WWF-CANADA

Watershed Report

Churchill

August 2020

CHURCHILL WATERSHED REPORT

CONTENTS

Disclaimer: This analysis reflects currently accessible and available data that aligns with our nationally consistent suite of indicators, as of August 2020.

FRESHWATER HEALTH ASSESSMENT

SUMMARY

OVERALL RIVER HEALTH SCORING

Overall River Health	Indicator		06A - Beaver	06B - Upper Churchill (Man.)	06C - Central Churchill (Man.)	06D - Reindeer	06E - Central Churchill (Man.) Lower	06F - Lower Churchill (Man.)	Basin
	Hydrology	**Hydrology Health Category**	Fair	Good	Good	Good	Fair	Fair	Fair
		Hydrology Score	3	4	4	4	3	3	3
	Water Quality	**Water Quality Health Category**	Fair	Data Deficient	Data Deficient	Data Deficient	Good	Data Deficient	Data Deficient
		Water Quality Health Score	3	0	0	0	4	0	0
	Benthic Macro-Invertebrates	**Benthic Health Category**	Data Deficient	Data Deficient	Data Deficient	Data Deficient	Data Deficient	Poor	Data Deficient
		Benthic Health Score	0	0	0	0	0	2	0
	Fish	**Fish Health Category**	Good	Data deficient	Data deficient	Data deficient	Data deficient	Data deficient	Data deficient
		Fish Health Score	4	0	0	0	0	0	0
	Total Score		10	4	4	4	7	5	3
	Total Available Score		15	5	5	5	10	10	5
	Percentage of Maximum Score		66.67%	80.00%	80.00%	80.00%	70.00%	50.00%	60.00%
	Overall Health Category		Fair	Data Deficient	Data Deficient	Data Deficient	Data Deficient	Data Deficient	Data Deficient

WWF-Canada Watershed Report for the CHURCHILL Watershed
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OVERALL DATA SUFFICIENCY SCORING

			Sub-Basin						*Basin*
	Indicator		**06A - Beaver**	**06B - Upper Churchill (Man.)**	**06C - Central Churchill (Man.)**	**06D - Reindeer**	**06E - Central Churchill (Man.) Lower**	**06F - Lower Churchill (Man.)**	
Overall Data Sufficiency	*Hydrology*	Data Sufficiency Category	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient
		Data Sufficiency Score	1	1	1	1	1	1	1
	Water Quality	Data Sufficiency Category	Partially Sufficient	Insufficient	Insufficient	Insufficient	Sufficient	Insufficient	Insufficient
		Data Sufficiency Score	1	0	0	0	3	0	0
	Benthic Macro-Invertebrates	Data Sufficiency Category	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient	Partially Sufficient	Data Deficient
		Data Sufficiency Score	0	0	0	0	0	1	0
	Fish	Data Sufficiency Category	Partially Sufficient	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient
		Data Sufficiency Score	1	0	0	0	0	0	0
	Total Score		3	1	1	1	4	2	1
	Total Available Score		12	12	12	12	12	12	12
	Percentage of Maximum Score		25.00%	*8.33%*	*8.33%*	*8.33%*	33.33%	*16.67%*	*8.33%*
	Overall Data Sufficiency Category		Partially Sufficient	Insufficient	Insufficient	Insufficient	Partially Sufficient	Insufficient	Insufficient

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HYDROLOGY

OVERALL HYDROLOGY RIVER HEALTH SCORING

Indicator			06A - Beaver	06B - Upper Churchill (Man.)	06C - Central Churchill (Man.)	06D - Reindeer	06E - Central Churchill (Man.) Lower	06F - Lower Churchill (Man.)	*Basin*
Long-Term Trends in Monthly Flow	Average percentage change in median monthly flow, measured as the relative change in median monthly flow per year, reported as an average across studied stations and weighted by the median annual flow per station.	*Period of Study*	*1933-2019*	*1930-2018*	*1963-2017*	*1966-2017*	*1928-2018*	*1960-2017*	*1928-2016*
		Number of Stations	*3*	*1*	*1*	*1*	*2*	*1*	9
		Value	*1.01*	*0*	*0*	*0.18*	*0.08*	*2.13*	0.61
		Health Category	*Fair*	*Very Good*	*Very Good*	*Good*	*Very Good*	*Fair*	*Good*
		Health Score	*3*	*5*	*5*	*4*	*5*	*3*	4
Recent-Term Trends in Monthly Flow	Average percentage change in median monthly flow, measured as the relative change in median monthly flow per year, reported as an average across studied stations and weighted by the median annual flow per station.	*Period of Study*	*1977-2019*	*1973-2018*	*1977-2017*	*1985-2018*	*1993-2018*	*1979-2017*	*1973-2019*
		Number of Stations	*15*	*4*	*3*	*5*	*4*	*6*	37
		Value	*0.73*	*0.013*	*0.86*	*0.44*	*1.51*	*0.08*	0.602
		Health Category	*Good*	*Very Good*	*Good*	*Good*	*Fair*	*Very Good*	Good
		Health Score	*4*	*5*	*4*	4	*3*	*5*	4
Long-Term Trends in Annual Flow	Average percentage change in median annual flow, reported as an average across studied stations and weighted by the median annual flow per station.	*Period of Study*	*1933-2019*	*1930-2018*	*1963-2017*	*1966-2017*	*1928-2018*	*1960-2017*	*1928-2016*
		Number of Stations	*3*	*1*	*1*	*1*	*2*	*1*	9
		Value	*0.00%*	*0%*	*0.00%*	*0*	*0.10%*	*3%*	0.39%
		Health Category	Very Good	Very Good	Very Good	*Very Good*	Good	Fair	Good
		Health Score	5	5	5	5	4	3	4

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Indicator			06A - Beaver	06B - Upper Churchill (Man.)	06C - Central Churchill (Man.)	06D - Reindeer	06E - Central Churchill (Man.) Lower	06F - Lower Churchill (Man.)	*Basin*
Pre- vs. Post-Dam or Recent vs. Historical Analysis of Monthly Flow	Percentage of total months, for all stations analyzed, with significantly different variance in monthly flow pre- vs. post-dam operation or for historical vs. Recent time periods in undammed systems.	*Period of Study*	*1933-2017*	*1930-2018*	*1963-2017*	*1966-2017*	*1928-2018*	*1960-2017*	*1928-2016*
		Number of Stations	*4*	*4*	*2*	*1*	*3*	*6*	20
		Value	*97.73%*	*65%*	*95.83%*	*91.67%*	*72.22%*	*79.17%*	81.21%
		Health Category	*Very Poor*	*Very Poor*	*Very Poor*	Very Poor	*Very Poor*	*Very Poor*	Very Poor
		Health Score	*1*	*1*	*1*	*1*	*1*	*1*	1
	Percentage change in median monthly flow pre- and post-dam or for historical vs. Recent time periods in undammed systems, averaged across studied stations by mean annual flow.	*Period of Study*	*1933-2016*	*1955-2016*	*1967-2016*	*1966-2017*	*1928-2016*	*1960-2016*	*1928-2016*
		Number of Stations	*4*	*4*	*2*	*1*	*3*	*6*	20
		Value	*48.29%*	*9.33%*	*4.82%*	*10.89%*	*10.85%*	*54.62%*	30.56%
		Health Category	Poor	Very Good	Very Good	Good	Good	Poor	Fair
		Health Score	2	5	5	*4*	4	2	3
Hydrology Score		*Total Score*	*15*	*21*	*20*	*18*	*17*	*14*	16
		Maximum Available Score	*25*	*25*	*25*	*25*	*25*	*25*	25
		Percentage of Maximum Score	*60.00%*	*84.00%*	*80.00%*	*72.00%*	*68.00%*	*56.00%*	64.00%
		Hydrology Health Category	Fair	Good	Good	Good	Fair	Fair	Fair
		Hydrology Score	3	4	4	4	3	3	3

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HYDROLOGY DATA SUFFICIENCY

	Data Sufficiency Indicator	06A - Beaver	06B - Upper Churchill (Man.)	06C - Central Churchill (Man.)	06D - Reindeer	06E - Central Churchill (Man.) Lower	06F - Lower Churchill (Man.)	Basin
Hydrology	Total number of sub-sub-basins	7	4	6	5	3	5	30
	Total number of dams (>10m)	0	0	0	2	5	1	8
	Year of earliest dam operation	-	-	-	1930	1930	1976	1930
	Year of earliest available continuous flow monitoring	*1933*	*1930*	*1963*	*1966*	*1928*	*1960*	1928
	Number of monitoring stations available for earliest, continuous flow monitoring	1	1	1	1	1	1	6
	Number of sub-sub-basins with monitoring stations	1	1	1	1	1	1	6
	Number of monitoring stations on river downstream of dams	0	0	0	0	1	0	1
	Data Sufficiency Category	Partially Sufficient	Partially Sufficient	Partially Sufficient	Insufficient	Insufficient	Insufficient	Partially Sufficient
	Year of long-term continuous flow monitoring	1967	1970	1967	1968	1973	1979	1979
	Number of monitoring stations available for continuous flow monitoring analysis	9	3	2	2	3	6	25
	Number of sub-sub-basins with monitoring stations	4	3	2	1	2	4	16
	Number of monitoring stations on river downstream of dams	0	0	0	0	1	0	1
	Data Sufficiency Category	Partially Sufficient	Partially Sufficient	Partially Sufficient	Insufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient
	Year of widespread, continuous flow monitoring	1971	1973	1977	1973	1973	1979	1979
	Number of monitoring stations available for continuous flow monitoring analysis	13	4	3	5	3	6	34
	Number of sub-sub-basins with monitoring stations	5	3	3	2	2	4	19
	Number of monitoring stations on river downstream of dams	0	0	0	0	1	0	1
	Data Sufficiency Category	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient
	Overall Data Sufficiency Category	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient	Partially Sufficient
	Data Sufficiency Score	1	1	1	1	1	1	1

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MAP. RESULTS OF A SERIES OF LONG-TERM TREND ANALYSES OF MEDIAN MONTHLY FLOW IN CHURCHILL WATERSHED FOR THE PERIOD <1963-2018.

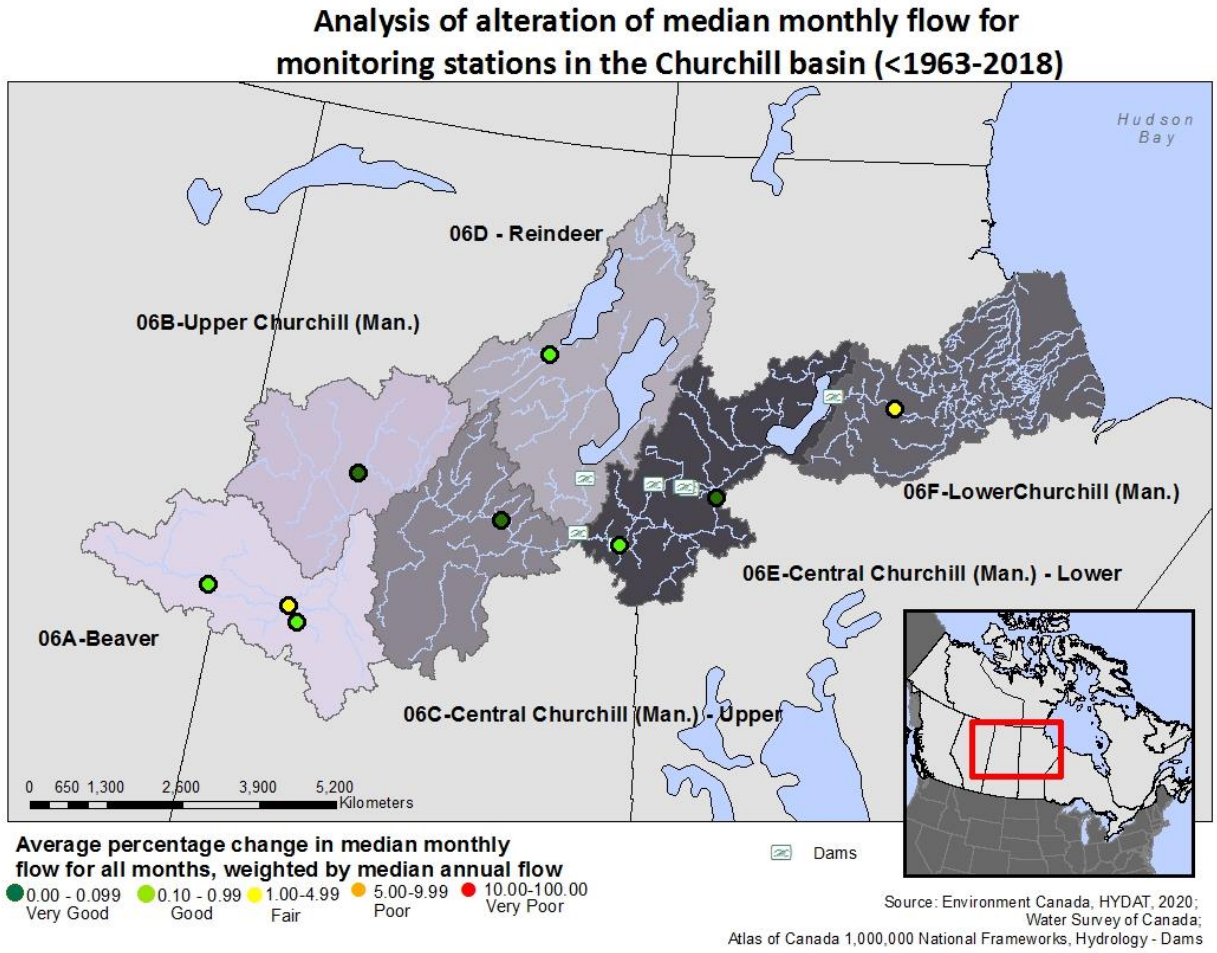

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TABLE. RESULTS OF LONG-TERM TREND ANALYSES FOR MEDIAN MONTHLY FLOW IN THE CHURCHILL WATERSHED.

	06A - BEAVER													
	06AD001					06AD006				06AD010				
	Start Year for Analysis			1933		Start Year for Analysis			1955	Start Year for Analysis			1958	
	Median Annual Flow (m^3/s)			20.97		Median Annual Flow (m^3/s)			10.17	Median Annual Flow (m^3/s)			4.08	
Month	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	-2.75E-01	4.53E-05	***	4.59	6.00	-2.22E-02	0.11		3.47		6.67E-04	0.40		0.17	
February	-1.34E-01	6.22E-04	***	3.99	3.37	-1.82E-02	0.20		3.09		0.00	0.14		0.22	
March	-2.37E-02	0.17		4.49		-1.27E-02	0.25		3.49		0.03	7.58E-04	***	0.65	4.16
April	-1.90E-01	0.22		34.82		-1.92E-01	0.06		25.21		0.02	0.56		5.01	
May	-5.55E-01	0.02	*	56.62	0.98	-4.17E-01	0.04	*	39.25	1.06	0.01	0.90		10.94	
June	-1.99E-01	0.23		45.08		-1.44E-01	0.31		33.14		0.02	0.68		8.15	
July	0.00	0.99		40.32		-5.86E-02	0.74		31.97		0.05	0.23		6.39	
August	-1.76E-02	0.86		28.02		-3.89E-02	0.60		20.51		0.05	0.04	*	3.77	1.42
September	-4.30E-02	0.58		18.12		-1.35E-01	0.08		16.29		0.05	0.05		3.02	
October	-5.12E-02	0.46		15.29		-1.48E-01	0.01	*	13.20	1.12	0.04	0.08		2.32	
November	-2.55E-01	0.01	**	10.32	2.47	-8.78E-02	0.02	*	7.99	1.10	0.05	0.05	*	1.87	2.44
December	-2.30E-01	3.21E-04	***	5.20	4.42	-2.79E-02	0.14		4.57		-7.82E-03	0.19		0.34	
Average for all months, for each station	-1.64E-01			22.24	1.44	-1.08E-01			16.85	0.27	0.03			3.57	0.67
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill				1.01											

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06B - Upper Churchill					
06BB003					
Start Year for Analysis				1930	
Median Annual Flow (m^3/s)				140.48	
Month	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	0.17	0.84		115.12	
February	0.14	0.85		107.73	
March	0.23	0.69		100.03	
April	0.35	0.77		98.51	
May	0.31	0.73		135.61	
June	0.48	0.73		164.10	
July	0.05	0.98		180.58	
August	1.02	0.35		169.19	
September	0.21	0.87		160.24	
October	0.75	0.59		146.13	
November	0.88	0.50		134.93	
December	0.87	0.53		126.23	
Average for all months, for each station	0.45			136.53	0.00E+00
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill				0	

06C - Central Churchill					
06CD002					
Start Year for Analysis				1963	
Median Annual Flow (m^3/s)				284.67	
Month	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	0.24	0.69		234.69	
February	0.24	0.74		213.66	
March	0.32	0.59		198.74	
April	0.44	0.61		194.17	
May	-1.94E-01	0.85		263.01	
June	-4.29E-02	0.98		345.55	
July	0.54	0.81		375.04	
August	0.95	0.58		371.85	
September	0.91	0.50		337.09	
October	0.08	0.95		316.05	
November	0.52	0.64		300.27	
December	0.63	0.52		270.95	
Average for all months, for each station	0.39			285.09	0.00E+00
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill				0.00	

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	06D - Reindeer				
	06DA004				
	Start Year for Analysis			1966	
	Median Annual Flow (m^3/s)			41.24	
Month	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	-1.83E-01	0.04	*	29.16	0.63
February	-2.21E-01	0.01	*	28.23	0.78
March	-2.28E-01	0.01	**	28.34	0.80
April	-2.88E-02	0.82		35.76	
May	0.02	0.92		71.51	
June	0.00	0.95		60.72	
July	-3.07E-01	0.13		54.28	
August	-2.29E-01	0.16		49.54	
September	-1.69E-01	0.25		46.79	
October	-1.50E-01	0.42		47.67	
November	-6.13E-02	0.72		41.61	
December	-9.15E-02	0.33		33.78	
Average for all months, for each station	-1.37E-01			43.95	0.18
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill				0.18	

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	06E - Central Churchill Lower									
	06EA002					06EA006				
	Start Year for Analysis			1928		Start Year for Analysis			1946	
	Median Annual Flow (m^3/s)			686.55		Median Annual Flow (m^3/s)			778.38	
Month	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	2.68	2.88E-05	***	663.27	0.40	-1.23E-01	0.88		731.34	
February	2.89	6.48E-06	***	652.57	0.44	0.92	0.20		705.60	
March	2.82	1.43E-06	***	633.29	0.44	0.61	0.45		700.06	
April	2.64	1.20E-05	***	621.48	0.42	0.29	0.79		694.62	
May	1.57	0.09		707.23		0.60	0.64		831.06	
June	-1.20E-01	0.92		768.65		-1.19E+00	0.43		893.93	
July	0.01	0.97		790.41		-1.43E+00	0.30		888.88	
August	0.45	0.76		788.84		-1.92E+00	0.28		878.14	
September	0.55	0.63		771.77		-2.22E+00	0.20		851.35	
October	1.07	0.26		725.47		-1.17E+00	0.41		837.70	
November	1.36	0.07		700.82		-1.04E+00	0.45		796.04	
December	2.15	9.85E-04	***	687.07	0.31	-5.81E-01	0.66		757.34	
Average for all months, for each station	1.51			709.24	0.17	-6.05E-01			797.17	0.00E+00
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill				0.08						

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	06F - Lower Churchill				
	06FB001				
	Start Year for Analysis			1960	
	Median Annual Flow (m^3/s)			502.08	
Month	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	-6.33E+00	6.98E-06	***	394.67	1.60
February	-5.07E+00	9.95E-07	***	320.65	1.58
March	-7.89E+00	1.17E-08	***	327.55	2.41
April	-3.44E+00	0.00	**	276.00	1.25
May	-1.13E+01	1.17E-05	***	406.16	2.77
June	-2.00E+01	1.86E-07	***	649.52	3.08
July	-1.79E+01	4.78E-05	***	648.41	2.76
August	-1.42E+01	0.00	**	626.56	2.27
September	-1.68E+01	2.93E-04	***	606.03	2.78
October	-1.39E+01	1.01E-04	***	532.83	2.62
November	-7.95E+00	0.00	**	517.41	1.54
December	-4.00E+00	0.02	*	427.47	0.94
Average for all months, for each station	-1.07E+01			477.77	2.13
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill				2.13	

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RECENT-TERM TRENDS IN MONTHLY FLOW FOR THE CHURCHILL WATERSHED

MAP. RESULTS OF A SERIES OF TREND ANALYSES OF MEDIAN MONTHLY FLOW IN CHURCHILL WATERSHED FOR THE PERIOD >1973-2018.

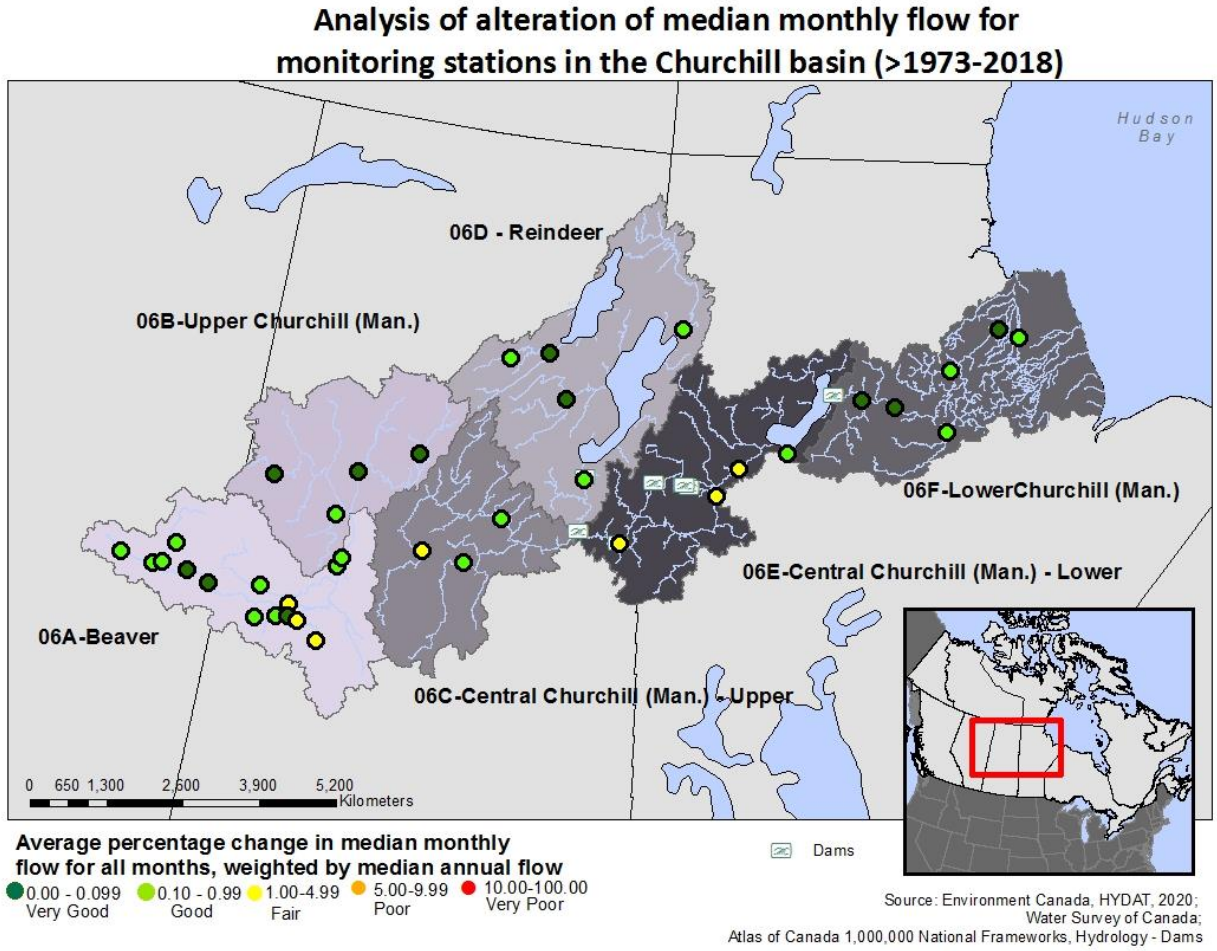

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TABLE. RESULTS OF RECENT-TERM TREND ANALYSES FOR MEDIAN MONTHLY FLOW IN THE CHURCHILL WATERSHED

	06A - BEAVER																							
	06AA001					06AA002				06AB001				06AB002					06AC001					
	Start Year for Analysis			1977		Start Year for Analysis			1977	Start Year for Analysis			1977	Start Year for Analysis			1977		Start Year for Analysis			1977		
	Median Annual Flow (m^3/s)			1.19		Median Annual Flow (m^3/s)			0.75	Median Annual Flow (m^3/s)			8.54	Median Annual Flow (m^3/s)			0.63		Median Annual Flow (m^3/s)			0.18		
Month	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	-	-		-		-	-		-		-	-		-		-1.40E-02	0.14		0.20		-	-		-	
February	-1.15E-03	0.90		0.15		-1.36E-03	0.83		0.11		-6.31E-02	0.55		1.76		-1.20E-02	0.17		0.20		3.57E-04	0.85		0.09	
March	-2.63E-03	0.20		0.51		0.00E+00	0.93		0.28		0.01	0.59		1.86		0.01	0.01	*	0.33	2.75	0.00	0.08		0.13	
April	-5.78E-02	0.18		5.62		-4.84E-02	0.07		2.43		-5.47E-02	0.28		8.28		0.01	0.04	*	0.64	1.67	0.01	0.18		0.61	
May	-2.50E-03	0.90		4.36		-3.33E-04	0.98		2.91		0.29	0.10		17.42		0.02	0.14		1.57		0.00	0.57		0.60	
June	-2.96E-03	0.85		3.59		-6.60E-04	0.90		2.47		0.21	0.19		19.77		0.02	0.31		2.32		0.00	0.20		0.50	
July	-8.33E-03	0.33		1.95		-8.62E-03	0.19		1.50		0.28	0.10		17.81		0.05	0.00	**	2.13	2.29	0.00	0.08		0.43	
August	-1.33E-02	0.01	**	0.96	1.39	-2.58E-03	0.02	*	0.79	0.33	0.19	0.05	*	11.29	1.66	0.03	0.01	*	1.25	2.47	0.00	0.06		0.23	
September	-4.00E-03	0.02	*	0.80	0.50	-3.88E-03	0.00	**	0.63	0.61	0.07	0.29		9.23		0.00	0.34		0.64		7.69E-05	0.44		0.13	
October	-4.32E-03	0.01	**	0.77	0.56	-2.60E-03	0.02	*	0.54	0.49	0.03	0.53		6.74		7.81E-04	0.45		0.48		4.44E-04	0.32		0.10	
November	-1.33E-02	0.12		0.78		-1.60E-02	0.09		0.65		-8.33E-02	0.49		4.62		-5.84E-03	0.21		0.27		-2.25E-04	0.26		0.09	
December	-	-		-		-	-		-		-	-		-		-1.11E-02	0.17		0.19		-	-		-	
Average for all months, for each station	-1.10E-02			1.95	0.25	-8.45E-03			1.23	0.14	0.09			9.88	0.17	0.01			0.85	0.76	0.00			0.29	0.00E+00

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	06A - BEAVER																								
	06AD001					06AD006					06AD007					06AD008					06AD009				
	Start Year for Analysis			1977		Start Year for Analysis			1977		Start Year for Analysis			1977		Start Year for Analysis			1977		Start Year for Analysis			1977	
	Median Annual Flow (m^3/s)			15.45		Median Annual Flow (m^3/s)			7.84		Median Annual Flow (m^3/s)			1.35		Median Annual Flow (m^3/s)			0.11		Median Annual Flow (m^3/s)			0.28	
Month	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	-1.61E-01	0.01	**	3.13	5.13	0.00	0.95		2.85		-	-		-		-	-		-		-	-		-	
February	-9.31E-02	0.02	*	2.95	3.15	0.00	0.95		2.62		0.01	0.47		0.32		NA	NA		0.01		-3.29E-02	1.00		0.24	
March	0.01	0.69		4.04		0.01	0.49		3.13		0.01	0.07		0.46		0.00E+00	0.07		0.03		-2.50E-04	0.42		0.18	
April	0.09	0.74		29.88		-5.47E-02	0.80		18.89		0.07	0.12		4.79		0.01	0.08		0.82		-8.17E-03	0.03	*	0.60	1.36
May	0.34	0.32		38.55		0.36	0.10		26.85		0.02	0.57		4.71		2.40E-04	0.70		0.62		0.00E+00	0.52		1.13	
June	0.34	0.33		35.00		0.28	0.15		26.74		0.03	0.22		3.02		1.94E-04	0.02	*	0.33	0.06	0.00E+00	0.35		0.86	
July	0.44	0.05	*	32.74	1.34	0.34	0.07		23.96		0.04	0.02	*	2.22	1.78	0.00E+00	0.02	*	0.20	0.00E+00	-2.14E-04	0.36		0.52	
August	0.26	0.07		22.31		0.21	0.09		16.00		0.03	0.01	*	1.60	1.98	0.00E+00	0.02	*	0.13	0.00E+00	-1.00E-03	0.06		0.37	
September	0.17	0.22		14.85		0.12	0.19		11.75		0.01	0.08		0.98		0.00E+00	0.06		0.10		-3.33E-04	0.10		0.23	
October	0.08	0.54		12.57		0.08	0.37		9.47		0.01	0.18		0.68		3.64E-05	0.01	**	0.05	0.07	-4.62E-04	0.44		0.18	
November	0.03	0.87		6.95		0.04	0.34		5.75		0.02	0.14		1.03		6.54E-04	0.16		0.07		0.00	0.43		0.11	
December	-1.88E-01	0.01	*	3.52	5.35	0.02	0.44		3.55		-	-		-		-	-		-		-	-		-	
Average for all months, for each station	0.11			17.21	1.25	0.12			12.63	0.00E+00	0.02			1.98	0.38	0.00			0.23	0.01	-4.17E-03			0.44	0.14

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	06A - BEAVER																							
	06AD010					06AD011					06AF005					06AG001					06AG002				
	Start Year for Analysis			1977		Start Year for Analysis			1977		Start Year for Analysis			1977		Start Year for Analysis			1977		Start Year for Analysis			1977	
	Median Annual Flow (m^3/s)			2.95		Median Annual Flow (m^3/s)			0.38		Median Annual Flow (m^3/s)			14.18		Median Annual Flow (m^3/s)			50.99		Median Annual Flow (m^3/s)			2.46	
Month	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	6.67E-04	0.40		0.17		-	-		-		-4.43E-01	0.04	*	7.24	6.11	-5.51E-01	0.10		12.79		0.01	0.28		1.50	
February	0.00	0.14		0.22		0.00	0.24		0.06		-2.70E-01	0.04	*	6.88	3.93	-3.07E-01	0.24		12.92		0.03	0.09		1.66	
March	0.03	2.79E-04	***	0.67	4.36	0.00	0.04	*	0.09	1.94	0.02	0.73		8.32		0.28	0.03	*	20.10	1.38	0.04	0.06		1.85	
April	0.09	0.04	*	4.12	2.16	0.02	0.09		1.32		0.14	0.12		9.93		0.57	0.13		55.07		0.11	0.05		4.18	
May	0.14	0.22		9.66		0.01	0.53		1.37		0.16	0.14		12.56		0.80	0.29		86.26		0.06	0.36		7.58	
June	0.07	0.26		8.00		0.04	0.01	*	1.22	2.92	0.20	0.20		16.64		1.03	0.15		75.26		0.09	0.08		5.93	
July	0.15	0.03	*	6.06	2.54	0.02	0.00	**	0.73	3.00	0.34	0.08		20.60		1.34	0.01	*	69.24	1.93	0.06	0.04	*	3.87	1.51
August	0.11	0.00	**	3.93	2.89	0.00	0.07		0.31		0.35	0.07		20.38		1.18	0.01	*	59.28	1.99	0.05	0.05		2.46	
September	0.09	0.01	*	3.20	2.68	4.61E-04	0.52		0.36		0.27	0.12		18.10		1.12	0.01	**	51.23	2.19	0.05	0.05		2.74	
October	0.08	0.01	*	2.53	3.24	0.01	0.02	*	0.31	1.76	0.21	0.14		16.14		0.66	0.04	*	47.04	1.40	0.06	0.07		2.80	
November	0.06	0.01	*	1.93	3.16	0.02	0.00	**	0.51	3.67	0.13	0.30		12.05		-1.02E+00	0.16		23.74		0.08	0.01	*	2.30	3.30
December	-8.29E-03	0.27		0.32		-	-		-		-3.78E-01	0.06		7.74		-6.18E-01	0.09		14.81		0.04	0.09		1.82	
Average for all months, for each station	0.07			3.40	1.75	0.01			0.63	1.33	0.06			13.05	0.84	0.37			43.98	0.74	0.06			3.22	0.40
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill	**0.73**																								

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	06B - Upper Churchill (Man.)																	
	06BA002					06BBb003					06BB005					06BD001				
	Start Year for Analysis			1973		Start Year for Analysis			1973		Start Year for Analysis			1973		Start Year for Analysis			1973	
	Median Annual Flow (m^3/s)			6.34		Median Annual Flow (m^3/s)			135.15		Median Annual Flow (m^3/s)			10.58		Median Annual Flow (m^3/s)			15.86	
Month	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	-4.71E-03	0.72		2.05		0.16	0.86		115.32		0.08	0.13		6.23		0.02	0.73		8.86	
February	0.01	0.66		1.48		0.14	0.85		107.73		0.08	0.10		5.22		0.00	0.90		7.76	
March	0.01	0.04	*	1.25	1.13	0.23	0.69		100.03		0.09	0.04	*	5.05	1.76	0.03	0.44		7.59	
April	-5.20E-03	0.79		4.05		0.35	0.77		98.51		0.11	0.13		11.56		0.06	0.10		10.88	
May	0.04	0.66		18.60		0.31	0.73		135.61		0.11	0.45		21.44		-8.43E-02	0.57		33.24	
June	0.24	0.12		18.11		0.35	0.80		165.16		0.07	0.64		16.55		0.10	0.49		28.33	
July	0.19	0.16		17.11		0.56	0.74		179.29		0.11	0.35		12.25		-7.36E-02	0.62		29.03	
August	0.10	0.28		12.93		0.93	0.60		172.90		0.13	0.15		10.97		-4.52E-02	0.72		23.06	
September	0.04	0.73		10.27		0.83	0.68		158.58		0.09	0.31		11.34		0.02	0.90		20.88	
October	-2.00E-02	0.80		9.00		0.63	0.68		147.37		0.03	0.83		13.13		-8.71E-03	0.93		20.48	
November	-1.57E-02	0.78		5.98		0.78	0.58		135.90		0.06	0.48		11.18		0.00E+00	1.00		15.07	
December	-7.69E-03	0.62		3.20		0.80	0.62		127.06		0.08	0.23		7.97		0.04	0.38		10.82	
Average for all months, for each station	0.05			8.67	0.09	0.51			136.95	0.00E+00	0.09			11.08	0.15	0.00			18.00	0.00E+00
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill	**0.01**																			

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	06C - Central Churchill (Man.)														
	06CA001					06CC001					06CD002				
	Start Year for Analysis			1977		Start Year for Analysis			1977		Start Year for Analysis			1977	
	Median Annual Flow (m^3/s)			15.13		Median Annual Flow (m^3/s)			14.29		Median Annual Flow (m^3/s)			268.65	
Month	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	0.12	0.44		10.19		-1.90E-01	0.01	**	3.33	5.71	2.58	0.04	*	220.80	1.17
February	0.15	0.32		8.76		-1.67E-01	0.01	*	2.91	5.72	2.08	0.08		201.65	
March	0.26	0.00	**	9.31	2.77	0.13	0.01	**	4.49	2.85	1.86	0.04	*	187.90	0.99
April	0.28	0.00	**	10.61	2.60	0.21	0.01	**	9.60	2.16	1.70	0.05		184.86	
May	0.29	0.07		17.39		0.48	0.06		28.04		1.28	0.42		249.55	
June	0.27	0.21		20.91		0.47	0.07		27.53		1.18	0.47		336.45	
July	0.35	0.12		21.46		0.42	0.03	*	23.89	1.77	3.13	0.14		358.61	
August	0.38	0.02	*	20.71	1.86	0.45	0.00	**	19.16	2.35	4.40	0.04	*	353.41	1.25
September	0.37	0.02	*	17.66	2.10	0.34	0.01	**	17.06	1.98	4.33	0.02	*	318.72	1.36
October	0.34	0.02	*	17.61	1.92	0.26	0.02	*	14.27	1.82	4.15	0.03	*	296.02	1.40
November	0.26	0.39		15.60		-1.31E-01	0.53		9.28		4.51	0.02	*	282.99	1.59
December	-5.81E-02	0.79		12.07		-2.15E-01	2.77E-04	***	4.11	5.23	3.84	0.01	*	256.05	1.50
Average for all months, for each station	0.25			15.19	0.94	0.17			13.64	2.46	2.92			270.59	0.77
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill	**0.86**														

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	06D - Reindeer																					
	06DA002					06DA004				06DA005				06DC001				06DD002				
	Start Year for Analysis			1985		Start Year for Analysis			1985	Start Year for Analysis			1985	Start Year for Analysis			1985	Start Year for Analysis			1985	
	Median Annual Flow (m^3/s)			156.23		Median Annual Flow (m^3/s)			39.53	Median Annual Flow (m^3/s)			15.46	Median Annual Flow (m^3/s)			49.98	Median Annual Flow (m^3/s)			340.18	
Month	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	0.17	0.83		126.86		-1.29E-01	0.39		27.26		-7.42E-02	0.12		13.33		0.18	0.50		34.06		-5.54E+00	0.00	**	399.42	1.39
February	-3.68E-01	0.60		118.33		-2.04E-01	0.10		25.85		-1.00E-01	0.04	*	12.80	0.78	0.18	0.46		28.34		-4.89E+00	0.01	**	417.32	1.17
March	-5.00E-01	0.37		112.56		-2.55E-01	0.02	*	26.08	0.98	-1.17E-01	0.02	*	12.59	0.93	0.14	0.50		24.26		-5.00E+00	0.00	**	410.39	1.22
April	-3.44E-01	0.60		111.99		0.02	0.88		34.45		-7.16E-02	0.15		14.54		0.07	0.68		23.68		-1.54E+00	0.39		372.20	
May	-2.80E+00	0.06		185.09		-3.09E-01	0.40		71.52		-1.21E-01	0.15		21.14		-7.67E-01	0.25		79.44		-3.65E-01	0.80		338.00	
June	-3.88E+00	0.03	*	224.29	1.73	-6.47E-03	0.98		59.44		-9.31E-02	0.14		20.36		0.06	0.93		91.03		5.67	0.05	*	282.31	2.01
July	-3.13E+00	0.07		209.00		-2.48E-01	0.54		50.56		-8.68E-02	0.24		18.08		0.31	0.59		77.67		3.60	0.13		252.54	
August	-2.23E+00	0.11		182.58		-2.57E-01	0.41		46.32		-1.29E-01	0.14		16.12		0.15	0.65		76.87		2.92	0.37		295.34	
September	-1.48E+00	0.21		181.58		-3.18E-01	0.22		43.97		-8.67E-02	0.29		15.22		0.10	0.84		65.60		1.70	0.61		322.65	
October	-1.80E+00	0.33		186.00		0.06	0.94		45.19		0.02	0.90		16.09		0.24	0.59		62.94		-8.75E-01	0.93		328.47	
November	0.48	0.65		167.62		0.17	0.49		39.69		0.02	0.89		15.81		0.30	0.48		54.65		-4.75E+00	0.05	*	369.72	1.28
December	0.60	0.33		142.95		0.04	0.85		32.22		-2.86E-02	0.60		14.32		0.26	0.47		43.41		-4.75E+00	0.02	*	389.24	1.22
Average for all months, for each station	-1.27E+00			162.40	0.14	-1.19E-01			41.88	0.08	-7.22E-02			15.87	0.14	0.10			55.16	0.00E+00	-1.15E+00			348.13	0.69
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill				**0.44**																					

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	06E - Central Churchill (Man.) Lower																			
	06EA002					06EA006					06EB004					06EC002				
	Start Year for Analysis			1993		Start Year for Analysis			1993		Start Year for Analysis			1993		Start Year for Analysis			1993	
	Median Annual Flow (m^3/s)			718.83		Median Annual Flow (m^3/s)			753.28		Median Annual Flow (m^3/s)			881.29		Median Annual Flow (m^3/s)			807.20	
Month	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall p-value		Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	10.38	0.01	**	705.19	1.47	13.29	0.01	**	709.28	1.87	14.00	0.01	**	835.12	1.68	9.07	0.07		866.52	
February	10.43	0.01	**	697.17	1.50	13.93	0.00	**	684.10	2.04	14.27	0.01	**	793.52	1.80	10.20	0.01	*	853.74	1.19
March	7.00	0.04	*	675.62	1.04	13.58	0.00	**	672.56	2.02	12.25	0.00	**	766.08	1.60	12.56	0.00	**	817.62	1.54
April	8.42	0.04	*	666.06	1.26	8.62	0.02	*	666.90	1.29	10.78	0.01	**	745.62	1.45	10.34	0.14		782.98	
May	13.50	0.02	*	747.00	1.81	12.72	0.03	*	820.44	1.55	11.60	0.03	*	880.88	1.32	5.30	0.54		696.96	
June	20.78	0.01	**	776.96	2.67	12.95	0.04	*	869.06	1.49	13.78	0.04	*	1006.69	1.37	-2.23E+00	0.65		708.46	
July	24.22	0.00	**	800.12	3.03	20.28	0.01	*	870.64	2.33	16.00	0.01	**	1005.00	1.59	-2.20E+00	0.74		690.64	
August	21.81	0.00	**	831.73	2.62	22.68	0.00	**	865.60	2.62	23.83	0.00	**	1023.73	2.33	3.59	0.74		691.59	
September	19.69	0.00	**	827.87	2.38	19.29	0.00	**	868.02	2.22	20.00	0.00	**	1019.08	1.96	9.10	0.19		744.27	
October	13.94	0.02	*	780.58	1.79	20.20	0.00	**	834.80	2.42	21.17	6.88E-04	***	1009.65	2.10	8.56	0.06		799.52	
November	12.36	0.02	*	758.58	1.63	14.88	0.00	**	790.00	1.88	19.21	4.21E-04	***	959.58	2.00	9.13	0.03	*	849.48	1.07
December	12.53	0.00	**	739.15	1.70	15.92	0.00	**	757.12	2.10	18.70	6.88E-04	***	899.31	2.08	10.37	0.01	*	861.63	1.20
Average for all months, for each station	14.59			750.50	1.91	15.70			784.04	1.99	16.30			912.02	1.77	6.98			780.28	0.42
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill	**1.51**																			

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	06F - Lower Churchill (Man.)																							
	06FA001					06FB001					06FB002					06FC001					06FD001					06FD002				
	Start Year for Analysis			1979		Start Year for Analysis			1979		Start Year for Analysis			1979		Start Year for Analysis			1979		Start Year for Analysis			1979		Start Year for Analysis			1979	
	Median Annual Flow (m^3/s)			29.45		Median Annual Flow (m^3/s)			180.06		Median Annual Flow (m^3/s)			13.80		Median Annual Flow (m^3/s)			30.61		Median Annual Flow (m^3/s)			261.71		Median Annual Flow (m^3/s)			6.07	
Month	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*	Theil-Sen Slope	Mann-Kendall	p-value	Average Median Monthly Flow	Average Percentage Change in Median Monthly Flow*
January	0.11	0.34		16.98		-3.33E-01	0.46		179.55		0.06	0.10		4.17		0.22	0.02	*	17.00	1.30	0.22	0.72		184.46		0.03	0.01	**	1.46	2.28
February	0.06	0.41		14.00		-6.61E-01	0.12		135.71		0.02	0.32		2.65		0.15	0.05		13.83		-5.31E-01	0.19		145.48		0.01	0.21		0.81	
March	0.02	0.65		12.36		-7.18E-01	0.08		108.15		0.02	0.33		1.96		0.11	0.08		11.54		-6.86E-01	0.08		136.68		0.01	0.28		0.59	
April	0.08	0.07		12.13		0.30	0.31		97.55		0.04	0.10		2.32		0.13	0.02	*	11.88	1.08	-1.70E-01	0.66		124.99		0.01	0.20		0.90	
May	-1.05E+00	0.16		61.85		-1.81E+00	0.27		197.65		-7.31E-01	0.29		66.73		-1.14E+00	0.14		77.81		-2.87E+00	0.48		362.59		0.02	0.92		33.59	
June	-9.45E-01	0.06		76.21		-1.00E+00	0.43		332.01		-1.38E+00	0.00	**	68.15	2.02	-8.50E-01	0.03	*	74.04	1.15	-5.11E+00	0.14		613.15		-7.00E-01	0.00	**	34.96	2.00
July	-3.59E-01	0.45		62.12		-1.09E-01	0.92		358.95		-1.73E-01	0.62		35.75		-3.21E-01	0.58		60.42		0.23	0.99		506.97		-1.00E-01	0.31		15.43	
August	-2.79E-01	0.49		49.08		3.06	0.16		377.18		0.14	0.47		34.58		-4.77E-02	0.82		46.55		4.68	0.13		527.17		0.07	0.52		13.79	
September	-9.42E-02	0.84		50.83		1.80	0.21		338.66		0.00E+00	1.00		44.97		0.23	0.53		56.48		6.62	0.07		551.56		0.20	0.23		22.24	
October	0.47	0.24		45.03		1.00	0.67		282.87		0.78	0.02	*	35.14	2.22	0.44	0.15		52.23		6.71	0.10		461.10		0.34	0.04	*	19.62	1.72
November	0.49	0.15		33.72		0.75	0.15		277.28		0.34	0.00	**	15.17	2.26	0.57	0.04	*	34.09	1.66	1.94	0.22		353.69		0.18	0.01	**	8.05	2.20
December	0.40	0.10		23.47		1.52	0.02	*	224.26	0.68	0.19	0.02	*	7.60	2.44	0.40	0.01	**	23.03	1.75	1.40	0.07		248.33		0.07	0.00	**	2.98	2.40
Average for all months, for each station	-9.14E-02			38.15	0.00E+00	0.32			242.49	0.06	-5.84E-02			26.60	0.75	-9.35E-03			39.91	0.58	1.04			351.35	0.00E+00	0.01			12.87	0.88
Average percentage change in median monthly flow for all months, weighted by median annual flow in the Churchill	**0.08**																													

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TABLE. RESULTS OF LINEAR REGRESSION ANALYSES FOR LONG-TERM TRENDS IN MEDIAN ANNUAL FLOW IN THE CHURCHILL BASIN, BY SUB-BASIN.

Sub-Basin	Station	Start Year	Intercept	Intercept Standard Error	Intercept T-Test Statistic	Intercept T-Test p-value	Slope	Slope Standard Error	Slope T-Test Statistic	Slope T-Test p-value		Adjusted R-Squared	F-Test Static	F-Test p-value	
06A - Beaver	06AD001	1933	334.16	197.83	1.69	0.09	-0.16	0.10	-1.57	0.12		0.02	2.47	0.12	
	06AD006	1955	234.03	102.19	2.29	0.03	-0.11	0.05	-2.19	0.03	*	0.06	4.80	0.03	*
	06AD010	1958	-15.69	89.46	-0.18	0.86	0.01	0.05	0.22	0.83		-0.02	0.05	0.83	
06B - Upper Churchill (Man.)	06BB003	1930	649.99	766.04	0.85	0.40	-0.26	0.39	-0.67	0.51		-0.01	0.44	0.51	
06C - Central Churchill (Man.)	06CD002	1963	-289.04	2002.86	-0.14	0.89	0.29	1.01	0.29	0.78		-0.02	0.08	0.78	
06D - Reindeer	06DA002	1966	234.40	190.20	1.23	0.22	-0.10	0.10	-1.02	0.31		0.00	1.03	0.31	
06E - Central Churchill (Man.) Lower	06EA002	1928	-2625.00	1303.20	-2.01	0.05	1.68	0.66	2.54	0.01	*	0.06	6.46	0.01	*
	06EA006	1946	2111.09	1829.08	1.15	0.25	-0.67	0.92	-0.73	0.47		-0.01	0.53	0.47	
06F - Lower Churchill (Man.)	06FB001	1960	44934.46	5468.14	8.22	0.00	-22.34	2.75	-8.13	0.00	***	0.53	66.03	0.00	***

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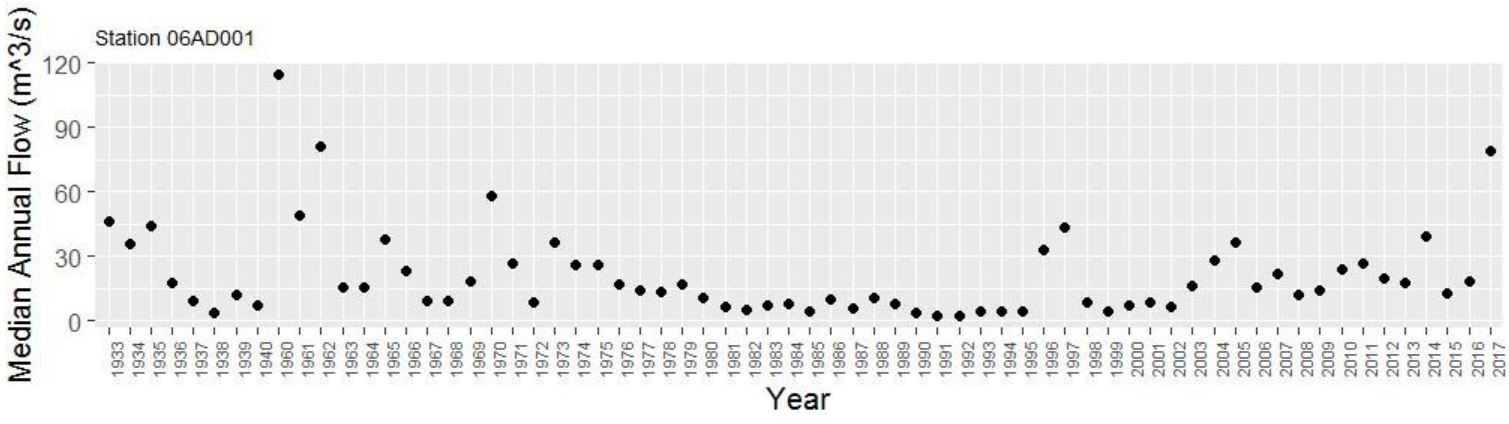
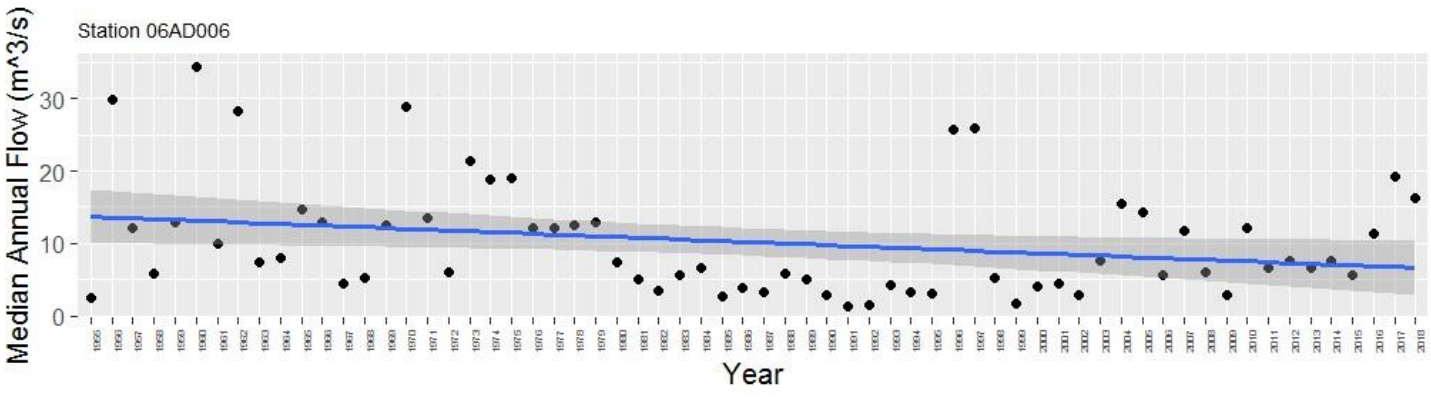
TABLE. RESULTS OF MANN-KENDALL NON-PARAMETRIC TREND ANALYSIS FOR LONG-TERM TRENDS IN MEDIAN ANNUAL FLOW IN THE CHURCHILL BASIN, BY SUB-BASIN.

Sub-Basin	Station	Start Year	Theil -Sen Slope	Mann-Kendall Test Statistic	Mann-Kendall Test p-value		Median Annual Flow (m^3/s)	Average Percentage Change in Median Annual Flow(%)	Weighted Averaged Between Stations
06A - Beaver	06AD001	1933	0.03	113.00	0.67		20.97	0.00	0.00
	06AD006	1955	-0.07	-304.00	0.08		10.17	0.00	
	06AD010	1958	0.02	152.00	0.34		4.08	0.00	
06B - Upper Churchill (Man.)	06BB003	1930	-0.08	-124.00	0.66		140.48	0.00	0.00
06C - Central Churchill (Man.)	06CD002	1963	0.06	8.00	0.96		284.67	0.00	0.00
06D - Reindeer	06DA004	1966	-0.09	-105.00	0.41		41.24	0.00	0.00
06E - Central Churchill (Man.) Lower	06EA002	1928	1.52	575.00	0.05	*	686.55	0.22	0.10
	06EA006	1946	-1.06	-248.00	0.23		778.38	0.00	
06F - Lower Churchill (Man.)	06FB001	1960	-17.00	-731.00	0.00	***	502.08	-3.39	-3.39

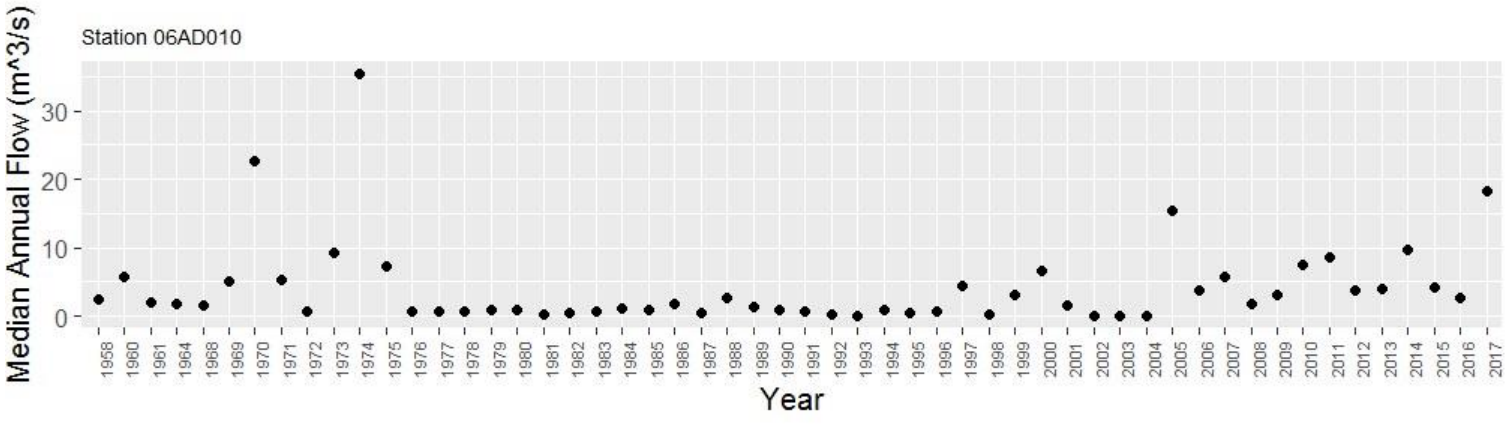
FIGURE. TIME-SERIES OF LONG-TERM TRENDS IN MEDIAN ANNUAL FLOW FOR THE CHURCHILL, BY STATION.



Intercept = 334.16 ; Intercept STE = 197.83 ; Intercept T-Statistic 1.6891 ; Intercept p-value = 0.094951
Slope = -0.15726 ; Slope STE = 0.10013 ; Slope T-Statistic -1.5707 ; Slope p-value = 0.12006
F-Statistic: 2.467 ; p-value: 0.1201
Theil-Sen Slope = 0.02614 ; Mann-Kendal Score = 113 ; Mann-Kendall p-value = 0.67072



Intercept = 234.03 ; Intercept STE = 102.19 ; Intercept T-Statistic 2.2901 ; Intercept p-value = 0.025428
Slope = -0.11269 ; Slope STE = 0.051441 ; Slope T-Statistic -2.1907 ; Slope p-value = 0.032239
F-Statistic: 4.7994 ; p-value: 0.03224
Theil-Sen Slope = -0.06982 ; Mann-Kendal Score = -304 ; Mann-Kendall p-value = 0.079136



Intercept = -15.686 ; Intercept STE = 89.455 ; Intercept T-Statistic -0.17535 ; Intercept p-value = 0.86141
Slope = 0.0098968 ; Slope STE = 0.045008 ; Slope T-Statistic 0.21989 ; Slope p-value = 0.82673
F-Statistic: 0.048352 ; p-value: 0.8267
Theil-Sen Slope = 0.0212 ; Mann-Kendal Score = 152 ; Mann-Kendall p-value = 0.33537

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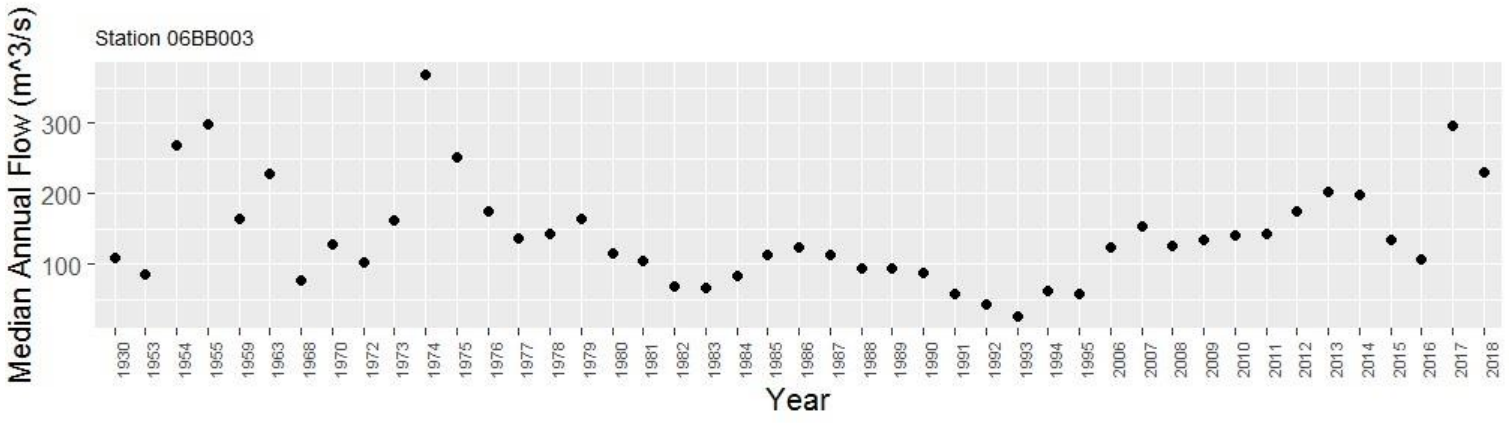
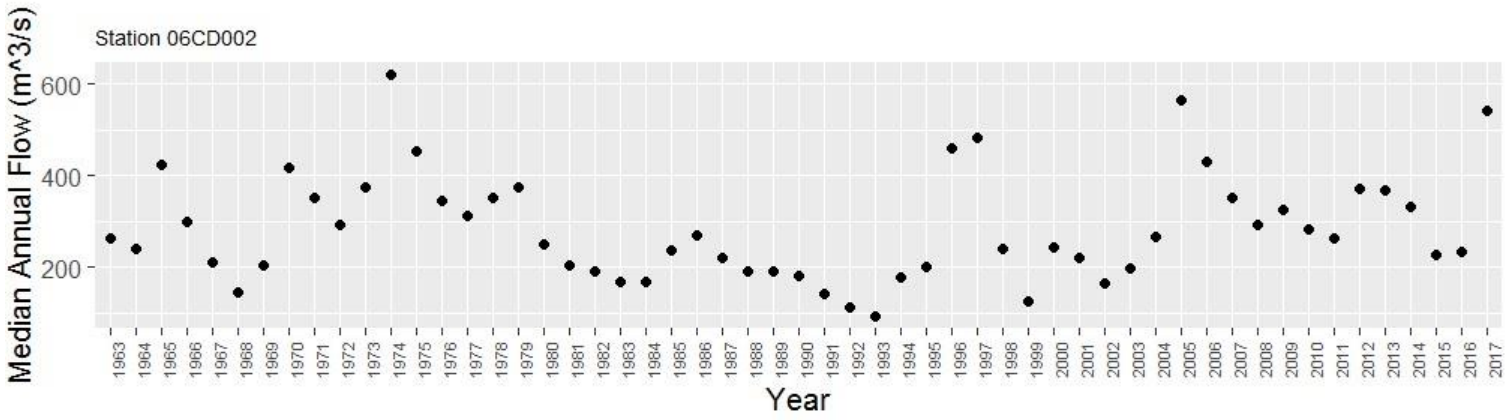
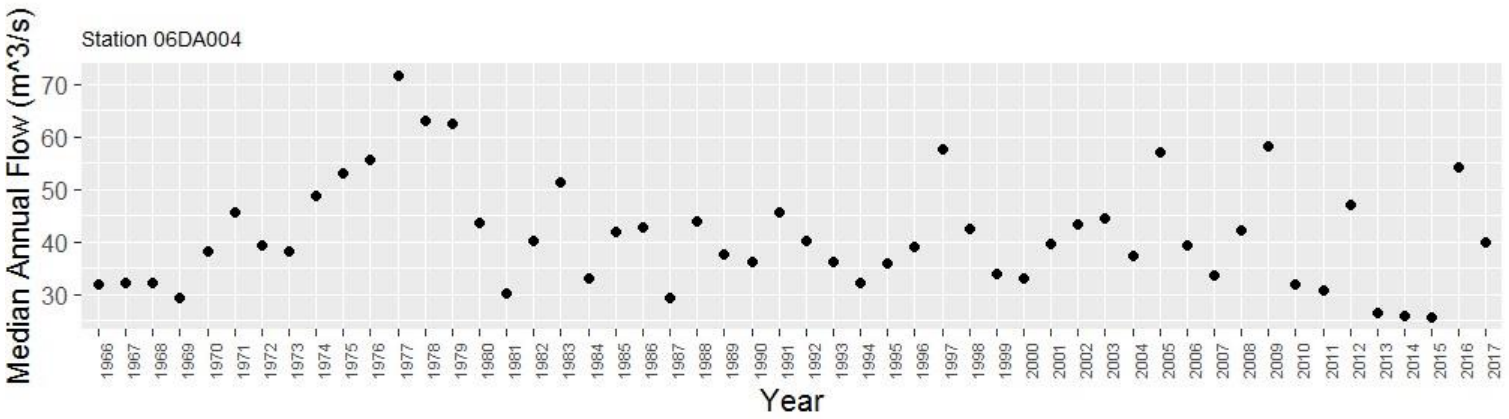


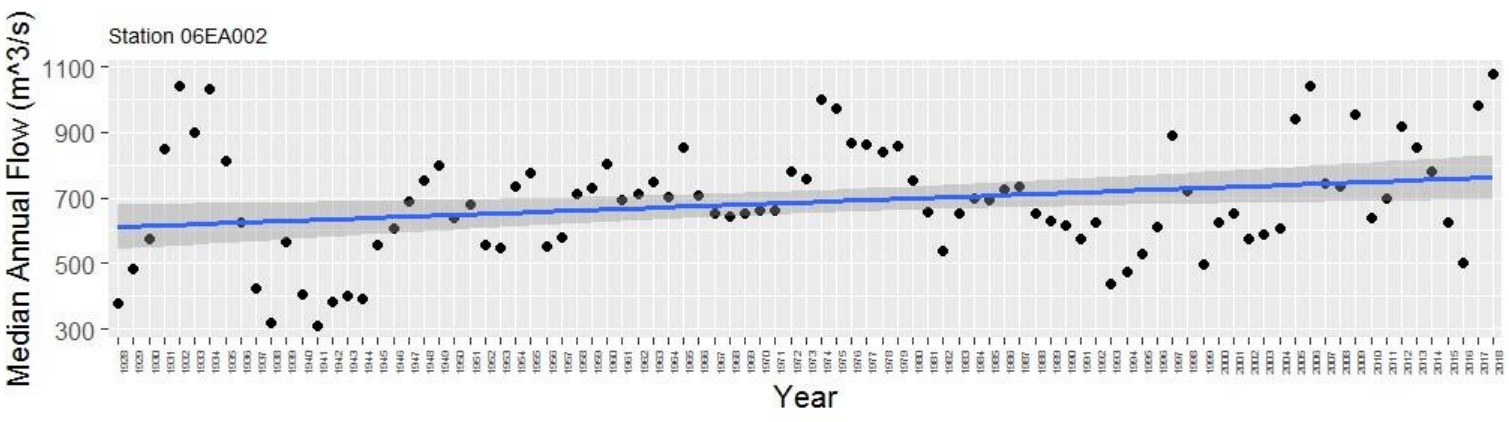
Intercept = 649.99 ; Intercept STE = 766.04 ; Intercept T-Statistic 0.84851 ; Intercept p-value = 0.39848
Slope = -0.25699 ; Slope STE = 0.38559 ; Slope T-Statistic -0.66648 ; Slope p-value = 0.50687
F-Statistic: 0.44419 ; p-value: 0.5069
Theil-Sen Slope = -0.07638 ; Mann-Kendal Score = -124 ; Mann-Kendall p-value = 0.6628



Intercept = -289.04 ; Intercept STE = 2002.9 ; Intercept T-Statistic -0.14431 ; Intercept p-value = 0.8858
Slope = 0.2883 ; Slope STE = 1.0064 ; Slope T-Statistic 0.28646 ; Slope p-value = 0.77565
F-Statistic: 0.082057 ; p-value: 0.7756
Theil-Sen Slope = 0.05556 ; Mann-Kendal Score = 8 ; Mann-Kendall p-value = 0.95947



Intercept = 234.4 ; Intercept STE = 190.2 ; Intercept T-Statistic 1.2324 ; Intercept p-value = 0.22355
Slope = -0.096993 ; Slope STE = 0.095502 ; Slope T-Statistic -1.0156 ; Slope p-value = 0.3147
F-Statistic: 1.0315 ; p-value: 0.3147
Theil-Sen Slope = -0.09043 ; Mann-Kendal Score = -105 ; Mann-Kendall p-value = 0.41176



Intercept = -2625 ; Intercept STE = 1303.2 ; Intercept T-Statistic -2.0143 ; Intercept p-value = 0.047
Slope = 1.6784 ; Slope STE = 0.66046 ; Slope T-Statistic 2.5413 ; Slope p-value = 0.012775
F-Statistic: 6.4583 ; p-value: 0.01278
Theil-Sen Slope = 1.523 ; Mann-Kendal Score = 575 ; Mann-Kendall p-value = 0.049077

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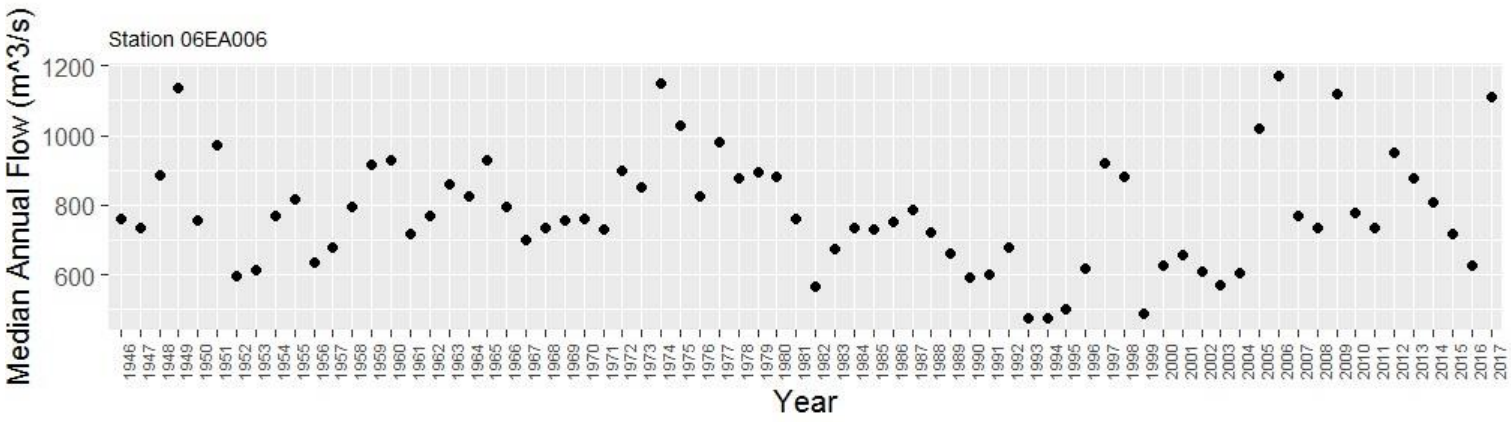
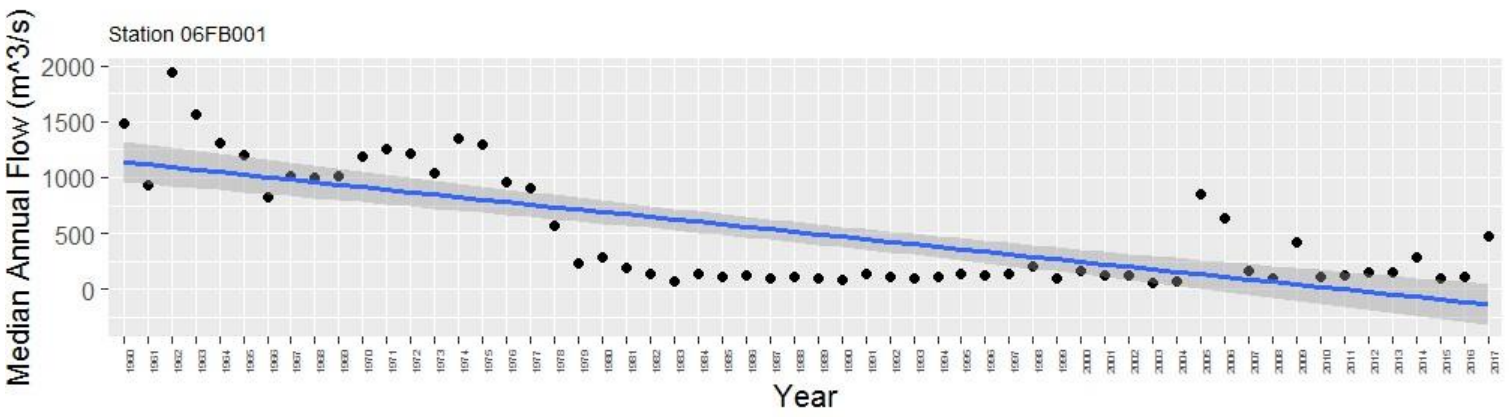


Intercept = 2111.1 ; Intercept STE = 1829.1 ; Intercept T-Statistic 1.1542 ; Intercept p-value = 0.25235
Slope = -0.67258 ; Slope STE = 0.92303 ; Slope T-Statistic -0.72866 ; Slope p-value = 0.46864
F-Statistic: 0.53095 ; p-value: 0.4686
Theil-Sen Slope = -1.058 ; Mann-Kendal Score = -248 ; Mann-Kendall p-value = 0.22982



Intercept = 44934 ; Intercept STE = 5468.1 ; Intercept T-Statistic 8.2175 ; Intercept p-value = 3.3957e-11
Slope = -22.345 ; Slope STE = 2.7498 ; Slope T-Statistic -8.126 ; Slope p-value = 4.7993e-11
F-Statistic: 66.032 ; p-value: 4.799e-11
Theil-Sen Slope = -17 ; Mann-Kendal Score = -731 ; Mann-Kendall p-value = 9.7177e-07

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TABLE. NON-PARAMETRIC COMPARISON OF VARIANCE FOR RECENT VS. HISTORICAL MONTHLY FLOW IN THE CHURCHILL WATERSHED, BY STATION.

