



Government of **Western Australia**
Department of **Water**

Swan-Canning Catchment Sampling Reporting

2009: October - December Quarter

Looking after all our water needs

Department of Water

March 2010

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Preface

The Swan and Canning River Catchment Water Quality Monitoring Program is a long-term program to assist the Swan River Trust with effectively managing the Swan-Canning Estuary. In 1994 the Swan and Canning River Catchment Water Quality Monitoring Program was designed and implemented by the Swan River Trust in conjunction with the Water and Rivers Commission as part of the Swan-Canning Clean-up Program (SCCP). Currently the Water Sciences Branch and the Swan River Trust jointly operate this program.

Following the Swan Canning Clean-up Program objectives the scope of the program was is to:

- Collect data on nutrient concentrations and water quality parameters in the catchment sufficient to detect trends in nutrient concentrations over time
- Provide nutrient concentration and flow data for basic process research
- Collect data that can be used to test compliance with the SCCP catchment targets
- Collect data that can be used to calculate loads for nutrients entering the estuary.

From 1994 to mid 2006 operational duties were conducted by Water Officers from the Swan River Trust and the project was managed by the Rivers and Estuaries Investigations Section of the Water and Rivers Commission. In mid 2000 the Rivers and Estuaries Investigations Section name was changed to the Water Sciences Branch (WSB) and in June 2007 the branch was renamed to the Water Science Branch (WSB) From the 16 September, 2006, sampling was carried out by one Water Officer from the Swan River Trust and one WSB staff member.

From 1994 to 1996 fifteen sites were sampled routinely. During the 1996/1997 monitoring an extra six sites were added (see table 1), these were located either on the Darling Scarp to determine whether the concentrations of nutrients were similar to the bottom of catchment sites or, in the case of Henley Brook, in a catchment not routinely sampled.

Table1: Additional sites to the Swan and Canning Catchment program in 1996/97:

Waterway	Site Code	Easting	Northing
Henley Brook	SWN2	405289	6481229
Avon River	SWN4	411739	6486349
Helena River	SWN9	411965	6466315
Bickley Brook	SWS5	406115	6455419
Jane Brook	SWS8	414389	6472069
Susannah Brook	SWS9	417589	6479049

In 1997/1998 it was decided to focus on nutrient concentrations entering the estuary so the six extra sites (see Table 1) sampled in the previous year were dropped.

In 1998/1999, two sites in the Northern section were relocated (Table 2). No new sites were added.

Table 2: Relocated Northern sites in 1998/99:

Waterway	Site Code	Action	Easting	Northing
Bennett Brook	SWN1	Removed	401339	6472899
Bennett Brook	SWN12	Added	401583	6473636
Susannah Brook	SWS9	Removed	417589	6479049
Susannah Brook	SWN11	Added	406686	6479346

Susannah Brook was relocated due to safety concerns at the initial site (sampling was conducted from a bridge on Great Northern Highway). When this site was relocated, a stream gauging station and staff gauges were installed.

The Bennett Brook site was also relocated due to safety concerns. To access the site it was necessary to cross over unstable ground and so the site was moved 200m downstream. Initially, stage height was still recorded from the staff gauges at the original site (SWN1) however these were relocated to the new site (SWN12) in 2000/2001.

In 2001, after a comprehensive data review, sampling frequency was changed from weekly to fortnightly. On the 23 October in the same year, the conductivity readings taken were changed from compensated (at 25°C) to uncompensated.

In September 2006 the instrument used to measure the physical parameters was changed from a WTW to a Quanta. This allowed a wider suite of parameters to be monitored (the WTW only measured conductivity and temperature). As a result of this change, conductivity readings changed from being uncompensated to compensated at 25°C (i.e. specific conductivity).

In October 2006 (from the 31 October onwards) the sampling site on the Canning River was moved roughly 550m downstream from McKenzie Grove to Seaforth. The reason for this move was twofold. Firstly, the gauging station is located at Seaforth so it makes more sense to sample the chemical and physical parameters at the same place as flow. Secondly, access to Seaforth is much easier than to McKenzie Grove. There is an auto sampler located at Seaforth and the data collected by this instrument and the data collected as part of the SG-C-SWANCATCH monitoring project at McKenzie Grove was compared and found to be similar enough to allow the site to be moved without losing continuity in the data.

A new site (Ellen Brook Avon Confluence) was established on Ellen Brook, approximately 15m upstream from its confluence with the Swan River in July 2005. This site was added to identify the quality of water draining the entire Ellen Brook catchment (the regular site, SWN3, is upstream of The Vines and numerous horticultural properties). The new site was initially sampled by the Water Science Branch *irregularly* as an investigation-monitoring site, in order to obtain baseline data but has been included in the regular sampling since October 2006 (first sampling occasion on the 31 October 2006). This site will be sampled for approximately a year after which data analysis will be carried out to determine if there is a significant difference between the two Ellen Brook sites. This site was sampled throughout 2007 and 2008 and it was intended that the site would continue to be sampled, however in March 2009 sampling was suspended as the Swan Anglican Parish Council have closed access to the confluence at All Saint's Church due to their concerns over the safety of the steps leading to the confluence.

In 2007 four extra variables were added to the monitoring program, these were pH, dissolved oxygen, total organic carbon (TOC) and dissolved organic nitrogen (DON)

As of 1 July 2008 total organic carbon (TOC) monitoring was discontinued because it was determined (using 2007 data) that the majority of carbon present was in the dissolved form. It may be worthwhile sampling TOC every 5 years fortnightly (for a year on each occasion to capture seasonal variation) to determine if the percentage of carbon present in the dissolved form is changing over time.

As of sampling event on the 10 June 2008 the method for collection of water for total organic carbon (TOC) and dissolved organic carbon (DOC) changed from filling to the shoulder of the sample vessel to filling to the top and excluding air. As per usual both sample vessels should be rinsed three times with sample water, unfiltered for TOC and filtered for DOC. This change was implemented across the entire Water Science Branch.

NOTE: As of 1 July 2008 TOC monitoring has been discontinued.

Table 3: Swan and Canning River Sampling Sites (containing site names, site codes, locations and coordinates):

Site Code	Site name	AWRC code	Flow status	Easting	Northing
SWS1	Mill St Main Drain, Palm Place, Cannington	616043	Continuous	397944	6457220
SWS2	Bannister Creek, Hybanthus Rd, Ferndale	616091	Continuous	397778	6454846
SWS3	Yule Brook, Brixton St	616042	Continuous	402466	6456282
SWS4	Bickley Brook Main Drain, Austin Ave, Kenwick	616047	Continuous	403329	6454317
SWS12	Canning River, Seaforth, Gosnells	616027	Continuous	407220	6448910
SWS7	Southern River, Anaconda Drive, Huntingdale	616092	Continuous	403622	6450423
SWS10	Bayswater Main Drain Slade St, Bayswater	616082	Continuous	398086	6467454
SWS11	South Belmont Main Drain, Great Eastern Highway, Belmont	616087	Continuous	397864	6464787
SWN3	Ellen Brook, Almería Pde, Upper Swan	616189	Ephemeral	407640	6486742
SWN5	Swan River, Upper Swan Bridge, Great Northern Highway	616076	Continuous	407488	6483347
SWN7	Jane Brook, Sweeting Bridge, Great Northern Highway, Middle Swan	6161090	Ephemeral	406725	6474359
SWN8	Blackadder Creek, Francis Street, Midland	6162925	Ephemeral	407052	6472871
SWN10	Helena River, Whiteman Rd	616086	Ephemeral	406131	6470158

SWN11	Susannah Brook, River Rd	616099	Ephemeral	406686	6479346
SWN12	Bennett Brook, Brook Rd	6163143	Continuous	401583	6473636
EBAC	Ellen Brook, Avon Confluence	6160712	Ephemeral	405778	6481775

Table 4: Sampling regime for the Catchment monitoring Program:

Parameter measured	Canning and Swan catchment sites
Temporal Pattern	All year, when flowing
Number of sites	16
Spatial Pattern	Fixed
Sampling Frequency	Fortnightly
Total Suspended Solids (TSS)	Grab sample
Total Nitrogen and Phosphorus (TN & TP)	Grab sample
Soluble reactive phosphorus, Nitrogen as ammonia/ammonium, Total oxidised Nitrogen & Dissolved organic Nitrogen (SRP, NH ₃ -N/NH ₄ -N, NO _x -N, DON)	Grab sample (filtered)
Dissolved Organic Carbon (DOC)	Grab sample (filtered)
Quanta (Dissolved Oxygen, pH & Specific Conductivity)	In-situ
Field Observations	All sites

Additionally, routine QC samples are taken quarterly.

Summary

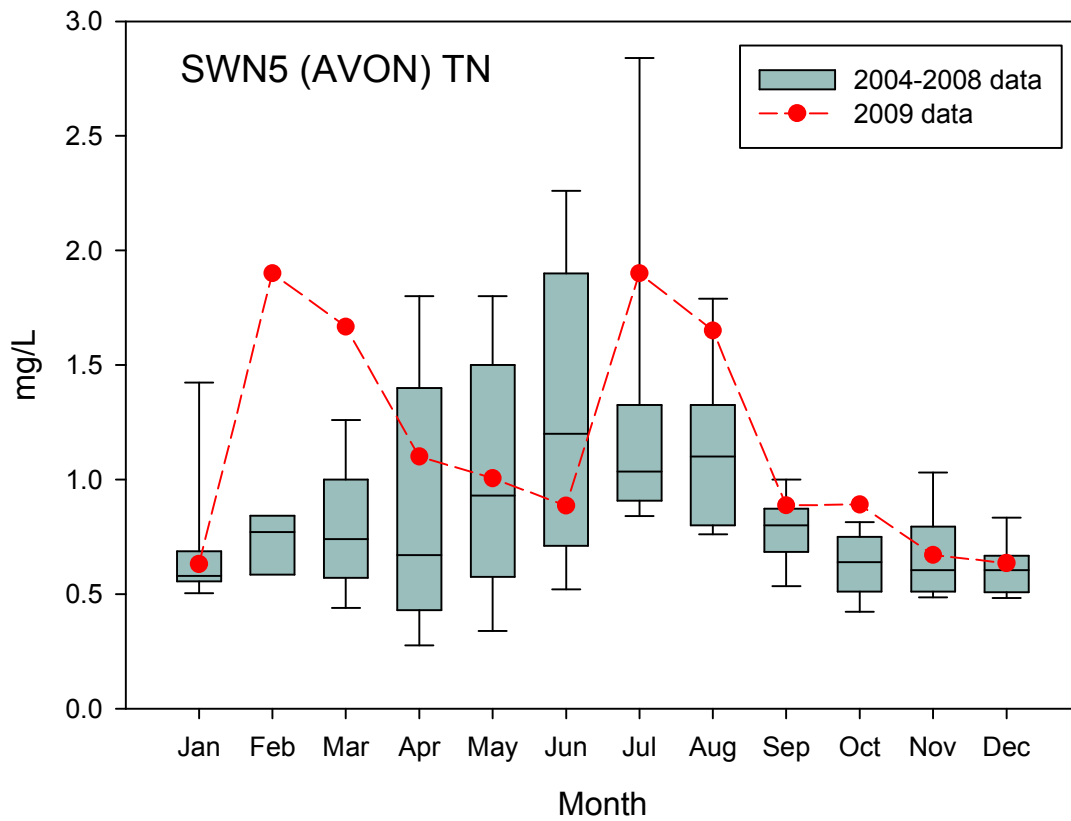
This data report presents information for seven key analytes - Total Nitrogen, Total Phosphorus, Total Oxidised Nitrogen, Nitrogen as ammonia/ammonium, Soluble Reactive Phosphorus, Dissolved Oxygen (all in mg/L) and Specific Conductivity (in mS/cm) - at each of the 15 routine SWANCATCH sites on a quarterly basis. The site at the confluence of Ellen Brook and the Swan River (EBAC) was not included as it hasn't be sampled for a sufficient period of time and isn't currently being sampled.

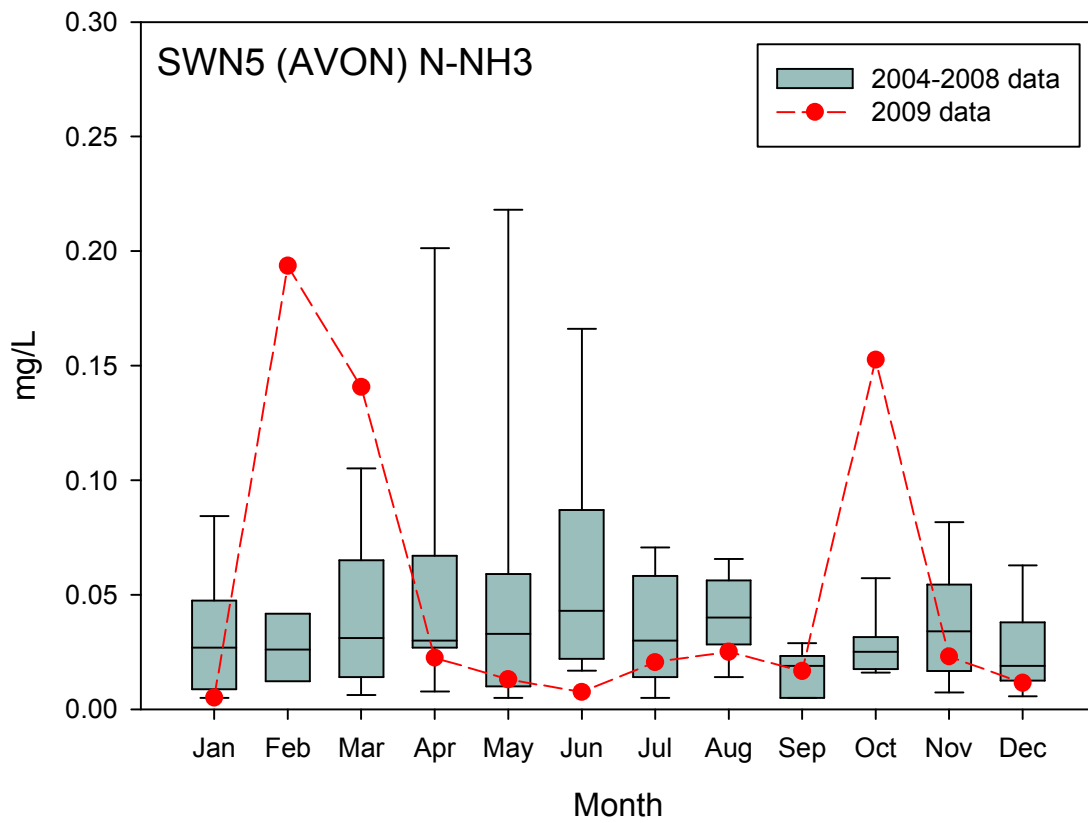
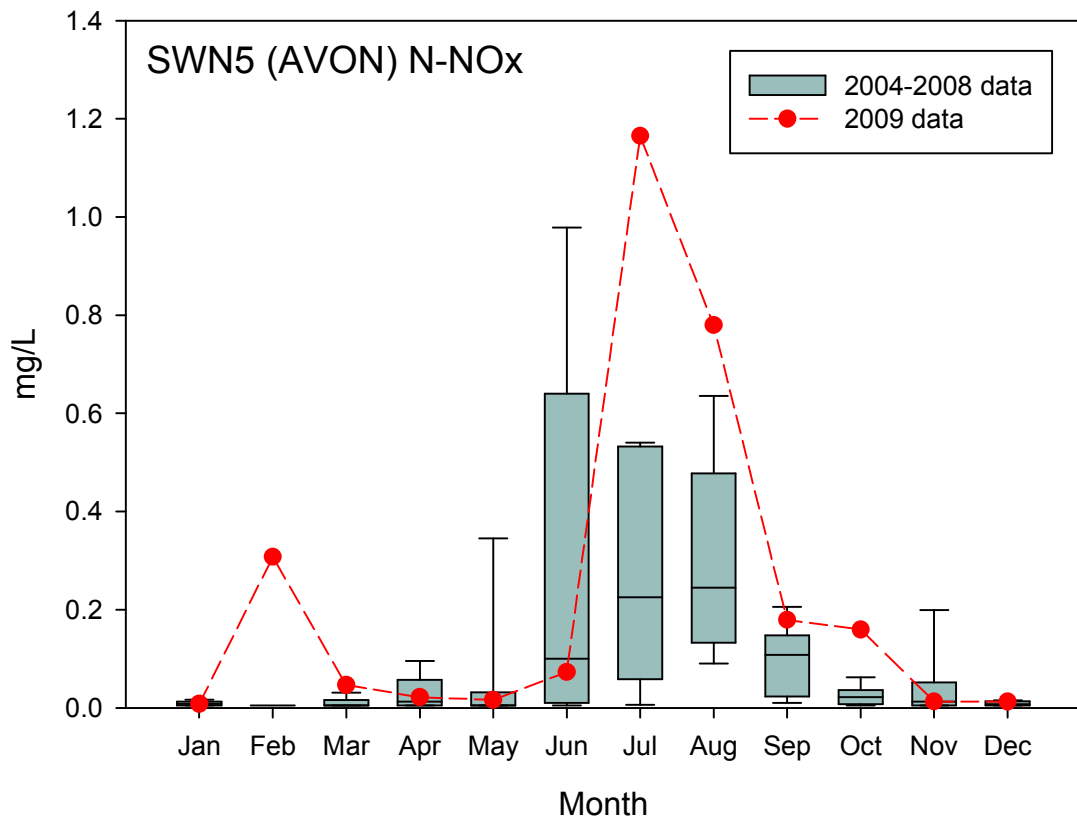
At each site the data is presented as a graph showing the previous five years of complete data as a box plot (the box encompasses values between the 25th and 75th percentiles with a median line (where sufficient data exists) and whiskers to the 5th and 95th percentile values (again, where sufficient data exists). This 5 years of data is intended to be a background over which the current year's data is plotted monthly to illustrate how these water quality indicators are 'performing' this year compared the values observed during recent years. It is important to note that when an analyte has recorded a value below the laboratory limit of reporting that this value is halved in order for the data to be graphed.

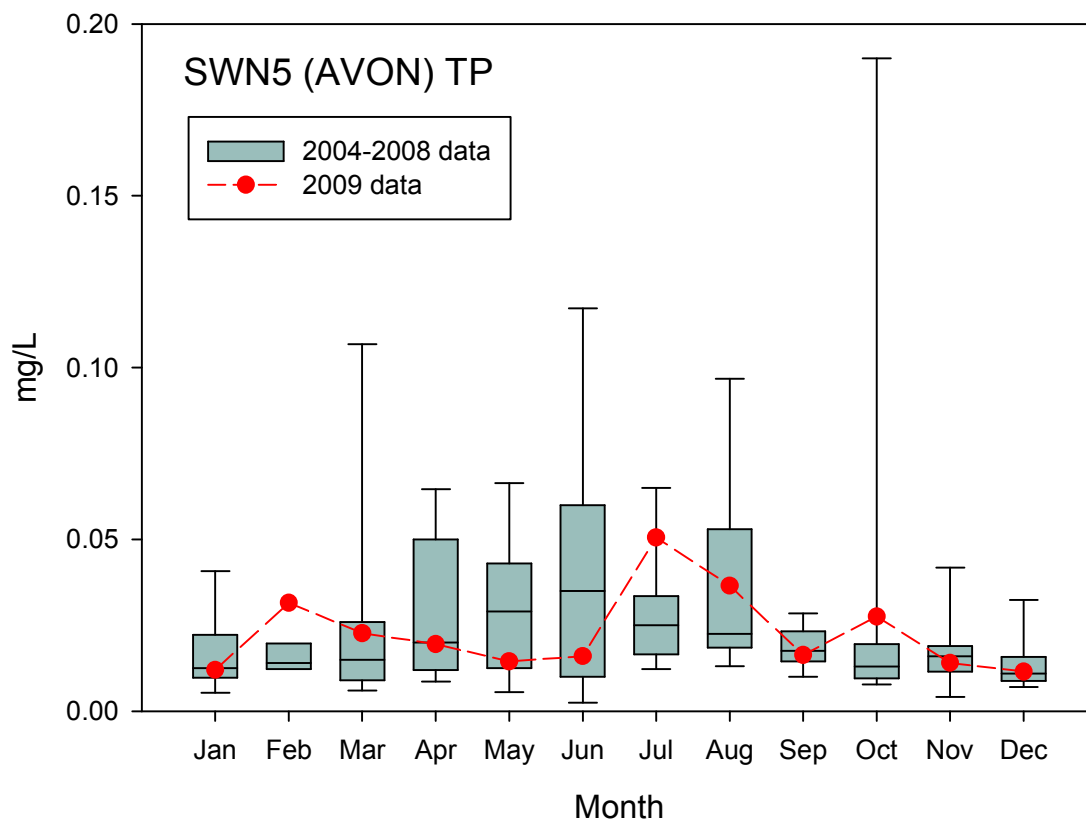
The data is also shown in a tabular format showing the number of samples taken for a given analyte each month and the minimum and maximum values recorded for each parameter in each month.

1 Avon River (SWN5)

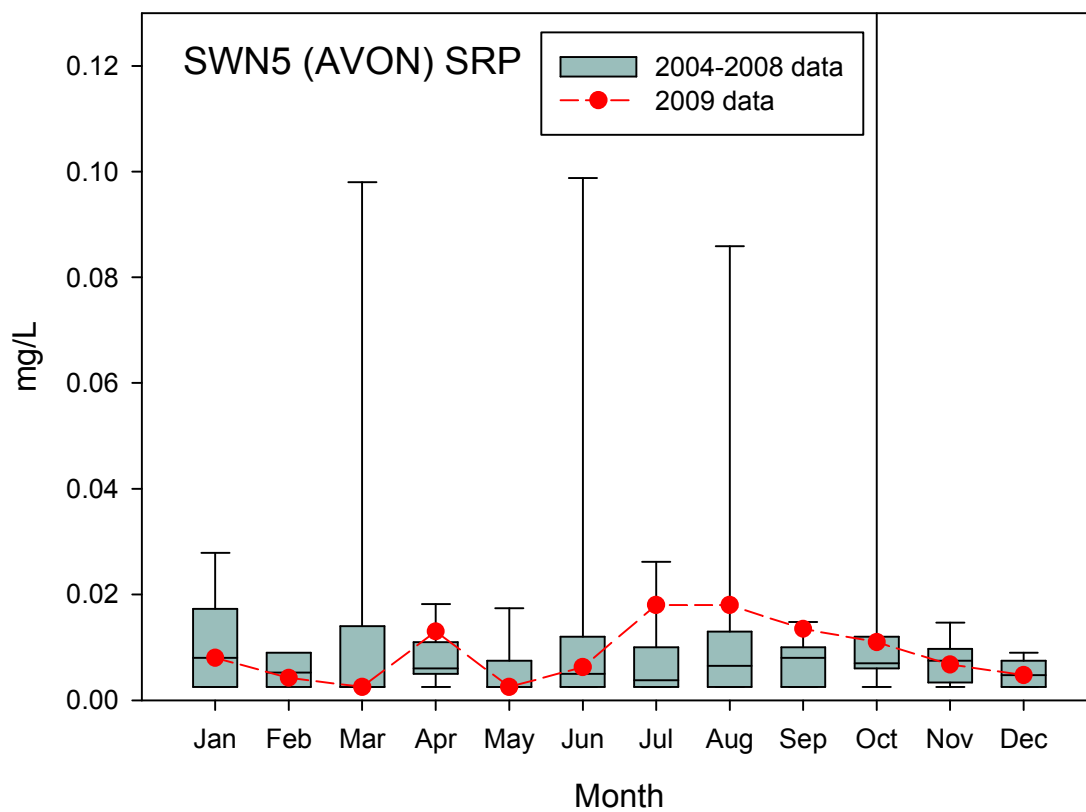
1.1 Avon River 2009 4th Quarter Summary Graphs:

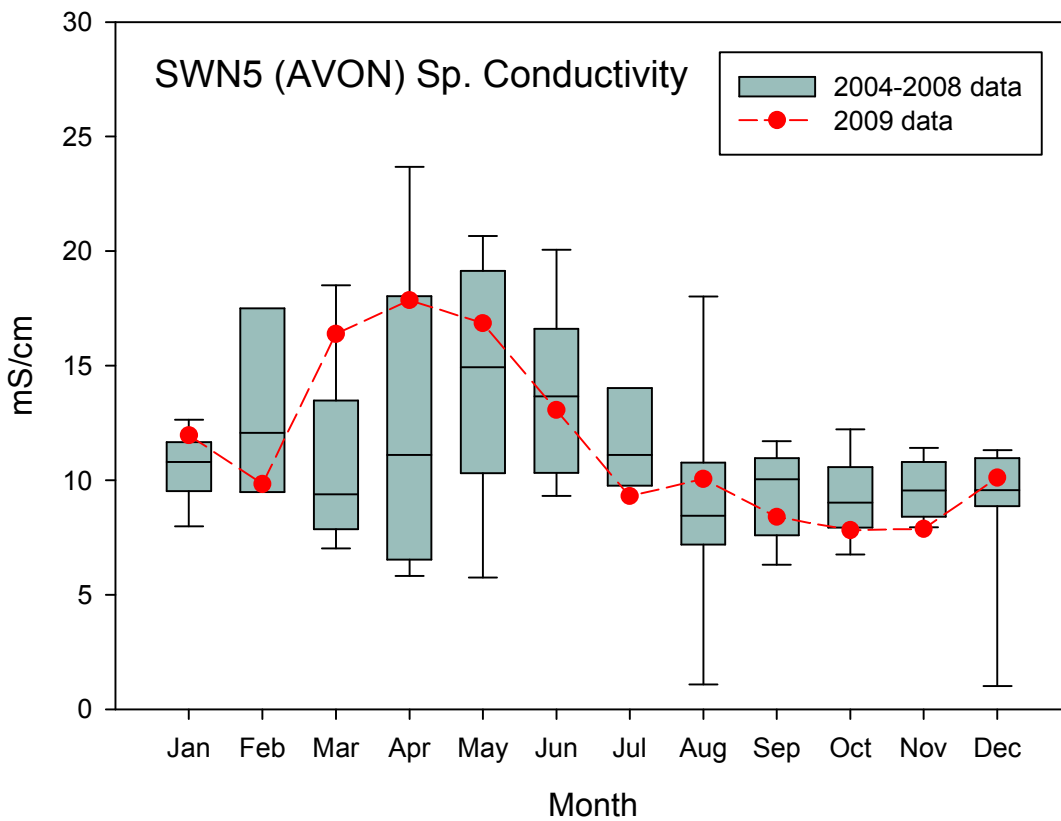
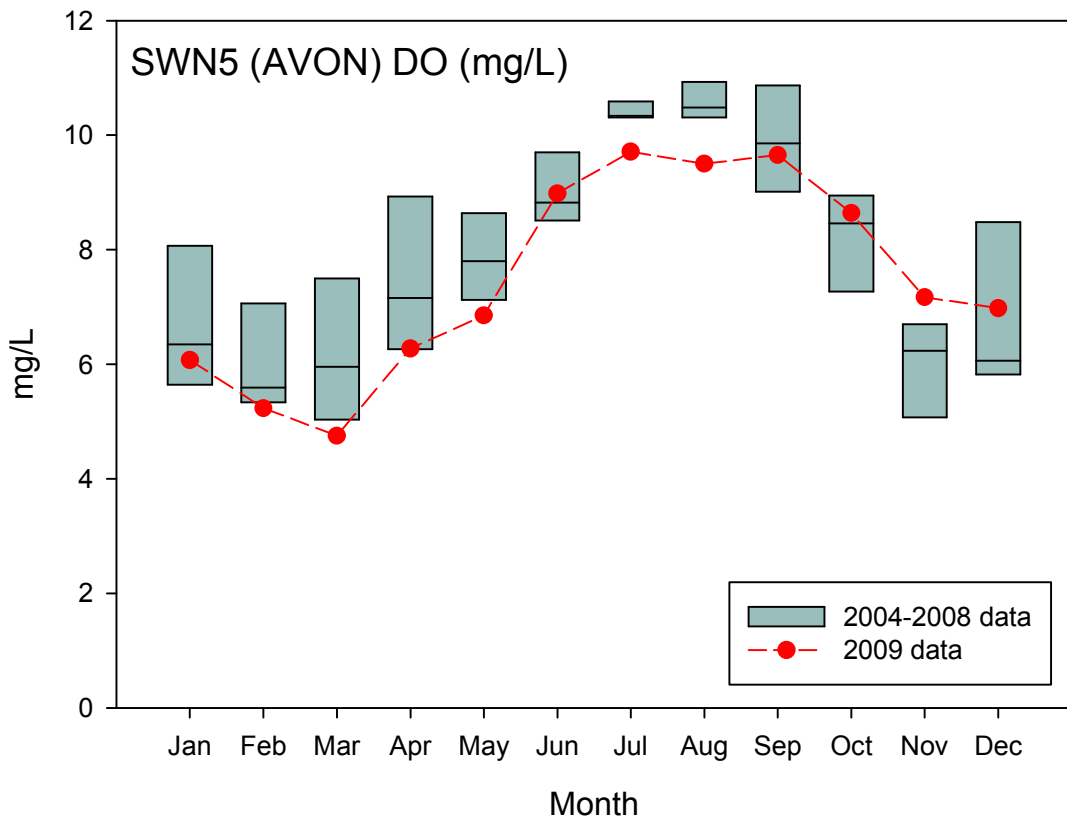






The 95th percentile for October is 0.185mg/L.





1.2 Avon River 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.63	1.20	1.00	1.10	0.81	0.77	1.70	1.20	0.70	0.58	0.63	0.62
max	0.63	2.60	2.50	1.10	1.20	1.00	2.10	2.10	1.20	1.20	0.71	0.65

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	<0.01	<0.01	<0.01	0.010	0.013	0.016	0.930	0.260	0.088	0.019	0.021	0.012
max	0.011	0.610	0.087	0.033	0.019	0.130	1.400	1.300	0.260	0.30	<0.01	0.013

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	<0.01	0.017	0.014	0.018	<0.01	<0.01	0.010	0.022	<0.01	<0.01	0.013	<0.01
max	<0.01	0.370	0.360	0.027	0.021	0.010	0.031	0.028	0.0300	0.30	0.033	0.018

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.011	0.018	0.011	0.018	0.014	0.011	0.023	0.025	0.009	0.013	0.014	0.01
max	0.012	0.045	0.040	0.021	0.015	0.021	0.078	0.048	0.020	0.042	0.014	0.013

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.008	<0.005	<0.005	0.007	<0.005	<0.005	0.012	0.016	<0.005	0.010	<0.005	<0.005
max	0.008	0.006	<0.005	0.019	<0.005	0.010	0.024	0.020	0.019	0.012	0.011	0.007

Dissolved Oxygen (mg/L)

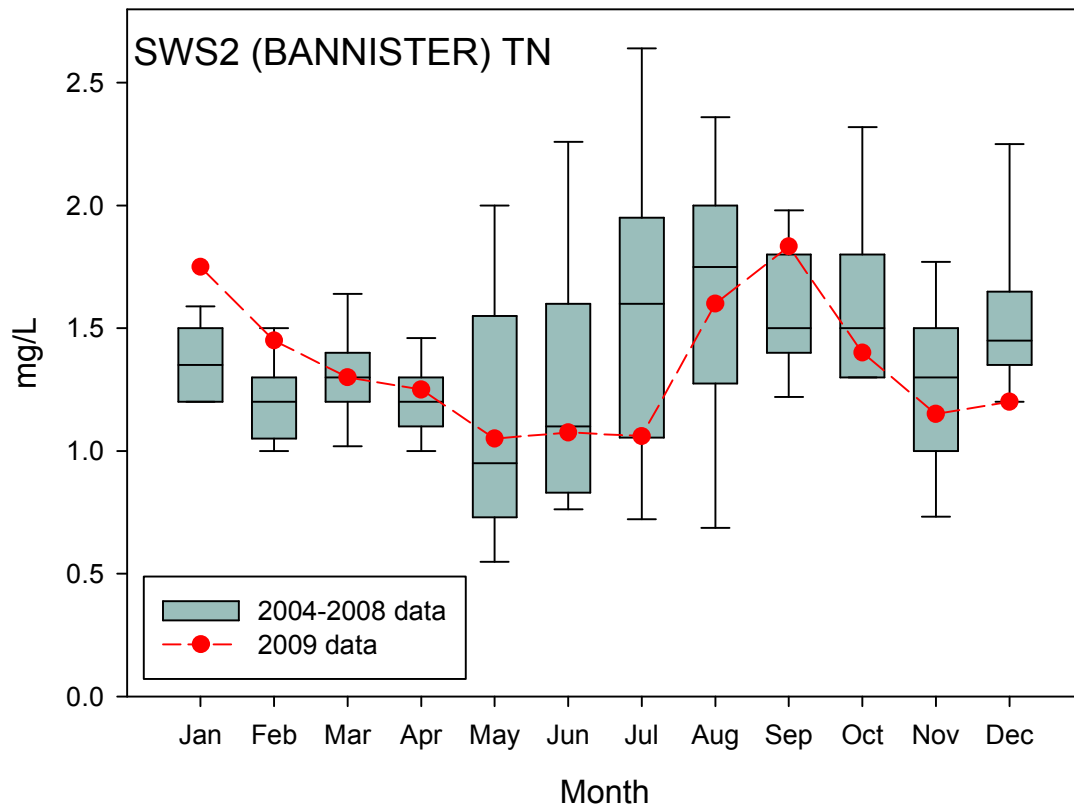
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	5.98	5.23	2.46	5.75	6.71	8.53	9.60	9.35	9.54	8.64	7.17	6.87
max	6.16	5.23	6.30	6.79	6.99	9.42	9.81	9.65	9.77	8.64	7.17	7.08

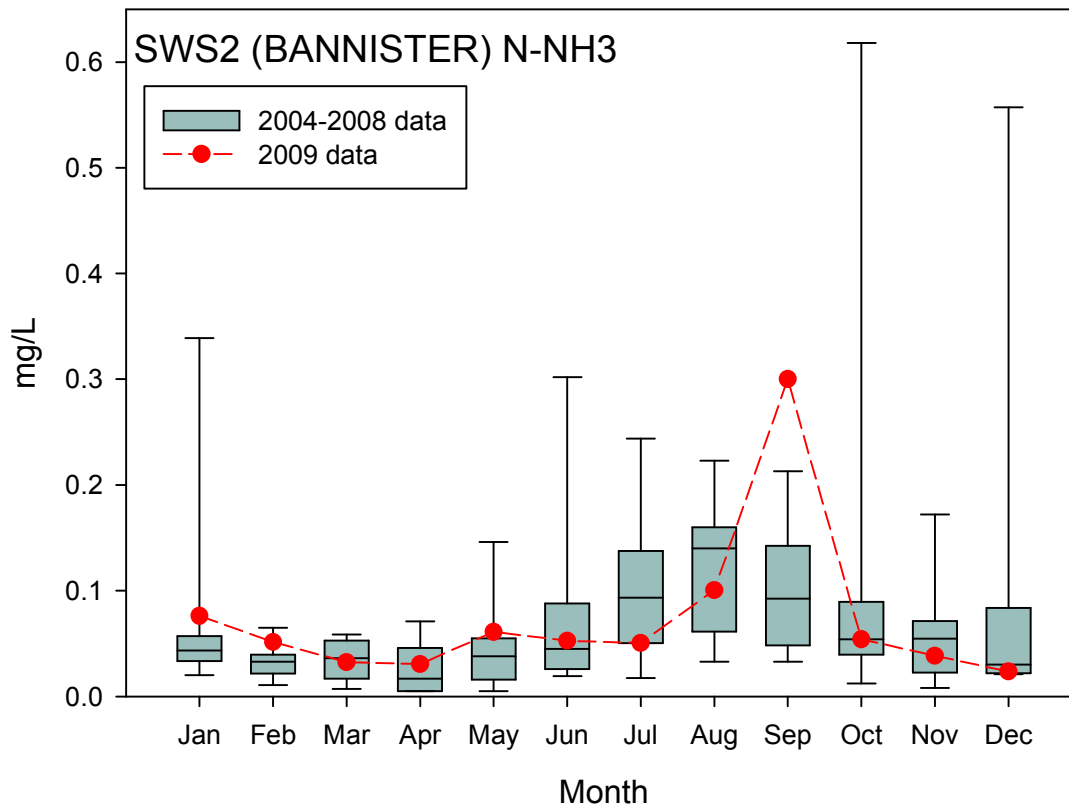
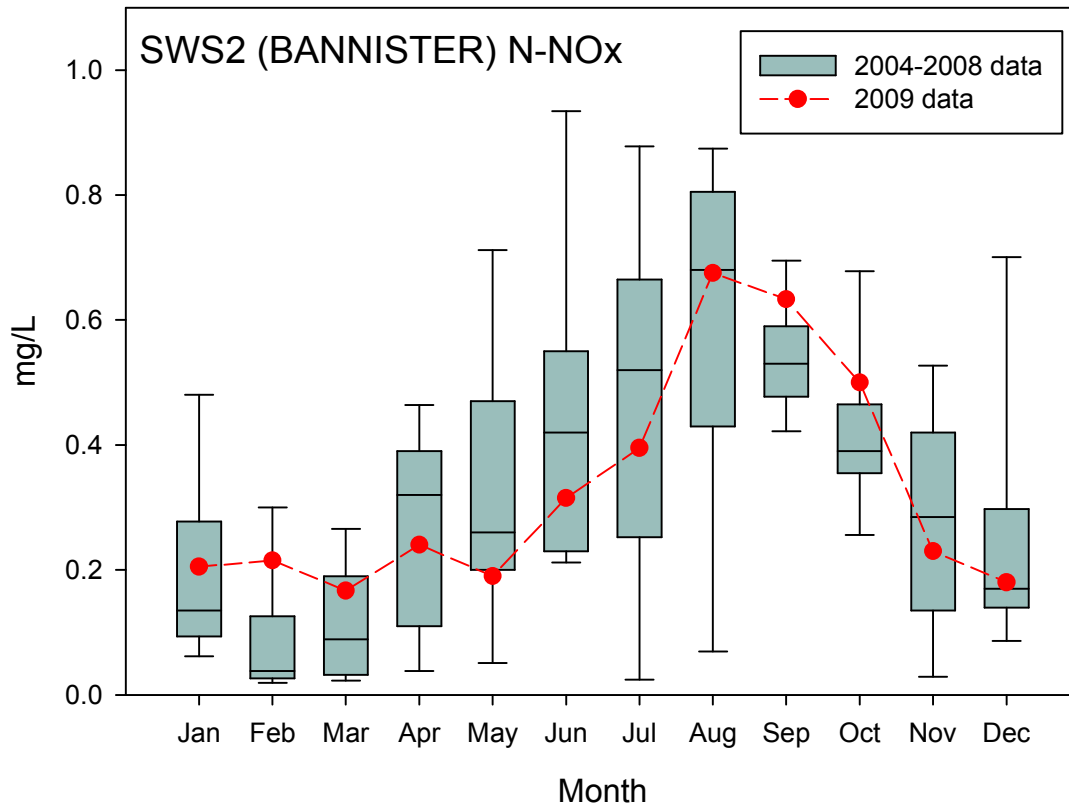
Specific Conductivity (mS/cm)

