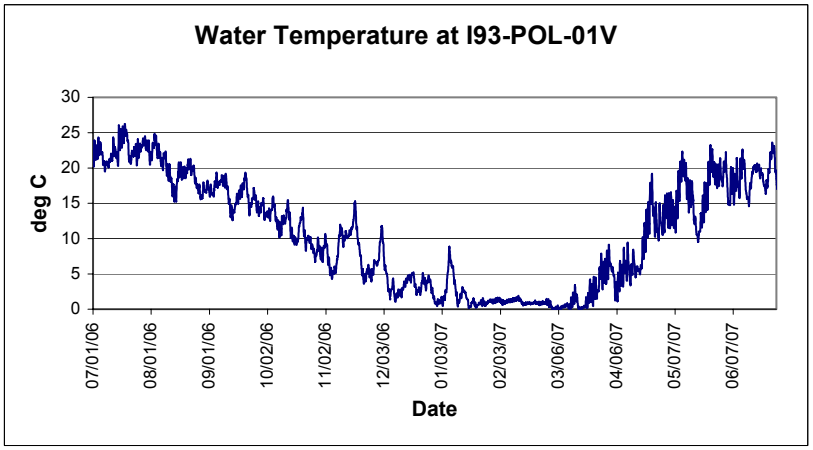
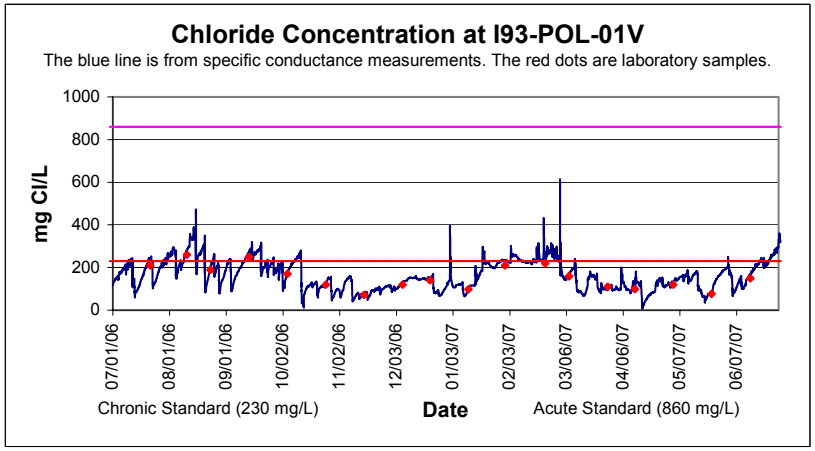
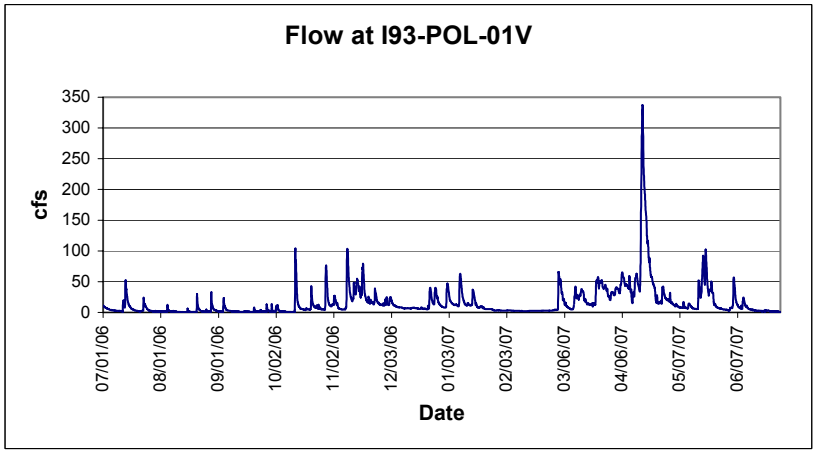
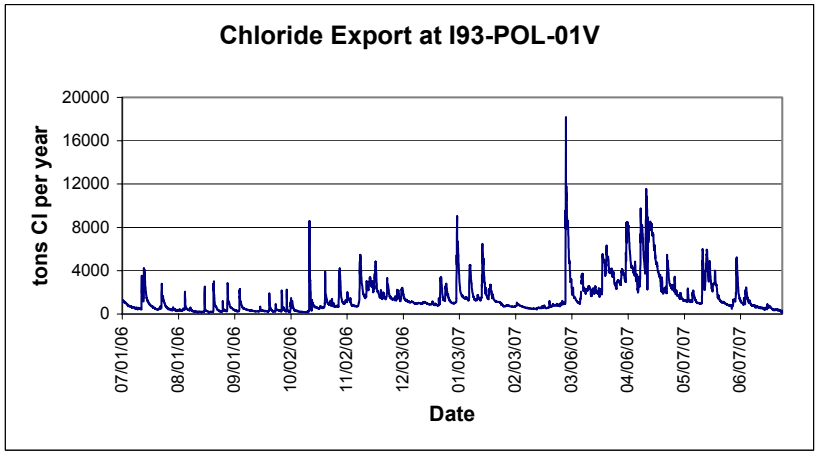
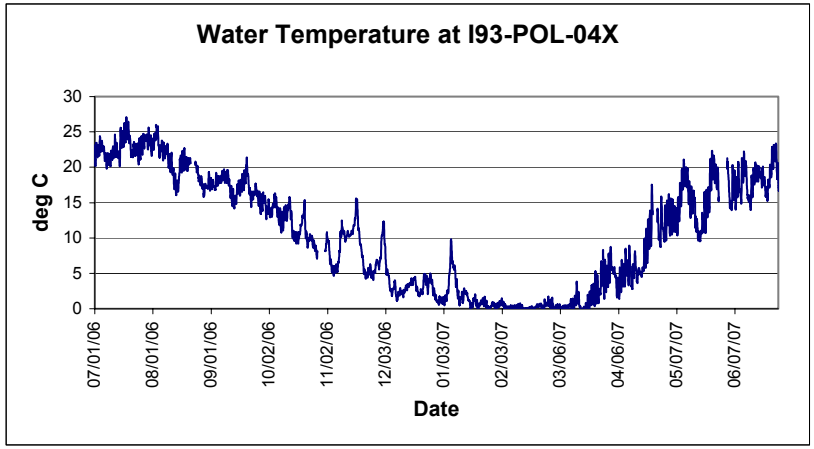
Appendix A: Time Series Graphs of Water Quality Parameters at Activity #1 Stations from 7/1/06 to 6/30/07

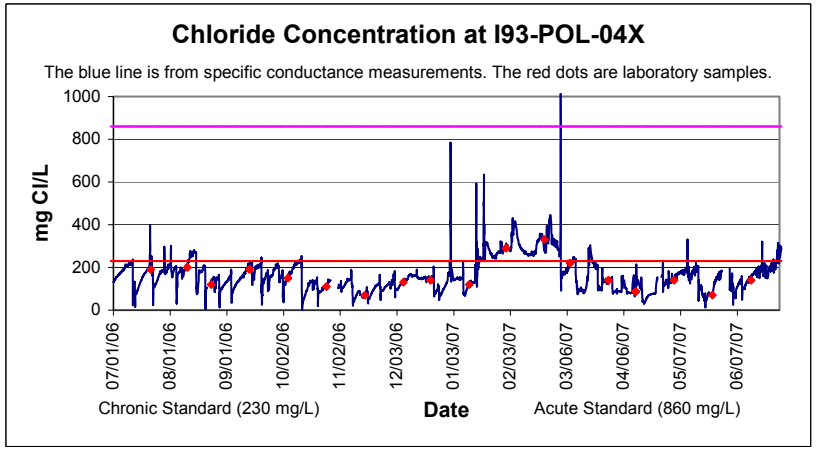


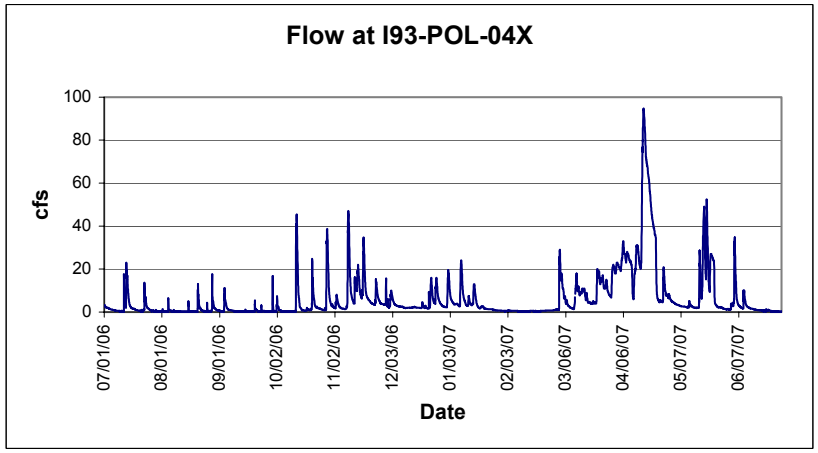


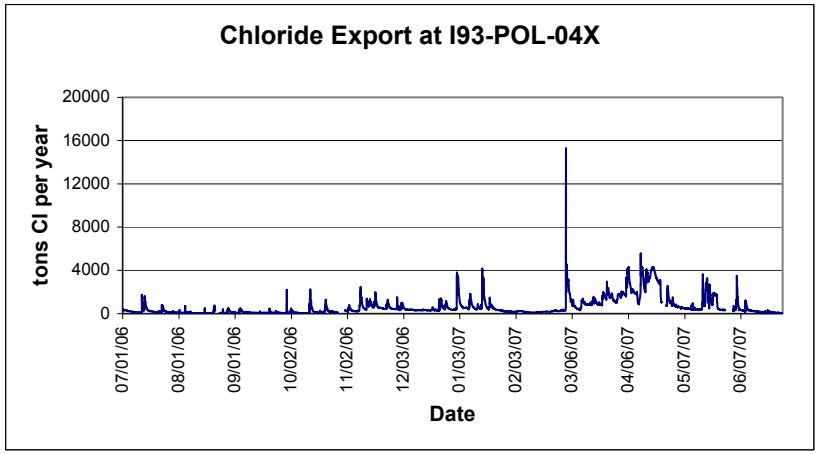


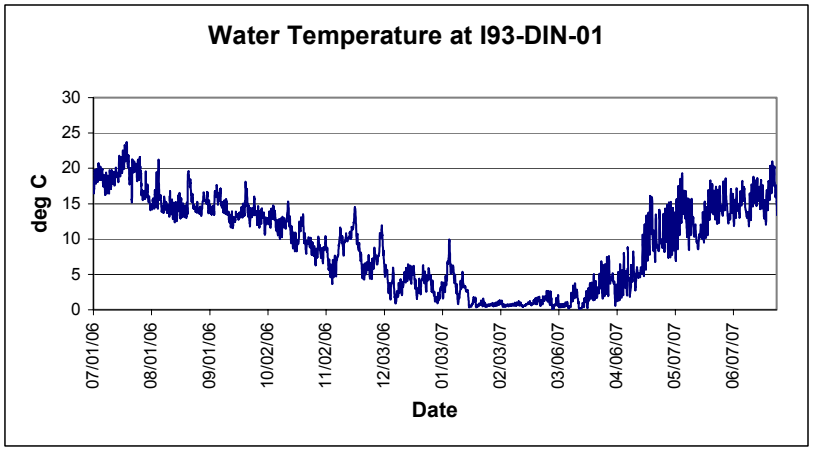


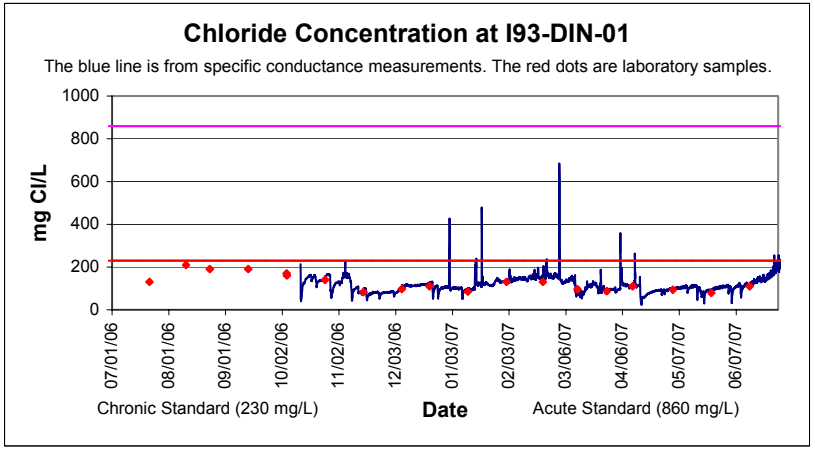

Water Temperature at I93-POL-04X
deg C
30
25
20
15
10
5
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

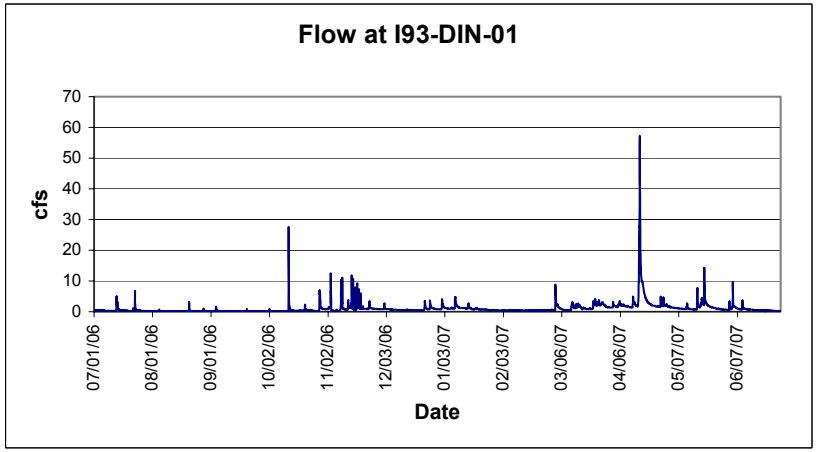

Chloride Concentration at I93-POL-04X
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

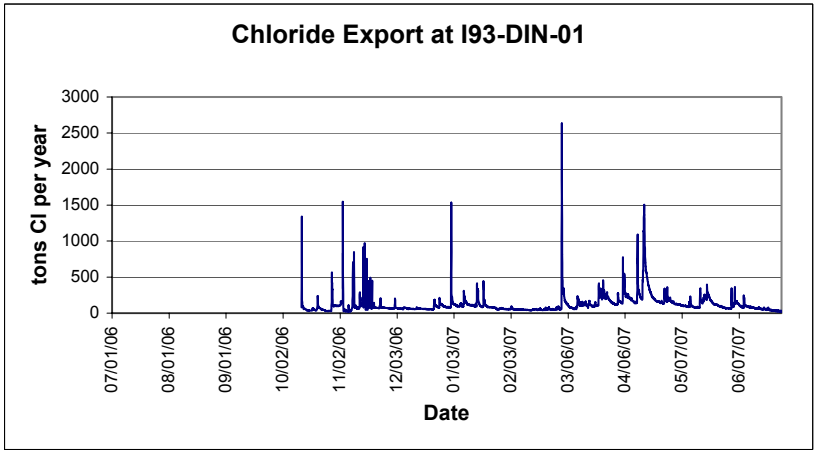

Flow at I93-POL-04X
cfs
100
80
60
40
20
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

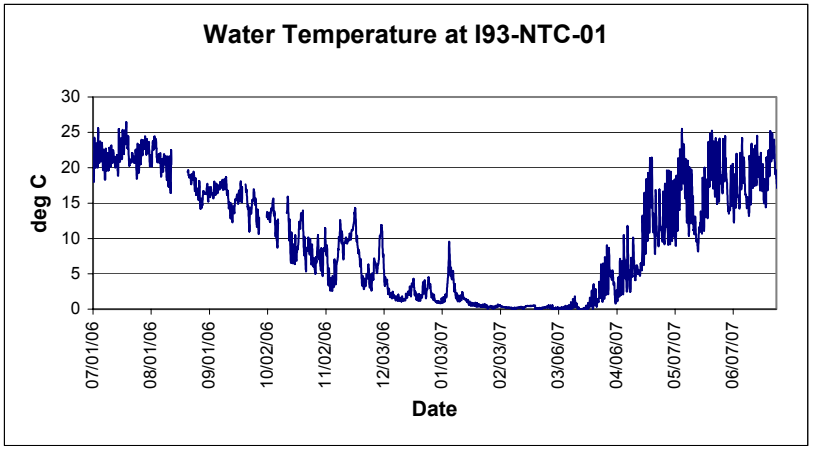

Chloride Export at I93-POL-04X
tons Cl per year
20000
16000
12000
8000
4000
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

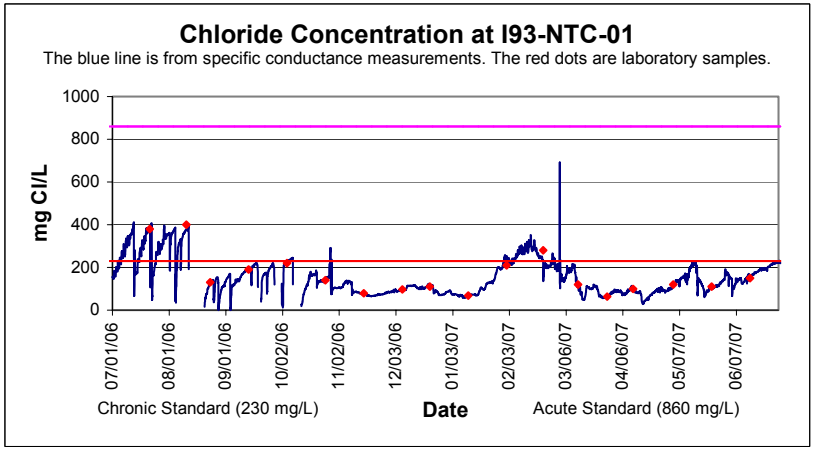

Water Temperature at I93-DIN-01
deg C
30
25
20
15
10
5
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

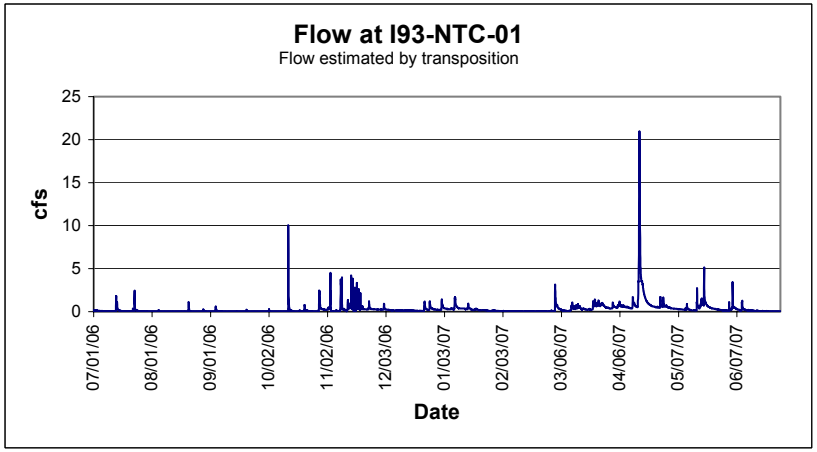

Chloride Concentration at I93-DIN-01
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

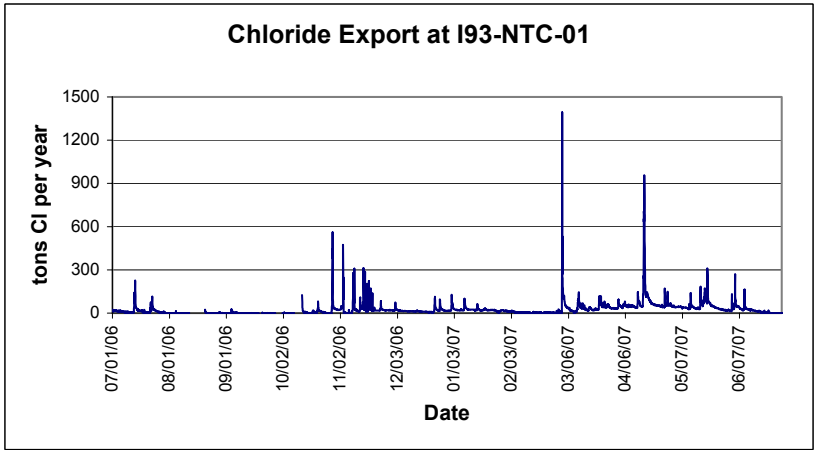

Flow at I93-DIN-01
cfs
70
60
50
40
30
20
10
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

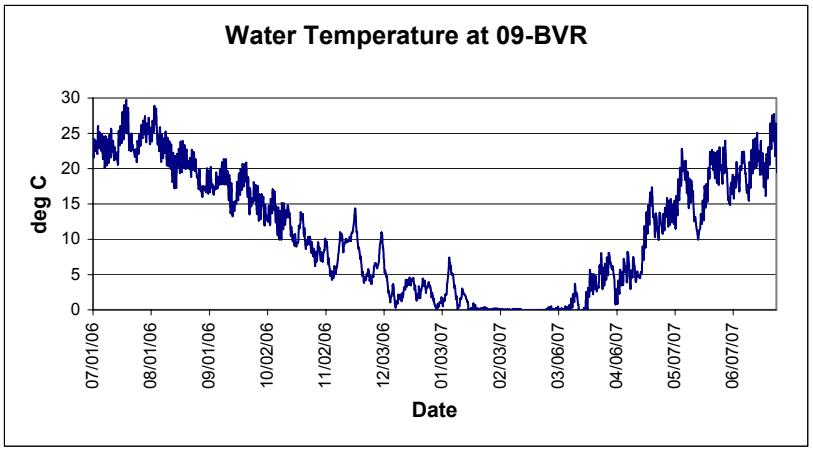

Chloride Export at I93-DIN-01
tons Cl per year
3000
2500
2000
1500
1000
500
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

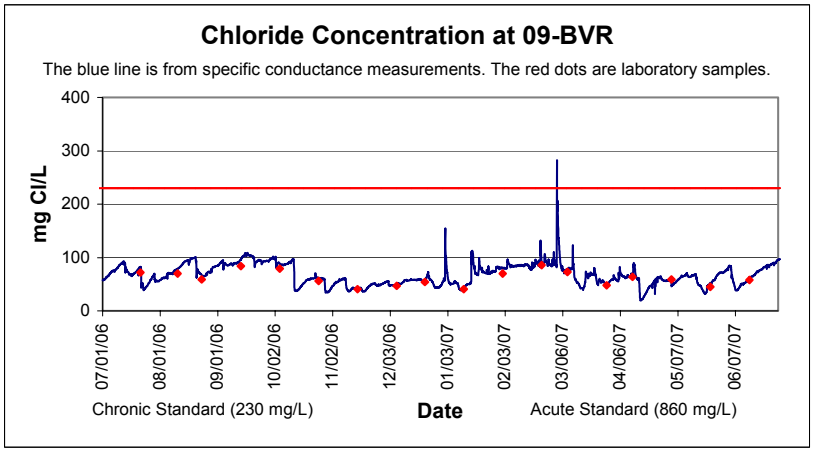

Water Temperature at I93-NTC-01
deg C
30
25
20
15
10
5
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

