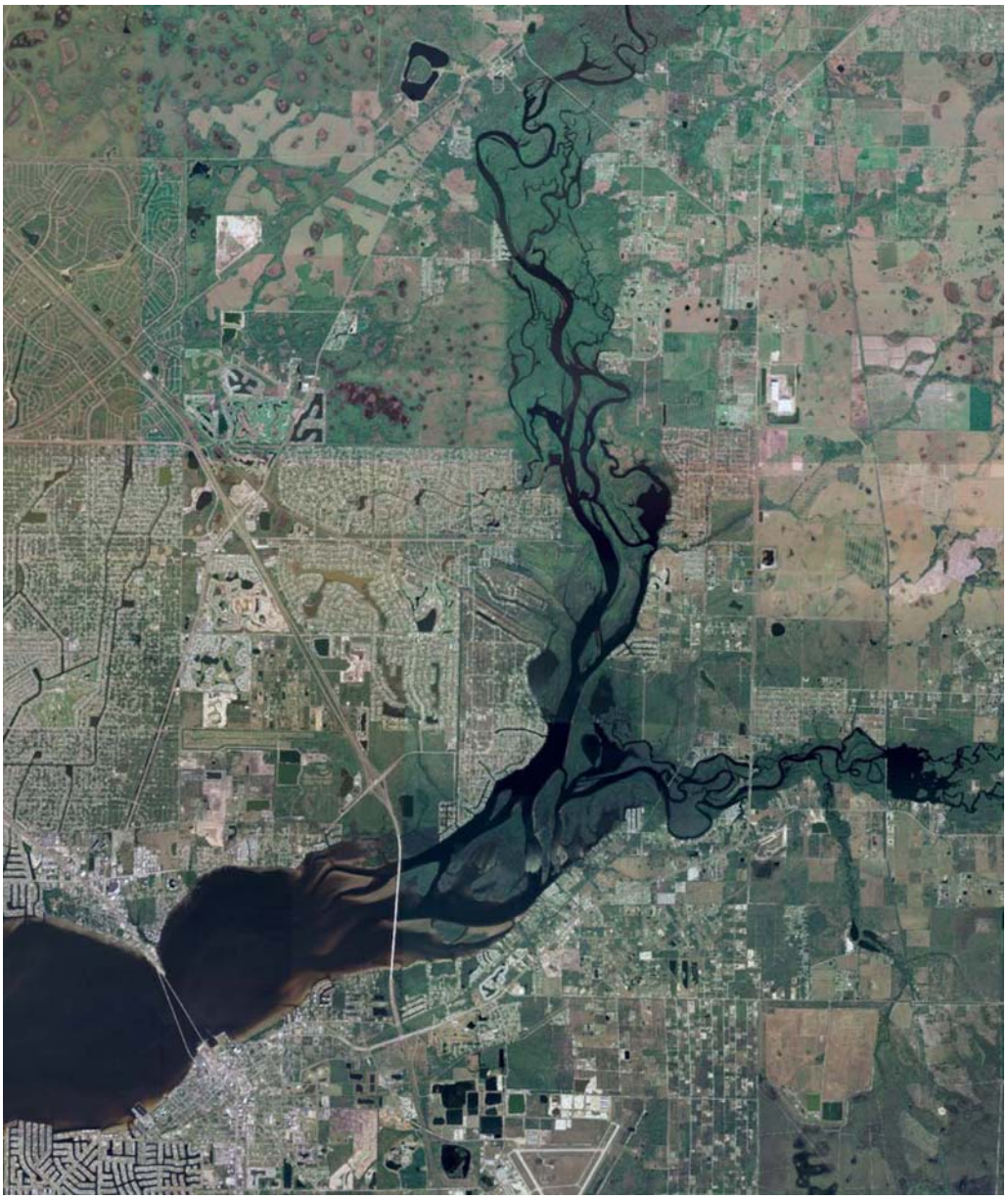
Proposed Minimum Flows and Levels for the Lower Peace River and Shell Creek



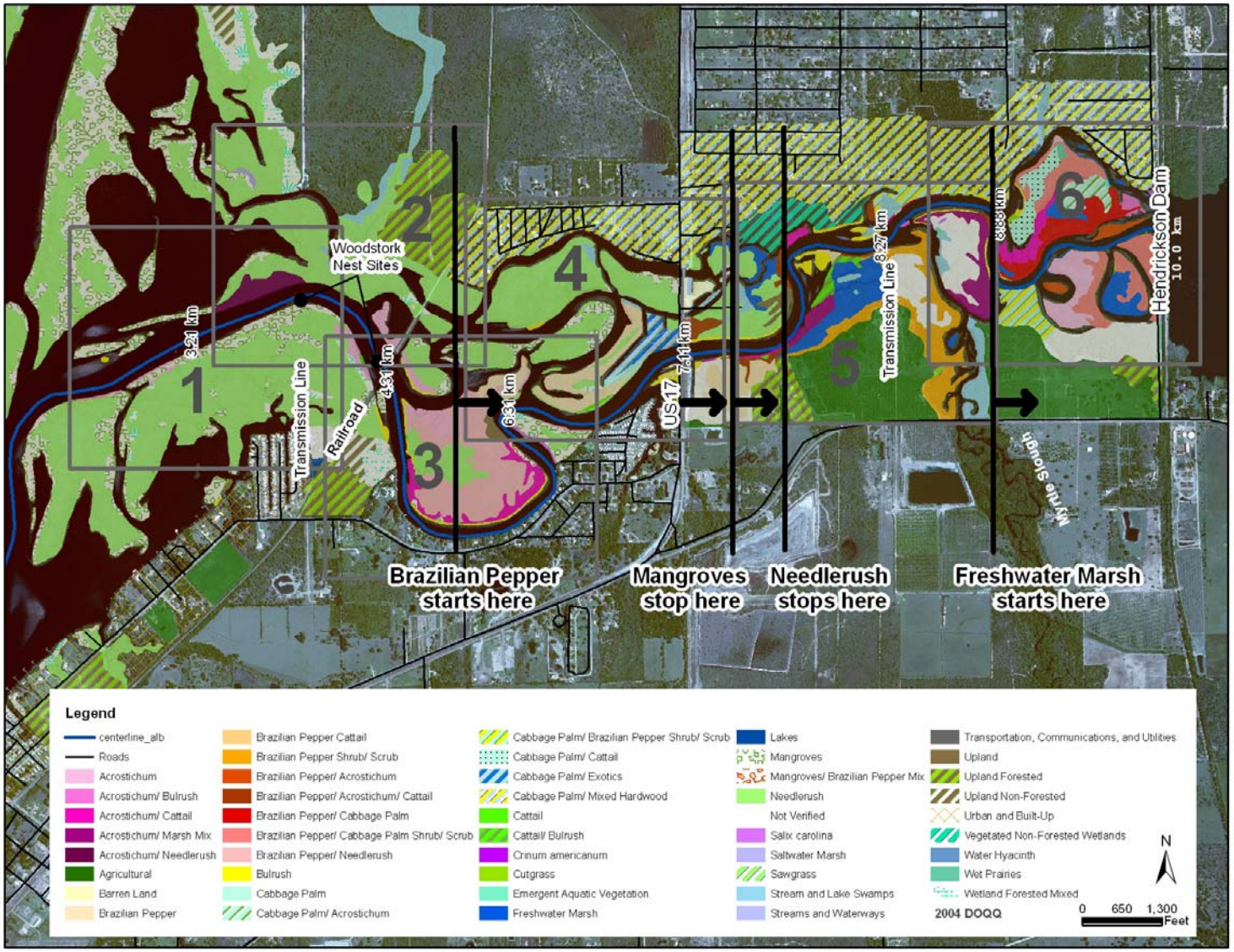
Southwest Florida Water Management District

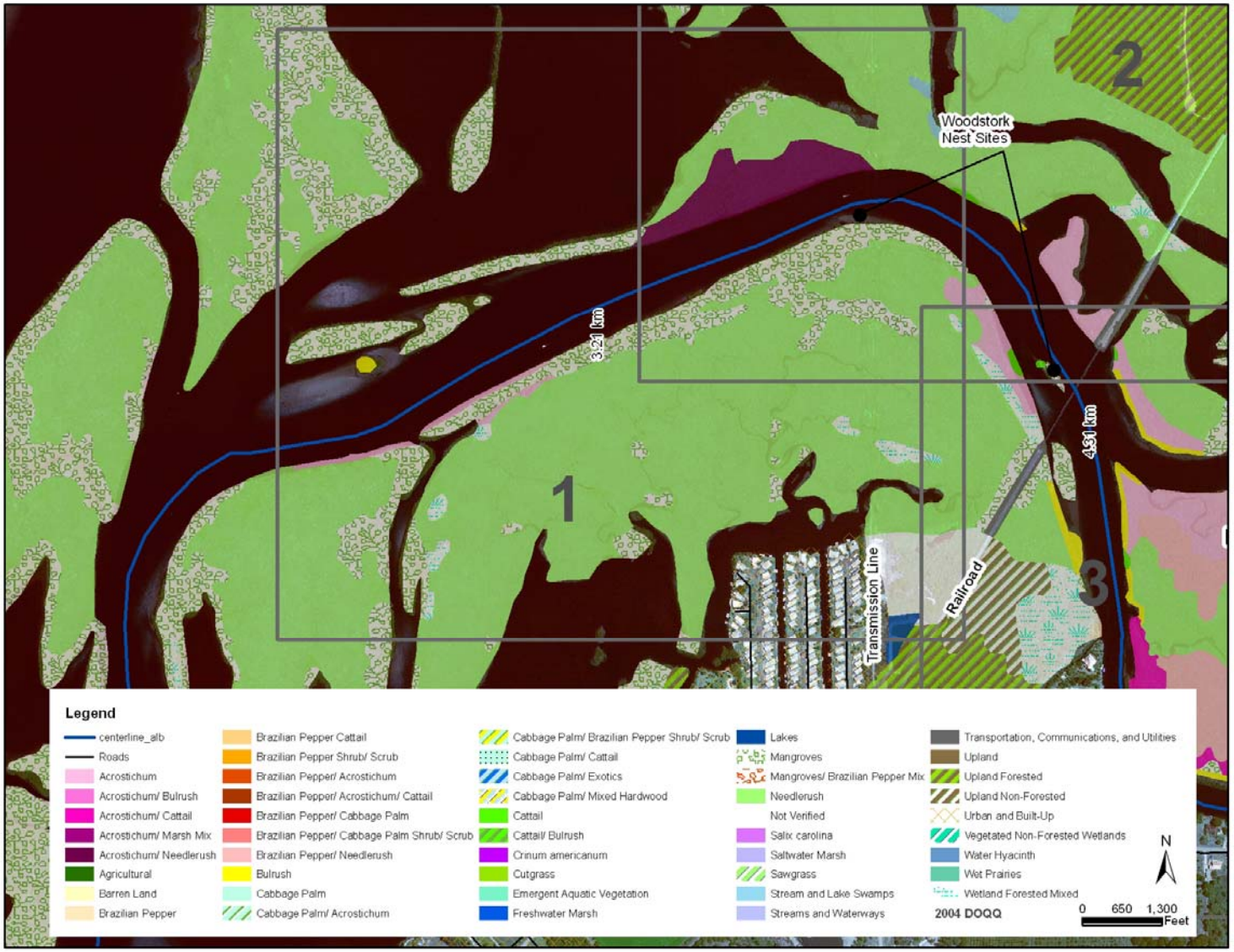
Appendices 2 - 5
Final Report April 2010

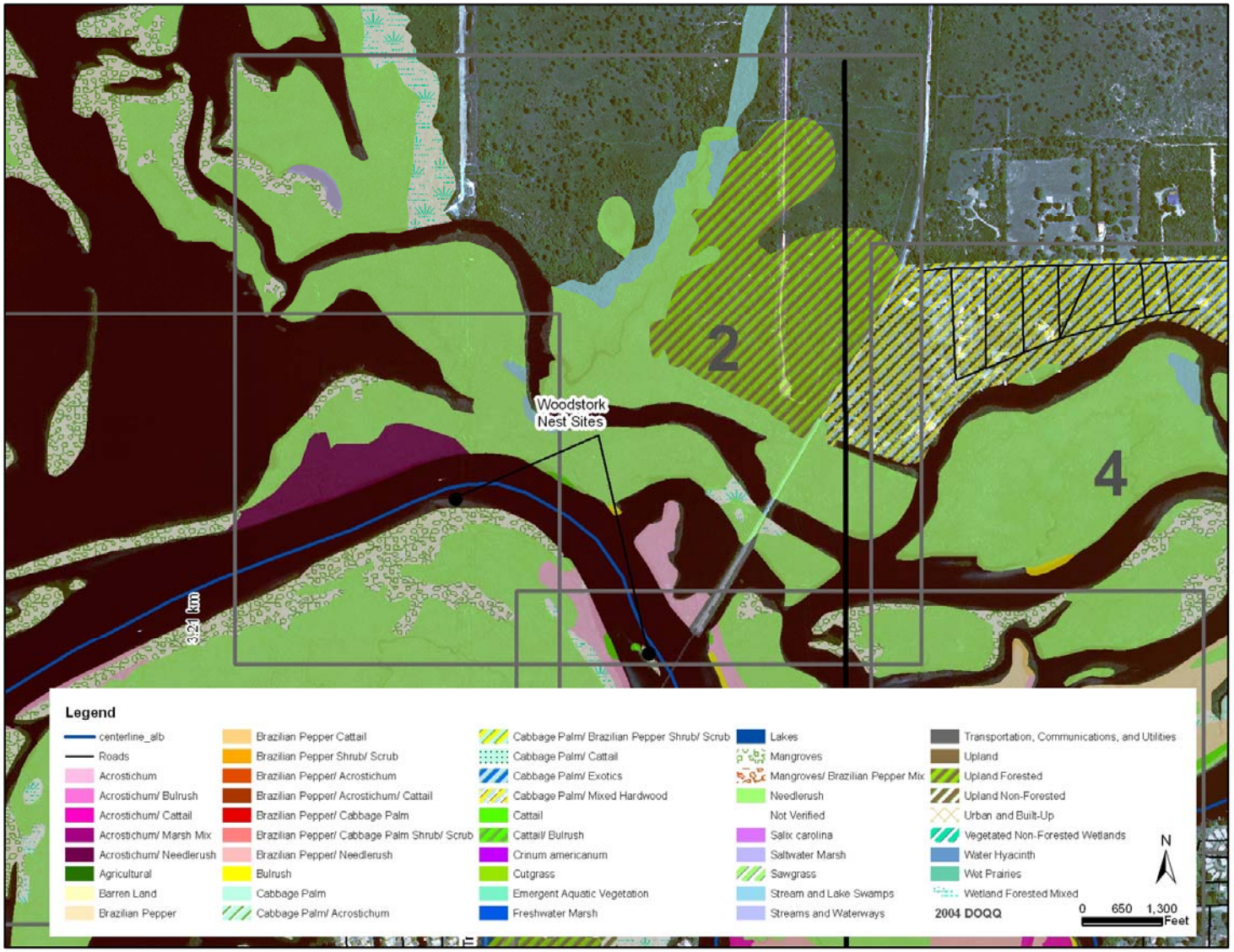
Appendices 2 - 5 (Bound Numbered Separately)

Appendix 2-1

Shell Creek Vegetation Maps (PBS&J, 2006)


Woodstork Nest Sites
3.21 km
4.31 km
6.31 km
7.11 km
8.27 km
8.83 km
10.0 km
Transmission Line
Railroad
US17
Hendrickson Dam
1
2
3
4
5
6
Brazilian Pepper starts here
Mangroves stop here
Needlerush stops here
Freshwater Marsh starts here
Legend
centerline_alb
Roads
Acrostichum
Acrostichum/ Bulrush
Acrostichum/ Cattail
Acrostichum/ Marsh Mix
Acrostichum/ Needlerush
Agricultural
Barren Land
Brazilian Pepper
Brazilian Pepper Cattail
Brazilian Pepper Shrub/ Scrub
Brazilian Pepper/ Acrostichum
Brazilian Pepper/ Acrostichum/ Cattail
Brazilian Pepper/ Cabbage Palm
Brazilian Pepper/ Cabbage Palm Shrub/ Scrub
Brazilian Pepper/ Needlerush
Bulrush
Cabbage Palm
Cabbage Palm/ Acrostichum
Cabbage Palm/ Brazilian Pepper Shrub/ Scrub
Cabbage Palm/ Cattail
Cabbage Palm/ Exotics
Cabbage Palm/ Mixed Hardwood
Cattail
Cattail/ Bulrush
Crinum americanum
Cutgrass
Emergent Aquatic Vegetation
Freshwater Marsh
Lakes
Mangroves
Mangroves/ Brazilian Pepper Mix
Needlerush
Not Verified
Salix carolina
Saltwater Marsh
Sawgrass
Stream and Lake Swamps
Streams and Waterways
Transportation, Communications, and Utilities
Upland
Upland Forested
Upland Non-Forested
Urban and Built-Up
Vegetated Non-Forested Wetlands
Water Hyacinth
Wet Prairies
Wetland Forested Mixed
2004 DOQQ
N
0 650 1,300
Feet


Woodstork Nest Sites
3.21 km
4.31 km
1
2
3
Transmission Line
Railroad
Legend
centerline_alb
Roads
Acrostichum
Acrostichum/ Bulrush
Acrostichum/ Cattail
Acrostichum/ Marsh Mix
Acrostichum/ Needlerush
Agricultural
Barren Land
Brazilian Pepper
Brazilian Pepper Cattail
Brazilian Pepper Shrub/ Scrub
Brazilian Pepper/ Acrostichum
Brazilian Pepper/ Acrostichum/ Cattail
Brazilian Pepper/ Cabbage Palm
Brazilian Pepper/ Cabbage Palm Shrub/ Scrub
Brazilian Pepper/ Needlerush
Bulrush
Cabbage Palm
Cabbage Palm/ Acrostichum
Cabbage Palm/ Brazilian Pepper Shrub/ Scrub
Cabbage Palm/ Cattail
Cabbage Palm/ Exotics
Cabbage Palm/ Mixed Hardwood
Cattail
Cattail/ Bulrush
Crinum americanum
Cutgrass
Emergent Aquatic Vegetation
Freshwater Marsh
Lakes
Mangroves
Mangroves/ Brazilian Pepper Mix
Needlerush
Not Verified
Salix carolina
Saltwater Marsh
Sawgrass
Stream and Lake Swamps
Streams and Waterways
Transportation, Communications, and Utilities
Upland
Upland Forested
Upland Non-Forested
Urban and Built-Up
Vegetated Non-Forested Wetlands
Water Hyacinth
Wet Prairies
Wetland Forested Mixed
2004 DOQQ
N
0 650 1,300
Feet


Woodstork
Nest Sites
2
4
3.21 km
Legend
centerline_alb
Roads
Acrostichum
Acrostichum/ Bulrush
Acrostichum/ Cattail
Acrostichum/ Marsh Mix
Acrostichum/ Needlerush
Agricultural
Barren Land
Brazilian Pepper
Brazilian Pepper Cattail
Brazilian Pepper Shrub/ Scrub
Brazilian Pepper/ Acrostichum
Brazilian Pepper/ Acrostichum/ Cattail
Brazilian Pepper/ Cabbage Palm
Brazilian Pepper/ Cabbage Palm Shrub/ Scrub
Brazilian Pepper/ Needlerush
Bulrush
Cabbage Palm
Cabbage Palm/ Acrostichum
Cabbage Palm/ Brazilian Pepper Shrub/ Scrub
Cabbage Palm/ Cattail
Cabbage Palm/ Exotics
Cabbage Palm/ Mixed Hardwood
Cattail
Cattail/ Bulrush
Crinum americanum
Cutgrass
Emergent Aquatic Vegetation
Freshwater Marsh
Lakes
Mangroves
Mangroves/ Brazilian Pepper Mix
Needlerush
Not Verified
Salix carolina
Saltwater Marsh
Sawgrass
Stream and Lake Swamps
Streams and Waterways
Transportation, Communications, and Utilities
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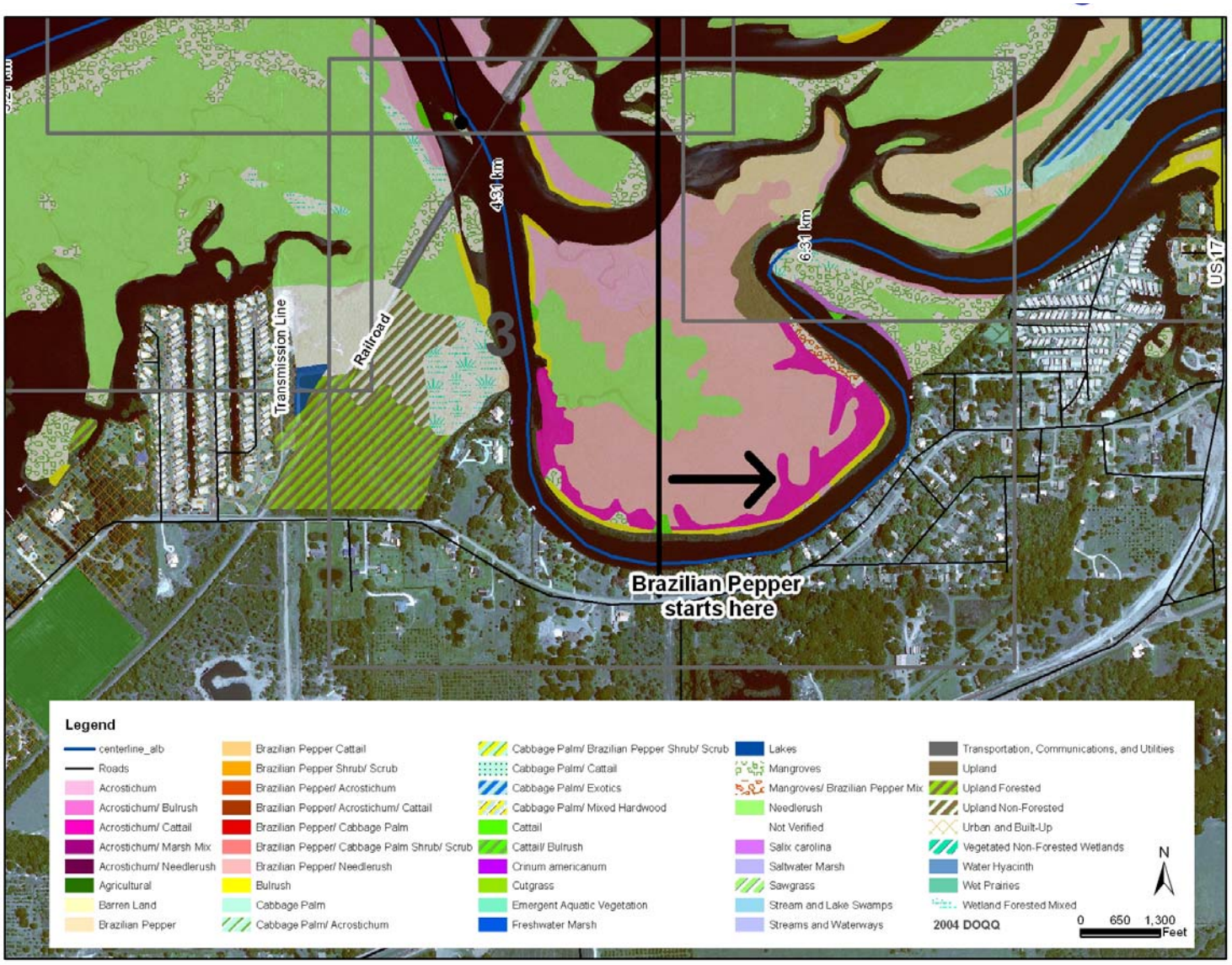
Upland Forested
Upland Non-Forested
Urban and Built-Up
Vegetated Non-Forested Wetlands
Water Hyacinth
Wet Prairies
Wetland Forested Mixed
2004 DOQQ
N
0 650 1,300
Feet


4.91 km
6.31 km
US 17
Transmission Line
Railroad
3
Brazilian Pepper
starts here
Legend
centerline_alb
Roads
Acrostichum
Acrostichum/ Bulrush
Acrostichum/ Cattail
Acrostichum/ Marsh Mix
Acrostichum/ Needlerush
Agricultural
Barren Land
Brazilian Pepper
Brazilian Pepper Cattail
Brazilian Pepper Shrub/ Scrub
Brazilian Pepper/ Acrostichum
Brazilian Pepper/ Acrostichum/ Cattail
Brazilian Pepper/ Cabbage Palm
Brazilian Pepper/ Cabbage Palm Shrub/ Scrub
Brazilian Pepper/ Needlerush
Bulrush
Cabbage Palm
Cabbage Palm/ Acrostichum
Cabbage Palm/ Brazilian Pepper Shrub/ Scrub
Cabbage Palm/ Cattail
Cabbage Palm/ Exotics
Cabbage Palm/ Mixed Hardwood
Cattail
Cattail/ Bulrush
Crinum americanum
Cutgrass
Emergent Aquatic Vegetation
Freshwater Marsh
Lakes
Mangroves
Mangroves/ Brazilian Pepper Mix
Needlerush
Not Verified
Salix carolina
Saltwater Marsh
Sawgrass
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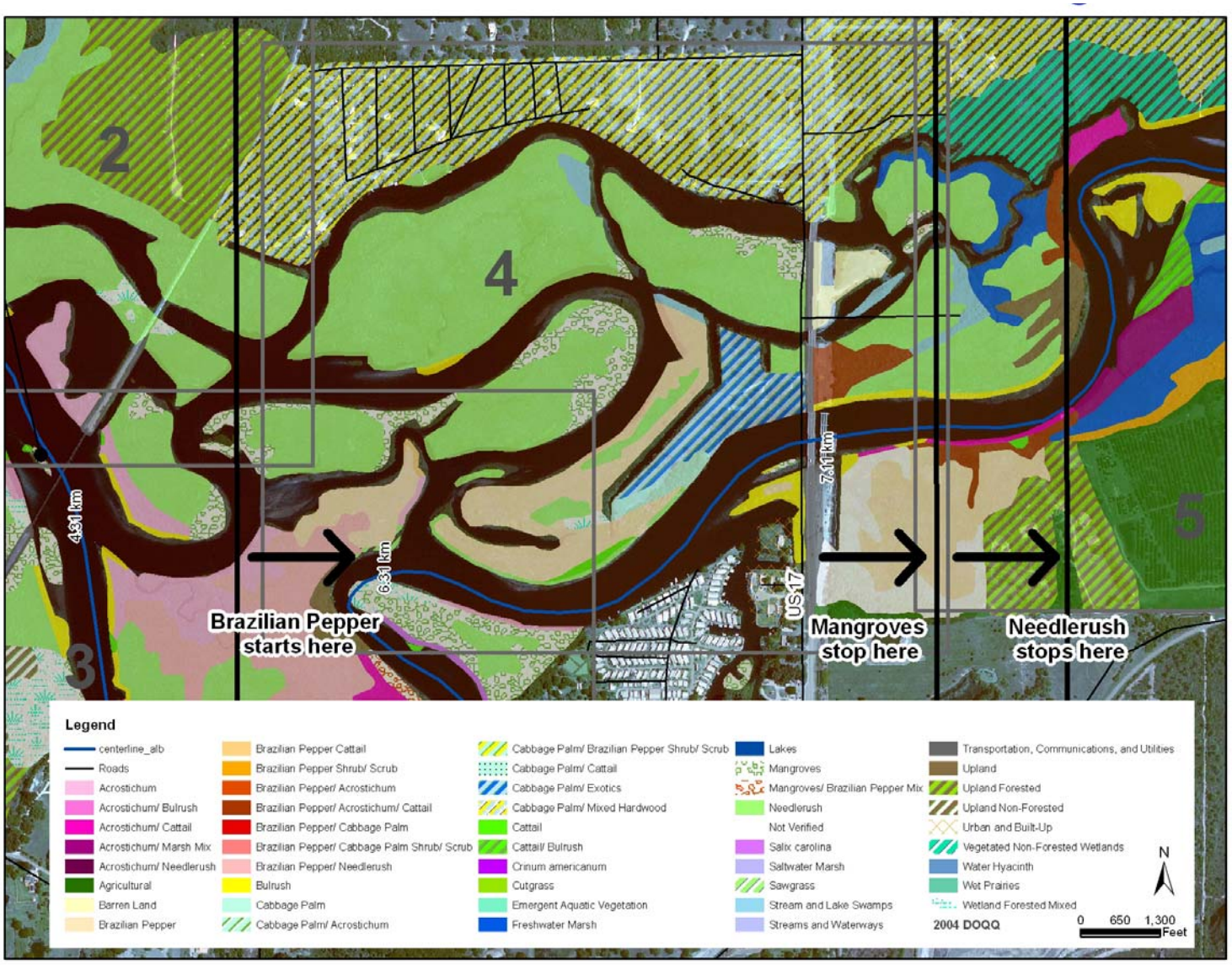
Upland
Upland Forested
Upland Non-Forested
Urban and Built-Up
Vegetated Non-Forested Wetlands
Water Hyacinth
Wet Prairies
Wetland Forested Mixed
2004 DOQQ
N
0 650 1,300
Feet


2
4
3
5
4.91 km
6.31 km
7.11 km
US17
Brazilian Pepper starts here
Mangroves stop here
Needlerush stops here
Legend
centerline_alb
Roads
Acrostichum
Acrostichum/ Bulrush
Acrostichum/ Cattail
Acrostichum/ Marsh Mix
Acrostichum/ Needlerush
Agricultural
Barren Land
Brazilian Pepper
Brazilian Pepper Cattail
Brazilian Pepper Shrub/ Scrub
Brazilian Pepper/ Acrostichum
Brazilian Pepper/ Acrostichum/ Cattail
Brazilian Pepper/ Cabbage Palm
Brazilian Pepper/ Cabbage Palm Shrub/ Scrub
Brazilian Pepper/ Needlerush
Bulrush
Cabbage Palm
Cabbage Palm/ Acrostichum
Cabbage Palm/ Brazilian Pepper Shrub/ Scrub
Cabbage Palm/ Cattail
Cabbage Palm/ Exotics
Cabbage Palm/ Mixed Hardwood
Cattail
Cattail/ Bulrush
Crinum americanum
Cutgrass
Emergent Aquatic Vegetation
Freshwater Marsh
Lakes
Mangroves
Mangroves/ Brazilian Pepper Mix
Needlerush
Not Verified
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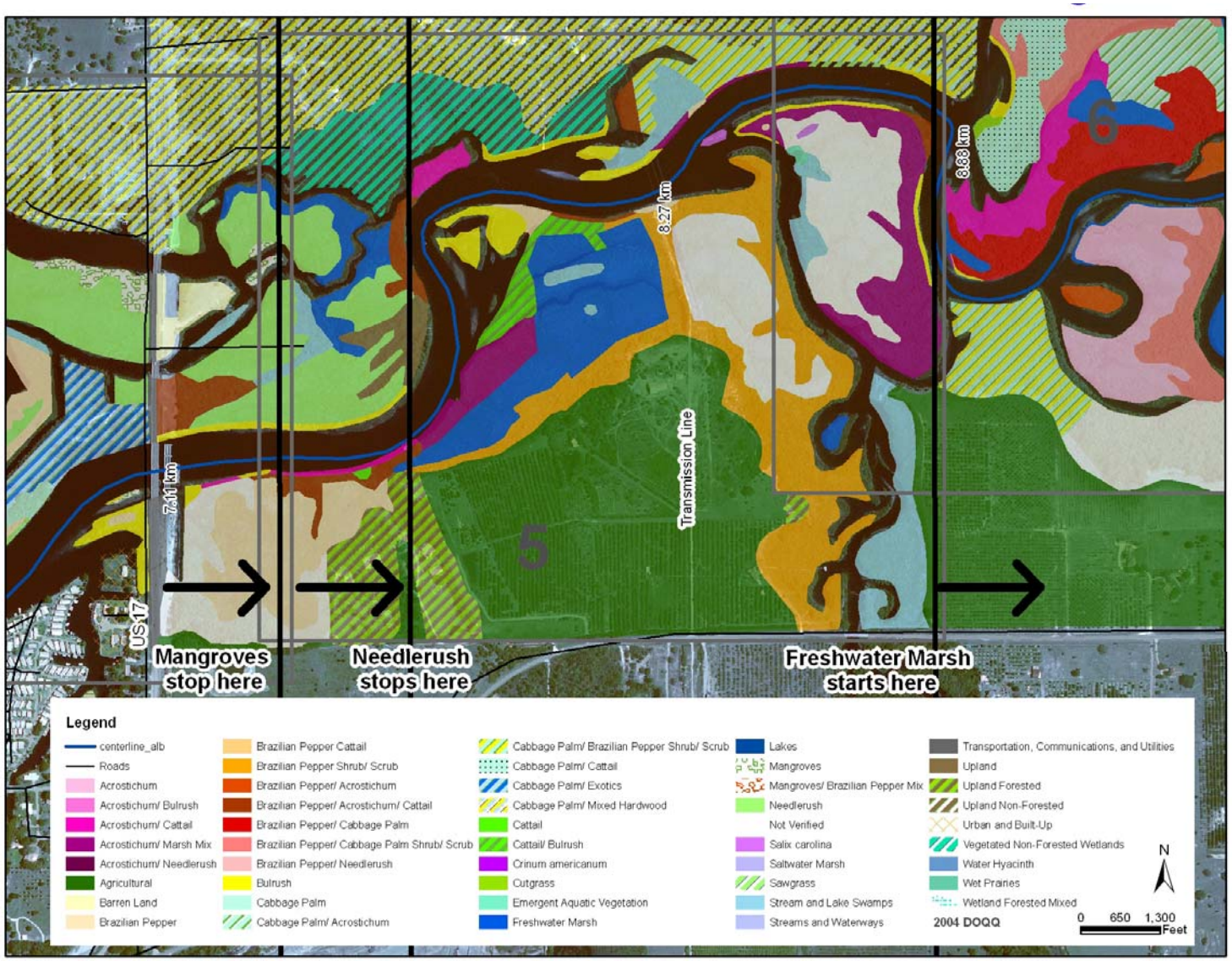
Vegetated Non-Forested Wetlands
Water Hyacinth
Wet Prairies
Wetland Forested Mixed
2004 DOQQ
N
0 650 1,300
Feet


7.11 km
8.27 km
8.88 km
Transmission Line
US17
Mangroves stop here
Needlerush stops here
Freshwater Marsh starts here
Legend
centerline_alb
Roads
Acrostichum
Acrostichum/ Bulrush
Acrostichum/ Cattail
Acrostichum/ Marsh Mix
Acrostichum/ Needlerush
Agricultural
Barren Land
Brazilian Pepper
Brazilian Pepper Cattail
Brazilian Pepper Shrub/ Scrub
Brazilian Pepper/ Acrostichum
Brazilian Pepper/ Acrostichum/ Cattail
Brazilian Pepper/ Cabbage Palm
Brazilian Pepper/ Cabbage Palm Shrub/ Scrub
Brazilian Pepper/ Needlerush
Bulrush
Cabbage Palm
Cabbage Palm/ Acrostichum
Cabbage Palm/ Brazilian Pepper Shrub/ Scrub
Cabbage Palm/ Cattail
Cabbage Palm/ Exotics
Cabbage Palm/ Mixed Hardwood
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Cattail/ Bulrush
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Mangroves/ Brazilian Pepper Mix
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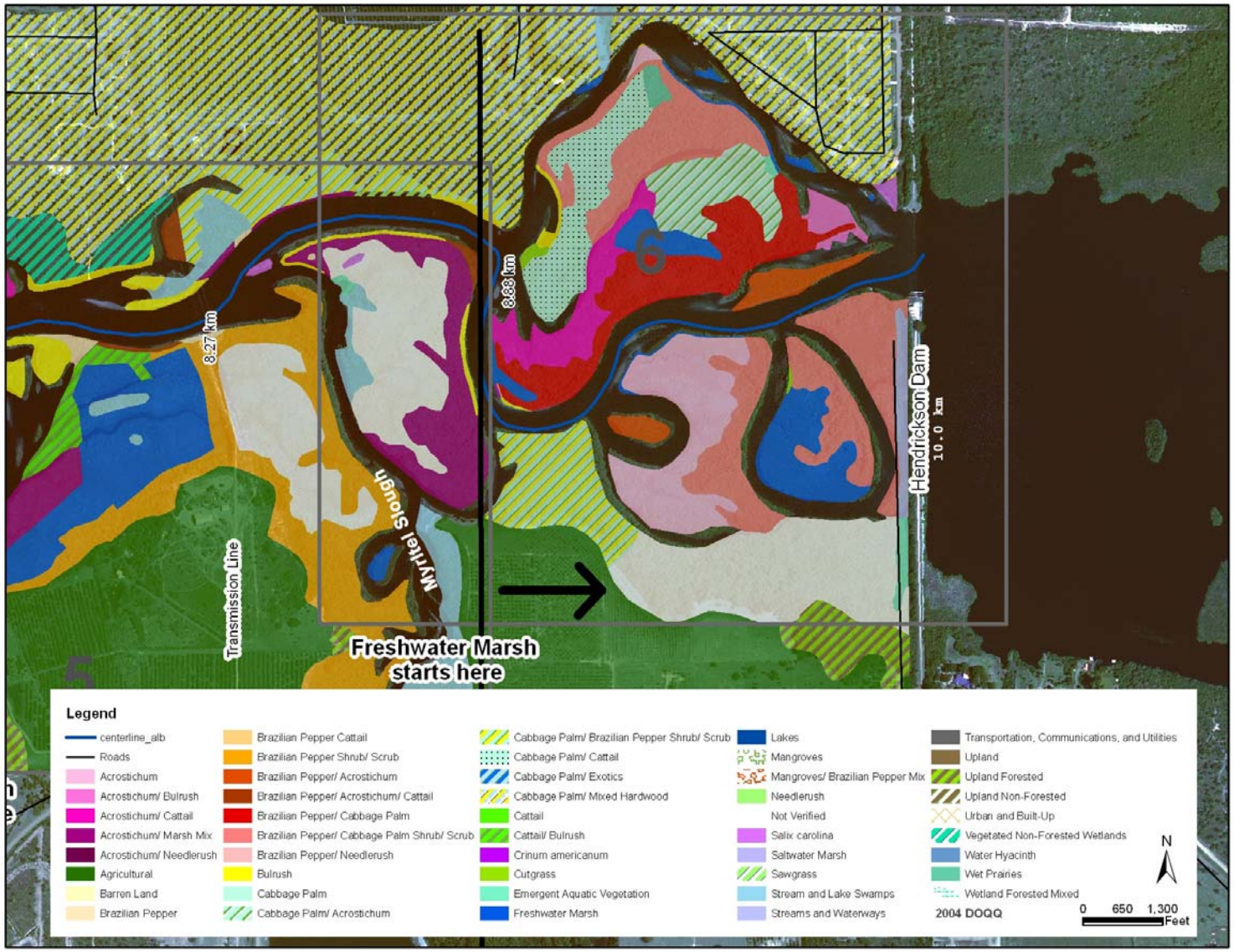
Urban and Built-Up
Vegetated Non-Forested Wetlands
Water Hyacinth
Wet Prairies
Wetland Forested Mixed
2004 DOQQ
N
0 650 1,300
Feet


8.27 km
8.88 km
10.0 km
Hendrickson Dam
Myrtle Slough
Transmission Line
Freshwater Marsh
starts here
Legend
centerline_alb
Roads
Acrostichum
Acrostichum/ Bulrush
Acrostichum/ Cattail
Acrostichum/ Marsh Mix
Acrostichum/ Needlerush
Agricultural
Barren Land
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Brazilian Pepper Cattail
Brazilian Pepper Shrub/ Scrub
Brazilian Pepper/ Acrostichum
Brazilian Pepper/ Acrostichum/ Cattail
Brazilian Pepper/ Cabbage Palm
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Brazilian Pepper/ Needlerush
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Cabbage Palm/ Brazilian Pepper Shrub/ Scrub
Cabbage Palm/ Cattail
Cabbage Palm/ Exotics
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Cattail/ Bulrush
Crinum americanum
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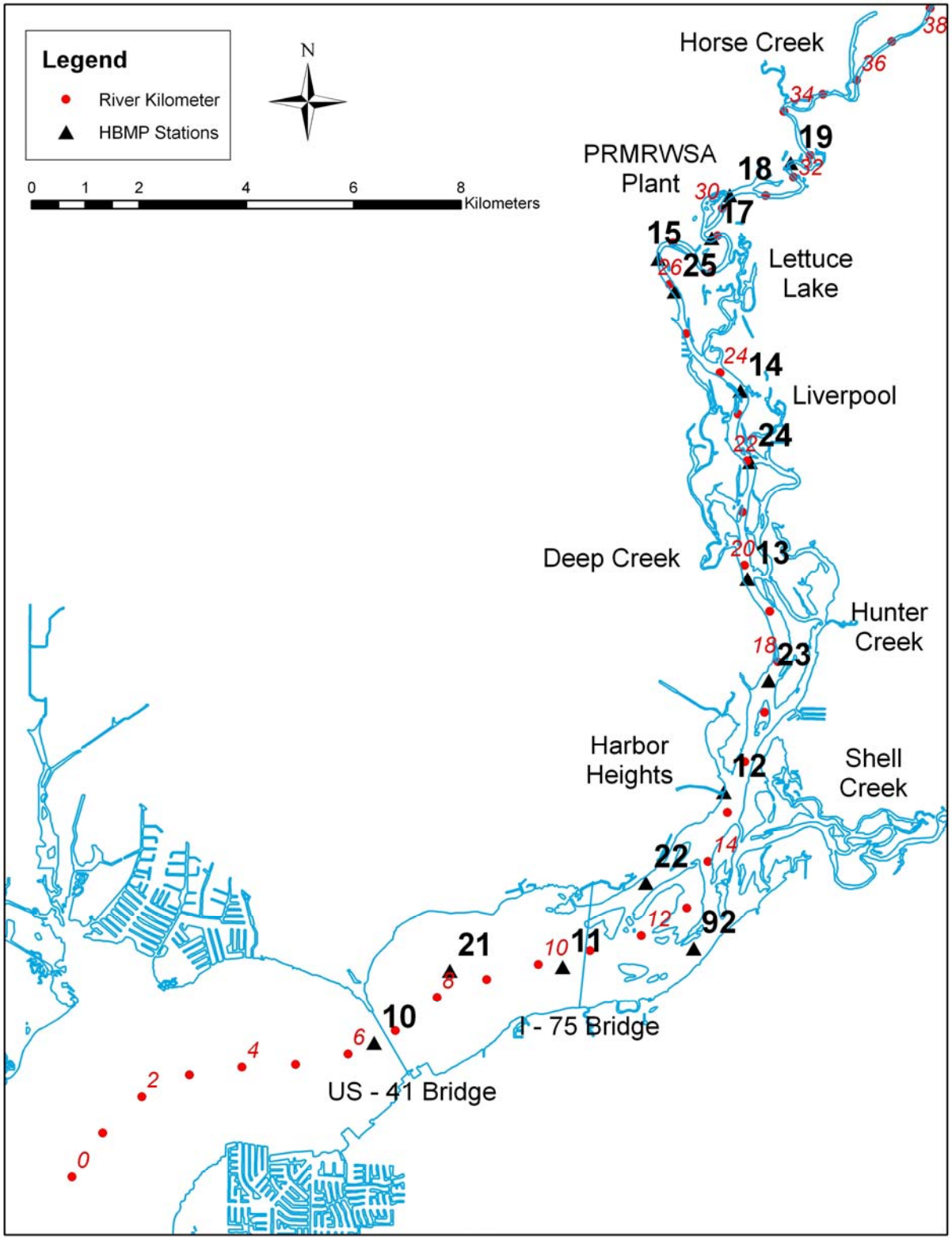
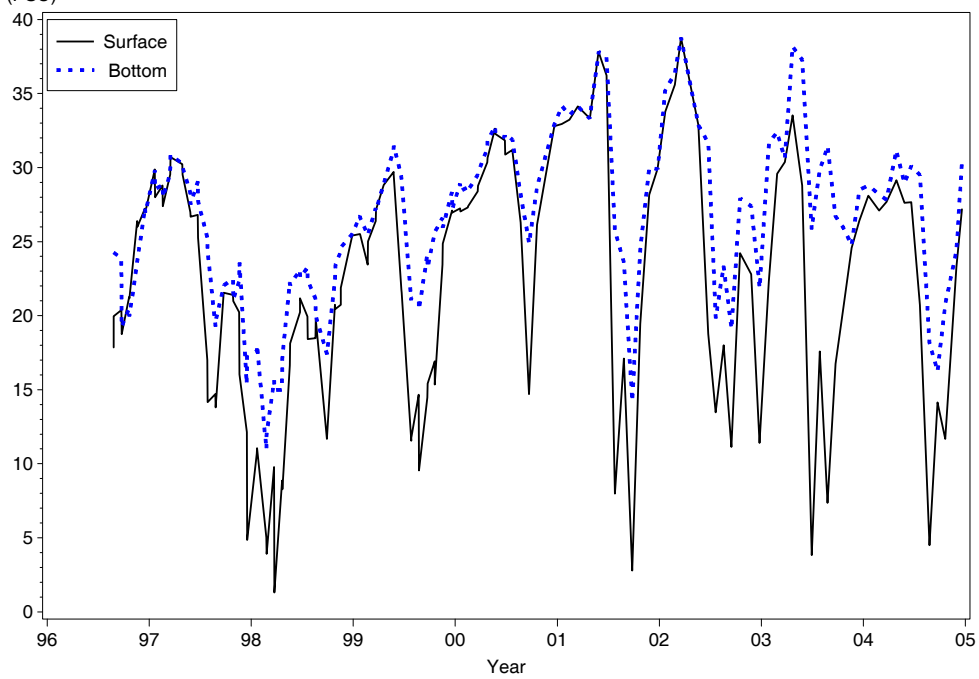
Vegetated Non-Forested Wetlands
Water Hyacinth
Wet Prairies
Wetland Forested Mixed
2004 DOQQ
N
0 650 1,300
Feet

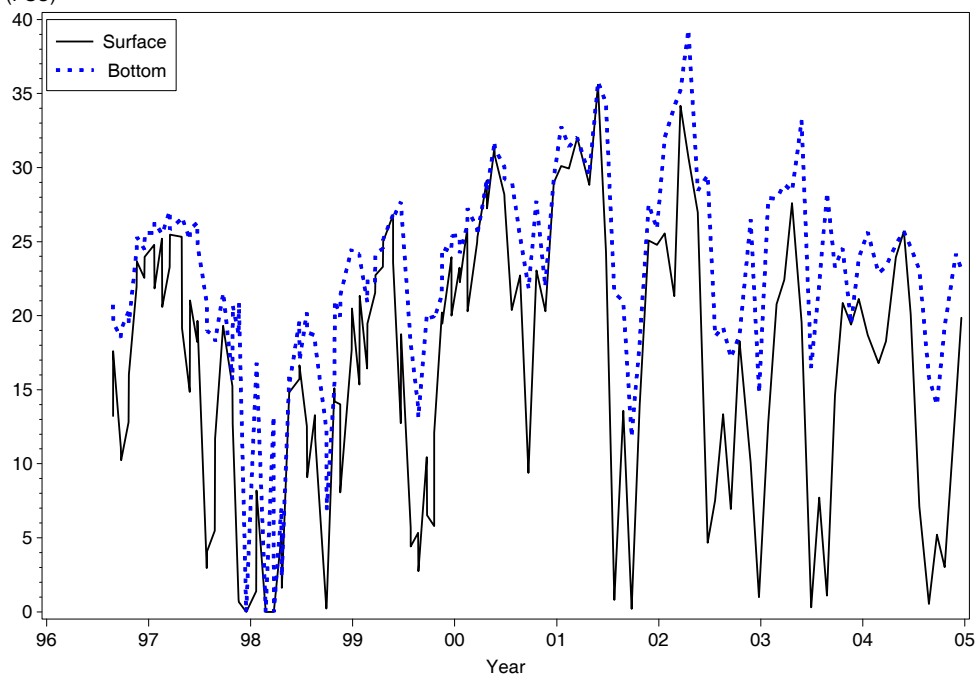
Appendix 3-1

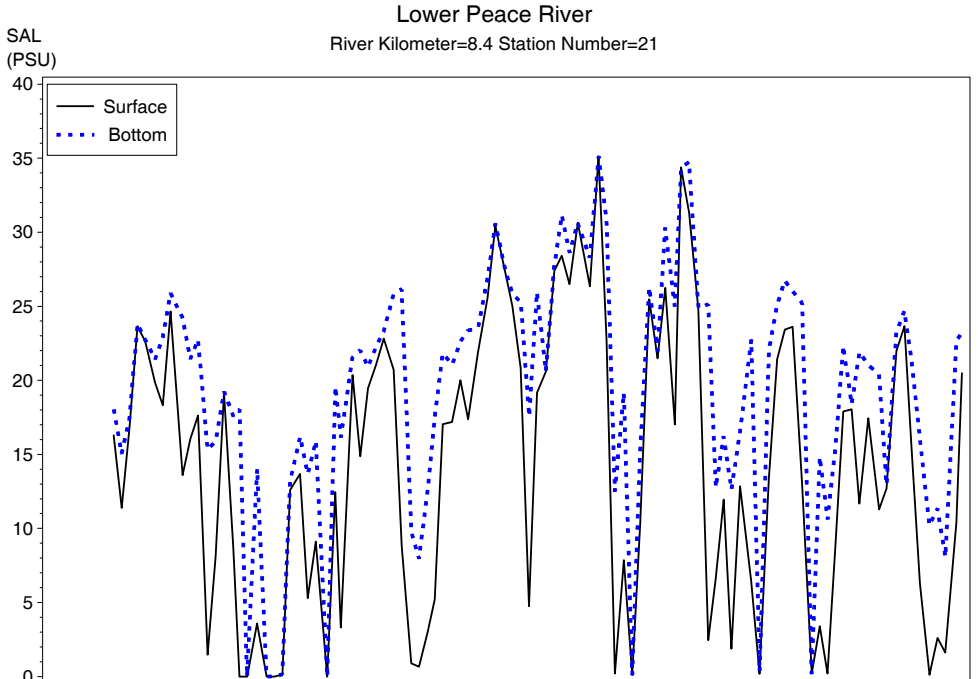
Annual Variation in Lower Peace River

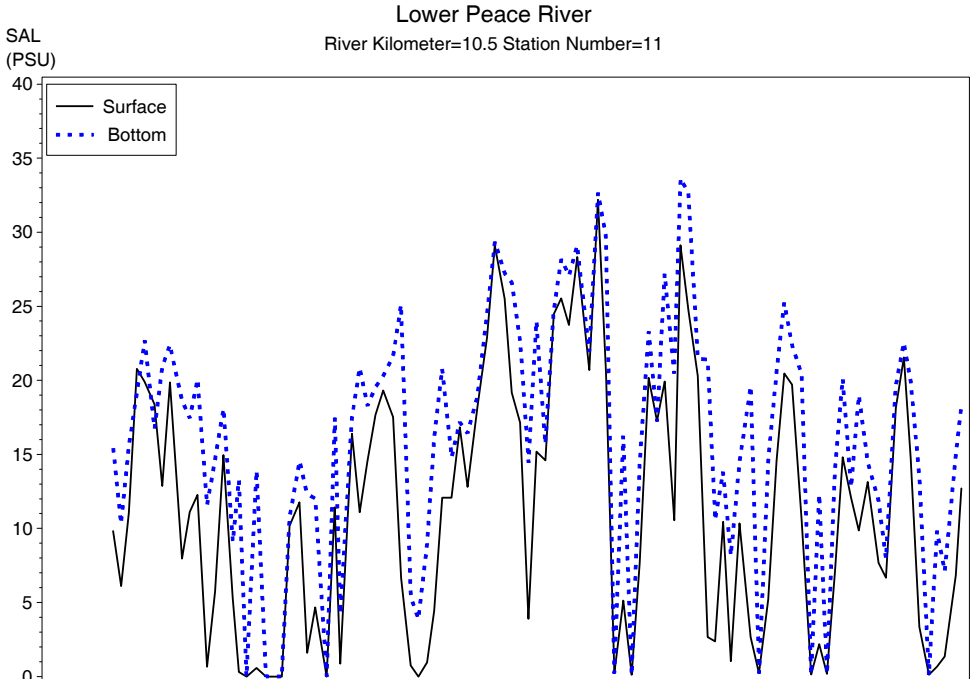
Water Quality Constituents

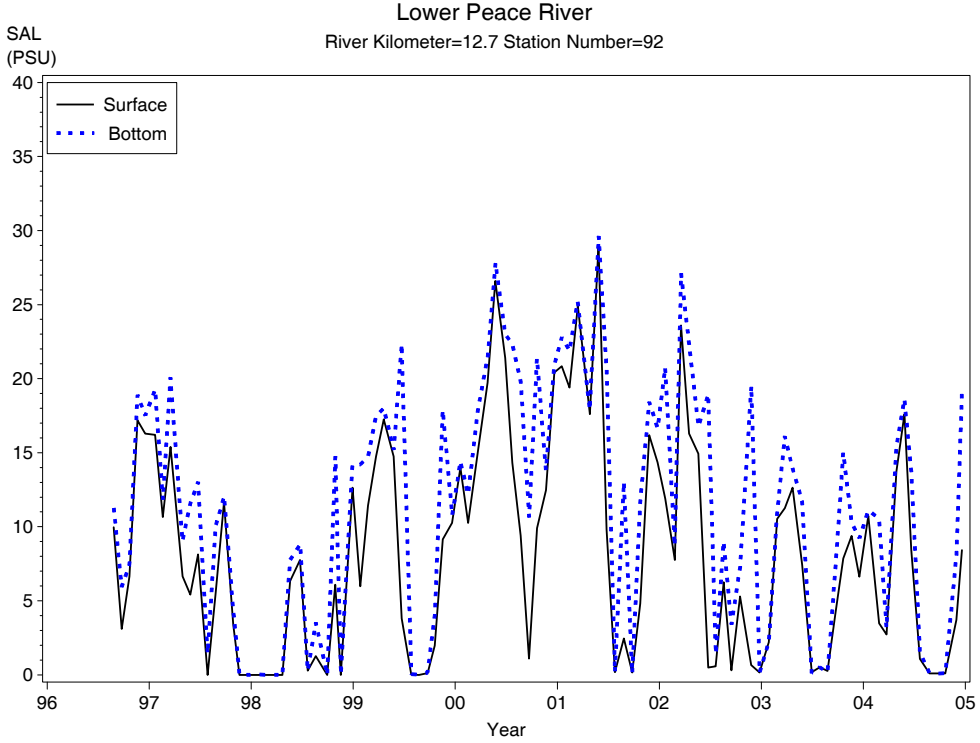

Legend
River Kilometer
HBMP Stations
N
0 1 2 4 6 8
Kilometers
Horse Creek
PRMRWSA Plant
Lettuce Lake
Liverpool
Deep Creek
Hunter Creek
Harbor Heights
Shell Creek
I - 75 Bridge
US - 41 Bridge
38
36
34
19
32
18
30
17
15
26
25
24
14
22
24
20
13
18
23
12
14
22
12
92
10
11
21
8
6
10
4
2
0

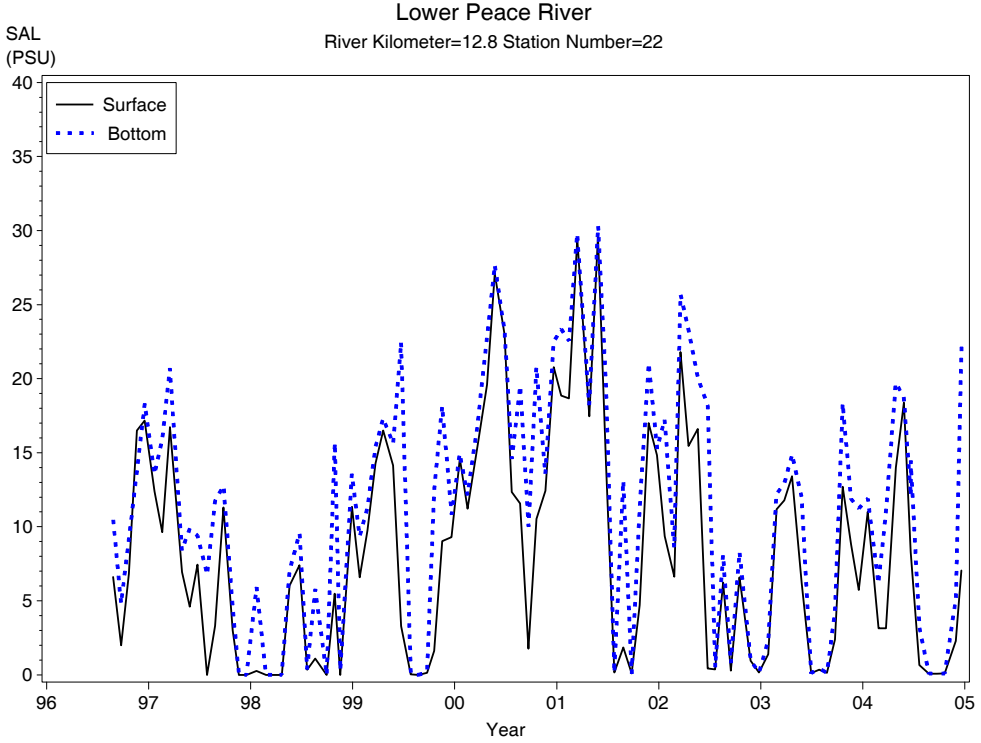

Lower Peace River
River Kilometer=-2.4 Station Number=9
SAL
(PSU)
Surface
Bottom
Year

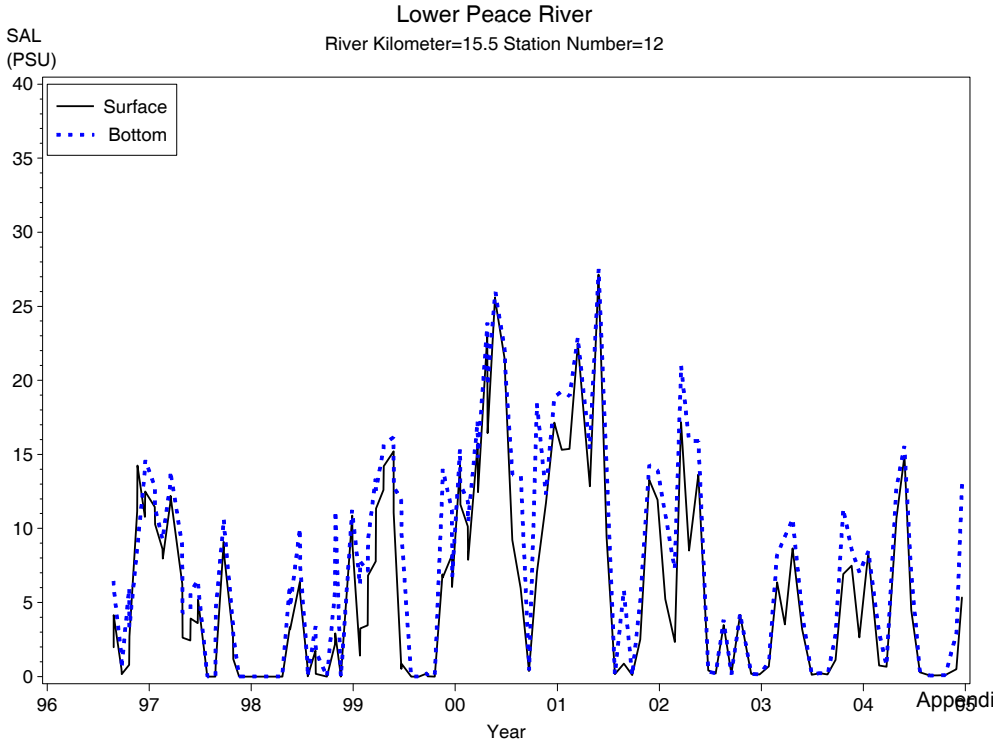

Lower Peace River
River Kilometer=6.6 Station Number=10
SAL
(PSU)
Surface
Bottom
Year

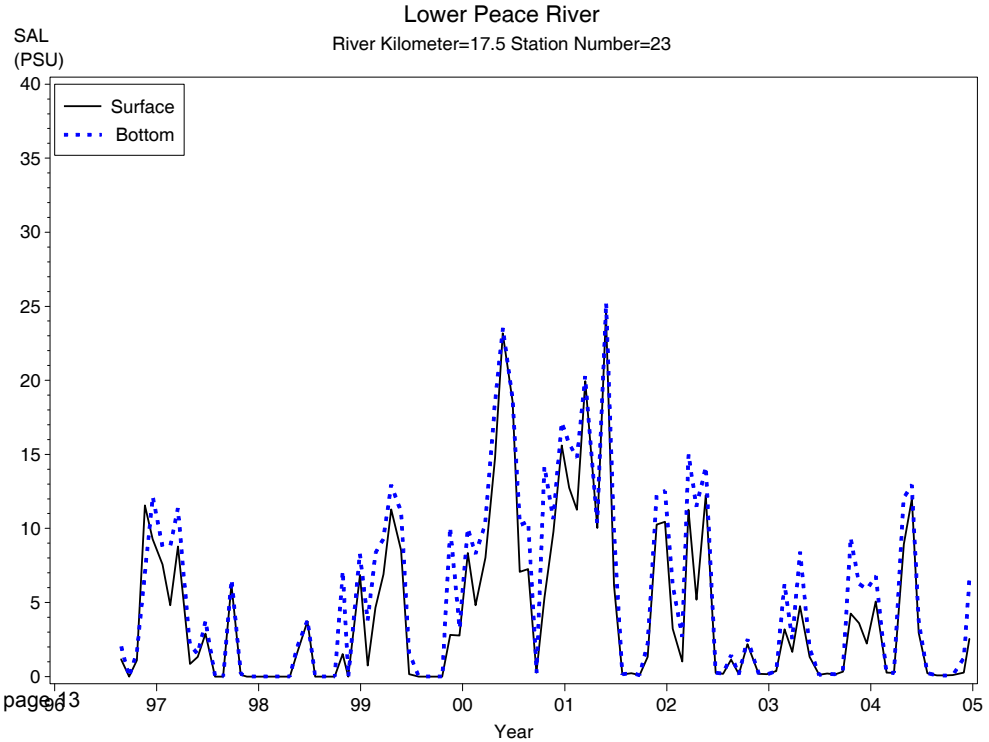

Lower Peace River
River Kilometer=8.4 Station Number=21
SAL
(PSU)
Surface
Bottom
Year

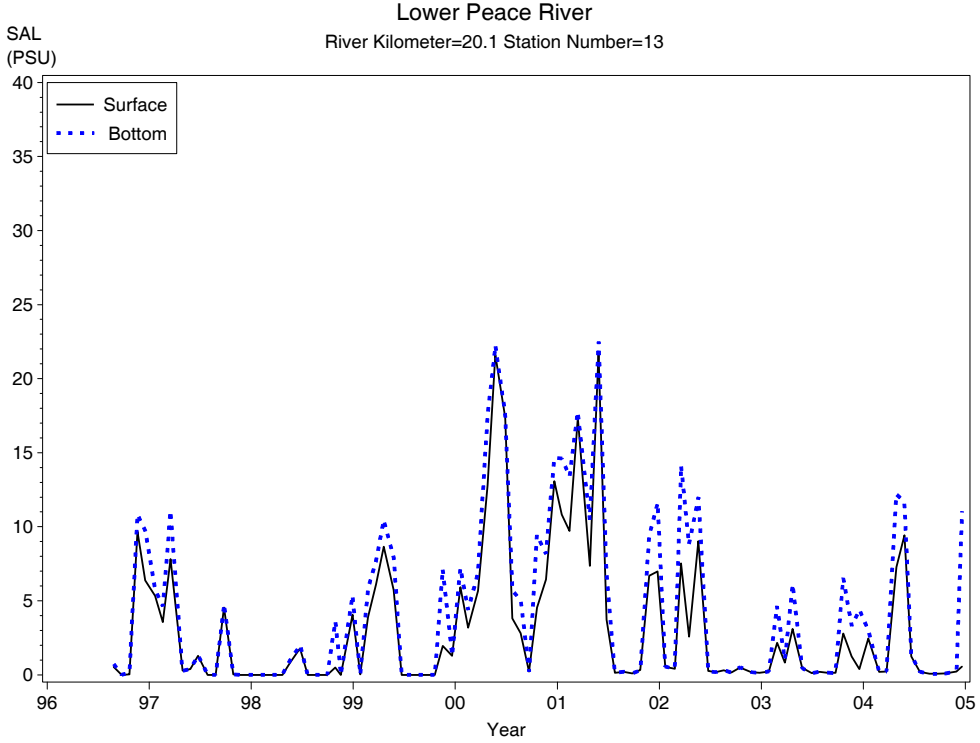

Lower Peace River
River Kilometer=10.5 Station Number=11
SAL
(PSU)
Surface
Bottom
Year

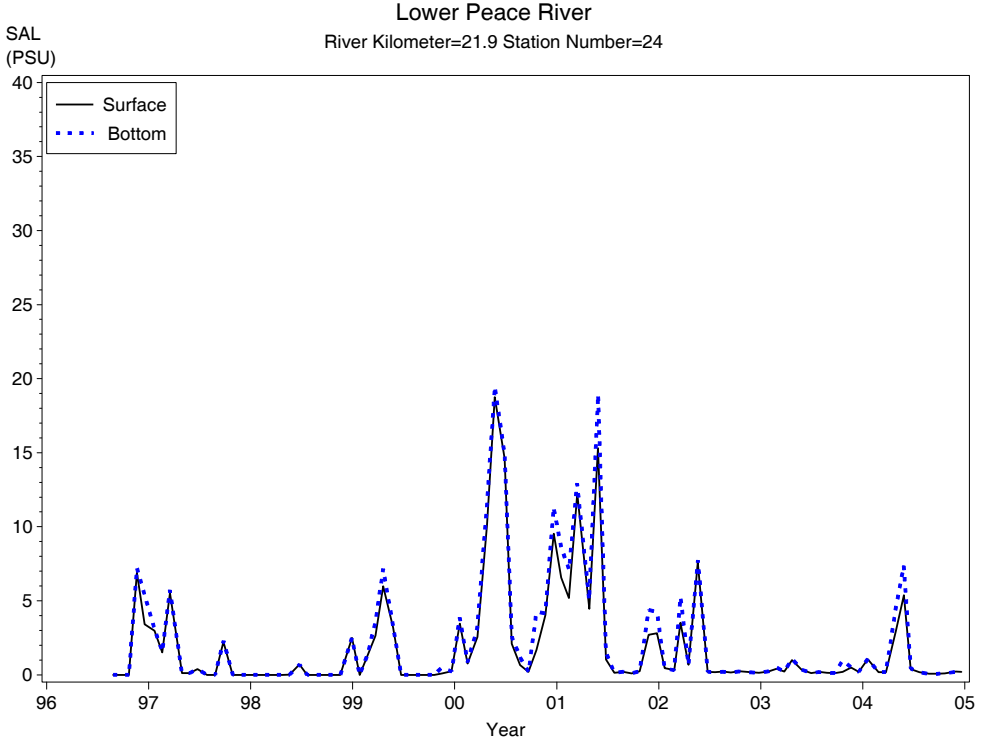

Lower Peace River
River Kilometer=12.7 Station Number=92
SAL
(PSU)
Surface
Bottom
Year

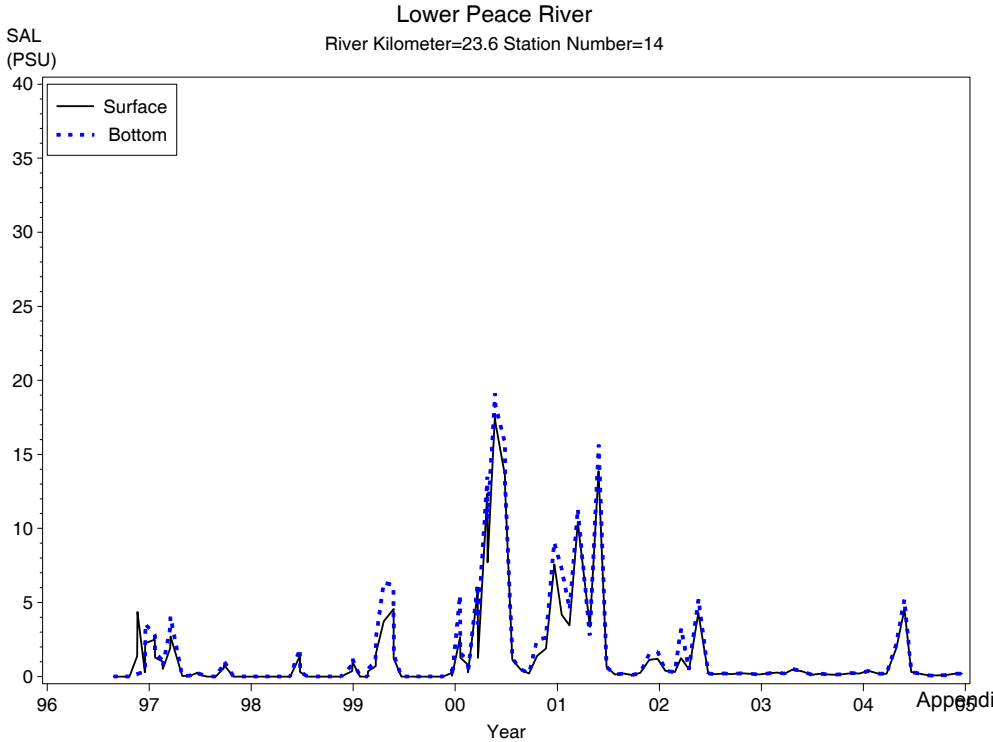

Lower Peace River
River Kilometer=12.8 Station Number=22
SAL
(PSU)
Surface
Bottom
Year

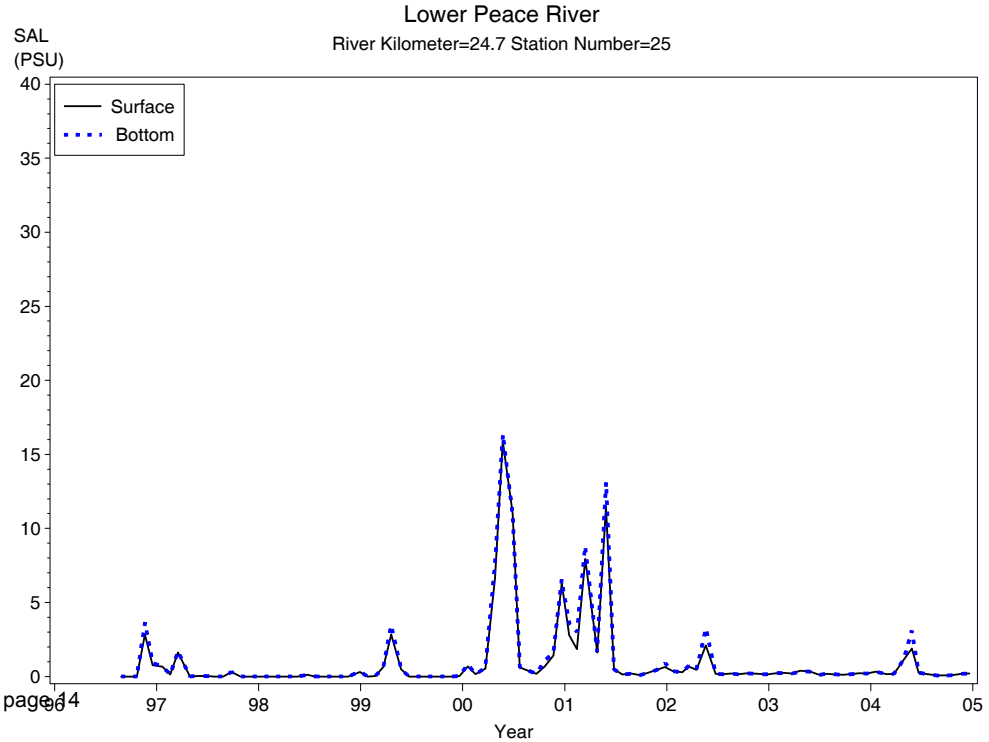

Lower Peace River
River Kilometer=15.5 Station Number=12
SAL
(PSU)
Surface
Bottom
Year

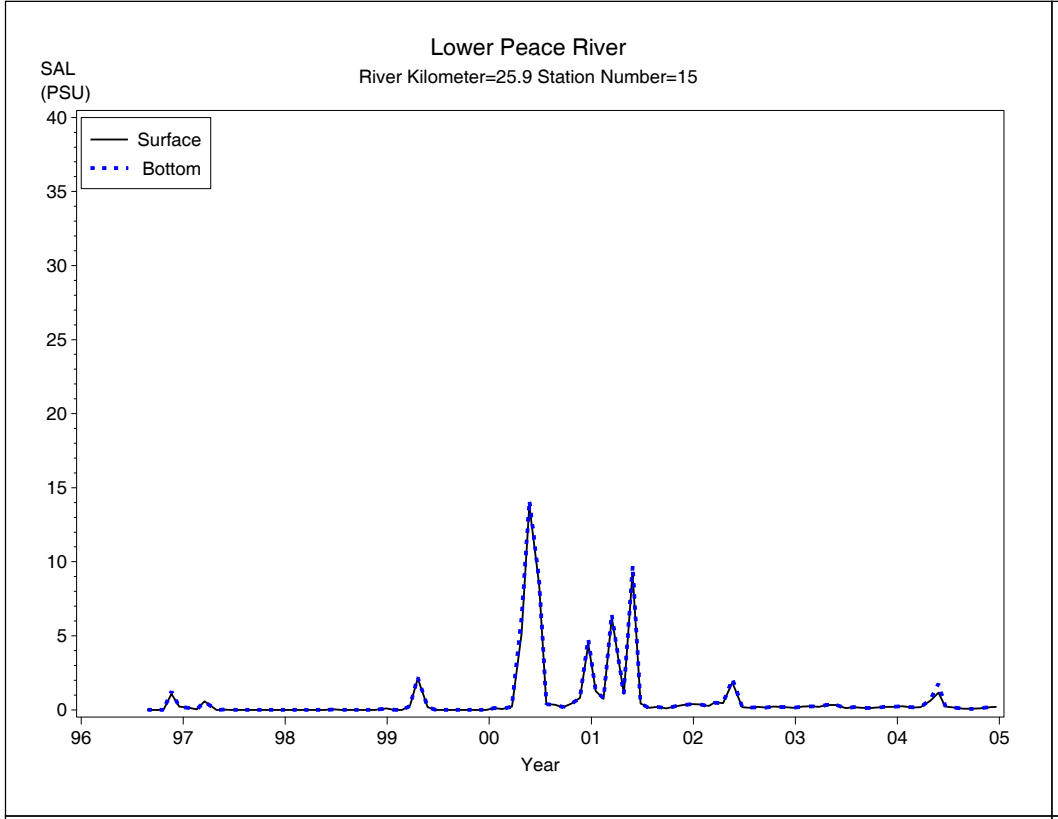

Lower Peace River
River Kilometer=17.5 Station Number=23
SAL
(PSU)
Surface
Bottom
Year

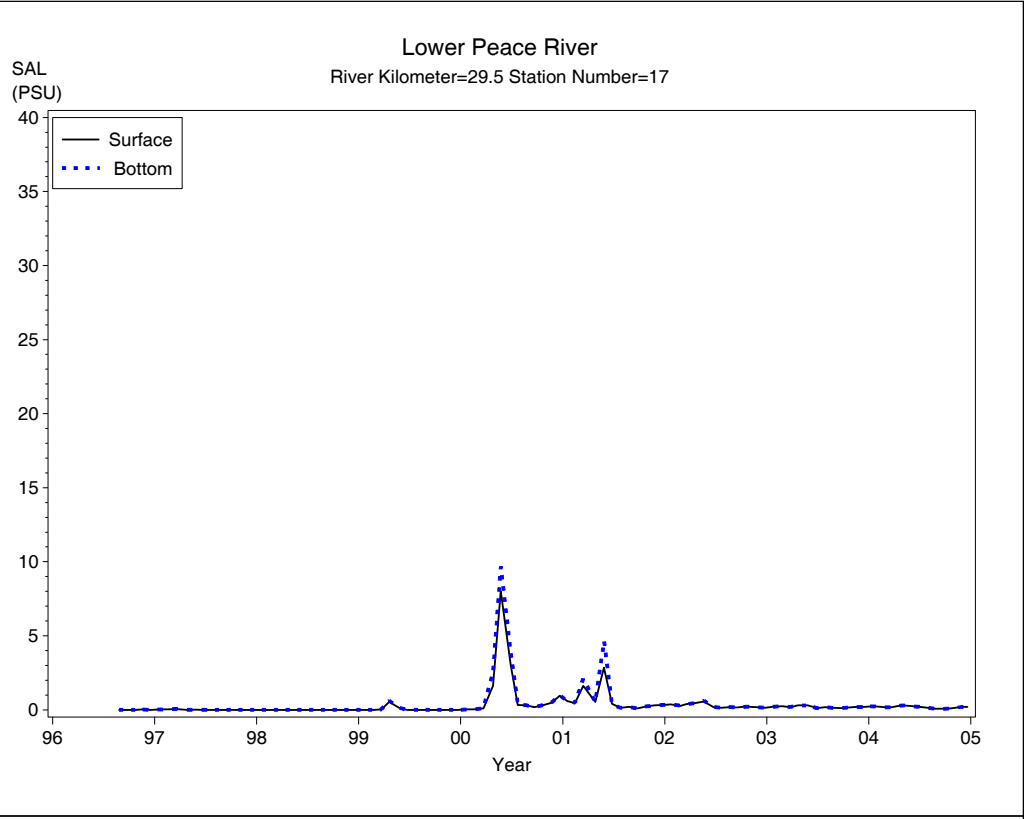

Lower Peace River
River Kilometer=20.1 Station Number=13
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year

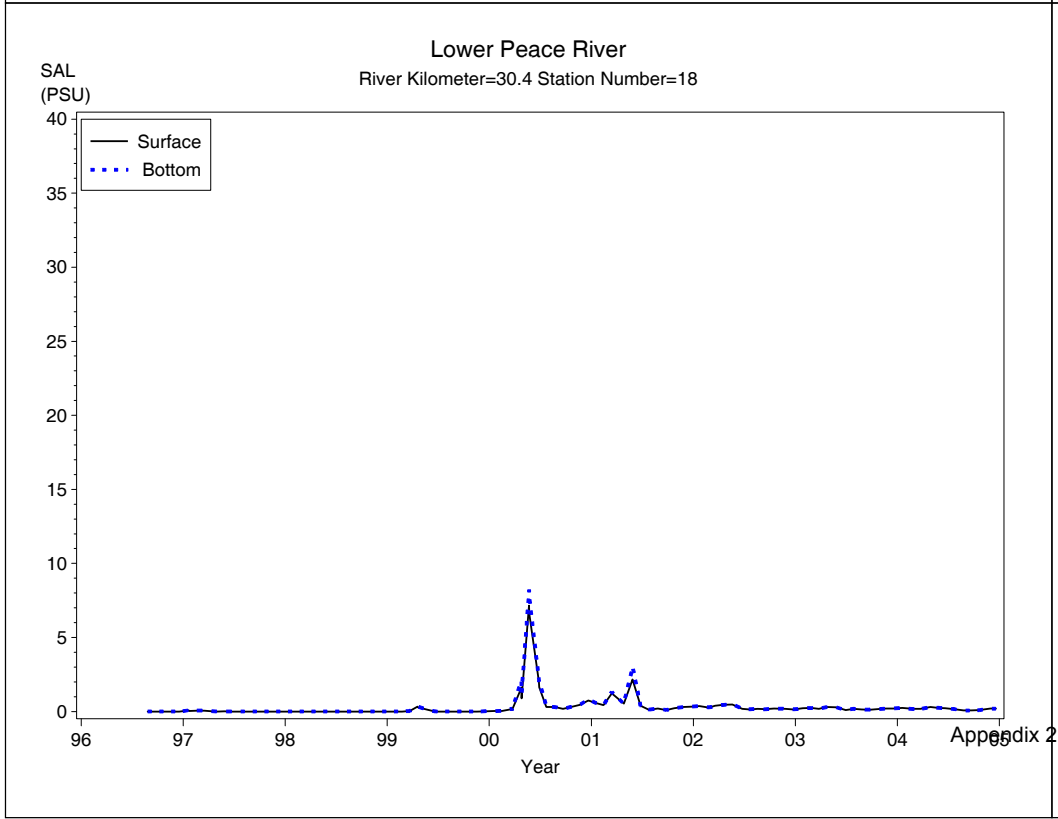

Lower Peace River
River Kilometer=21.9 Station Number=24
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year

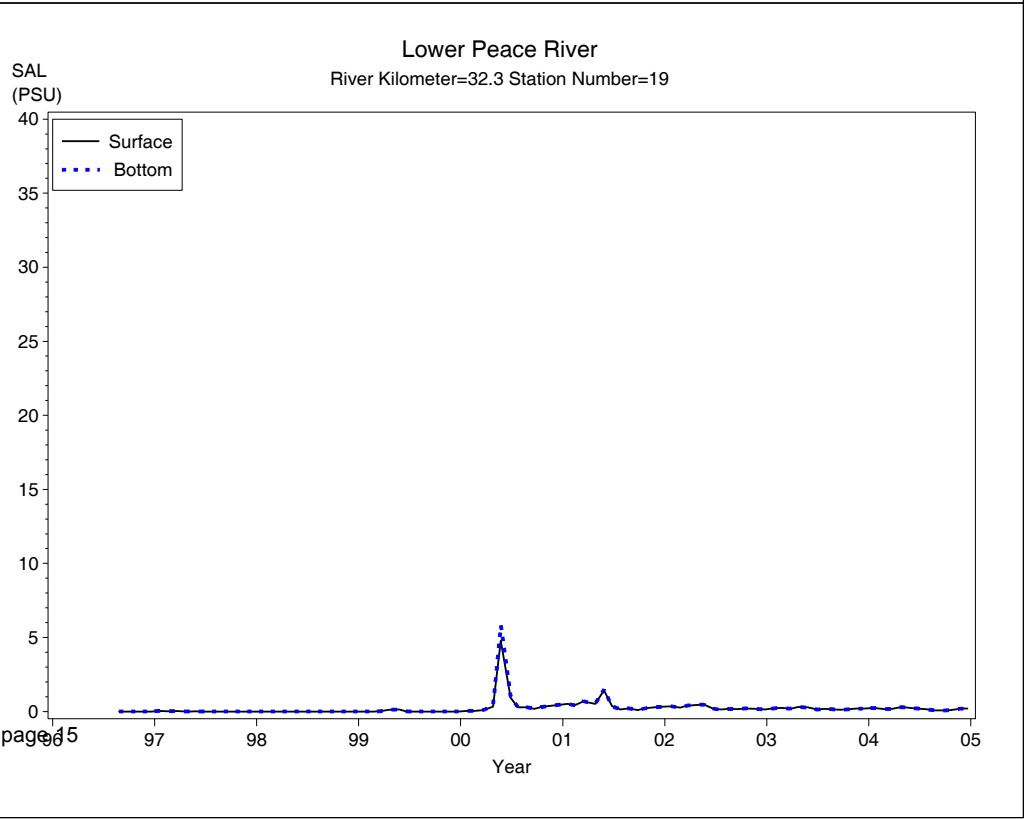

Lower Peace River
River Kilometer=23.6 Station Number=14
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year

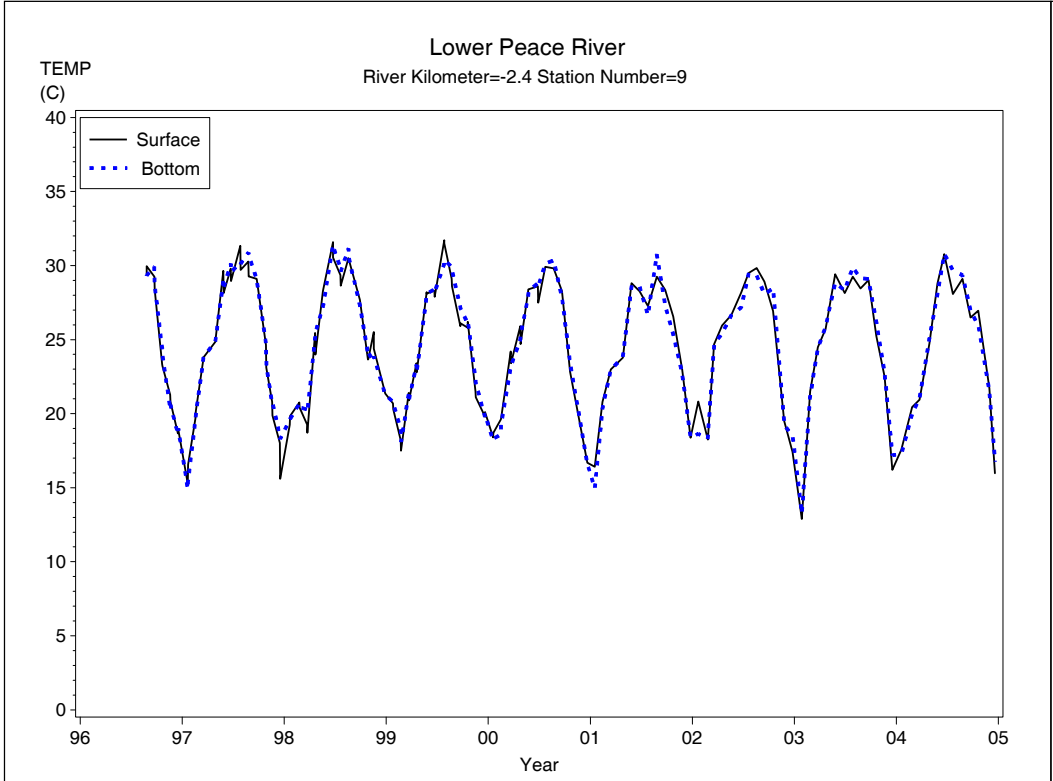

Lower Peace River
River Kilometer=24.7 Station Number=25
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year

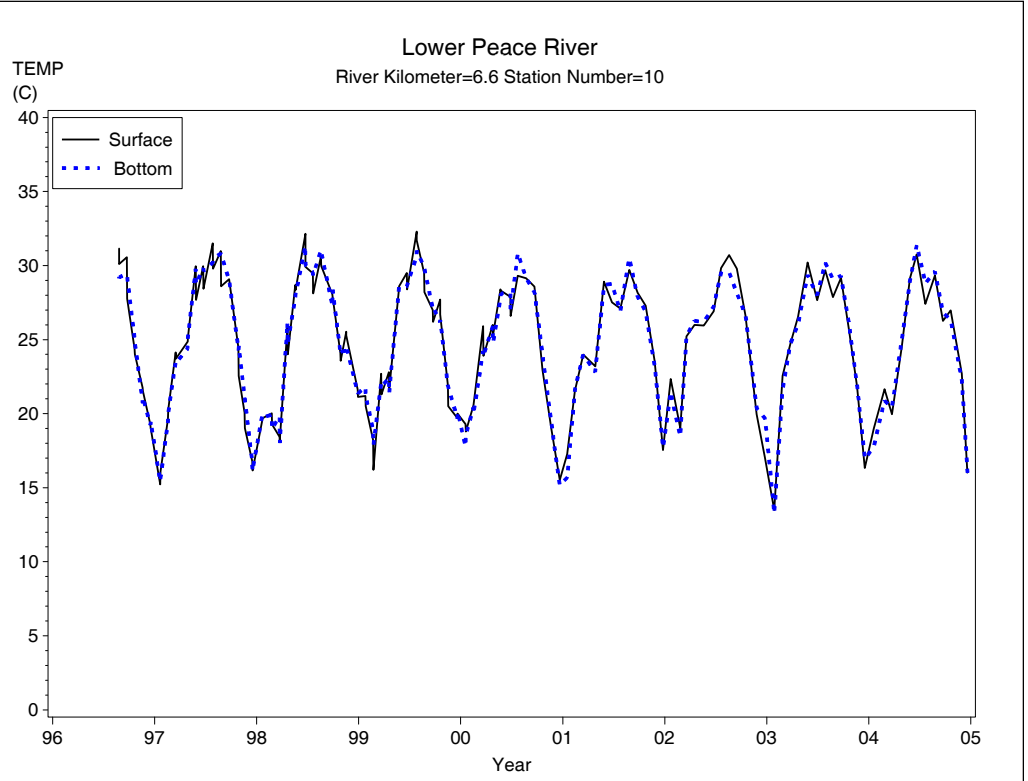

Lower Peace River
River Kilometer=25.9 Station Number=15
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=29.5 Station Number=17
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=30.4 Station Number=18
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=32.3 Station Number=19
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=-2.4 Station Number=9
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=6.6 Station Number=10
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
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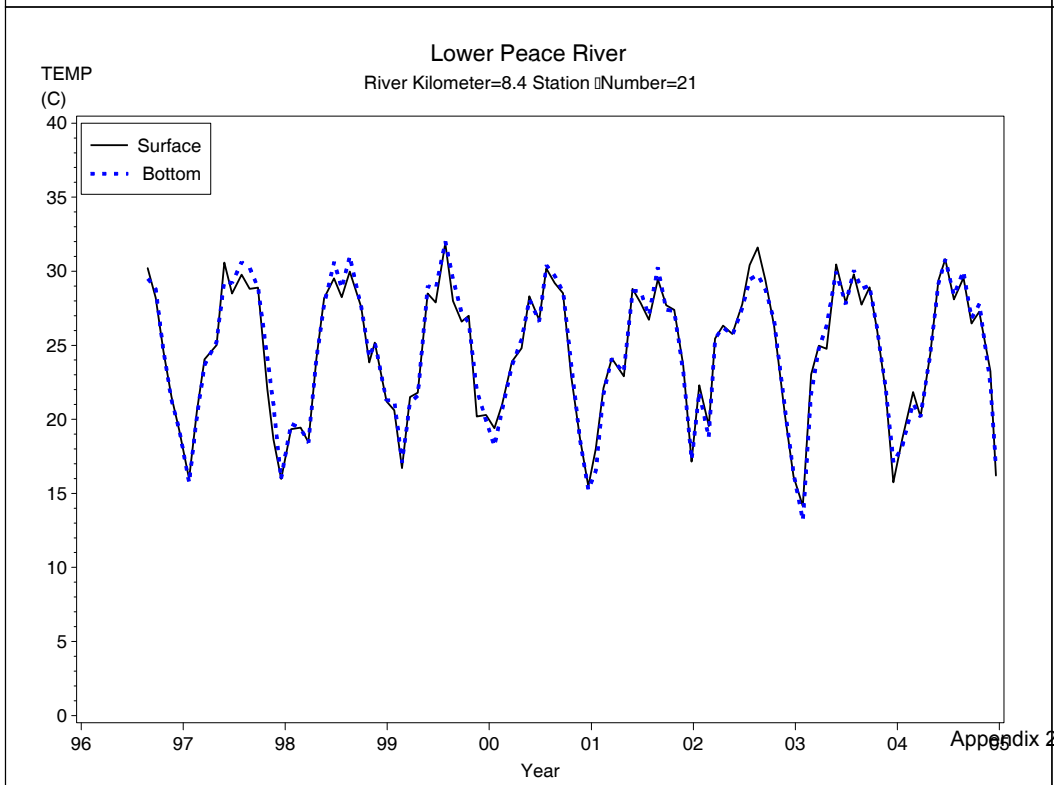
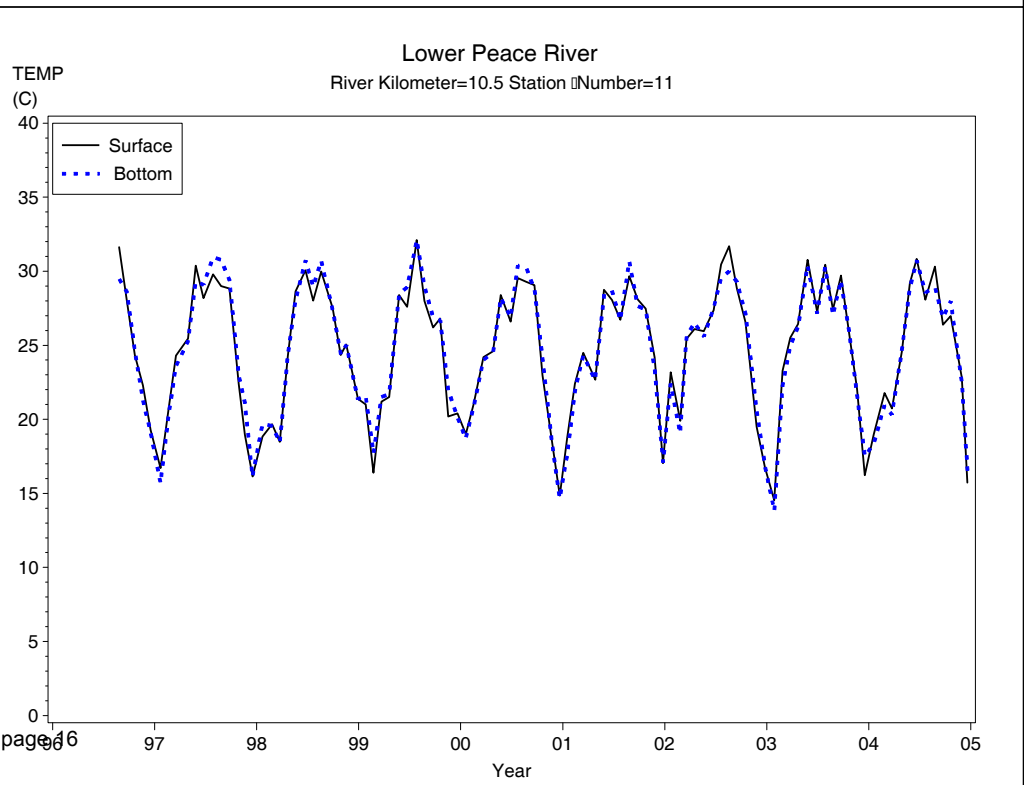
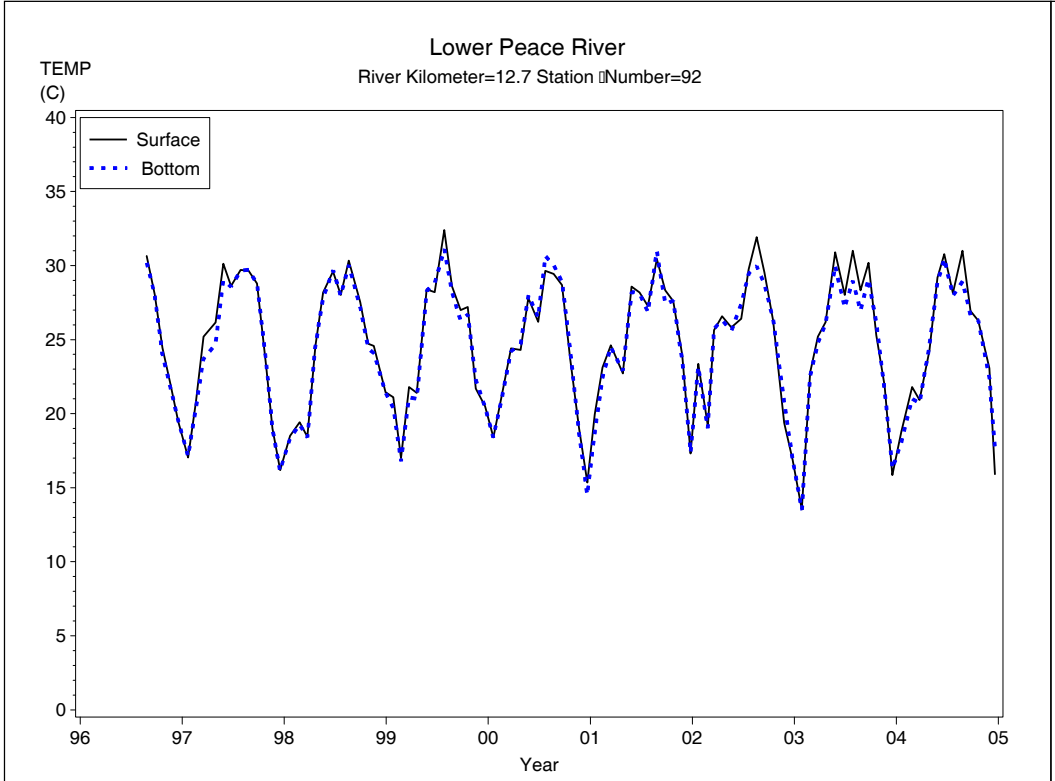
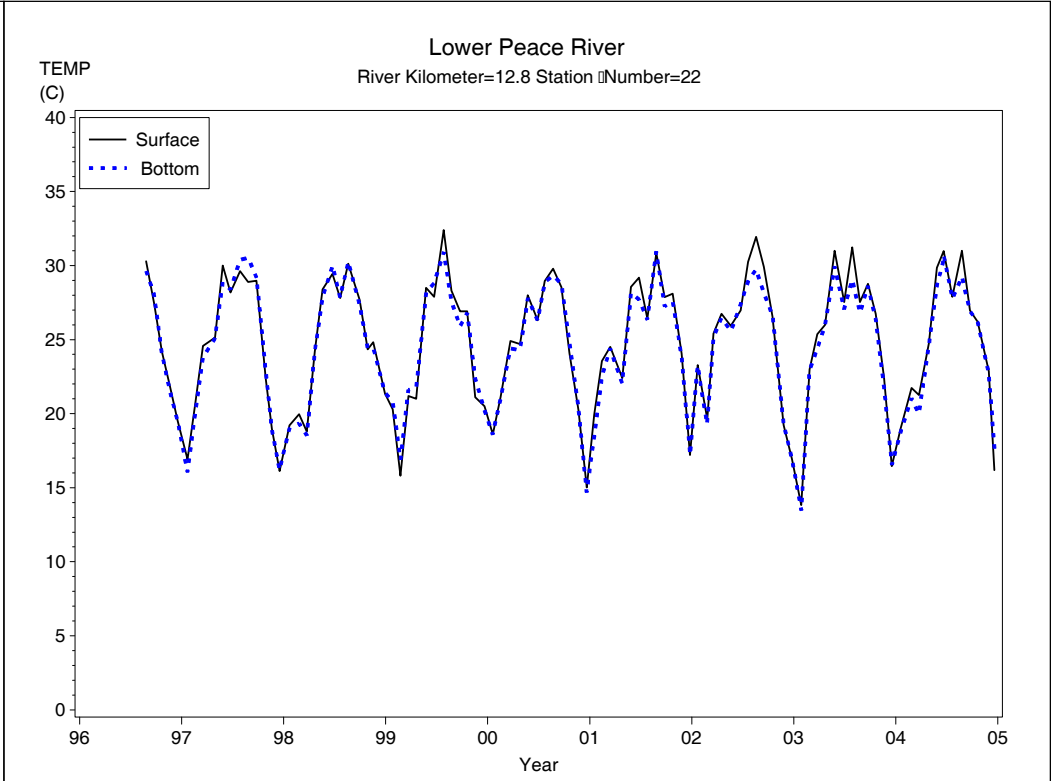
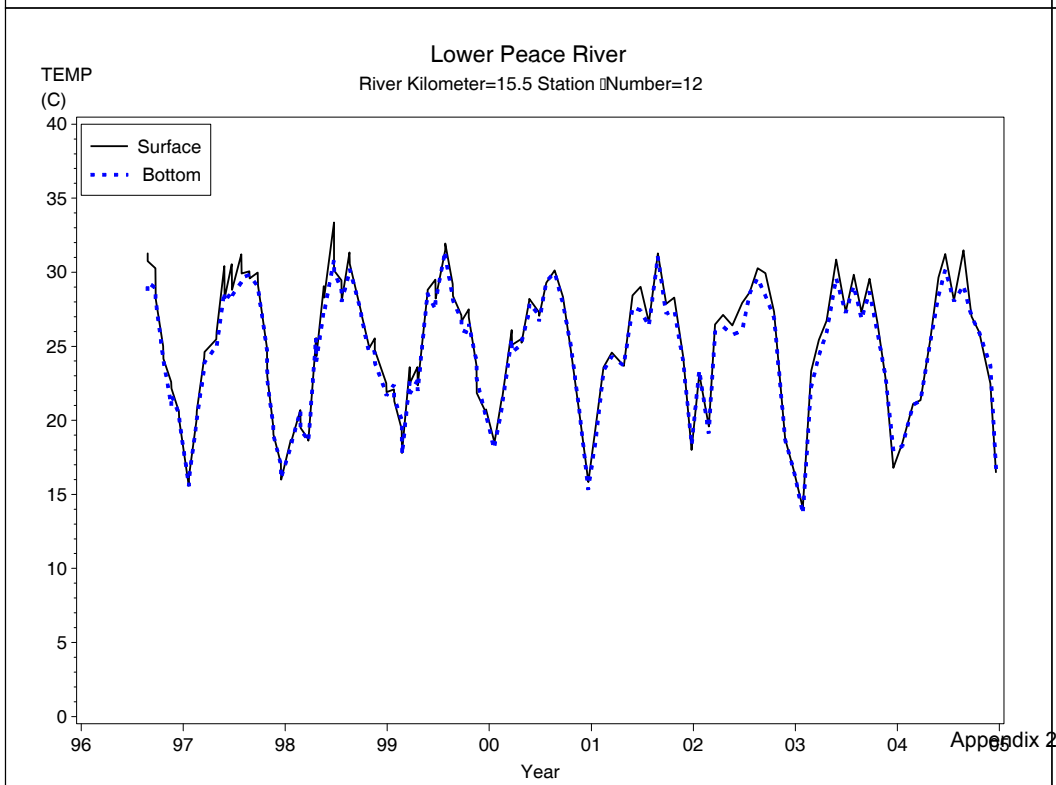
00
01
02
03
04
05
Year

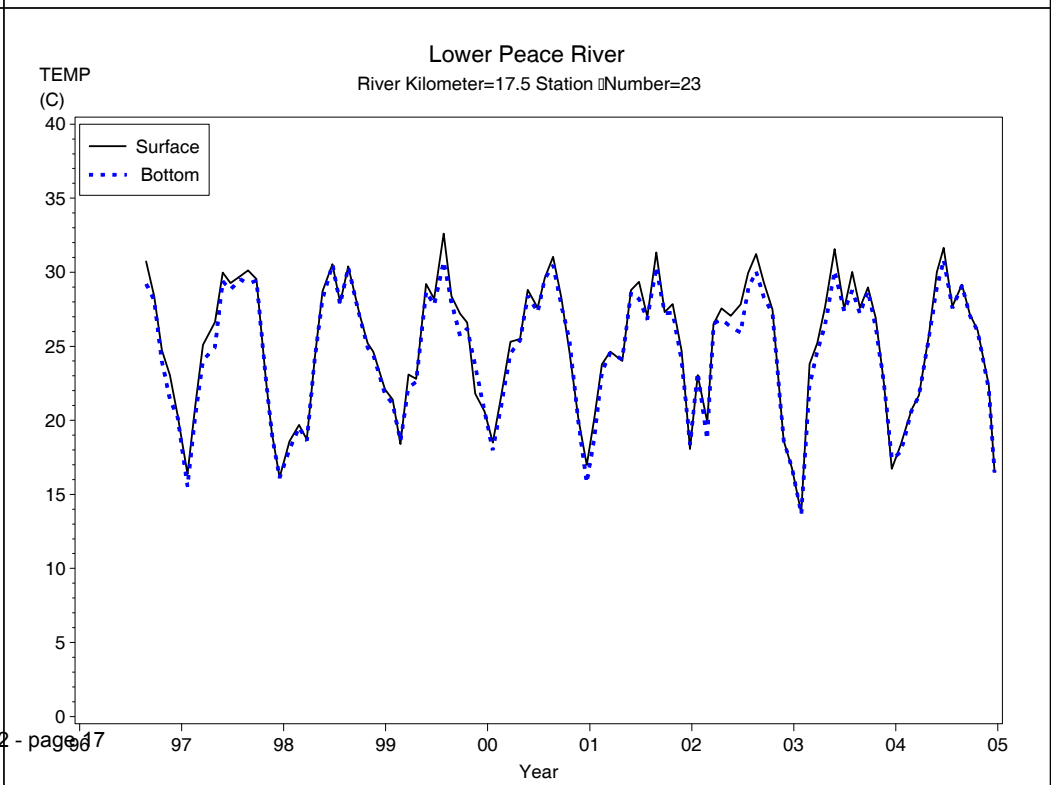

Lower Peace River
River Kilometer=8.4 Station Number=21
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year

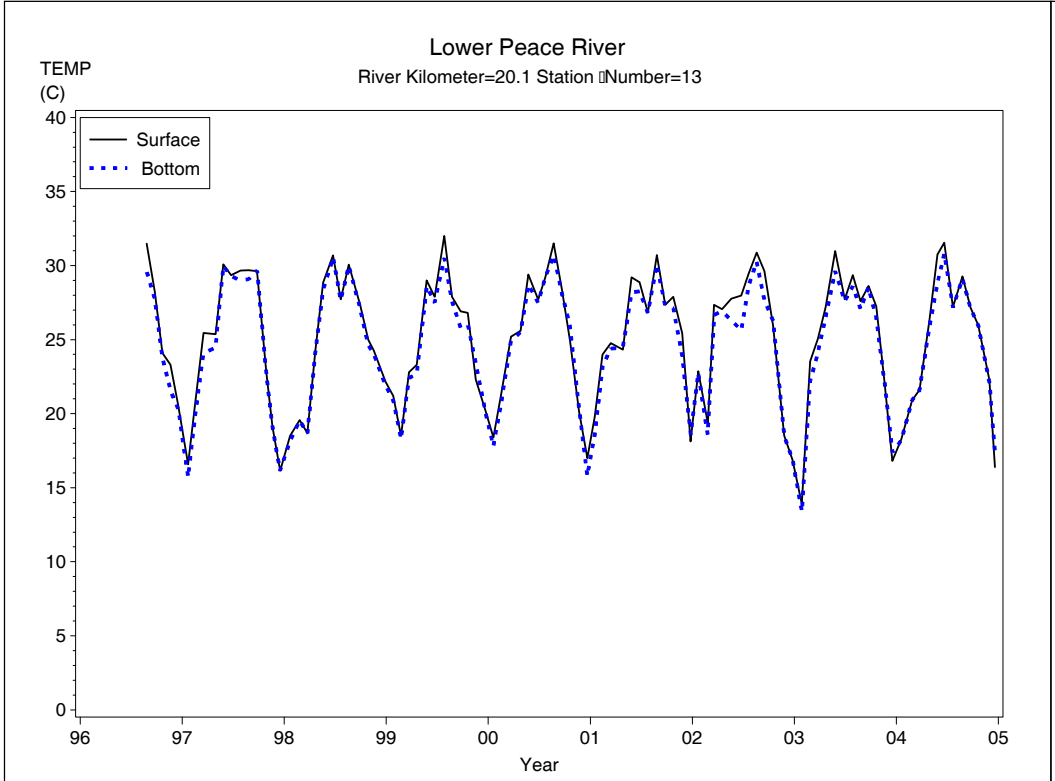

Lower Peace River
River Kilometer=10.5 Station Number=11
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
96
97
98
99
00
01
02
03
04
05
Year

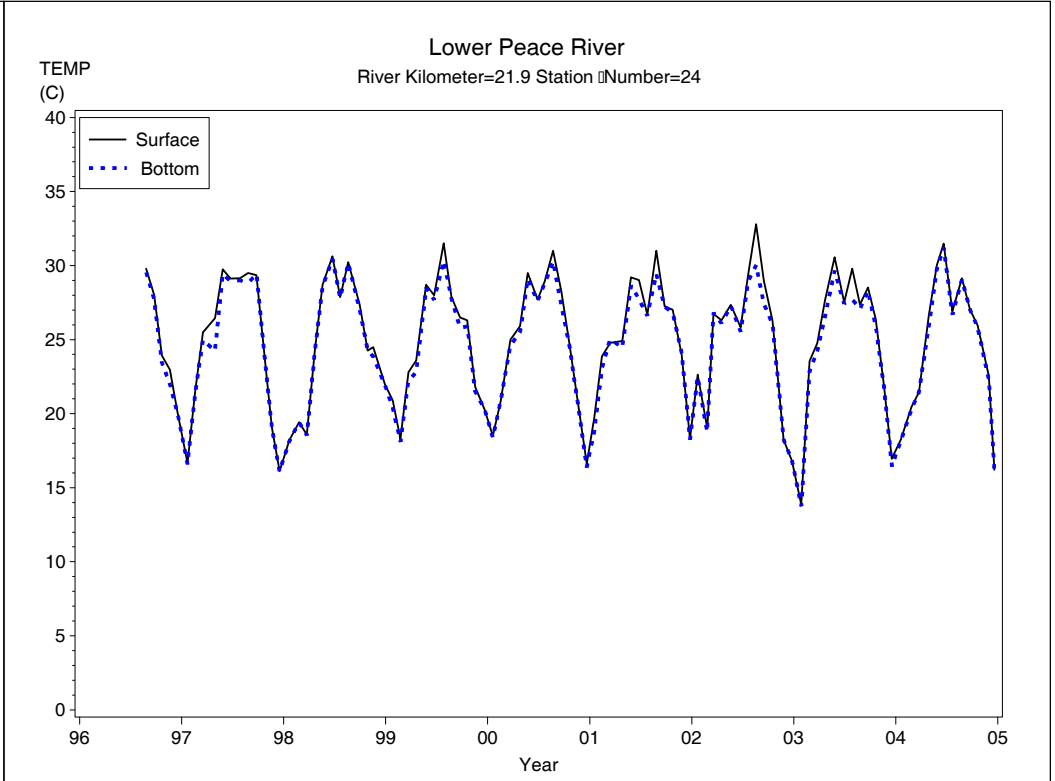

Lower Peace River
River Kilometer=12.7 Station Number=92
TEMP
(C)
Surface
Bottom
Year

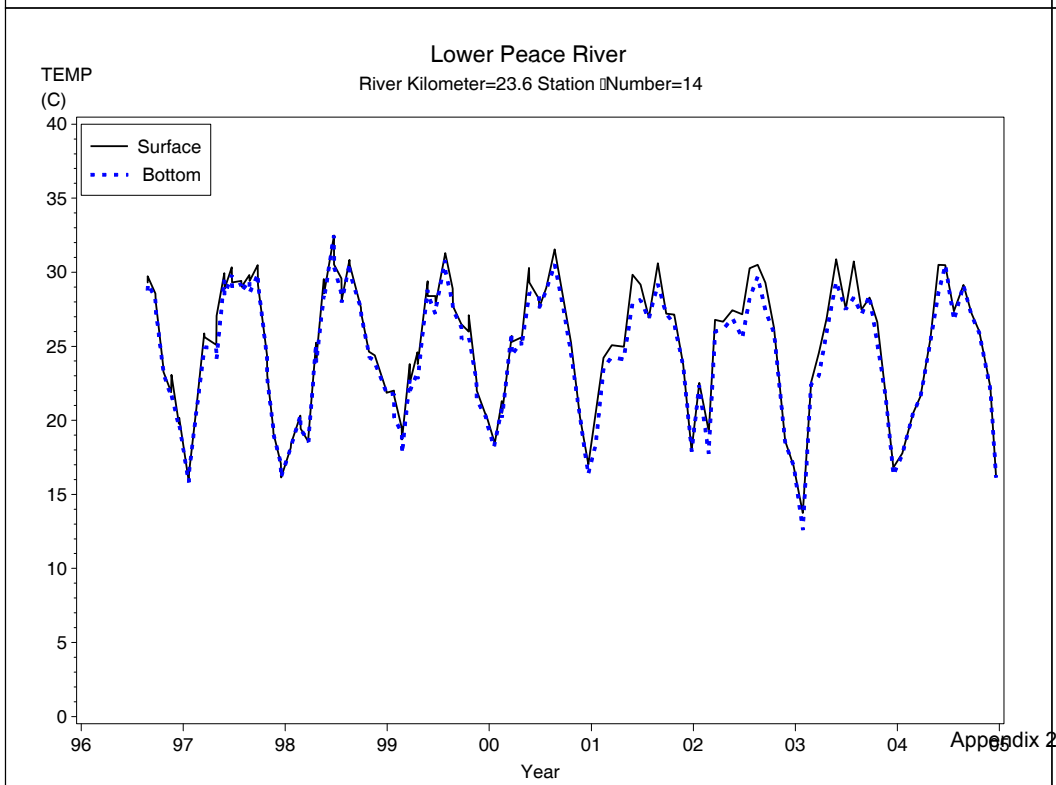

Lower Peace River
River Kilometer=12.8 Station Number=22
TEMP
(C)
Surface
Bottom
Year

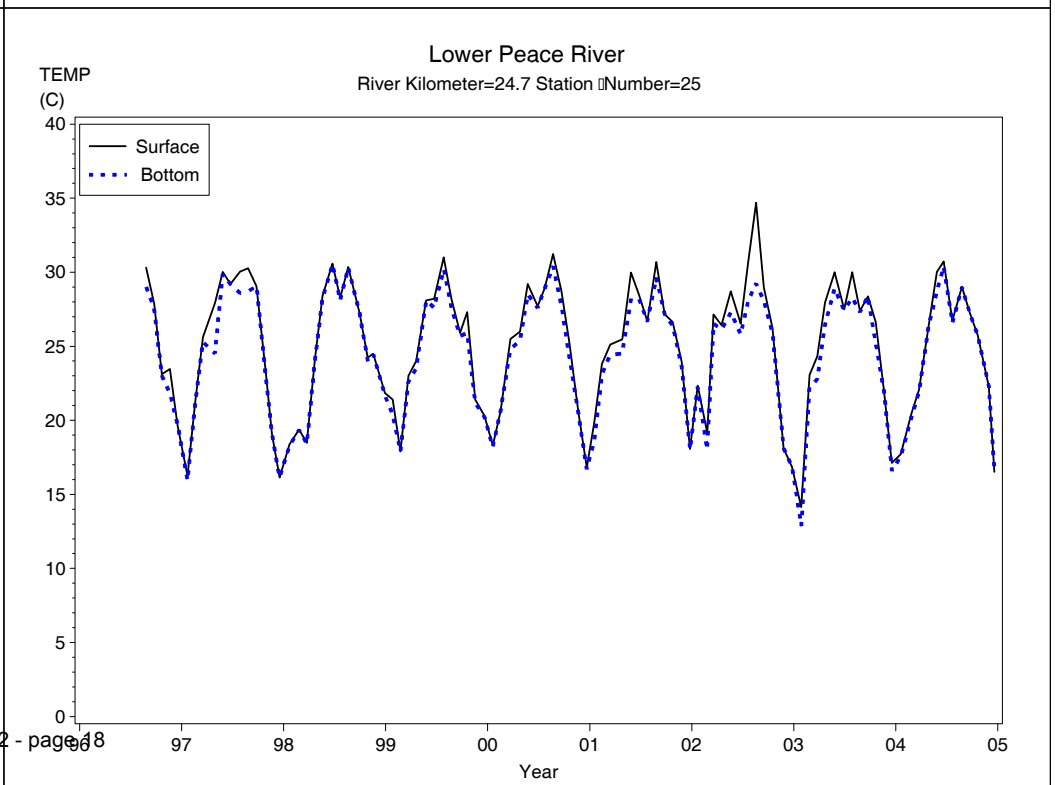

Lower Peace River
River Kilometer=15.5 Station Number=12
TEMP
(C)
Surface
Bottom
Year

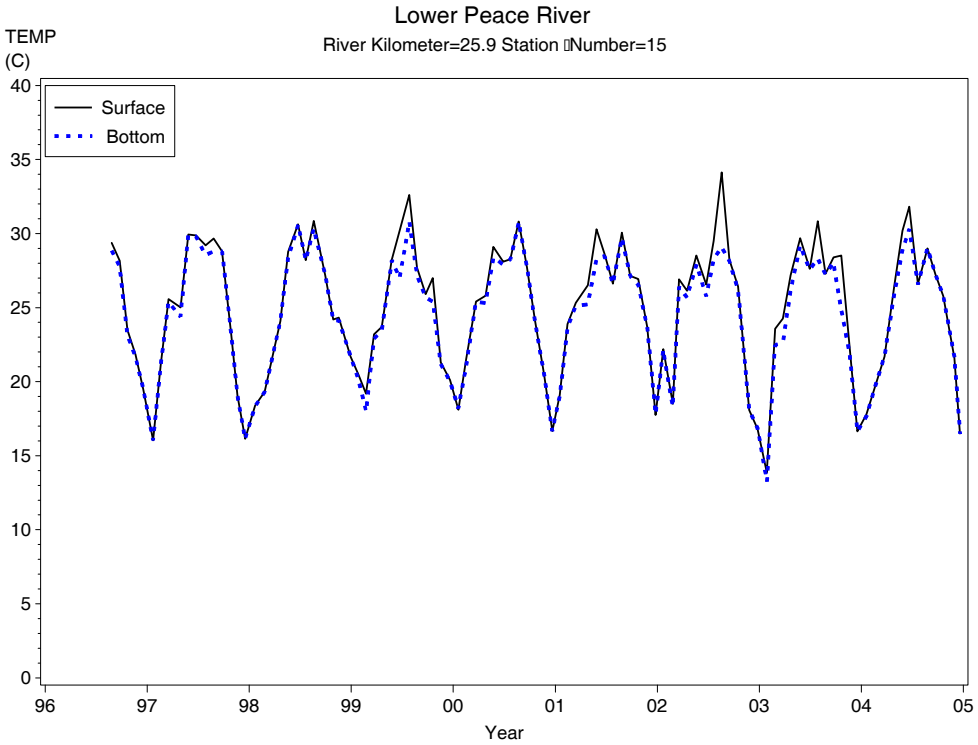

Lower Peace River
River Kilometer=17.5 Station Number=23
TEMP
(C)
Surface
Bottom
Year

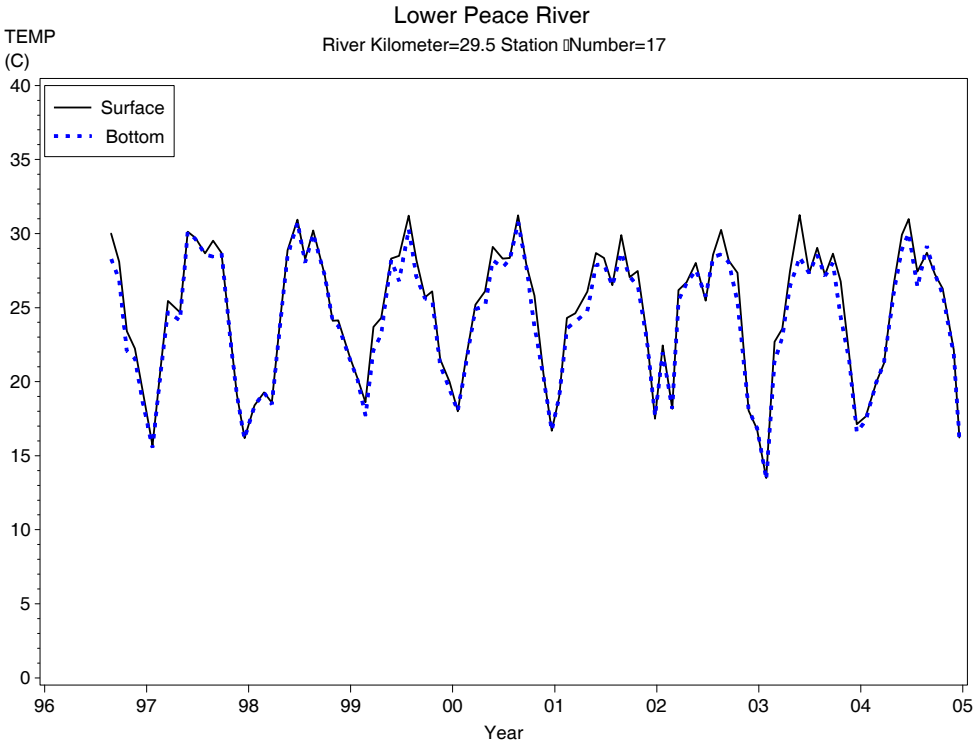

Lower Peace River
River Kilometer=20.1 Station Number=13
TEMP
(C)
Surface
Bottom
Year