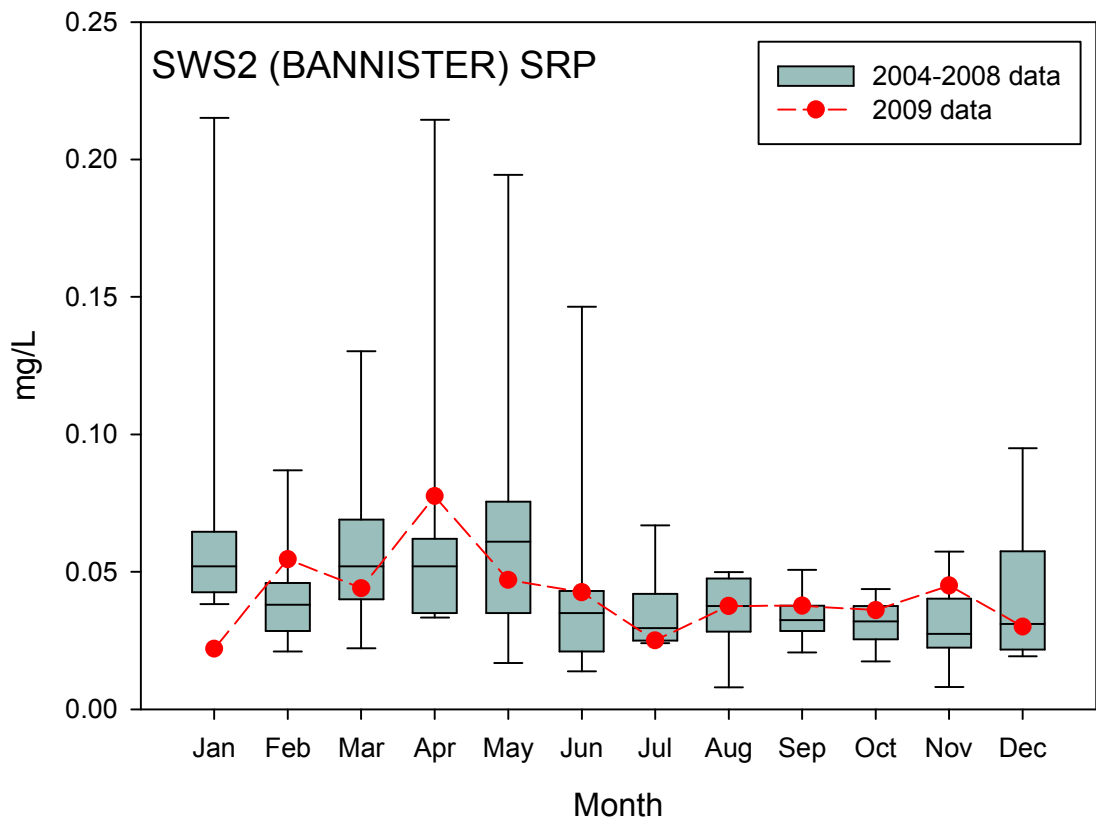
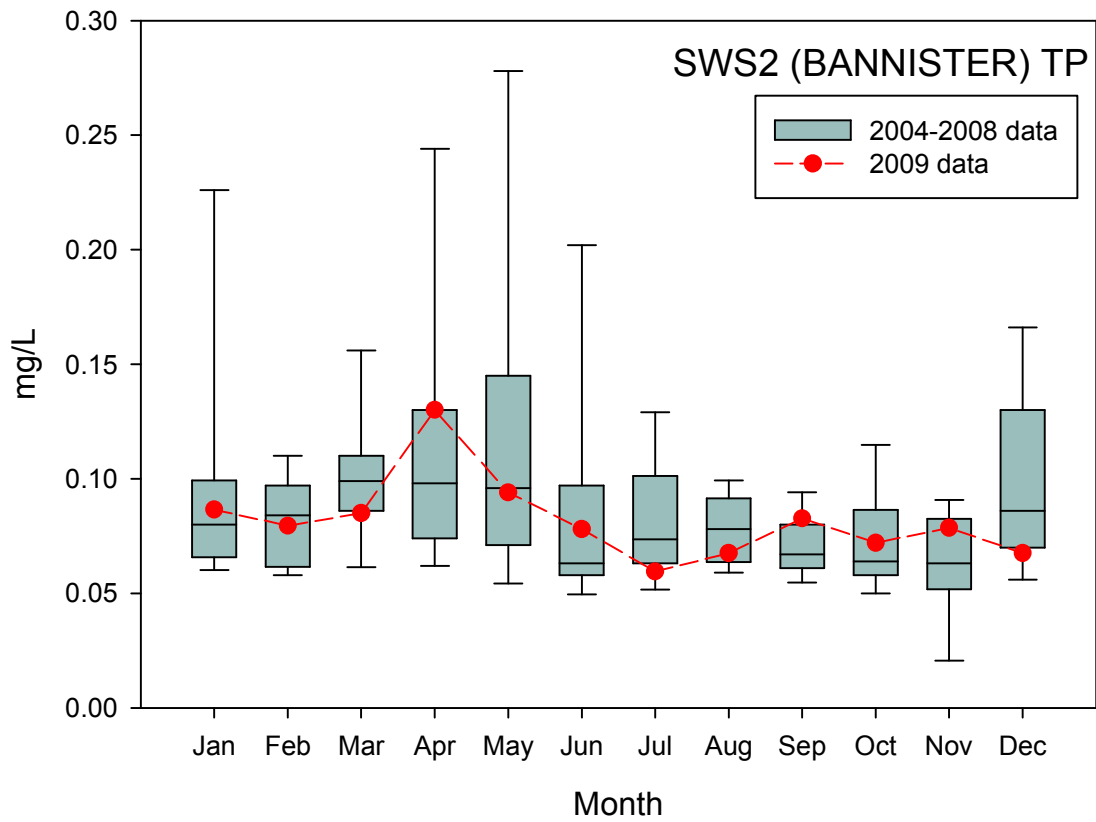
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	11.60	8.26	11.45	17.50	15.40	11.63	5.83	9.25	8.26	7.81	7.87	9.99
max	12.32	11.40	19.5	18.20	18.30	14.50	12.77	10.84	8.56	7.81	7.87	10.22

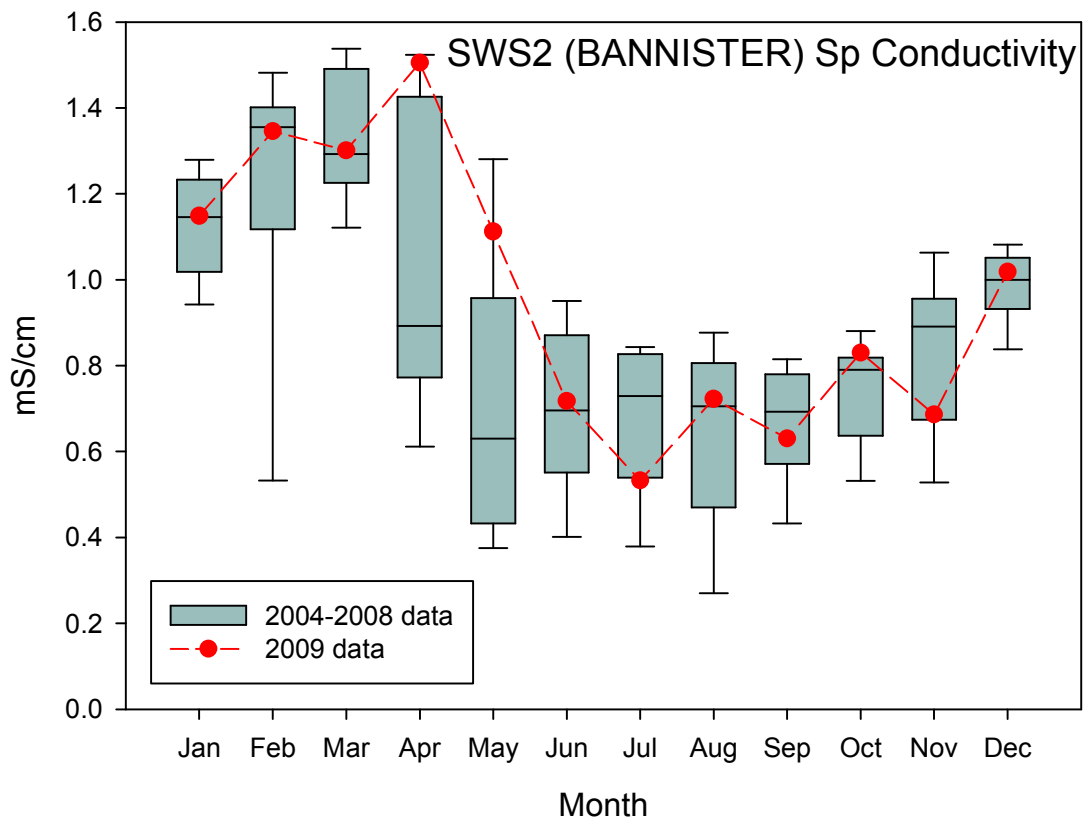
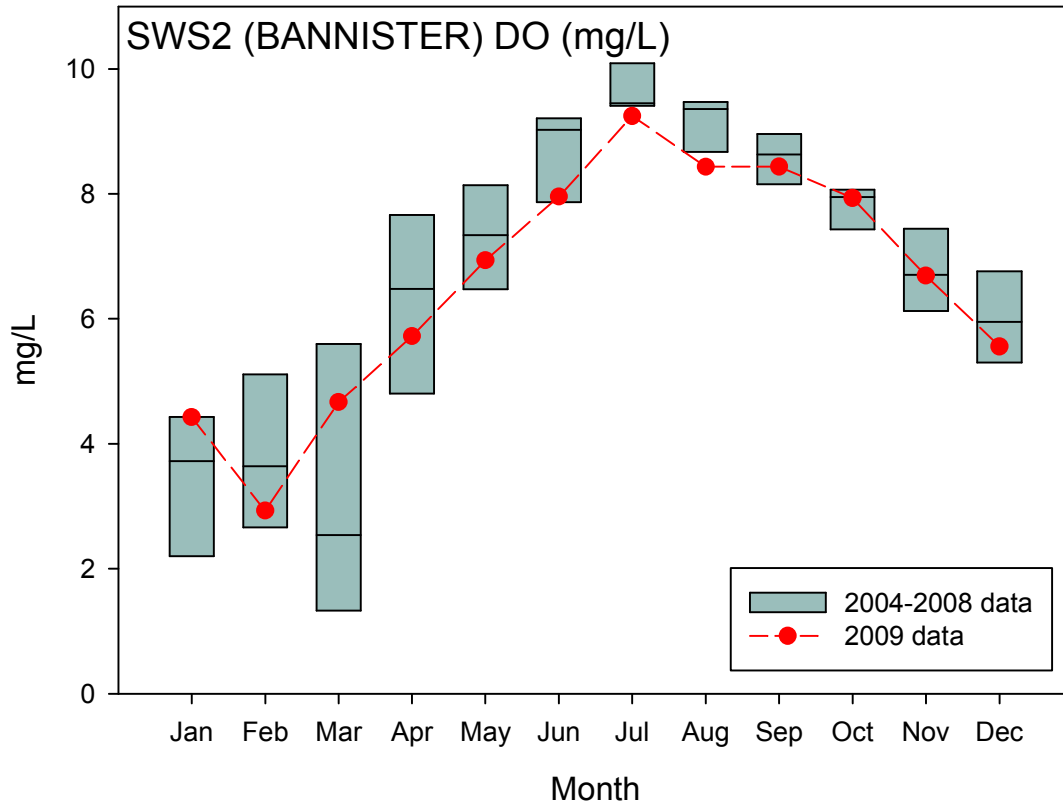
2 Bannister Creek (SWS2)

2.1 Bannister Ck 2009 4th Quarter Summary Graphs:









2.2 Bannister Creek 2009 4th Quarter Summary Tables

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	1.30	1.40	1.20	1.20	1.00	0.85	0.82	1.20	1.20	1.20	1.00	1.20
max	2.20	1.50	1.40	1.30	1.10	1.30	1.30	2.00	2.20	1.60	1.30	1.20

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.120	0.190	0.100	0.150	0.170	0.240	0.330	0.490	0.400	0.49	0.20	0.14
max	0.290	0.240	0.270	0.330	0.210	0.390	0.460	0.860	0.760	0.51	0.26	0.22

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.012	0.035	0.030	0.026	0.033	0.050	0.037	0.071	0.240	0.037	0.037	0.005
max	0.140	0.068	0.036	0.035	0.089	0.055	0.064	0.130	0.380	0.071	0.040	0.042

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.070	0.073	0.074	0.120	0.094	0.065	0.052	0.055	0.080	0.067	0.071	0.066
max	0.100	0.086	0.100	0.140	0.094	0.091	0.067	0.080	0.085	0.077	0.086	0.069

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.016	0.050	0.034	0.076	0.044	0.037	0.024	0.034	0.032	0.036	0.033	0.021
max	0.030	0.059	0.051	0.079	0.050	0.048	0.026	0.041	0.042	0.036	0.057	0.039

Dissolved Oxygen (mg/L)

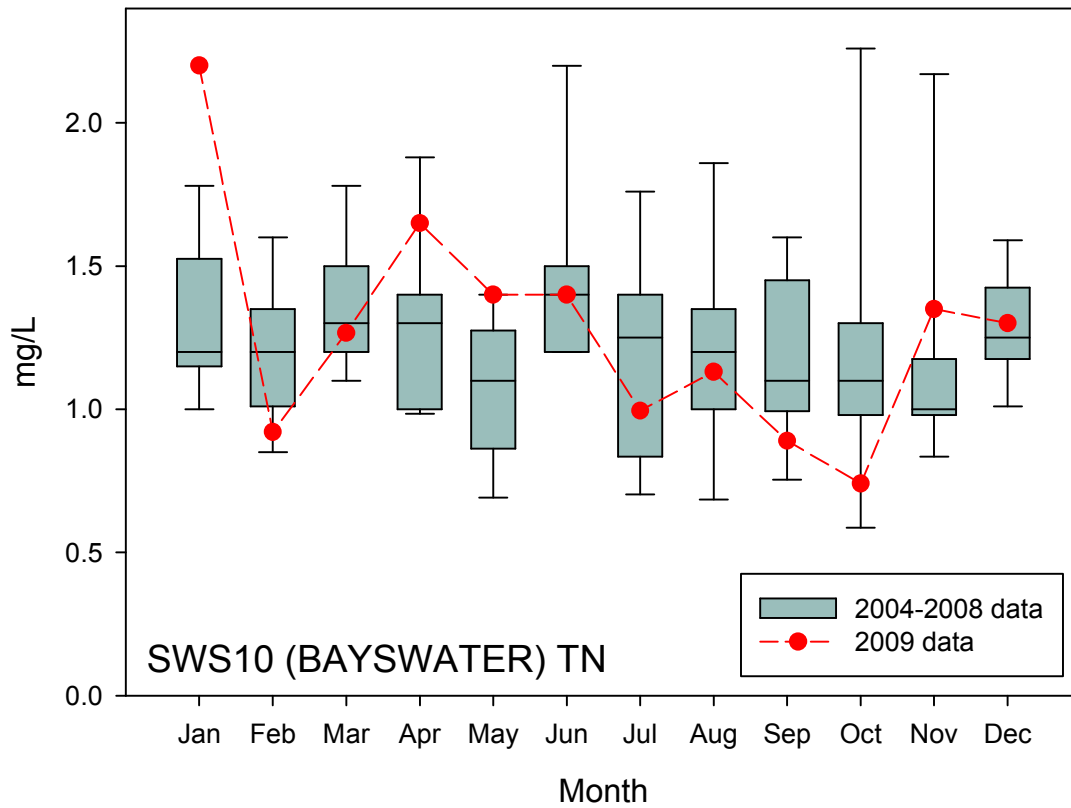
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	3	2	2	2	2	2	3	1	1	2
min	4.18	2.93	3.89	5.18	6.24	7.21	8.75	8.15	8.30	7.93	6.69	5.09
max	4.67	2.93	5.31	6.26	7.63	8.70	9.74	8.71	8.66	7.93	6.69	6.02

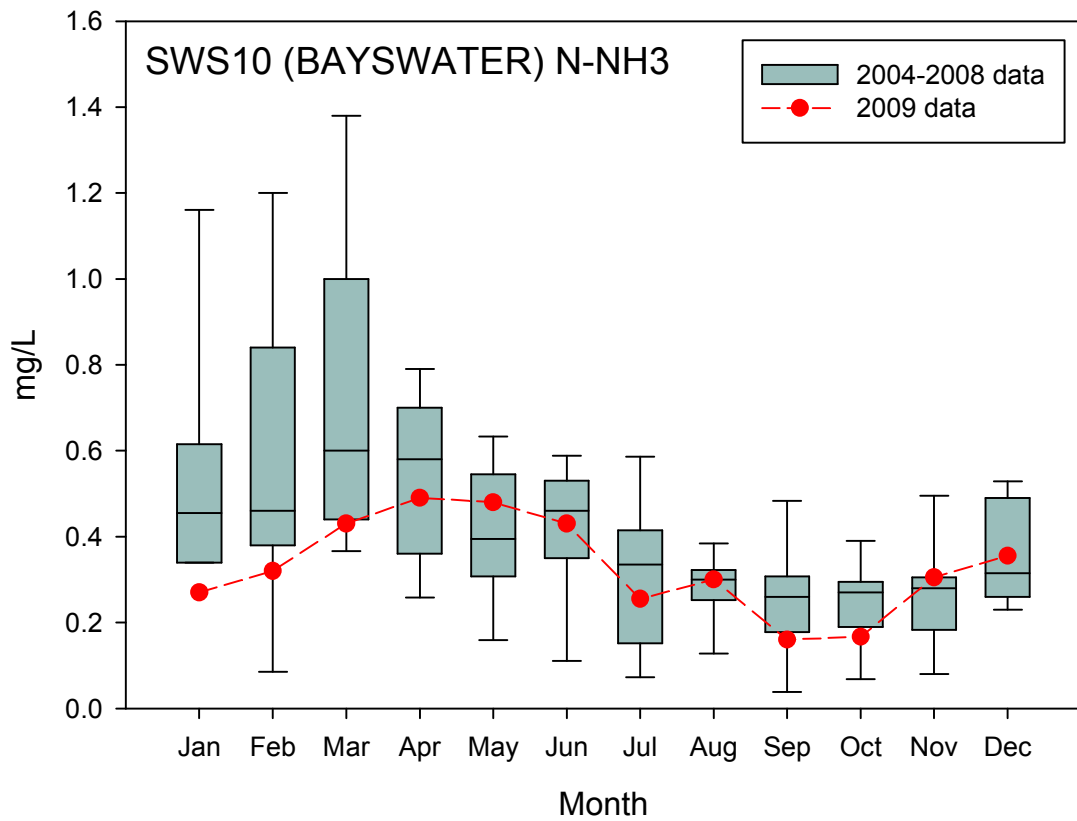
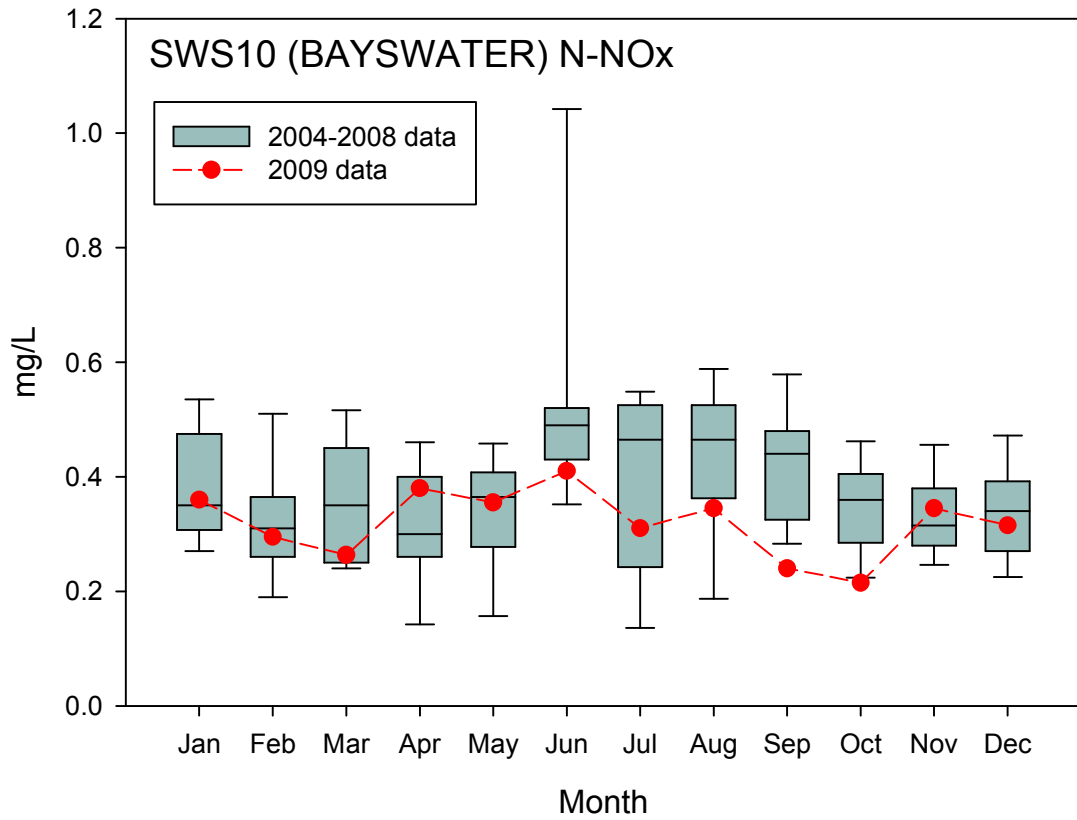
Specific Conductivity (mS/cm)

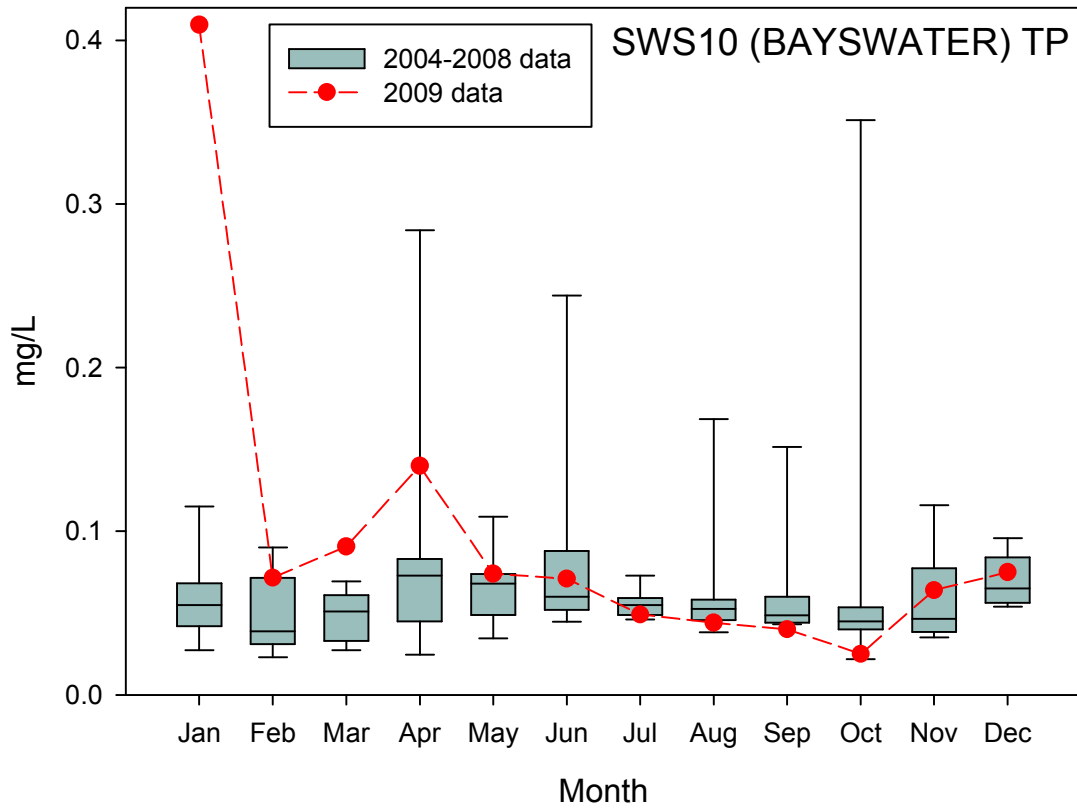
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	1.058	1.211	1.177	1.490	0.694	0.540	0.404	0.555	0.417	0.83	0.686	1.007
max	1.239	1.480	1.401	1.520	1.530	0.895	0.661	0.890	0.750	0.83	0.686	1.029

3 Bayswater Main Drain (SWS10)

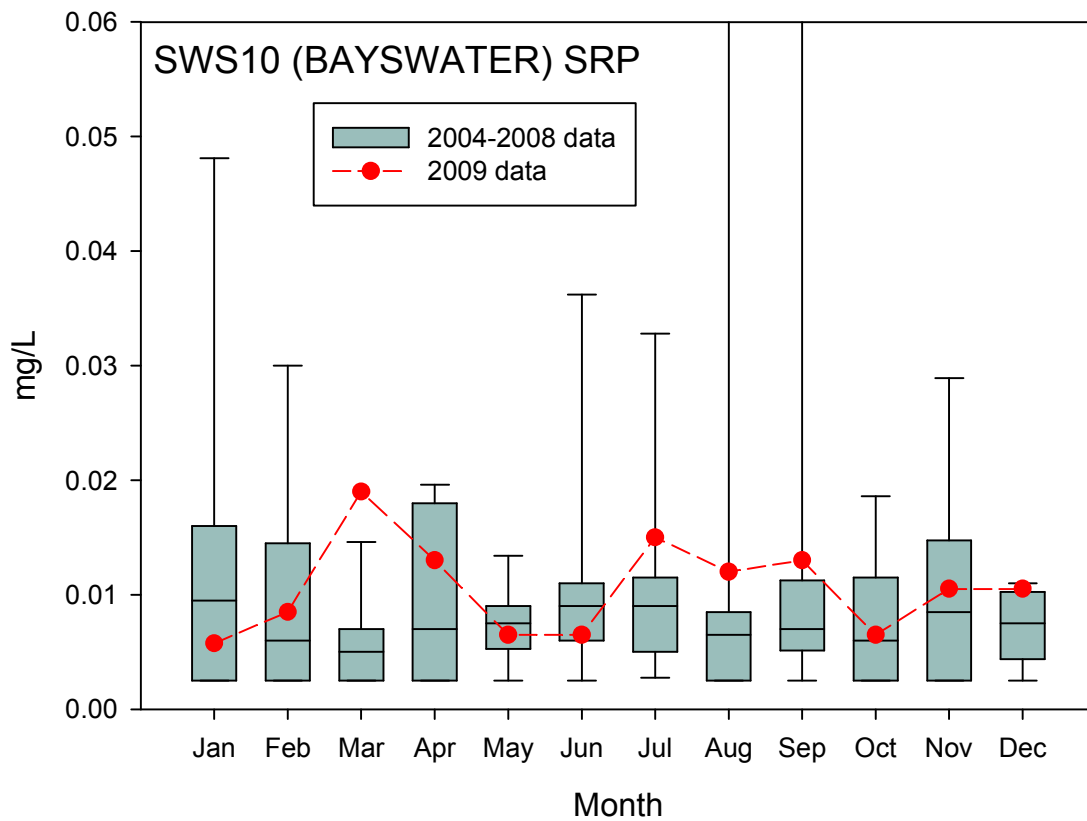
3.1 Bayswater MD 2009 4th Quarter Summary Graphs:

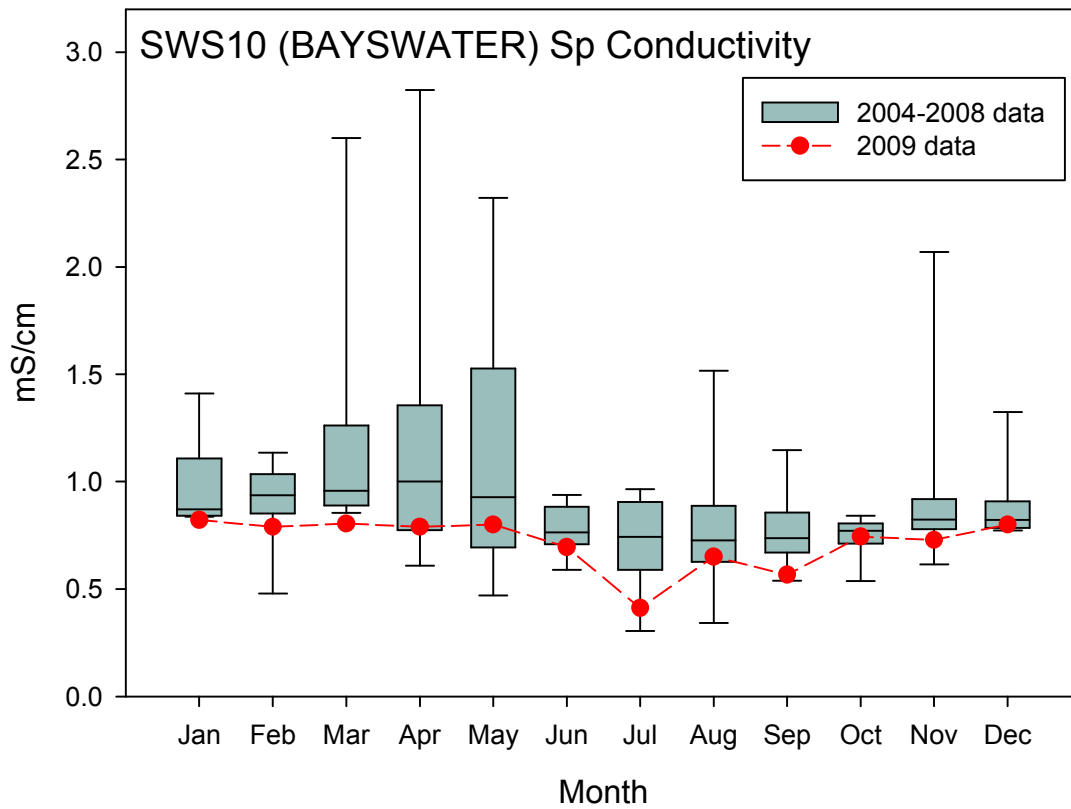
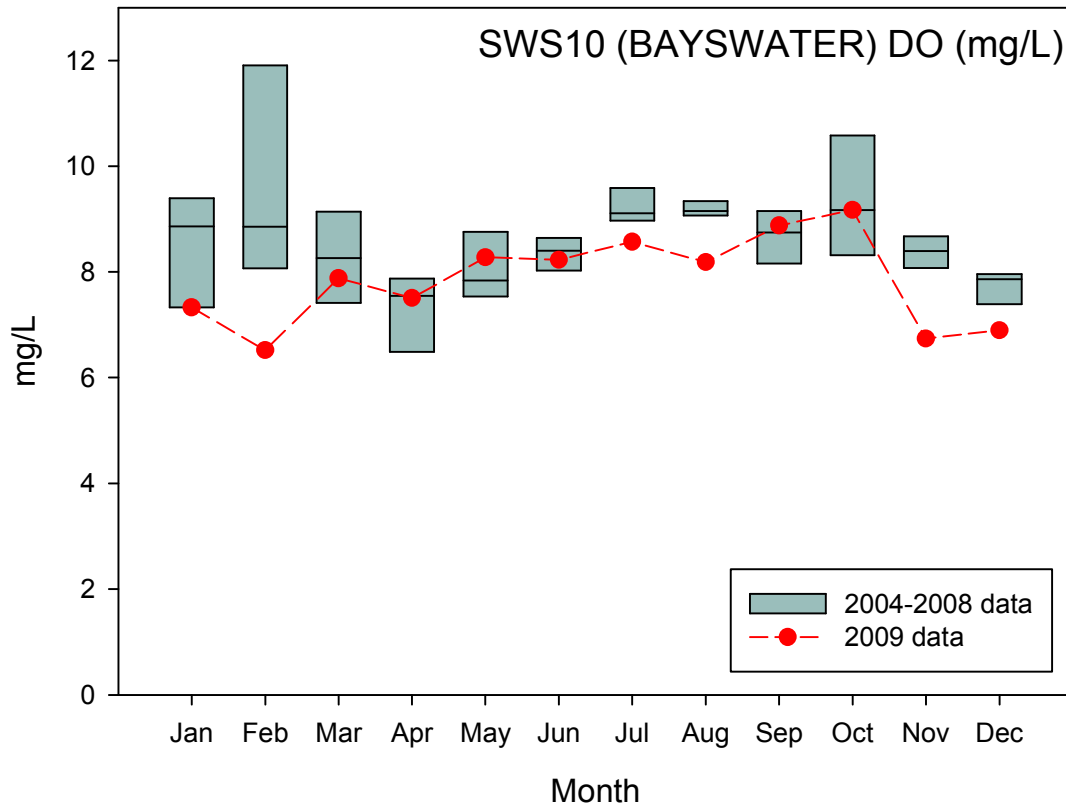






The 95th percentile for August is 0.15mg/L and for September is 0.14 mg/L.





3.2 Bayswater MD 2009 4th Quarter Summary Tables

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	1.30	0.74	1.10	1.60	1.40	1.40	0.79	0.96	0.75	0.38	1.30	1.30
max	3.10	1.10	1.50	1.70	1.40	1.40	1.20	1.30	1.10	1.10	1.40	1.30

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.33	0.27	0.23	0.34	0.35	0.41	0.23	0.30	0.20	0.19	0.33	0.30
max	0.39	0.32	0.29	0.42	0.36	0.41	0.39	0.39	0.32	0.24	0.36	0.33

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.27	0.30	0.40	0.46	0.47	0.40	0.15	0.25	0.11	0.29	0.30	0.35
max	0.27	0.34	0.45	0.52	0.49	0.46	0.36	0.35	0.25	0.04	0.31	0.36

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.079	0.059	0.036	0.110	0.061	0.058	0.045	0.042	0.039	0.014	0.046	0.072
max	0.740	0.084	0.170	0.170	0.087	0.084	0.053	0.046	0.042	0.036	0.082	0.078

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	<0.005	0.006	0.005	0.009	0.006	0.005	0.010	0.008	0.012	0.006	0.008	0.008
max	0.009	0.011	0.046	0.017	0.007	0.008	0.020	0.016	0.015	0.007	0.013	0.013

Dissolved Oxygen (mg/L)

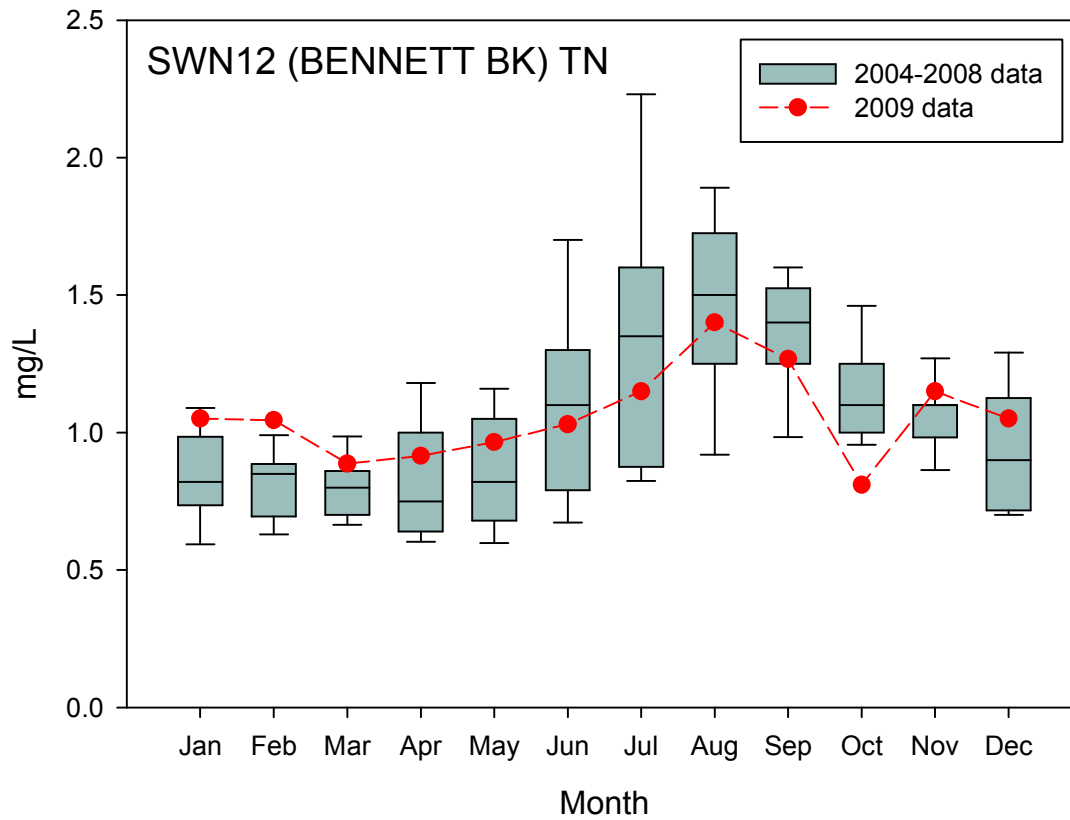
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	3	2	2	2	2	2	3	1	1	2
min	7.02	6.52	7.50	6.64	8.25	6.59	8.26	7.79	8.72	9.17	6.74	6.65
max	7.64	6.52	8.36	8.37	8.30	9.87	8.88	8.58	9.00	9.17	6.74	7.14

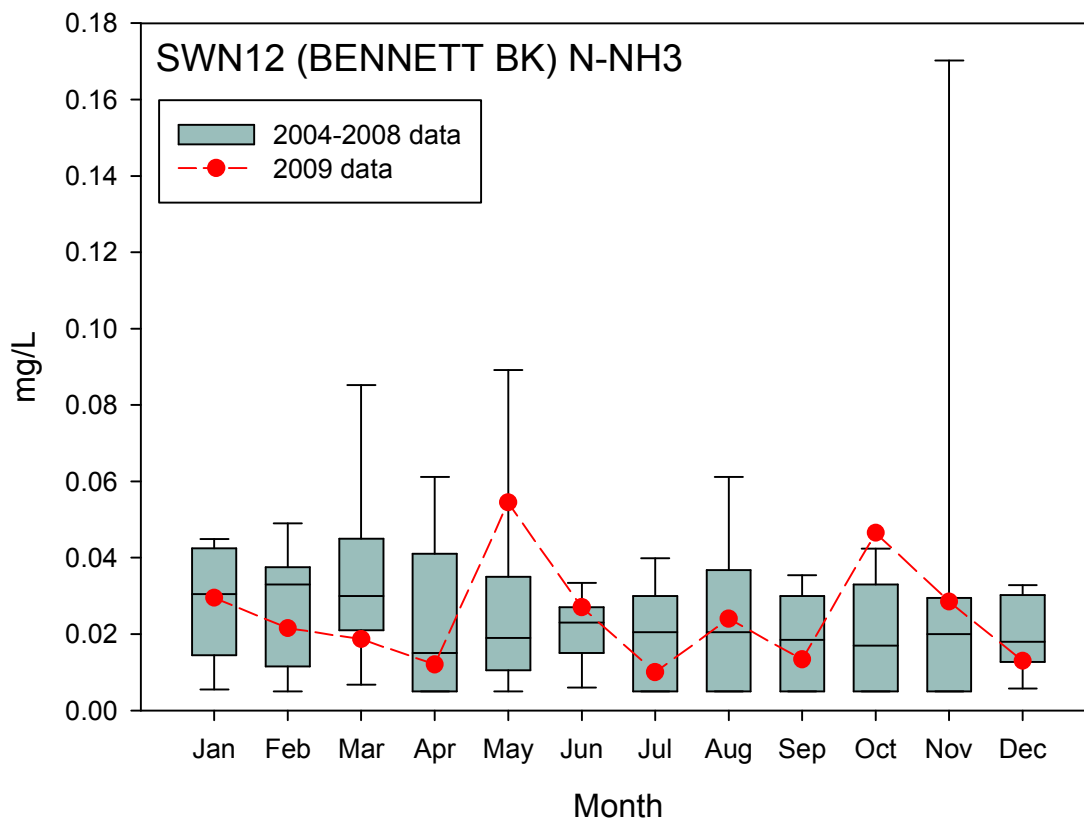
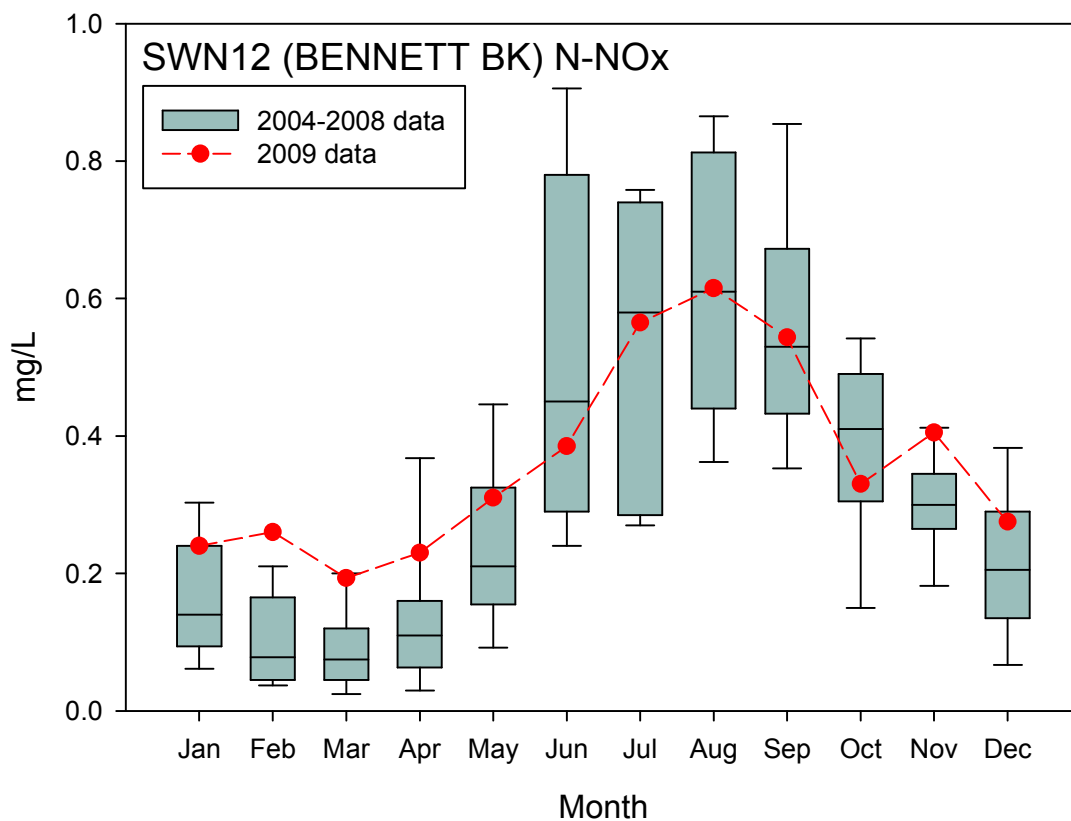
Specific Conductivity (mS/cm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	0.799	0.782	0.799	0.771	0.783	0.611	0.402	0.550	0.492	0.744	0.728	0.792
max	0.844	0.797	0.807	0.809	0.817	0.779	0.420	0.749	0.713	0.744	0.728	0.807