			Historical			Recent			Fligner-Killeen			Mann-Whitney						
Sub-watershed	Station	Month	Number of Years of Sampling	Median Monthly Flow (m^3/s)	Median Absolute Deviation in Monthly Flow (m^3/s)	Number of Years of Sampling	Median Monthly Flow (m^3/s)	Median Absolute Deviation in Monthly Flow (m^3/s)	Test Statistic	p-value		Test Statistic	p-value		Percentage Change in Monthly Flow Between the Two Time Periods	Average Percentage Change Across Months*	Median Annual Flow (m^3/s)	Weighted average across sub-watershed
06A - Beaver	06AD001	January	14	5.15	2.72	12	2.22	1.16	130.82	0.00	***	127397.00	0.00	***	56.85	39.20	20.97	48.29
		February	16	5.01	2.99	16	2.33	1.02	125.60	0.00	***	112379.50	0.00	***	53.59			
		March	22	5.04	3.02	33	3.28	1.97	29.09	0.00	***	470281.00	0.00	***	34.92			
		April	25	26.70	29.69	33	22.60	23.54	81.83	0.00	***	425071.00	0.00	***	15.36			
		May	33	55.80	49.52	33	28.00	24.61	247.54	0.00	***	736842.50	0.00	***	49.82			
		June	33	38.50	36.62	33	22.40	20.86	131.19	0.00	***	625395.50	0.00	***	41.82			
		July	33	26.10	24.51	33	22.50	21.20	30.36	0.00	***	581033.00	0.00	***	13.79			
		August	33	18.45	16.23	33	16.60	13.80	39.73	0.00	***	583833.50	0.00	***	10.03			
		September	32	15.90	15.12	33	11.45	10.55	100.39	0.00	***	556680.50	0.00	***	27.99			
		October	30	16.80	14.23	28	9.77	7.06	142.76	0.00	***	517974.50	0.00	***	41.88			
		November	19	9.45	5.45	17	3.49	2.68	139.12	0.00	***	142127.00	0.00	***	63.05			
		December	14	5.87	2.75	11	2.27	1.32	79.32	0.00	***	130661.50	0.00	***	61.33			
	06AD006	January	29	3.96	2.73	34	2.18	1.56	108.64	0.00	***	665089.50	0.00	***	45.08	85.37	10.17	
		February	29	3.54	2.28	34	2.20	1.45	87.33	0.00	***	546989.00	0.00	***	37.85			
		March	29	3.82	2.30	34	2.55	1.36	69.22	0.00	***	644795.00	0.00	***	33.25			
		April	29	20.95	22.05	34	14.55	13.77	141.93	0.00	***	542891.50	0.00	***	30.55			
		May	29	41.90	38.99	34	20.05	18.47	222.97	0.00	***	675797.50	0.00	***	52.15			
		June	29	28.60	28.11	34	18.00	16.61	98.45	0.00	***	566953.00	0.00	***	37.06			
		July	29	21.00	18.53	34	18.75	18.36	26.35	0.00	***	546578.50	0.00	***	10.71			
		August	29	14.80	12.29	34	12.50	11.94	33.92	0.00	***	562166.00	0.00	***	15.54			
		September	29	17.45	17.07	34	8.02	8.12	280.20	0.00	***	619823.50	0.00	***	54.04			
		October	30	16.90	13.91	34	5.87	4.53	318.58	0.00	***	748126.00	0.00	***	65.30			
		November	30	8.44	6.05	34	3.47	2.19	170.89	0.00	***	692290.50	0.00	***	58.89			
		December	30	4.81	3.98	34	2.44	1.76	149.19	0.00	***	696125.50	0.00	***	49.22			
	06AD010	March	18	0.11	0.16	25	0.79	1.18	328.43	0.00	***	137725.50	0.00	***	635.19	113.83	4.08	
		April	28	2.77	3.26	25	2.91	3.80	5.81	0.02	*	271291.50	0.91		5.06			
		May	28	6.25	6.22	25	6.17	8.47	3.25	0.07		315243.50	0.02	*	1.28			
		June	25	4.87	5.29	25	4.31	6.26	25.98	0.00	***	255615.00	0.75		11.50			
		July	25	2.93	3.07	25	3.29	4.88	167.36	0.00	***	235522.00	0.00	***	12.29			
		August	25	1.93	1.75	25	2.94	3.79	204.97	0.00	***	210320.50	0.00	***	52.33			
		September	23	1.20	1.09	25	2.67	3.63	250.52	0.00	***	162735.50	0.00	***	122.50			
		October	24	0.82	0.68	21	2.47	3.08	363.31	0.00	***	127103.00	0.00	***	200.85			
		November	19	0.44	0.53	13	0.54	0.79	123.62	0.00	***	43590.00	0.15		22.85			
	06AF005	January	23	7.74	5.43	5	1.53	2.27	20.49	0.00	***	88468.00	0.00	***	80.23	18.52	15.24	
		February	23	7.73	4.70	7	1.29	1.91	23.68	0.00	***	78377.00	0.00	***	83.31			
		March	25	7.50	3.77	23	7.61	7.65	31.07	0.00	***	300748.50	0.00	***	1.47			
		April	25	9.12	4.67	26	11.70	7.09	18.84	0.00	***	287794.00	0.59					
		May	25	13.40	6.06	26	13.75	10.46	34.56	0.00	***	326135.00	0.13					
		June	25	15.90	6.45	26	15.80	13.94	91.97	0.00	***	305925.50	0.12					
		July	25	17.40	7.71	26	21.10	20.37	148.53	0.00	***	309198.50	0.73					
		August	25	16.50	8.75	26	19.10	17.19	120.09	0.00	***	303896.50	0.35					
		September	25	14.50	8.14	24	16.30	16.33	73.51	0.00	***	253177.50	0.28					
		October	25	12.80	8.75	20	17.75	12.83	42.14	0.00	***	210000.50	0.00	***	38.67			
		November	24	10.10	6.81	15	12.30	11.42	12.33	0.00	***	91499.50	0.63					

06B - Upper Churchill (Man.)	06BA002	January	21	1.76	1.23	25	1.77	1.11	41.21	0.00	***	278260.50	0.00	***	0.57	28.51	6.40	9.33
		February	21	1.15	0.60	25	1.52	0.83	0.00	0.99		188248.50	0.04	*	32.17			
		March	20	1.01	0.40	25	1.33	0.78	19.68	0.00	***	188743.00	0.00	***	32.34			
		April	20	3.60	3.30	25	3.05	2.12	19.66	0.00	***	230158.50	0.47					
		May	21	11.40	8.26	25	12.80	13.20	1.11	0.29		248612.50	0.64					
		June	21	9.97	6.60	25	18.90	16.23	177.55	0.00	***	169477.00	0.00	***	89.57			
		July	22	12.20	8.08	25	17.20	17.05	230.67	0.00	***	174514.50	0.00	***	40.98			
		August	23	7.12	5.75	25	11.60	5.75	1.36	0.24		174688.00	0.00	***	62.92			
		September	22	5.95	4.98	25	9.26	6.18	2.85	0.09		187620.50	0.00	***	55.55			
		October	22	6.64	5.35	25	7.67	5.25	0.07	0.79		227202.50	0.00	***	15.51			
		November	22	4.99	3.17	25	5.61	3.58	1.71	0.19		219909.00	0.00	***	12.54			
		December	22	3.10	1.96	25	2.99	1.84	3.99	0.05	*	271241.50	0.38					
	06BB003	January	16	118.00	36.62	20	107.50	49.00	1.43	0.23		162583.50	0.00	***	8.90	3.89	140.48	
		February	15	111.00	34.10	20	99.60	42.11	1.50	0.22		134339.50	0.00	***	10.27			
		April	15	103.00	33.66	20	95.90	38.10	1.87	0.17		159485.50	0.00	**	6.89			
		May	15	105.00	30.84	20	98.20	43.74	3.85	0.05	*	152440.00	0.00	***	6.48			
		June	15	122.00	52.93	20	121.50	63.75	7.40	0.01	**	162740.50	0.00	***	0.41			
		July	16	168.00	66.72	20	145.00	78.58	11.46	0.00	***	140432.00	0.01	*	13.69			
		August	19	168.00	60.79	19	163.00	84.51	19.36	0.00	***	144259.50	0.21					
		March	17	158.00	63.75	19	156.00	92.96	30.14	0.00	***	143123.00	0.95					
		October	17	141.50	68.79	19	134.50	82.14	17.39	0.00	***	134440.50	0.80					
		September	16	131.50	68.94	20	125.50	77.84	3.81	0.05		153365.00	0.44					
		November	16	124.00	60.12	20	134.00	72.72	2.26	0.13		146639.00	0.60					
		December	16	120.00	52.41	20	122.00	69.39	0.57	0.45		157629.00	0.47					
	06BB005	January	22	4.75	3.24	23	6.71	4.88	58.31	0.00	***	148603.00	0.00	***	41.41	65.83	10.58	
		February	22	3.20	2.77	23	6.31	4.38	29.47	0.00	***	115992.00	0.00	***	97.03			
		March	22	3.10	3.08	23	6.41	3.05	11.11	0.00	***	133115.50	0.00	***	106.77			
		April	21	8.26	8.48	23	12.45	8.40	1.16	0.28		154847.00	0.00	***	50.82			
		May	21	18.20	9.64	23	21.60	11.27	9.72	0.00	**	190055.50	0.00	***	18.68			
		June	22	10.20	8.18	23	14.80	11.73	10.97	0.00	***	171852.00	0.00	***	45.10			
		July	21	6.10	5.00	23	14.10	10.38	60.99	0.00	***	139713.00	0.00	***	131.15			
		August	22	5.56	4.69	23	12.90	10.01	120.65	0.00	***	131960.00	0.00	***	132.01			
		September	22	7.56	7.09	23	11.60	8.30	16.51	0.00	***	144024.50	0.00	***	53.54			
		October	23	10.10	8.29	23	14.20	8.41	0.82	0.37		188599.50	0.00	***	40.59			
		November	23	8.47	5.97	23	11.75	7.34	7.50	0.01	**	170301.00	0.00	***	38.72			
		December	23	6.15	3.75	23	8.25	5.71	51.58	0.00	***	163521.00	0.00	***	34.15			
	06BD001	January	25	8.69	1.94	26	8.81	3.10	74.52	0.00	***	247794.50	0.00	***	1.38	12.13	15.75	
		February	22	7.59	1.66	26	7.21	2.15	29.35	0.00	***	213793.00	0.04	*	5.01			
		March	23	7.11	1.51	26	7.70	2.34	97.21	0.00	***	213442.50	0.00	***	8.30			
		April	22	8.89	3.90	26	11.10	5.63	6.02	0.01	*	212931.00	0.00	***	24.86			
		May	23	30.90	12.90	26	31.00	11.86	3.87	0.05	*	294887.00	0.02	*	0.32			
		June	25	24.80	9.79	26	28.15	14.16	47.19	0.00	***	255058.50	0.00	**	13.51			
		July	26	22.75	12.08	26	26.25	15.20	0.46	0.50		289932.50	0.76					
		August	24	18.20	10.08	26	21.30	9.64	0.39	0.53		253827.00	0.00	***	17.03			
		September	24	15.80	8.15	26	21.00	11.71	34.72	0.00	***	194660.50	0.00	***	32.91			
		October	26	16.50	8.90	26	19.75	8.23	1.41	0.24		260767.00	0.00	***	19.70			
		November	22	12.85	4.89	26	14.30	6.97	30.98	0.00	***	225012.50	0.00	***	11.28			
		December	22	9.98	3.68	26	11.10	4.24	67.65	0.00	***	210894.00	0.00	***	11.28			
06C - Central Churchill (Man.)	06CA001	January	24	8.67	4.88	10	8.04	7.07	23.77	0.00	***	102278.50	0.66			31.59	16.13	4.82
		February	24	7.67	4.10	10	7.75	6.52	31.91	0.00	***	82646.50	0.14					
		March	24	7.09	3.87	24	11.10	8.30	91.86	0.00	***	210779.50	0.00	***	56.56			
		April	24	7.87	4.05	25	12.20	10.51	81.04	0.00	***	200576.00	0.00	***	55.02			
		May	24	15.20	11.18	26	15.55	12.94	22.94	0.00	***	300681.50	0.92					
		June	24	19.70	13.27	26	17.70	15.86	42.04	0.00	***	289553.00	0.22					
		July	24	18.20	14.33	25	18.90	18.10	18.83	0.00	***	288775.00	0.96					
		August	25	13.60	10.23	25	17.70	12.01	20.73	0.00	***	272697.00	0.00	**	30.15			
		September	25	10.60	6.68	26	17.40	11.71	38.46	0.00	***	204355.00	0.00	***	64.15			
		October	25	11.60	8.26	21	19.80	13.20	18.02	0.00	***	180325.50	0.00	***	70.69			
		November	25	10.40	6.97	10	18.50	14.59	55.55	0.00	***	79431.50	0.00	**	77.88			
		December	25	9.58	5.84	8	11.95	10.97	64.66	0.00	***	87364.00	0.03	*	24.69			
	06CD002	January	26	220.00	84.51	28	235.00	94.89	1.92	0.17		364161.50	0.15			3.30	284.67	
		February	26	206.00	72.65	28	218.00	80.06	4.10	0.04	*	299987.50	0.28					
		March	26	194.00	67.46	28	204.50	80.06	9.68	0.00	**	357207.50	0.45					
		April	26	188.00	63.75	28	198.00	89.70	21.59	0.00	***	341422.50	0.14					
		May	26	259.00	96.37	28	241.50	107.49	9.39	0.00	**	397794.00	0.00	***	6.76			
		June	26	345.00	118.61	28	288.50	130.47	46.05	0.00	***	368946.00	0.00	***	16.38			
		July	26	382.00	127.50	28	319.00	164.57	53.92	0.00	***	374894.50	0.01	*	16.49			
		August	26	362.00	180.88	28	331.50	196.44	37.70	0.00	***	357204.00	0.45					
		September	26	300.00	130.47	28	319.00	181.62	23.41	0.00	***	322035.00	0.55					
		October	27	303.00	124.54	28	303.50	159.38	35.03	0.00	***	362528.00	0.94					
		November	27	278.50	125.28	28	299.50	151.97	18.78	0.00	***	338162.00	0.83					
		December	27	246.00	105.26	28	268.00	134.92	19.36	0.00	***	357007.50	0.54					
06D - Reindeer	06DA004	January	25	30.90	8.75	26	26.20	6.97	7.93	0.00	**	405474.50	0.00	***	15.21	10.89	41.24	10.89
		February	25	30.25	9.27	26	24.50	6.38	55.72	0.00	***	360686.50	0.00	***	19.01			
		March	25	31.10	8.45	26	24.50	4.60	75.02	0.00	***	435456.50	0.00	***	21.22			
		April	25	34.80	12.53	26	34.50	12.38	11.34	0.00	***	310398.50	0.04	*	0.86			
		May	25	66.80	20.90	26	62.60	18.24	46.45	0.00	***	365872.50	0.00	***	6.29			
		June	25	62.30	21.65	26	56.85	16.68	18.66	0.00	***	331017.50	0.00	***	8.75			
		July	26	58.60	19.87	26	48.35	14.01	61.52	0.00	***	423326.00	0.00	***	17.49			
		August	26	48.60	18.24	26	42.55	13.71	16.48	0.00	***	381812.00	0.00	***	12.45			
		September	26	45.85	16.83	26	41.65	17.20	6.79	0.01	**	335626.50	0.00	***	9.16			
		October	26	44.40	15.72	26	42.50	18.09	3.48	0.06		350435.50	0.01	**	4.28			
		November	26	40.45	12.31	26	38.00	14.90	8.09	0.00	**	326904.00	0.01	*	6.06			
		December	26	33.30	8.30	26	30.00	11.27	16.71	0.00	***	382351.50	0.00	***	9.91			

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06E - Central Churchill (Man.) Lower	06EA002	January	44	626.00	142.33	46	725.00	130.47	19.01	0.00	***	513210.50	0.00	***	15.81	10.16	686.55	10.85
		February	44	600.00	134.92	46	722.00	130.47	10.52	0.00	**	388061.00	0.00	***	20.33			
		March	44	575.00	155.67	46	721.00	111.20	30.05	0.00	***	427414.50	0.00	***	25.39			
		April	44	584.50	141.59	46	702.00	149.74	1.78	0.18		500630.00	0.00	***	20.10			
		May	44	668.00	212.01	46	703.50	159.38	30.31	0.00	***	825288.50	0.00	***	5.31			
		June	44	748.00	269.83	46	691.00	203.12	22.85	0.00	***	931520.50	0.31					
		July	44	790.00	289.11	46	690.00	223.13	15.64	0.00	***	1037138.00	0.00	**	12.66			
		August	44	739.00	263.90	46	684.00	198.67	1.54	0.22		998026.50	0.23					
		September	44	699.00	247.59	46	659.50	183.10	2.63	0.10		905248.00	0.78					
		October	45	654.00	201.63	46	678.00	180.14	1.91	0.17		900392.00	0.00	***	3.67			
		November	45	643.00	161.60	46	686.50	134.18	0.17	0.68		739035.50	0.00	***	6.77			
		December	45	643.00	151.23	46	719.00	137.88	6.76	0.01	**	648515.00	0.00	***	11.82			
	06EA006	January	30	750.00	123.06	35	697.00	136.40	40.01	0.00	***	653203.00	0.00	***	7.07	14.35	778.38	
		February	33	728.00	100.82	34	698.00	136.40	62.20	0.00	***	531533.50	0.00	***	4.12			
		March	33	719.00	117.13	34	683.00	111.20	34.99	0.00	***	633442.00	0.00	***	5.01			
		April	30	740.00	124.54	36	681.00	137.88	25.06	0.00	***	614965.00	0.00	***	7.97			
		May	30	844.00	185.33	36	795.00	167.53	0.10	0.75		607850.00	0.00	***	5.81			
		June	31	903.00	247.59	36	790.00	171.98	16.92	0.00	***	637630.50	0.00	***	12.51			
		July	31	943.00	252.04	36	758.00	191.26	1.53	0.22		696734.50	0.00	***	19.62			
		August	33	909.00	209.05	36	721.00	237.22	14.30	0.00	***	726795.50	0.00	***	20.68			
		September	34	861.00	217.94	36	685.50	186.07	0.01	0.94		696729.50	0.00	***	20.38			
		October	29	900.00	272.80	35	655.00	146.78	6.63	0.01	*	698706.00	0.00	***	27.22			
		November	29	838.00	189.77	35	639.00	131.95	0.80	0.37		656651.00	0.00	***	23.75			
		December	29	796.00	139.36	35	652.00	115.64	8.54	0.00	**	678708.00	0.00	***	18.09			
	06EB004	January	23	826.00	146.78	23	801.00	149.74	17.85	0.00	***	252695.50	0.85			8.29	883.42	
		February	23	824.00	128.99	23	782.00	170.50	19.97	0.00	***	222395.50	0.09					
		March	23	800.00	123.06	23	759.00	149.74	11.08	0.00	***	274385.00	0.01	**	5.13			
		April	23	788.00	140.85	23	756.50	158.64	1.46	0.23		261010.00	0.00	**	4.00			
		May	23	913.00	158.64	23	882.00	180.88	4.25	0.04	*	264587.50	0.18					
		June	23	954.00	171.98	23	995.00	248.34	10.92	0.00	***	221501.50	0.27					
		July	23	902.50	180.14	23	987.00	271.32	15.51	0.00	***	216647.50	0.00	**	9.36			
		August	23	822.00	182.36	23	1020.00	307.64	22.13	0.00	***	172866.00	0.00	***	24.09			
		September	23	784.00	200.15	23	936.50	229.06	36.65	0.00	***	152330.00	0.00	***	19.45			
		October	23	754.00	152.71	23	891.00	194.22	28.51	0.00	***	153946.50	0.00	***	18.17			
		November	23	772.00	228.32	23	868.00	209.79	10.09	0.00	**	170776.50	0.00	***	12.44			
		December	23	786.00	185.33	23	840.00	180.88	15.09	0.00	***	200486.00	0.00	***	6.87			

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06F - Lower Churchill (Man.)	06FA001	January	19	14.10	5.19	19	17.70	6.97	59.63	0.00	***	135858.00	0.00	***	25.53	24.86	29.45	54.62
		February	19	12.70	4.20	19	14.50	4.30	30.24	0.00	***	107416.50	0.00	***	14.17			
		March	19	11.40	2.91	19	12.80	3.41	30.03	0.00	***	120355.00	0.00	***	12.28			
		April	19	10.80	2.52	19	13.70	4.30	66.76	0.00	***	104449.50	0.00	***	26.85			
		May	17	70.40	45.66	19	48.30	48.18	0.00	0.97		154053.50	0.01	**	31.39			
		June	18	81.70	30.99	19	67.00	37.51	4.00	0.05	*	162892.00	0.00	***	17.99			
		July	17	65.10	24.76	18	48.30	28.32	22.82	0.00	***	181114.50	0.00	***	25.81			
		August	17	43.40	25.20	18	46.00	28.47	5.34	0.02	*	137906.00	0.32					
		September	19	34.90	24.39	17	45.10	35.88	9.10	0.00	**	119771.50	0.08					
		October	17	32.80	22.24	19	45.00	23.87	5.64	0.02	*	107097.50	0.00	***	37.20			
		November	18	22.90	17.49	18	36.30	11.86	0.05	0.82		103593.50	0.00	***	58.52			
		December	19	17.90	10.08	18	26.60	10.53	3.10	0.08		125775.00	0.00	***	48.60			
	06FB001	January	26	739.00	719.06	29	126.00	28.17	547.49	0.00	***	494938.50	0.00	***	82.95	85.41	502.08	
		February	23	733.00	647.90	29	95.20	26.39	576.45	0.00	***	444148.50	0.00	***	87.01			
		March	27	691.00	665.69	29	72.20	17.64	793.81	0.00	***	538668.00	0.00	***	89.55			
		April	22	682.00	646.41	29	67.85	16.38	719.84	0.00	***	460967.00	0.00	***	90.05			
		May	21	898.00	610.83	29	135.00	88.36	606.97	0.00	***	455499.00	0.00	***	84.97			
		June	26	1120.00	548.56	29	171.00	94.89	305.40	0.00	***	466111.50	0.00	***	84.73			
		July	25	1210.00	563.39	29	127.50	84.95	169.21	0.00	***	549451.00	0.00	***	89.46			
		August	25	978.50	682.74	29	130.00	109.71	95.85	0.00	***	485889.00	0.00	***	86.71			
		September	28	920.00	741.30	29	118.00	95.33	89.46	0.00	***	422189.00	0.00	***	87.17			
		October	24	951.00	702.75	29	132.00	91.62	183.81	0.00	***	517444.00	0.00	***	86.12			
		November	24	827.00	790.23	29	180.00	43.00	328.26	0.00	***	425102.00	0.00	***	78.23			
		December	22	721.00	786.52	29	159.00	43.00	508.33	0.00	***	411999.50	0.00	***	77.95			
	06FB002	January	22	4.44	2.78	24	4.31	3.16	3.36	0.07		232417.00	0.07			22.30	14.63	
		February	21	2.71	1.85	24	2.33	1.52	3.26	0.07		215607.00	0.03	*	13.86			
		March	21	1.85	1.26	24	1.98	1.09	9.80	0.00	**	255094.00	0.09					
		April	21	1.90	1.72	24	2.25	1.62	0.35	0.55		203173.50	0.01	**	18.42			
		May	20	77.05	65.23	24	47.50	58.99	0.24	0.62		266322.00	0.00	***	38.35			
		June	22	69.90	38.10	24	50.05	31.36	9.25	0.00	**	290484.50	0.00	***	28.40			
		July	21	31.20	17.94	24	23.50	17.20	1.46	0.23		288368.00	0.00	***	24.68			
		August	22	24.25	19.79	24	29.60	30.65	59.68	0.00	***	216899.00	0.01	**	22.06			
		September	23	29.40	21.65	24	33.60	26.69	3.32	0.07		224456.50	0.36					
		October	22	23.70	15.27	24	32.50	23.43	64.55	0.00	***	199149.50	0.00	***	37.13			
		November	22	11.00	5.63	24	16.50	10.67	95.91	0.00	***	166776.50	0.00	***	50.00			
		December	22	6.58	4.23	24	8.86	5.75	64.63	0.00	***	193440.50	0.00	***	34.65			
	06FC001	January	23	15.00	6.52	26	17.90	8.15	55.12	0.00	***	217398.00	0.00	***	19.33	10.60	30.89	
		February	22	12.60	4.89	26	14.60	6.38	44.19	0.00	***	186817.50	0.00	***	15.87			
		March	22	11.00	3.41	26	11.70	4.32	94.56	0.00	***	225133.00	0.00	***	6.36			
		April	22	10.20	3.17	26	12.15	5.03	71.12	0.00	***	179003.50	0.00	***	19.12			
		May	21	75.30	66.27	22	52.95	47.44	8.41	0.00	**	220538.50	0.06					
		June	24	82.00	34.10	26	63.50	30.84	2.71	0.10		295185.50	0.00	***	22.56			
		July	24	59.00	25.43	24	48.90	32.62	1.80	0.18		308315.00	0.00	***	17.12			
		August	24	41.70	19.27	24	42.10	23.43	1.46	0.23		269142.50	0.39					
		September	24	42.35	26.91	26	40.25	29.13	20.21	0.00	***	266147.50	0.57					
		October	24	49.00	28.10	26	44.50	26.98	16.92	0.00	***	276993.50	0.05					
		November	24	28.90	15.86	25	32.40	22.24	52.45	0.00	***	231501.00	0.00	***	12.11			
		December	24	20.00	9.12	26	22.95	12.82	63.96	0.00	***	236283.00	0.00	***	14.75			
	06FD001	January	22	161.00	50.41	23	153.00	37.07	108.37	0.00	***	294751.50	0.00	***	4.97	23.87	416.16	
		February	22	150.00	66.72	23	115.00	25.20	310.89	0.00	***	304823.50	0.00	***	23.33			
		March	22	135.50	64.49	24	98.40	18.38	461.86	0.00	***	380989.50	0.00	***	27.38			
		April	20	115.00	58.56	24	95.90	25.50	199.29	0.00	***	260751.00	0.00	***	16.61			
		May	17	599.00	673.10	22	221.00	164.57	245.59	0.00	***	199582.00	0.00	***	63.11			
		June	21	742.00	500.38	24	431.00	221.65	104.23	0.00	***	271978.50	0.00	***	41.91			
		July	20	632.00	584.89	23	284.00	212.01	56.69	0.00	***	278522.50	0.00	***	55.06			
		August	21	371.50	409.05	24	318.50	300.23	8.18	0.00	**	204648.00	0.44					
		October	20	359.00	399.71	24	394.00	401.04	14.15	0.00	***	204039.50	0.05					
		September	22	398.50	429.21	24	322.00	296.52	53.19	0.00	***	263481.00	0.00	***	19.20			
		November	18	323.50	212.01	23	245.00	99.33	49.35	0.00	***	226012.00	0.00	***	24.27			
		December	19	216.00	97.85	23	193.00	51.89	72.12	0.00	***	230422.50	0.00	**	10.65			
	06FD002	January	19	0.86	0.44	20	1.85	0.96	98.15	0.00	***	84437.50	0.00	***	113.54	62.11	5.97	
		February	19	0.57	0.27	19	0.95	0.59	95.24	0.00	***	92800.00	0.00	***	67.67			
		March	19	0.49	0.28	19	0.65	0.45	97.79	0.00	***	130264.50	0.00	***	31.44			
		April	19	0.48	0.24	19	0.64	0.50	76.89	0.00	***	105830.00	0.00	***	34.24			
		May	17	14.40	20.74	18	31.50	42.70	4.08	0.04	*	108956.00	0.00	***	118.75			
		June	20	36.05	21.57	19	19.20	10.53	70.26	0.00	***	238931.50	0.00	***	46.74			
		July	20	13.90	7.71	19	10.30	7.85	0.01	0.91		201902.00	0.00	***	25.90			
		August	18	10.20	9.18	18	13.00	11.18	2.35	0.13		126832.00	0.02	*	27.45			
		September	17	10.60	10.96	19	17.70	12.77	0.28	0.59		115283.00	0.00	***	66.98			
		October	20	12.00	10.53	20	17.00	11.33	10.10	0.00	**	124572.00	0.00	***	41.67			
		November	20	4.70	3.88	20	8.32	5.66	61.14	0.00	***	102789.00	0.00	***	76.91			
		December	20	1.74	1.13	20	3.38	1.99	114.85	0.00	***	98342.50	0.00	***	93.97			

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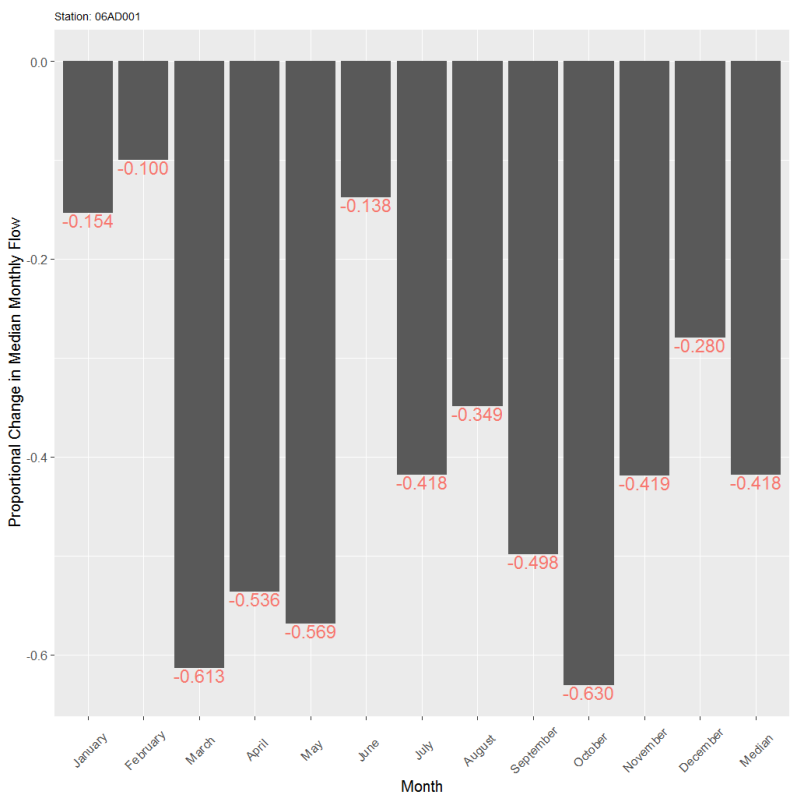
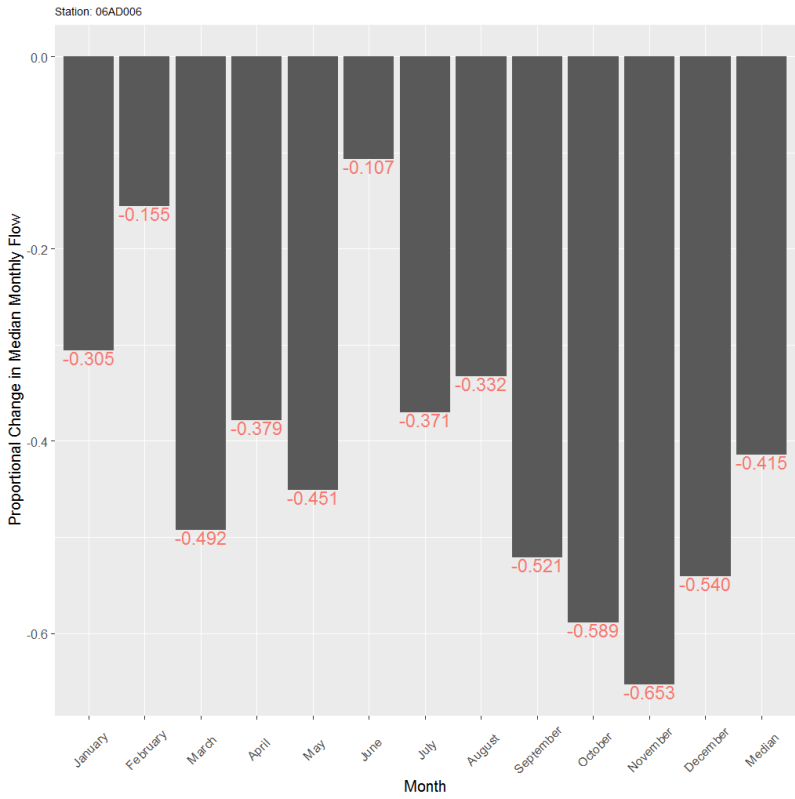
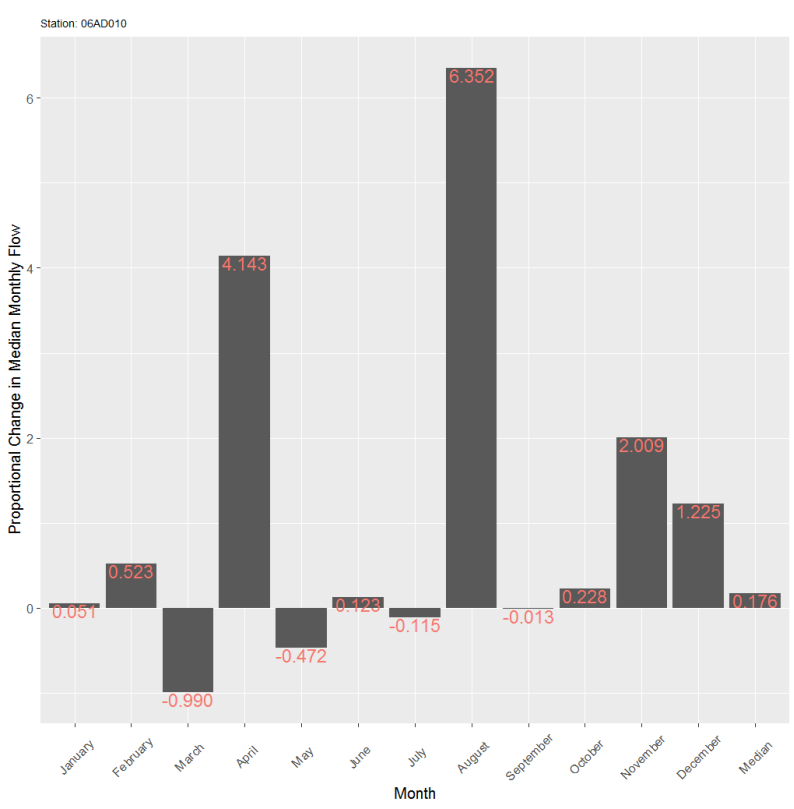
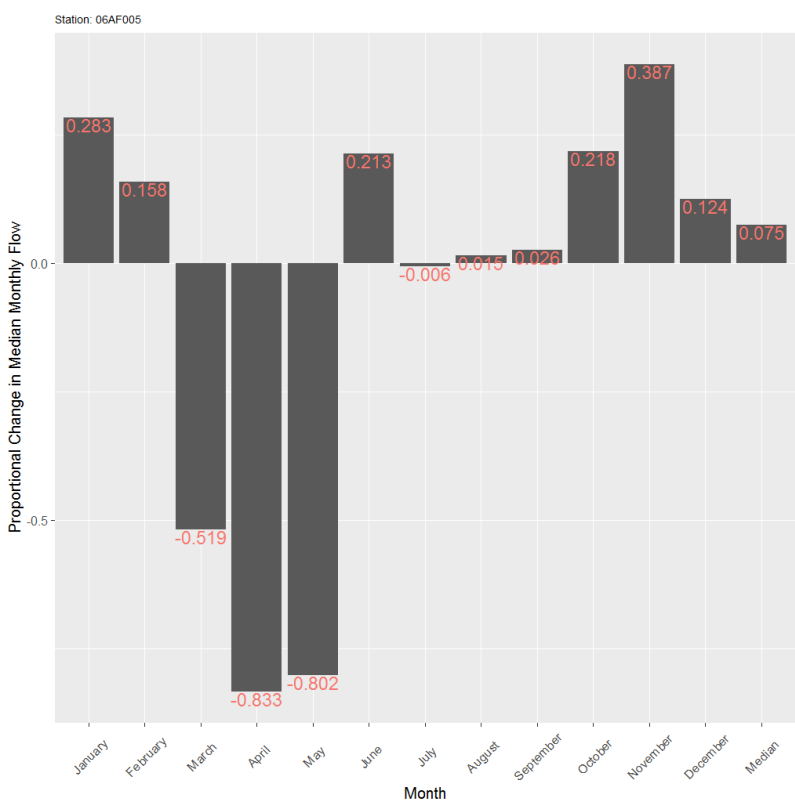
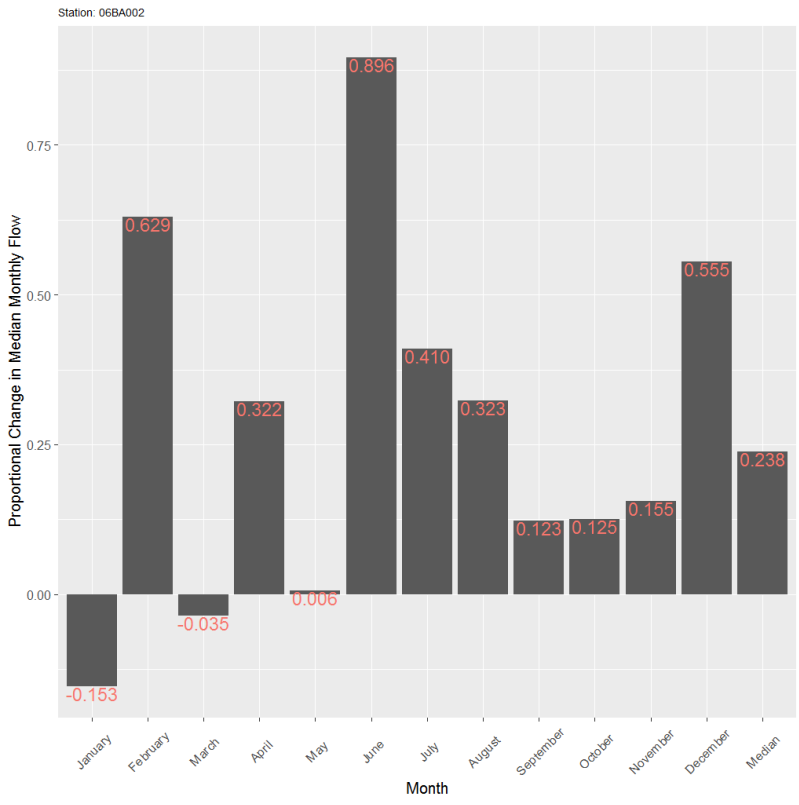
FIGURE. PERCENTAGE CHANGE IN MEDIAN MONTHLY FLOW FOR RECENT VS. HISTORICAL PERIODS IN THE CHURCHILL BASIN

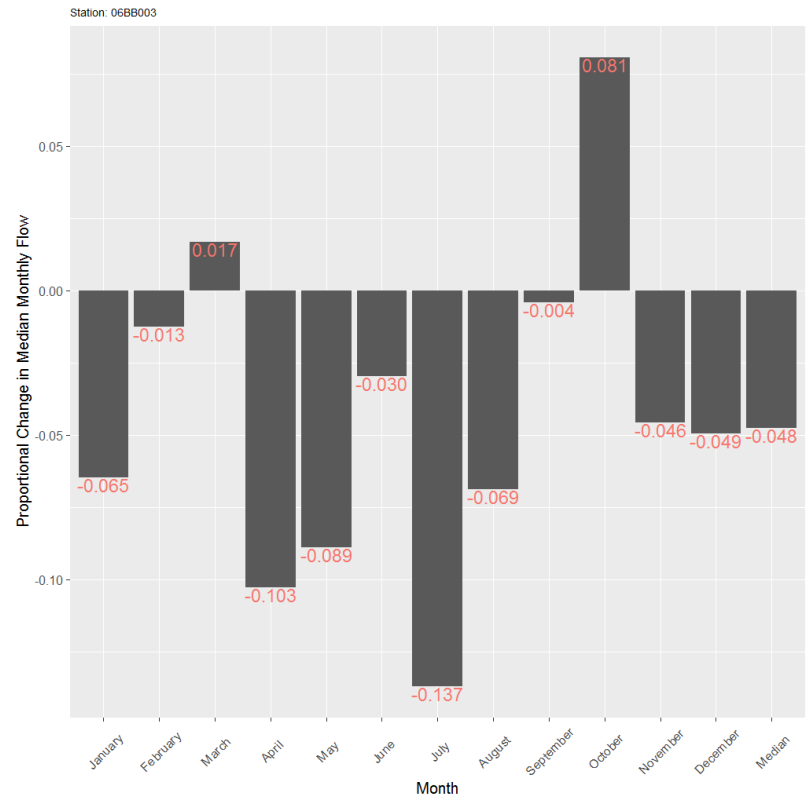












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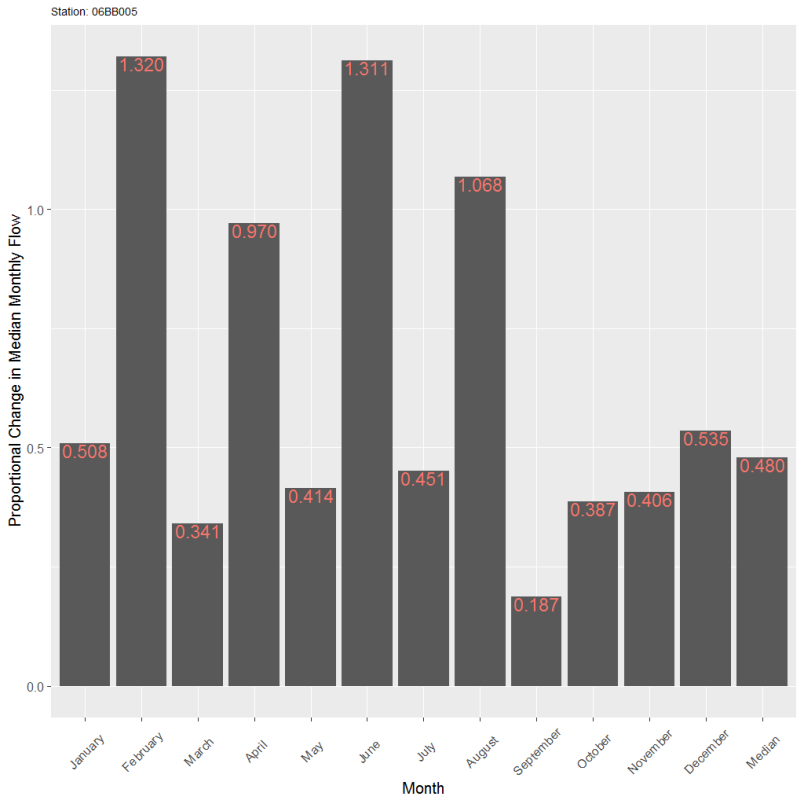

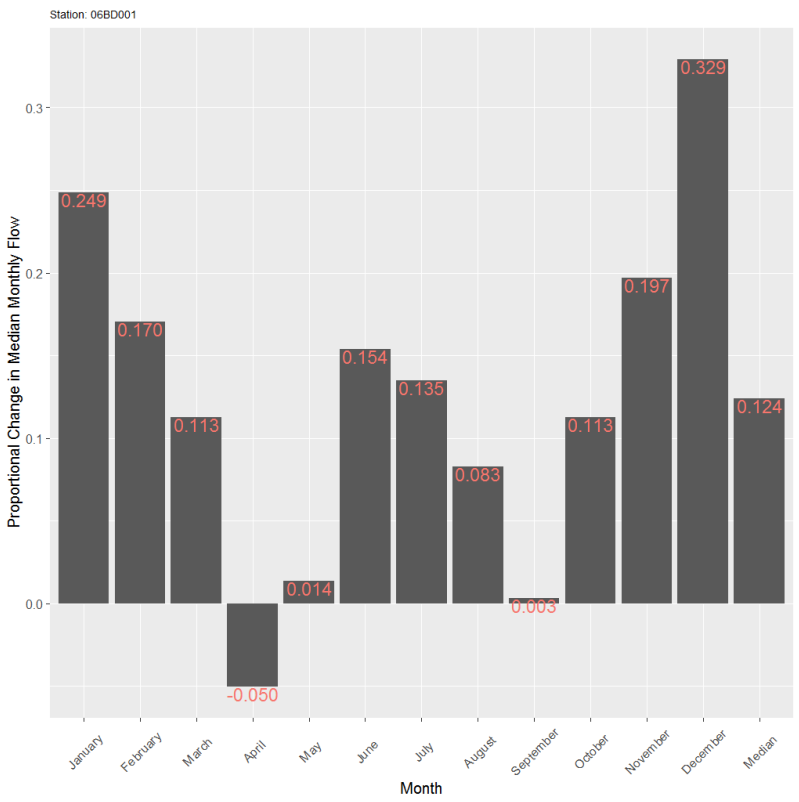

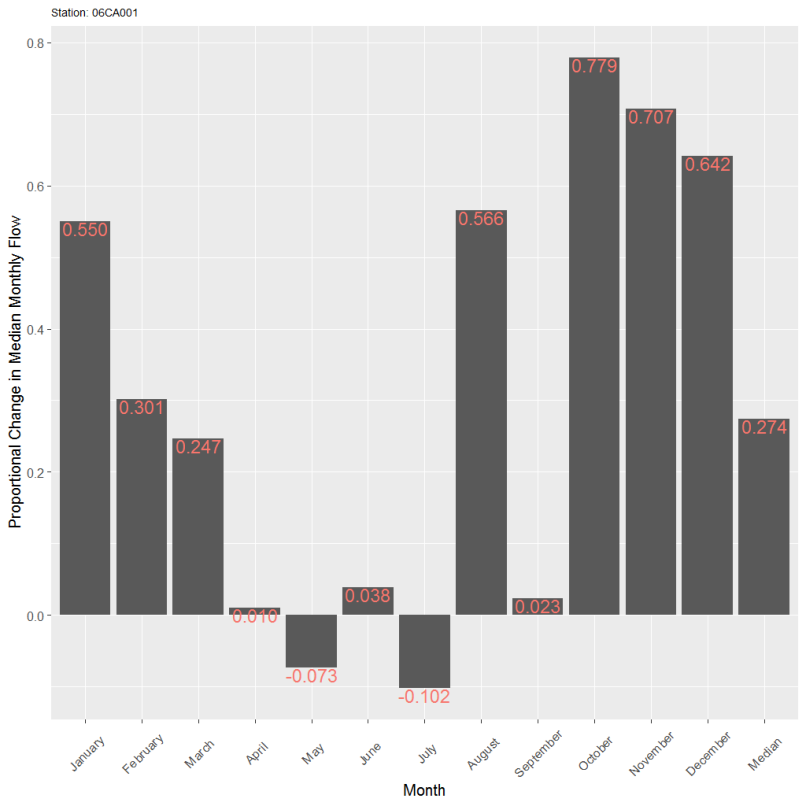

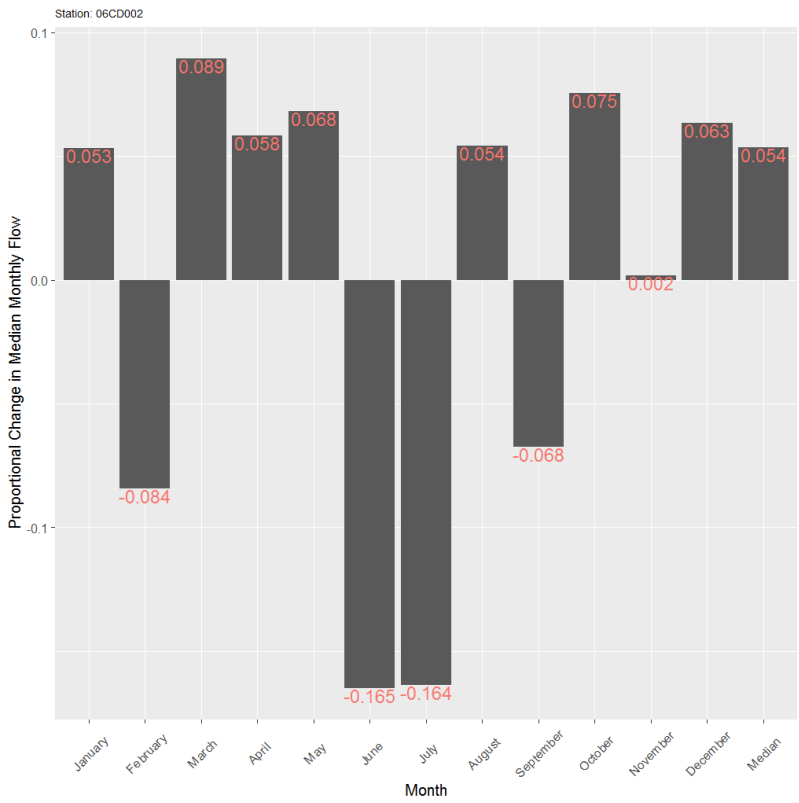

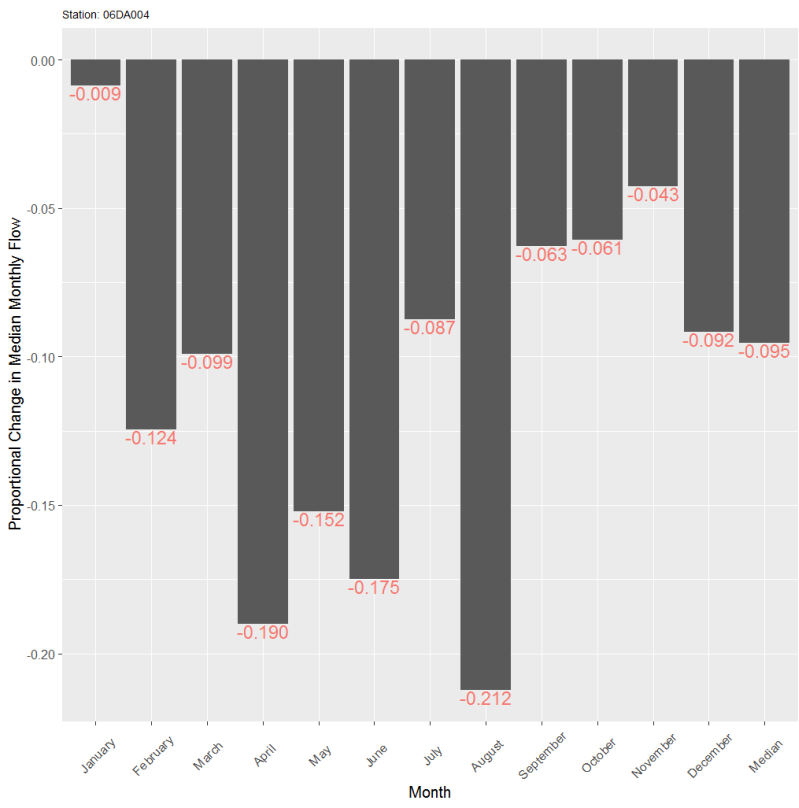

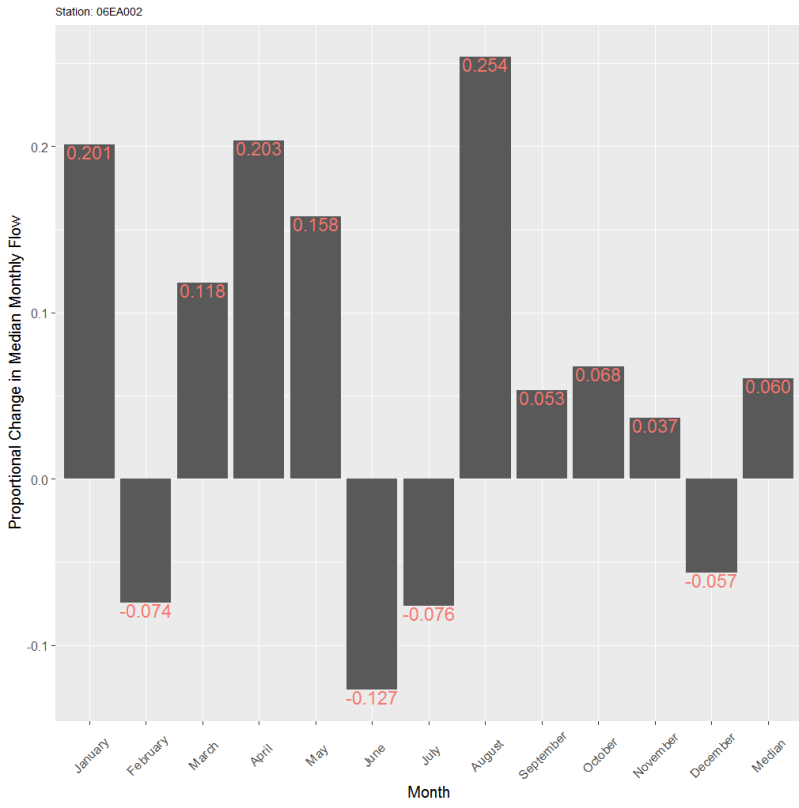

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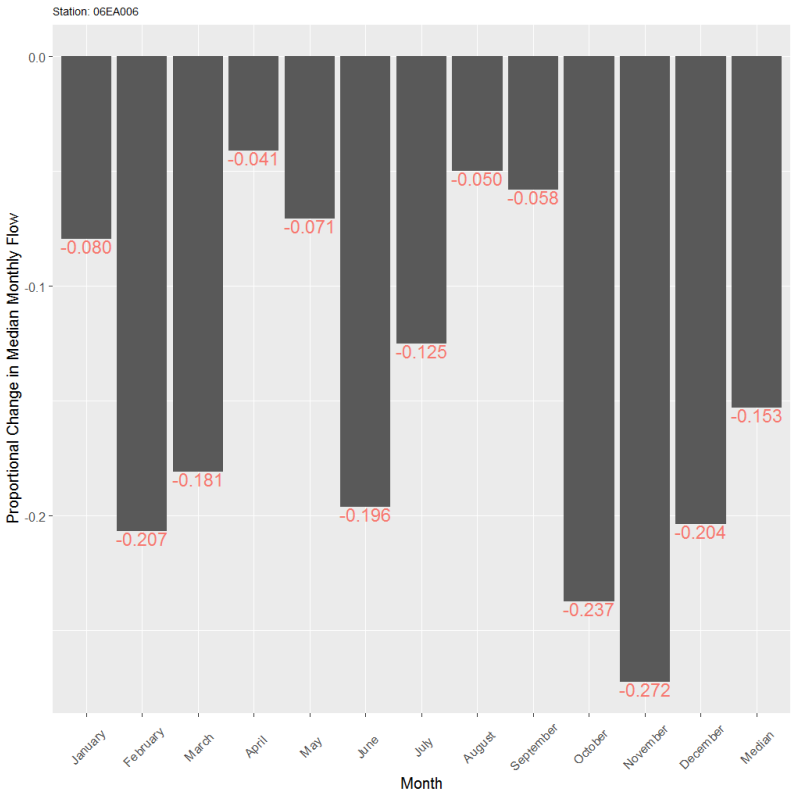

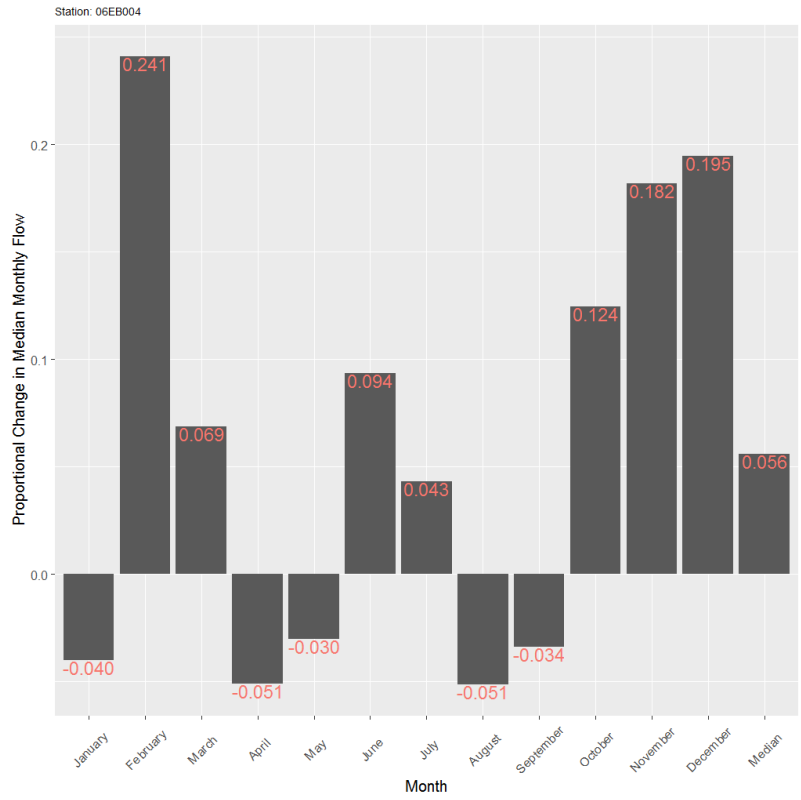

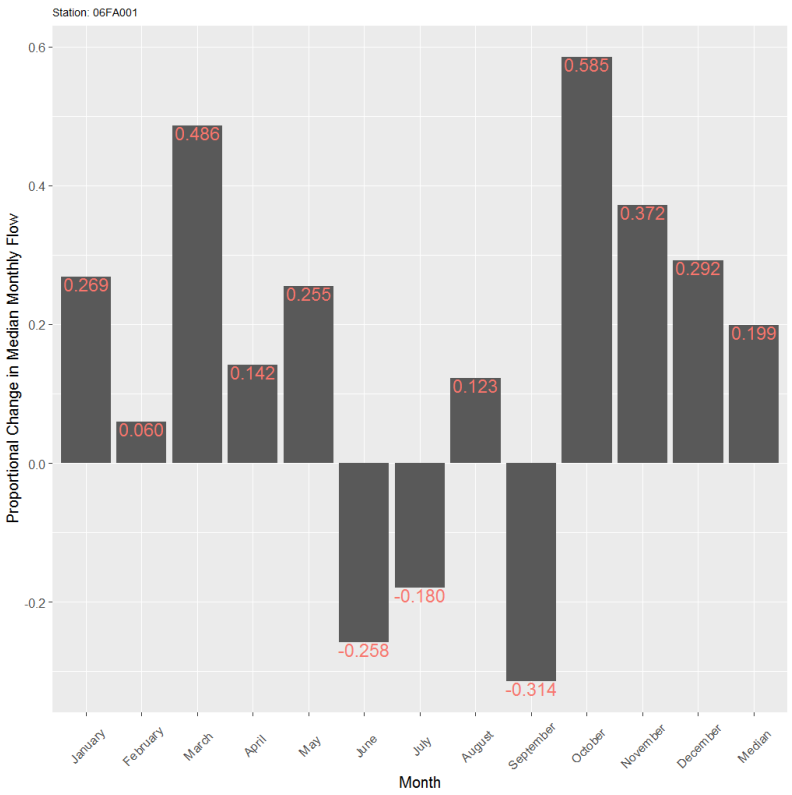

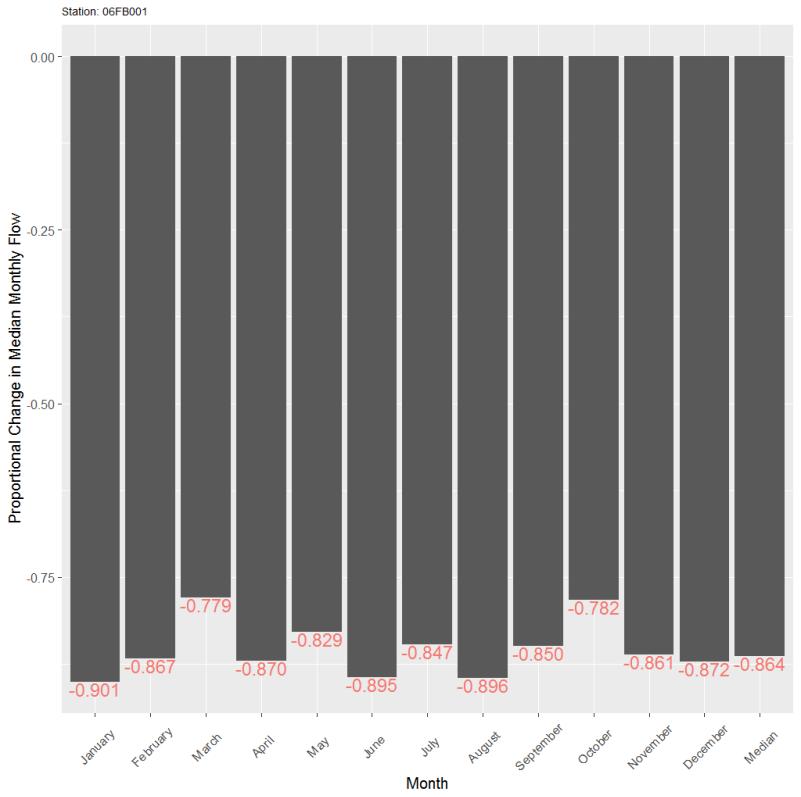

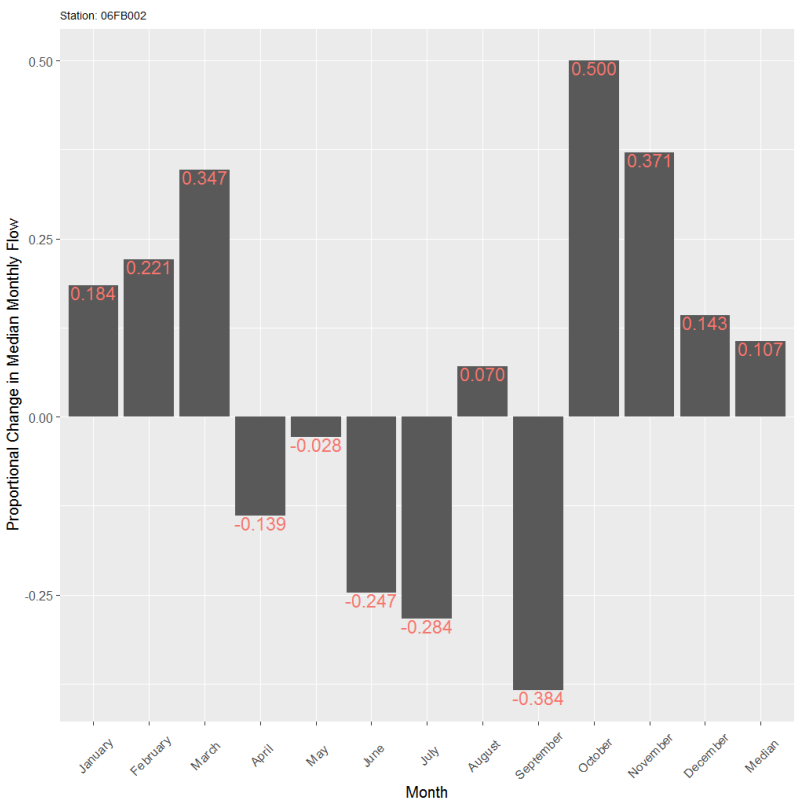

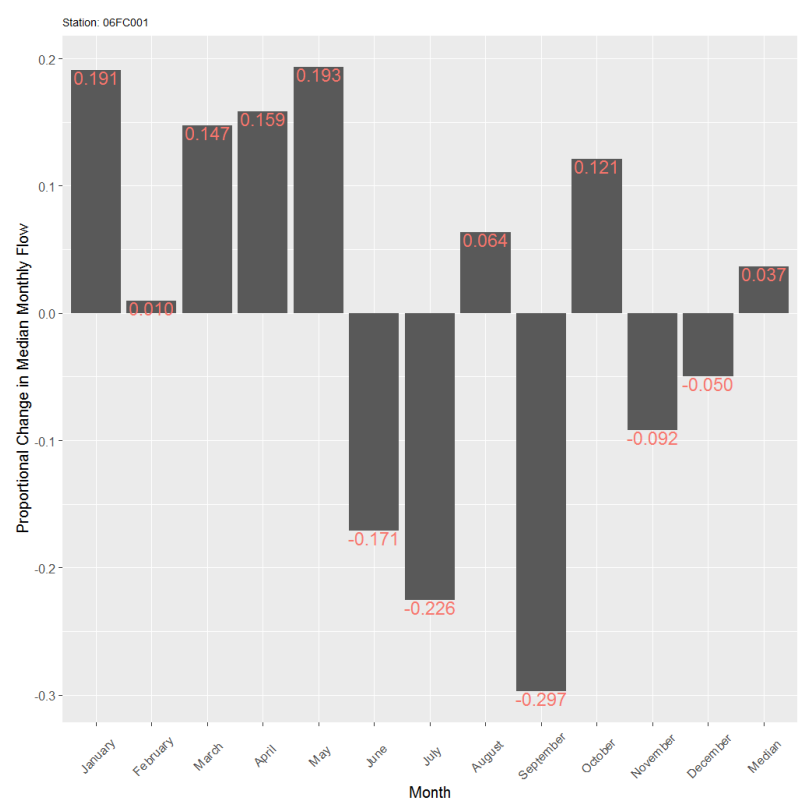

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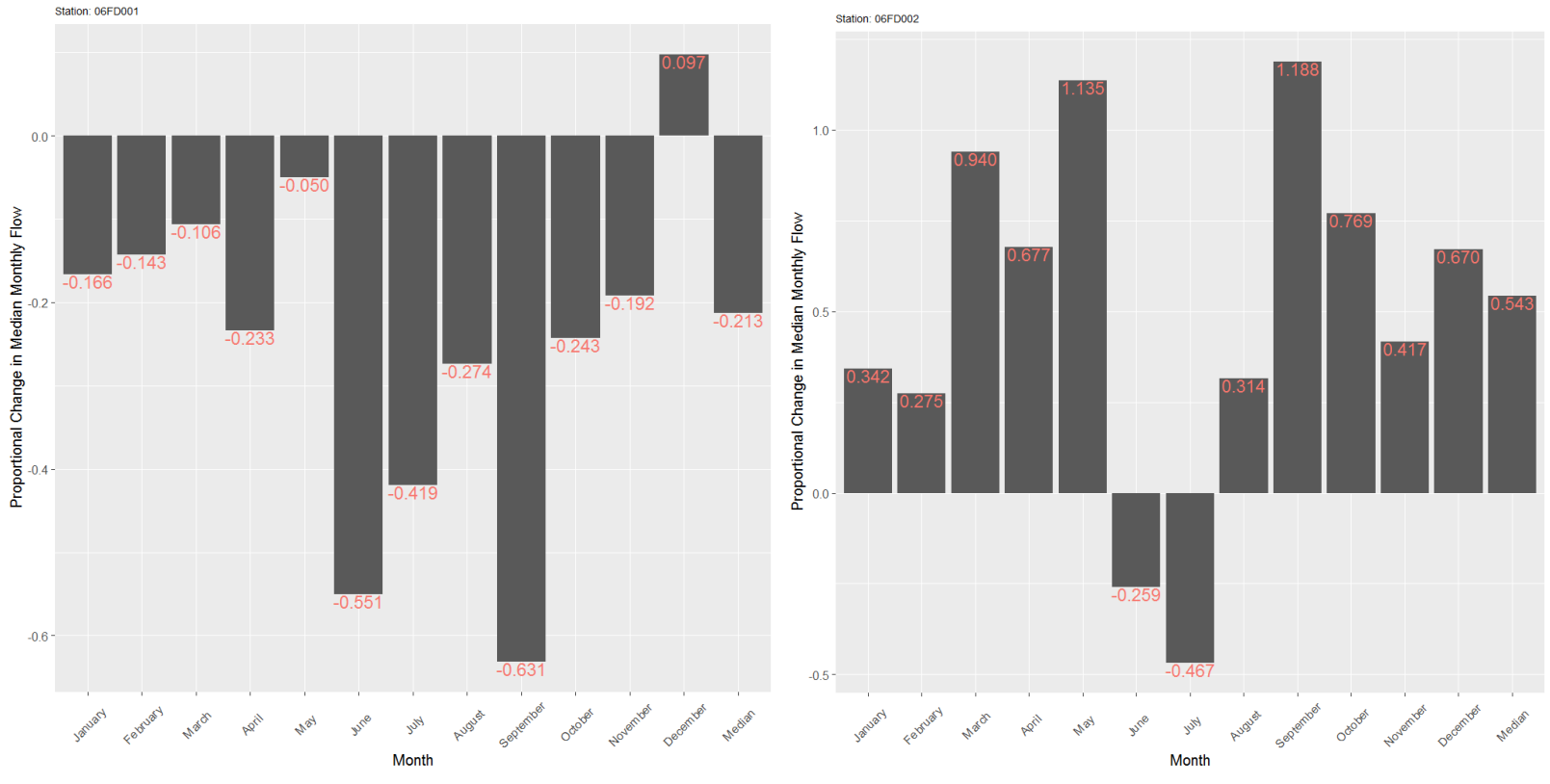
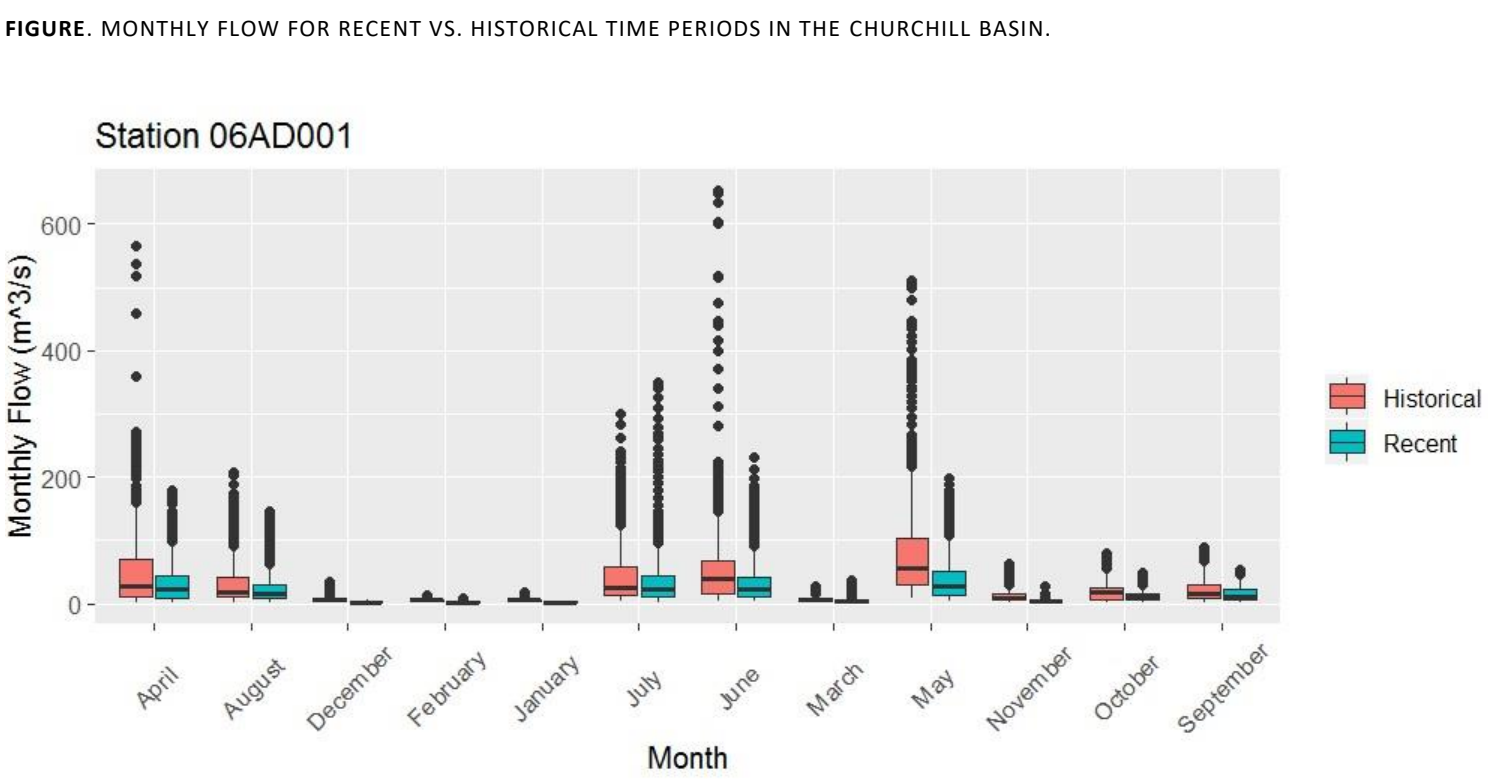
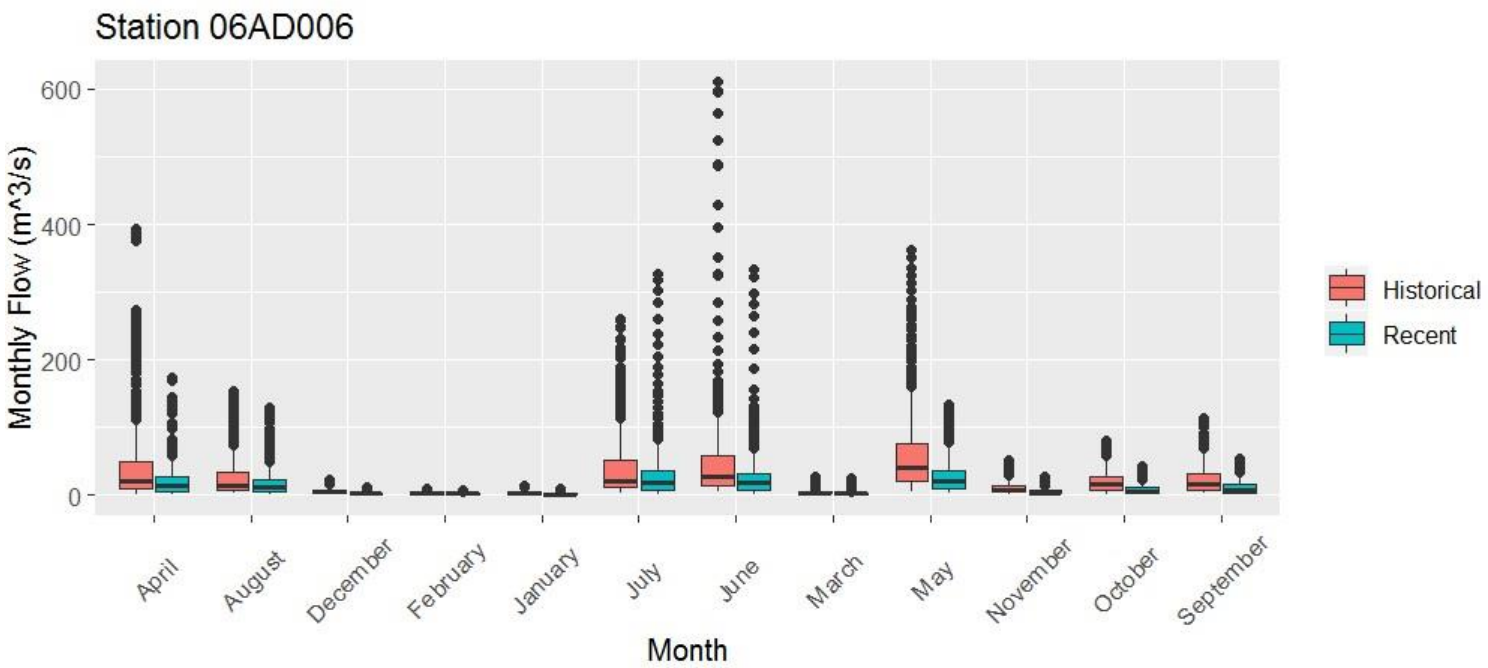


FIGURE. MONTHLY FLOW FOR RECENT VS. HISTORICAL TIME PERIODS IN THE CHURCHILL BASIN.