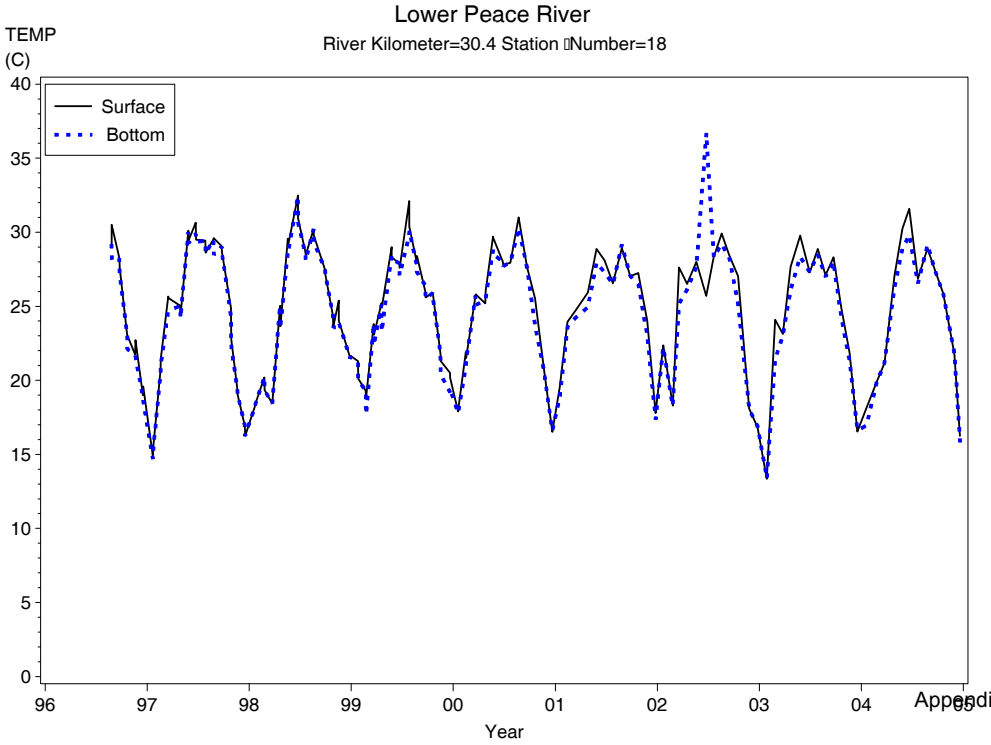

Lower Peace River
River Kilometer=21.9 Station Number=24
TEMP
(C)
Surface
Bottom
Year

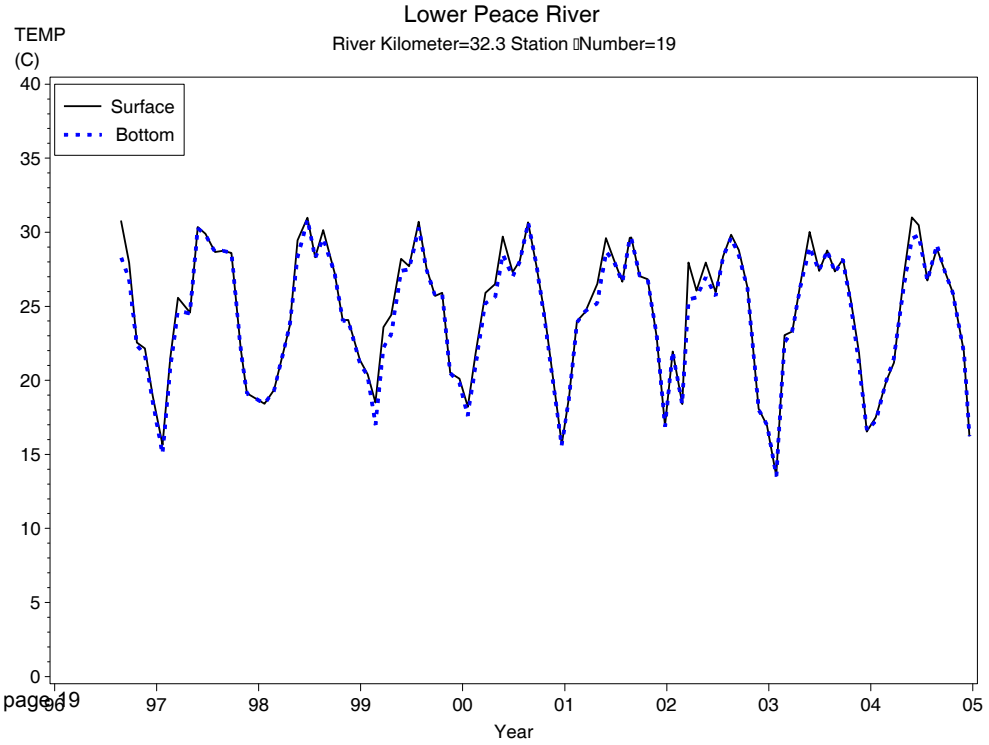

Lower Peace River
River Kilometer=23.6 Station Number=14
TEMP
(C)
Surface
Bottom
Year

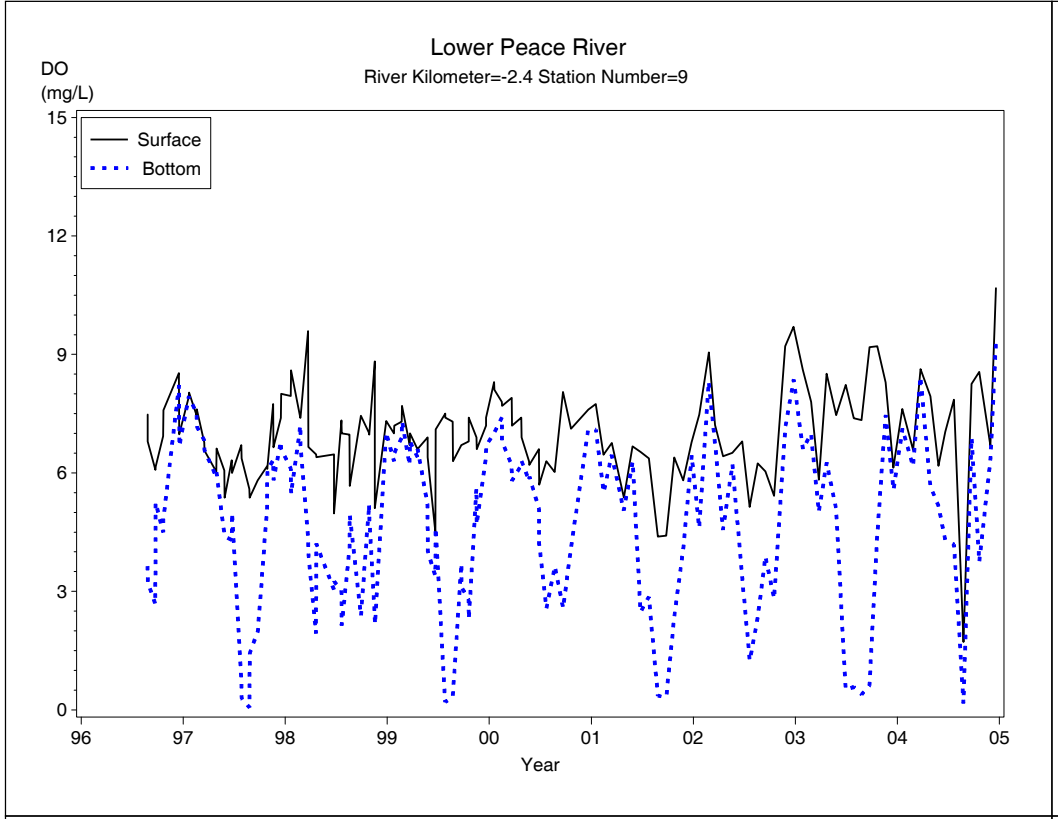

Lower Peace River
River Kilometer=24.7 Station Number=25
TEMP
(C)
Surface
Bottom
Year

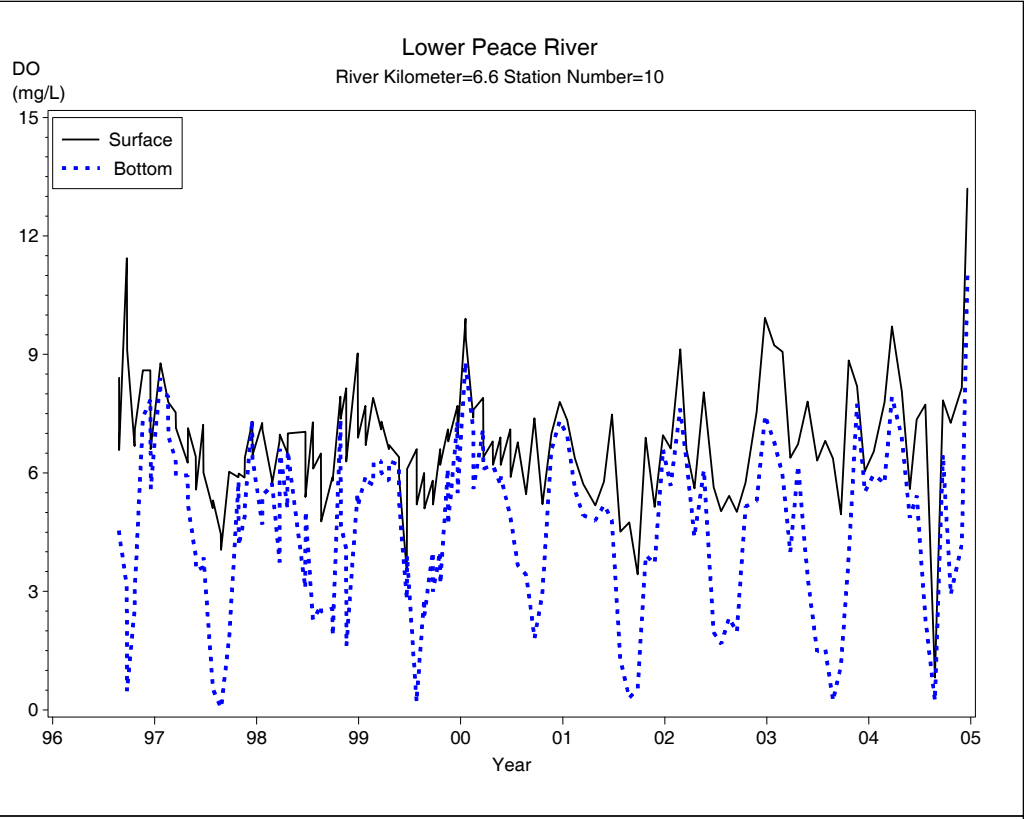

Lower Peace River
River Kilometer=25.9 Station Number=15
TEMP
(C)
Surface
Bottom
Year

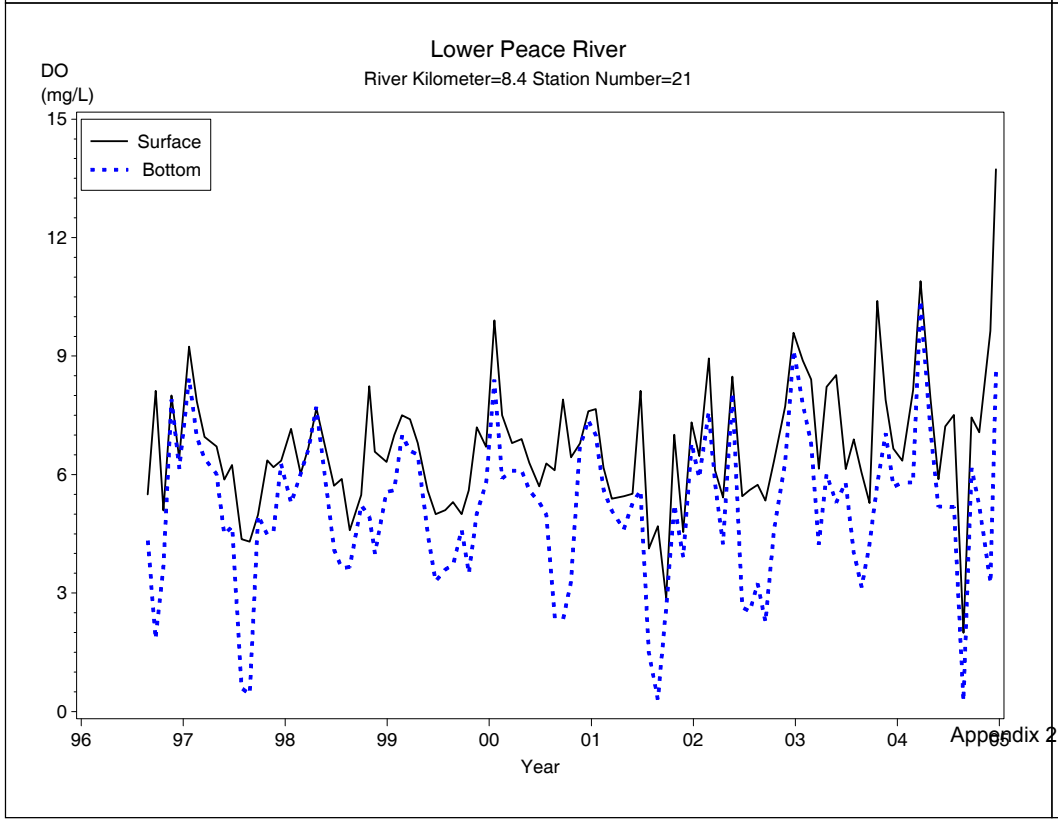

Lower Peace River
River Kilometer=29.5 Station Number=17
TEMP
(C)
Surface
Bottom
Year

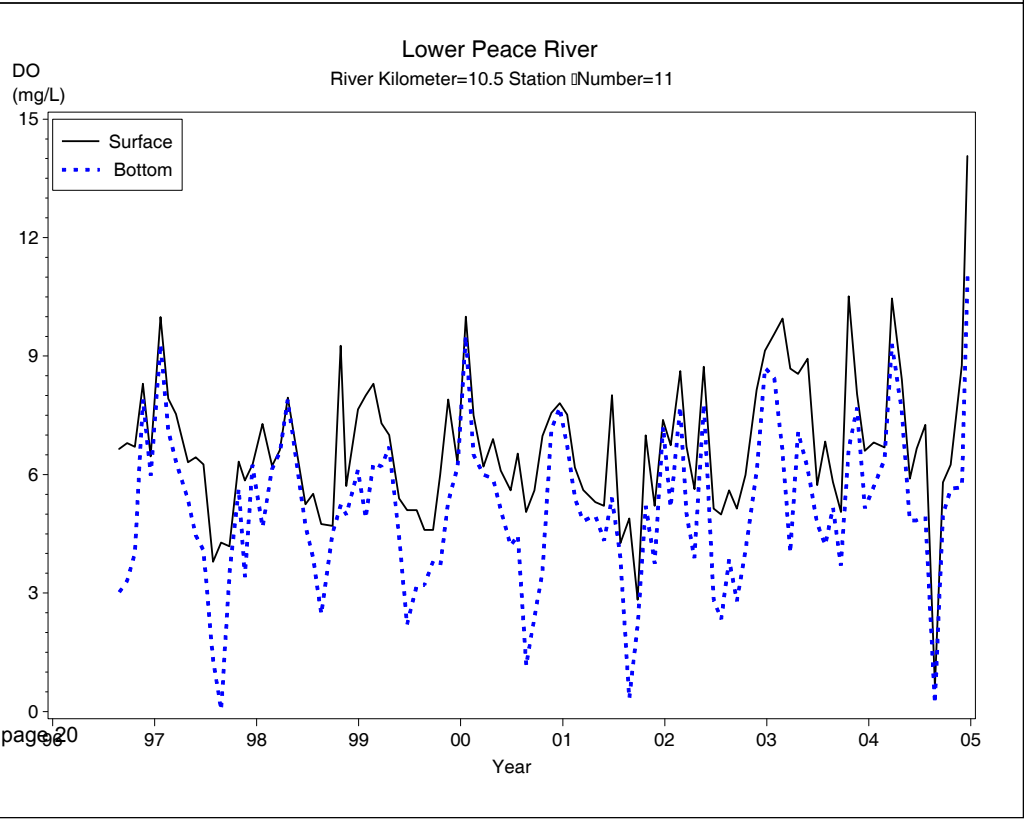

Lower Peace River
River Kilometer=30.4 Station Number=18
TEMP
(C)
Surface
Bottom
Year

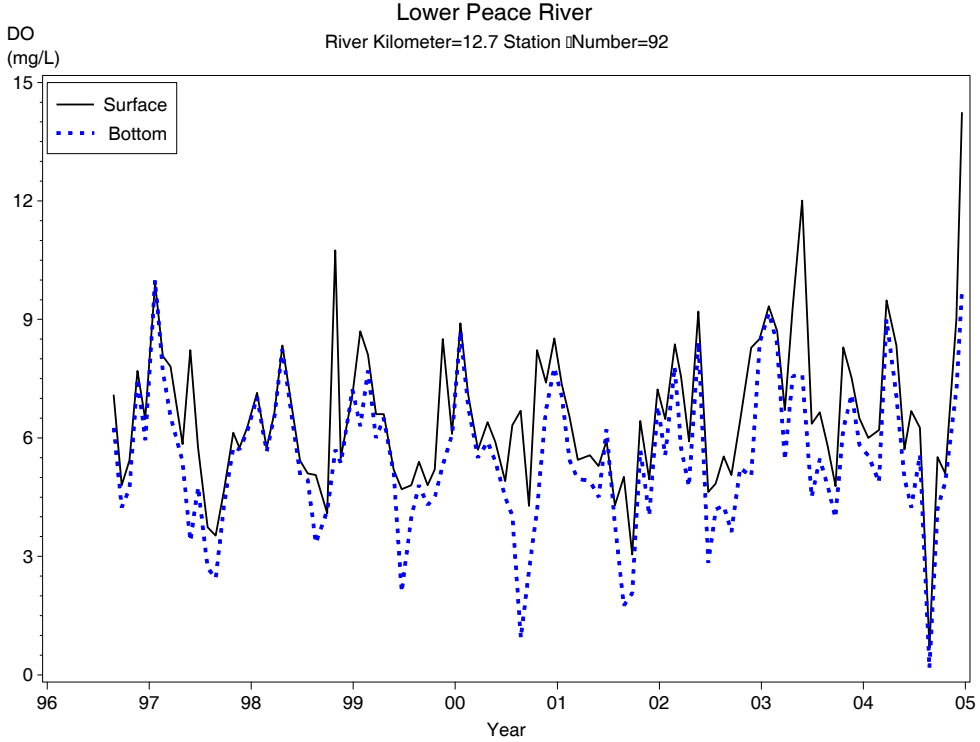

Lower Peace River
River Kilometer=32.3 Station Number=19
TEMP
(C)
Surface
Bottom
Year

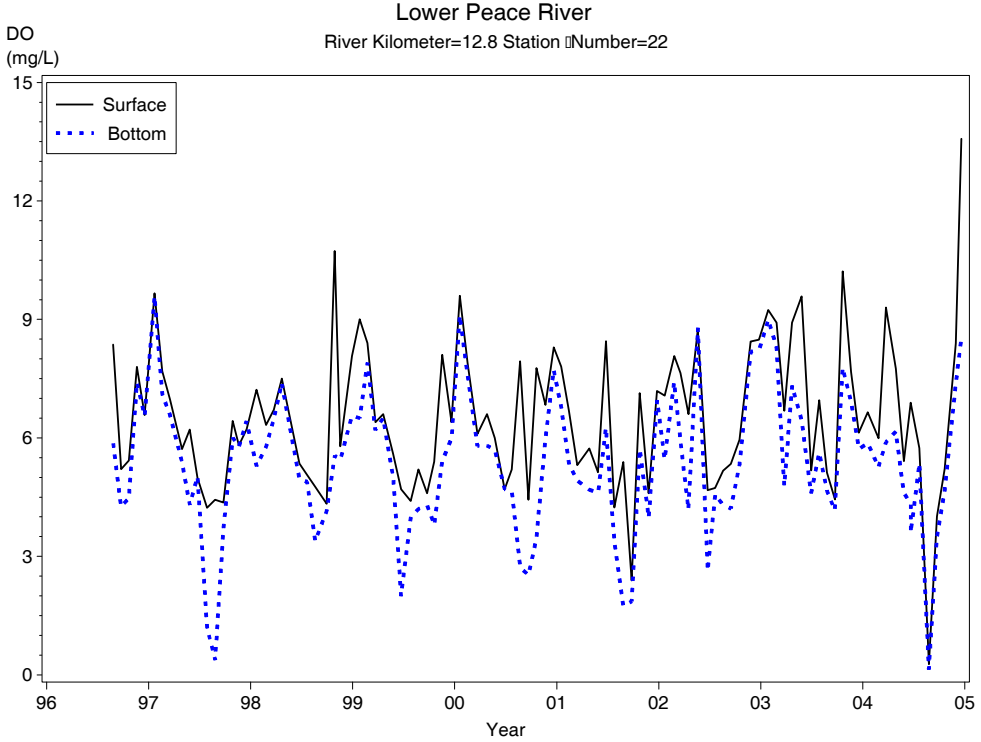

Lower Peace River
River Kilometer=-2.4 Station Number=9
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

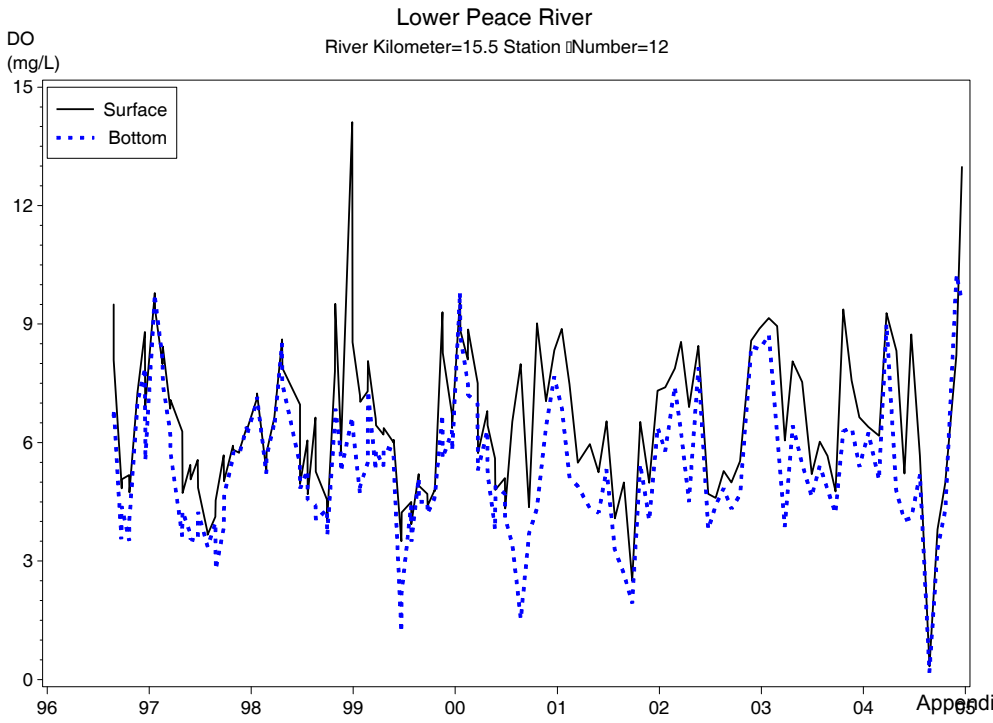

Lower Peace River
River Kilometer=6.6 Station Number=10
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

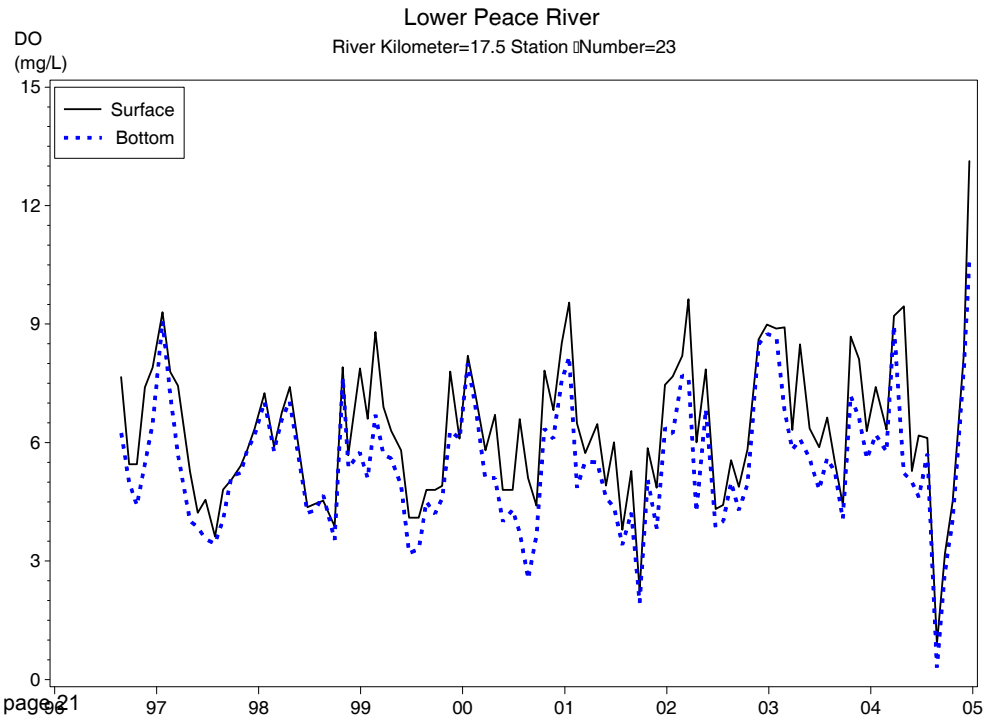

Lower Peace River
River Kilometer=8.4 Station Number=21
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

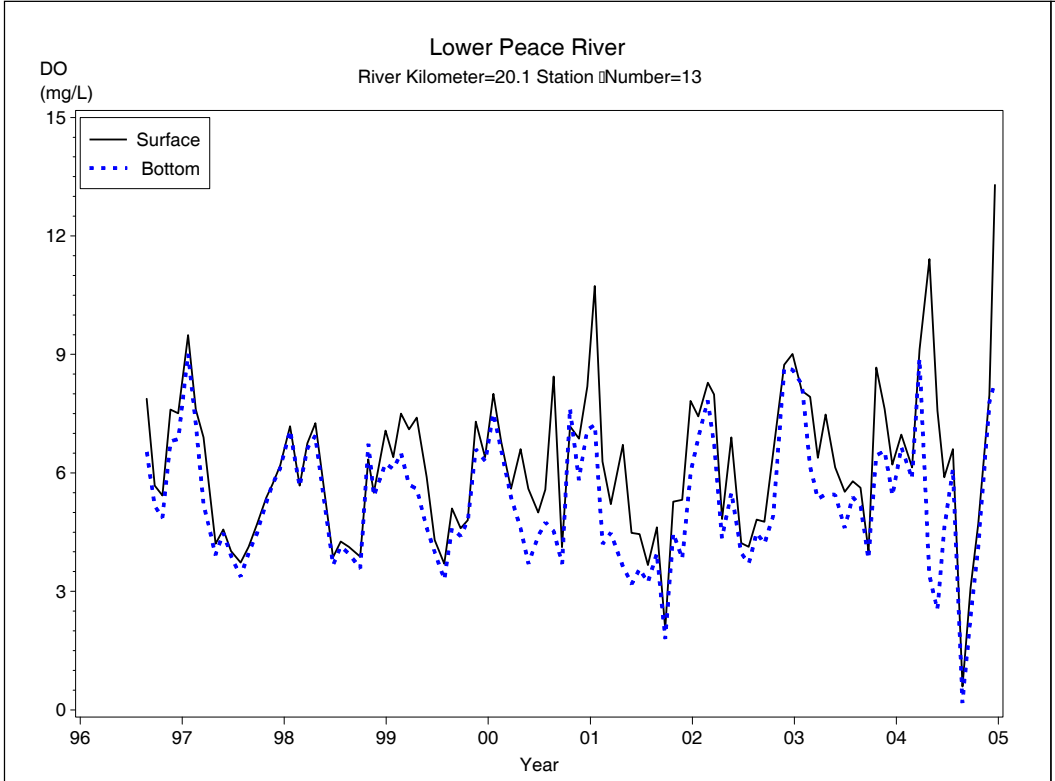

Lower Peace River
River Kilometer=10.5 Station Number=11
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

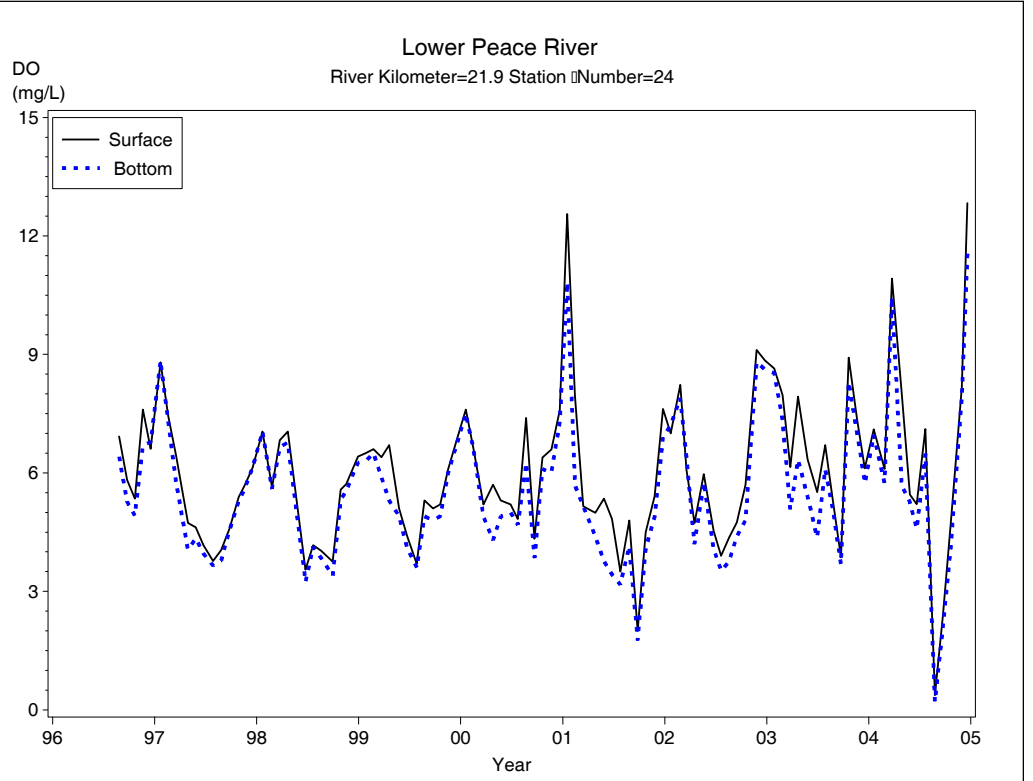

Lower Peace River
River Kilometer=12.7 Station Number=92
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

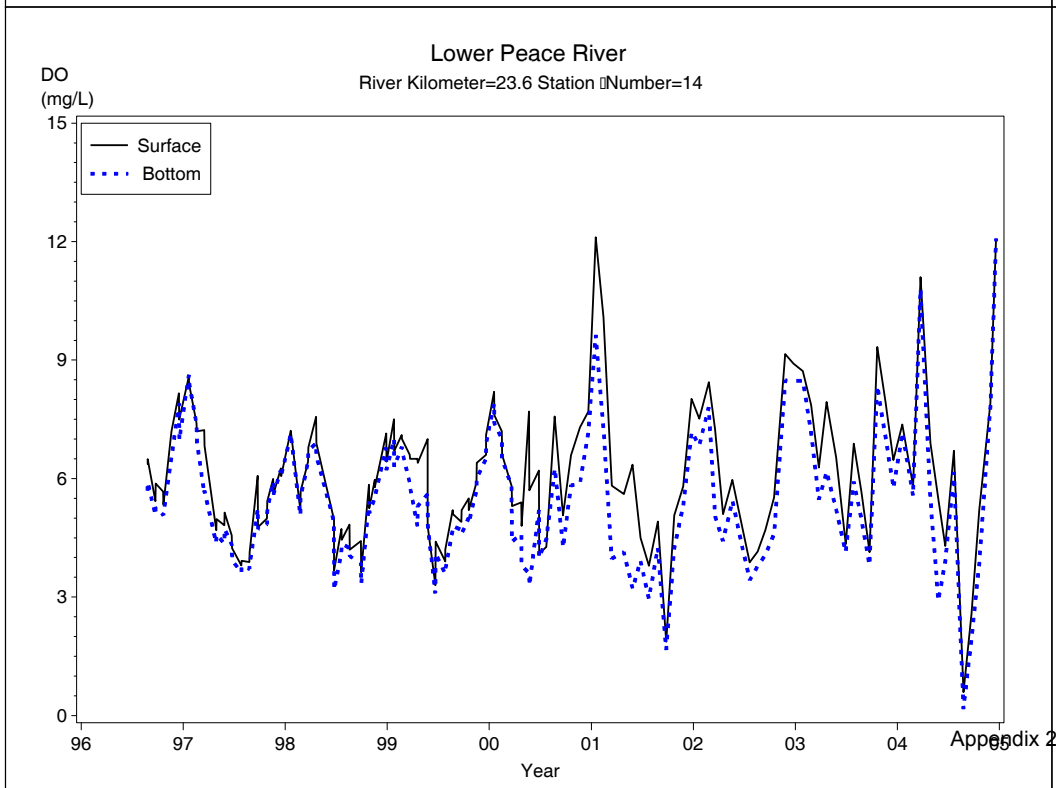

Lower Peace River
River Kilometer=12.8 Station Number=22
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

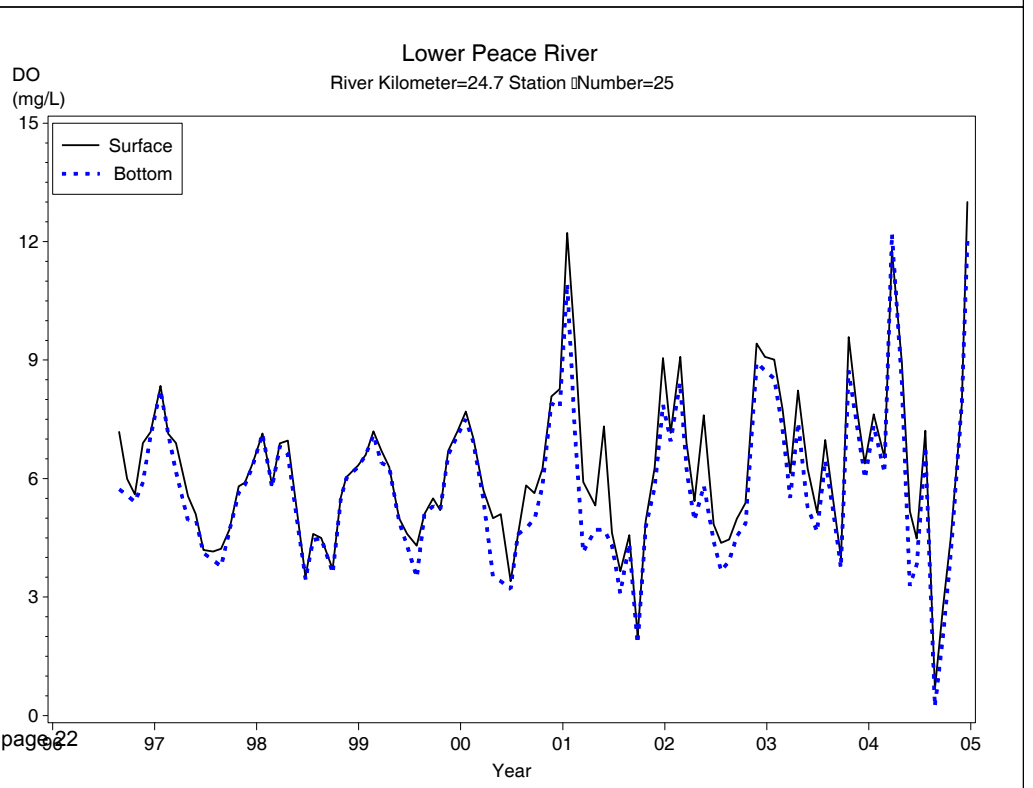

Lower Peace River
River Kilometer=15.5 Station Number=12
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

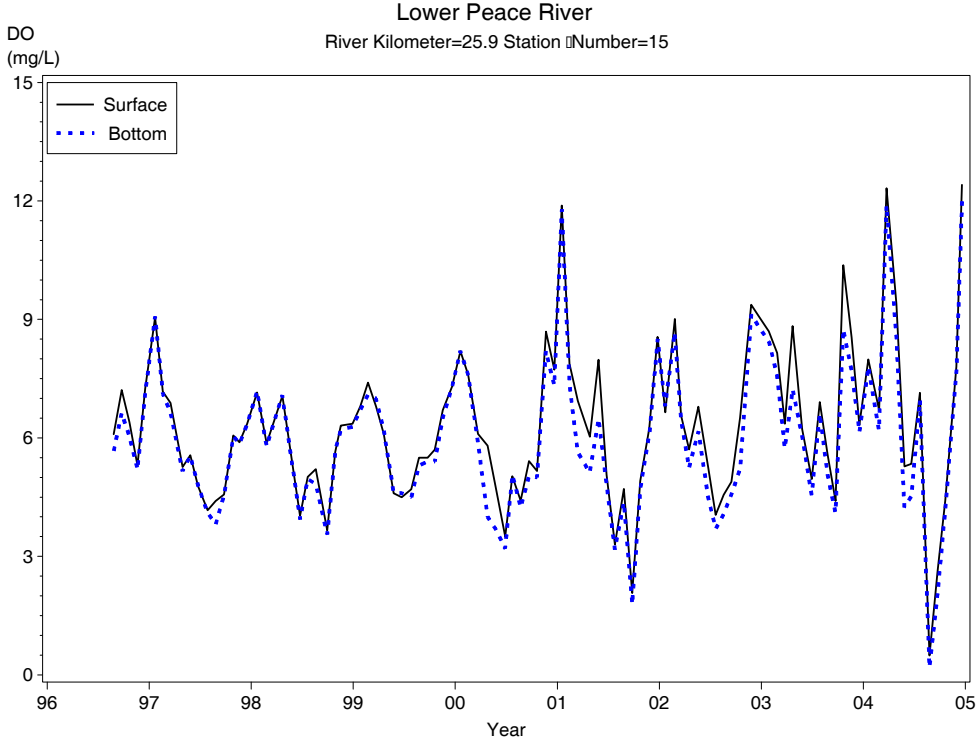

Lower Peace River
River Kilometer=17.5 Station Number=23
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

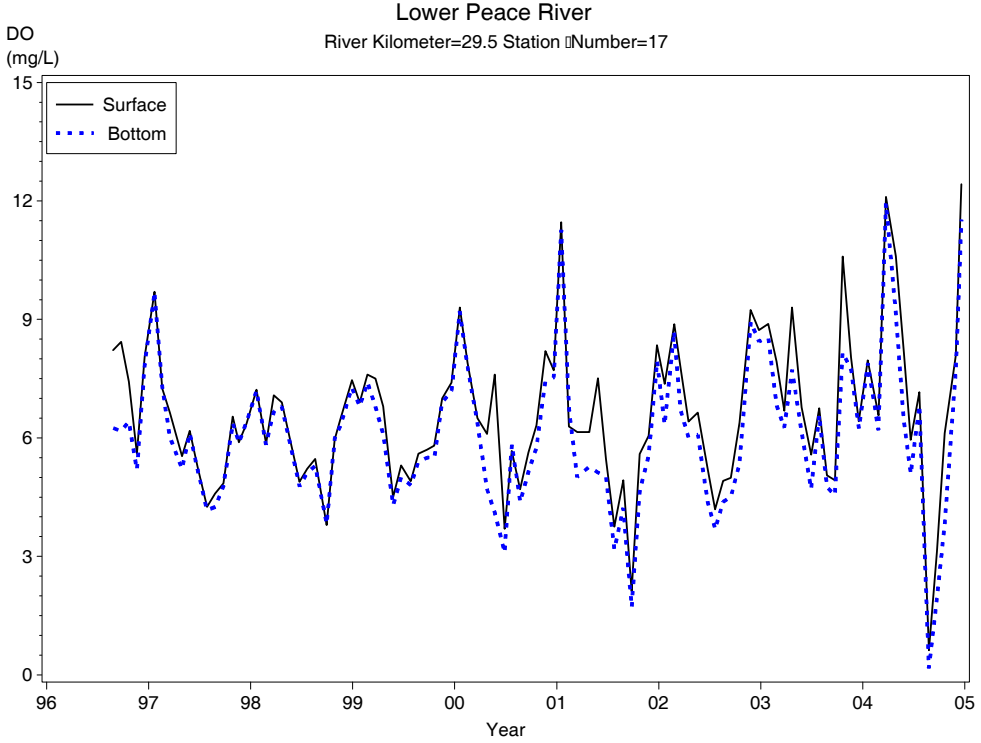

Lower Peace River
River Kilometer=20.1 Station Number=13
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

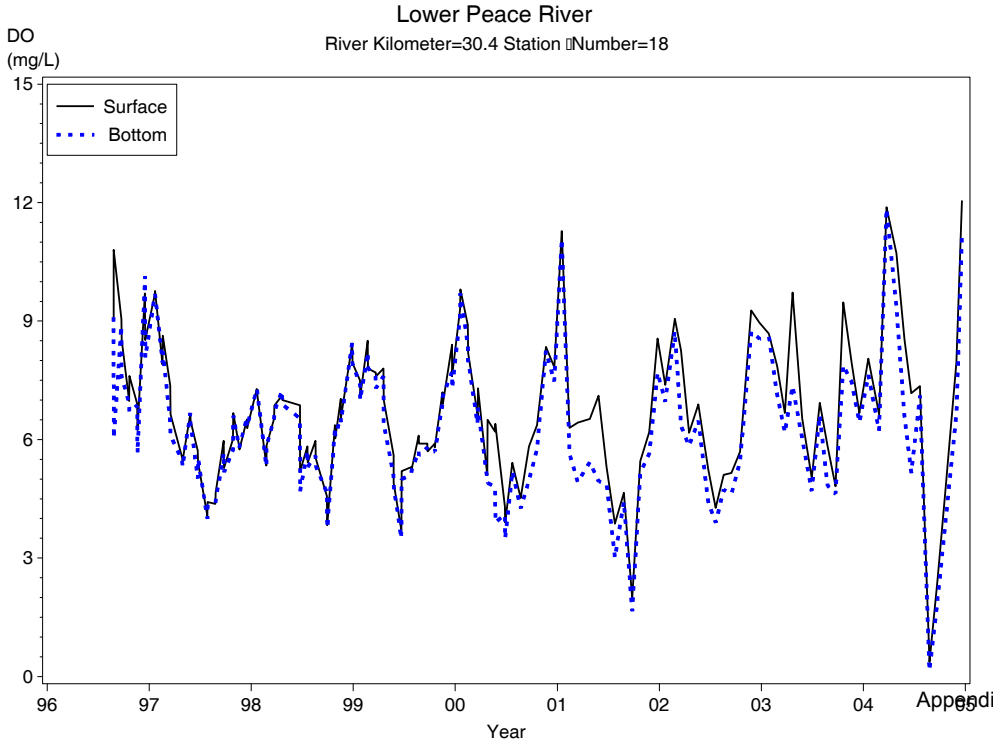

Lower Peace River
River Kilometer=21.9 Station Number=24
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

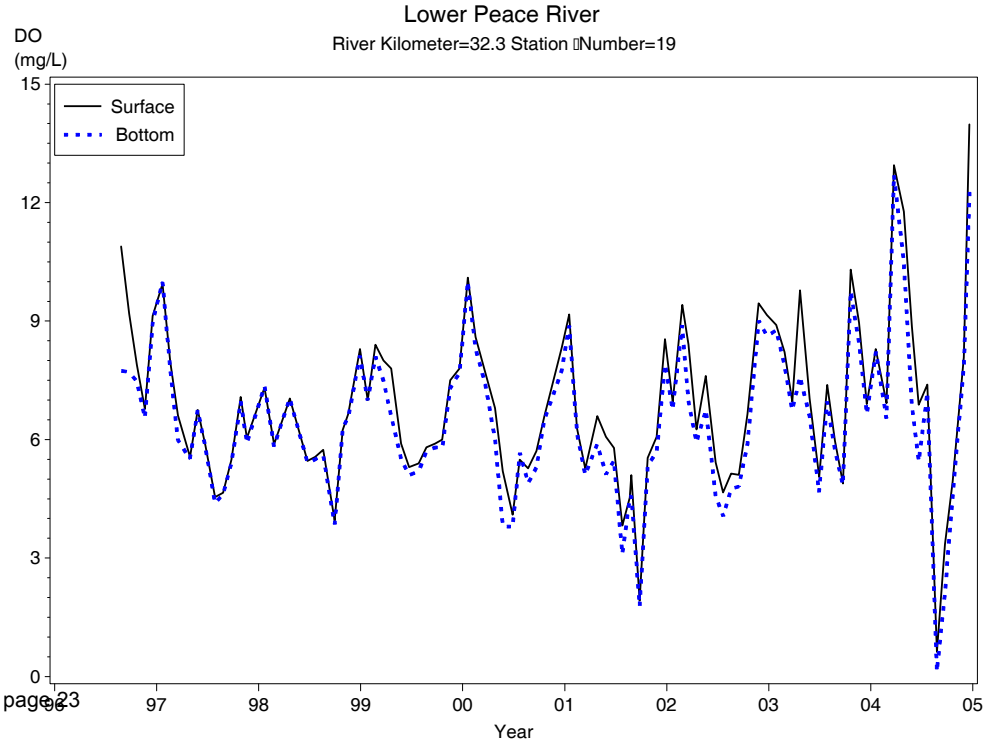

Lower Peace River
River Kilometer=23.6 Station Number=14
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

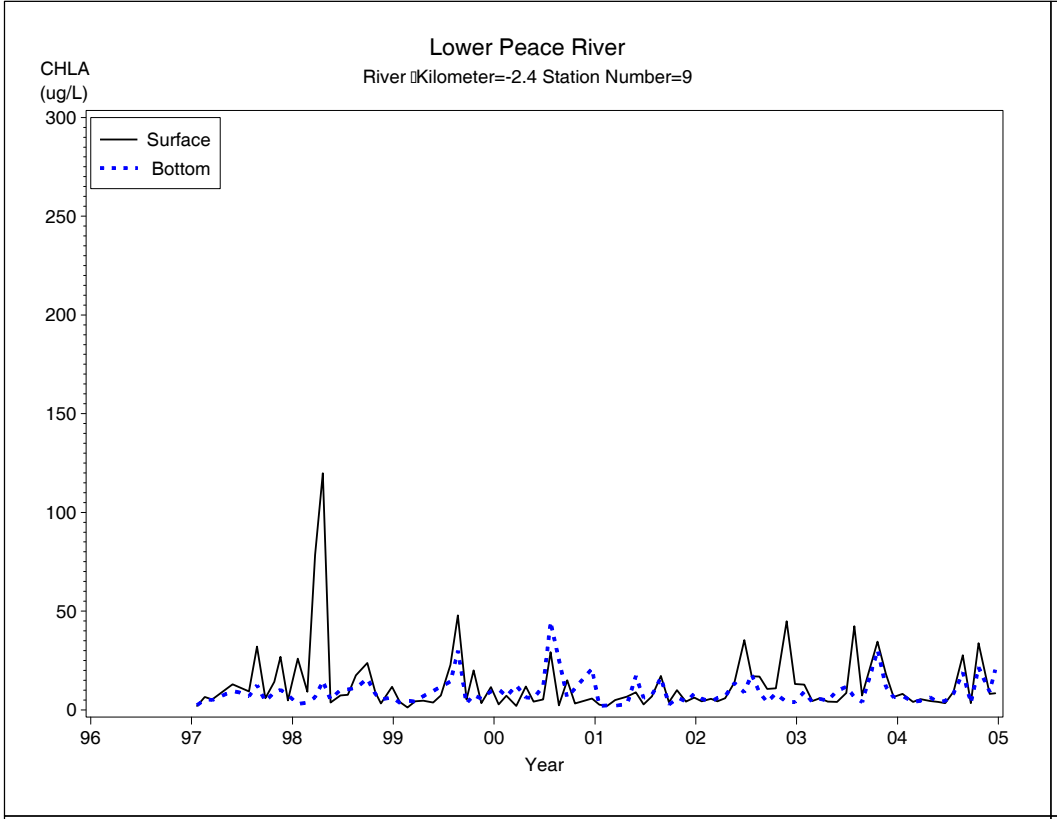

Lower Peace River
River Kilometer=24.7 Station Number=25
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

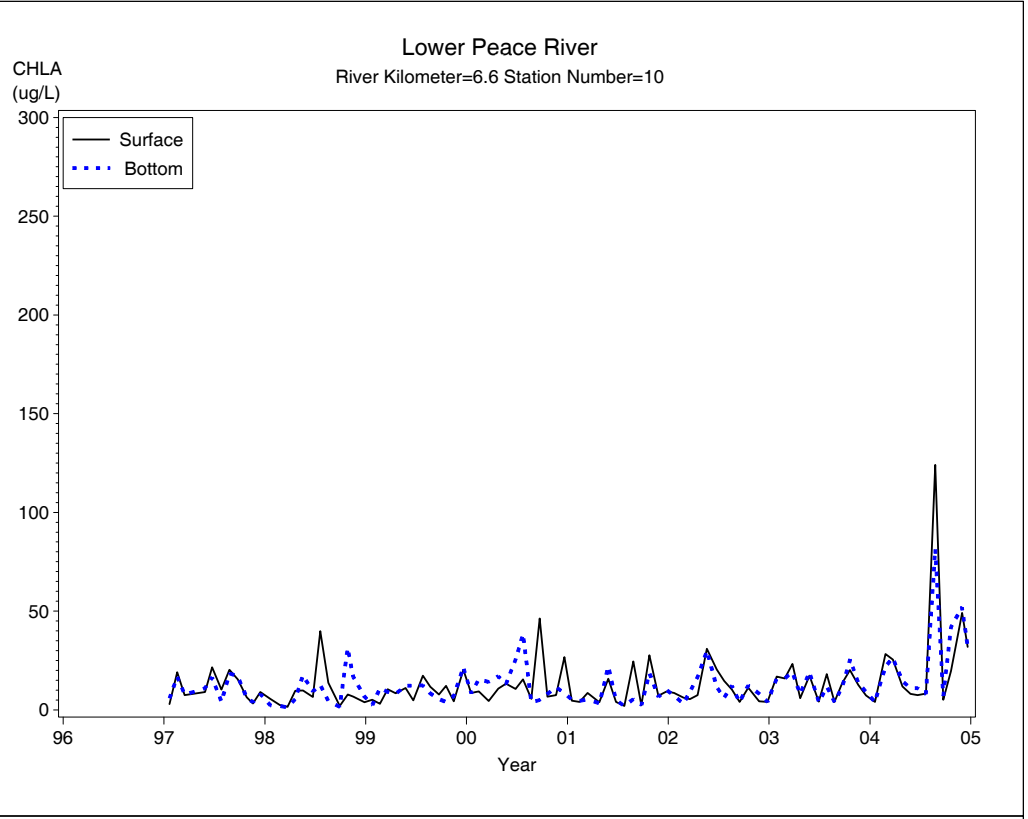

Lower Peace River
River Kilometer=25.9 Station Number=15
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

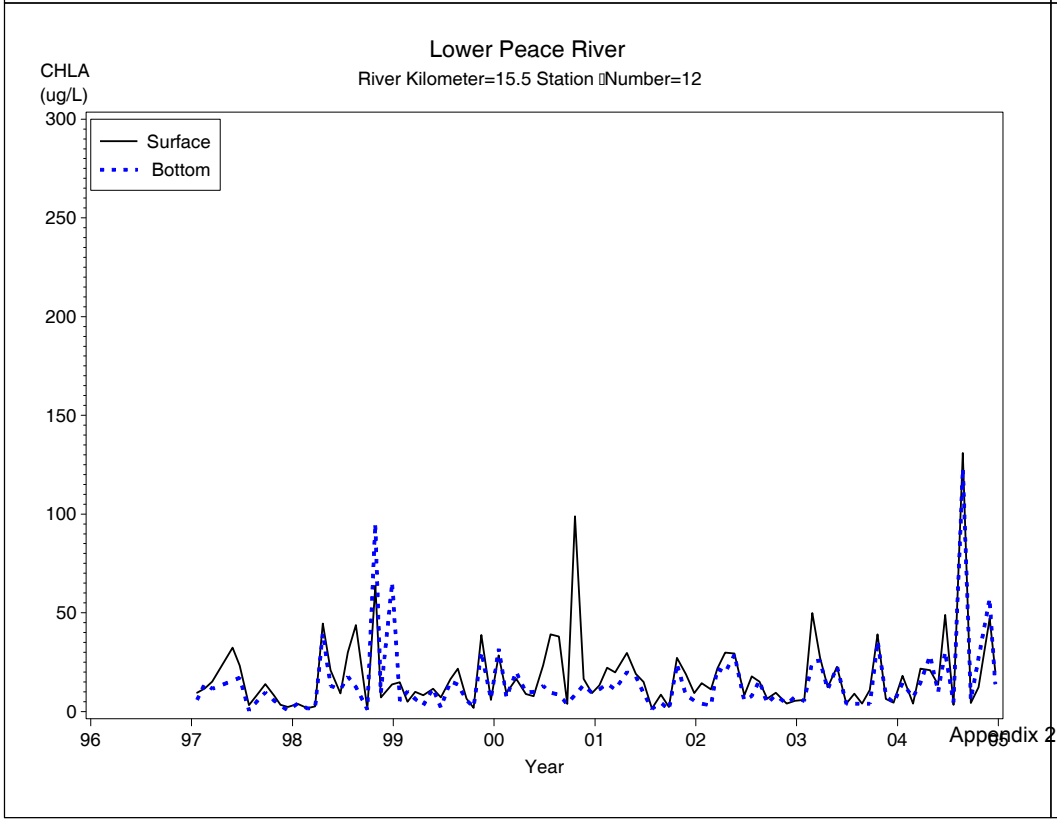

Lower Peace River
River Kilometer=29.5 Station Number=17
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

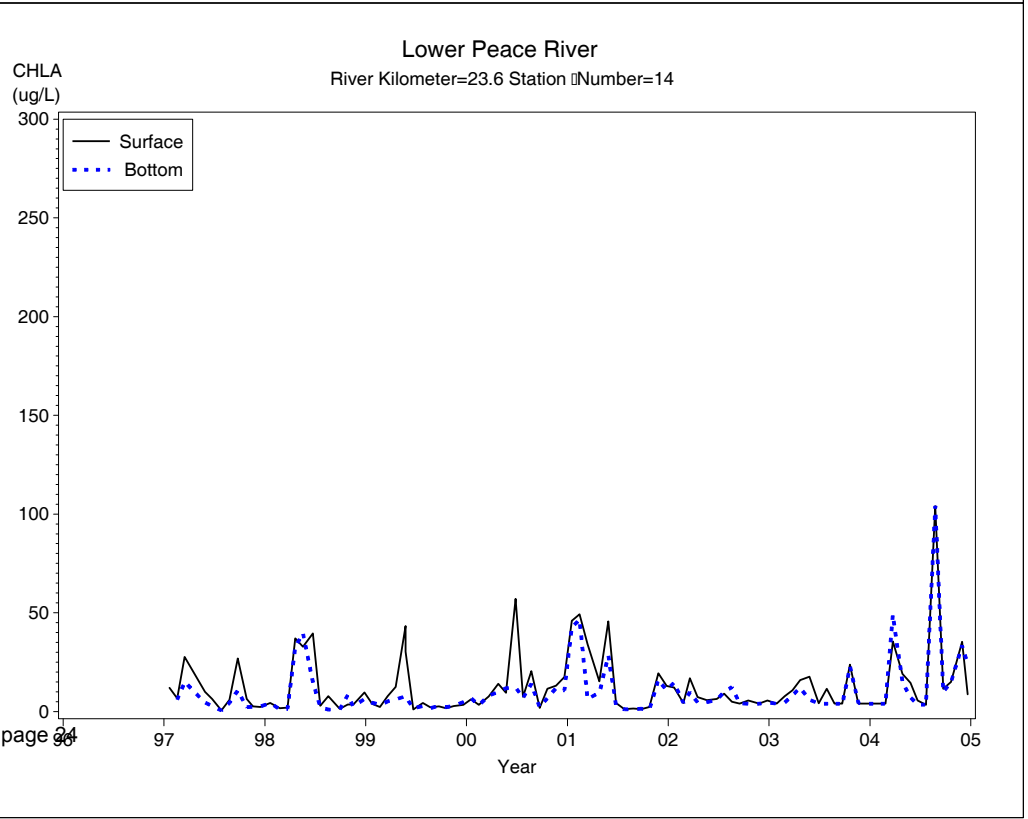

Lower Peace River
River Kilometer=30.4 Station Number=18
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

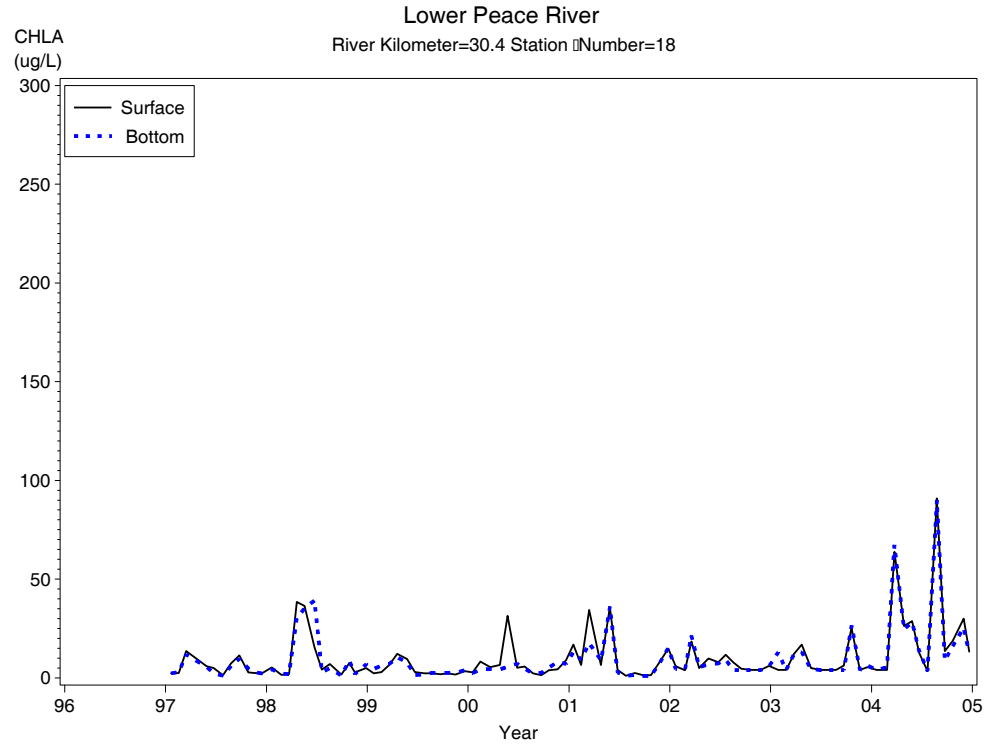

Lower Peace River
River Kilometer=32.3 Station Number=19
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
96
97
98
99
00
01
02
03
04
05
Year

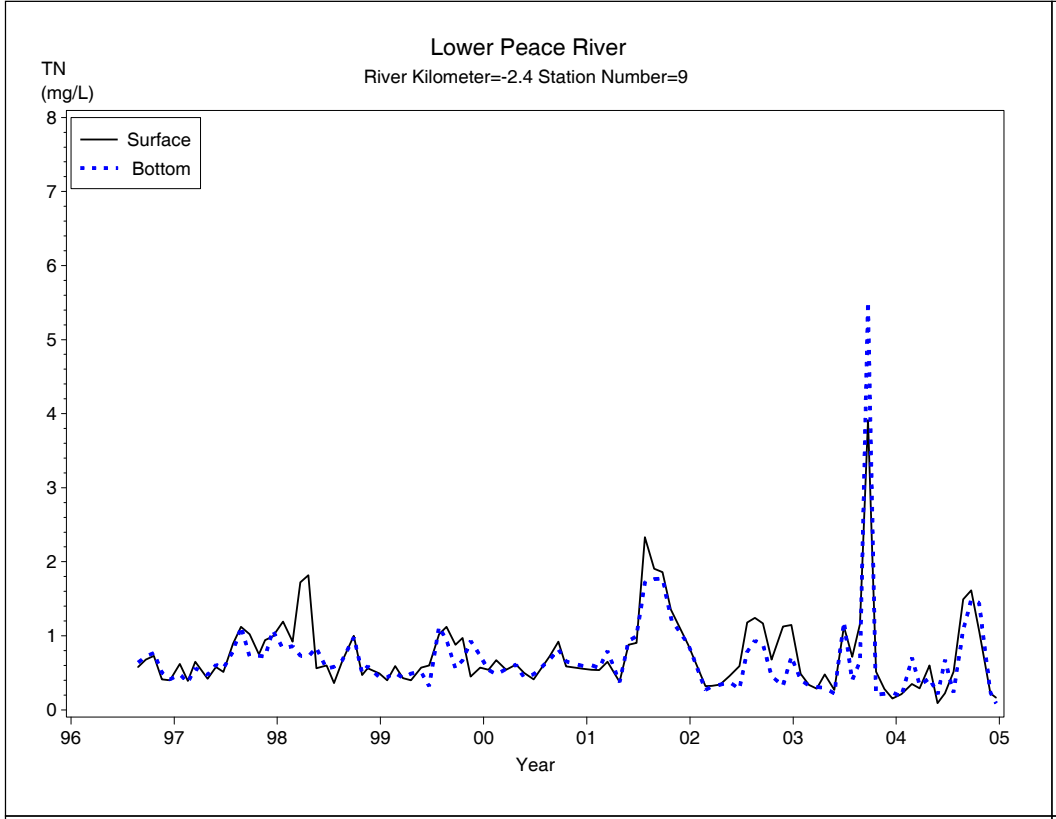

Lower Peace River
River Kilometer=-2.4 Station Number=9
CHLA
(ug/L)
Surface
Bottom
300
250
200
150
100
50
0
96
97
98
99
00
01
02
03
04
05
Year

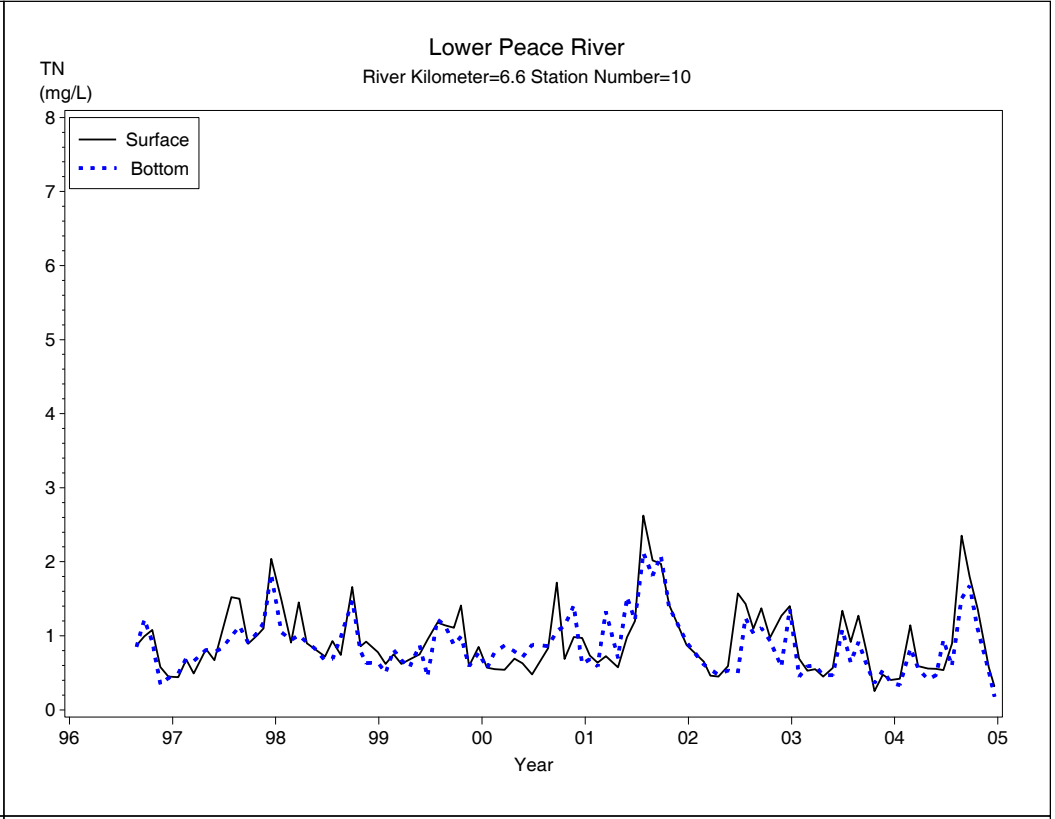

Lower Peace River
River Kilometer=6.6 Station Number=10
CHLA
(ug/L)
Surface
Bottom
300
250
200
150
100
50
0
96
97
98
99
00
01
02
03
04
05
Year

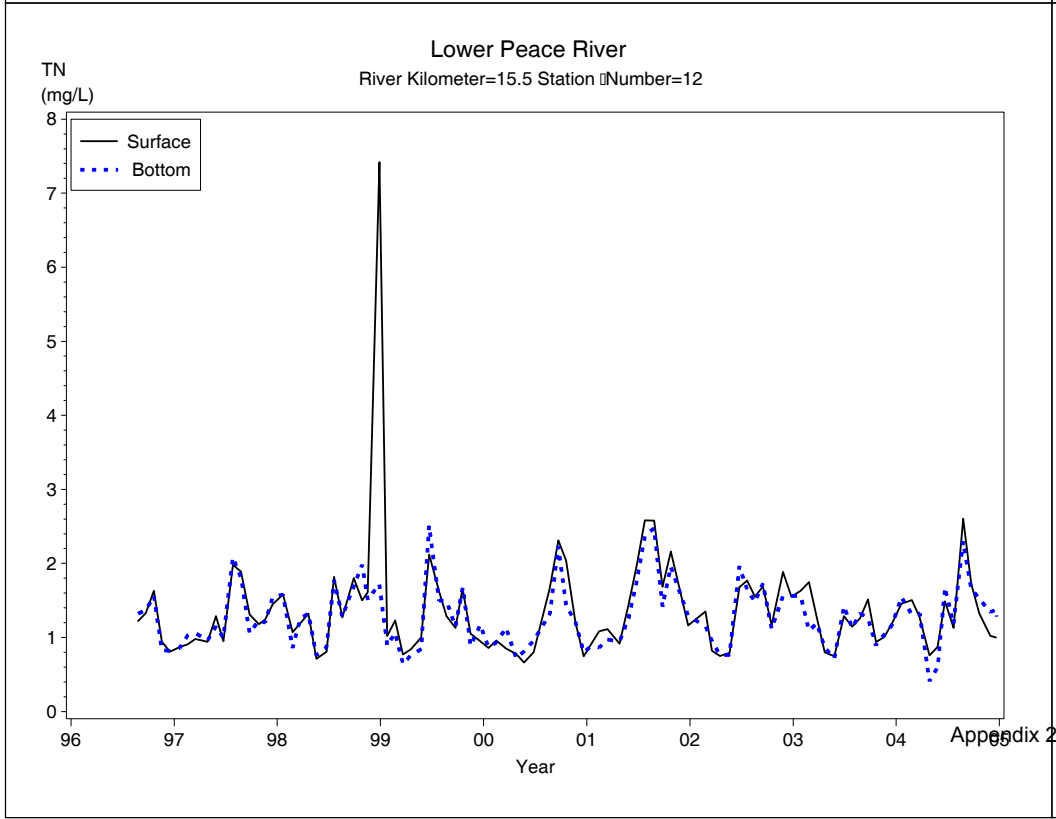

Lower Peace River
River Kilometer=15.5 Station Number=12
CHLA
(ug/L)
Surface
Bottom
300
250
200
150
100
50
0
96
97
98
99
00
01
02
03
04
05
Year

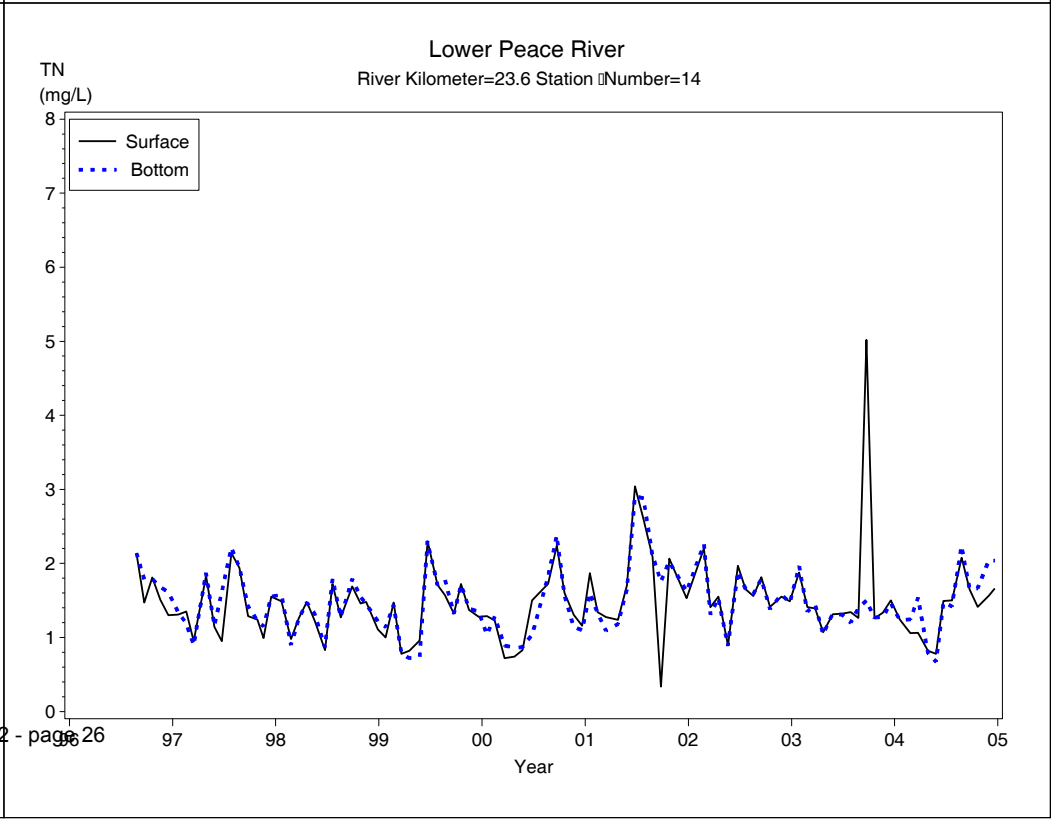

Lower Peace River
River Kilometer=23.6 Station Number=14
CHLA
(ug/L)
Surface
Bottom
300
250
200
150
100
50
0
96
97
98
99
00
01
02
03
04
05
Year

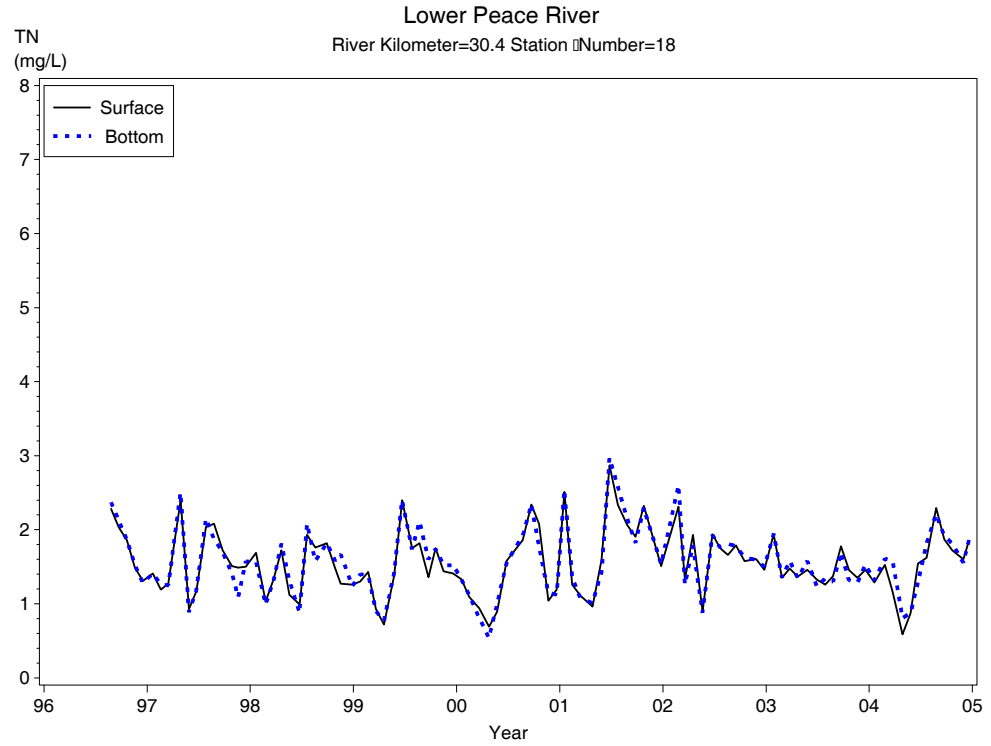

Lower Peace River
River Kilometer=30.4 Station Number=18
CHLA
(ug/L)
300
250
200
150
100
50
0
Surface
Bottom
96
97
98
99
00
01
02
03
04
05
Year

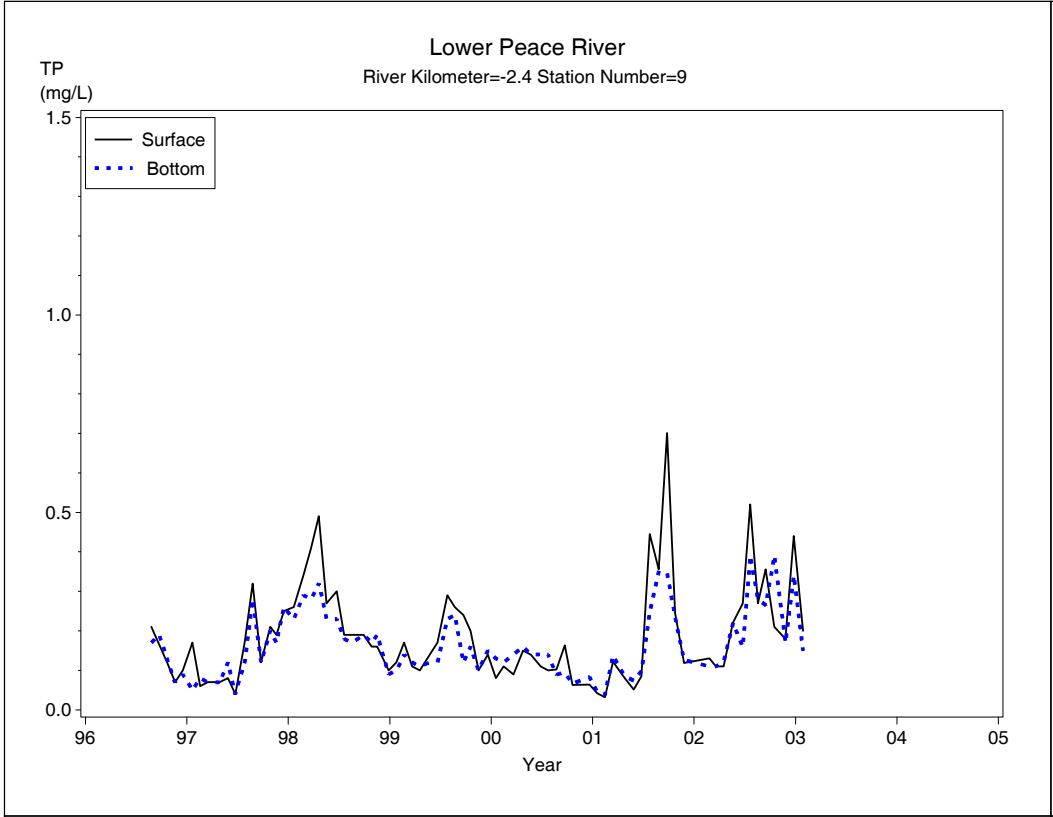

Lower Peace River
River Kilometer=-2.4 Station Number=9
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
96
97
98
99
00
01
02
03
04
05
Year

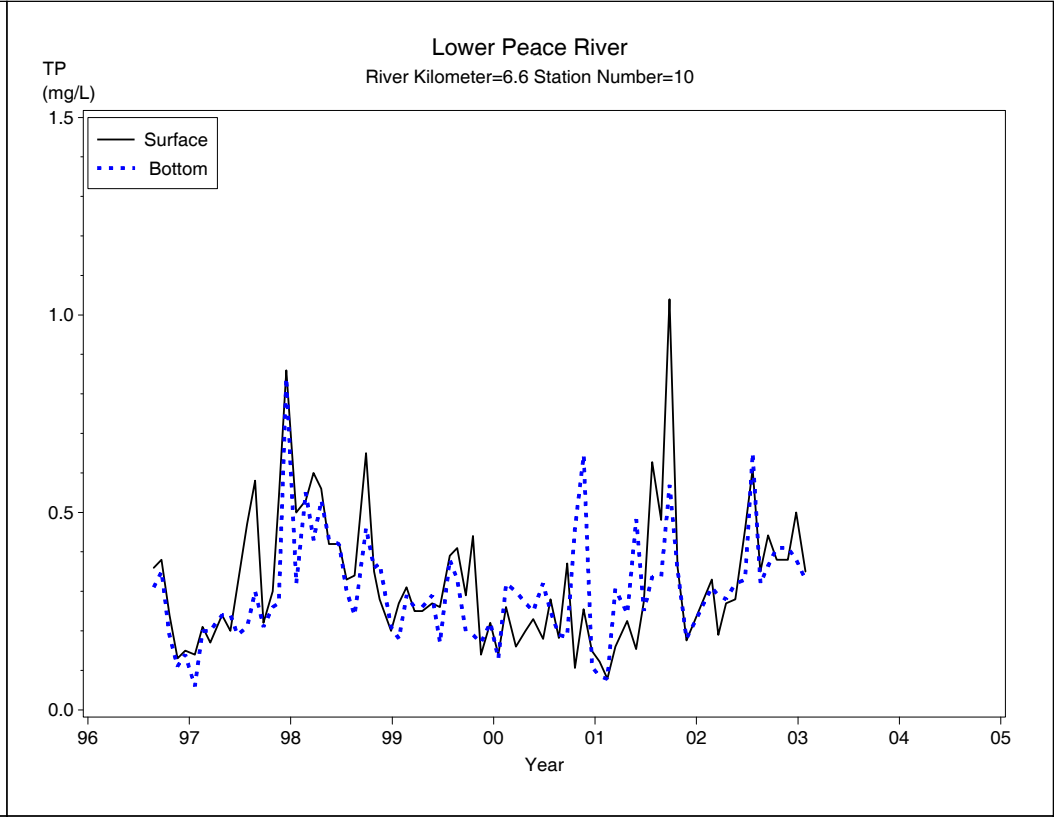

Lower Peace River
River Kilometer=6.6 Station Number=10
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
96
97
98
99
00
01
02
03
04
05
Year

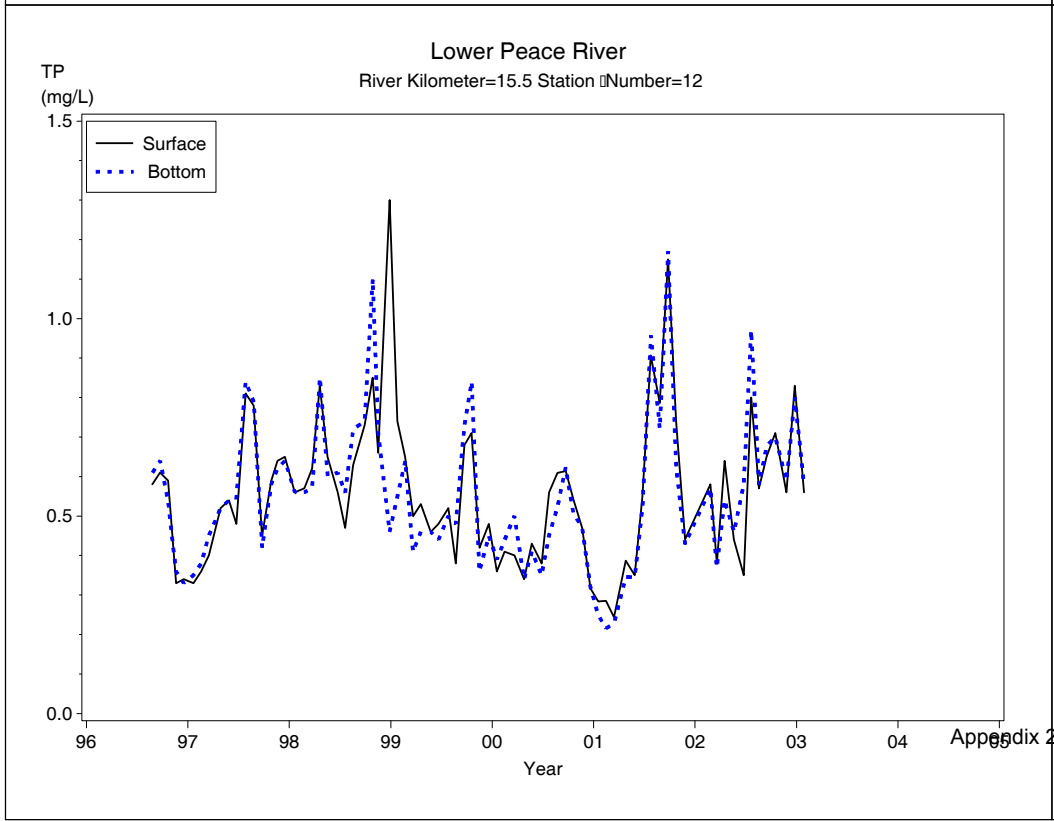

Lower Peace River
River Kilometer=15.5 Station Number=12
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
96
97
98
99
00
01
02
03
04
05
Year

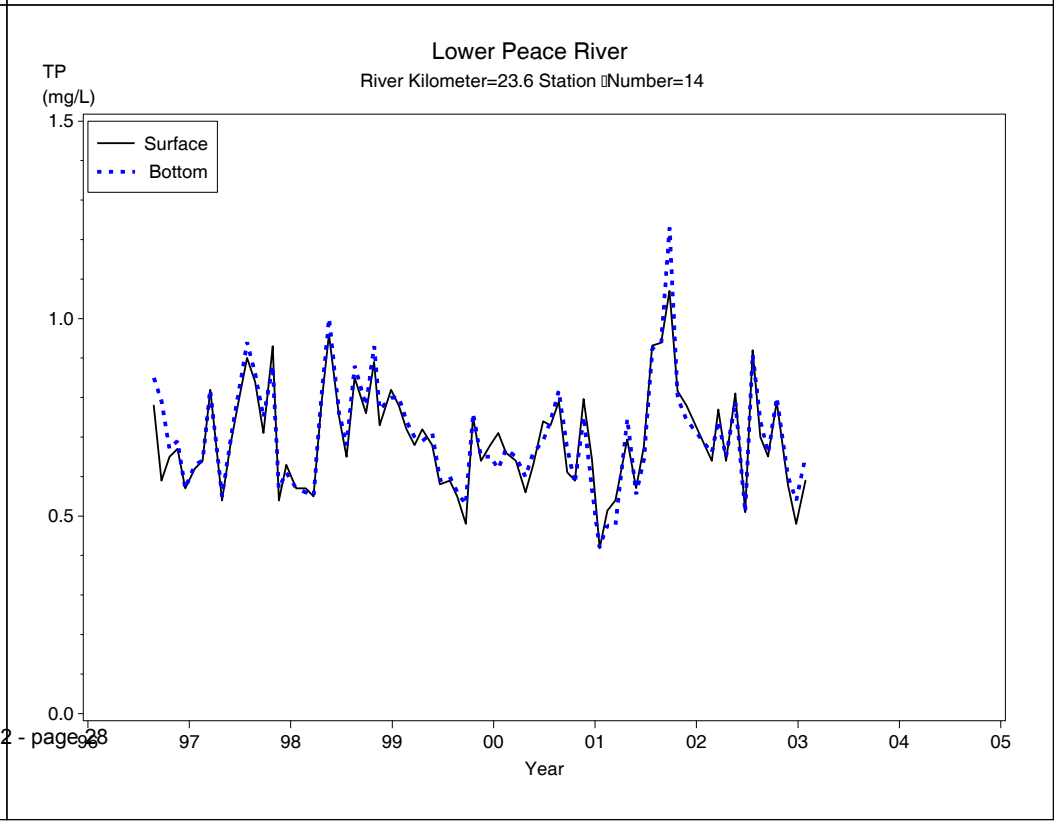

Lower Peace River
River Kilometer=23.6 Station Number=14
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
96
97
98
99
00
01
02
03
04
05
Year

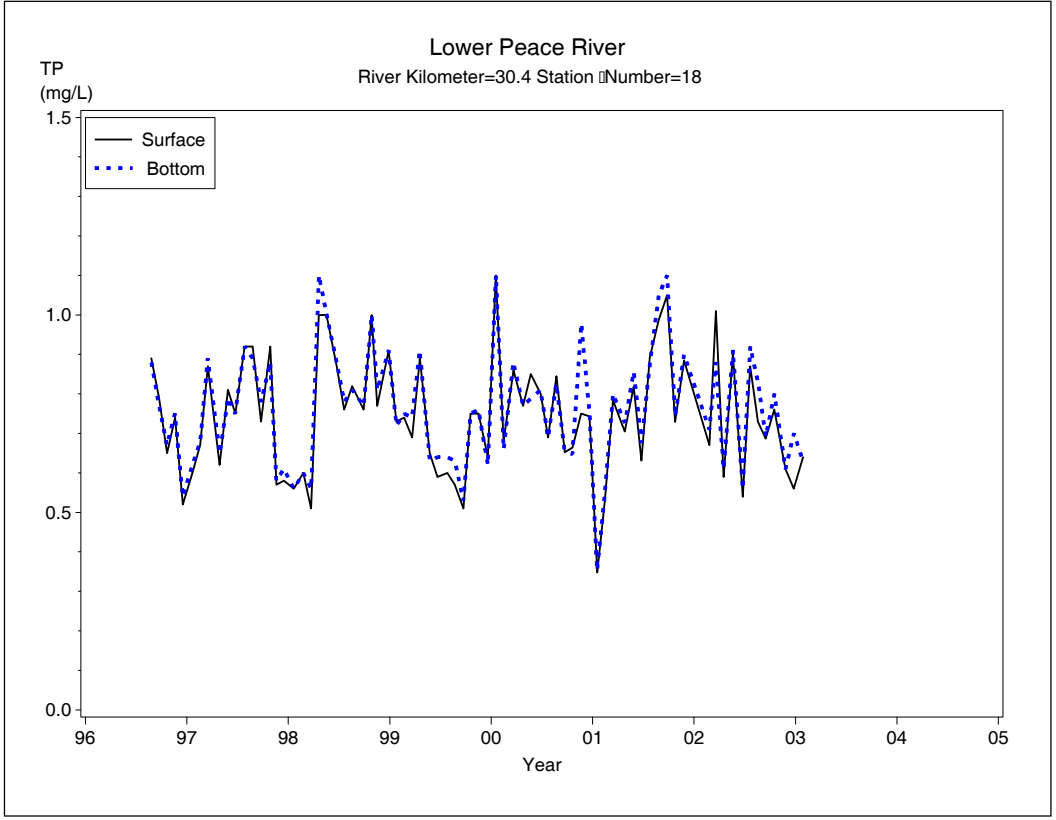

Lower Peace River
River Kilometer=30.4 Station Number=18
TN
(mg/L)
Surface
Bottom
8
7
6
5
4
3
2
1
0
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=-2.4 Station Number=9
TP
(mg/L)
Surface
Bottom
1.5
1.0
0.5
0.0
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=6.6 Station Number=10
TP
(mg/L)
Surface
Bottom
1.5
1.0
0.5
0.0
96
97
98
99
00
01
02
03
04
05
Year


Lower Peace River
River Kilometer=15.5 Station Number=12
TP
(mg/L)
Surface
Bottom
1.5
1.0
0.5
0.0
96
97
98
99
00
01
02
03
04
05
Year

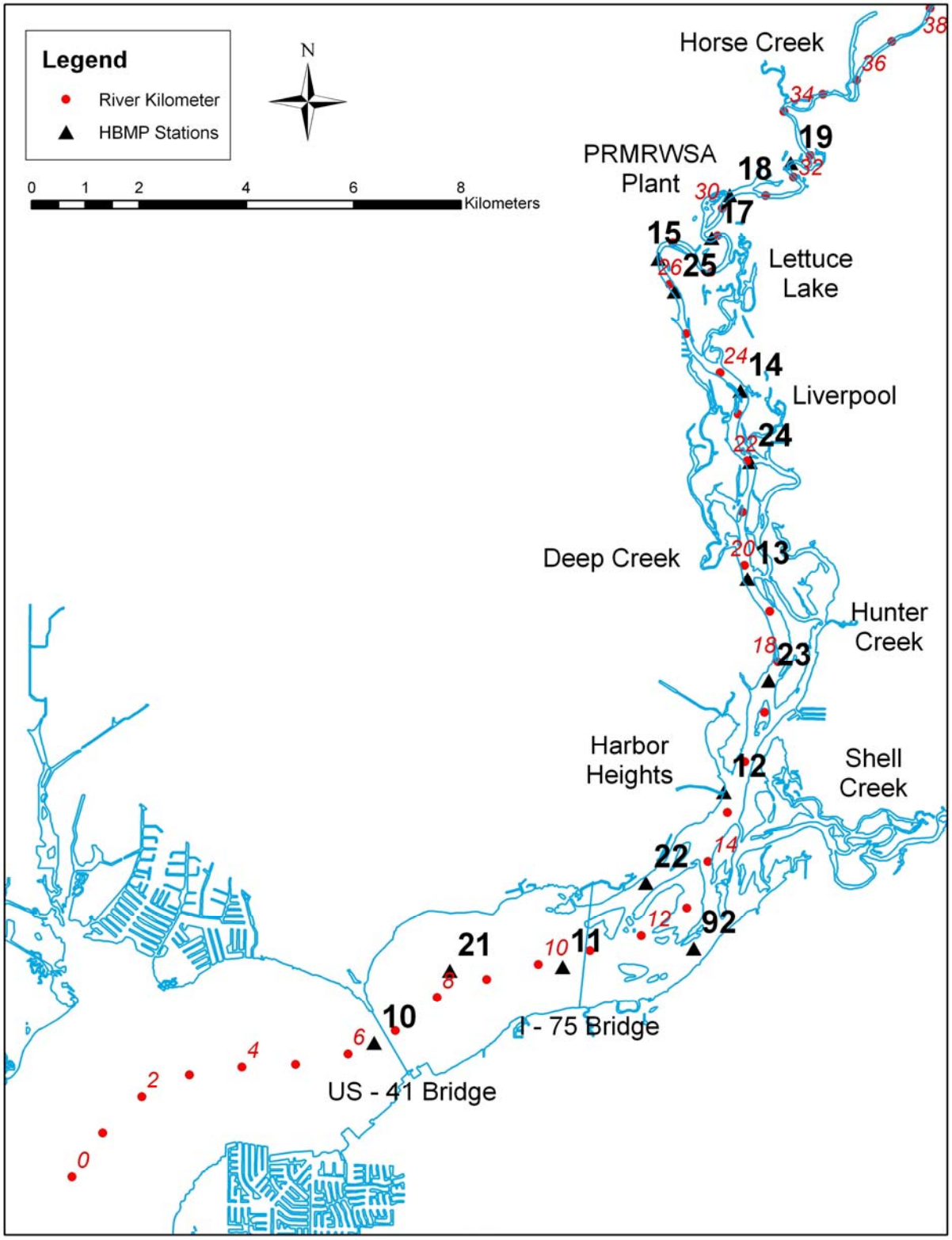

Lower Peace River
River Kilometer=23.6 Station Number=14
TP
(mg/L)
Surface
Bottom
1.5
1.0
0.5
0.0
96
97
98
99
00
01
02
03
04
05
Year

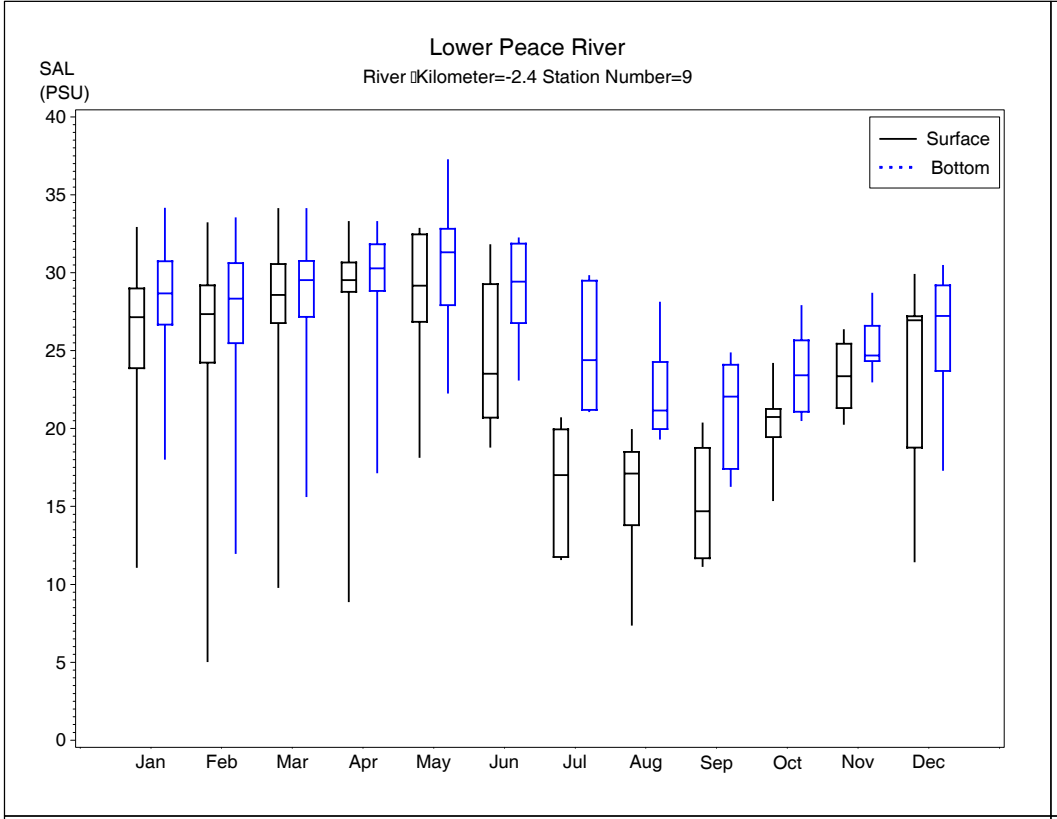

Lower Peace River
River Kilometer=30.4 Station Number=18
TP
(mg/L)
1.5
1.0
0.5
0.0
Surface
Bottom
96
97
98
99
00
01
02
03
04
05
Year

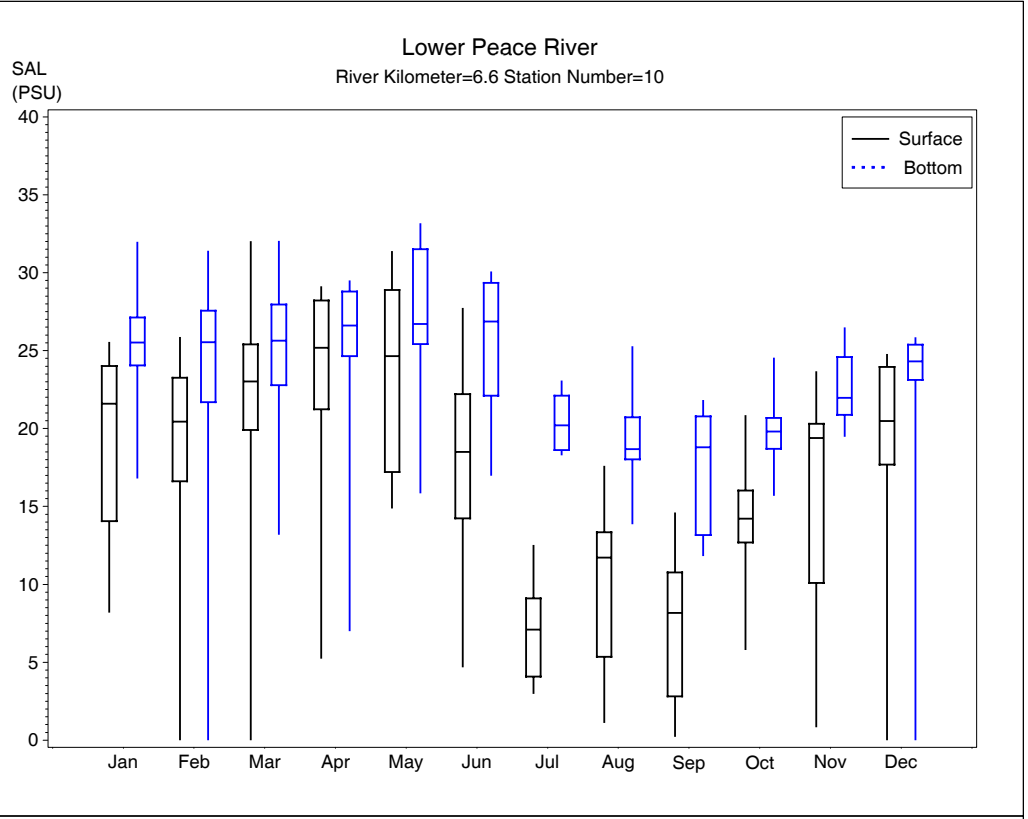
Appendix 3-2

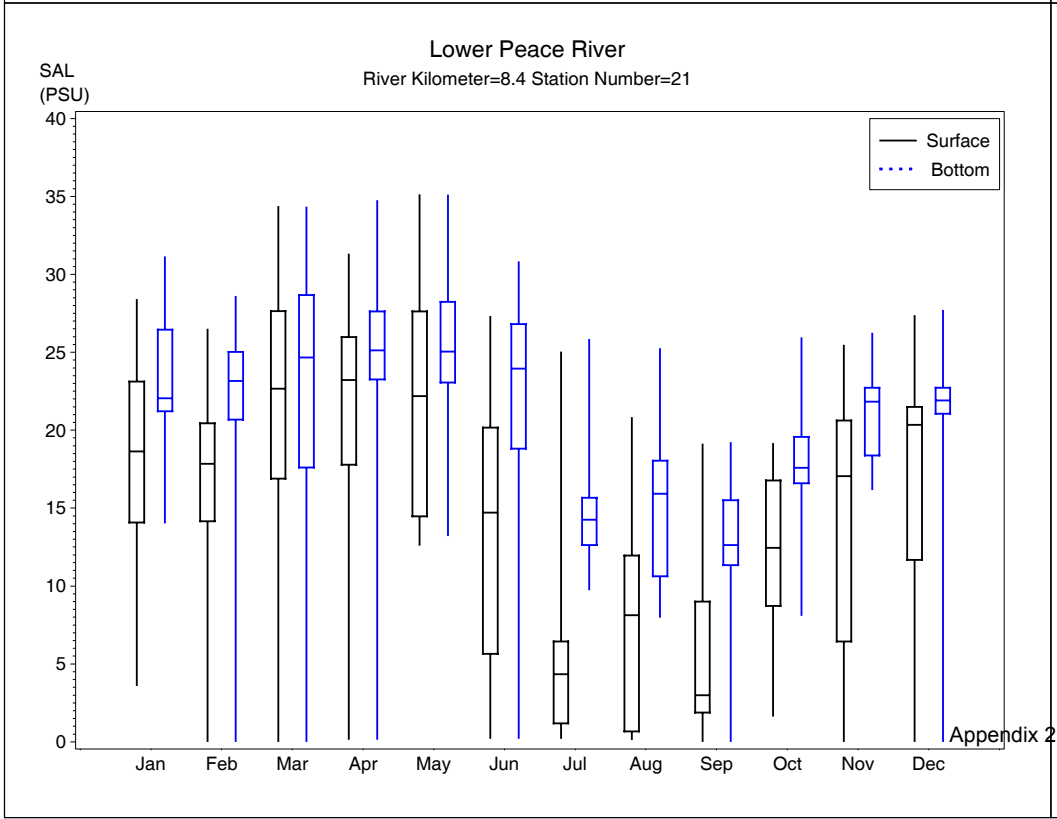
Within-Year Variation in Lower Peace River

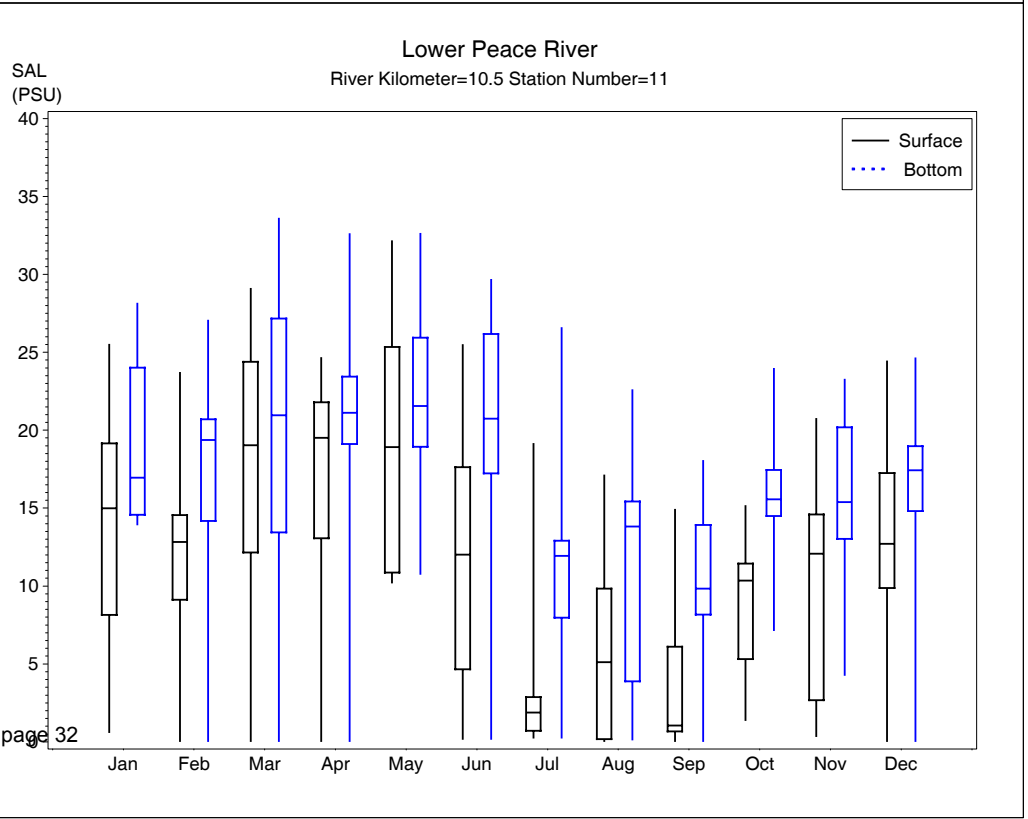
Water Quality Constituents

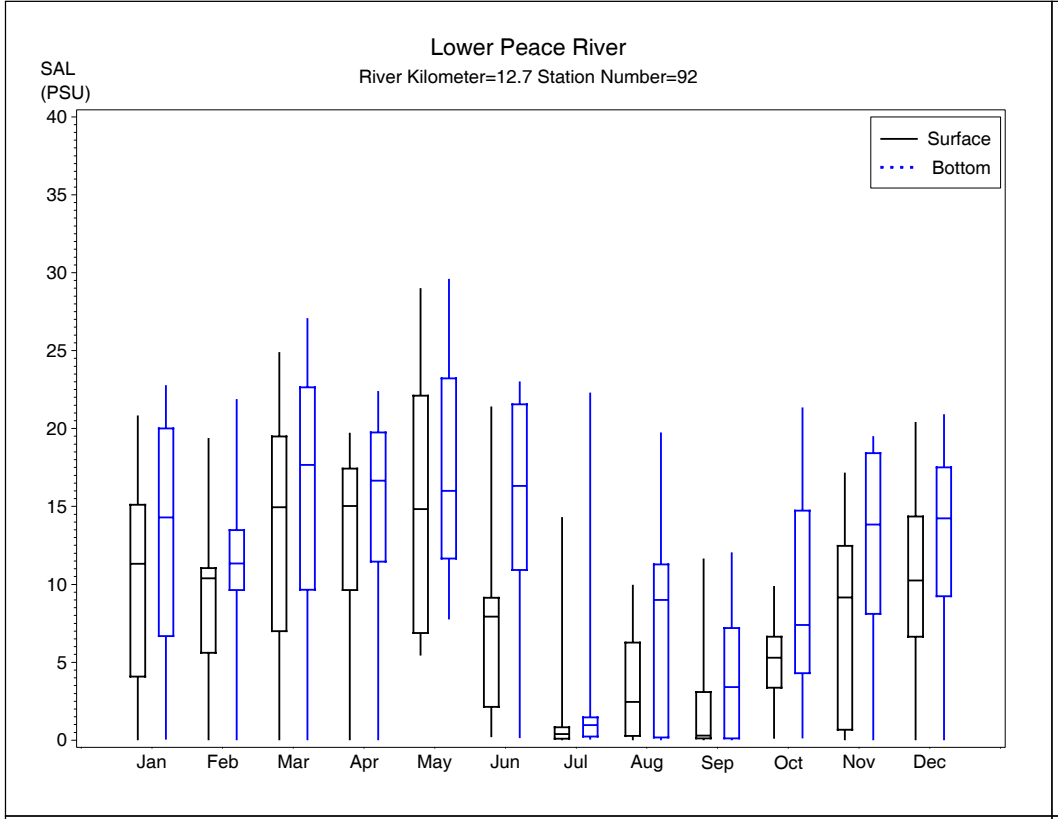

Legend
River Kilometer
HBMP Stations
N
0 1 2 4 6 8
Kilometers
Horse Creek
PRMRWSA Plant
Lettuce Lake
Liverpool
Deep Creek
Hunter Creek
Harbor Heights
Shell Creek
I - 75 Bridge
US - 41 Bridge
38
36
34
19
32
18
30
17
15
26
25
24
14
22
24
20
13
18
23
12
14
22
12
92
10
11
21
8
6
10
4
2
0

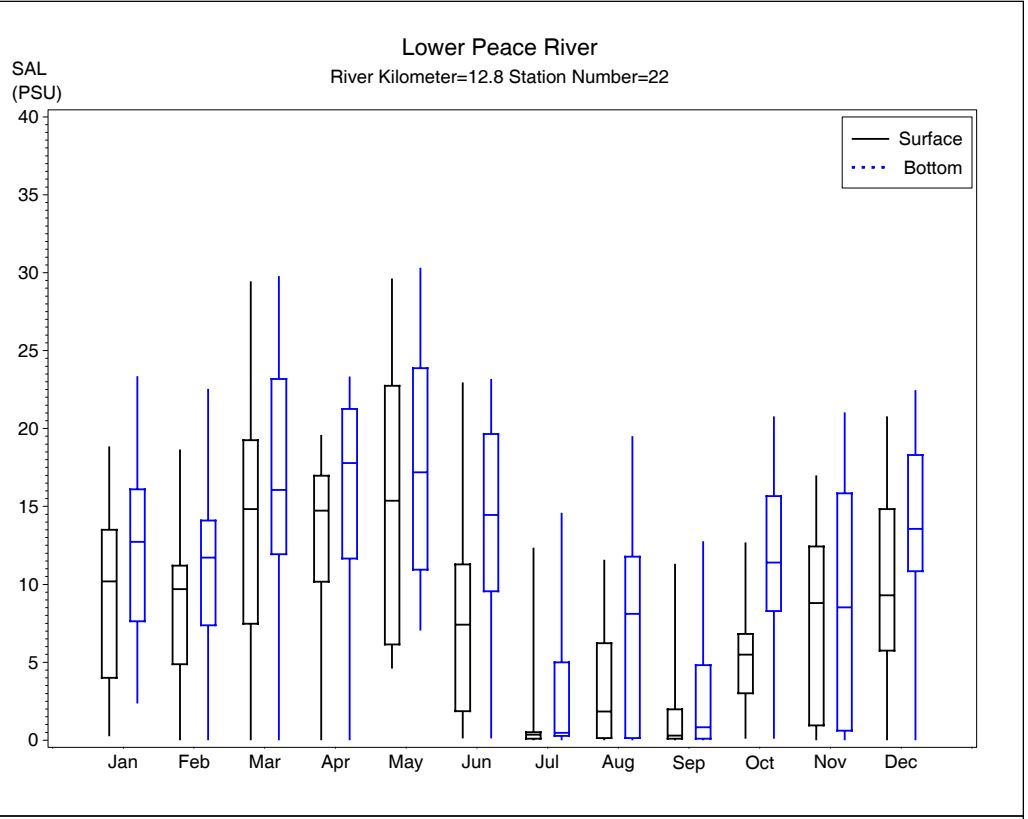

Lower Peace River
River Kilometer=-2.4 Station Number=9
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

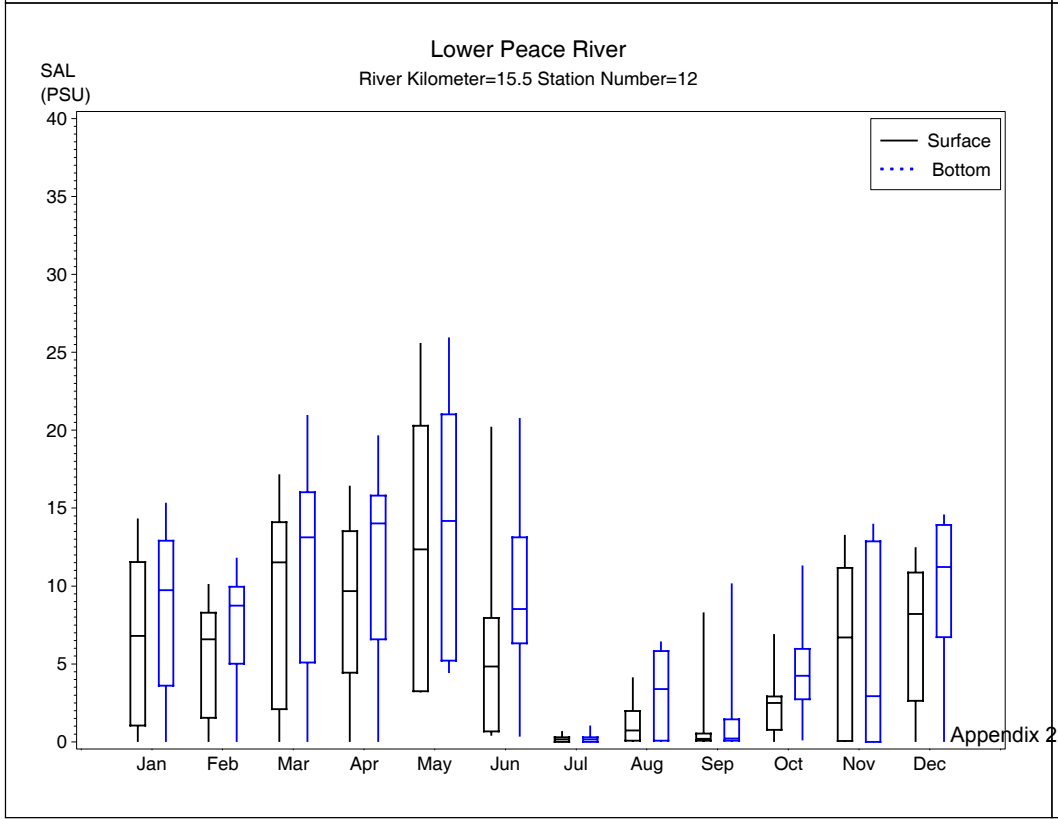

Lower Peace River
River Kilometer=6.6 Station Number=10
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

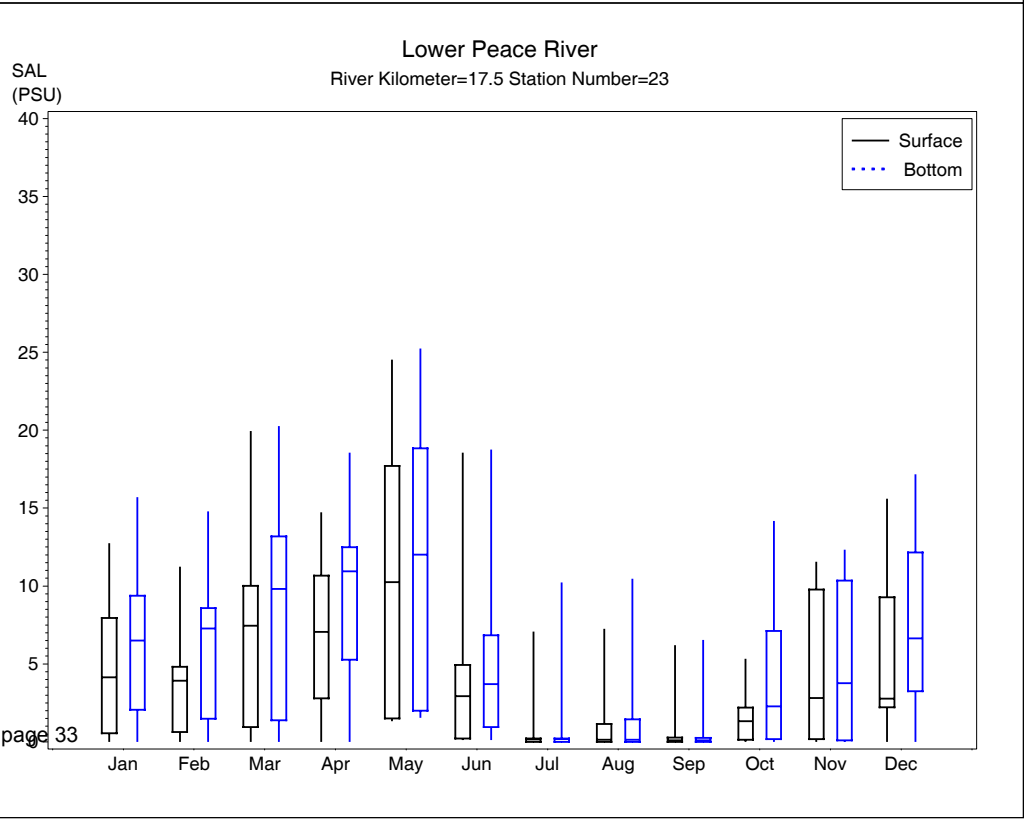

Lower Peace River
River Kilometer=8.4 Station Number=21
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

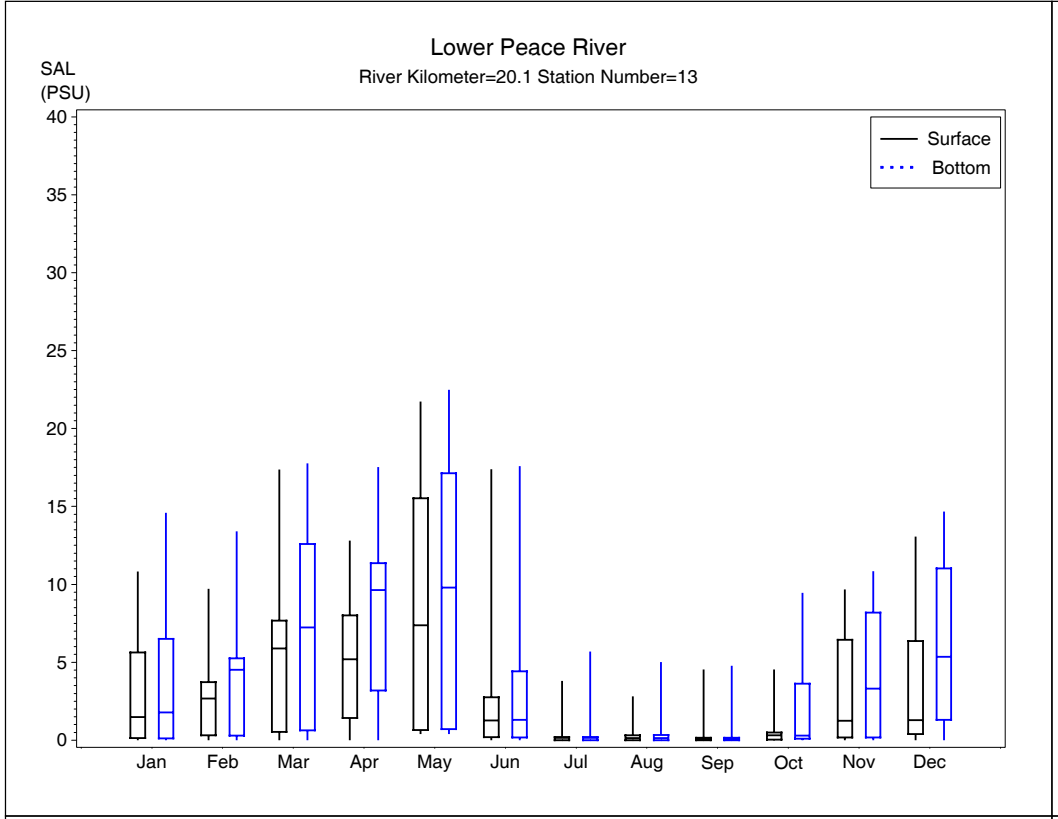

Lower Peace River
River Kilometer=10.5 Station Number=11
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

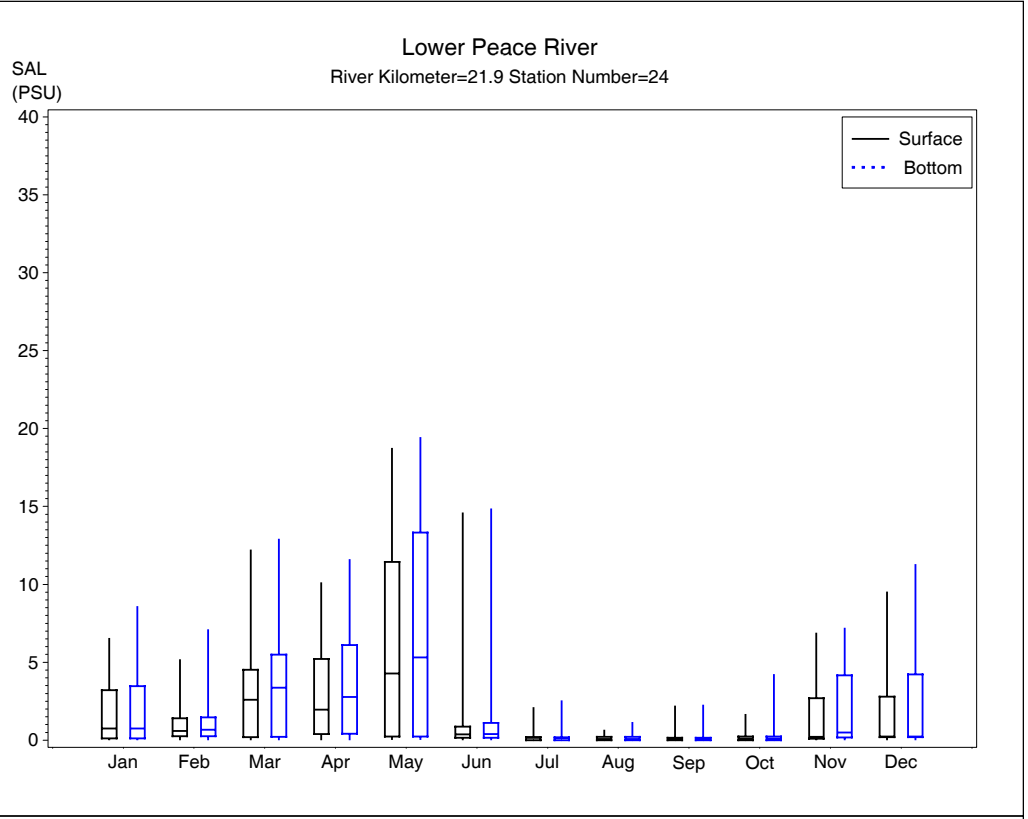

Lower Peace River
River Kilometer=12.7 Station Number=92
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

