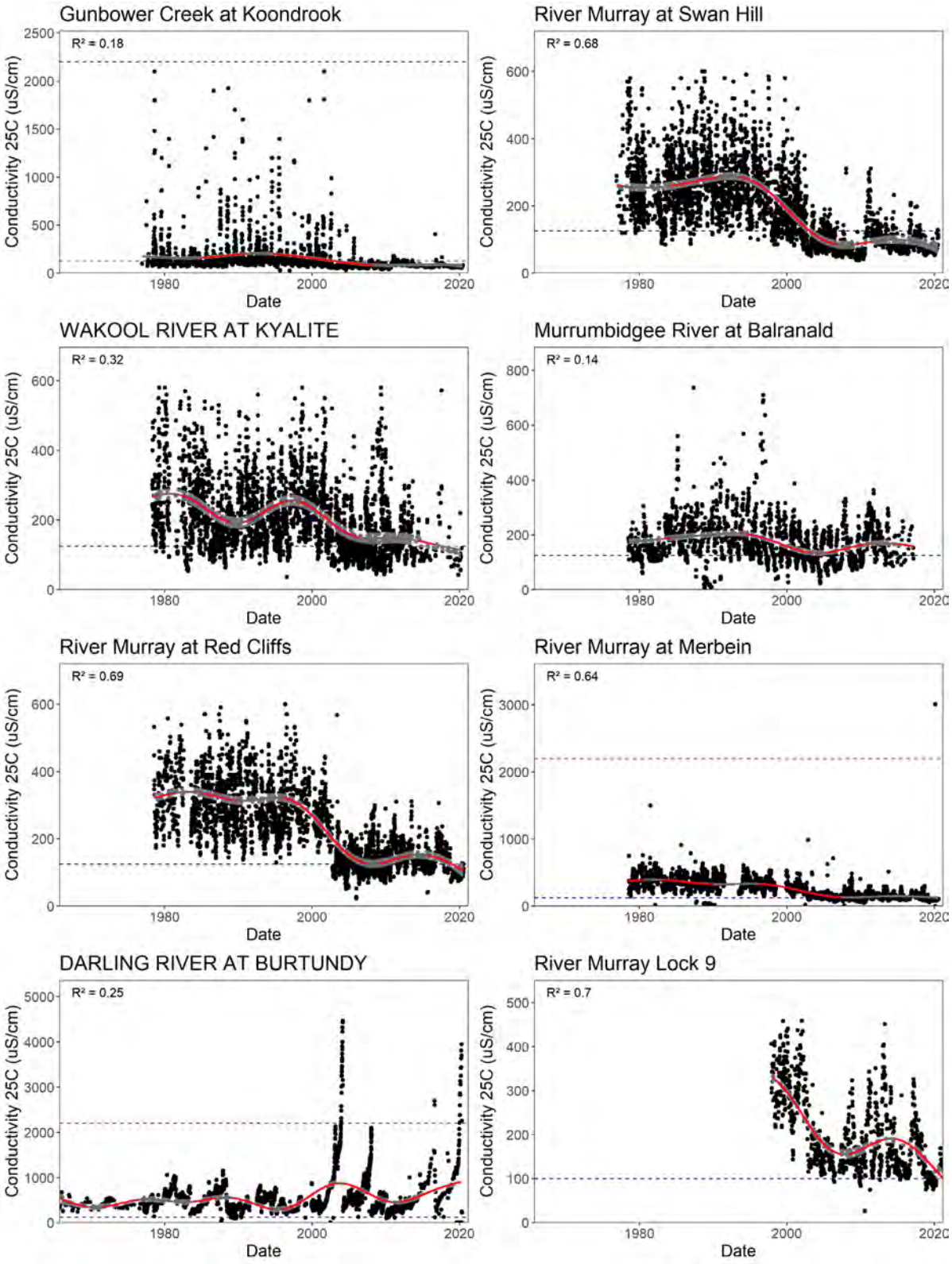

Gunbower Creek at Koondrook
R² = 0.34
River Murray at Swan Hill
R² = 0.11
WAKOOL RIVER AT KYALITE
R² = 0.12
Murrumbidgee River at Balranald
R² = 0.08
River Murray at Red Cliffs
R² = 0.16
River Murray at Merbein
R² = 0.06
DARLING RIVER AT BURTUNDY
R² = 0.08
River Murray below Rufus
R² = 0.1
Dissolved Oxygen (mg-O2/L)
Date

Figure C5. RMWQMP Spot data GAMS – Electrical conductivity. Note the dashed lines represent the default ANZG trigger values for EC. Some plots only contain the lower value as the higher exceeds the current y axes values.




Gunbower Creek at Koondrook
R² = 0.18
River Murray at Swan Hill
R² = 0.68
WAKOOL RIVER AT KYALITE
R² = 0.32
Murrumbidgee River at Balranald
R² = 0.14
River Murray at Red Cliffs
R² = 0.69
River Murray at Merbein
R² = 0.64
DARLING RIVER AT BURTUNDY
R² = 0.25
River Murray Lock 9
R² = 0.7
Conductivity 25C (uS/cm)
Date
1980
2000
2020

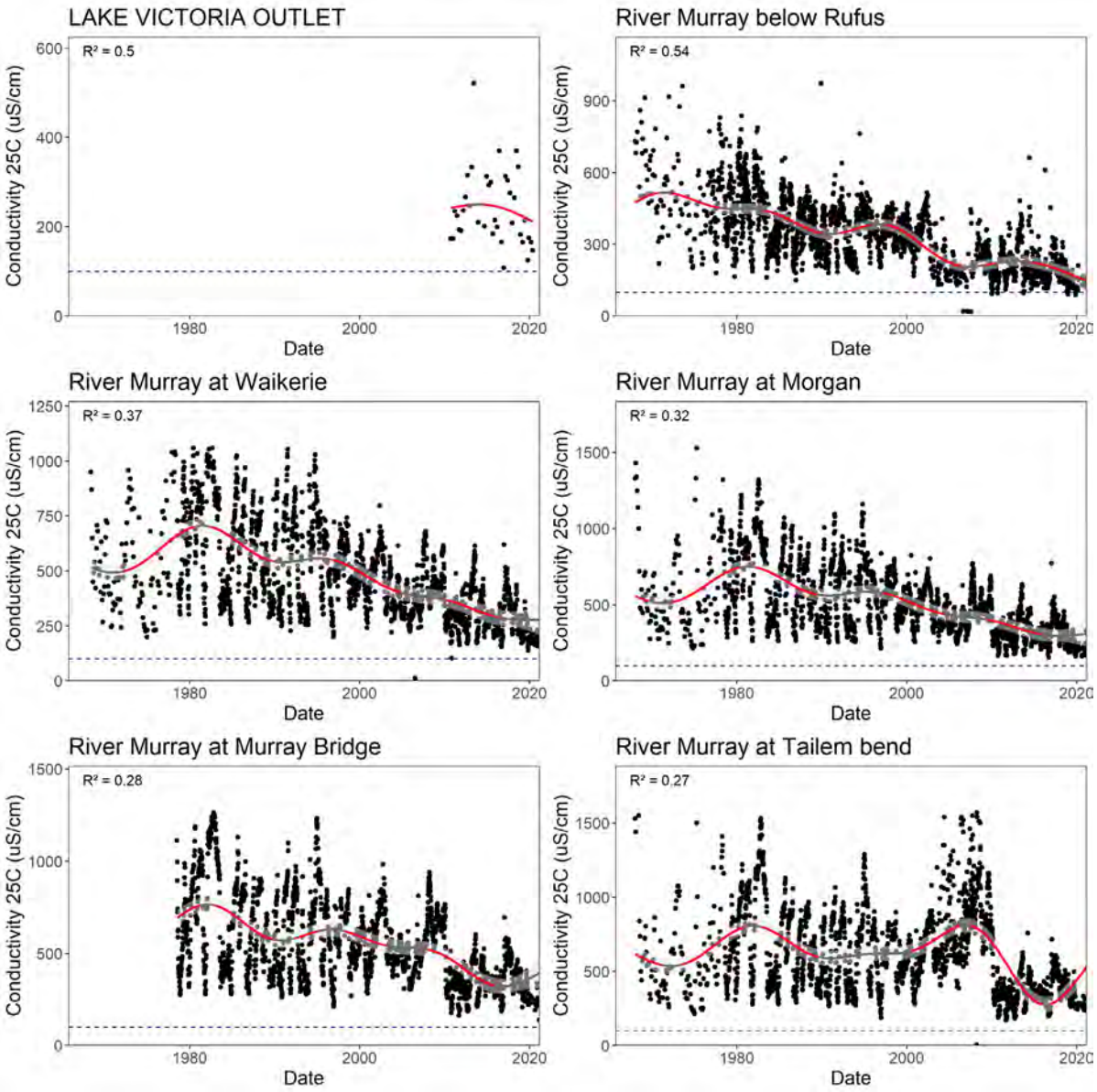
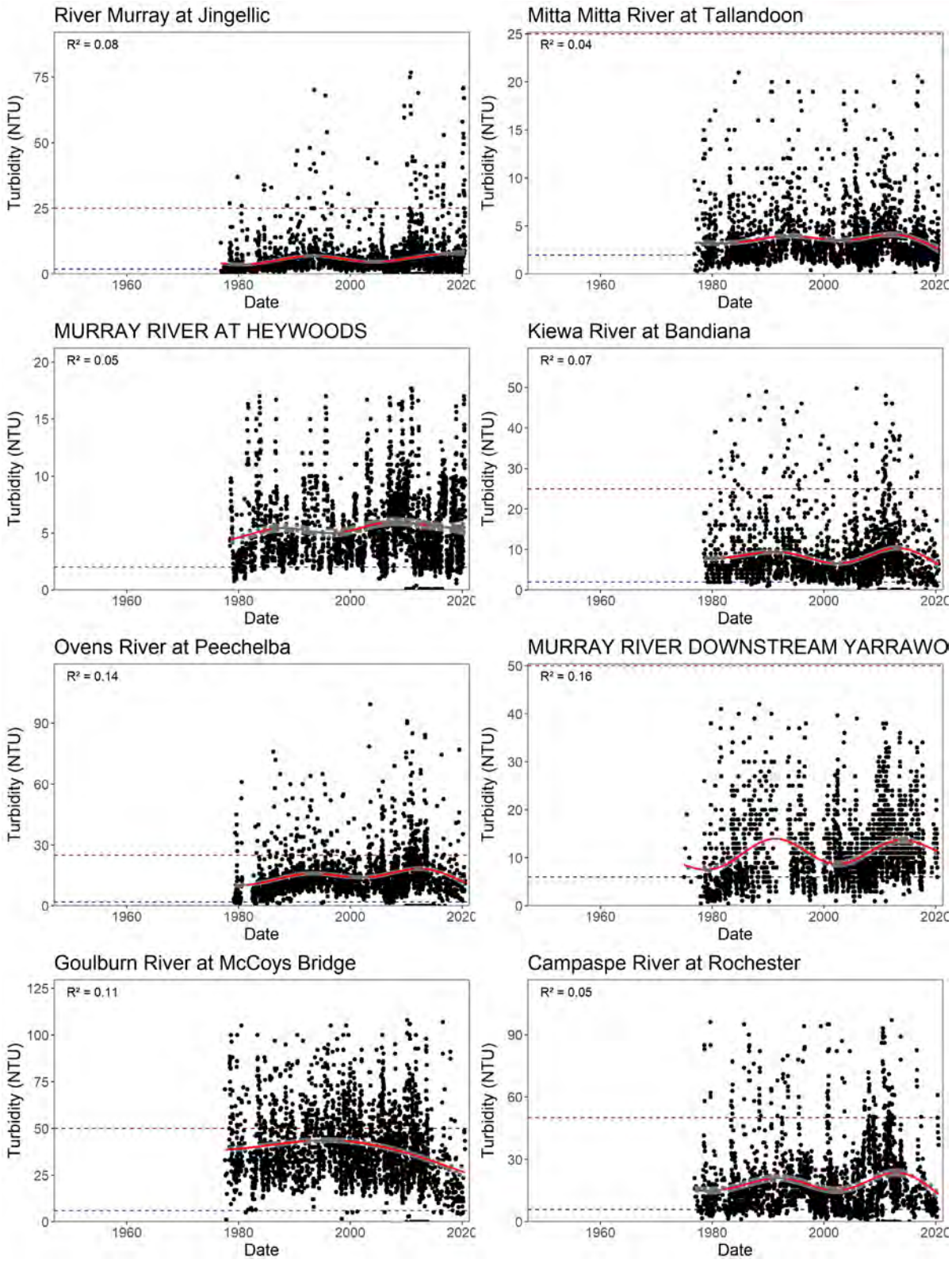
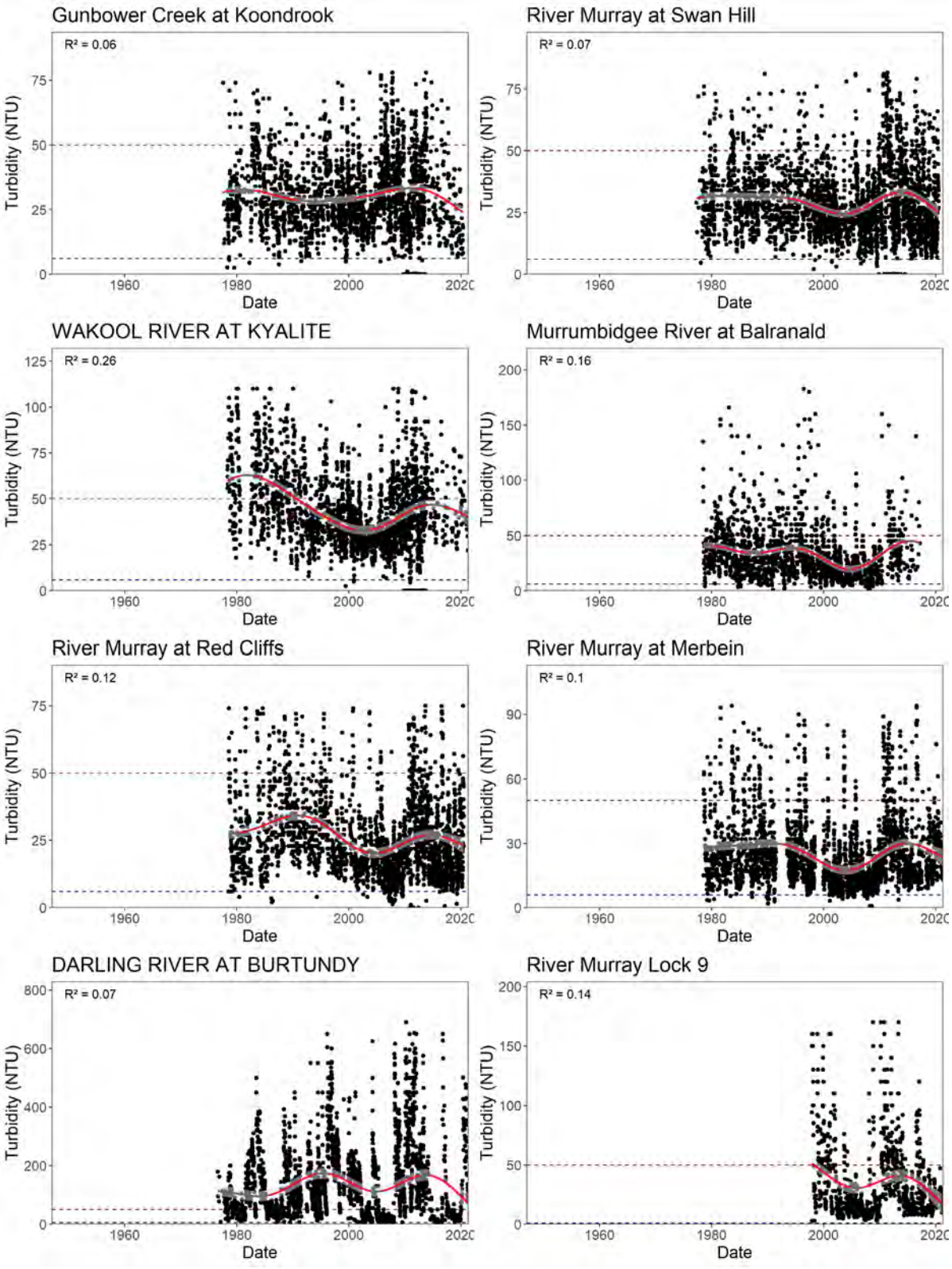

LAKE VICTORIA OUTLET
R² = 0.5
Conductivity 25C (uS/cm)
Date
River Murray below Rufus
R² = 0.54
River Murray at Waikerie
R² = 0.37
River Murray at Morgan
R² = 0.32
River Murray at Murray Bridge
R² = 0.28
River Murray at Tailem bend
R² = 0.27

Figure C6. RMWQMP Spot data GAMS – Turbidity. Note the dashed lines represent the default ANZG trigger values for turbidity. Some plots only contain the lower value as the higher exceeds the current y axes values.