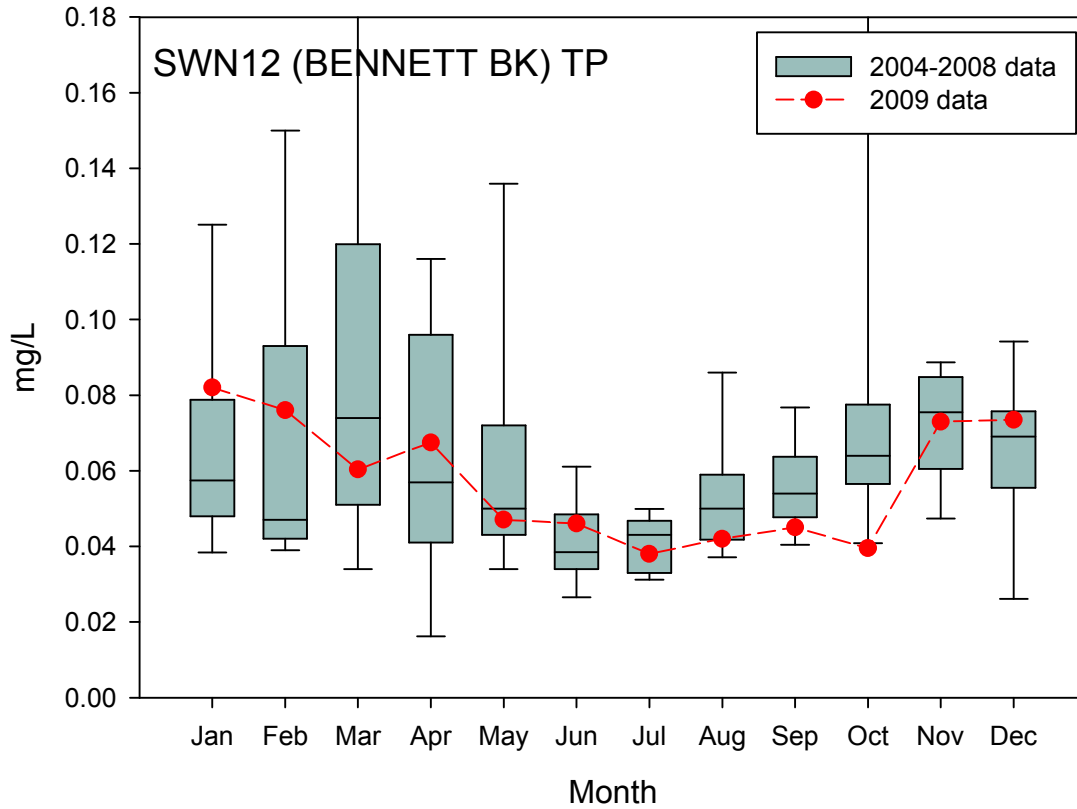
4 Bennett Brook (SWN12)

4.1 Bennett Brook 2009 4th Quarter Summary Graphs:

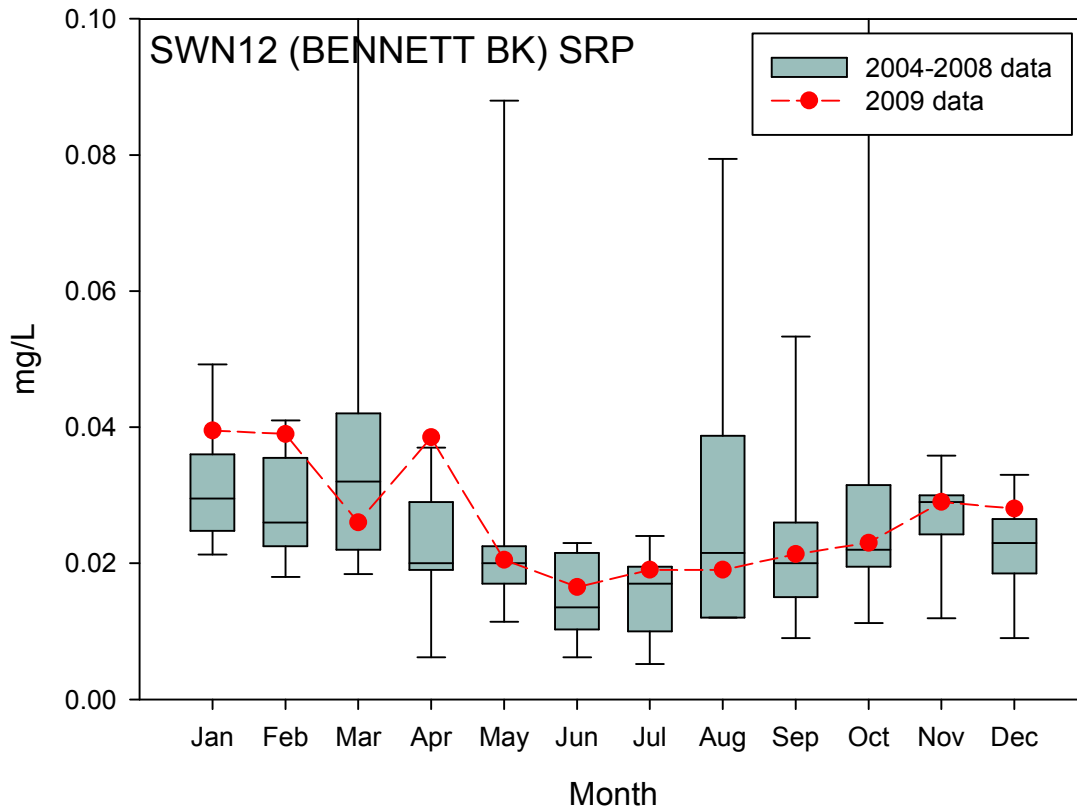


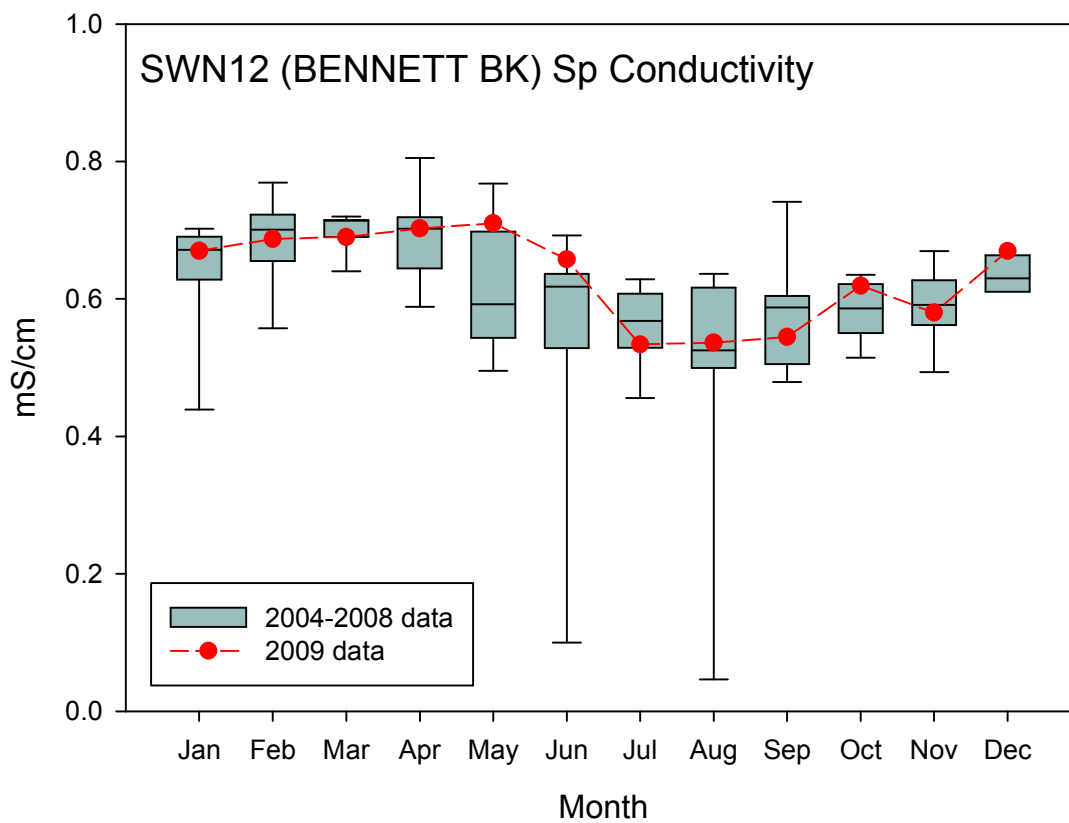
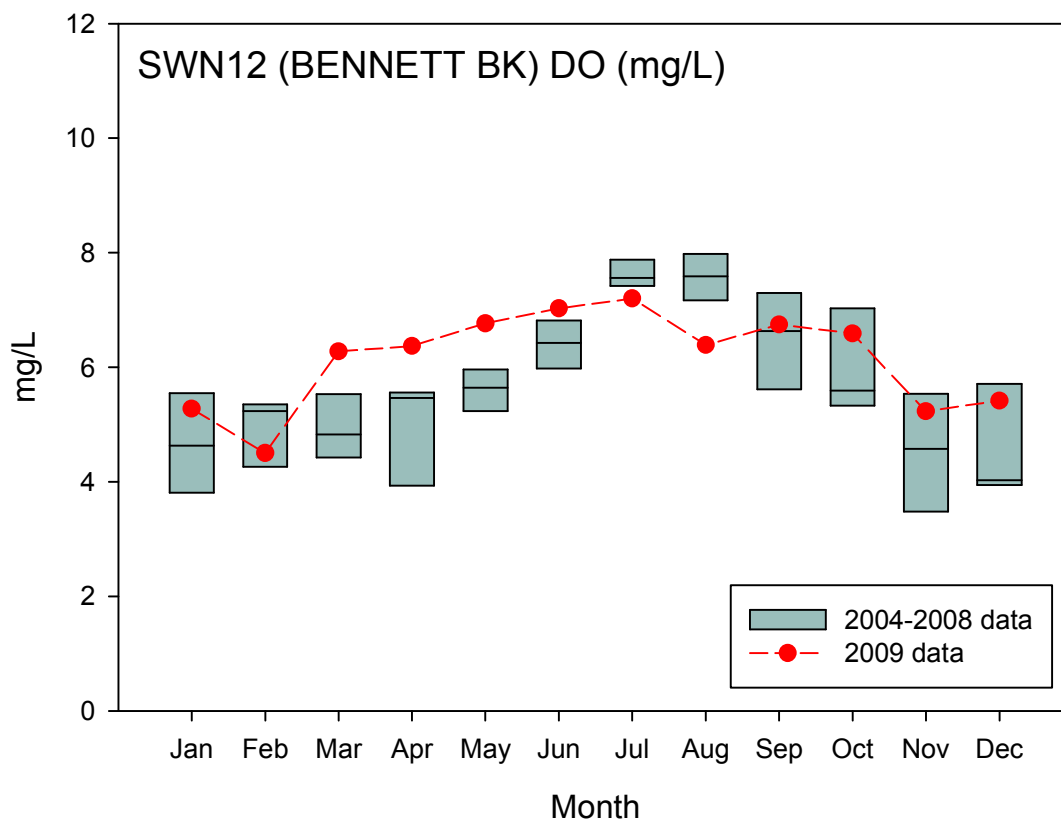


The 95th percentile for March is 0.25mg/L and for October is 0.51 mg/L.



The 95th percentile for March is 0.24mg/L and for October is 0.49 mg/L.





4.2 Bennett Brook 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	1.00	0.99	0.83	0.89	0.94	0.96	1.10	1.30	1.10	0.42	1.10	1.00
max	1.10	1.10	0.97	0.94	0.99	1.10	1.20	1.50	1.50	1.20	1.20	1.10

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.24	0.24	0.18	0.19	0.3	0.38	0.52	0.43	0.43	0.16	0.37	0.26
max	0.24	0.28	0.20	0.27	0.32	0.39	0.61	0.80	0.66	0.50	0.44	0.29

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.024	0.021	0.017	<0.01	0.020	0.024	<0.01	0.024	<0.01	0.021	0.028	<0.01
max	0.035	0.022	0.020	0.019	0.089	0.030	0.015	0.024	0.019	0.072	0.029	0.021

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.073	0.059	0.046	0.056	0.044	0.042	0.037	0.040	0.043	0.021	0.068	0.073
max	0.091	0.093	0.070	0.079	0.050	0.050	0.039	0.044	0.046	0.058	0.078	0.074

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.028	0.039	0.016	0.035	0.015	0.016	0.015	0.017	0.020	0.017	0.024	0.027
max	0.051	0.039	0.032	0.042	0.026	0.017	0.023	0.021	0.023	0.029	0.034	0.029

Dissolved Oxygen (mg/L)

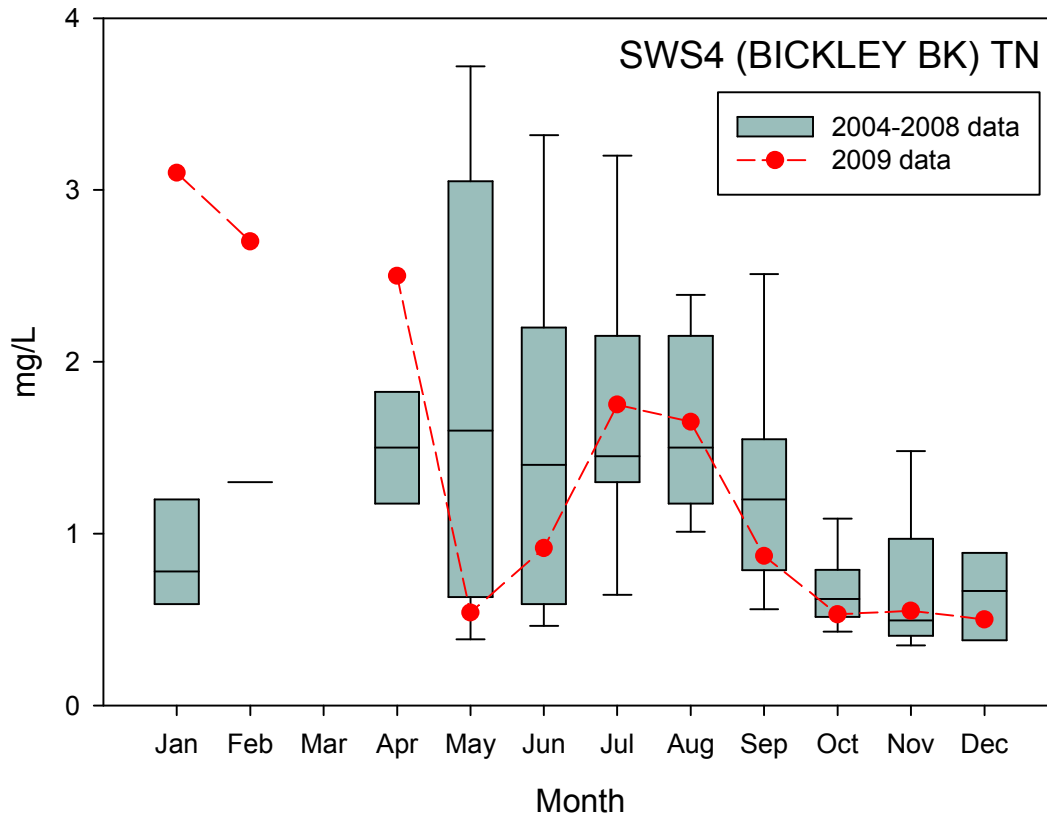
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	3	2	2	2	2	2	3	1	1	2
min	5.15	4.50	5.87	5.51	6.56	7.00	7.13	6.12	6.57	6.59	5.23	5.22
max	5.40	4.50	6.84	7.23	6.97	7.05	7.27	6.65	7.00	6.59	5.23	5.61

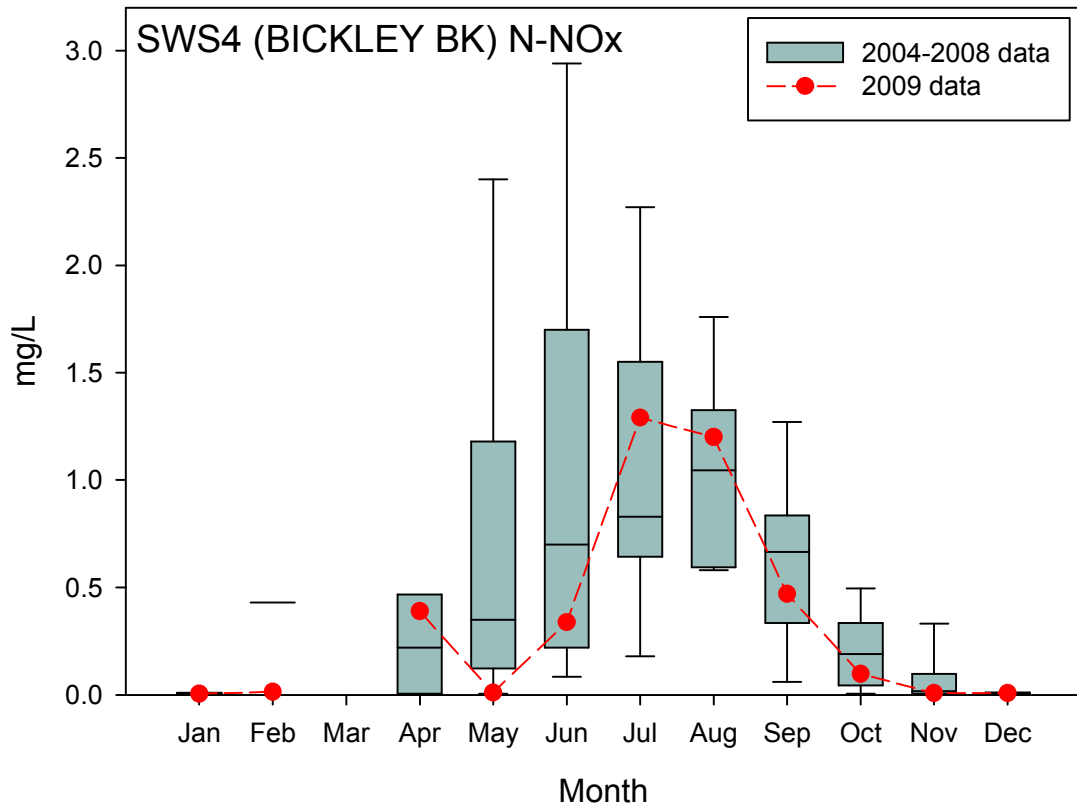
Specific Conductivity (mS/cm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	0.669	0.685	0.680	0.693	0.702	0.597	0.462	0.427	0.486	0.619	0.580	0.659
max	0.671	0.689	0.695	0.712	0.718	0.718	0.605	0.645	0.578	0.619	0.580	0.680

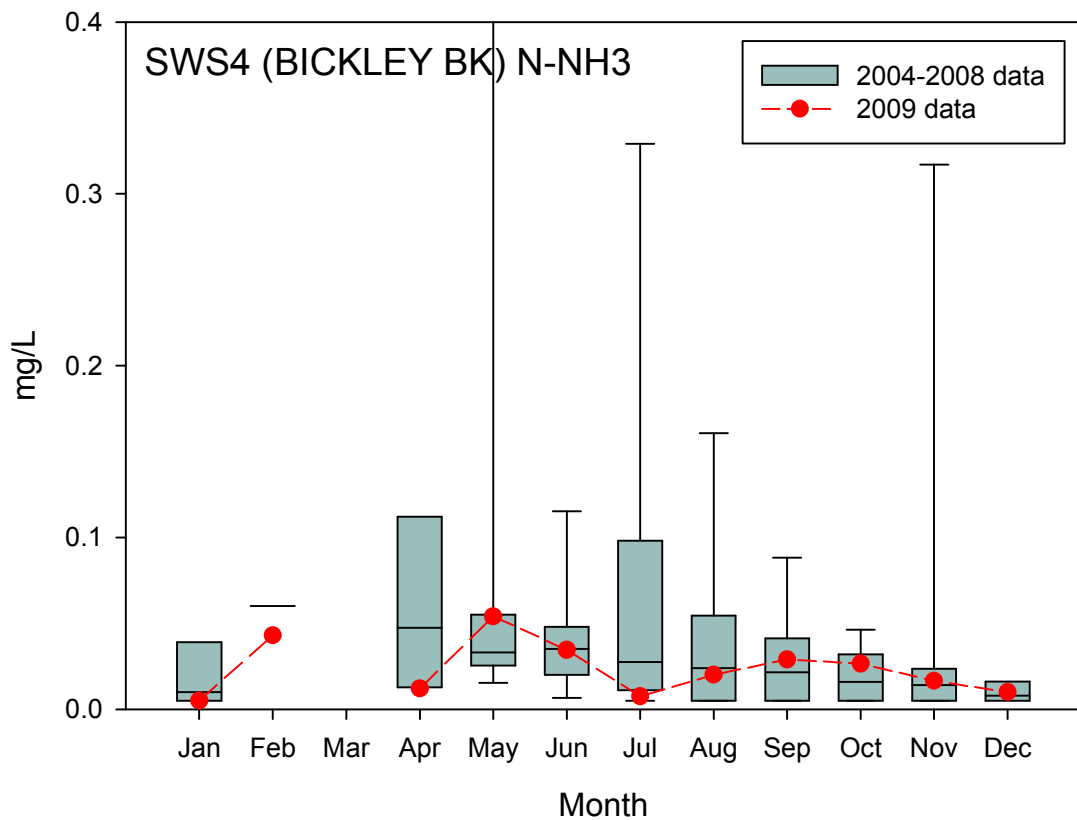
5 Bickley Brook (SWS4)

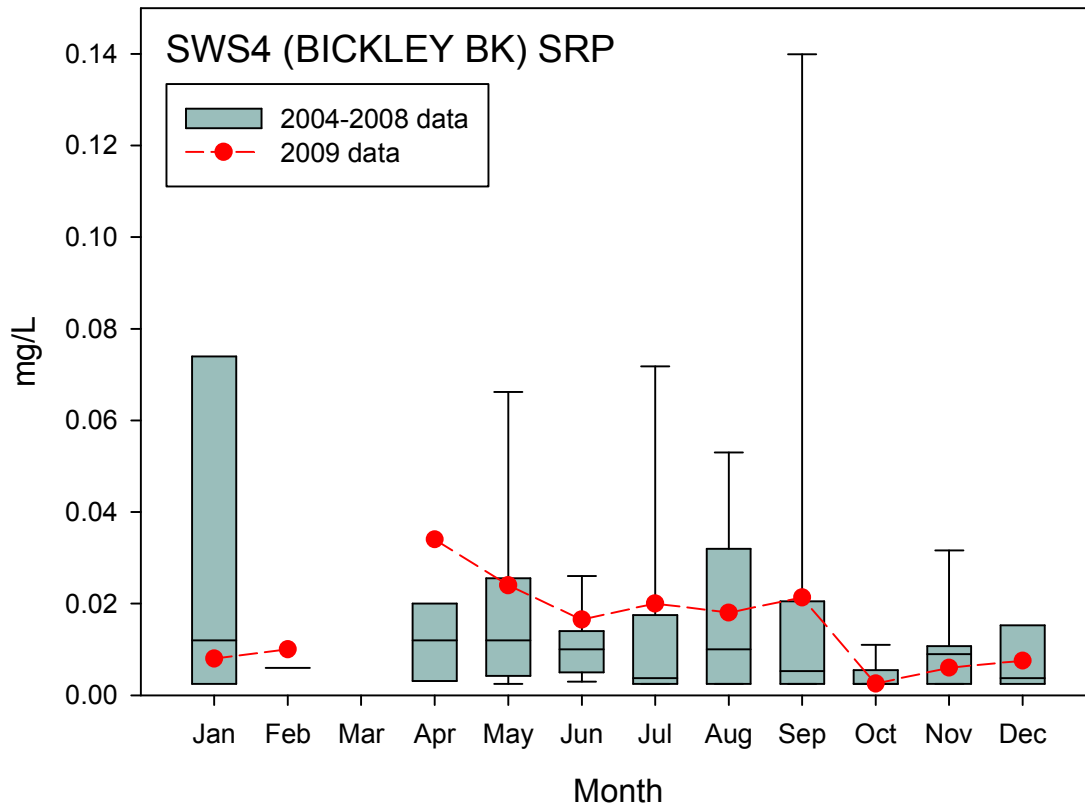
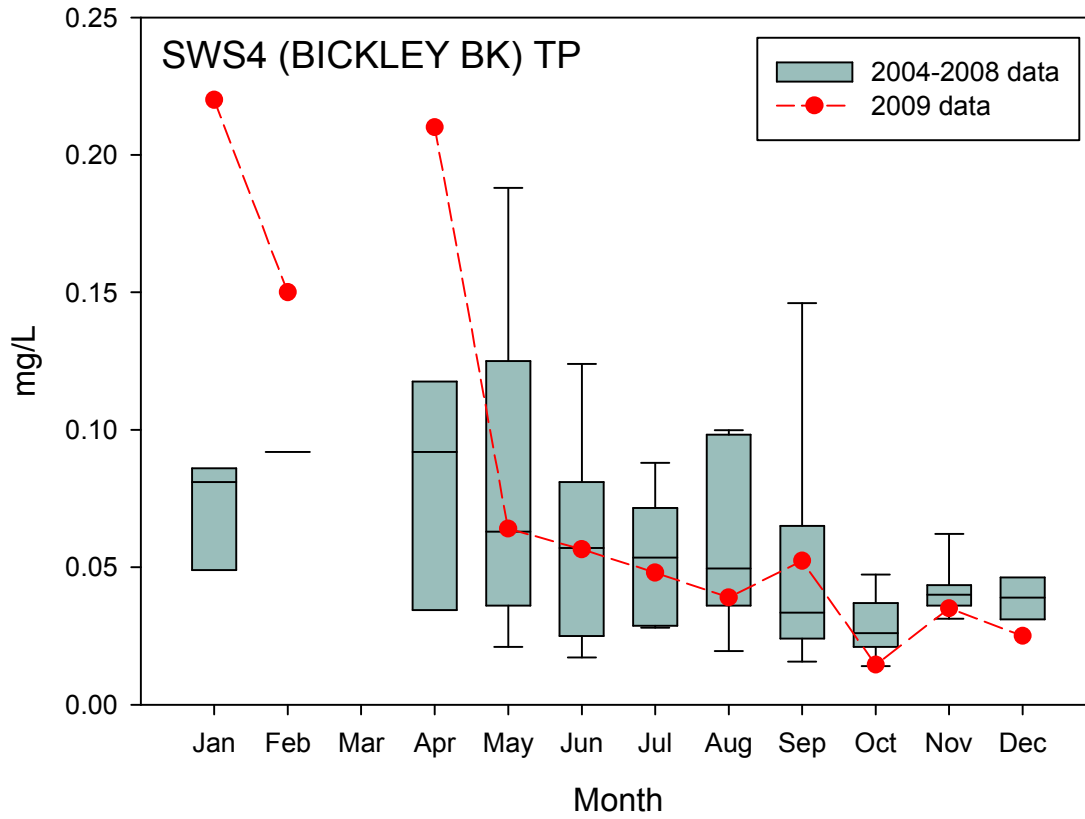
5.1 Bickley Brook 2009 4th Quarter Summary Graphs:

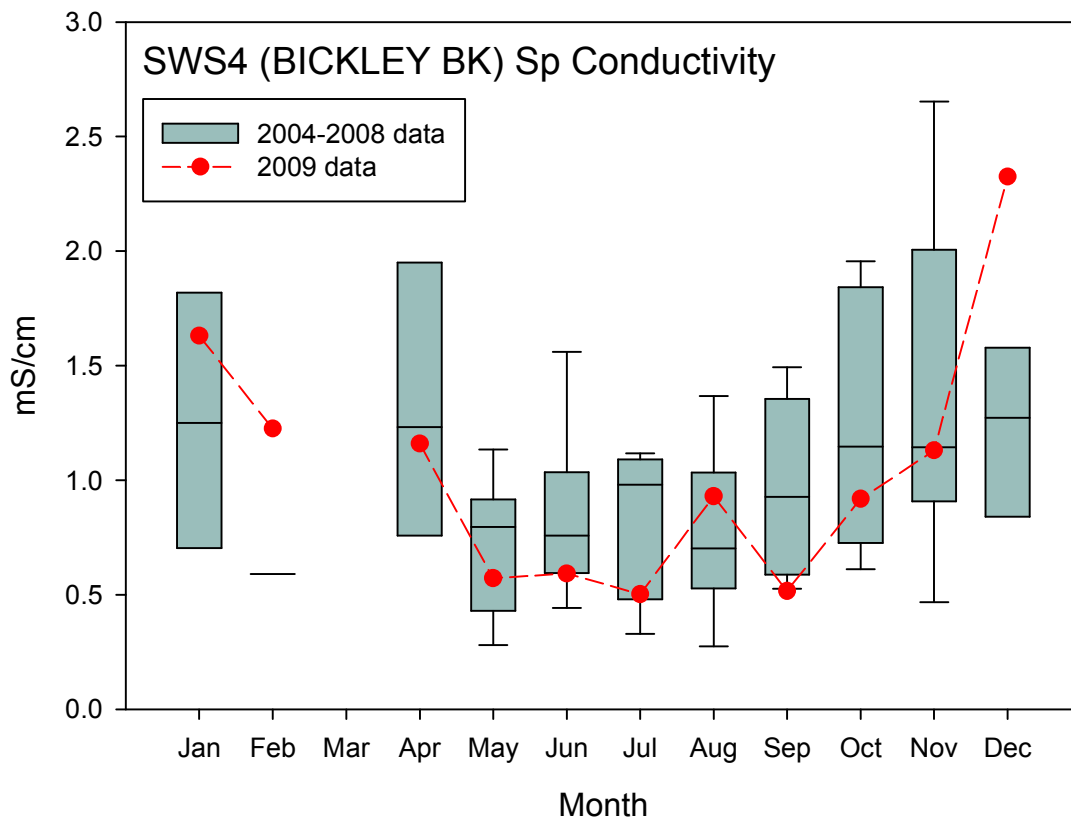
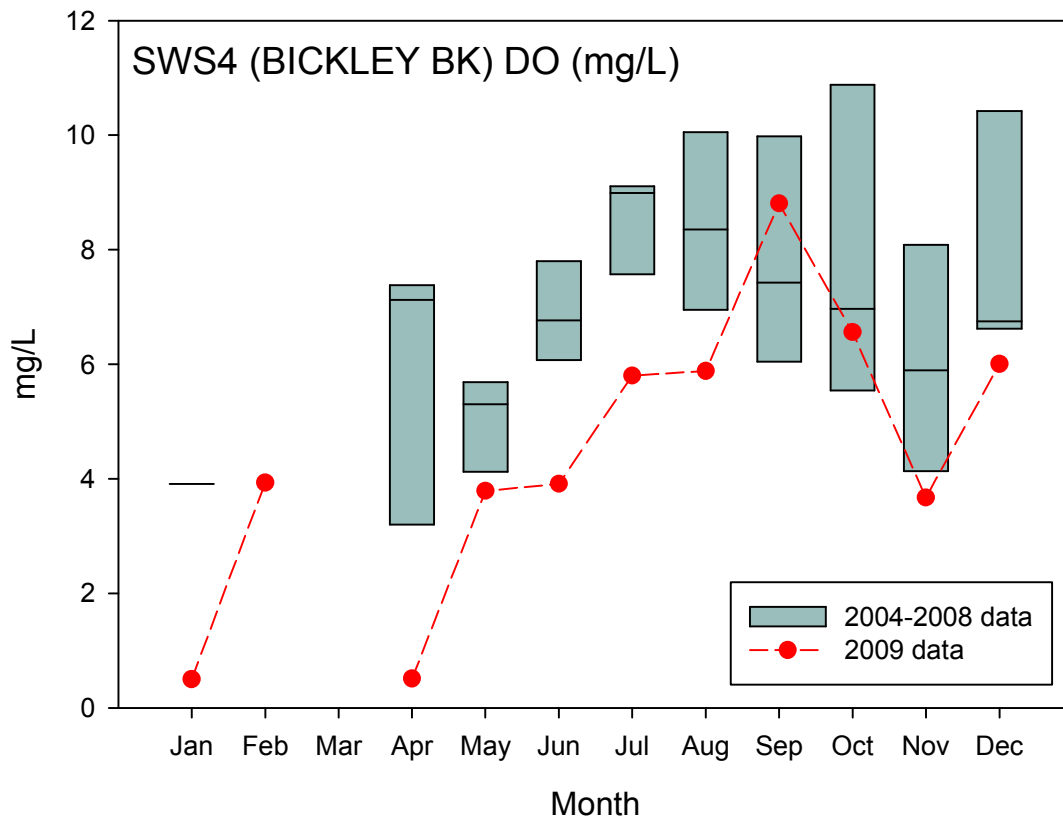




The 95th percentile for May is 2.63mg/L.







5.2 Bickley BK 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	1	1	0	1	1	2	2	2	3	2	2	2
min	3.10	2.70	-	2.50	0.54	0.63	1.20	1.60	0.71	0.46	0.47	0.43
max	3.10	2.70	-	2.50	0.54	1.20	2.30	1.70	0.95	0.60	0.63	0.57

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	1	1	0	1	1	2	2	2	3	2	2	2
min	<0.01	0.014	-	0.390	0.010	0.017	0.780	1.100	0.390	0.024	<0.01	<0.01
max	<0.01	0.014	-	0.390	0.010	0.660	1.800	1.300	0.620	0.170	0.010	0.011

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	1	1	0	1	1	2	2	2	3	2	2	2
min	<0.01	0.043	-	0.012	0.054	0.017	<0.01	0.011	<0.01	<0.01	0.016	<0.01
max	<0.01	0.043	-	0.012	0.054	0.052	0.010	0.029	0.071	0.048	0.017	0.015

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	1	1	0	1	1	2	2	2	3	2	2	2
min	0.220	0.150	-	0.210	0.064	0.048	0.032	0.021	0.017	0.014	0.029	0.025
max	0.220	0.150	-	0.210	0.064	0.065	0.064	0.057	0.110	0.015	0.041	0.025

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	1	1	0	1	1	2	2	2	3	2	2	2
min	0.008	0.010	-	0.034	0.024	0.015	0.010	0.005	0.008	<0.005	0.005	0.005
max	0.008	0.010	-	0.034	0.024	0.018	0.030	0.031	0.043	<0.005	0.007	0.010

Dissolved Oxygen (mg/L)

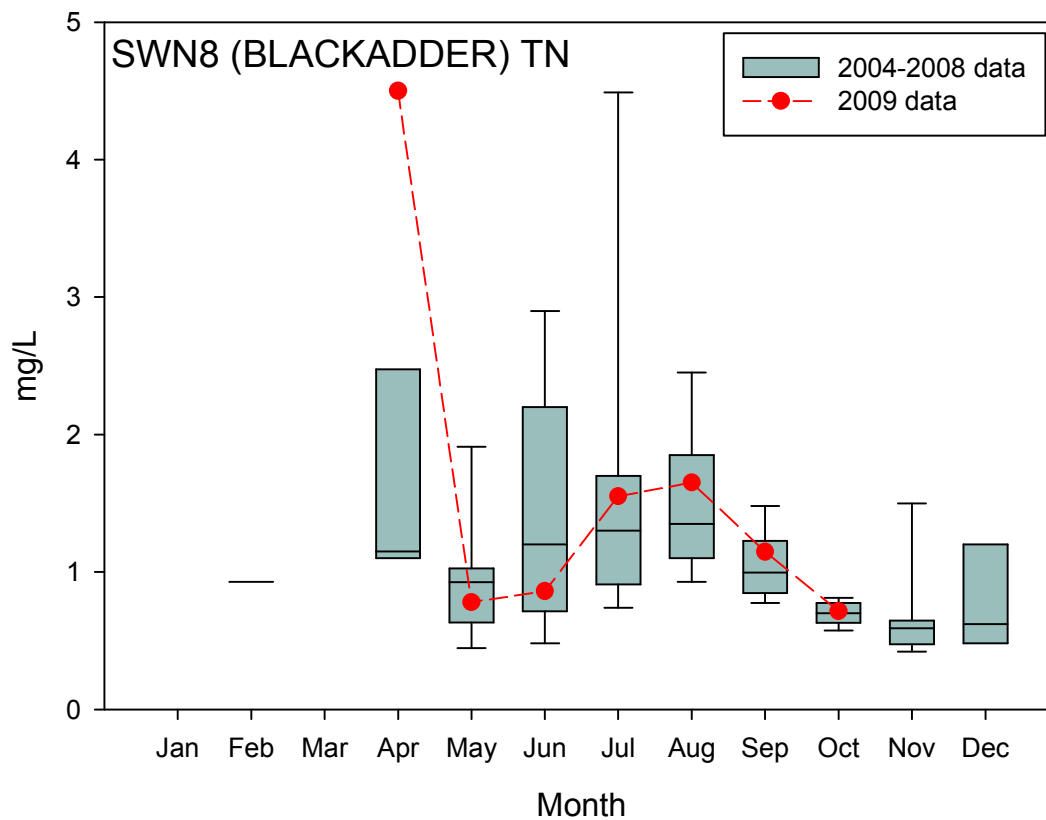
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	1	1	0	1	1	2	2	2	3	1	1	2
min	0.50	3.93	-	0.51	3.79	3.13	4.04	4.37	8.11	6.56	3.67	3.64
max	0.50	3.93	-	0.51	3.79	4.69	7.56	7.39	9.78	6.56	3.67	8.37

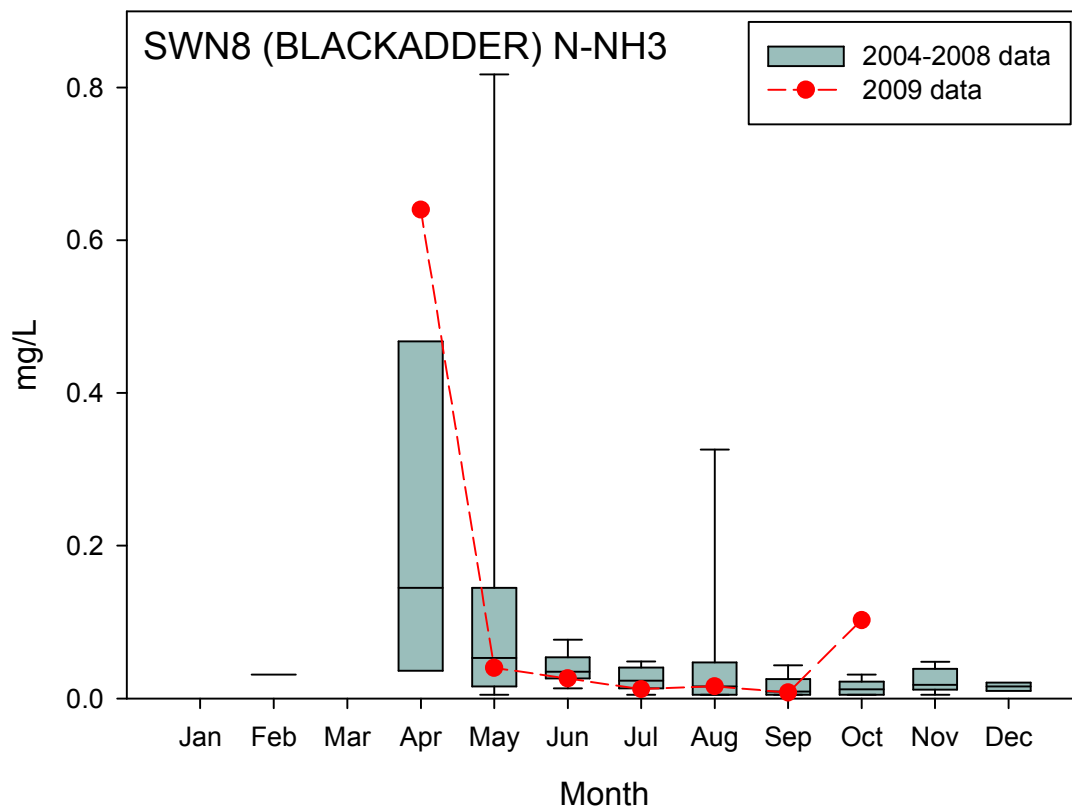
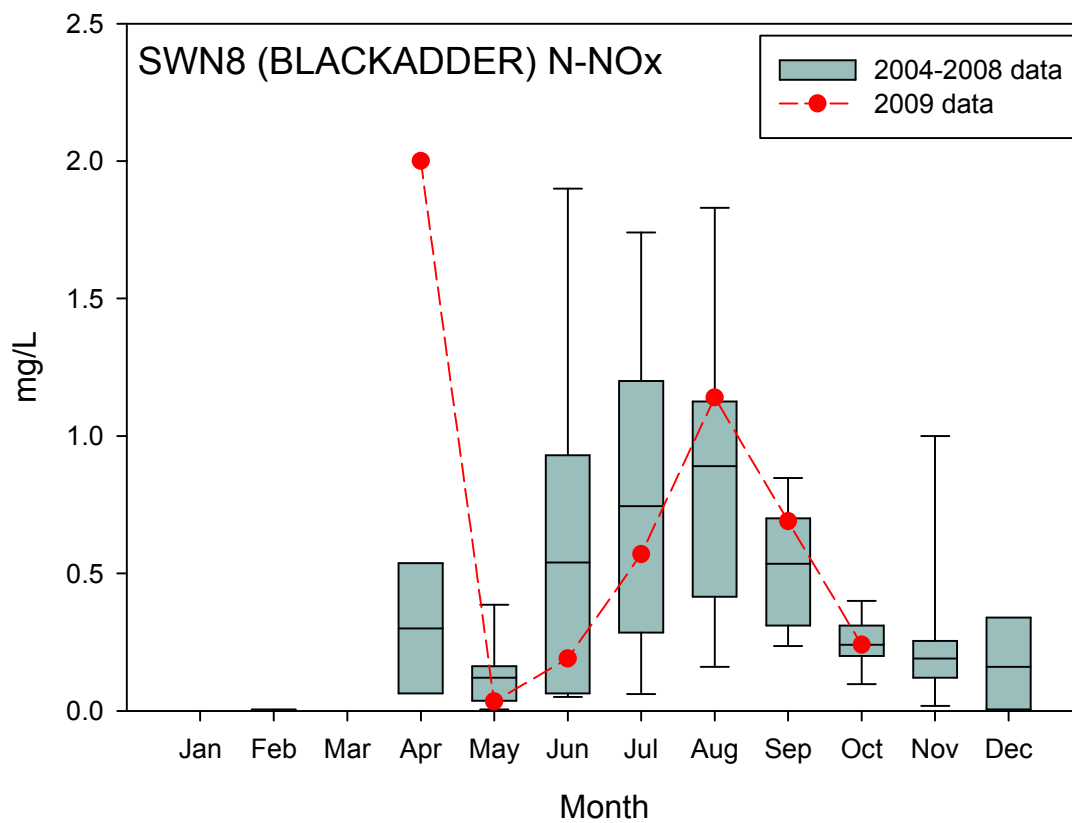
Specific Conductivity (mS/cm)