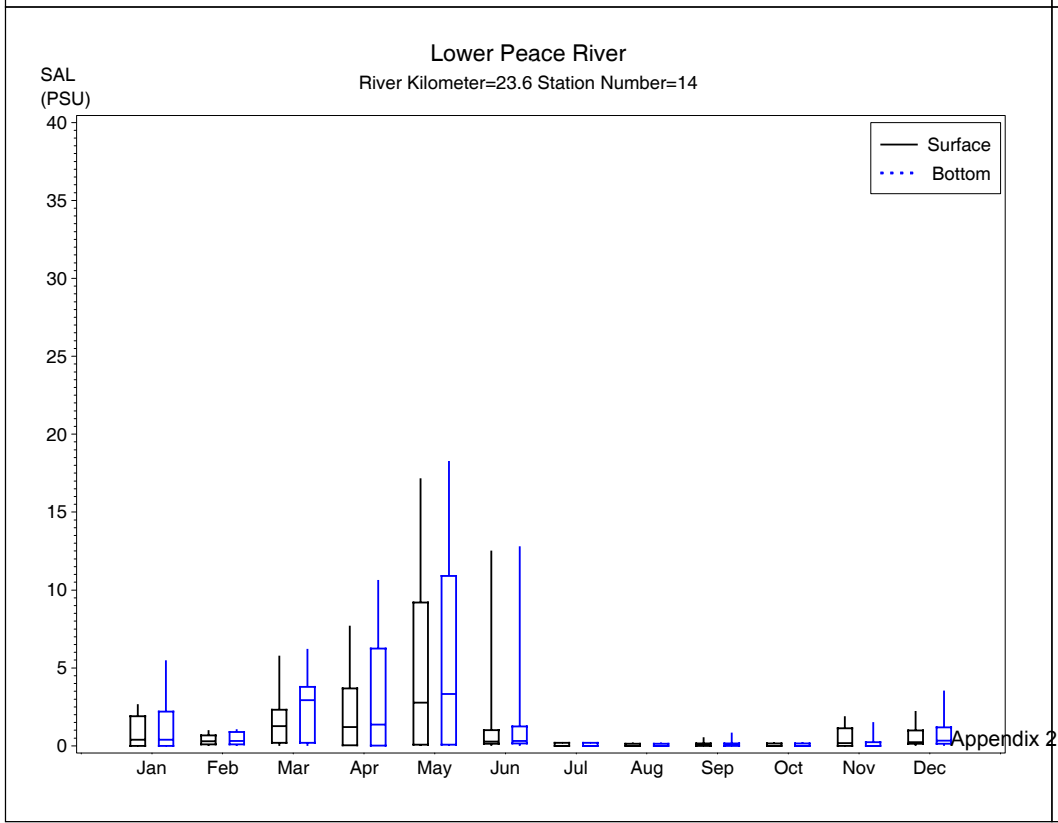

Lower Peace River
River Kilometer=12.8 Station Number=22
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

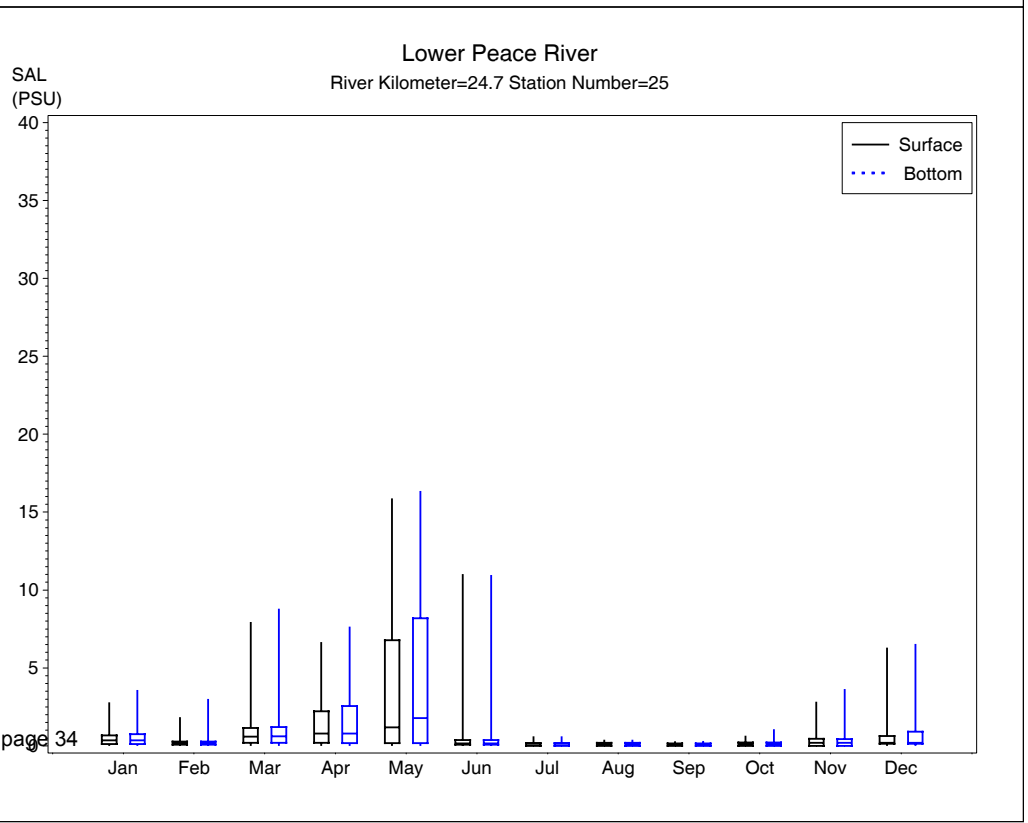

Lower Peace River
River Kilometer=15.5 Station Number=12
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

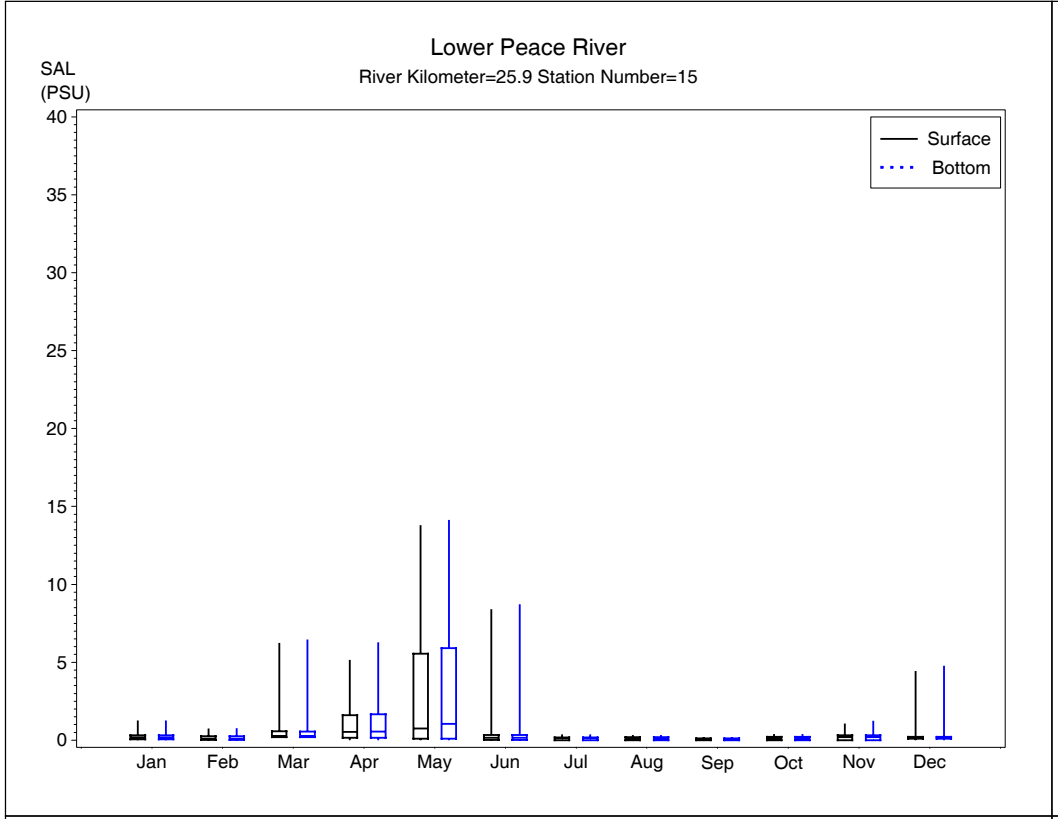

Lower Peace River
River Kilometer=17.5 Station Number=23
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

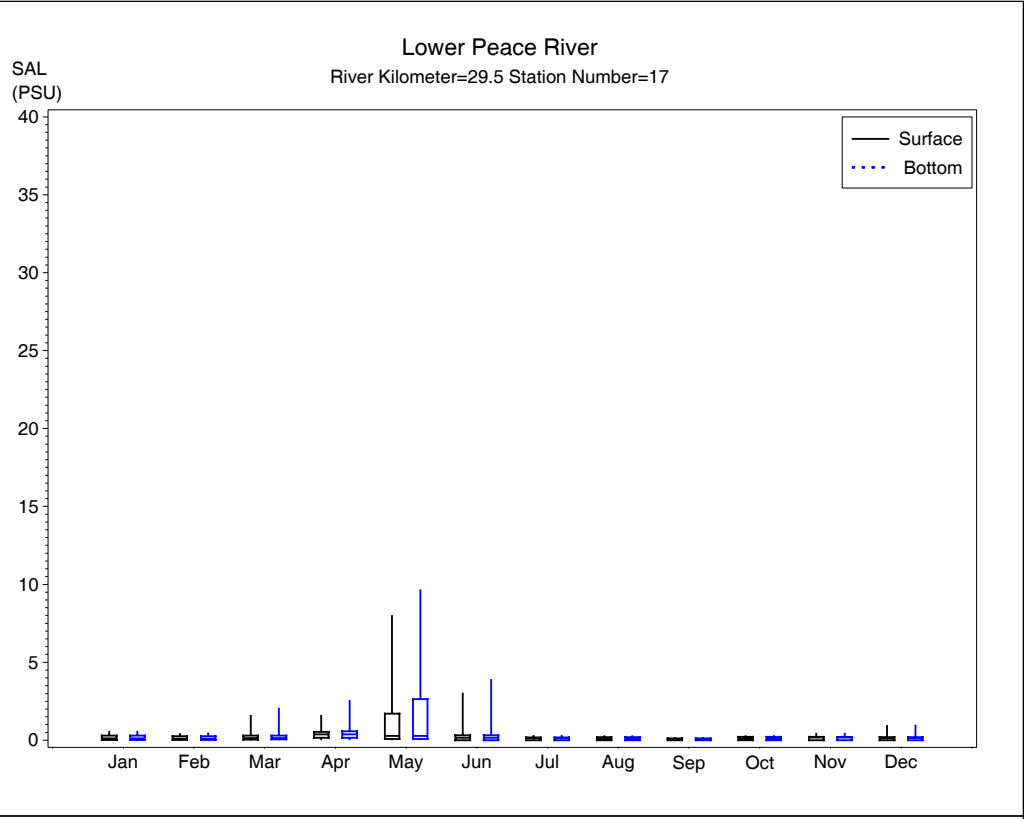

Lower Peace River
River Kilometer=20.1 Station Number=13
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

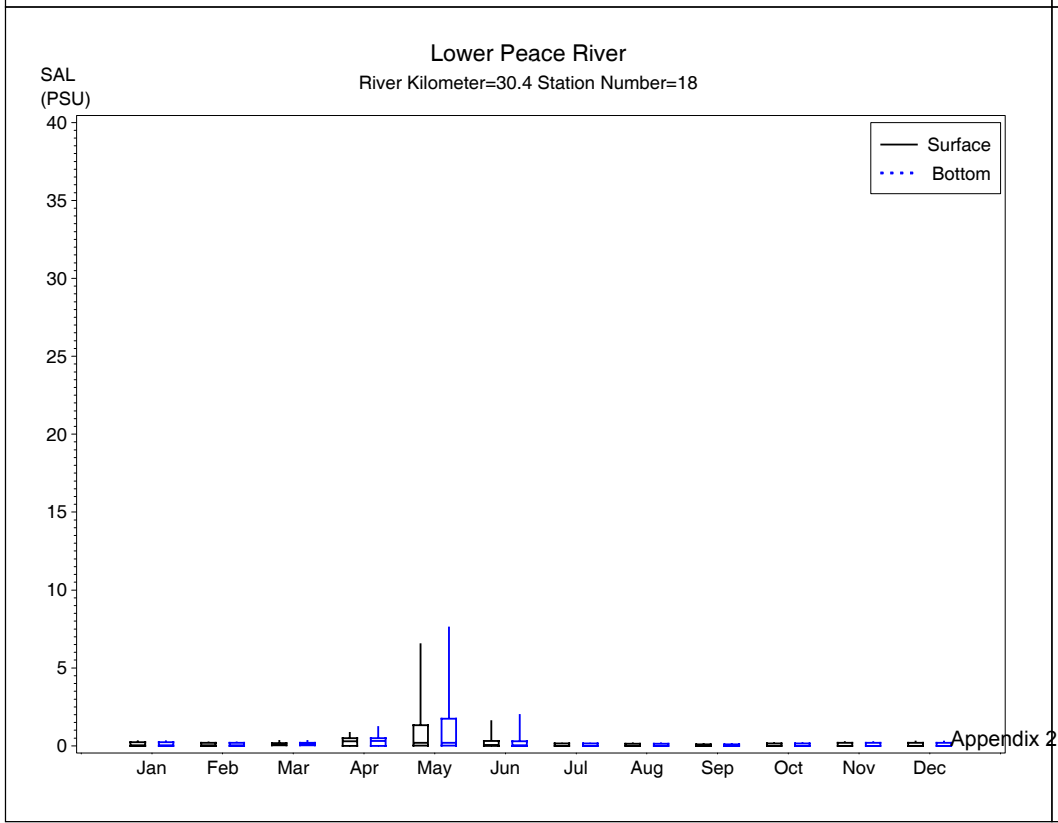

Lower Peace River
River Kilometer=21.9 Station Number=24
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

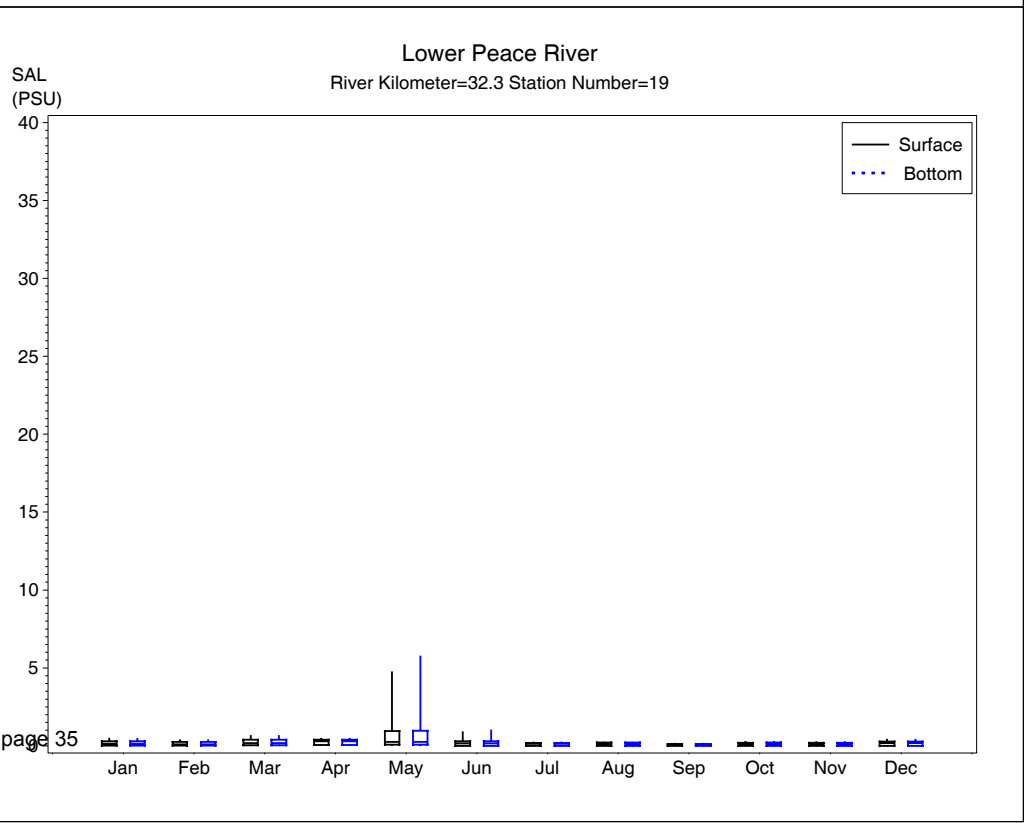

Lower Peace River
River Kilometer=23.6 Station Number=14
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

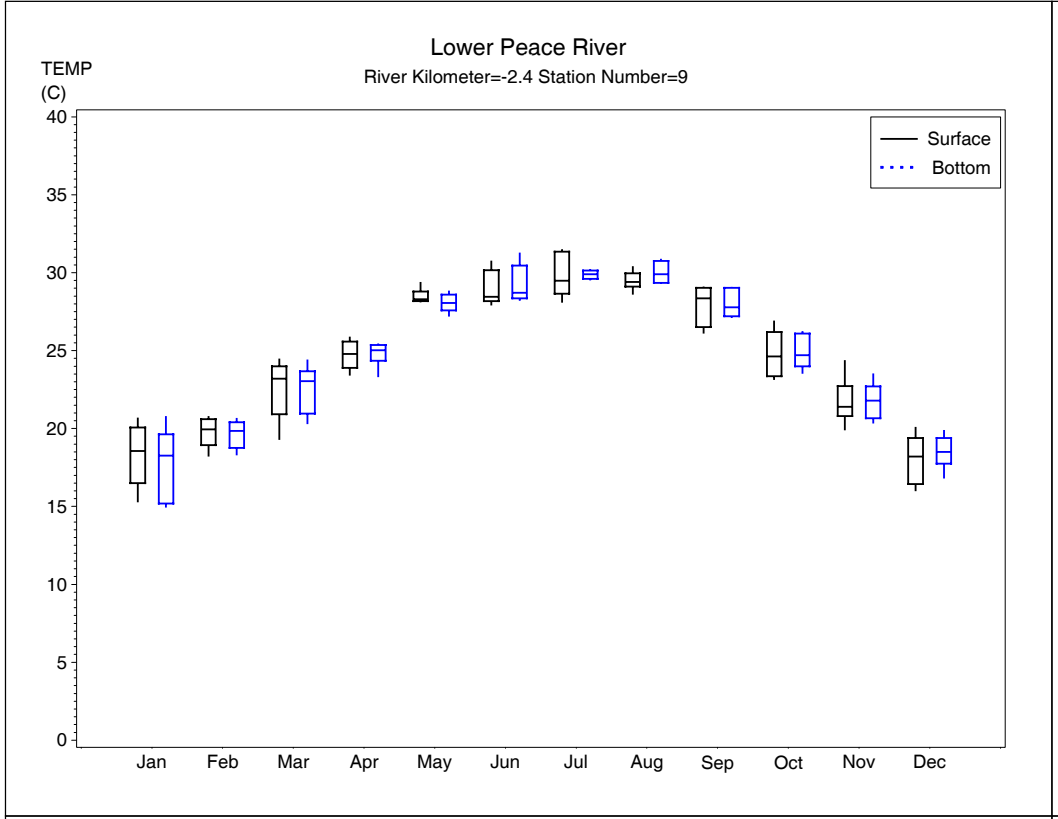

Lower Peace River
River Kilometer=24.7 Station Number=25
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

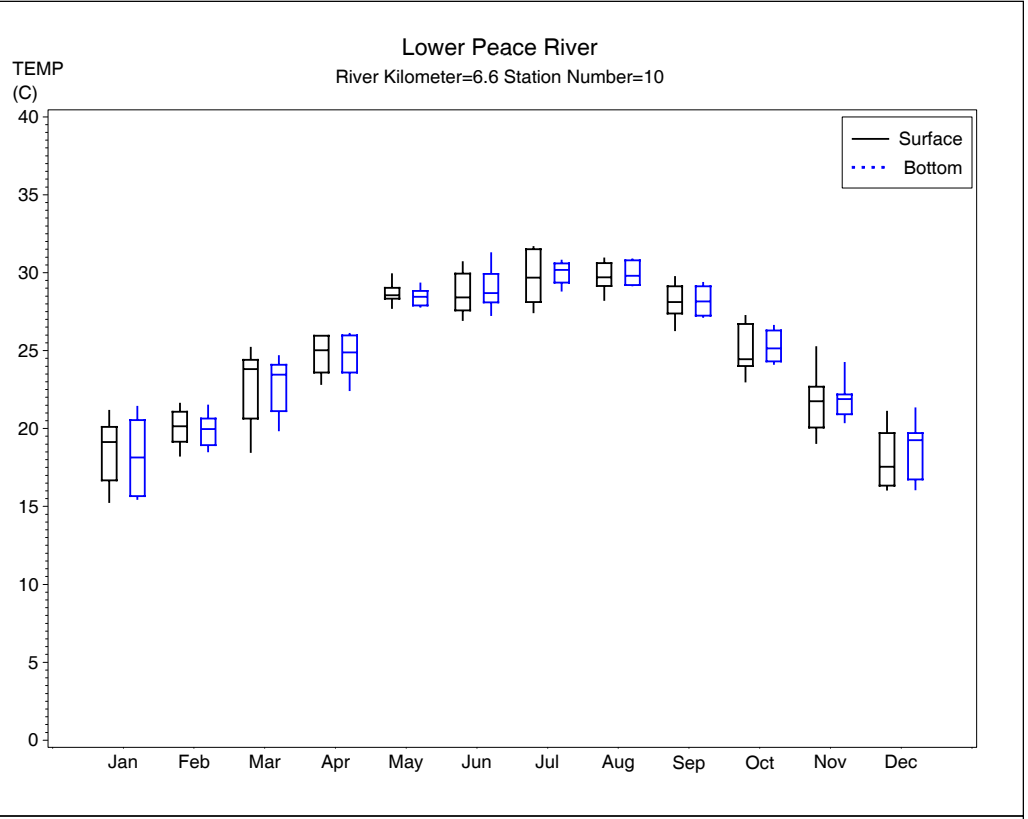

Lower Peace River
River Kilometer=25.9 Station Number=15
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

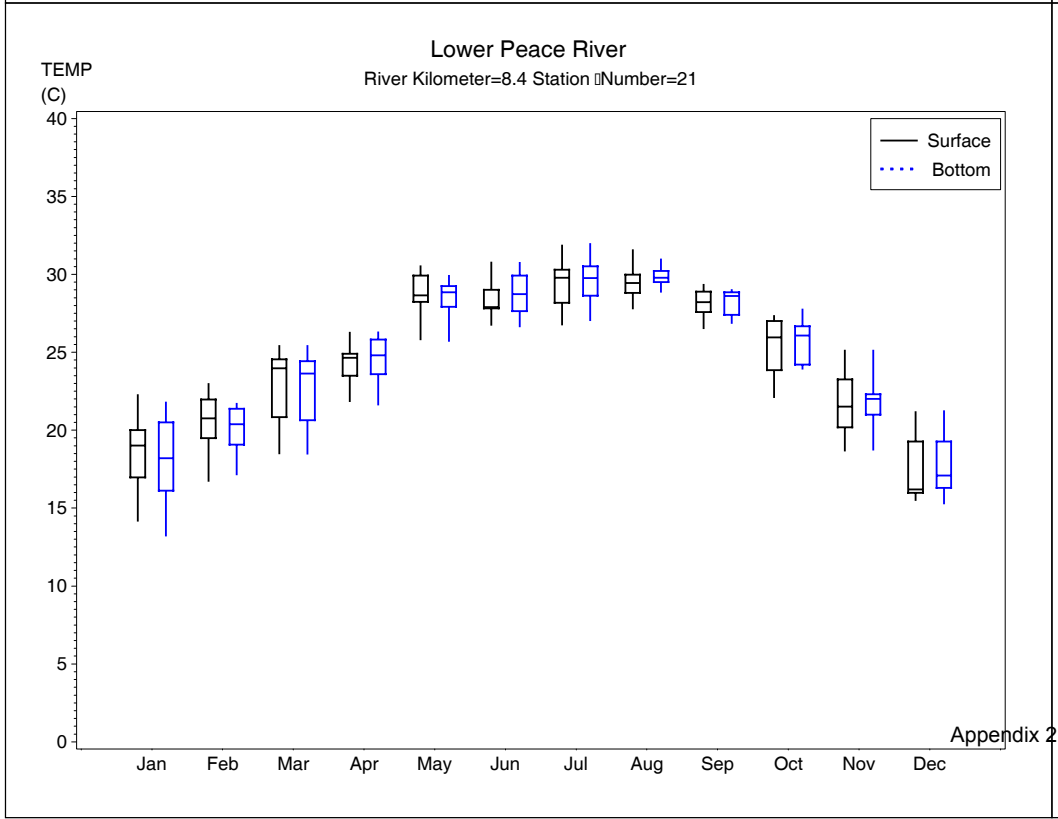

Lower Peace River
River Kilometer=29.5 Station Number=17
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

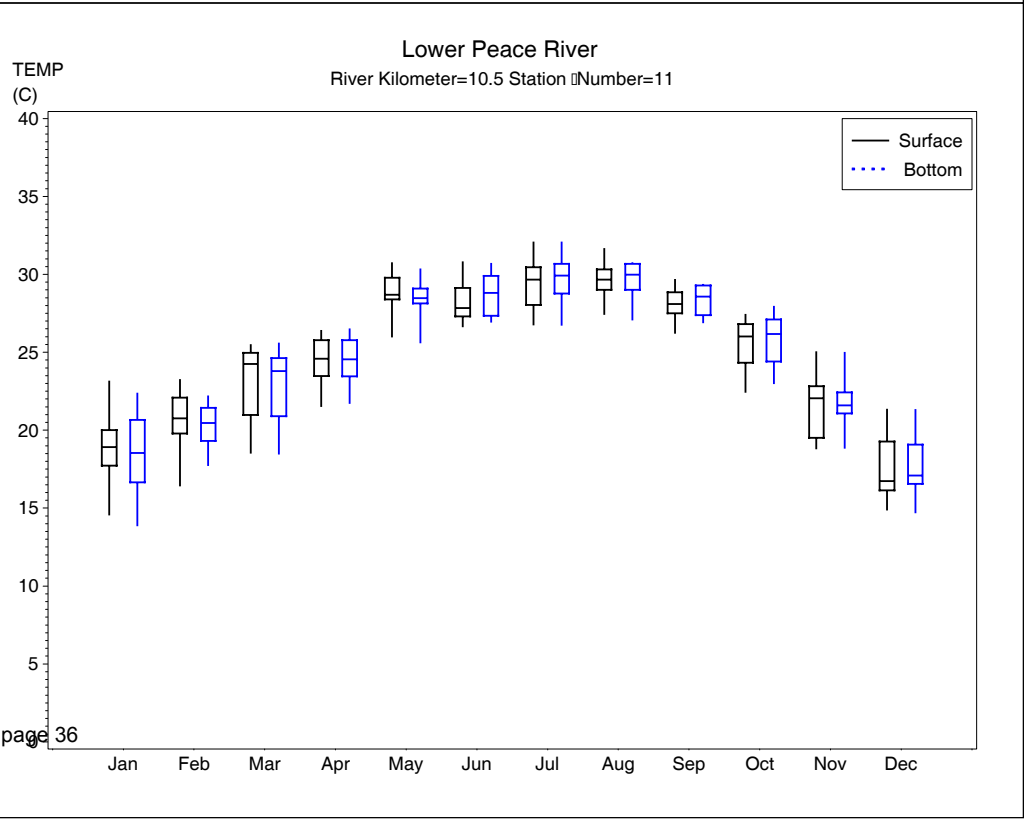

Lower Peace River
River Kilometer=30.4 Station Number=18
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

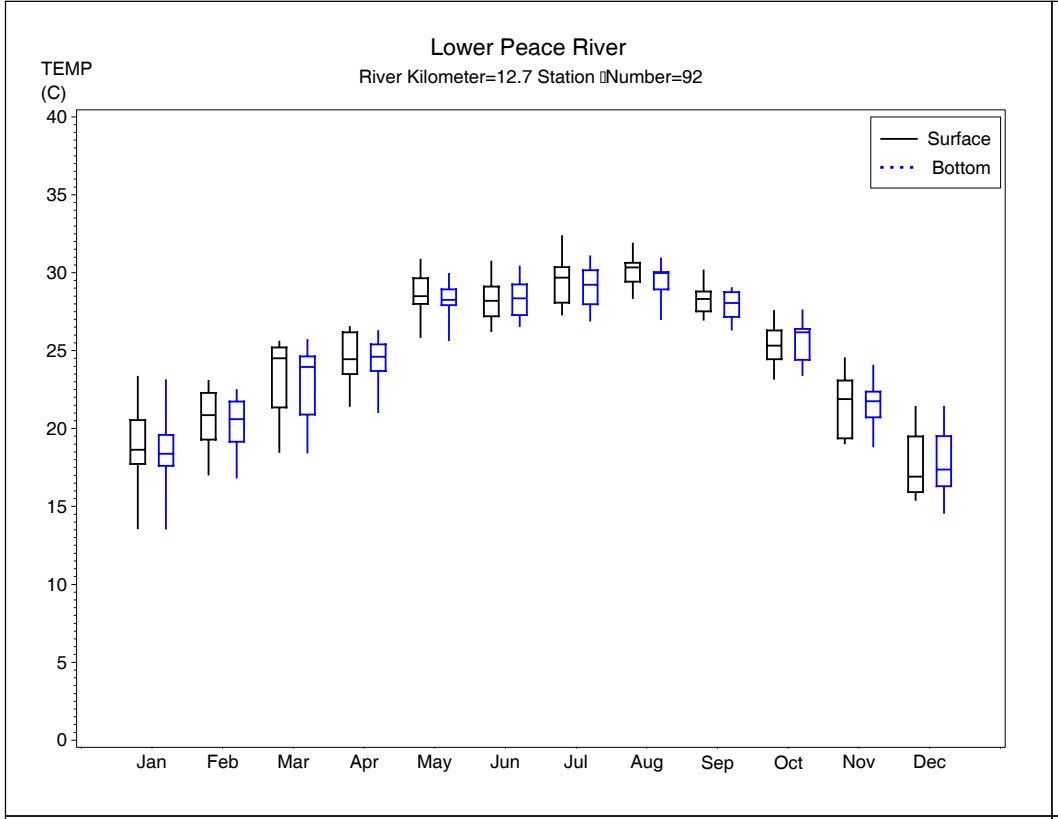

Lower Peace River
River Kilometer=32.3 Station Number=19
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

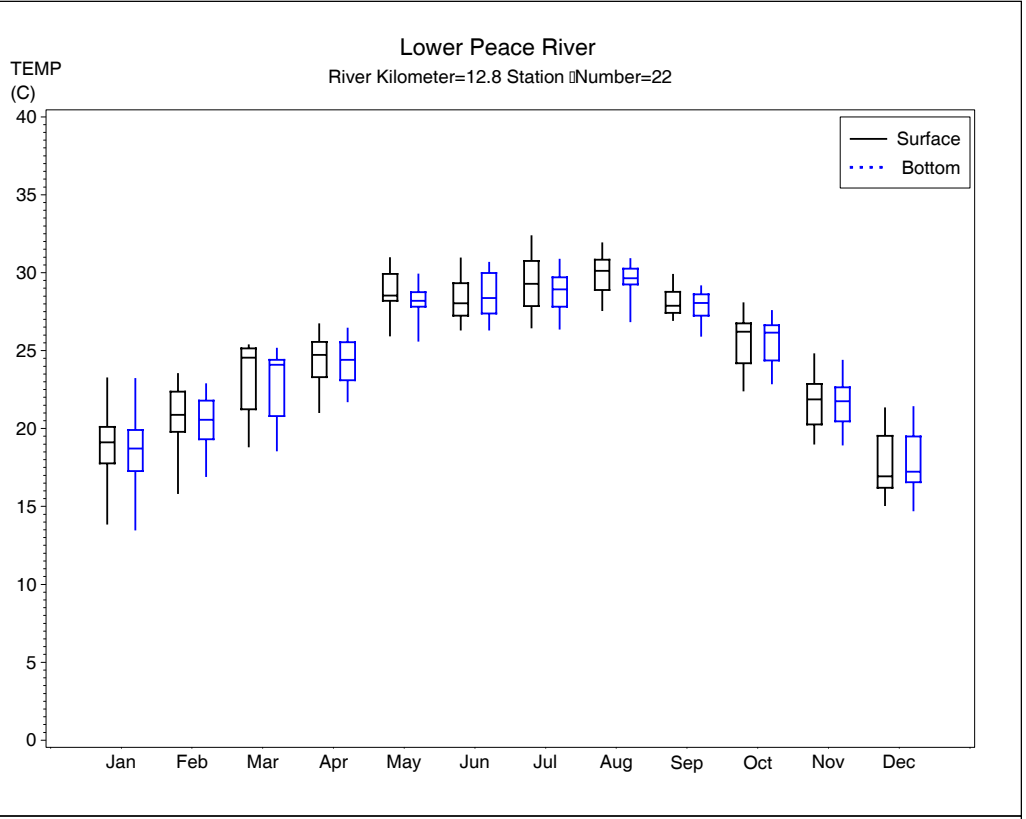

Lower Peace River
River Kilometer=-2.4 Station Number=9
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

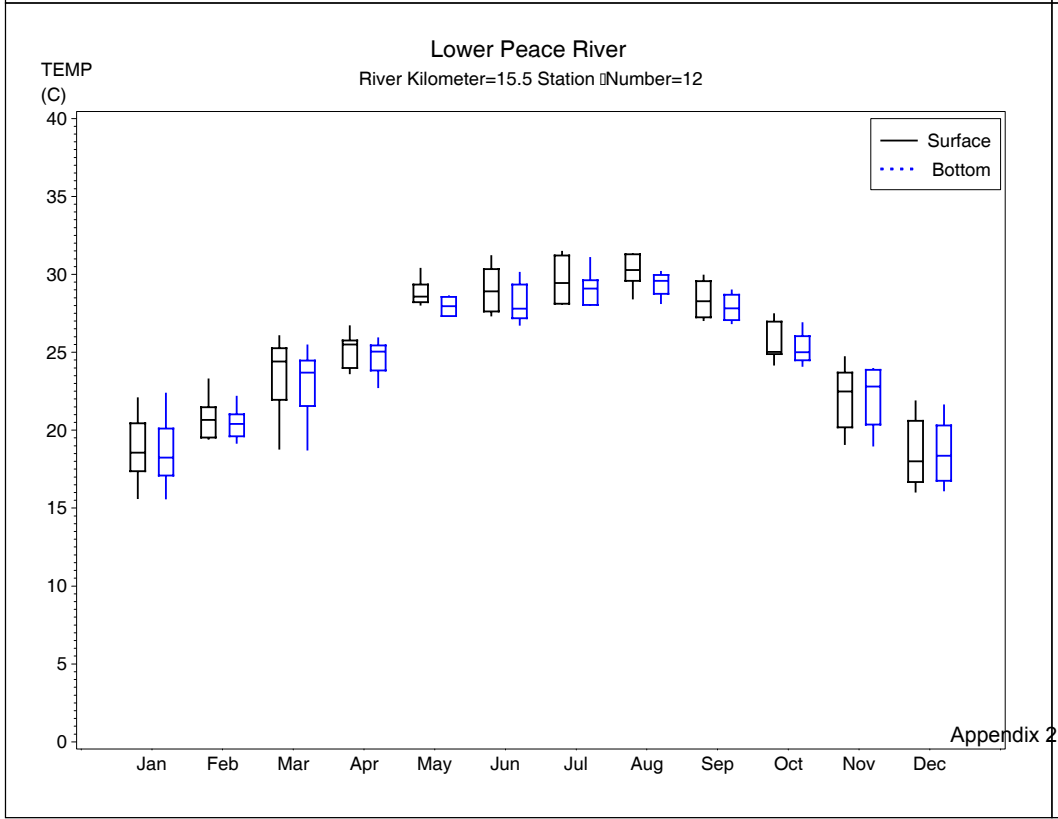

Lower Peace River
River Kilometer=6.6 Station Number=10
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

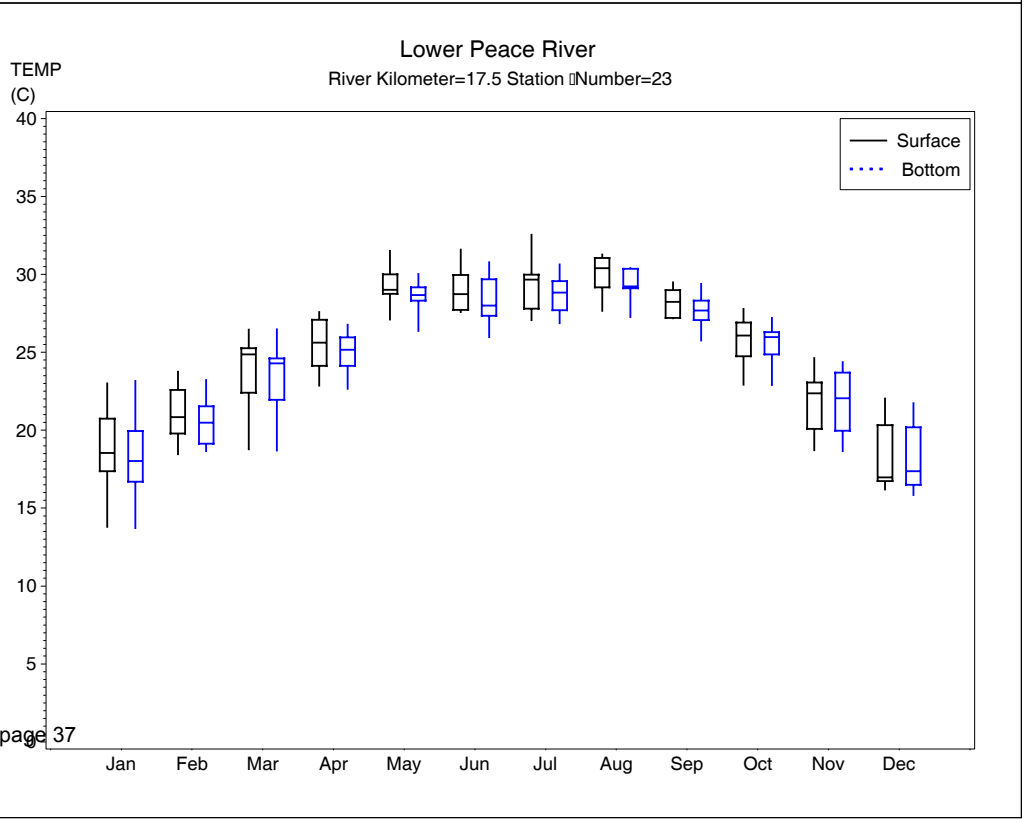

Lower Peace River
River Kilometer=8.4 Station Number=21
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

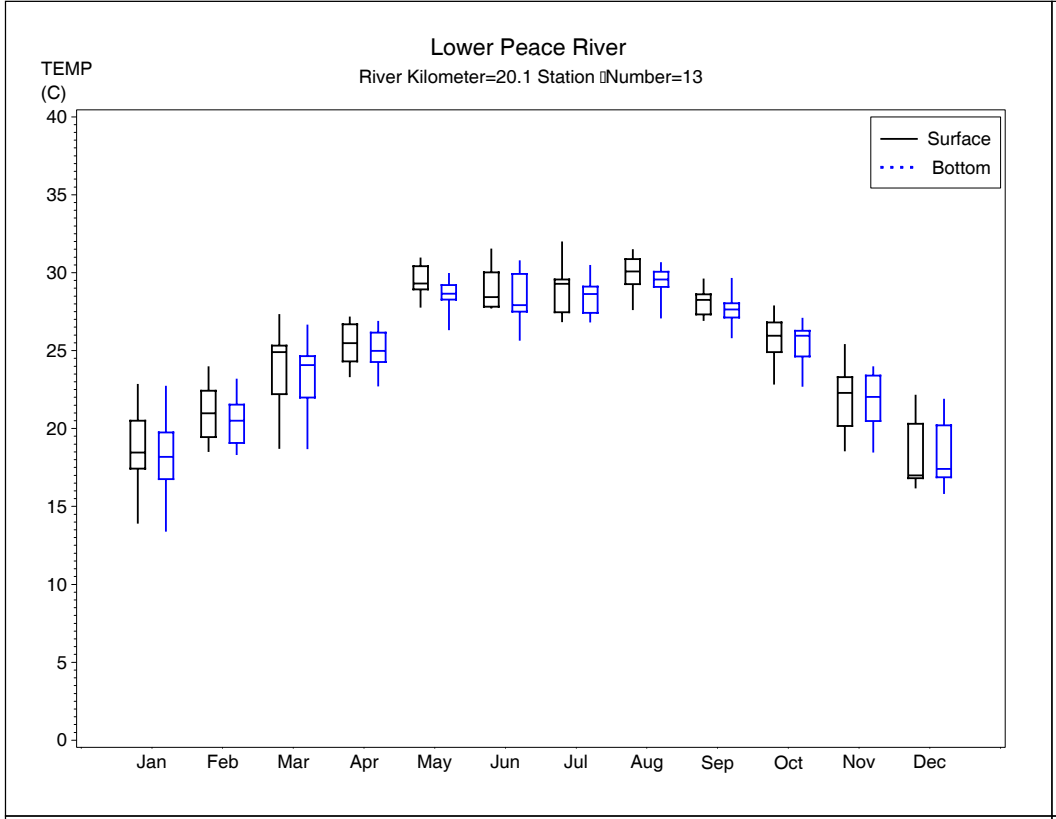

Lower Peace River
River Kilometer=10.5 Station Number=11
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

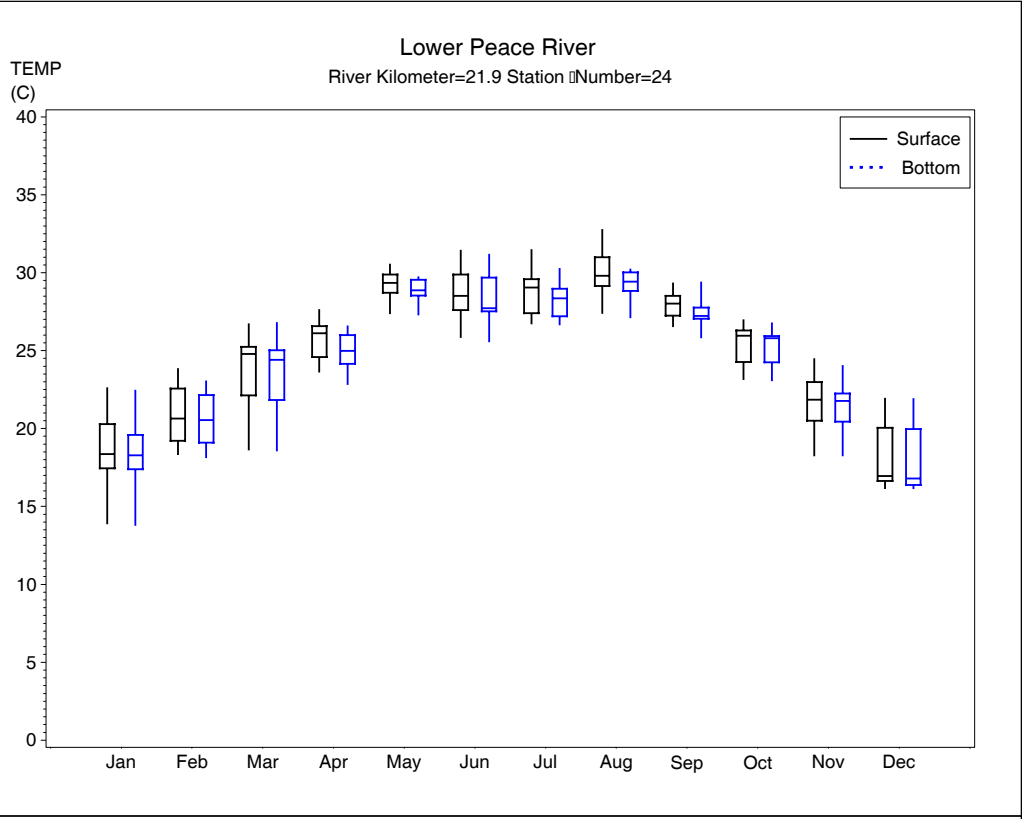

Lower Peace River
River Kilometer=12.7 Station Number=92
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

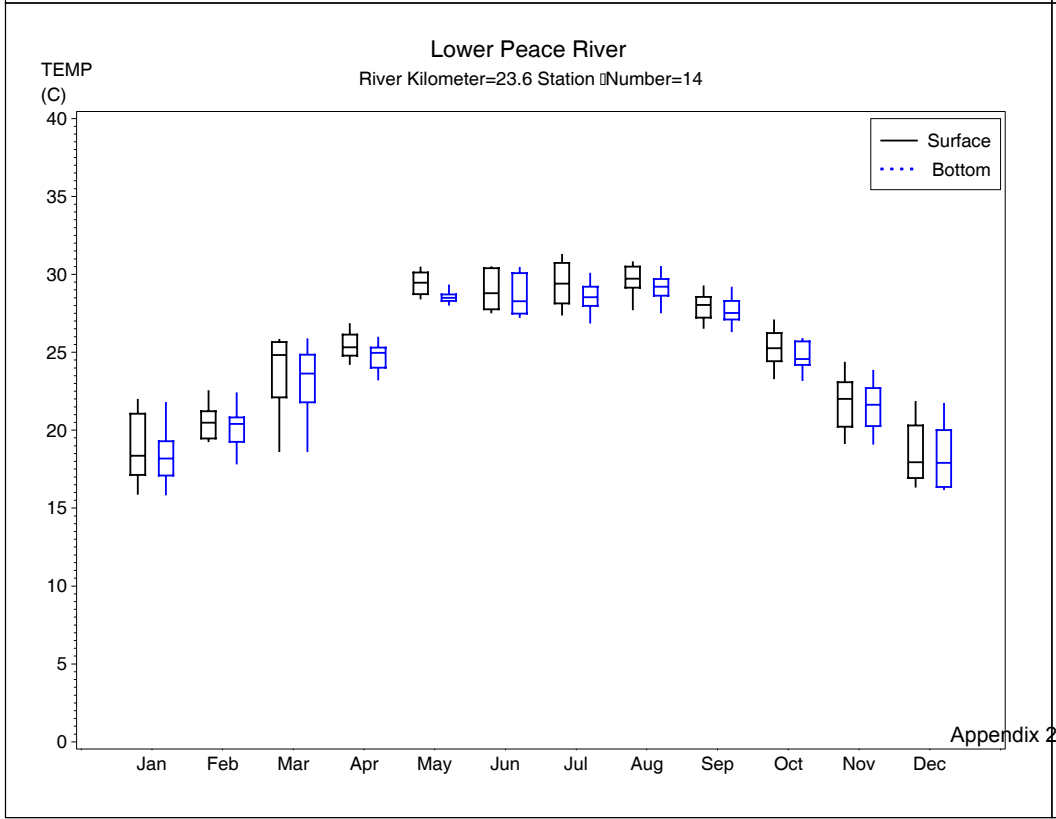

Lower Peace River
River Kilometer=12.8 Station Number=22
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

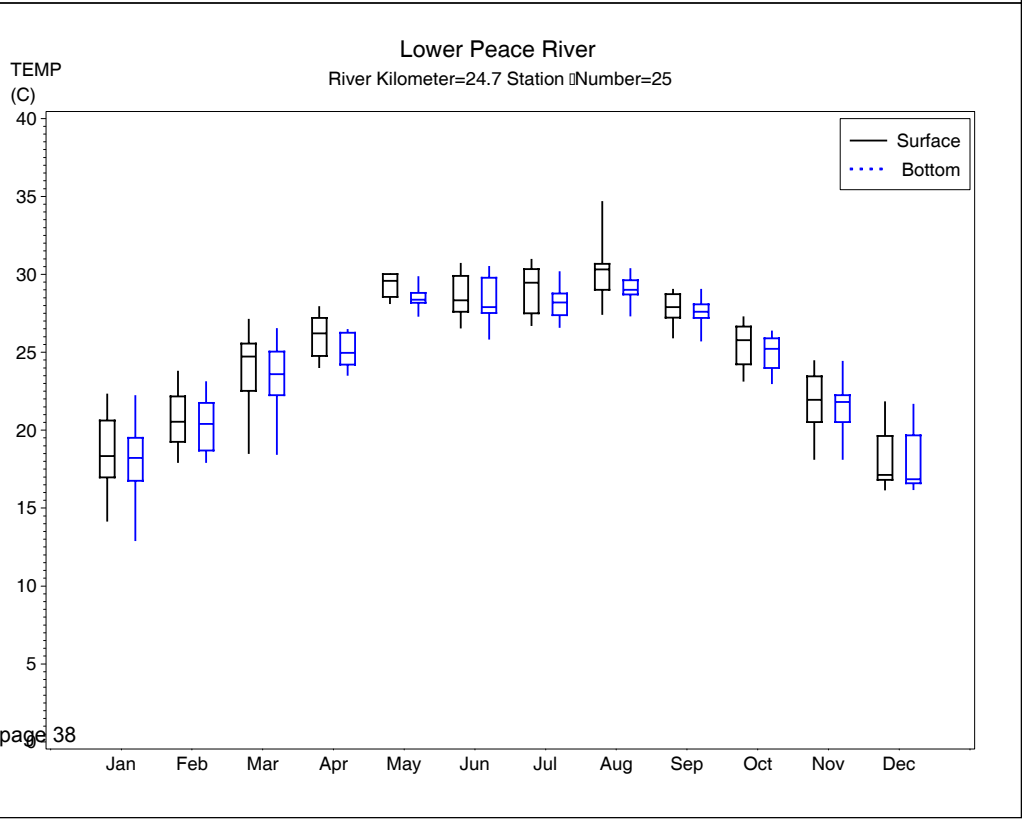

Lower Peace River
River Kilometer=15.5 Station Number=12
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

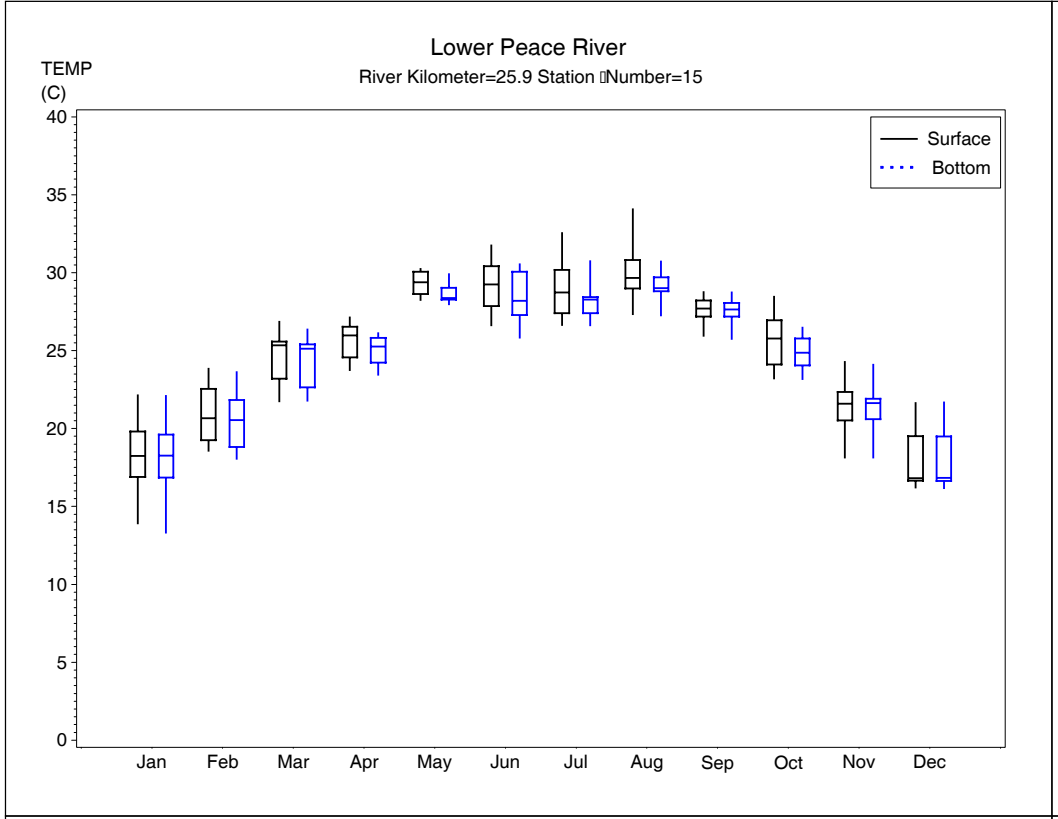

Lower Peace River
River Kilometer=17.5 Station Number=23
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

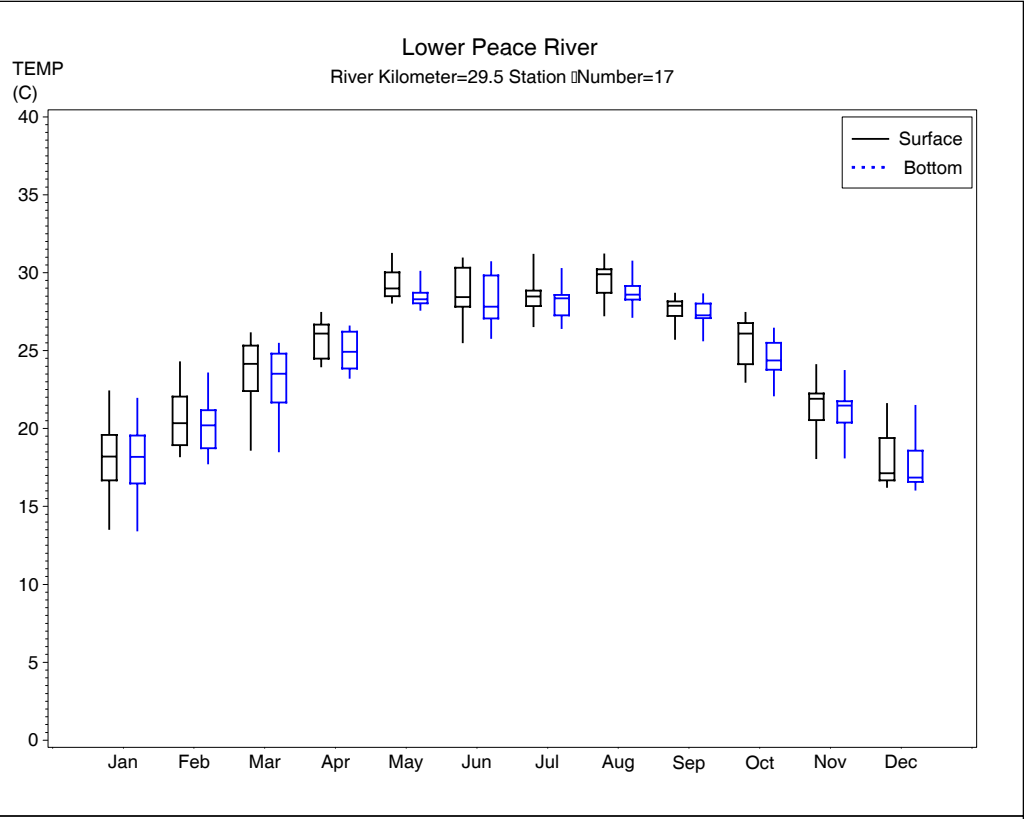

Lower Peace River
River Kilometer=20.1 Station Number=13
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

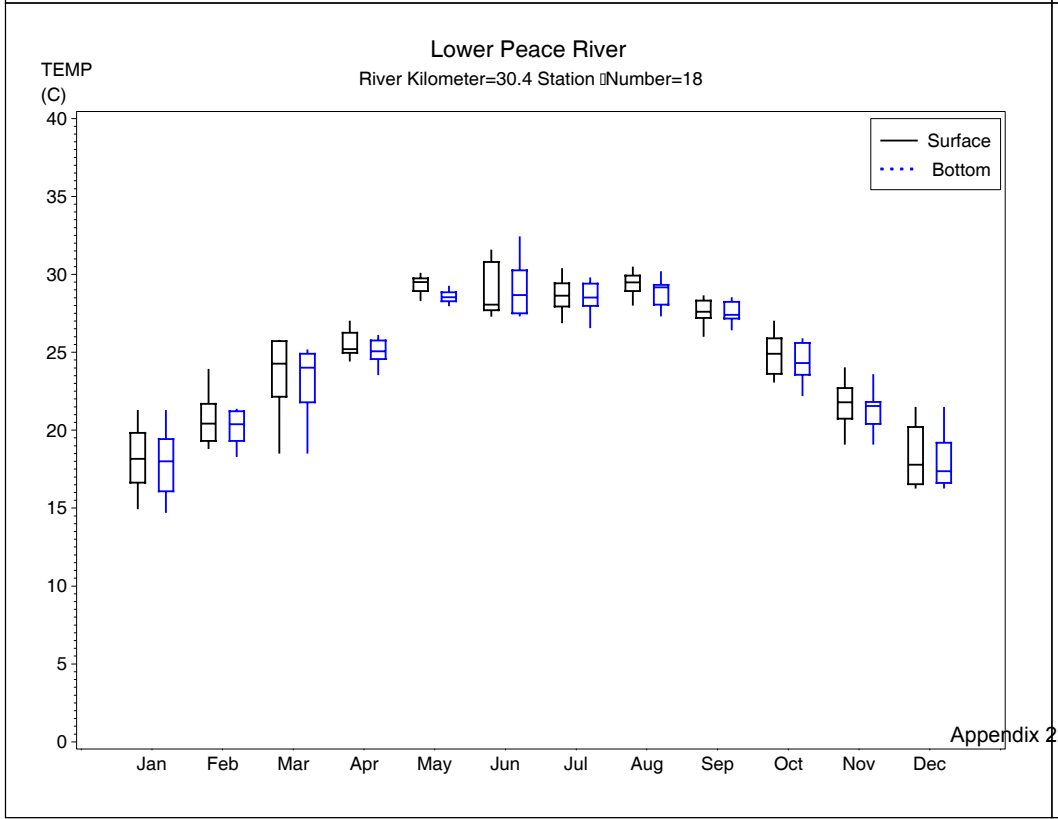

Lower Peace River
River Kilometer=21.9 Station Number=24
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

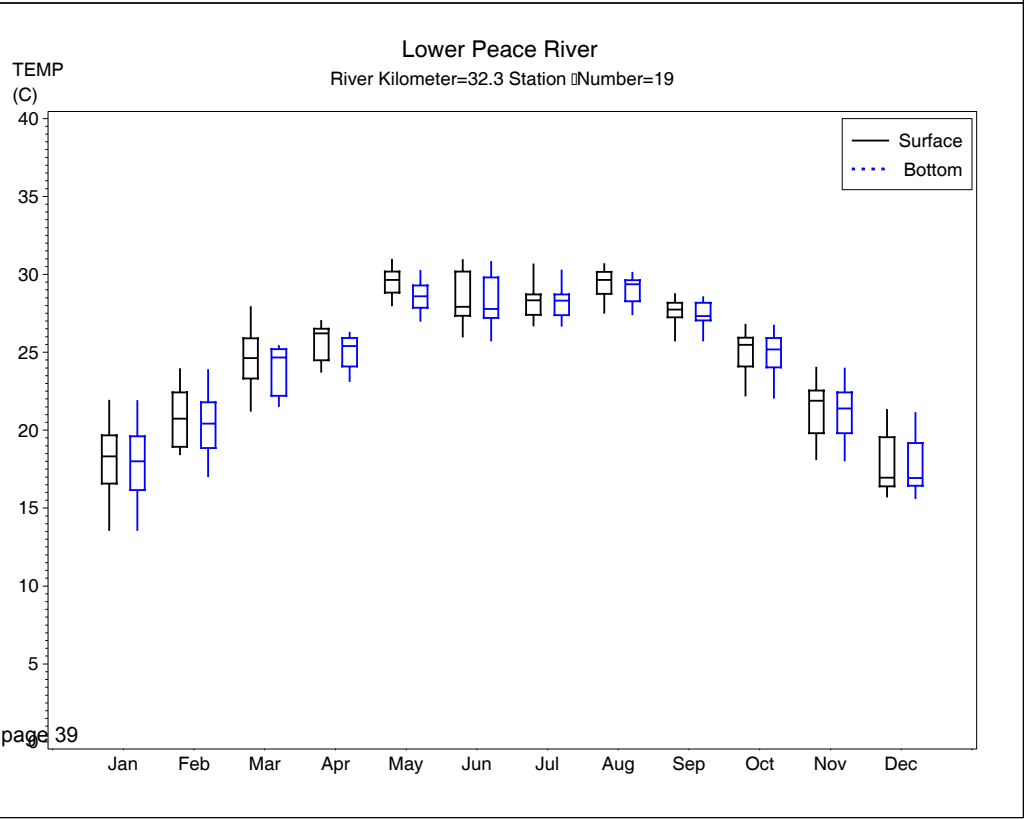

Lower Peace River
River Kilometer=23.6 Station Number=14
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

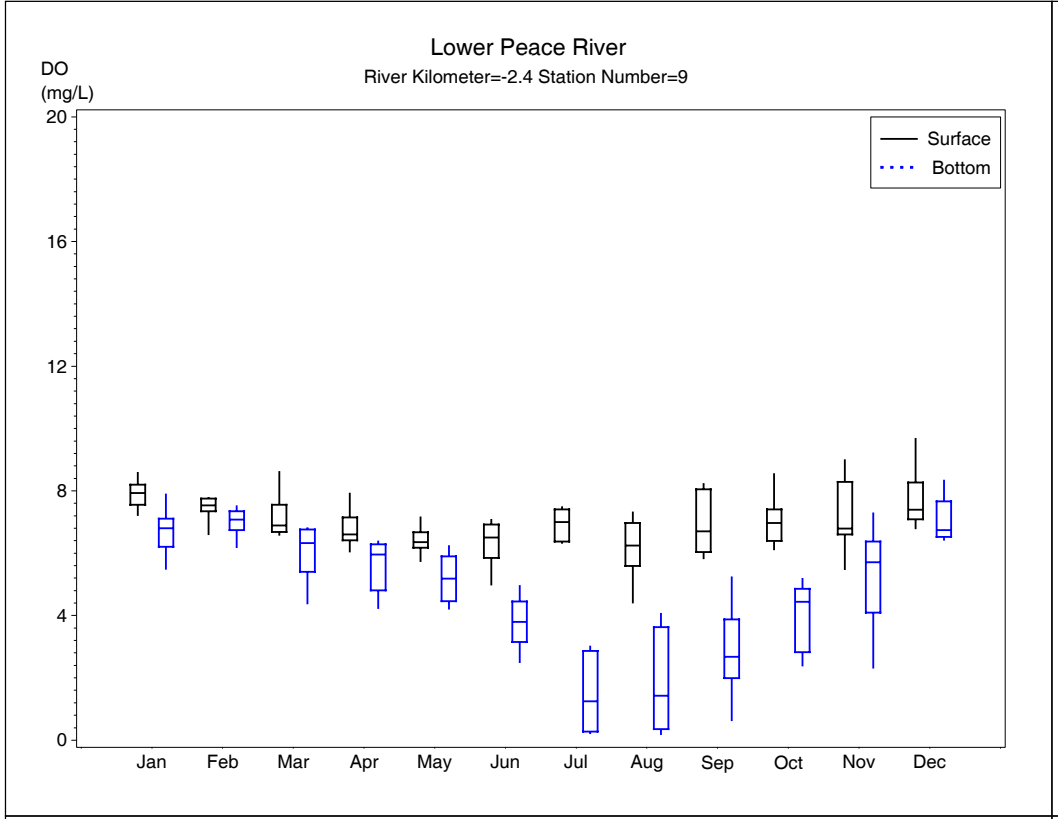

Lower Peace River
River Kilometer=24.7 Station Number=25
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

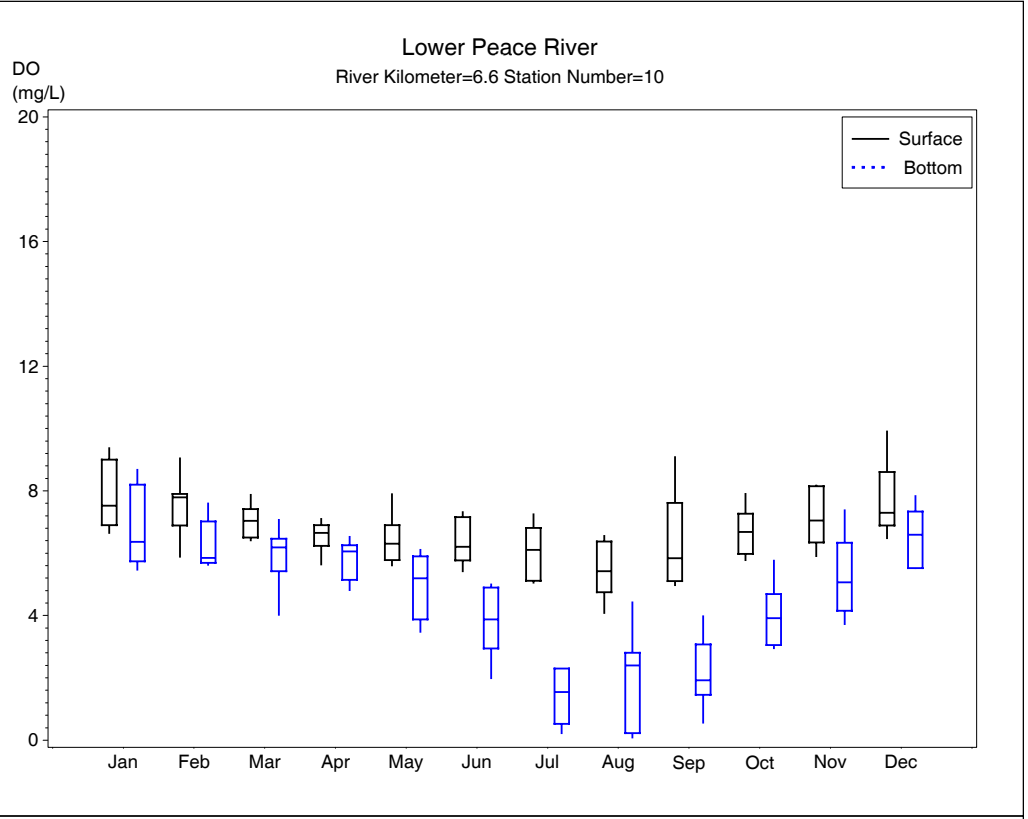

Lower Peace River
River Kilometer=25.9 Station Number=15
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

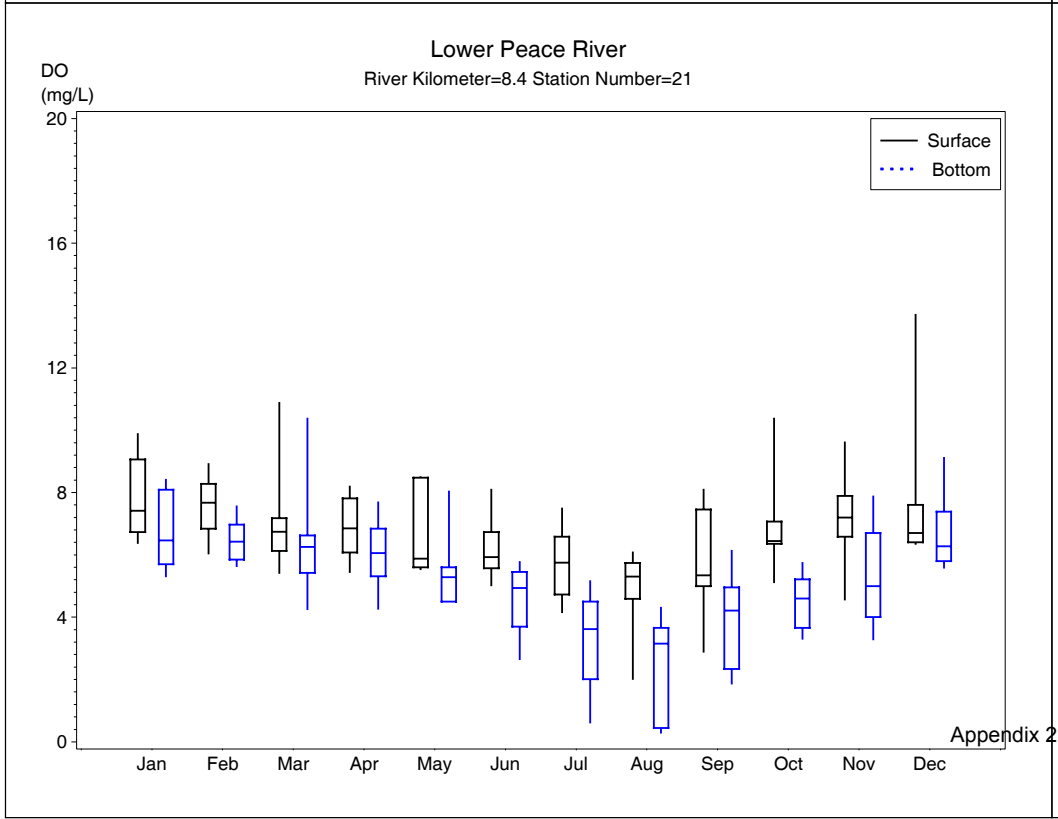

Lower Peace River
River Kilometer=29.5 Station Number=17
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

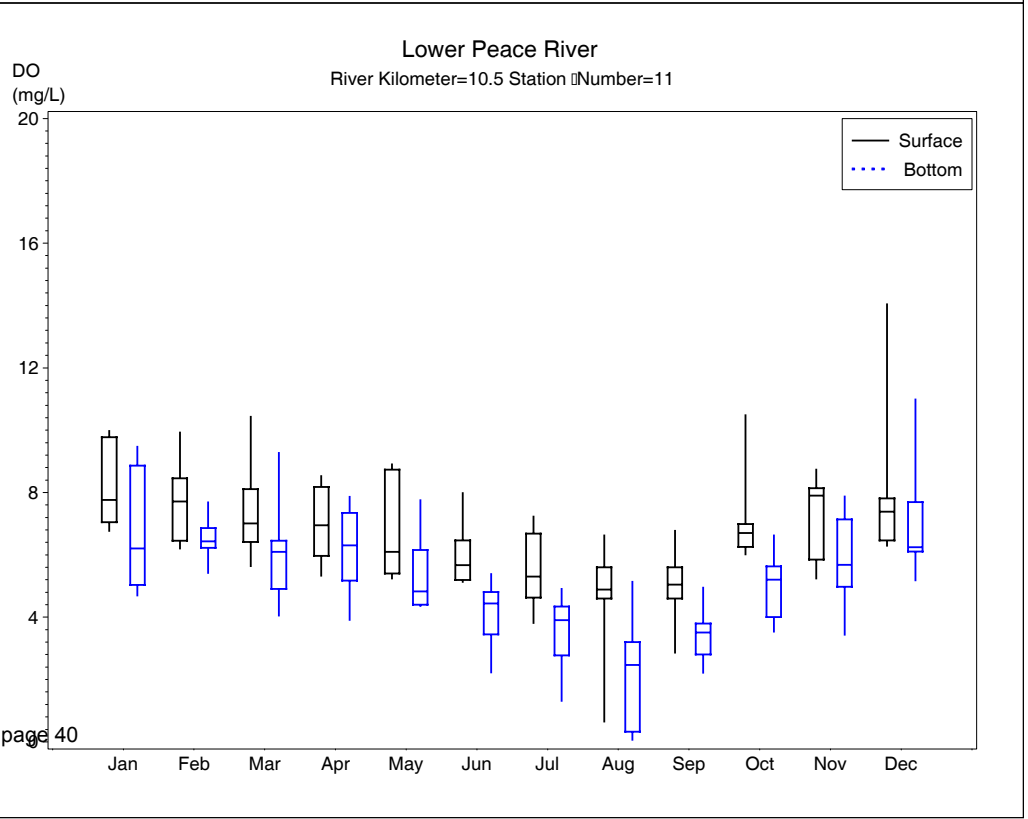

Lower Peace River
River Kilometer=30.4 Station Number=18
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

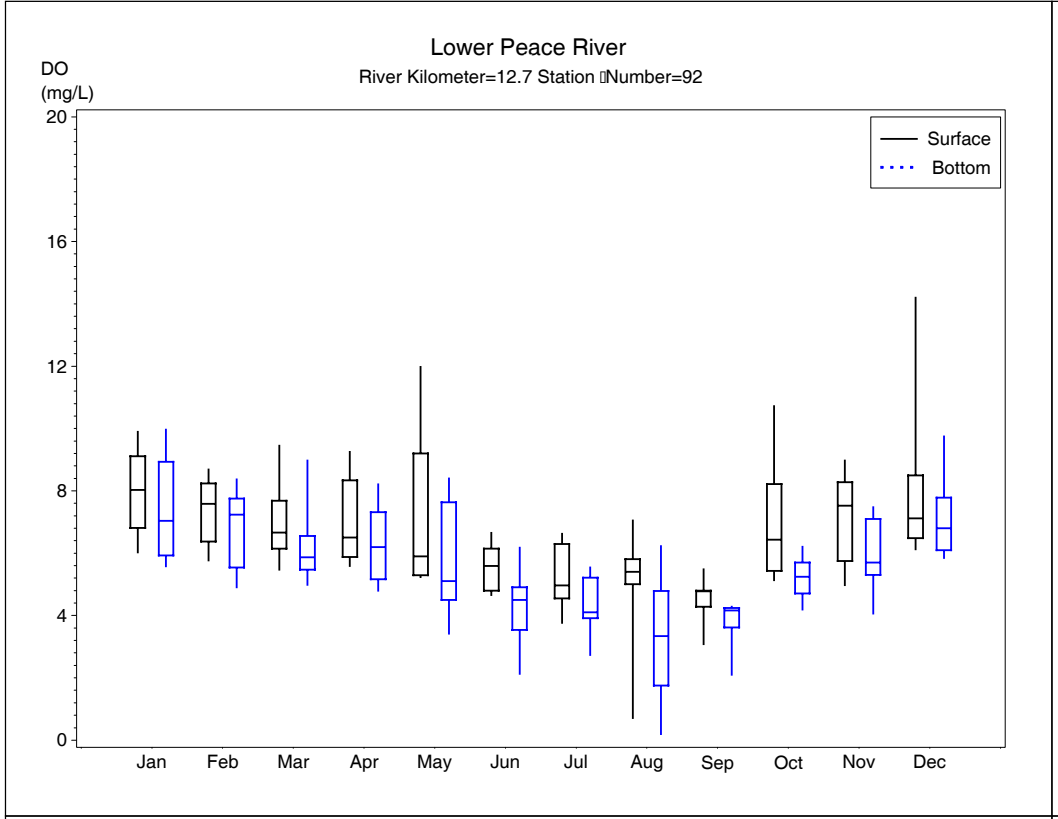

Lower Peace River
River Kilometer=32.3 Station Number=19
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

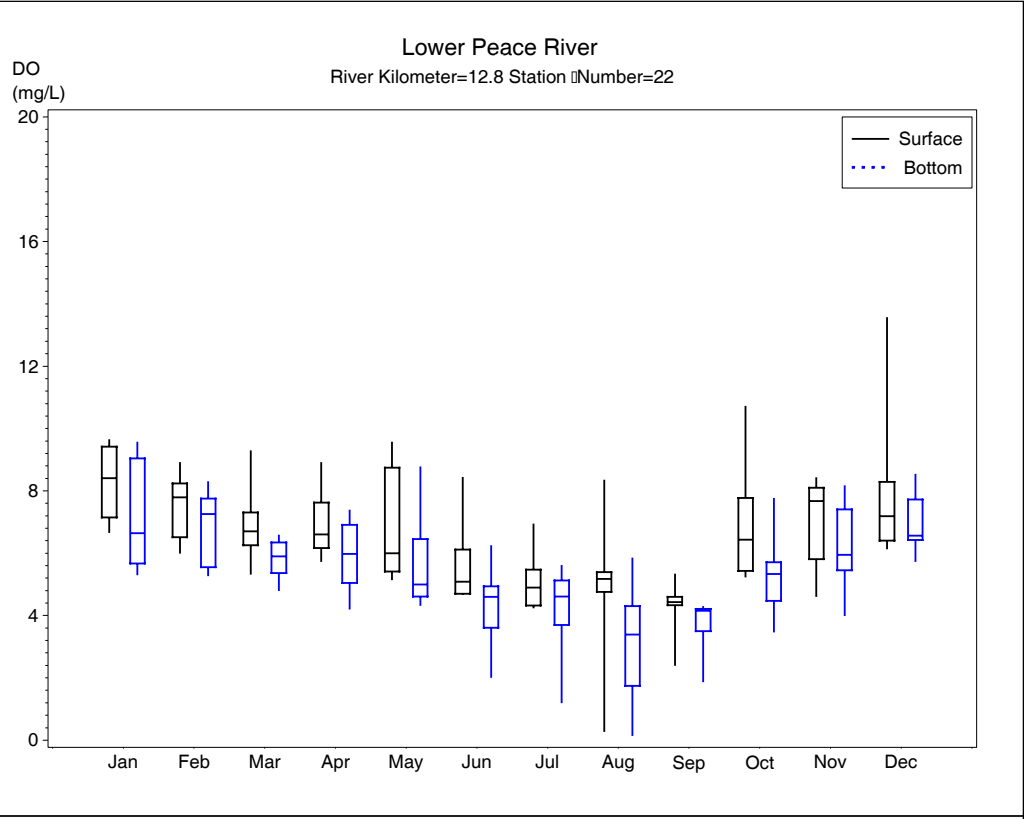

Lower Peace River
River Kilometer=-2.4 Station Number=9
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

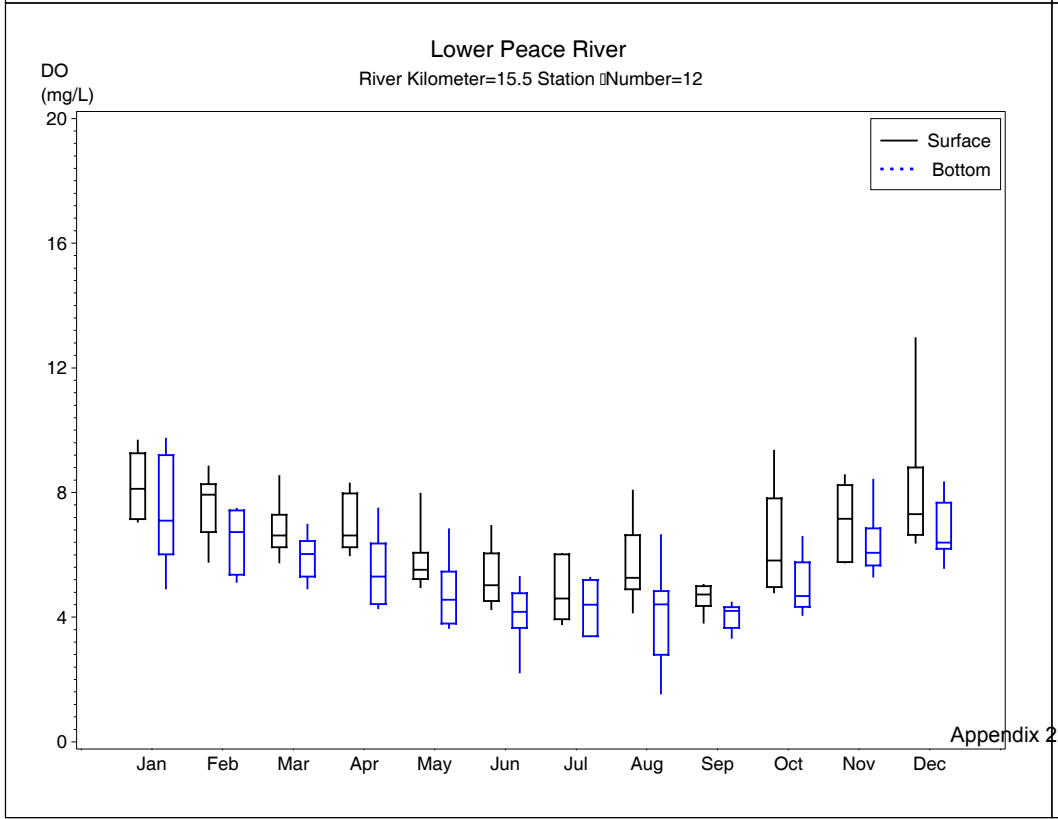

Lower Peace River
River Kilometer=6.6 Station Number=10
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

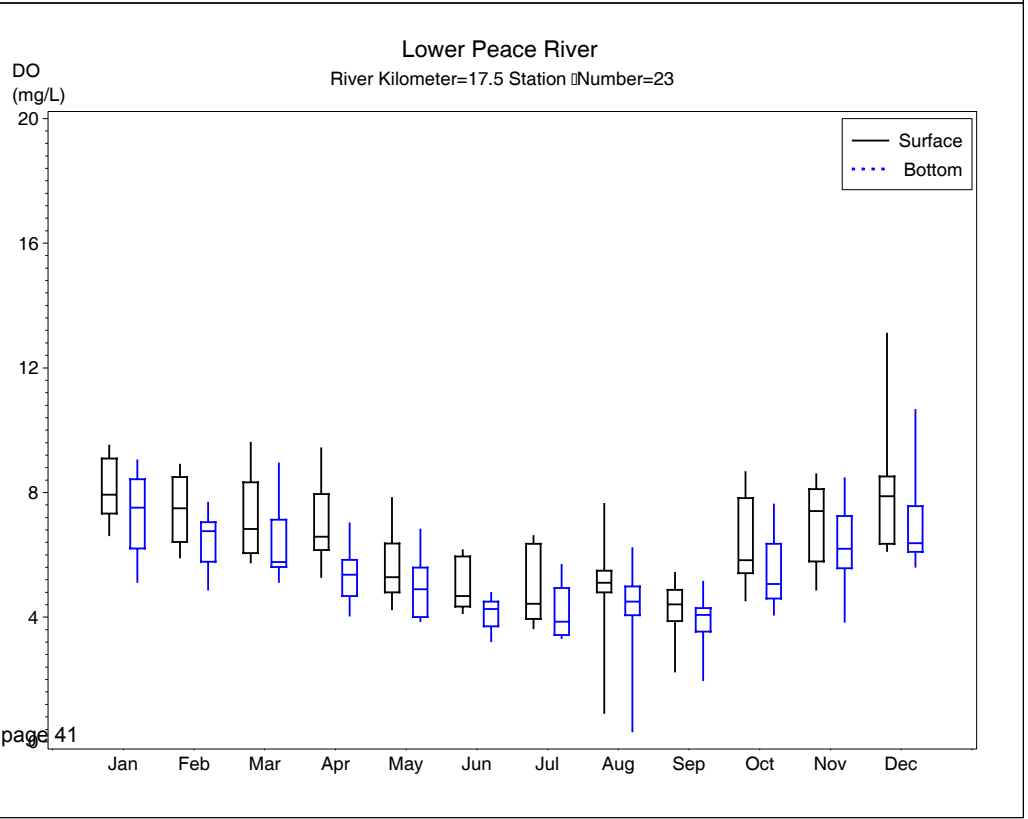

Lower Peace River
River Kilometer=8.4 Station Number=21
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

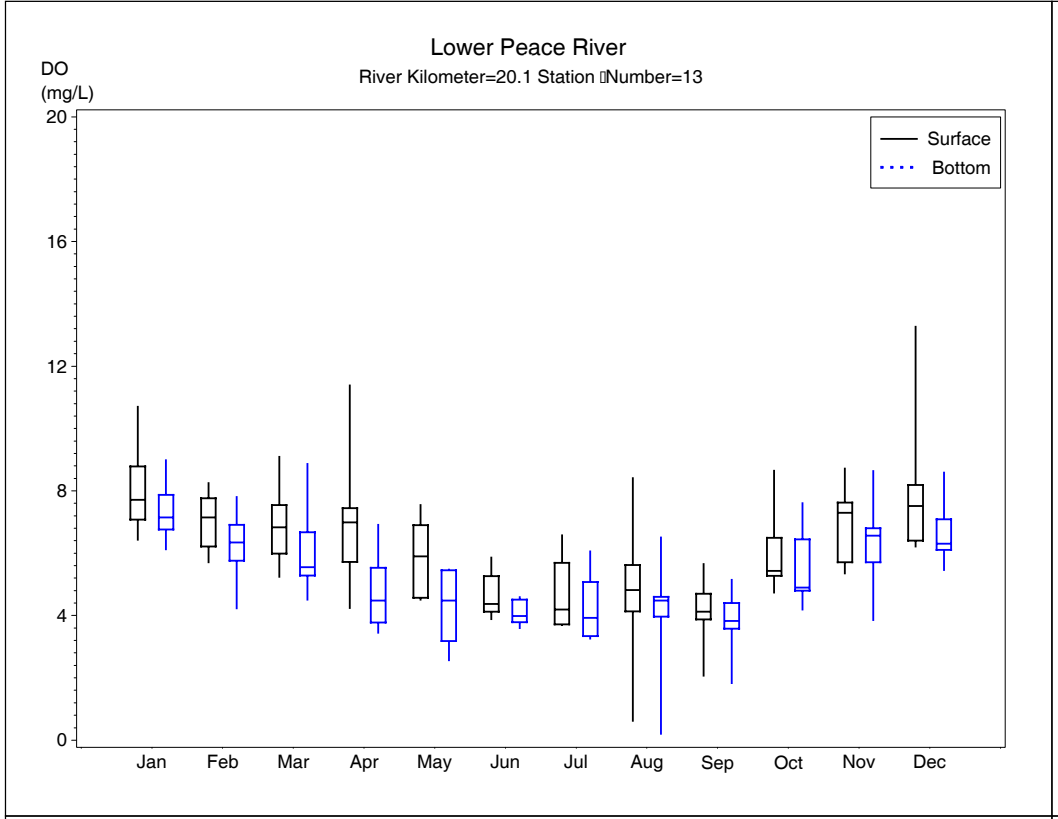

Lower Peace River
River Kilometer=10.5 Station Number=11
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

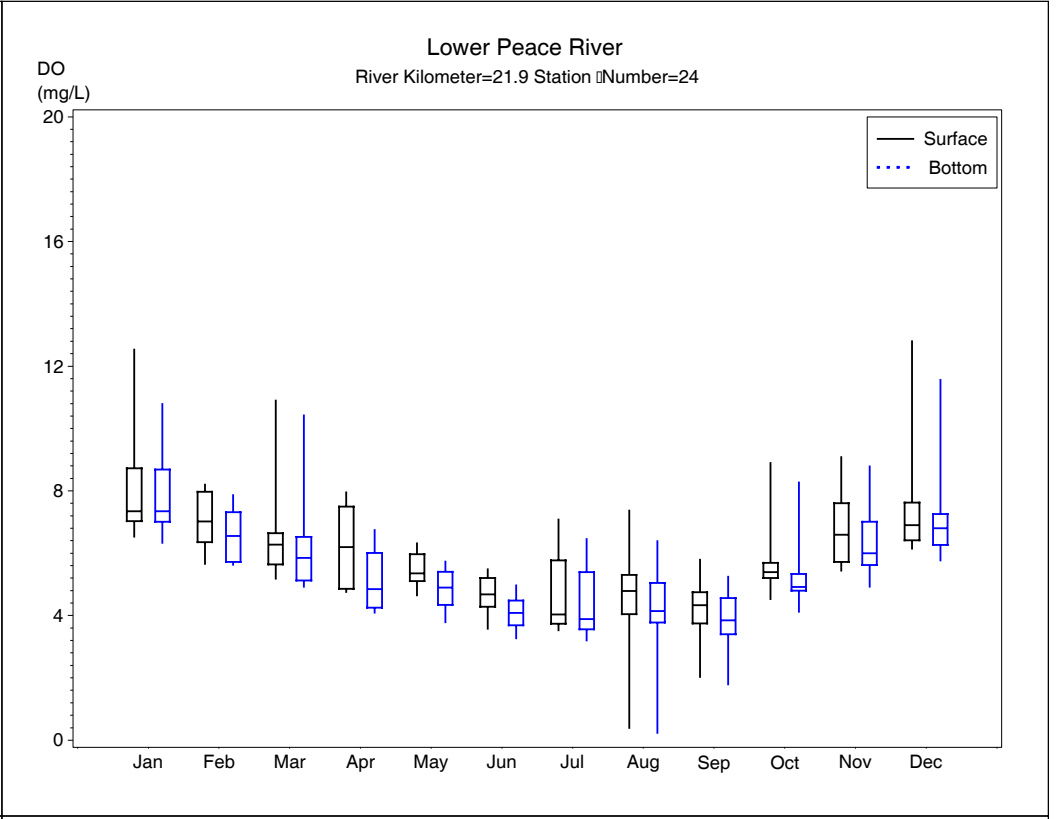

Lower Peace River
River Kilometer=12.7 Station Number=92
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

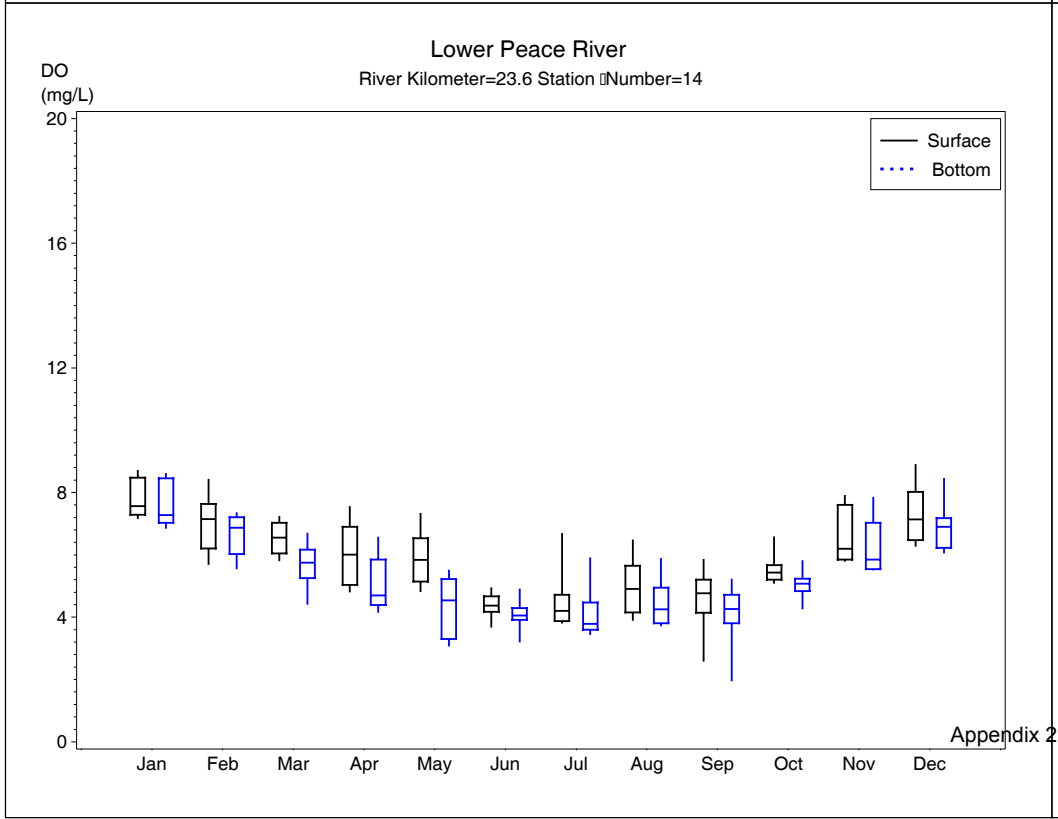

Lower Peace River
River Kilometer=12.8 Station Number=22
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

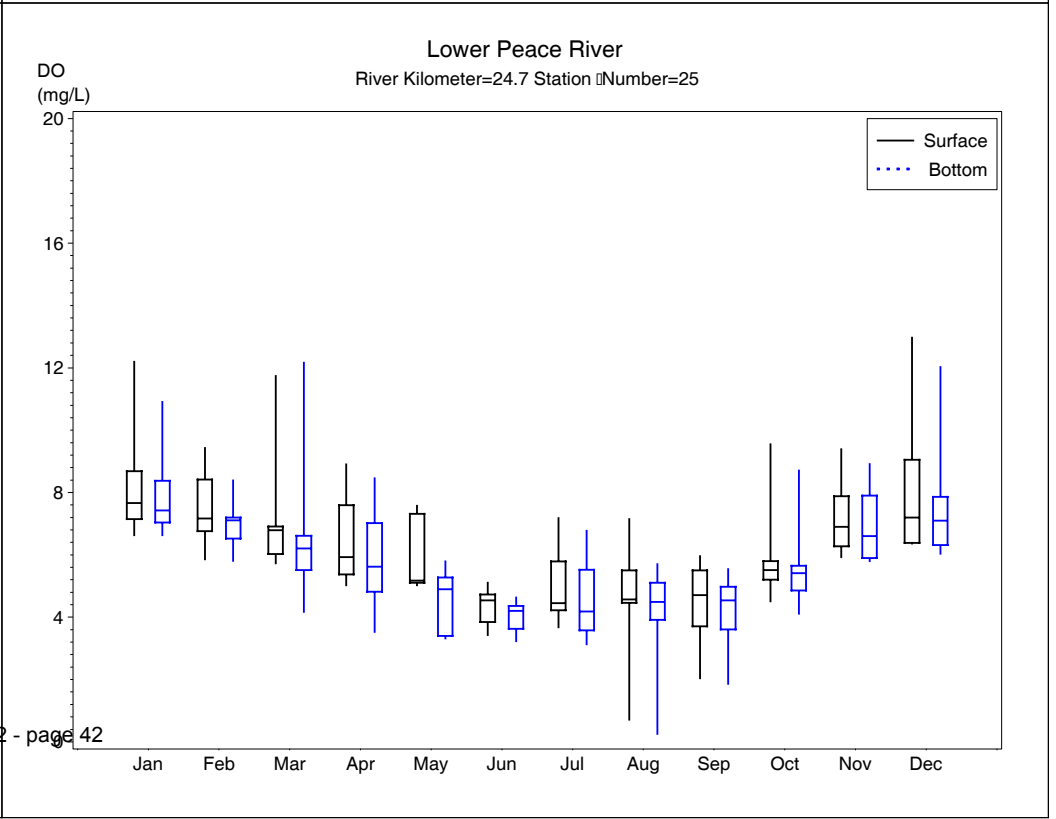

Lower Peace River
River Kilometer=15.5 Station Number=12
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

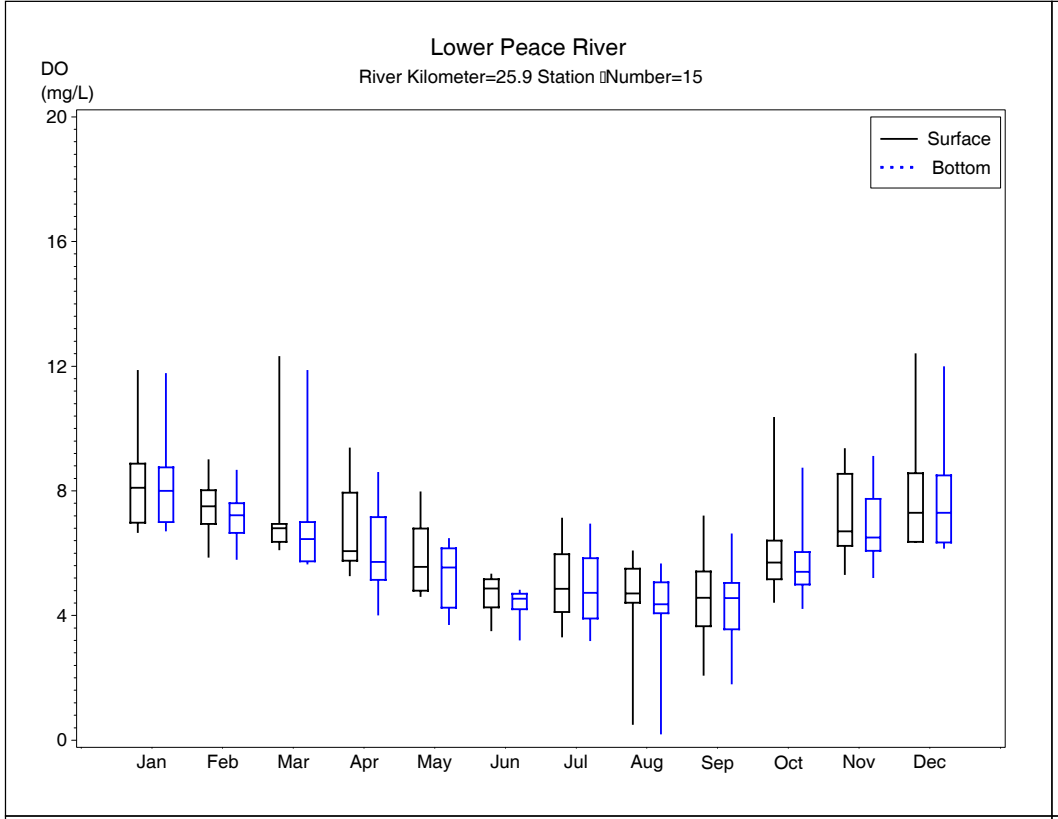

Lower Peace River
River Kilometer=17.5 Station Number=23
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

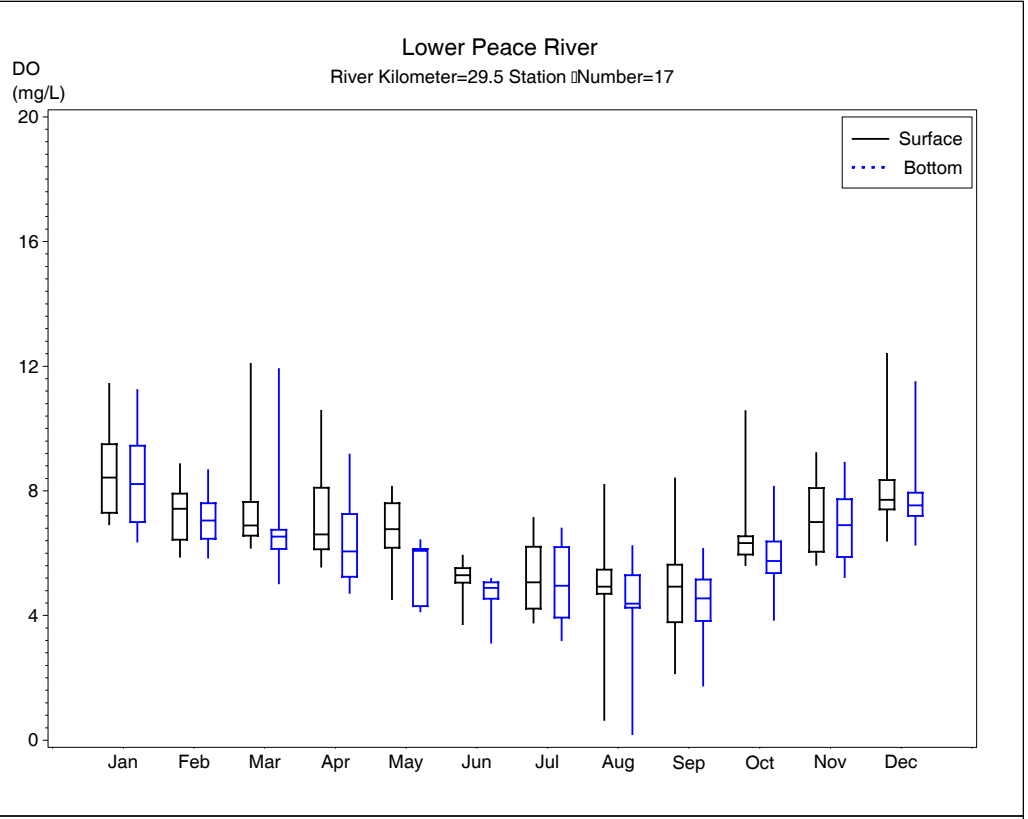

Lower Peace River
River Kilometer=20.1 Station Number=13
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

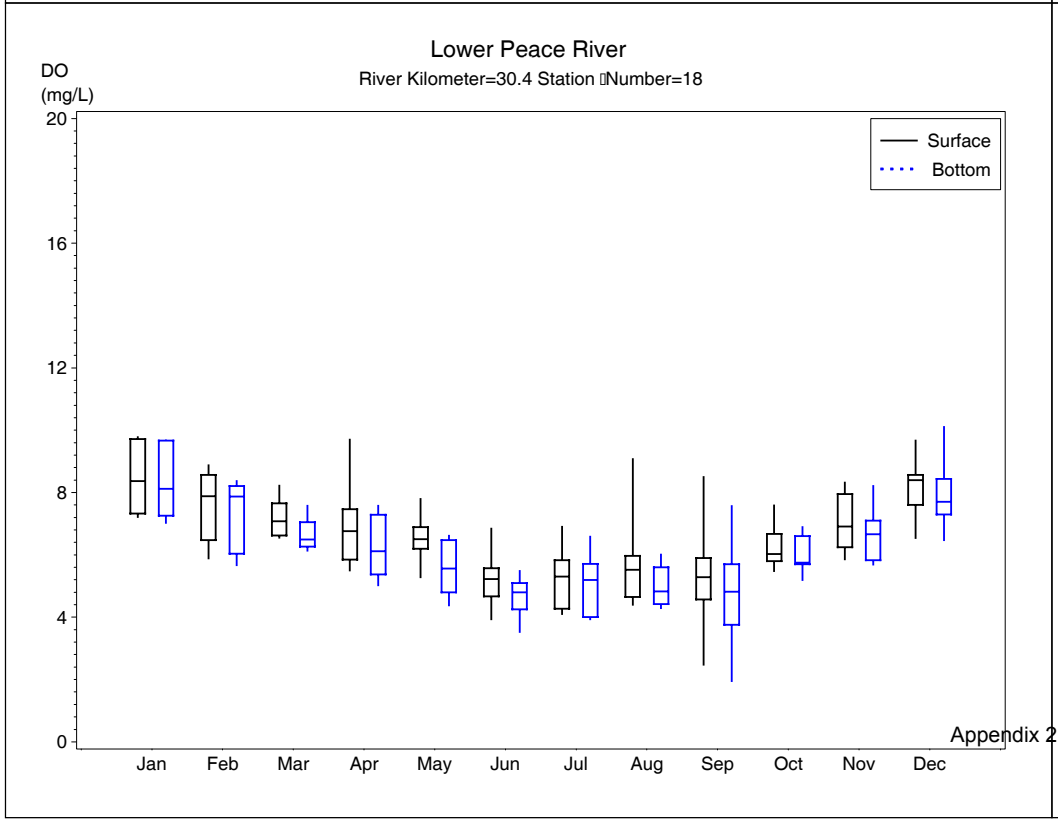

Lower Peace River
River Kilometer=21.9 Station Number=24
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

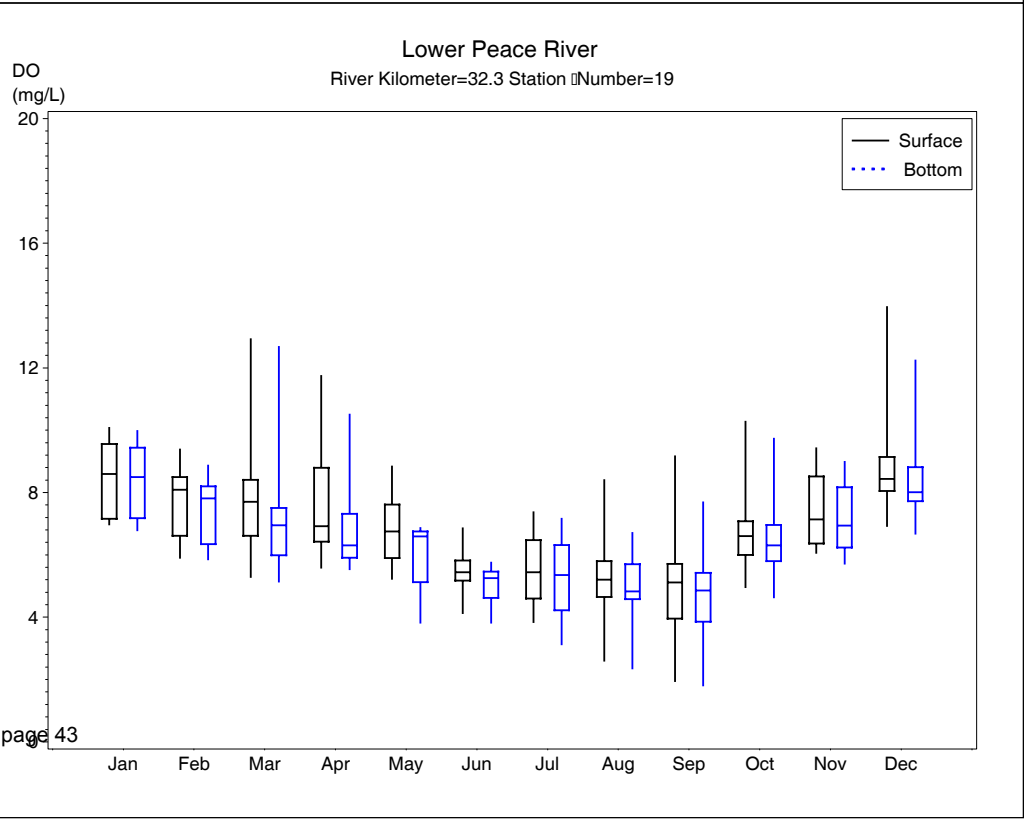

Lower Peace River
River Kilometer=23.6 Station Number=14
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

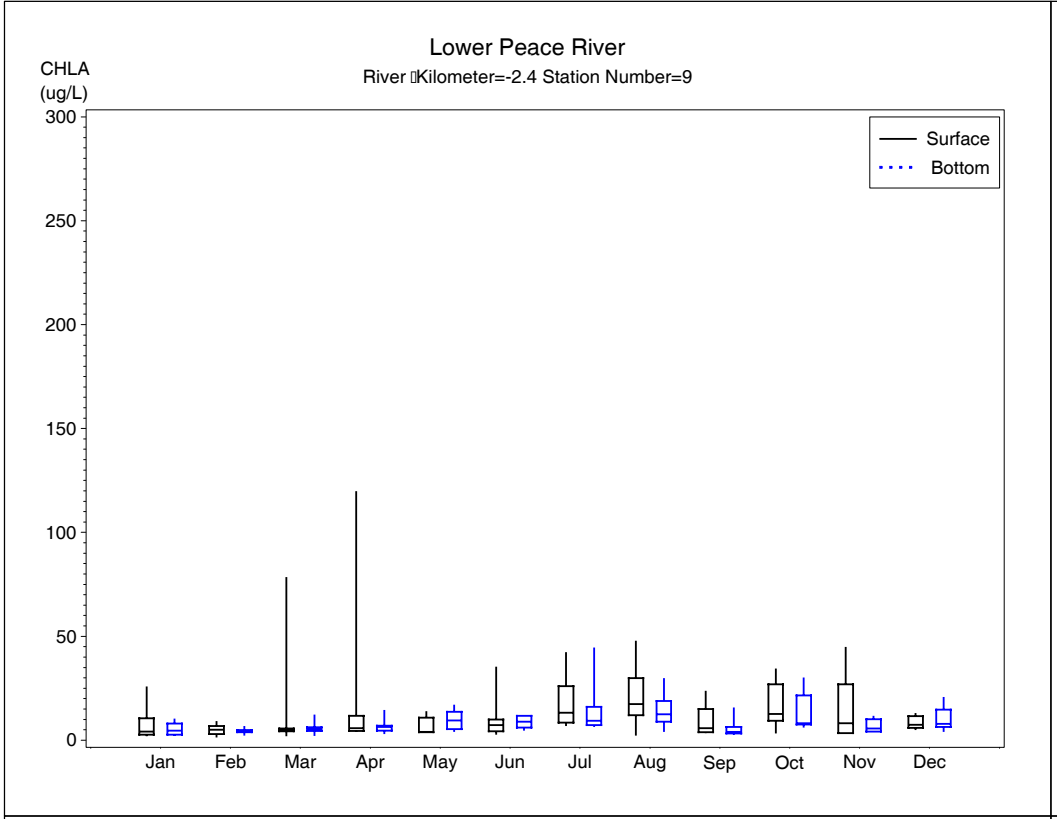

Lower Peace River
River Kilometer=24.7 Station Number=25
DO
(mg/L)
Surface
Bottom
0
4
8
12
16
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

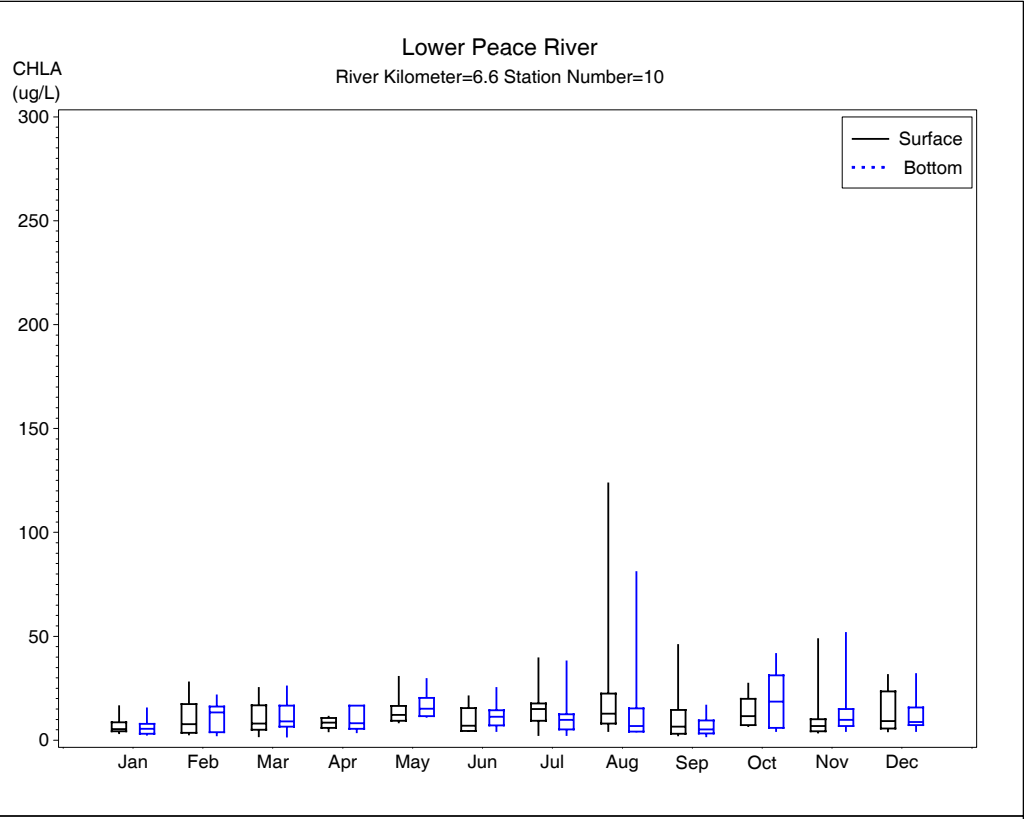

Lower Peace River
River Kilometer=25.9 Station Number=15
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

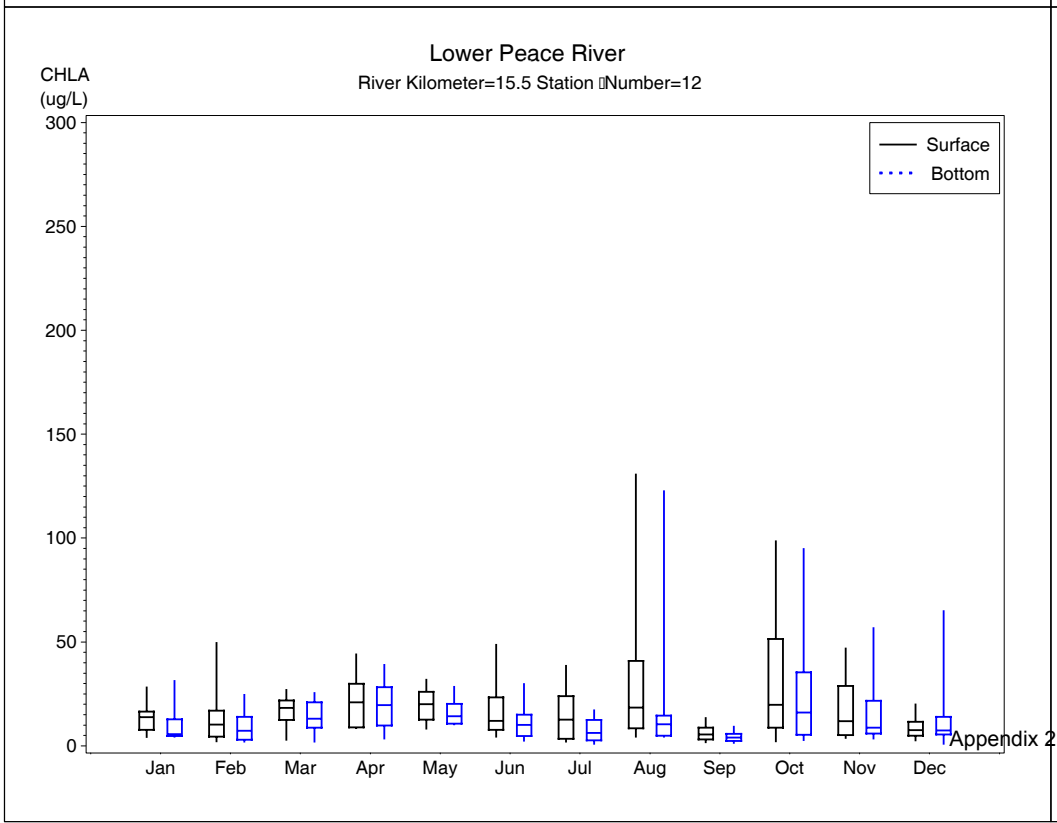

Lower Peace River
River Kilometer=29.5 Station Number=17
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

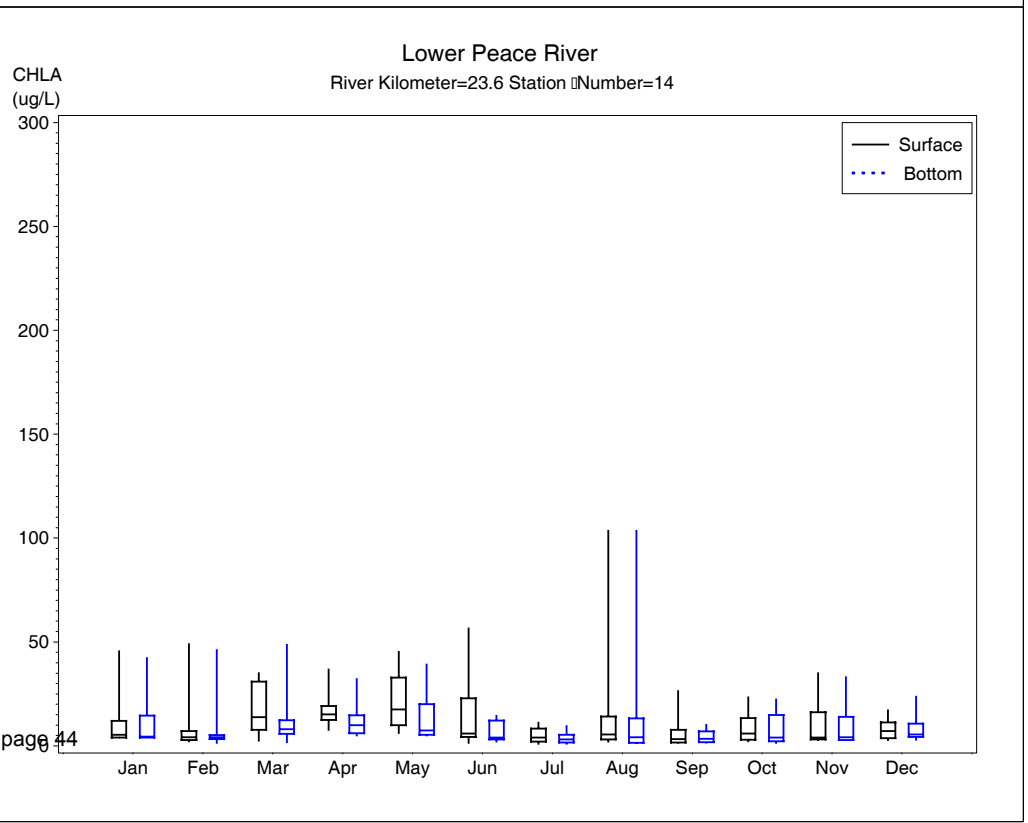

Lower Peace River
River Kilometer=30.4 Station Number=18
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

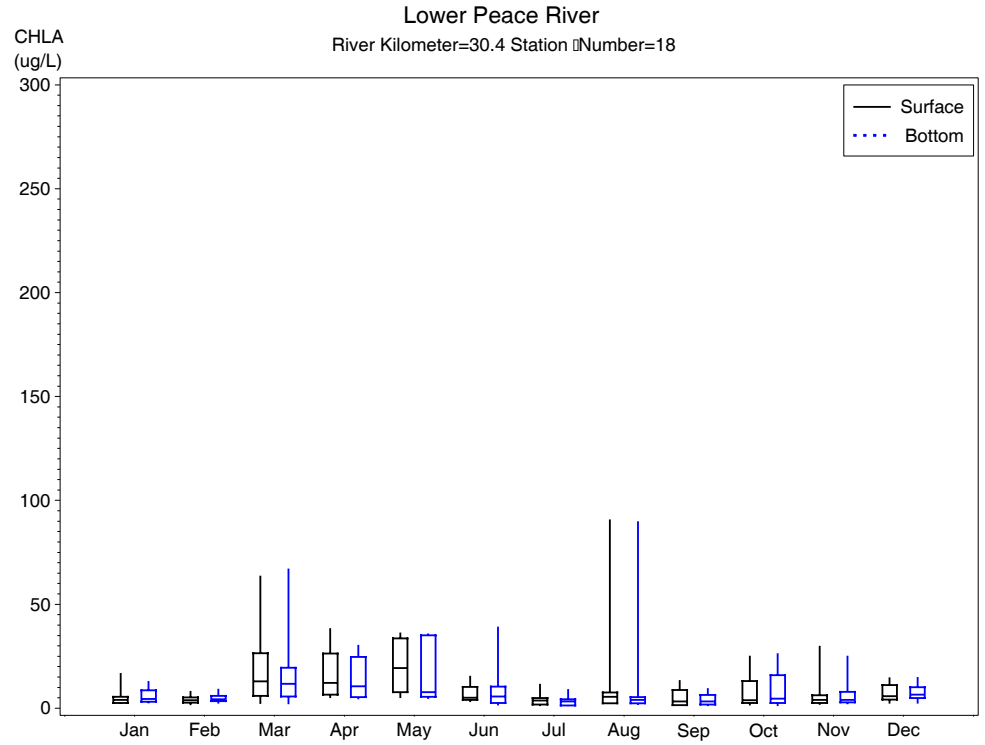

Lower Peace River
River Kilometer=32.3 Station Number=19
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