Gunbower Creek at Koondrook
R² = 0.06
River Murray at Swan Hill
R² = 0.07
WAKOOL RIVER AT KYALITE
R² = 0.26
Murrumbidgee River at Balranald
R² = 0.16
River Murray at Red Cliffs
R² = 0.12
River Murray at Merbein
R² = 0.1
DARLING RIVER AT BURTUNDY
R² = 0.07
River Murray Lock 9
R² = 0.14
Turbidity (NTU)
Date
1960
1980
2000

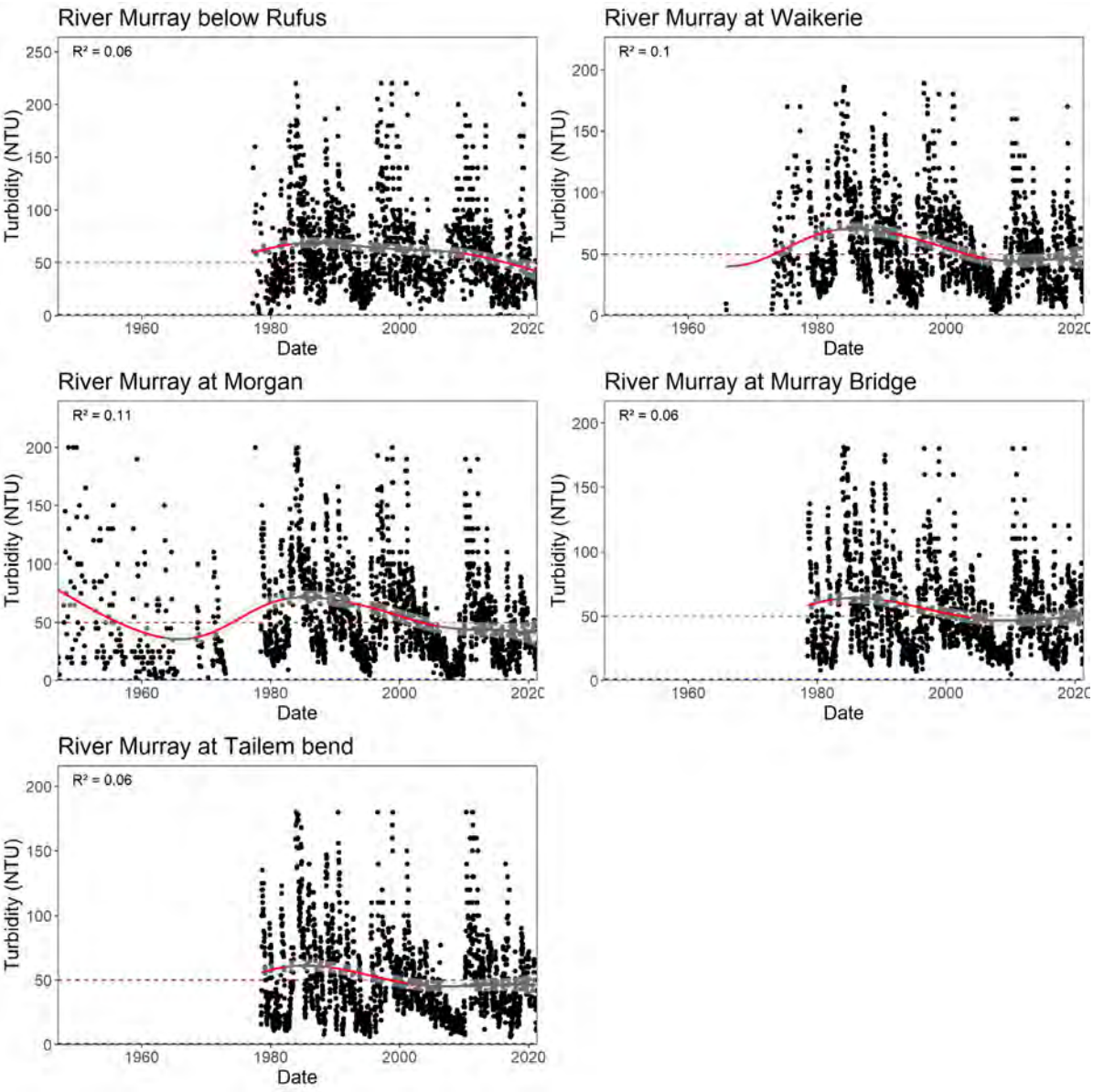
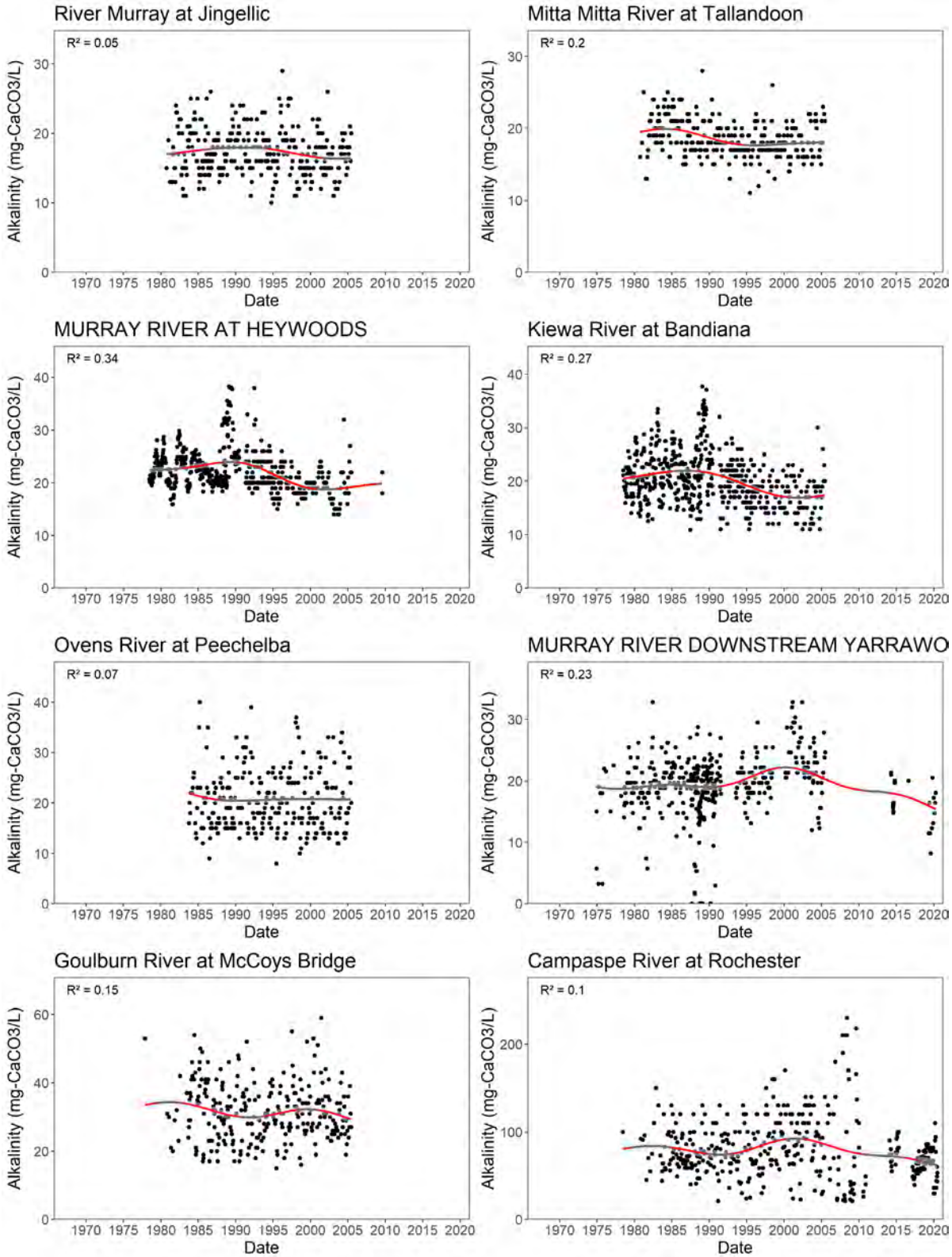
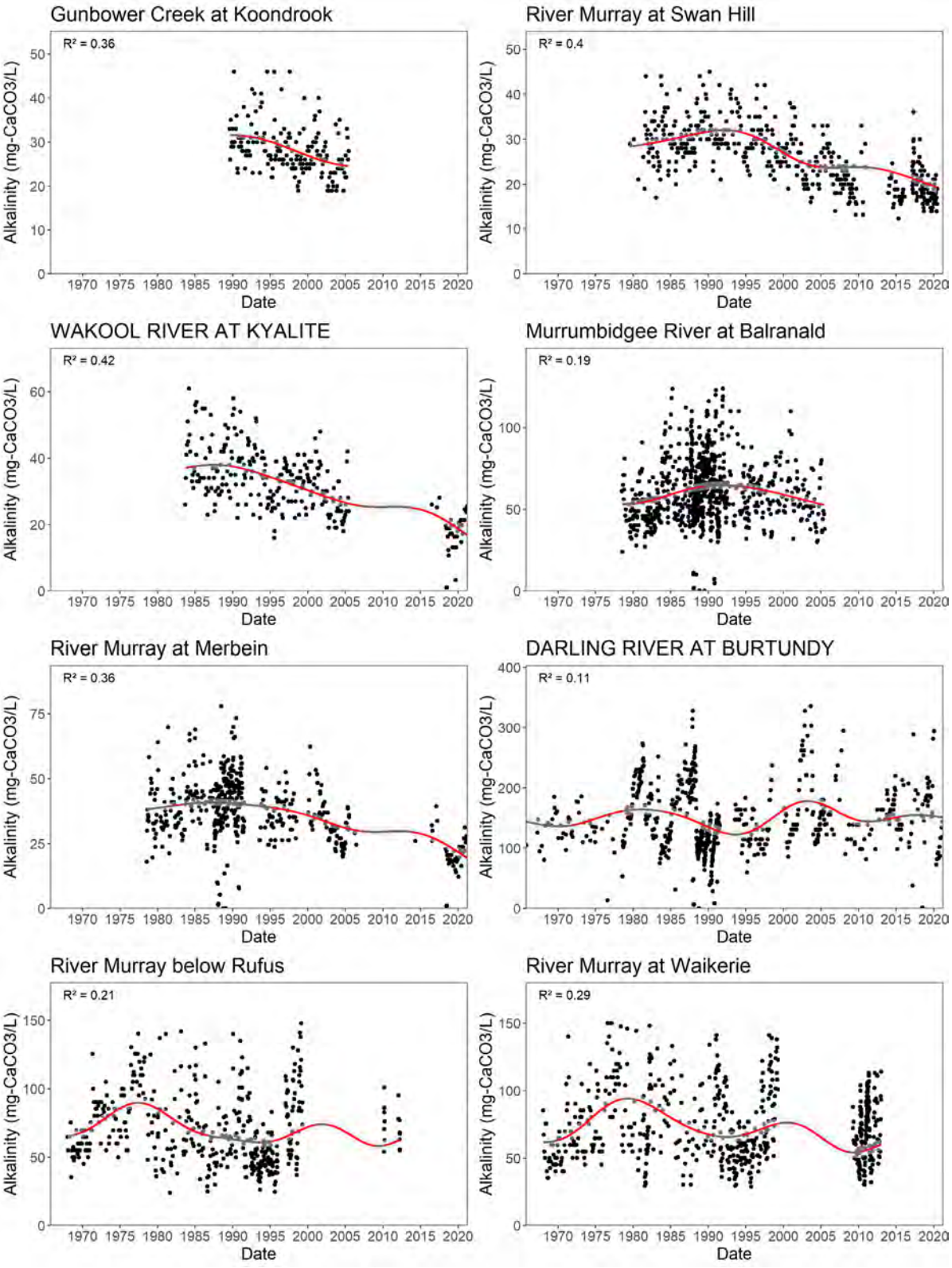

River Murray below Rufus
R² = 0.06
River Murray at Waikerie
R² = 0.1
River Murray at Morgan
R² = 0.11
River Murray at Murray Bridge
R² = 0.06
River Murray at Tailem bend
R² = 0.06
Turbidity (NTU)
Date
0
50
100
150
200
250
1960
1980
2000
2020

Figure C7. RMWQMP Spot data GAMS – Alkalinity




Gunbower Creek at Koondrook
R² = 0.36
River Murray at Swan Hill
R² = 0.4
WAKOOL RIVER AT KYALITE
R² = 0.42
Murrumbidgee River at Balranald
R² = 0.19
River Murray at Merbein
R² = 0.36
DARLING RIVER AT BURTUNDY
R² = 0.11
River Murray below Rufus
R² = 0.21
River Murray at Waikerie
R² = 0.29
Alkalinity (mg-CaCO3/L)
Date

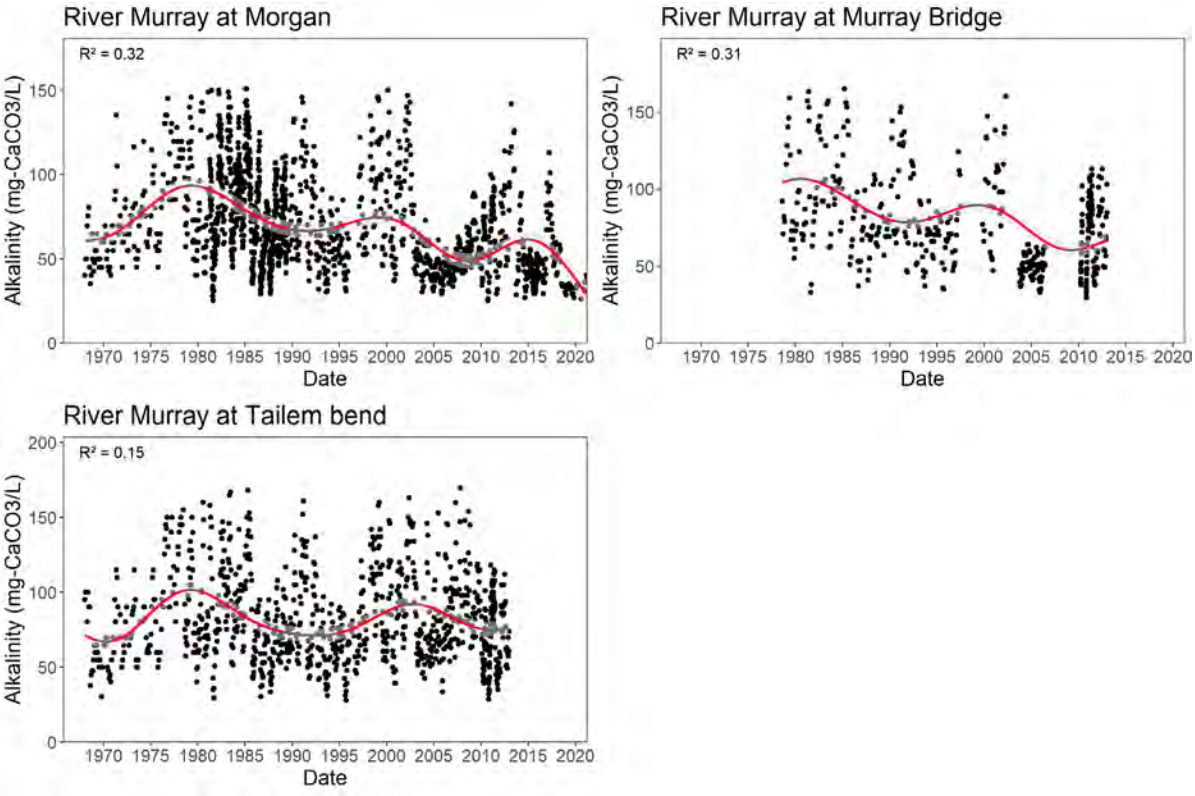
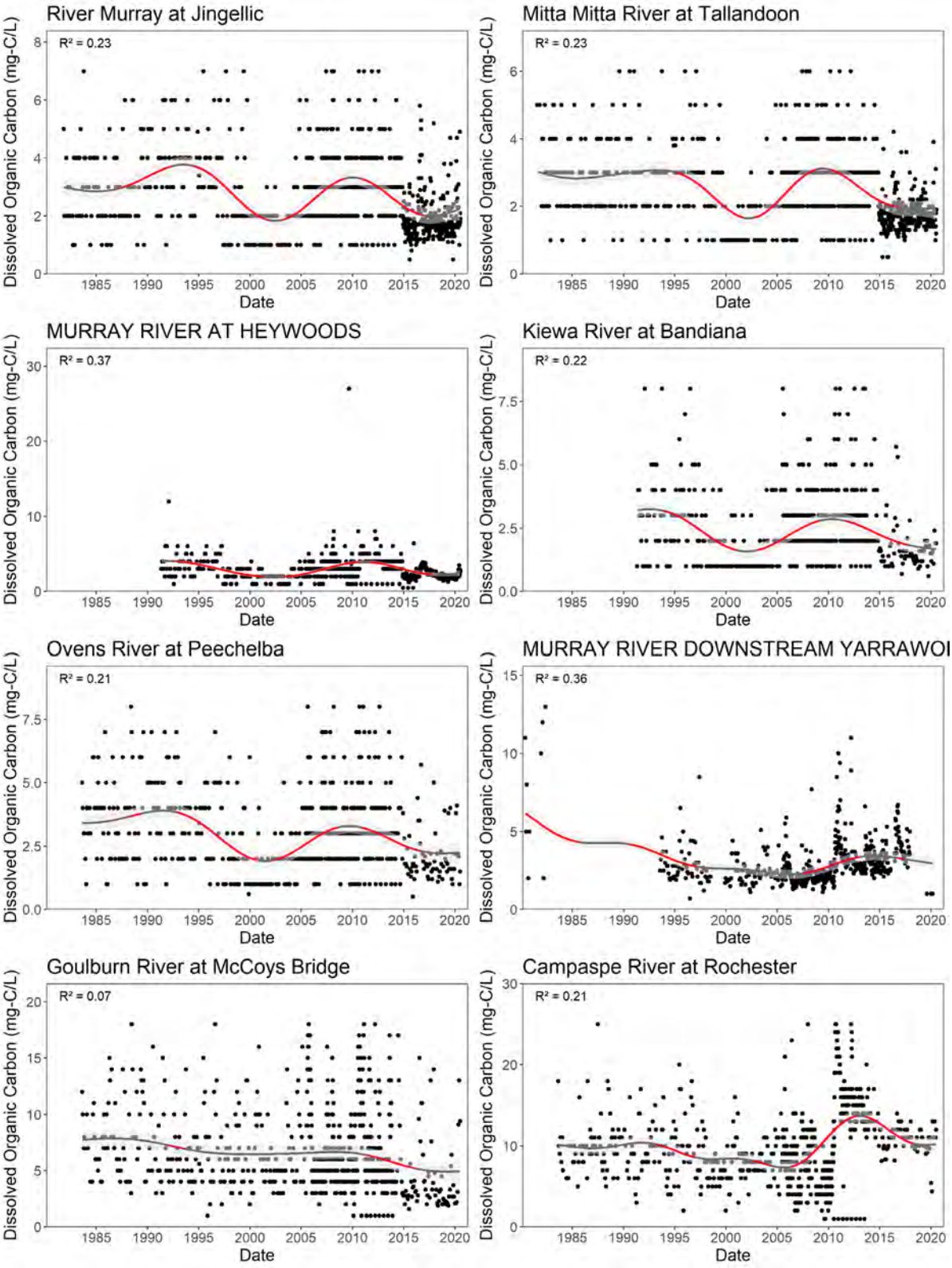
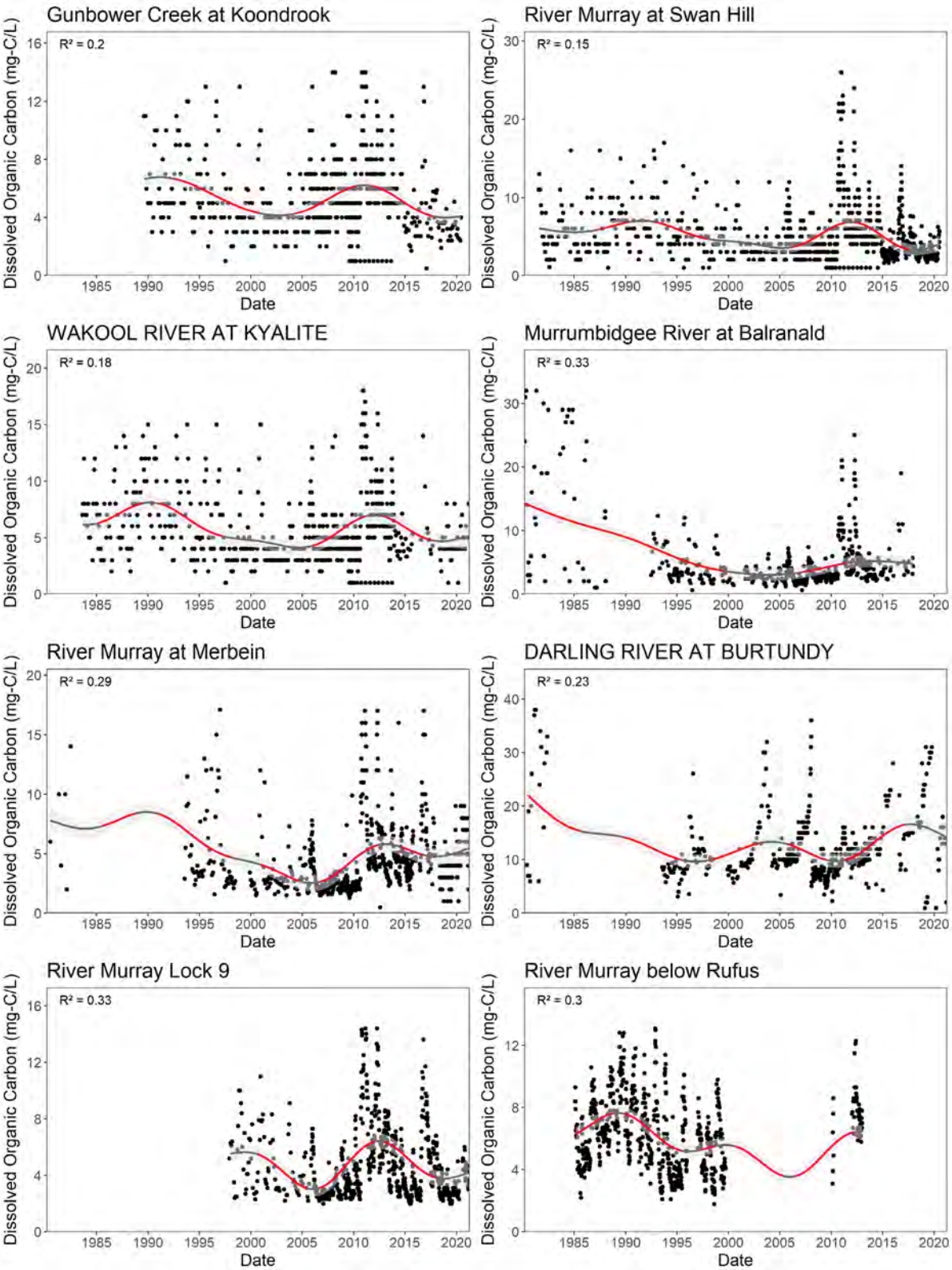

