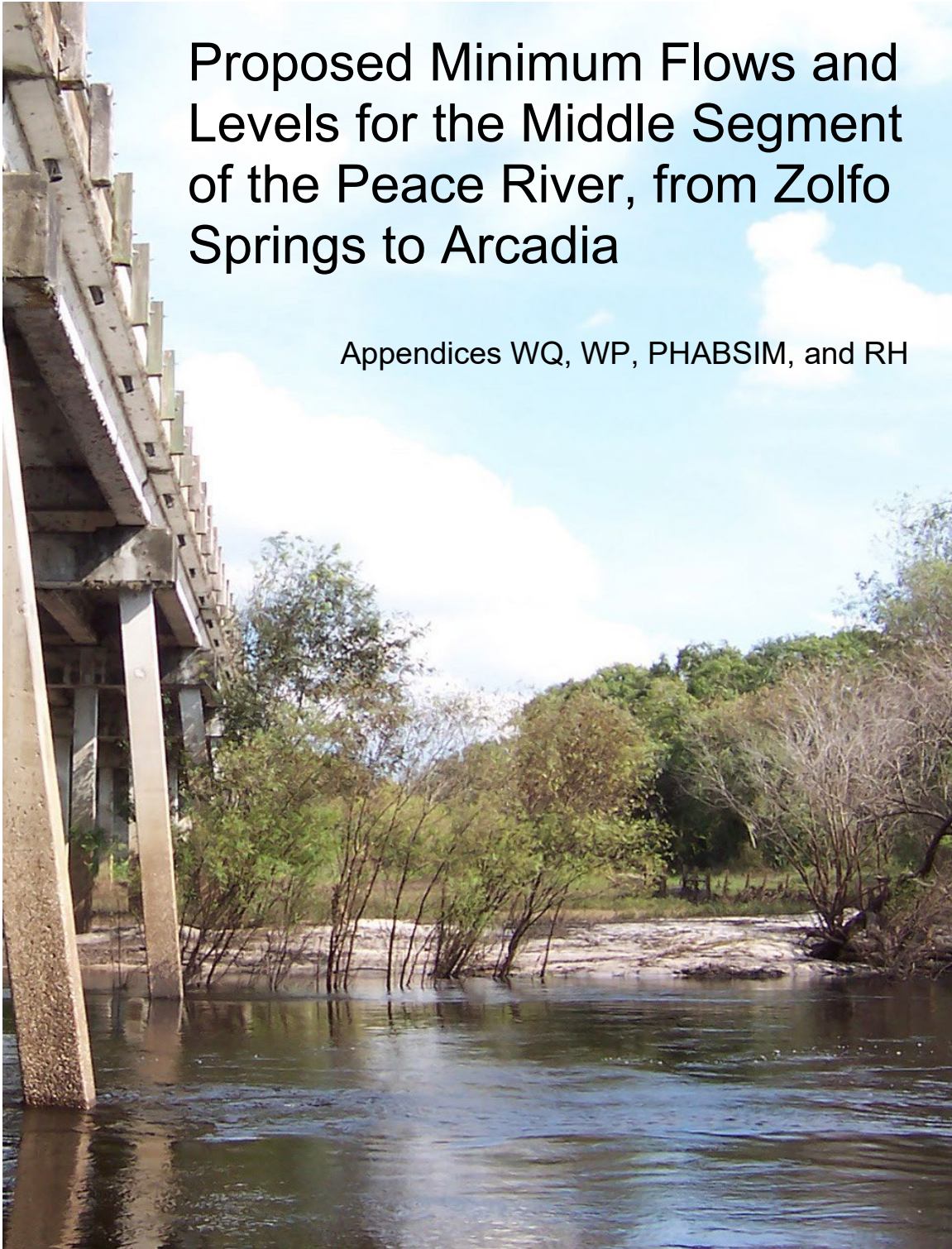




Proposed Minimum Flows and Levels for the Middle Segment of the Peace River, from Zolfo Springs to Arcadia

Appendices WQ, WP, PHABSIM, and RH

Southwest Florida
Water Management District



Proposed Minimum Flows and Levels for the Middle Segment of the Peace River, from Zolfo Springs to Arcadia

Appendices WQ, WP, PHABSIM and RH

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Appendices

APPENDIX WQ – WATER QUALITY ANALYSIS RESULTS

APPENDIX WP – WETTED PERIMETER PLOTS

APPENDIX PHABSIM – PHYSICAL HABITAT SIMULATION ANALYSIS RESULTS

APPENDIX RH – FLOODPLAIN ELEVATIONS INFORMATION

Note that two additional appendices, Appendix A and Appendix B, are included in the main minimum flows report file for the middle segment of the Peace River and are not included in this appendix file.

APPENDIX A – PEER REVIEW

APPENDIX B – STAFF RESPONSE TO PEER REVIEW

APPENDIX WQ

Water Quality – WQ

This appendix contains water quality plots for selected physico-chemical parameters for several waterbodies. Plots are given for selected sites on the Alafia, Peace, Myakka and Withlacoochee Rivers. Both the Alafia and Peace Rivers have experienced extremes in a number of parameters due primarily to phosphate mining activities within their respective watersheds. The Withlacoochee River, which exhibits good water quality, is presented as a point of reference when considering what one might expect water quality to be in the absence of major anthropogenic factors. Typically three plots are given for each parameter: 1) time series plot of parameter; 2) plot of parameter versus flow; and 3) times series plot of residuals of parameter regressed against flow.

Significant changes in water chemistry are often apparent over time and can be appreciated simply by inspecting time series plots. However, since this document is specifically concerned with flows, chemical parameters were routinely regressed against flow and the resultant residuals plotted against time. This was done to evaluate changes in constituent loading unrelated to flow. This analysis is helpful for appreciating apparent increases or decreases due to anthropogenic factors. The residuals obtained from the regression on an individual parameter against flow were evaluated by subjecting the residuals to a Kendall's tau analysis. Results of this analysis are given in a series of tables beginning on page 182 of this Appendix.

Alafia River at Lithia – Flow (1950-2000)	WQ-13
Alafia River at Lithia – Specific Conductivity (1950-2000)	WQ-14
Alafia River at Lithia – Specific Conductivity vs. Flow	WQ-14
Alafia River at Lithia – Specific Conductivity Residuals over Time	WQ-14
Alafia River at Lithia – pH (1950-2000)	WQ-15
Alafia River at Lithia – pH vs. Flow	WQ-15
Alafia River at Lithia – pH Residuals over Time	WQ-15
Alafia River at Lithia – Dissolved Oxygen (1950-2000)	WQ-16
Alafia River at Lithia – Dissolved Oxygen vs. Flow	WQ-16
Alafia River at Lithia – Dissolved Oxygen Residuals over Time	WQ-16
Alafia River at Lithia – Nitrate/Nitrite Nitrogen (1960-2000)	WQ-17
Alafia River at Lithia – Nitrate/Nitrite Nitrogen vs. Flow	WQ-17
Alafia River at Lithia – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-17
Alafia River at Lithia – Phosphorus (1950-2000)	WQ-18
Alafia River at Lithia – Phosphorus vs. Flow	WQ-18
Alafia River at Lithia – Phosphorus Residuals over Time	WQ-18
Alafia River at Lithia – Calcium (1950-2000)	WQ-19
Alafia River at Lithia – Calcium vs. Flow	WQ-19
Alafia River at Lithia – Calcium Residuals over Time	WQ-19

Alafia River at Lithia – Chloride (1950-2000)	WQ-20
Alafia River at Lithia – Chloride vs. Flow	WQ-20
Alafia River at Lithia – Chloride Residuals over Time	WQ-20
Alafia River at Lithia – Fluoride (1950-2000)	WQ-21
Alafia River at Lithia – Fluoride vs. Flow	WQ-21
Alafia River at Lithia – Fluoride Residuals over Time	WQ-21
Alafia River at Lithia – Iron (1950-2000)	WQ-22
Alafia River at Lithia – Iron vs. Flow	WQ-22
Alafia River at Lithia – Iron Residuals over Time	WQ-22
Alafia River at Lithia – Magnesium (1950-2000)	WQ-23
Alafia River at Lithia – Magnesium vs. Flow	WQ-23
Alafia River at Lithia – Magnesium Residuals over Time	WQ-23
Alafia River at Lithia – Potassium (1950-2000)	WQ-24
Alafia River at Lithia – Potassium vs. Flow	WQ-24
Alafia River at Lithia – Potassium Residuals over Time	WQ-24
Alafia River at Lithia – Sodium (1950-2000)	WQ-25
Alafia River at Lithia – Sodium vs. Flow	WQ-25
Alafia River at Lithia – Sodium Residuals over Time	WQ-25
Alafia River at Lithia – Sulfate (1950-2000)	WQ-26
Alafia River at Lithia – Sulfate vs. Flow	WQ-26
Alafia River at Lithia – Sulfate Residuals over Time	WQ-26
North Prong of the Alafia River – Flow	WQ-27
North Prong of the Alafia River – Specific Conductivity (1950-2000)	WQ-28
North Prong of the Alafia River – Specific Conductivity vs. Flow	WQ-28
North Prong of the Alafia River – Specific Conductivity Residuals over Time	WQ-28
North Prong of the Alafia River – pH (1950-2000)	WQ-29
North Prong of the Alafia River – pH vs. Flow	WQ-29
North Prong of the Alafia River – pH Residuals over Time	WQ-29
North Prong of the Alafia River – Dissolved Oxygen (1950-2000)	WQ-30
North Prong of the Alafia River – Dissolved Oxygen vs. Flow	WQ-30
North Prong of the Alafia River – Dissolved Oxygen Residuals over Time	WQ-30
North Prong of the Alafia River – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-31
North Prong of the Alafia River – Nitrate/Nitrite Nitrogen vs. Flow	WQ-31
North Prong of the Alafia River – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-31
North Prong of the Alafia River – Phosphorus (1950-2000)	WQ-32
North Prong of the Alafia River – Phosphorus vs. Flow	WQ-32
North Prong of the Alafia River – Phosphorus Residuals over Time	WQ-32
North Prong of the Alafia River – Calcium (1950-2000)	WQ-33
North Prong of the Alafia River – Calcium vs. Flow	WQ-33
North Prong of the Alafia River – Calcium Residuals over Time	WQ-33
North Prong of the Alafia River – Chloride (1950-2000)	WQ-34
North Prong of the Alafia River – Chloride vs. Flow	WQ-34
North Prong of the Alafia River – Chloride Residuals over Time	WQ-34
North Prong of the Alafia River – Fluoride (1950-2000)	WQ-35
North Prong of the Alafia River – Fluoride vs. Flow	WQ-35

North Prong of the Alafia River – Fluoride Residuals over Time	WQ-35
North Prong of the Alafia River – Iron (1950-2000)	WQ-36
North Prong of the Alafia River – Iron vs. Flow	WQ-36
North Prong of the Alafia River – Iron Residuals over Time	WQ-36
North Prong of the Alafia River – Magnesium (1950-2000)	WQ-37
North Prong of the Alafia River – Magnesium vs. Flow	WQ-37
North Prong of the Alafia River – Magnesium Residuals over Time	WQ-37
North Prong of the Alafia River – Potassium (1950-2000)	WQ-38
North Prong of the Alafia River – Potassium vs. Flow	WQ-38
North Prong of the Alafia River – Potassium Residuals over Time	WQ-38
North Prong of the Alafia River – Sodium (1950-2000)	WQ-39
North Prong of the Alafia River – Sodium vs. Flow	WQ-39
North Prong of the Alafia River – Sodium Residuals over Time	WQ-39
North Prong of the Alafia River – Sulfate (1950-2000)	WQ-40
North Prong of the Alafia River – Sulfate vs. Flow	WQ-40
North Prong of the Alafia River – Sulfate Residuals over Time	WQ-40
South Prong of the Alafia River – Flow (1950-2000)	WQ-41
South Prong of the Alafia River – Specific Conductivity (1950-2000)	WQ-42
South Prong of the Alafia River – Specific Conductivity vs. Flow	WQ-42
South Prong of the Alafia River – Specific Conductivity Residuals over Time	WQ-42
South Prong of the Alafia River – pH (1950-2000)	WQ-43
South Prong of the Alafia River – pH vs. Flow	WQ-43
South Prong of the Alafia River – pH Residuals over Time	WQ-43
South Prong of the Alafia River – Dissolved Oxygen (1950-2000)	WQ-44
South Prong of the Alafia River – Dissolved Oxygen vs. Flow	WQ-44
South Prong of the Alafia River – Dissolved Oxygen Residuals over Time	WQ-44
South Prong of the Alafia River – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-45
South Prong of the Alafia River – Nitrate/Nitrite Nitrogen vs. Flow	WQ-45
South Prong of the Alafia River – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-45
South Prong of the Alafia River – Phosphorus (1950-2000)	WQ-46
South Prong of the Alafia River – Phosphorus vs. Flow	WQ-46
South Prong of the Alafia River – Phosphorus Residuals over Time	WQ-46
South Prong of the Alafia River – Calcium (1950-2000)	WQ-47
South Prong of the Alafia River – Calcium vs. Flow	WQ-47
South Prong of the Alafia River – Calcium Residuals over Time	WQ-47
South Prong of the Alafia River – Chloride (1950-2000)	WQ-48
South Prong of the Alafia River – Chloride vs. Flow	WQ-48
South Prong of the Alafia River – Chloride Residuals over Time	WQ-48
South Prong of the Alafia River – Fluoride (1950-2000)	WQ-49
South Prong of the Alafia River – Fluoride vs. Flow	WQ-49
South Prong of the Alafia River – Fluoride Residuals over Time	WQ-49
South Prong of the Alafia River – Iron (1950-2000)	WQ-50
South Prong of the Alafia River – Iron vs. Flow	WQ-50
South Prong of the Alafia River – Iron Residuals over Time	WQ-50
South Prong of the Alafia River – Magnesium (1950-2000)	WQ-51

South Prong of the Alafia River – Magnesium vs. Flow	WQ-51
South Prong of the Alafia River – Magnesium Residuals over Time	WQ-51
South Prong of the Alafia River – Potassium (1950-2000)	WQ-52
South Prong of the Alafia River – Potassium vs. Flow	WQ-52
South Prong of the Alafia River – Potassium Residuals over Time	WQ-52
South Prong of the Alafia River – Sodium (1950-2000)	WQ-53
South Prong of the Alafia River – Sodium vs. Flow	WQ-53
South Prong of the Alafia River – Sodium Residuals over Time	WQ-53
South Prong of the Alafia River – Sulfate (1950-2000)	WQ-54
South Prong of the Alafia River – Sulfate vs. Flow	WQ-54
South Prong of the Alafia River – Sulfate Residuals over Time	WQ-54
Myakka River near Sarasota – Conductance (1950-2000)	WQ-55
Myakka River near Sarasota – Conductance vs. Flow	WQ-55
Myakka River near Sarasota – Conductance Residuals over Time	WQ-55
Myakka River near Sarasota – pH (1950-2000)	WQ-56
Myakka River near Sarasota – pH vs. Flow	WQ-56
Myakka River near Sarasota – pH Residuals over Time	WQ-56
Myakka River near Sarasota – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-57
Myakka River near Sarasota – Nitrate/Nitrite Nitrogen vs. Flow	WQ-57
Myakka River near Sarasota – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-57
Myakka River near Sarasota – Phosphorus (1950-2000)	WQ-58
Myakka River near Sarasota – Phosphorus vs. Flow	WQ-58
Myakka River near Sarasota – Phosphorus Residuals over Time	WQ-58
Myakka River near Sarasota – Chloride (1950-2000)	WQ-59
Myakka River near Sarasota – Chloride vs. Flow	WQ-59
Myakka River near Sarasota – Chloride Residuals over Time	WQ-59
Myakka River near Sarasota – Fluoride (1950-2000)	WQ-60
Myakka River near Sarasota – Fluoride vs. Flow	WQ-60
Myakka River near Sarasota – Fluoride Residuals over Time	WQ-60
Myakka River near Sarasota – Magnesium (1950-2000)	WQ-61
Myakka River near Sarasota – Magnesium vs. Flow	WQ-61
Myakka River near Sarasota – Magnesium Residuals over Time	WQ-61
Myakka River near Sarasota – Potassium (1950-2000)	WQ-62
Myakka River near Sarasota – Potassium vs. Flow	WQ-62
Myakka River near Sarasota – Potassium Residuals over Time	WQ-62
Myakka River near Sarasota – Silica (1950-2000)	WQ-63
Myakka River near Sarasota – Silica vs. Flow	WQ-63
Myakka River near Sarasota – Silica Residuals over Time	WQ-63
Myakka River near Sarasota – Sodium (1950-2000)	WQ-64
Myakka River near Sarasota – Sodium vs. Flow	WQ-64
Myakka River near Sarasota – Sodium Residuals over Time	WQ-64
Myakka River near Sarasota – Sulfate (1950-2000)	WQ-65
Myakka River near Sarasota – Sulfate vs. Flow	WQ-65
Myakka River near Sarasota – Sulfate Residuals over Time	WQ-65
Peace River at Bartow – Flow (1950-2000)	WQ-66
Peace River at Bartow – Conductance (1950-2000)	WQ-67

Peace River at Bartow – Conductance vs. Flow	WQ-67
Peace River at Bartow – Conductance Residuals over Time	WQ-67
Peace River at Bartow – Dissolved Oxygen (1950-2000)	WQ-68
Peace River at Bartow – Dissolved Oxygen vs. Flow	WQ-68
Peace River at Bartow – Dissolved Oxygen Residuals over Time	WQ-68
Peace River at Bartow – pH (1950-2000)	WQ-69
Peace River at Bartow – pH vs. Flow	WQ-69
Peace River at Bartow – pH Residuals over Time	WQ-69
Peace River at Bartow – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-70
Peace River at Bartow – Nitrate/Nitrite Nitrogen vs. Flow	WQ-70
Peace River at Bartow – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-70
Peace River at Bartow – Phosphorus (1950-2000)	WQ-71
Peace River at Bartow – Phosphorus vs. Flow	WQ-71
Peace River at Bartow – Phosphorus Residuals over Time	WQ-71
Peace River at Bartow – Calcium (1950-2000)	WQ-72
Peace River at Bartow – Calcium vs. Flow	WQ-72
Peace River at Bartow – Calcium Residuals over Time	WQ-72
Peace River at Bartow – Chloride (1950-2000)	WQ-73
Peace River at Bartow – Chloride vs. Flow	WQ-73
Peace River at Bartow – Chloride Residuals over Time	WQ-73
Peace River at Bartow – Fluoride (1950-2000)	WQ-74
Peace River at Bartow – Fluoride vs. Flow	WQ-74
Peace River at Bartow – Fluoride Residuals over Time	WQ-74
Peace River at Bartow – Iron (1950-2000)	WQ-75
Peace River at Bartow – Iron vs. Flow	WQ-75
Peace River at Bartow – Iron Residuals over Time	WQ-75
Peace River at Bartow – Magnesium (1950-2000)	WQ-76
Peace River at Bartow – Magnesium vs. Flow	WQ-76
Peace River at Bartow – Magnesium Residuals over Time	WQ-76
Peace River at Bartow – Potassium (1950-2000)	WQ-77
Peace River at Bartow – Potassium vs. Flow	WQ-77
Peace River at Bartow – Potassium Residuals over Time	WQ-77
Peace River at Bartow – Silica (1950-2000)	WQ-78
Peace River at Bartow – Silica vs. Flow	WQ-78
Peace River at Bartow – Silica Residuals over Time	WQ-78
Peace River at Bartow – Sodium (1950-2000)	WQ-79
Peace River at Bartow – Sodium vs. Flow	WQ-79
Peace River at Bartow – Sodium Residuals over Time	WQ-79
Peace River at Bartow – Sulfate (1950-2000)	WQ-80
Peace River at Bartow – Sulfate vs. Flow	WQ-80
Peace River at Bartow – Sulfate Residuals over Time	WQ-80
Peace River at Zolfo Springs – Flow (1950-2000)	WQ-81
Peace River at Zolfo Springs – Conductance (1950-2000)	WQ-82
Peace River at Zolfo Springs – Conductance vs. Flow	WQ-82
Peace River at Zolfo Springs – Conductance Residuals over Time	WQ-82
Peace River at Zolfo Springs – Dissolved Oxygen (1950-2000)	WQ-83

Peace River at Zolfo Springs – Dissolved Oxygen vs. Flow	WQ-83
Peace River at Zolfo Springs – Dissolved Oxygen Residuals over Time	WQ-83
Peace River at Zolfo Springs – pH (1950-2000)	WQ-84
Peace River at Zolfo Springs – pH vs. Flow	WQ-84
Peace River at Zolfo Springs – pH Residuals over Time	WQ-84
Peace River at Zolfo Springs – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-85
Peace River at Zolfo Springs – Nitrate/Nitrite Nitrogen vs. Flow	WQ-85
Peace River at Zolfo Springs – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-85
Peace River at Zolfo Springs – Phosphorus (1950-2000)	WQ-86
Peace River at Zolfo Springs – Phosphorus vs. Flow	WQ-86
Peace River at Zolfo Springs – Phosphorus Residuals over Time	WQ-86
Peace River at Zolfo Springs – Calcium (1950-2000)	WQ-87
Peace River at Zolfo Springs – Calcium vs. Flow	WQ-87
Peace River at Zolfo Springs – Calcium Residuals over Time	WQ-87
Peace River at Zolfo Springs – Chloride (1950-2000)	WQ-88
Peace River at Zolfo Springs – Chloride vs. Flow	WQ-88
Peace River at Zolfo Springs – Chloride Residuals over Time	WQ-88
Peace River at Zolfo Springs – Fluoride (1950-2000)	WQ-89
Peace River at Zolfo Springs – Fluoride vs. Flow	WQ-89
Peace River at Zolfo Springs – Fluoride Residuals over Time	WQ-89
Peace River at Zolfo Springs – Magnesium (1950-2000)	WQ-90
Peace River at Zolfo Springs – Magnesium vs. Flow	WQ-90
Peace River at Zolfo Springs – Magnesium Residuals over Time	WQ-90
Peace River at Zolfo Springs – Potassium (1950-2000)	WQ-91
Peace River at Zolfo Springs – Potassium vs. Flow	WQ-91
Peace River at Zolfo Springs – Potassium Residuals over Time	WQ-91
Peace River at Zolfo Springs – Sodium (1950-2000)	WQ-92
Peace River at Zolfo Springs – Sodium vs. Flow	WQ-92
Peace River at Zolfo Springs – Sodium Residuals over Time	WQ-92
Peace River at Zolfo Springs – Sulfate (1950-2000)	WQ-93
Peace River at Zolfo Springs – Sulfate vs. Flow	WQ-93
Peace River at Zolfo Springs – Sulfate Residuals over Time	WQ-93
Peace River at Zolfo Springs – Silica (1950-2000)	WQ-94
Peace River at Zolfo Springs – Silica vs. Flow	WQ-94
Peace River at Zolfo Springs – Silica Residuals over Time	WQ-94
Peace River at Arcadia – Flow (1950-2000)	WQ-95
Peace River at Arcadia – Conductance (1950-2000)	WQ-96
Peace River at Arcadia – Conductance vs. Flow	WQ-96
Peace River at Arcadia – Conductance Residuals over Time	WQ-96
Peace River at Arcadia – Dissolved Oxygen (1950-2000)	WQ-97
Peace River at Arcadia – Dissolved Oxygen vs. Flow	WQ-97
Peace River at Arcadia – Dissolved Oxygen Residuals over Time	WQ-97
Peace River at Arcadia – pH (1950-2000)	WQ-98
Peace River at Arcadia – pH vs. Flow	WQ-98
Peace River at Arcadia – pH Residuals over Time	WQ-98
Peace River at Arcadia – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-99

Peace River at Arcadia – Nitrate/Nitrite Nitrogen vs. Flow	WQ-99
Peace River at Arcadia – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-99
Peace River at Arcadia – Phosphorus (1950-2000)	WQ-100
Peace River at Arcadia – Phosphorus vs. Flow	WQ-100
Peace River at Arcadia – Phosphorus Residuals over Time	WQ-100
Peace River at Arcadia – Hardness (1950-2000)	WQ-101
Peace River at Arcadia – Hardness vs. Flow	WQ-101
Peace River at Arcadia – Hardness Residuals over Time	WQ-101
Peace River at Arcadia – Calcium (1950-2000)	WQ-102
Peace River at Arcadia – Calcium vs. Flow	WQ-102
Peace River at Arcadia – Calcium Residuals over Time	WQ-102
Peace River at Arcadia – Chloride (1950-2000)	WQ-103
Peace River at Arcadia – Chloride vs. Flow	WQ-103
Peace River at Arcadia – Chloride Residuals over Time	WQ-103
Peace River at Arcadia – Fluoride (1950-2000)	WQ-104
Peace River at Arcadia – Fluoride vs. Flow	WQ-104
Peace River at Arcadia – Fluoride Residuals over Time	WQ-104
Peace River at Arcadia – Iron (1950-2000)	WQ-105
Peace River at Arcadia – Iron vs. Flow	WQ-105
Peace River at Arcadia – Iron Residuals over Time	WQ-105
Peace River at Arcadia – Magnesium (1950-2000)	WQ-106
Peace River at Arcadia – Magnesium vs. Flow	WQ-106
Peace River at Arcadia – Magnesium Residuals over Time	WQ-106
Peace River at Arcadia – Potassium (1950-2000)	WQ-107
Peace River at Arcadia – Potassium vs. Flow	WQ-107
Peace River at Arcadia – Potassium Residuals over Time	WQ-107
Peace River at Arcadia – Sodium (1950-2000)	WQ-108
Peace River at Arcadia – Sodium vs. Flow	WQ-108
Peace River at Arcadia – Sodium Residuals over Time	WQ-108
Peace River at Arcadia – Sulfate (1950-2000)	WQ-109
Peace River at Arcadia – Sulfate vs. Flow	WQ-109
Peace River at Arcadia – Sulfate Residuals over Time	WQ-109
Peace River at Arcadia – Silica (1950-2000)	WQ-110
Peace River at Arcadia – Silica vs. Flow	WQ-110
Peace River at Arcadia – Silica Residuals over Time	WQ-110
Payne Creek near Bowling Green – Flow (1950-2000)	WQ-111
Payne Creek near Bowling Green – Conductance (1950-2000)	WQ-112
Payne Creek near Bowling Green – Conductance vs. Flow	WQ-112
Payne Creek near Bowling Green – Conductance Residuals over Time	WQ-112
Payne Creek near Bowling Green – pH (1950-2000)	WQ-113
Payne Creek near Bowling Green – pH vs. Flow	WQ-113
Payne Creek near Bowling Green – pH Residuals over Time	WQ-113
Payne Creek near Bowling Green – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-114
Payne Creek near Bowling Green – Nitrate/Nitrite Nitrogen vs. Flow	WQ-114
Payne Creek near Bowling Green – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-114
Payne Creek near Bowling Green – Phosphorus (1950-2000)	WQ-115

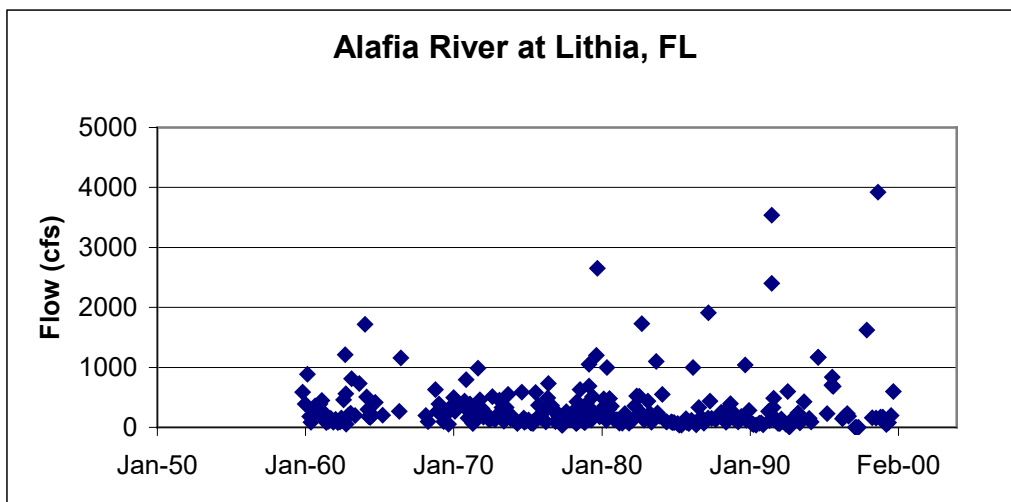
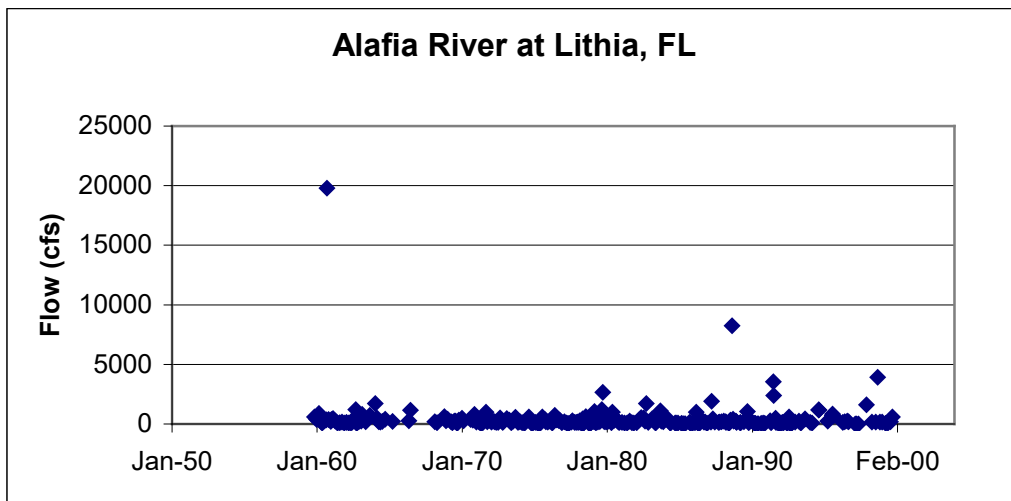
Payne Creek near Bowling Green – Phosphorus vs. Flow	WQ-115
Payne Creek near Bowling Green	WQ-115
Payne Creek near Bowling Green – Chloride (1950-2000)	WQ-116
Payne Creek near Bowling Green – Chloride vs. Flow	WQ-116
Payne Creek near Bowling Green – Chloride Residuals over Time	WQ-116
Payne Creek near Bowling Green – Fluoride (1950-2000)	WQ-117
Payne Creek near Bowling Green – Fluoride vs. Flow	WQ-117
Payne Creek near Bowling Green – Fluoride Residuals over Time	WQ-117
Payne Creek near Bowling Green – Magnesium (1950-2000)	WQ-118
Payne Creek near Bowling Green – Magnesium vs. Flow	WQ-118
Payne Creek near Bowling Green – Magnesium Residuals over Time	WQ-118
Payne Creek near Bowling Green – Potassium (1950-2000)	WQ-119
Payne Creek near Bowling Green – Potassium vs. Flow	WQ-119
Payne Creek near Bowling Green – Potassium Residuals over Time	WQ-119
Payne Creek near Bowling Green – Silica (1950-2000)	WQ-120
Payne Creek near Bowling Green – Silica vs. Flow	WQ-120
Payne Creek near Bowling Green – Silica Residuals over Time	WQ-120
Charlie Creek near Gardner – Flow (1950-2000)	WQ-121
Charlie Creek near Gardner – Conductance (1950-2000)	WQ-122
Charlie Creek near Gardner – Conductance vs. Flow	WQ-122
Charlie Creek near Gardner – Conductance Residuals over Time	WQ-122
Charlie Creek near Gardner – Dissolved Oxygen (1950-2000)	WQ-123
Charlie Creek near Gardner – Dissolved Oxygen vs. Flow	WQ-123
Charlie Creek near Gardner – Dissolved Oxygen Residuals over Time	WQ-123
Charlie Creek near Gardner – pH (1950-2000)	WQ-124
Charlie Creek near Gardner – pH vs. Flow	WQ-124
Charlie Creek near Gardner – pH Residuals over Time	WQ-124
Charlie Creek near Gardner – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-125
Charlie Creek near Gardner – Nitrate/Nitrite Nitrogen vs. Flow	WQ-125
Charlie Creek near Gardner – Nitrate/Nitrite Nitrogen Residuals over Time	WQ-125
Charlie Creek near Gardner – Phosphorus (1950-2000)	WQ-126
Charlie Creek near Gardner – Phosphorus vs. Flow	WQ-126
Charlie Creek near Gardner – Phosphorus Residuals over Time	WQ-126
Charlie Creek near Gardner – Calcium (1950-2000)	WQ-127
Charlie Creek near Gardner – Calcium vs. Flow	WQ-127
Charlie Creek near Gardner – Calcium Residuals over Time	WQ-127
Charlie Creek near Gardner – Chloride (1950-2000)	WQ-128
Charlie Creek near Gardner – Chloride vs. Flow	WQ-128
Charlie Creek near Gardner – Chloride Residuals over Time	WQ-128
Charlie Creek near Gardner – Fluoride (1950-2000)	WQ-129
Charlie Creek near Gardner – Fluoride vs. Flow	WQ-129
Charlie Creek near Gardner – Fluoride Residuals over Time	WQ-129
Charlie Creek near Gardner – Magnesium (1950-2000)	WQ-130
Charlie Creek near Gardner – Magnesium vs. Flow	WQ-130
Charlie Creek near Gardner – Magnesium Residuals over Time	WQ-130
Charlie Creek near Gardner – Potassium (1950-2000)	WQ-131

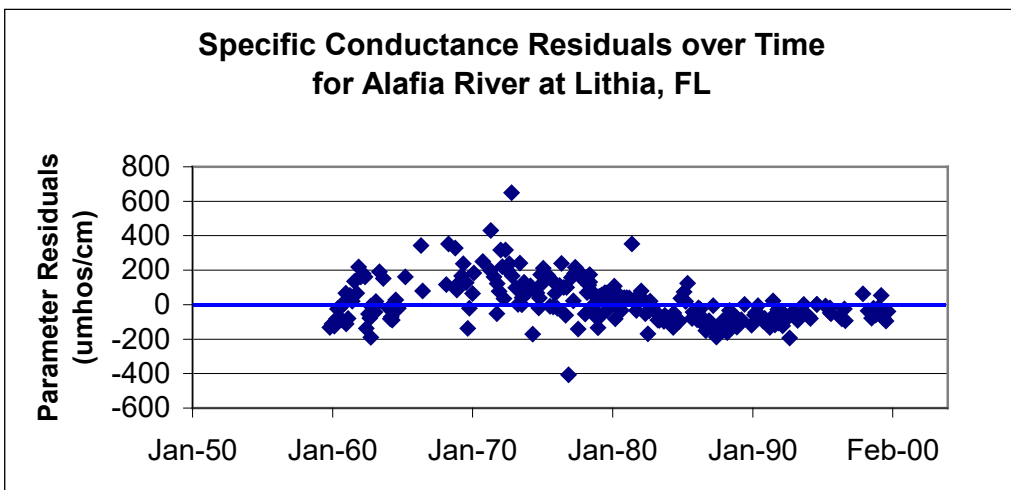
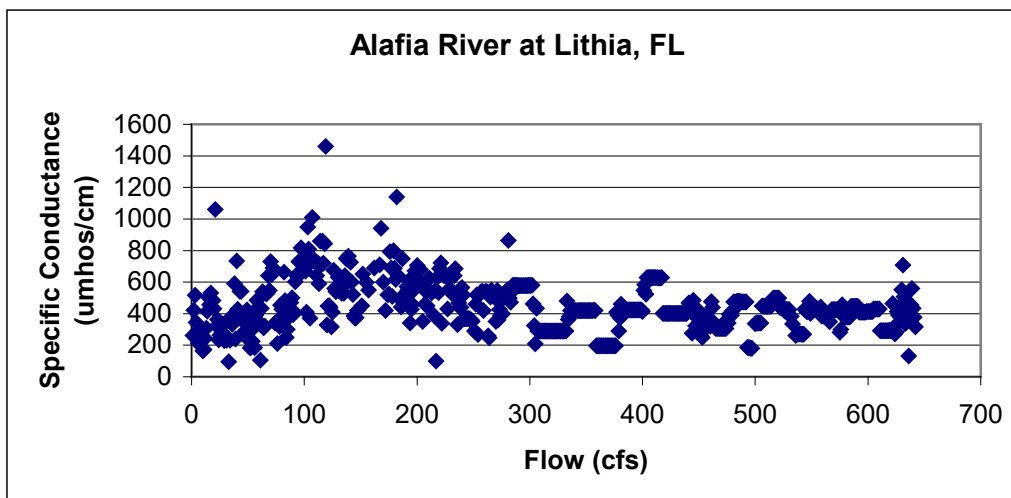
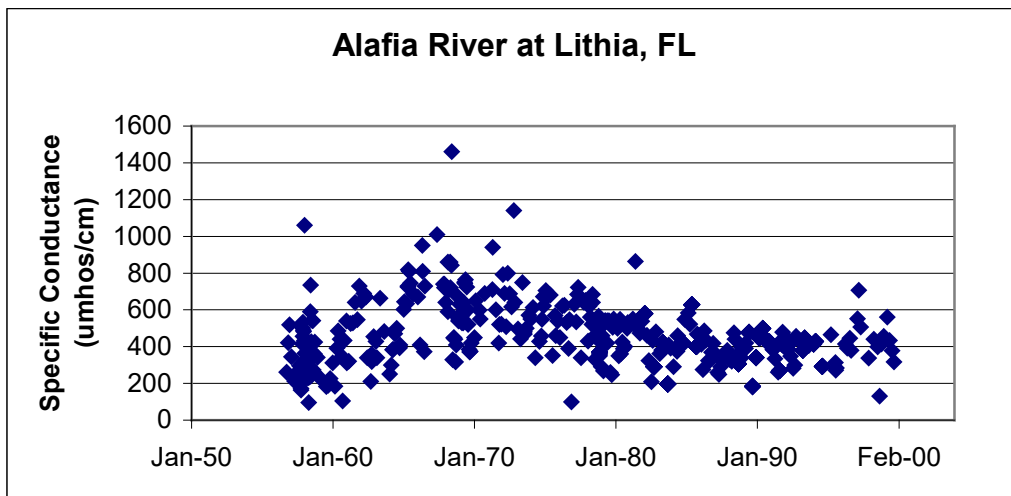
Charlie Creek near Gardner – Potassium vs. Flow	WQ-131
Charlie Creek near Gardner – Potassium Residuals over Time	WQ-131
Charlie Creek near Gardner – Sodium (1950-2000)	WQ-132
Charlie Creek near Gardner – Sodium vs. Flow	WQ-132
Charlie Creek near Gardner – Sodium Residuals over Time	WQ-132
Charlie Creek near Gardner – Sulfate (1950-2000)	WQ-133
Charlie Creek near Gardner – Sulfate vs. Flow	WQ-133
Charlie Creek near Gardner – Sulfate Residuals over Time	WQ-133
Charlie Creek near Gardner – Silica (1950-2000)	WQ-134
Charlie Creek near Gardner – Silica vs. Flow	WQ-134
Charlie Creek near Gardner – Silica Residuals over Time	WQ-134
Horse Creek at Arcadia – Flow (1950-2000)	WQ-135
Horse Creek at Arcadia – Conductance (1950-2000)	WQ-136
Horse Creek at Arcadia – Conductance vs. Flow	WQ-136
Horse Creek at Arcadia – Conductance Residuals over Time	WQ-136
Horse Creek at Arcadia – pH (1950-2000)	WQ-137
Horse Creek at Arcadia – pH vs. Flow	WQ-137
Horse Creek at Arcadia – pH Residuals over Time	WQ-137
Horse Creek at Arcadia – Dissolved Oxygen (1950-2000)	WQ-138
Horse Creek at Arcadia – Dissolved Oxygen vs. Flow	WQ-138
Horse Creek at Arcadia – Dissolved Oxygen Residuals over Time	WQ-138
Horse Creek at Arcadia – Phosphorus (1950-2000)	WQ-139
Horse Creek at Arcadia – Phosphorus vs. Flow	WQ-139
Horse Creek at Arcadia – Phosphorus Residuals over Time	WQ-139
Horse Creek at Arcadia – Calcium (1950-2000)	WQ-140
Horse Creek at Arcadia – Calcium vs. Flow	WQ-140
Horse Creek at Arcadia – Calcium Residuals over Time	WQ-140
Horse Creek at Arcadia – Chloride (1950-2000)	WQ-141
Horse Creek at Arcadia – Chloride vs. Flow	WQ-141
Horse Creek at Arcadia – Chloride Residuals over Time	WQ-141
Horse Creek at Arcadia – Fluoride (1950-2000)	WQ-142
Horse Creek at Arcadia – Fluoride vs. Flow	WQ-142
Horse Creek at Arcadia – Fluoride Residuals over Time	WQ-142
Horse Creek at Arcadia – Magnesium (1950-2000)	WQ-143
Horse Creek at Arcadia – Magnesium vs. Flow	WQ-143
Horse Creek at Arcadia – Magnesium Residuals over Time	WQ-143
Horse Creek at Arcadia – Potassium (1950-2000)	WQ-144
Horse Creek at Arcadia – Potassium vs. Flow	WQ-144
Horse Creek at Arcadia – Potassium Residuals over Time	WQ-144
Horse Creek at Arcadia – Sodium (1950-2000)	WQ-145
Horse Creek at Arcadia – Sodium vs. Flow	WQ-145
Horse Creek at Arcadia – Sodium Residuals over Time	WQ-145
Horse Creek at Arcadia – Sulfate (1950-2000)	WQ-146
Horse Creek at Arcadia – Sulfate vs. Flow	WQ-146
Horse Creek at Arcadia – Sulfate Residuals over Time	WQ-146
Horse Creek at Arcadia – Silica (1950-2000)	WQ-147

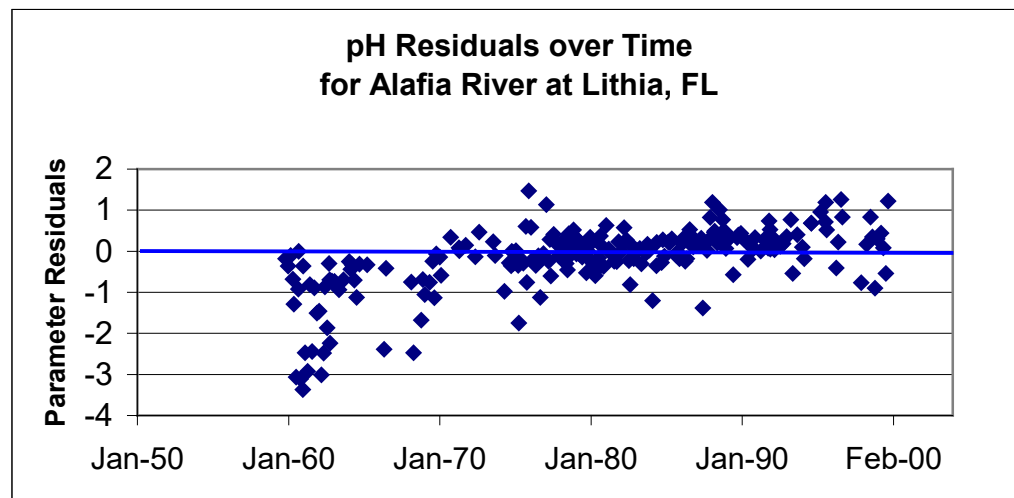
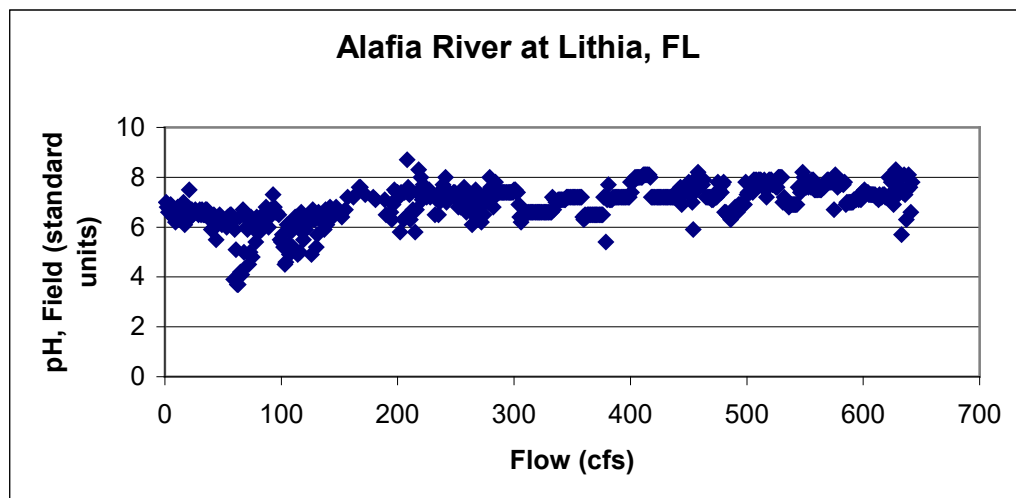
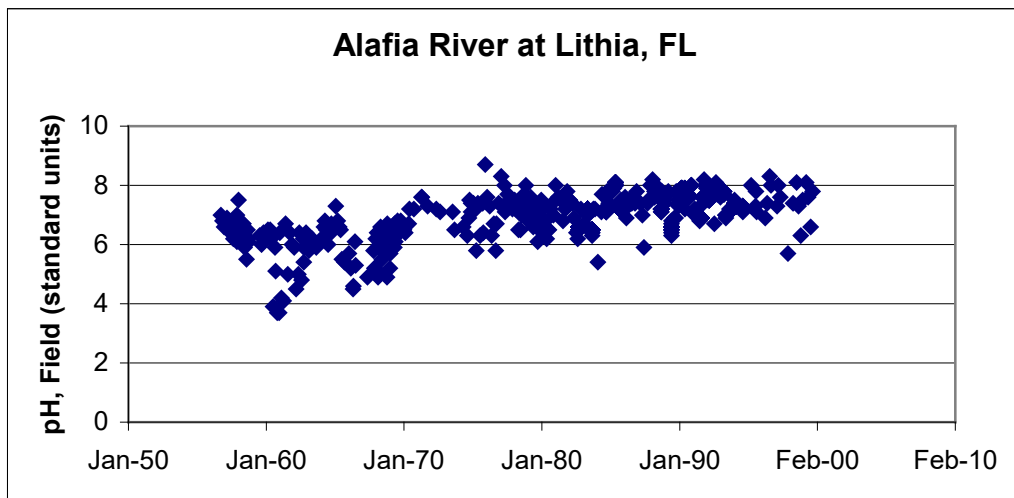
Horse Creek at Arcadia – Silica vs. Flow	WQ-147
Horse Creek at Arcadia – Silica Residuals over Time	WQ-147
Withlacoochee River at Croom – Flow (1950-2000)	WQ-148
Withlacoochee River at Croom – Conductance (1950-2000)	WQ-149
Withlacoochee River at Croom – Conductance vs. Flow	WQ-149
Withlacoochee River at Croom – Conductance Residuals over Time	WQ-149
Withlacoochee River at Croom – Dissolved Oxygen (1950-2000)	WQ-150
Withlacoochee River at Croom – Dissolved Oxygen vs. Flow	WQ-150
Withlacoochee River at Croom – Dissolved Oxygen Residuals over Time	WQ-150
Withlacoochee River at Croom – pH (1950-2000)	WQ-151
Withlacoochee River at Croom – pH vs. Flow	WQ-151
Withlacoochee River at Croom – pH Residuals over Time	WQ-151
Withlacoochee River at Croom – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-152
Withlacoochee River at Croom – Nitrate/Nitrite Nitrogen vs. Flow	WQ-152
Withlacoochee River at Croom – Nitrate/Nitrite Nitrogen Residuals over time	WQ-152
Withlacoochee River at Croom – Phosphorus (1950-2000)	WQ-153
Withlacoochee River at Croom – Phosphorus vs. Flow	WQ-153
Withlacoochee River at Croom – Phosphorus Residuals over Time	WQ-153
Withlacoochee River at Croom – Calcium (1950-2000)	WQ-154
Withlacoochee River at Croom – Calcium vs. Flow	WQ-154
Withlacoochee River at Croom – Calcium Residuals over Time	WQ-154
Withlacoochee River at Croom – Chloride (1950-2000)	WQ-155
Withlacoochee River at Croom – Chloride vs. Flow	WQ-155
Withlacoochee River at Croom – Chloride Residuals over Time	WQ-155
Withlacoochee River at Croom – Fluoride (1950-2000)	WQ-156
Withlacoochee River at Croom – Fluoride vs. Flow	WQ-156
Withlacoochee River at Croom – Fluoride Residuals over Time	WQ-156
Withlacoochee River at Croom – Magnesium (1950-2000)	WQ-157
Withlacoochee River at Croom – Magnesium vs. Flow	WQ-157
Withlacoochee River at Croom – Magnesium Residuals over Time	WQ-157
Withlacoochee River at Croom – Potassium (1950-2000)	WQ-158
Withlacoochee River at Croom – Potassium vs. Flow	WQ-158
Withlacoochee River at Croom – Potassium Residuals over Time	WQ-158
Withlacoochee River at Croom – Silica (1950-2000)	WQ-159
Withlacoochee River at Croom – Silica vs. Flow	WQ-159
Withlacoochee River at Croom – Silica Residuals over Time	WQ-159
Withlacoochee River at Croom – Sodium (1950-2000)	WQ-160
Withlacoochee River at Croom – Sodium vs. Flow	WQ-160
Withlacoochee River at Croom – Sodium Residuals over Time	WQ-160
Withlacoochee River at Croom – Sulfate (1950-2000)	WQ-161
Withlacoochee River at Croom – Sulfate vs. Flow	WQ-161
Withlacoochee River at Croom – Sulfate Residuals over Time	WQ-161
Withlacoochee River at Trilby – Flow (1950-2000)	WQ-162
Withlacoochee River at Trilby – Conductance (1950-2000)	WQ-163
Withlacoochee River at Trilby – Conductance vs. Flow	WQ-163
Withlacoochee River at Trilby – Conductance Residuals over Time	WQ-163

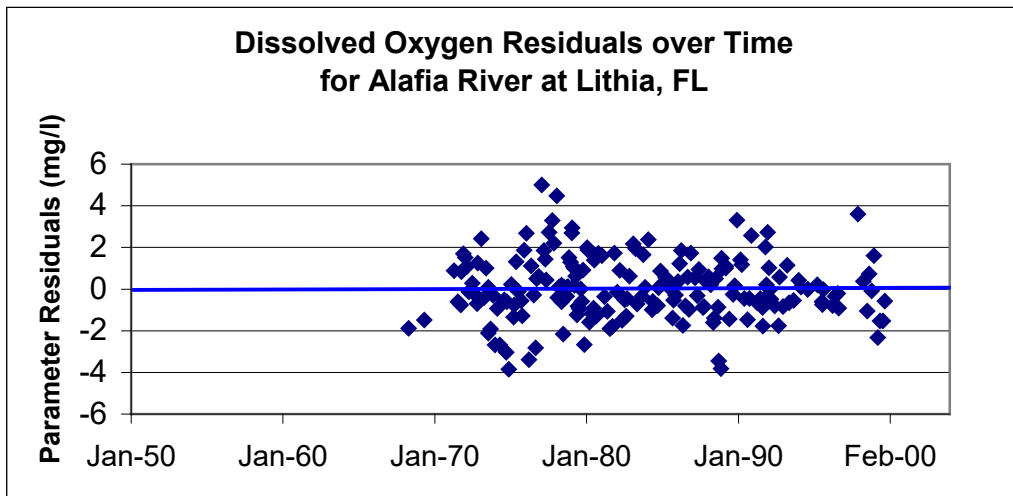
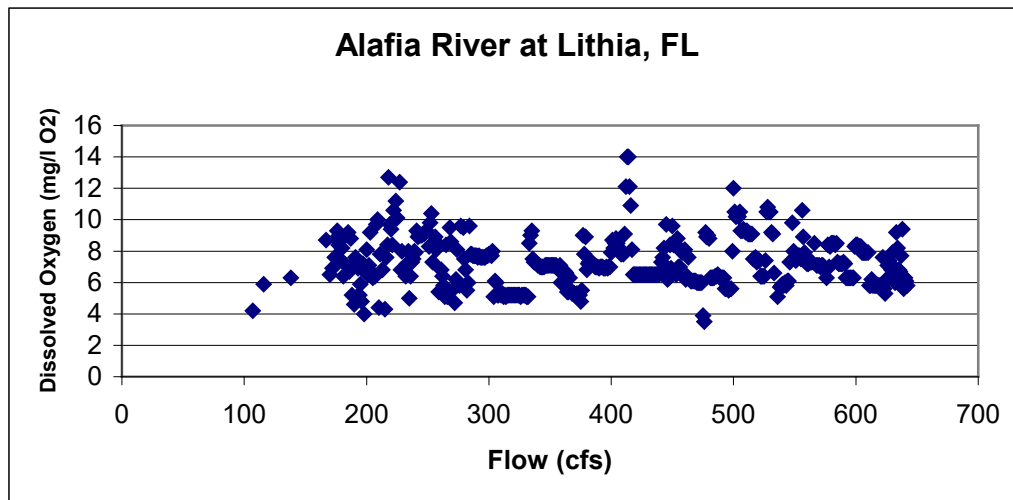
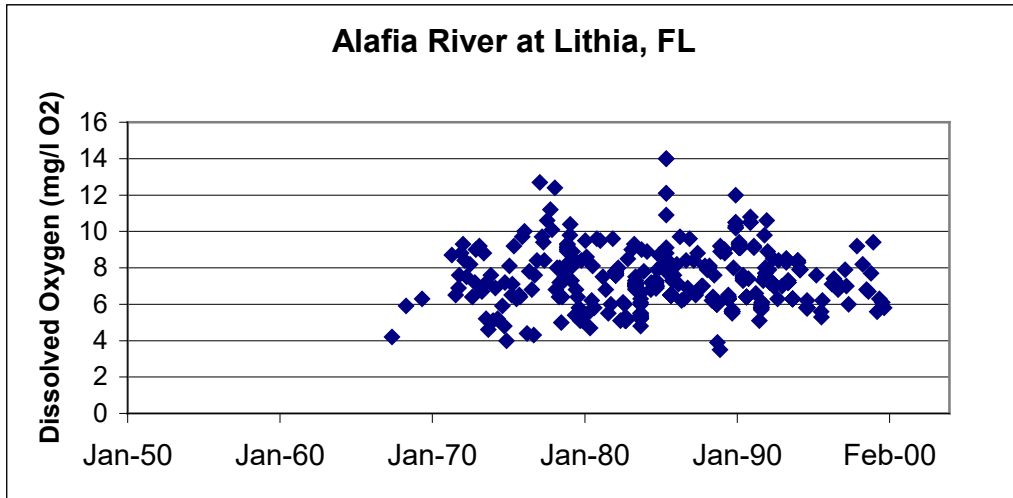
Withlacoochee River at Trilby – Dissolved Oxygen (1950-2000)	WQ-164
Withlacoochee River at Trilby – Dissolved Oxygen vs. Flow	WQ-164
Withlacoochee River at Trilby – Dissolved Oxygen Residuals over Time	WQ-164
Withlacoochee River at Trilby – pH (1950-2000)	WQ-165
Withlacoochee River at Trilby – pH vs. Flow	WQ-165
Withlacoochee River at Trilby – pH Residuals over Time	WQ-165
Withlacoochee River at Holder – Flow (1950-2000)	WQ-166
Withlacoochee River at Holder – Conductance (1950-2000)	WQ-167
Withlacoochee River at Holder – Conductance vs. Flow	WQ-167
Withlacoochee River at Holder – Conductance Residuals over Time	WQ-167
Withlacoochee River at Holder – Dissolved Oxygen (1950-2000)	WQ-168
Withlacoochee River at Holder – Dissolved Oxygen vs. Flow	WQ-168
Withlacoochee River at Holder – Dissolved Oxygen Residuals over Time	WQ-168
Withlacoochee River at Holder – pH (1950-2000)	WQ-169
Withlacoochee River at Holder – pH vs. Flow	WQ-169
Withlacoochee River at Holder – pH Residuals over Time	WQ-169
Withlacoochee River at Holder – Nitrate/Nitrite Nitrogen (1950-2000)	WQ-170
Withlacoochee River at Holder – Nitrate/Nitrite Nitrogen vs. Flow	WQ-170
Withlacoochee River at Holder – Nitrate/Nitrite Nitrogen Residuals over time	WQ-170
Withlacoochee River at Holder – Phosphorus (1950-2000)	WQ-171
Withlacoochee River at Holder – Phosphorus vs. Flow	WQ-171
Withlacoochee River at Holder – Phosphorus Residuals over Time	WQ-171
Withlacoochee River at Holder – Hardness (1950-2000)	WQ-172
Withlacoochee River at Holder – Hardness vs. Flow	WQ-172
Withlacoochee River at Holder – Hardness Residuals over Time	WQ-172
Withlacoochee River at Holder – Calcium (1950-2000)	WQ-173
Withlacoochee River at Holder – Calcium vs. Flow	WQ-173
Withlacoochee River at Holder – Calcium Residuals over Time	WQ-173
Withlacoochee River at Holder – Chloride (1950-2000)	WQ-174
Withlacoochee River at Holder – Chloride vs. Flow	WQ-174
Withlacoochee River at Holder – Chloride Residuals over Time	WQ-174
Withlacoochee River at Holder – Fluoride (1950-2000)	WQ-175
Withlacoochee River at Holder – Fluoride vs. Flow	WQ-175
Withlacoochee River at Holder – Fluoride Residuals over Time	WQ-175
Withlacoochee River at Holder – Iron (1950-2000)	WQ-176
Withlacoochee River at Holder – Iron vs. Flow	WQ-176
Withlacoochee River at Holder – Iron Residuals over Time	WQ-176
Withlacoochee River at Holder – Magnesium (1950-2000)	WQ-177
Withlacoochee River at Holder – Magnesium vs. Flow	WQ-177
Withlacoochee River at Holder – Magnesium Residuals over Time	WQ-177
Withlacoochee River at Holder – Potassium (1950-2000)	WQ-178
Withlacoochee River at Holder – Potassium vs. Flow	WQ-178
Withlacoochee River at Holder – Potassium Residuals over Time	WQ-178
Withlacoochee River at Holder – Silica (1950-2000)	WQ-179
Withlacoochee River at Holder – Silica vs. Flow	WQ-179
Withlacoochee River at Holder – Silica Residuals over Time	WQ-179

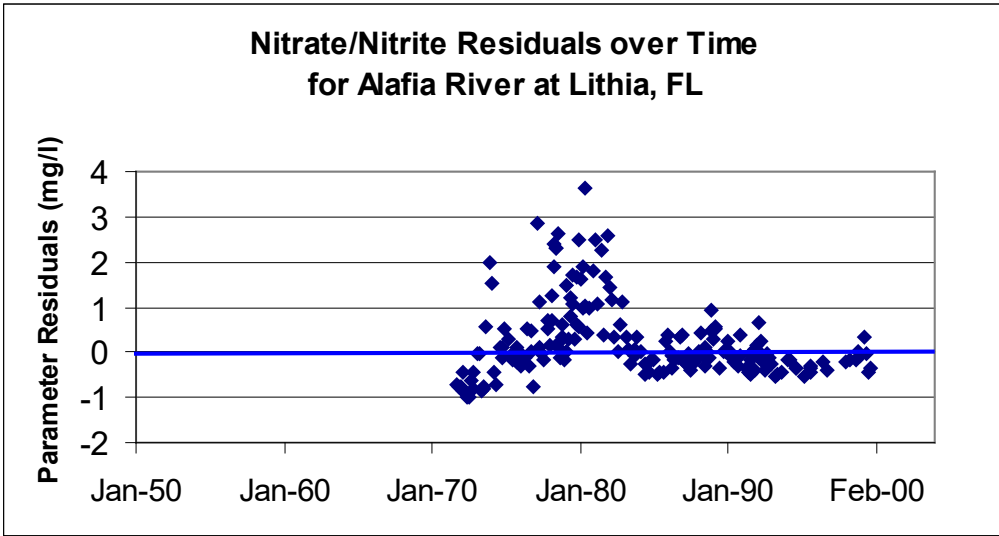
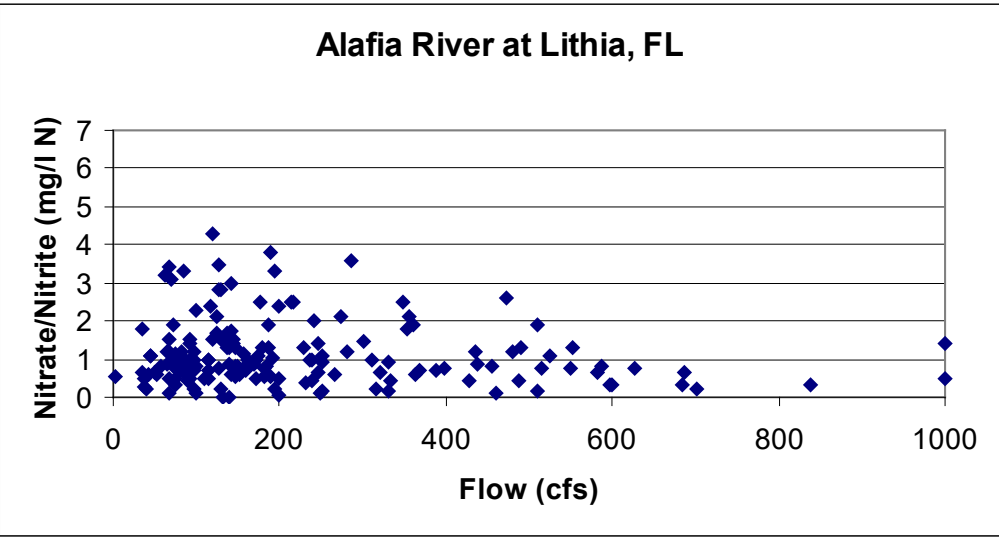
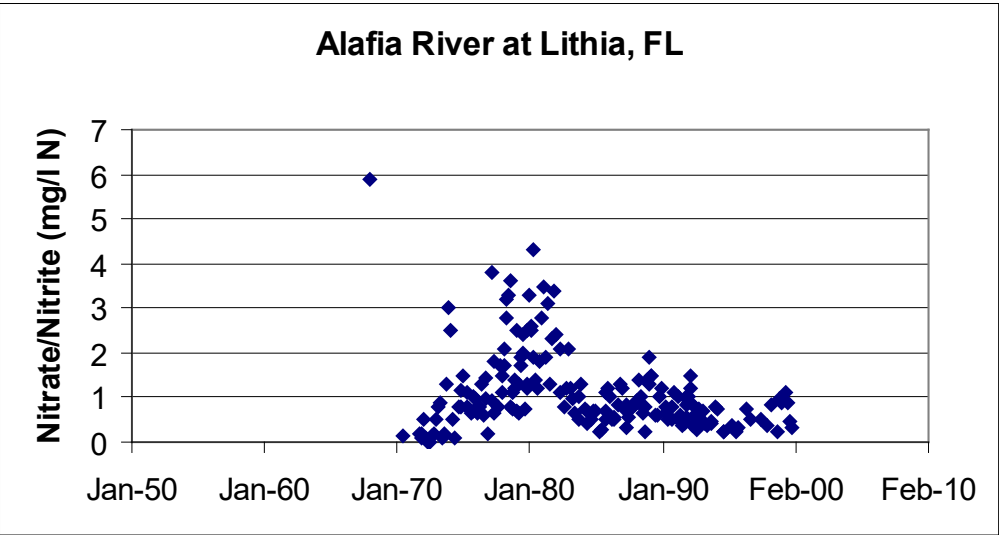
Withlacoochee River at Holder – Sodium (1950-2000)	WQ-180
Withlacoochee River at Holder – Sodium vs. Flow	WQ-180
Withlacoochee River at Holder – Sodium Residuals over Time	WQ-180
Withlacoochee River at Holder – Sulfate (1950-2000)	WQ-181
Withlacoochee River at Holder – Sulfate vs. Flow	WQ-181
Withlacoochee River at Holder – Sulfate Residuals over Time	WQ-181
Alafia River at Lithia – Parameter Residuals	WQ-182
South Prong of Alafia River – Parameter Residuals	WQ-183
North Prong of Alafia River – Parameter Residuals	WQ-184
Withlacoochee River at Croom – Parameter Residuals	WQ-185
Withlacoochee River at Holder – Parameter Residuals	WQ-186
Myakka River near Sarasota – Parameter Residuals	WQ-187
Peace River at Zolfo Springs – Parameter Residuals	WQ-188
Peace River at Arcadia – Parameter Residuals	WQ-189
Charlie Creek near Gardner – Parameter Residuals	WQ-190
Horse Creek at Arcadia – Parameter Residuals	WQ-191
Joshua Creek at Nocatee – Parameter Residuals	WQ-192

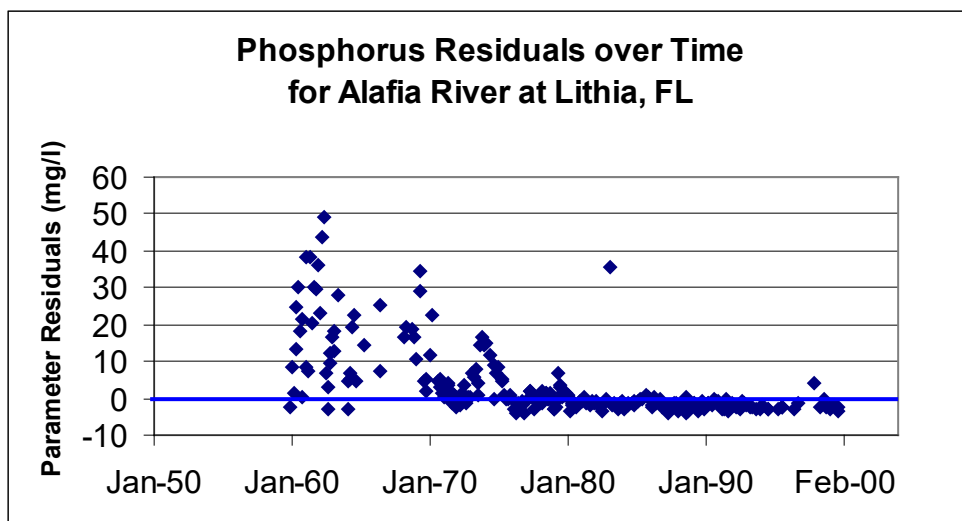
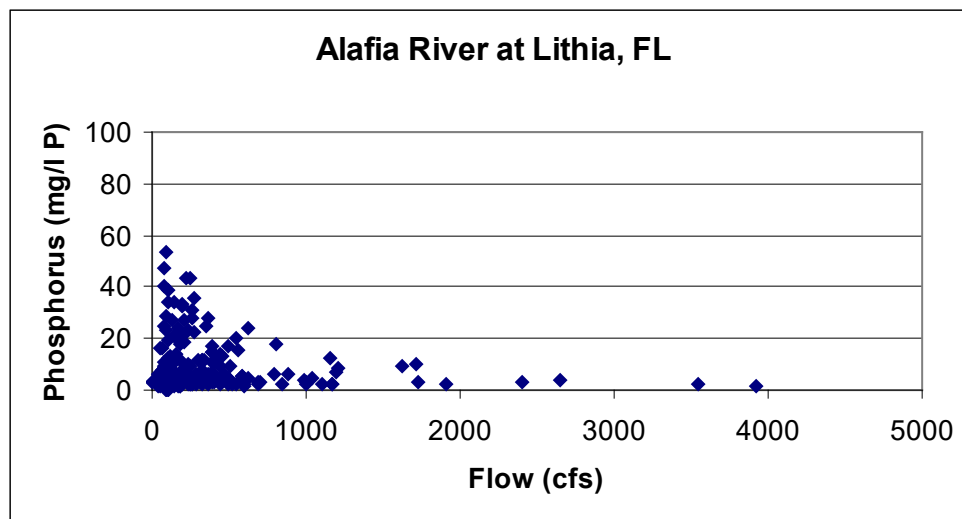
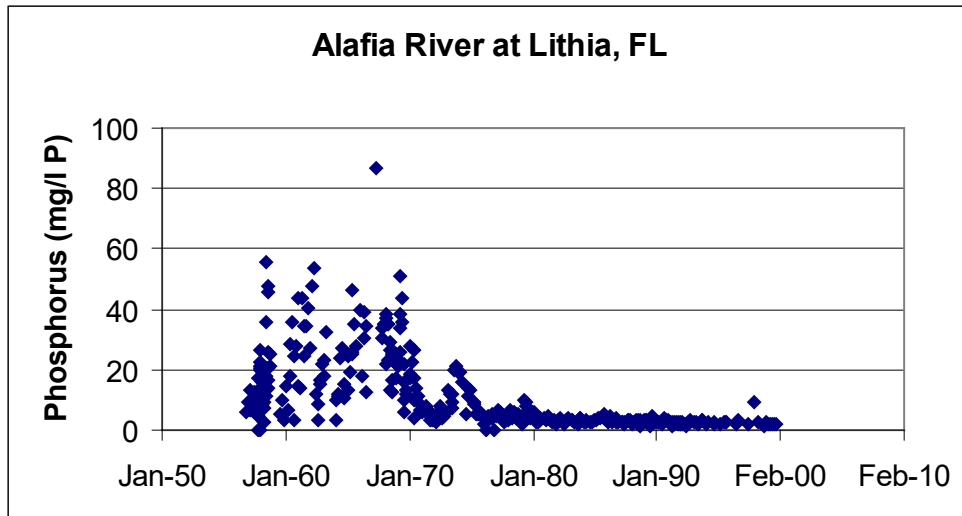


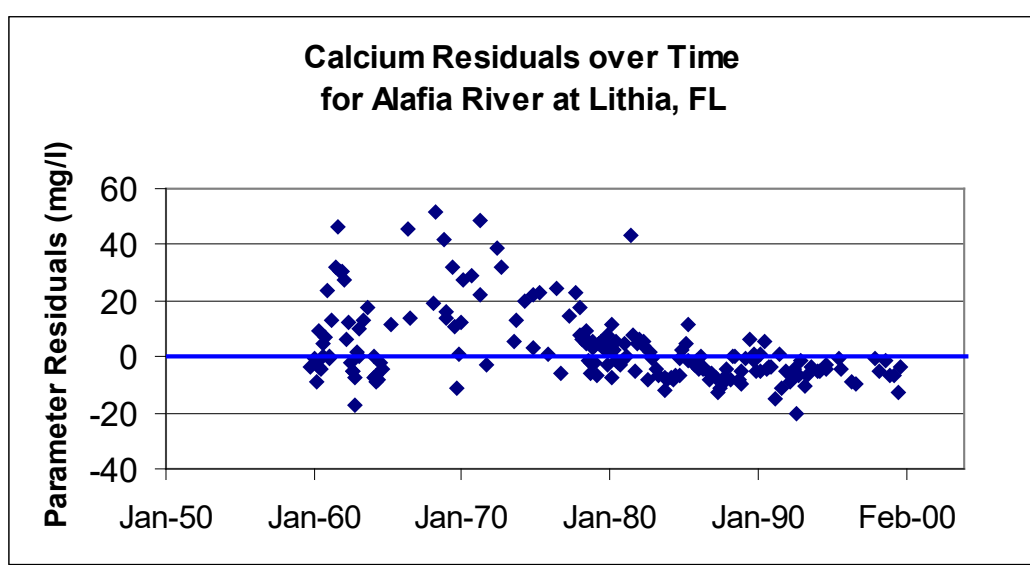
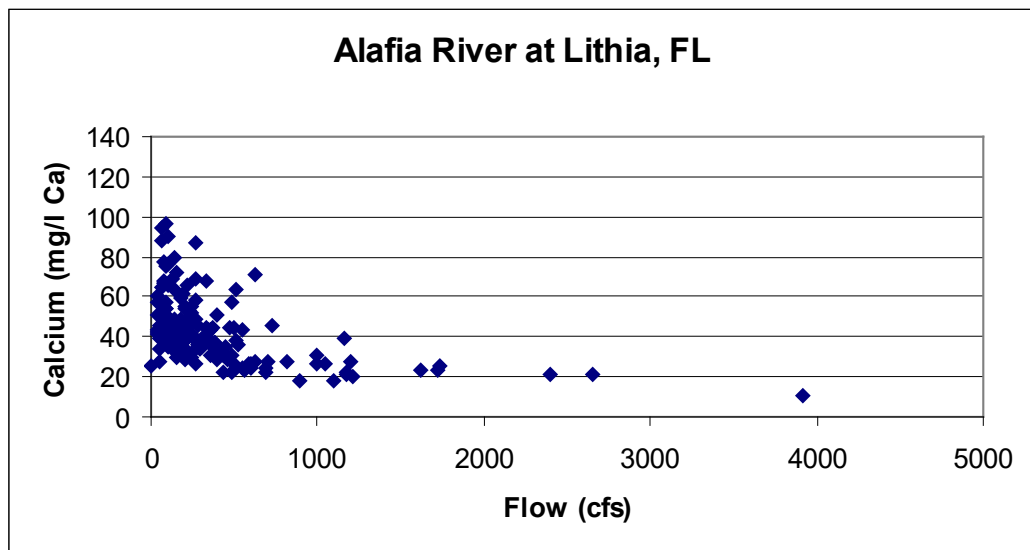
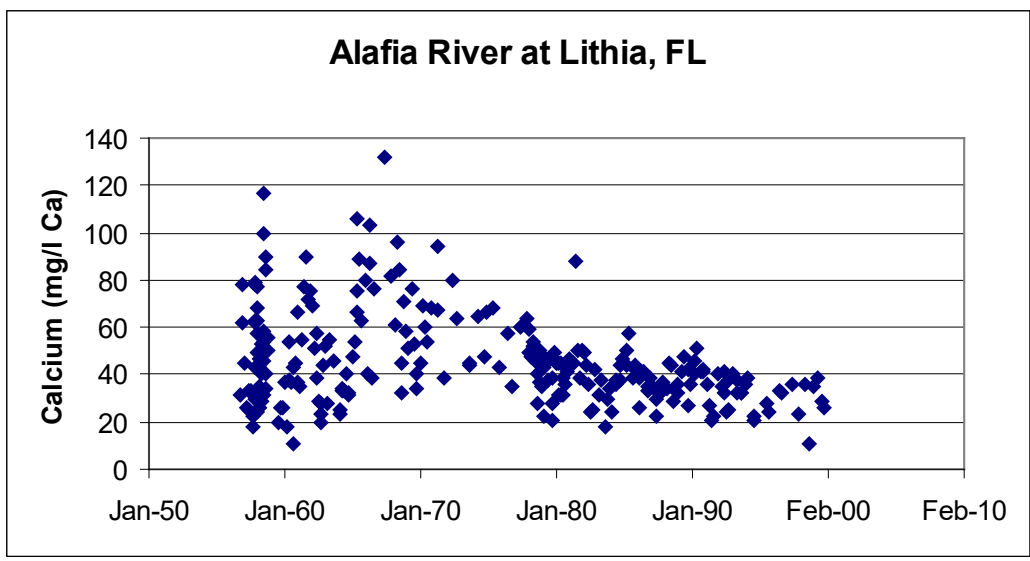


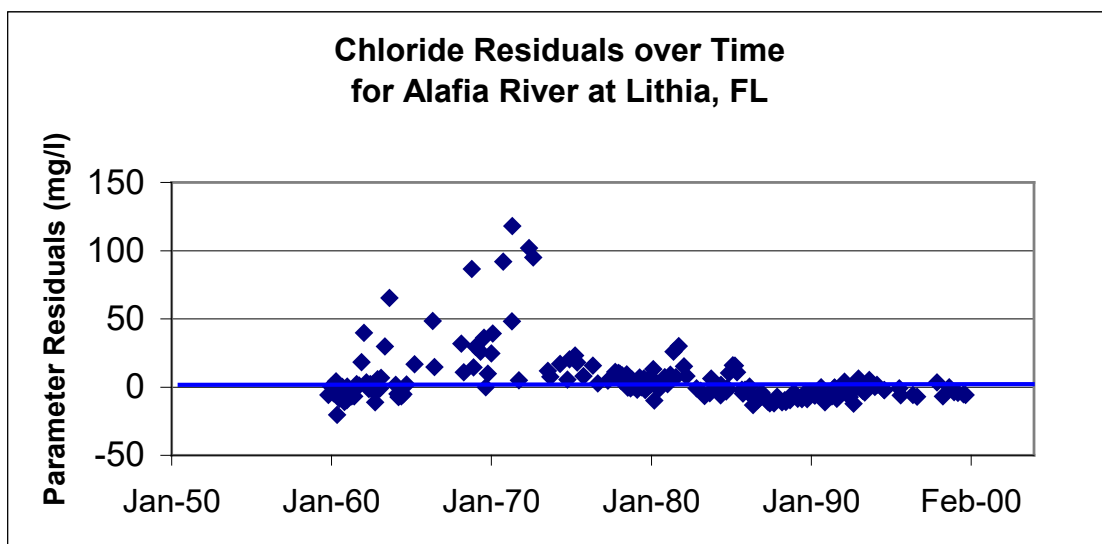
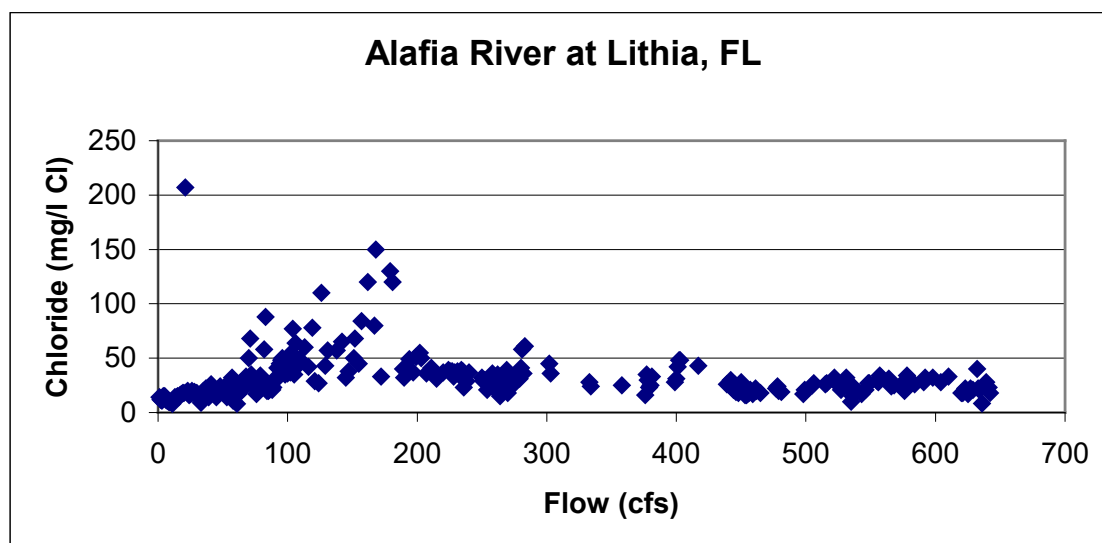
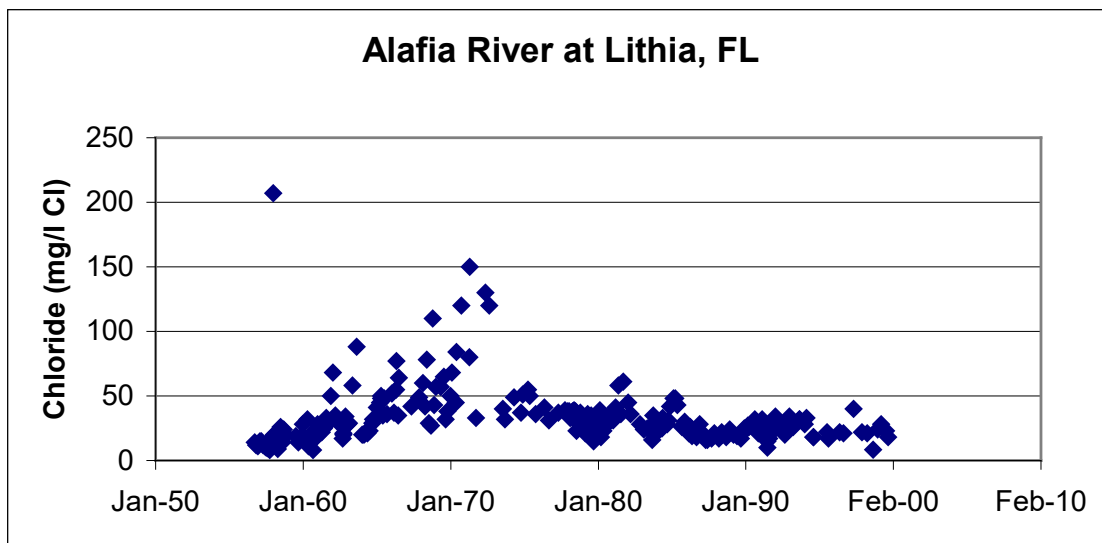


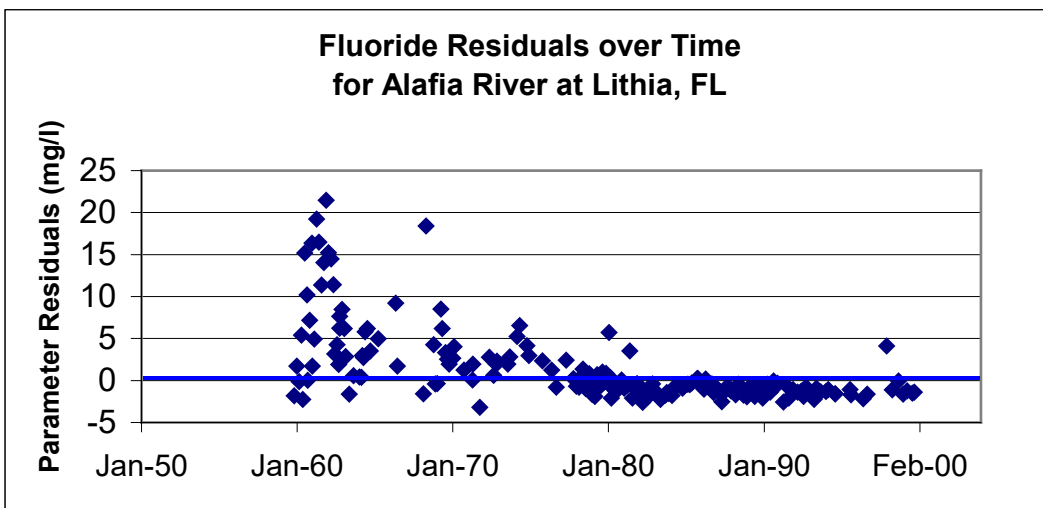
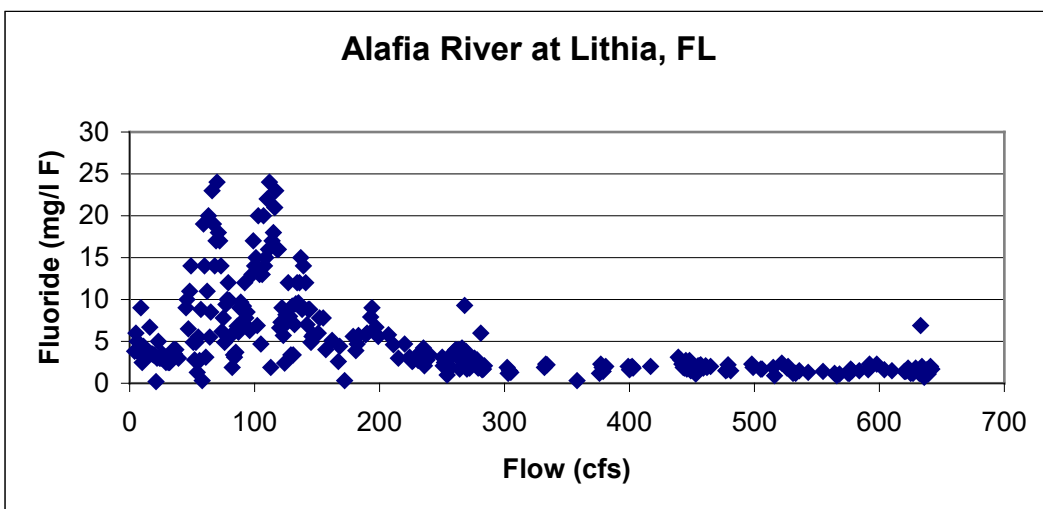
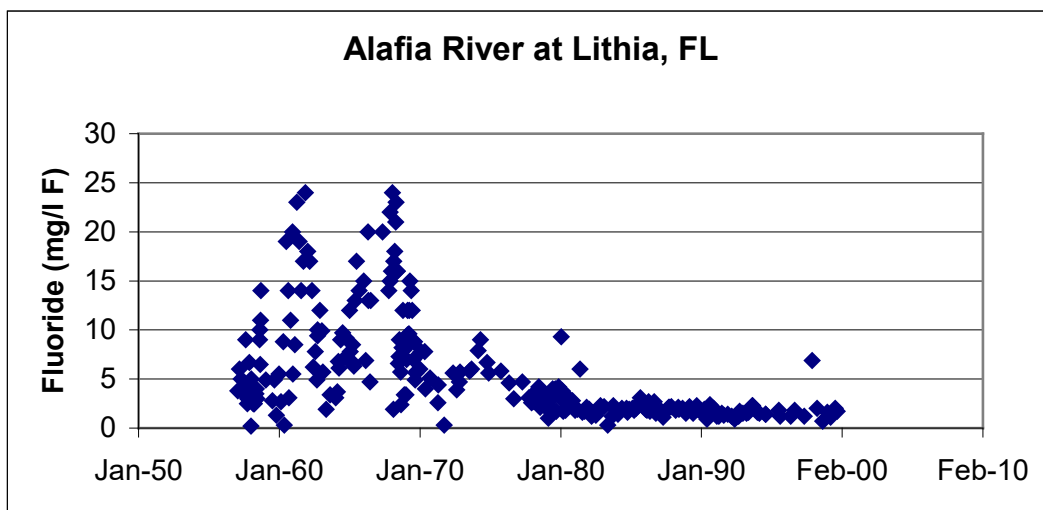


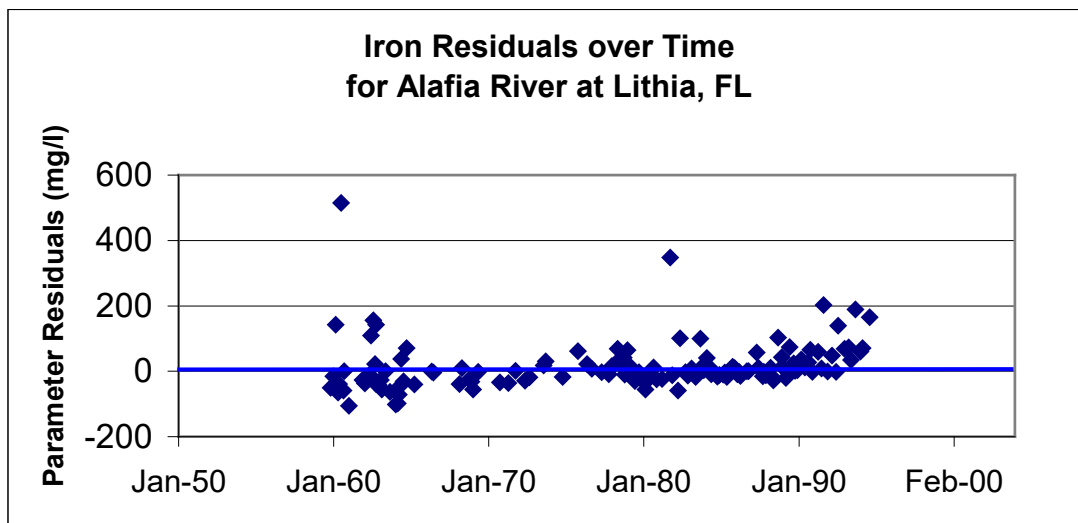
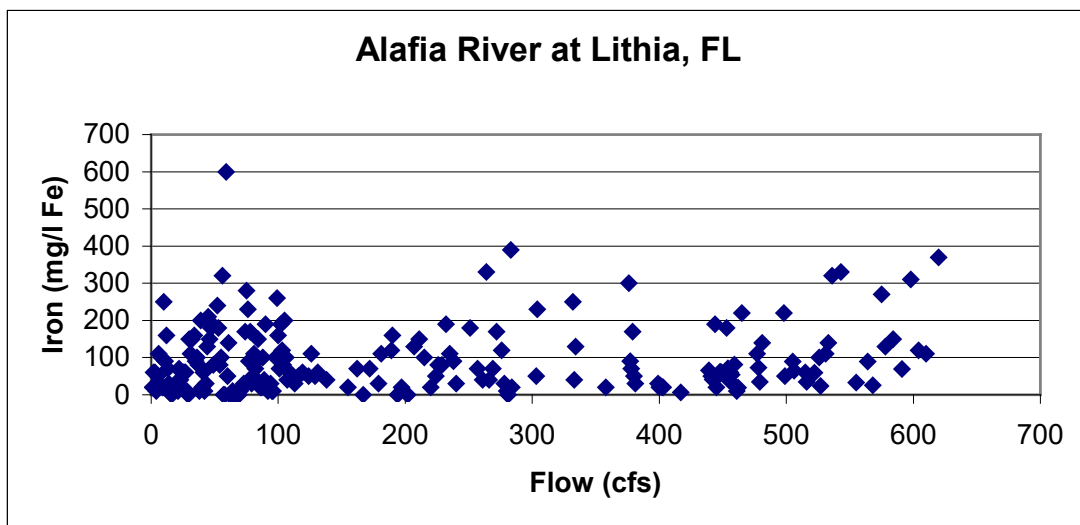
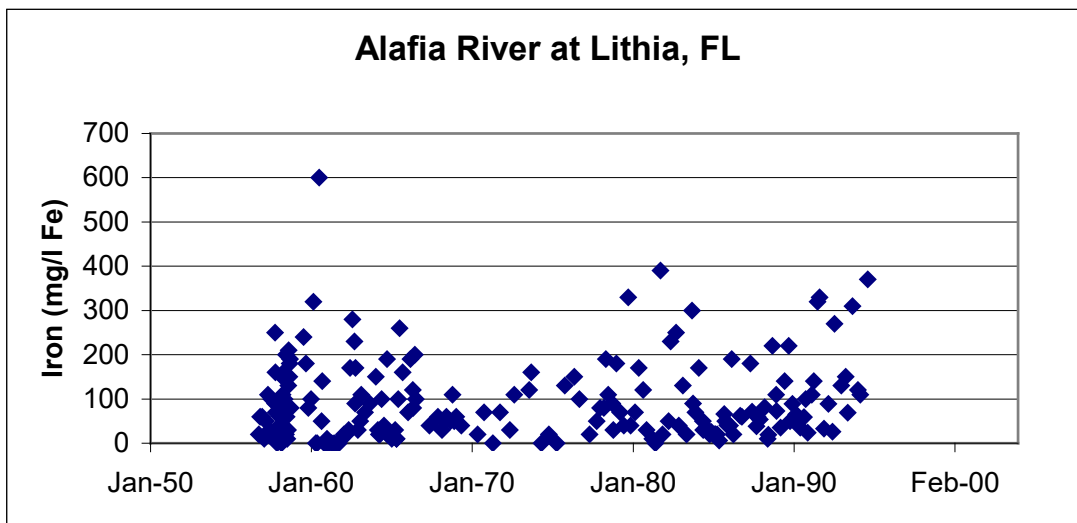


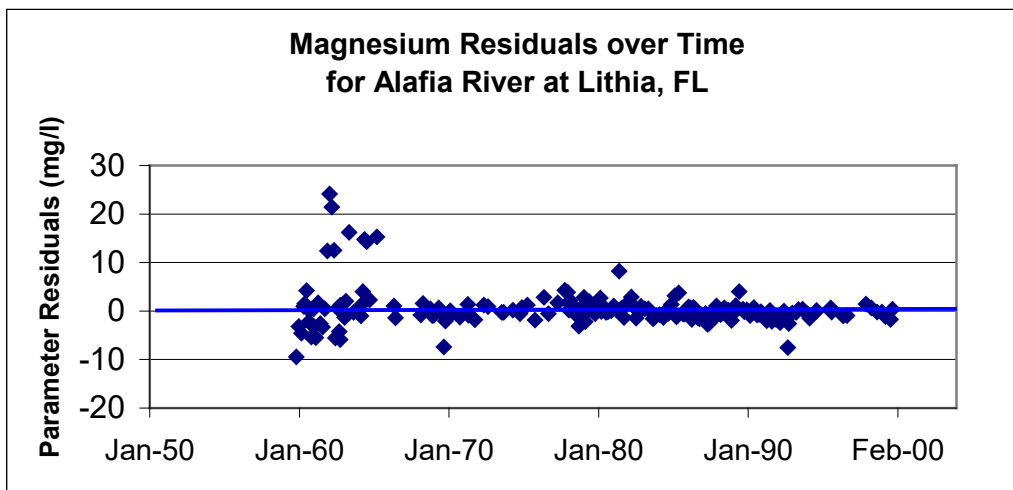
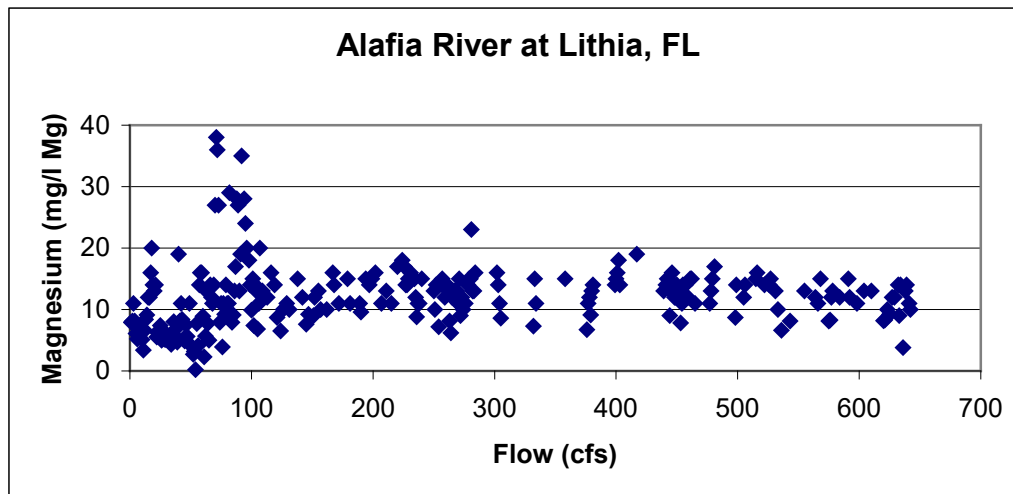
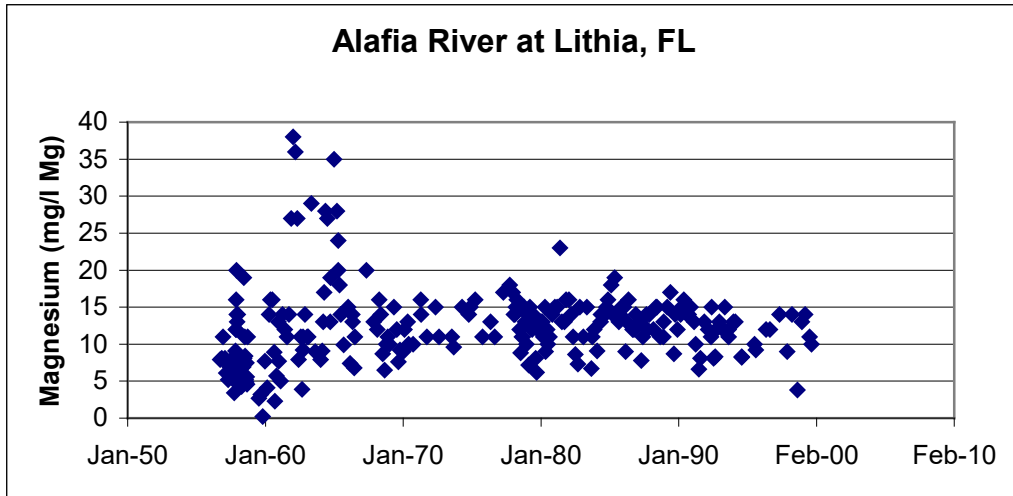


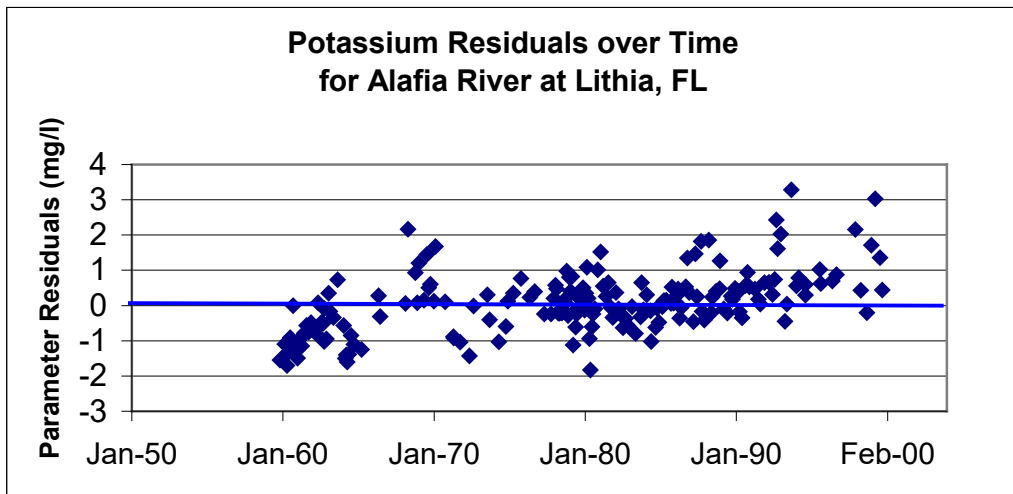
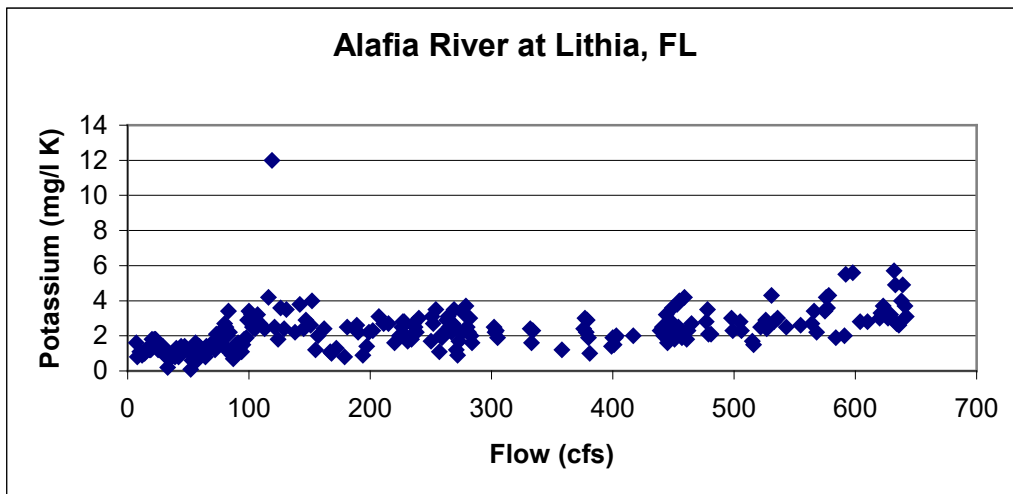
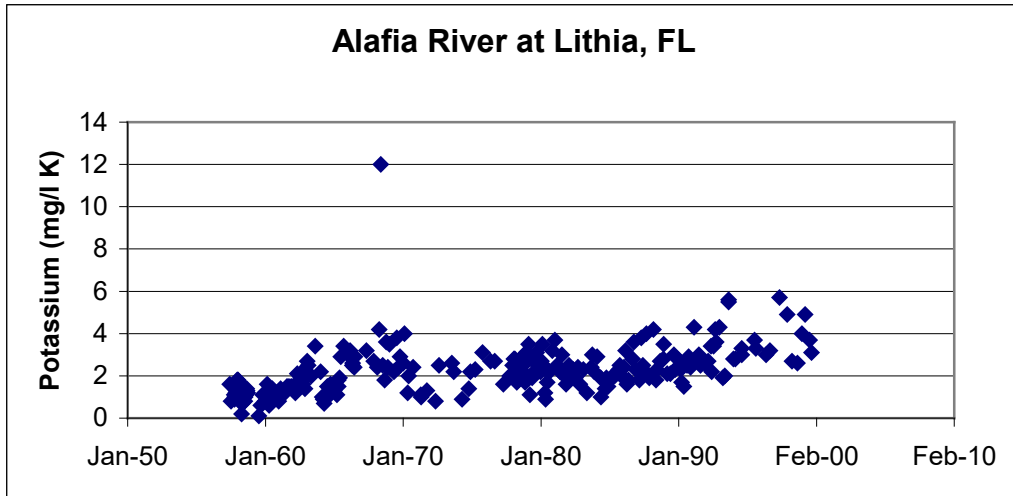


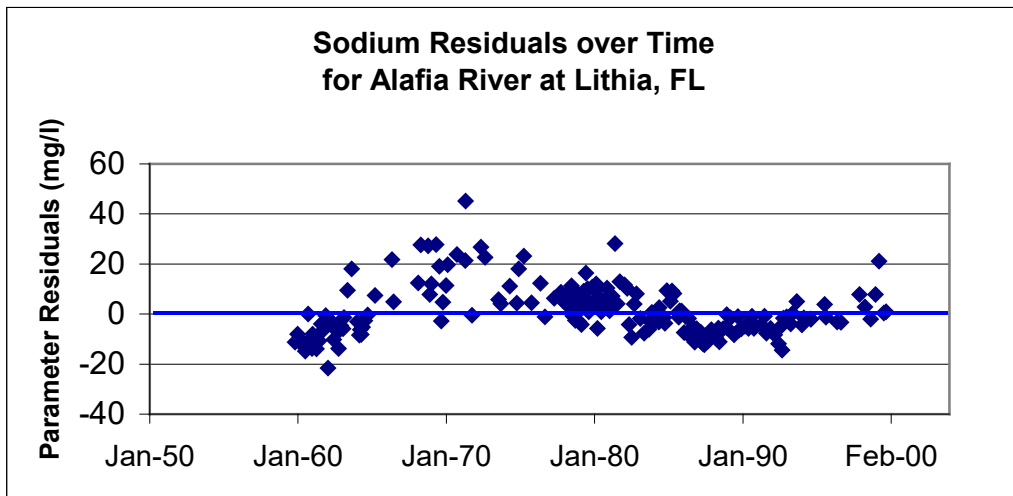
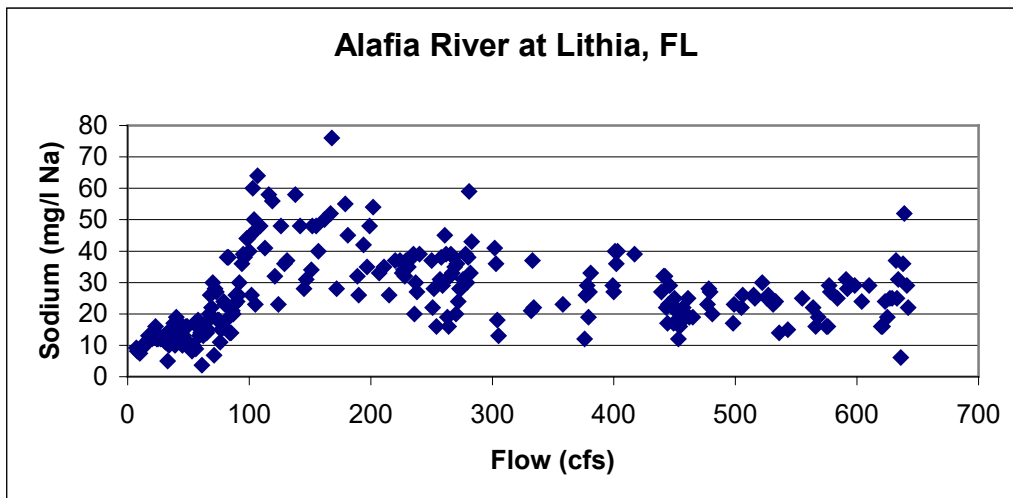
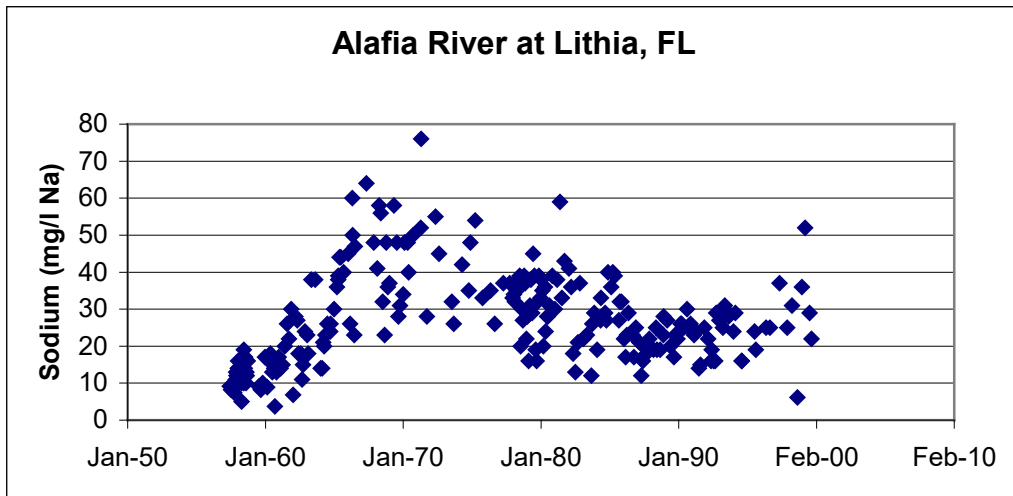


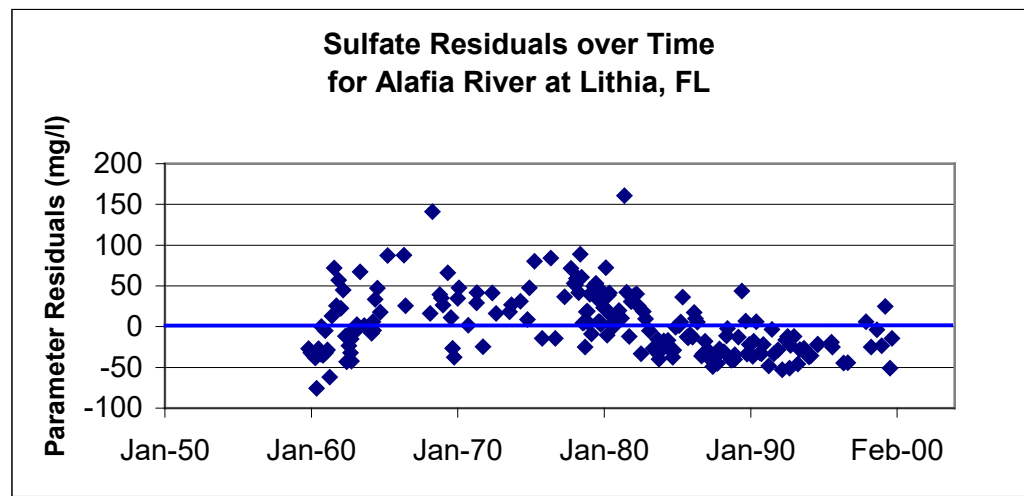
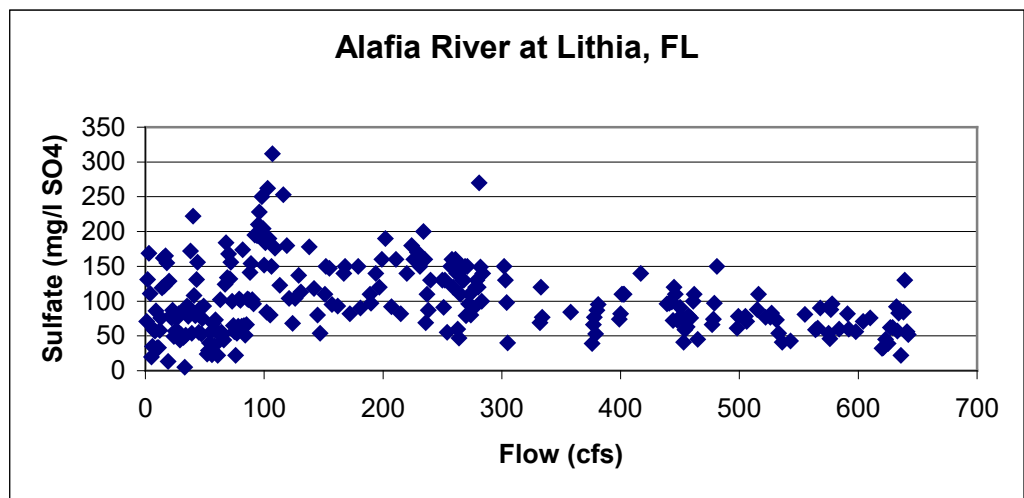
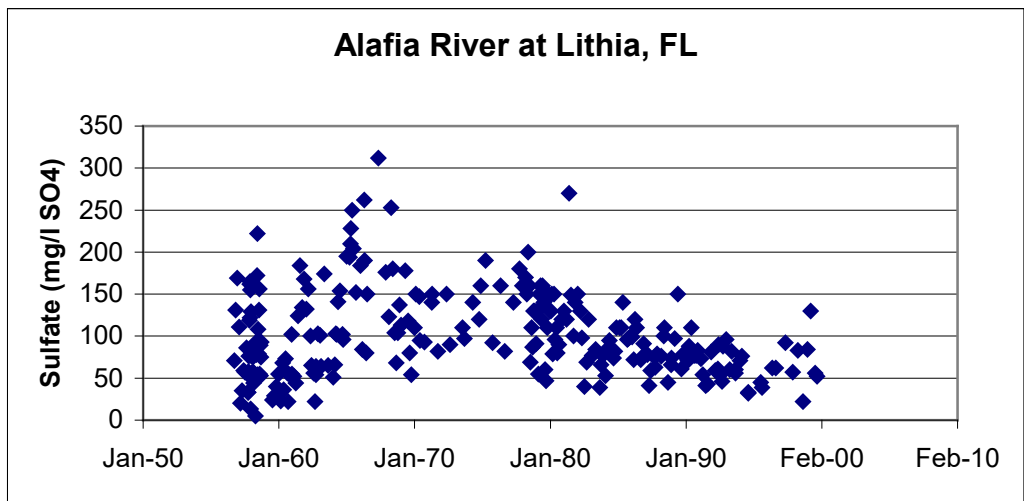


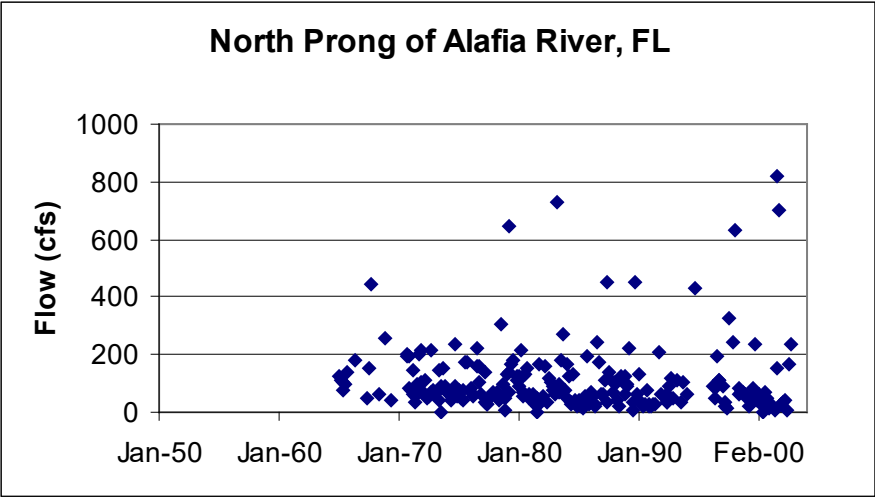


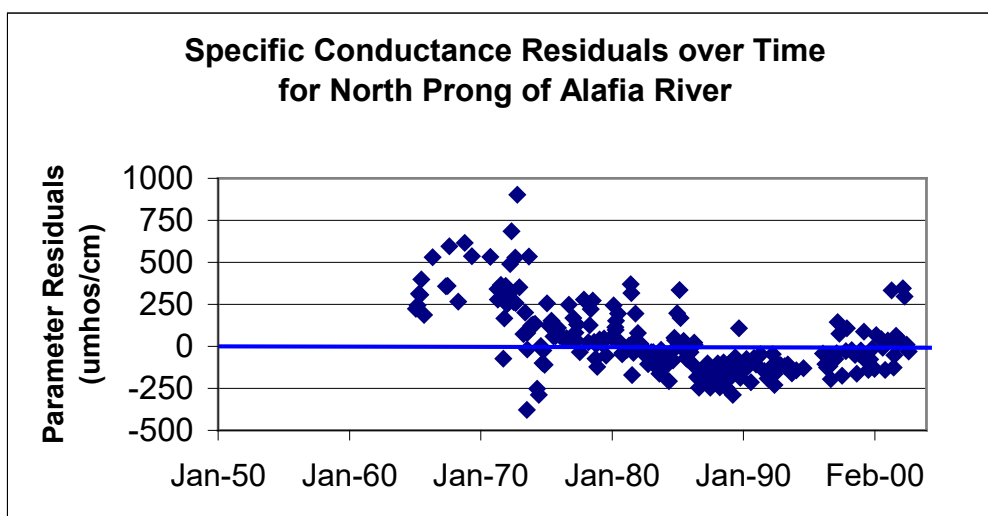
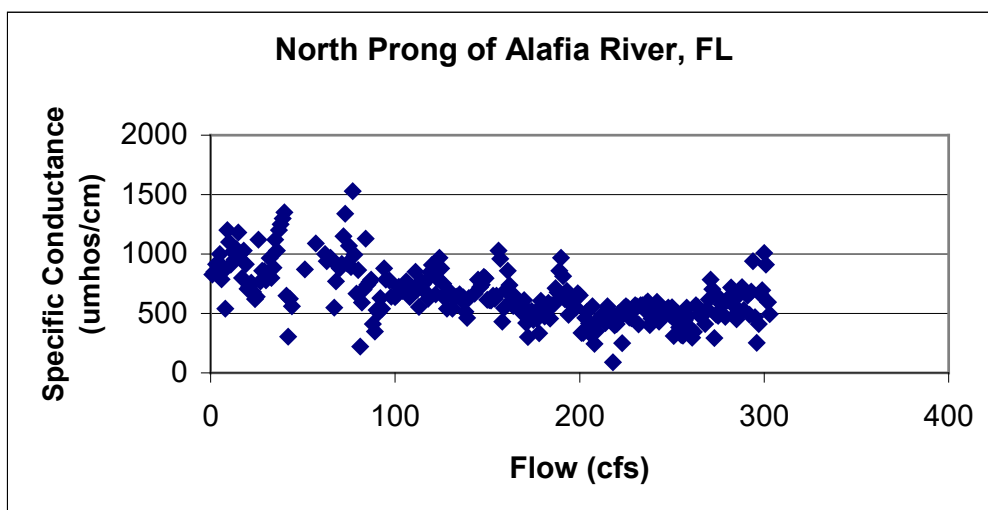
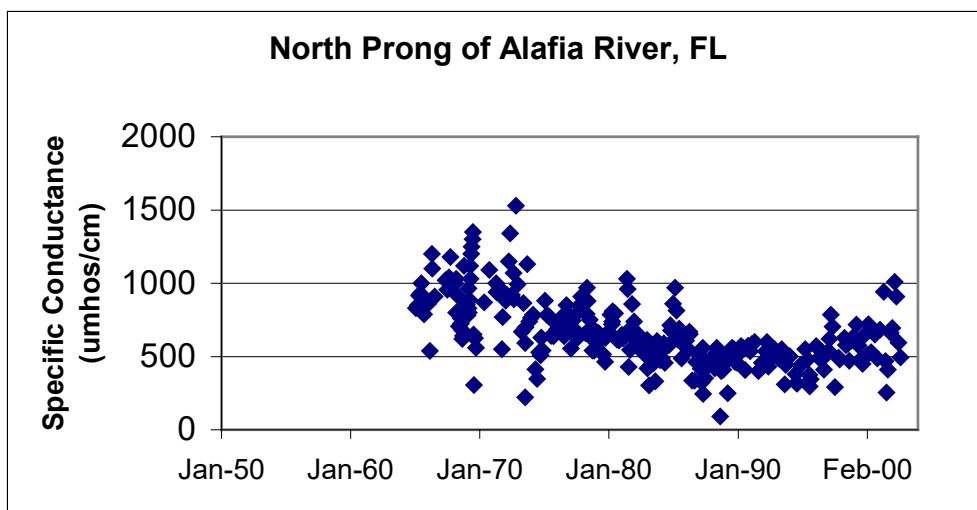


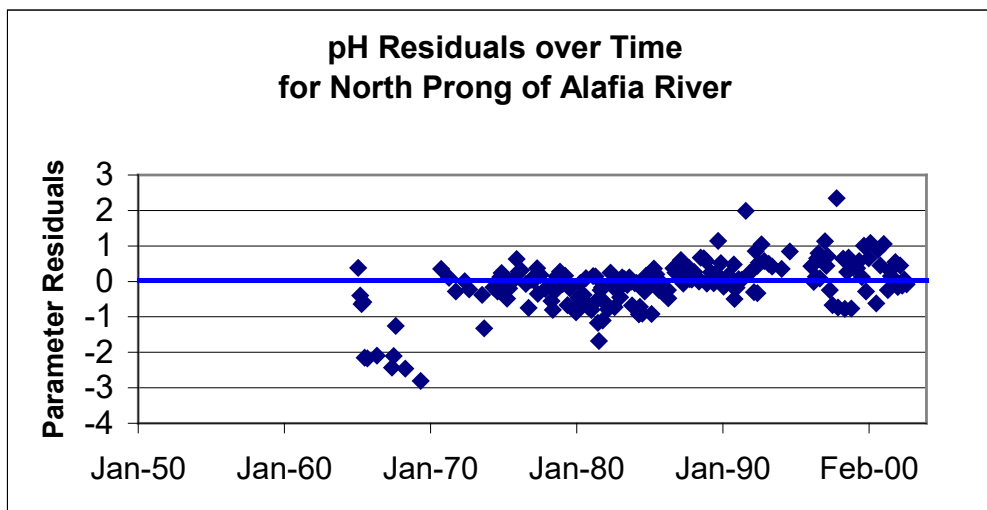
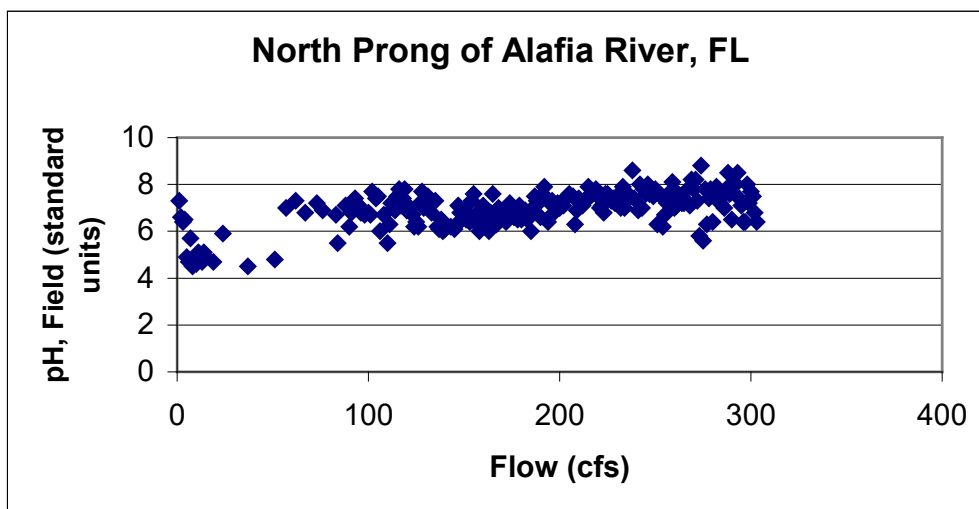
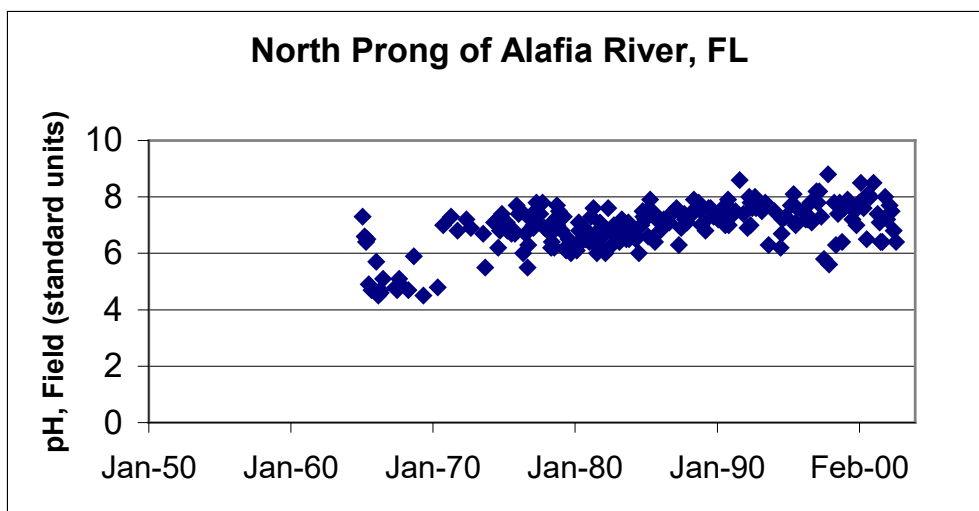


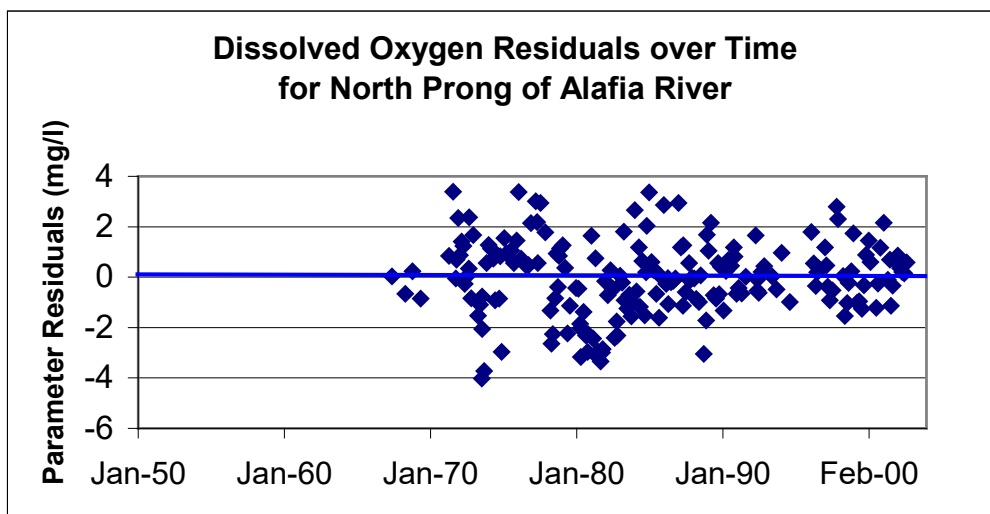
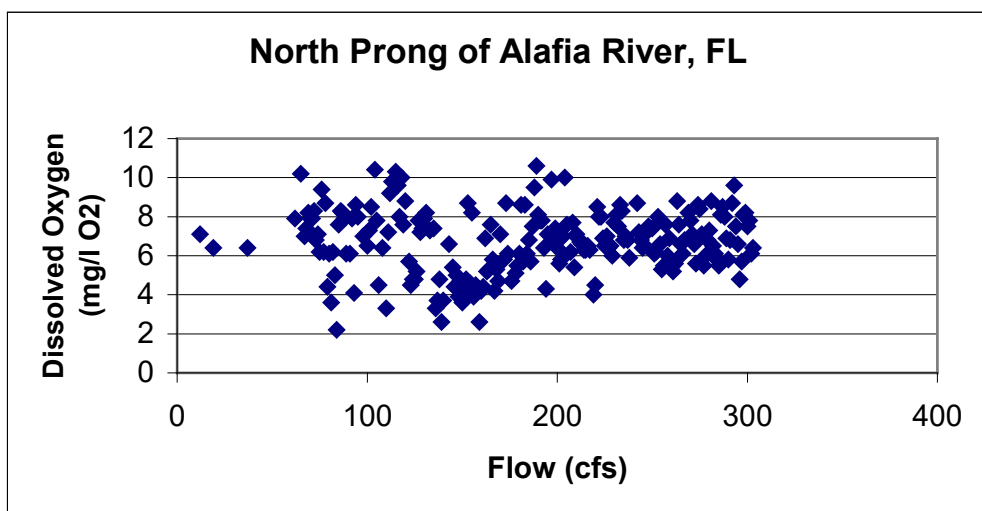
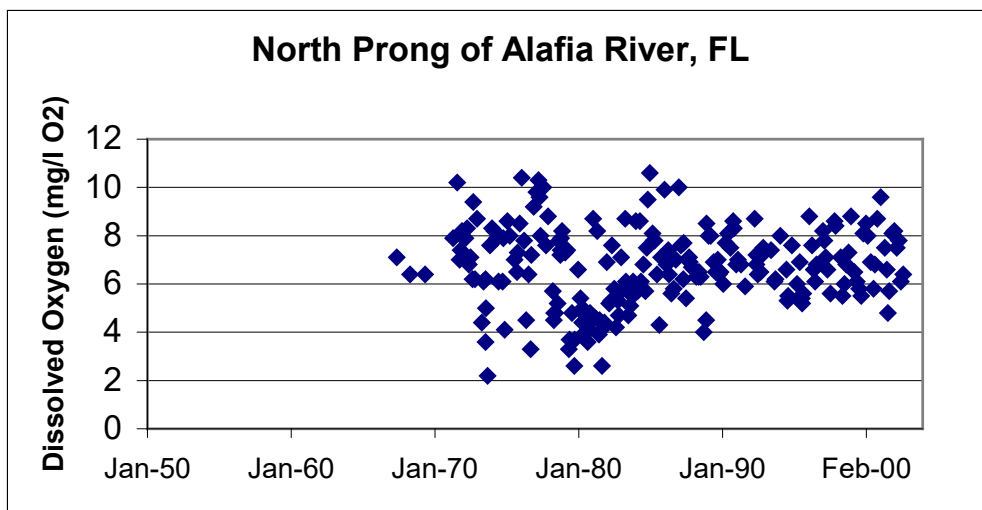


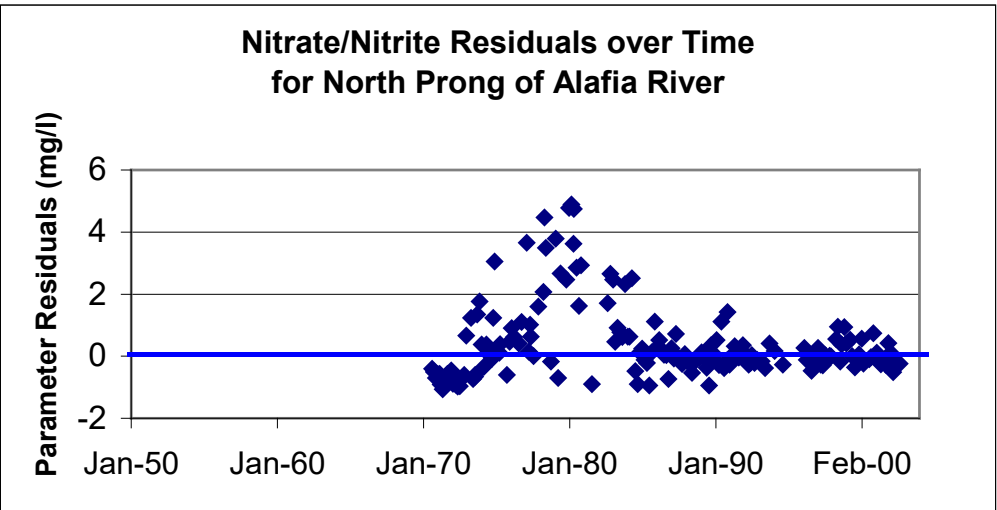
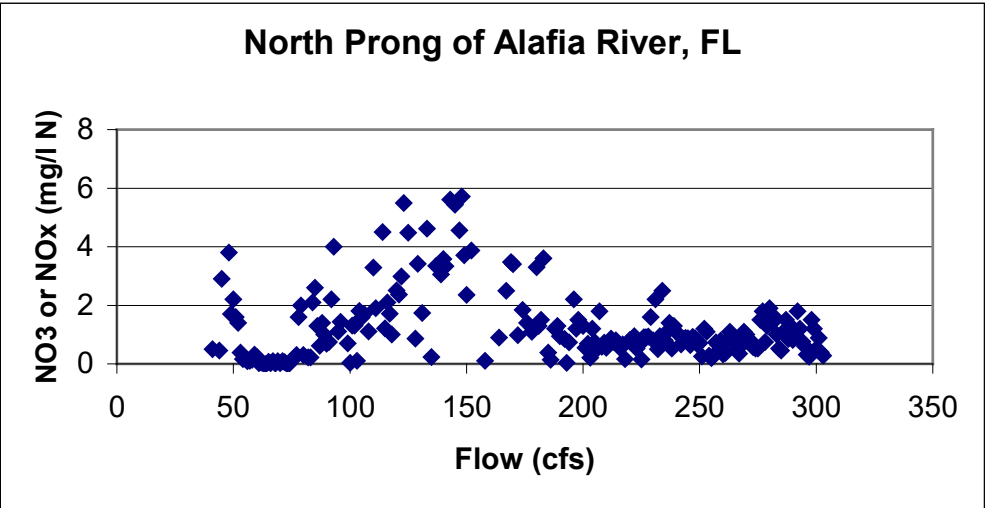
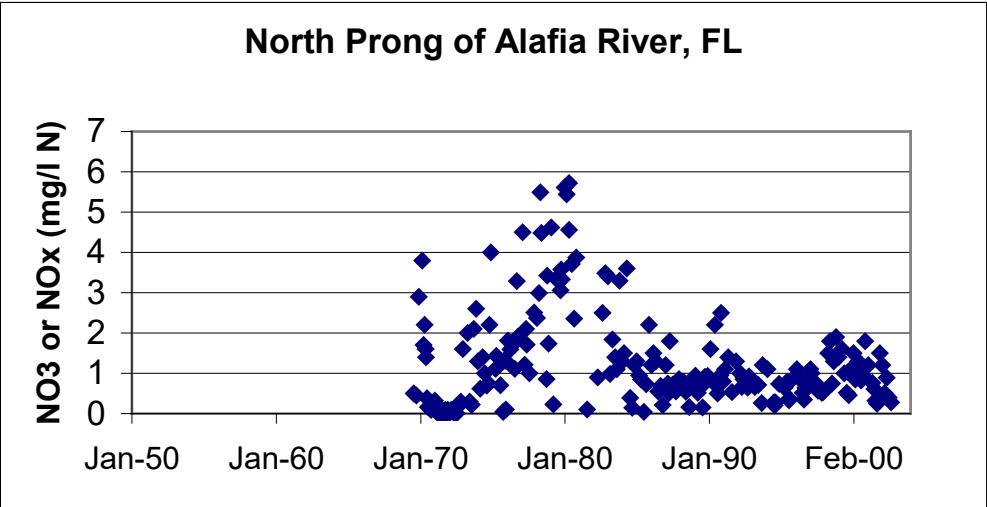


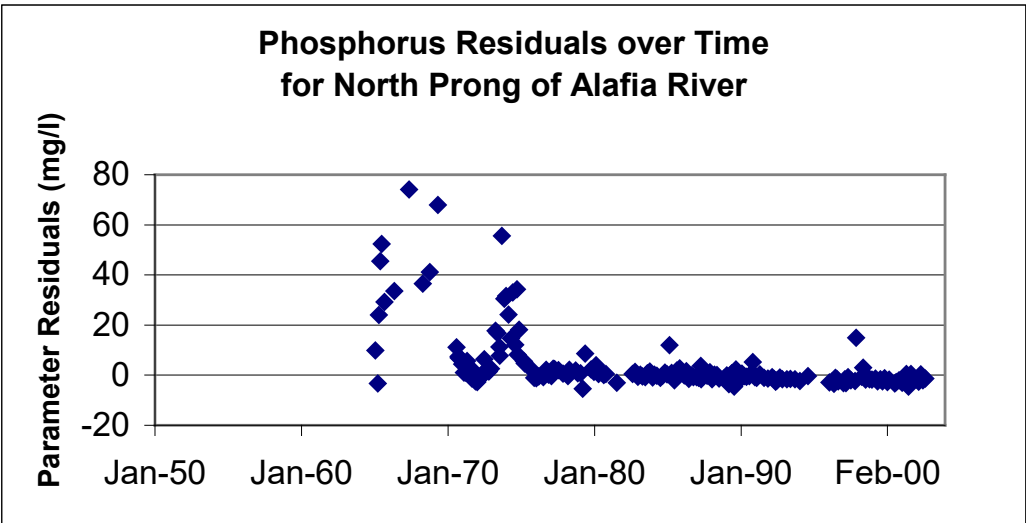
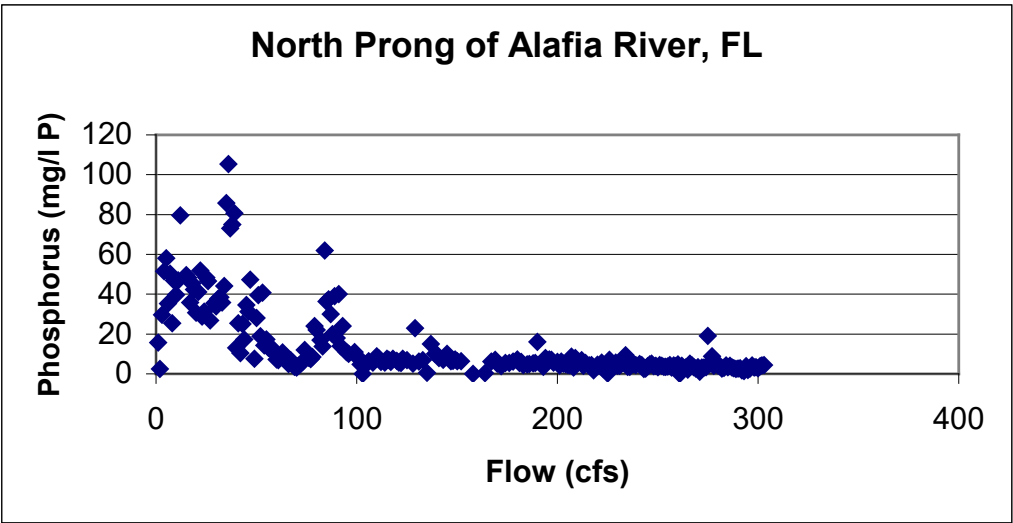
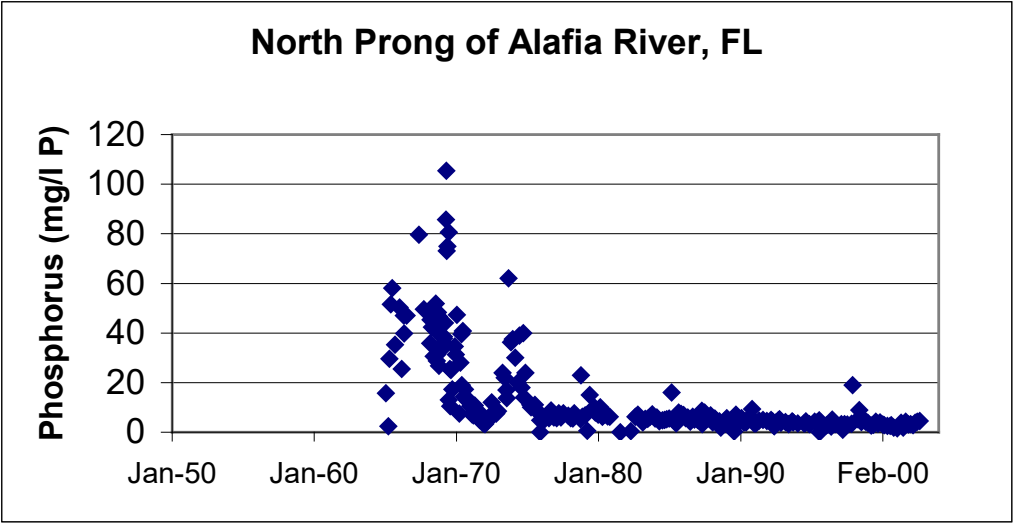


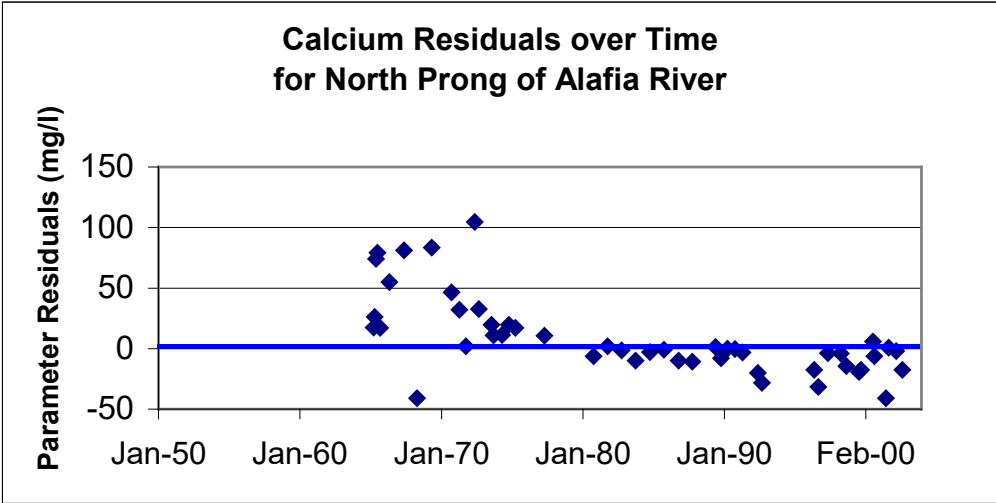
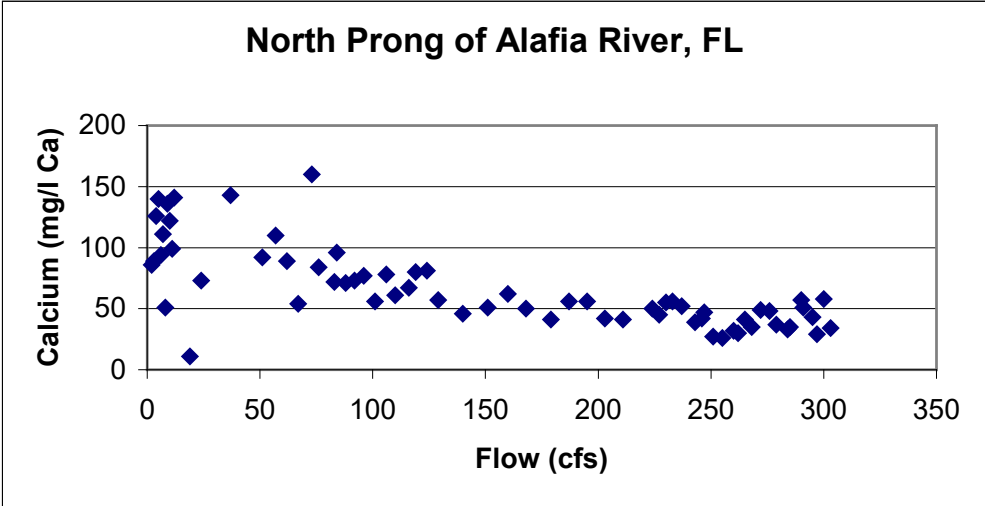
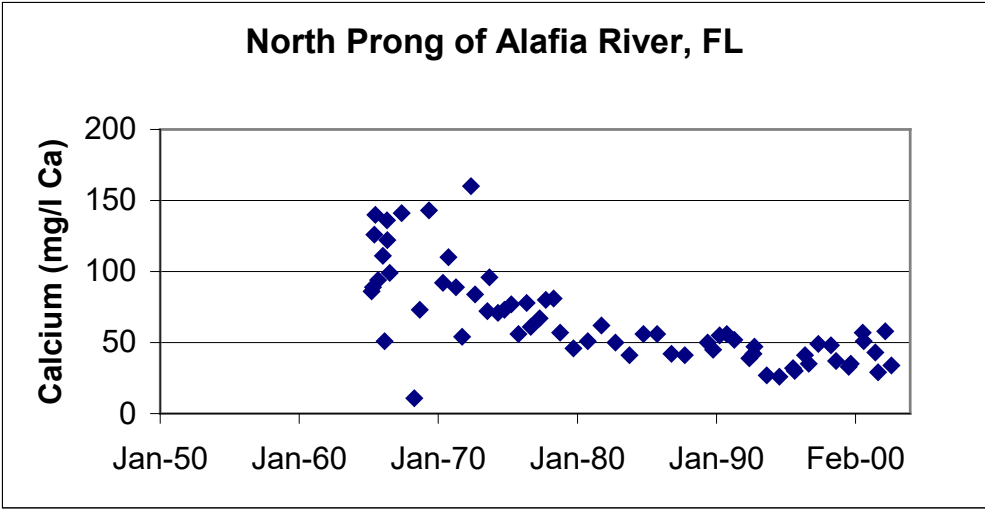


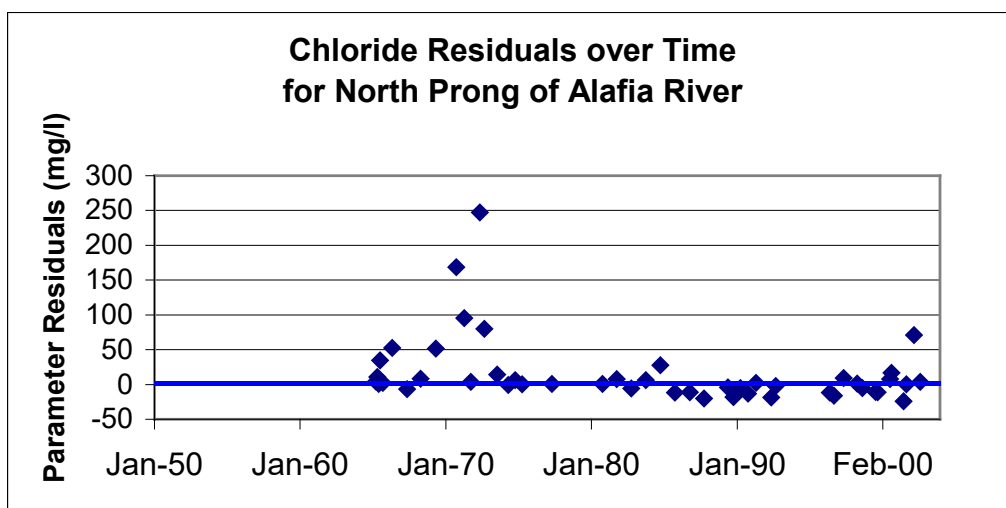
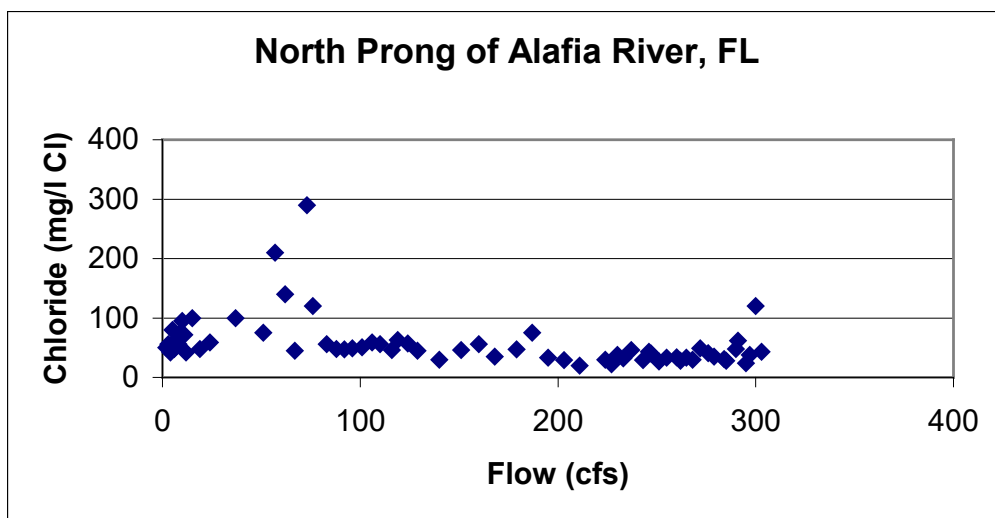
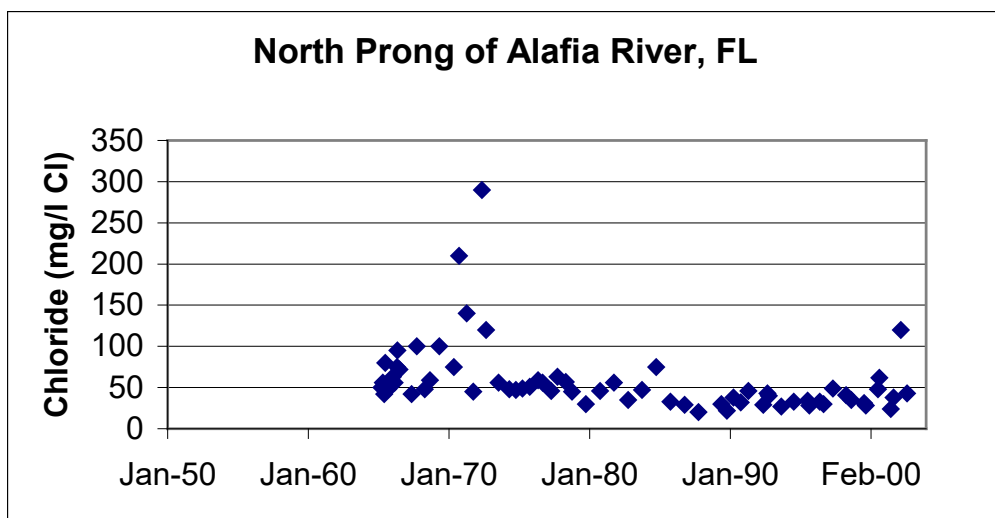


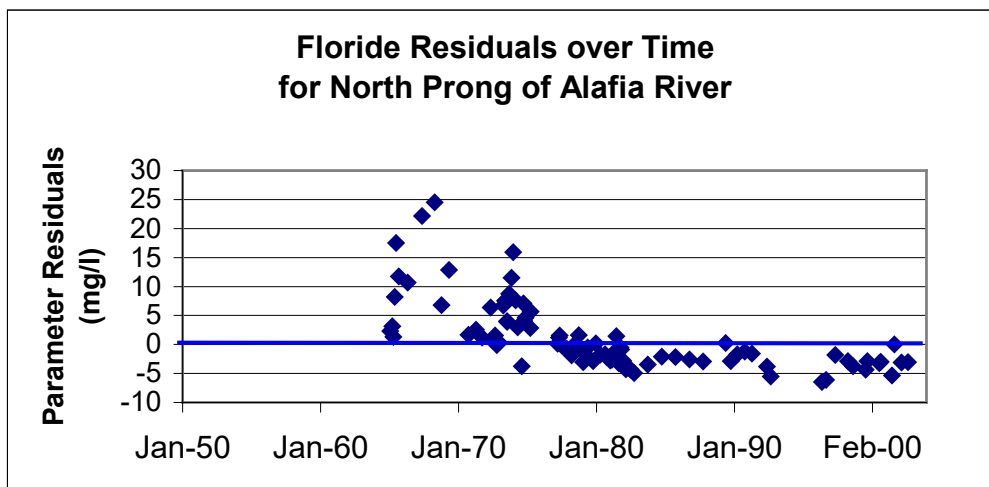
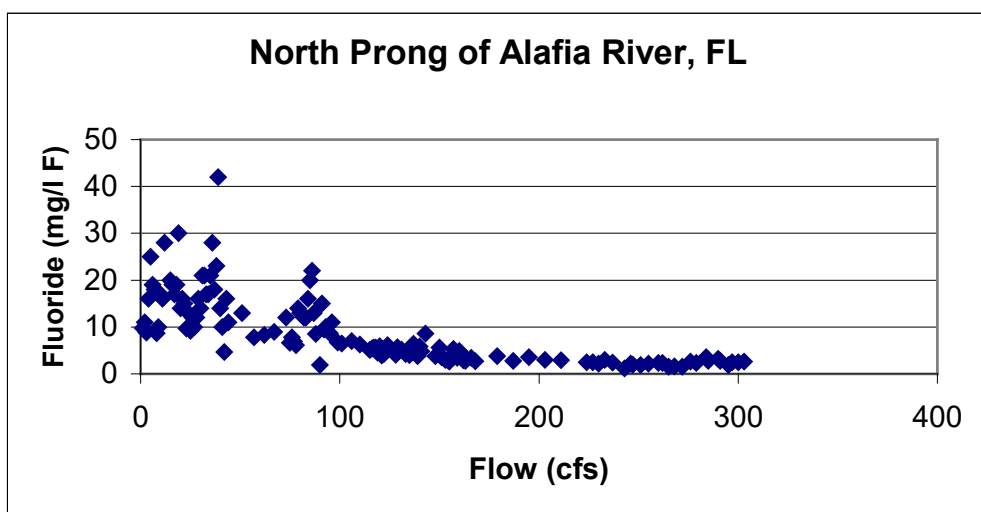
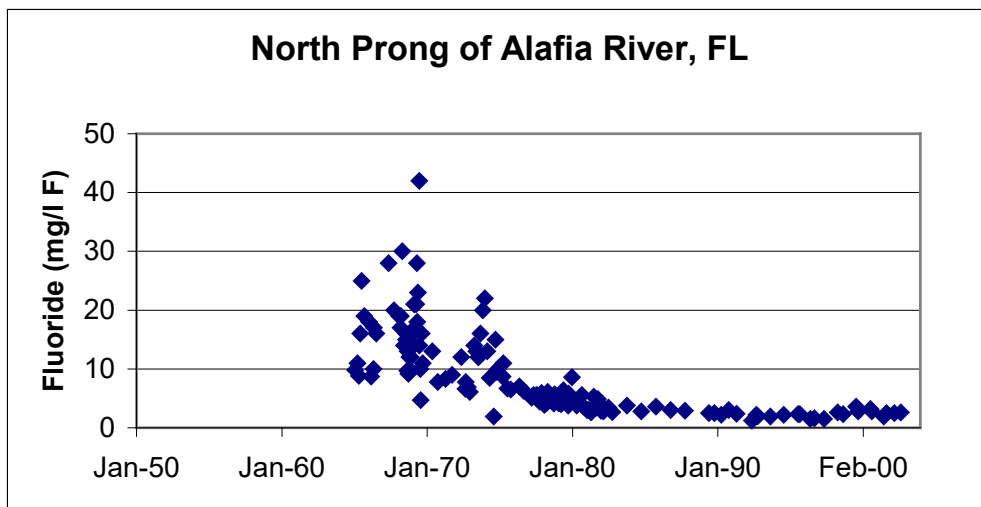


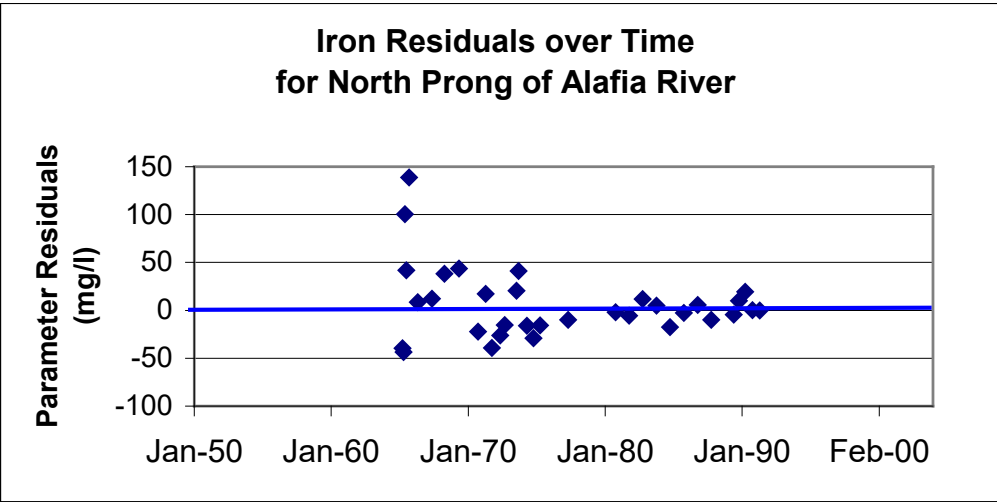
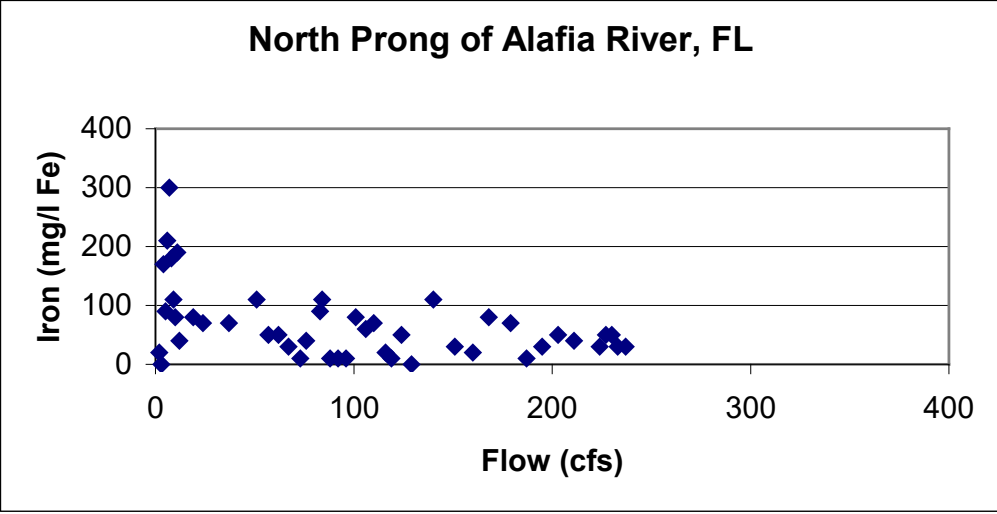
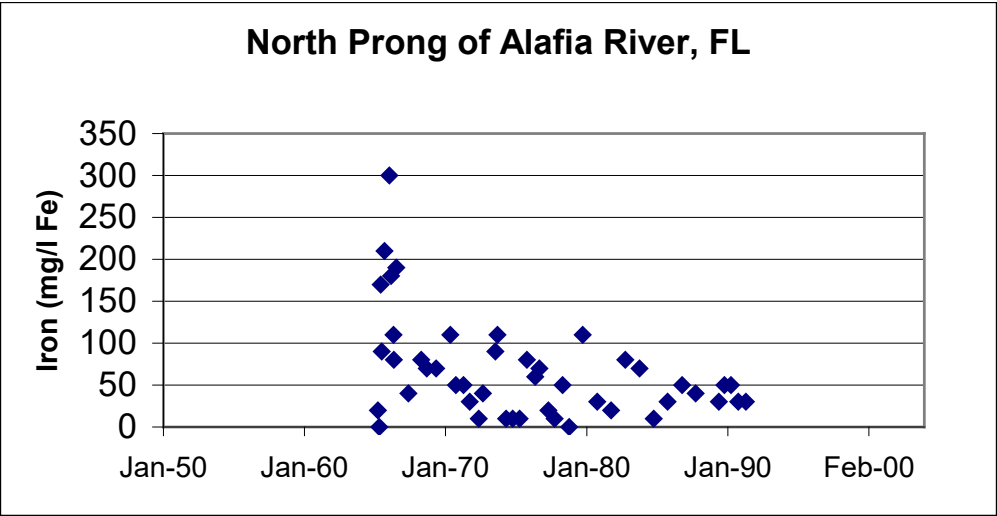