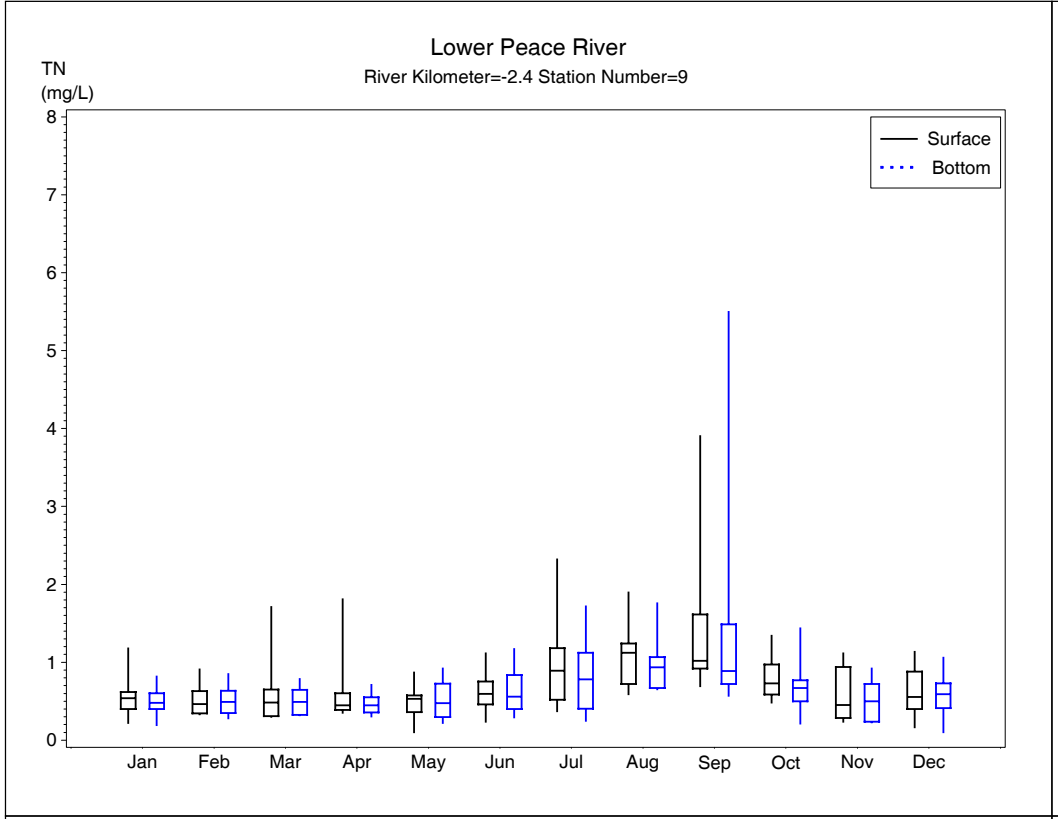

Lower Peace River
River Kilometer=-2.4 Station Number=9
CHLA
(ug/L)
300
250
200
150
100
50
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

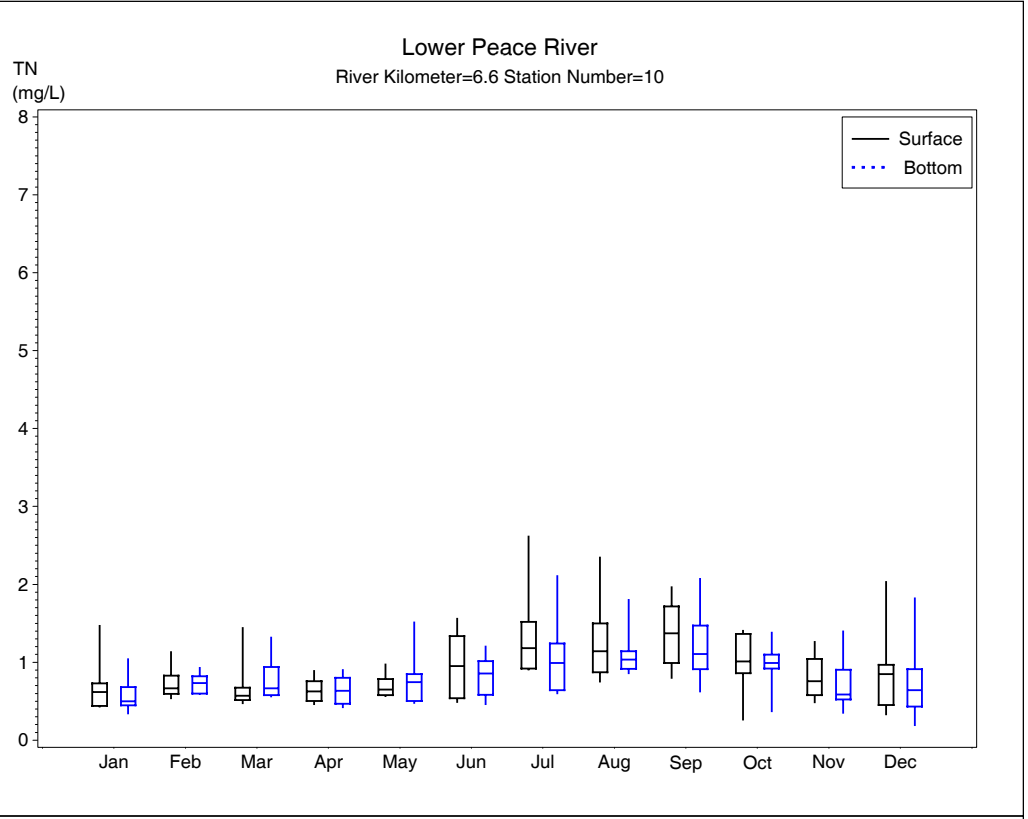

Lower Peace River
River Kilometer=6.6 Station Number=10
CHLA
(ug/L)
300
250
200
150
100
50
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

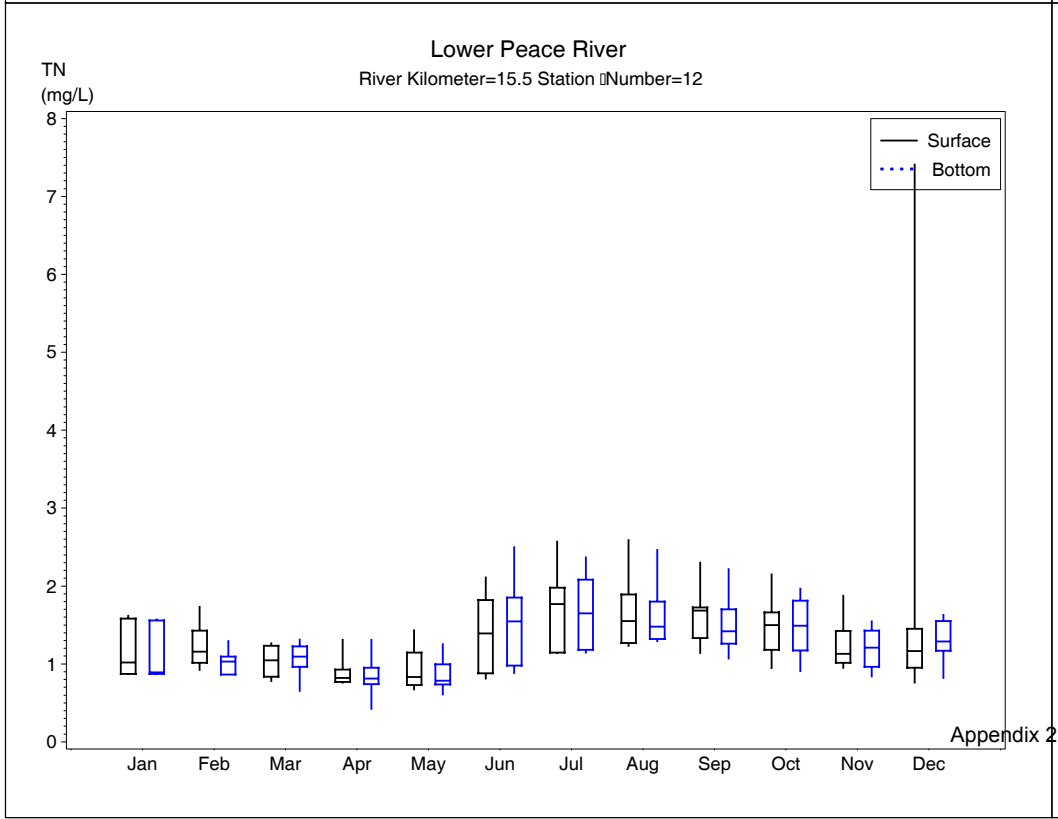

Lower Peace River
River Kilometer=15.5 Station Number=12
CHLA
(ug/L)
300
250
200
150
100
50
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

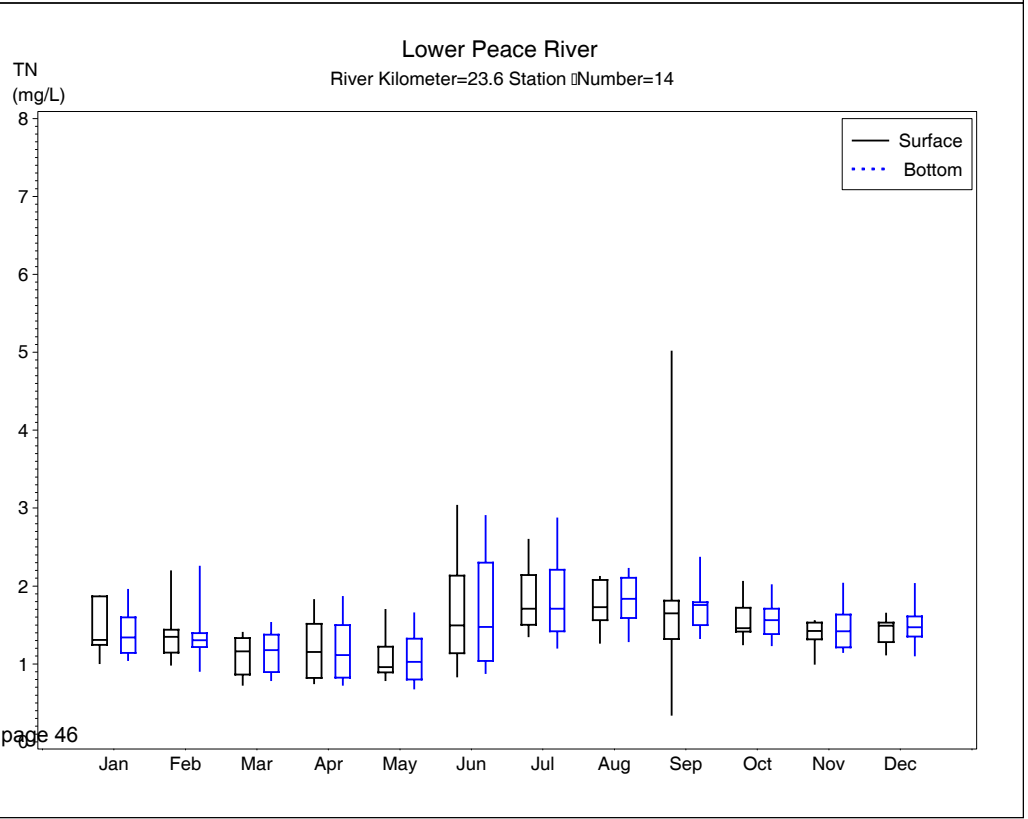

Lower Peace River
River Kilometer=23.6 Station Number=14
CHLA
(ug/L)
300
250
200
150
100
50
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

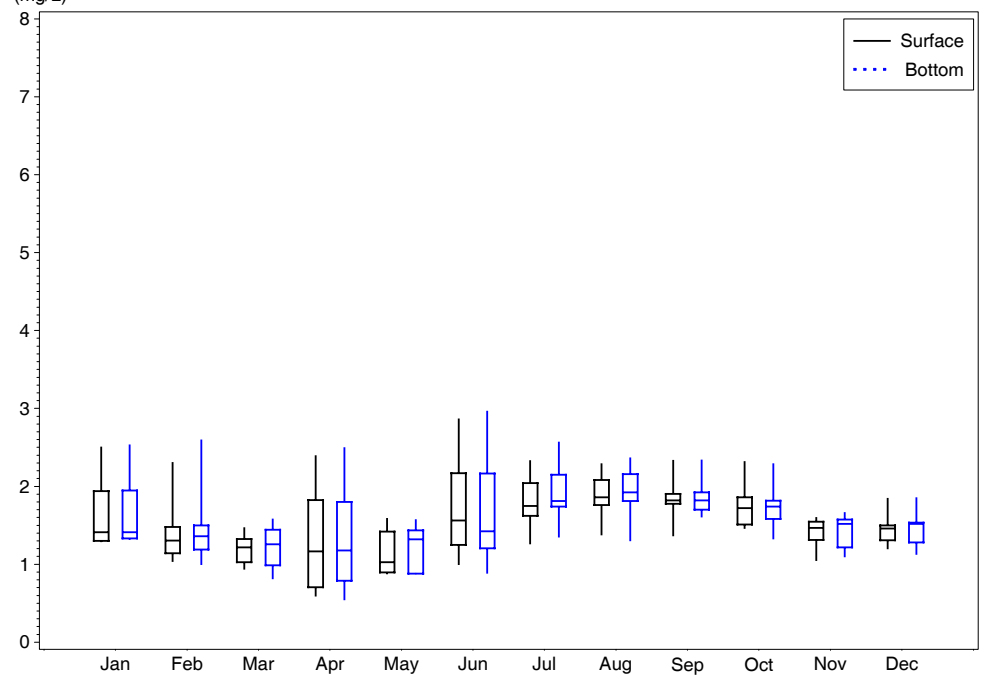

Lower Peace River
River Kilometer=30.4 Station Number=18
CHLA
(ug/L)
300
250
200
150
100
50
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

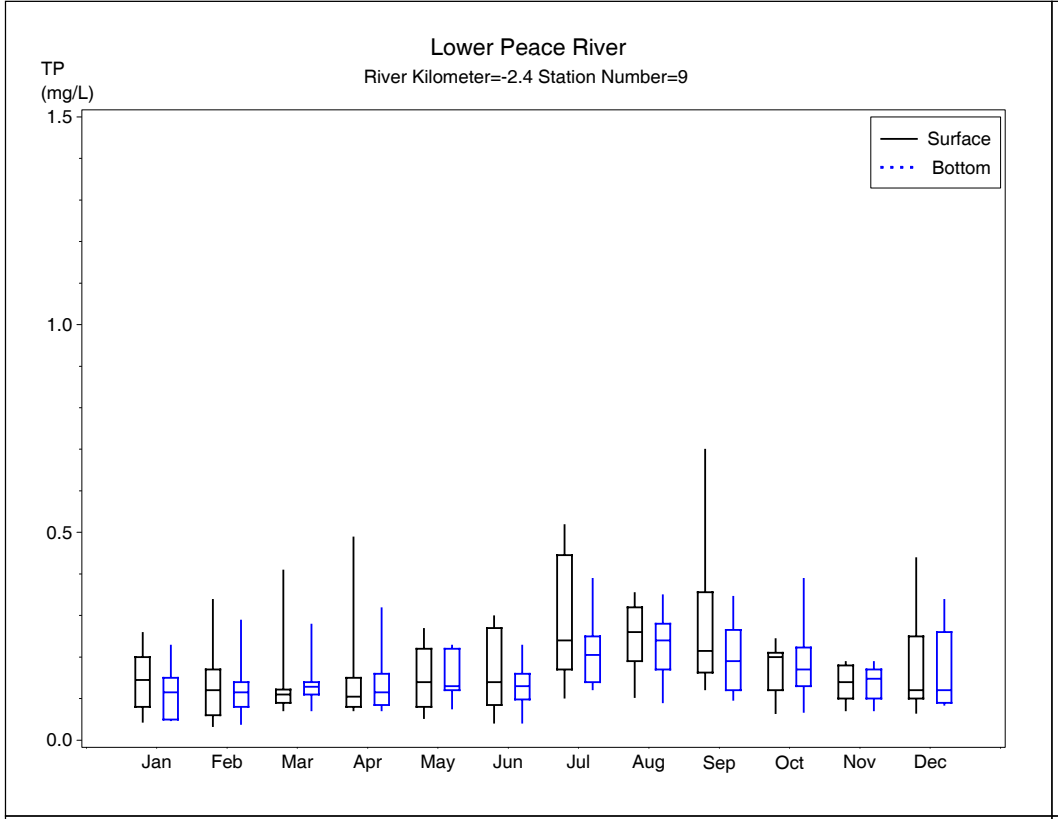

Lower Peace River
River Kilometer=-2.4 Station Number=9
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

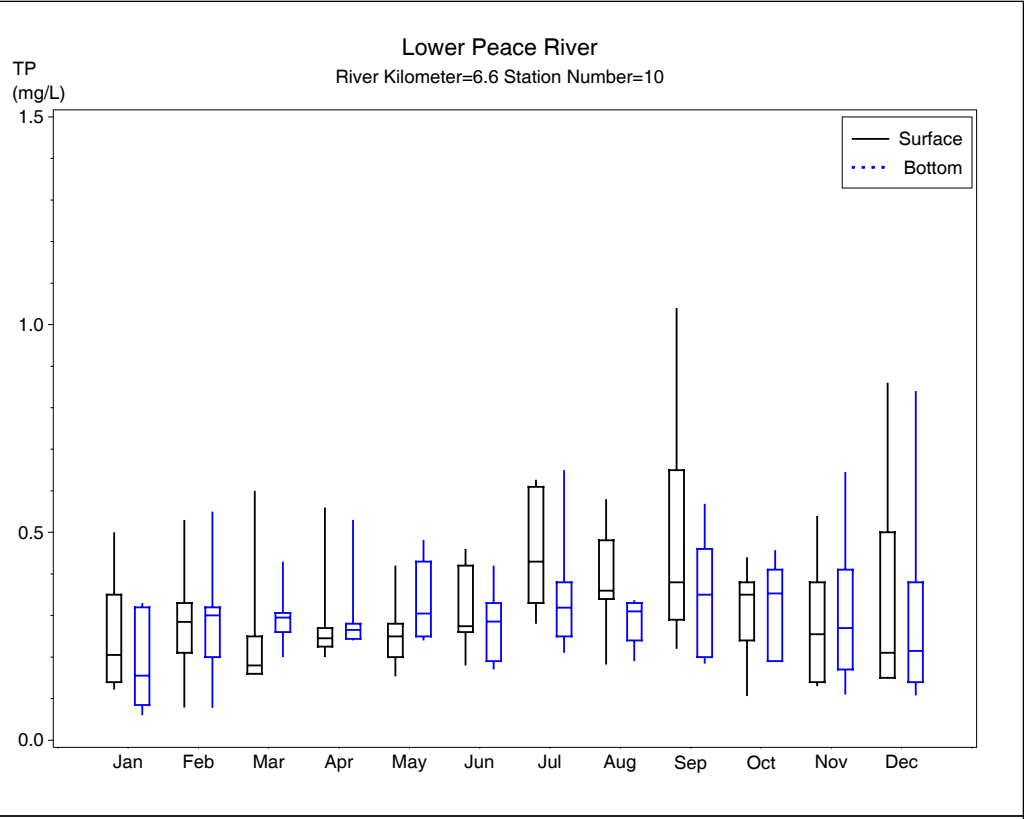

Lower Peace River
River Kilometer=6.6 Station Number=10
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

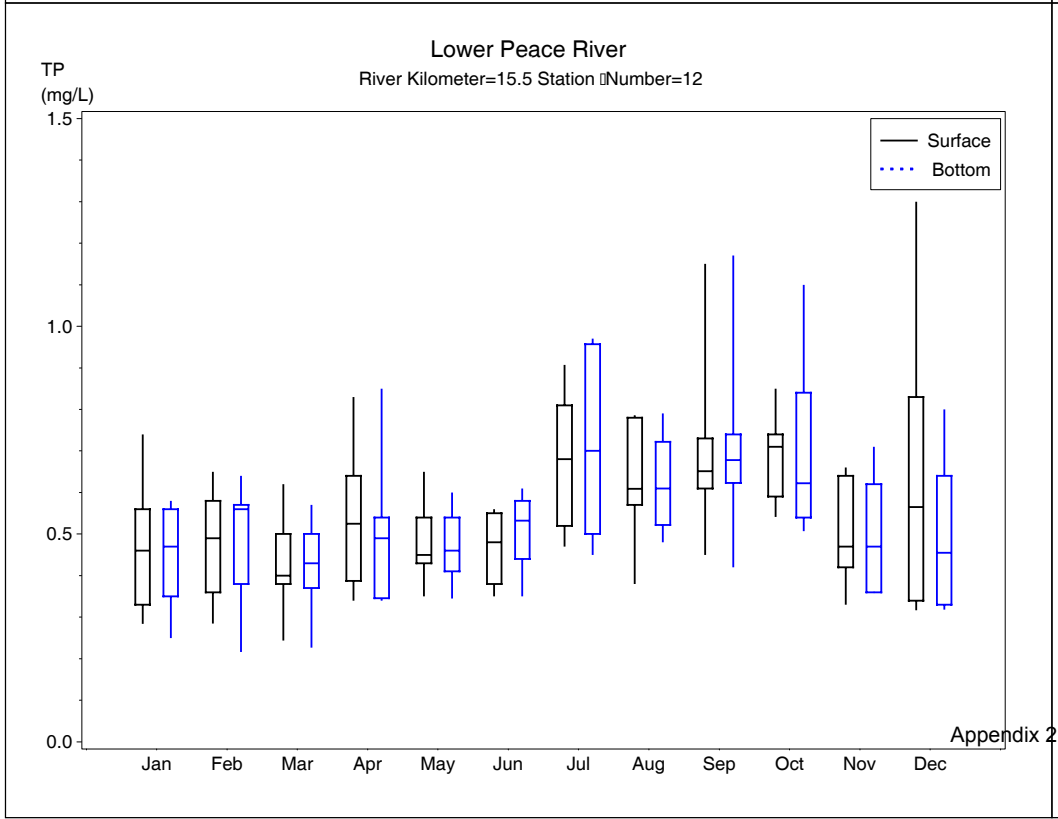

Lower Peace River
River Kilometer=15.5 Station Number=12
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

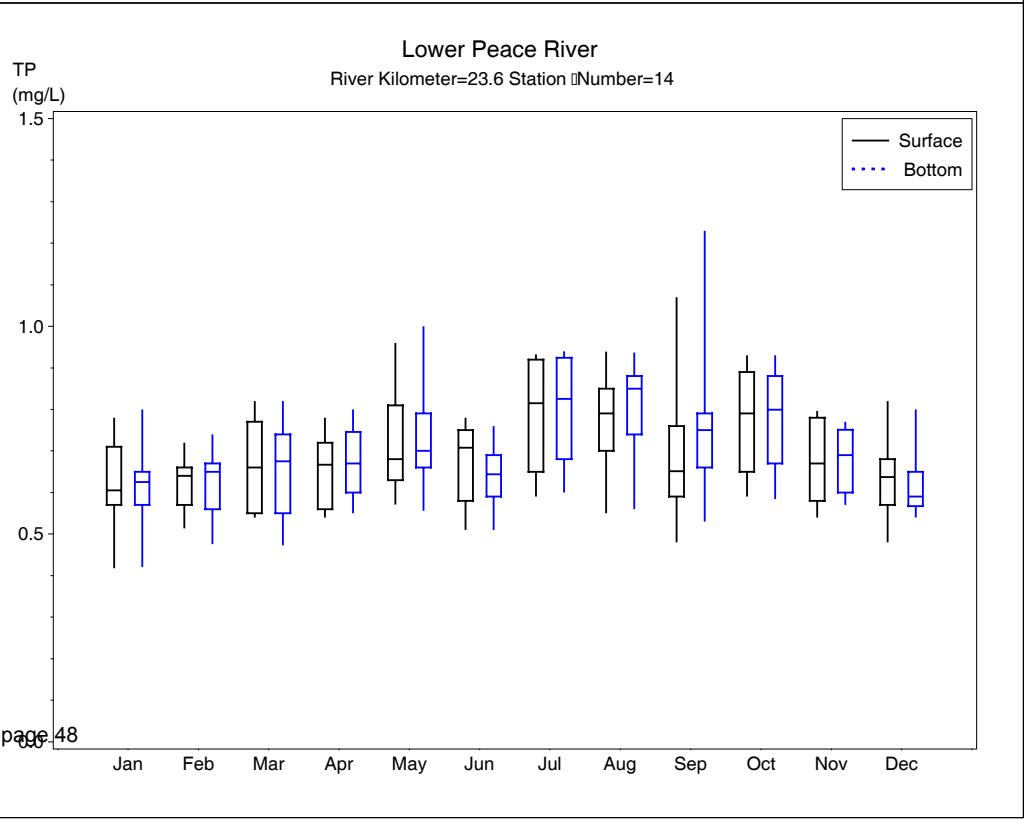

Lower Peace River
River Kilometer=23.6 Station Number=14
TN
(mg/L)
Surface
Bottom
0
1
2
3
4
5
6
7
8
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

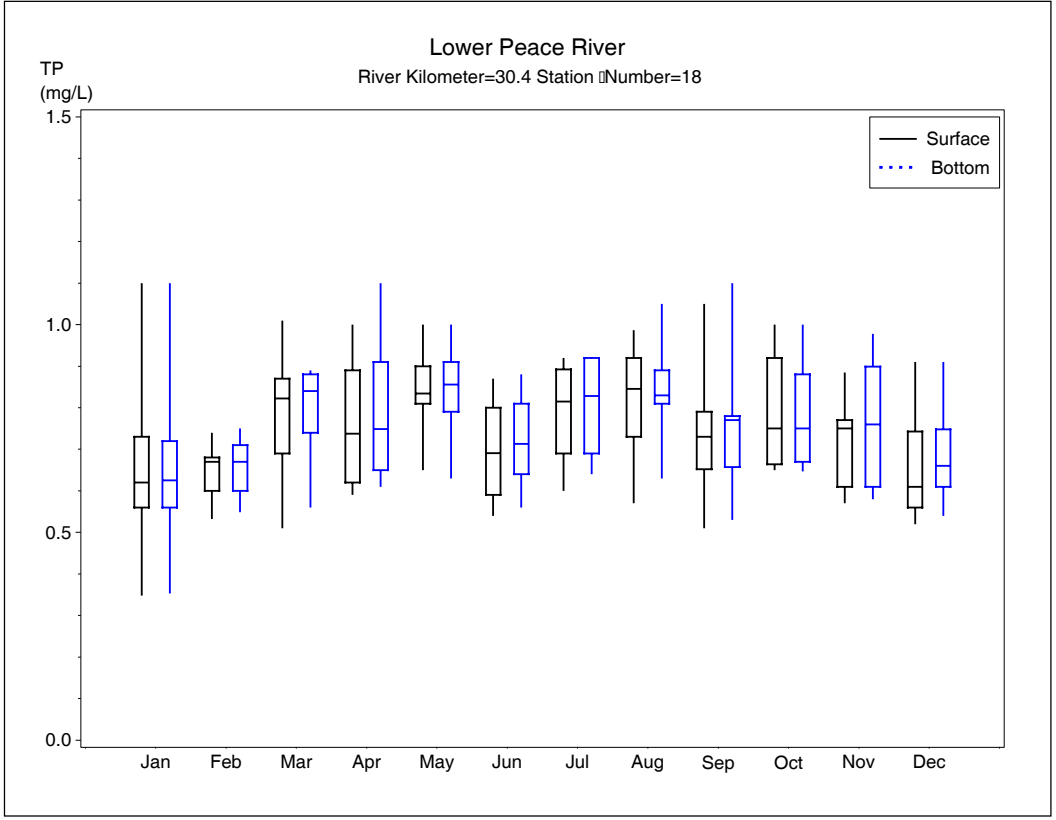

Lower Peace River
River Kilometer=30.4 Station Number=18
TN
(mg/L)
8
7
6
5
4
3
2
1
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Lower Peace River
River Kilometer=-2.4 Station Number=9
TP
(mg/L)
1.5
1.0
0.5
0.0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Lower Peace River
River Kilometer=6.6 Station Number=10
TP
(mg/L)
1.5
1.0
0.5
0.0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Lower Peace River
River Kilometer=15.5 Station Number=12
TP
(mg/L)
1.5
1.0
0.5
0.0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

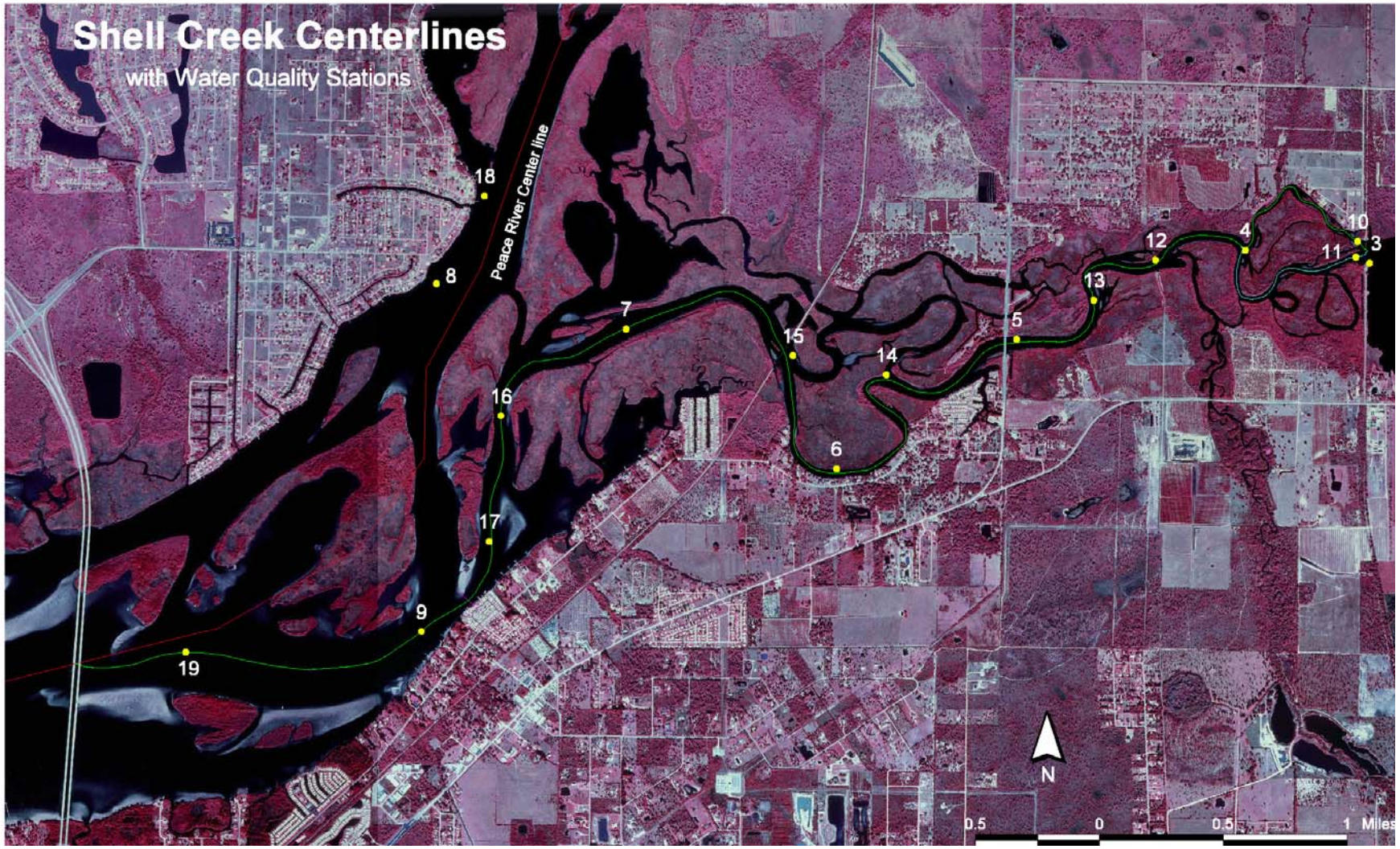

Lower Peace River
River Kilometer=23.6 Station Number=14
TP
(mg/L)
1.5
1.0
0.5
0.0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

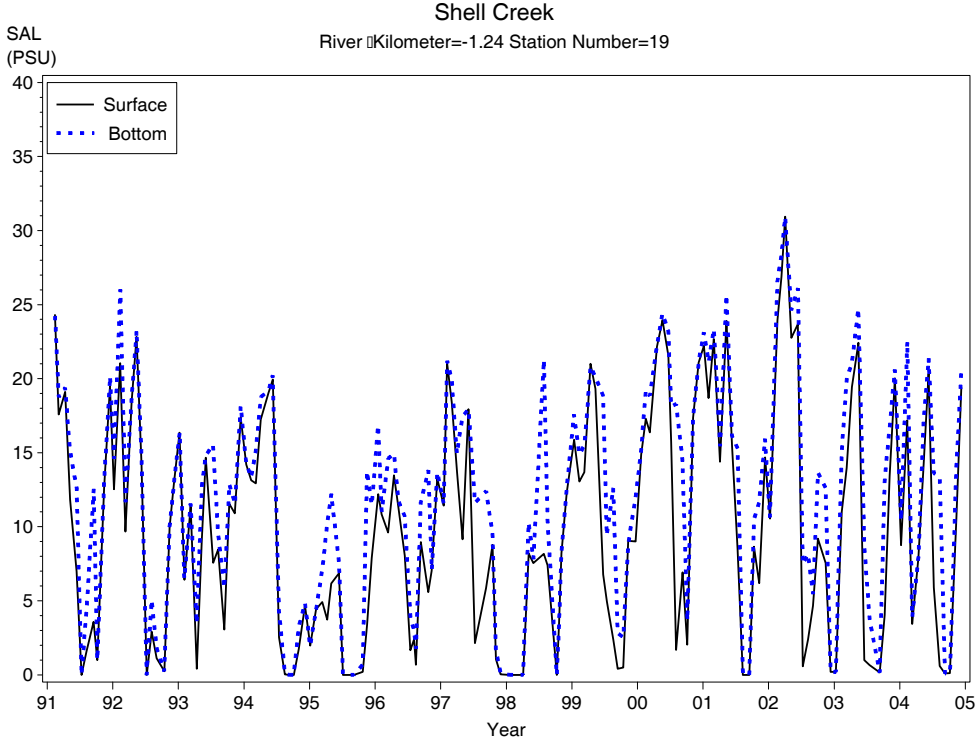

Lower Peace River
River Kilometer=30.4 Station Number=18
TP
(mg/L)
1.5
1.0
0.5
0.0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

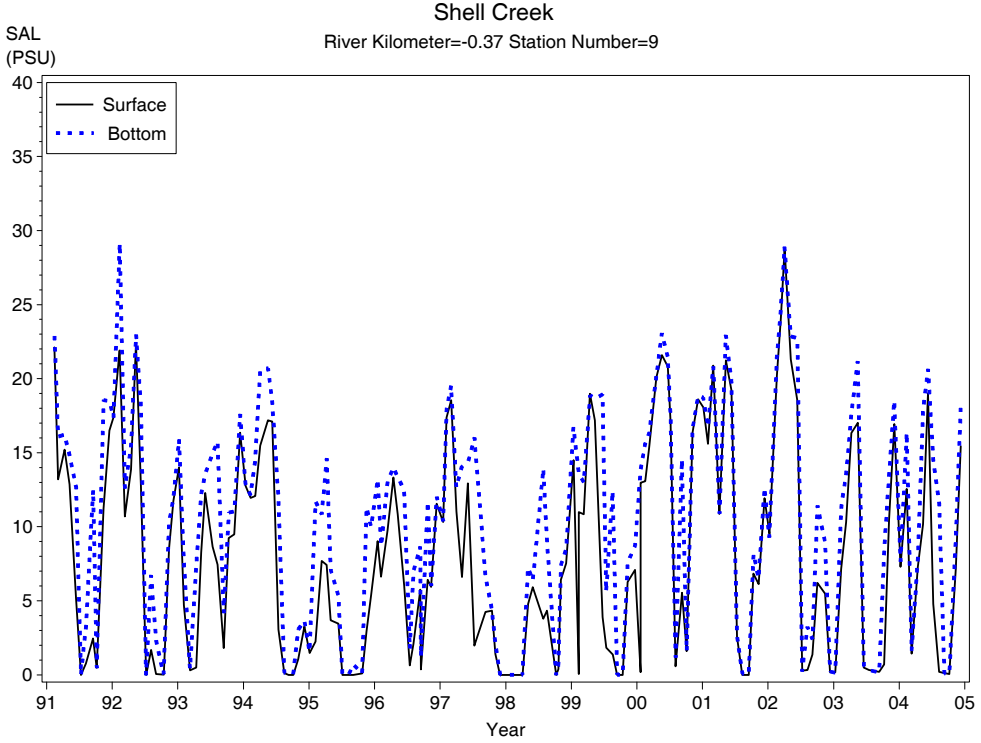
Appendix 3-3

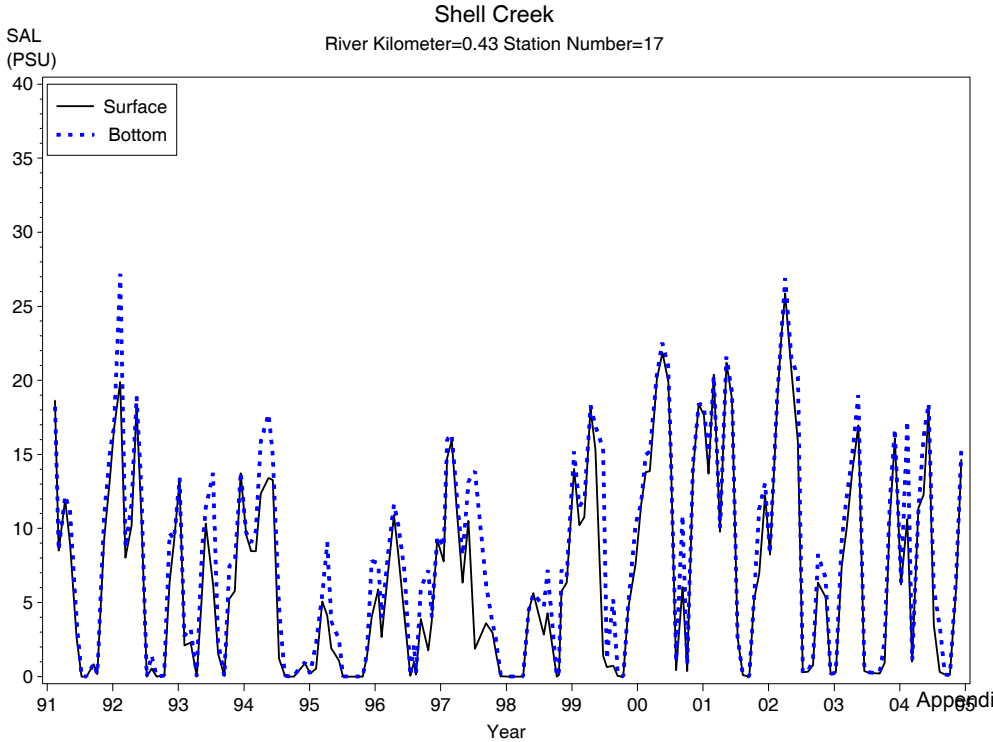
Annual Variation in Shell Creek

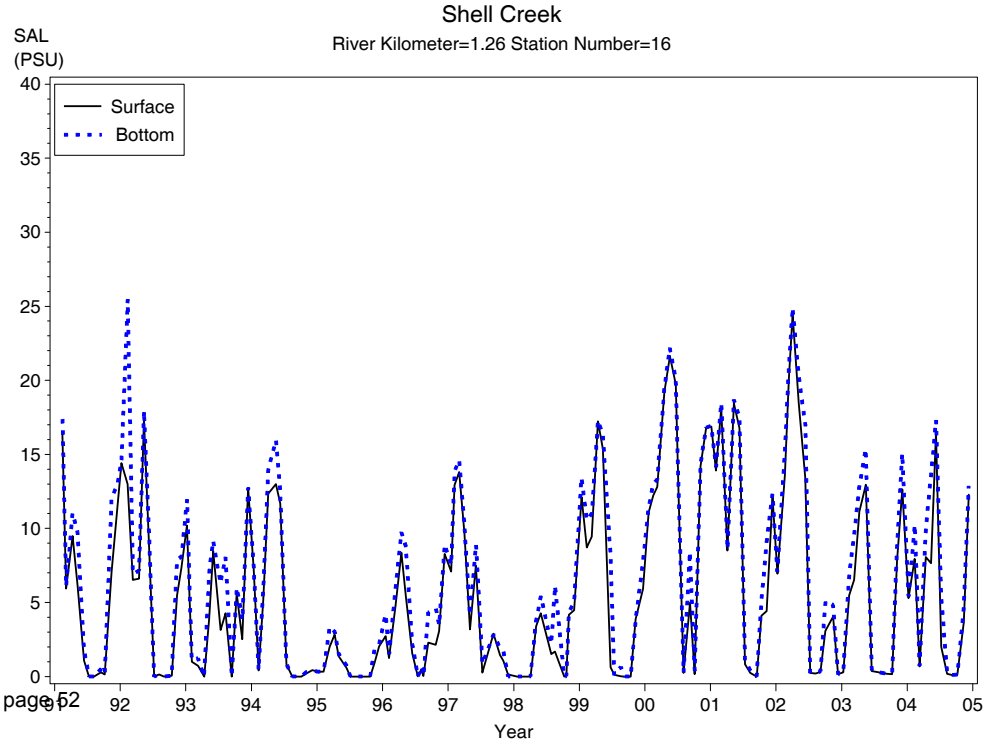
Water Quality Constituents

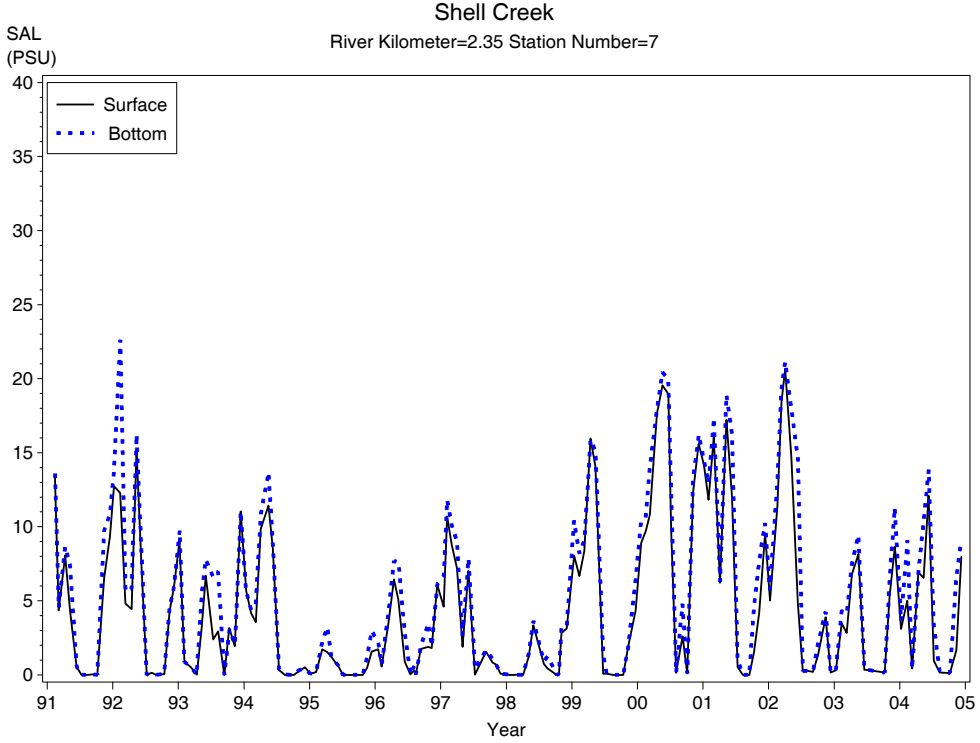

Shell Creek Centerlines
with Water Quality Stations
Peace River Center line
18
8
7
15
14
5
13
12
4
10
11
3
16
6
17
9
19
N
0.5
0
0.5
1 Miles


Shell Creek
River Kilometer=-1.24 Station Number=19
SAL
(PSU)
Surface
Bottom
Year


Shell Creek
River Kilometer=-0.37 Station Number=9
SAL
(PSU)
Surface
Bottom
Year


Shell Creek
River Kilometer=0.43 Station Number=17
SAL
(PSU)
Surface
Bottom
Year


Shell Creek
River Kilometer=1.26 Station Number=16
SAL
(PSU)
Surface
Bottom
Year


Shell Creek
River Kilometer=2.35 Station Number=7
SAL
(PSU)
Surface
Bottom
0
5
10
15
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25
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92
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96
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99
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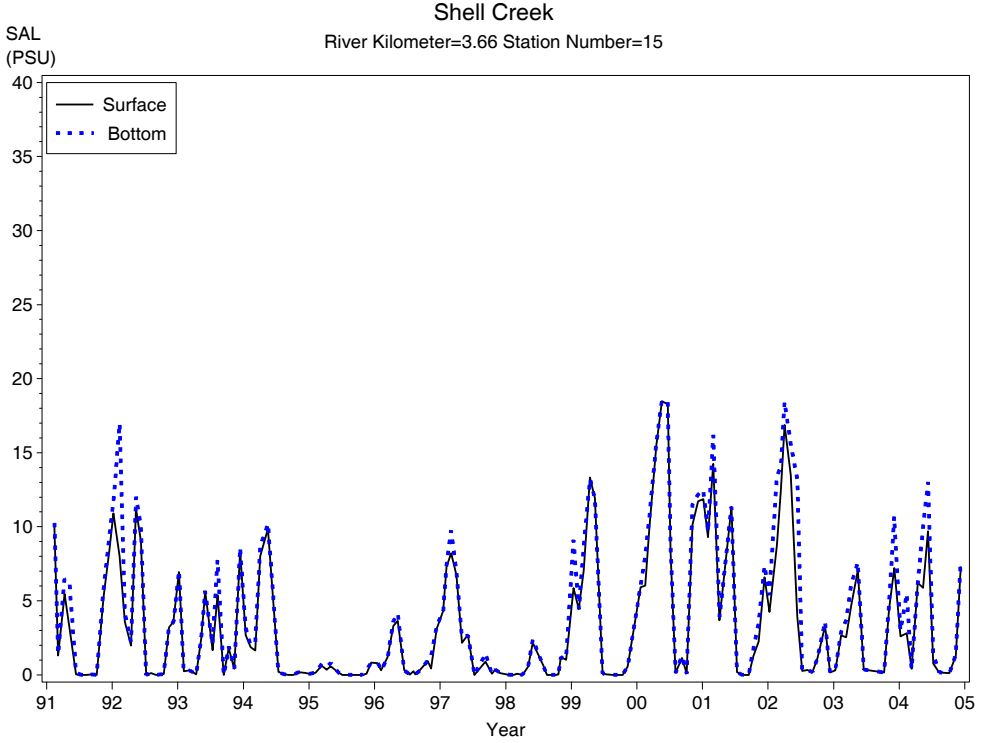
01
02
03
04
05
Year


Shell Creek
River Kilometer=3.66 Station Number=15
SAL
(PSU)
Surface
Bottom
0
5
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15
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25
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91
92
93
94
95
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99
00
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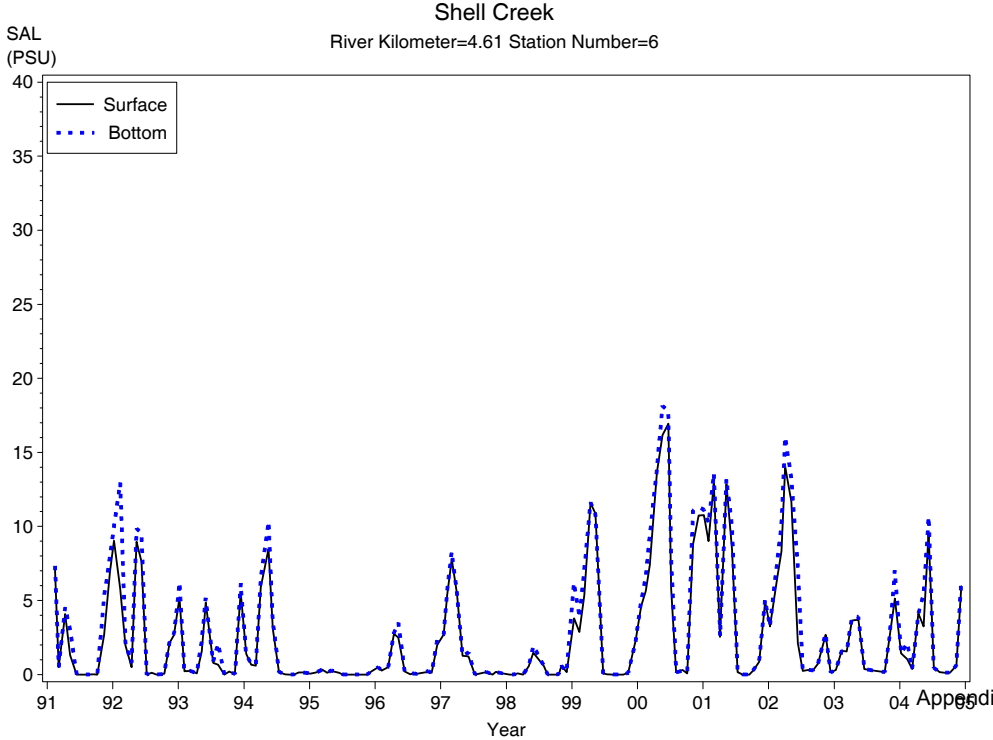
02
03
04
05
Year


Shell Creek
River Kilometer=4.61 Station Number=6
SAL
(PSU)
Surface
Bottom
0
5
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15
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92
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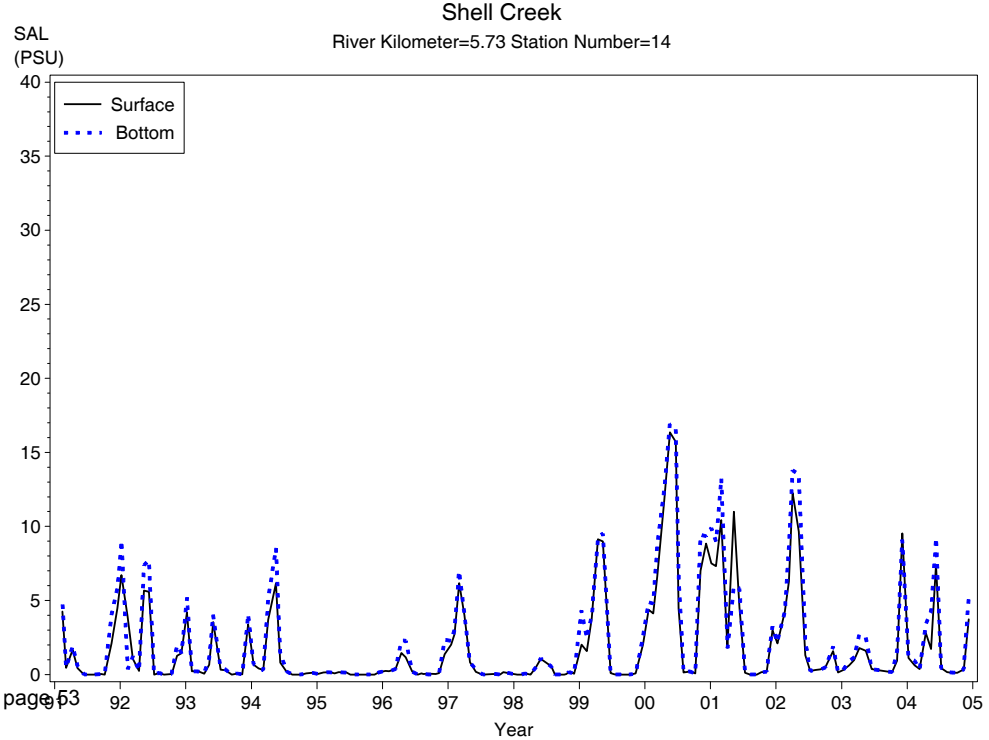
05
Year


Shell Creek
River Kilometer=5.73 Station Number=14
SAL
(PSU)
Surface
Bottom
0
5
10
15
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25
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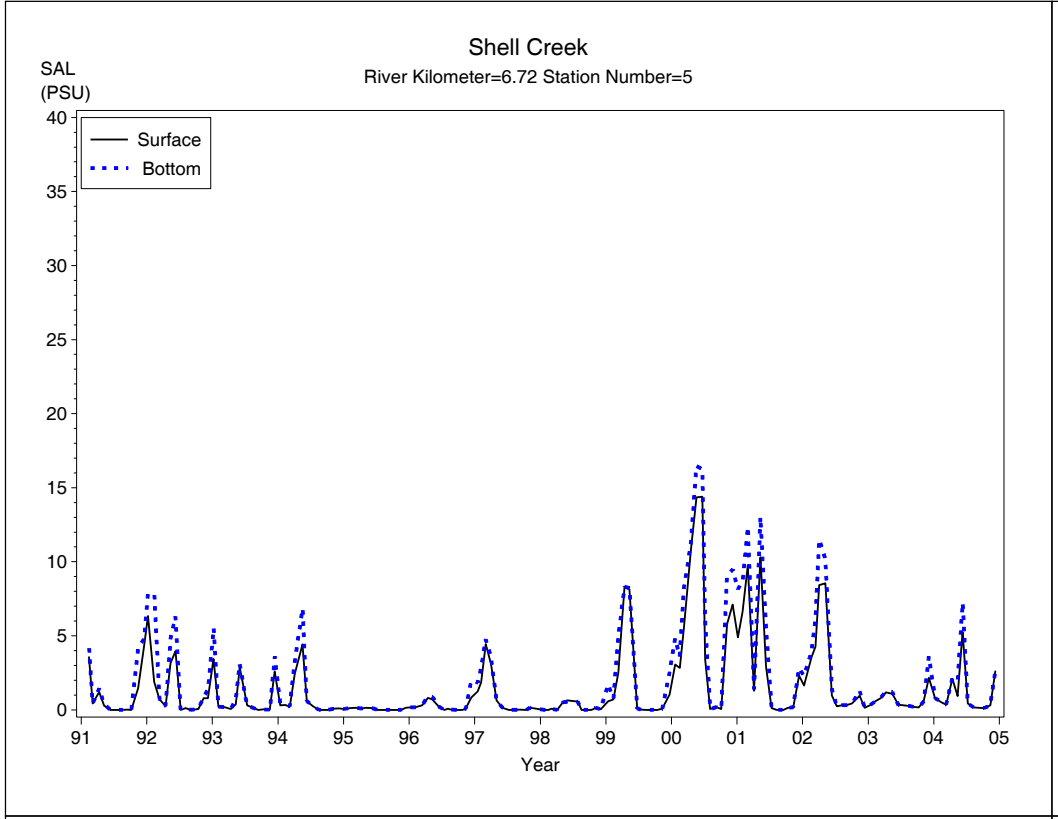
03
04
05
Year


Shell Creek
River Kilometer=6.72 Station Number=5
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
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92
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99
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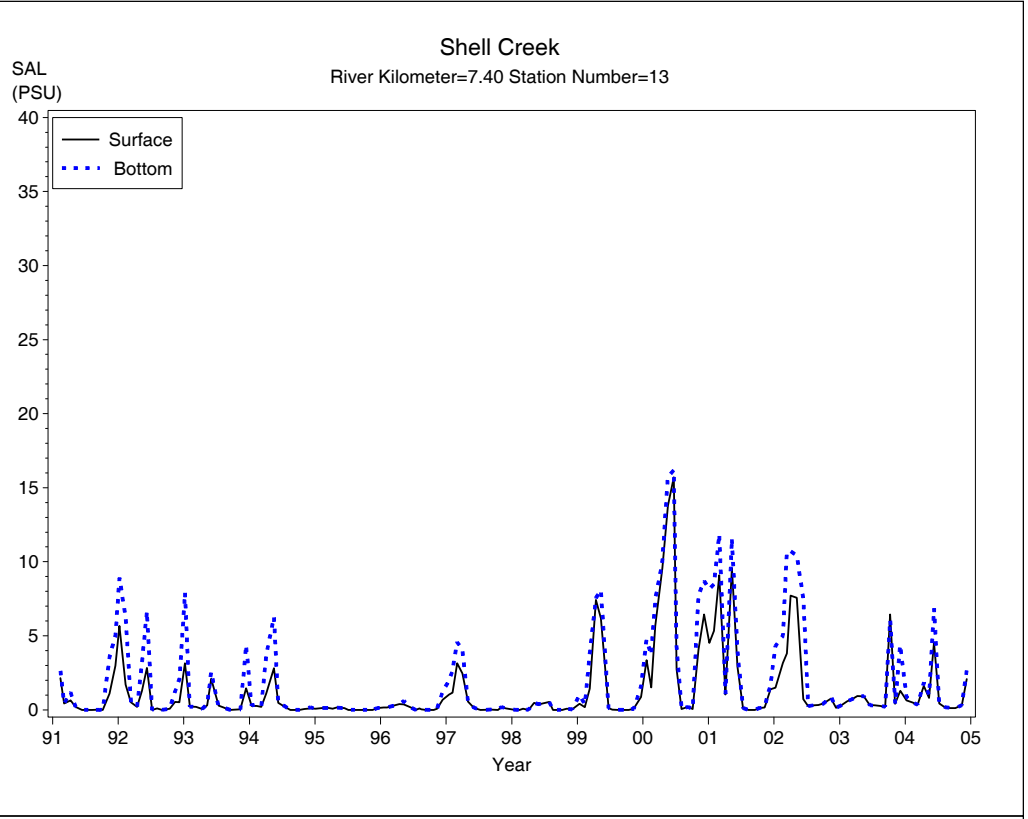
03
04
05
Year


Shell Creek
River Kilometer=7.40 Station Number=13
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
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91
92
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99
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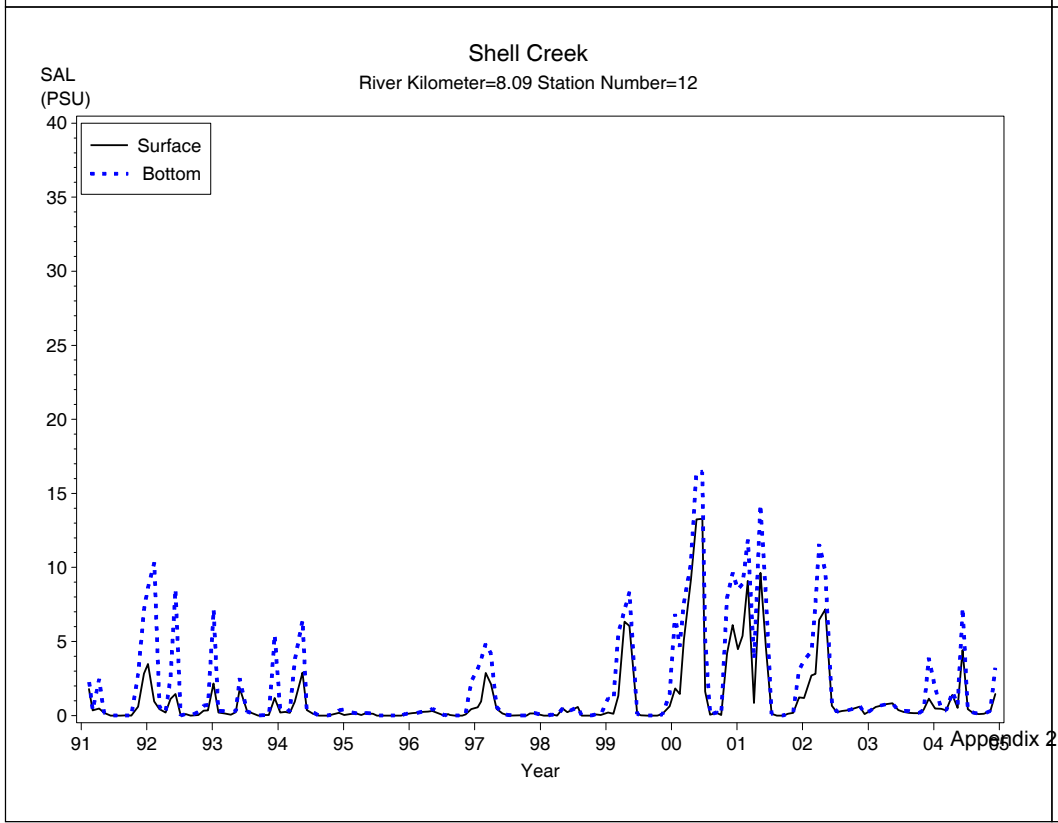
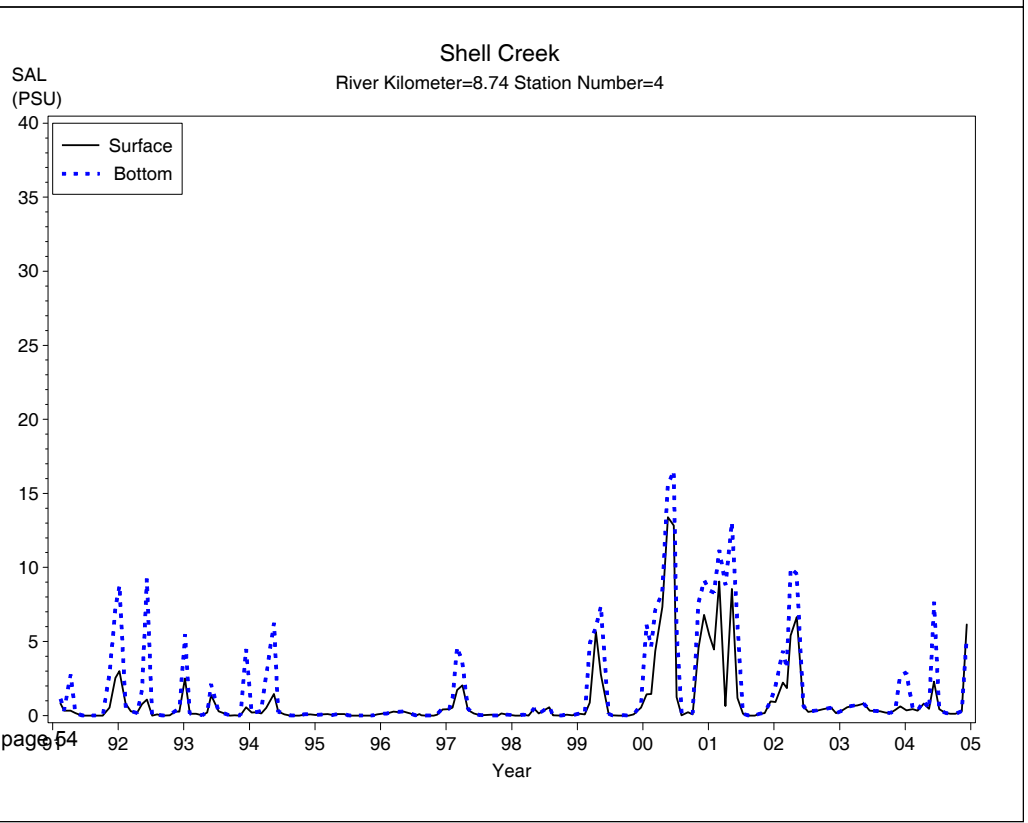
04
05
Year


Shell Creek
River Kilometer=8.09 Station Number=12
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year


Shell Creek
River Kilometer=8.74 Station Number=4
SAL
(PSU)
Surface
Bottom
0
5
10
15
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25
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91
92
93
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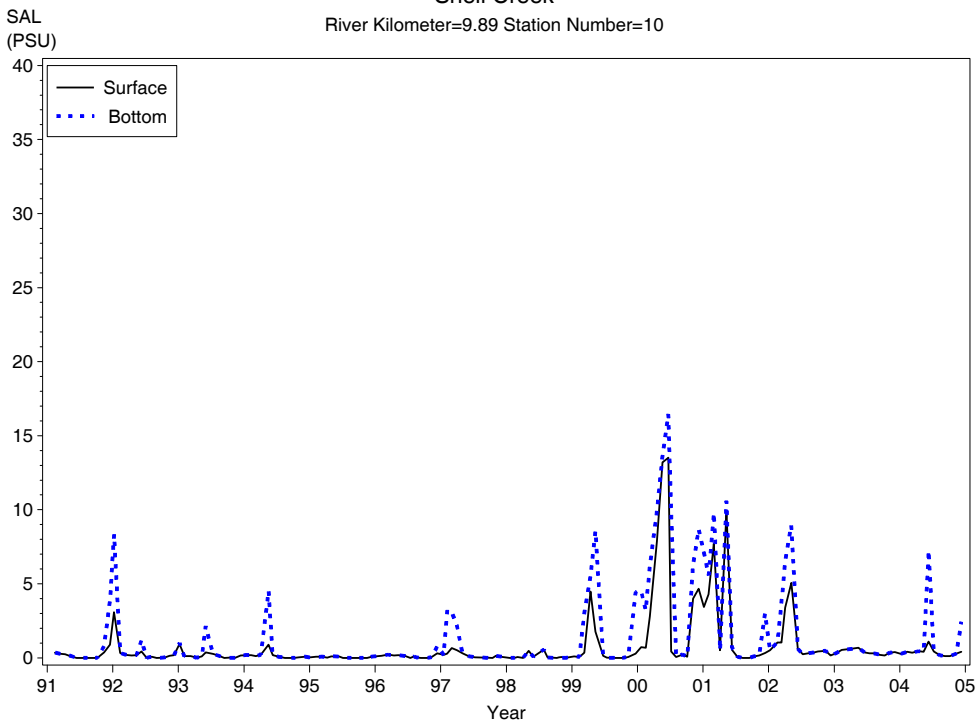
05
Year


Shell Creek
River Kilometer=9.89 Station Number=10
SAL
(PSU)
Surface
Bottom
40
35
30
25
20
15
10
5
0
91
92
93
94
95
96
97
98
99
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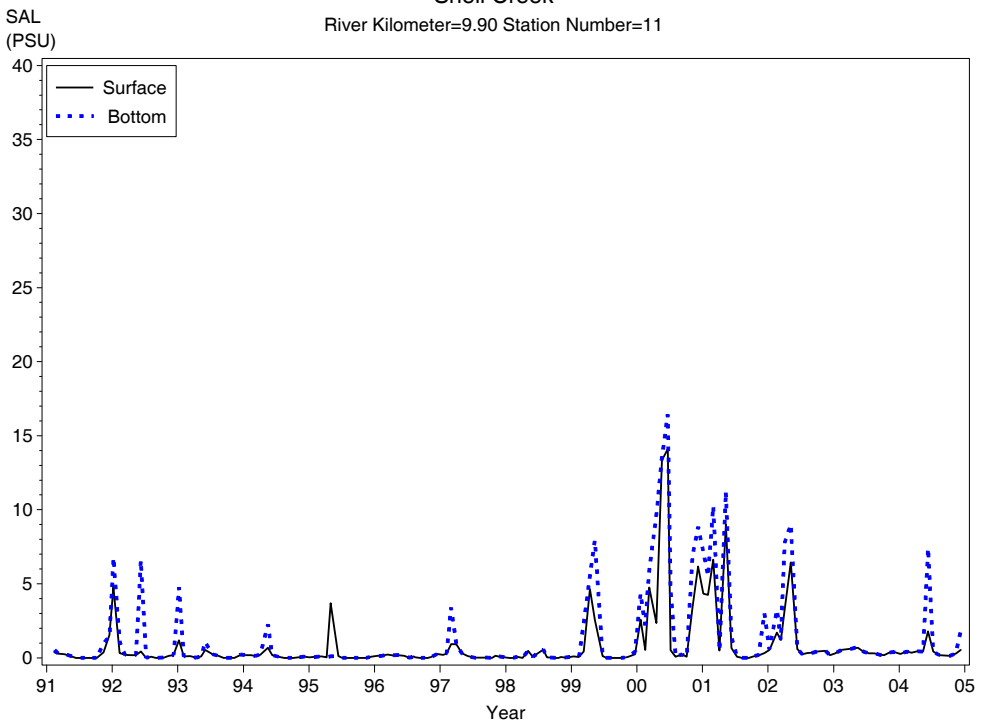
01
02
03
04
05
Year


Shell Creek
River Kilometer=9.90 Station Number=11
SAL
(PSU)
Surface
Bottom
40
35
30
25
20
15
10
5
0
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92
93
94
95
96
97
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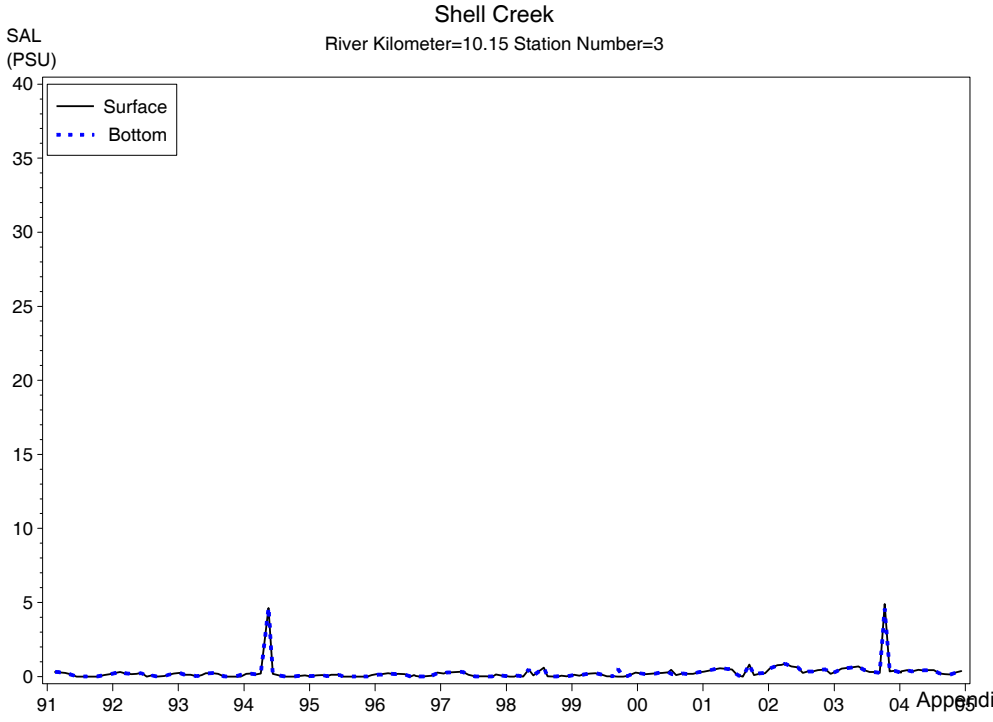
99
00
01
02
03
04
05
Year


Shell Creek
River Kilometer=10.15 Station Number=3
SAL
(PSU)
Surface
Bottom
40
35
30
25
20
15
10
5
0
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92
93
94
95
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99
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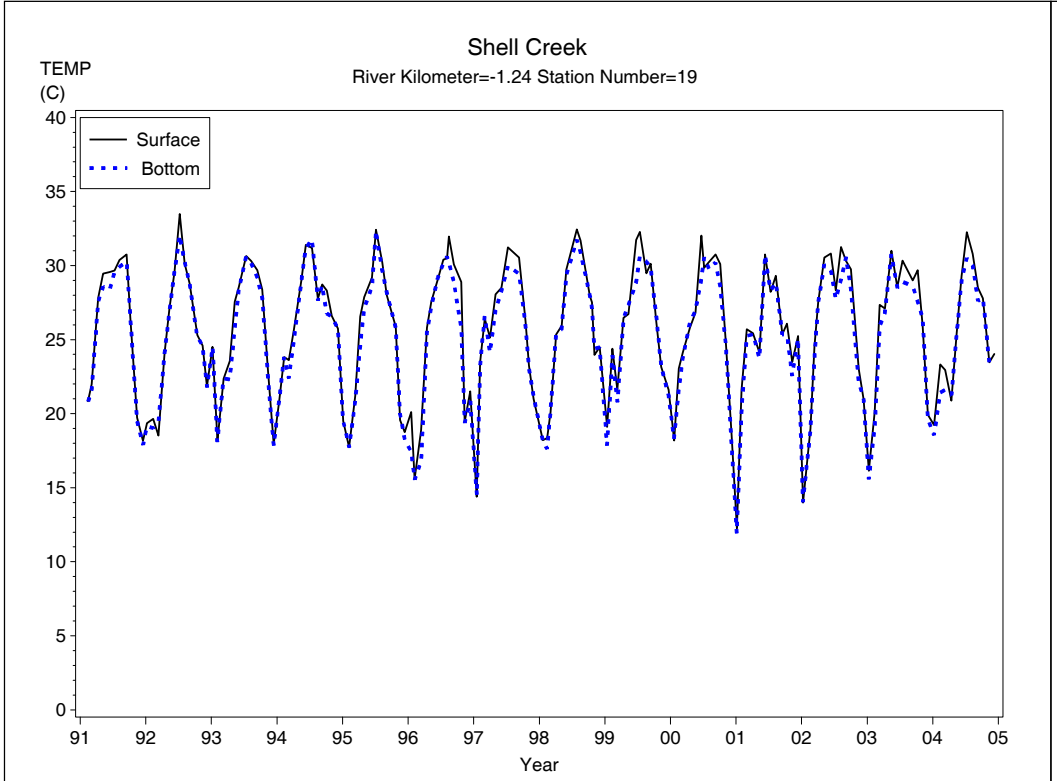
01
02
03
04
05
Year


Shell Creek
River Kilometer=-1.24 Station Number=19
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
91
92
93
94
95
96
97
98
99
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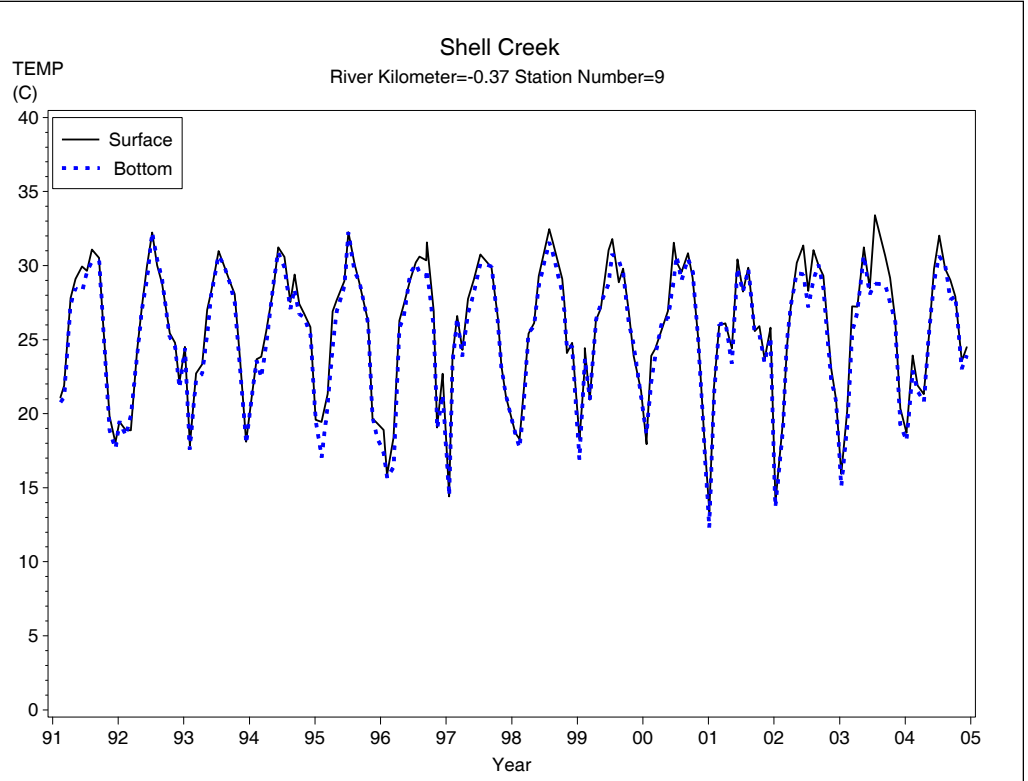
01
02
03
04
05
Year


Shell Creek
River Kilometer=-0.37 Station Number=9
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
91
92
93
94
95
96
97
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99
00
01
02
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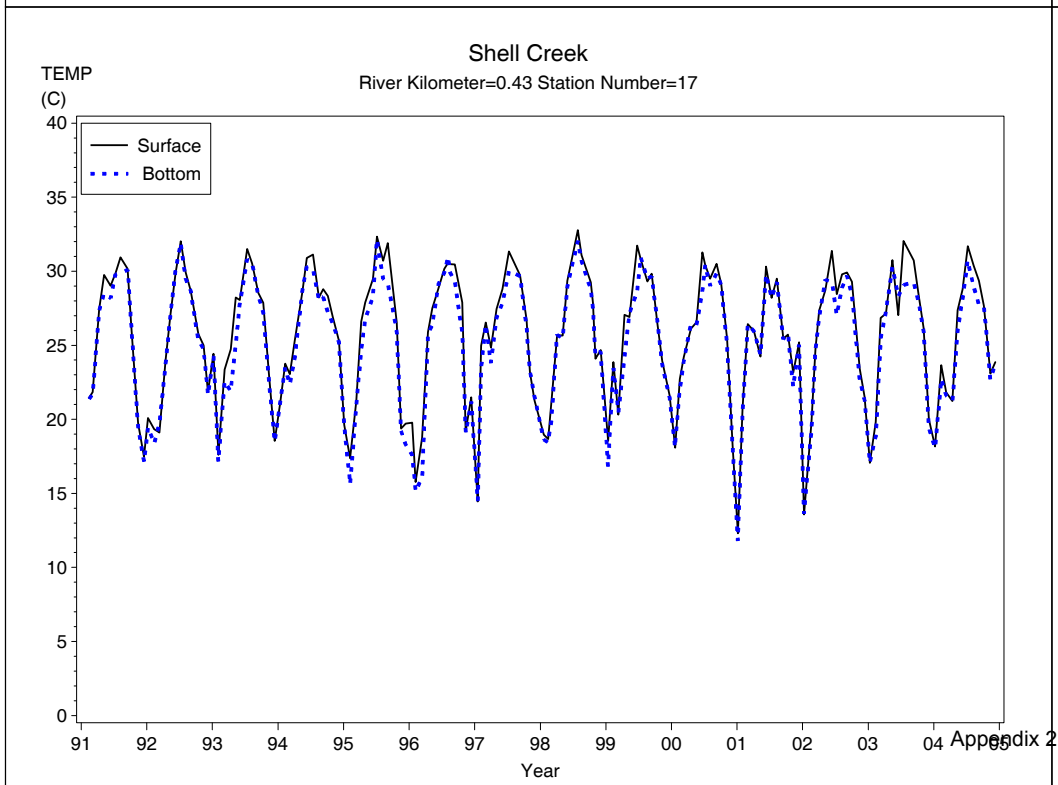
05
Year


Shell Creek
River Kilometer=0.43 Station Number=17
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
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92
93
94
95
96
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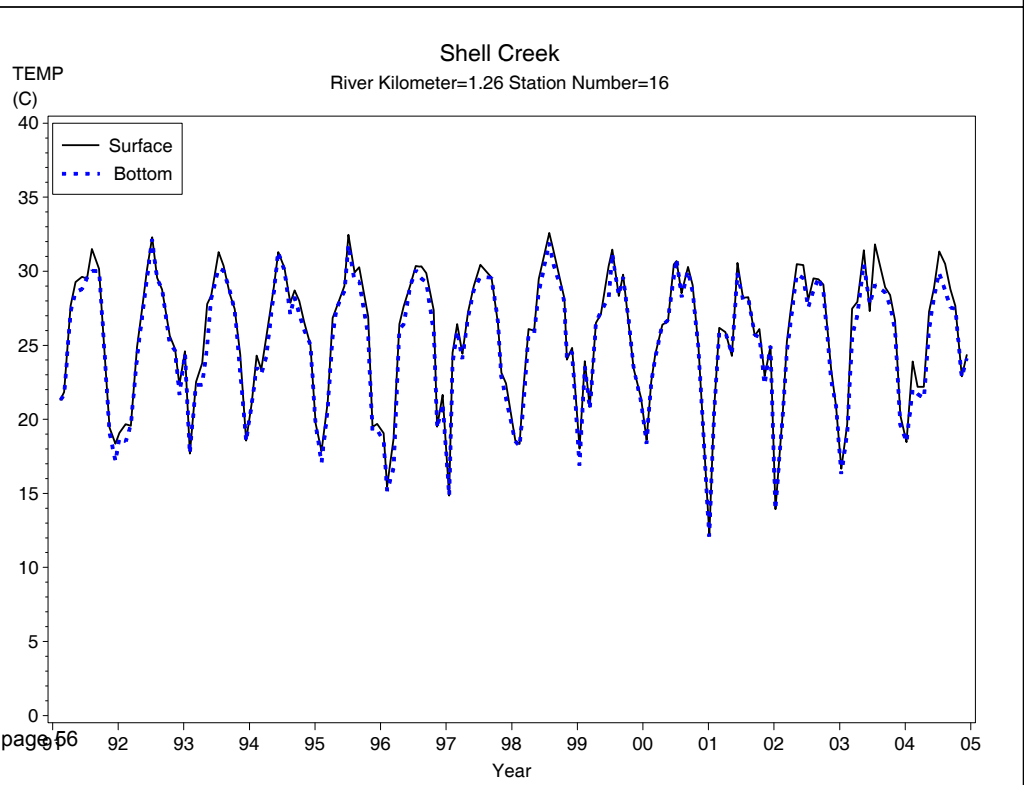
05
Year


Shell Creek
River Kilometer=1.26 Station Number=16
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
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91
92
93
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97
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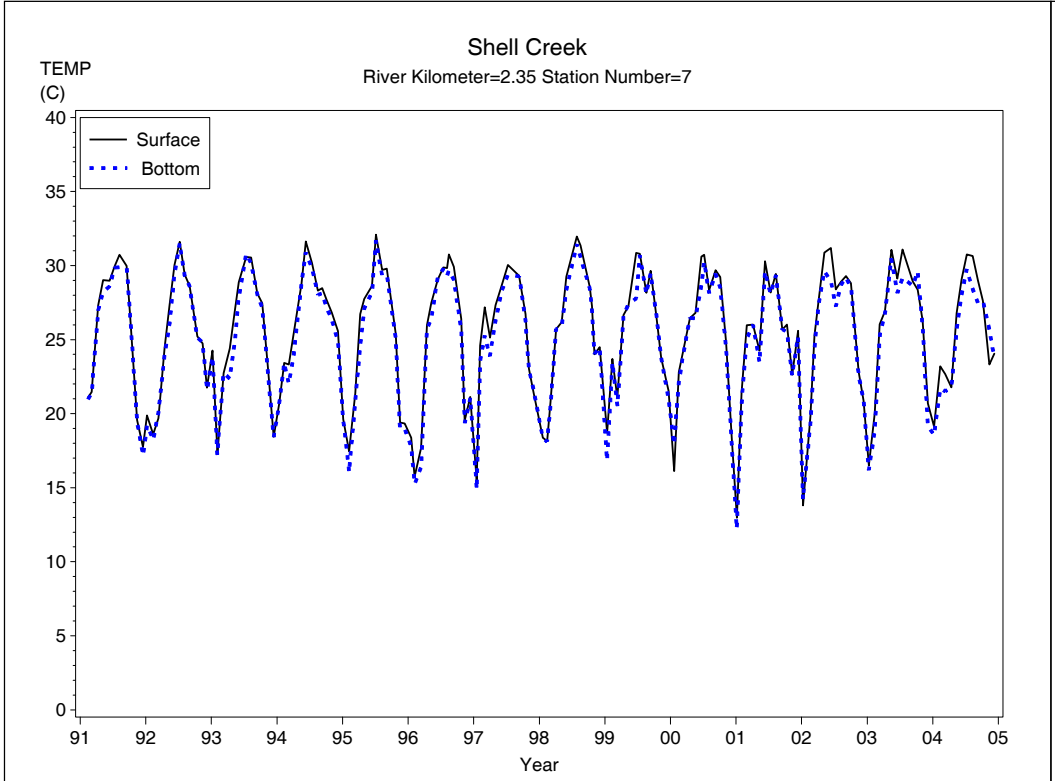
Year


Shell Creek
River Kilometer=2.35 Station Number=7
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
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92
93
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95
96
97
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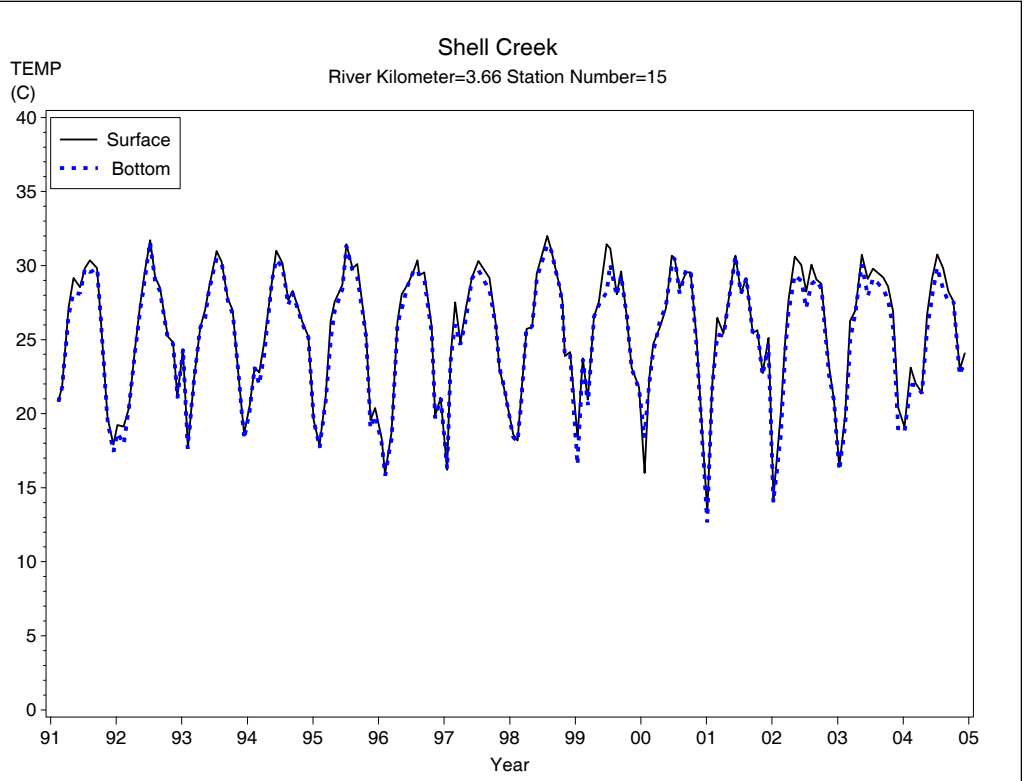
Year


Shell Creek
River Kilometer=3.66 Station Number=15
TEMP
(C)
Surface
Bottom
0
5
10
15
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25
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92
93
94
95
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97
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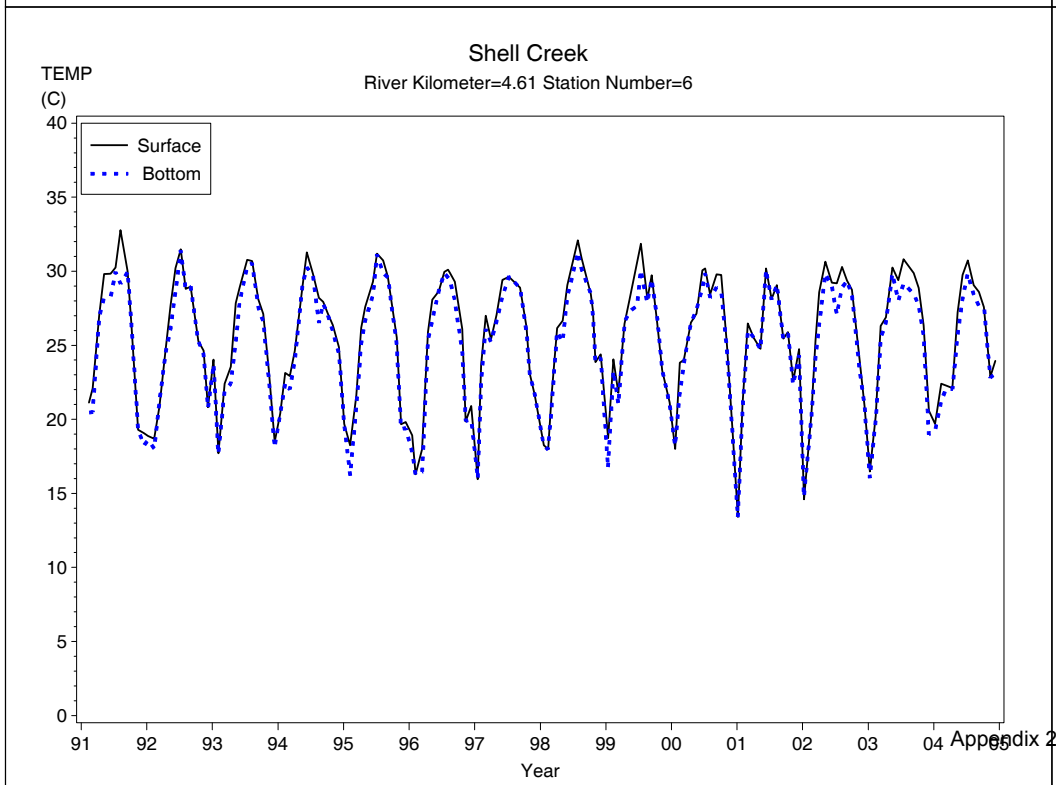
Year


Shell Creek
River Kilometer=4.61 Station Number=6
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
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40
91
92
93
94
95
96
97
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99
00
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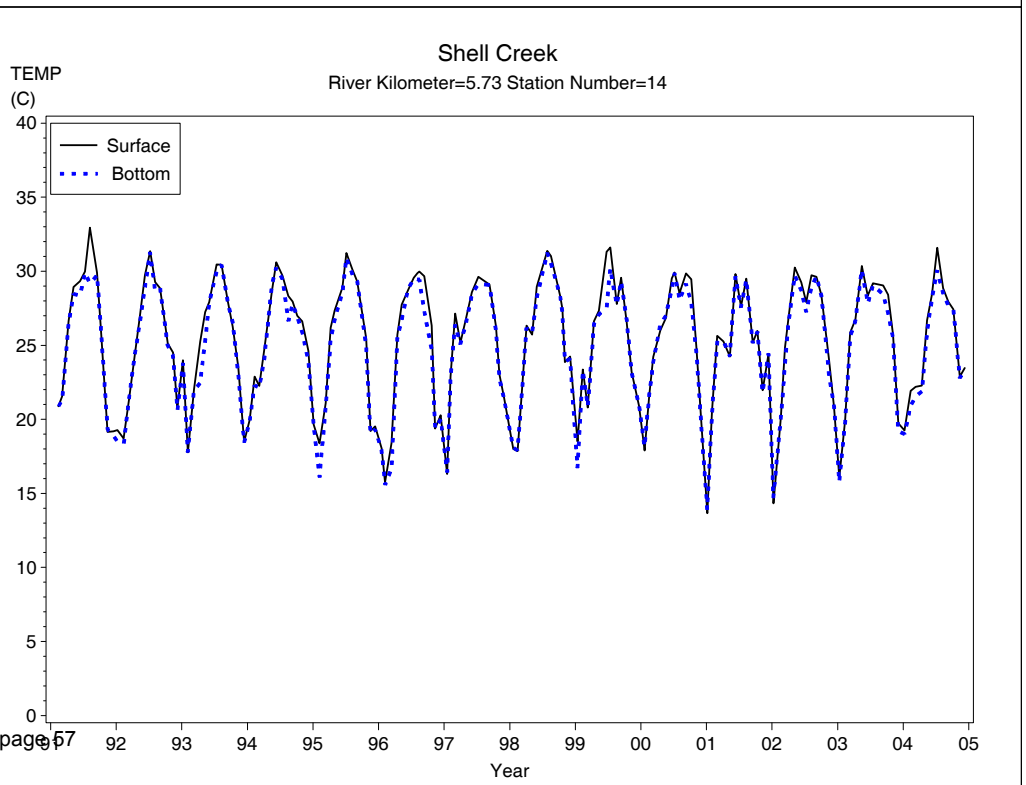
02
03
04
05
Year


Shell Creek
River Kilometer=5.73 Station Number=14
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
91
92
93
94
95
96
97
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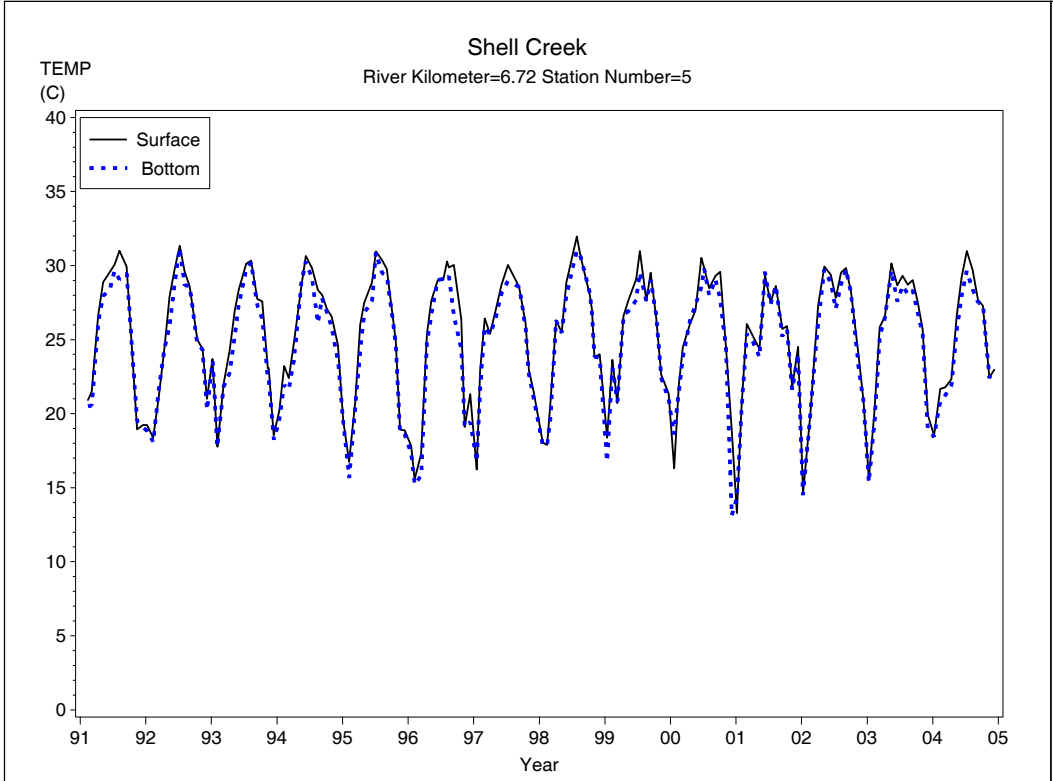
05
Year


Shell Creek
River Kilometer=6.72 Station Number=5
TEMP
(C)
Surface
Bottom
40
35
30
25
20
15
10
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0
91
92
93
94
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97
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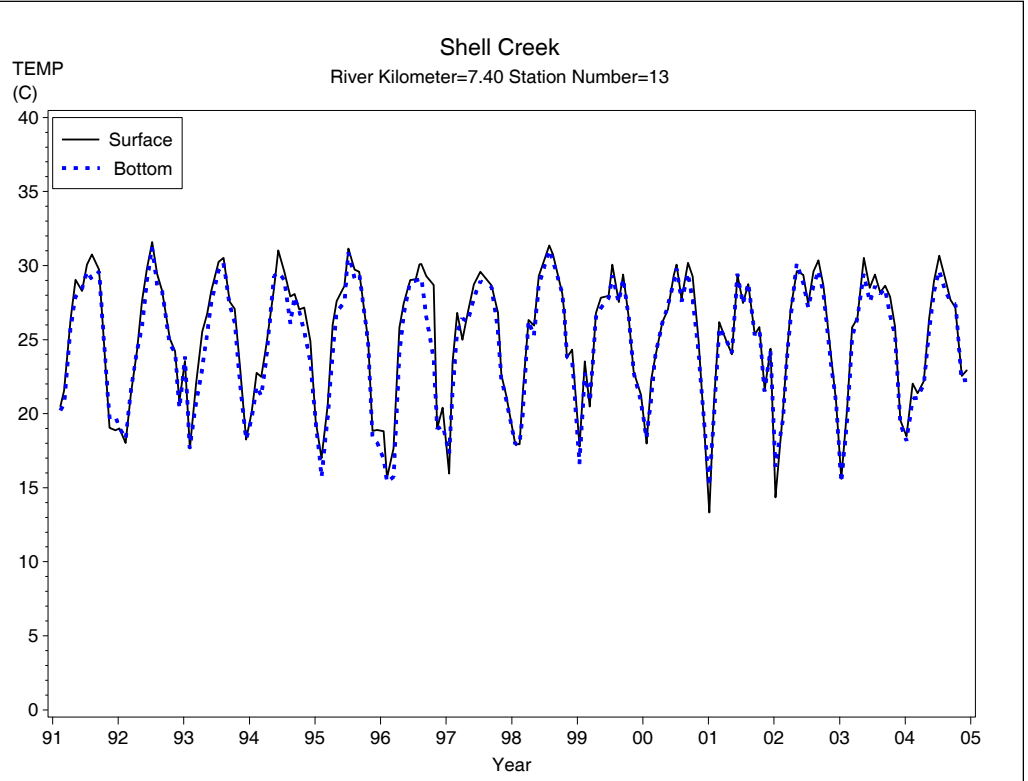
Year


Shell Creek
River Kilometer=7.40 Station Number=13
TEMP
(C)
Surface
Bottom
40
35
30
25
20
15
10
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0
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92
93
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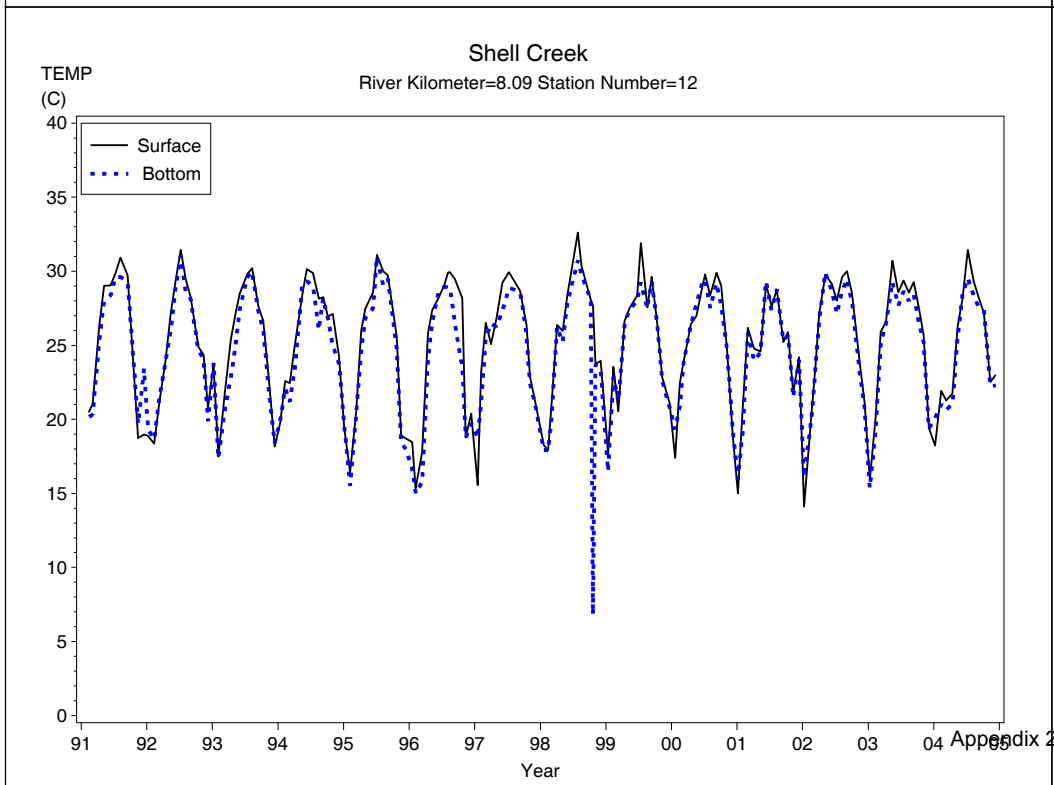
05
Year


Shell Creek
River Kilometer=8.09 Station Number=12
TEMP
(C)
Surface
Bottom
40
35
30
25
20
15
10
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92
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94
95
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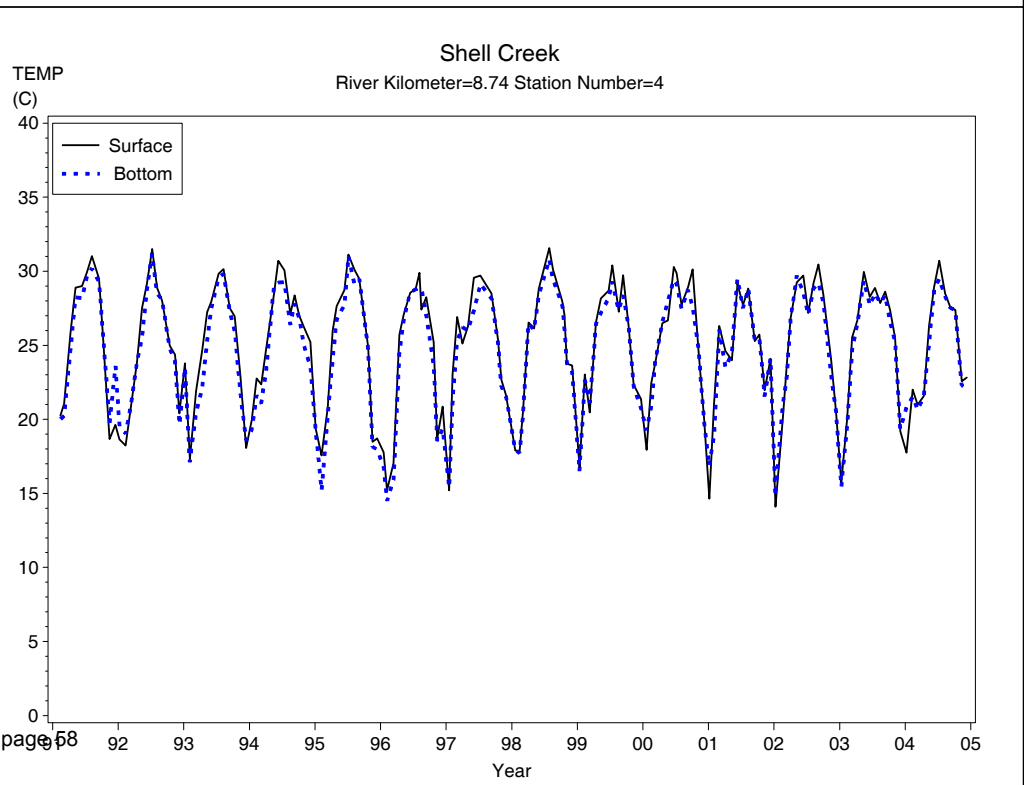
05
Year


Shell Creek
River Kilometer=8.74 Station Number=4
TEMP
(C)
Surface
Bottom
40
35
30
25
20
15
10
5
0
91
92
93
94
95
96
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01
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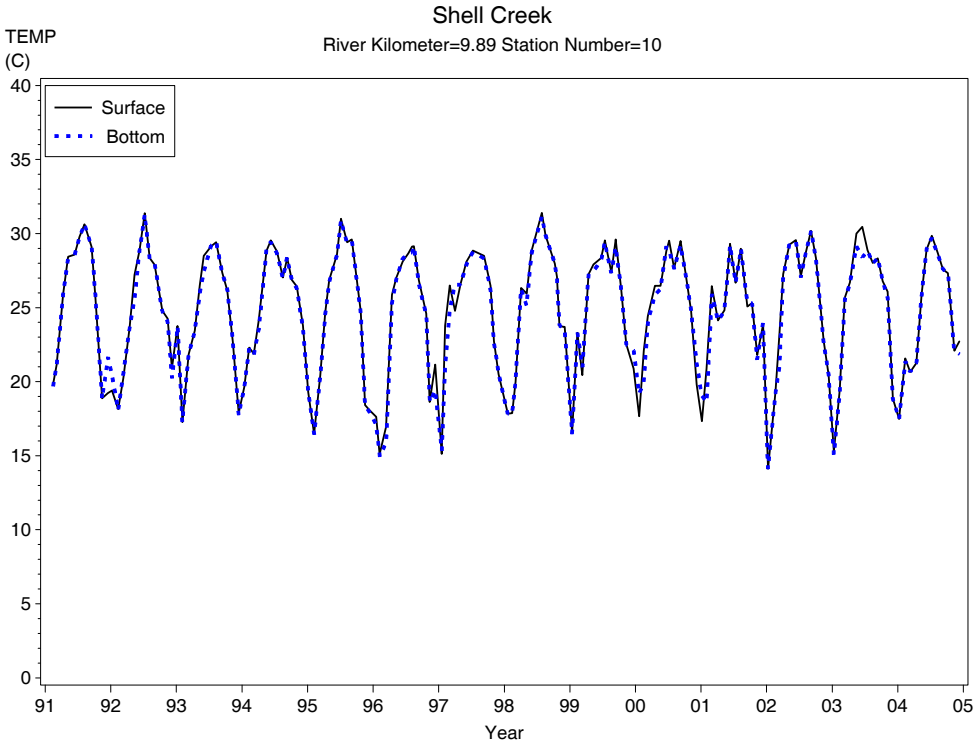
05
Year


Shell Creek
River Kilometer=9.89 Station Number=10
TEMP
(C)
Surface
Bottom
40
35
30
25
20
15
10
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0
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92
93
94
95
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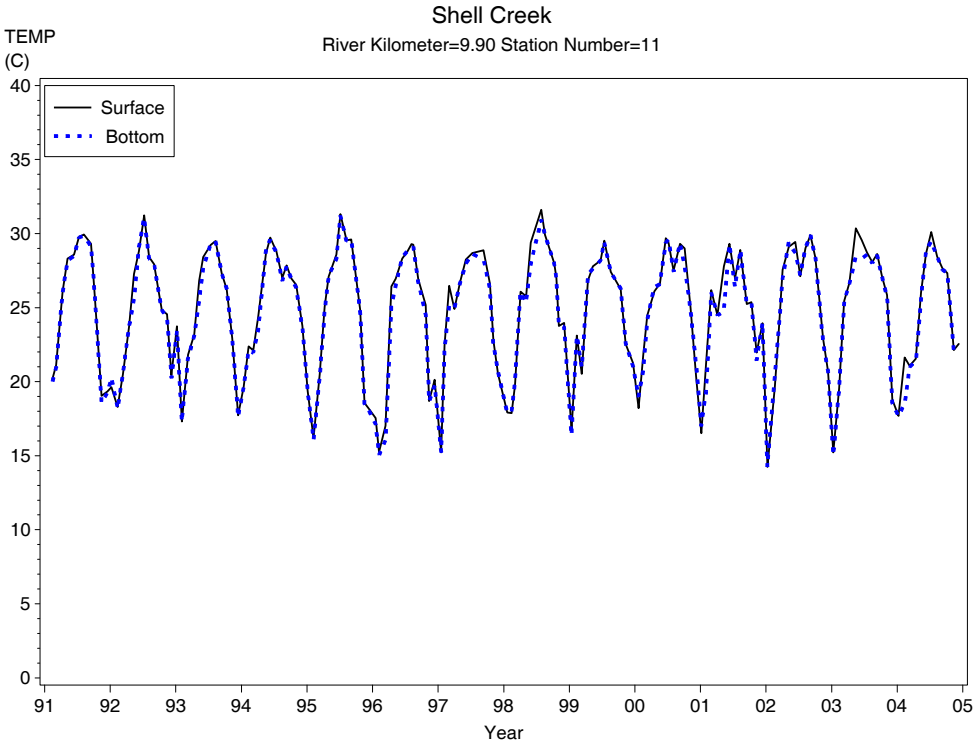
05
Year


Shell Creek
River Kilometer=9.90 Station Number=11
TEMP
(C)
Surface
Bottom
40
35
30
25
20
15
10
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0
91
92
93
94
95
96
97
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99
00
01
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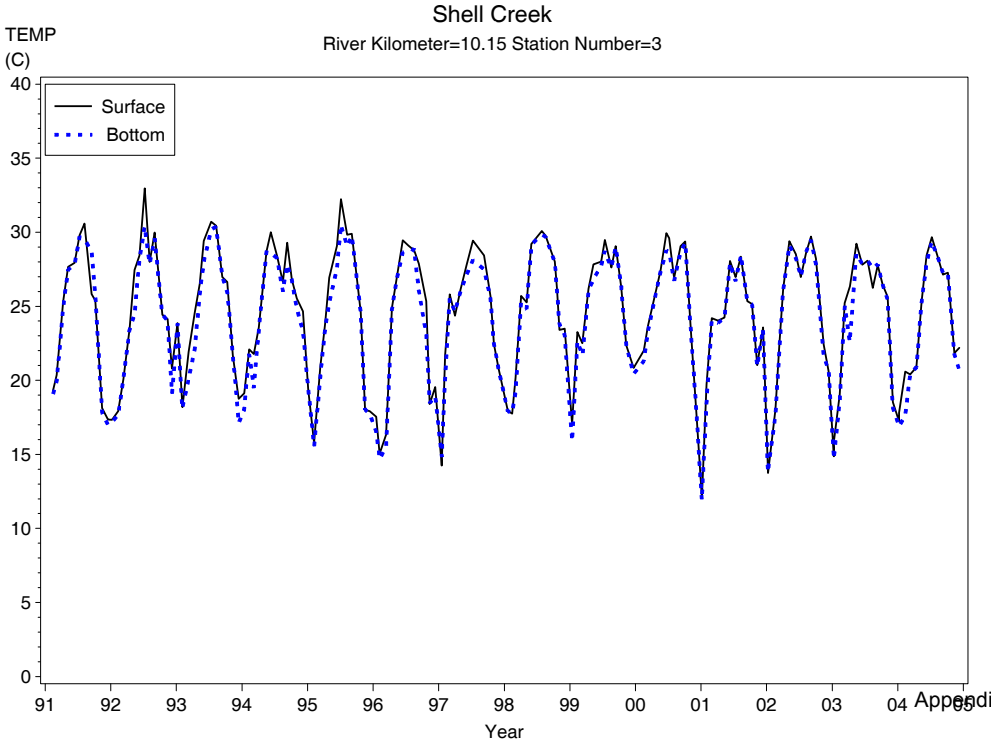
05
Year


Shell Creek
River Kilometer=10.15 Station Number=3
TEMP
(C)
Surface
Bottom
40
35
30
25
20
15
10
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0
91
92
93
94
95
96
97
98
99
00
01
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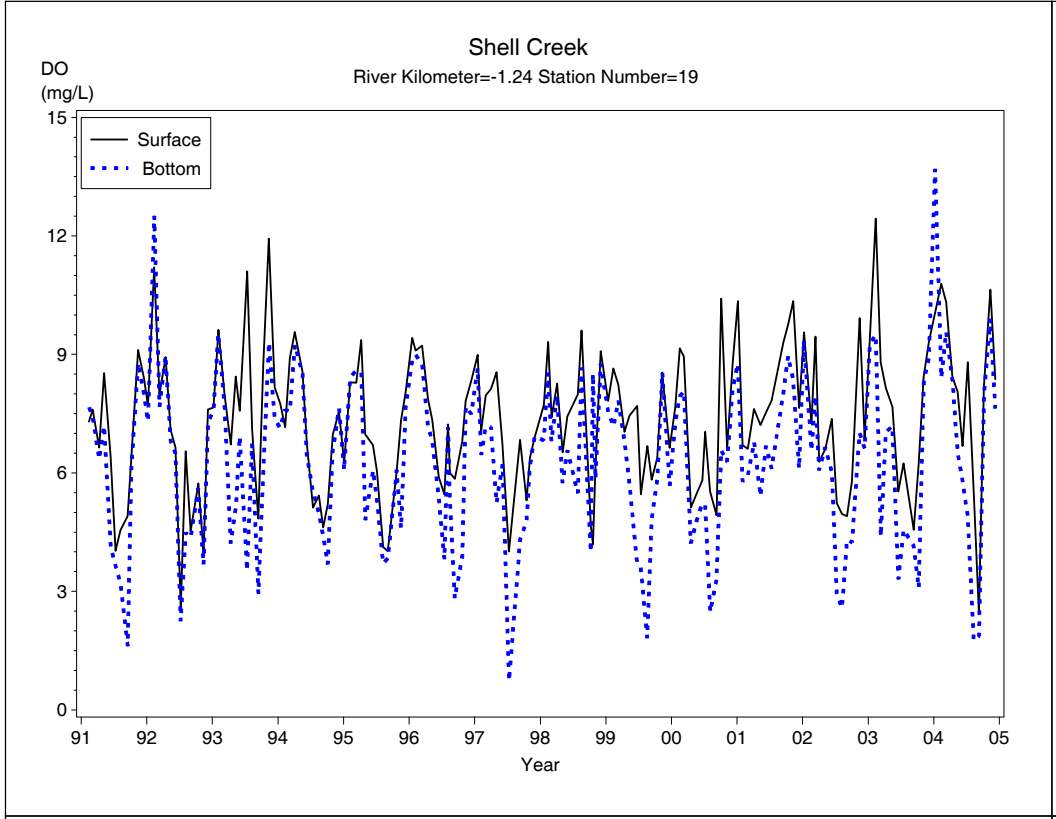
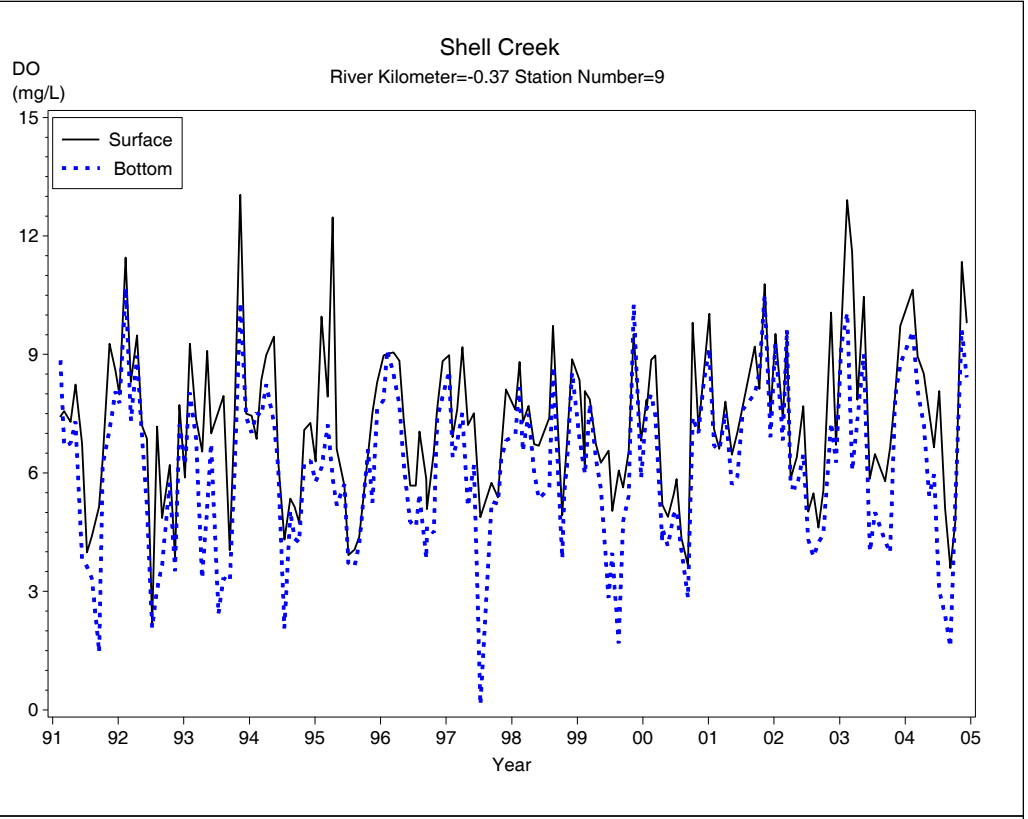
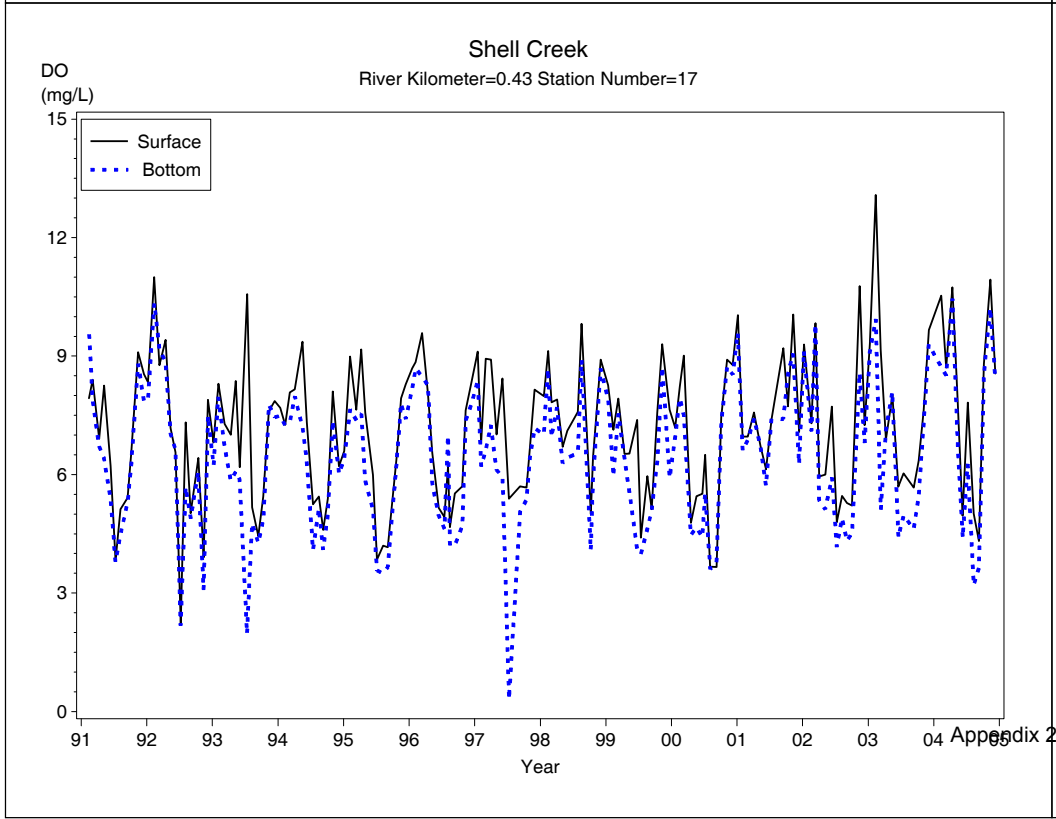
04
05
Year


Shell Creek
River Kilometer=-1.24 Station Number=19
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year


Shell Creek
River Kilometer=-0.37 Station Number=9
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year