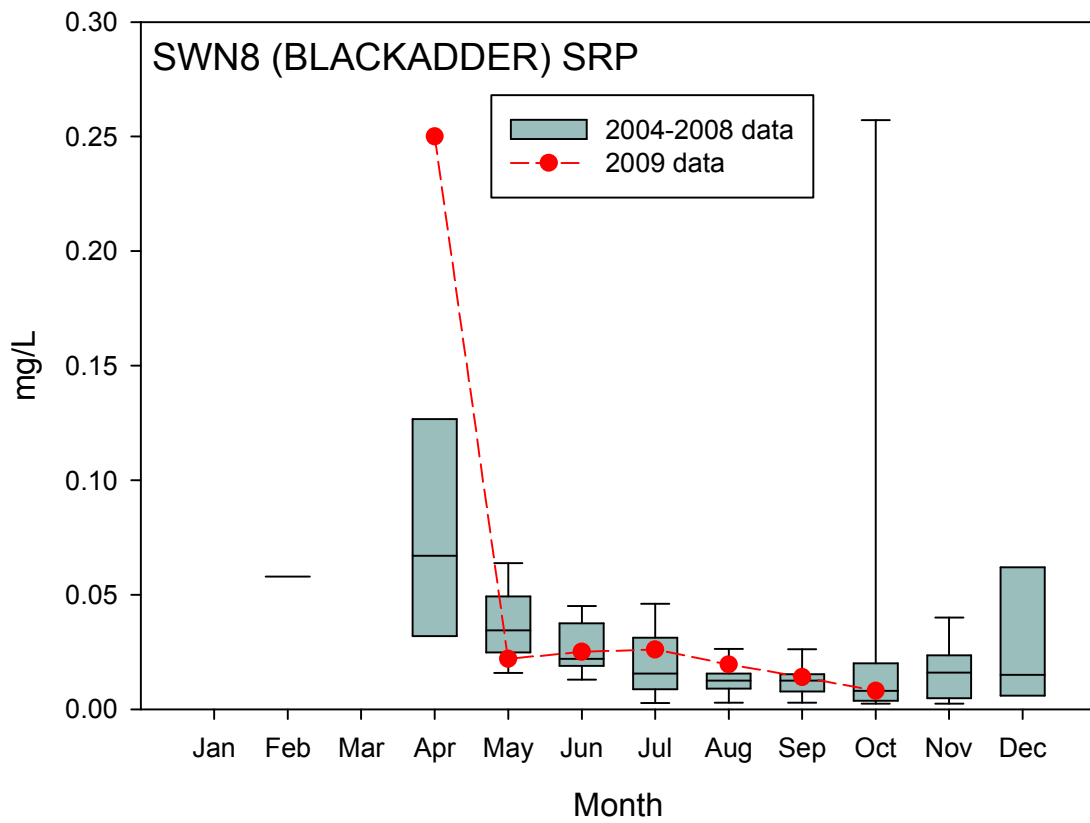
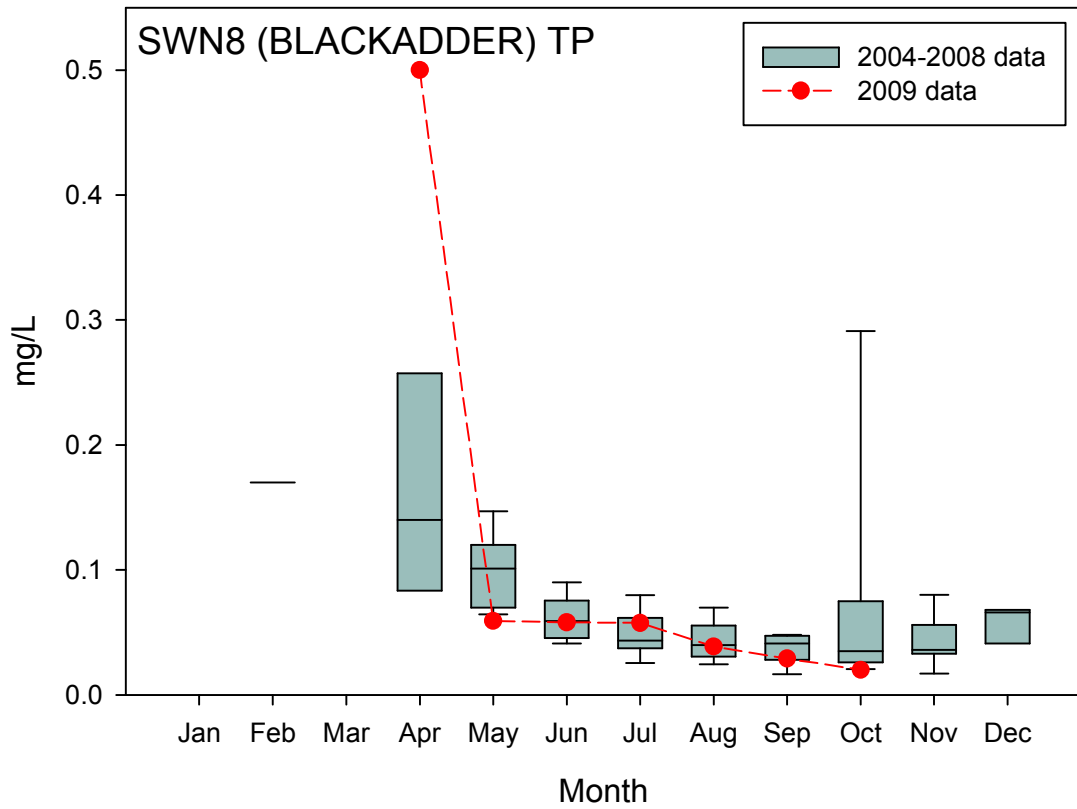
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	1	1	0	1	1	2	2	2	3	1	1	2
min	1.630	1.225	-	1.160	0.572	0.582	0.431	0.701	0.295	0.918	1.130	1.930
max	1.630	1.225	-	1.160	0.572	0.602	0.572	1.158	0.655	0.918	1.130	2.720

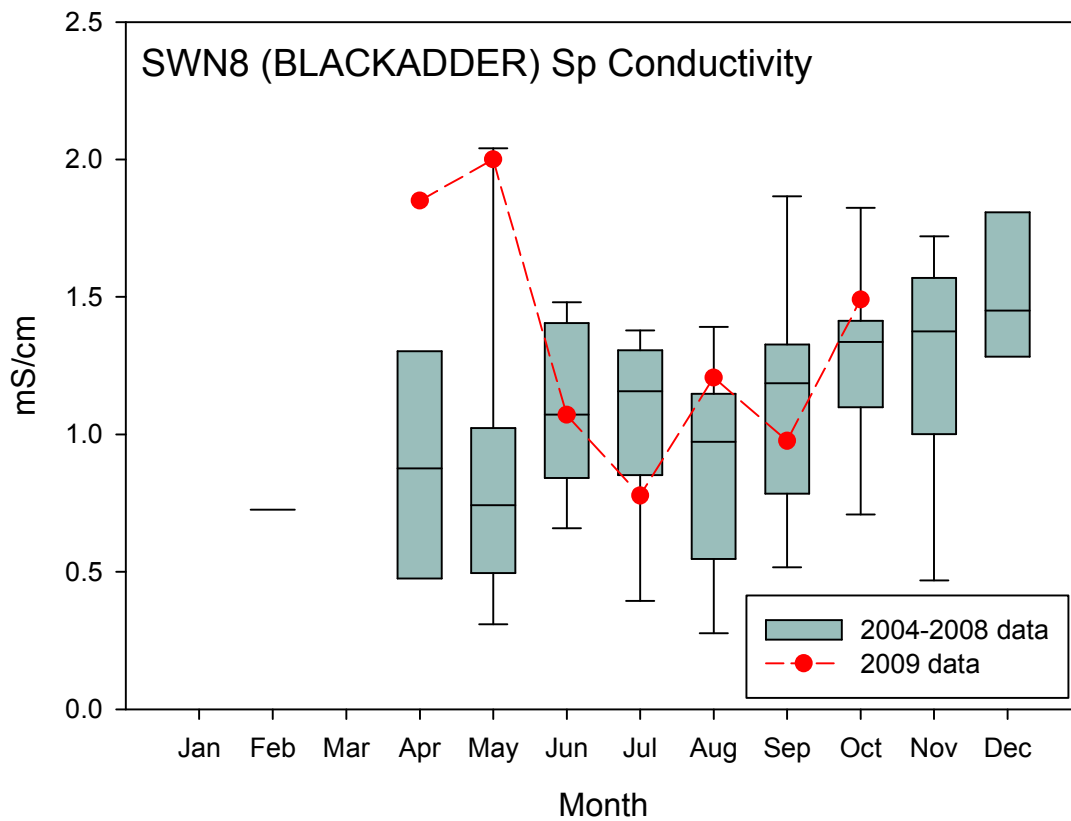
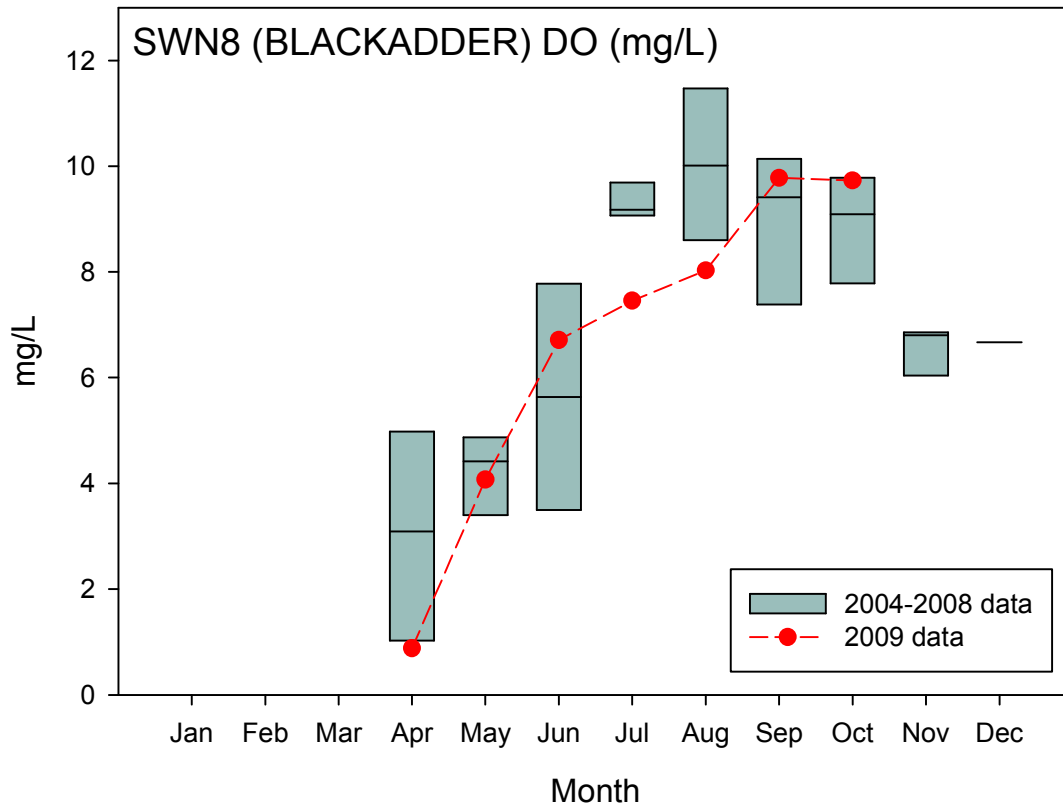
6 Blackadder Creek (SWN8)

6.1 Blackadder Ck 2009 4th Quarter Summary Graphs:









6.2 Blackadder Ck 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	1	1	1	2	2	3	2	0	0
min	-	-	-	4.50	0.78	0.86	1.10	1.30	0.74	0.70	-	-
max	-	-	-	4.50	0.78	0.86	2.00	2.00	1.50	0.73	-	-

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	1	1	1	2	2	3	2	0	0
min	-	-	-	2.00	0.034	0.190	0.180	0.880	0.360	0.18	-	-
max	-	-	-	2.00	0.034	0.190	0.960	1.400	0.890	0.30	-	-

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	1	1	1	2	2	3	2	0	0
min	-	-	-	0.640	0.040	0.026	0.011	<0.01	<0.01	<0.01	-	-
max	-	-	-	0.640	0.040	0.026	0.013	0.027	0.013	0.20	-	-

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	1	1	1	2	2	3	2	0	0
min	-	-	-	0.500	0.059	0.058	0.045	0.025	0.021	0.018	-	-
max	-	-	-	0.500	0.059	0.058	0.070	0.052	0.042	0.022	-	-

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	1	1	1	2	2	3	2	0	0
min	-	-	-	0.250	0.022	0.025	0.025	0.011	0.012	0.007	-	-
max	-	-	-	0.250	0.022	0.025	0.027	0.028	0.016	0.009	-	-

Dissolved Oxygen (mg/L)

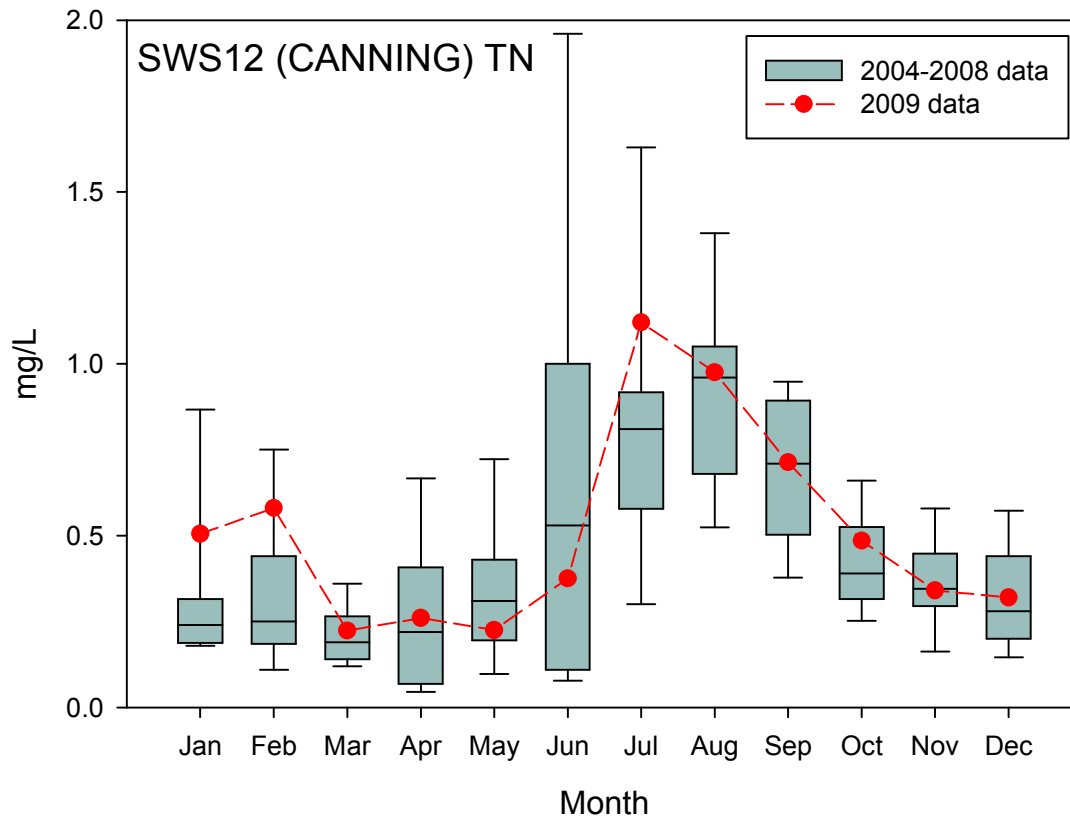
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	1	1	1	2	2	3	1	0	0
min	-	-	-	0.88	4.07	6.71	6.54	7.97	8.84	9.73	-	-
max	-	-	-	0.88	4.07	6.71	8.37	8.08	10.28	9.73	-	-

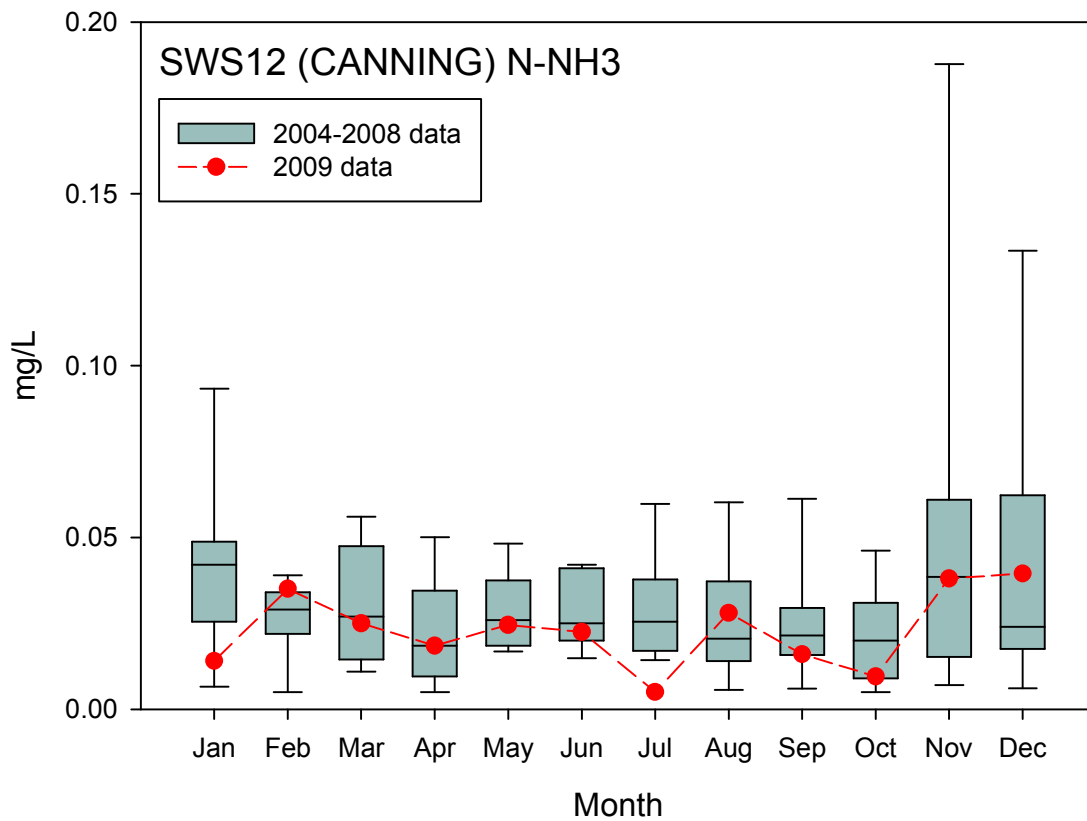
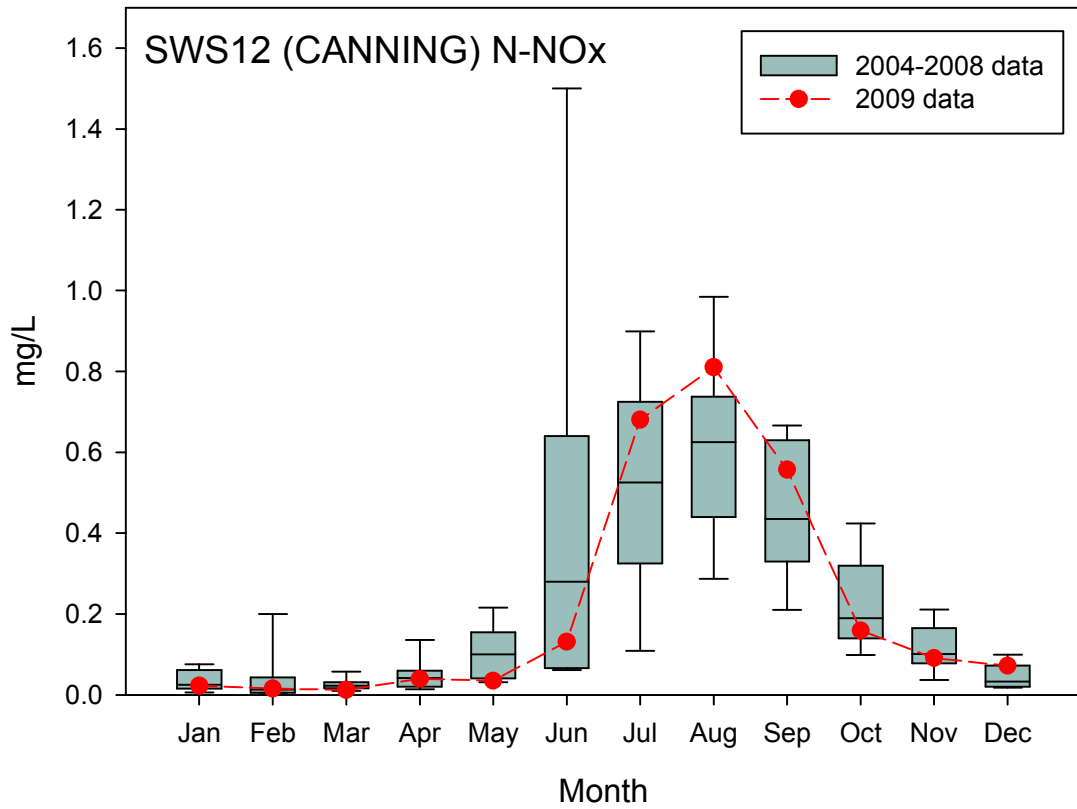
Specific Conductivity (mS/cm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	1	1	1	2	2	3	1	0	0
min	-	-	-	1.850	2.00	1.071	0.733	0.934	0.497	1.490	-	-
max	-	-	-	1.850	2.00	1.071	0.822	1.478	1.231	1.490	-	-

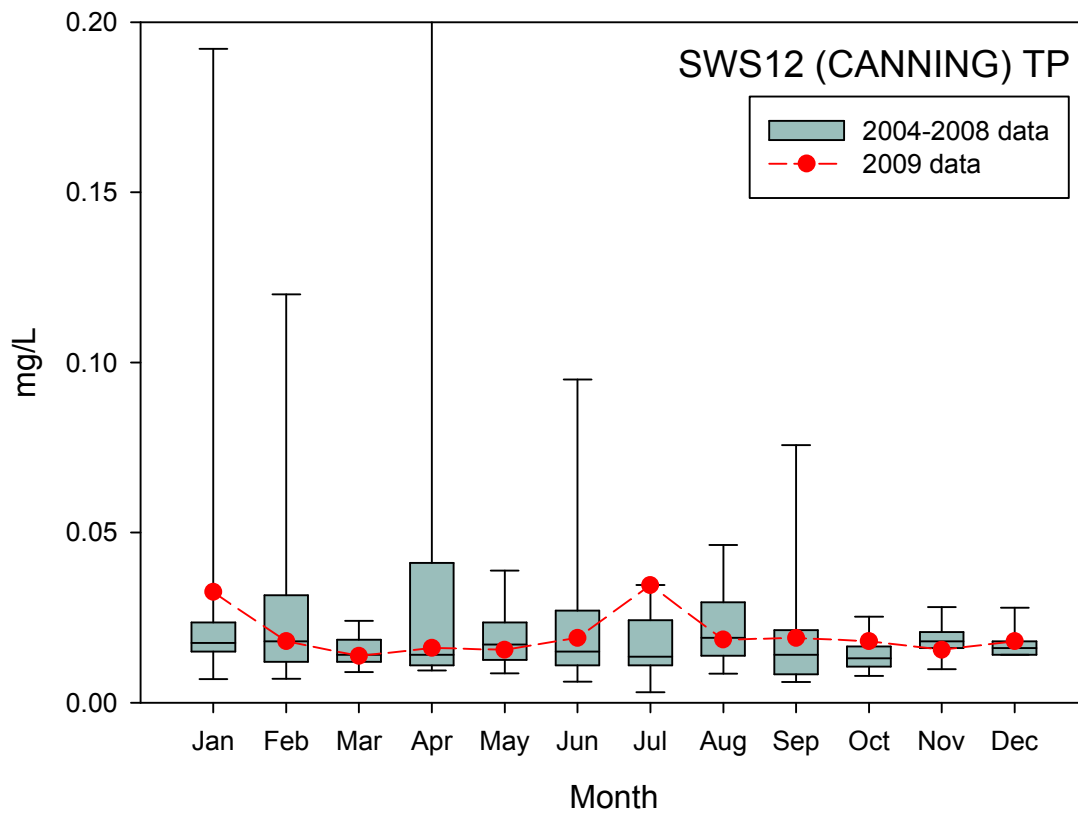
7 Canning River (SWS12)

7.1 Canning River 2009 4th Quarter Summary Graphs:

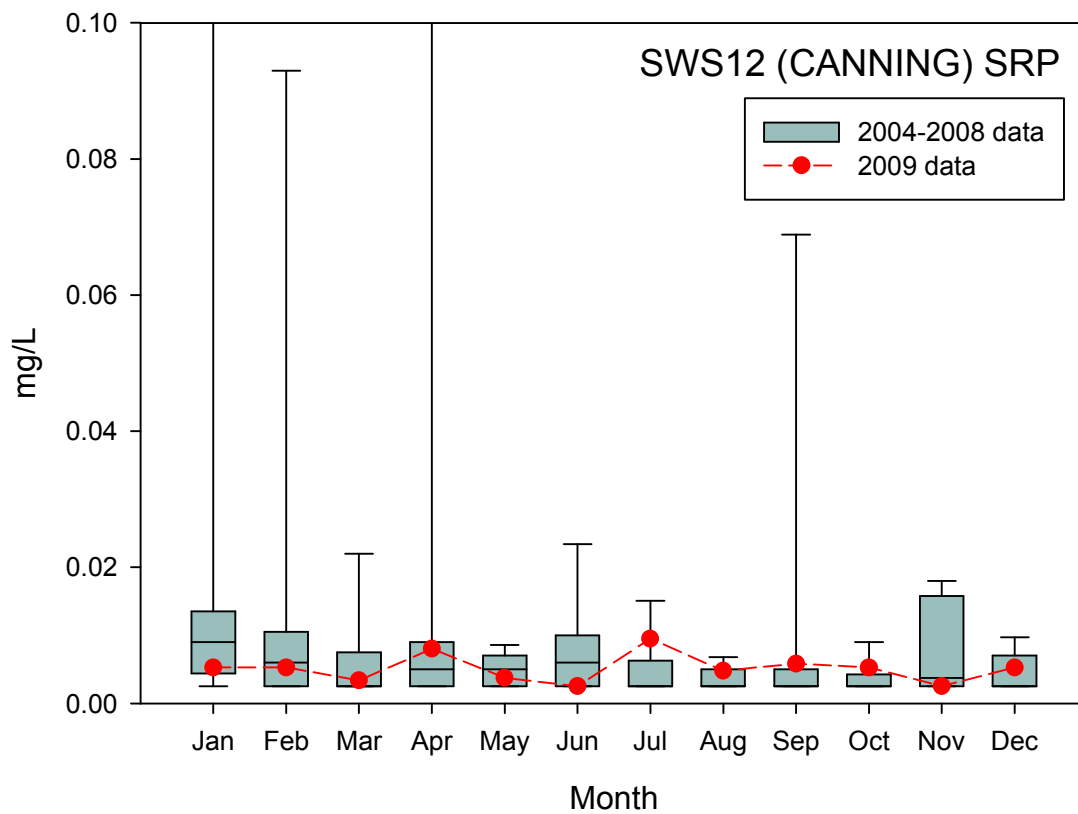


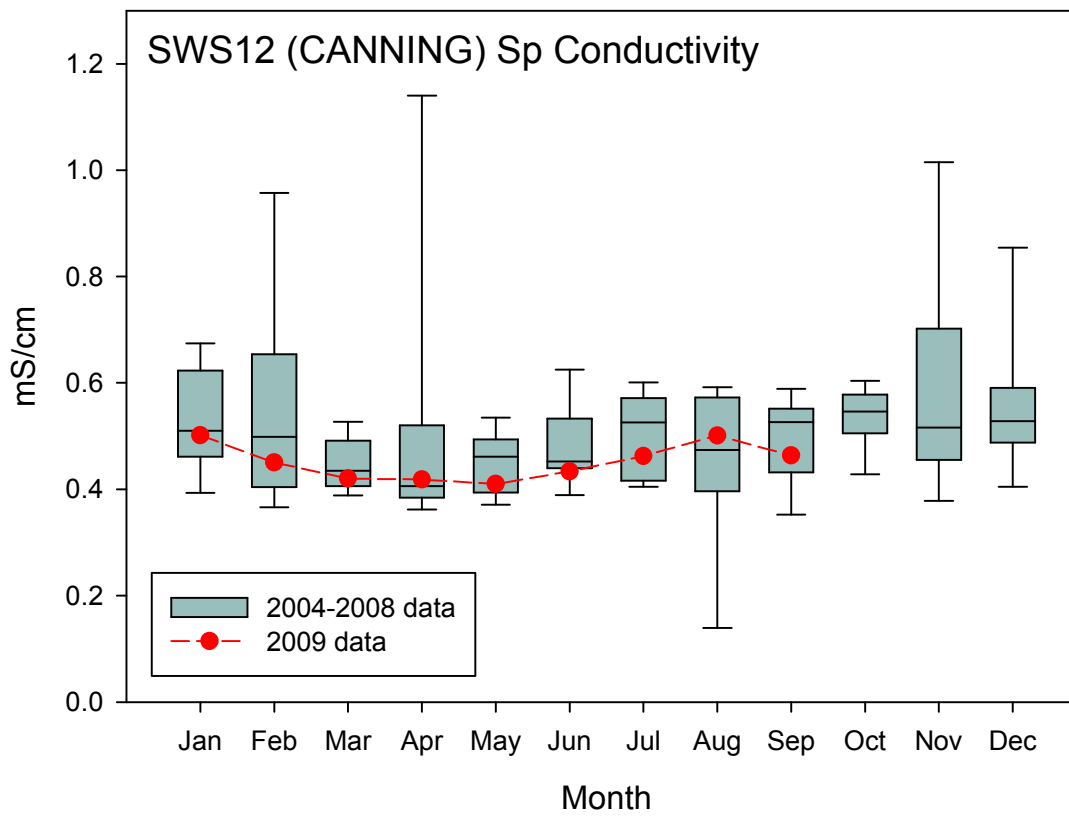
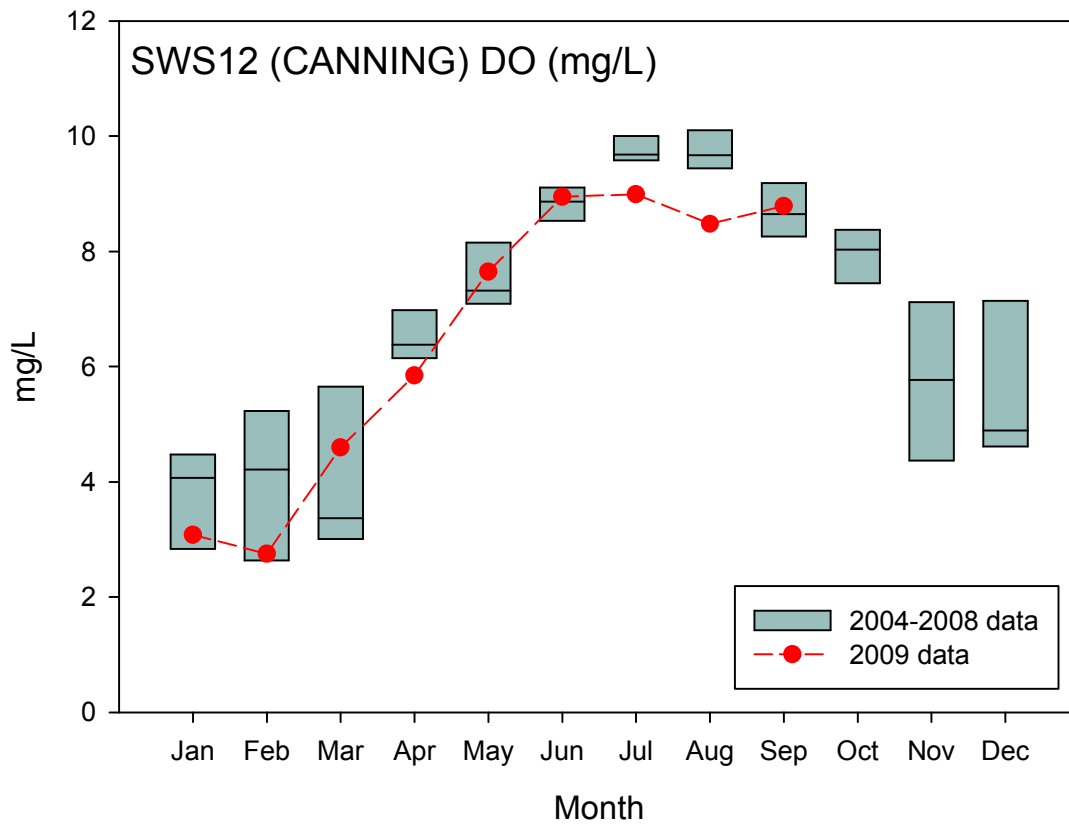


The 95th percentile for April is 0.42 mg/L.



The 95th percentile for January is 0.18mg/L and for April is 0.40 mg/L.





7.2 Canning River 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.37	0.21	0.20	0.15	0.15	0.26	0.74	0.85	0.64	0.48	0.31	0.26
max	0.64	0.95	0.25	0.37	0.30	0.49	1.50	1.10	0.82	0.49	0.37	0.38

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.014	0.010	0.011	0.015	0.021	0.042	0.420	0.660	0.500	0.018	0.072	0.049
max	0.031	0.020	0.014	0.064	0.049	0.220	0.940	0.960	0.630	0.300	0.110	0.094

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	<0.01	0.029	0.023	0.011	0.019	0.017	<0.01	0.027	<0.01	<0.01	0.034	0.019
max	0.023	0.041	0.027	0.026	0.030	0.028	<0.01	0.029	0.026	0.014	0.042	0.060

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.019	0.016	0.011	0.015	0.013	0.012	0.021	0.011	0.008	0.012	0.015	0.016
max	0.046	0.020	0.015	0.017	0.018	0.026	0.048	0.026	0.034	0.024	0.016	0.020

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
max	0.008	0.008	0.005	0.011	0.005	<0.005	0.011	0.007	0.008	0.008	<0.005	0.008

Dissolved Oxygen (mg/L)

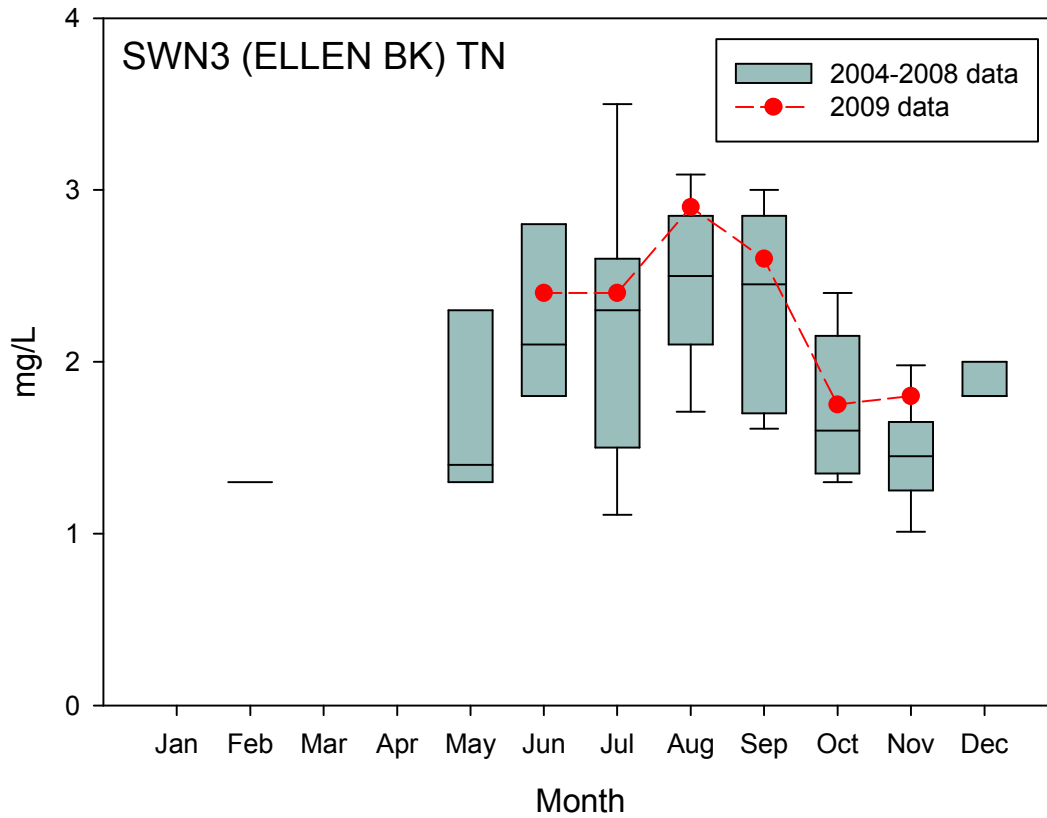
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	3	2	2	2	2	2	3	1	1	2
min	2.82	2.75	3.97	4.88	7.12	8.38	8.76	8.32	8.76	9.1	7.21	5.56
max	3.34	2.75	4.58	6.81	8.17	9.51	9.22	8.63	8.81	9.1	7.21	5.80

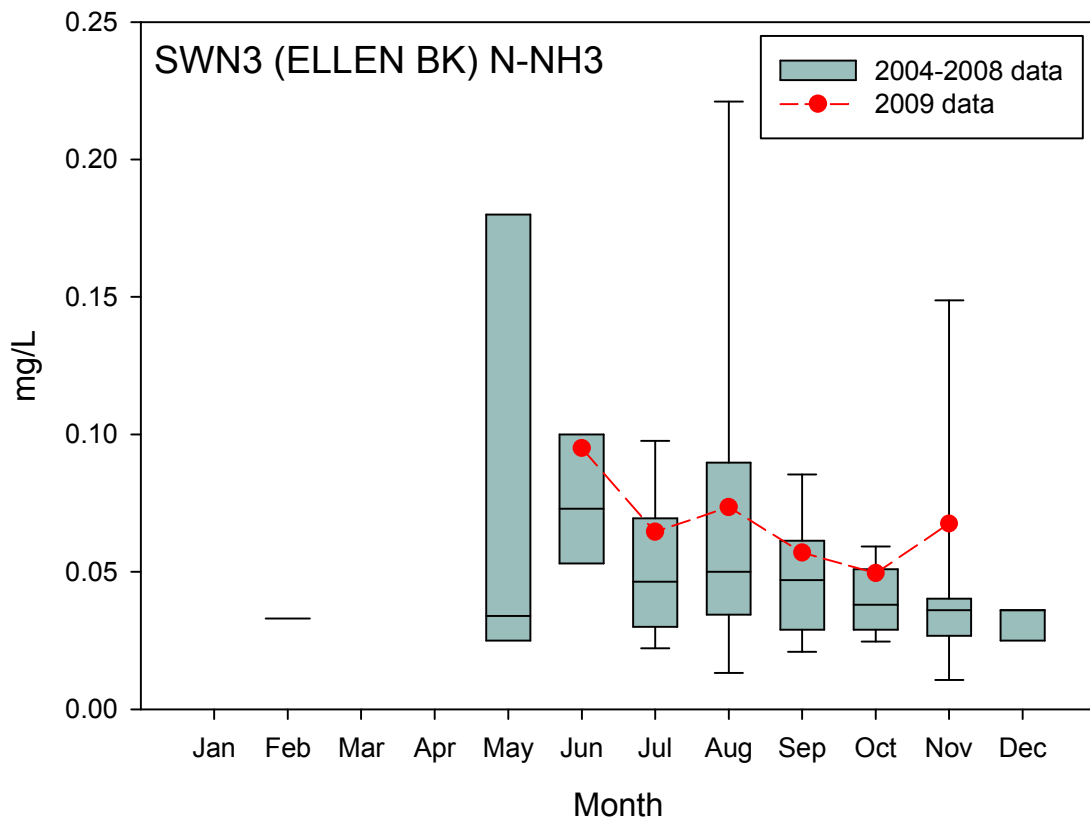
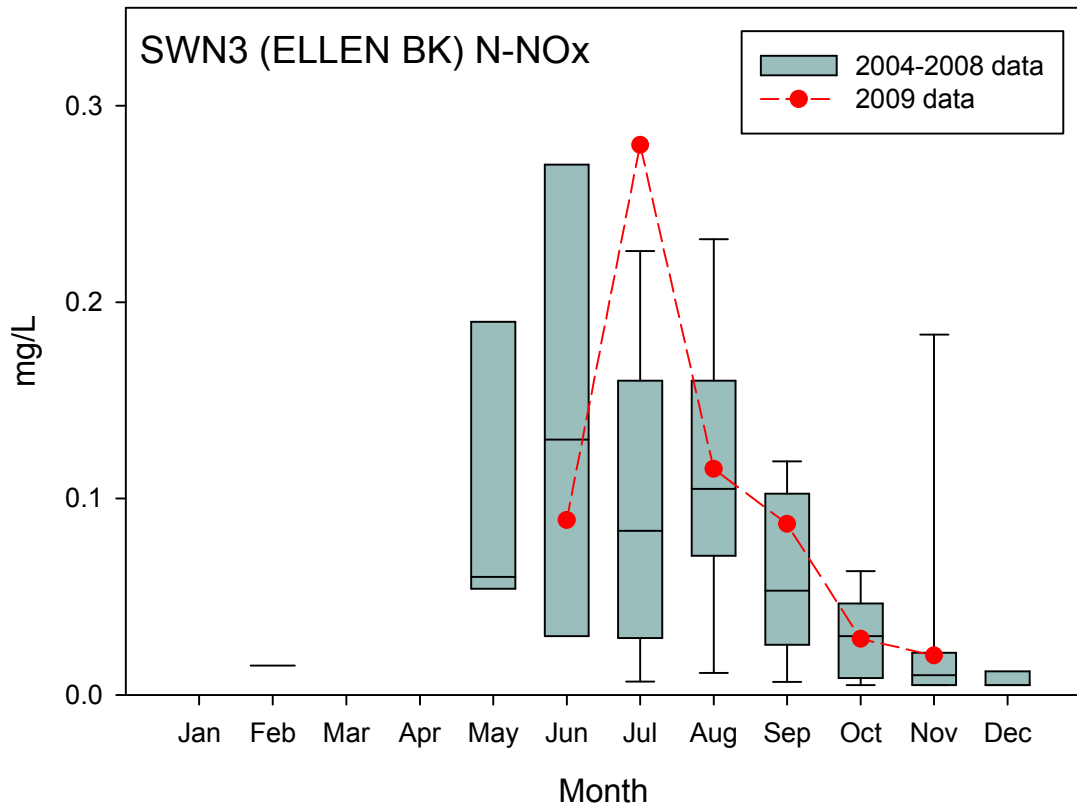
Specific Conductivity (mS/cm)