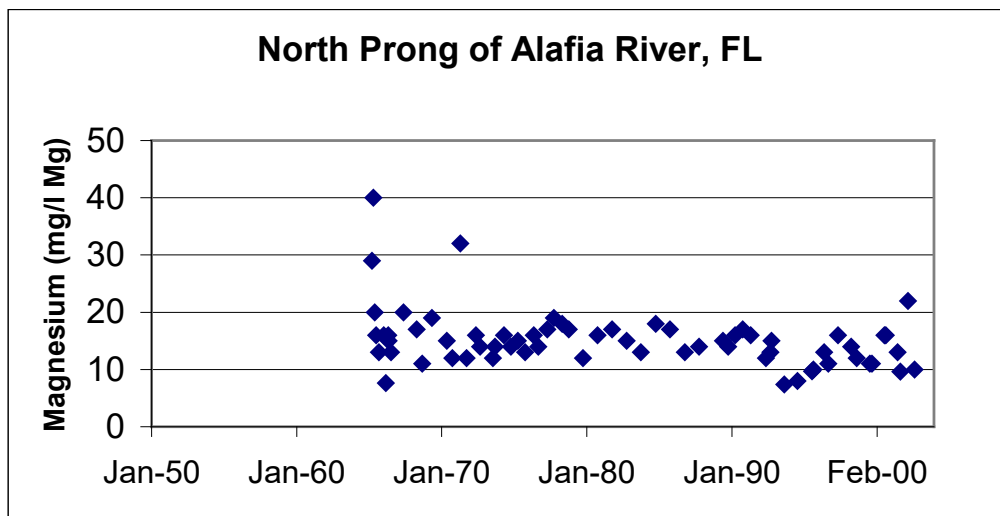


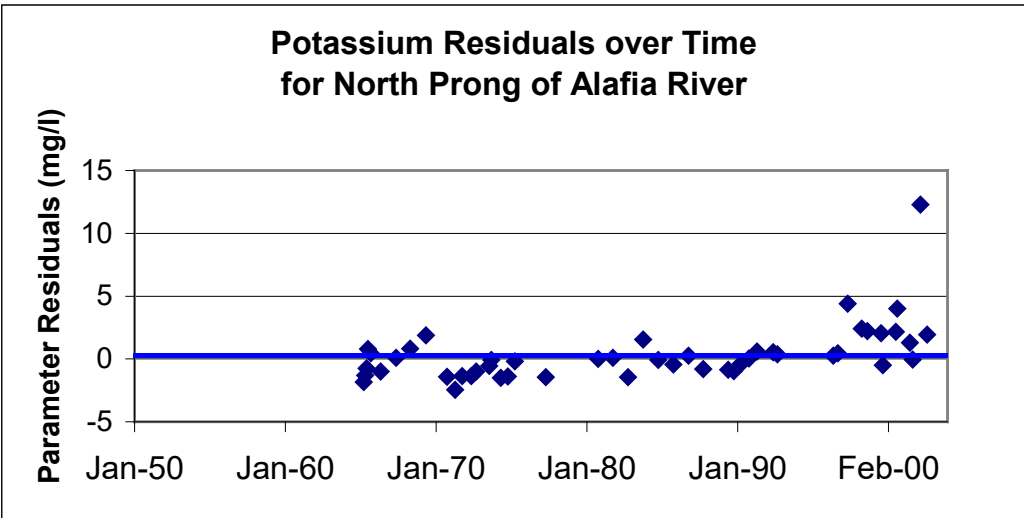
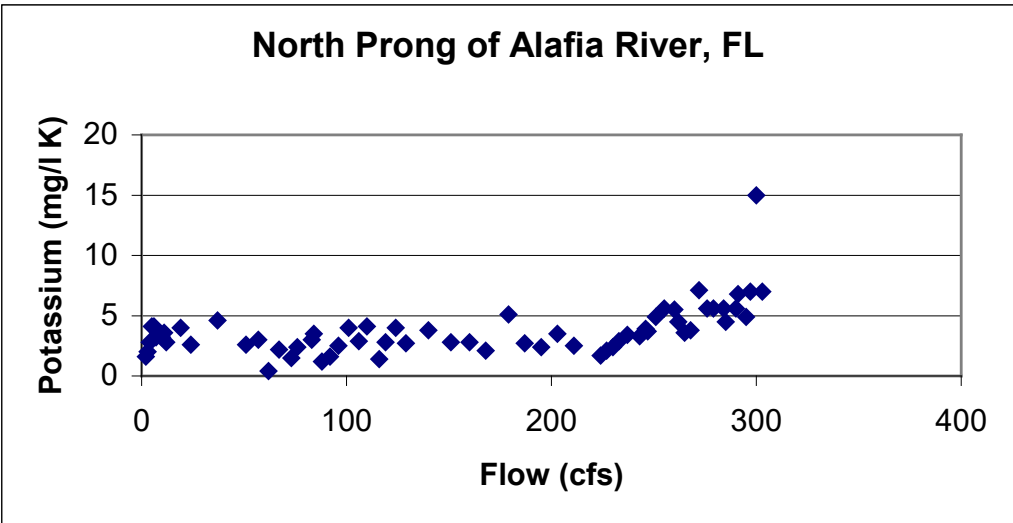
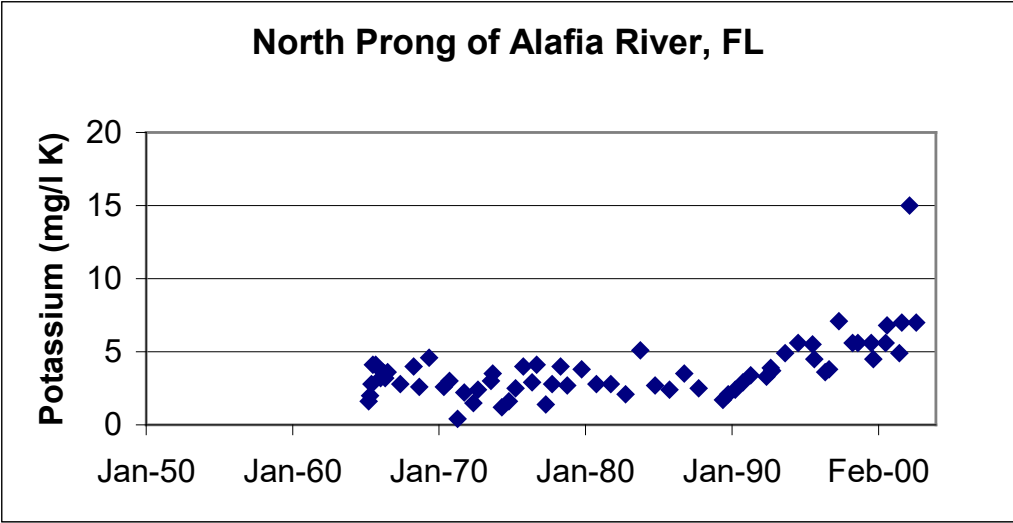


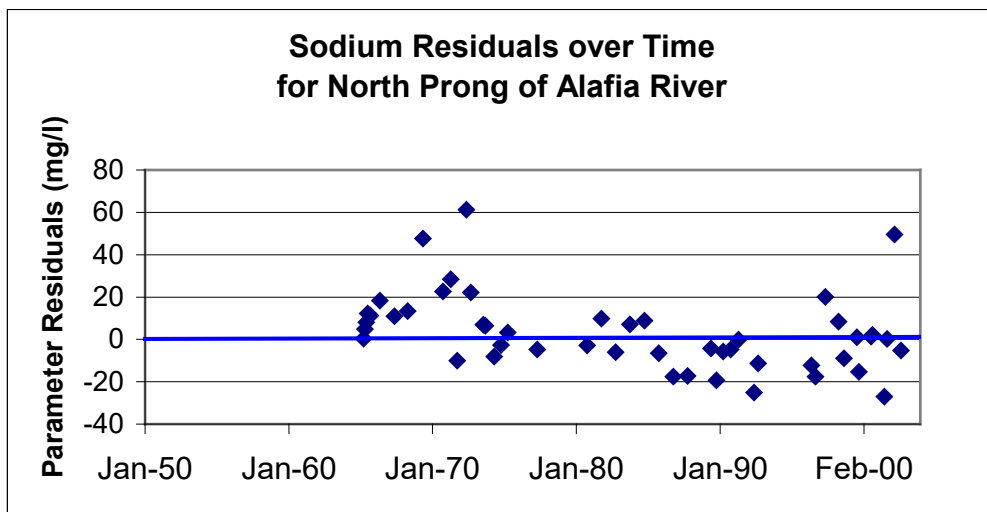
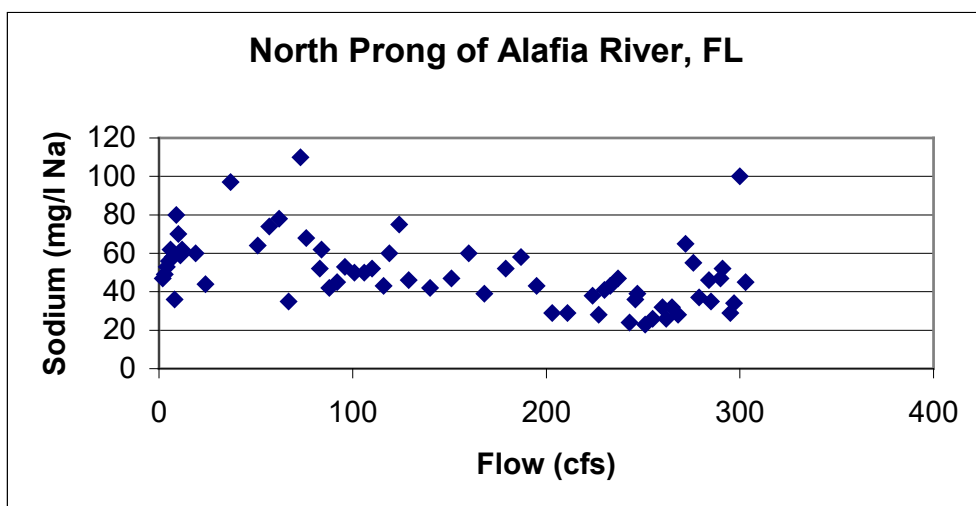
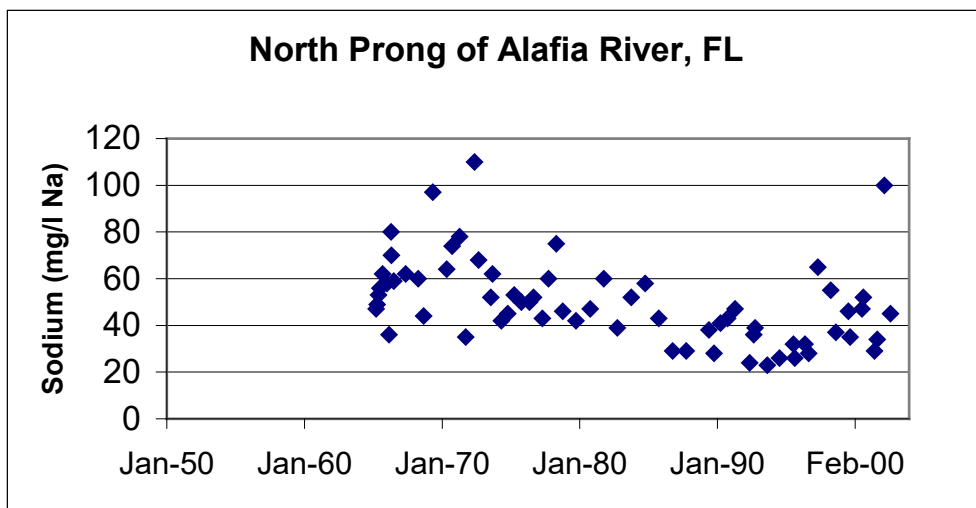


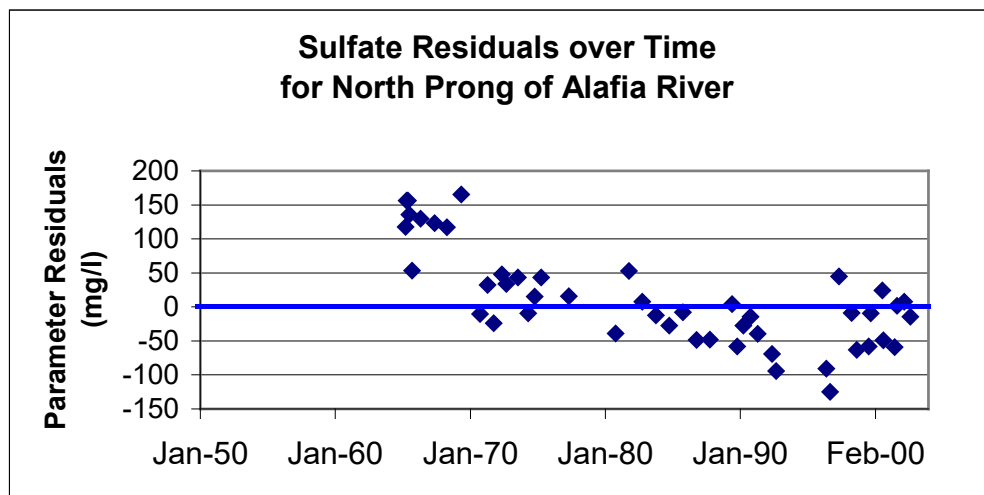
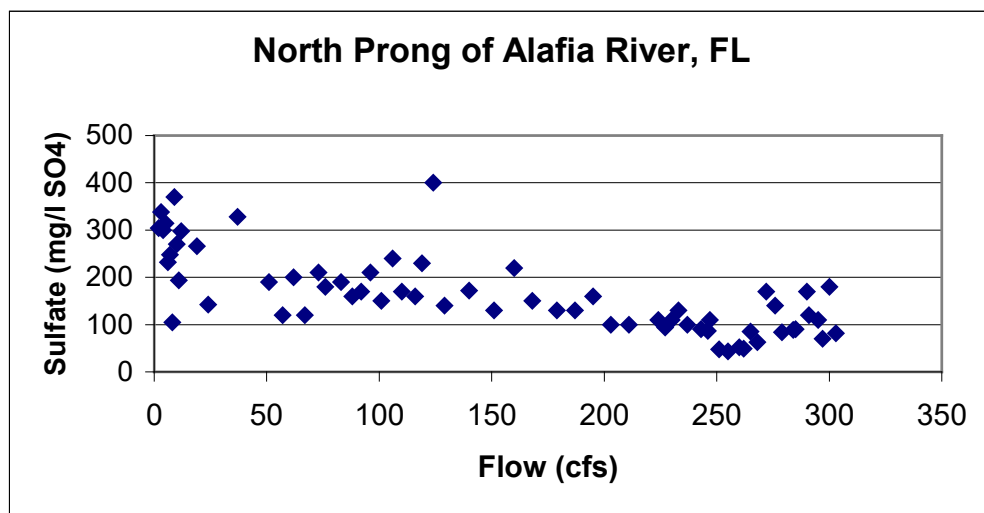
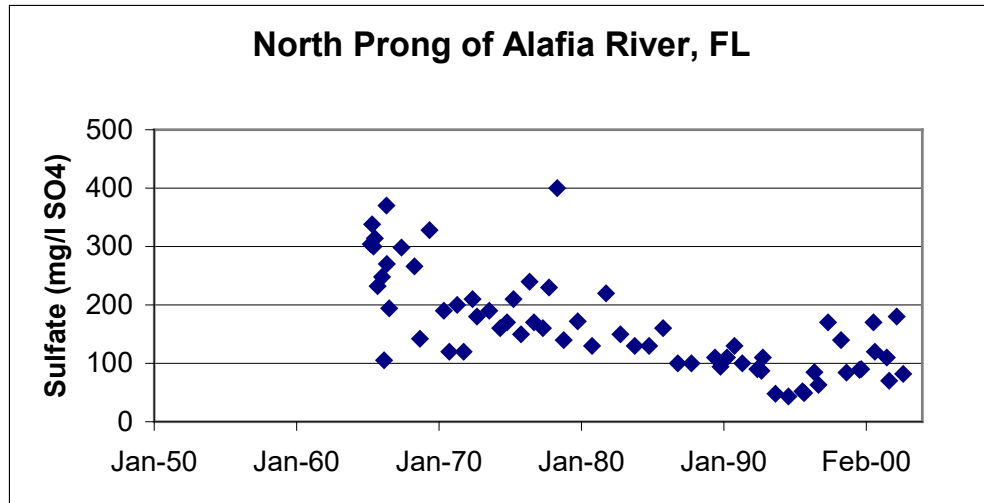


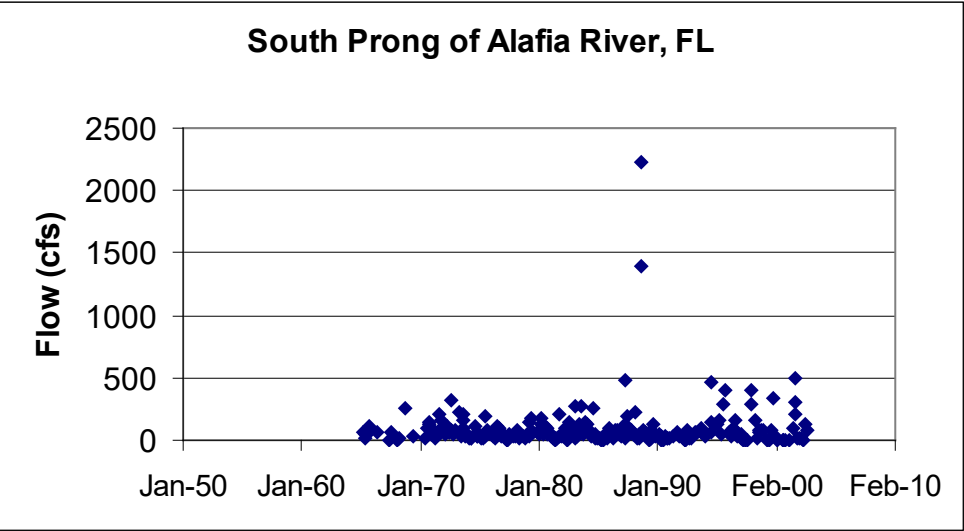


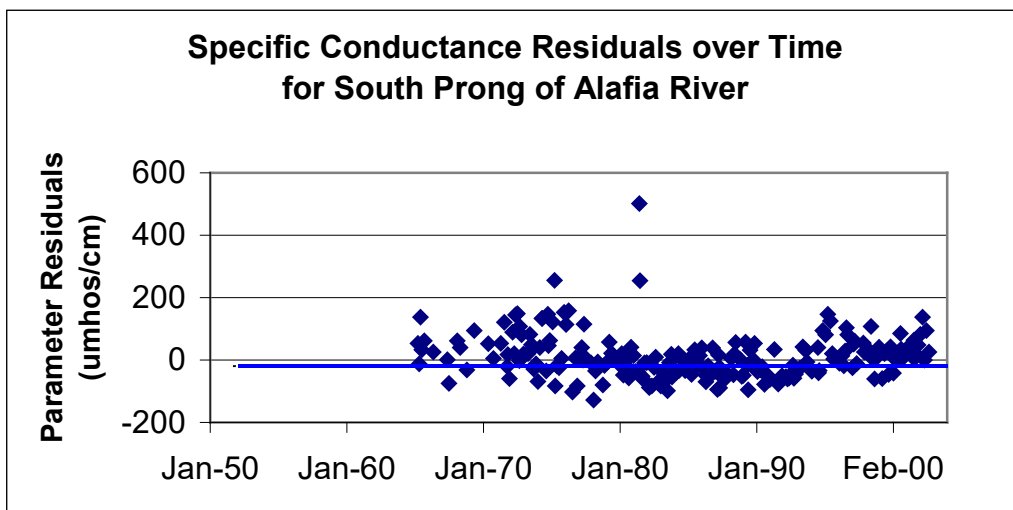
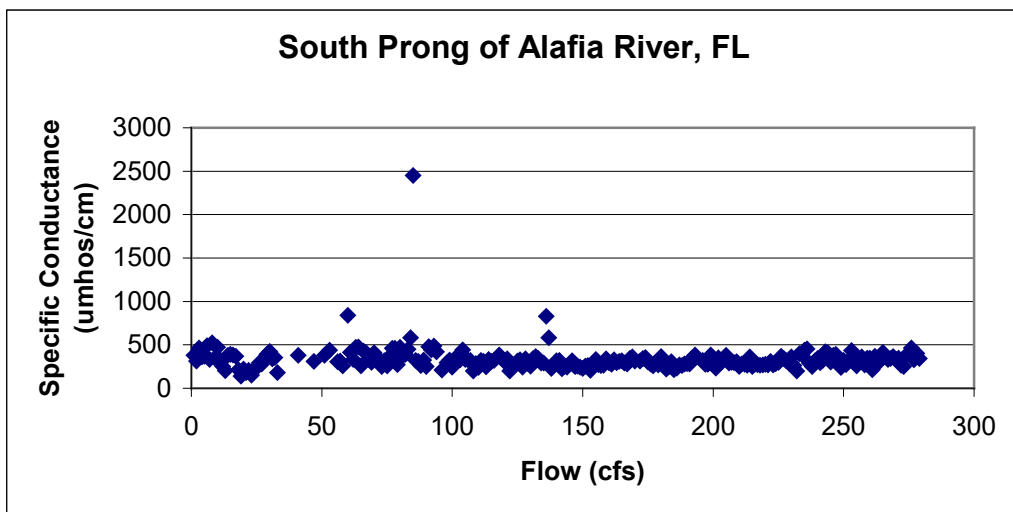
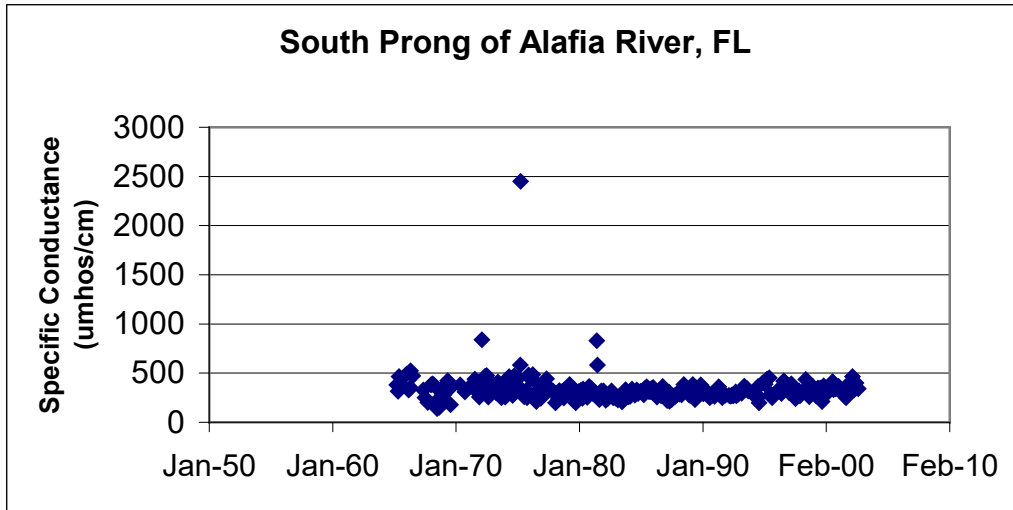


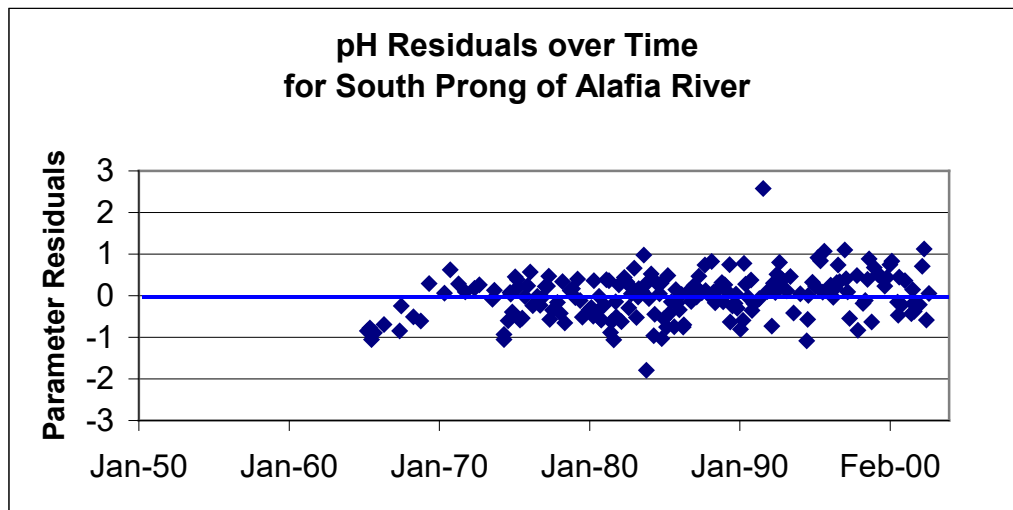
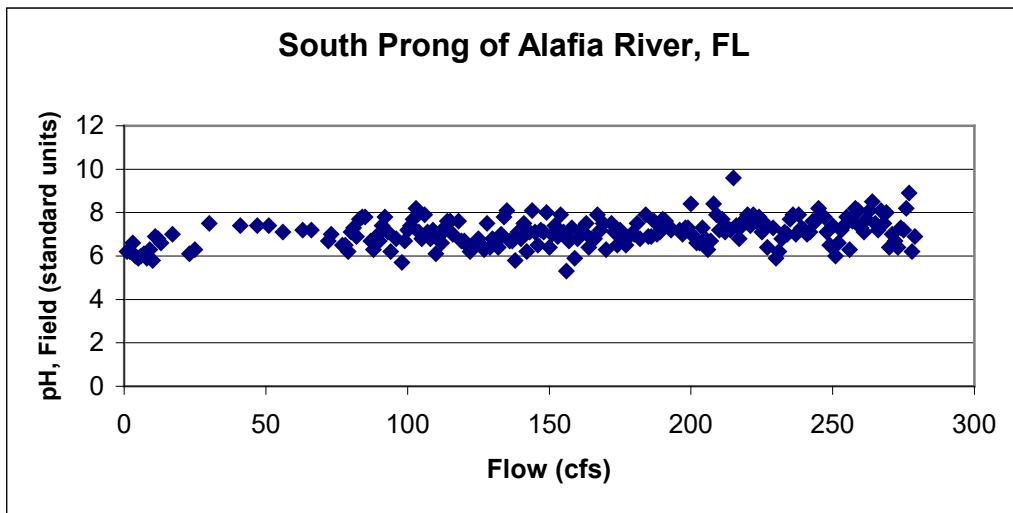
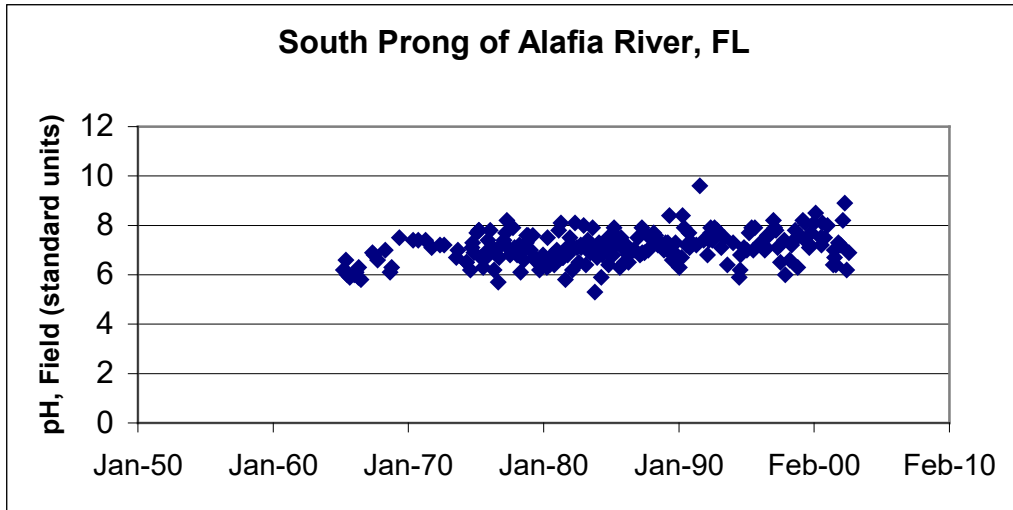


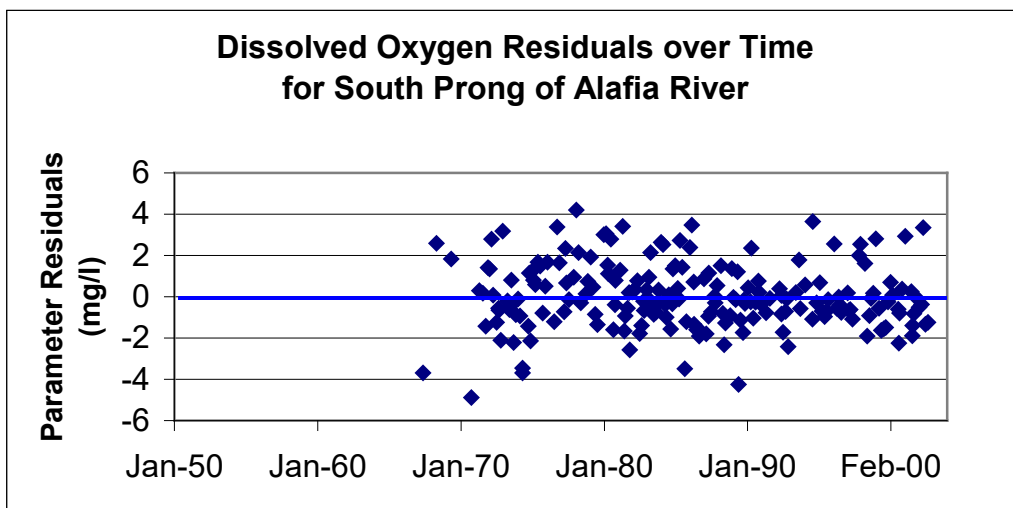
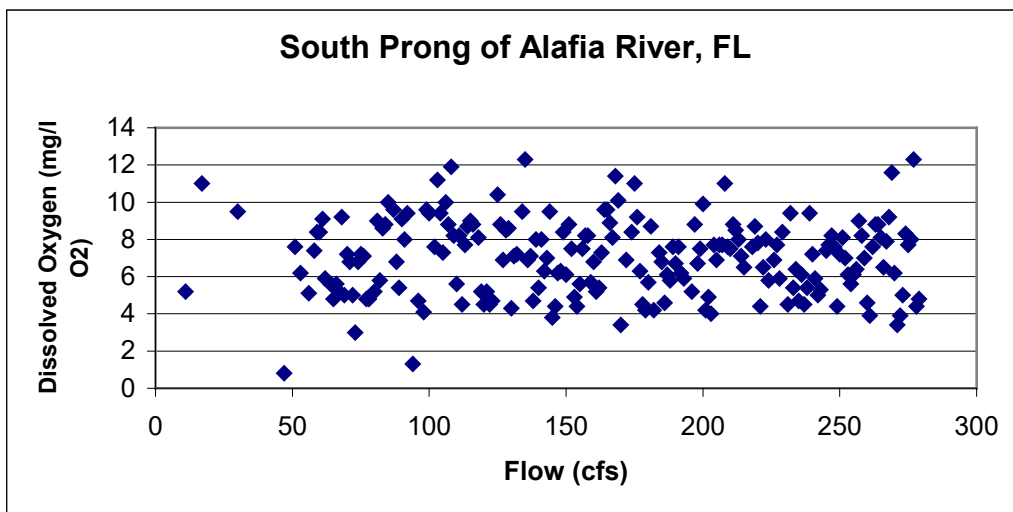
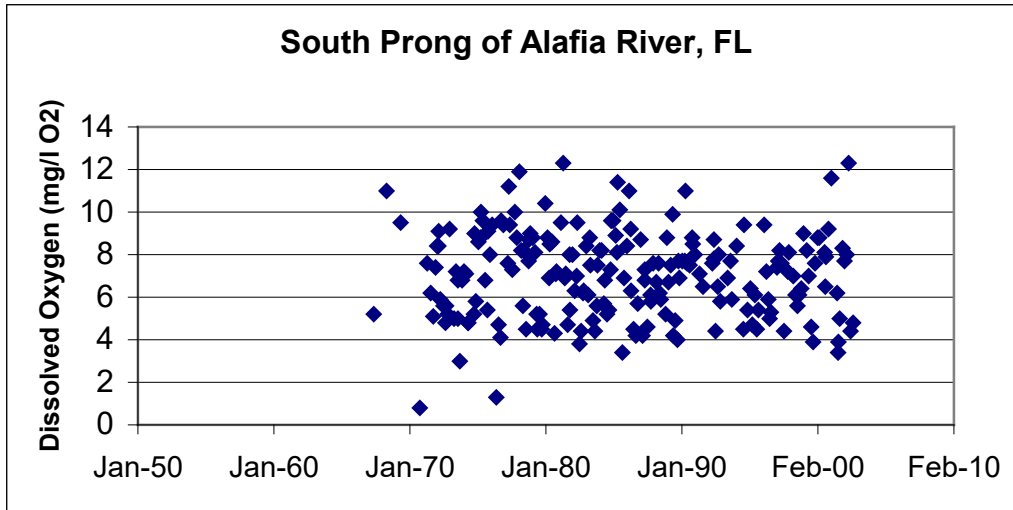


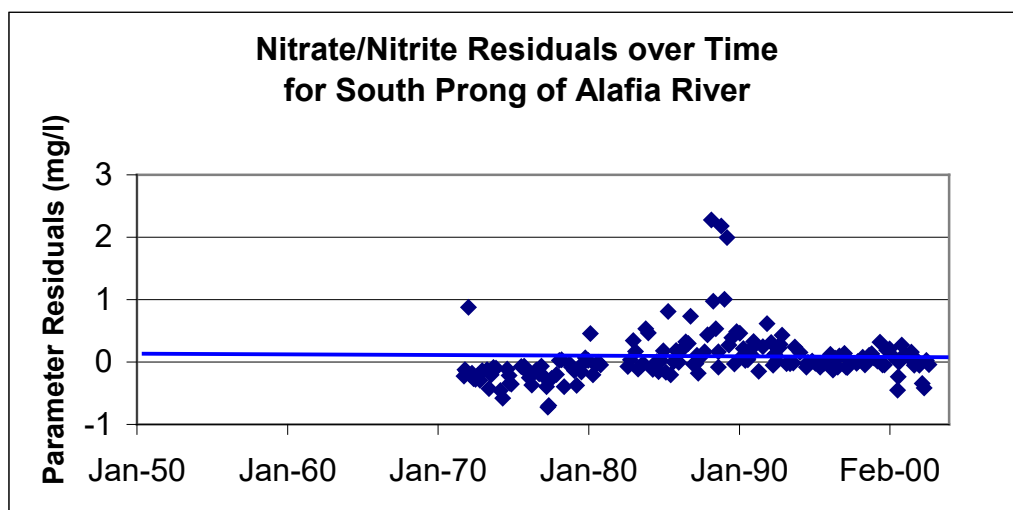
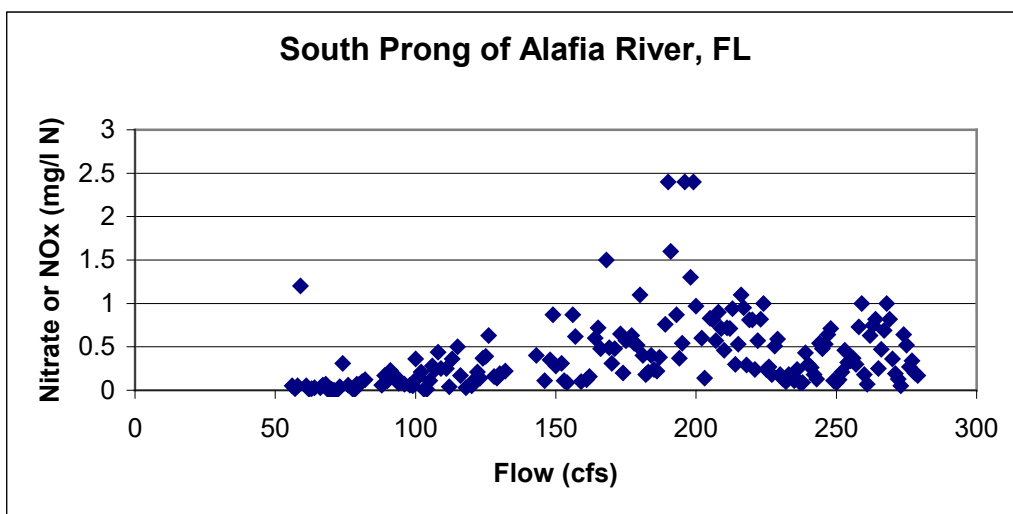
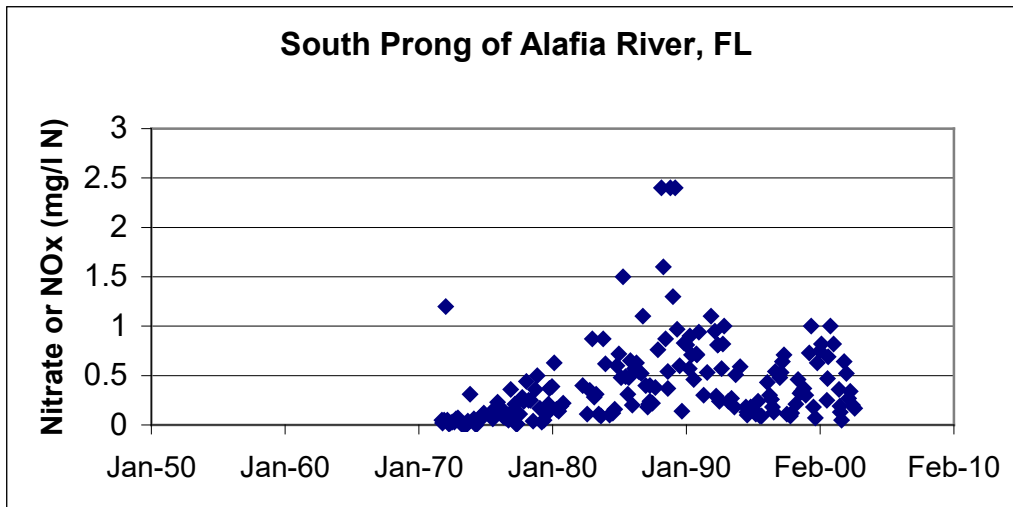


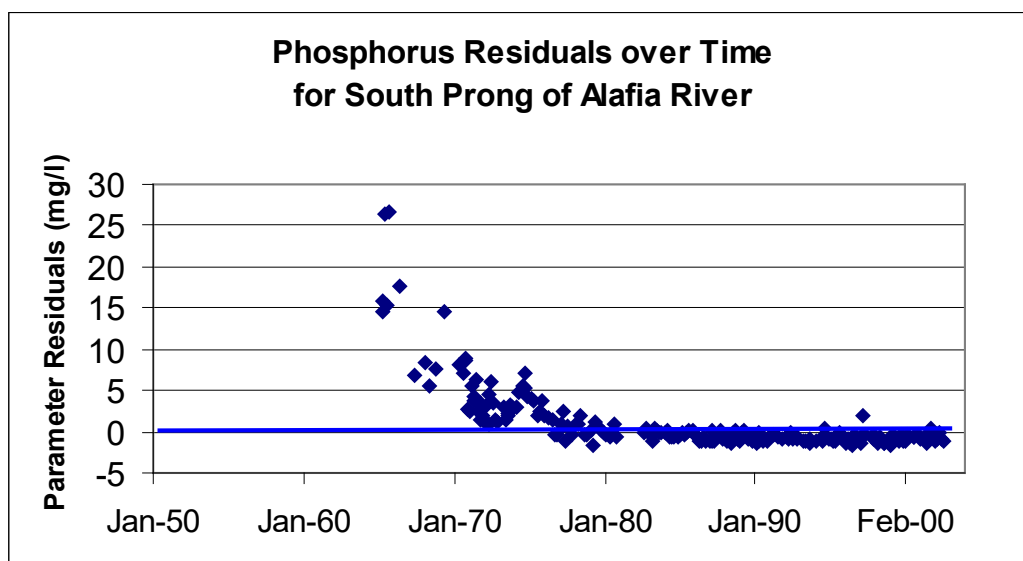
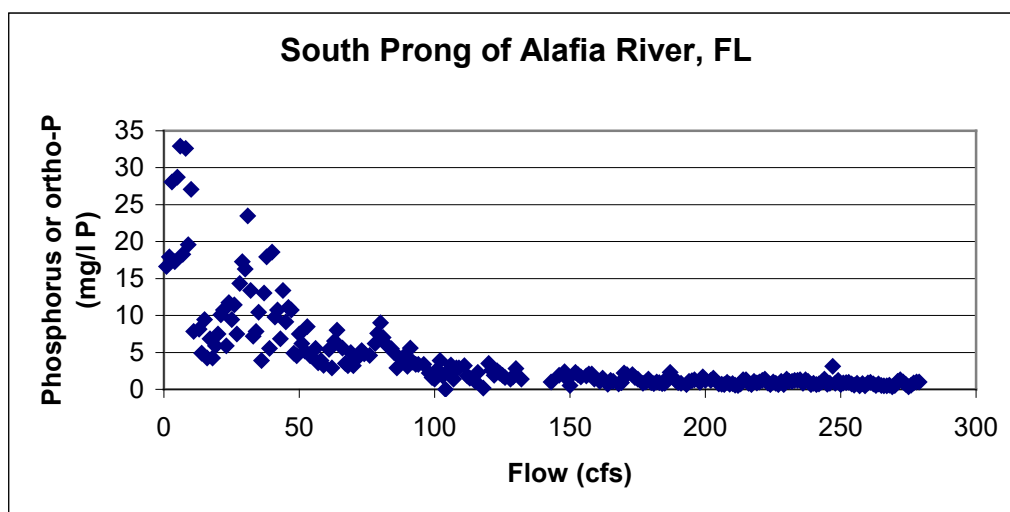
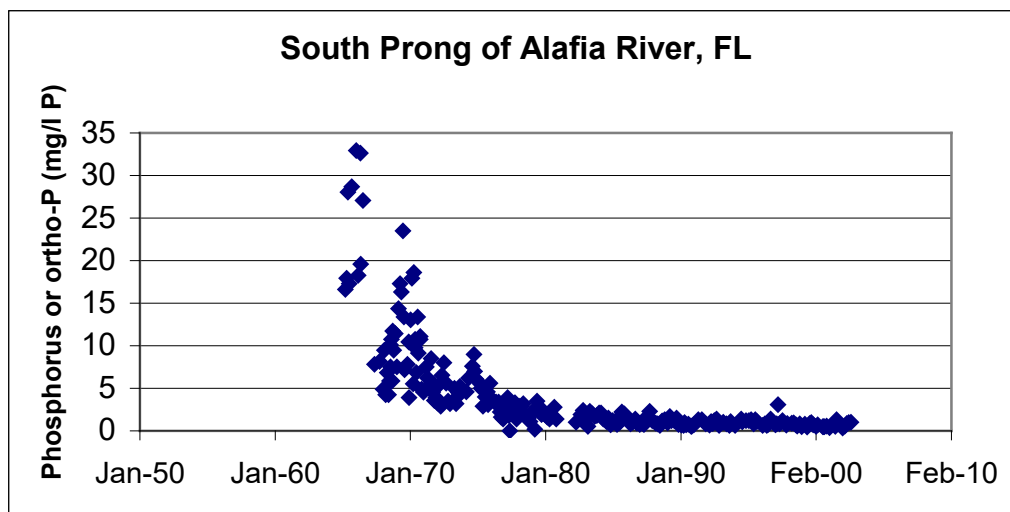


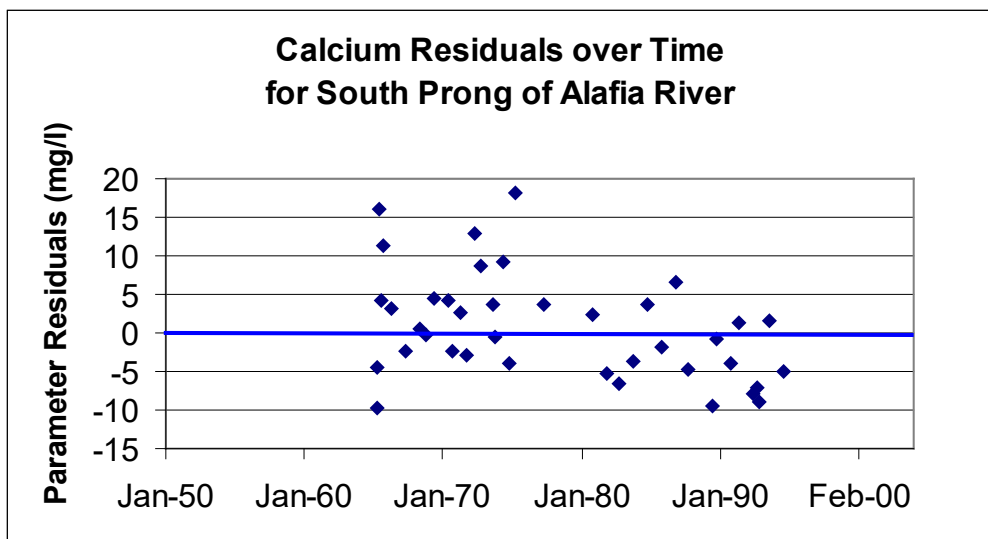
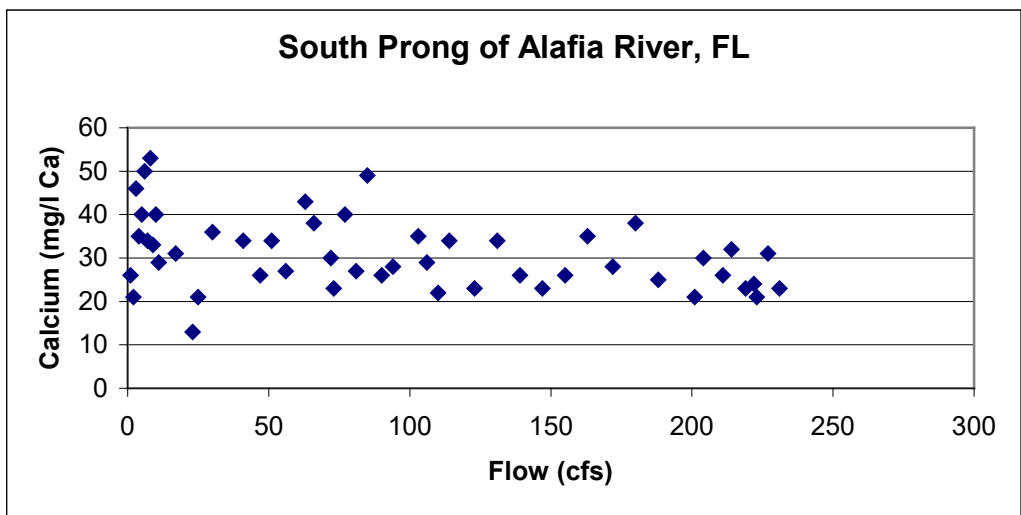
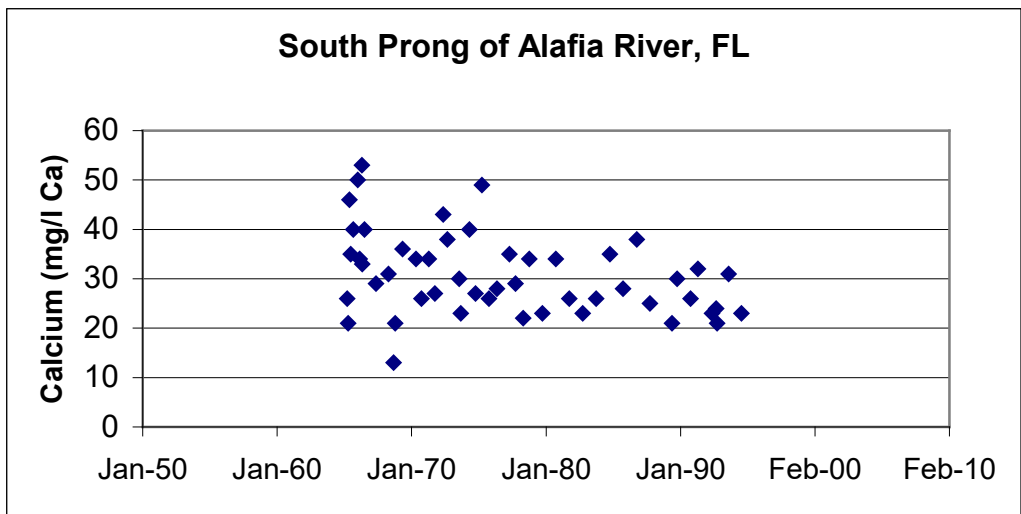


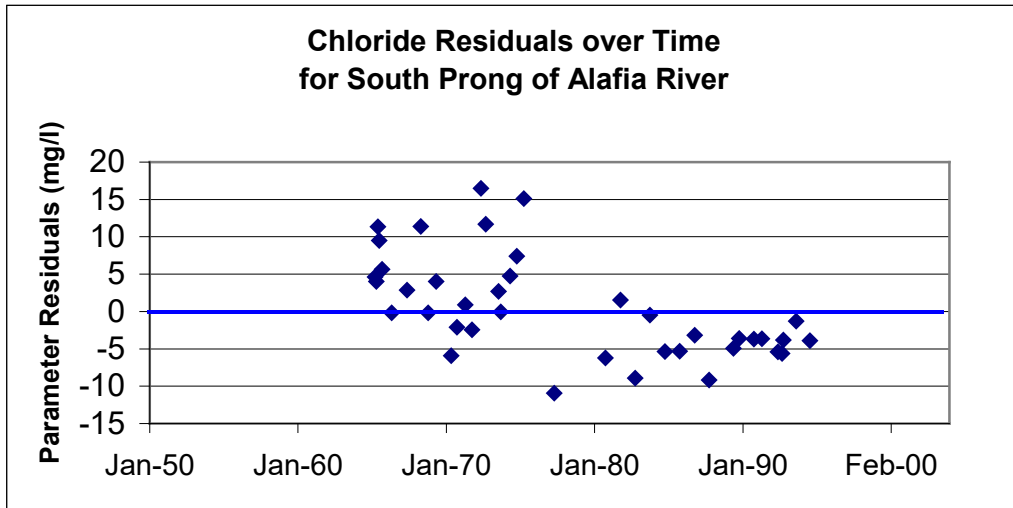
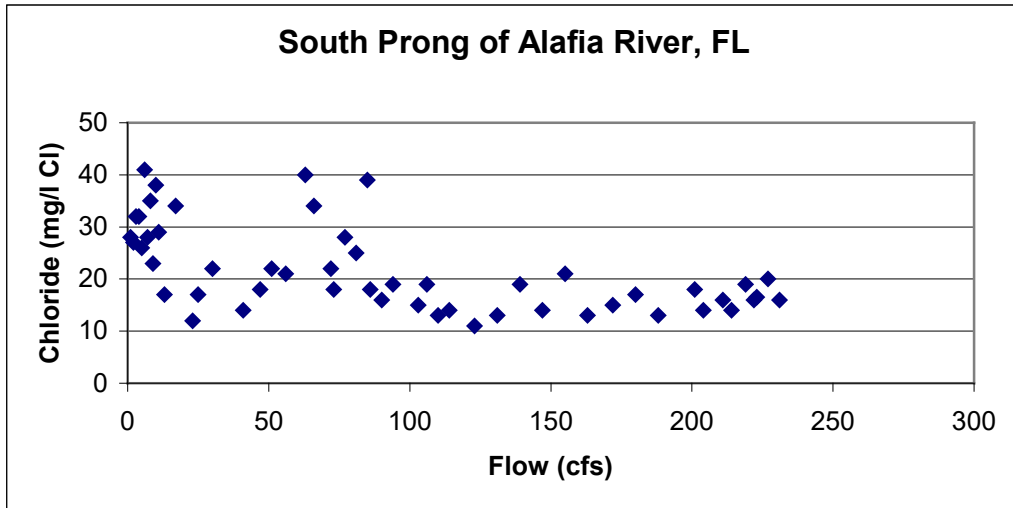
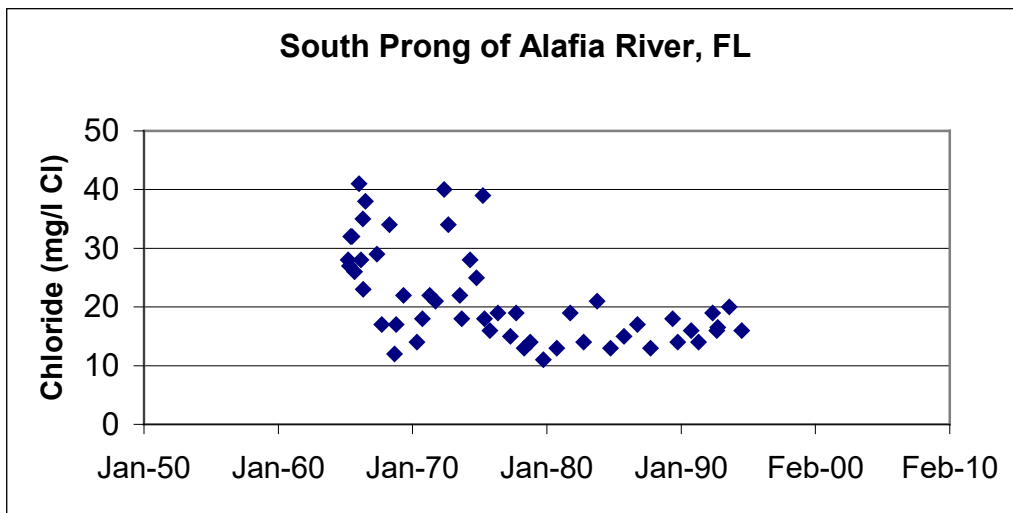


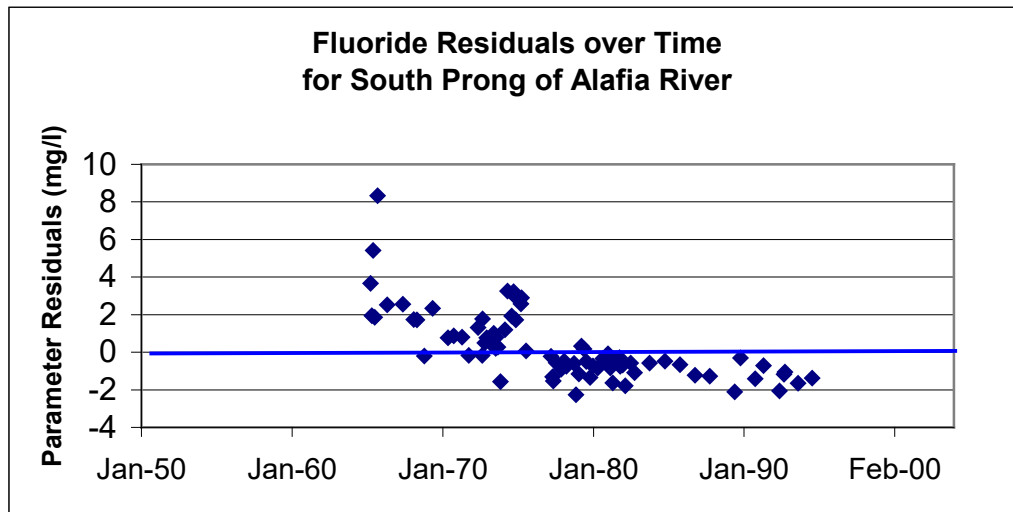
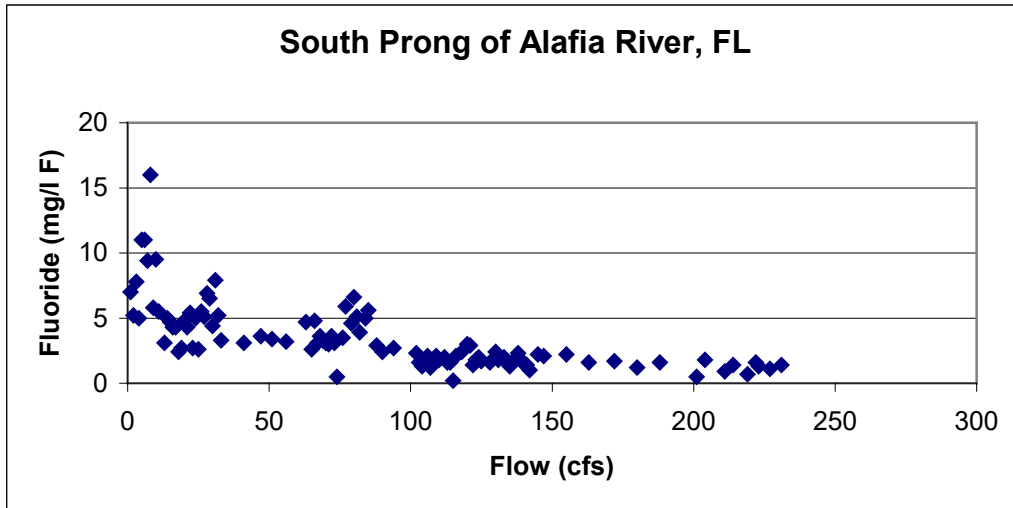
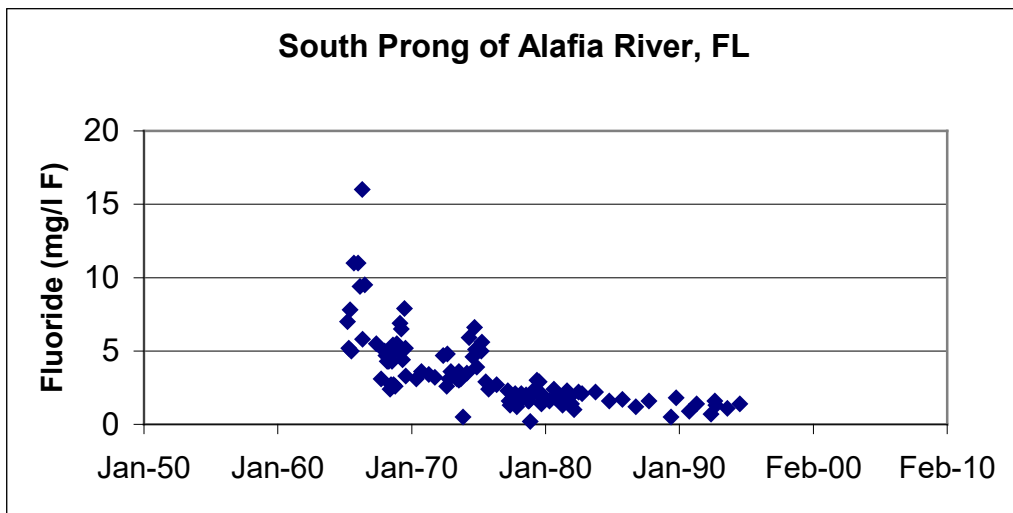


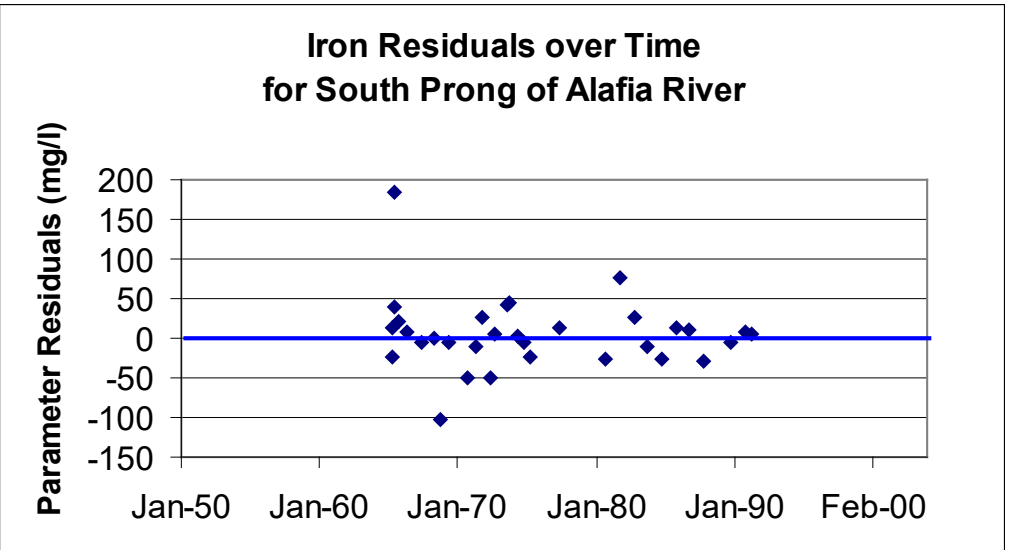
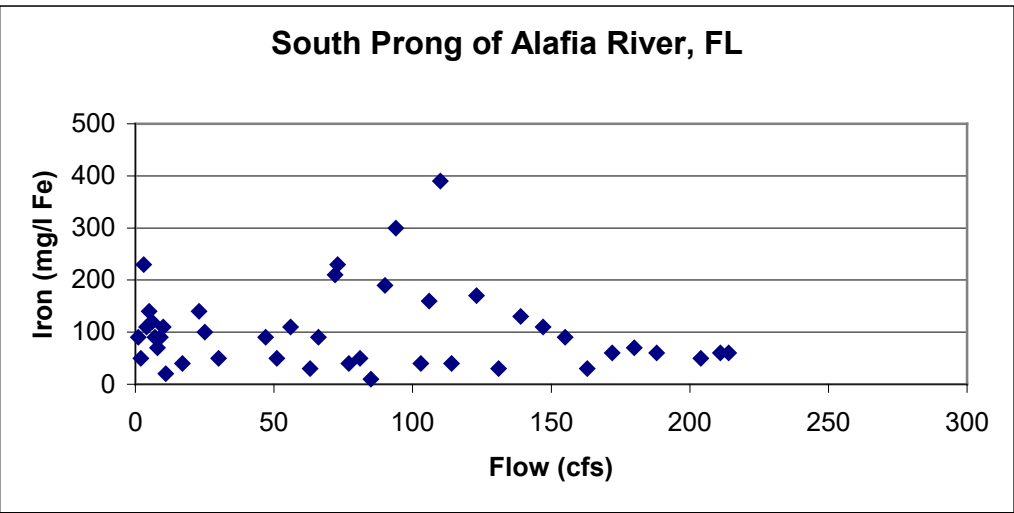
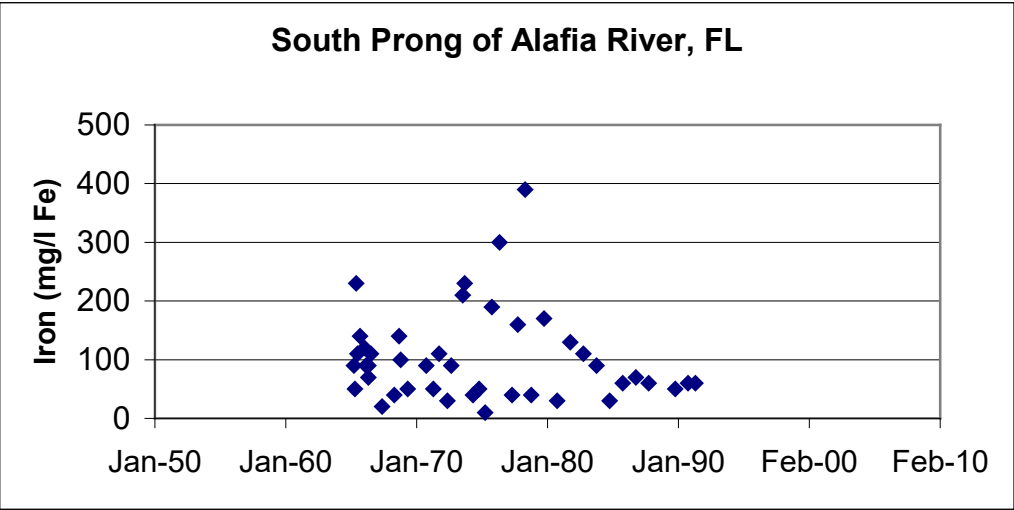


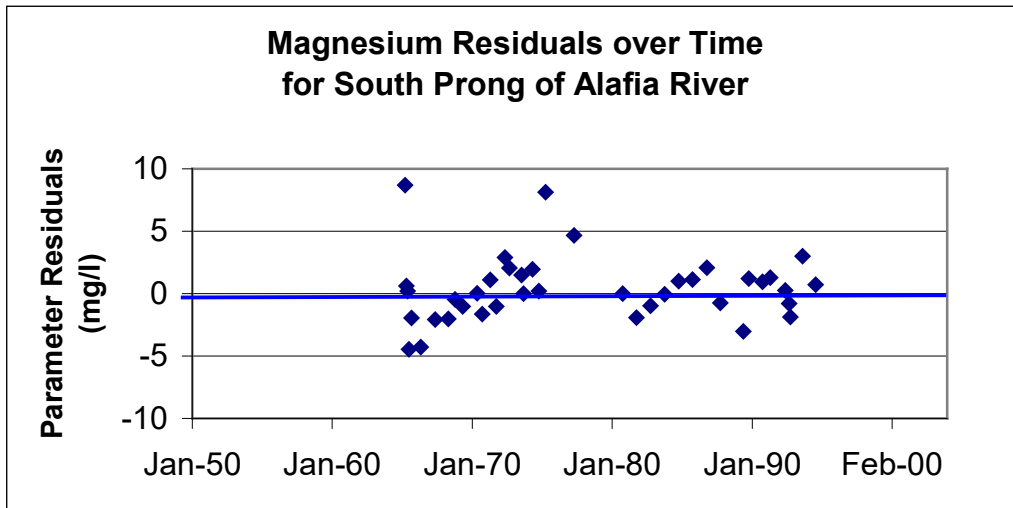
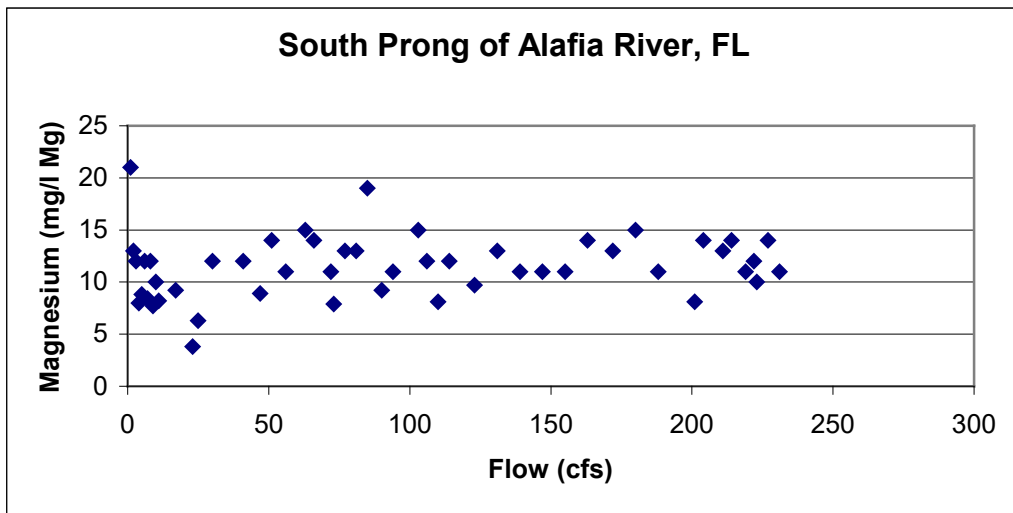
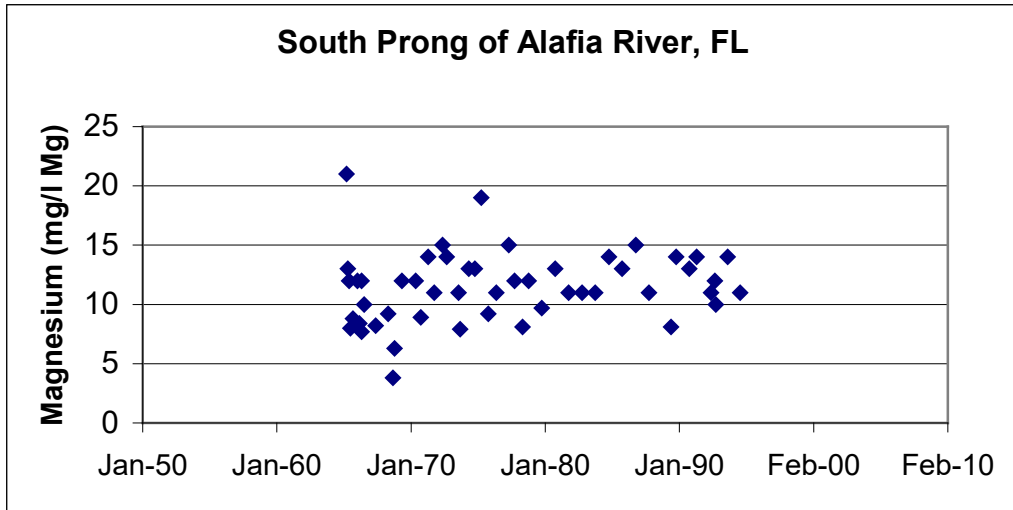


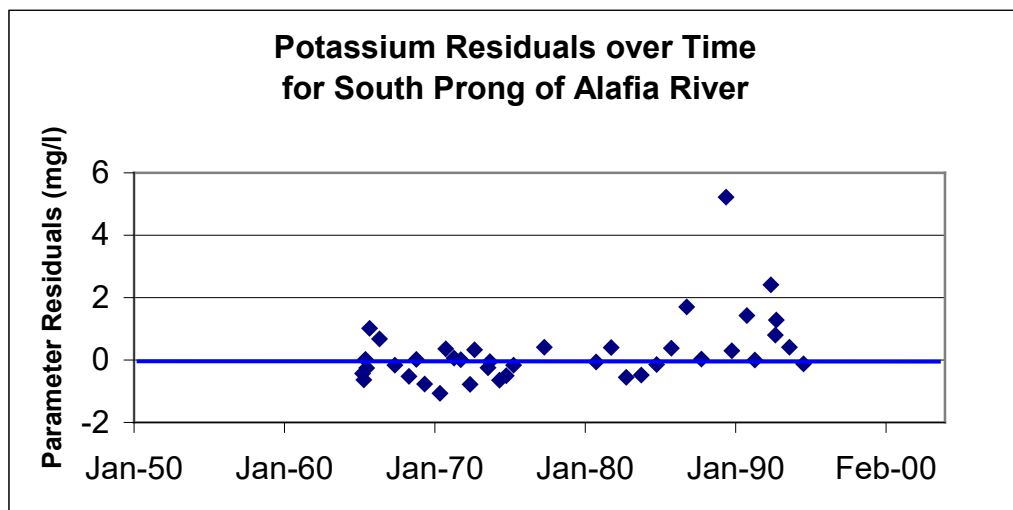
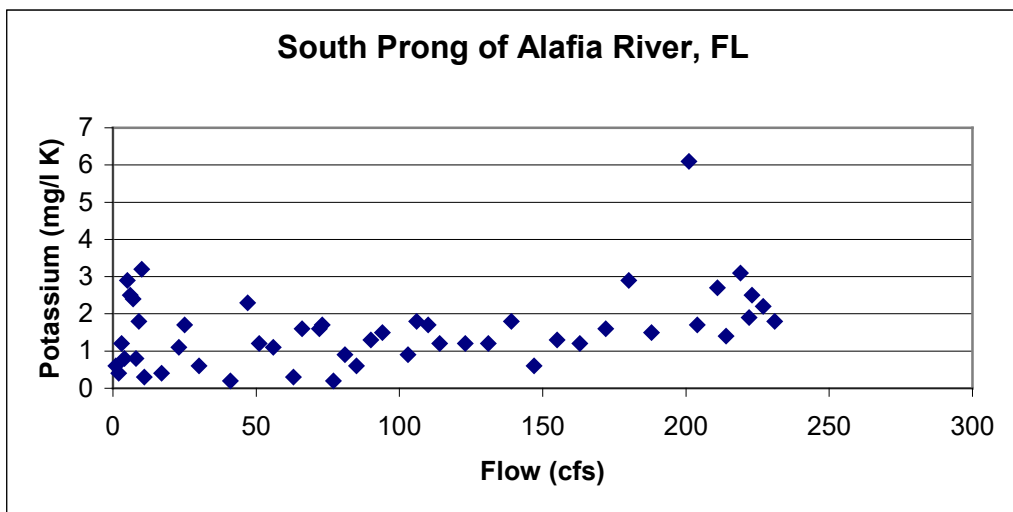
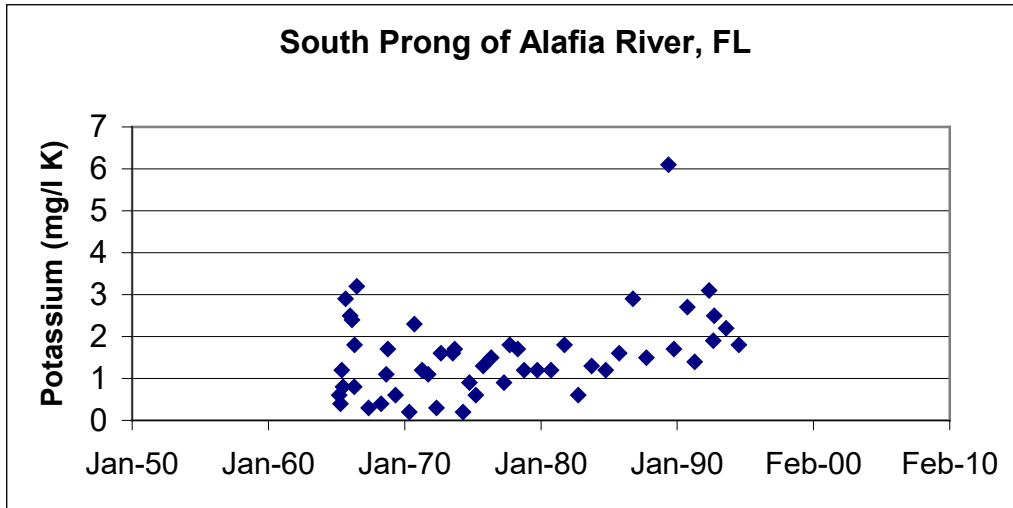


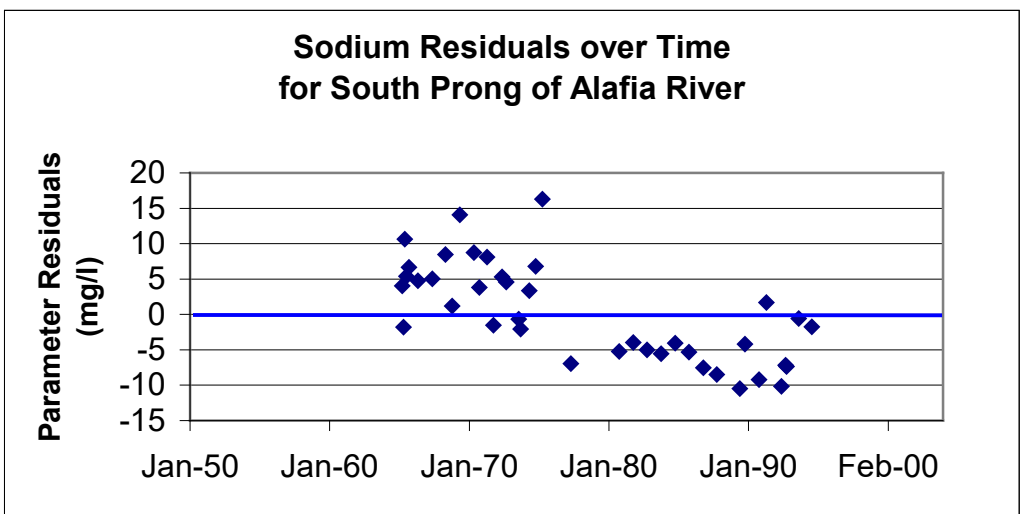
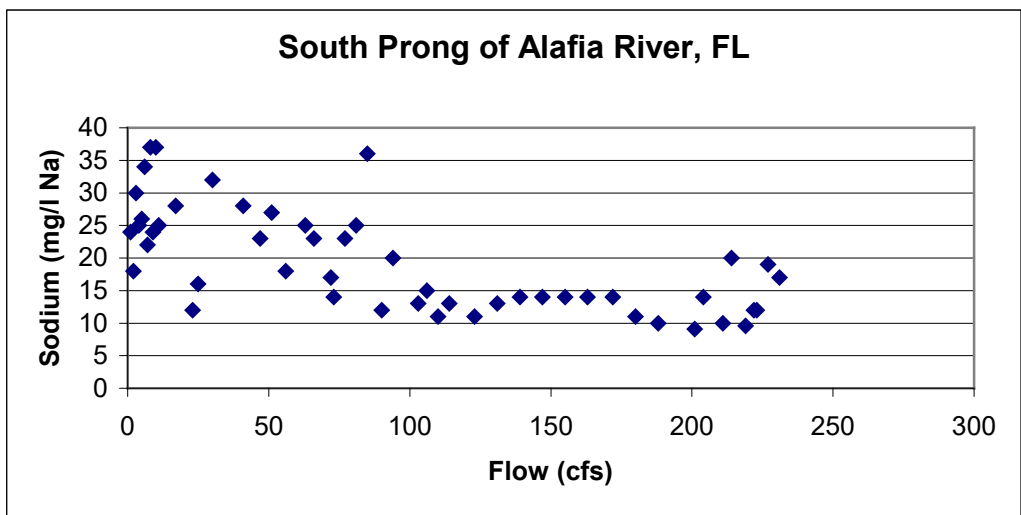
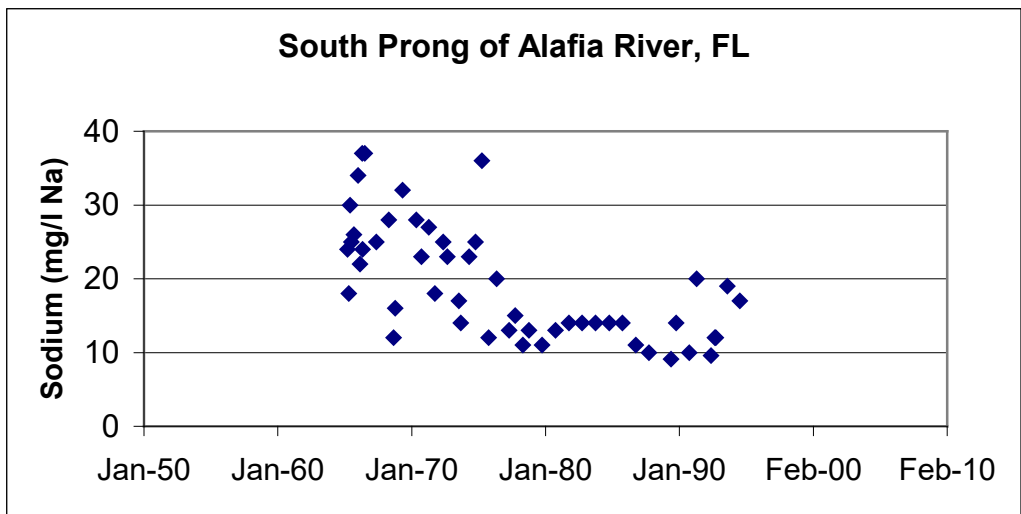


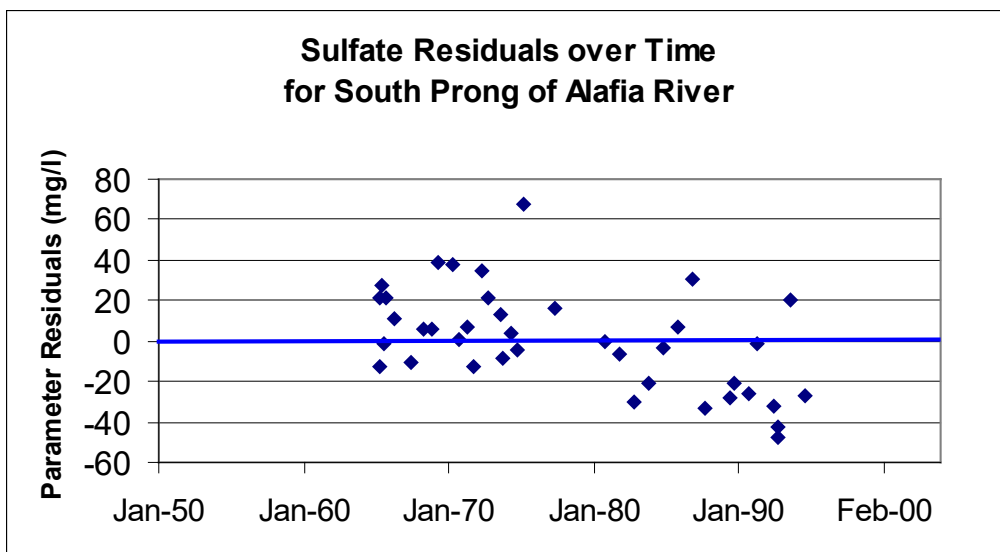
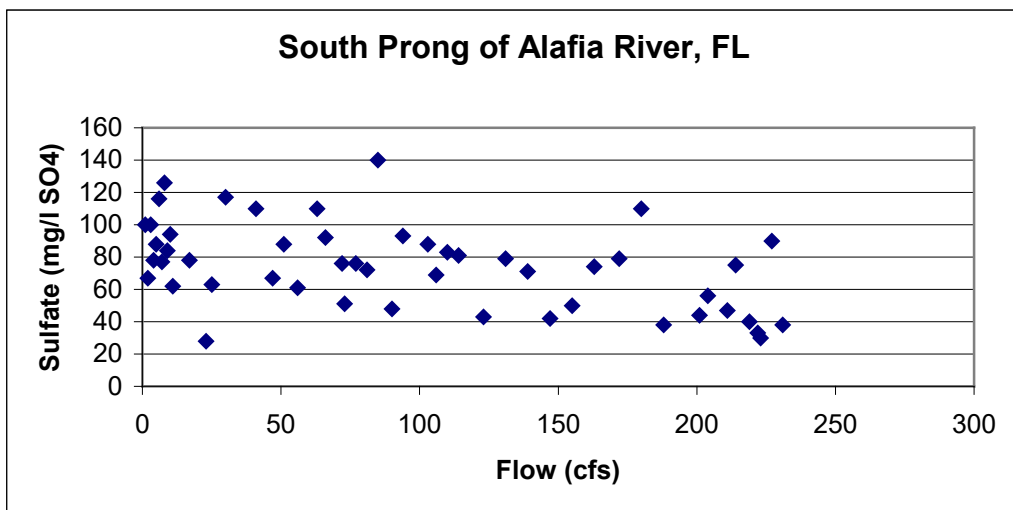
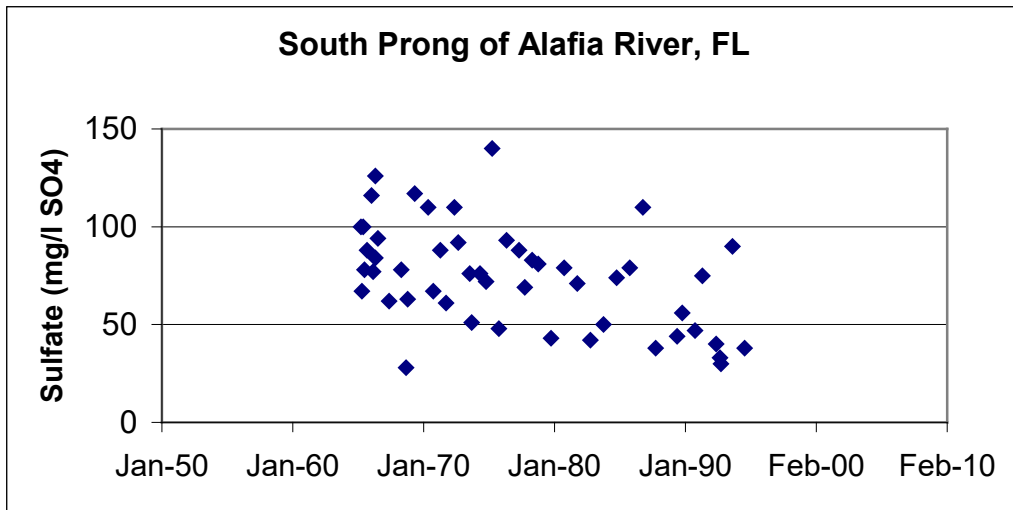


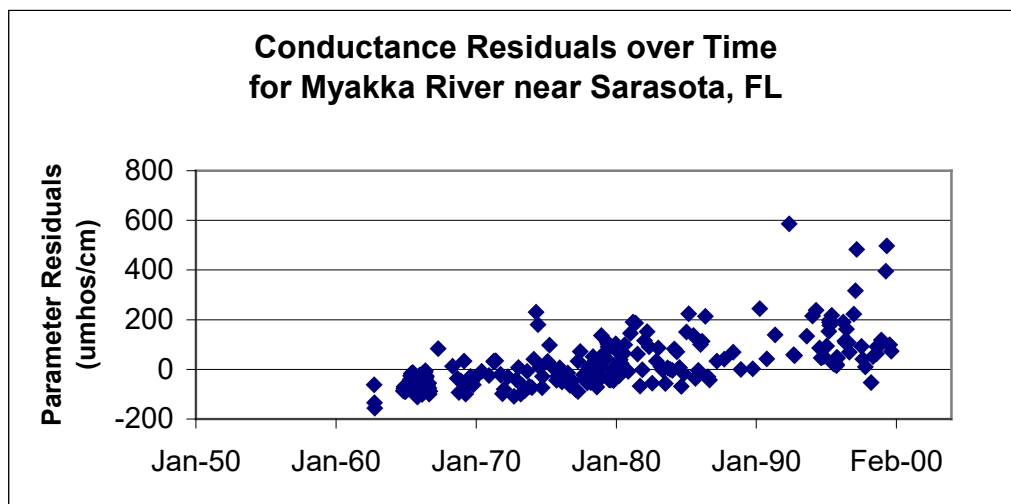
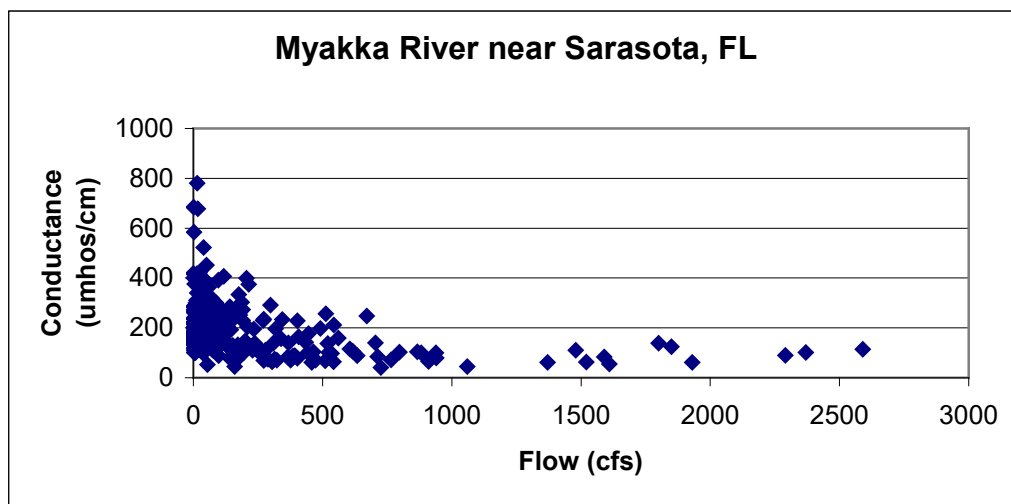
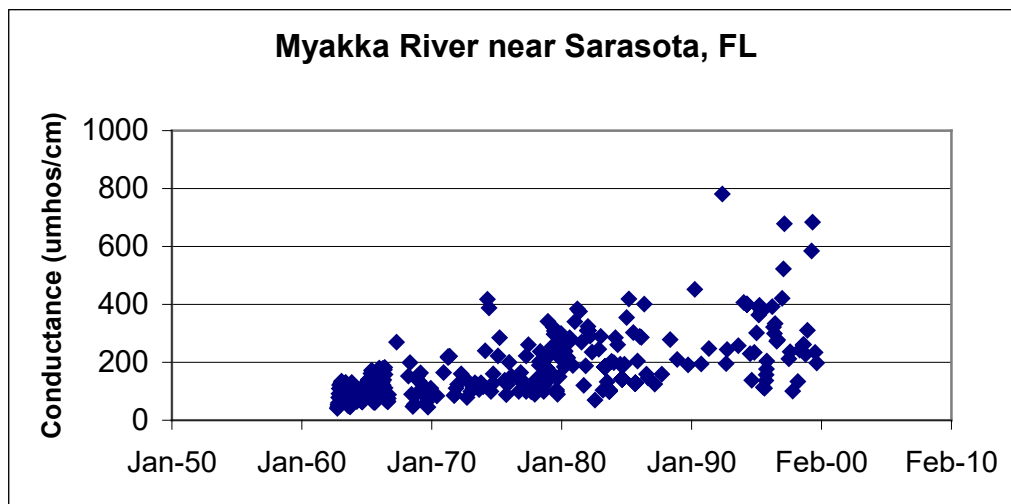


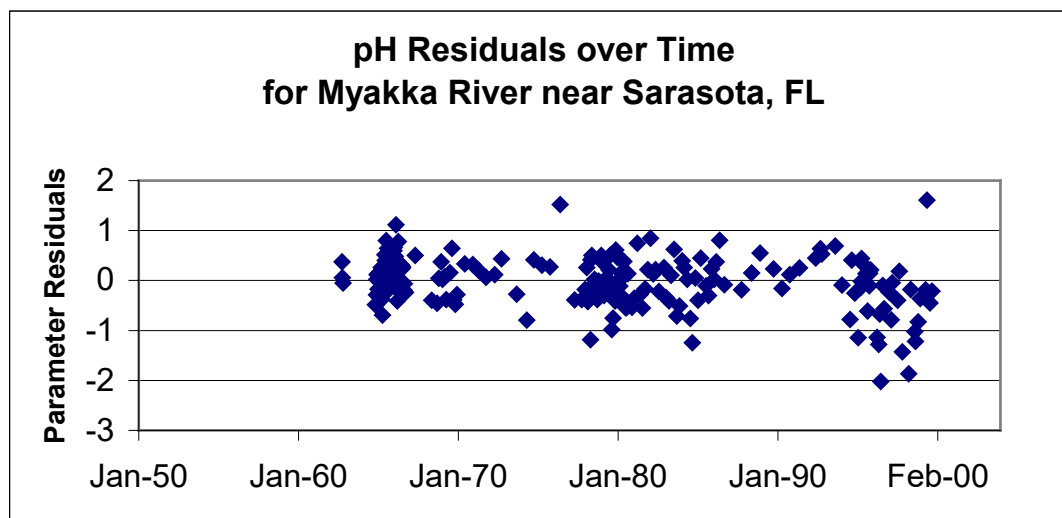
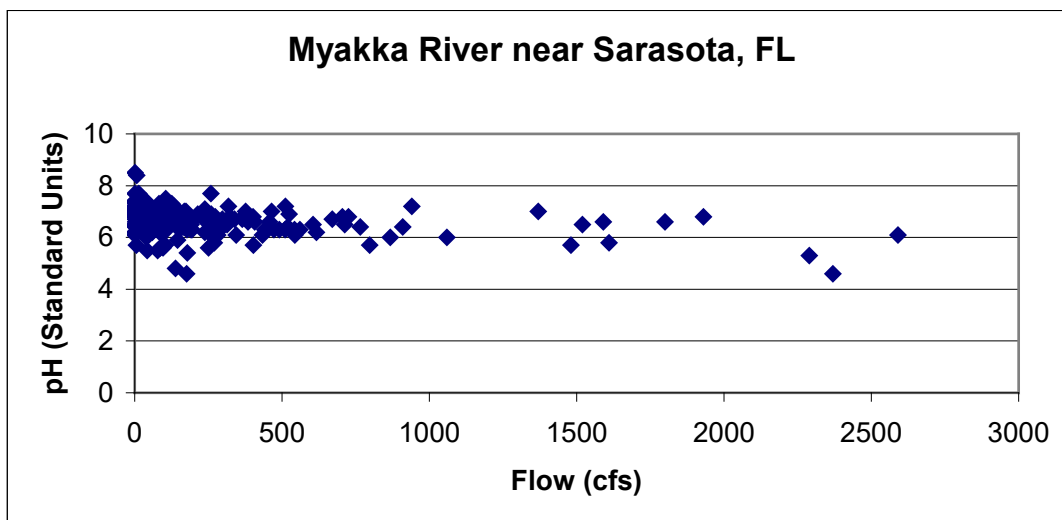
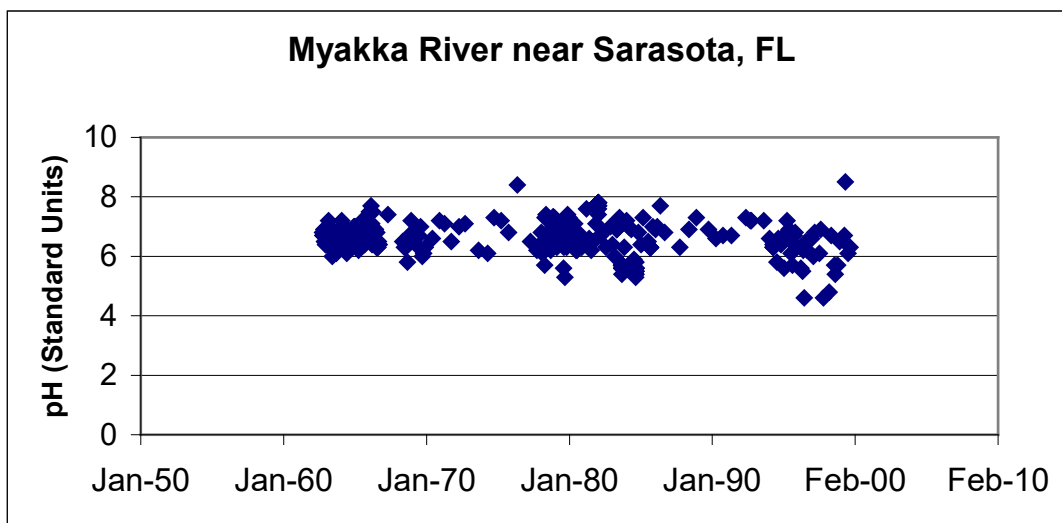


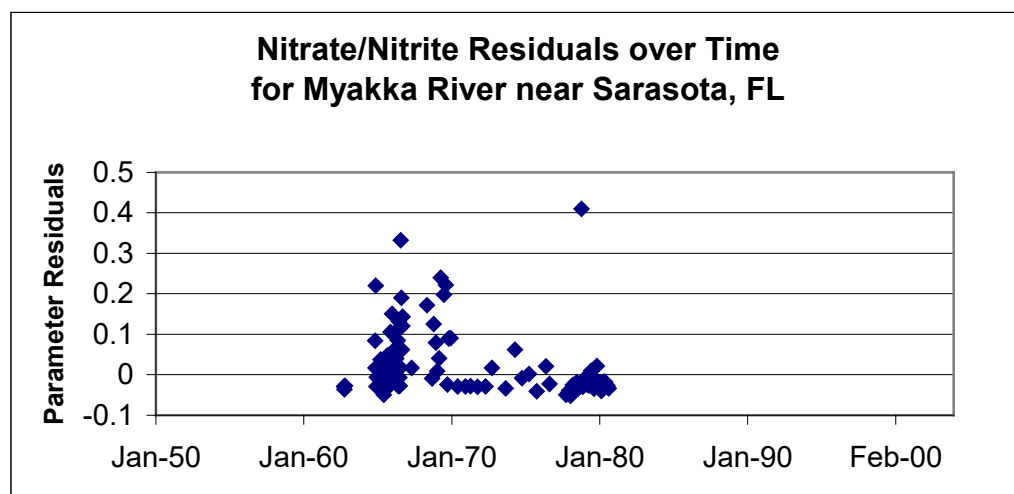
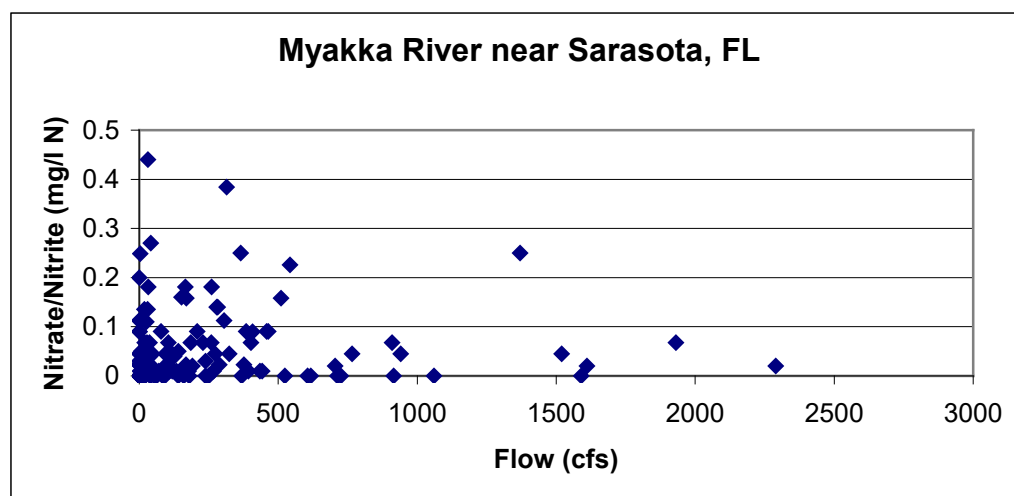
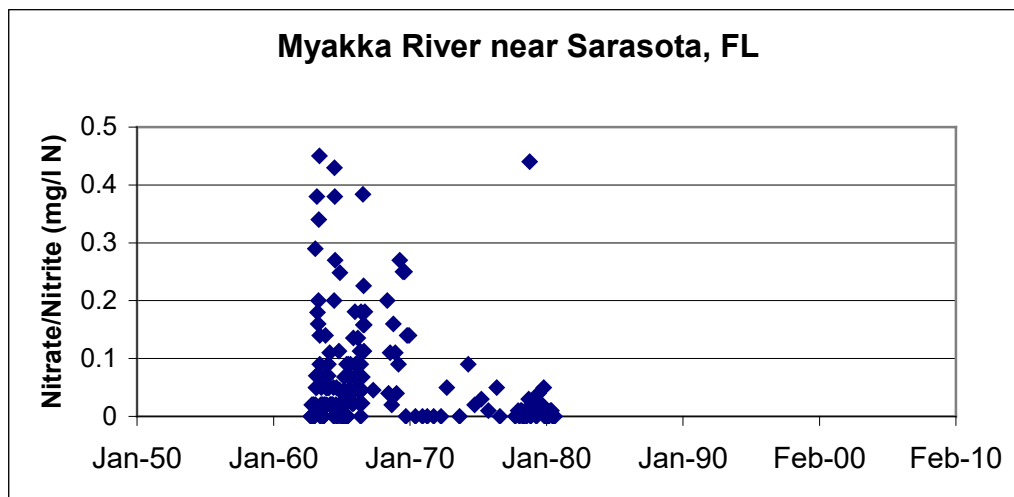


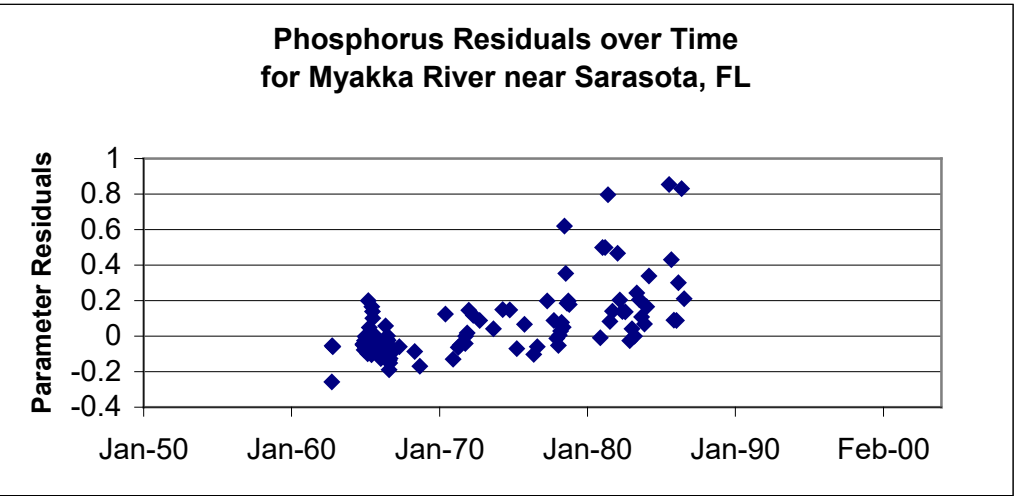
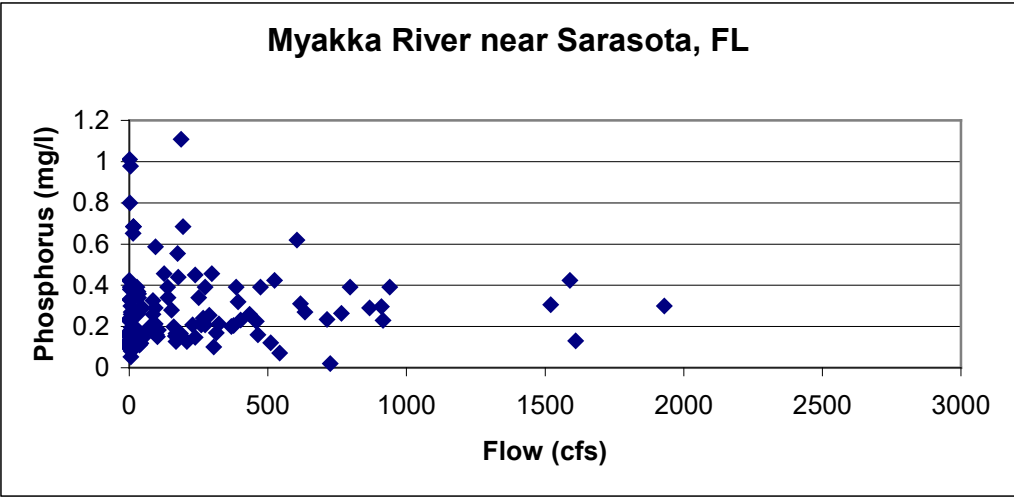
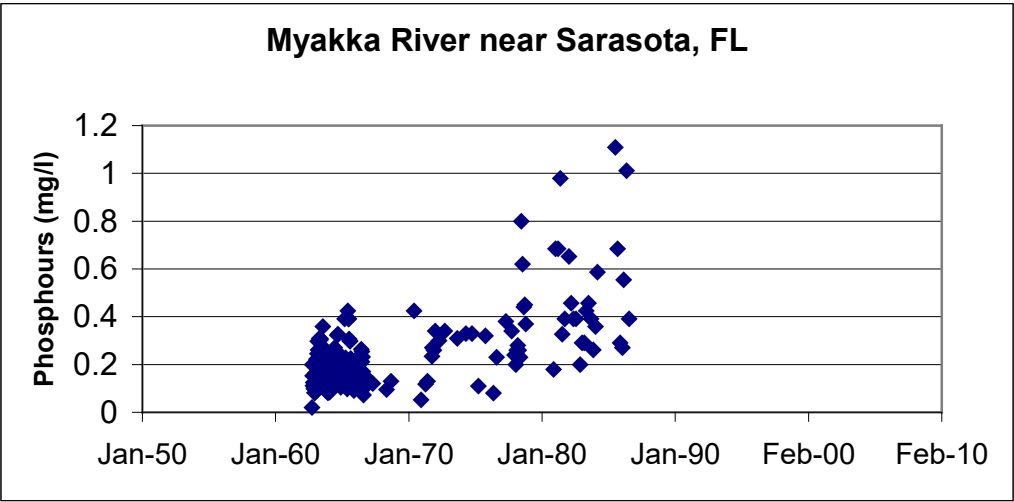


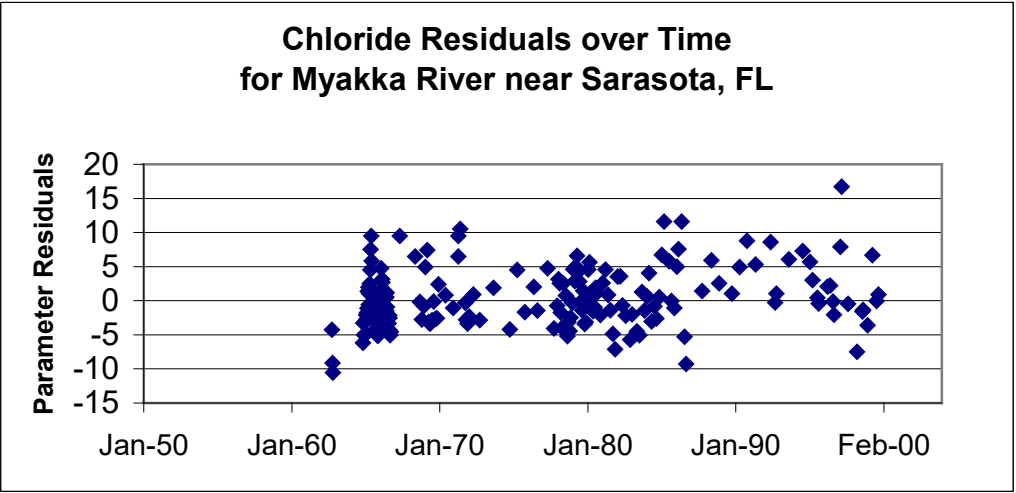
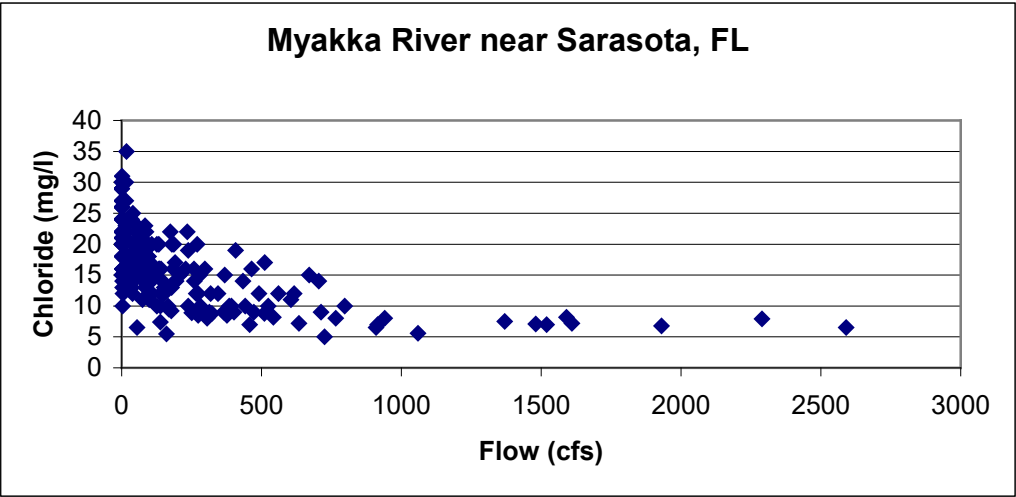
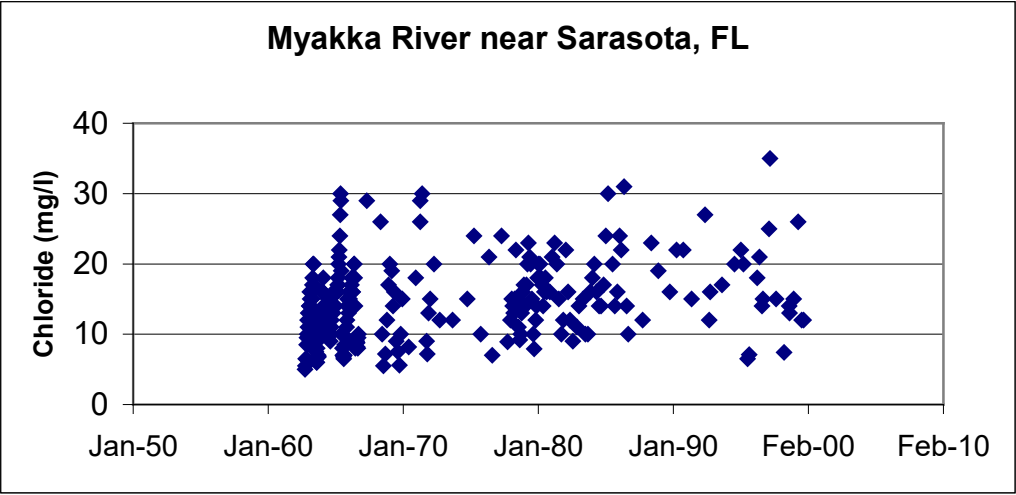


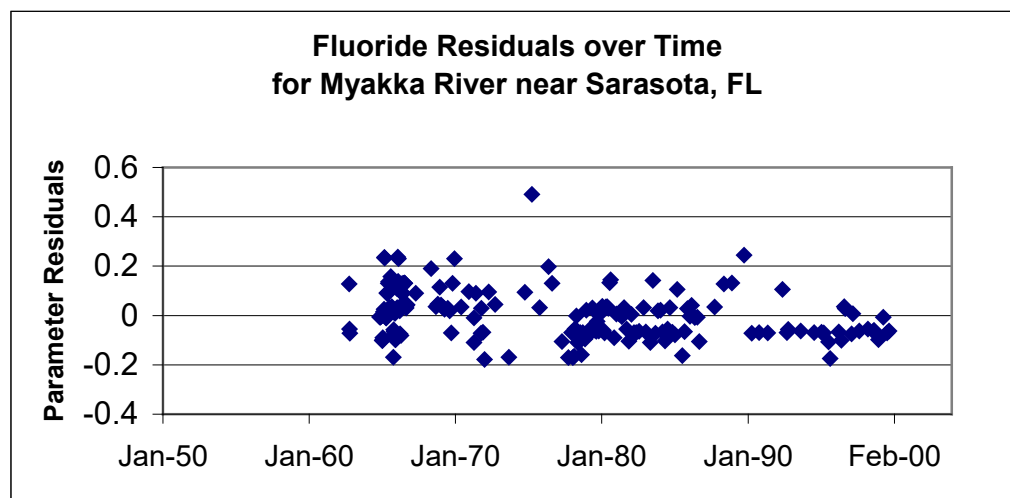
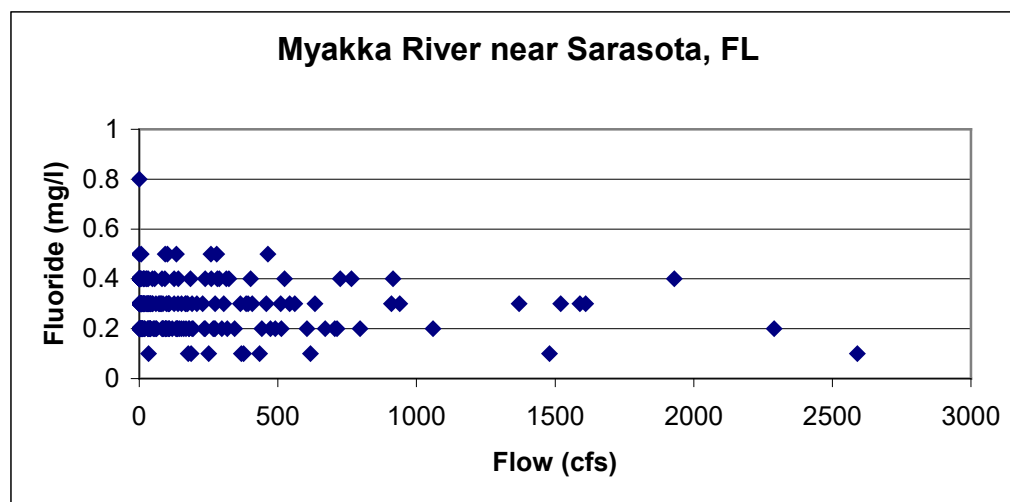
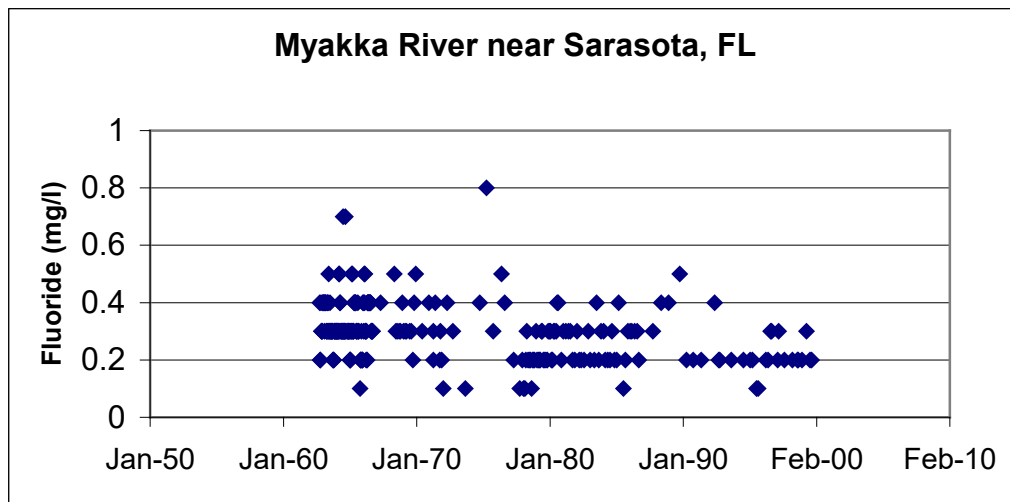


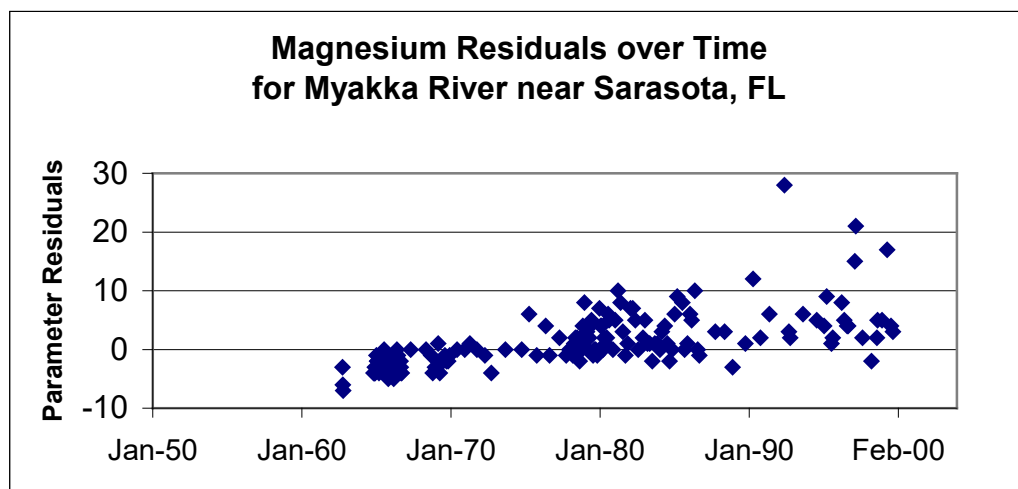
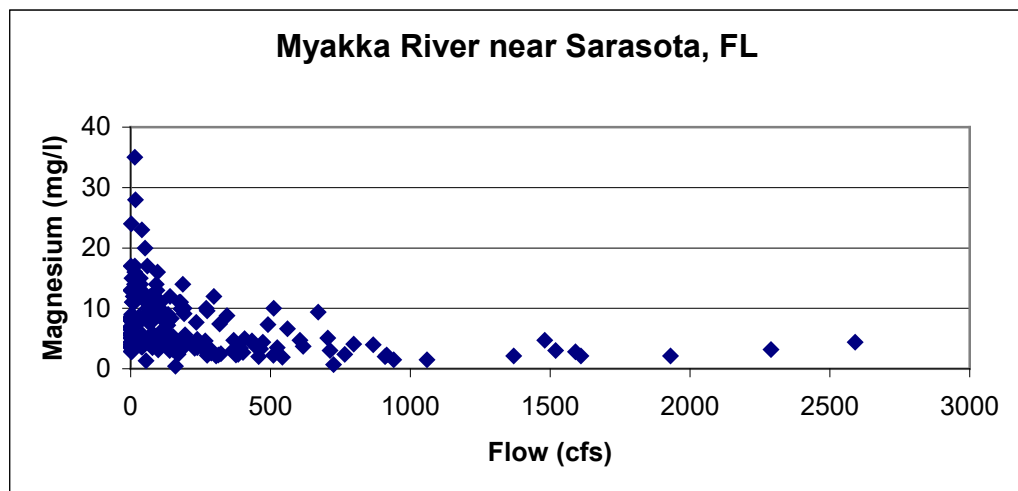
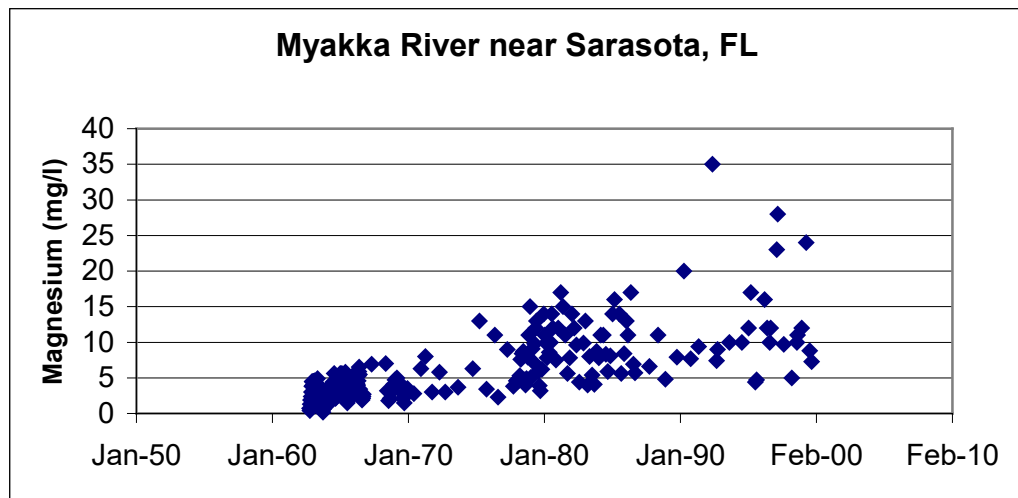


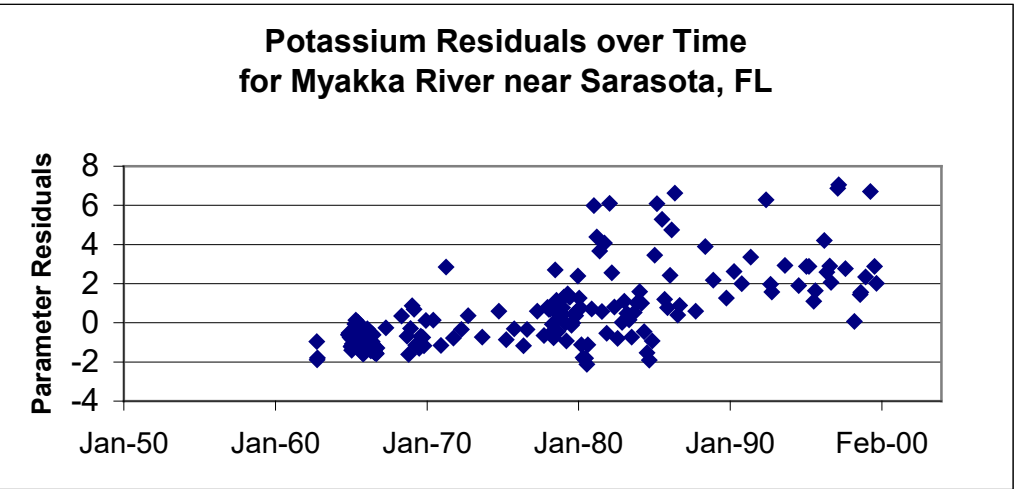
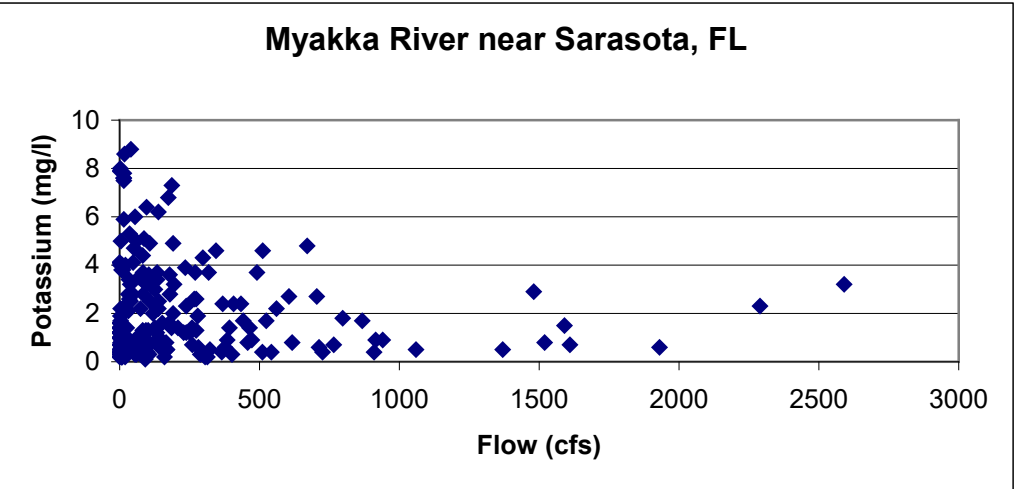
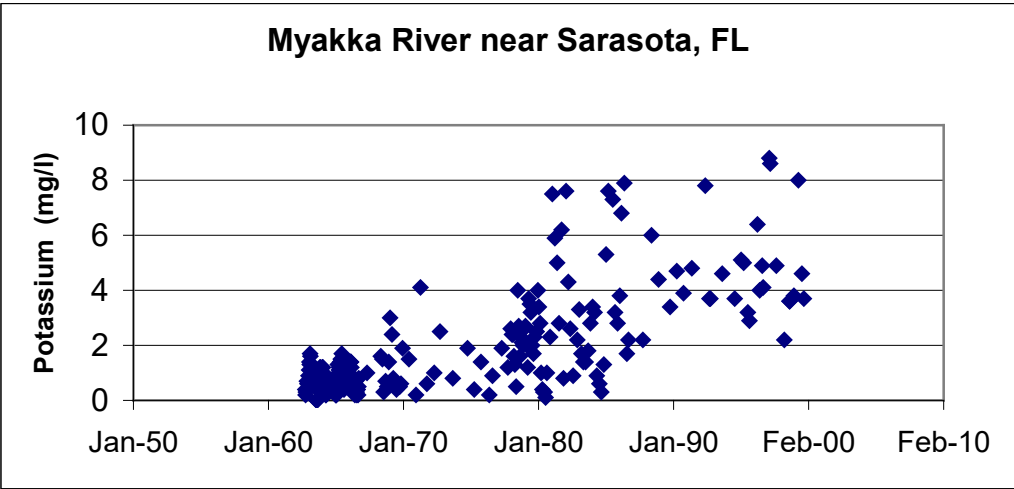


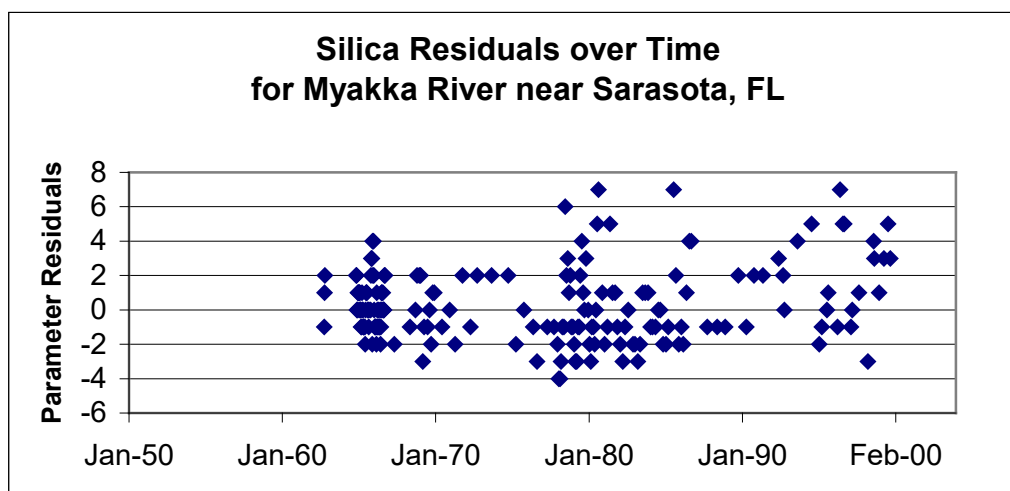
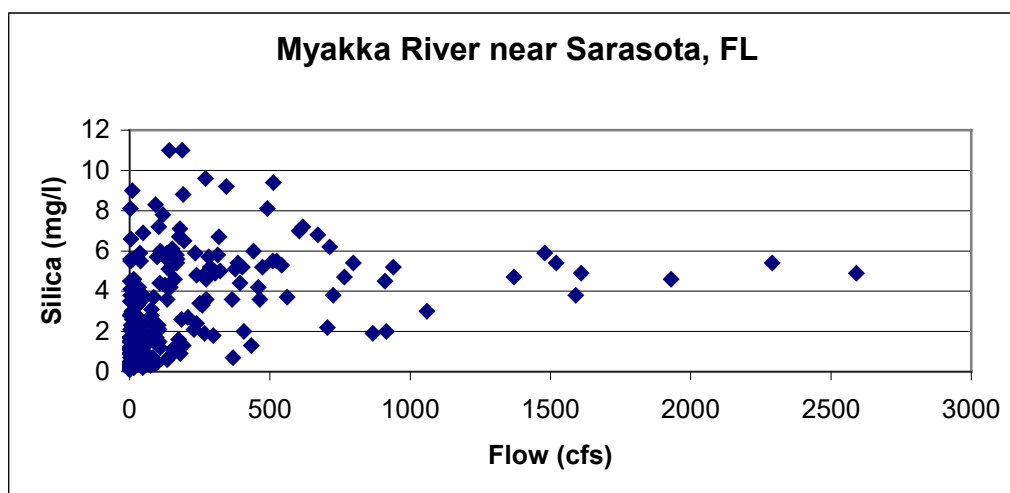
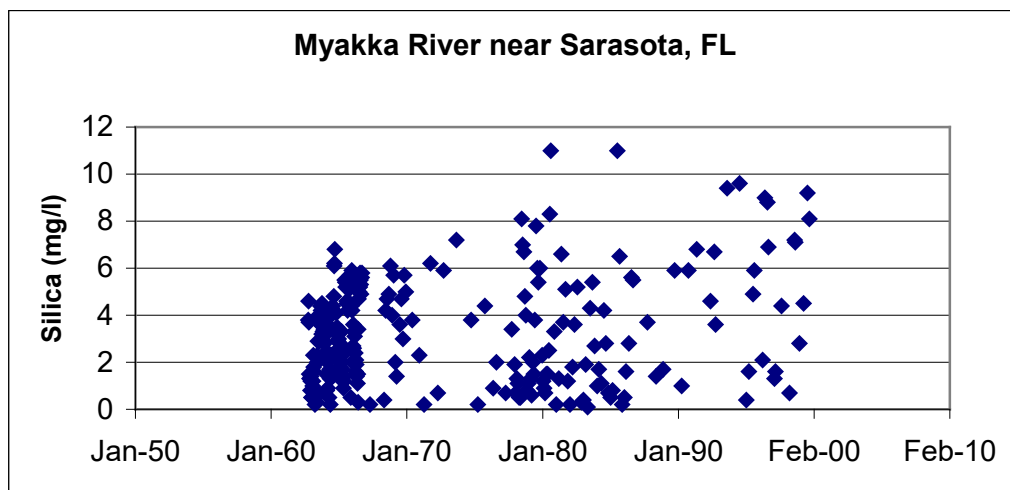


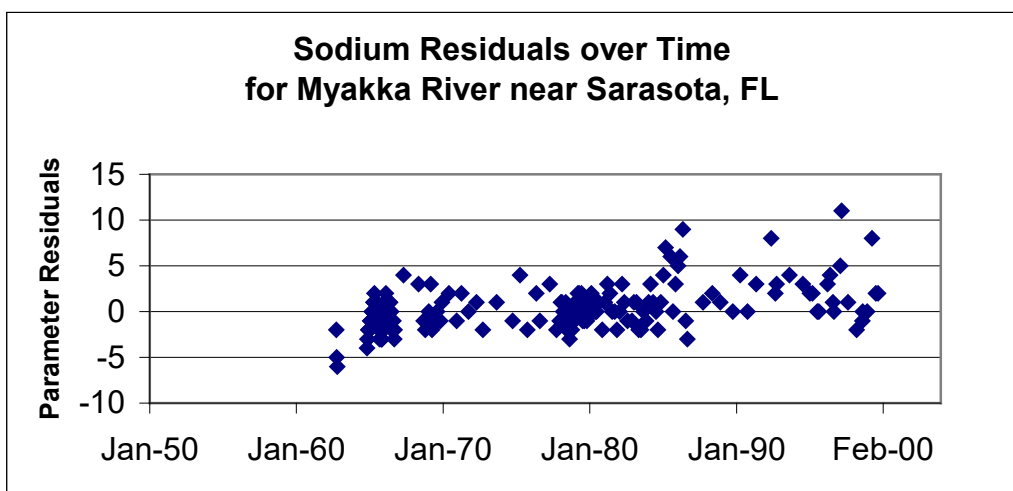
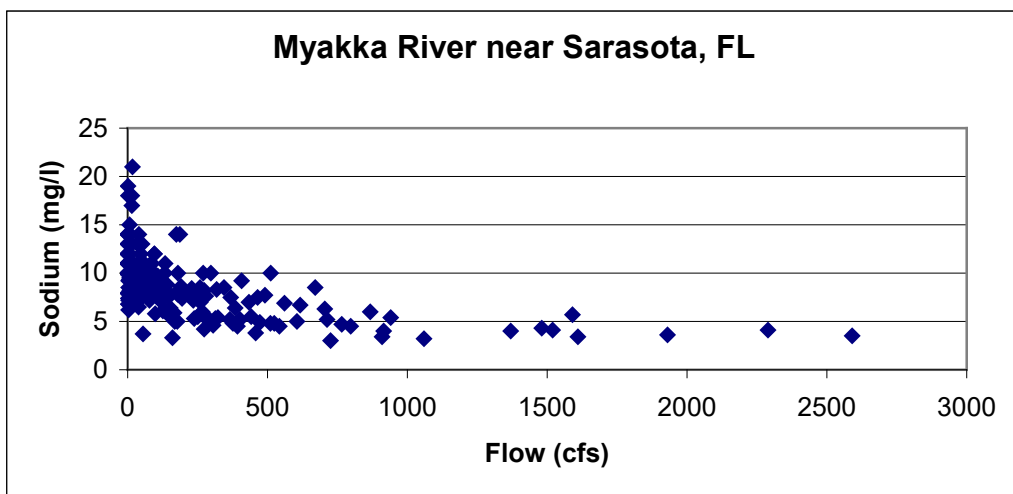
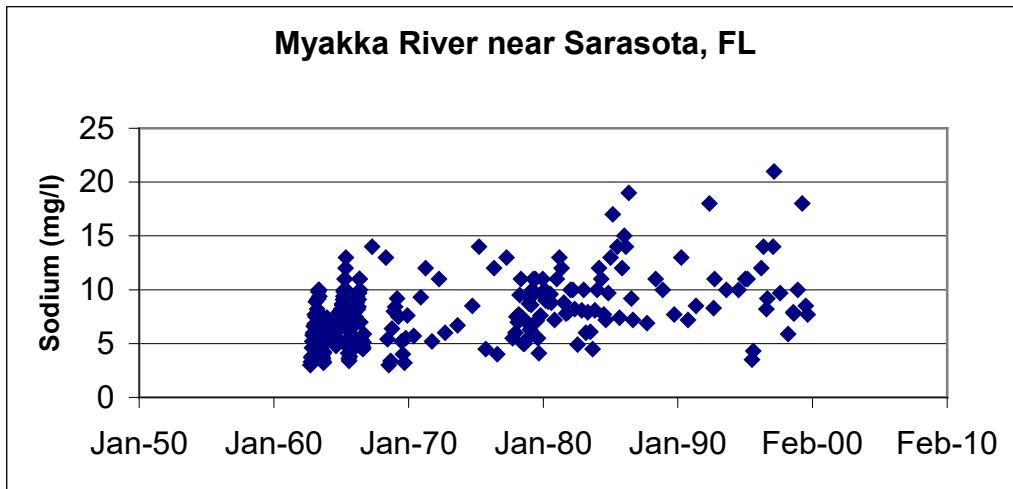


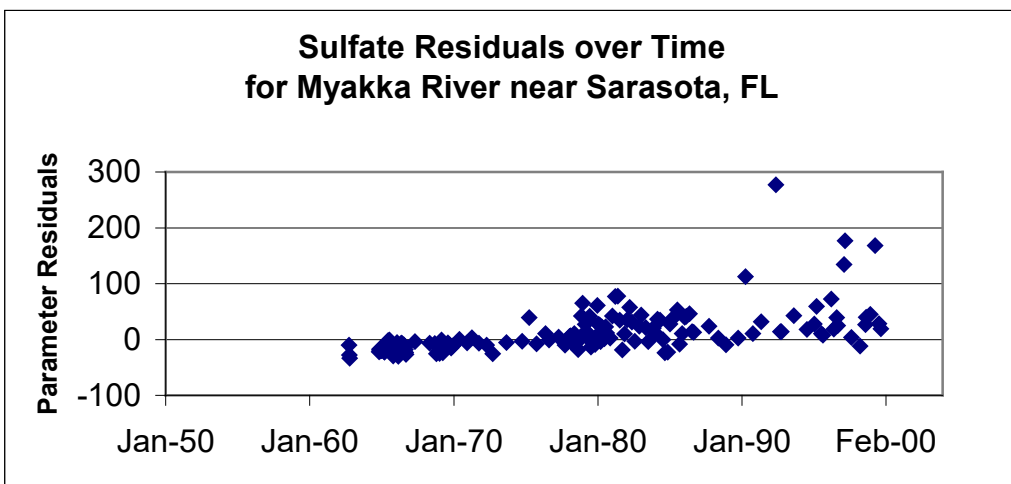
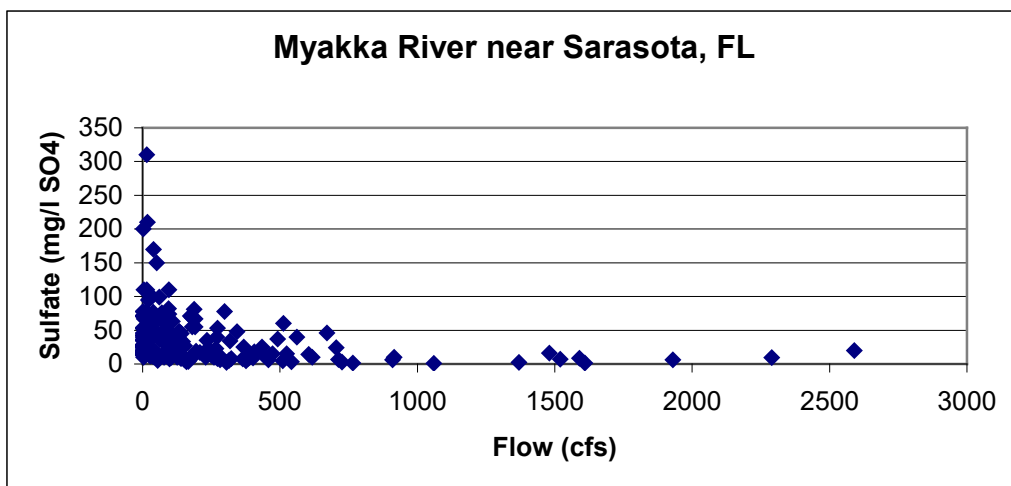
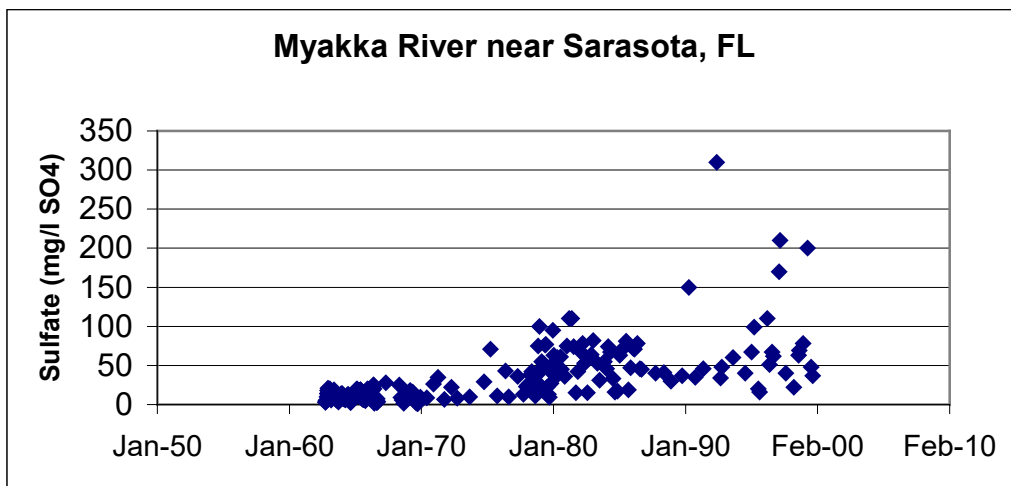


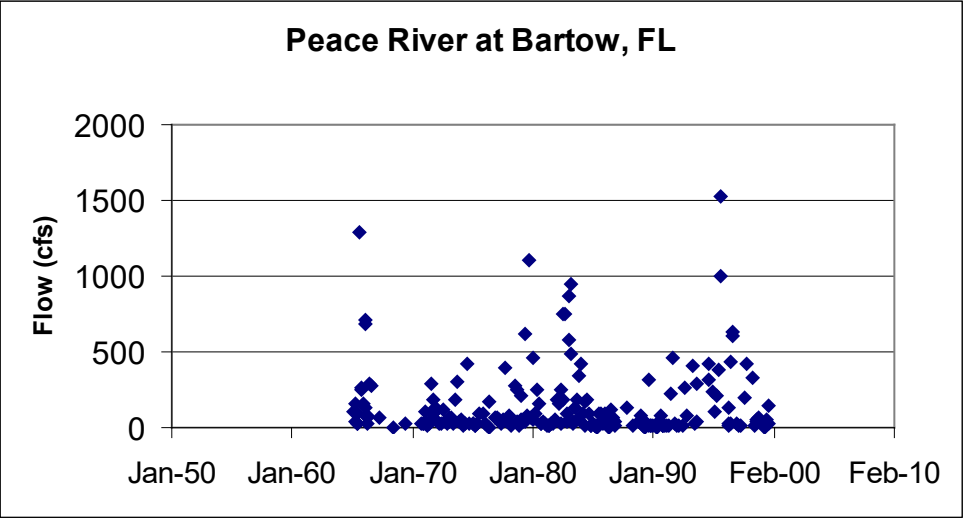


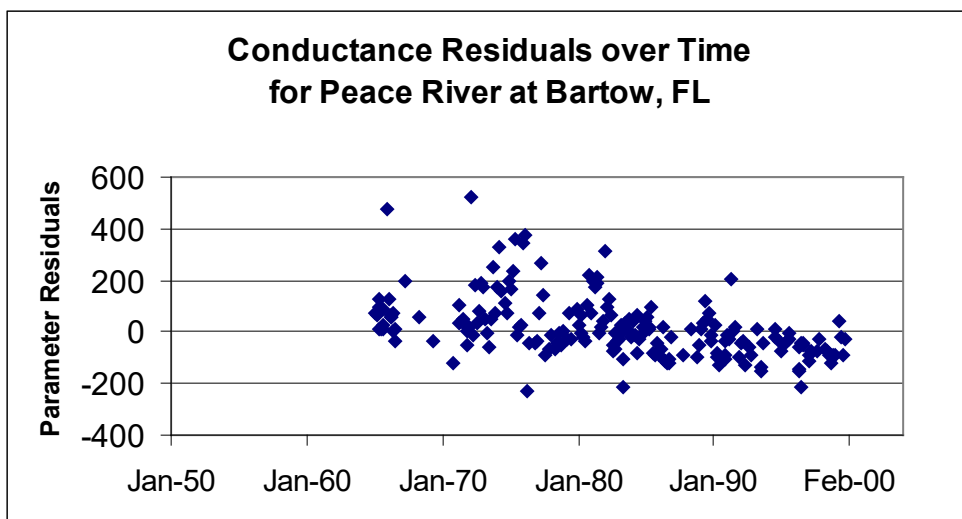
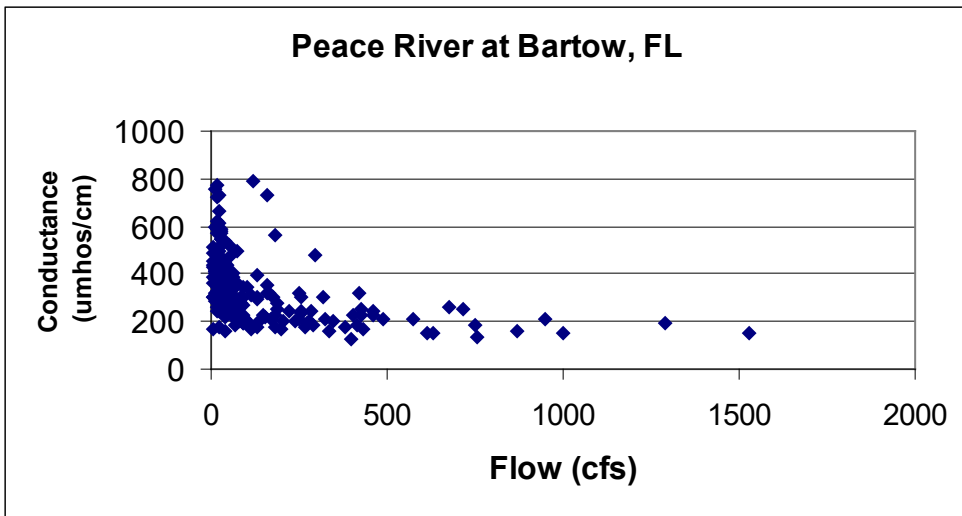
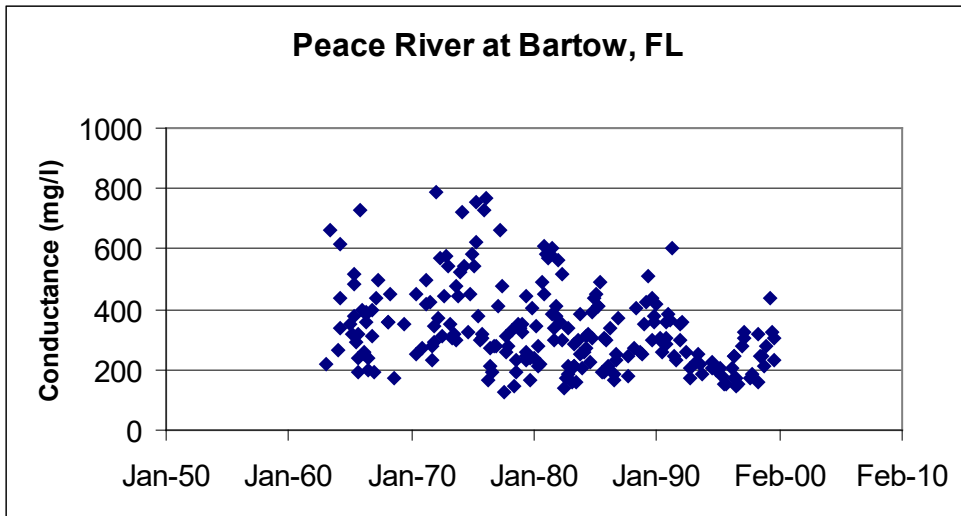


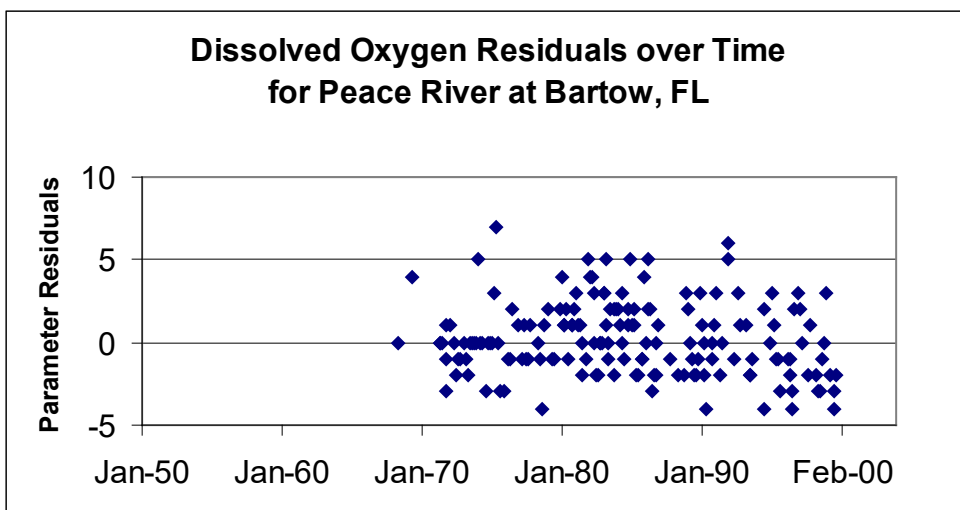
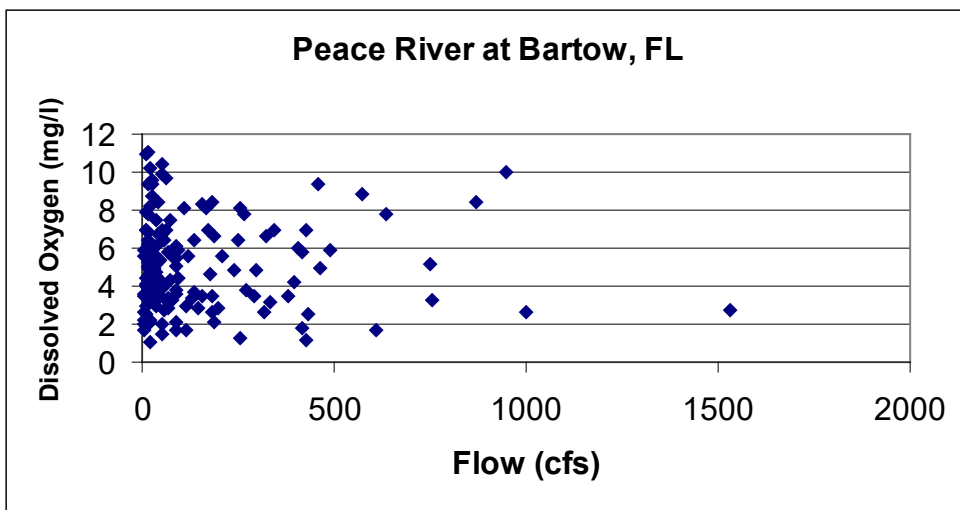
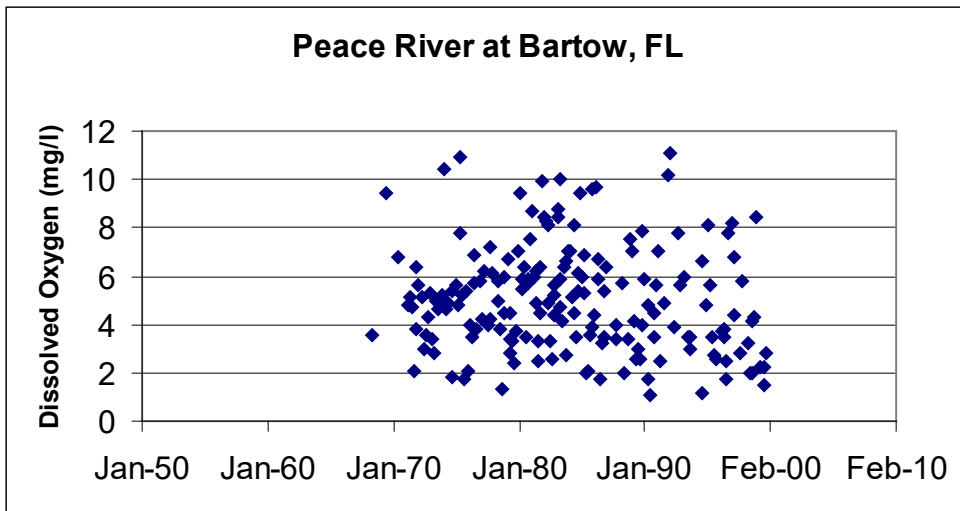


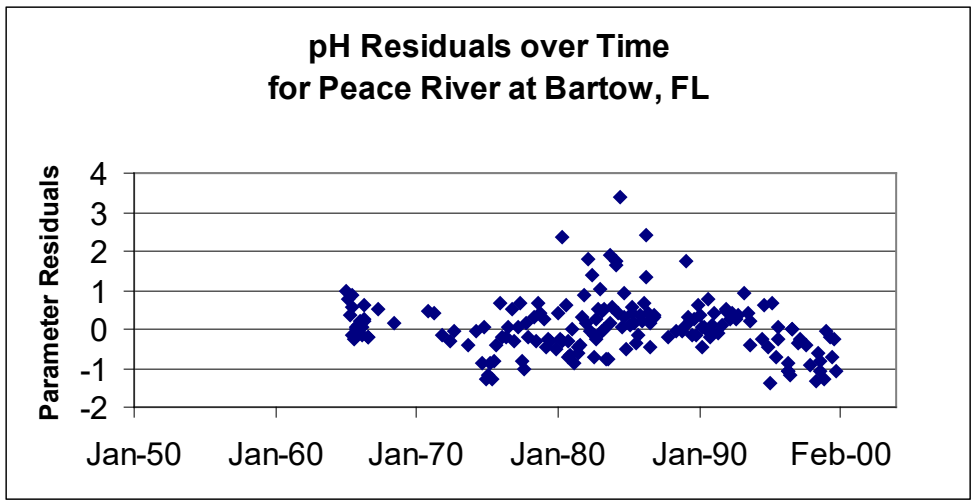
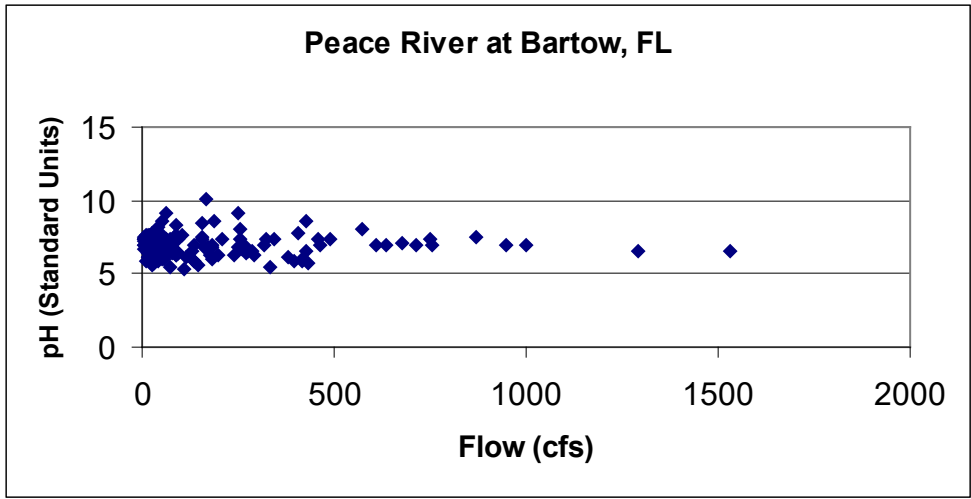
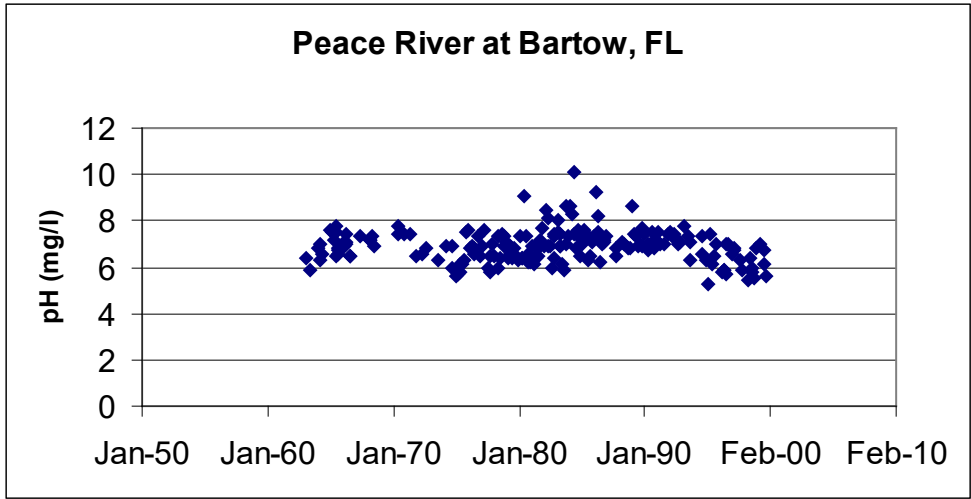


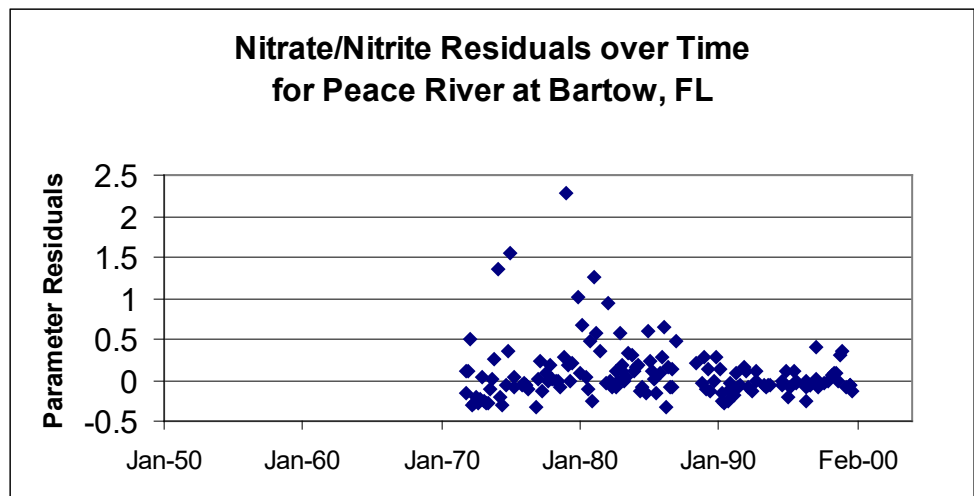
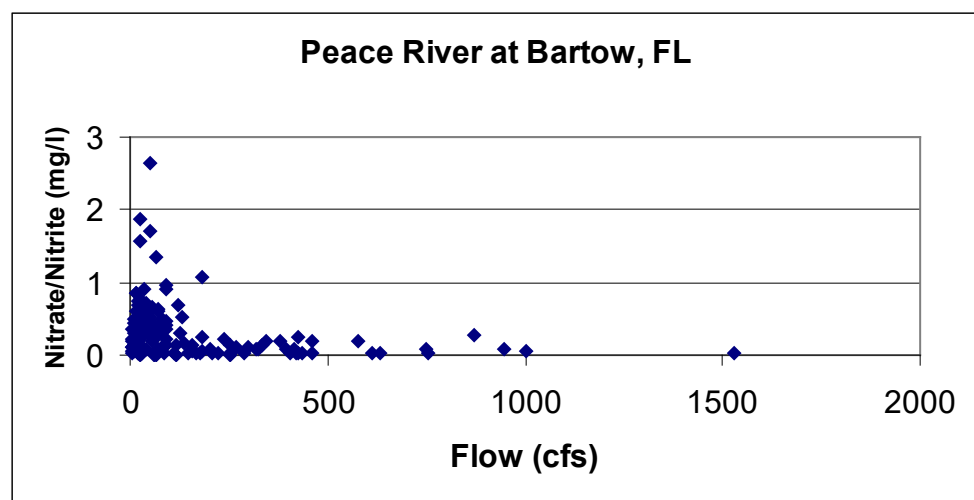
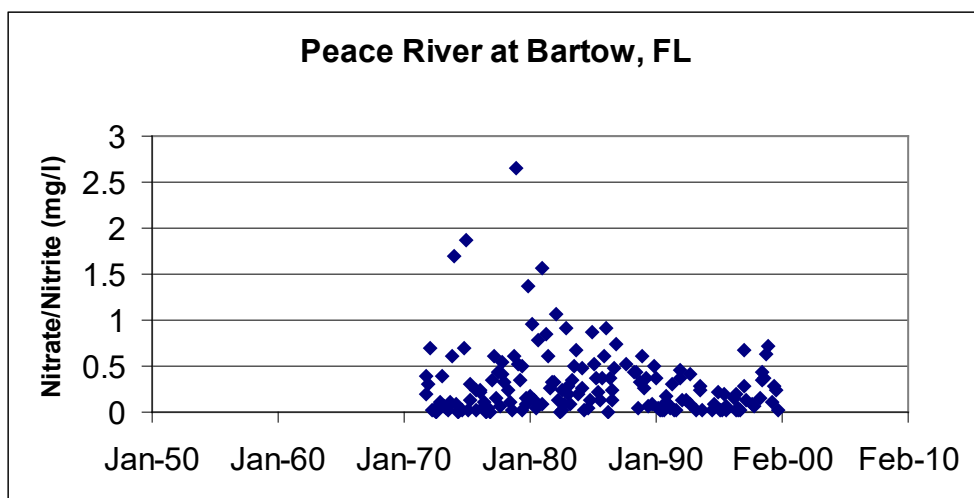