Shell Creek
River Kilometer=0.43 Station Number=17
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
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99
00
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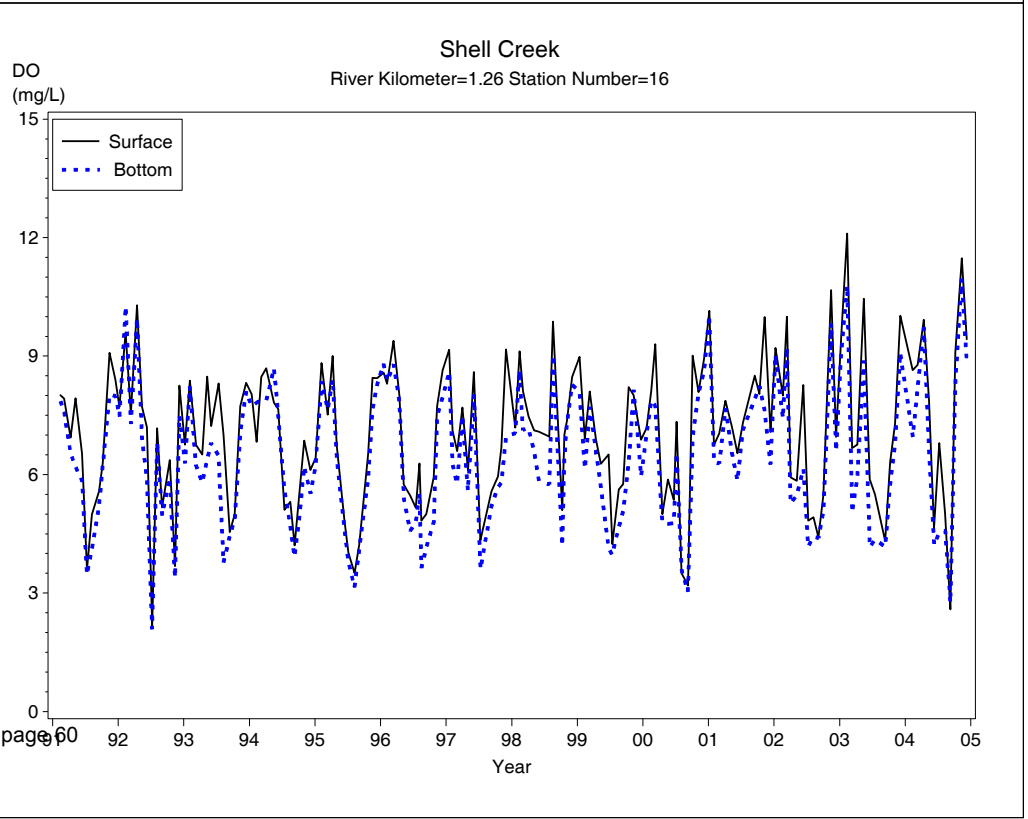
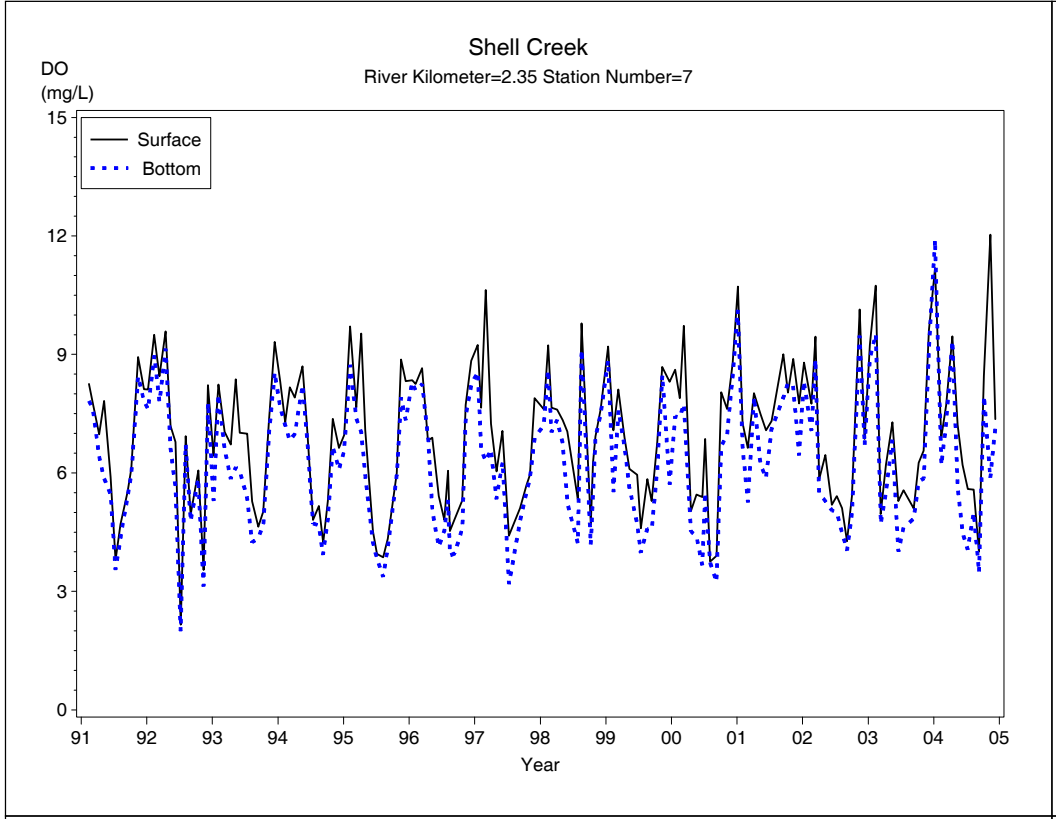
02
03
04
05
Year


Shell Creek
River Kilometer=1.26 Station Number=16
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year


Shell Creek
River Kilometer=2.35 Station Number=7
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
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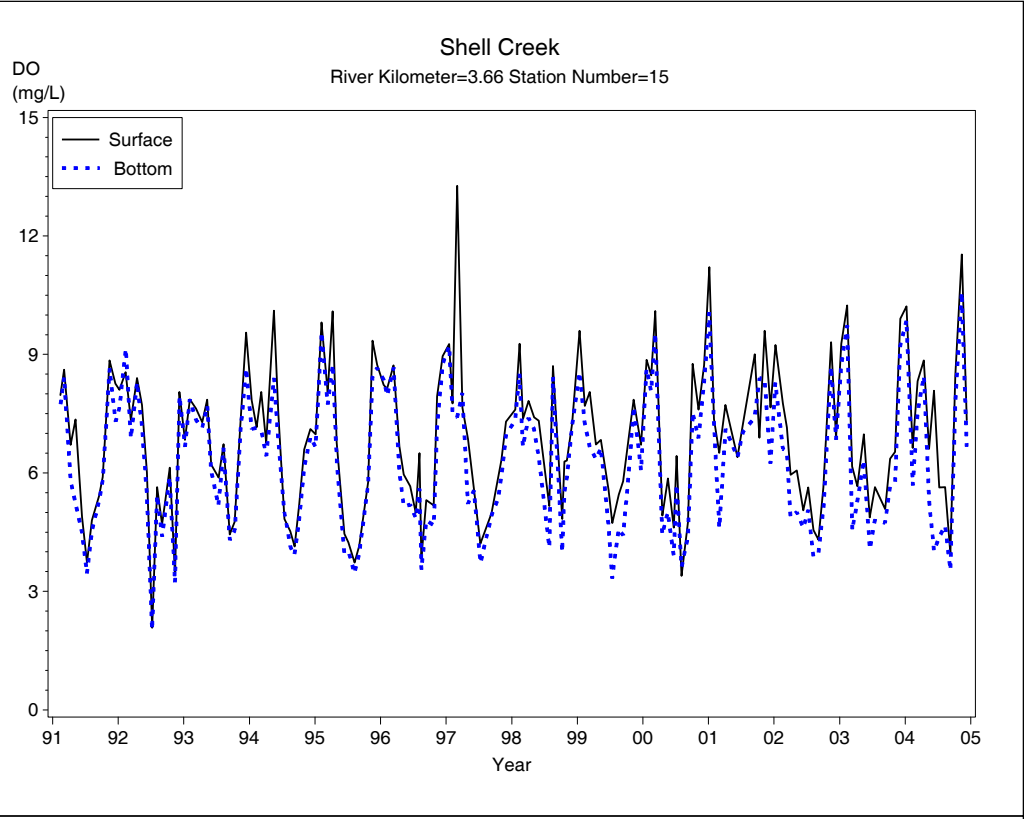
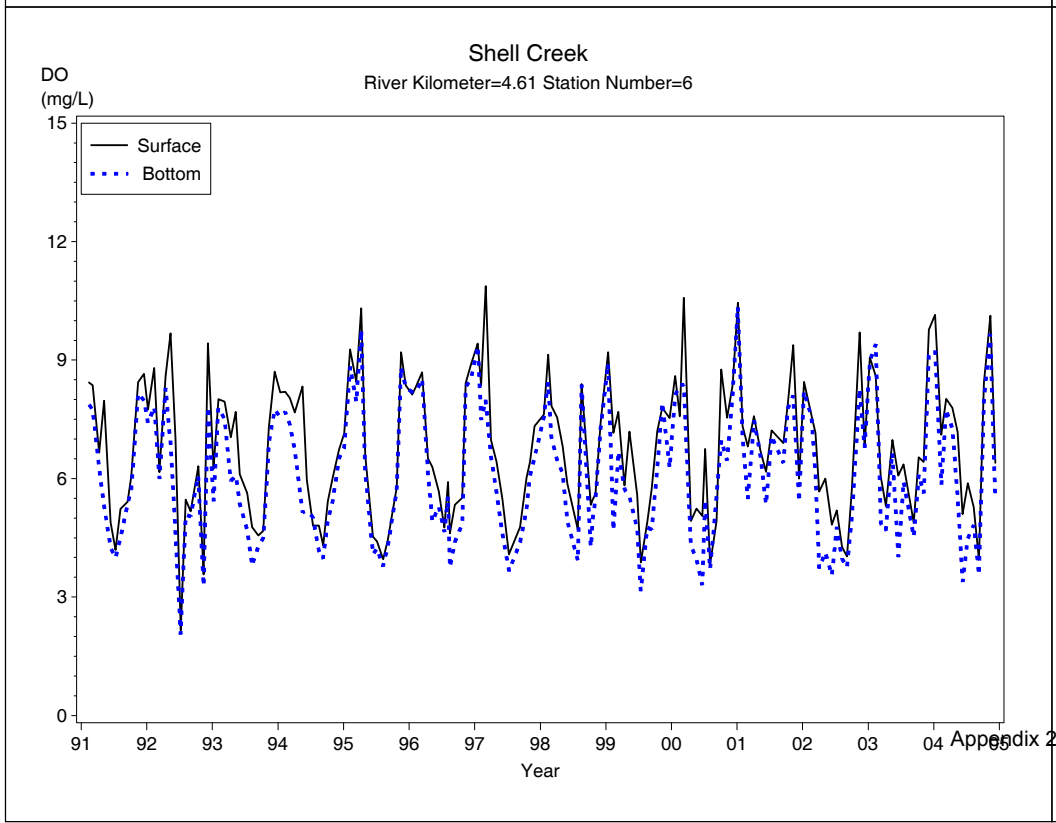
99
00
01
02
03
04
05
Year


Shell Creek
River Kilometer=3.66 Station Number=15
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year


Shell Creek
River Kilometer=4.61 Station Number=6
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
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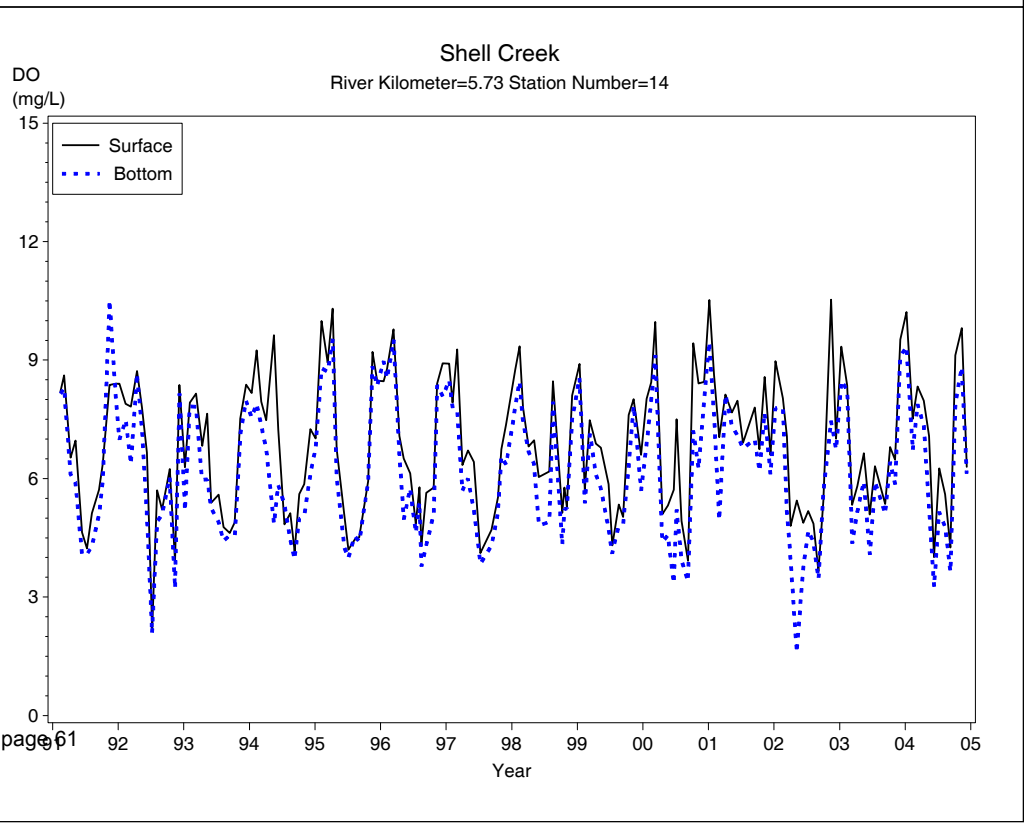
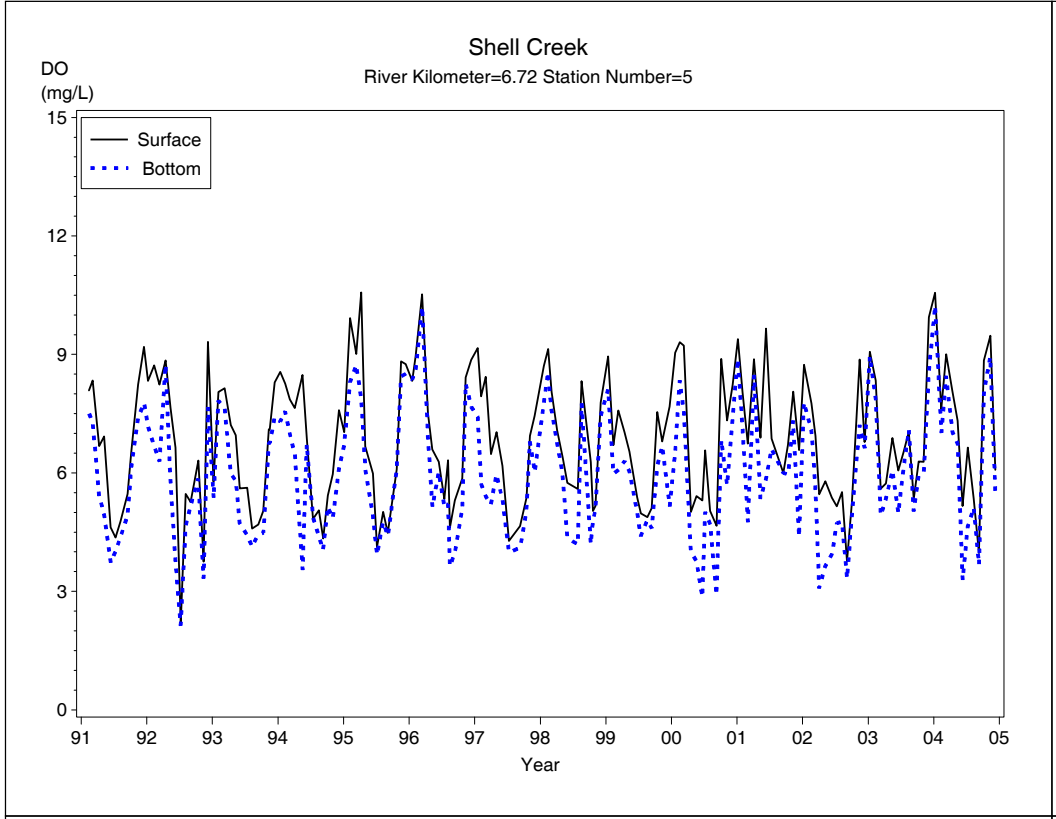
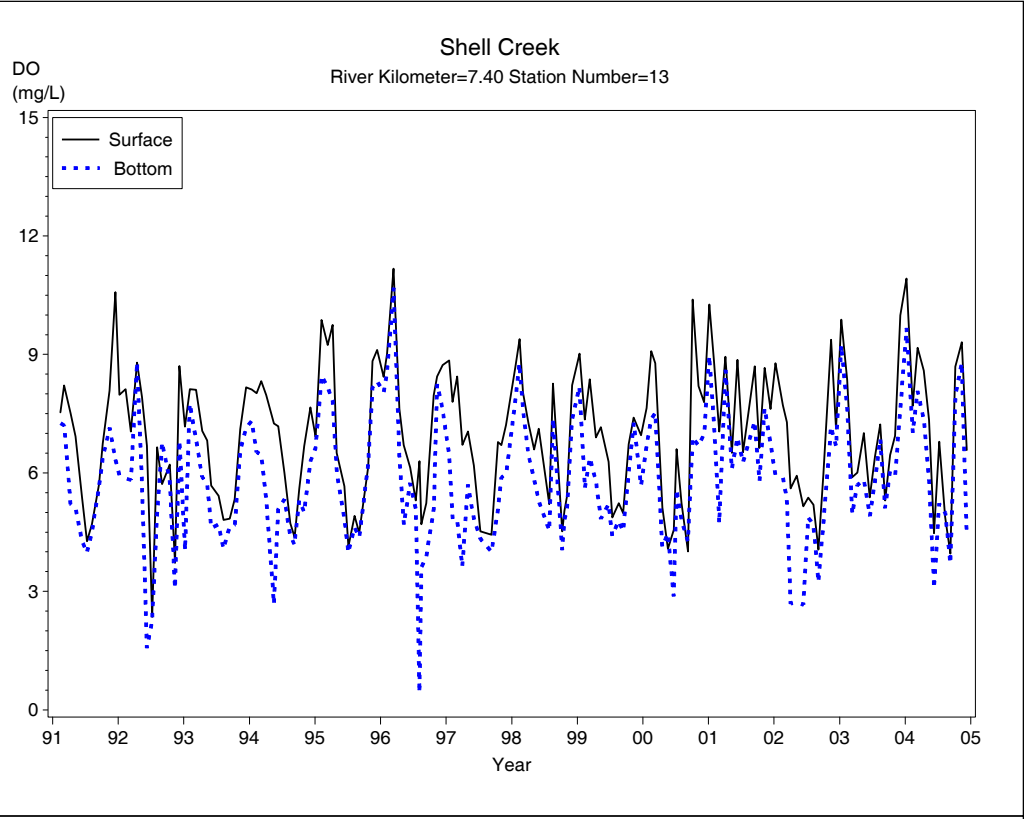
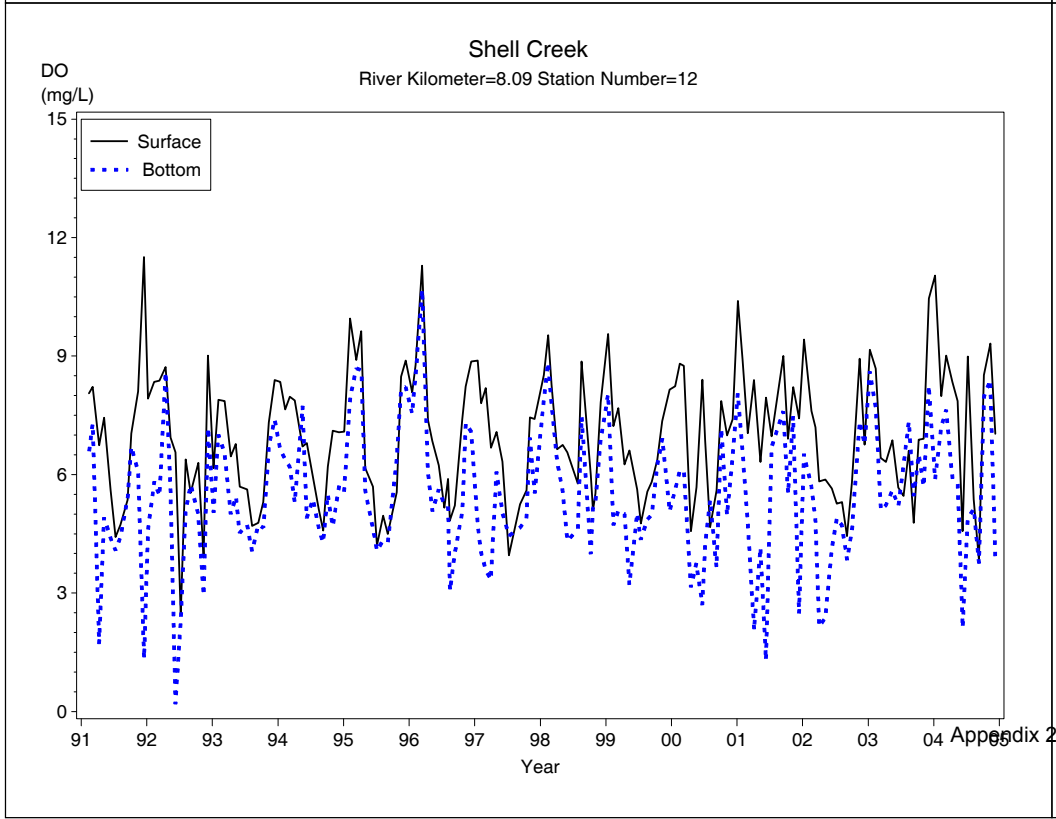
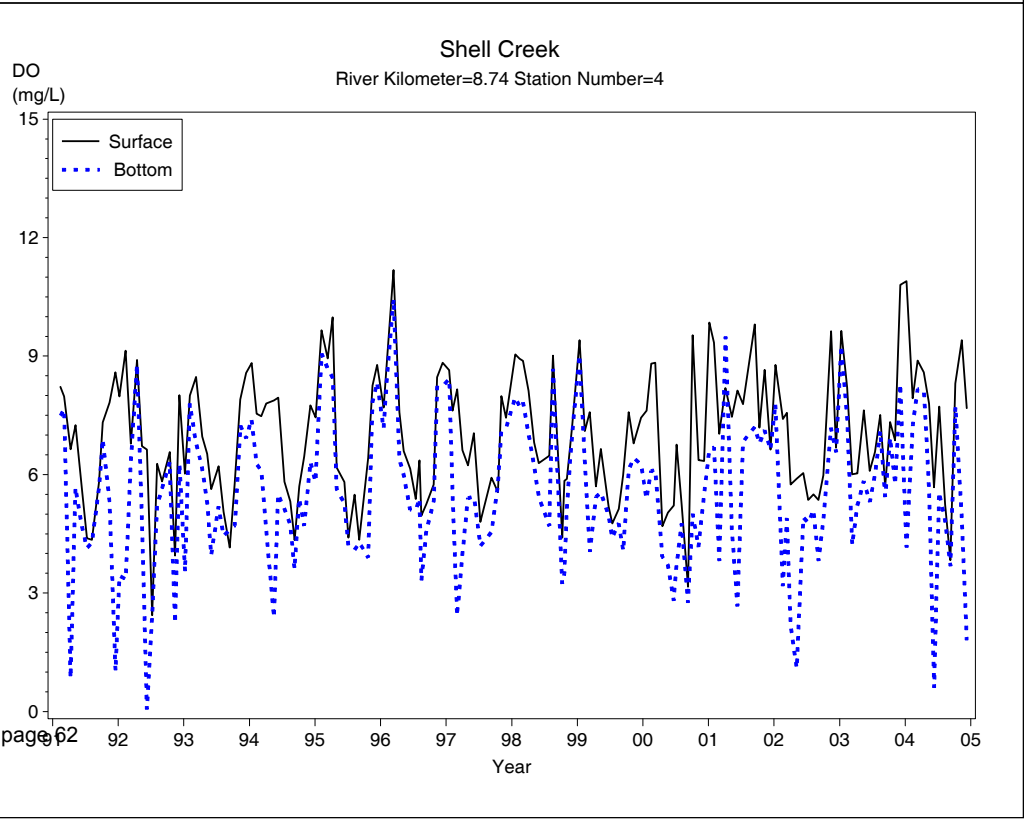
05
Year

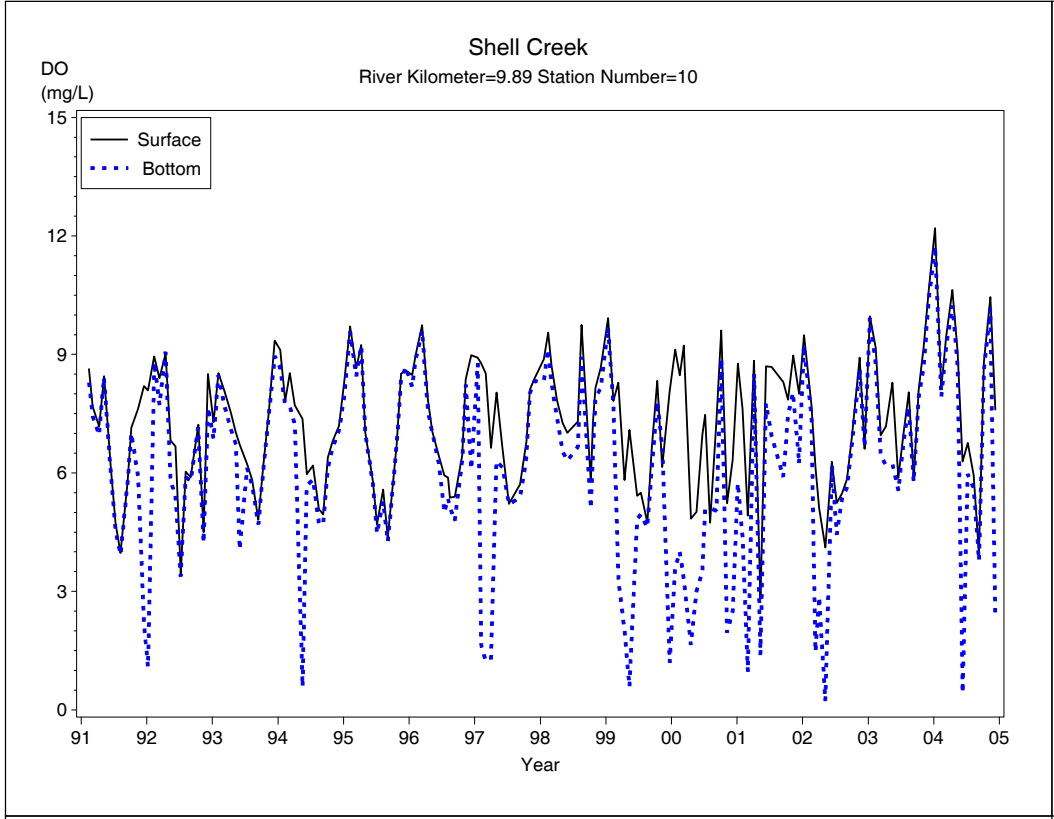

Shell Creek
River Kilometer=5.73 Station Number=14
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

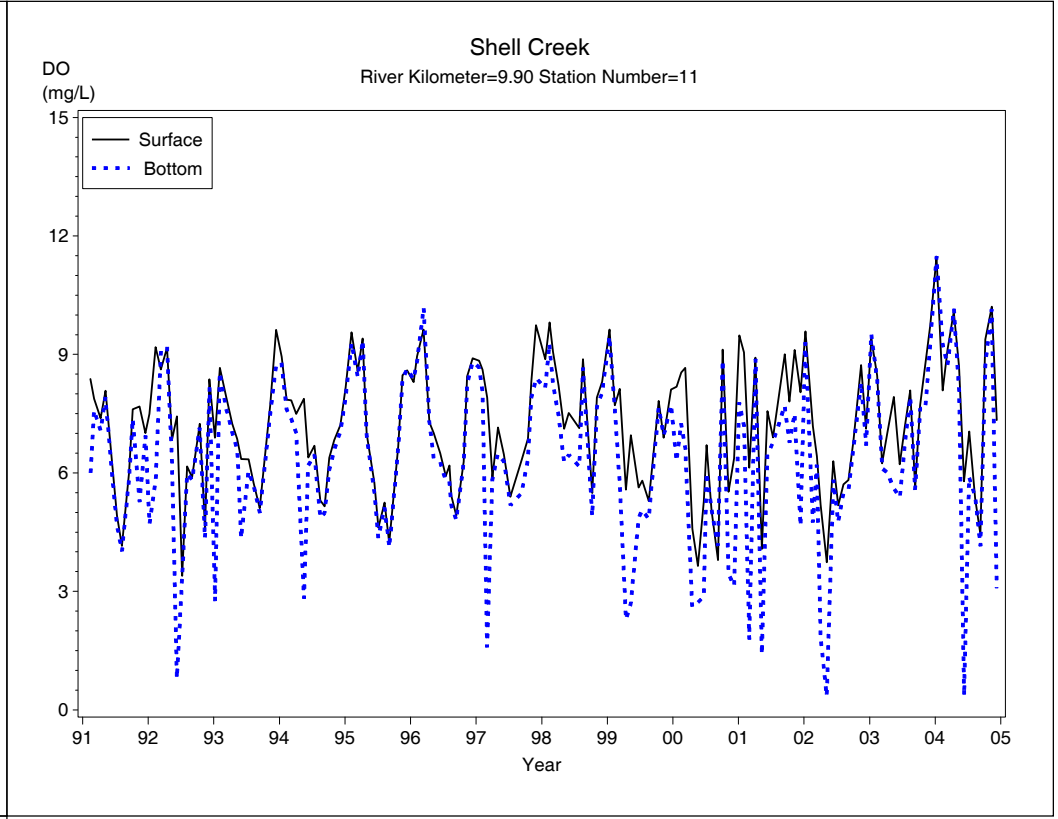

Shell Creek
River Kilometer=6.72 Station Number=5
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

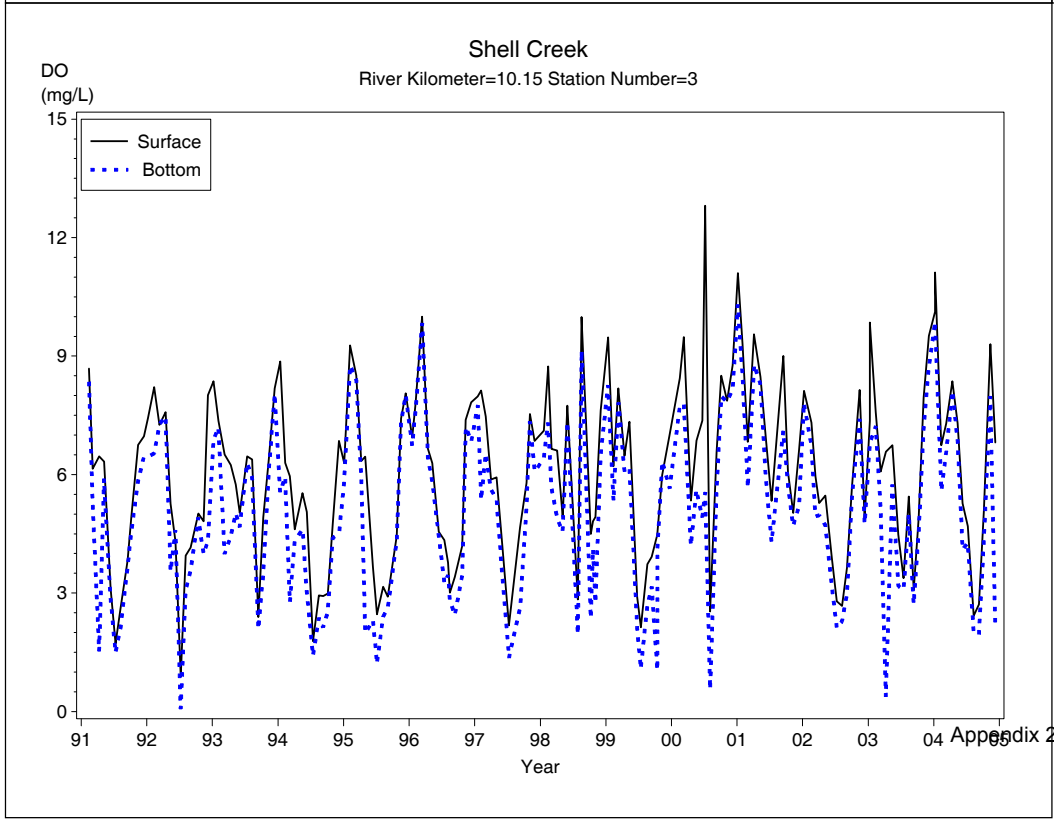

Shell Creek
River Kilometer=7.40 Station Number=13
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

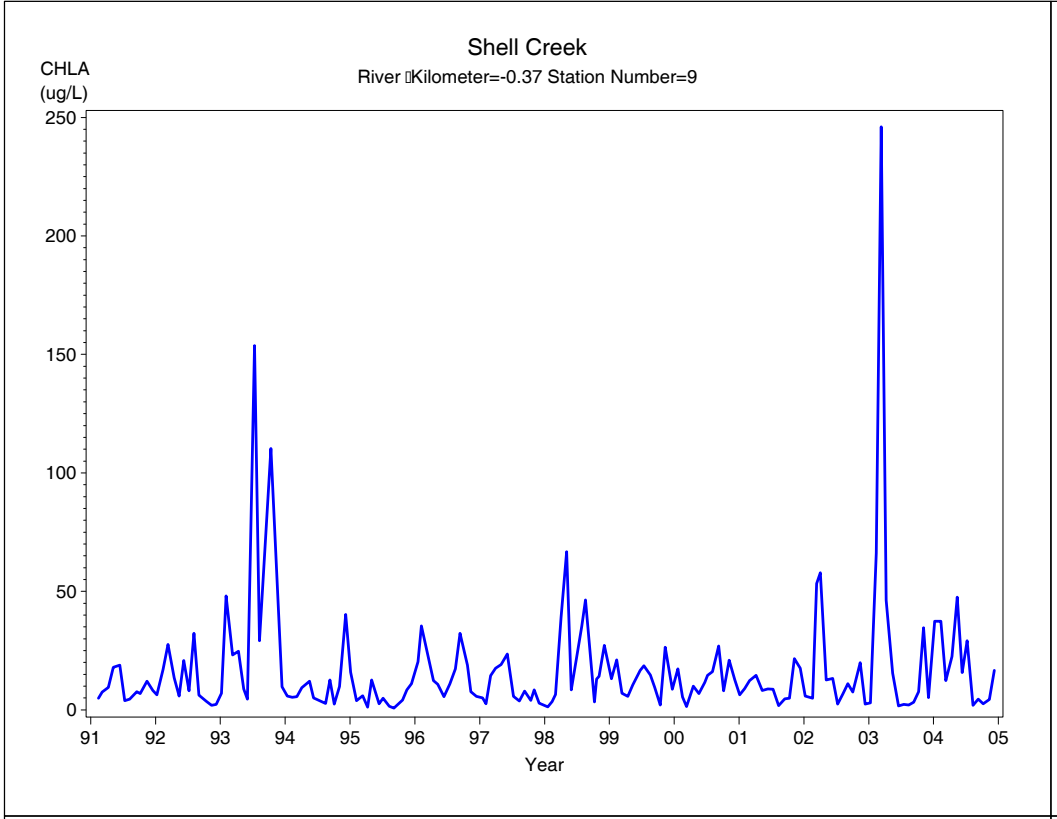

Shell Creek
River Kilometer=8.09 Station Number=12
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

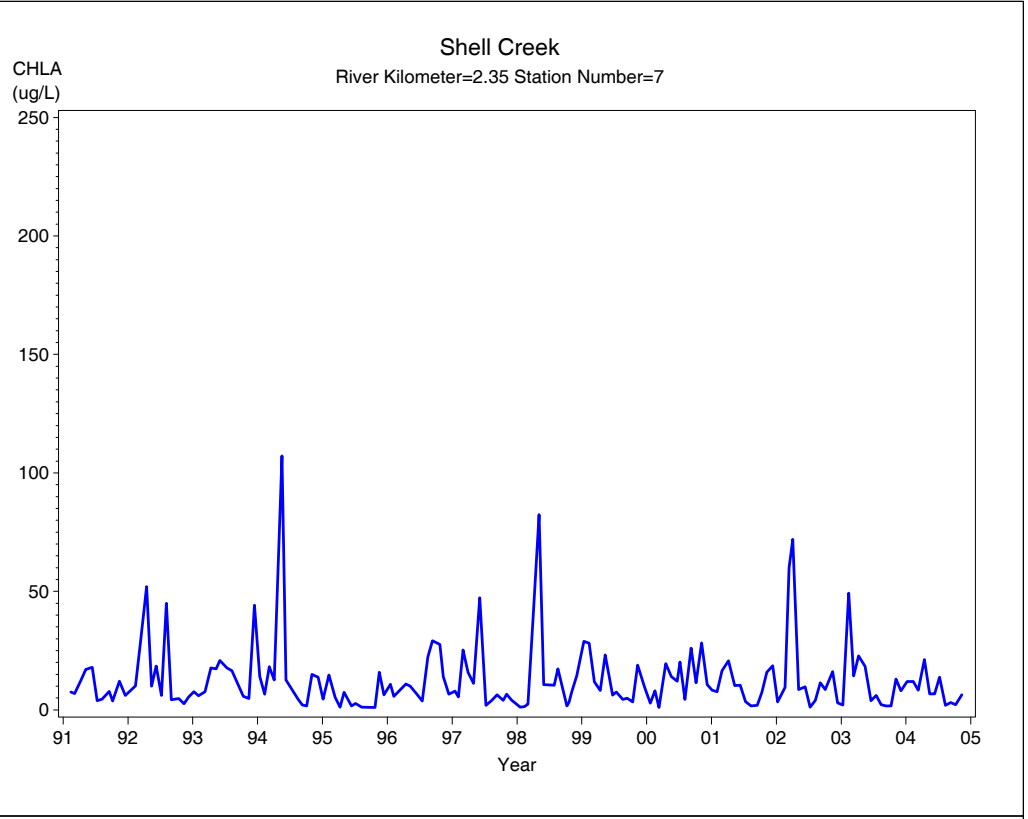

Shell Creek
River Kilometer=8.74 Station Number=4
DO
(mg/L)
Surface
Bottom
0
3
6
9
12
15
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

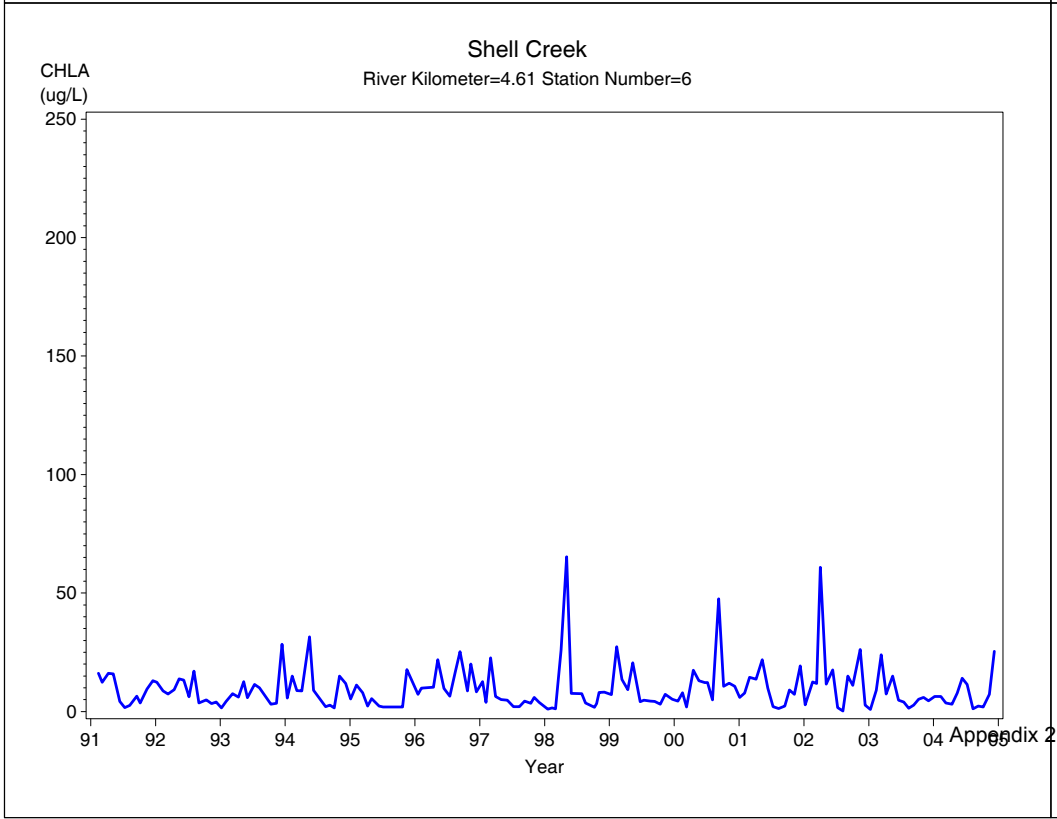

Shell Creek
River Kilometer=9.89 Station Number=10
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

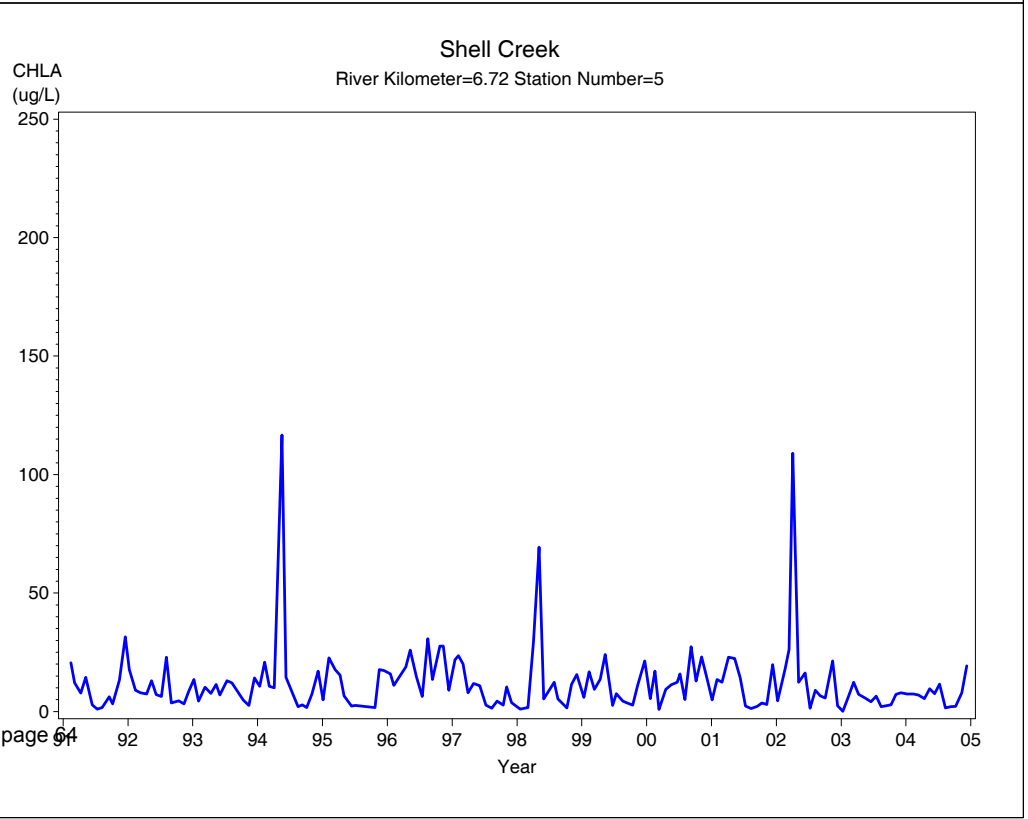

Shell Creek
River Kilometer=9.90 Station Number=11
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

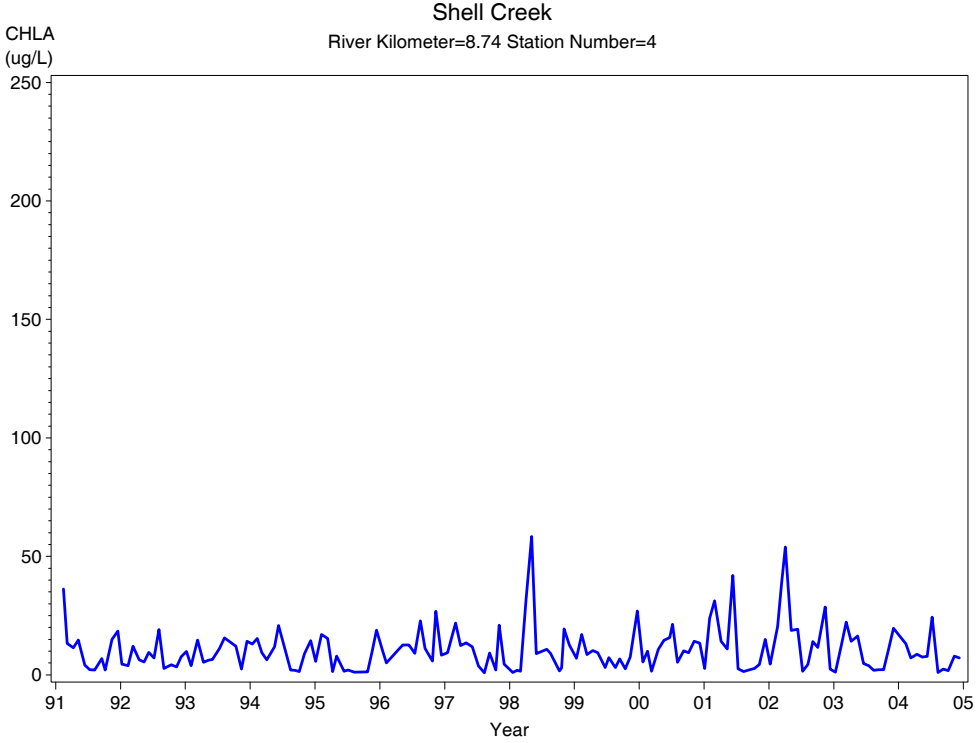

Shell Creek
River Kilometer=10.15 Station Number=3
DO
(mg/L)
Surface
Bottom
15
12
9
6
3
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

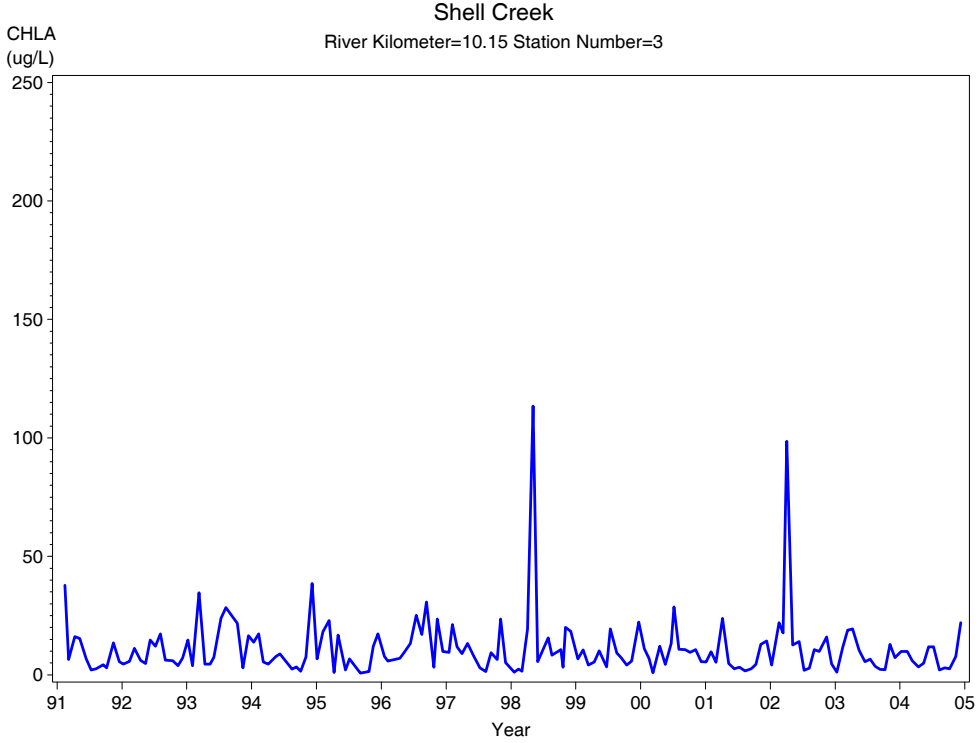

Shell Creek
River Kilometer=-0.37 Station Number=9
CHLA
(ug/L)
250
200
150
100
50
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

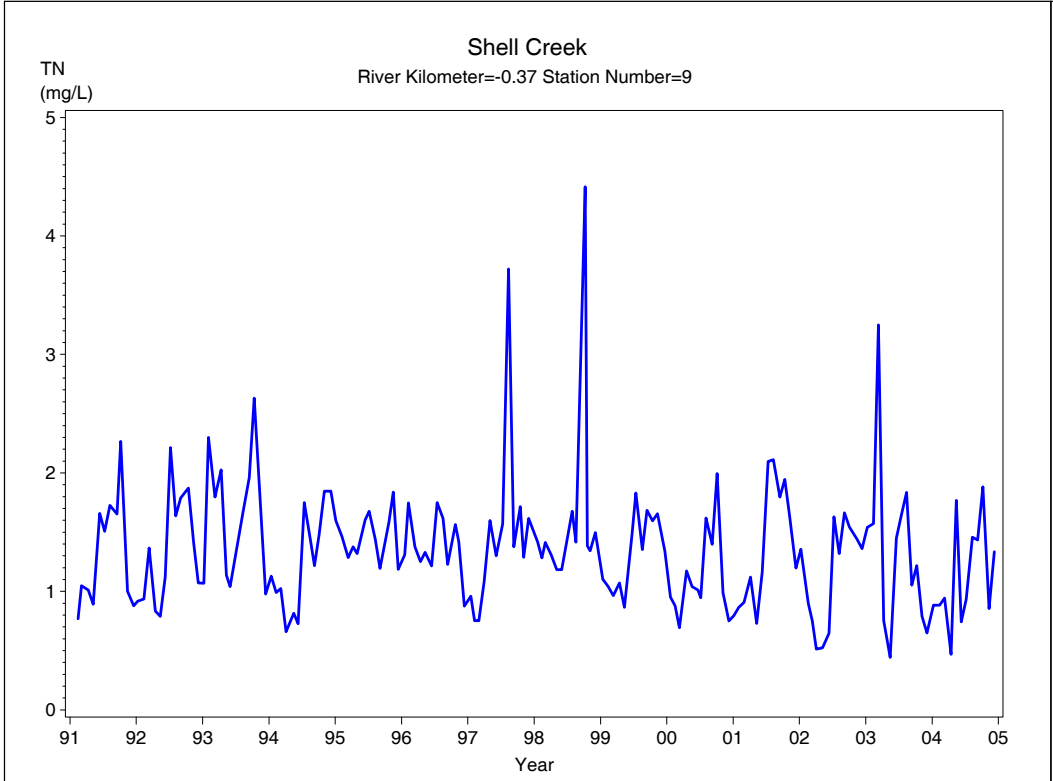

Shell Creek
River Kilometer=2.35 Station Number=7
CHLA
(ug/L)
250
200
150
100
50
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

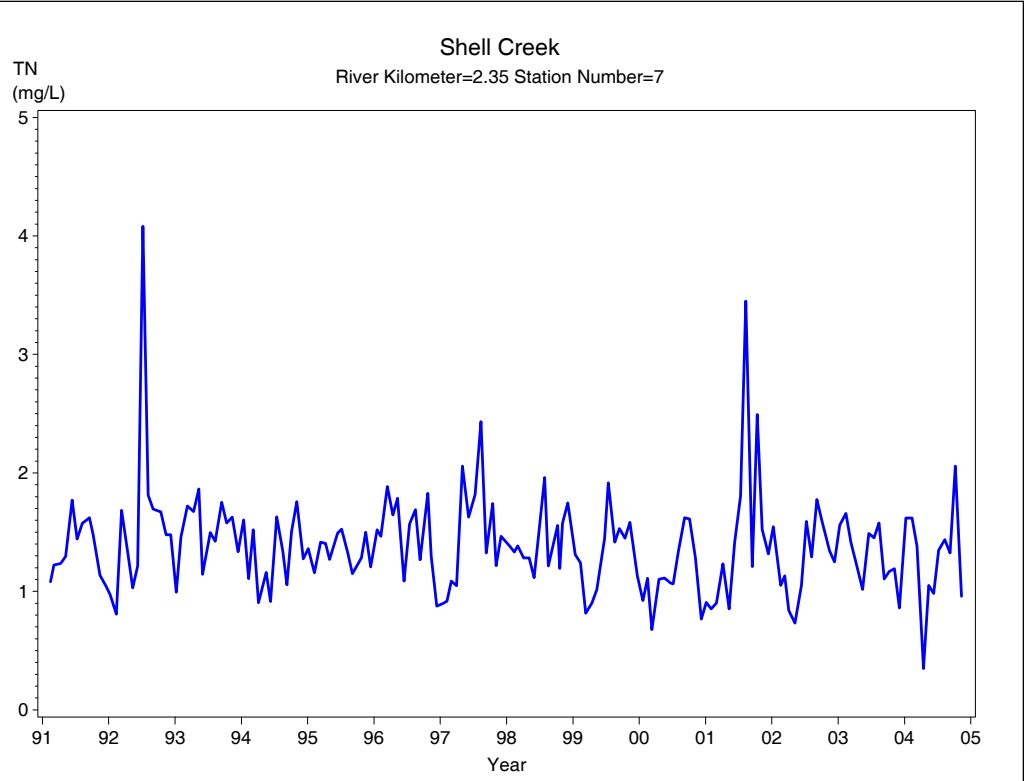

Shell Creek
River Kilometer=4.61 Station Number=6
CHLA
(ug/L)
250
200
150
100
50
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

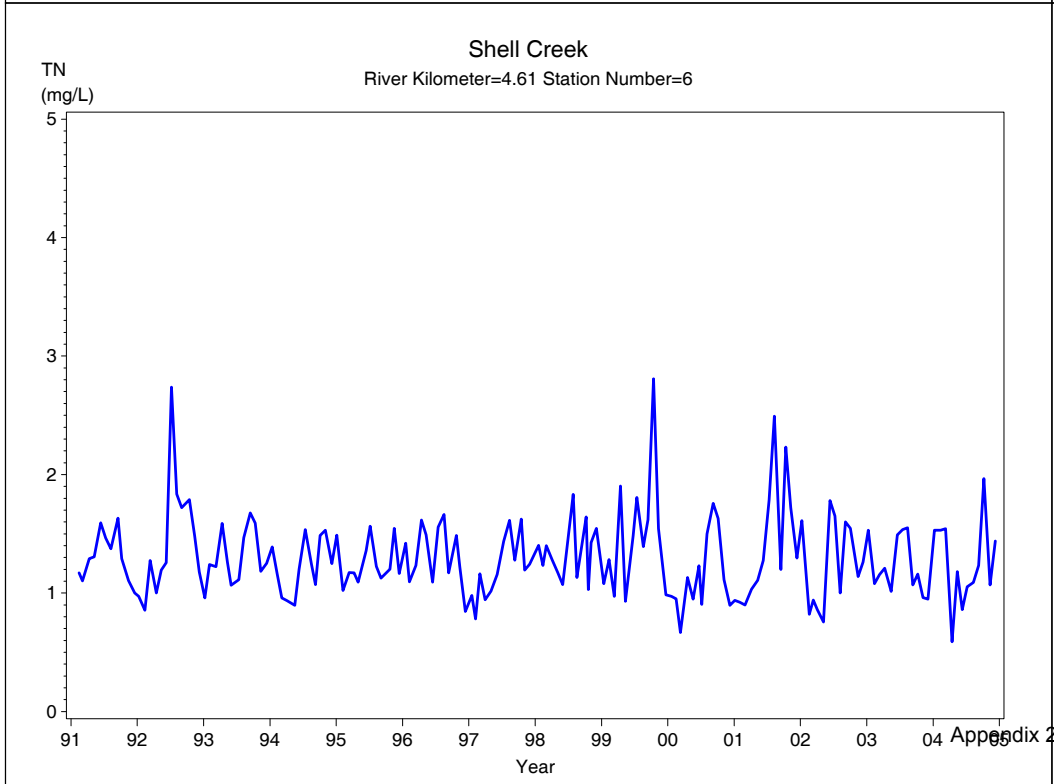

Shell Creek
River Kilometer=6.72 Station Number=5
CHLA
(ug/L)
250
200
150
100
50
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

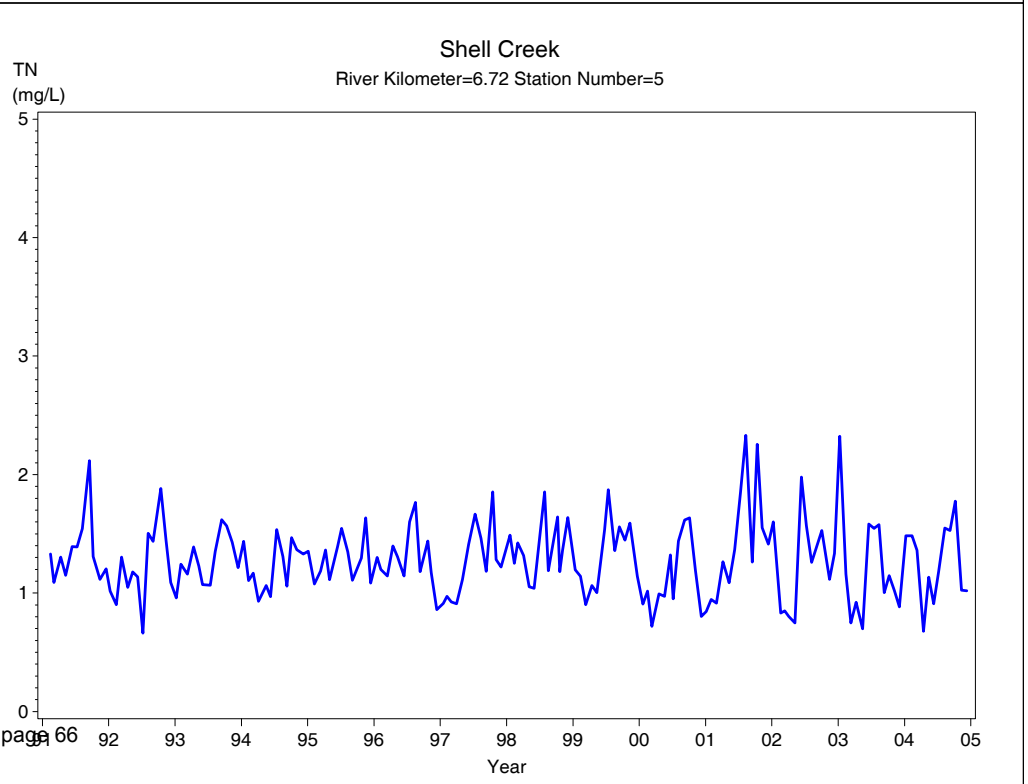

Shell Creek
River Kilometer=8.74 Station Number=4
CHLA
(ug/L)
250
200
150
100
50
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

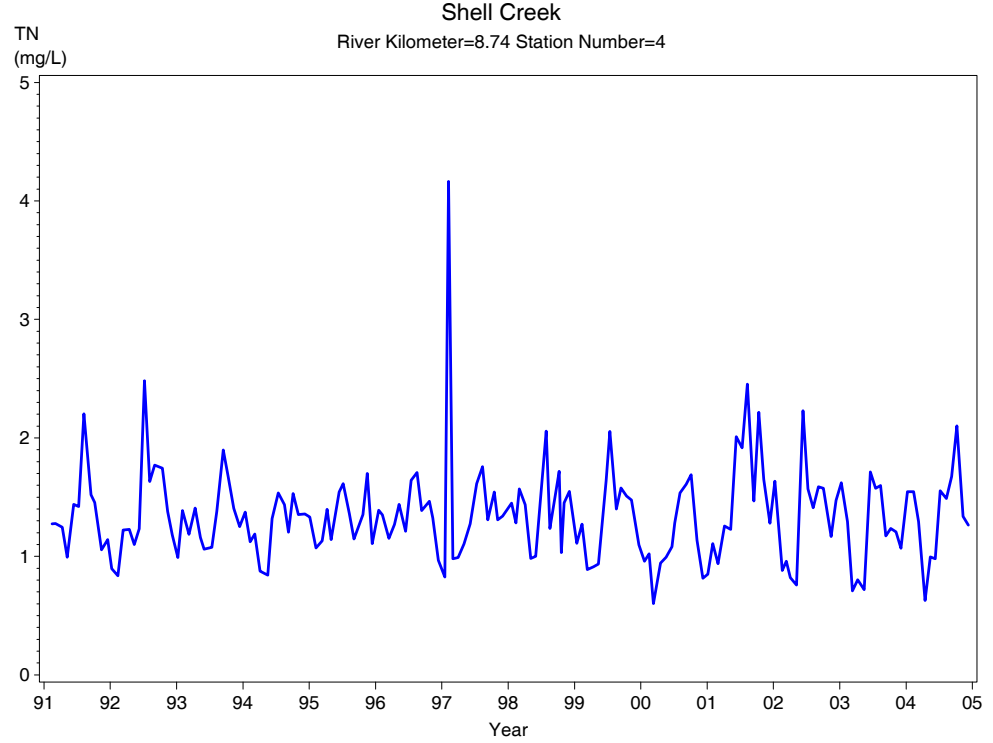

Shell Creek
River Kilometer=10.15 Station Number=3
CHLA
(ug/L)
250
200
150
100
50
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

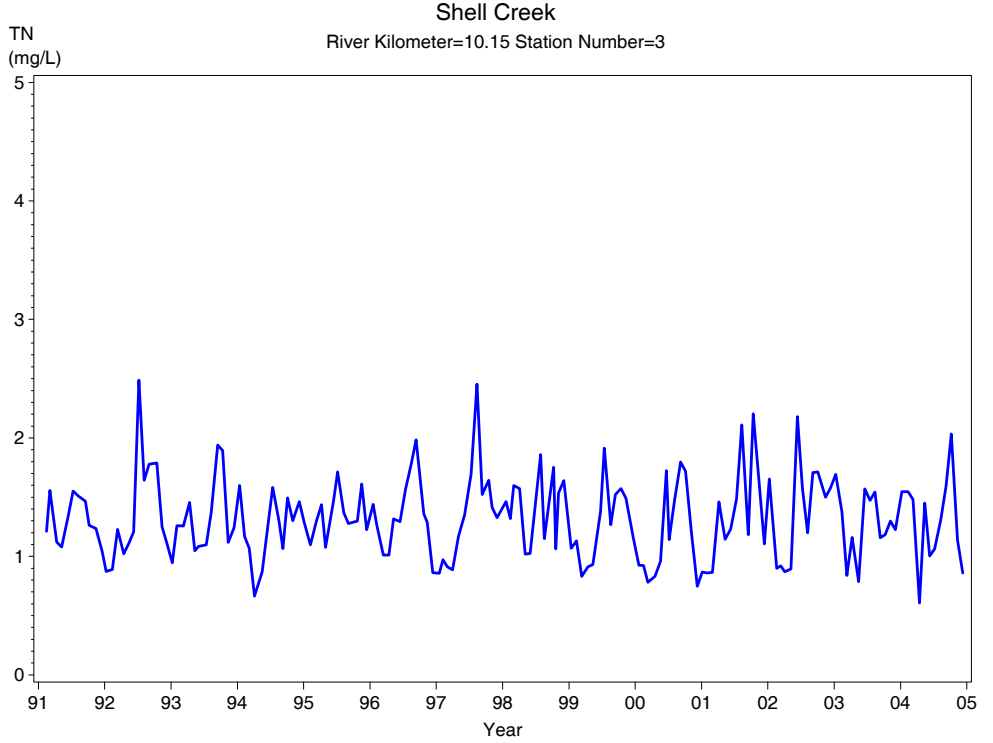

Shell Creek
River Kilometer=-0.37 Station Number=9
TN
(mg/L)
0
1
2
3
4
5
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

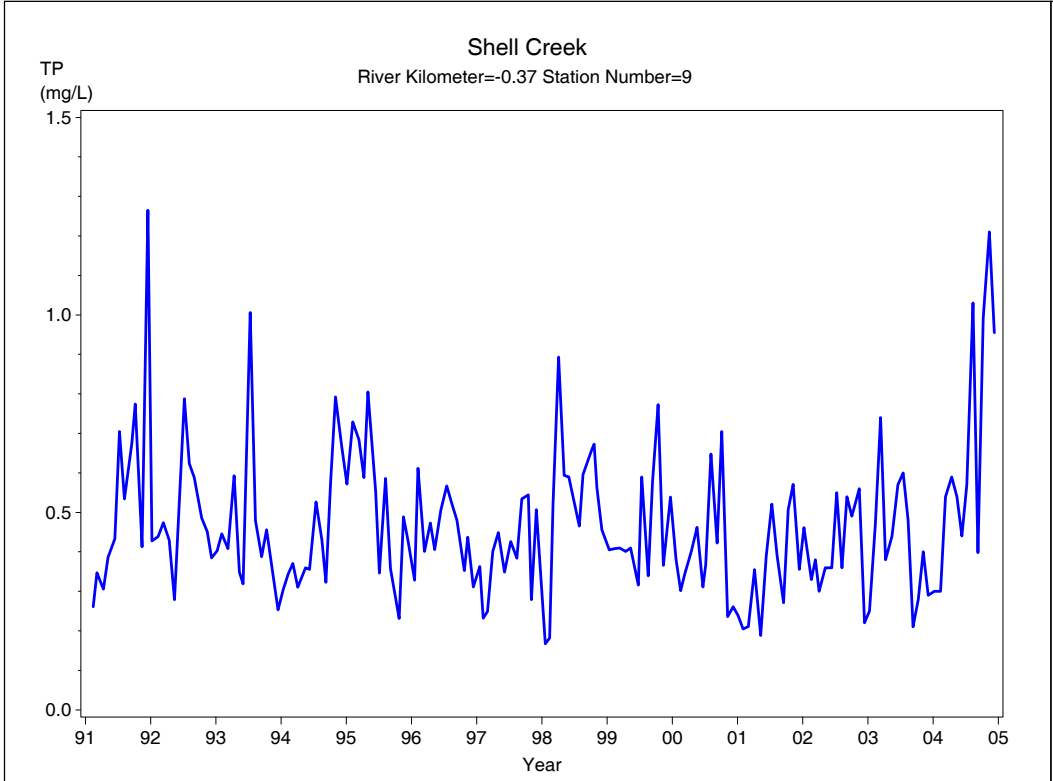

Shell Creek
River Kilometer=2.35 Station Number=7
TN
(mg/L)
0
1
2
3
4
5
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

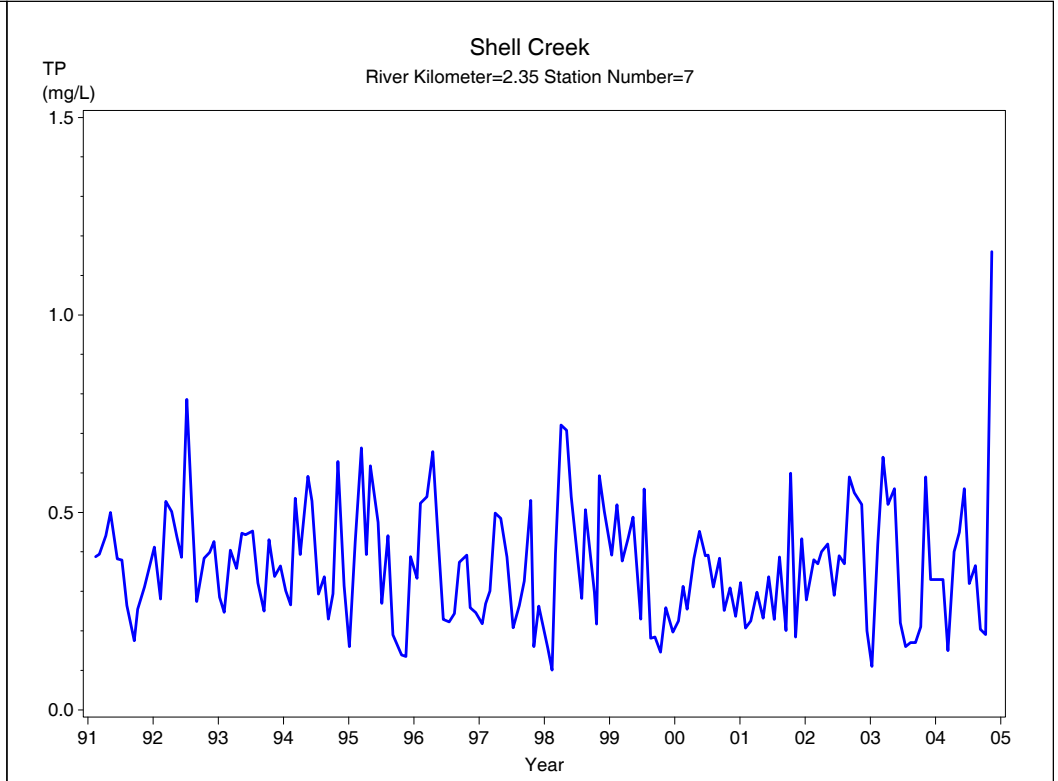

Shell Creek
River Kilometer=4.61 Station Number=6
TN
(mg/L)
0
1
2
3
4
5
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

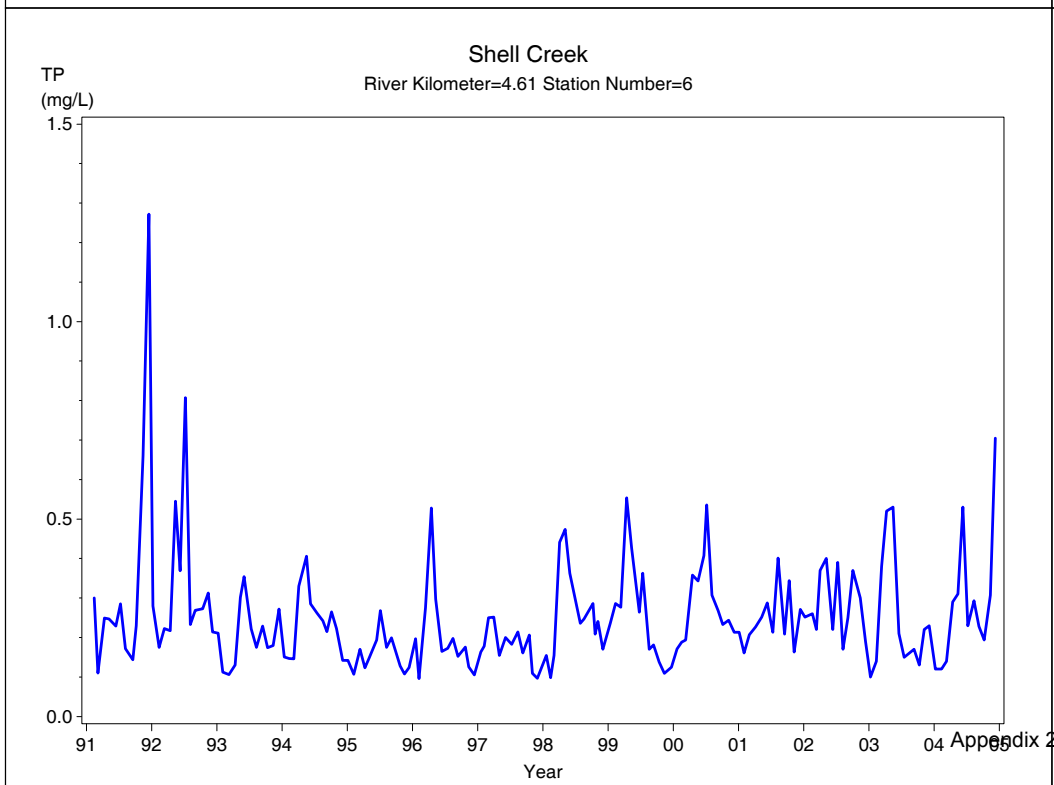

Shell Creek
River Kilometer=6.72 Station Number=5
TN
(mg/L)
0
1
2
3
4
5
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

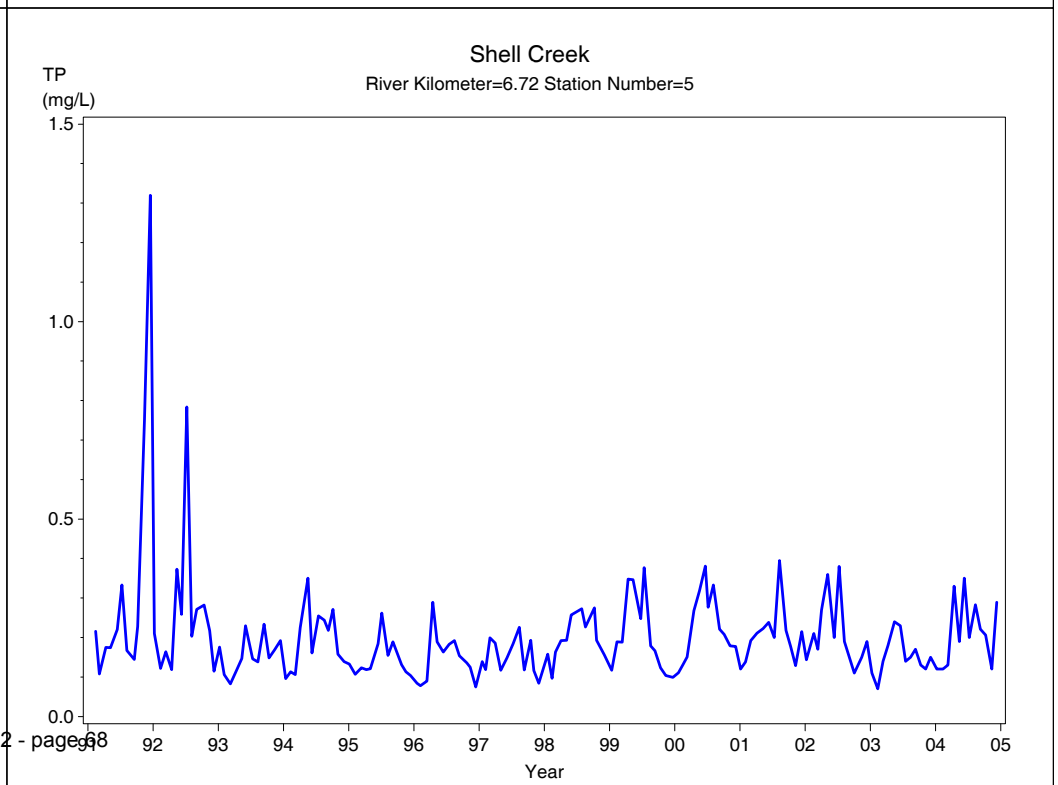

Shell Creek
River Kilometer=8.74 Station Number=4
TN
(mg/L)
5
4
3
2
1
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

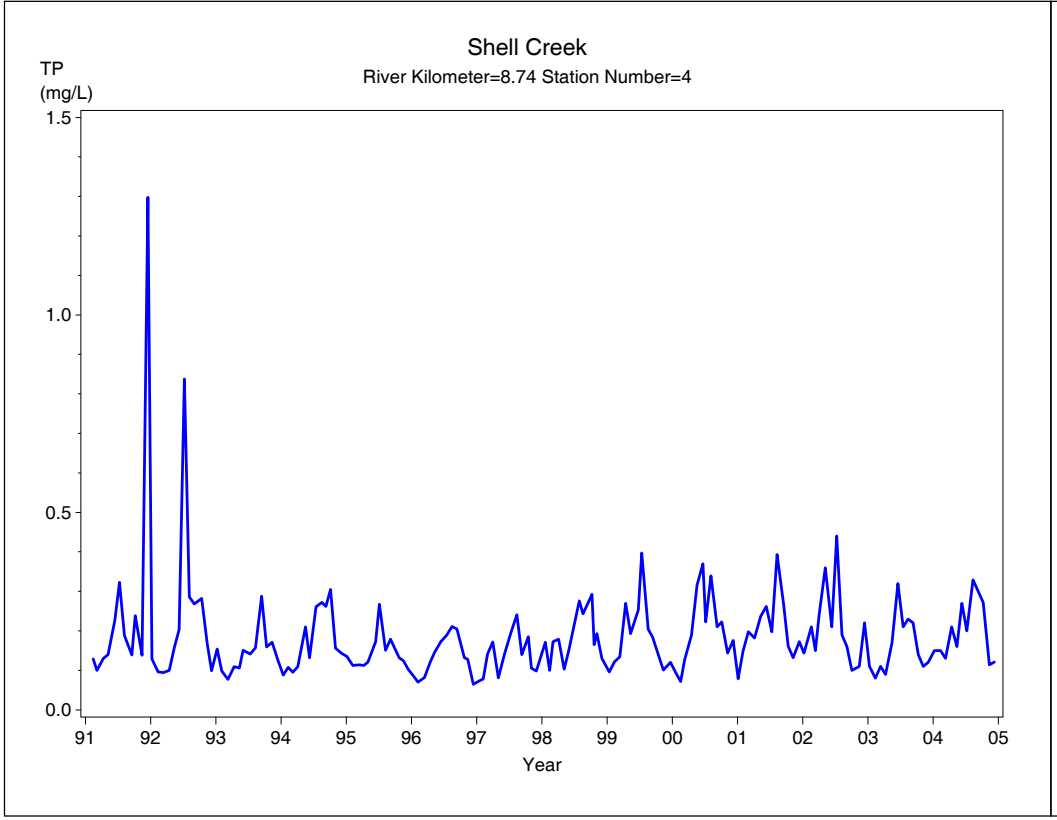

Shell Creek
River Kilometer=10.15 Station Number=3
TN
(mg/L)
5
4
3
2
1
0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

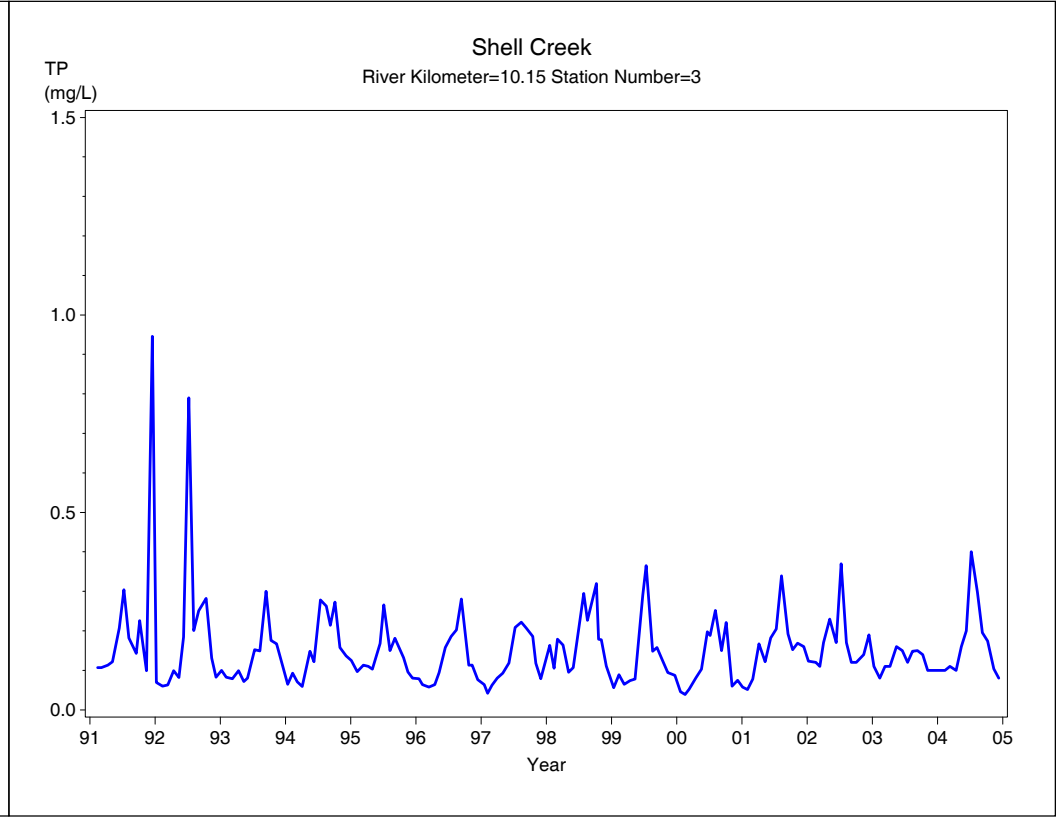

Shell Creek
River Kilometer=-0.37 Station Number=9
TP
(mg/L)
1.5
1.0
0.5
0.0
91 92 93 94 95 96 97 98 99 00 01 02 03 04 05
Year


Shell Creek
River Kilometer=2.35 Station Number=7
TP
(mg/L)
1.5
1.0
0.5
0.0
91 92 93 94 95 96 97 98 99 00 01 02 03 04 05
Year


Shell Creek
River Kilometer=4.61 Station Number=6
TP
(mg/L)
1.5
1.0
0.5
0.0
91 92 93 94 95 96 97 98 99 00 01 02 03 04 05
Year


Shell Creek
River Kilometer=6.72 Station Number=5
TP
(mg/L)
1.5
1.0
0.5
0.0
91 92 93 94 95 96 97 98 99 00 01 02 03 04 05
Year

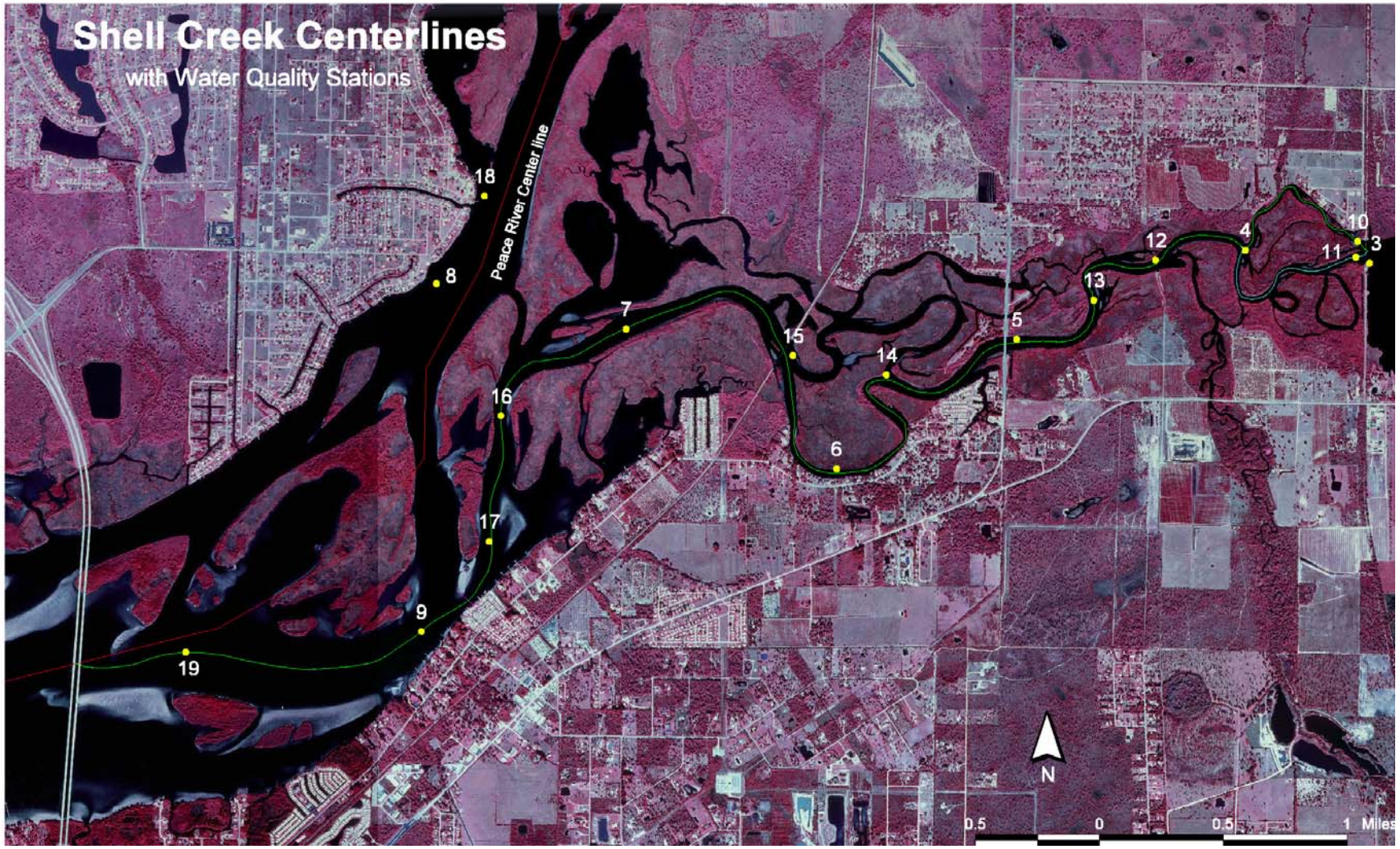

Shell Creek
River Kilometer=8.74 Station Number=4
TP
(mg/L)
1.5
1.0
0.5
0.0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

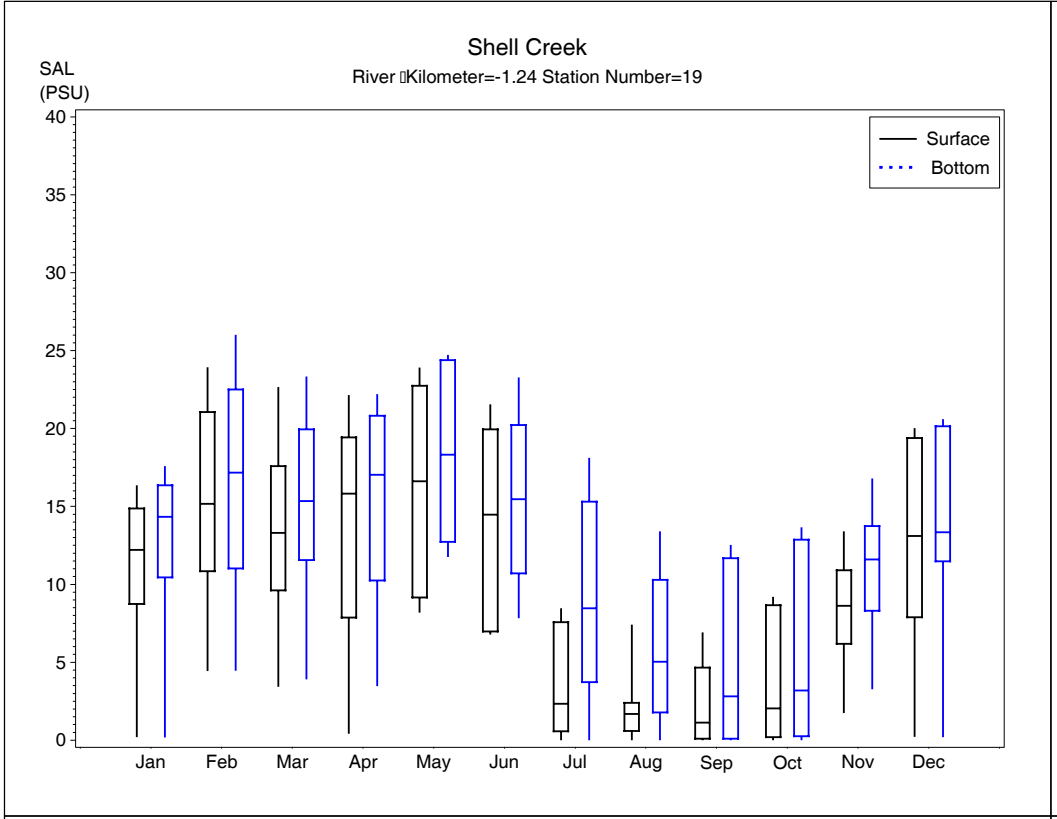

Shell Creek
River Kilometer=10.15 Station Number=3
TP
(mg/L)
1.5
1.0
0.5
0.0
91
92
93
94
95
96
97
98
99
00
01
02
03
04
05
Year

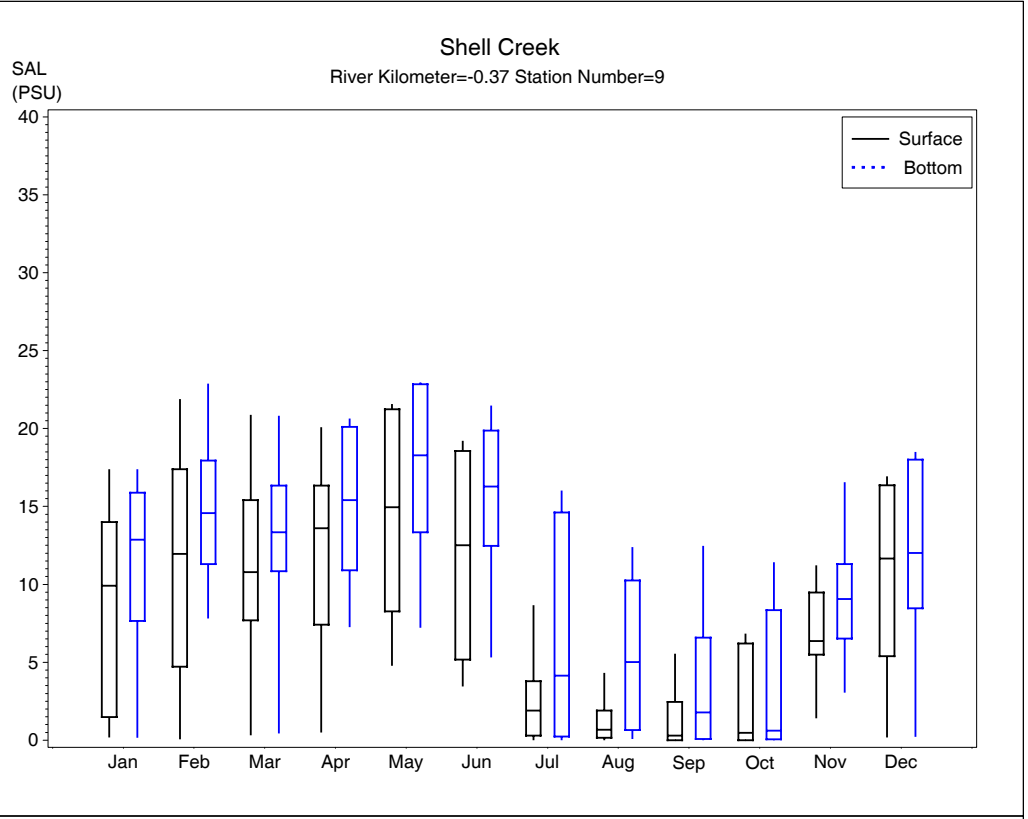
Appendix 3-4

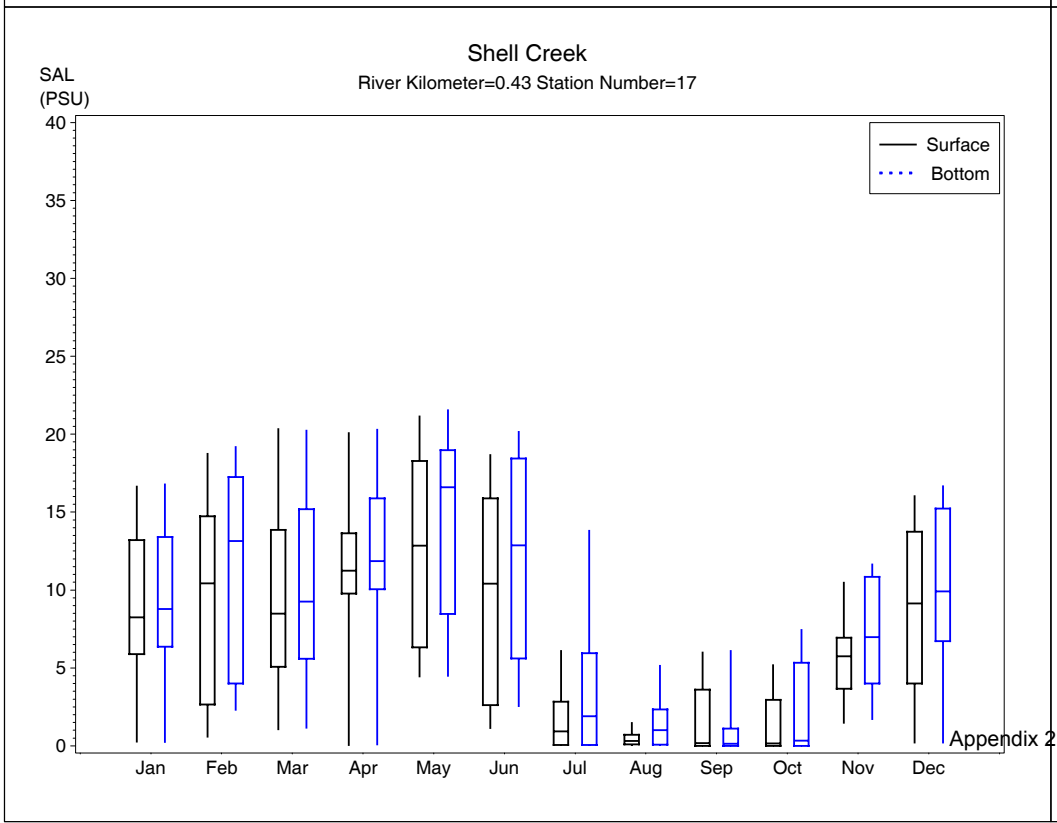
Within-Year Variation in Shell Creek

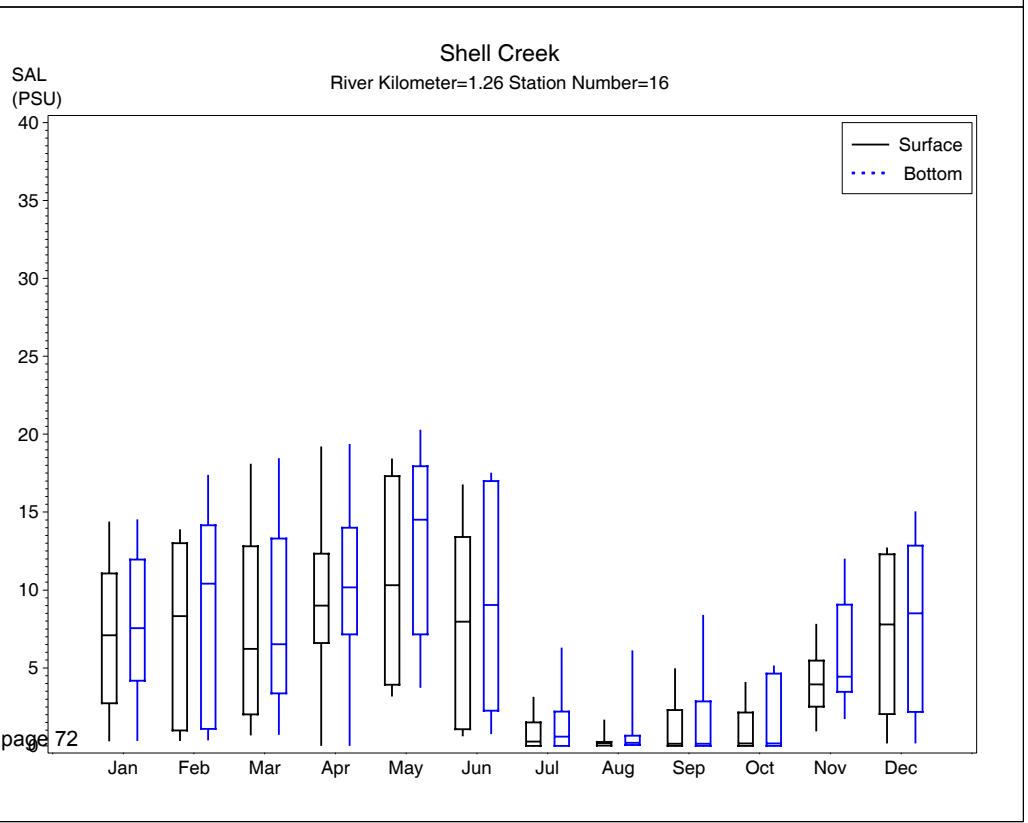
Water Quality Constituents

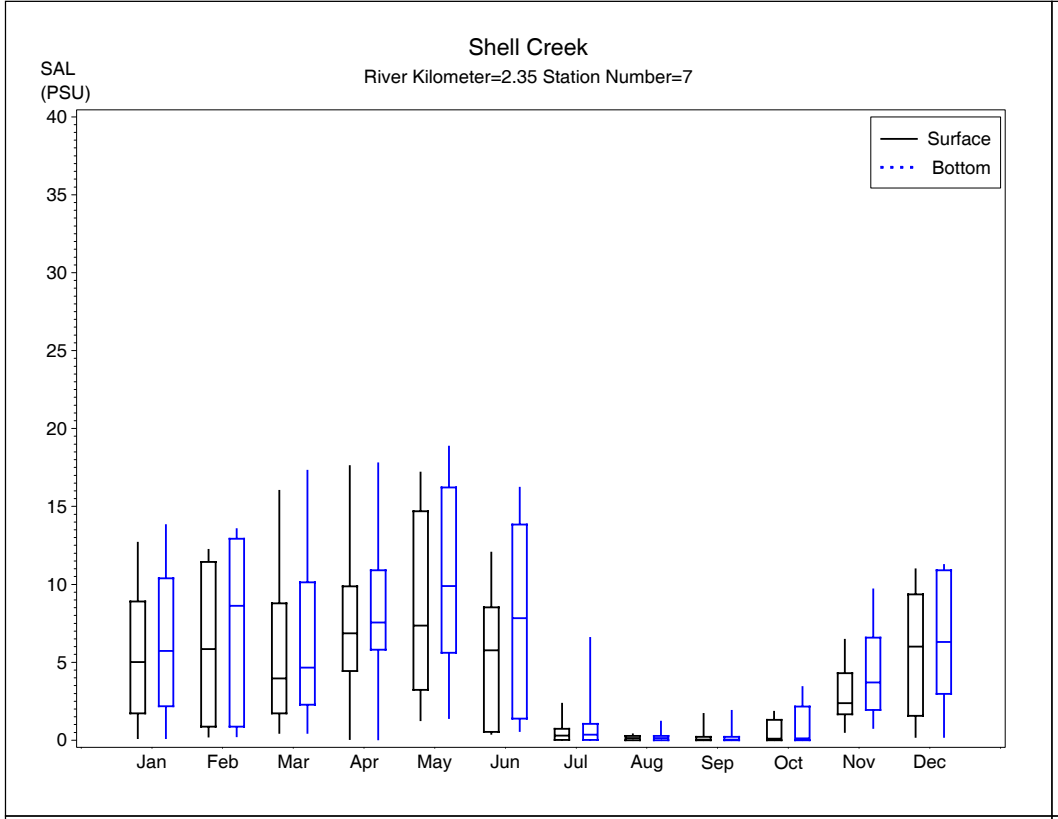

Shell Creek Centerlines
with Water Quality Stations
Peace River Center line
18
8
7
15
14
5
13
12
4
10
11
3
16
6
17
9
19
N
0.5
0
0.5
1 Miles

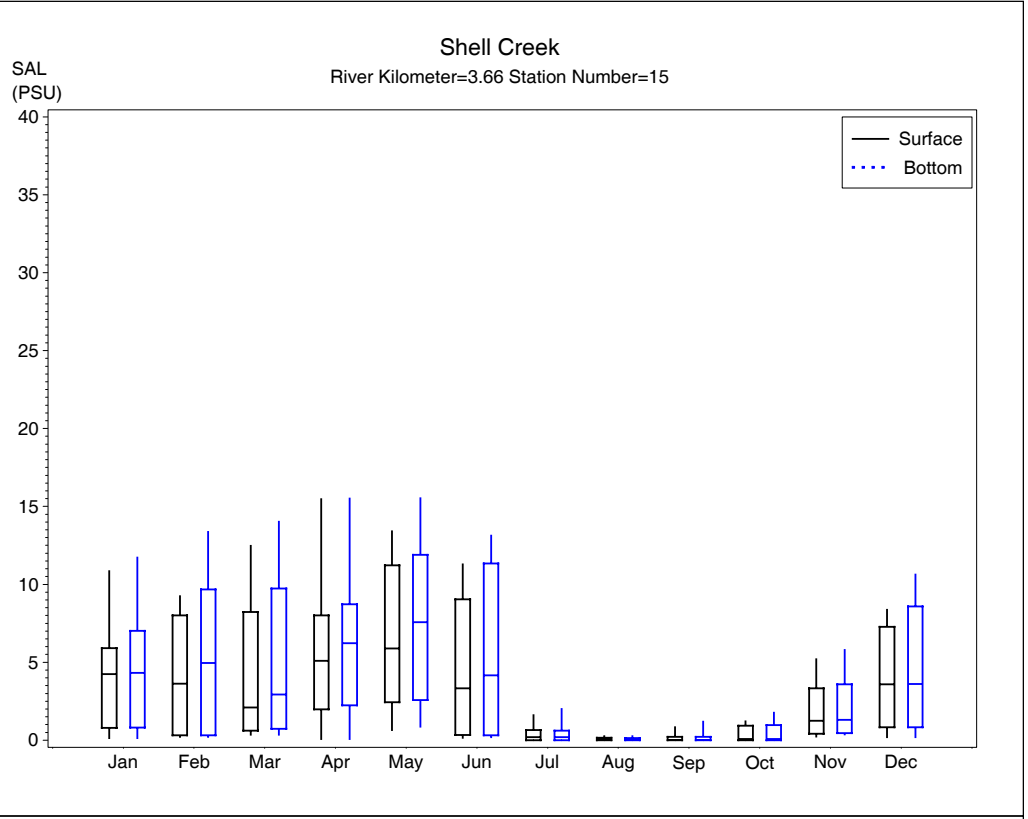

Shell Creek
River Kilometer=-1.24 Station Number=19
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

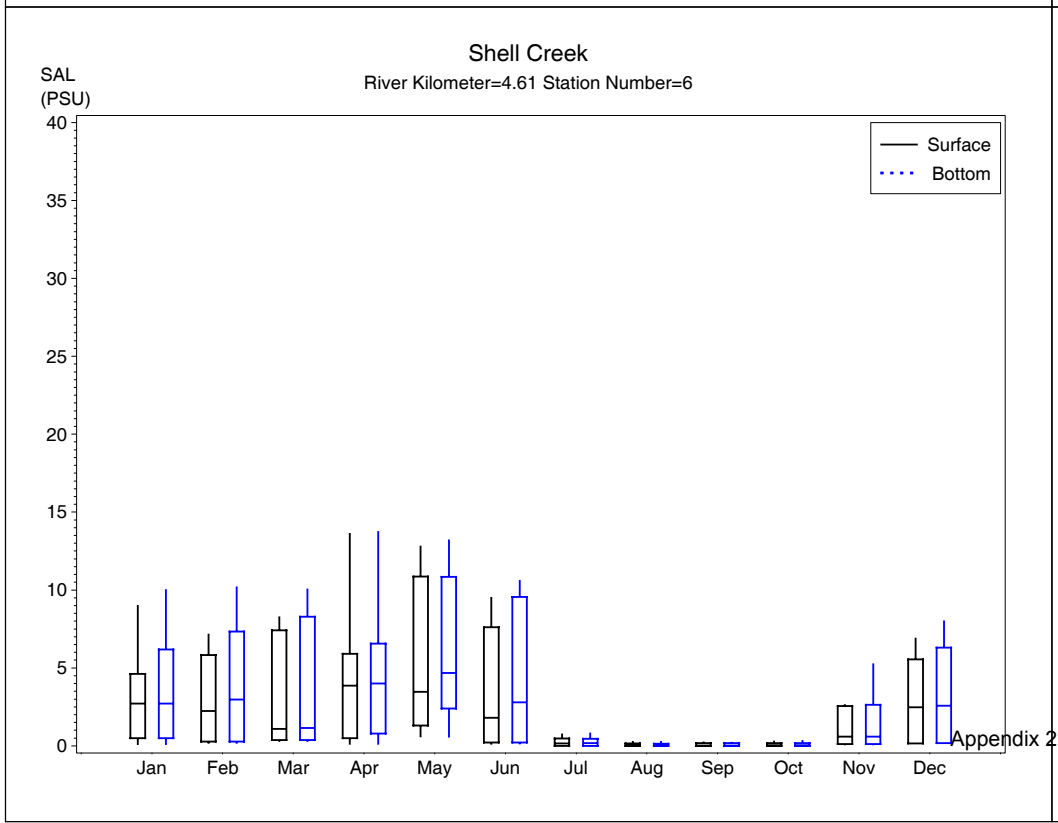

Shell Creek
River Kilometer=-0.37 Station Number=9
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

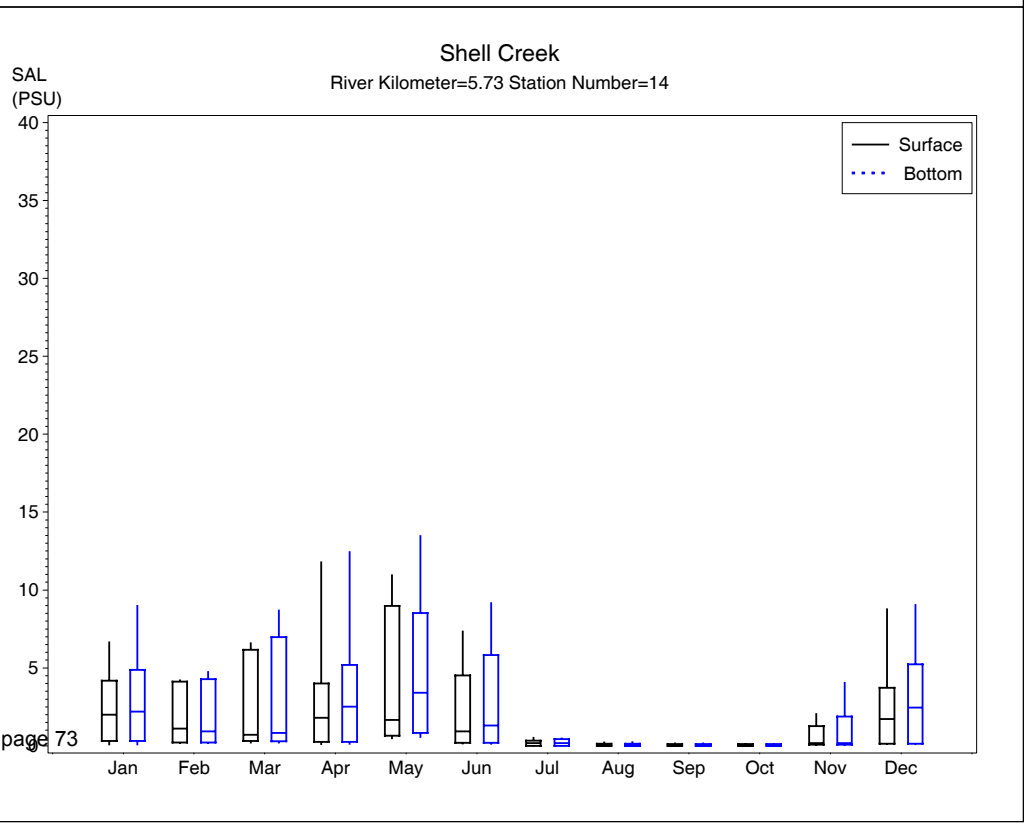

Shell Creek
River Kilometer=0.43 Station Number=17
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

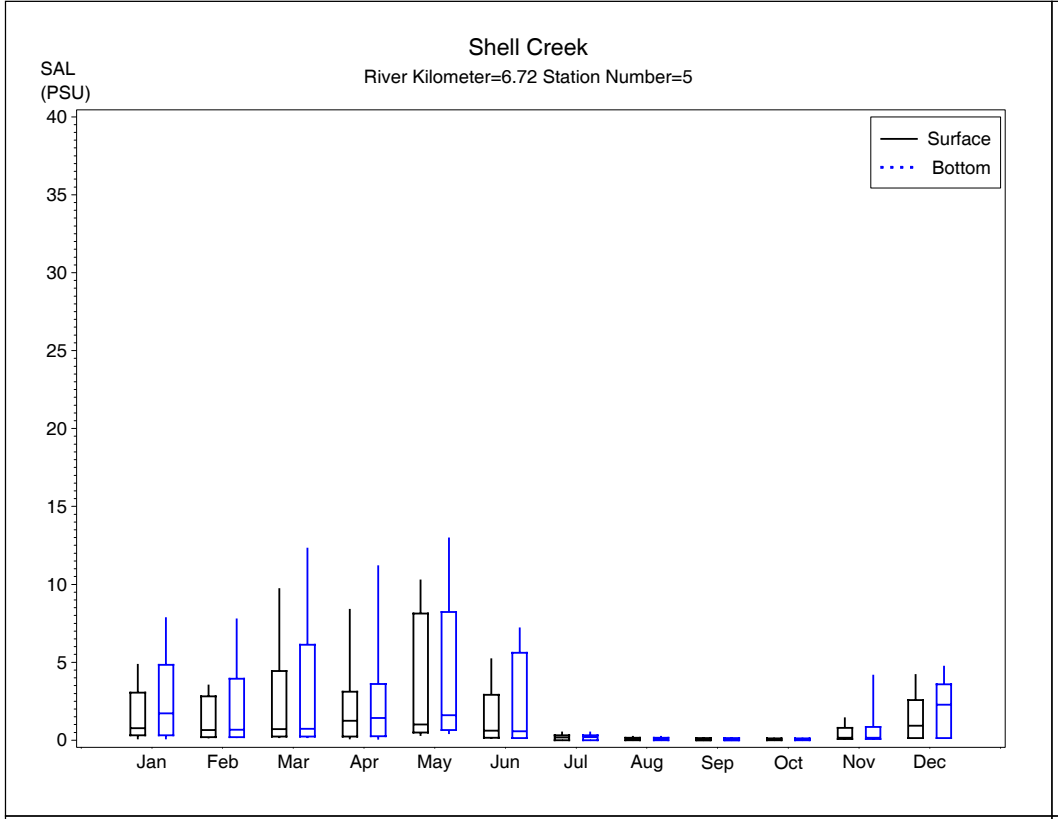

Shell Creek
River Kilometer=1.26 Station Number=16
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

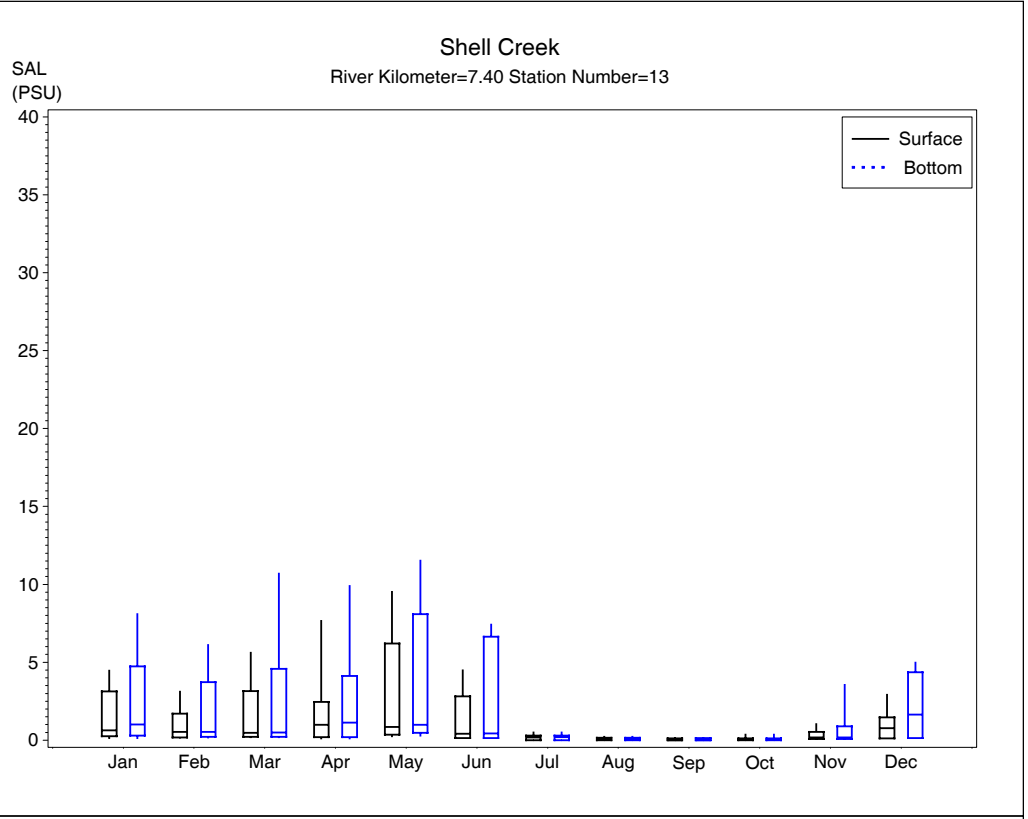

Shell Creek
River Kilometer=2.35 Station Number=7
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

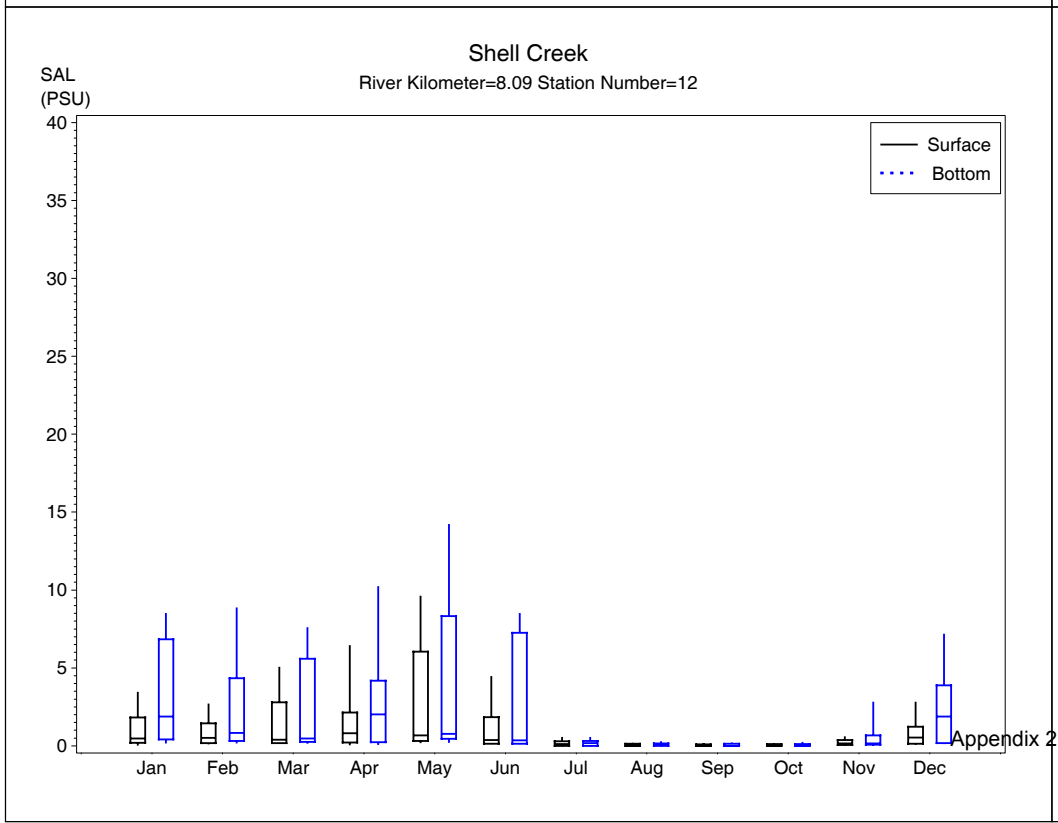

Shell Creek
River Kilometer=3.66 Station Number=15
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=4.61 Station Number=6
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=5.73 Station Number=14
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=6.72 Station Number=5
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=7.40 Station Number=13
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=8.09 Station Number=12
SAL
(PSU)
Surface
Bottom
0
5
10
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20
25
30
35
40
Jan
Feb
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Apr
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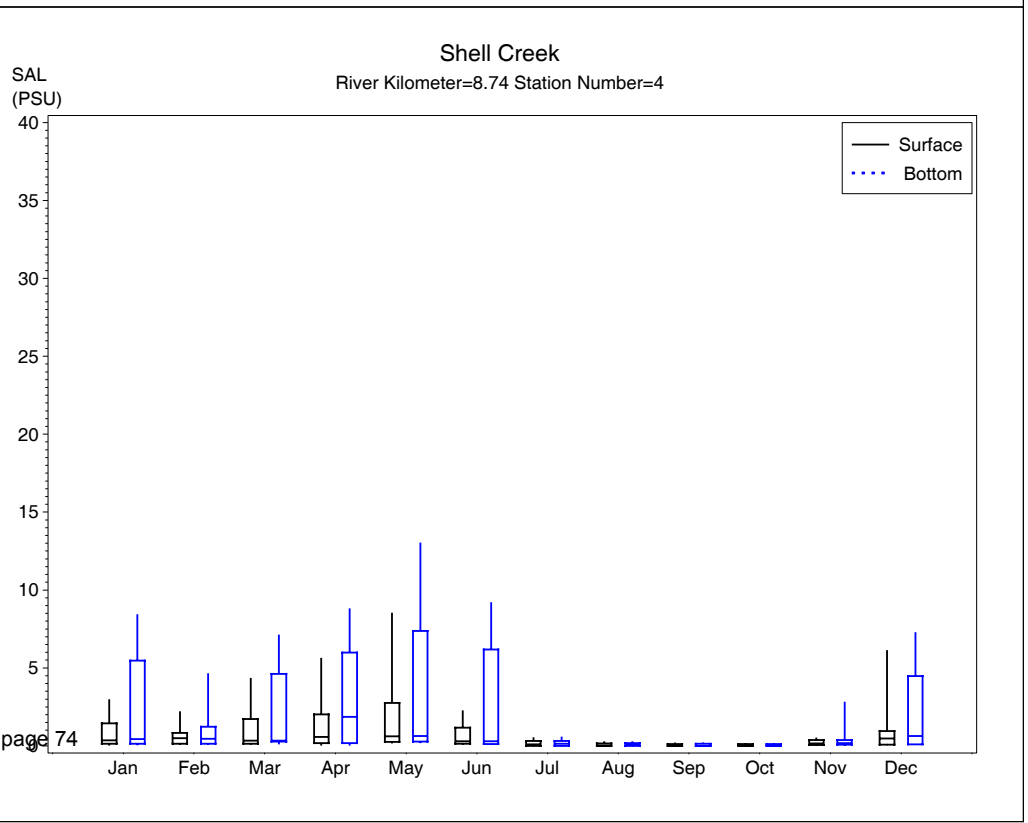
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=8.74 Station Number=4
SAL
(PSU)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
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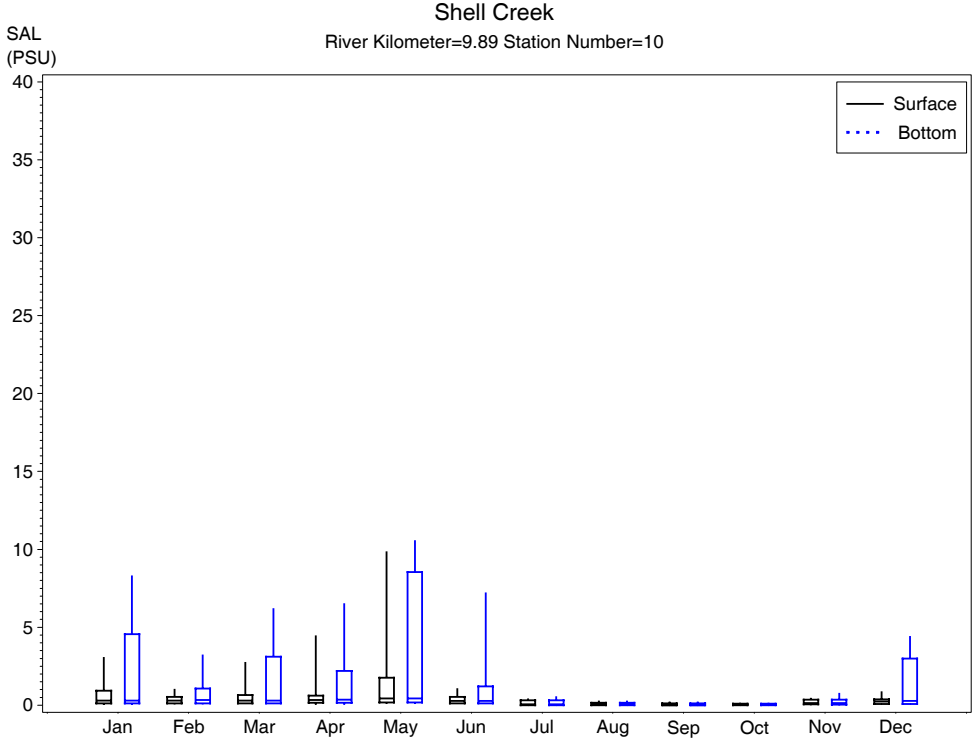
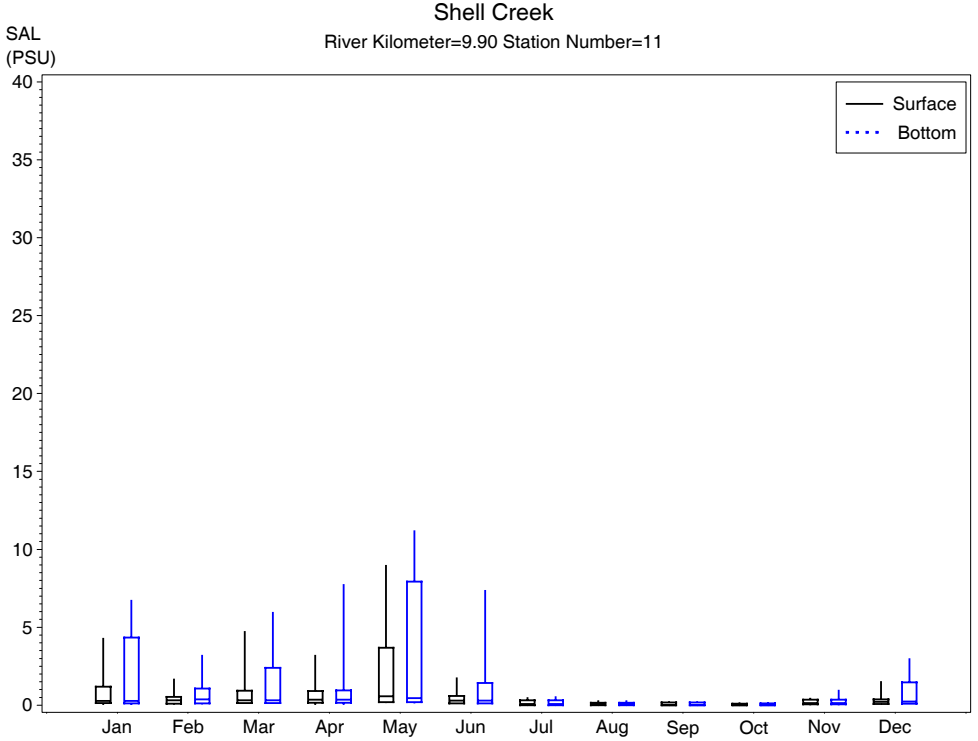
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=9.89 Station Number=10
SAL
(PSU)
Surface
Bottom
40
35
30
25
20
15
10
5
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=9.90 Station Number=11
SAL
(PSU)
Surface
Bottom
40
35
30
25
20
15
10
5
0
Jan
Feb
Mar
Apr
May
Jun
Jul
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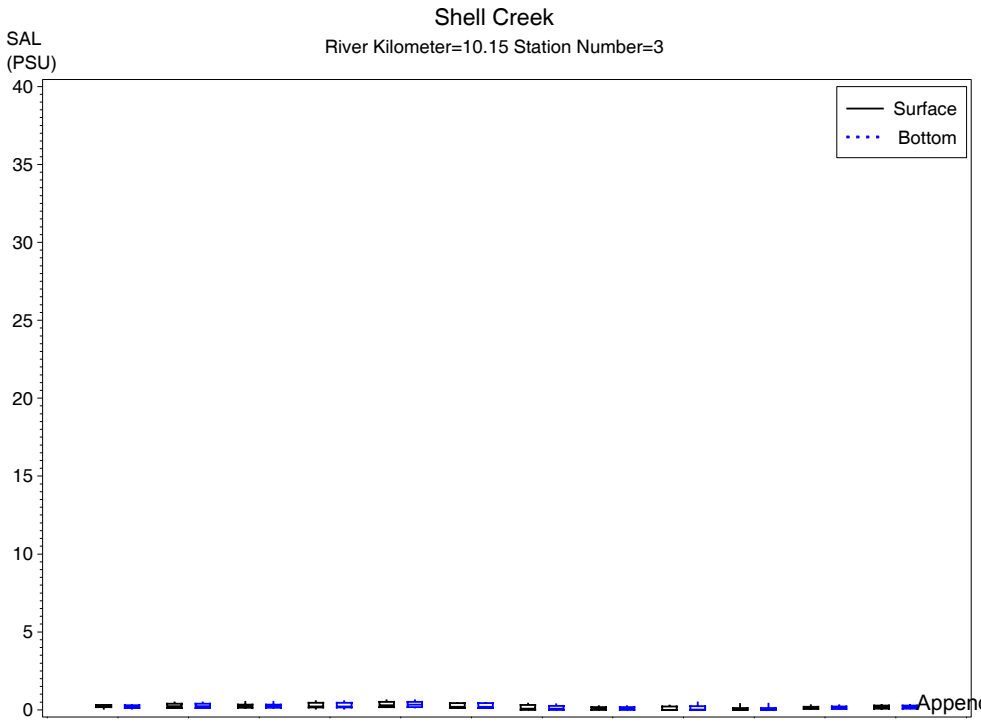
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=10.15 Station Number=3
SAL
(PSU)
Surface
Bottom
40
35
30
25
20
15
10
5
0
Jan
Feb
Mar
Apr
May
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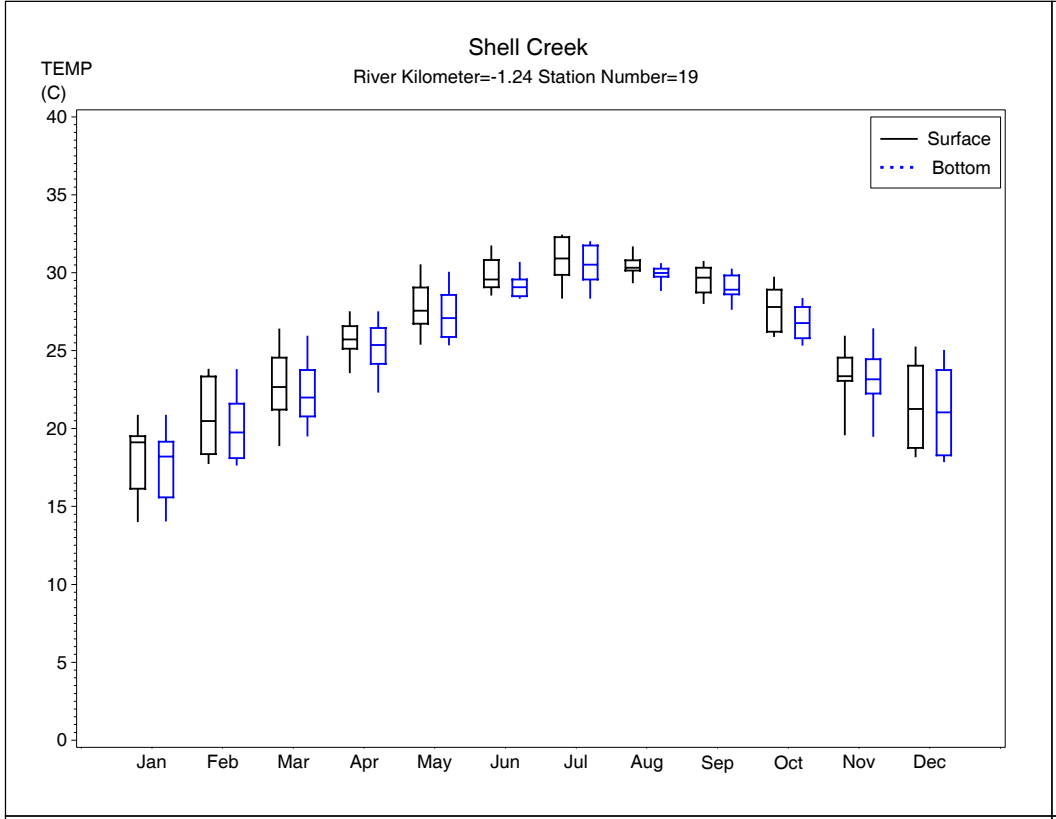
Oct
Nov
Dec