River Murray at Morgan
R² = 0.32
Alkalinity (mg-CaCO3/L)
0
50
100
150
1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020
Date
River Murray at Murray Bridge
R² = 0.31
Alkalinity (mg-CaCO3/L)
0
50
100
150
1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020
Date
River Murray at Tailem bend
R² = 0.15
Alkalinity (mg-CaCO3/L)
0
50
100
150
200
1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020
Date

Figure C8. RMWQMP Spot data GAMS – Dissolved organic carbon




Gunbower Creek at Koondrook
R² = 0.2
River Murray at Swan Hill
R² = 0.15
WAKOOL RIVER AT KYALITE
R² = 0.18
Murrumbidgee River at Balranald
R² = 0.33
River Murray at Merbein
R² = 0.29
DARLING RIVER AT BURTUNDY
R² = 0.23
River Murray Lock 9
R² = 0.33
River Murray below Rufus
R² = 0.3
Dissolved Organic Carbon (mg-C/L)
Date

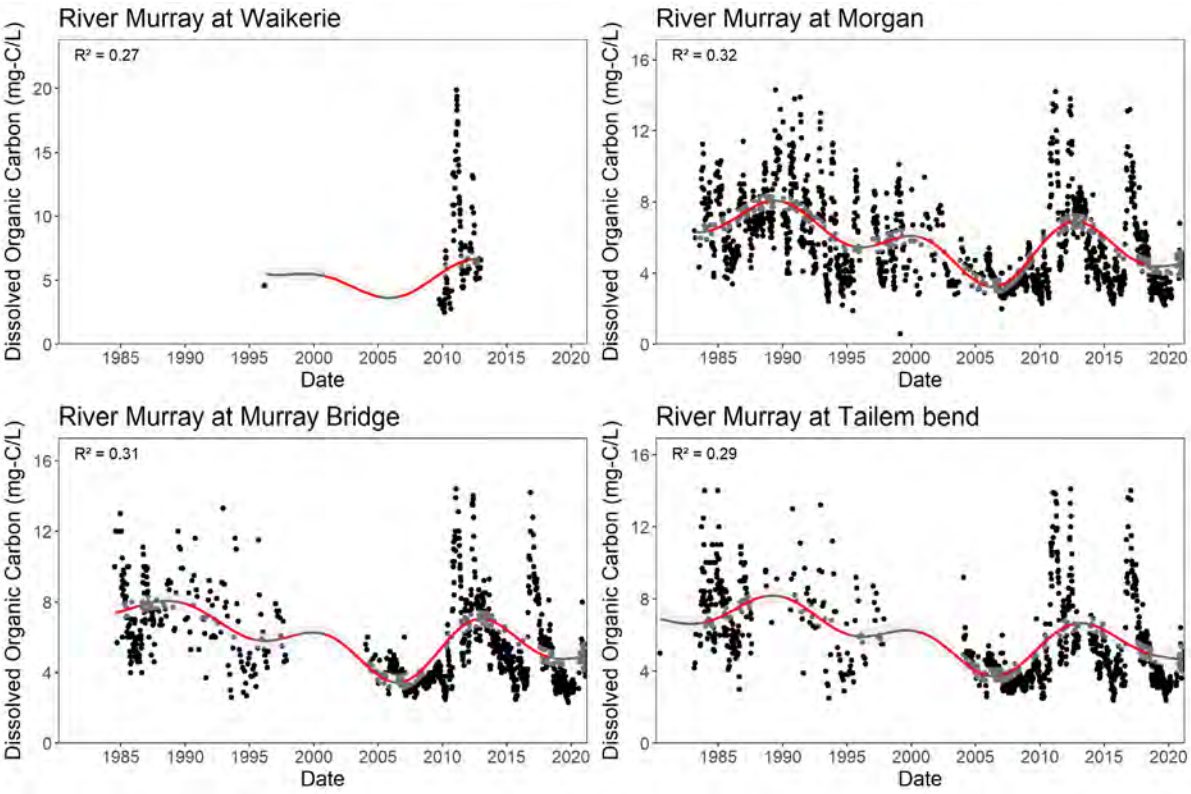
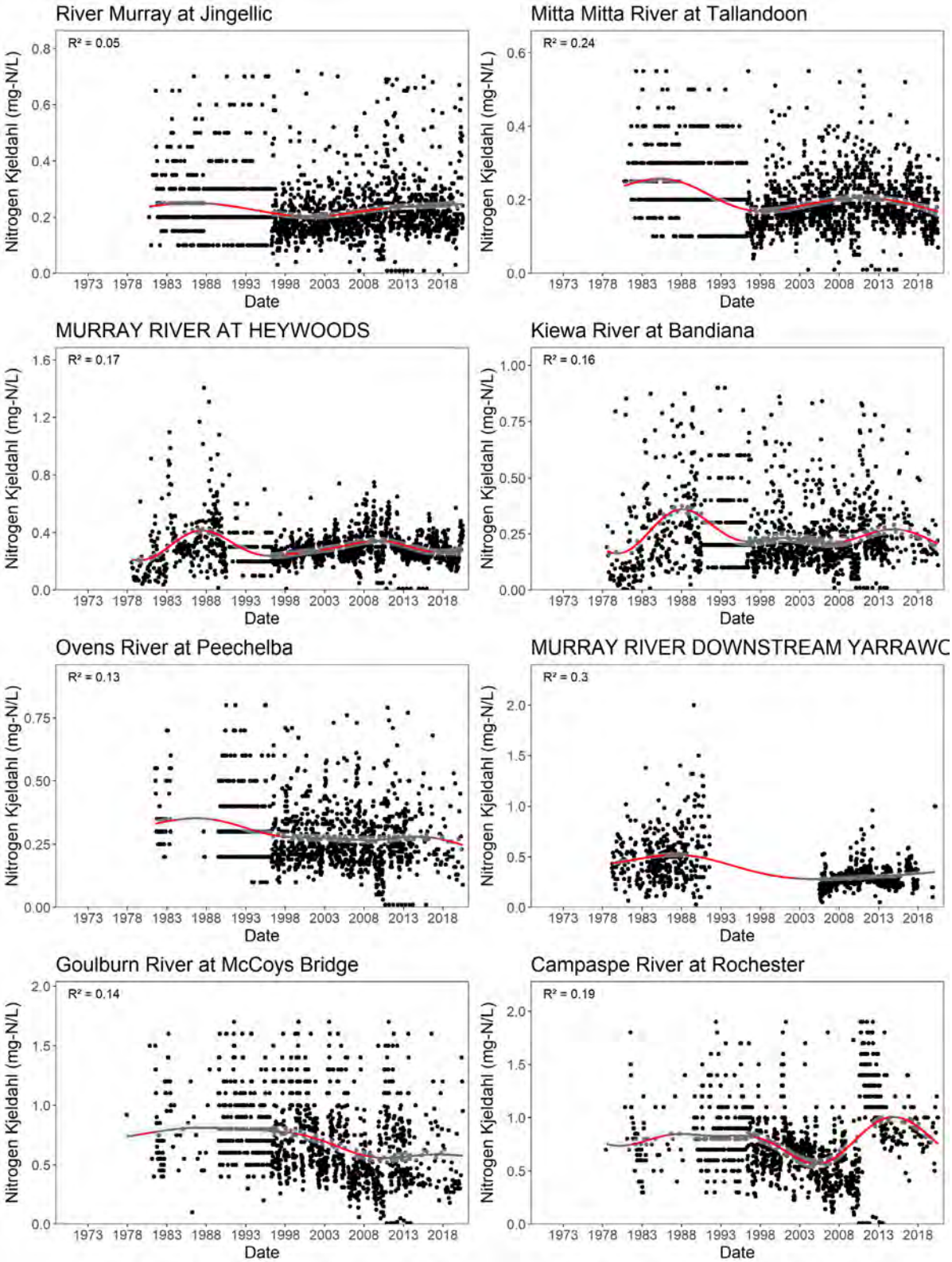
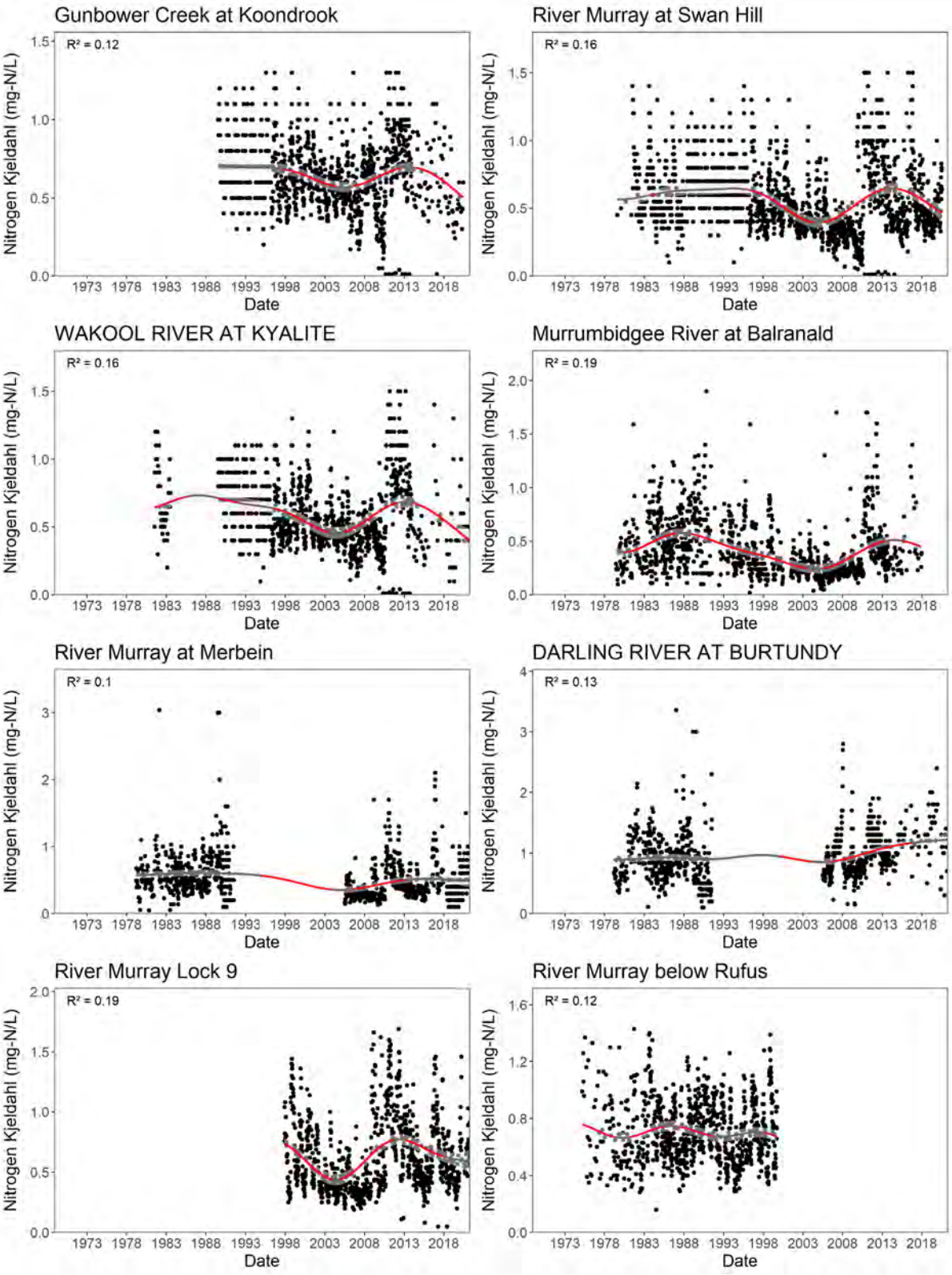

River Murray at Waikerie
R² = 0.27
River Murray at Morgan
R² = 0.32
River Murray at Murray Bridge
R² = 0.31
River Murray at Tailem bend
R² = 0.29
Dissolved Organic Carbon (mg-C/L)
Date
0
4
5
8
10
12
15
16
20
1985
1990
1995
2000
2005
2010
2015
2020

Figure C9. RMWQMP Spot data GAMS – Total Kjeldahl nitrogen




Gunbower Creek at Koondrook
R² = 0.12
River Murray at Swan Hill
R² = 0.16
WAKOOL RIVER AT KYALITE
R² = 0.16
Murrumbidgee River at Balranald
R² = 0.19
River Murray at Merbein
R² = 0.1
DARLING RIVER AT BURTUNDY
R² = 0.13
River Murray Lock 9
R² = 0.19
River Murray below Rufus
R² = 0.12
Nitrogen Kjeldahl (mg-N/L)
Date
1973 1978 1983 1988 1993 1998 2003 2008 2013 2018

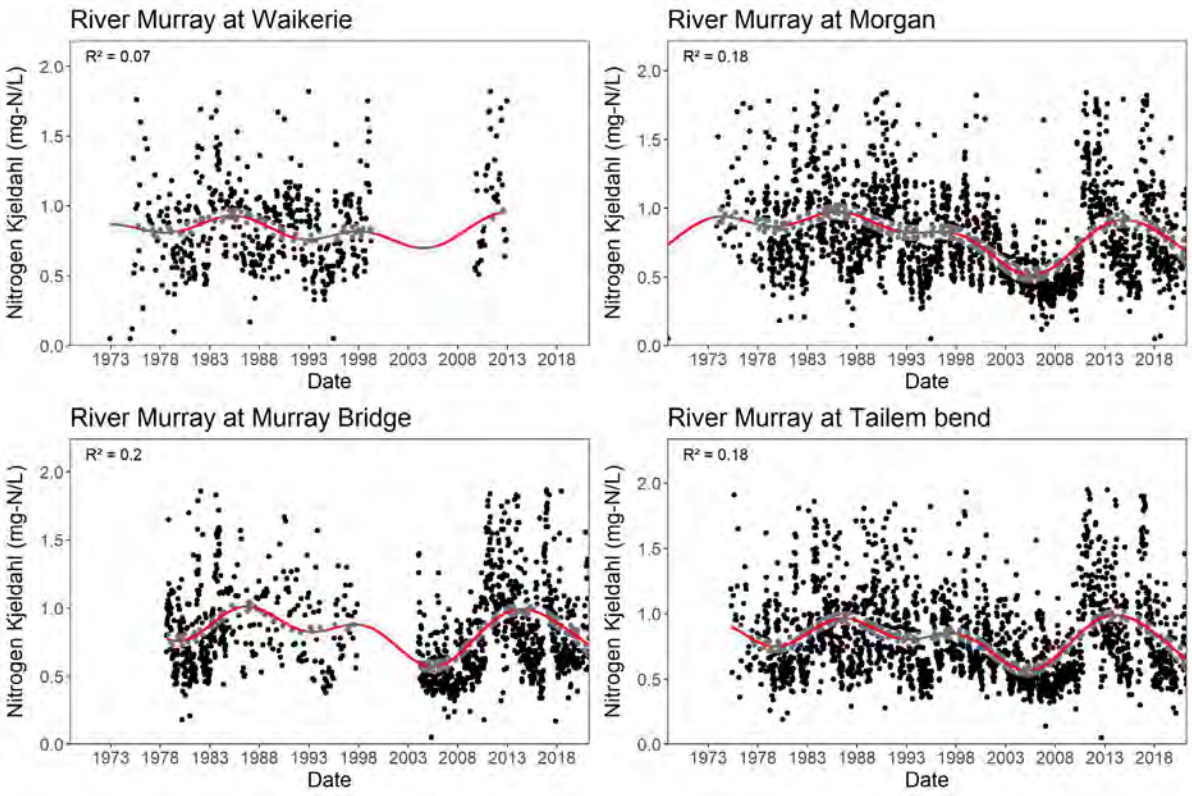
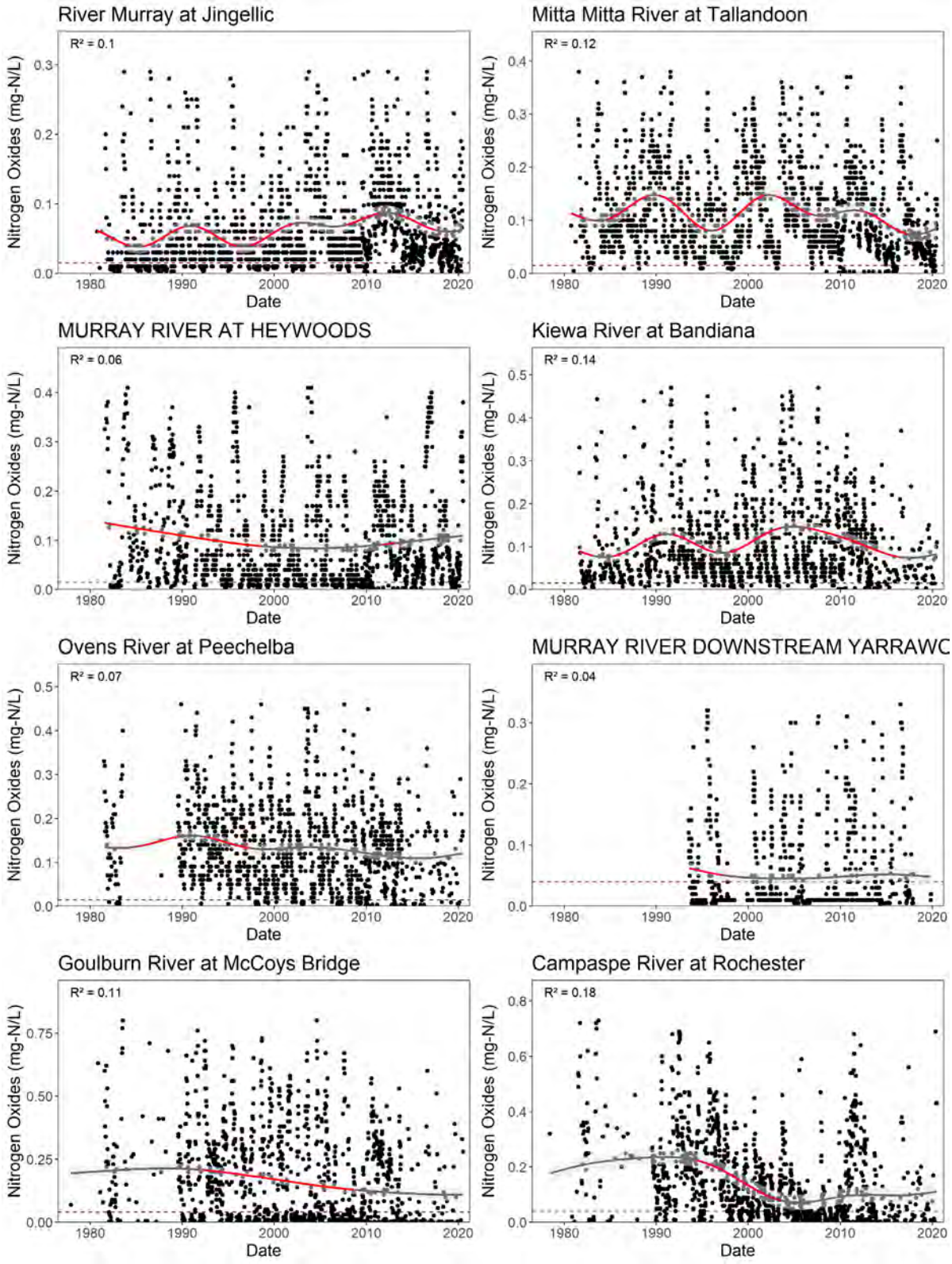
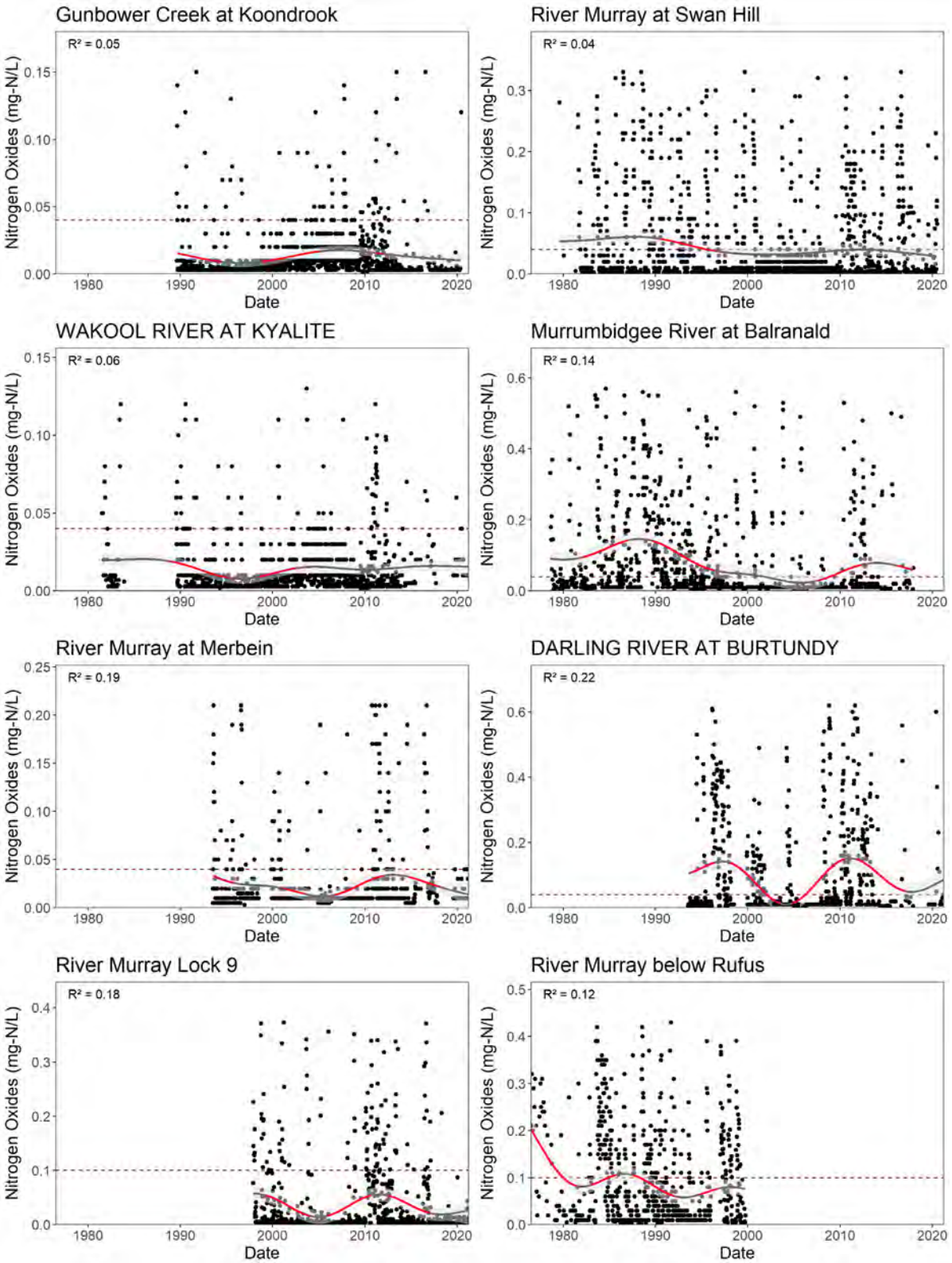