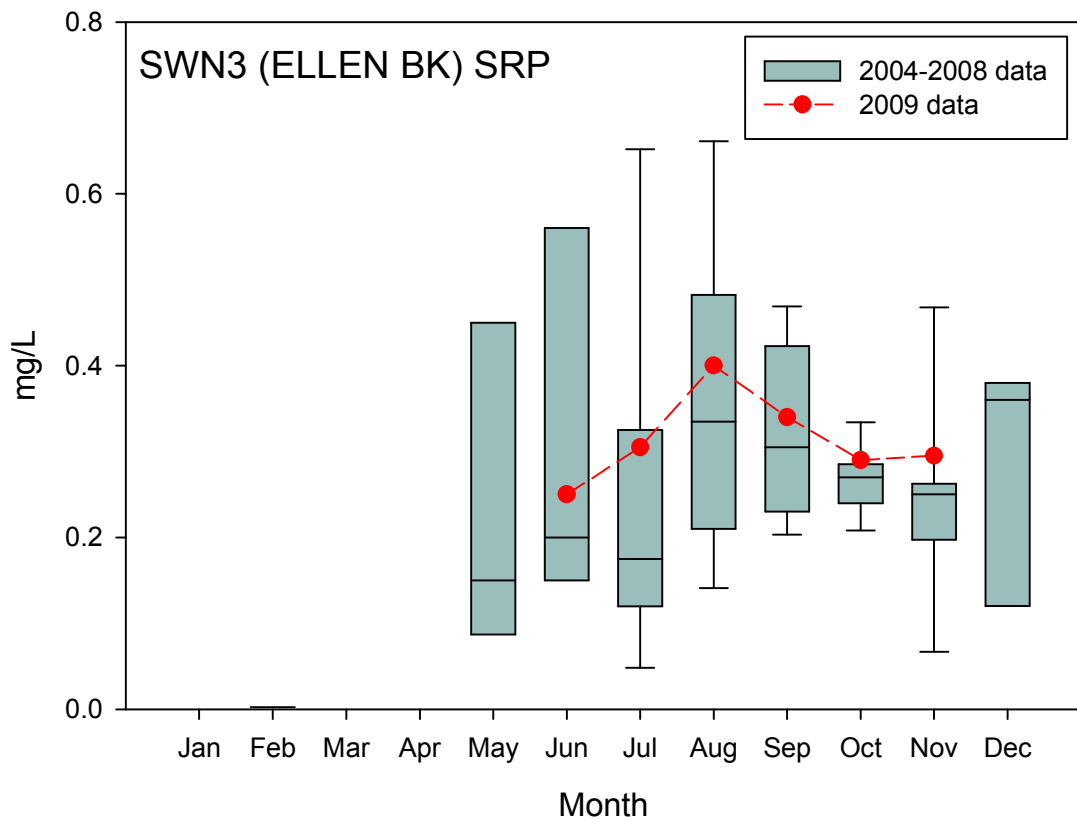
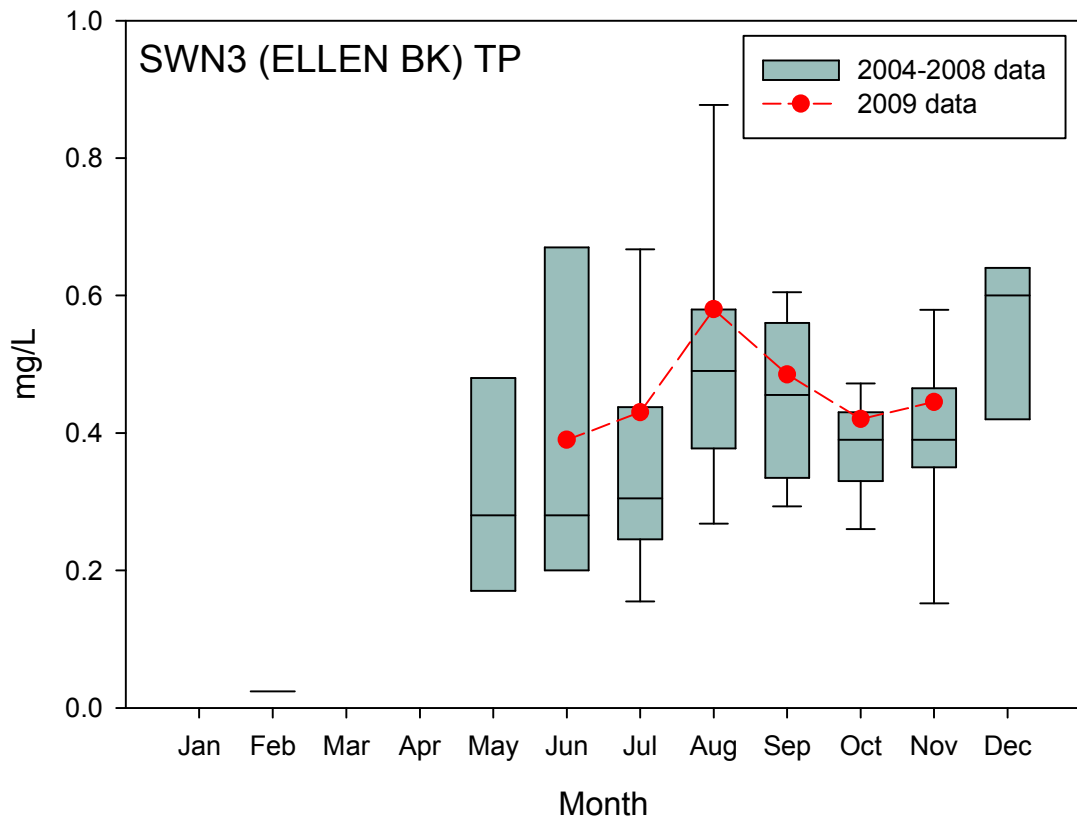
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	0.430	0.450	0.417	0.413	0.409	0.424	0.342	0.447	0.355	0.549	0.497	0.464
max	0.573	0.450	0.424	0.423	0.410	0.443	0.582	0.555	0.519	0.549	0.497	0.581

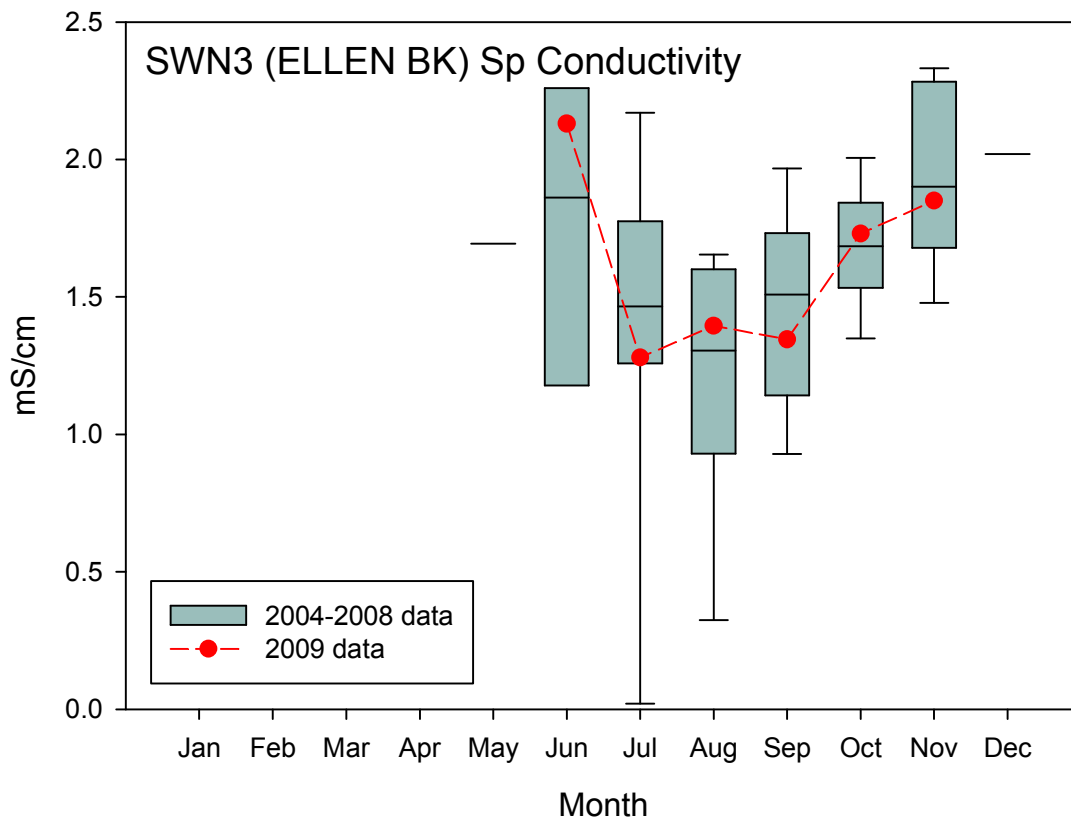
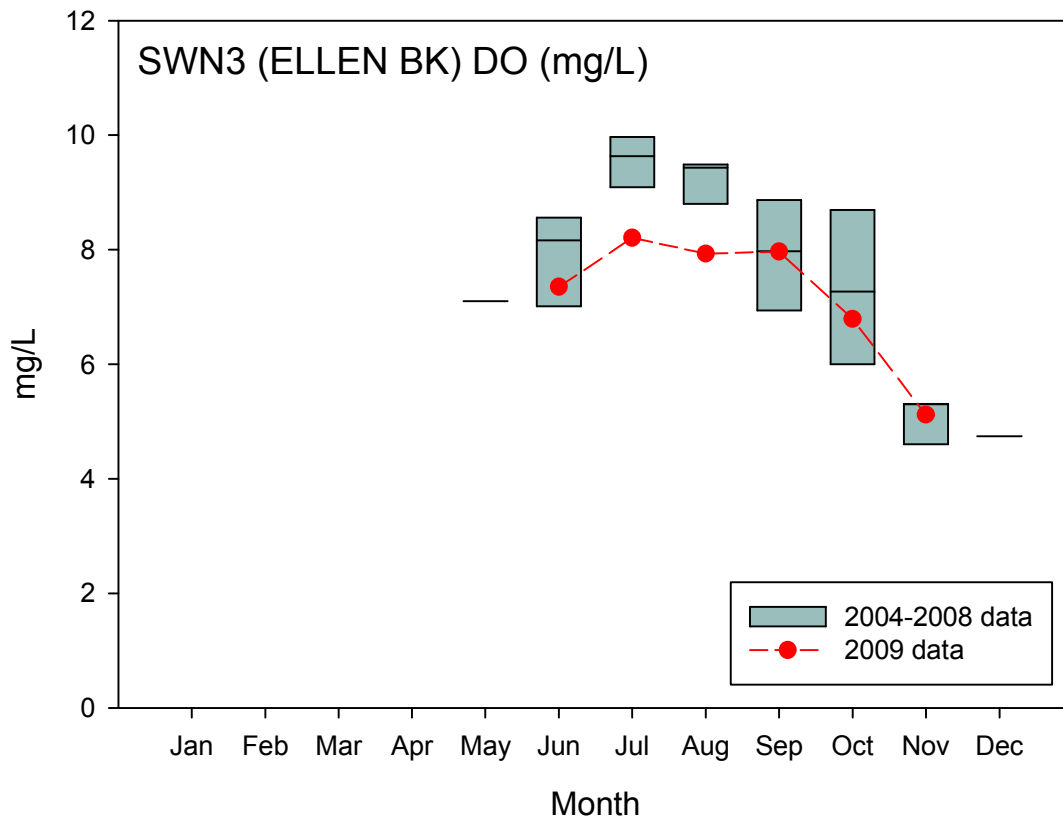
8 Ellen Brook (SWN3)

8.1 Ellen Brook 2009 4th Quarter Summary Graphs:









8.2 Ellen Brook 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	2	2	2	0
min	-	-	-	-	-	2.4	2.3	3.0	2.4	1.60	1.80	-
max	-	-	-	-	-	2.4	2.5	2.8	2.8	1.90	1.80	-

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	2	2	2	0
min	-	-	-	-	-	0.089	0.190	0.100	0.077	0.020	0.015	-
max	-	-	-	-	-	0.089	0.370	0.130	0.097	0.037	0.025	-

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	2	2	2	0
min	-	-	-	-	-	0.095	0.047	0.073	0.049	0.043	0.056	-
max	-	-	-	-	-	0.095	0.082	0.074	0.065	0.056	0.079	-

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	2	2	2	0
min	-	-	-	-	-	0.39	0.42	0.54	0.42	0.38	0.44	-
max	-	-	-	-	-	0.39	0.44	0.62	0.55	0.46	0.45	-

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	2	2	2	0
min	-	-	-	-	-	0.25	0.29	0.37	0.29	0.28	0.28	-
max	-	-	-	-	-	0.25	0.32	0.43	0.39	0.30	0.31	-

Dissolved Oxygen (mg/L)

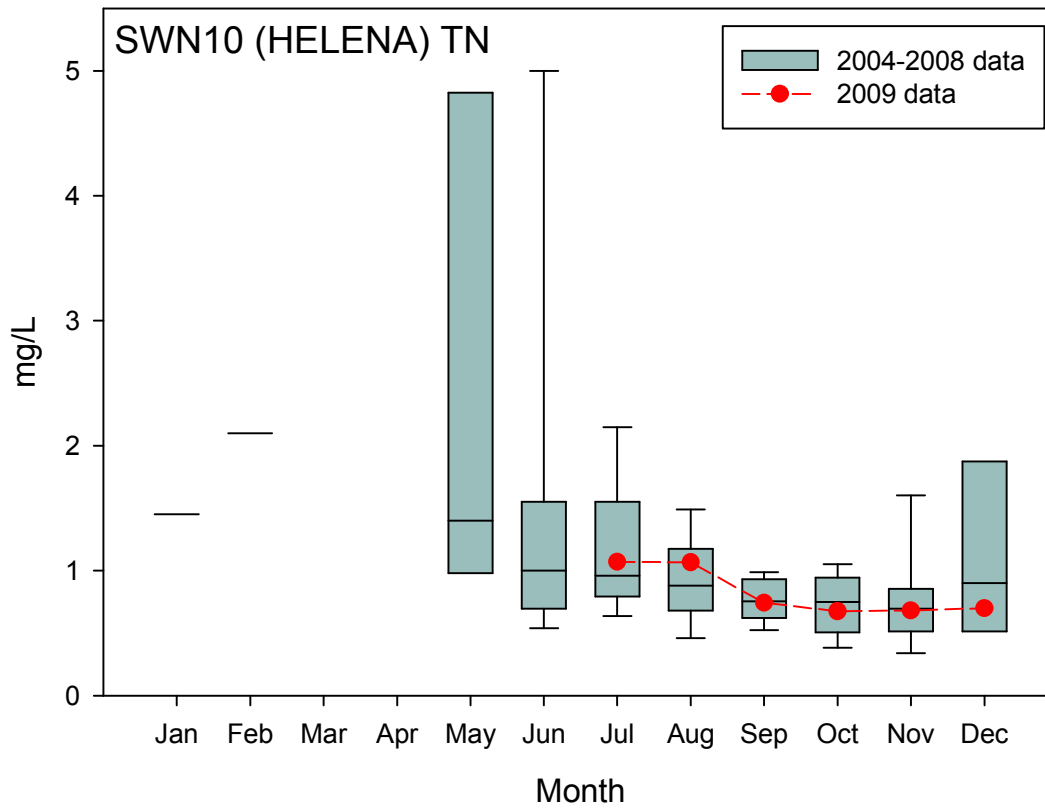
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	2	1	1	0
min	-	-	-	-	-	7.35	7.32	7.69	7.95	6.79	5.12	-
max	-	-	-	-	-	7.35	9.09	8.17	7.98	6.79	5.12	-

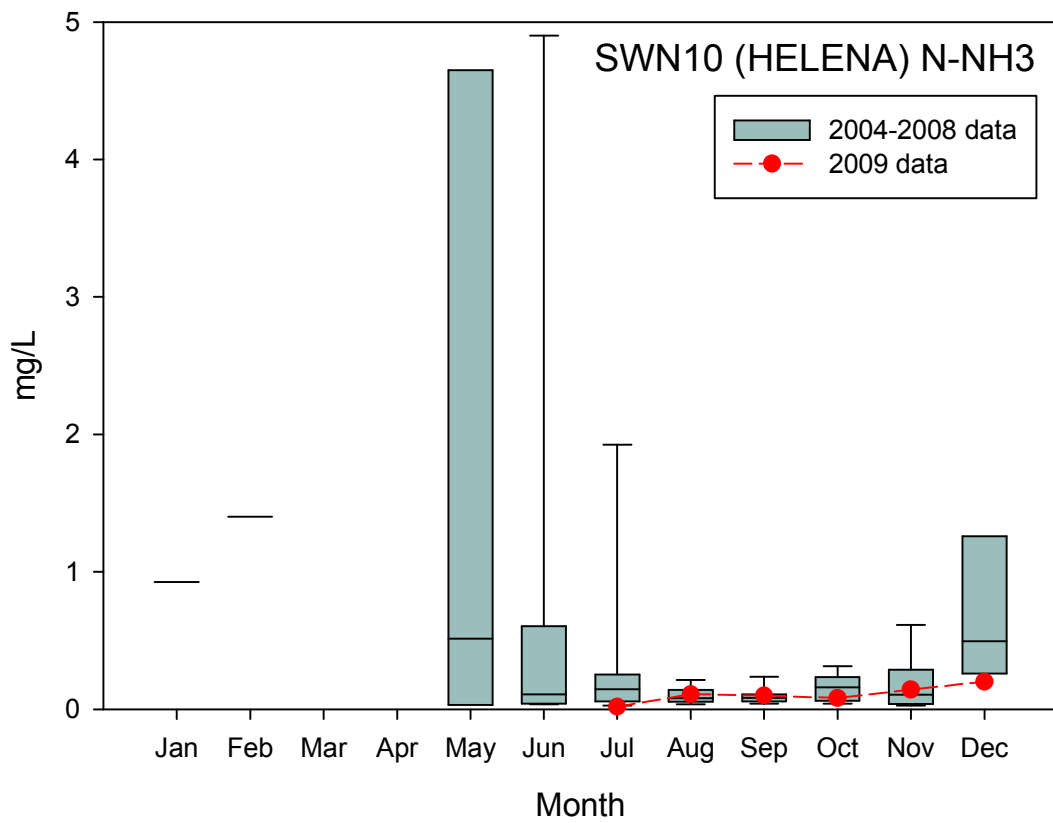
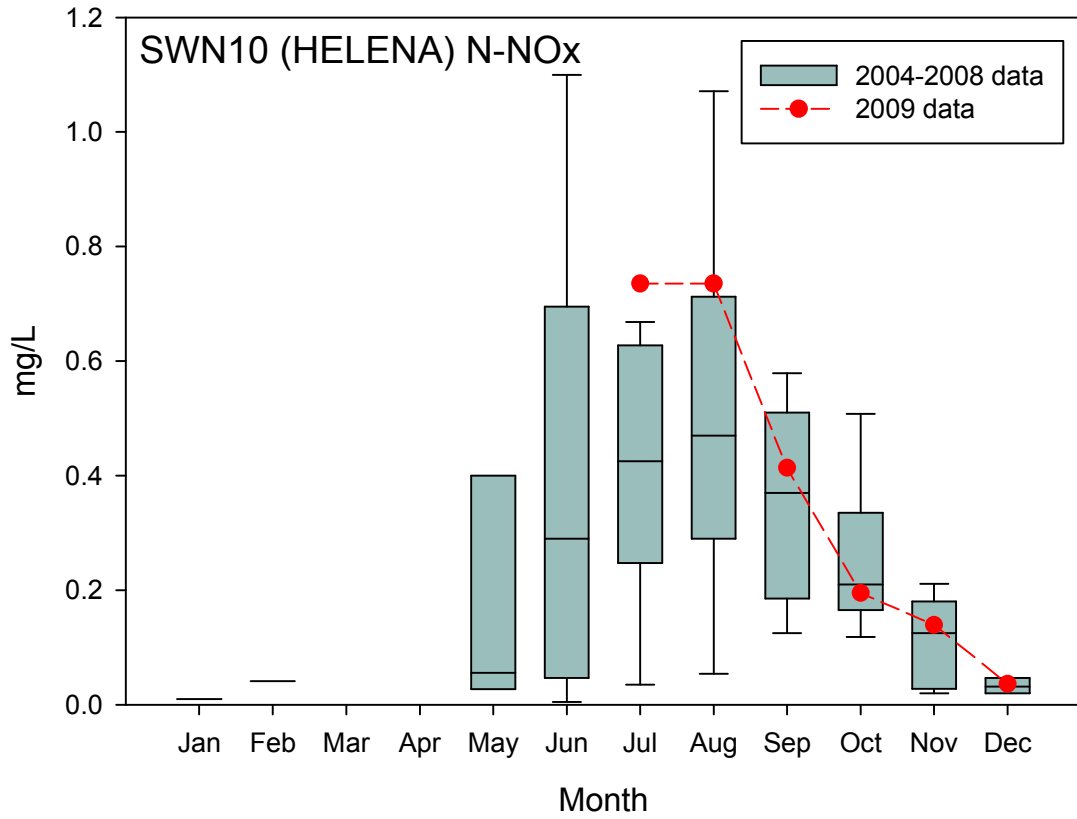
Specific Conductivity (mS/cm)

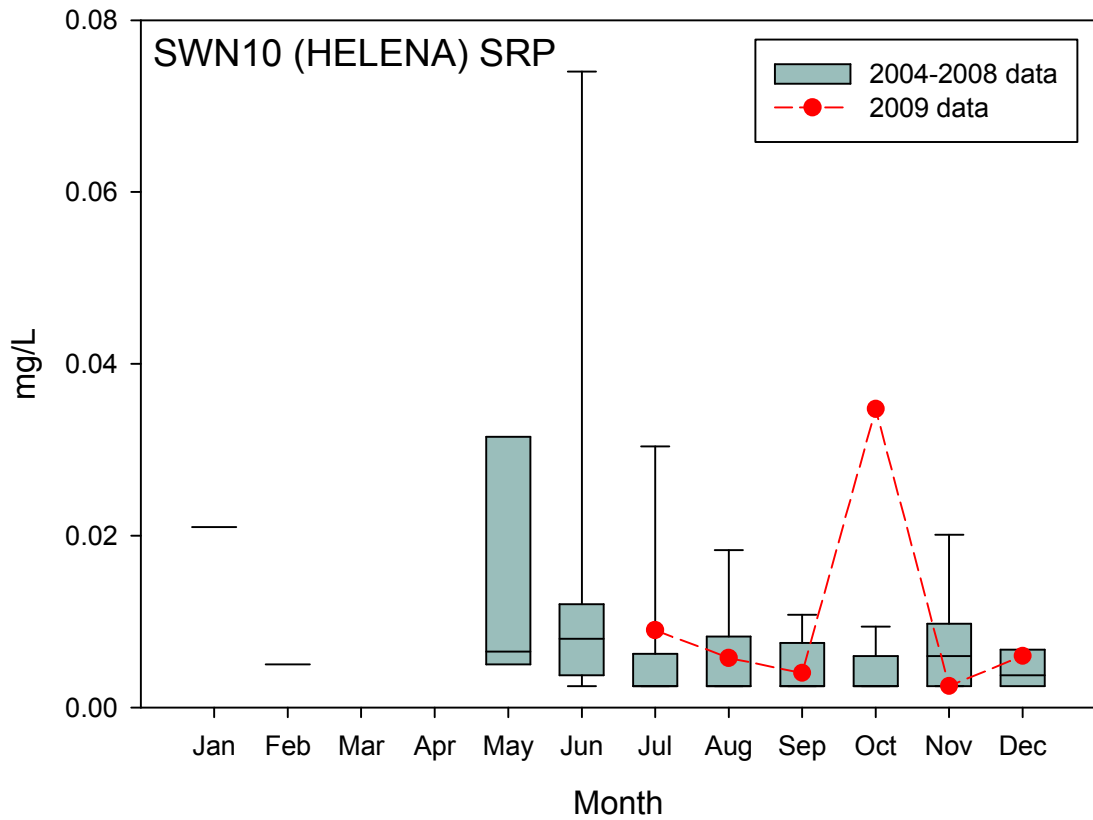
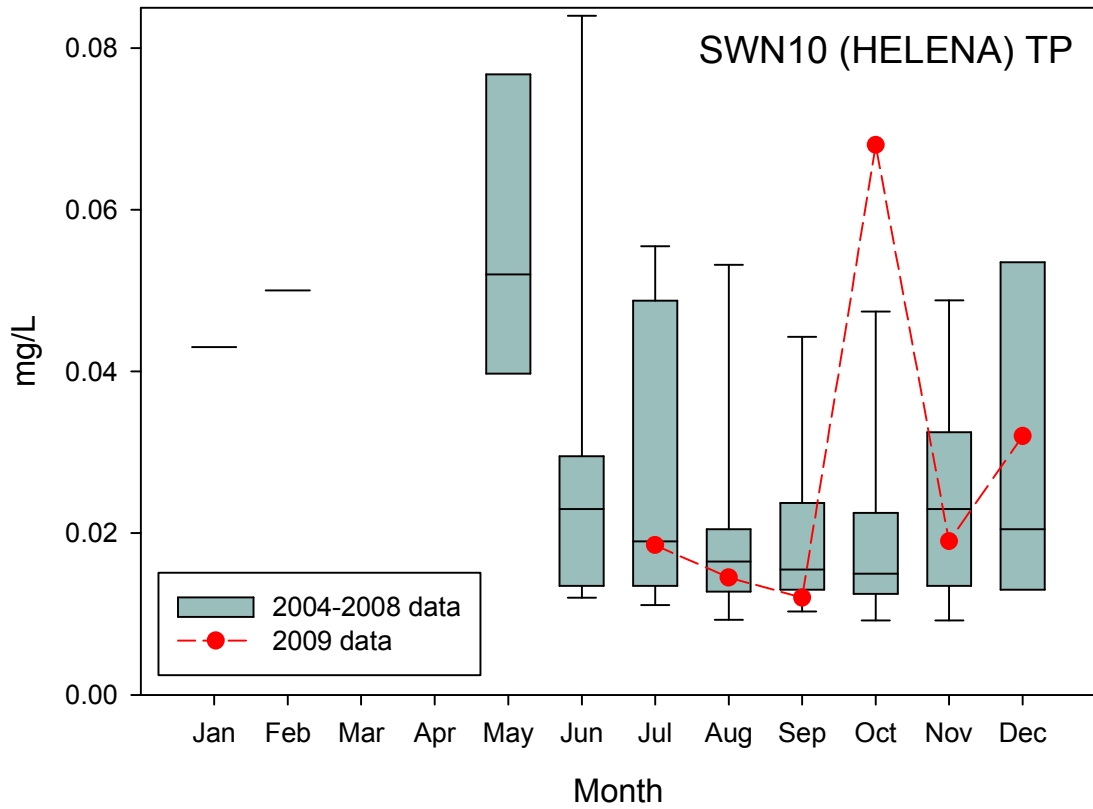
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	2	1	1	0
min	-	-	-	-	-	2.130	0.719	1.326	1.060	1.730	1.850	-
max	-	-	-	-	-	2.130	1.840	1.464	1.630	1.730	1.850	-

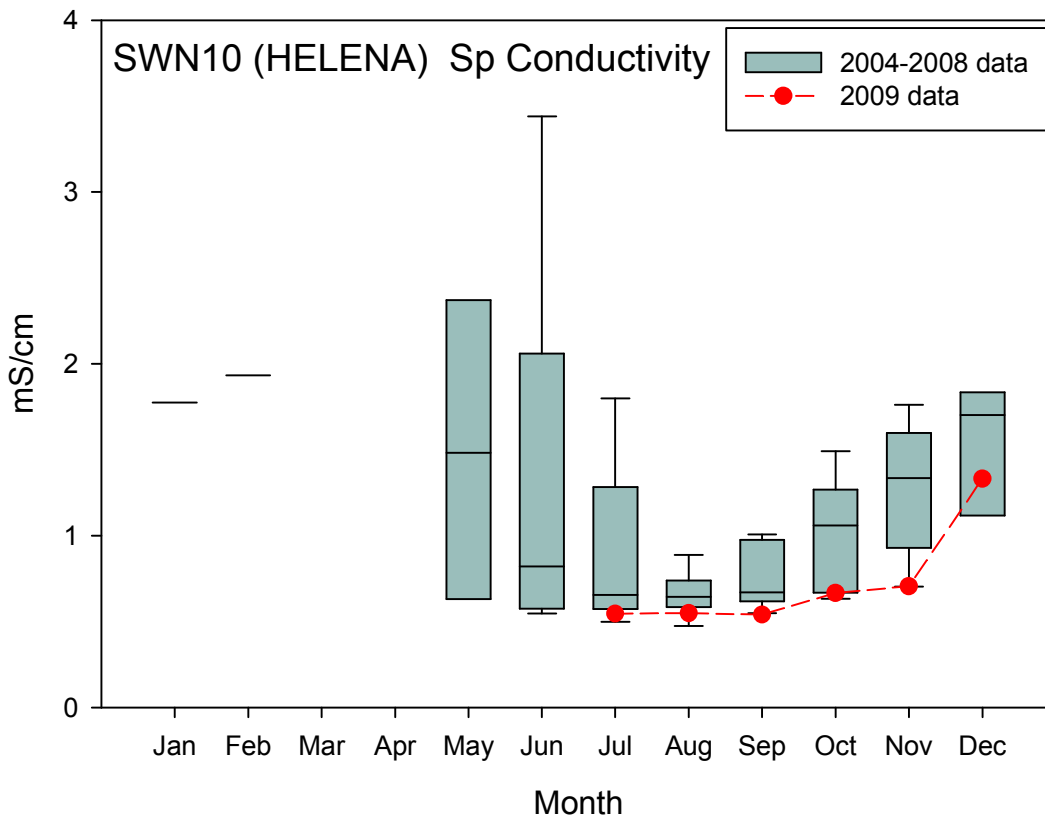
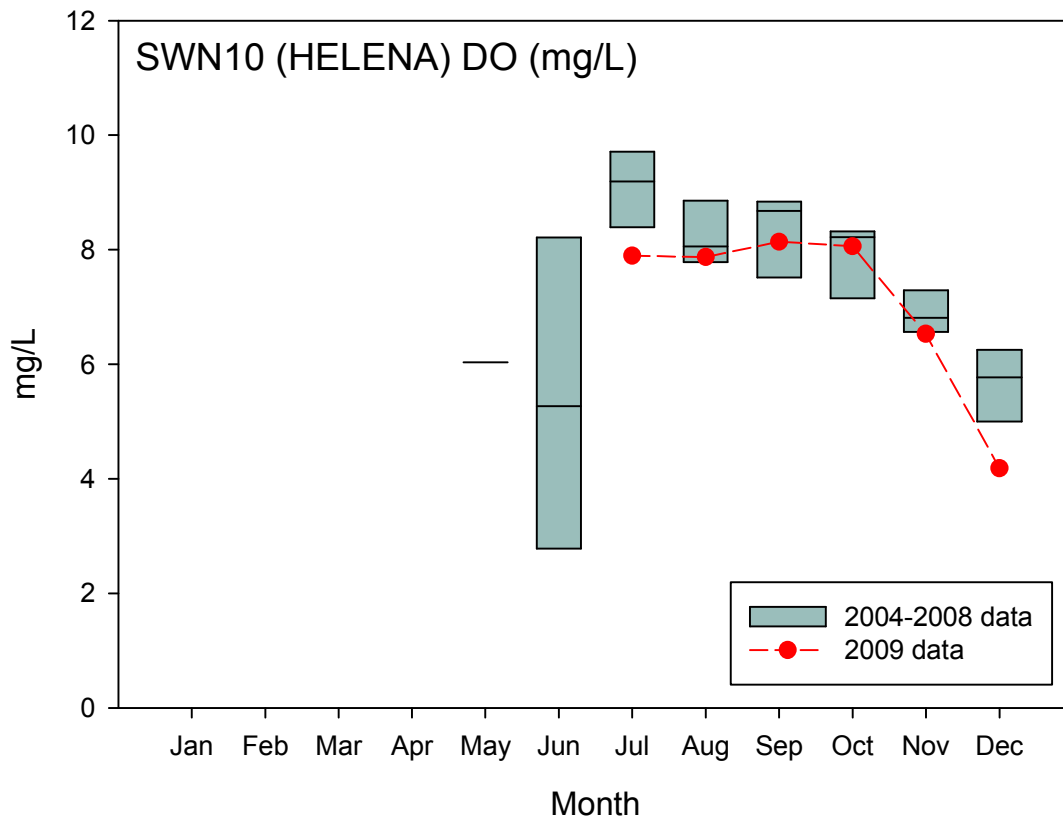
9 Helena River (SWN10)

9.1 Helena River 2009 4th Quarter Summary Graphs:









9.2 Helena River 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	2	1
min	-	-	-	-	-	-	0.74	0.93	0.66	0.65	0.53	0.70
max	-	-	-	-	-	-	1.40	1.20	0.87	0.70	0.83	0.70

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	2	1
min	-	-	-	-	-	-	0.54	0.60	0.34	0.11	0.098	0.036
max	-	-	-	-	-	-	0.93	0.87	0.46	0.28	0.18	0.036

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	2	1
min	-	-	-	-	-	-	0.017	0.058	0.072	0.023	0.077	0.20
max	-	-	-	-	-	-	0.018	0.160	0.130	0.140	0.210	0.20

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	2	1
min	-	-	-	-	-	-	0.013	0.009	0.008	0.016	0.018	0.032
max	-	-	-	-	-	-	0.024	0.020	0.017	0.120	0.020	0.032

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	2	1
min	-	-	-	-	-	-	0.005	<0.005	<0.005	0.067	<0.005	0.006
max	-	-	-	-	-	-	0.013	0.009	0.007	<0.005	<0.005	0.006

Dissolved Oxygen (mg/L)

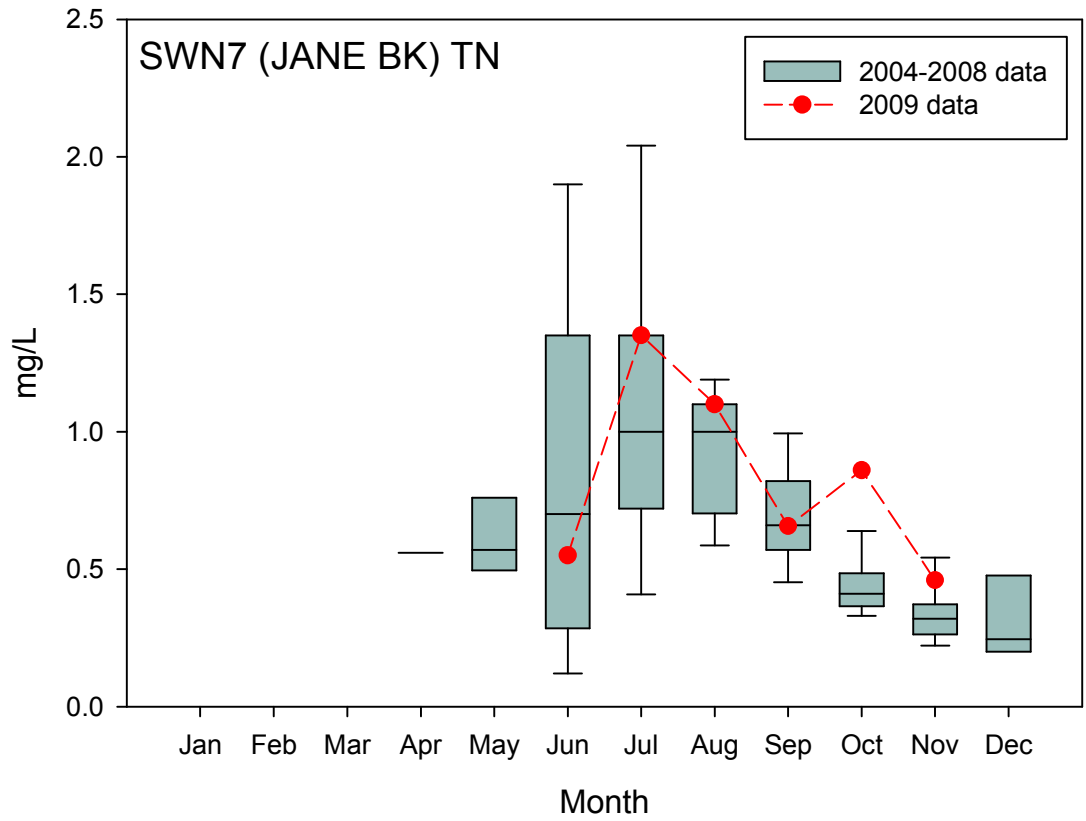
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	1	1	1
min	-	-	-	-	-	-	7.03	7.45	7.69	8.06	6.53	4.18
max	-	-	-	-	-	-	8.76	8.29	8.52	8.06	6.53	4.18

Specific Conductivity (mS/cm)

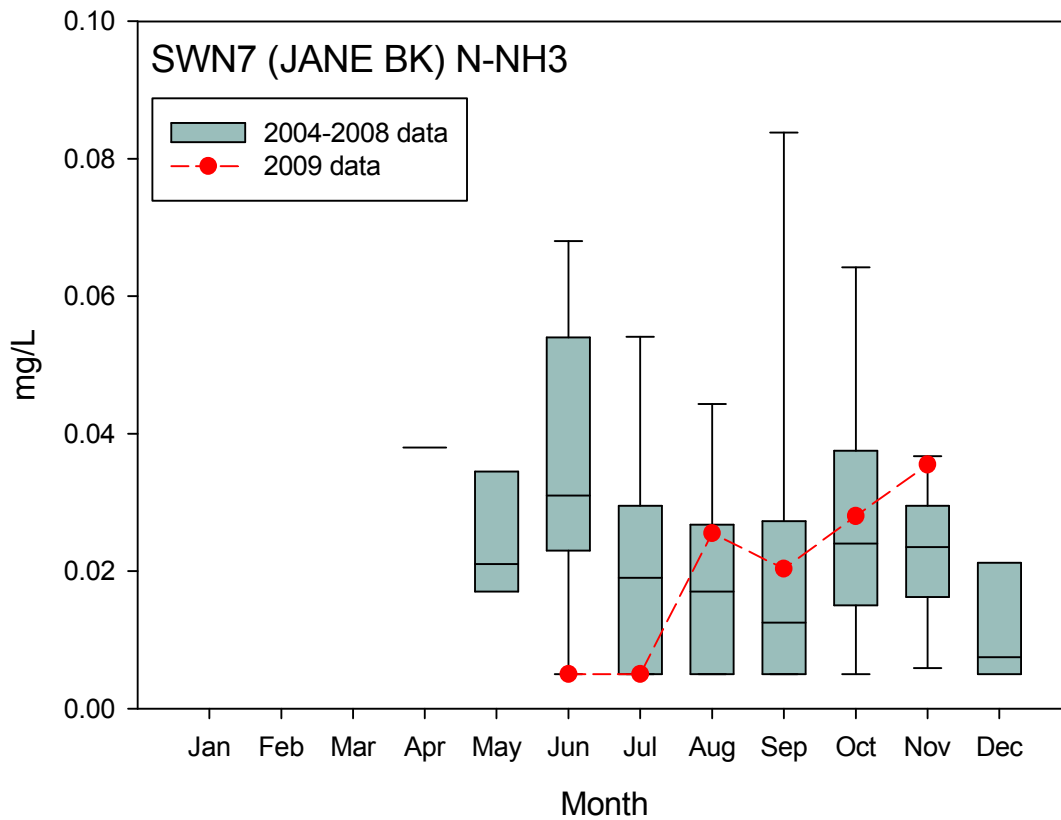
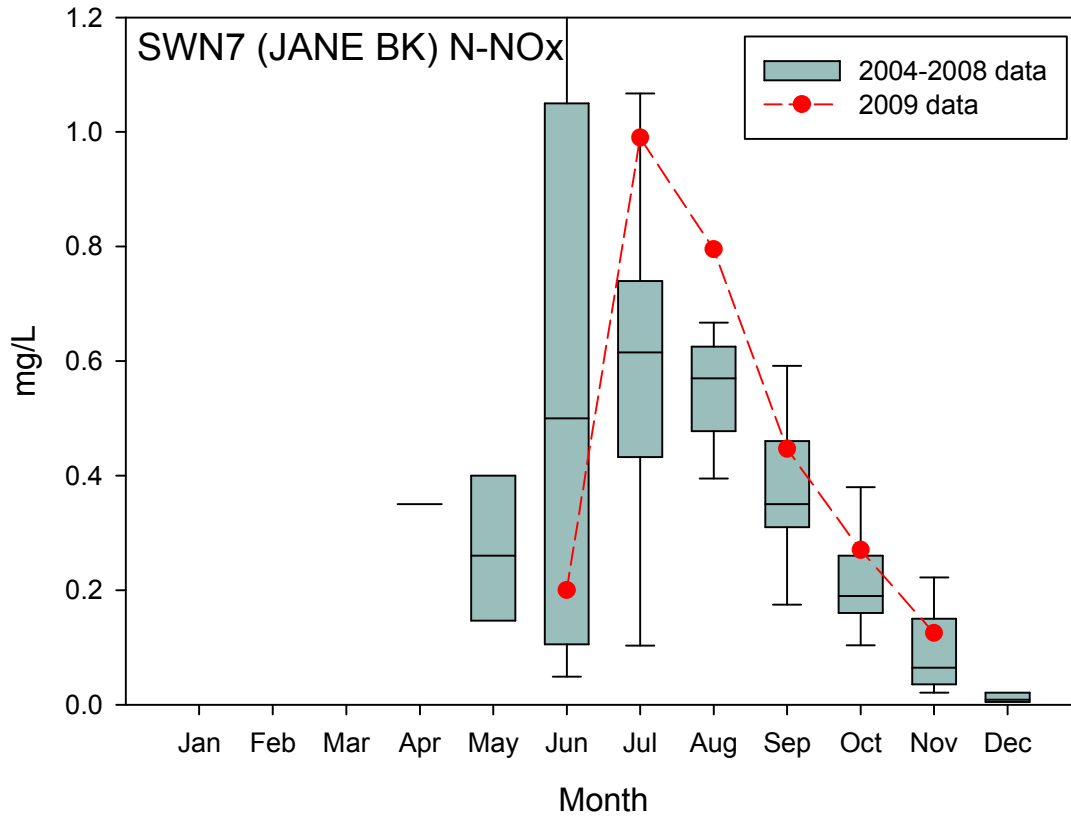
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	1	1	1
min	-	-	-	-	-	-	0.459	0.440	0.556	0.665	0.705	1.33
max	-	-	-	-	-	-	0.633	0.656	0.496	0.665	0.705	1.33