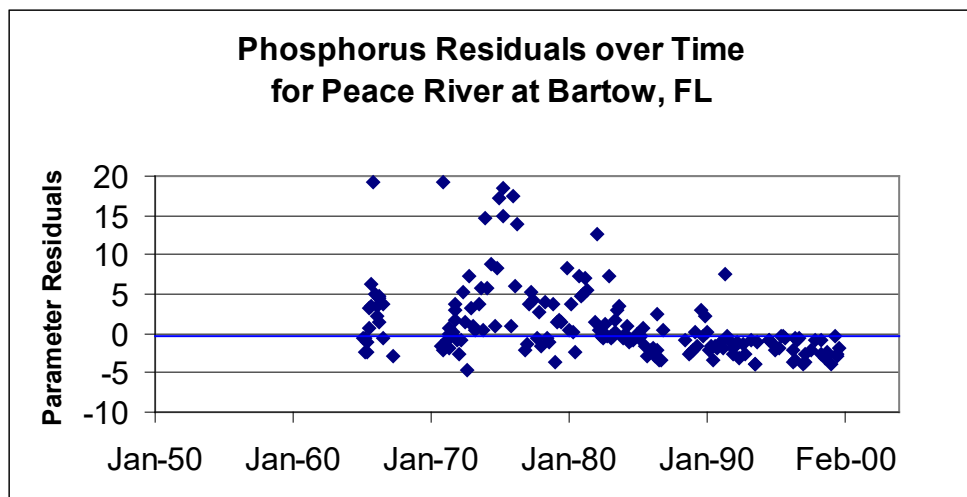
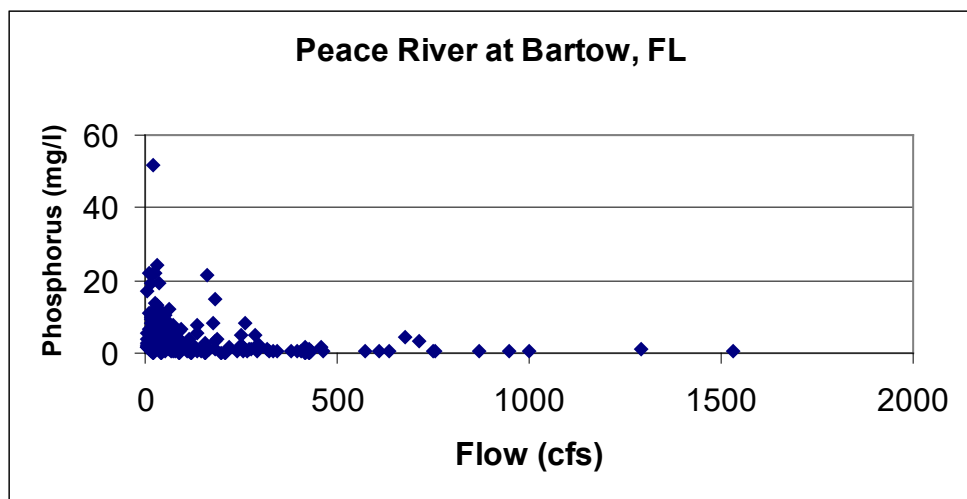
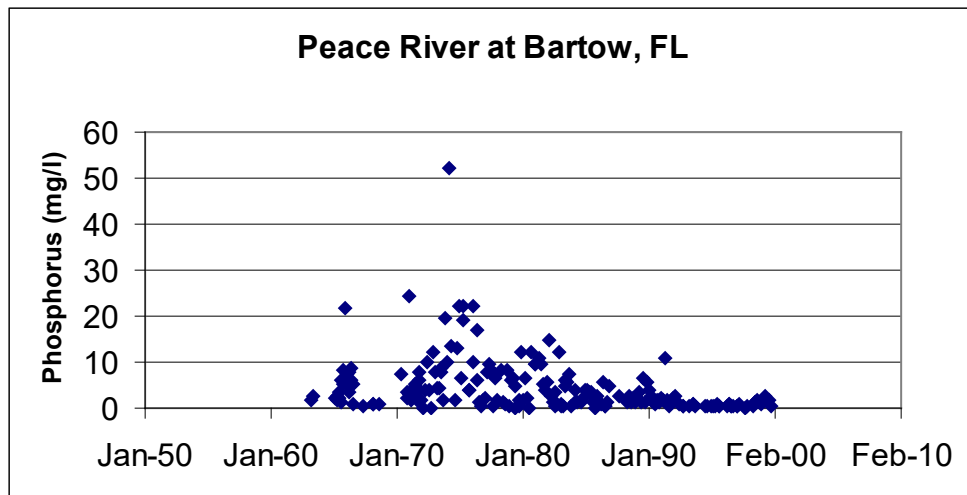


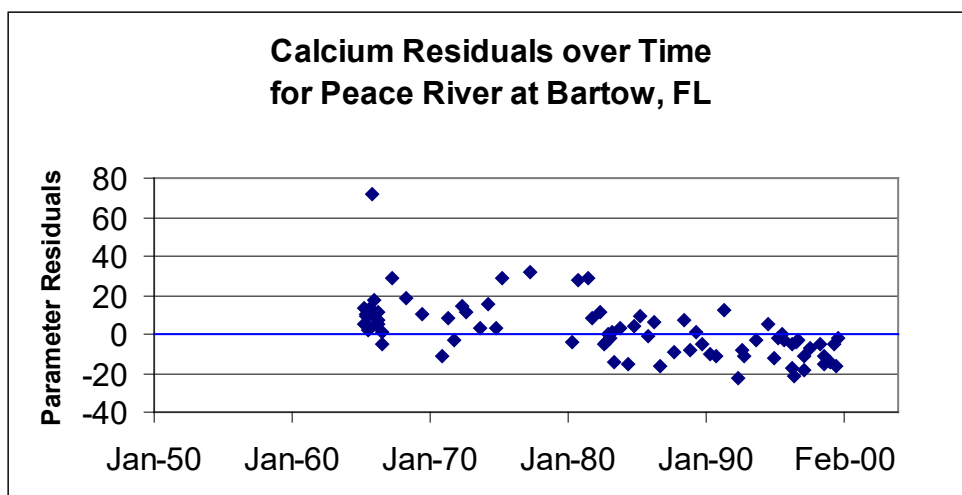
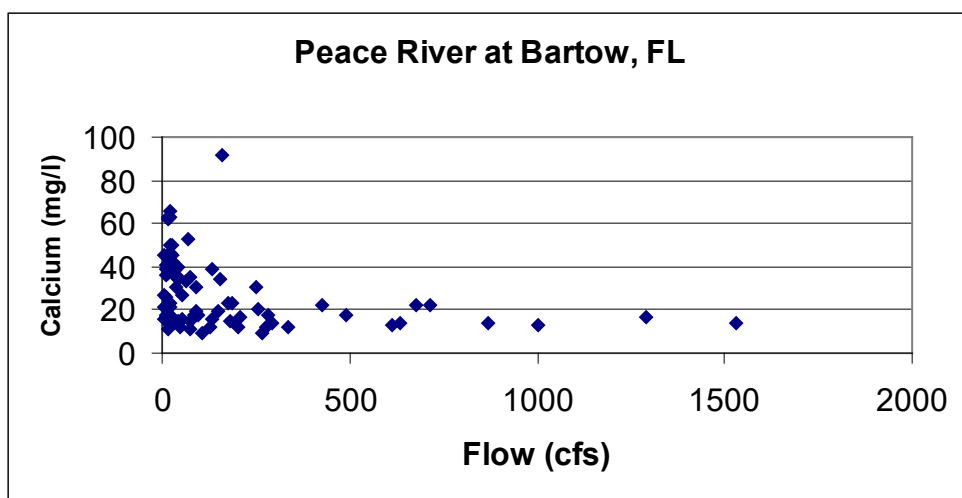
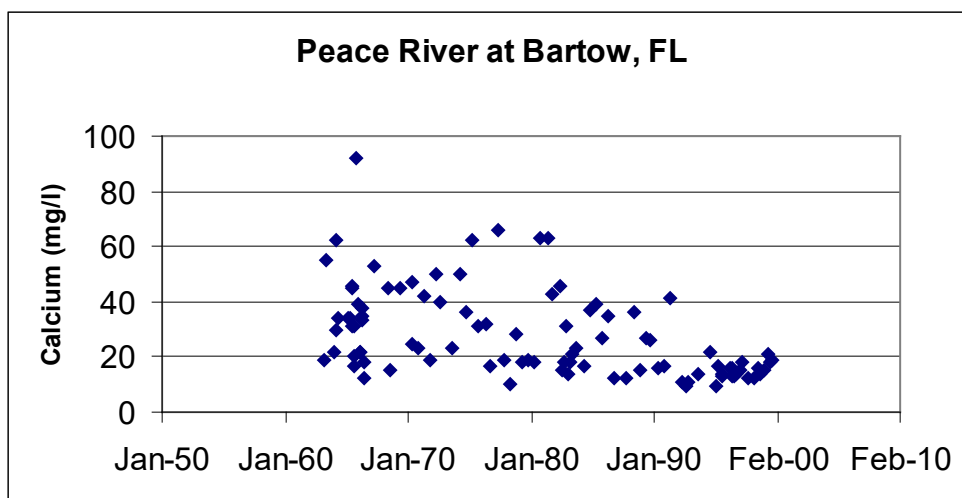


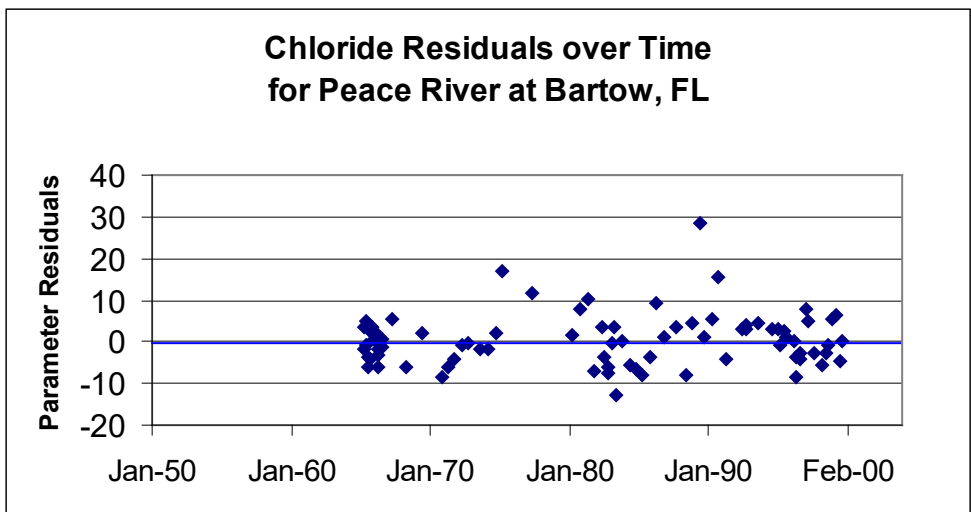
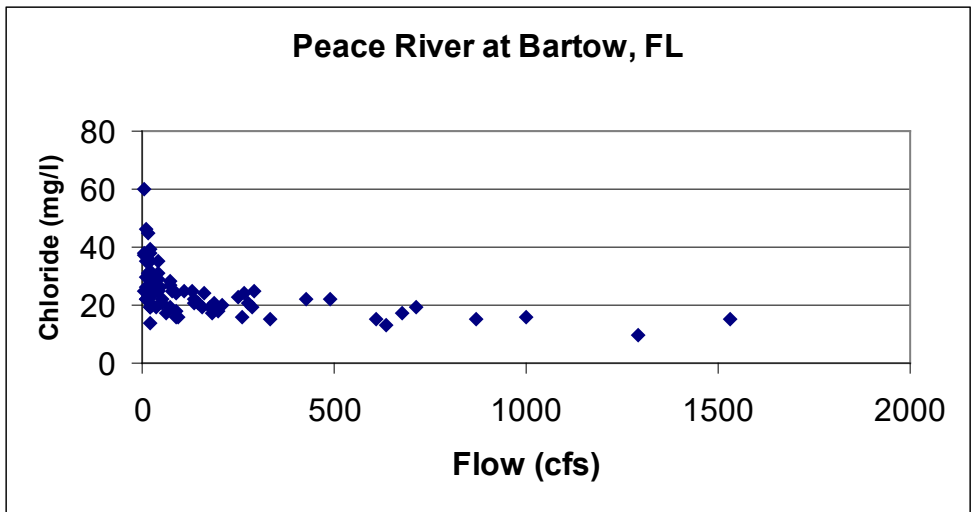
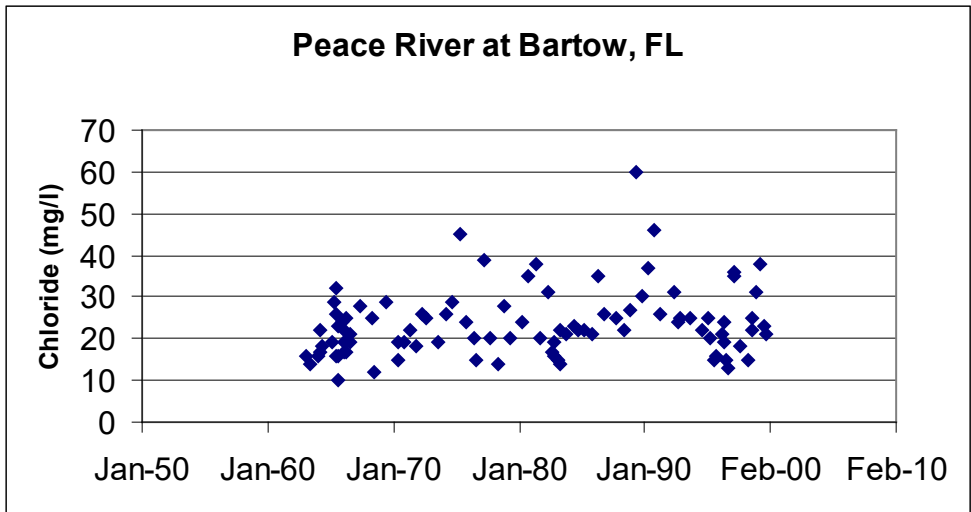




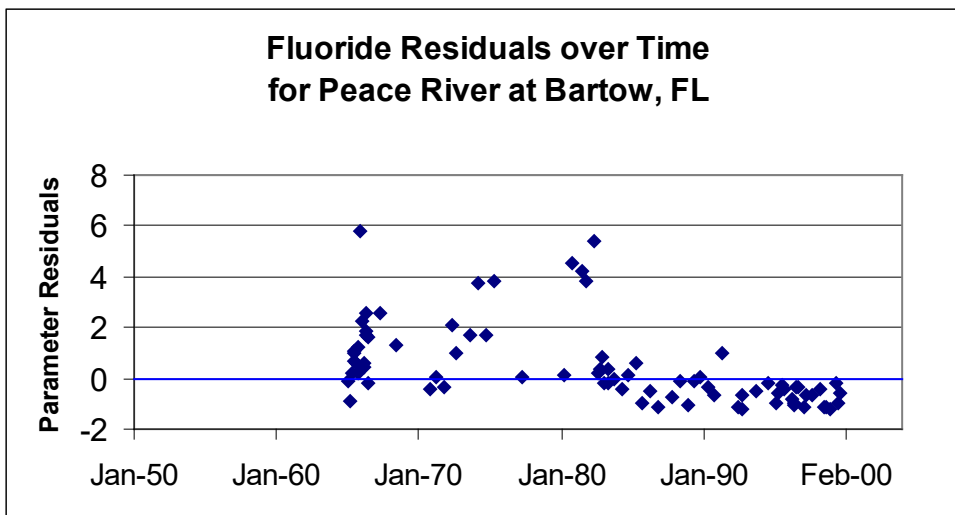
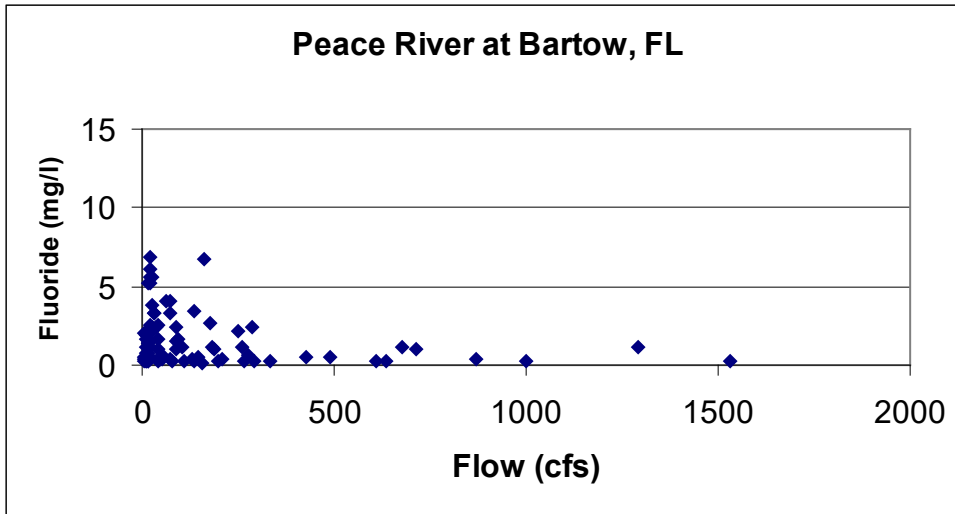
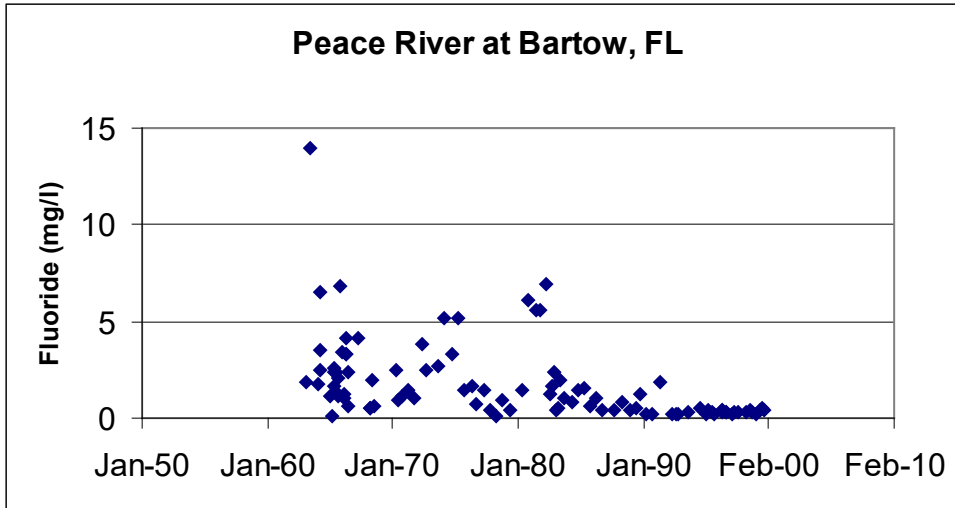


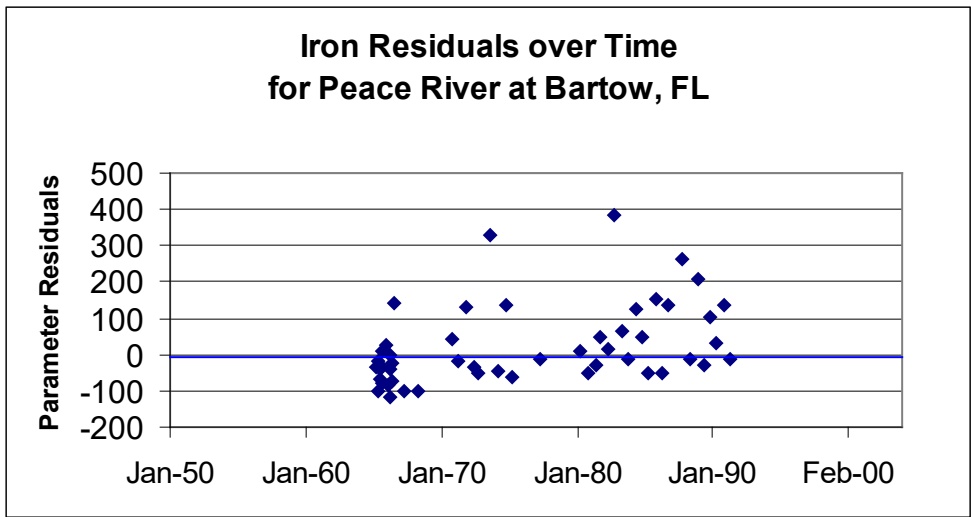
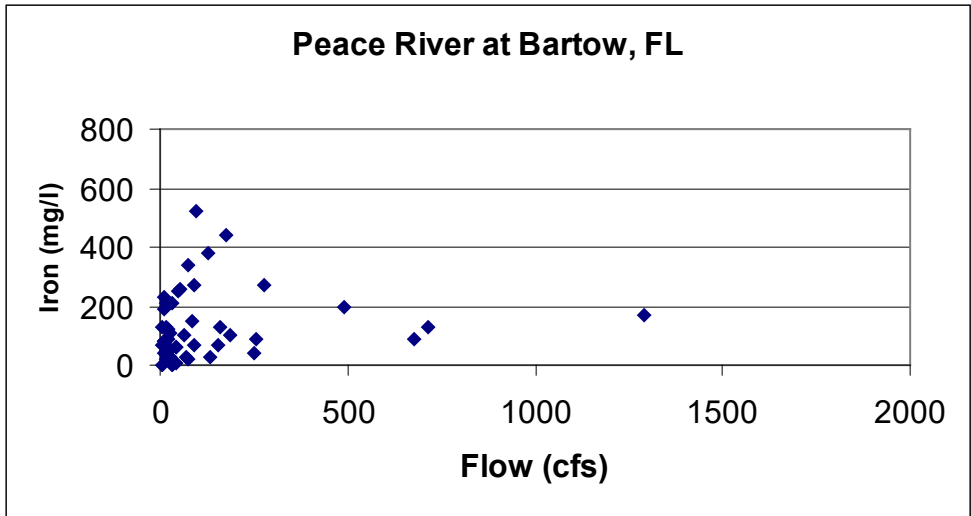
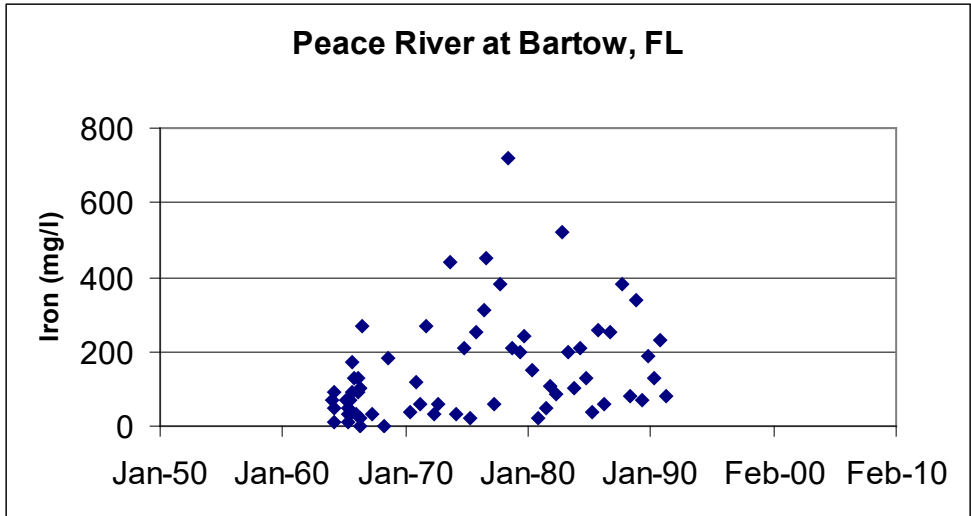


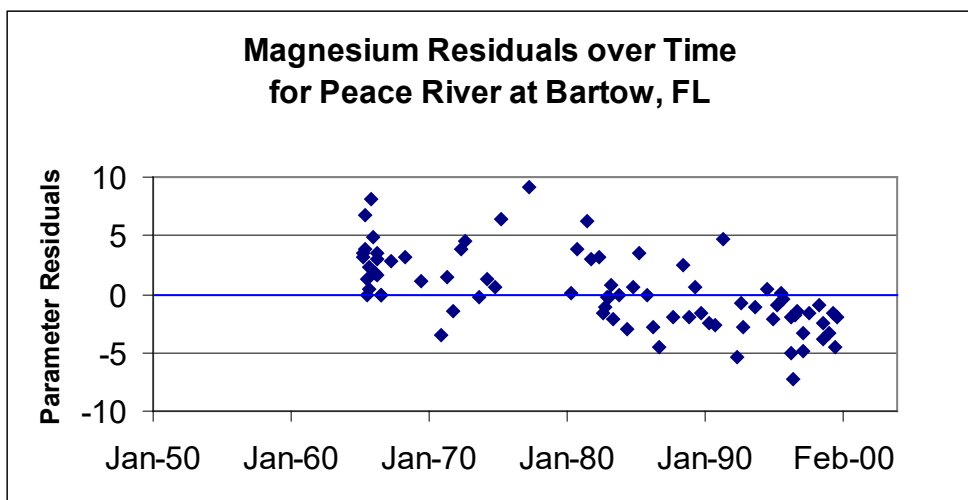
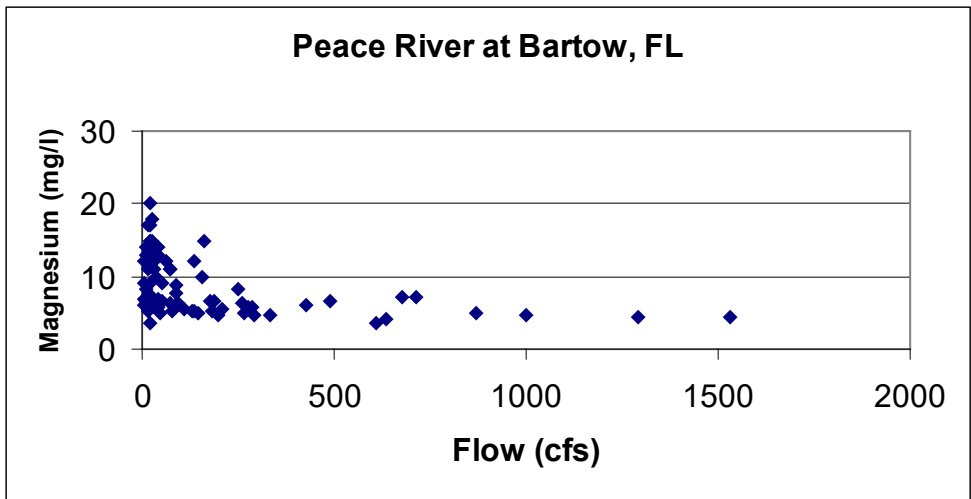
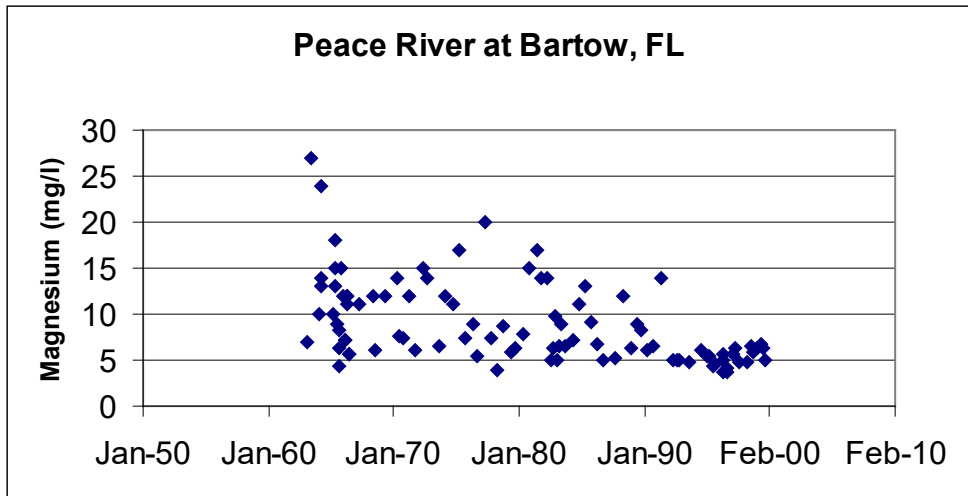


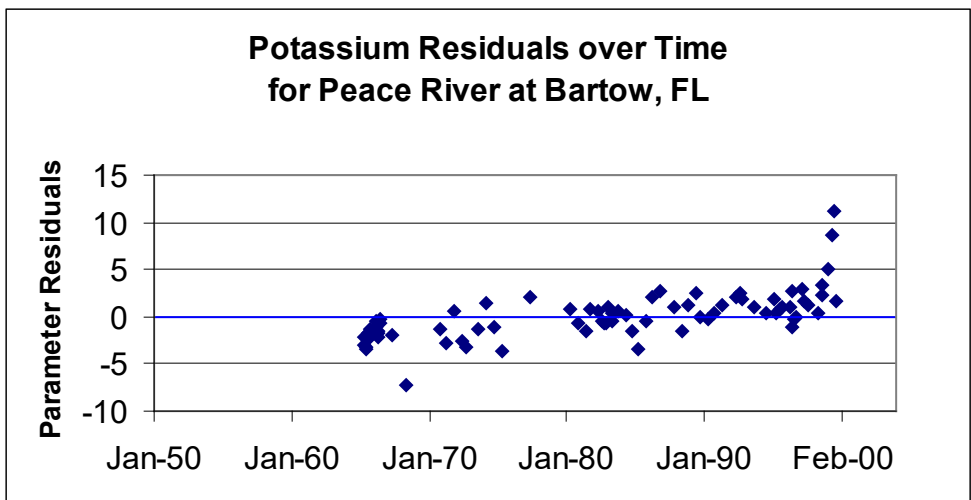
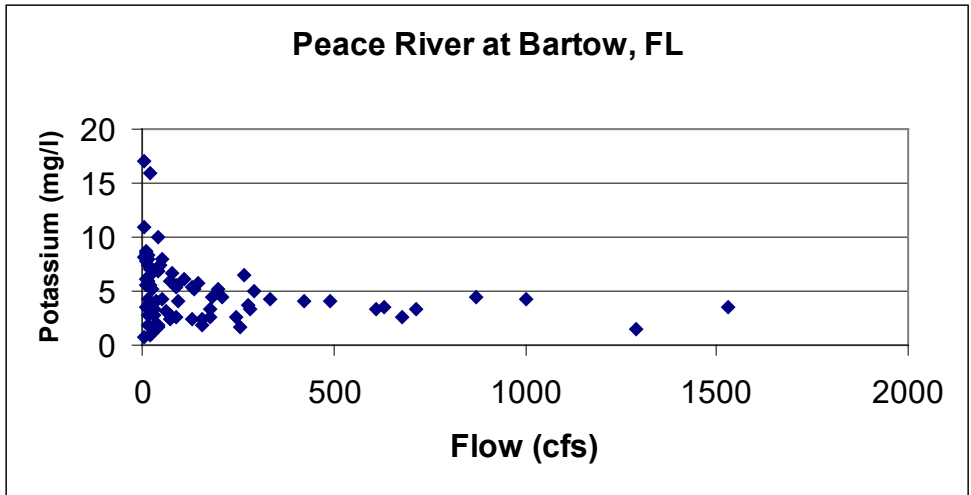
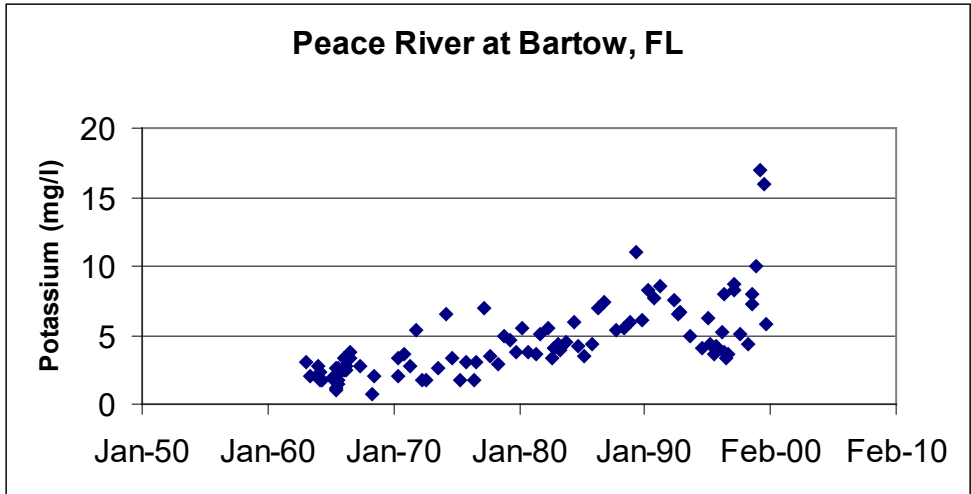


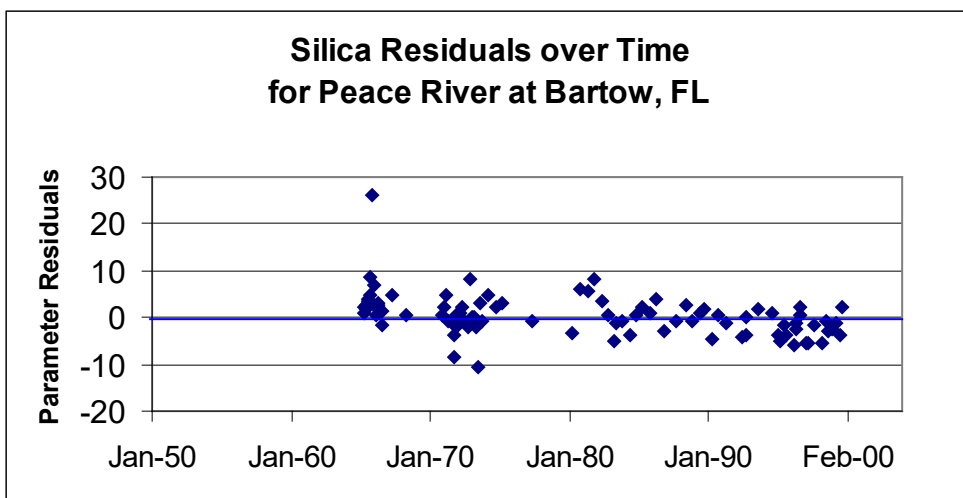
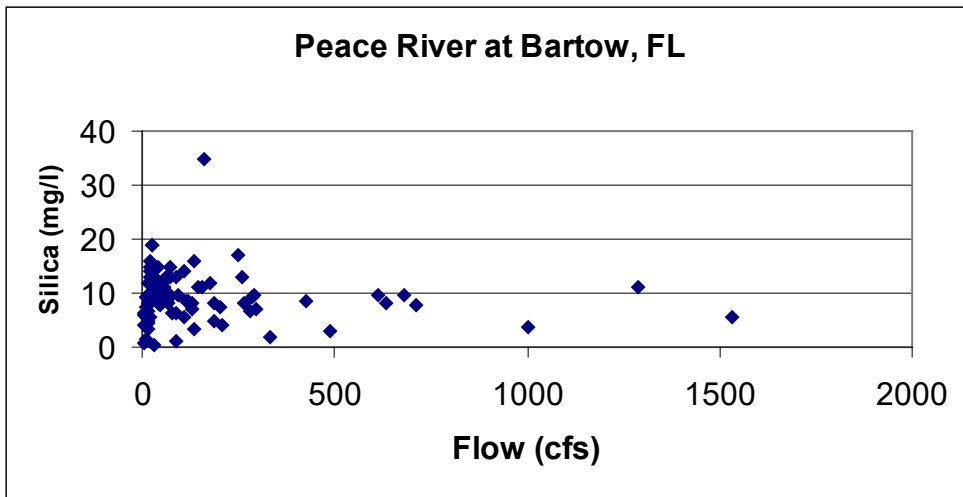
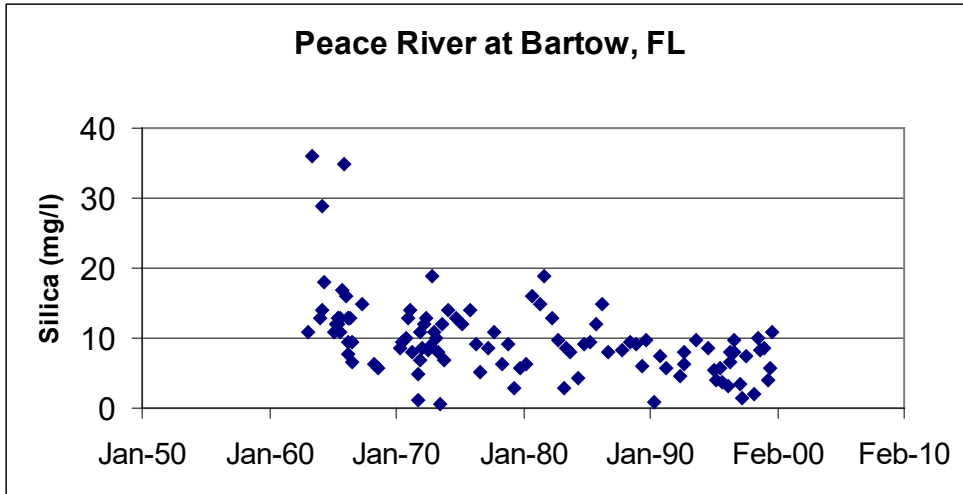
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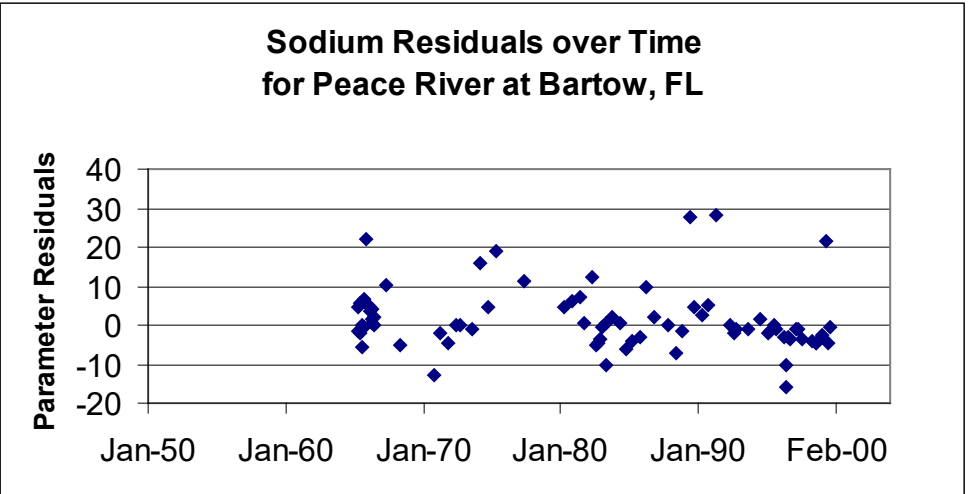
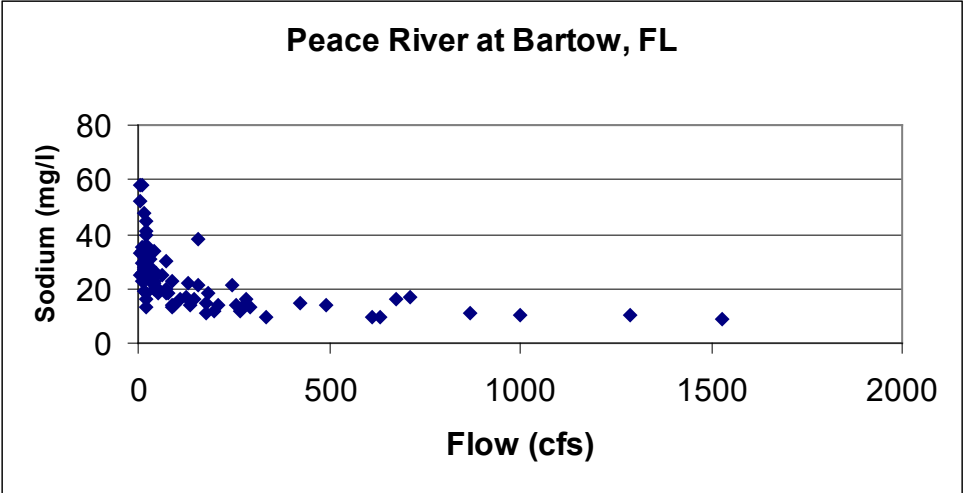
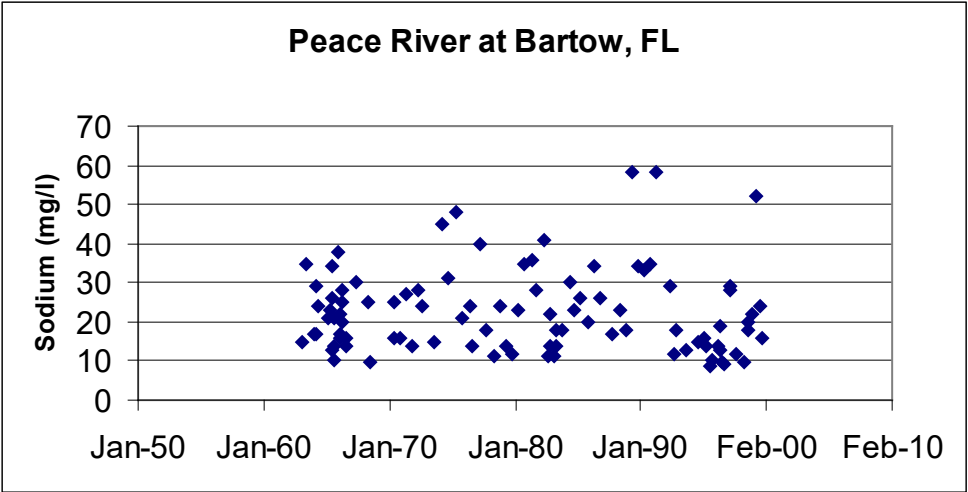


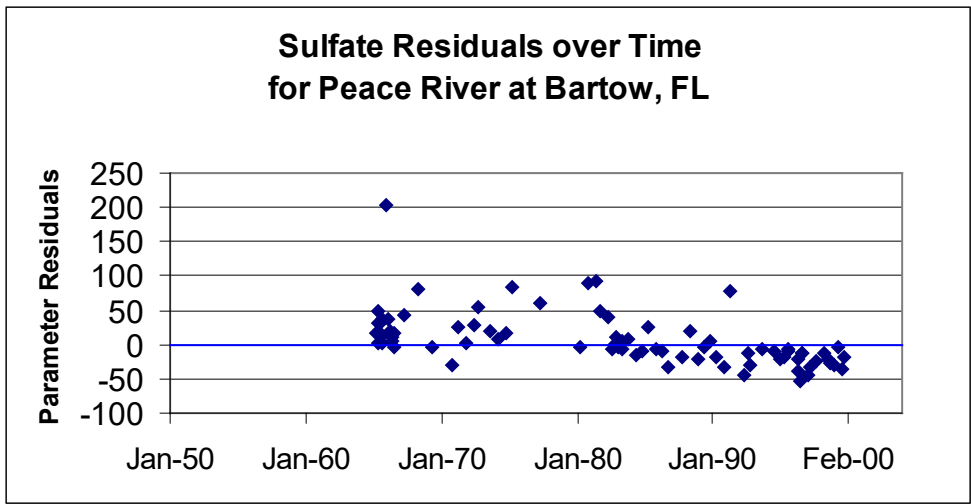
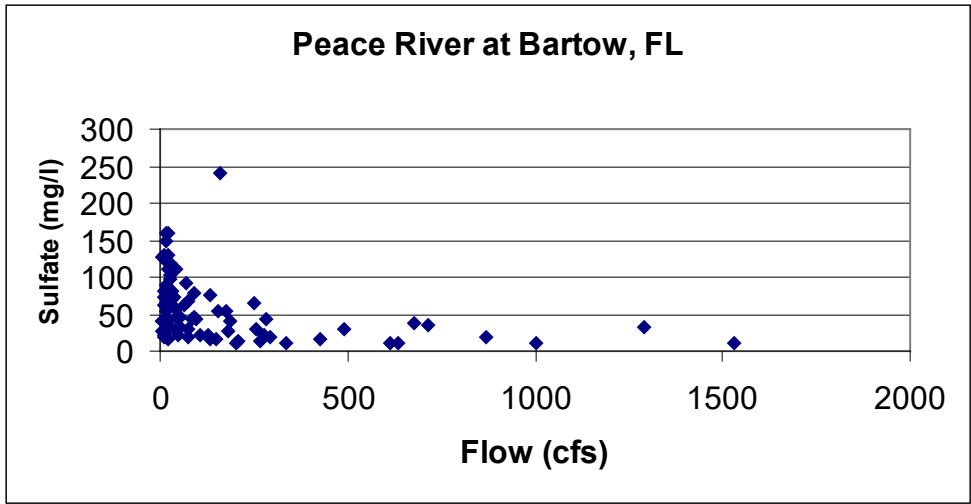
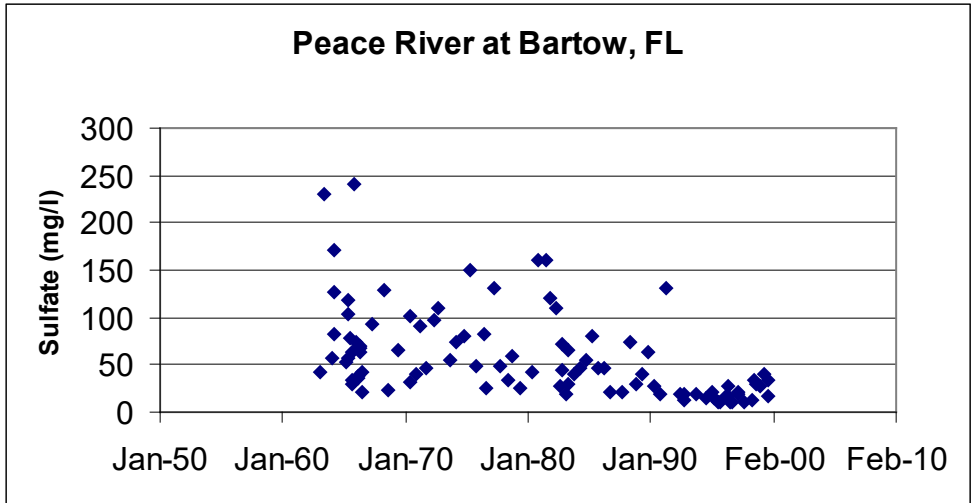


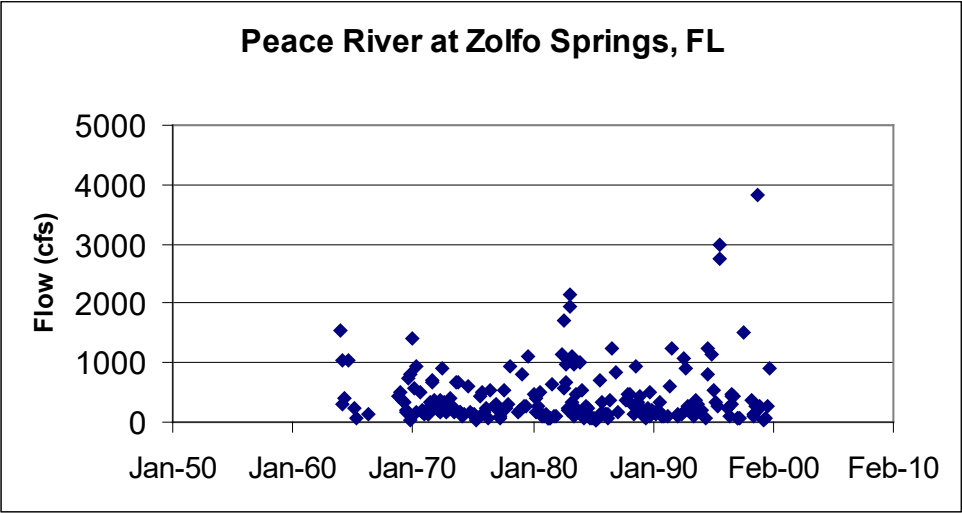


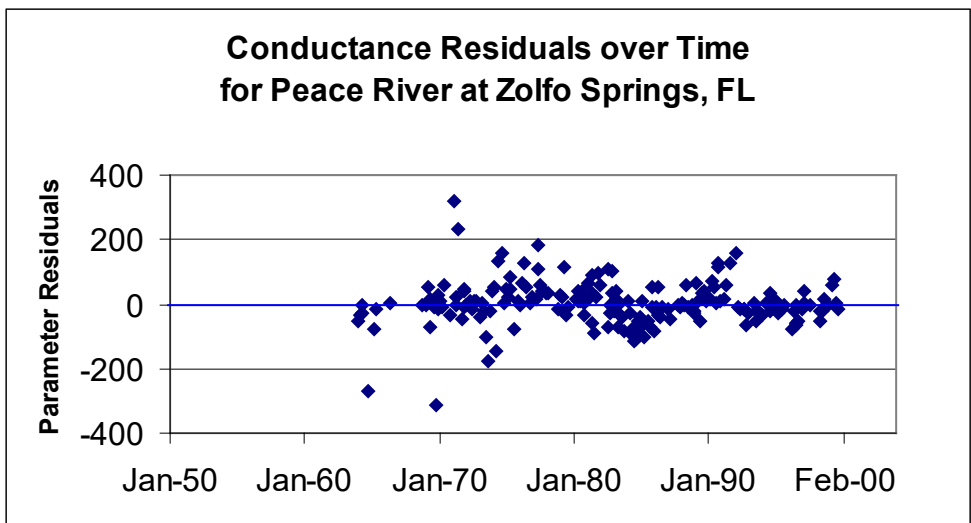
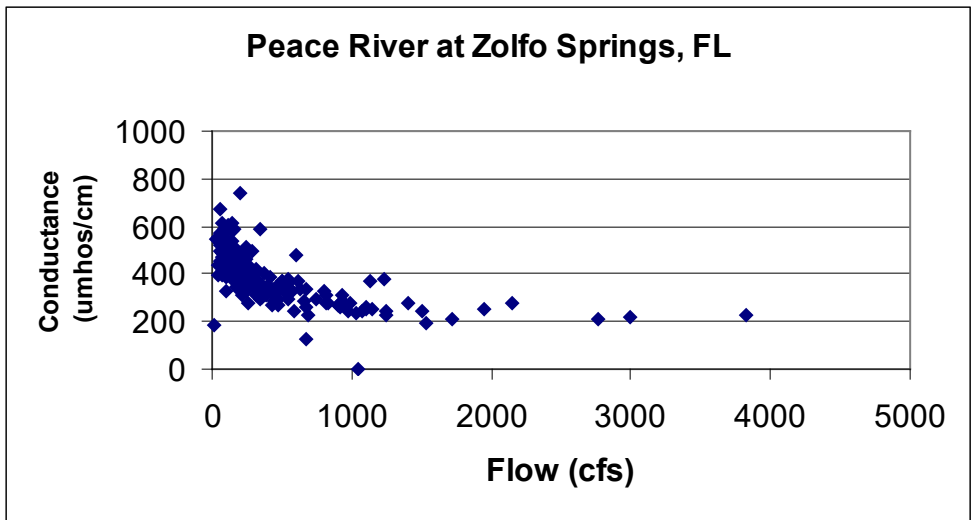
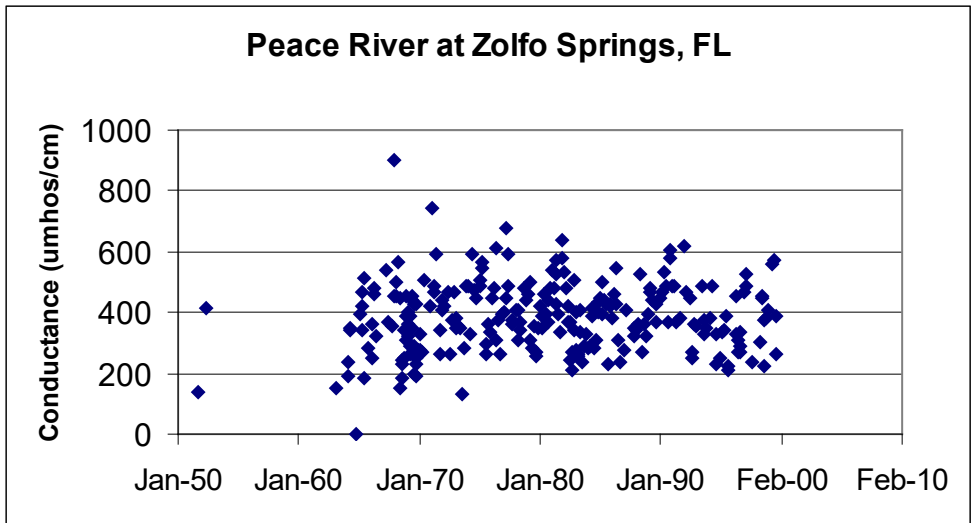


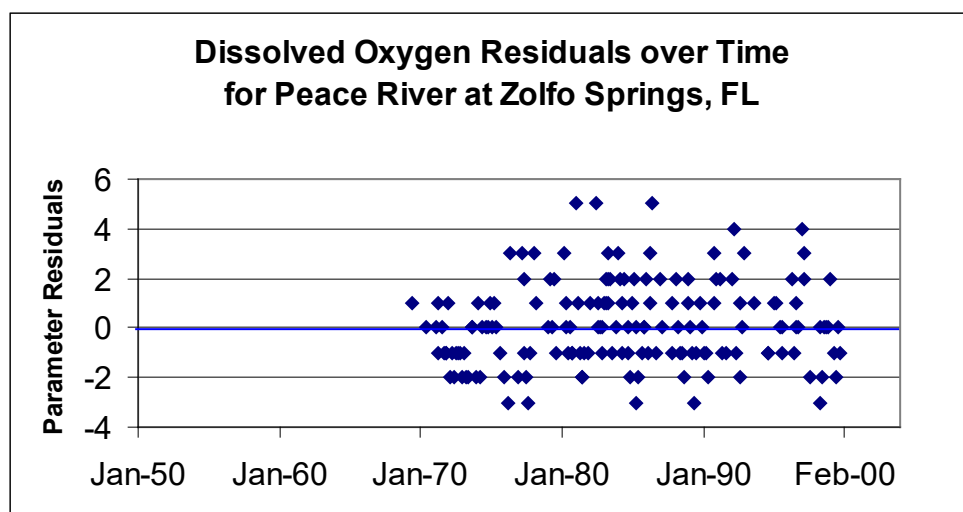
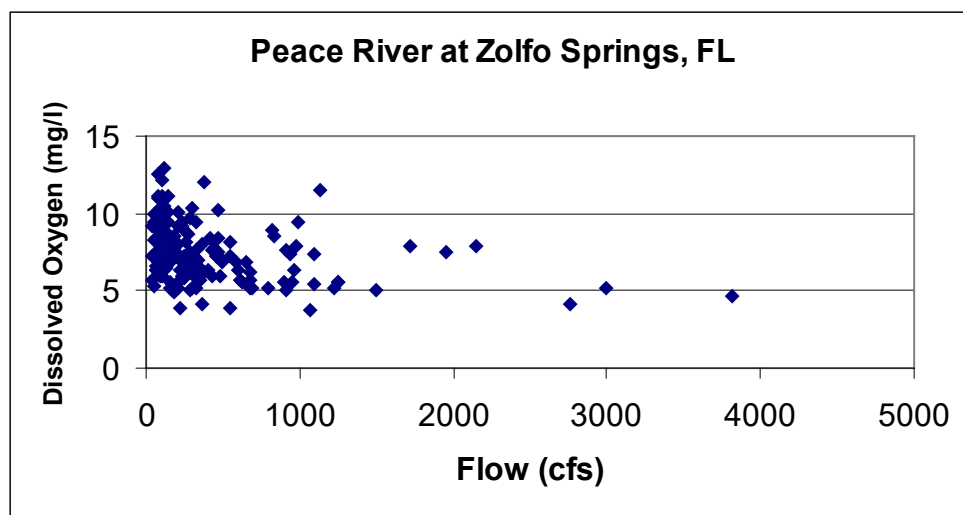
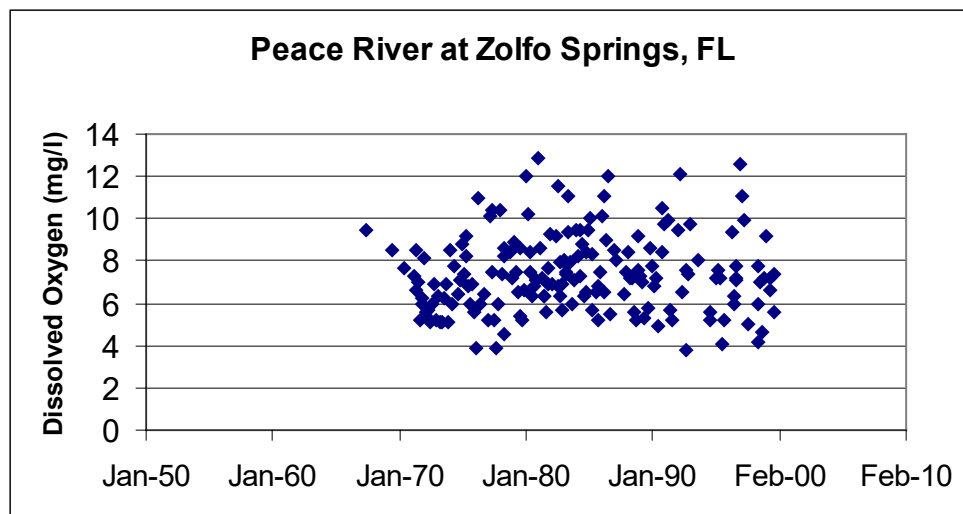


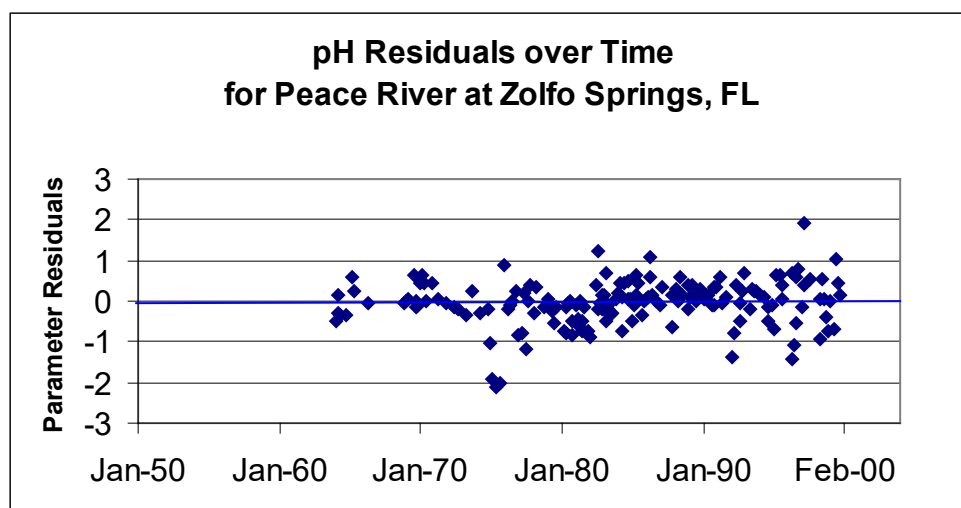
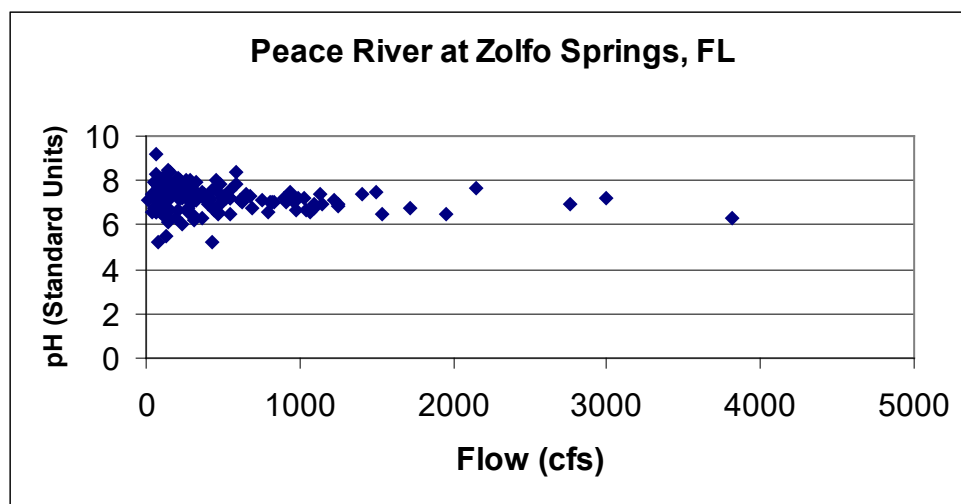
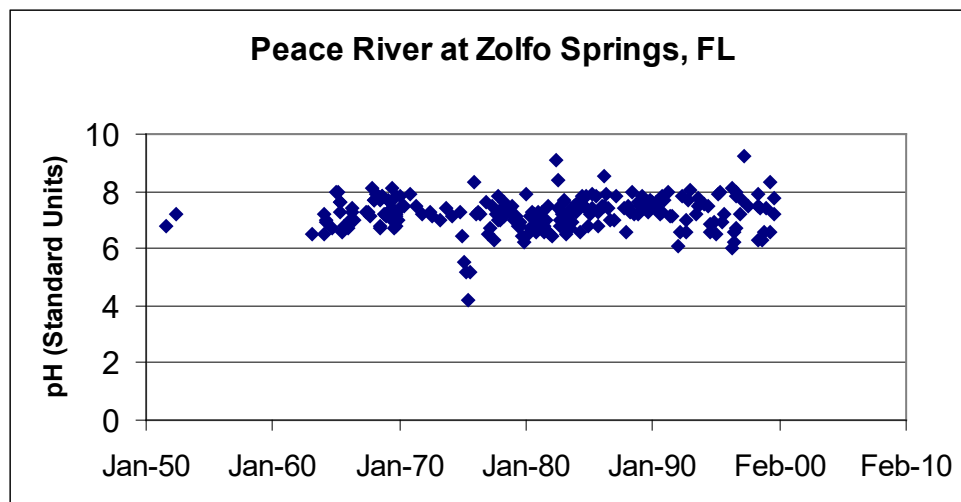


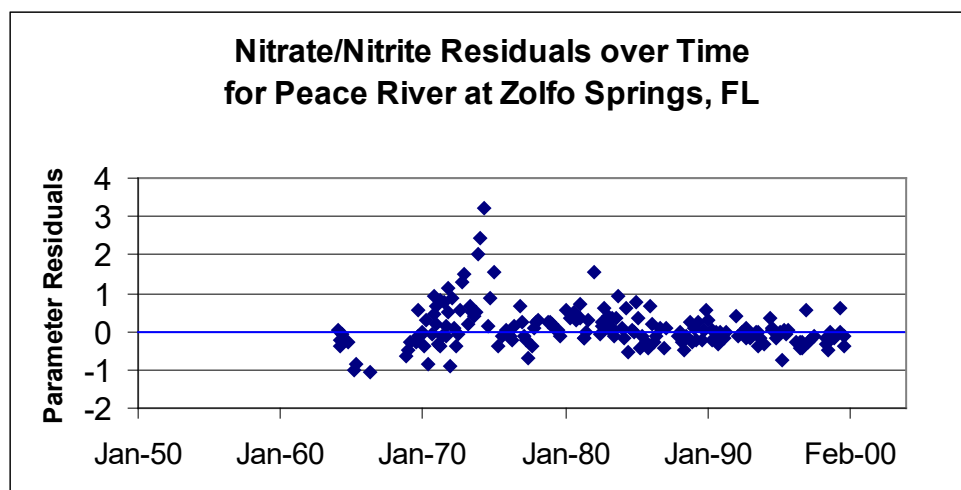
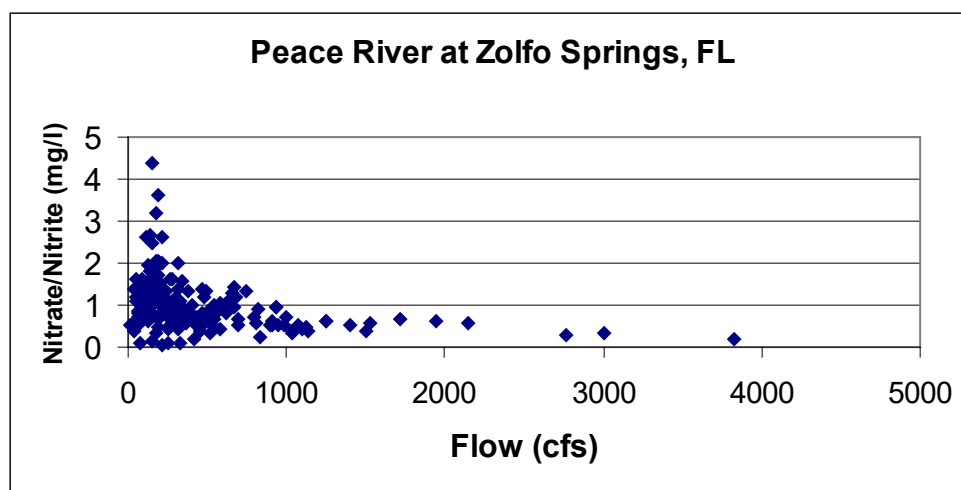
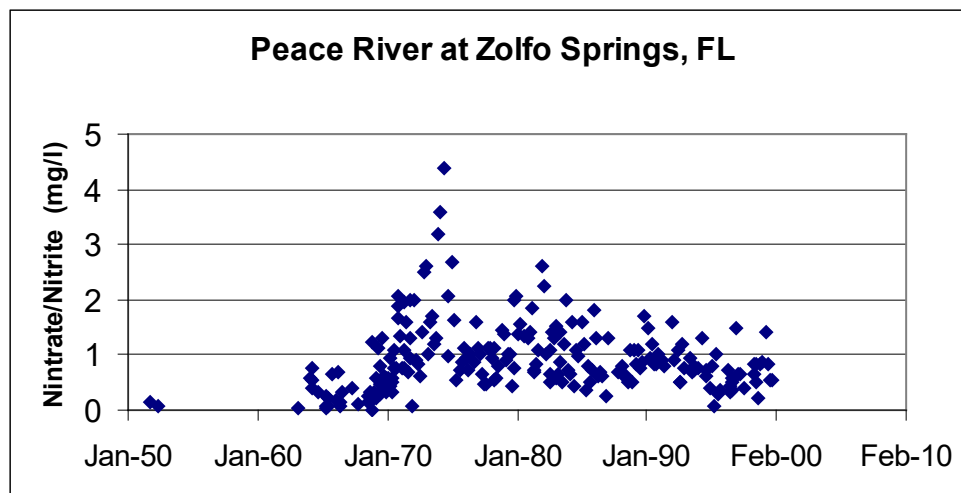


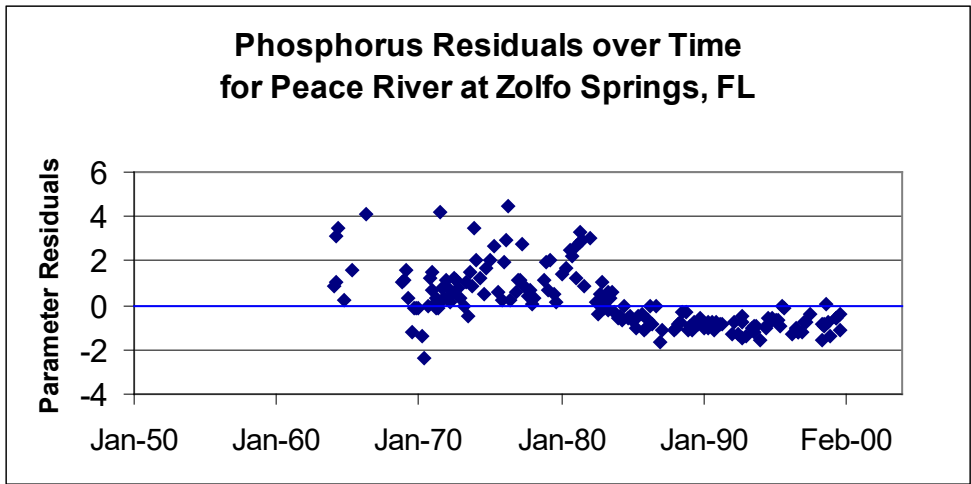
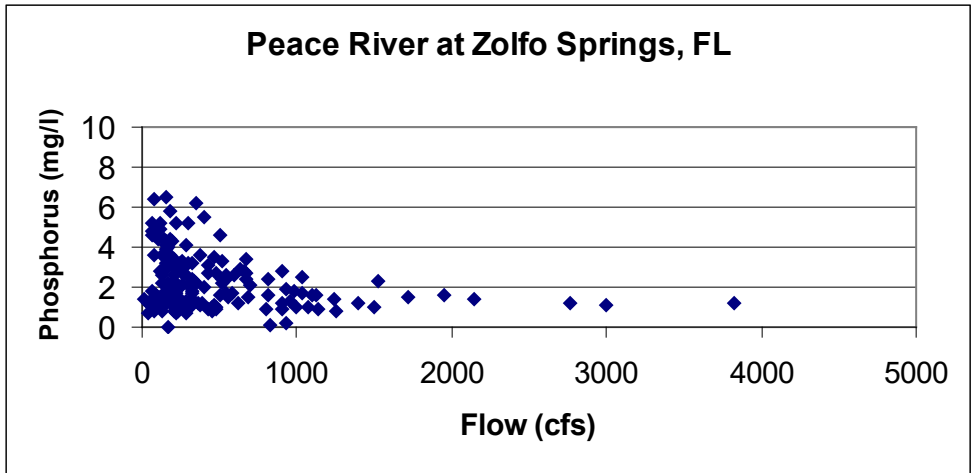
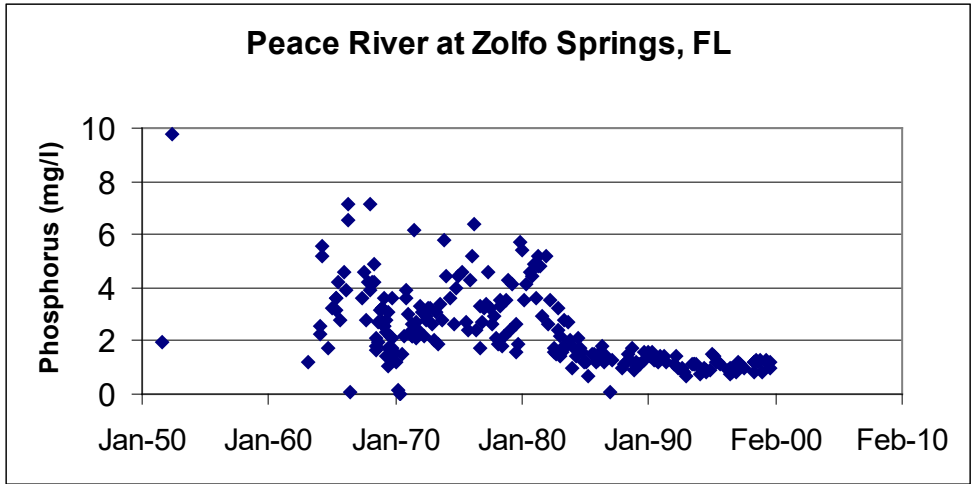


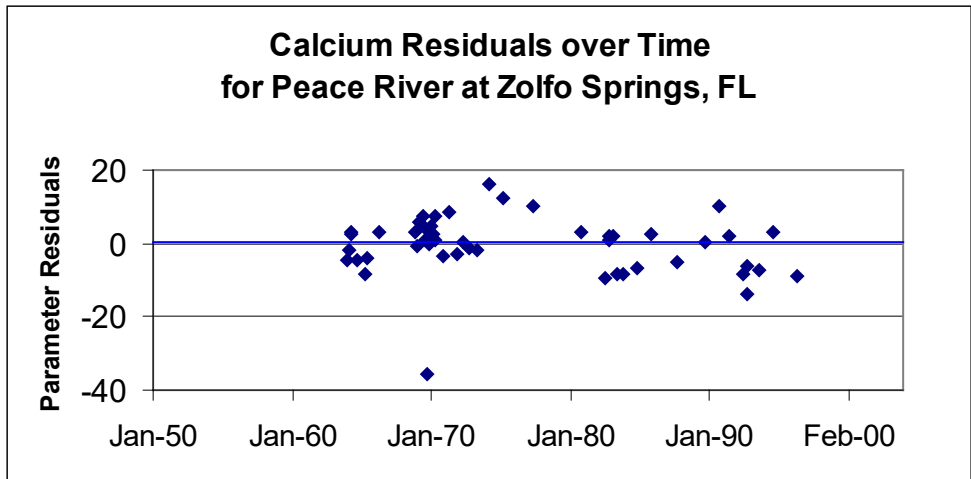
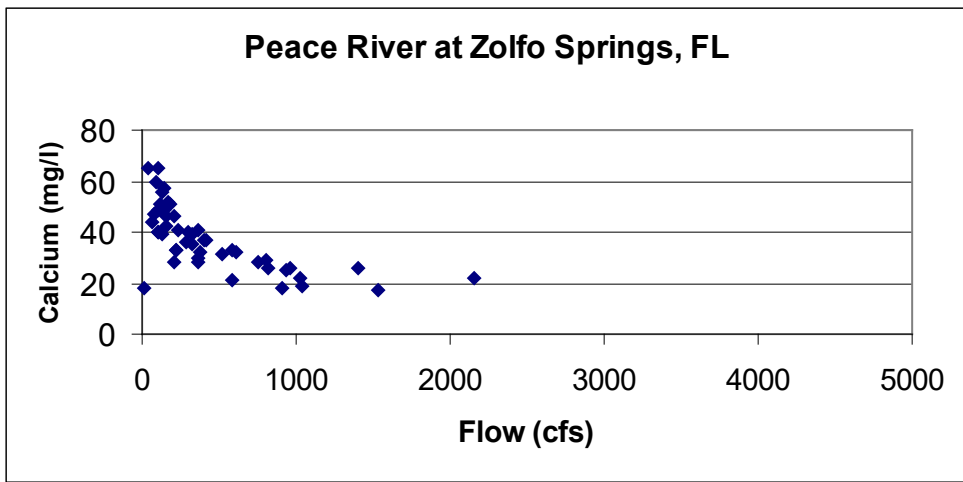
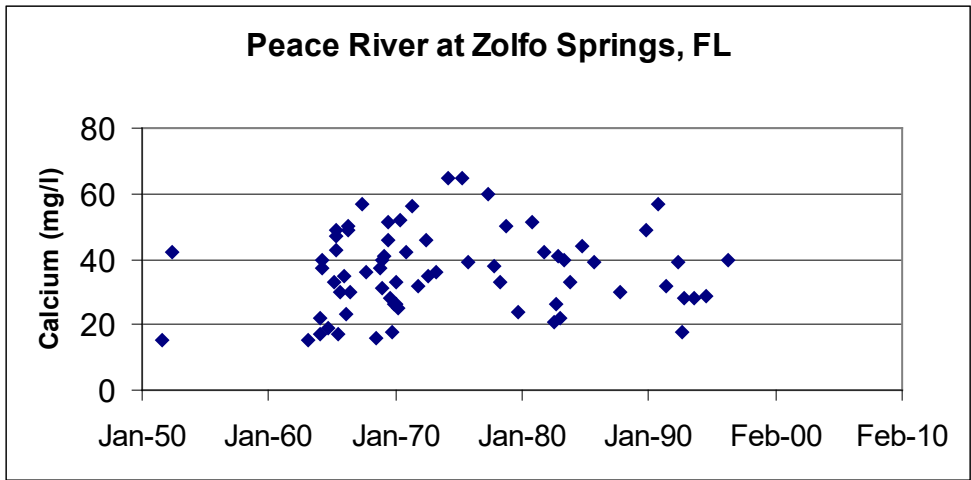


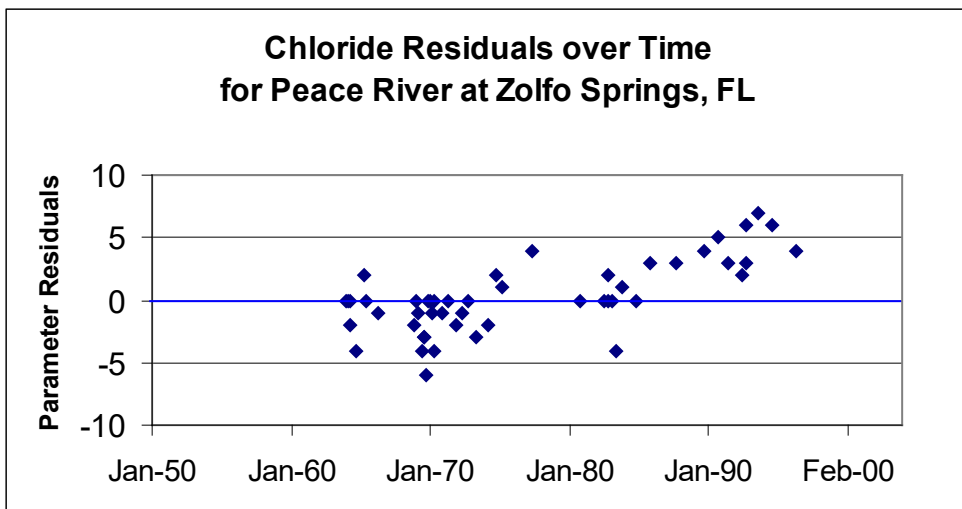
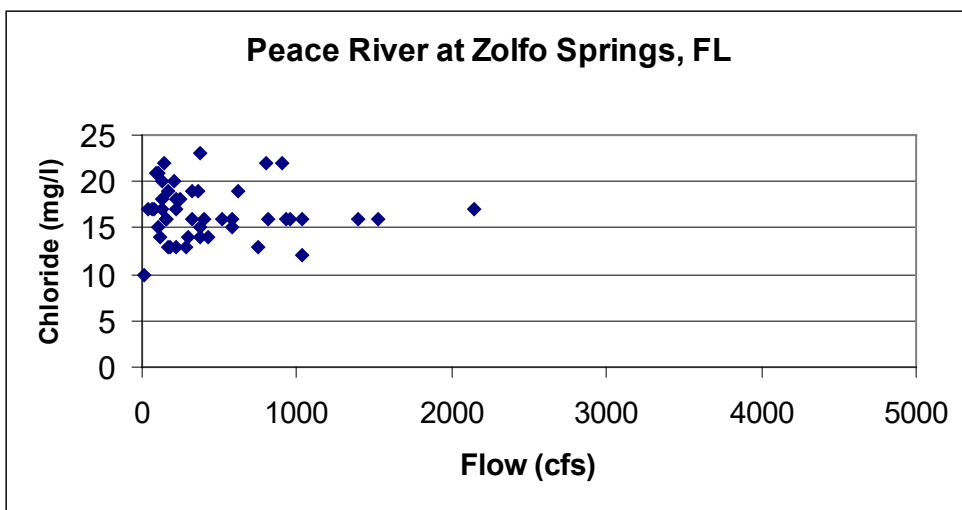
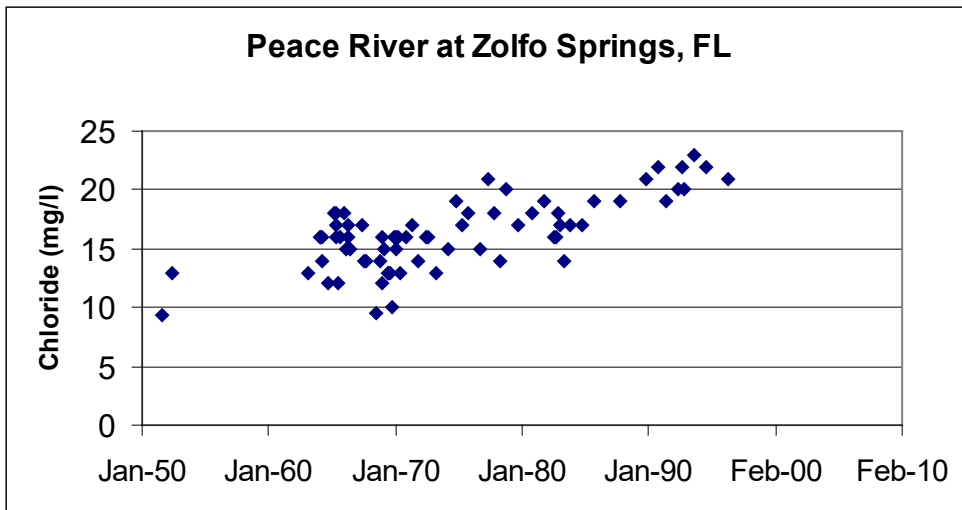


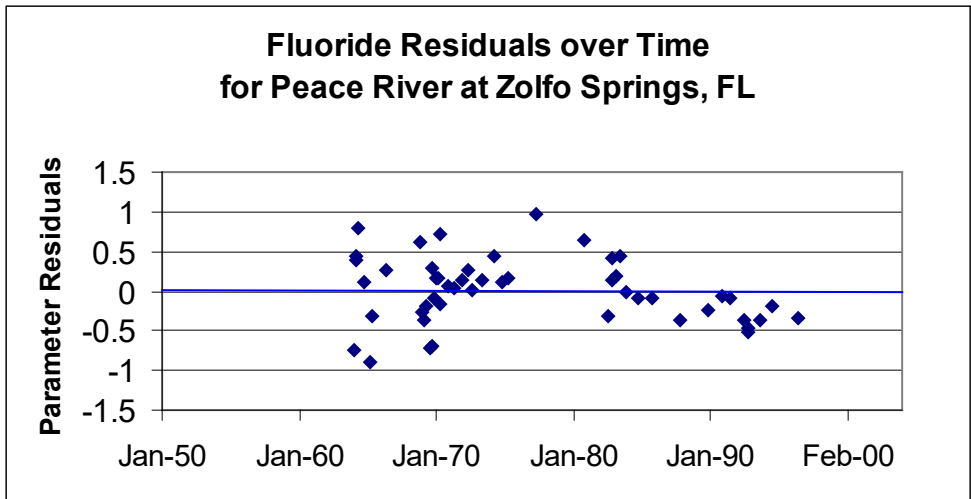
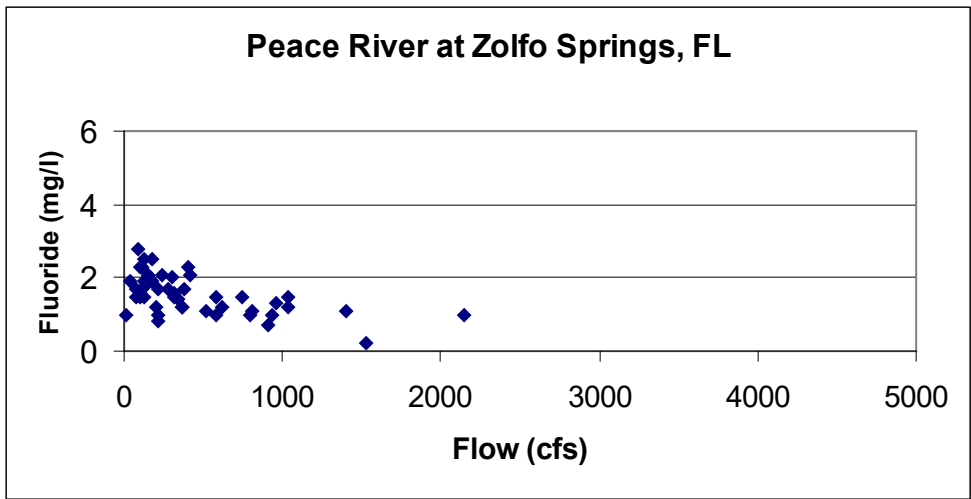
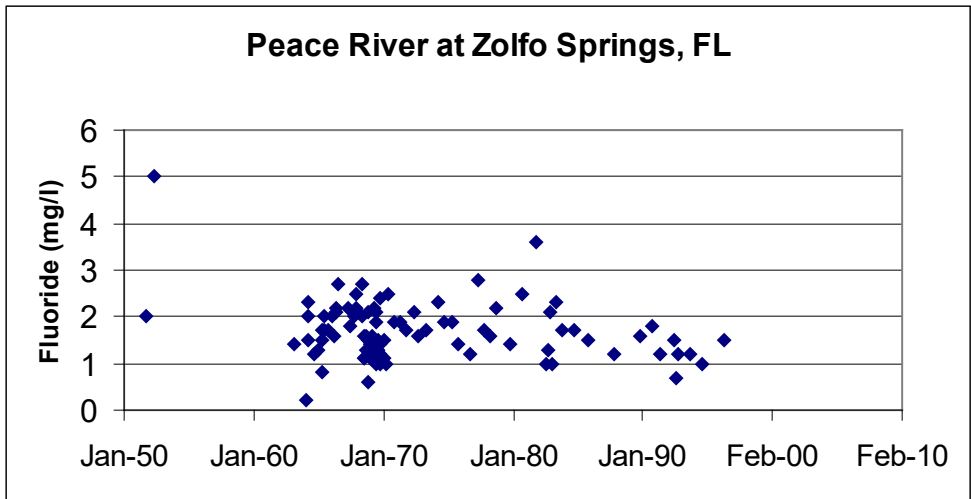


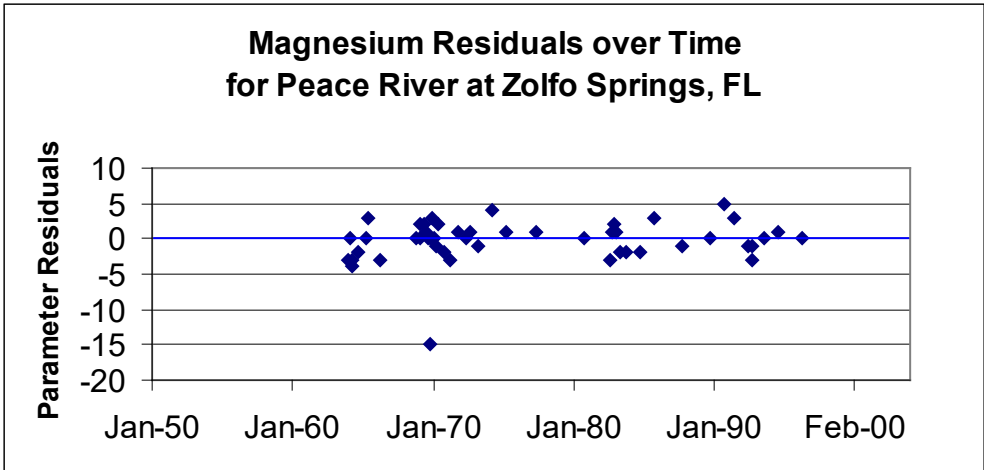
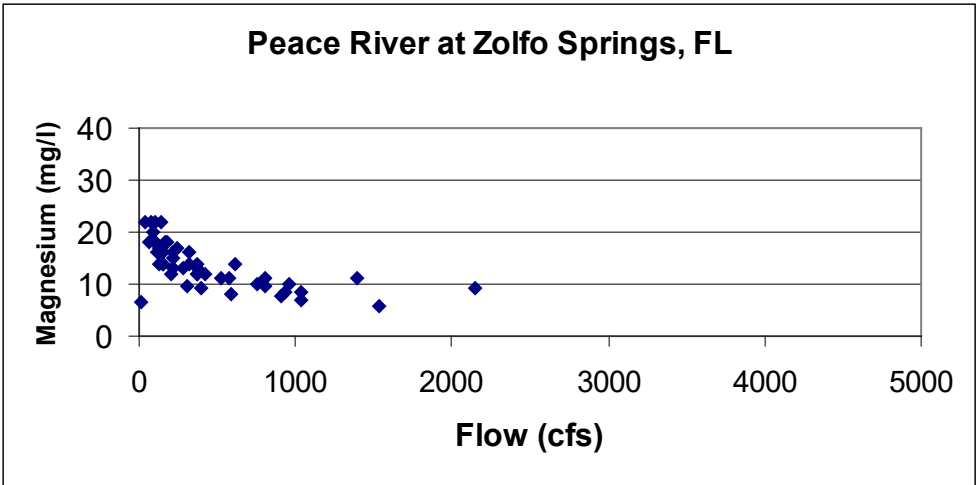
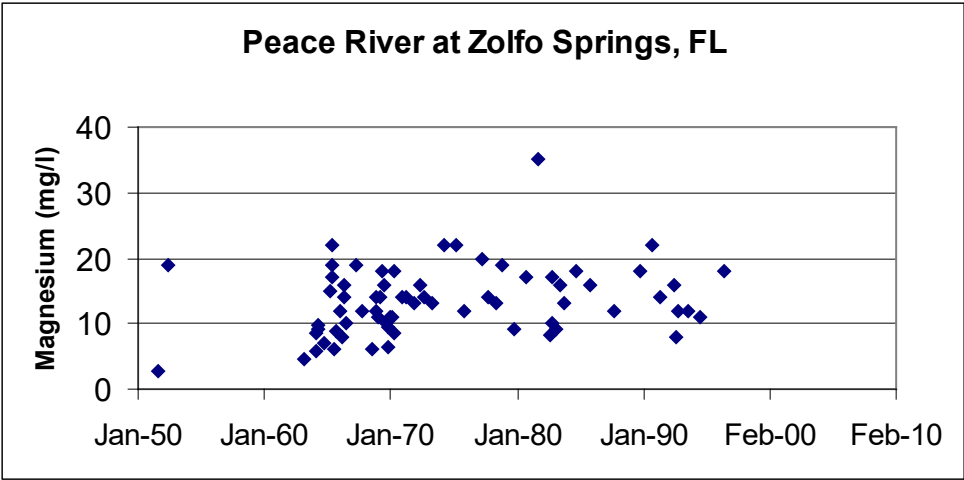


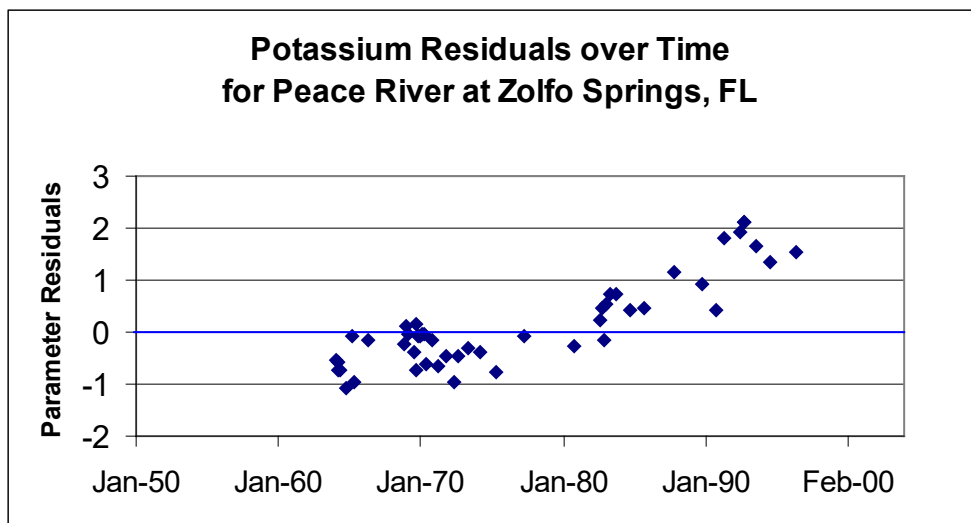
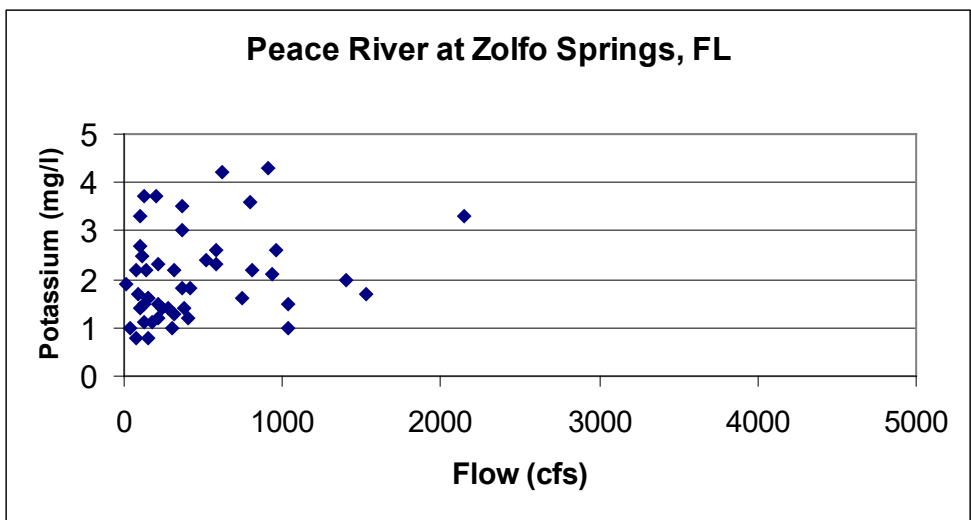
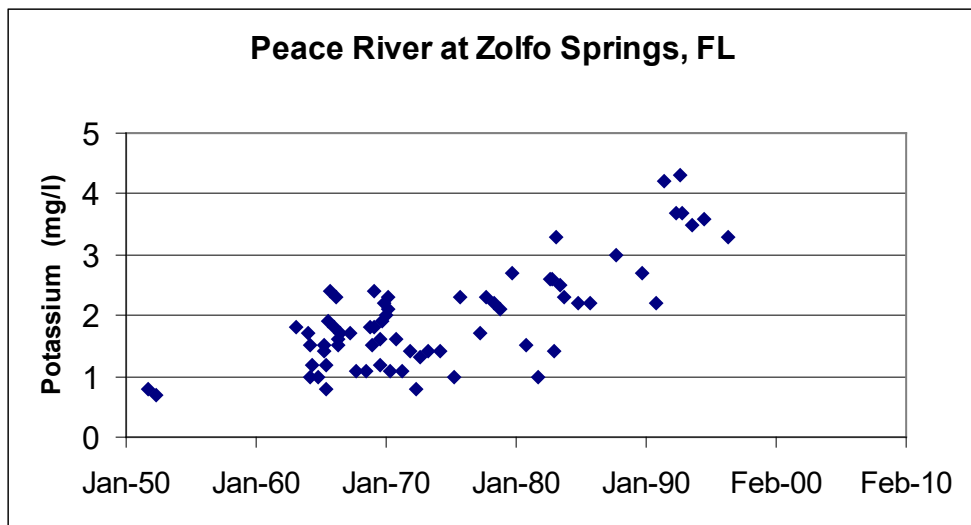


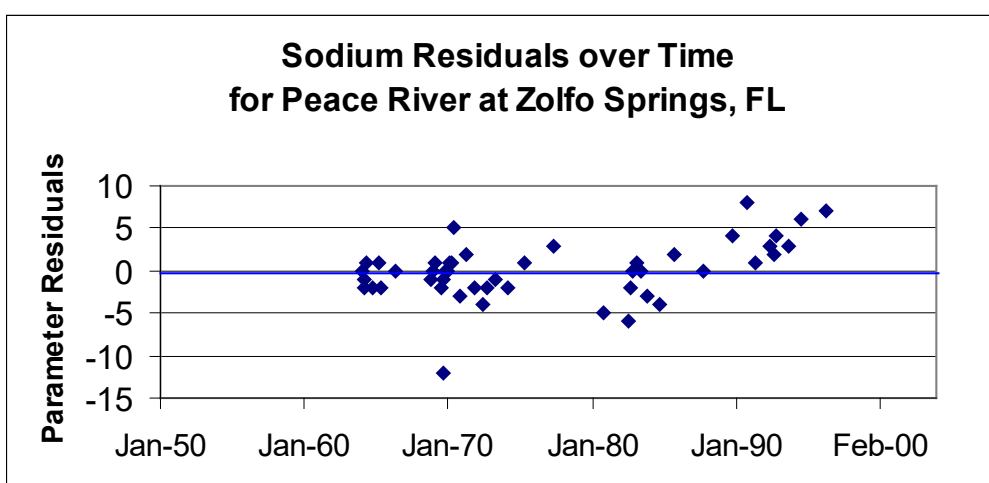
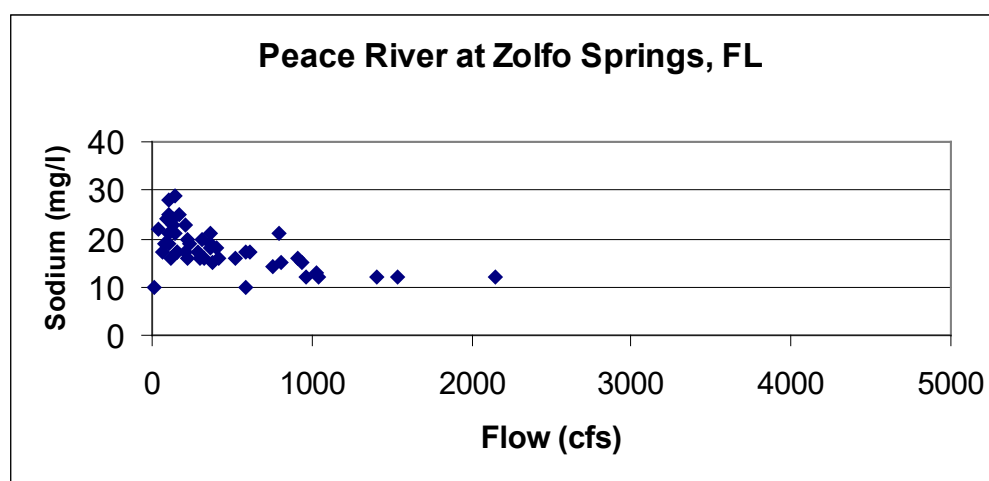
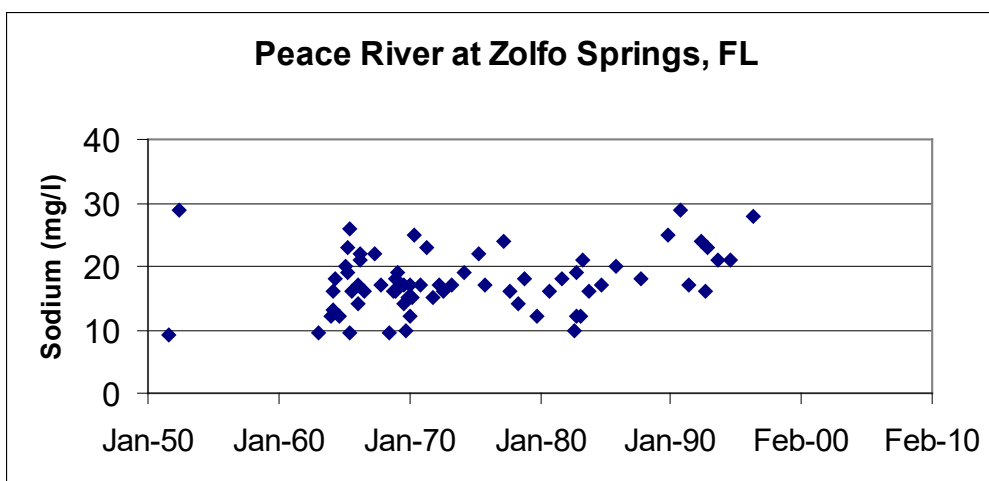


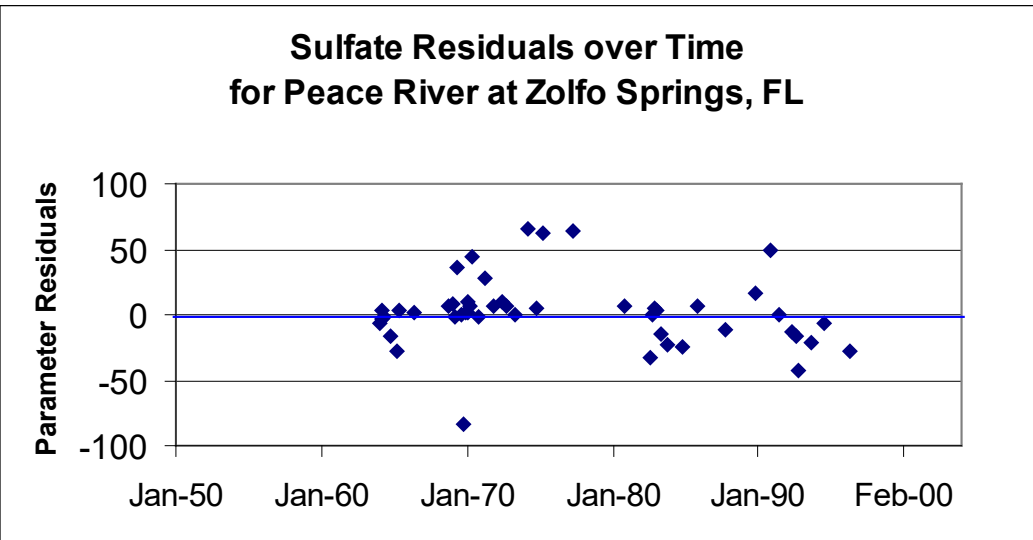
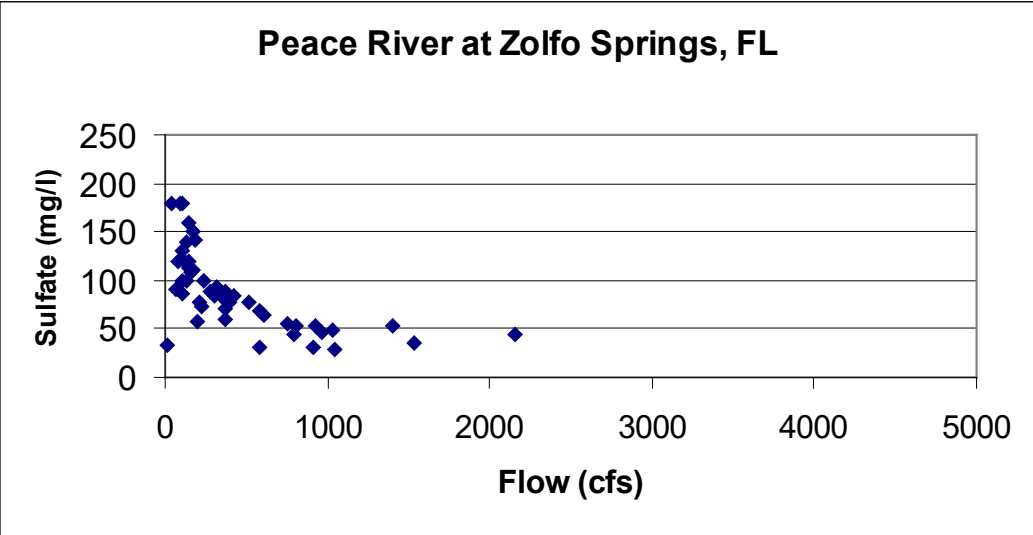
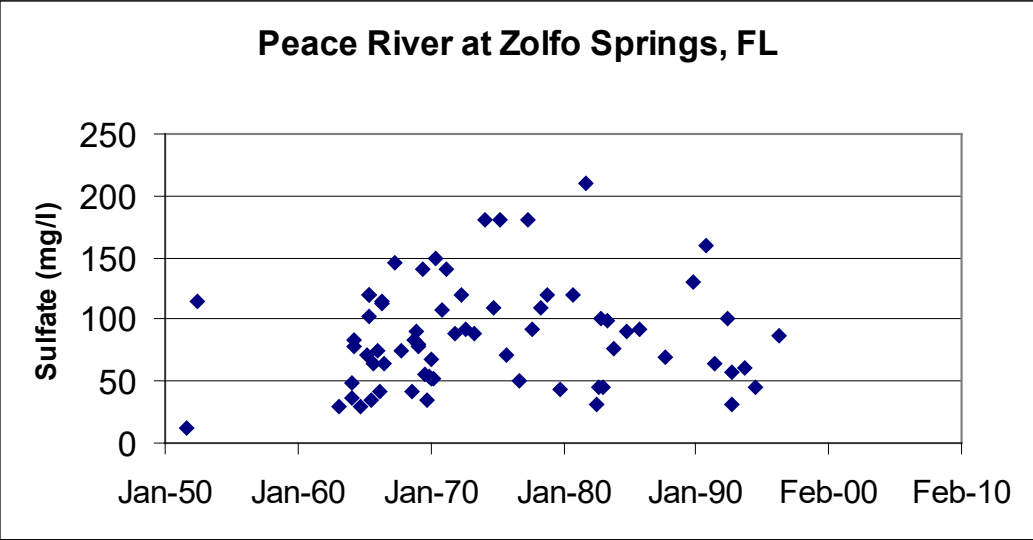


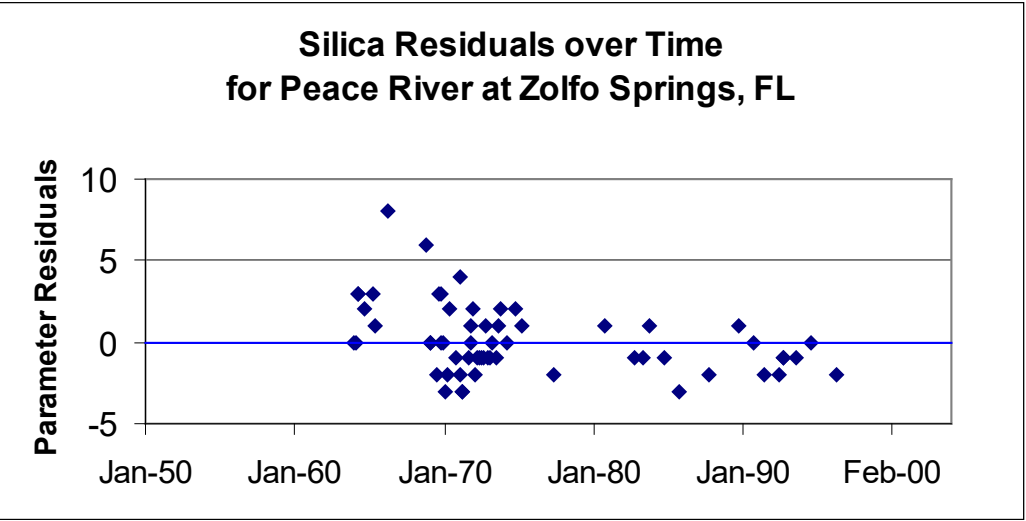
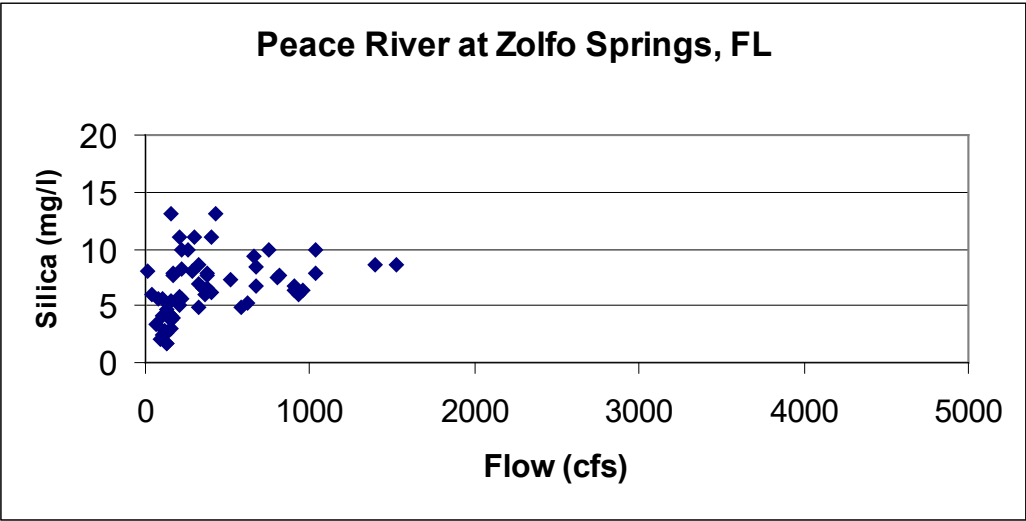
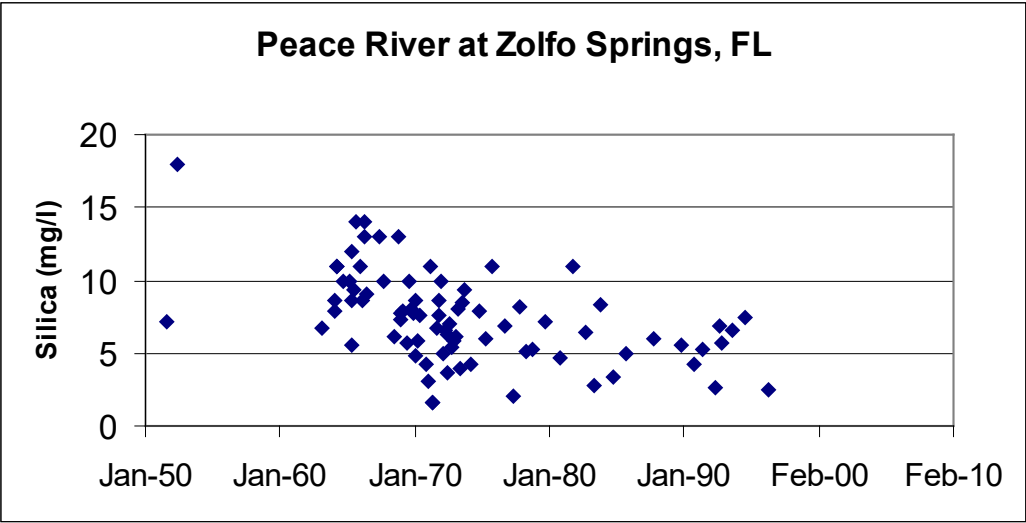


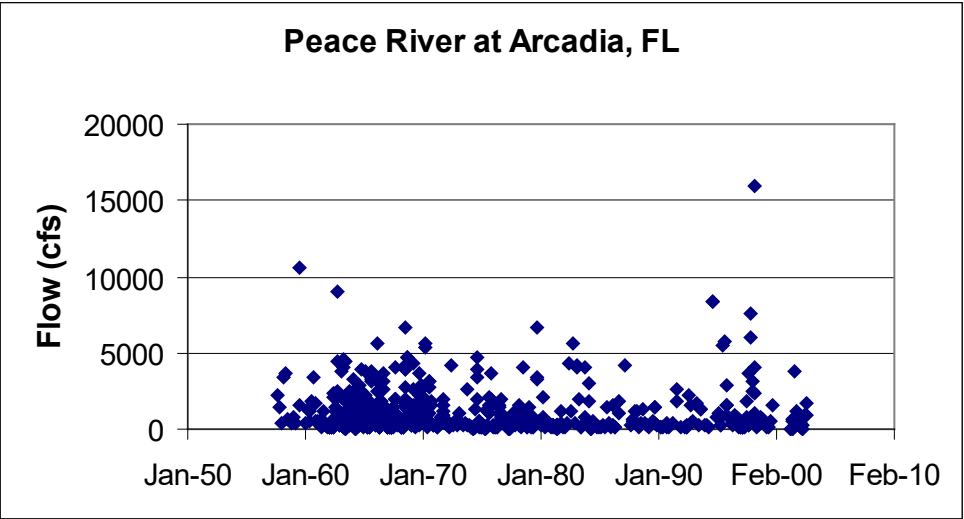


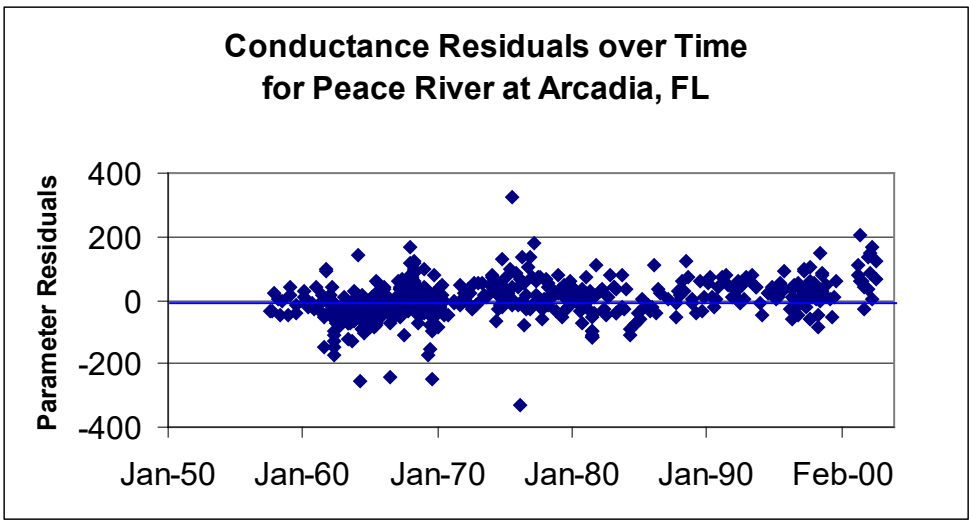
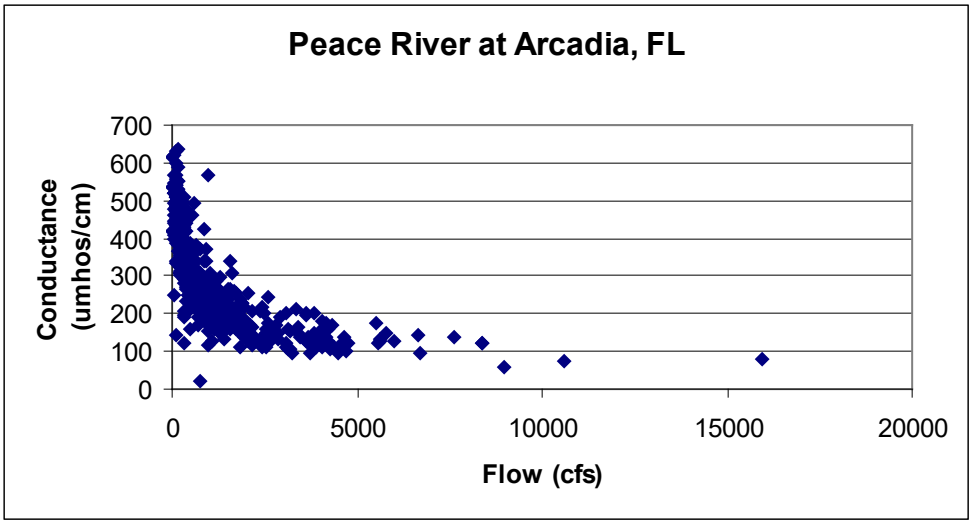
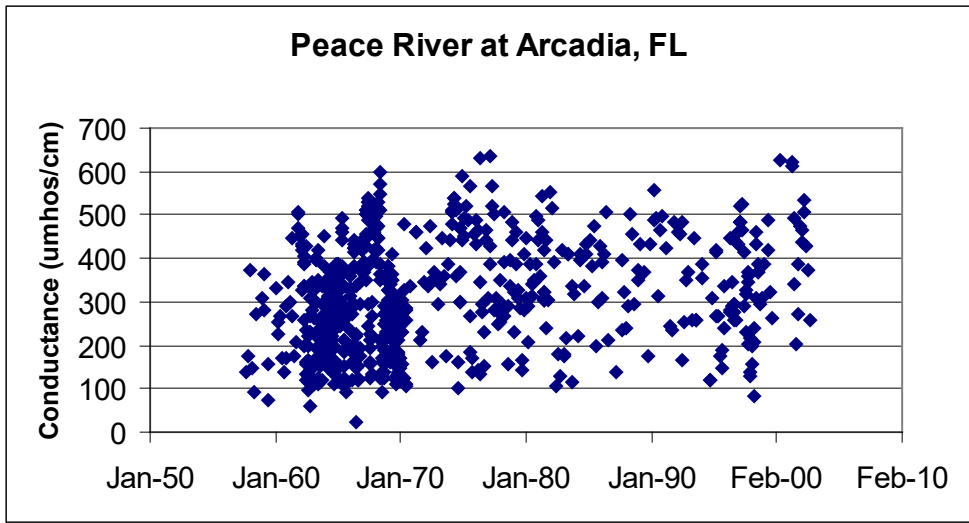


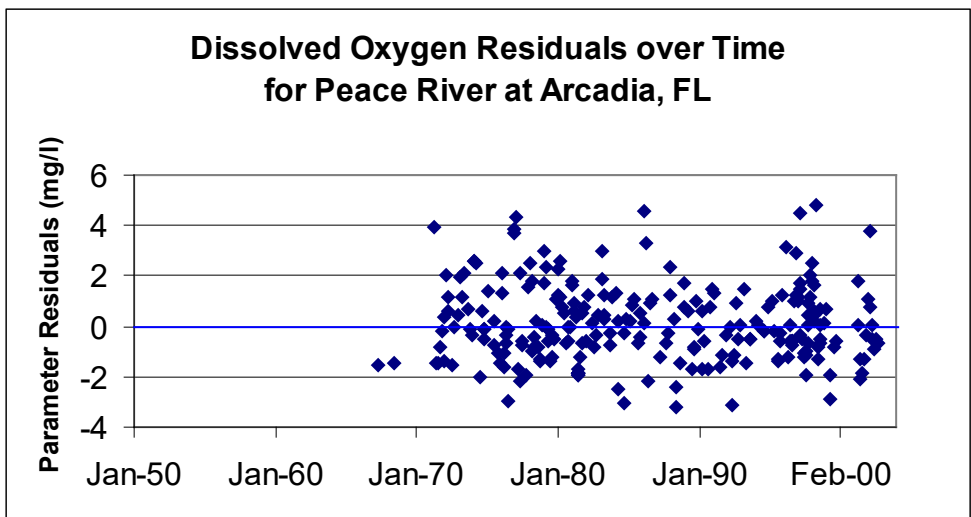
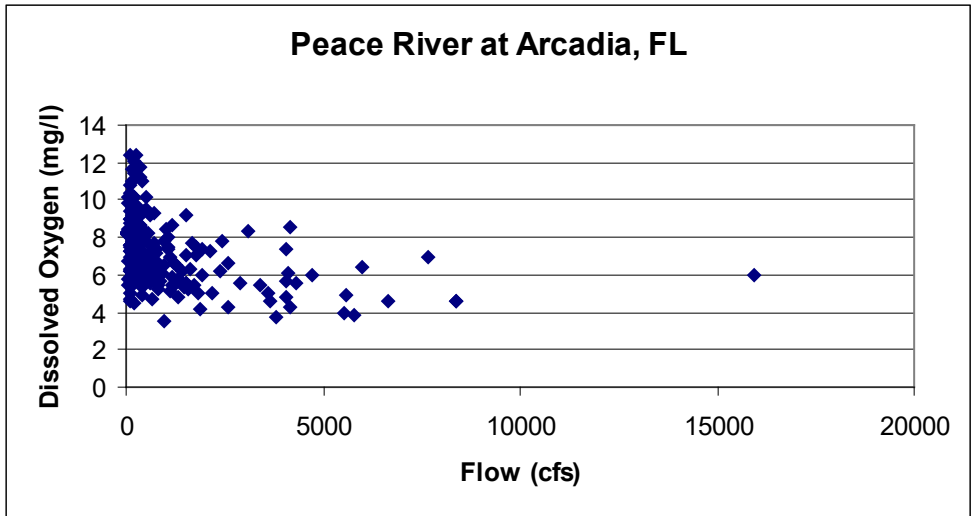
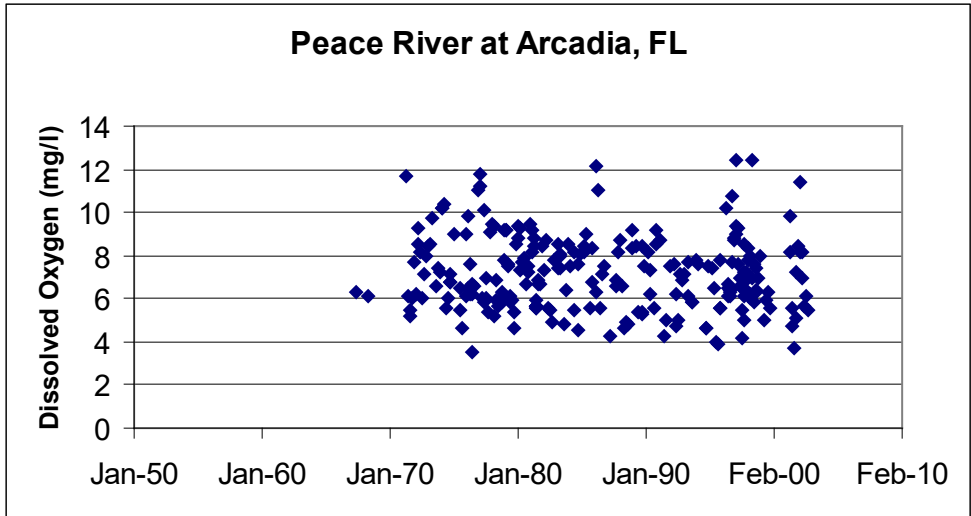


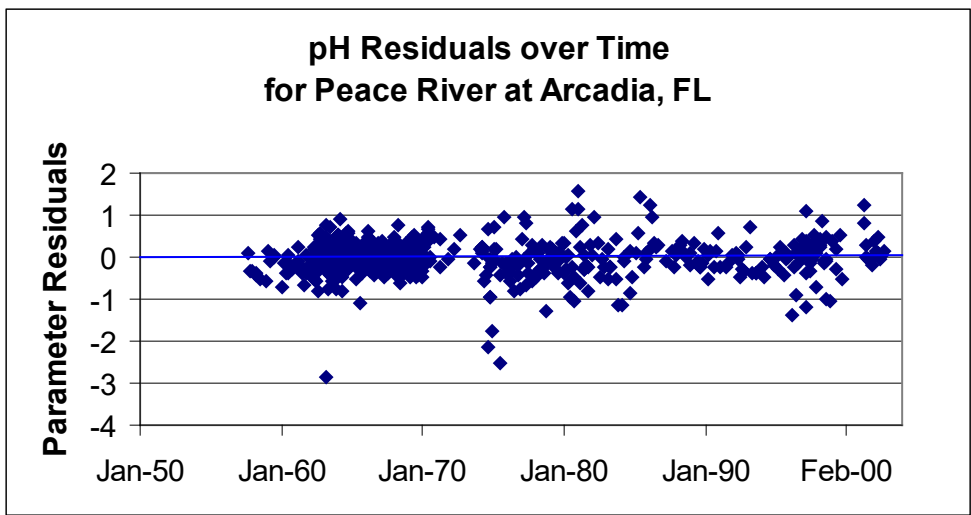
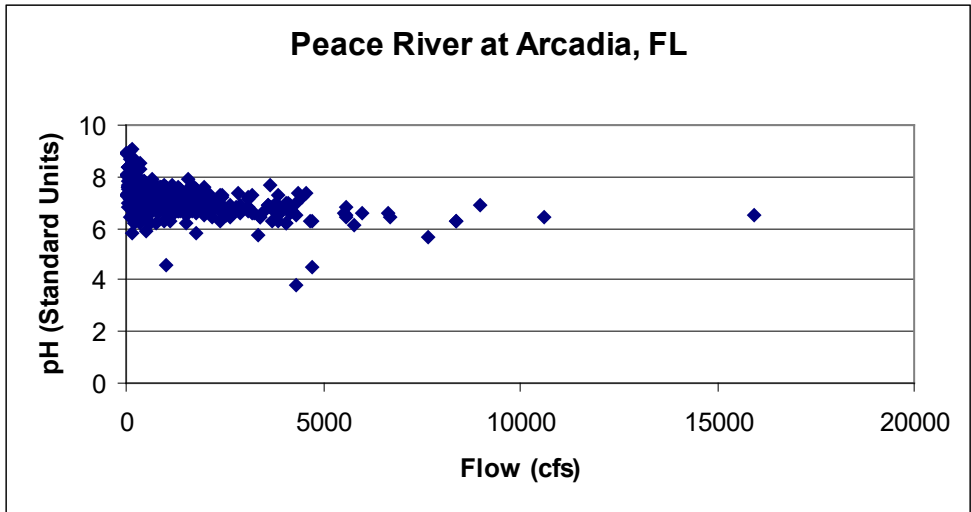
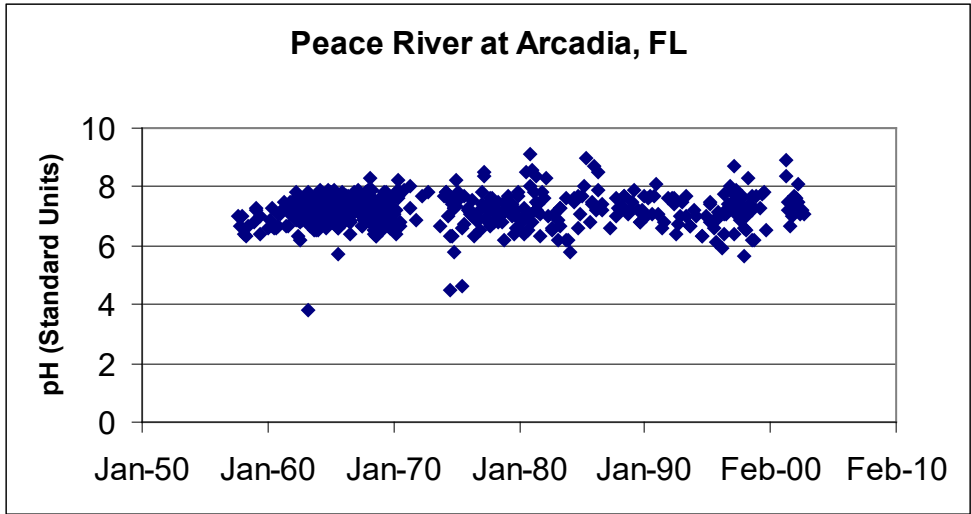


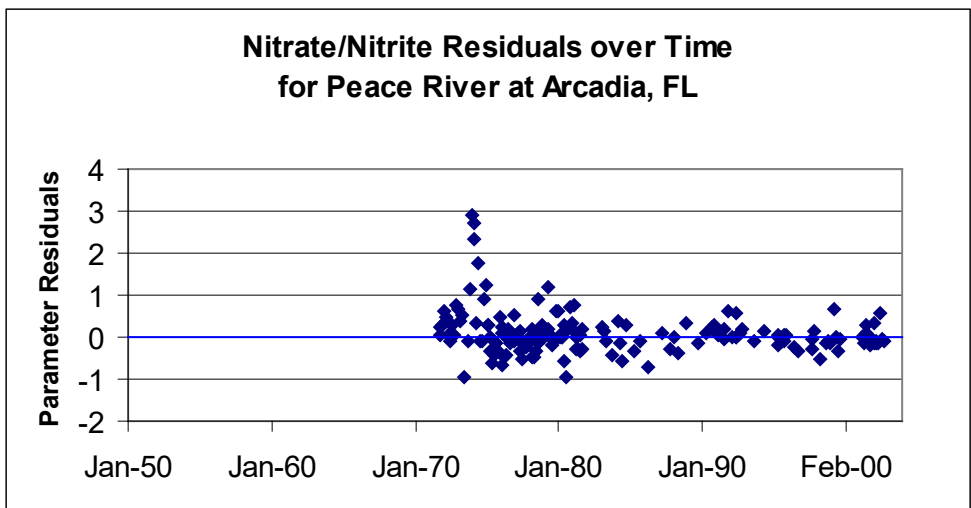
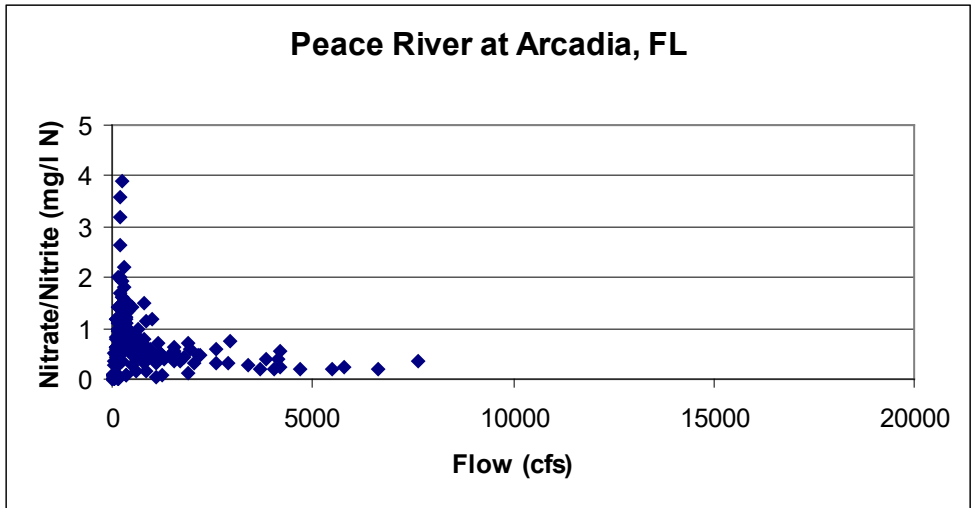
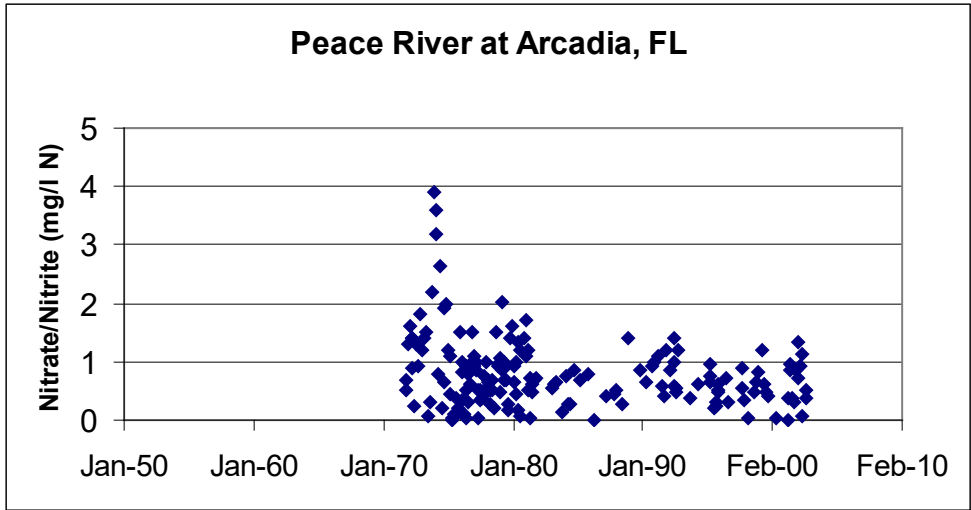


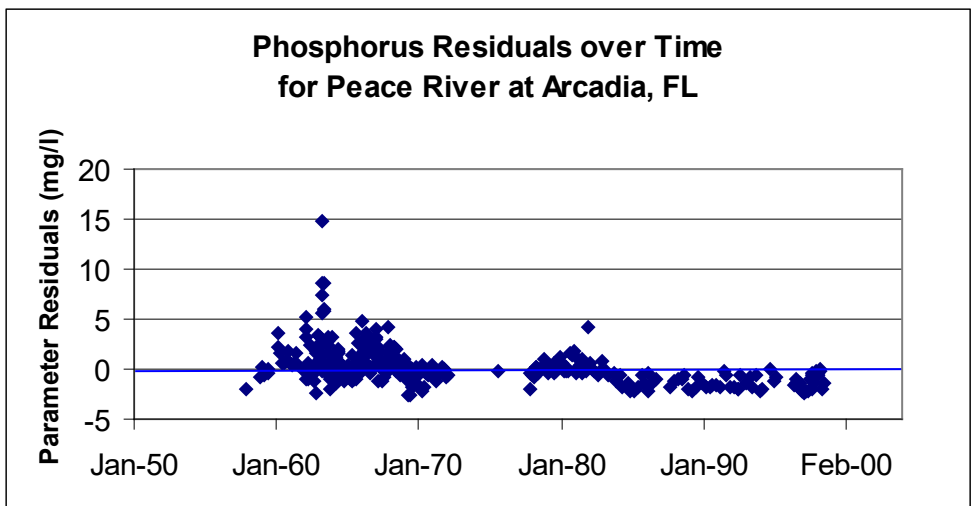
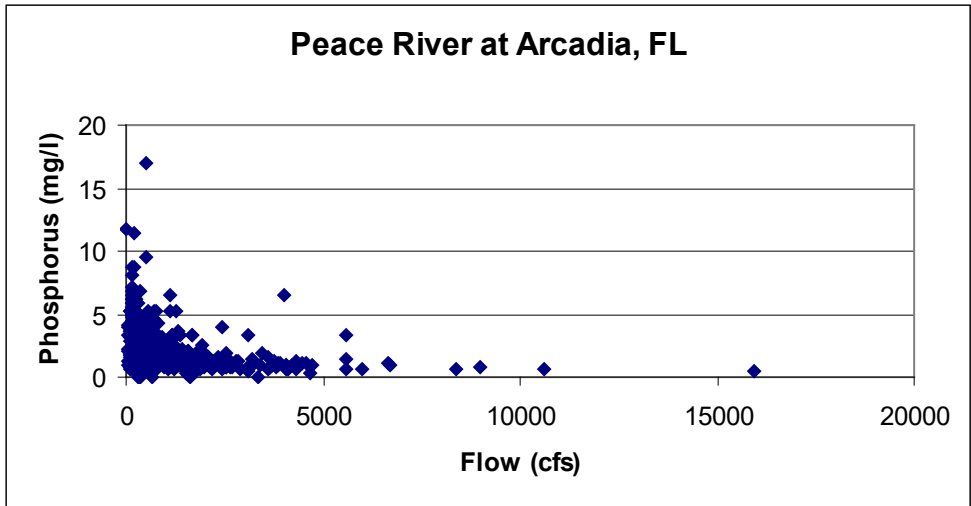
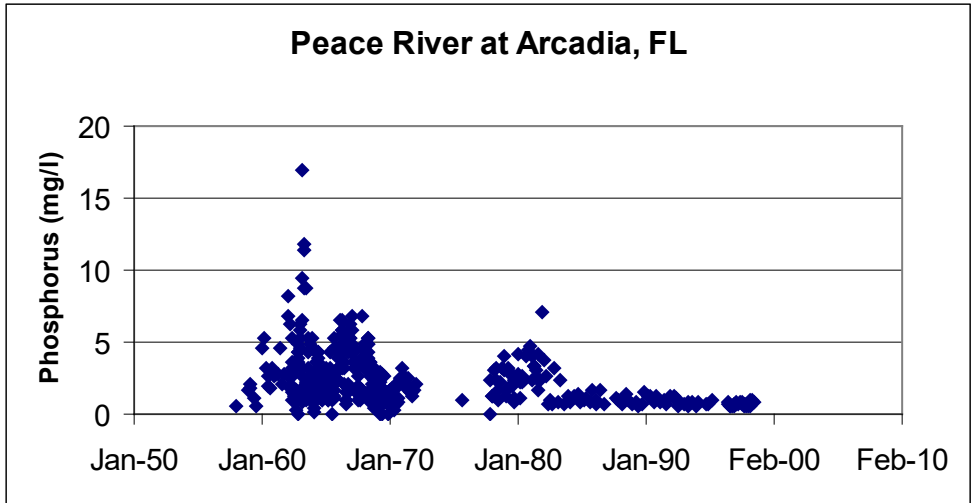


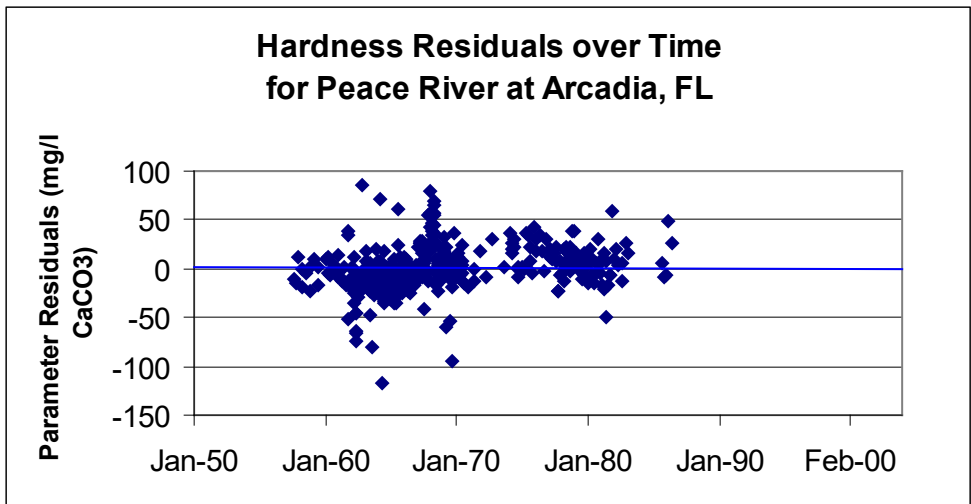
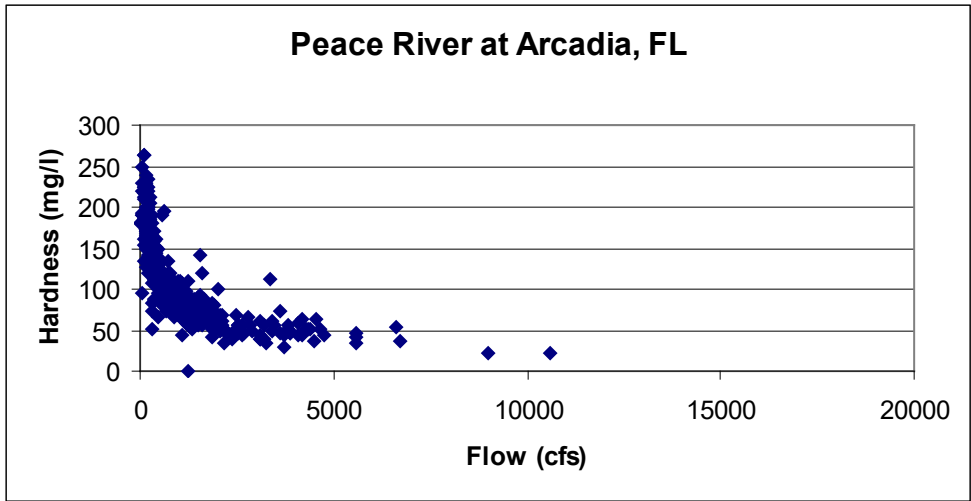
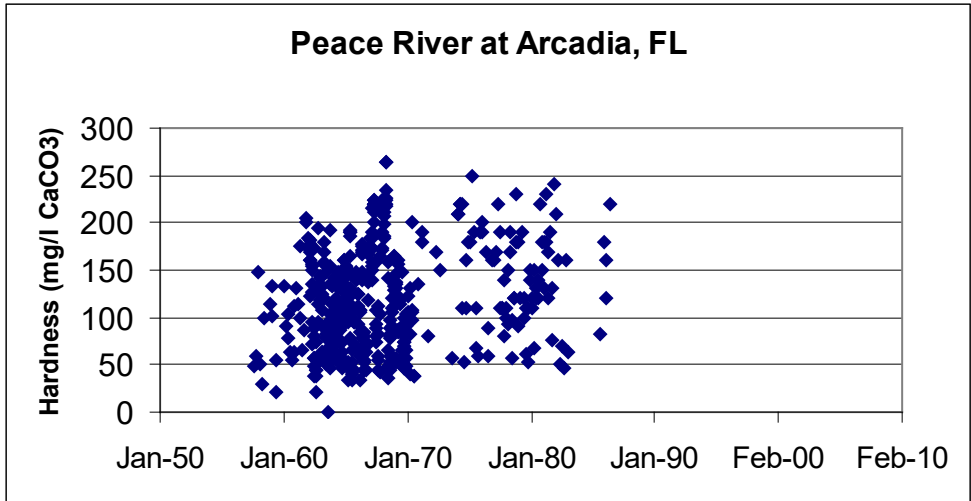


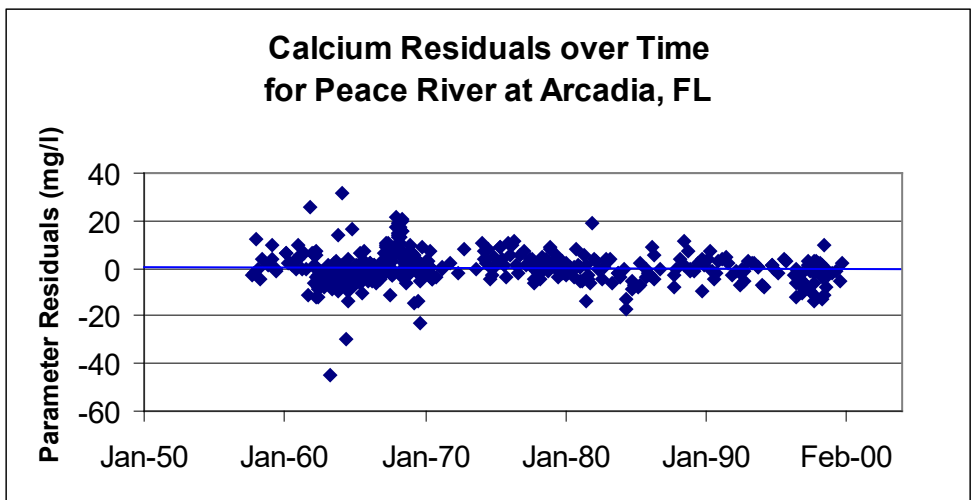
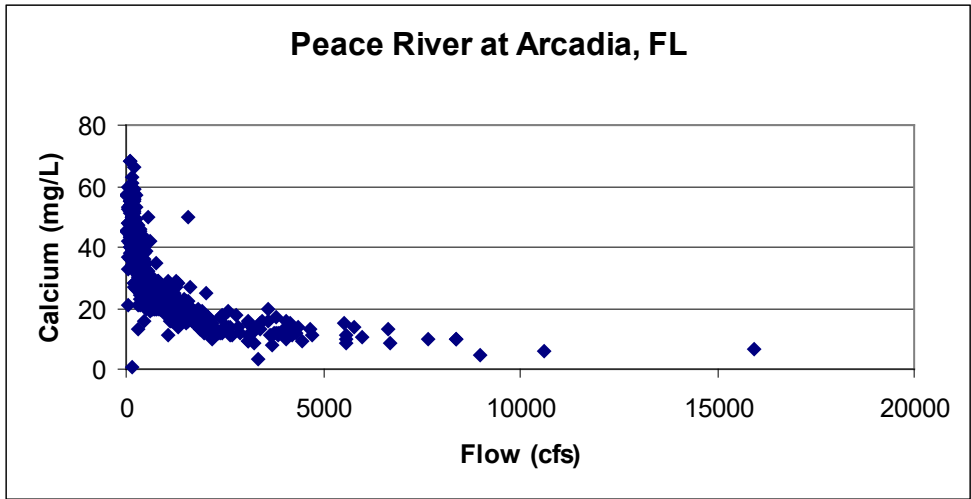
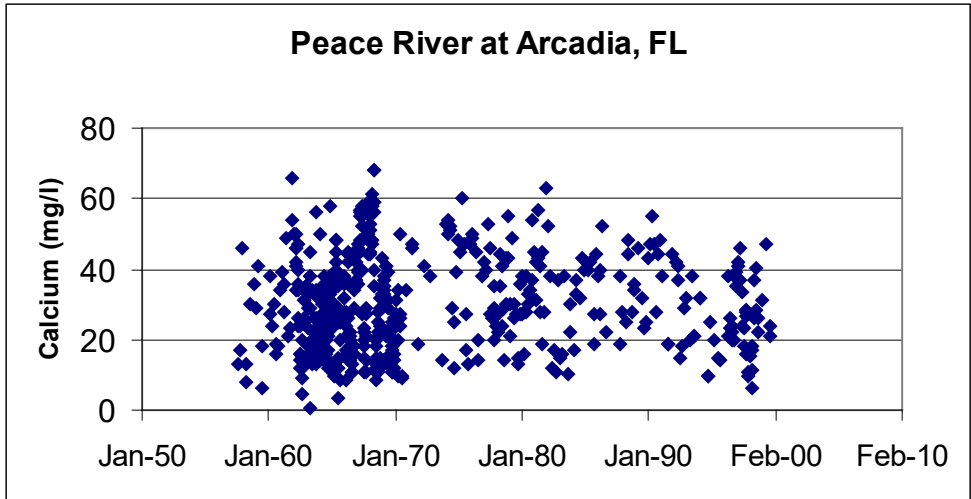


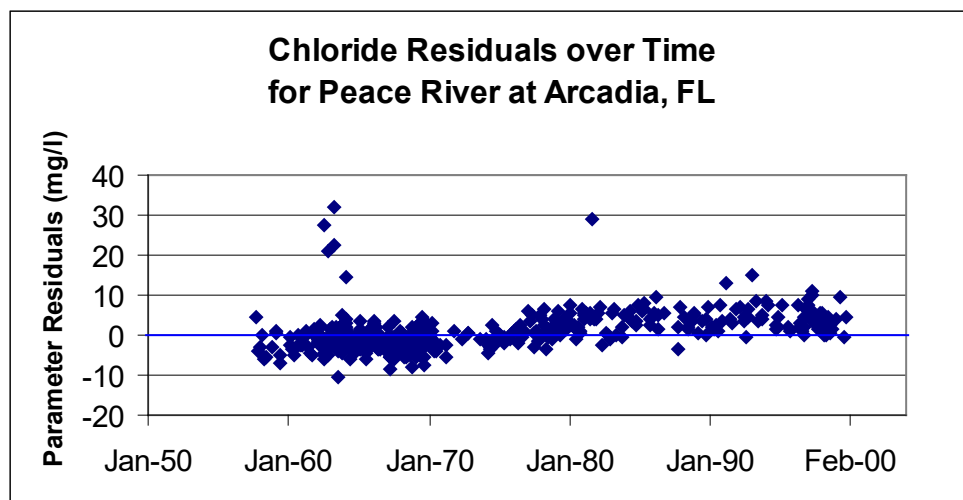
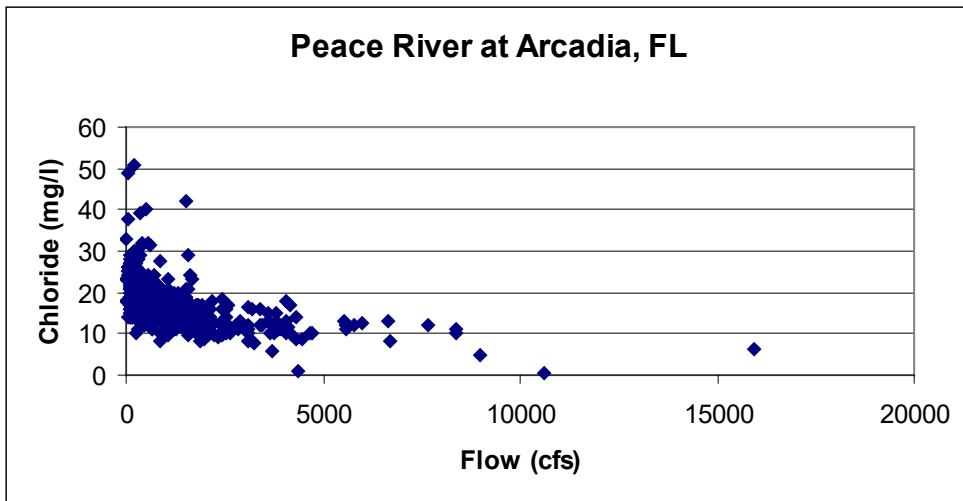
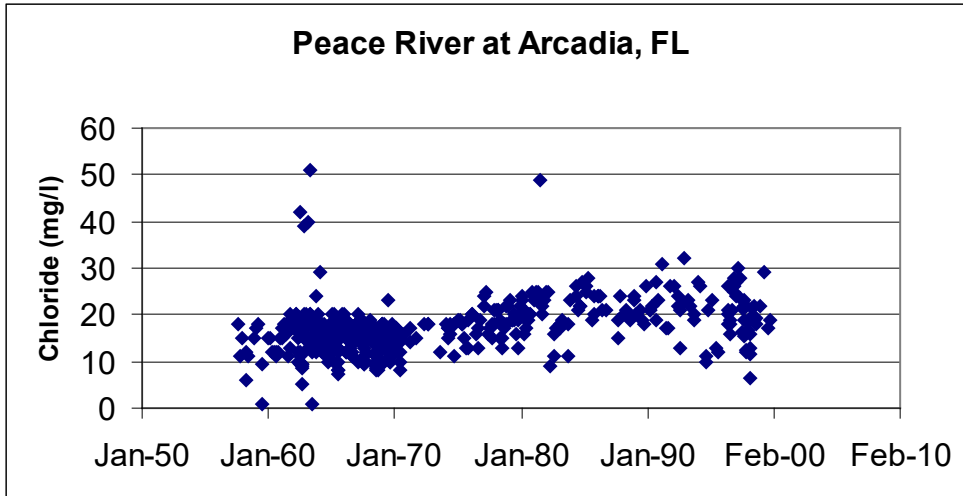


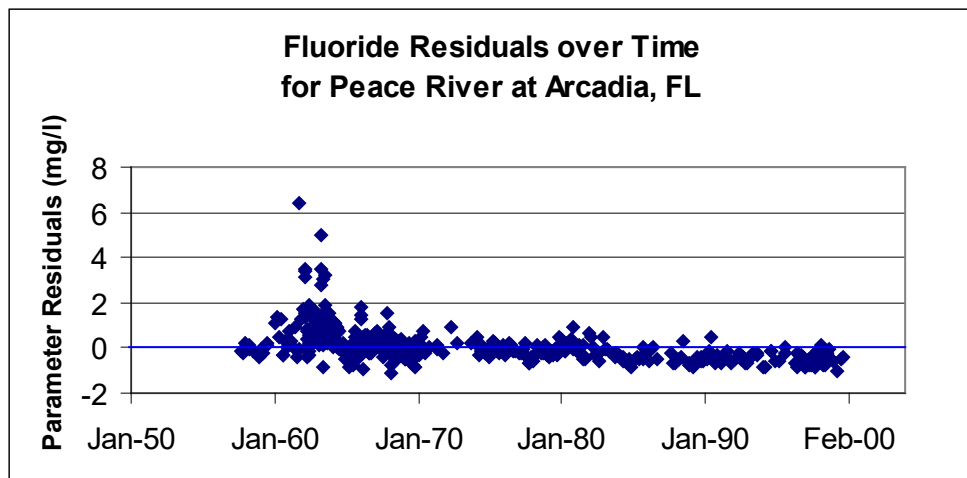
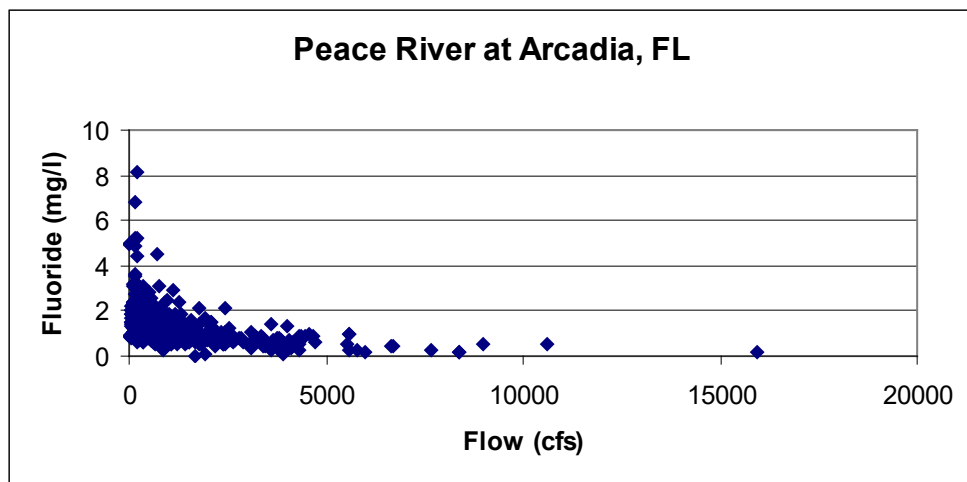
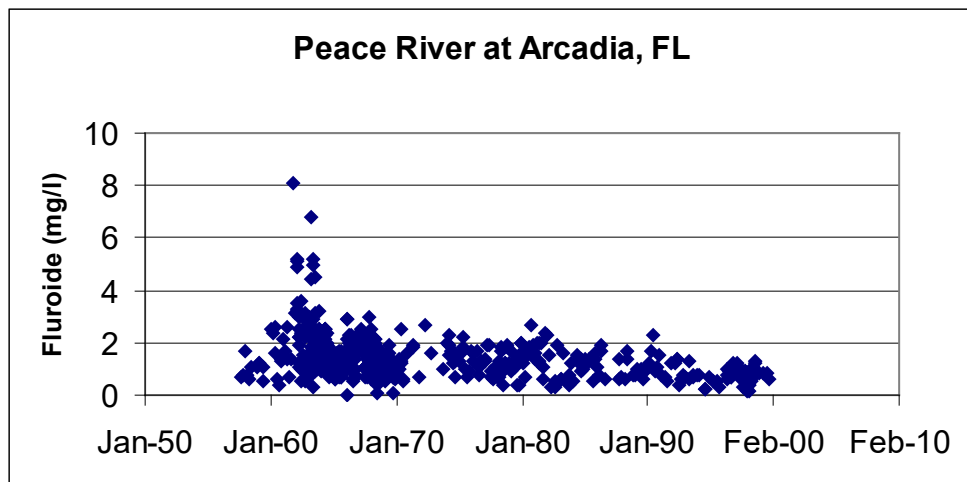