Start Year = 1933 ; Baseline Year = 1985
Kruskal-Wallis Test
Statistic = 607.87 ; p-value = 3.2523e-134



Start Year = 1955 ; Baseline Year = 1985
Kruskal-Wallis Test
Statistic = 1124.2 ; p-value = 1.8478e-246

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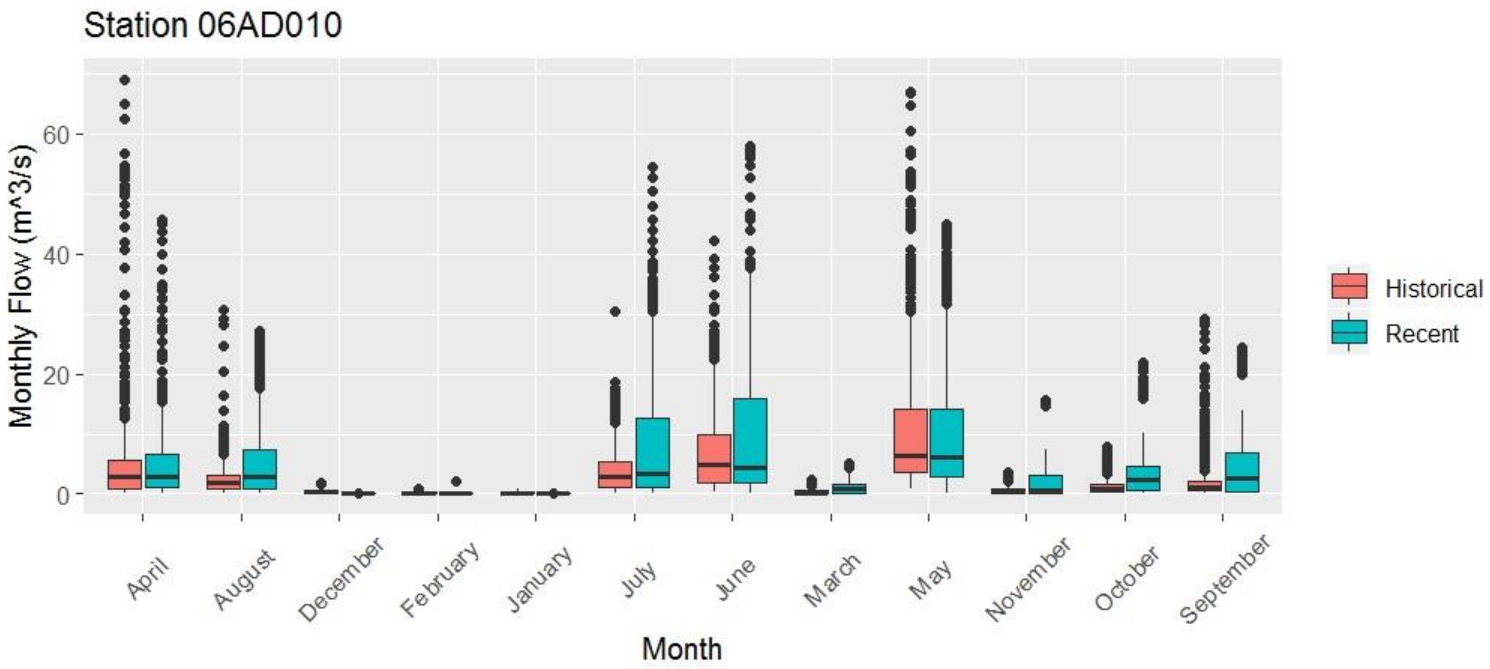
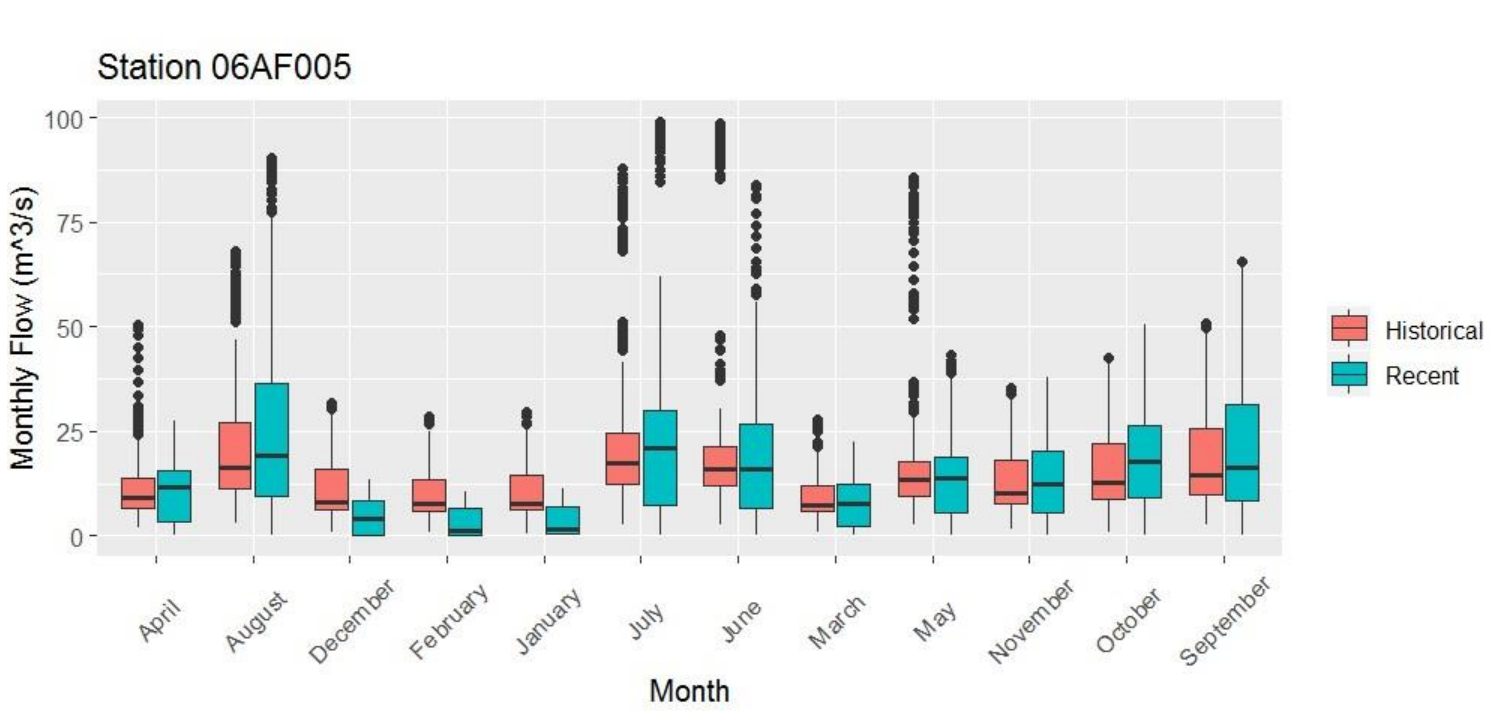
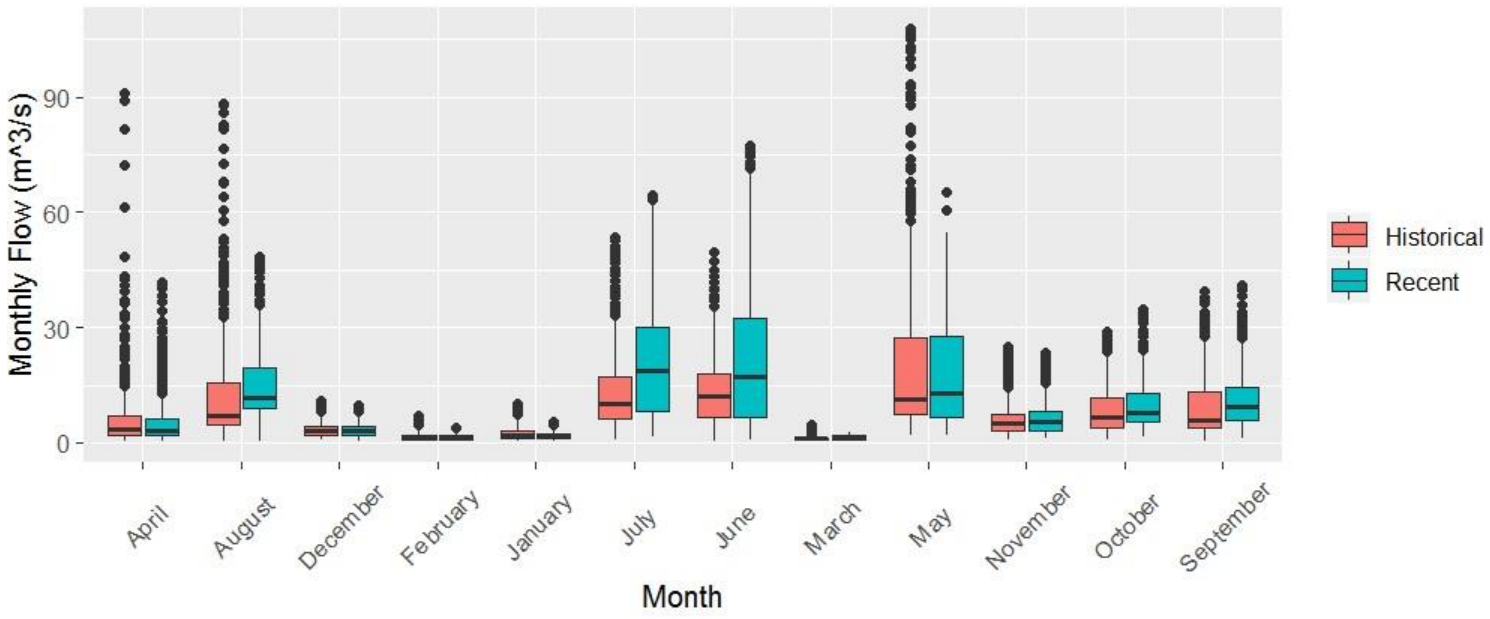


Start Year = 1958 ; Baseline Year = 1993
Kruskal-Wallis Test
Statistic = 408.54 ; p-value = 7.6314e-91



Start Year = 1967 ; Baseline Year = 1992
Kruskal-Wallis Test
Statistic = 0.93267 ; p-value = 0.33417



Start Year = 1970 ; Baseline Year = 1994
Kruskal-Wallis Test
Statistic = 58.029 ; p-value = 2.583e-14

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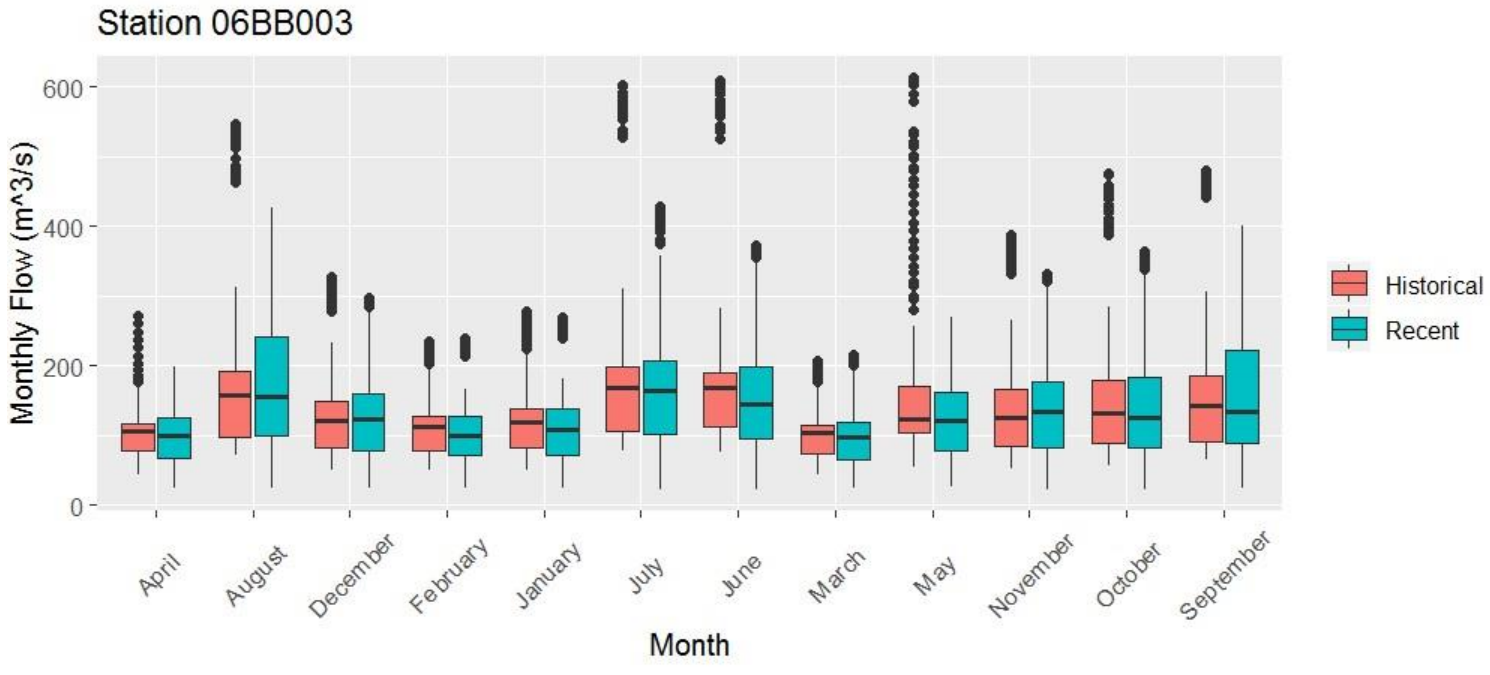
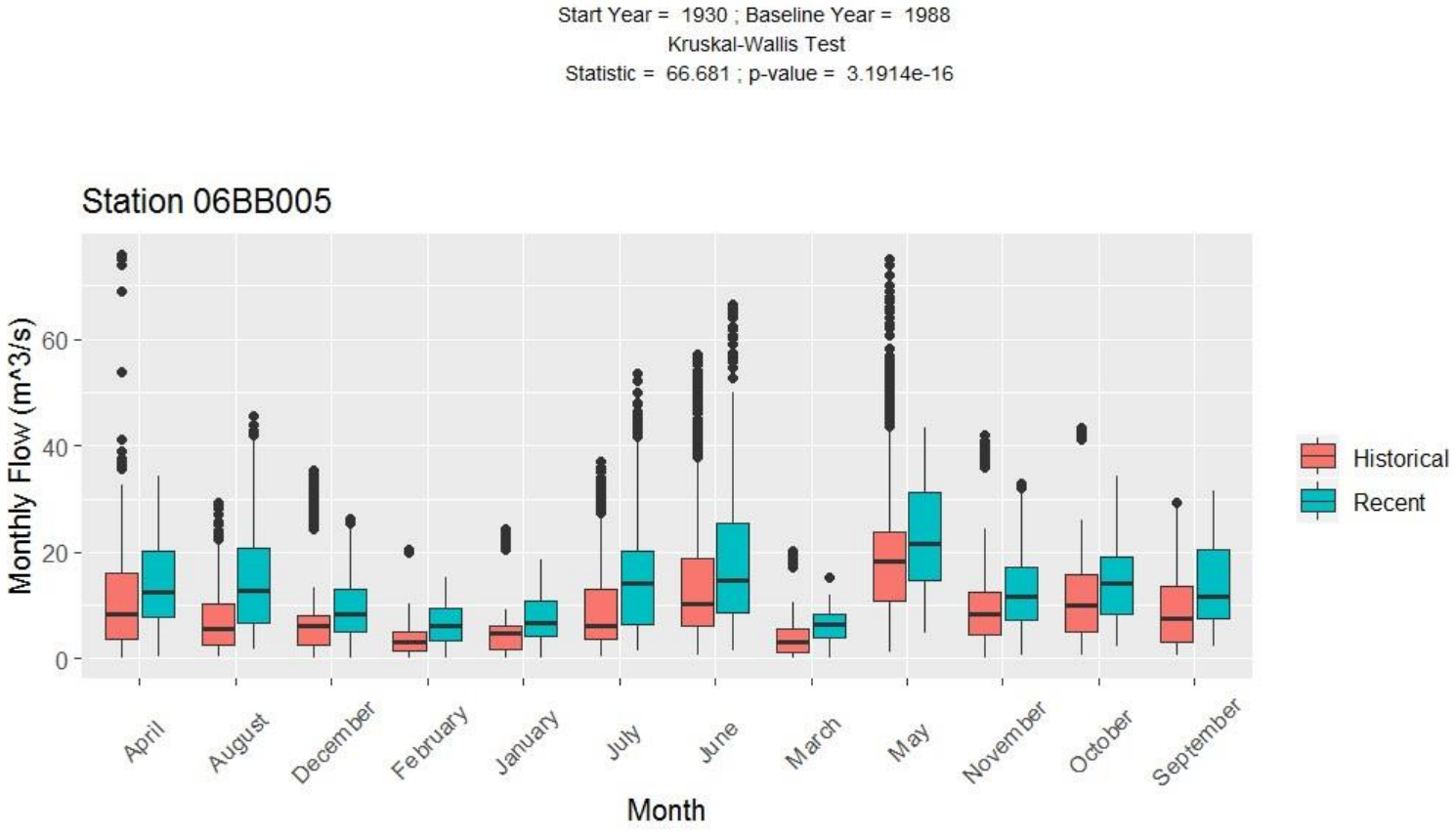
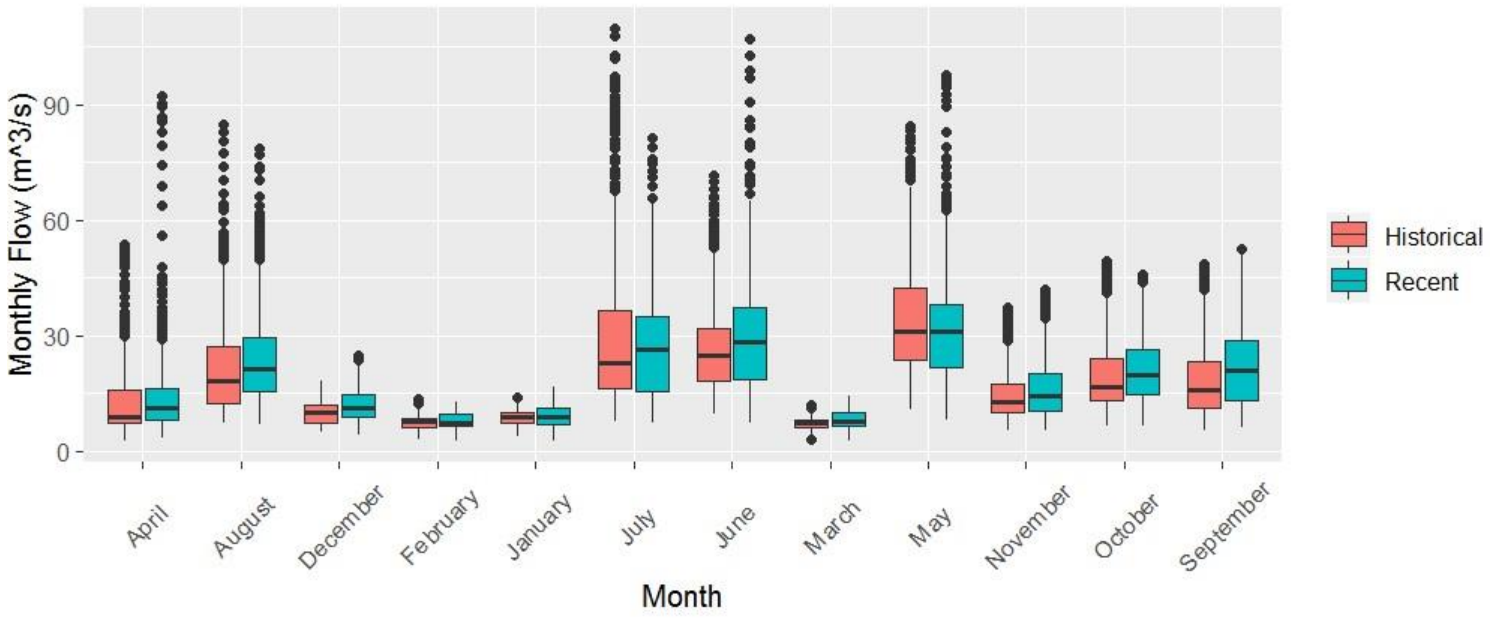


Start Year = 1930 ; Baseline Year = 1988
Kruskal-Wallis Test
Statistic = 66.681 ; p-value = 3.1914e-16



Start Year = 1973 ; Baseline Year = 1996
Kruskal-Wallis Test
Statistic = 1098.4 ; p-value = 7.3639e-241



Start Year = 1966 ; Baseline Year = 1992
Kruskal-Wallis Test
Statistic = 59.185 ; p-value = 1.4355e-14

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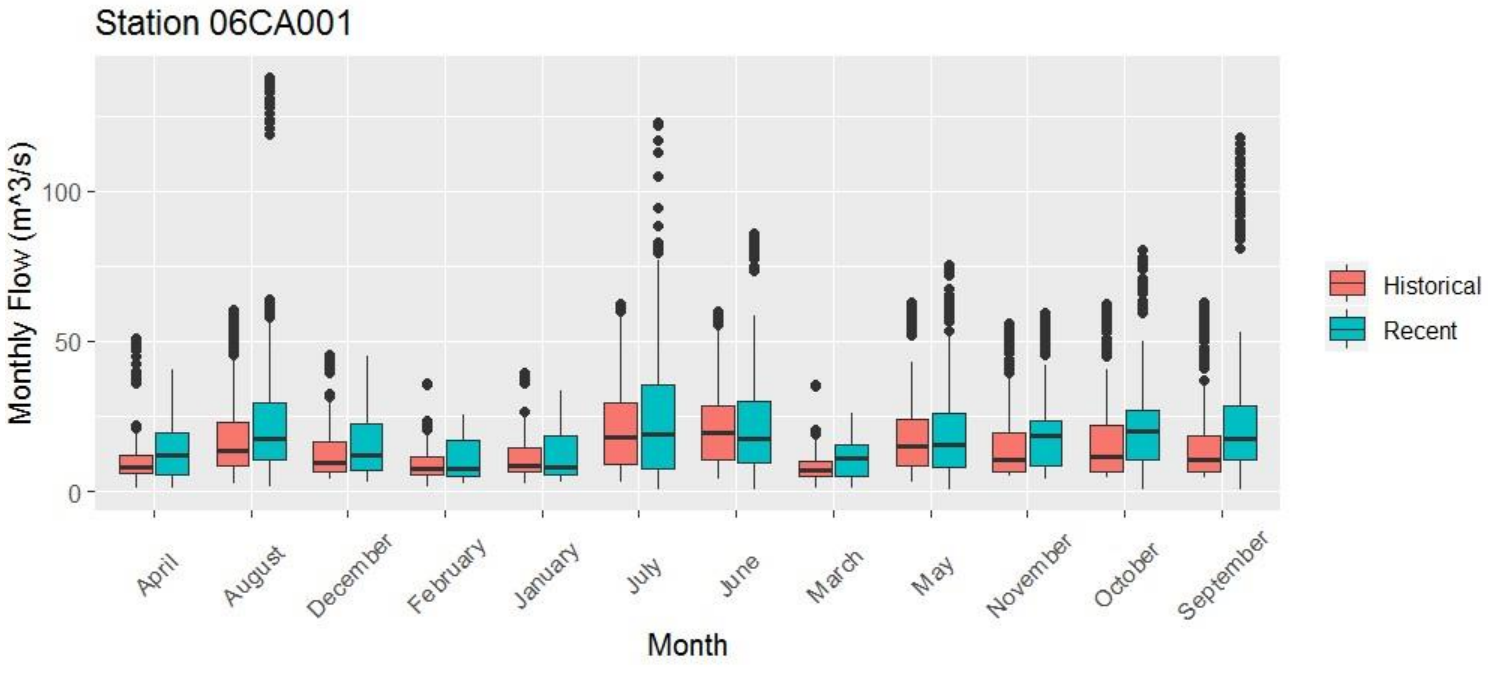
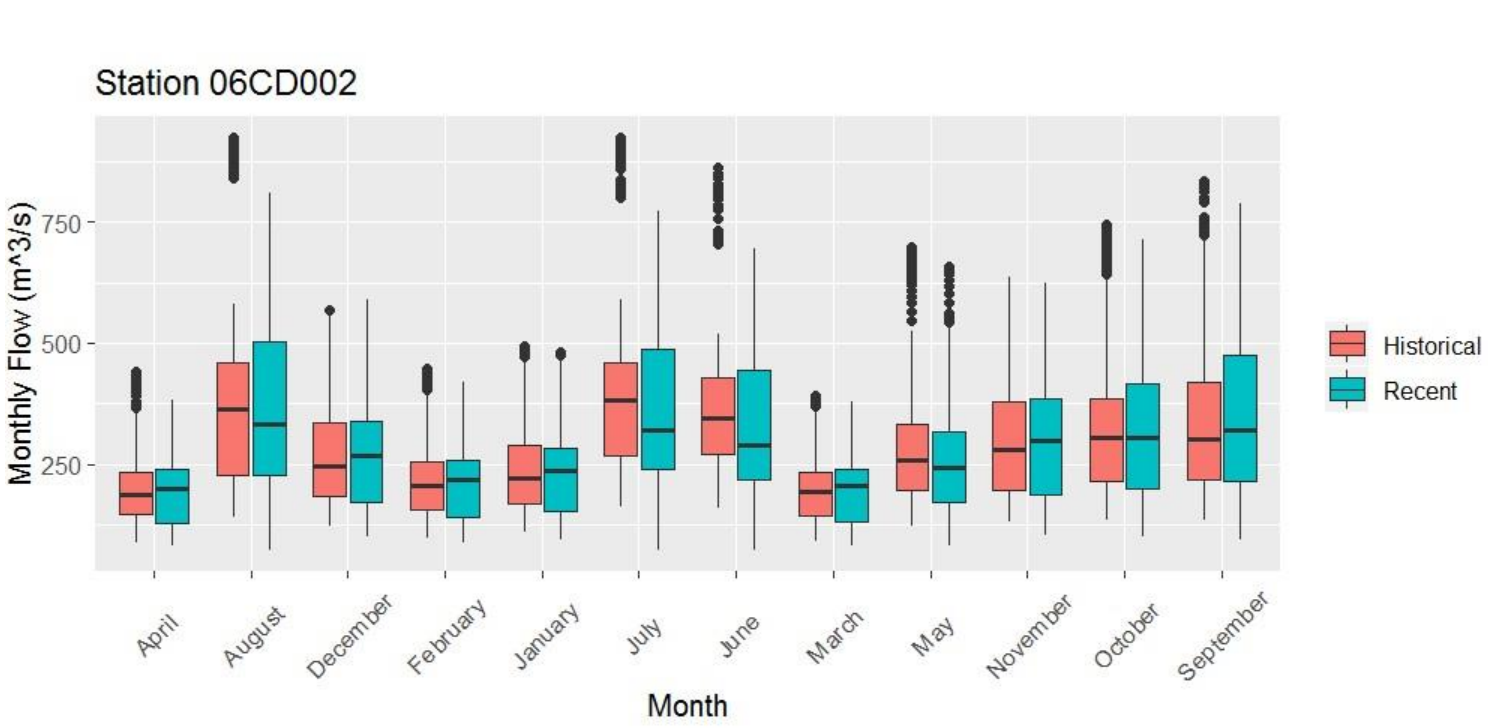
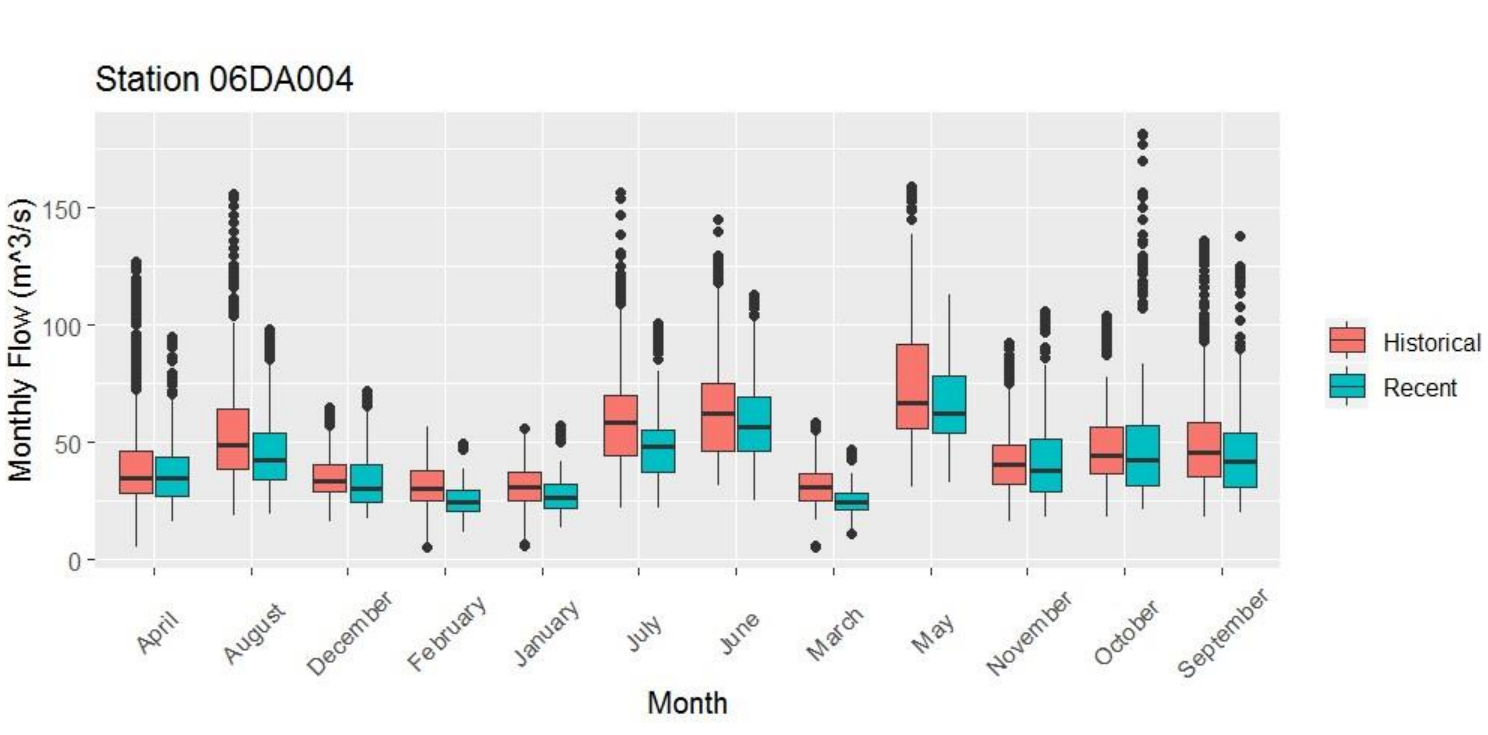


Start Year = 1967 ; Baseline Year = 1992
Kruskal-Wallis Test
Statistic = 195.11 ; p-value = 2.4411e-44



Start Year = 1963 ; Baseline Year = 1990
Kruskal-Wallis Test
Statistic = 37.342 ; p-value = 9.915e-10



Start Year = 1966 ; Baseline Year = 1992
Kruskal-Wallis Test
Statistic = 269.16 ; p-value = 1.7303e-60

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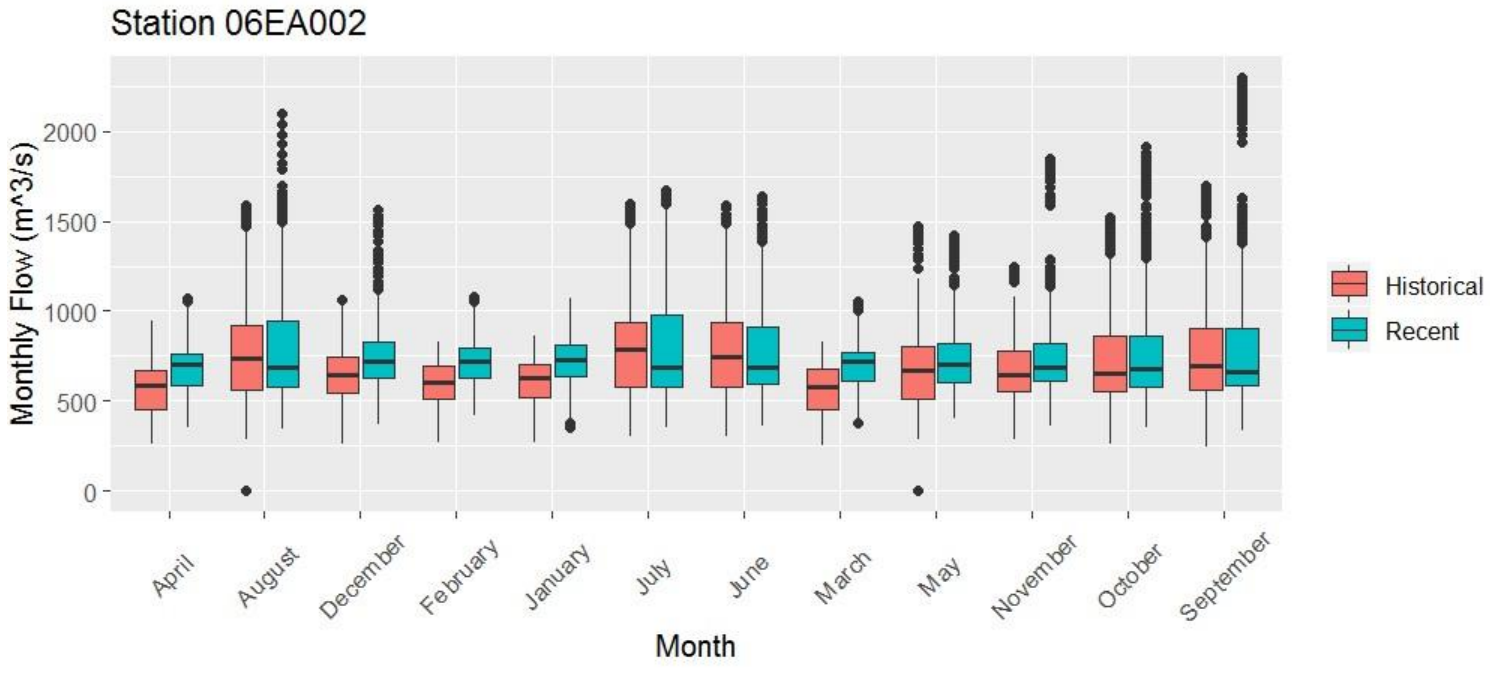
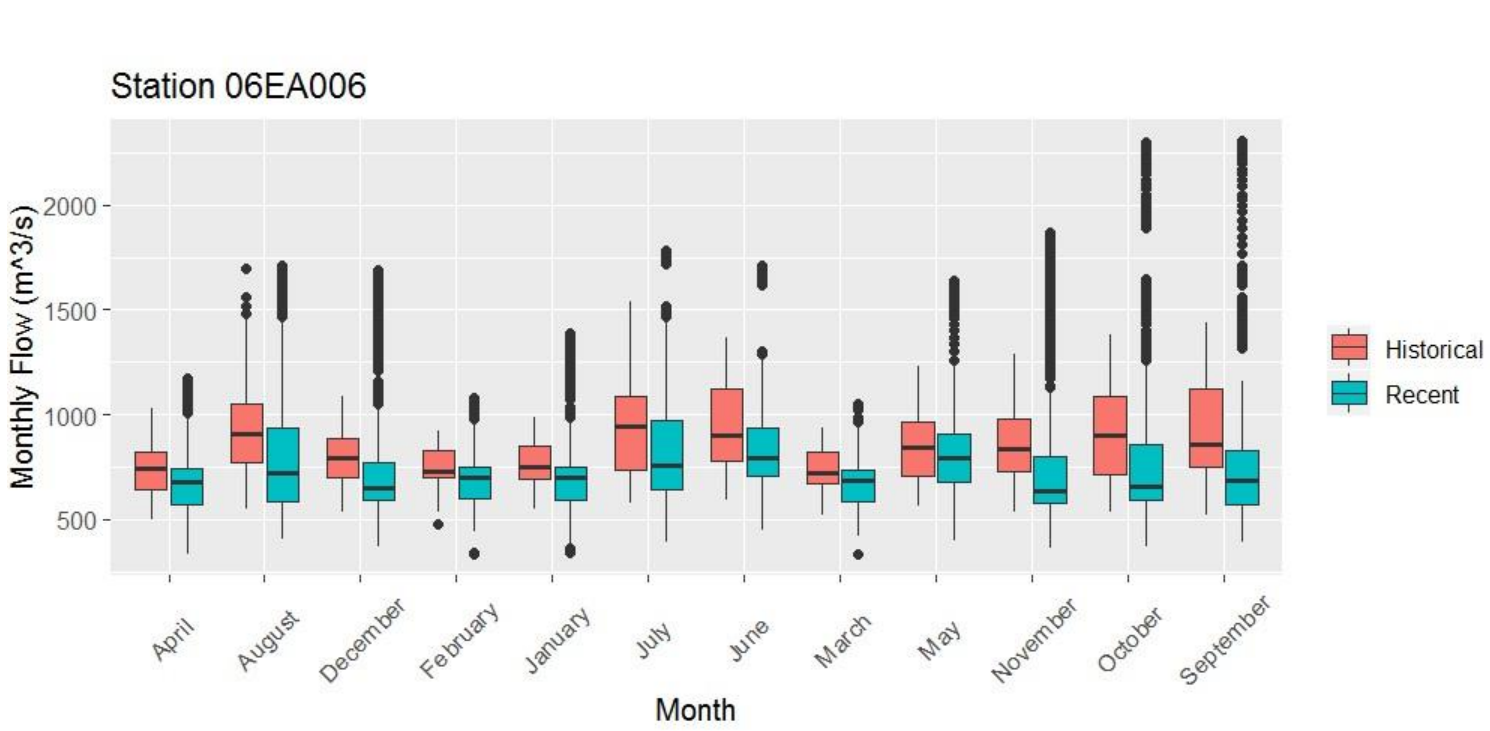
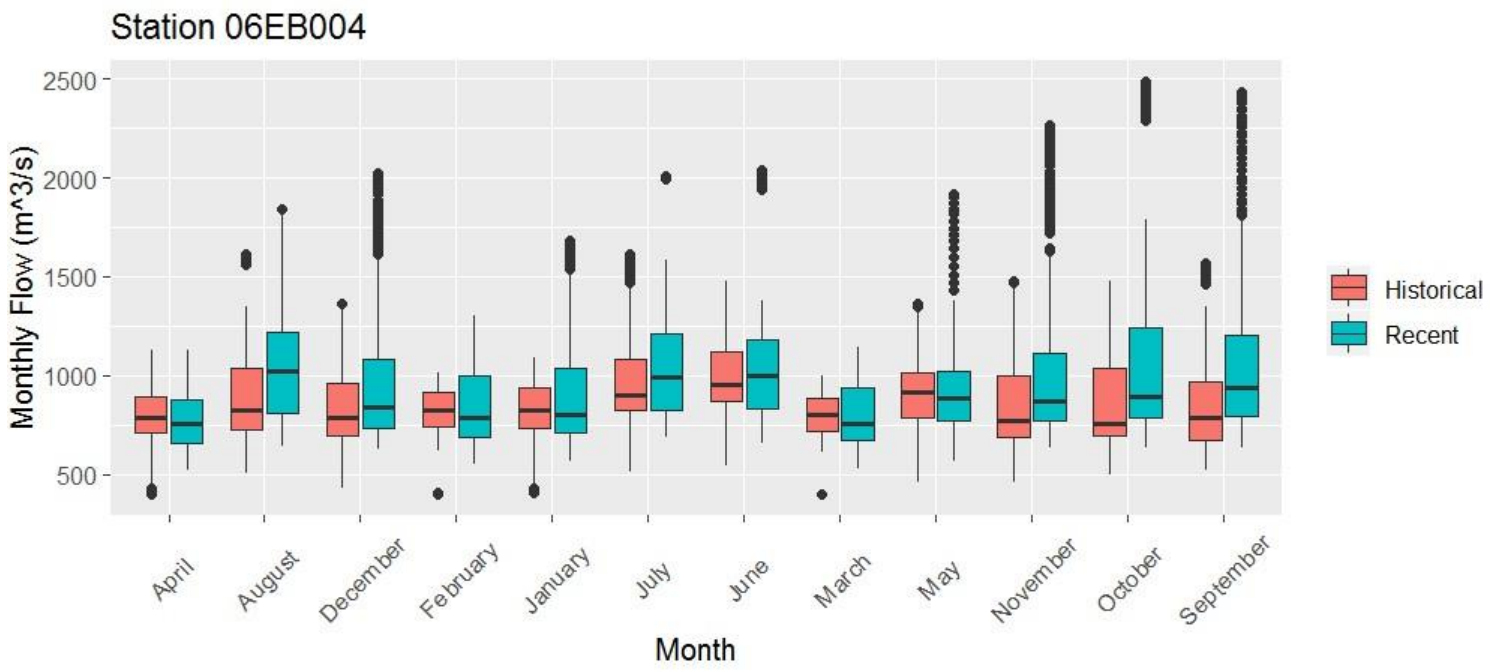


Start Year = 1928 ; Baseline Year = 1973
Kruskal-Wallis Test
Statistic = 922.54 ; p-value = 1.236e-202



Start Year = 1946 ; Baseline Year = 1982
Kruskal-Wallis Test
Statistic = 1924.4 ; p-value = 0



Start Year = 1973 ; Baseline Year = 1996
Kruskal-Wallis Test
Statistic = 188.05 ; p-value = 8.4693e-43

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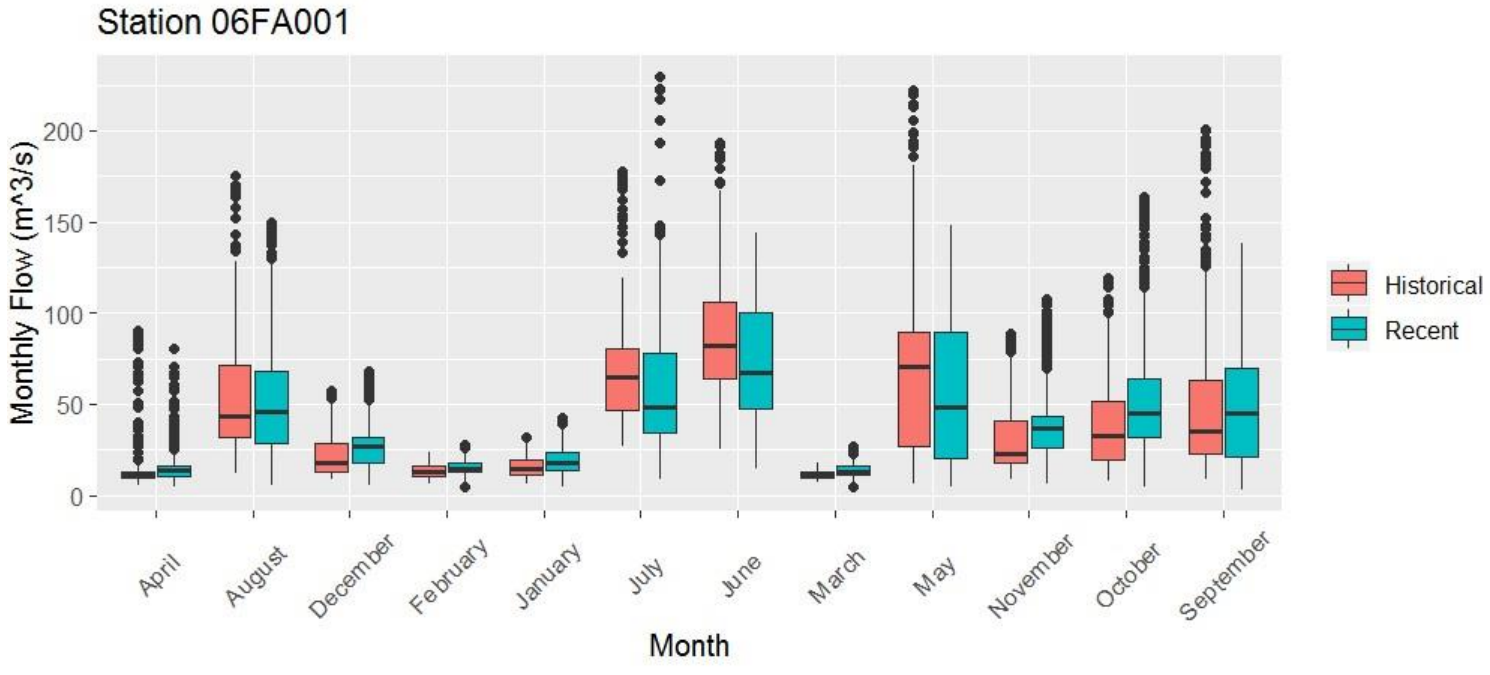
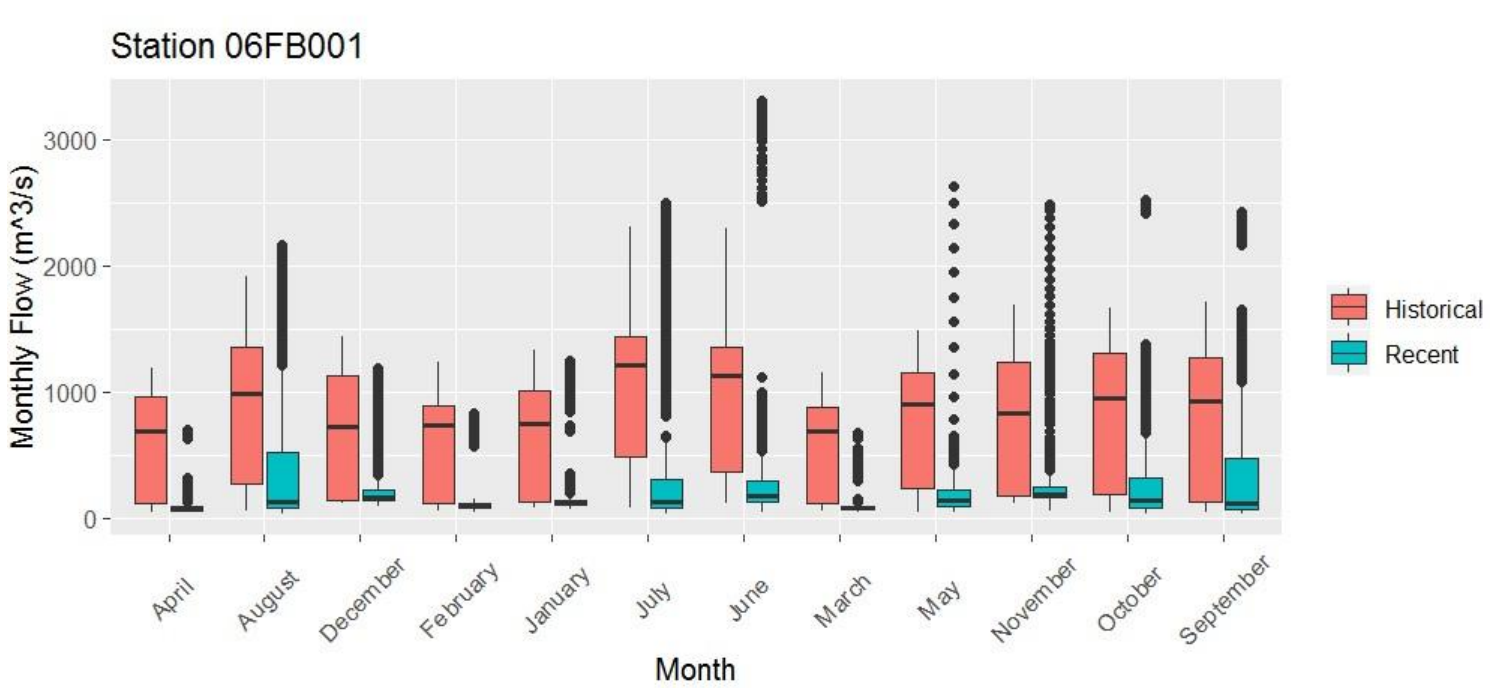
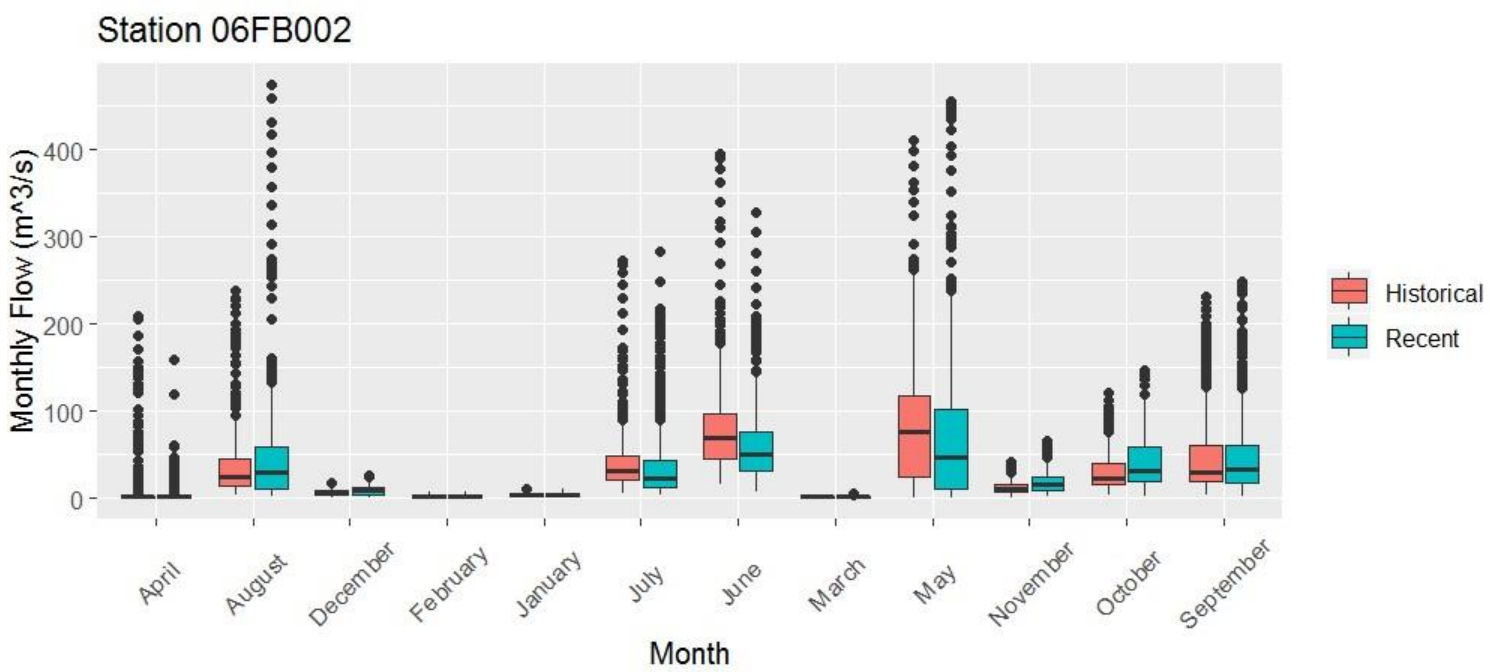


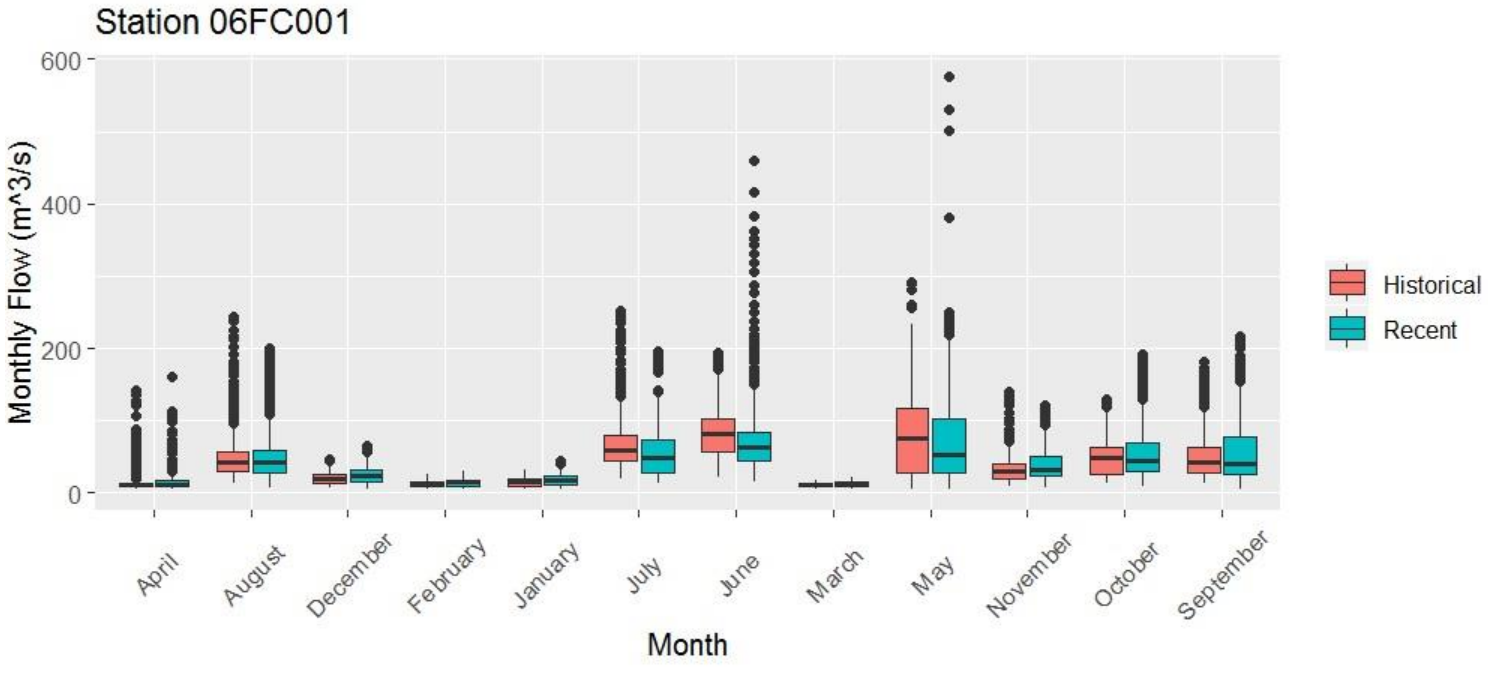
Start Year = 1979 ; Baseline Year = 1998
Kruskal-Wallis Test
Statistic = 37.966 ; p-value = 7.1974e-10



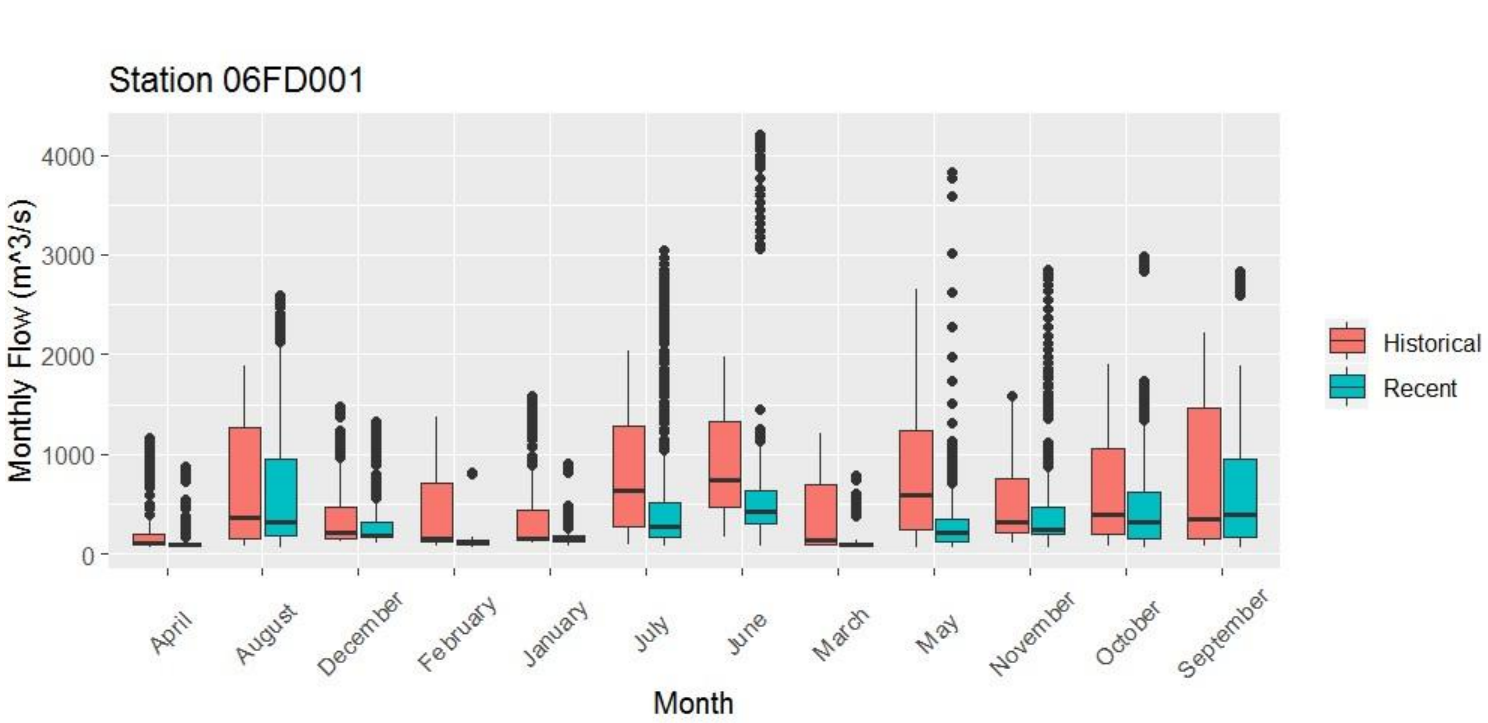
Start Year = 1960 ; Baseline Year = 1989
Kruskal-Wallis Test
Statistic = 4438.6 ; p-value = 0



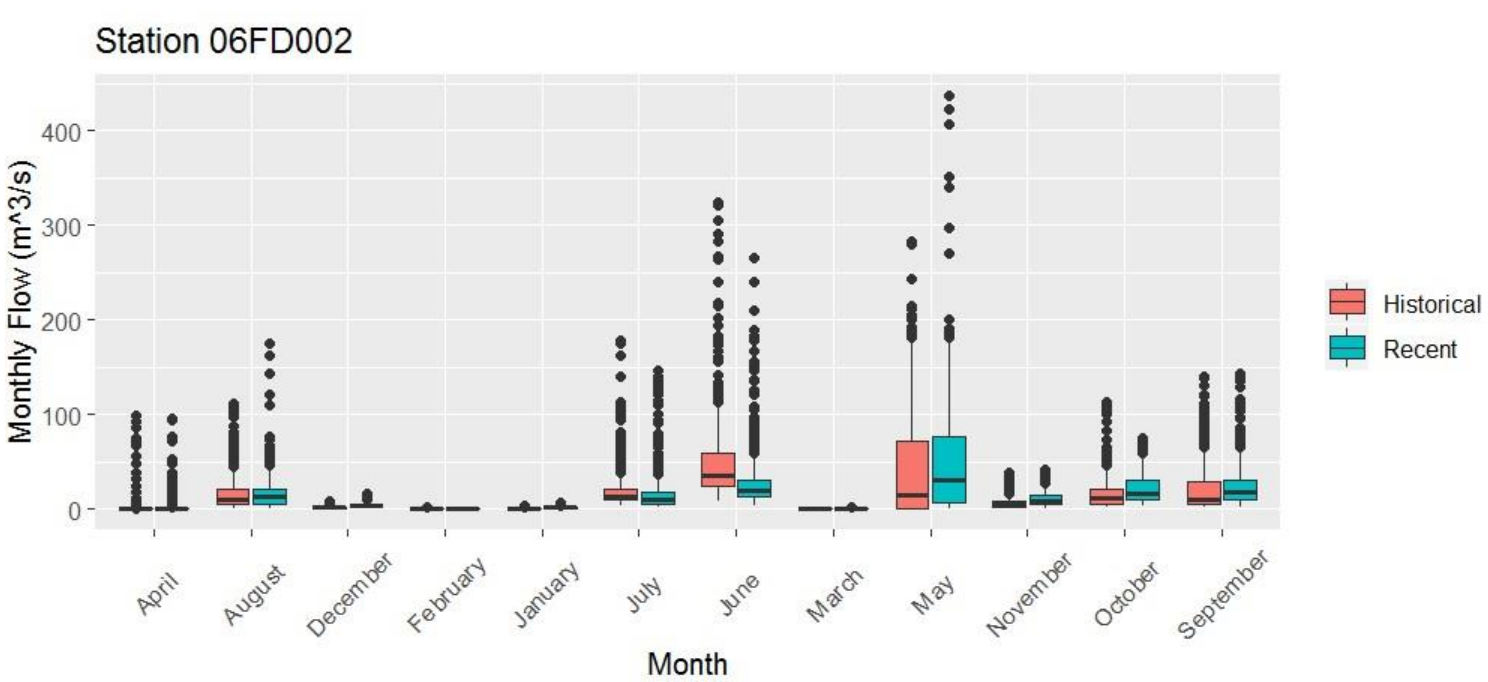
Start Year = 1971 ; Baseline Year = 1994
Kruskal-Wallis Test
Statistic = 0.093945 ; p-value = 0.75922



Start Year = 1967 ; Baseline Year = 1992
Kruskal-Wallis Test
Statistic = 0.45306 ; p-value = 0.50089



Start Year = 1971 ; Baseline Year = 1994
Kruskal-Wallis Test
Statistic = 609.03 ; p-value = 1.8191e-134



Start Year = 1978 ; Baseline Year = 1998
Kruskal-Wallis Test
Statistic = 103.14 ; p-value = 3.1266e-24

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WATER QUALITY

OVERALL WATER QUALITY HEALTH SCORING

				Sub-Basin						*Basin*
	Indicator			**06A - Beaver**	**06B - Upper Churchill (Man.)**	**06C - Central Churchill (Man.)**	**06D - Reindeer**	**06E - Central Churchill (Man.) Lower**	**06F - Lower Churchill (Man.)**	**Value**
Water Quality	**Exceedance of water quality guidelines for aquatic life**	Exceedance of water quality thresholds. Weighted average of exceedances of three thresholds: water quality guidelines, 90th percentile and 75th percentile. Expressed as a proportion of total measurements. Reported as a weighted average for the last five years.	***Year***	2015-2019	-	2015-2019	-	2015-2019	2015	2015-2019
			Number of Stations	7	0	1	0	3	2	13
			Value	0.190	-	0.020	-	0.118	0.187	0.160
			Water Quality Health Category	Fair	Data Deficient	Data Deficient	Data Deficient	Good	Data Deficient	Data Deficient
			Water Quality Health Score	3	0	0	0	4	0	0
		Variance of annual water quality scores	***Value***	0.12	-	0.05	-	0.09	0.08	0.1
		Significant Mann-Kendal time-series test to determine directional trend in proportion of exceedance of water quality thresholds.	***Time Period***	1970-2019	1973-1999	1971-2019	1971-2006	1972-2019	1972-2015	1970-2019
			Trend	No trend	No trend	No trend	No trend	Significantly increasing trend in Manitoba	No trend	Significantly increasing trend in Manitoba

WATER QUALITY DATA SUFFICIENCY

		Sub-Basin						Basin
	Data Sufficiency Indicator	**06A - Beaver**	**06B - Upper Churchill (Man.)**	**06C - Central Churchill (Man.)**	**06D - Reindeer**	**06E - Central Churchill (Man.) Lower**	**06F - Lower Churchill (Man.)**	
Water Quality	Total number of sub-sub-basins	7	4	6	5	3	5	30
	Year of earliest available monitoring	1970	1973	1972	1971	1972	1972	1970
	Number of monitoring stations available for earliest monitoring	2	1	1	1	3	6	1
	Number of sub-sub-basins with earliest available monitoring stations	2	1	1	1	3	5	13
	Year of most recently available monitoring	2019	1989	2019	2005	2019	2019	2019
	Number of monitoring stations available within last five years	7	0	1	0	3	2	13
	Number of sub-sub-basins within last five years	4	0	2	0	3	1	10
	Percentage of samples with at least 10 elements measured within last 5 years.	82.90%	-	20.00%	-	100.00%	85.70%	72.15%
	Number of years of sampling in last 10 years	10	0	10	0	10	10	10
	Overall Data Sufficiency Category	Partially Sufficient	Insufficient	Insufficient	Insufficient	Sufficient	Insufficient	Insufficient
	Data Sufficiency Score	1	0	0	0	3	0	0

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MAP. EXCEEDANCE OF WATER QUALITY THRESHOLDS AS REPORTED FOR MONITORING STATIONS IN THE CHURCHILL BASIN FOR THE FIVE MOST RECENT YEARS AVAILABLE, 2016-2020.

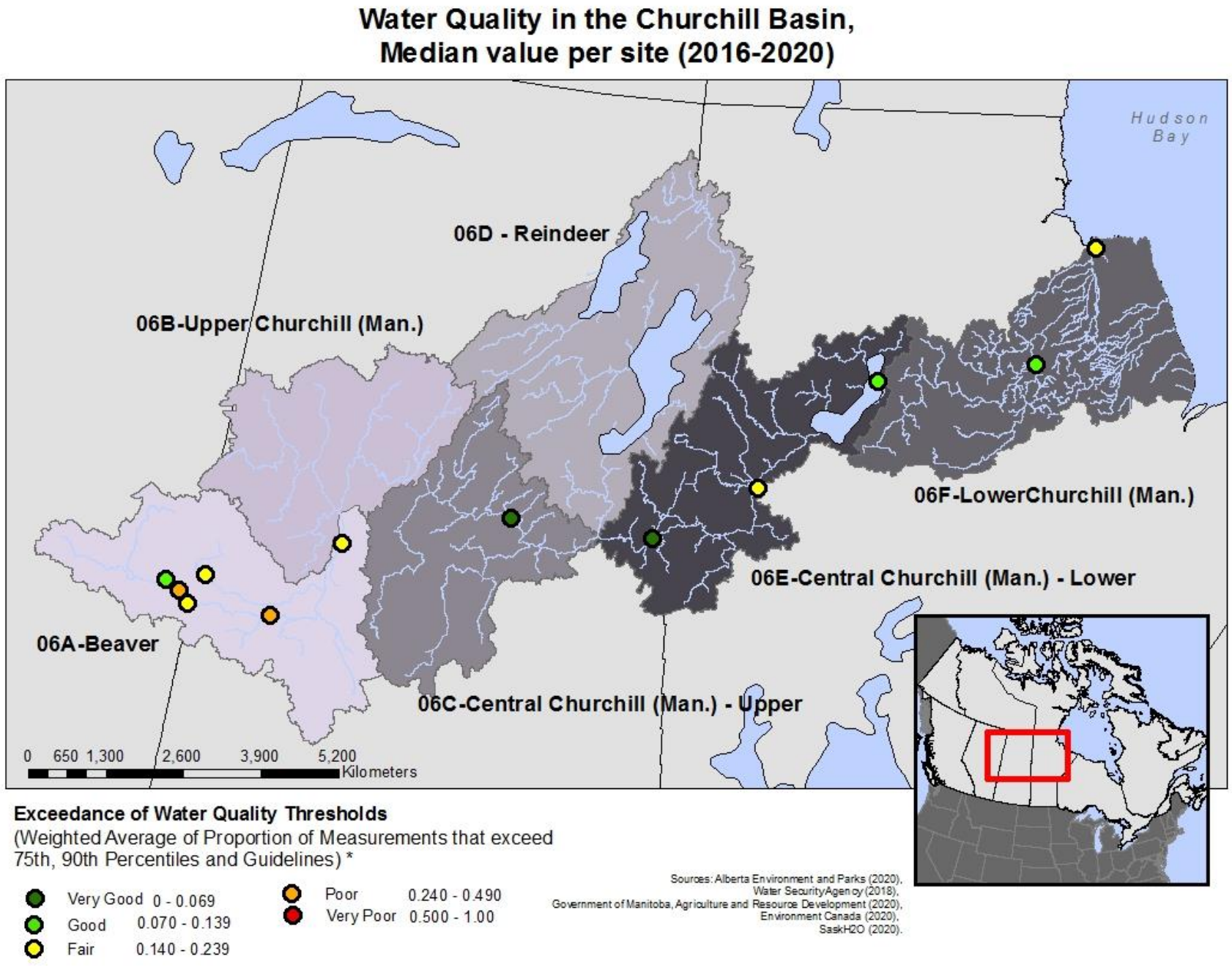

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TABLE. WATER QUALITY IN THE CHURCHILL BASIN BASED ON PROPORTION OF EXCEEDANCE OF THREE THRESHOLDS: PROVINCIAL WATER QUALITY GUIDELINES, 90TH & 75TH PRECENTILES EXCEEDANCES.