River Murray at Waikerie
R² = 0.07
River Murray at Morgan
R² = 0.18
River Murray at Murray Bridge
R² = 0.2
River Murray at Tailem bend
R² = 0.18
Nitrogen Kjeldahl (mg-N/L)
Date
0.0
0.5
1.0
1.5
2.0
1973
1978
1983
1988
1993
1998
2003
2008
2013
2018

Figure C10. RMWQMP Spot data GAMS – Nitrogen oxides. Note the dashed lines represent the default ANZG trigger values for NOx.




Gunbower Creek at Koondrook
R² = 0.05
River Murray at Swan Hill
R² = 0.04
WAKOOL RIVER AT KYALITE
R² = 0.06
Murrumbidgee River at Balranald
R² = 0.14
River Murray at Merbein
R² = 0.19
DARLING RIVER AT BURTUNDY
R² = 0.22
River Murray Lock 9
R² = 0.18
River Murray below Rufus
R² = 0.12
Nitrogen Oxides (mg-N/L)
Date

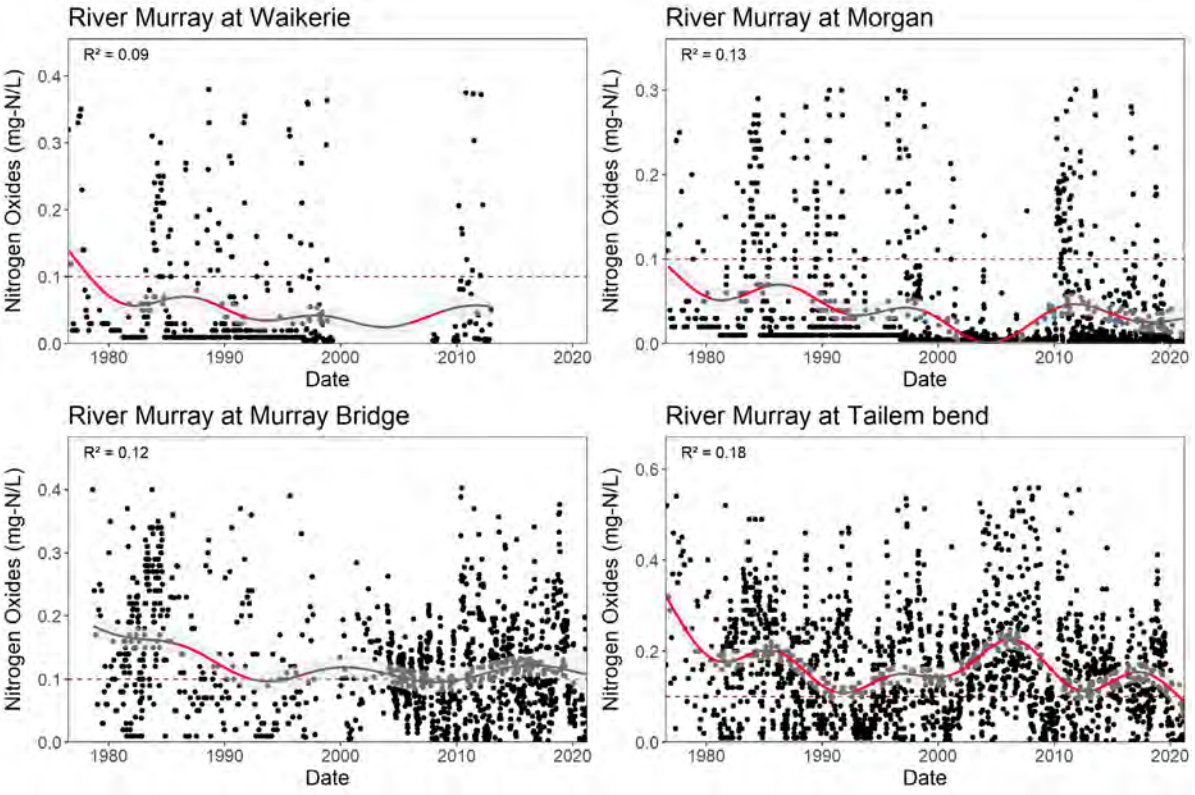
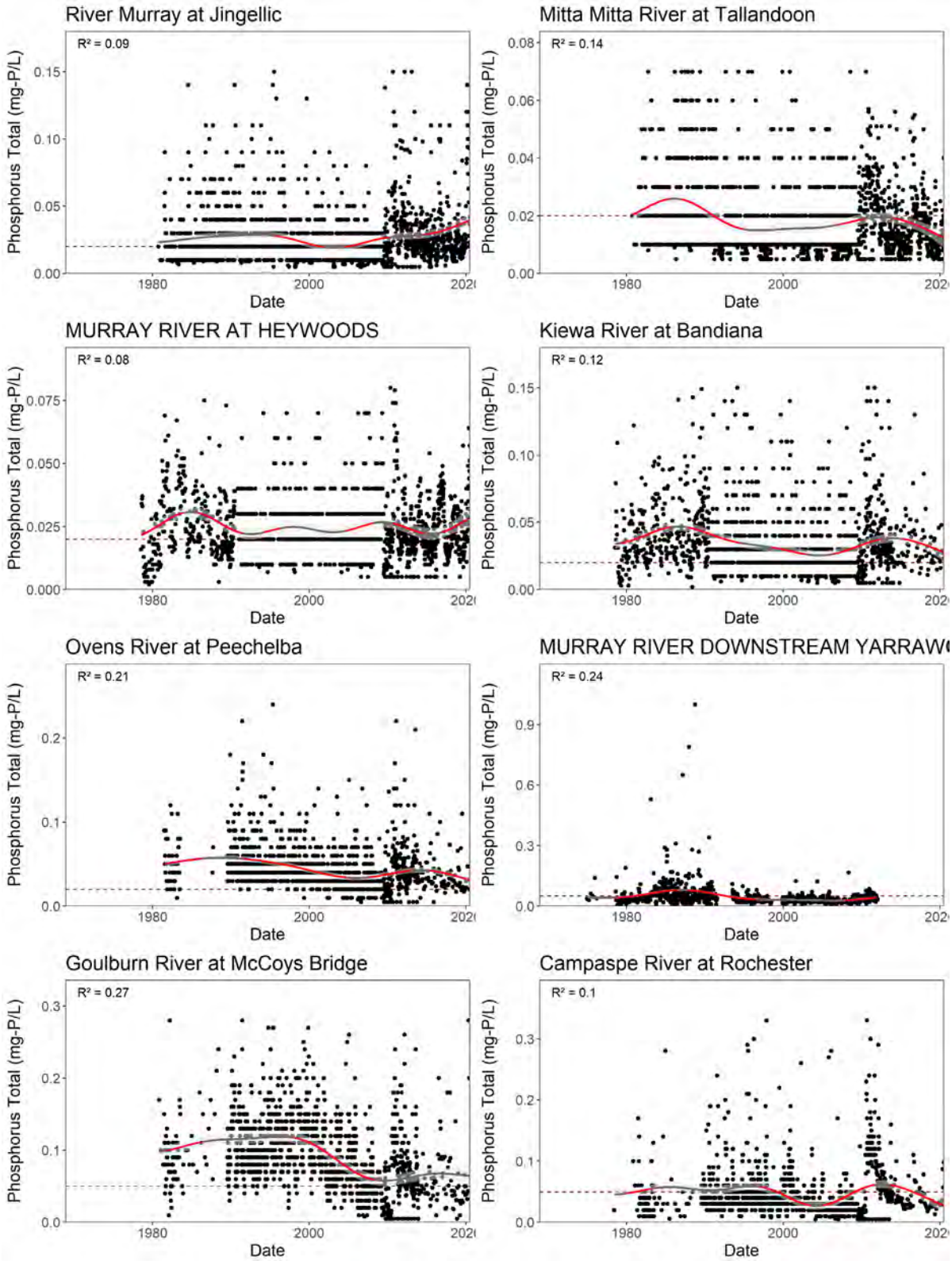
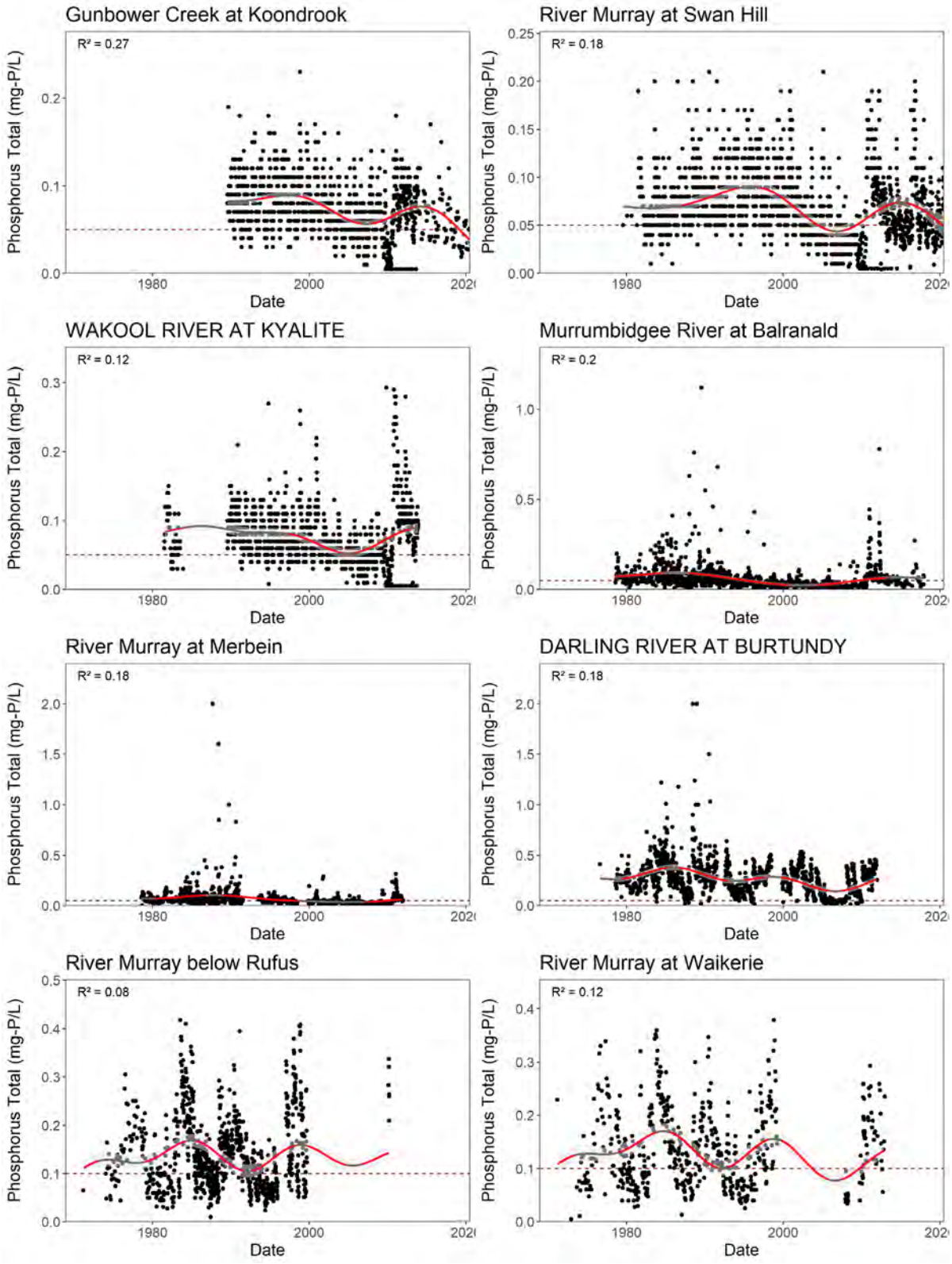

River Murray at Waikerie
R² = 0.09
River Murray at Morgan
R² = 0.13
River Murray at Murray Bridge
R² = 0.12
River Murray at Tailem bend
R² = 0.18
Nitrogen Oxides (mg-N/L)
Date
0.0
0.1
0.2
0.3
0.4
0.6
1980
1990
2000
2010
2020

Figure C11. RMWQMP Spot data GAMS – Total phosphorus. Note the dashed lines represent the default ANZG trigger values for TP.