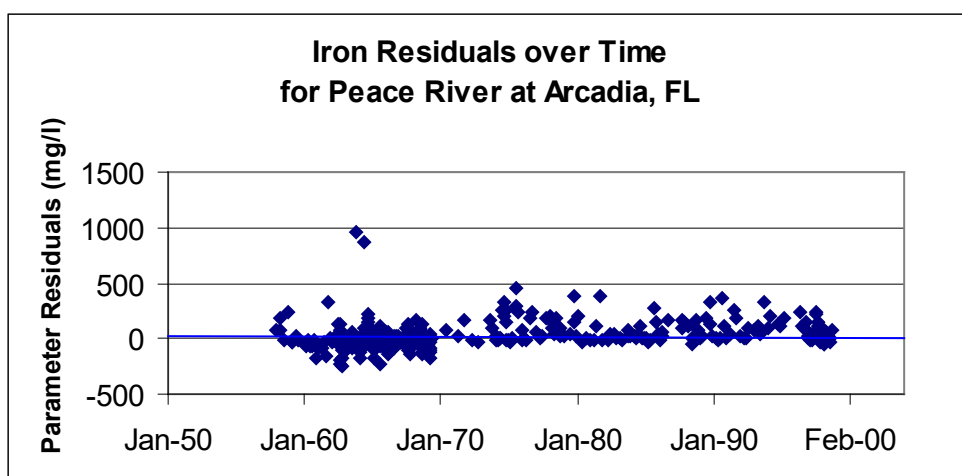
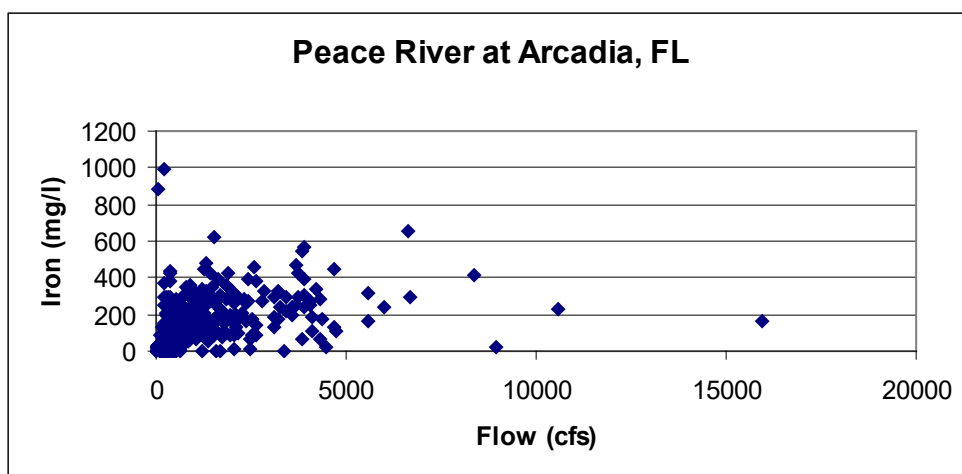
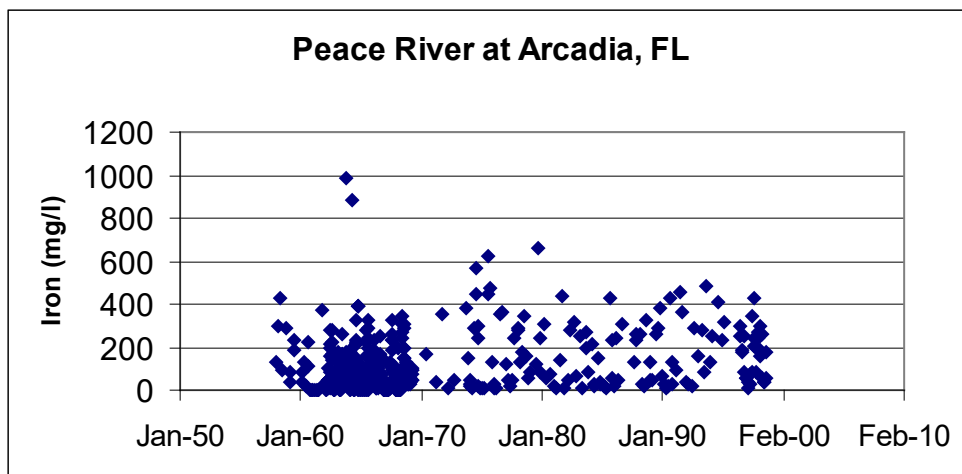


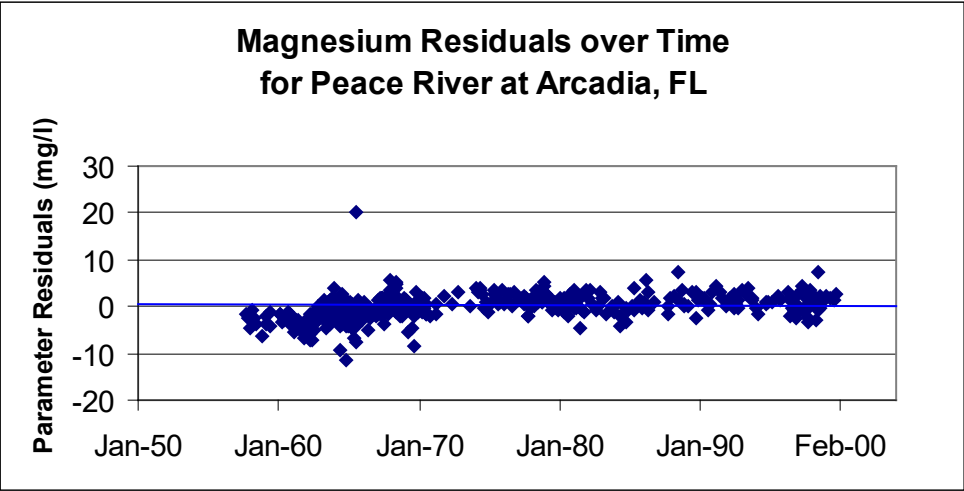
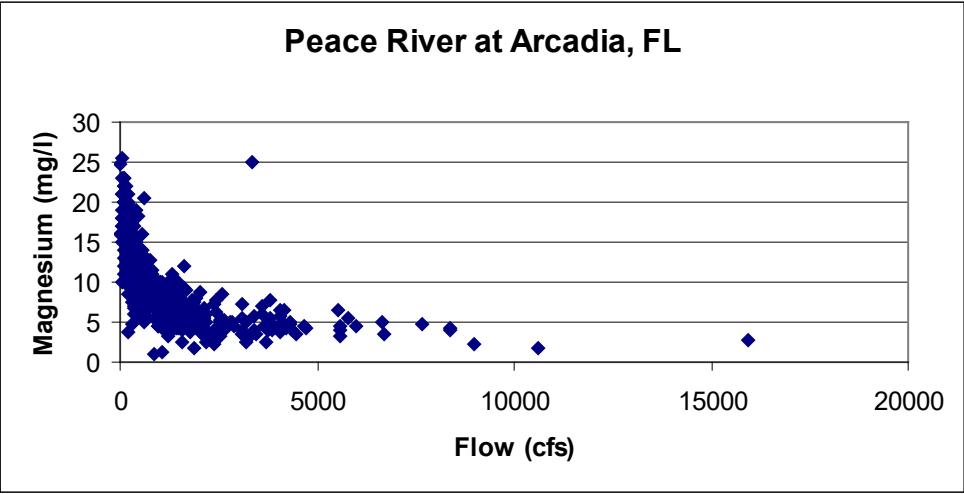
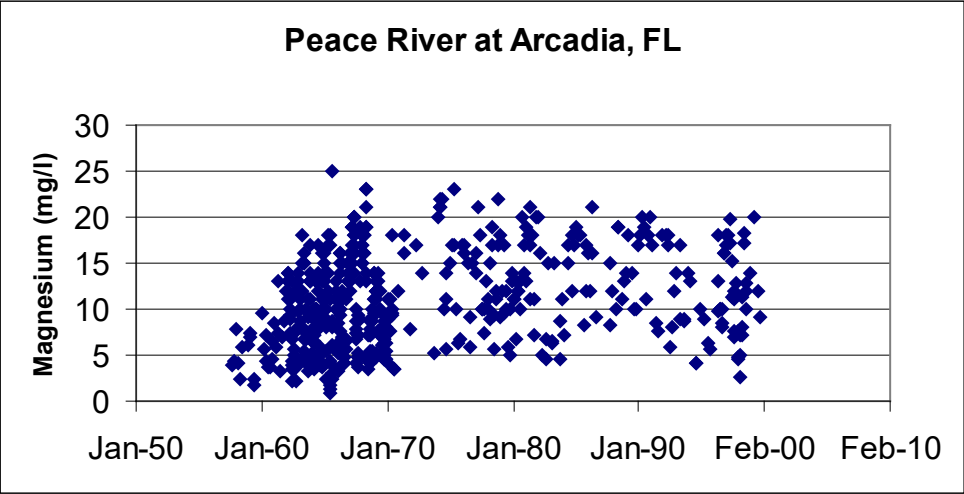


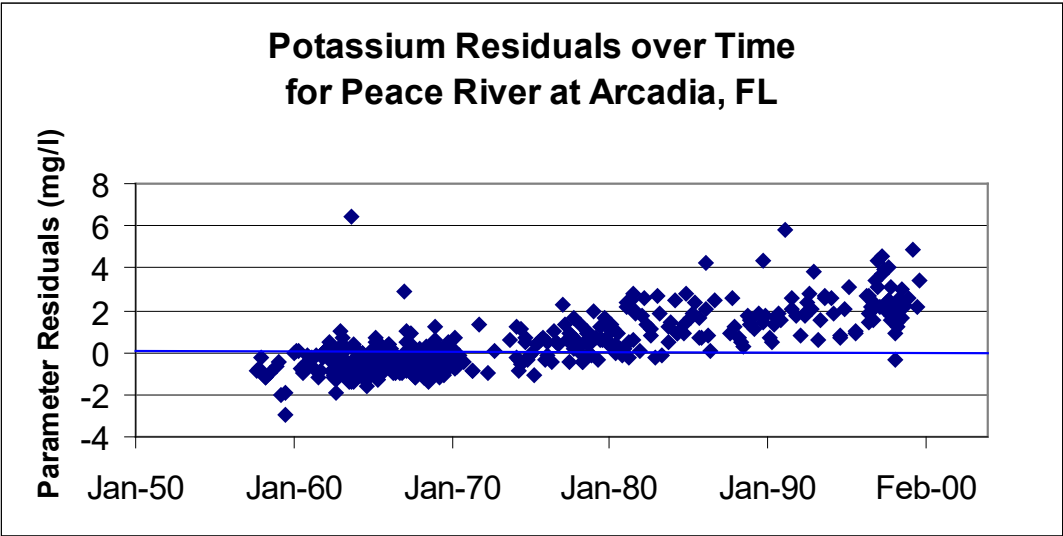
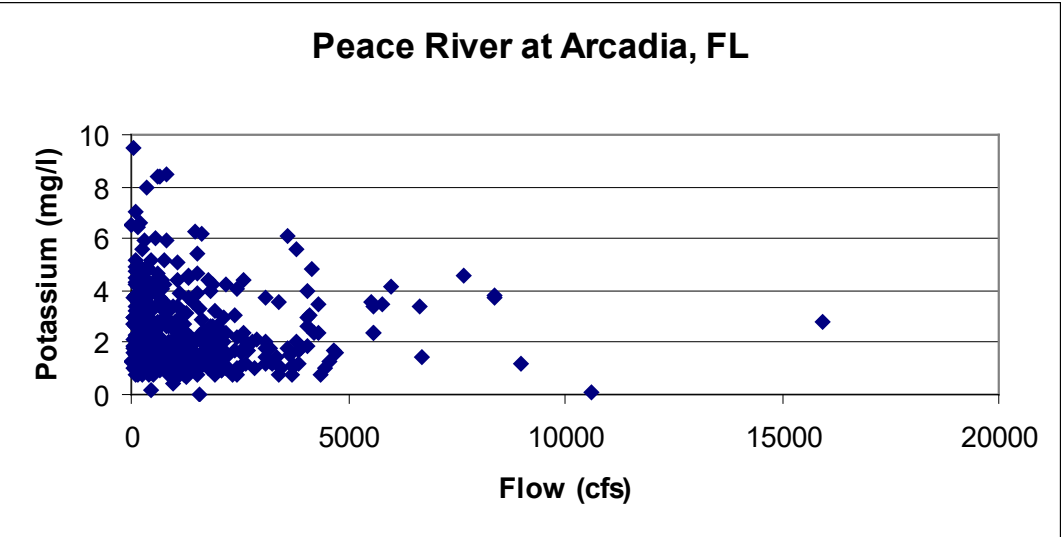
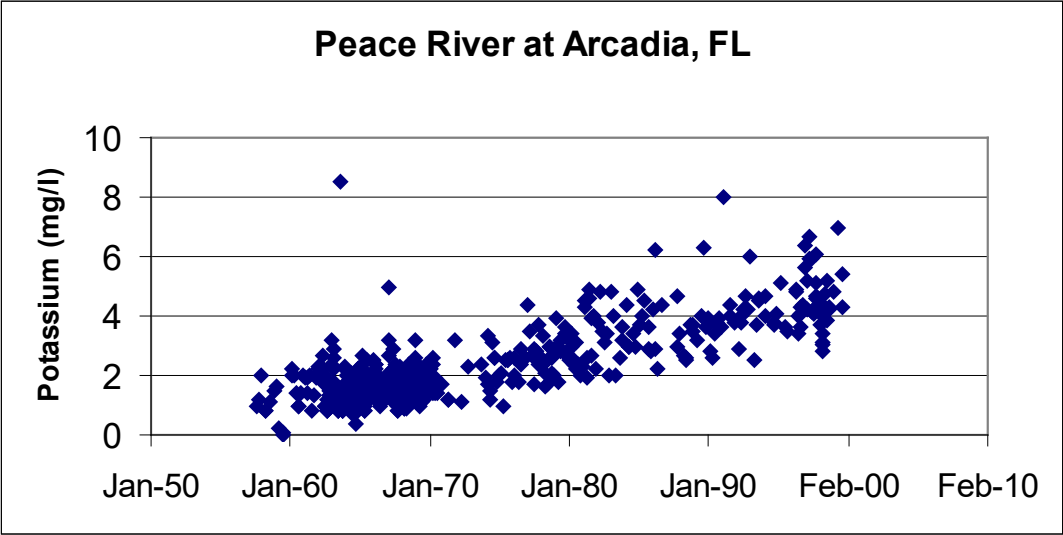


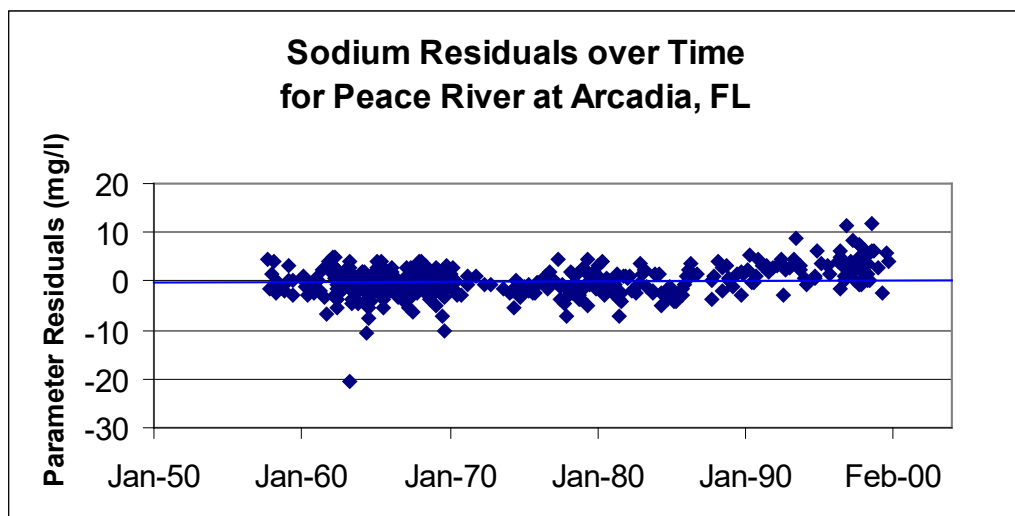
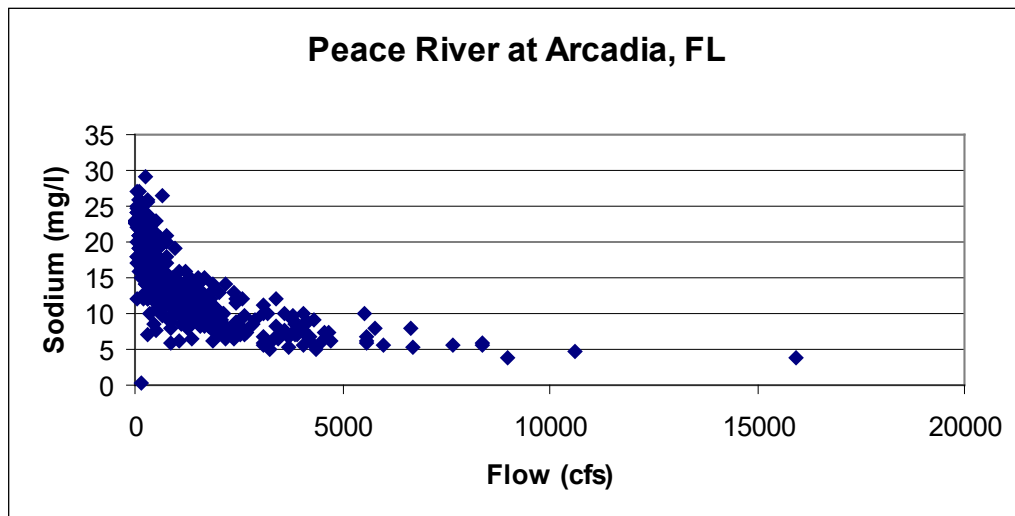
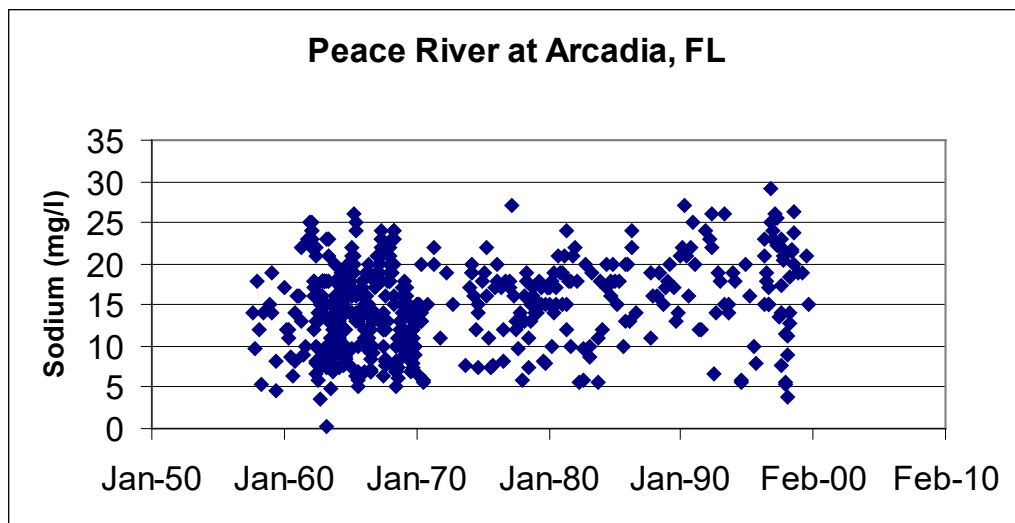


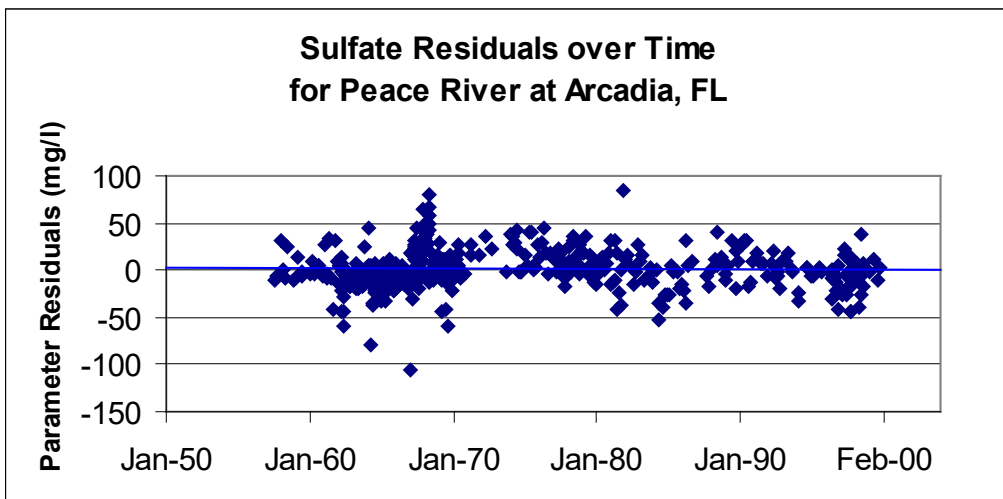
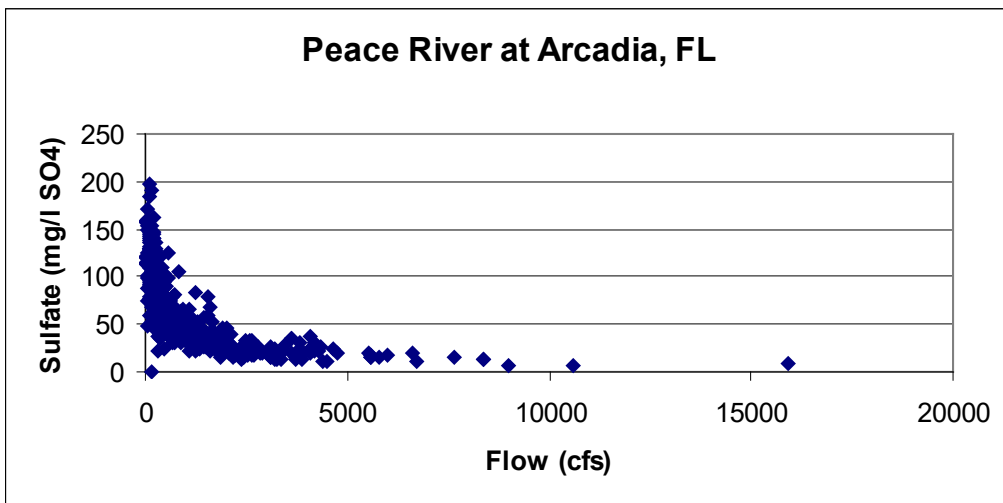
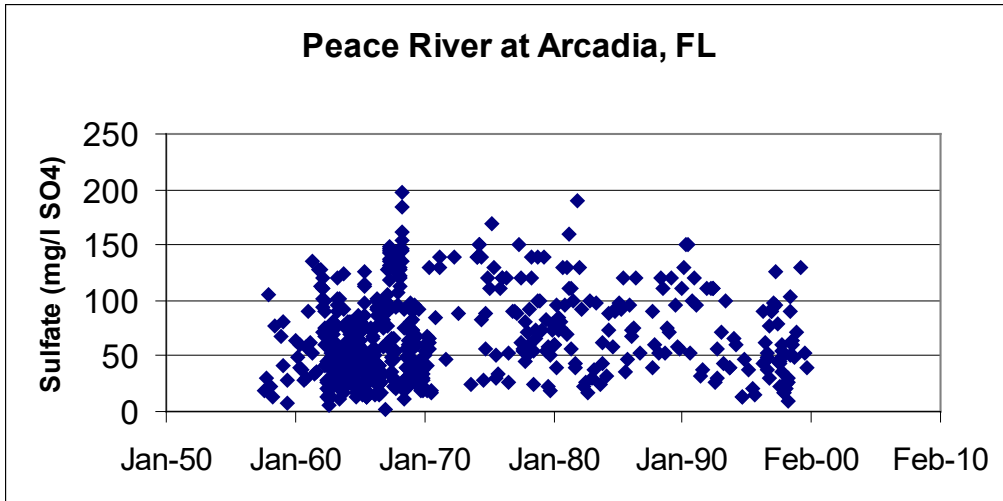


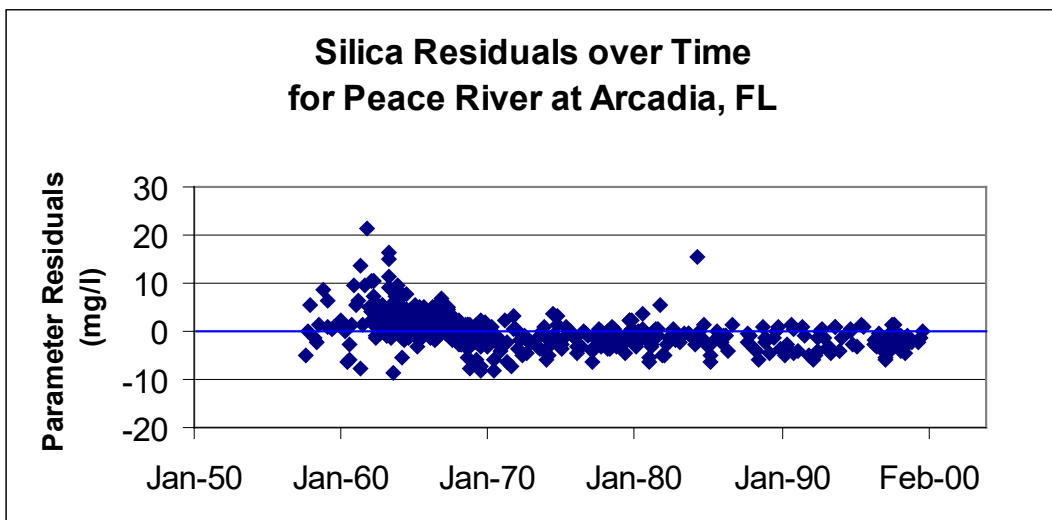
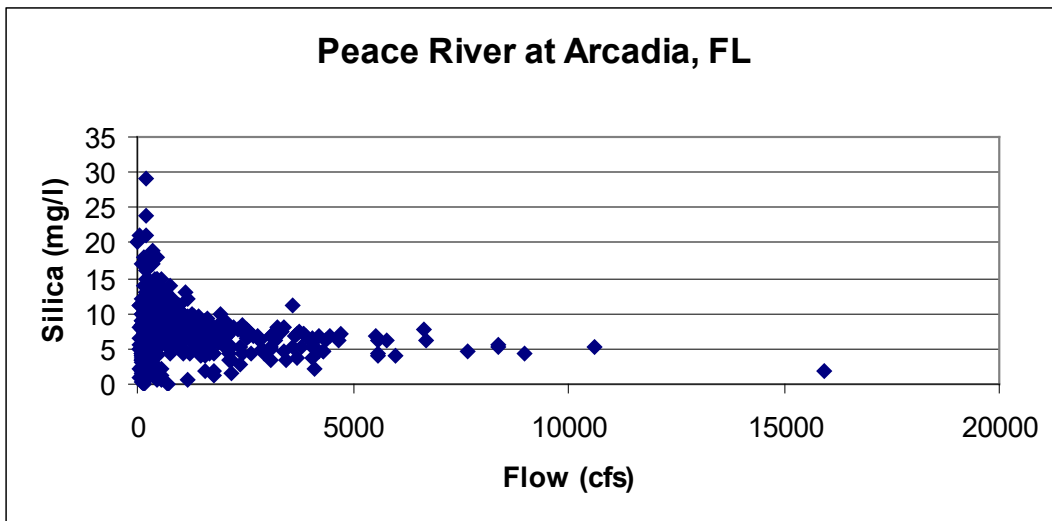
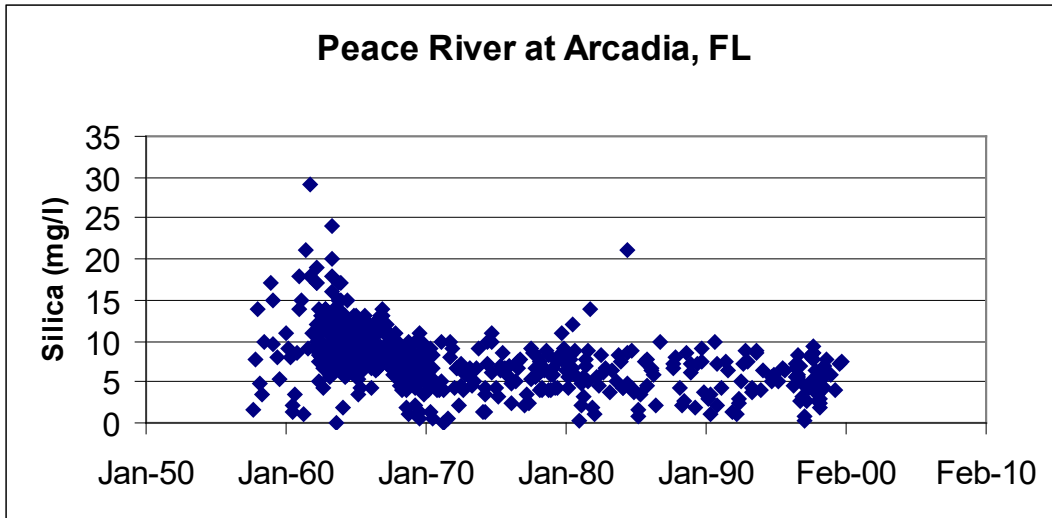


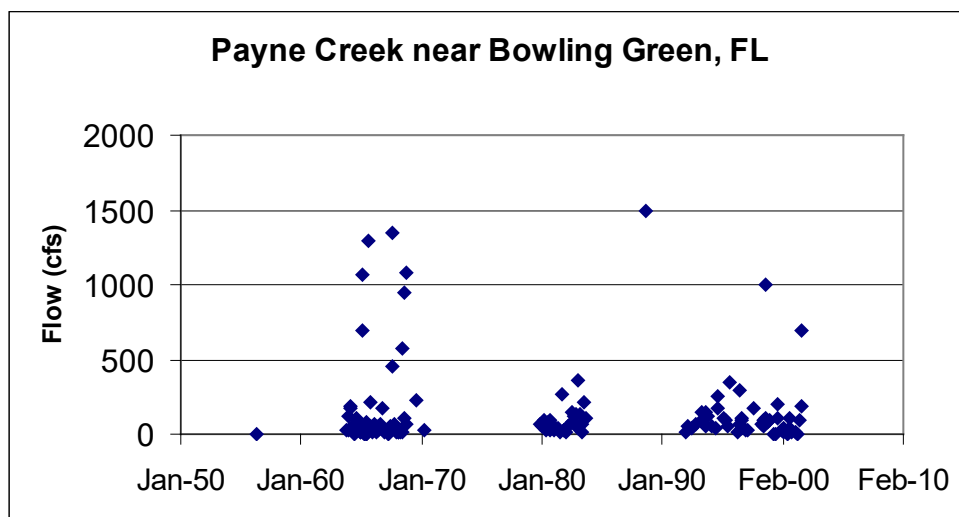


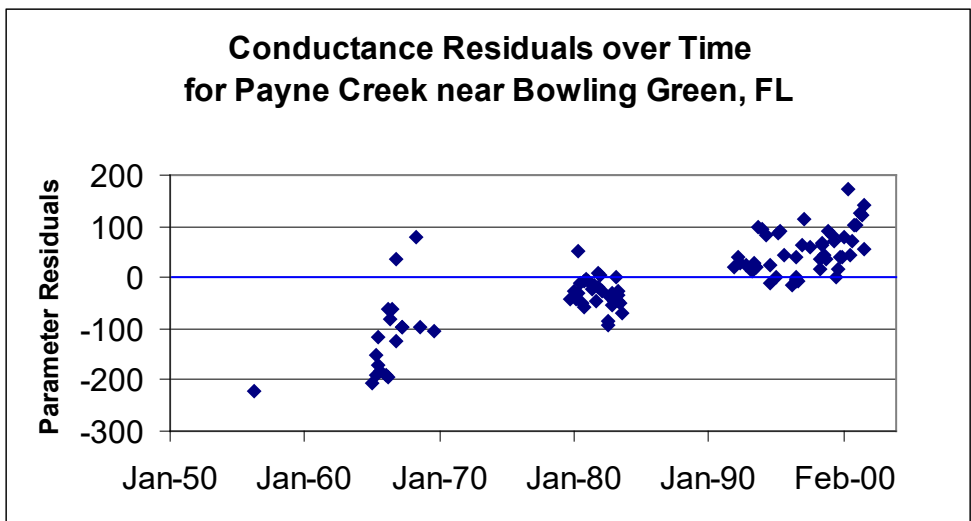
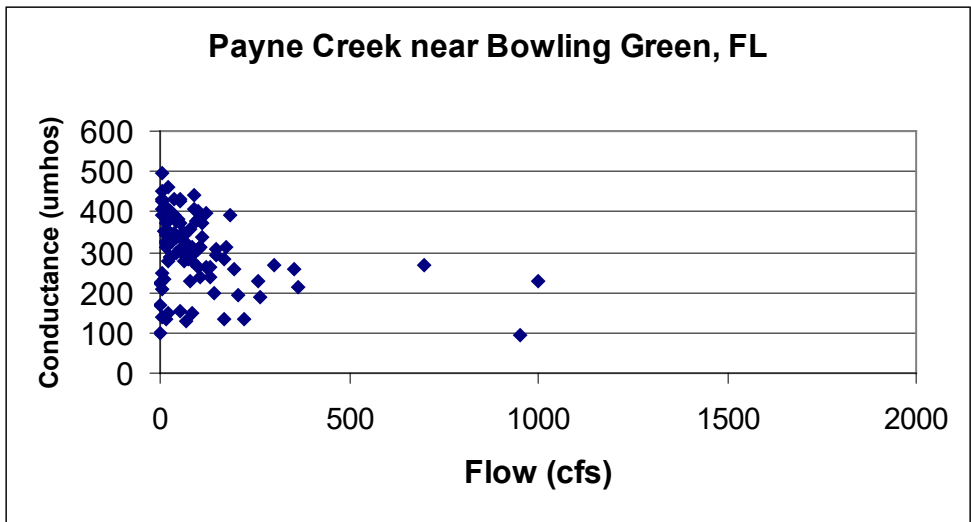
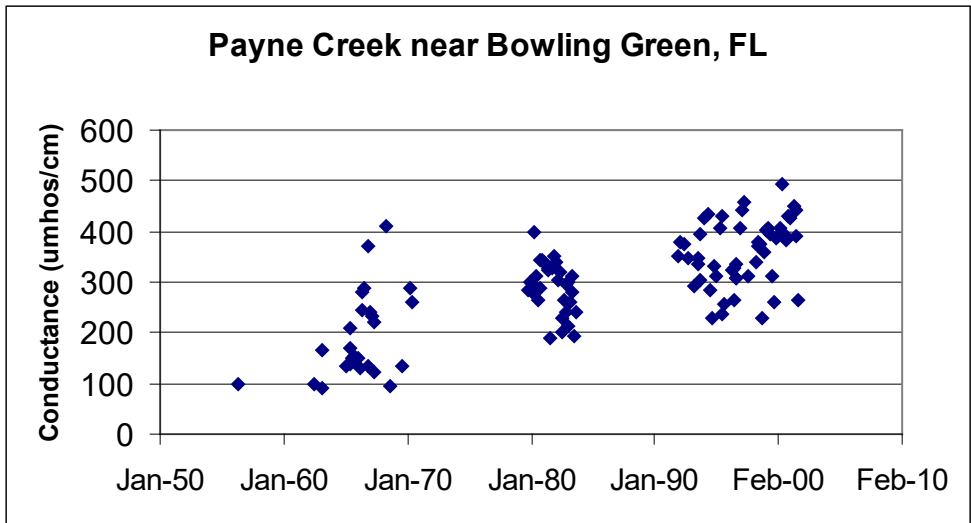


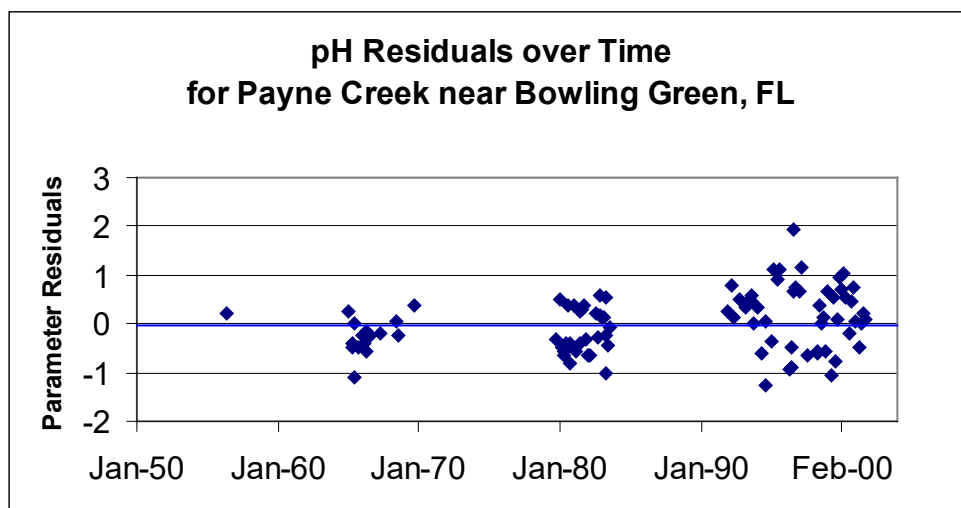
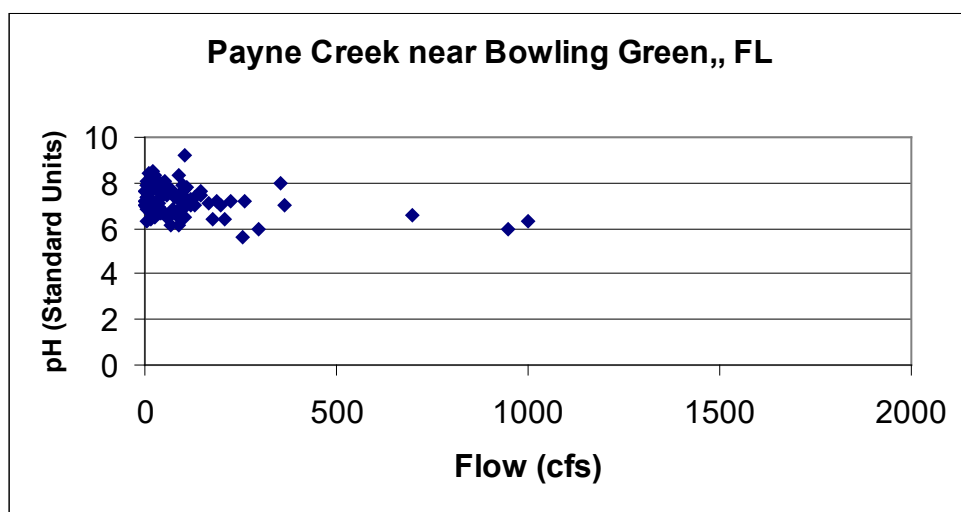
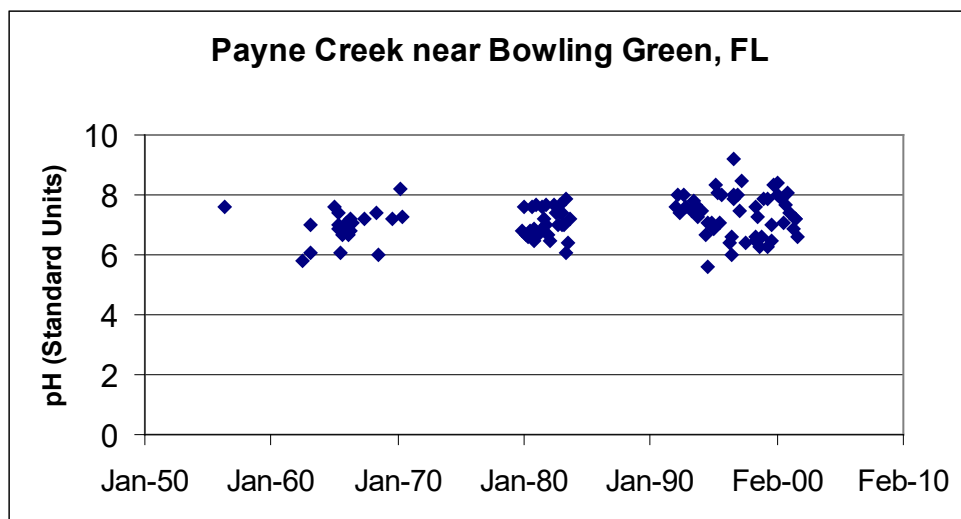


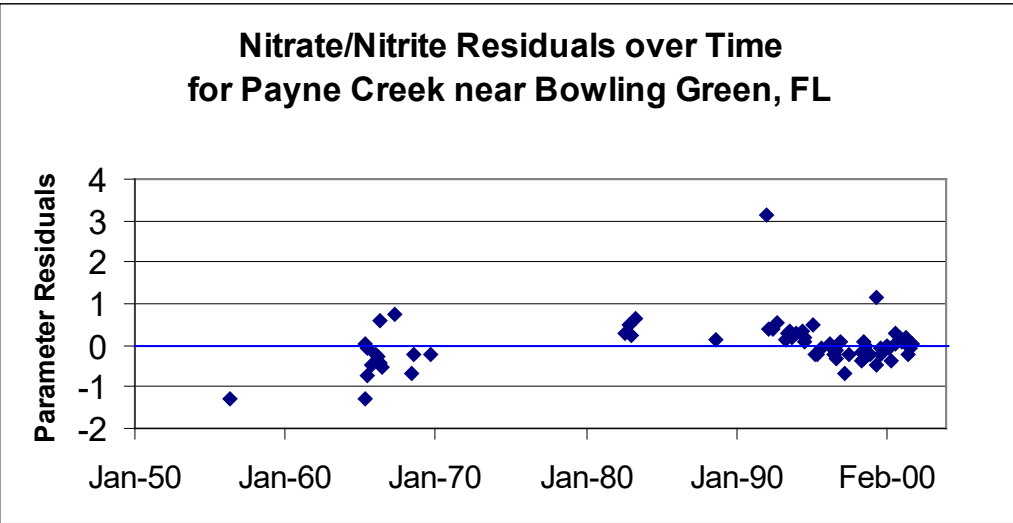
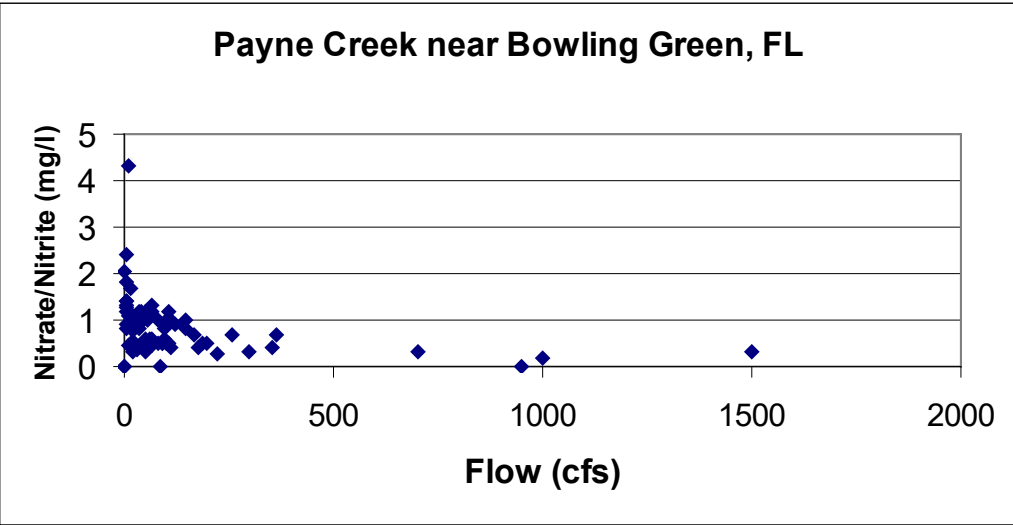
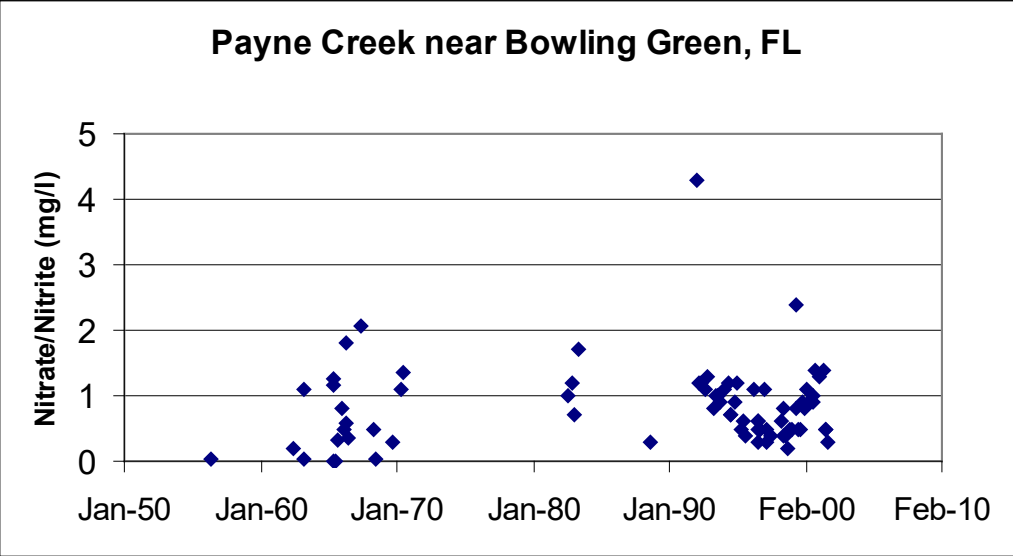


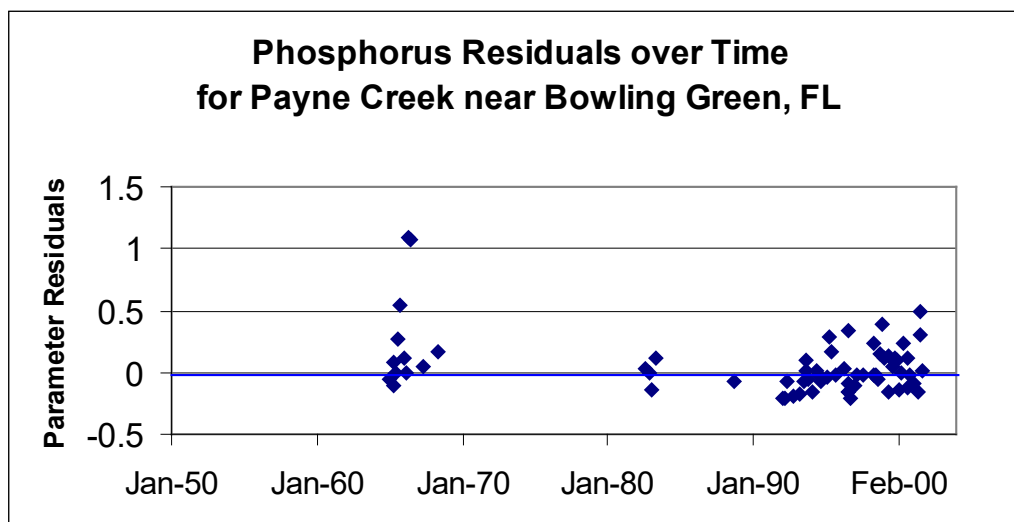
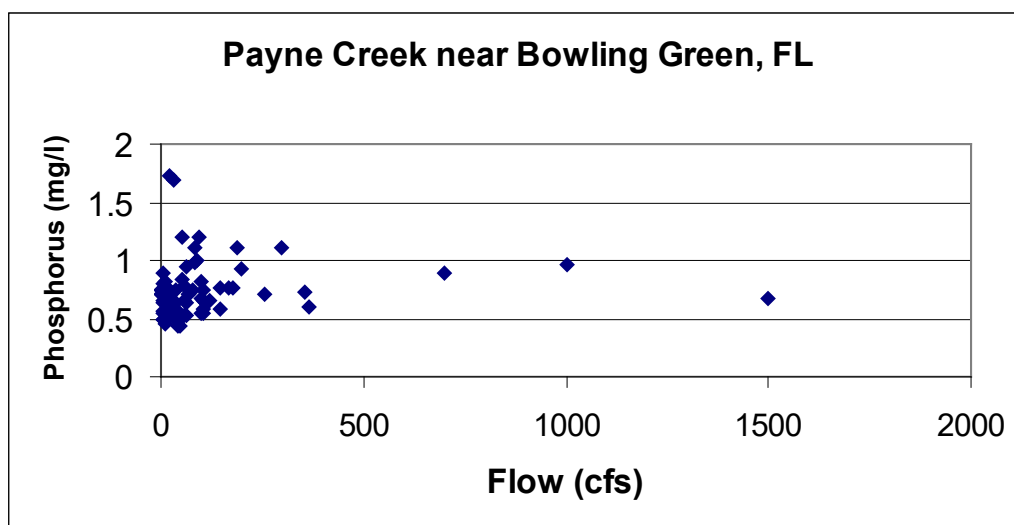
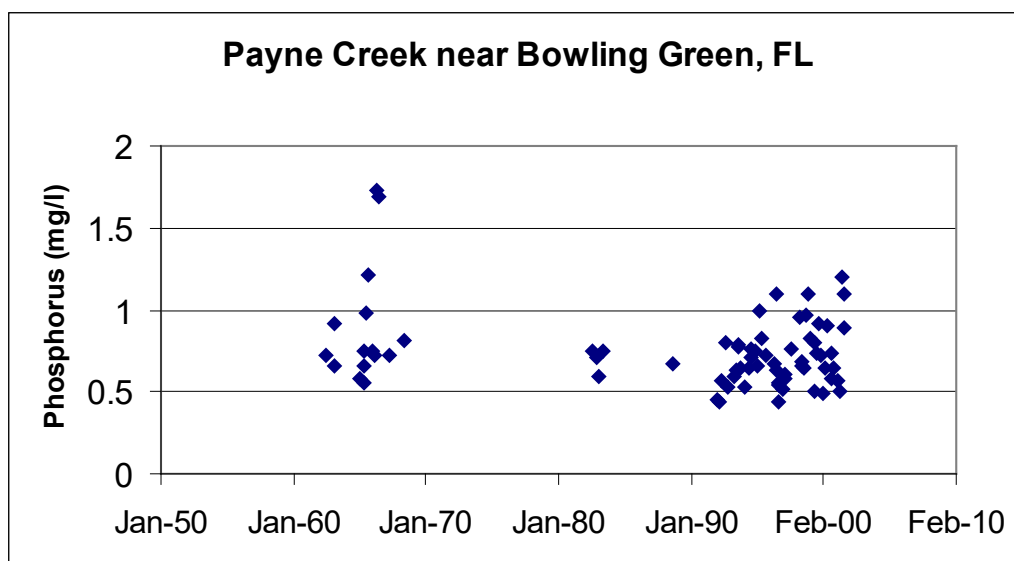


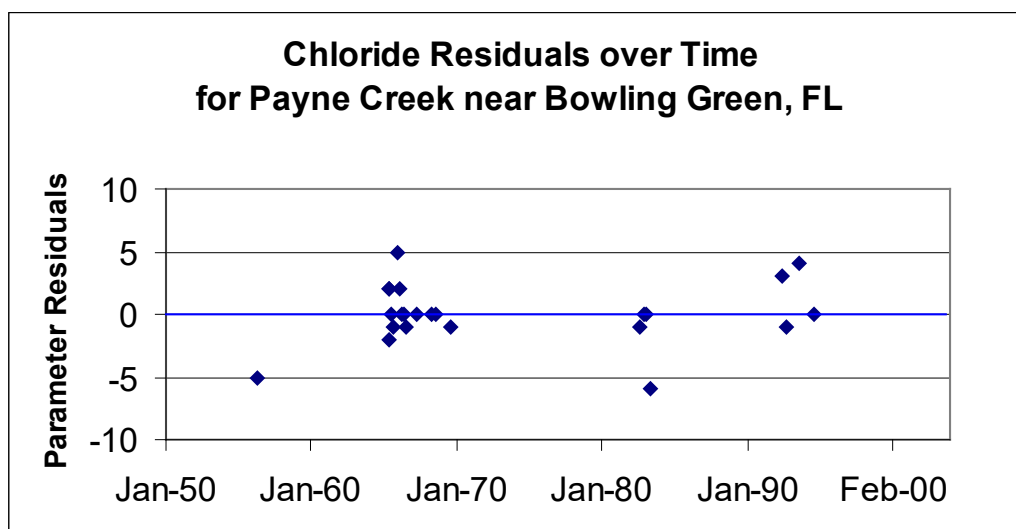
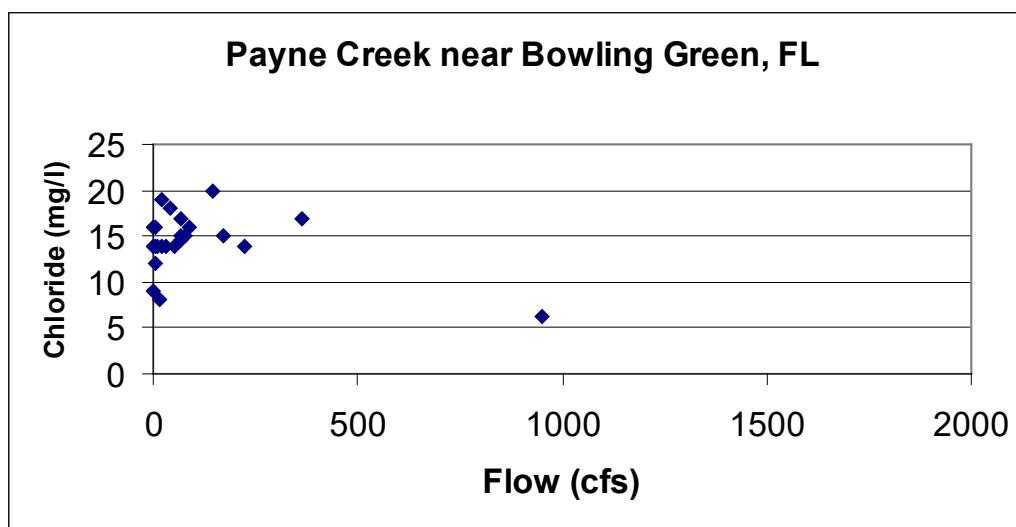
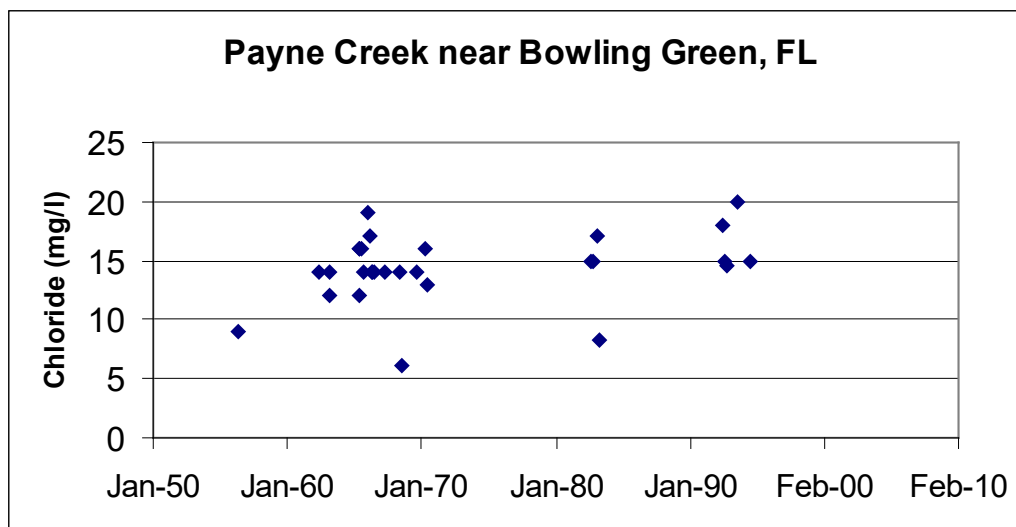


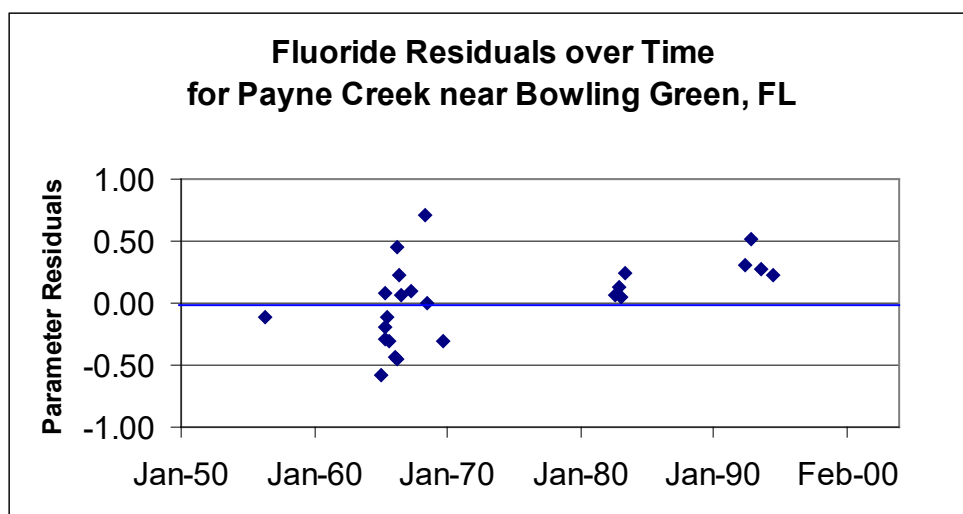
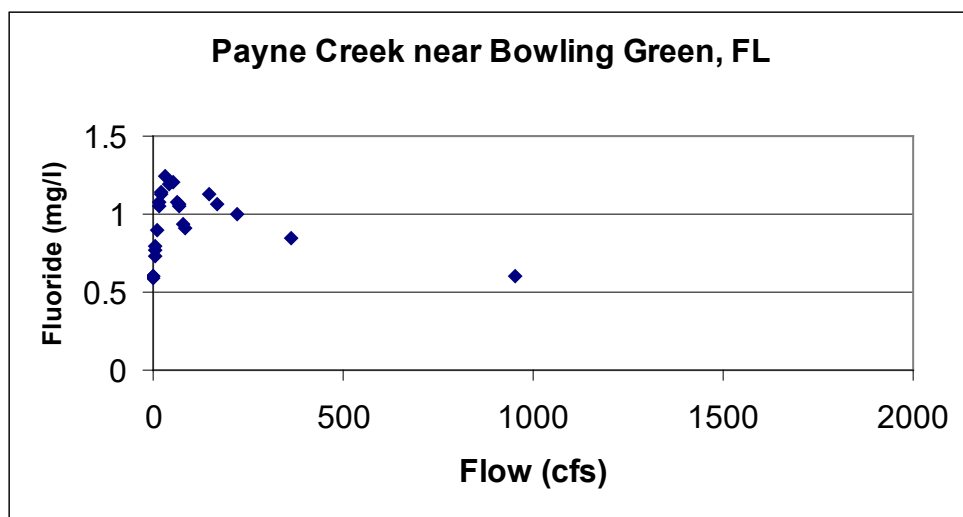
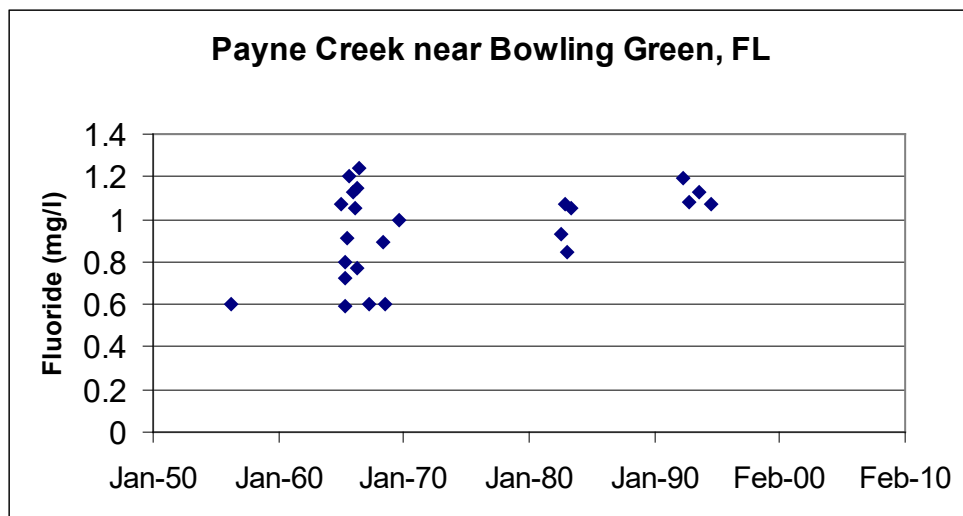


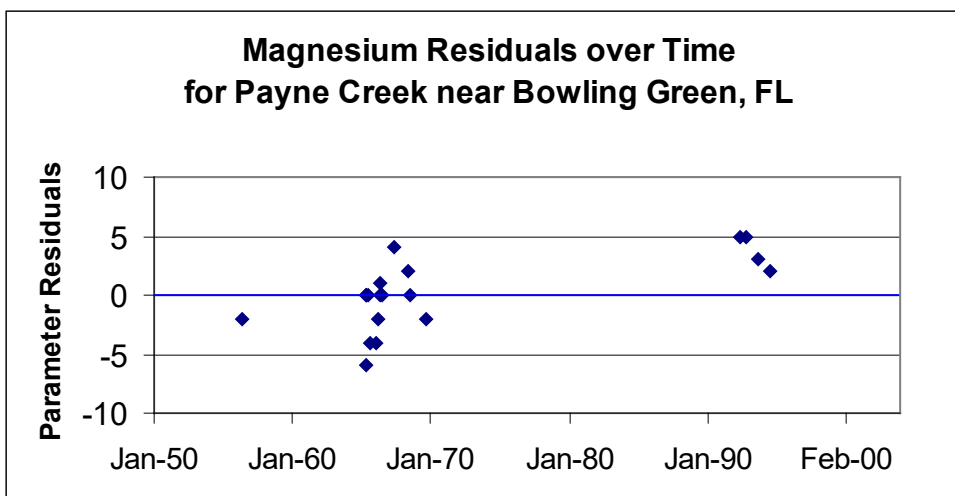
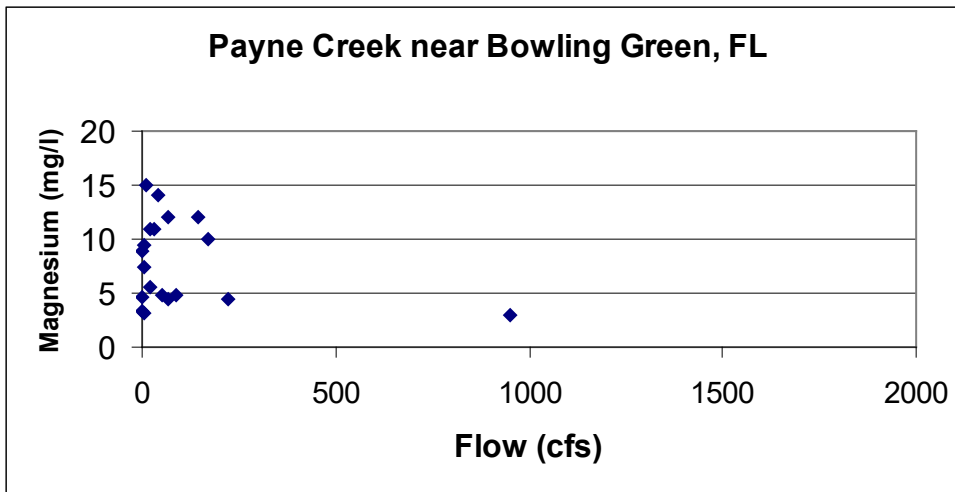
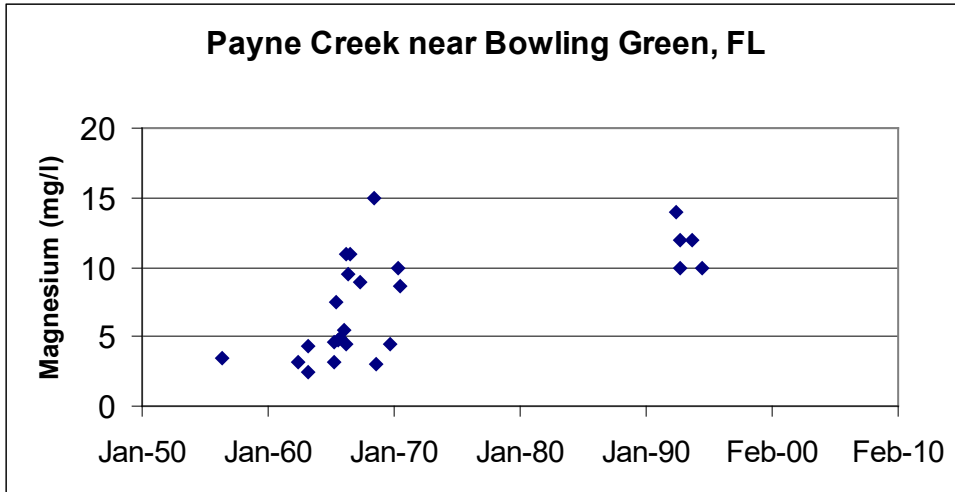


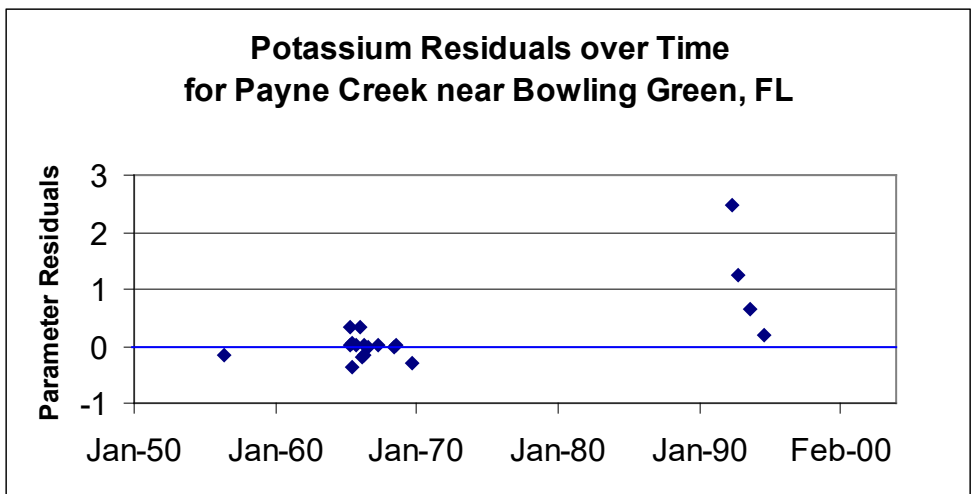
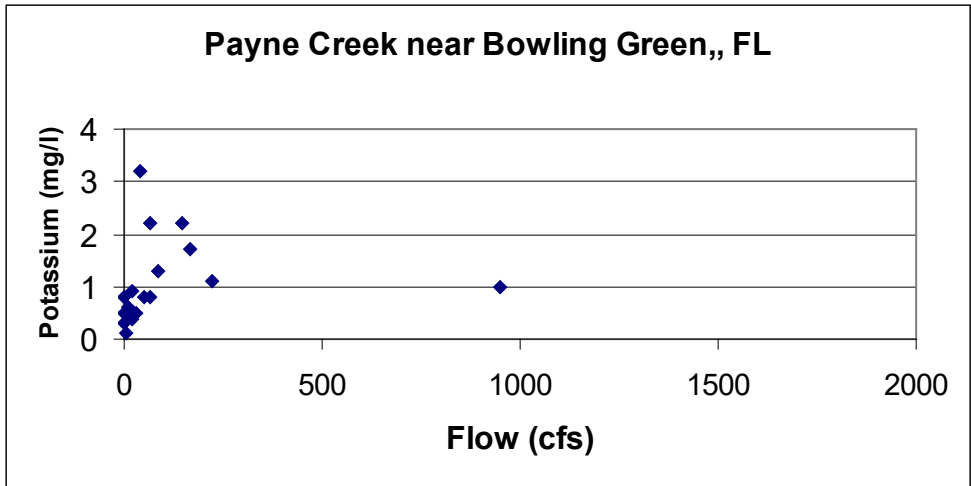
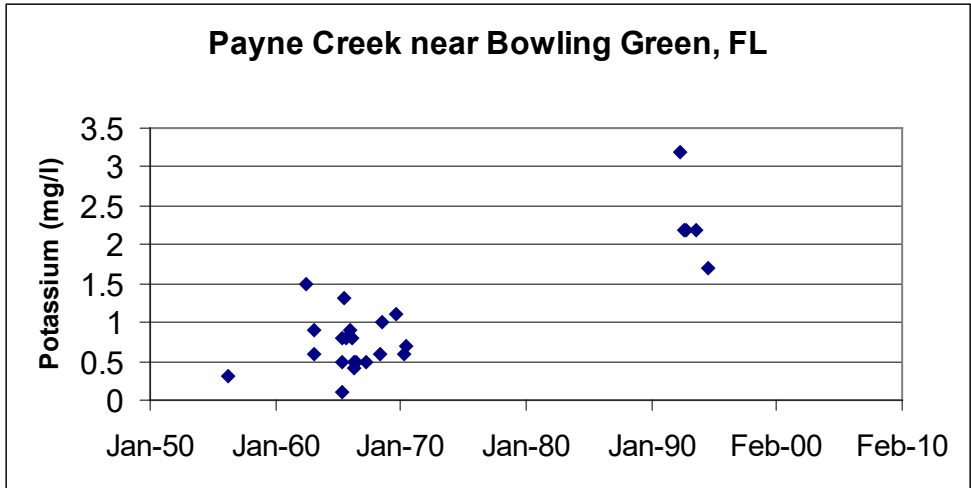


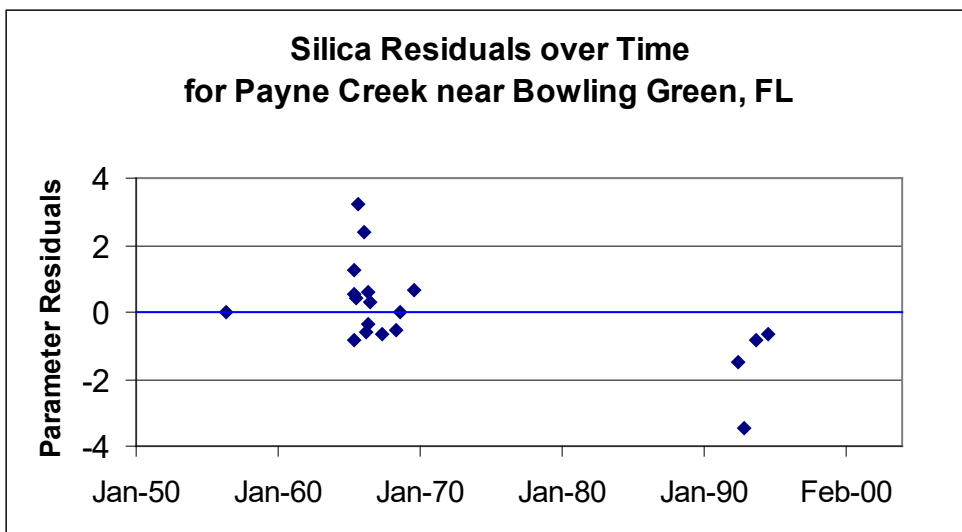
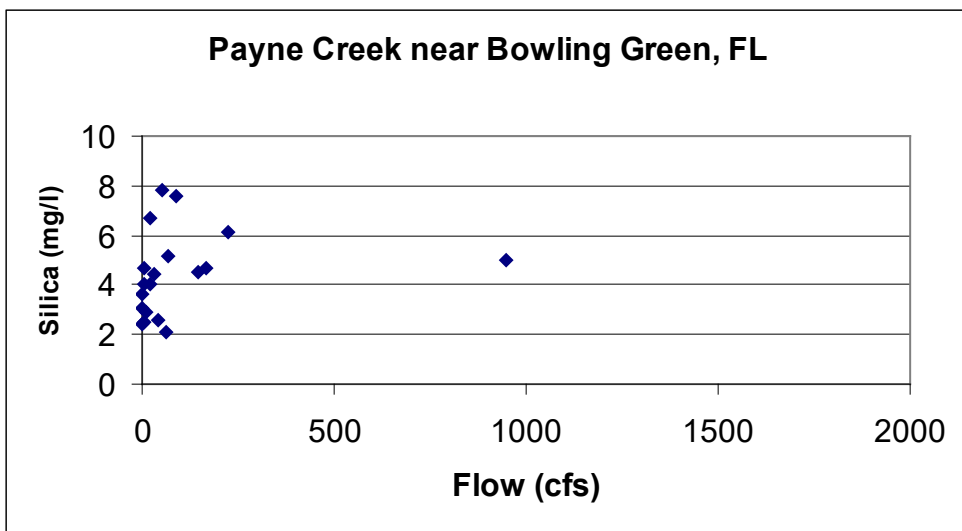
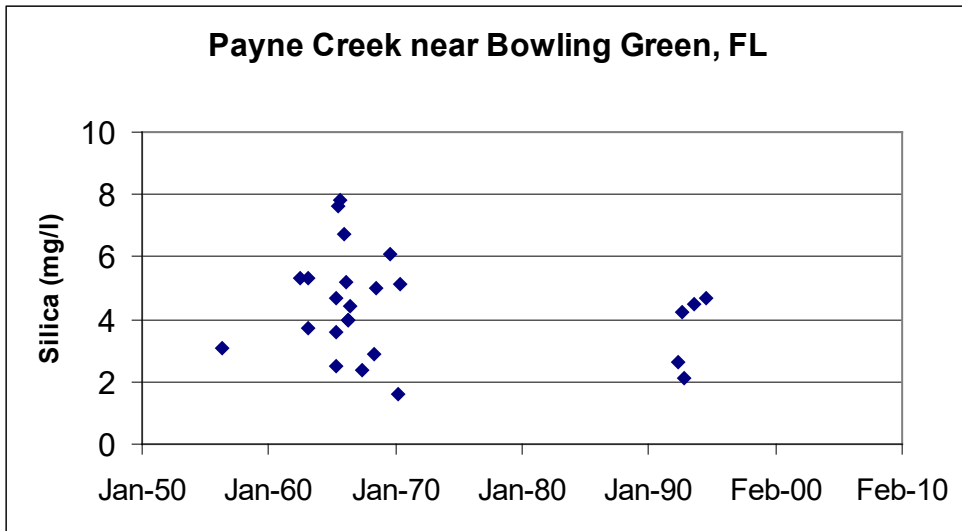


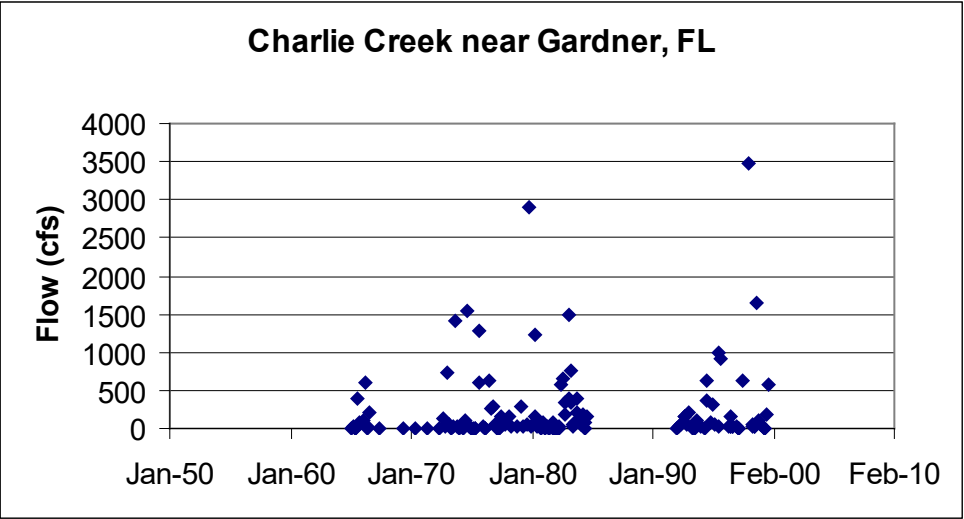


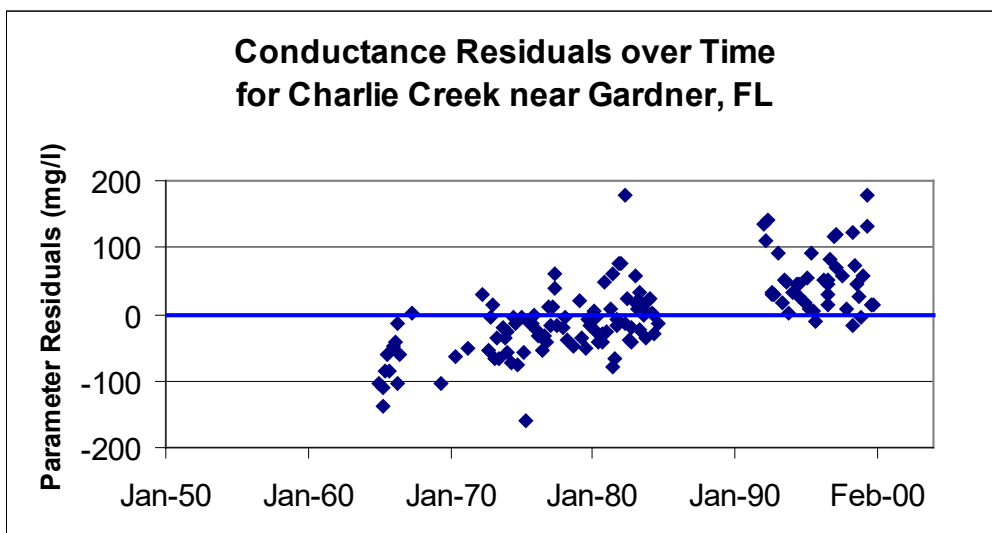
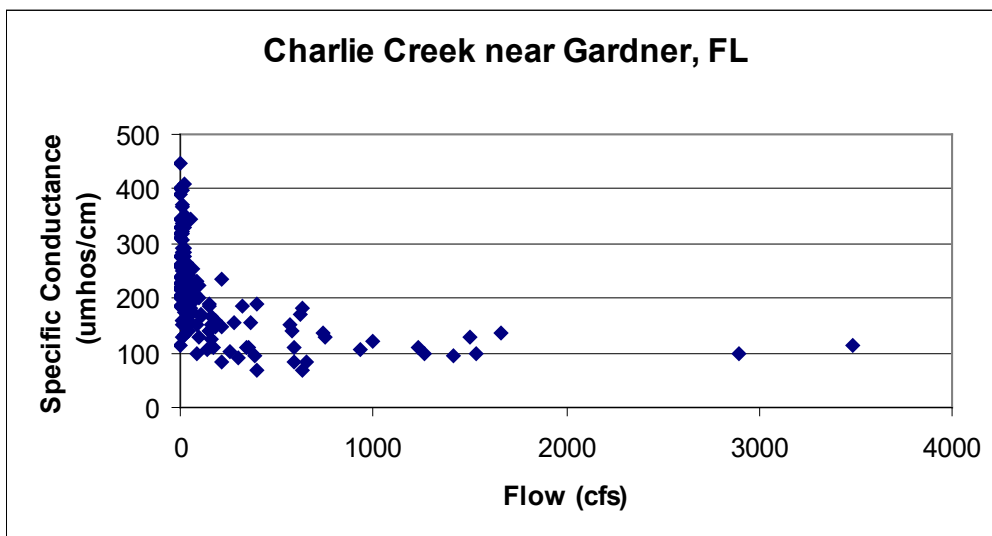
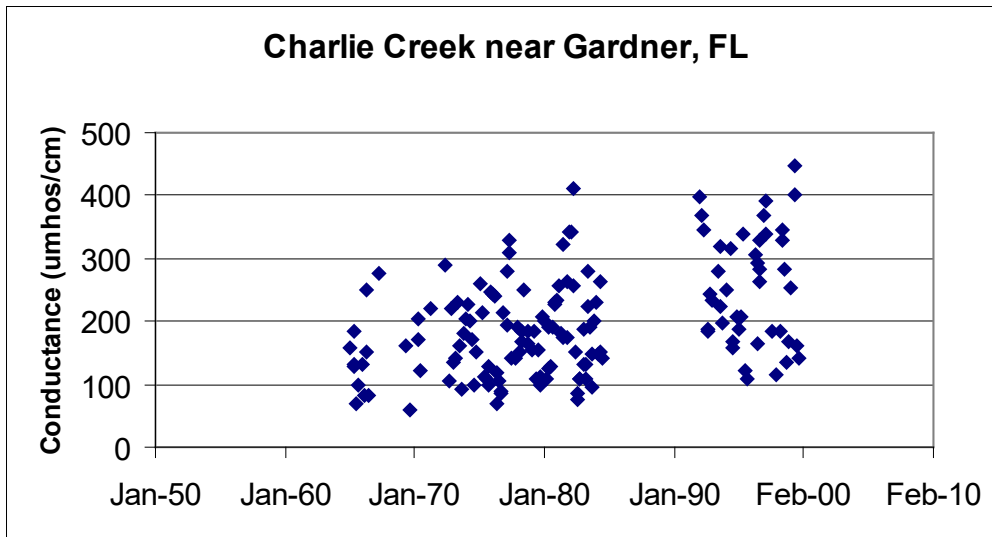


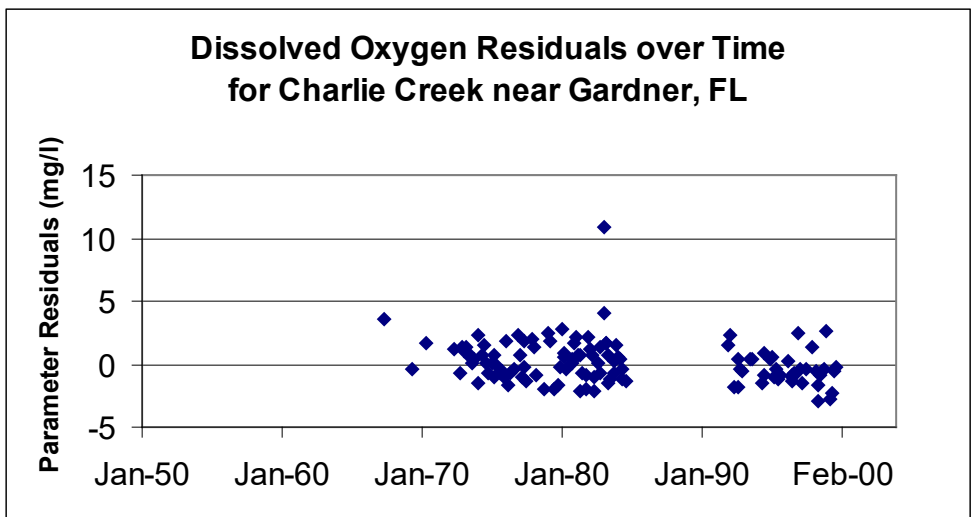
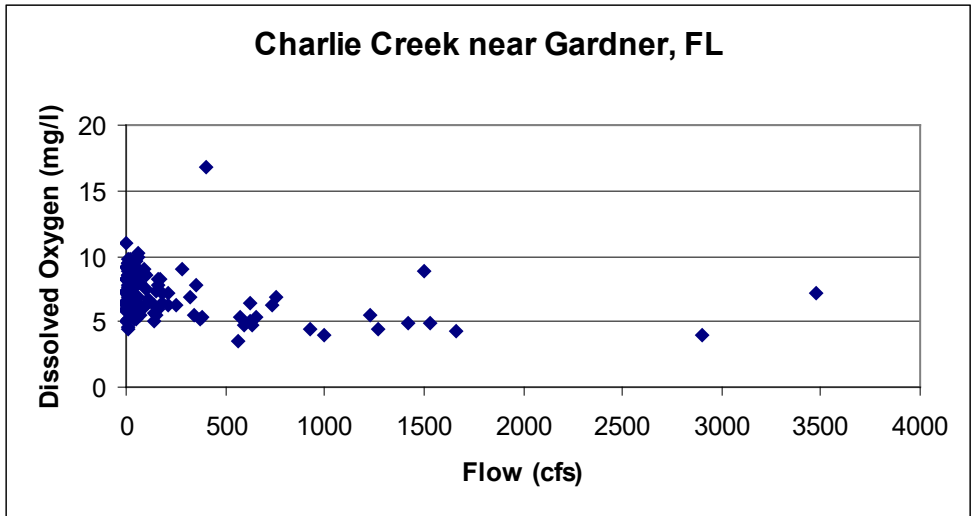
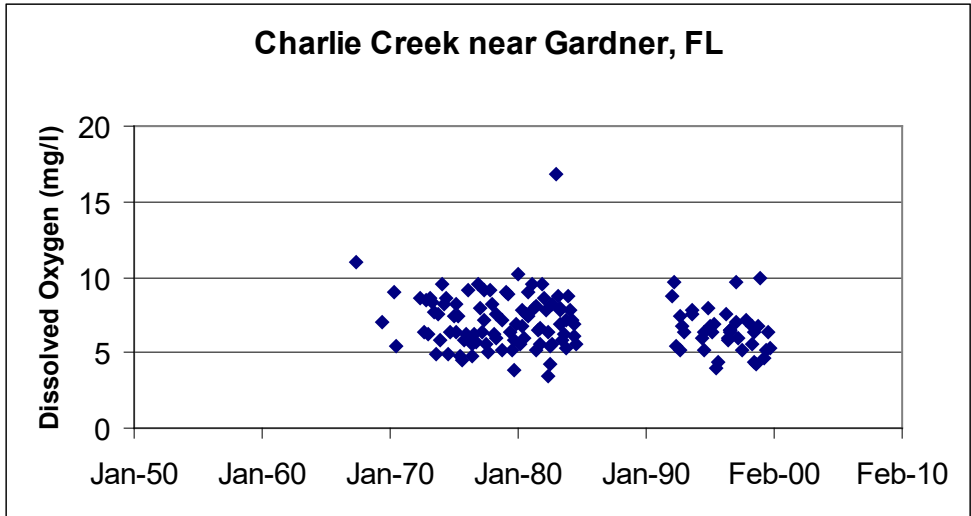


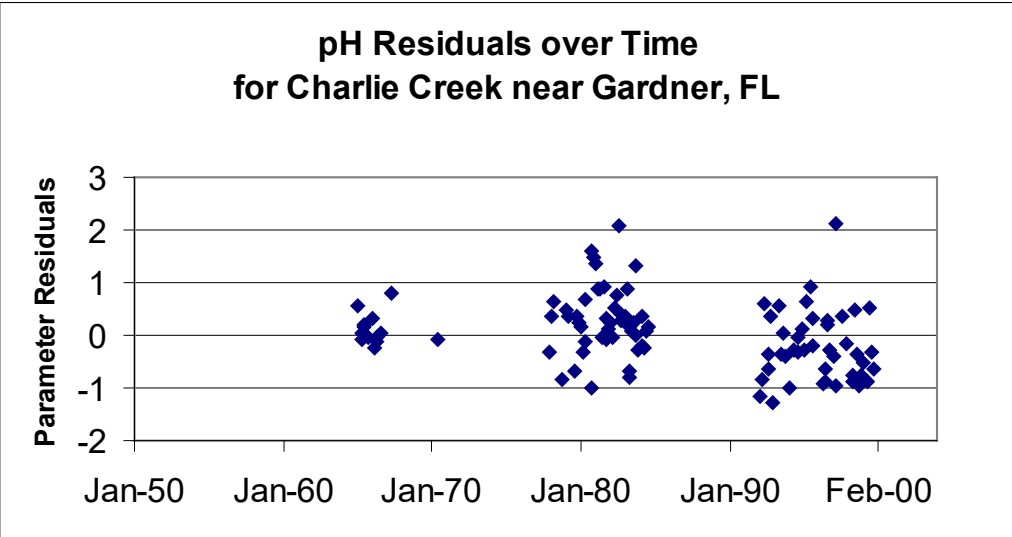
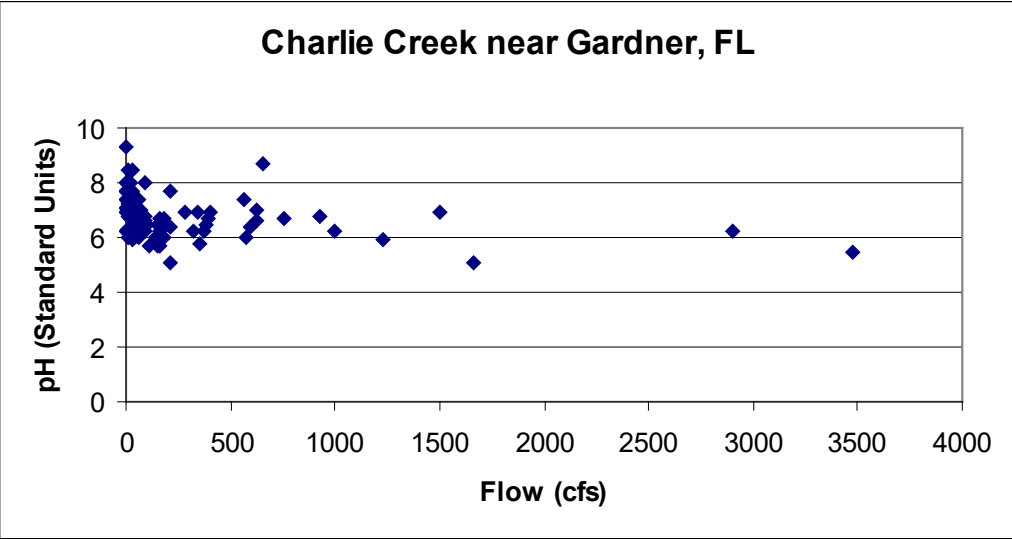
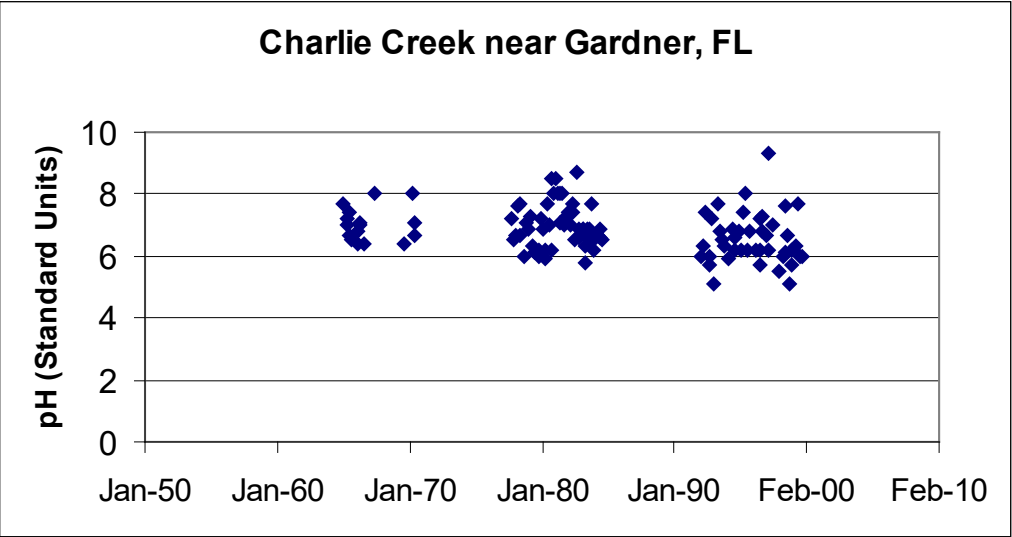


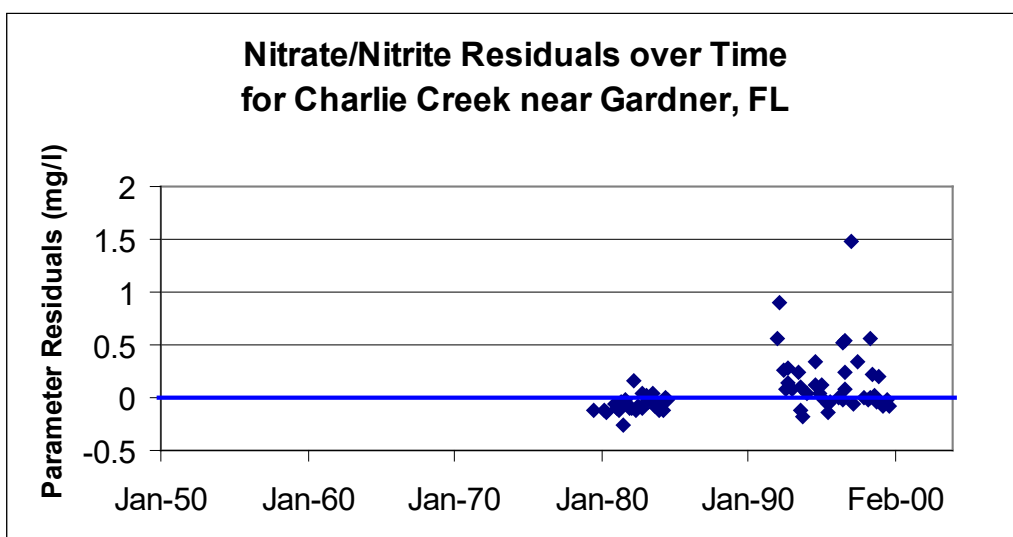
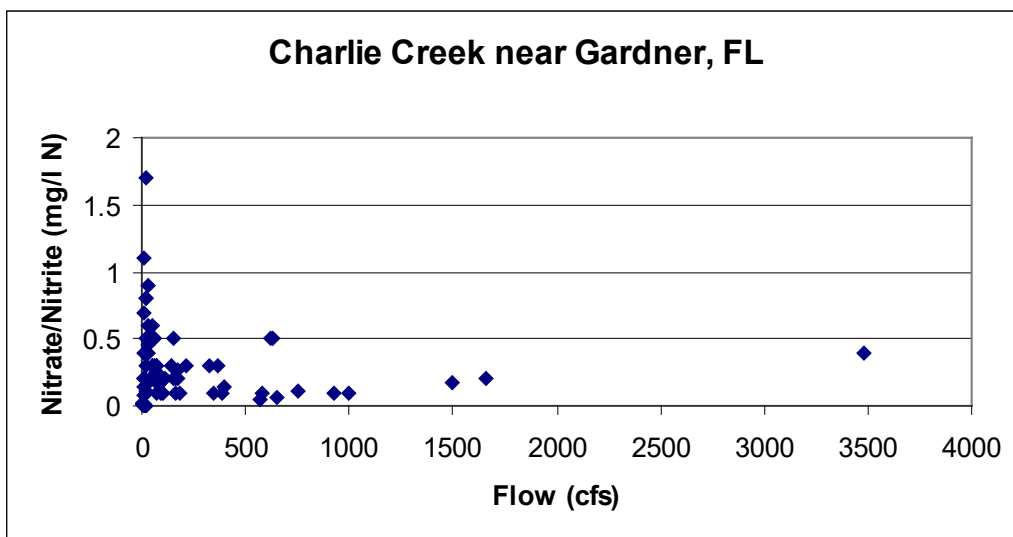
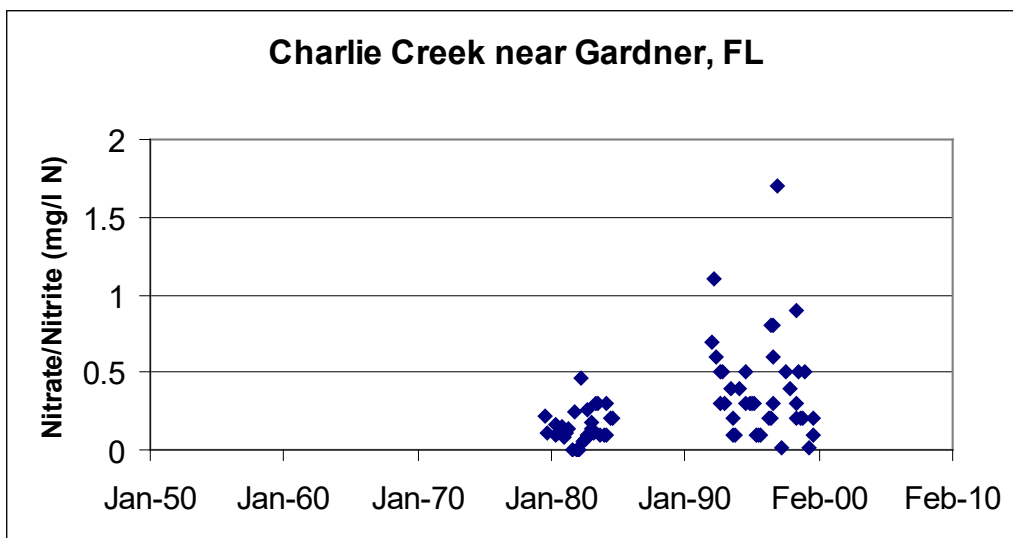


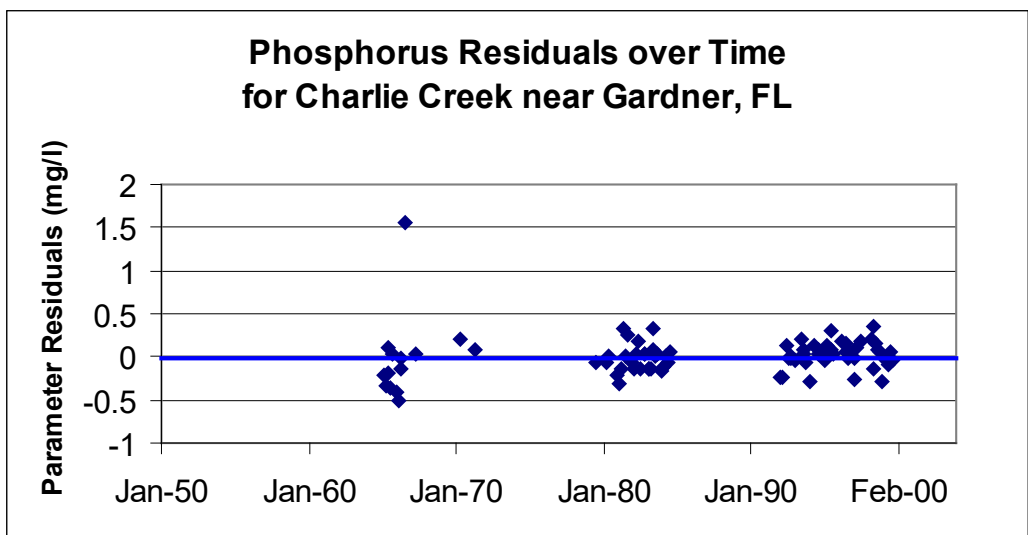
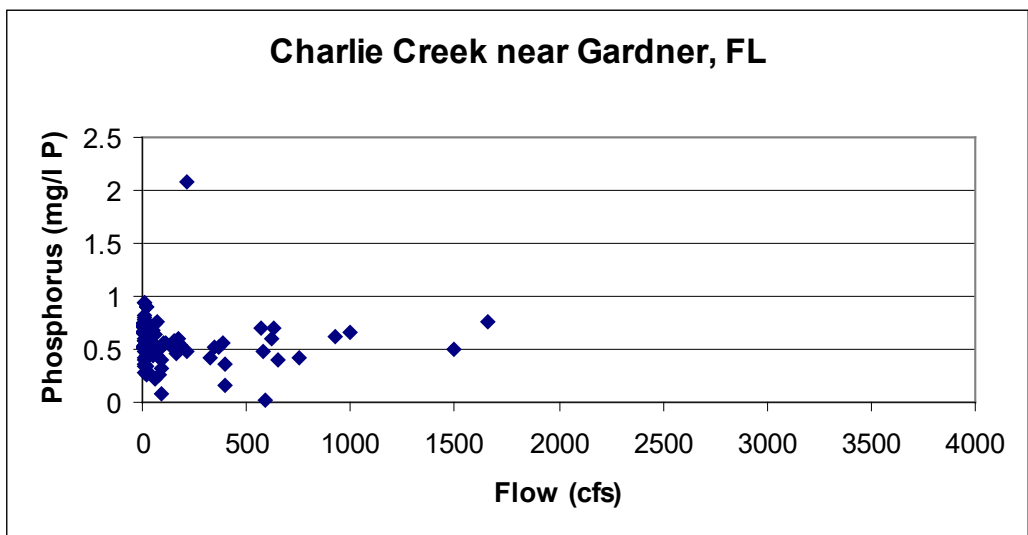
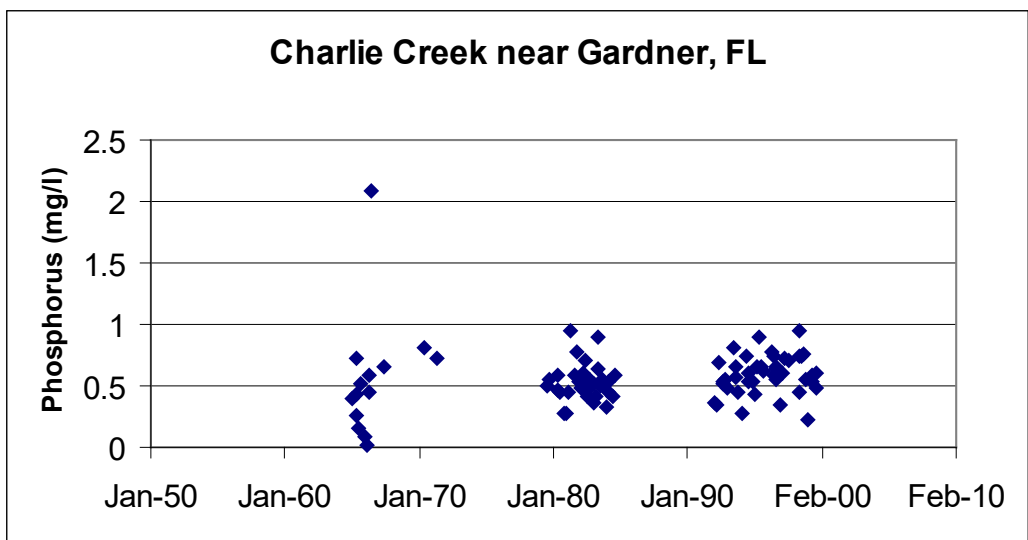


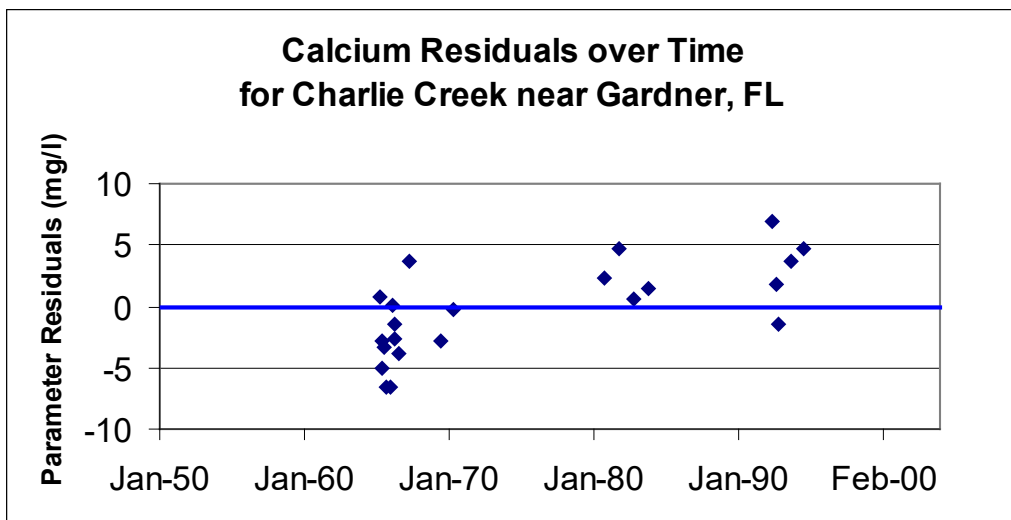
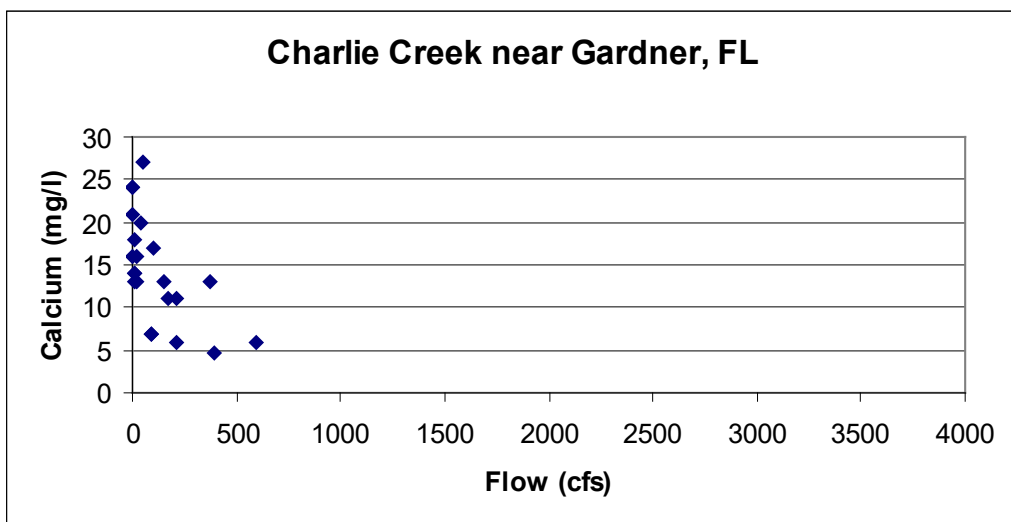
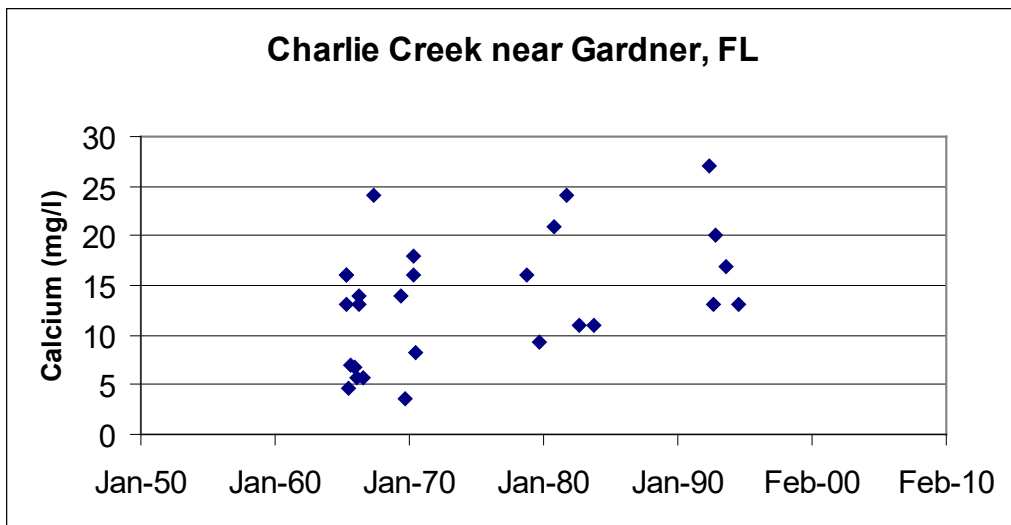


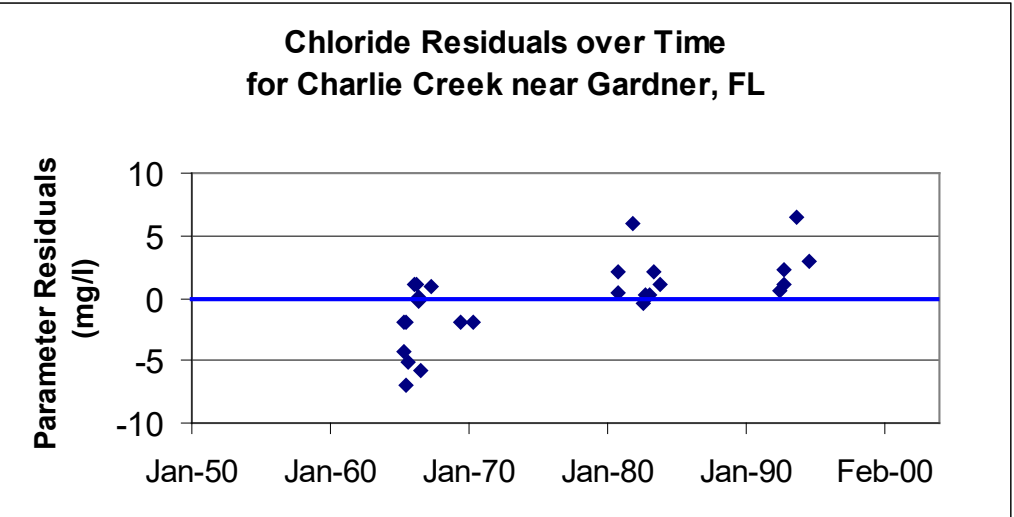
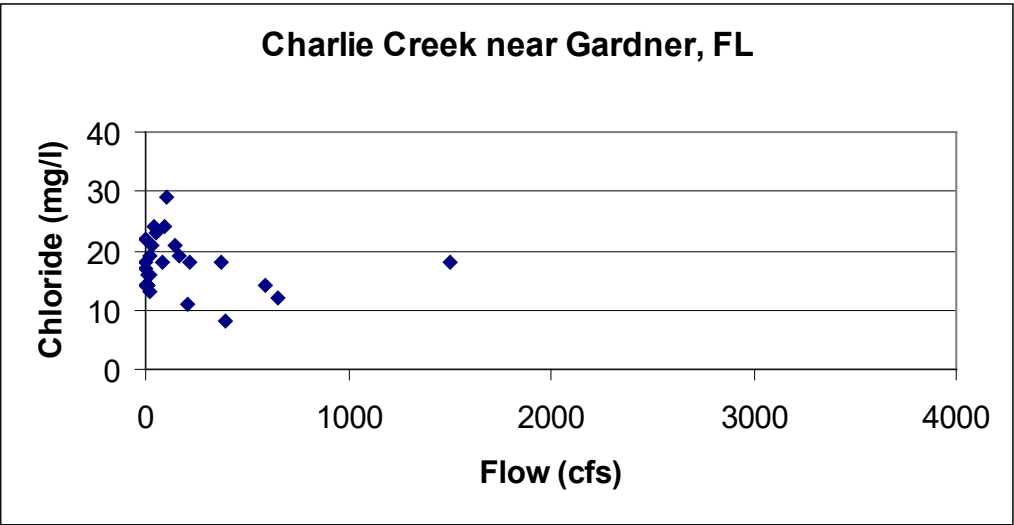
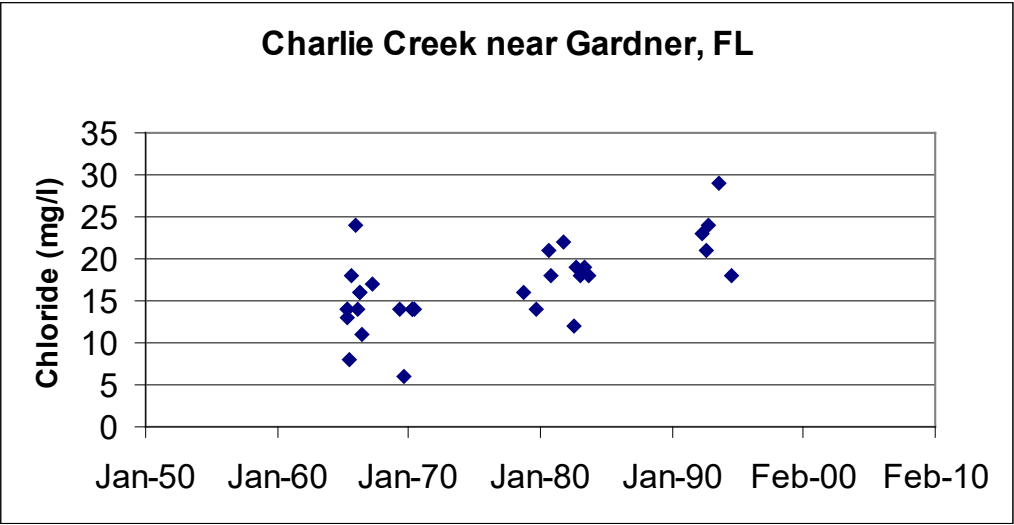


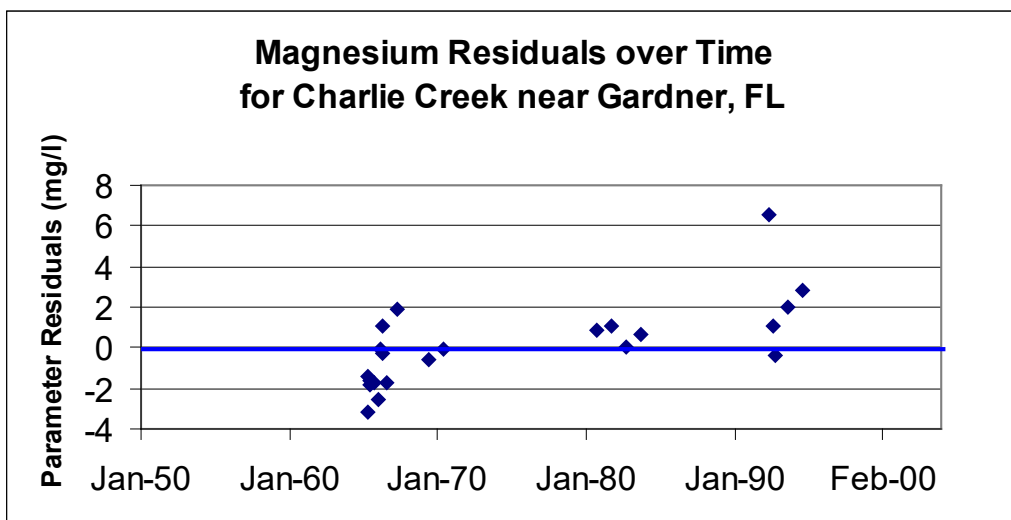
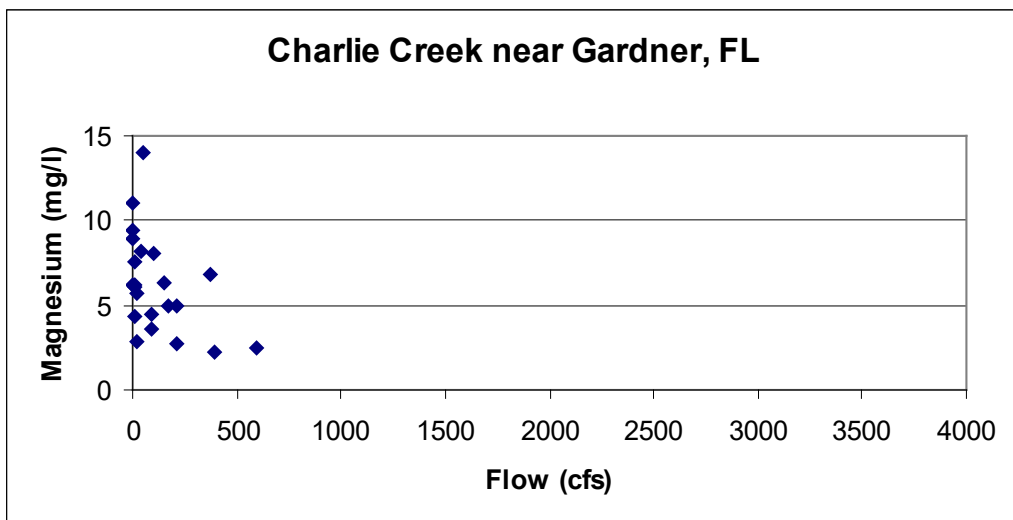
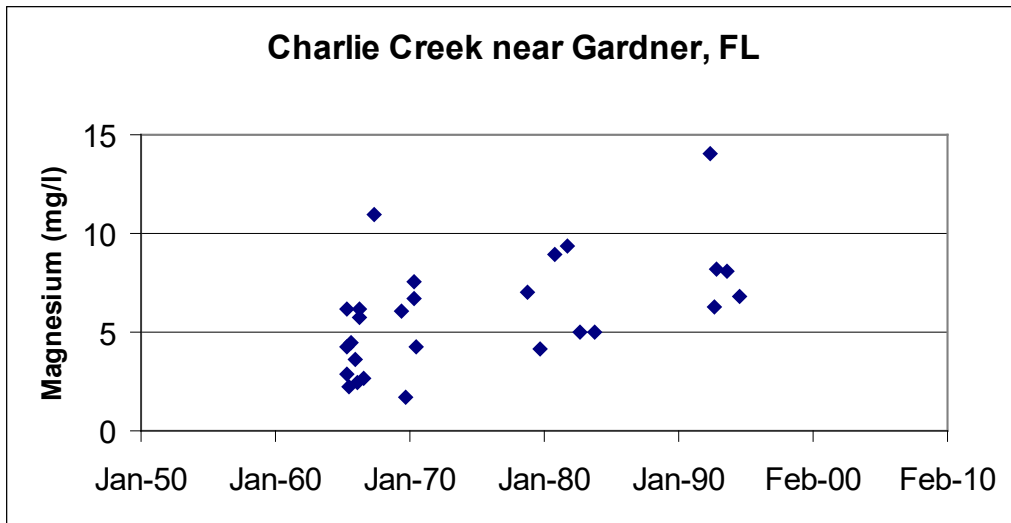


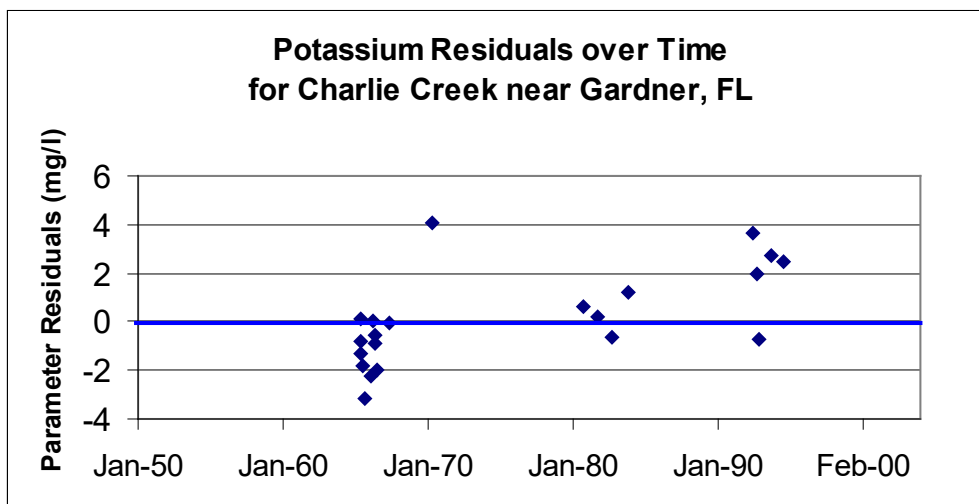
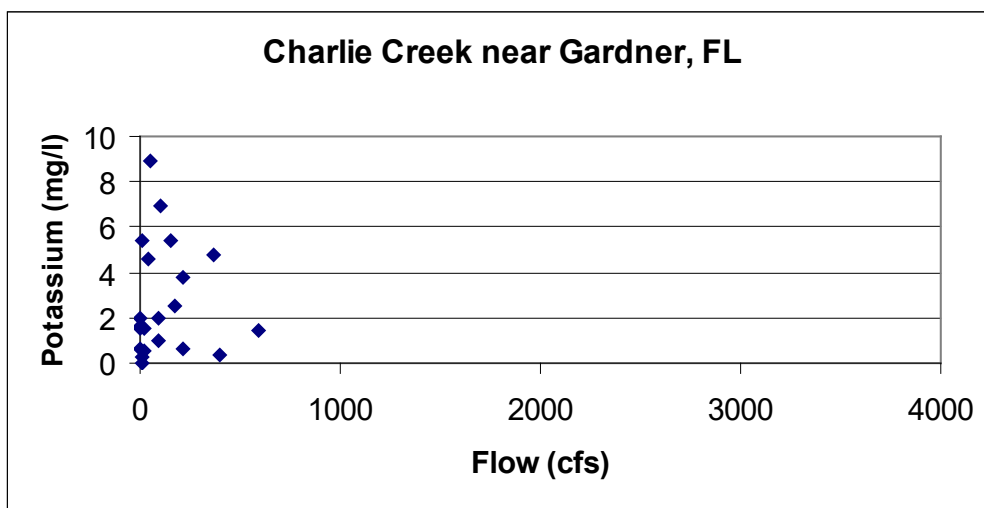
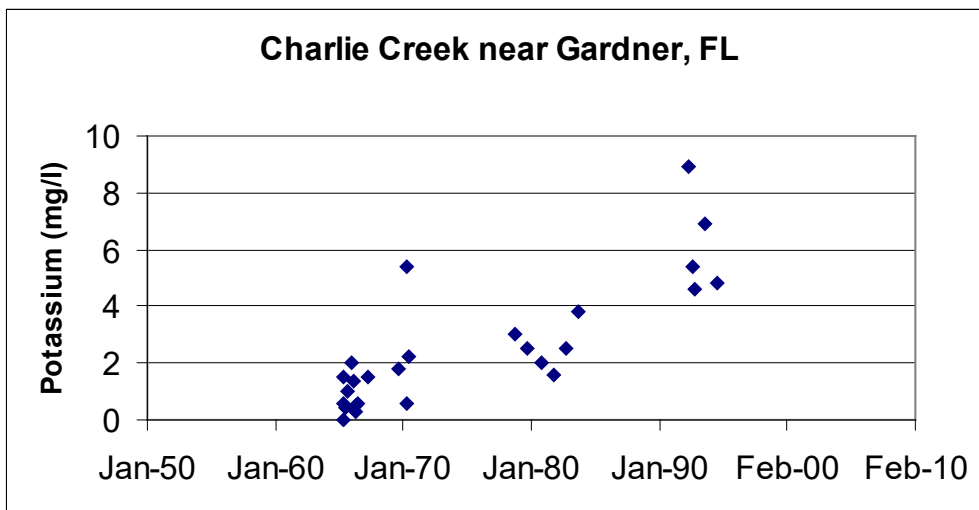


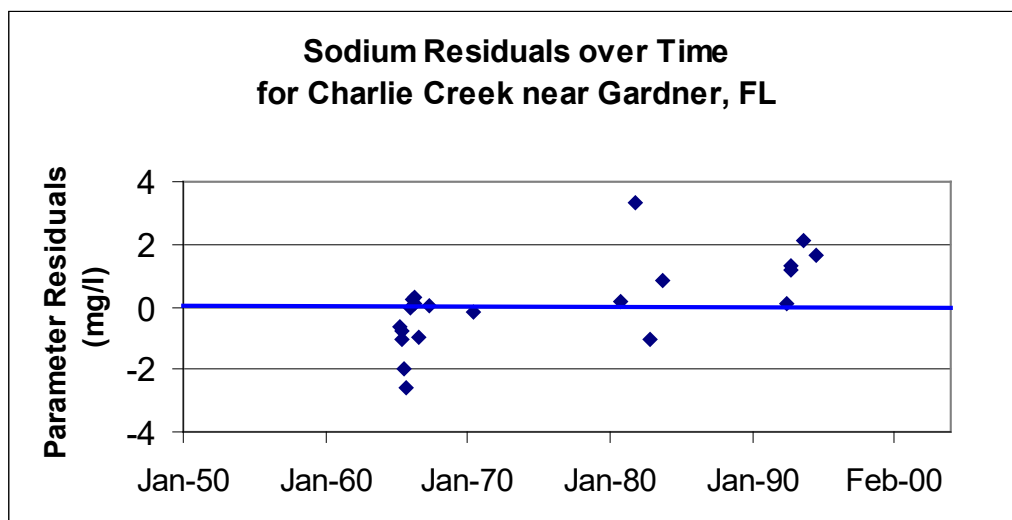
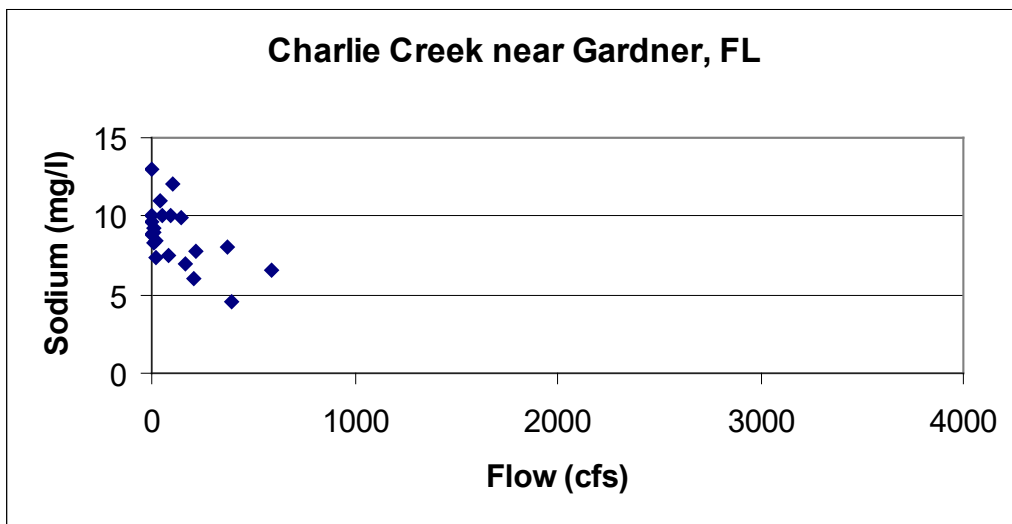
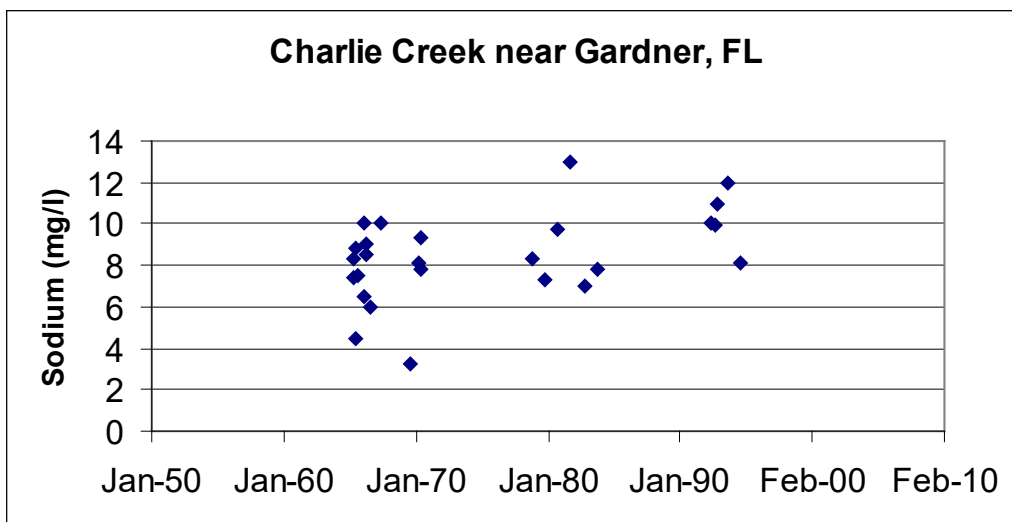


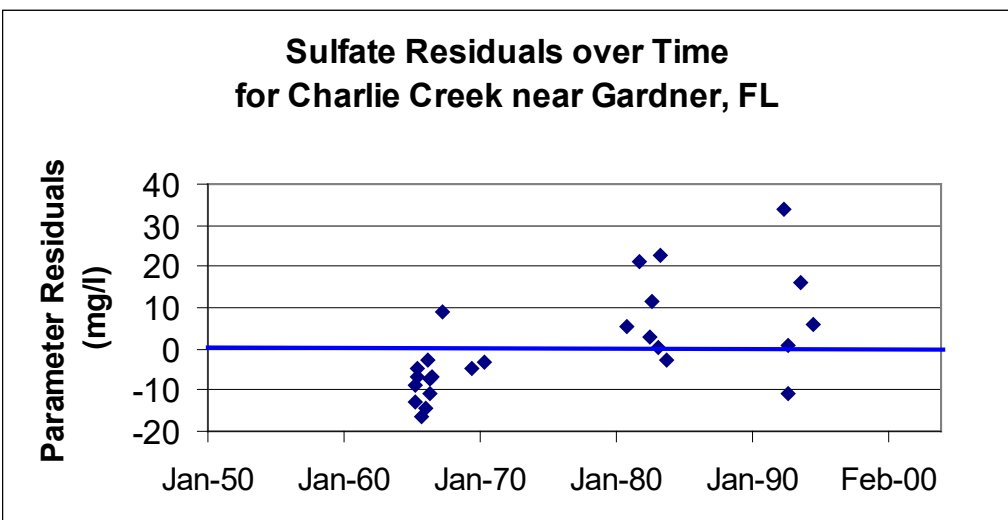
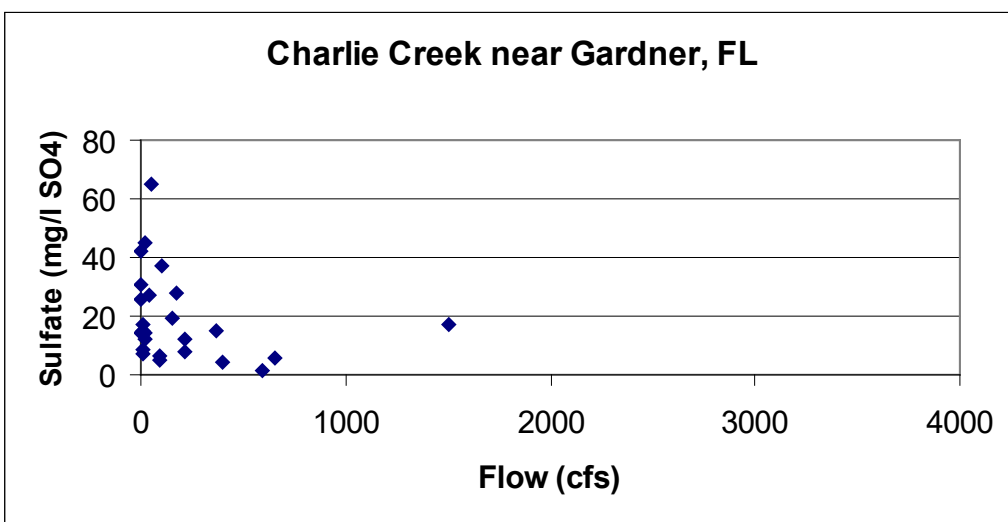
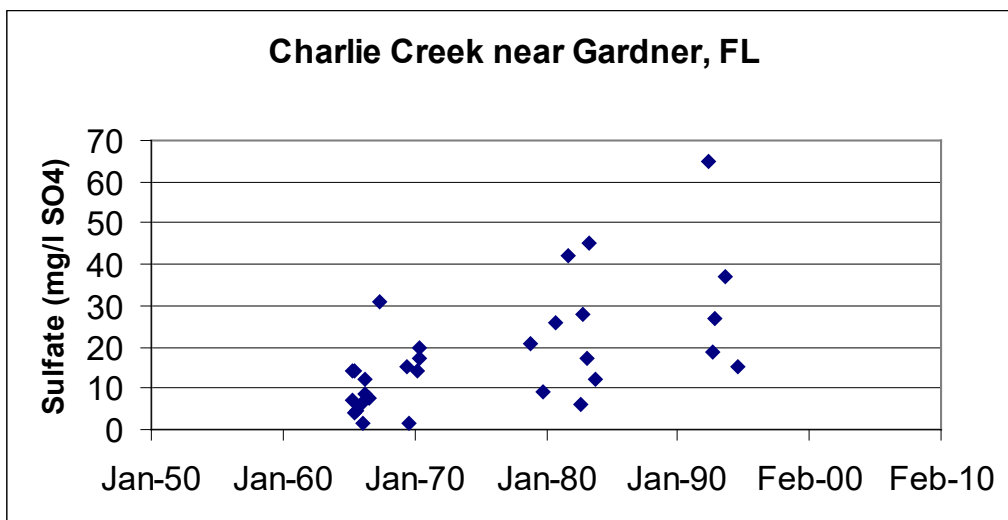


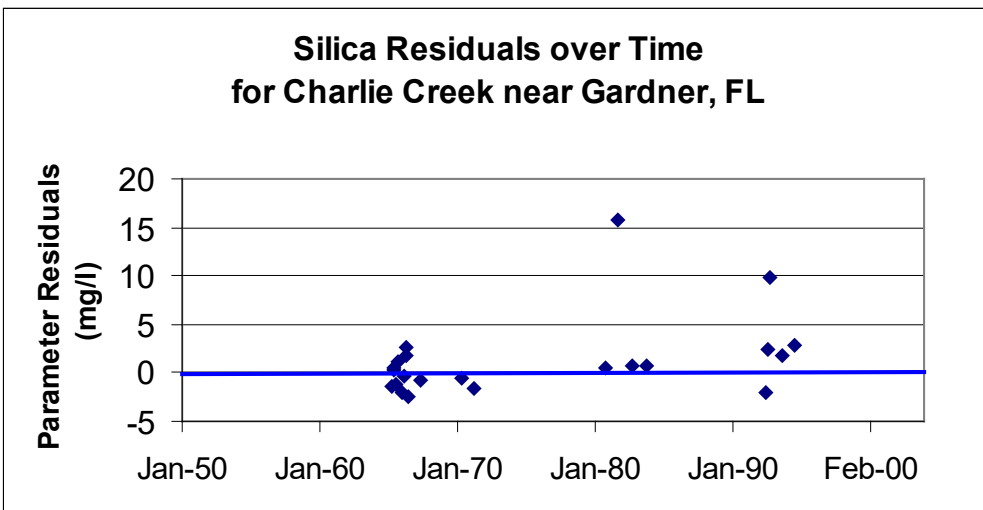
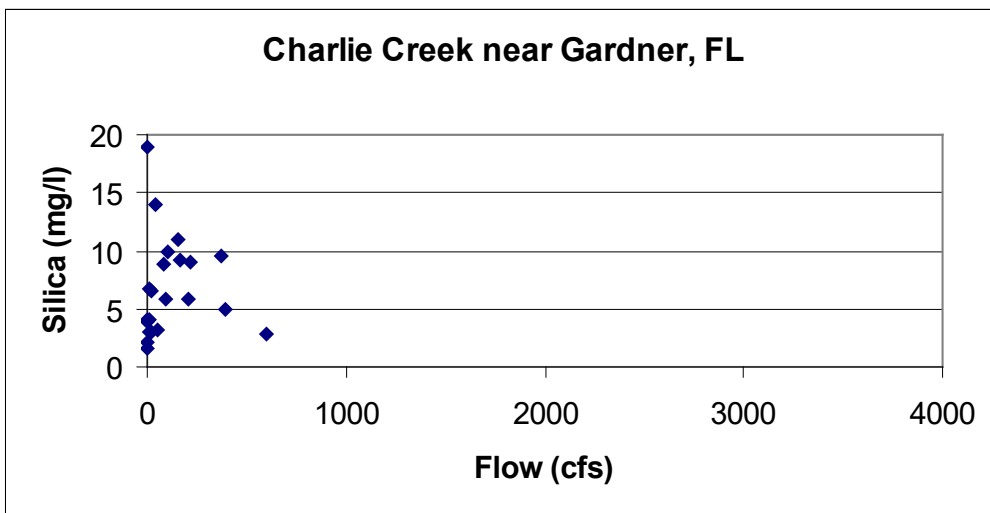
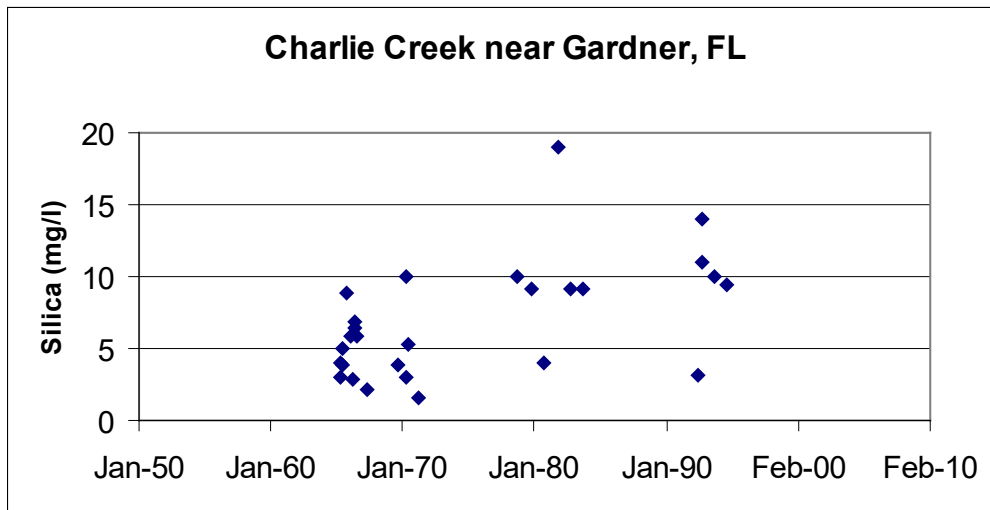


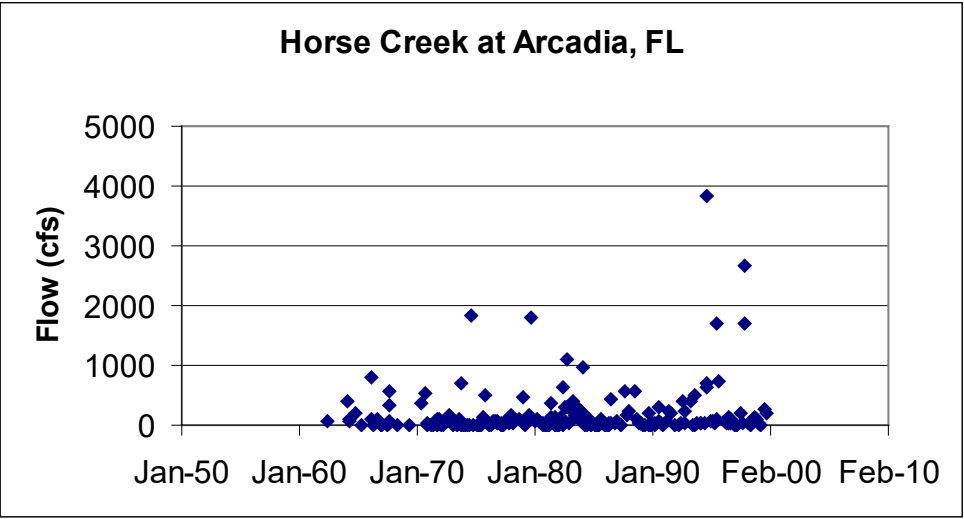


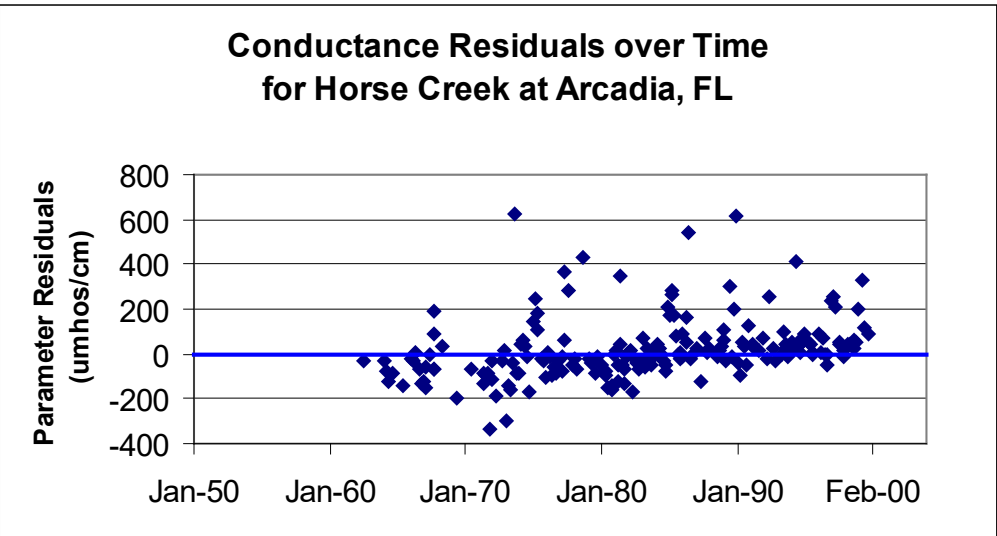
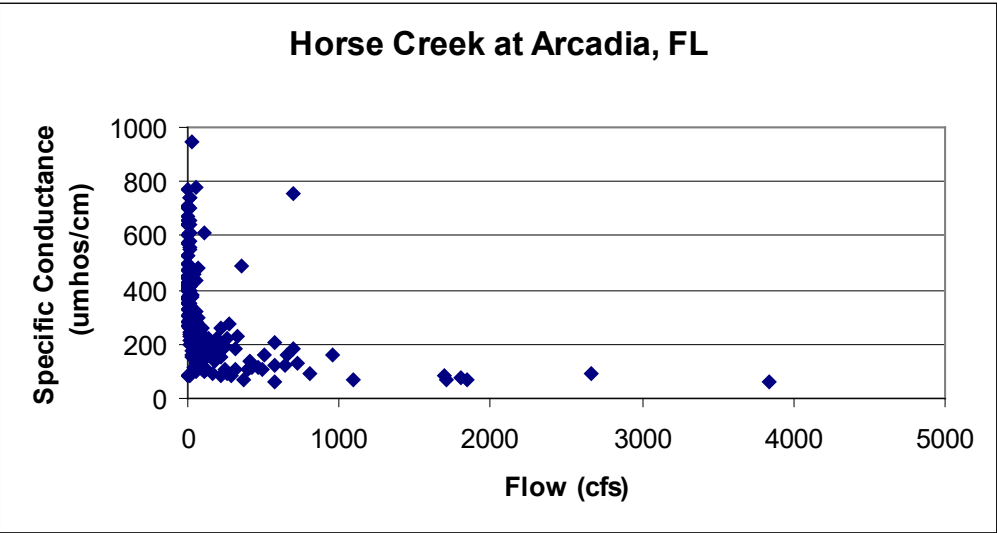
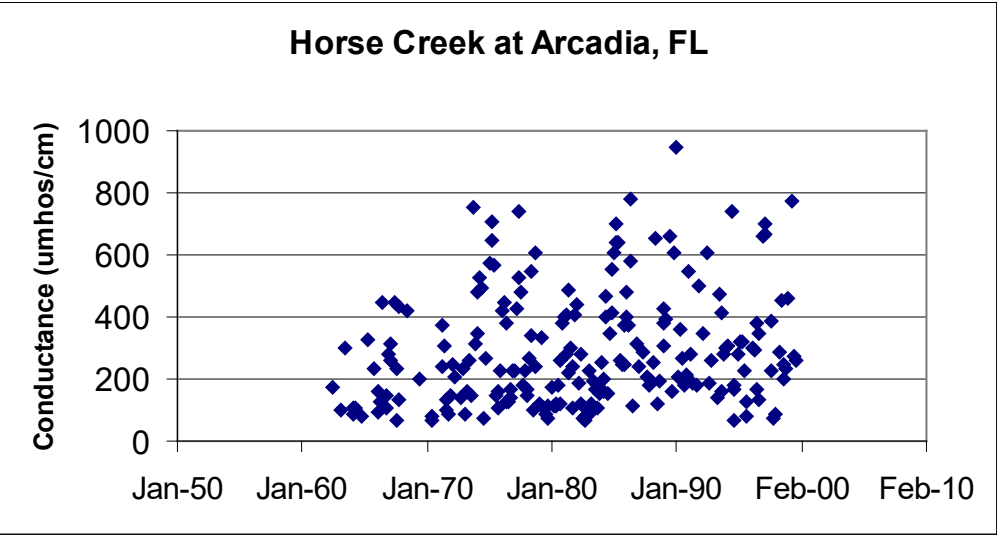


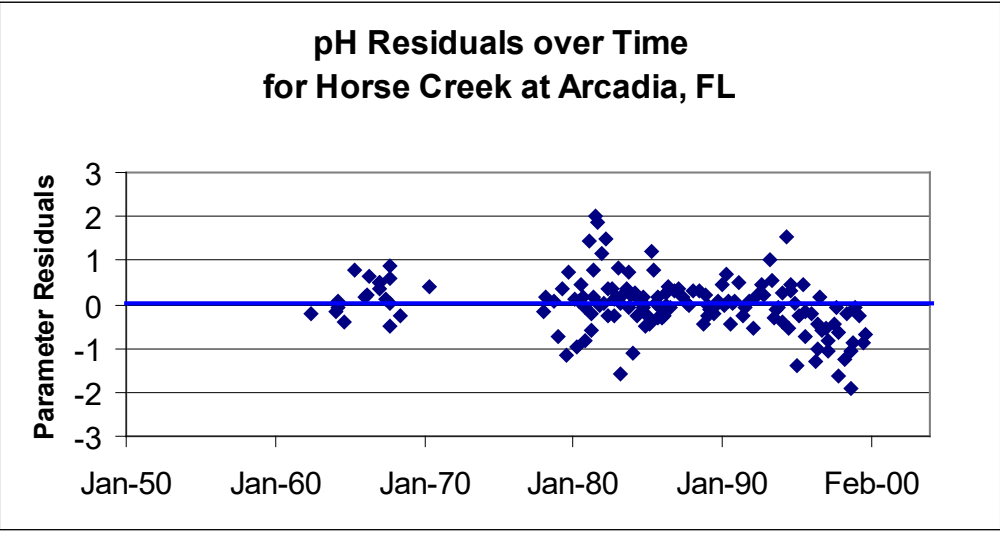
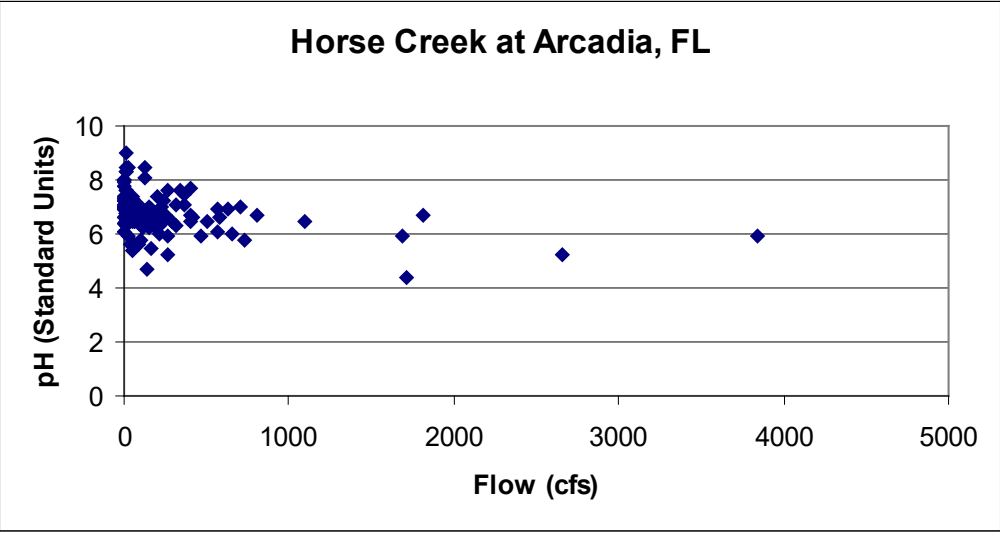
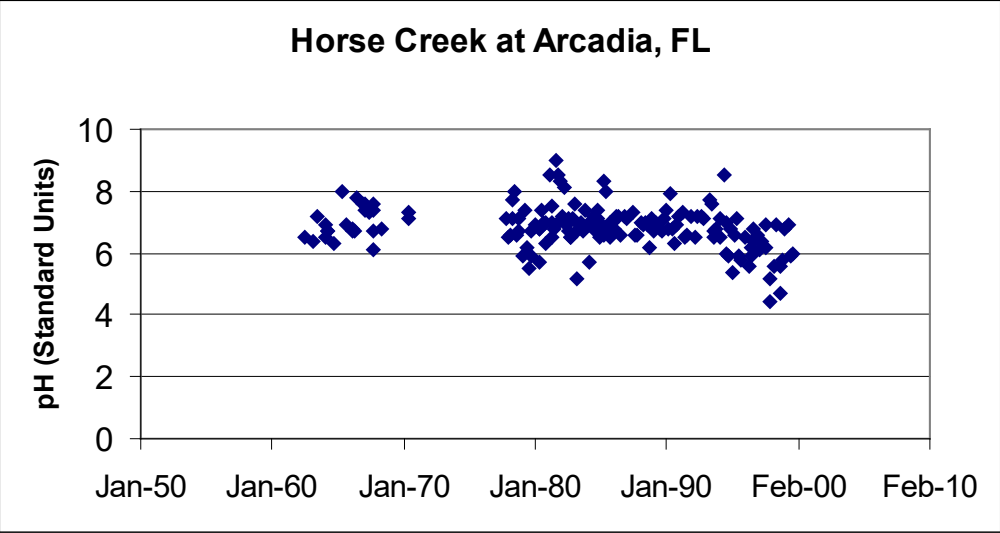


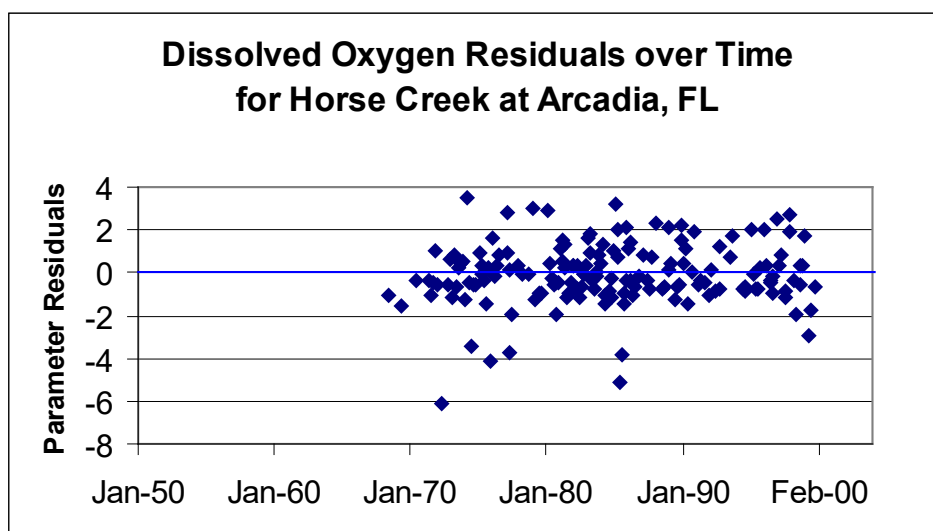
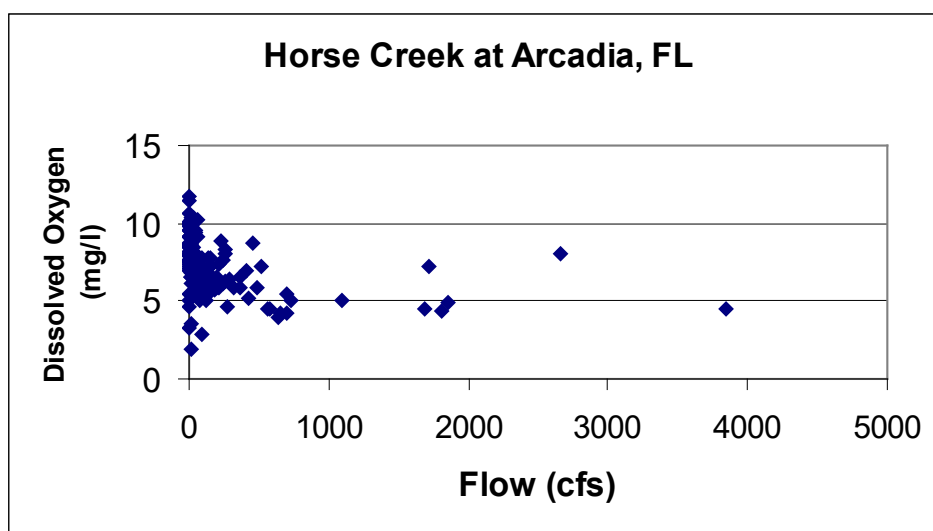
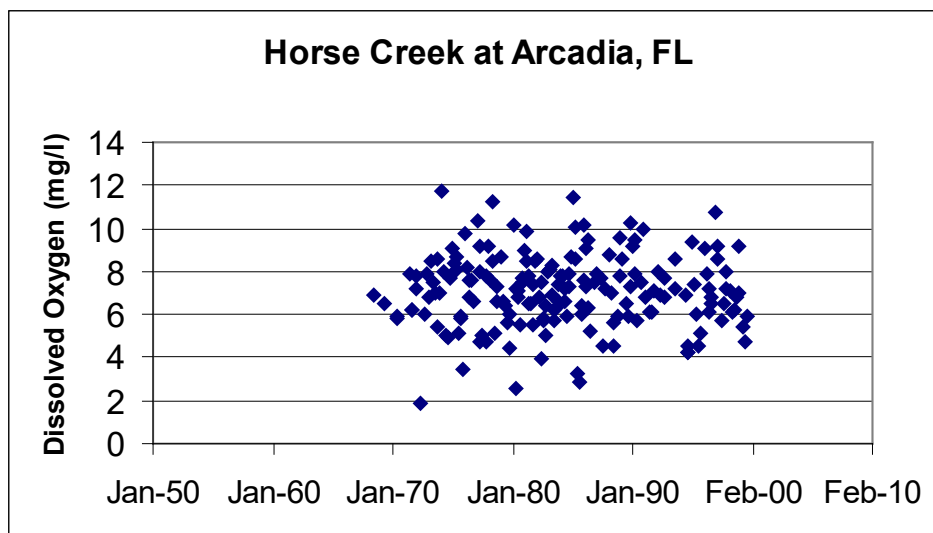


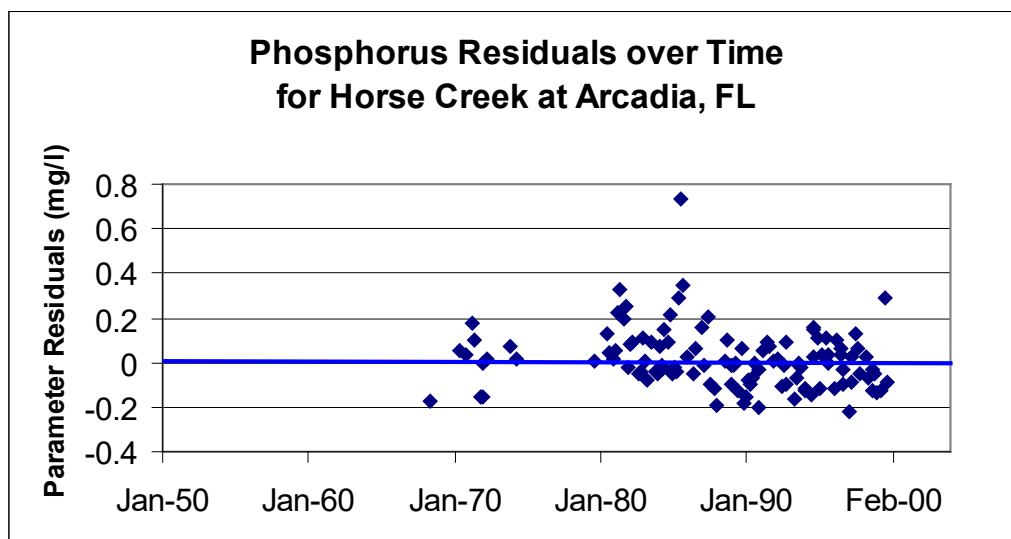
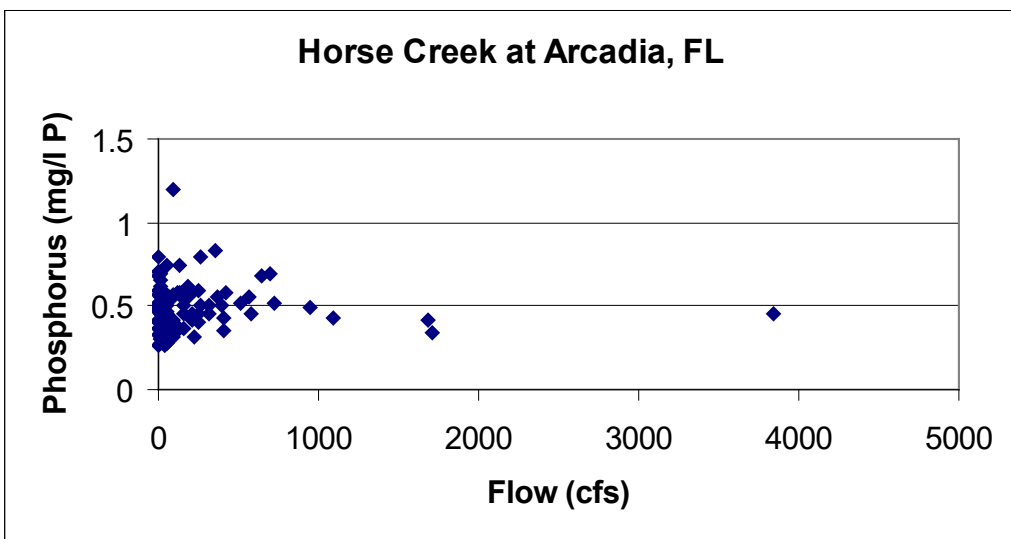
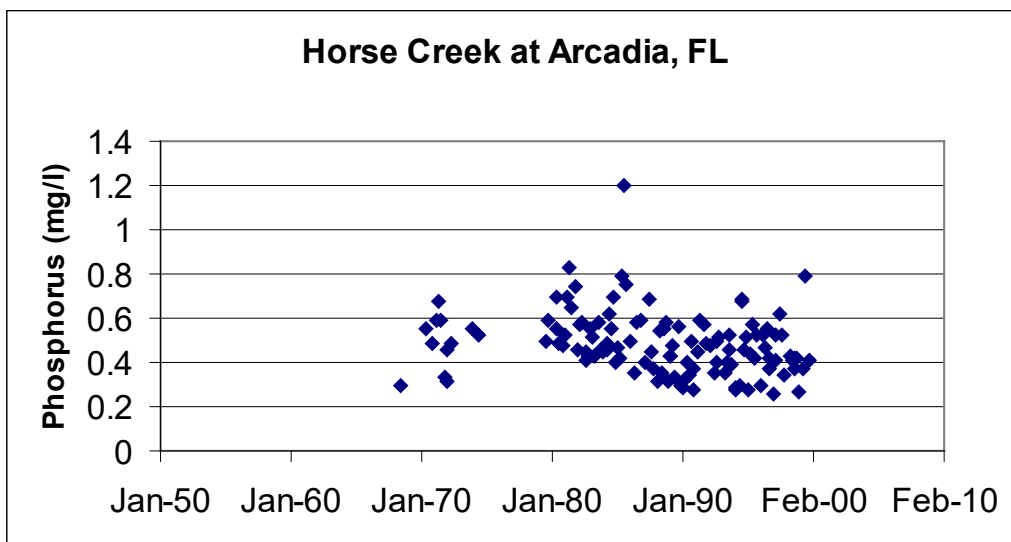