Source	WSCSDA	Year	Number of Contaminants Measured	Total Number of Sites	Number of Measurements	Total Number of Guidelines Exceedances	Proportion of Guideline Exceedance	Total Number of 90th Percentile Exceedances	Proportion of 90th Percentile Exceedance	Total Number of 75th Percentile Exceedances	Proportion of 75th Percentile Exceedance	Weighted Average Exceedance	5-Years Weighted Average Exceedance by sub-watershed
AEP	06A – Beaver	2019	16	3	171	31	0.18	10	0.06	49	0.29	0.16	0.190
EC		2019	15	2	134	18	0.13	7	0.05	14	0.10	0.10	
SaskH2O		2019	6	2	38	12	0.32	9	0.24	20	0.53	0.32	
AEP		2018	18	3	668	137	0.21	82	0.12	232	0.35	0.20	
EC		2018	15	2	378	43	0.11	20	0.05	78	0.21	0.11	
SaskH2O		2018	6	2	44	15	0.34	7	0.16	26	0.59	0.32	
AEP		2017	18	3	720	151	0.21	144	0.20	259	0.36	0.23	
EC		2017	17	2	381	44	0.12	29	0.08	85	0.22	0.12	
SaskH2O		2017	7	2	49	15	0.31	12	0.24	29	0.59	0.33	
AEP		2016	18	3	565	94	0.17	48	0.08	119	0.21	0.15	
EC		2016	15	2	371	31	0.08	20	0.05	59	0.16	0.09	
SaskH2O		2016	6	2	23	5	0.22	2	0.09	14	0.61	0.24	
WSA		2016	10	2	38	7	0.18	6	0.16	13	0.34	0.20	
AEP		2015	18	3	227	41	0.18	17	0.07	57	0.25	0.16	
EC		2015	15	2	360	26	0.07	16	0.04	42	0.12	0.07	
WSA		2015	10	2	95	18	0.19	23	0.24	48	0.51	0.26	
SaskH2O	06C – Central Churchill, upper	2019	5	1	18	1	0.06	0	0.00	0	0.00	0.03	0.020
SaskH2O		2018	5	1	14	0	0.00	0	0.00	0	0.00	0.00	
SaskH2O		2017	6	1	22	0	0.00	1	0.05	1	0.05	0.02	
SaskH2O		2016	5	1	10	0	0.00	0	0.00	1	0.10	0.02	
WSA		2016	9	1	15	0	0.00	0	0.00	0	0.00	0.00	
WSA		2015	9	1	33	0	0.00	3	0.09	5	0.15	0.06	
EC	06E – Central Churchill, lower	2019	14	1	22	0	0.00	0	0.00	1	0.05	0.01	0.118
MB.gov		2019	11	1	11	2	0.18	2	0.18	7	0.64	0.26	
EC		2018	14	1	64	6	0.09	0	0.00	7	0.11	0.07	
MB.gov		2018	11	1	33	6	0.18	4	0.12	14	0.42	0.20	
EC		2017	14	1	64	6	0.09	0	0	5	0.08	0.06	
MB.gov		2017	11	1	29	6	0.21	3	0.10	10	0.34	0.20	
EC		2016	14	1	61	1	0.02	2	0.03	2	0.03	0.02	
MB.gov		2016	12	1	31	6	0.19	5	0.16	13	0.42	0.22	
EC		2015	14	1	63	6	0.10	0	0.00	2	0.03	0.05	
MB.gov		2015	13	2	69	10	0.14	2	0.03	11	0.16	0.11	
MB.gov	06F – Lower Churchill	2019	11	1	11	2	0.18	2	0.18	4	0.36	0.21	0.187
MB.gov		2018	11	2	50	11	0.22	9	0.18	23	0.46	0.25	
MB.gov		2017	12	2	49	7	0.14	6	0.12	17	0.35	0.17	
MB.gov		2016	11	1	36	3	0.08	7	0.19	16	0.44	0.18	
MB.gov		2015	12	1	31	2	0.06	2	0.06	5	0.16	0.08	

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FIGURE. ANALYSIS OF VARIANCE IN EXCEEDANCE OF WATER QUALITY THRESHOLDS OVER TIME FOR MONITORING STATIONS IN THE CHURCHILL BASIN (1970-2019).

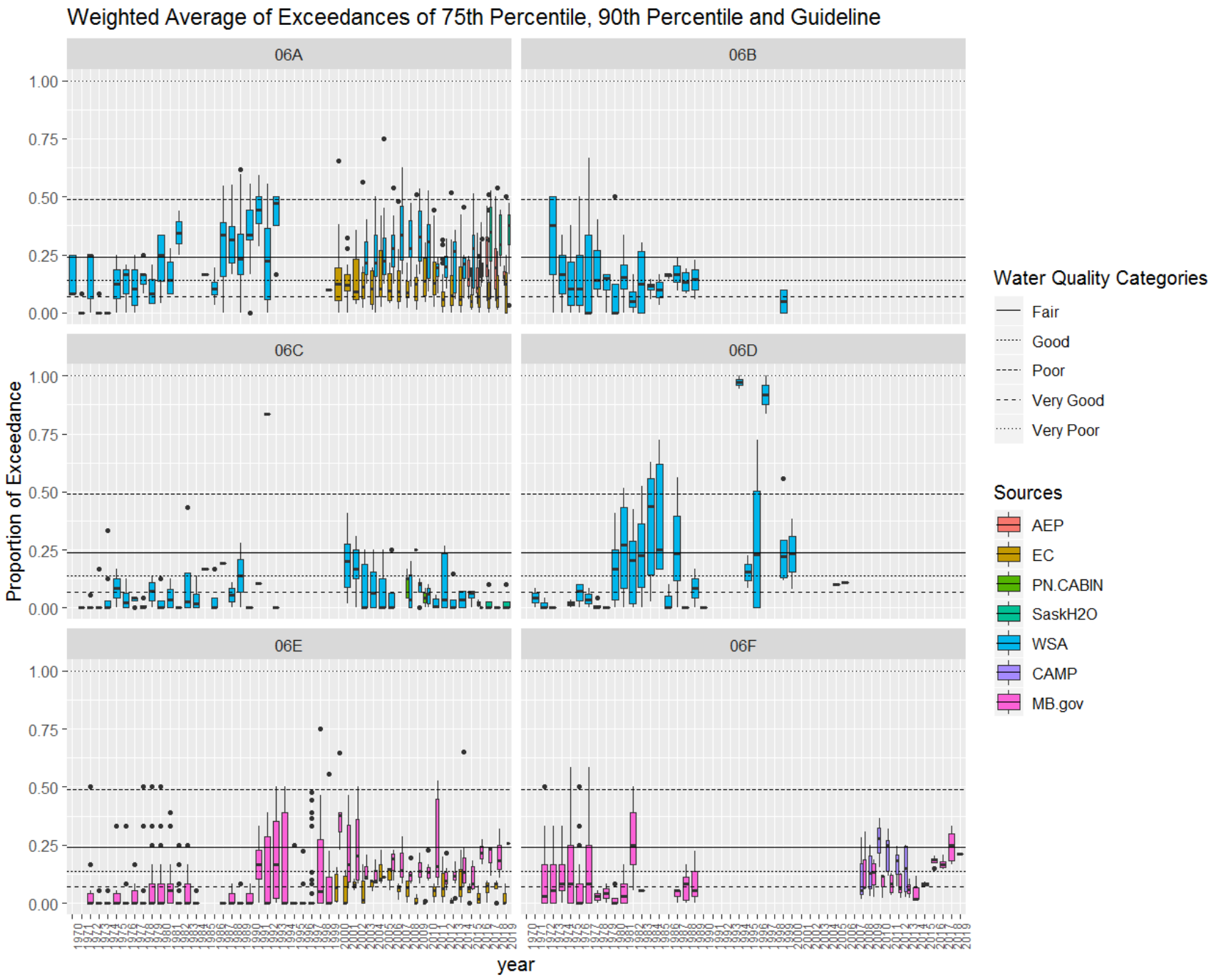

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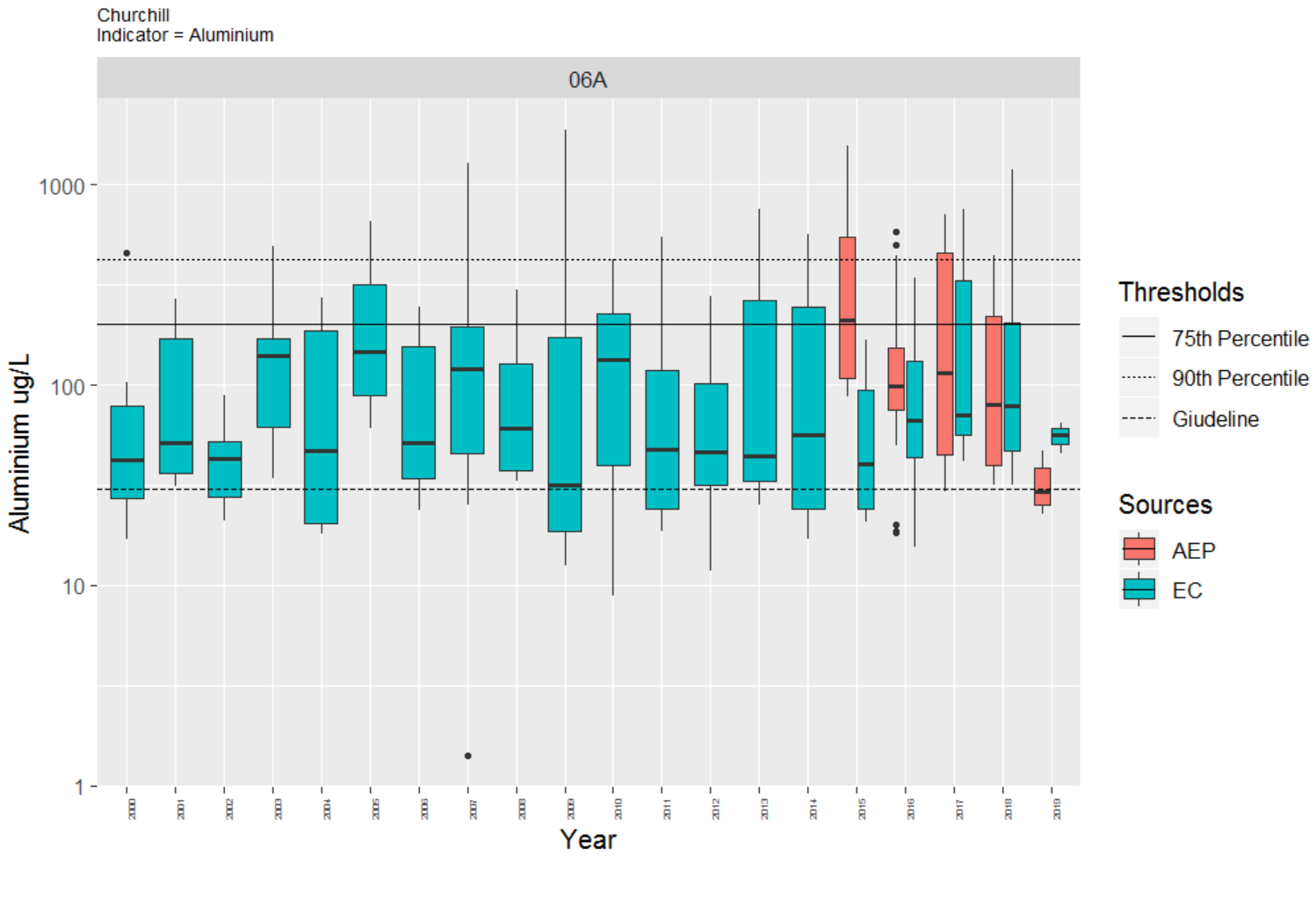
TABLE. PROPROTION OF SELECT MEASUREMENTS EXCEEDING THE WATER QUALITY THRESHOLDS, IN THE CHURCHILL BASIN, BY PROVINCE, SUB-WATERSHEDS AND PARAMETER MEASURED.

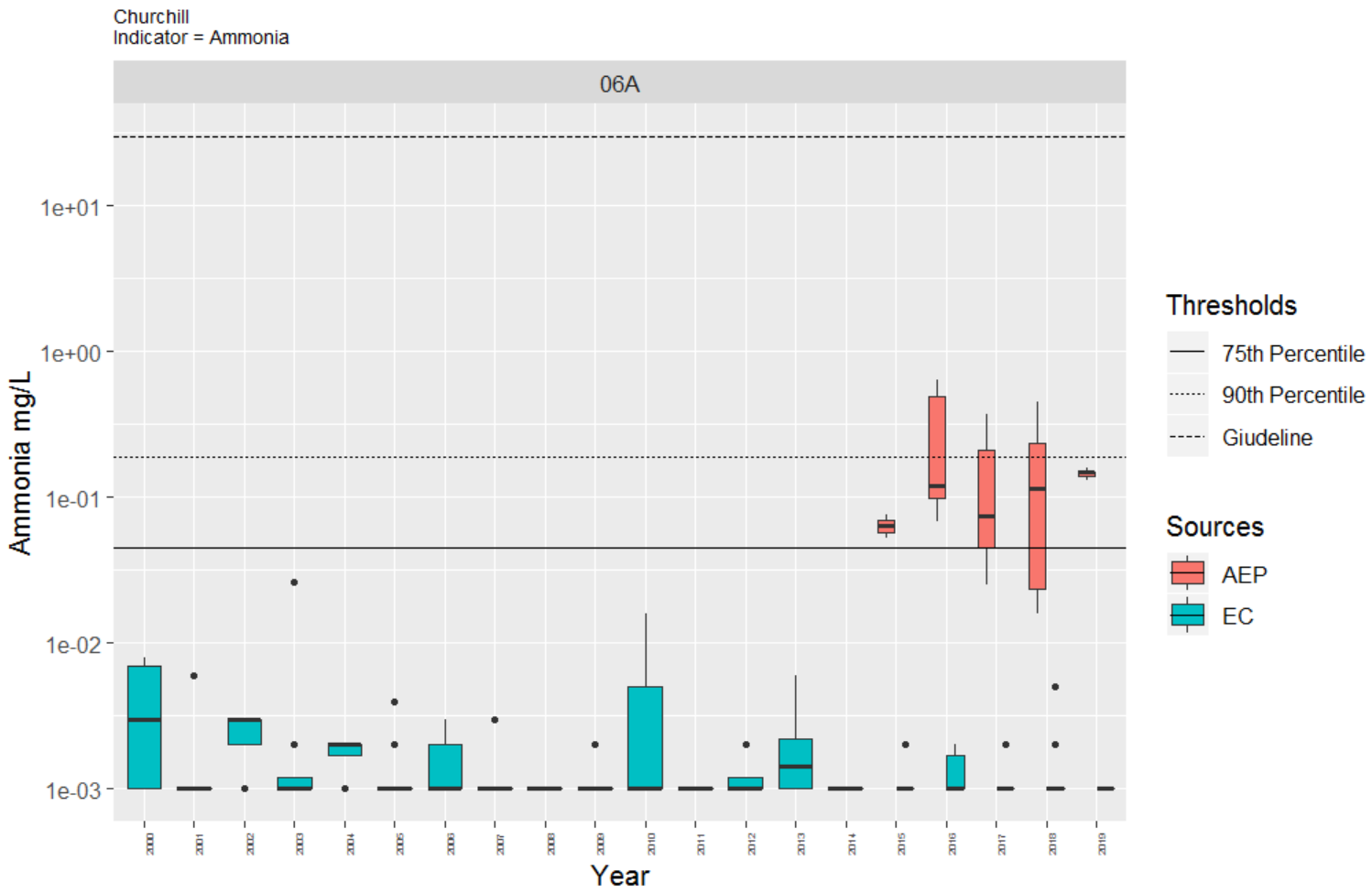
Alberta			
variable	06A - Beaver		
	Measurement	exceedances	ratio
aluminium	627	273	0.44
ammonia	373	1	0.00
arsenic	326	0	0.00
bromoxynil	5	0	0.00
cadmium	263	2	0.01
chloride	303	0	0.00
copper	330	1	0.00
dissolved.oxygen	358	112	0.31
iron	330	318	0.96
lead	315	1	0.00
mcpa	12	0	0.00
mercury	121	0	0.00
nickel	328	0	0.00
nitrate	103	0	0.00
nitrite	41	41	1.00
nitrogen	327	146	0.45
ph	628	1	0.00
phosphorus	334	216	0.65
uranium	306	0	0.00
zinc	328	15	0.05
TOTAL	5758	1127	0.20

Saskatchewan															
variable	06A - Beaver			06B - Upper Churchill			06C - Central Churchill			06D - Reindeer			06E - Central Churchill, Lower		
	Measurement	exceedances	ratio	Measurement	exceedances	ratio	Measurement	exceedances	ratio	Measurement	exceedances	ratio	Measurement	exceedances	ratio
aluminium	533	167	0.31	7	1	0.14	69	4	0.06	99	48	0.48	123	69	0.56
ammonia	169	42	0.25	0	0	-	9	4	0.44	255	14	0.05	59	0	0.00
arsenic	356	4	0.01	25	1	0.04	45	0	0.00	62	21	0.34	64	0	0.00
cadmium	117	0	0.00	6	0	0.00	4	1	0.25	6	3	0.50	57	0	0.00
chloride	566	0	0.00	0	0	-	13	0	0.00	0	0	-	70	0	0.00
dissolved.oxygen	147	5	0.03	10	0	0.00	105	0	0.00	73	0	0.00	55	3	0.05
iron	298	102	0.34	0	0	-	21	7	0.33	63	24	0.38	70	2	0.03
lead	112	17	0.15	7	6	0.86	14	5	0.36	19	19	1.00	62	1	0.02
mercury	11	11	1.00	1	1	1.00	5	5	1.00	0	0	-	0	0	-
nickel	195	1	0.01	8	0	0.00	16	0	0.00	50	14	0.28	70	0	0.00
nitrate	2	0	0.00	4	0	0.00	0	0	-	2	0	0.00	0	0	-
nitrogen	259	50	0.19	39	5	0.13	54	1	0.02	79	9	0.11	70	1	0.01
ph	949	5	0.01	110	1	0.01	302	2	0.01	229	0	0.00	127	1	0.01
phosphorus	381	257	0.67	29	11	0.38	103	26	0.25	76	44	0.58	43	0	0.00
uranium	178	0	0.00	2	0	0.00	21	0	0.00	84	22	0.26	57	0	0.00
zinc	186	15	0.08	15	0	0.00	29	0	0.00	65	8	0.12	70	0	0.00
TOTAL	4459	676	0.15	263	26	0.10	810	55	0.07	1162	226	0.19	997	77	0.08

Manitoba						
variable	06E - Central Churchill, Lower			06F - Lower Churchill		
	Measurement	exceedances	ratio	Measurement	exceedances	ratio
aluminium	167	132	0.79	146	112	0.77
ammonia	14	6	0.43	27	2	0.07
arsenic	107	0	0.00	66	0	0.00
cadmium	59	4	0.07	24	0	0.00
chloride	60	0	0.00	70	0	0.00
copper	129	48	0.37	70	6	0.09
dissolved.oxygen	8	0	0.00	93	0	0.00
iron	137	63	0.46	73	11	0.15
lead	74	10	0.14	40	0	0.00
mercury	0	0	-	5	0	0.00
nitrate	16	0	0.00	18	0	0.00
nitrite	5	0	0.00	0	0	-
nitrogen	270	1	0.00	147	3	0.02
ph	634	3	0.00	396	0	0.00
phosphorus	471	23	0.05	246	10	0.04
uranium	66	0	0.00	68	0	0.00
TOTAL	2217	290	0.13	1489	144	0.10

FIGURE. ANALYSIS OF VARIANCE IN EXCEEDANCE OF WATER QUALITY THRESHOLDS OVER TIME FOR MONITORING STATIONS IN THE CHURCHILL BASIN, SUB-WATERSHED AND BY PARAMETER IN THE PROVINCE OF ALBERTA.





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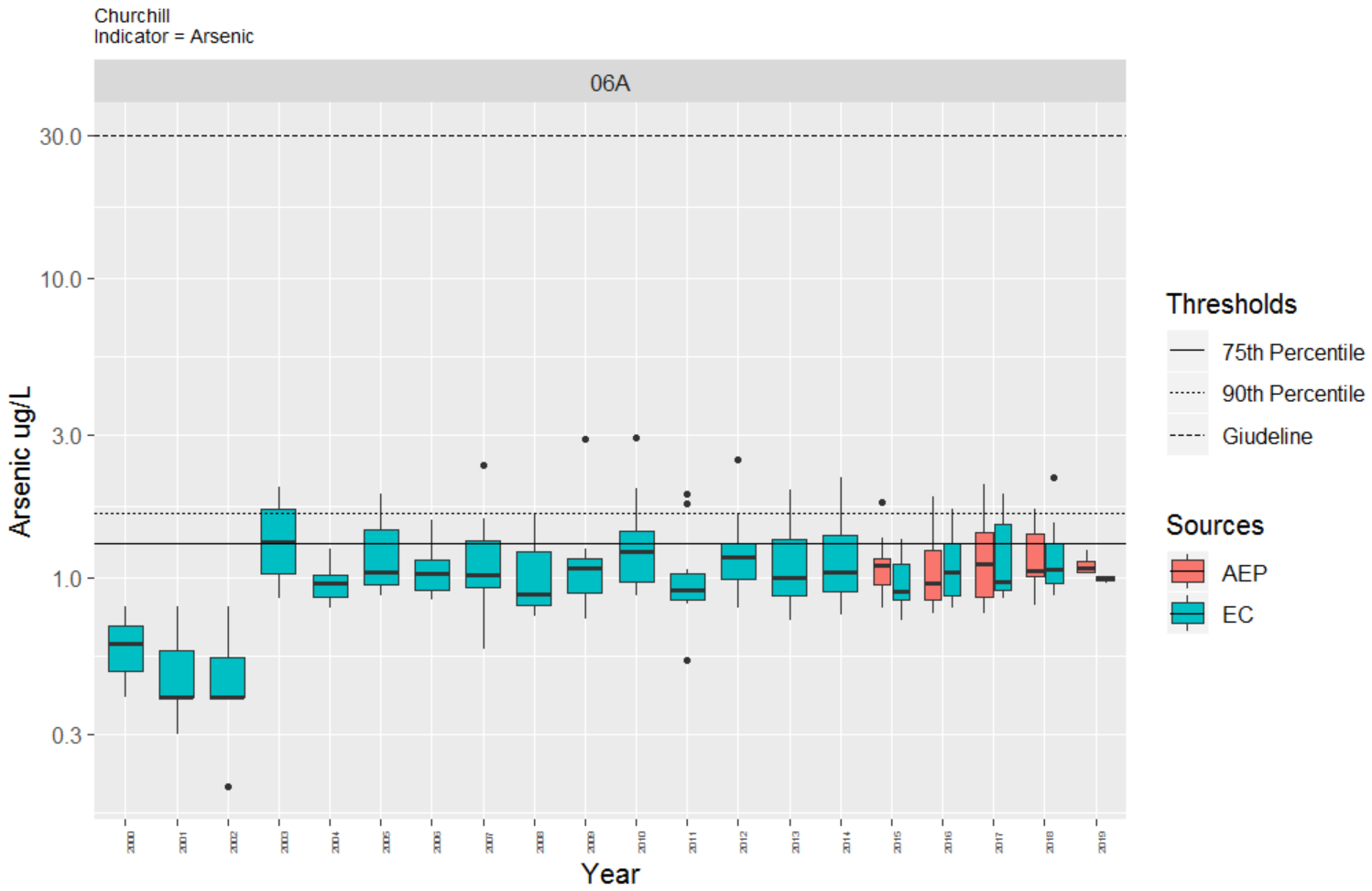

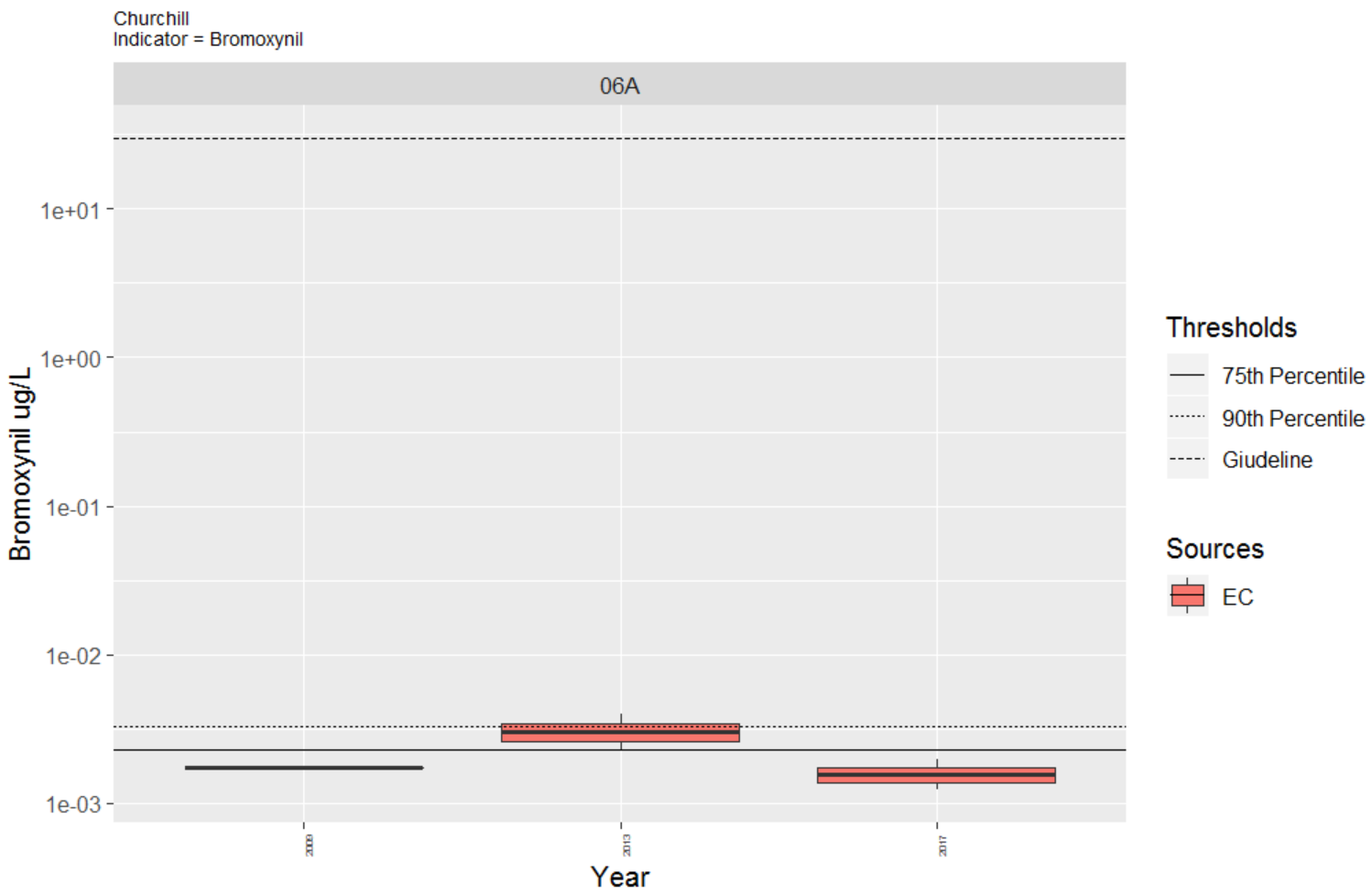

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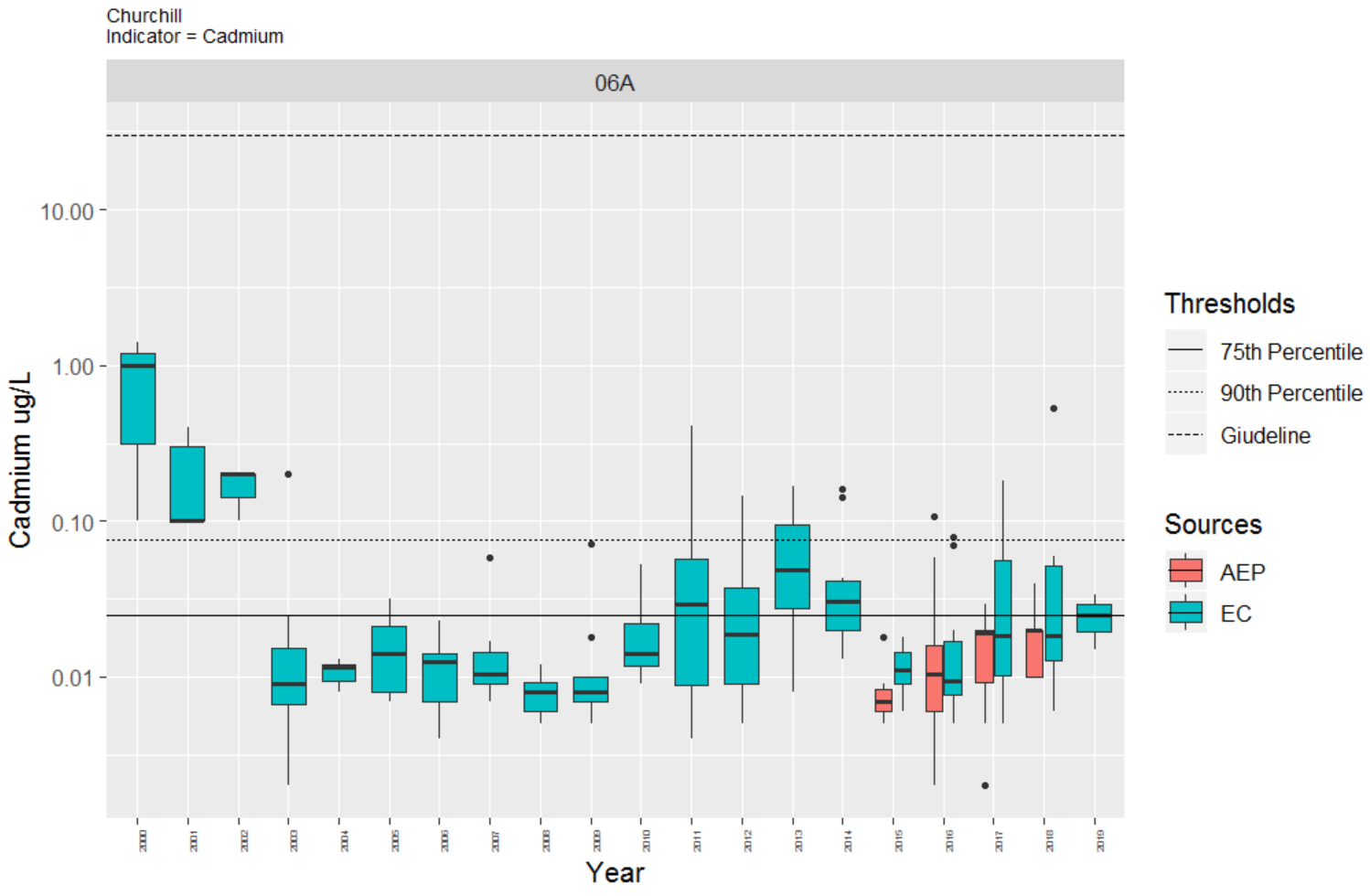

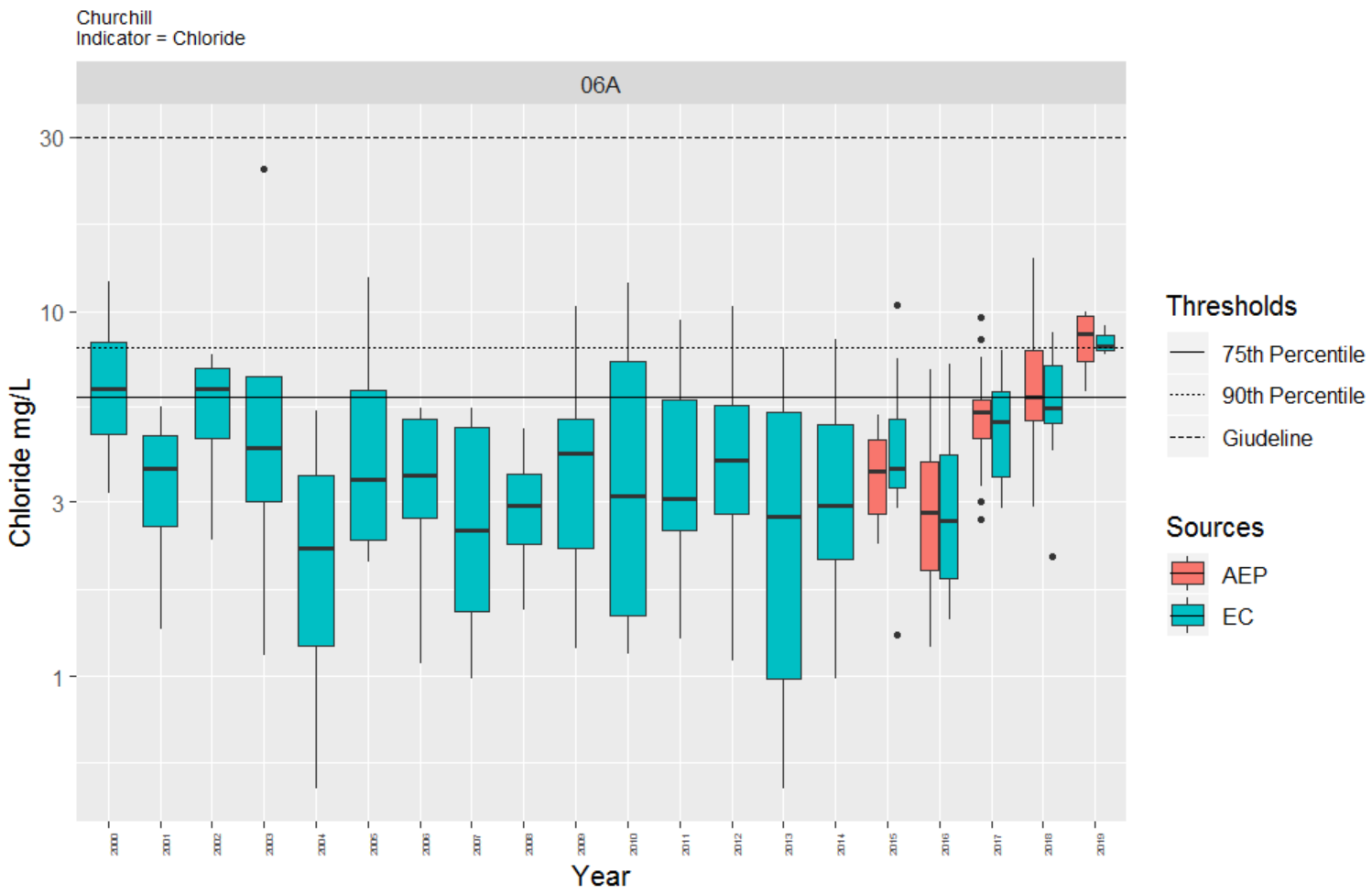

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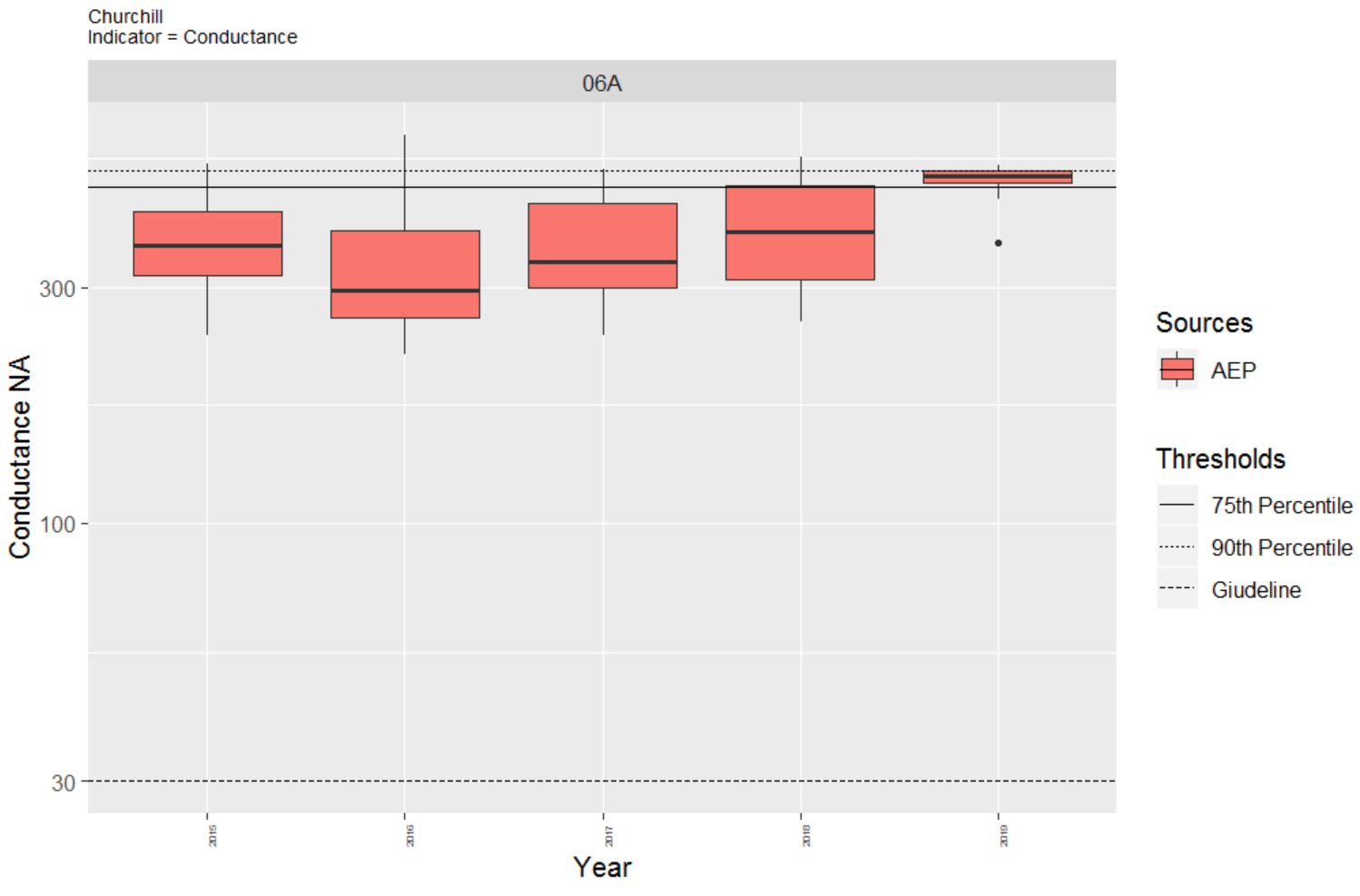

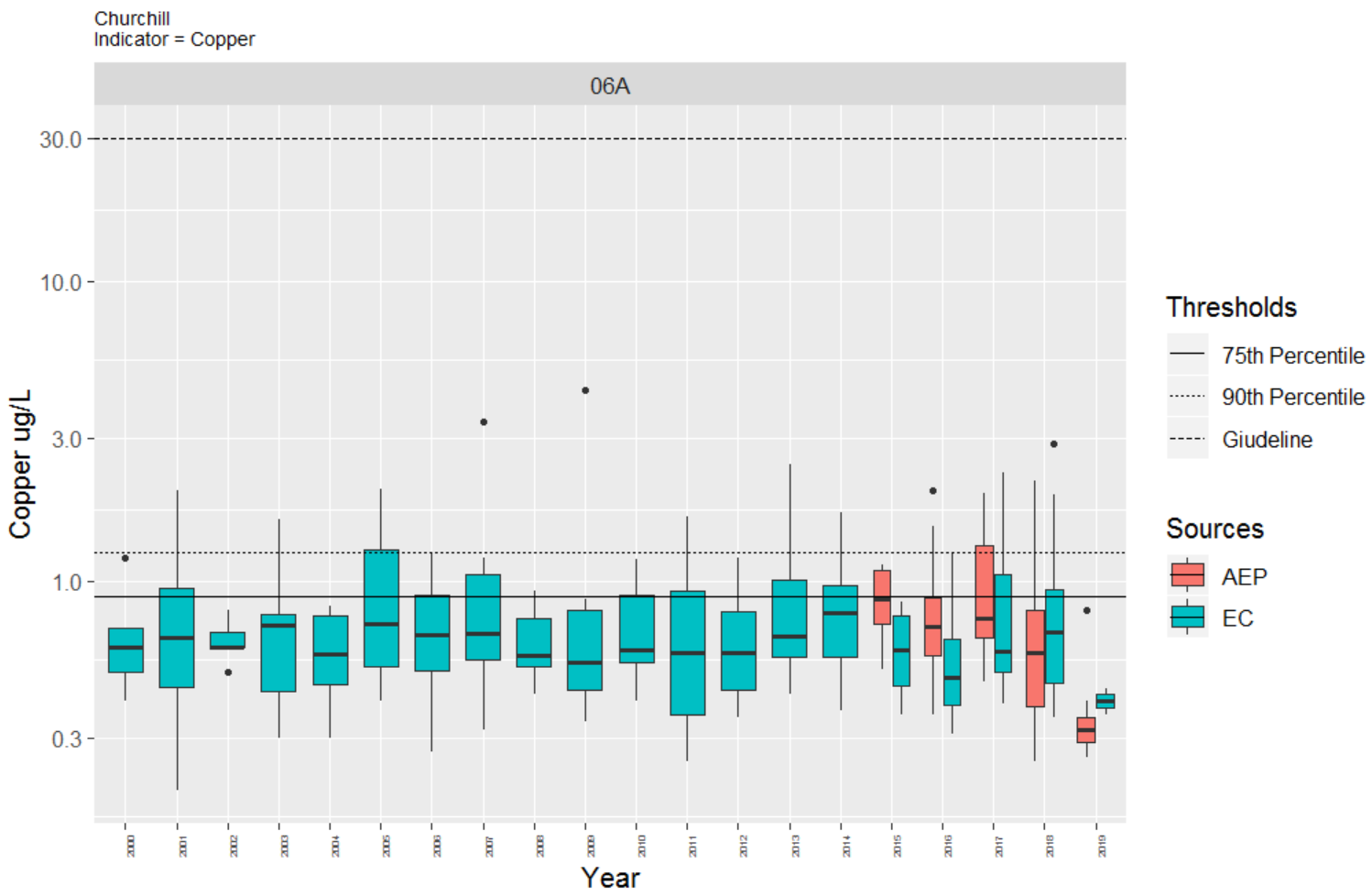

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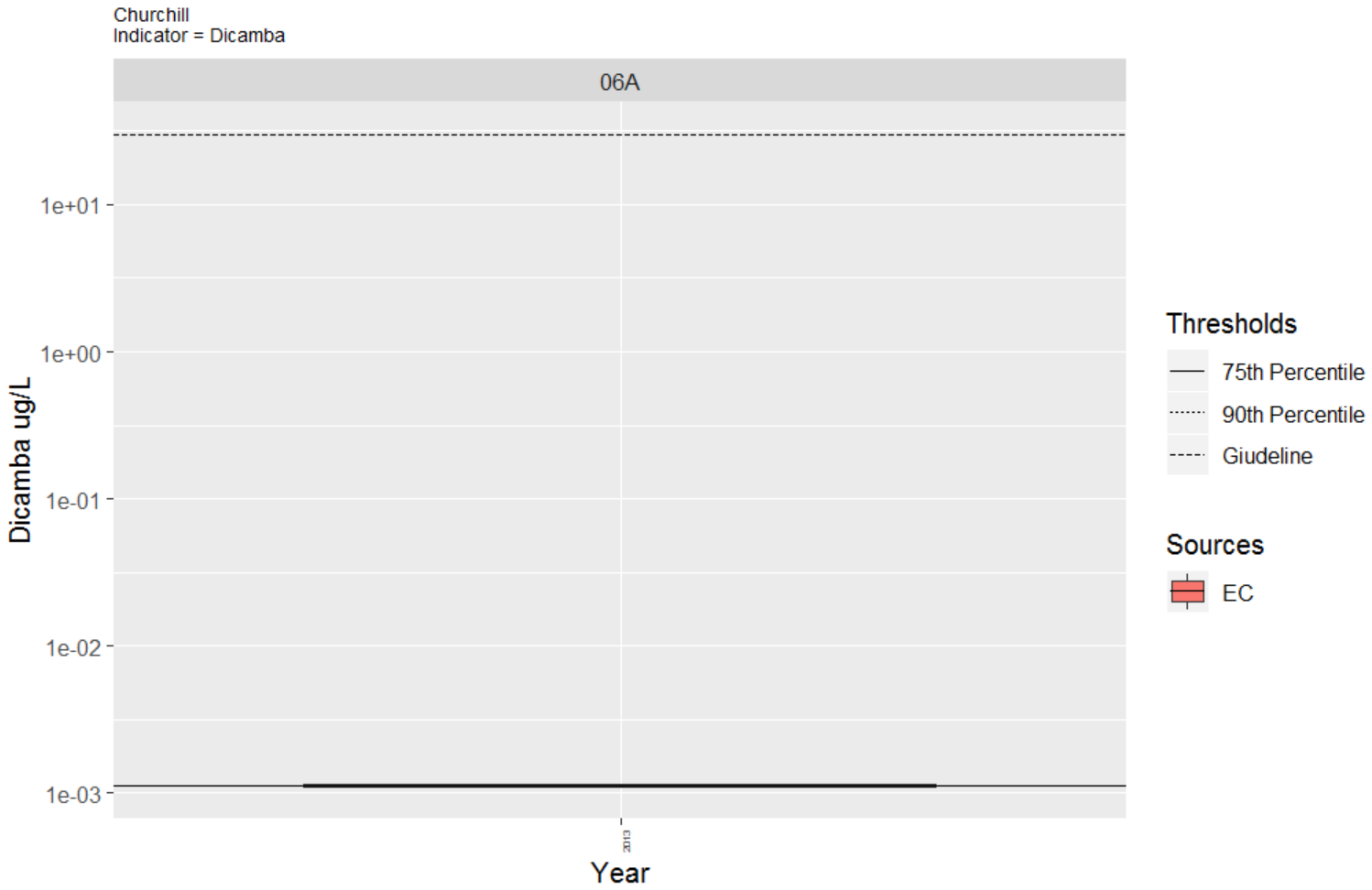

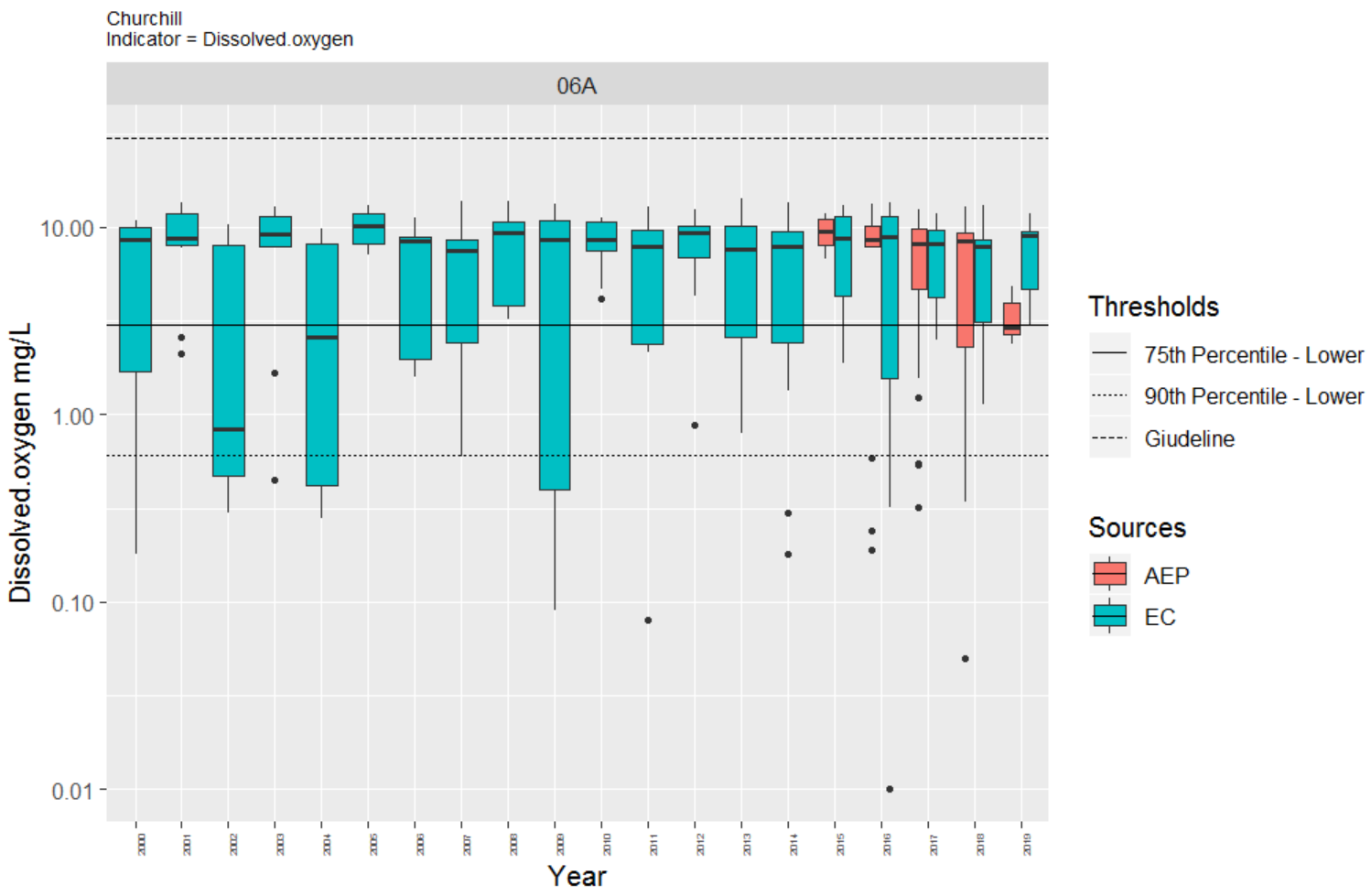

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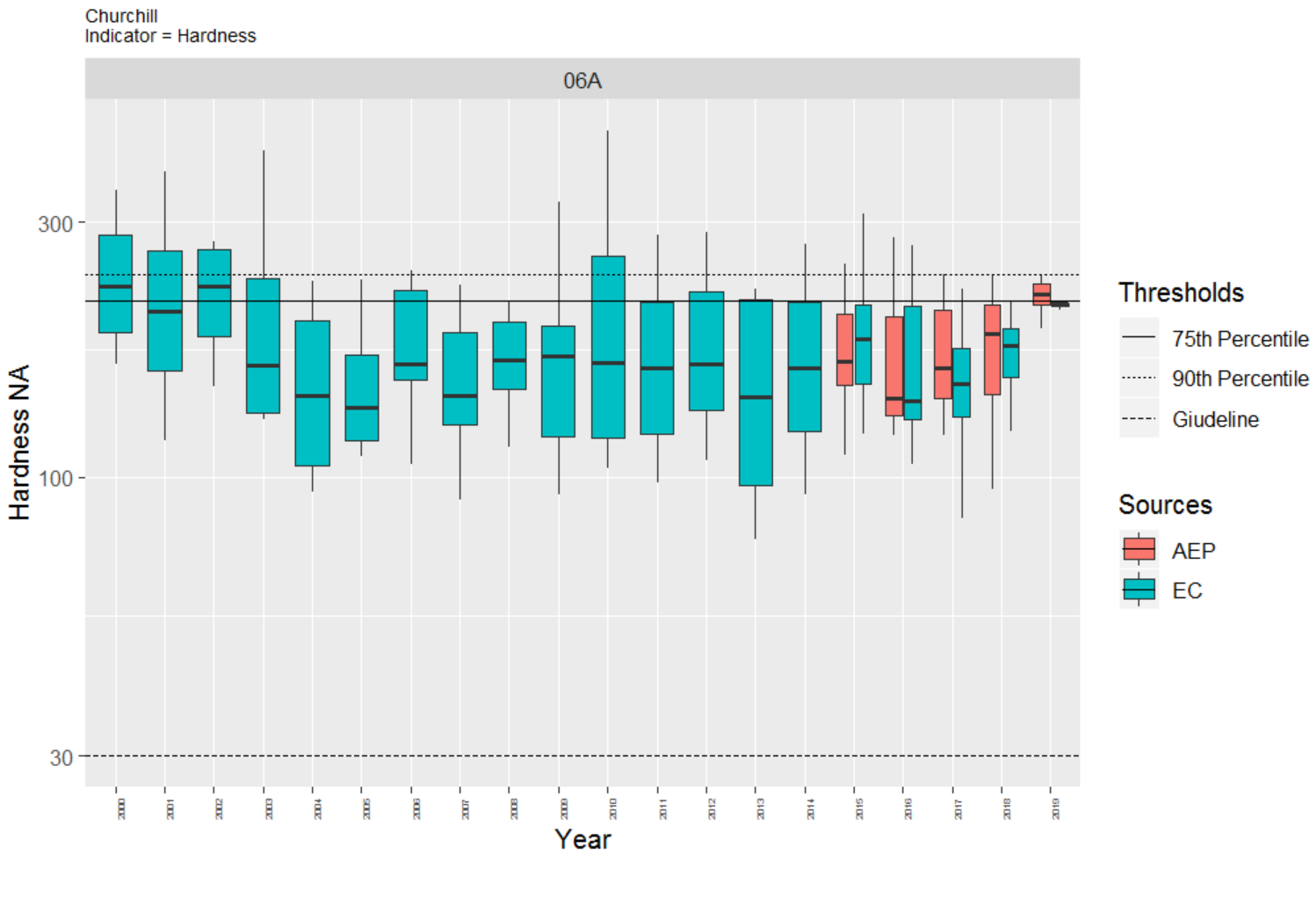

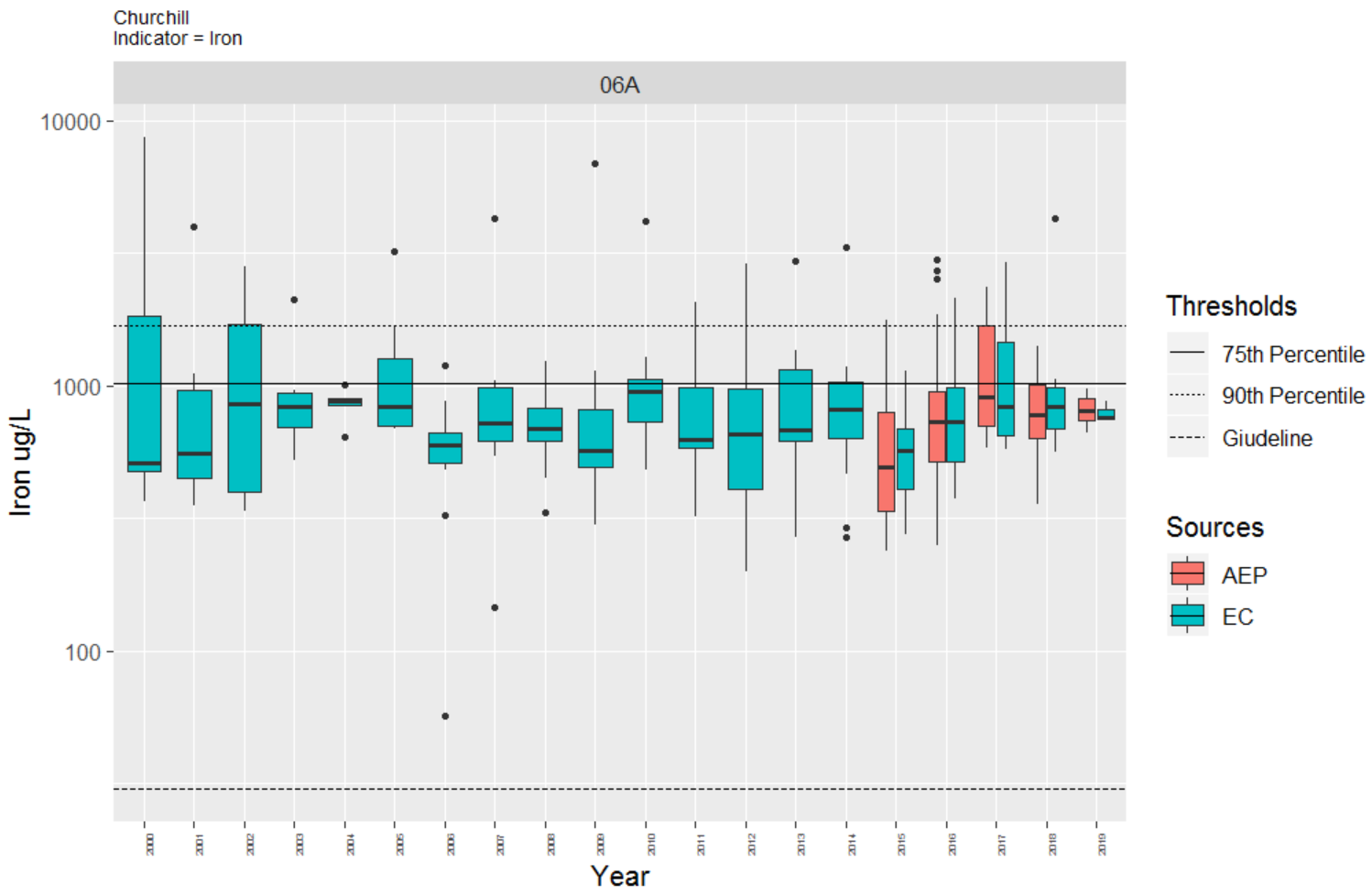

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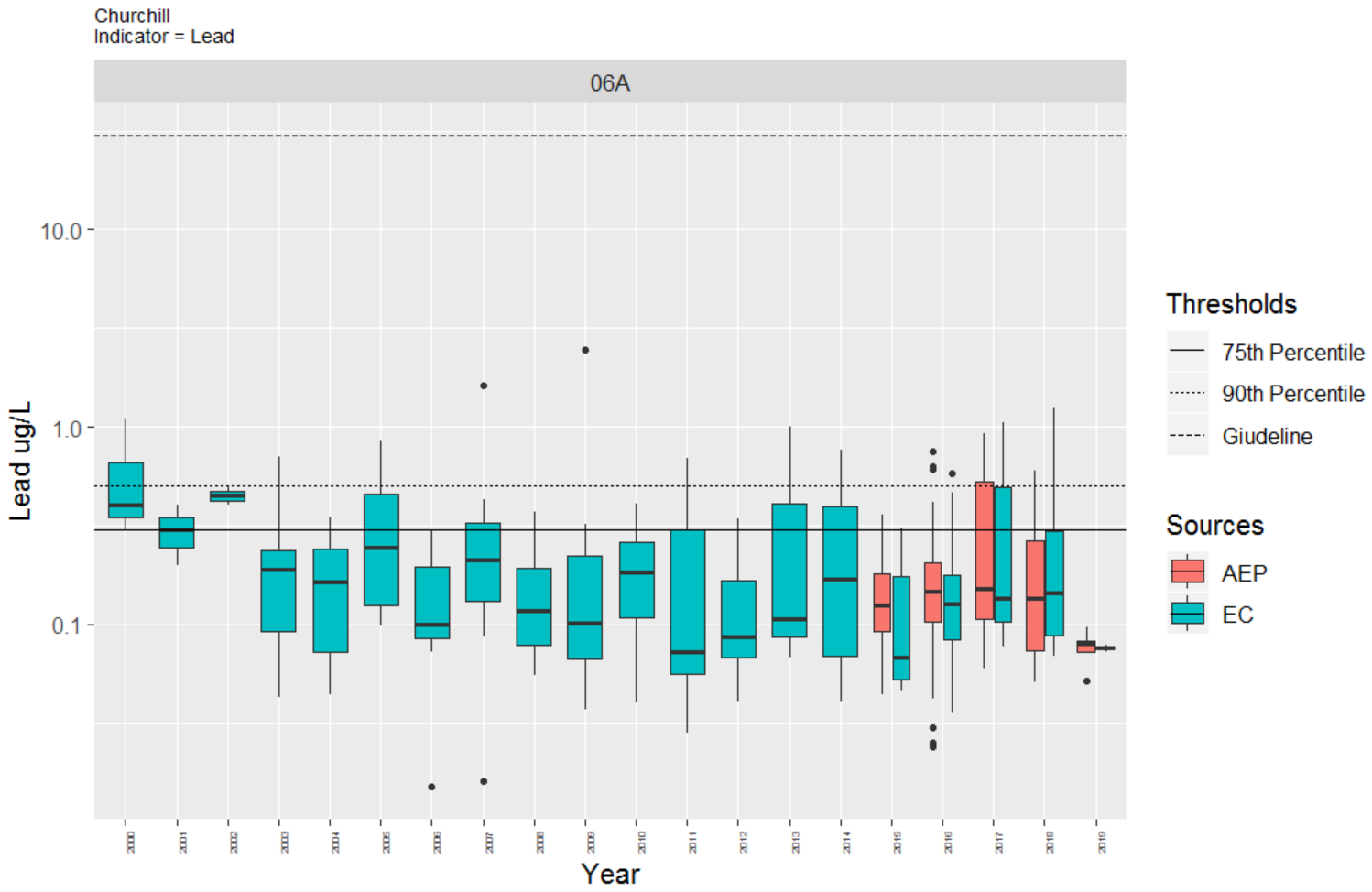

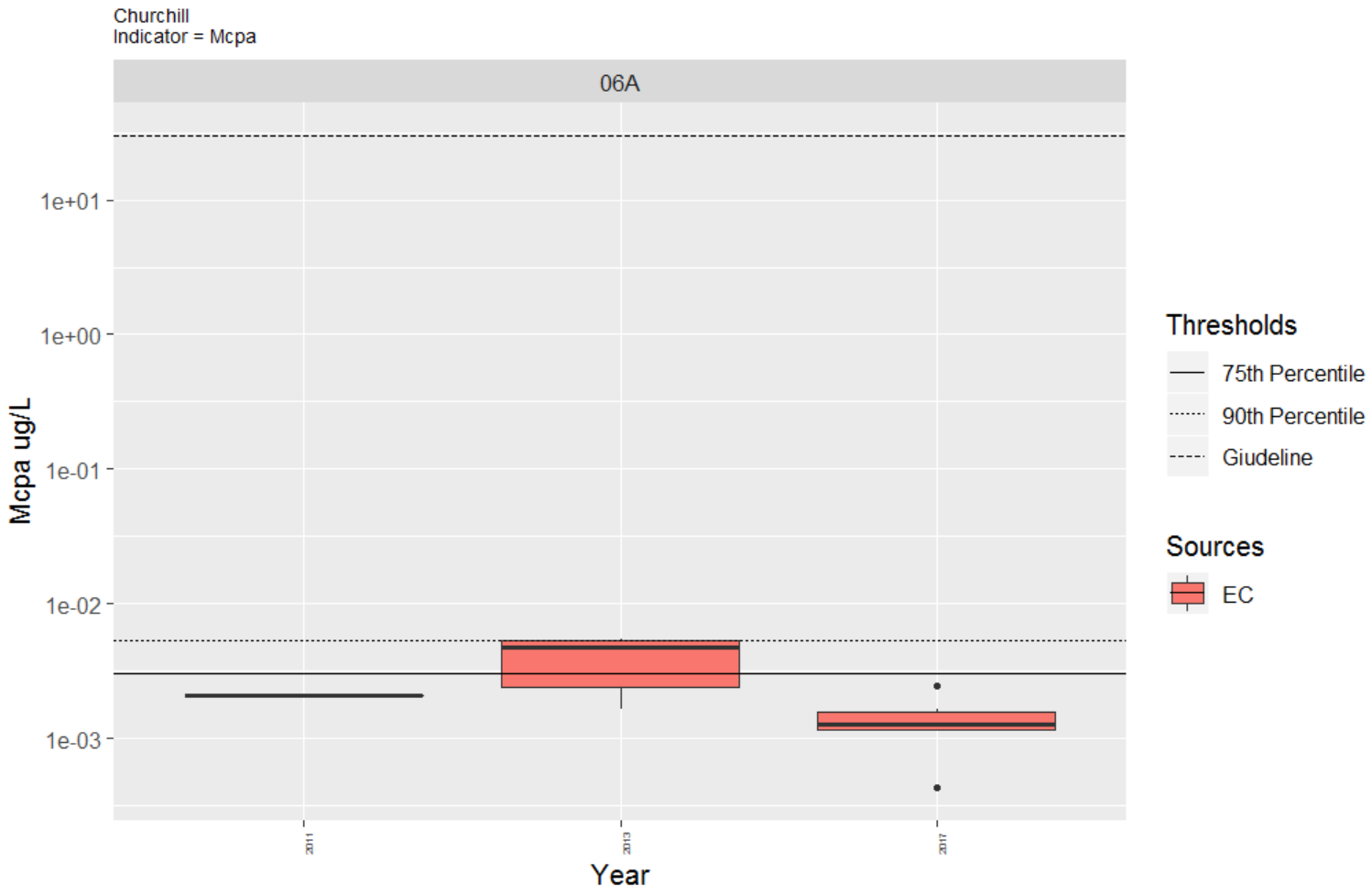

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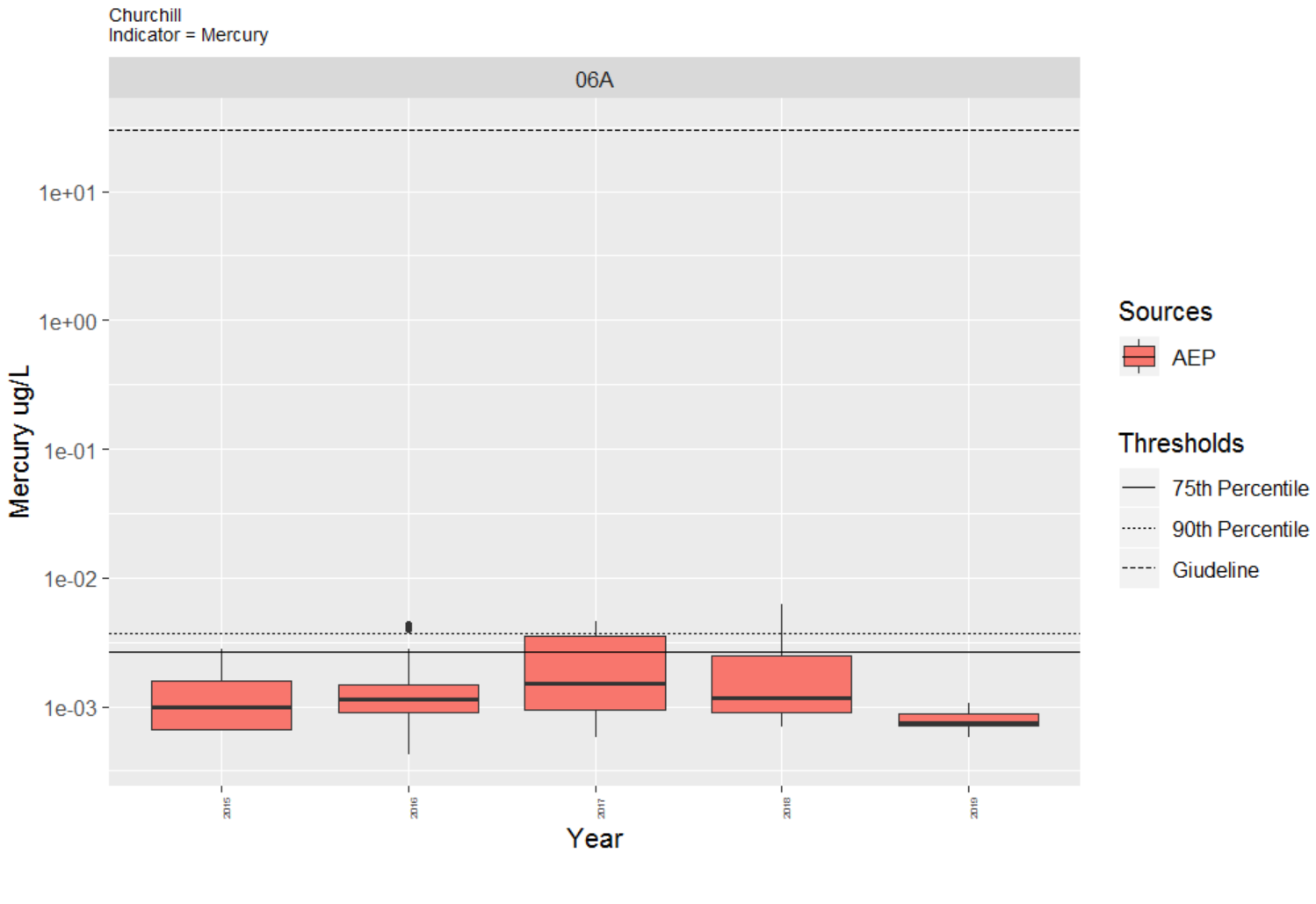

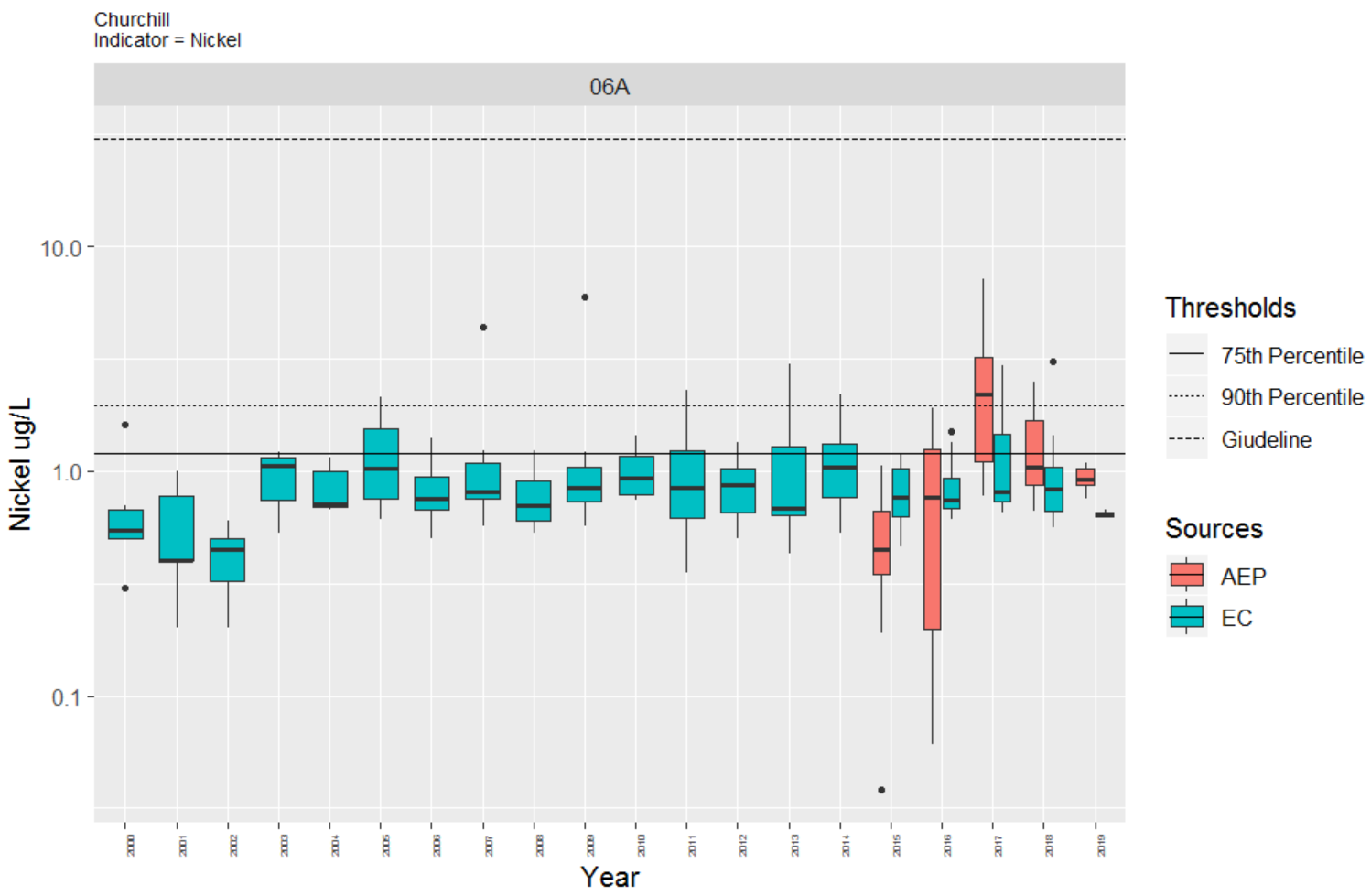

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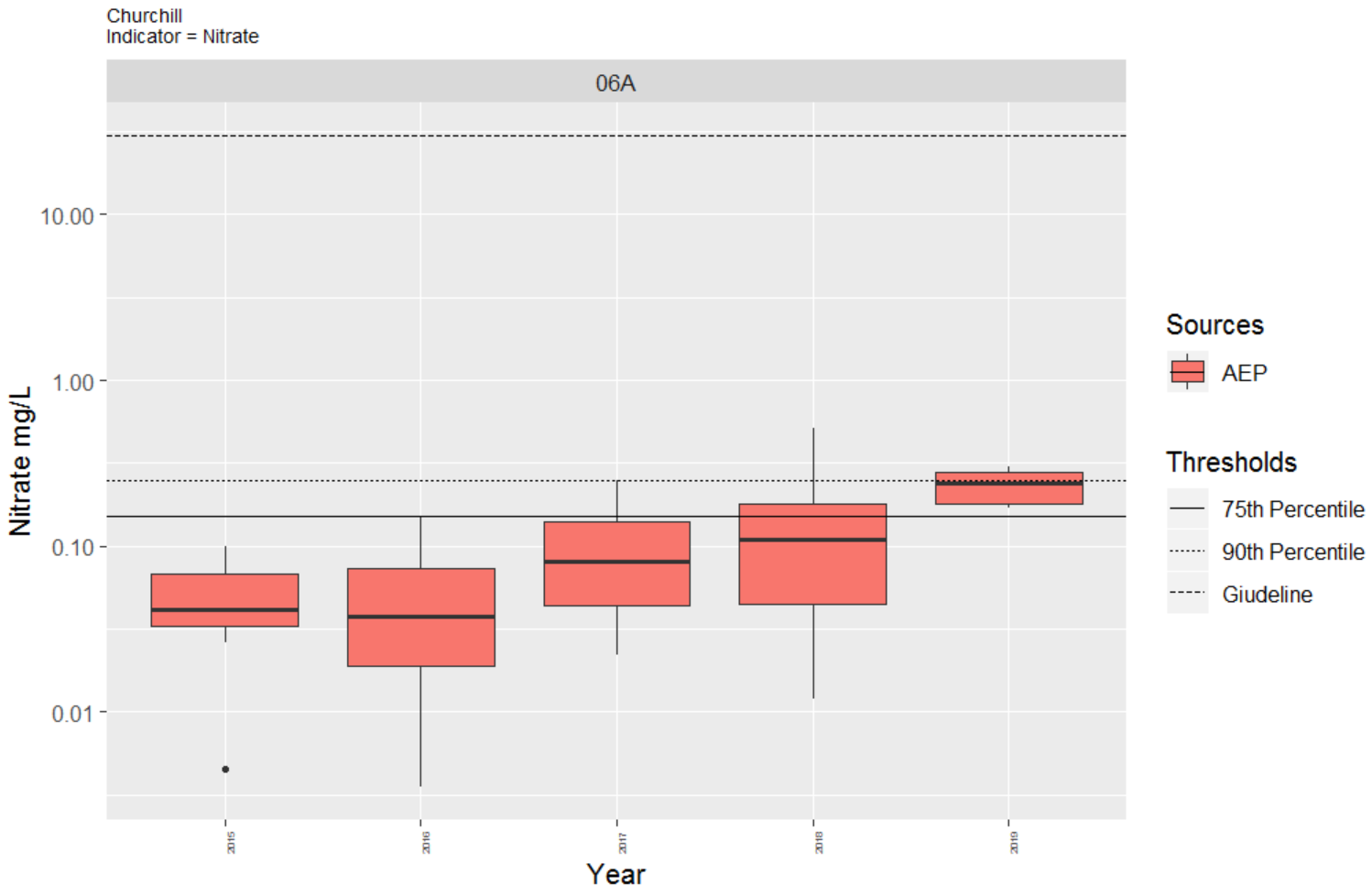