Gunbower Creek at Koondrook
R² = 0.27
River Murray at Swan Hill
R² = 0.18
WAKOOL RIVER AT KYALITE
R² = 0.12
Murrumbidgee River at Balranald
R² = 0.2
River Murray at Merbein
R² = 0.18
DARLING RIVER AT BURTUNDY
R² = 0.18
River Murray below Rufus
R² = 0.08
River Murray at Waikerie
R² = 0.12
Phosphorus Total (mg-P/L)
Date
1980
2000

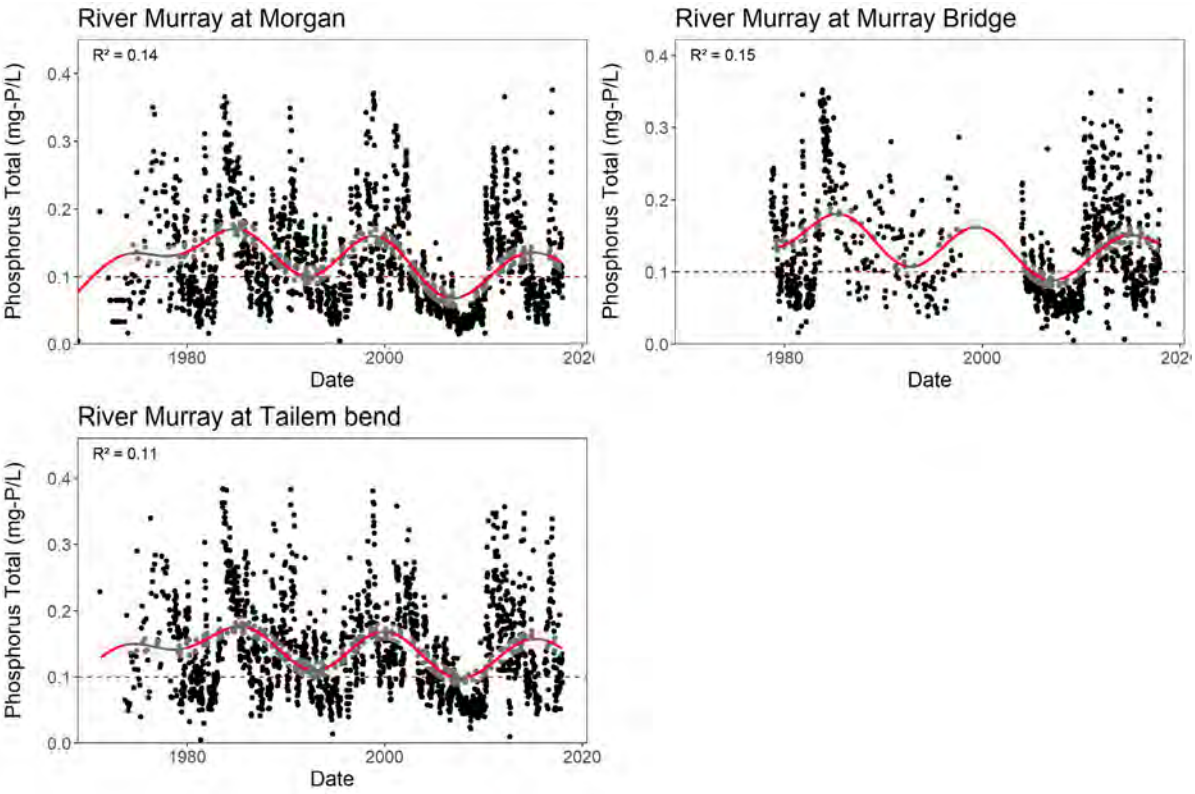
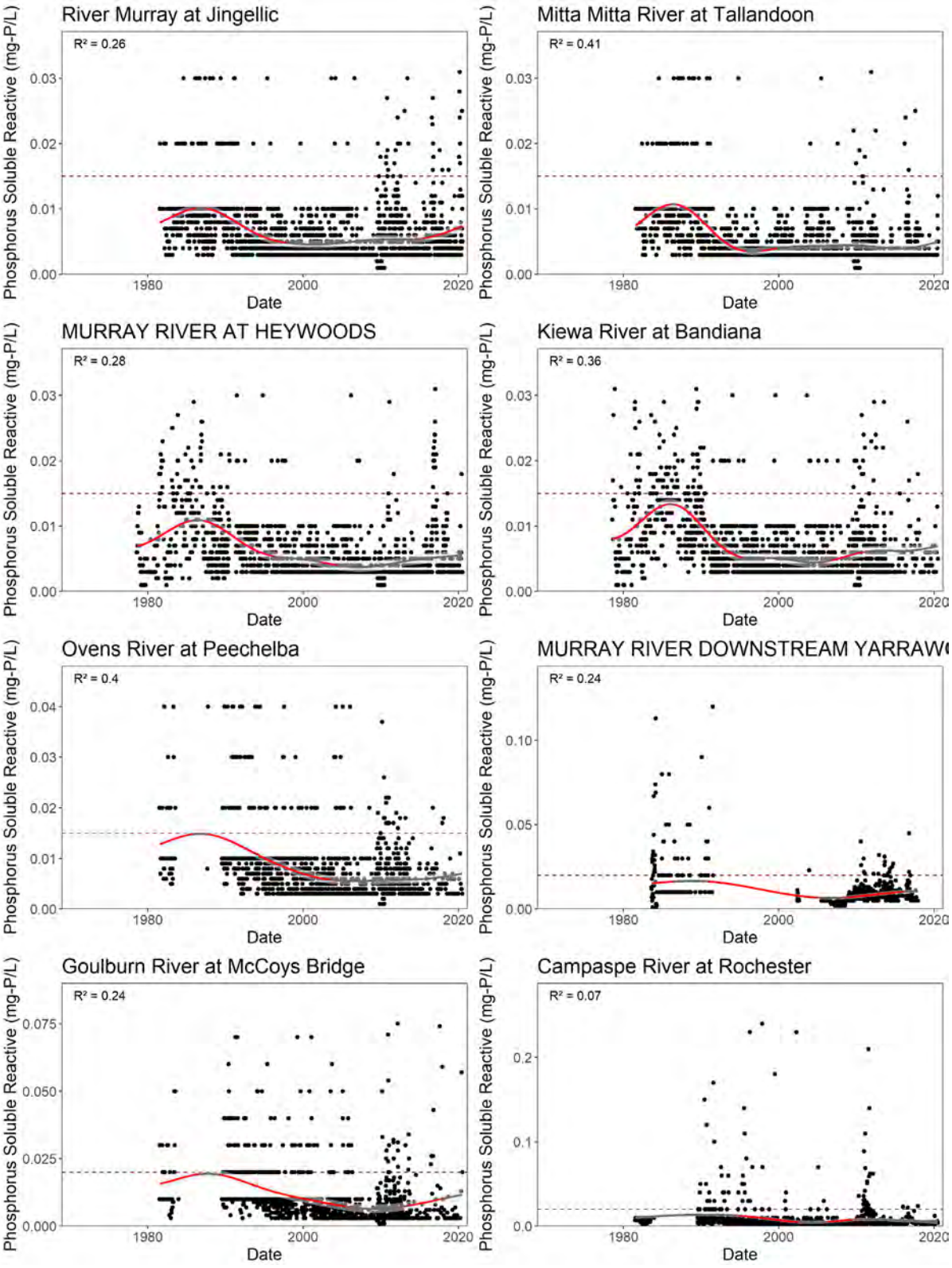
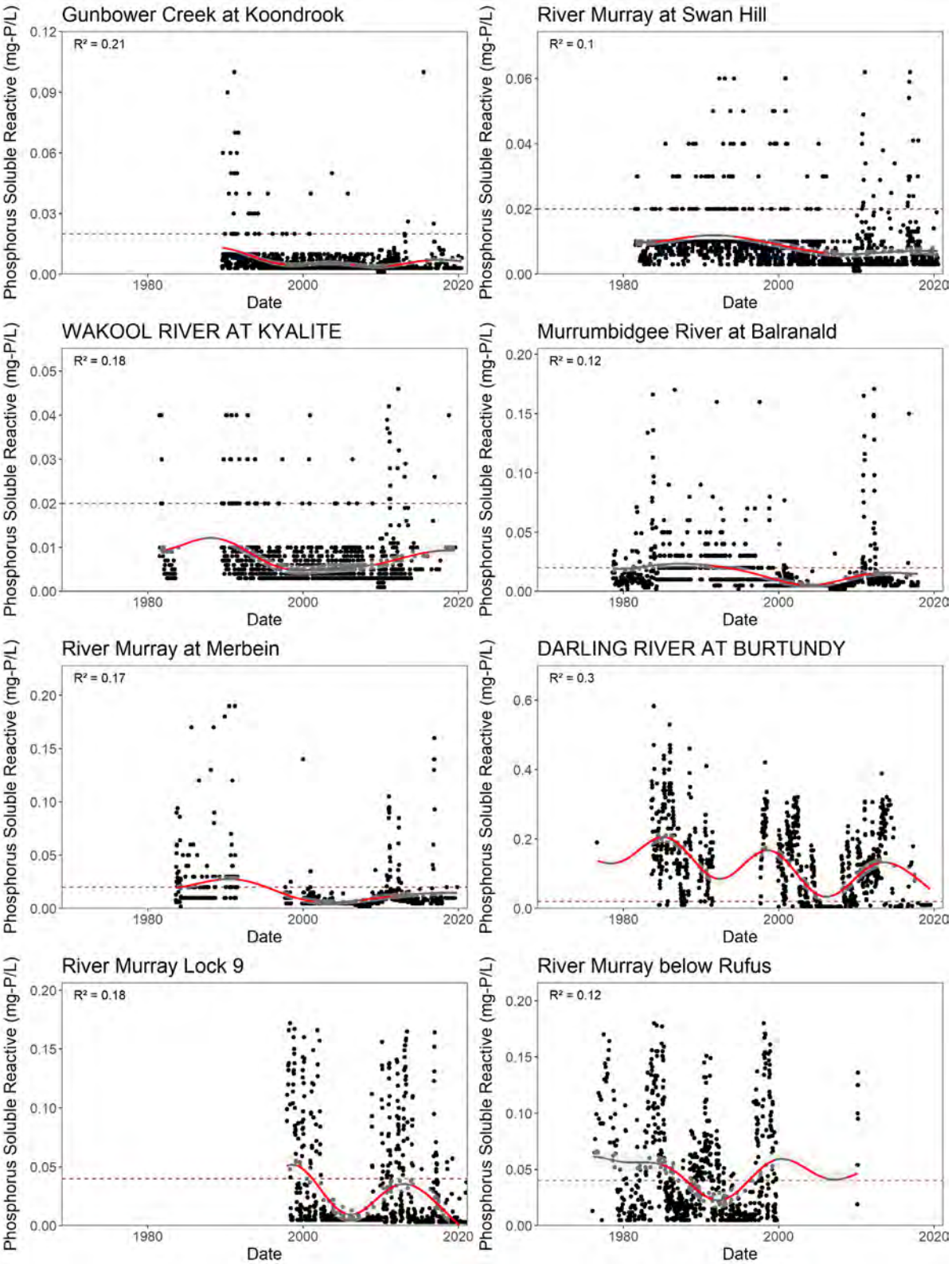

River Murray at Morgan
R² = 0.14
Phosphorus Total (mg-P/L)
0.0
0.1
0.2
0.3
0.4
1980
2000
Date
River Murray at Murray Bridge
R² = 0.15
Phosphorus Total (mg-P/L)
0.0
0.1
0.2
0.3
0.4
1980
2000
Date
River Murray at Tailem bend
R² = 0.11
Phosphorus Total (mg-P/L)
0.0
0.1
0.2
0.3
0.4
1980
2000
2020
Date

Figure C12. RMWQMP Spot data GAMS – Soluble reactive phosphorus. Note the dashed line represents the default ANZG trigger values for SRP.




Gunbower Creek at Koondrook
R² = 0.21
River Murray at Swan Hill
R² = 0.1
WAKOOL RIVER AT KYALITE
R² = 0.18
Murrumbidgee River at Balranald
R² = 0.12
River Murray at Merbein
R² = 0.17
DARLING RIVER AT BURTUNDY
R² = 0.3
River Murray Lock 9
R² = 0.18
River Murray below Rufus
R² = 0.12
Phosphorus Soluble Reactive (mg-P/L)
Date
1980
2000
2020

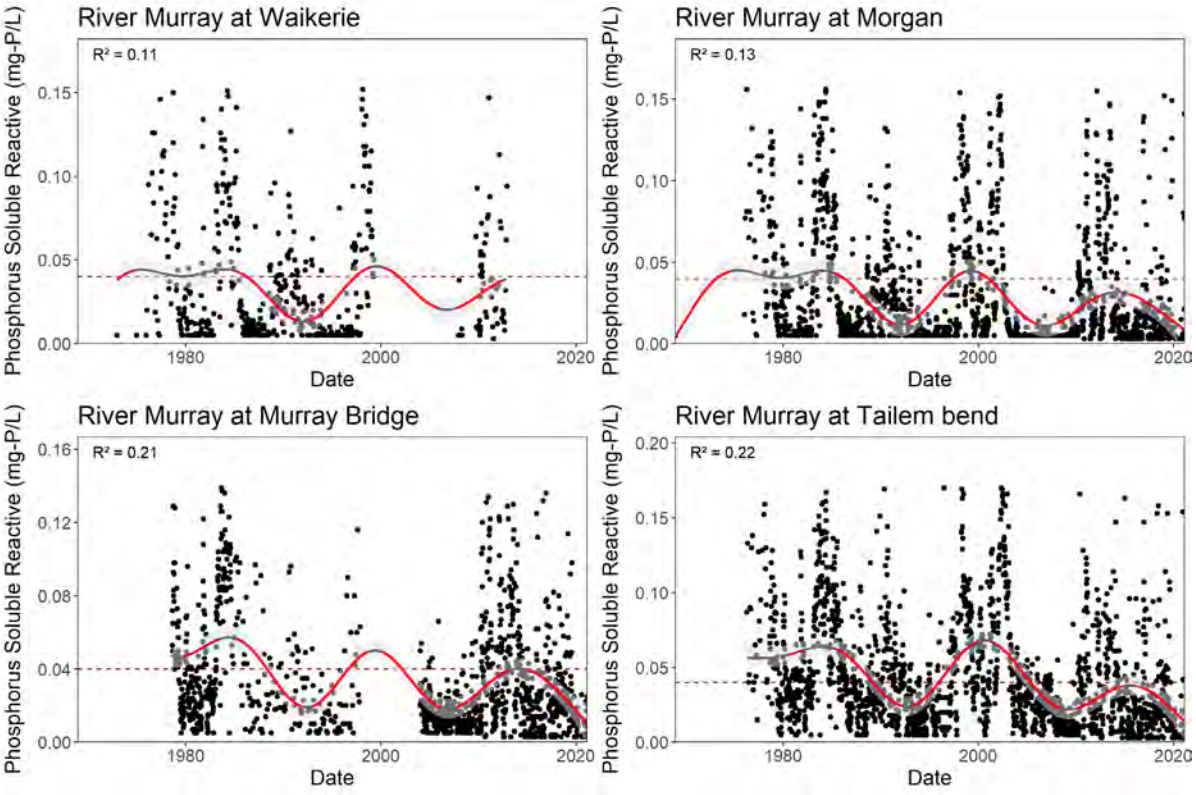
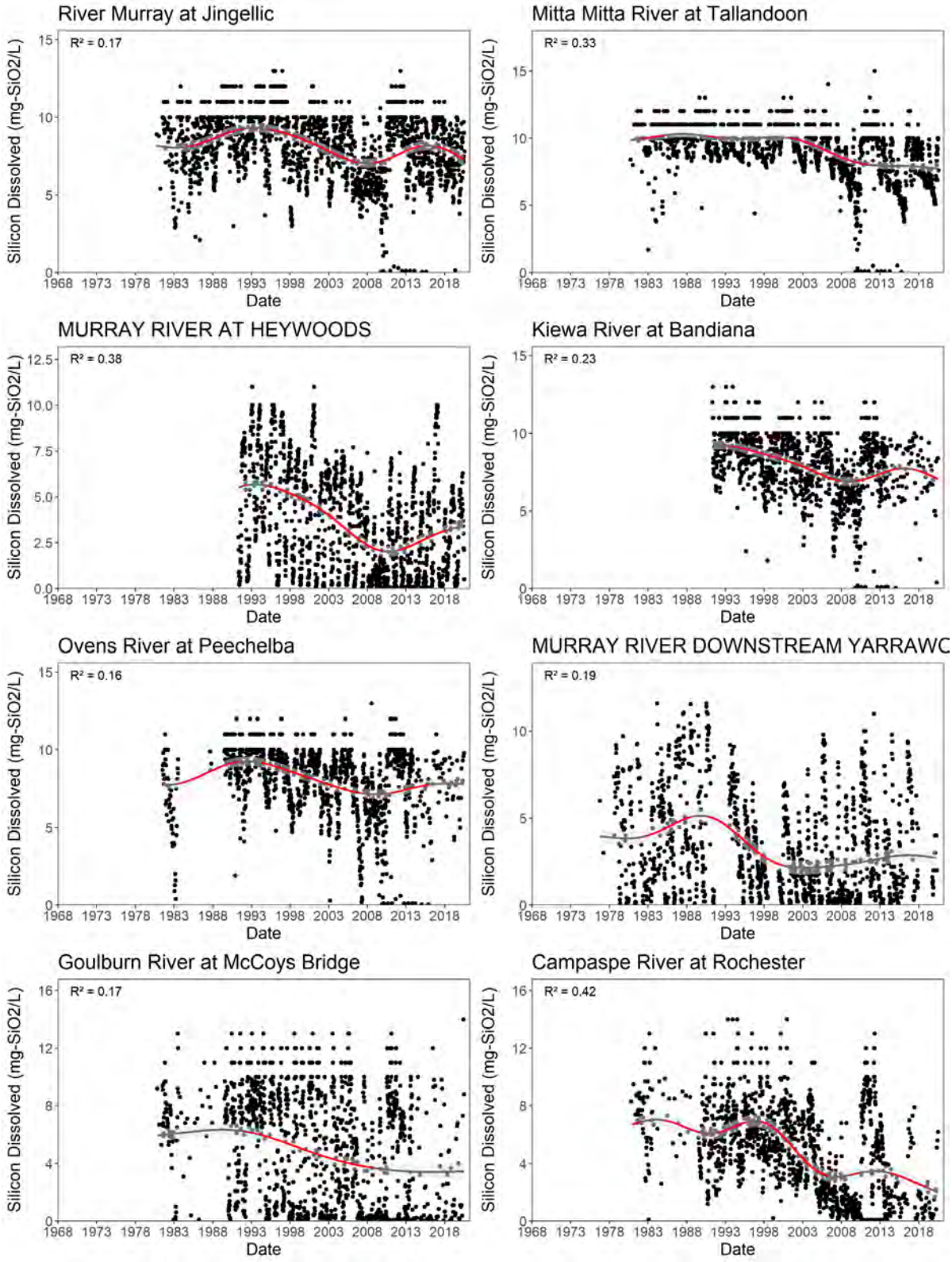
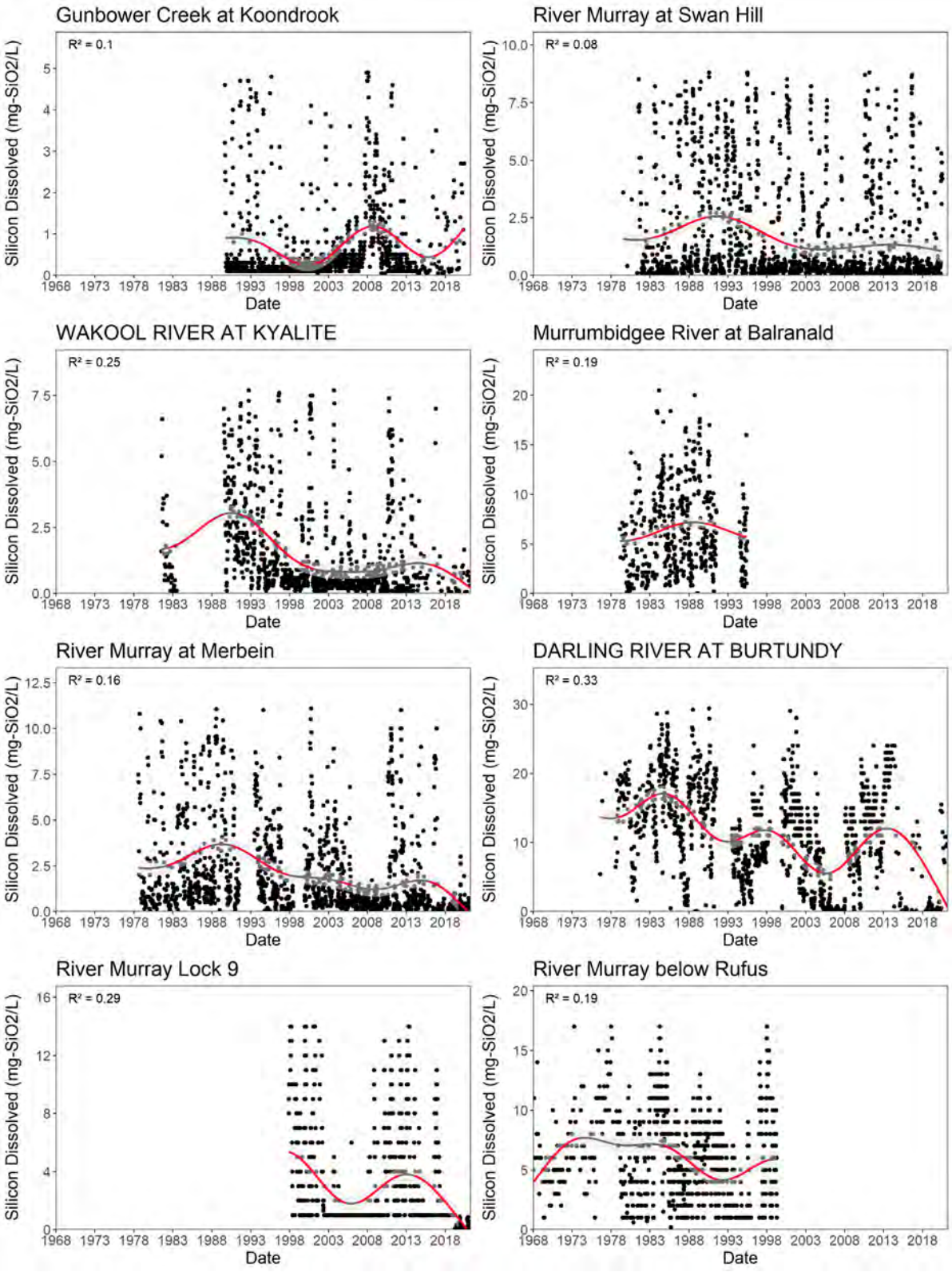
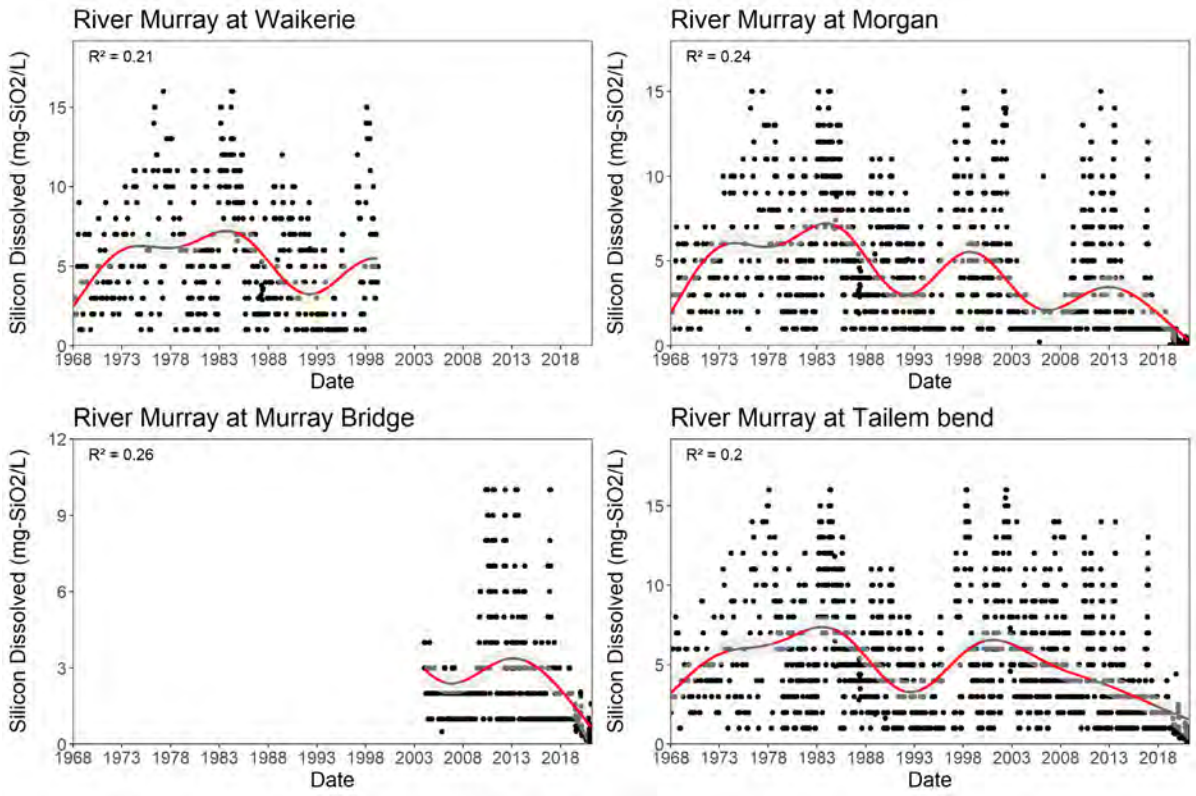