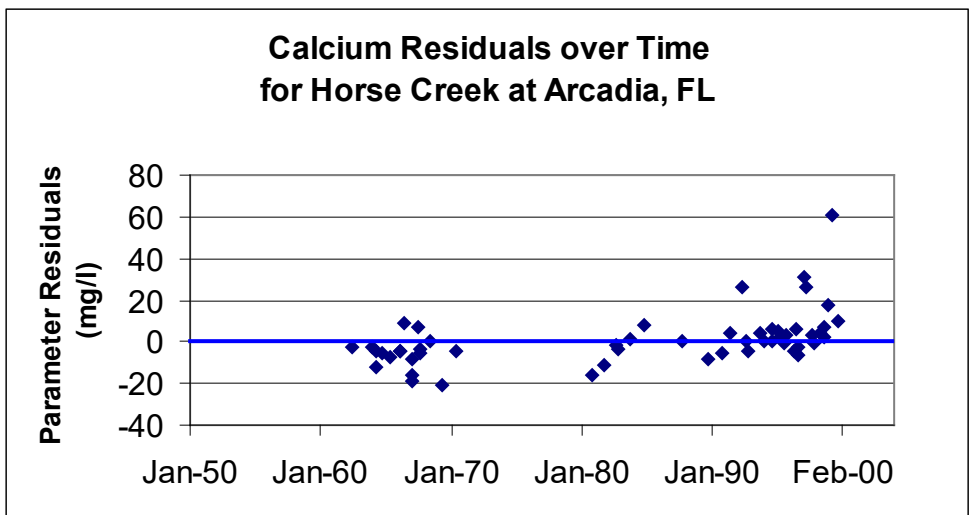
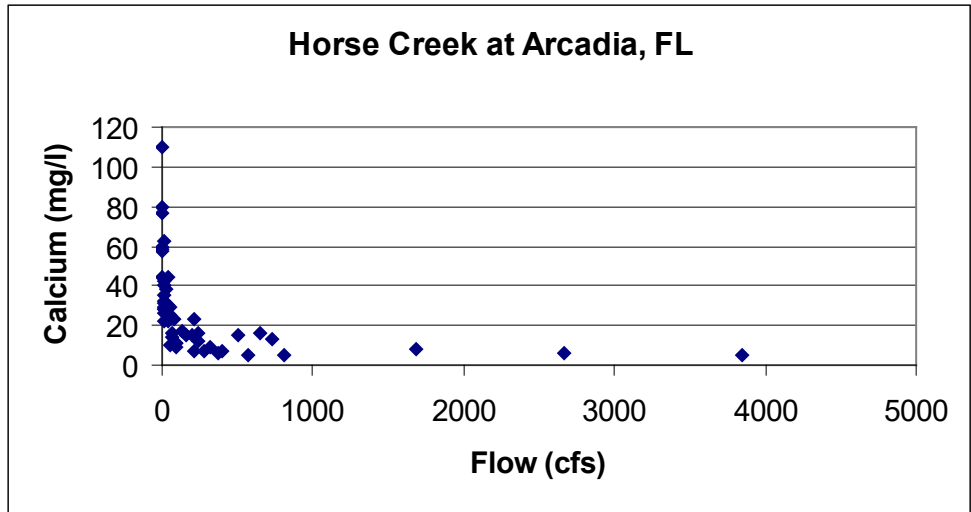
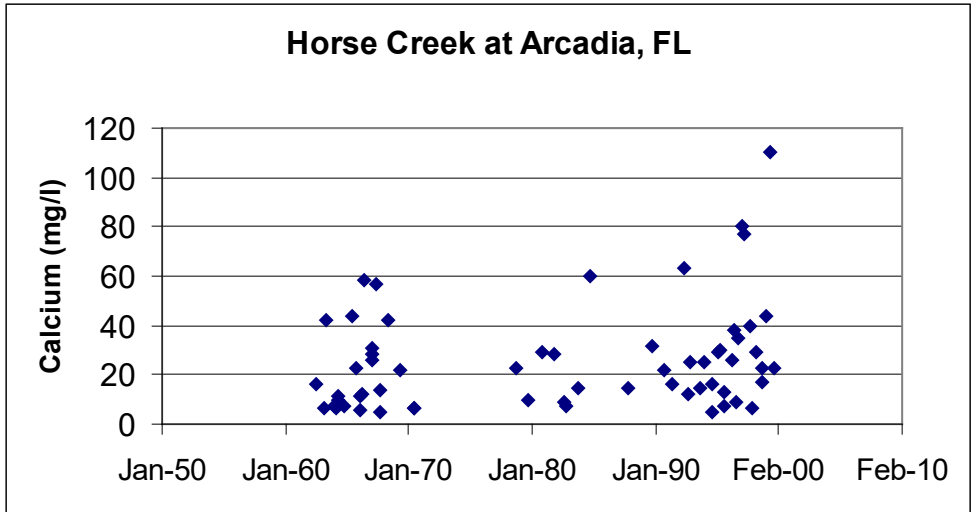


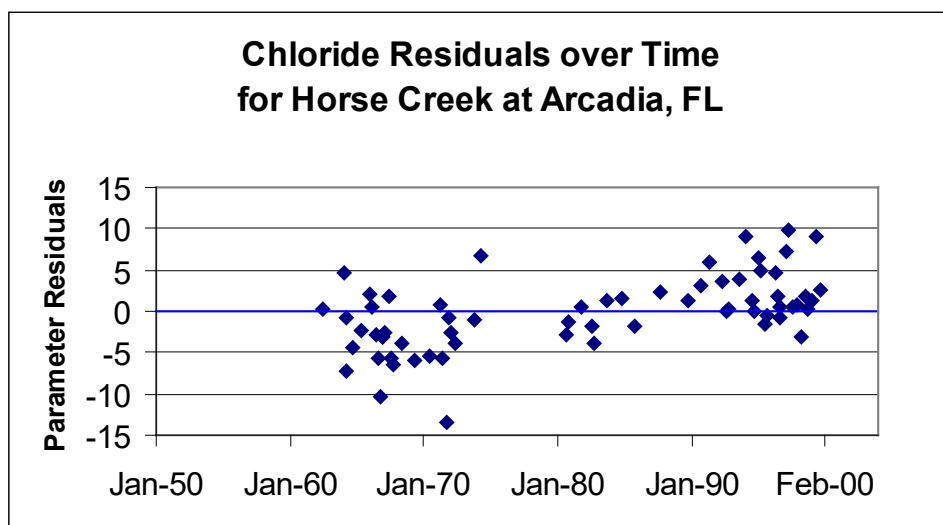
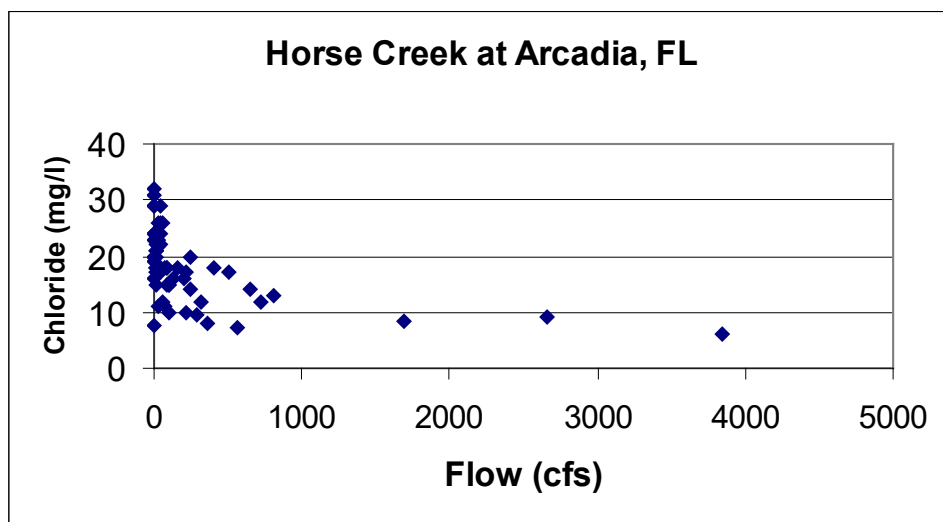
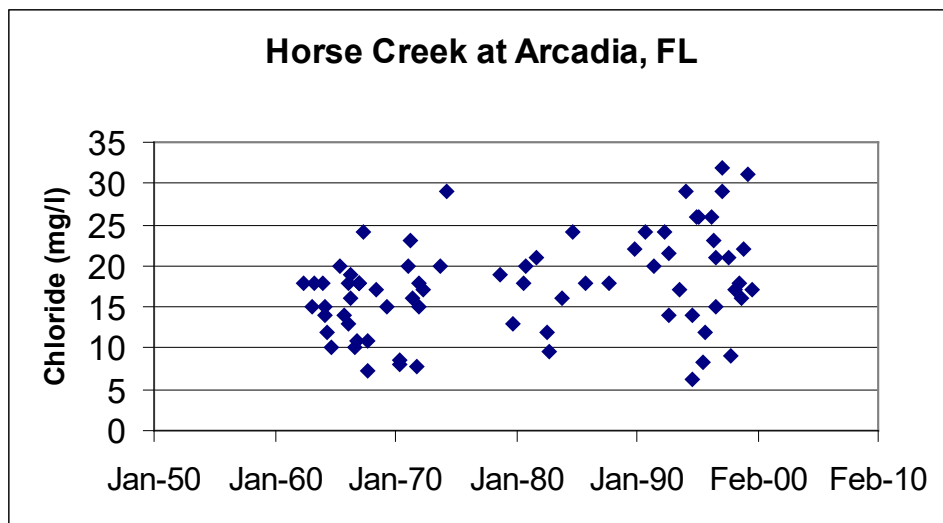


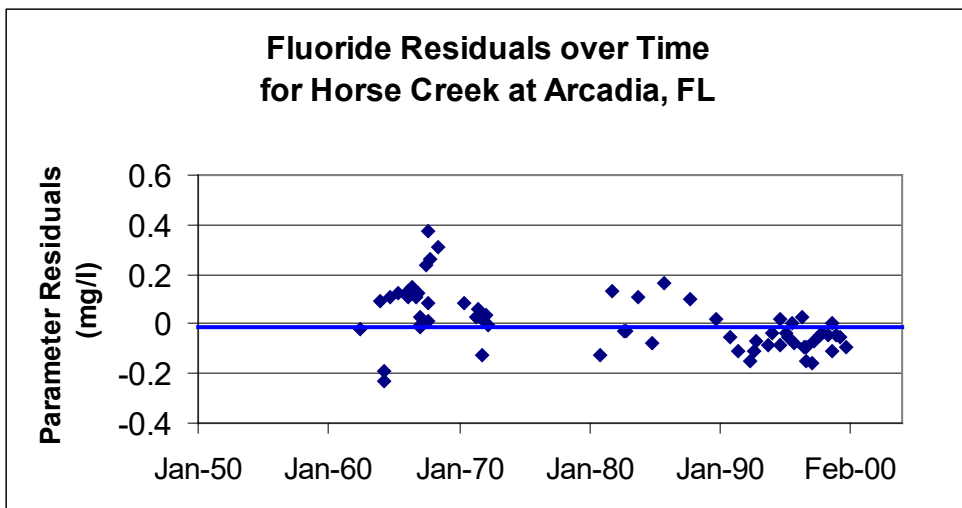
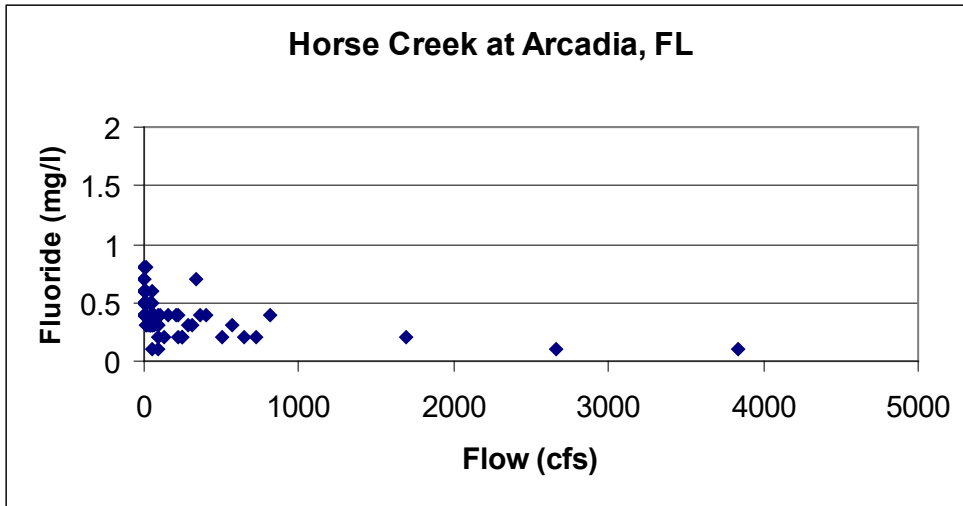
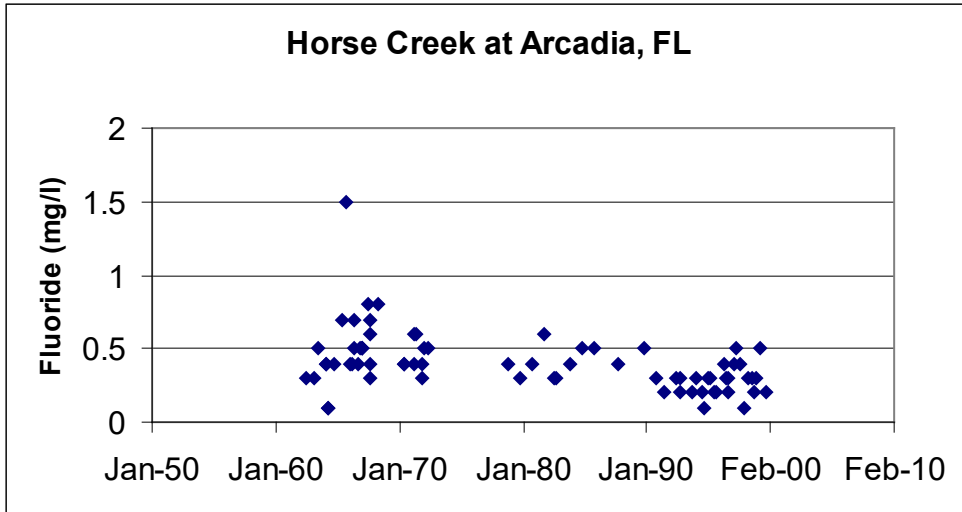


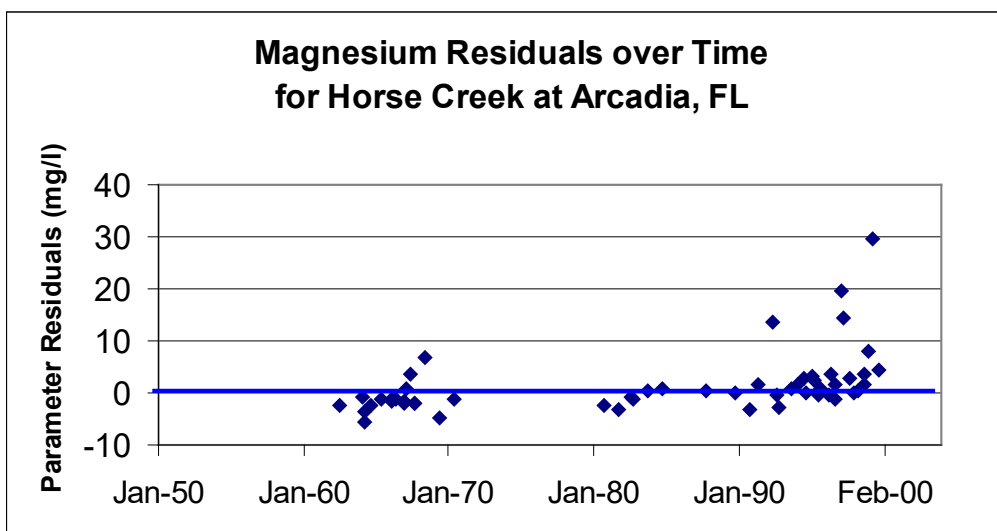
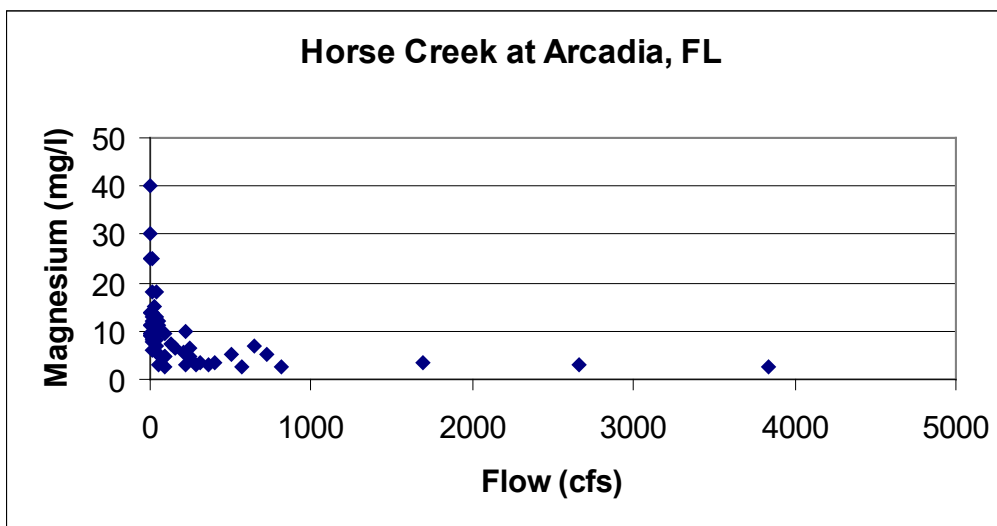
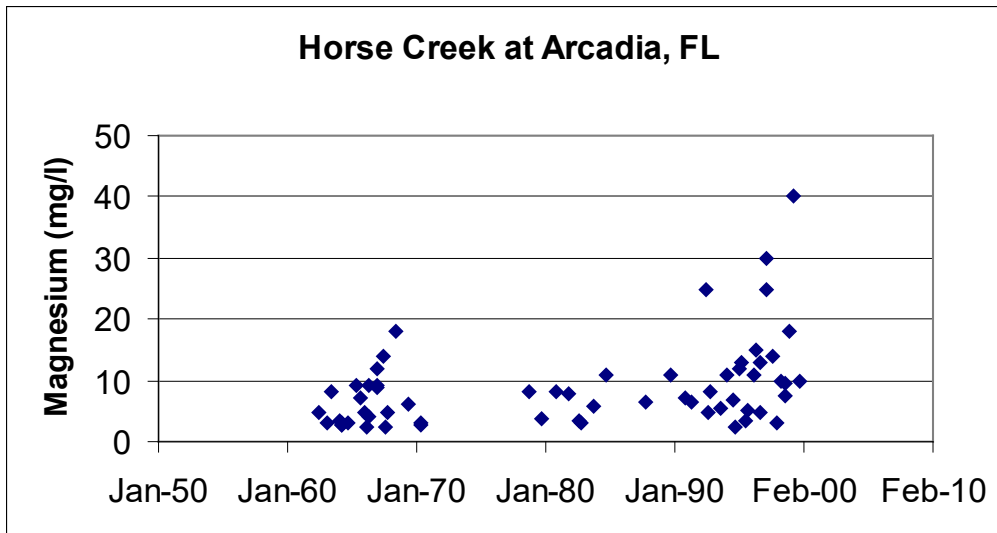


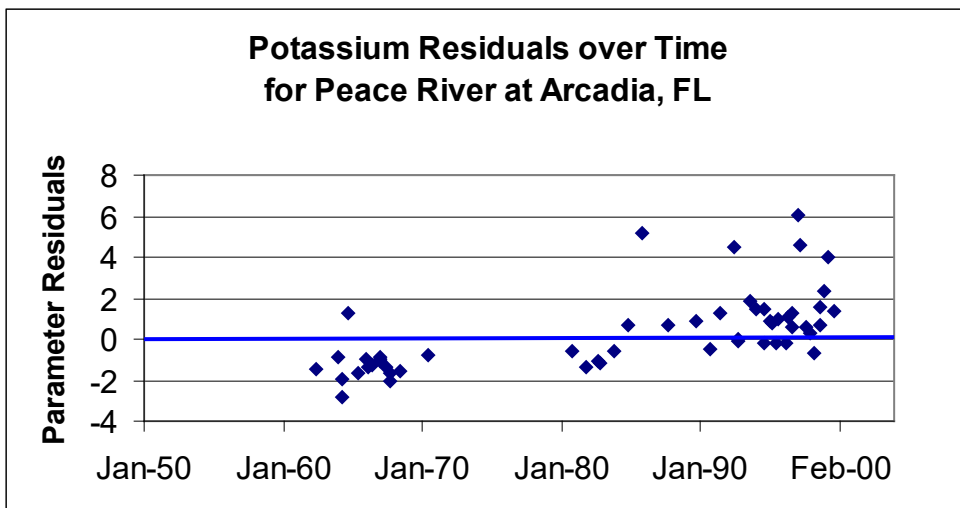
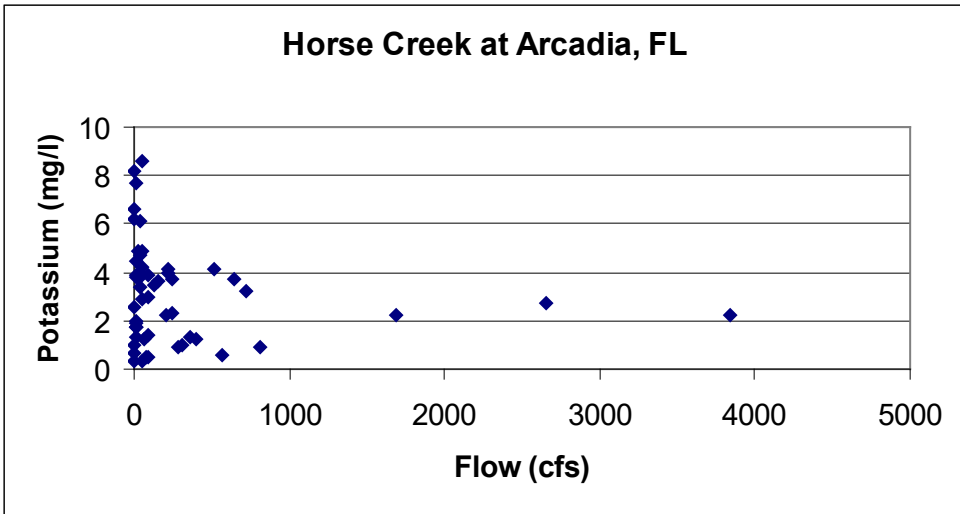
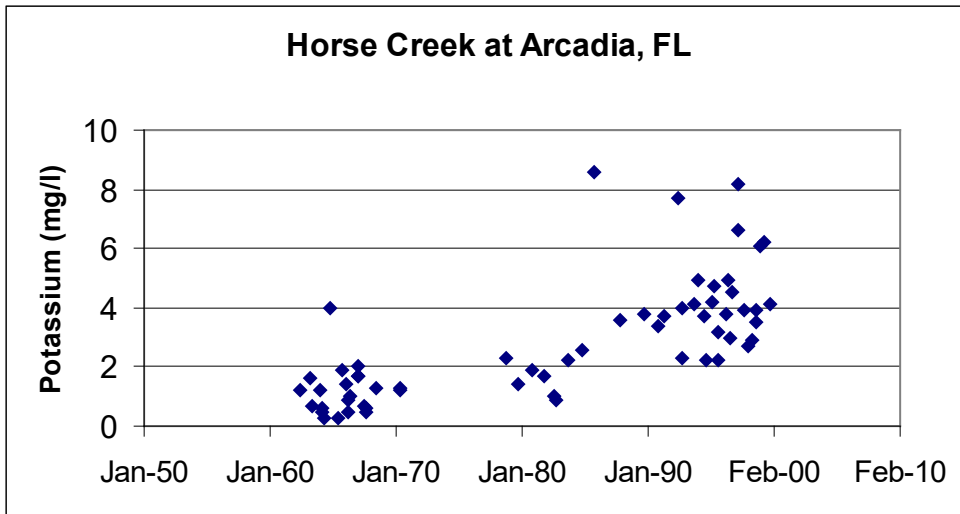


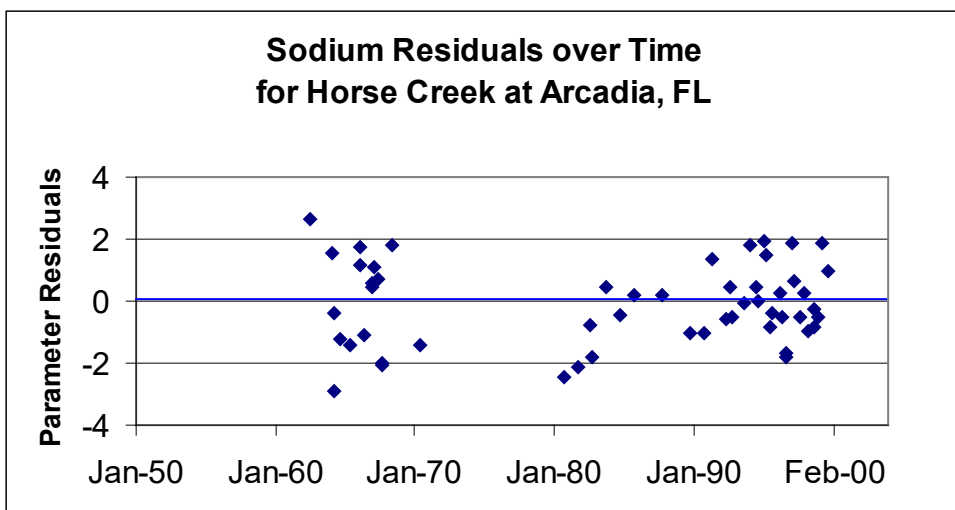
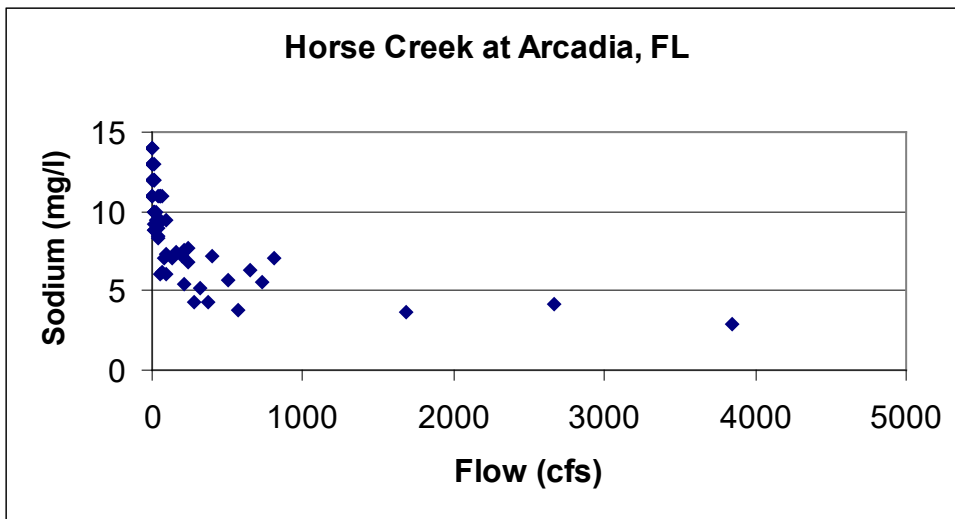
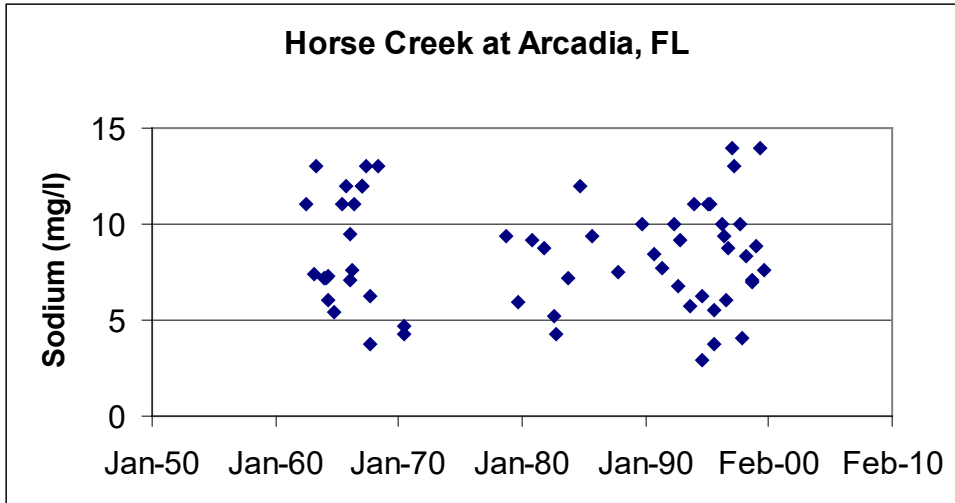


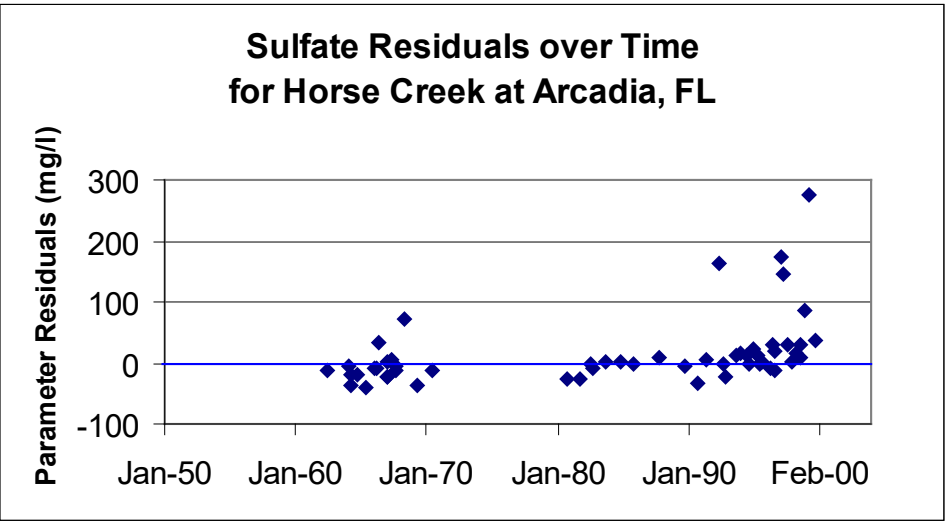
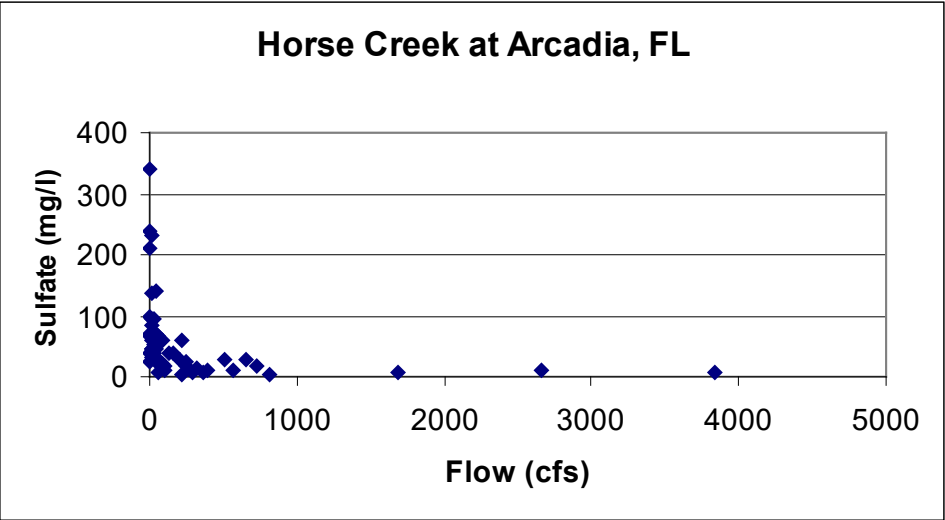
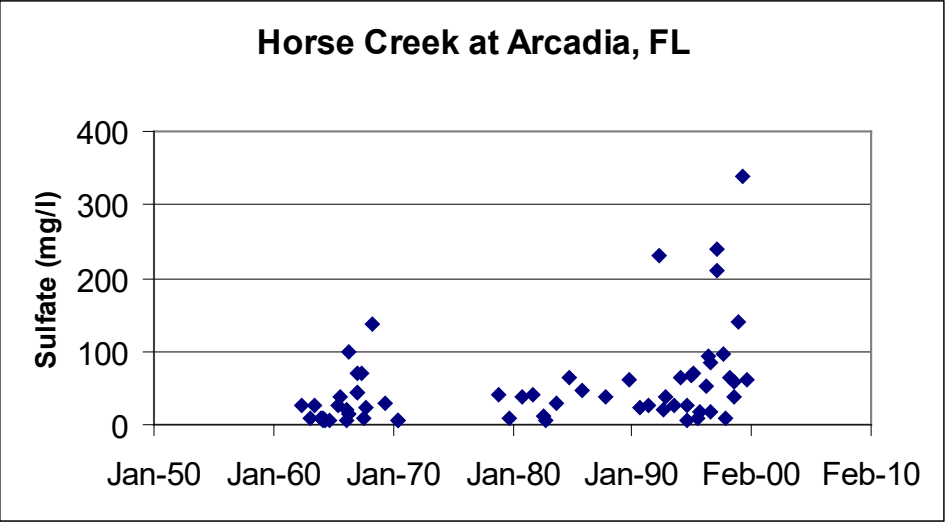


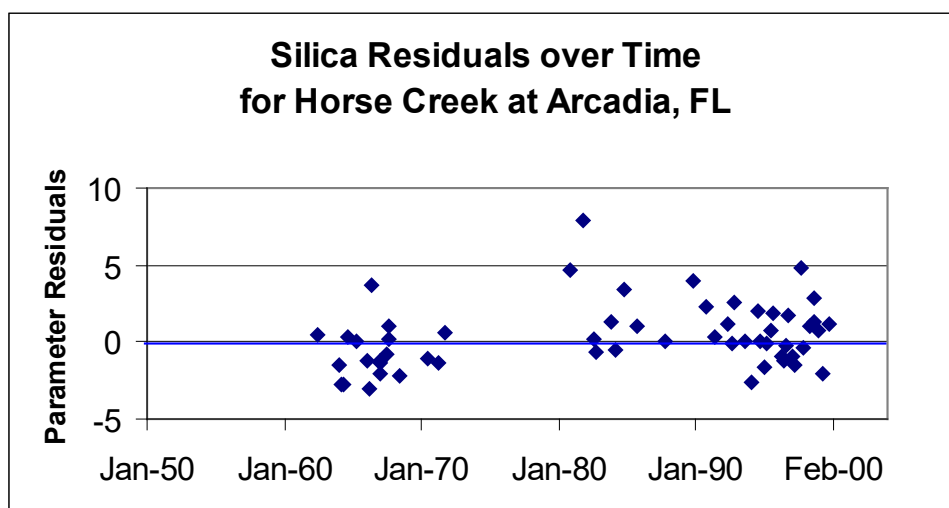
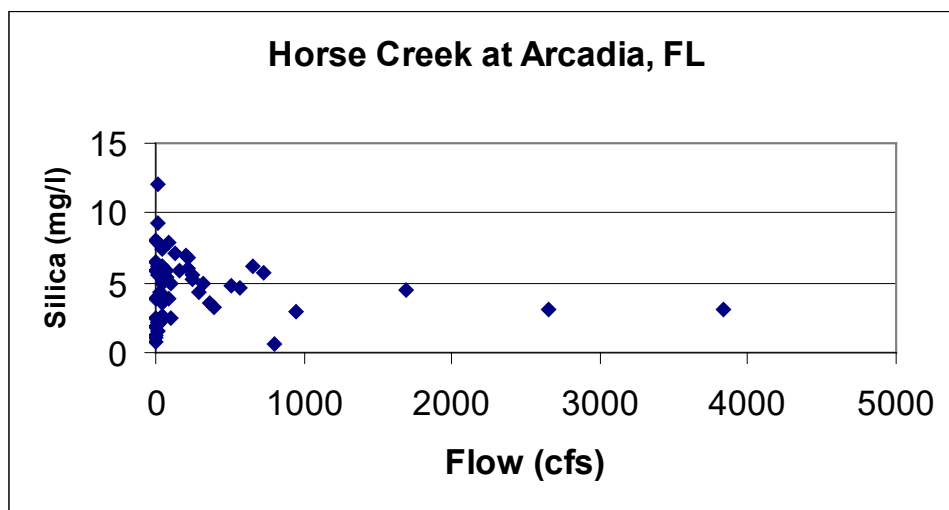
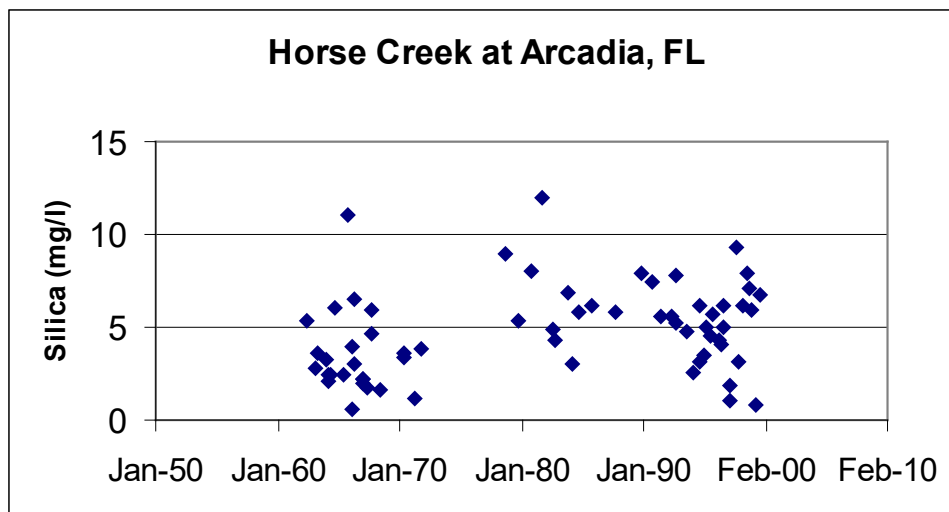


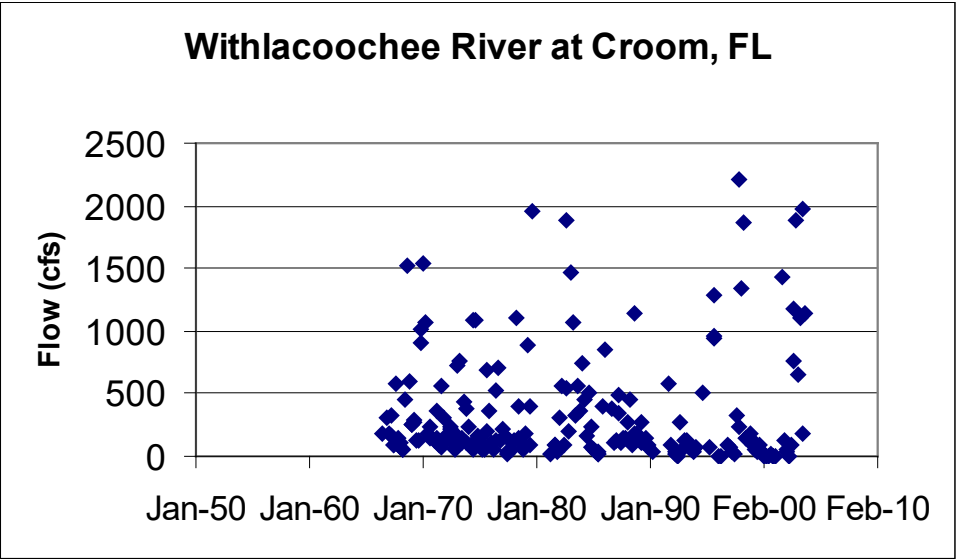


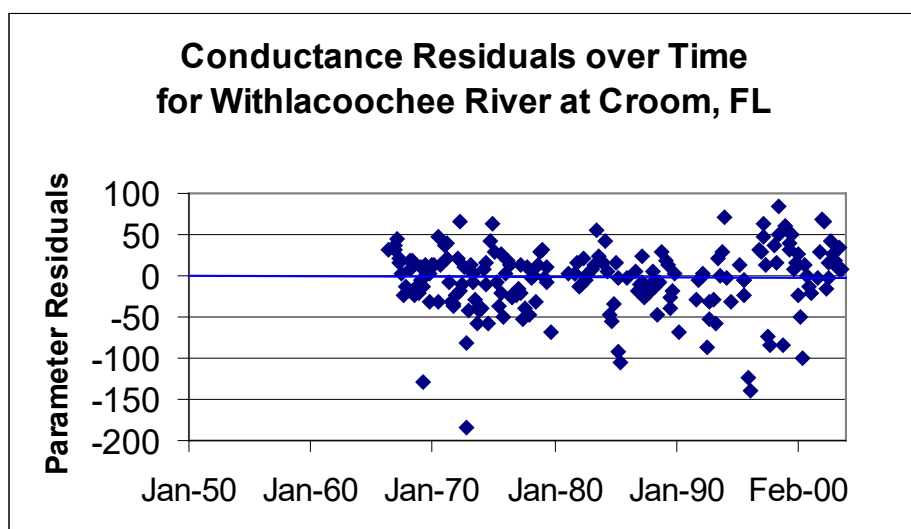
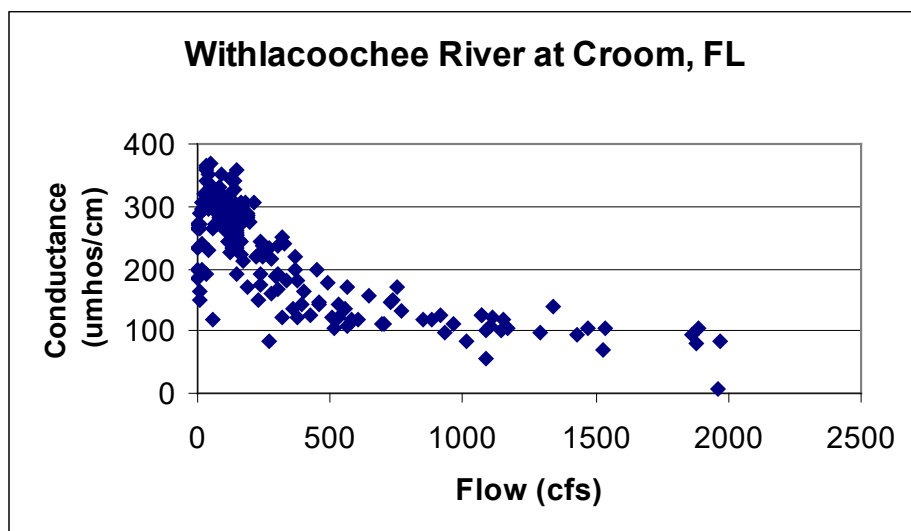
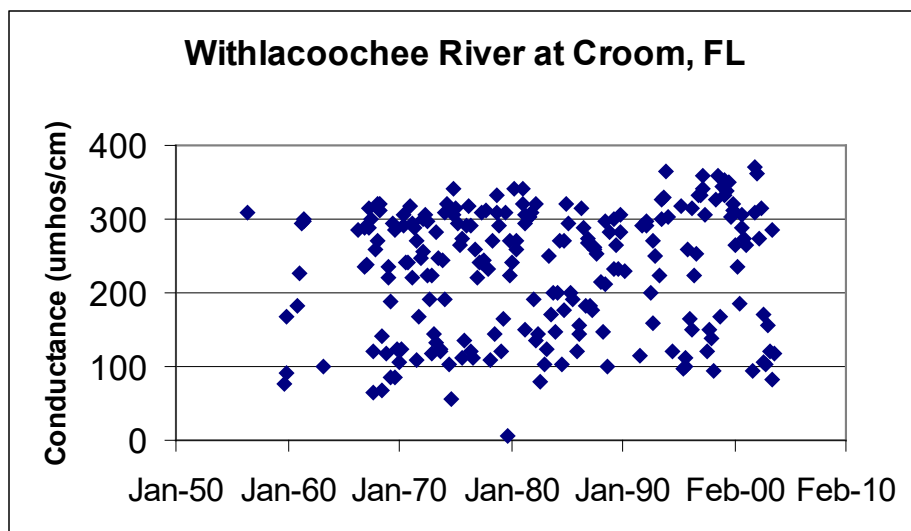


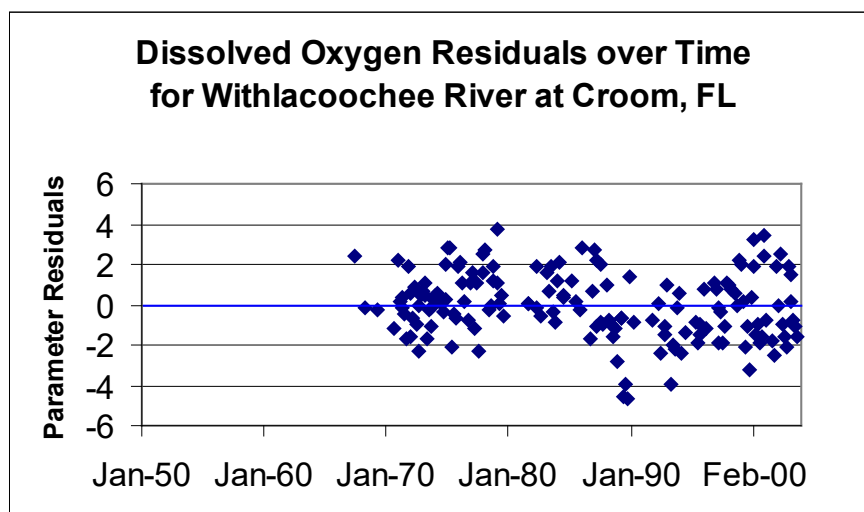
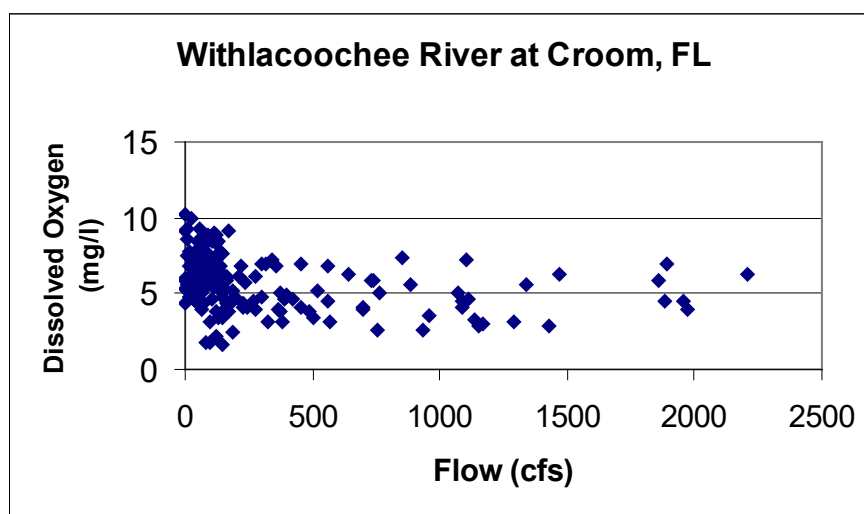
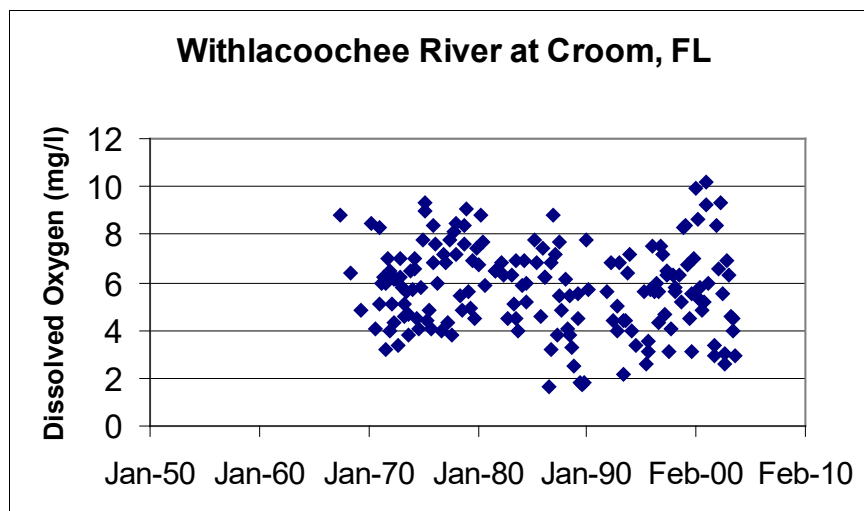


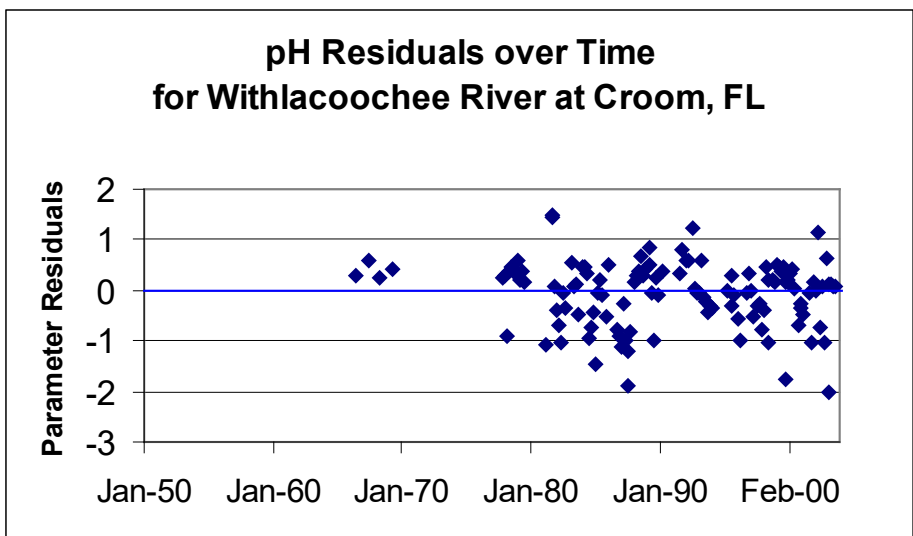
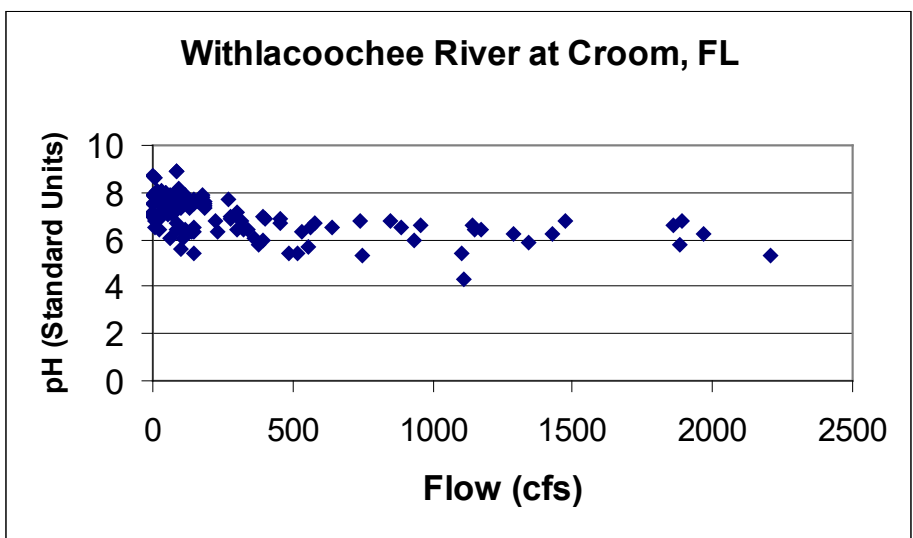
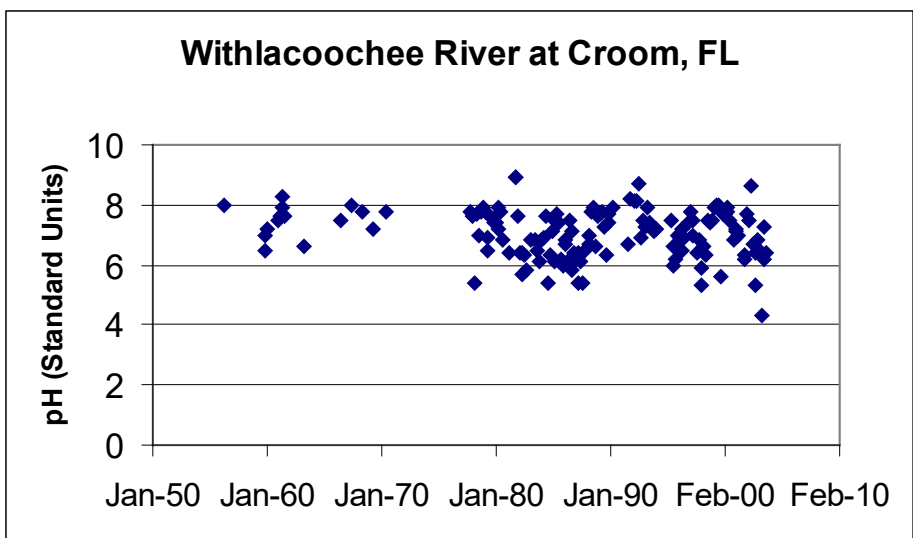


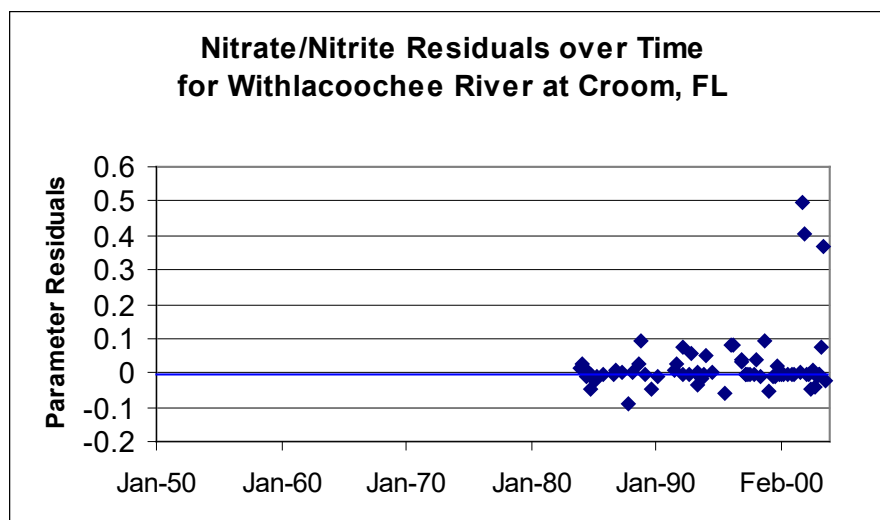
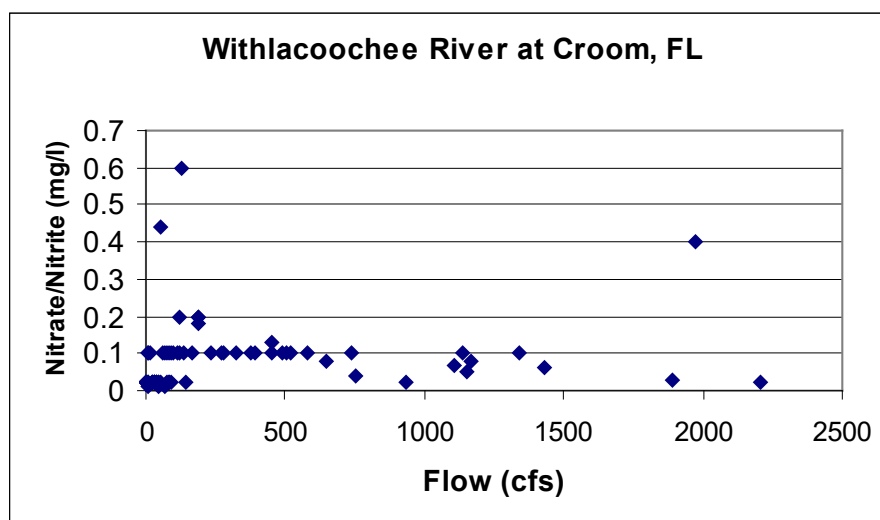
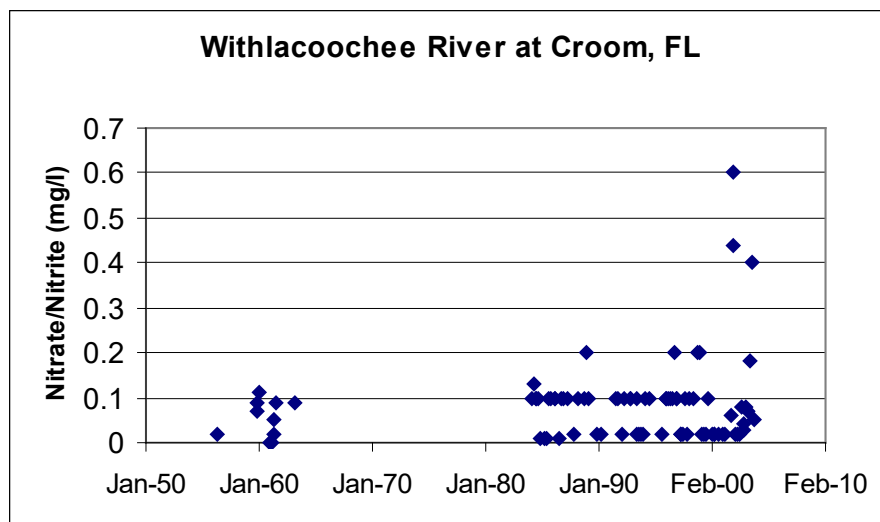


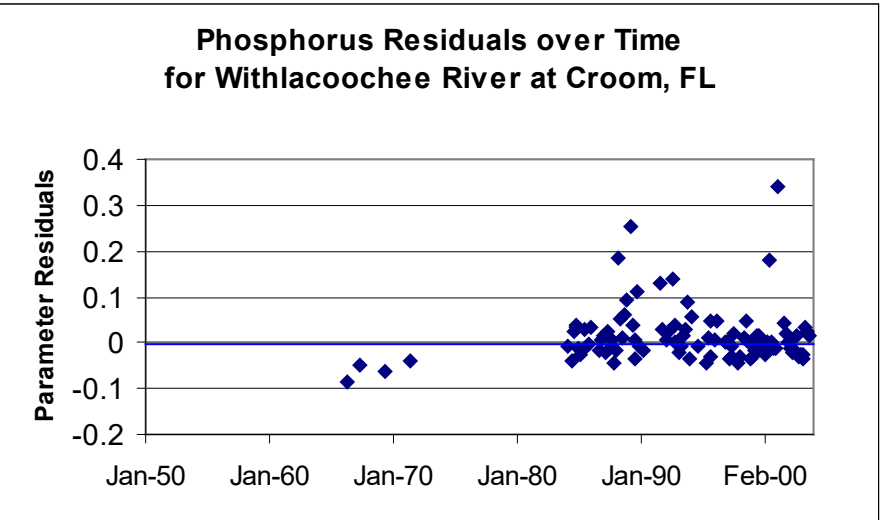
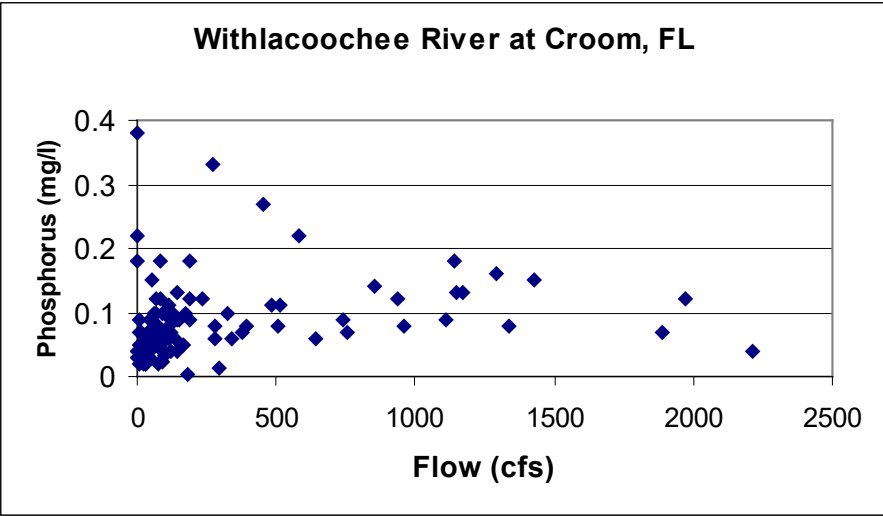
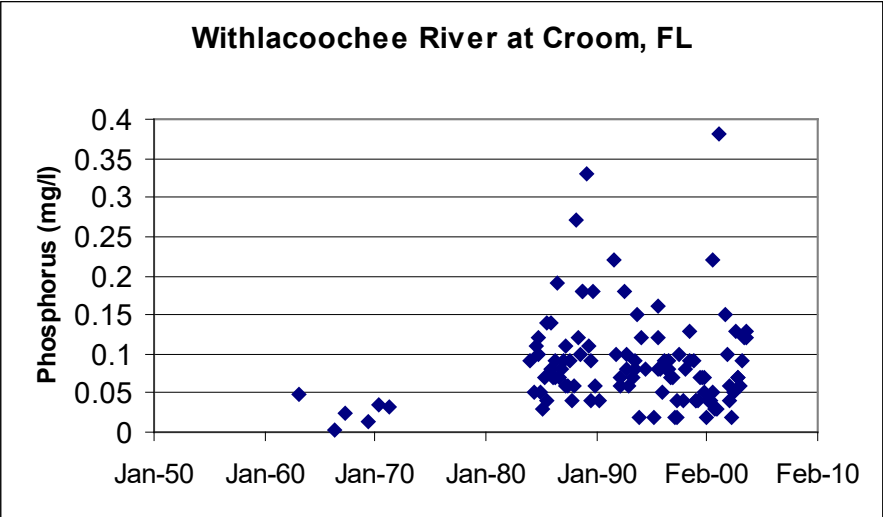


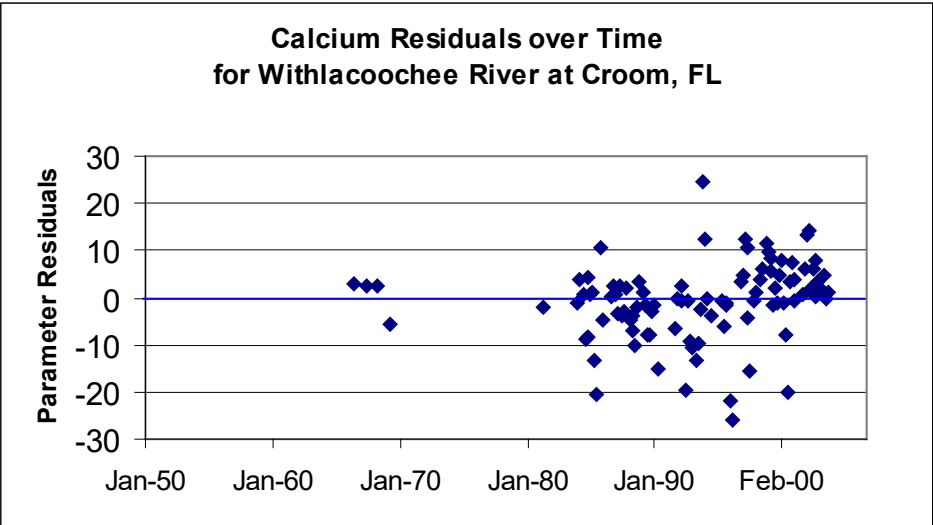
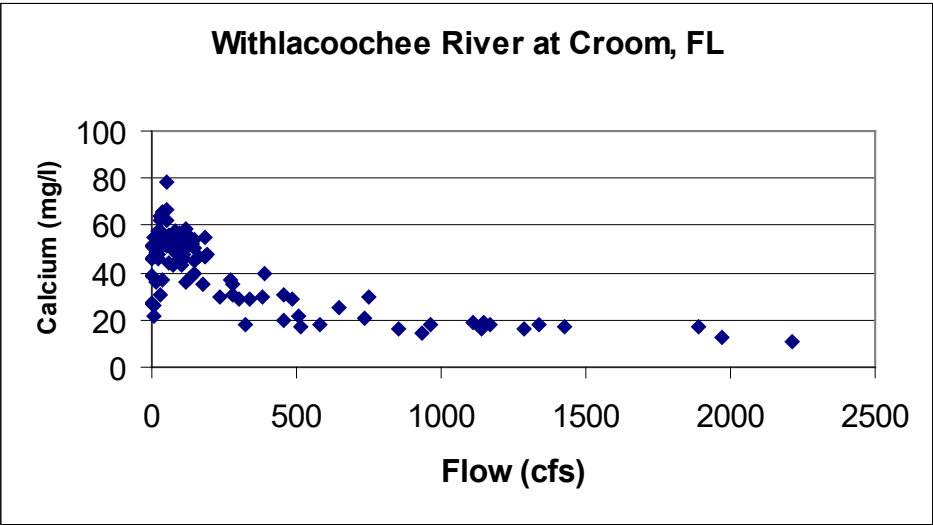
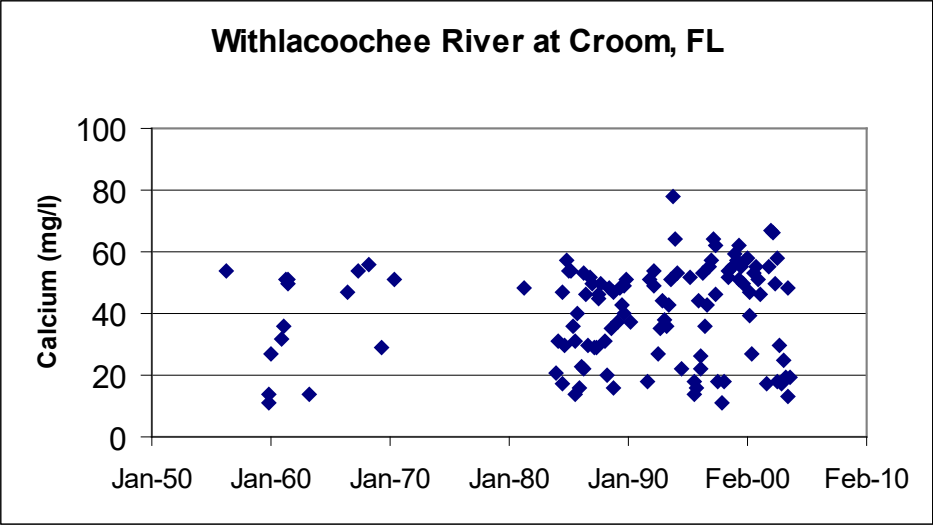


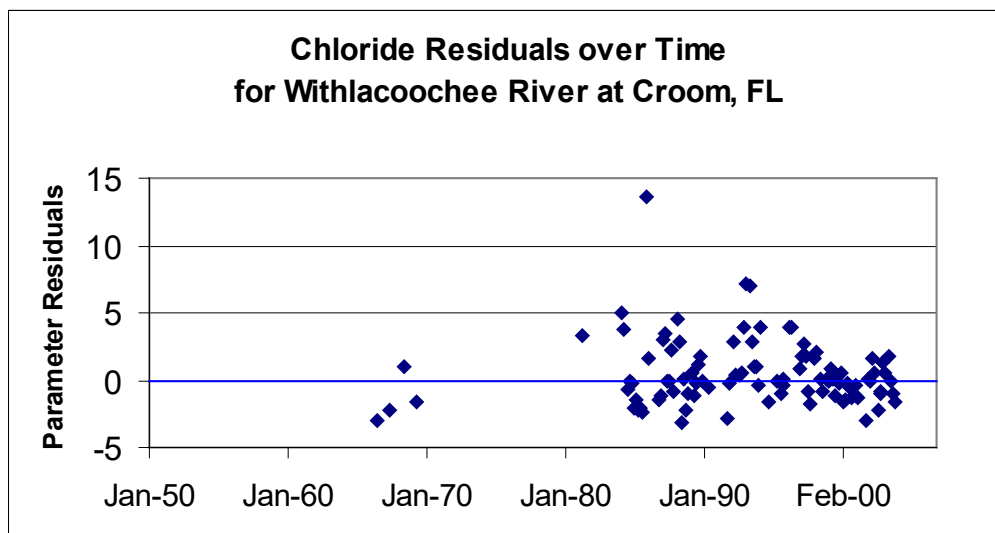
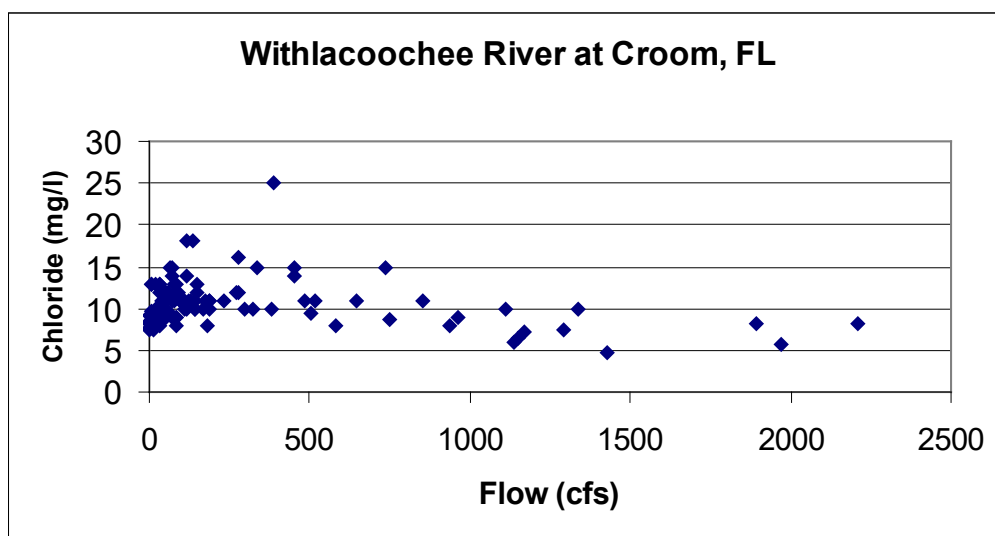
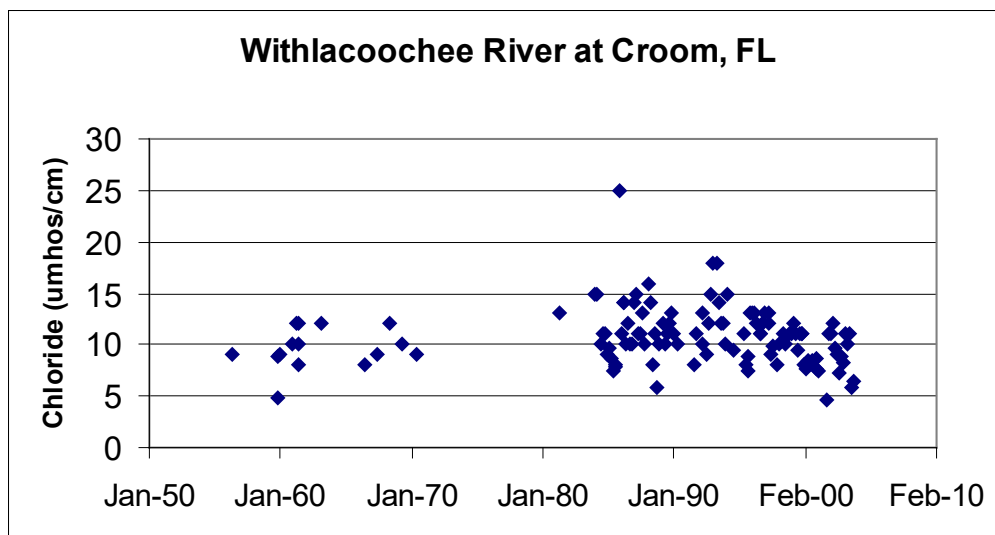


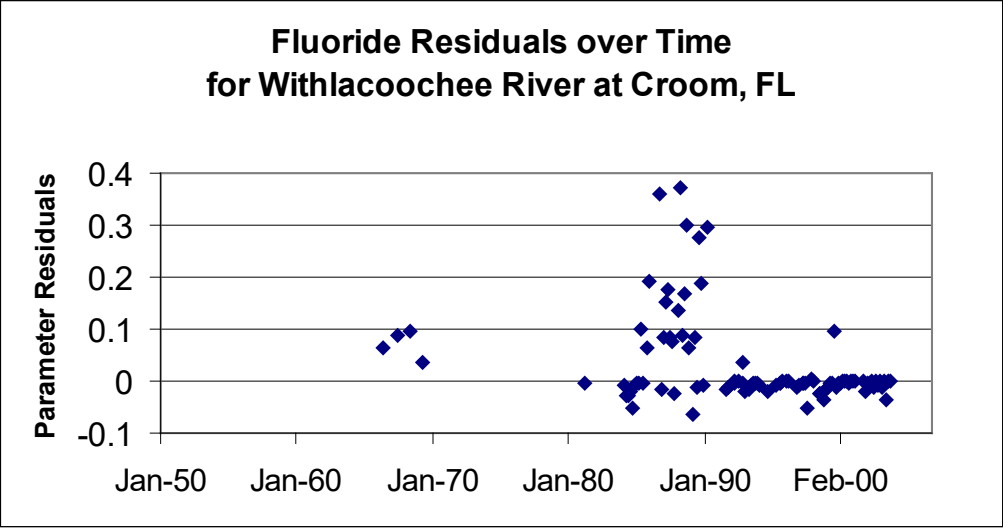
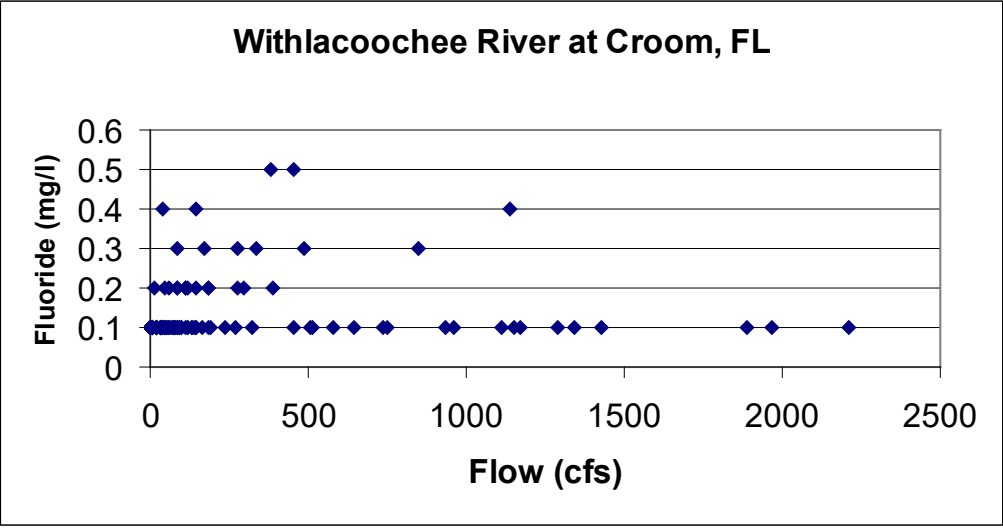
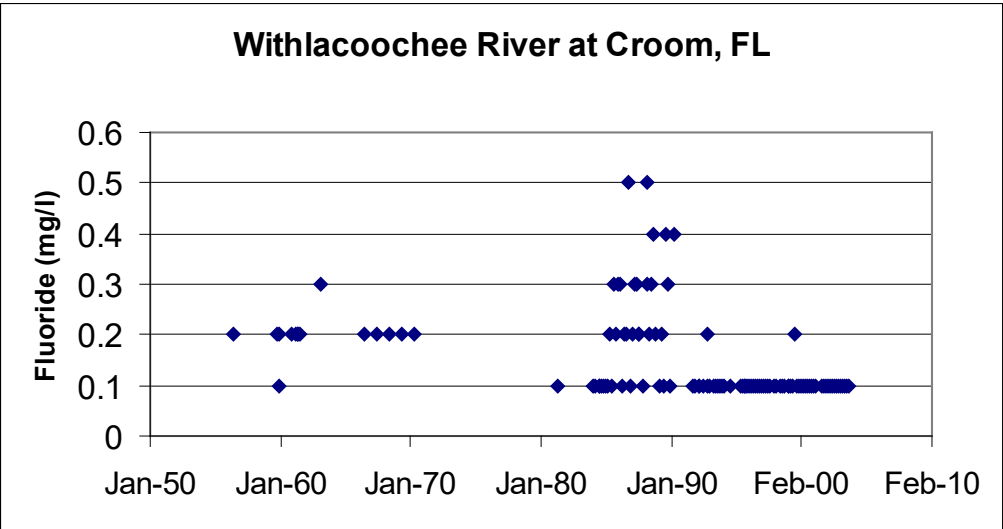


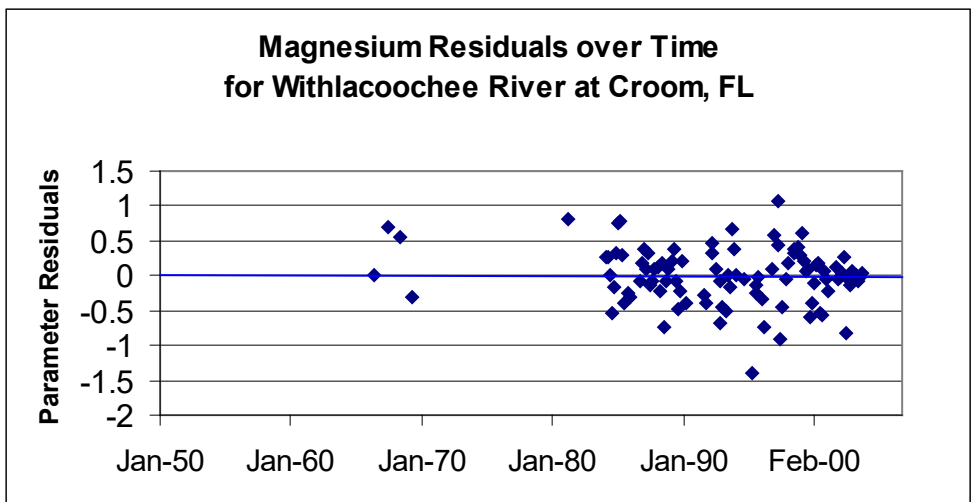
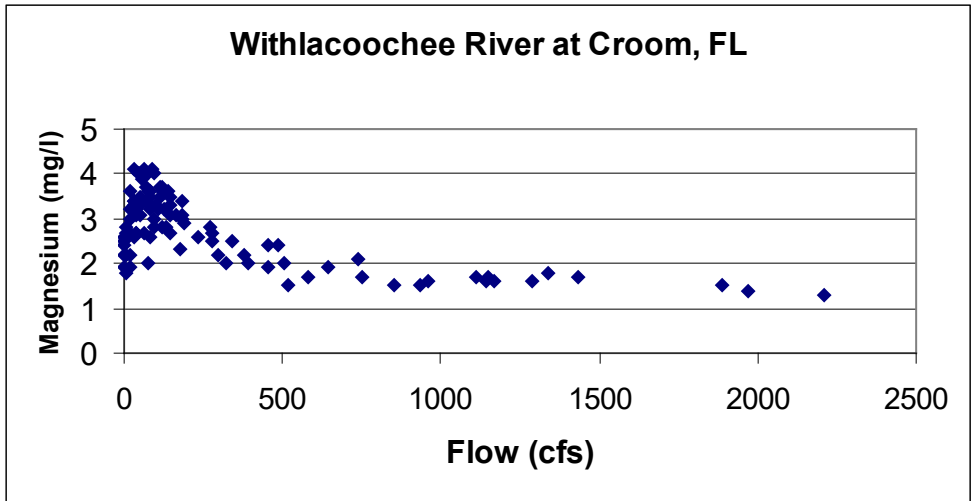
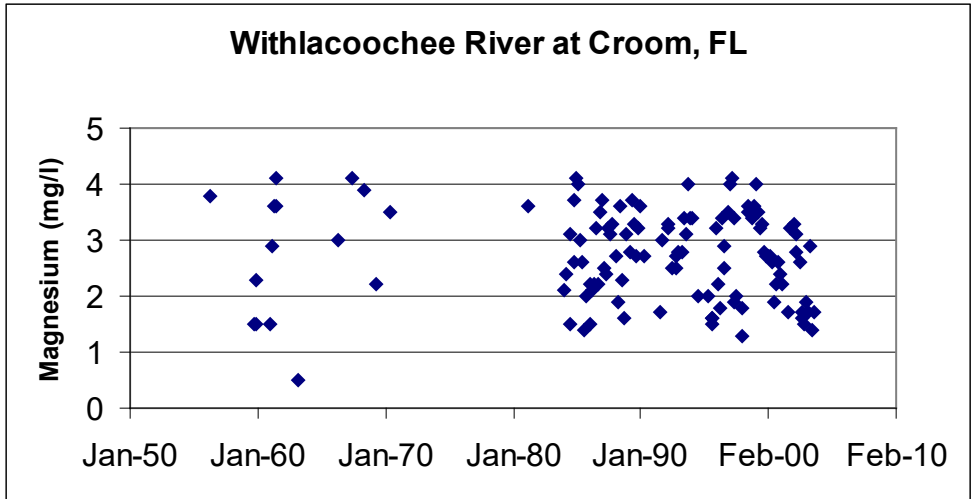


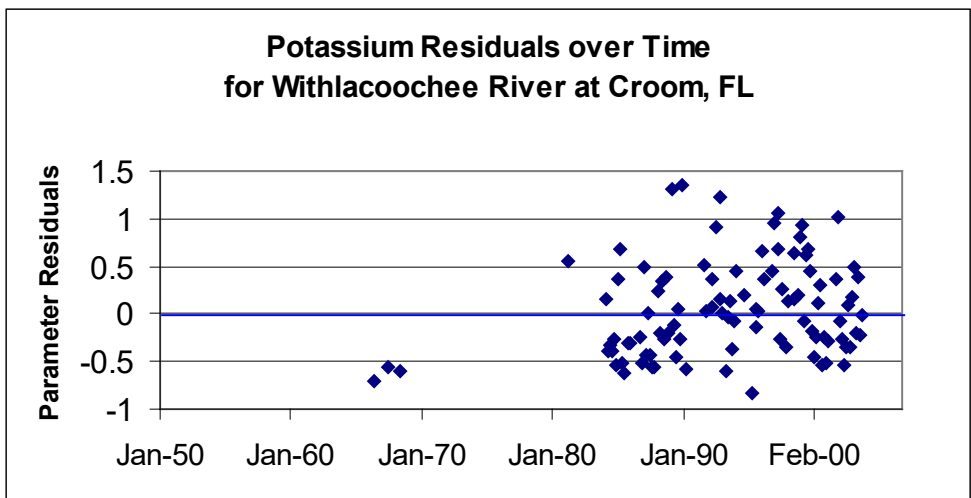
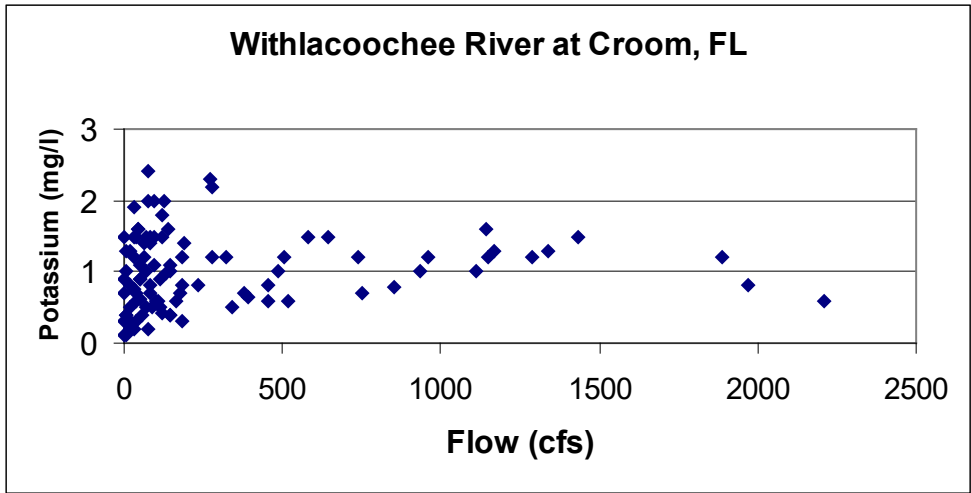
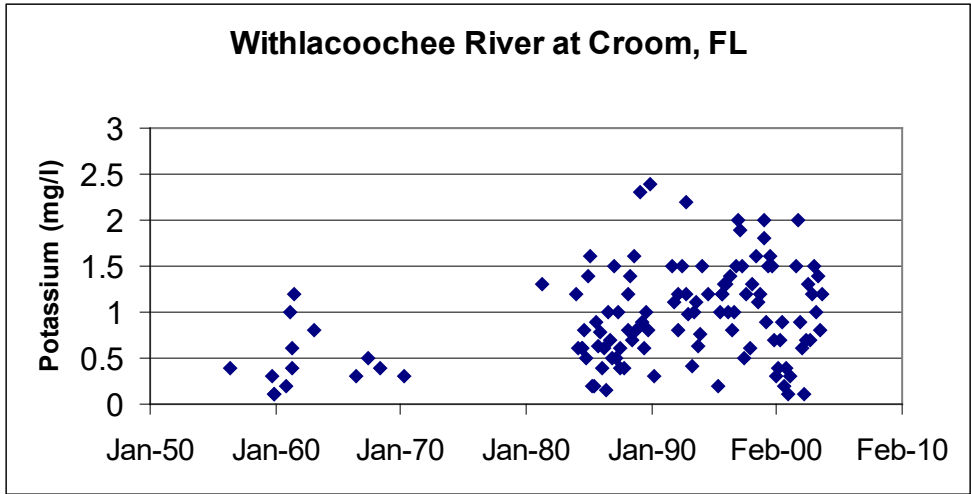


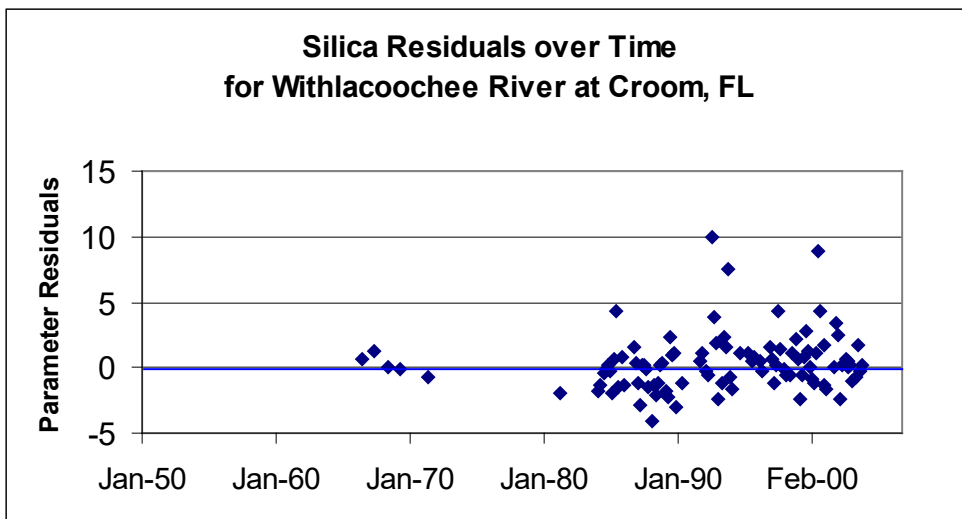
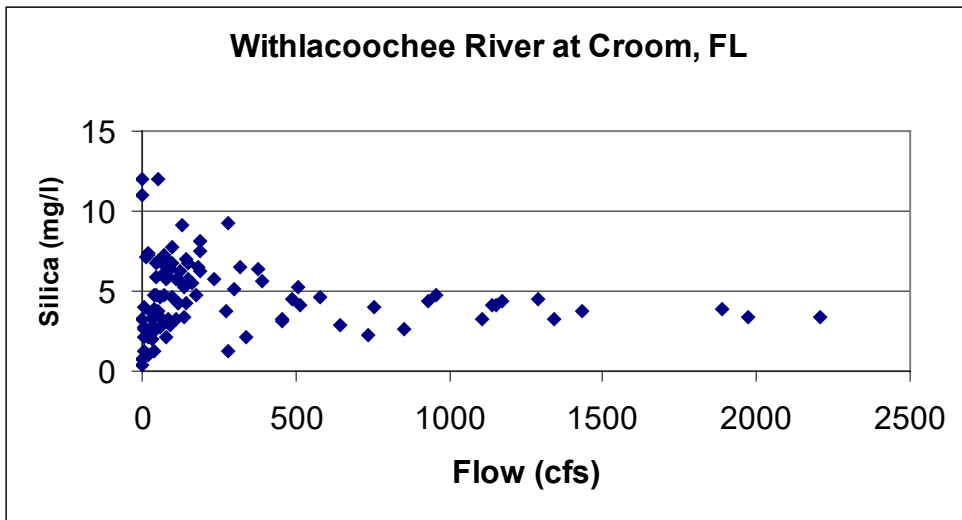
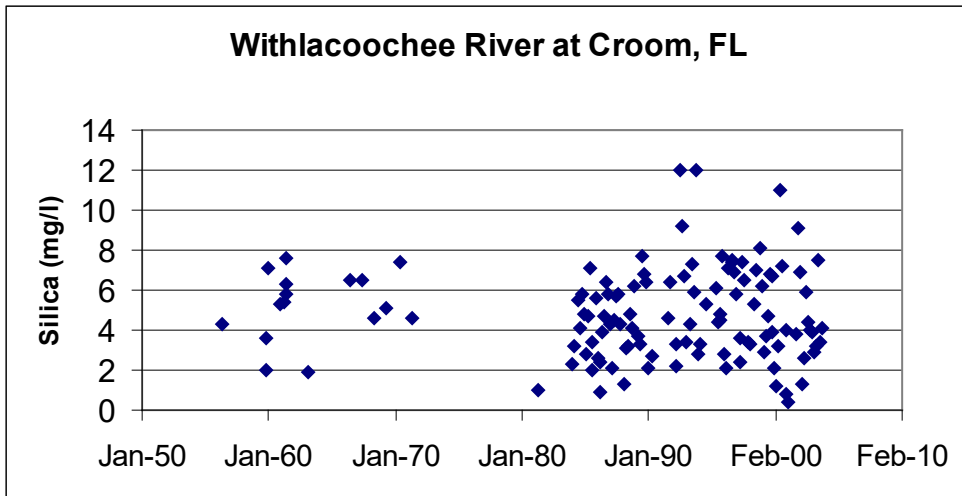


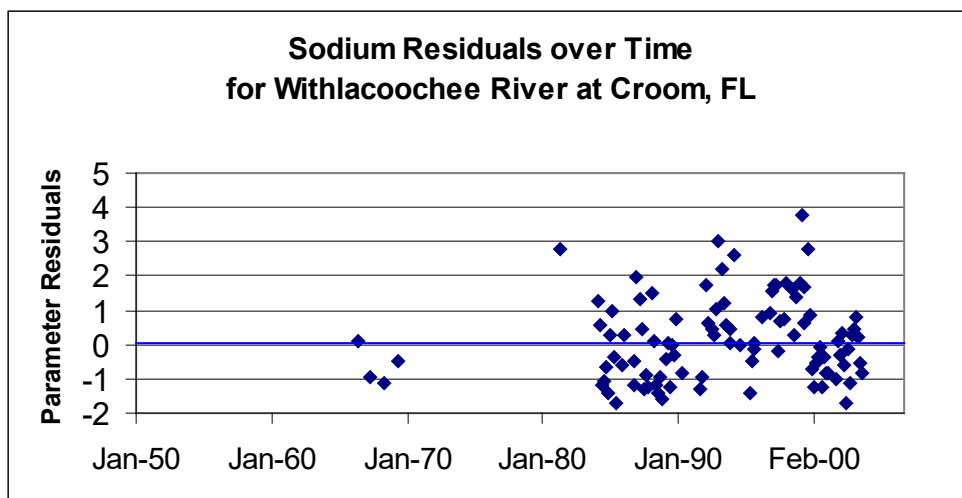
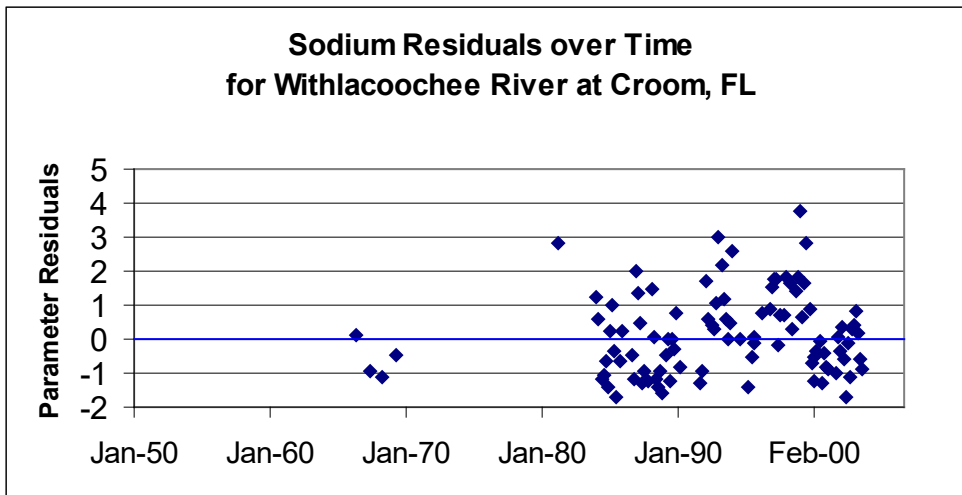
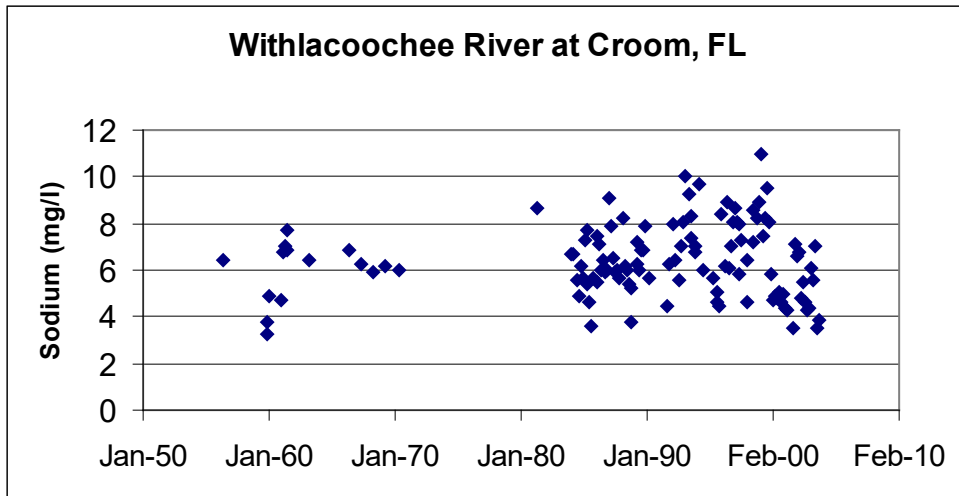


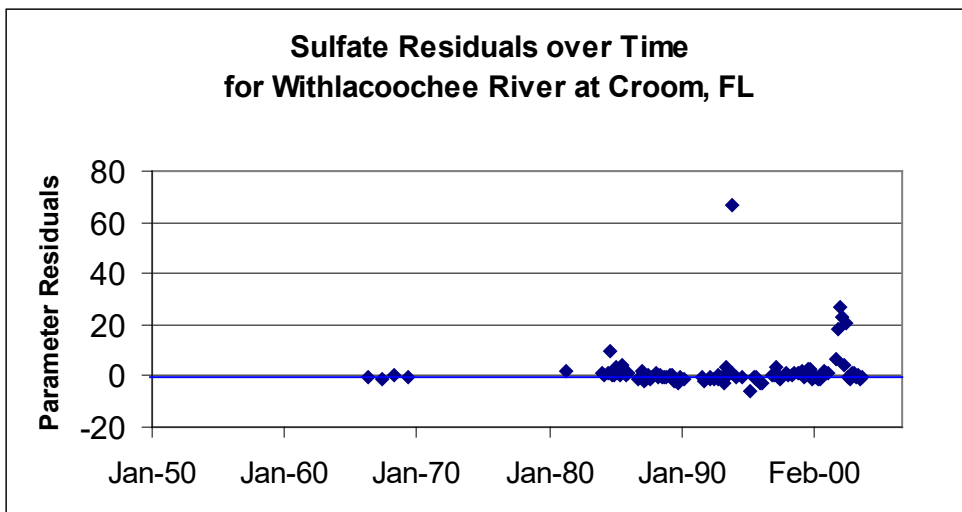
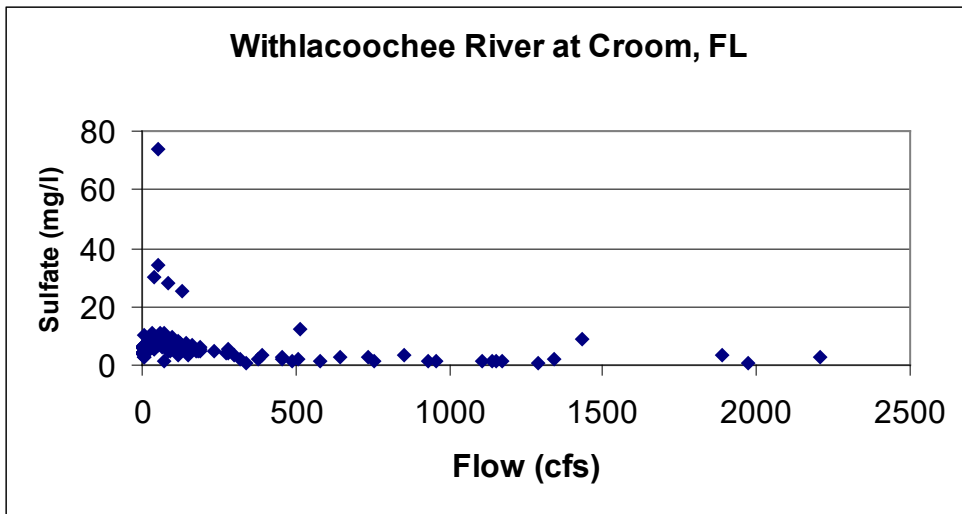
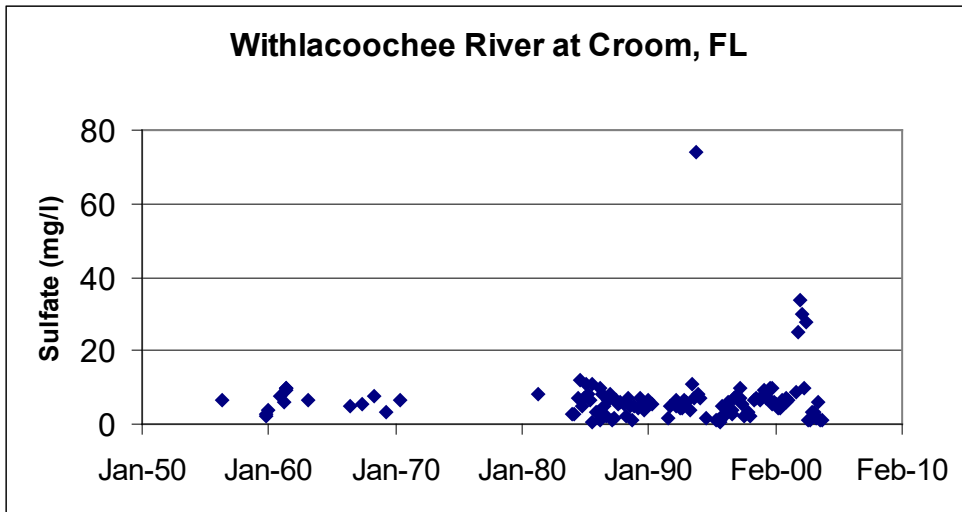


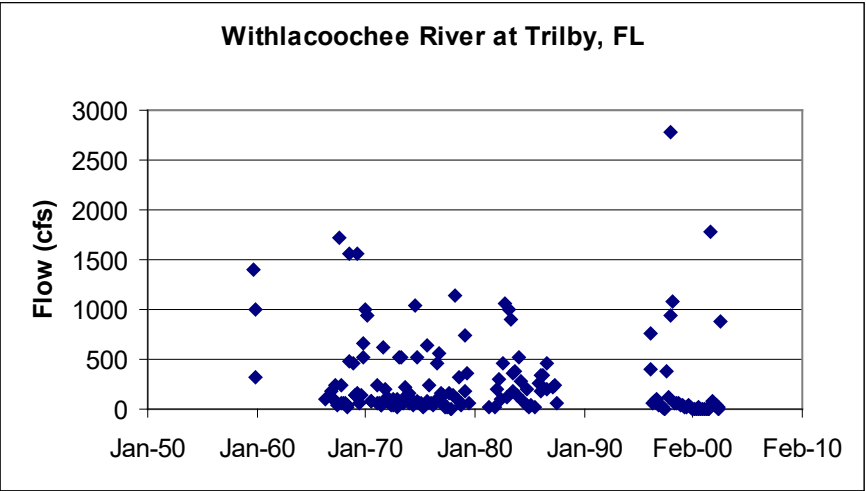


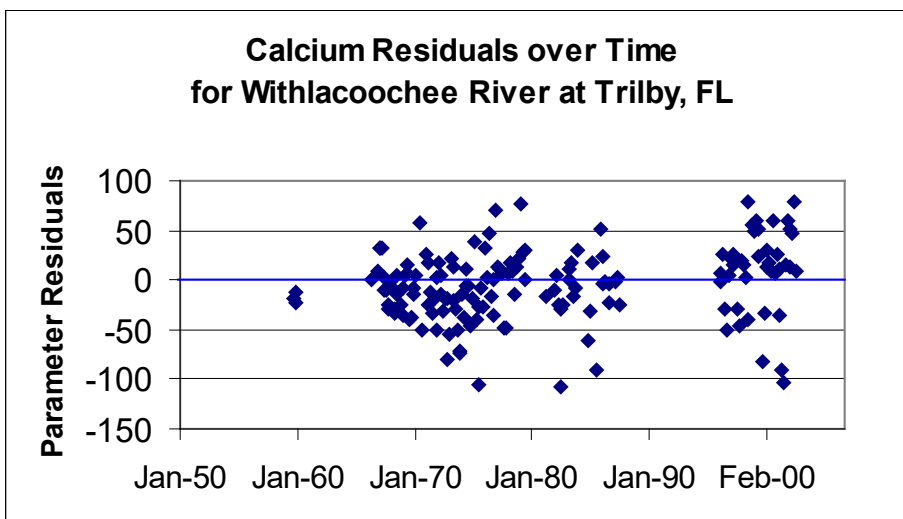
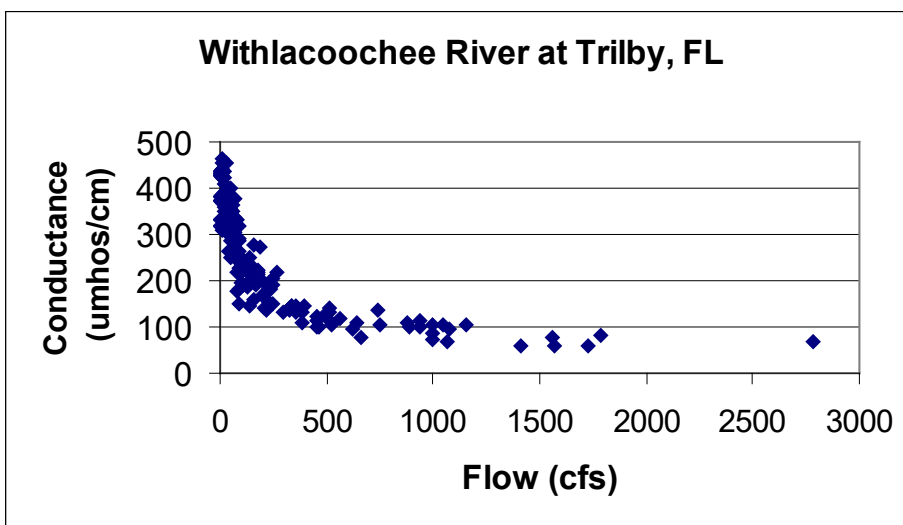
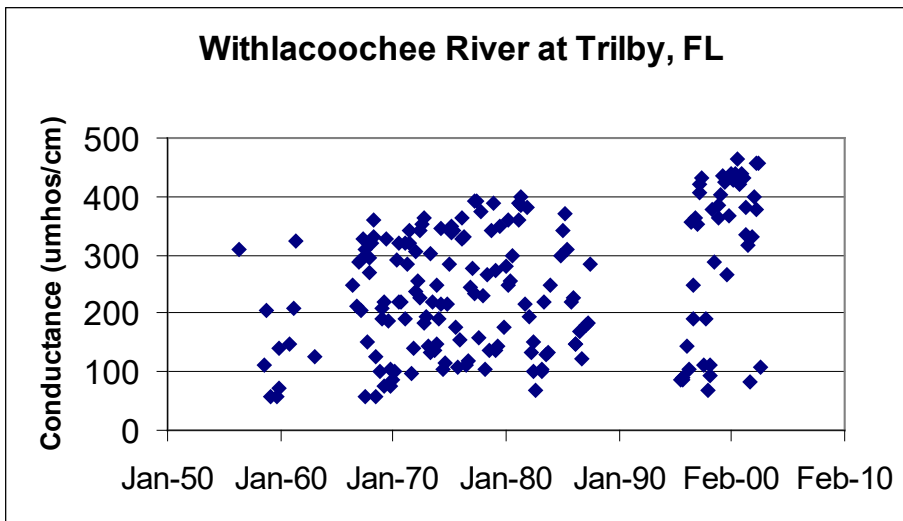


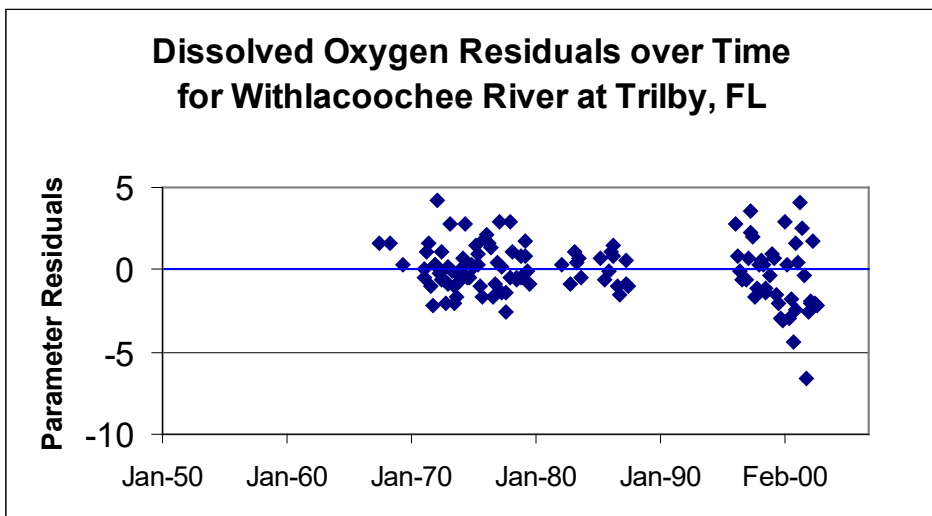
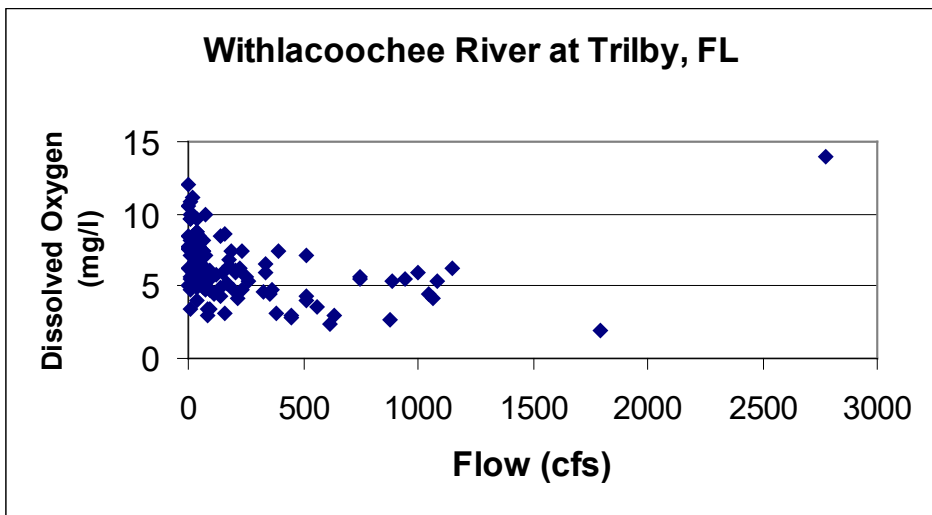
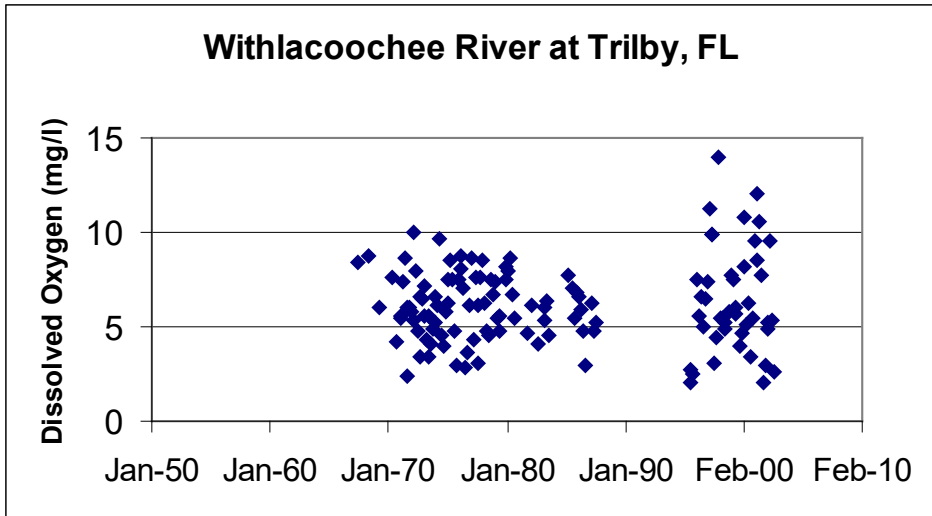


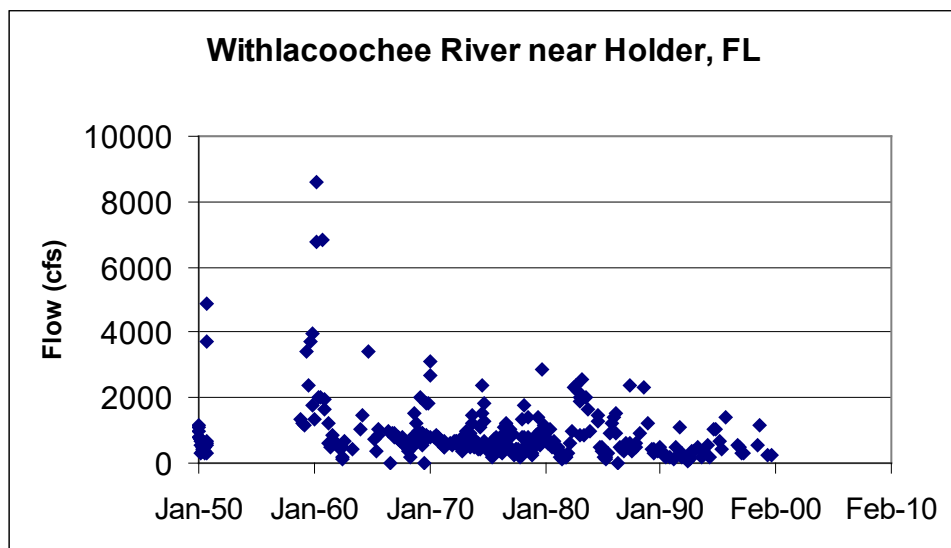


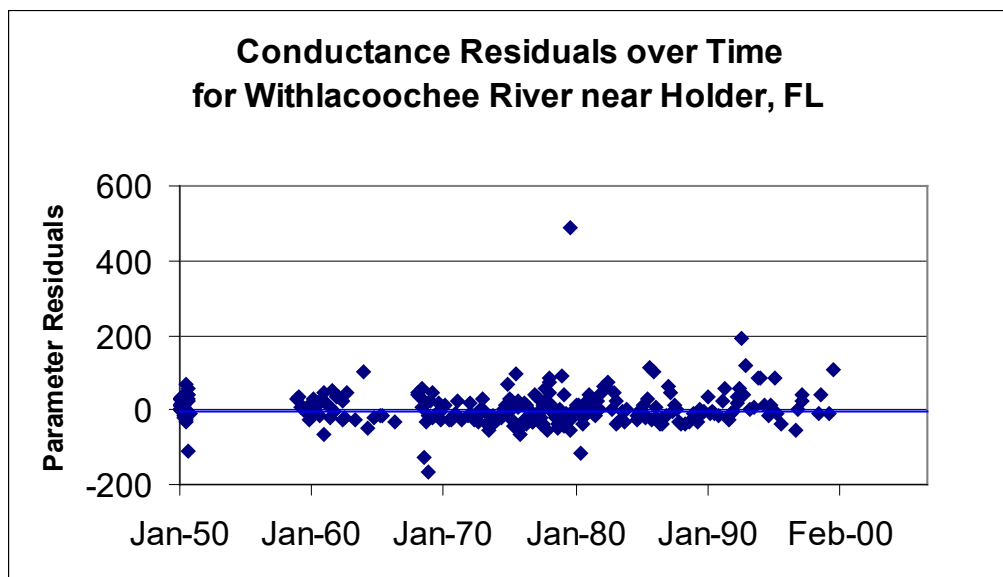
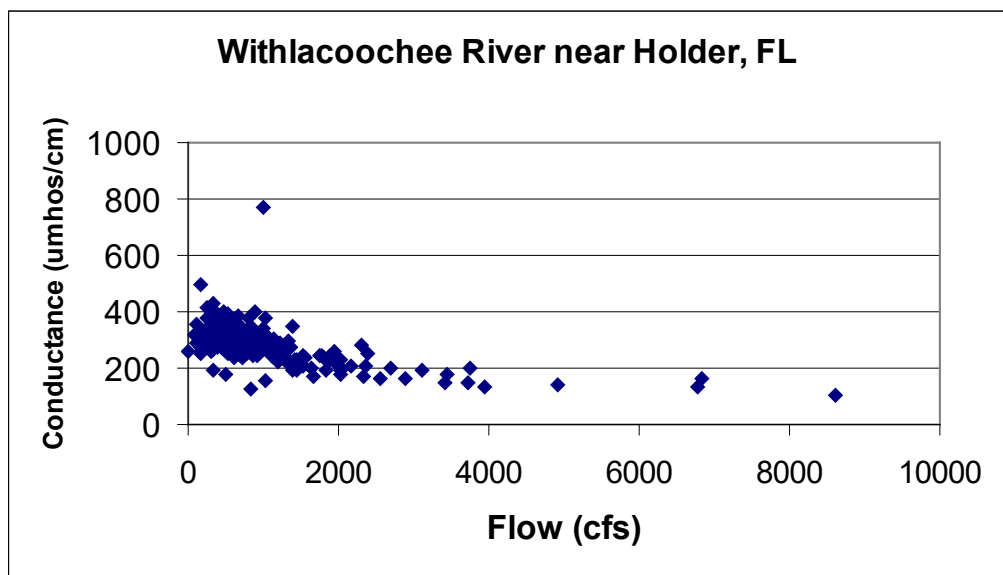
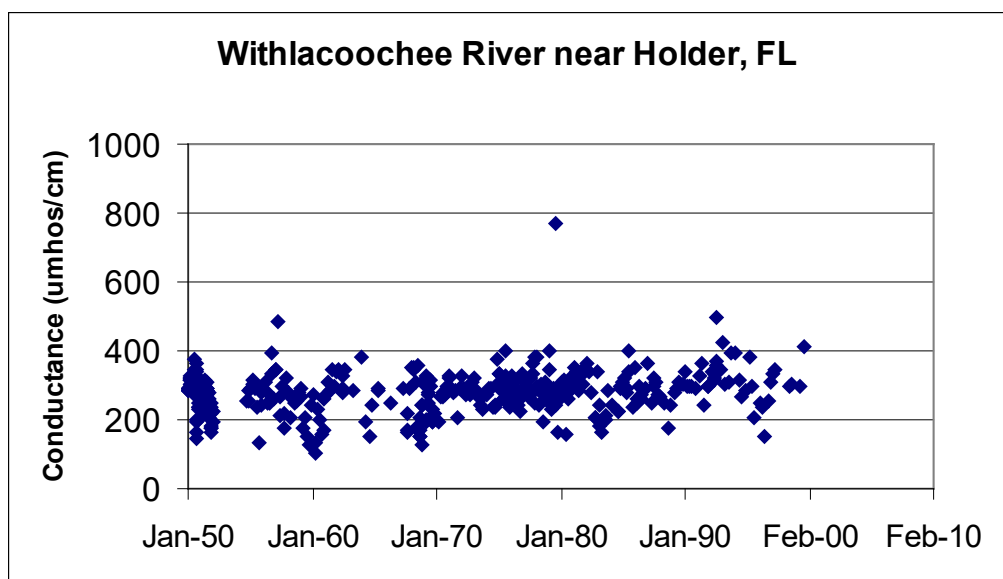


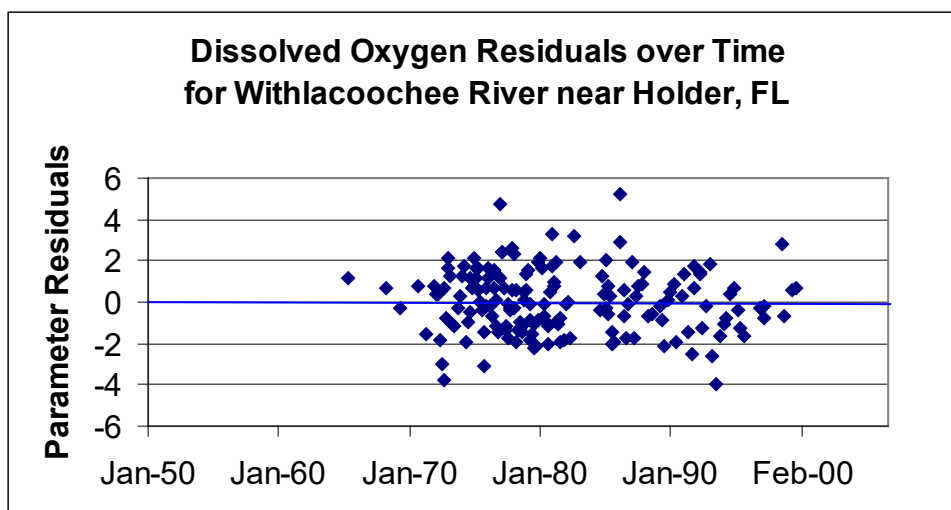
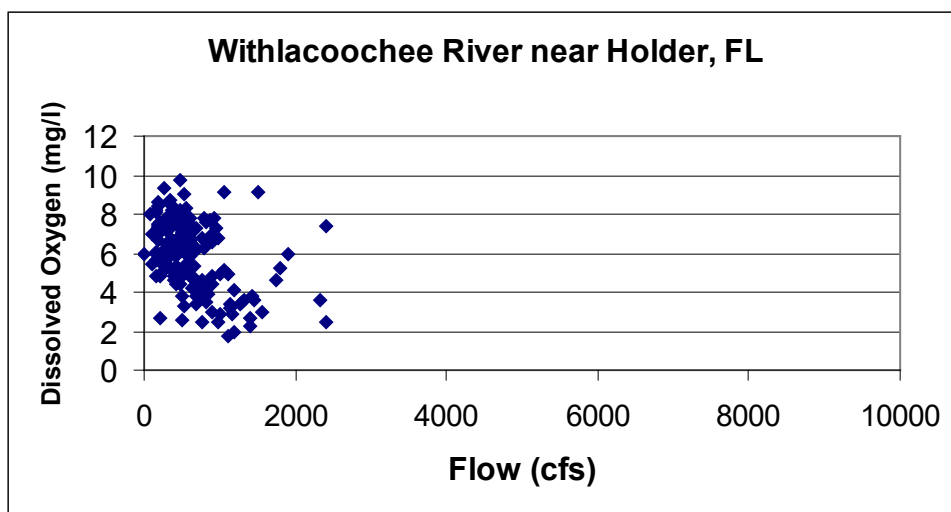
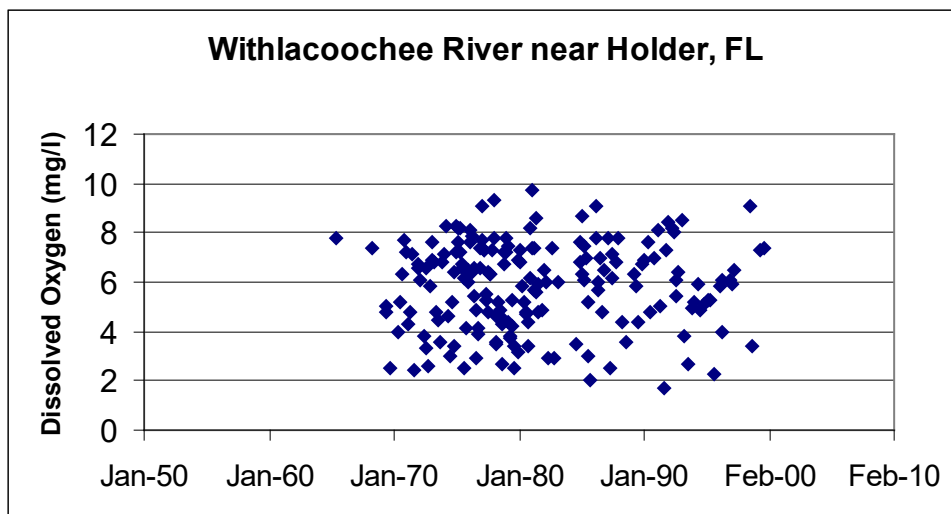


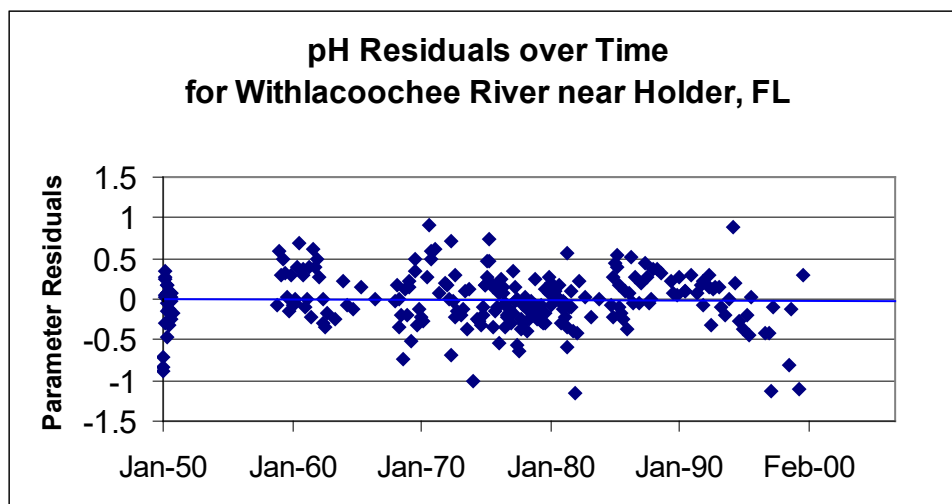
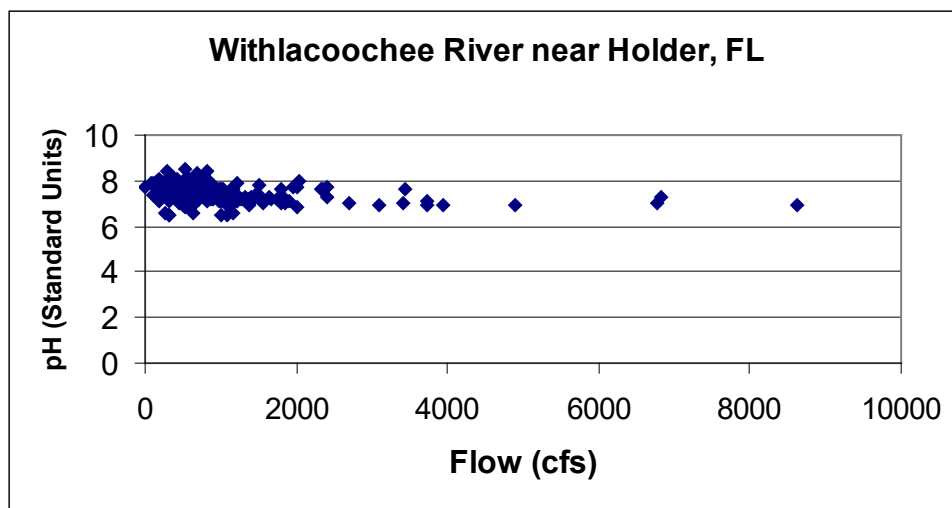
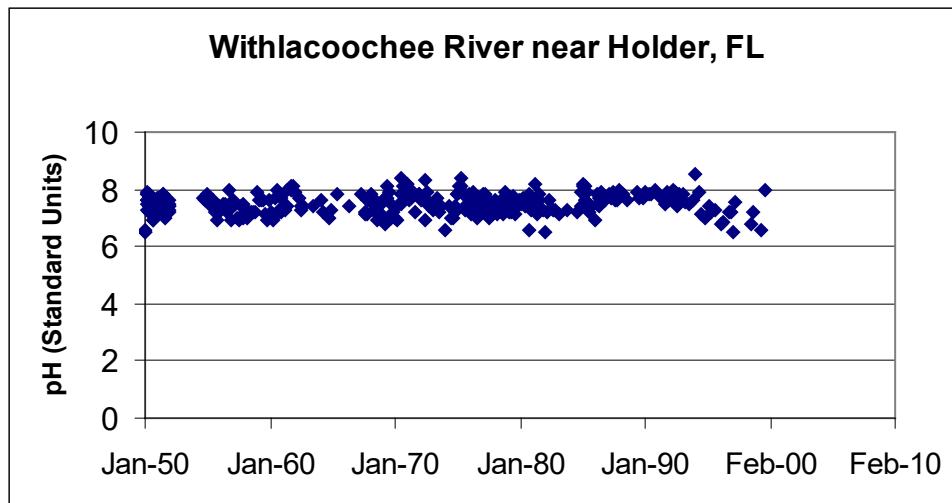


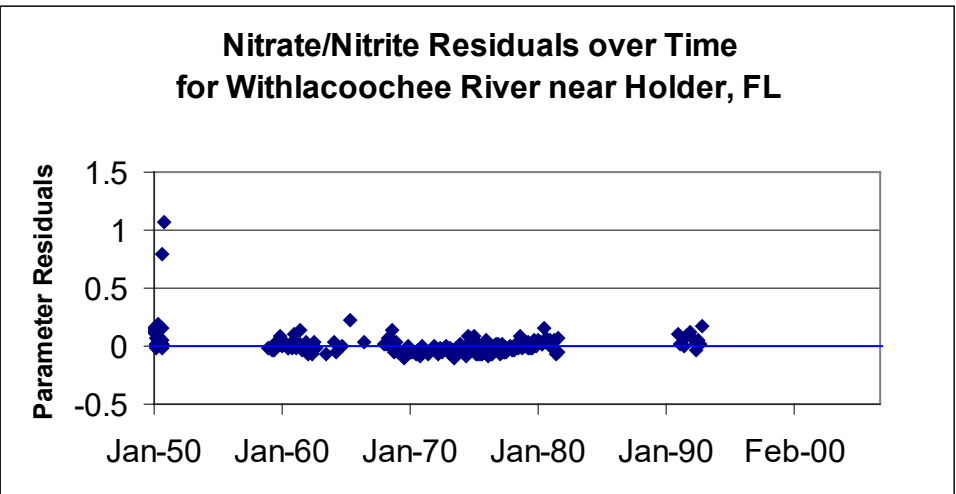
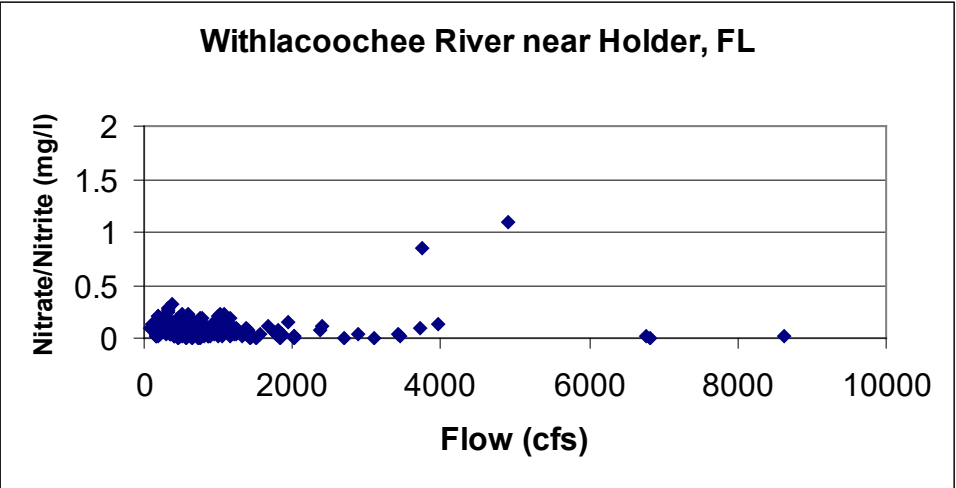
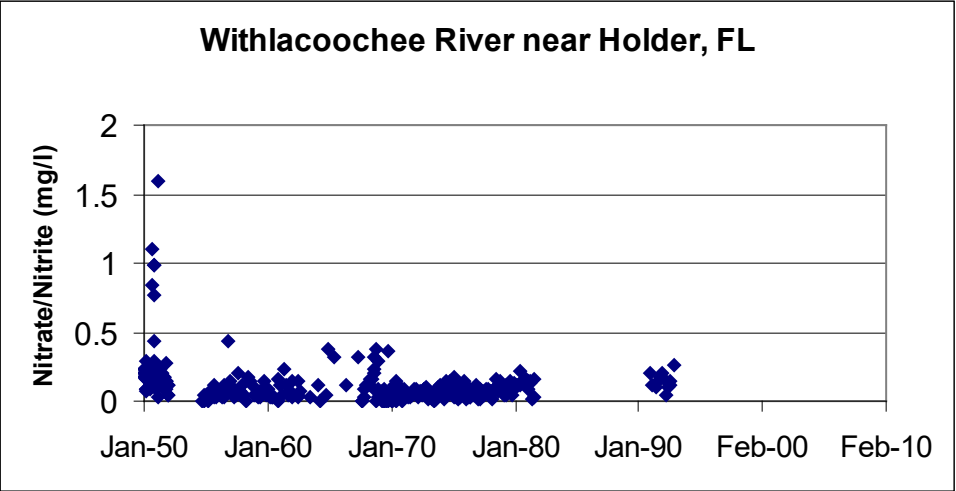


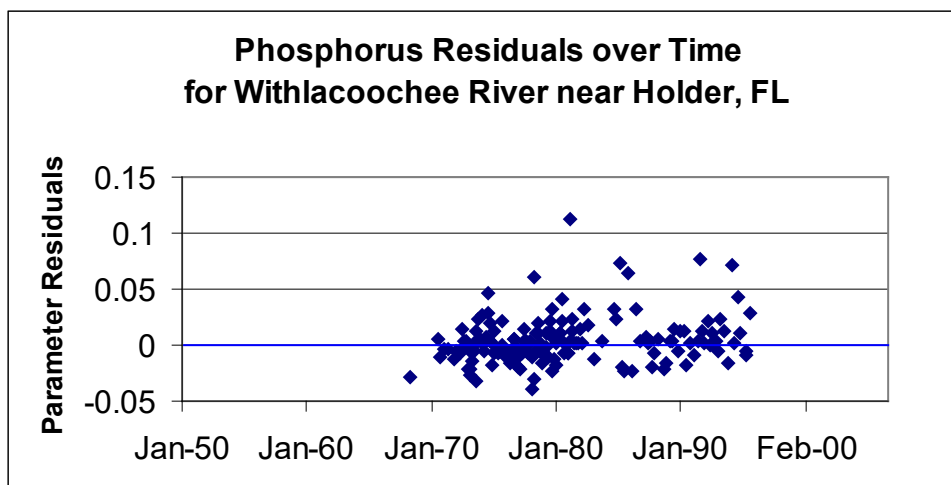
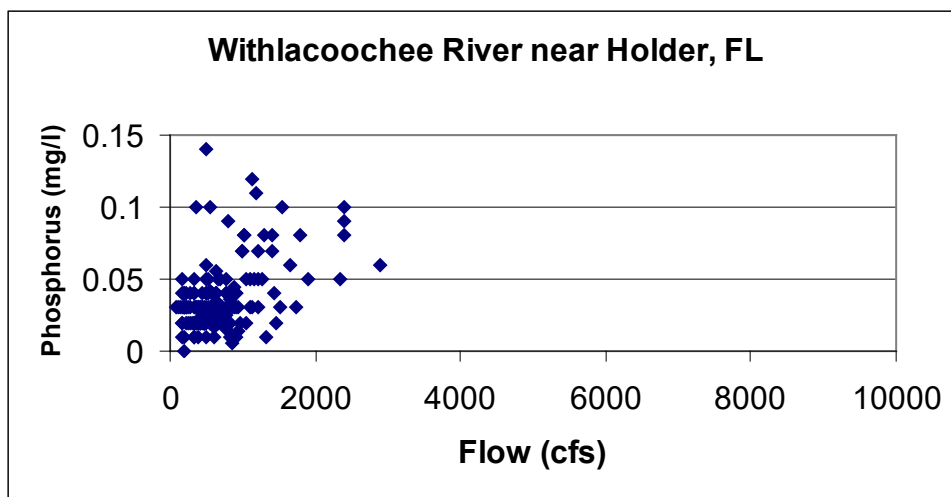
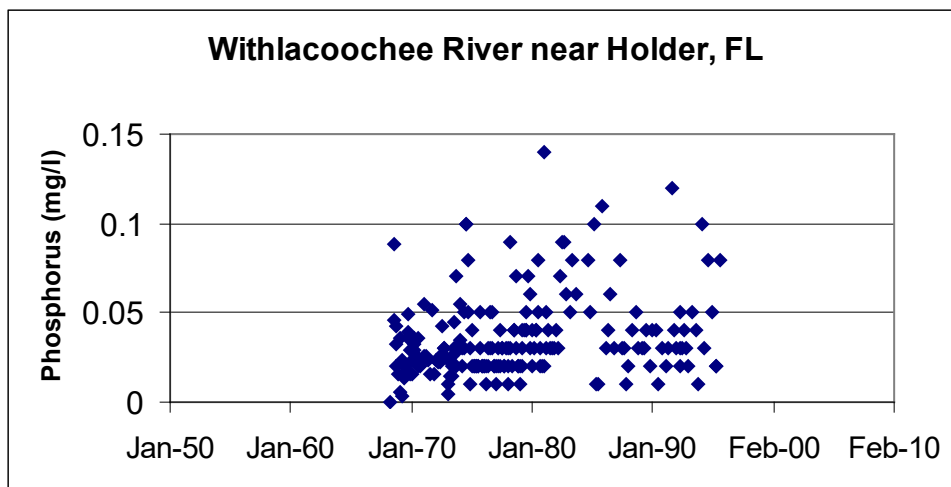


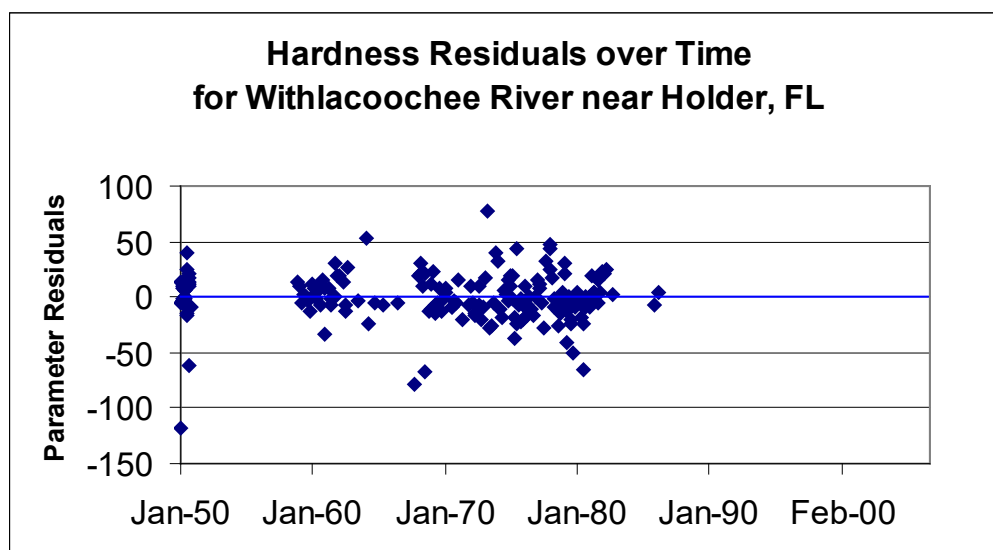
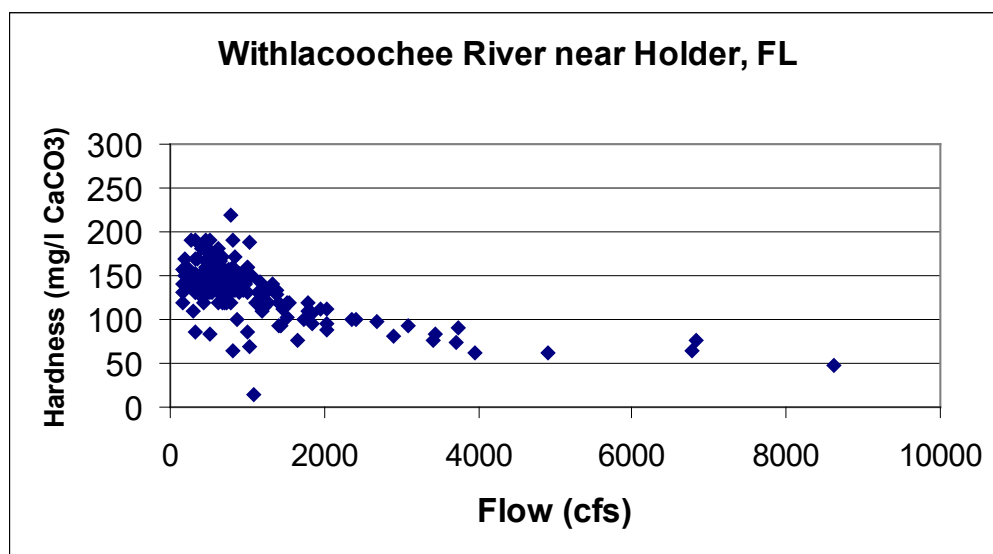
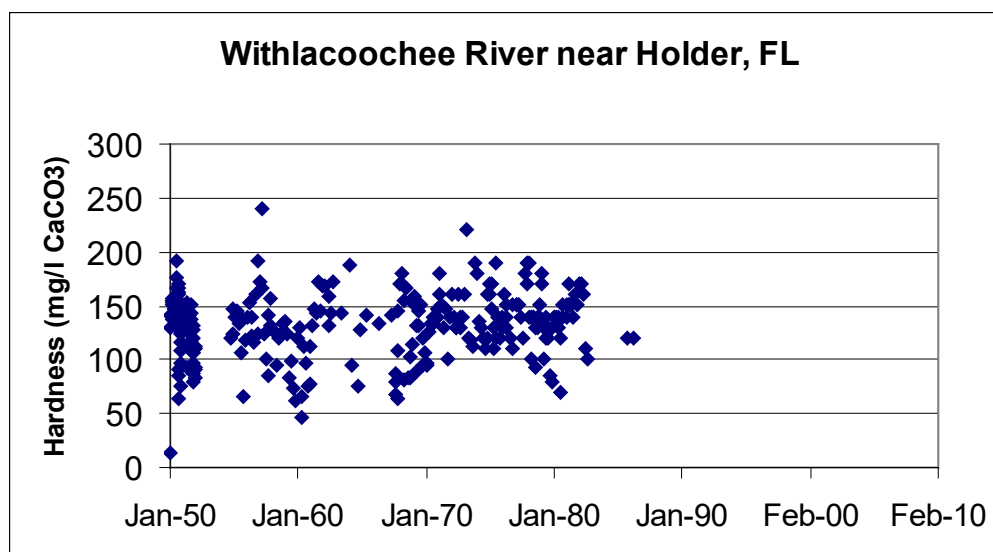


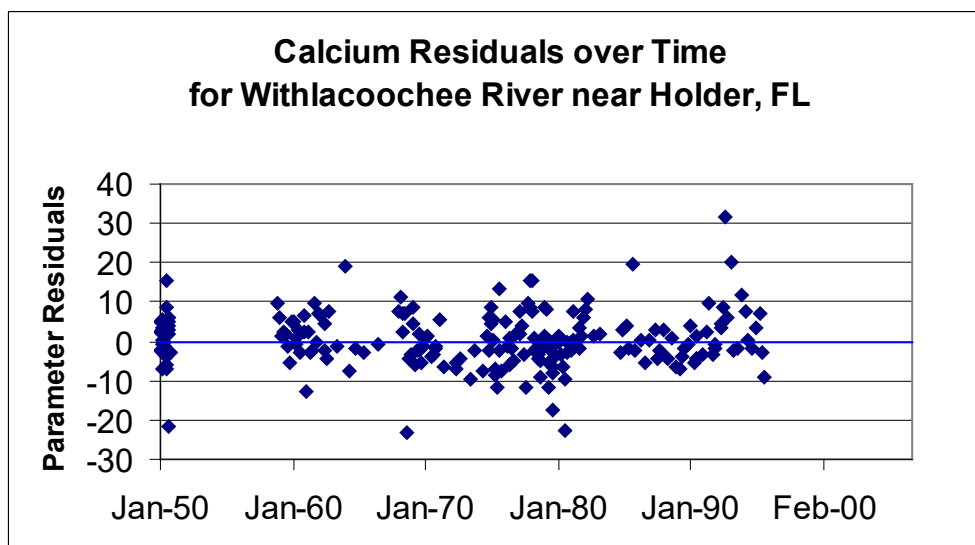
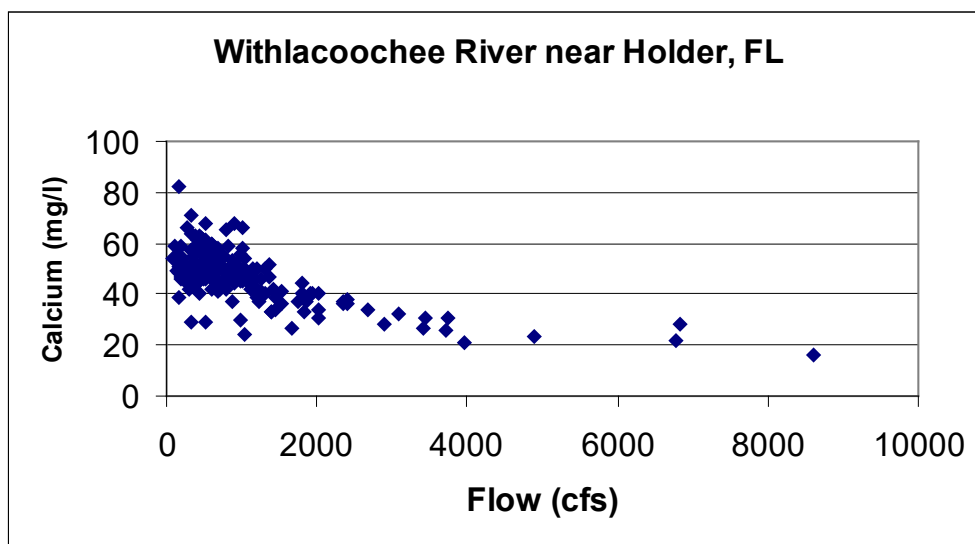
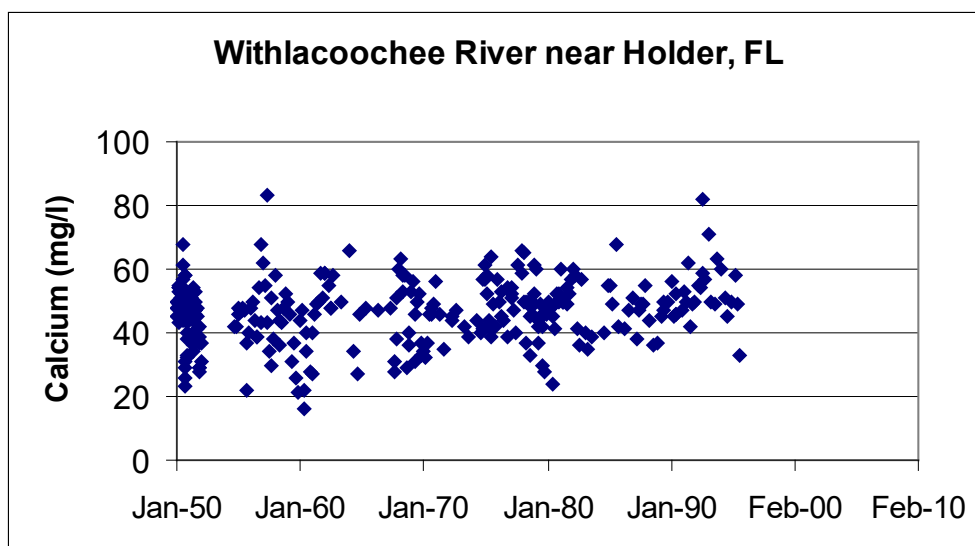


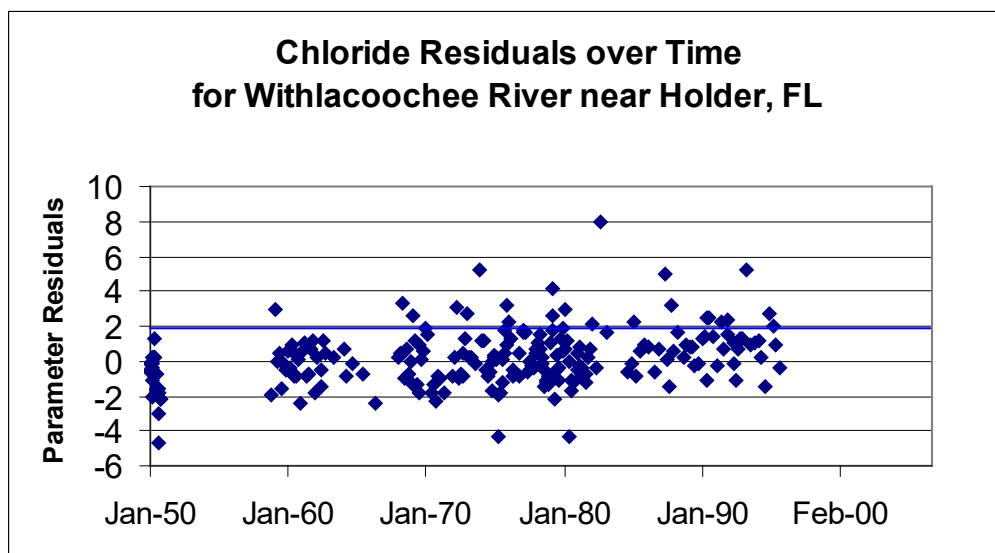
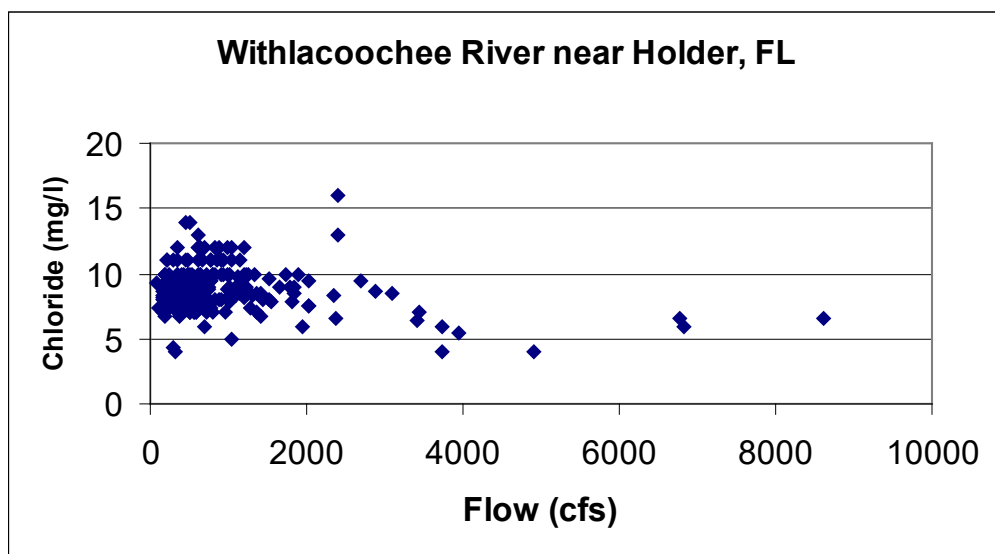
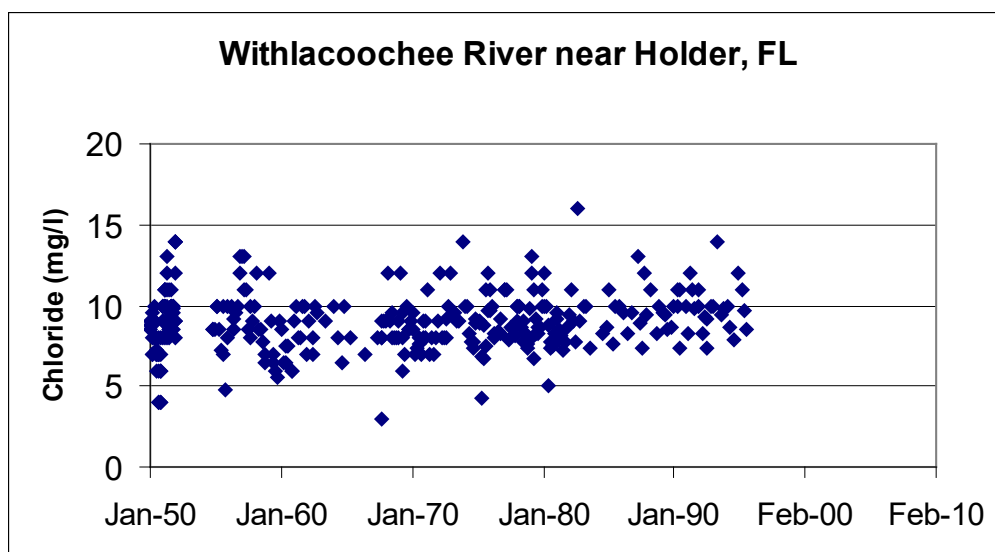


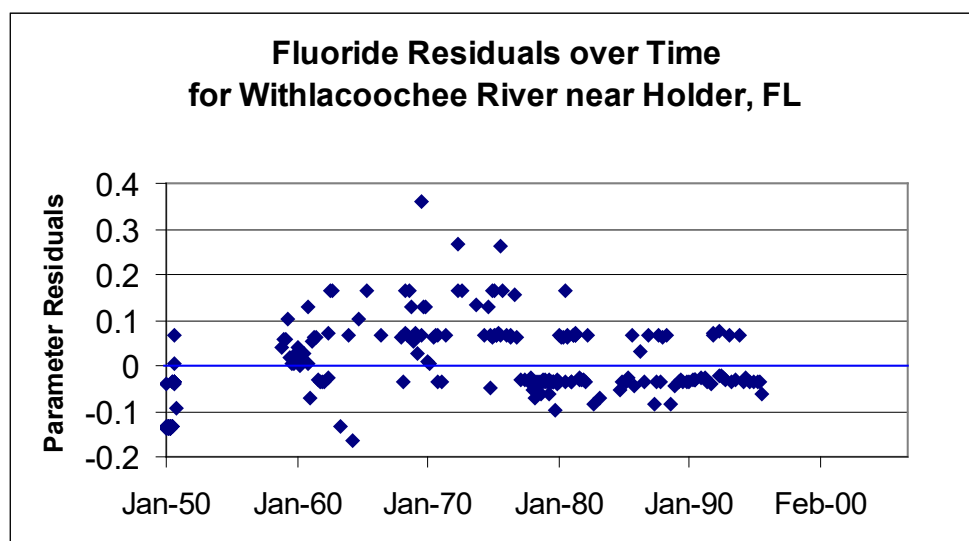
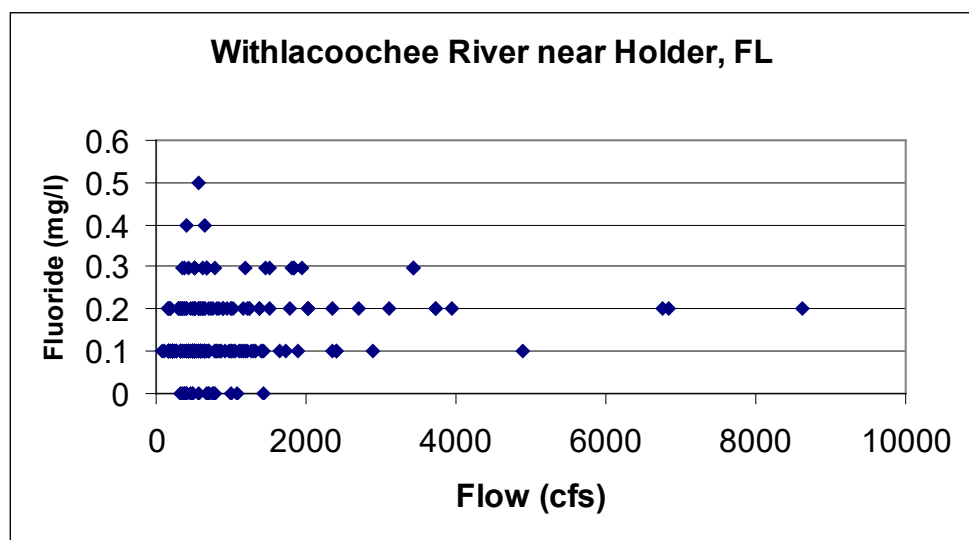
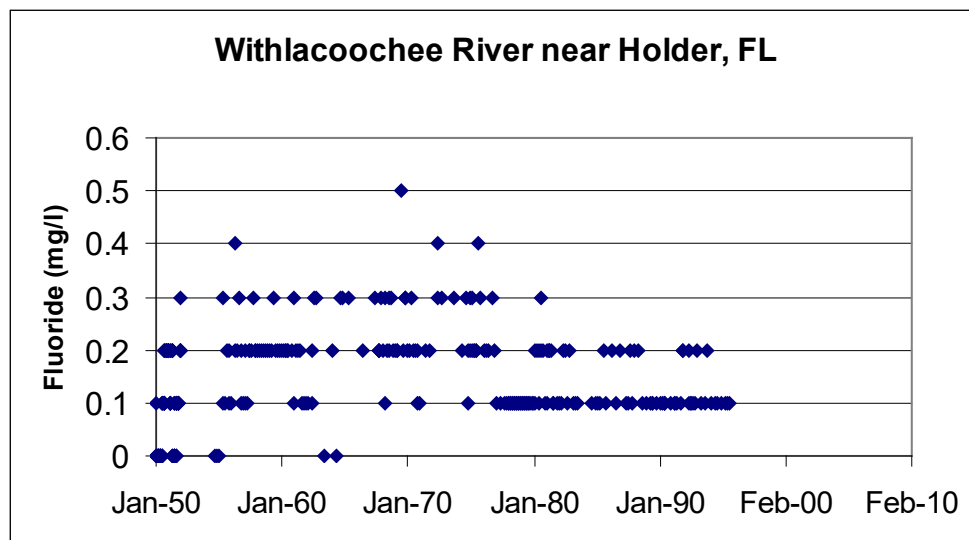