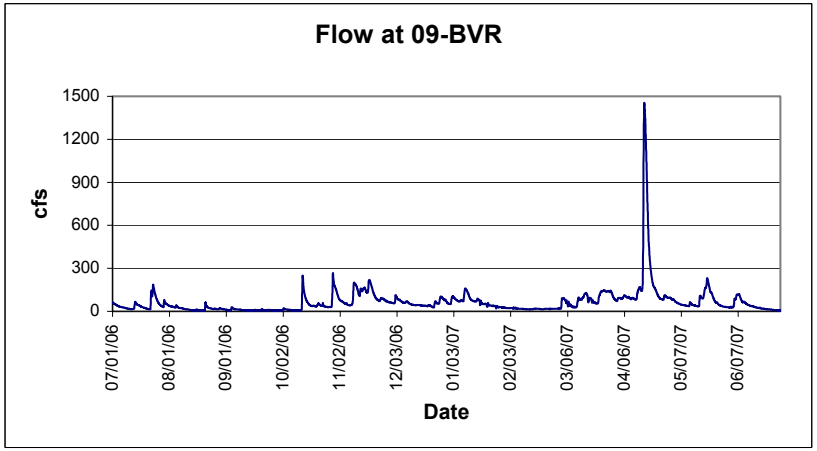

Chloride Concentration at I93-NTC-01
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

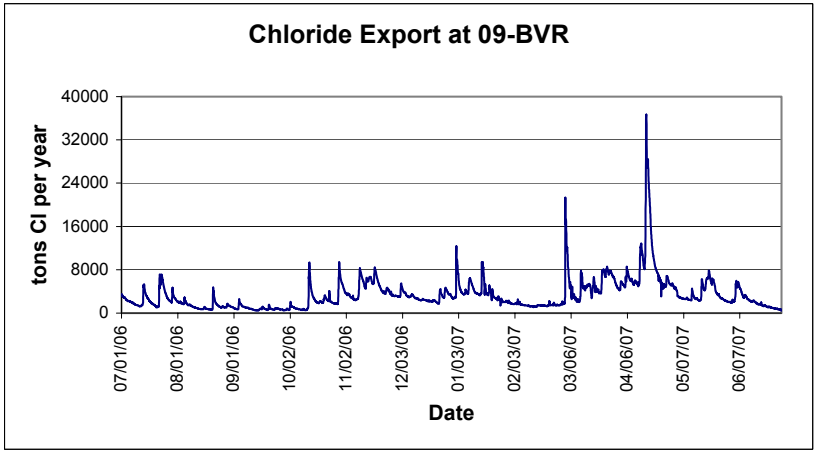

Flow at I93-NTC-01
Flow estimated by transposition
cfs
25
20
15
10
5
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

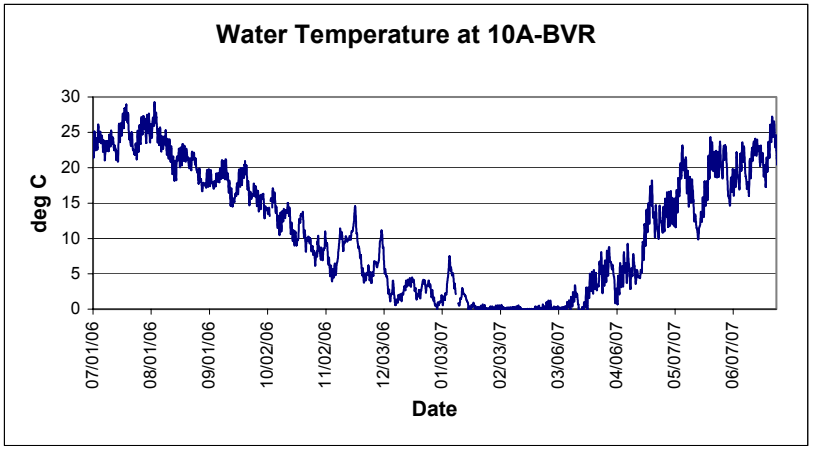

Chloride Export at I93-NTC-01
tons Cl per year
1500
1200
900
600
300
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

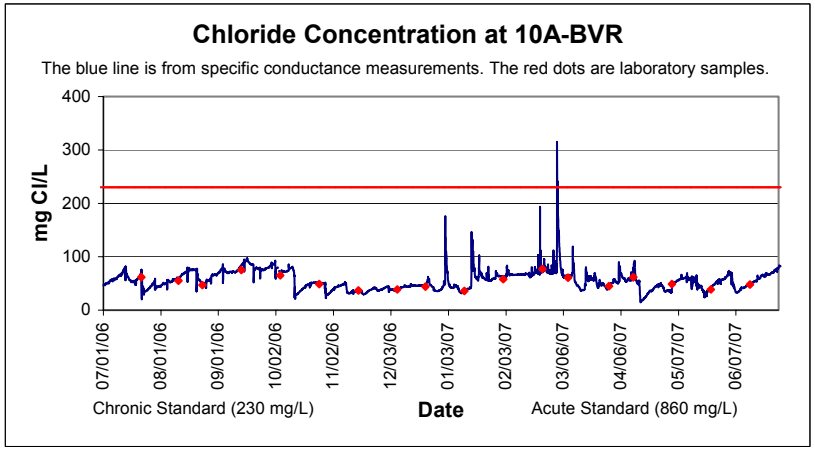

Water Temperature at 09-BVR
deg C
30
25
20
15
10
5
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

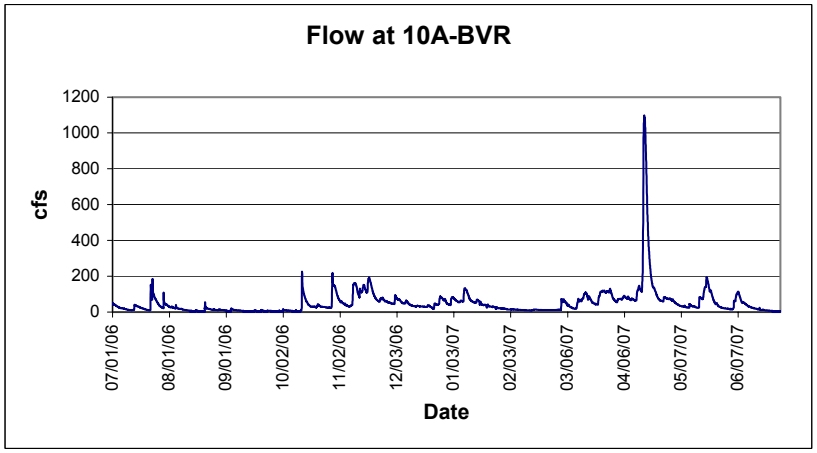

Chloride Concentration at 09-BVR
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
400
300
200
100
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

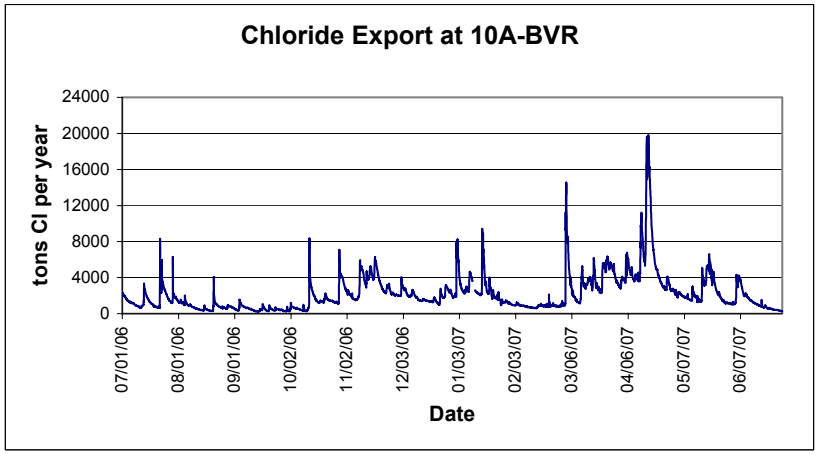

Flow at 09-BVR
cfs
1500
1200
900
600
300
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date


Chloride Export at 09-BVR
tons Cl per year
40000
32000
24000
16000
8000
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

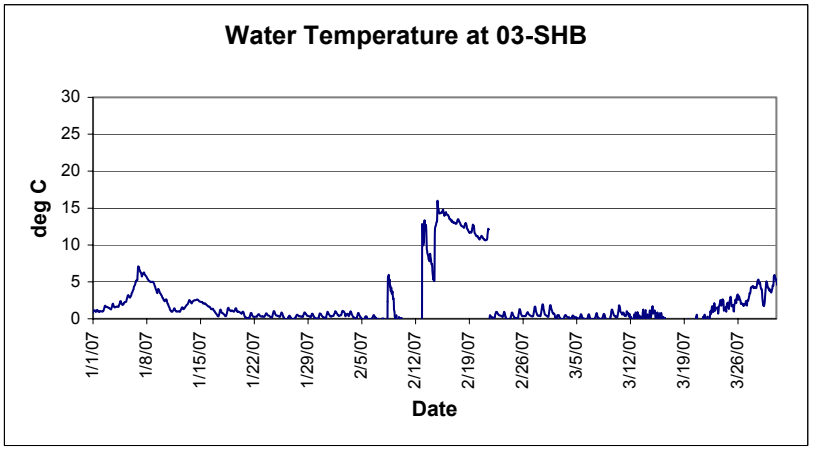

Water Temperature at 10A-BVR
deg C
30
25
20
15
10
5
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

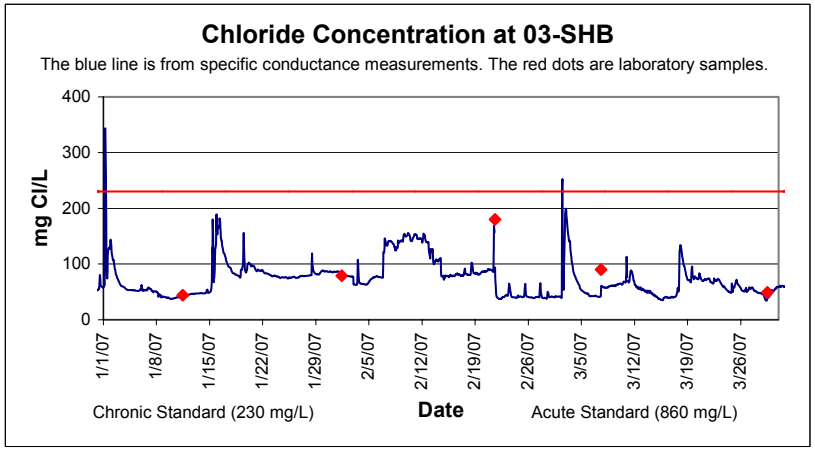

Chloride Concentration at 10A-BVR
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
400
300
200
100
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

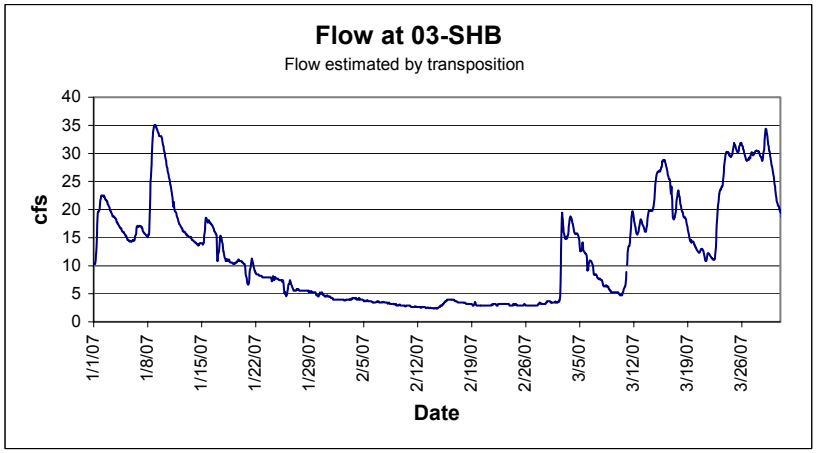

Flow at 10A-BVR
cfs
1200
1000
800
600
400
200
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

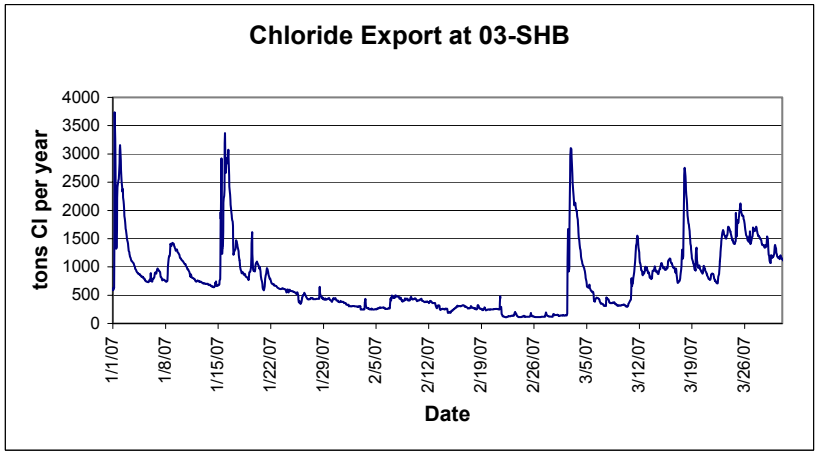

Chloride Export at 10A-BVR
tons Cl per year
24000
20000
16000
12000
8000
4000
0
07/01/06
08/01/06
09/01/06
10/02/06
11/02/06
12/03/06
01/03/07
02/03/07
03/06/07
04/06/07
05/07/07
06/07/07
Date

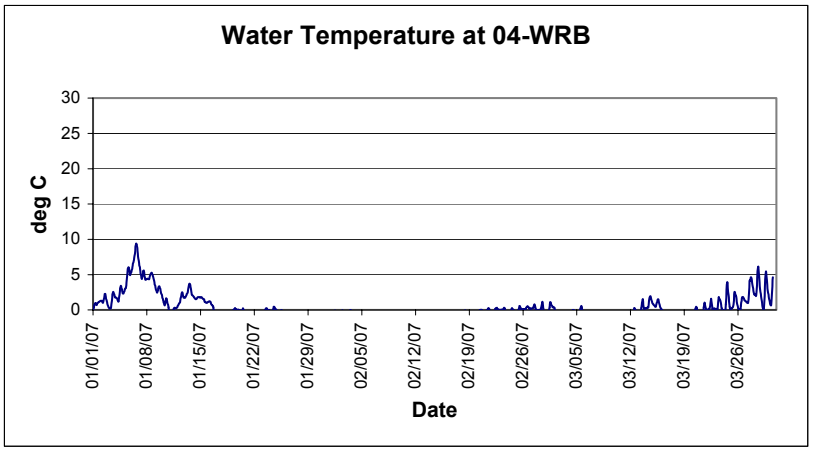
Appendix B: Time Series Graphs of Water Quality Parameters at Activity #2 Stations from 1/1/07 to 3/31/07

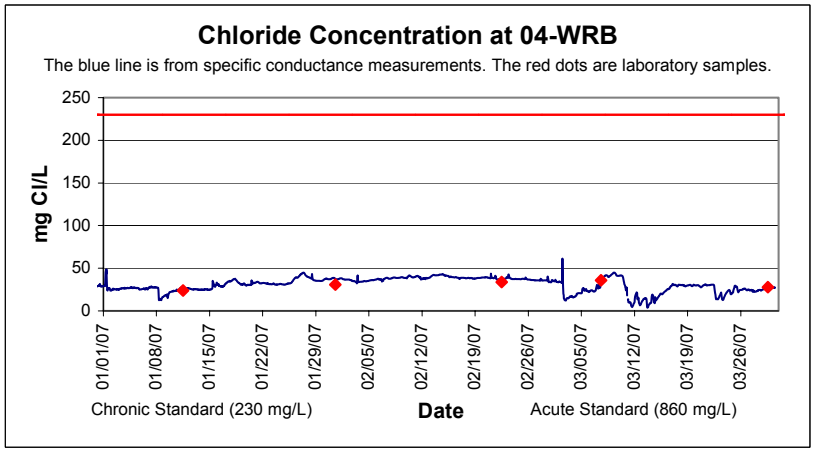


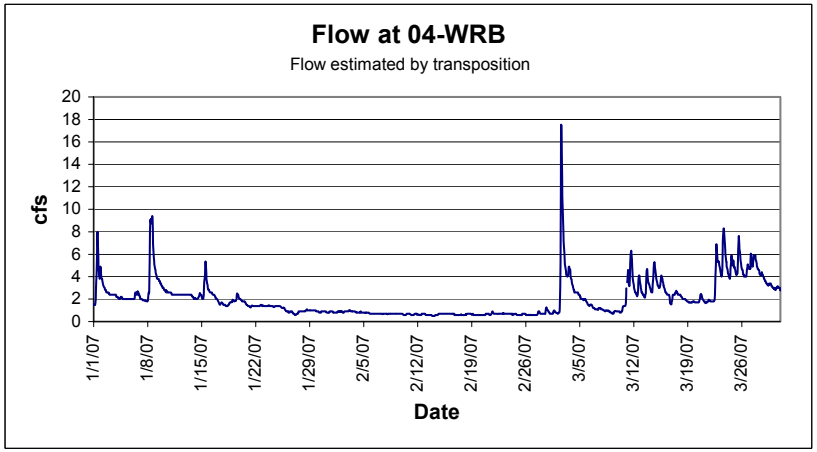


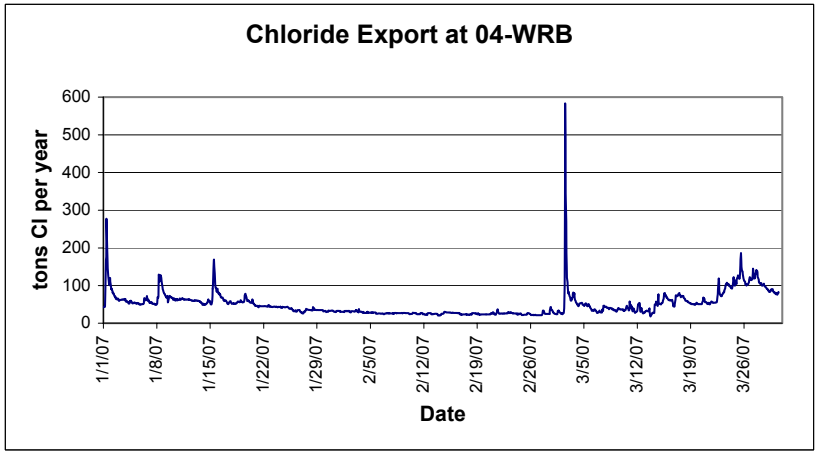


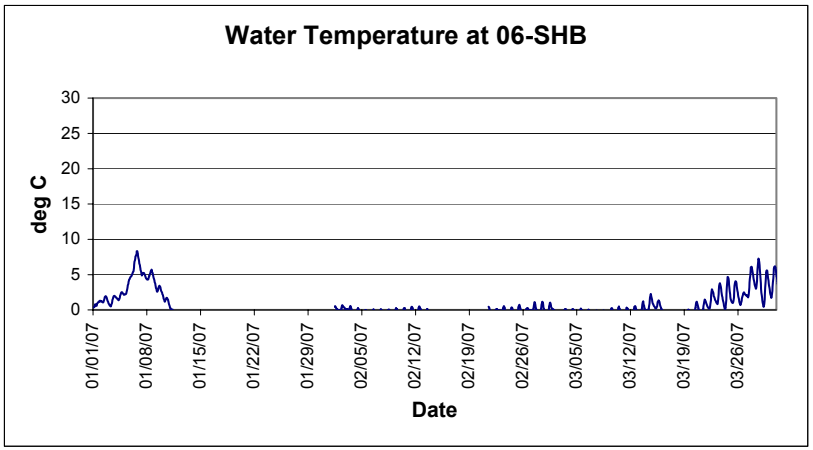


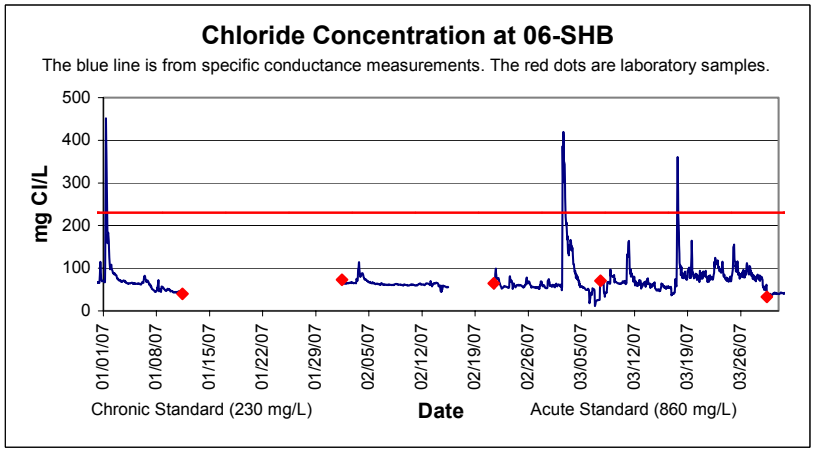

Water Temperature at 04-WRB
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

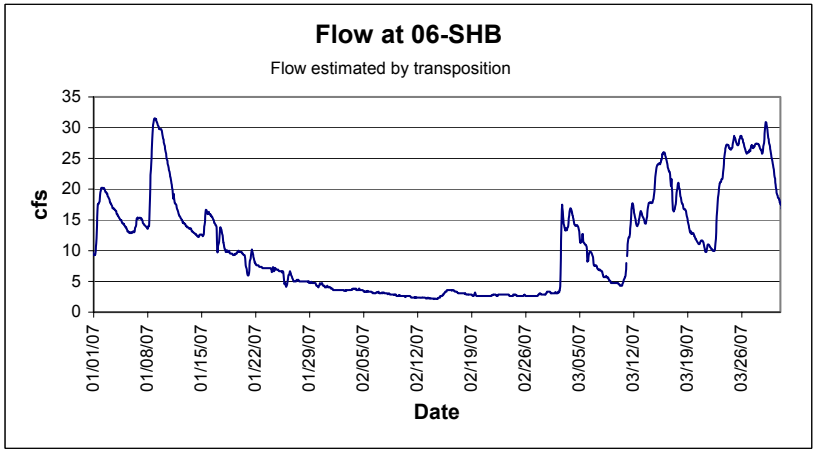

Chloride Concentration at 04-WRB
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
250
200
150
100
50
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