River Murray at Waikerie
R² = 0.11
River Murray at Morgan
R² = 0.13
River Murray at Murray Bridge
R² = 0.21
River Murray at Tailem bend
R² = 0.22
Phosphorus Soluble Reactive (mg-P/L)
Date
1980
2000
2020
0.00
0.05
0.10
0.15
0.04
0.08
0.12
0.16
0.20

Figure C13. RMWQMP Spot data GAMS – Dissolved silicon




Gunbower Creek at Koondrook
R² = 0.1
River Murray at Swan Hill
R² = 0.08
WAKOOL RIVER AT KYALITE
R² = 0.25
Murrumbidgee River at Balranald
R² = 0.19
River Murray at Merbein
R² = 0.16
DARLING RIVER AT BURTUNDY
R² = 0.33
River Murray Lock 9
R² = 0.29
River Murray below Rufus
R² = 0.19
Silicon Dissolved (mg-SiO2/L)
Date
1968 1973 1978 1983 1988 1993 1998 2003 2008 2013 2018


River Murray at Waikerie
R² = 0.21
River Murray at Morgan
R² = 0.24
River Murray at Murray Bridge
R² = 0.26
River Murray at Tailem bend
R² = 0.2
Silicon Dissolved (mg-SiO2/L)
Date
1968 1973 1978 1983 1988 1993 1998 2003 2008 2013 2018

Appendix D – S/ARIMA components

Figure D1. Seasonal component of S/ARIMA models for the main channel sites selected for this trends analysis.

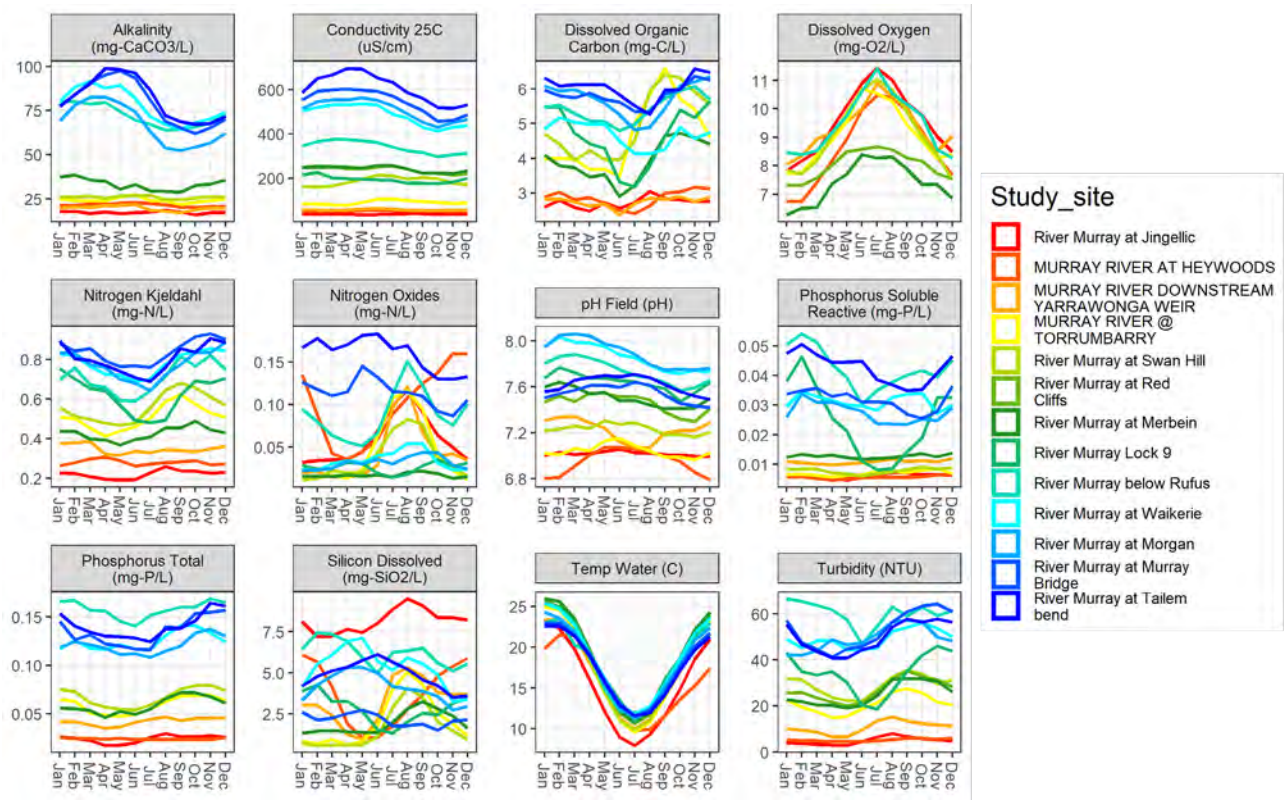
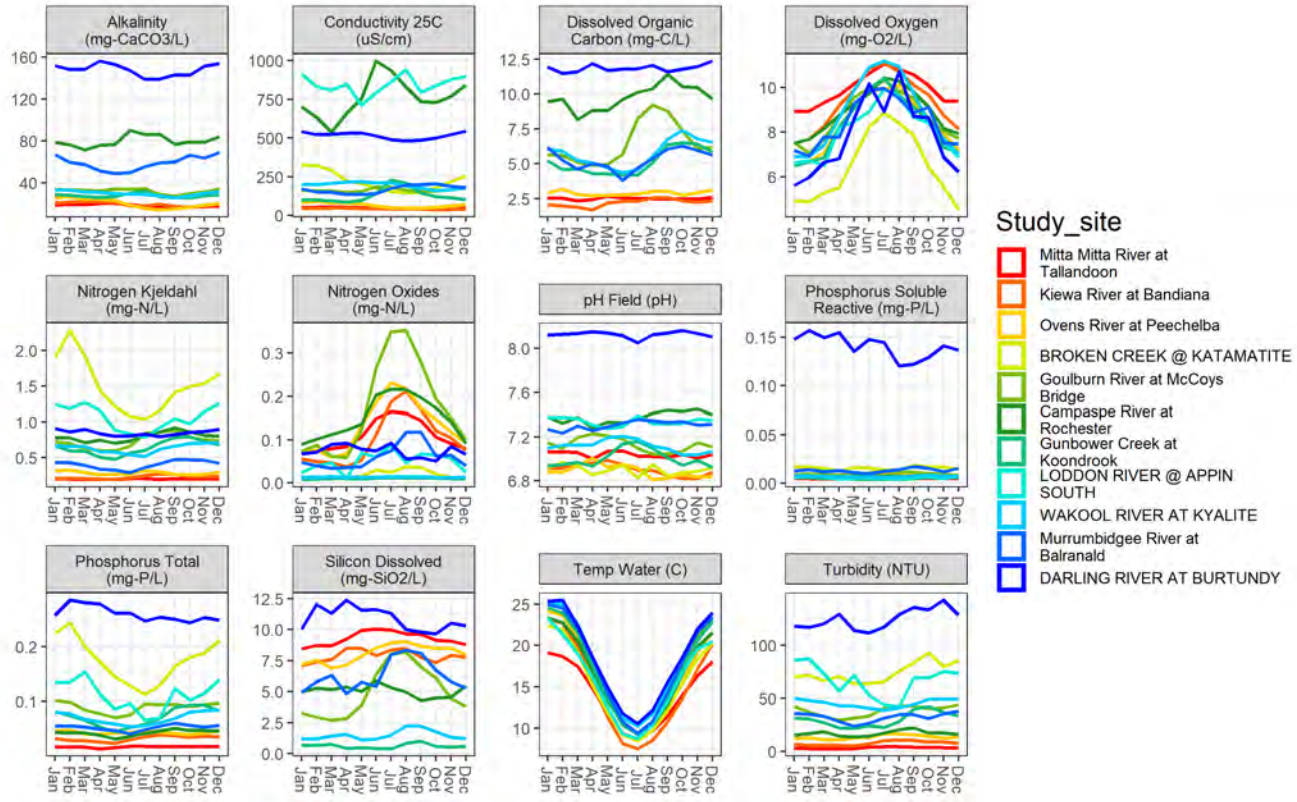


Figure D2. Seasonal component of S/ARIMA models for <u>tributary</u> sites selected for this trends analysis



Appendix E – Trends patterns (pooled sites)

Figure E1. Linear trend component derived from a general linear model (GLM) for changes in field pH at pooled sites.

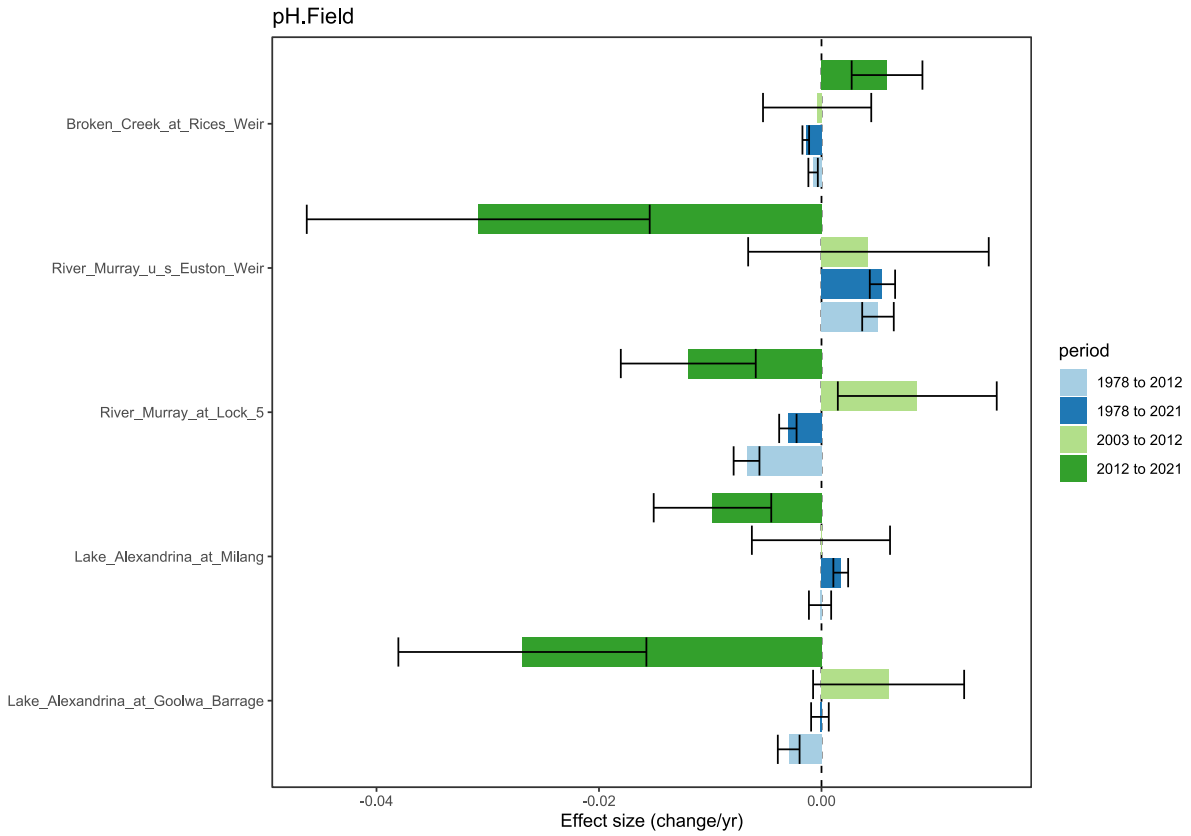


Figure E2. Linear trend component derived from a general linear model (GLM) for changes in water temperature at pooled sites.

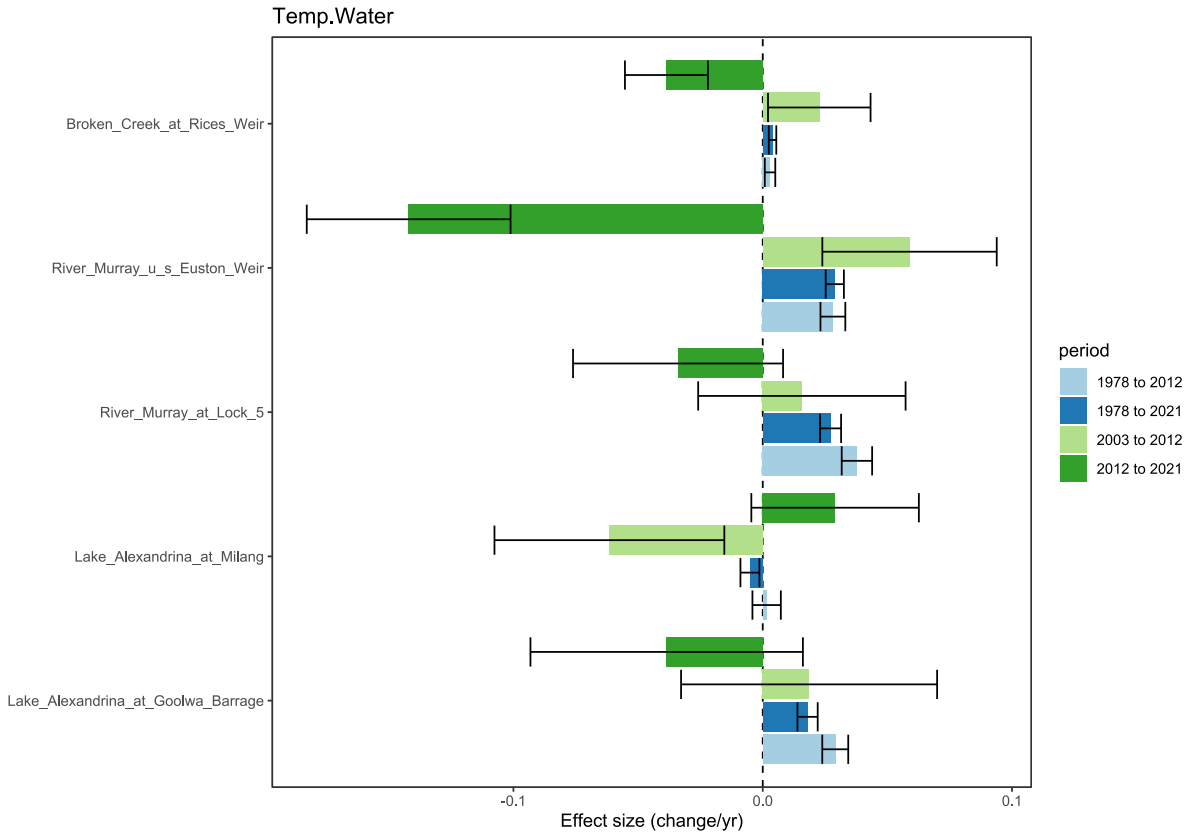


Figure E3. Linear trend component derived from a general linear model (GLM) for changes in dissolved oxygen at pooled sites.