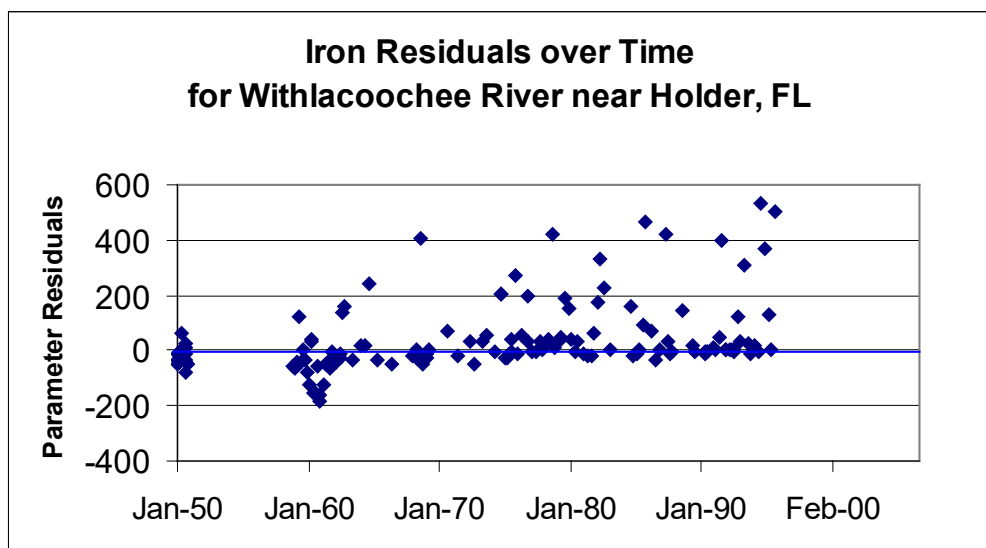
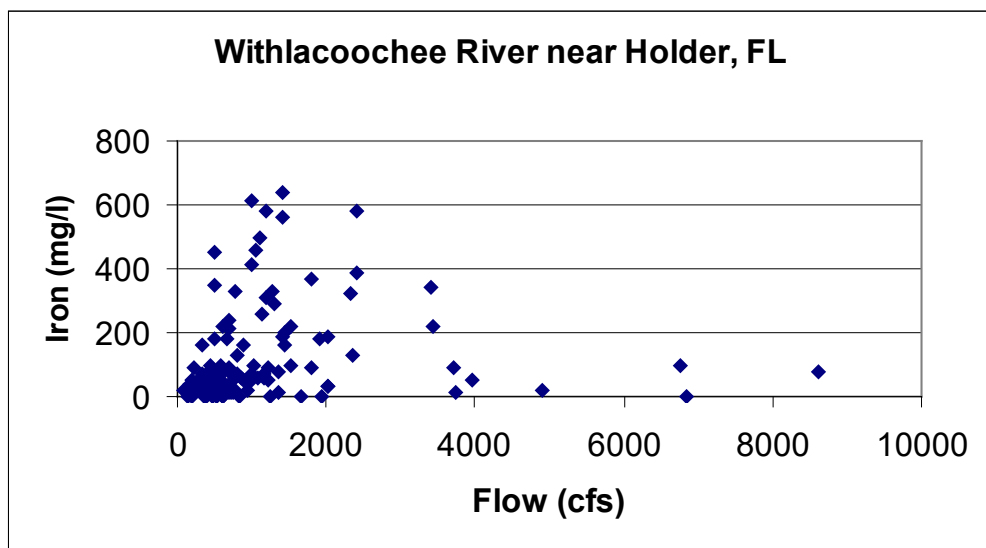
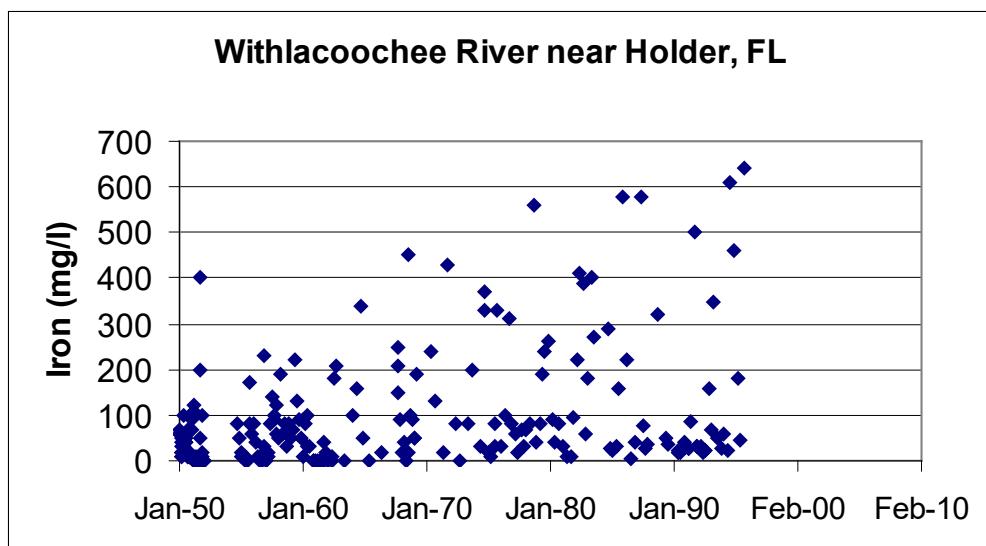


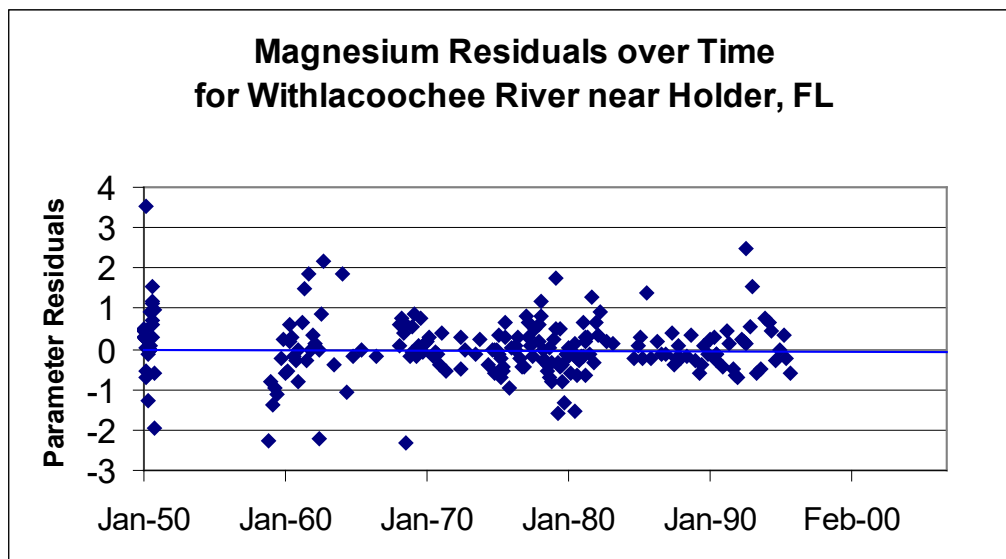
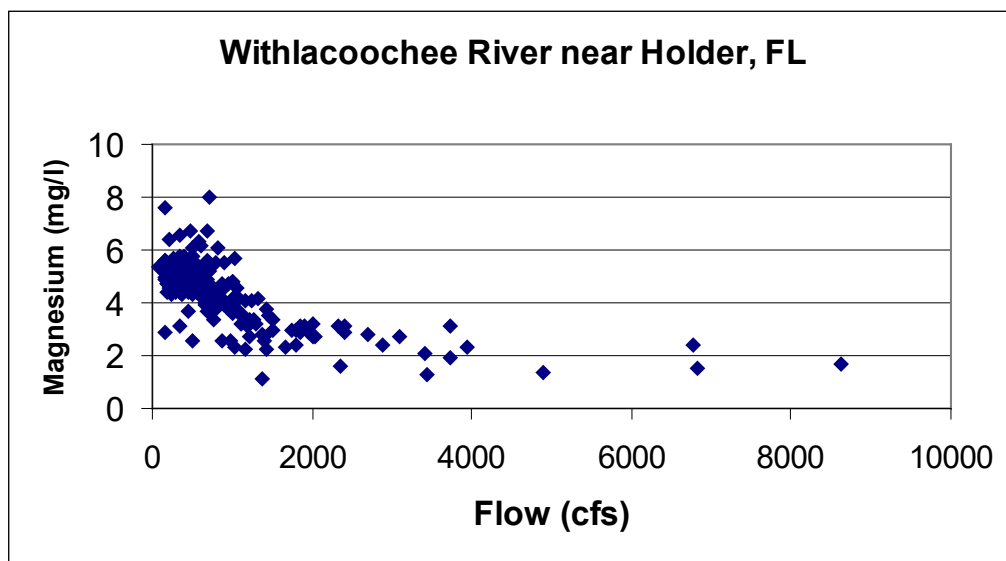
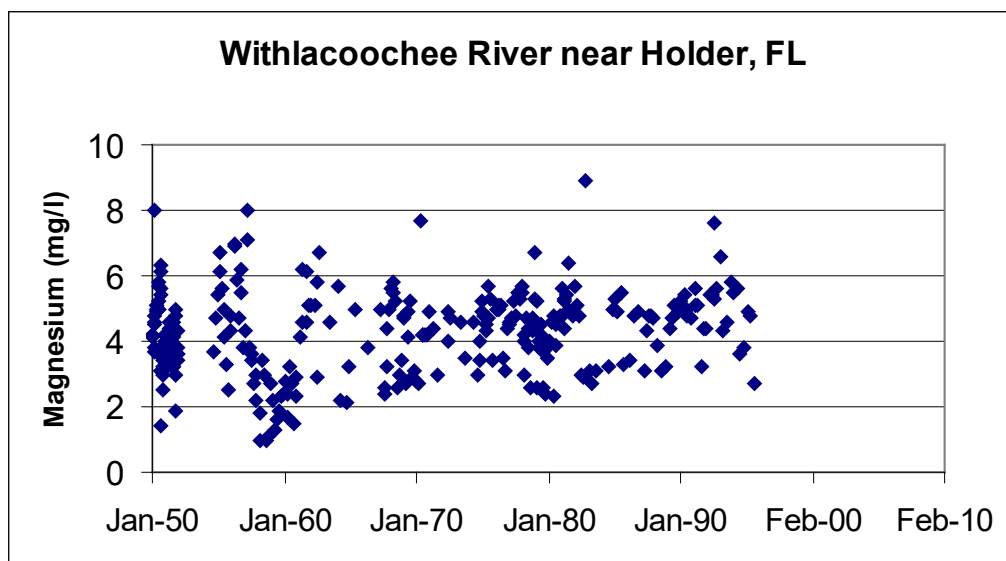


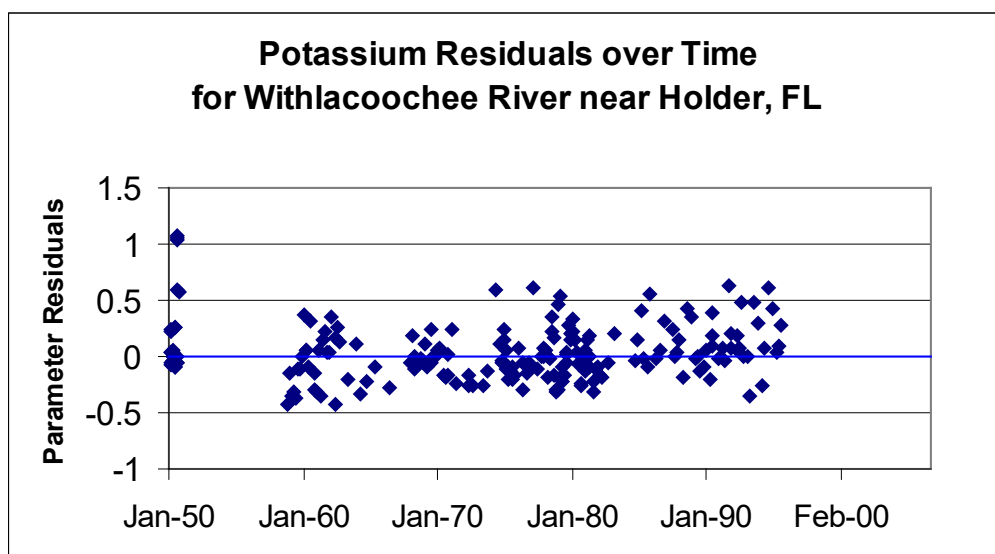
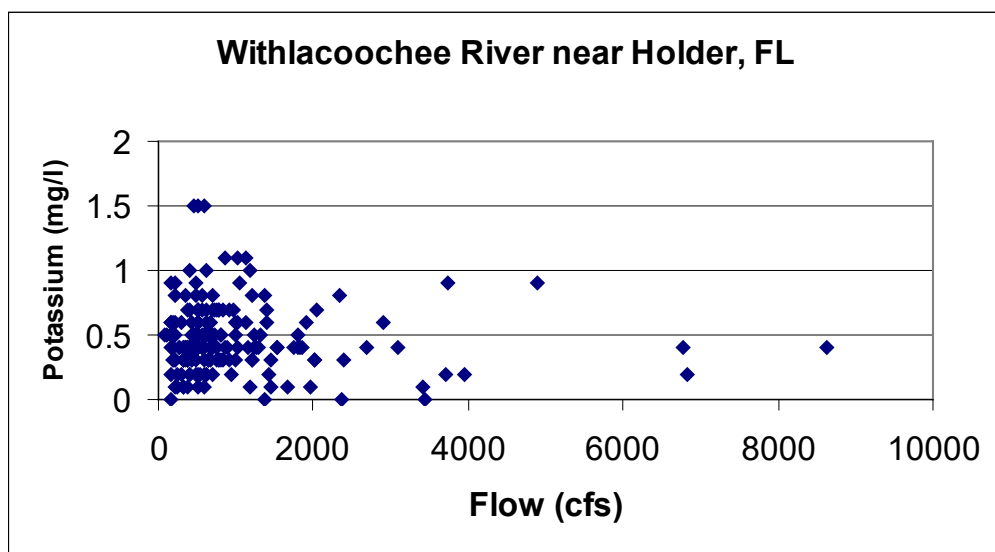
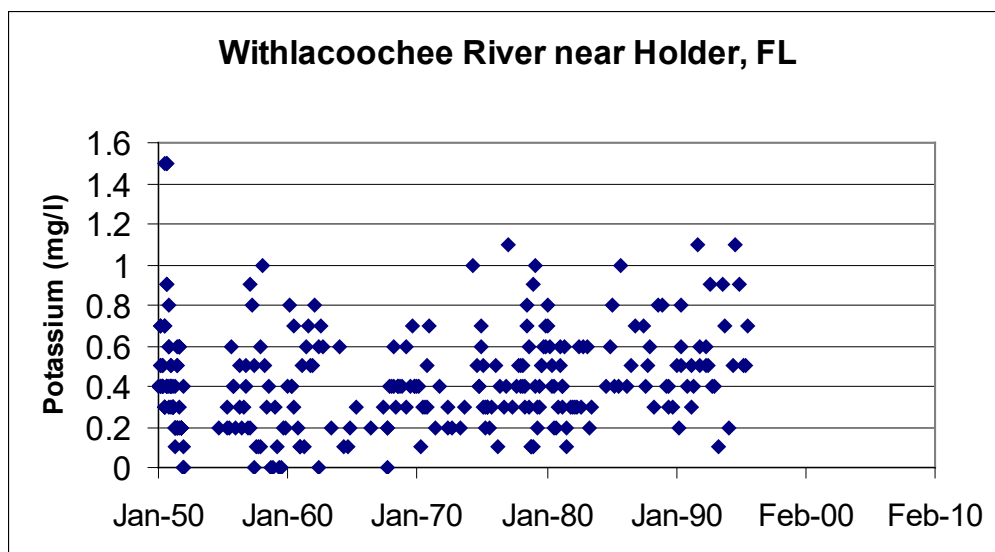


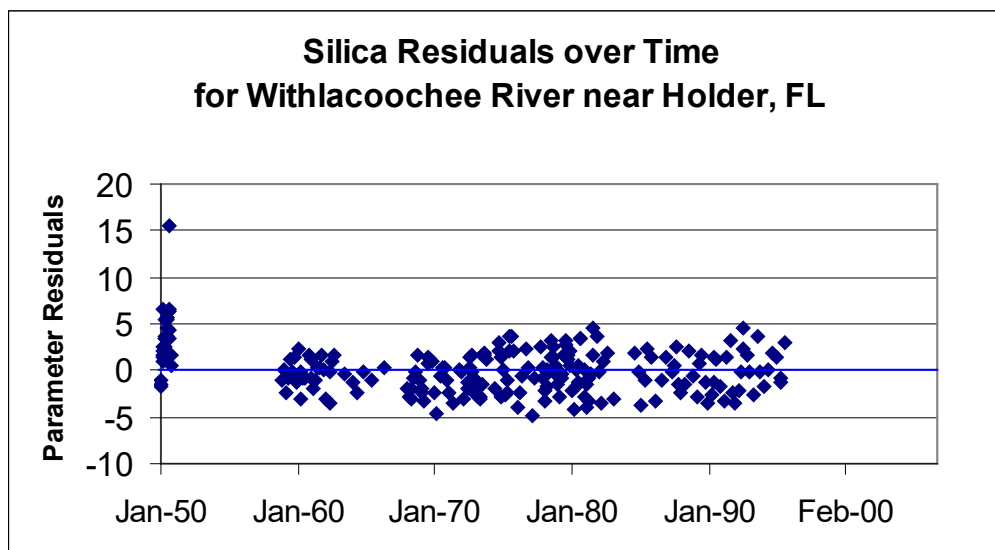
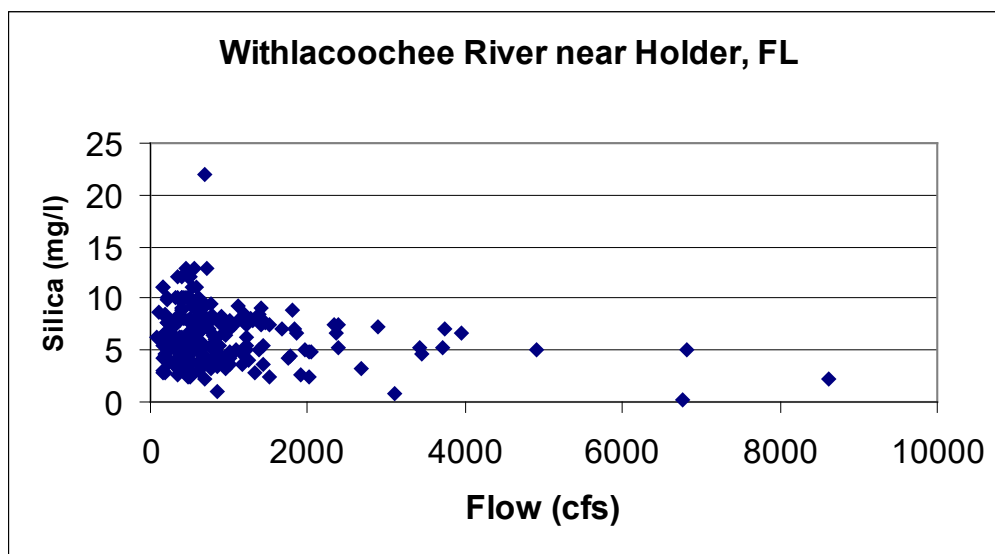
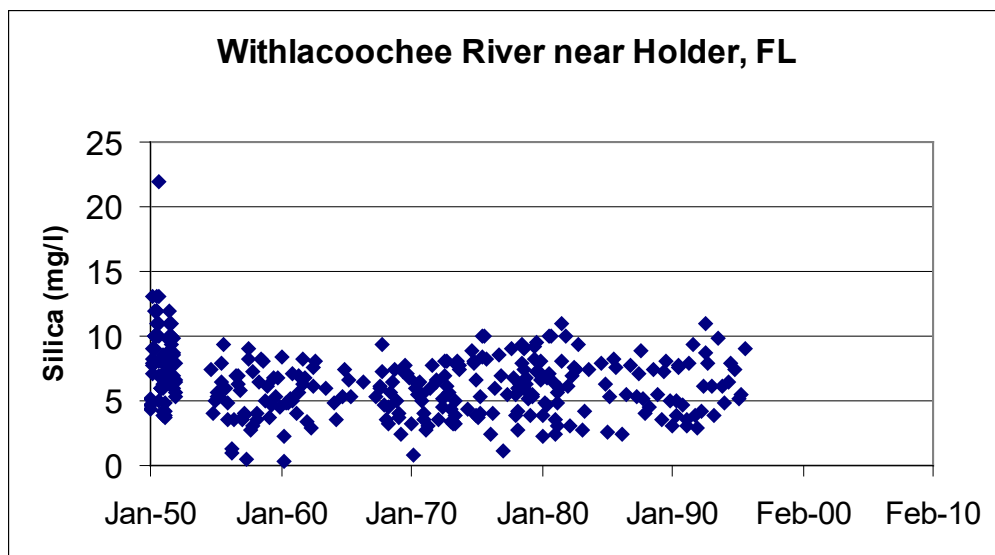


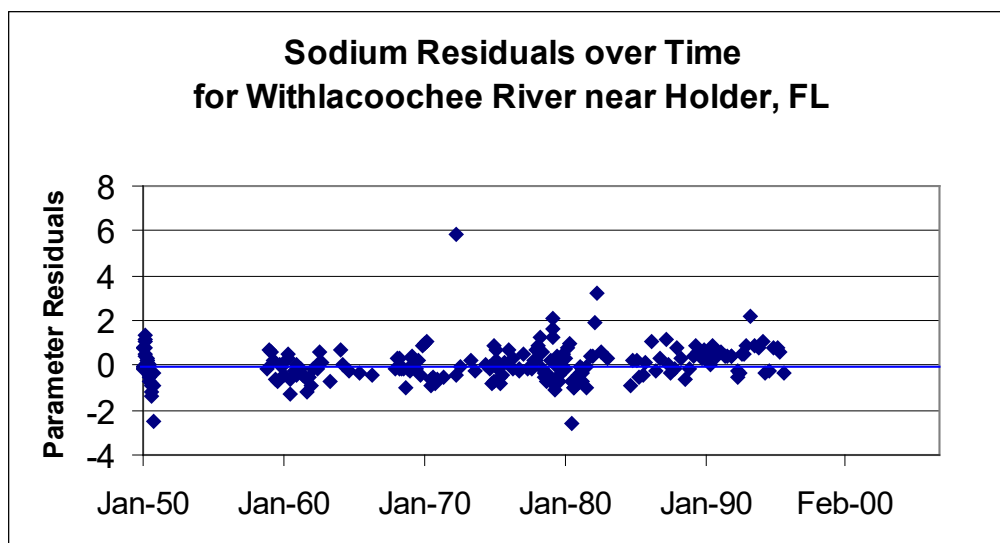
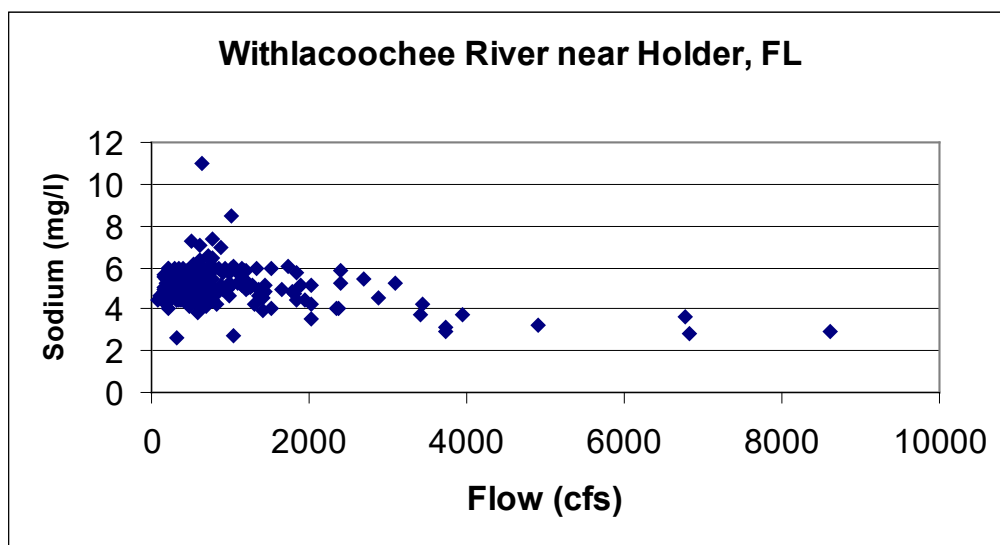
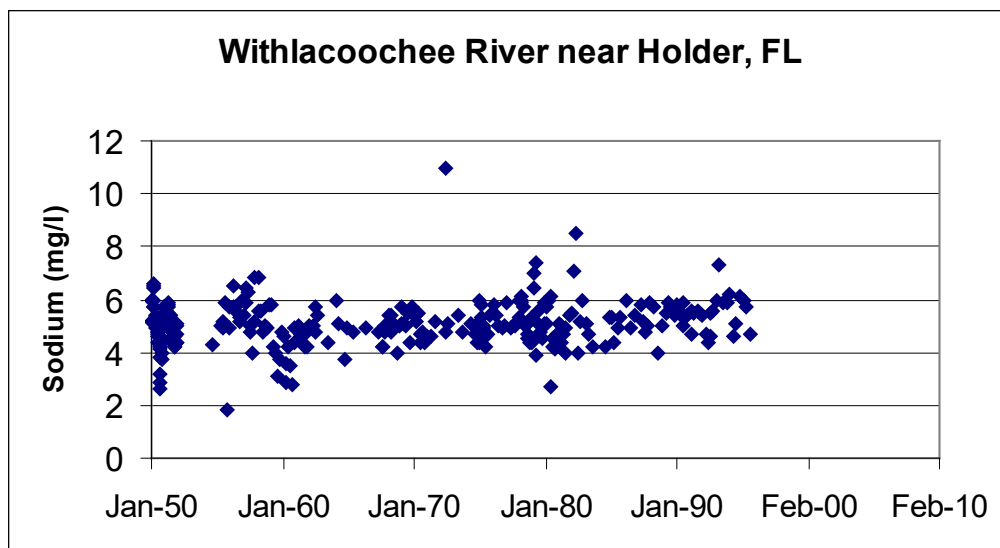


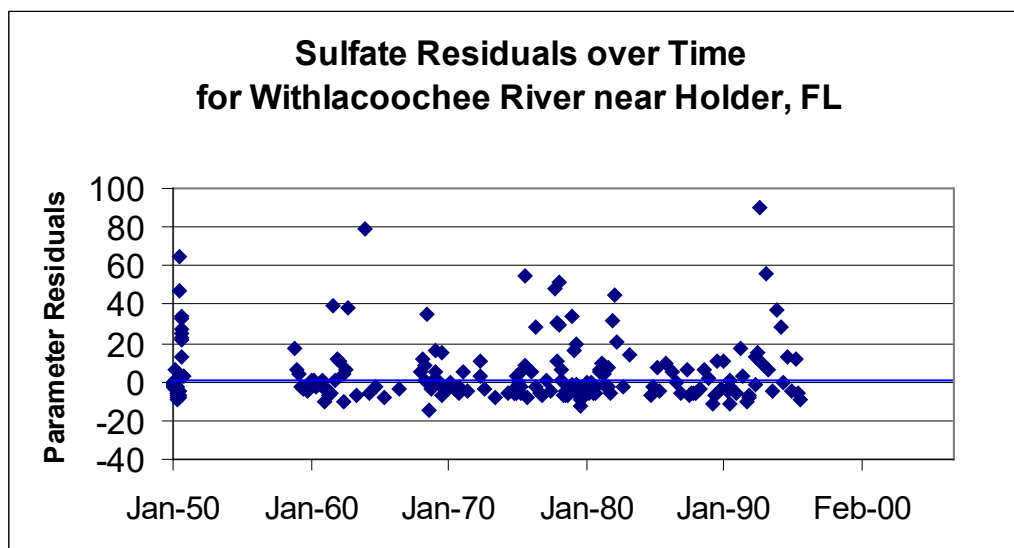
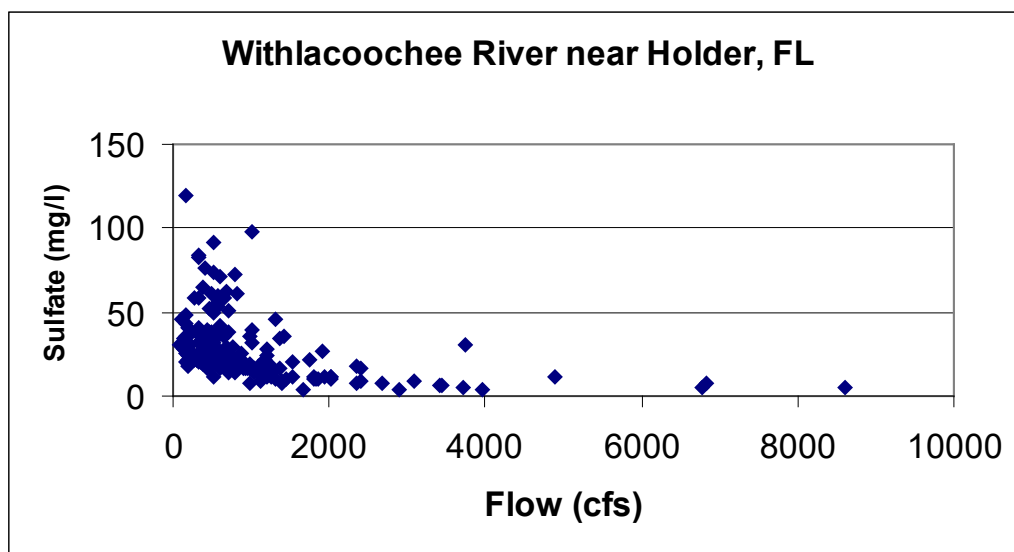
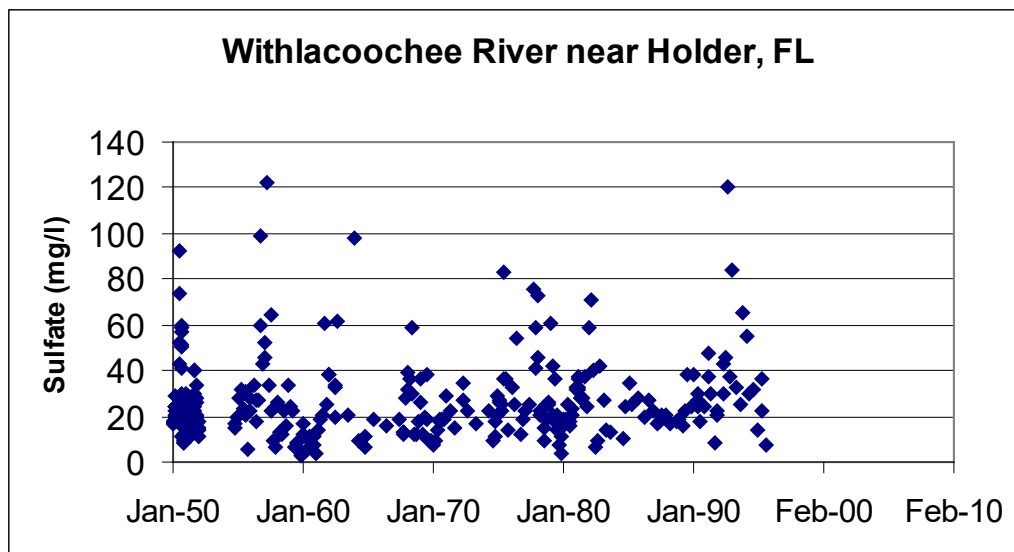












ALAFIA AT LITHIA

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-15.5800	250	0.0000	408.3210	-0.01459
Dissolved Oxygen	-0.0570	194	0.5140	0.6278	-0.00002
pH	-0.0043	234	0.0000	-2.7960	0.00010
Nox	-0.0079	186	0.0168	1.0721	-0.00004
Phosphorus	-0.4750	249	0.0000	22.0165	-0.00064
Hardness	-5.7500	118	0.0131	79.6733	-0.00314
Calcium	-0.4370	188	0.0000	41.1177	-0.00132
Magnesium	0.0210	188	0.0295	2.2041	-0.00007
Sodium	-1.0410	187	0.2962	4.4662	-0.00188
Potassium	0.0583	188	0.0000	-3.3258	0.00012
Chloride	-0.0300	195	0.0000	27.9862	-0.00095
Sulfate	-2.6600	188	0.0000	101.0630	-0.00354
Fluoride	-0.3910	191	0.0000	12.6430	-0.00045
Iron	-0.9400	131	0.0000	-156.5600	0.00527

SOUTH PRONG ALAFIA

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	0.9900	218	0.3902	35.6830	-0.00111
Dissolved Oxygen	-0.1500	196	0.0916	1.6287	-0.00006
pH	0.0451	199	0.0000	-1.3383	0.00004
NOx	-0.0174	171	0.0000	-0.7500	0.00002
Phosphorus	-0.3230	196	0.0000	11.2074	-0.00037
Hardness	2.0700	25	0.9070	-5.7956	0.00030
Calcium	-0.3700	39	0.0111	19.0877	-0.00071
Chloride	-0.4600	39	0.0003	25.6541	-0.00096
Fluoride	-0.2950	78	0.0000	11.1929	-0.00040
Iron	4.4100	32	0.6038	29.8924	-0.00095
Magnesium	0.2060	39	0.1605	-3.1844	0.00035
Potassium	0.0110	39	0.0078	-2.2458	0.00008
Sodium	-0.6500	39	0.0001	35.9532	-0.00134
Sulfate	-0.1700	38	0.0011	102.9050	-0.00377

NORTH PRONG ALAFIA

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-21.3000	214	0.0000	878.8210	-0.02930
Dissolved Oxygen	0.0170	193	0.6645	-0.4388	0.00001
pH	-0.0012	192	0.0000	-2.4658	0.00008
NOx	0.0147	176	0.8931	-0.0722	0.00000
Phosphorus	0.0930	188	0.0000	17.7527	-0.00057
Hardness	-6.7000	23	0.0013	619.2720	-0.02388
Calcium	-0.1400	48	0.0000	119.9610	-0.00390
Chloride	1.3900	47	0.0066	46.6772	-0.00146
Fluoride	-0.4890	87	0.0000	27.1319	-0.00096
Iron	-0.3000	33	0.8891	8.7662	-0.00033
Magnesium	-0.6980	48	0.0016	5.9995	-0.00020
Potassium	-0.0190	48	0.0000	-5.7432	0.00019
Sodium	0.6700	48	0.0019	44.5403	-0.00142
Sulfate	-7.9000	47	0.0000	323.4700	-0.01070

WITHLACOOCHEE RIVER AT CROOM

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	0.6900	196	0.24695	-20.93220	0.00071
Dissolved Oxygen	-0.0760	161	0.01795	2.49541	-0.00001
pH	0.0823	122	0.14721	0.80572	-0.00002
NOx	-0.0036	70	0.39718	-0.02900	0.00000
Phosphorus	0.0022	97	0.94037	0.00552	0.00000
Hardness	insufficient data (n=7)				
Calcium	-0.0340	99	0.00389	-24.40160	0.00711
Chloride	-0.0270	99	0.54945	1.40672	-0.00004
Fluoride	-0.0023	99	0.17852	0.03435	0.00000
Iron	insufficient data (n=12)				
Magnesium	0.0095	99	0.18848	0.75054	-0.00002
Potassium	-0.0047	99	0.05191	-1.21668	0.00004
Silica	0.1980	100	0.04316	-3.63283	0.00011
Sodium	0.0230	98	0.30529	-1.54163	0.00046
Sulfate	0.0600	99	0.21405	-2.28699	0.00007

WITHLACOOCHEE RIVER AT HOLDER

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-2.8100	269	0.67368	-8.56307	0.00020
Dissolved Oxygen	-0.0530	170	0.23039	1.51387	-0.00005
pH	-0.0124	249	0.39982	0.09717	0.00000
NOx	-0.0006	205	0.30559	0.03173	-0.00001
Phosphorus	0.0008	168	0.00289	-0.04168	0.00000
Hardness	-1.9200	185	0.23975	8.70238	0.00270
Calcium	-0.4120	214	0.62894	0.76156	-0.00004
Chloride	0.0870	228	0.00000	-2.76800	0.00010
Fluoride	-0.0287	207	0.43782	-0.03258	0.00000
Iron	-2.6000	155	0.00000	-118.59200	0.00431
Magnesium	-0.0256	214	0.38274	0.17967	0.00001
Potassium	0.0023	204	0.03940	-0.17603	0.00001
Silica	-0.0700	223	0.02427	2.19811	-0.00008
Sodium	-0.0356	208	0.00087	-0.93858	0.00003
Sulfate	-1.6400	208	0.82802	-0.90412	-0.00003

MYAKKA RIVER NEAR SARASOTA

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-10.0000	248	0.00000	-424.30800	0.01456
Dissolved Oxygen	0.0350	120	0.50922	1.46821	-0.00005
pH	-0.0083	215	0.00416	0.63905	-0.00002
NOx	-0.0069	129	0.06248	0.04895	0.00000
Phosphorus	-0.0171	127	0.00000	-0.73127	0.00003
Calcium	-1.0090	193	0.00000	-36.99860	0.00127
Chloride	-0.3290	198	0.00001	-9.87780	0.00034
Fluoride	0.0045	197	0.00027	0.17920	-0.00001
Hardness	-2.9100	146	0.00000	-187.61700	0.00734
Magnesium	-0.4650	193	0.00000	-19.95630	0.00069
Potassium	-0.2810	193	0.00000	-8.17683	0.00028
Silica	0.0850	192	0.77540	-0.23801	0.00001
Sodium	0.0070	192	0.00000	-7.44218	0.00026
Sulfate	-3.7800	191	0.00000	-135.29300	0.00463

PEACE RIVER AT ZOLFO SPRINGS

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-2.1600	194	0.24105	33.38050	0.00087
Dissolved Oxygen	-0.0110	163	0.10035	-2.16677	0.00007
pH	0.0129	172	0.00716	-0.83519	0.00005
NOx	-0.0257	179	0.00926	0.64039	-0.00002
Phosphorus	-0.0960	176	0.00000	6.15835	-0.00021
Hardness	-1.0800	34	0.09685	-70.09360	0.00270
Calcium	0.4600	48	0.25157	8.88164	-0.00032
Chloride	-0.1780	49	0.00000	-14.12370	0.00053
Fluoride	0.0214	49	0.15745	0.77328	-0.00003
Iron	insufficient data (n=18)				
Magnesium	-0.2170	48	0.35994	-2.83899	0.00010
Potassium	-0.0710	47	0.00000	-4.97350	0.00018
Silica	-0.0820	60	0.00394	6.10975	-0.00023
Sodium	0.1820	47	0.00741	-9.13969	0.00035
Sulfate	1.8600	48	0.47157	18.84010	-0.00064

PEACE RIVER AT ARCADIA

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-6.0400	642	0.00000	-131.00000	0.00495
Dissolved Oxygen	-0.0791	245	0.57867	0.41129	-0.00002
pH	-0.0064	621	0.95414	-0.00224	0.00000
NOx	0.0059	173	0.01243	0.48939	-0.00002
Phosphorus	-0.0345	495	0.00000	4.00839	-0.00016
Hardness	-3.7300	446	0.00000	-87.03340	0.00341
Calcium	-0.4210	551	0.03372	-3.34403	0.00012
Chloride	-0.2820	560	0.00000	-12.67960	0.00050
Fluoride	-0.0132	570	0.00000	1.83663	-0.00007
Iron	-2.3100	450	0.00000	-153.77200	0.00616
Magnesium	-0.1790	552	0.00000	-8.13830	0.00032
Potassium	-0.1309	548	0.00000	-5.54515	0.00022
Silica	0.1470	563	0.00000	11.16780	-0.00044
Sodium	-0.2390	548	0.00000	-3.74362	0.00014
Sulfate	-1.9490	555	0.00000	-24.41510	0.00090

CHARLIE CREEK NEAR GARDNER

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-2.8600	136	0.00000	-310.74100	0.01032
Dissolved Oxygen	-0.2350	121	0.00233	3.58942	-0.00013
pH	0.0291	102	0.00138	1.72877	-0.00006
NOx	-0.0158	67	0.00044	-0.78126	0.00002
Phosphorus	0.0151	84	0.00743	-0.40872	0.00001
Hardness	insufficient data (n=16)				
Calcium	-0.1510	21	0.00159	-17.02650	0.00068
Chloride	0.3800	26	0.00013	-13.24990	0.00049
Fluoride	0.0053	25	0.98130	0.01862	0.00001
Iron	insufficient data (n=4)				
Magnesium	-0.1020	22	0.00031	-9.32514	0.00369
Potassium	-0.0270	21	0.00600	-7.68303	0.00031
Silica	0.4760	22	0.02784	-6.99980	0.00030
Sodium	0.0700	21	0.00123	-5.24280	0.00022
Sulfate	-2.6700	25	0.00050	-57.08330	0.00212

HORSE CREEK AT ARCADIA

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-3.1000	193	0.00000	-386.42100	0.01257
Dissolved Oxygen	-0.2400	162	0.47790	-0.99684	0.00002
pH	0.0192	149	0.00001	1.90689	-0.00006
NOx	-0.0075	125	0.00000	-0.92137	0.00003
Phosphorus	-0.0003	115	0.01138	0.33833	-0.00001
Hardness	insufficient data (n=21)				
Calcium	-0.2200	53	0.00001	-32.70440	0.00098
Chloride	0.1760	65	0.00001	-14.10770	0.00047
Fluoride	-0.0157	63	0.00005	0.34637	-0.00001
Magnesium	-0.0450	53	0.00000	-12.98900	0.00039
Potassium	-0.1360	53	0.00000	-7.27912	0.00022
Sodium	-0.2890	53	0.62347	-1.14148	0.00003
Sulfate	-0.0400	54	0.00000	-105.26500	0.00319
Silica	0.0980	56	0.05545	-3.45960	0.00020

JOSHUA CREEK AT NOCATEE

Parameter Residual	Residual Median	n	p Value	intercept	slope
Conductance	-23.4000	135	0.00000	-913.14400	0.02954
Dissolved Oxygen	-0.1360	116	0.24815	-1.60478	0.00005
pH	0.0203	99	0.58218	0.29755	-0.00001
NOx	-0.0130	68	0.00003	-2.23268	0.00007
Phosphorus	-0.0060	70	0.00000	0.76209	-0.00002
Hardness	insufficient data (n=10)				
Calcium	1.9900	34	0.00003	-81.12080	0.00239
Chloride	3.3900	49	0.00000	-186.59200	0.00608
Fluoride	-0.0090	34	0.00832	0.22202	-0.00001
Magnesium	1.1090	34	0.00065	-22.25370	0.00067
Potassium	0.1790	33	0.00279	-9.69056	0.00028
Silica	0.2190	37	0.35310	-1.87070	0.00006
Sodium	1.1800	33	0.00000	-89.25580	0.00260
Sulfate	1.4500	35	0.00059	-132.69900	0.00386

WP

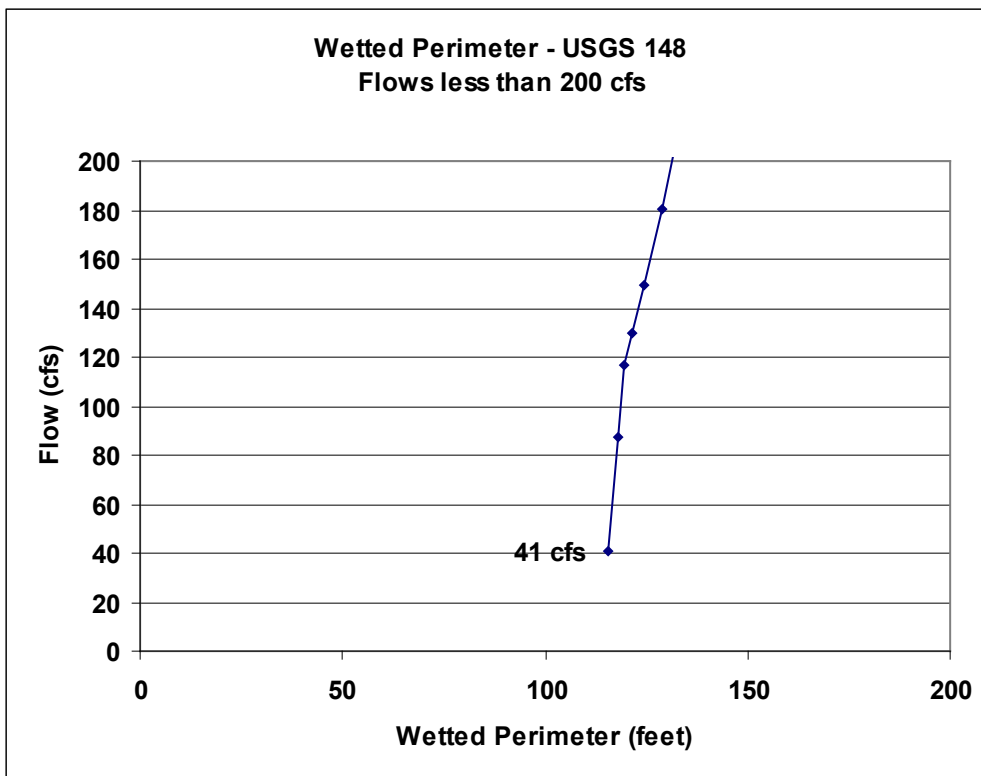
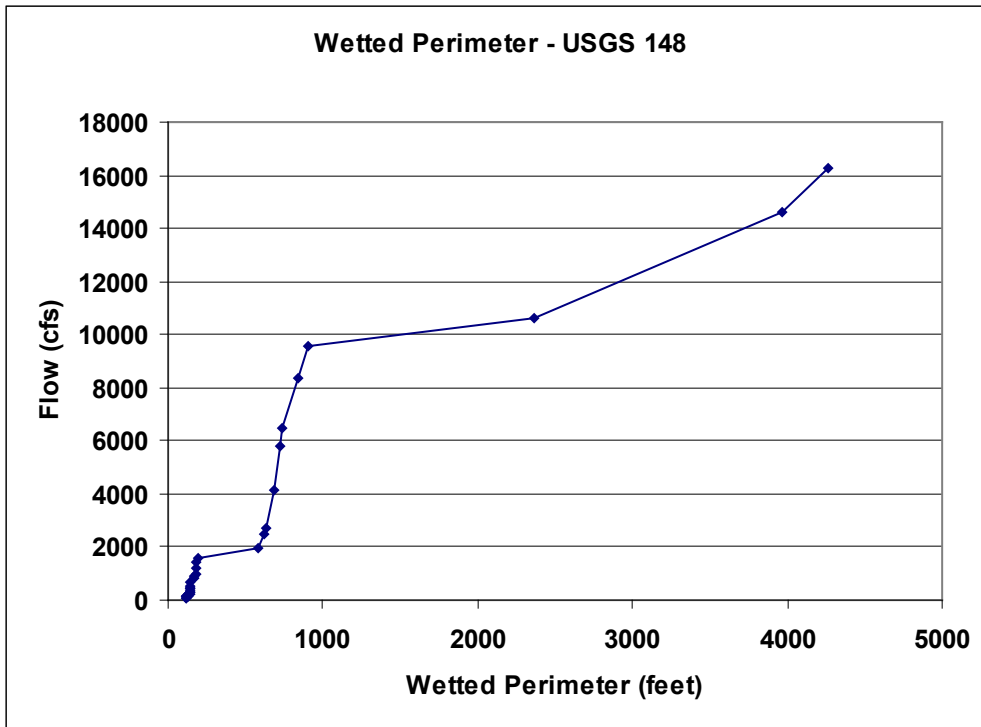
Wetted Perimeter – WP

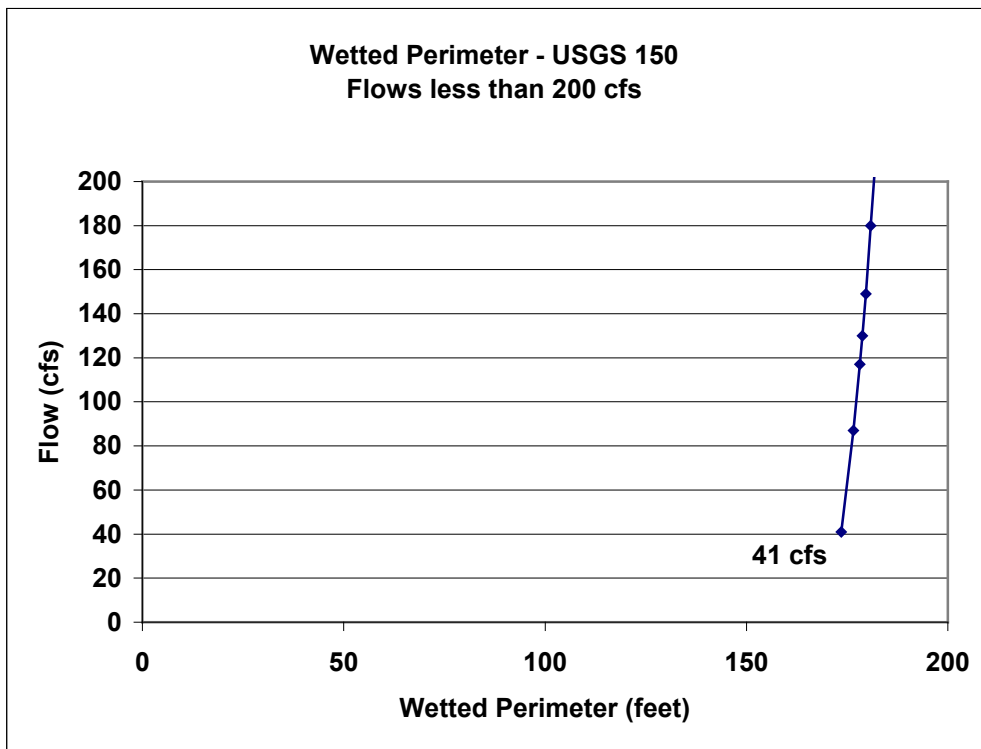
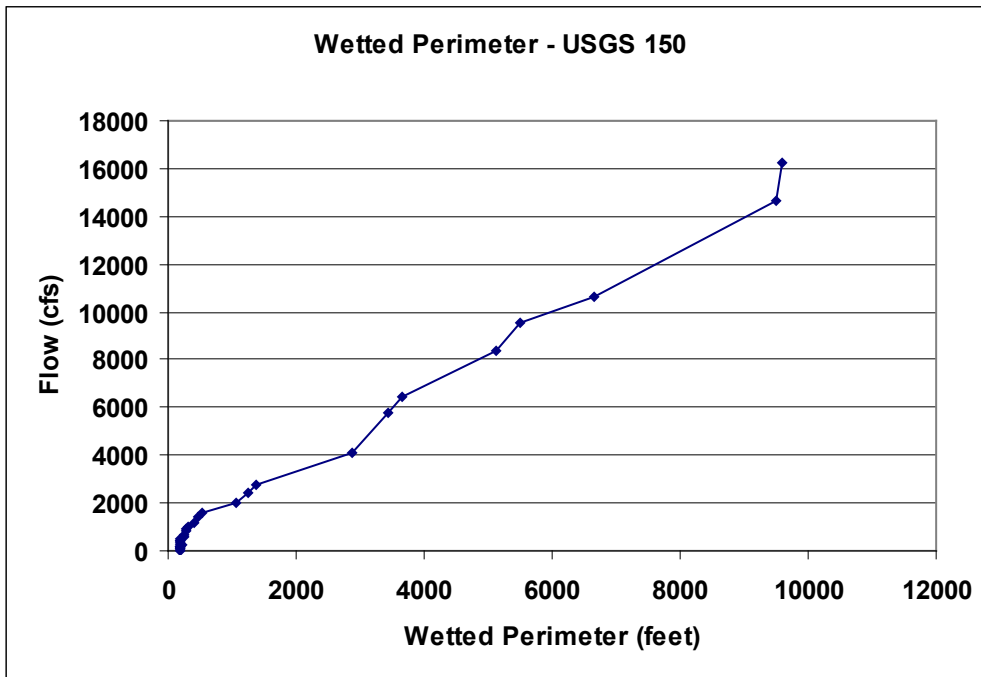
This appendix contains all wetted perimeter plots generated for the Middle Peace River cross sections. Cross sections identified by "USGS #" refer to cross section data obtained from USGS for use in the HEC_RAS model. Cross sections referred to in the form "USGS #.#" identify cross sections inserted between USGS transects. This cross section data was obtained by the SWFWMD for the purpose of this MFL study. In most cases these sites are also identified a corresponding shoal number or vegetative transect number in the format "Shoal #" or "SWFWMD #", respectively.

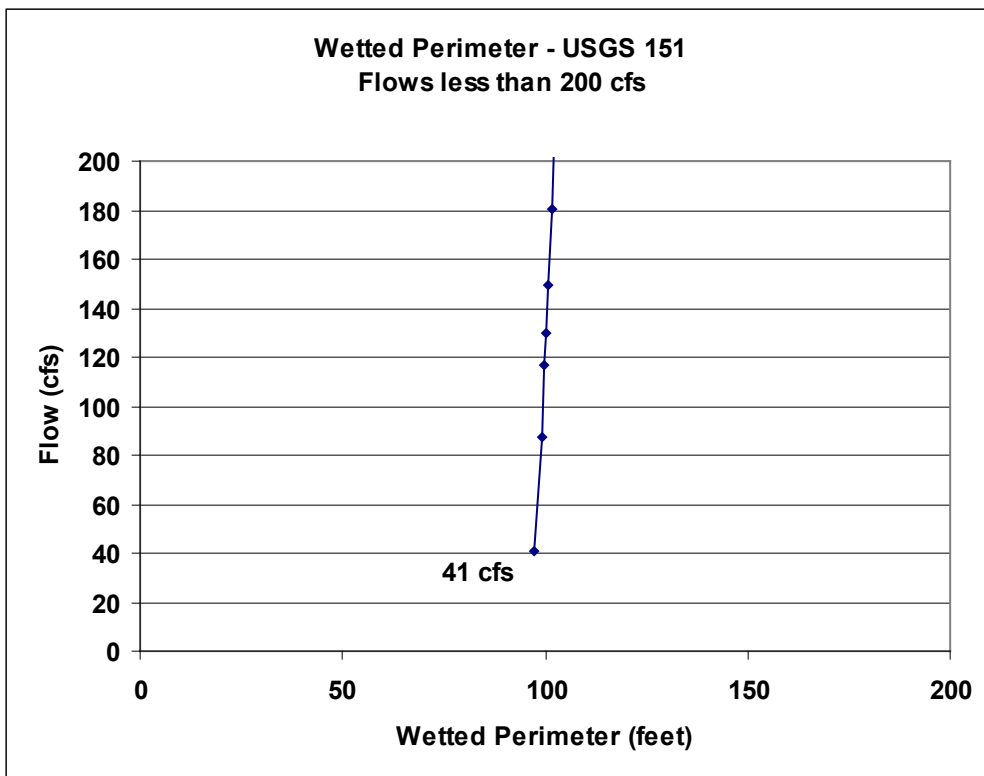
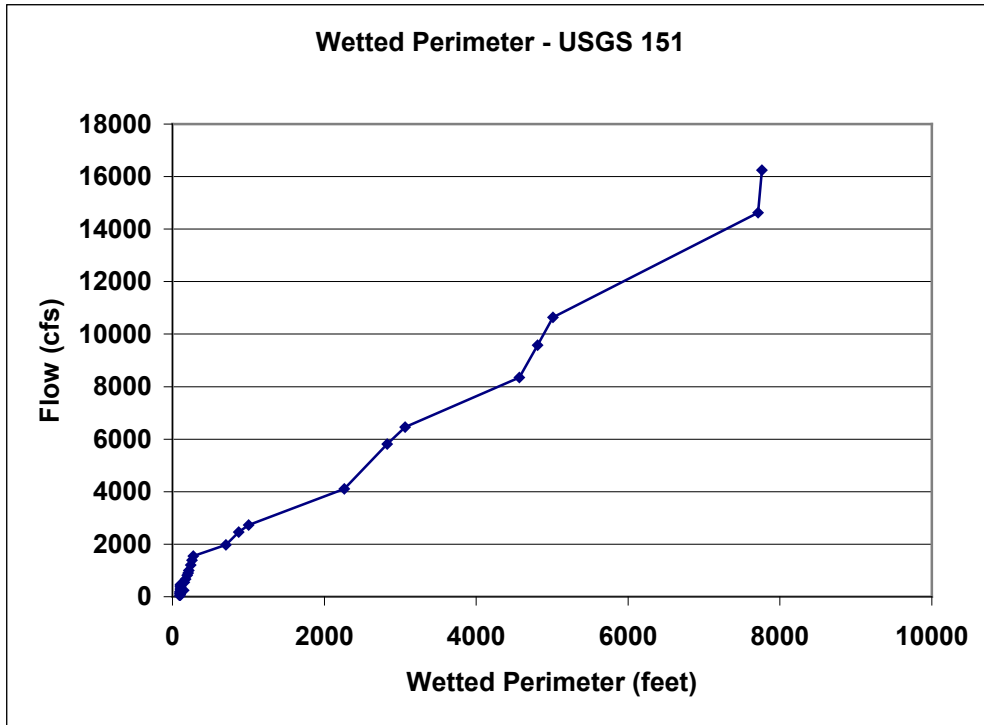
Wetted perimeter plots for USGS 148	WP 4
Wetted perimeter plots for USGS 150	WP 5
Wetted perimeter plots for USGS 151	WP 6
Wetted perimeter plots for USGS 152	WP 7
Wetted perimeter plots for USGS 152.1	WP 8
Wetted perimeter plots for USGS 154	WP 9
Wetted perimeter plots for USGS 156	WP 10
Wetted perimeter plots for USGS 158	WP 11
Wetted perimeter plots for USGS 160	WP 12
Wetted perimeter plots for USGS 161.5	WP 13
Wetted perimeter plots for USGS 162	WP 14
Wetted perimeter plots for USGS 164	WP 15
Wetted perimeter plots for USGS 166	WP 16
Wetted perimeter plots for USGS 166.1	WP 17
Wetted perimeter plots for USGS 168	WP 18
Wetted perimeter plots for USGS 170	WP 19
Wetted perimeter plots for USGS 172	WP 20
Wetted perimeter plots for USGS 173	WP 21
Wetted perimeter plots for USGS 174	WP 22
Wetted perimeter plots for USGS 176	WP 23
Wetted perimeter plots for USGS 178	WP 24
Wetted perimeter plots for USGS 180	WP 25
Wetted perimeter plots for USGS 182	WP 26
Wetted perimeter plots for USGS 184	WP 27
Wetted perimeter plots for USGS 186	WP 28
Wetted perimeter plots for USGS 188	WP 29
Wetted perimeter plots for USGS 189	WP 30
Wetted perimeter plots for USGS 190.5	WP 31
Wetted perimeter plots for USGS 191	WP 32
Wetted perimeter plots for USGS 196	WP 33
Wetted perimeter plots for USGS 198	WP 34

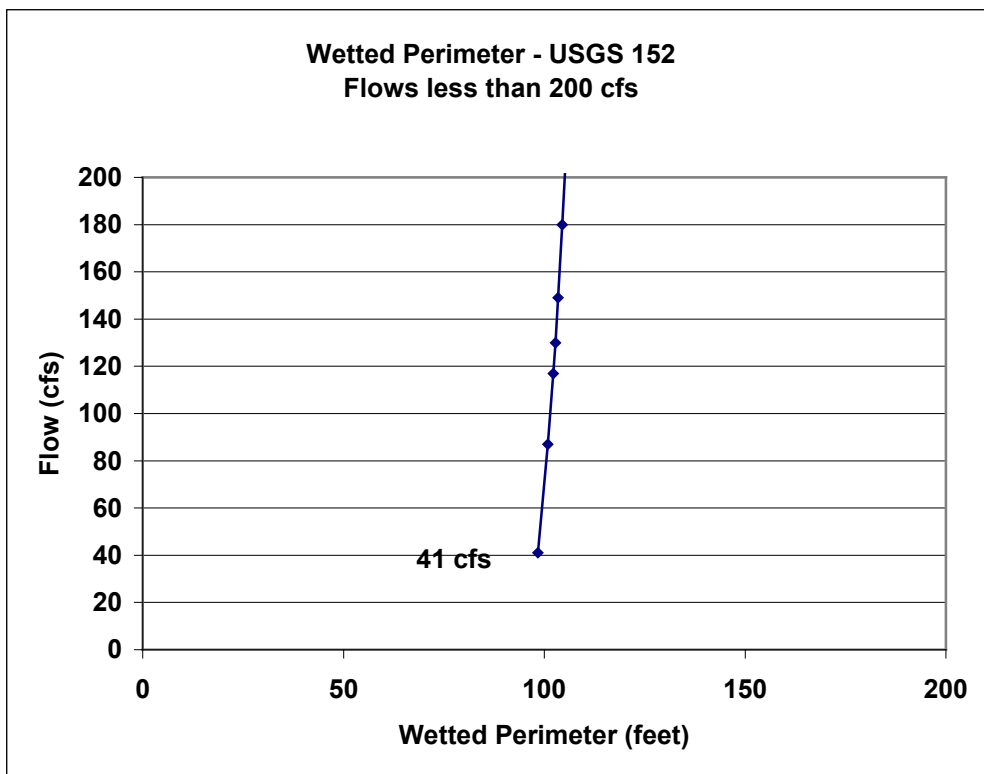
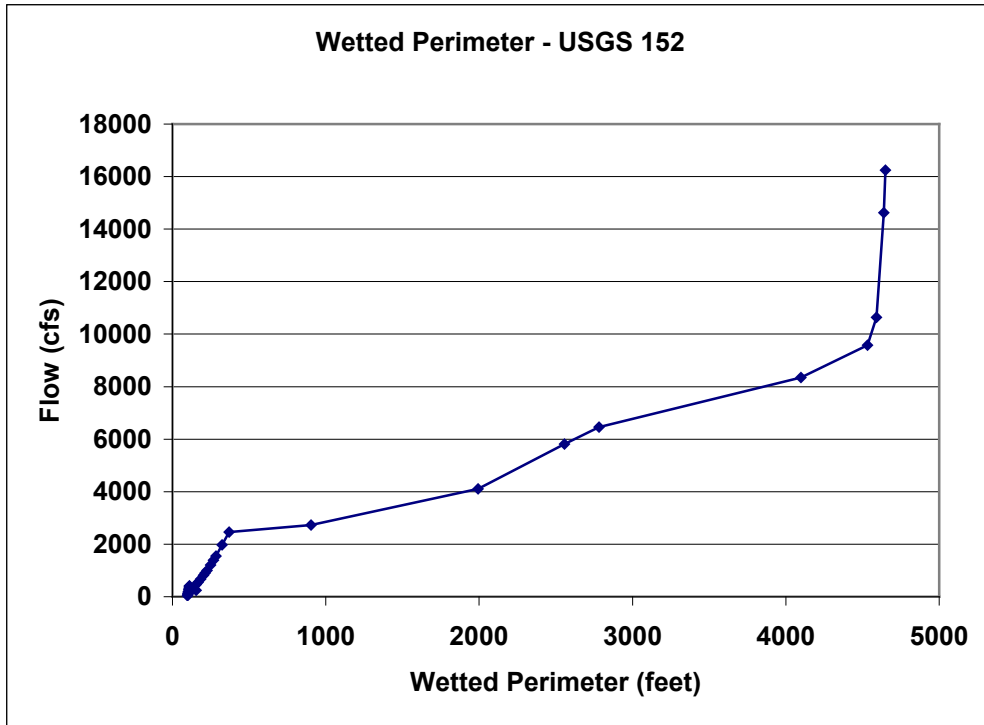
Wetted perimeter plots for USGS 200	WP 35
Wetted perimeter plots for USGS 202	WP 36
Wetted perimeter plots for USGS 204	WP 37
Wetted perimeter plots for USGS 206	WP 38
Wetted perimeter plots for USGS 208	WP 39
Wetted perimeter plots for USGS 210	WP 40
Wetted perimeter plots for USGS 212	WP 41
Wetted perimeter plots for USGS 212.1	WP 42
Wetted perimeter plots for USGS 214	WP 43
Wetted perimeter plots for USGS 216	WP 44
Wetted perimeter plots for USGS 216.1	WP 45
Wetted perimeter plots for USGS 218	WP 46
Wetted perimeter plots for USGS 220	WP 47
Wetted perimeter plots for USGS 222	WP 48
Wetted perimeter plots for USGS 224	WP 49
Wetted perimeter plots for USGS 226	WP 50
Wetted perimeter plots for USGS 228	WP 51
Wetted perimeter plots for USGS 230	WP 52
Wetted perimeter plots for USGS 232	WP 53
Wetted perimeter plots for USGS 234	WP 54
Wetted perimeter plots for USGS 236	WP 55
Wetted perimeter plots for USGS 238	WP 56
Wetted perimeter plots for USGS 240	WP 57
Wetted perimeter plots for USGS 240.1	WP 58
Wetted perimeter plots for USGS 242	WP 59
Wetted perimeter plots for USGS 244	WP 60
Wetted perimeter plots for USGS 246	WP 61
Wetted perimeter plots for USGS 246.1	WP 62
Wetted perimeter plots for USGS 248	WP 63
Wetted perimeter plots for USGS 250	WP 64
Wetted perimeter plots for USGS 252	WP 65
Wetted perimeter plots for USGS 254	WP 66
Wetted perimeter plots for USGS 254.1	WP 67
Wetted perimeter plots for USGS 256	WP 68
Wetted perimeter plots for USGS 258	WP 69
Wetted perimeter plots for USGS 260	WP 70
Wetted perimeter plots for USGS 262	WP 71
Wetted perimeter plots for USGS 264	WP 72
Wetted perimeter plots for USGS 266	WP 73
Wetted perimeter plots for USGS 268	WP 74
Wetted perimeter plots for USGS 270	WP 75
Wetted perimeter plots for USGS 272	WP 76
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Wetted perimeter plots for USGS 279	WP 80

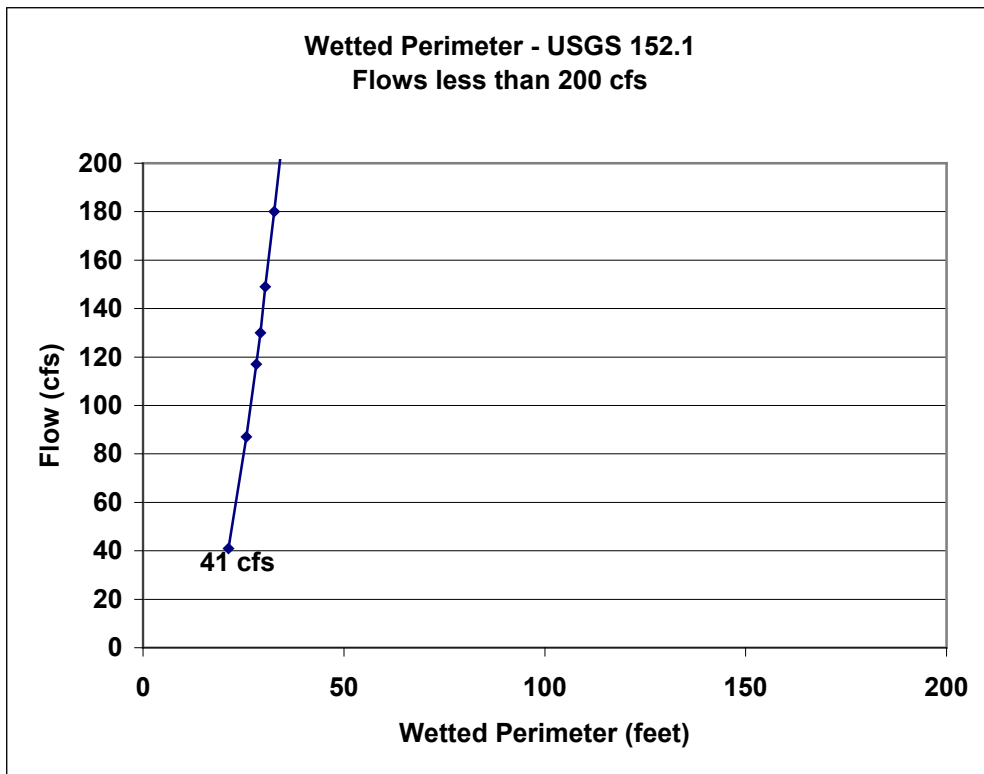
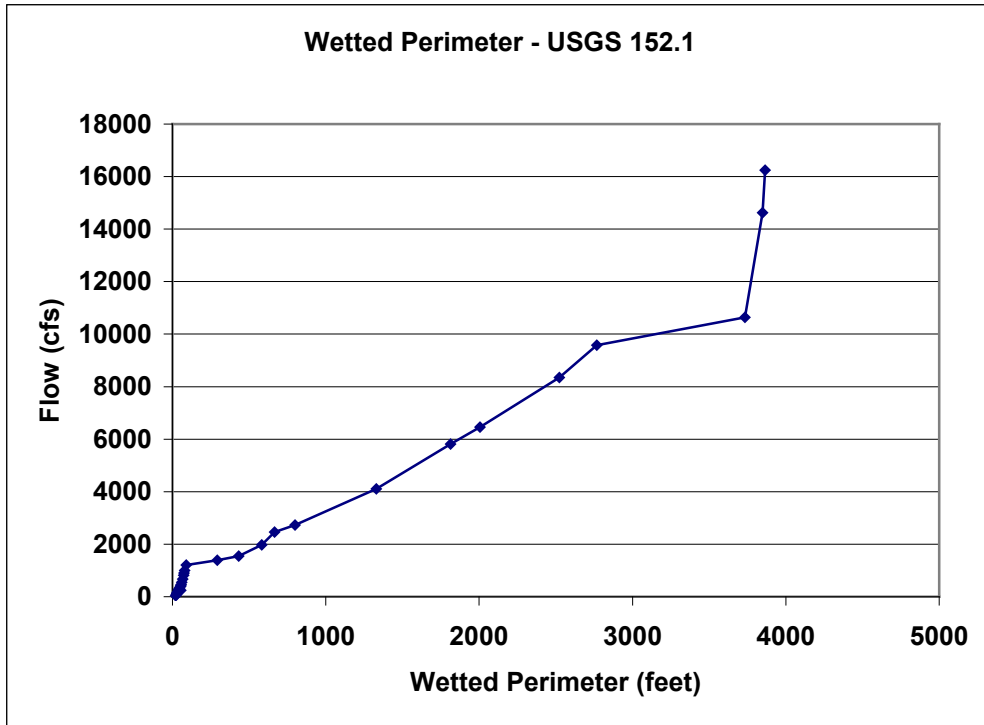
Wetted perimeter plots for USGS 279.1	WP 81
Wetted perimeter plots for USGS 279.5	WP 82
Wetted perimeter plots for USGS 280	WP 83
Wetted perimeter plots for USGS 282	WP 84
Wetted perimeter plots for USGS 284	WP 85
Wetted perimeter plots for USGS 286	WP 86
Wetted perimeter plots for USGS 287	WP 87
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Wetted perimeter plots for USGS 290	WP 89
Wetted perimeter plots for USGS 291	WP 90
Wetted perimeter plots for USGS 292	WP 91

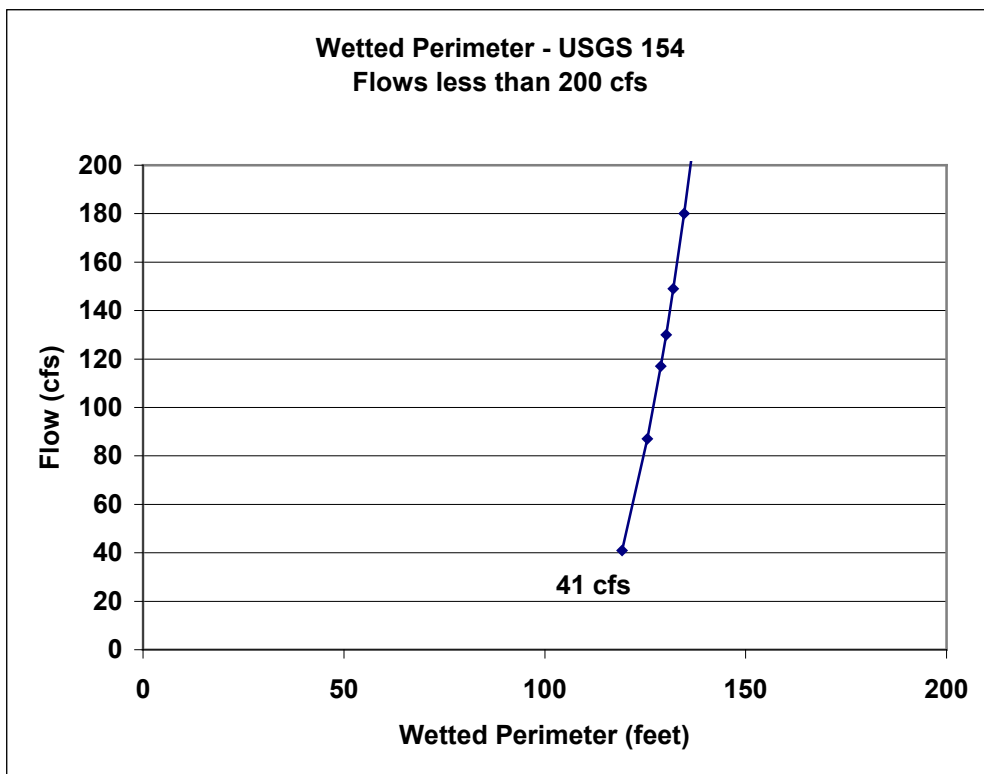
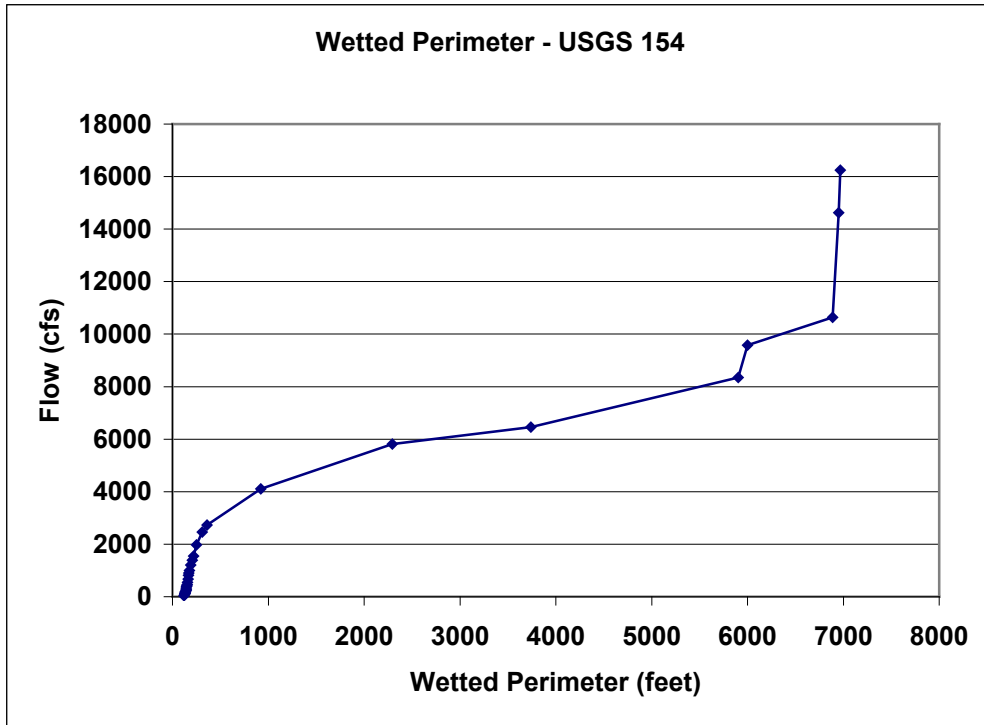


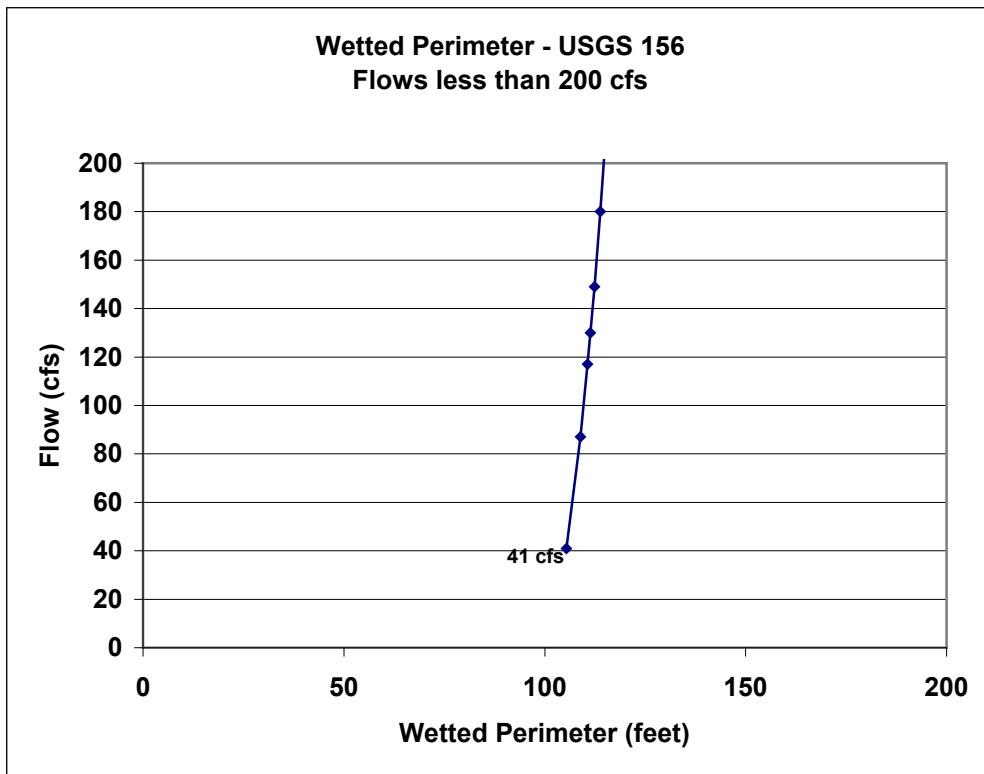
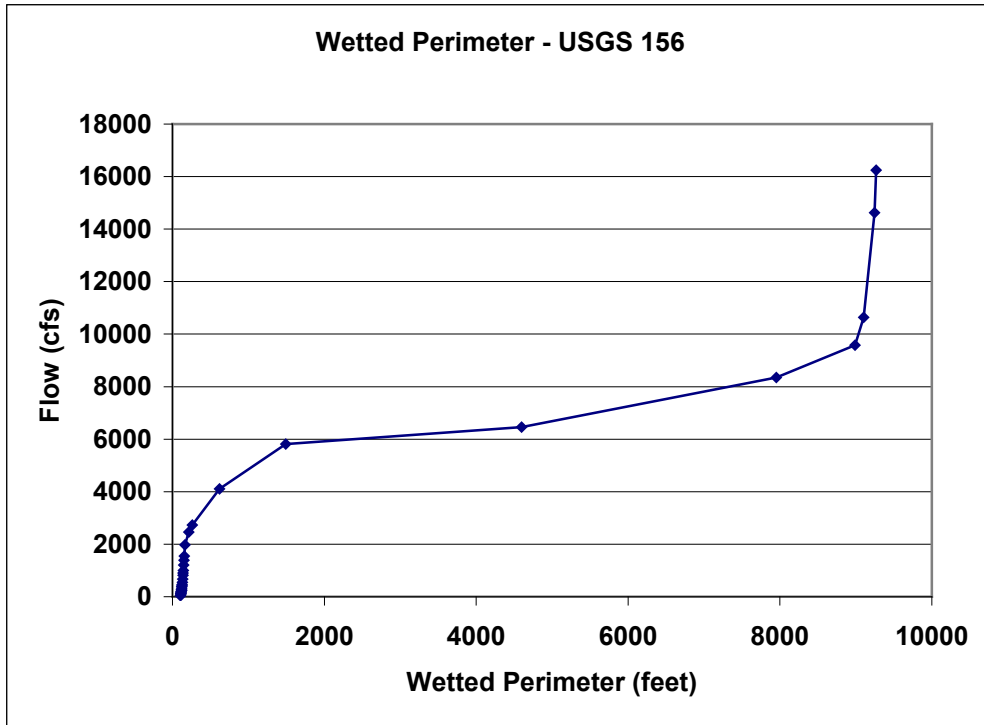


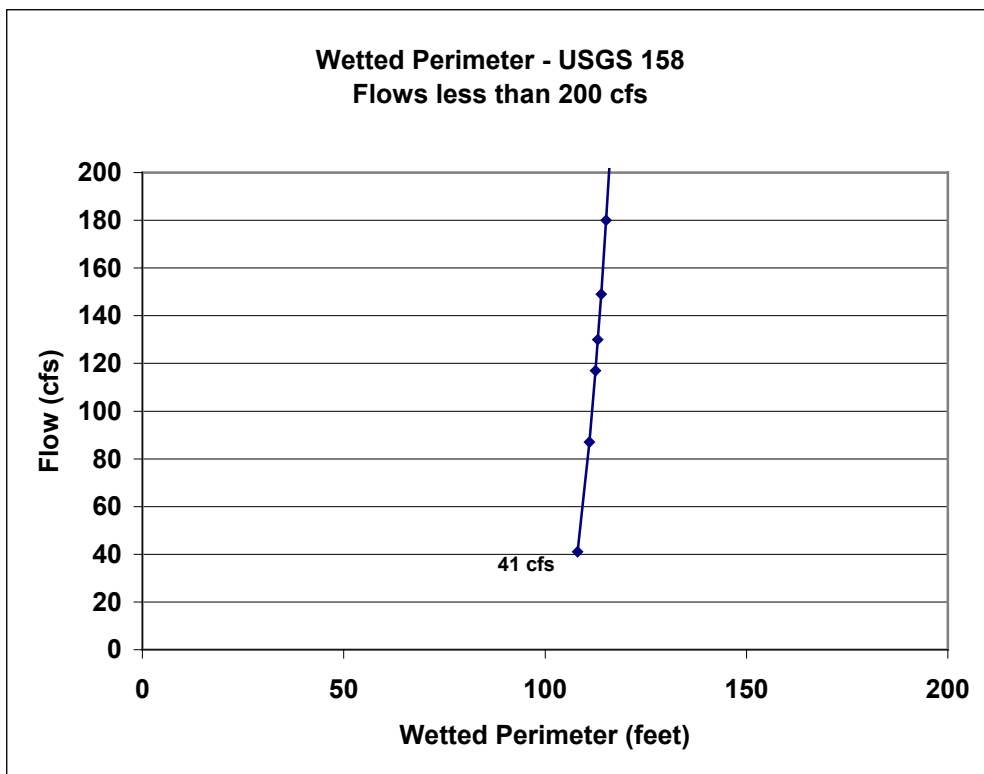
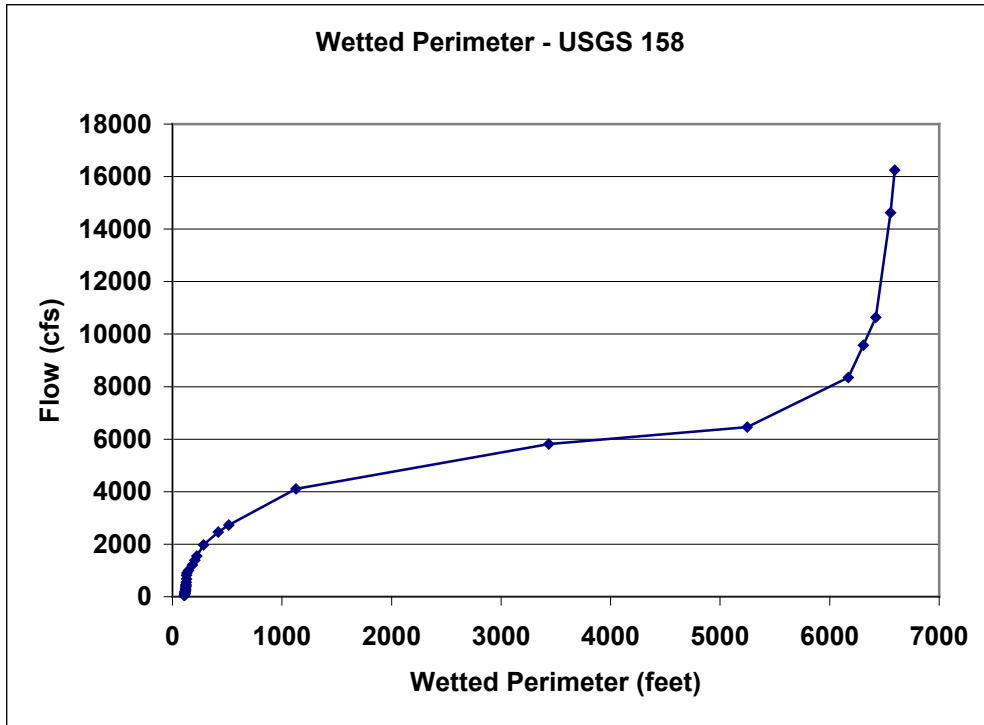


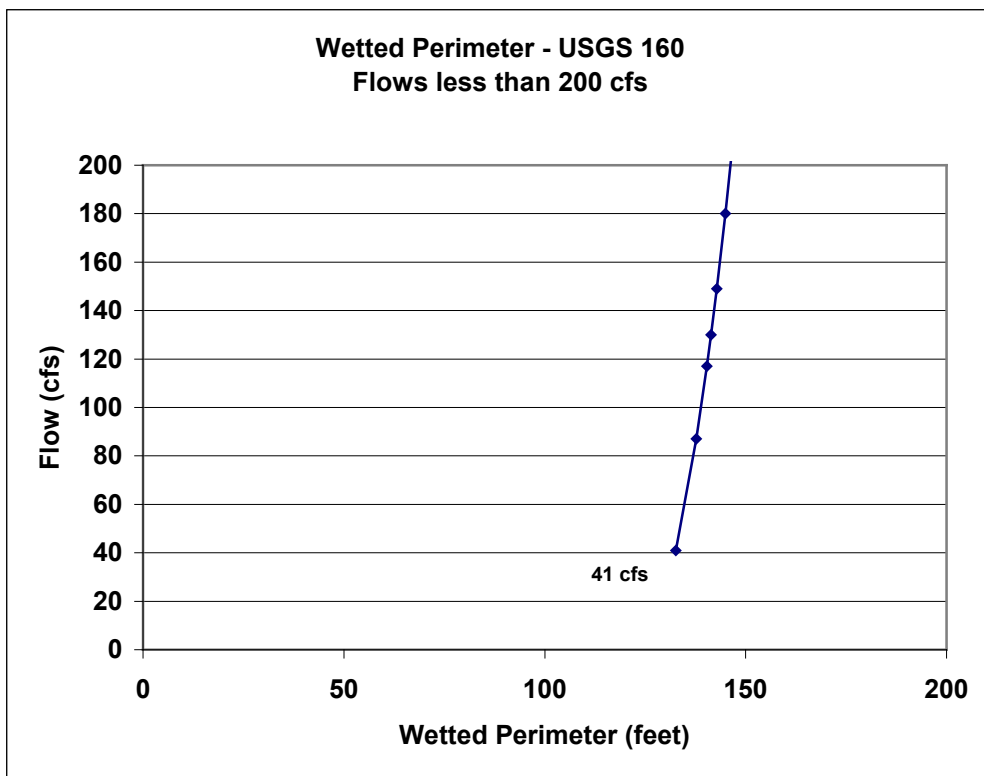
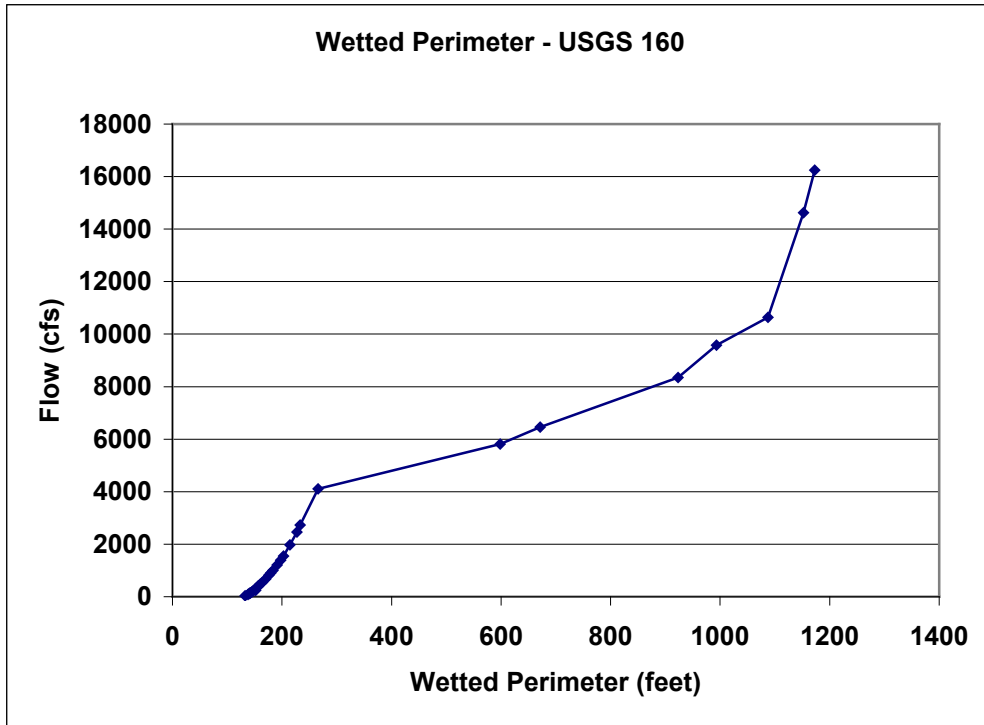


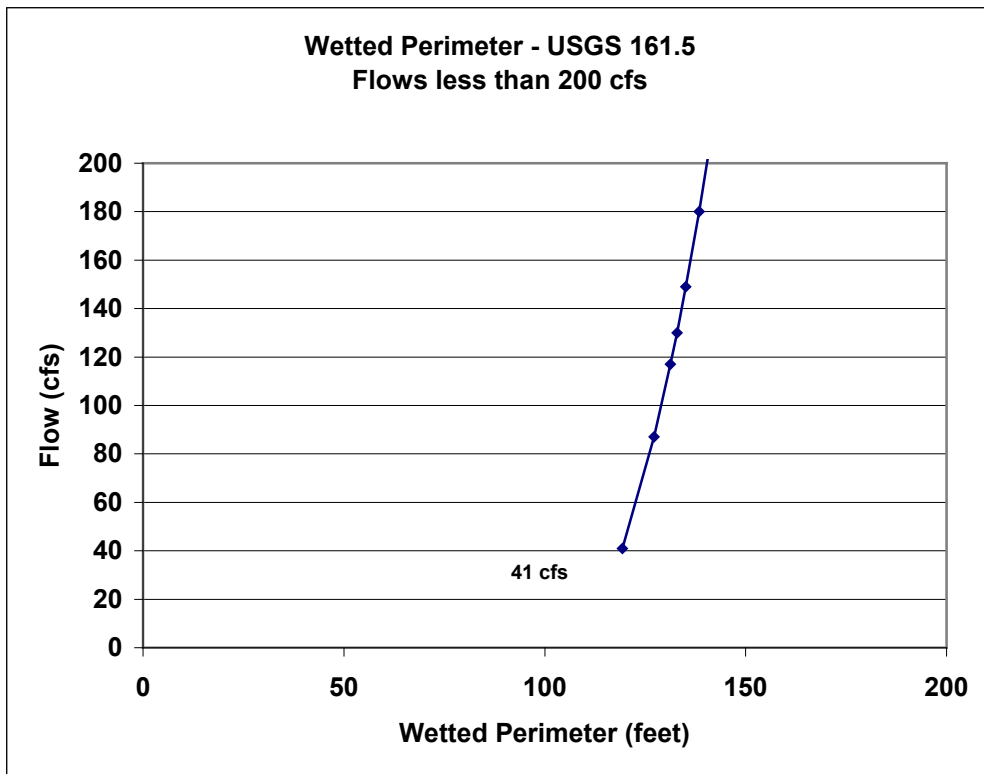
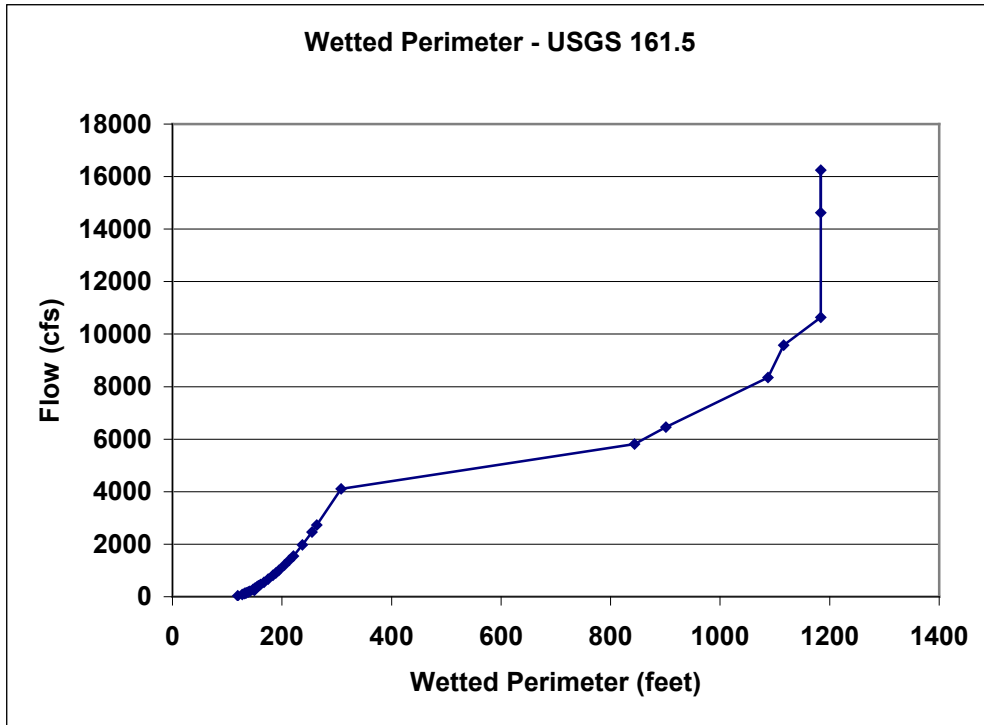


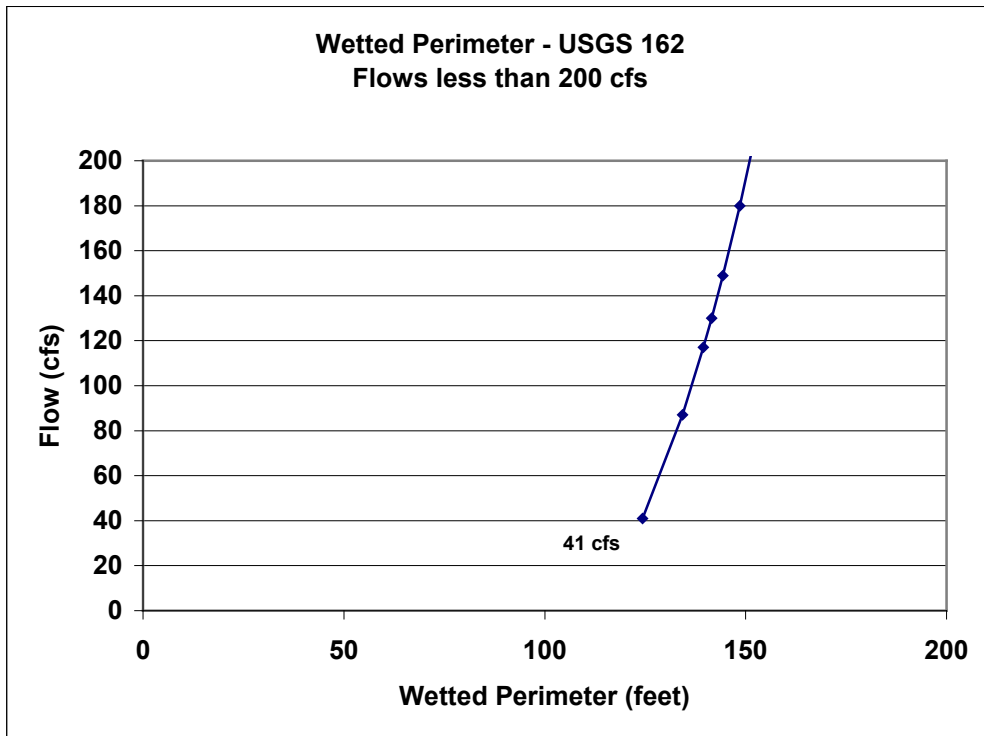
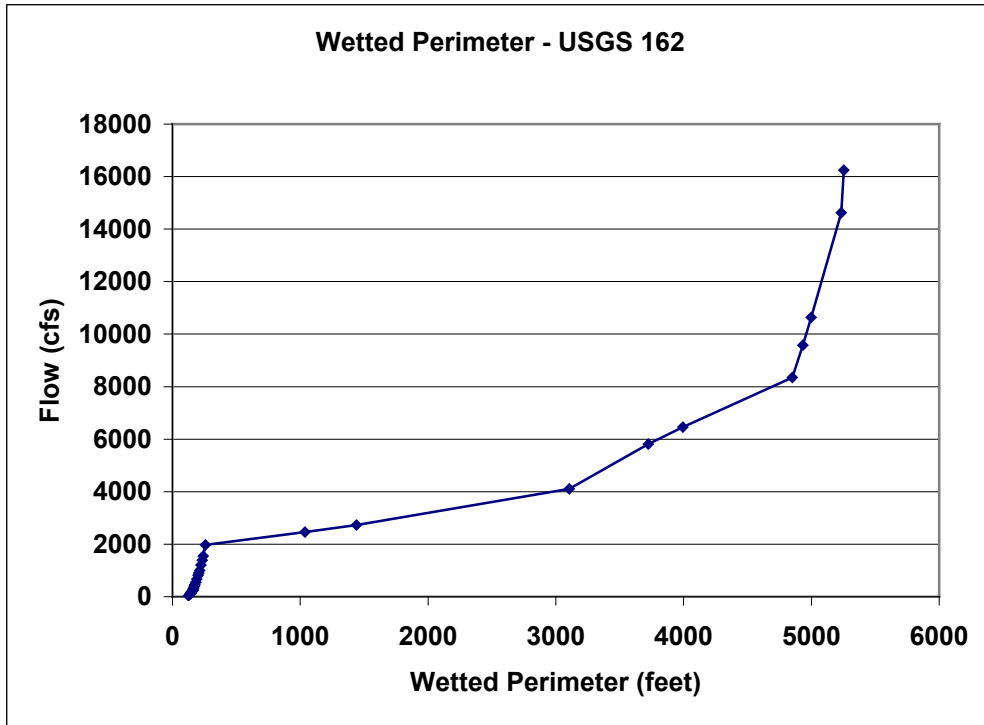


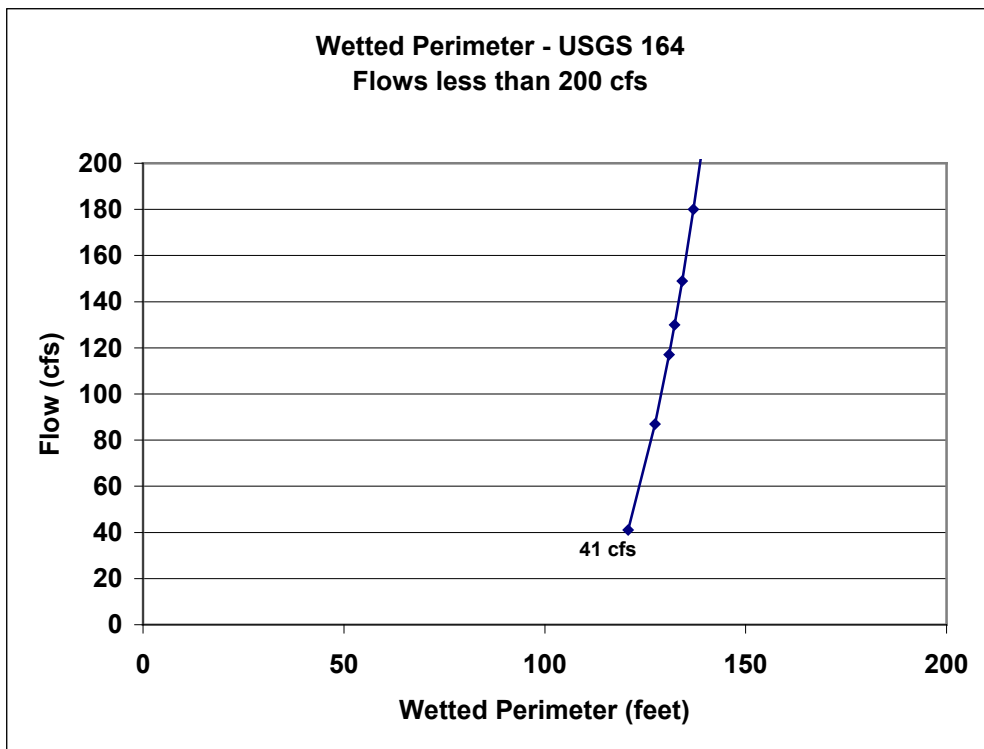
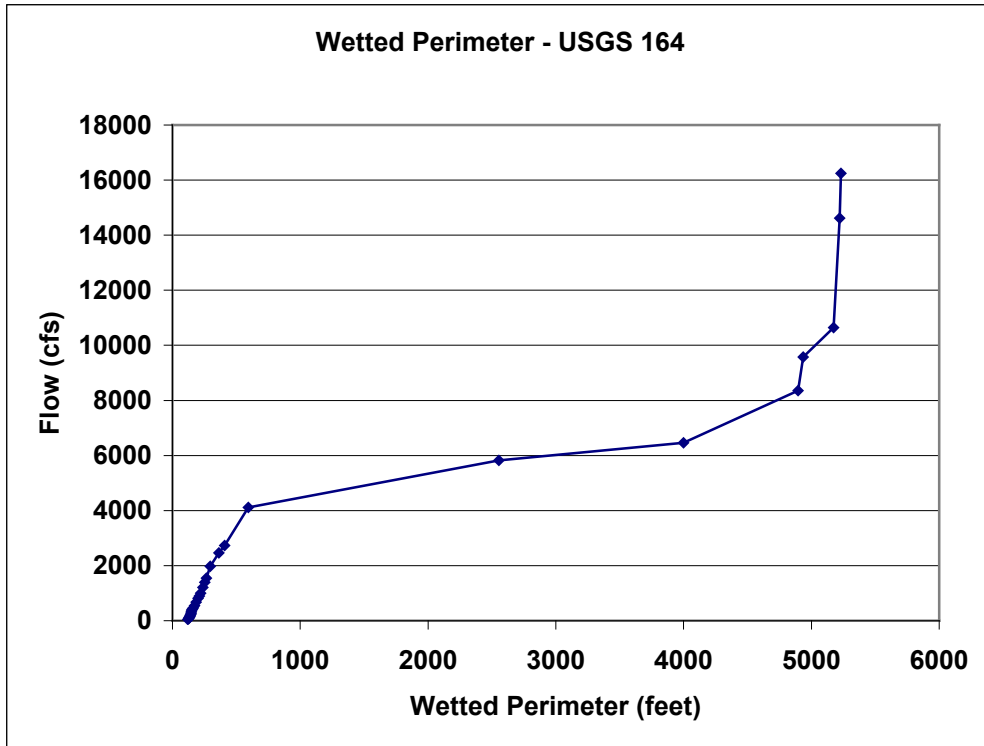


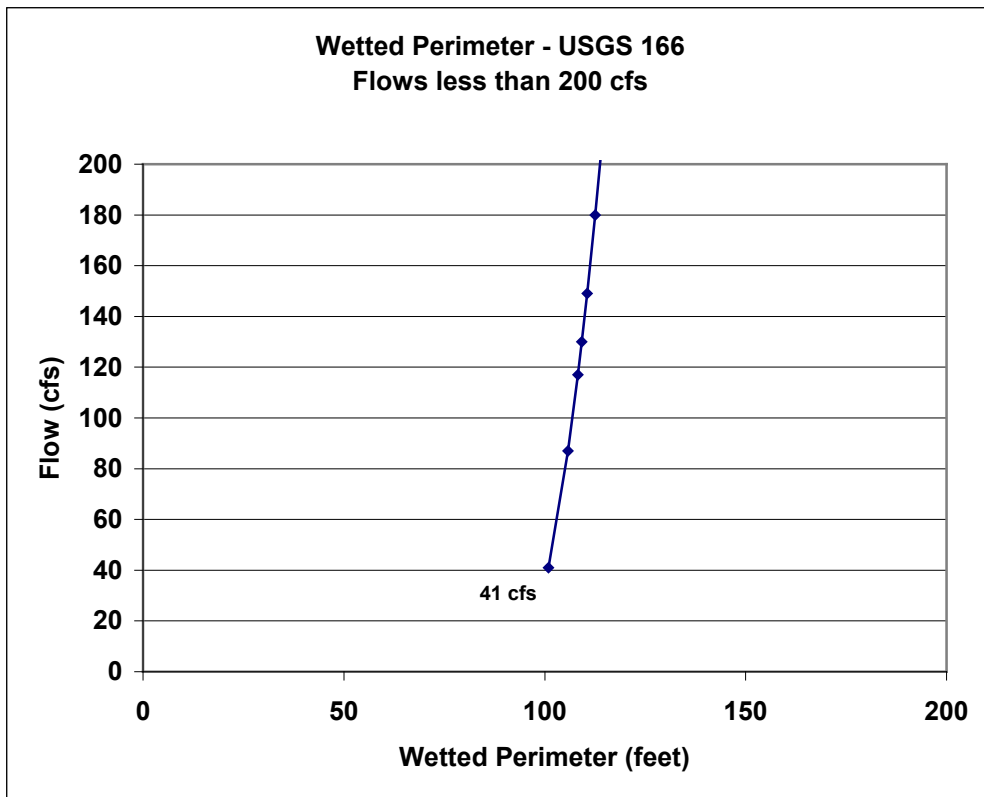
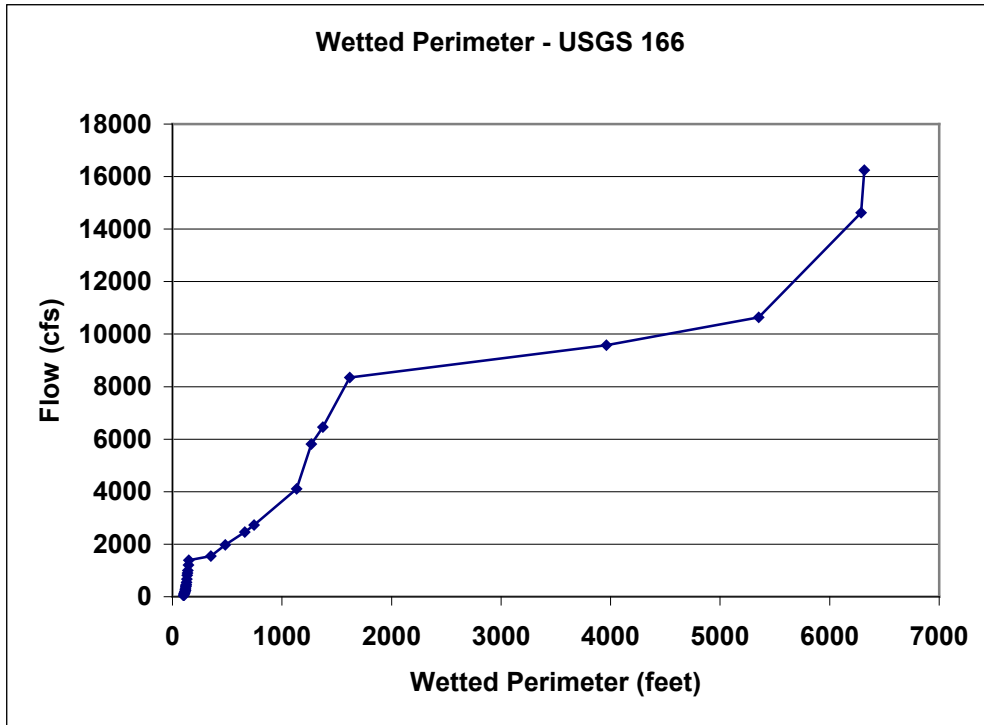


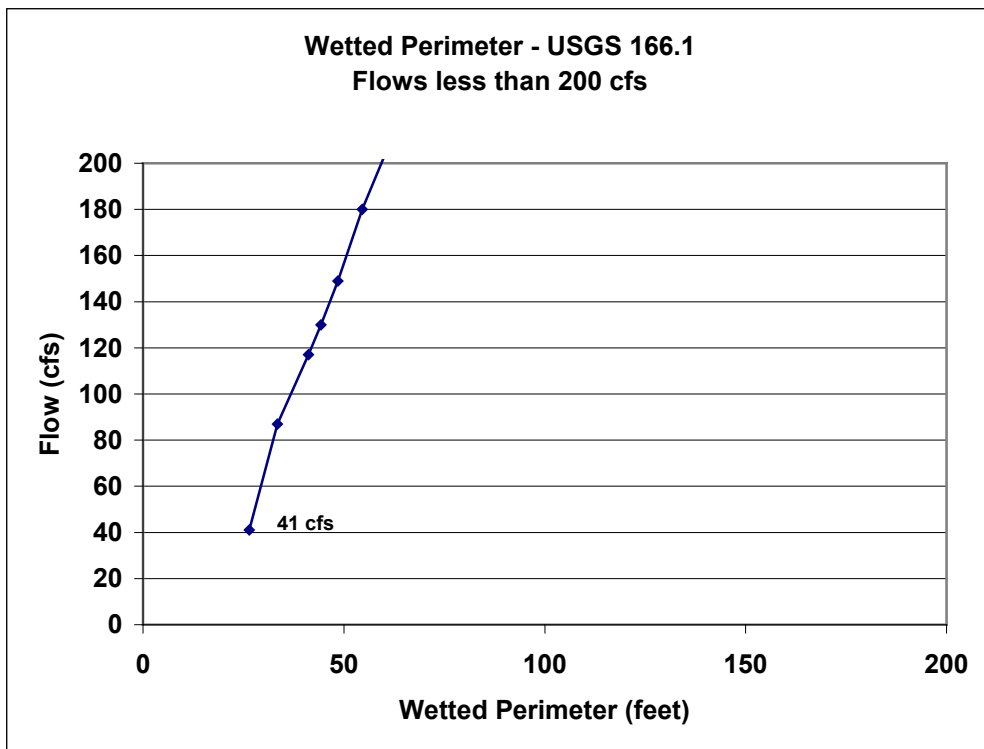
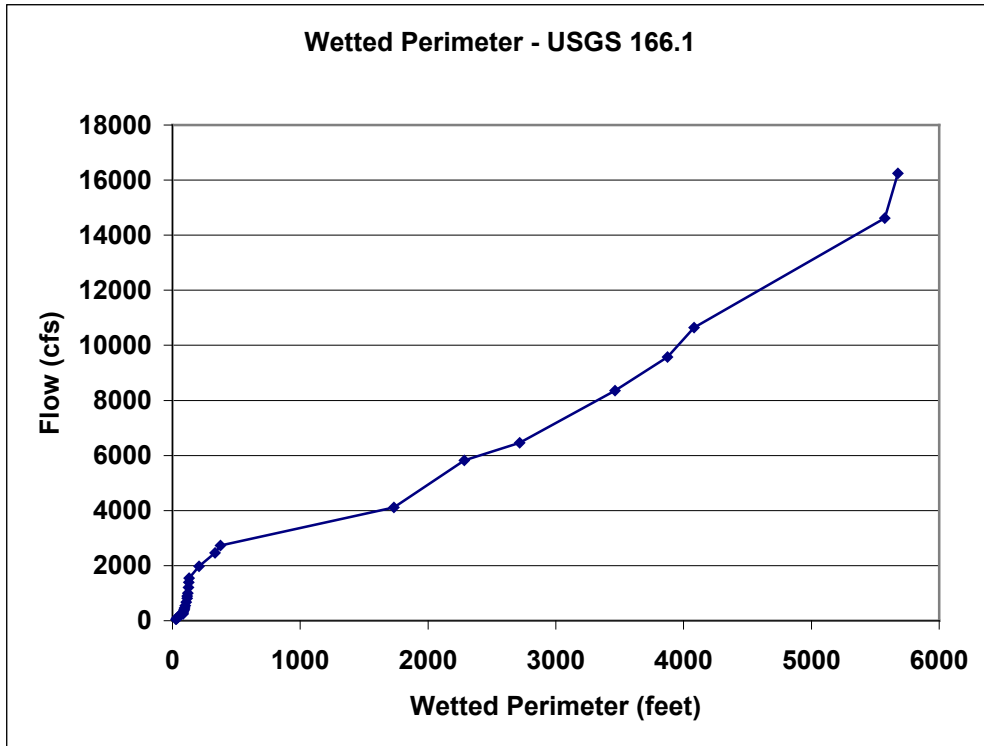


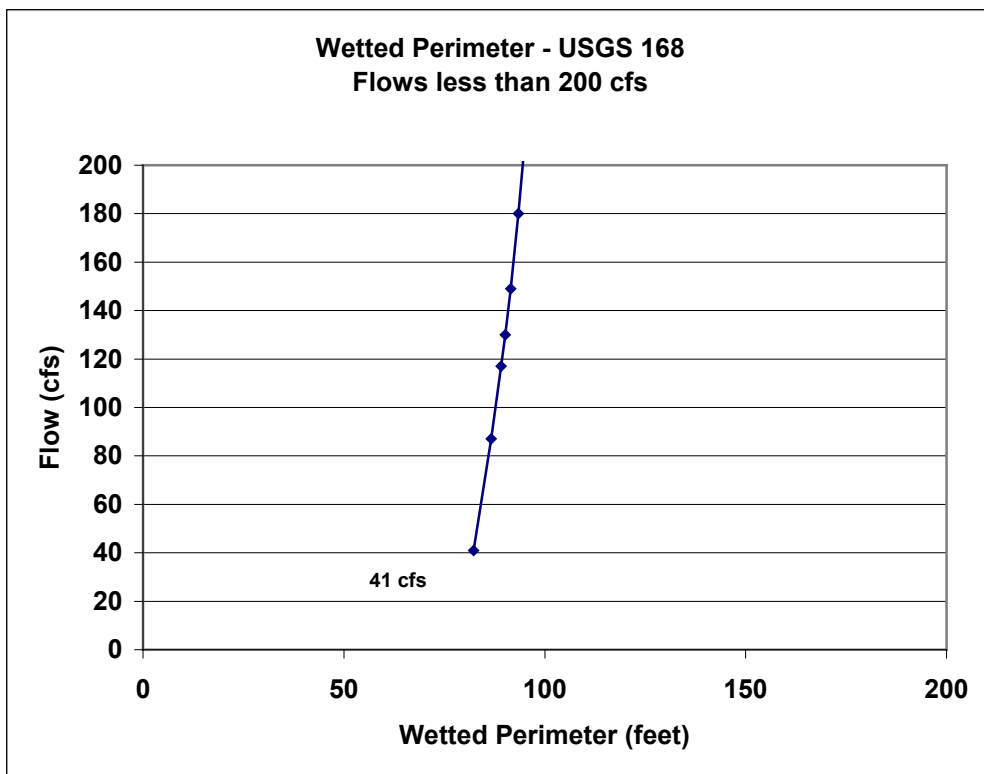
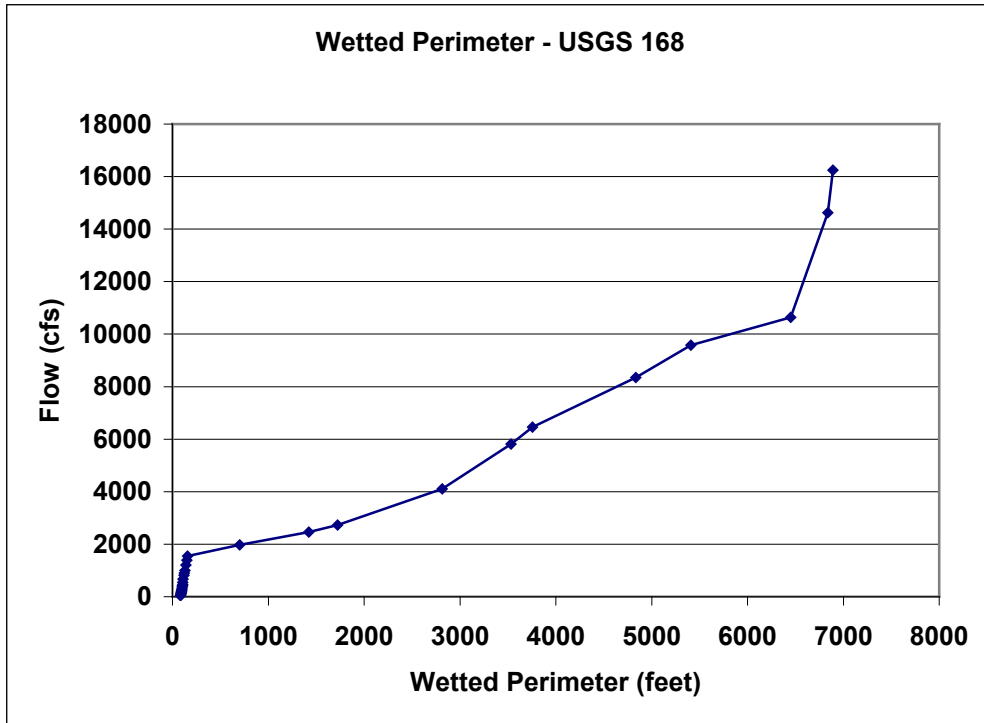


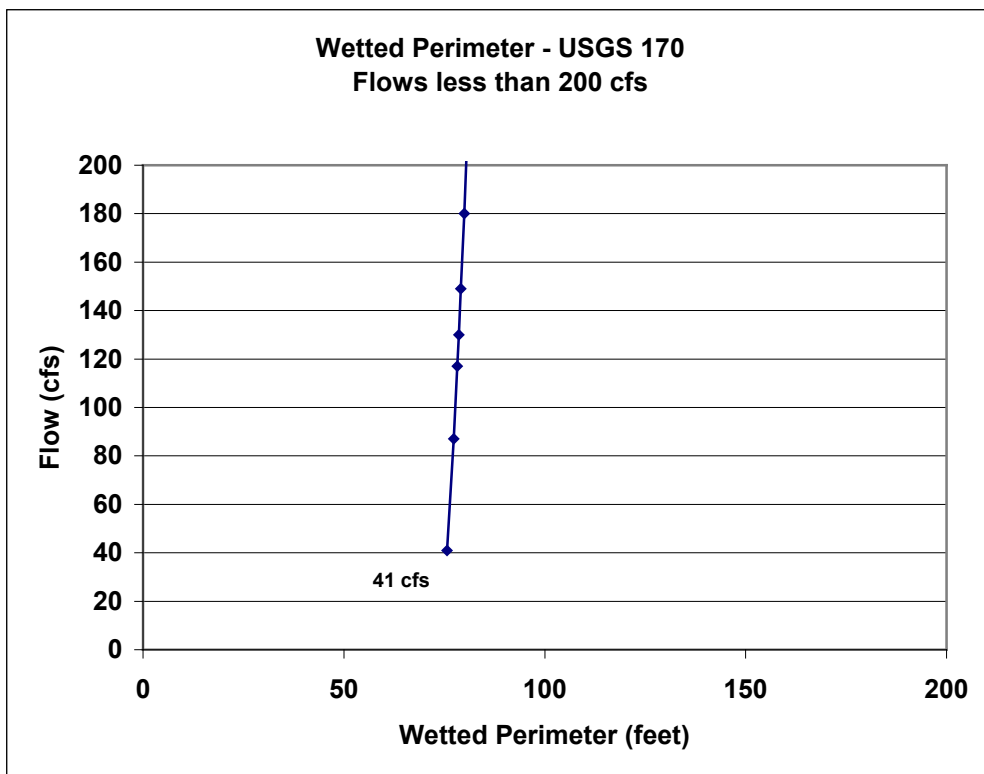
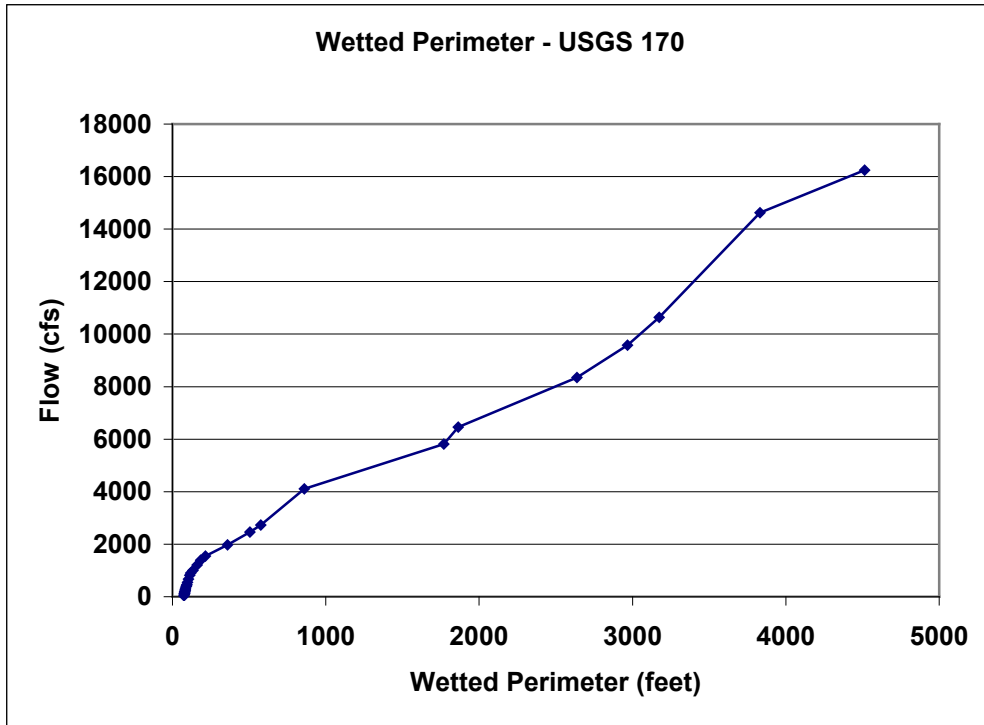


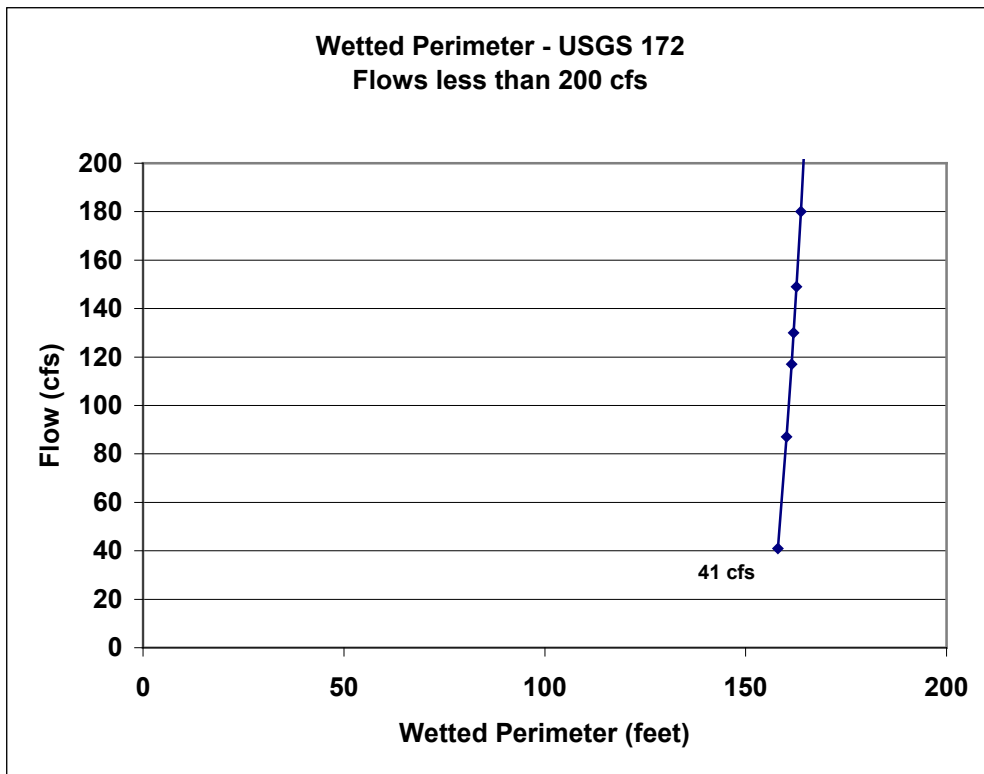
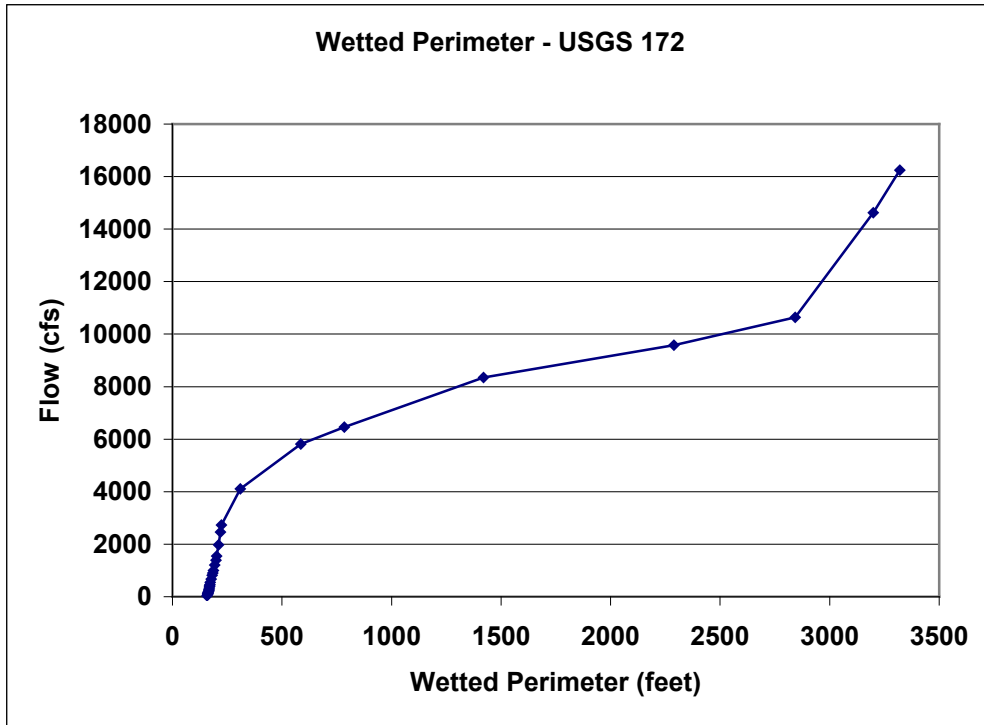


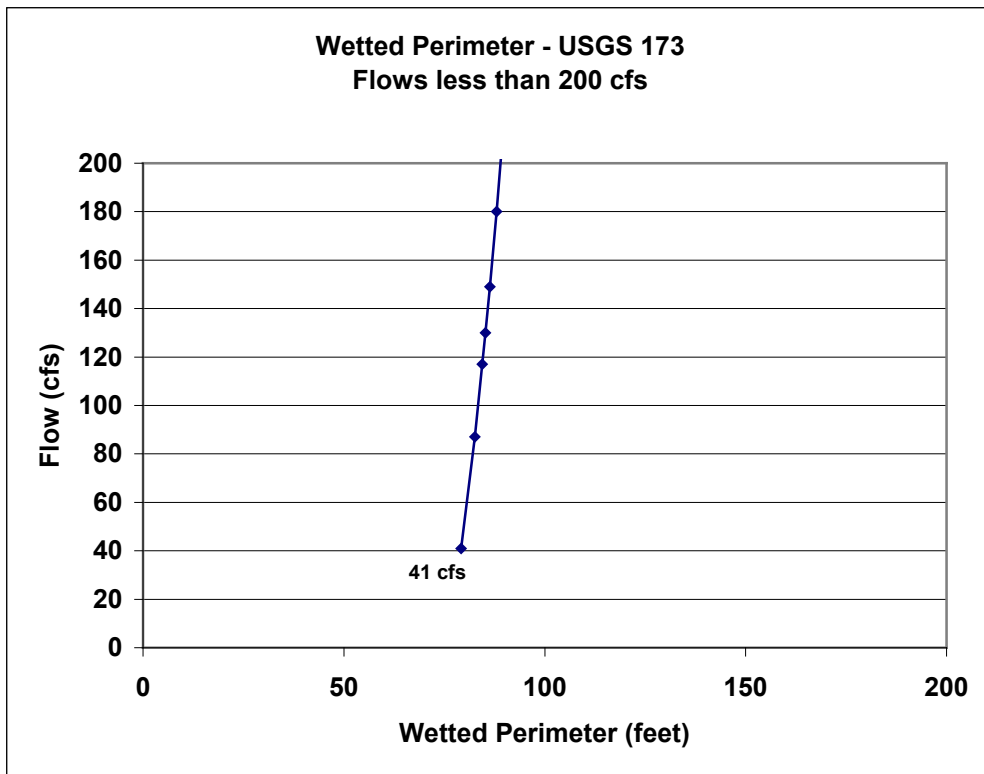
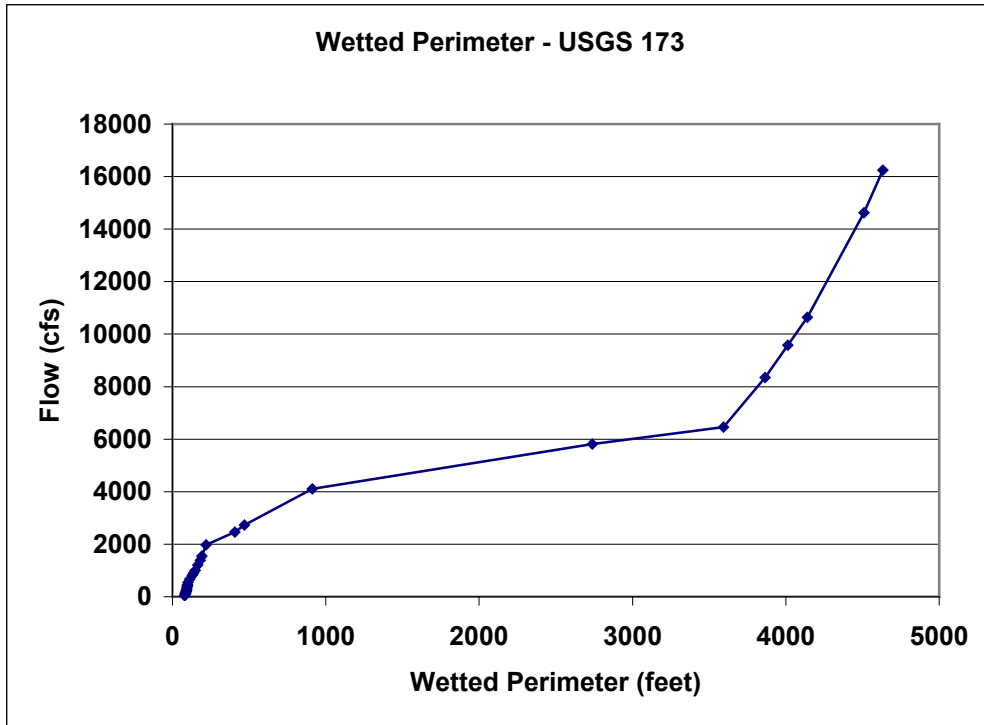


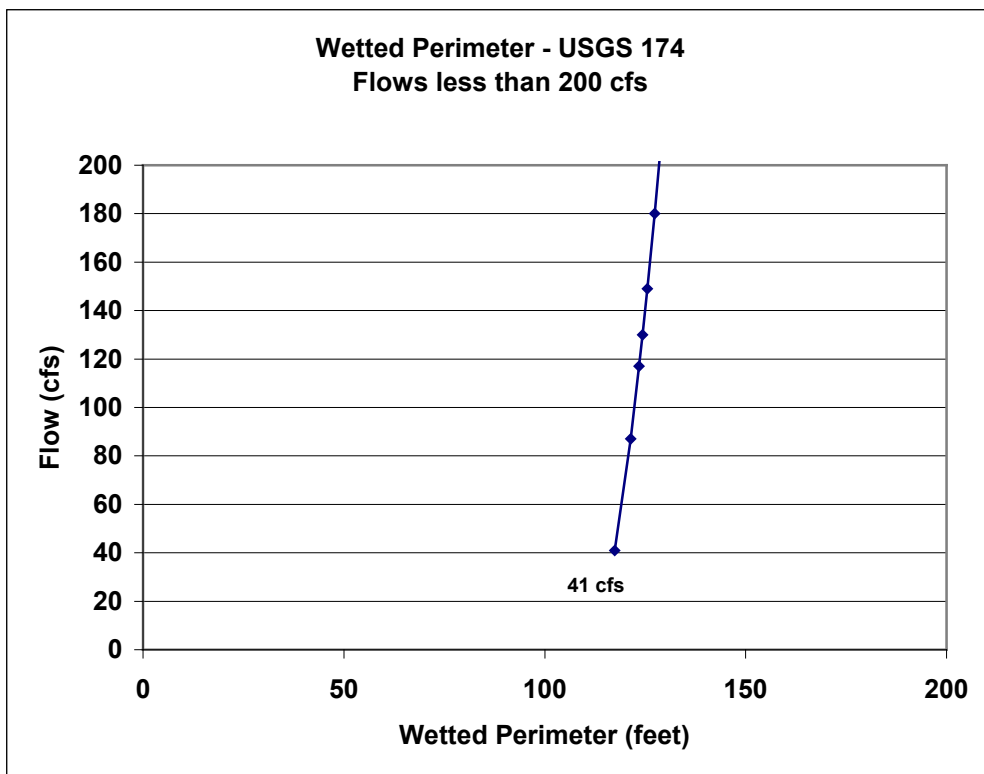
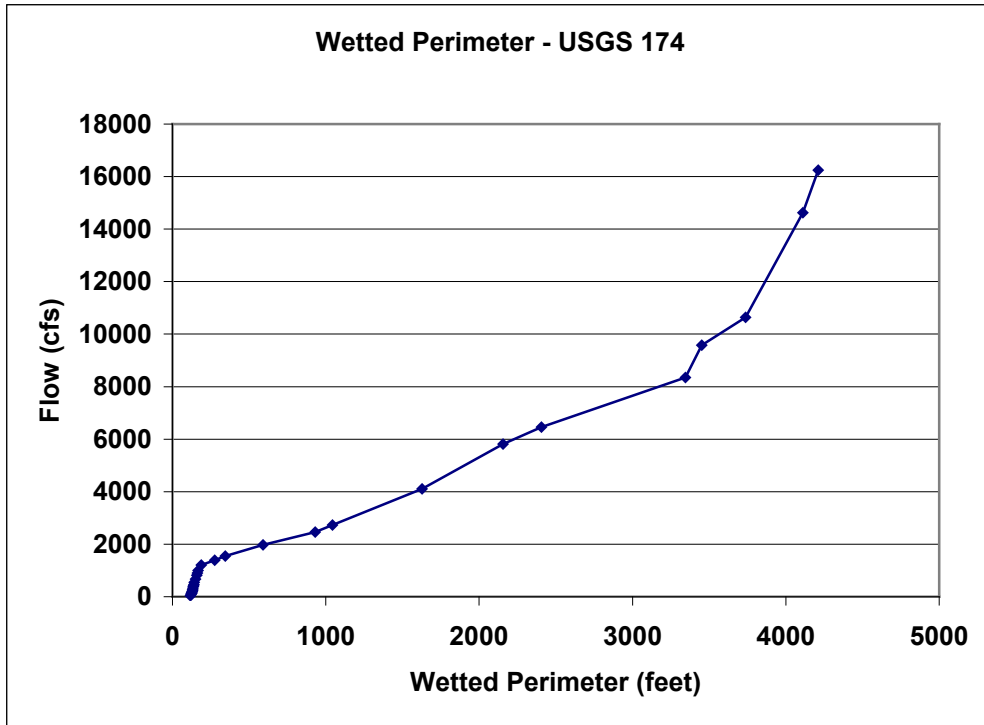


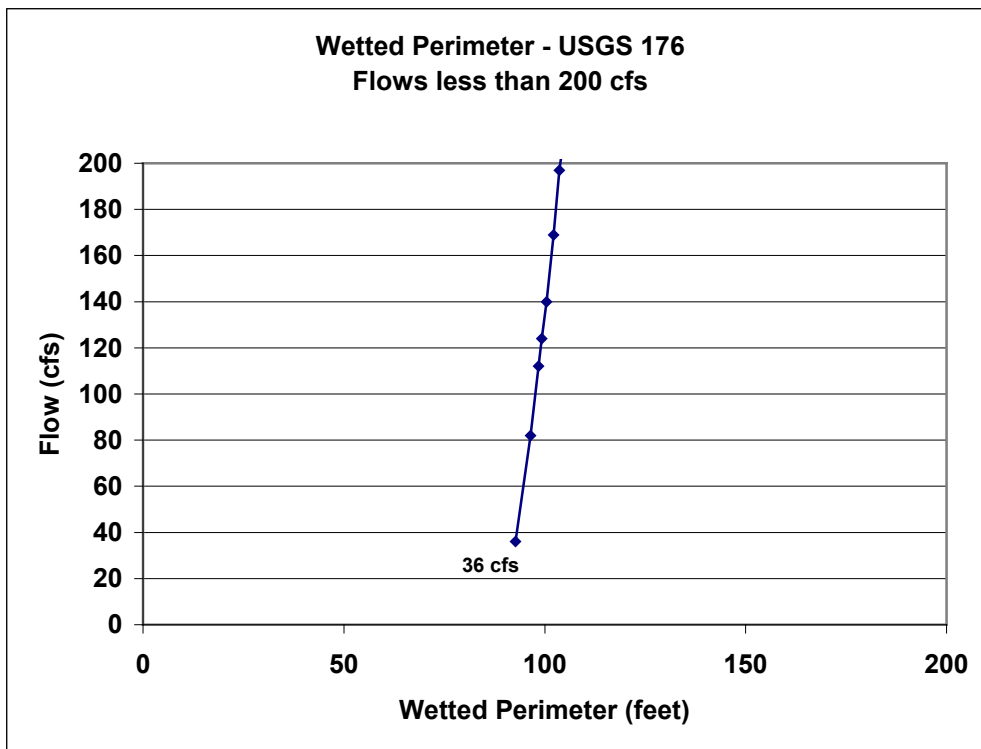
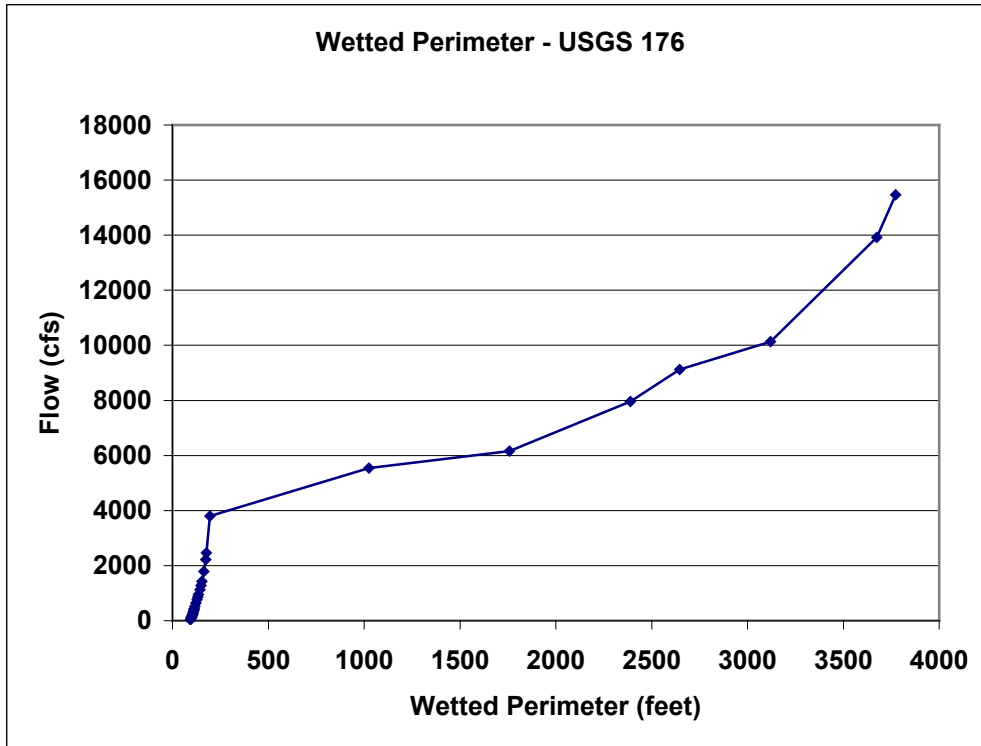


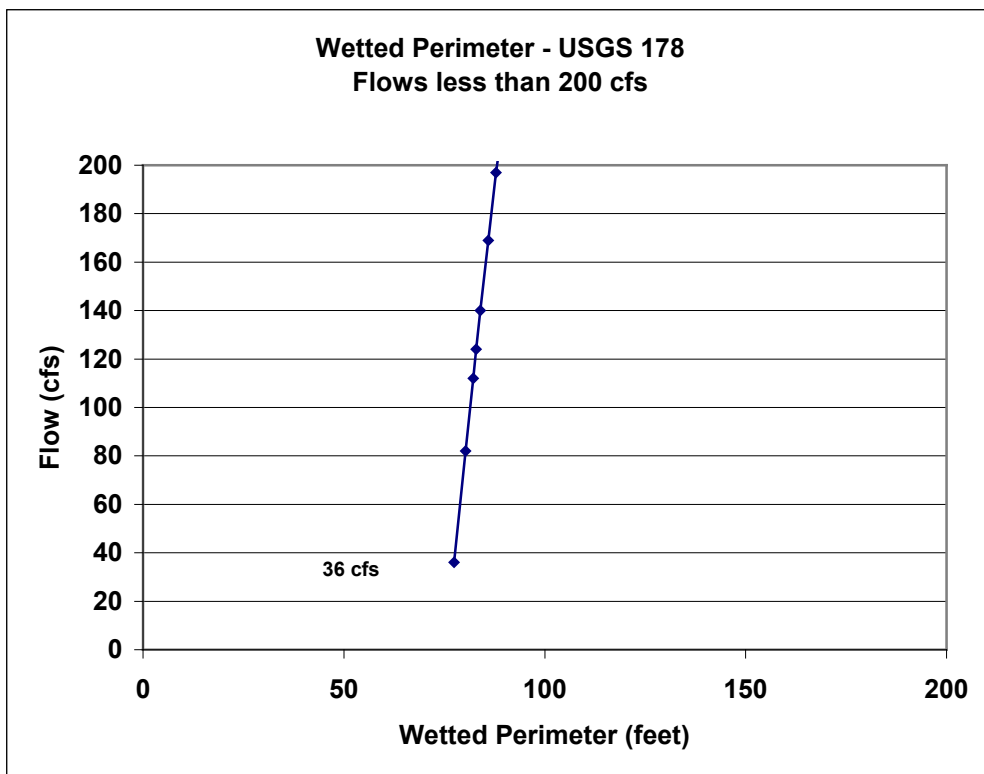
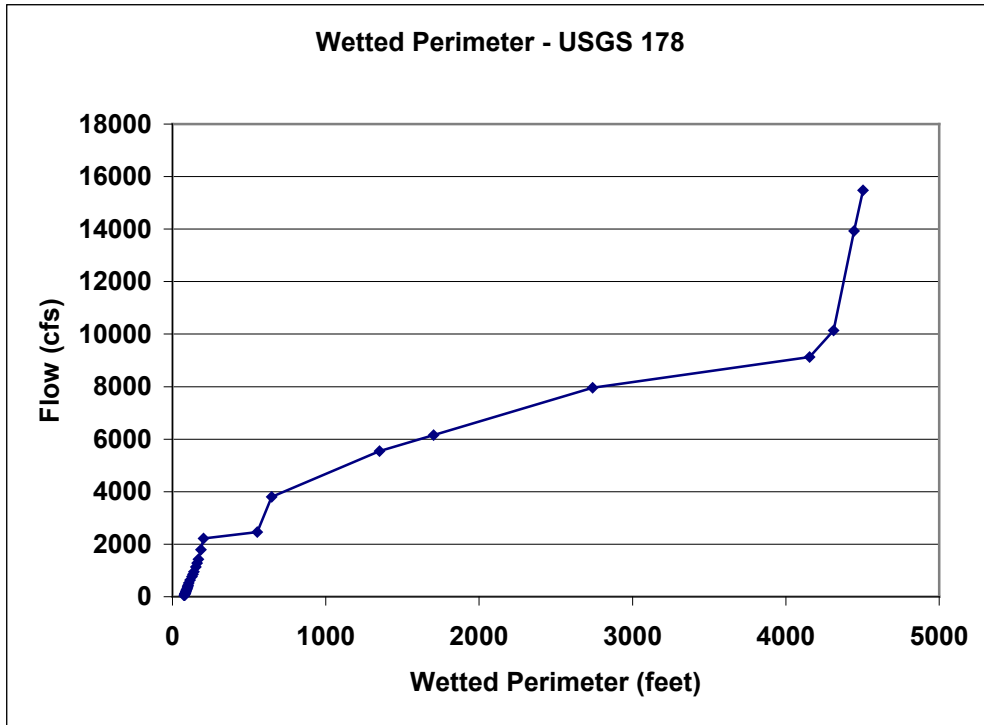


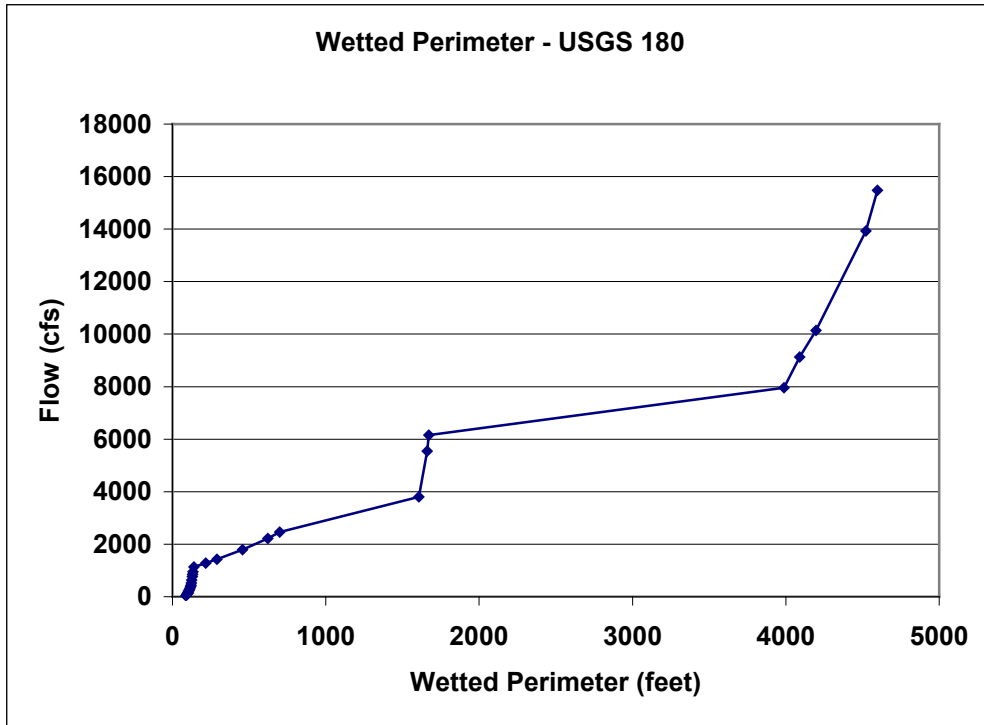


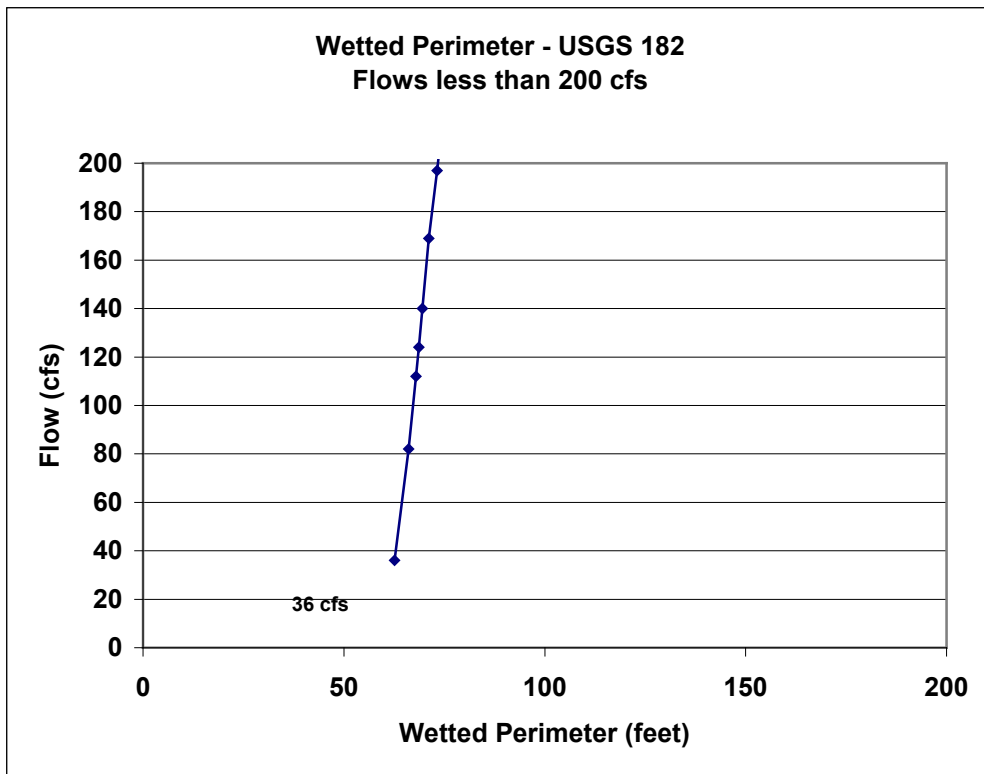
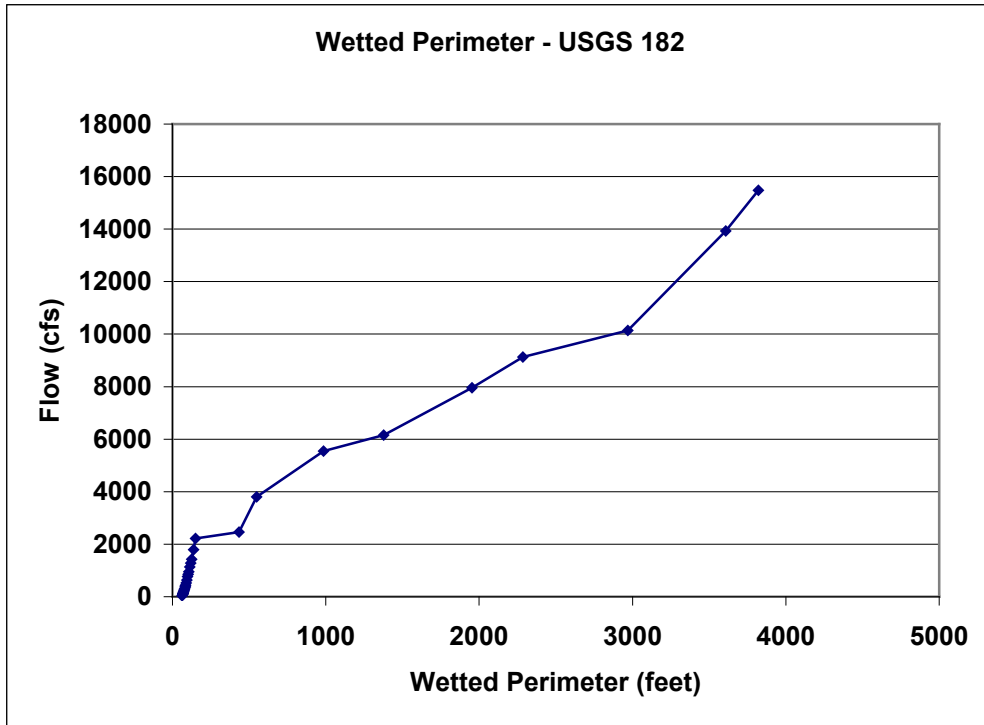