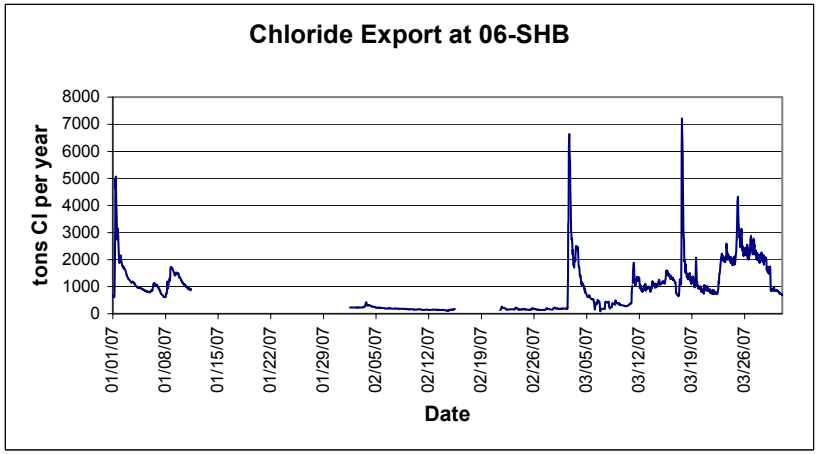

Flow at 04-WRB
Flow estimated by transposition
cfs
20
18
16
14
12
10
8
6
4
2
0
1/1/07
1/8/07
1/15/07
1/22/07
1/29/07
2/5/07
2/12/07
2/19/07
2/26/07
3/5/07
3/12/07
3/19/07
3/26/07
Date

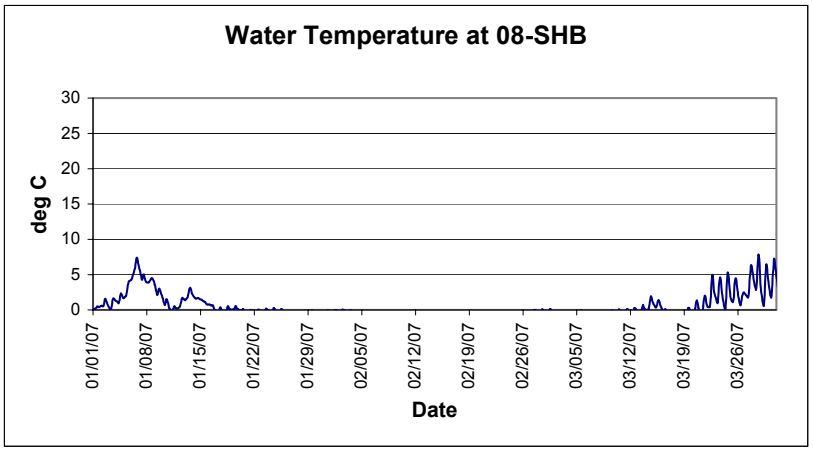

Chloride Export at 04-WRB
tons Cl per year
600
500
400
300
200
100
0
1/1/07
1/8/07
1/15/07
1/22/07
1/29/07
2/5/07
2/12/07
2/19/07
2/26/07
3/5/07
3/12/07
3/19/07
3/26/07
Date

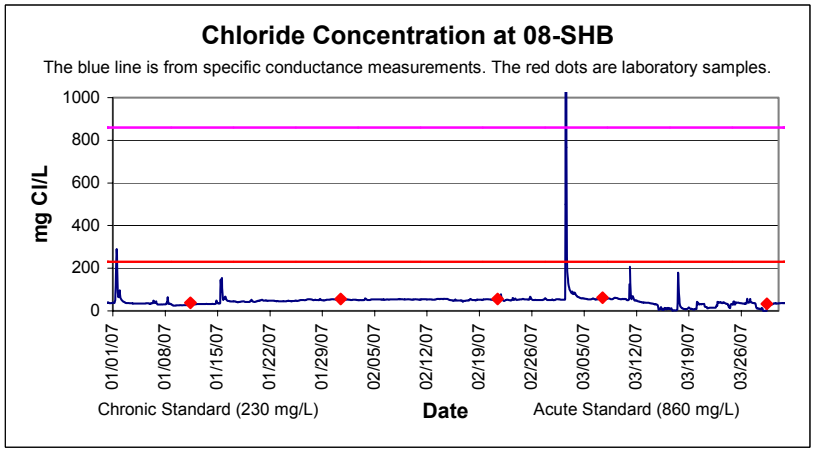

Water Temperature at 06-SHB
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

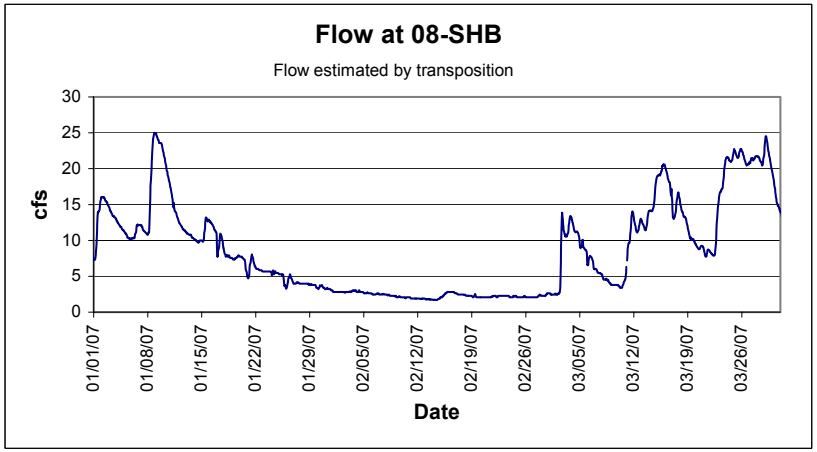

Chloride Concentration at 06-SHB
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
500
400
300
200
100
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

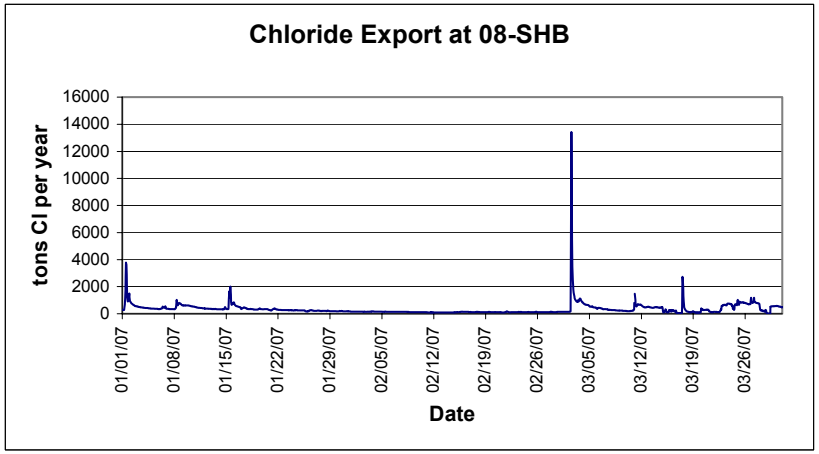

Flow at 06-SHB
Flow estimated by transposition
cfs
35
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

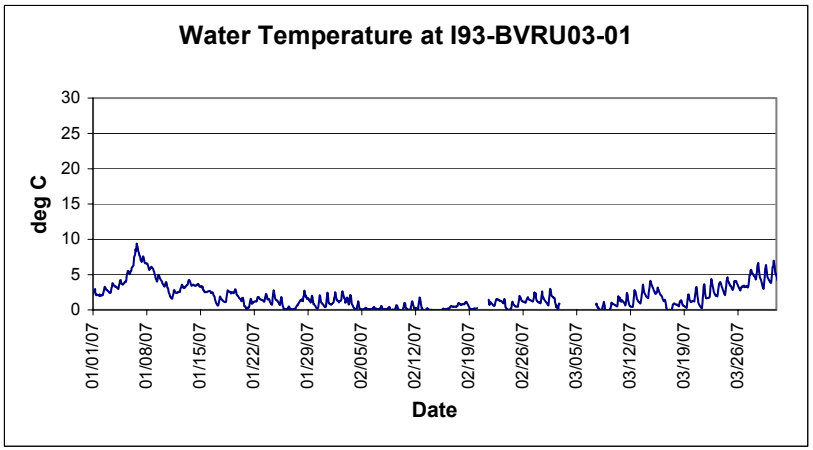

Chloride Export at 06-SHB
tons Cl per year
8000
7000
6000
5000
4000
3000
2000
1000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

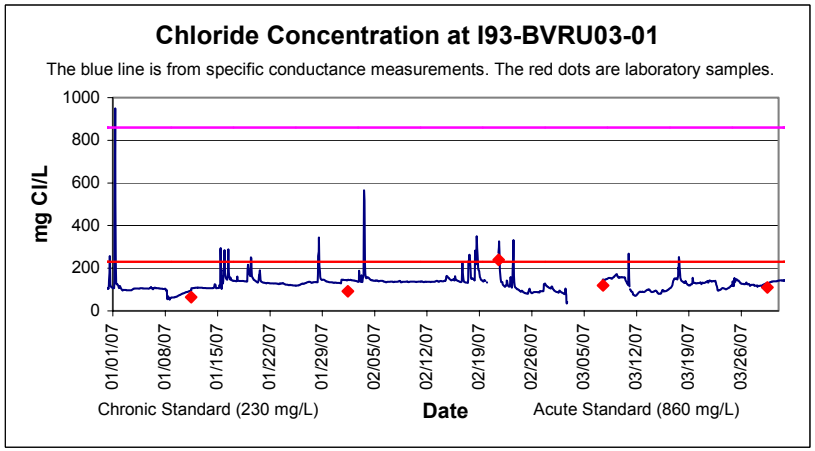

Water Temperature at 08-SHB
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

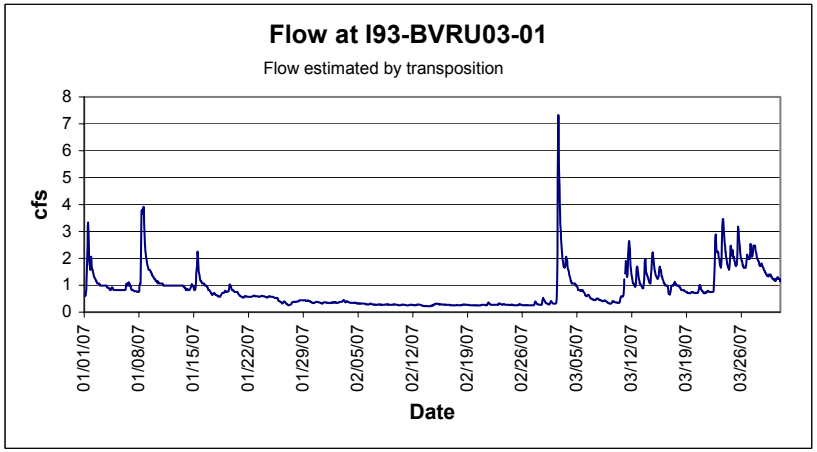

Chloride Concentration at 08-SHB
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

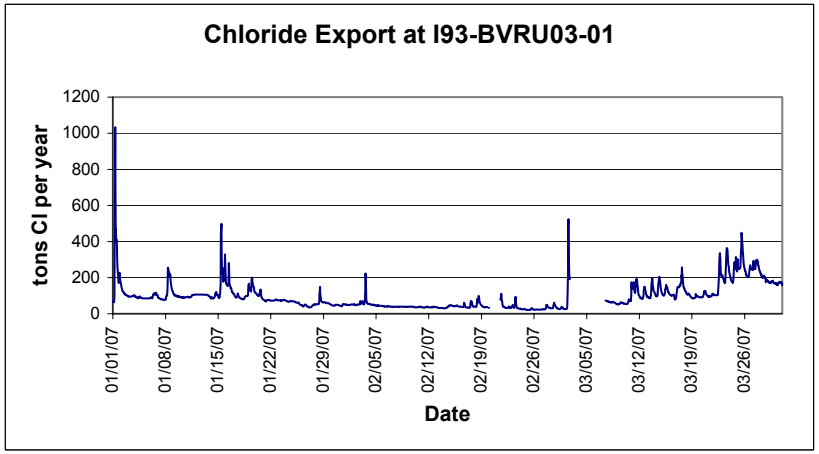

Flow at 08-SHB
Flow estimated by transposition
cfs
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

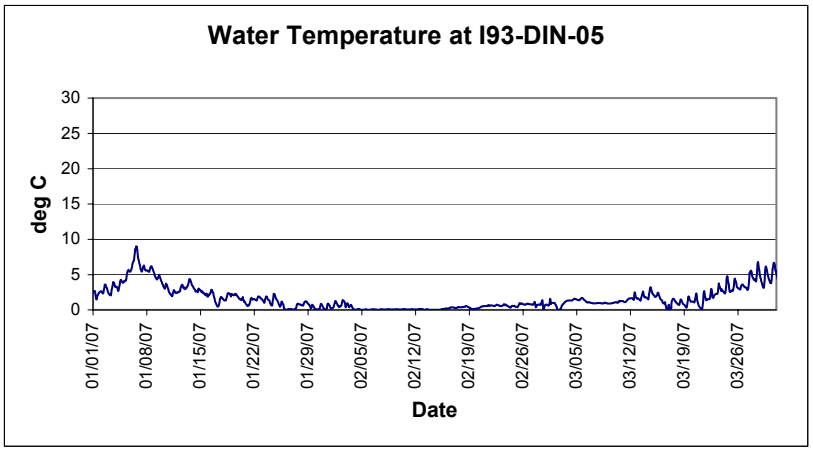

Chloride Export at 08-SHB
tons Cl per year
16000
14000
12000
10000
8000
6000
4000
2000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

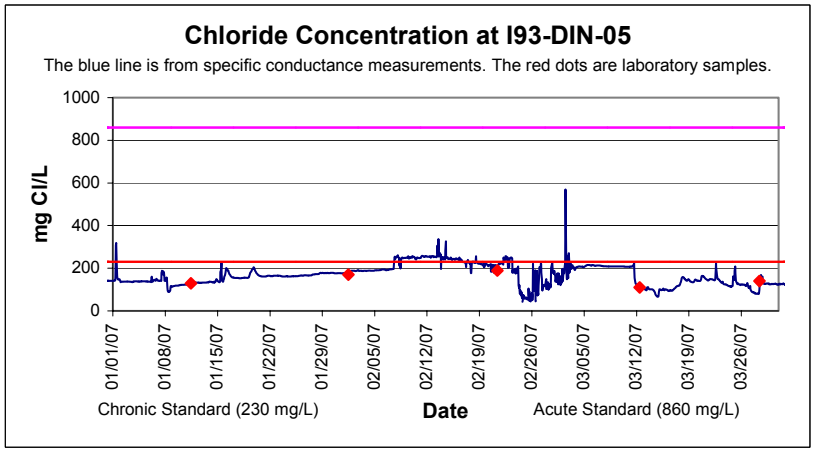

Water Temperature at I93-BVRU03-01
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

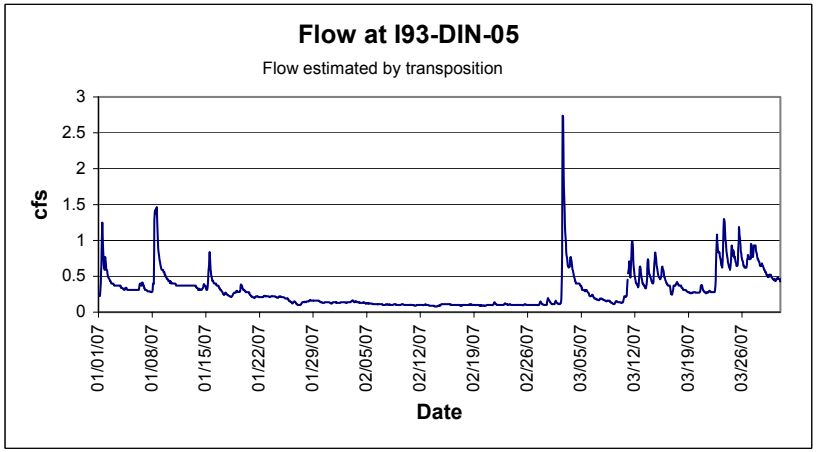

Chloride Concentration at I93-BVRU03-01
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

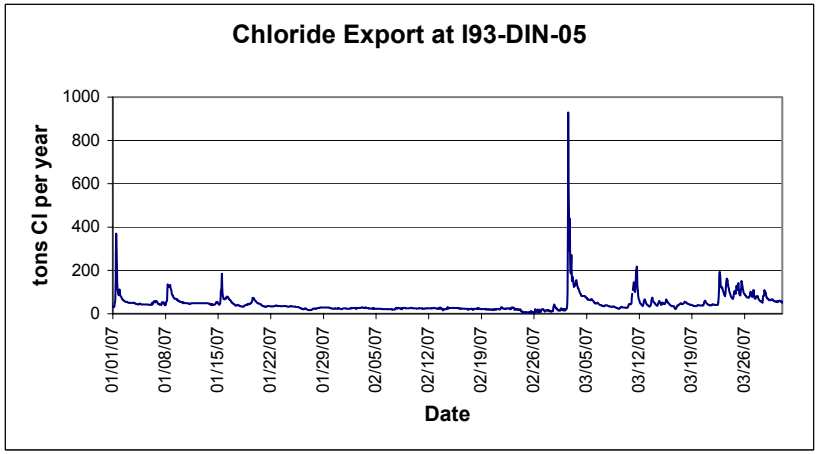

Flow at I93-BVRU03-01
Flow estimated by transposition
cfs
8
7
6
5
4
3
2
1
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

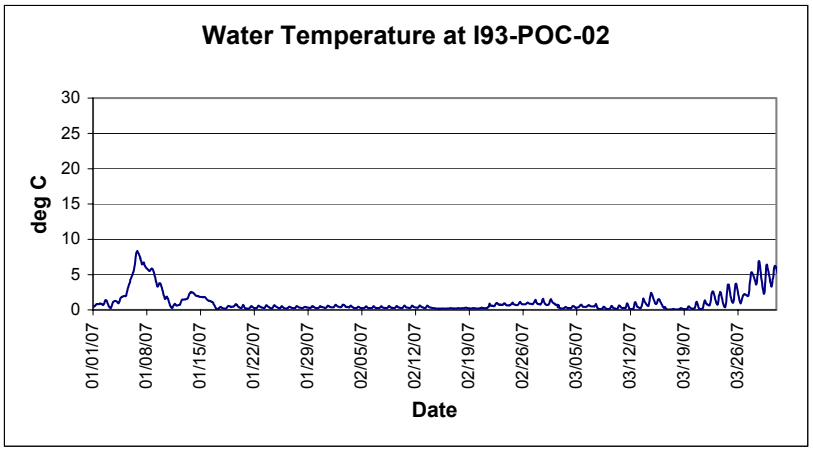

Chloride Export at I93-BVRU03-01
tons Cl per year
1200
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

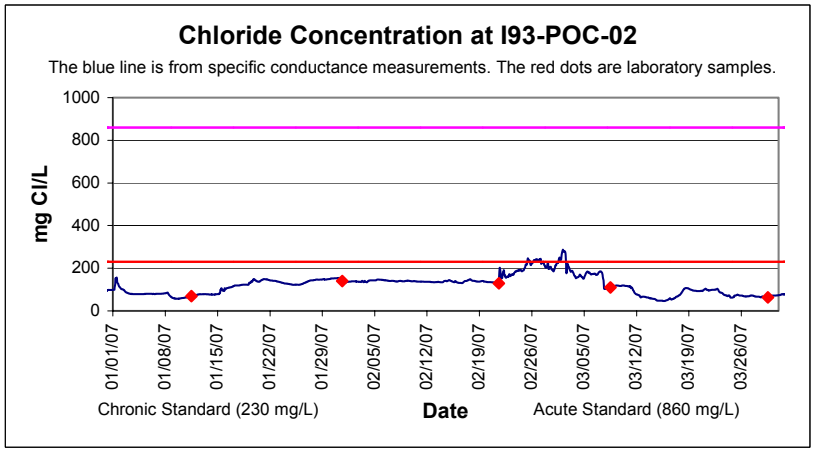

Water Temperature at I93-DIN-05
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

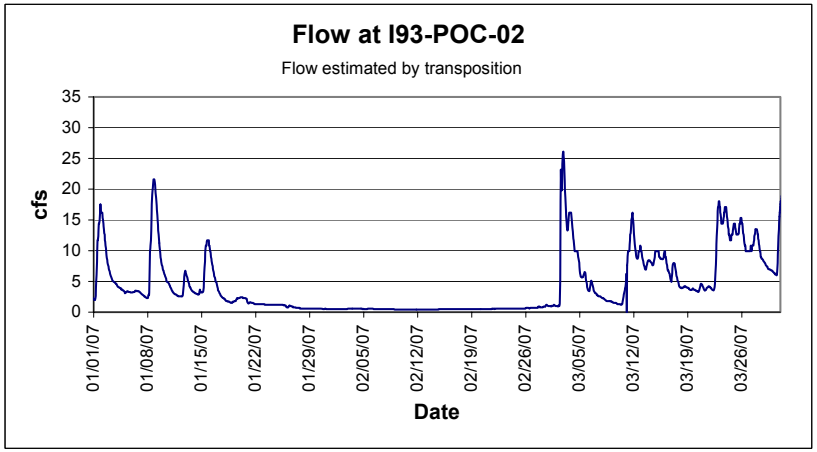

Chloride Concentration at I93-DIN-05
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

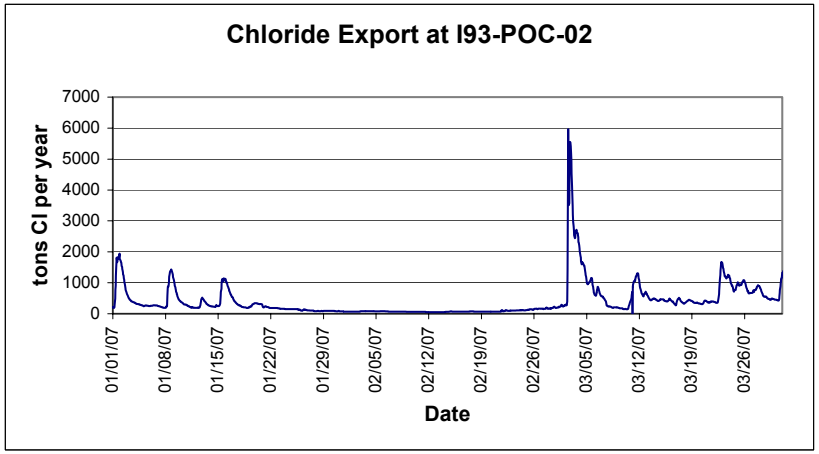

Flow at I93-DIN-05
Flow estimated by transposition
cfs
3
2.5
2
1.5
1
0.5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