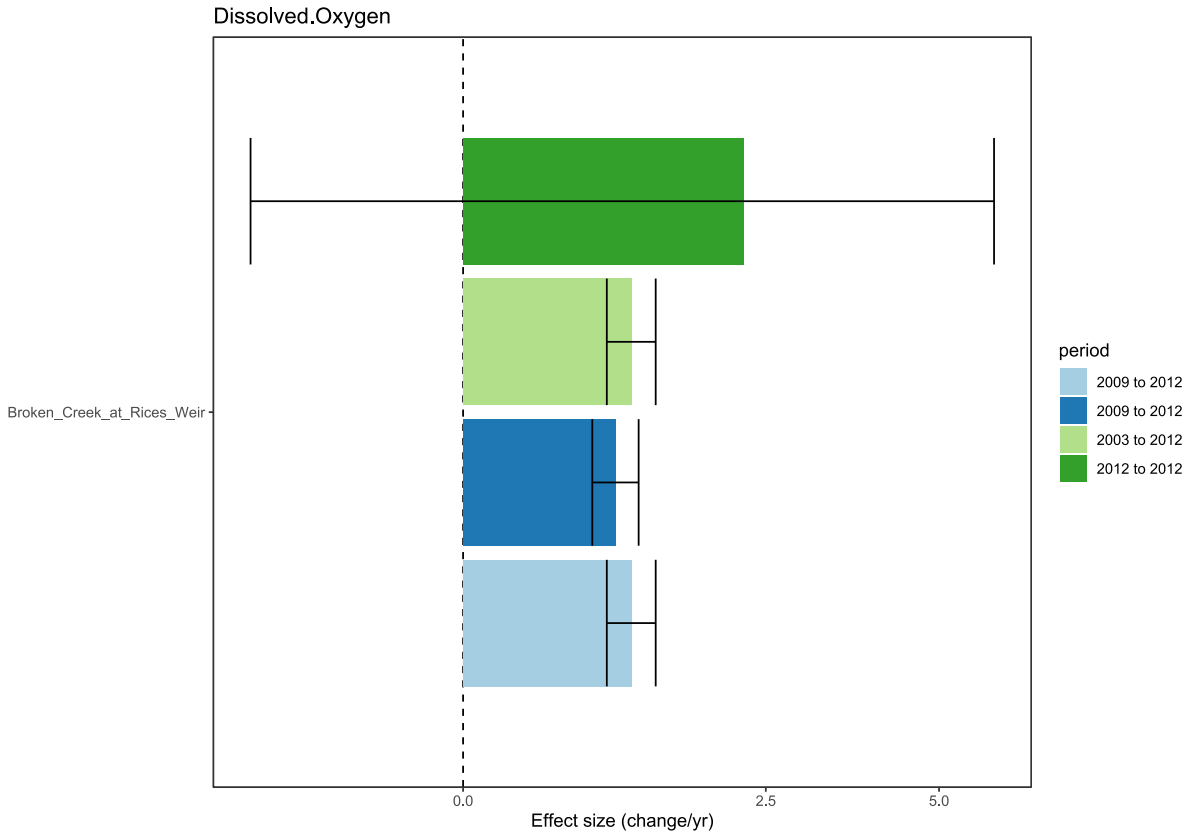


Figure E4. Linear trend component derived from a general linear model (GLM) for changes in electrical conductivity (at 25 °C) at pooled sites.

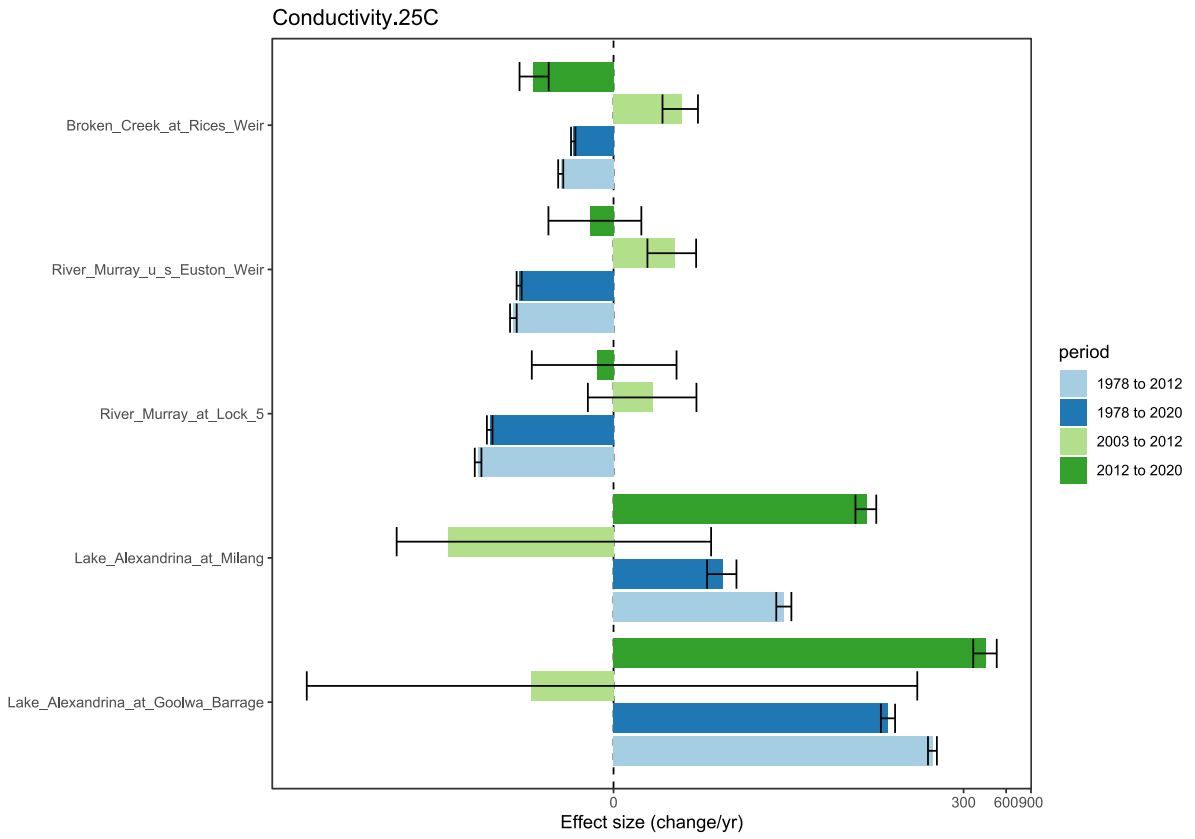


Figure E5. Linear trend component derived from a general linear model (GLM) for changes in turbidity at pooled sites.

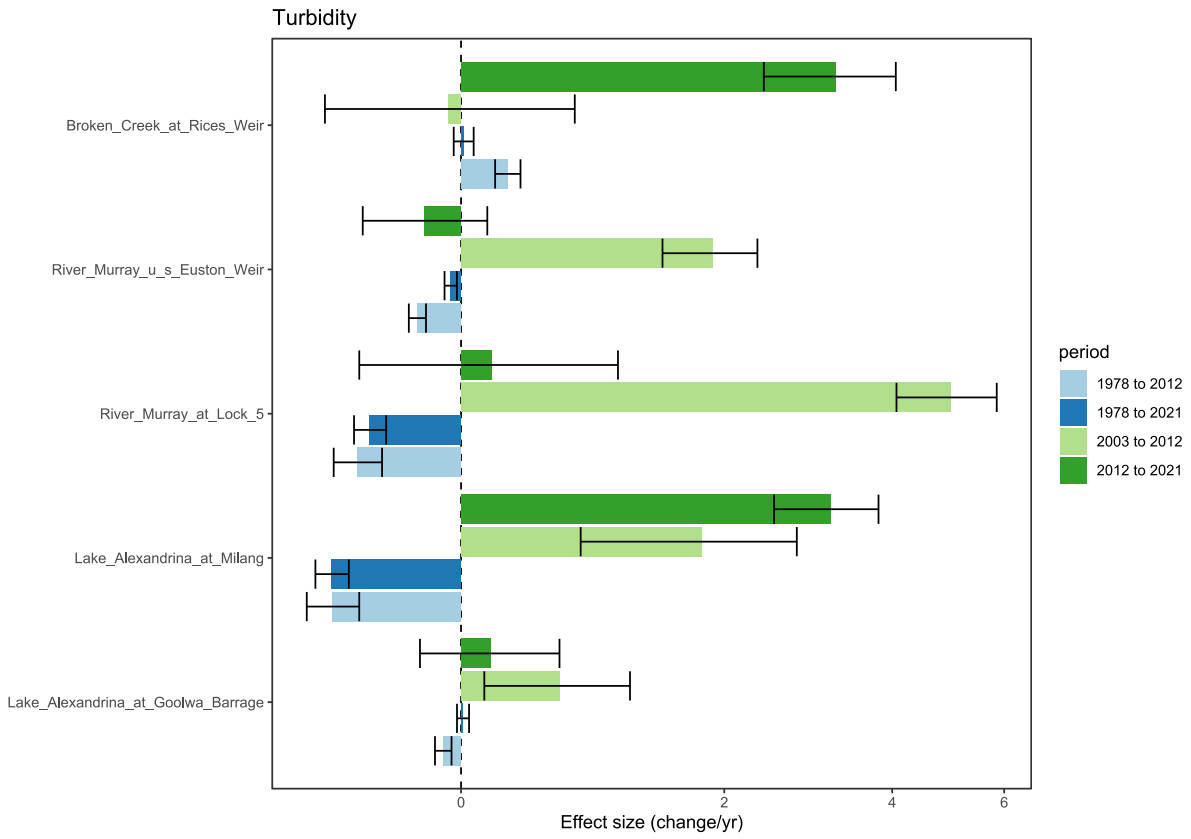


Figure E6. Linear trend component derived from a general linear model (GLM) for changes in alkalinity at pooled sites.

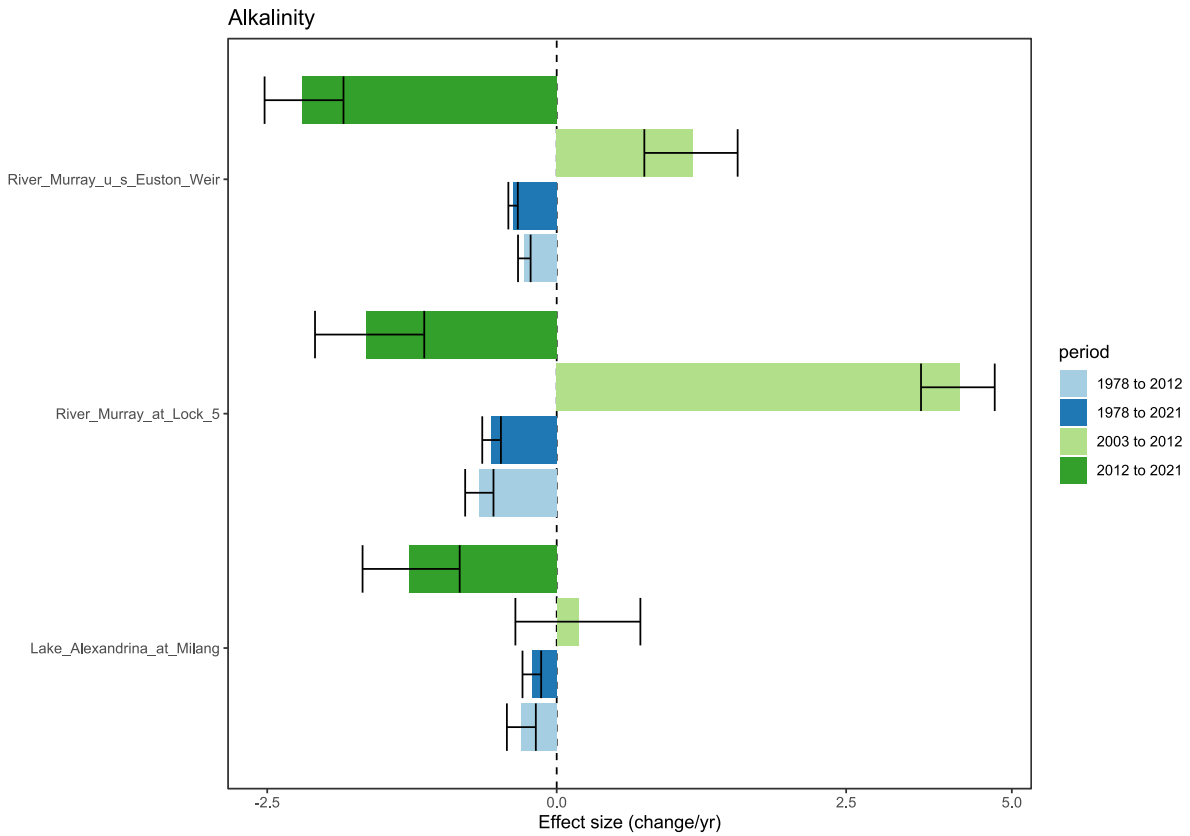


Figure E7. Linear trend component derived from a general linear model (GLM) for changes in dissolved organic carbon at pooled sites.

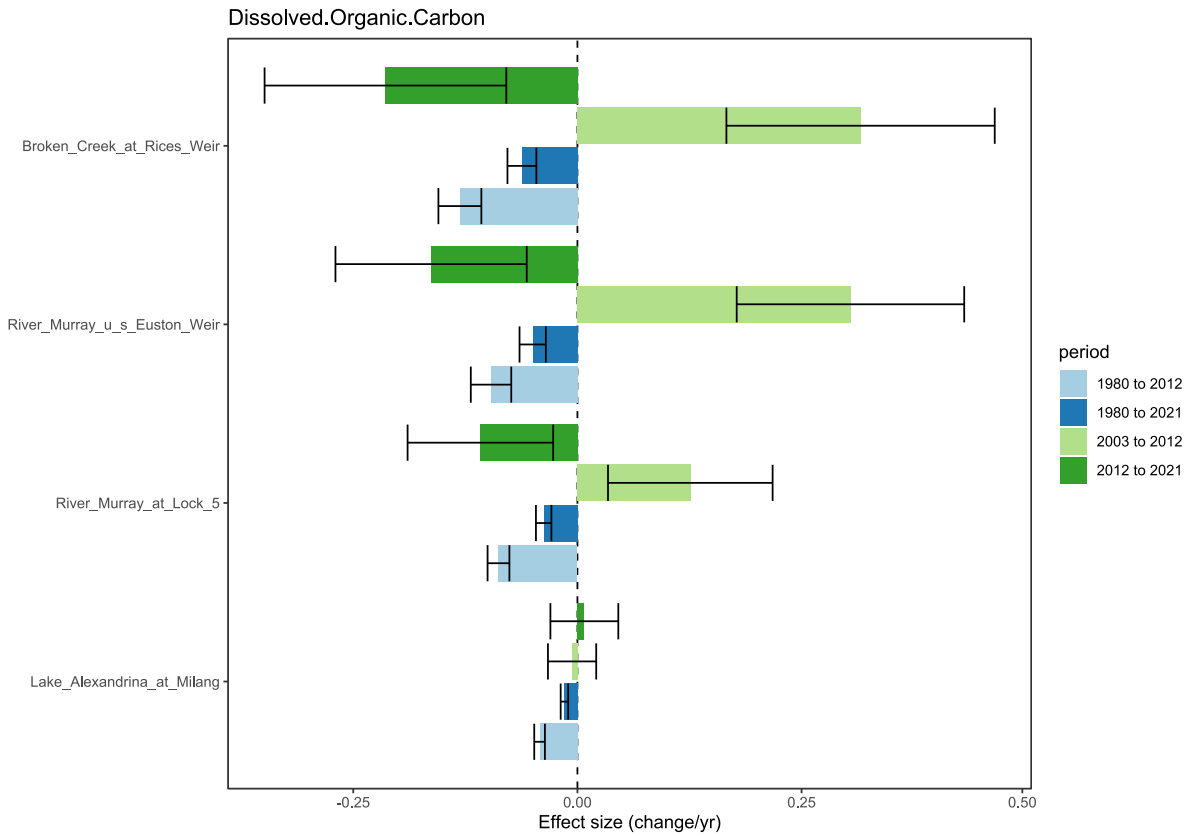


Figure E8. Linear trend component derived from a general linear model (GLM) for changes in total Kjeldahl nitrogen at pooled sites.

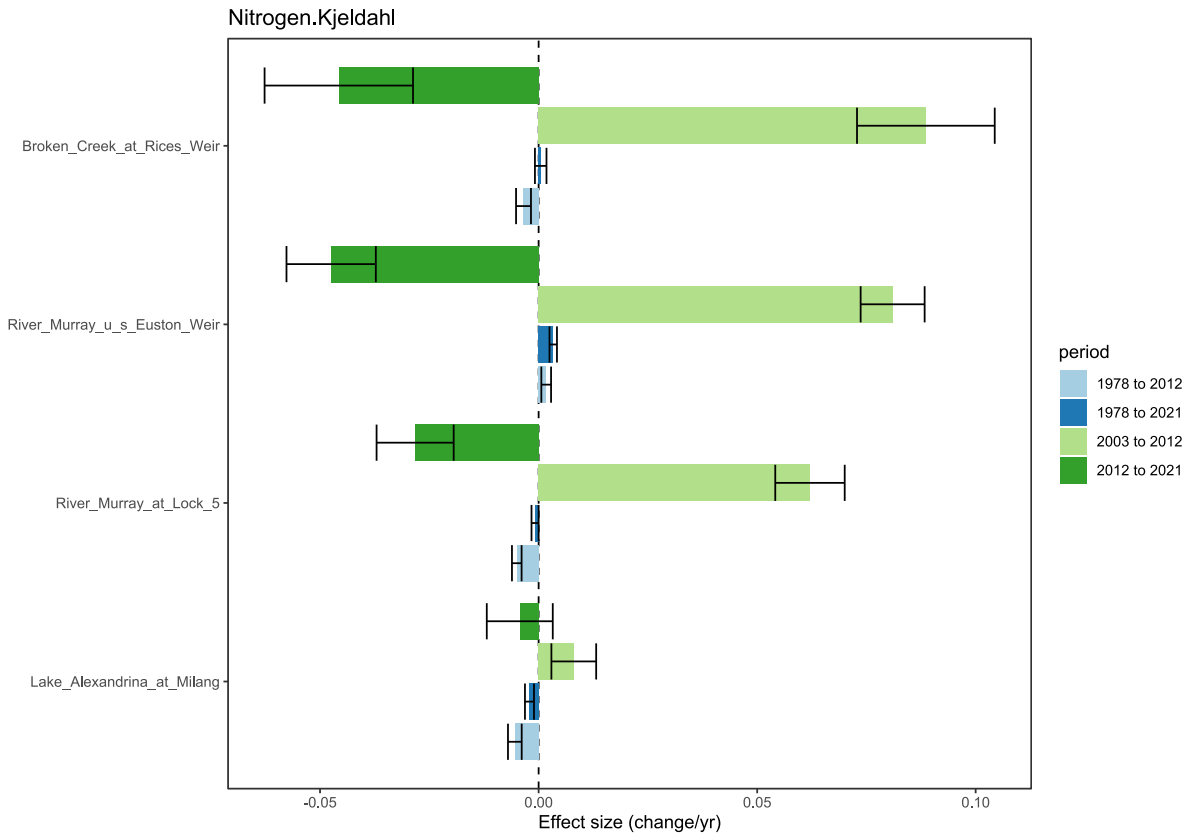


Figure E9. Linear trend component derived from a general linear model (GLM) for changes in nitrogen oxides at pooled sites.