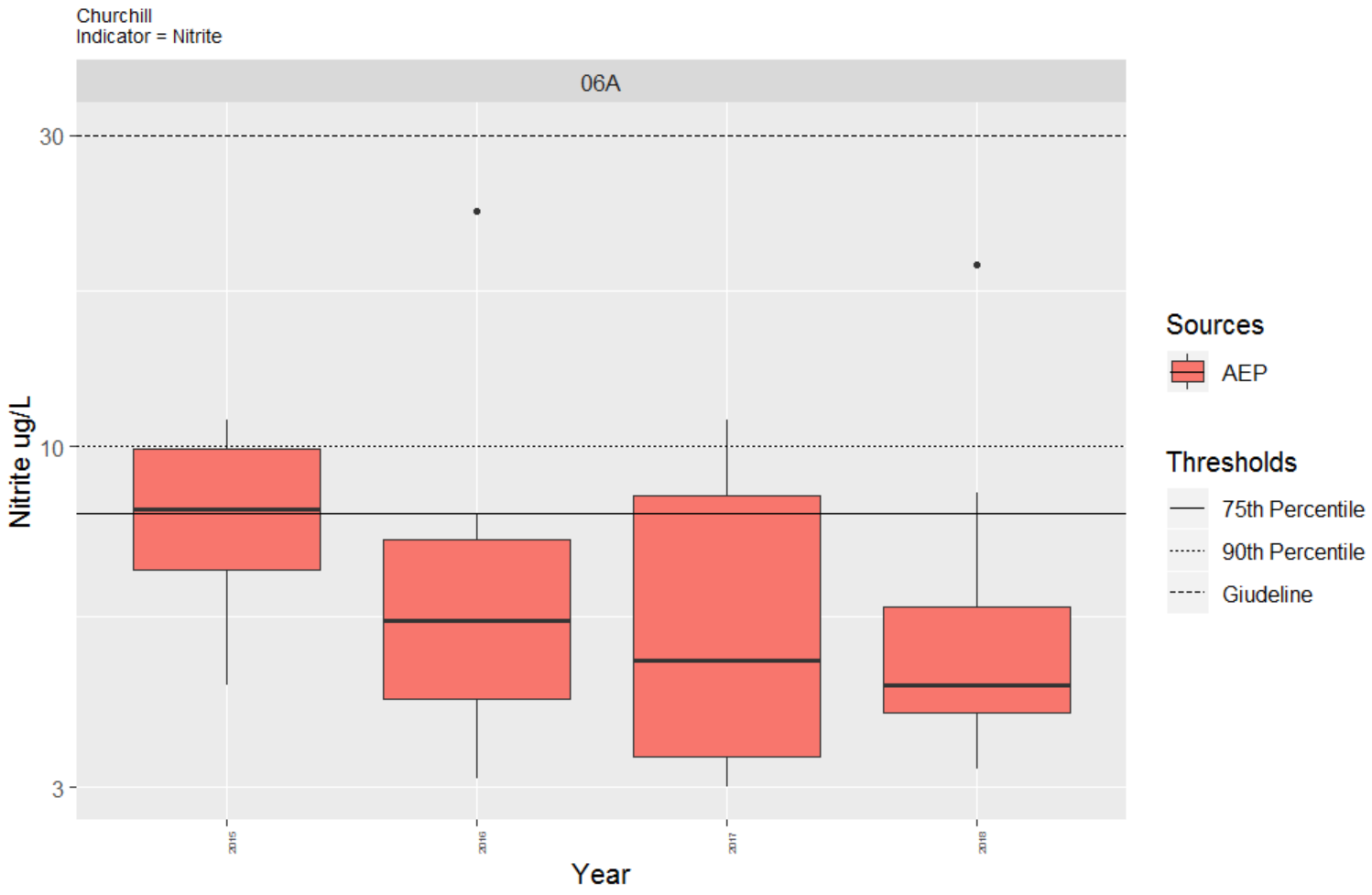

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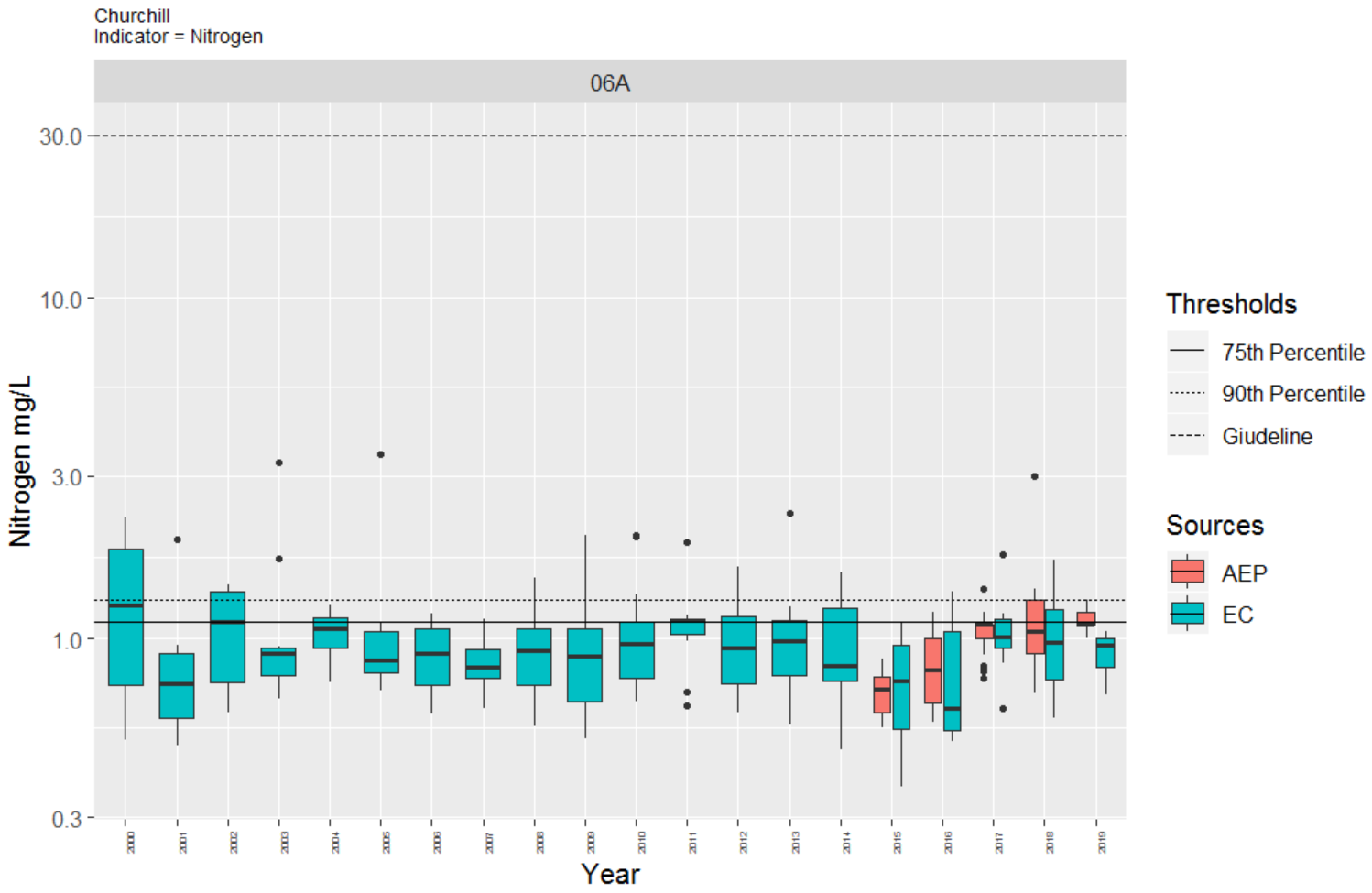

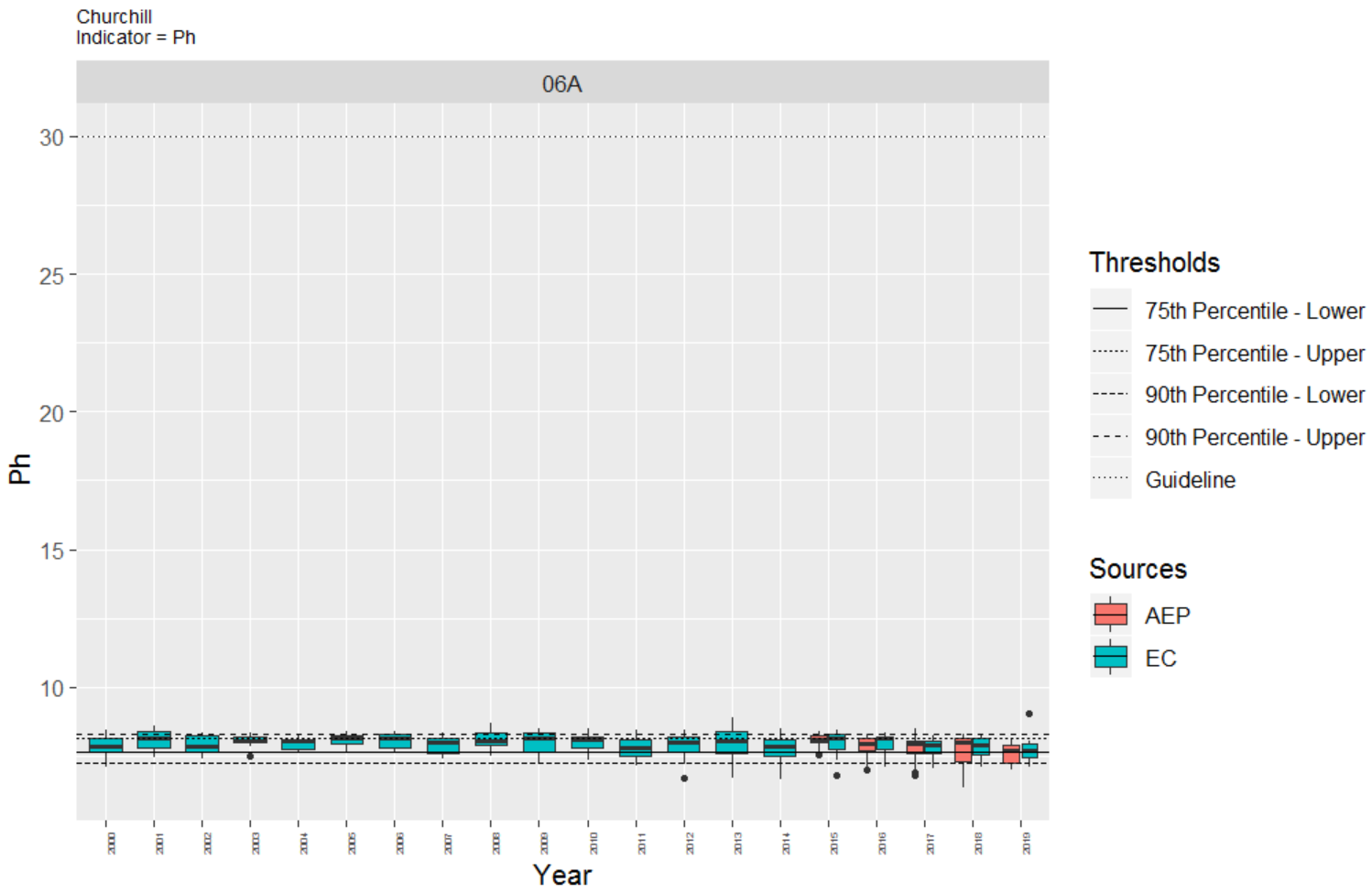

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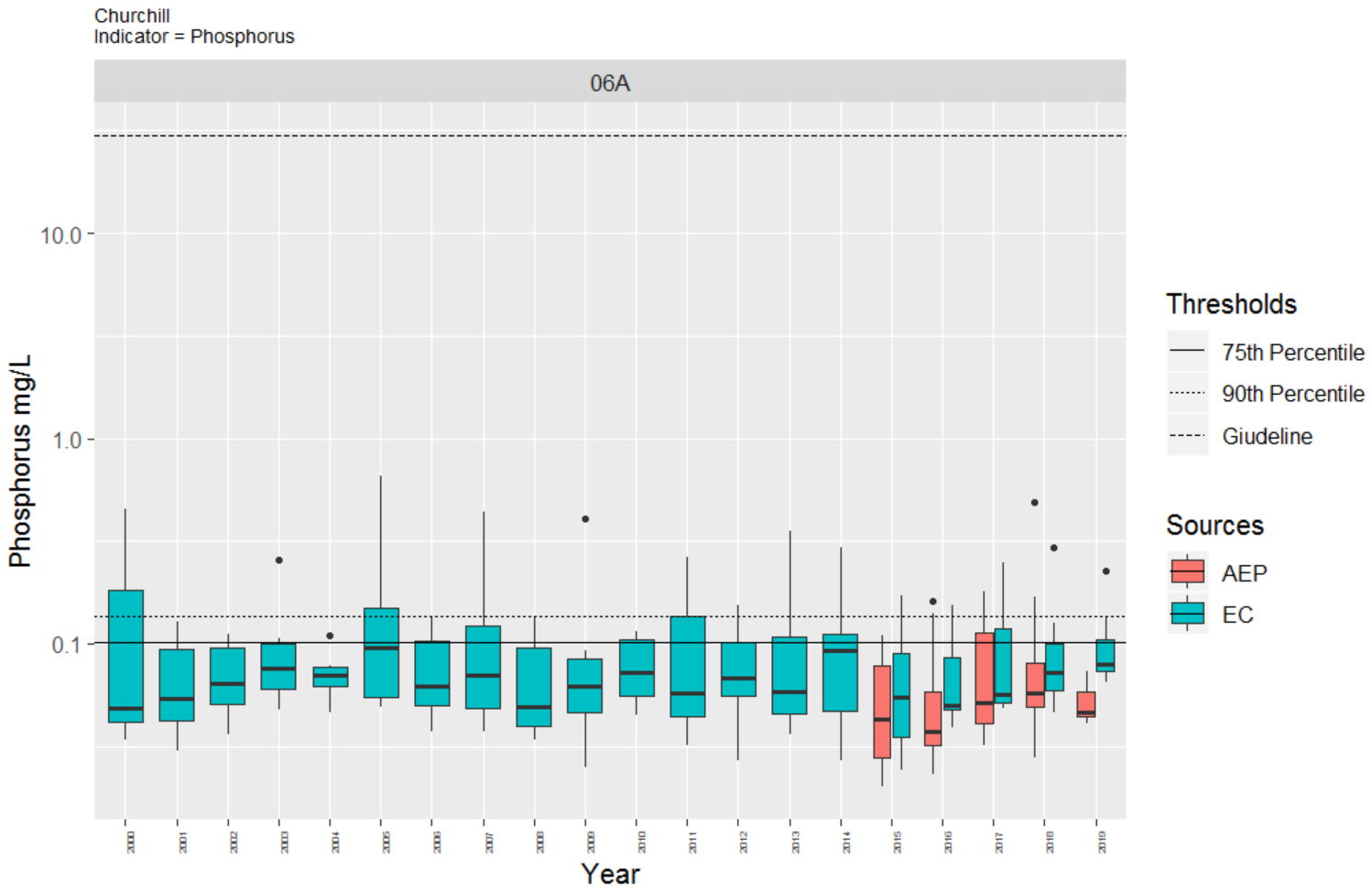

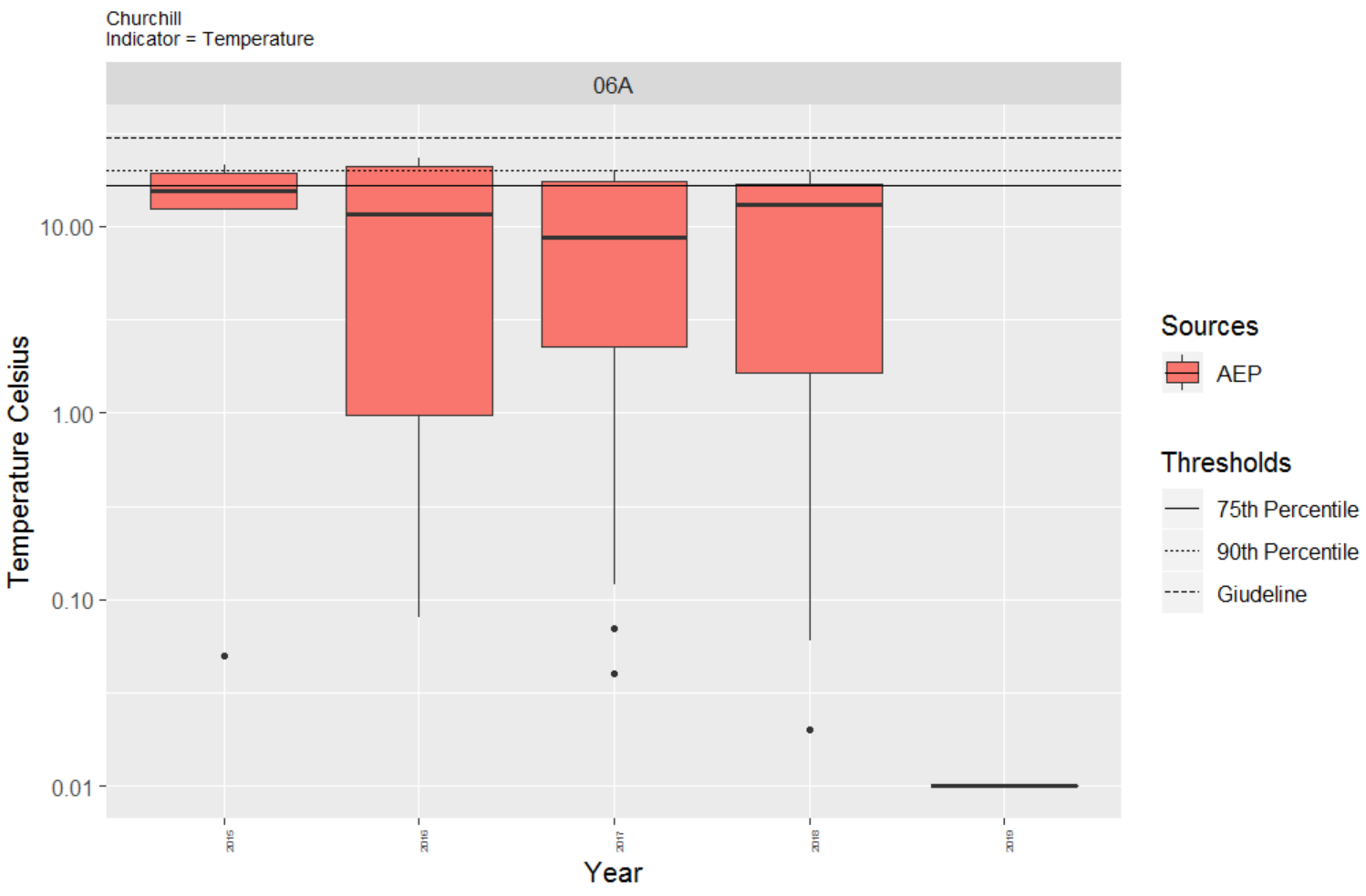

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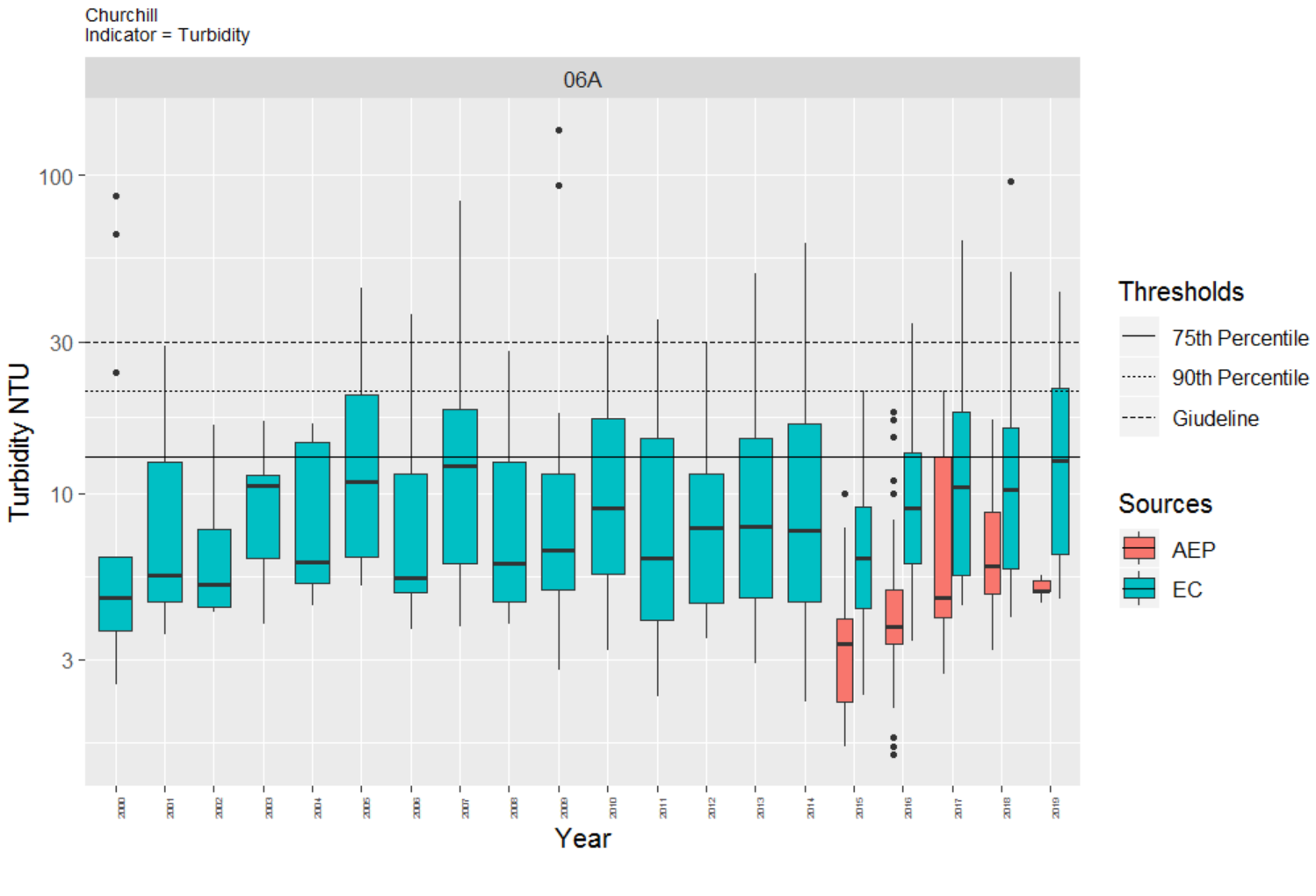

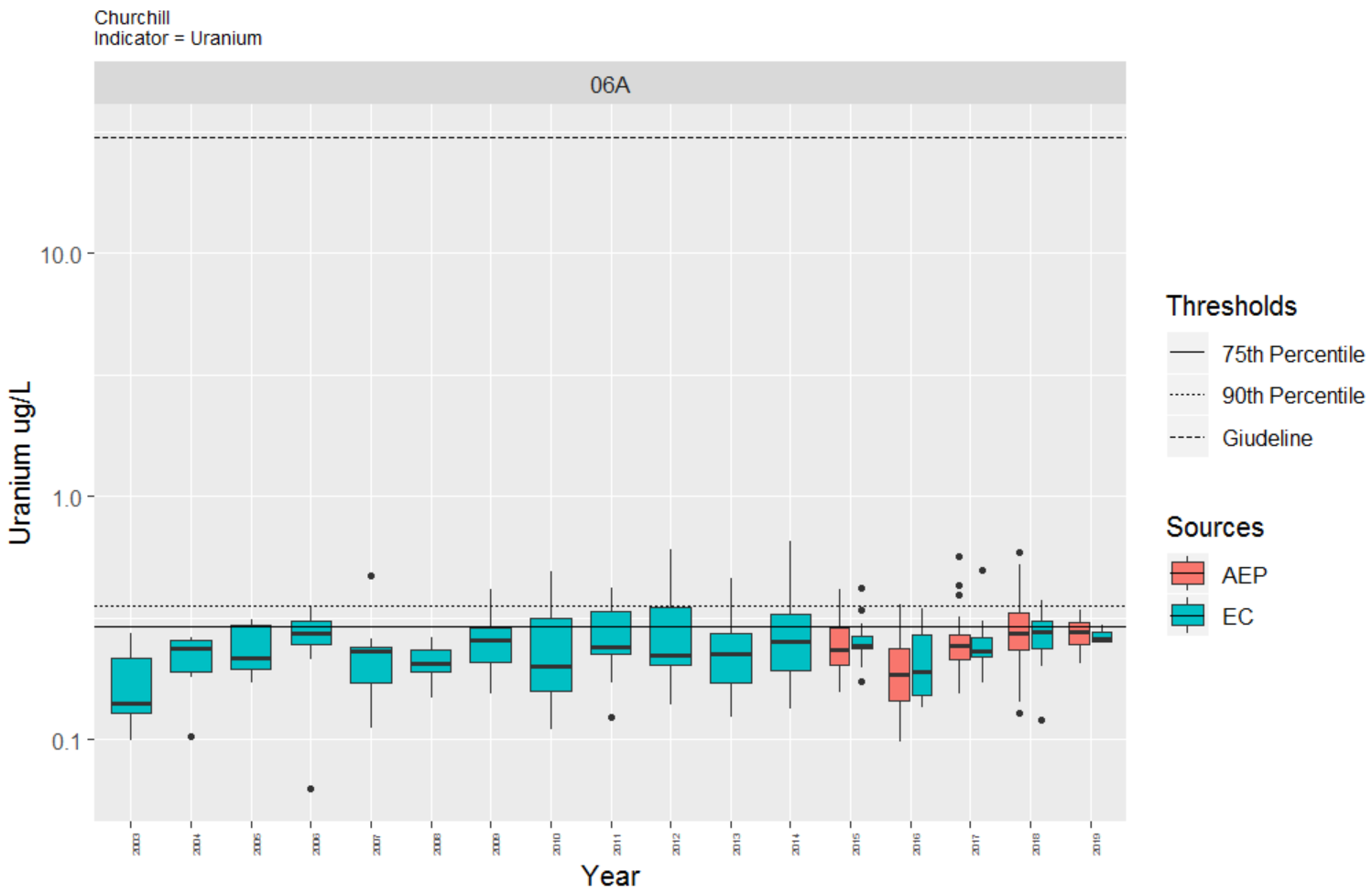

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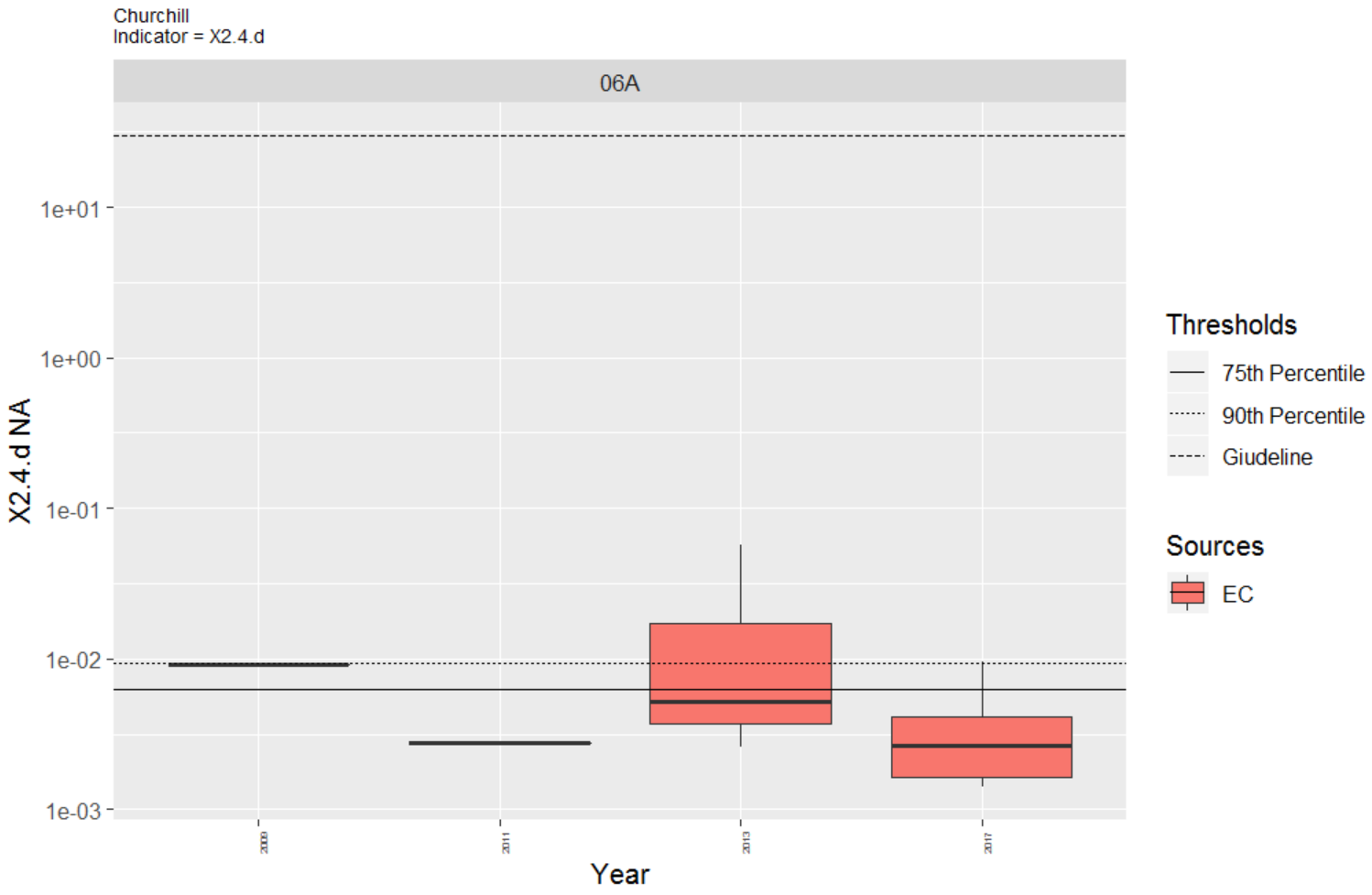

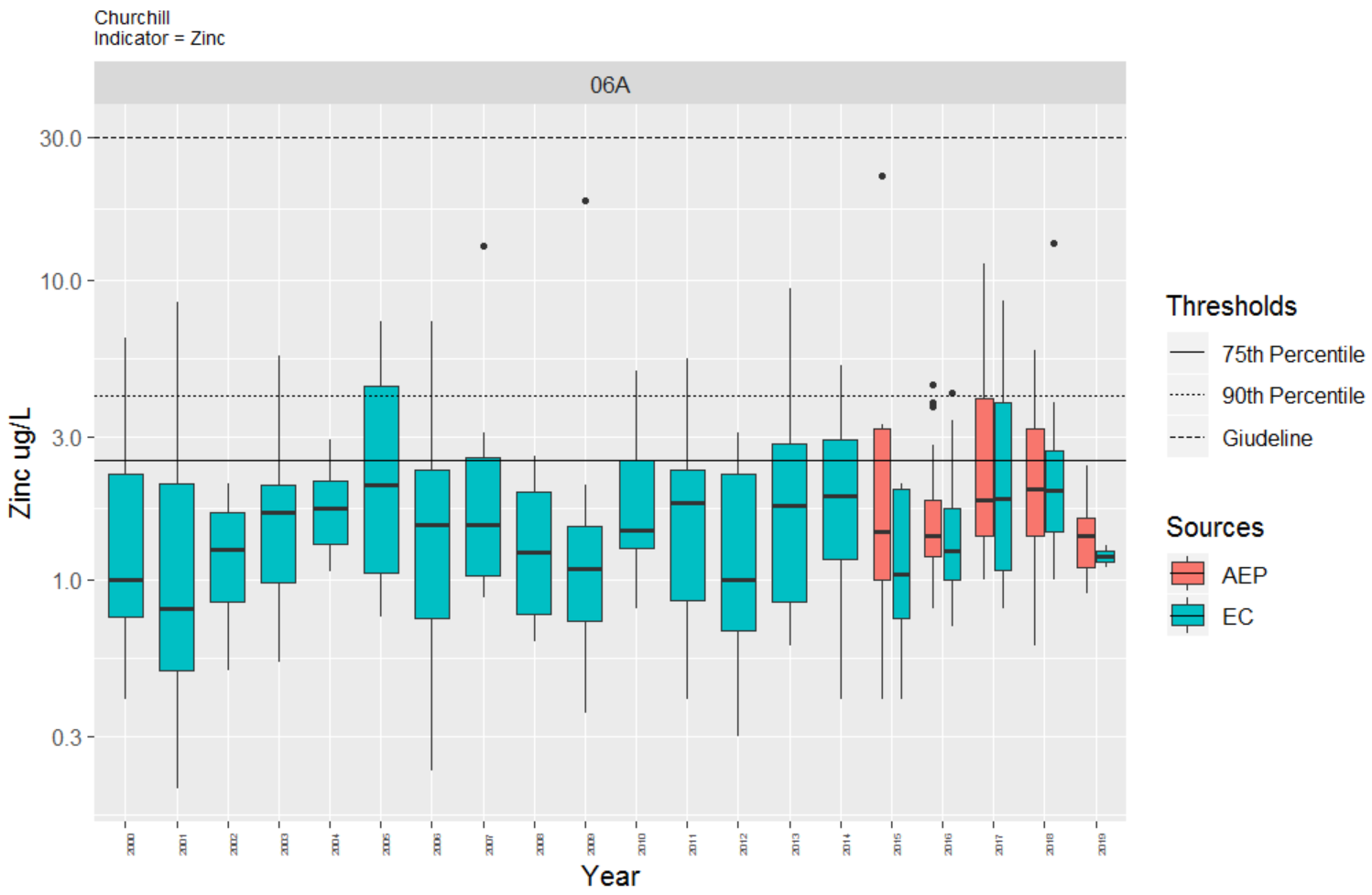

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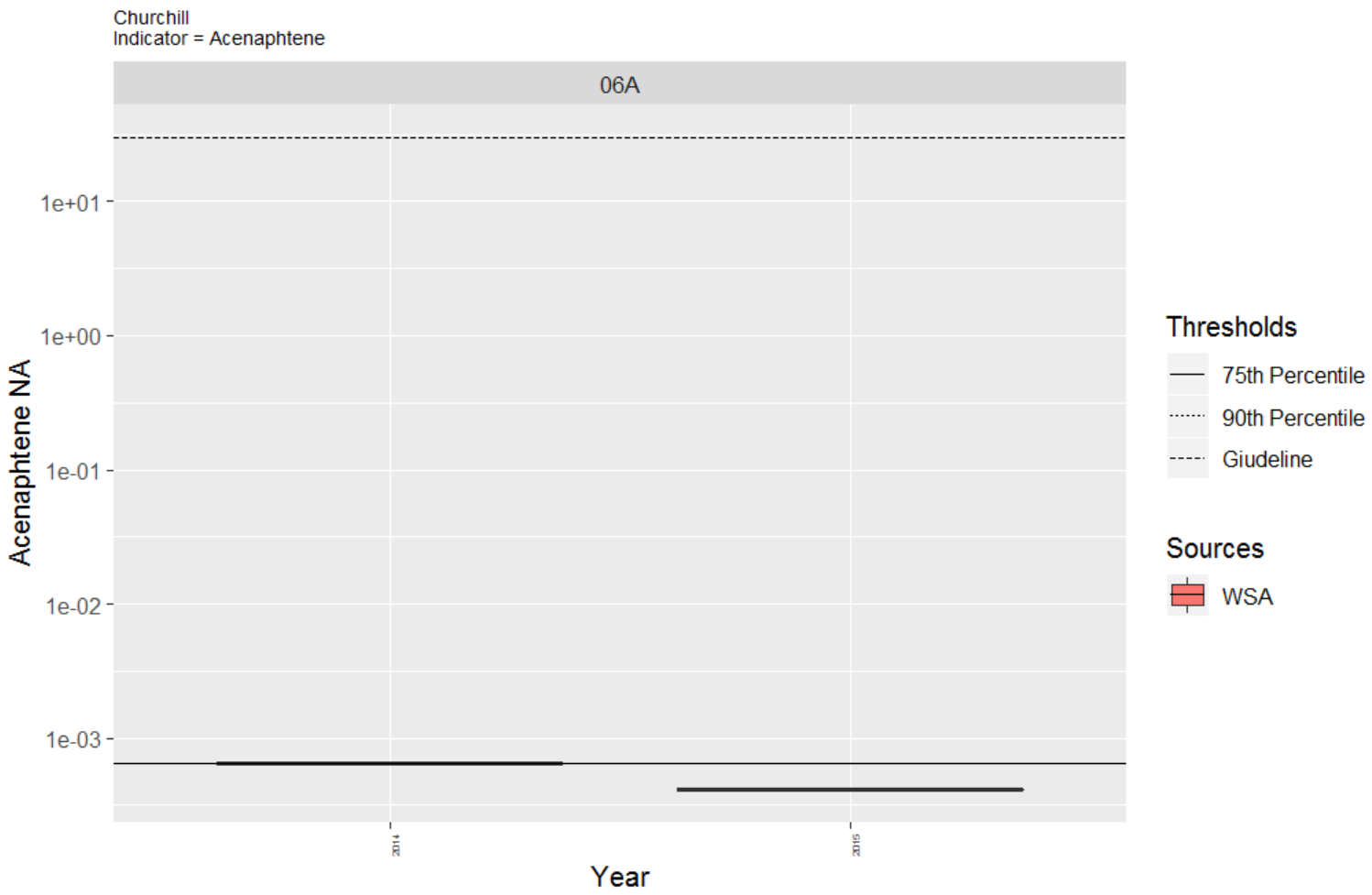
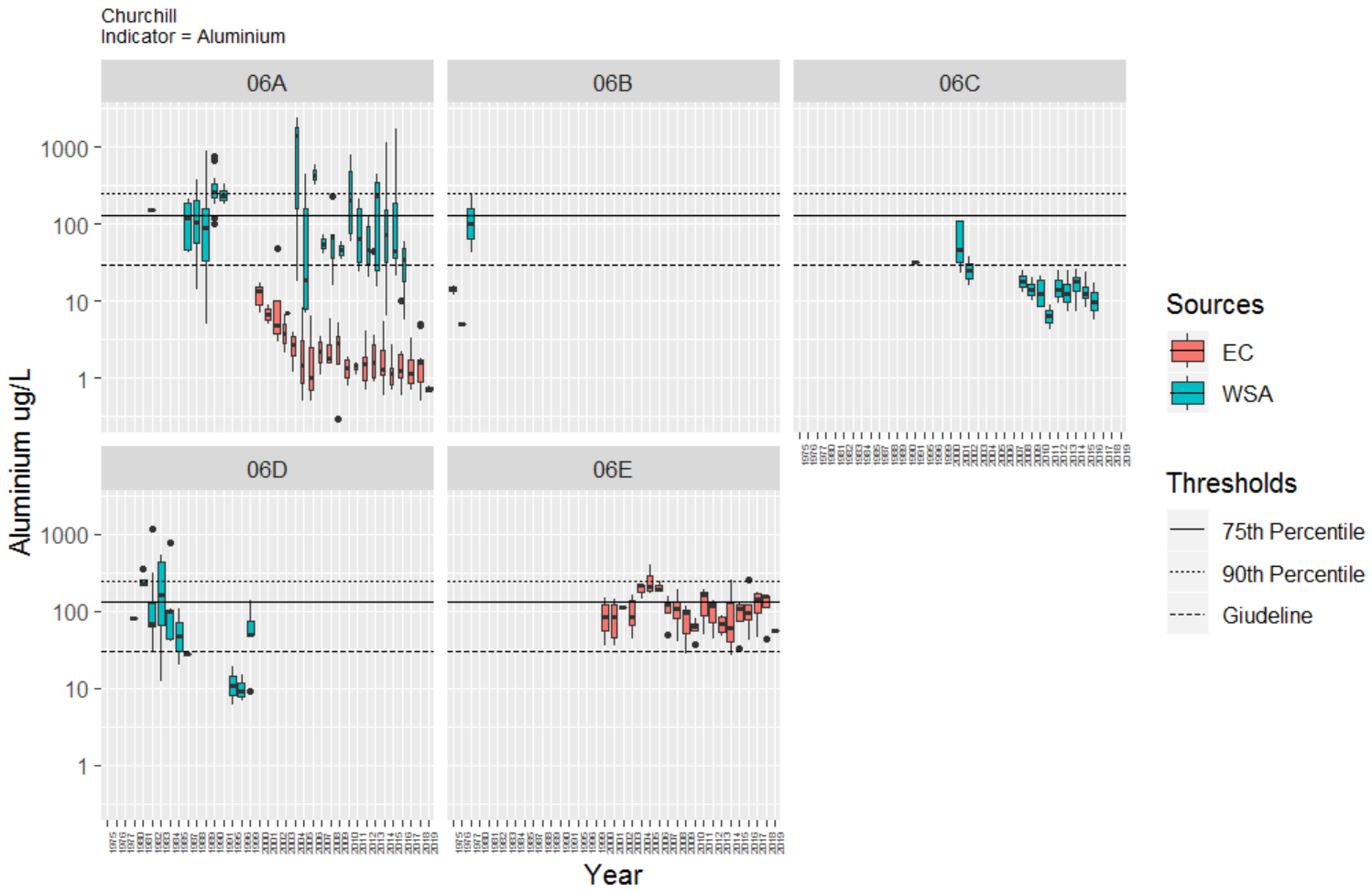
FIGURE. ANALYSIS OF VARIANCE IN EXCEEDANCE OF WATER QUALITY THRESHOLDS OVER TIME FOR MONITORING STATIONS IN THE CHURCHILL BASIN, SUB-WATERSHED AND BY PARAMETER IN THE PROVINCE OF SASKATCHEWAN.





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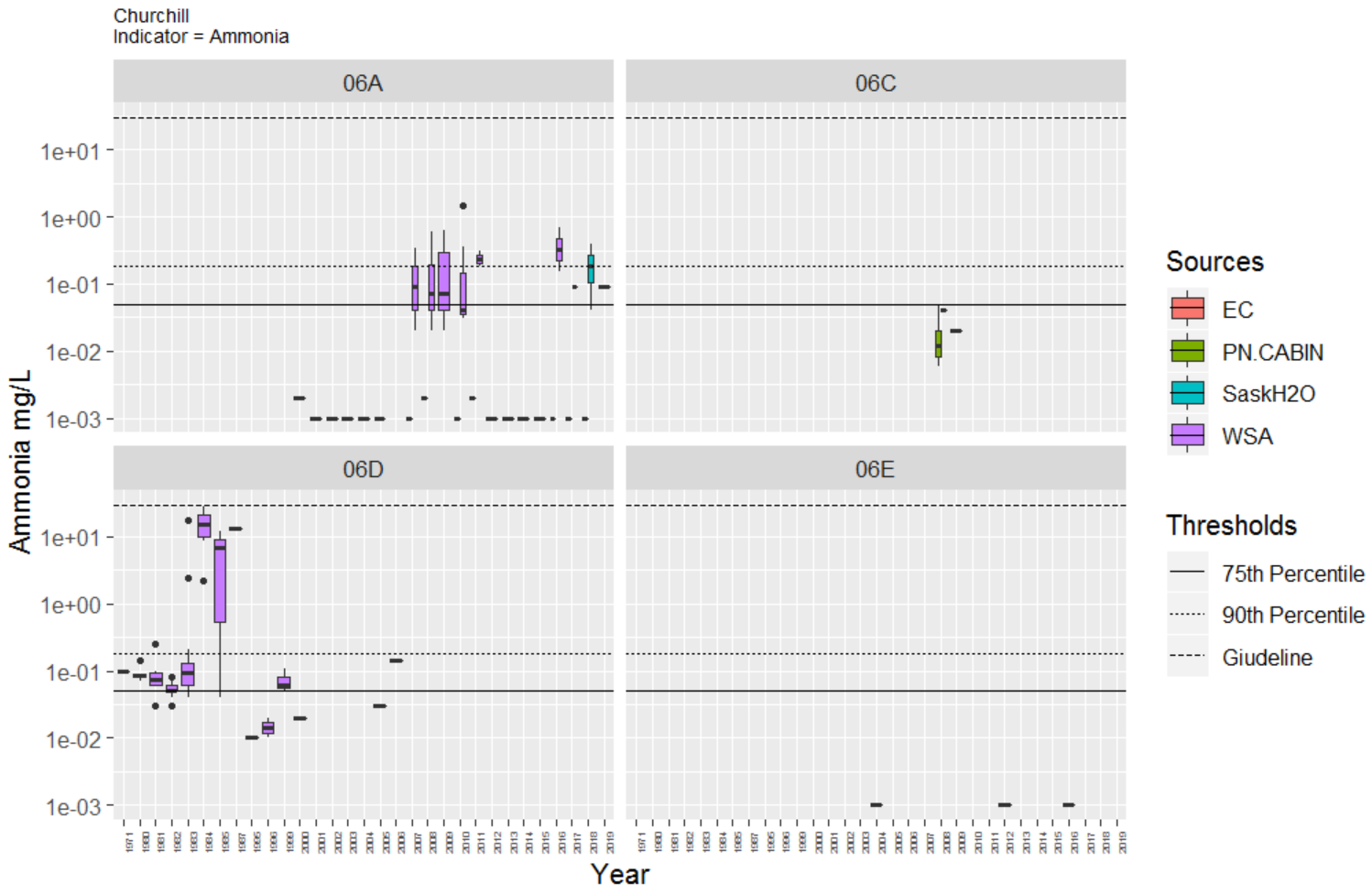

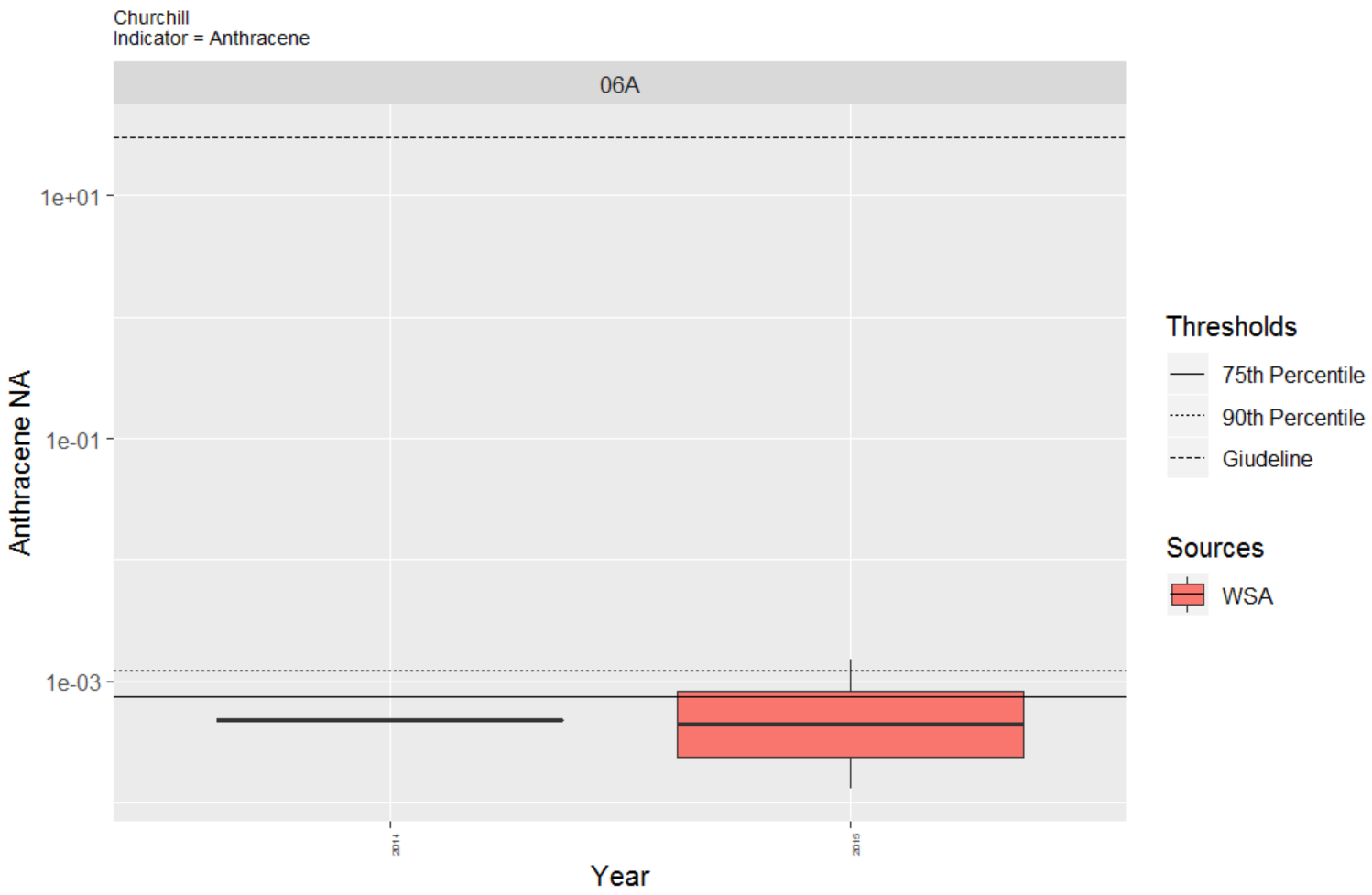

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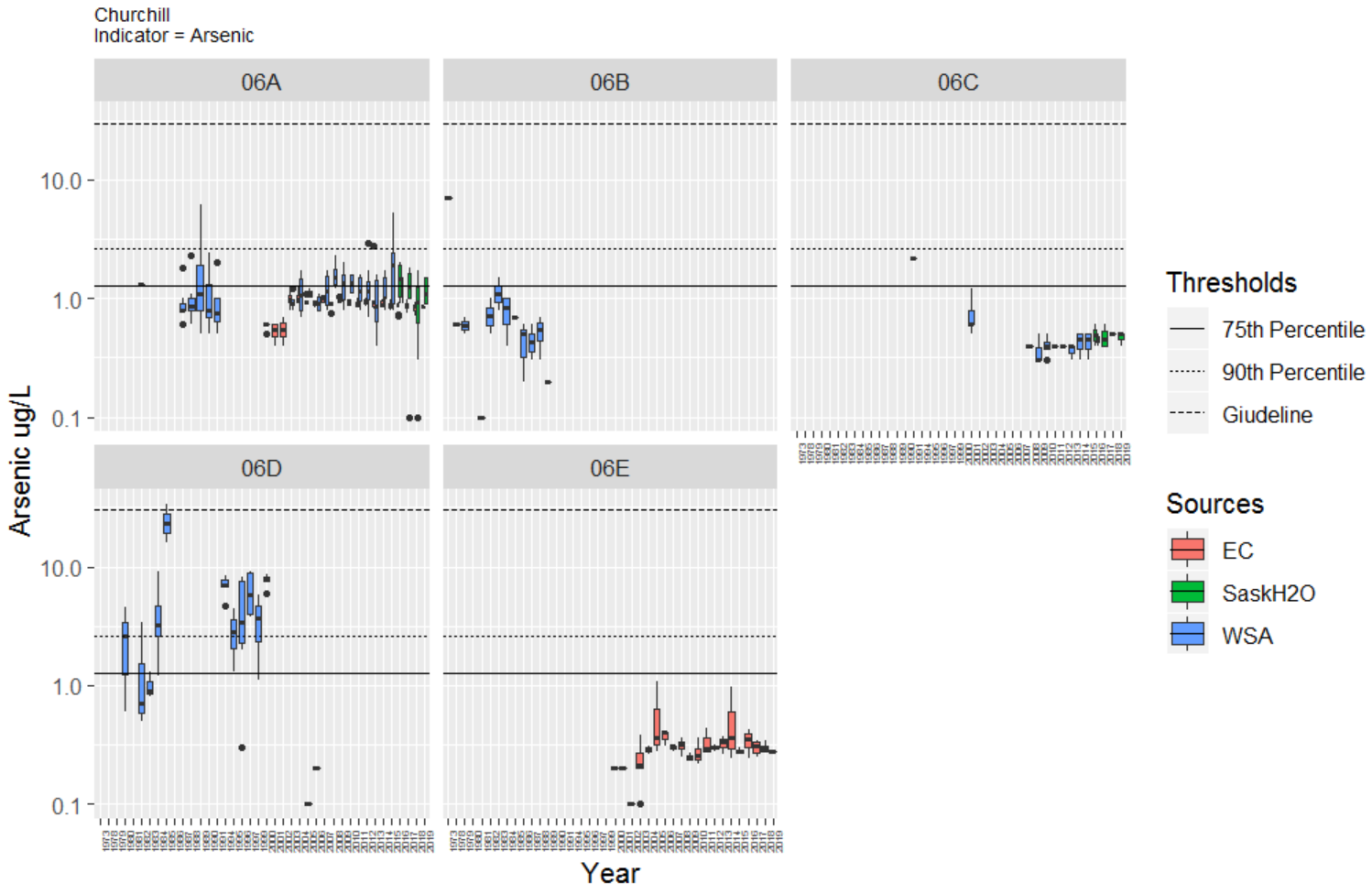

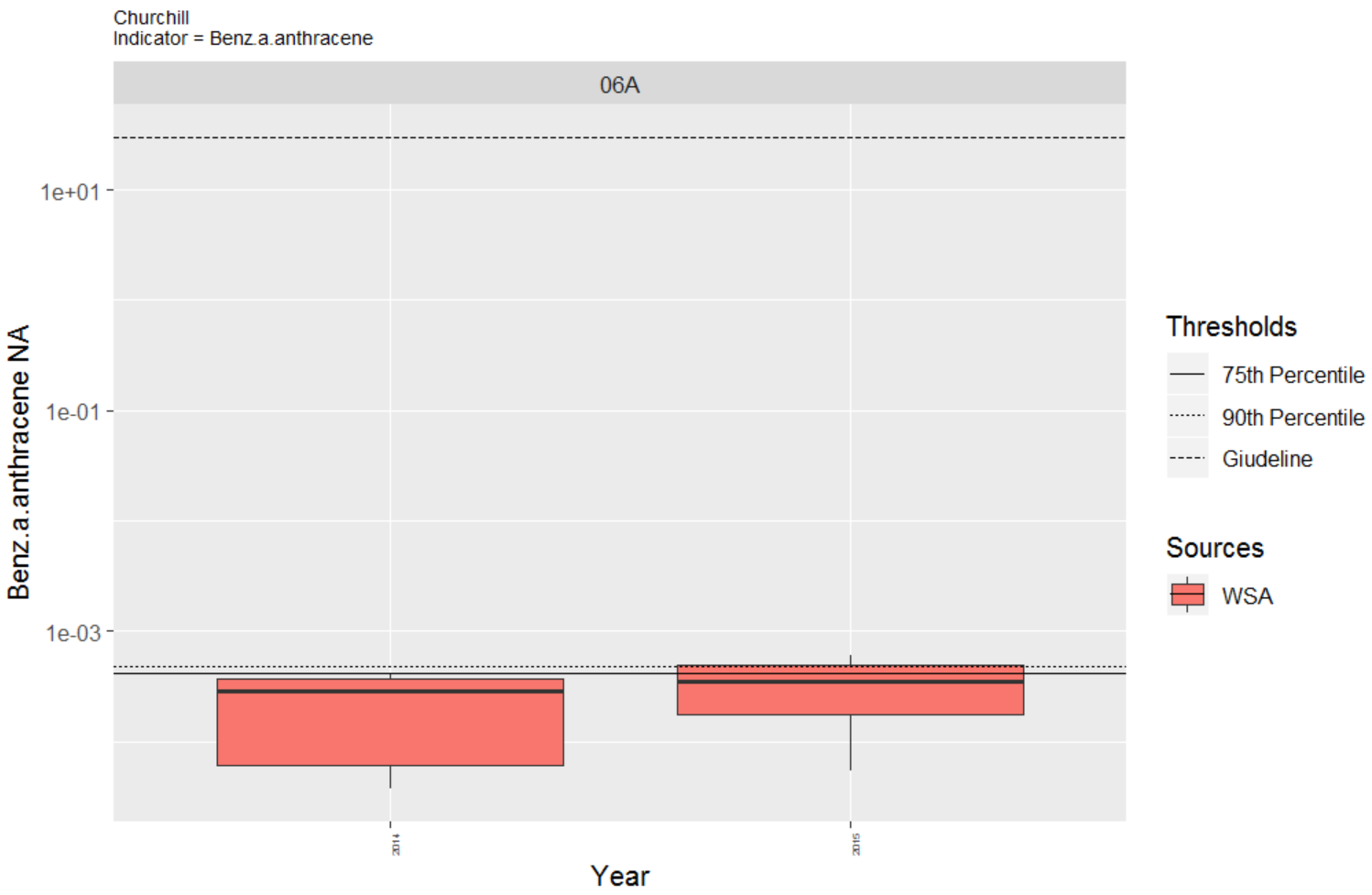

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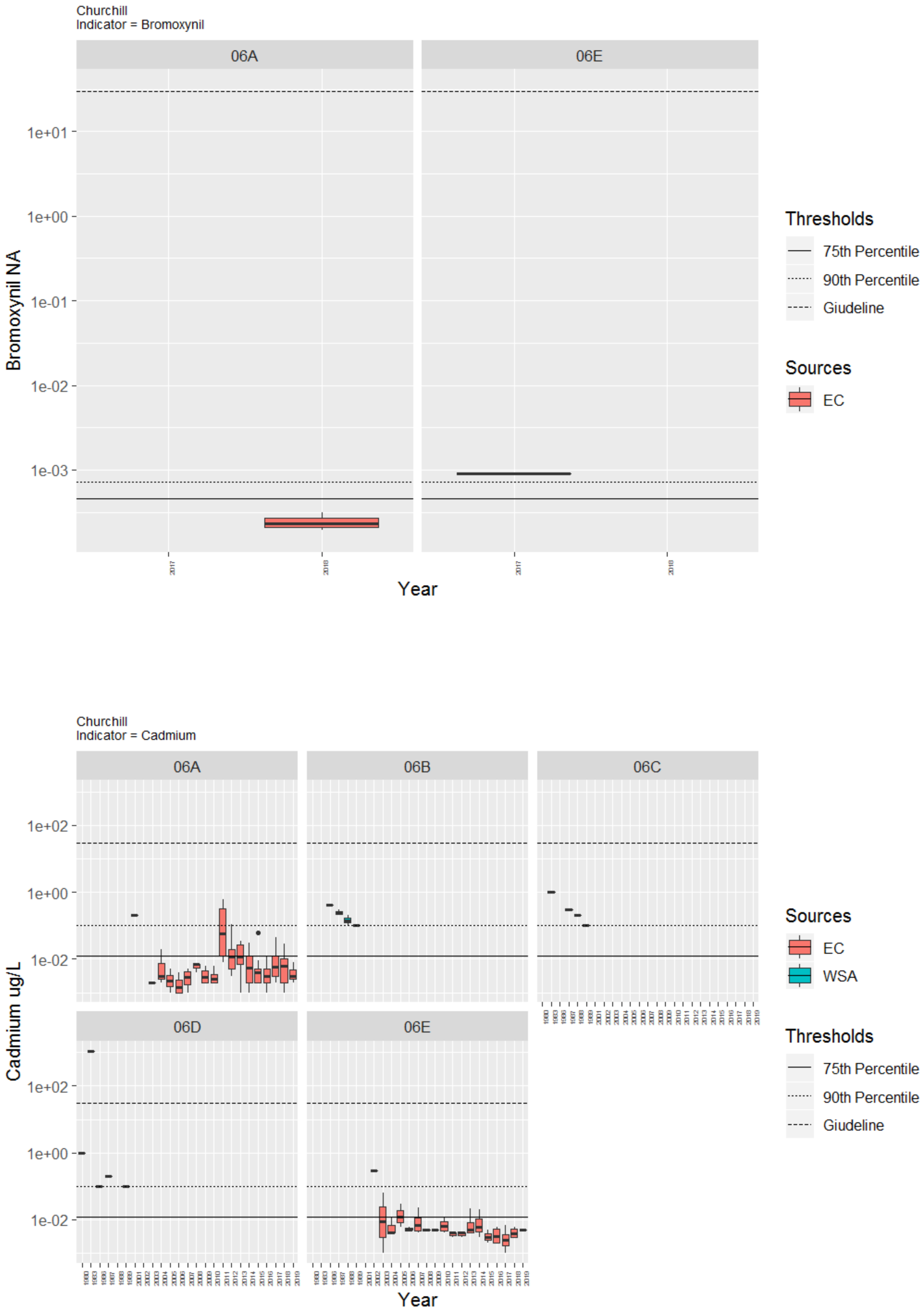

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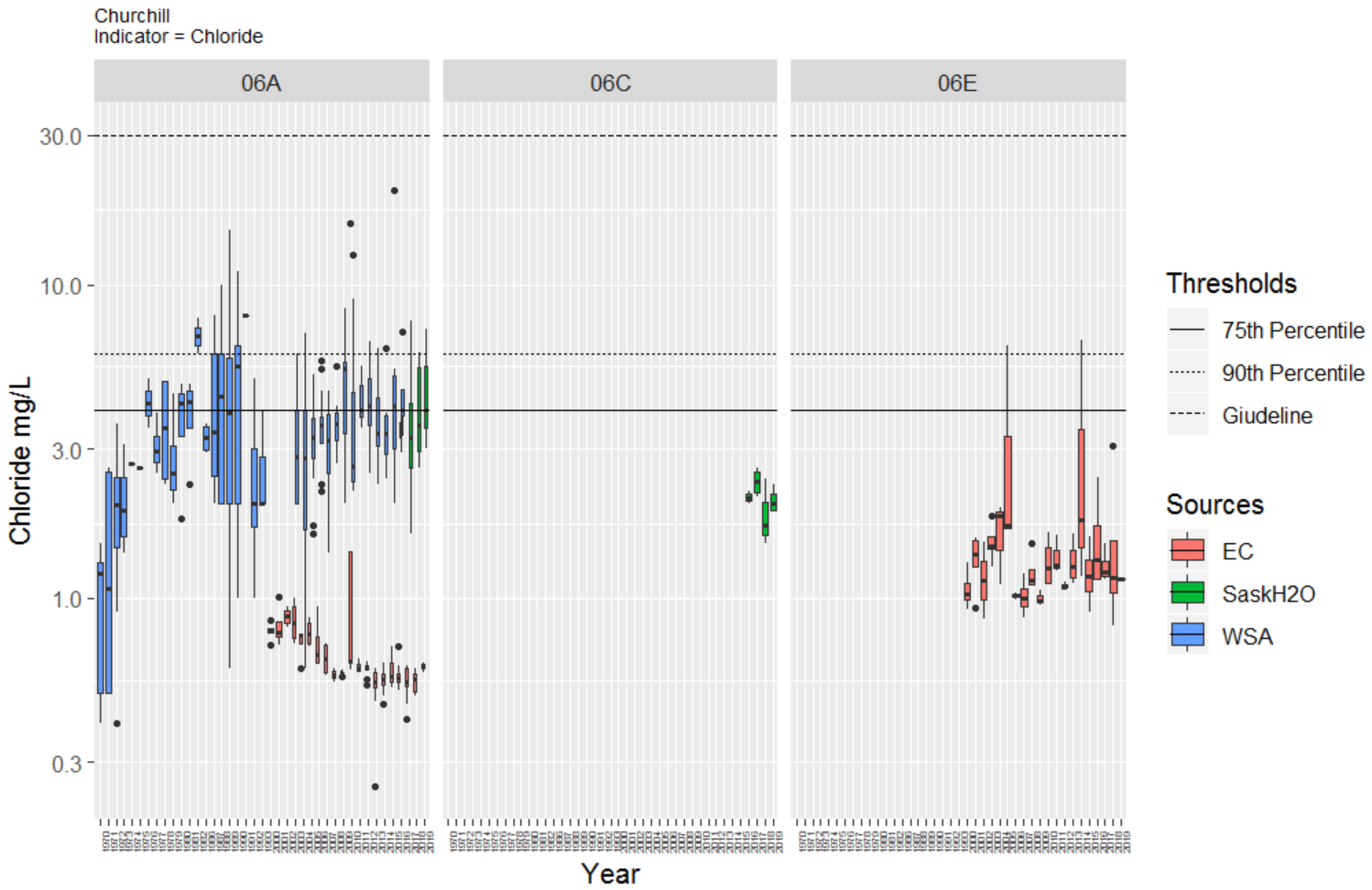

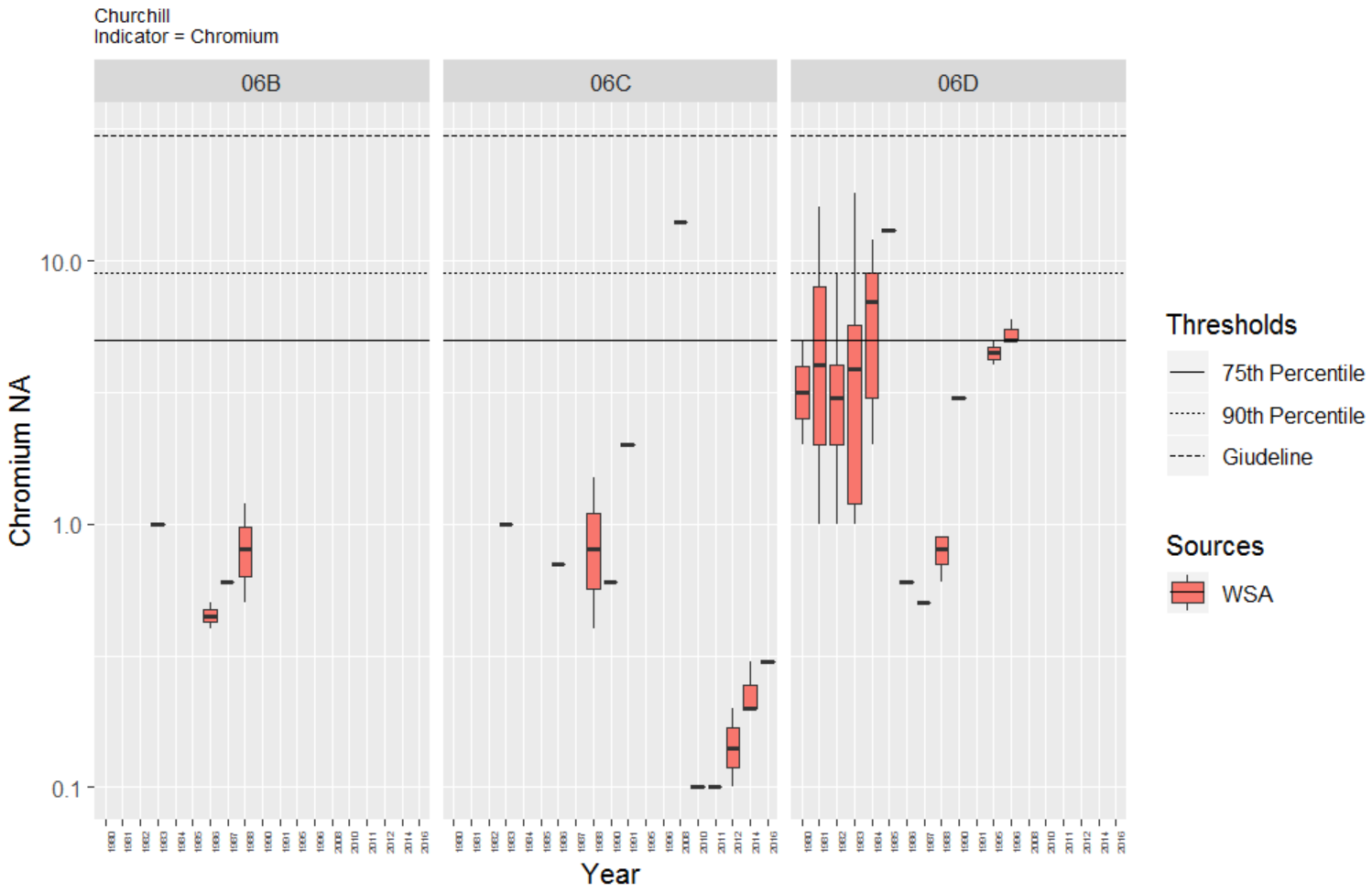

WWF-Canada Watershed Report for the CHURCHILL Watershed

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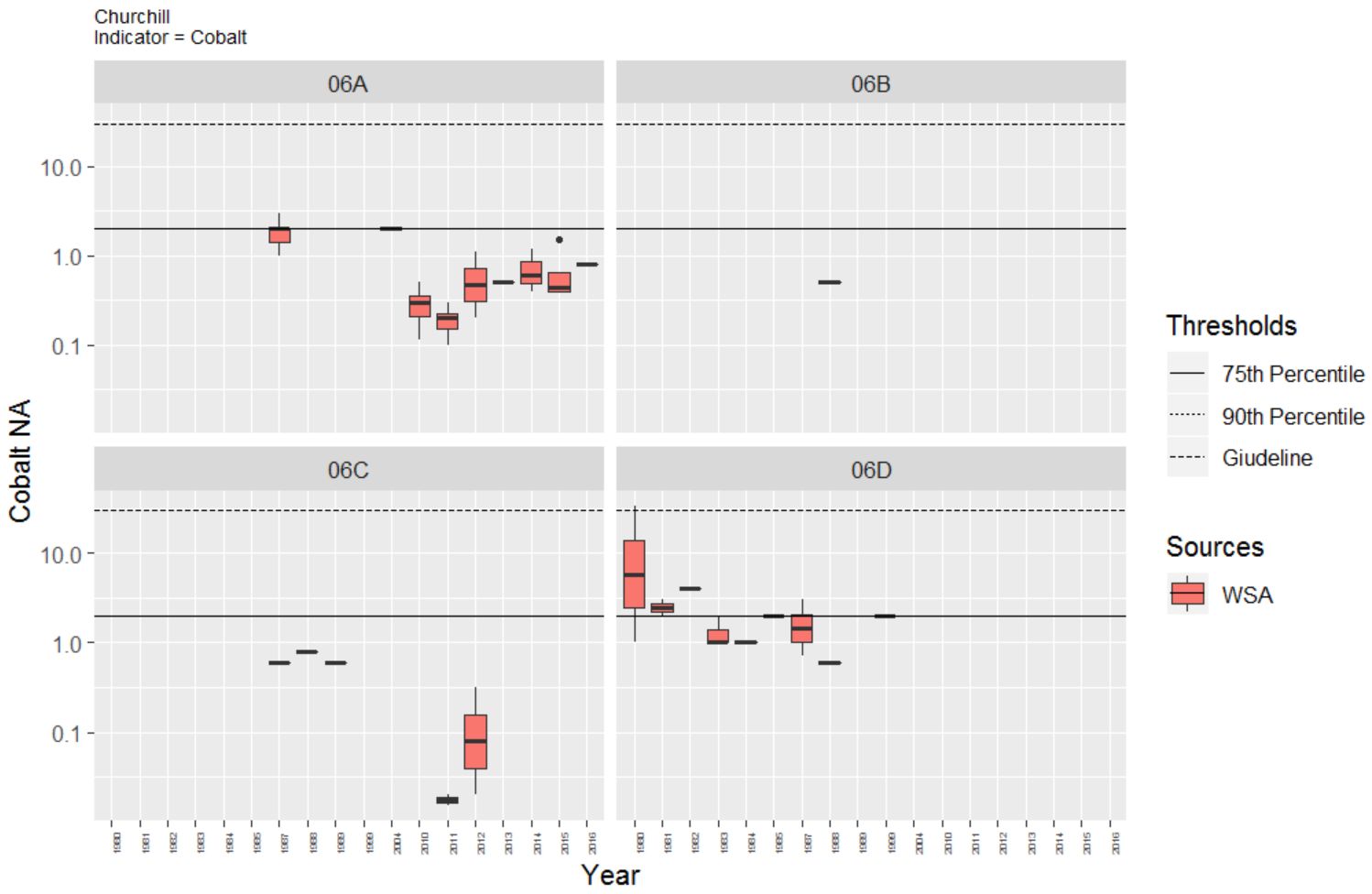