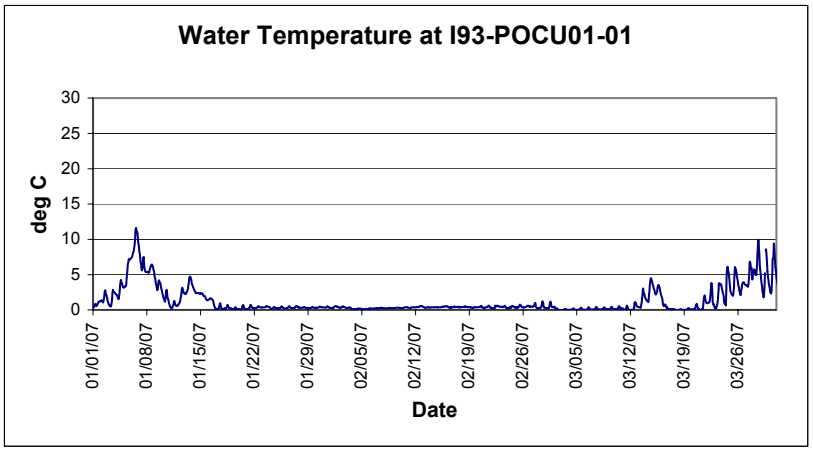

Chloride Export at I93-DIN-05
tons Cl per year
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

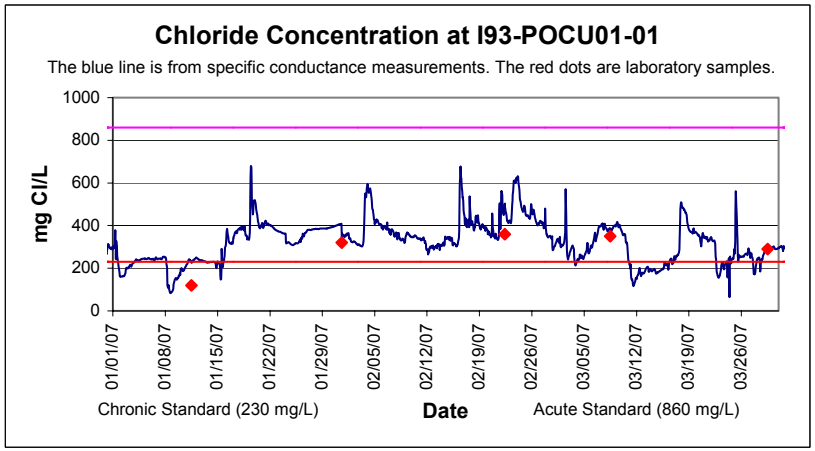

Water Temperature at I93-POC-02
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

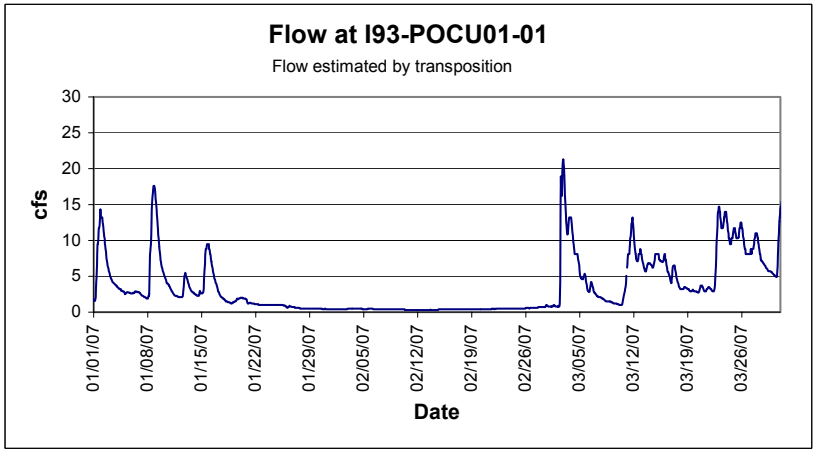

Chloride Concentration at I93-POC-02
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

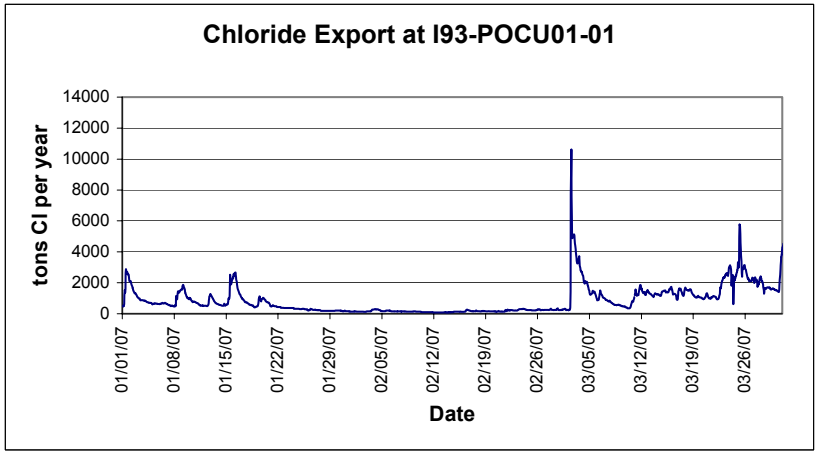

Flow at I93-POC-02
Flow estimated by transposition
cfs
35
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

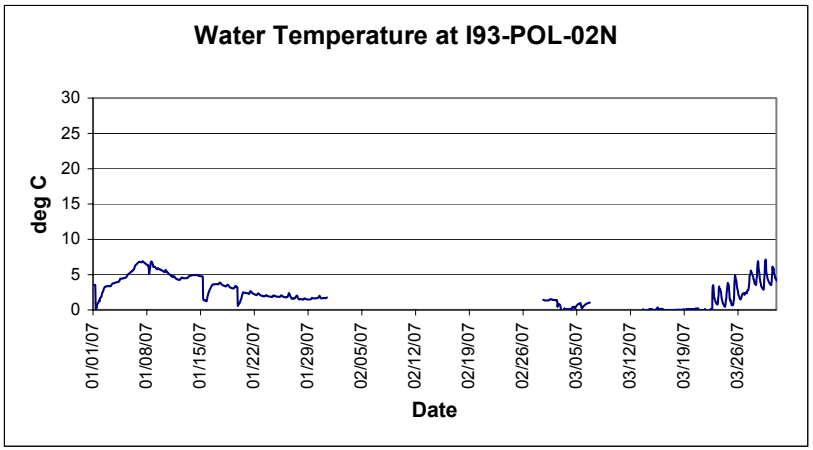

Chloride Export at I93-POC-02
tons Cl per year
7000
6000
5000
4000
3000
2000
1000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

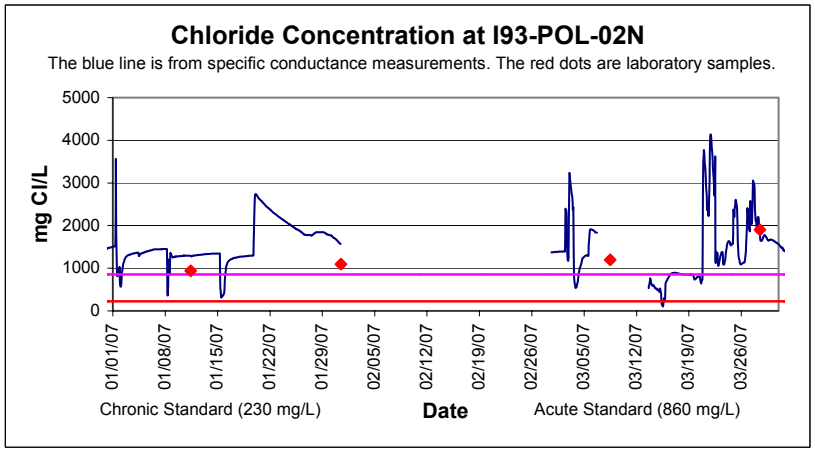

Water Temperature at I93-POCU01-01
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

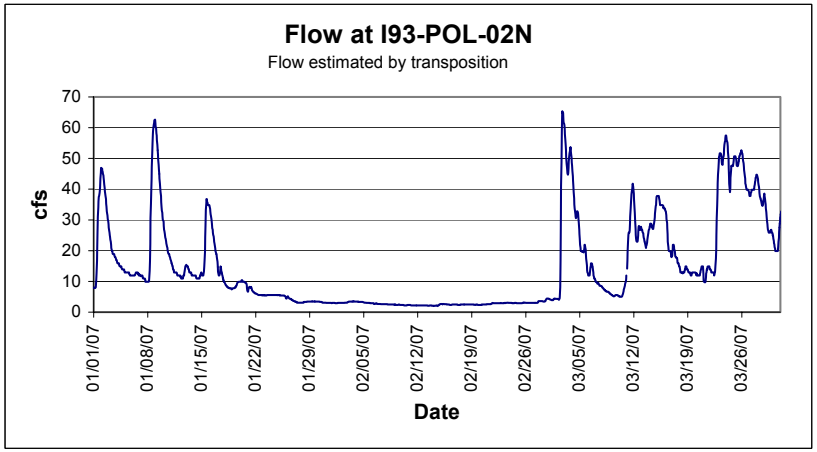

Chloride Concentration at I93-POCU01-01
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

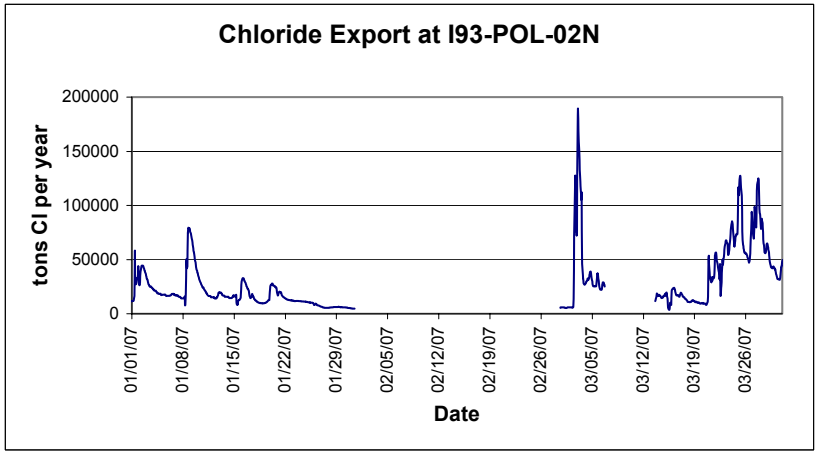

Flow at I93-POCU01-01
Flow estimated by transposition
cfs
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

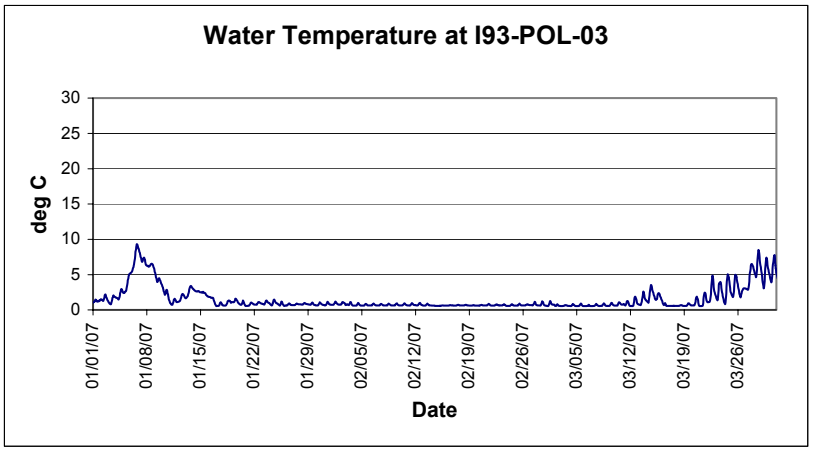

Chloride Export at I93-POCU01-01
tons Cl per year
14000
12000
10000
8000
6000
4000
2000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

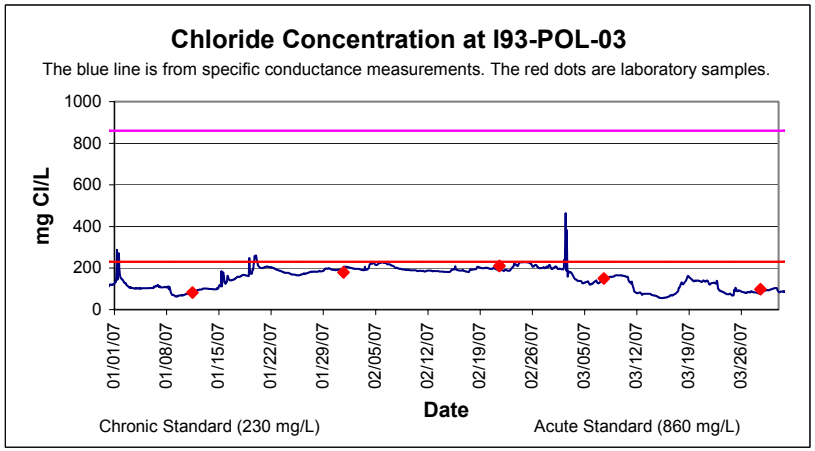

Water Temperature at I93-POL-02N
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

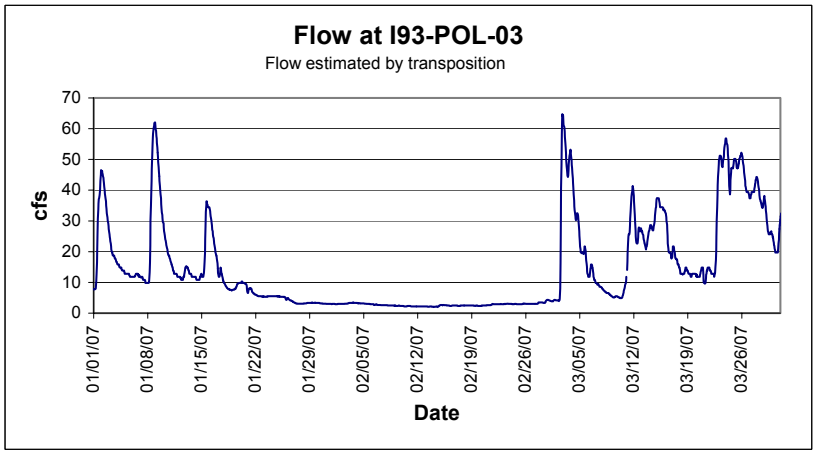

Chloride Concentration at I93-POL-02N
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
5000
4000
3000
2000
1000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

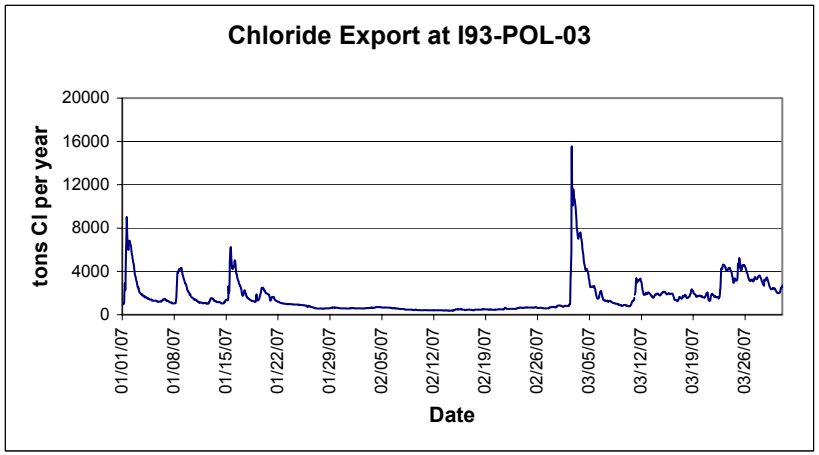

Flow at I93-POL-02N
Flow estimated by transposition
cfs
70
60
50
40
30
20
10
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

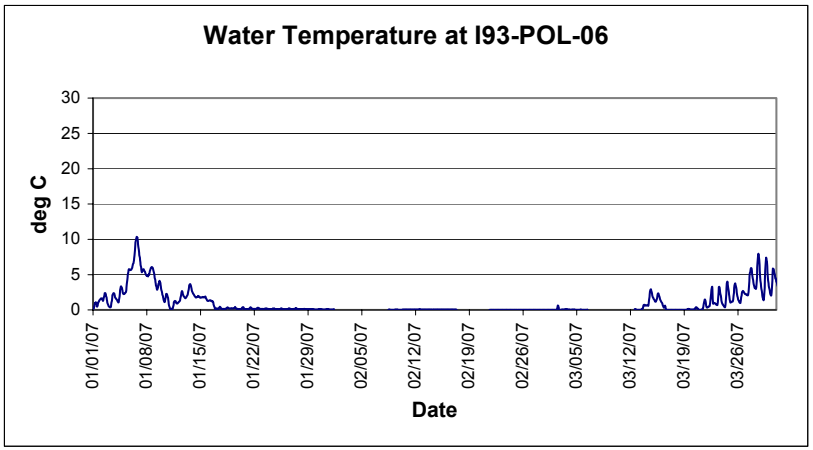

Chloride Export at I93-POL-02N
tons Cl per year
200000
150000
100000
50000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

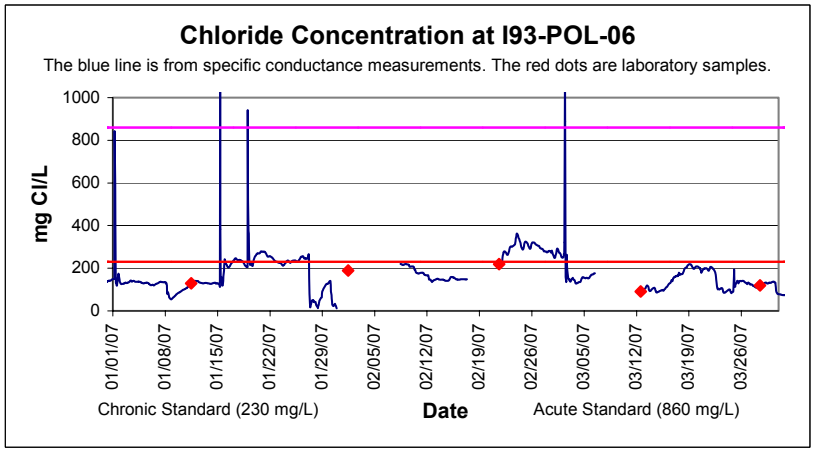

Water Temperature at I93-POL-03
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

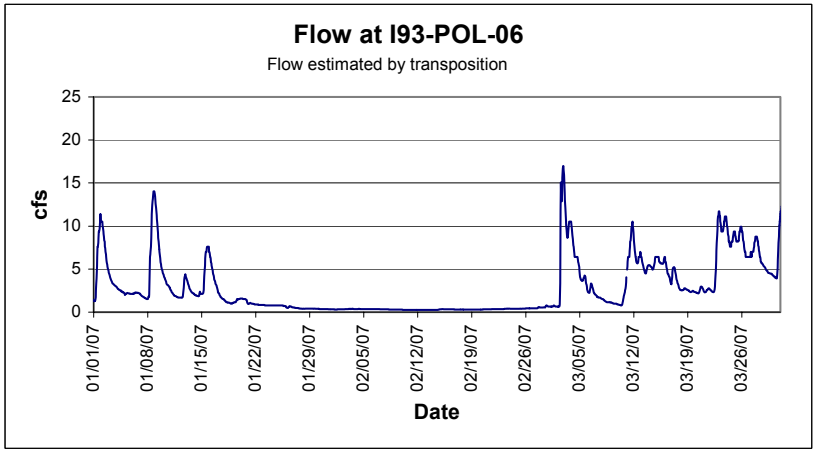

Chloride Concentration at I93-POL-03
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date
Chronic Standard (230 mg/L)
Acute Standard (860 mg/L)

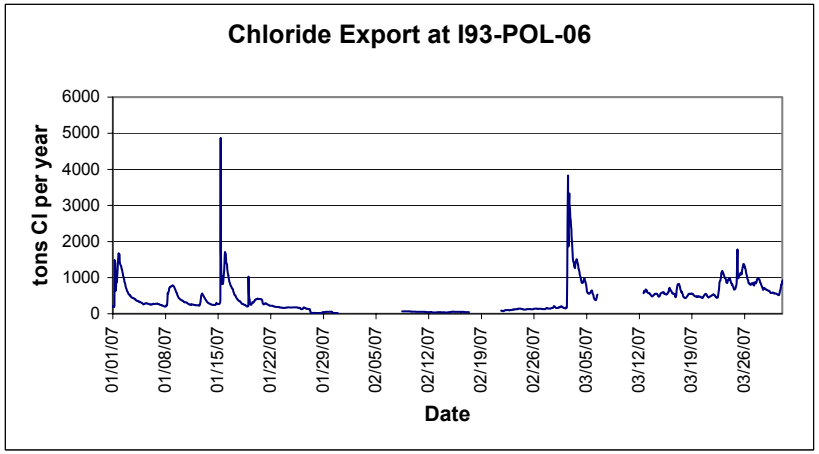

Flow at I93-POL-03
Flow estimated by transposition
cfs
70
60
50
40
30
20
10
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

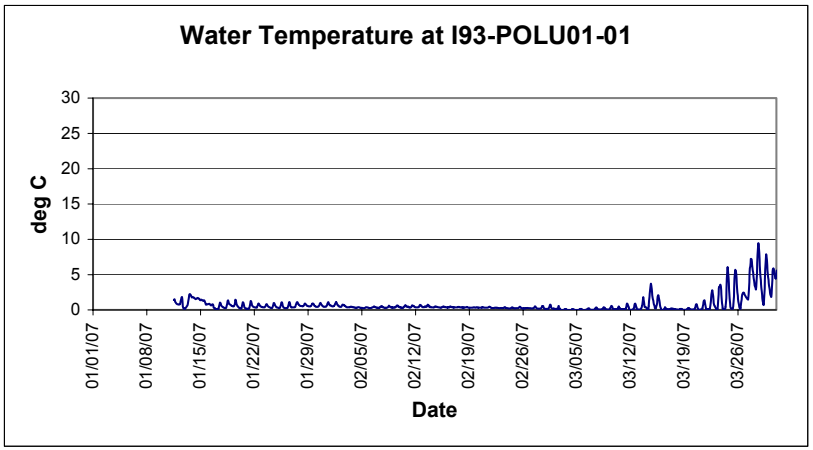

Chloride Export at I93-POL-03
tons Cl per year
20000
16000
12000
8000
4000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