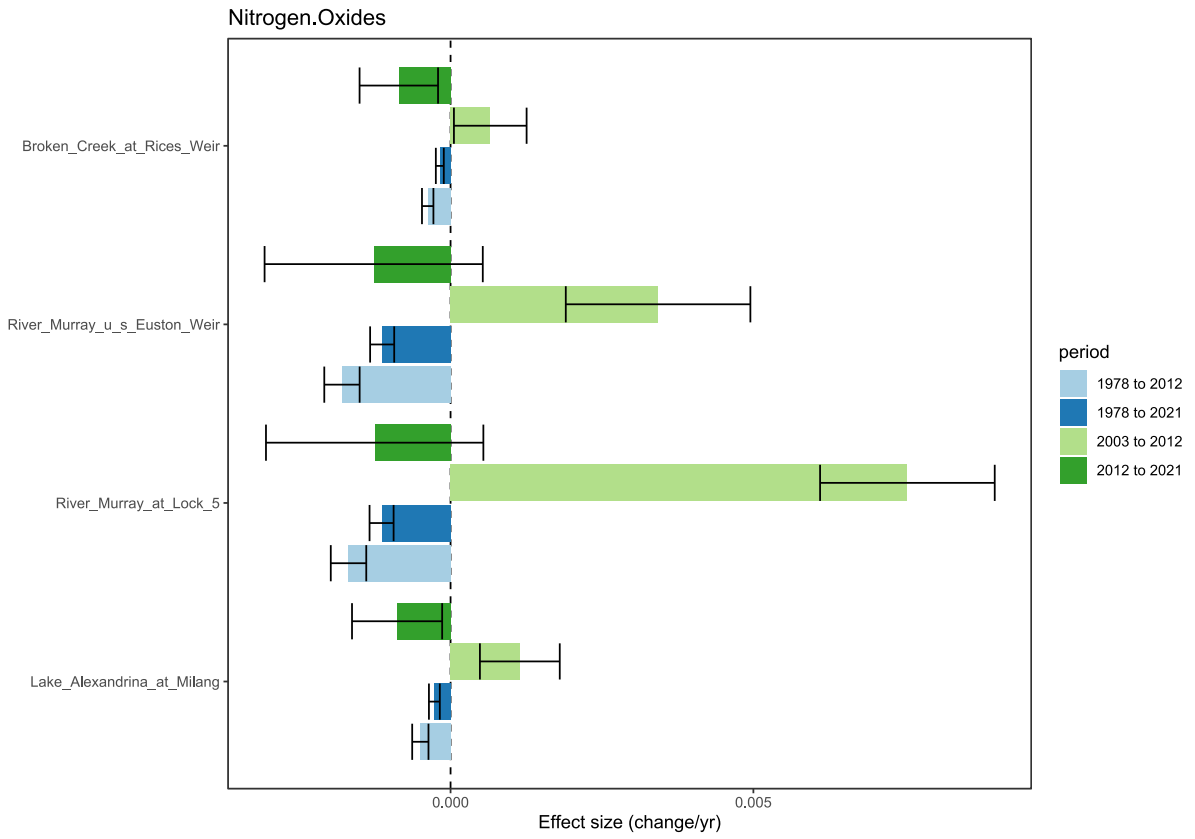


Figure E10. Linear trend component derived from a general linear model (GLM) for changes in total phosphorus at pooled sites.

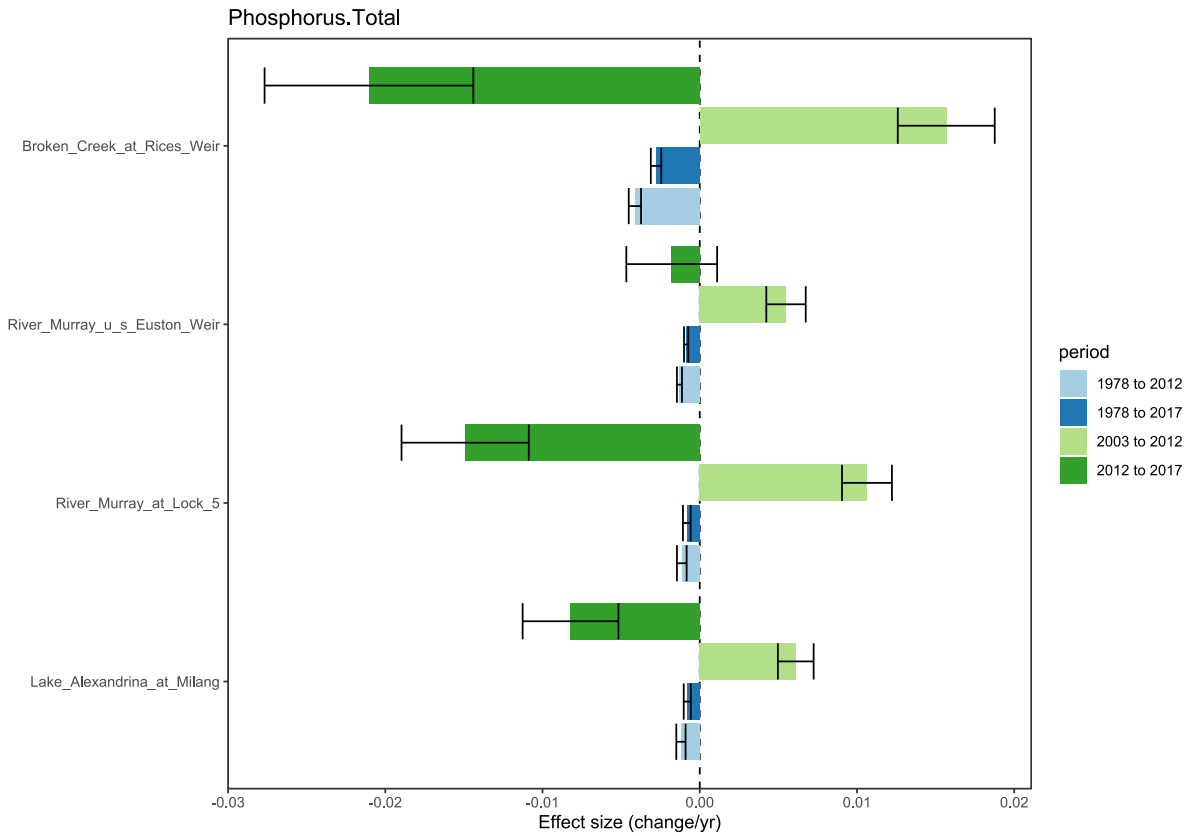


Figure E11. Linear trend component derived from a general linear model (GLM) for changes in soluble reactive phosphorus at pooled sites.

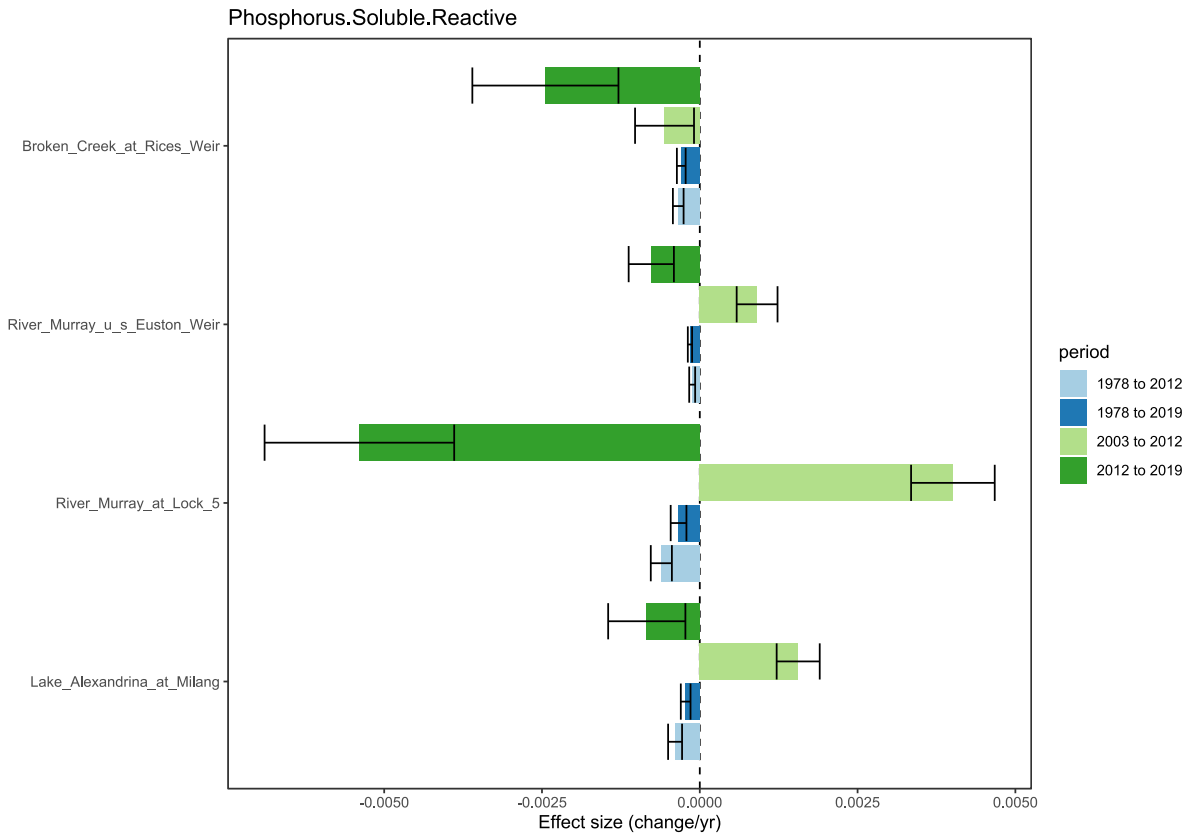


Figure E12. Linear trend component derived from a general linear model (GLM) for changes in dissolved silicon at pooled sites.

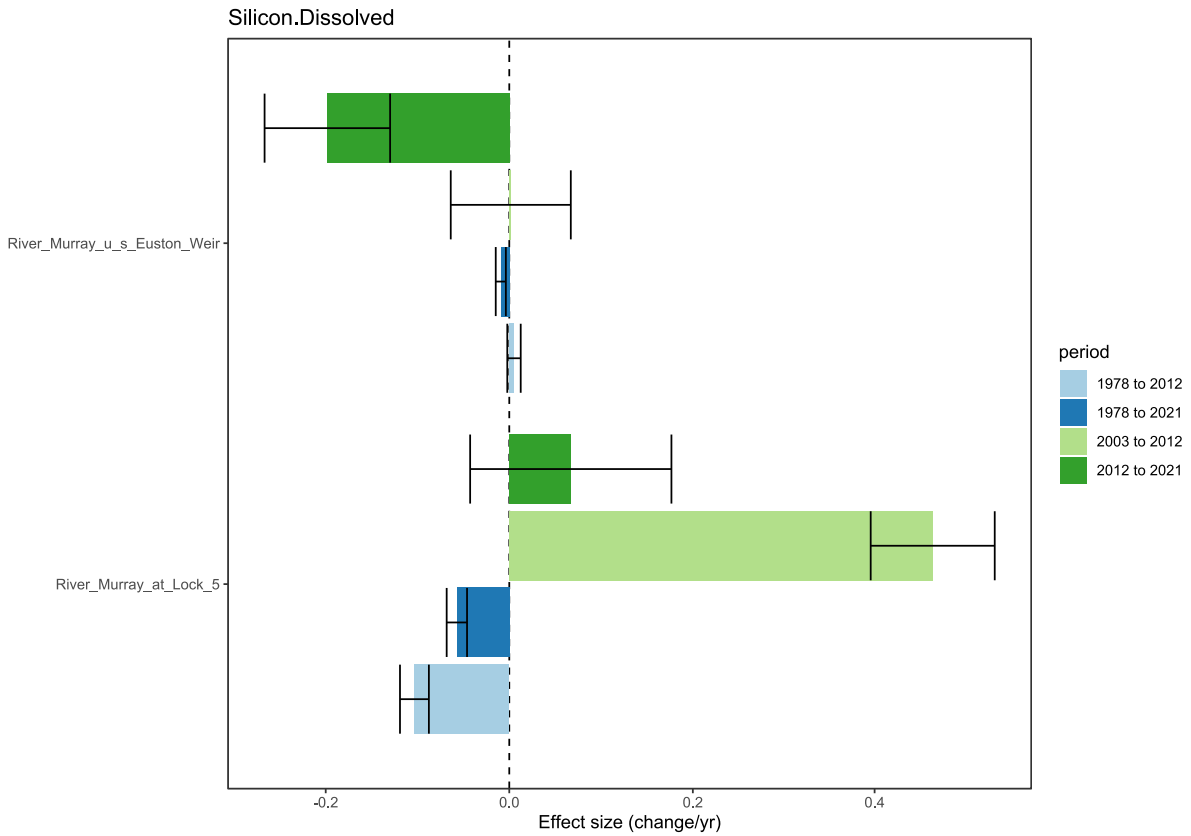


Table A1. Availability of telemetry data at River Murray and tributary sites; state responsible for data archiving and date period for dissolved oxygen (DO) data availability (see additional comments).

Site ID	Site name	Site type	Telemetry variables	Real time State	DO telemetry date range	DO telemetry comments
401201A	River Murray at Jingellic	Channel	pH, DO, T, Turb, EC	VIC	Mar 2020 -June 2022	Continuous; no events captured
401204A	Mitta Mitta River at Tallandoon	Tributary	T, EC	VIC	NA	
409016	River Murray at Heywoods	Channel	NA	VIC	NA	
402205A	Kiewa River at Bandiana	Tributary	DO, T, Turb, EC	VIC	Aug 2019 - June 2022	Continuous; no events captured
403241A	Ovens River at Peechelba	Tributary	DO, T, Turb, EC	VIC	Jan 2020 - June 2022	Continuous; no events captured
409025	River Murray D/S Yarrawonga Weir	Channel	pH, DO, T, EC	NSW	May 2013 - Oct 2014	Full year continuous: Aug 2013 - Oct 2014; no events captured
404214	BROKEN_CREEK_KATAMATITE	Tributary	DO, T, EC	VIC	May 2007 - June 2019	Highly fragmented; unreliable
405232	Goulburn River at McCoy Bridge	Tributary	pH, DO, T, EC	VIC	May 2009 - June 2022	Fragmented; missing June 2011 - Nov 2013; one captured BW event
406202	Campaspe River at Rochester	Tributary	T, EC	VIC	NA	
409207B	River Murray d/s Torrumbarry Weir	Channel	T, EC	VIC	NA	
407209	Gunbower Creek at Koondrook	Tributary	NA	VIC	NA	
407205	LODDON_RIVER_APPIN_SOUTH	Tributary	NA	VIC	NA	
409204C	River Murray at Swan Hill	Channel	T, EC	VIC	NA	
409034	Wakool River at Kyalite	Tributary	NA	VIC	NA	
410130	Murrumbidgee River at Balranald	Tributary	DO, T, EC	NSW	Mar 2012 - June 2022	Continuous; two captured BW events
414204	Murray River at Redcliff	Channel	NA	VIC	NA	

414206	River Murray at Merbein	Channel	T, EC	VIC	NA	
425007	Darling River at Burtundy	Tributary	DO, T, Turb, EC	NSW	Mar 2012- June 2022	Missing Jun 2019 - May 2020; no events captured
A4260501	River Murray at Lock 9	Channel	EC	SA	NA	
A4260200	River Murray d/s Rufus River Junction	Channel	NA	VIC	NA	
A4260539	River Murray at Waikerie	Channel	NA	SA	NA	
A4260554	River Murray at Morgan	Channel	EC	SA	NA	
A4260522	River Murray at Murray Bridge	Channel	EC	SA	NA	
A4260551	River Murray at Tailem Bend	Channel	NA	SA	NA	
414209	River Murray U/S Euston Weir	Pool	NA	VIC	NA	
404210	Broken Creek at Rices Weir	Pool	DO, T, EC	VIC	Oct 2009 - Mar 2020	Fragmented; one event captured (2010-2011)
407202	Loddon River at Kerang	Pool	T, EC	VIC	NA	
A4260512	River Murray at Lock 5 D/S	Pool	NA	SA	NA	
A4260524	Lake Alexandrina at Milang	Pool	NA	SA	NA	
A4261034	Goolwa site	Pool	NA	SA	NA	

Table A2. Default ANZG trigger values and River Murray site specific targets for water quality parameters.

					pH		DO saturation (%)		EC (µS/cm)			Turbidity (NTU)		TN	NOx	TP	SRP
Site ID	Site name	Position in catchment	ANZG Region	Ecosystem type	Lower limit	Upper limit	Lower limit	Upper limit	Lower limit	Upper limit	Murray	Lower lim	Upper lim	trigger (mg-N/L)	trigger (mg-N/L)	trigger (mg-	trigger (mg-P/L)
401201A	River Murray at Jingellic	1	South East-Aust	Upland	6.5	7.5	90	110	30	350		2	25	0.25	0.015	0.02	0.015
401204A	Mitta Mitta River at Tallandoon	2	South East-Aust	Upland	6.5	7.5	90	110	30	350		2	25	0.25	0.015	0.02	0.015
409016	River Murray at Heywoods	3	South East-Aust	Upland	6.5	7.5	90	110	30	350		2	25	0.25	0.015	0.02	0.015
402205A	Kiewa River at Bandiana	4	South East-Aust	Upland	6.5	7.5	90	110	30	350		2	25	0.25	0.015	0.02	0.015
403241A	Ovens River at Peechelba	5	South East-Aust	Upland	6.5	7.5	90	110	30	350		2	25	0.25	0.015	0.02	0.015
409025	River Murray D/S Yarrawonga Weir	6	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
404214	BROKEN_CREEK_KATAMATITE	7	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
405232	Goulburn River at McCoy Bridge	8	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
406202	Campaspe River at Rochester	9	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
409207B	River Murray d/s Torrumbarry Weir	10	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
407209	Gunbower Creek at Koondrook	11	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
407205	LODDON_RIVER_APPIN_SOUTH	12	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
409204C	River Murray at Swan Hill	13	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
409034	Wakool River at Kyalite	14	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
410130	Murrumbidgee River at Balranald	15	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
414204	Murray River at Redcliff	16	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
414206	River Murray at Merbein	17	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
425007	Darling River at Burtundy	18	South East-Aust	Lowland	6.5	8	85	110	125	2200	830	6	50	0.5	0.04	0.05	0.02
A4260501	River Murray at Lock 9	19	South Central-Aust	Lowland	6.5	9	90	NA	100	5000		1	50	1	0.1	0.1	0.04
A4260553	LAKE_VICTORIA_OUTLET	20	South Central-Aust	Lowland	6.5	9	90	NA	100	5000		1	50	1	0.1	0.1	0.04
A4260200	River Murray d/s Rufus River Junction	21	South Central-Aust	Lowland	6.5	9	90	NA	100	5000		1	50	1	0.1	0.1	0.04
A4260539	River Murray at Waikerie	22	South Central-Aust	Lowland	6.5	9	90	NA	100	5000		1	50	1	0.1	0.1	0.04
A4260554	River Murray at Morgan	23	South Central-Aust	Lowland	6.5	9	90	NA	100	5000	800	1	50	1	0.1	0.1	0.04
A4260522	River Murray at Murray Bridge	24	South Central-Aust	Lowland	6.5	9	90	NA	100	5000	830	1	50	1	0.1	0.1	0.04
A4260551	River Murray at Tailem Bend	25	South Central-Aust	Lowland	6.5	9	90	NA	100	5000		1	50	1	0.1	0.1	0.04
404210	Broken Creek at Rices Weir	pool	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
407202	Loddon River at Kerang	pool	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
414209	River Murray U/S Euston Weir	pool	South East-Aust	Lowland	6.5	8	85	110	125	2200		6	50	0.5	0.04	0.05	0.02
A4260512	River Murray at Lock 5 D/S	pool	South Central-Aust	Lowland	6.5	9	90	NA	100	5000		1	50	1	0.1	0.1	0.04
A4260524	Lake Alexandrina at Milang	pool	South Central-Aust	Lowland	6.5	9	90	NA	100	5000	1000	1	50	1	0.1	0.1	0.04
A4261034	Goolwa site	pool	South Central-Aust	Lowland	6.5	9	90	NA	100	5000		1	50	1	0.1	0.1	0.04