Shell Creek
River Kilometer=-1.24 Station Number=19
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
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May
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Sep
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Nov
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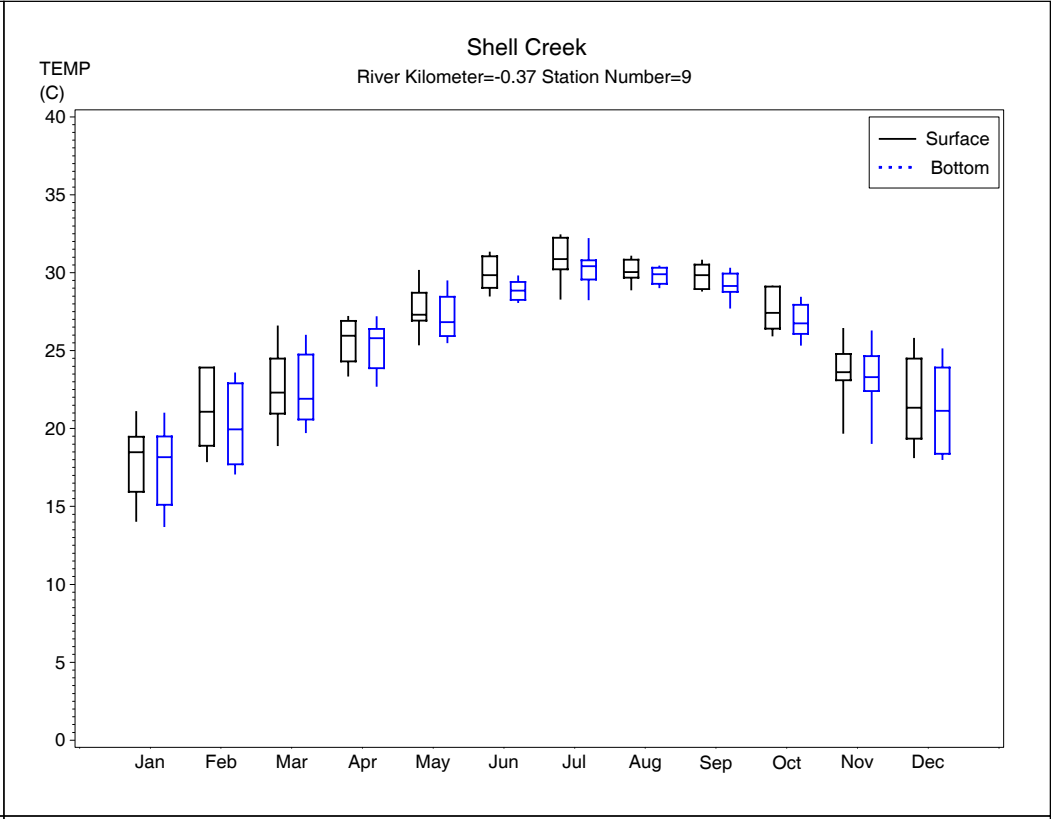
Shell Creek
River Kilometer=-0.37 Station Number=9
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
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Sep
Oct
Nov
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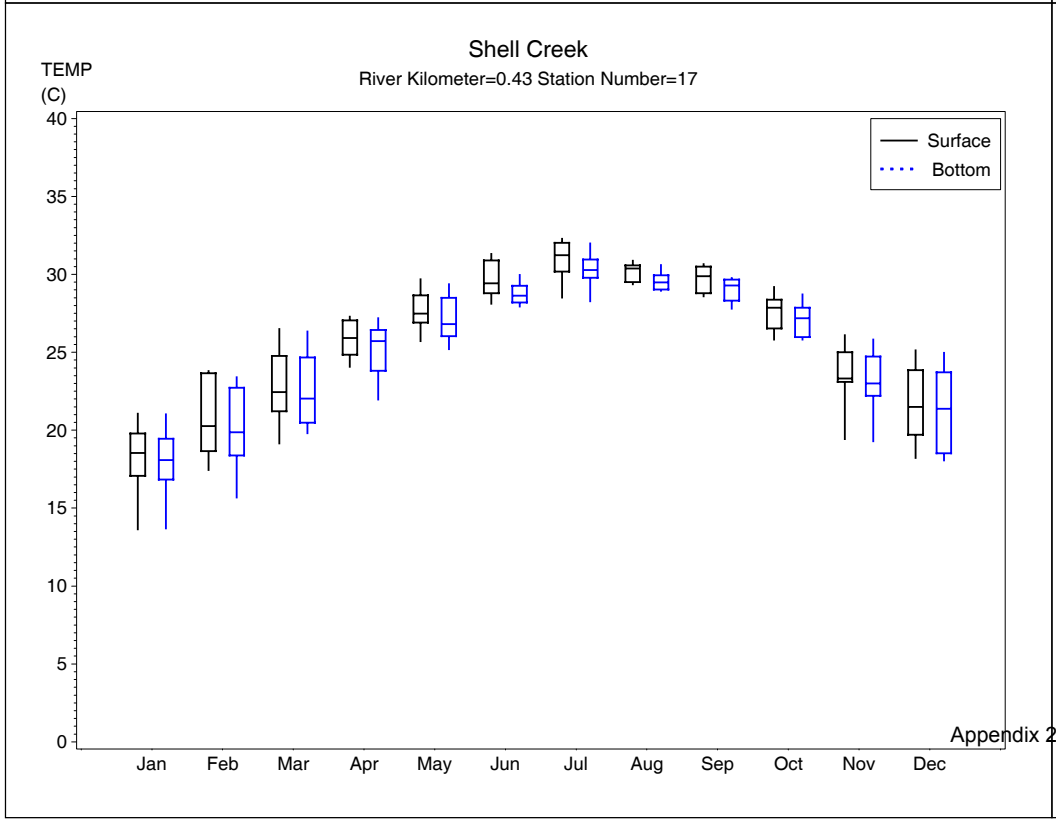
Shell Creek
River Kilometer=0.43 Station Number=17
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
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Oct
Nov
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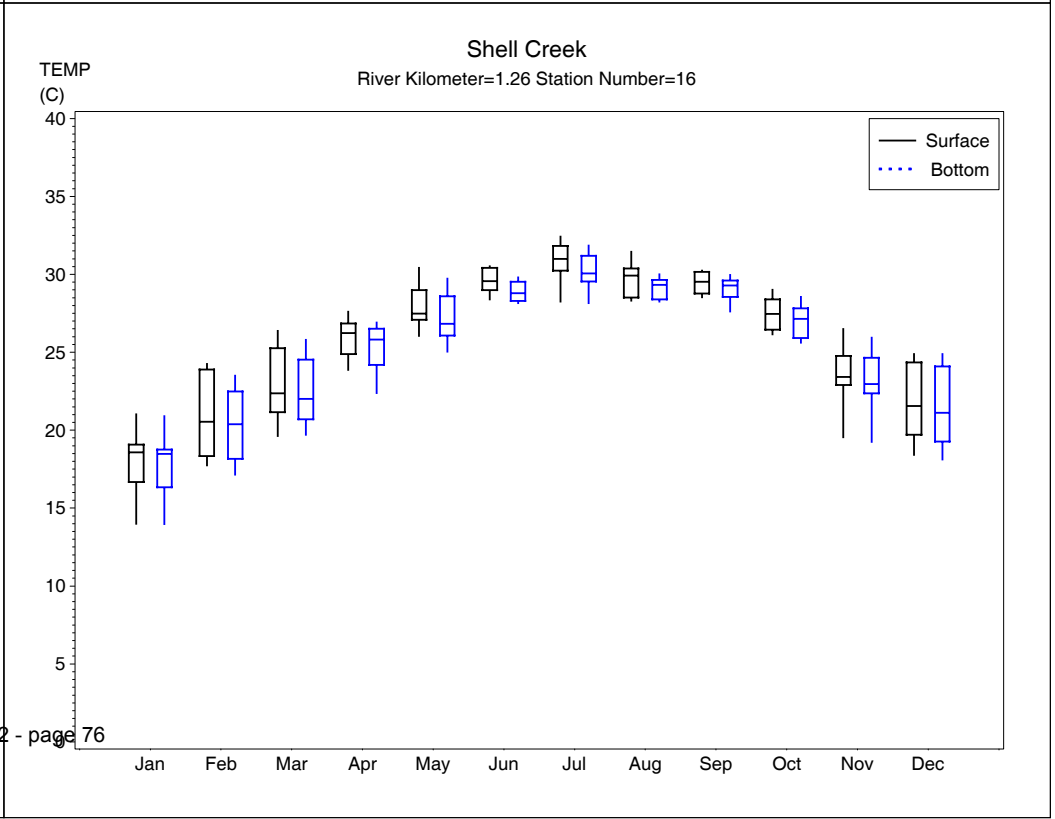
Shell Creek
River Kilometer=1.26 Station Number=16
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
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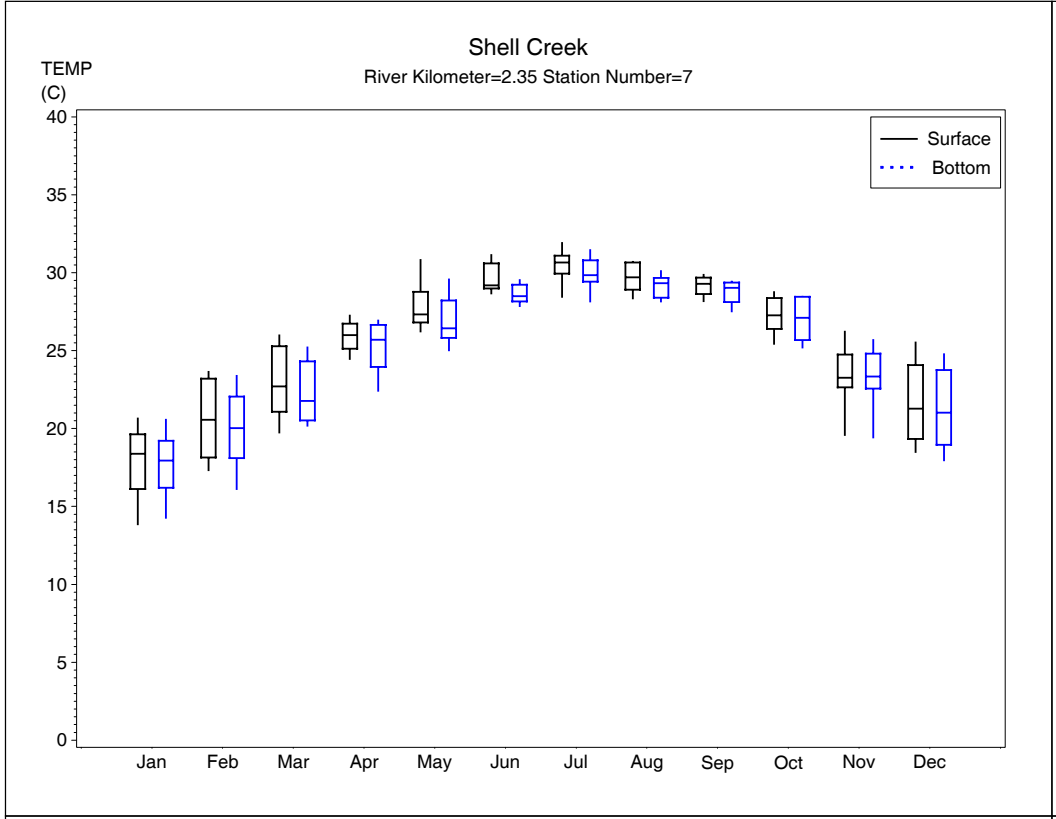
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=2.35 Station Number=7
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
Jun
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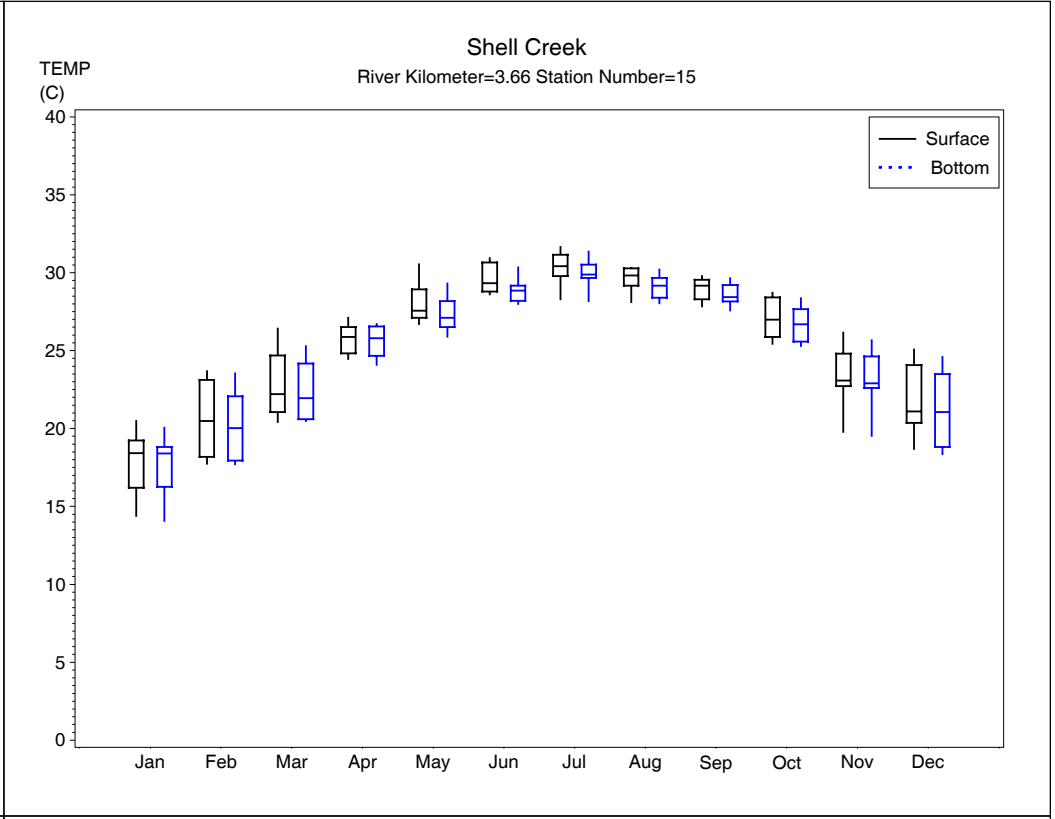
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=3.66 Station Number=15
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
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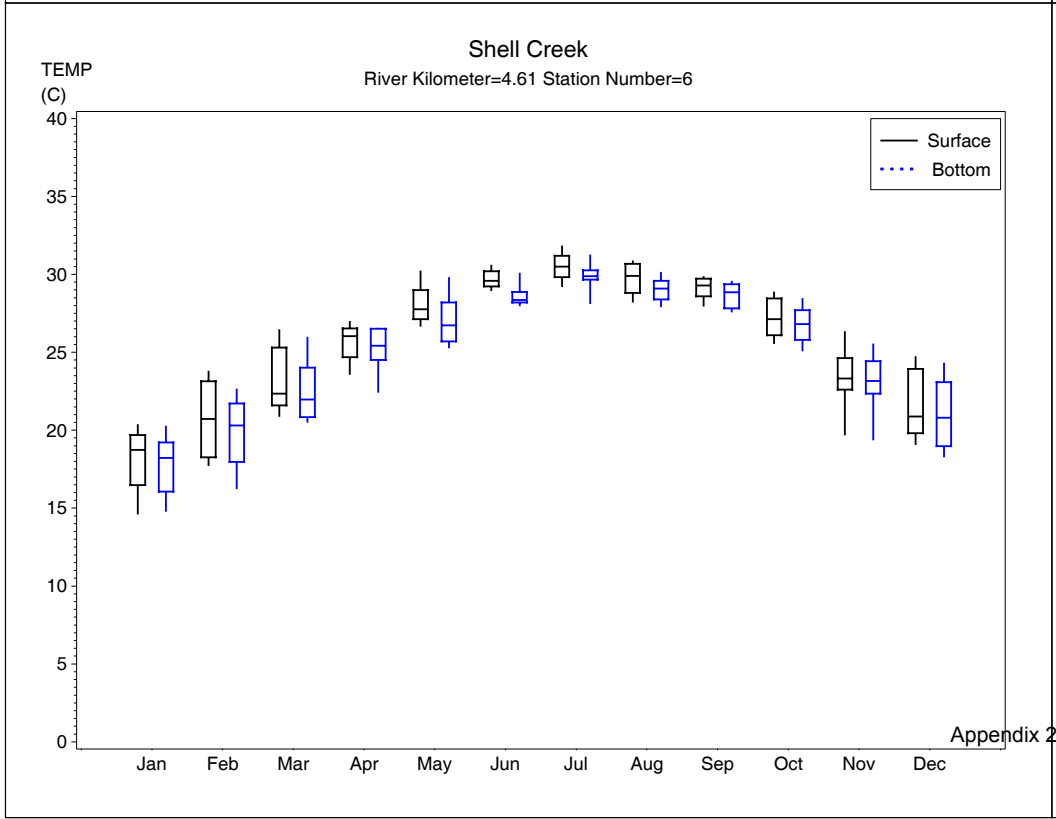
Oct
Nov
Dec


Shell Creek
River Kilometer=4.61 Station Number=6
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
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May
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Oct
Nov
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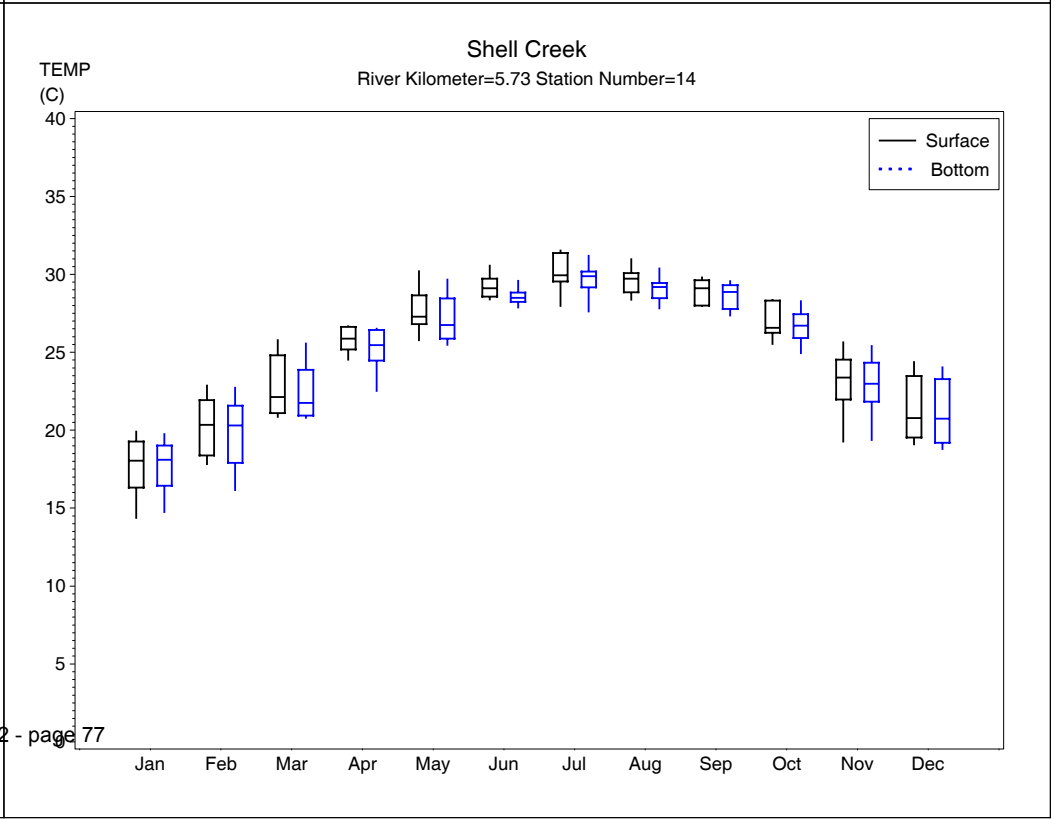
Shell Creek
River Kilometer=5.73 Station Number=14
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
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May
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Nov
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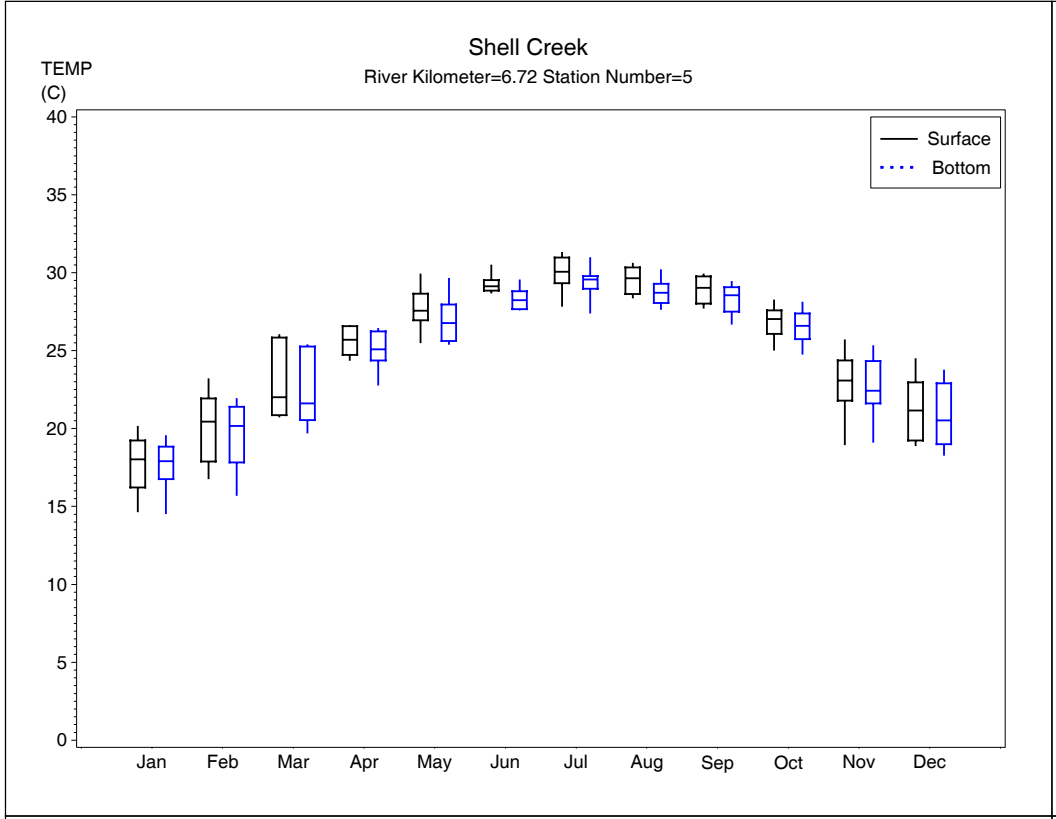
Shell Creek
River Kilometer=6.72 Station Number=5
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
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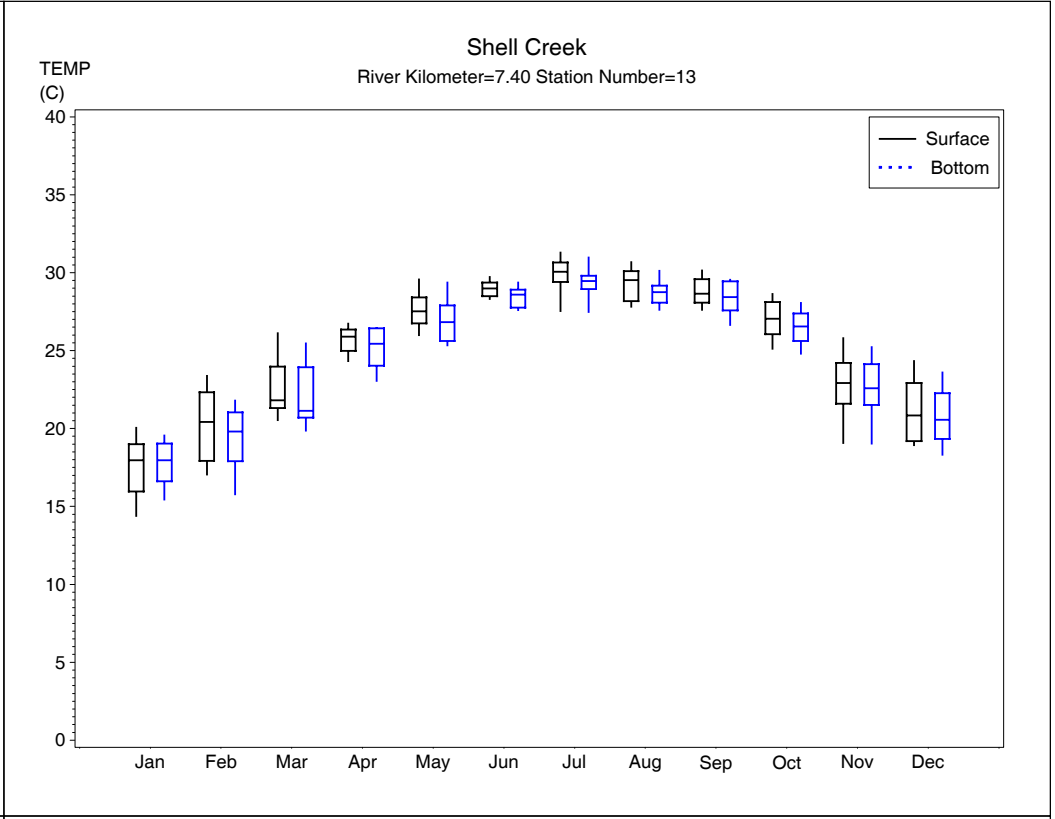
Shell Creek
River Kilometer=7.40 Station Number=13
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
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Jul
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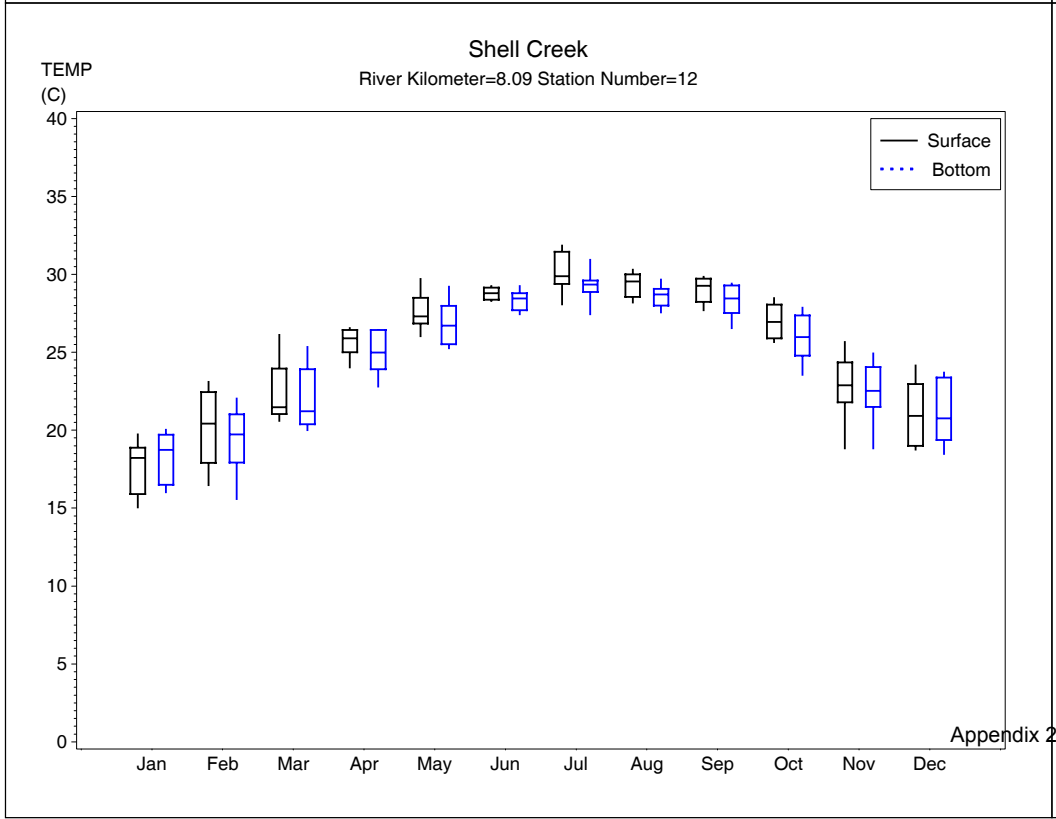
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=8.09 Station Number=12
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
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May
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Oct
Nov
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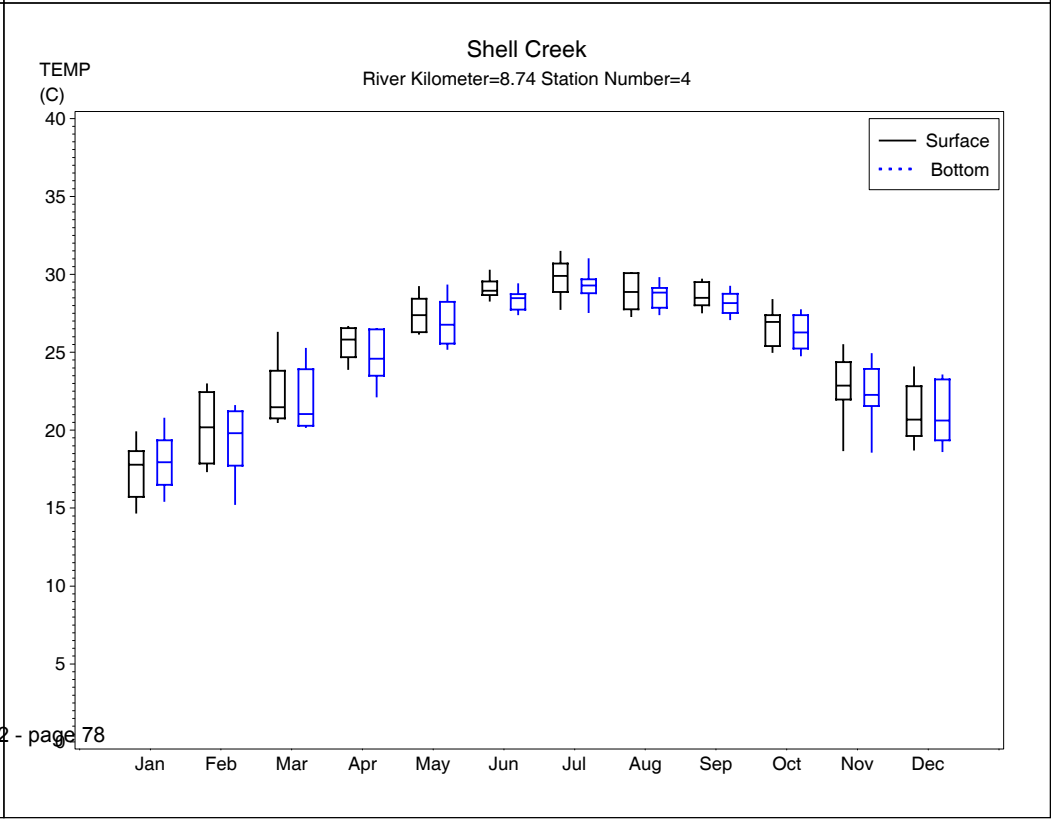
Shell Creek
River Kilometer=8.74 Station Number=4
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
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May
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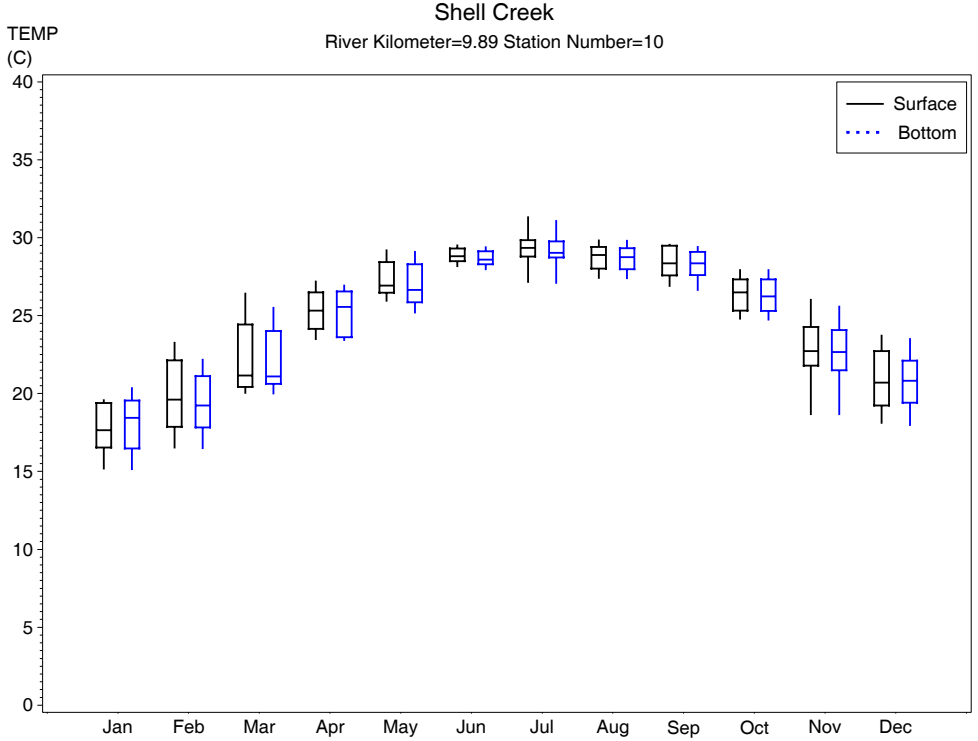
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=9.89 Station Number=10
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
Mar
Apr
May
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Oct
Nov
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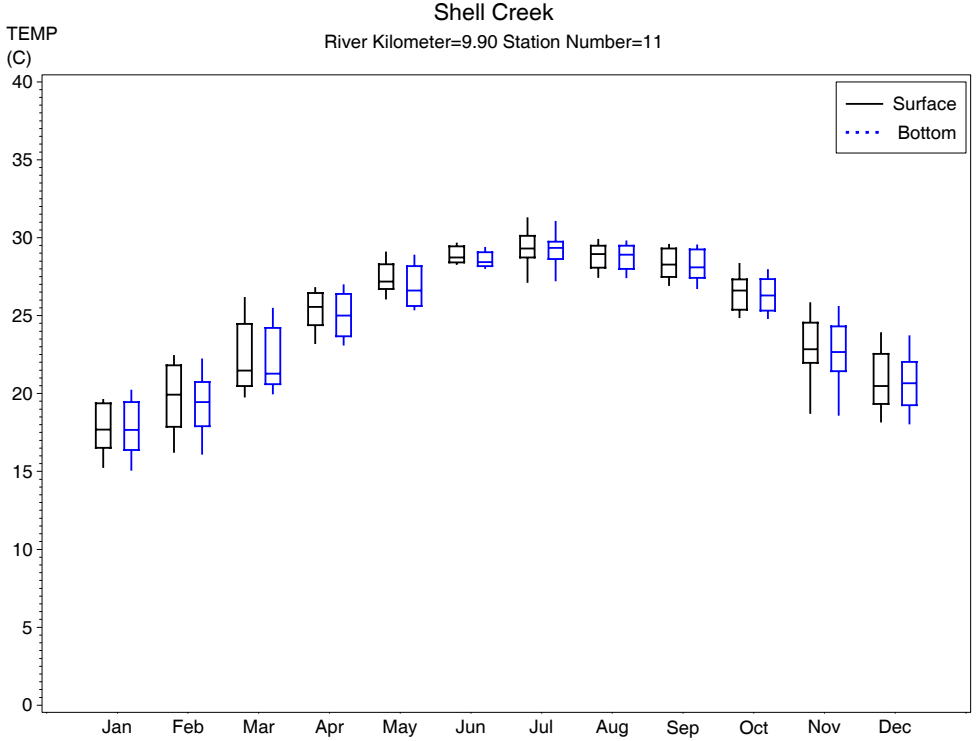
Shell Creek
River Kilometer=9.90 Station Number=11
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
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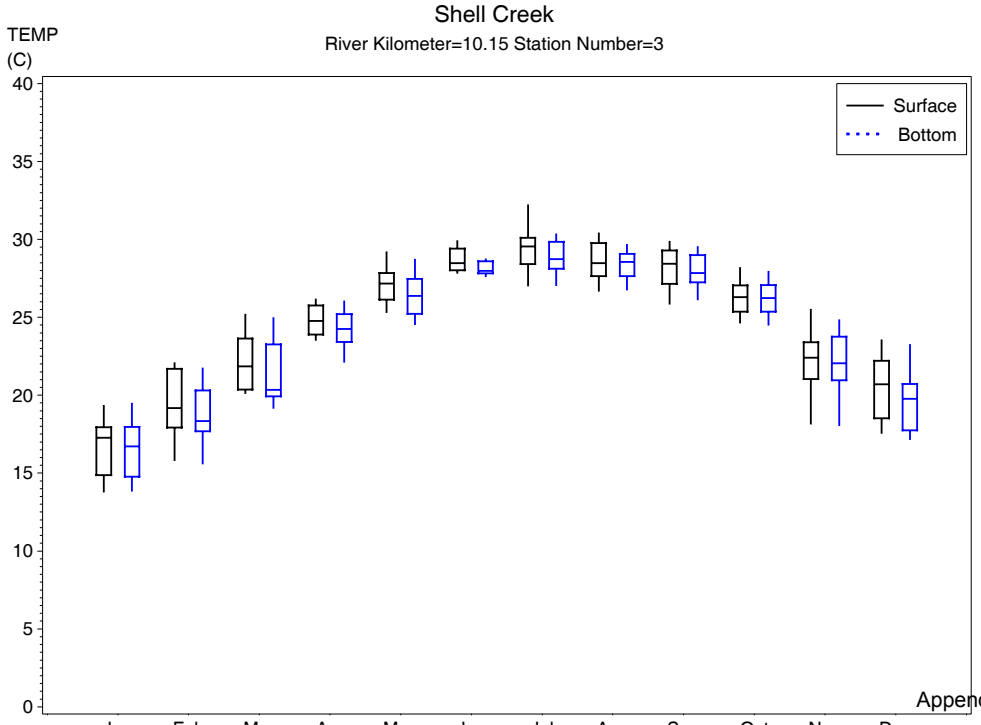
Shell Creek
River Kilometer=10.15 Station Number=3
TEMP
(C)
Surface
Bottom
0
5
10
15
20
25
30
35
40
Jan
Feb
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May
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Nov
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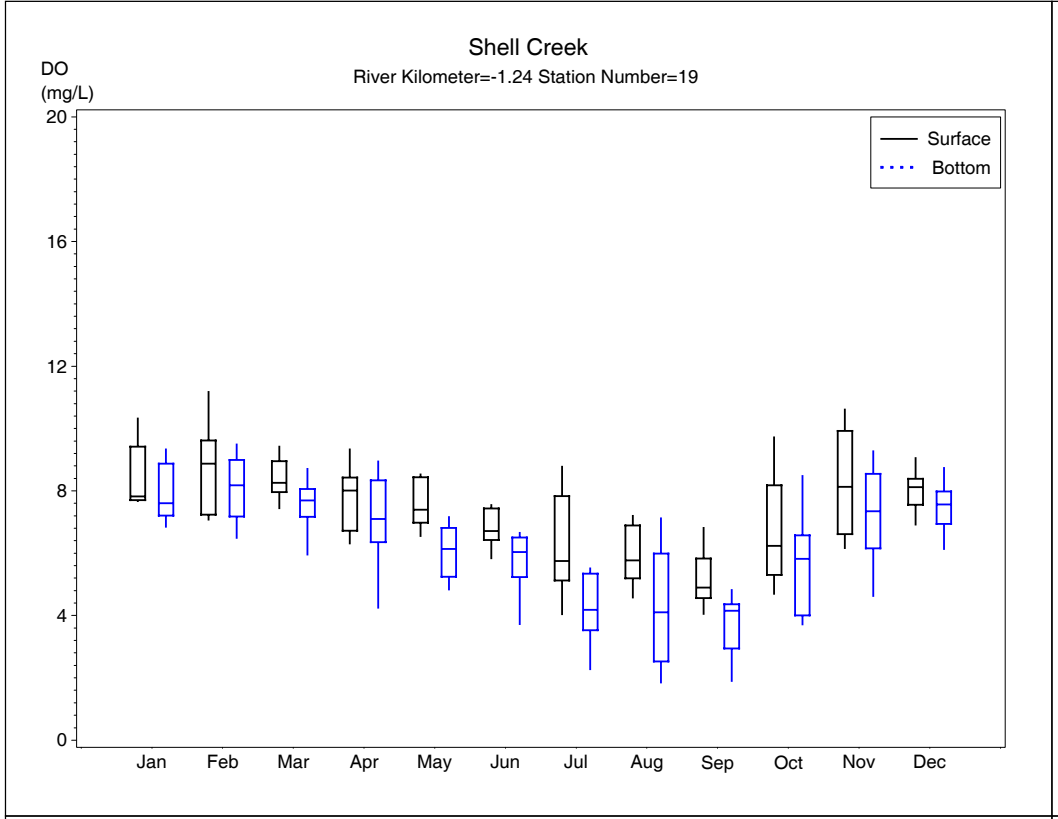
Shell Creek
River Kilometer=-1.24 Station Number=19
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
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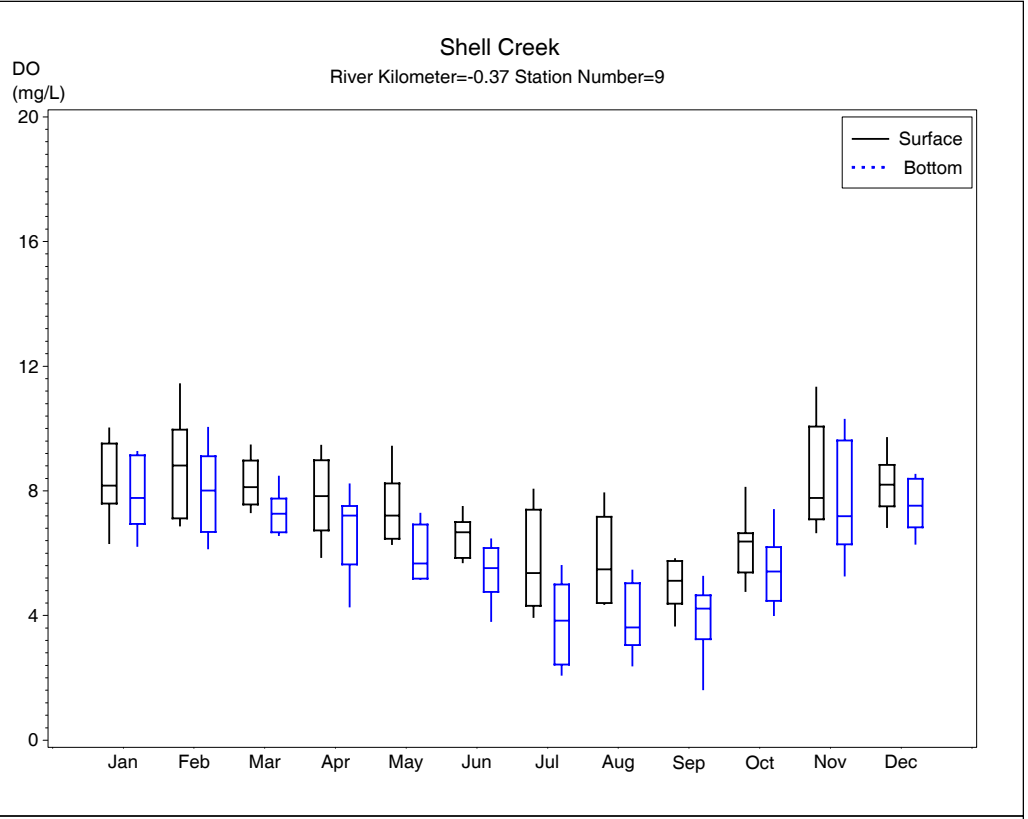
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=-0.37 Station Number=9
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
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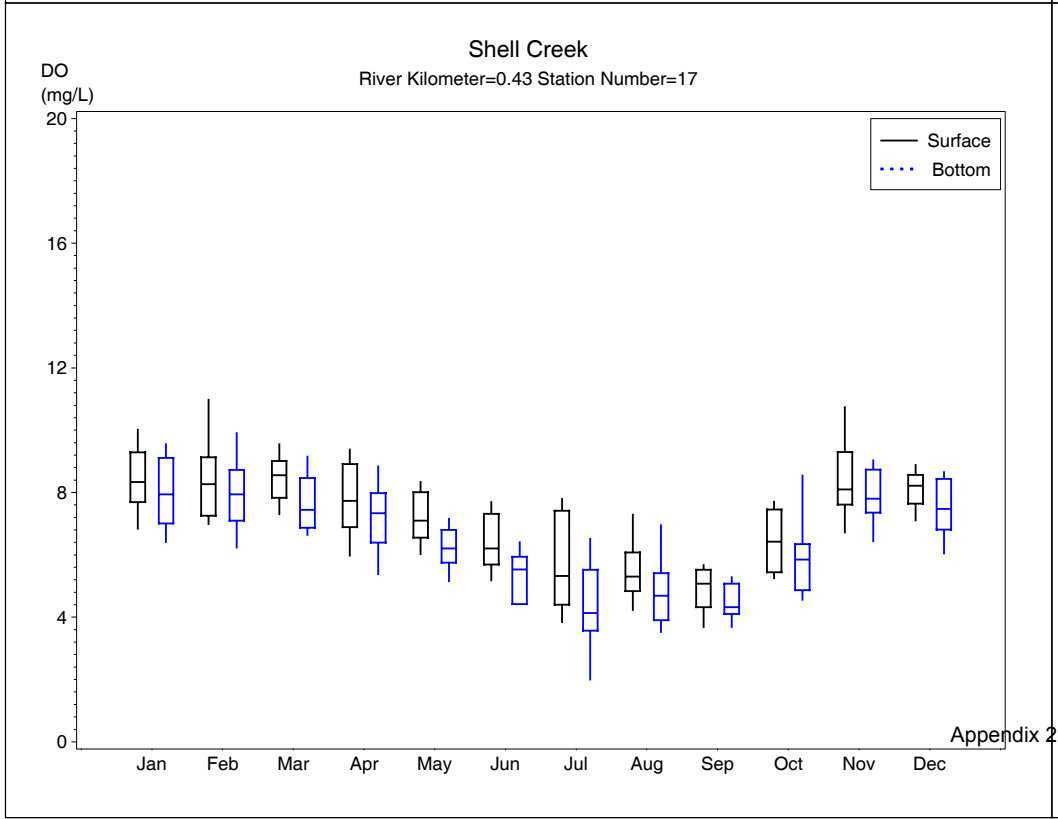
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=0.43 Station Number=17
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
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Oct
Nov
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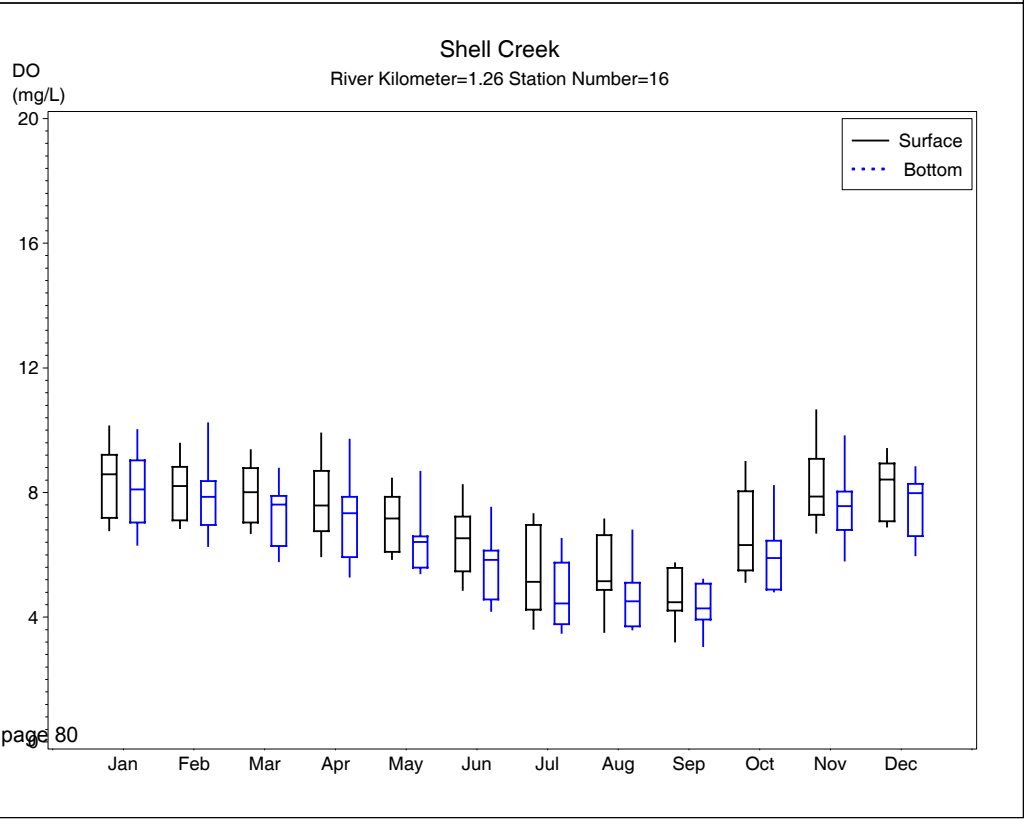
Shell Creek
River Kilometer=1.26 Station Number=16
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
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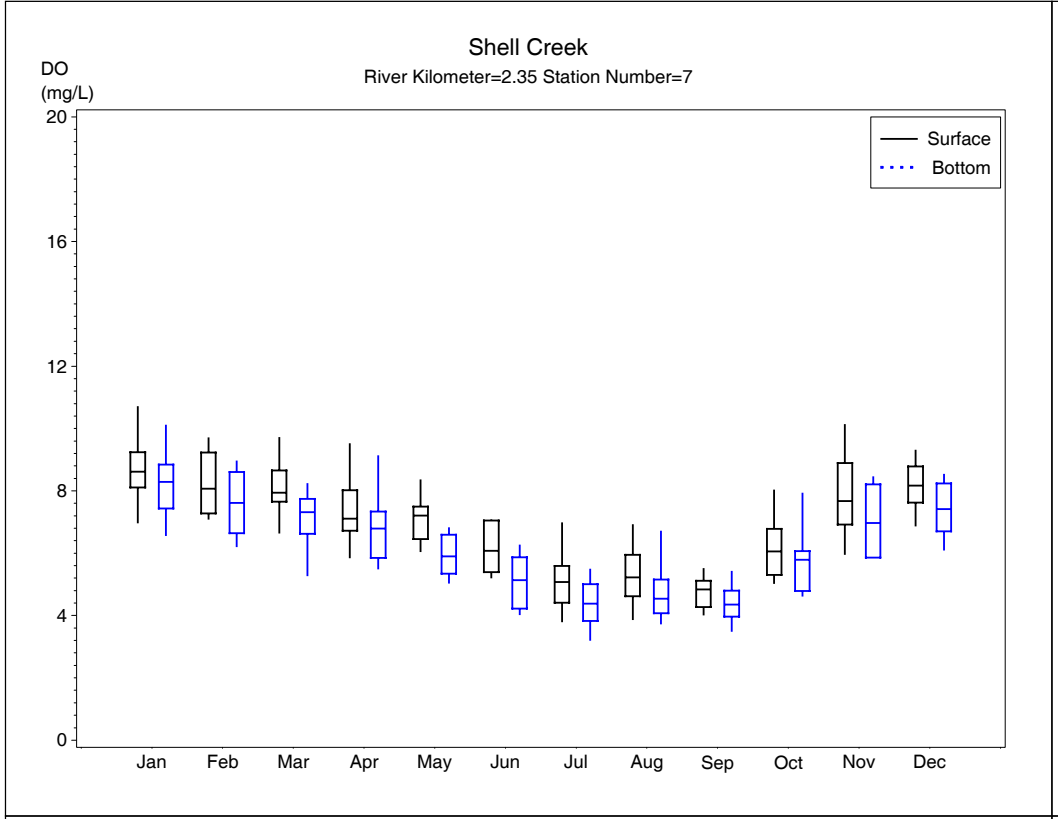
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=2.35 Station Number=7
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
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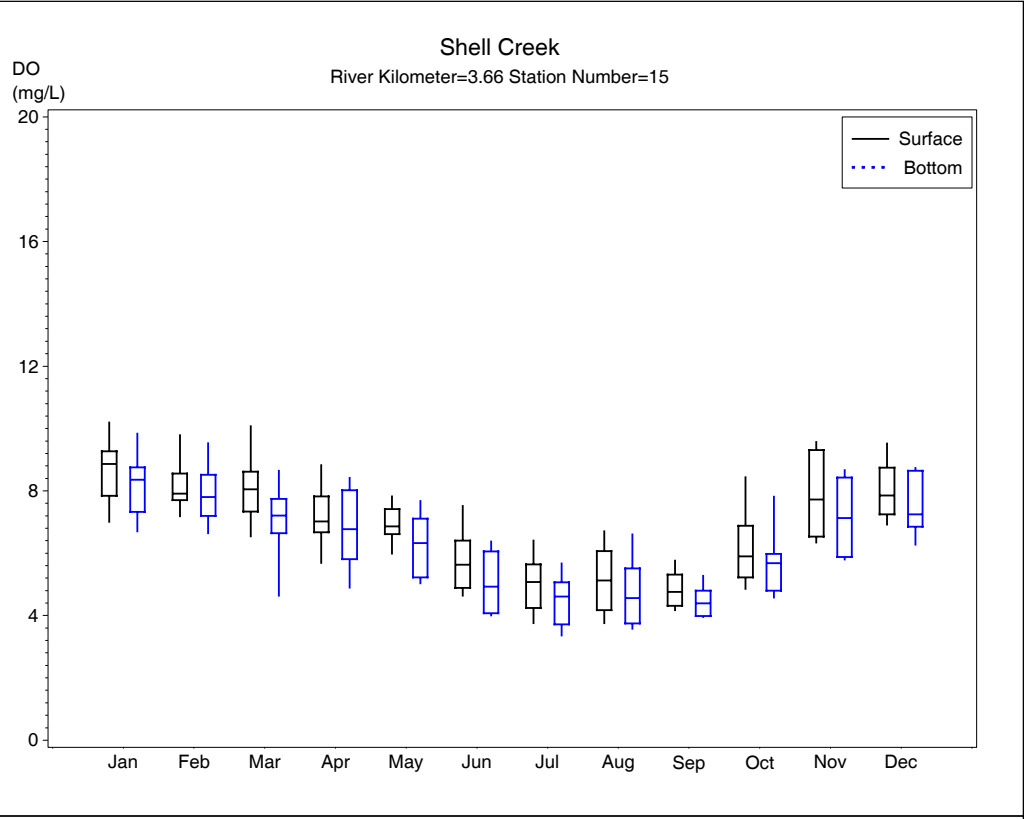
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=3.66 Station Number=15
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
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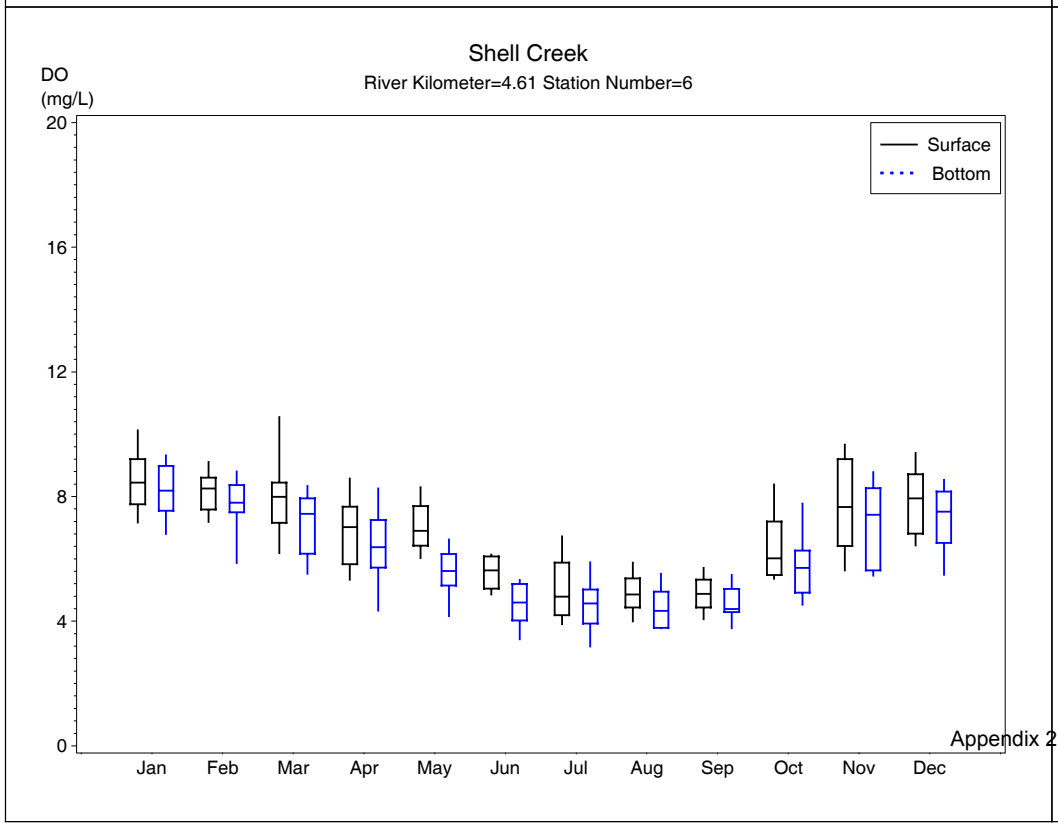
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=4.61 Station Number=6
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
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Apr
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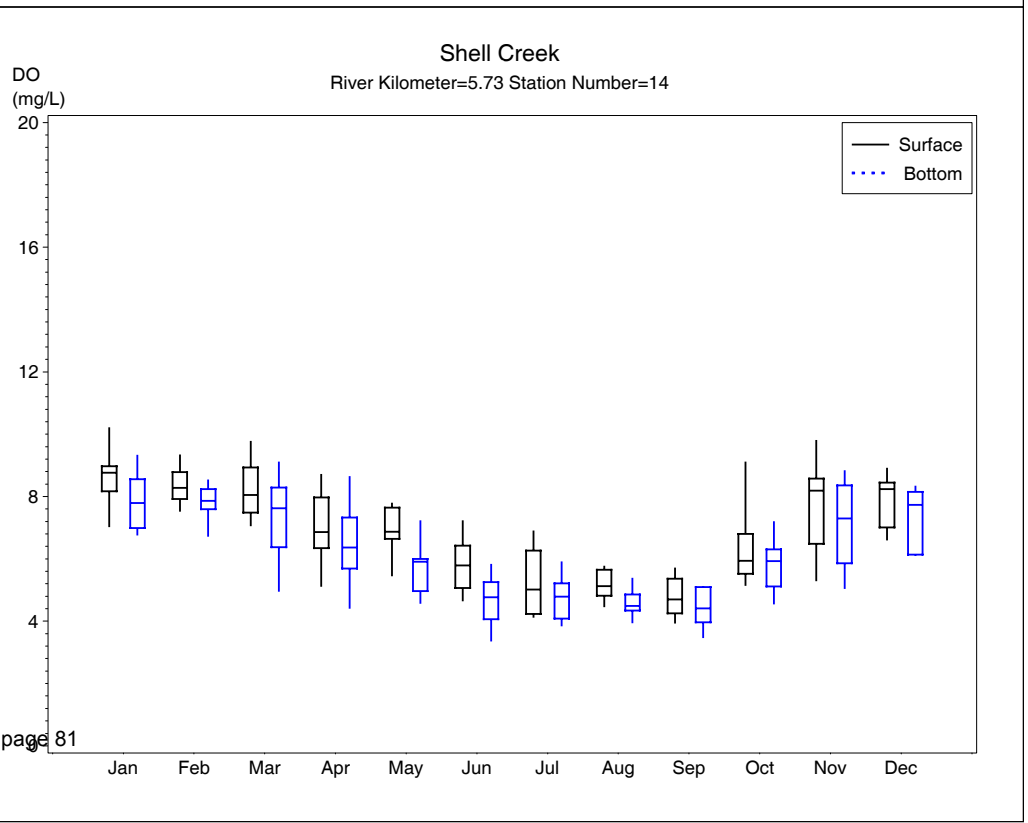
Oct
Nov
Dec


Shell Creek
River Kilometer=5.73 Station Number=14
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
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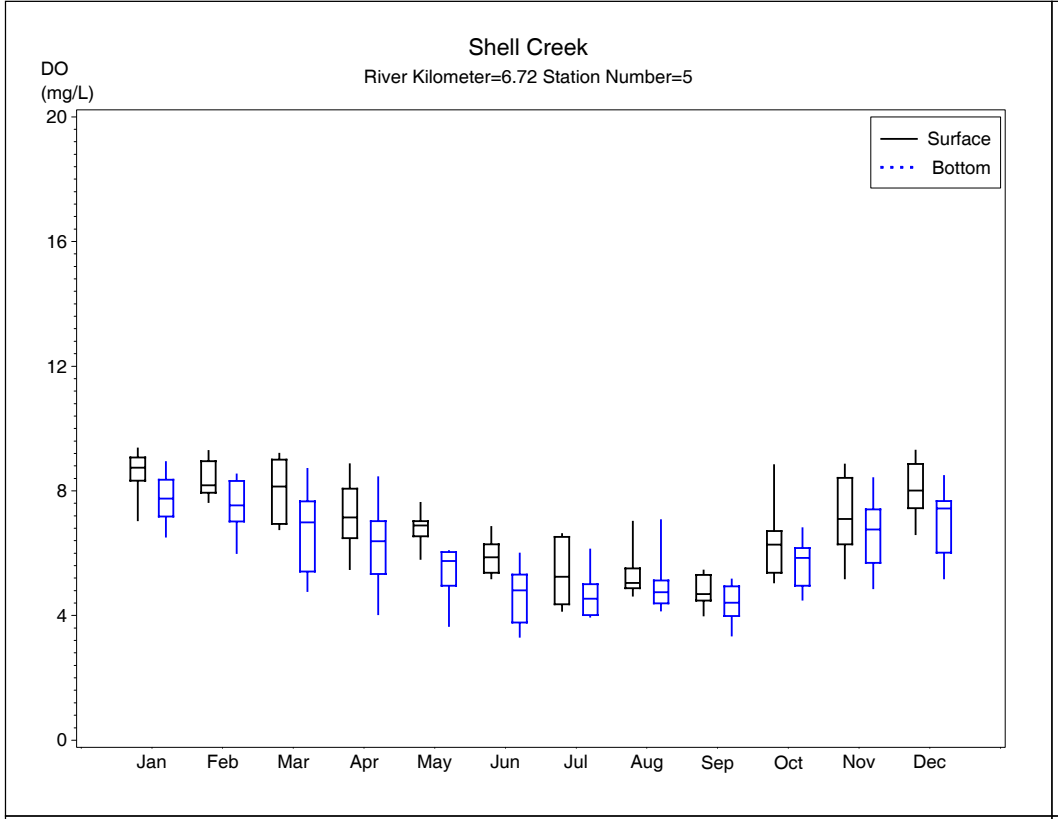
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=6.72 Station Number=5
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
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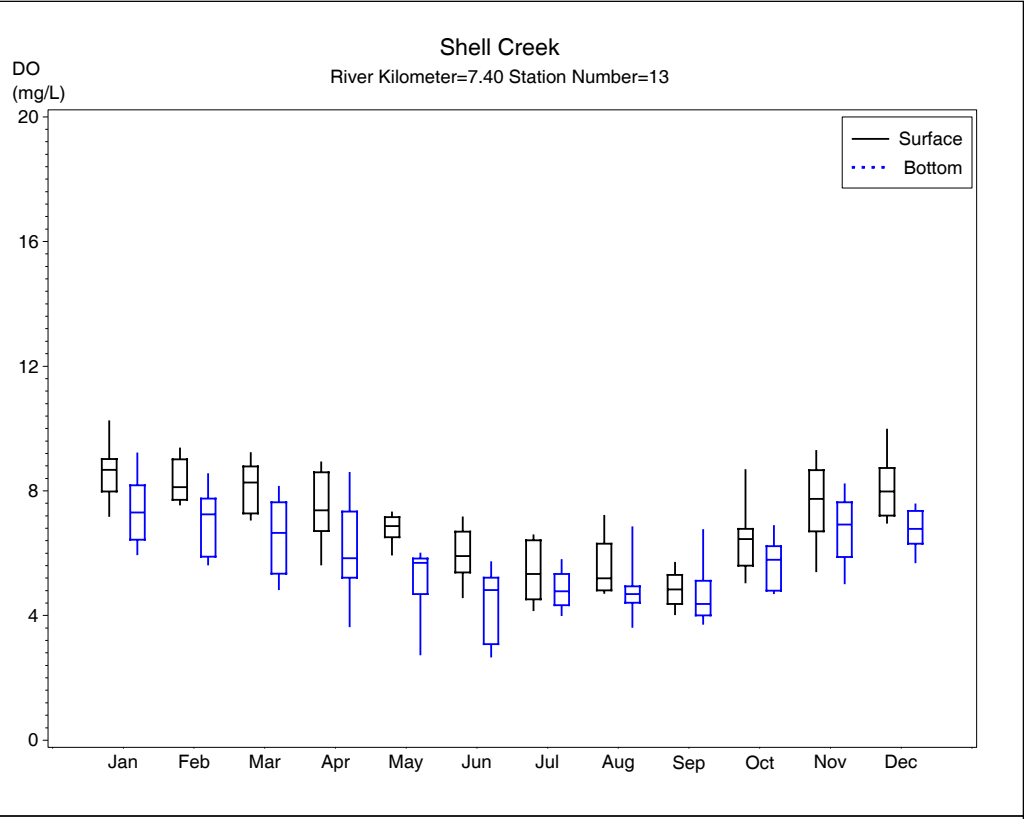
Oct
Nov
Dec


Shell Creek
River Kilometer=7.40 Station Number=13
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
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Nov
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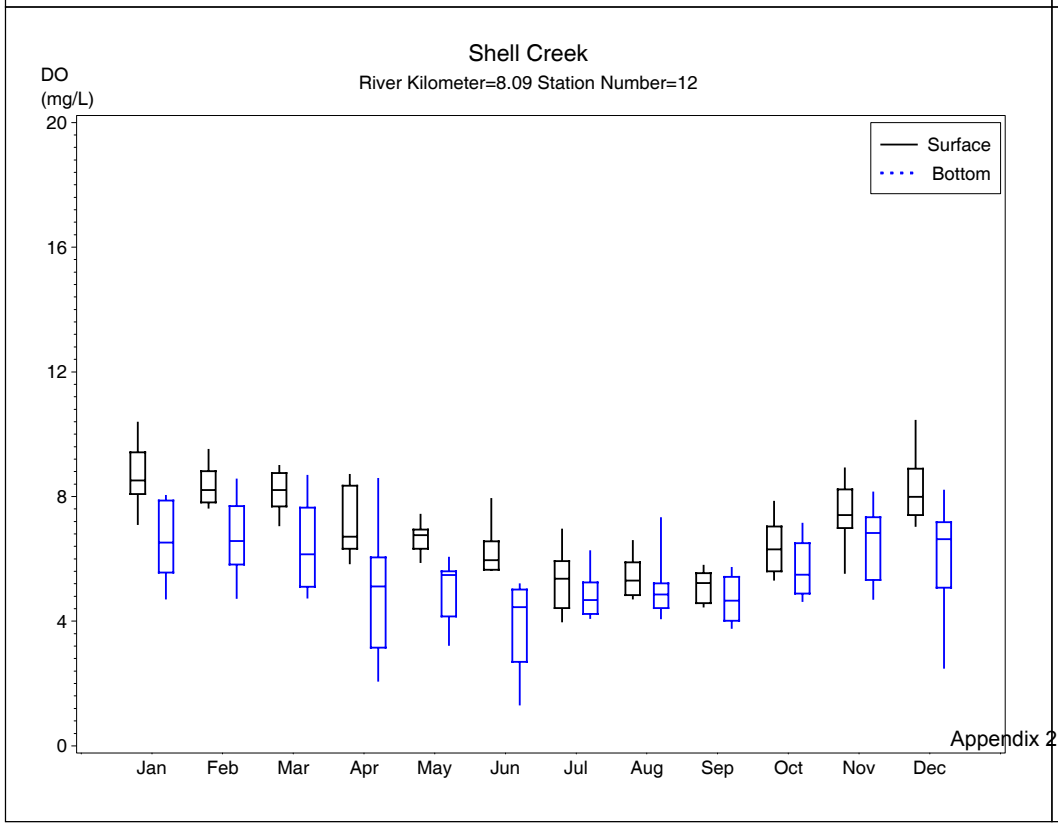
Shell Creek
River Kilometer=8.09 Station Number=12
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
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May
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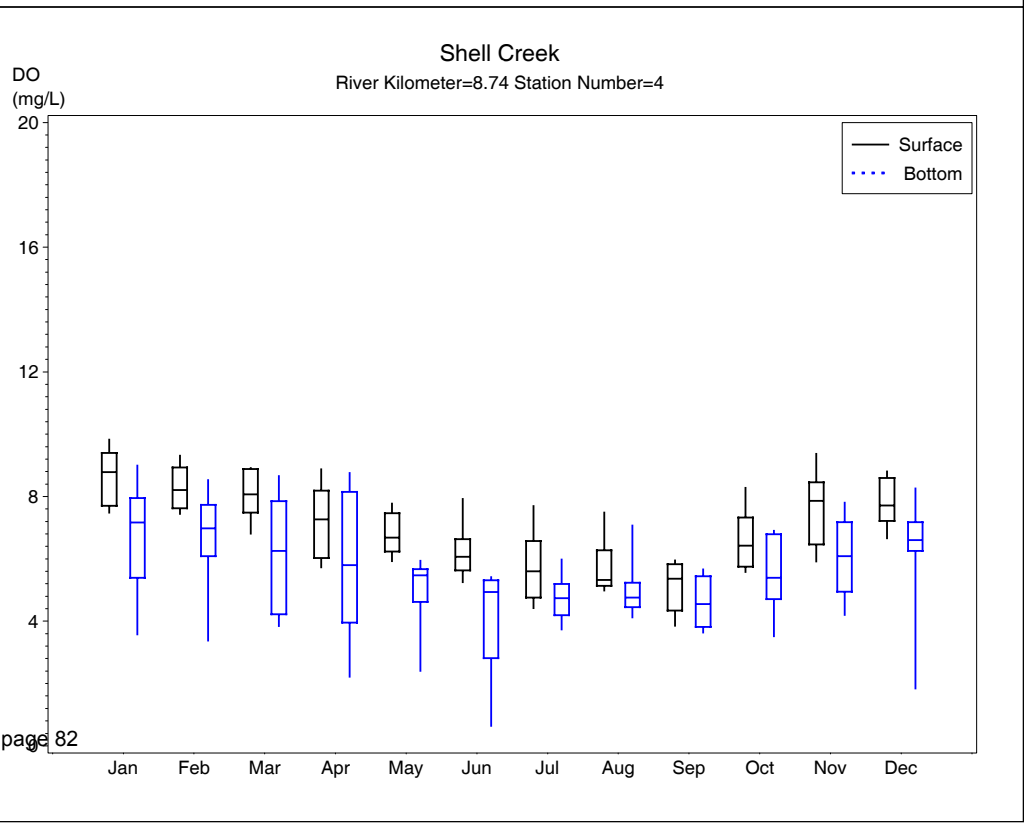
Shell Creek
River Kilometer=8.74 Station Number=4
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
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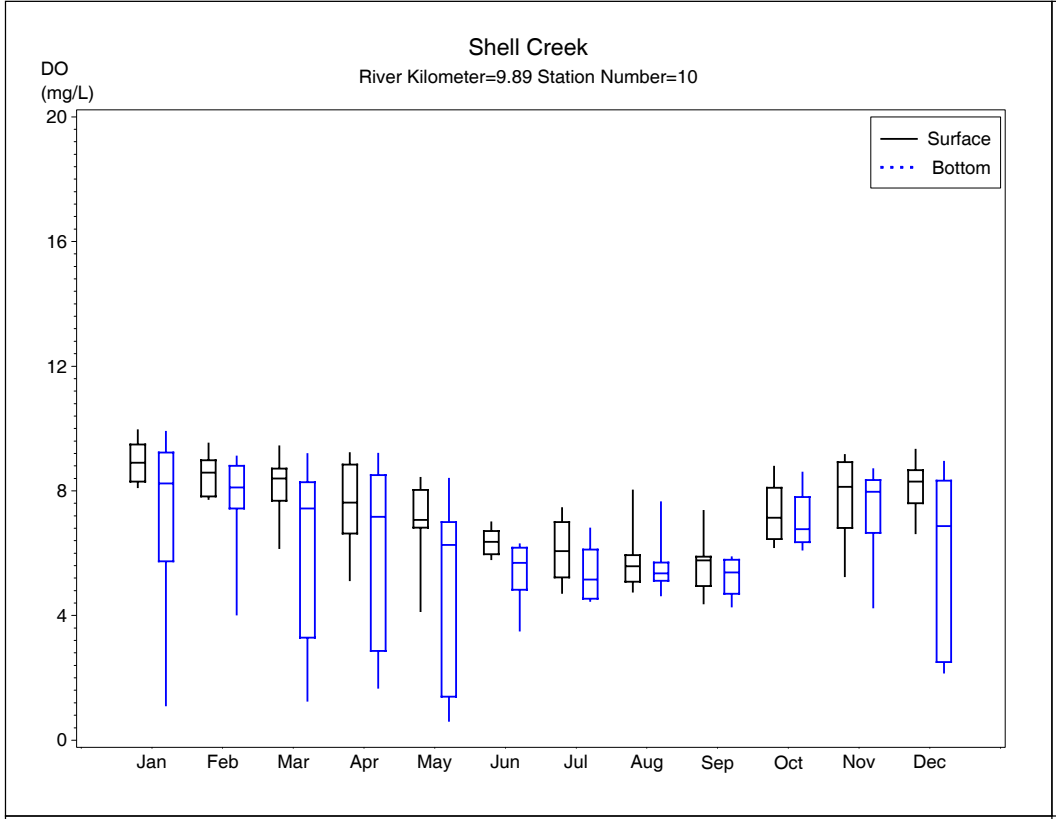
Oct
Nov
Dec


Shell Creek
River Kilometer=9.89 Station Number=10
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
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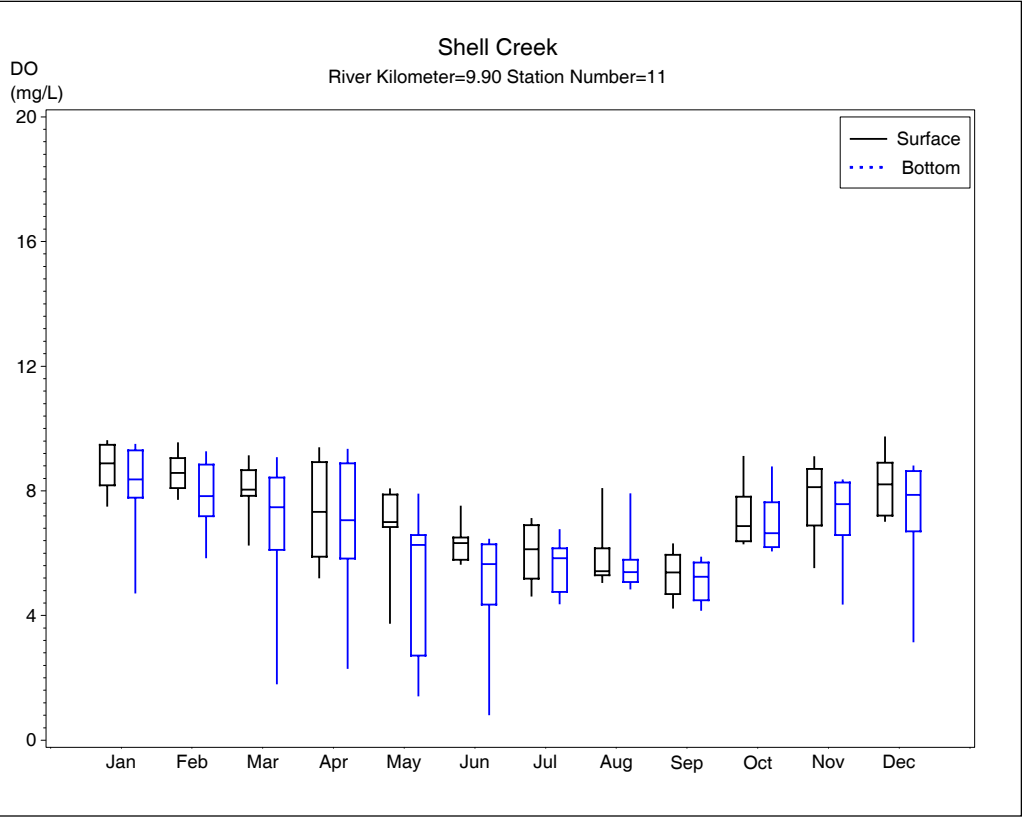
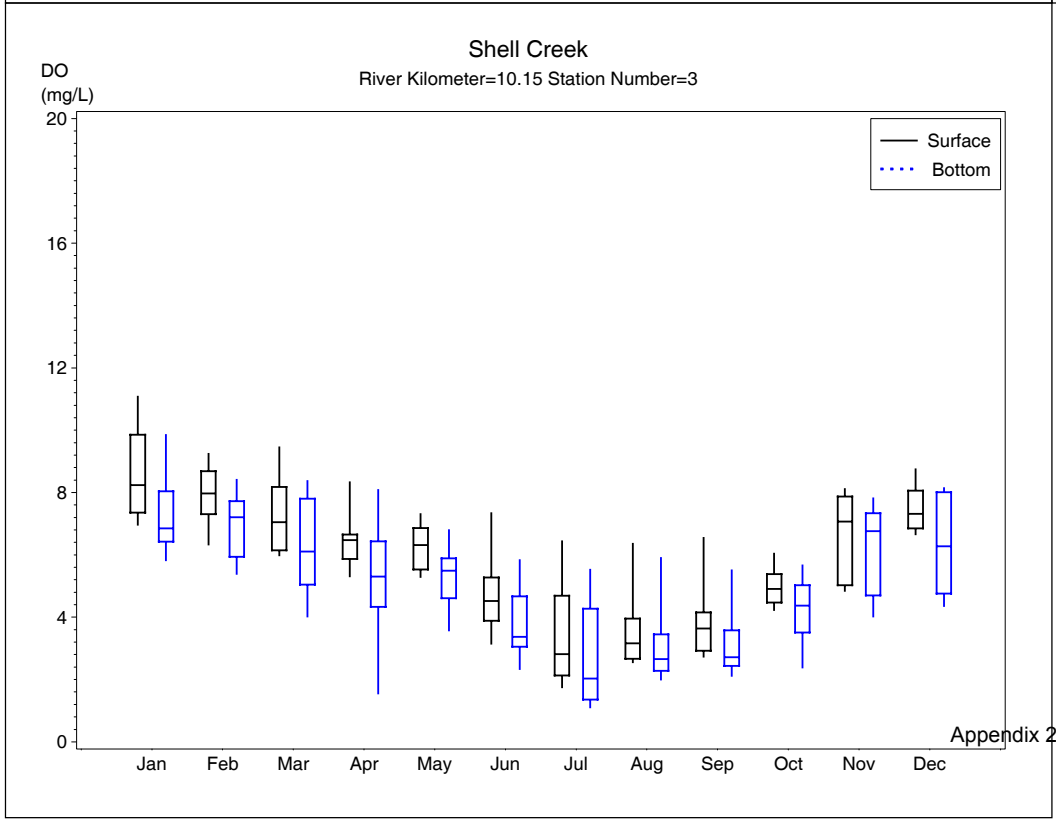
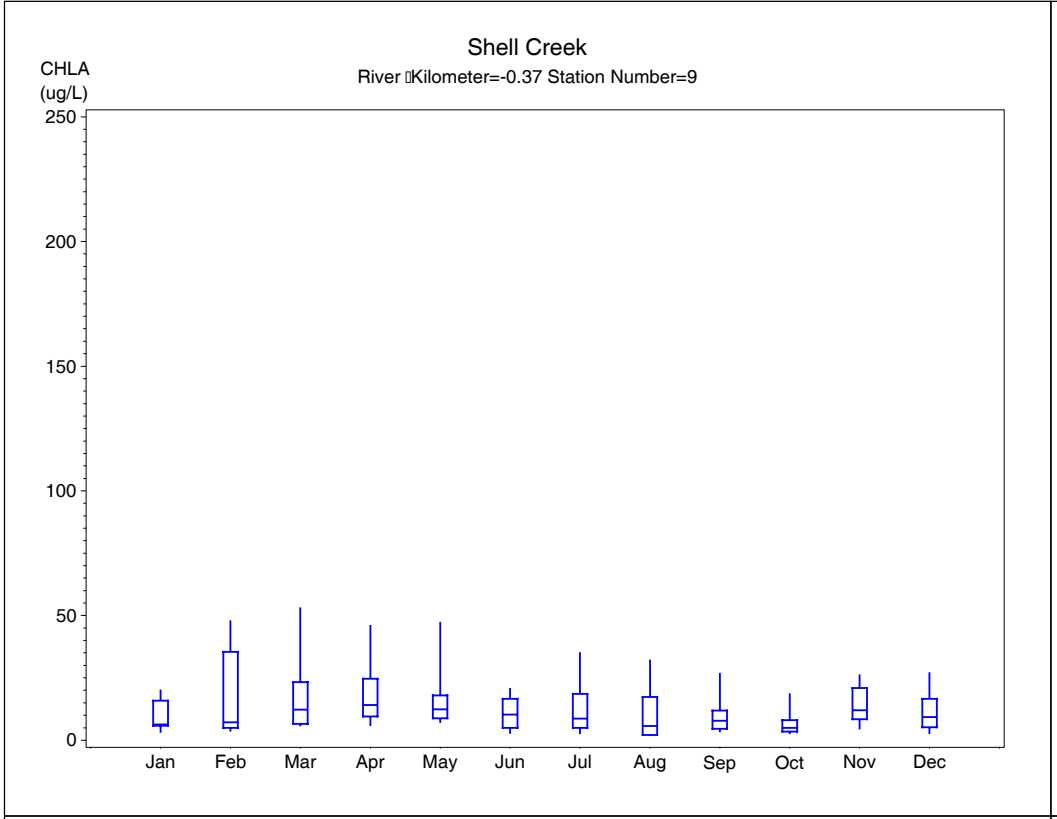
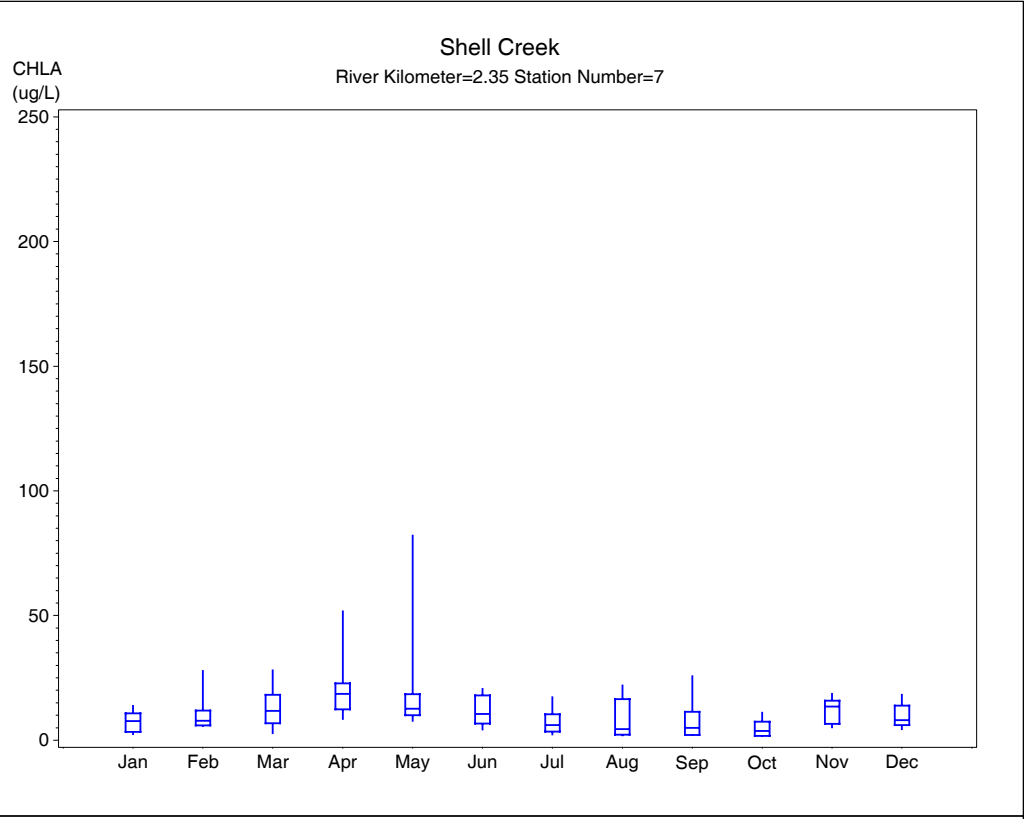
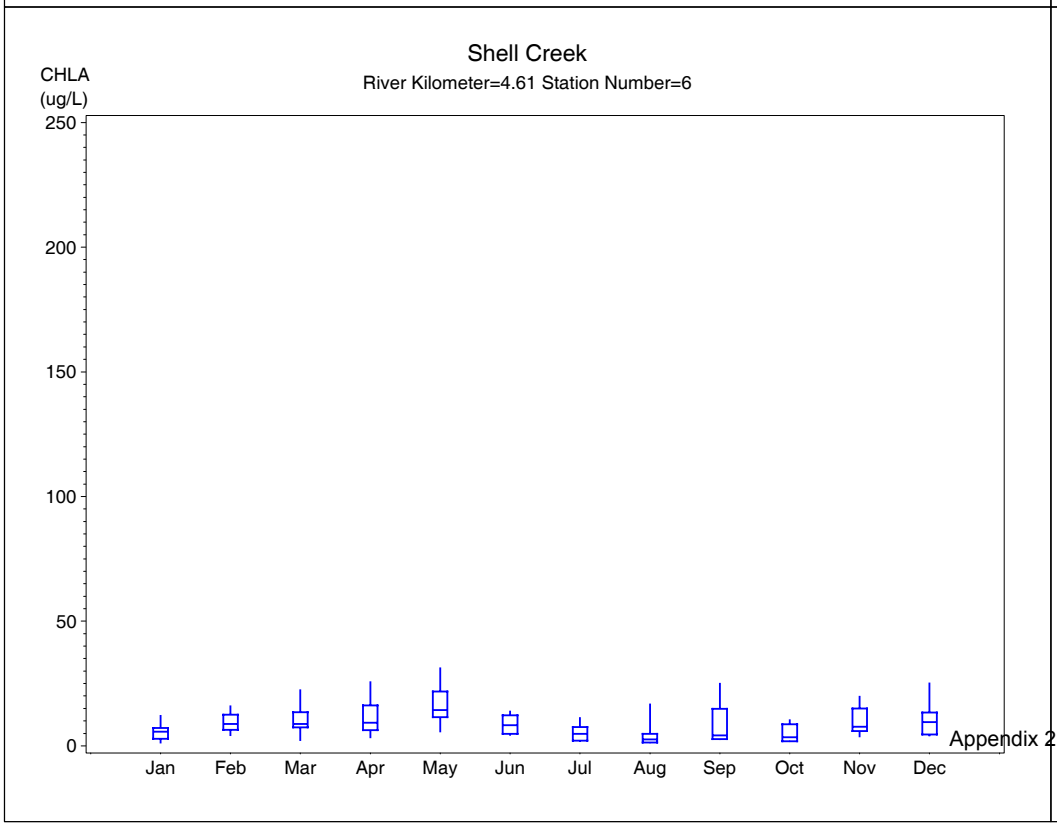
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=9.90 Station Number=11
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=10.15 Station Number=3
DO
(mg/L)
20
16
12
8
4
0
Surface
Bottom
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=-0.37 Station Number=9
CHLA
(ug/L)
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=2.35 Station Number=7
CHLA
(ug/L)
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=4.61 Station Number=6
CHLA
(ug/L)
250
200
150
100
50
0
Jan
Feb
Mar
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May
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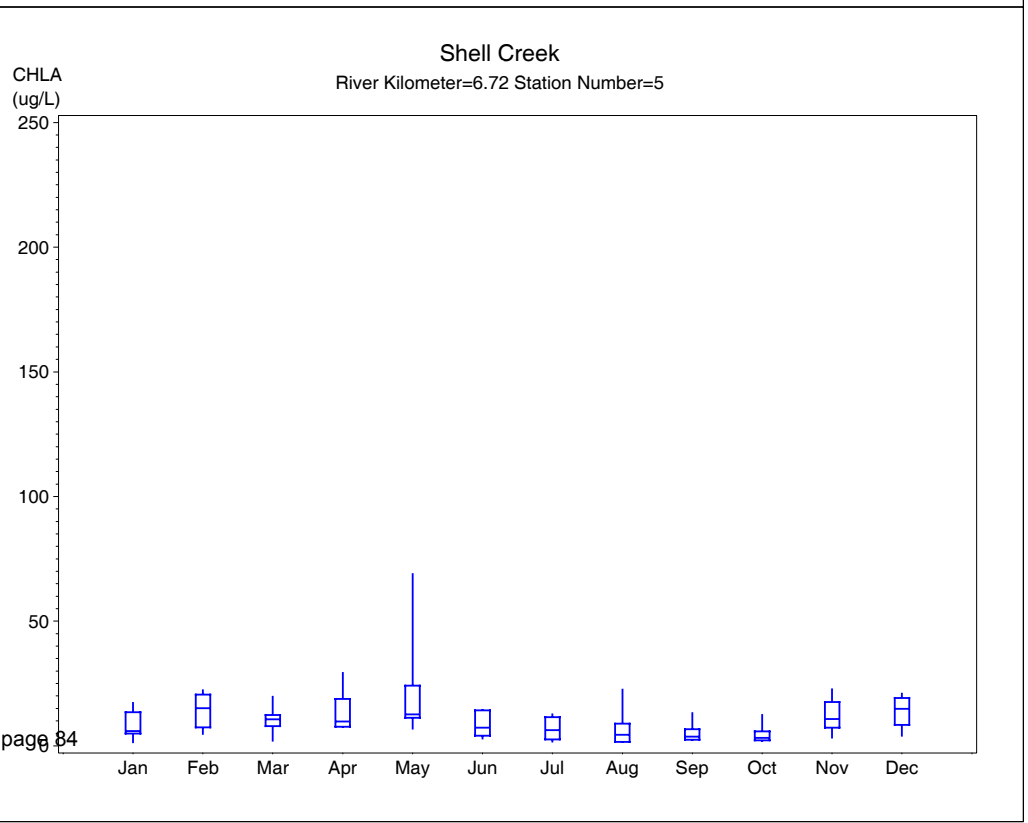
Oct
Nov
Dec


Shell Creek
River Kilometer=6.72 Station Number=5
CHLA
(ug/L)
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
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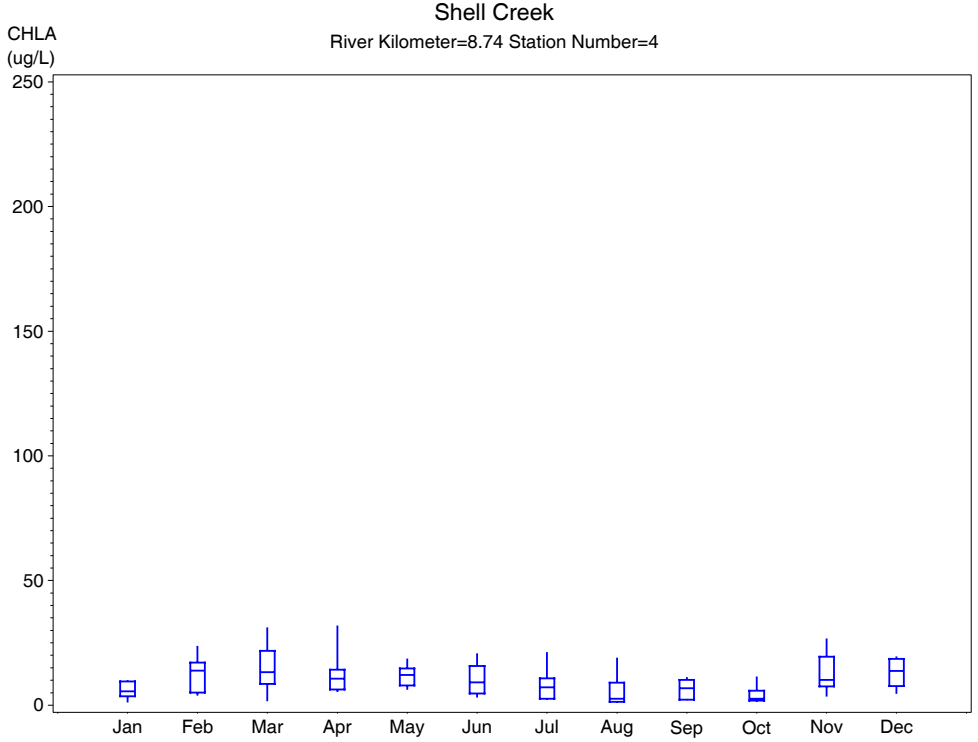
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=8.74 Station Number=4
CHLA
(ug/L)
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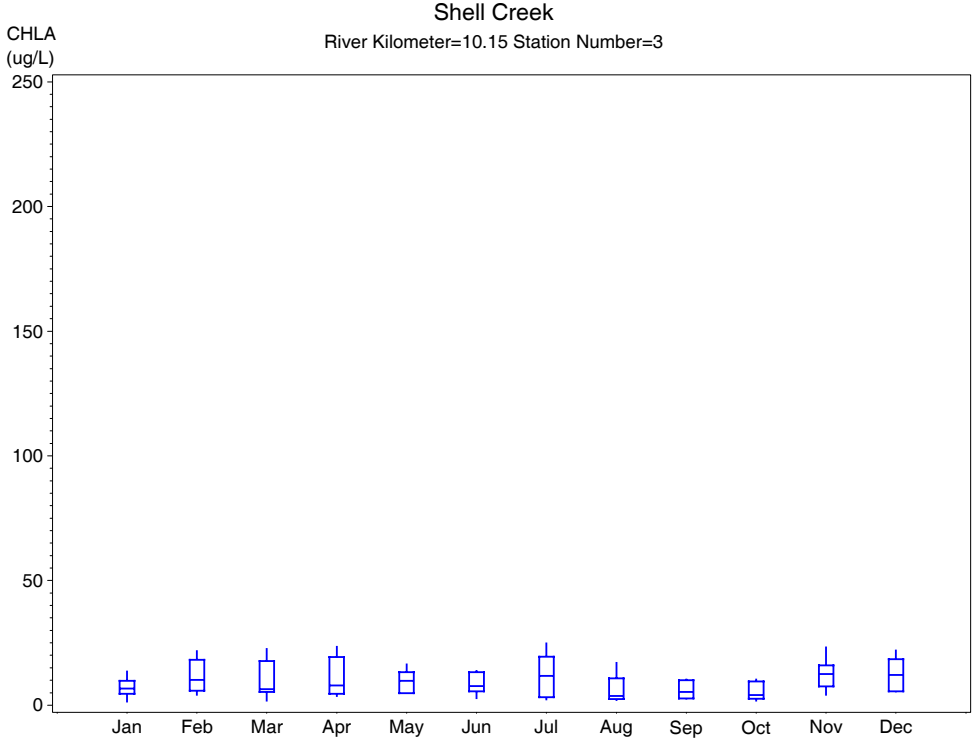
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=10.15 Station Number=3
CHLA
(ug/L)
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200
150
100
50
0
Jan
Feb
Mar
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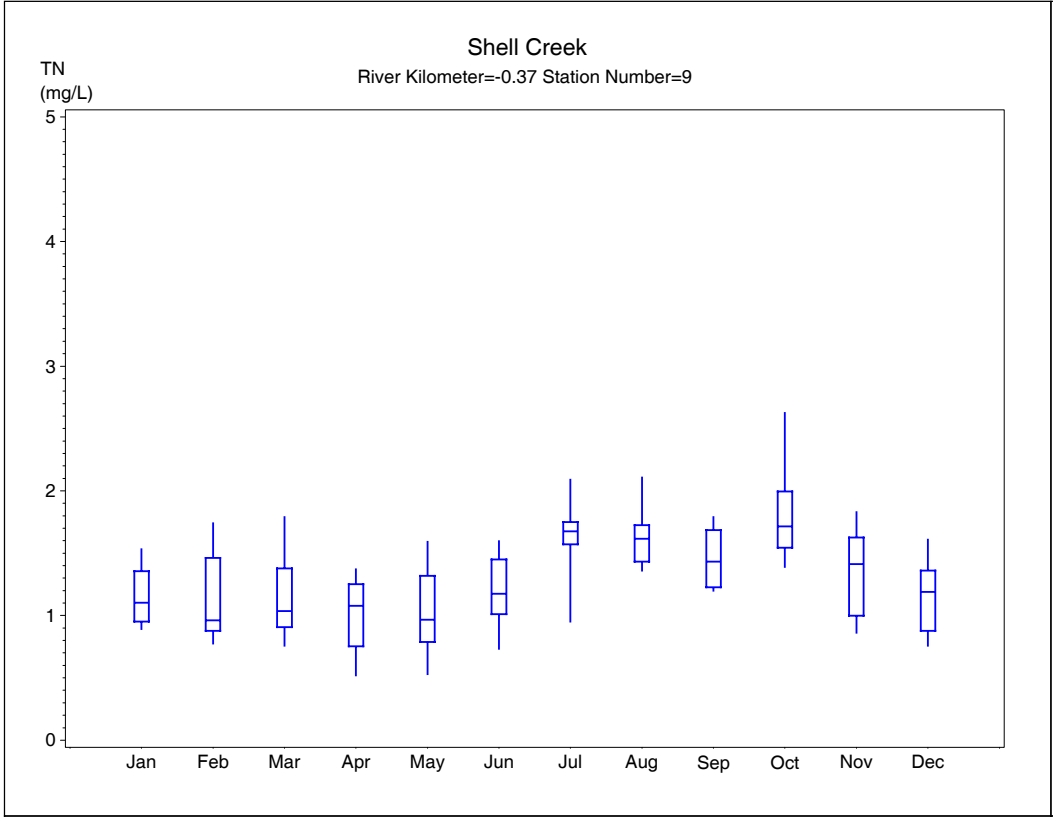
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=-0.37 Station Number=9
TN
(mg/L)
5
4
3
2
1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
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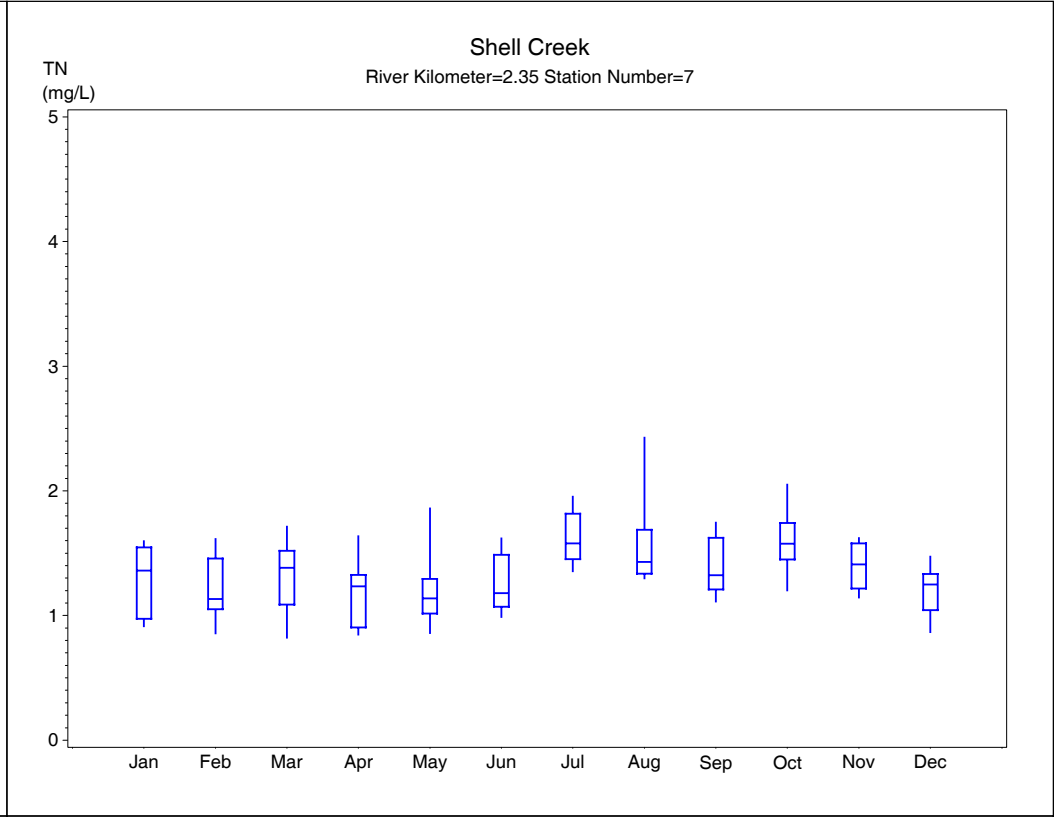
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=2.35 Station Number=7
TN
(mg/L)
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4
3
2
1
0
Jan
Feb
Mar
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Jun
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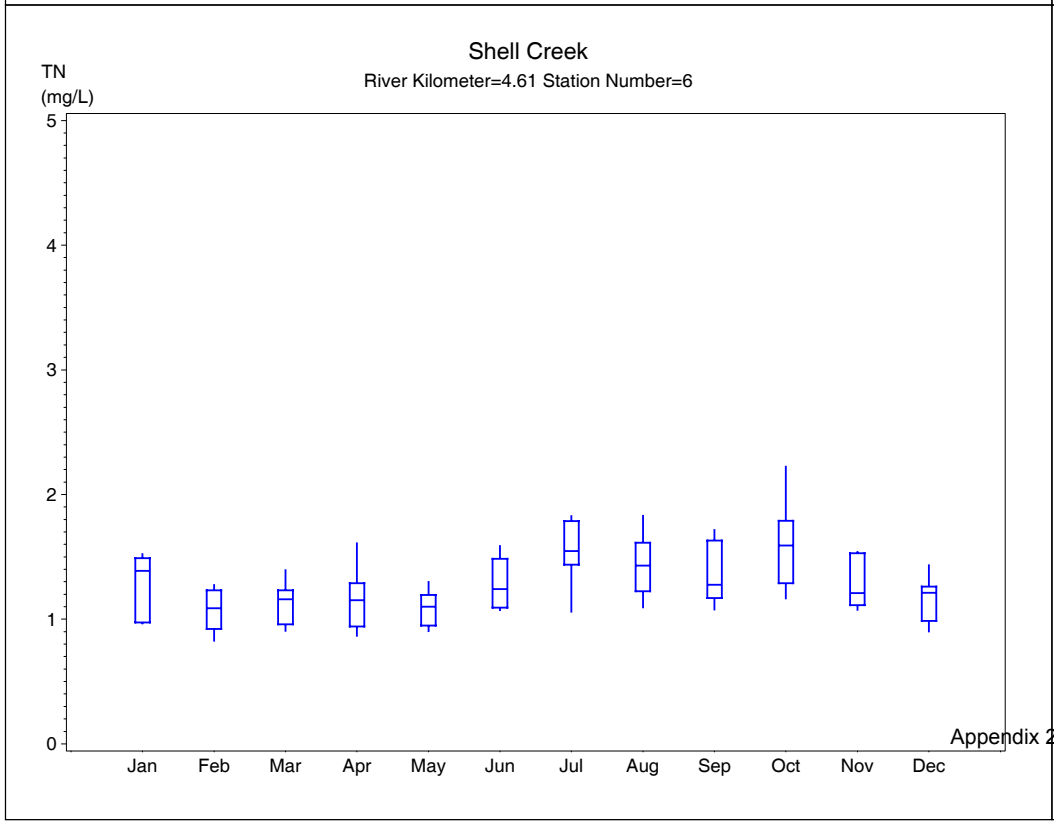
Oct
Nov
Dec


Shell Creek
River Kilometer=4.61 Station Number=6
TN
(mg/L)
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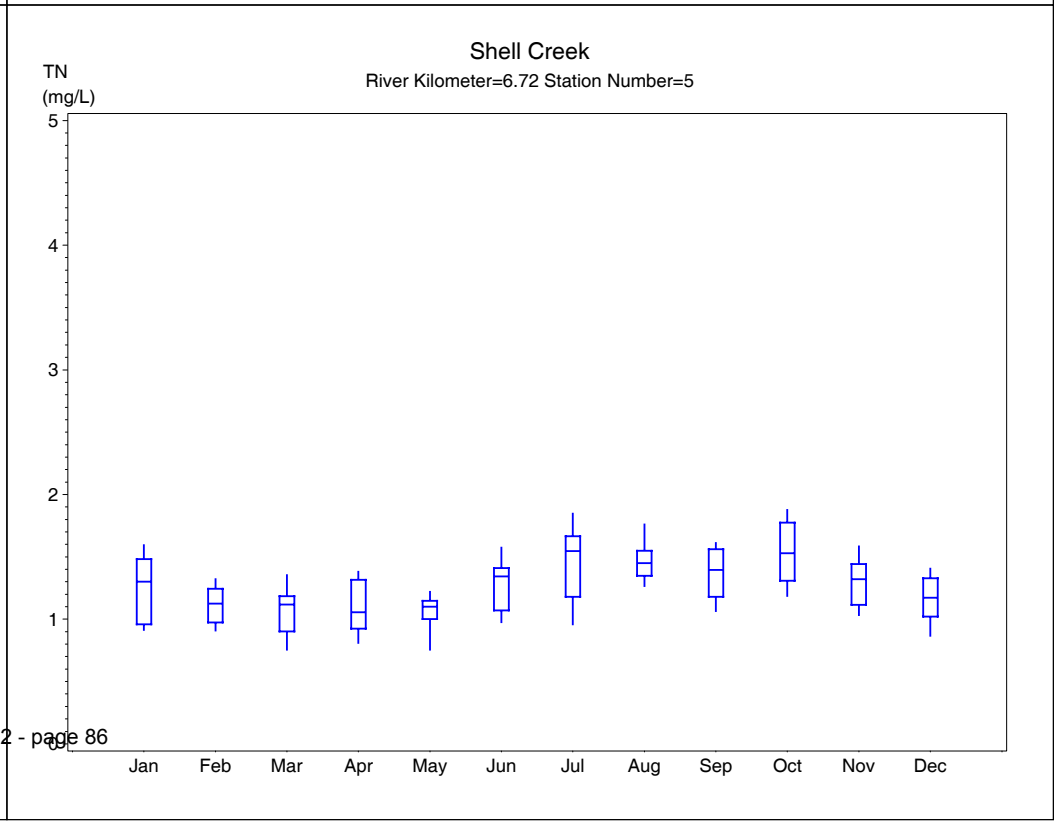
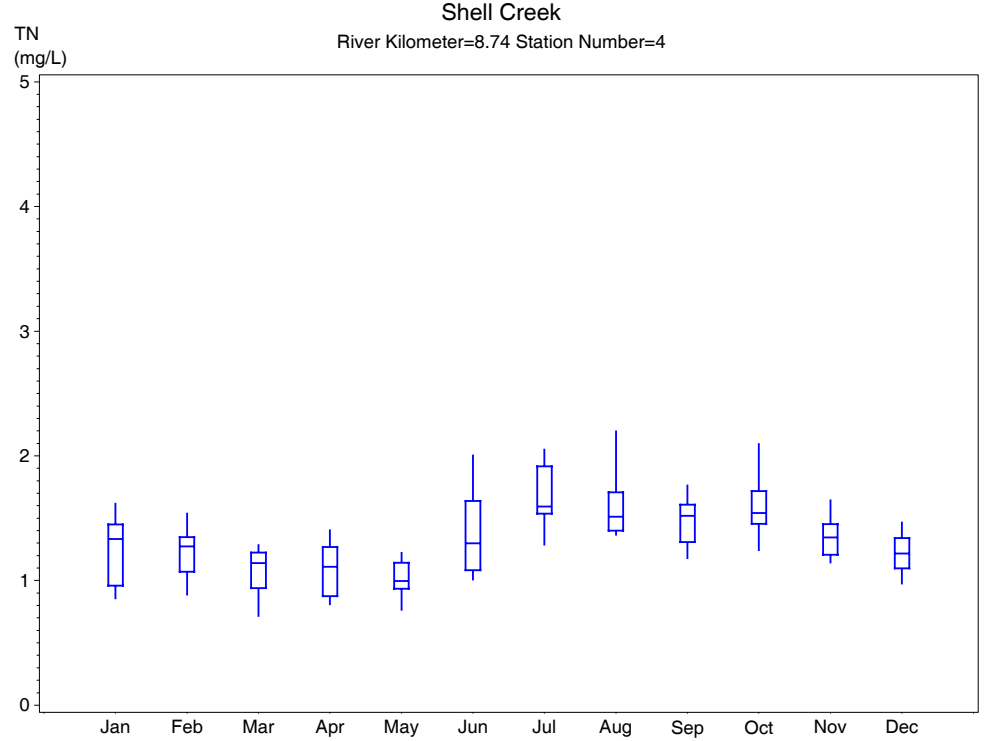
4
3
2
1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=6.72 Station Number=5
TN
(mg/L)
5
4
3
2
1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=8.74 Station Number=4
TN
(mg/L)
5
4
3
2
1
0
Jan
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Jun
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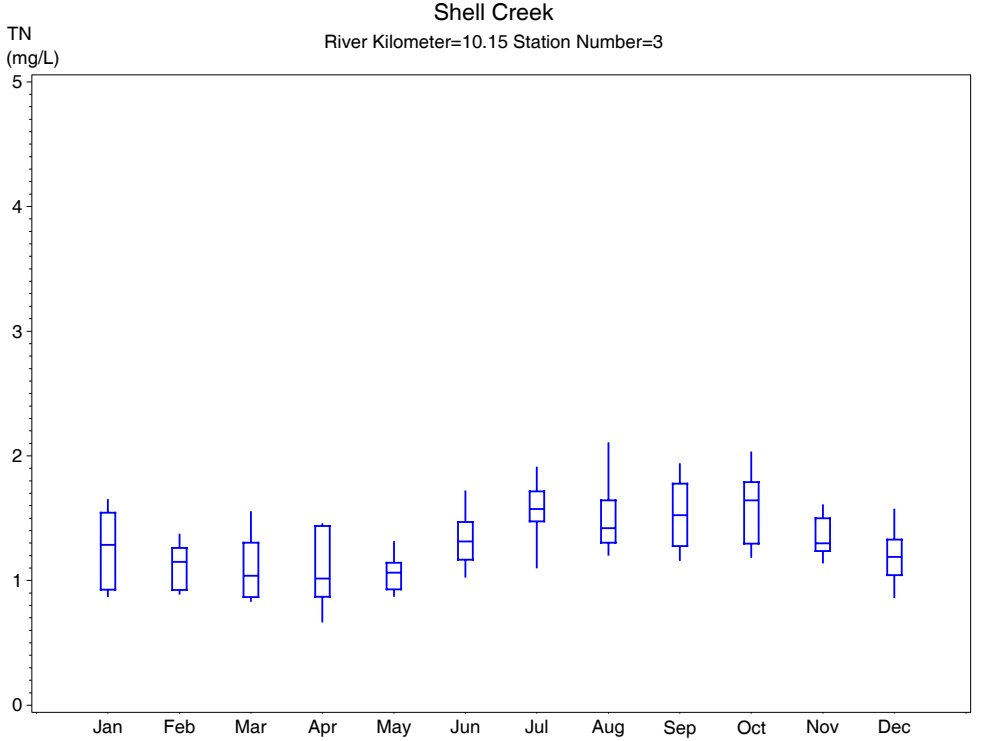
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=10.15 Station Number=3
TN
(mg/L)
5
4
3
2
1
0
Jan
Feb
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Apr
May
Jun
Jul
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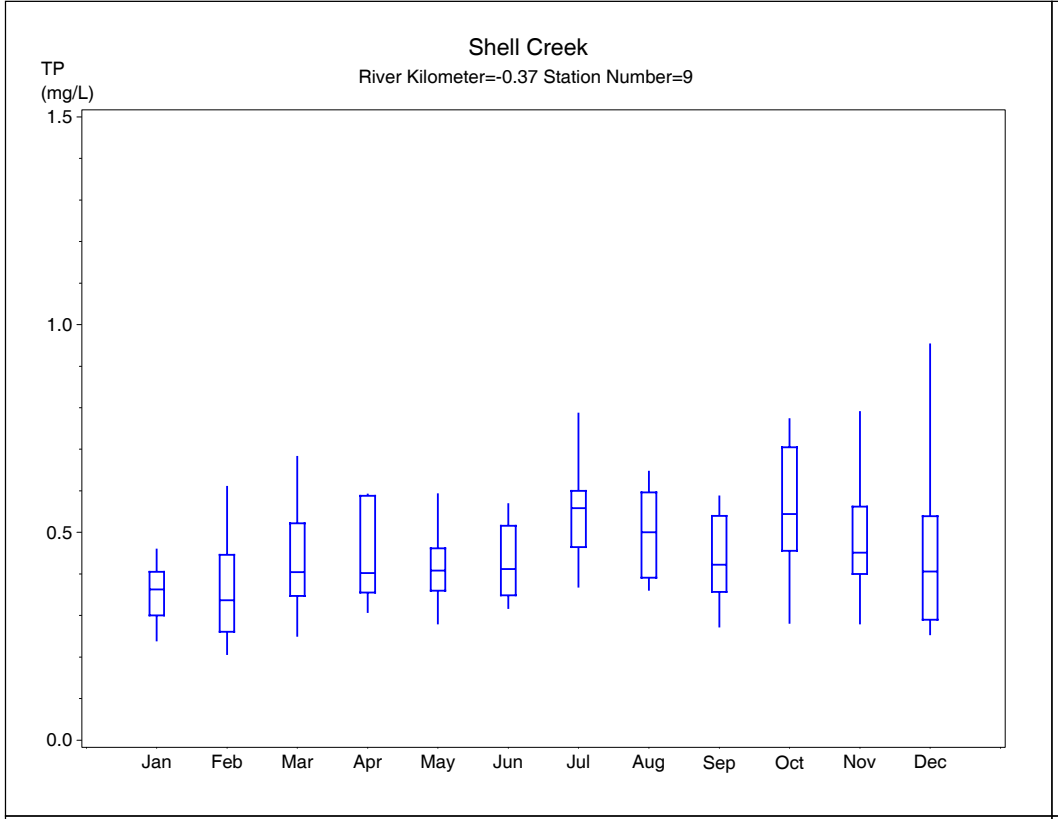
Sep
Oct
Nov
Dec