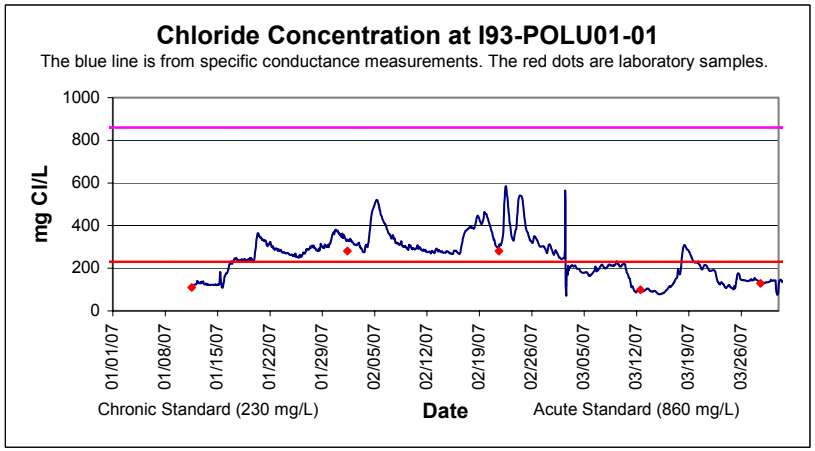

Water Temperature at I93-POL-06
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

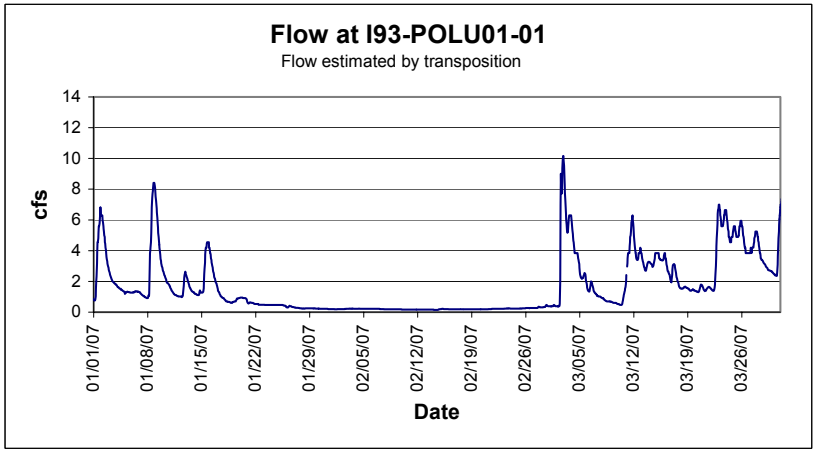

Chloride Concentration at I93-POL-06
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

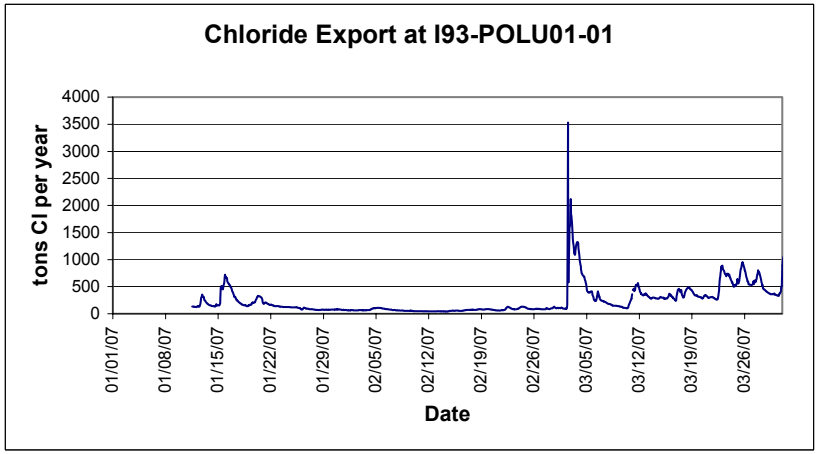

Flow at I93-POL-06
Flow estimated by transposition
cfs
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

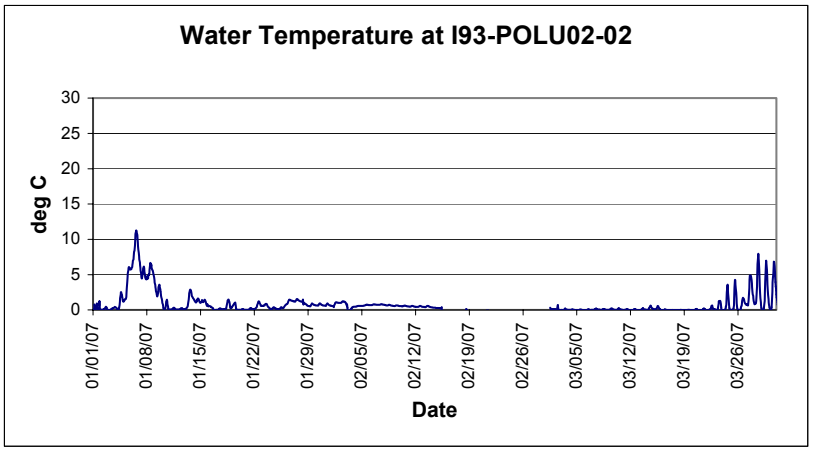

Chloride Export at I93-POL-06
tons Cl per year
6000
5000
4000
3000
2000
1000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

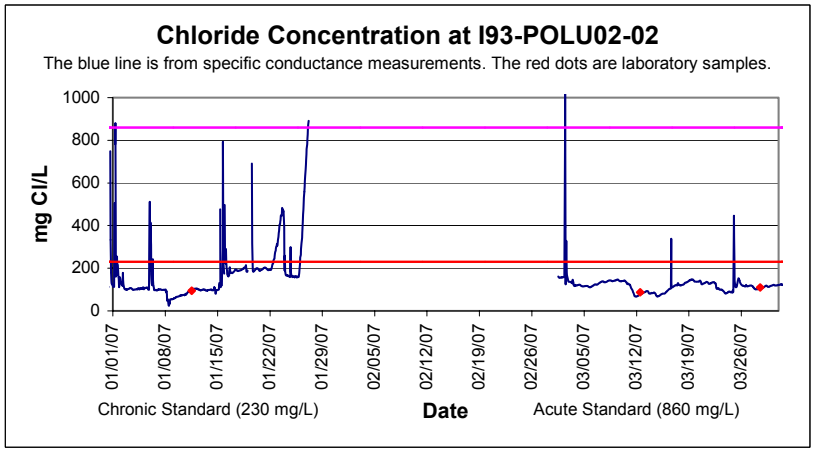

Water Temperature at I93-POLU01-01
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

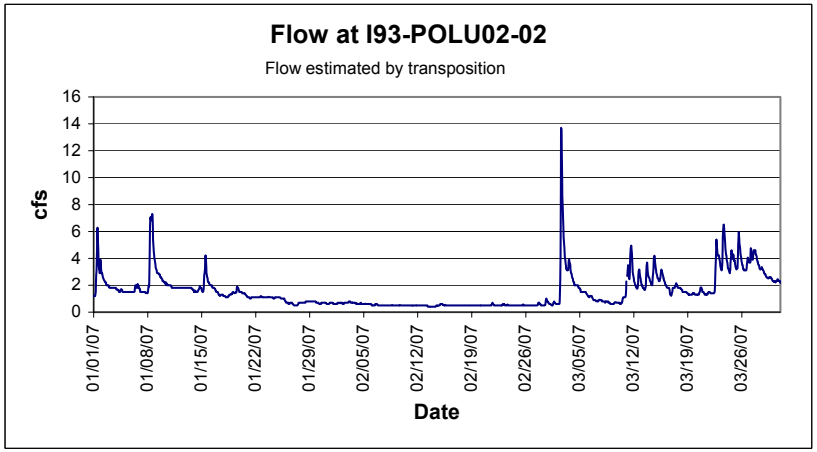

Chloride Concentration at I93-POLU01-01
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

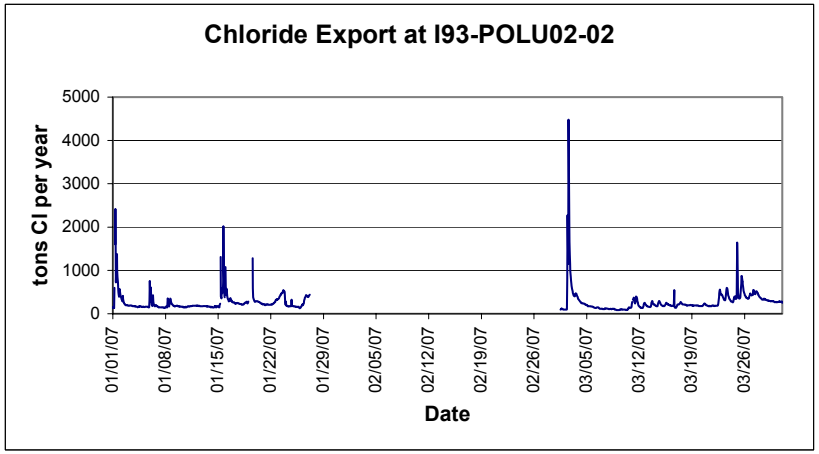

Flow at I93-POLU01-01
Flow estimated by transposition
cfs
14
12
10
8
6
4
2
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

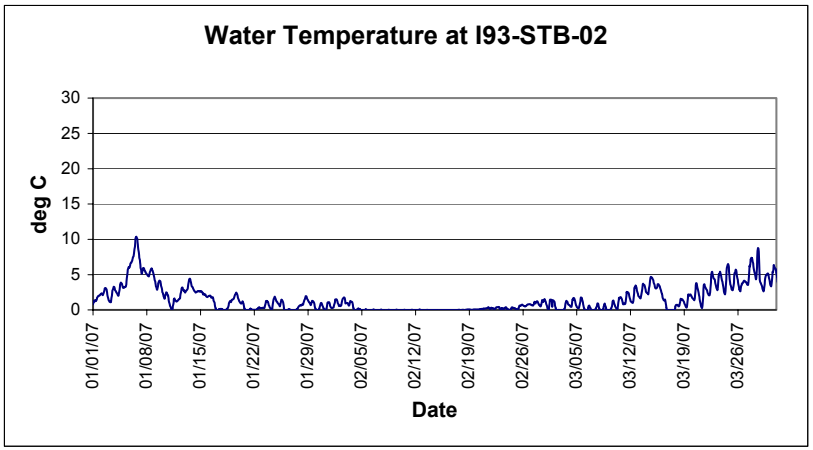

Chloride Export at I93-POLU01-01
tons Cl per year
4000
3500
3000
2500
2000
1500
1000
500
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

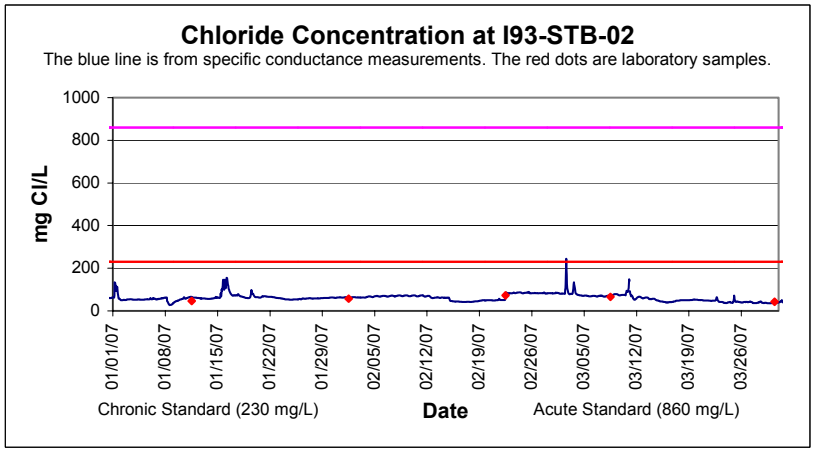

Water Temperature at I93-POLU02-02
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

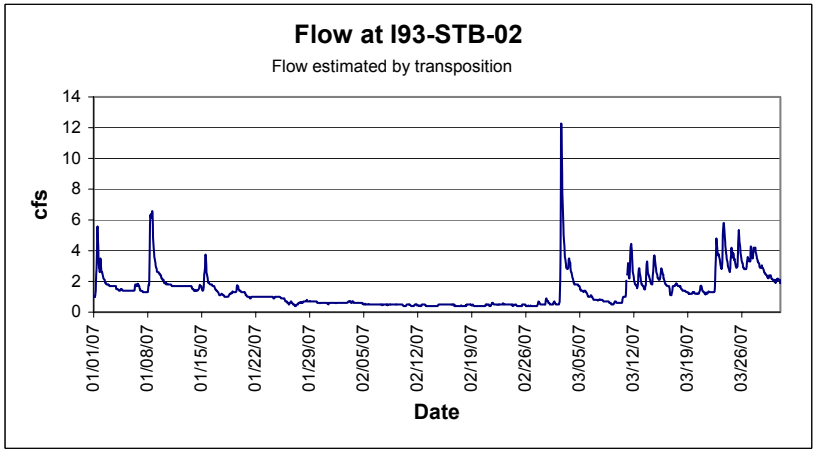

Chloride Concentration at I93-POLU02-02
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

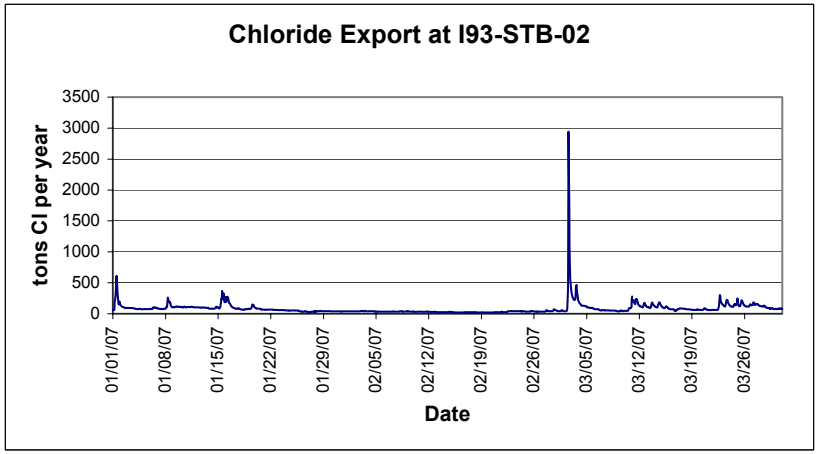

Flow at I93-POLU02-02
Flow estimated by transposition
cfs
16
14
12
10
8
6
4
2
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

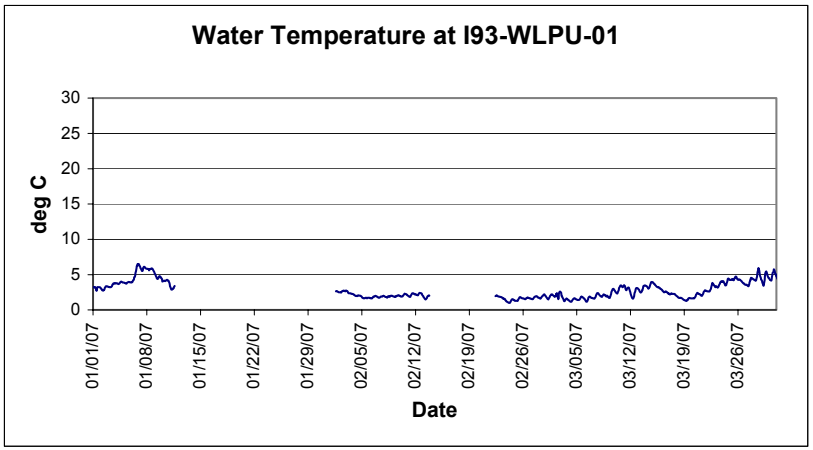

Chloride Export at I93-POLU02-02
tons Cl per year
5000
4000
3000
2000
1000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

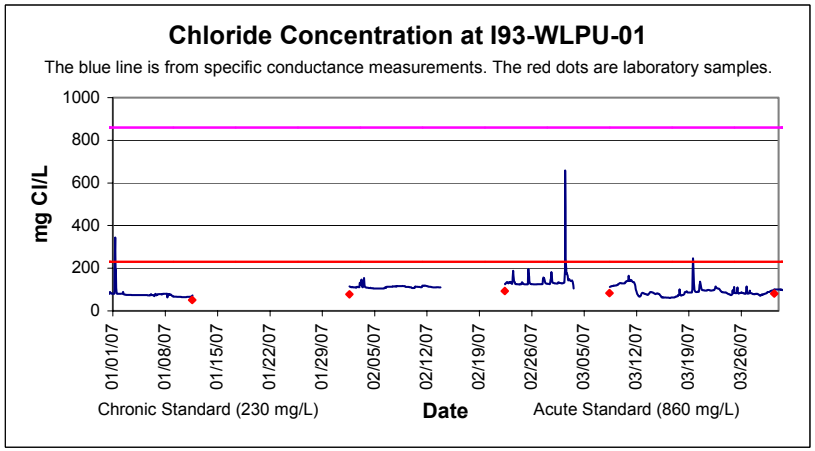

Water Temperature at I93-STB-02
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

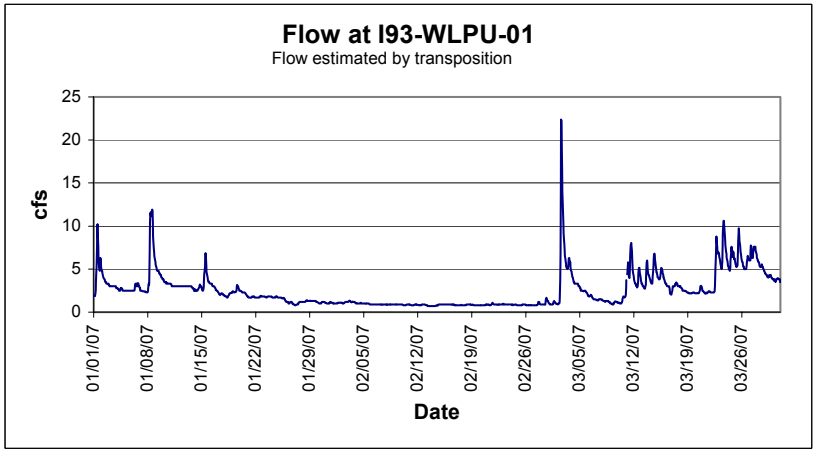

Chloride Concentration at I93-STB-02
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

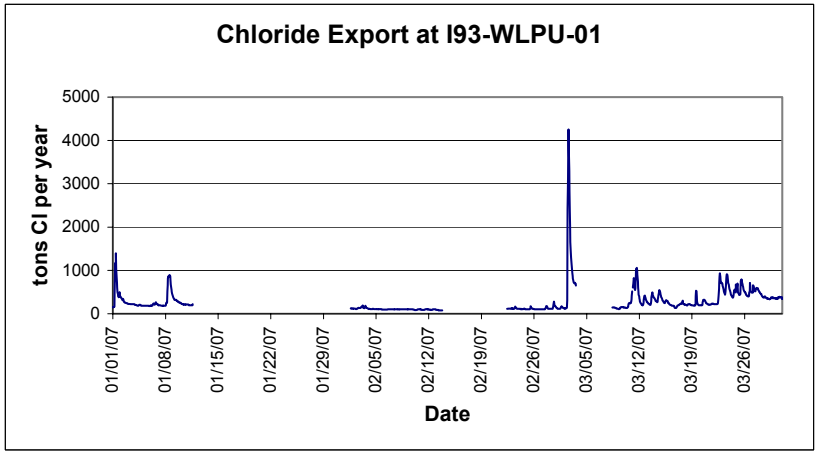

Flow at I93-STB-02
Flow estimated by transposition
cfs
14
12
10
8
6
4
2
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date


Chloride Export at I93-STB-02
tons Cl per year
3500
3000
2500
2000
1500
1000
500
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date


Water Temperature at I93-WLPU-01
deg C
30
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

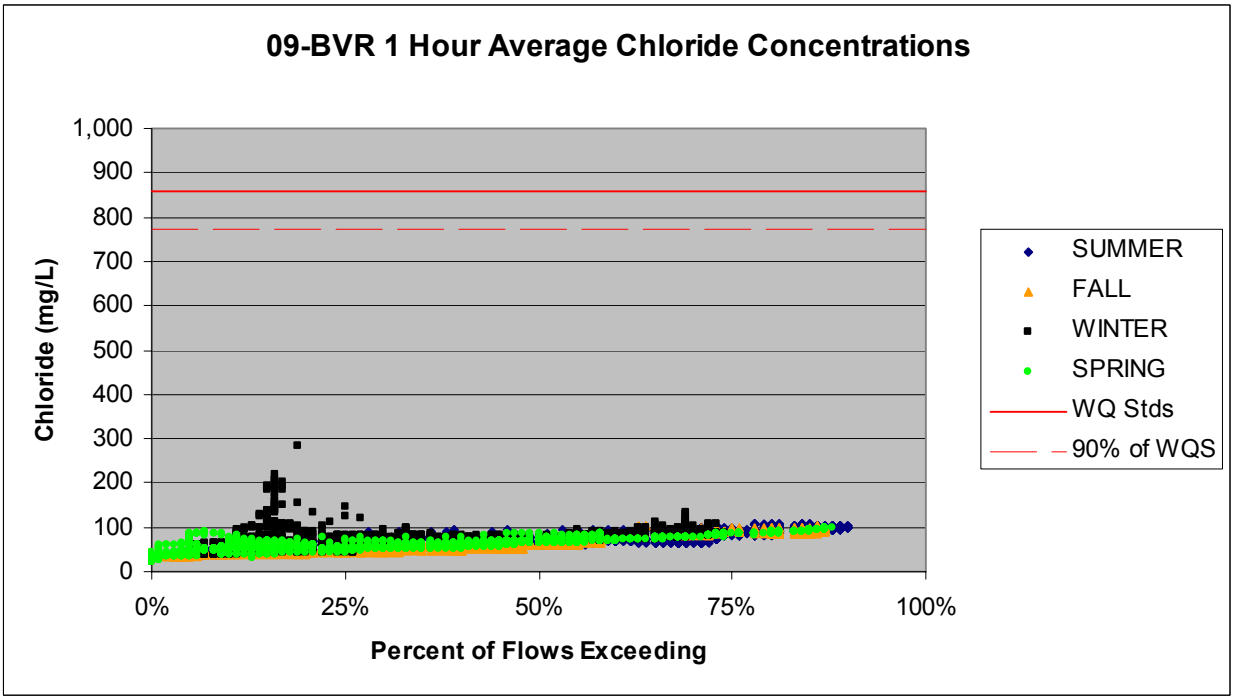

Chloride Concentration at I93-WLPU-01
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)