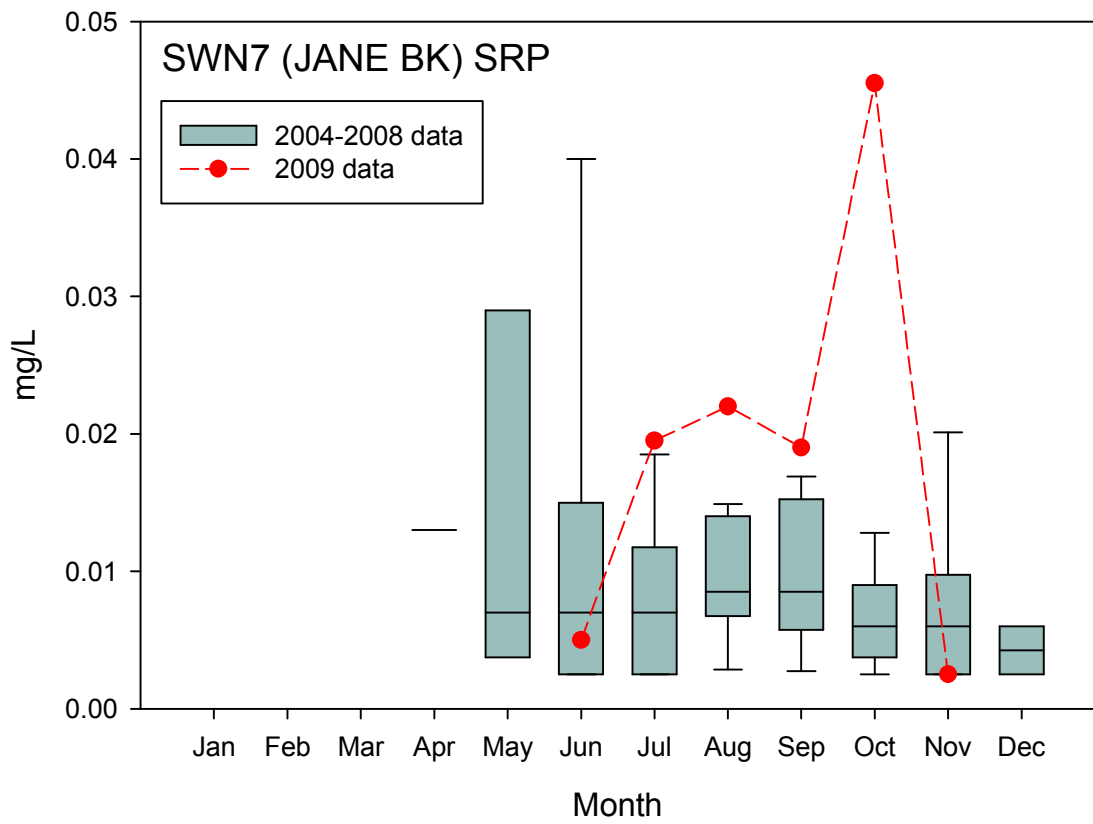
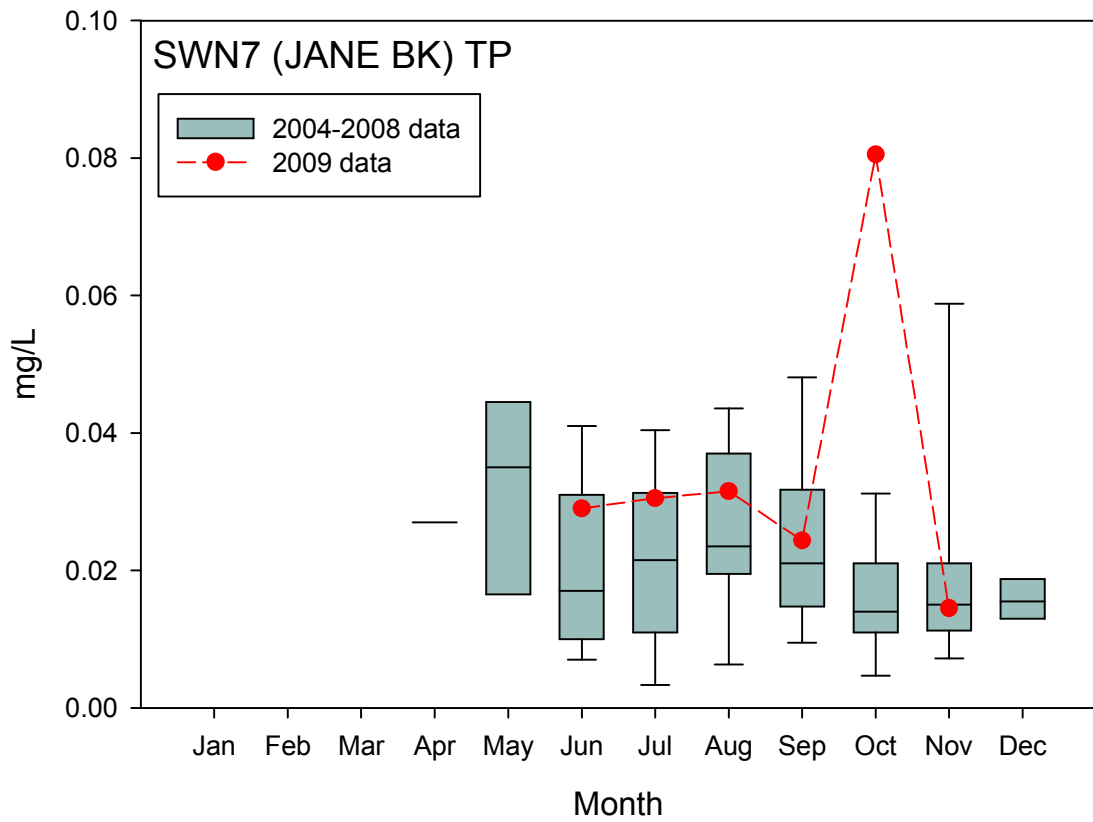
10 Jane Brook (SWN7)

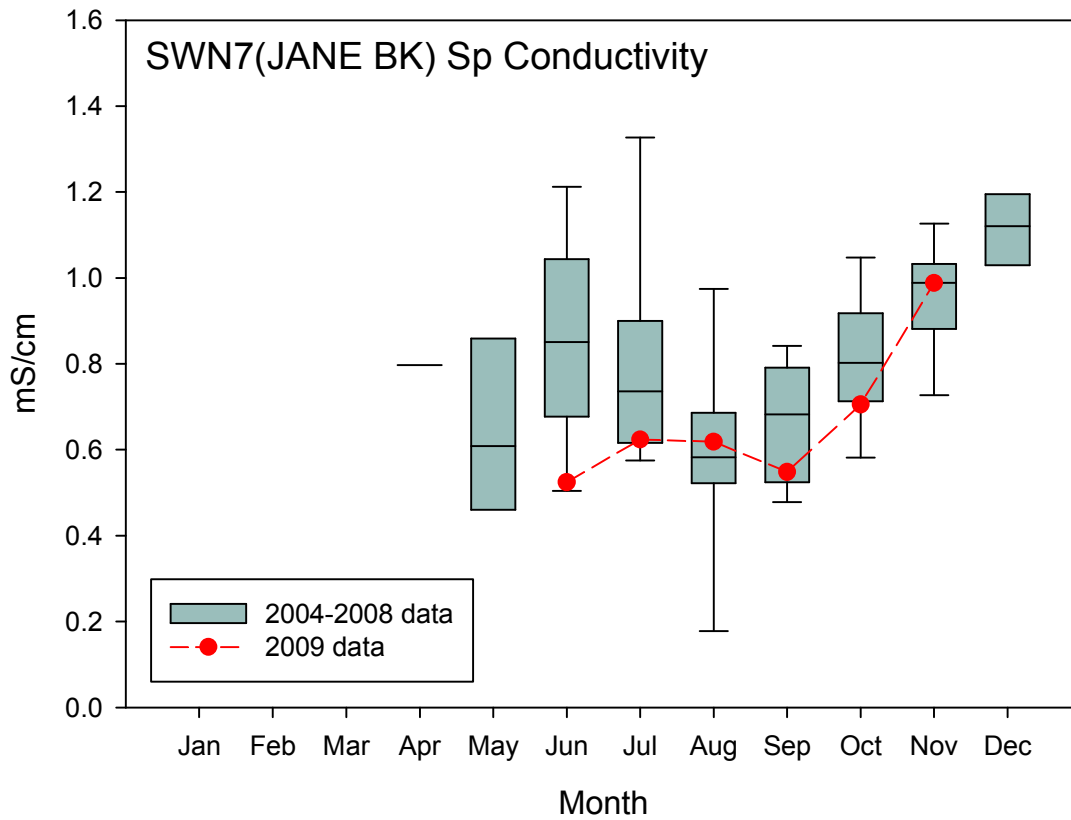
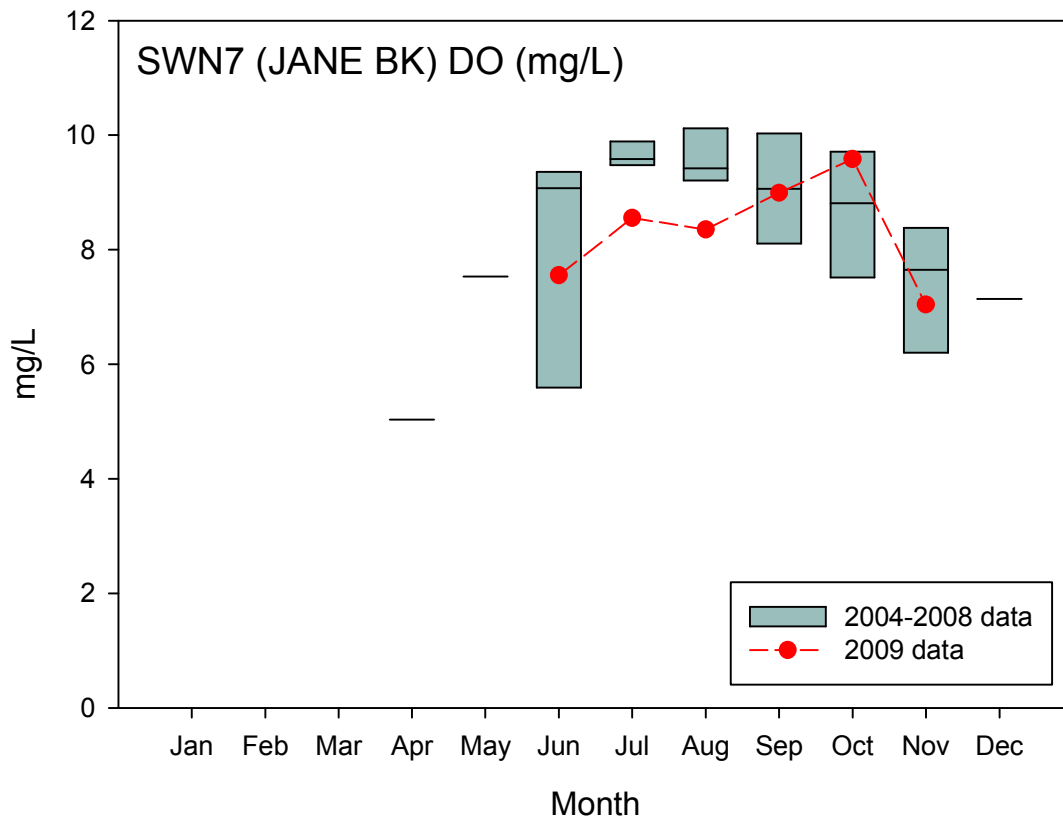
10.1 Jane Brook 2009 4th Quarter Summary Graphs:



The 95th percentile for June is 1.80mg/L.







10.2 Jane Brook 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	3	2	2	0
min	-	-	-	-	-	0.55	1.20	1.10	0.58	0.42	0.42	-
max	-	-	-	-	-	0.55	1.50	1.10	0.72	1.30	0.50	-

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	3	2	2	0
min	-	-	-	-	-	0.20	0.88	0.59	0.31	0.18	0.11	-
max	-	-	-	-	-	0.20	1.10	1.00	0.55	0.36	0.14	-

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	3	2	2	0
min	-	-	-	-	-	<0.01	<0.01	0.015	0.011	0.012	0.021	-
max	-	-	-	-	-	<0.01	<0.01	0.036	0.025	0.044	0.05	-

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	3	2	2	0
min	-	-	-	-	-	0.029	0.011	0.016	0.021	0.021	0.013	-
max	-	-	-	-	-	0.029	0.050	0.047	0.029	0.140	0.016	-

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	3	2	2	0
min	-	-	-	-	-	0.005	0.008	0.013	0.018	0.013	<0.005	-
max	-	-	-	-	-	0.005	0.031	0.031	0.020	0.078	<0.005	-

Dissolved Oxygen (mg/L)

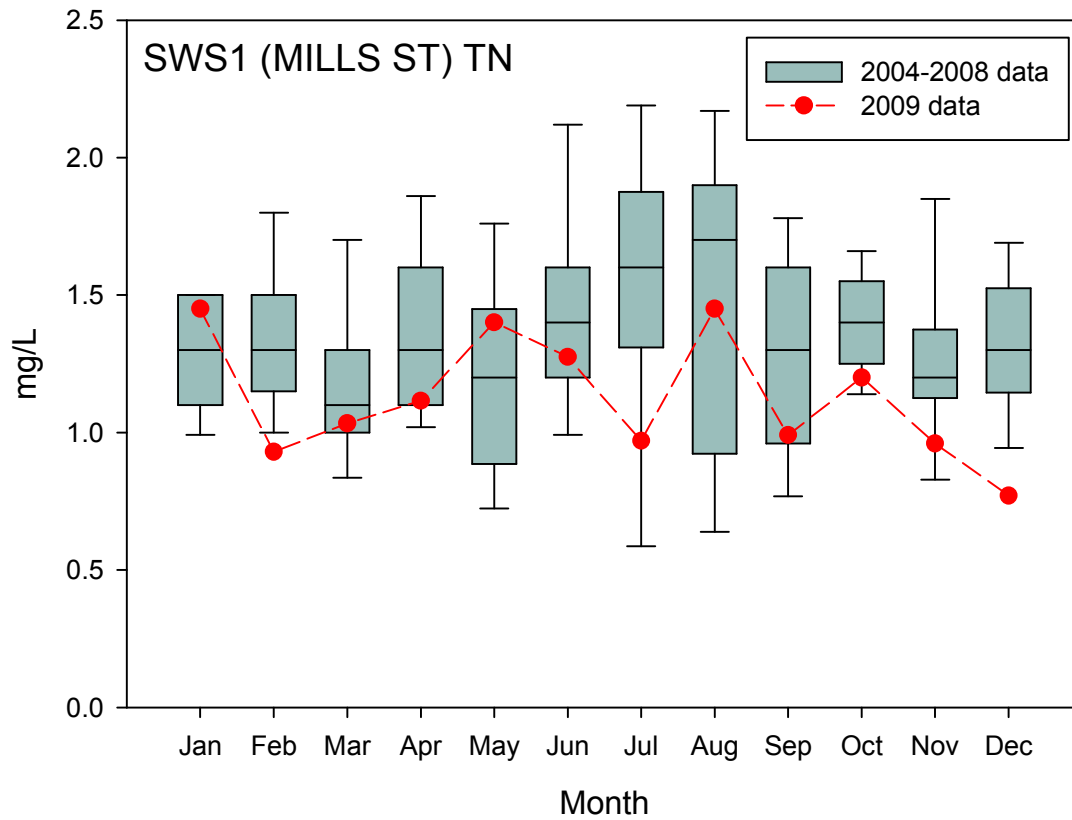
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	3	1	1	0
min	-	-	-	-	-	7.55	8.30	8.28	8.77	9.58	7.04	-
max	-	-	-	-	-	7.55	8.81	8.42	9.25	9.58	7.04	-

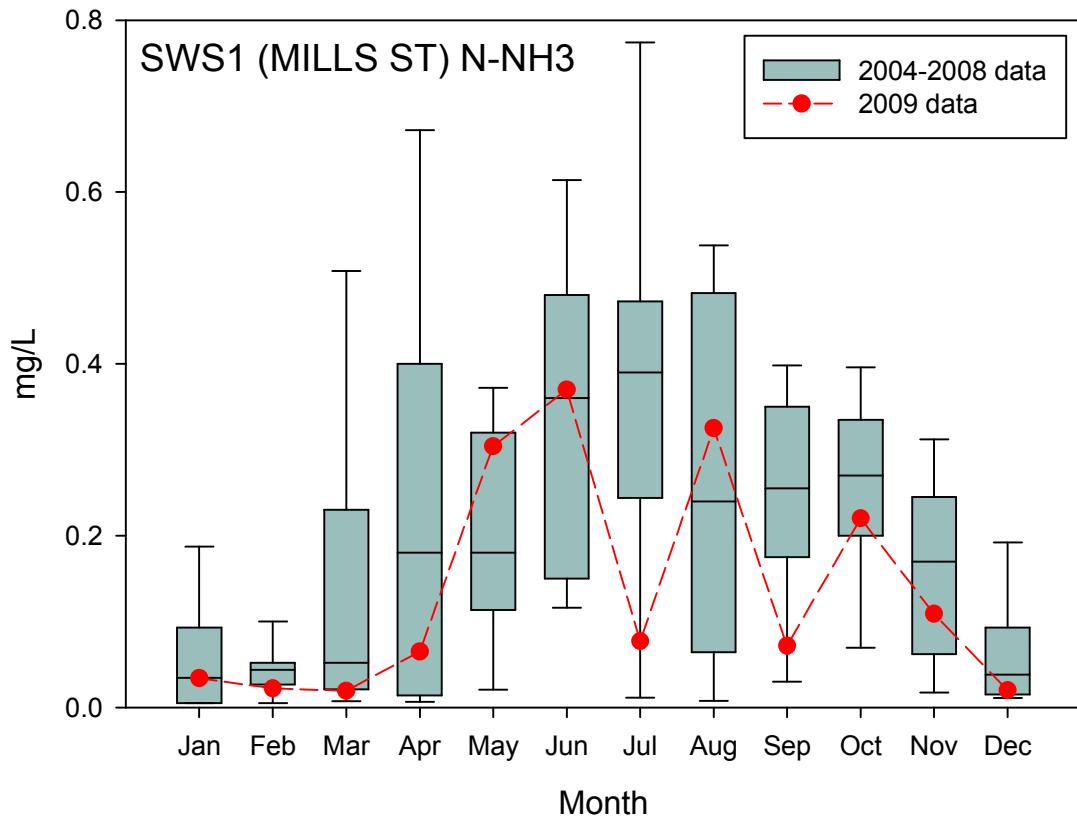
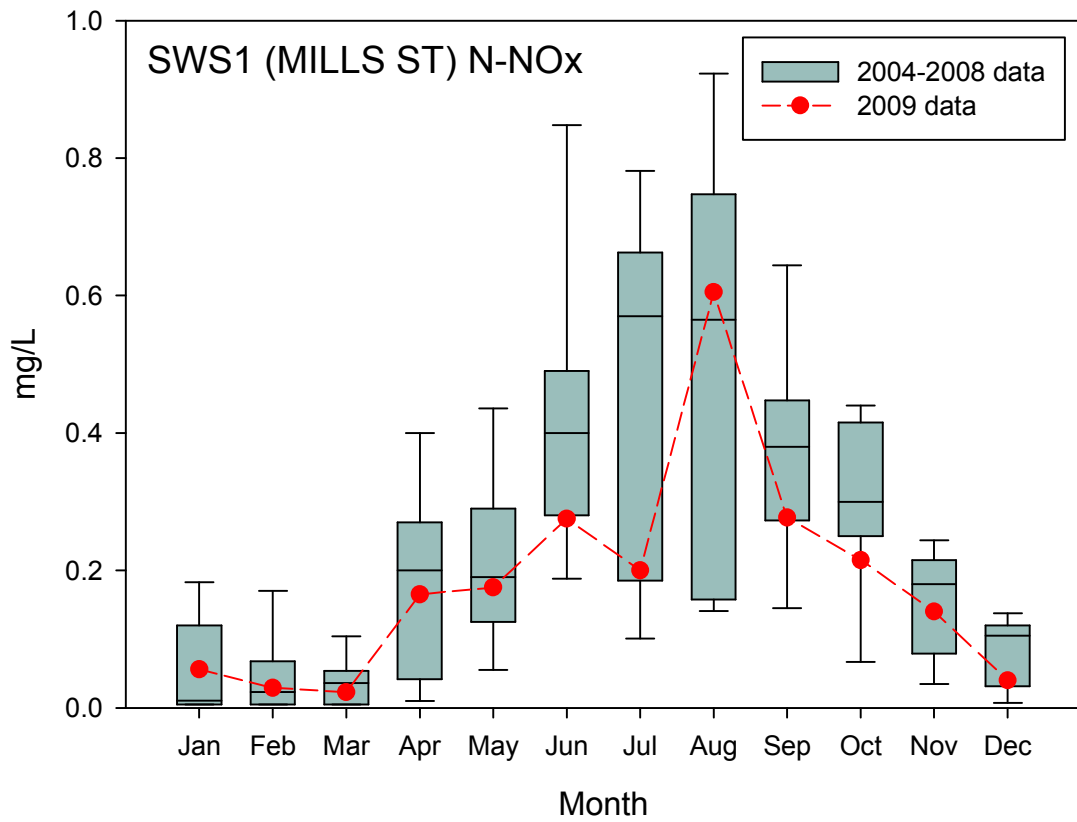
Specific Conductivity (mS/cm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	1	2	2	3	1	1	0
min	-	-	-	-	-	0.524	0.418	0.512	0.486	0.705	0.988	-
max	-	-	-	-	-	0.524	0.829	0.725	0.590	0.705	0.988	-

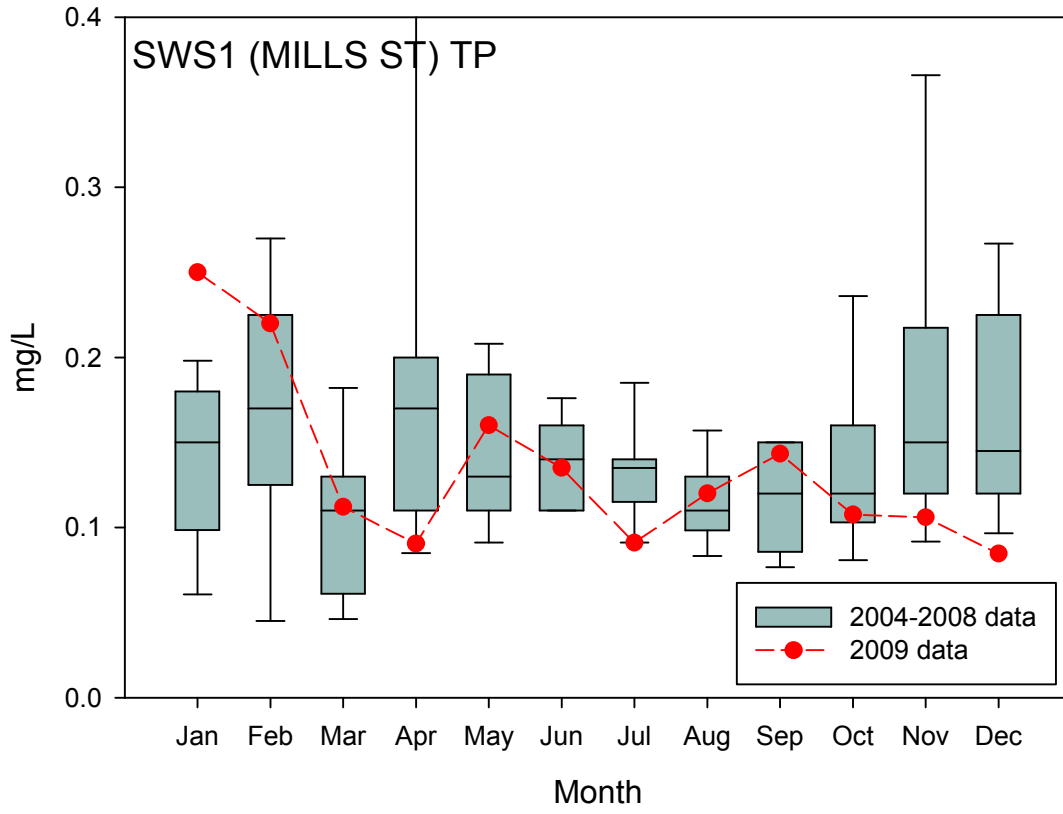
11 Mills Street Main Drain (SWS1)

11.1 Mills Street MD 2009 4th Quarter Summary Graphs:

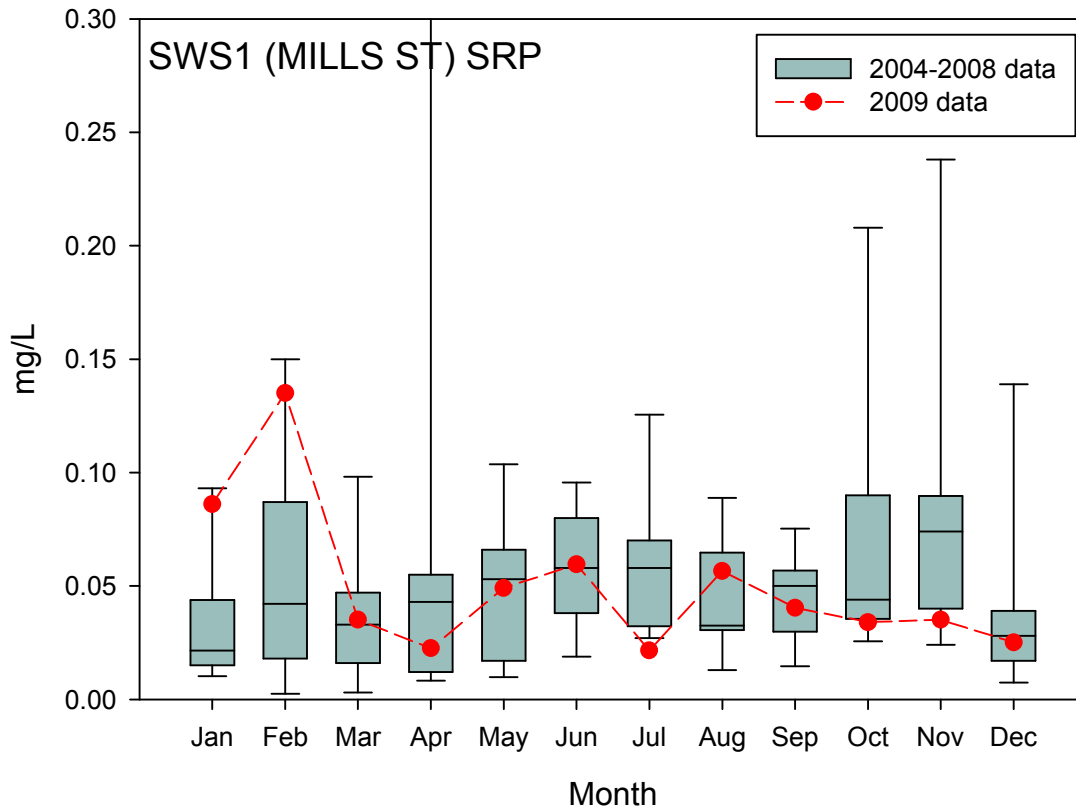


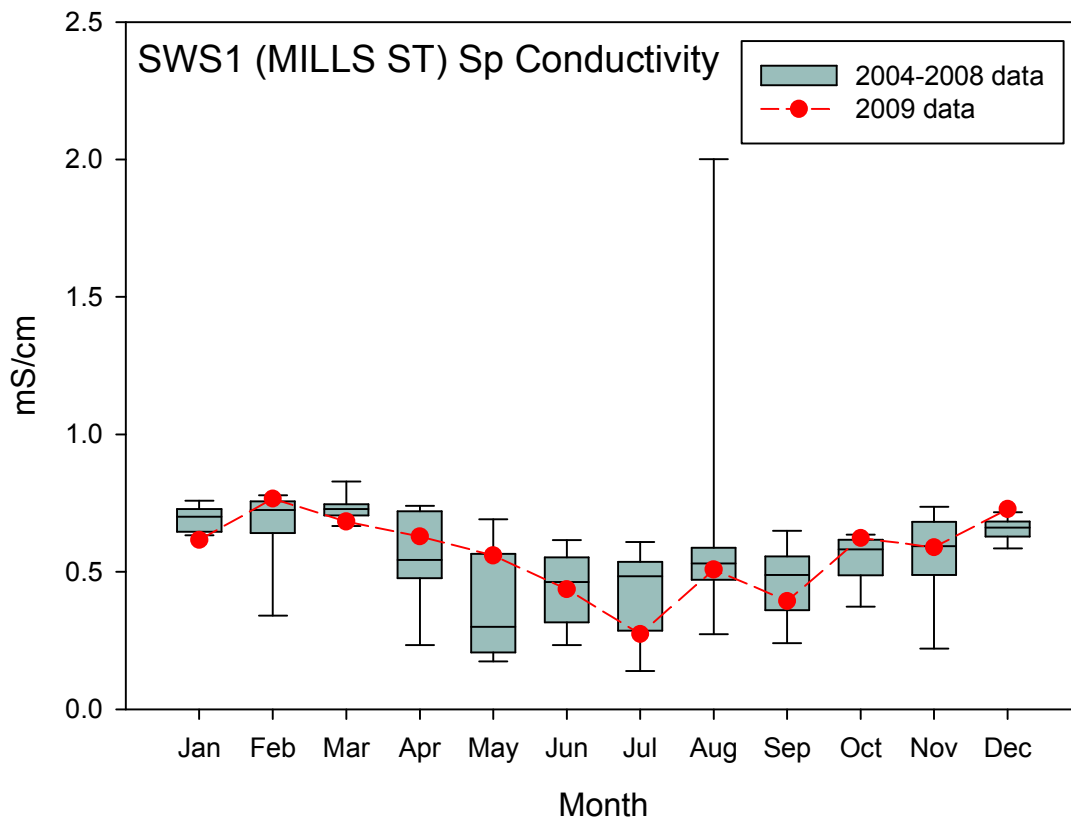
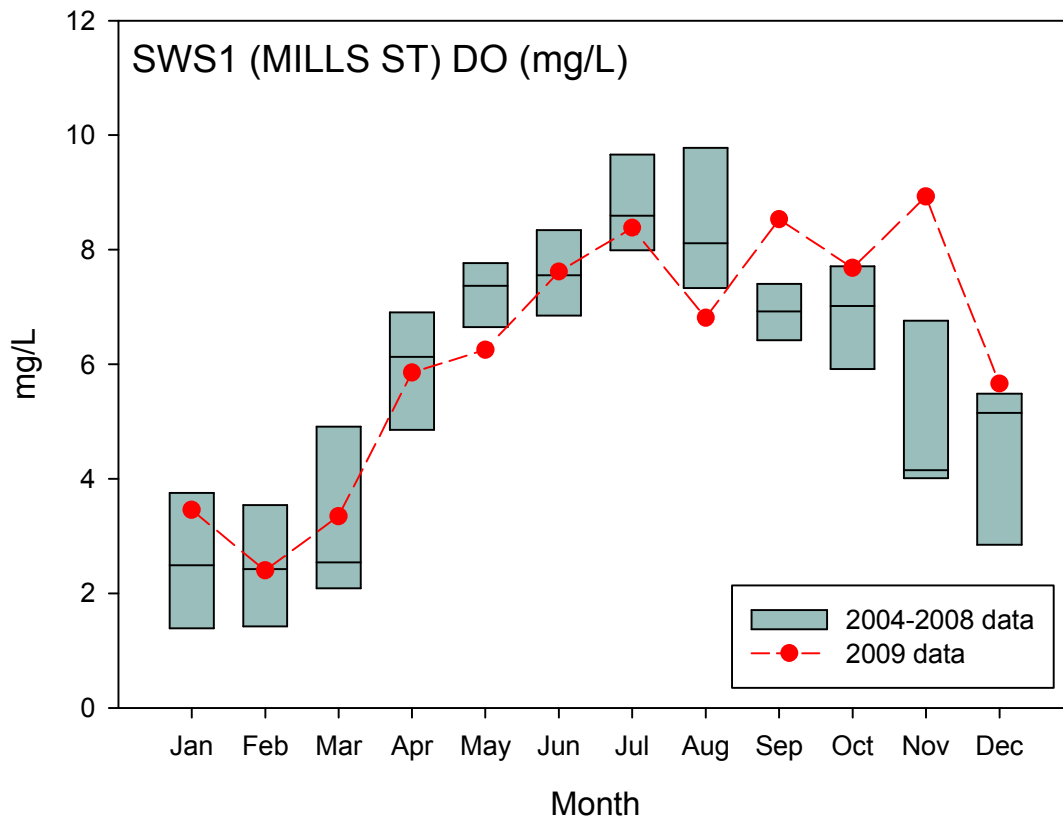


The 95th percentile for April is 0.64mg/L.



The 95th percentile for April is 0.63mg/L.





11.2 Mills Street MD 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	1.00	0.93	1.00	0.93	1.40	0.95	0.74	1.10	0.77	1.20	0.93	0.74
max	1.90	0.93	1.10	1.30	1.40	1.60	1.20	1.80	1.10	1.20	0.99	0.80

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.053	0.029	0.005	0.140	0.150	0.200	0.140	0.510	0.140	0.180	0.140	0.018
max	0.059	0.029	0.045	0.190	0.200	0.350	0.260	0.700	0.450	0.250	0.140	0.062

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.028	0.018	0.012	0.059	0.098	0.270	0.034	0.290	0.042	0.210	0.098	<0.01
max	0.040	0.026	0.032	0.071	0.510	0.470	0.120	0.360	0.120	0.230	0.120	0.035

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.150	0.190	0.066	0.082	0.150	0.130	0.052	0.120	0.120	0.095	0.092	0.076
max	0.350	0.250	0.150	0.099	0.170	0.140	0.130	0.120	0.170	0.120	0.120	0.093

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.062	0.120	0.016	0.022	0.017	0.041	0.016	0.038	0.031	0.028	0.032	0.018
max	0.110	0.150	0.054	0.023	0.081	0.078	0.027	0.075	0.048	0.040	0.038	0.032

Dissolved Oxygen (mg/L)

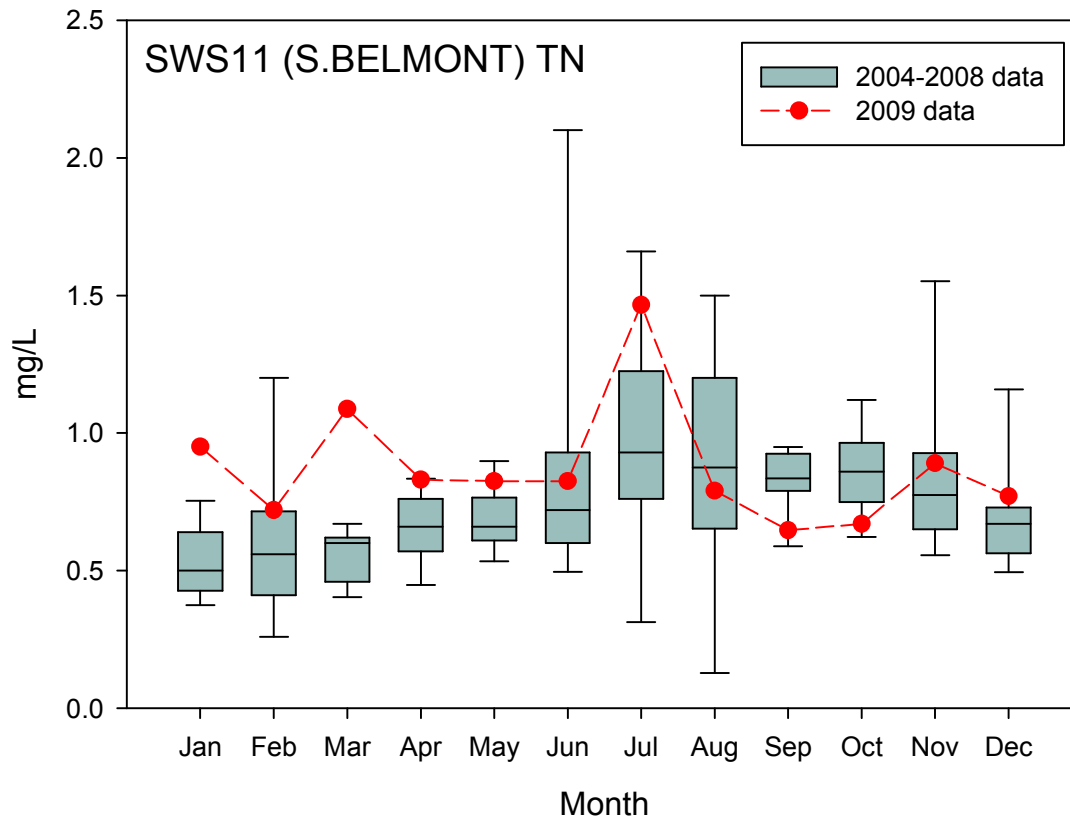
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	3	2	2	2	2	2	3	1	2	2
min	2.90	2.40	2.05	4.91	5.28	6.84	7.33	6.14	8.22	7.68	7.89	4.98
max	4.01	2.40	4.40	6.80	7.22	8.39	9.43	7.48	8.95	7.68	9.96	6.34

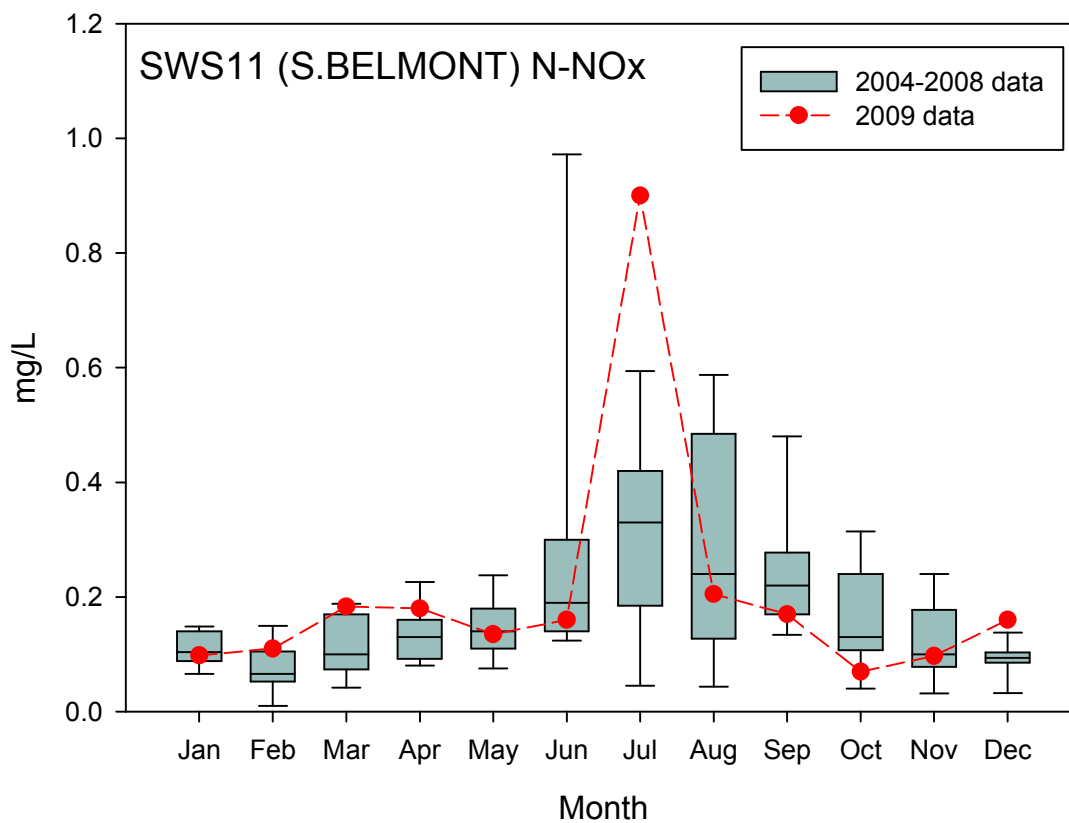
Specific Conductivity (mS/cm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	2	2
min	0.523	0.734	0.619	0.584	0.427	0.347	0.237	0.363	0.234	0.623	0.531	0.699
max	0.709	0.798	0.739	0.673	0.692	0.526	0.310	0.652	0.533	0.623	0.647	0.757