Shell Creek
River Kilometer=-0.37 Station Number=9
TP
(mg/L)
1.5
1.0
0.5
0.0
Jan
Feb
Mar
Apr
May
Jun
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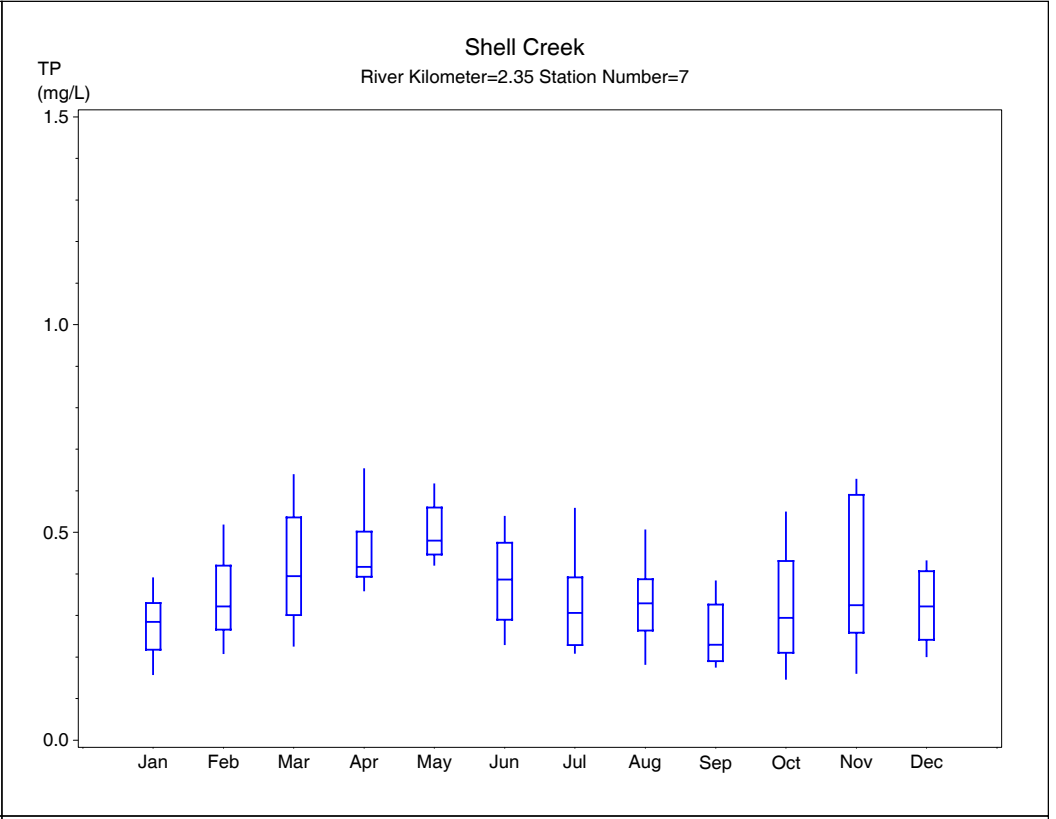
Oct
Nov
Dec


Shell Creek
River Kilometer=2.35 Station Number=7
TP
(mg/L)
1.5
1.0
0.5
0.0
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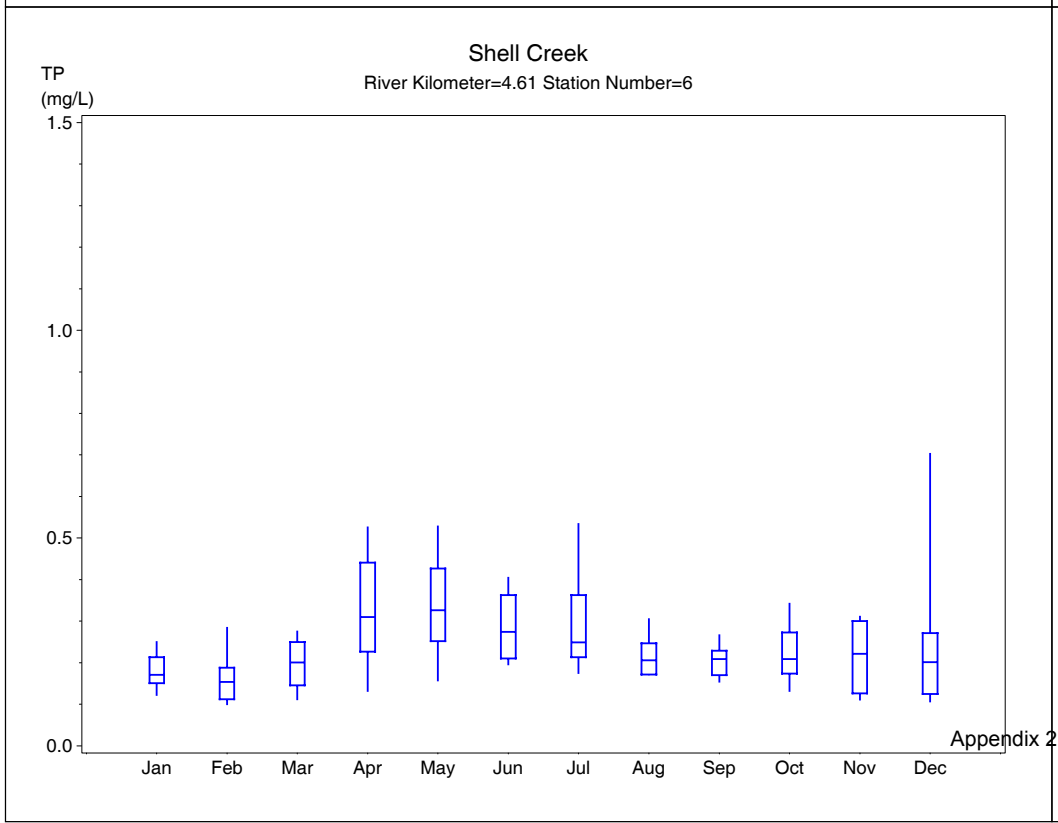
Nov
Dec


Shell Creek
River Kilometer=4.61 Station Number=6
TP
(mg/L)
1.5
1.0
0.5
0.0
Jan
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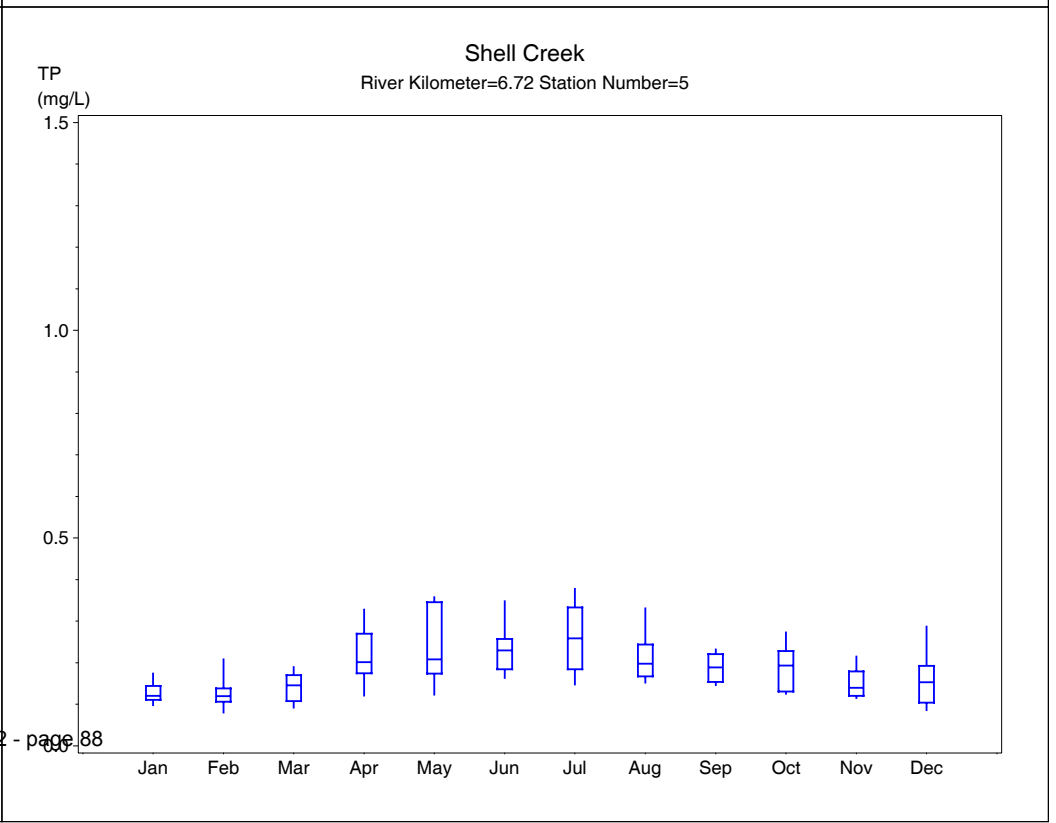
Dec


Shell Creek
River Kilometer=6.72 Station Number=5
TP
(mg/L)
1.5
1.0
0.5
0.0
Jan
Feb
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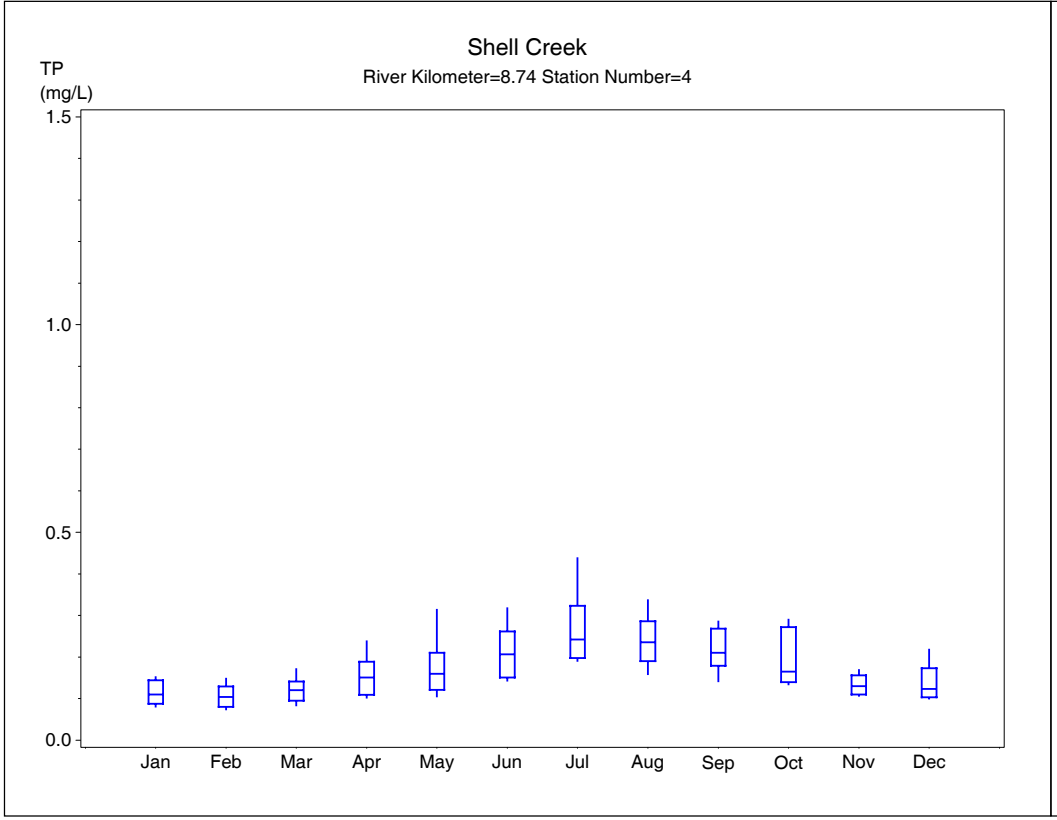
Oct
Nov
Dec


Shell Creek
River Kilometer=8.74 Station Number=4
TP
(mg/L)
1.5
1.0
0.5
0.0
Jan
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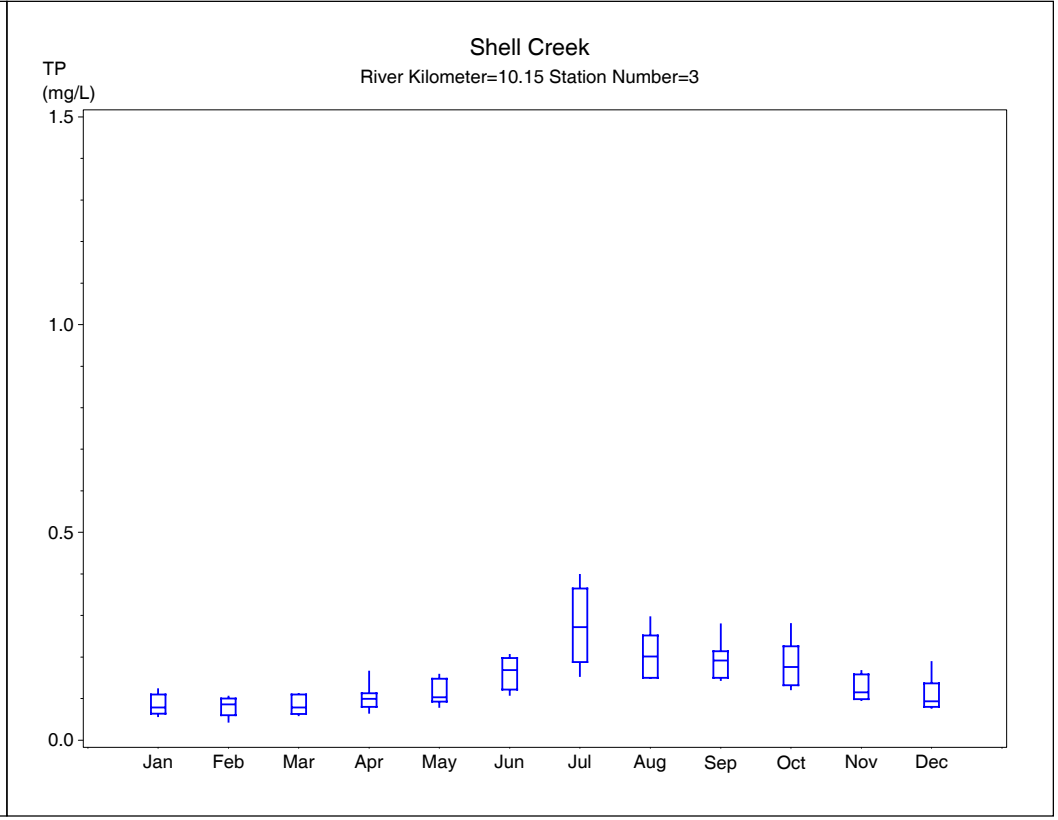
Nov
Dec


Shell Creek
River Kilometer=10.15 Station Number=3
TP
(mg/L)
1.5
1.0
0.5
0.0
Jan
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Dec

Appendix 4-1

Alphabetical Taxonomic Inventory of Benthos Identified in the Lower Peace River (1998-1999) and Shell Creek (2003)

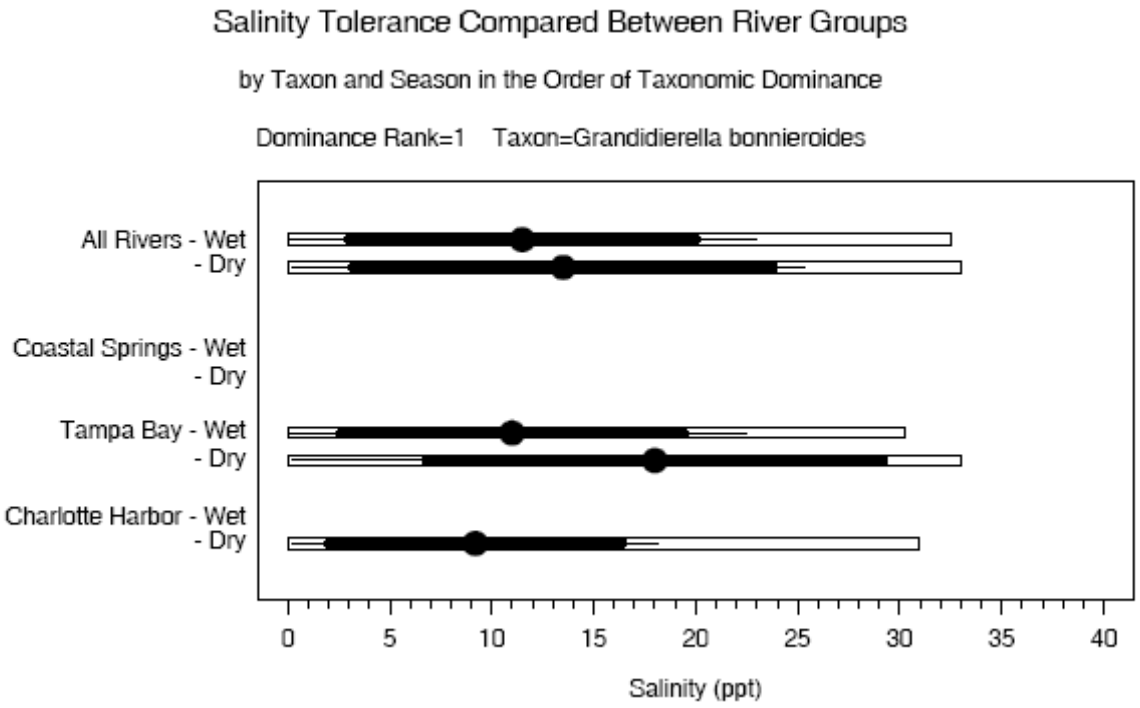
Acteocina canaliculata	*Cryptotendipes spp*	*Leitoscoloplos fragilis*	*Polydora ligni*
Almyracuma proximoculi	*Cyclaspis cf varians*	*Leitoscoloplos robustus*	*Polymesoda caroliniana*
Amakusanthura magnifica	*Cyclinella tenuis*	*Leptoceridae*	*Polypedilum halterale grp*
Americamysis almyra	*Cymadusa compta*	*Leptochela serratorbita*	*Polypedilum scalaenum gp*
Americamysis bahia	*Dicrotendipes cf neomodestus*	*Limulus polyphemus*	*Prionospio perkinsi*
Americamysis bigelowi	*Dicrotendipes cf tritomus*	*Lopescaldius sp*	*Pristinella*
Ampelisca abdita	*Dicrotendipes lobus*	*Macoma constricta*	*Processa*
Amygdalum papyrium	*Diopatra cuprea*	*Macoma tenta*	*Procladius*
Anachis sp	*Dipolydora socialis*	*Mactridae*	*Rangia cuneata*
Anadara transversa	*Djalmabatista pulchra*	*Mediomastus californiensis*	*Rhithropanopeus harrisii*
Apocorophium lacustre	*Edotea montosa*	*Mesanthura pulchra*	*Rictaxis punctostriatus*
Apocorophium louisianum	*Einfeldia natchitocheae*	*Mesovelia*	*Saldidae*
Argissa hamatipes	*Elasmopus levis*	*Molgulidae*	*Scolelepis texana*
Aricidea philbinae	*Elmidae*	*Monticellina dorsobranchialis*	*Sigalionidae*
Ascidiacea	*Ensis minor*	*Mulinia lateralis*	*Sigambra bassi*
Assiminea succinea	*Epitonium spp*	*Mysella planulata*	*Sigambra tentaculata*
Astyris lunata	*Erichsonella attenuata*	*Mytilopsis leucophaeata*	*Sipuncula*
Asychis elongata	*Erichthonius brasiliensis*	*Nassarius vibex*	*Sminthuridae*
Axarus sp	*Eteone heteropoda*	*Nemertea a*	*Sphaeroma quadridentata*
Batea catharinensis	*Exosphaeroma diminuta*	*Nemertea b*	*Sphaeroma terebrans*
Bemlos sp	*Fissimentum sp*	*Nemertea sp f*	*Spiochaetopterus costarum oculat*
Boccardiella	*Fittkauimyia*	*Nereis succinea*	*Stempellina*
Bowmaniella portoricensis	*Gammarus cf tigrinus*	*Neritina usnea*	*Stenochironomus spp*
Brachidontes exustus	*Gammarus mucronatus*	*Neverita duplicata*	*Stenothoe sp*
Branchiostoma floridae	*Genetyllis castanea*	*Nudibranchia*	*Sthenelais*
Brania wellfleetensis	*Glottidia pyramidata*	*Odostomia spp*	*Stictochironomus*
Caenidae	*Glycinde solitaria*	*Oecetis cinerascens*	*Streblospio gynobranchiata*
Callinectes sapidus	*Goeldichironomus sp*	*Oenonidae*	*Tagelus plebeius*
Capitella capitata complex	*Grandidierella bonnieroides*	*Ogyrides alphaerostris*	*Tanytarsus sp g*
Caprella	*Haminoea succinea*	*Orchestia*	*Tanytarsus sp k*
Ceratopogonidae	*Hargeria rapax*	*Oxyurostylis smithi*	*Tanytarsus sp o*
Chironomini genus a	*Hartmanodes nyei*	*Palaemonetes pugio*	*Tanytarsus sp s*
Chironomus sp	*Hemipodus roseus*	*Parachironomus carinatus*	*Taphromysis bowmani*
Cirratulidae	*Heteromastus filiformis*	*Paracladopelma sp*	*Tellina tampaensis*
Cladopelma spp	*Heteromysis formosa*	*Paramphinome sp b*	*Tellina texana*
Cladotanytarsus	*Hippolyte zostericola*	*Paraprionospio pinnata*	*Tozeuma carolinense*
Cladotanytarsus sp b	*Hobsonia florida*	*Paratendipes basidens*	*Trichoptera*
Coelotanypus	*Hourstonius laguna*	*Parvilucina multilineata*	*Tricorythodes albilineatus*
Corbicula fluminea	*Hydracarina*	*Pectinaria gouldii*	*Typosyllis sp*
Cordulegastridae	*Hydrobiidae*	*Phyllodoce arenae*	*Uromunna sp*
Corixidae	*Hydroptila*	*Pinnixa sayana*	*Vitrinellidae*
Crassostrea virginica	*Isotomidae*	*Planorbidae*	*Xenanthura brevitelson*
Crepidula	*Laeonereis culveri*	*Podarkeopsis levifuscina*	*Zavreliella*
Cryptochironomus	*Laevicardium mortoni*	*Polydora caulleryi*	*Zygoptera*

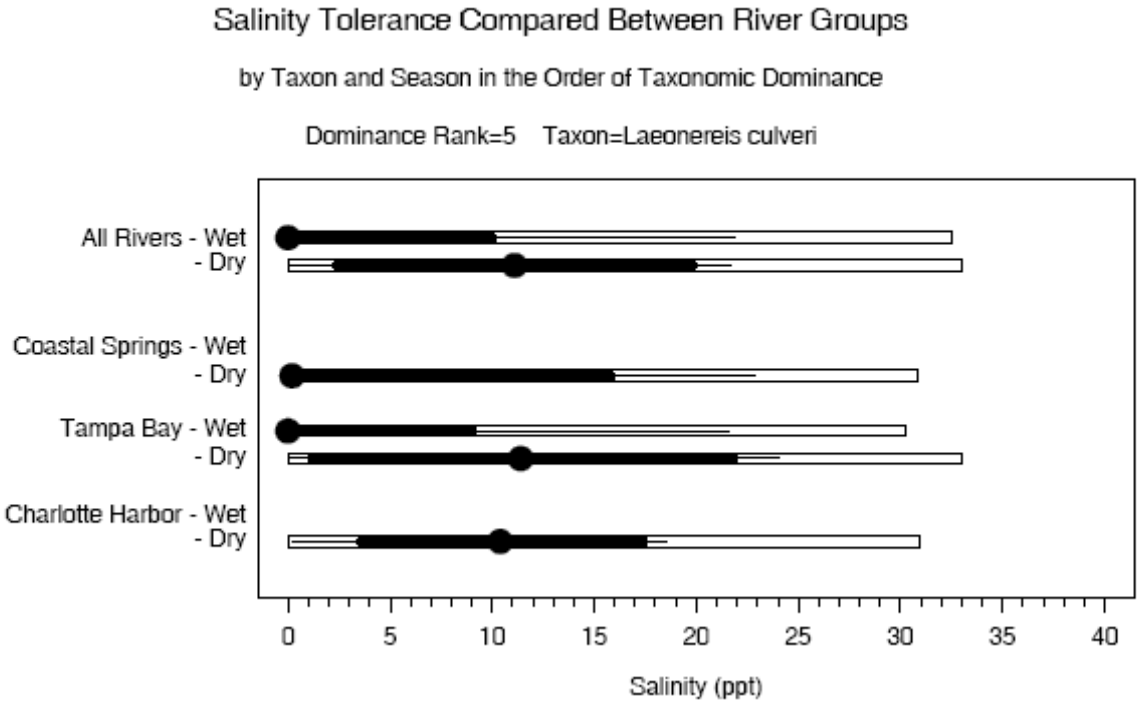
Appendix 4-2

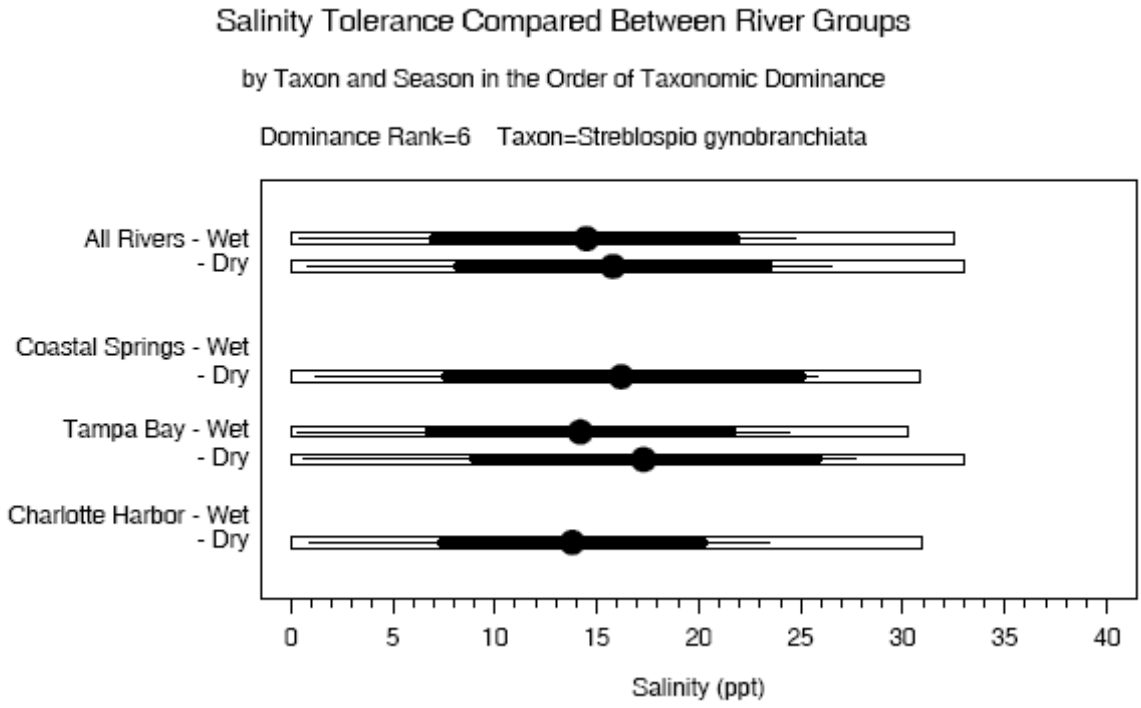
Logistic Regression Analysis Summary Plots:

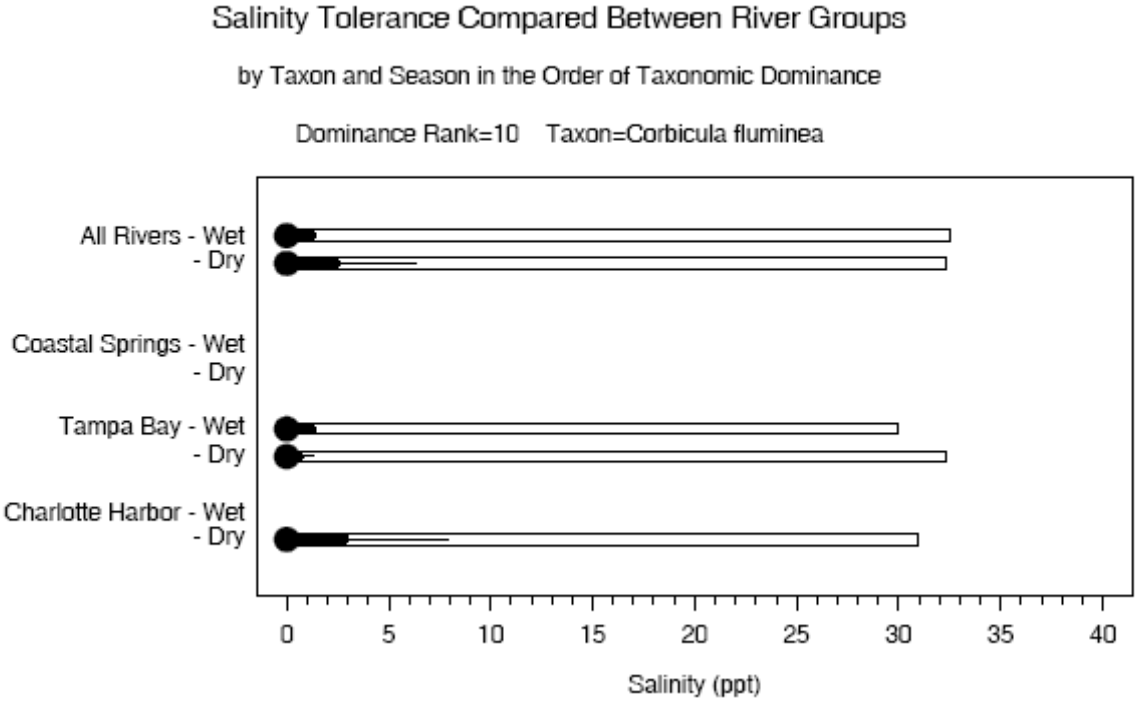
Salinity Optima and Tolerance Ranges for Selected Taxa

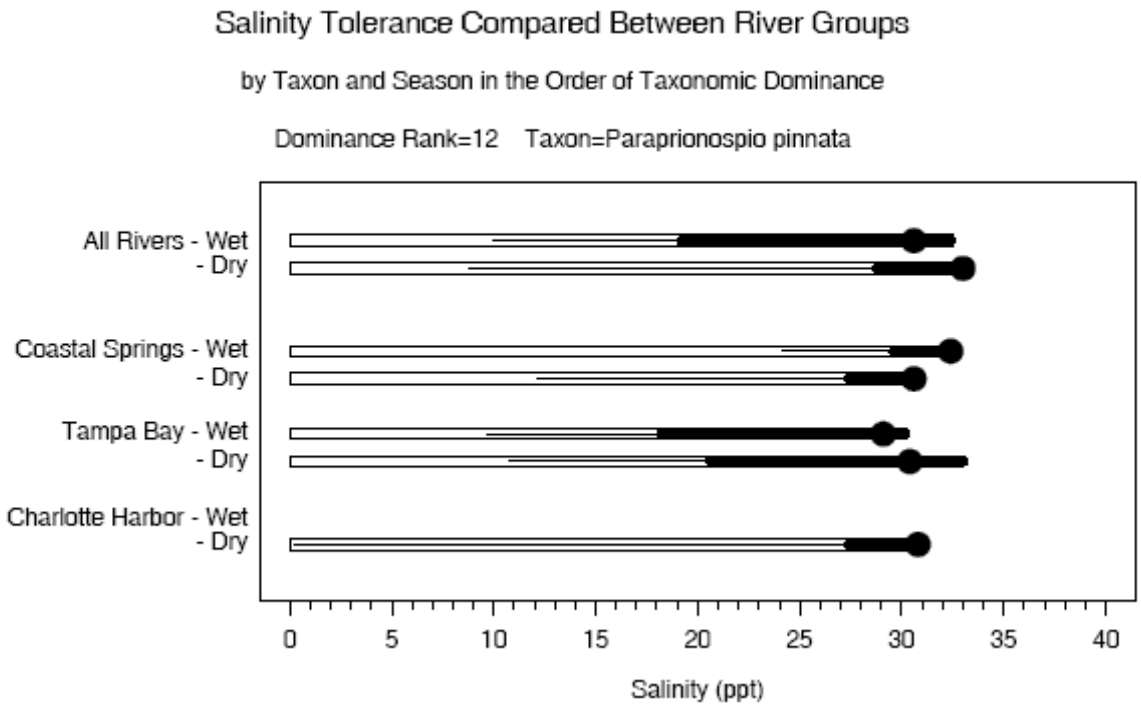
Dominants in the Lower Peace River and Shell Creek

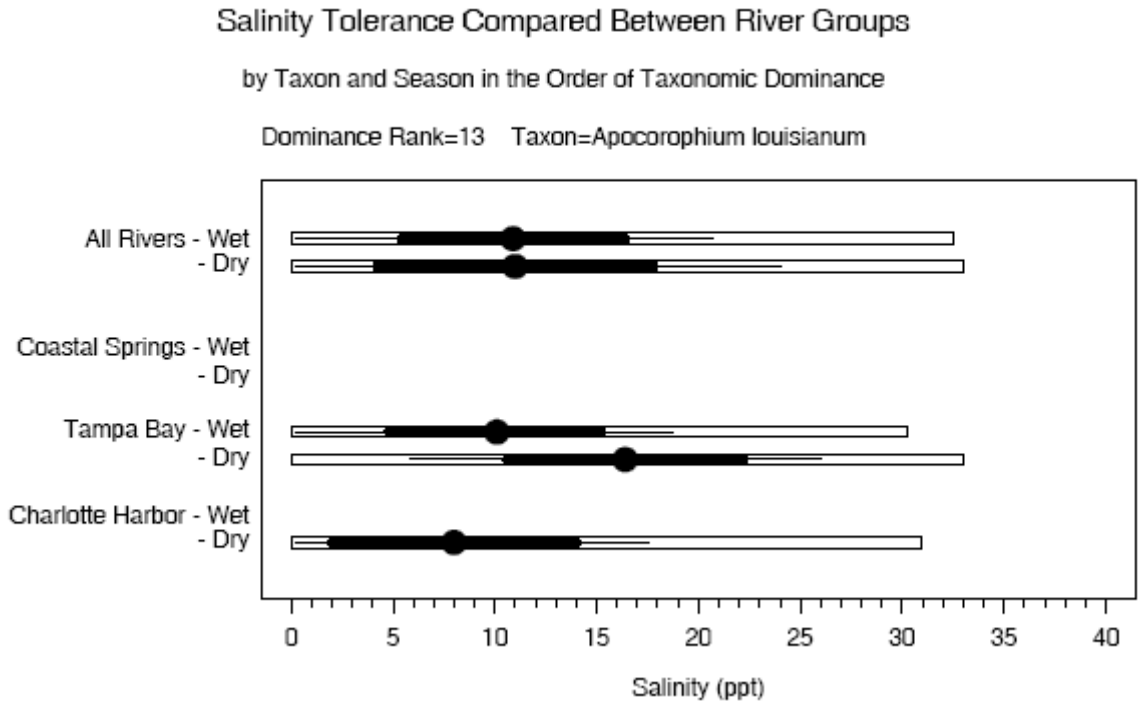

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=1 Taxon=Grandidierella bonnieroides
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

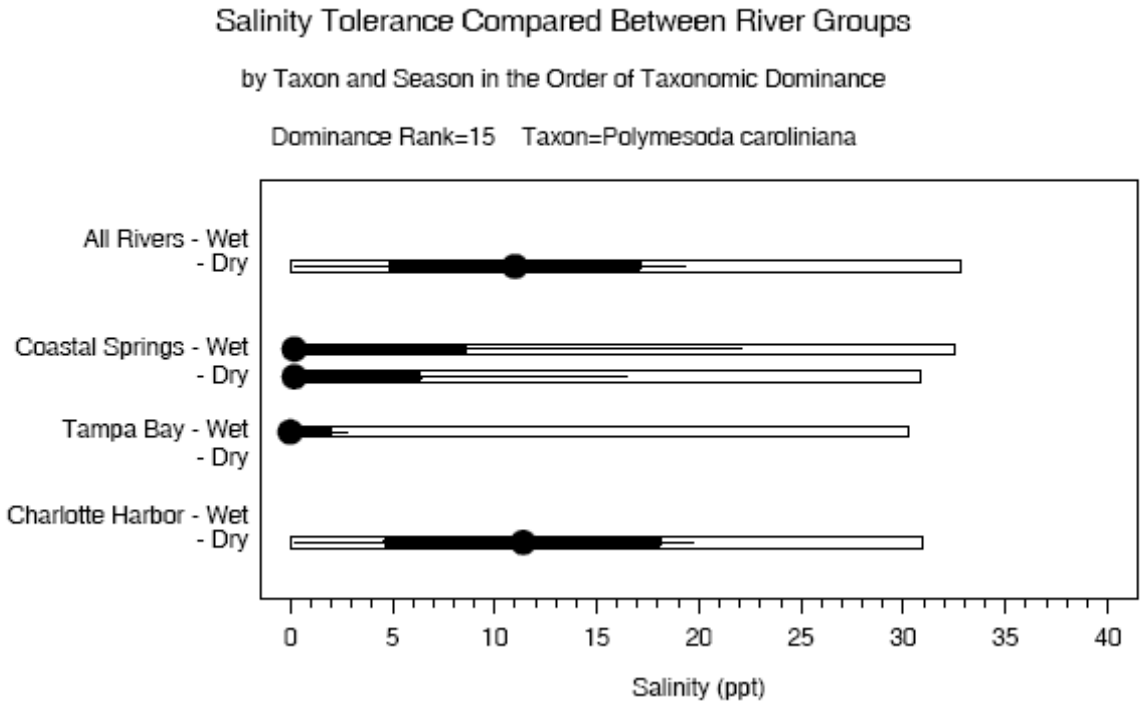

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=5 Taxon=Laeonereis culveri
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

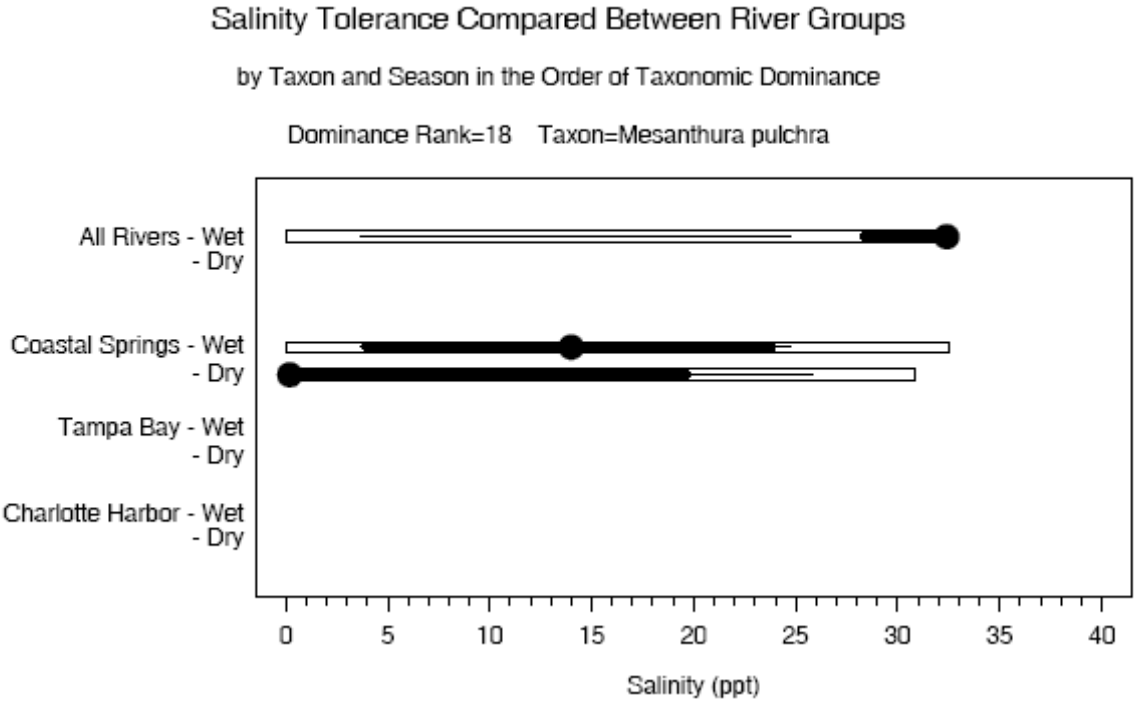

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=6 Taxon=Streblospio gynobranchiata
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

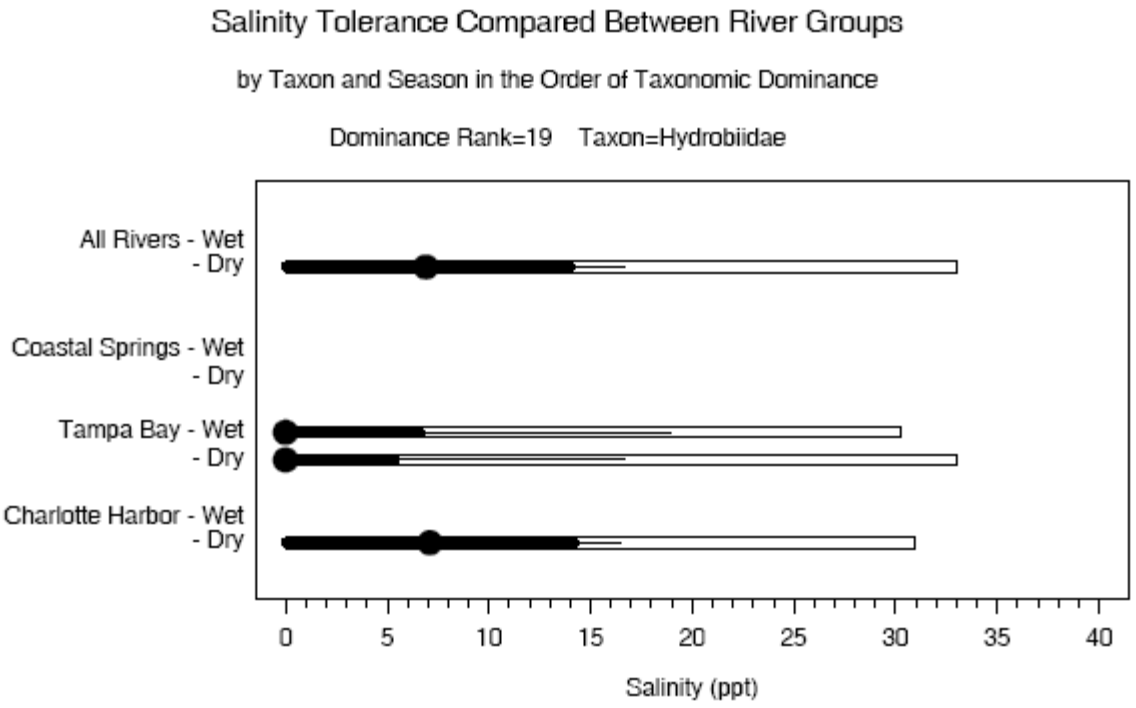

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=10 Taxon=Corbicula fluminea
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

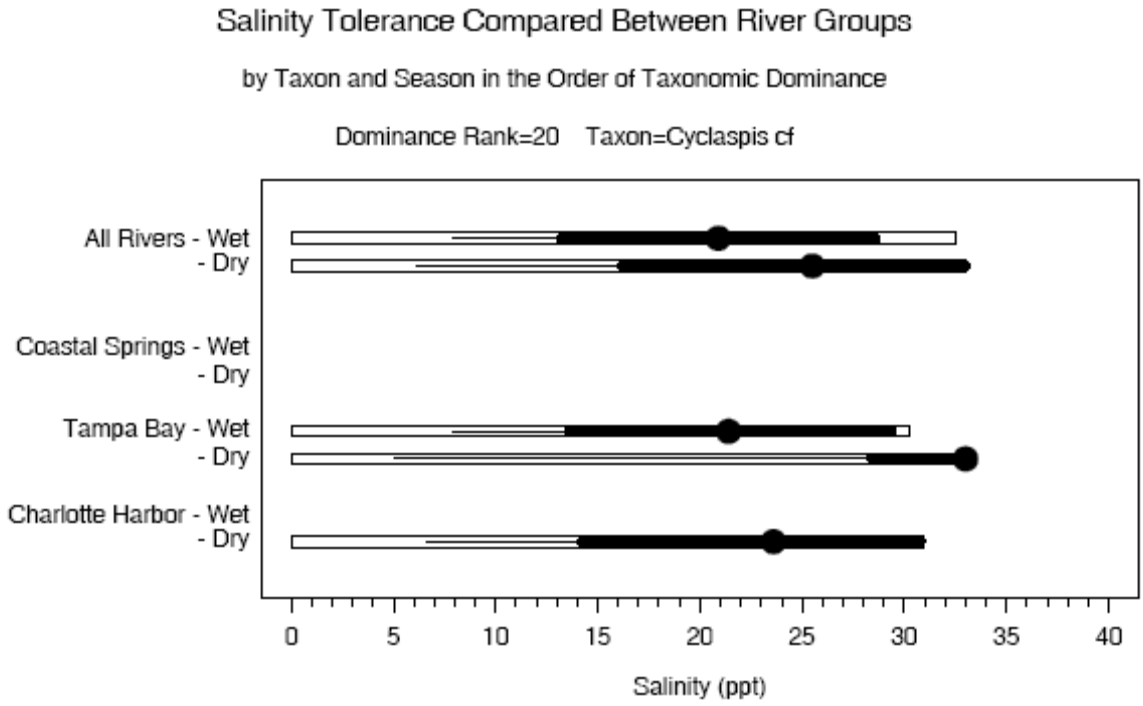

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=12 Taxon=Paraprionospio pinnata
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

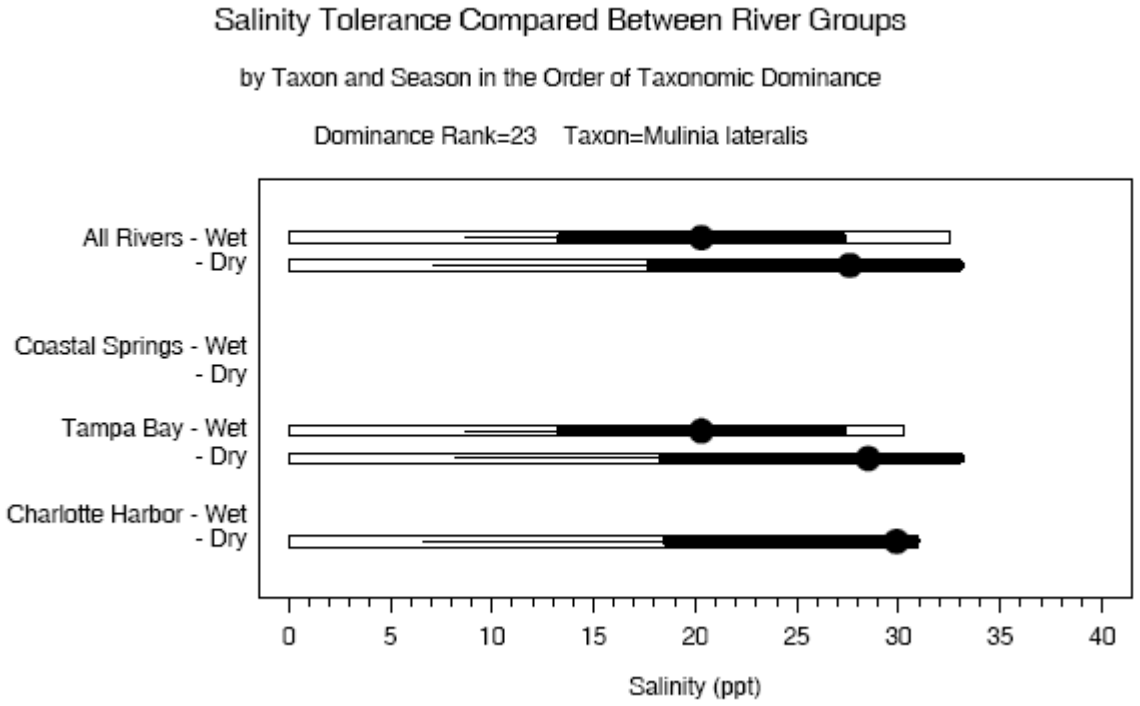

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=13 Taxon=Apocorophium louisianum
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

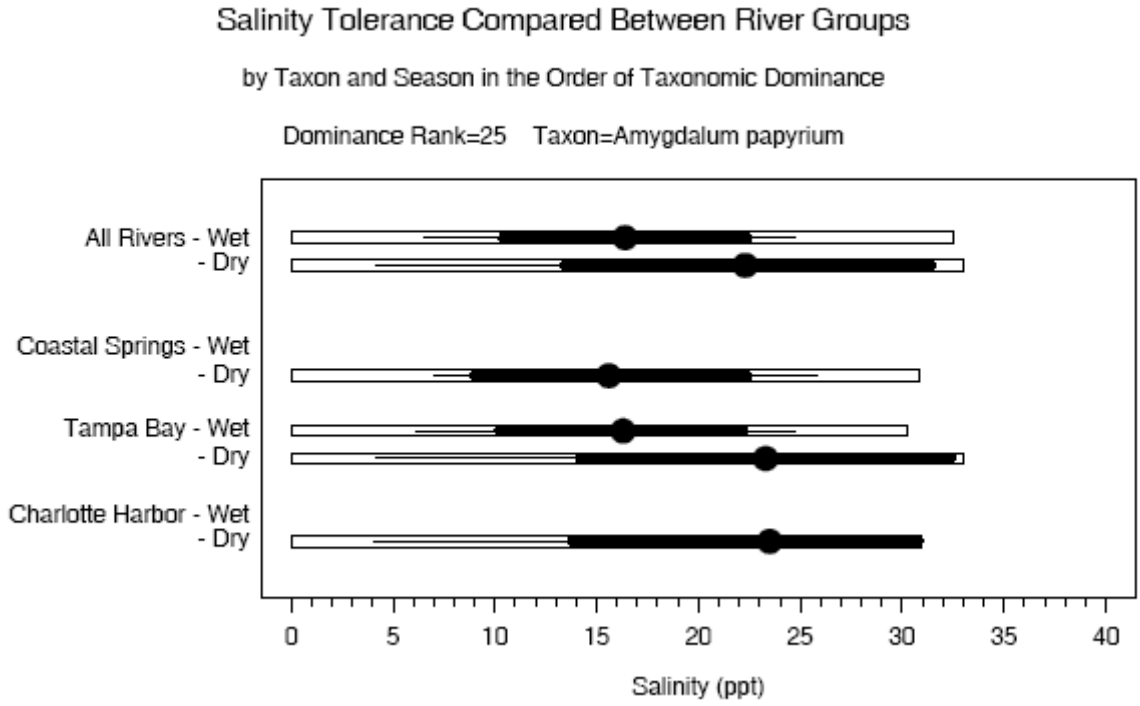

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=15 Taxon=Polymesoda caroliniana
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

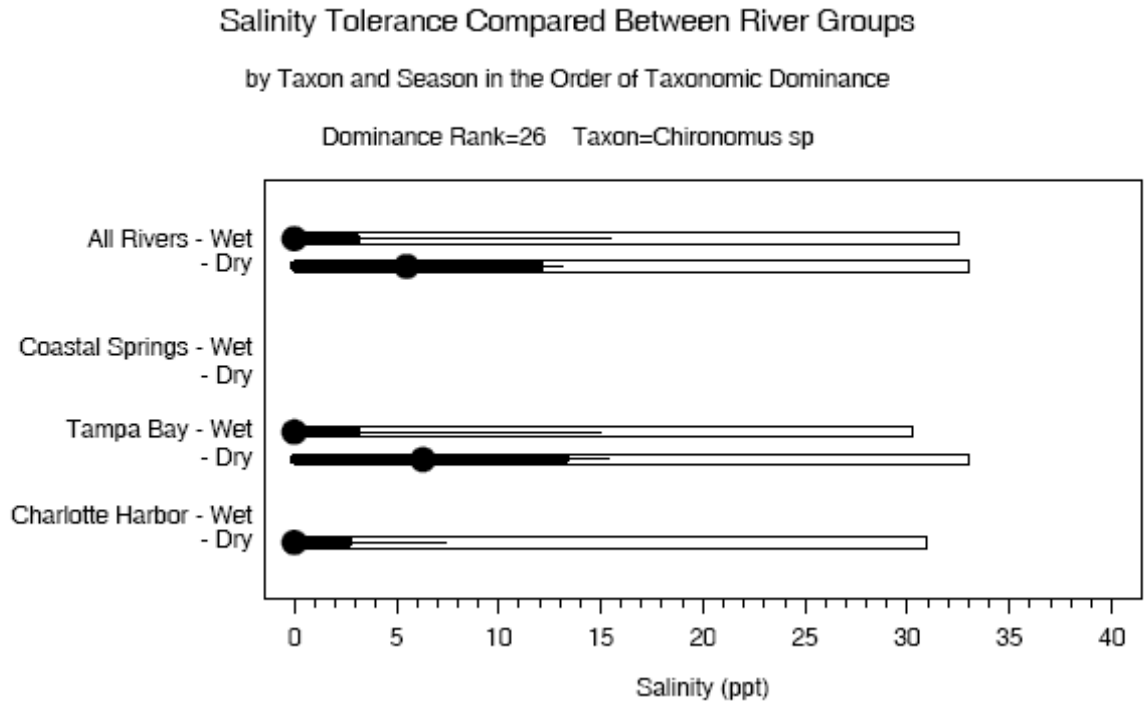

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=18 Taxon=Mesanthura pulchra
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

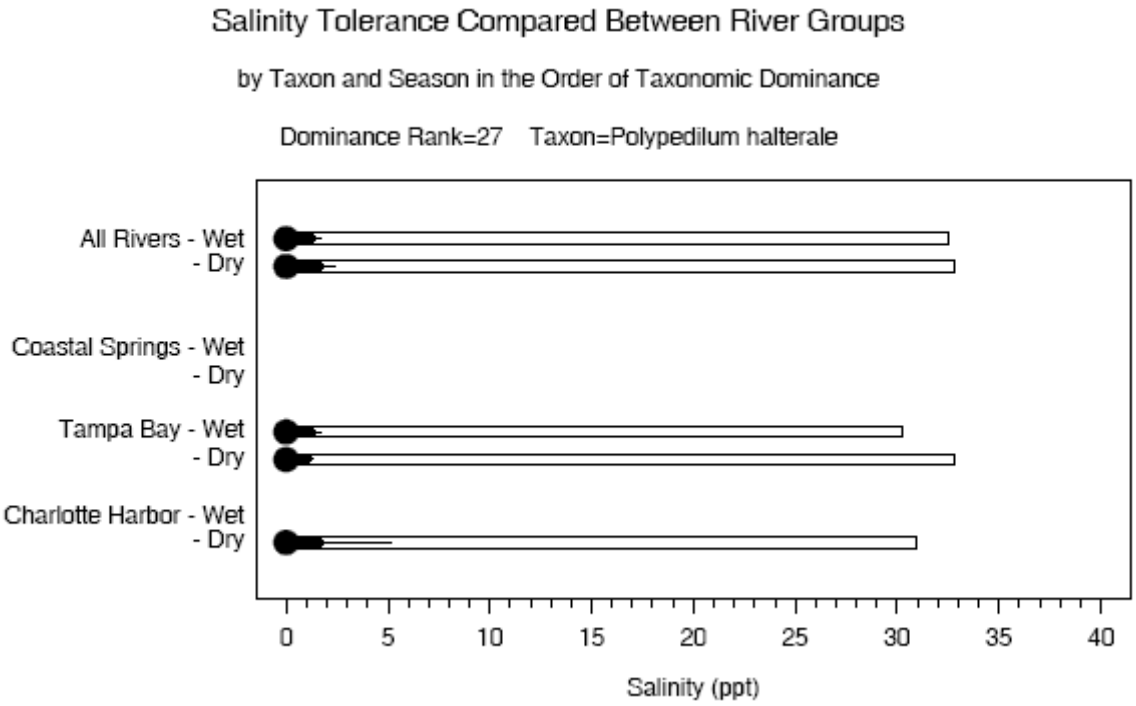

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=19 Taxon=Hydrobiidae
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

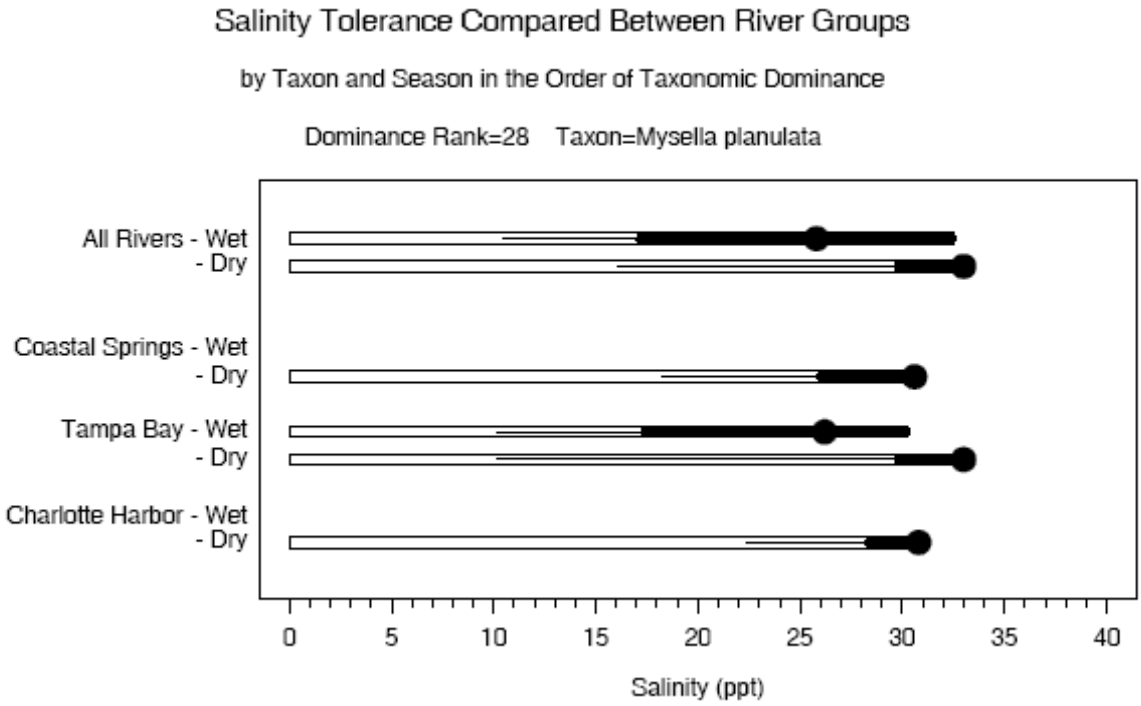

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=20 Taxon=Cyclaspis cf
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

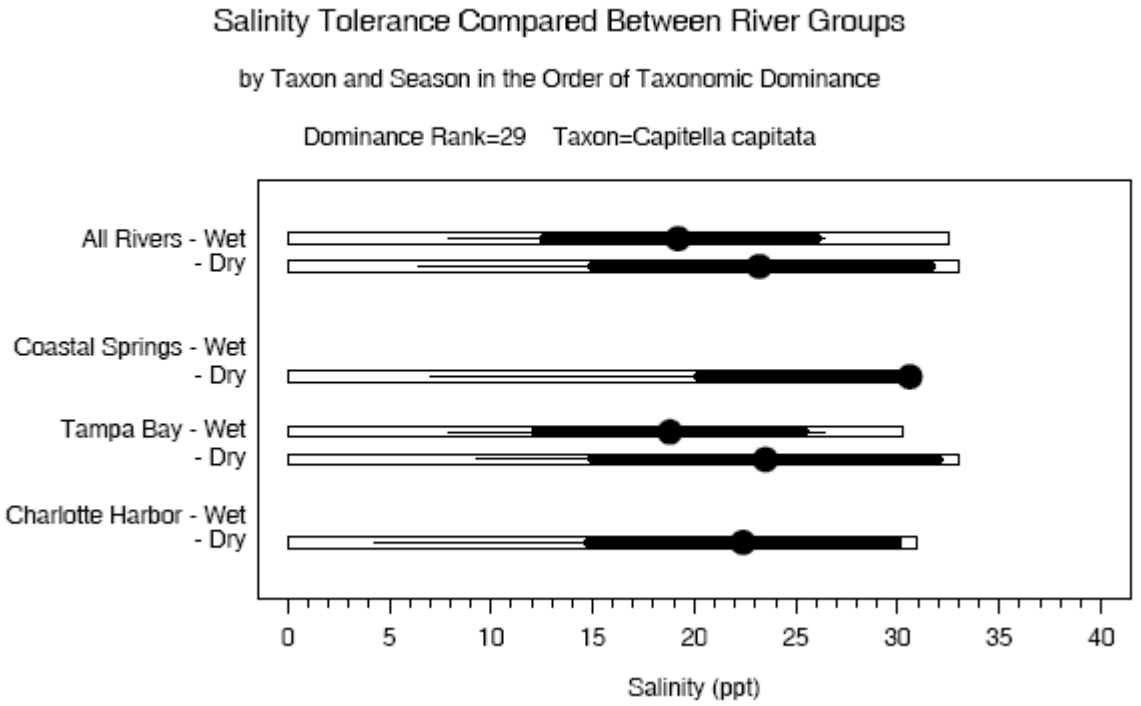

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=23 Taxon=Mulinia lateralis
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)

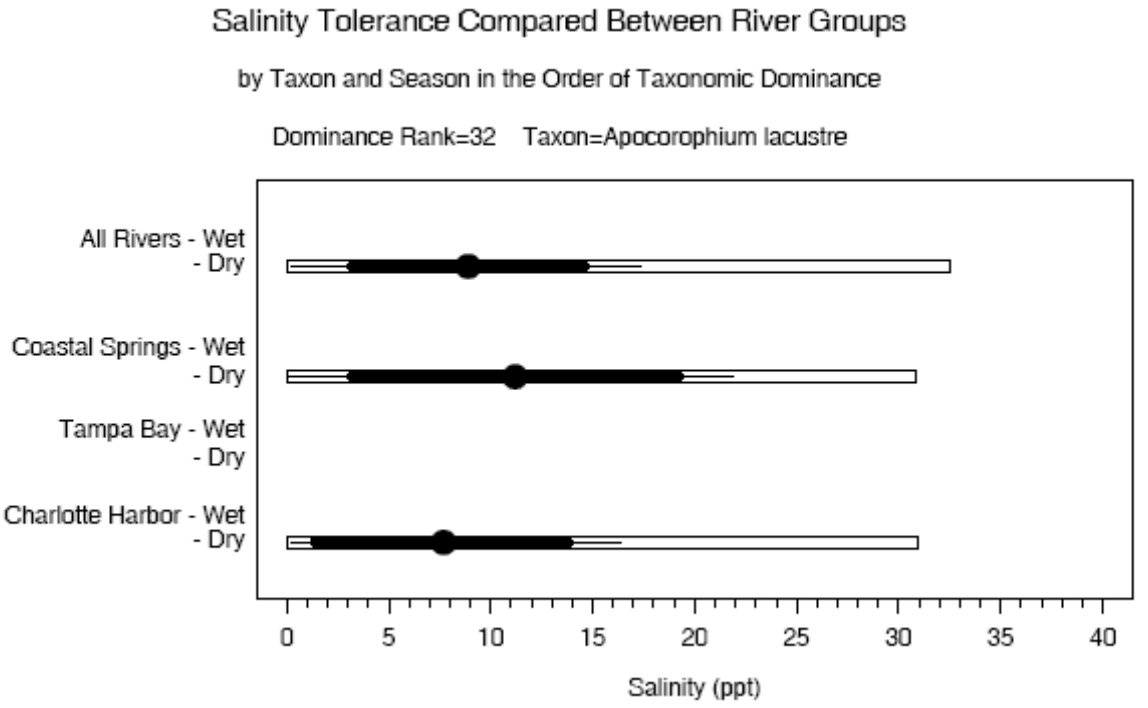

Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=25 Taxon=Amygdalum papyrium
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=26 Taxon=Chironomus sp
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=27 Taxon=Polypedilum halterale
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=28 Taxon=Mysella planulata
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=29 Taxon=Capitella capitata
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
20
25
30
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=32 Taxon=Apocorophium lacustre
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
10
15
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25
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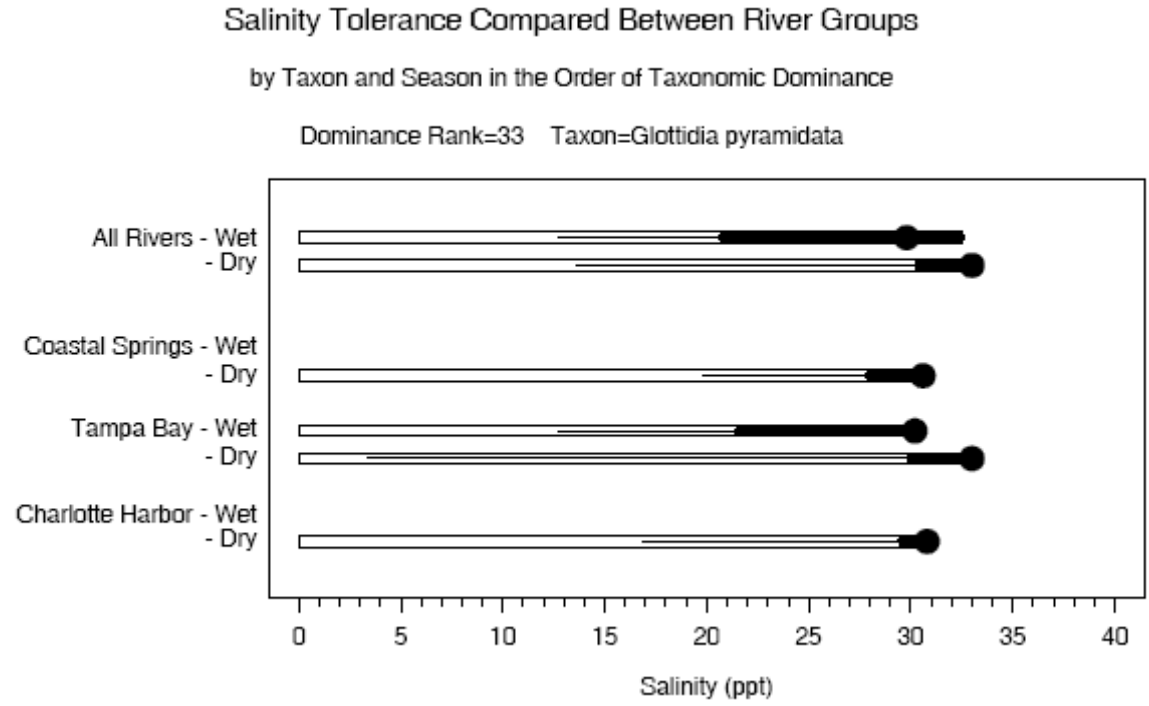
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=33 Taxon=Glottidia pyramidata
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
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25
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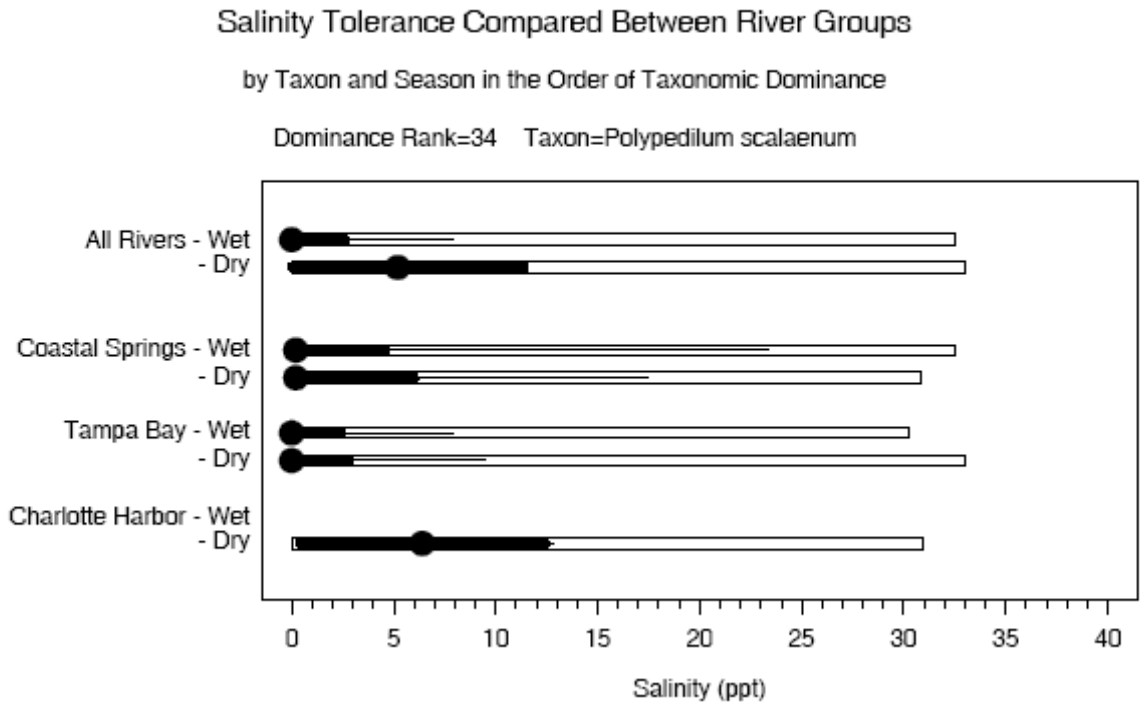
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=34 Taxon=Polypedilum scalaenum
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
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25
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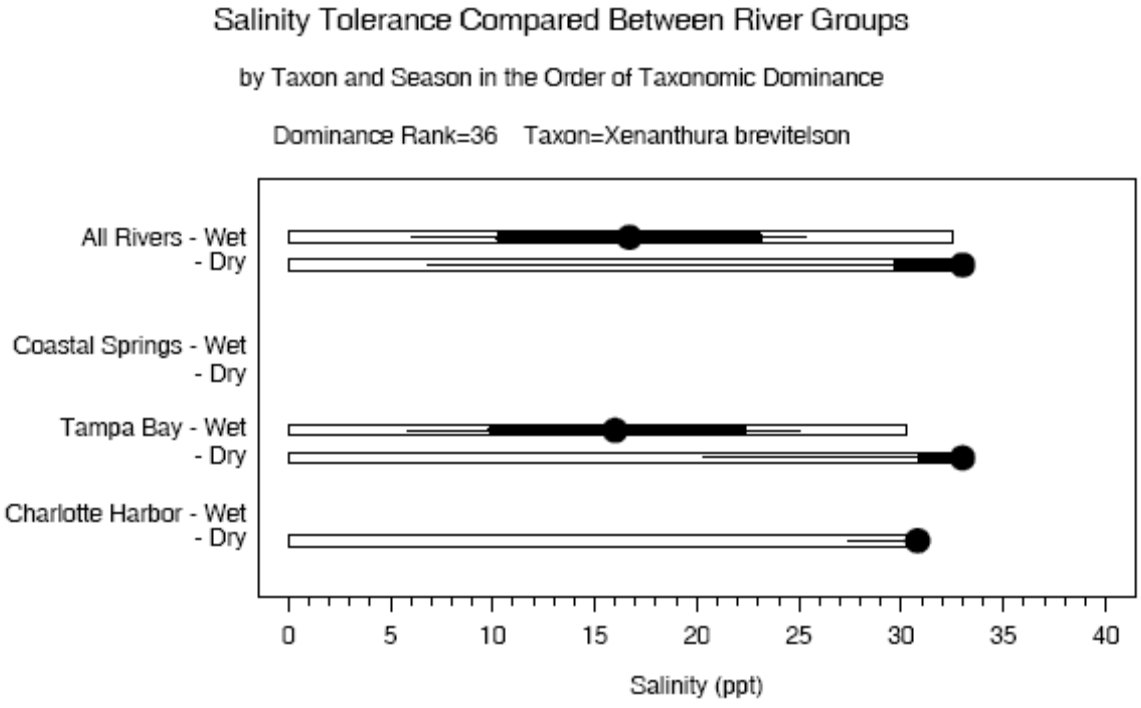
35
40
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=36 Taxon=Xenanthura brevitelson
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
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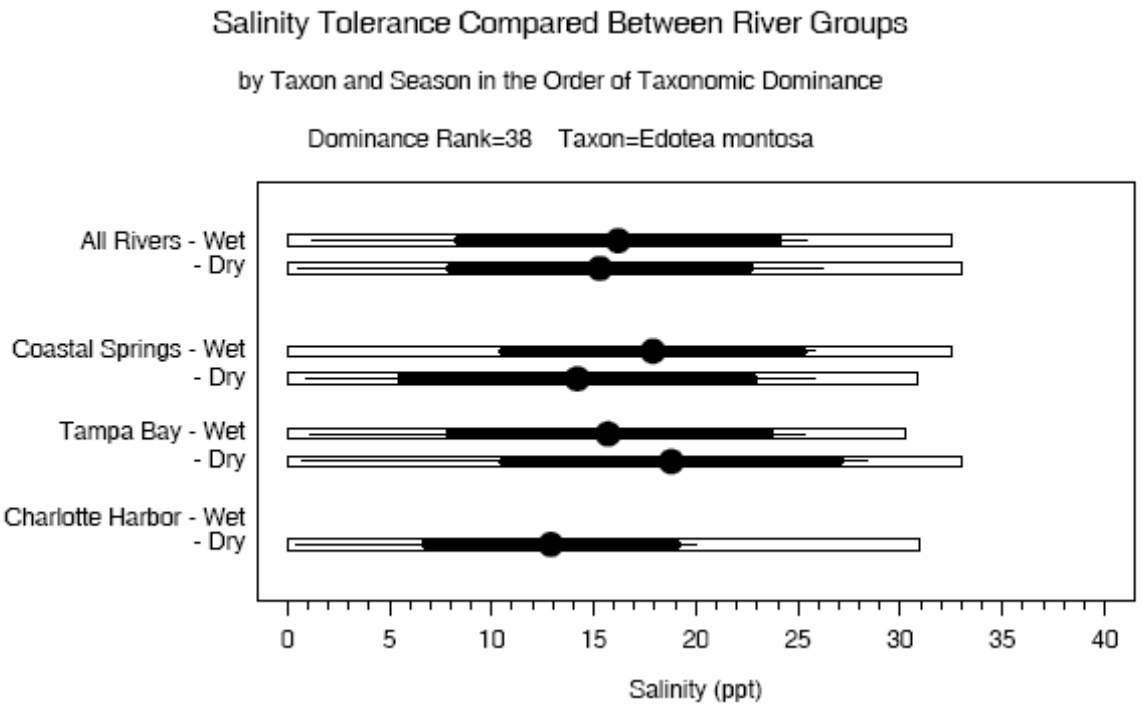
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=38 Taxon=Edotea montosa
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
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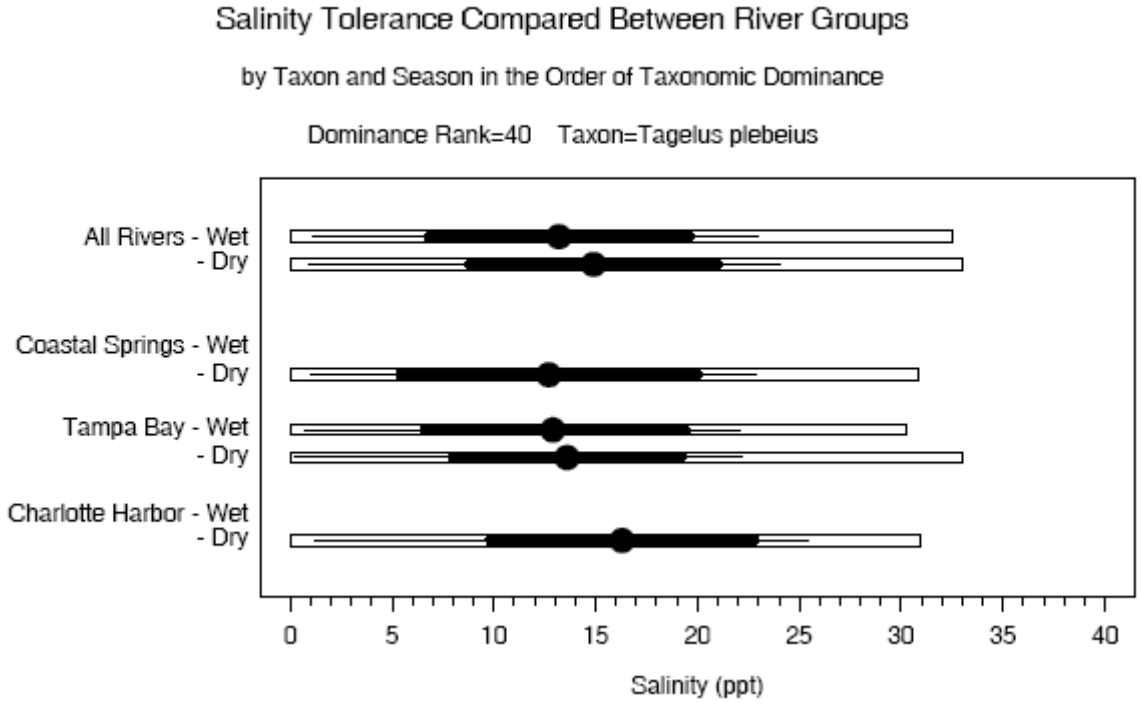
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=40 Taxon=Tagelus plebeius
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
5
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25
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35
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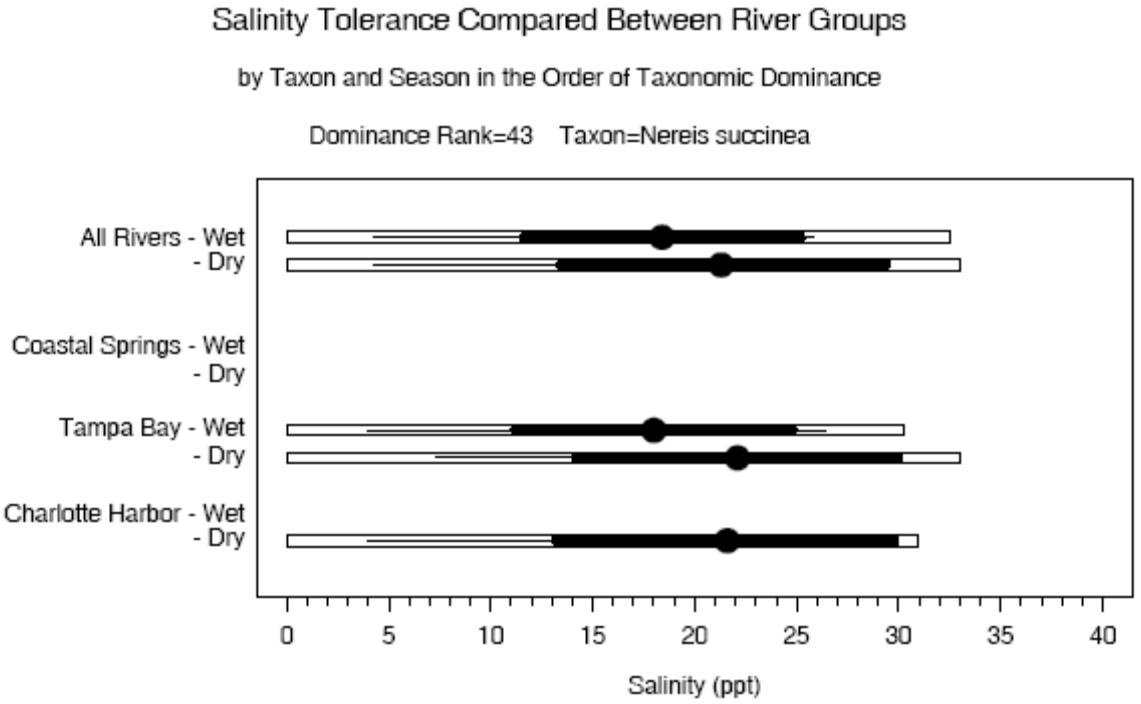
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=43 Taxon=Nereis succinea
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
0
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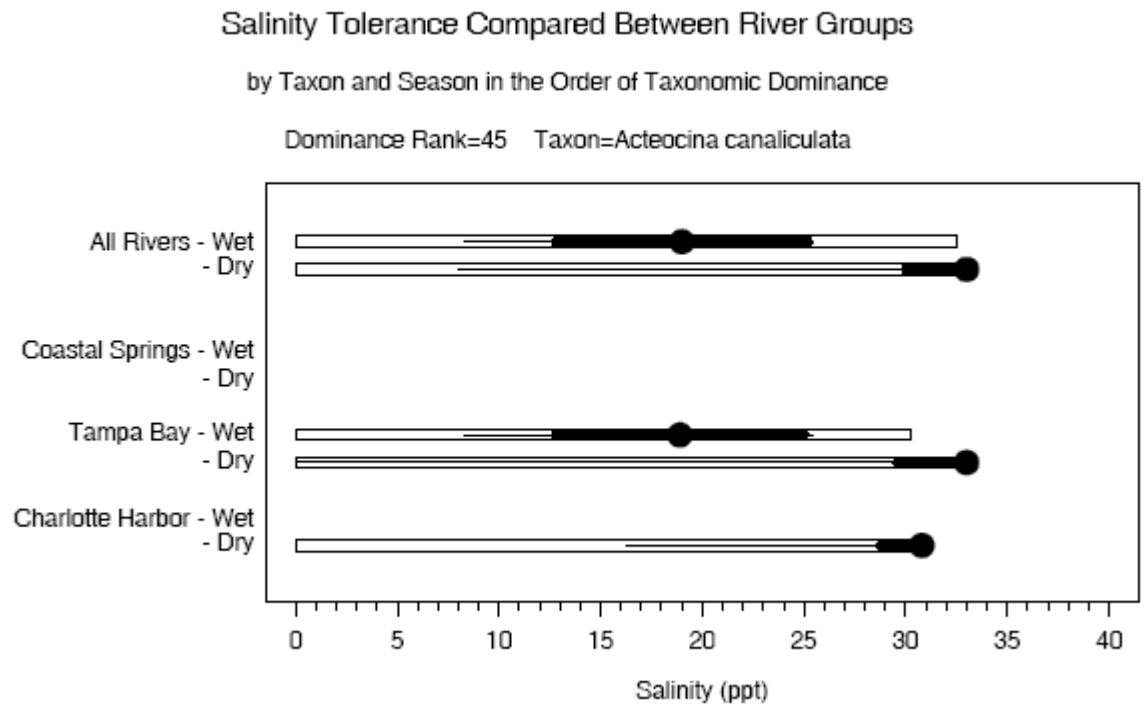
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=45 Taxon=Acteocina canaliculata
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
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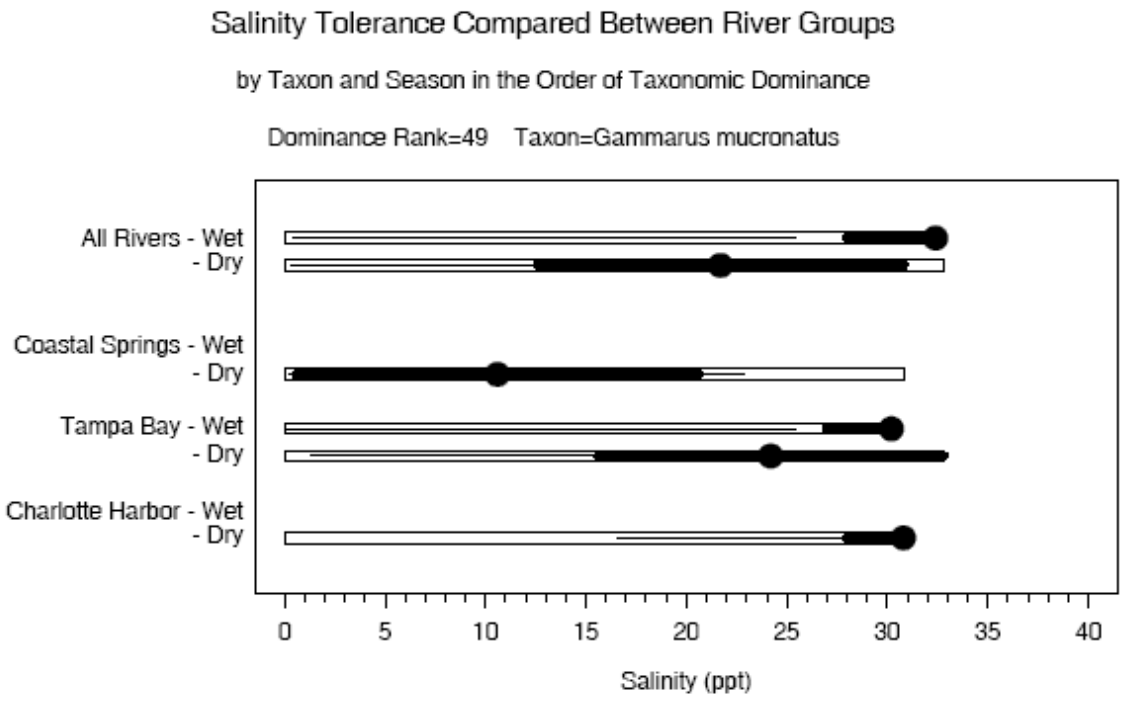
Salinity (ppt)


Salinity Tolerance Compared Between River Groups
by Taxon and Season in the Order of Taxonomic Dominance
Dominance Rank=49 Taxon=Gammarus mucronatus
All Rivers - Wet
- Dry
Coastal Springs - Wet
- Dry
Tampa Bay - Wet
- Dry
Charlotte Harbor - Wet
- Dry
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Salinity (ppt)

Appendix 5-1

Shell Creek Whole River Regression

Whole River Regression Model:

Salinity in Shell Creek is affected by multiple forces including Shell Creek flow, Peace River flow, salinity in the Charlotte Harbor, tide, wind, etc. The Peace River Water Supply Authority has maintained a Hydro-Biological Monitoring Program (HBMP) in Shell Creek conducting fixed station profile and water chemistry samples since 1991. The HBMP station locations are spread throughout Shell Creek from the dam (rkm 10.15) to near the confluence of the Peace River (rkm 2.35). Profile data including salinity, temperature and dissolved oxygen measures were taken at surface, bottom and 1 meter intervals in the water column. Analysis of the surface, bottom, and water column average salinity by river km (Figure below) revealed that Shell Creek was well mixed, with a difference between average surface and bottom salinity generally less than one part per thousand. Therefore, water column average salinity was used for the regression analysis. Examination of scatter plots of salinity and flow revealed that at flows above 500cfs in Shell Creek, salinity at all fixed stations was nearly null (i.e., fresh water). Therefore, the regression analysis was censored to include only flows below 500cfs.

A whole river regression model was developed to predict water column average salinity in Shell Creek as a function of several physical variables. Several factors including missing time values for salinity data and lack of information on background salinity at station Black Marker #9 prior to 1997 restricted analysis to data from 1997-2004 Because the flows from Shell Creek and Peace River at Arcadia were not normally distributed, mathematical transformations of these variables were used to improve the fit of the predictors to the response variable. The natural log transformation was used for the Peace River flow. For Shell Creek, the flow was raised to the power of -0.05. For the purposes of fitting the regression model the river kilometer system was re-assigned such that the distance increases in the downstream direction by subtracting 10.15 from each fixed station and multiplying by -1; however, all results are reported (labeled) in their original scale. Further, the river kilometer was transformed to account for nonlinear increases in salinity with increasing distance downstream. As an indicator of the background salinity, the salinity in Charlotte Harbor at Black Marker #9 was used as a covariate in the regression model. Monthly intercepts were also used to capture variability in the response due to unmeasured factors such as prevailing wind direction and speed that was expressed as seasonality affecting the relationship between inflow and salinity. A Variance Inflation Factor (VIF) score was used to screen the predictor variables for multi-colinearity and no significant multi colinearity existed in the final model based on the VIF scores.

The whole river regression model was highly statistically significant ($Pr>F = < 0.0001$, $r^2 = 0.82$) and predicted water column average salinity adequately at all fixed stations. Plots comparing the predicted and observed salinities and box plots of the inter and intra-annual distribution of residuals (i.e., observed salinity – predicted salinity) for each fixed sampling station modeled in Shell Creek is provided along with the analysis of variance table and parameter estimates in the following pages of this appendix.

The final form of the regression model is:

$$Salinity = \alpha + \beta_{1\text{-}11} Month + \beta_{12} Q_{SC}^{-0.05} + \beta_{13} S_{BM} + \beta_{14} Tide + \beta_{15} (lnQ_{PR}) + \beta_{16} RK^{1.5} + \beta_{17} Q_{SC} * RK$$

where:

Salinity	=	Water Column Average Salinity
$Month_{1\text{-}11}$	=	January-November using December as a reference group
Q_{SC}	=	Shell Creek Flow (raised to the negative power of 0.05)
S_{BM}	=	Salinity - Black Marker
Tide	=	Tide Height at Boca Grande
Q_{PR}	=	Peace River Flow (Natural log transformed)
RK	=	River Kilometer
Q_{SC}*RK	=	Interaction term of Shell flow and River Kilometer
$\beta_{1\text{-}17}$	=	Regression coefficients

Distribution of Depth-Integrated Salinity by Month

The GLM Procedure

Number of Observations Read	591
Number of Observations Used	582

Distribution of Depth-Integrated Salinity by Month

The GLM Procedure

Dependent Variable: mnsal Salinity

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	17	10818.47010	636.38059	147.47	<.0001
Error	564	2433.81568	4.31528		
Corrected Total	581	13252.28578			

R-Square	Coeff Var	Root MSE	mnsal Mean
0.816347	54.67415	2.077324	3.799463

Source	DF	Type I SS	Mean Square	F Value	Pr > F
fpower_05m	1	7286.357847	7286.357847	1688.50	<.0001
rk_x	1	1516.900444	1516.900444	351.52	<.0001
bot_sal_blmk	1	802.345005	802.345005	185.93	<.0001
SHELL*rk1	1	31.160525	31.160525	7.22	0.0074
elev	1	216.806807	216.806807	50.24	<.0001
lpeace	1	639.044918	639.044918	148.09	<.0001
m2	1	71.750932	71.750932	16.63	<.0001
m1	1	1.973149	1.973149	0.46	0.4992
m3	1	13.532186	13.532186	3.14	0.0771
m4	1	18.011355	18.011355	4.17	0.0415
m5	1	17.992774	17.992774	4.17	0.0416
m6	1	105.960786	105.960786	24.55	<.0001
m7	1	10.840312	10.840312	2.51	0.1135
m8	1	6.363217	6.363217	1.47	0.2251
m9	1	12.278109	12.278109	2.85	0.0922

Distribution of Depth-Integrated Salinity by Month

The GLM Procedure

Dependent Variable: mnsal Salinity

Source	DF	Type I SS	Mean Square	F Value	Pr > F
m10	1	35.489015	35.489015	8.22	0.0043
m11	1	31.662718	31.662718	7.34	0.0070

Source	DF	Type III SS	Mean Square	F Value	Pr > F
fpower_05m	1	319.265189	319.265189	73.98	<.0001
rk_x	1	1407.051640	1407.051640	326.06	<.0001
bot_sal_blmk	1	129.831788	129.831788	30.09	<.0001
SHELL*rk1	1	141.852246	141.852246	32.87	<.0001
elev	1	23.007527	23.007527	5.33	0.0213
lpeace	1	438.554417	438.554417	101.63	<.0001
m2	1	56.988738	56.988738	13.21	0.0003
m1	1	3.779015	3.779015	0.88	0.3498
m3	1	5.865884	5.865884	1.36	0.2441
m4	1	18.517632	18.517632	4.29	0.0388
m5	1	1.673624	1.673624	0.39	0.5337
m6	1	72.931655	72.931655	16.90	<.0001
m7	1	9.272204	9.272204	2.15	0.1432
m8	1	9.763383	9.763383	2.26	0.1331
m9	1	7.777553	7.777553	1.80	0.1800
m10	1	6.589706	6.589706	1.53	0.2171
m11	1	31.662718	31.662718	7.34	0.0070

Distribution of Depth-Integrated Salinity by Month

The GLM Procedure

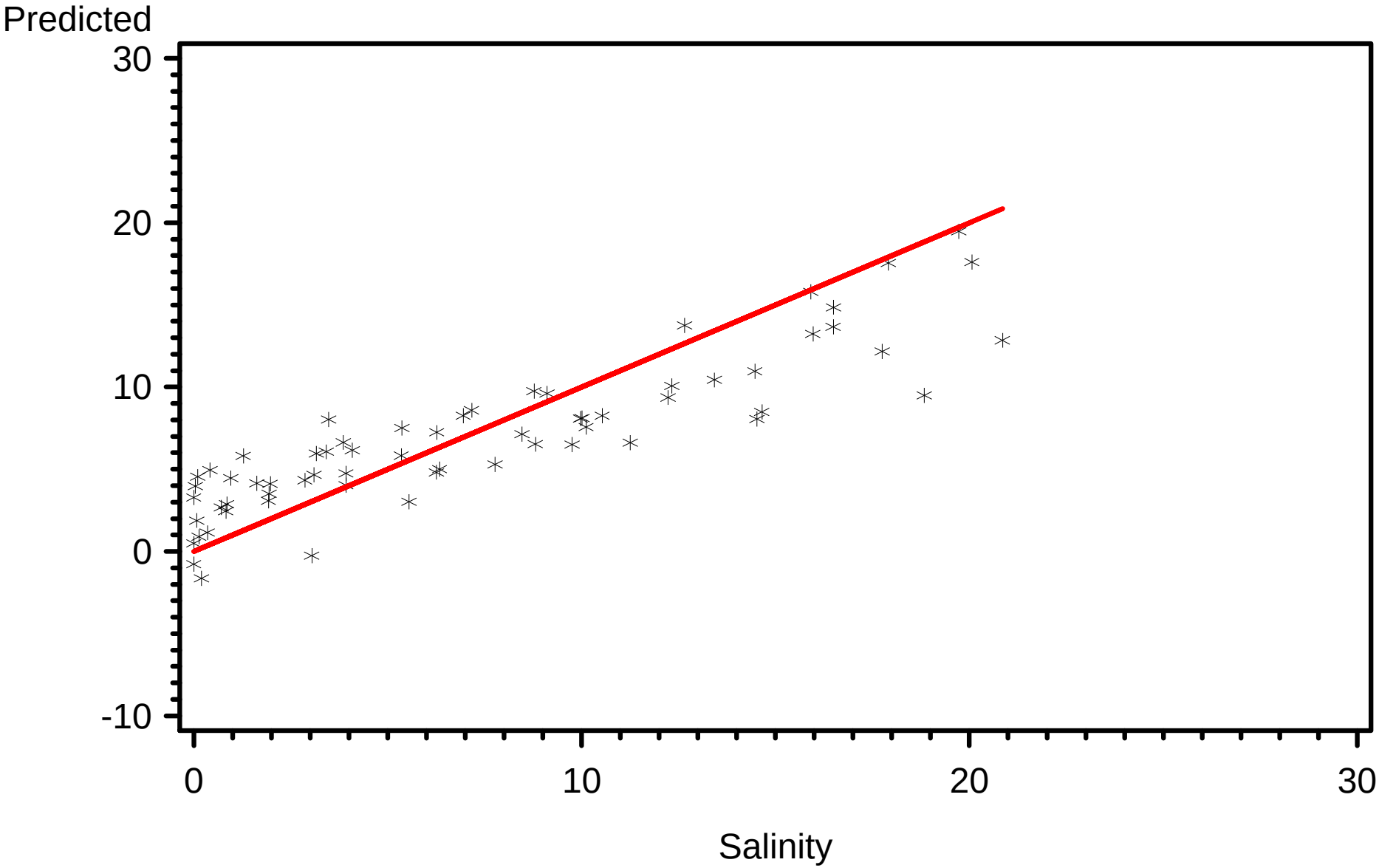
Dependent Variable: mnsal Salinity

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-12.40717646	3.03151701	-4.09	<.0001
fpower_05m	22.69300848	2.63827815	8.60	<.0001
rk_x	0.29157160	0.01614710	18.06	<.0001
bot_sal_blmk	0.12356416	0.02252715	5.49	<.0001
SHELL*rk1	-0.00132505	0.00023111	-5.73	<.0001
elev	0.60967040	0.26403678	2.31	0.0213
lpeace	-1.47377952	0.14619249	-10.08	<.0001
m2	-1.44253769	0.39695104	-3.63	0.0003
m1	-0.39873146	0.42608423	-0.94	0.3498
m3	-0.45960712	0.39420699	-1.17	0.2441
m4	0.81065421	0.39133366	2.07	0.0388
m5	-0.25258403	0.40558442	-0.62	0.5337
m6	1.70346190	0.41436082	4.11	<.0001
m7	-0.83128481	0.56710392	-1.47	0.1432
m8	0.95172737	0.63272747	1.50	0.1331
m9	0.67116598	0.49993407	1.34	0.1800
m10	0.51411462	0.41603629	1.24	0.2171
m11	-1.01206124	0.37362591	-2.71	0.0070

Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

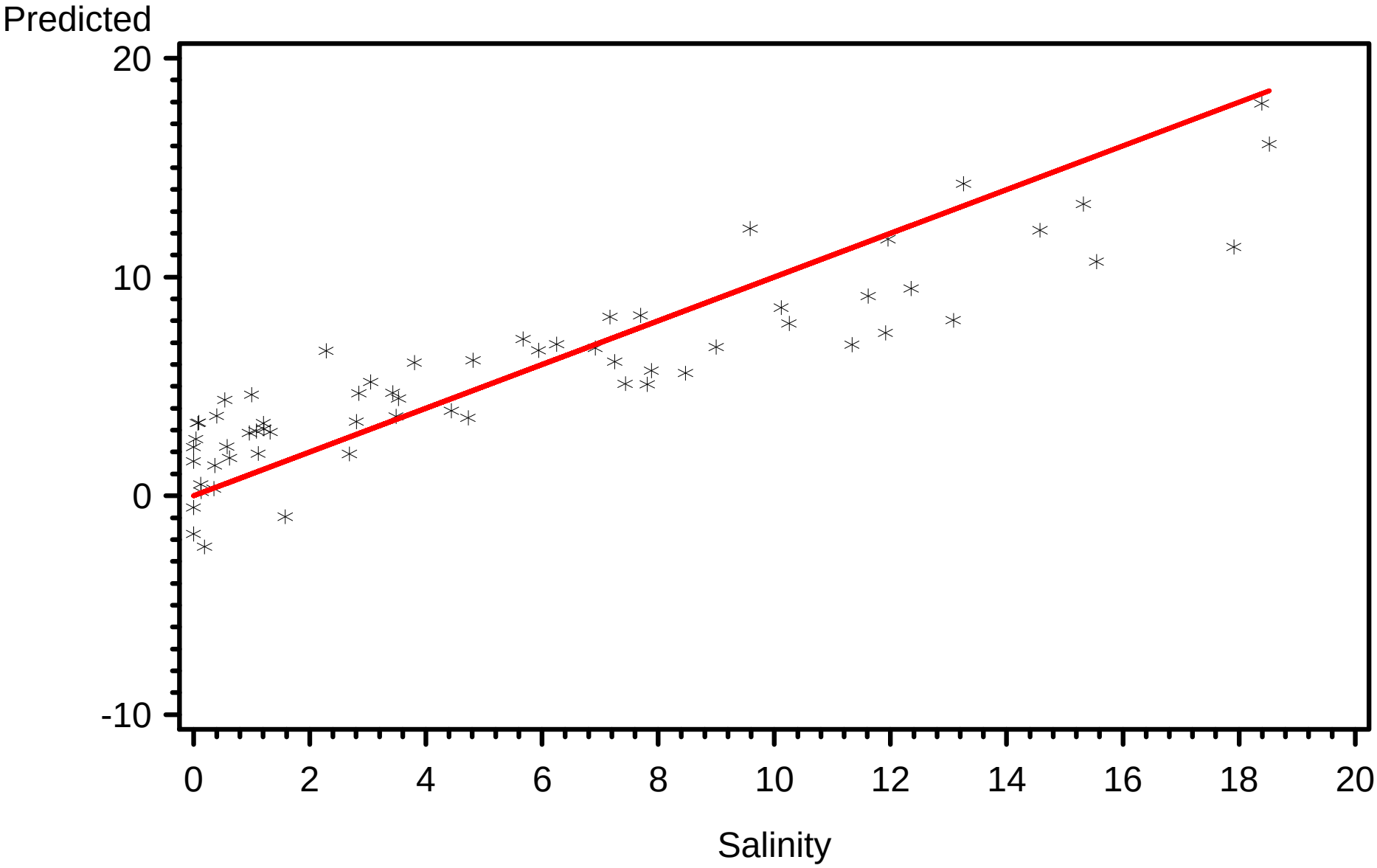
River Kilometer=2.35



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

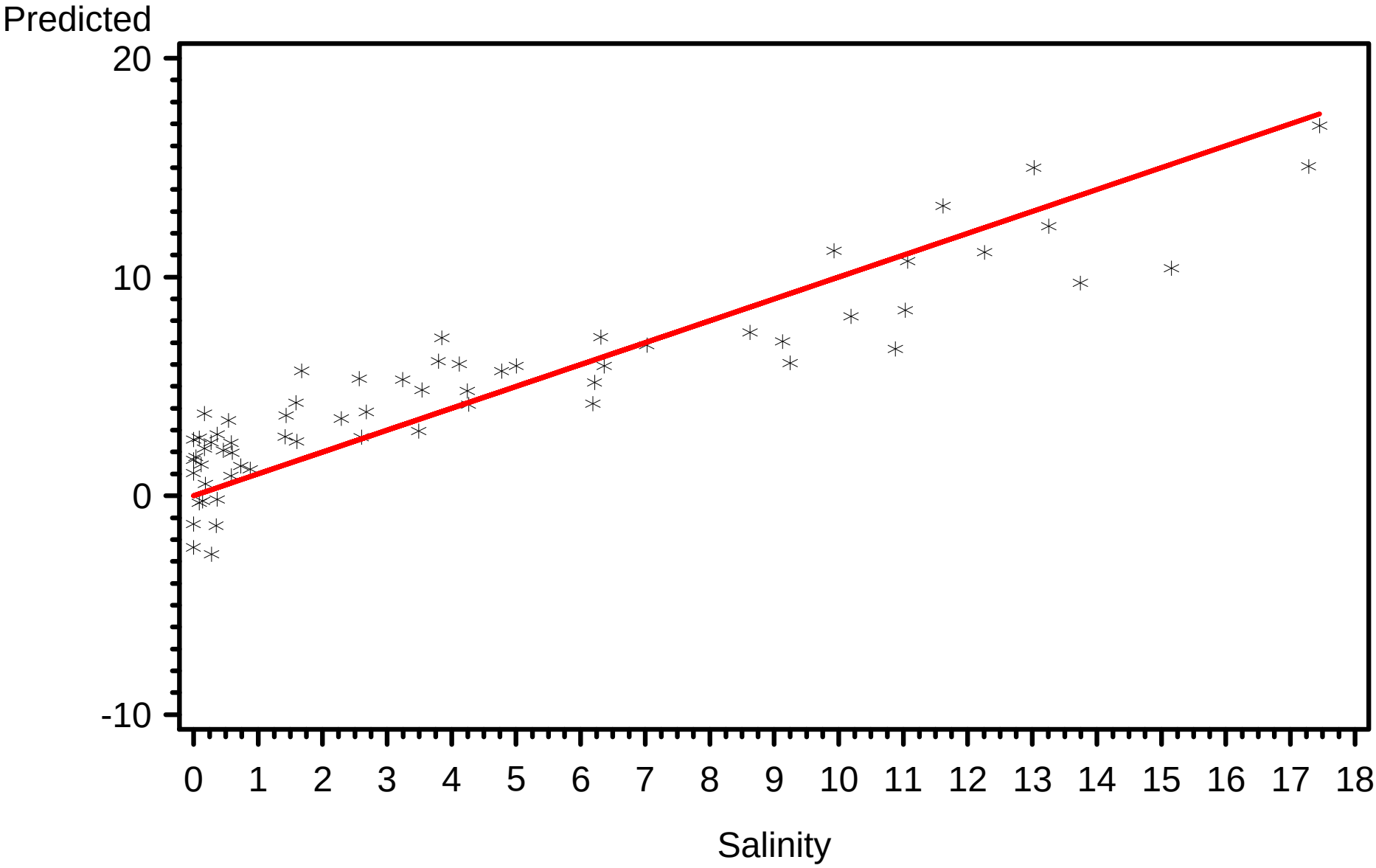
River Kilometer=3.66



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

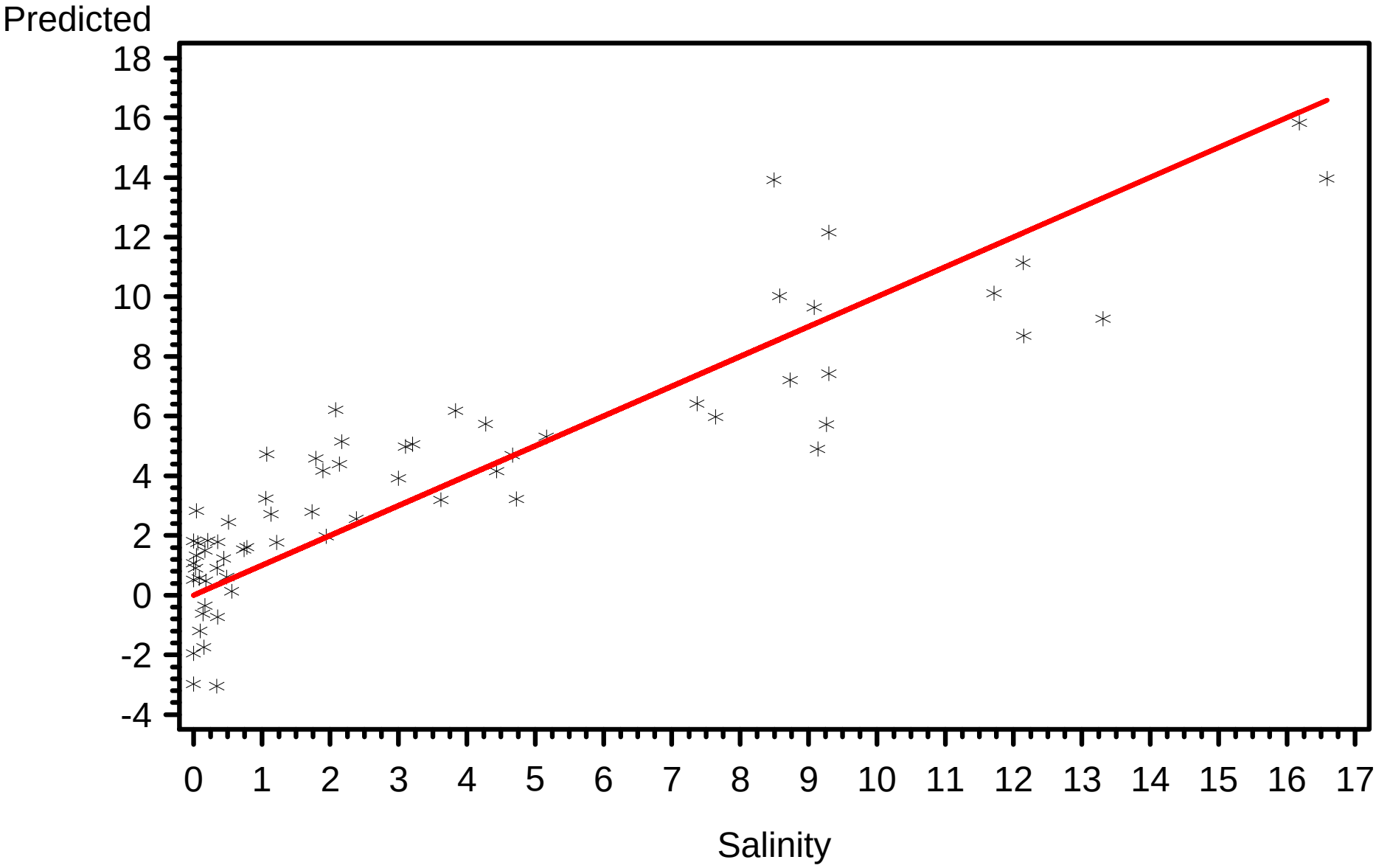
River Kilometer=4.61



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

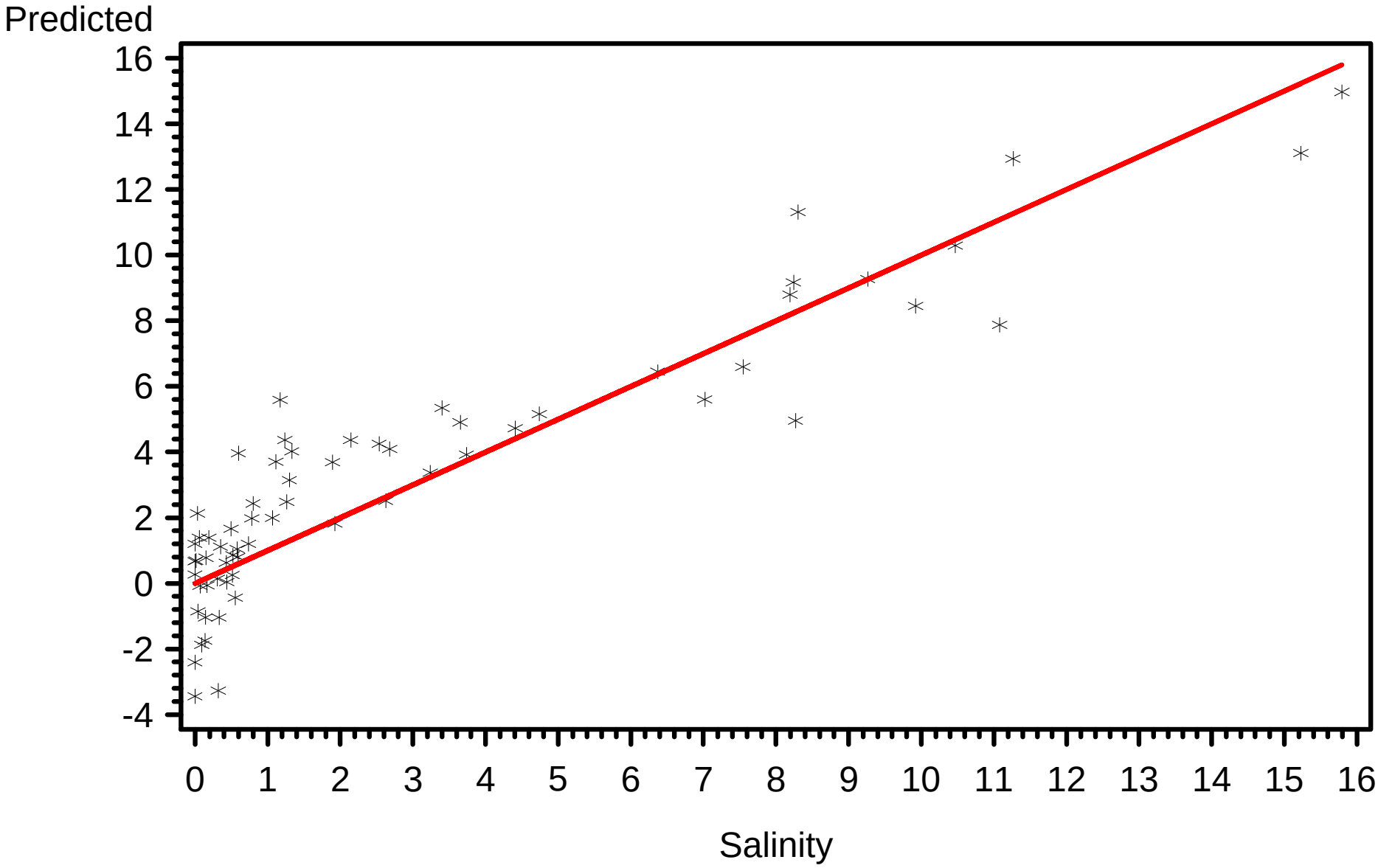
River Kilometer=5.73



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

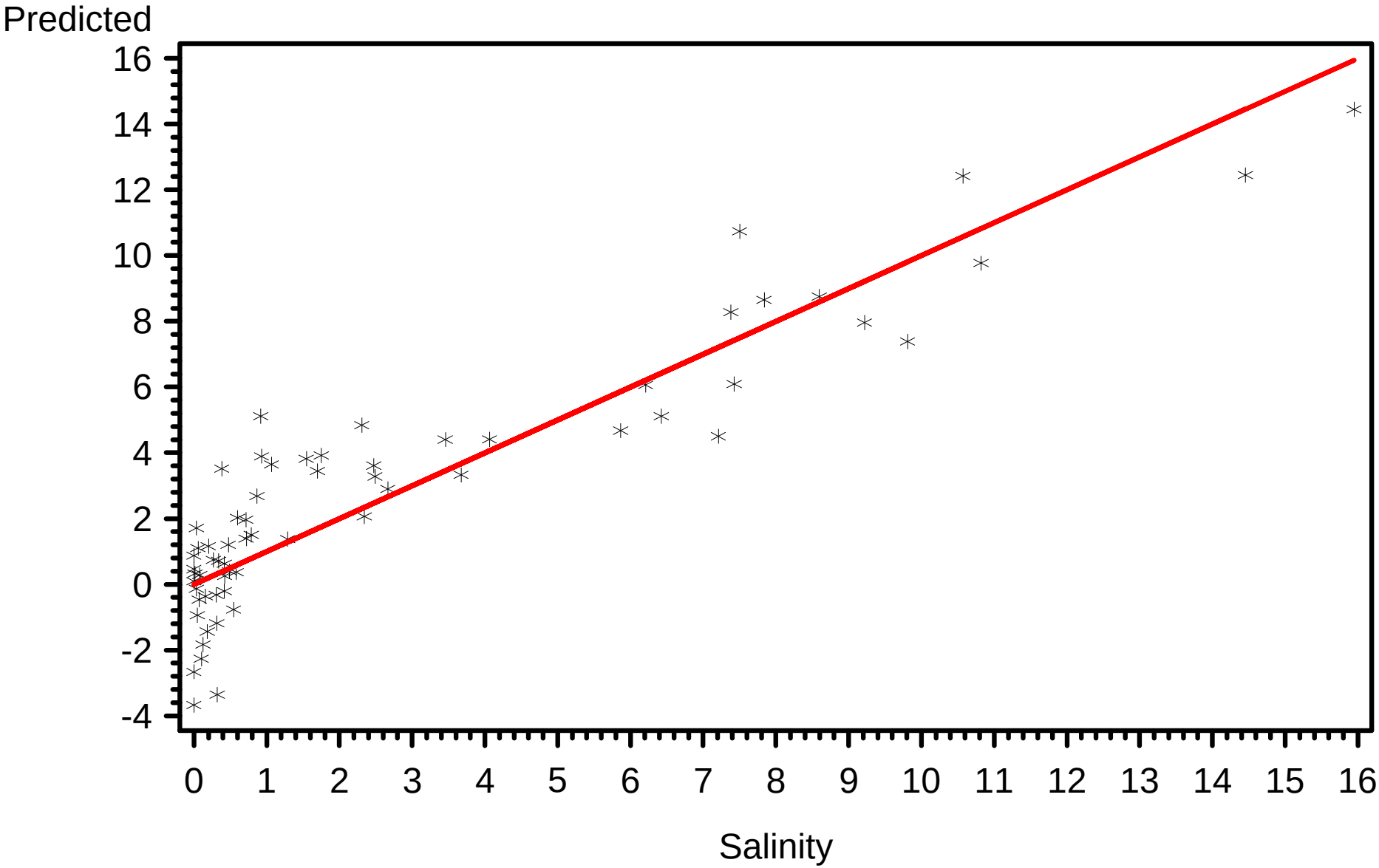
River Kilometer=6.72



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

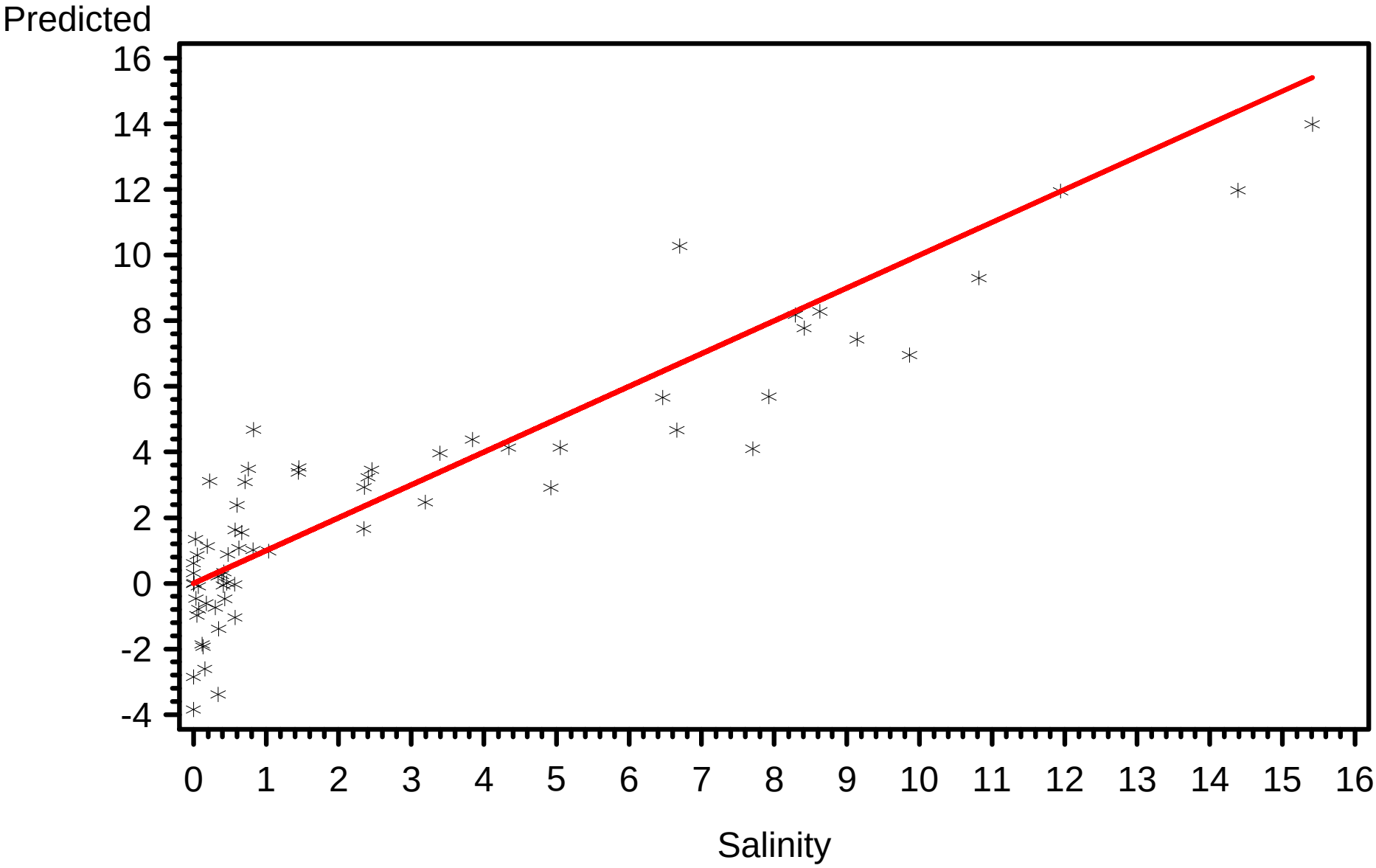
River Kilometer=7.40



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

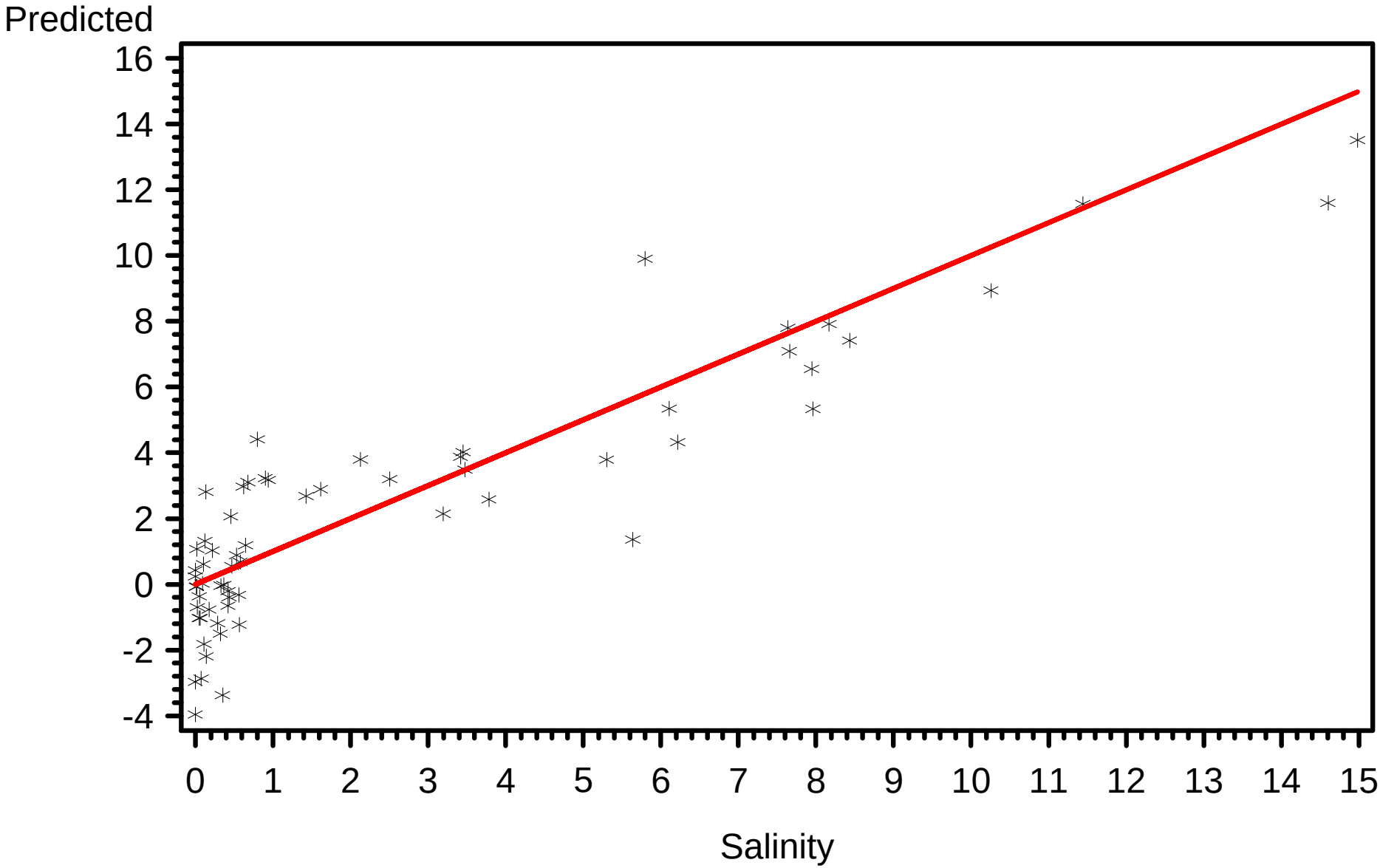
River Kilometer=8.09



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

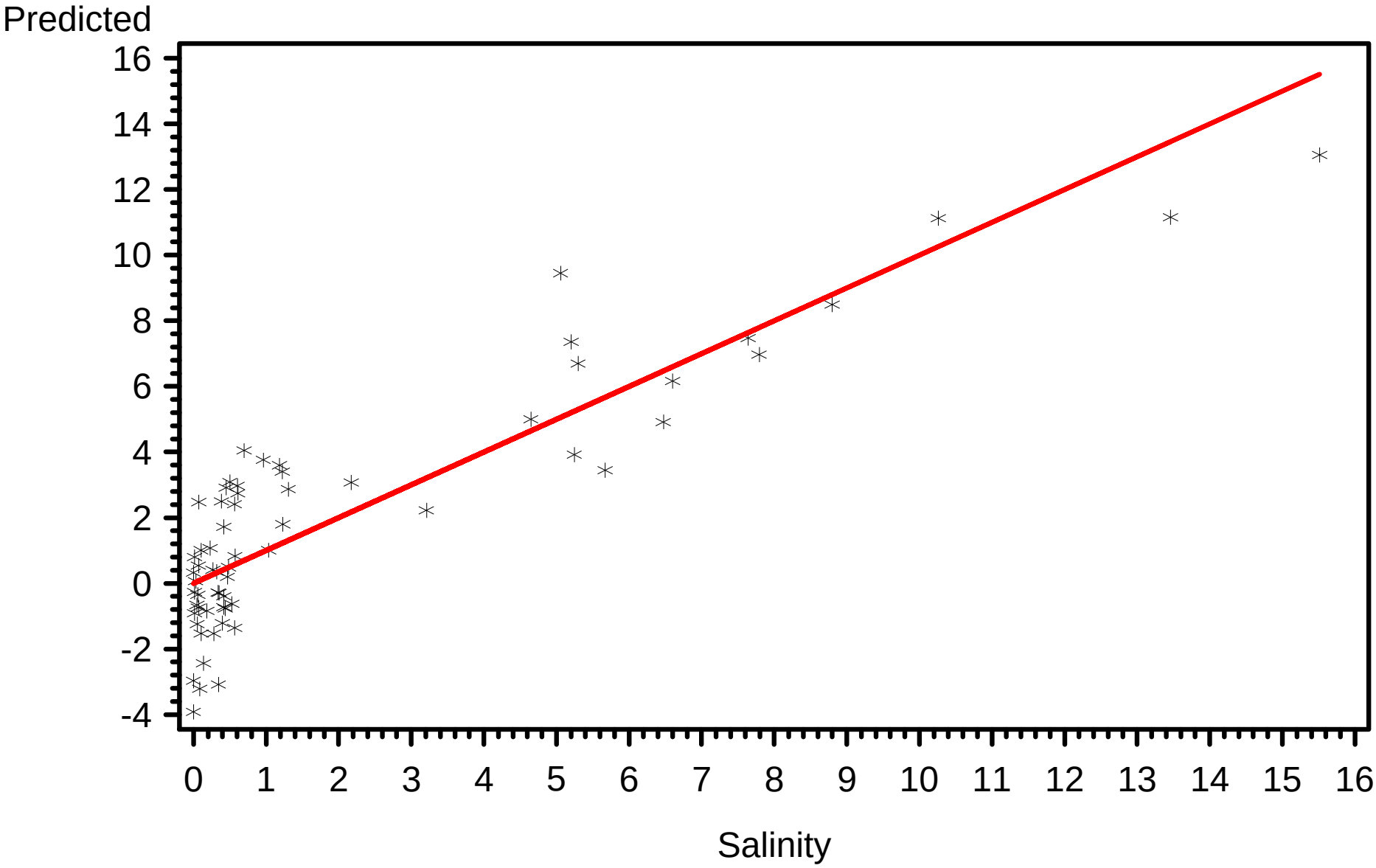
River Kilometer=8.74



Shell Creek 1997-2004

Predicted vs Observed Salinity by Station

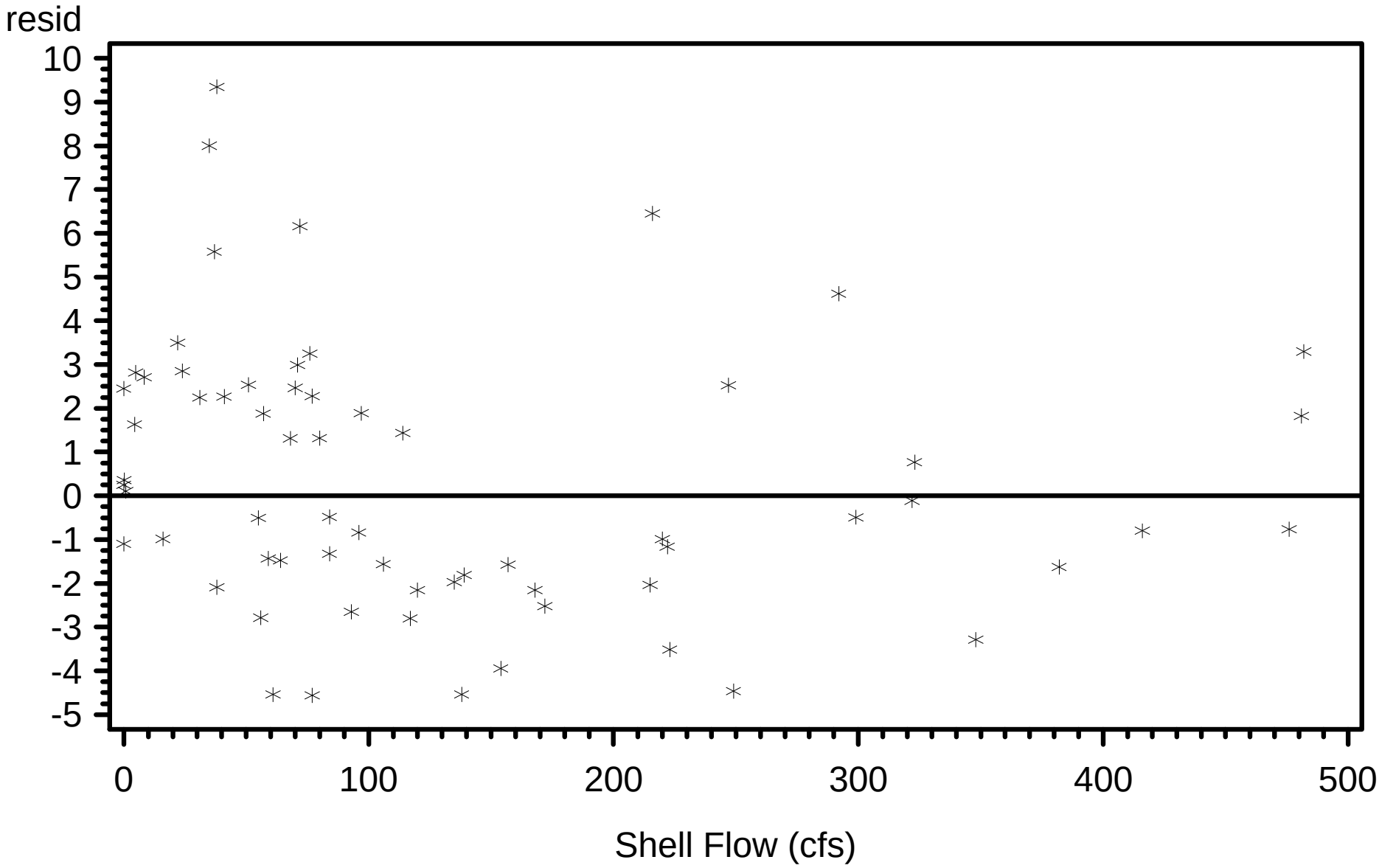
River Kilometer=9.90



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

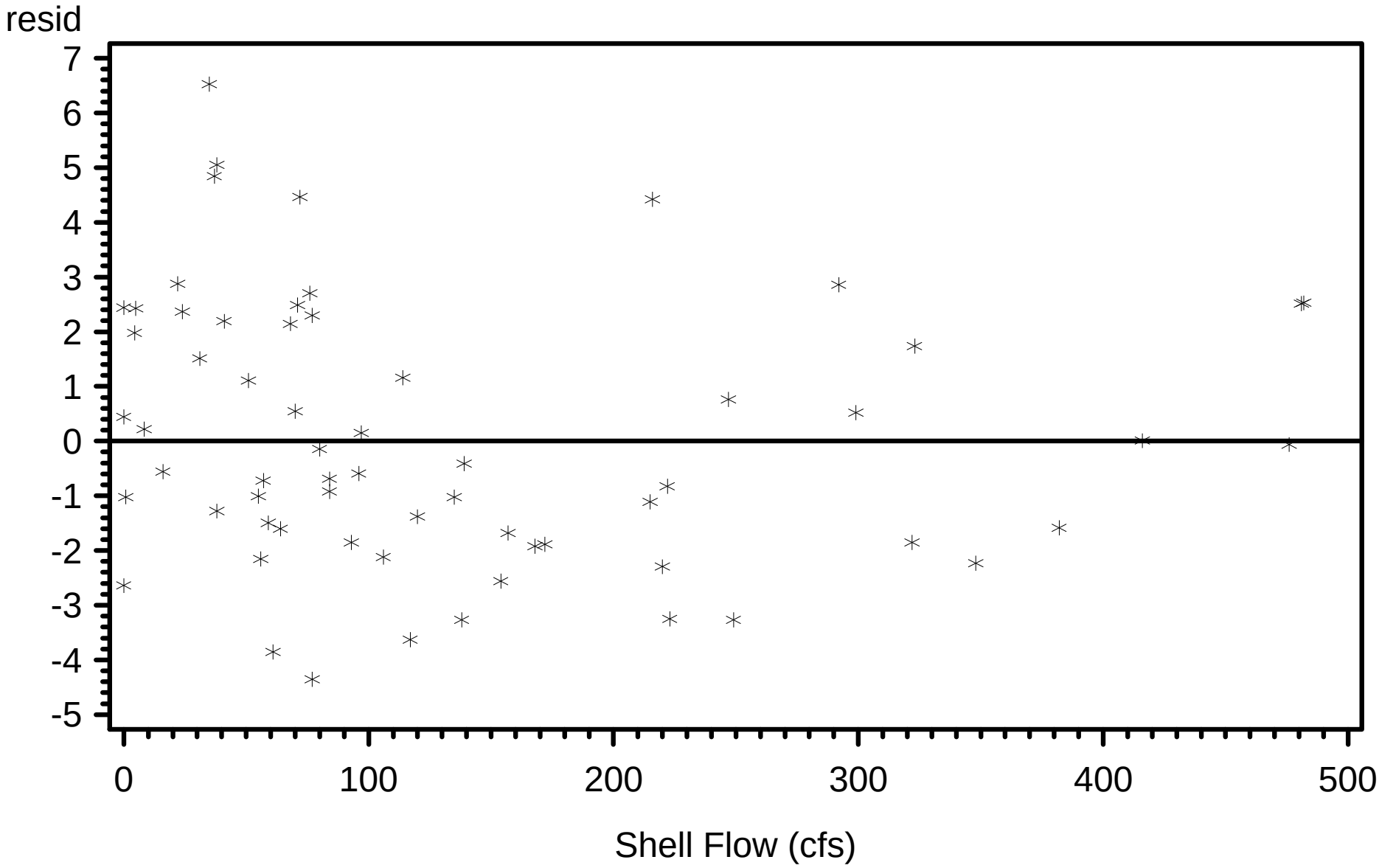
River Kilometer=2.35



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

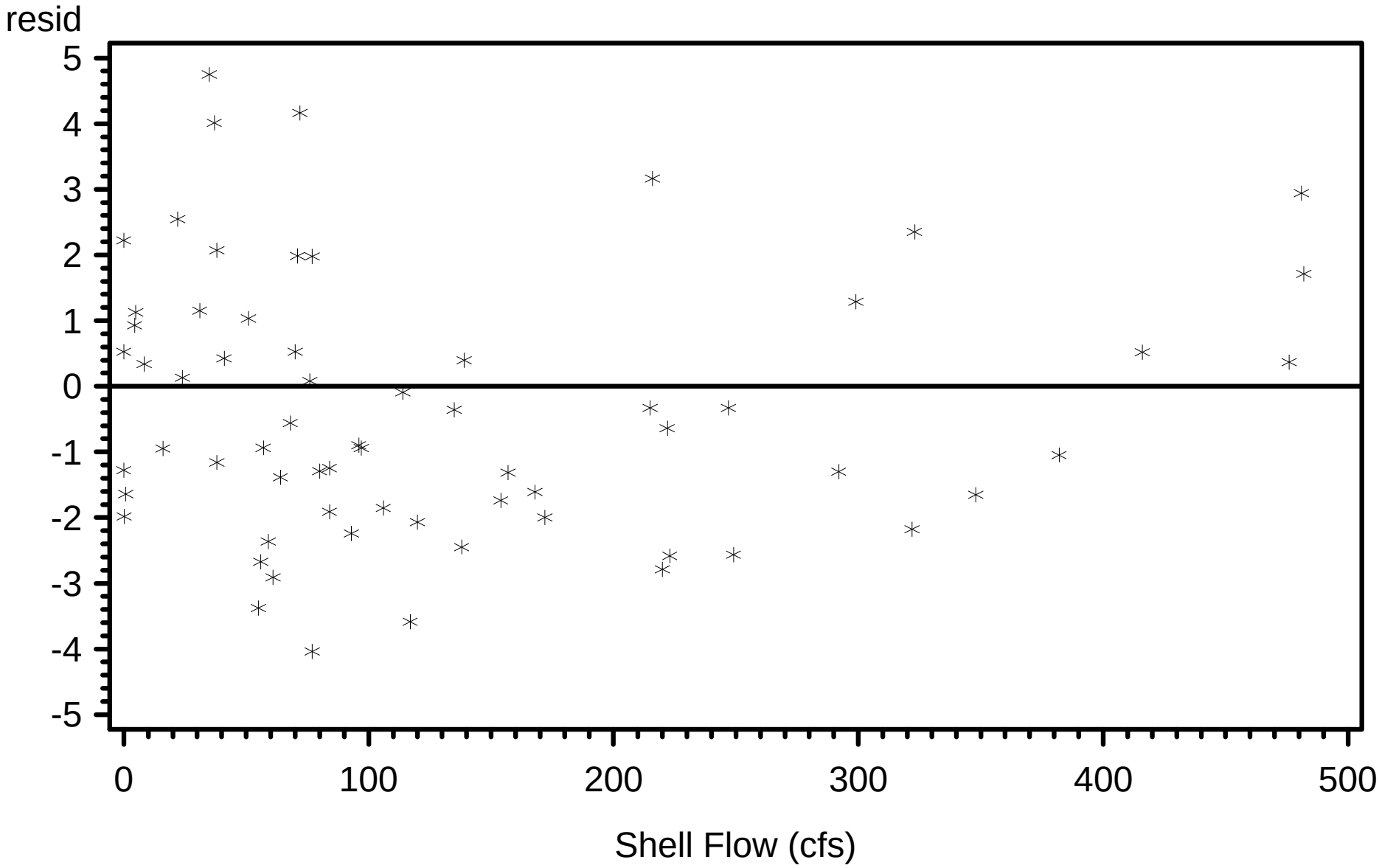
River Kilometer=3.66



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

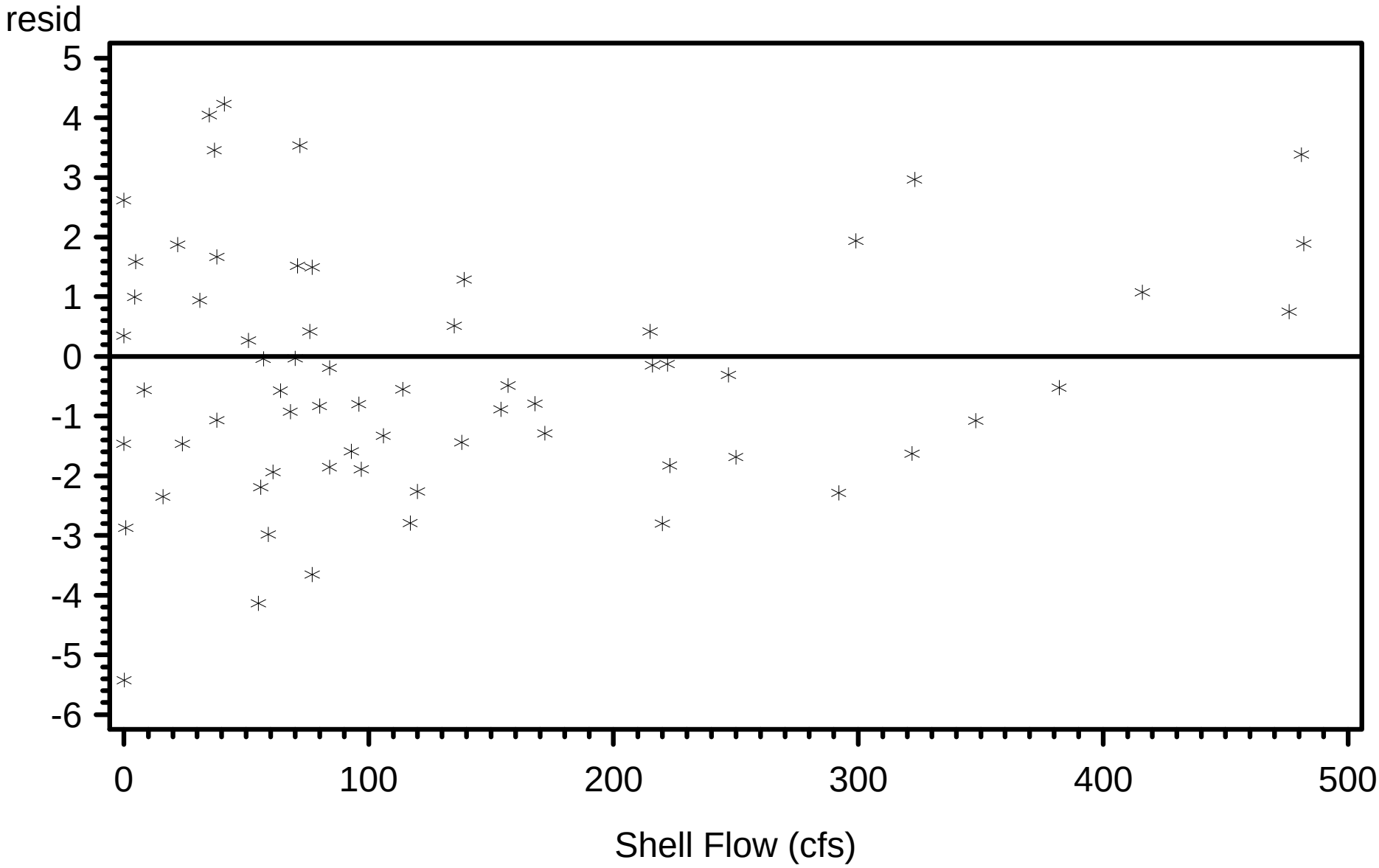
River Kilometer=4.61



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

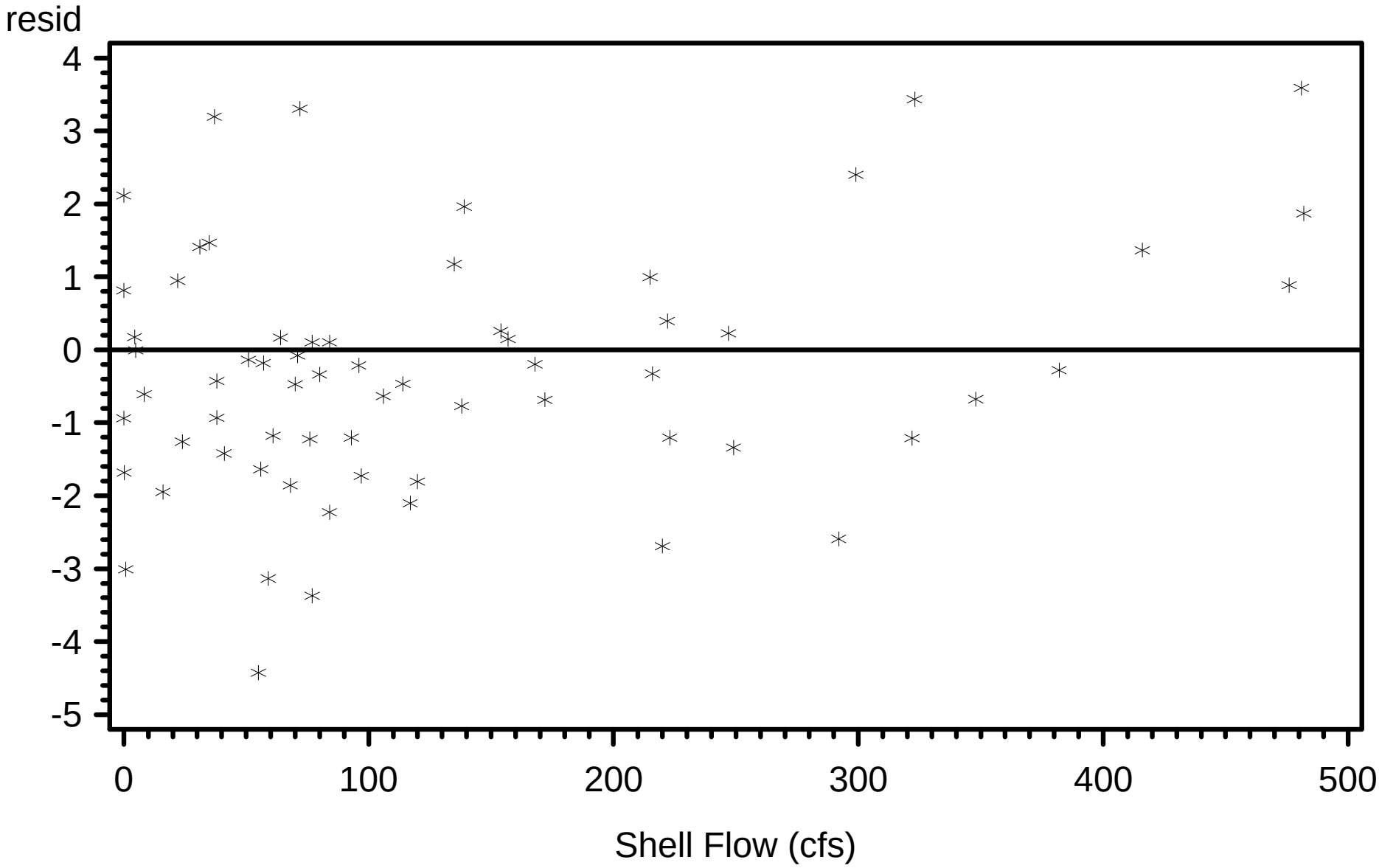
River Kilometer=5.73



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

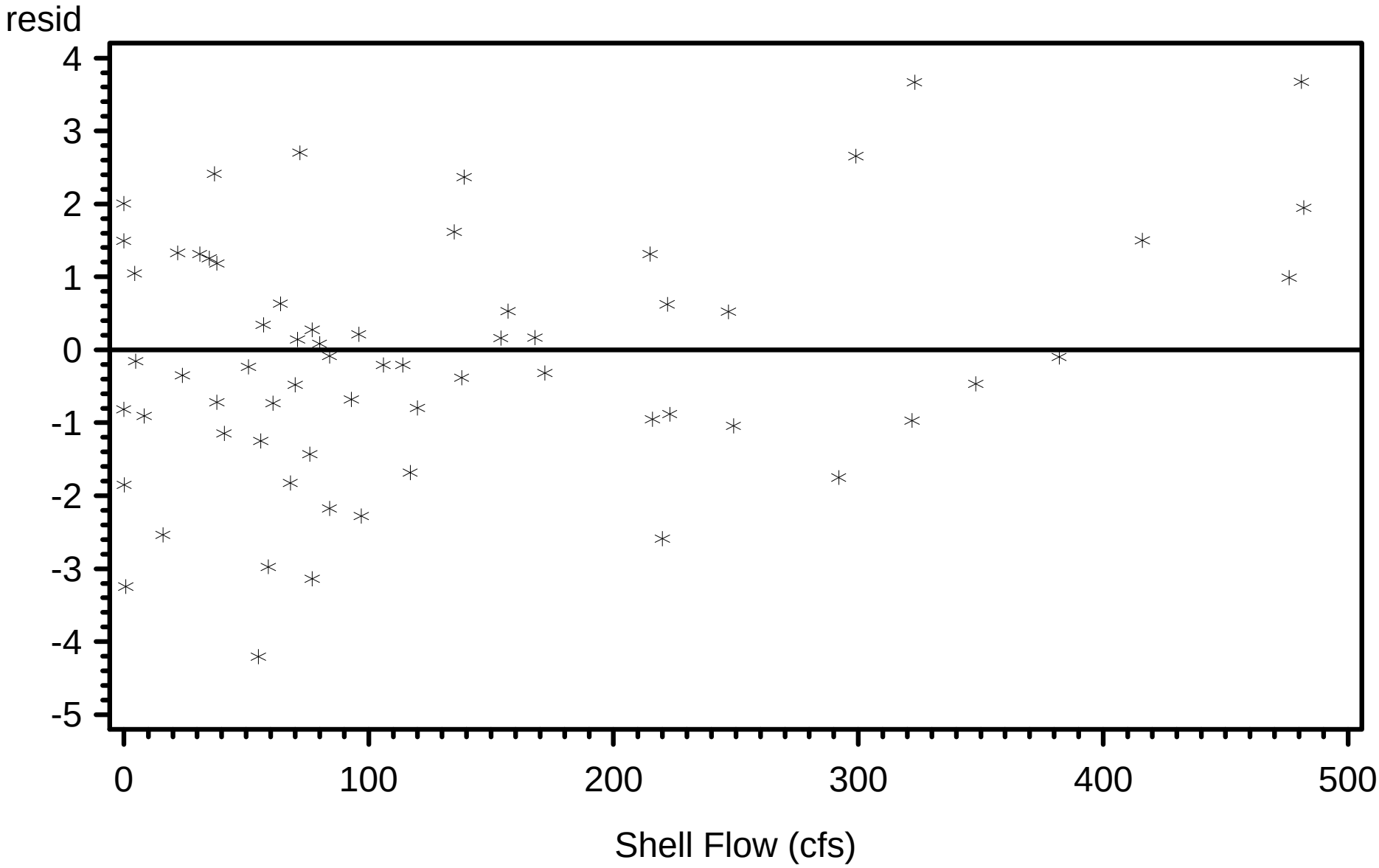
River Kilometer=6.72



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

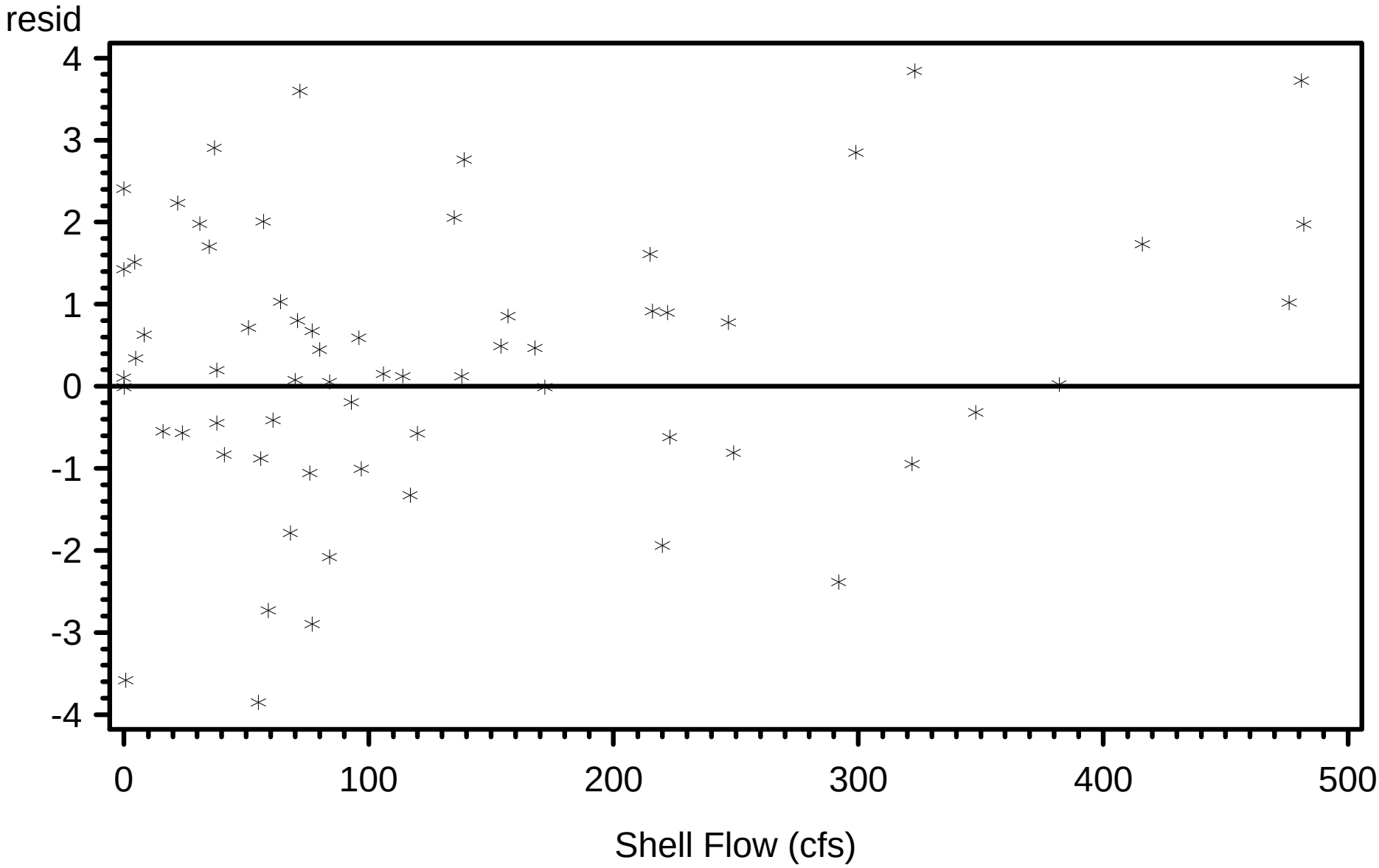
River Kilometer=7.40



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

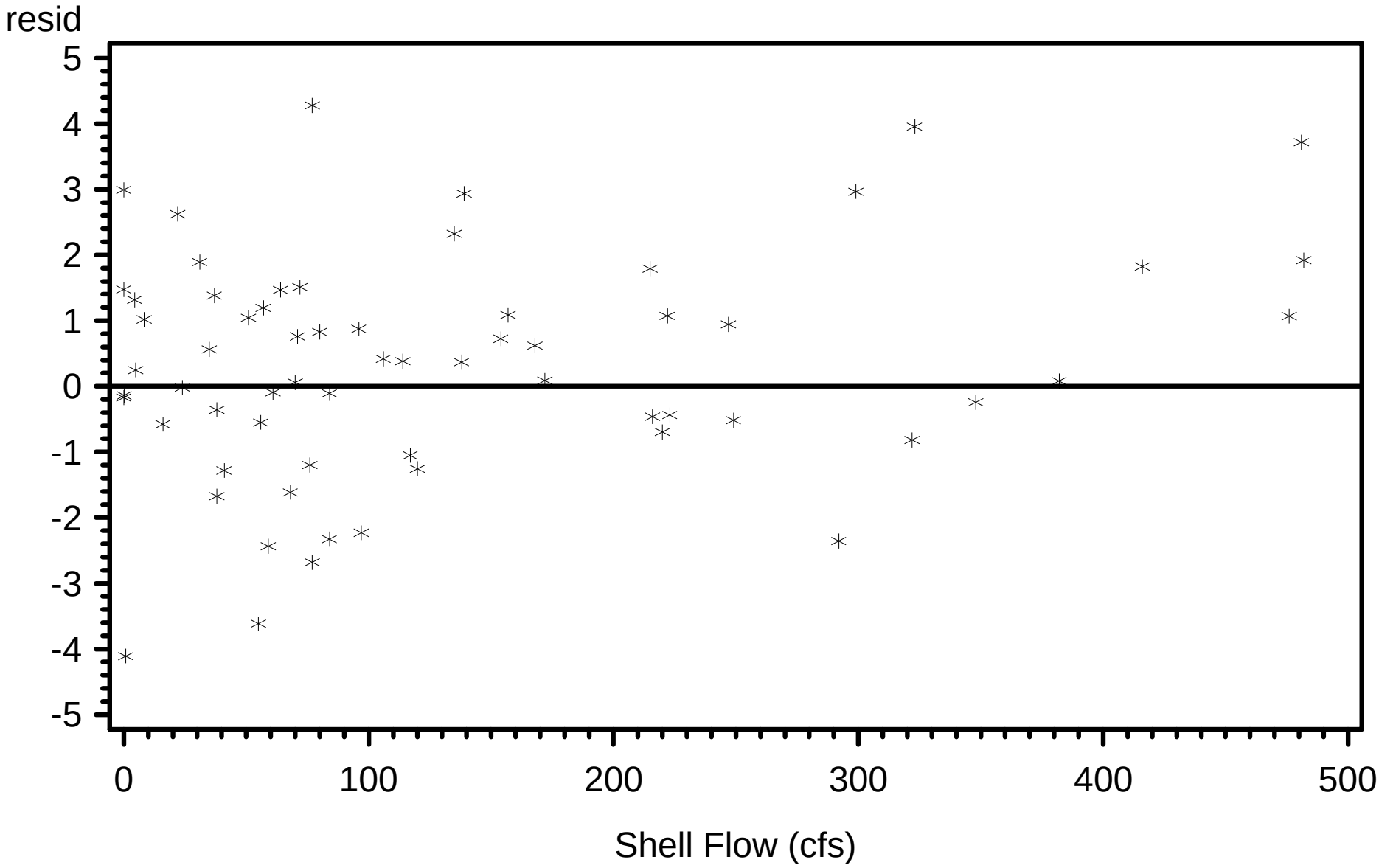
River Kilometer=8.09



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

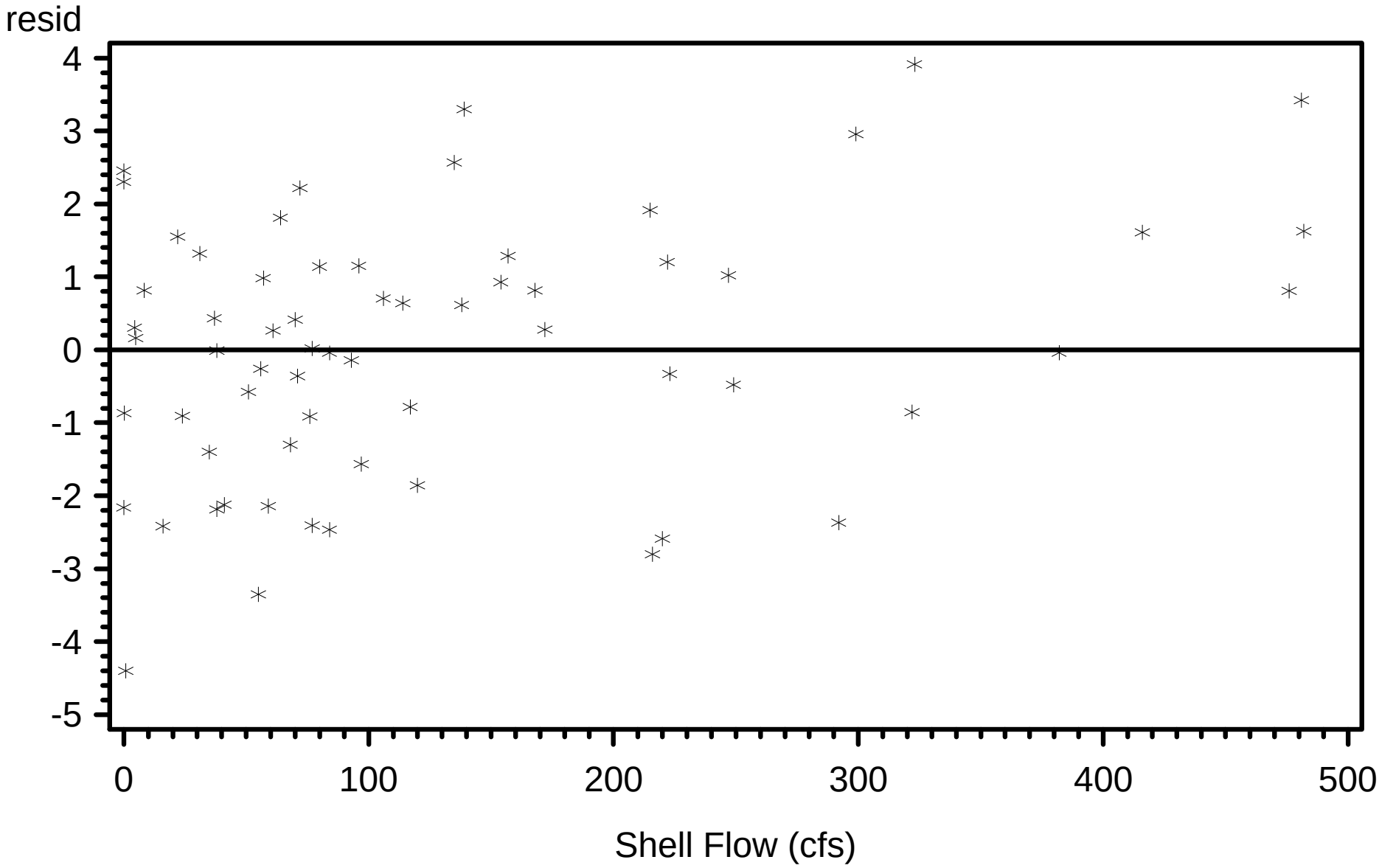
River Kilometer=8.74



Shell Creek 1997-2004

Residuals vs Shell Creek Flow (cfs)

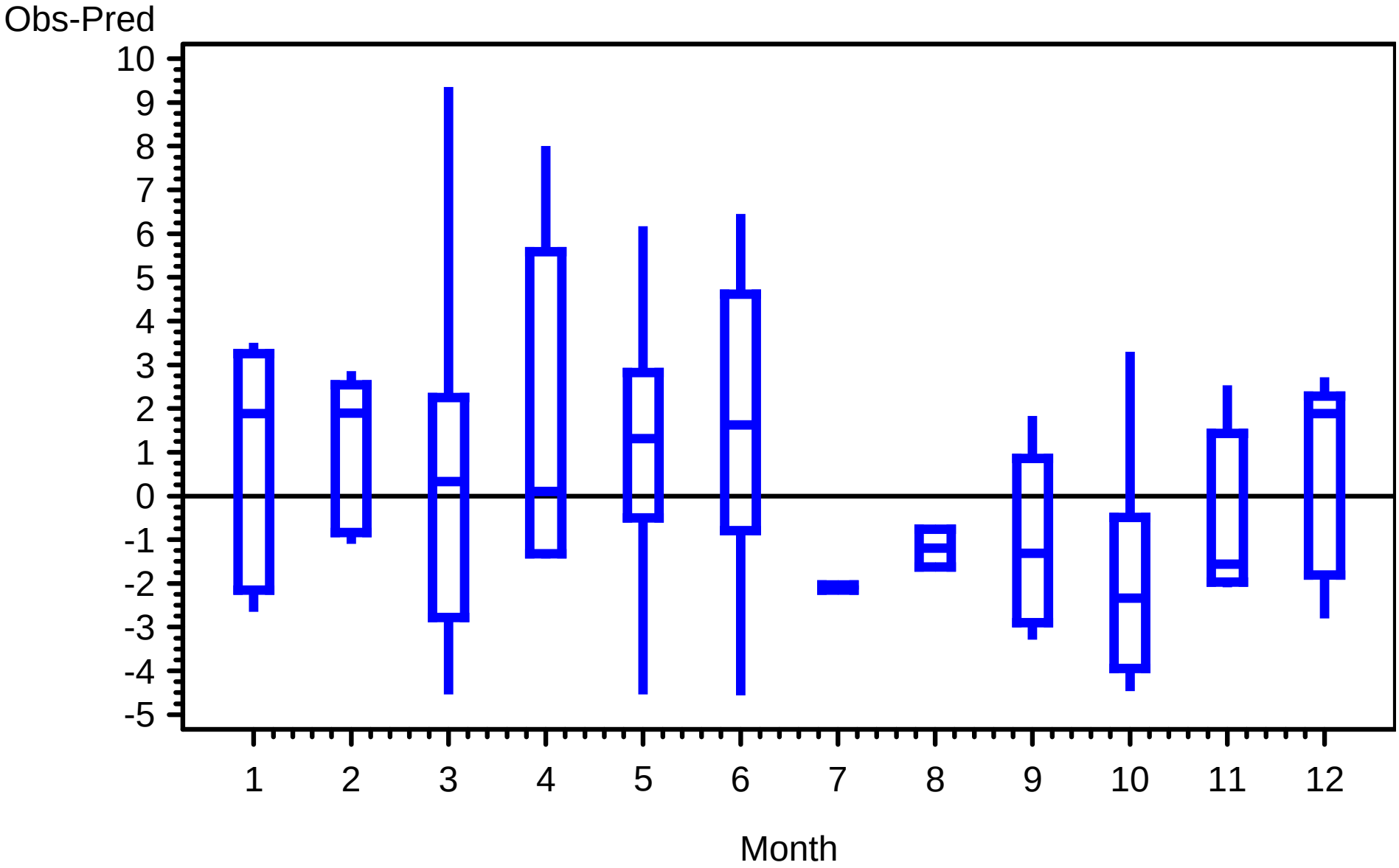
River Kilometer=9.90



Shell Creek 1997-2004

Residuals by Month

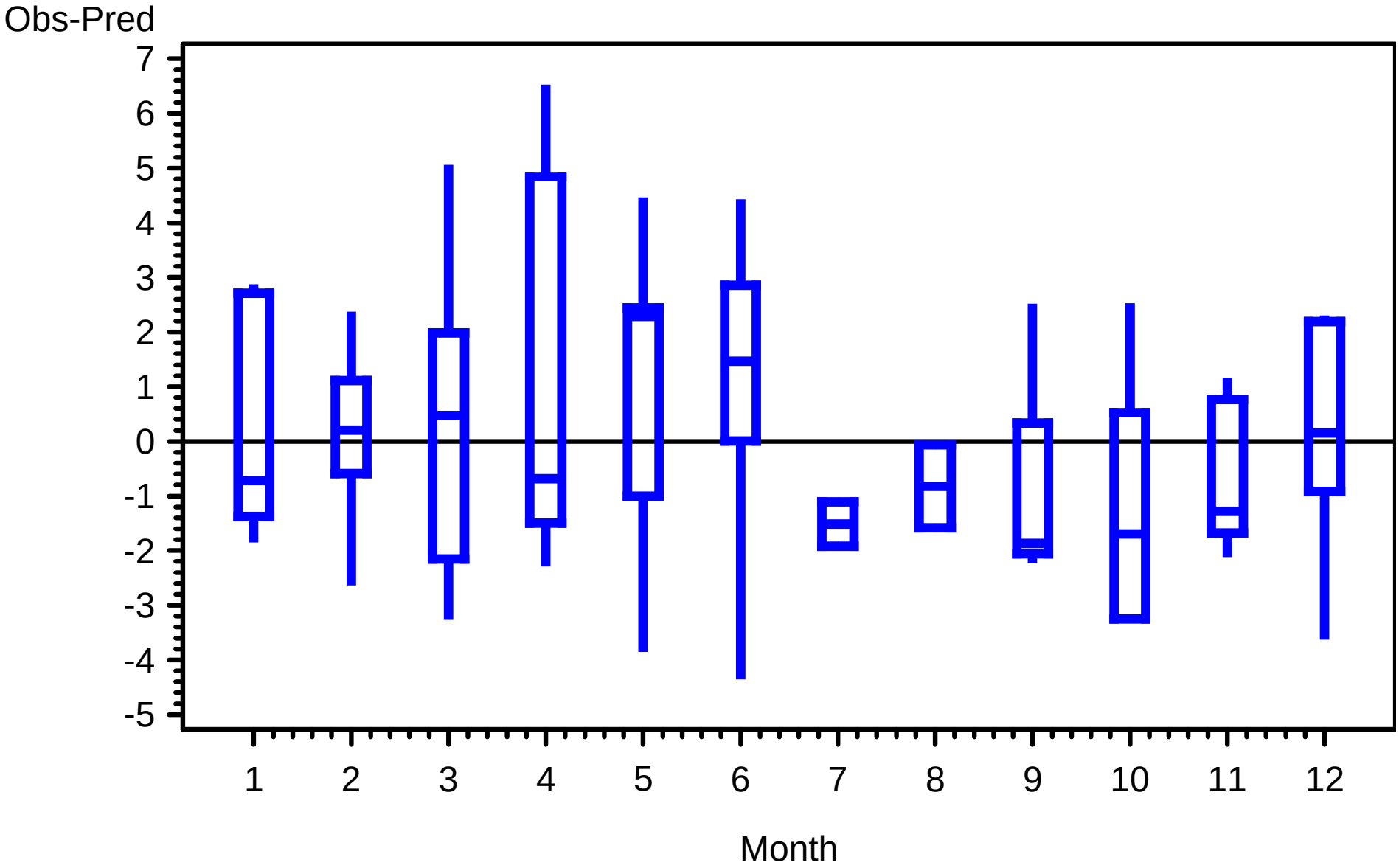
River Kilometer=2.35



Shell Creek 1997-2004

Residuals by Month

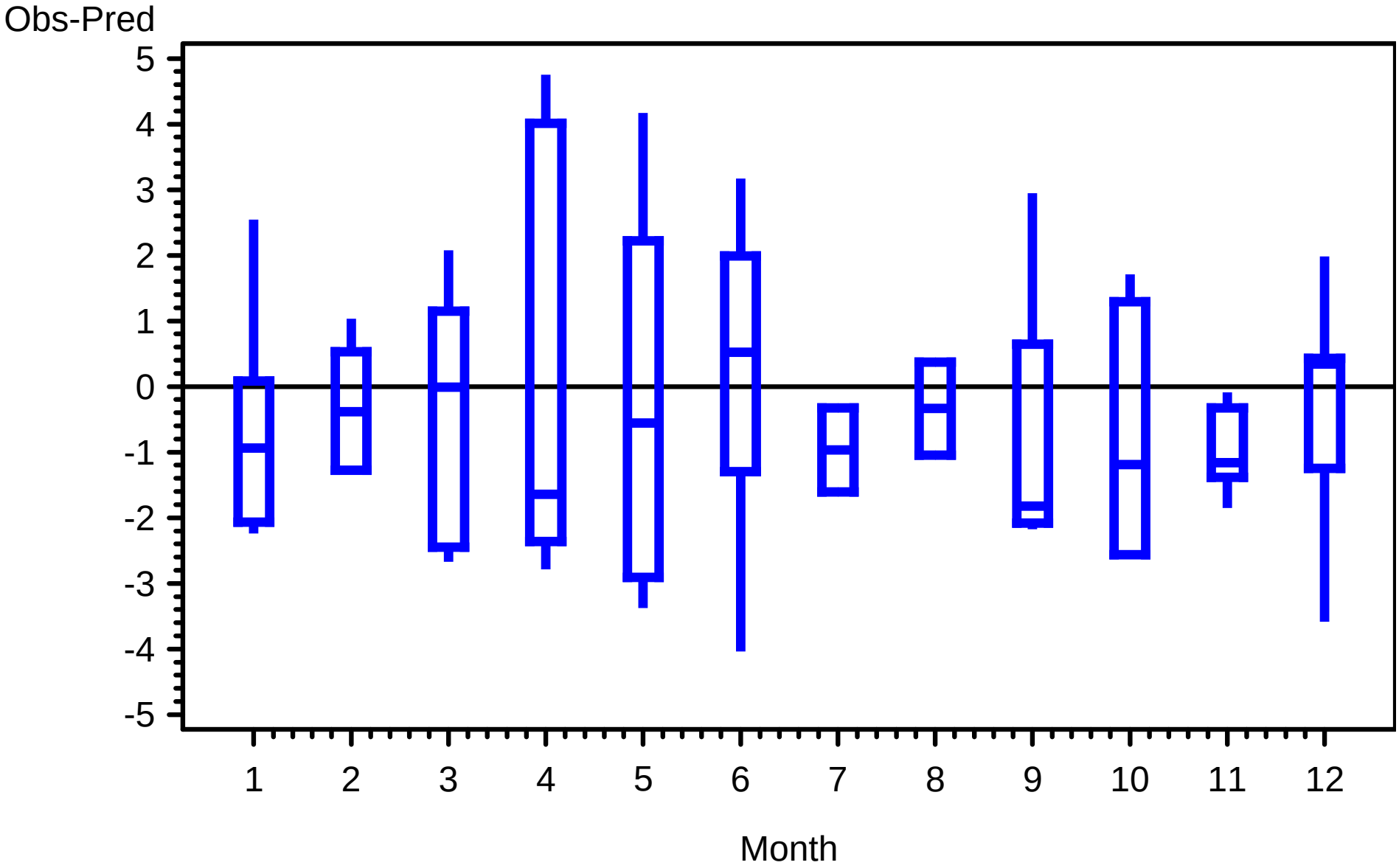
River Kilometer=3.66



Shell Creek 1997-2004

Residuals by Month

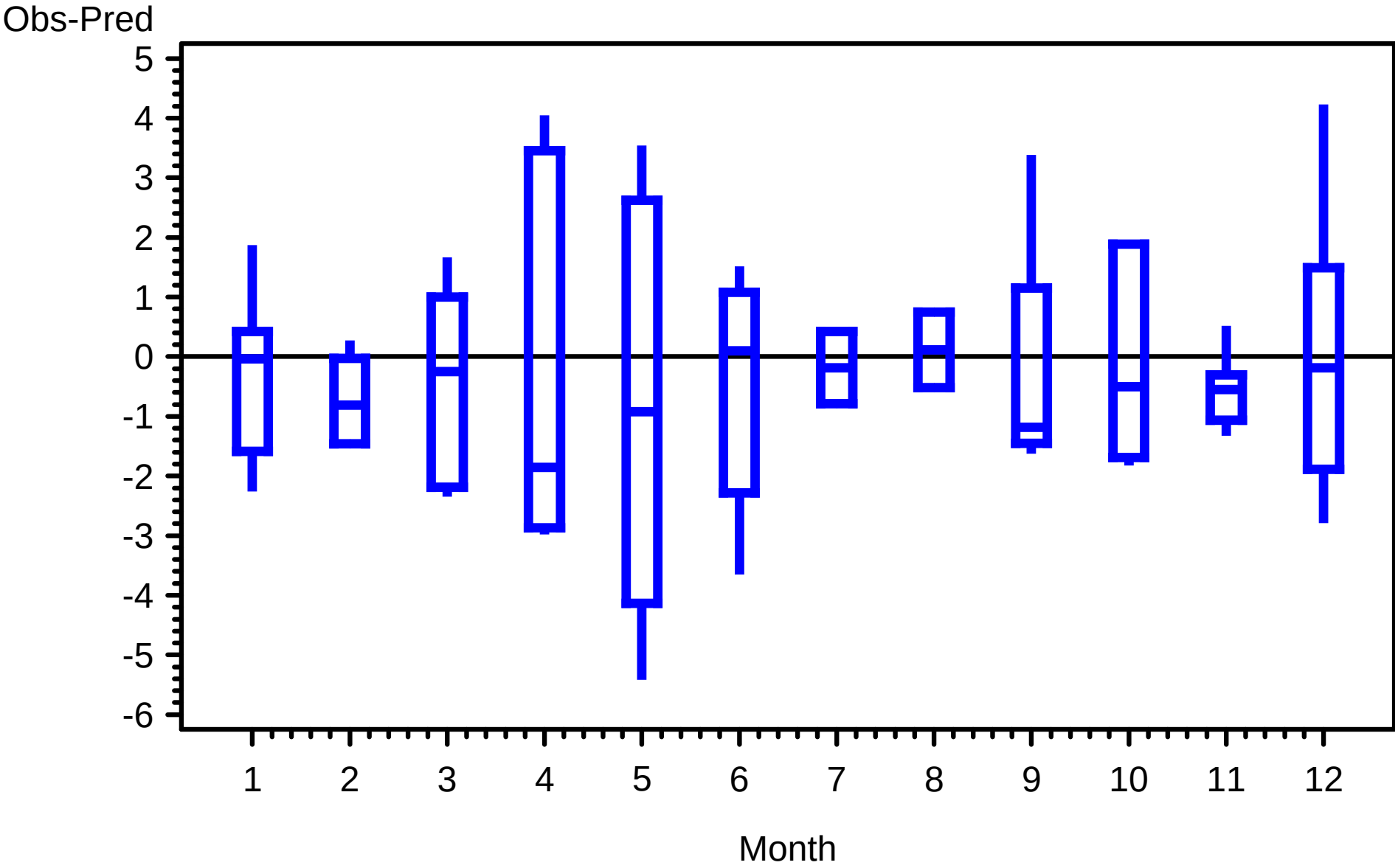
River Kilometer=4.61



Shell Creek 1997-2004

Residuals by Month

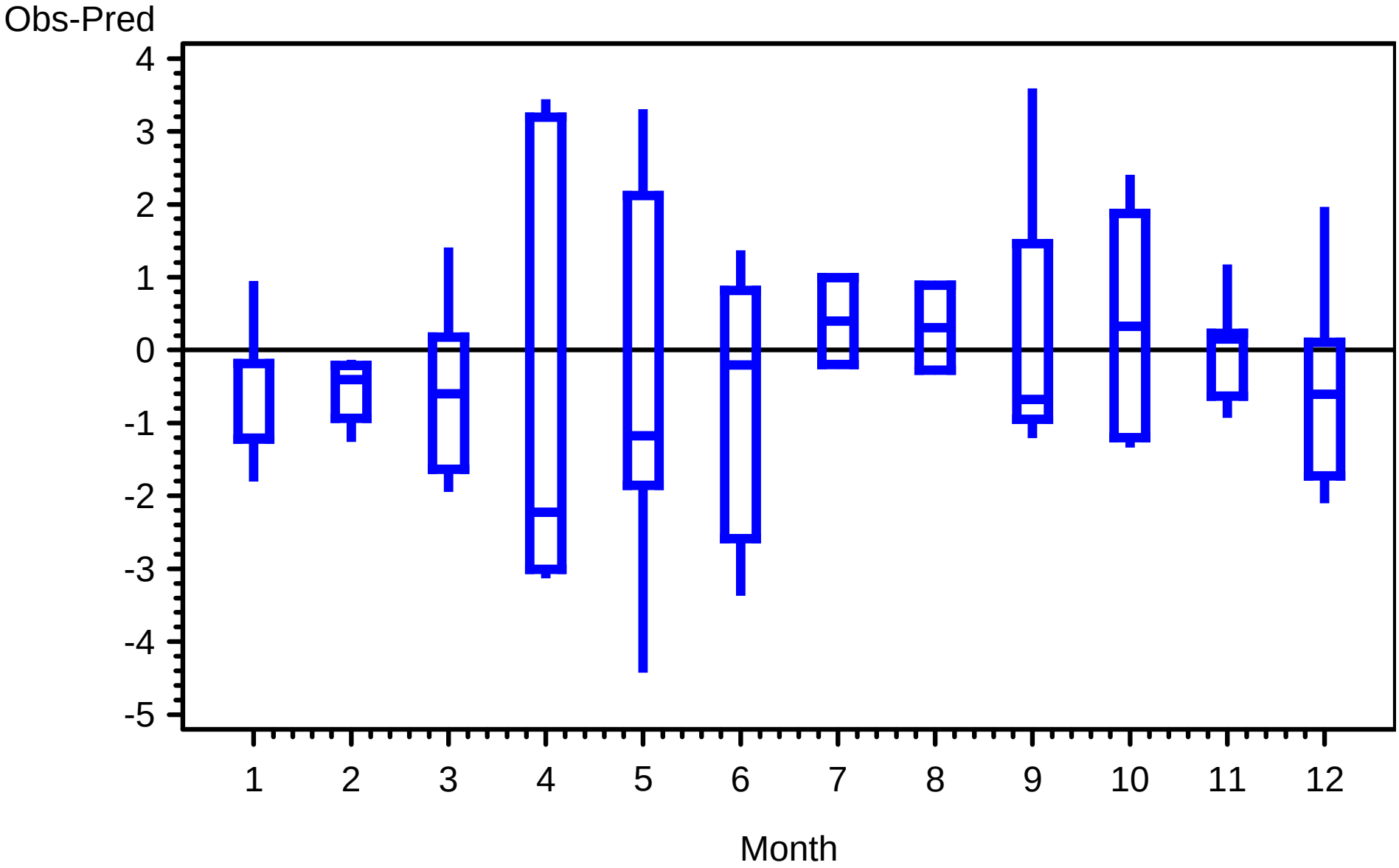
River Kilometer=5.73



Shell Creek 1997-2004

Residuals by Month

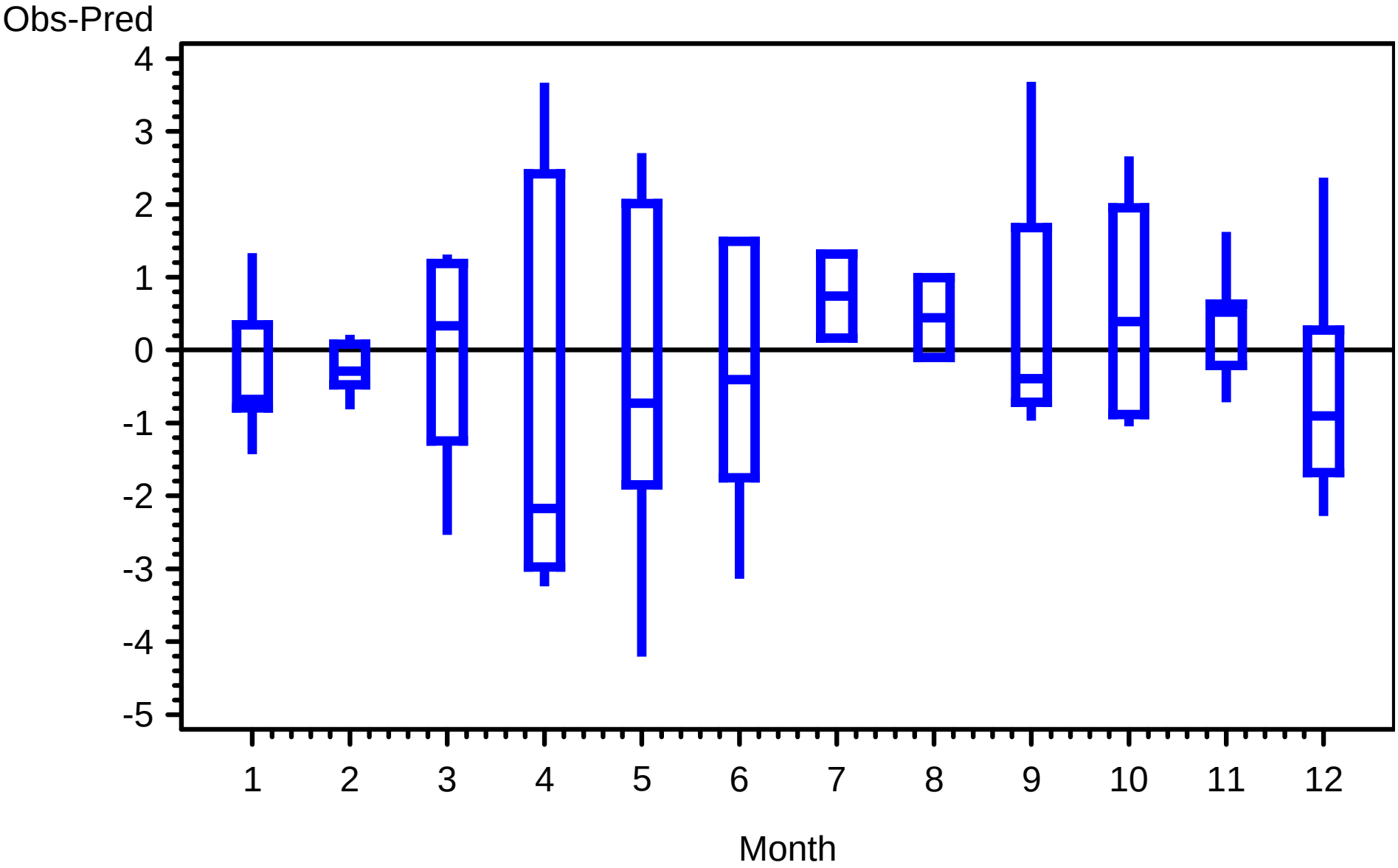
River Kilometer=6.72



Shell Creek 1997-2004

Residuals by Month

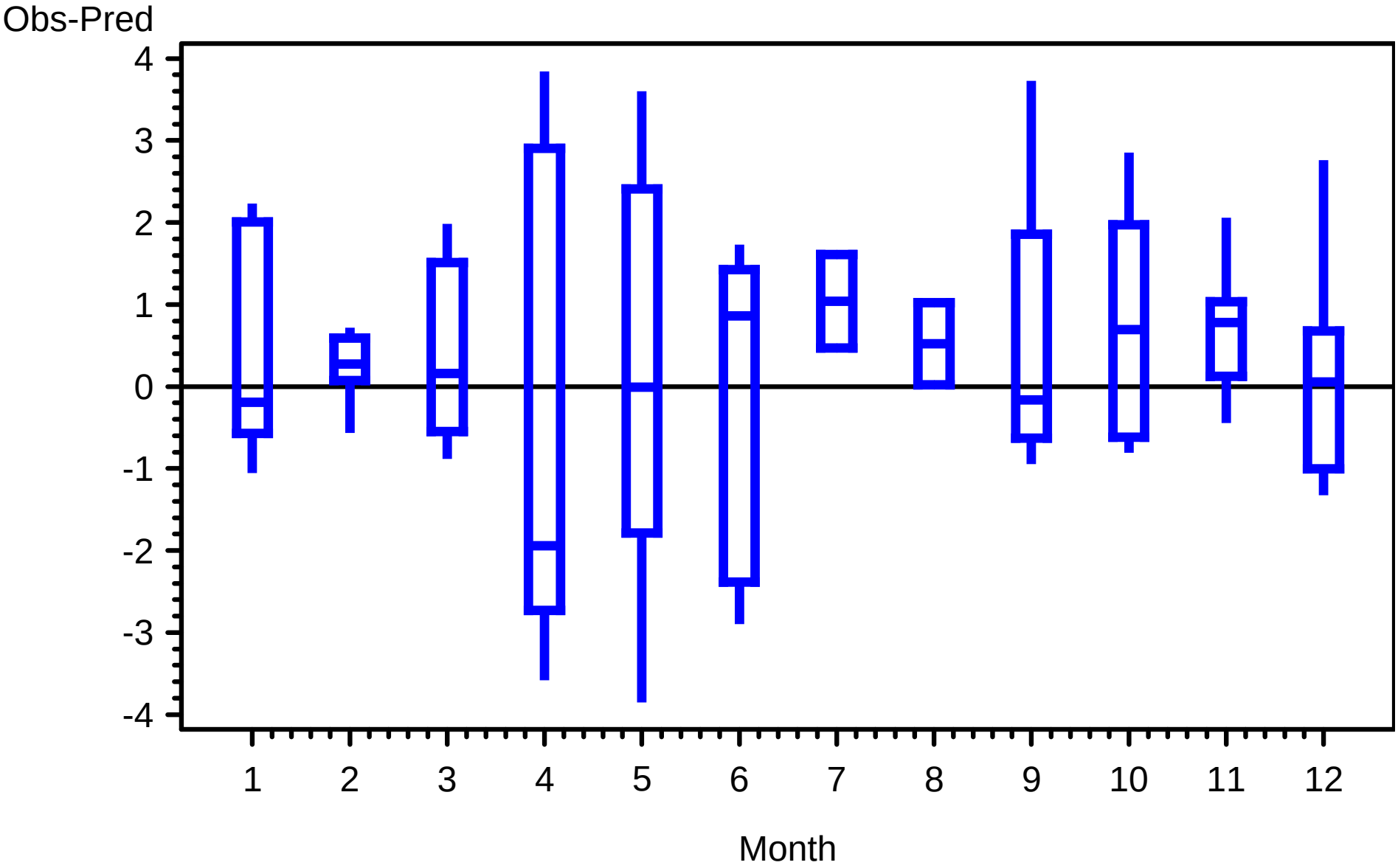
River Kilometer=7.40



Shell Creek 1997-2004

Residuals by Month

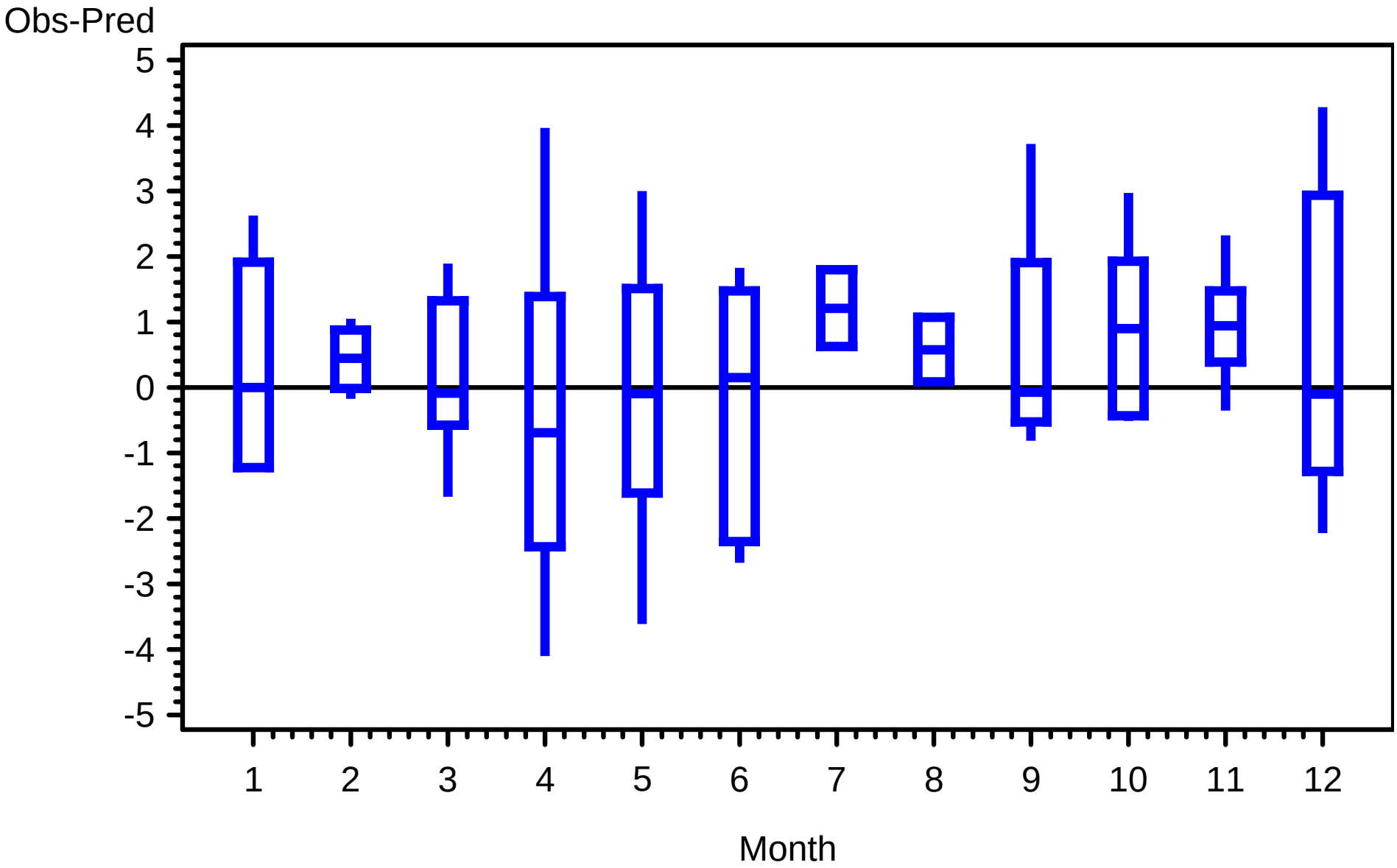
River Kilometer=8.09



Shell Creek 1997-2004

Residuals by Month

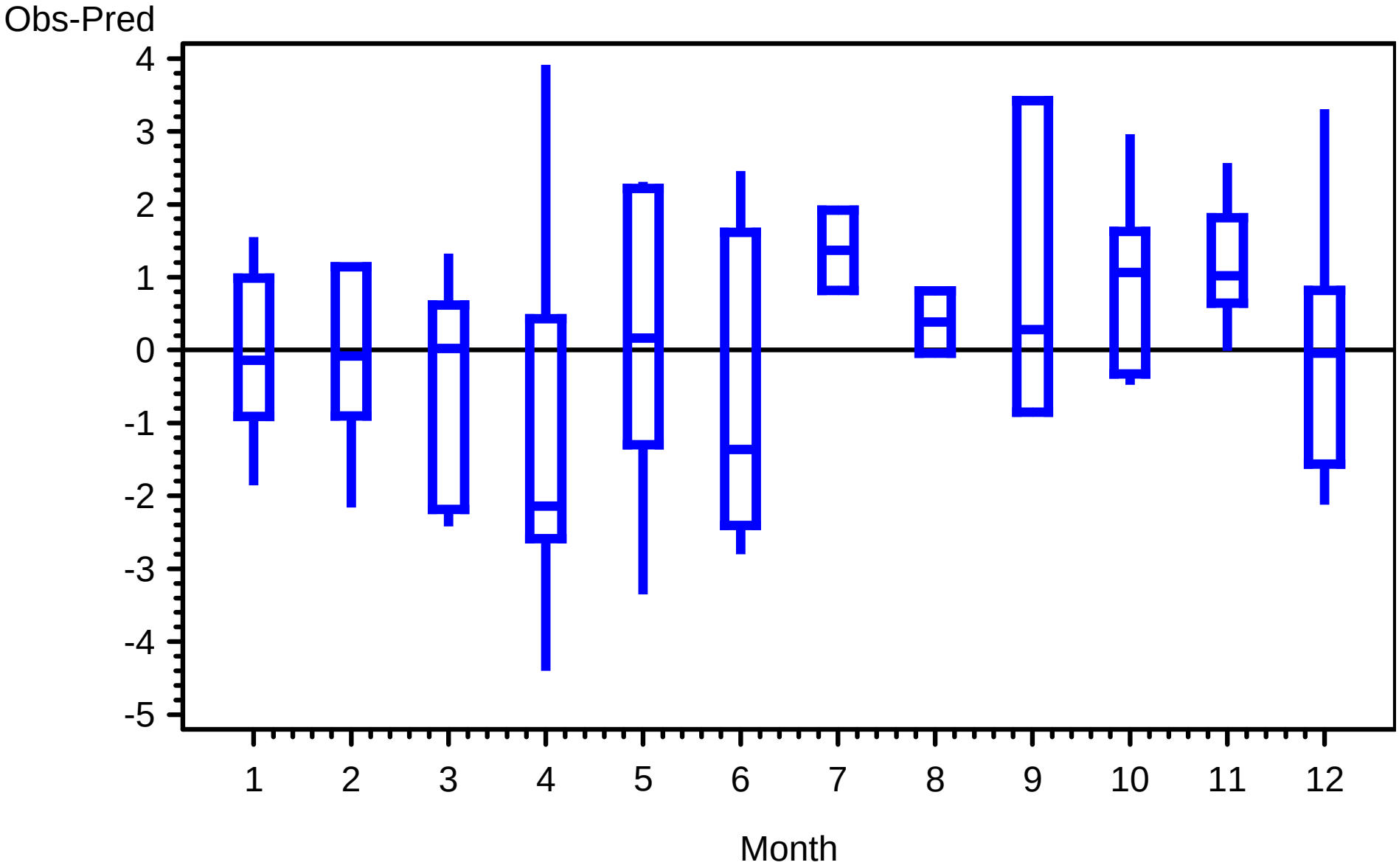
River Kilometer=8.74



Shell Creek 1997-2004

Residuals by Month

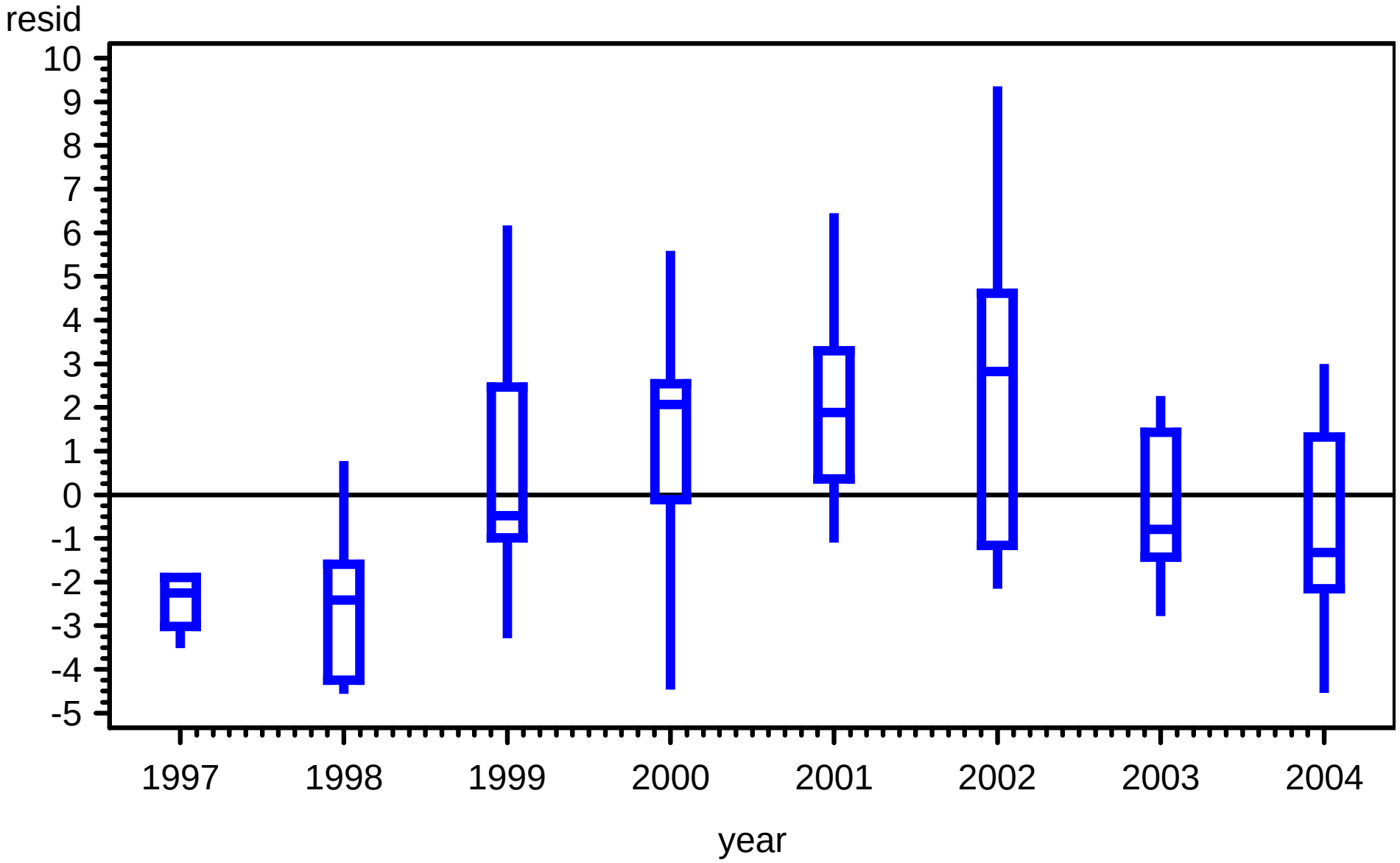
River Kilometer=9.90



Shell Creek 1997-2004

Residuals by Year

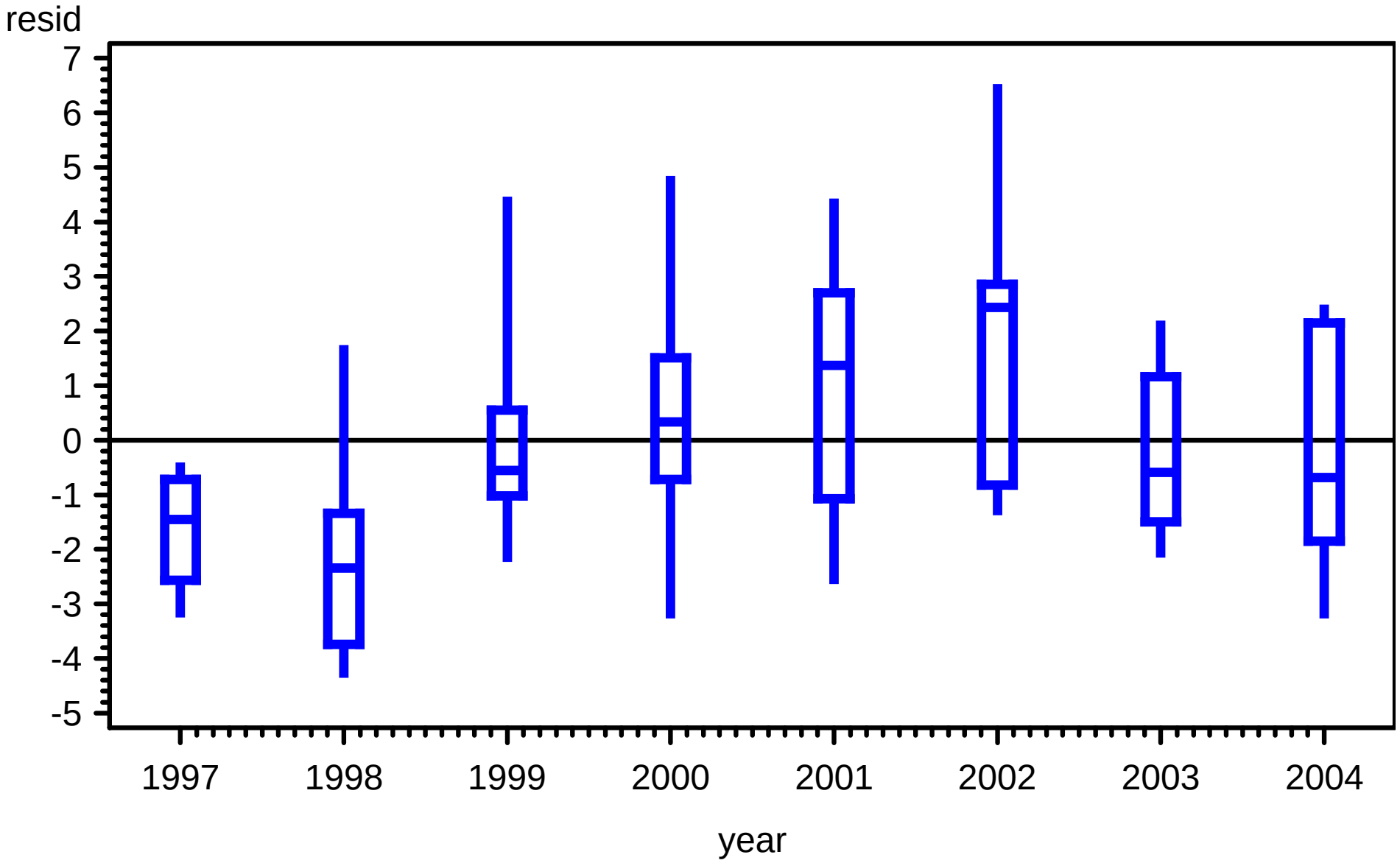
River Kilometer=2.35



Shell Creek 1997-2004

Residuals by Year

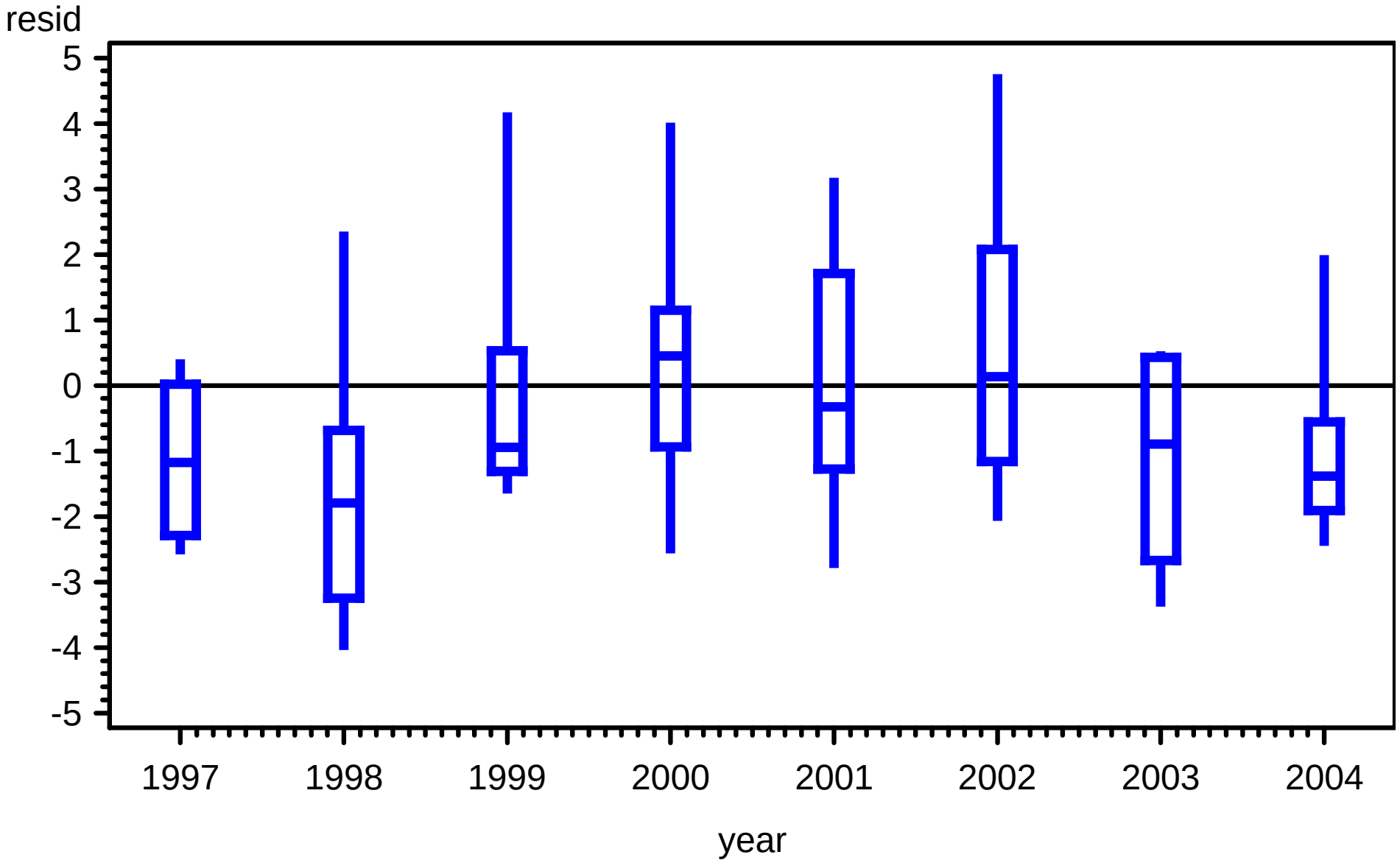
River Kilometer=3.66

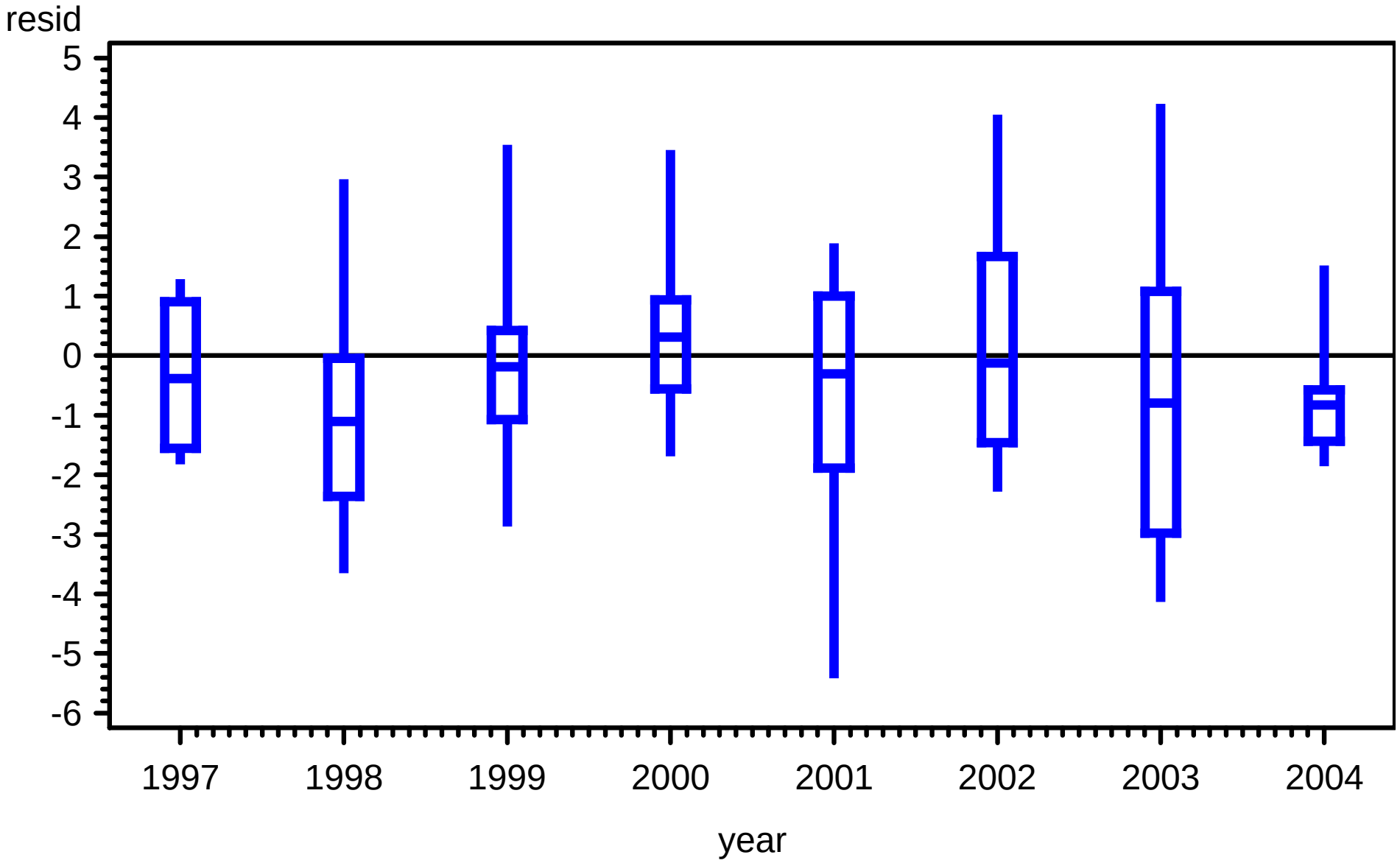


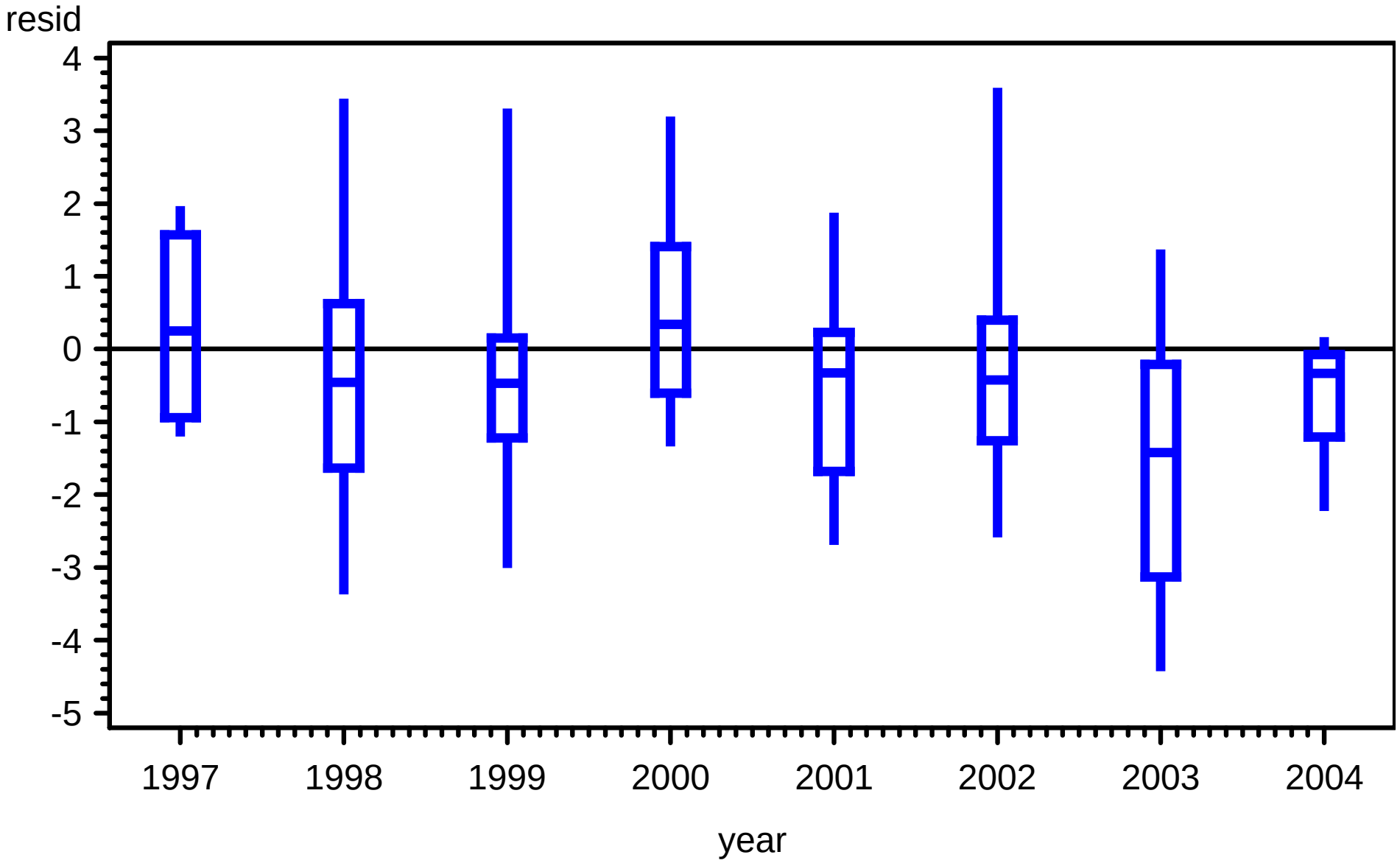
Shell Creek 1997-2004

Residuals by Year

River Kilometer=4.61



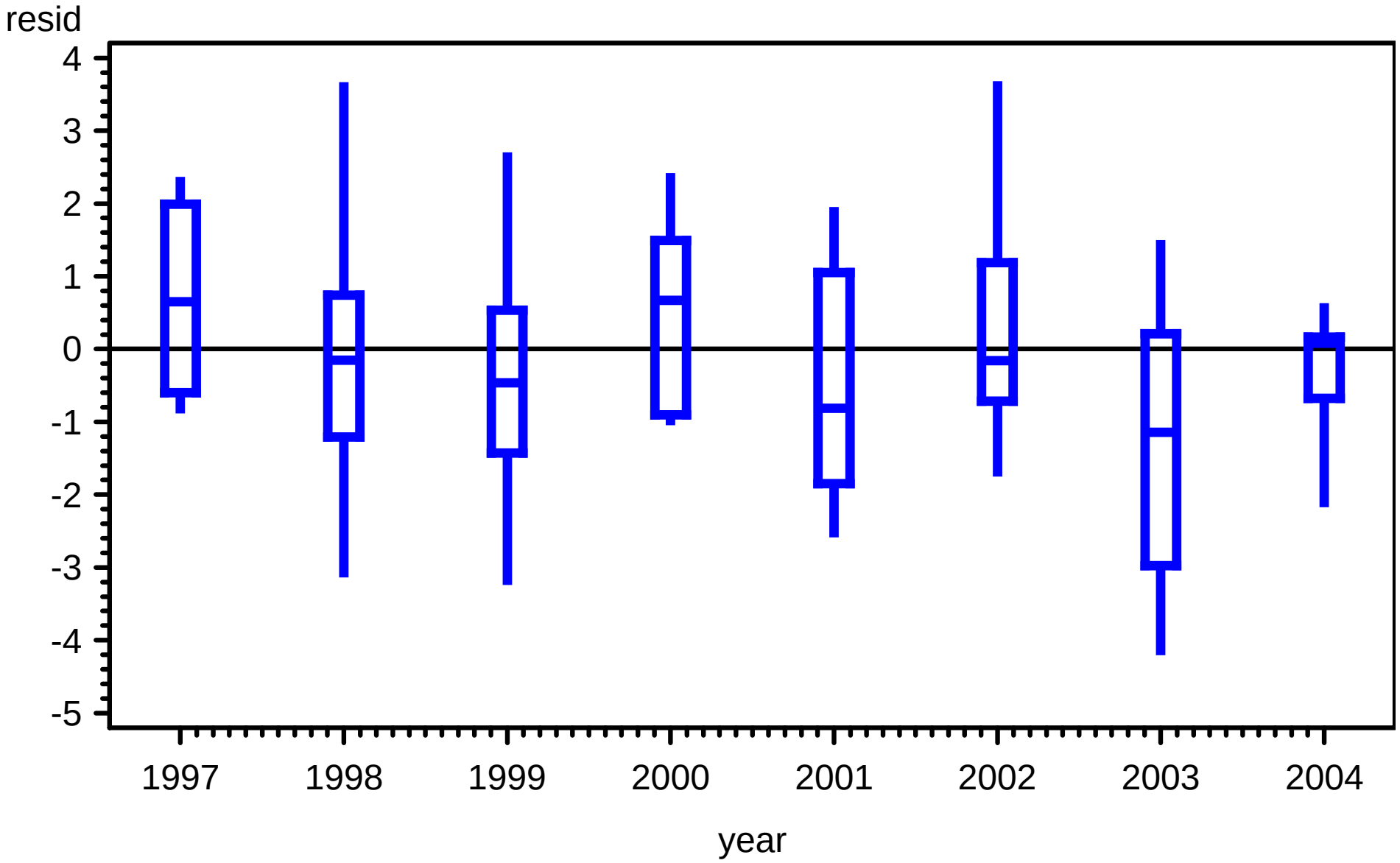

Shell Creek 1997-2004
Residuals by Year
River Kilometer=5.73
resid
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
1997
1998
1999
2000
2001
2002
2003
2004
year


Shell Creek 1997-2004
Residuals by Year
River Kilometer=6.72
resid
4
3
2
1
0
-1
-2
-3
-4
-5
1997
1998
1999
2000
2001
2002
2003
2004
year

Shell Creek 1997-2004

Residuals by Year

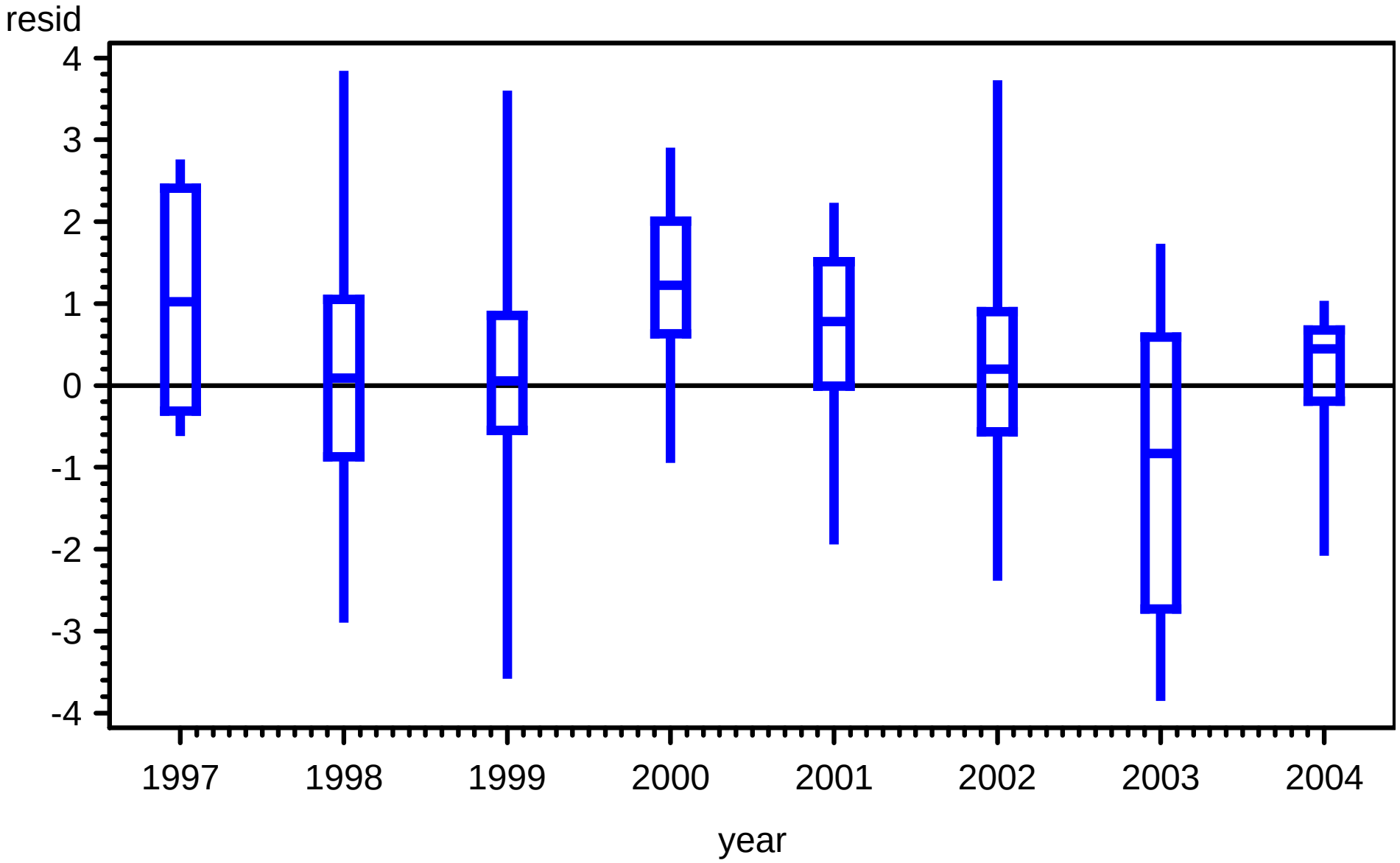
River Kilometer=7.40



Shell Creek 1997-2004

Residuals by Year

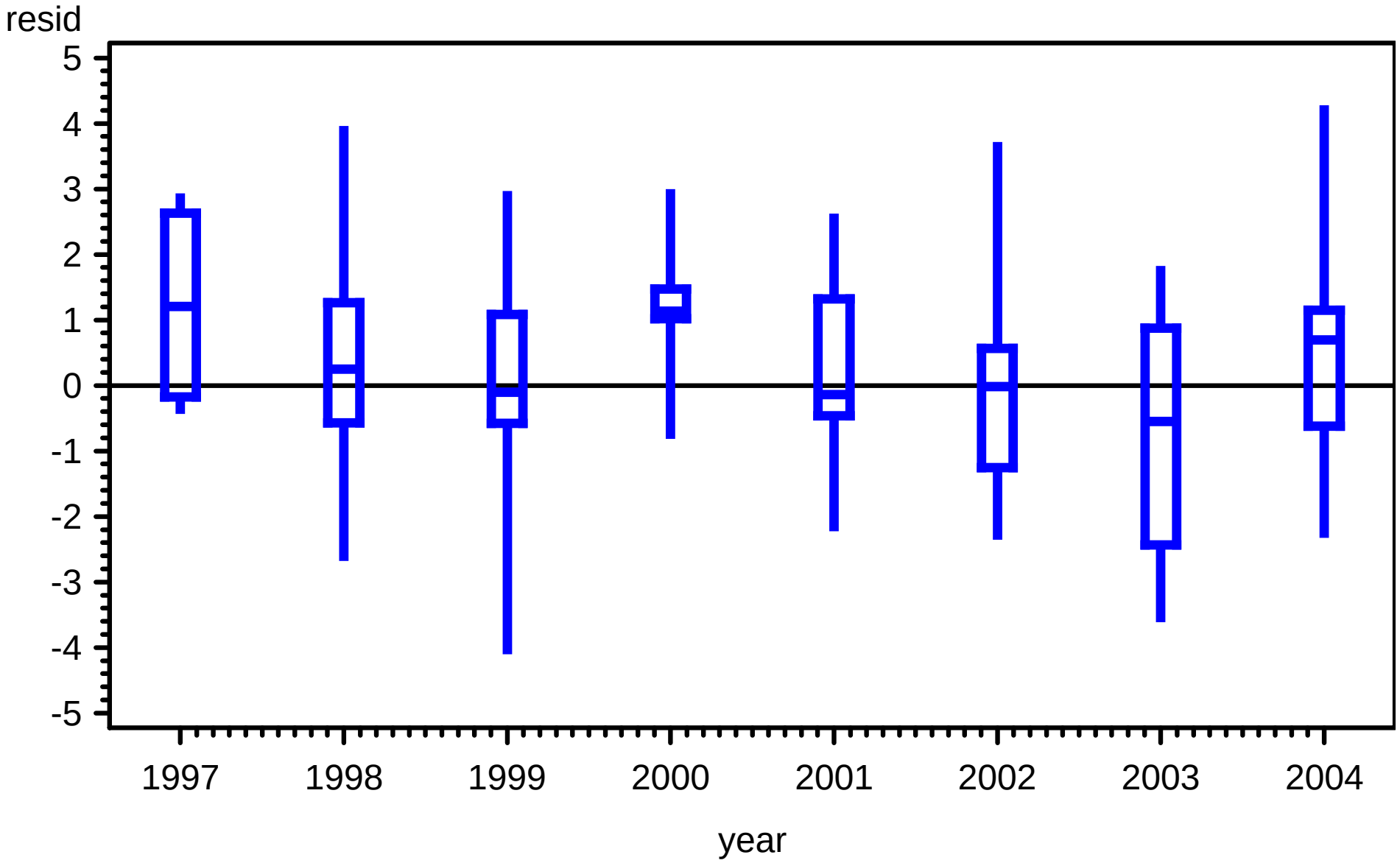
River Kilometer=8.09

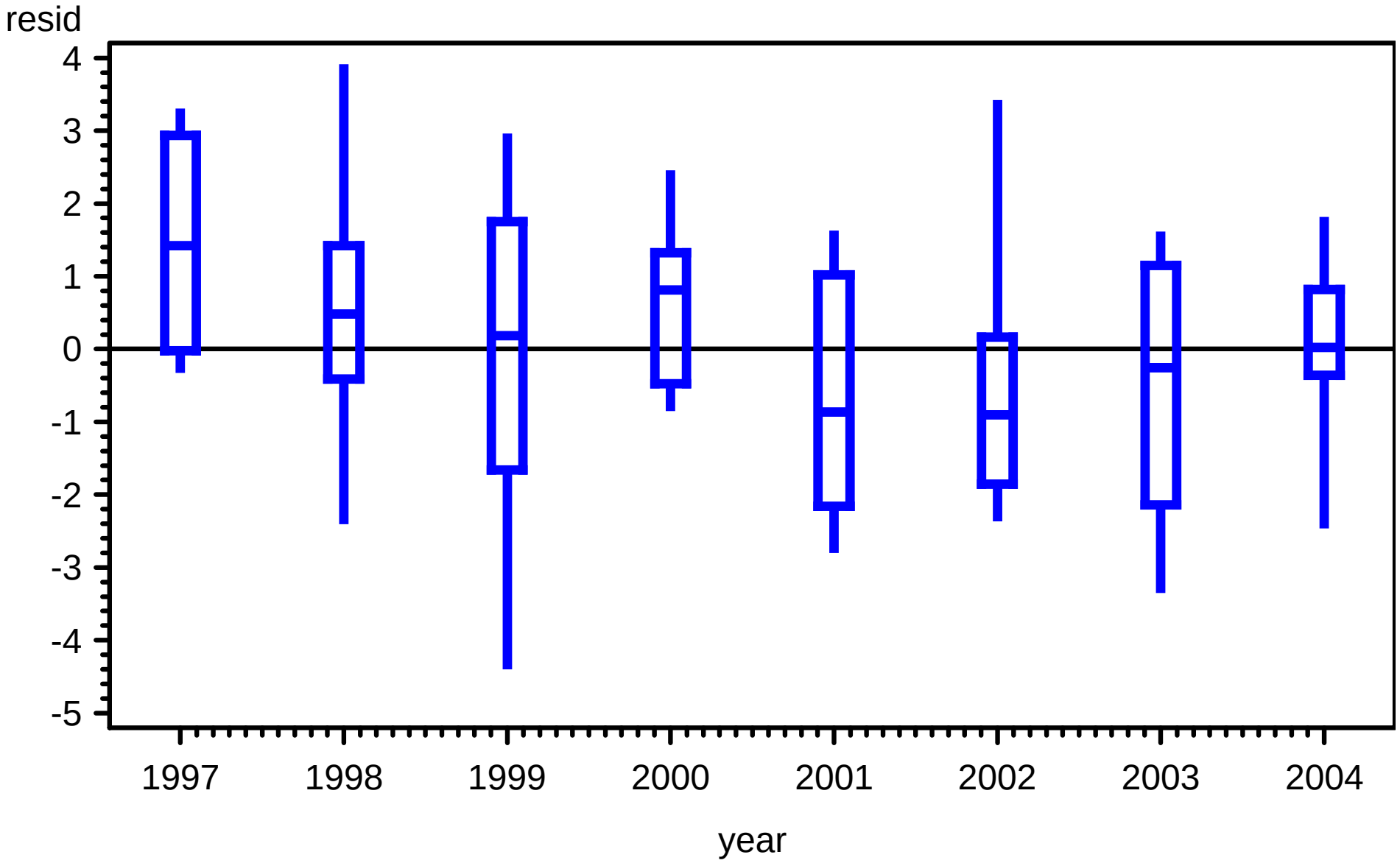


Shell Creek 1997-2004

Residuals by Year

River Kilometer=8.74




Shell Creek 1997-2004
Residuals by Year
River Kilometer=9.90
resid
4
3
2
1
0
-1
-2
-3
-4
-5
1997
1998
1999
2000
2001
2002
2003
2004
year

Distribution of Depth-Integrated Salinity by Month

The UNIVARIATE Procedure
Variable: resid

Moments			
N	582	**Sum Weights**	582
Mean	0	**Sum Observations**	0
Std Deviation	2.04670748	**Variance**	4.18901149
Skewness	0.45199117	**Kurtosis**	0.83877232
Uncorrected SS	2433.81568	**Corrected SS**	2433.81568
Coeff Variation	.	**Std Error Mean**	0.08483875

Basic Statistical Measures			
Location		**Variability**	
Mean	0.00000	**Std Deviation**	2.04671
Median	-0.11574	**Variance**	4.18901
Mode	.	**Range**	14.77015
		Interquartile Range	2.69203

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	**t**	0	**Pr > |t|**	1.0000
Sign	**M**	-17	**Pr >= |M|**	0.1713
Signed Rank	**S**	-2871.5	**Pr >= |S|**	0.4797

Distribution of Depth-Integrated Salinity by Month

The UNIVARIATE Procedure
Variable: resid

Tests for Normality				
Test	**Statistic**		**p Value**	
Shapiro-Wilk	**W**	0.987846	**Pr < W**	<0.0001
Kolmogorov-Smirnov	**D**	0.039537	**Pr > D**	0.0251
Cramer-von Mises	**W-Sq**	0.161193	**Pr > W-Sq**	0.0183
Anderson-Darling	**A-Sq**	0.931159	**Pr > A-Sq**	0.0195

Quantiles (Definition 5)	
Quantile	**Estimate**
100% Max	9.350552
99%	5.583082
95%	3.438479
90%	2.567972
75% Q3	1.312504
50% Median	-0.115745
25% Q1	-1.379526
10%	-2.445263
5%	-3.134682
1%	-4.424244
0% Min	-5.419602

Distribution of Depth-Integrated Salinity by Month

The UNIVARIATE Procedure
Variable: resid

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
-5.41960	225	6.16430	26
-4.55708	32	6.45287	34
-4.54027	25	6.52864	88
-4.53521	17	8.00335	22
-4.45803	49	9.35055	15

Missing Values			
		Percent Of	
Missing Value	Count	All Obs	Missing Obs
.	9	1.52	100.00

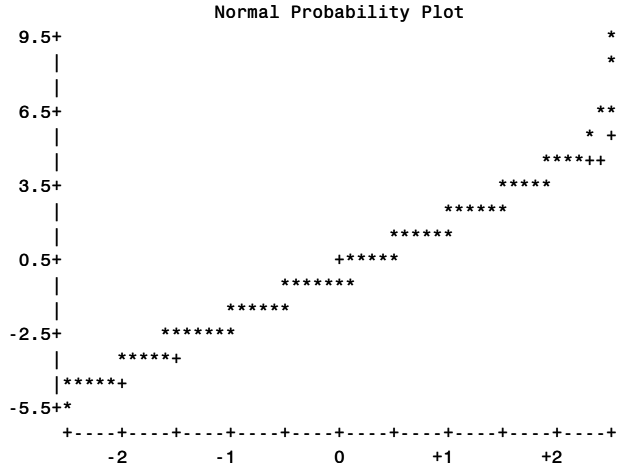
Distribution of Depth-Integrated Salinity by Month

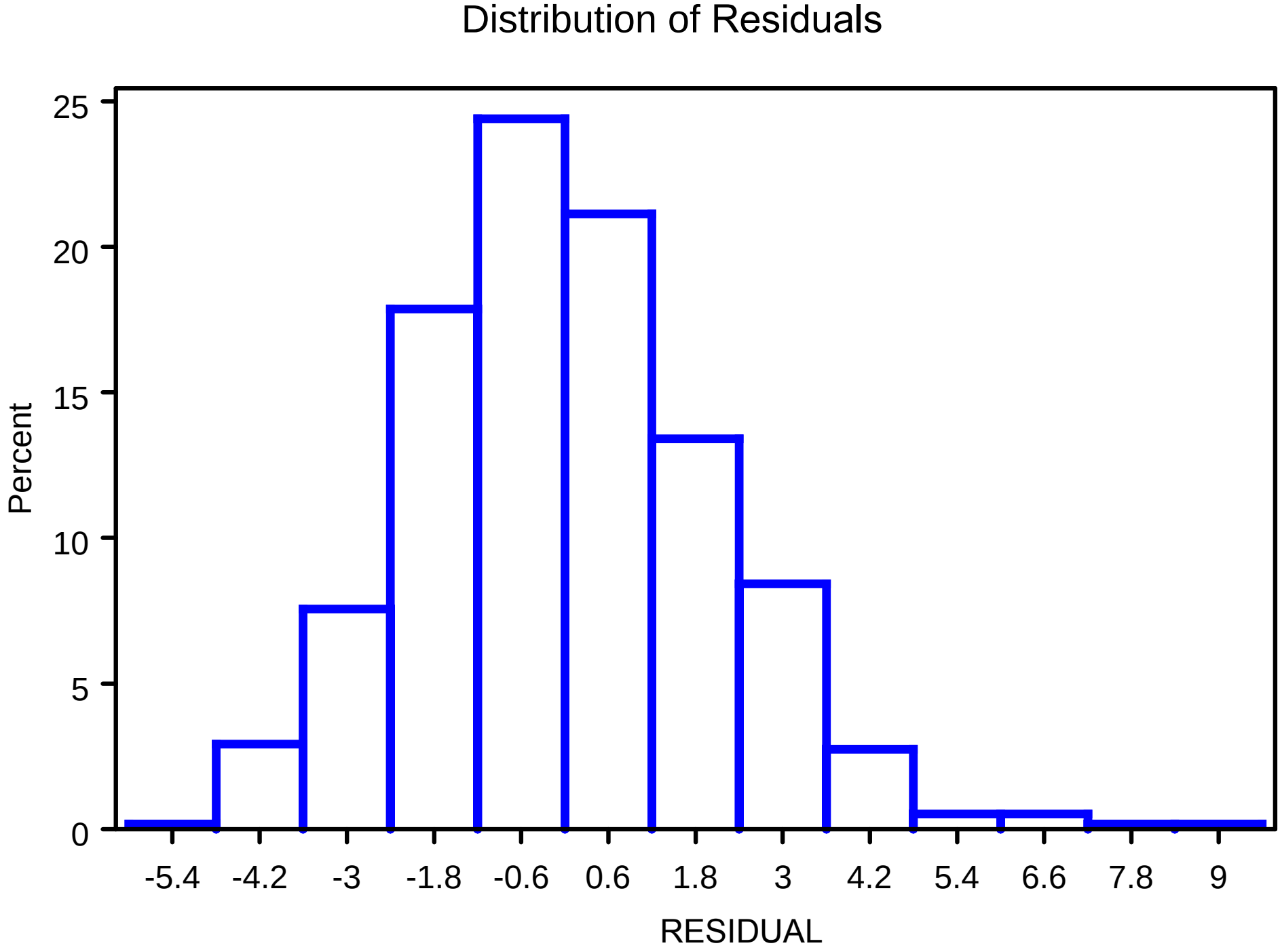
The UNIVARIATE Procedure
Variable: resid

```
                Histogram                     #             Boxplot
 9.5+*                                        1                0
    .*                                        1                0
    .
 6.5+*                                        3                0
    .*                                        2                0
    .****                                    10                |
 3.5+*******                                 21                |
    .******************                      54                |
    .*************************              79               +-----+
 0.5+***********************************     103              |  +  |
    .*****************************************  125           *-----*
    .******************************           91               +-----+
-2.5+*******************                     60                |
    .*******                                 20                |
    .****                                    11                |
-5.5+*                                       1                0
     ----+----+----+----+----+----+----+----+--
     * may represent up to 3 counts
```

Distribution of Depth-Integrated Salinity by Month

The UNIVARIATE Procedure
Variable: resid




Distribution of Residuals
Percent
25
20
15
10
5
0
-5.4
-4.2
-3
-1.8
-0.6
0.6
1.8
3
4.2
5.4
6.6
7.8
9
RESIDUAL