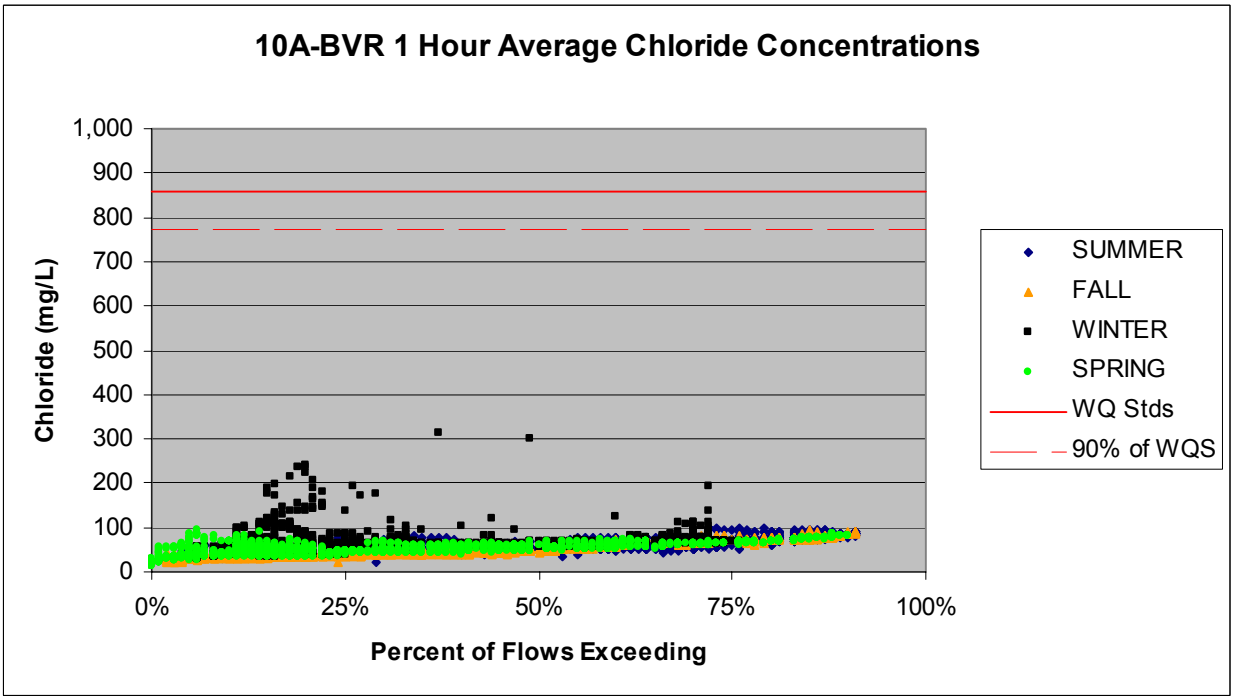

Flow at I93-WLPU-01
Flow estimated by transposition
cfs
25
20
15
10
5
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

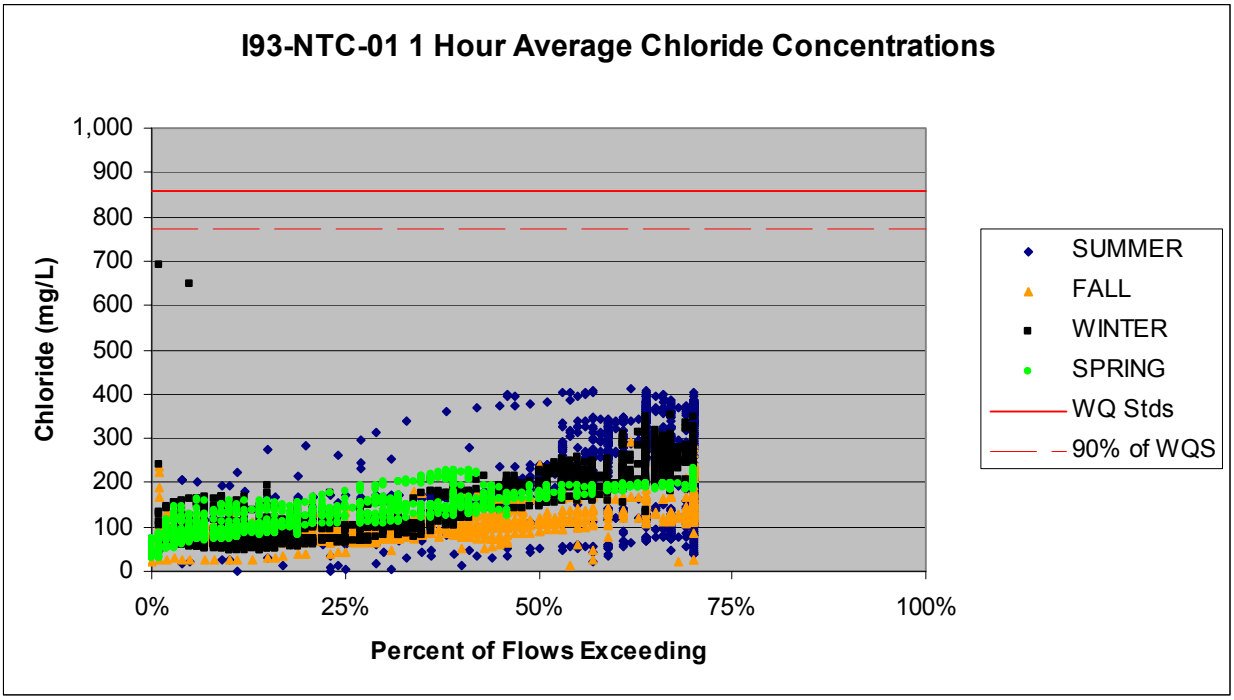

Chloride Export at I93-WLPU-01
tons Cl per year
5000
4000
3000
2000
1000
0
01/01/07
01/08/07
01/15/07
01/22/07
01/29/07
02/05/07
02/12/07
02/19/07
02/26/07
03/05/07
03/12/07
03/19/07
03/26/07
Date

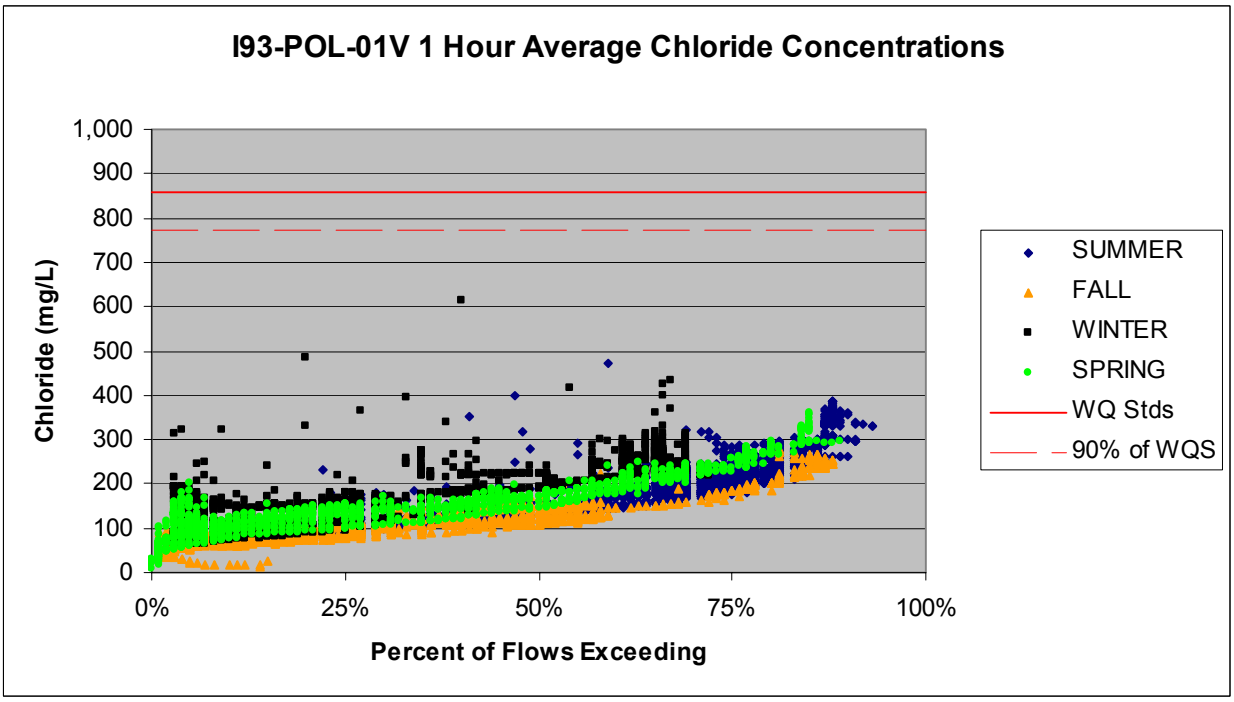
Appendix C: Chloride Concentration vs. Flow Duration Plots

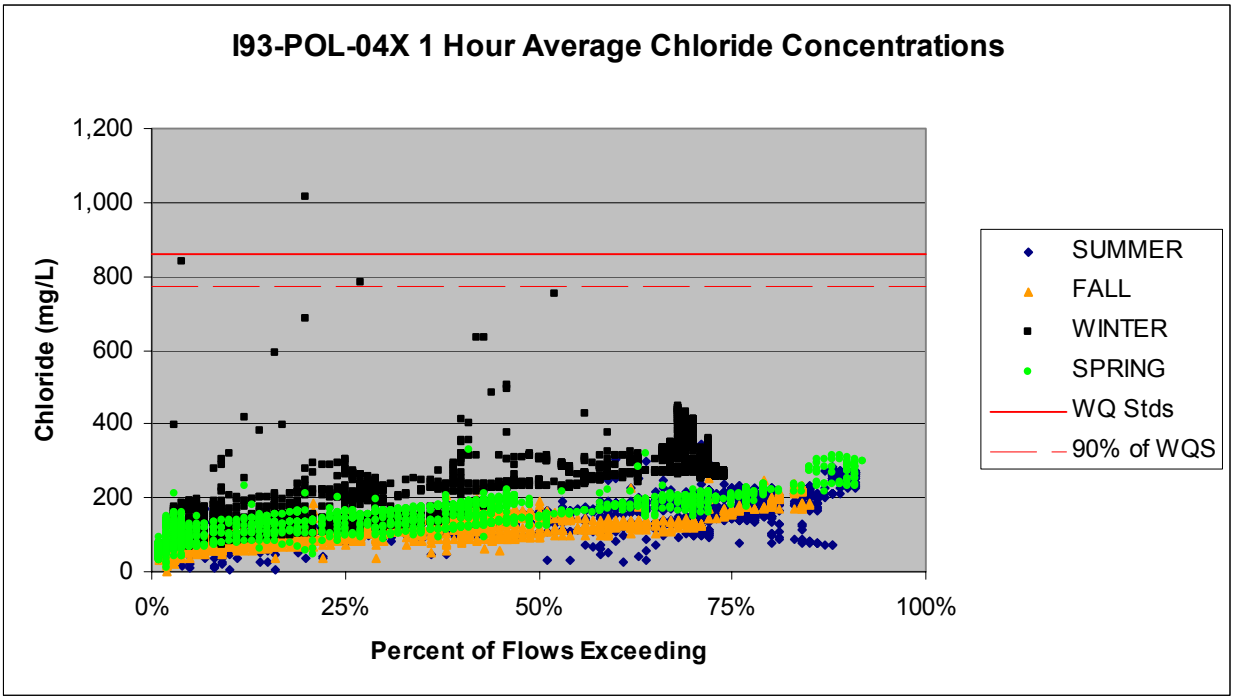
(a) One Hour Average Concentrations



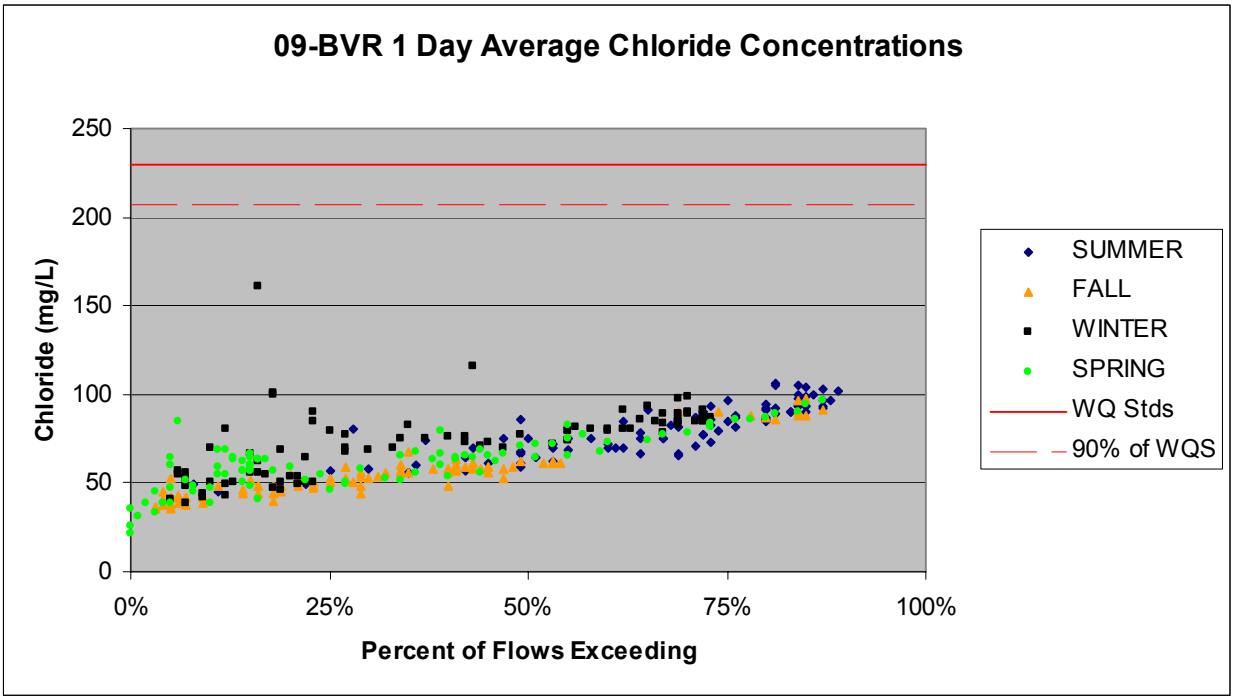


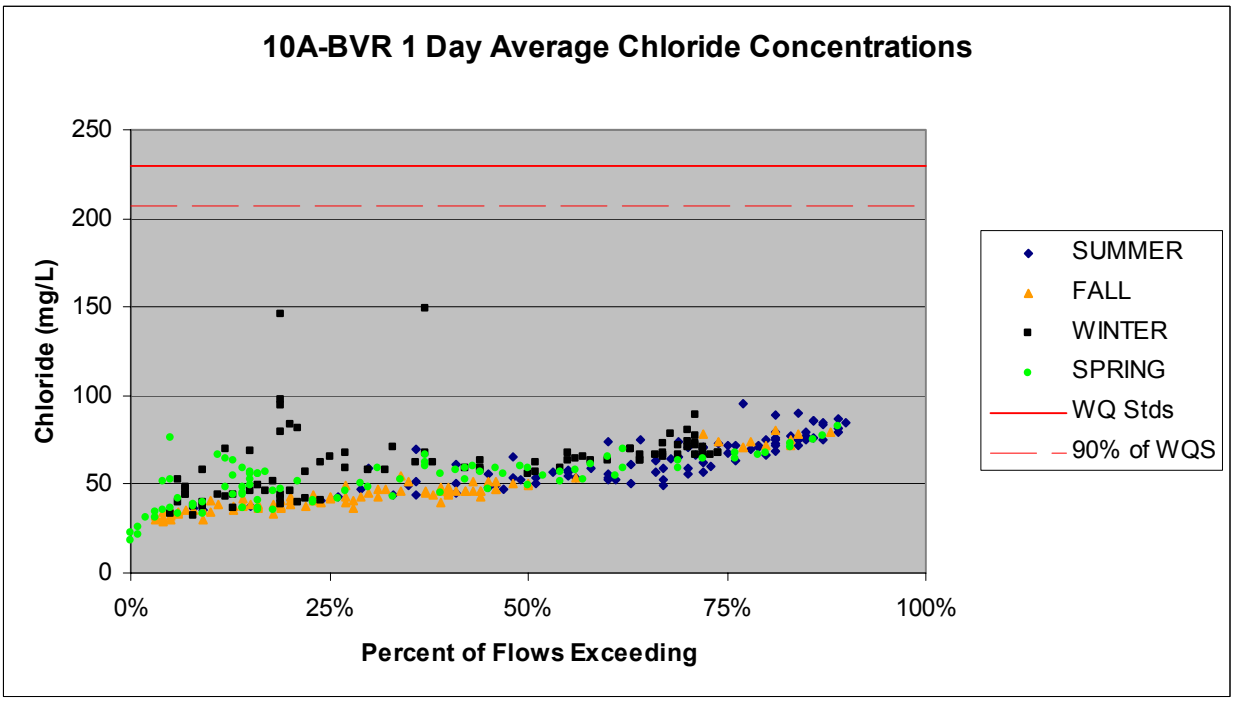

I93-NTC-01 1 Hour Average Chloride Concentrations
Chloride (mg/L)
1,000
900
800
700
600
500
400
300
200
100
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS

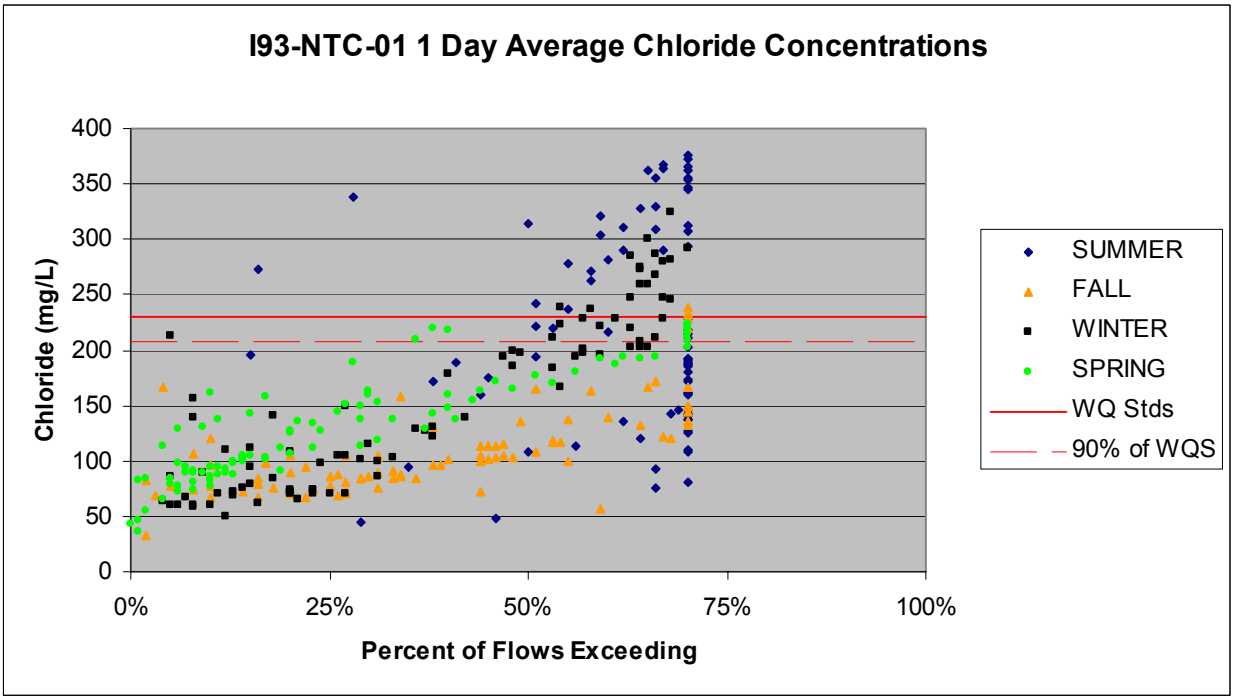

I93-POL-01V 1 Hour Average Chloride Concentrations
Chloride (mg/L)
1,000
900
800
700
600
500
400
300
200
100
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS

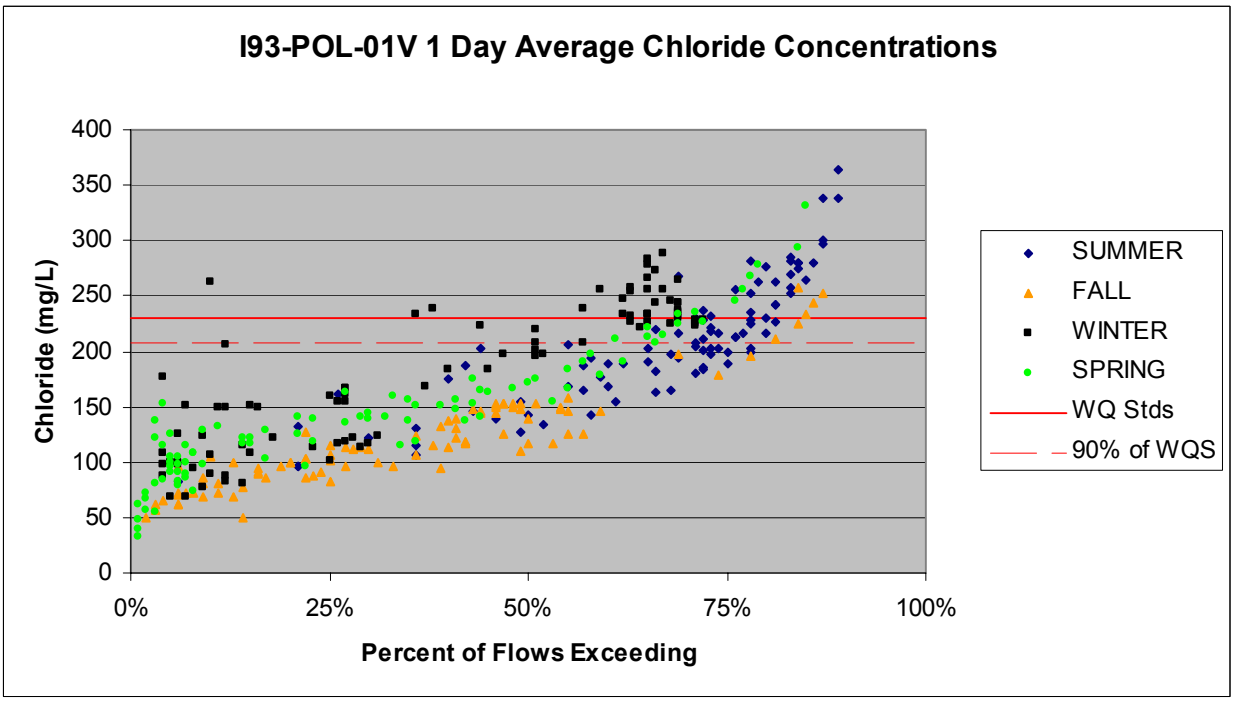

I93-POL-04X 1 Hour Average Chloride Concentrations
Chloride (mg/L)
1,200
1,000
800
600
400
200
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS