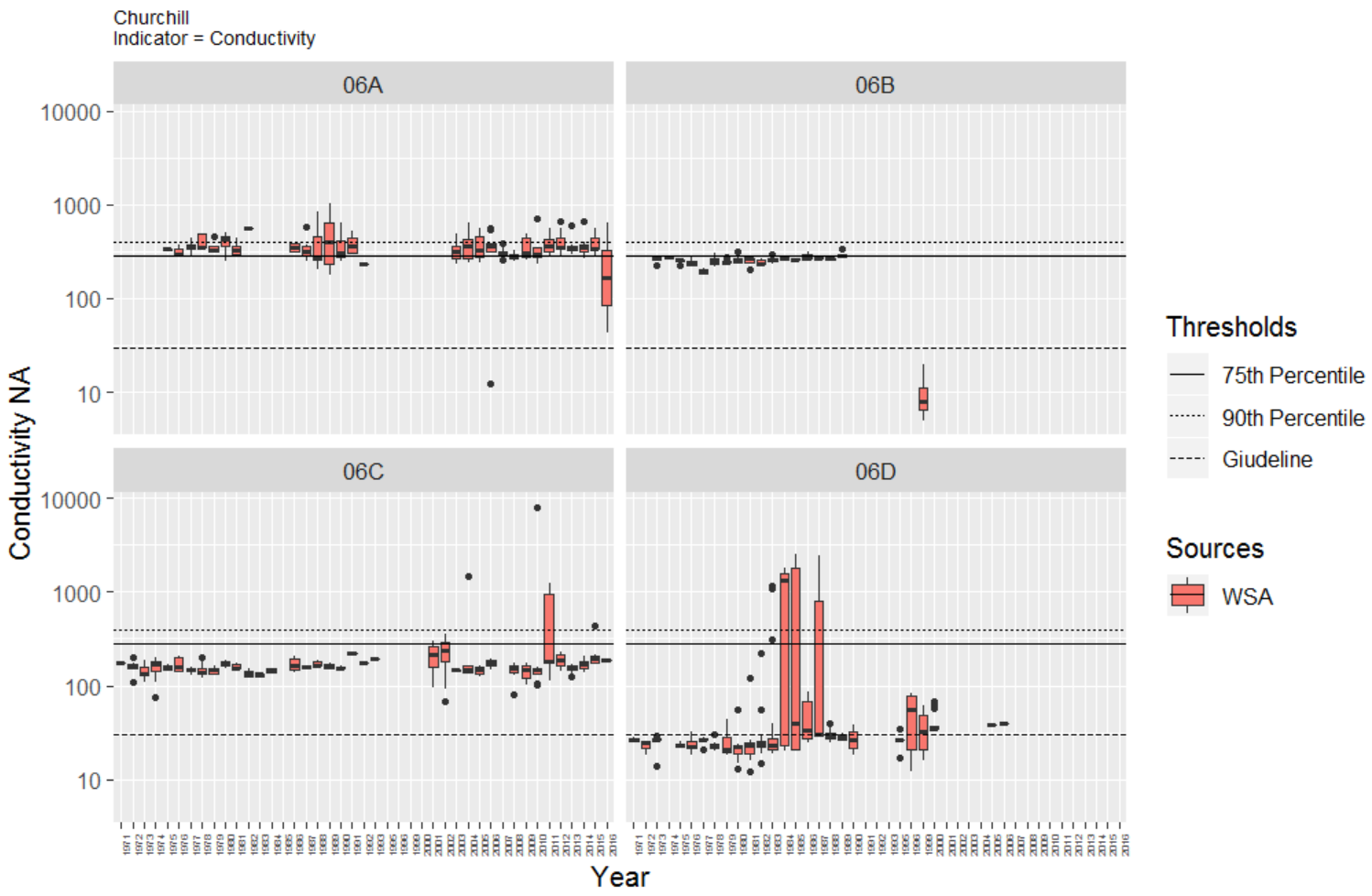

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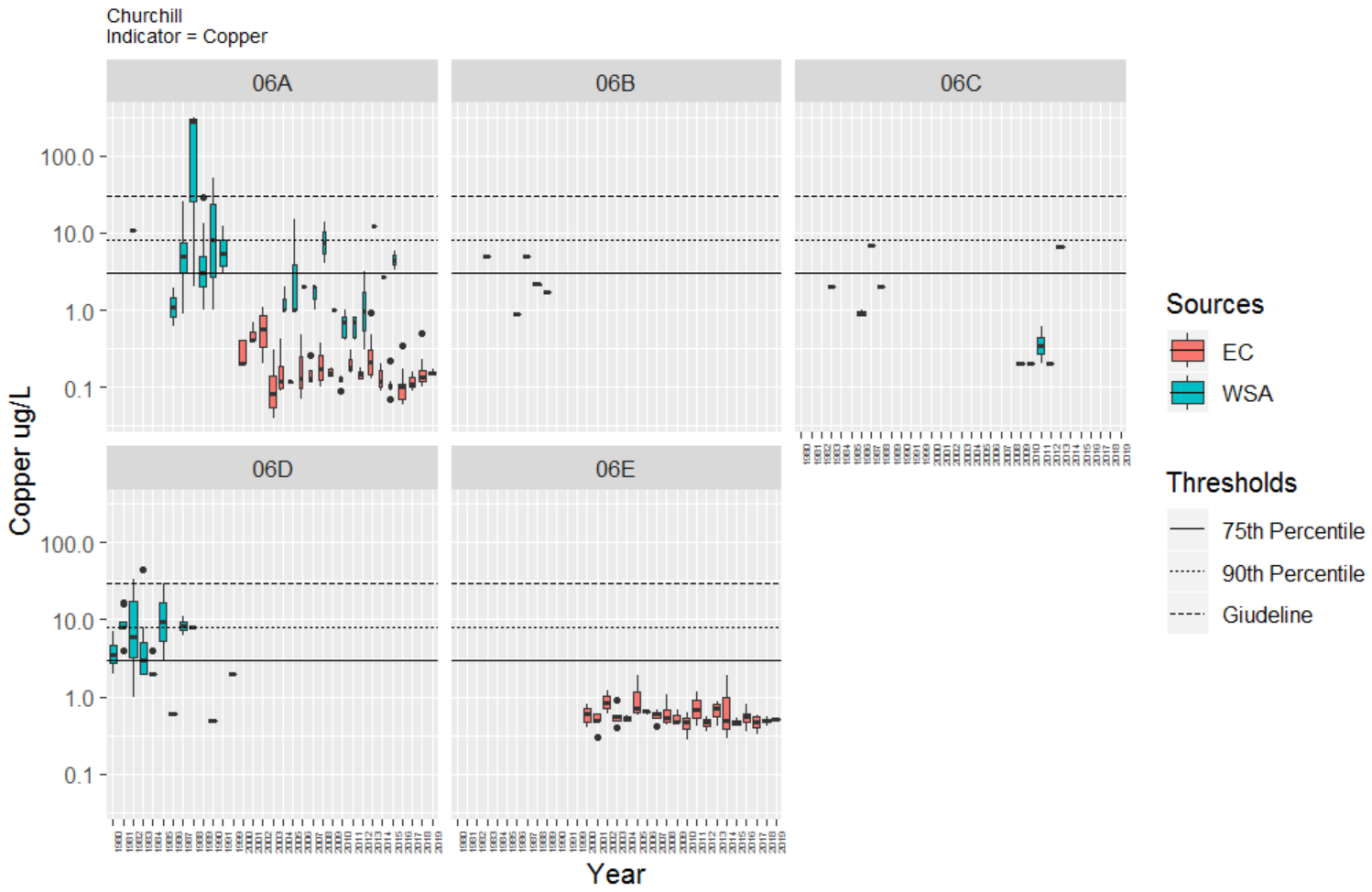

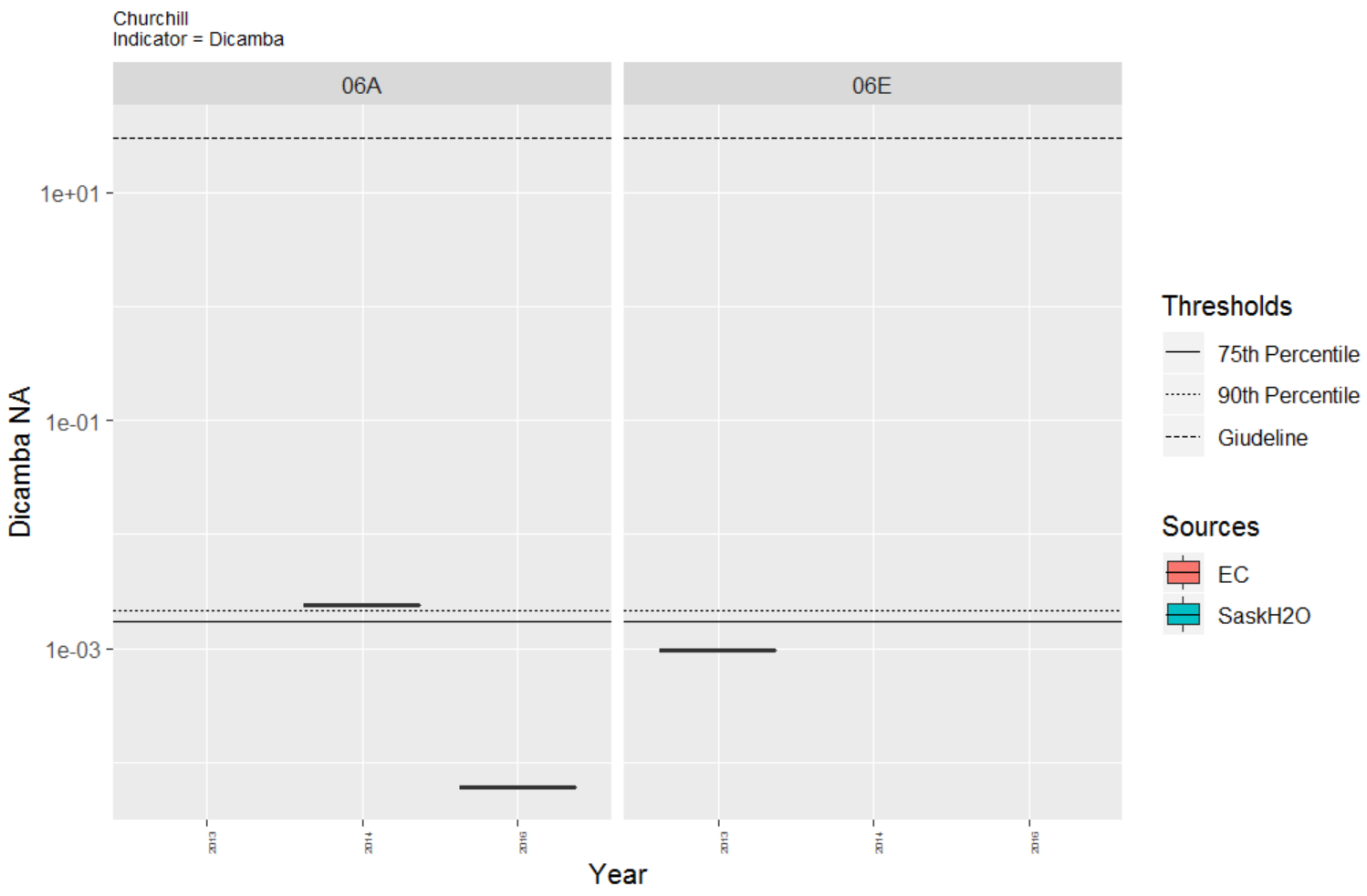

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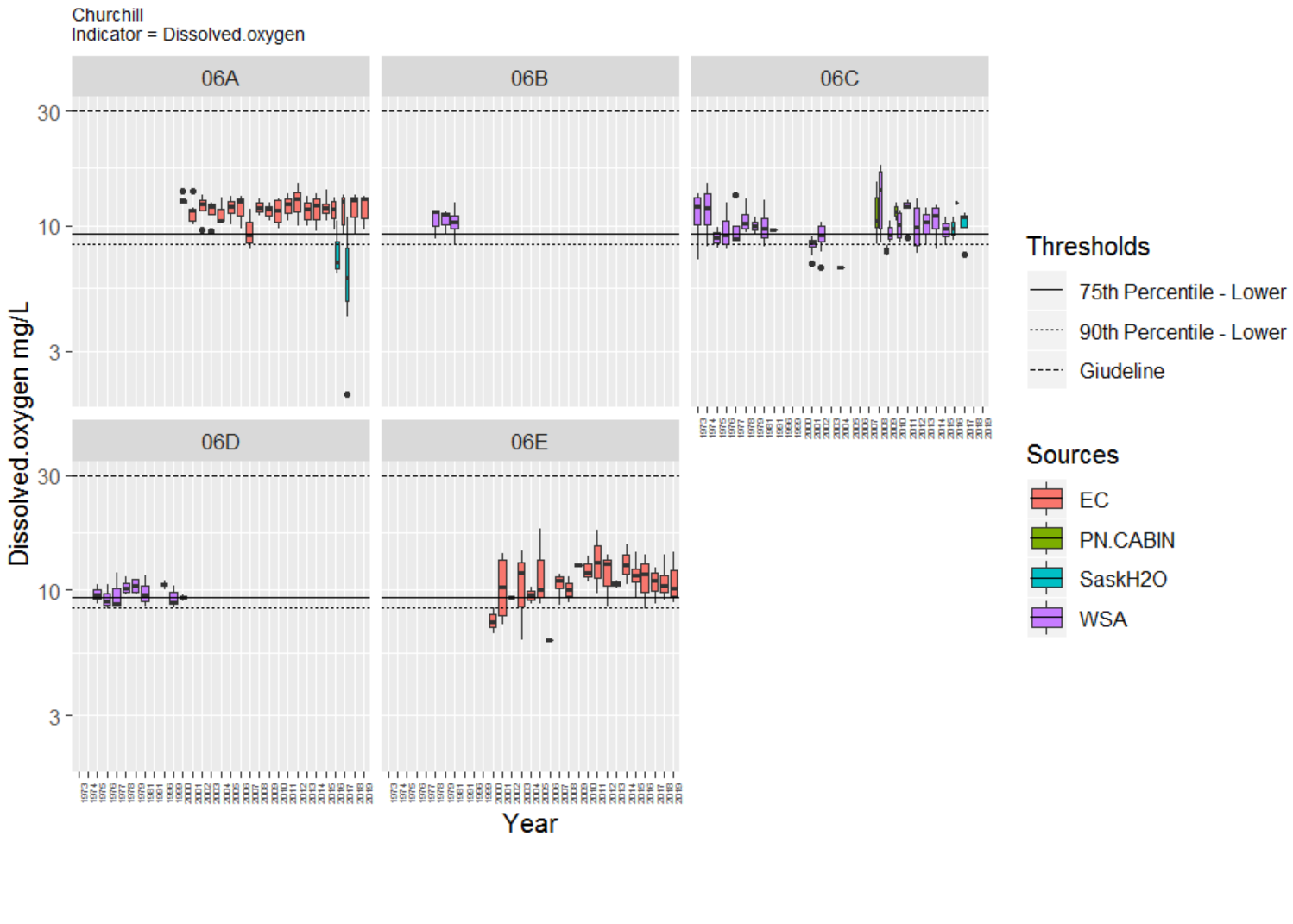

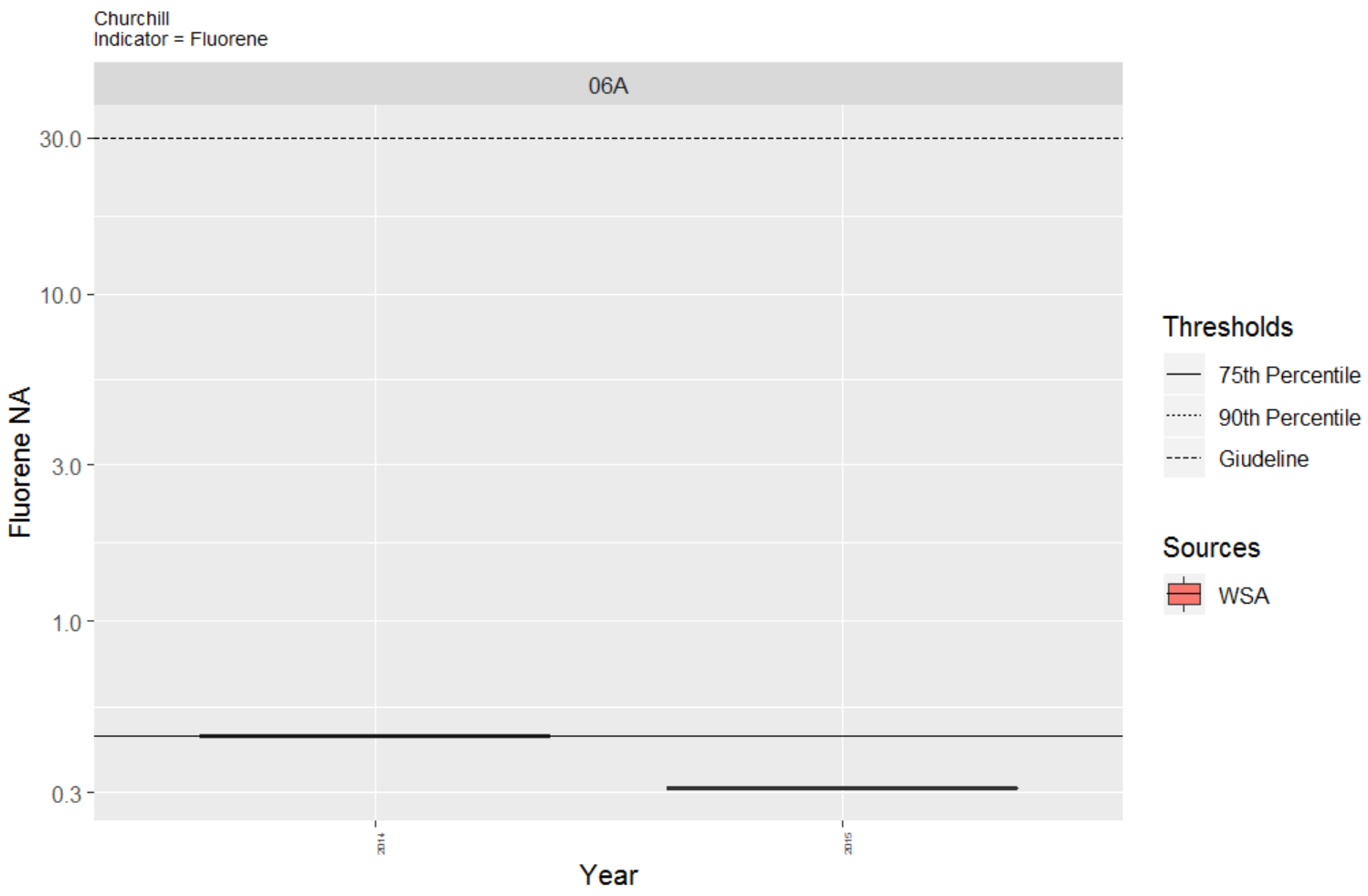

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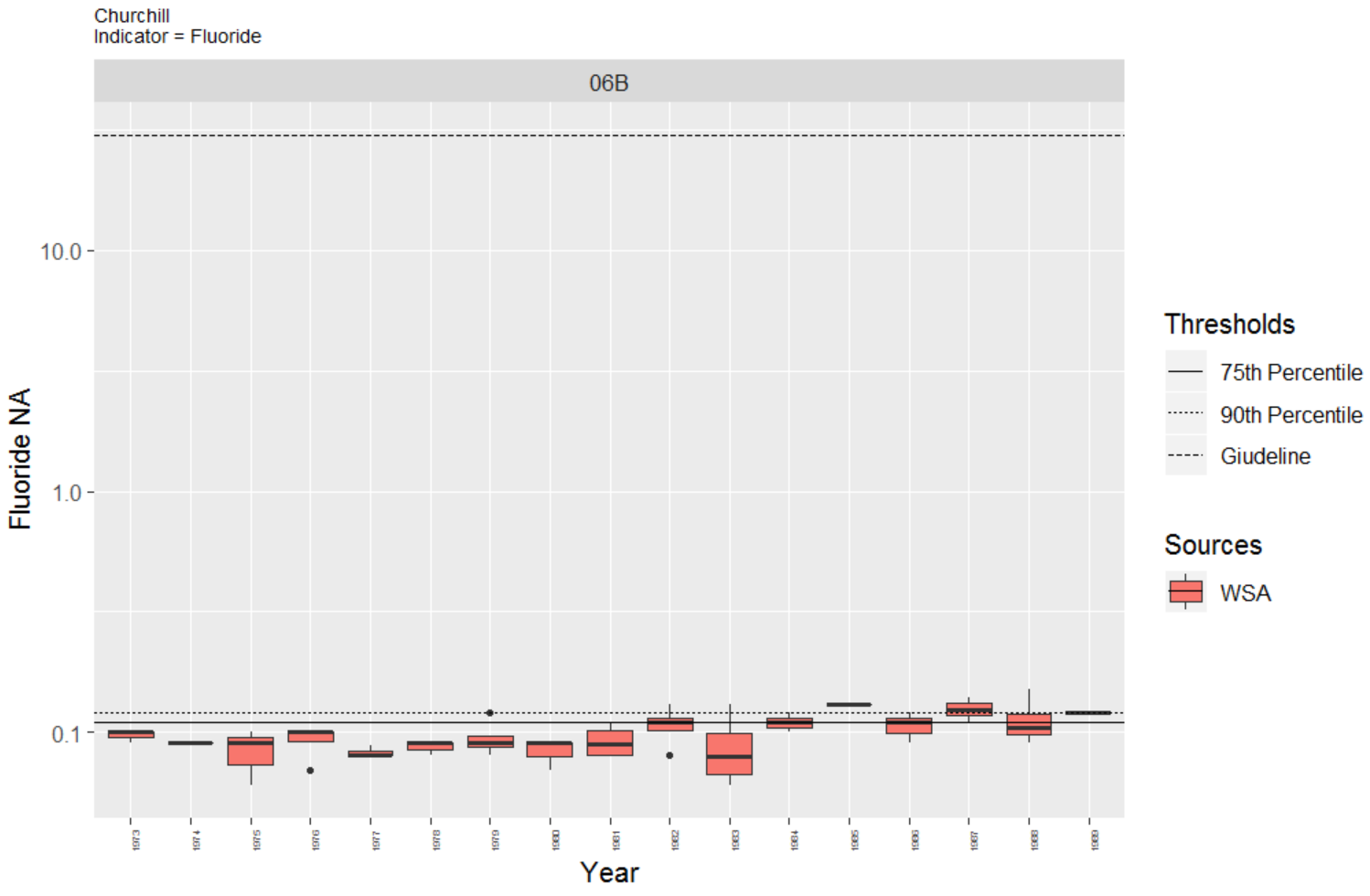

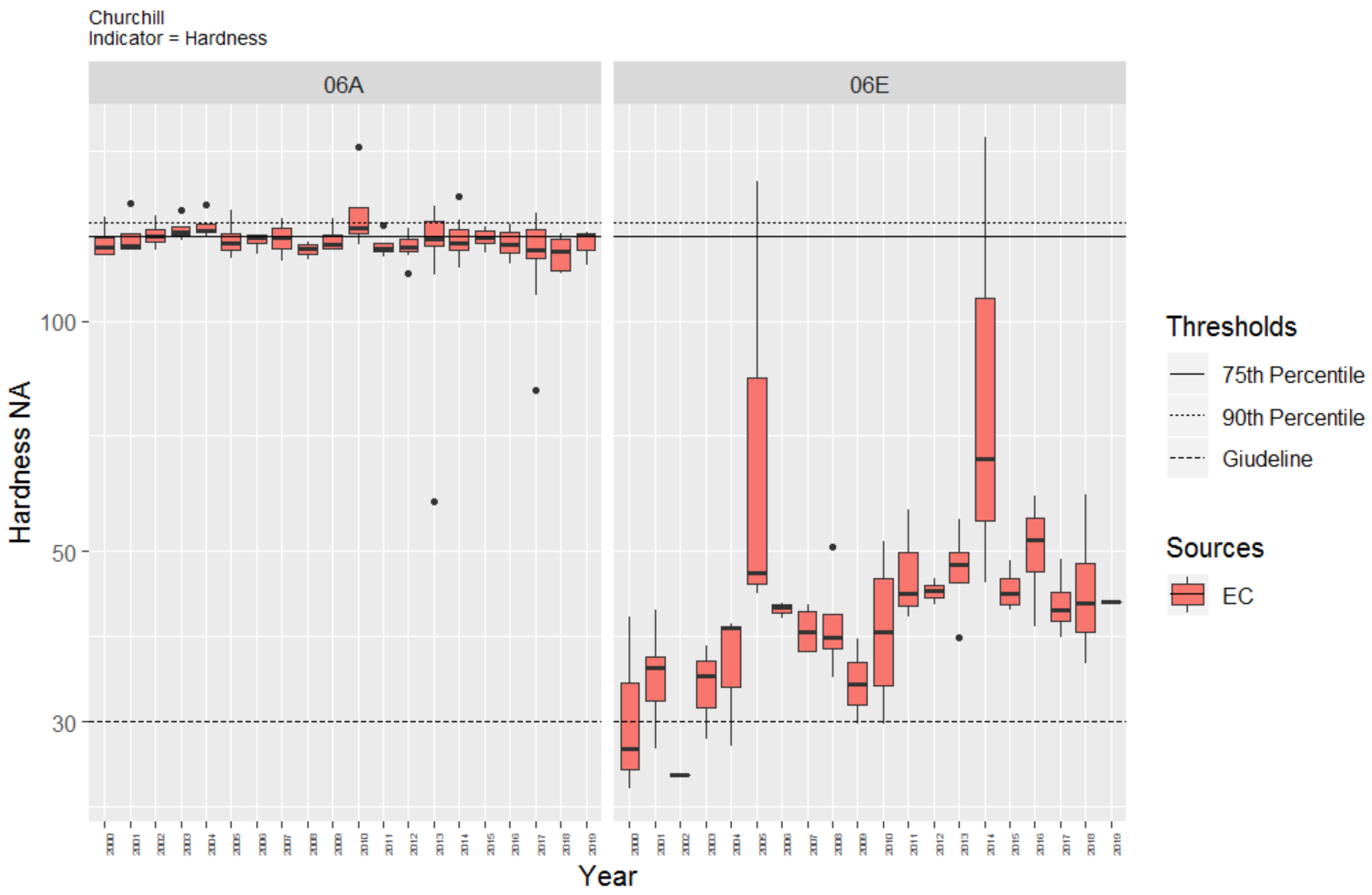

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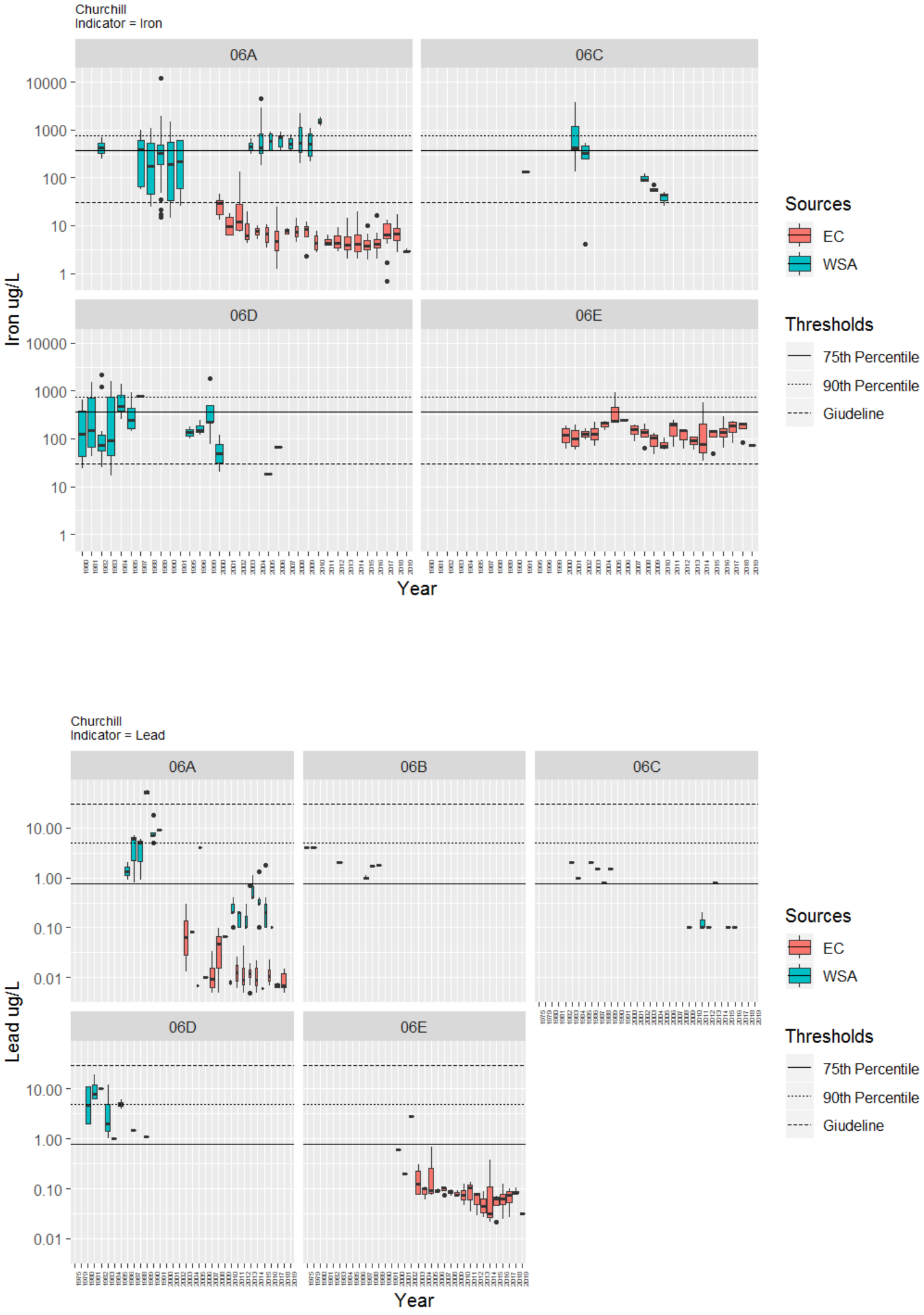

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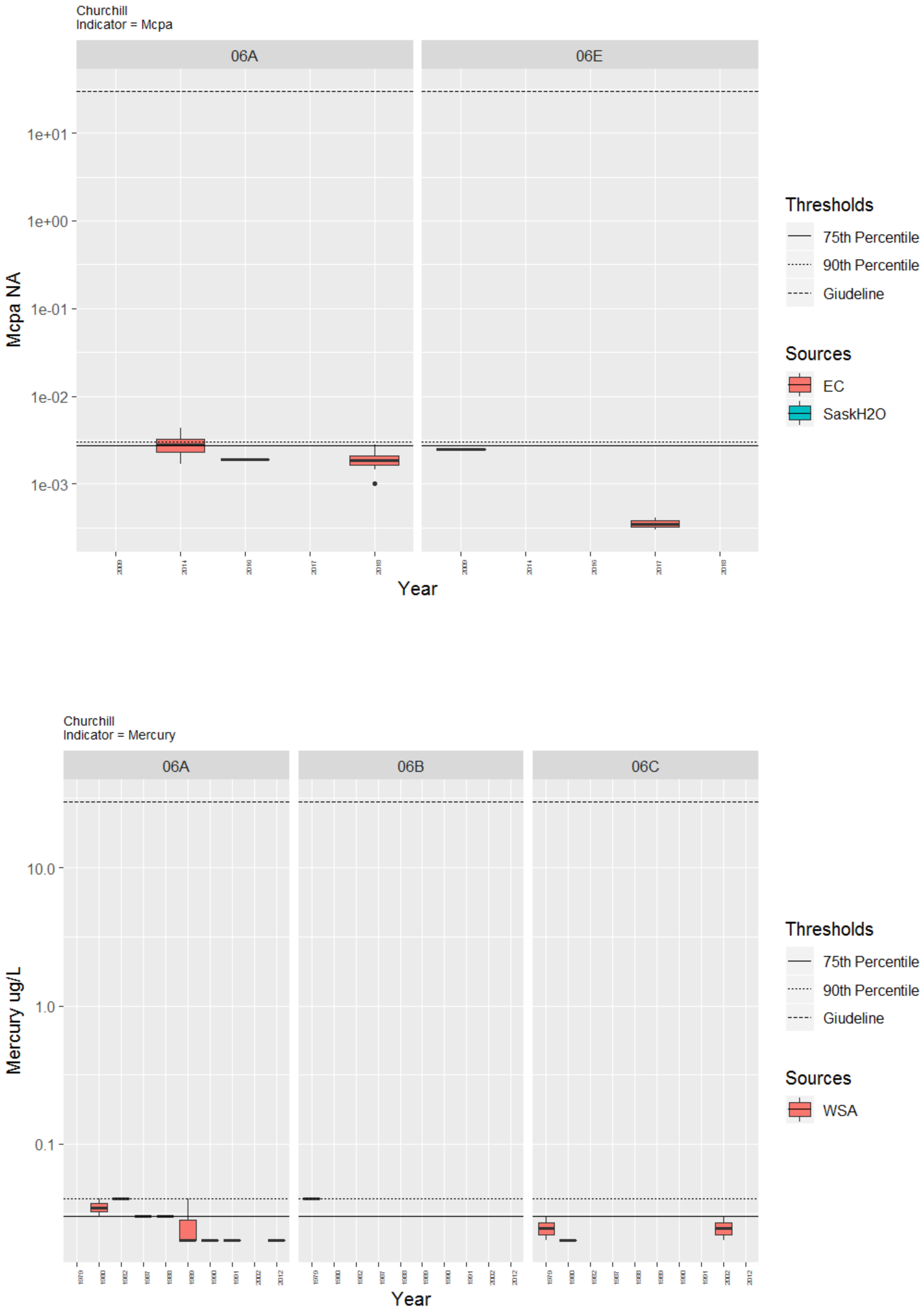

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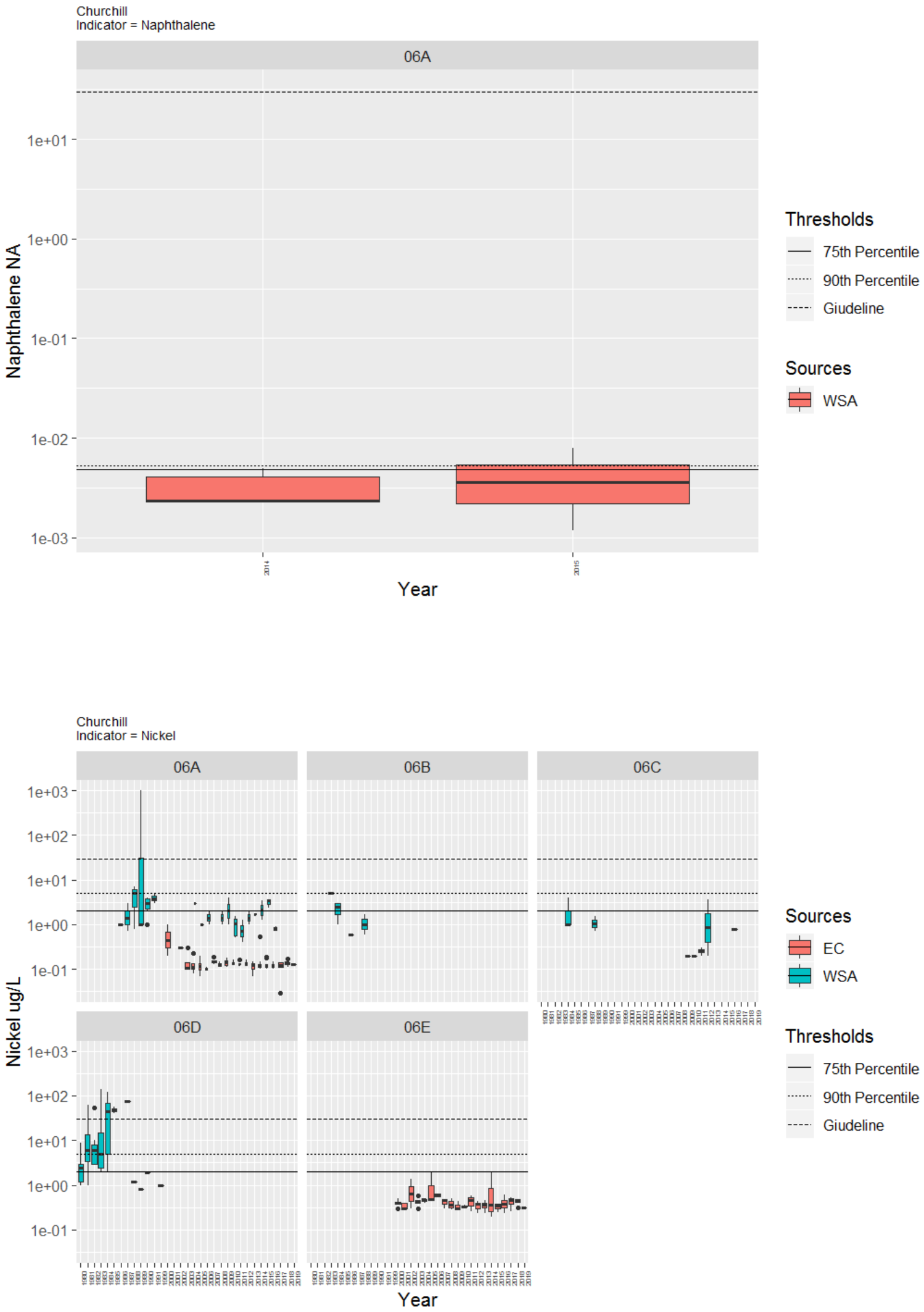

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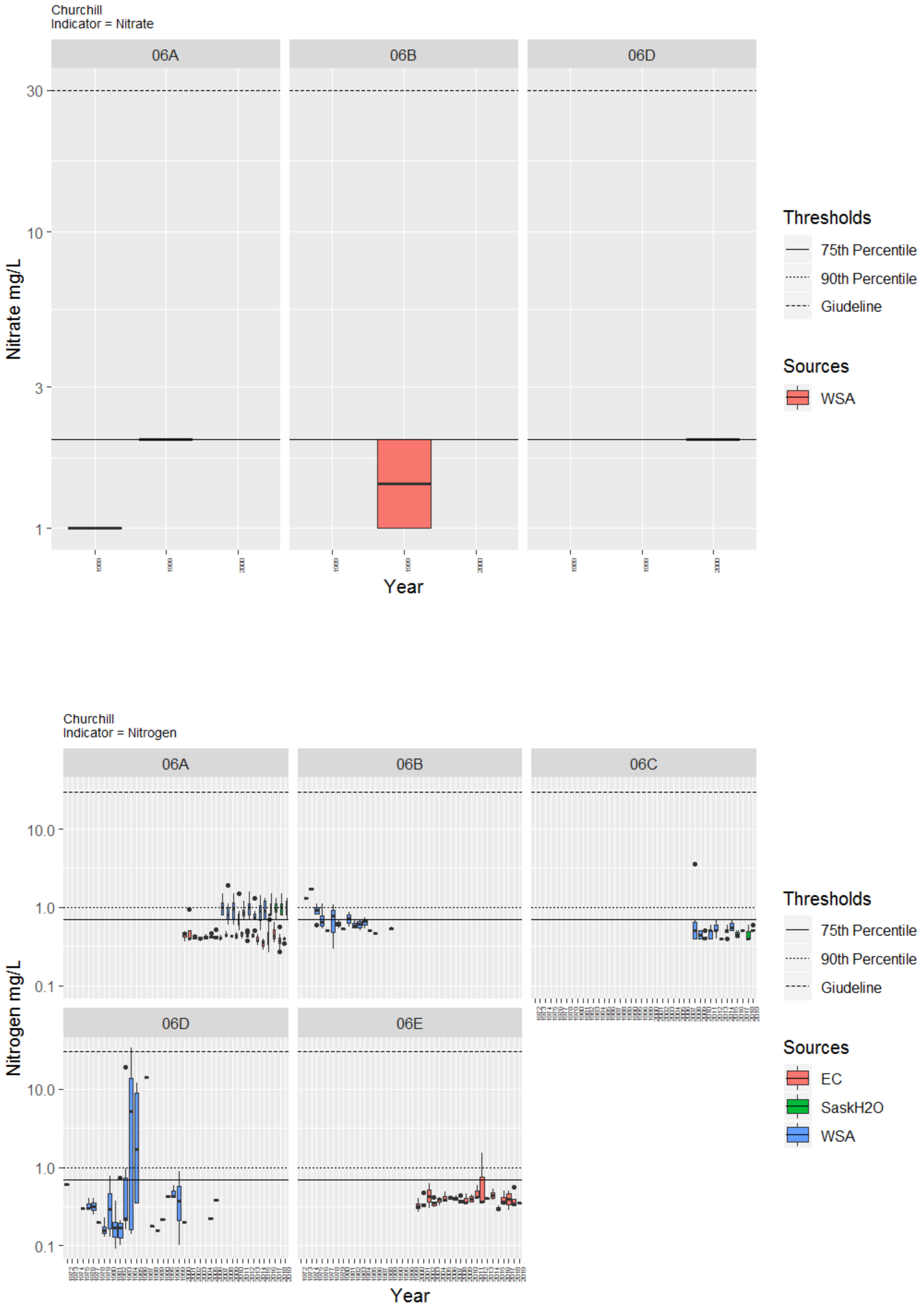

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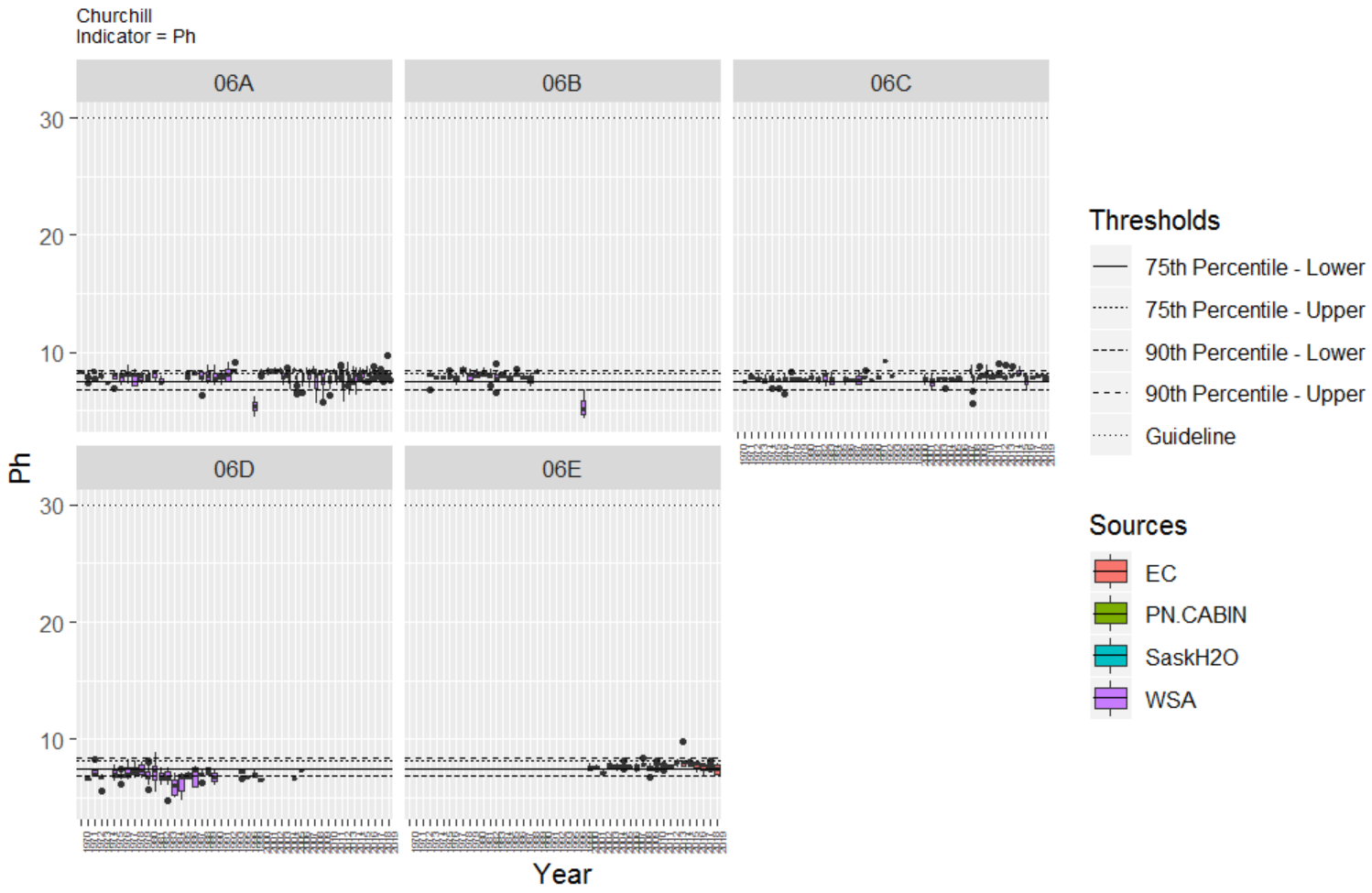

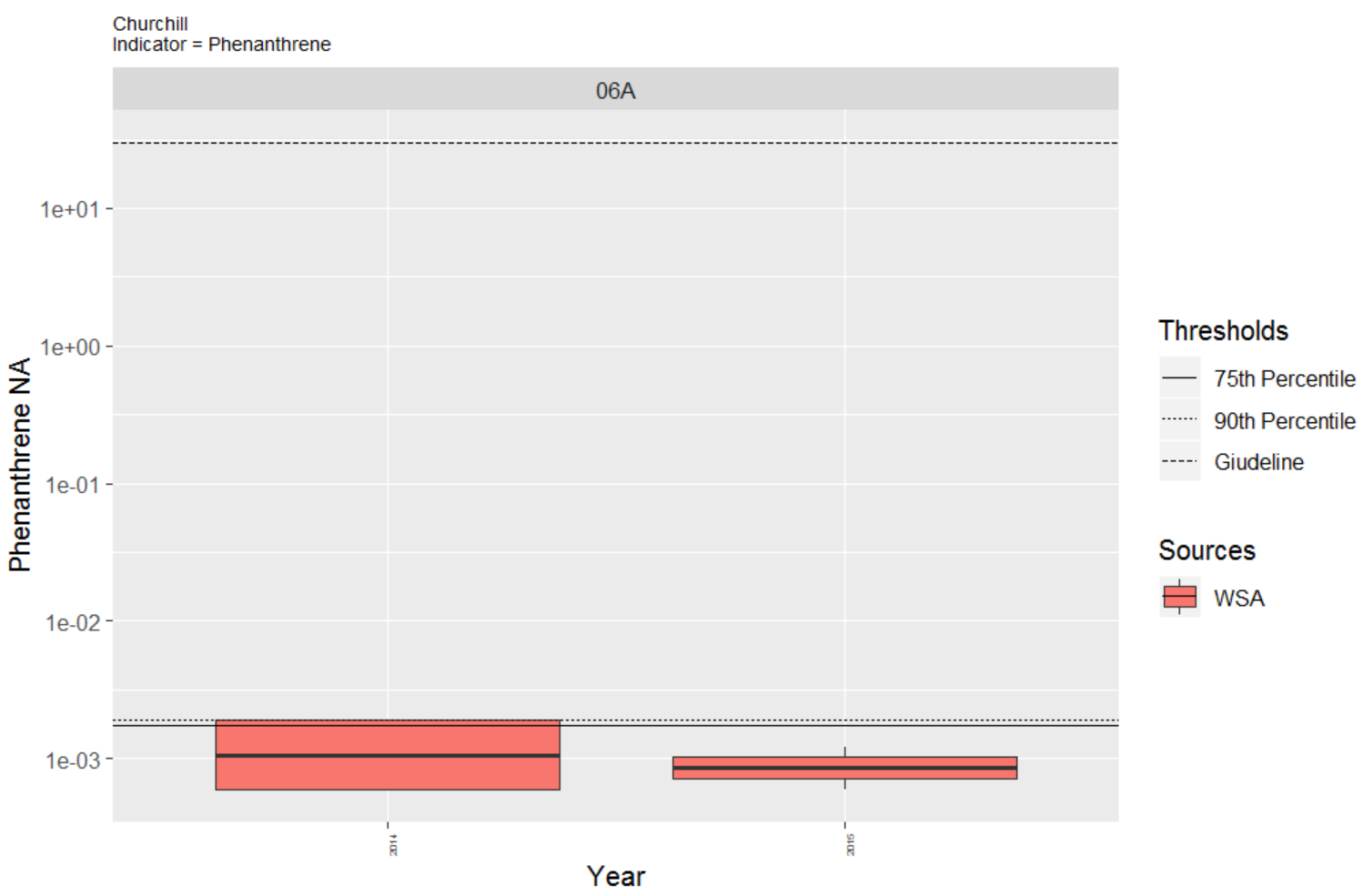

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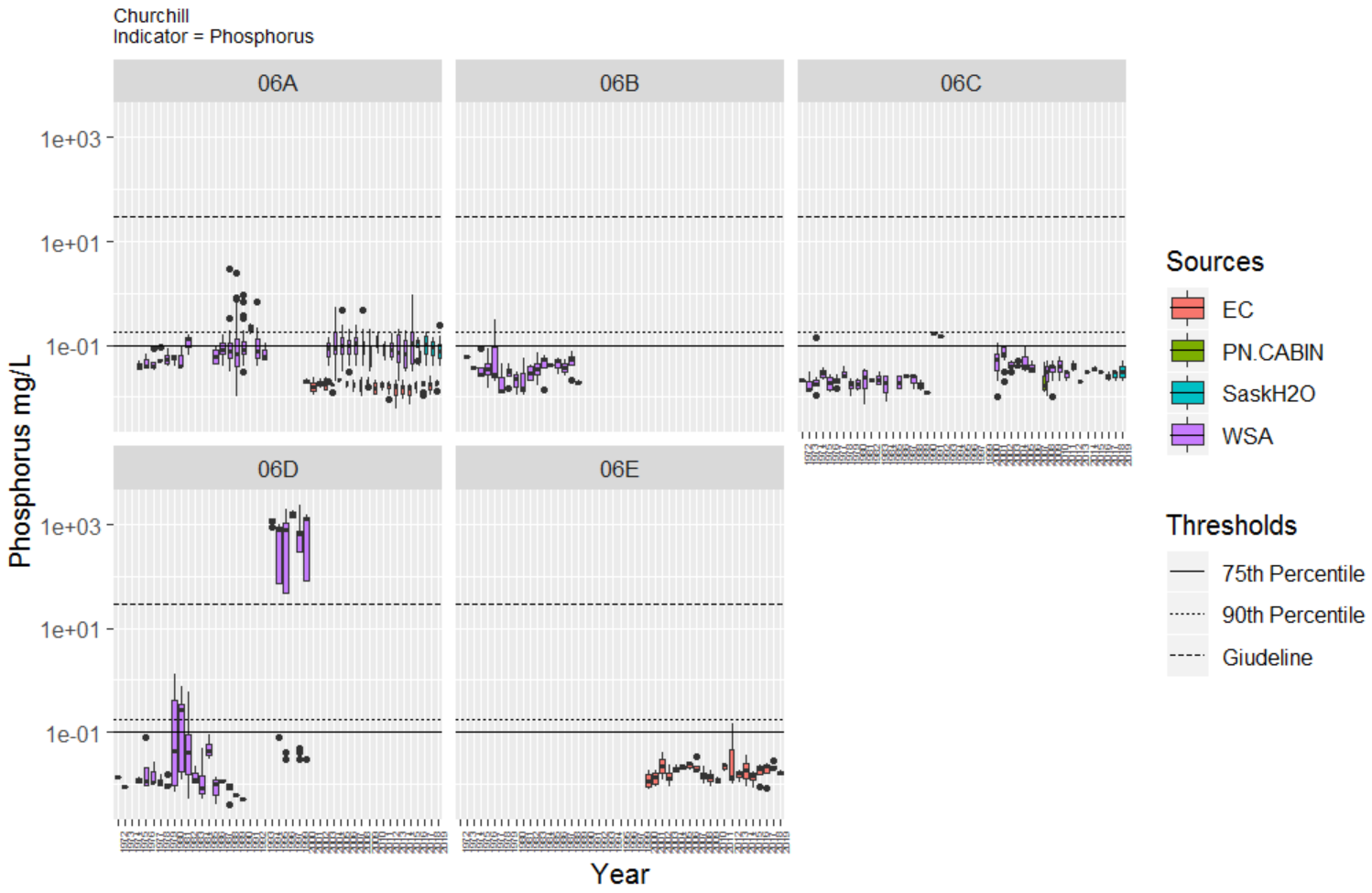

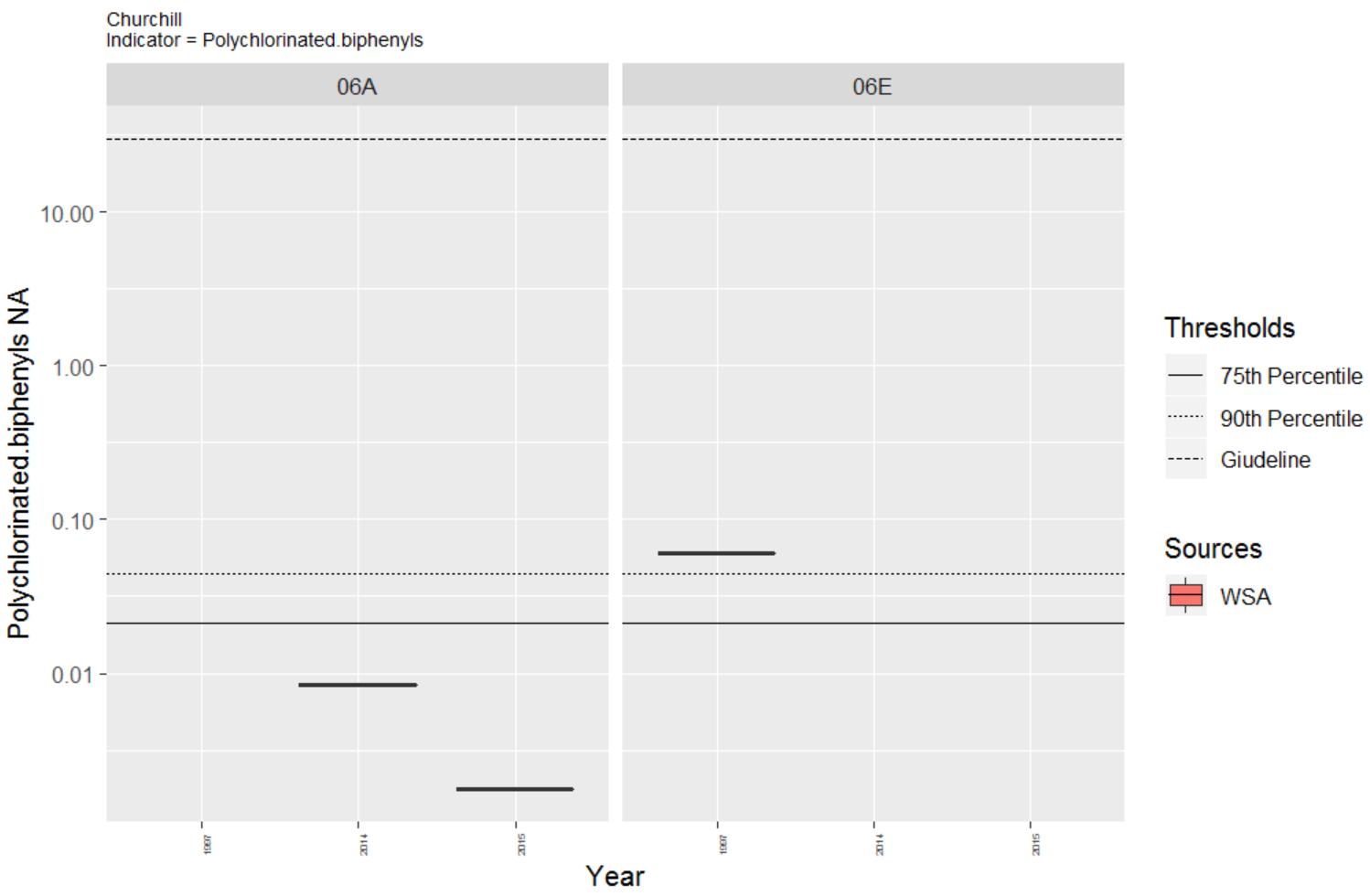

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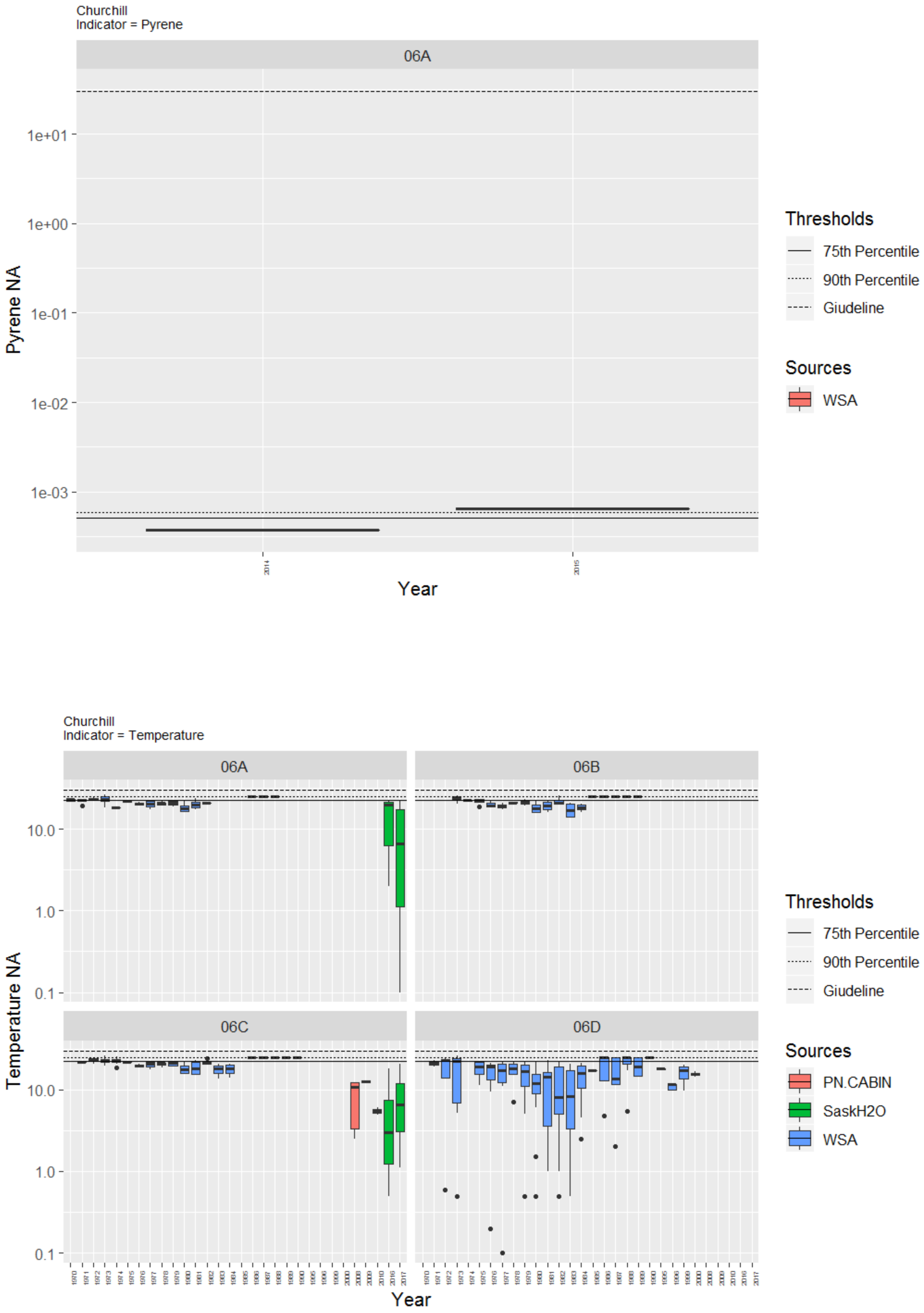

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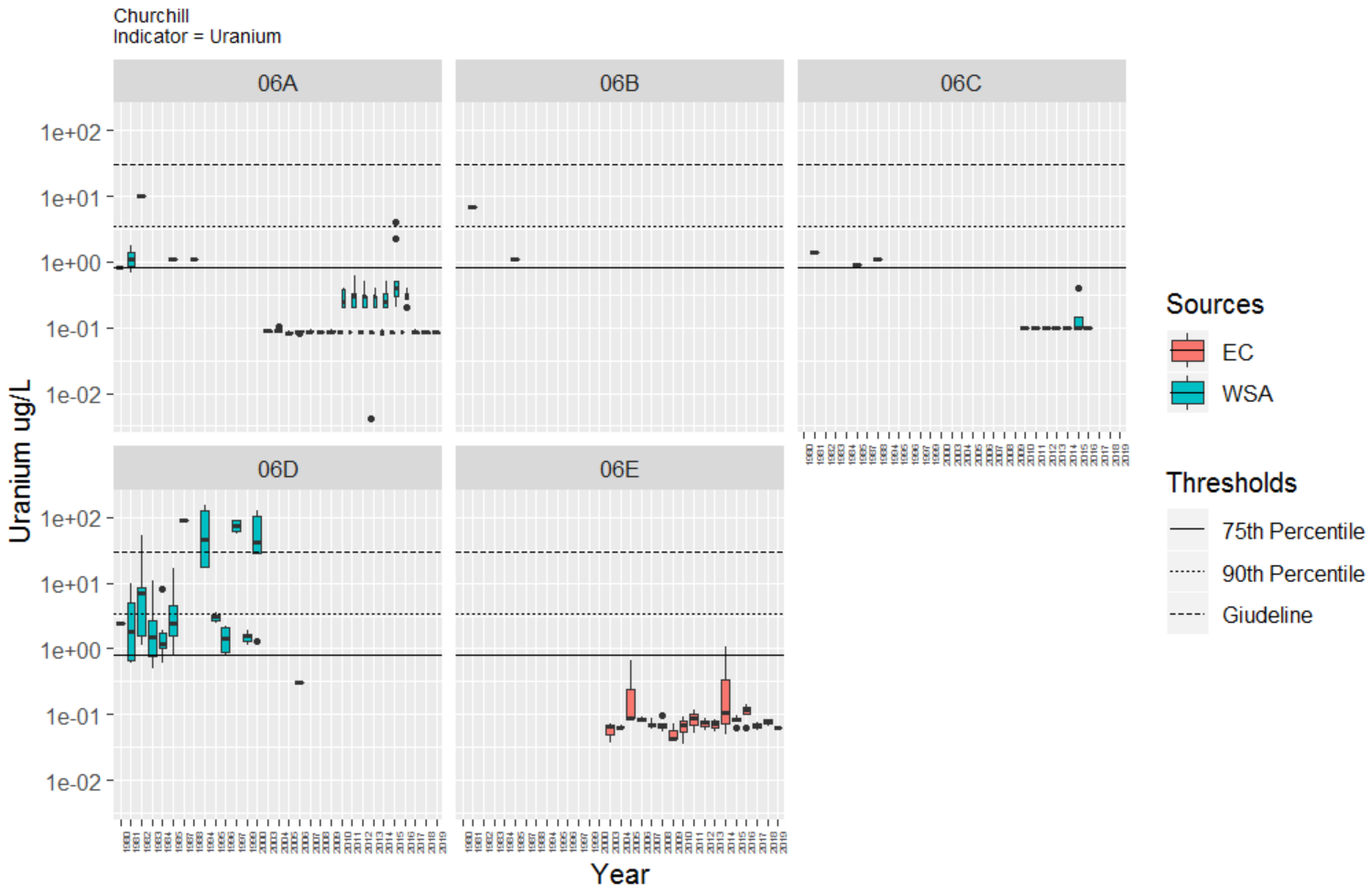

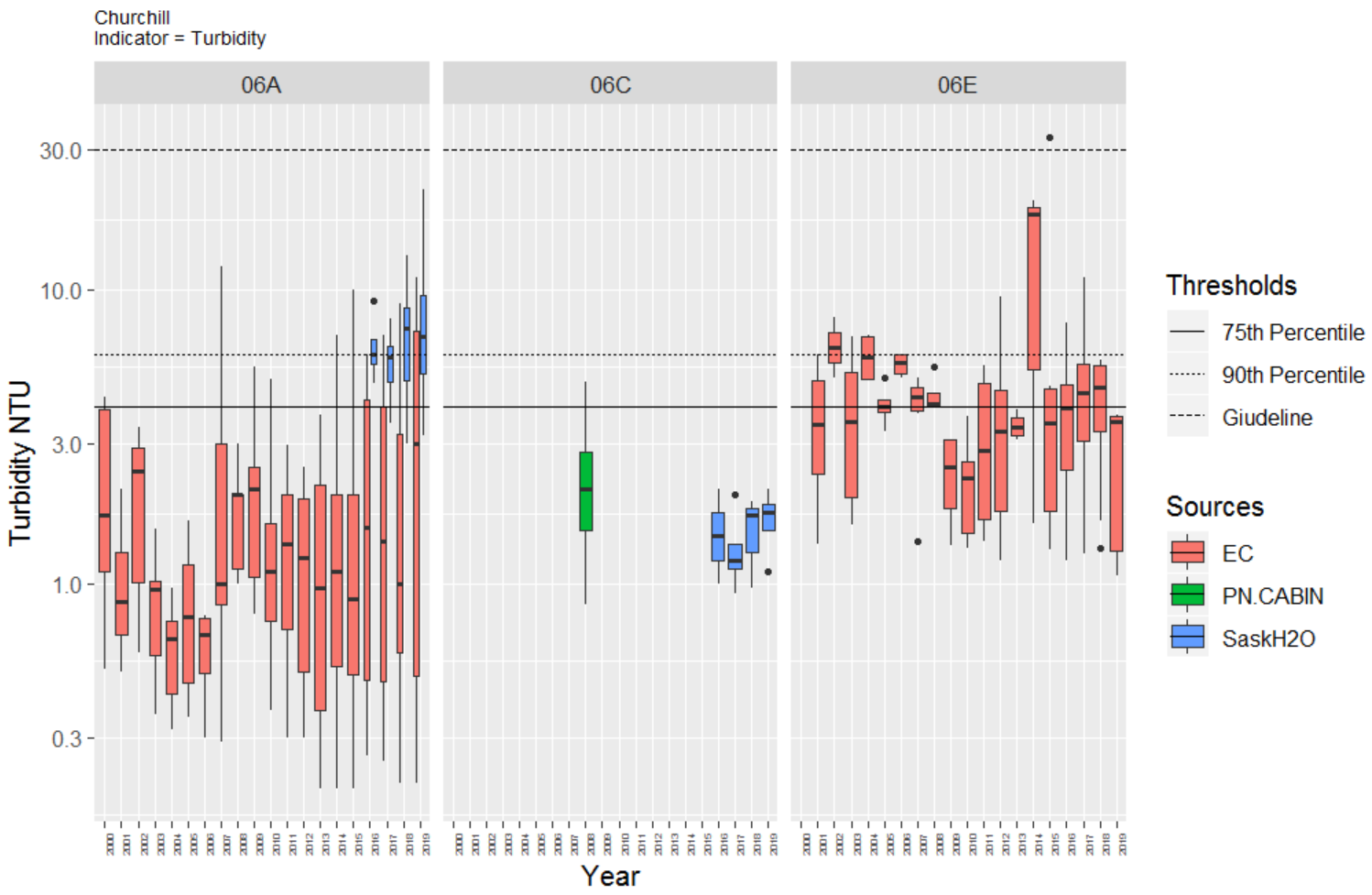

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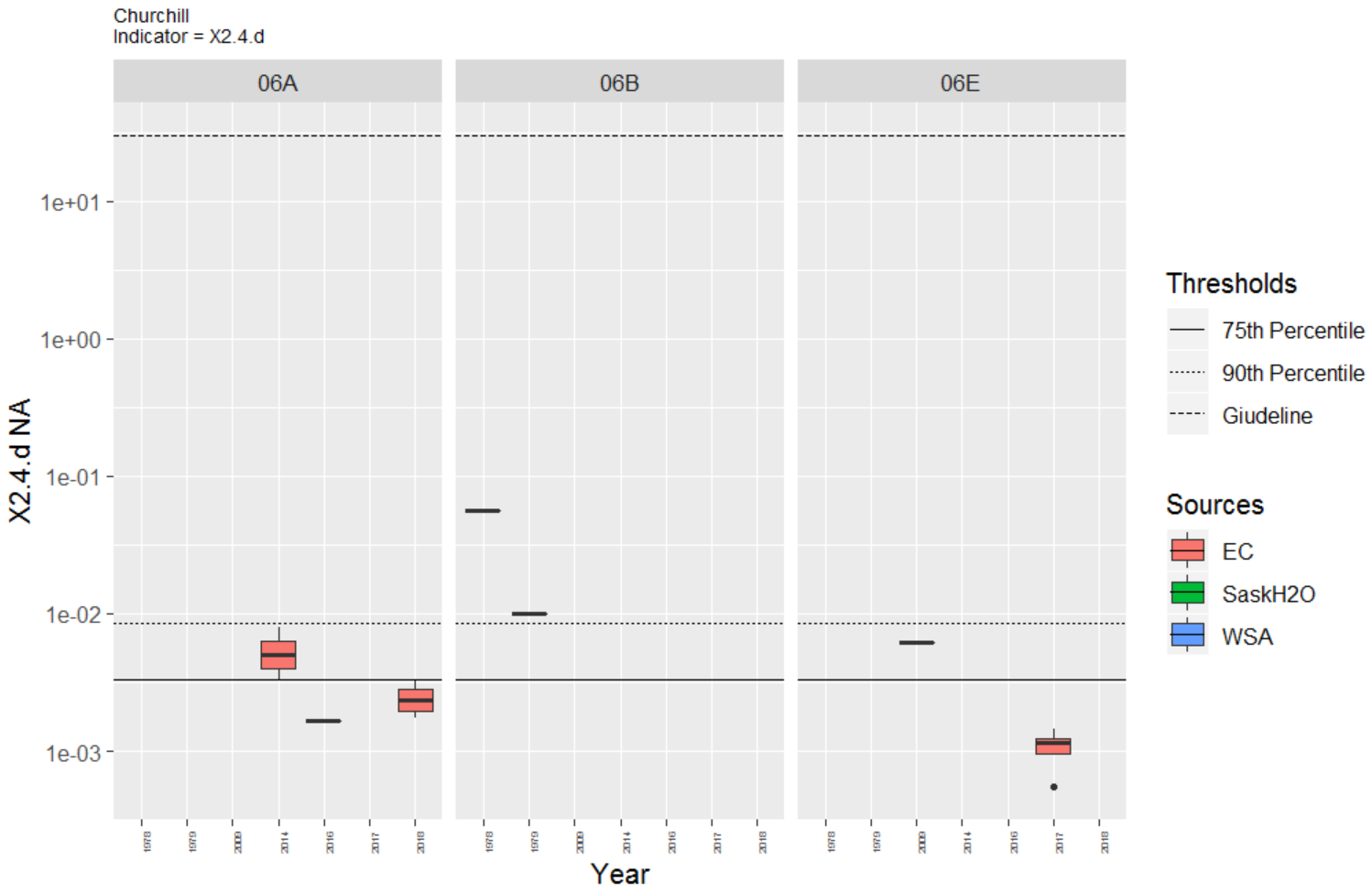