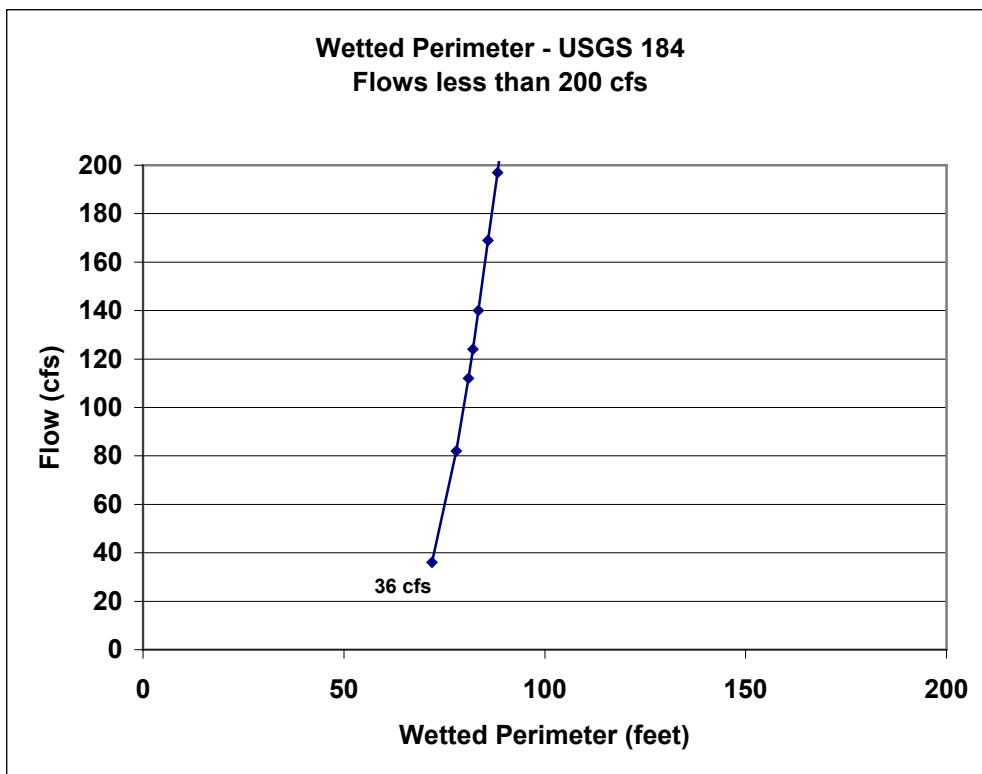
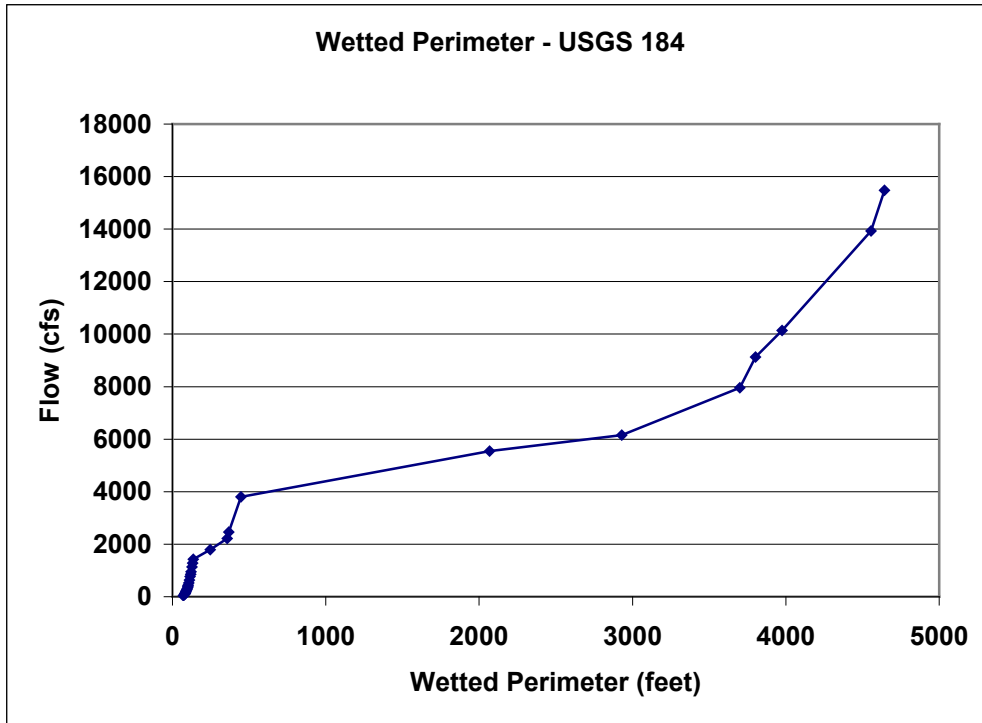


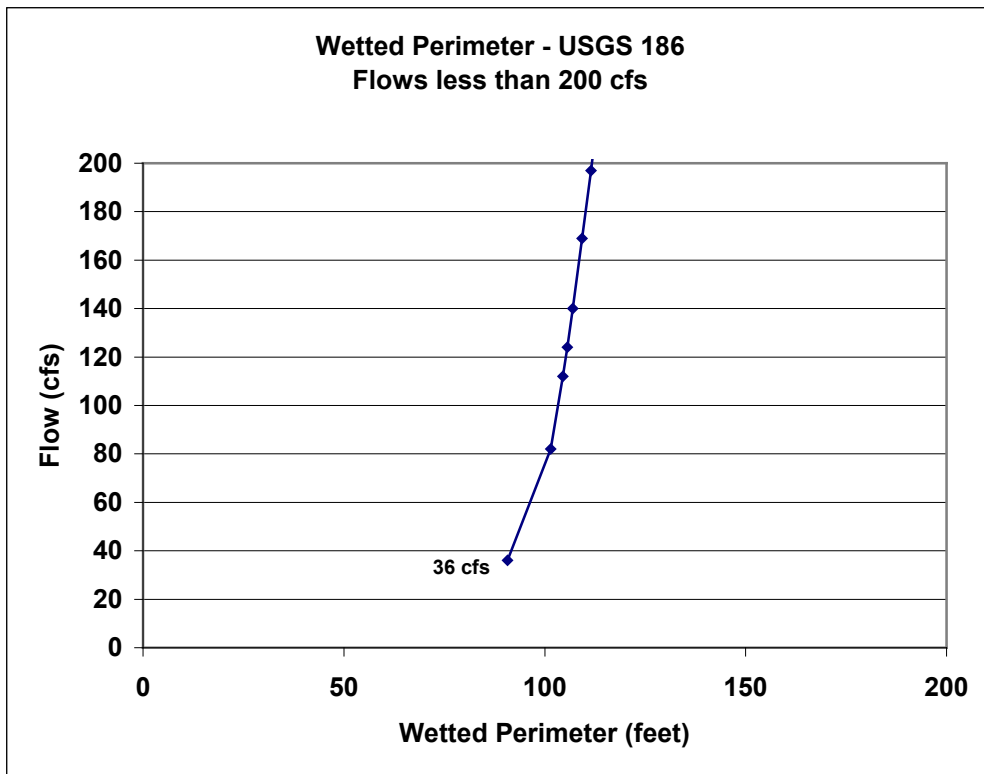
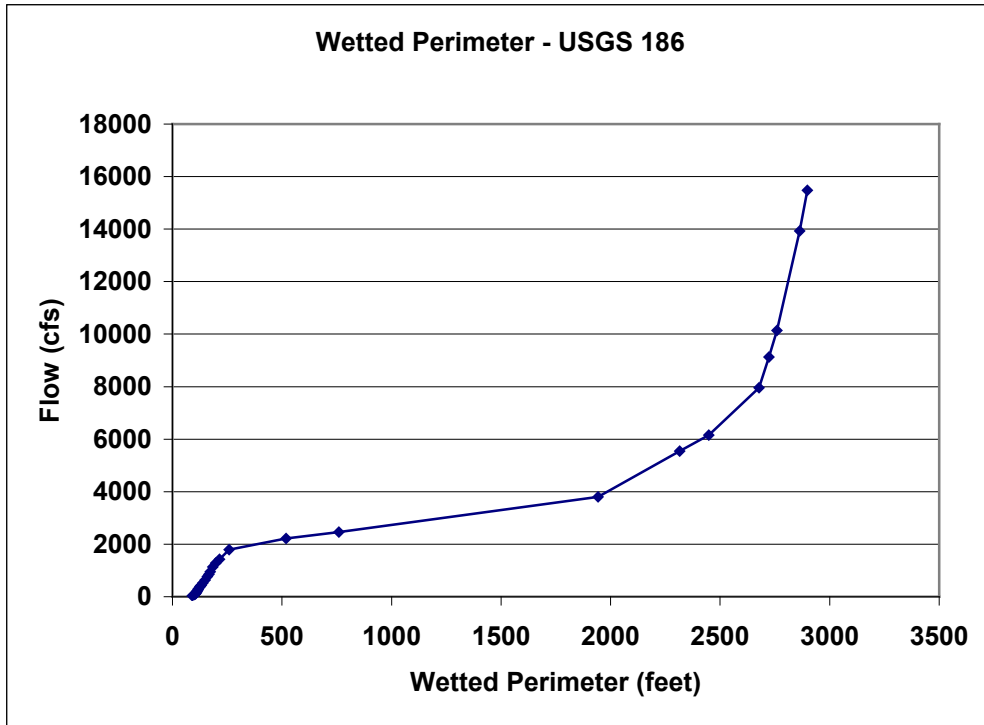


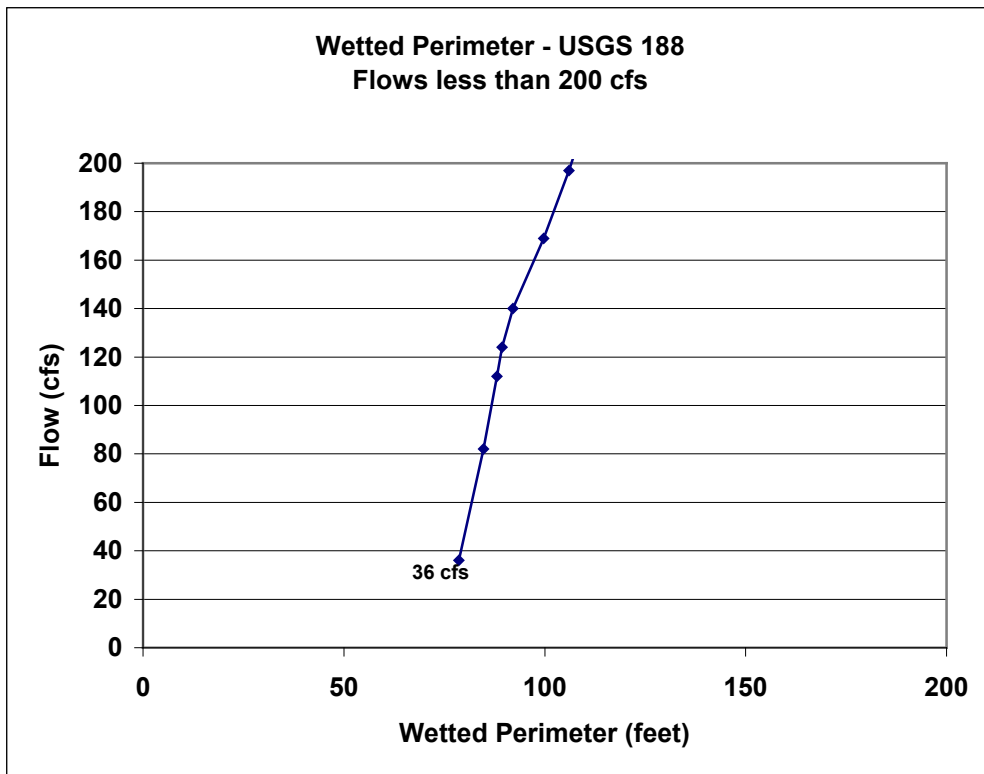
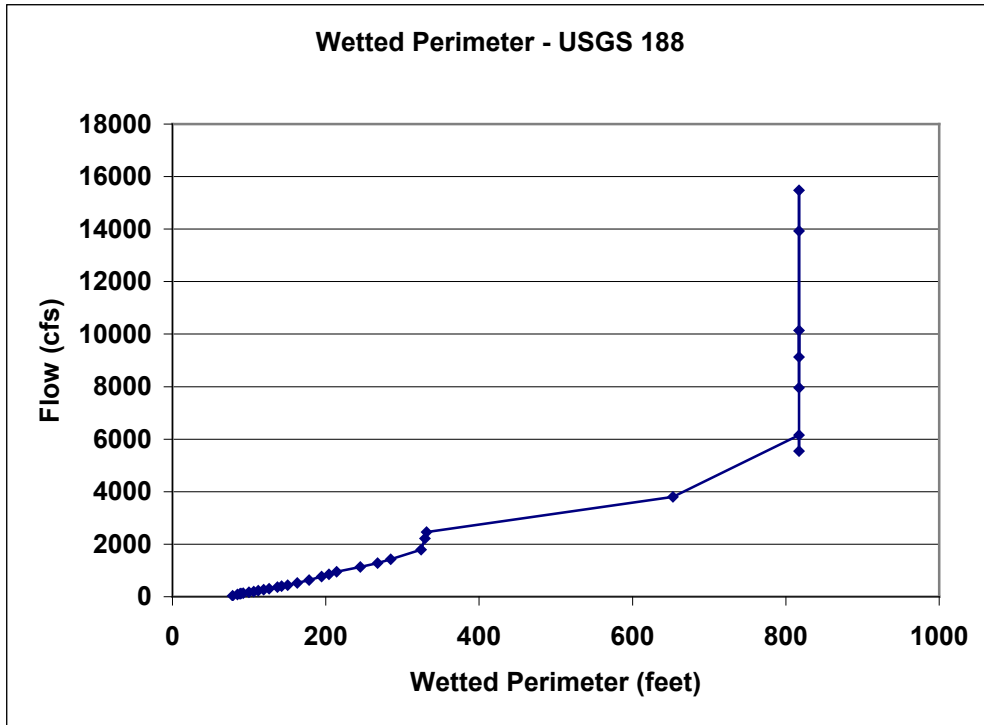


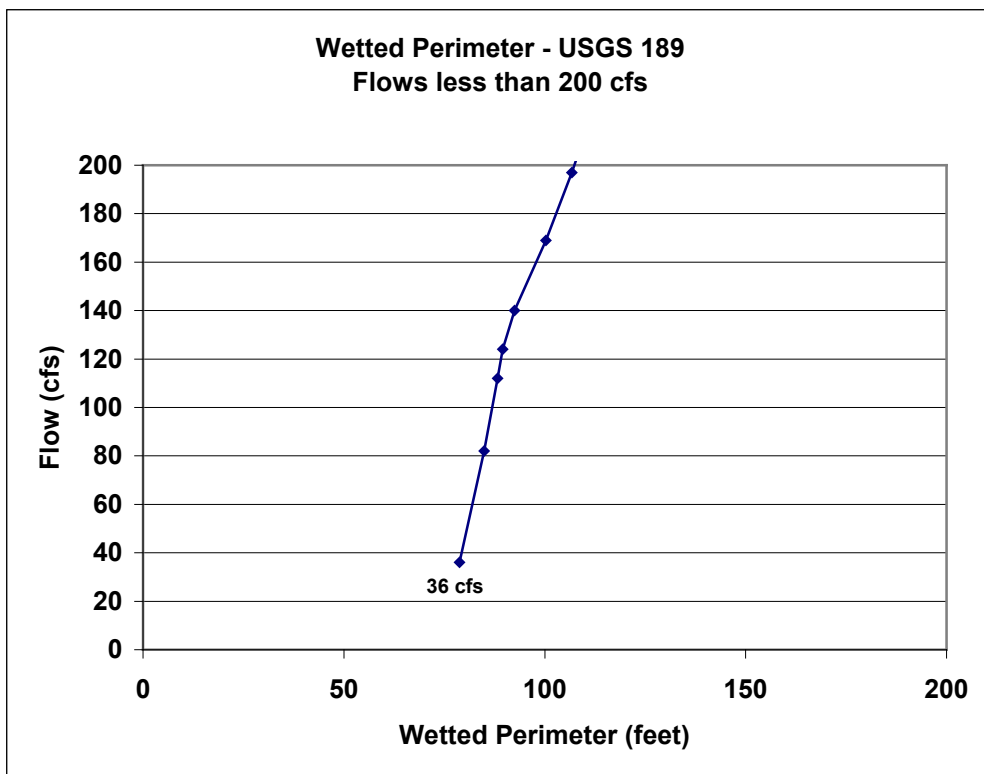
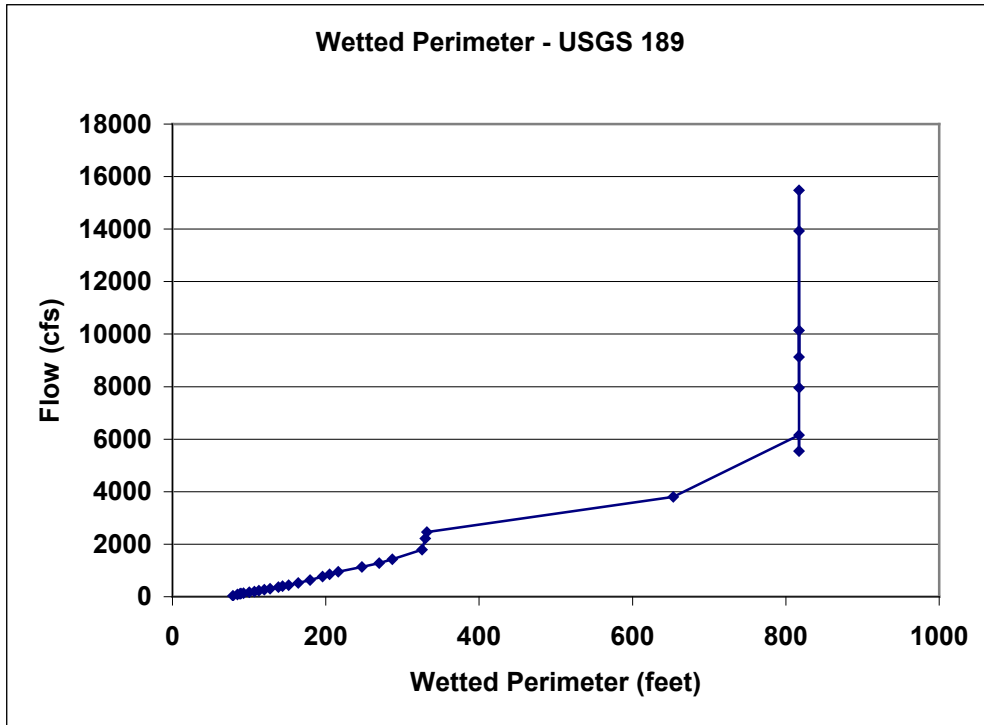


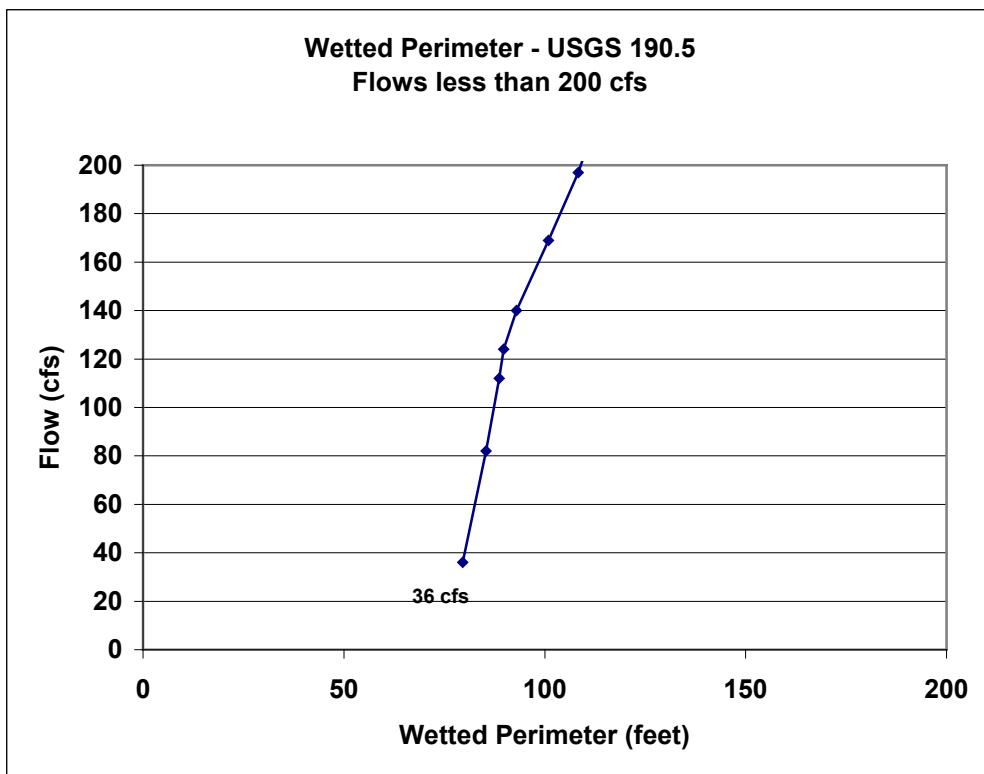
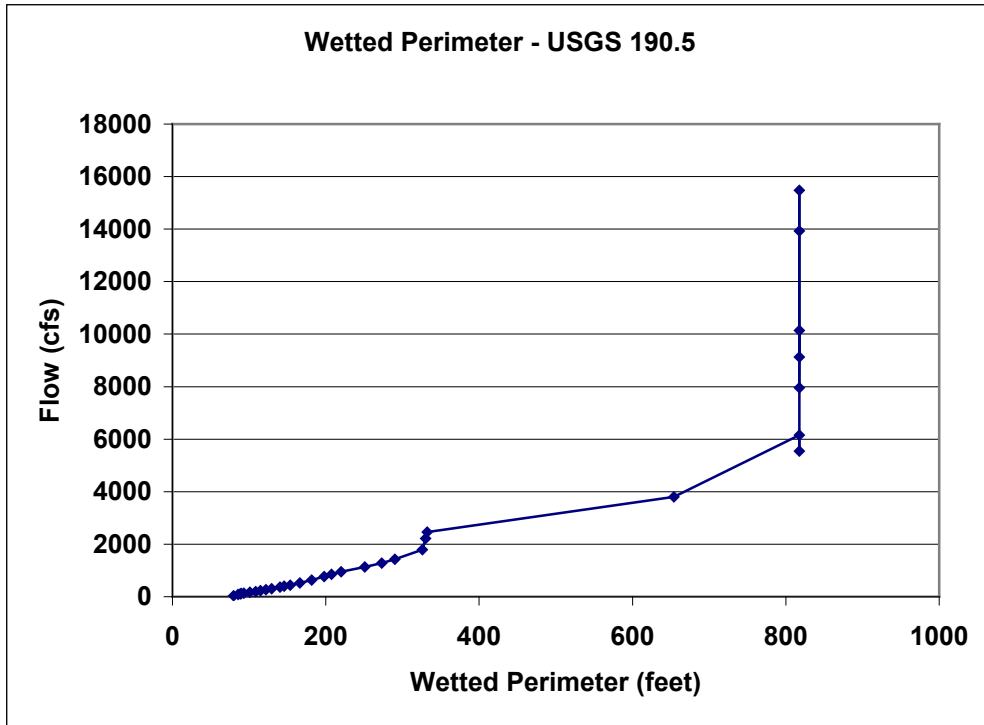


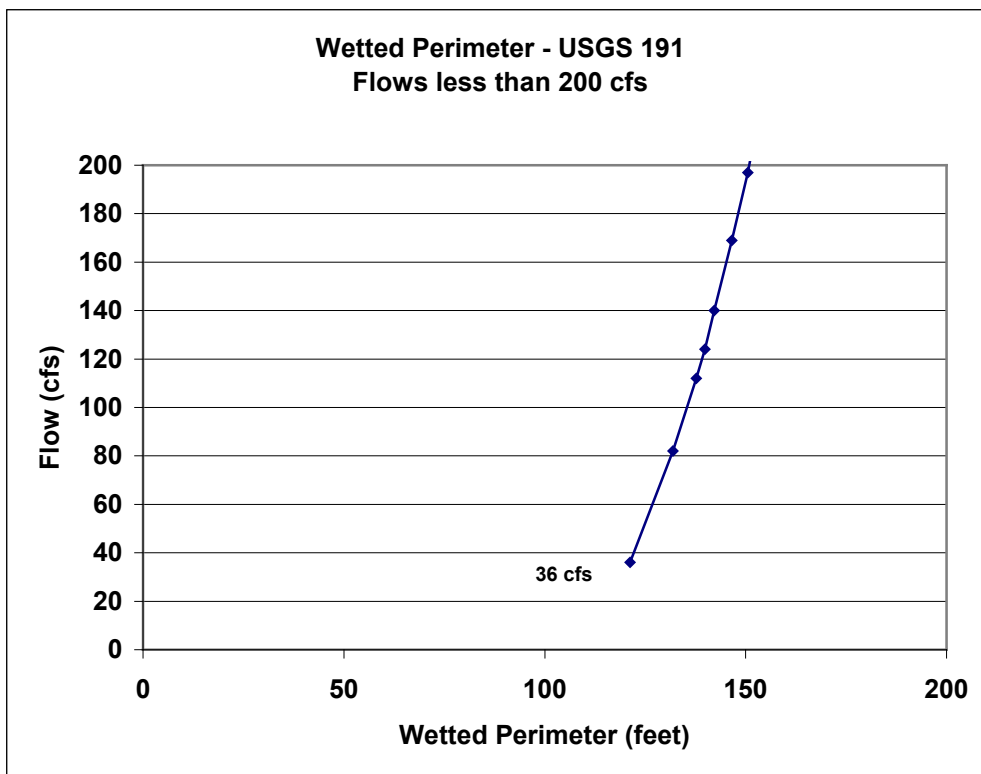
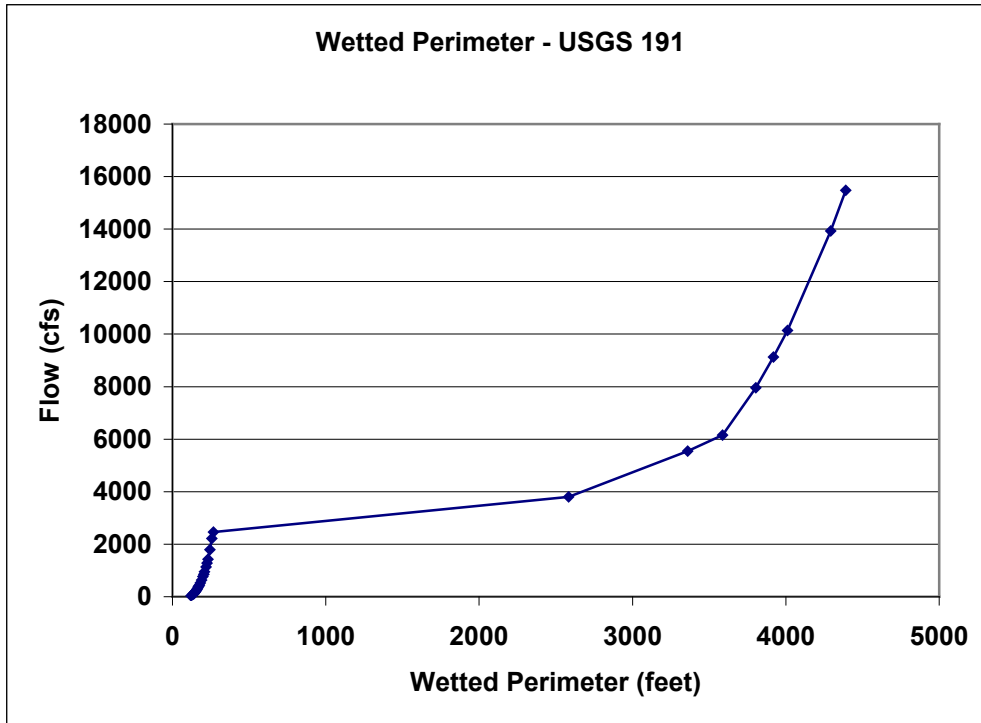


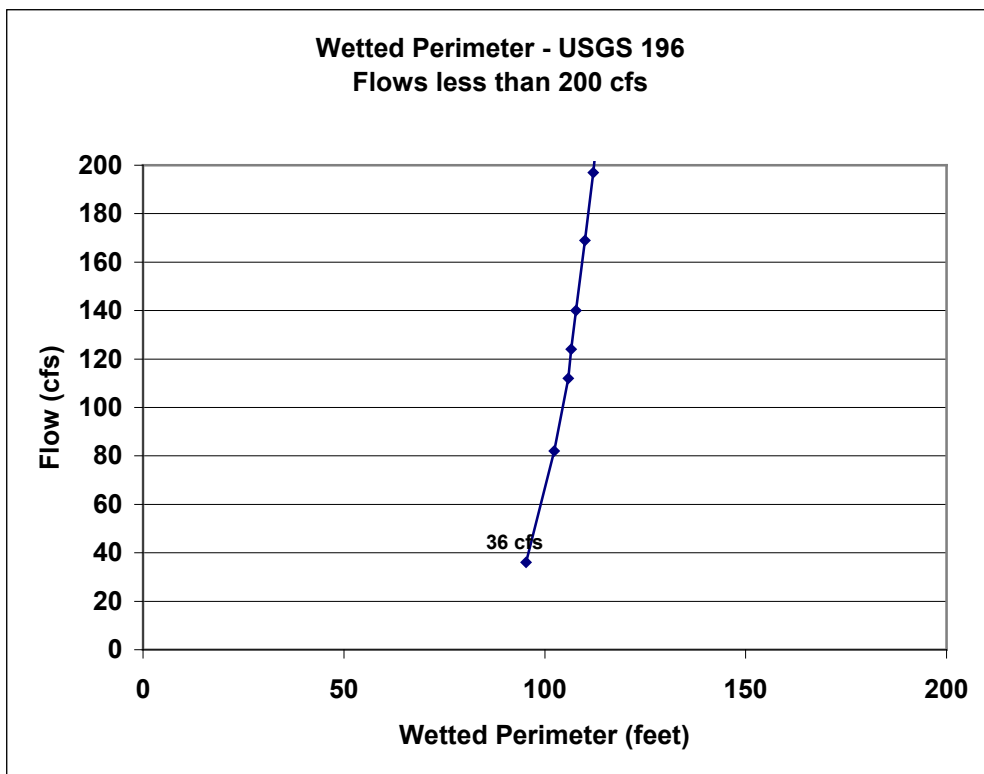
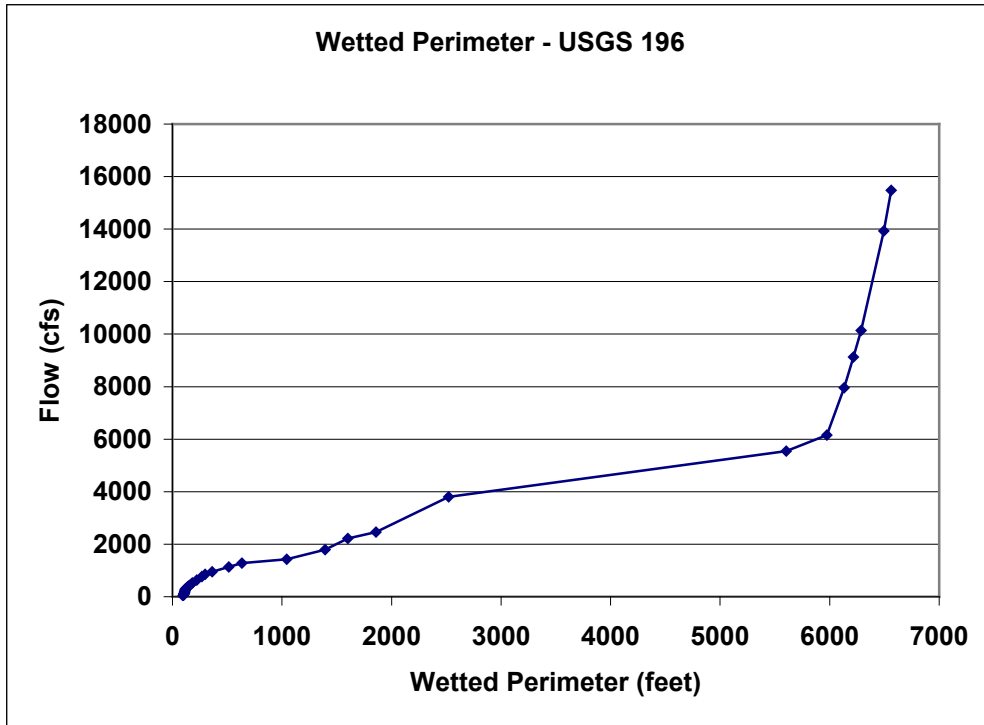


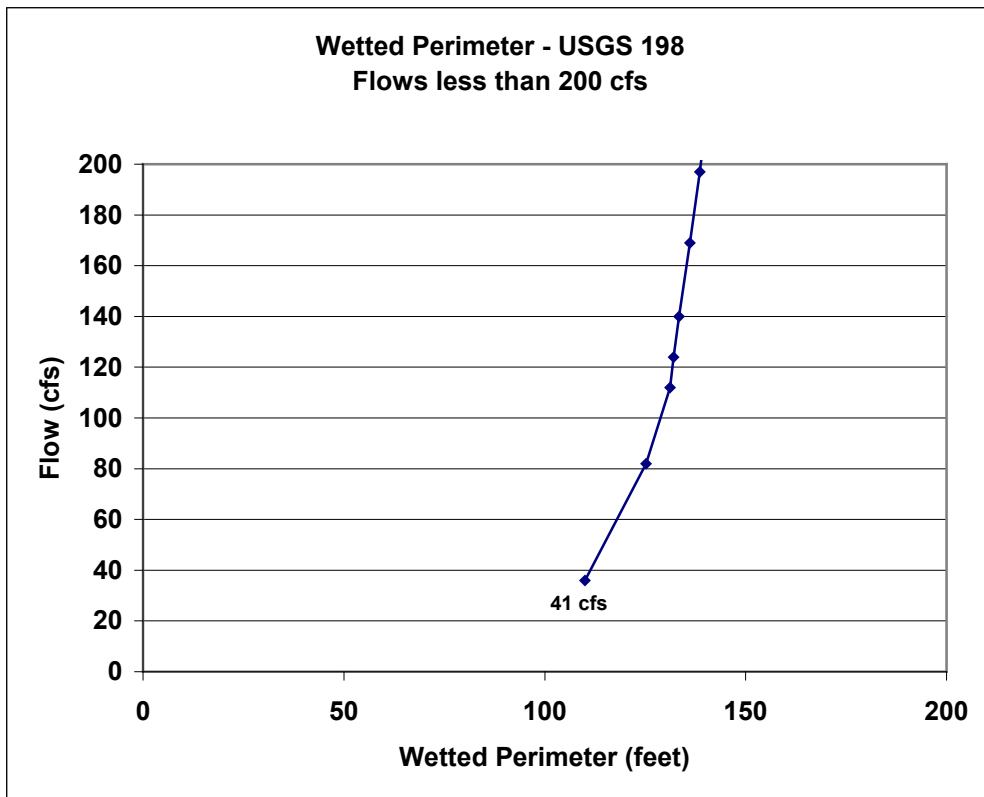
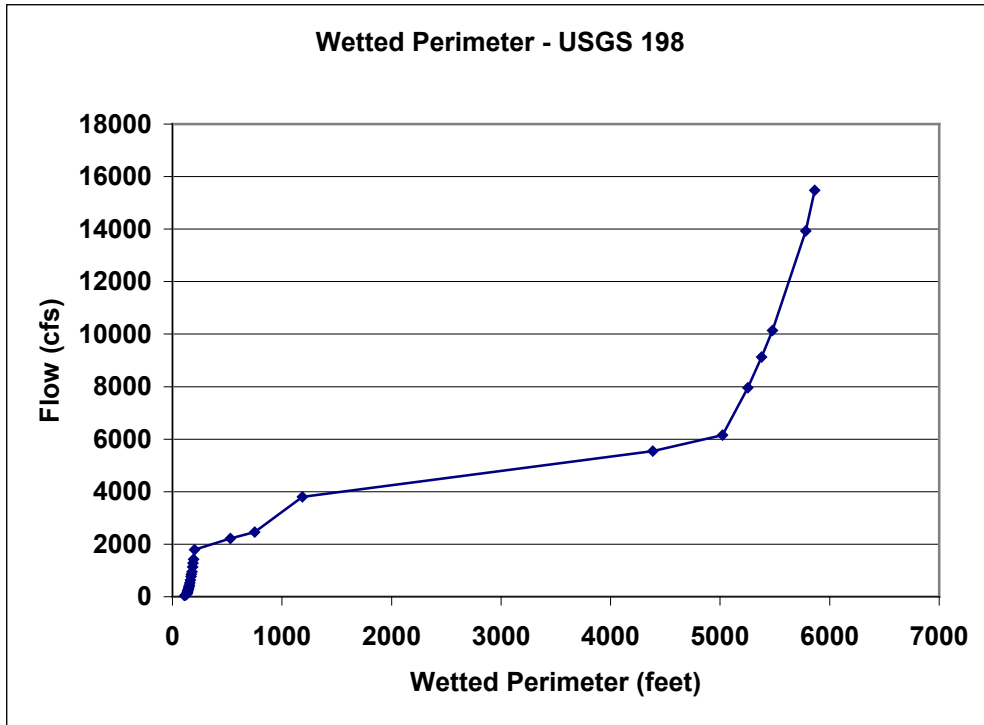


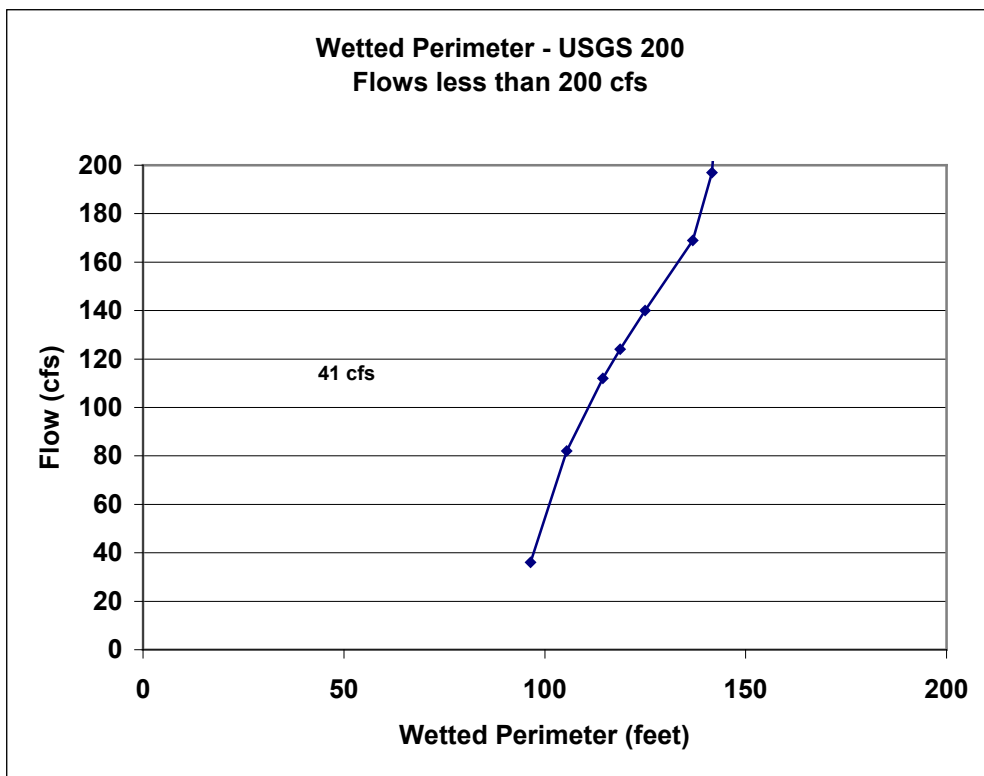
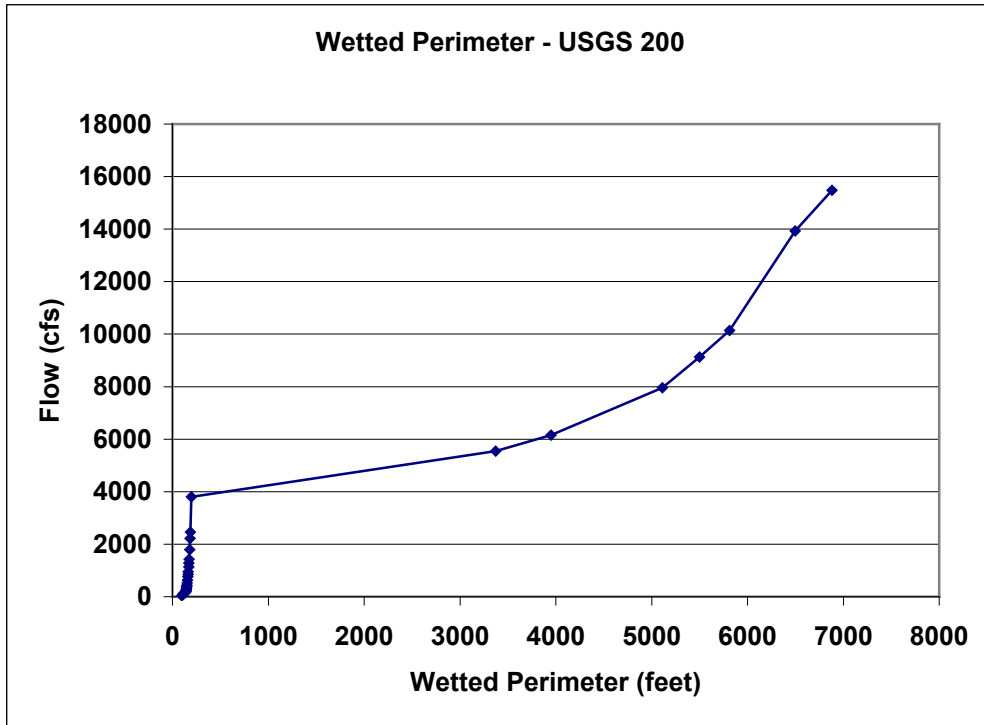


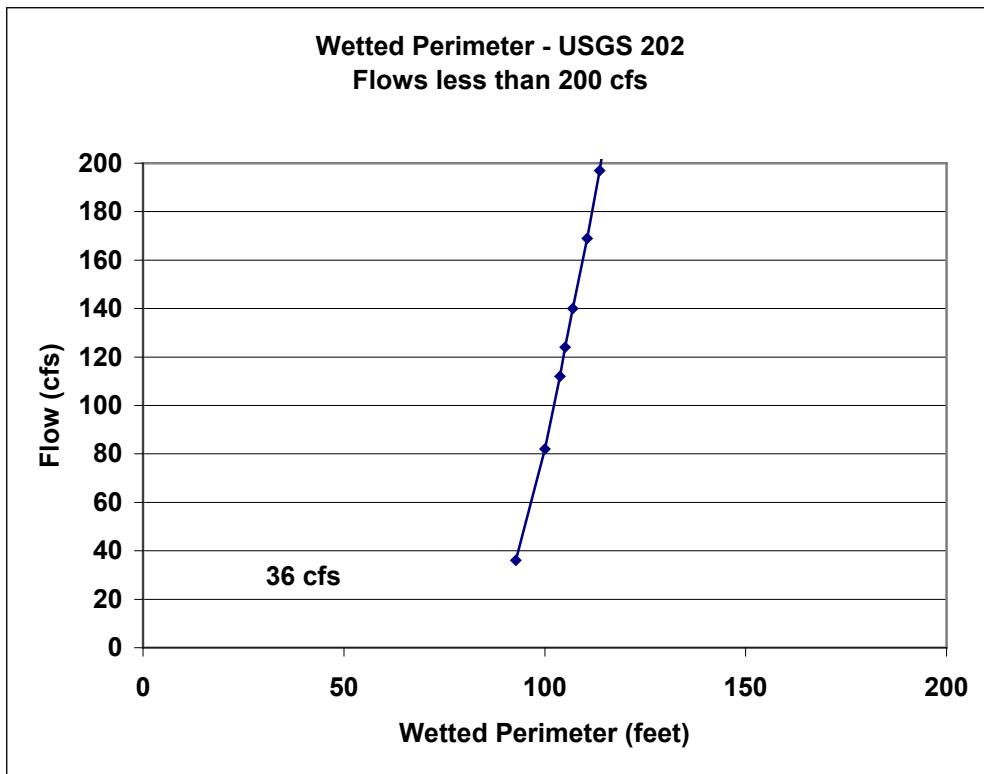
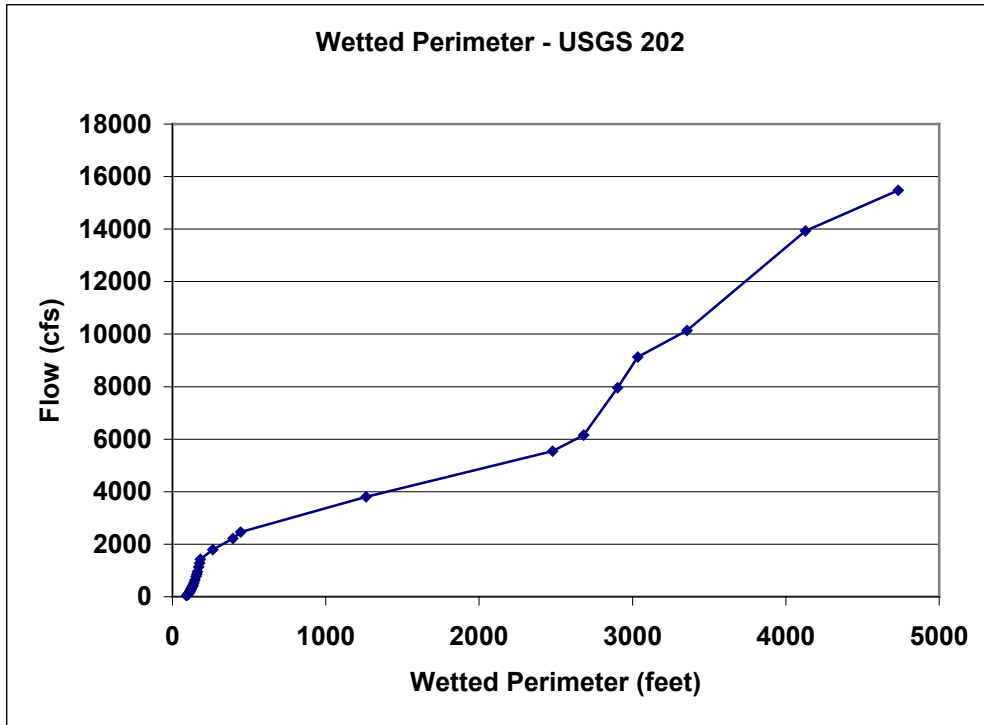


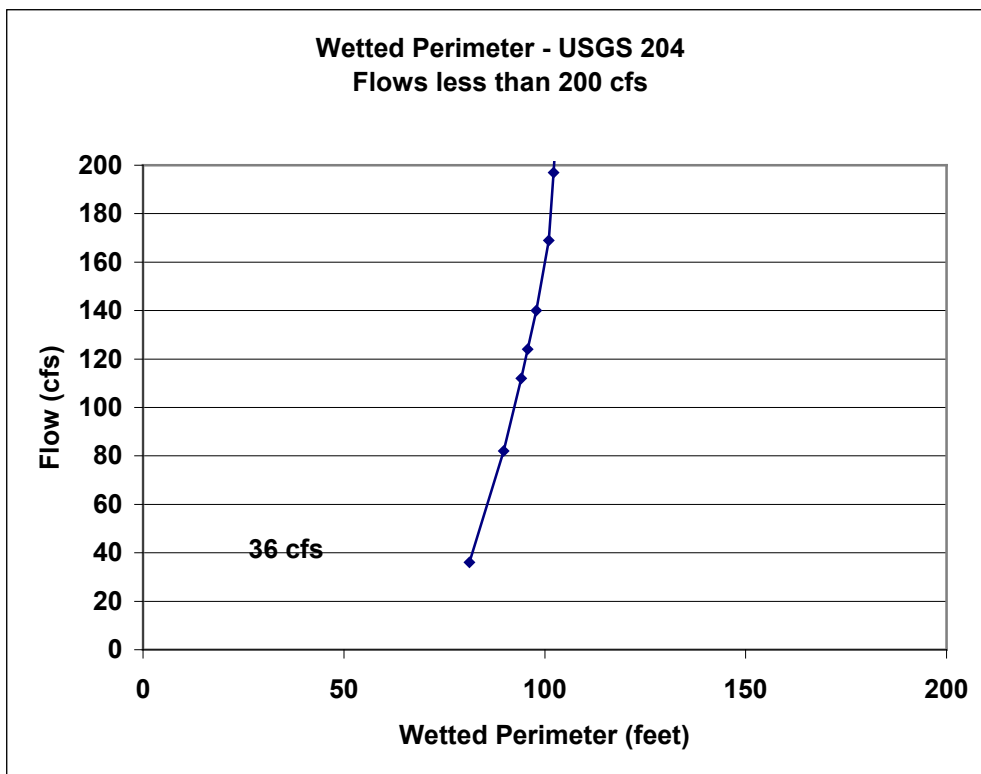
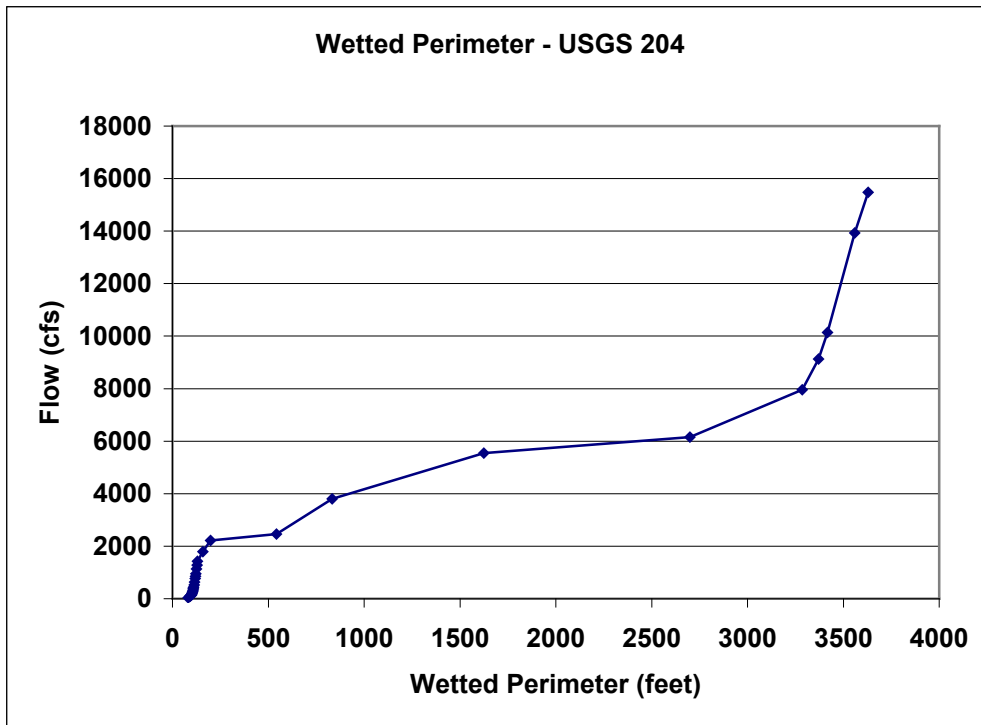


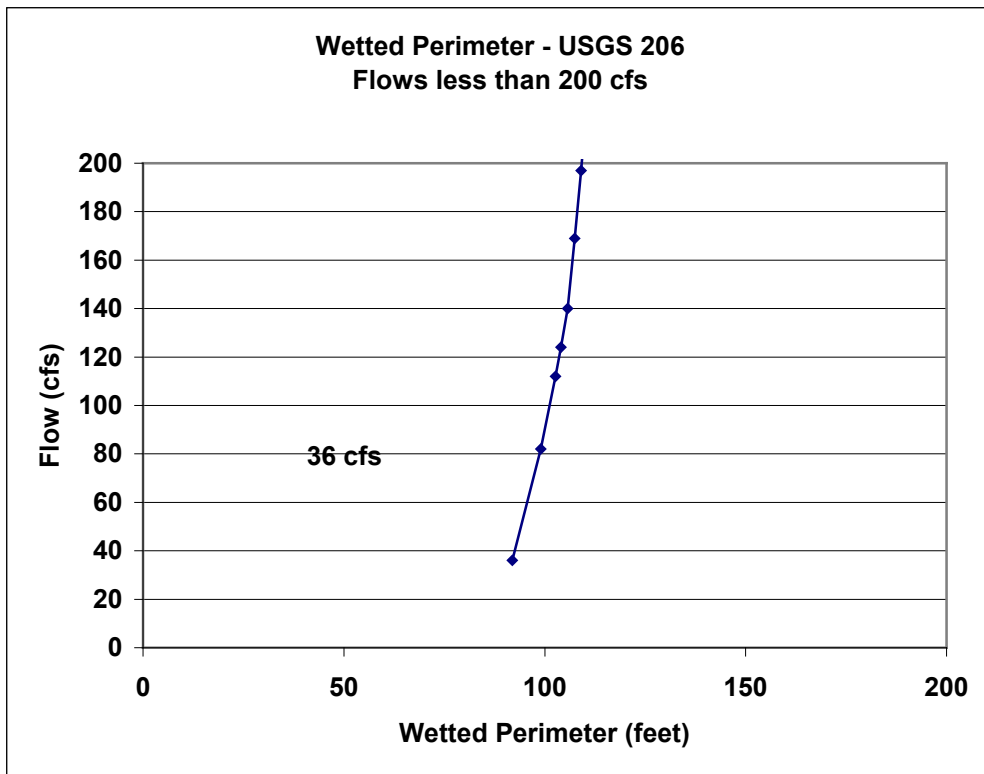
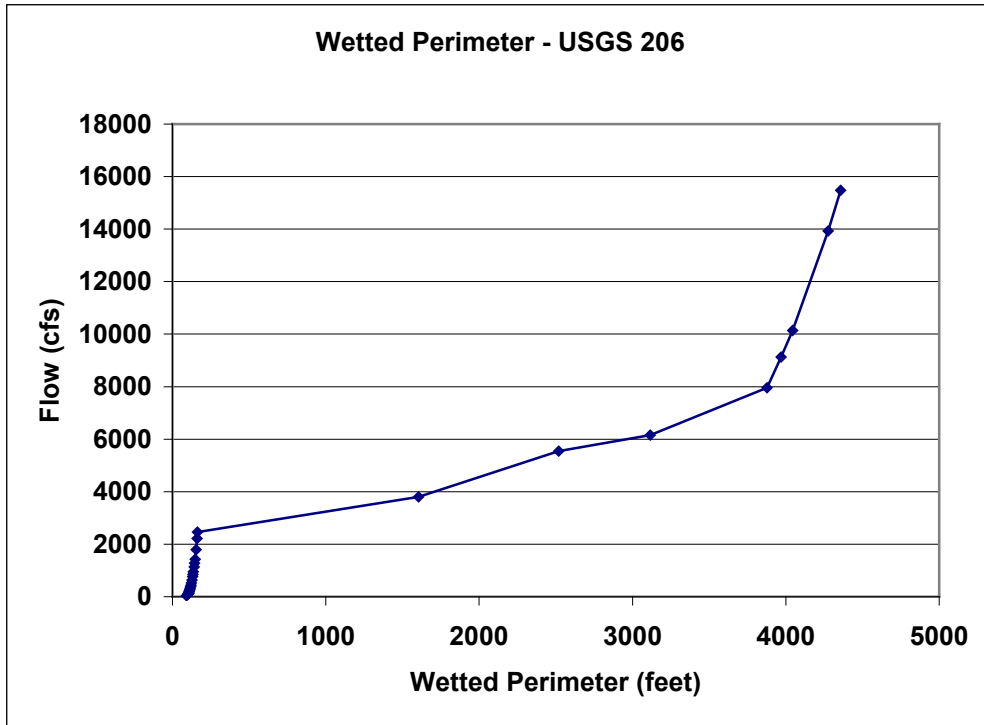


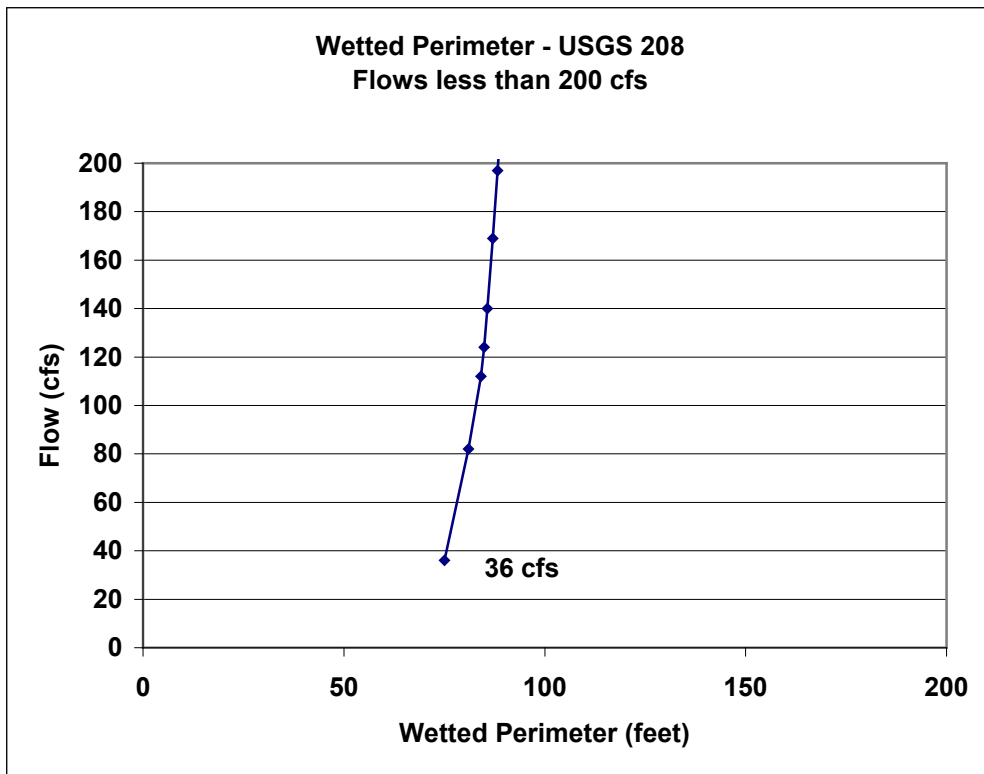
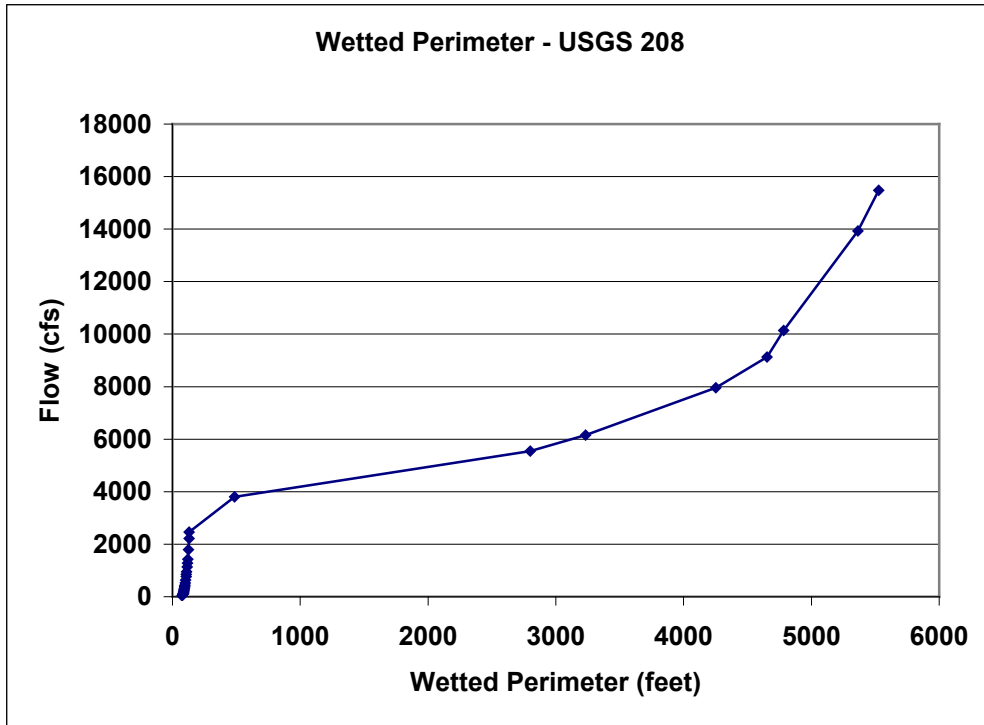


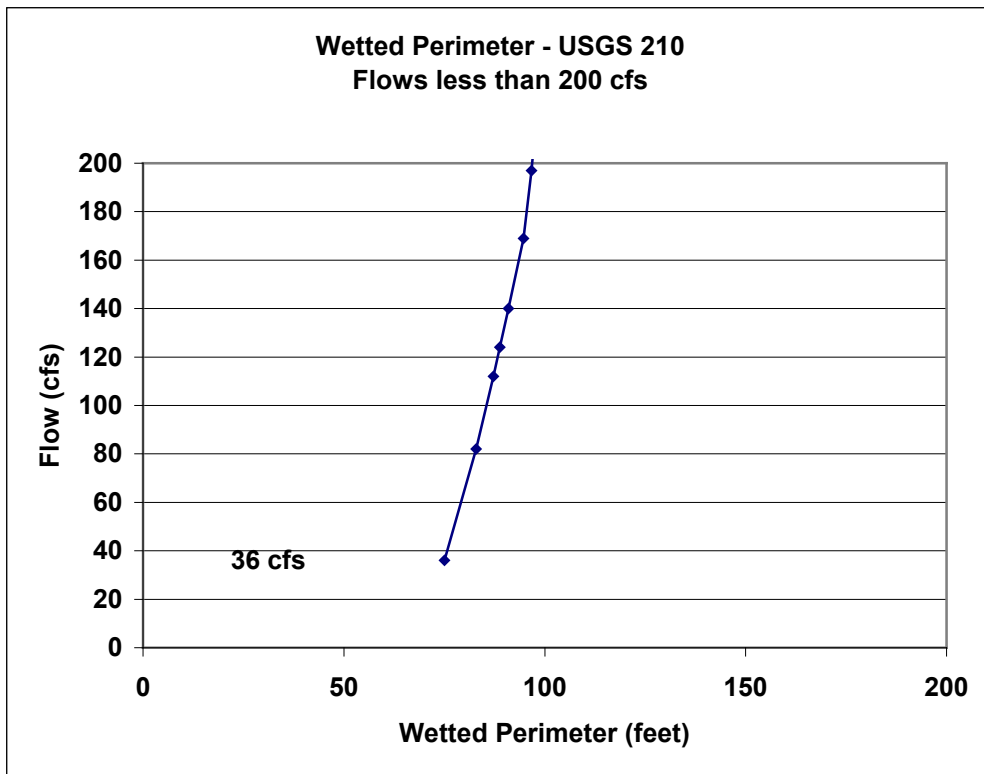
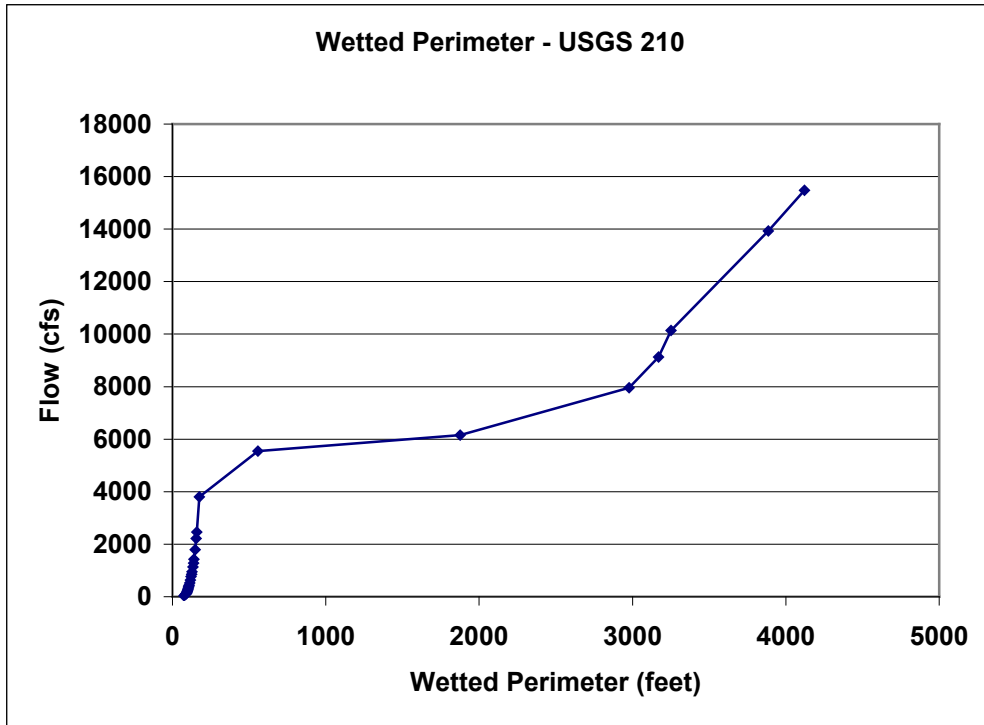


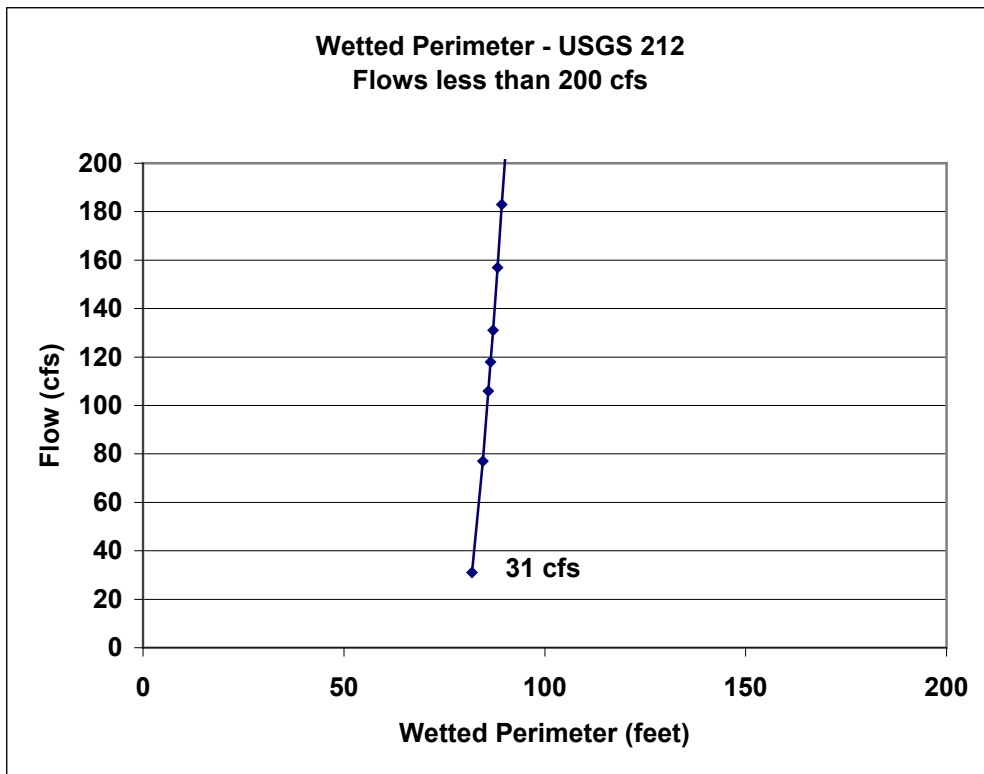
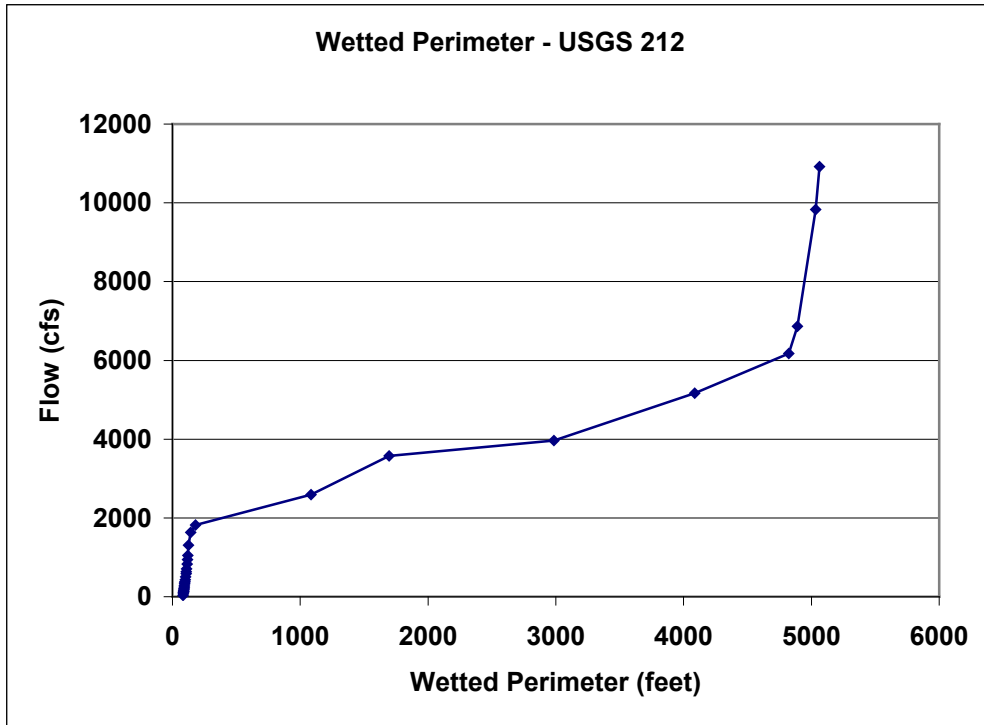


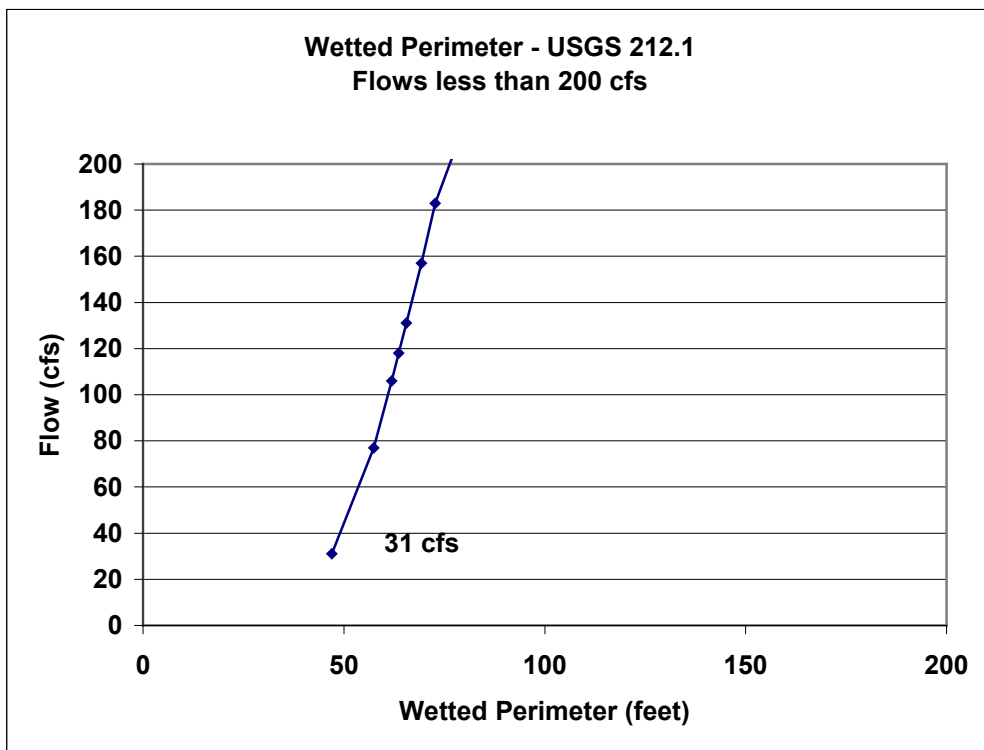
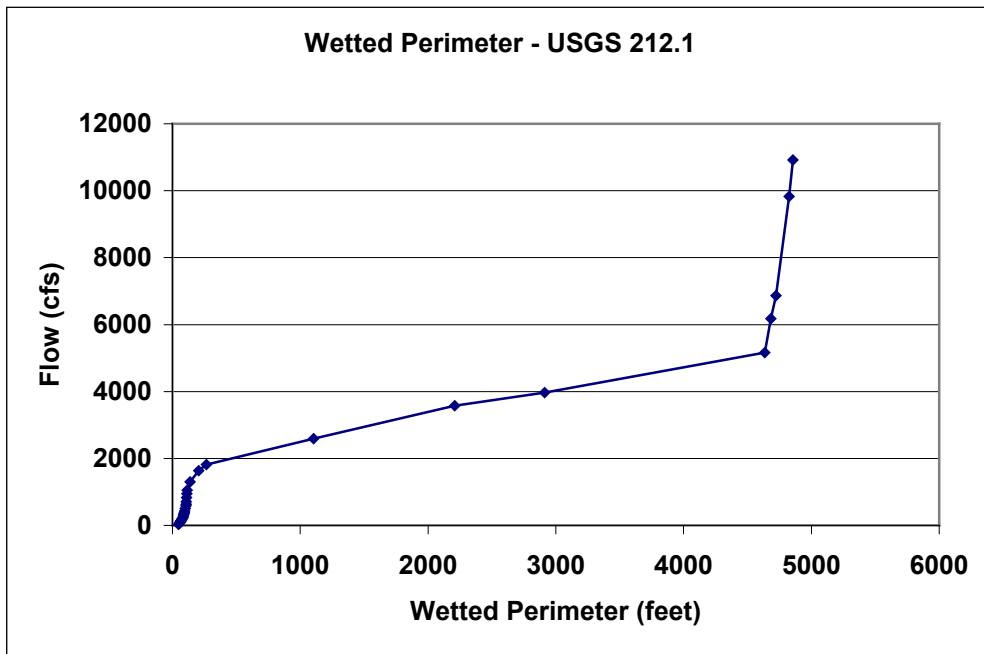


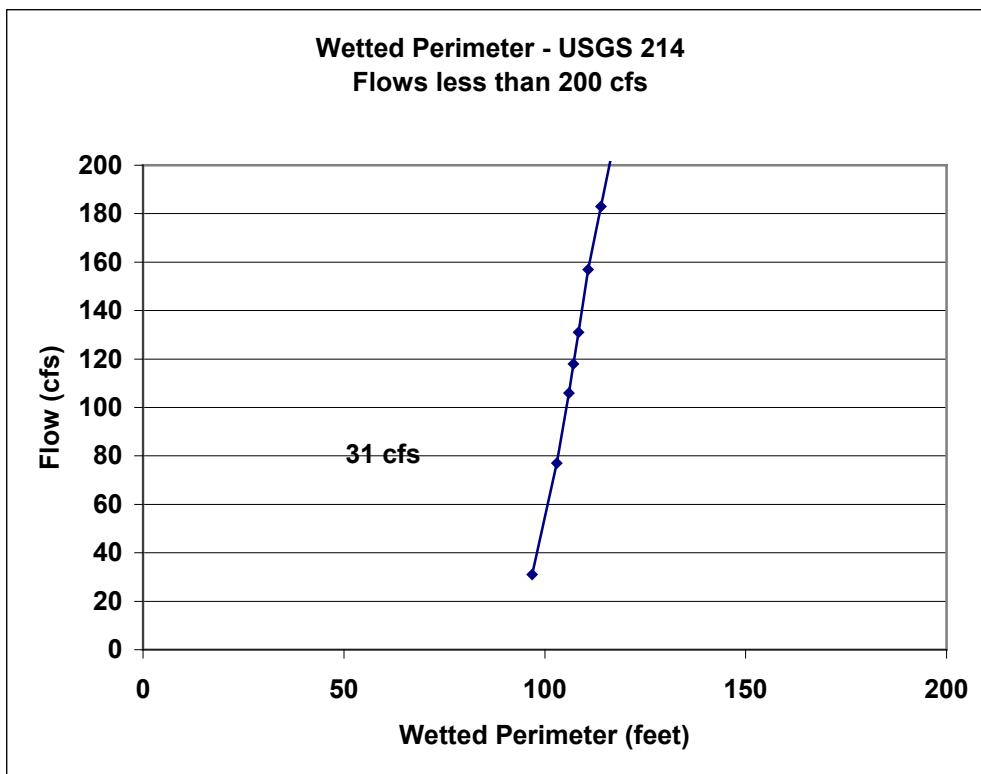
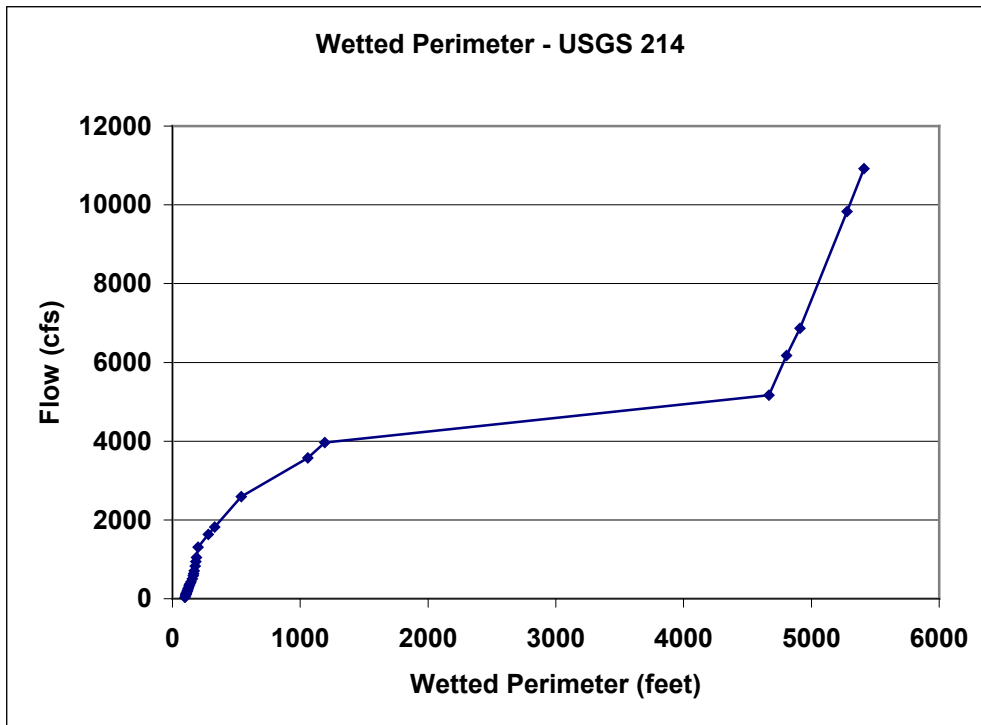


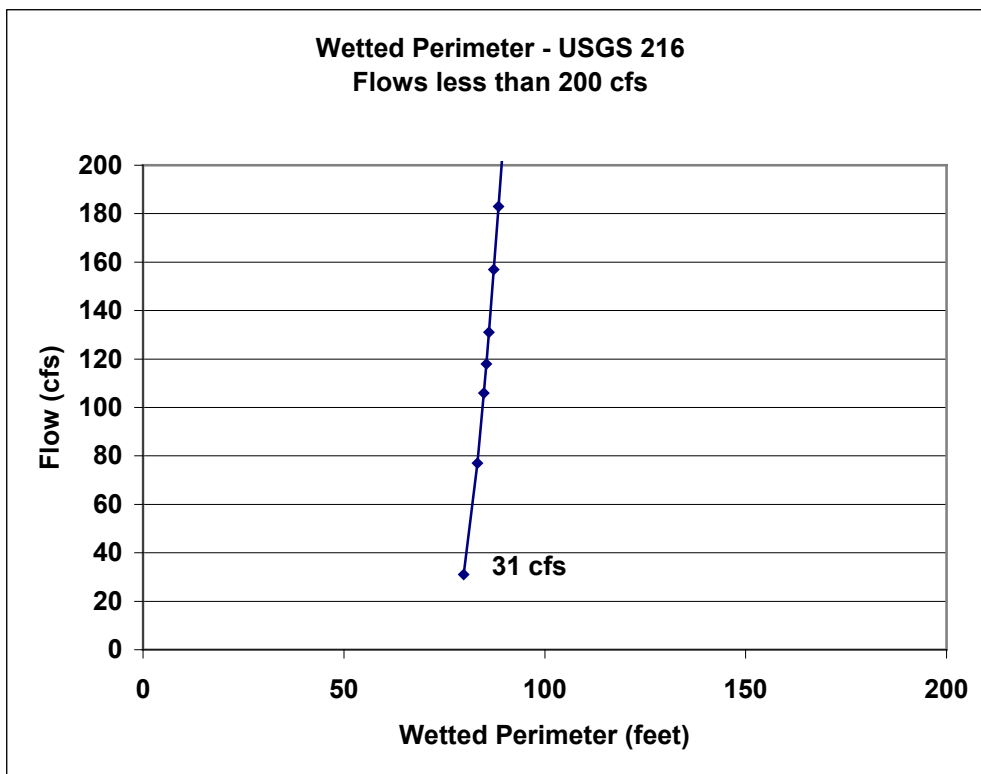
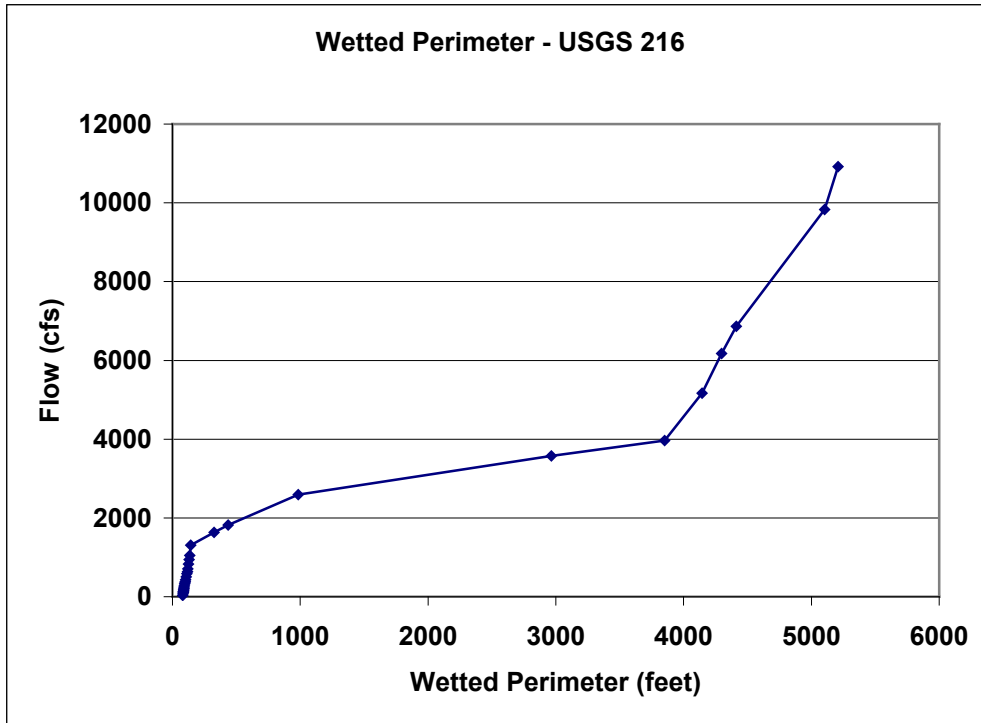


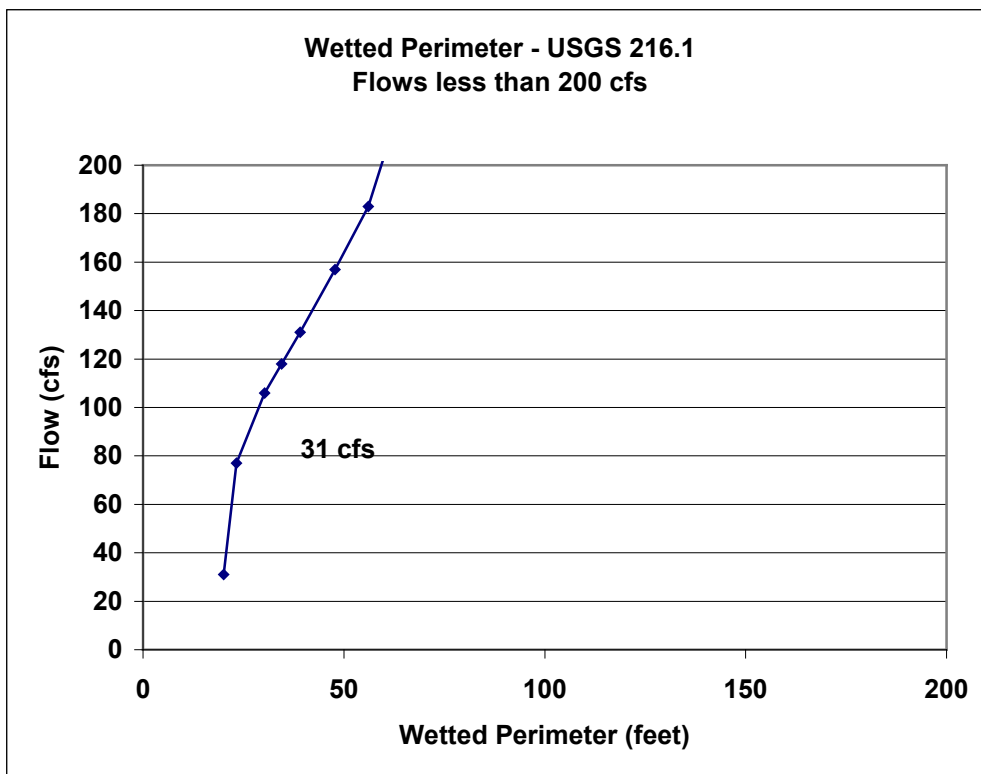
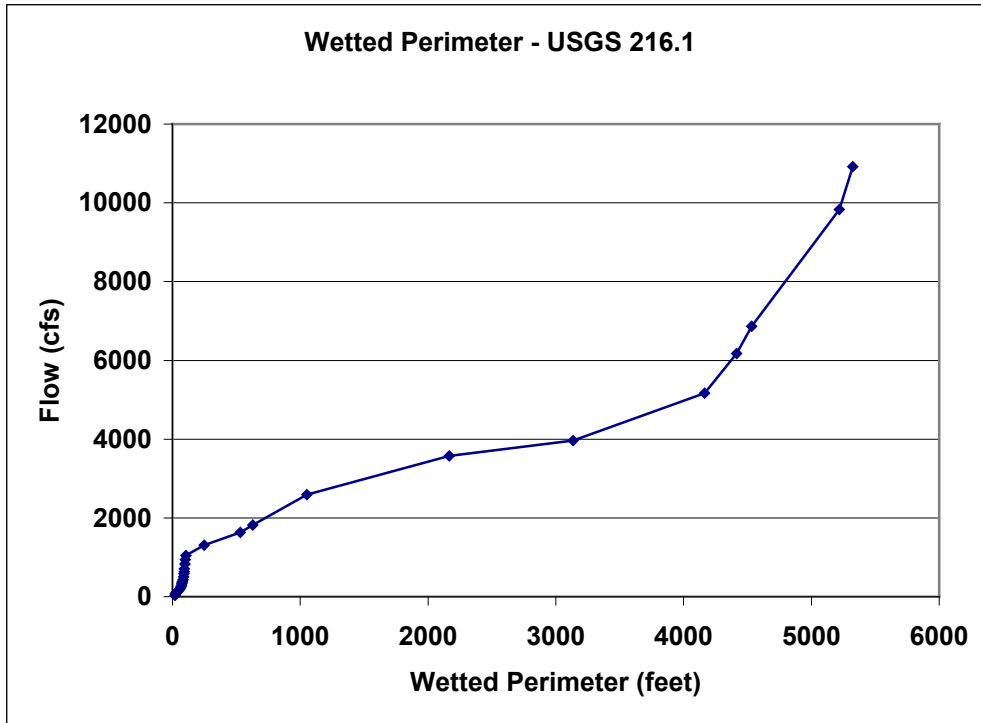


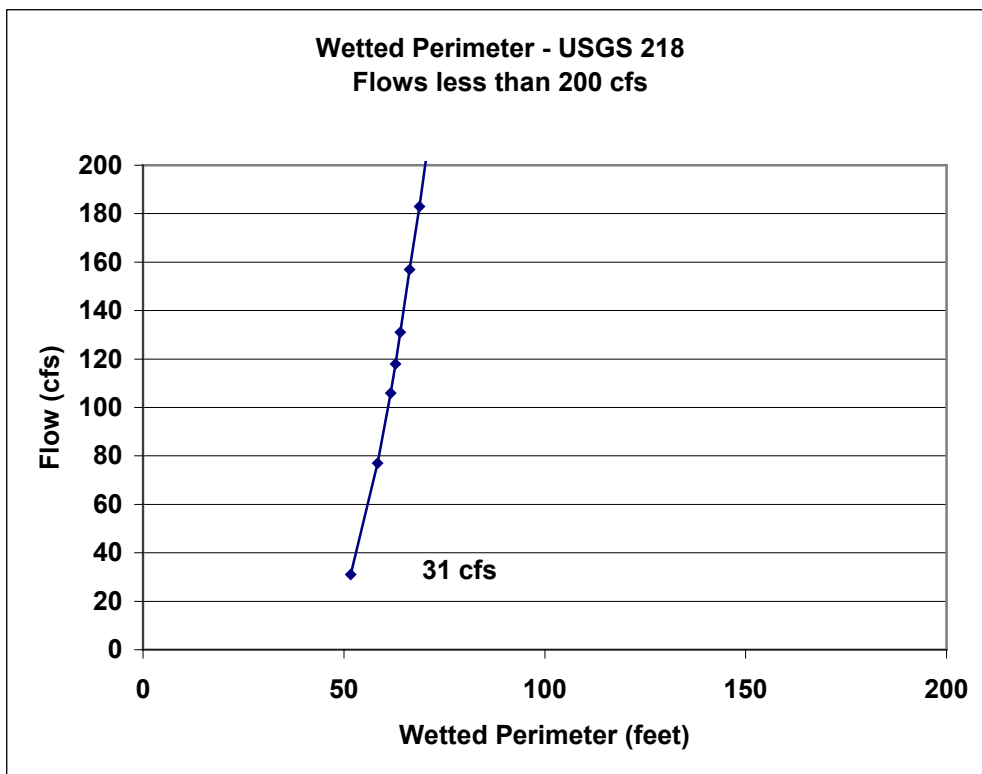
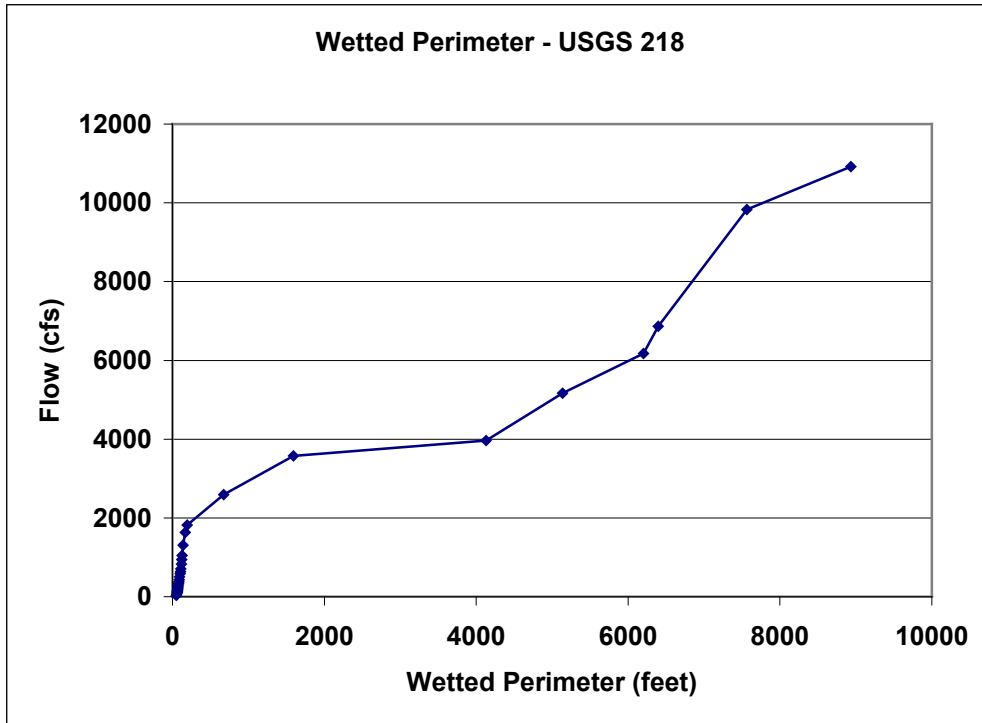


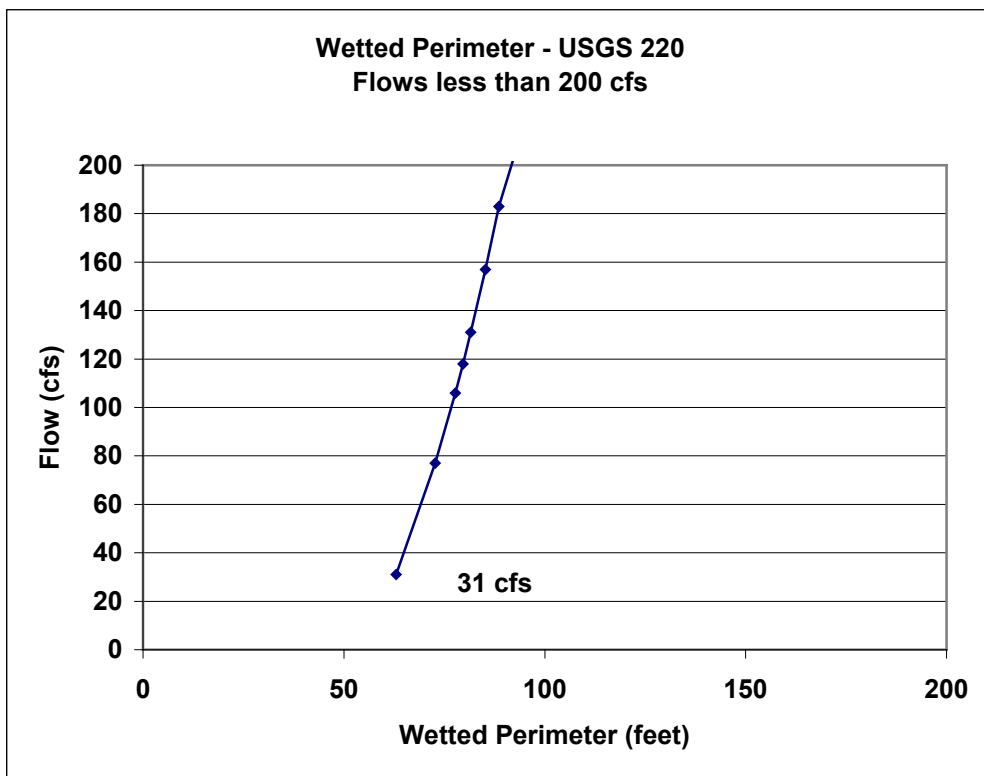
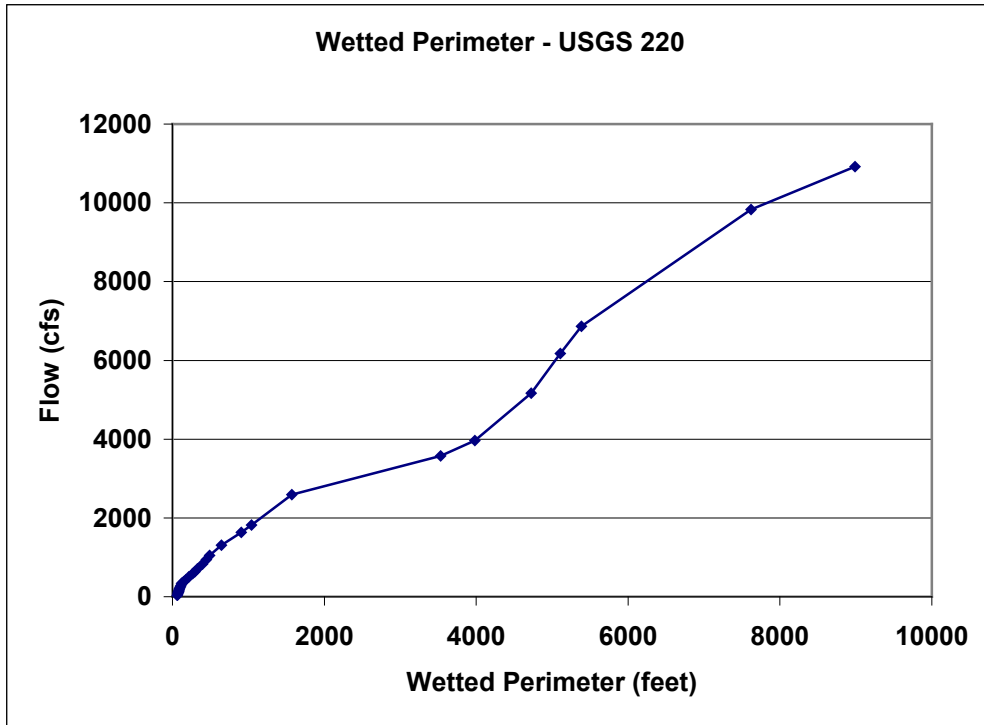


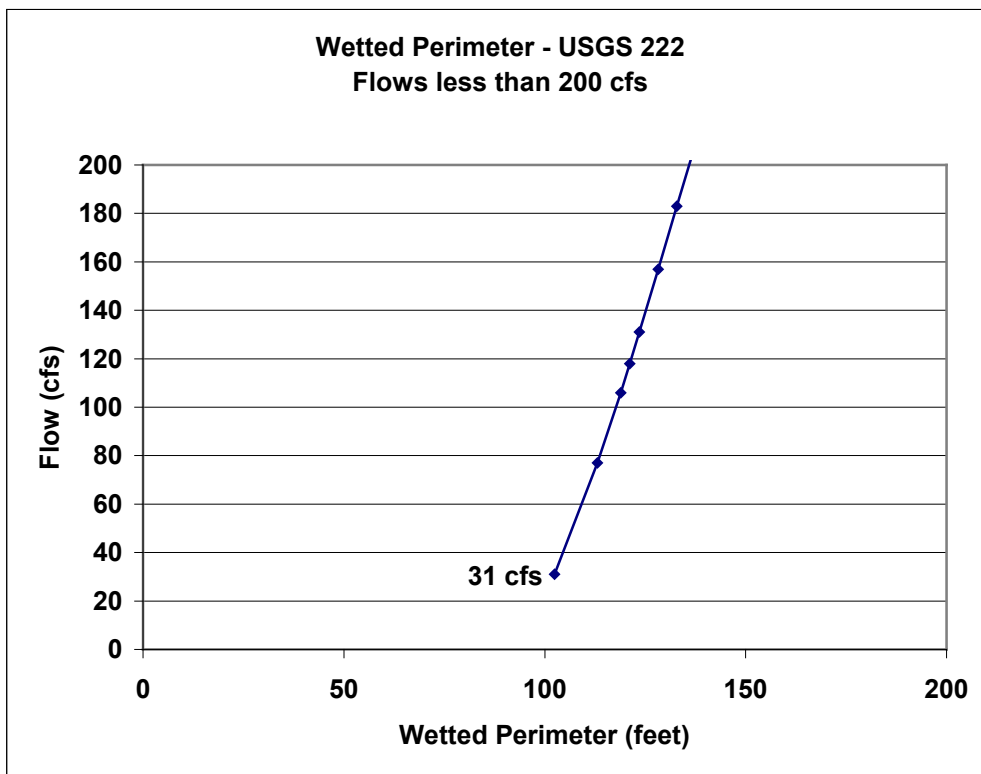
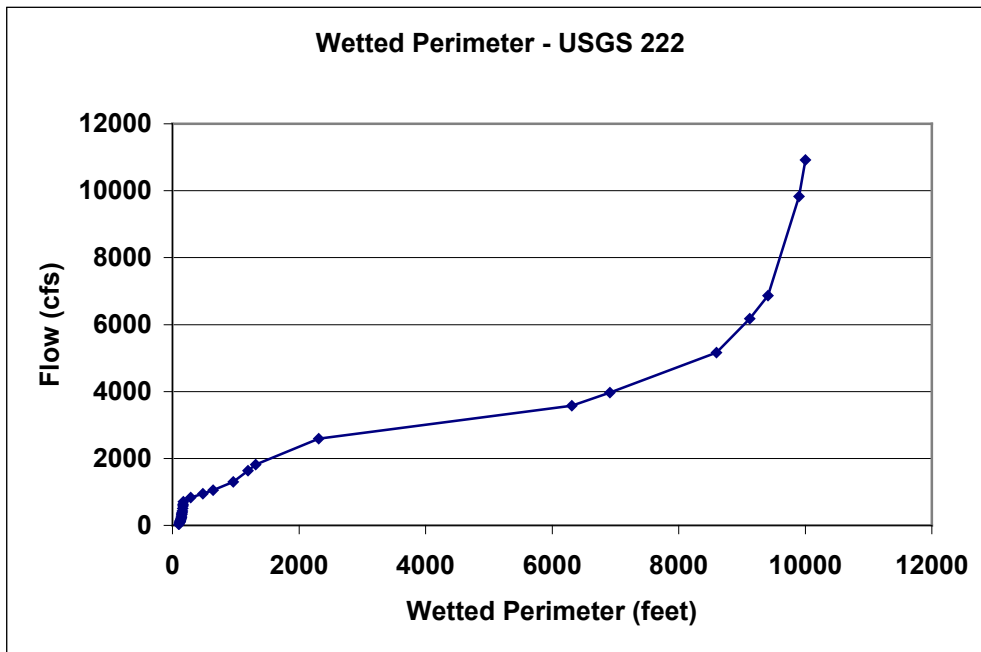


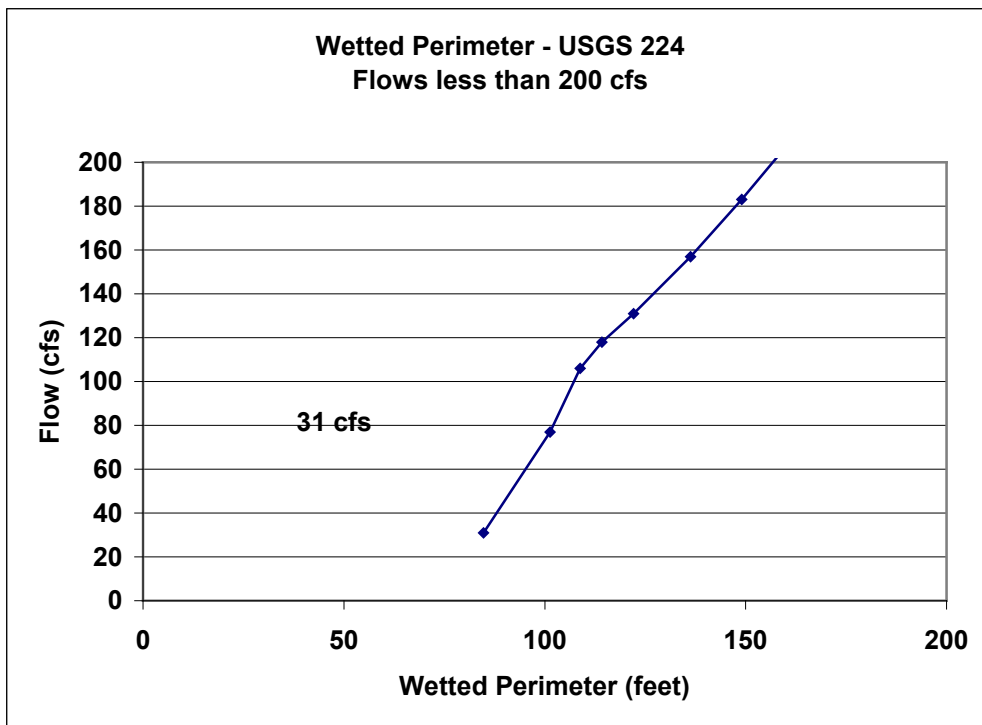
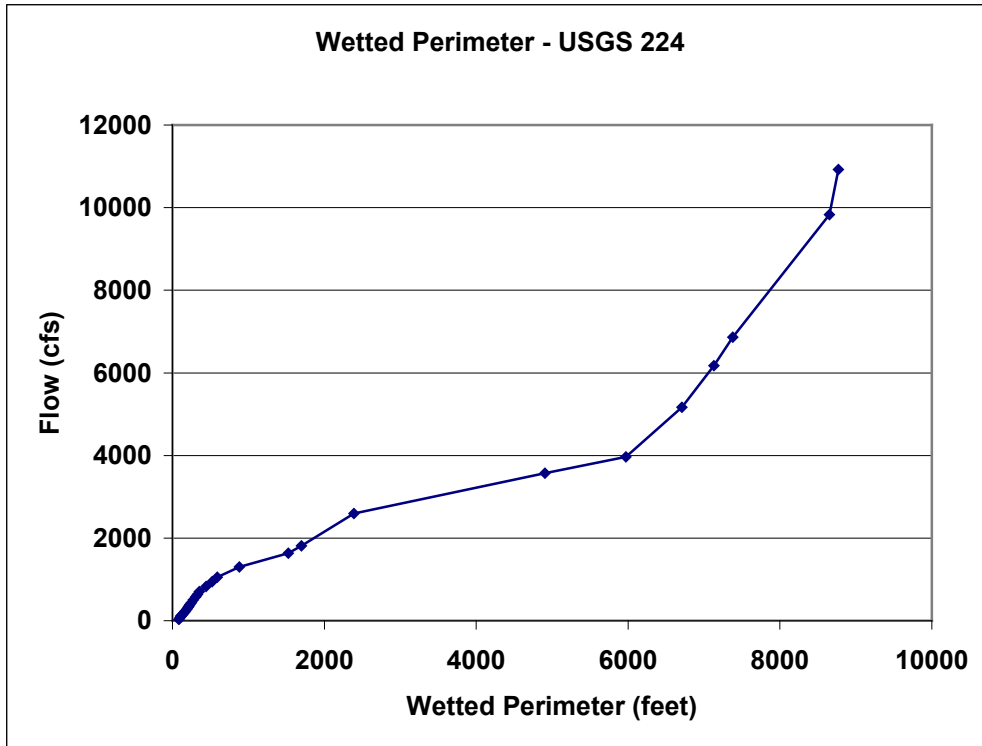


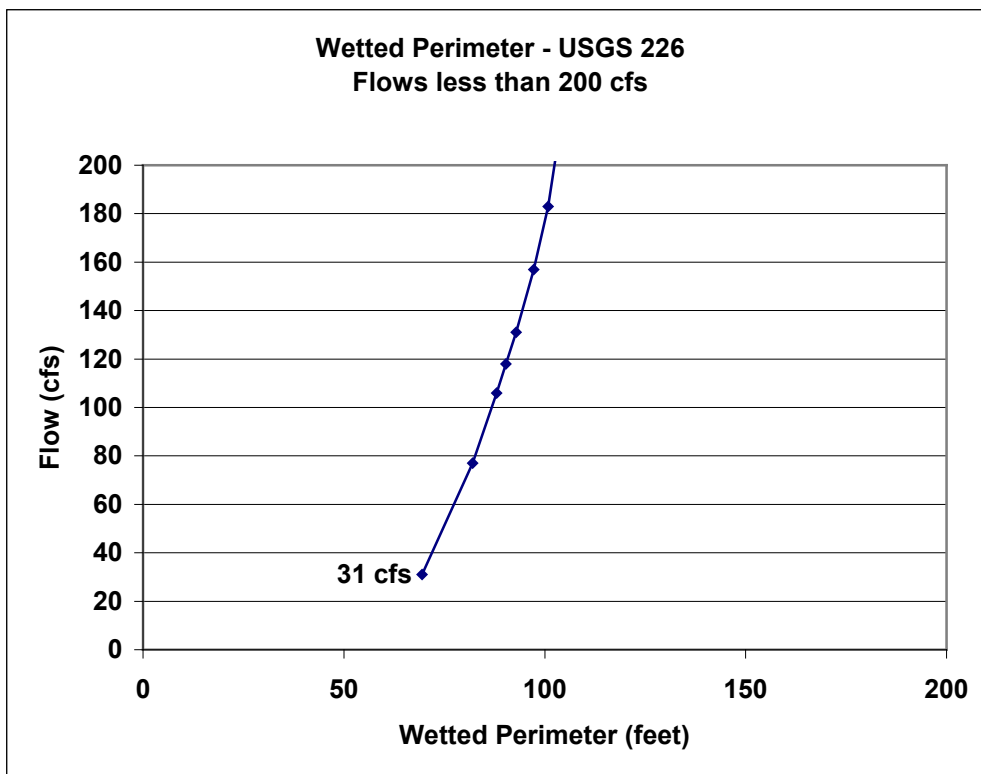
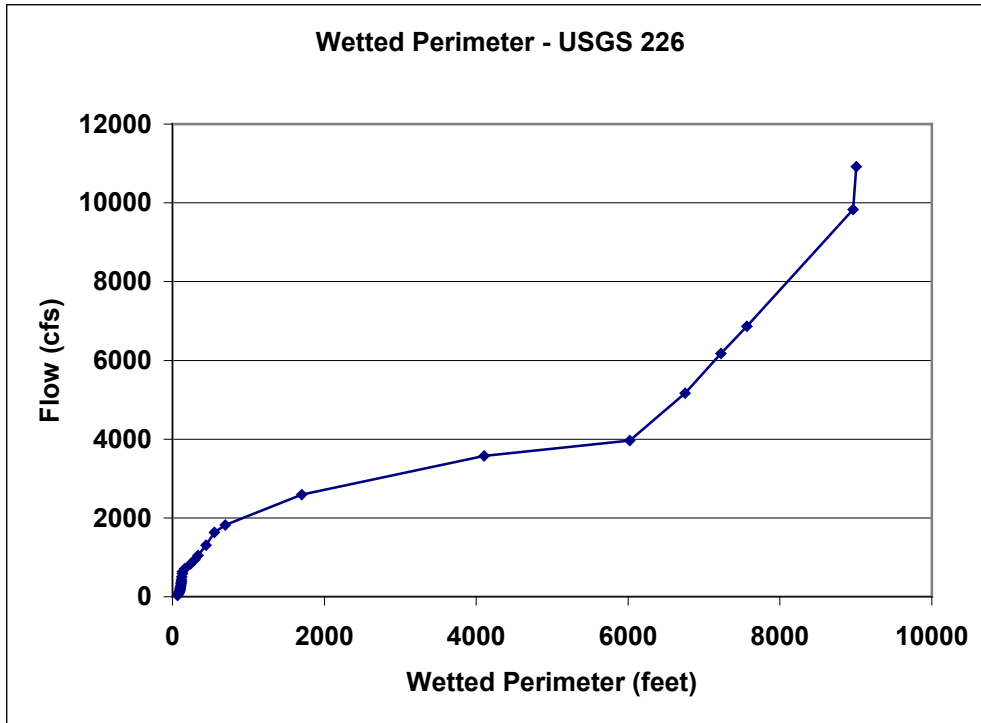


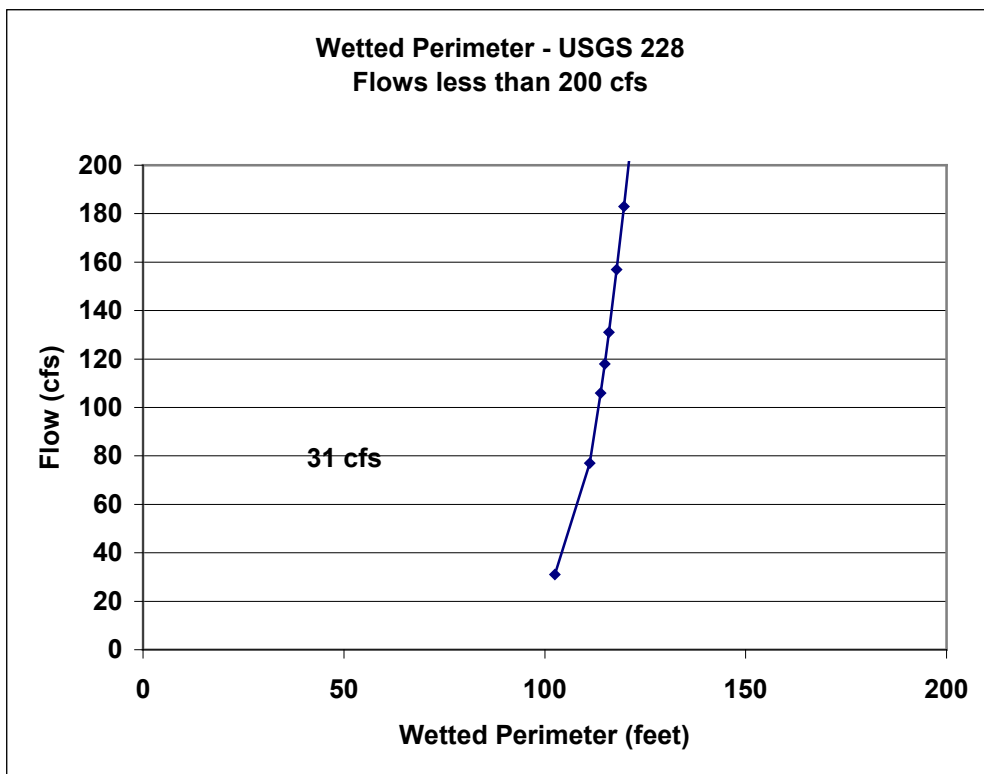
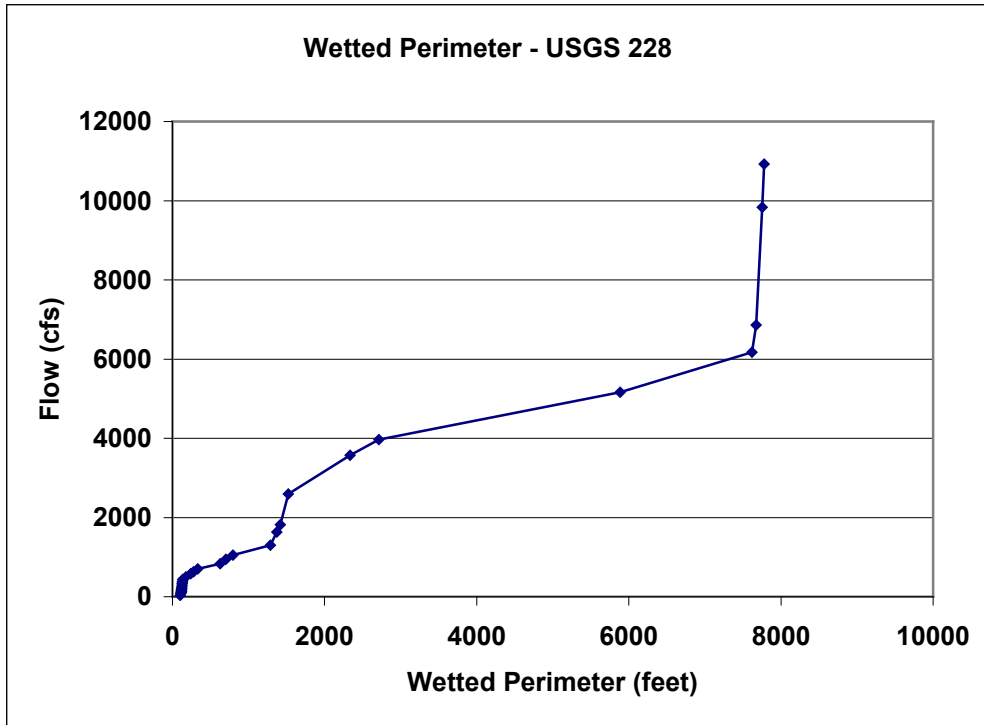


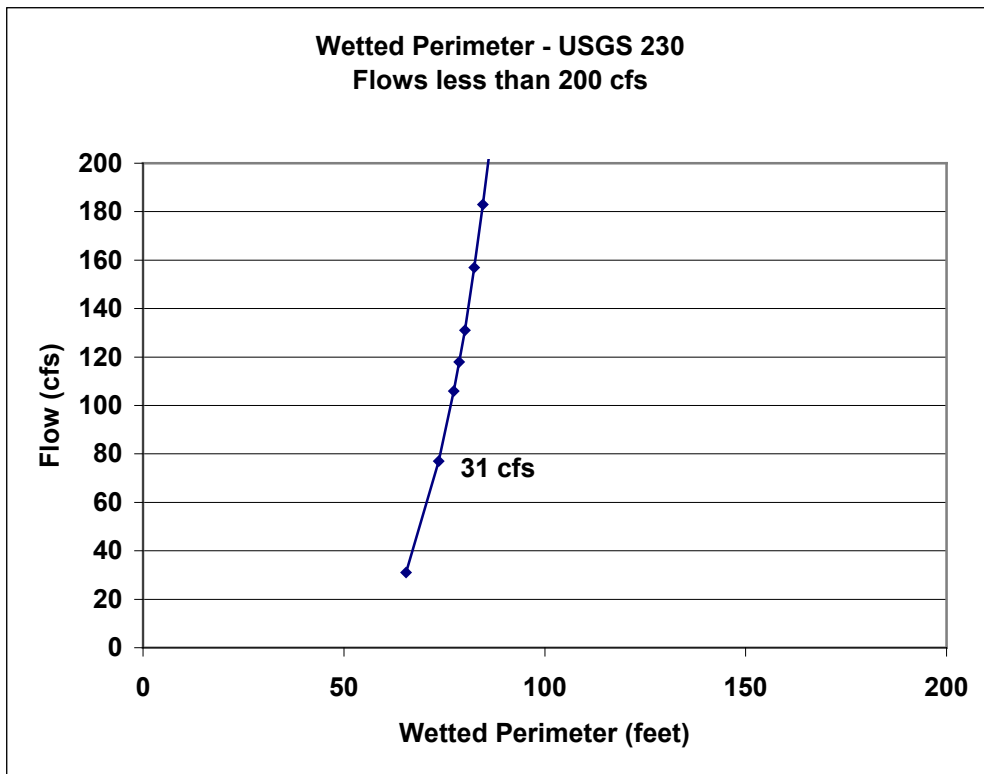
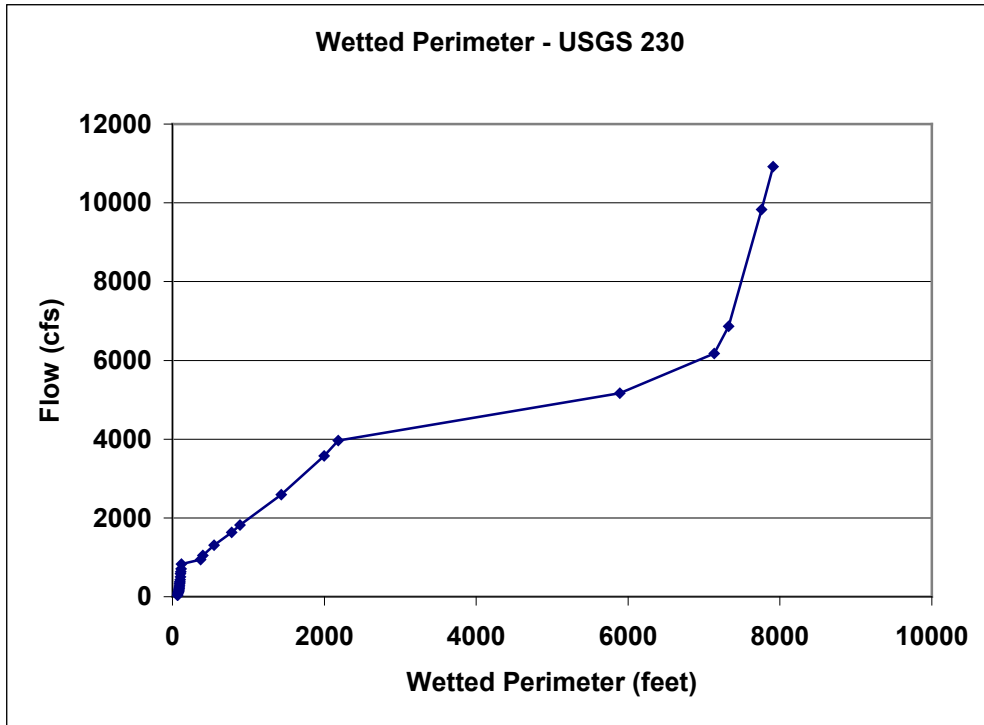


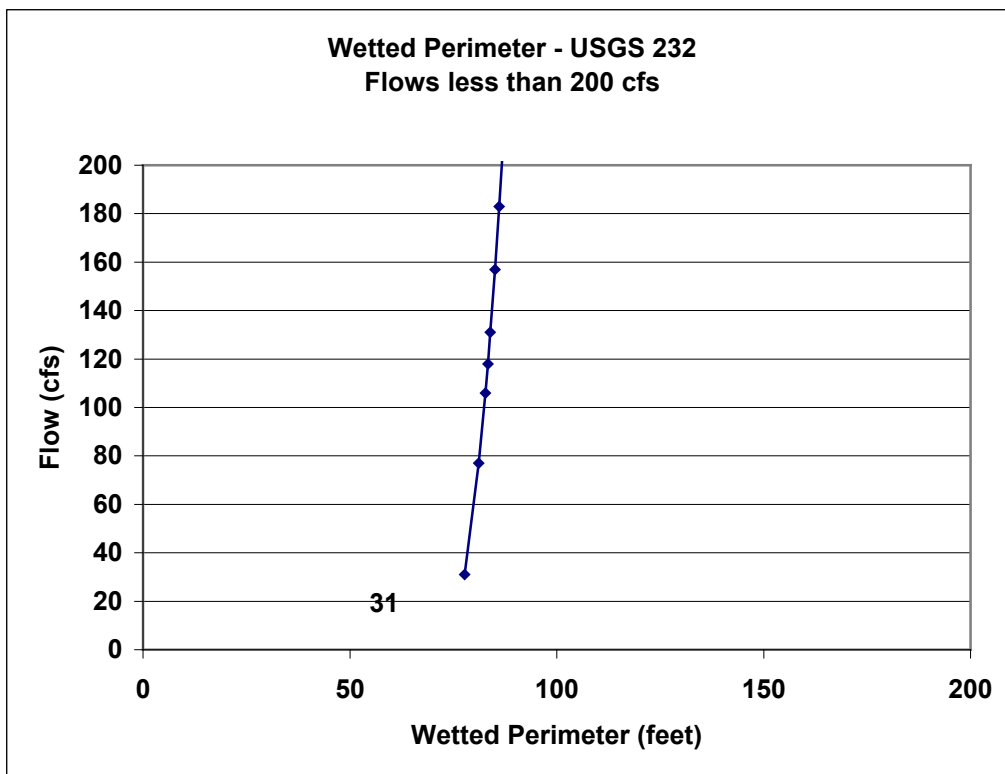
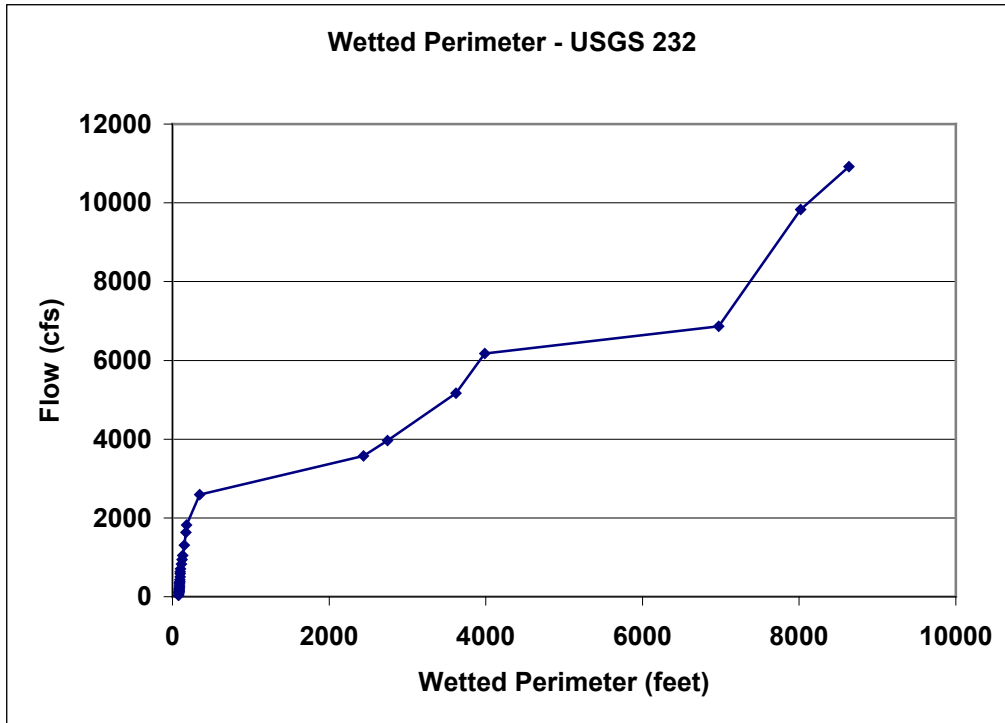


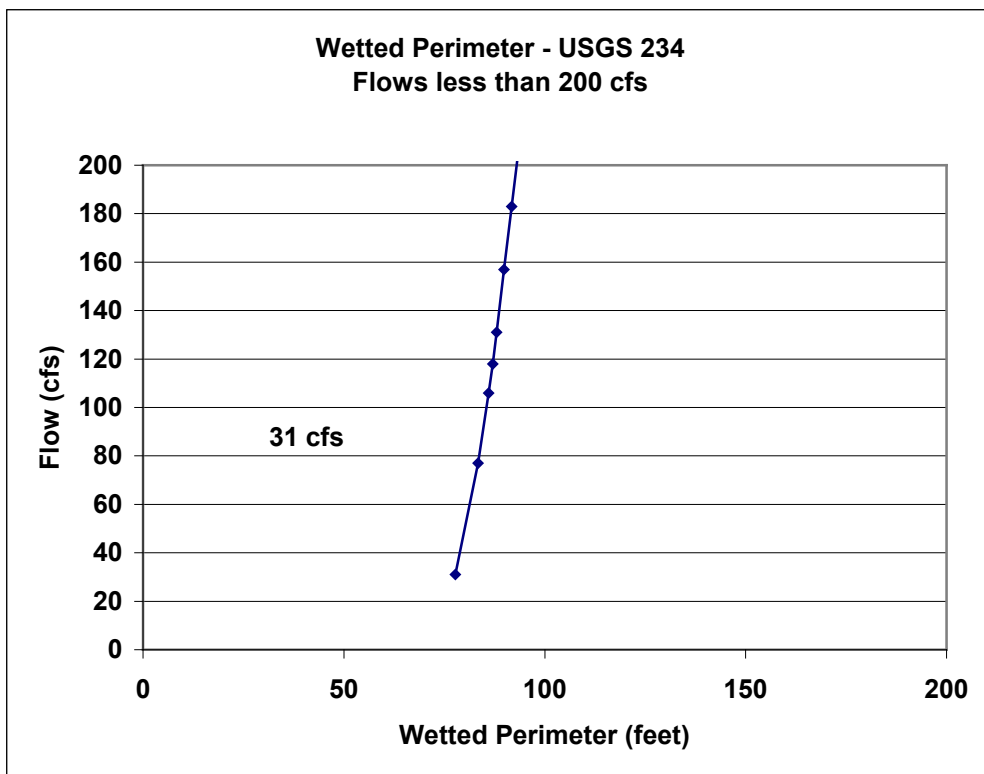
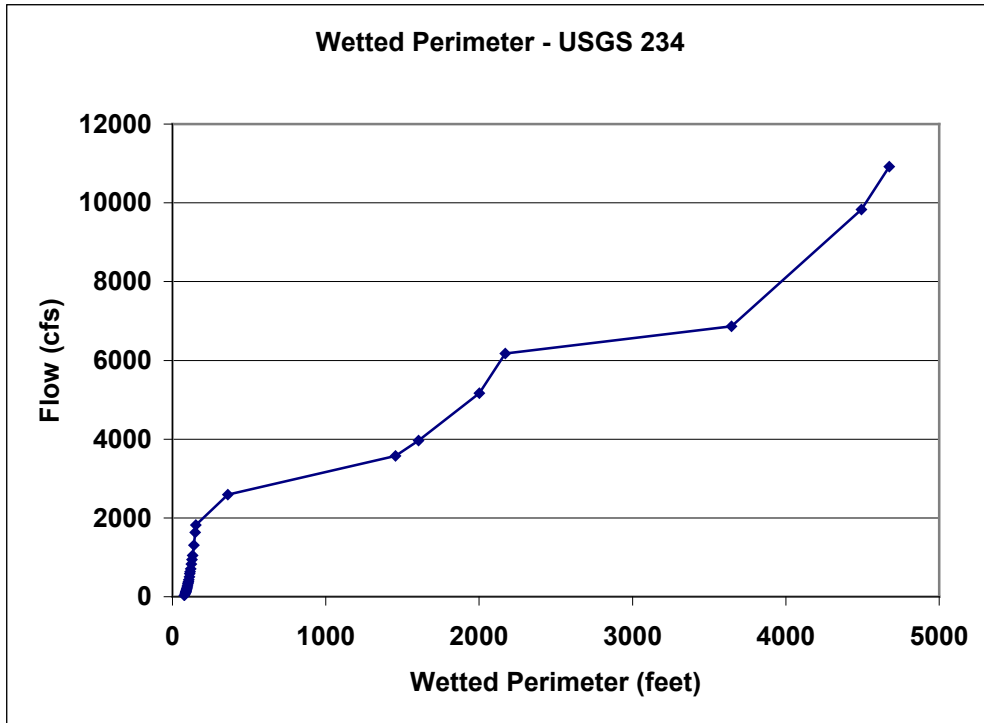


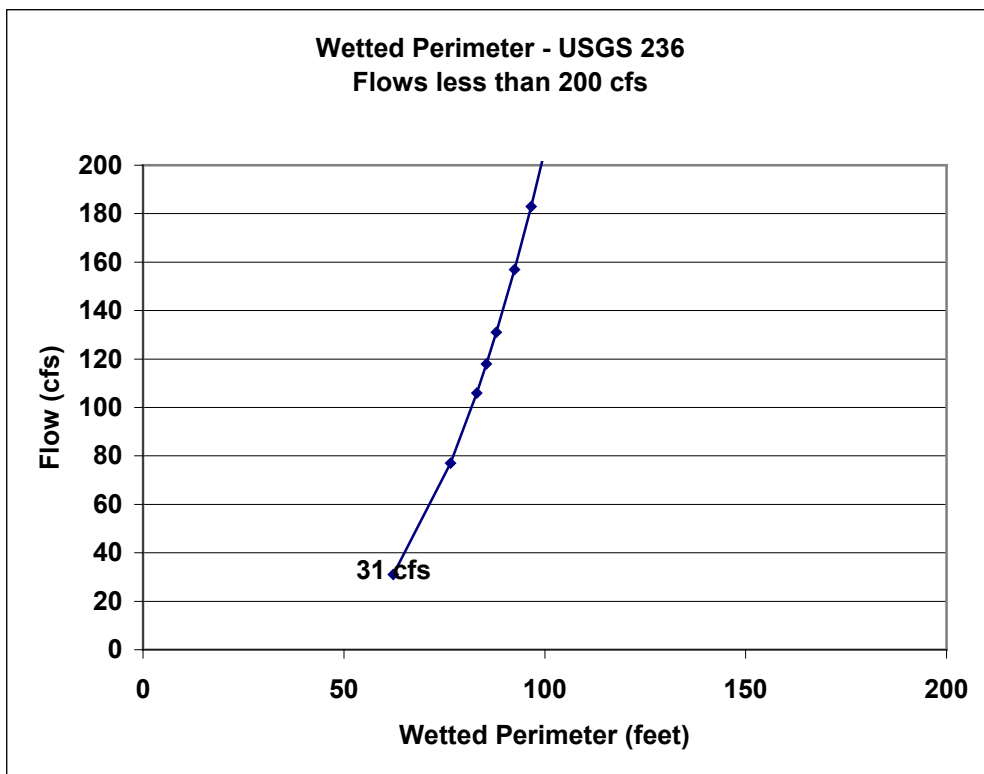
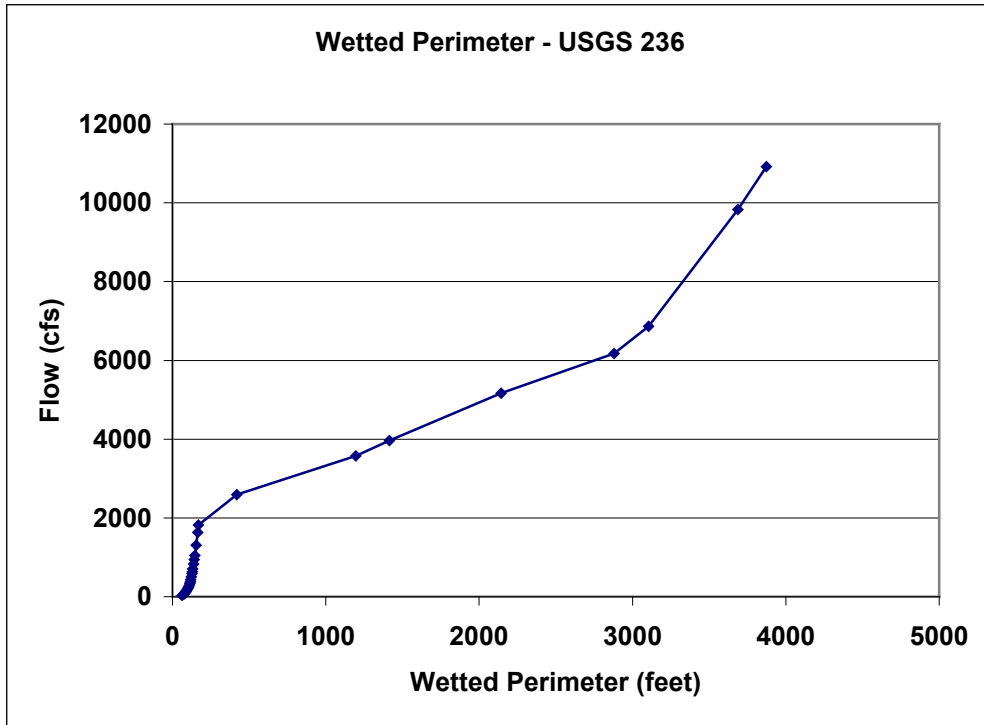


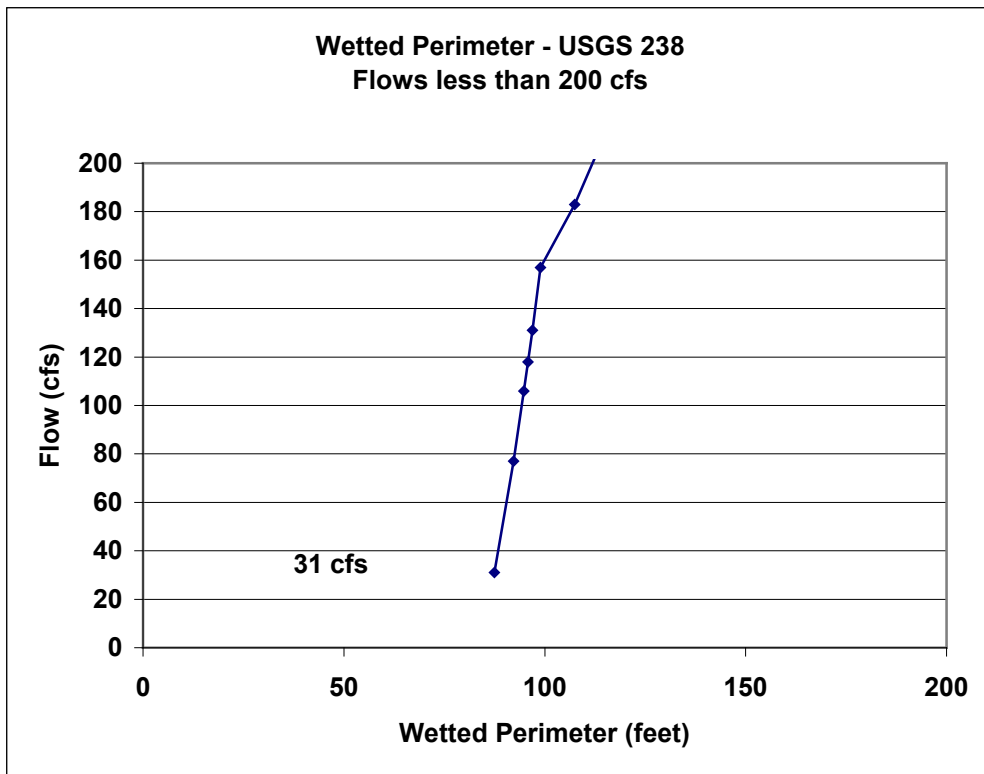
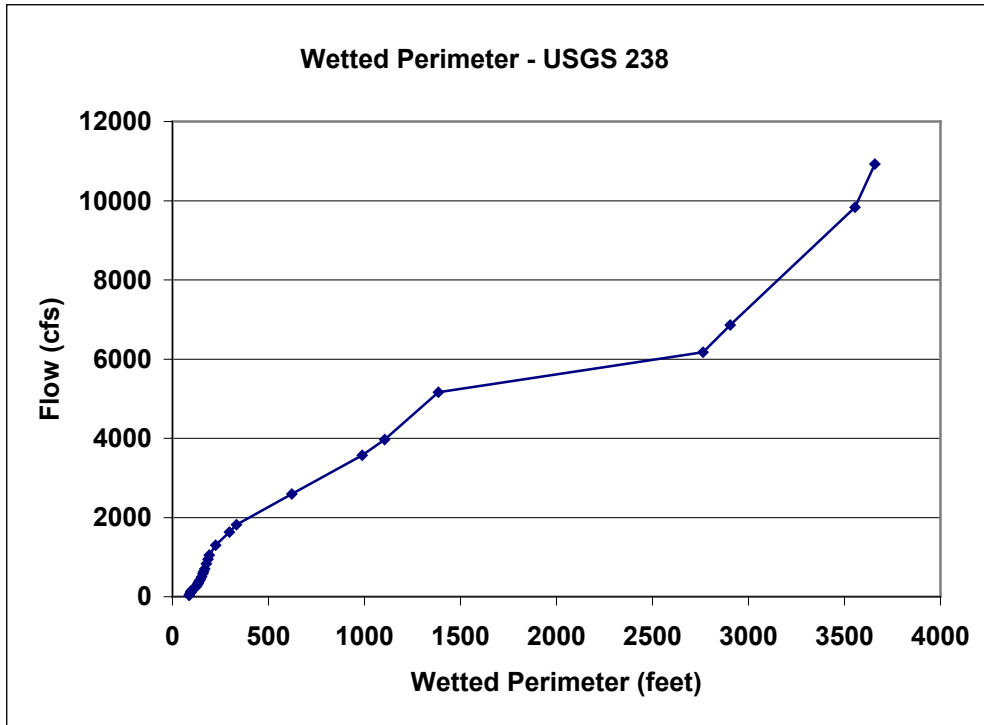


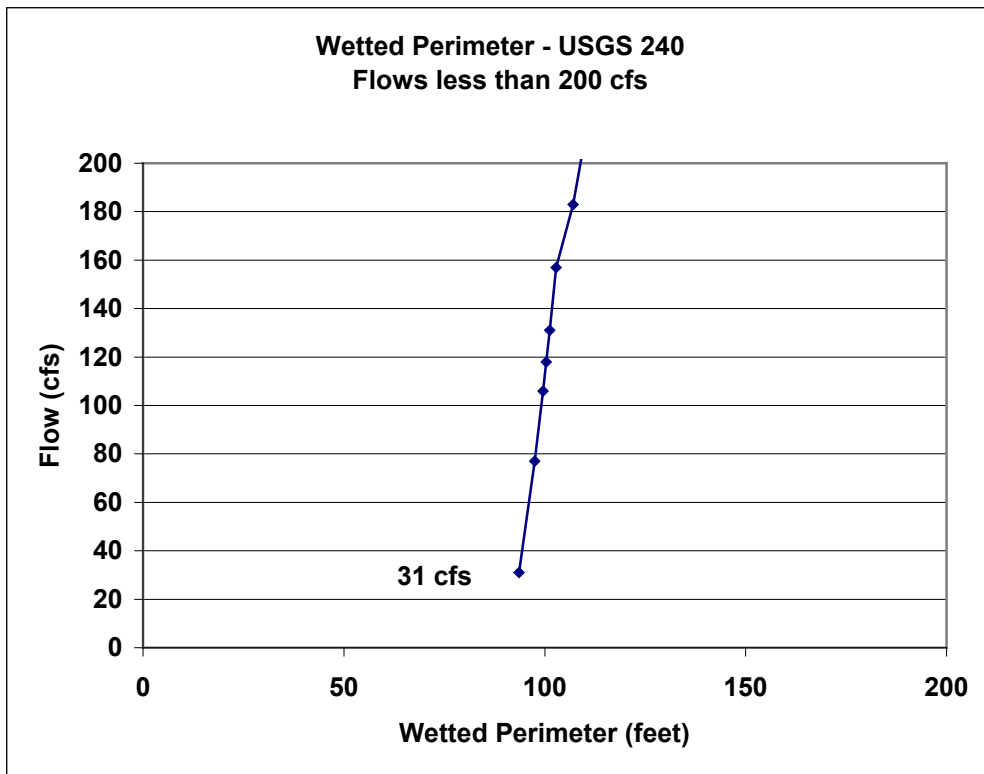
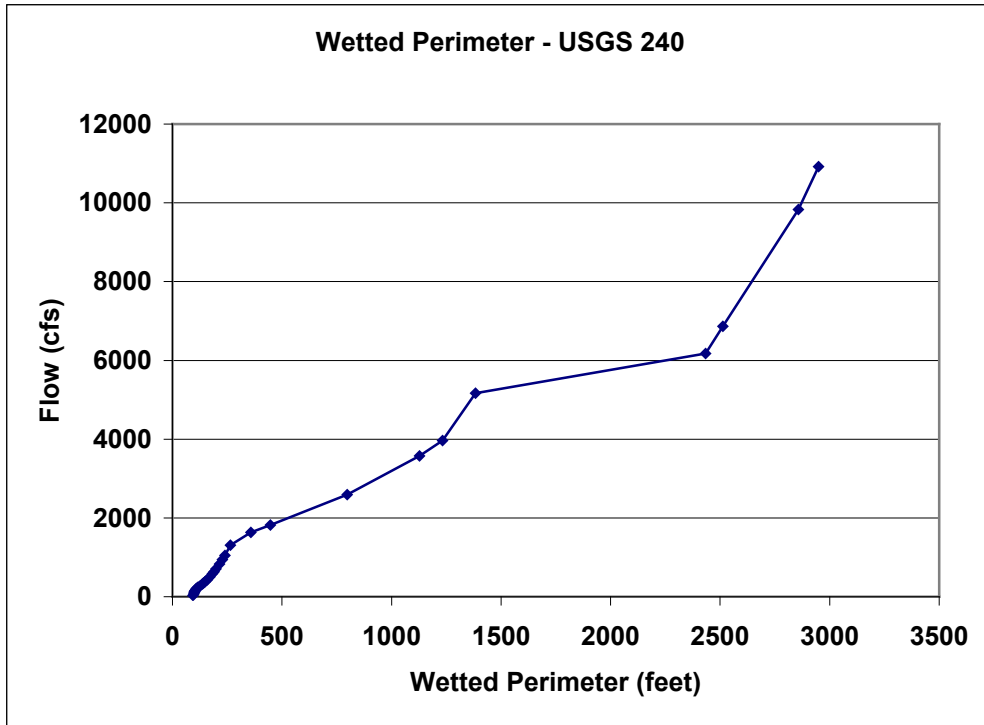


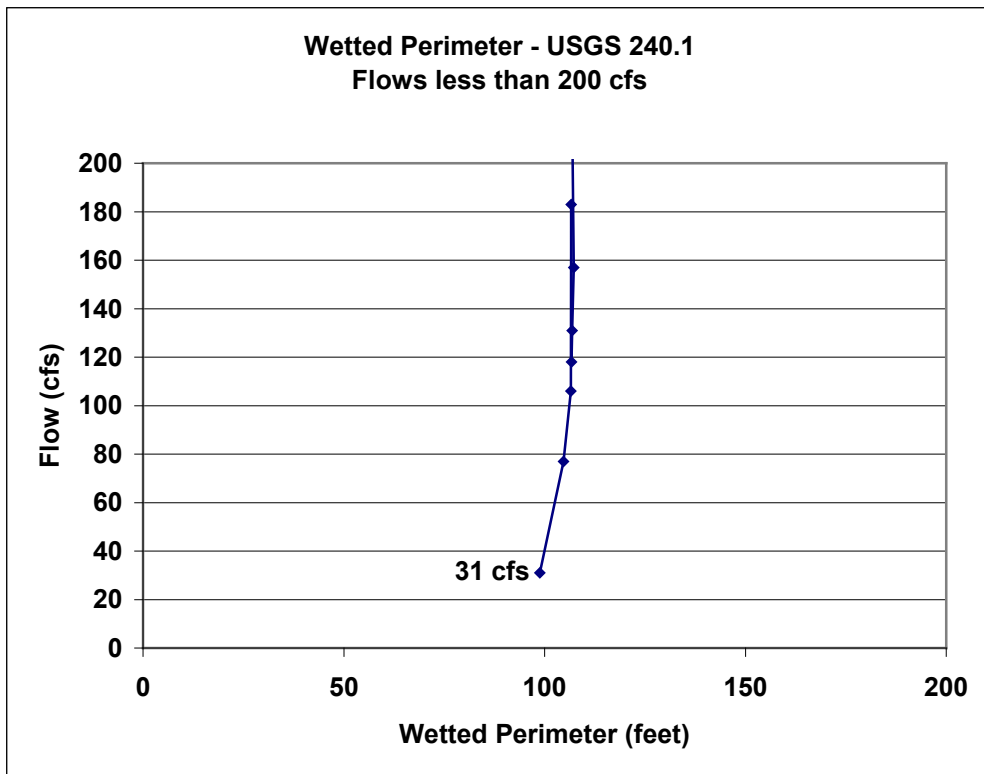
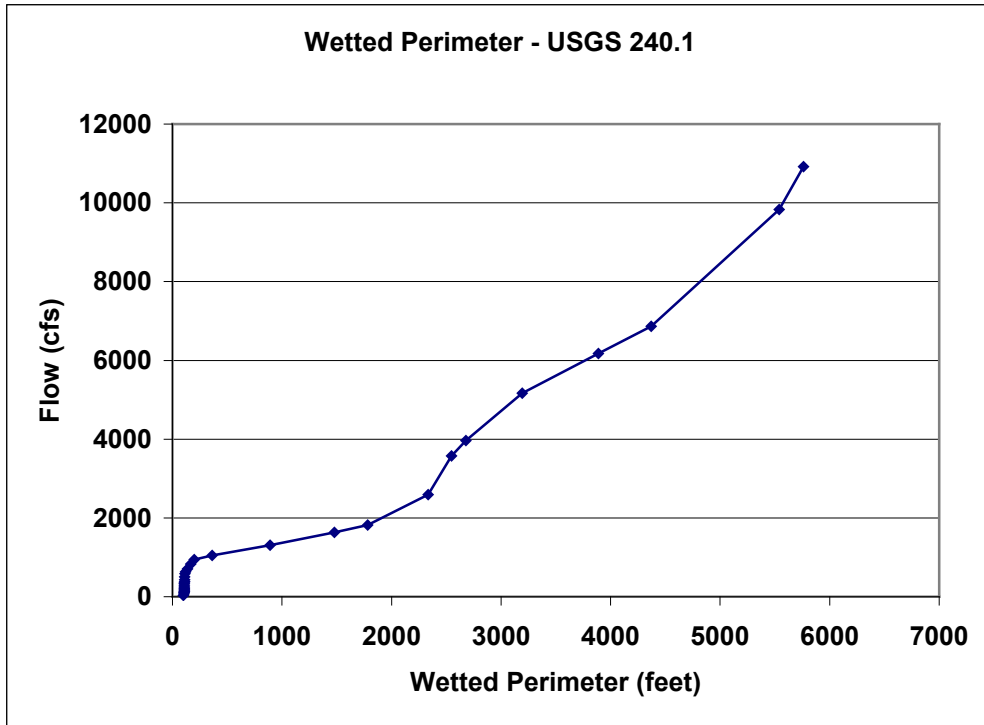


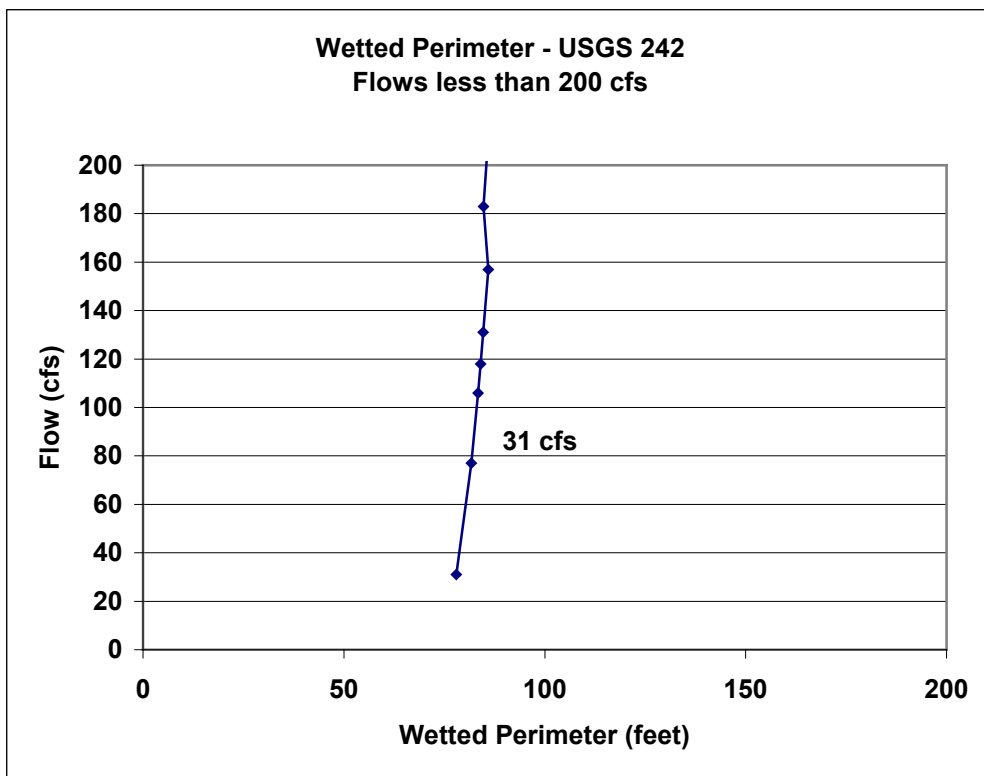
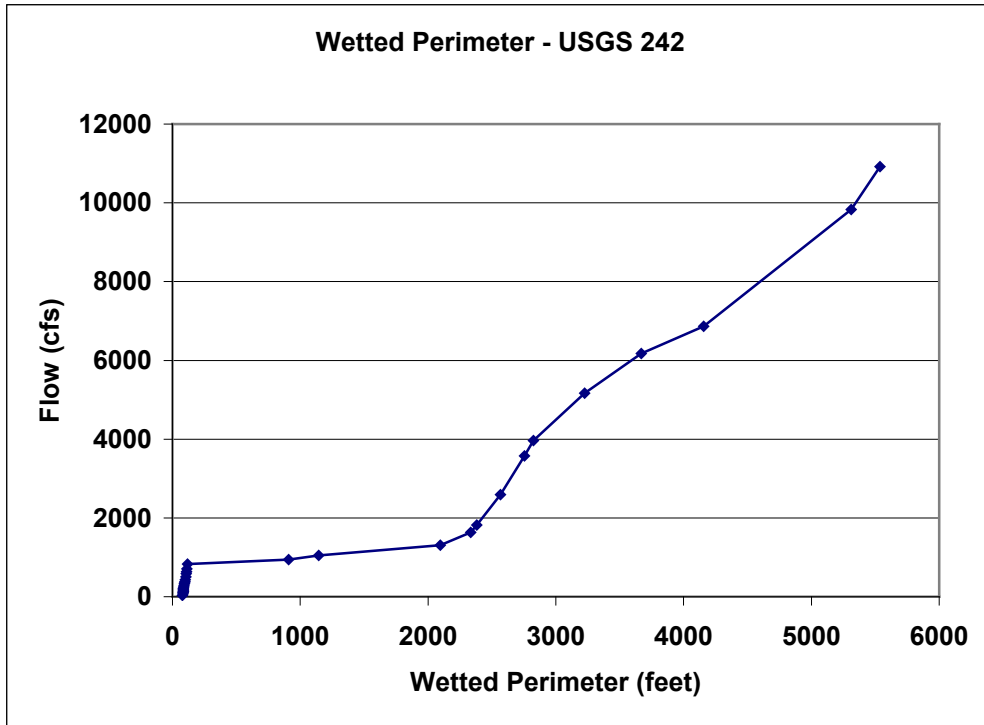


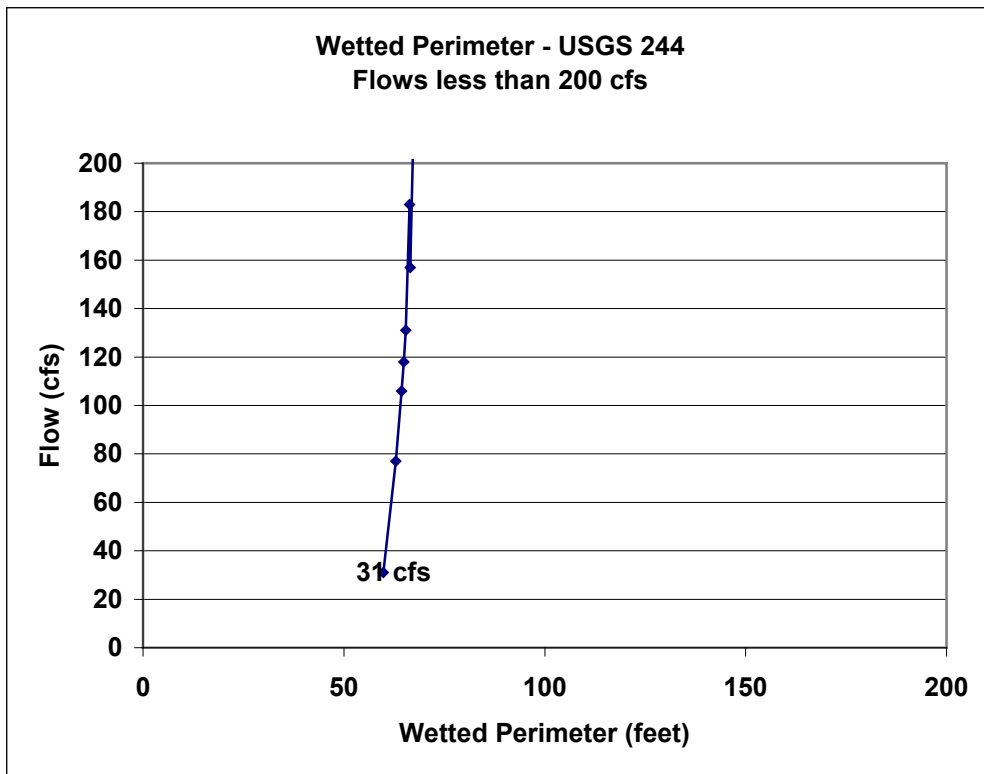
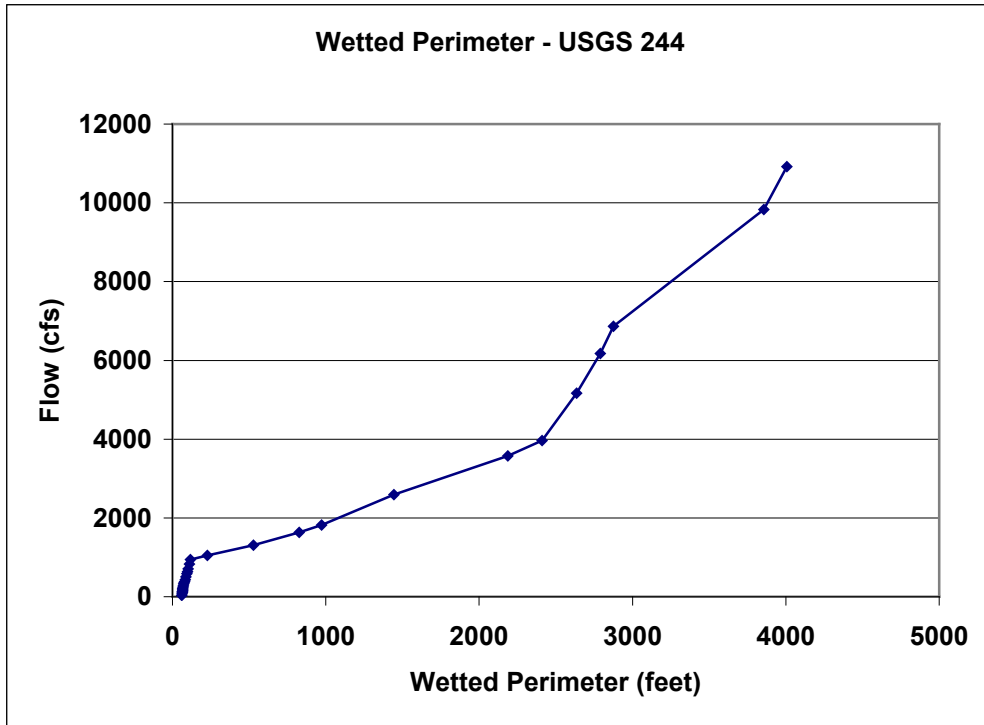