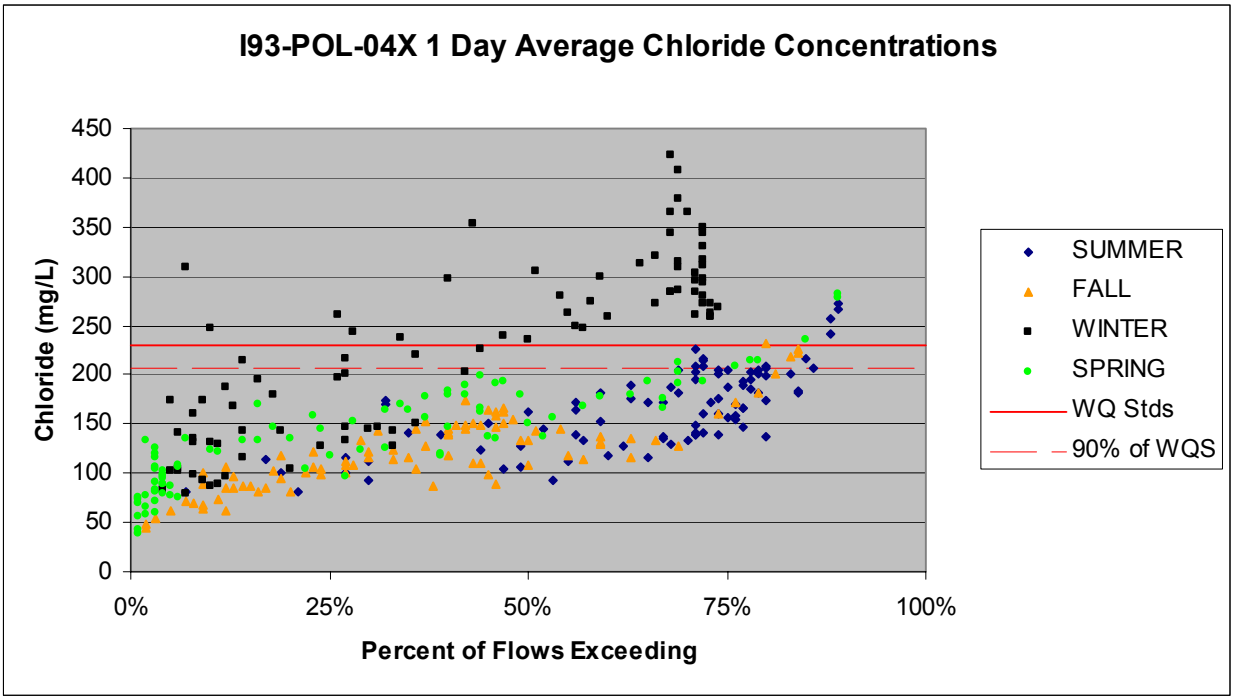
(b) One Day Average Concentrations



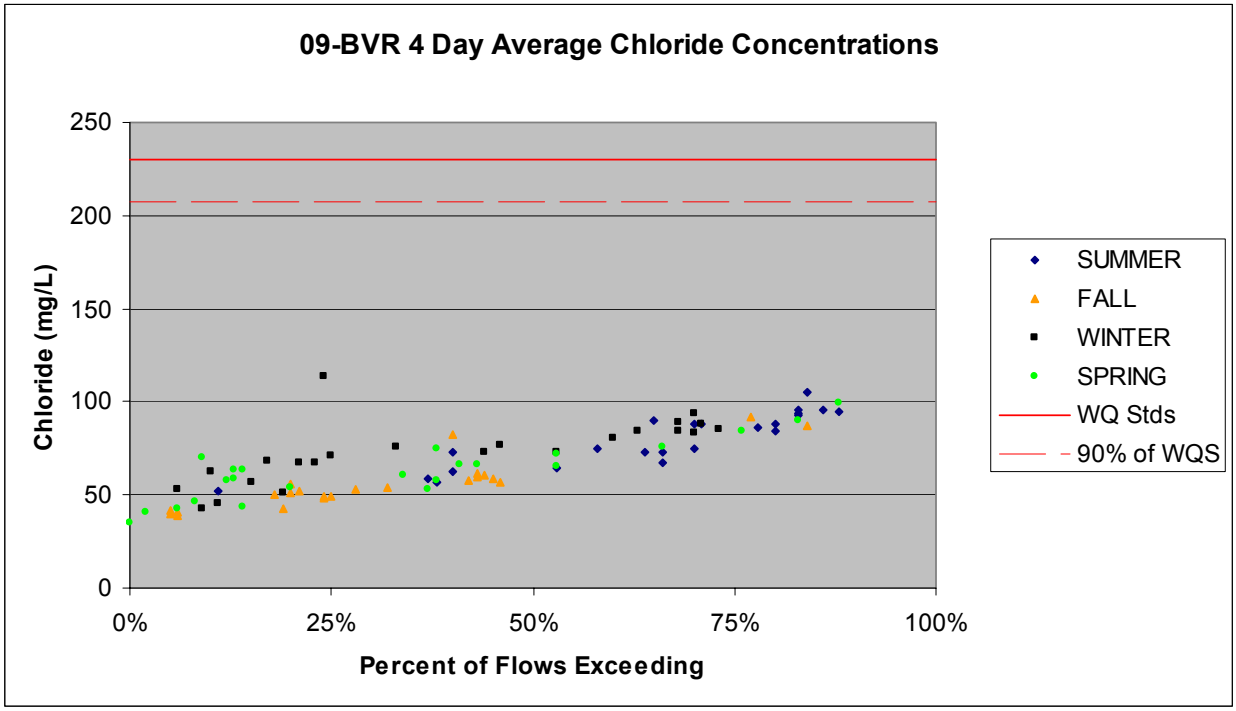


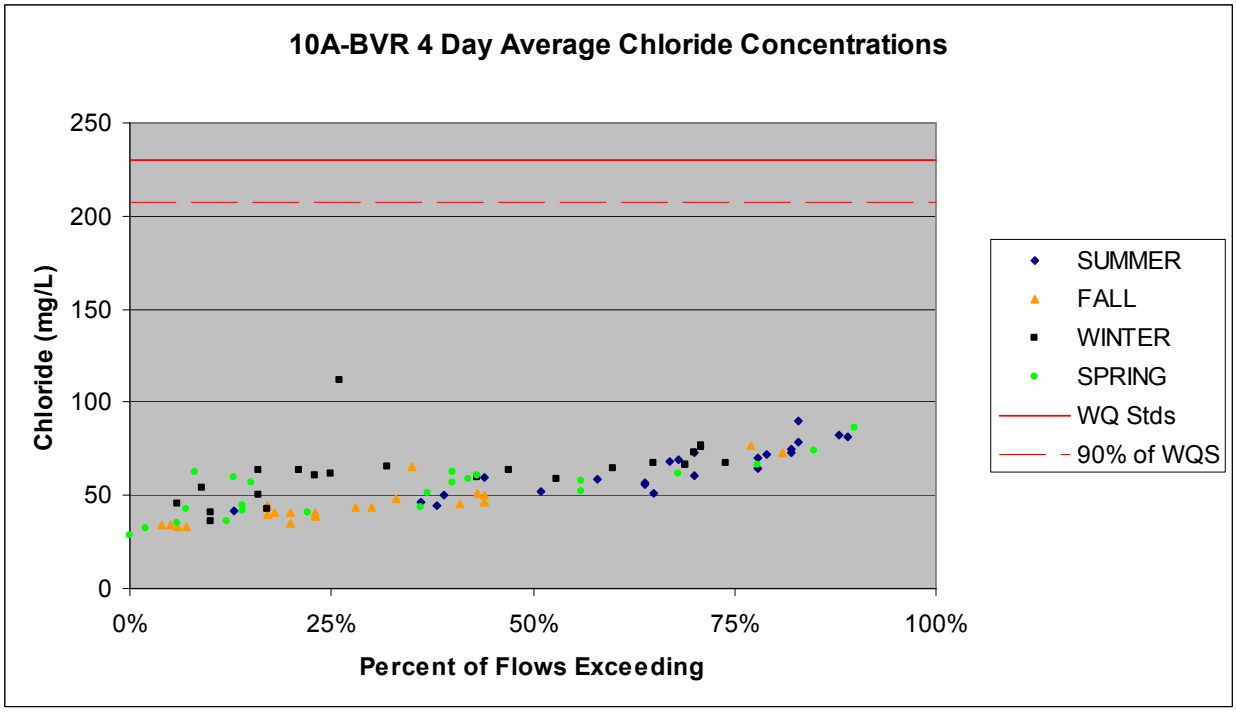

I93-NTC-01 1 Day Average Chloride Concentrations
Chloride (mg/L)
400
350
300
250
200
150
100
50
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS

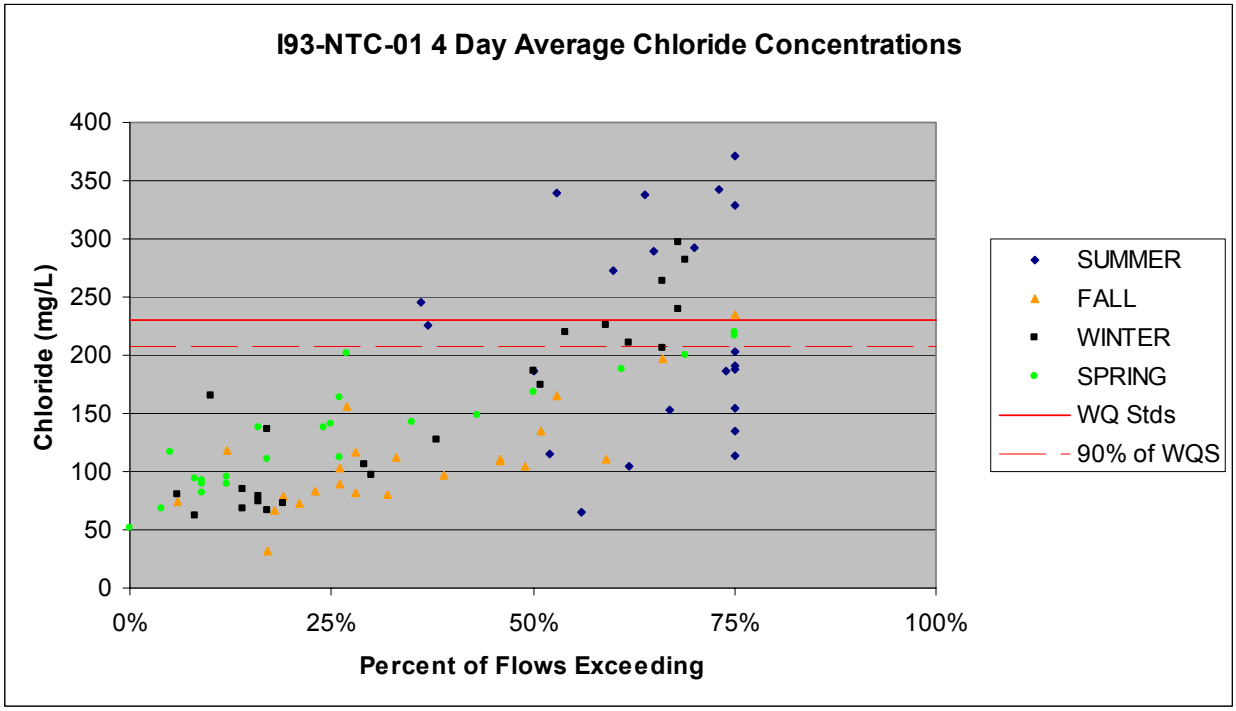

I93-POL-01V 1 Day Average Chloride Concentrations
Chloride (mg/L)
400
350
300
250
200
150
100
50
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS

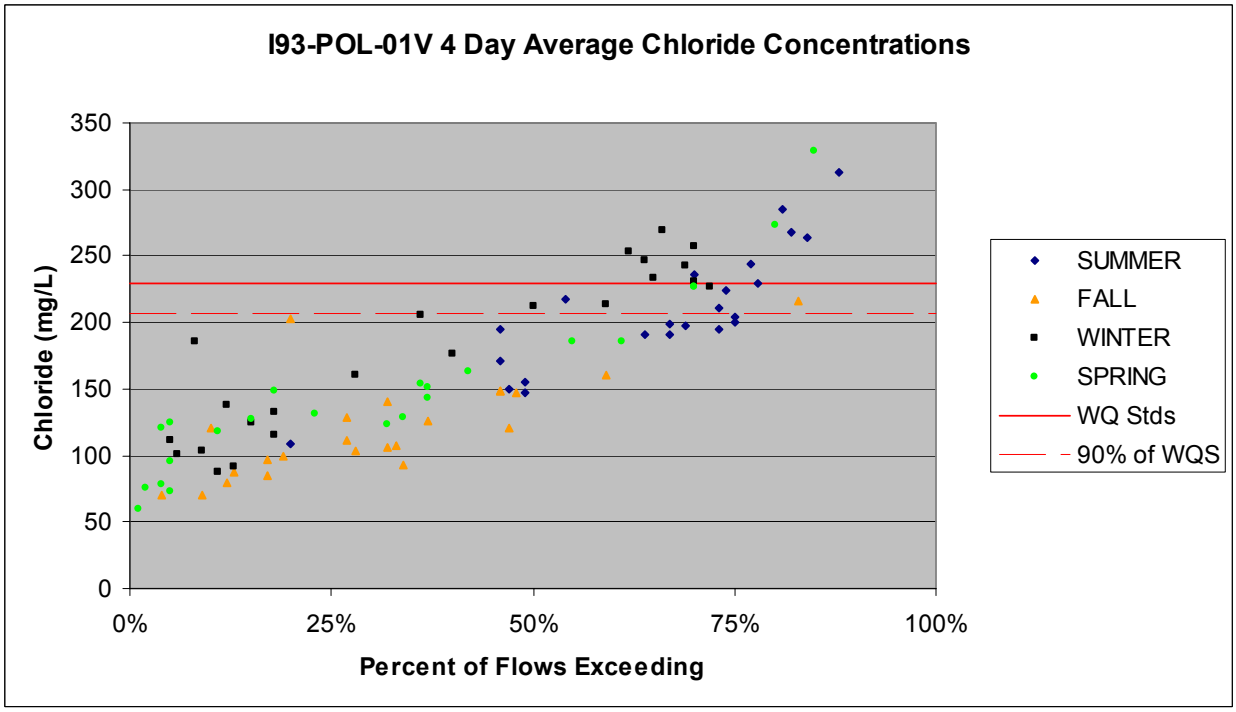

I93-POL-04X 1 Day Average Chloride Concentrations
Chloride (mg/L)
450
400
350
300
250
200
150
100
50
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS

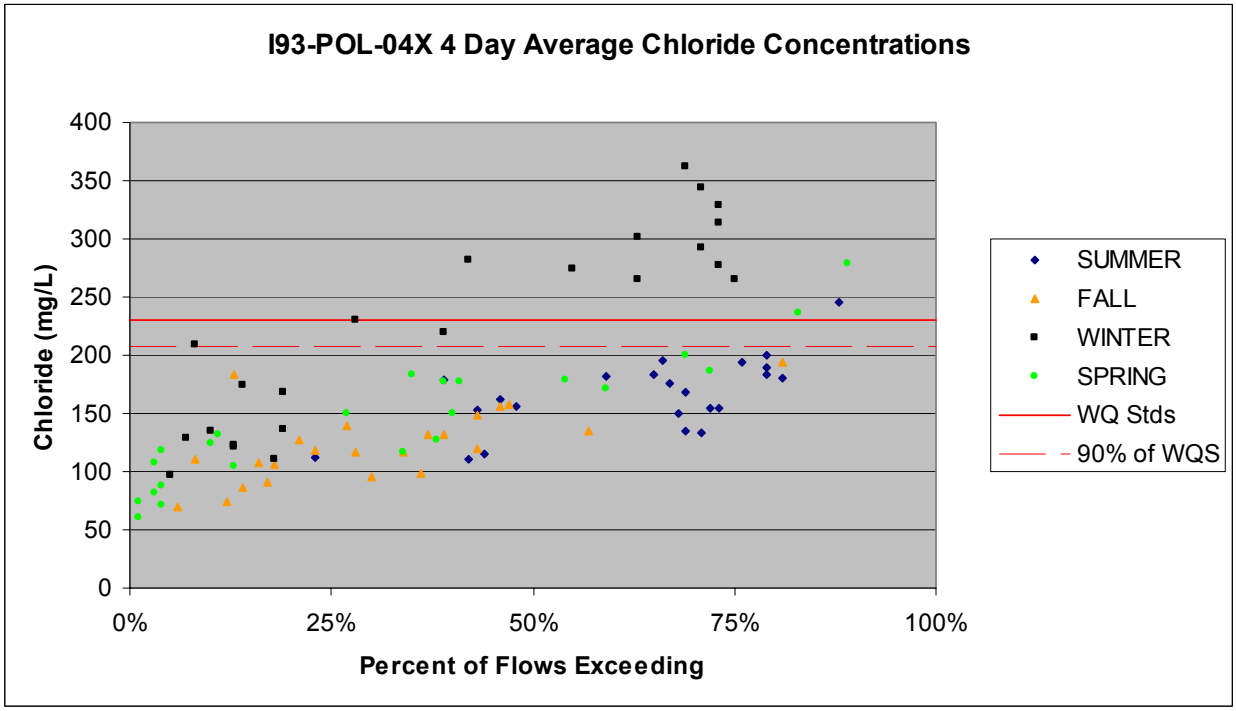
(c) Four Day Average Concentrations






I93-NTC-01 4 Day Average Chloride Concentrations
Chloride (mg/L)
400
350
300
250
200
150
100
50
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS


I93-POL-01V 4 Day Average Chloride Concentrations
Chloride (mg/L)
350
300
250
200
150
100
50
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS


I93-POL-04X 4 Day Average Chloride Concentrations
Chloride (mg/L)
400
350
300
250
200
150
100
50
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS

Appendix D

Data Report Addendum

Dinsmore Brook TMDL Data from 7/1/07 to 10/9/07

December 1, 2007

The purpose of this addendum is to summarize the data collected in the Dinsmore Brook watershed for the TMDL study.

Data collection for the Dinsmore Brook TMDL began on 7/1/06 and was scheduled to end on 6/30/07. However, the first three months of data at station I93-DIN-01 were invalidated because of ionic stratification at the site. DES extended the sampling period at I93-DIN-01 until 9/30/07 to obtain a full year of valid water quality data at the station. Therefore, the data period for the Dinsmore Brook TMDL will be 10/1/06 to 9/30/07.

Data collection for the TMDLs in other watersheds ended on 6/30/07. In September 2007, DES prepared a Data Report for the data collected between 7/1/06 and 6/30/07 (NHDES-R-WD-07-40). The Data Report did not include the full water quality record for I93-DIN-01 because the data were still being collected. The Data Report did include watershed characteristics and salt import estimates for the Dinsmore Brook watershed.

This addendum contains summary statistics for measurements at station I93-DIN-01 for the 10/1/06 to 9/30/07 period. The tables and figures in the Data Report which should be updated with these data are provided below. For tables, only the additional information for station I93-DIN-01 between 10/1/06 and 9/30/07 has been provided.

Update to Data Report Table 5: Data Logger Deployments for Water Quality Measurements in FY07 for the TMDL Study

Activity	Station	InstallationID	Start Date	End Date
1	I93-DIN-01	I93T040	7/3/07	10/9/07

Update to Data Report Tables 8, 9, 11,18, and 30: Summary Statistics of Water Quality and Stream Flow Measured by In-Situ Dataloggers at I93-DIN-01

Parameter	Period of Record	Number of Measurements	Minimum	Average	Maximum
Water Temperature (deg C)	10/1/06-9/30/07	34,997	0.07	9.12	20.99
Specific Conductance (uS/cm)	10/1/06-9/30/07	34,997	149.90	563.60	2,302.45
Chloride (mg/L)	10/1/06-9/30/07	33,942	24.02	148.95	684.86
Stream flow (cfs)	10/1/06-9/30/07	35,036	0.00	0.97	57.25
Chloride Export (tons Cl/yr)	10/1/06-9/30/07	33,942	1.84	92.44	2,635.85

Update to Data Report Table 13: Violations of Chloride Water Quality Standards from In-Situ Datalogger Deployments in FY07

Station	Period of Record	Number of Violations of Acute Standard (1 hour rolling average)	Number of Violations of Chronic Standard (4 day rolling average)
I93-DIN-01	10/1/06-9/30/07	0	17 (68.5 d)

Update to Data Report Table 15: Periods in Violation of the Chronic Water Quality Standard from Water Quality Monitoring in FY07

Station	Violation Episode	Start Time	End Time	Duration (days)	Number of Violations
I93-DIN-01	1	7/24/07 12:30	9/30/07 23:45	68.47	17

Update to Data Report Table 31: Chloride Mass Balance in Study Watersheds

Station	Period of Record	Chloride Imports (tons Cl/yr)	Chloride Exports (tons Cl/yr)	Net Chloride Gain or Loss (tons Cl/yr)	Percent of Cl Imports Retained
I93-DIN-01	10/1/06-9/30/07	100.98	92.44	8.54	8%

Update to Data Report Table 32: Chloride Mass Balance in Study Watersheds Normalized by Watershed Area

Station	Period of Record	Drainage Area (sq.mile)	Chloride Imports (tons Cl/yr/sq.mi)	Chloride Exports (tons Cl/yr/sq.mi)	Chloride Storage (tons Cl/yr/sq.mile)
I93-DIN-01	10/1/06-9/30/07	0.55	183.60	168.08	15.52

Update to Data Report Table 33: Summary Statistics for Daily Average Chloride Concentrations (mg/L) by Hydrologic Condition Class

Station	Statistic	High	Moist	Mid Range	Dry	Low
I93-DIN-01	N	54	126	71	52	51
	50th %ile	88.3	102.2	140.4	197.3	**295.9**
	90th %ile	129.3	125.5	155.6	**254.4**	**310.3**
	Target	207	207	207	207	207

* Concentrations greater than the target (90% of the chronic water quality standard) are shown in **bold**.

Update to Data Report Table 34: Summary Statistics for Daily Average Chloride Loads (tons Cl/day) by Hydrologic Condition Class

Station	Statistic	High	Moist	Mid Range	Dry	Low
I93-DIN-01	N	54	126	71	52	51
	50th %ile	0.59	0.27	0.15	0.07	**0.01**
	90th %ile	1.04	0.40	0.18	**0.10**	**0.03**
	Target	1.44	0.52	0.23	0.07	0.01

* Loads greater than the target (90% of the chronic water quality standard times flow) are shown in **bold**.

Update to Data Report Table 35: Summary Statistics for 4-Day Average Chloride Concentrations (mg/L) by Hydrologic Condition Class

Station	Statistic	High	Moist	Mid Range	Dry	Low
I93-DIN-01	N	12	34	22	9	13
	50th %ile	90.3	100.2	142.1	**219.8**	**279.4**
	90th %ile	123.0	122.0	162.1	**284.2**	**306.2**
	Target	207	207	207	207	207

* Concentrations greater than the target (90% of the chronic water quality standard) are shown in **bold**.