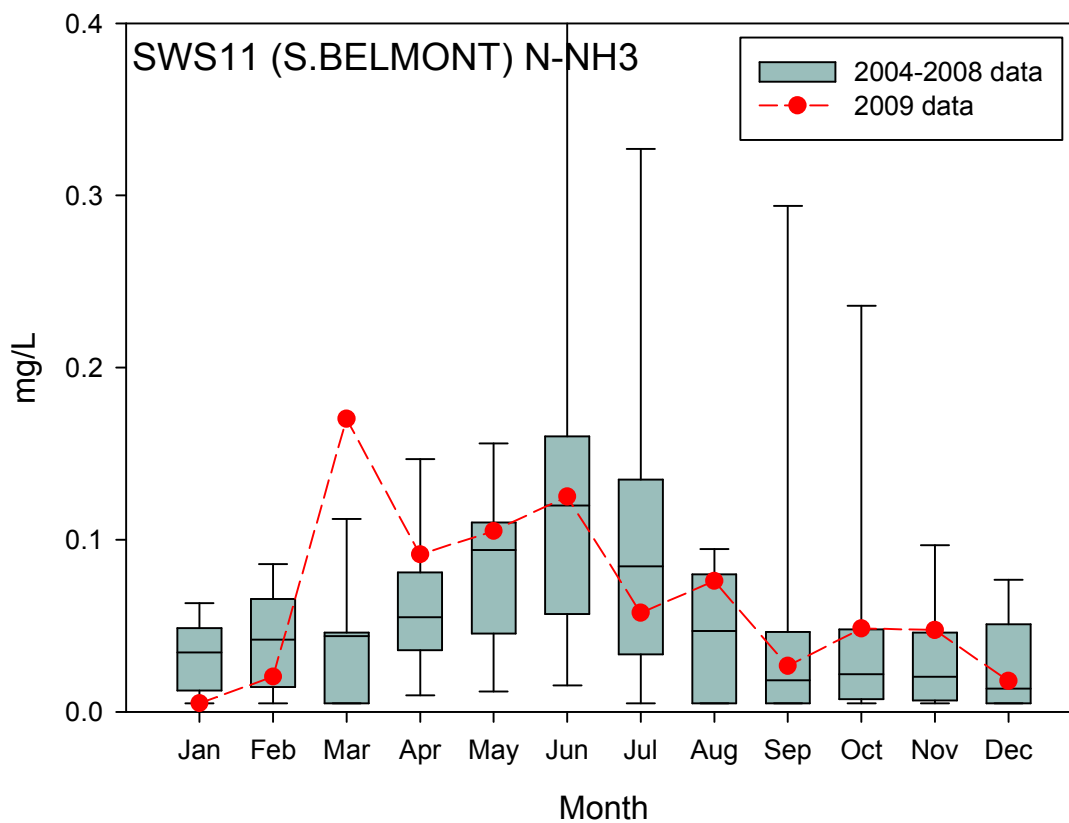
12 South Belmont Main Drain (SWS11)

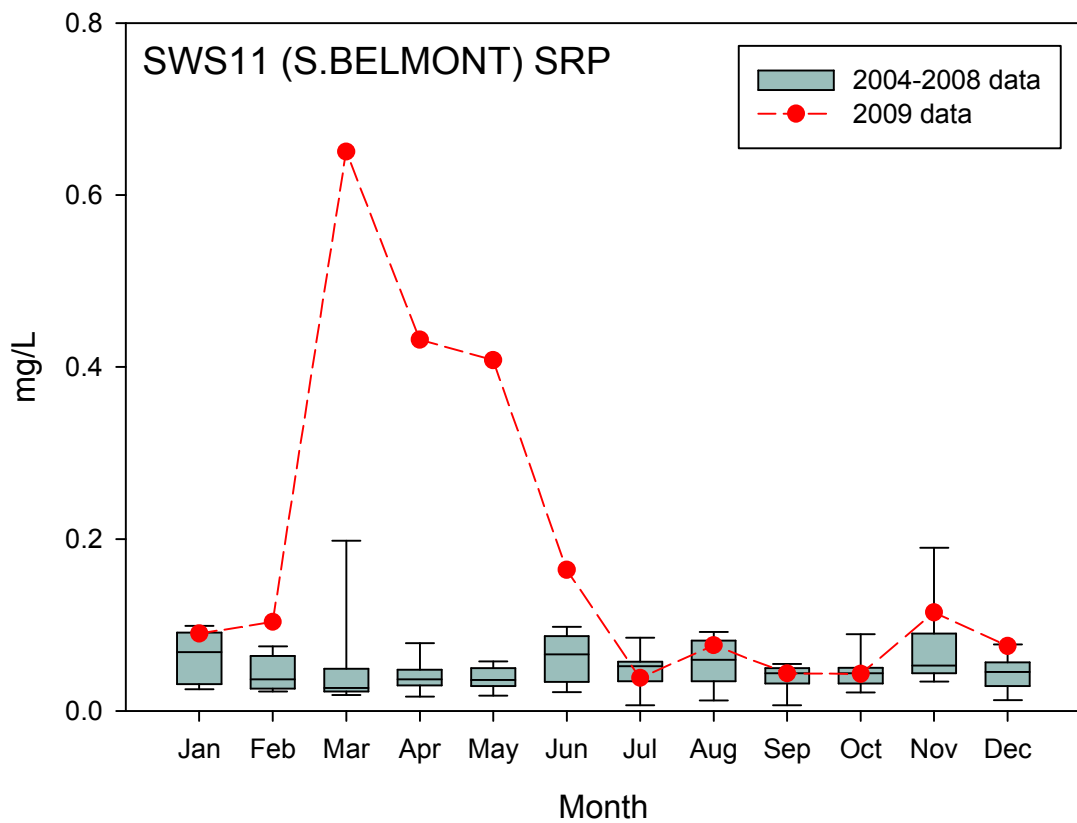
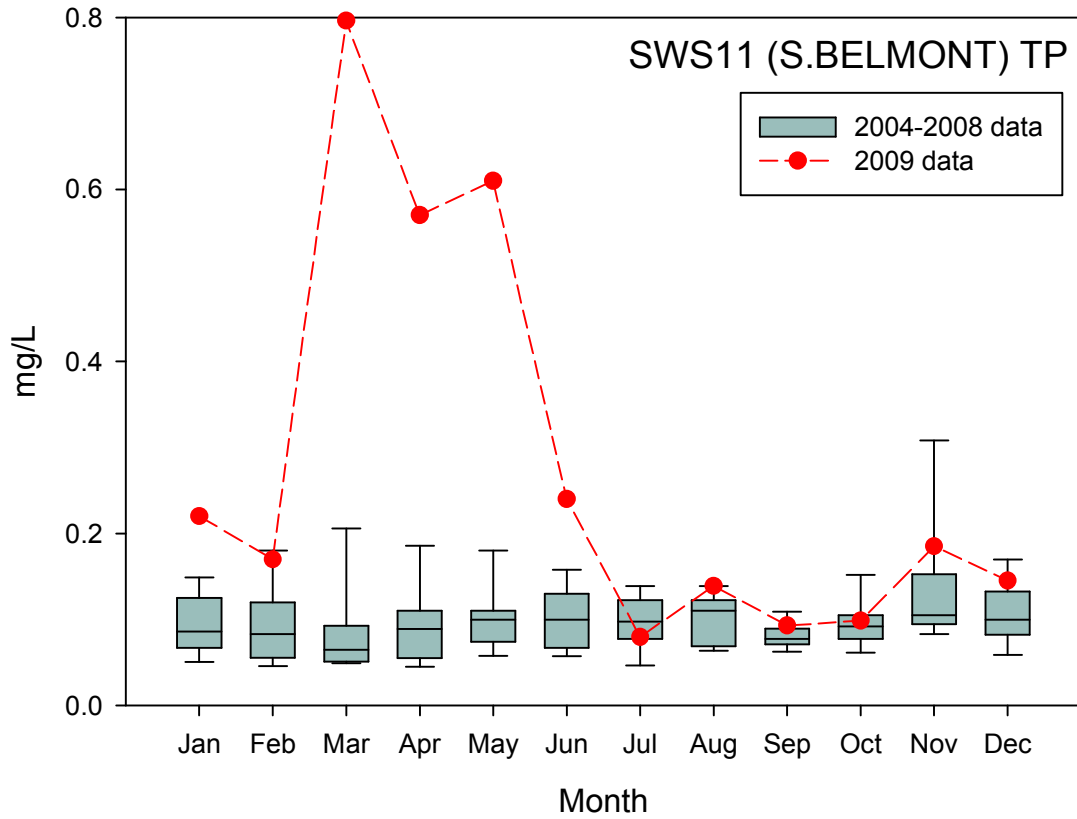
12.1 S. Belmont MD 2009 4th Quarter Summary Graphs:

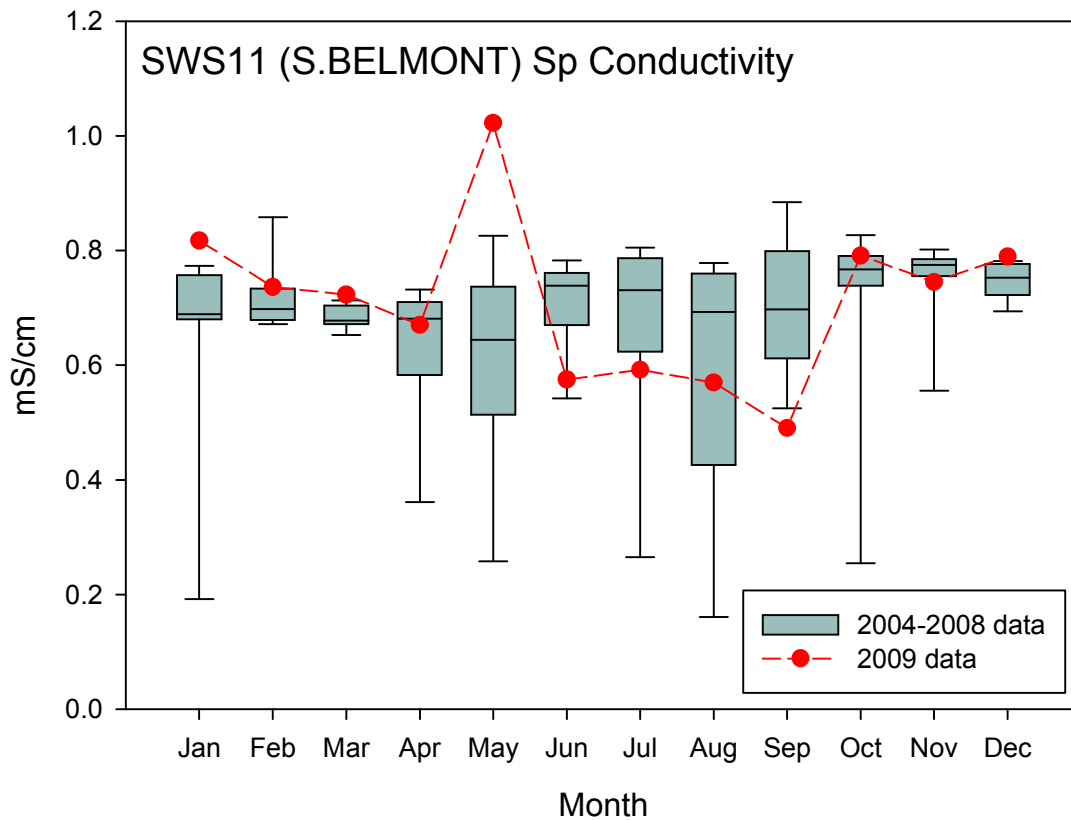
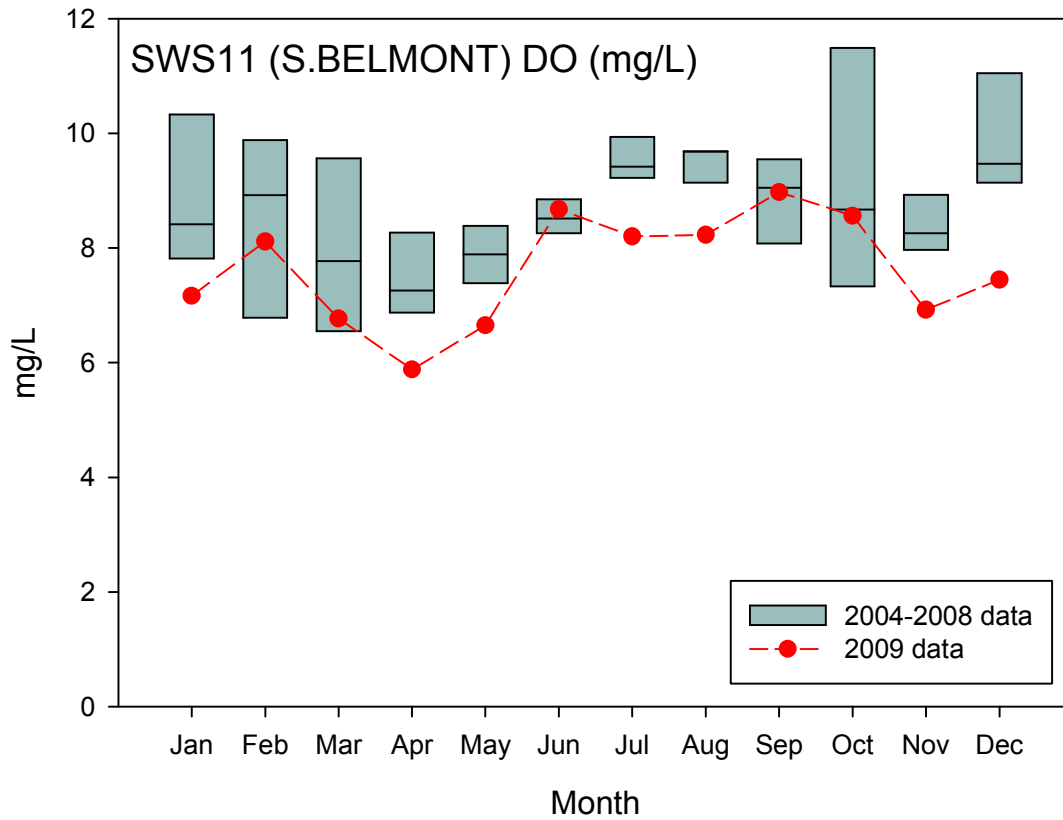




The 95th percentile for June is 0.76 mg/L.







12.2 S. Belmont MD 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.80	0.66	0.62	0.68	0.70	0.80	0.93	0.58	0.48	0.53	0.78	0.67
max	1.10	0.78	1.90	0.98	0.95	0.85	2.00	1.00	0.89	0.81	1.00	0.87

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.066	0.100	0.140	0.170	0.110	0.140	1.600	0.170	0.120	0.043	0.095	0.100
max	0.130	0.120	0.250	0.190	0.160	0.180	0.200	0.240	0.270	0.096	0.099	0.220

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	<0.01	0.019	0.049	0.053	0.080	0.120	<0.01	0.066	<0.01	0.015	0.030	<0.01
max	<0.01	0.022	0.400	0.130	0.130	0.130	0.110	0.086	0.040	0.082	0.065	0.018

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.170	0.110	0.099	0.140	0.120	0.170	0.029	0.098	0.077	0.037	0.140	0.120
max	0.270	0.230	2.000	1.000	1.100	0.310	0.130	0.180	0.120	0.160	0.230	0.170

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.080	0.057	0.051	0.073	0.076	0.088	0.012	0.043	0.027	0.011	0.099	0.074
max	0.100	0.150	1.700	0.790	0.740	0.240	0.065	0.110	0.069	0.075	0.130	0.077

Dissolved Oxygen (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	3	2	2	2	2	2	3	1	1	2
min	6.99	8.11	5.76	5.04	6.11	8.01	7.60	7.69	8.81	8.56	6.92	7.24
max	7.34	8.11	7.35	6.72	7.19	9.34	8.80	8.77	9.14	8.56	6.92	7.65

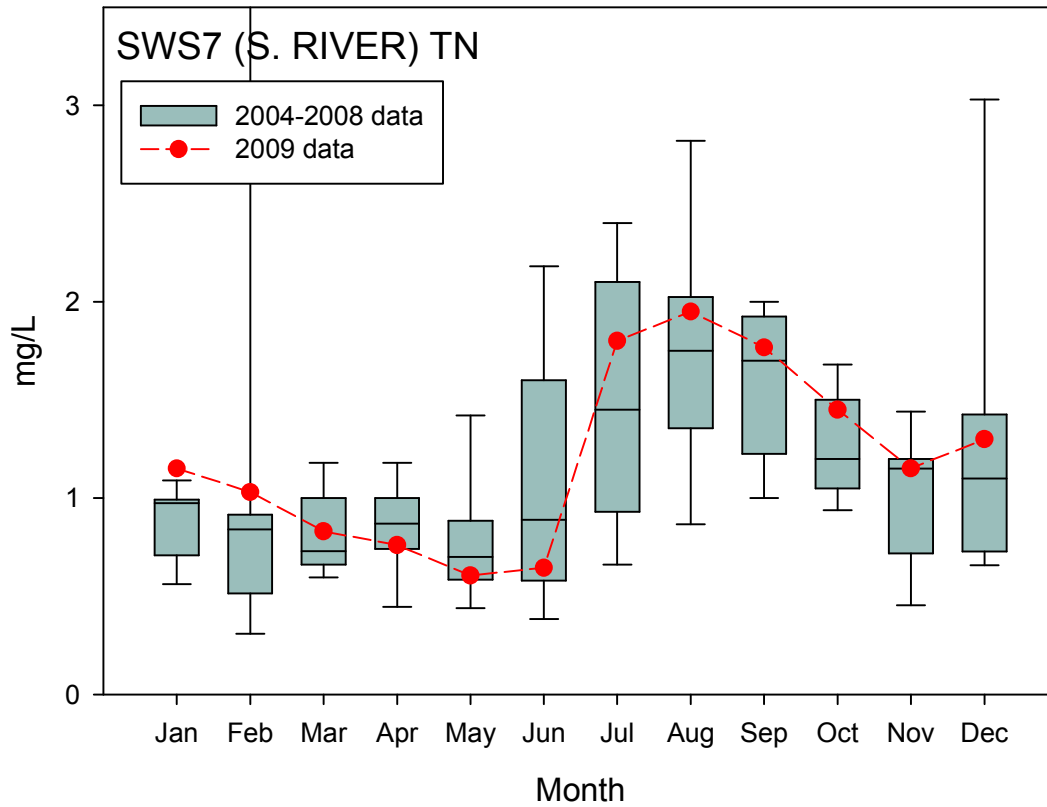
Specific Conductivity (mS/cm)

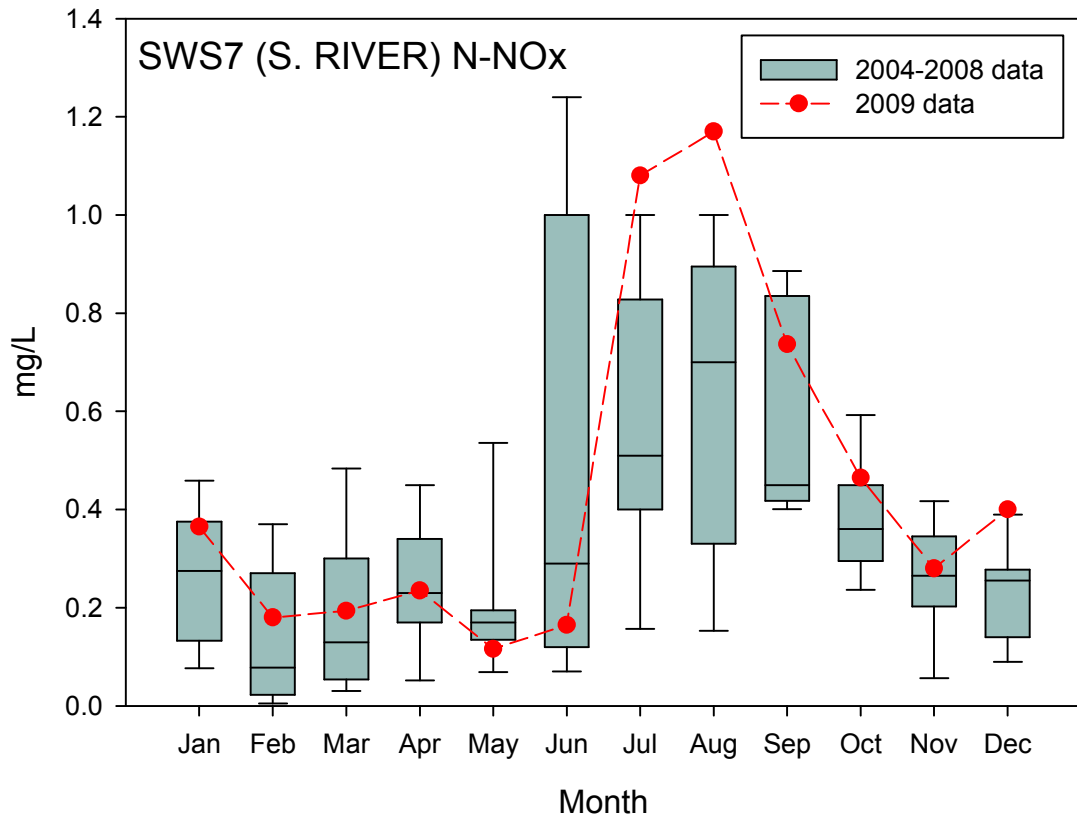
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	0.790	0.723	0.700	0.632	0.829	0.356	0.514	0.341	0.293	0.791	0.745	0.776
max	0.844	0.749	0.758	0.708	1.216	0.794	0.670	0.798	0.742	0.791	0.745	0.803

13 Southern River (SWS7)

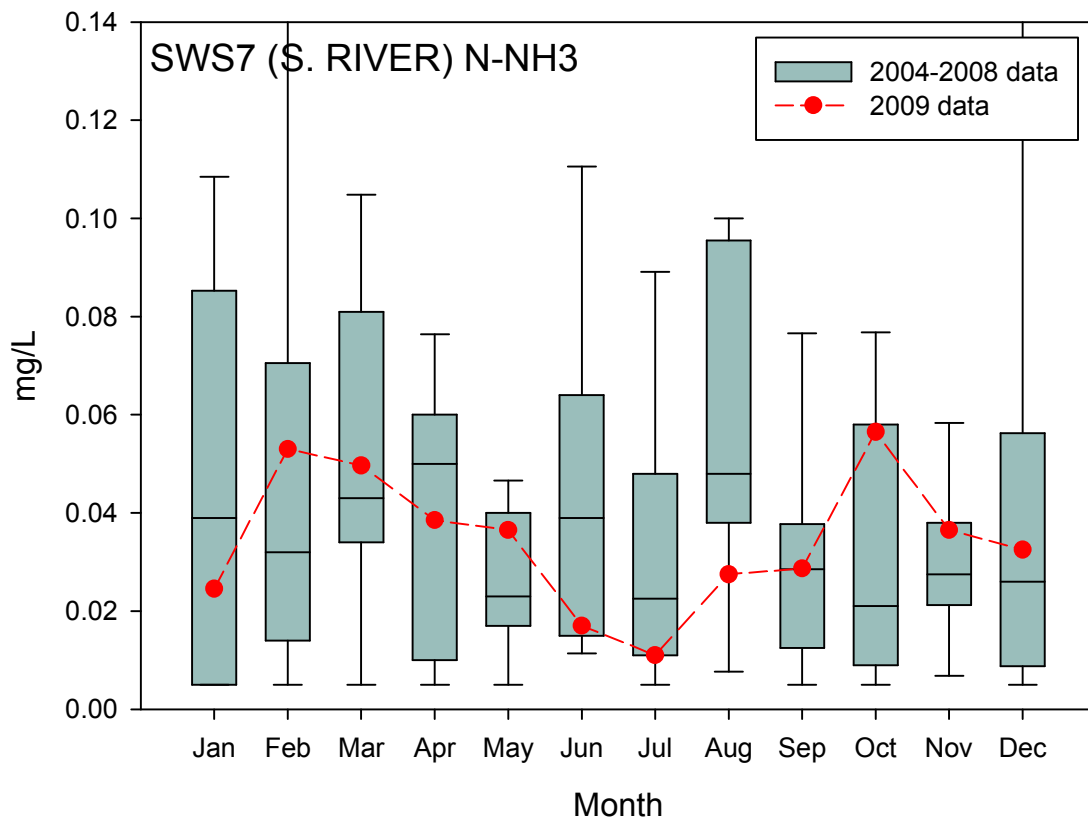
13.1 Southern River 2009 4th Quarter Summary Graphs:

The 95th percentile for February is 4.99 mg/L.

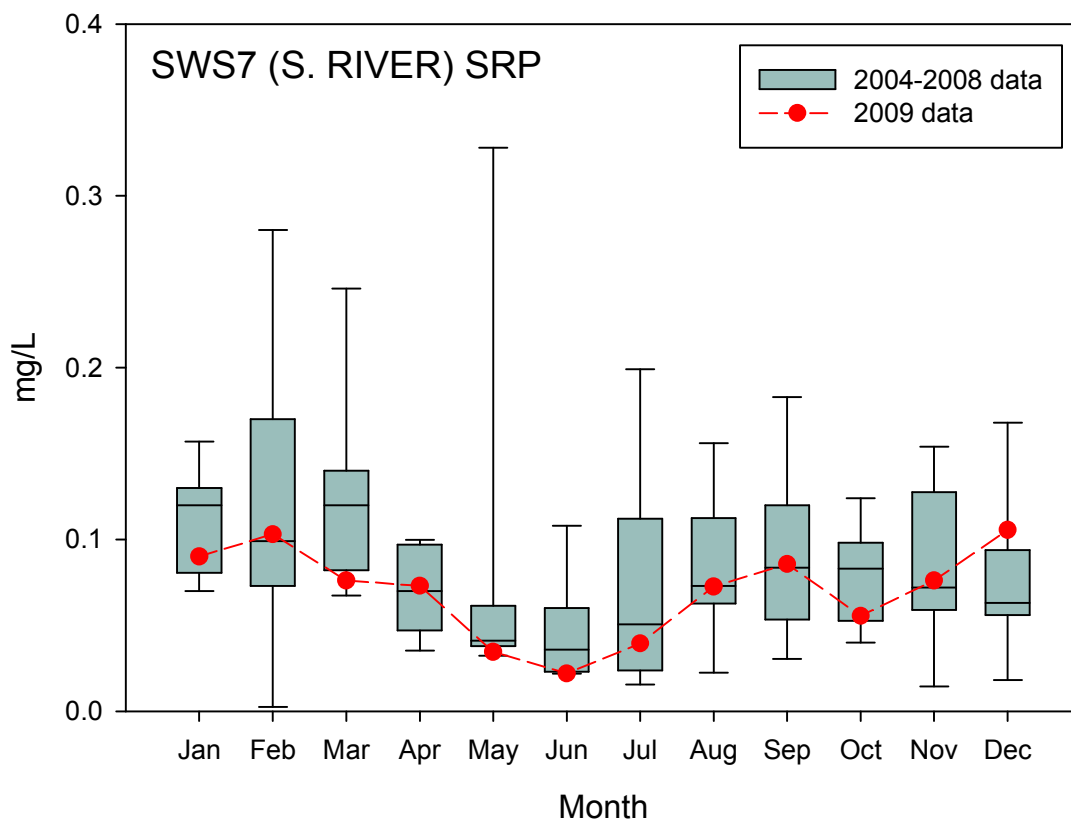
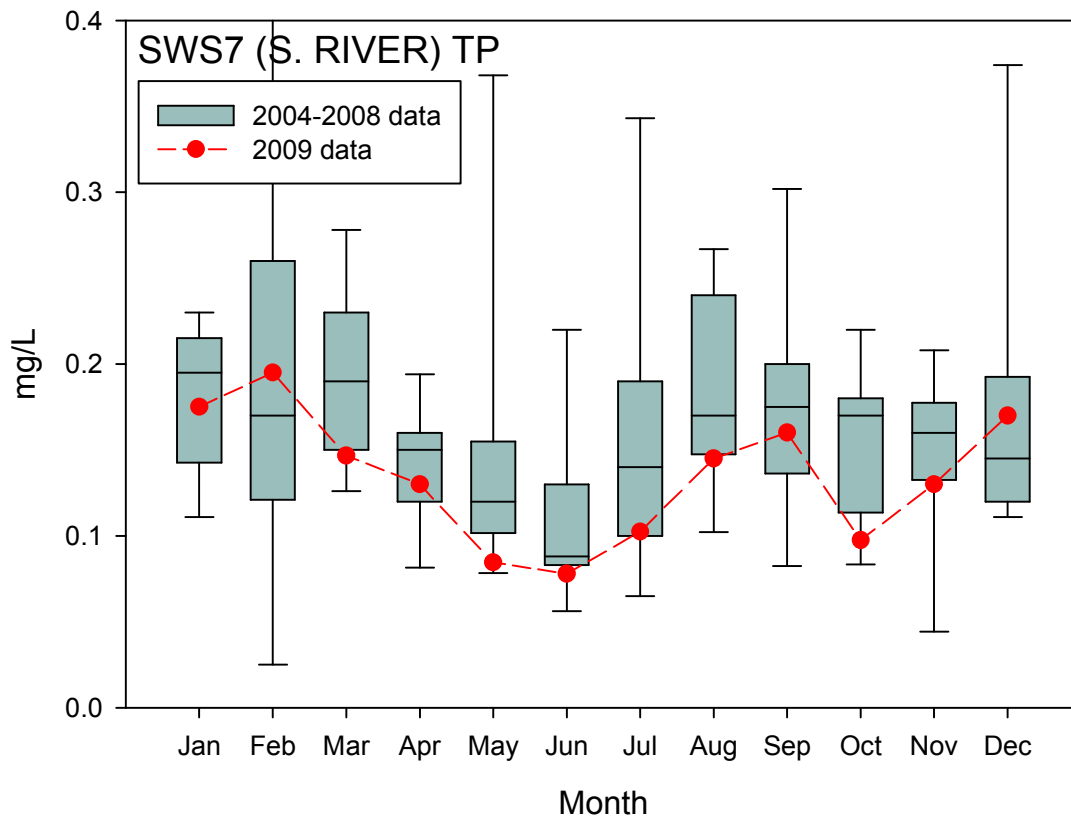


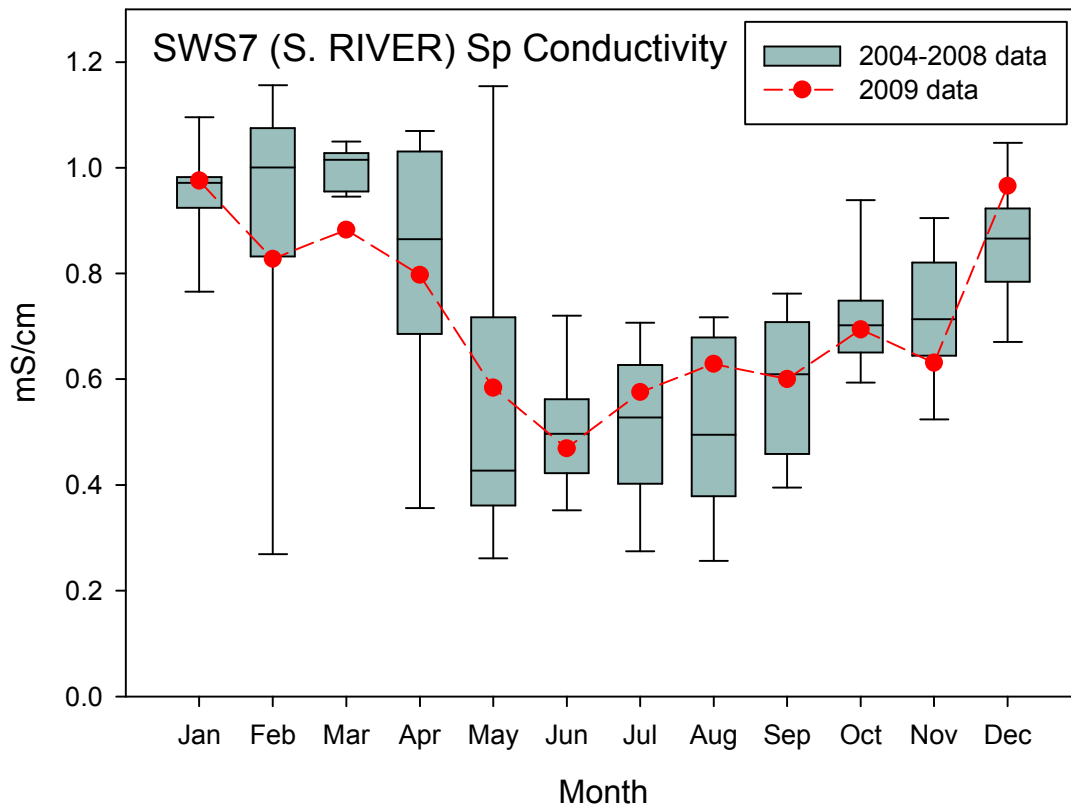
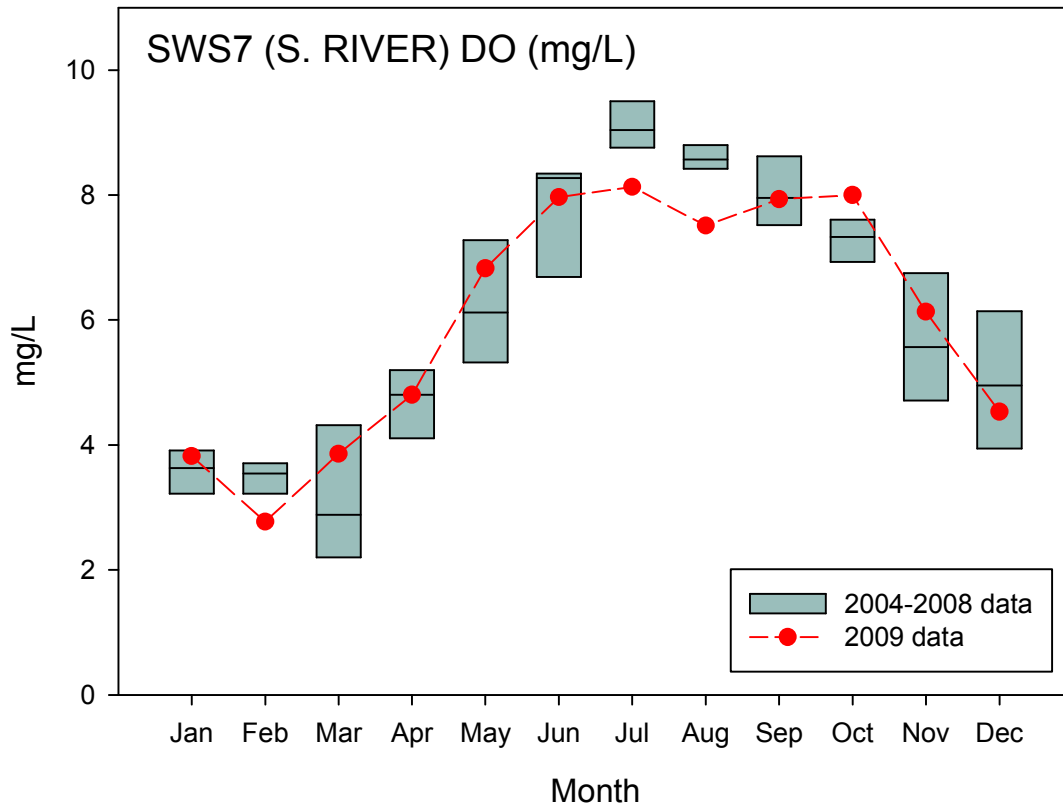


The 95th percentile for February is 4.58mg/L and for December is 1.62mg/L.



The 95th percentile for February is 0.67mg/L.





13.2 Southern River 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	1.10	0.86	0.79	0.64	0.51	0.58	1.50	1.80	1.40	1.30	1.00	1.20
max	1.20	1.20	0.86	0.88	0.70	0.71	2.10	2.10	2.20	1.60	1.30	1.40

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.360	0.160	0.180	0.150	0.072	0.150	0.660	0.840	0.540	0.39	0.23	0.37
max	0.370	0.200	0.200	0.320	0.160	0.180	1.500	1.500	1.100	0.54	0.33	0.43

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.015	0.047	0.037	0.032	0.031	<0.01	0.011	0.010	0.011	0.027	0.036	0.010
max	0.034	0.059	0.062	0.045	0.042	0.029	0.011	0.045	0.040	0.086	0.037	0.055

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.170	0.160	0.130	0.110	0.073	0.069	0.075	0.120	0.140	0.065	0.120	0.130
max	0.180	0.230	0.160	0.150	0.096	0.087	0.130	0.170	0.180	0.130	0.140	0.210

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	2	2	2
min	0.090	0.096	0.071	0.067	0.034	0.019	0.025	0.053	0.089	0.036	0.064	0.091
max	0.090	0.110	0.082	0.079	0.035	0.025	0.054	0.092	0.100	0.075	0.088	0.120

Dissolved Oxygen (mg/L)

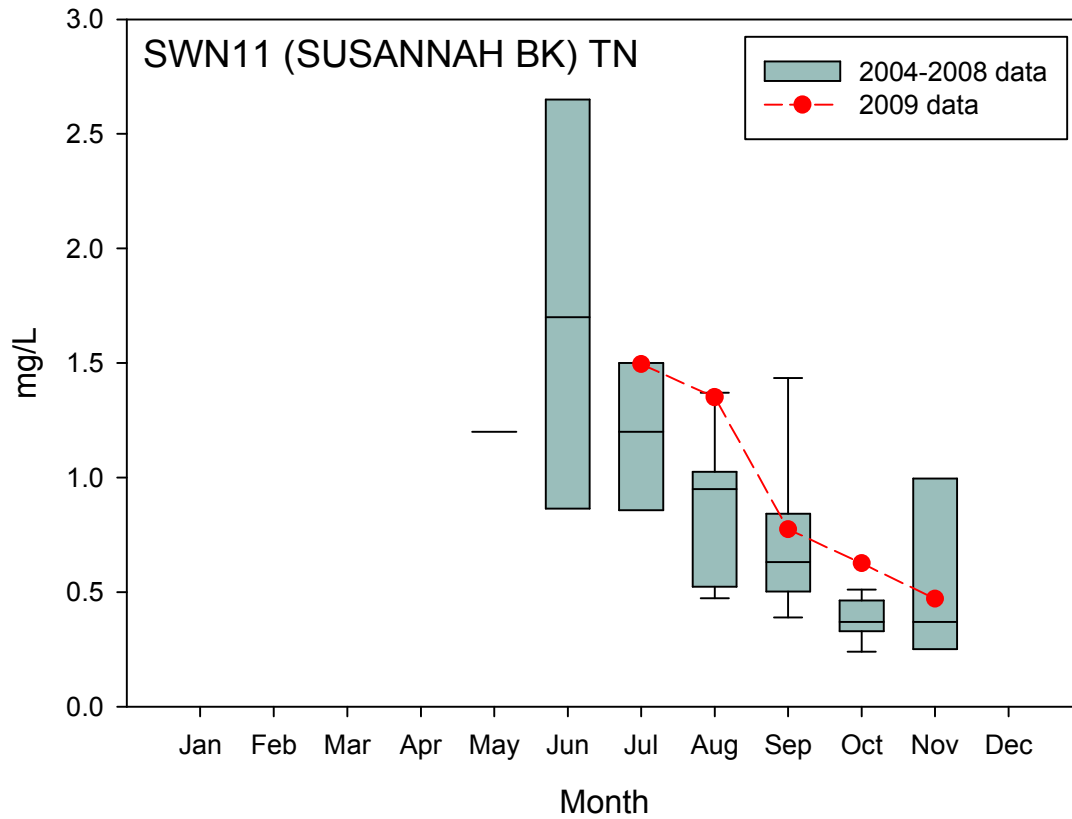
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	3	2	2	2	2	2	3	1	1	2
min	3.79	2.77	3.55	3.86	5.72	7.33	7.97	7.50	7.76	8.00	6.13	4.25
max	3.85	2.77	4.44	5.74	7.93	8.60	8.29	7.52	8.02	8.00	6.13	4.81