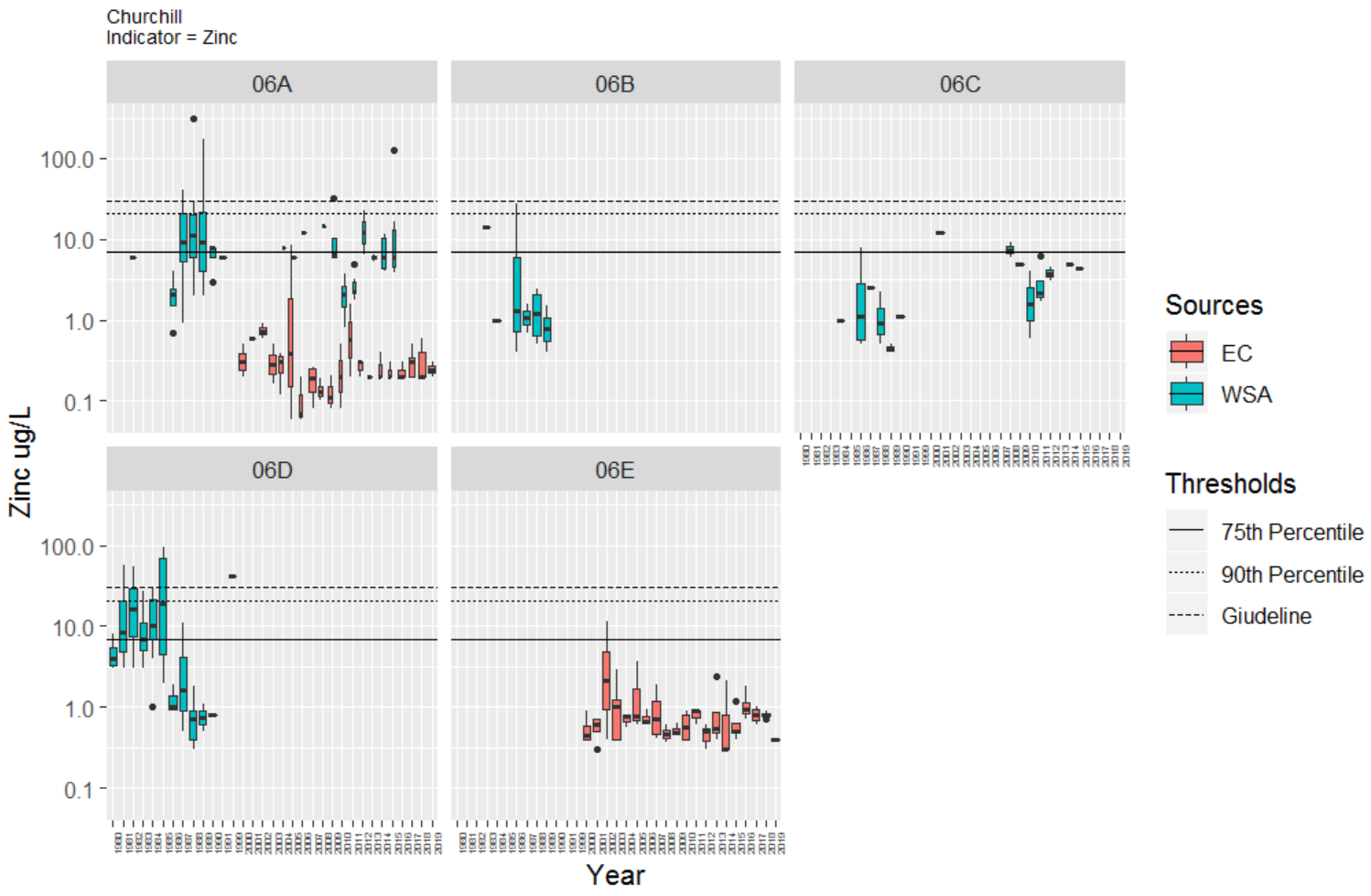

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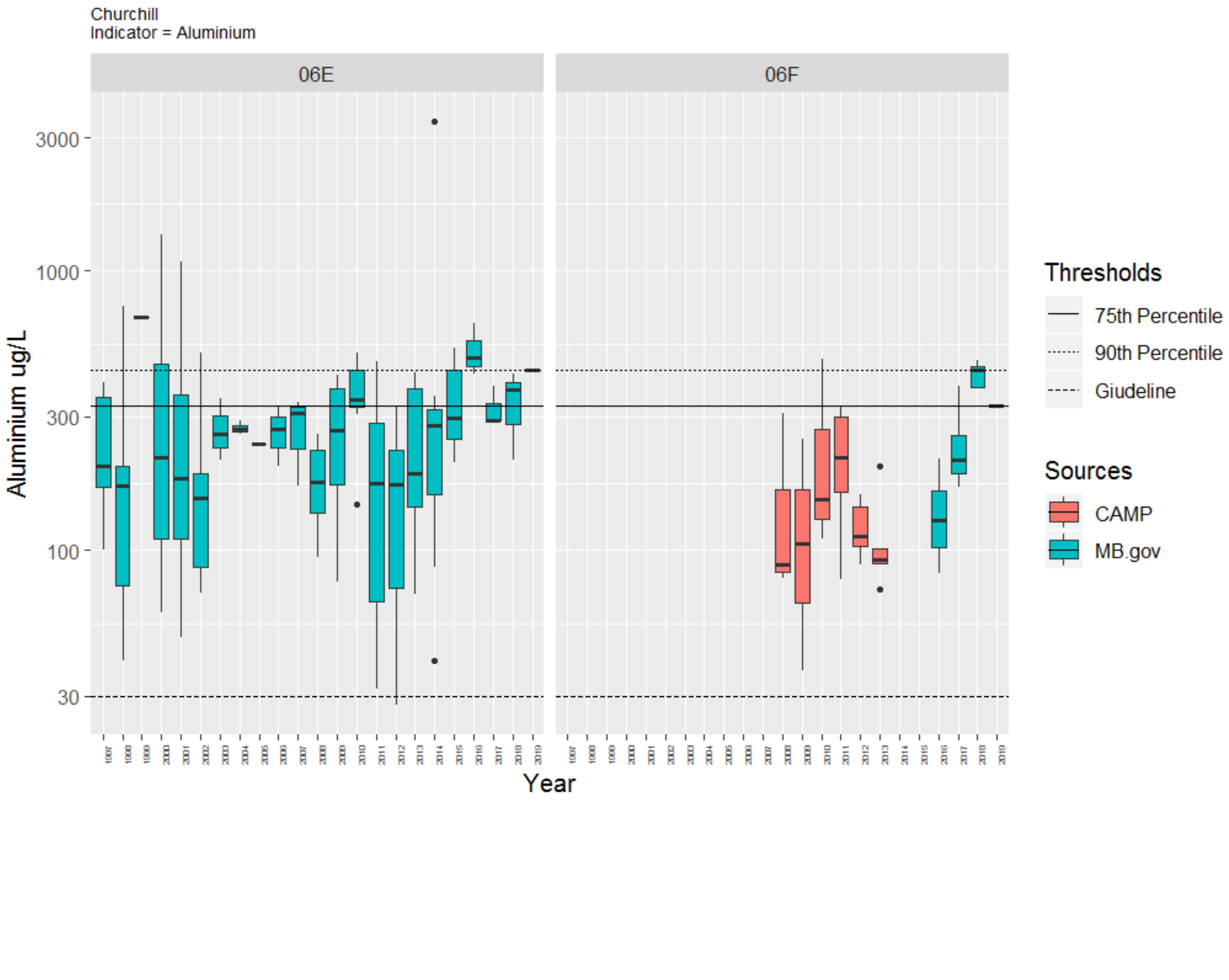
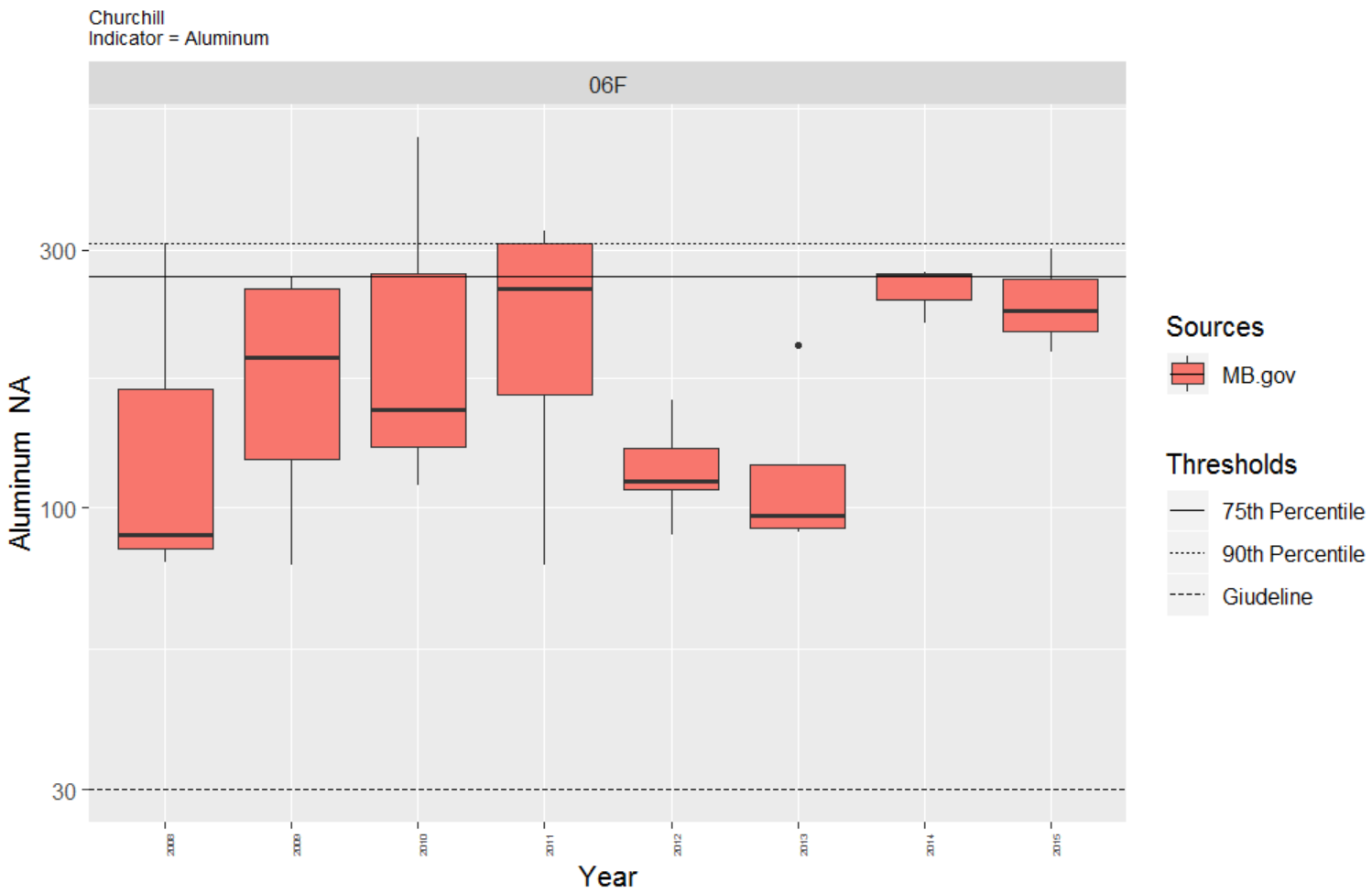
FIGURE. ANALYSIS OF VARIANCE IN EXCEEDANCE OF WATER QUALITY THRESHOLDS OVER TIME FOR MONITORING STATIONS IN THE CHURCHILL BASIN, SUB-WATERSHED AND BY PARAMETER IN THE PROVINCE OF MANITOBA.





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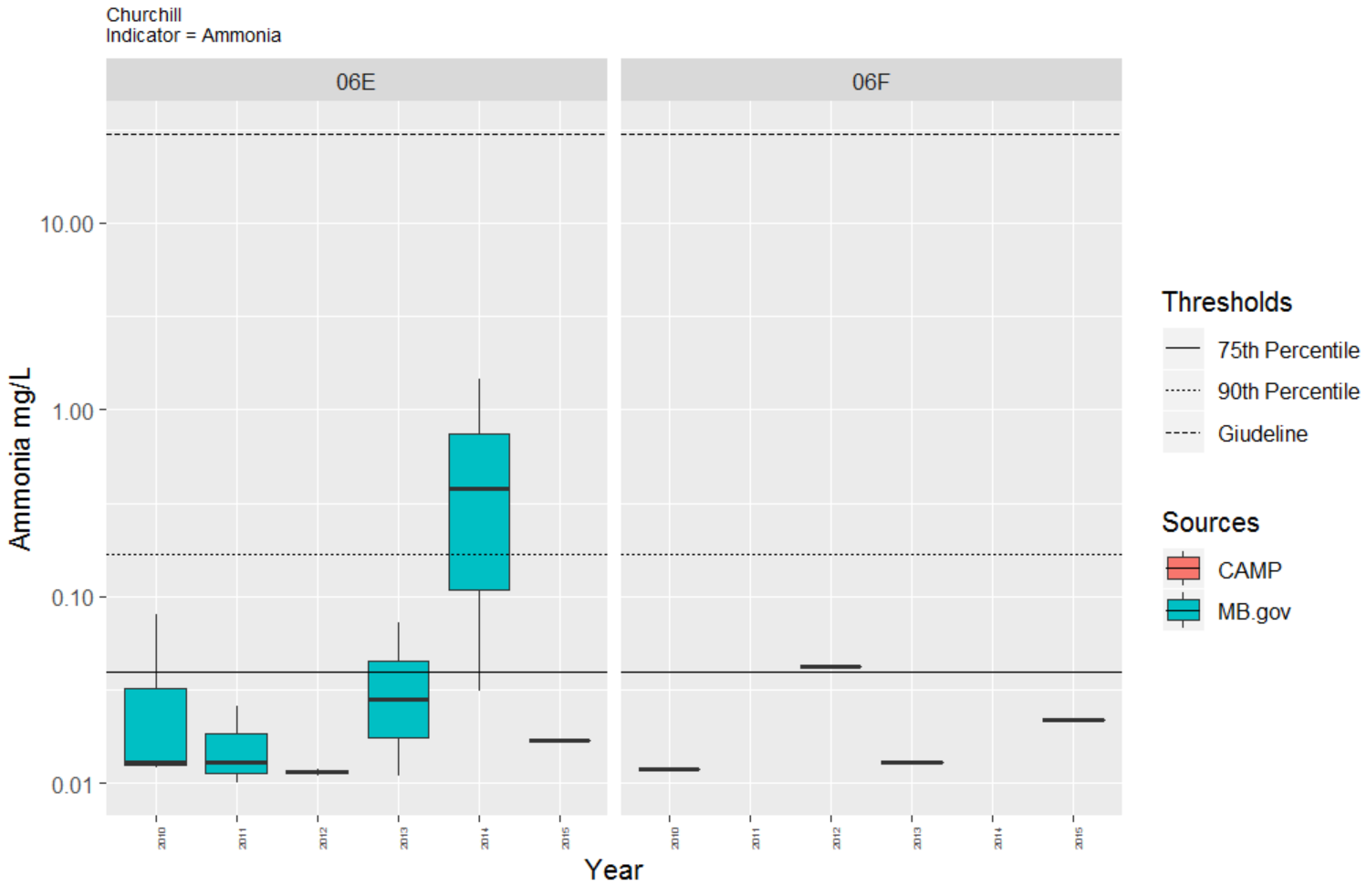

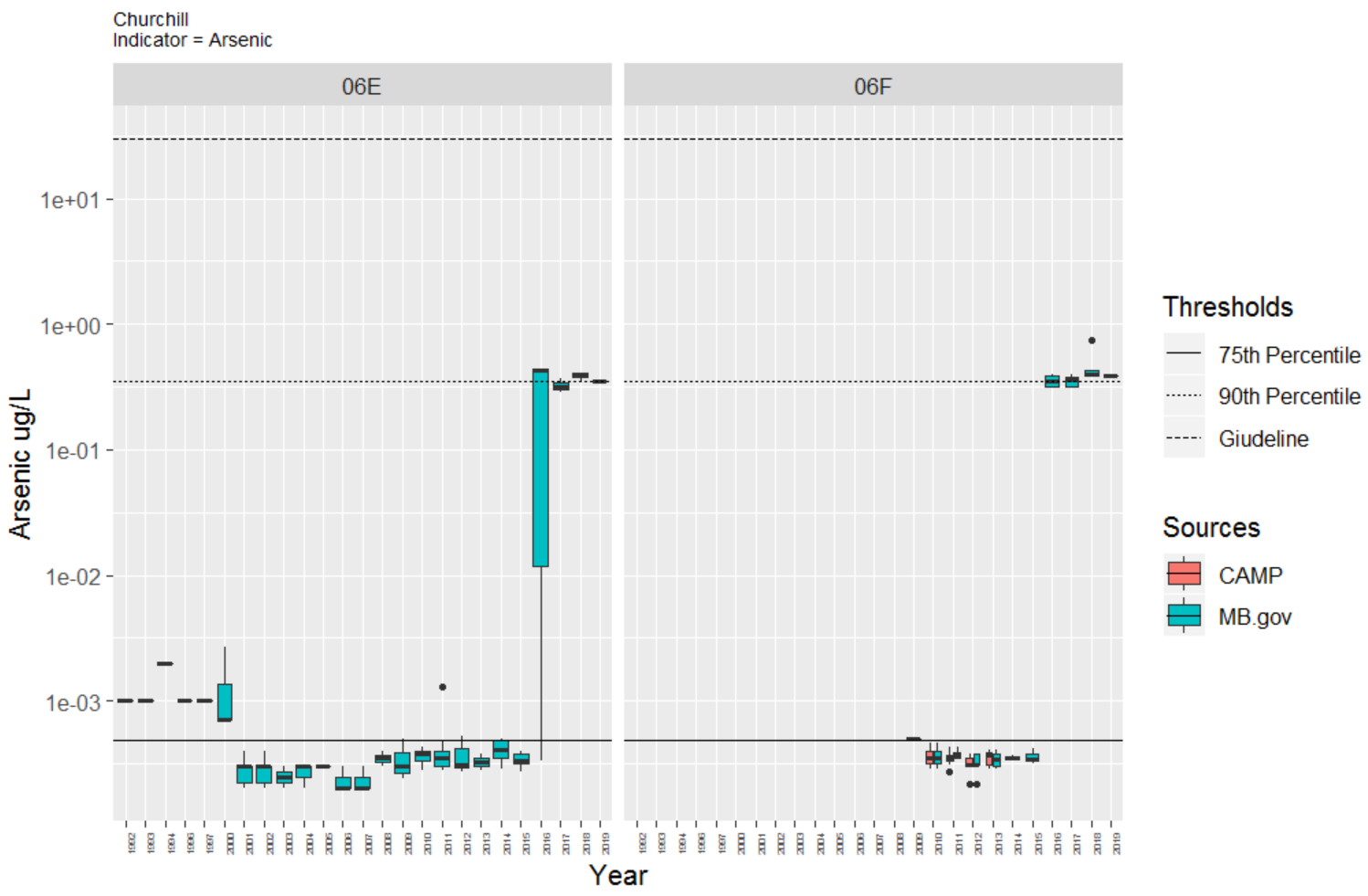

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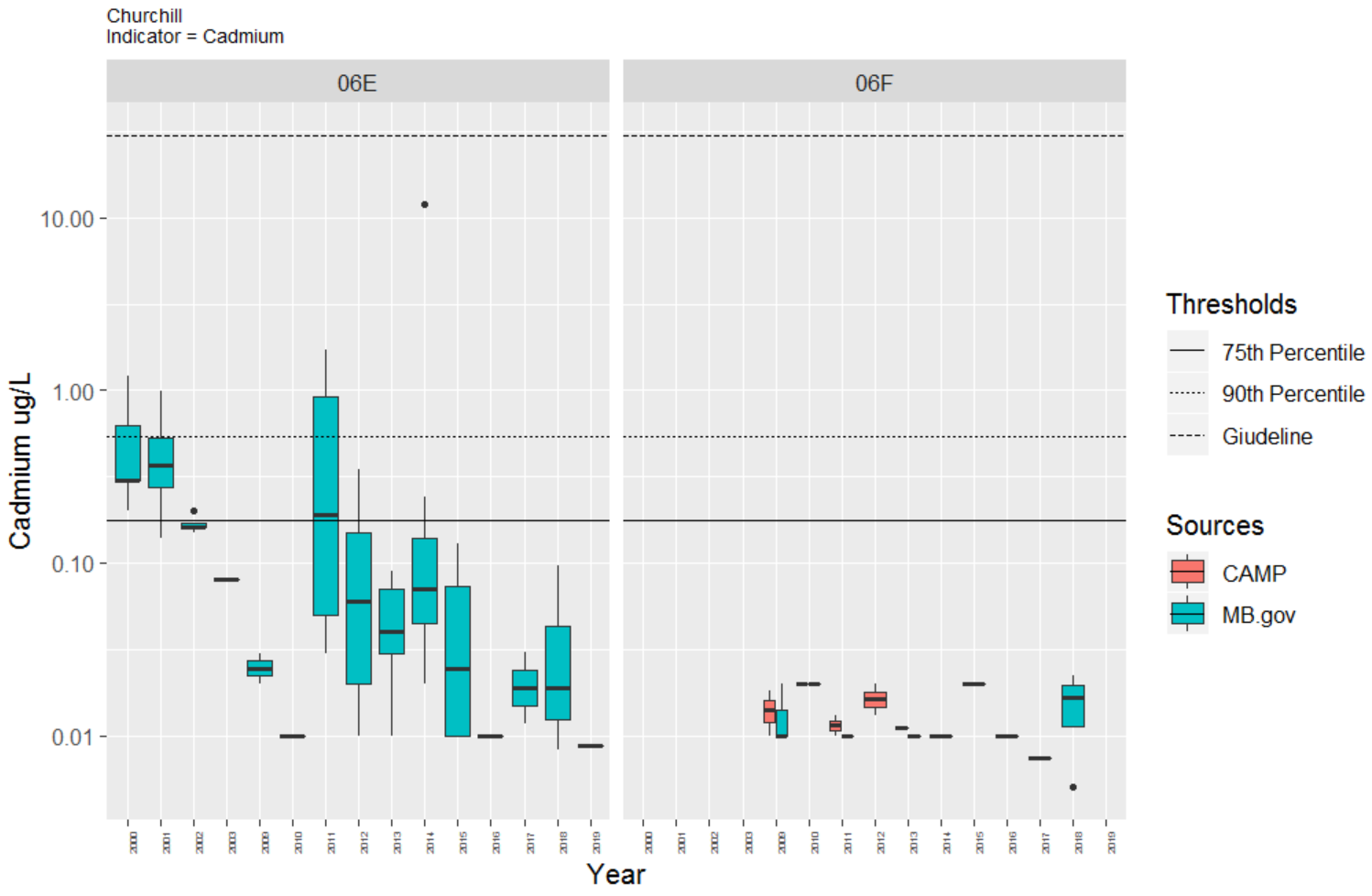

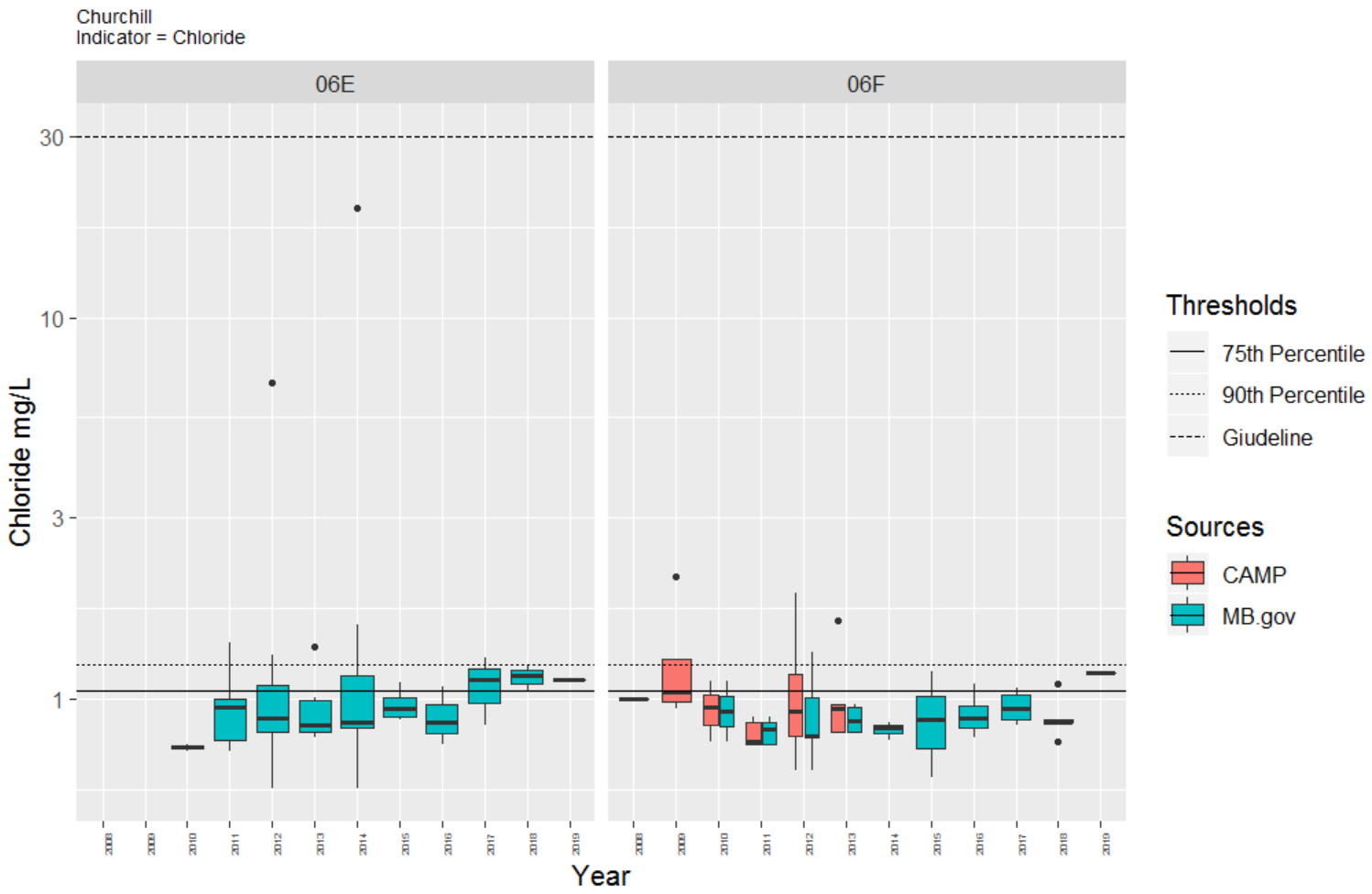

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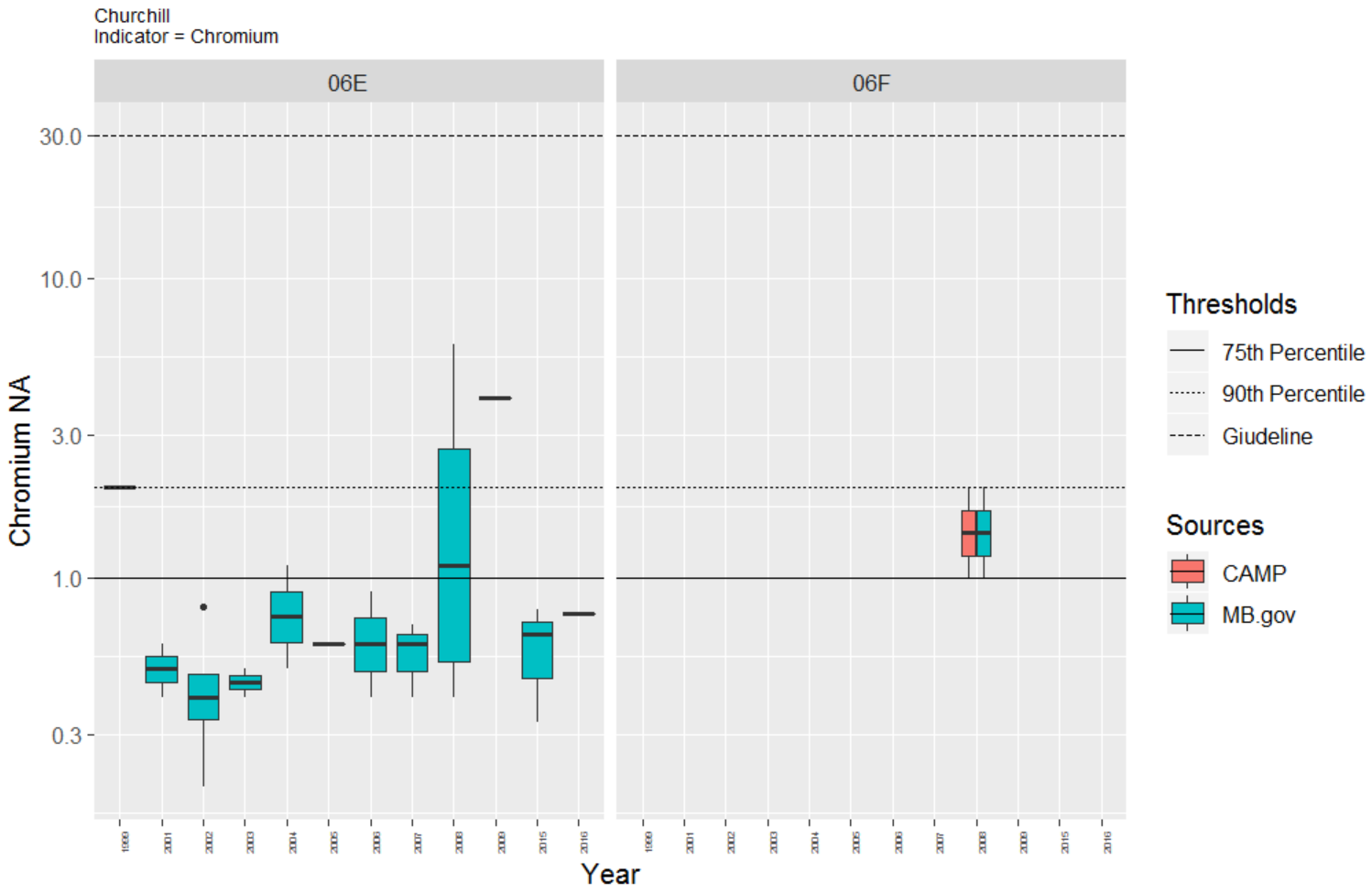

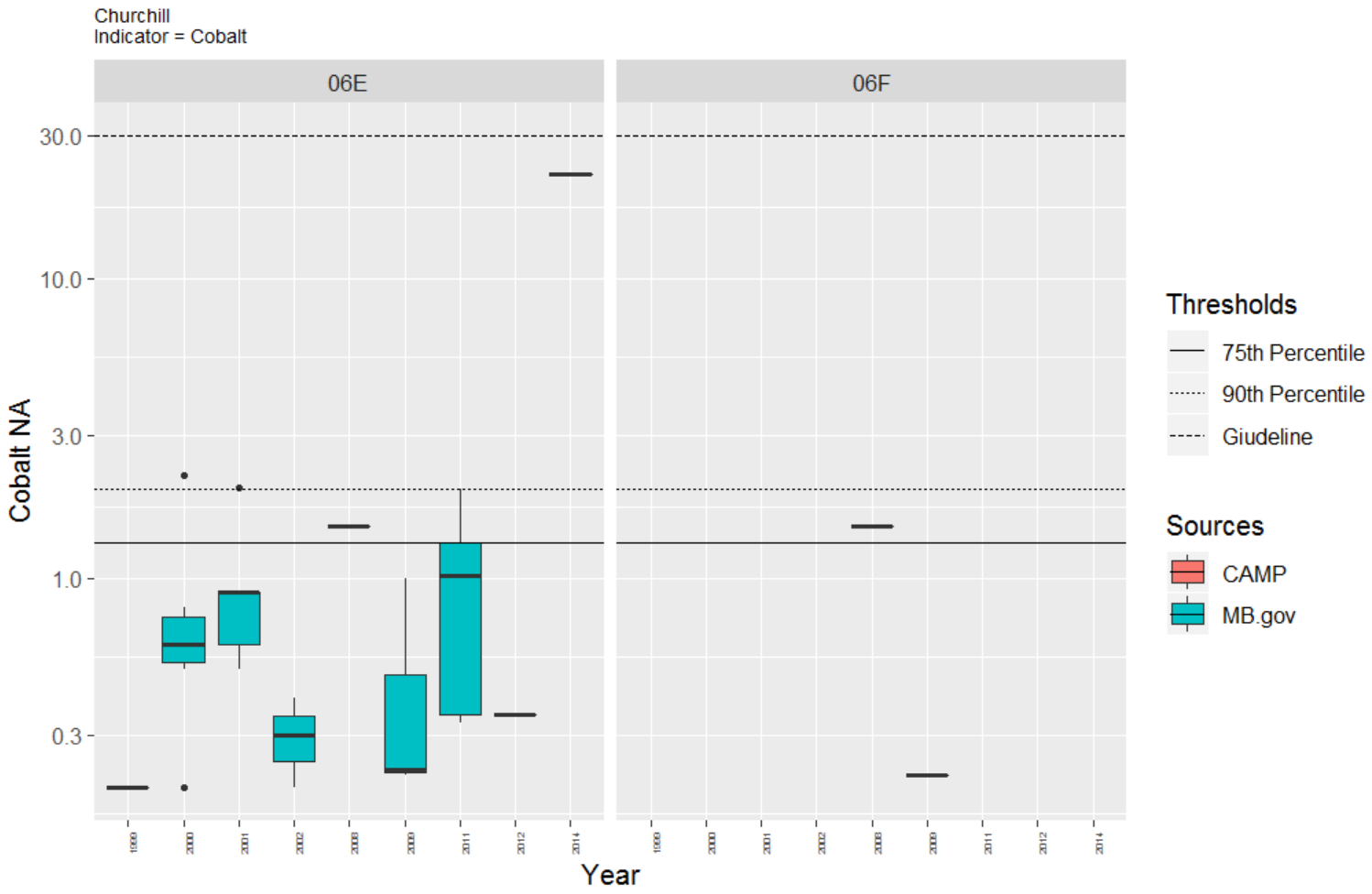

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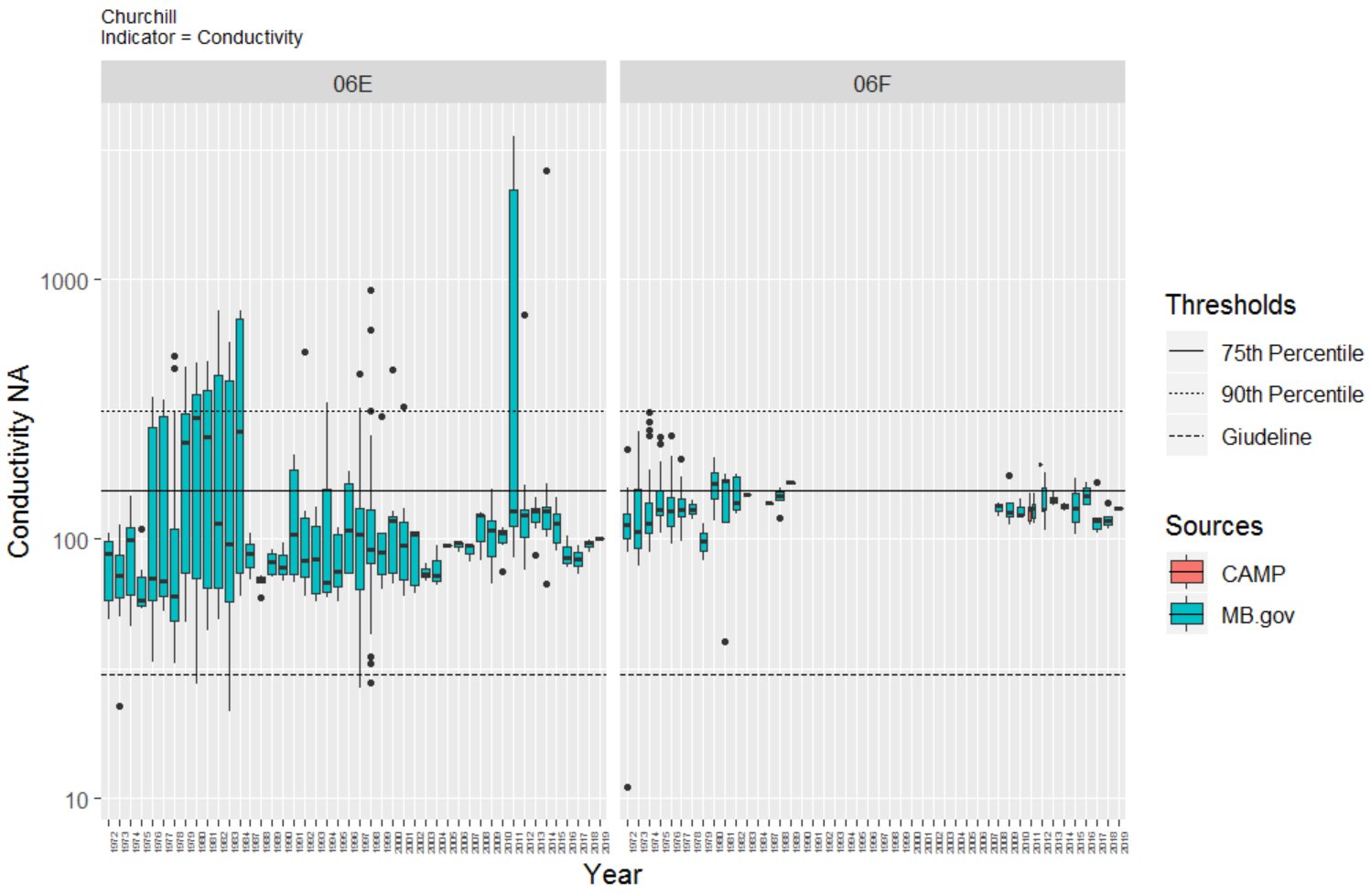

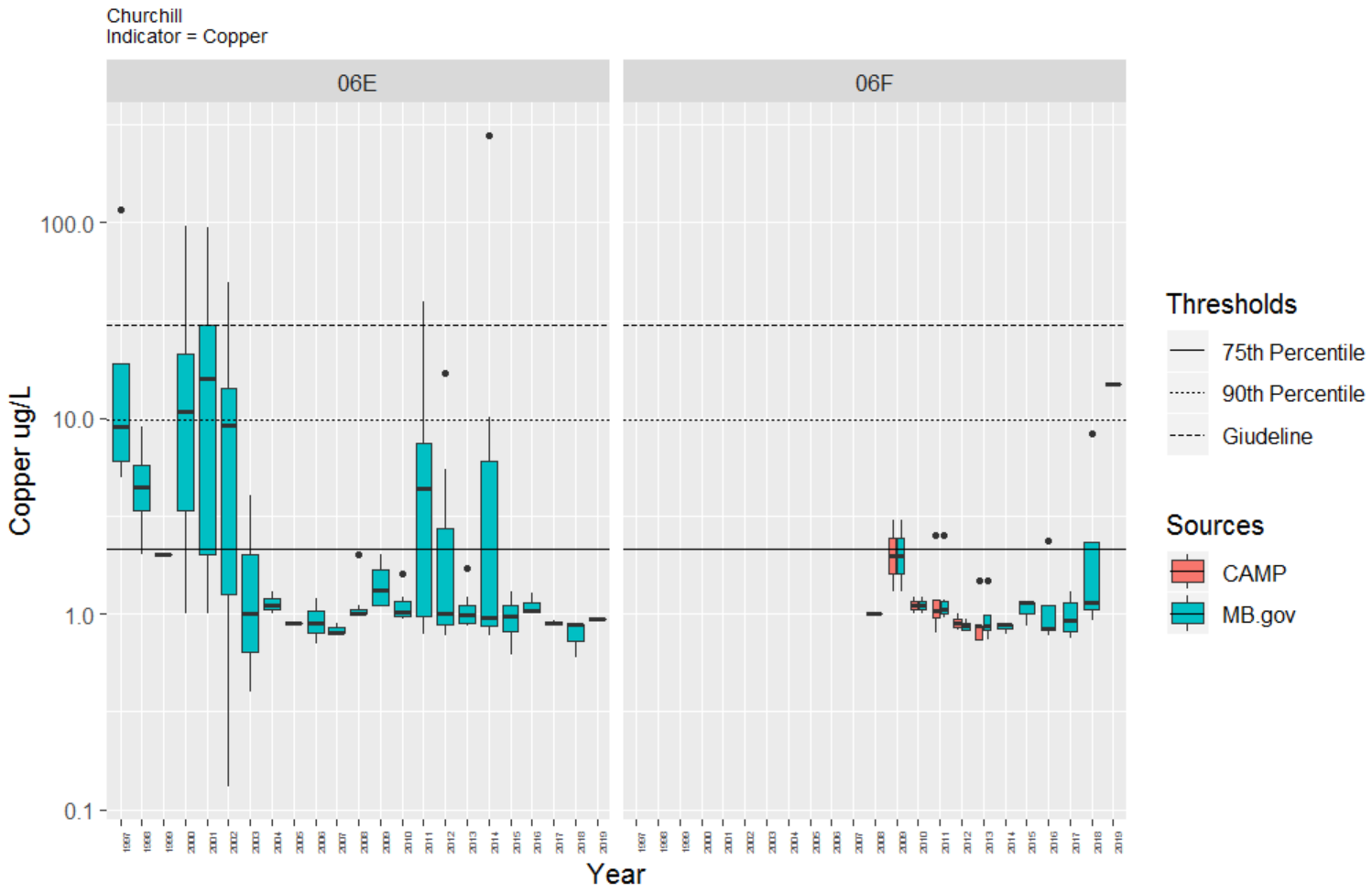

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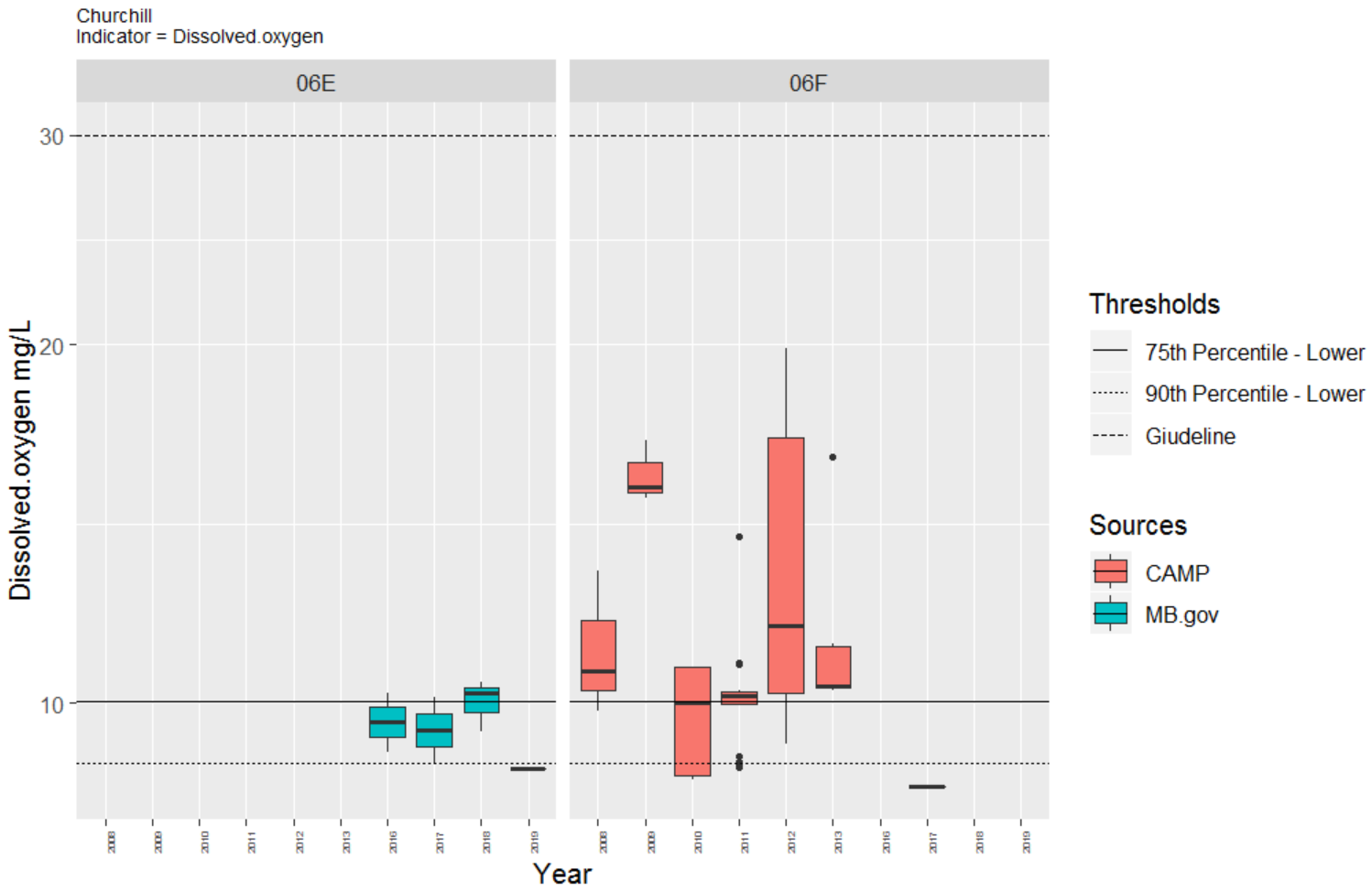

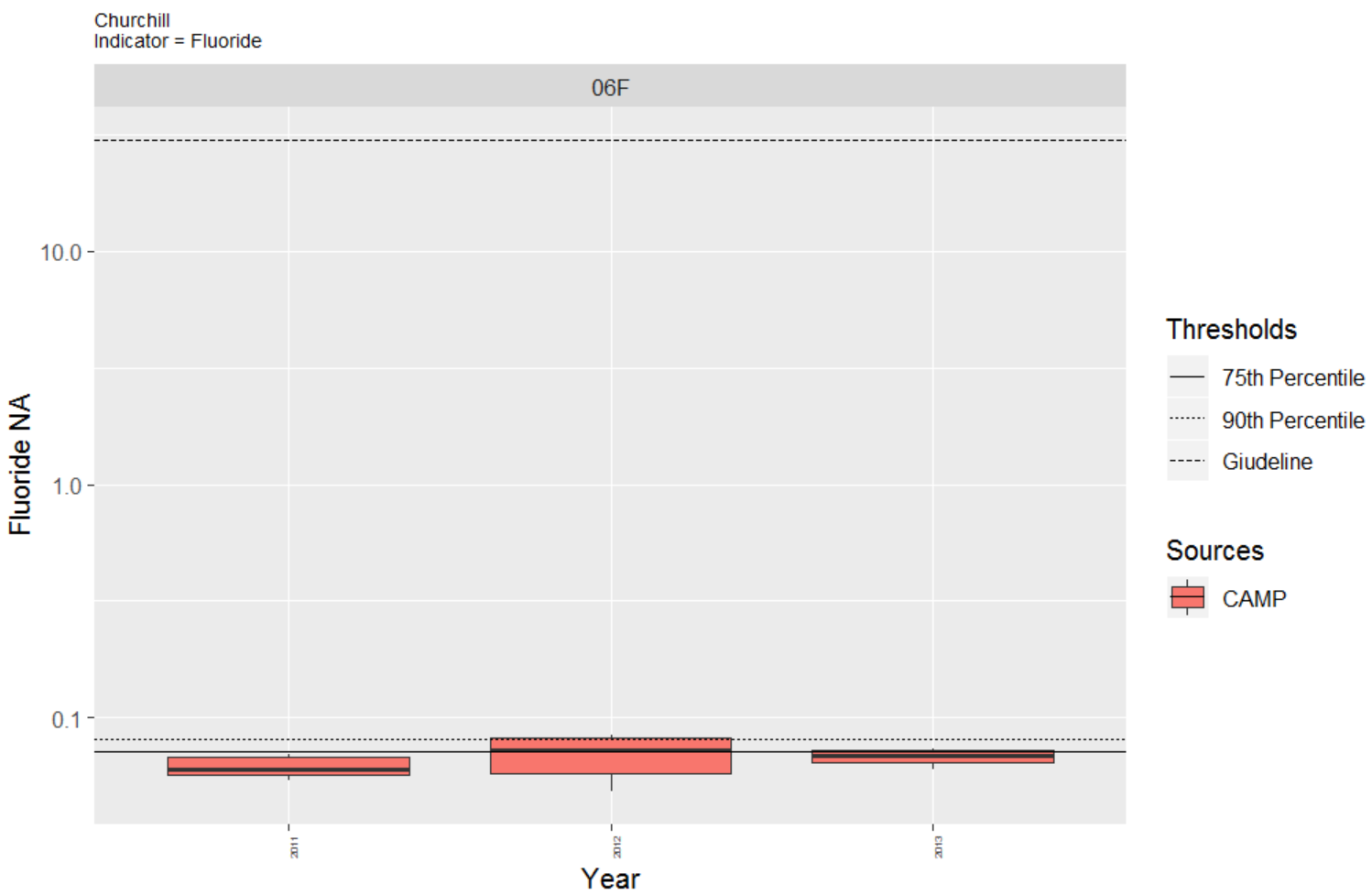

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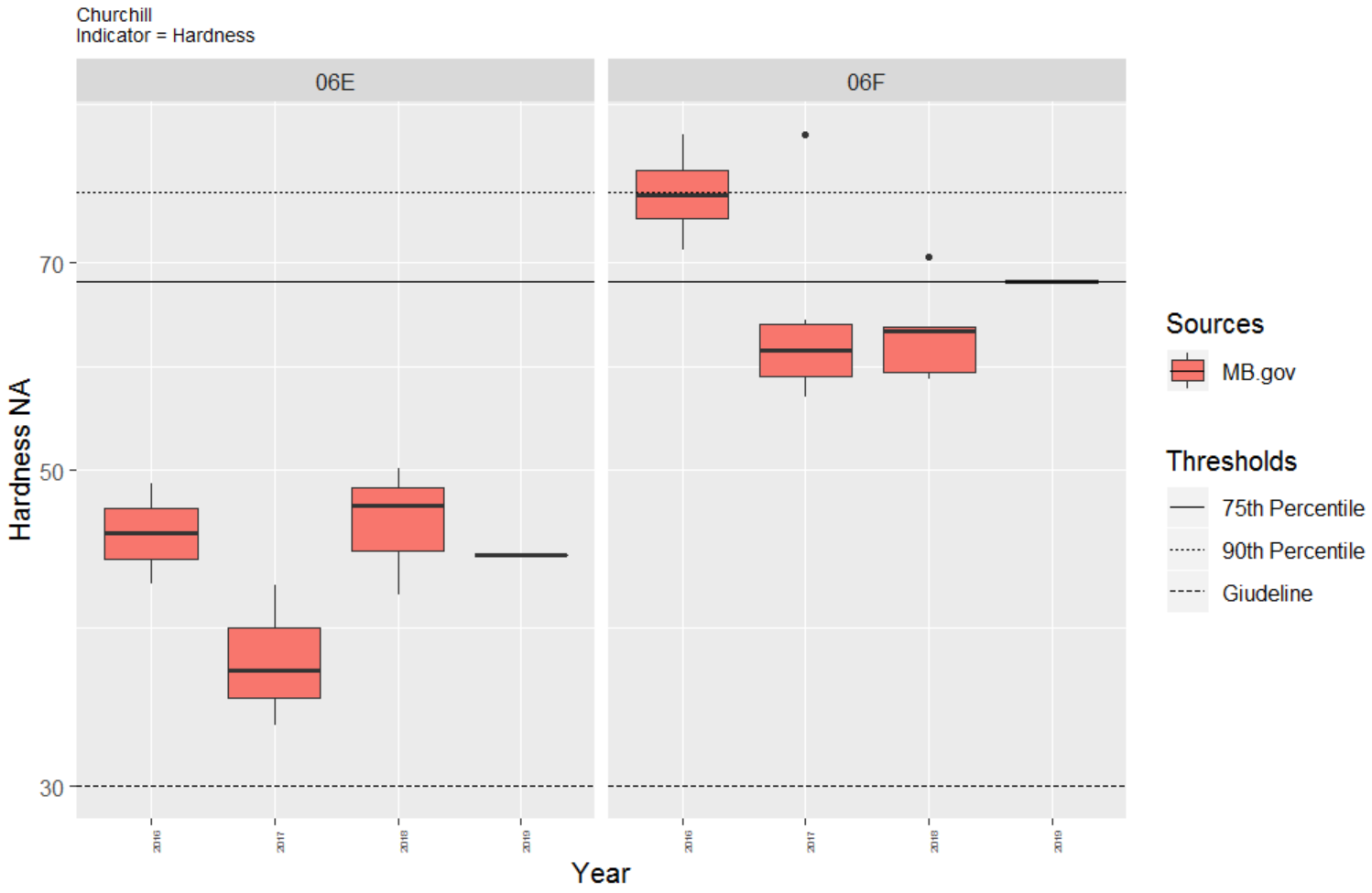

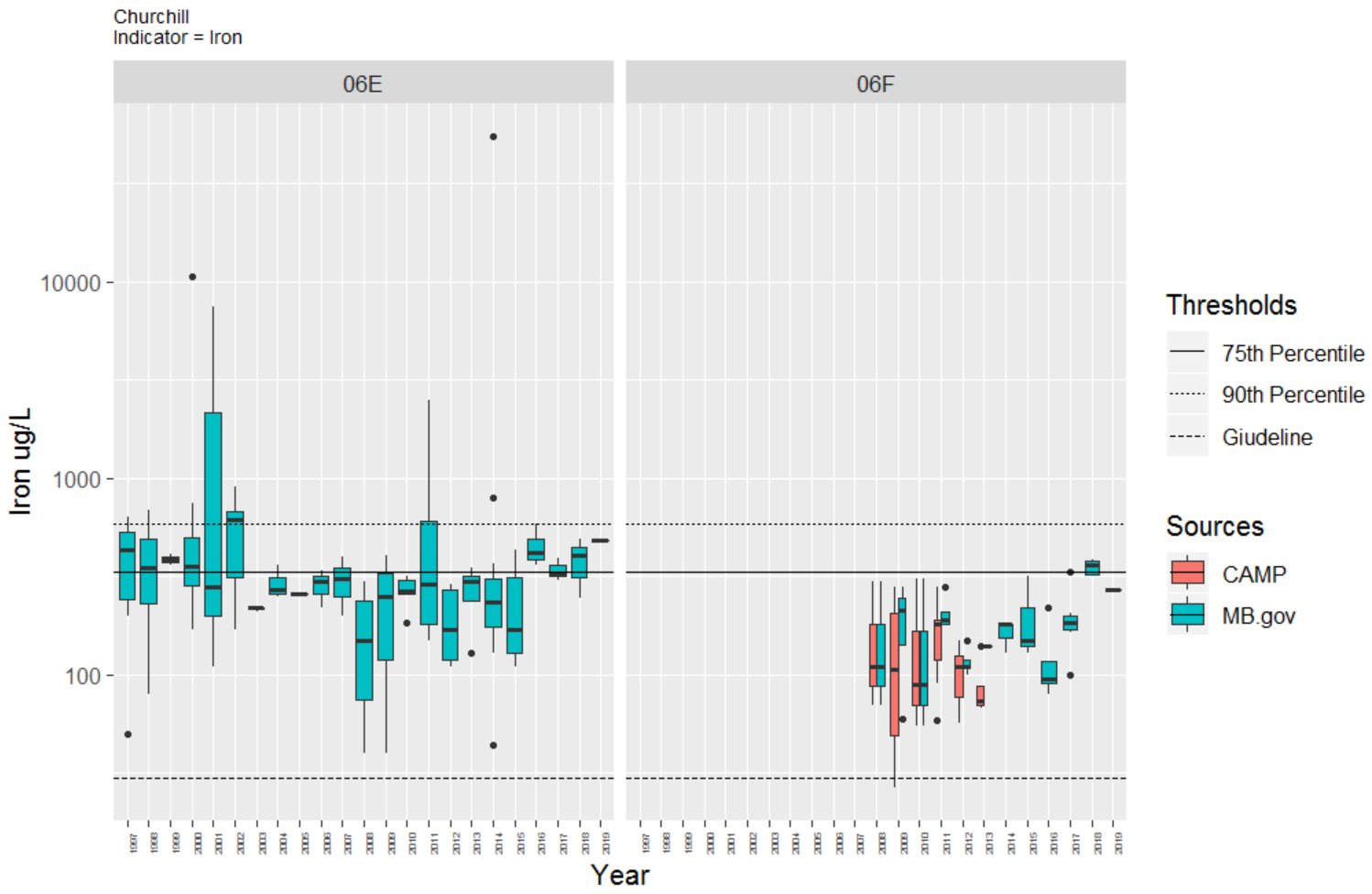

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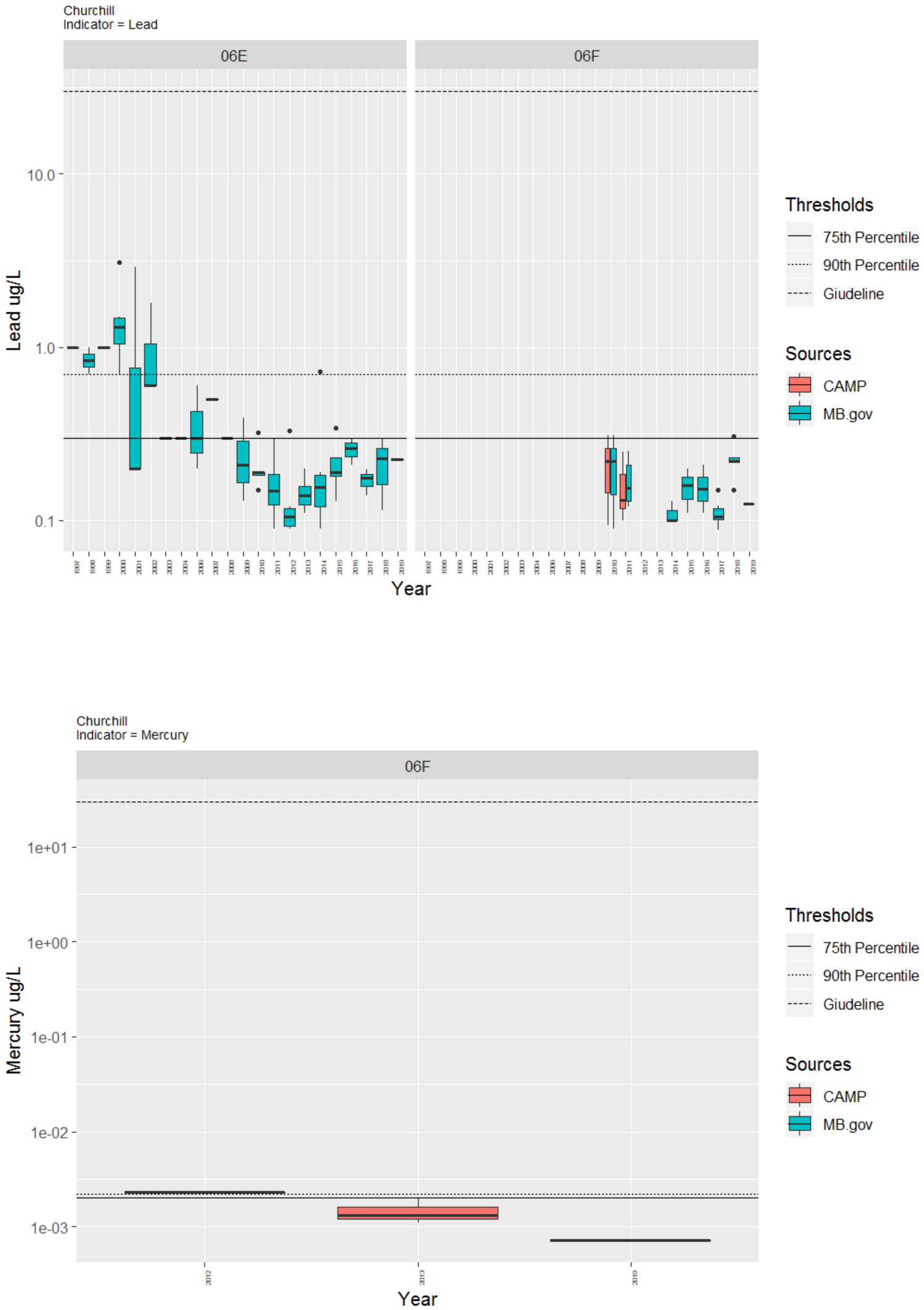

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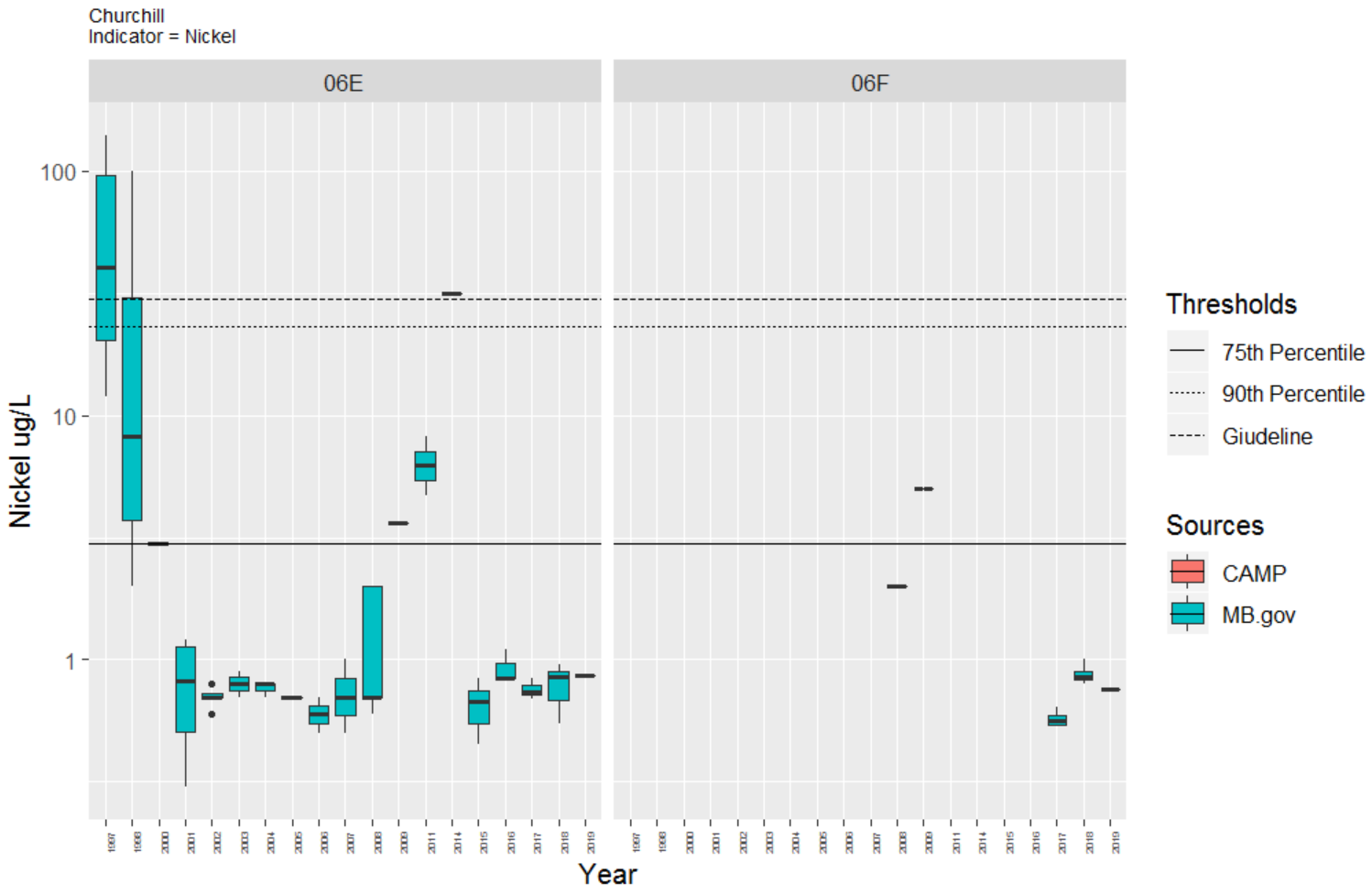

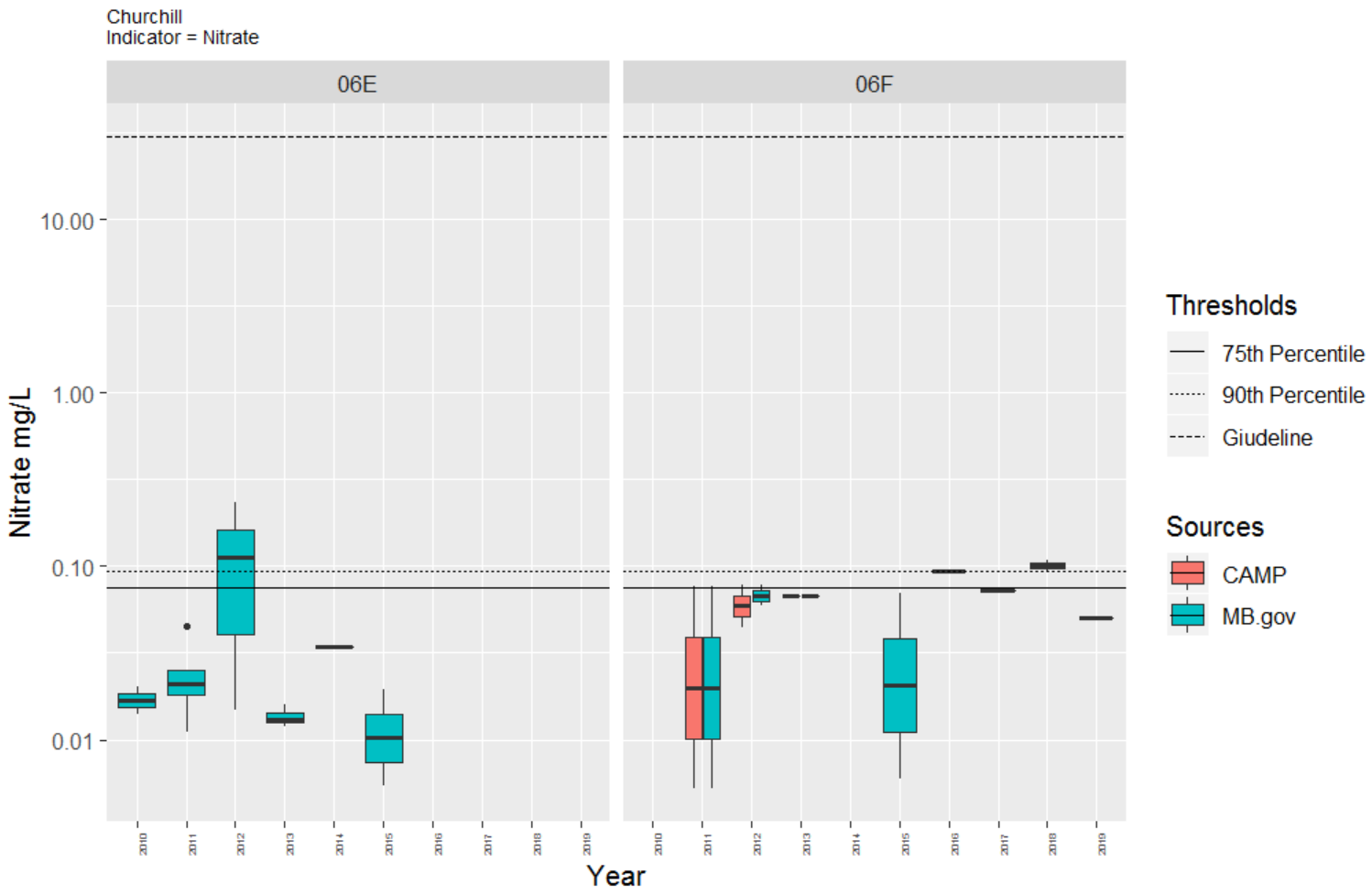

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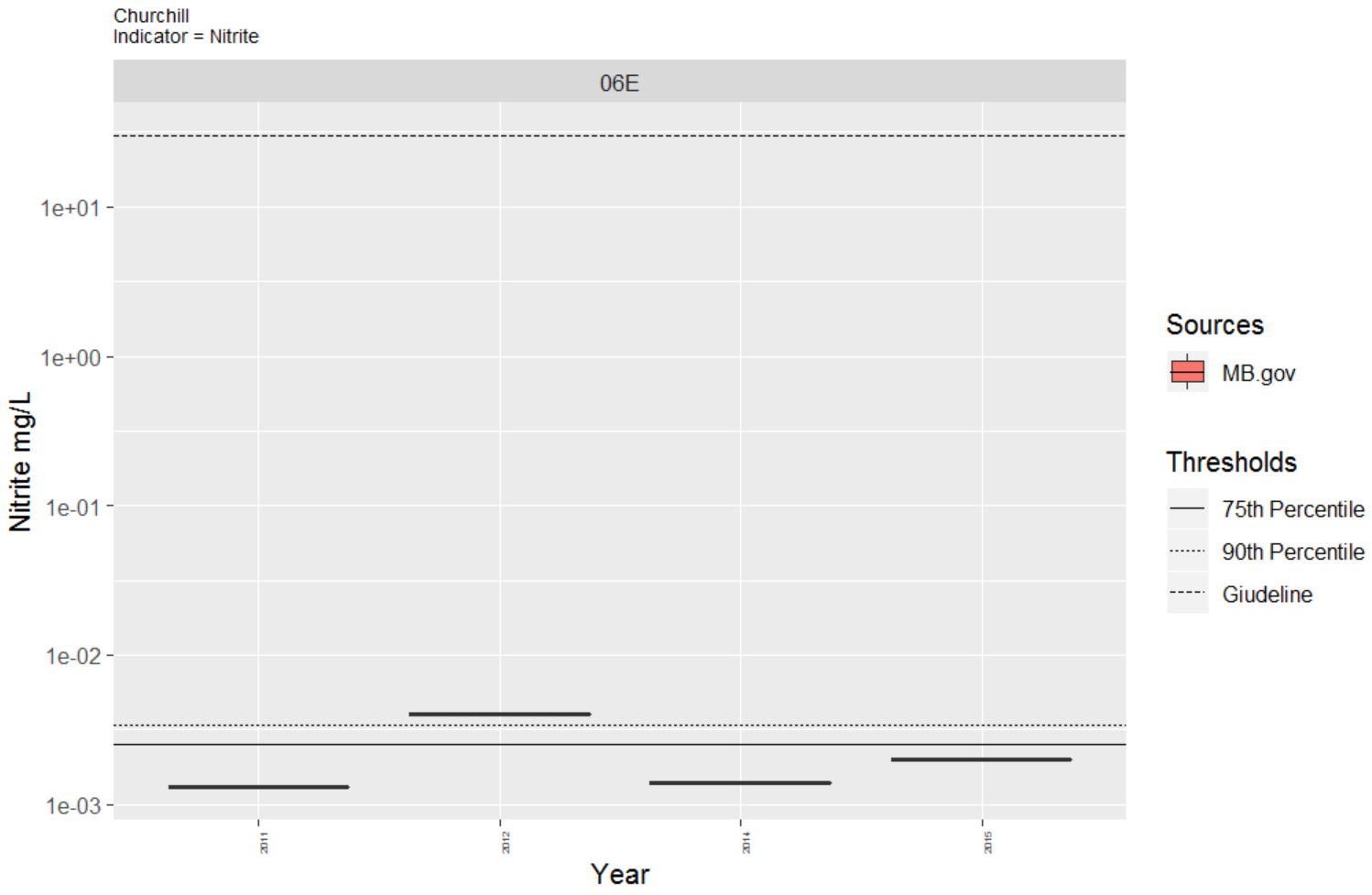