Update to Data Report Table 36: Summary Statistics for 4-Day Average Chloride Loads (tons Cl/day) by Hydrologic Condition Class

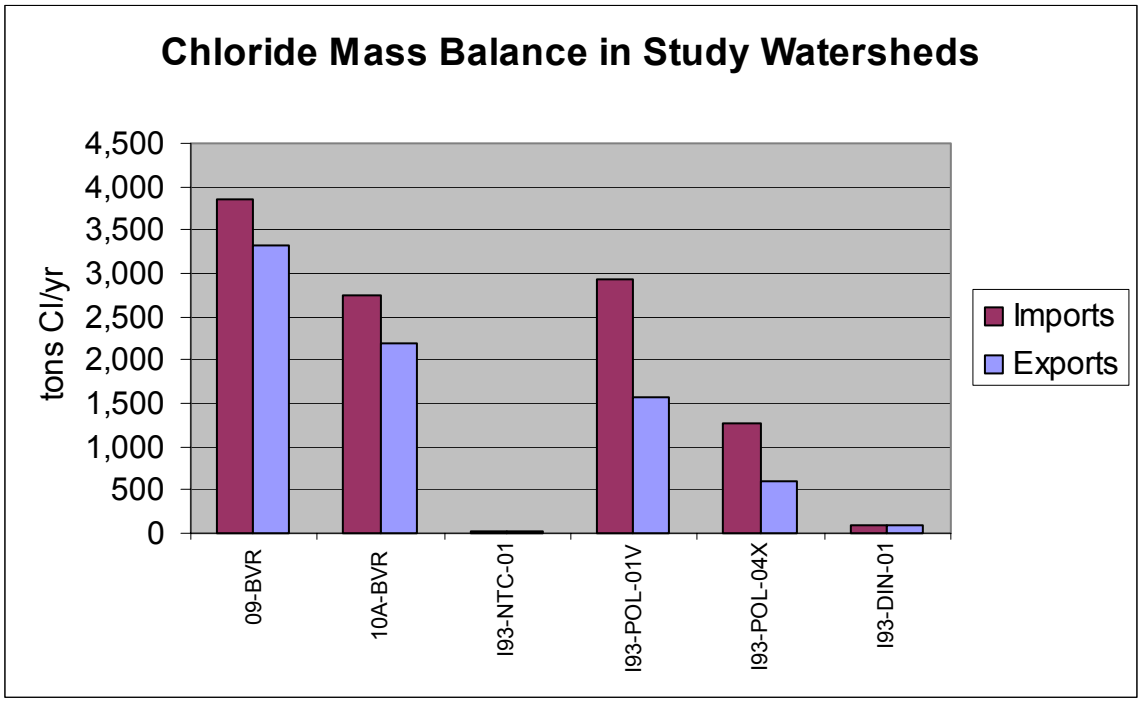
Station	Statistic	High	Moist	Mid Range	Dry	Low
I93-DIN-01	N	12	34	22	9	13
	50th %ile	0.60	0.29	0.16	0.06	**0.01**
	90th %ile	0.85	0.41	0.17	**0.09**	**0.03**
	Target	1.40	0.54	0.24	0.08	0.01

* Loads greater than the target (90% of the chronic water quality standard times flow) are shown in **bold**.

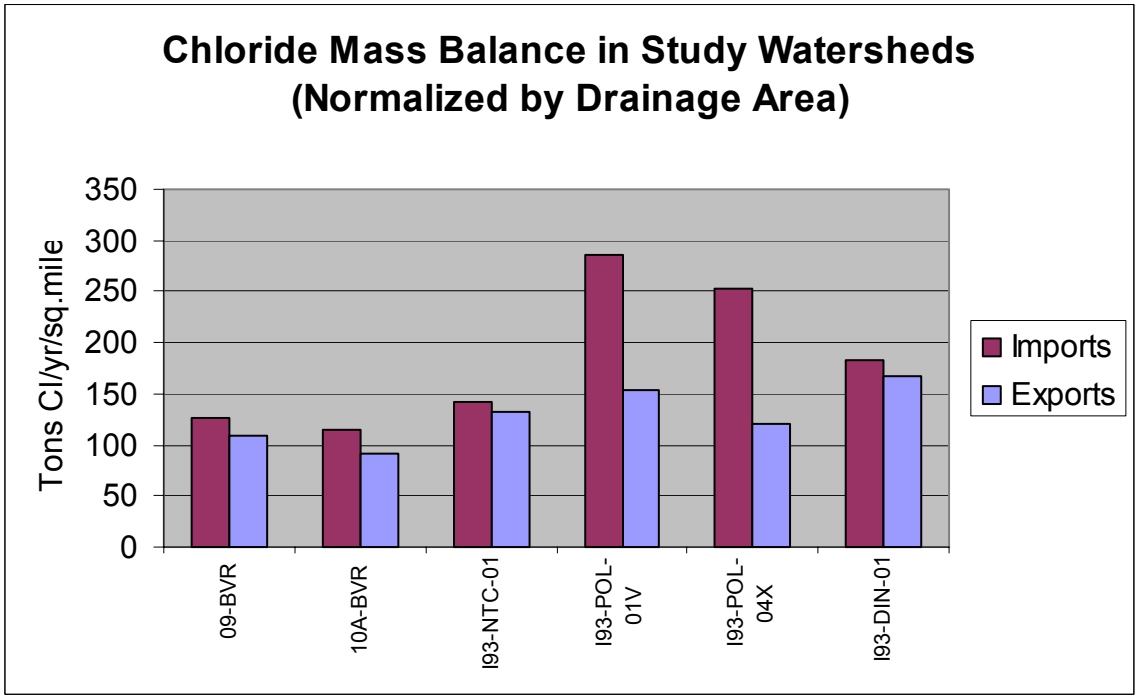
Update to Data Report Table 37: Percent Reduction Goals for Each Hydrologic Condition

Station	Averaging Period*	Method**	High	Moist	Mid Range	Dry	Low
I93-DIN-01	1 day	90th %ile of individual PRGs	NC	NC	NC	26.1	33.3
		90th %ile of conc. vs target	0.0	0.0	0.0	18.6	33.3
	4 day	90th %ile of individual PRGs	NC	NC	NC	24.3	32.4
		90th %ile of conc. vs target	0.0	0.0	0.0	27.2	32.4

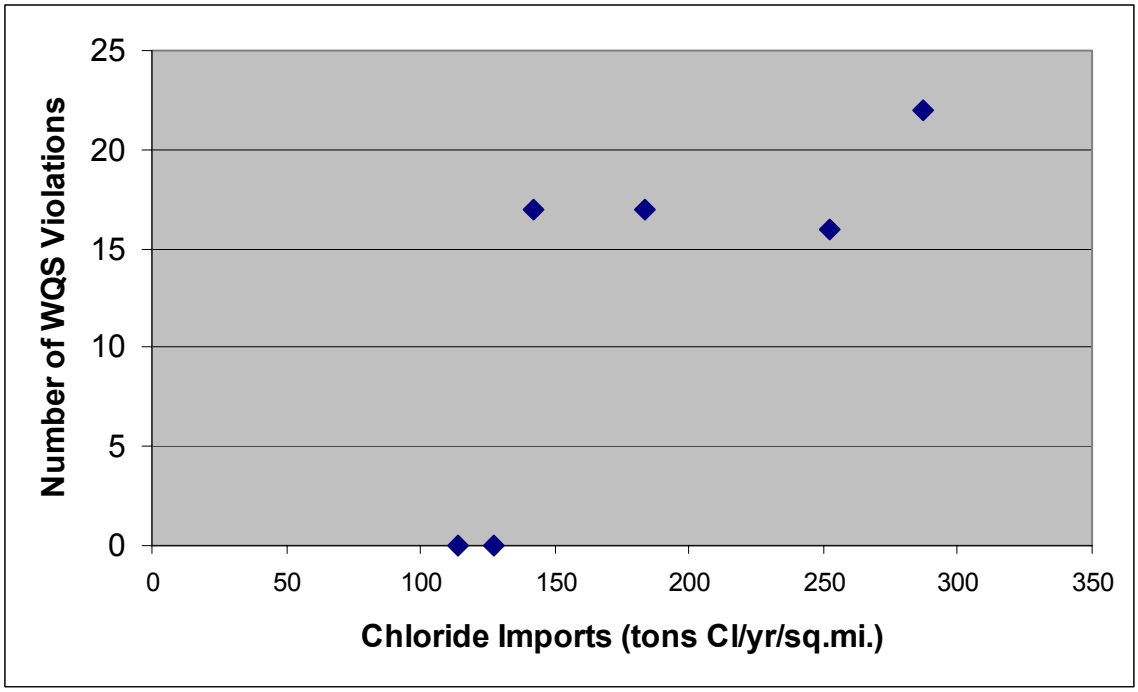
Update to Data Report Figure 18: Chloride Mass Balance in Study Watersheds

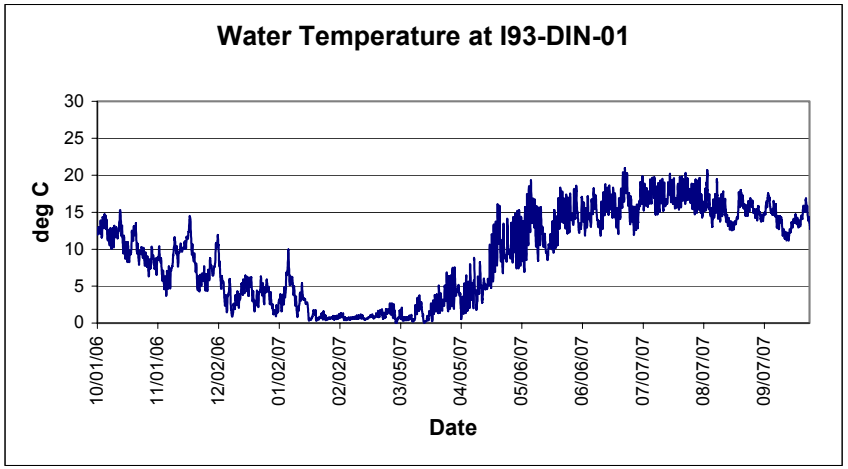


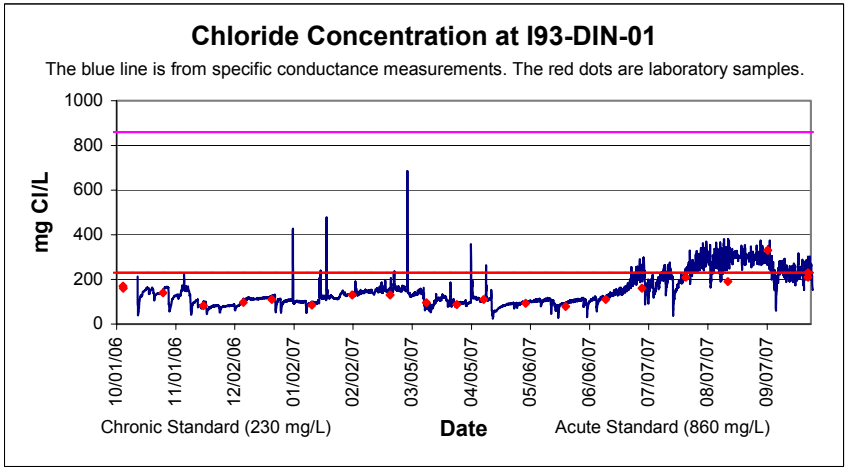
Update to Data Report Figure 19: Chloride Mass Balance in Study Watersheds Normalized by Drainage Area

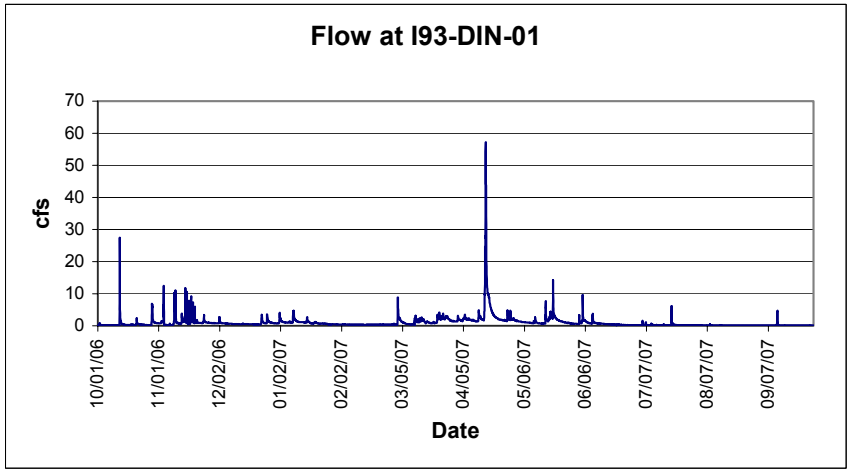


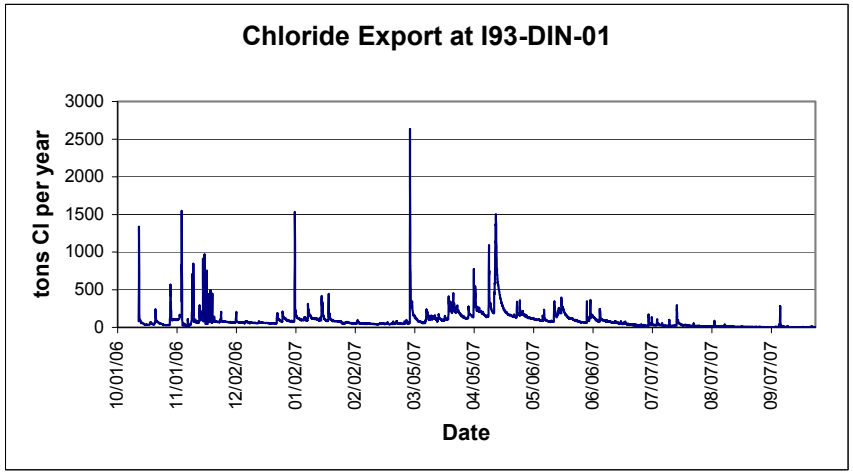
Update to Data Report Figure 20: Relationship between Chloride Imports to Activity #1 Watersheds and Violations of the Chronic Water Quality Standard

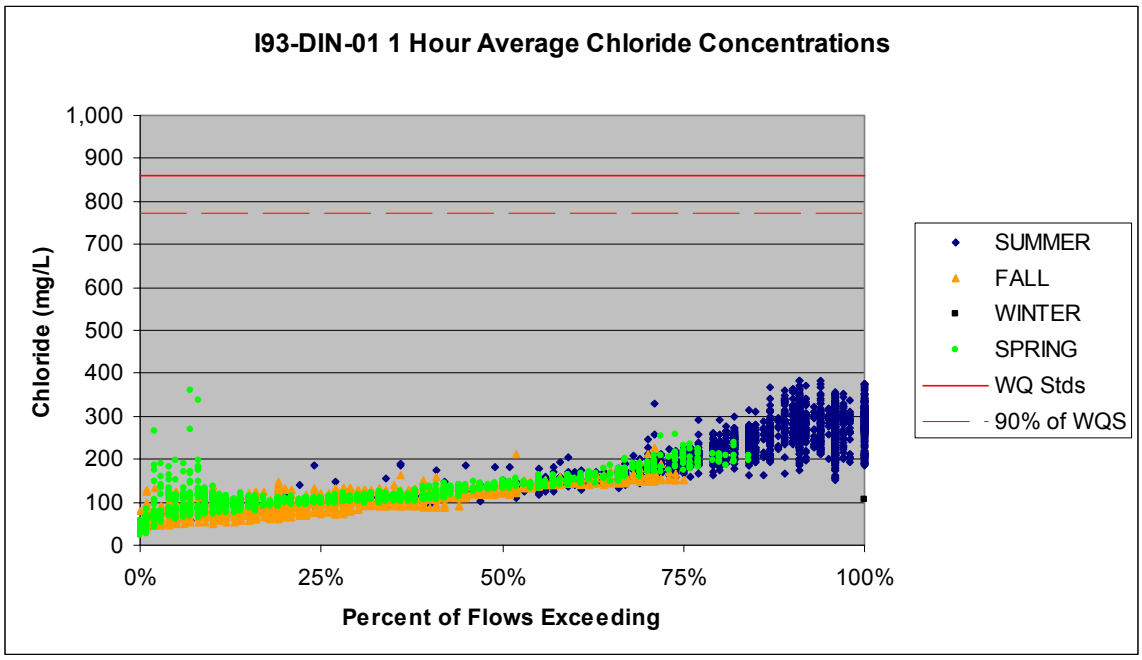


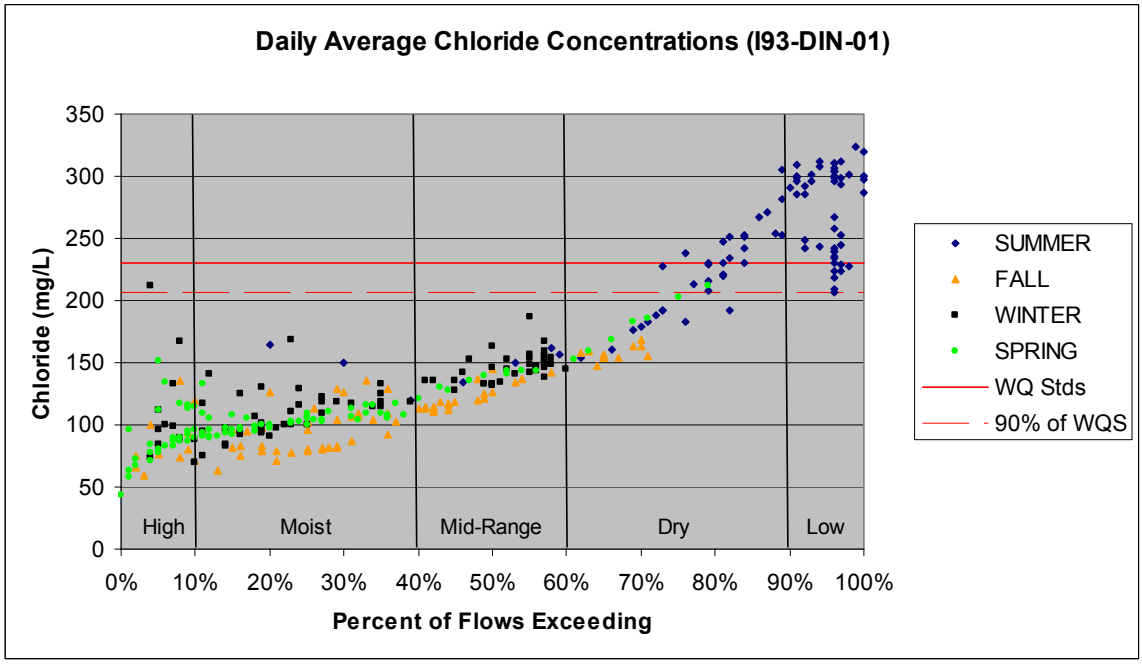

Water Temperature at I93-DIN-01
deg C
30
25
20
15
10
5
0
10/01/06
11/01/06
12/02/06
01/02/07
02/02/07
03/05/07
04/05/07
05/06/07
06/06/07
07/07/07
08/07/07
09/07/07
Date

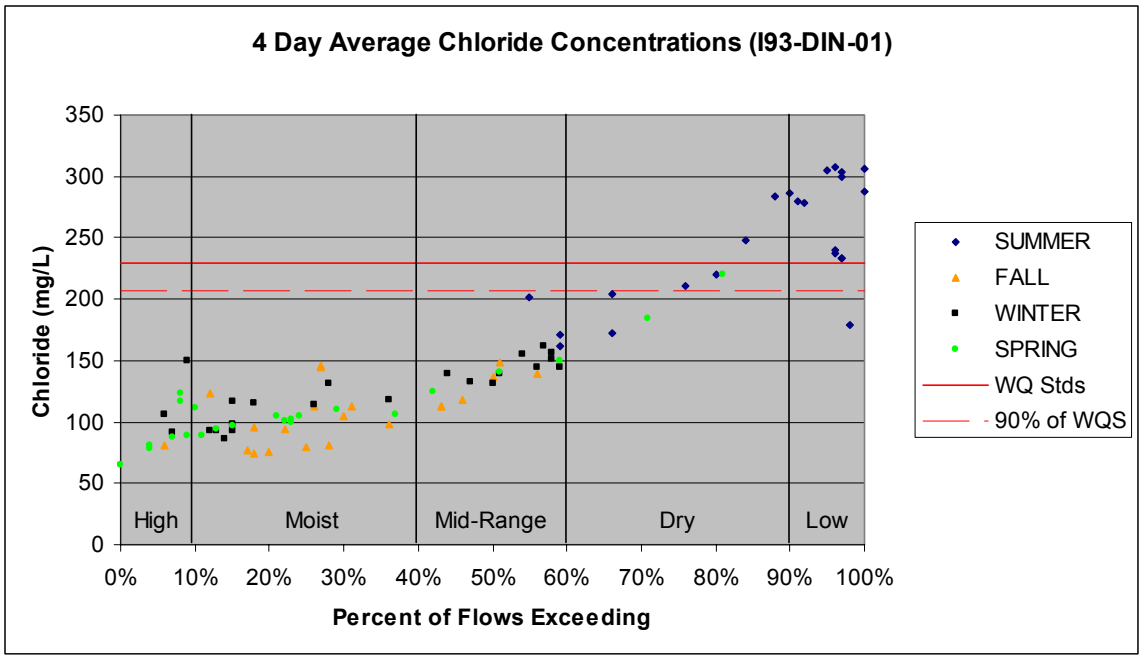

Chloride Concentration at I93-DIN-01
The blue line is from specific conductance measurements. The red dots are laboratory samples.
mg Cl/L
1000
800
600
400
200
0
10/01/06
11/01/06
12/02/06
01/02/07
02/02/07
03/05/07
04/05/07
05/06/07
06/06/07
07/07/07
08/07/07
09/07/07
Chronic Standard (230 mg/L)
Date
Acute Standard (860 mg/L)


Flow at I93-DIN-01
cfs
70
60
50
40
30
20
10
0
10/01/06
11/01/06
12/02/06
01/02/07
02/02/07
03/05/07
04/05/07
05/06/07
06/06/07
07/07/07
08/07/07
09/07/07
Date


Chloride Export at I93-DIN-01
tons Cl per year
3000
2500
2000
1500
1000
500
0
10/01/06
11/01/06
12/02/06
01/02/07
02/02/07
03/05/07
04/05/07
05/06/07
06/06/07
07/07/07
08/07/07
09/07/07
Date


I93-DIN-01 1 Hour Average Chloride Concentrations
Chloride (mg/L)
1,000
900
800
700
600
500
400
300
200
100
0
0%
25%
50%
75%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS


Daily Average Chloride Concentrations (I93-DIN-01)
Chloride (mg/L)
350
300
250
200
150
100
50
0
High
Moist
Mid-Range
Dry
Low
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS


4 Day Average Chloride Concentrations (I93-DIN-01)
Chloride (mg/L)
350
300
250
200
150
100
50
0
High
Moist
Mid-Range
Dry
Low
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Flows Exceeding
SUMMER
FALL
WINTER
SPRING
WQ Stds
90% of WQS