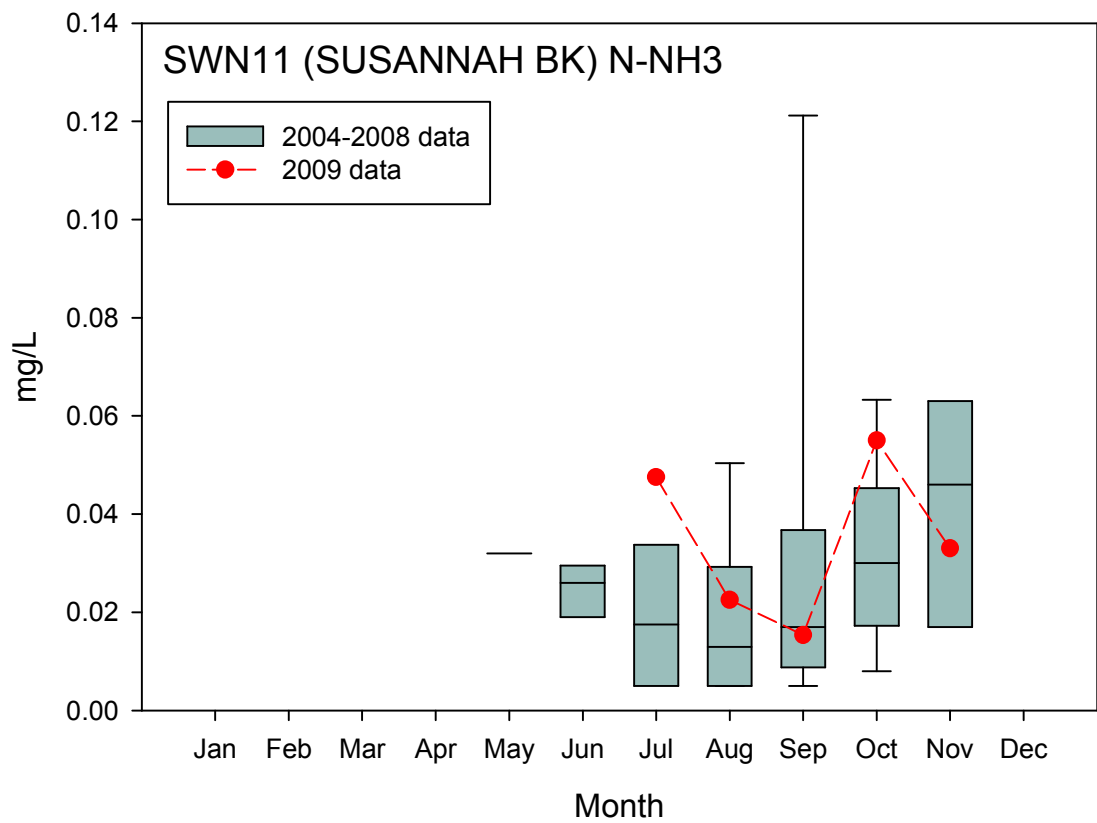
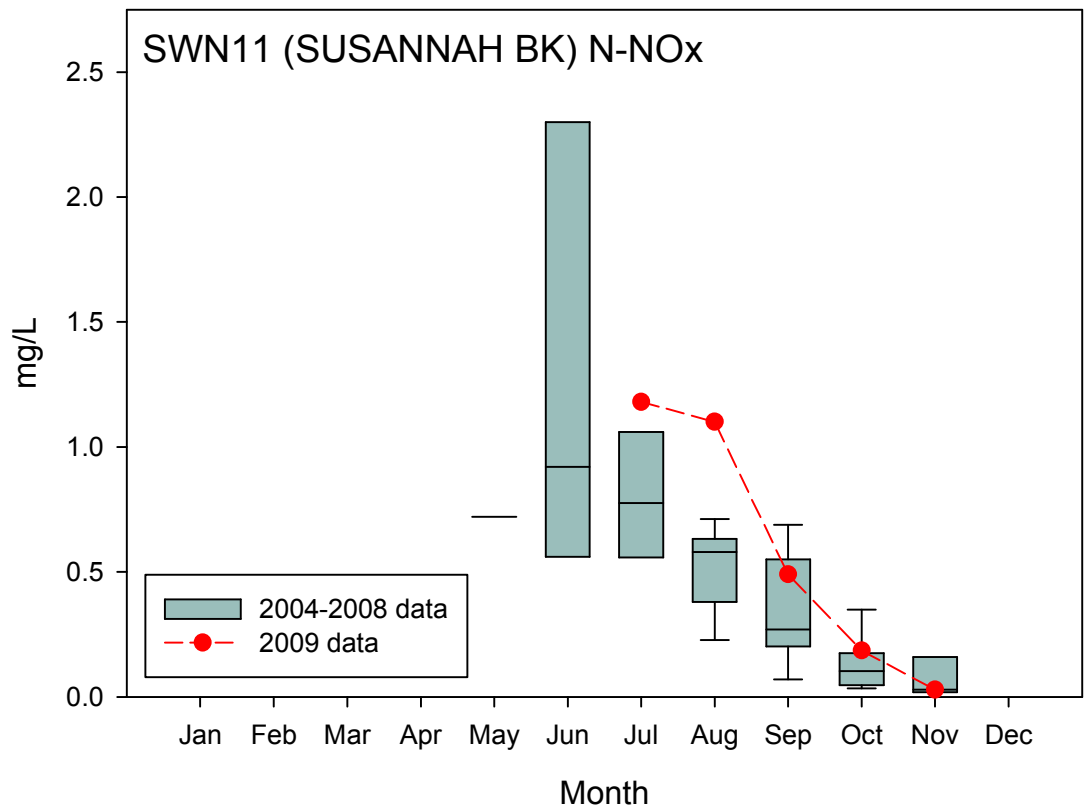
Specific Conductivity (mS/cm)

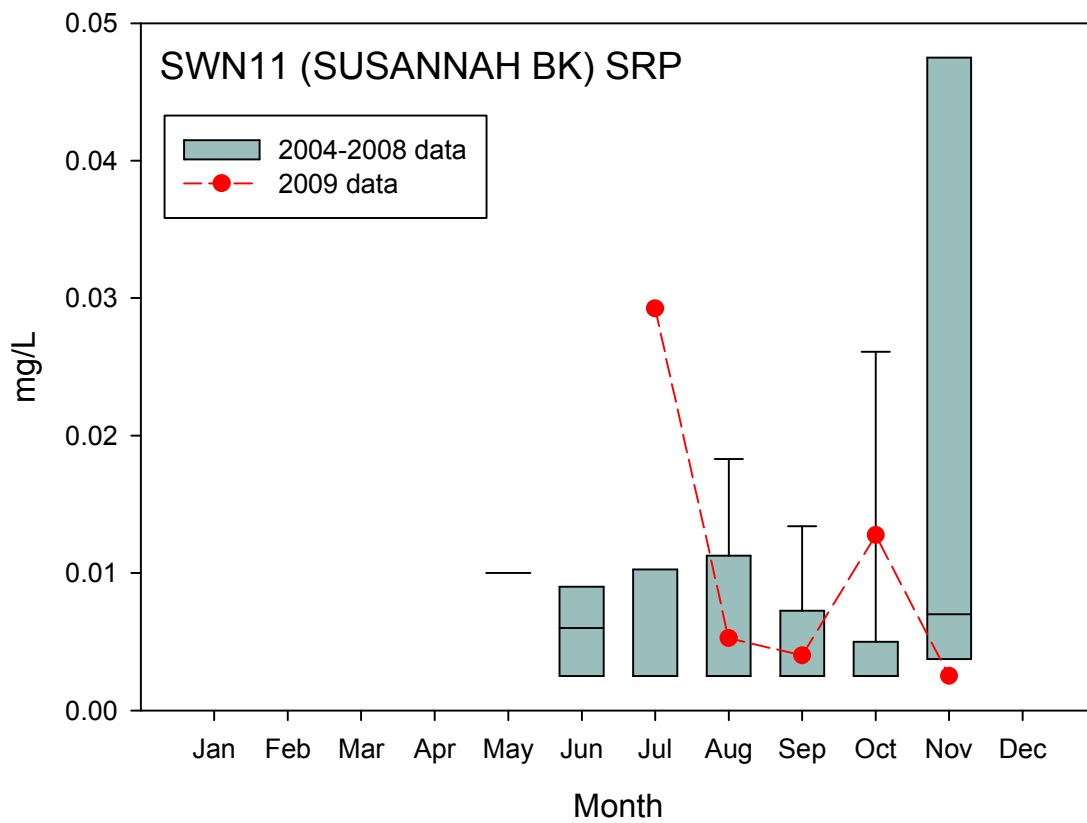
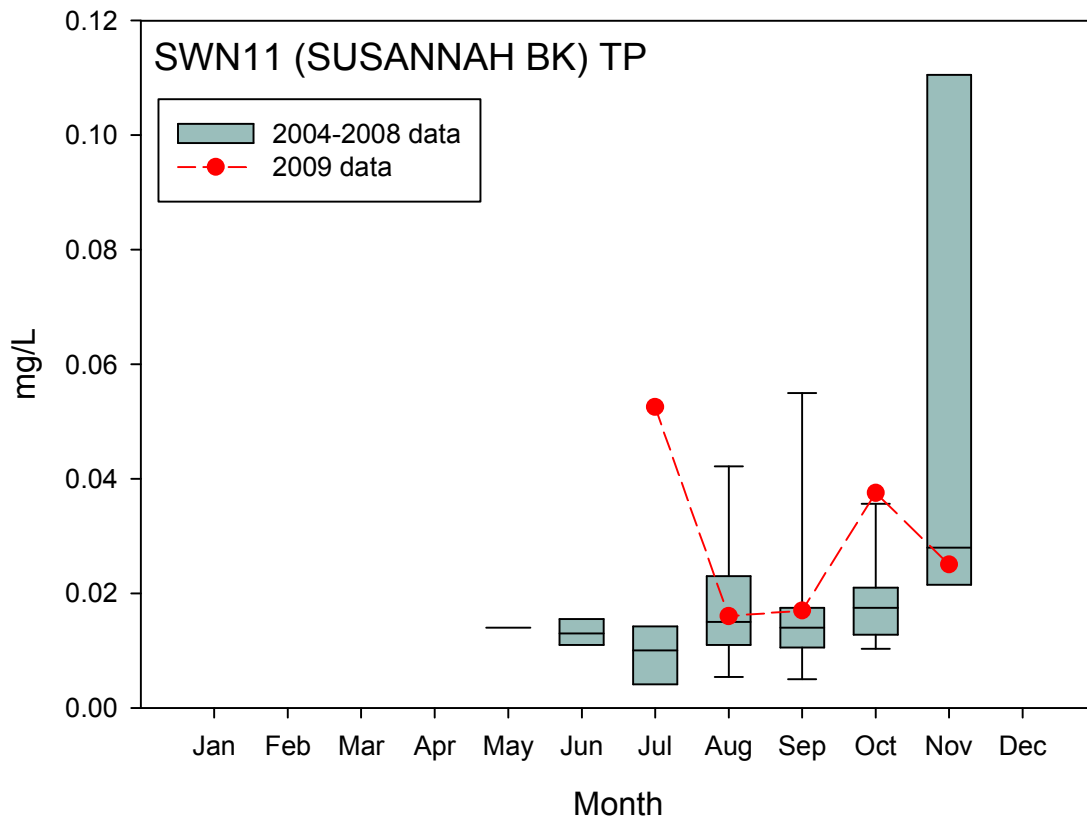
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	2	3	2	2	2	2	2	3	1	1	2
min	0.961	0.789	0.831	0.699	0.489	0.366	0.489	0.519	0.490	0.694	0.631	0.883
max	0.990	0.866	0.976	0.895	0.679	0.572	0.662	0.739	0.676	0.694	0.631	1.048

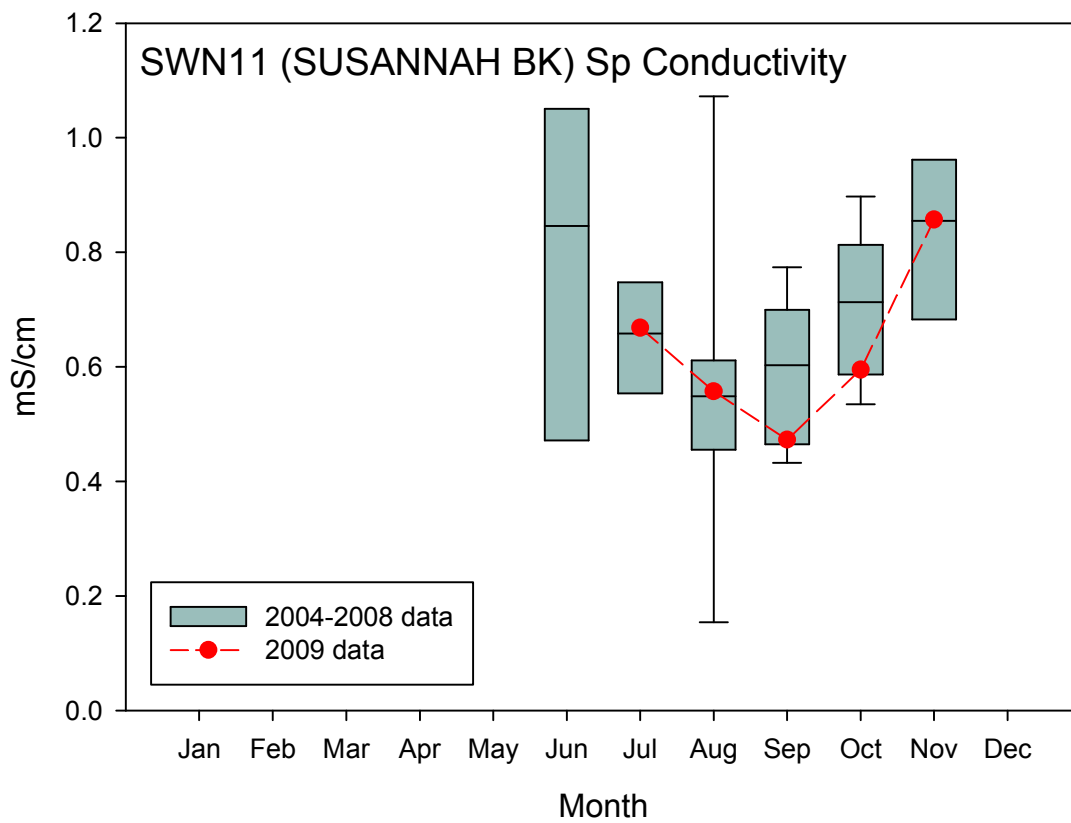
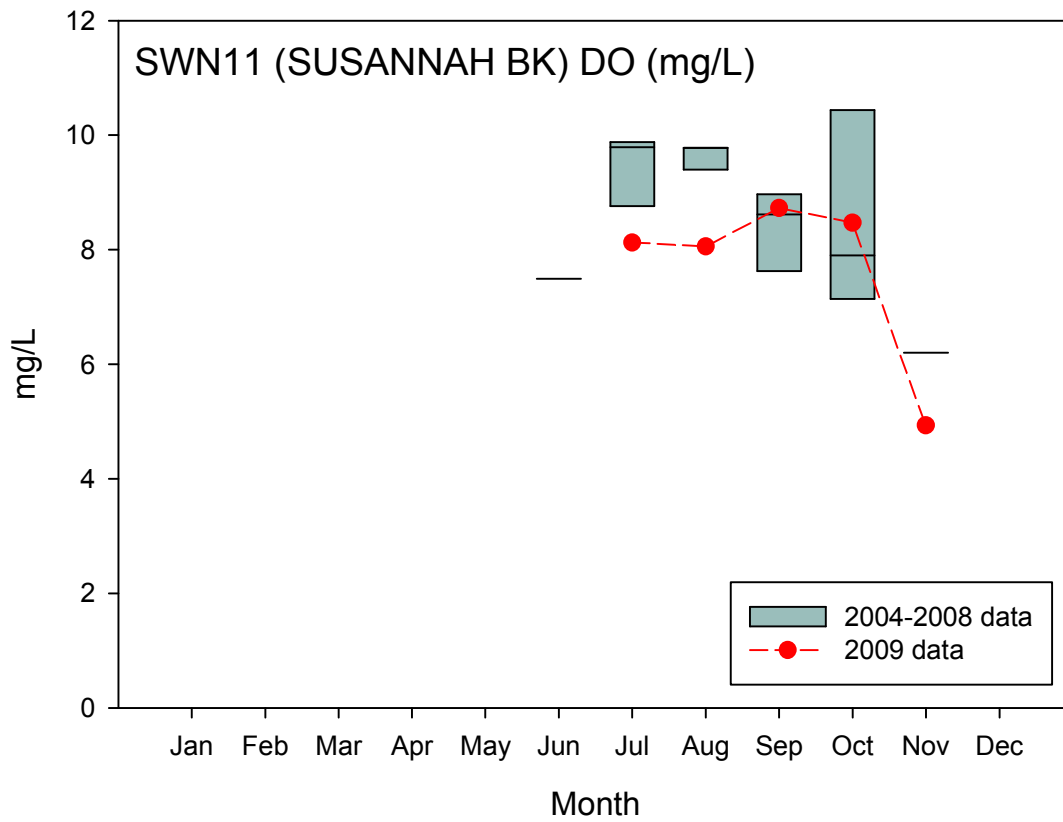
14 Susannah Brook (SWN11)

14.1 Susannah Brook 2009 4th Quarter Summary Graphs:









14.2 Susannah Brook 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	1	0
min	-	-	-	-	-	-	0.69	1.30	0.57	0.45	0.47	-
max	-	-	-	-	-	-	2.30	1.40	0.92	0.80	0.47	-

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	1	0
min	-	-	-	-	-	-	0.16	1.00	0.32	0.16	0.028	-
max	-	-	-	-	-	-	2.20	1.20	0.60	0.21	0.028	-

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	1	0
min	-	-	-	-	-	-	<0.01	0.014	<0.01	0.012	0.033	-
max	-	-	-	-	-	-	0.090	0.031	0.022	0.098	0.033	-

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	1	0
min	-	-	-	-	-	-	0.010	0.009	0.009	0.017	0.025	-
max	-	-	-	-	-	-	0.095	0.023	0.029	0.058	0.025	-

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	2	1	0
min	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	-
max	-	-	-	-	-	-	0.056	0.008	0.007	0.023	<0.005	-

Dissolved Oxygen (mg/L)

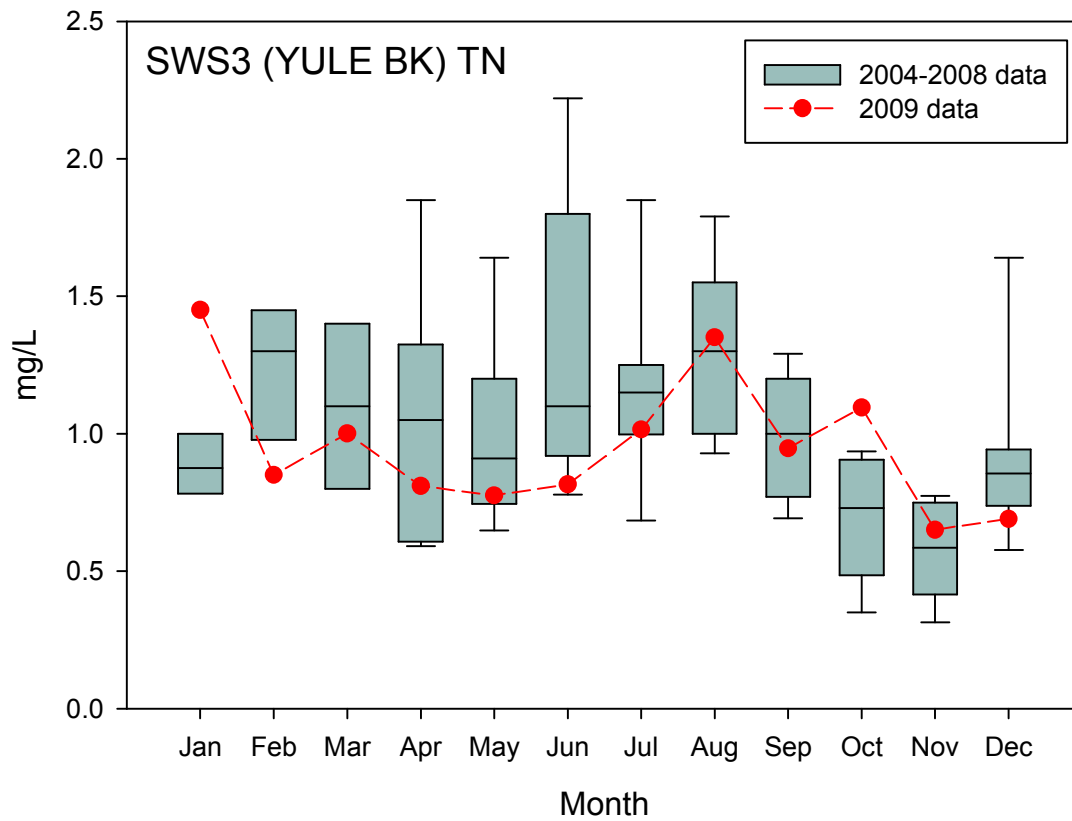
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	1	1	0
min	-	-	-	-	-	-	7.63	7.76	8.58	8.47	4.93	-
max	-	-	-	-	-	-	8.62	8.35	8.98	8.47	4.93	-

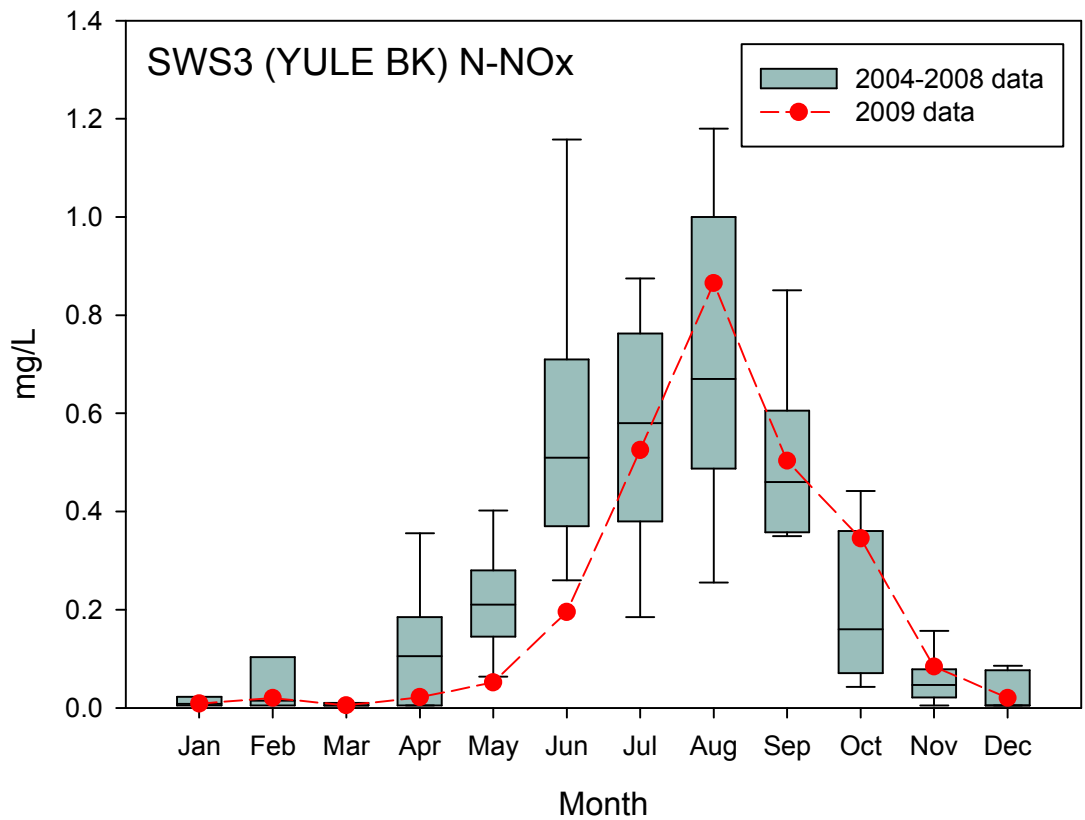
Specific Conductivity (mS/cm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	0	0	0	0	0	0	2	2	3	1	1	0
min	-	-	-	-	-	-	0.439	0.481	0.442	0.595	0.857	-
max	-	-	-	-	-	-	0.897	0.633	0.498	0.595	0.857	-

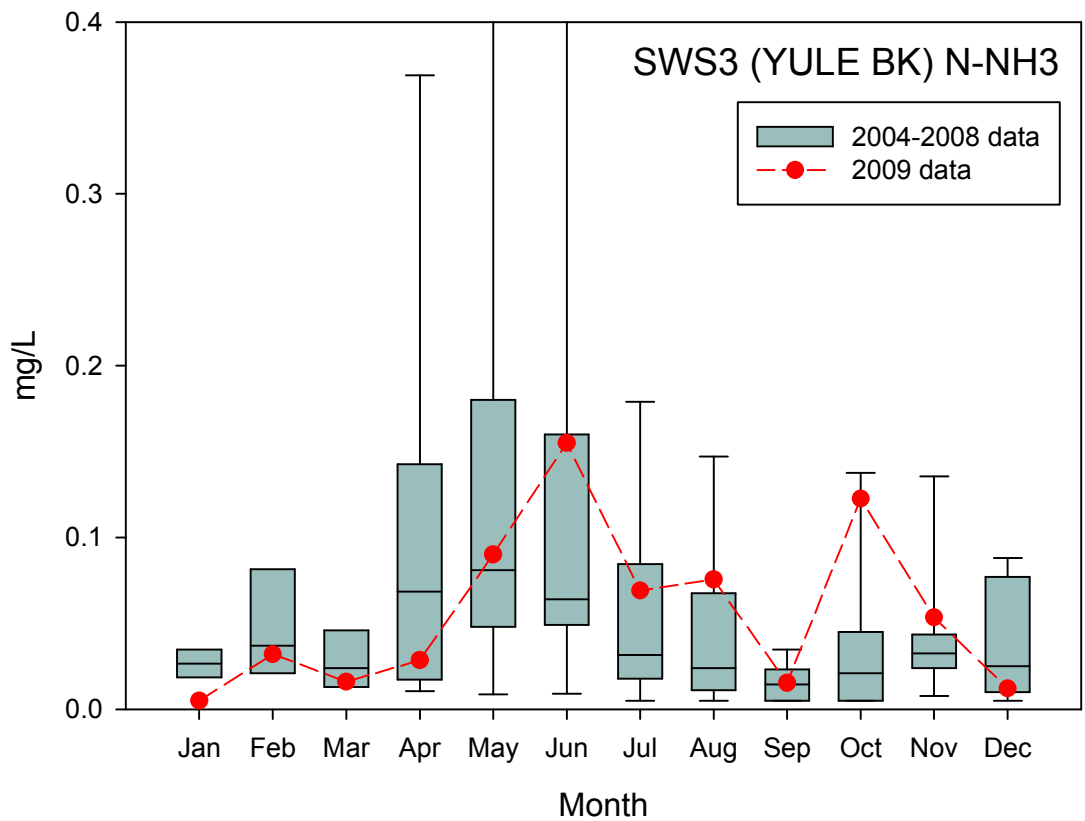
15 Yule Brook (SWS3)

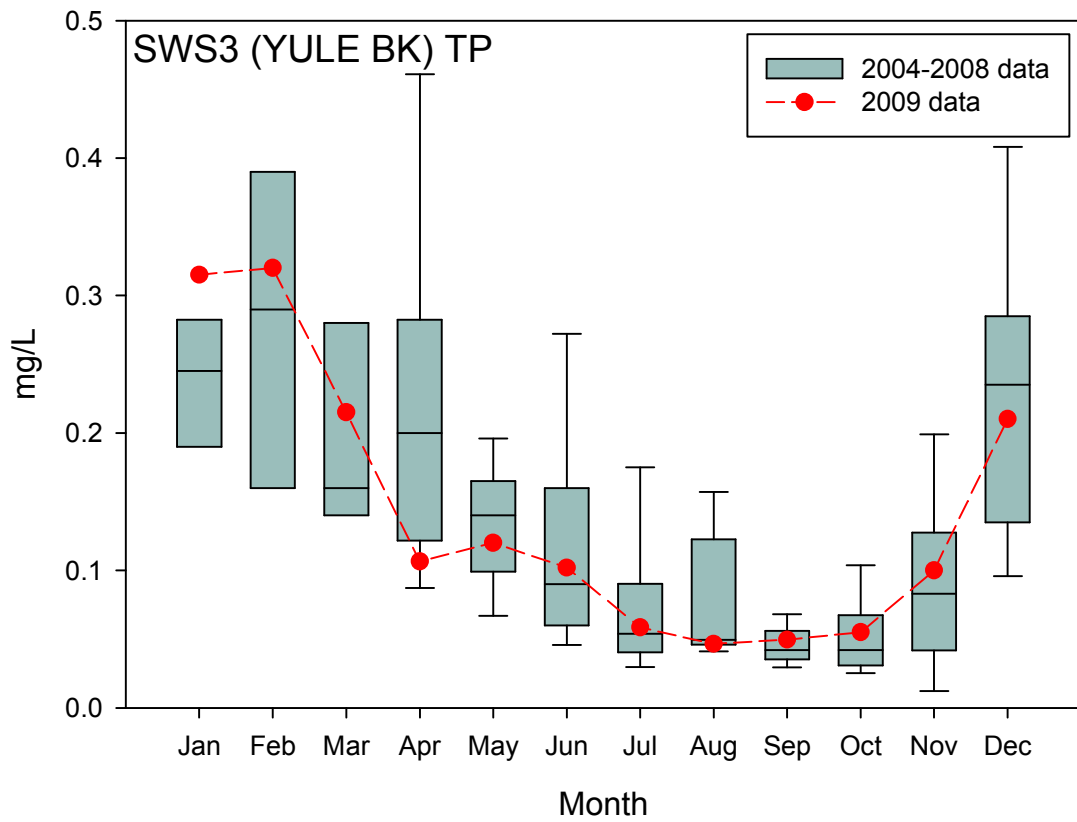
15.1 Yule Brook 2009 4th Quarter Summary Graphs:



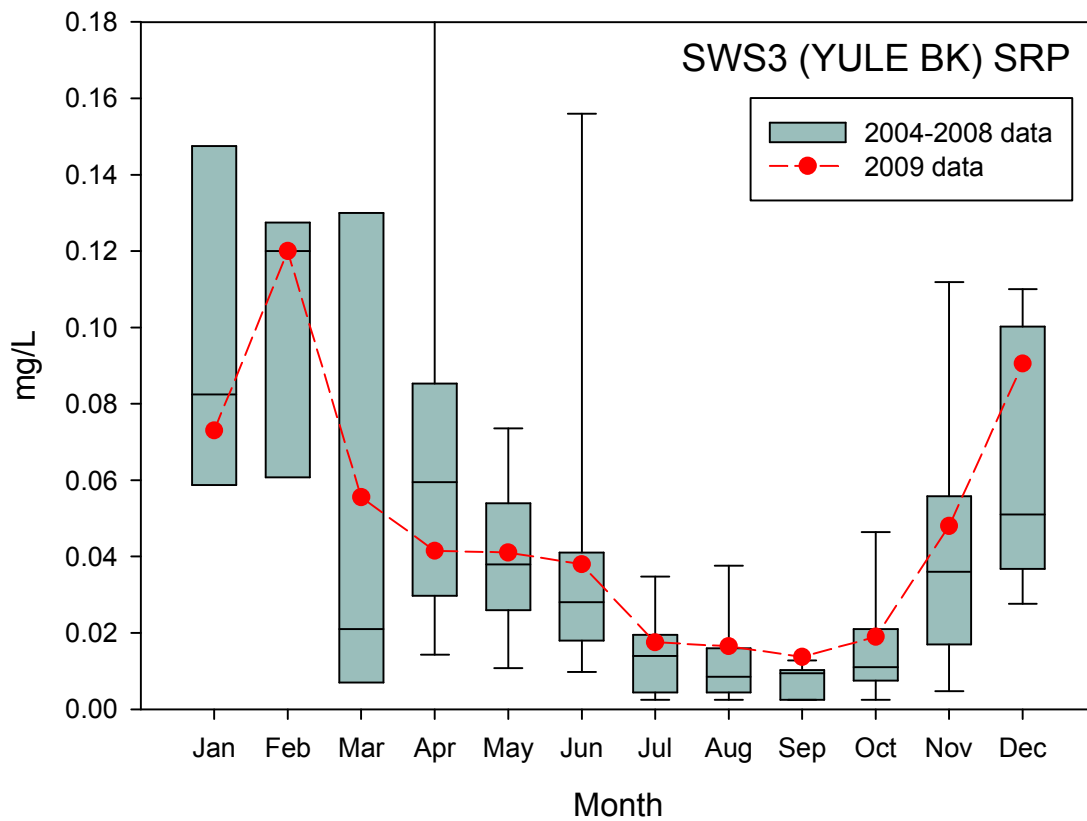


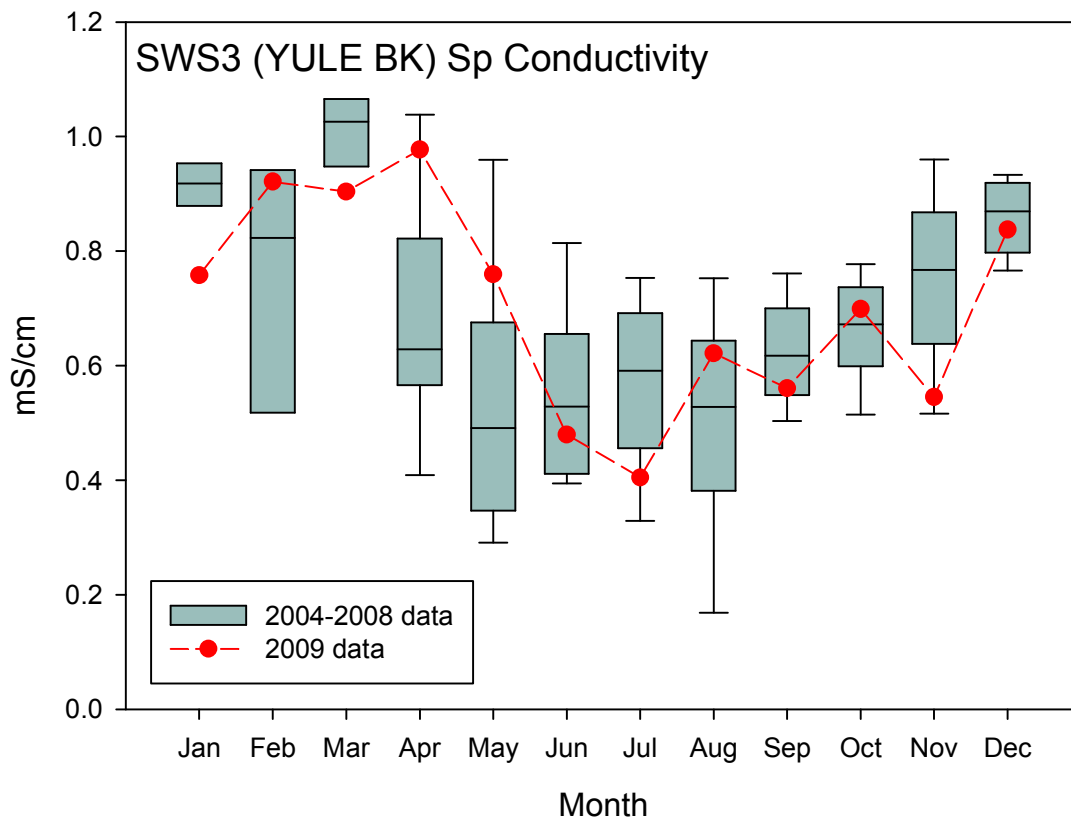
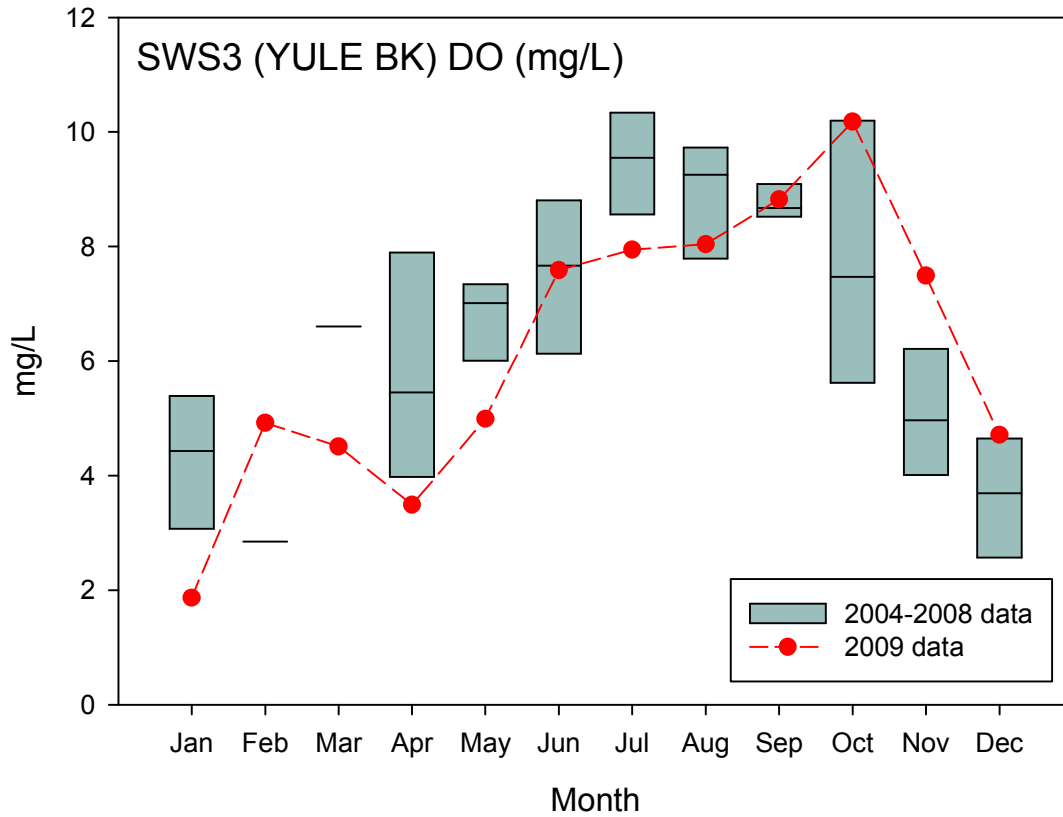
The 95th percentile for May is 0.89mg/L and for June is 0.56mg/L.





The 95th percentile for April is 0.44mg/L.





15.2 Yule Brook 2009 4th Quarter Summary Tables:

TN (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	2	2	2	2	2	2	3	2	2	2
min	0.80	0.85	0.90	0.67	0.77	0.63	0.93	1.30	0.79	0.59	0.65	0.65
max	2.10	0.85	1.10	0.95	0.78	1.00	1.10	1.40	1.10	1.60	0.65	0.73

N-NO_x (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	2	2	2	2	2	2	3	2	2	2
min	<0.01	0.020	<0.01	<0.01	0.039	0.160	0.330	0.850	0.400	0.230	0.058	<0.01
max	0.012	0.020	<0.01	0.038	0.064	0.230	0.720	0.880	0.680	0.460	0.110	0.020

N-NH₃ (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	2	2	2	2	2	2	3	2	2	2
min	<0.01	0.032	0.015	0.012	0.020	0.110	0.066	0.069	<0.01	<0.01	0.044	<0.01
max	<0.01	0.032	0.017	0.045	0.160	0.200	0.072	0.082	0.024	0.240	0.063	0.019

TP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	2	2	2	2	2	2	3	2	2	2
min	0.220	0.320	0.140	0.083	0.100	0.074	0.048	0.039	0.029	0.035	0.100	0.140
max	0.410	0.320	0.290	0.130	0.140	0.130	0.069	0.054	0.080	0.075	0.100	0.280

SRP (mg/L)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	2	2	2	2	2	2	3	2	2	2
min	0.067	0.120	0.033	0.020	0.021	0.030	0.017	0.013	0.008	0.028	0.045	0.061
max	0.079	0.120	0.078	0.063	0.061	0.046	0.018	0.020	0.018	0.010	0.051	0.120

Dissolved Oxygen (mg/L)

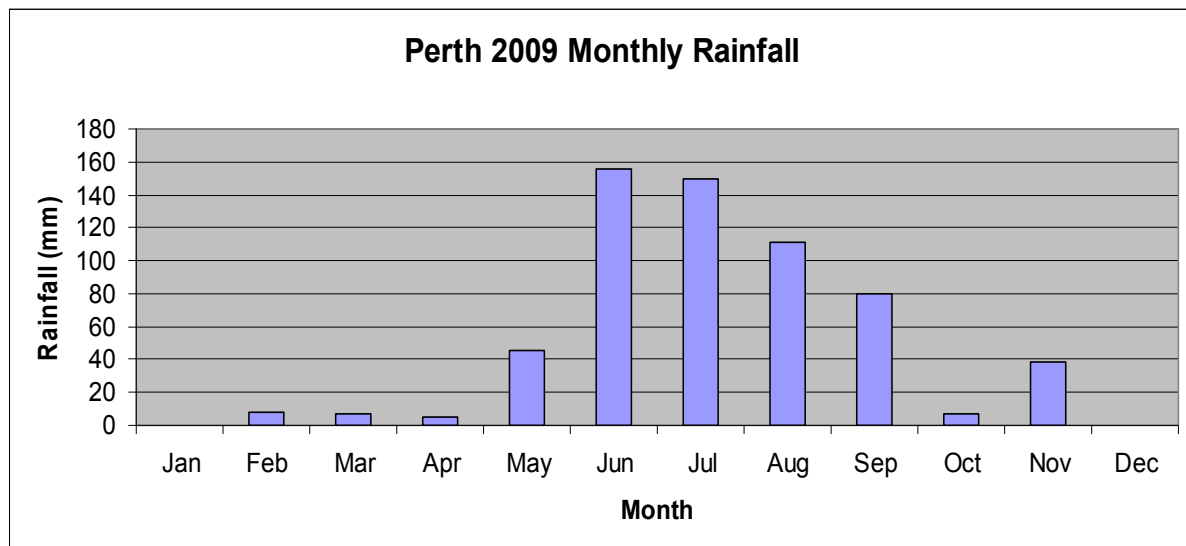
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	2	2	2	2	2	2	3	1	1	2
min	1.27	4.92	3.88	2.61	2.77	6.94	7.84	7.72	8.24	10.18	7.49	3.44
max	2.46	4.92	5.13	4.37	7.21	8.23	8.05	8.36	9.41	10.18	7.49	5.98

Specific Conductivity (mS/cm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
n	2	1	2	2	2	2	2	2	3	1	1	2
min	0.582	0.921	0.902	0.941	0.695	0.364	0.354	0.516	0.407	0.699	0.545	0.799
max	0.934	0.921	0.905	1.013	0.824	0.595	0.455	0.727	0.644	0.699	0.545	0.876

16 2009 Perth rainfall:

This graph displays the rainfall recorded (in millimetres) in Perth during the first nine months of 2009 on a monthly basis, as shown on the Bureau of Meteorology website (although it is actually a combination of observations from the Mt Lawley and Perth Airport weather stations).



Glossary

TN	Total Nitrogen
TP	Total Phosphorus
SRP	Soluble Reactive Phosphorus
N-NO_x	Total Oxidised Nitrogen (sum of Nitrogen as nitrite and nitrate)
N-NH₃	Nitrogen as ammonia/ammonium
TSS	Total Suspended Solids
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
DON	Dissolved Organic Nitrogen
TOC	Total Organic Carbon
SRT	Swan River Trust
WRC	Waters and Rivers Commission
DOW	Department of Water
WSB	Water Science Branch
SCCP	Swan-Canning Clean-up Program

References

Department of Water 2008, 'Project SG-C-SWANCATCH sampling and analysis plan 2008'