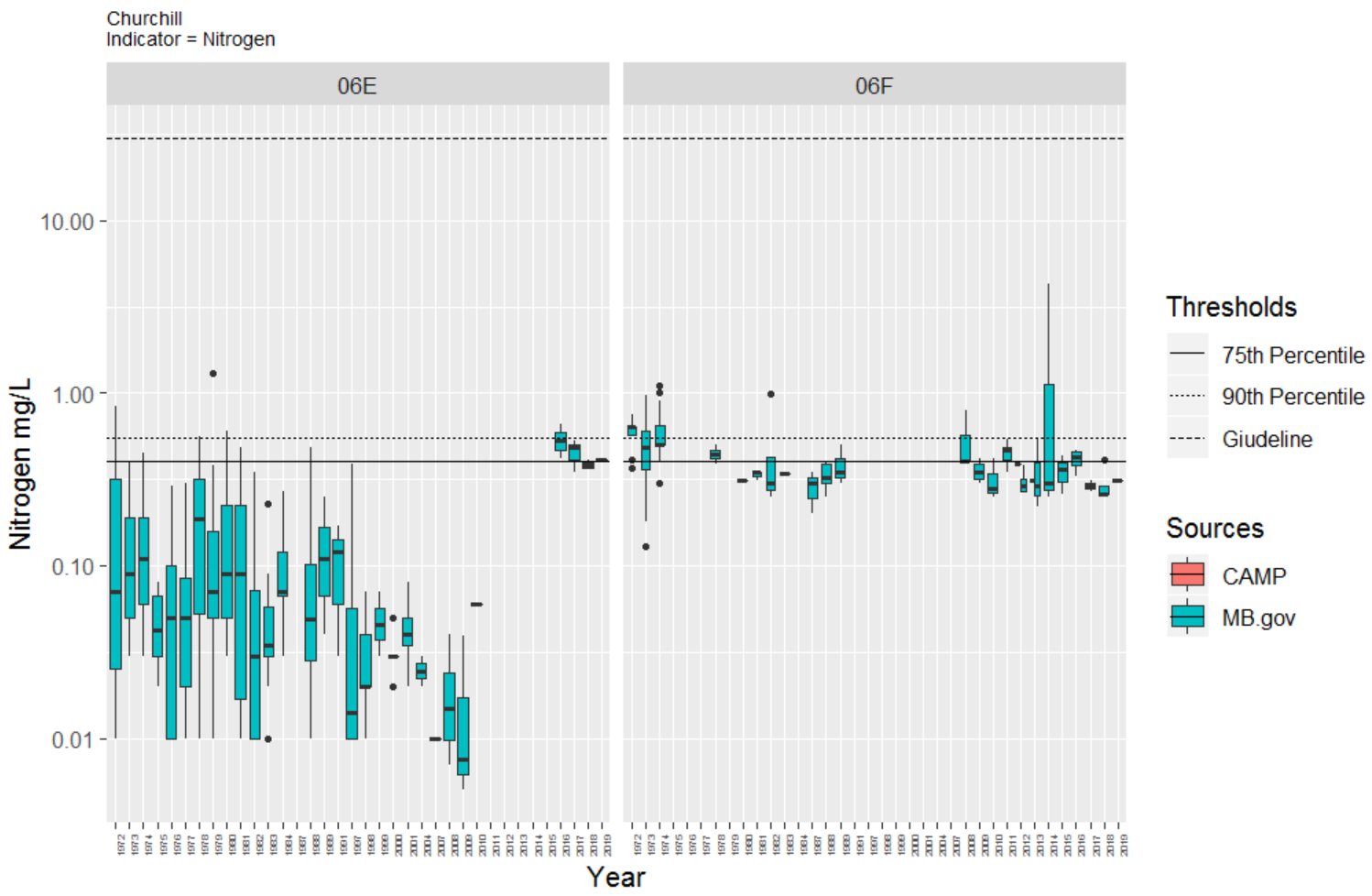

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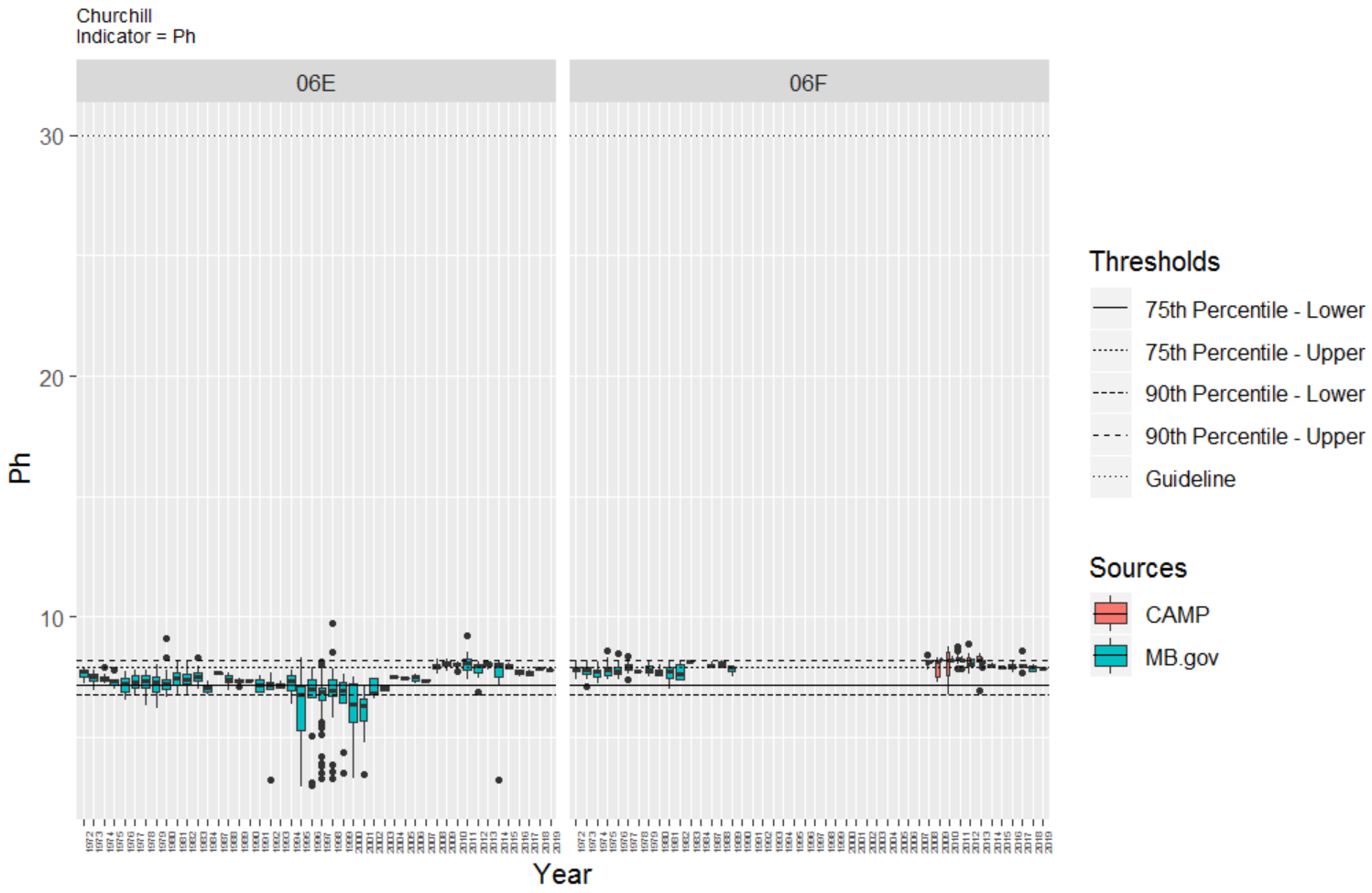

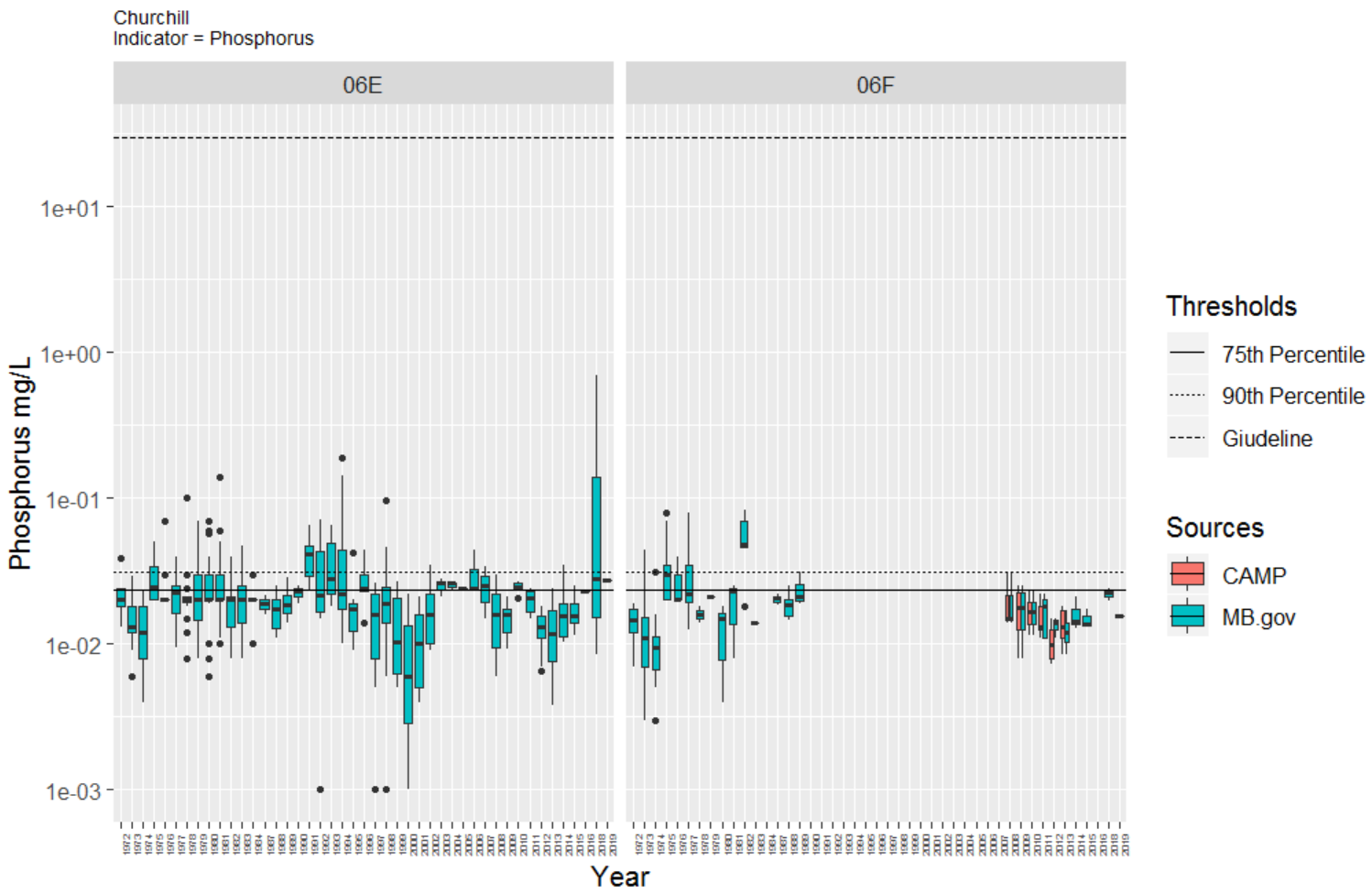

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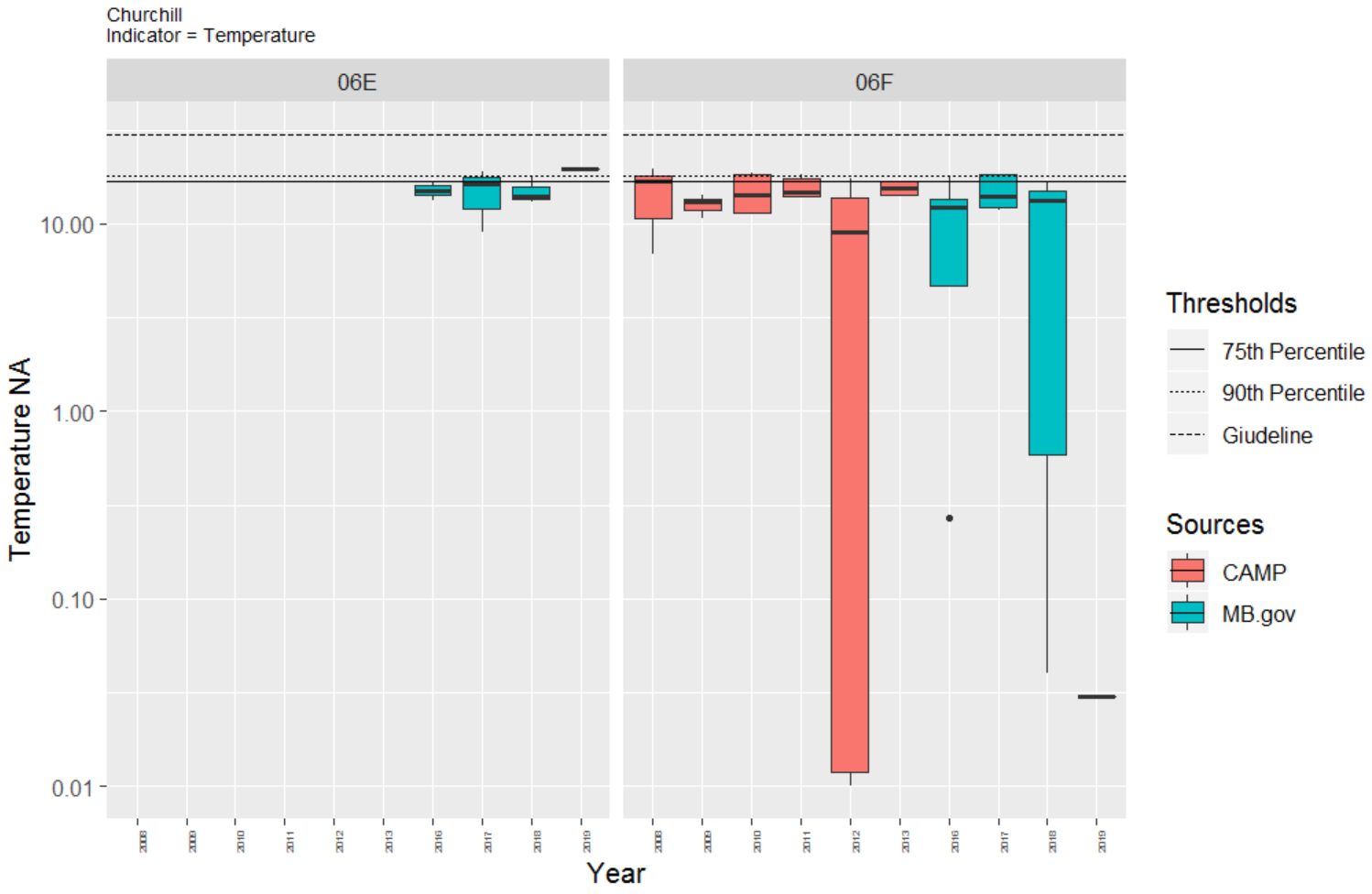

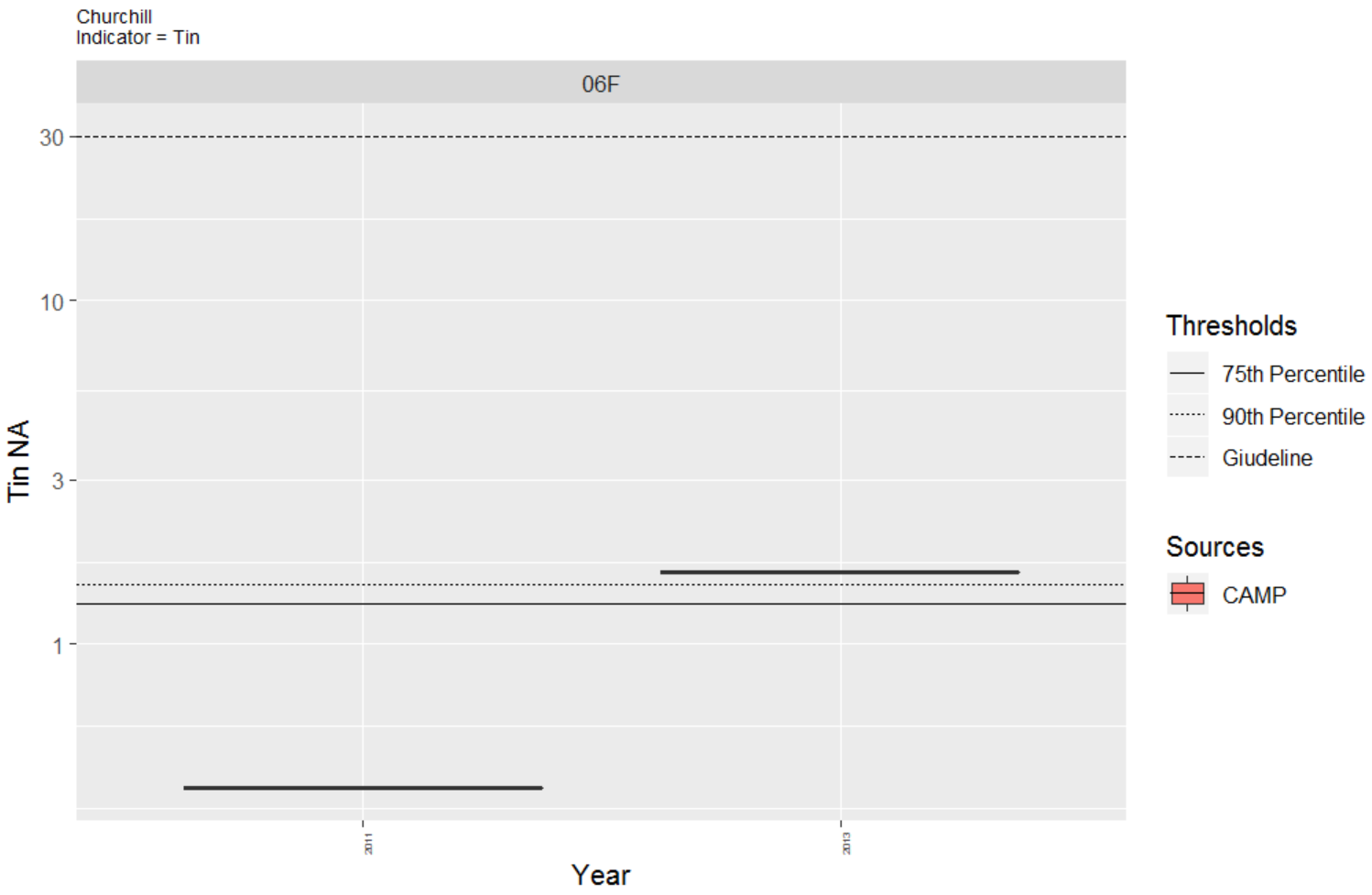

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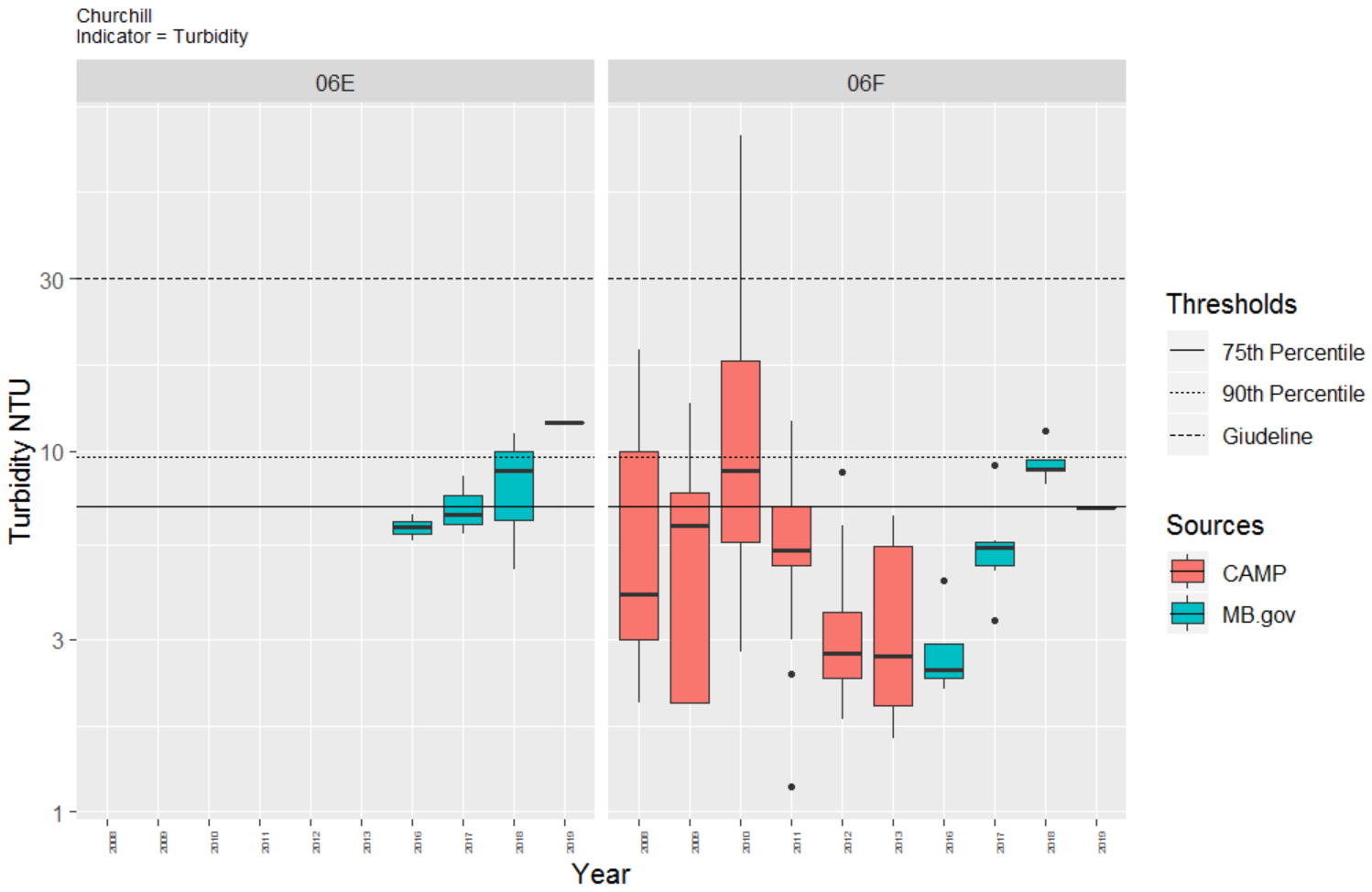

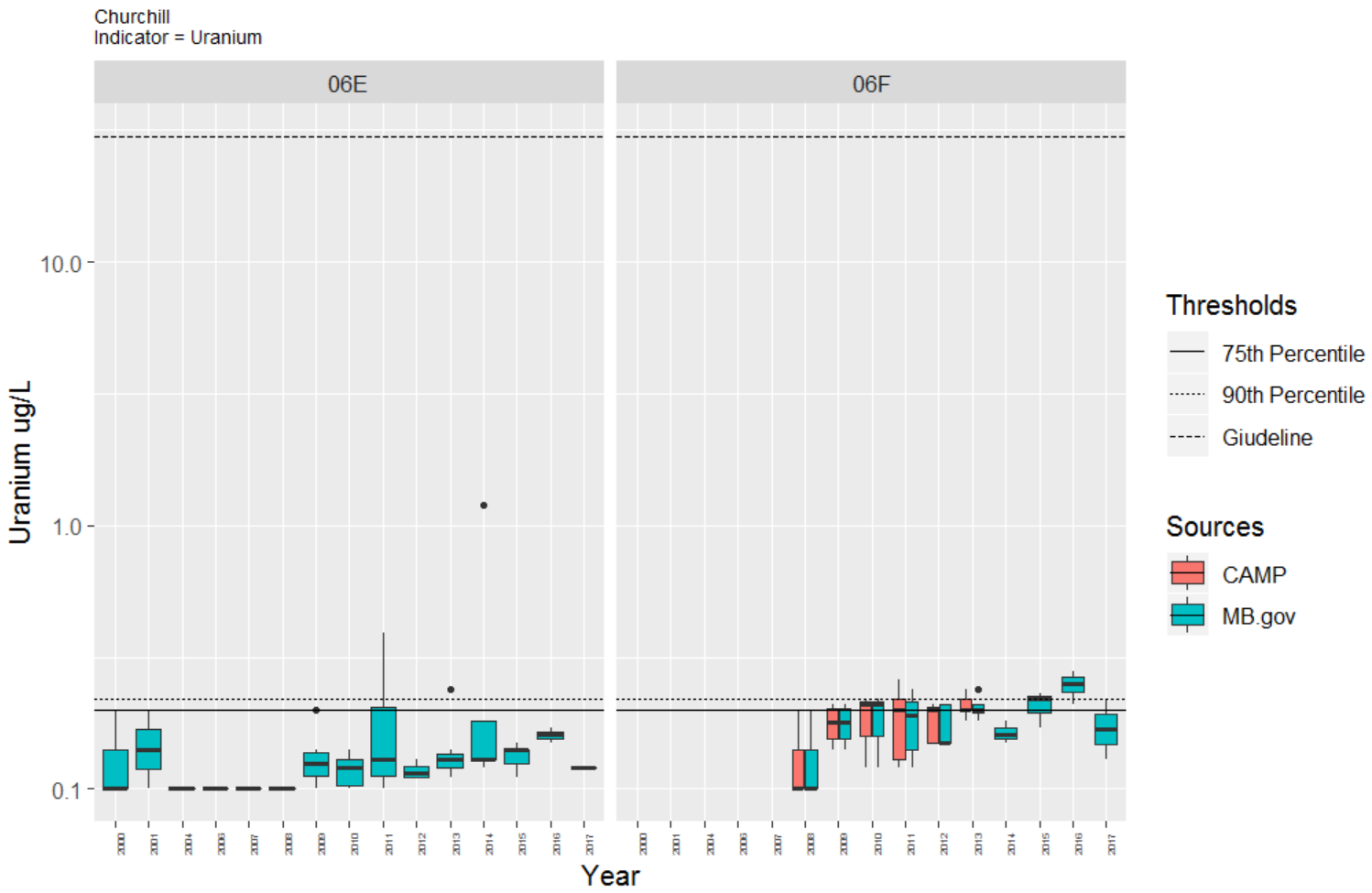

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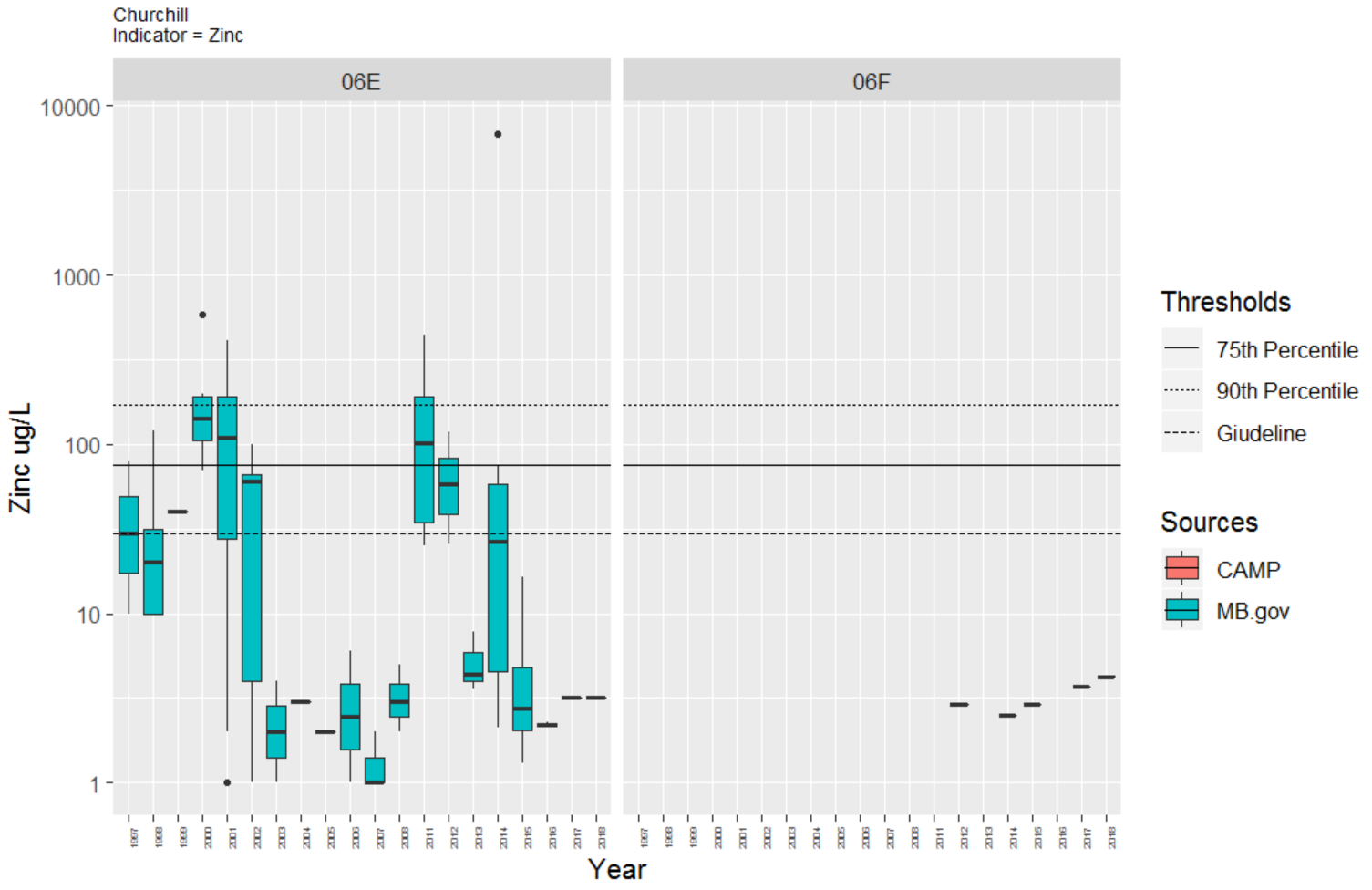

TABLE. RESULTS OF MANN-KENDALL NON-PARAMETRIC TREND ANALYSIS OF ANNUAL EXCEEDANCE OF WATER QUALITY THRESHOLDS OVER TIME IN THE CHURCHILL WATERSHED, BY SUB-WATERSHED AND DATA SOURCE.

	Scale	Source	Start Year	End Year	Number of Years	Number of Sites	Theil-Sen Slope	Mann-Ken Score	Mann-Ken p-value	
Saskatchewan	Saskatchewan portion of the Churchill Basin	All	1970	2019	49	54	0.00	80	0.51	
		EC	2000	2019	20	2	0.00	-93	0.00	**
		SaskH2O	2016	2019	4	3	0.04	4	0.33	
		WSA	1970	2016	46	47	0.00	355	0.00	**
	06A - Beaver	All	1970	2019	43	19	0.00	-164	0.17	
		EC	2000	2019	20	1	0.00	-118	0.00	***
		SaskH2O	2016	2019	4	2	0.04	4	0.33	
		WSA	1970	2016	37	18	0.00	-9	0.94	
	06B - Upper Churhcill	All	1973	1999	18	5	0.00	-10	0.85	
		WSA	1973	1999	18	5	0.00	-10	0.85	
	06C - Central Churchill	All	1971	2019	41	16	0.00	-66	0.55	
		PN.CABIN	2008	2010	3	5	NA	NA	NA	
		SaskH2O	2016	2019	4	1	0.00	-3	0.37	
		WSA	1971	2016	38	11	0.00	-6	0.96	
	06D - Reindeer	All	1971	2006	27	13	0.00	-6	0.94	
		WSA	1971	2006	27	13	0.00	-6	0.94	
	06E - Central Churchill, Lower	All	2000	2019	20	1	0.00	-19	0.56	
		EC	2000	2019	20	1	0.00	-19	0.56	
Manitoba	Manitoba portion of the Churchill Basin	All	1972	2019	46	67	0.00	421	0.00	***
		CAMP	2008	2013	6	29	0.02	3	0.72	
		MB.gov	1972	2019	46	38	0.00	417	0.00	***
	06E - Central Churchill, Lower	All	1972	2019	46	24	0.00	469	0.00	***
		MB.gov	1972	2019	46	24	0.00	469	0.00	***
	06F - Lower Churchill	All	1972	2019	27	43	0.00	151	0.18	
		CAMP	2008	2013	6	29	0.02	3	0.72	
		MB.gov	1972	2019	27	14	0.00	127	0.26	
Alberta	Alberta portion of the Churchill Basin	All	2000	2019	20	4	0.00	25	0.44	
		AEP	2015	2019	5	3	0.01	2	0.82	
		EC	2000	2019	20	1	0.00	-1	1.00	
	06A - Beaver	All	2000	2019	20	4	0.00	25	0.44	
		AEP	2015	2019	5	3	0.01	2	0.82	
		EC	2000	2019	20	1	0.00	-1	1.00	

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FISH

OVERALL FISH HEALTH SCORING

				Sub-watershed						Basin
	Indicator			06A - Beaver	06B - Upper Churchill (Man.)	06C - Central Churchill (Man.)	06D - Reindeer	06E - Central Churchill (Man.) Lower	06F - Lower Churchill (Man.)	
Fish	Change in Native Fish Species Richness		Period of Study	1954-2018	2018-2019	-	2016-2017	-	2008-2014	1954-2019
			Number of Sites	808	1	-	3	-	106	918
		Presence of statistically significant decline in number of total species observed per year.	Trend	None	-	-	-	-	None	None
		Presence of statistically significant decline in median species richness for the basin.	Trend	None	-	-	-	-	None	None
			Fish Health Category	Good	Data deficient	Data deficient	Data deficient	Data deficient	Data deficient	Data deficient
			Fish Health Score	4	0	0	0	0	0	0

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FISH DATA SUFFICIENCY

		Sub-Basin						Basin
	Data Sufficiency Indicator	**06A - Beaver**	**06B - Upper Churchill (Man.)**	**06C - Central Churchill (Man.)**	**06D - Reindeer**	**06E - Central Churchill (Man.) Lower**	**06F - Lower Churchill (Man.)**	**Basin**
Fish	Total number of sub-sub-basins	7	4	6	5	3	5	30
	Year of earliest available monitoring	1954	2018	-	2016	-	2008	2008
	Number of sampling locations available for earliest monitoring	1	1	-	1	-	12	15
	Number of sub-sub-basins with earliest available sampling locations	1	1	-	1	-	2	5
	Earliest year of continuous monitoring	1977	2018	-	2016	-	2008	2008
	Number of sampling locations available for first year of continuous monitoring	8	1	-	1	-	12	12
	Number of sub-sub-basins for first year of continuous monitoring	1	1	-	1	-	2	2
	Year of most recently available monitoring	2018	2019	-	2017	-	2014	2019
	Number of monitoring stations available within last five years	75	1	-	3	-	0	79
	Number of sub-sub-basins within last five years	4	1	-	1	-	0	6
	Number of years of sampling in last 10 years	9	2	0	2	0	5	9
	Overall Data Sufficiency Category	Partially Sufficient	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient
	Data Sufficiency Score	1	0	0	0	0	0	0

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MAP. FISH COMMUNITY RICHNESS IN THE CHURCHILL BASIN (2015-2018), MEDIAN VALUE PER SITE.

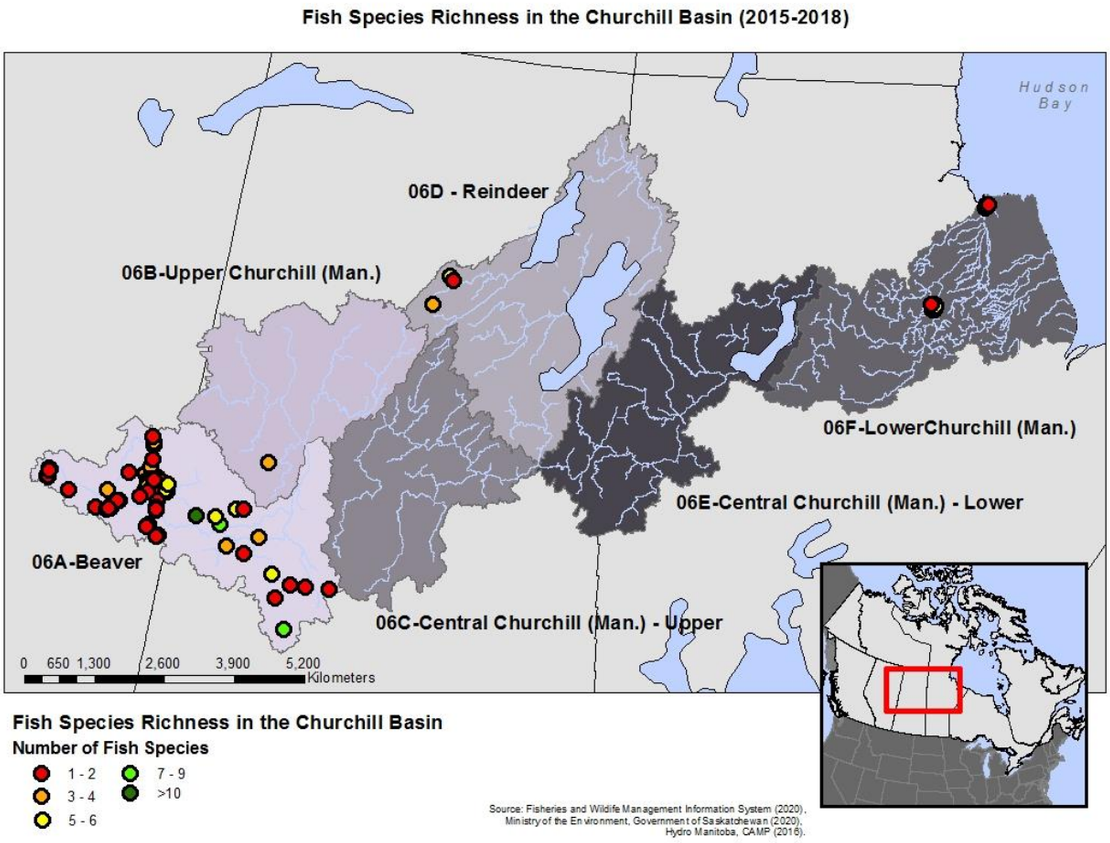

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FIGURE. NON-PARAMETRIC ANALYSIS OF VARIANCE IN ANNUAL FISH SPECIES RICHNESS IN THE CHURCHILL BASIN (2008-2019), BY SUB-BASIN.

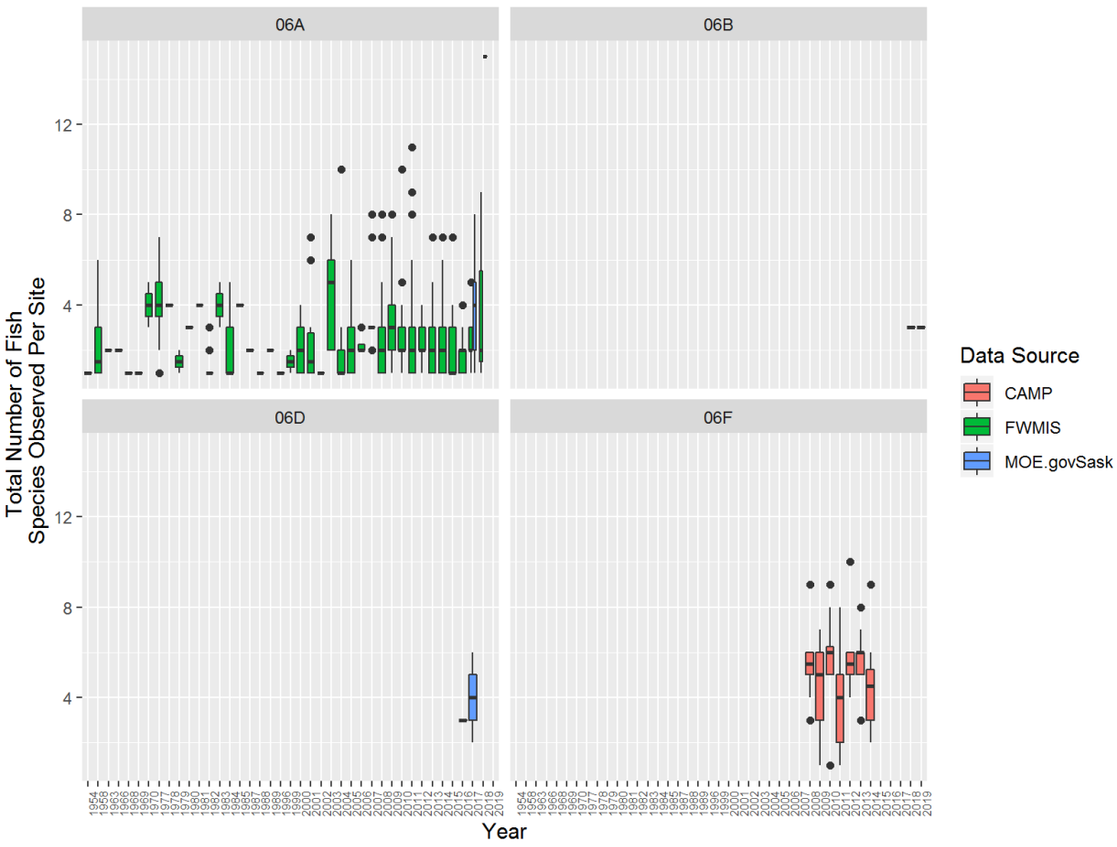

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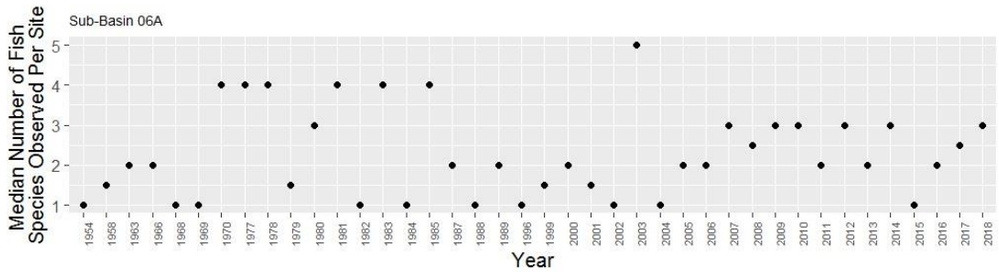
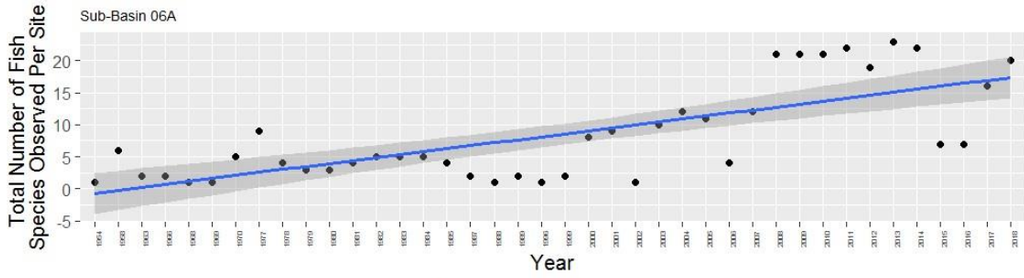
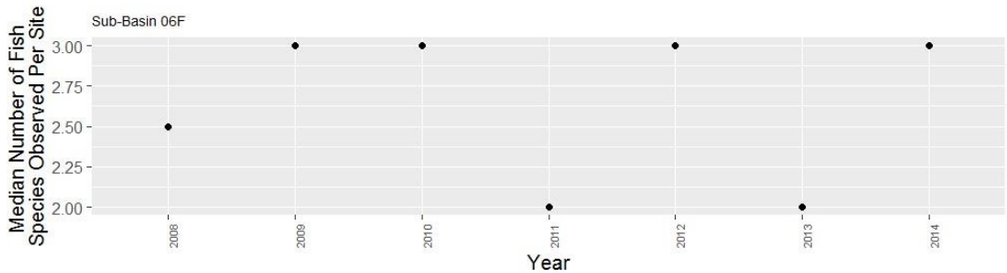
FIGURE.TIME-SERIES OF TOTAL AND MEDIAN NATIVE FISH SPECIES RICHNESS IN THE CHURCHILL BASIN, IN THE CHURCHILL BASIN BY SUB-WATERSHED.



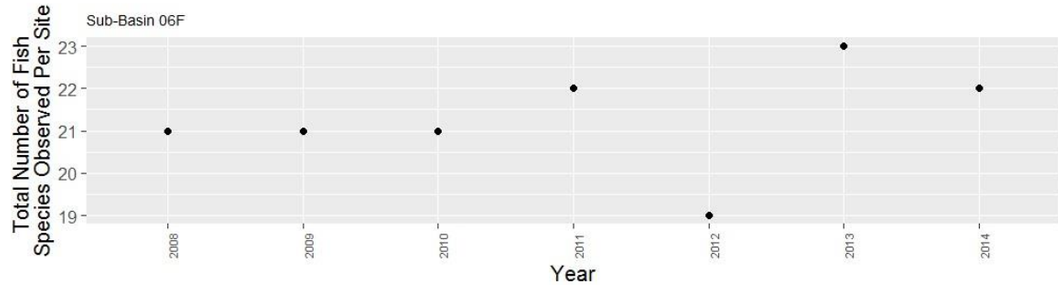
Intercept = 3.6708 ; Intercept STE = 16.646 ; Intercept T-Statistic 0.22053 ; Intercept p-value = 0.82617
Slope = -0.00064499 ; Slope STE = 0.0083471 ; Slope T-Statistic -0.077272 ; Slope p-value = 0.93865
F-Statistic: 0.0059709 ; p-value: 0.9387
Theil-Sen Slope = 0 ; Mann-Kendal Score = -209 ; Mann-Kendall p-value = 0.22864
Data Source:FWMIS



Intercept = -565.77 ; Intercept STE = 78.631 ; Intercept T-Statistic -7.1952 ; Intercept p-value = 9.1239e-10
Slope = 0.28829 ; Slope STE = 0.03943 ; Slope T-Statistic 7.3115 ; Slope p-value = 5.7145e-10
F-Statistic: 53.458 ; p-value: 5.715e-10
Theil-Sen Slope = -0.03125 ; Mann-Kendal Score = -180 ; Mann-Kendall p-value = 0.30879
Data Source:FWMIS



Intercept = 38.554 ; Intercept STE = 197.35 ; Intercept T-Statistic 0.19536 ; Intercept p-value = 0.8528
Slope = -0.017857 ; Slope STE = 0.098133 ; Slope T-Statistic -0.18197 ; Slope p-value = 0.86275
F-Statistic: 0.033113 ; p-value: 0.8628
Theil-Sen Slope = 0 ; Mann-Kendal Score = 0 ; Mann-Kendall p-value = 1
Data Source:CAMP



Intercept = -337.82 ; Intercept STE = 496.56 ; Intercept T-Statistic -0.68033 ; Intercept p-value = 0.52652
Slope = 0.17857 ; Slope STE = 0.24692 ; Slope T-Statistic 0.7232 ; Slope p-value = 0.50196
F-Statistic: 0.52301 ; p-value: 0.502
Theil-Sen Slope = 0.2 ; Mann-Kendal Score = 7 ; Mann-Kendall p-value = 0.34076
Data Source:CAMP

Disclaimer: This analysis reflects currently accessible and available data that aligns with our nationally consistent suite of indicators, as of August 2020.

TABLE. RESULTS OF MANN-KENDALL NON-PARAMETRIC TREND ANALYSIS OF FISH SPECIES RICHNESS OVER TIME IN THE CHURCHILL WATERSHED.

Analysis	Source	WSCSDA	Start Year	Theil-Sen Slope	Mann-Ken S	Mann-Ken p-value	
Total Richness	CAMP	06F - Lower Churchill	2008	0.2	7	0.34	
	FWMIS	06A - Beaver	1954	-0.03	-180	0.31	
	CAMP;FWMIS;MOE.govSask	Churchill Basin	2017	0	0	1.00	
Median Richness	CAMP	06F - Lower Churchill	2008	0	0	1.00	
	FWMIS	06A - Beaver	1954	0	-209	0.23	
	CAMP;FWMIS;MOE.govSask	Churchill Basin	2017	0	0	1.00	

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OVERALL BENTHIC HEALTH SCORING

	Indicator			Sub-Basin						Basin
				06A - Beaver	06B - Upper Churchill (Man.)	06C - Central Churchill (Man.)	06D - Reindeer	06E - Central Churchill (Man.) Lower	06F - Lower Churchill (Man.)	
Benthic Macro-Invertebrates	Index of benthic community composition based on sensitivity to disturbance	Median Hilsenhoff Biotic Index (HBI) score for the basin. Reported as a weighted average for the most recent five years.	*Year*	-	-	2013	-	-	2015-2016	2015-2016
			Number of Sites	-	-	0	-	-	20	20
			Value	-	-	-	-	-	6.192	6.192
			Benthic Health Category	Data Deficient	Data Deficient	Data Deficient	Data Deficient	Data Deficient	Poor	Data Deficient
			Benthic Health Score	0	0	0	0	0	2	0
		Variance of annual HBI scores	*Value*	-	-	0.47	-	-	1.04	1.23
		Significant Mann-Kendal time-series test to determine directional trend in **HBI** over time.	*Time Period*	-	-	2013	-	-	2008-2016	2008-2016
			Trend	-	-	No Trend	-	-	No Trend	No Trend

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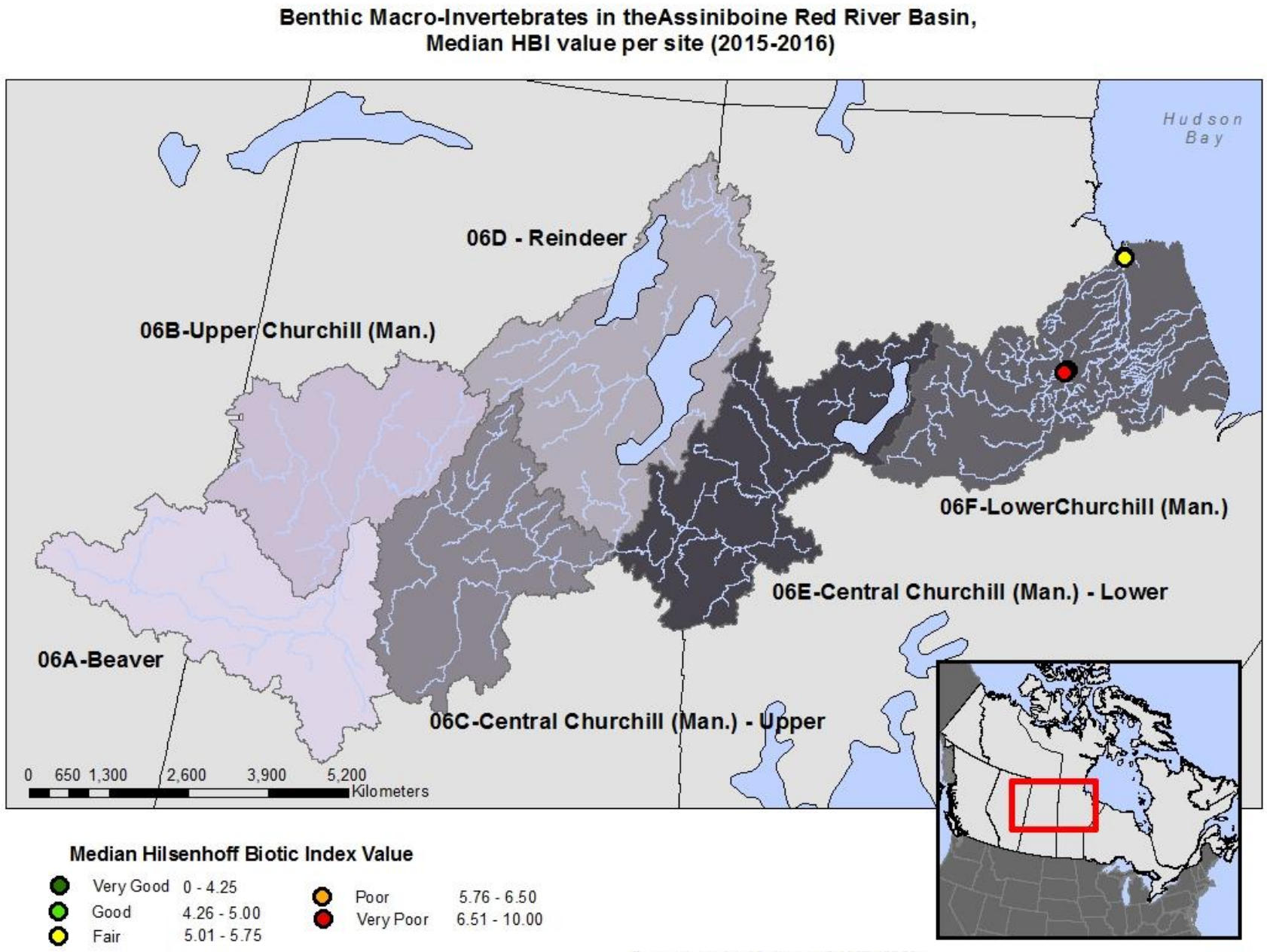
BENTHIC DATA SUFFICIENCY

		Sub-Basin						Basin
	Data Sufficiency Indicator	**06A - Beaver**	**06B - Upper Churchill (Man.)**	**06C - Central Churchill (Man.)**	**06D - Reindeer**	**06E - Central Churchill (Man.) Lower**	**06F - Lower Churchill (Man.)**	
Benthic Macro-Invertebrates	Total number of sub-sub-basins	7	4	6	5	3	5	30
	Year of earliest available monitoring	-	-	2010	-	-	2009	2009
	Number of monitoring stations available for earliest monitoring	-	-	1	-	-	15	16
	Number of sub-sub-basins with earliest available monitoring stations	-	-	1	-	-	2	3
	Year of most recently available monitoring	-	-	2013	-	-	2016	2016
	Number of monitoring stations available within last five years	-	-	0	-	-	20	20
	Number of sub-sub-basins within last five years	0	0	0	0	0	2	2
	Number of years of sampling in last 10 years	-	-	2	-	-	7	7
	Overall Data Sufficiency Category	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient	Partially Sufficient	Data Deficient
	Data Sufficiency Score	0	0	0	0	0	1	0

Disclaimer: This analysis reflects currently accessible and available data that aligns with our nationally consistent suite of indicators, as of August 2020.

MAP. HILSENHOFF'S BIOTIC INDEX SCORES FOR BENTHIC MACRO-INVERTEBRATE COMMUNITIES IN THE CHURCHILL BASIN (2015-2016).



Sources: Hydro Manitoba, CAMP (2020).

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FIGURE. ANALYSIS OF VARIANCE FOR HILSENHOFF'S BIOTIC INDEX VALUES FOR BENTHIC MACRO-INVERTEBRATE COMMUNITIES SAMPLED IN THE CHURCHILL BASIN (2008-2016).

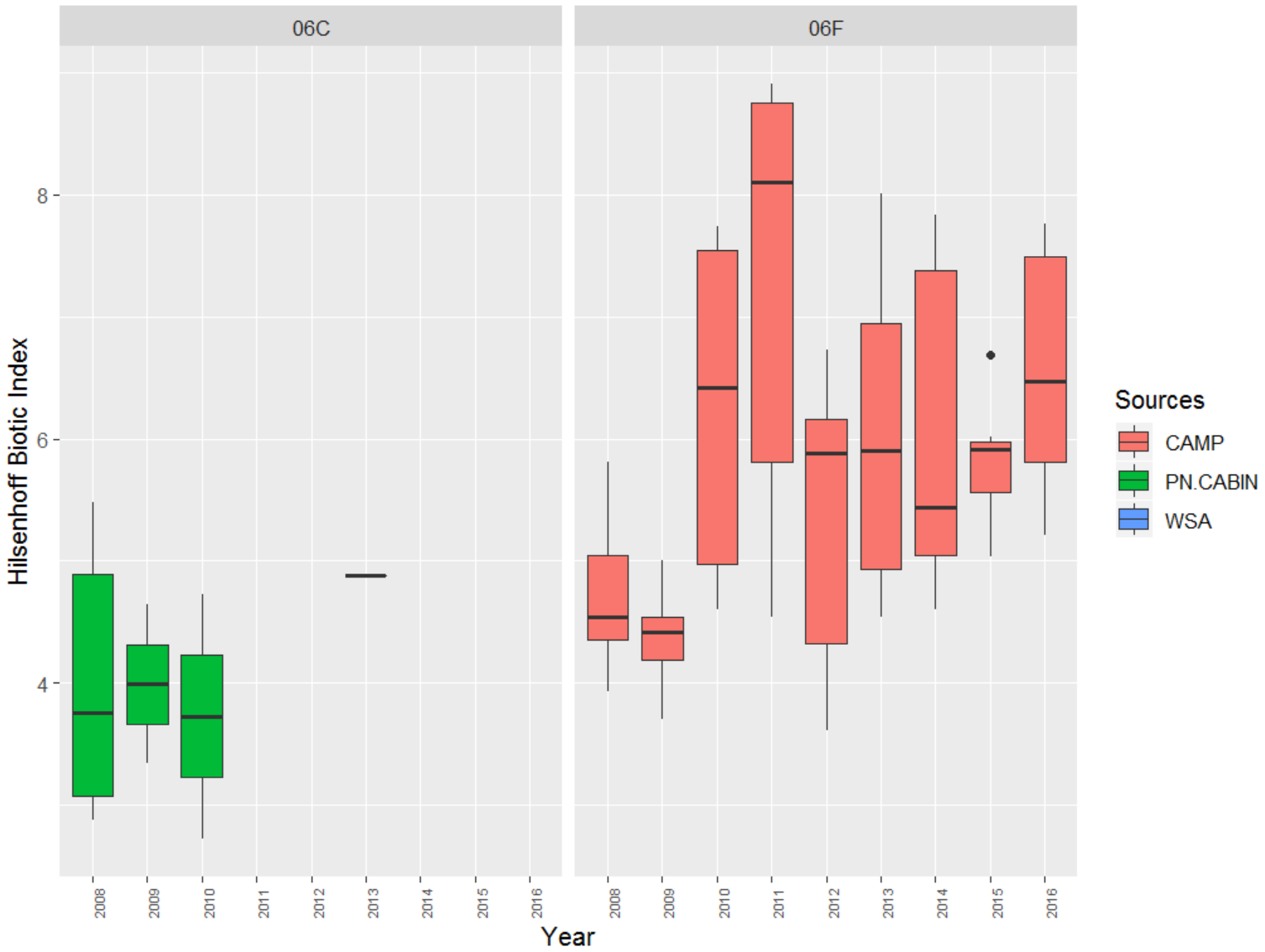

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TABLE. HILSENHOFF'S BIOTIC INDEX VALUSES FOR BENTHIC MACRO-INVERTEBRATE COMMUNITIES SAMPLED IN THE CHURCHILL BASIN BY YEAR, SUB-WATERSHED AND DATA SOURCE.

Sub-Watershed	Year	Data Source	HBI Value	Number of sites	5-Years Weighted Average by sub-watershed
06C - Central Churchill (Man.)	2013	WSA	4.89	1	-
	2010	PN.CABIN	3.73	2	
	2009	PN.CABIN	3.99	2	
	2008	PN.CABIN	3.76	5	
06F - Lower Churchill (Man.)	2016	CAMP	6.47	10	6.19
	2015	CAMP	5.91	10	
	2014	CAMP	5.44	16	
	2013	CAMP	5.91	10	
	2012	CAMP	5.88	10	
	2011	CAMP	8.10	14	
	2010	CAMP	6.42	10	
	2009	CAMP	4.42	15	
	2008	CAMP	4.54	10	

TABLE. RESULTS OF MANN-KENDALL NON-PARAMETRIC TREND ANALYSIS OF HILSENHOFF'S BIOTIC INDEX OVER TIME IN THE CHURCHILL BASIN, BY SUB-WATERSHED.

wscsda	Data Source	Start Year	End Year	Number of Sites	Theil-Sen Slope	Mann-Ken Score	Mann-Ken p-value	
Churchill Basin	All	2008	2016	111	0.17	12	0.26	
	CAMP	2008	2016	105	0.17	12	0.26	
	PN.CABIN	2008	2010	5	-0.02	-1	1	
06C - Central Churchill	All	2008	2013	6	0.02	3	0.6967	
06F - Lower Churchill	All	2008	2016	105	0.17	12	0.26	

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FRESHWATER THREATS ASSESSMENT

SUMMARY

TABLE. OVERALL SCORING RESULTS FRESHWATER THREATS ASSESSMENT OF THE CHURCHILL WATERSHED.

PEARSE BASIN	SUB WATERSHED SCORE			
	WSCSDA	**SUB WATERSHED NAME**	**SCORE**	**FINAL - *MEDIAN***
Churchill	06A	Beaver (Alta.-Sask.)	THREAT CLASSIFICATION	High
			SCORE	60
	06B	Upper Churchill (Man.)	THREAT CLASSIFICATION	Low
			SCORE	32.5
	06C	Central Churchill (Man.) - Upper	THREAT CLASSIFICATION	Low
			SCORE	36.67
	06D	Reindeer	THREAT CLASSIFICATION	High
			SCORE	65
	06E	Central Churchill (Man.) - Lower	THREAT CLASSIFICATION	Moderate
			SCORE	51.67
	06F	Lower Churchill (Man.)	THREAT CLASSIFICATION	Moderate
			SCORE	53.33
	OVERALL PEARSE BASIN SCORE			
			THREAT CLASSIFICATION	Moderate
			SCORE	52.17

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TABLE. SCORING RESULTS FRESHWATER THREAT INDICATORS OF THE CHURCHILL WATERSHED.

PEARSE BASIN	SUB WATERSHED SCORE											
	WSCSDA	SUB WATERSHED NAME	INDICATOR	POLLUTION	CLIMATE CHANGE	ALTERATION OF WATER FLOWS	INVASIVE SPECIES	FRAGMENTATION	WATER USE	HABITAT LOSS	WATERSHED AREA (m2)	RELATIVE WATERSHED AREA
Churchill	06A	Beaver (Alta.-Sask.)	THREAT CLASSIFICATION	Moderate	Moderate	No threat reported	Very low	Moderate	Low	Moderate	48,945,784,099	16.02%
			SCORE	60	66.67	0	20	60	25	60		
	06B	Upper Churchill (Man.)	THREAT CLASSIFICATION	Very low	Moderate	No threat reported	Unknown	Low	Low	Moderate	43,196,067,923	14.14%
			SCORE	20	66.67	0	-9999	40	25	60		
	06C	Central Churchill (Man.) - Upper	THREAT CLASSIFICATION	Low	Low	No threat reported	Unknown	High	Low	Moderate	44,861,432,966	14.68%
			SCORE	40	33.33	0	-9999	80	25	60		
	06D	Reindeer	THREAT CLASSIFICATION	Moderate	Low	Very High	Unknown	High	Low	Very High	65,504,868,548	21.44%
			SCORE	60	33.33	100	-9999	70	25	100		
	06E	Central Churchill (Man.) - Lower	THREAT CLASSIFICATION	Very low	Low	Very High	Unknown	High	Low	High	49,987,009,423	16.36%
			SCORE	20	33.33	100	-9999	70	25	80		
	06F	Lower Churchill (Man.)	THREAT CLASSIFICATION	No threat reported	Moderate	Very High	Unknown	Low	Low	Very High	53,098,211,448	17.38%
			SCORE	0	66.67	100	-9999	40	25	100		
	OVERALL PEARSE BASIN SCORE											
			THREAT CLASSIFICATION	Low	Moderate	Moderate	Unknown	High	Low	High		
			SCORE	34.44	49.18	55.17	-9999	60.41	25	78.8		

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SUB-INDICATOR SCORES BY SUB-WATERSHED

POLLUTION

TABLE. SCORING RESULTS OF POLLUTION THREAT BY SUB-INDICATOR AND SUB-WATERSHED

		SUB-INDICATOR																	
		Point Source Pollution			Pipeline incidents			Transportation Incidents			Agricultural Contamination								
		SUB-SUB-INDICATOR									Risk of Water Contamination by N			Risk of Water Contamination by Pesticides			Risk of Water Contamination by P		
WSCSDA	SUB WATERSHED NAME	Value	Score	Threat Classification	Value	Score	Threat Classification	Value	Score	Threat Classification	Value	Score	Threat Classification	Value	Score	Threat Classification	Value	Score	Threat Classification
06A	Beaver (Alta.-Sask.)	57.99	20	Very Low	-9999	-9999	Unknown	2	20	Very Low	0.49	60	Moderate	0.65	60	Moderate	0.56	60	Moderate
06B	Upper Churchill (Man.)	0	0	None	0	0	None	8	20	Very Low	0	0	None	0	0	None	0	0	None
06C	Central Churchill (Man.) - Upper	377.2	40	Low	-9999	-9999	Unknown	2	20	Very Low	0	0	None	0	0	None	0	20	Very Low
06D	Reindeer	2563.84	60	Moderate	0	0	None	0	0	None	0	0	None	0	0	None	0	0	None
06E	Central Churchill (Man.) - Lower	14.65	20	Very Low	0	0	None	0	0	None	0	0	None	0	0	None	0	0	None
06F	Lower Churchill (Man.)	0	0	None	0	0	None	0	0	None	0	0	None	0	0	None	0	0	None

TABLE. SCORING RESULTS OF CLIMATE CHANGE THREAT BY SUB-INDICATOR AND SUB-WATERSHED

		SUB-INDICATOR											
		Spring Precipitation Anomaly			Summer Maximum Temperature Anomaly			Summer Precipitation Anomaly			Winter Mean Temperature Anomaly		
WSCSDA	SUB WATERSHED NAME	Value	Score	Threat Classification	Value	Score	Threat Classification	Value	Score	Threat Classification	Value	Score	Threat Classification
06A	Beaver (Alta.-Sask.)	0.09	33.33	Low	0.21	33.33	Low	0.08	33.33	Low	0.12	66.67	Moderate
06B	Upper Churchill (Man.)	0.33	66.67	Moderate	0.57	33.33	Low	0.05	33.33	Low	0.31	33.33	Low
06C	Central Churchill (Man.) - Upper	0.01	33.33	Low	0.58	33.33	Low	0.09	33.33	Low	0.07	33.33	Low
06D	Reindeer	-0.04	33.33	Low	1.3	33.33	Low	-0.01	33.33	Low	0.09	33.33	Low
06E	Central Churchill (Man.) - Lower	-0.06	33.33	Low	1.21	33.33	Low	0.08	33.33	Low	0.07	33.33	Low
06F	Lower Churchill (Man.)	-0.1	33.33	Low	1.4	66.67	Moderate	0.1	33.33	Low	-0.03	33.33	Low

Disclaimer: This analysis reflects currently accessible and available data that aligns with our nationally consistent suite of indicators, as of March 2017.

ALTERATION OF WATER FLOWS

TABLE. SCORING RESULTS OF ALTERATION OF WATER FLOWS THREAT BY SUB-INDICATOR AND SUB-WATERSHED

		SUB-INDICATOR		
		Area of Reservoirs/Dams		
WSCSDA	**SUB WATERSHED NAME**	Value	Score	Threat Classification
06A	Beaver (Alta.-Sask.)	0	0	None
06B	Upper Churchill (Man.)	0	0	None
06C	Central Churchill (Man.) - Upper	0	0	None
06D	Reindeer	5424.9	100	Very High
06E	Central Churchill (Man.) - Lower	2990.9	100	Very High
06F	Lower Churchill (Man.)	2944.9	100	Very High

INVASIVE SPECIES

TABLE. SCORING RESULTS OF INVASIVE SPECIES THREAT BY SUB-INDICATOR AND SUB-WATERSHED

		SUB-INDICATOR		
		Presence of Invasive Species		
WSCSDA	**SUB WATERSHED NAME**	Value	Score	Threat Classification
06A	Beaver (Alta.-Sask.)	4	20	Very Low
06B	Upper Churchill (Man.)	-9999	-9999	Unknown
06C	Central Churchill (Man.) - Upper	-9999	-9999	Unknown
06D	Reindeer	-9999	-9999	Unknown
06E	Central Churchill (Man.) - Lower	-9999	-9999	Unknown
06F	Lower Churchill (Man.)	-9999	-9999	Unknown

WATER USE

TABLE. SCORING RESULTS OF WATER USE THREAT BY SUB-INDICATOR AND SUB-WATERSHED

		SUB-INDICATOR		
		Water Use		
WSCSDA	**SUB WATERSHED NAME**	Value	Score	Threat Classification
06A	Beaver (Alta.-Sask.)	N/A	25	Low
06B	Upper Churchill (Man.)	N/A	25	Low
06C	Central Churchill (Man.) - Upper	N/A	25	Low
06D	Reindeer	N/A	25	Low
06E	Central Churchill (Man.) - Lower	N/A	25	Low
06F	Lower Churchill (Man.)	N/A	25	Low

FRAGMENTATION

TABLE. SCORING RESULTS OF FRAGMENTATION THREAT BY SUB-INDICATOR AND SUB-WATERSHED

		SUB-INDICATOR					
		Fragmentation by dams			Fragmentation by roads and rail		
WSCSDA	**SUB WATERSHED NAME**	Value	Score	Threat Classification	Value	Score	Threat Classification
06A	Beaver (Alta.-Sask.)	0.53	60	Moderate	0	60	Moderate
06B	Upper Churchill (Man.)	0.36	40	Low	0	40	Low
06C	Central Churchill (Man.) - Upper	1	100	Very High	0	60	Moderate
06D	Reindeer	1	100	Very High	0	40	Low
06E	Central Churchill (Man.) - Lower	1	100	Very High	0	40	Low
06F	Lower Churchill (Man.)	0.41	40	Low	0	40	Low

HABITAT LOSS

TABLE. SCORING RESULTS OF HABITAT LOSS THREAT BY SUB-INDICATOR AND SUB-WATERSHED

		SUB-INDICATOR					
		Land use/Land cover			Forest loss		
WSCSDA	**SUB WATERSHED NAME**	Value	Score	Threat Classification	Value	Score	Threat Classification
06A	Beaver (Alta.-Sask.)	14.04	60	Moderate	5.48	60	Moderate
06B	Upper Churchill (Man.)	0.18	20	Very Low	8.11	60	Moderate
06C	Central Churchill (Man.) - Upper	0.34	20	Very Low	7.81	60	Moderate
06D	Reindeer	0.1	20	Very Low	24.63	100	Very High
06E	Central Churchill (Man.) - Lower	0.13	20	Very Low	9.34	80	High
06F	Lower Churchill (Man.)	0.02	20	Very Low	25.14	100	Very High