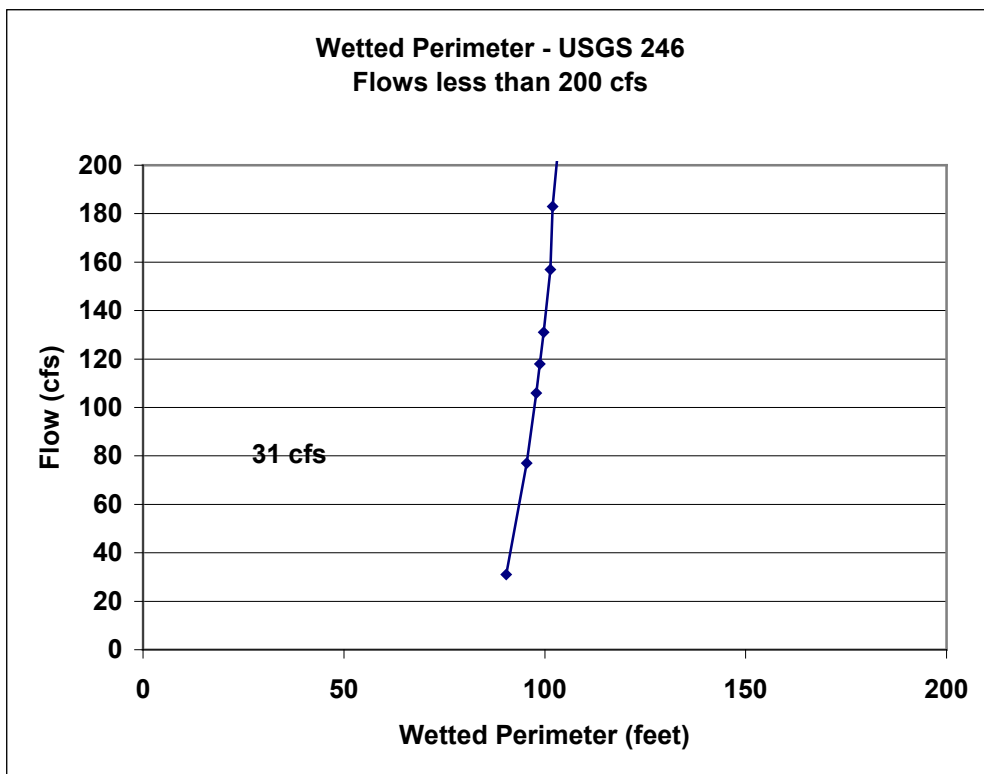
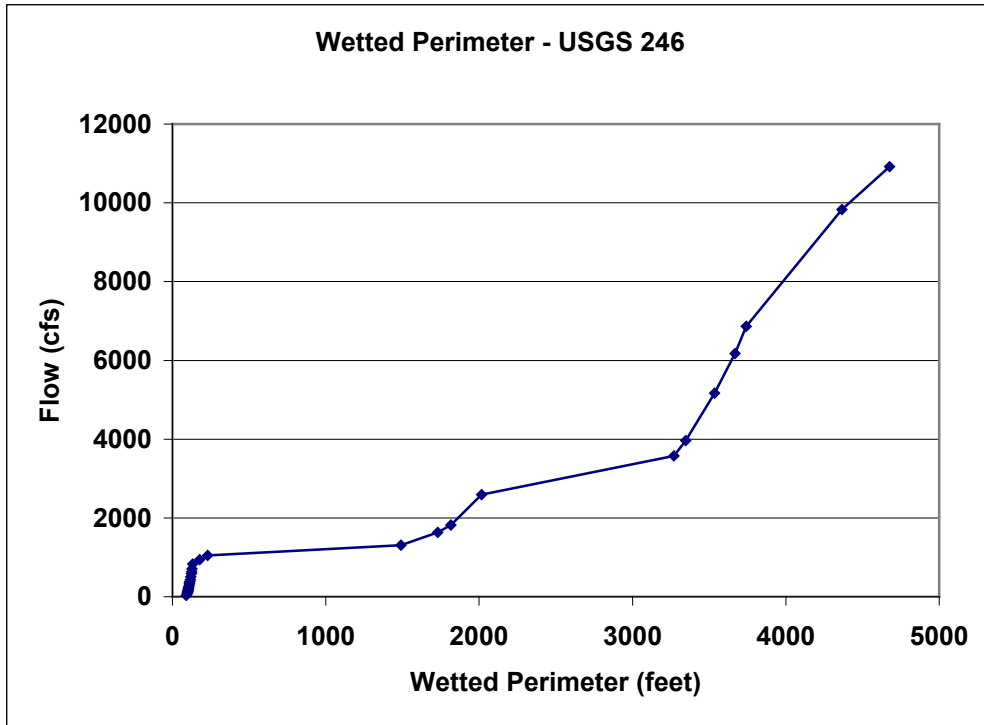


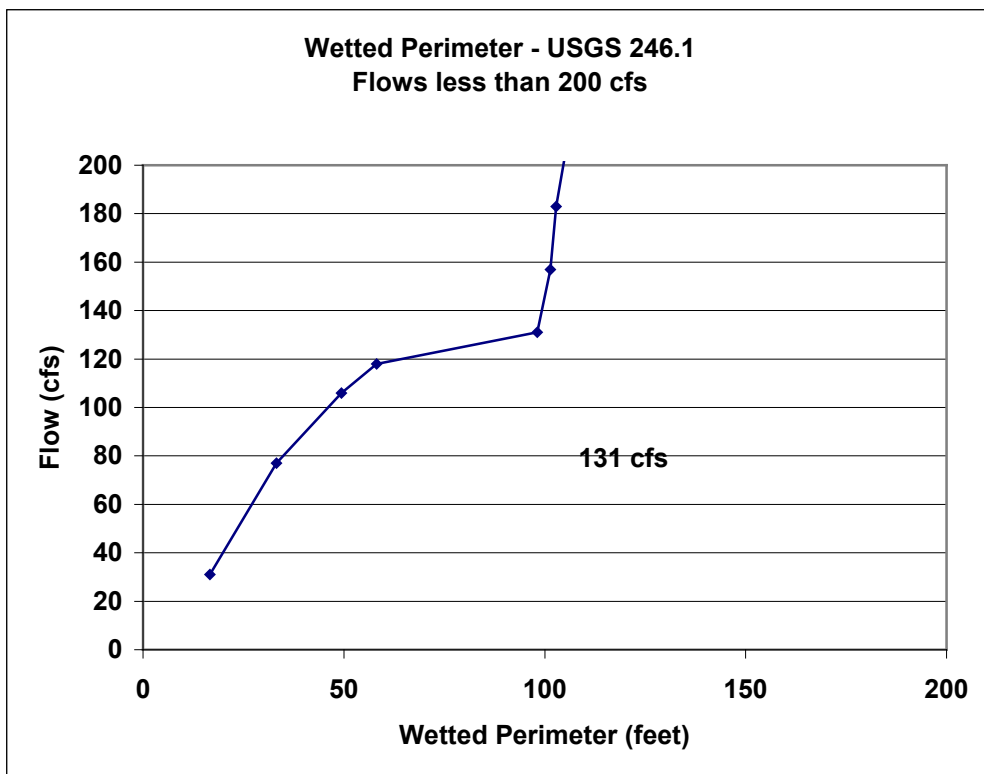
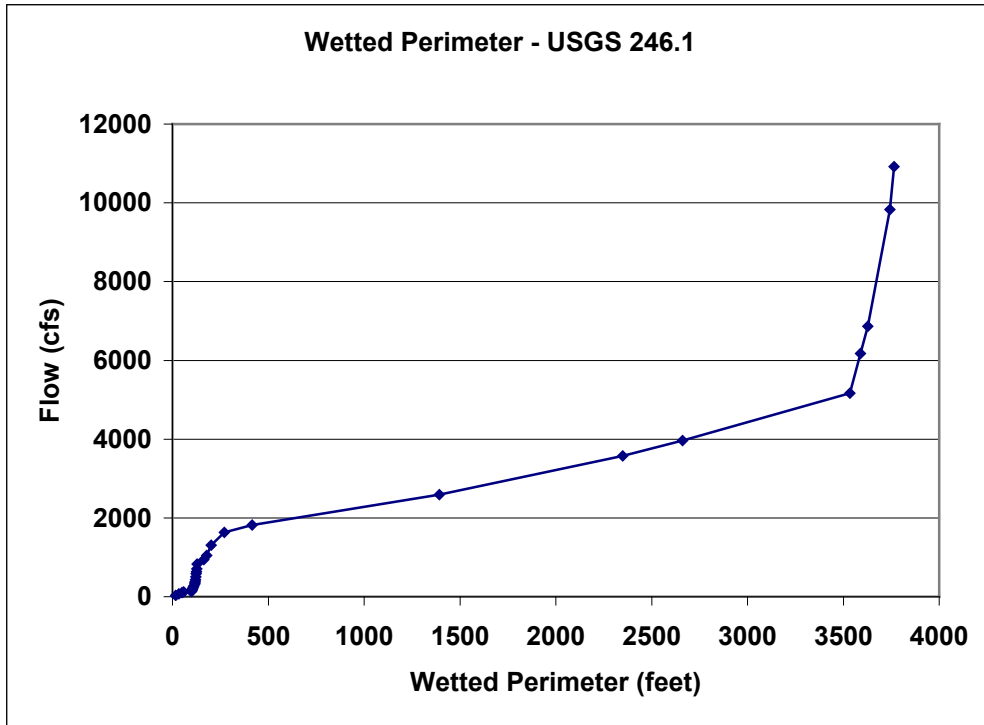


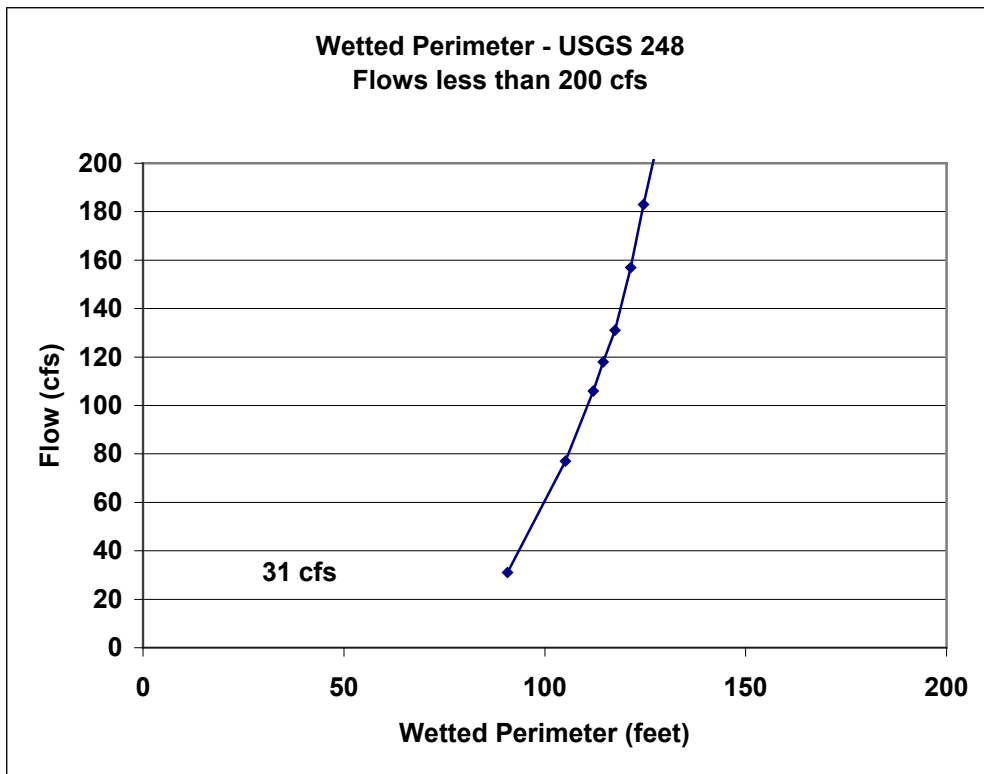
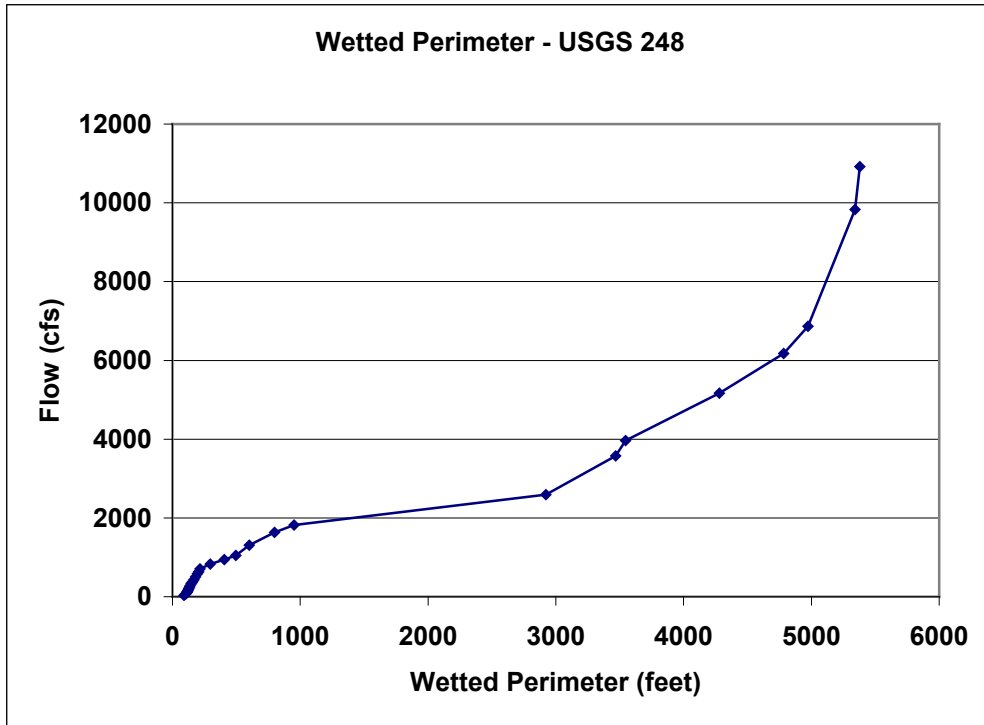


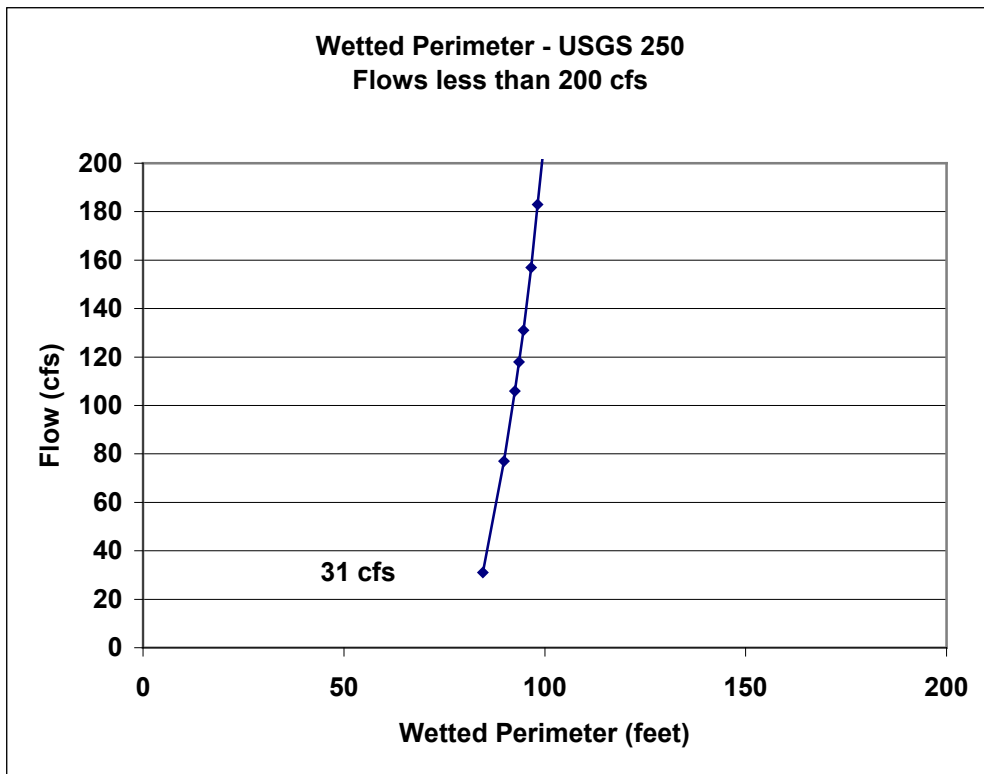
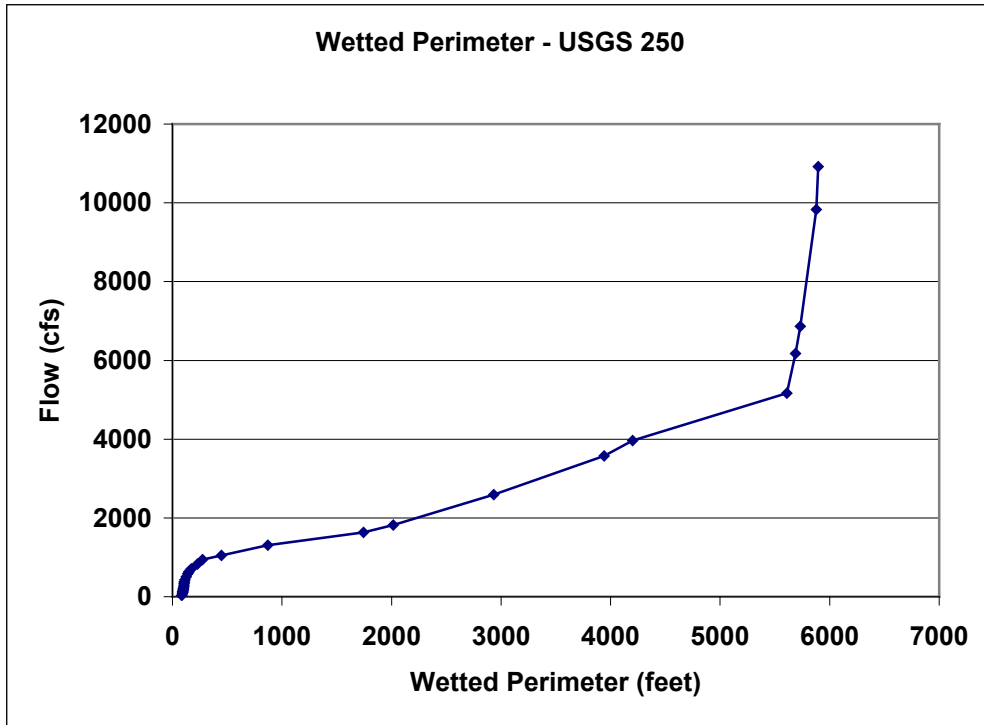


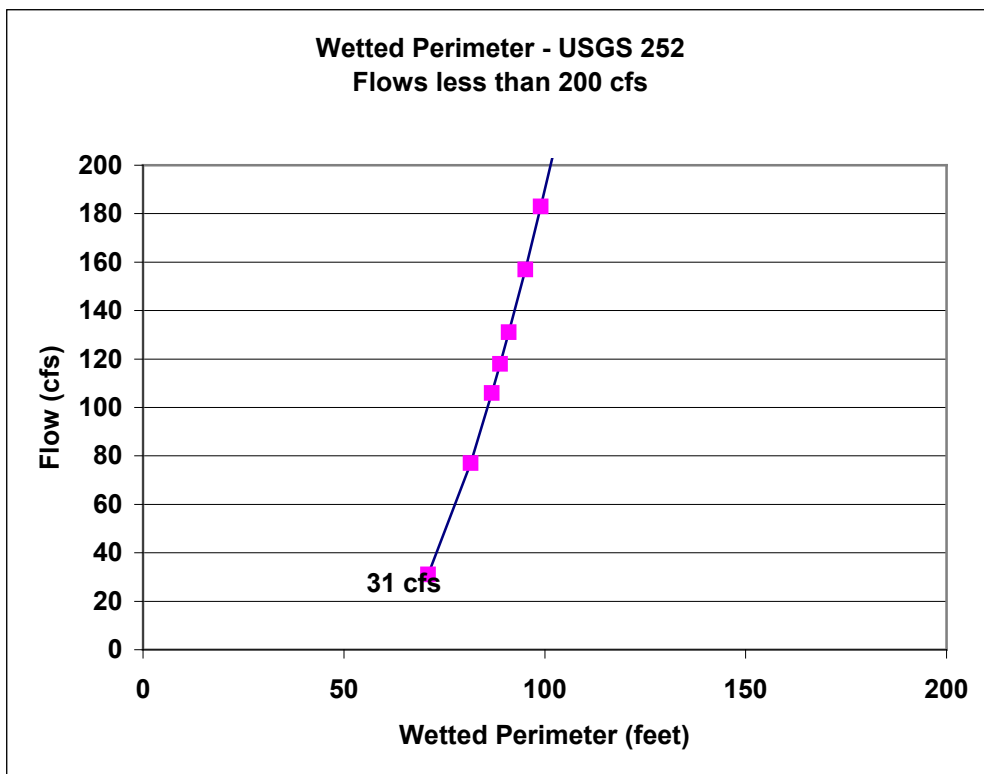
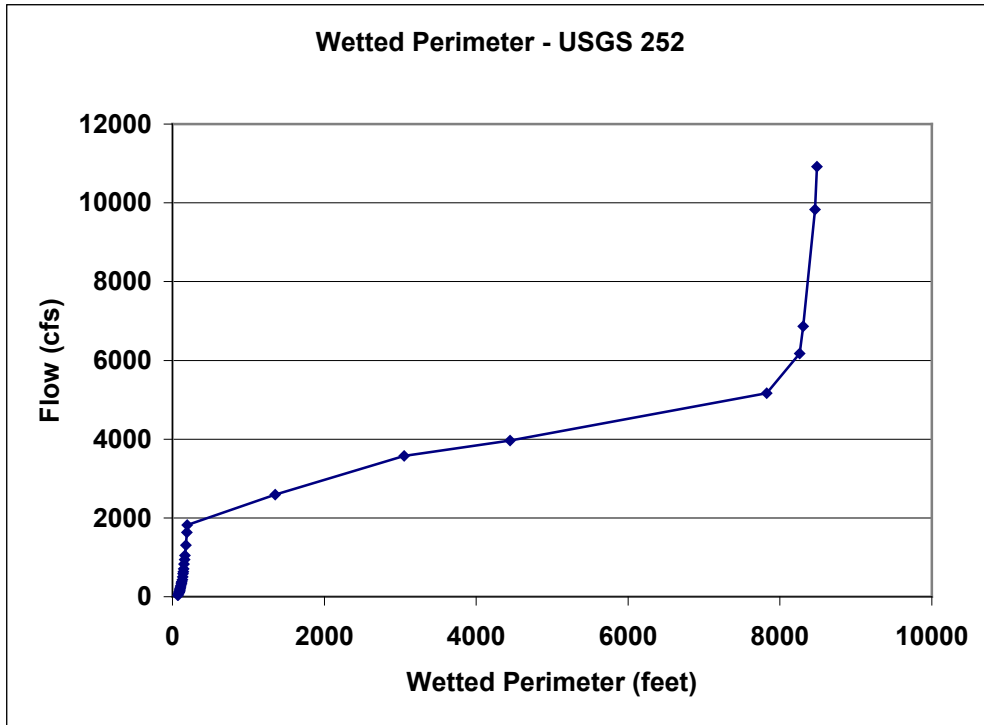


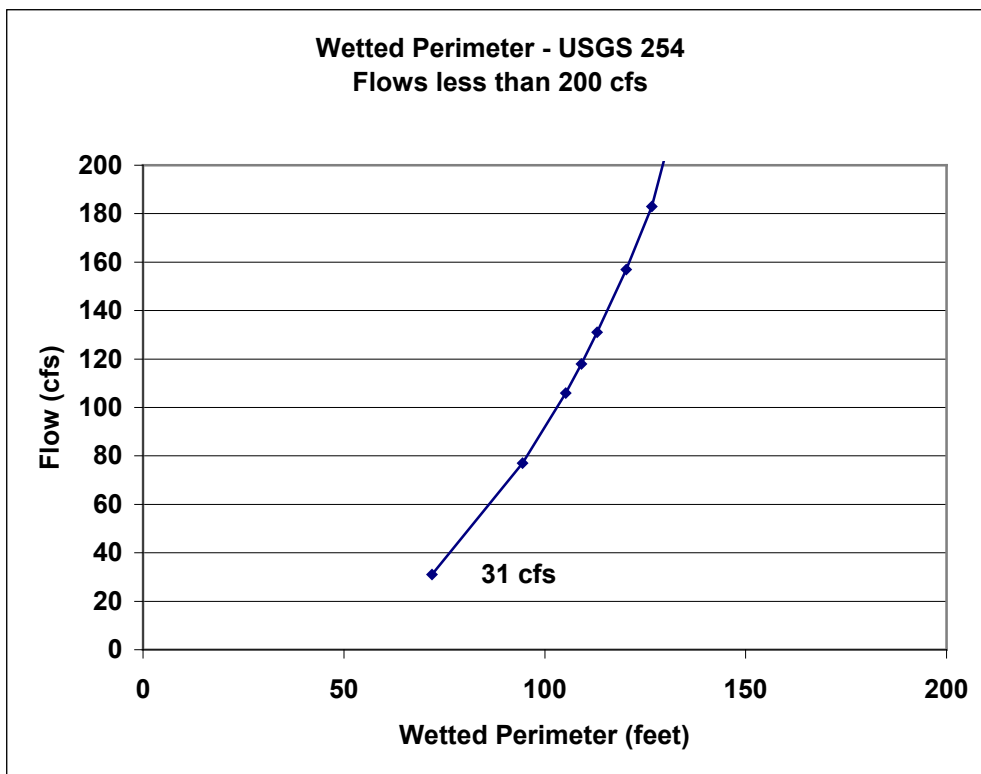
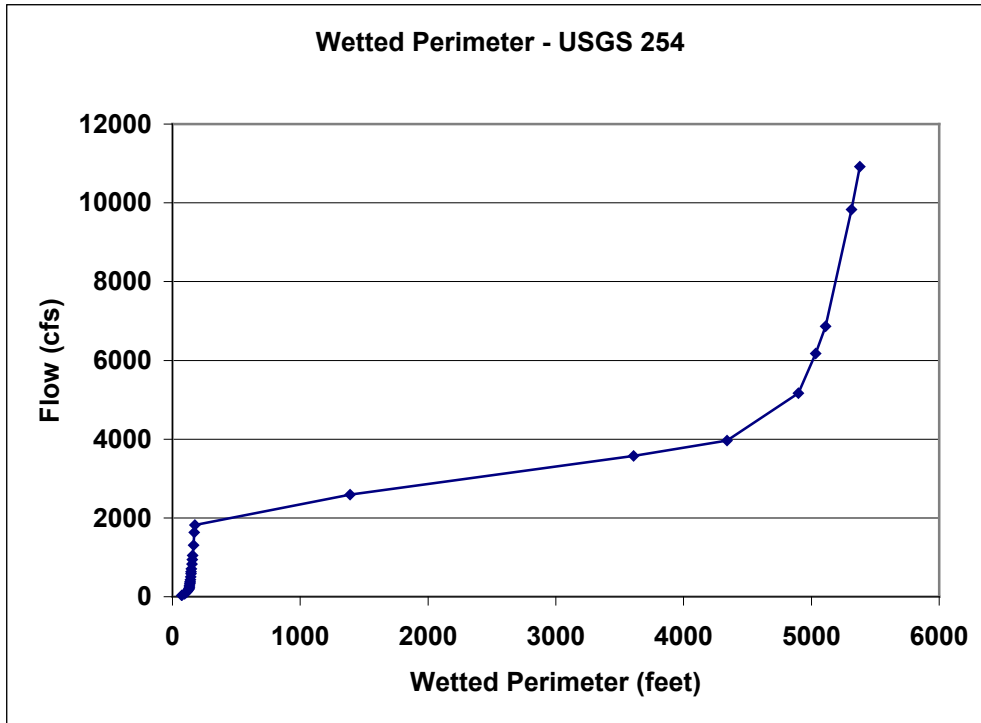


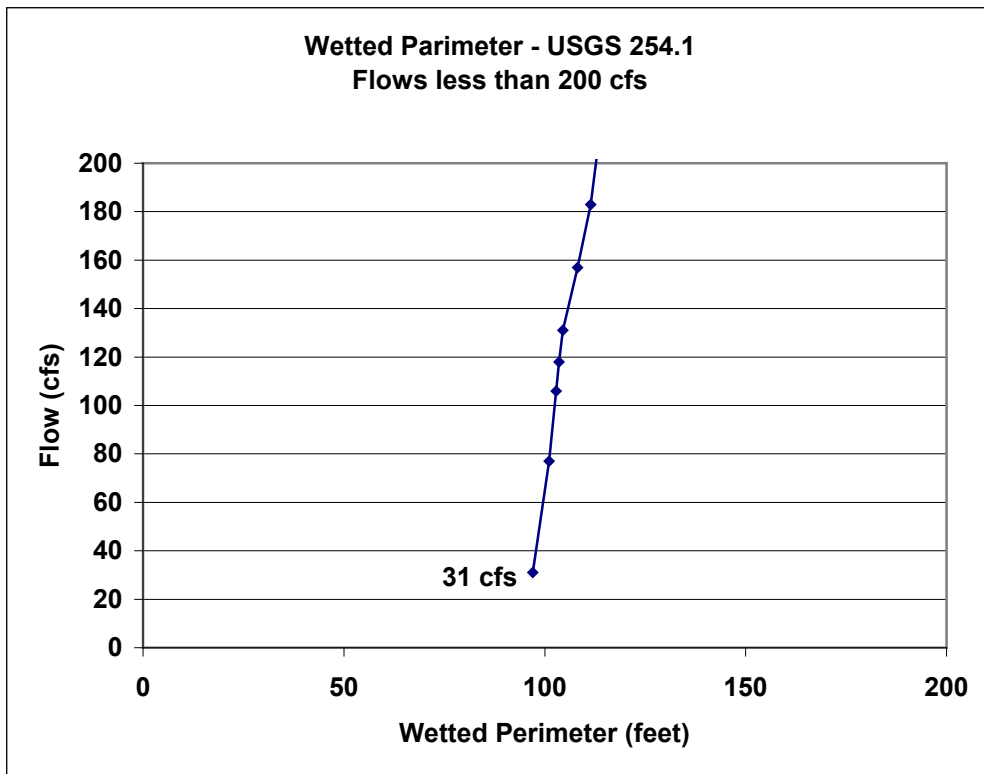
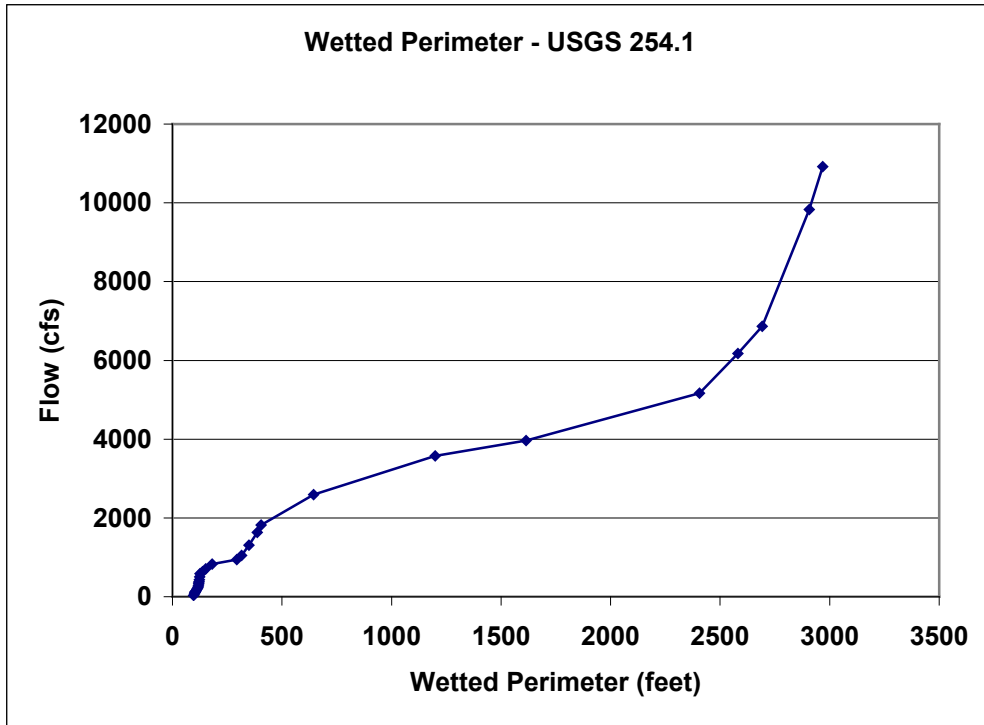


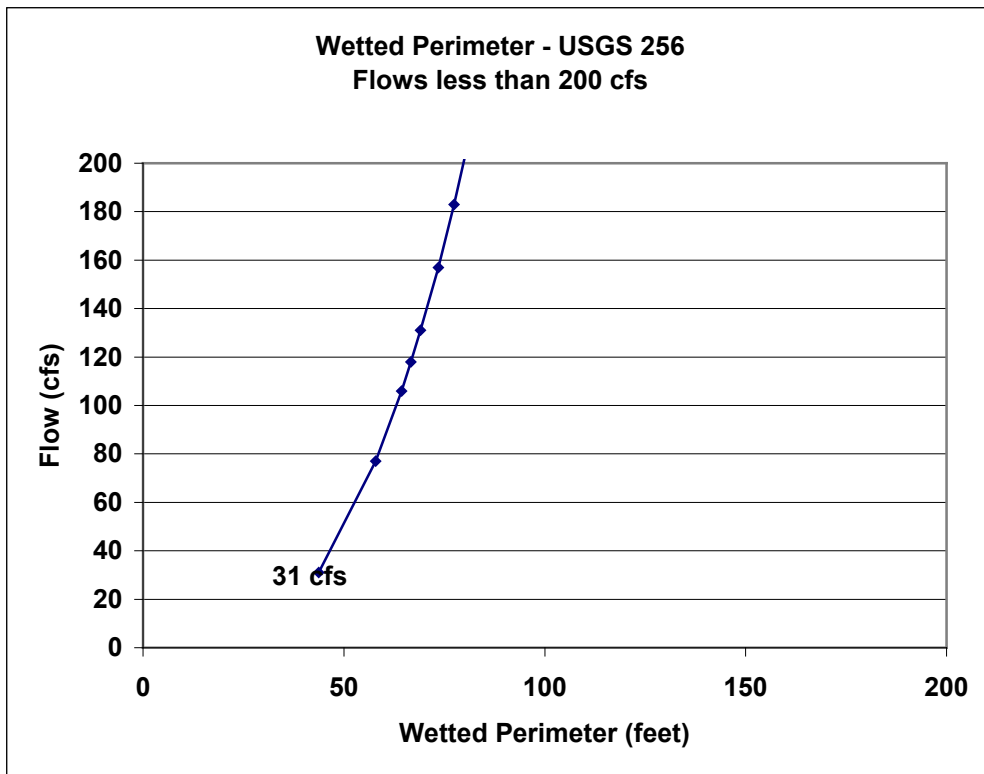
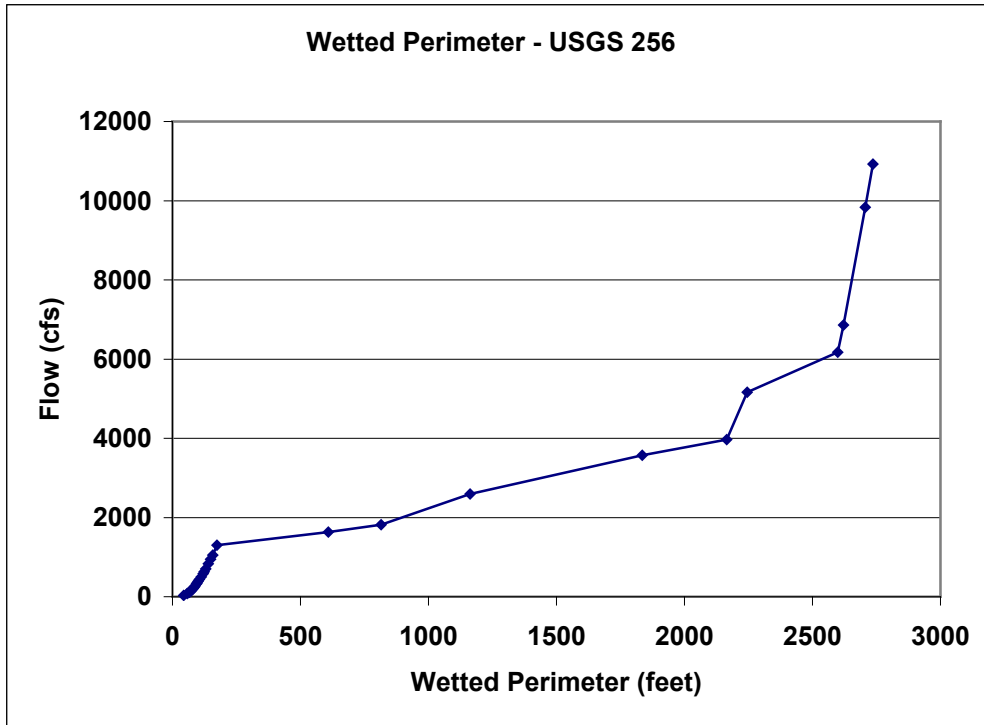


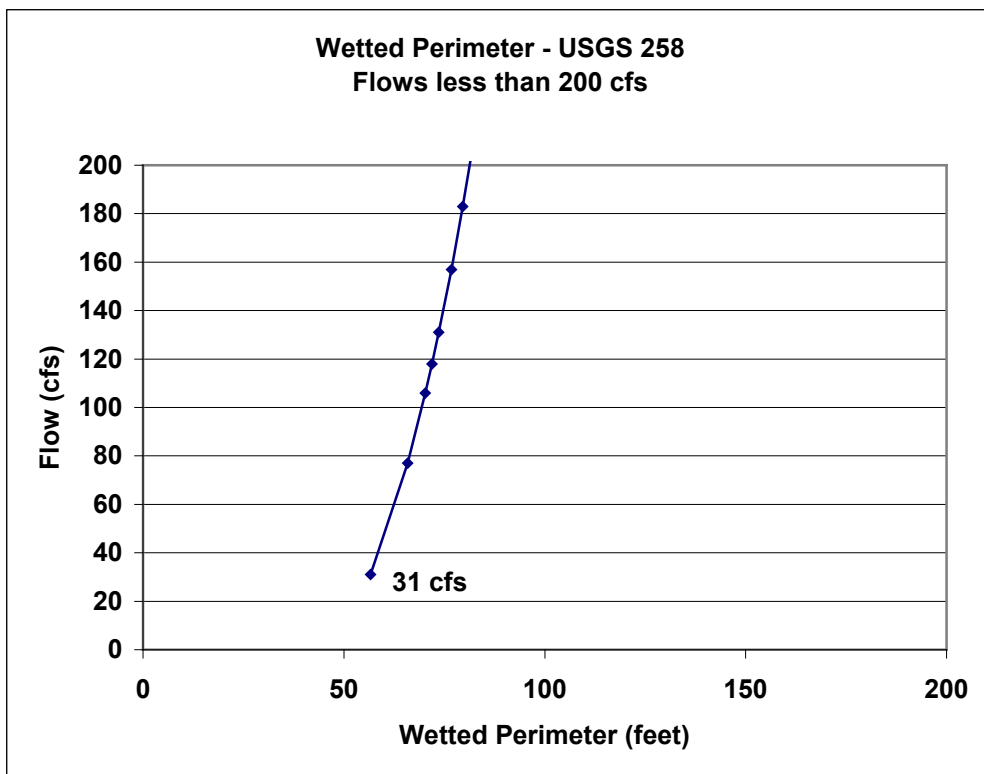
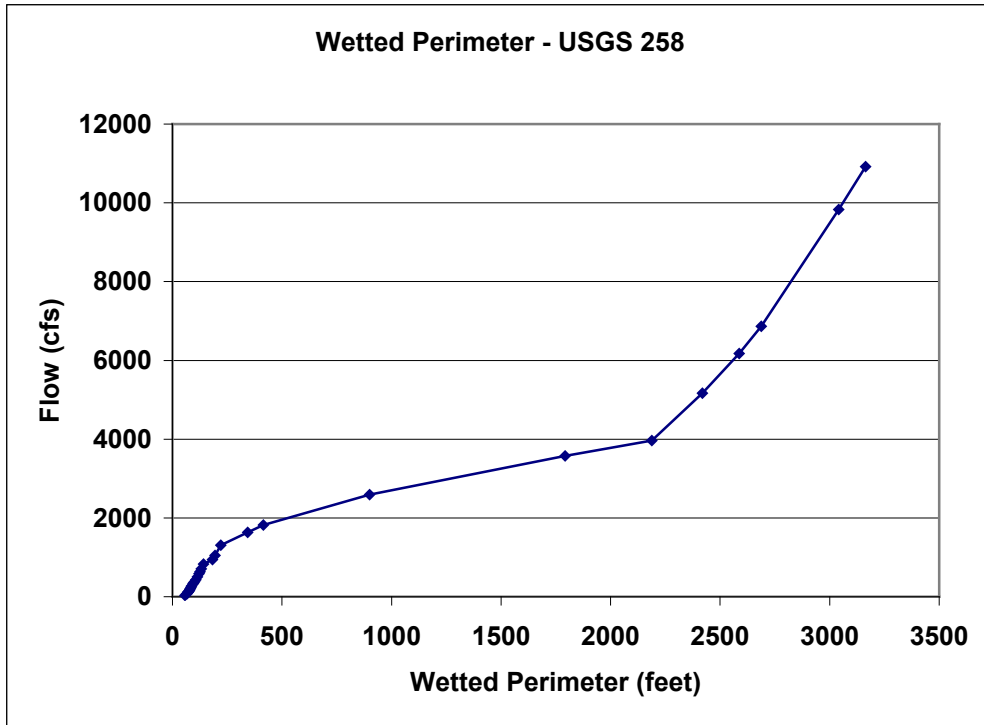


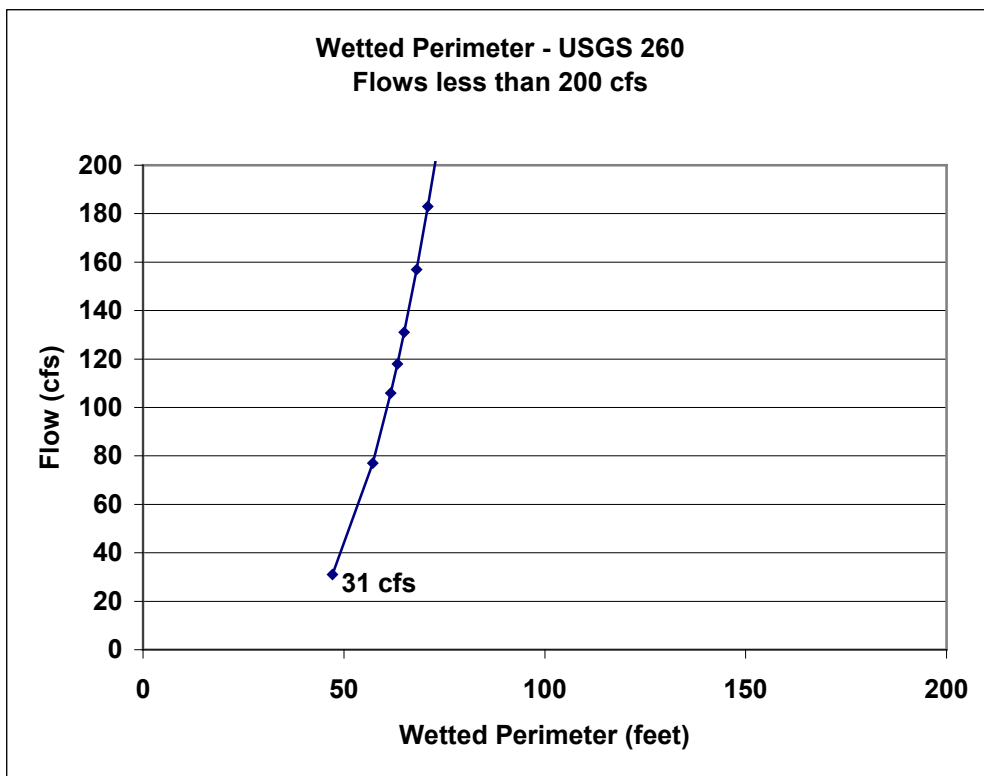
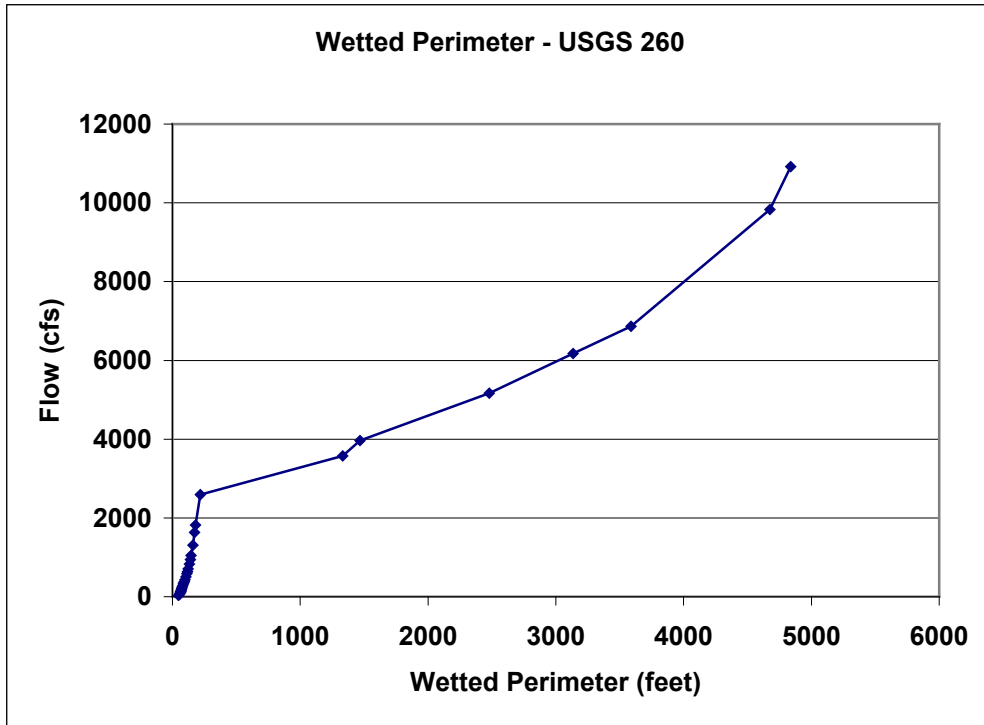


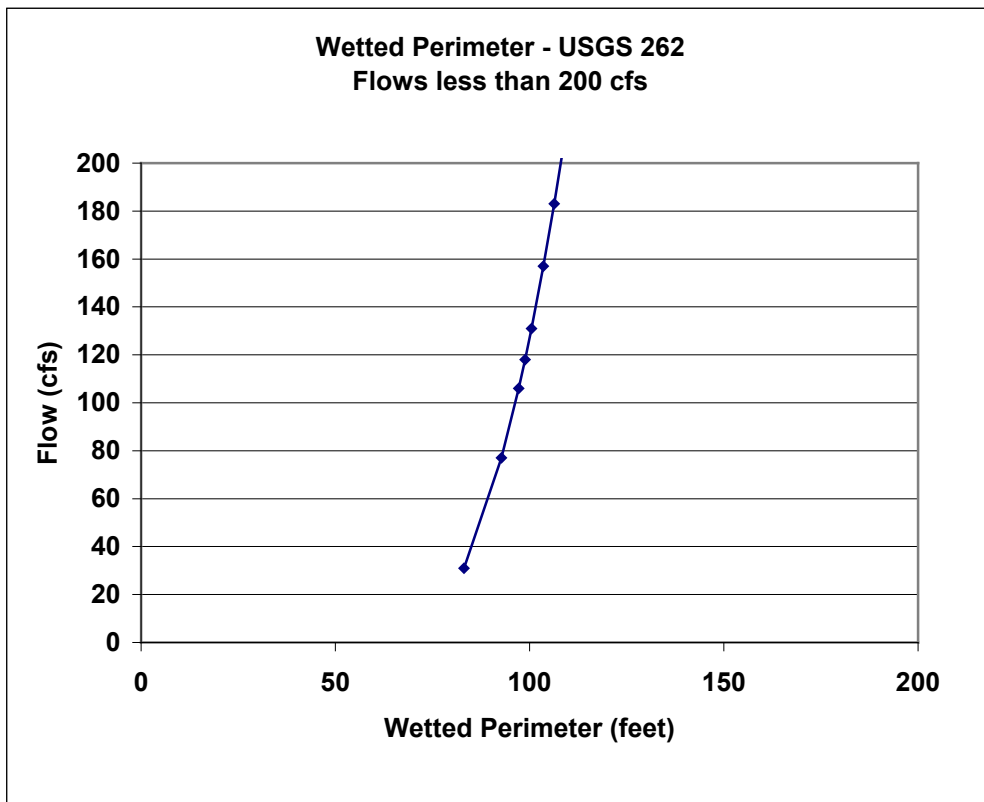
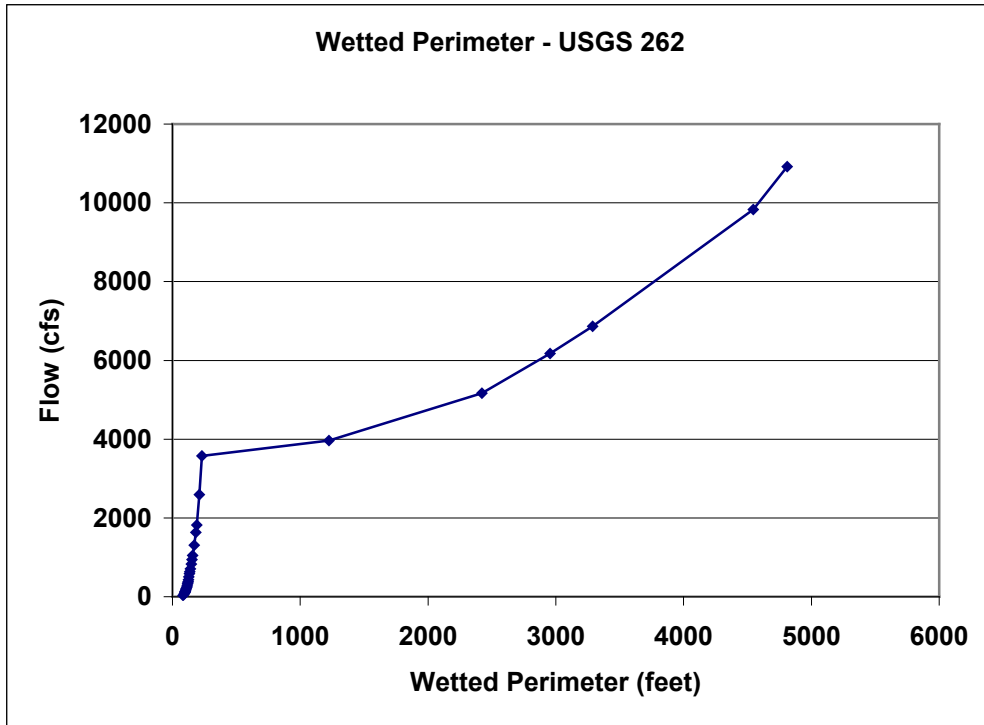


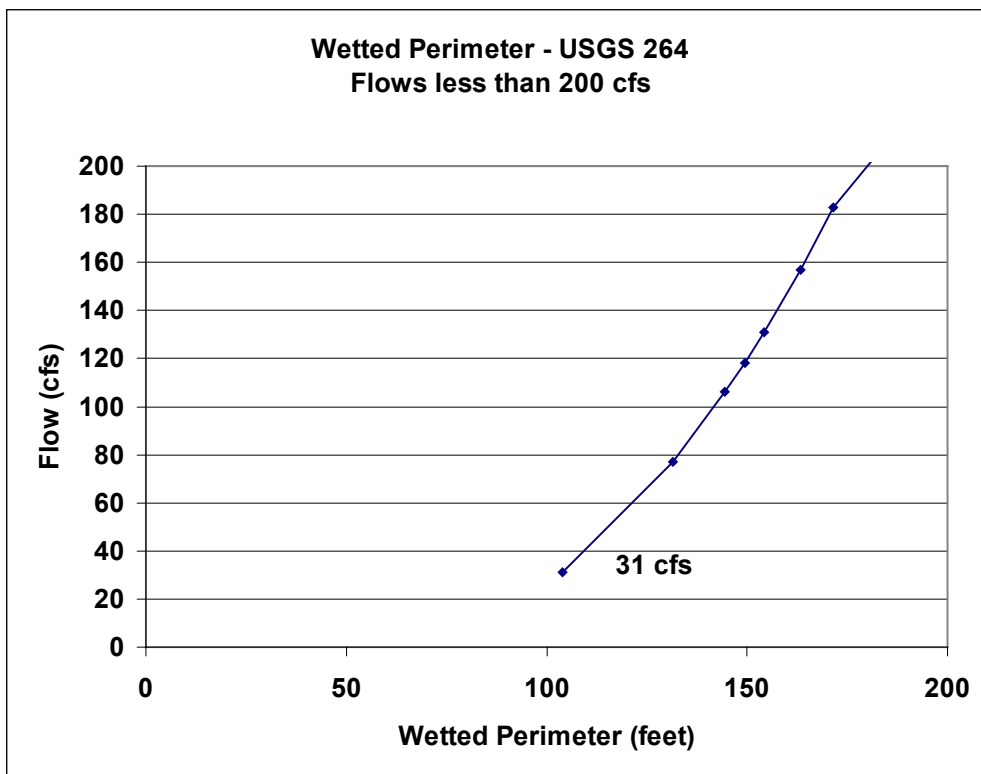
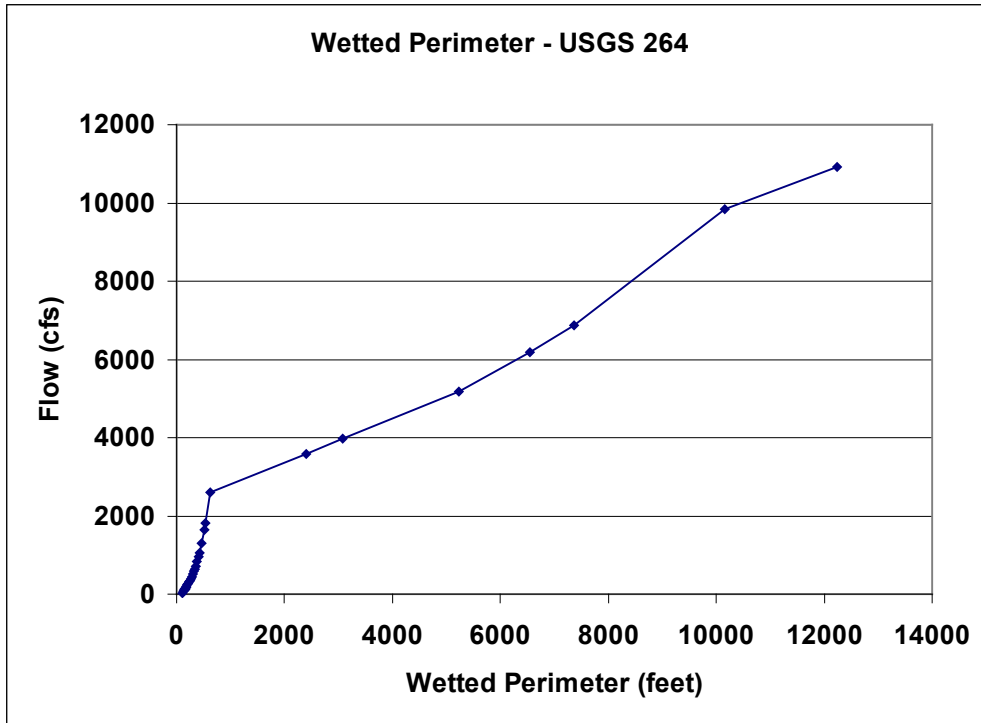


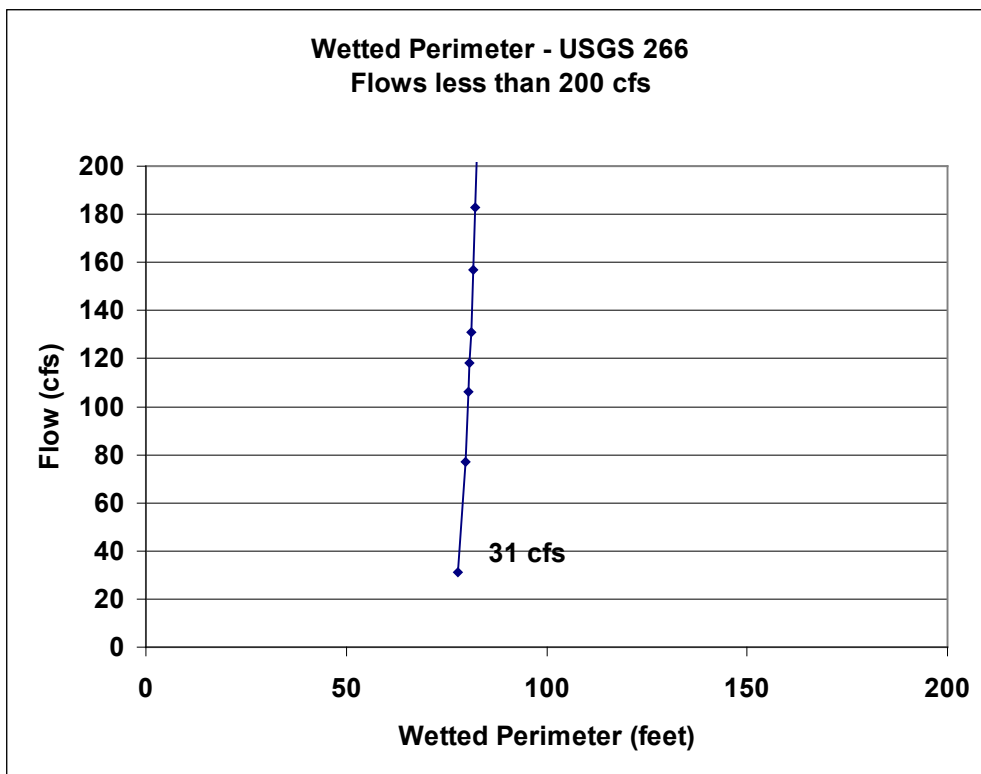
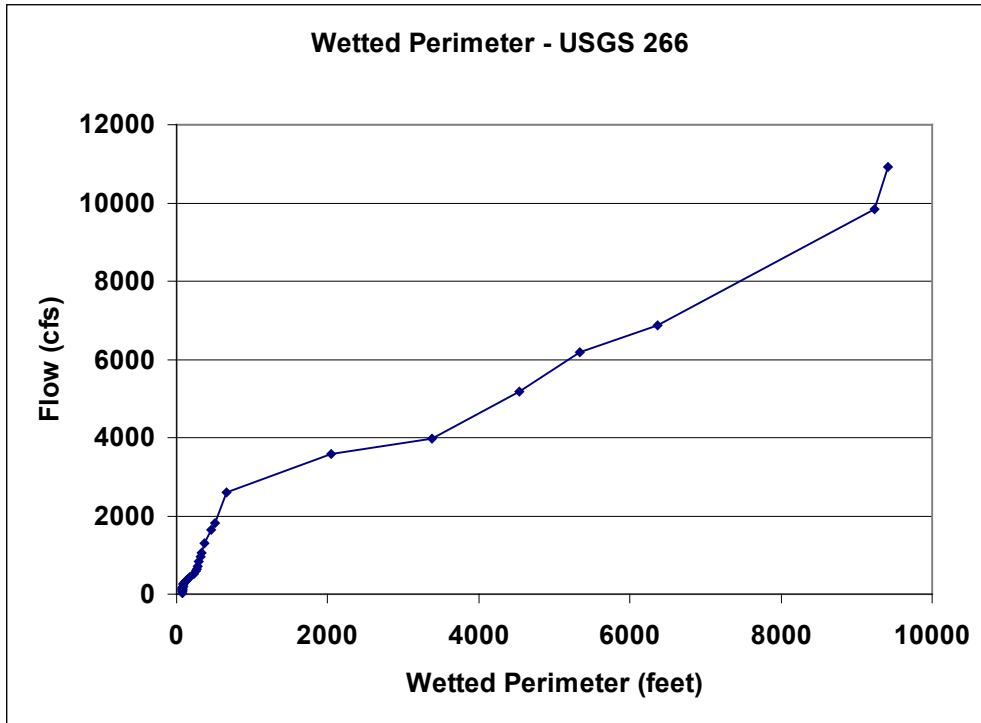


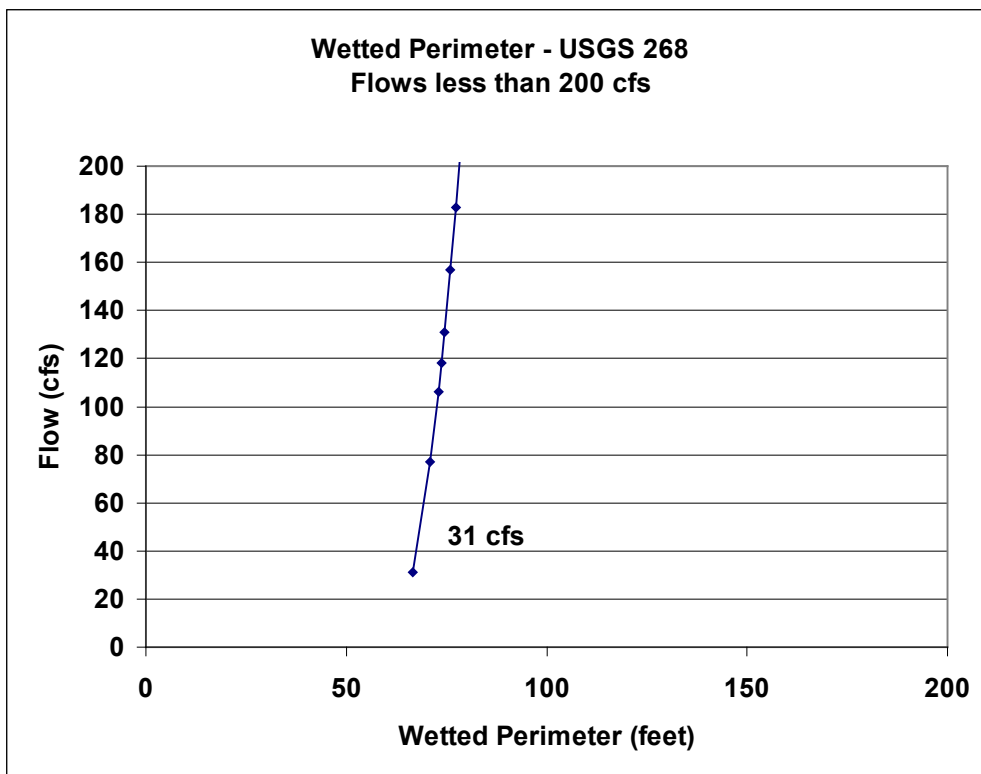
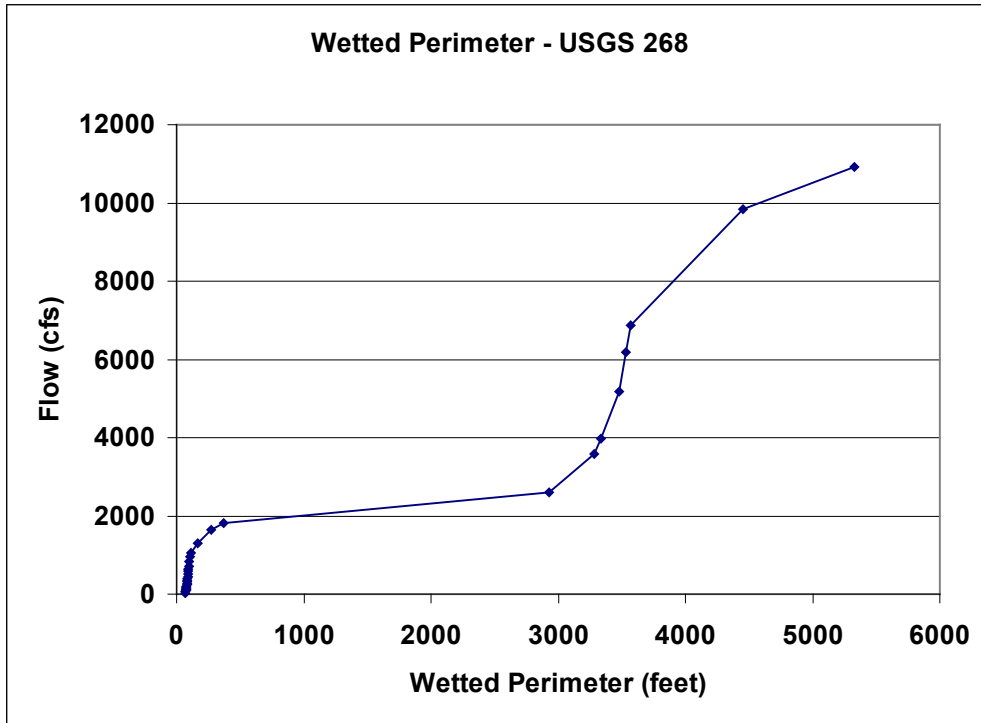


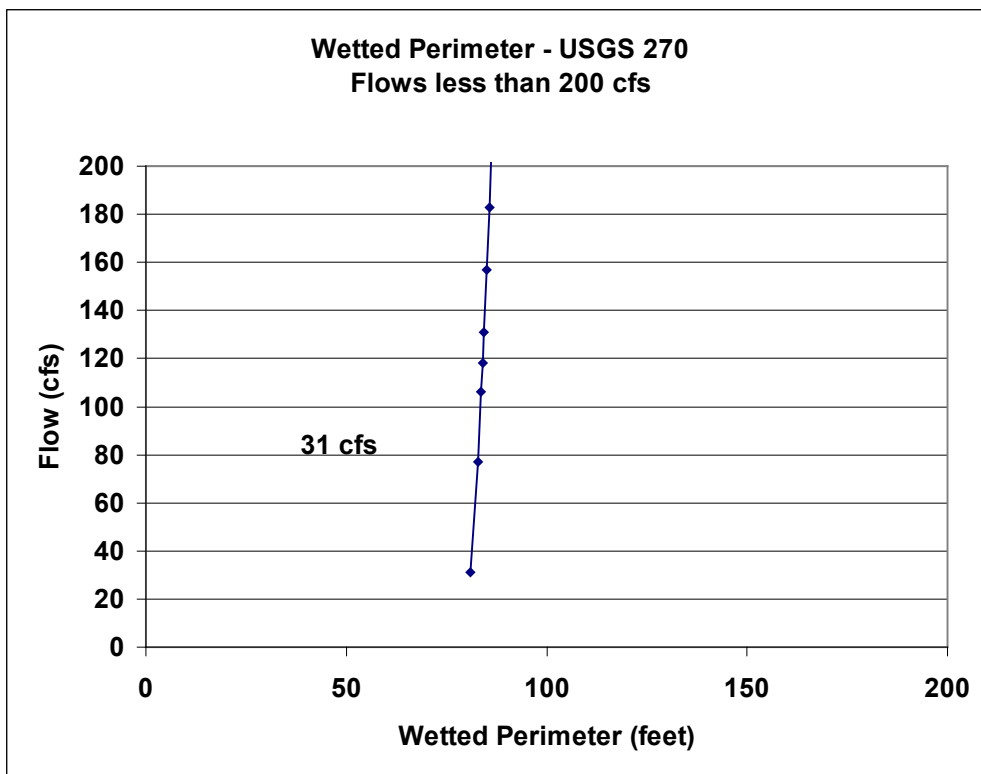
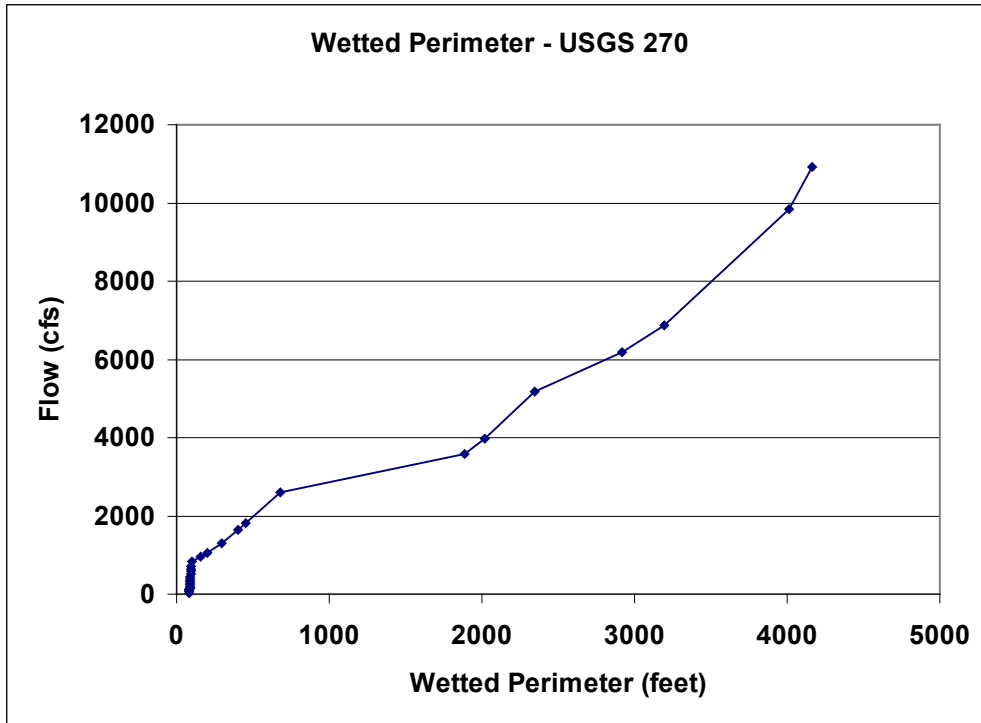


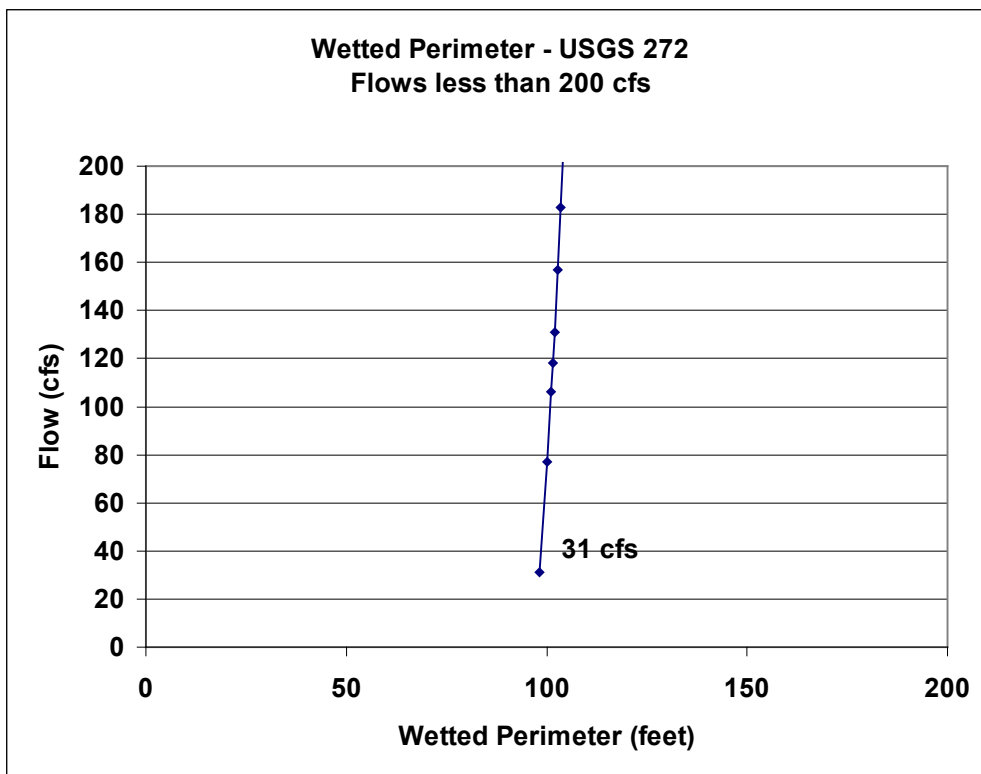
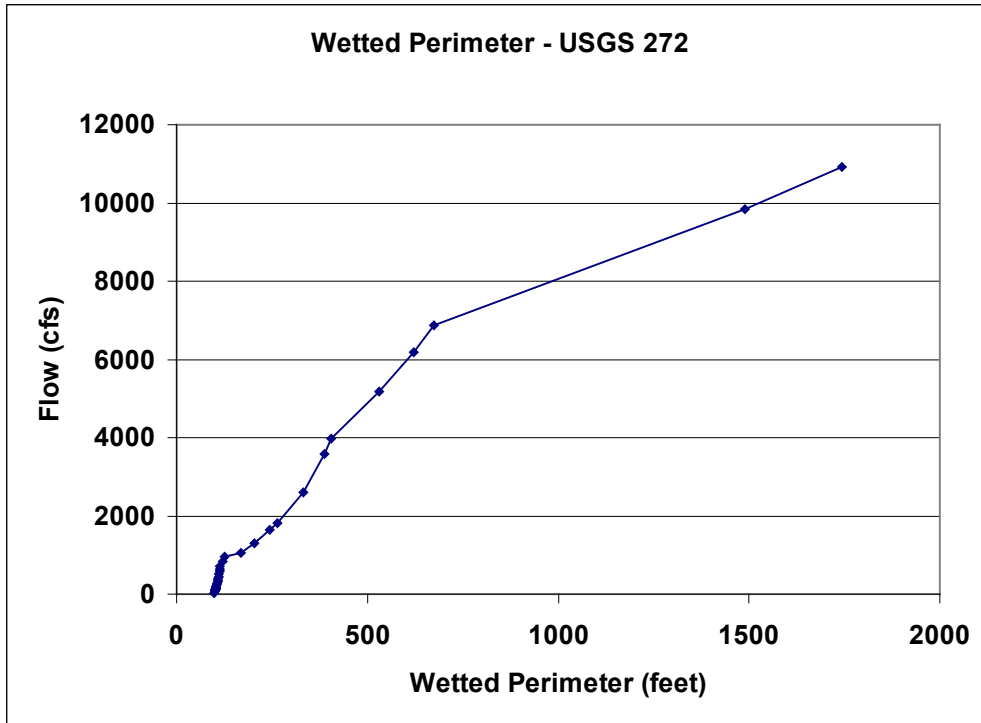


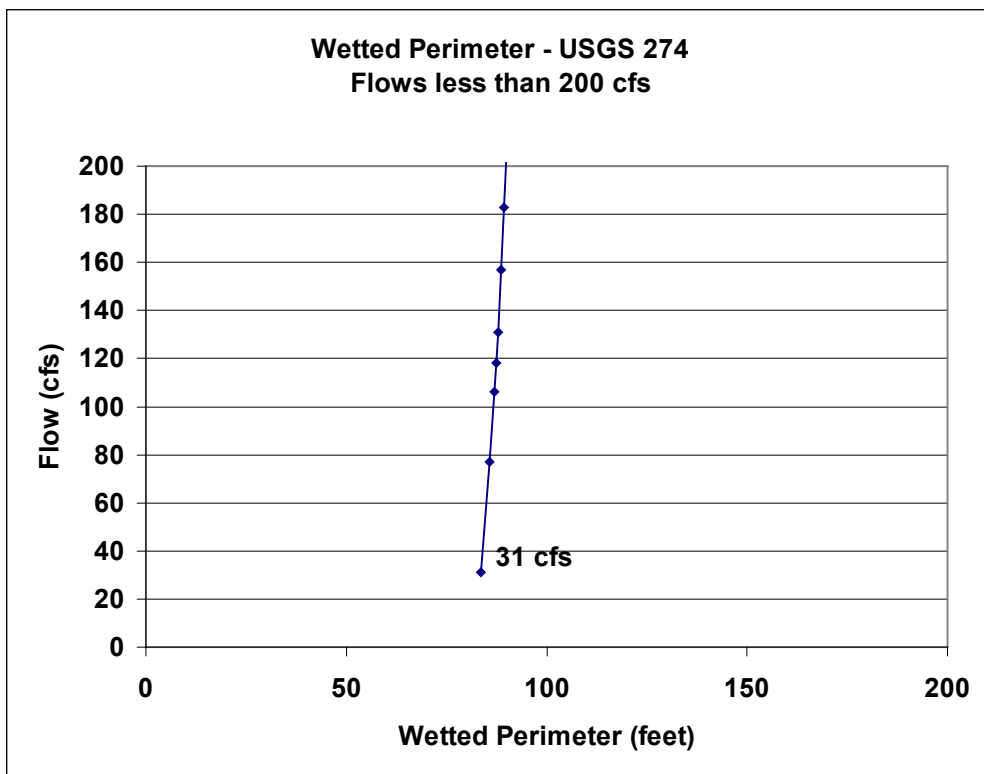
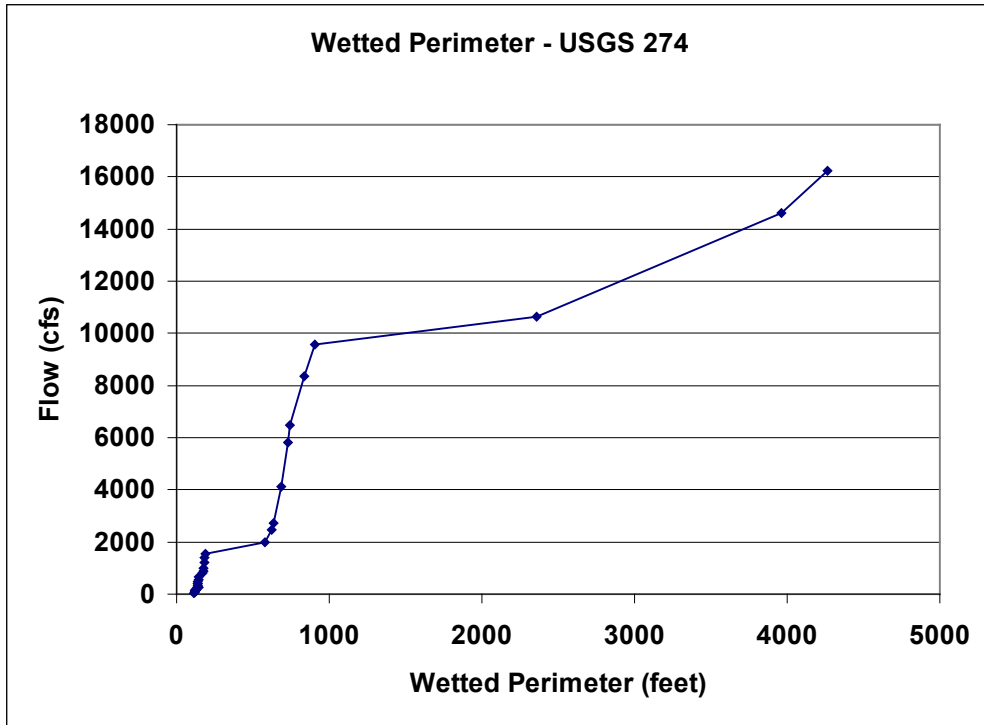


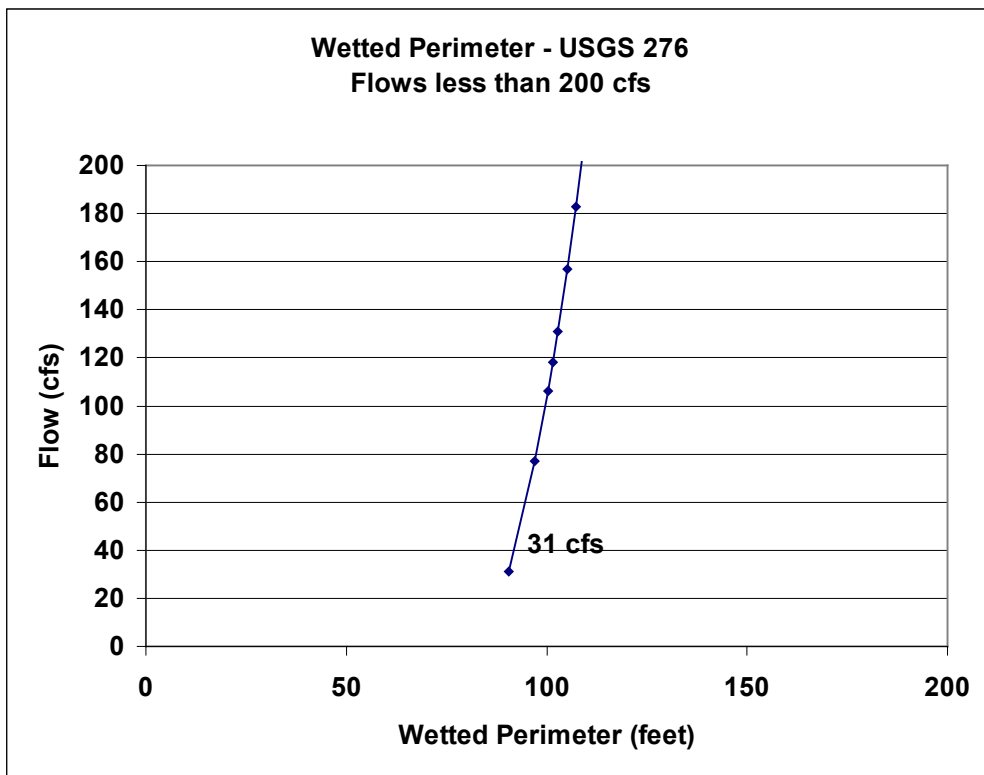
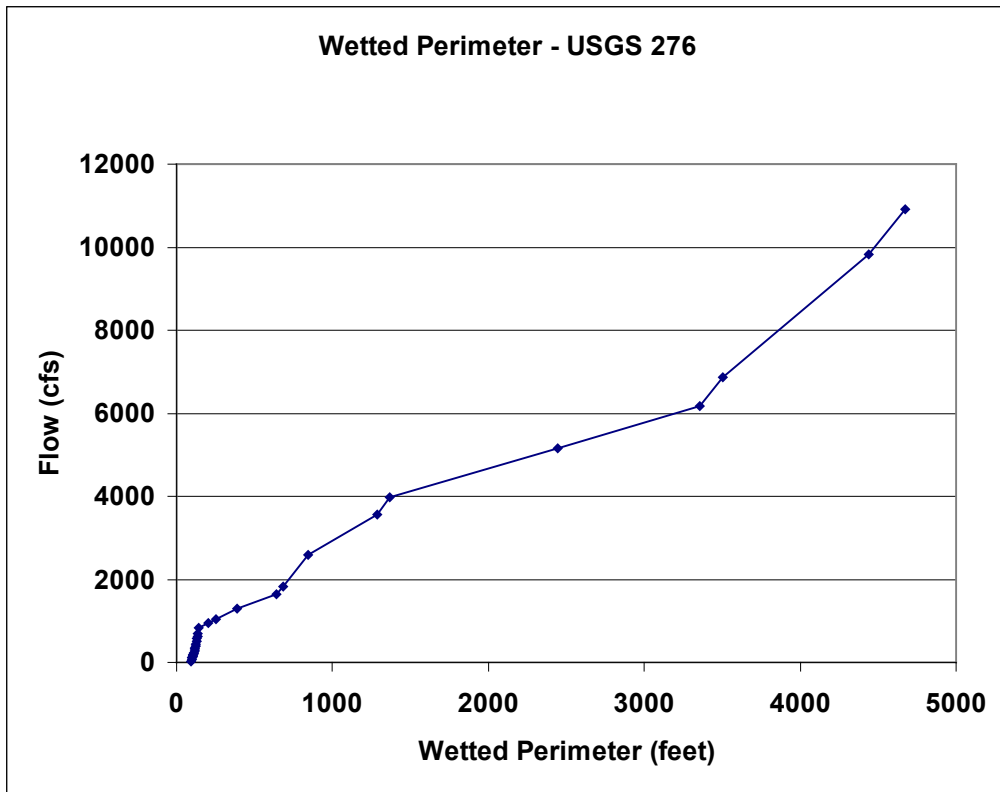


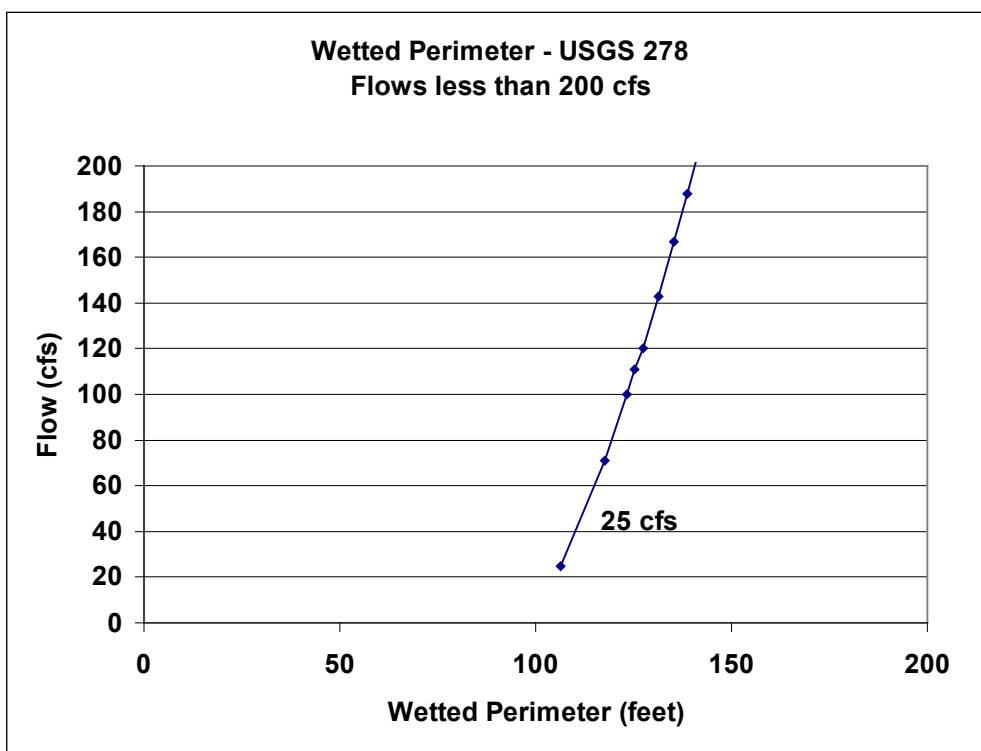
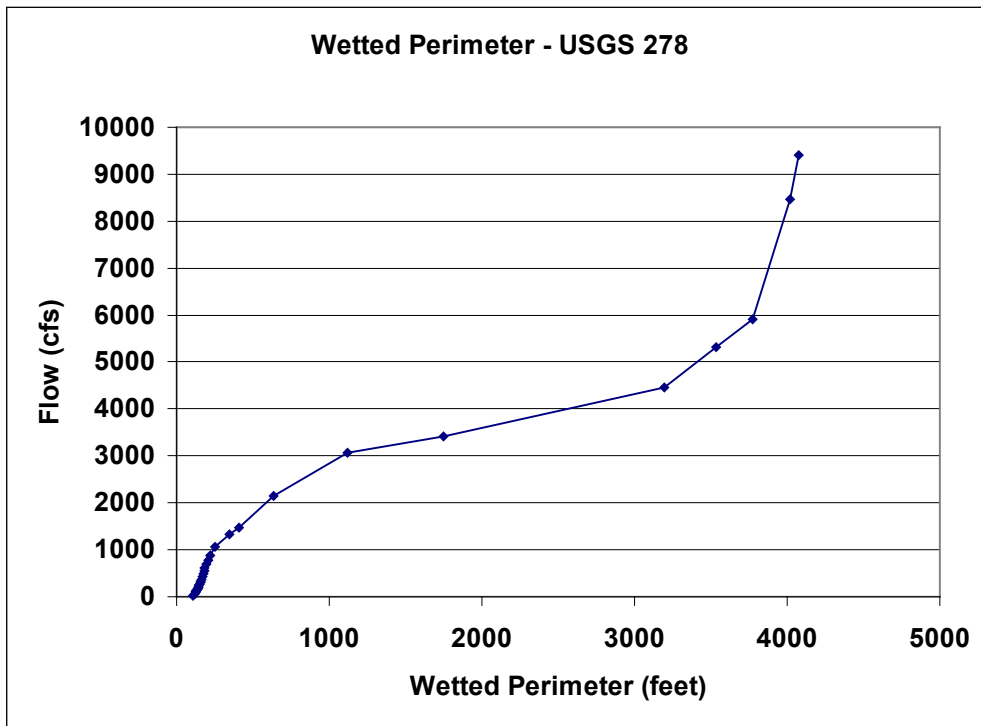


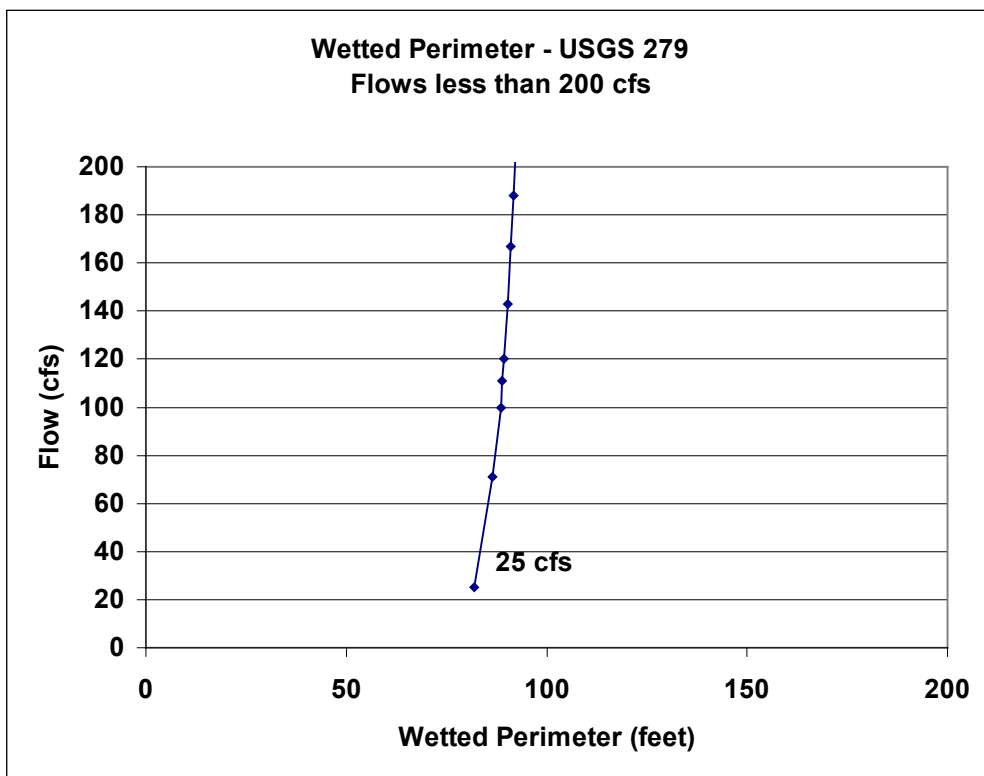
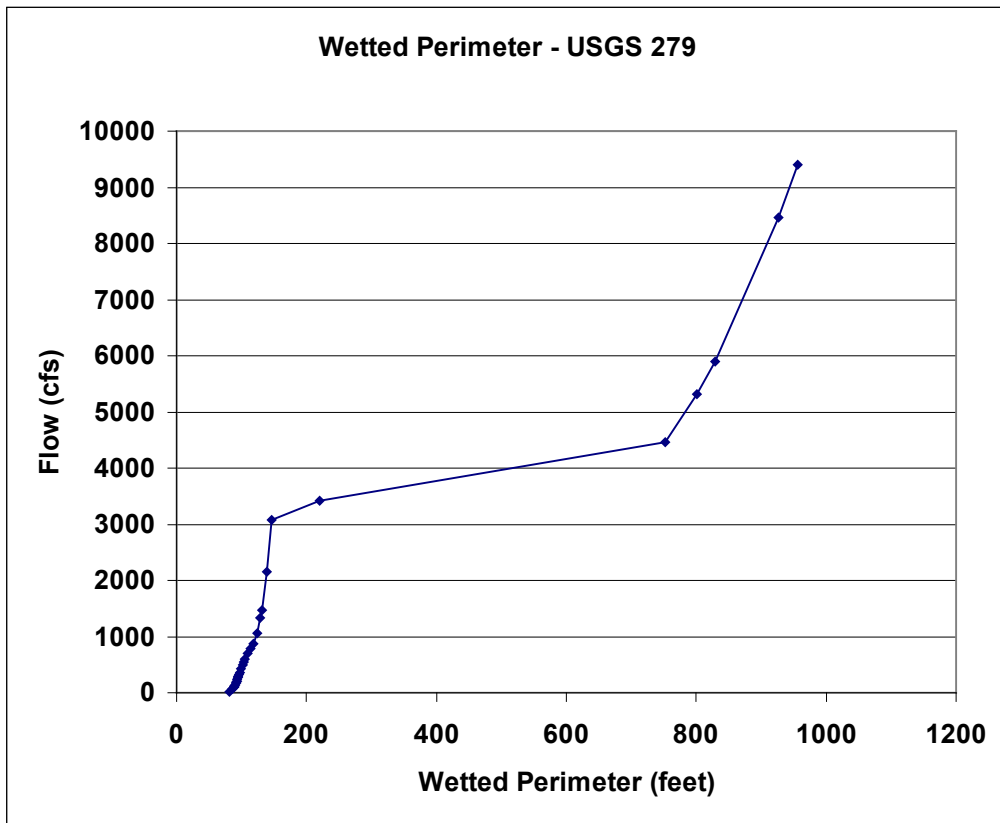


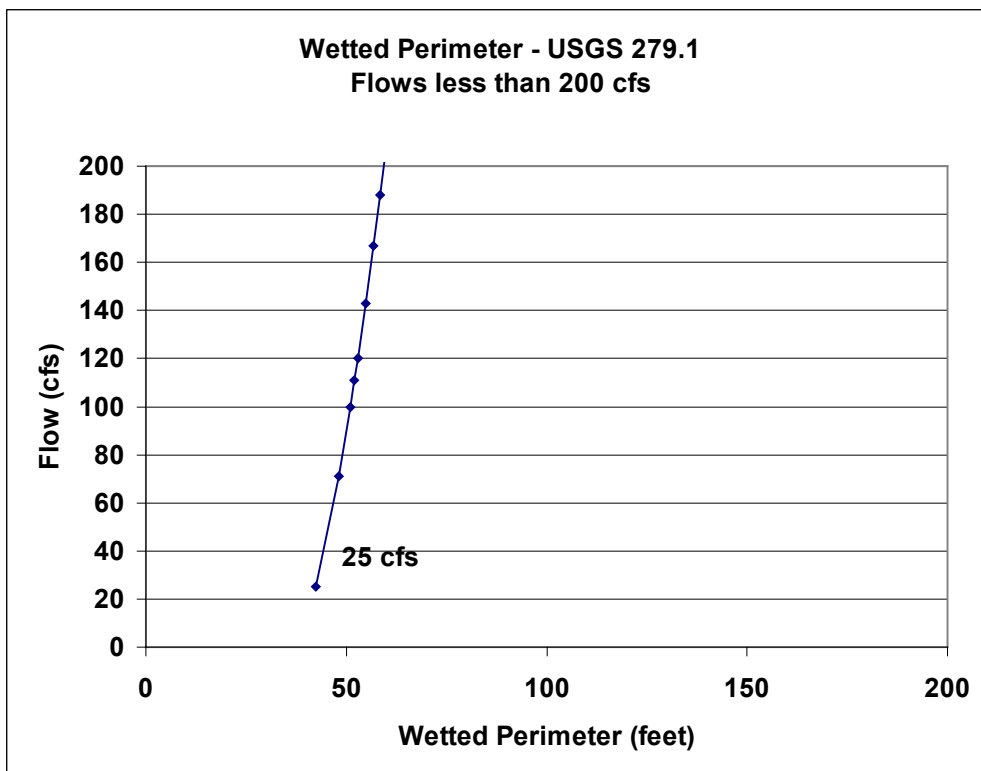
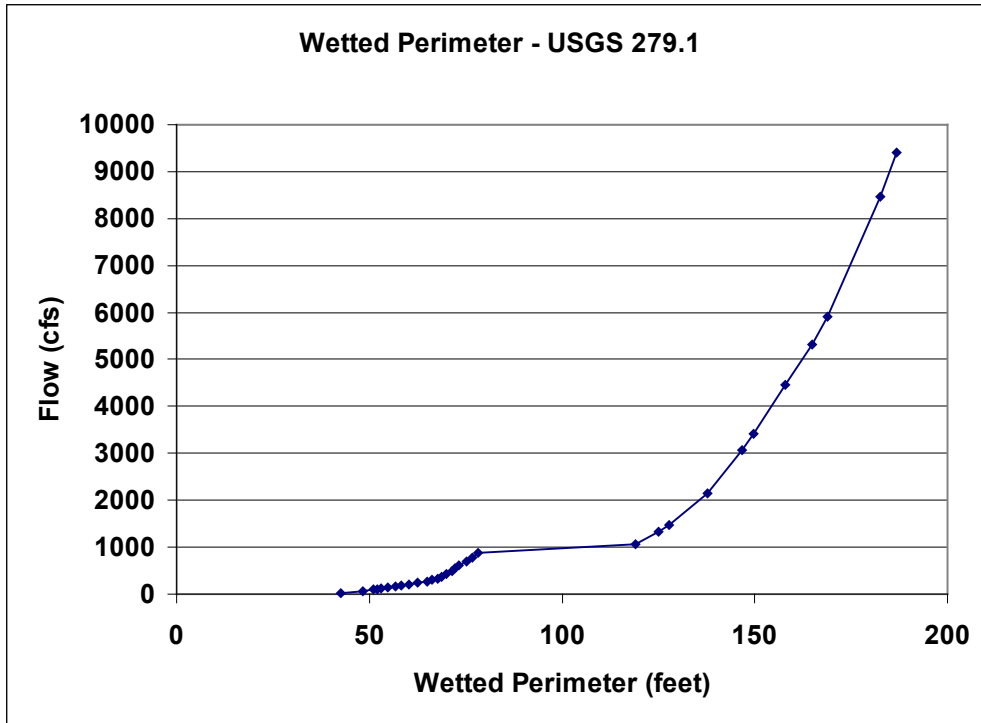


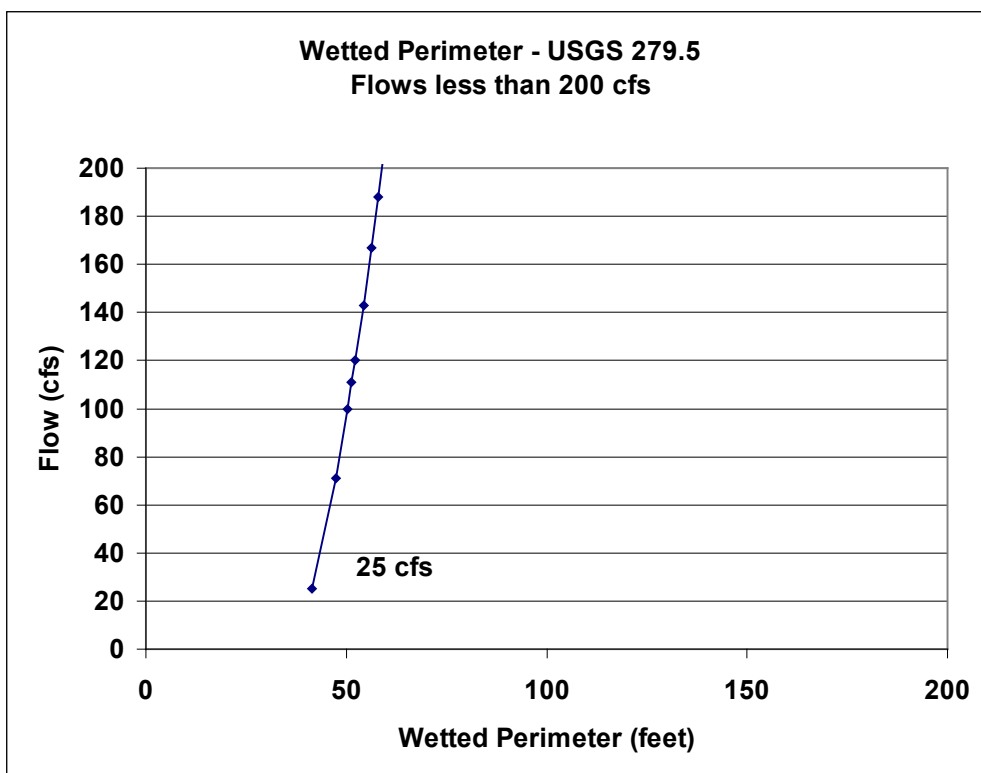
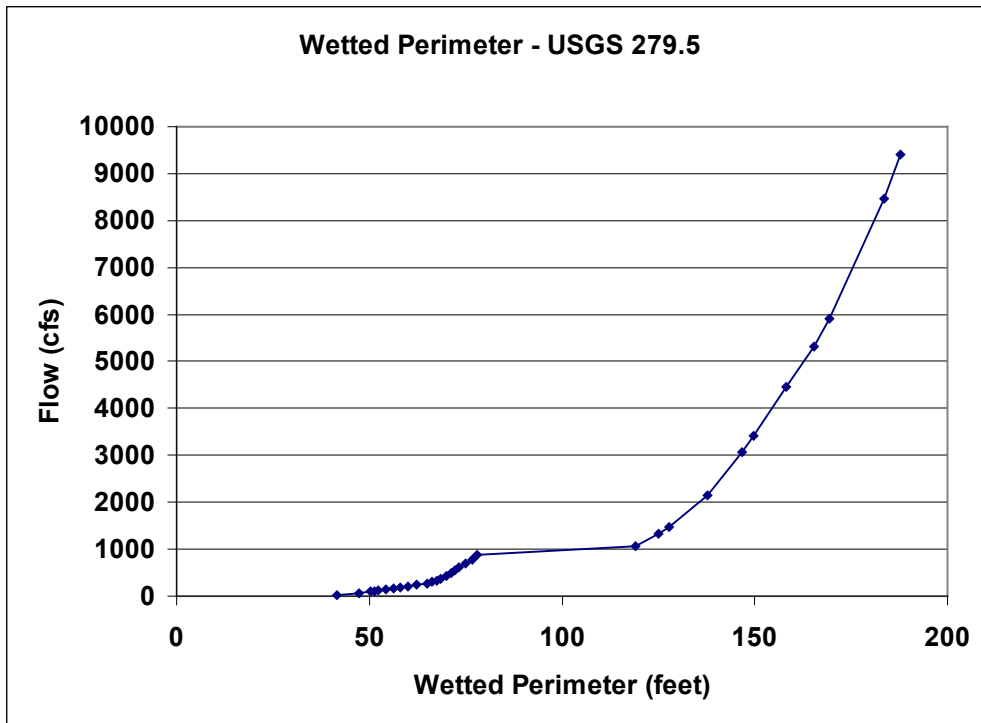


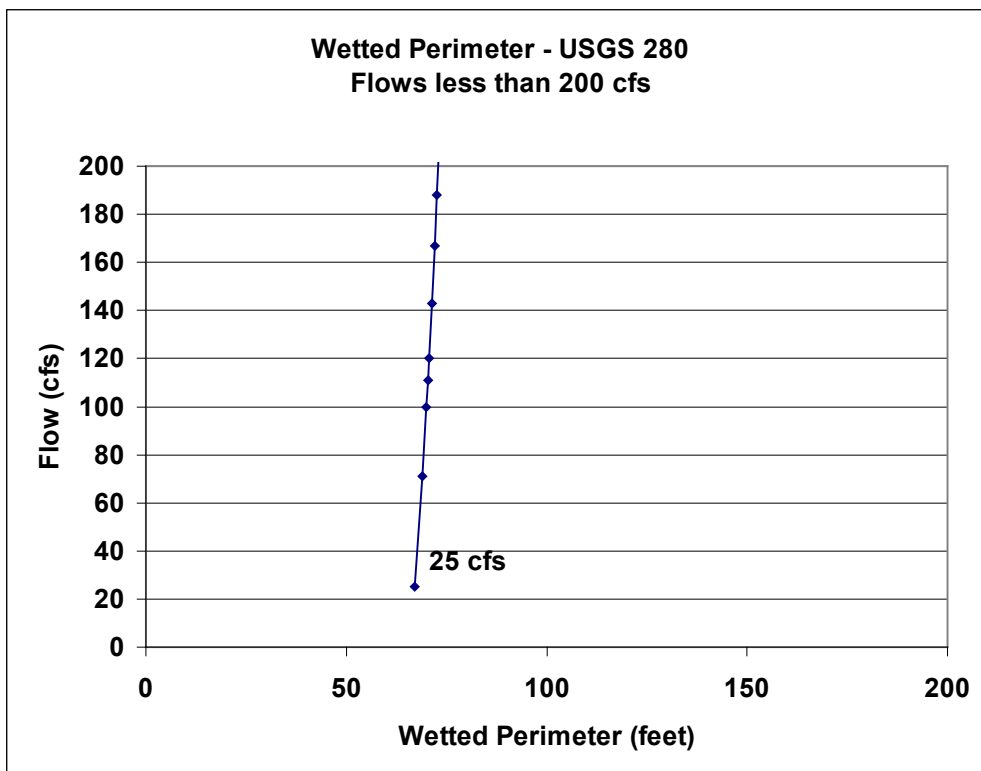
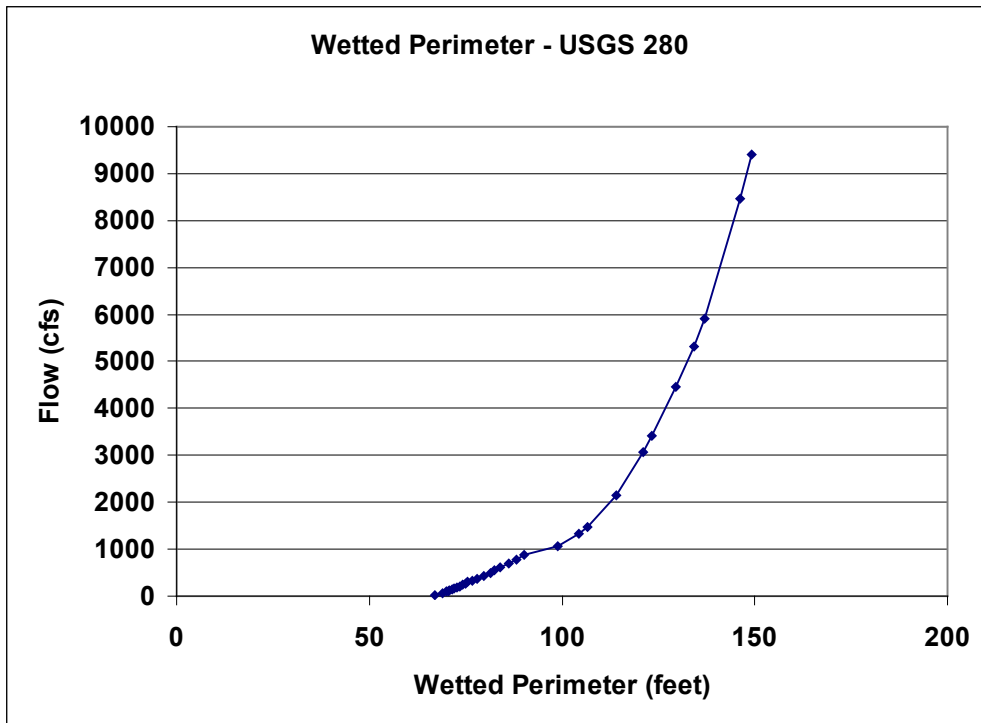


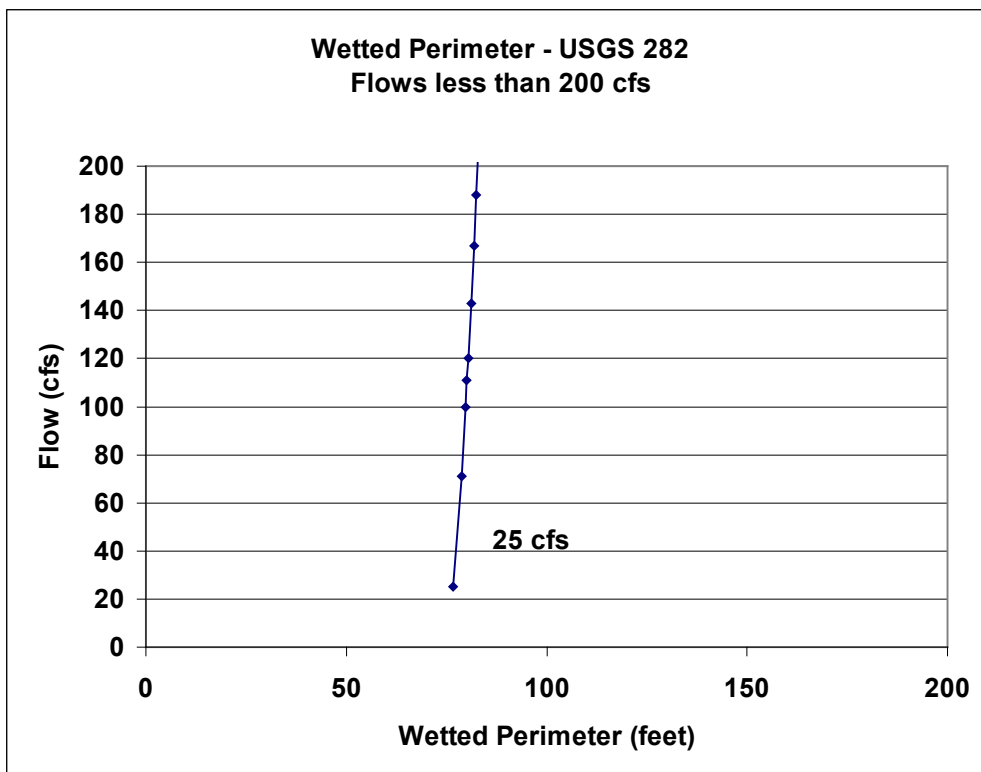
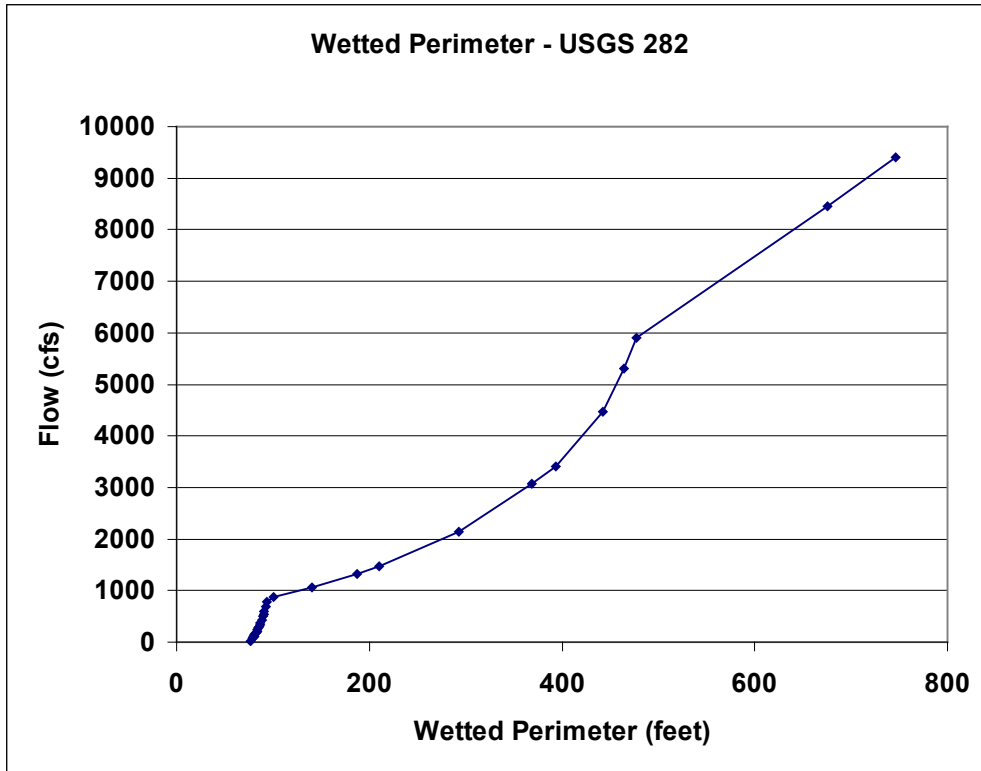


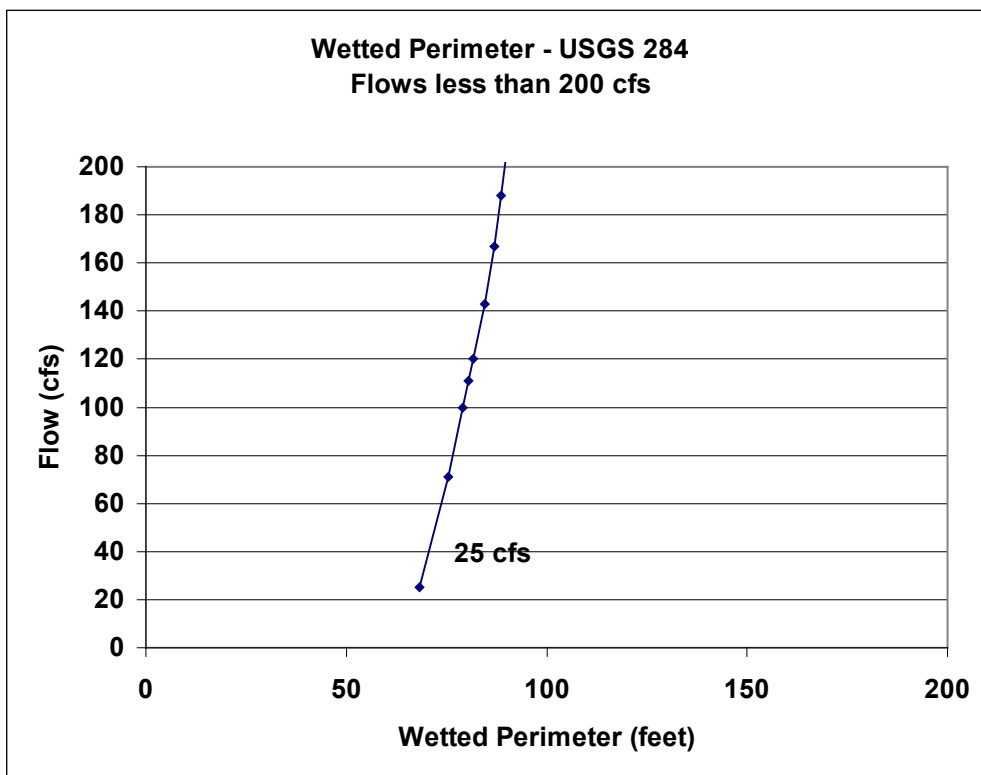
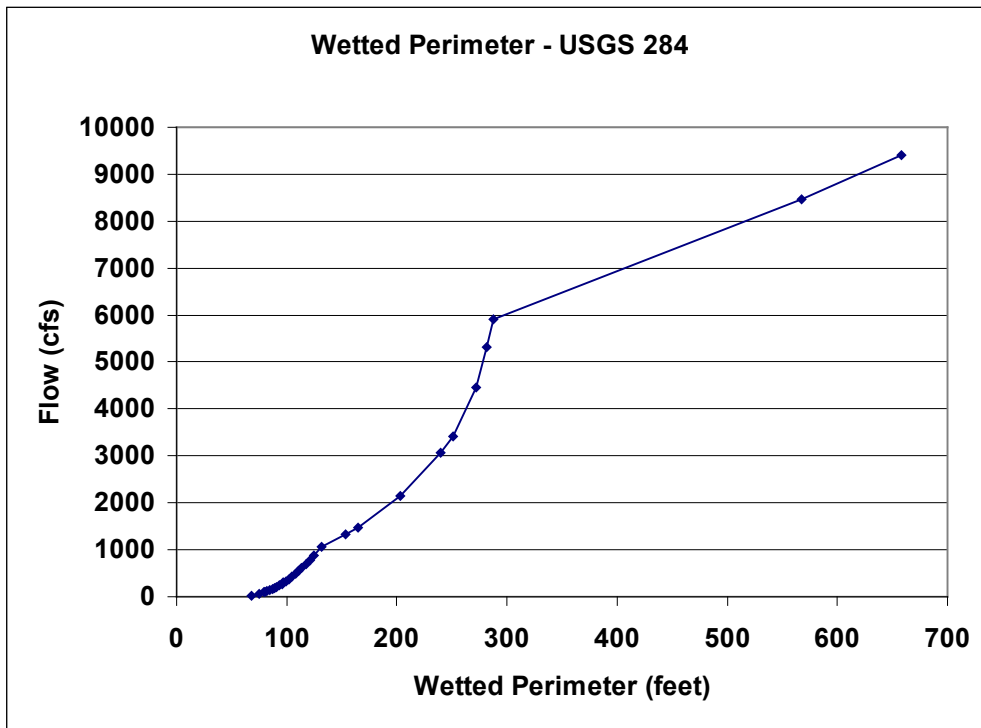


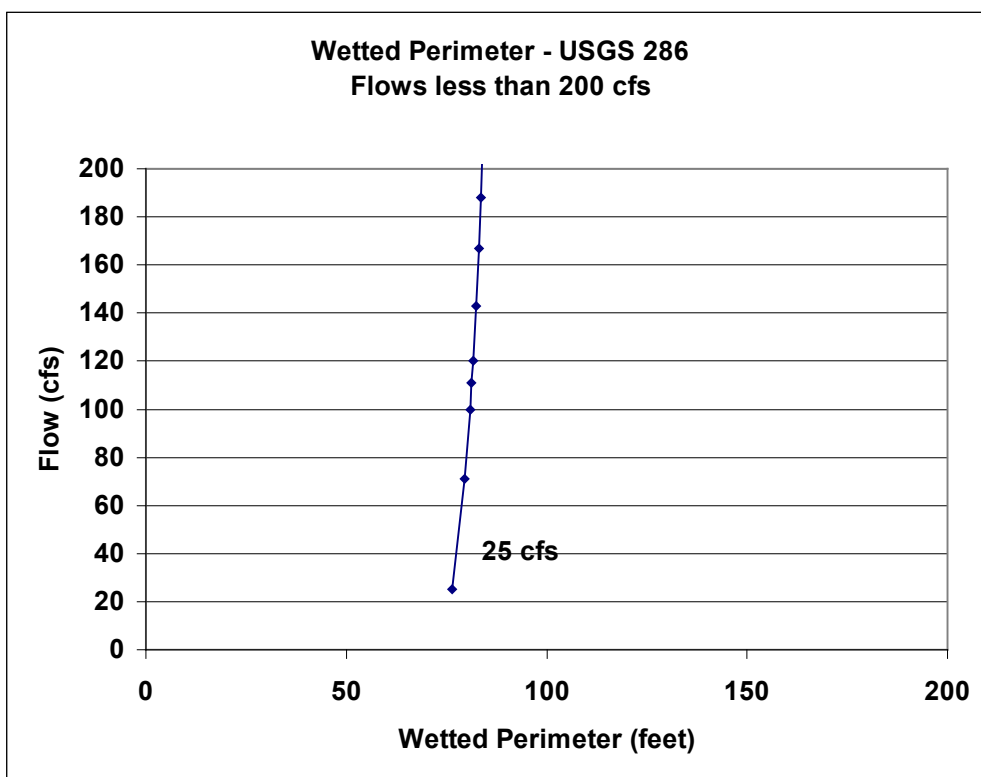
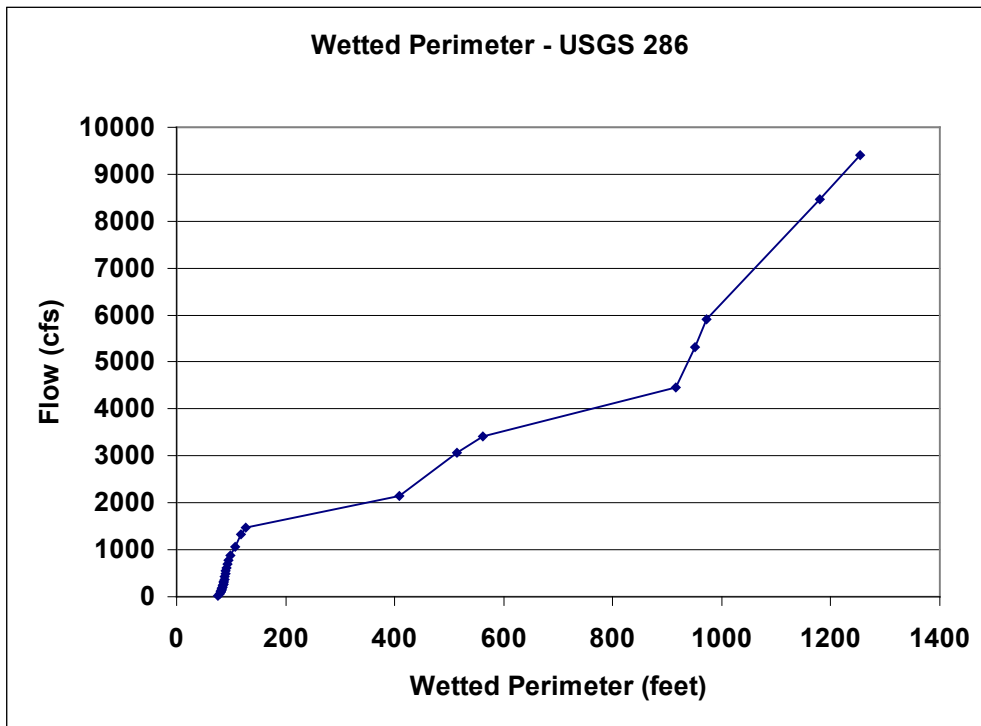


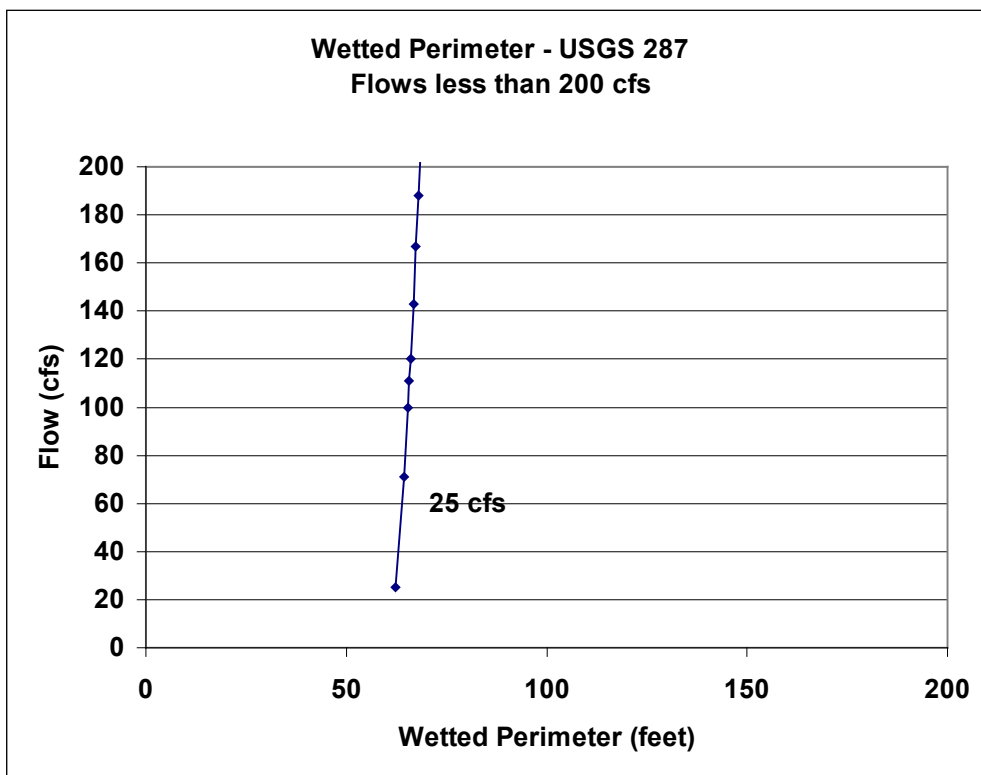
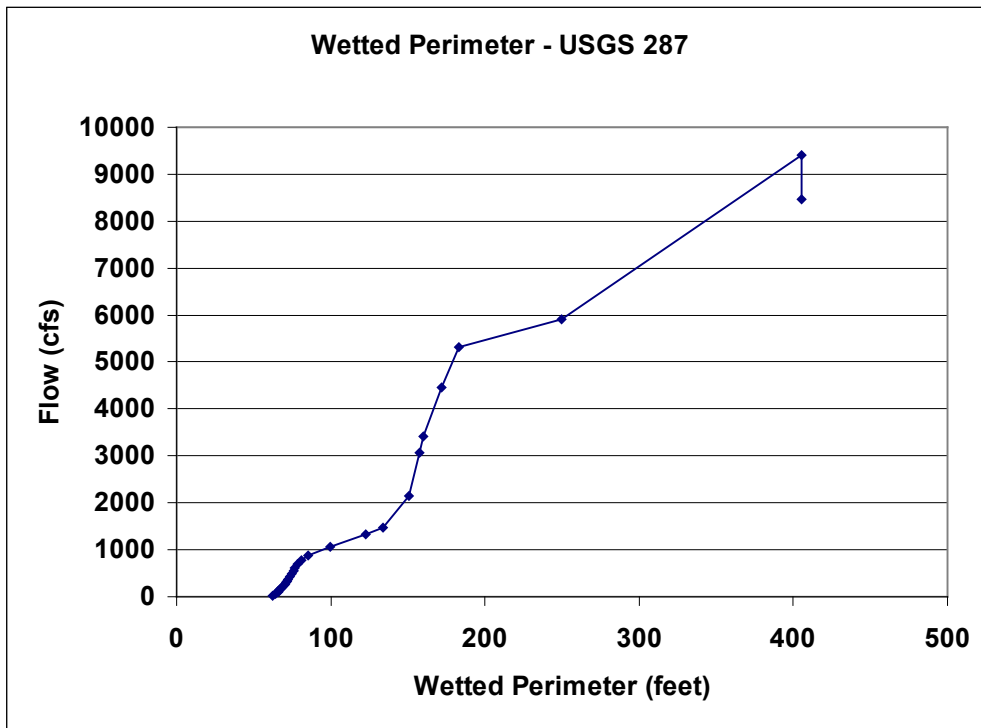


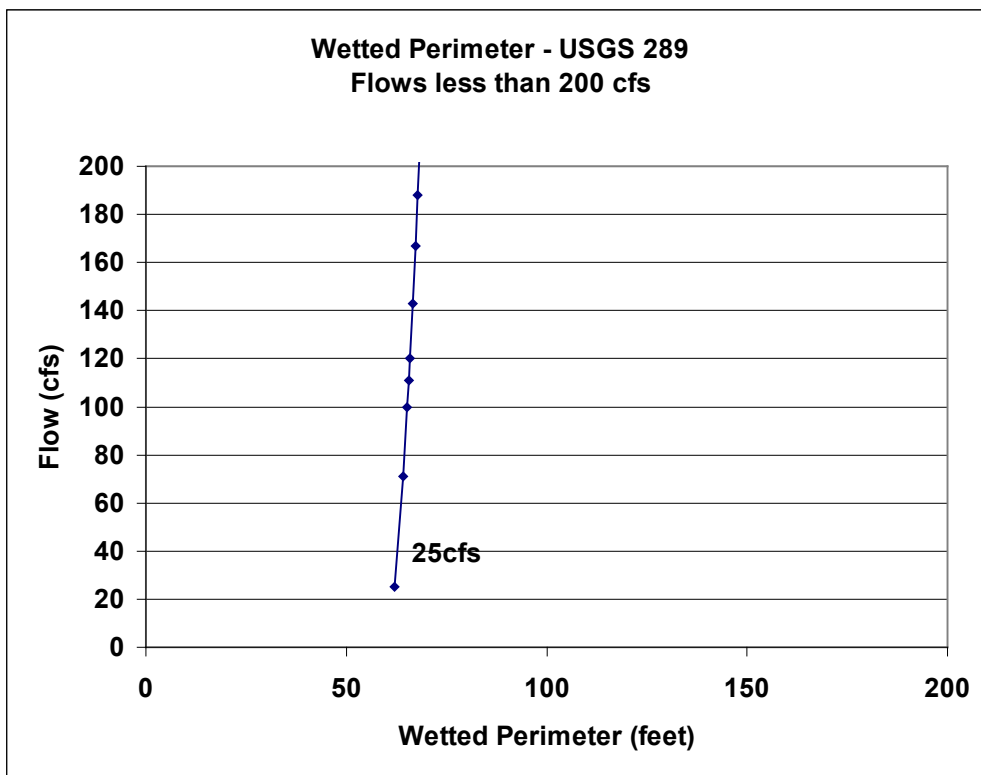
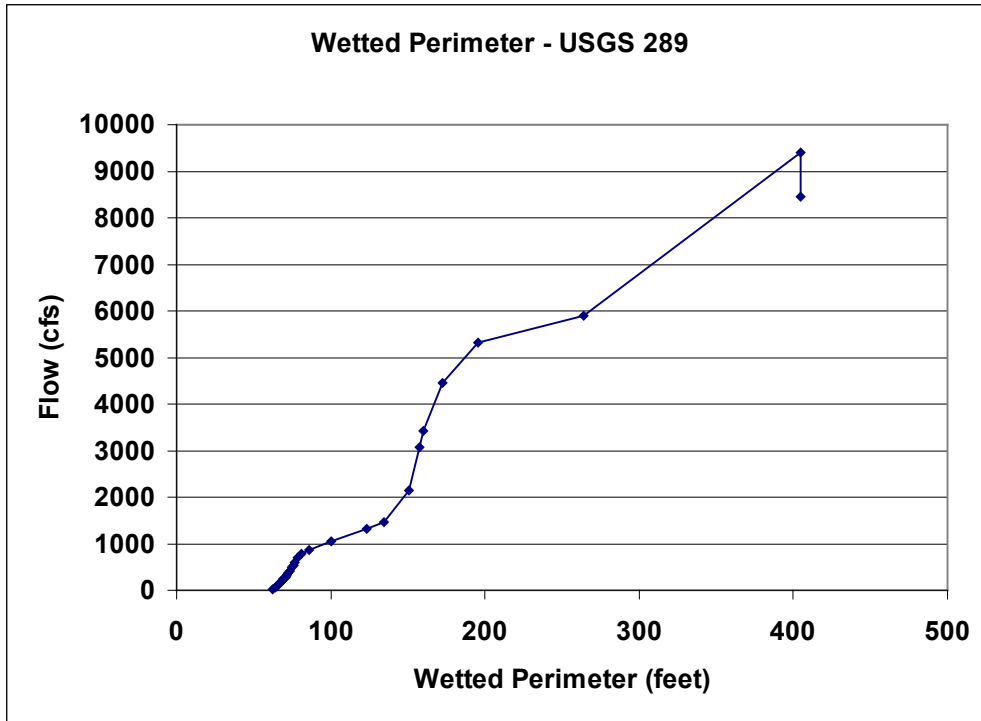


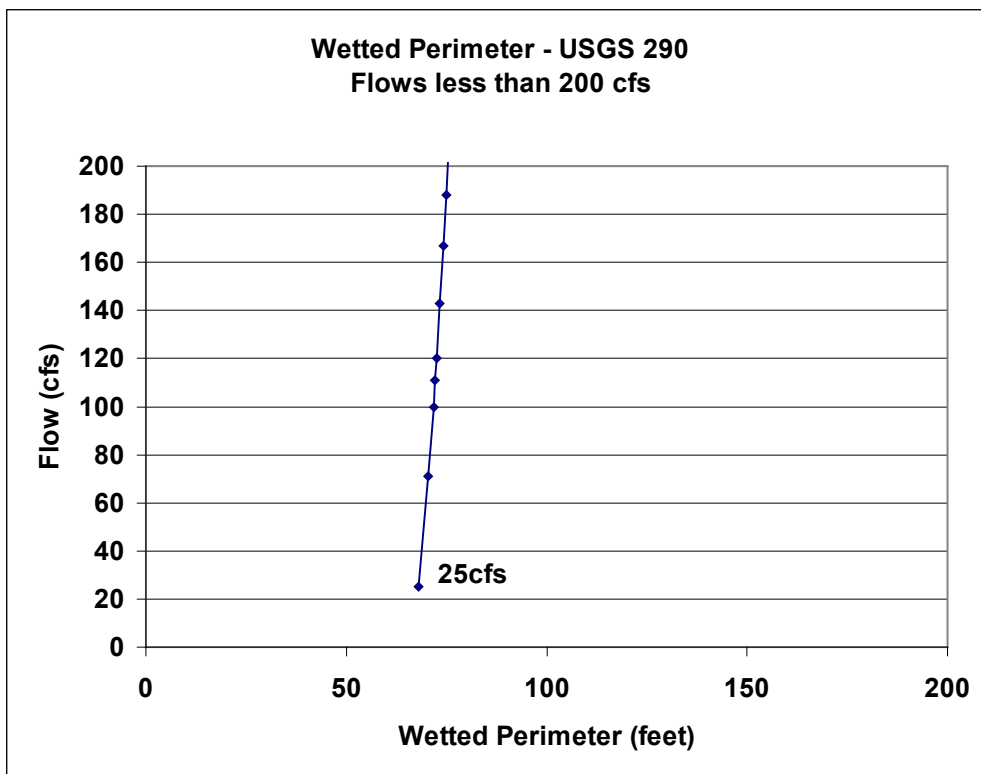
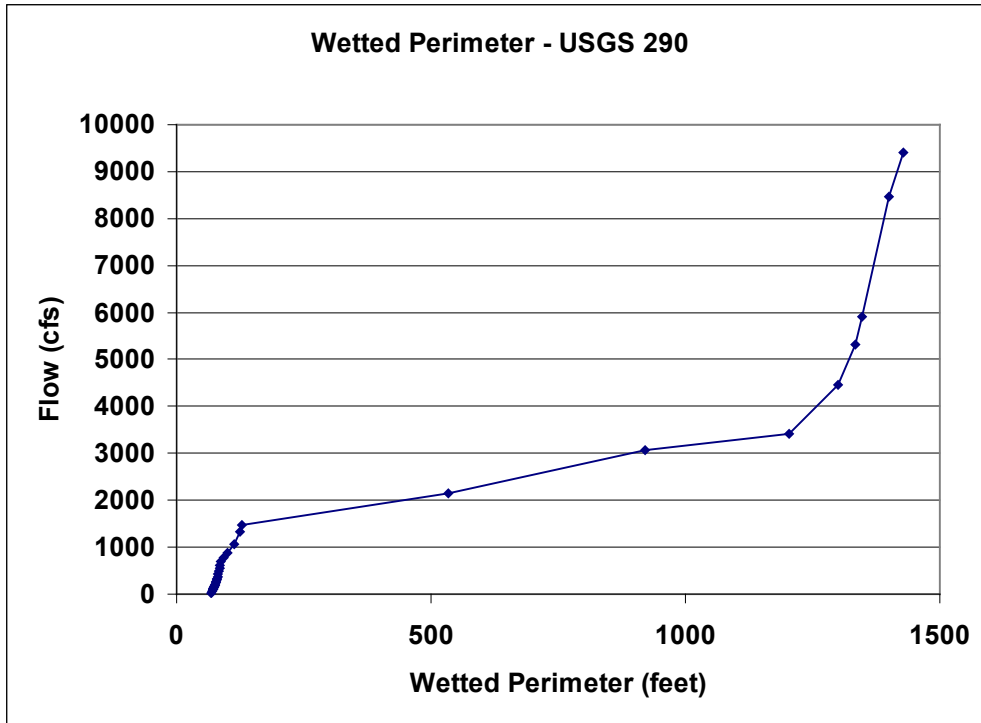


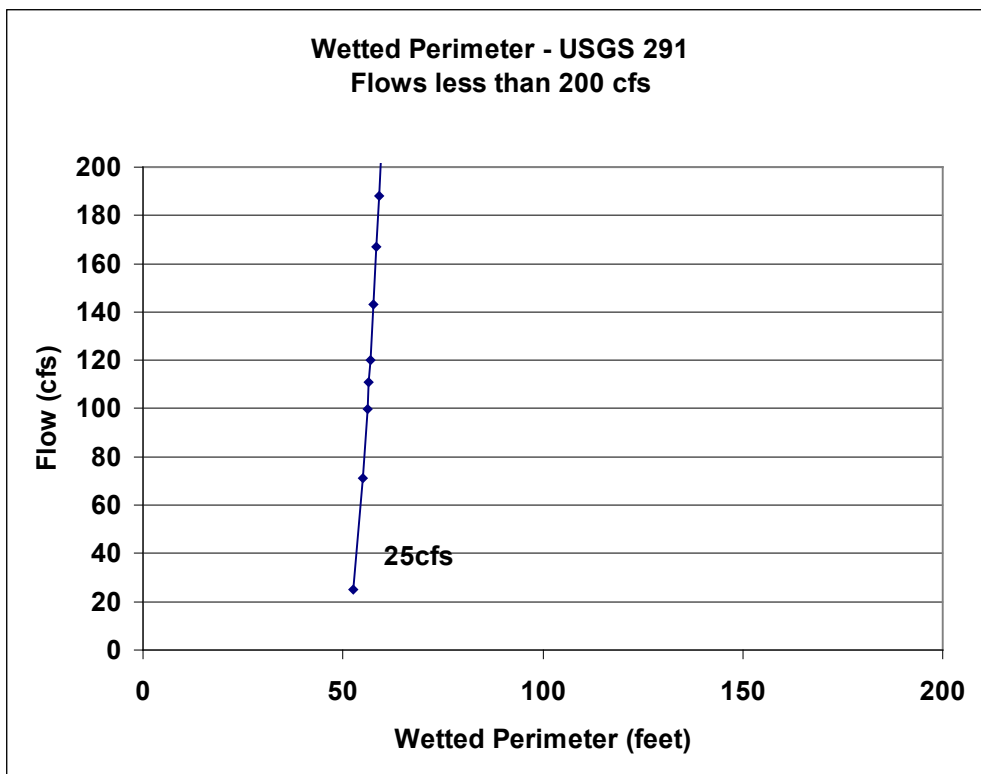
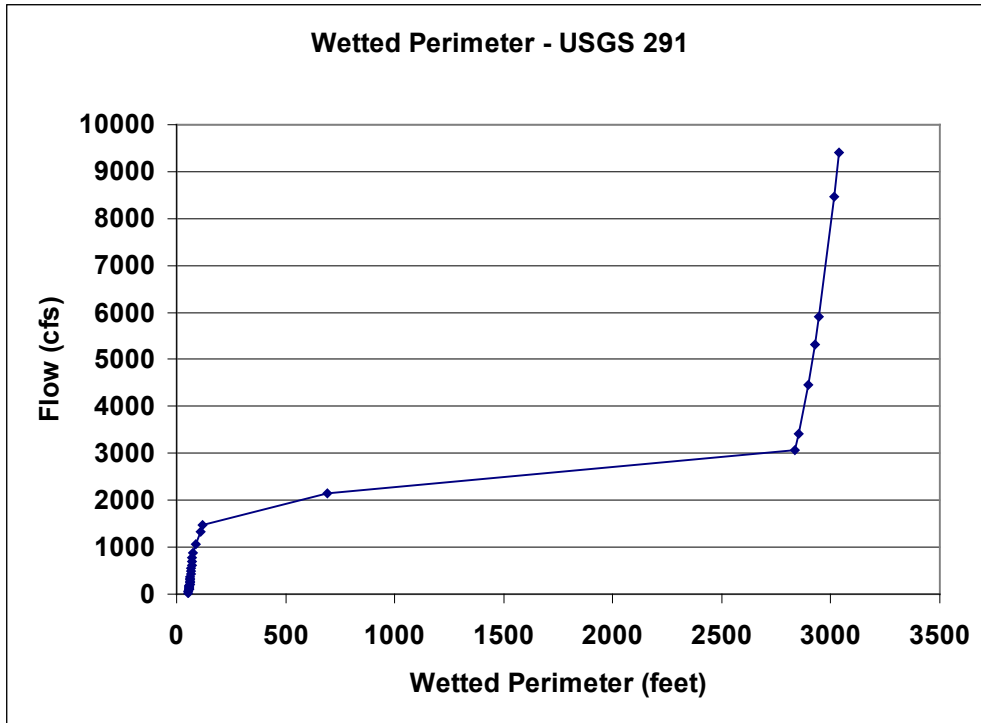


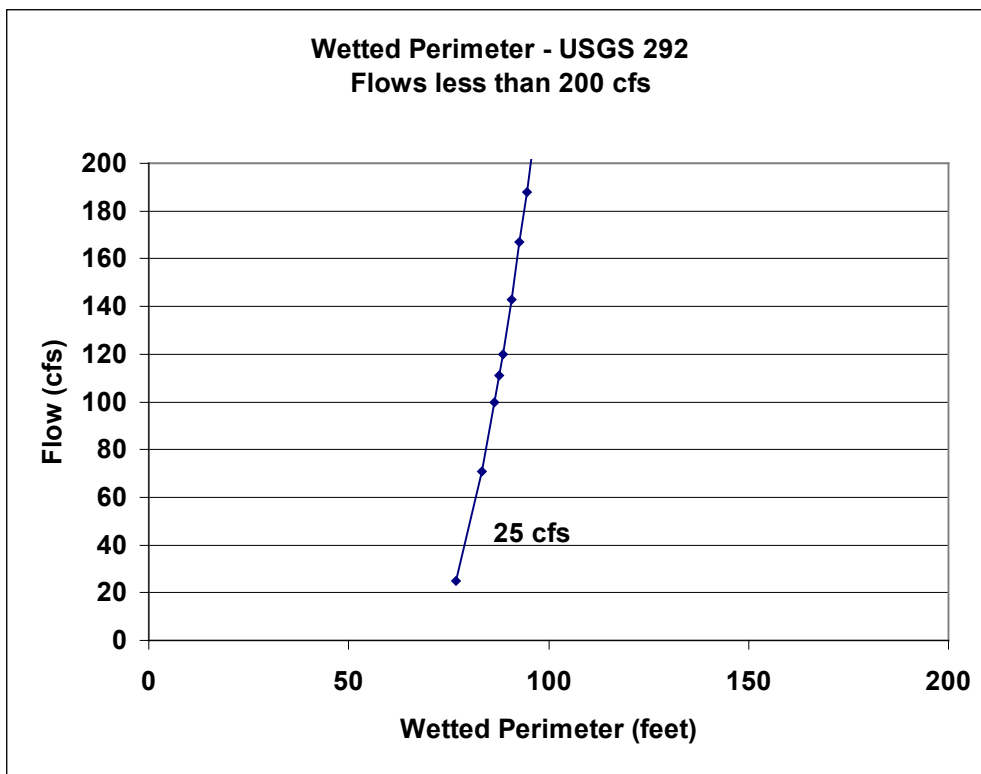
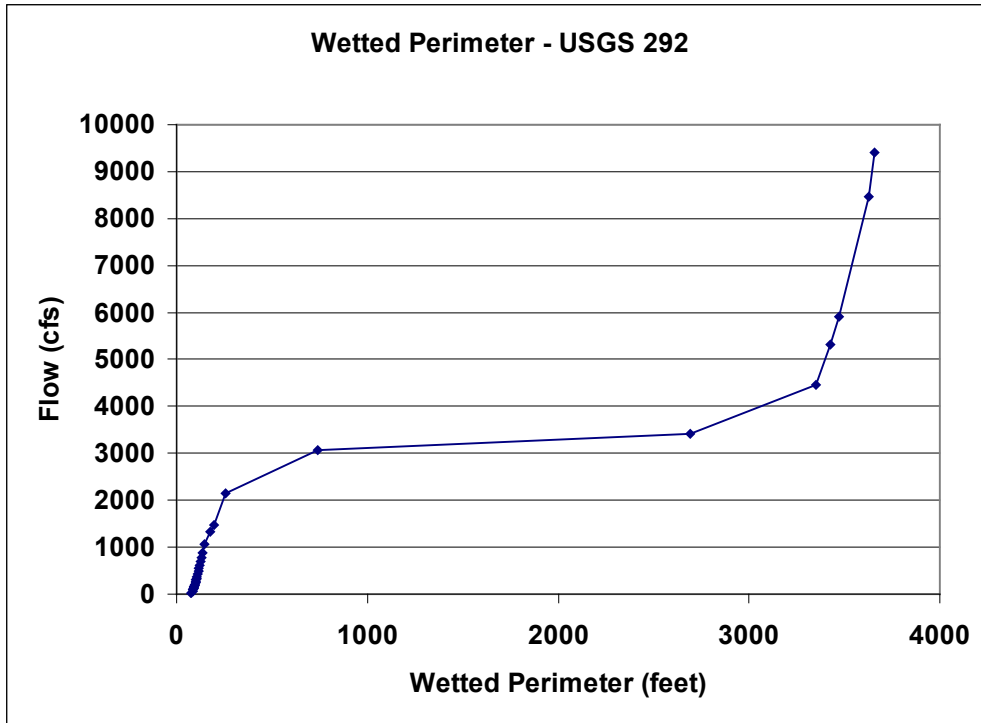












APPENDIX PHABSIM

Physical Habitat Simulation Model – PHABSIM

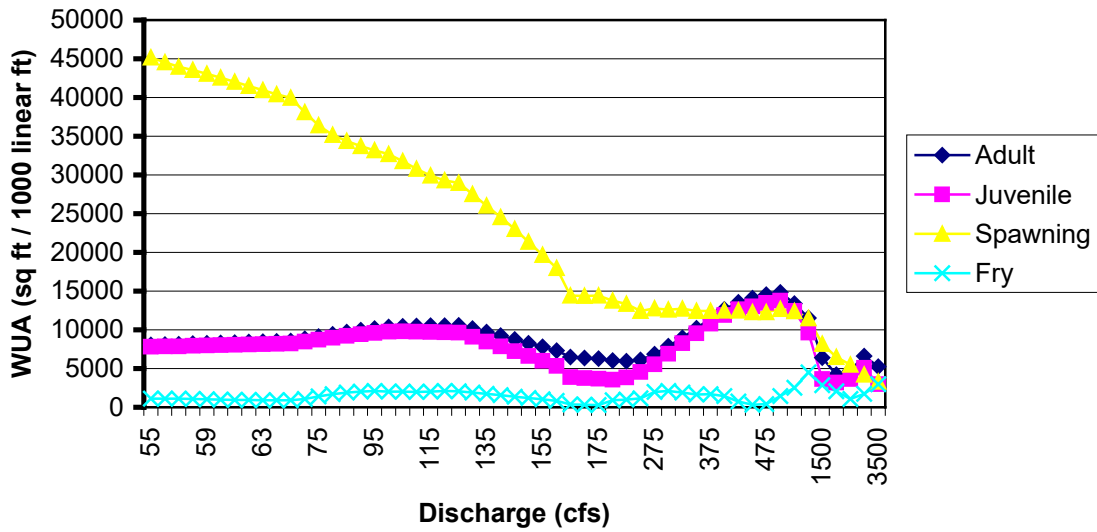
PHABSIM analysis was performed for three locations on the Middle Peace River. Sites corresponded to vegetation transect at Arcadia and Zolfo Springs. This appendix contains all PHABSIM plots generated for the Middle Peace River. These plots were generated from data gathered by SWFWMD staff. Data was then submitted to consultants with expertise in Physical Habitat Simulation Modeling. The first series of plots in this appendix are Weighted Useable Area (WUA) vs. Discharge for each species of interest at sites Arcadia and Zolfo Springs. The second set of plots displays the percent change in predicted WUA for different flow reduction (10, 20, 30, and 40 %) for each month of the year for historic flow conditions from 1940 to 1969 and for 1970 to 1999 for each species of interest.

Arcadia - Weighted Usable Area versus Discharge for Largemouth Bass	PHABSIM-4
Arcadia - Weighted Usable Area versus Discharge for Bluegill Sunfish	PHABSIM-4
Arcadia - Weighted Usable Area versus Discharge for Spotted Sunfish	PHABSIM-5
Arcadia - Weighted Usable Area versus Discharge for Benthos	PHABSIM-5
Zolfo Springs - Weighted Usable Area versus Discharge for Largemouth Bass	PHABSIM-6
Zolfo Springs - Weighted Usable Area versus Discharge for Bluegill Sunfish	PHABSIM-6
Zolfo Springs - Weighted Usable Area versus Discharge for Spotted Sunfish	PHABSIM-7
Zolfo Springs - Weighted Usable Area versus Discharge for Benthos	PHABSIM-7
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Adults (1940-1969)	PHABSIM-8
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Adults (1970-1999)	PHABSIM-8
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Juveniles (1940-1969)	PHABSIM-9
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Juveniles (1970-1999)	PHABSIM-9
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Spawning (1940-1969)	PHABSIM-10
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Spawning (1970-1999)	PHABSIM-10
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Fry (1940- 1969)	PHABSIM-11
Arcadia - Predicted Habitat Gain/Loss for Largemouth Bass Fry (1970- 1999)	PHABSIM-11
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Adults (1940- 1969)	PHABSIM-12
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Adults (1970- 1999)	PHABSIM-12
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles (1940-1969)	PHABSIM-13

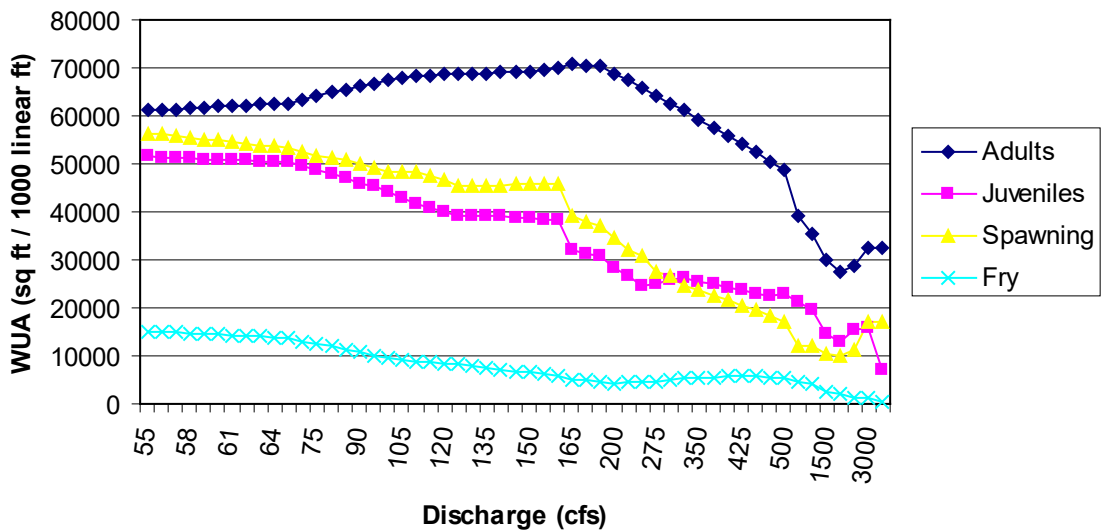
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles (1970-1999)	PHABSIM-13
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning (1940-1969)	PHABSIM-14
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning (1970-1999)	PHABSIM-14
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Fry (1940-1969)	PHABSIM-15
Arcadia - Predicted Habitat Gain/Loss for Bluegill Sunfish Fry (1970-1999)	PHABSIM-15
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Adults (1940-1969)	PHABSIM-16
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Adults (1970-1999)	PHABSIM-16
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Juveniles (1940-1969)	PHABSIM-17
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Juveniles (1970-1999)	PHABSIM-17
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Spawning (1940-1969)	PHABSIM-18
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Spawning (1970-1999)	PHABSIM-18
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Fry (1940-1969)	PHABSIM-19
Arcadia - Predicted Habitat Gain/Loss for Spotted Sunfish Fry (1970-1999)	PHABSIM-19
Arcadia - Predicted Habitat Gain/Loss for Benthic Macroinvertebrates (1940-1969)	PHABSIM-20
Arcadia - Predicted Habitat Gain/Loss for Benthic Macroinvertebrates (1970-1999)	PHABSIM-20
Arcadia – Biological Restrictions on Flow Reductions	PHABSIM-21
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Adults (1940-1969)	PHABSIM-22
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Adults (1970-1999)	PHABSIM-22
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Juveniles (1940-1969)	PHABSIM-23
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Juveniles (1970-1999)	PHABSIM-23
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Spawning (1940-1969)	PHABSIM-24
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Spawning (1970-1999)	PHABSIM-24
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Fry (1940-1969)	PHABSIM-25
Zolpho - Predicted Habitat Gain/Loss for Largemouth Bass Fry (1970-1999)	PHABSIM-25
Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Adults (1940-1969)	PHABSIM-26
Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Adults (1970-1999)	PHABSIM-26

Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles (1940-1969)	PHABSIM-27
Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles (1970-1999)	PHABSIM-27
Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning (1940-1969)	PHABSIM-28
Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning (1970-1999)	PHABSIM-28
Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Fry (1940-1969)	PHABSIM-29
Zolpho - Predicted Habitat Gain/Loss for Bluegill Sunfish Fry (1970-1999)	PHABSIM-29
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Adults (1940-1969)	PHABSIM-30
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Adults (1970-1999)	PHABSIM-30
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Juveniles (1940-1969)	PHABSIM-31
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Juveniles (1970-1999)	PHABSIM-31
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Spawning (1940-1969)	PHABSIM-32
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Spawning (1970-1999)	PHABSIM-32
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Fry (1940-1969)	PHABSIM-33
Zolpho - Predicted Habitat Gain/Loss for Spotted Sunfish Fry (1970-1999)	PHABSIM-33
Zolpho - Predicted Habitat Gain/Loss for Benthic Macroinvertebrates (1940-1969)	PHABSIM-34
Zolpho - Predicted Habitat Gain/Loss for Benthic Macroinvertebrates (1970-1999)	PHABSIM-34
Zolpho - Biological Restrictions on Flow Reductions	PHABSIM-35

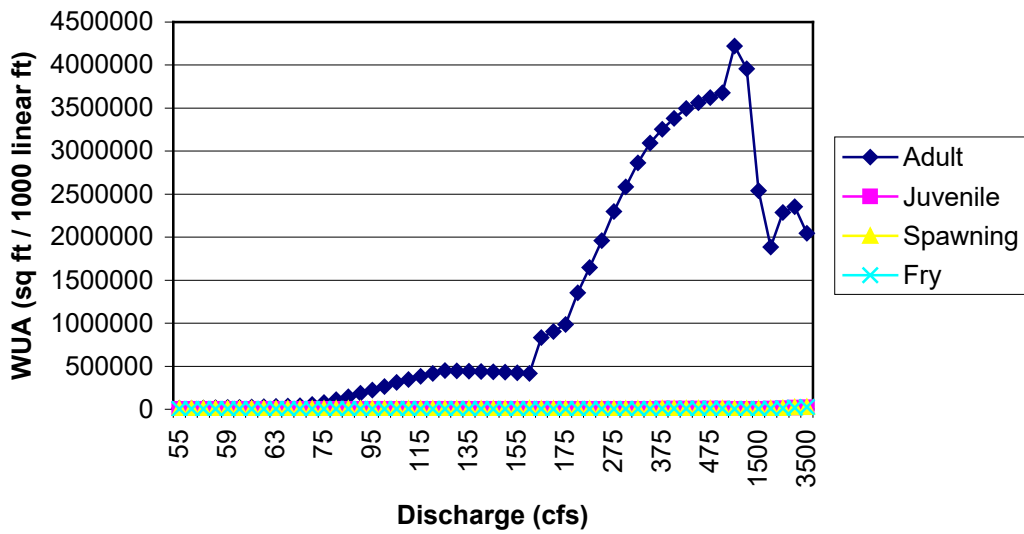
Middle Peace River at Arcadia - Weighted Usable Area versus Discharge for Largemouth Bass



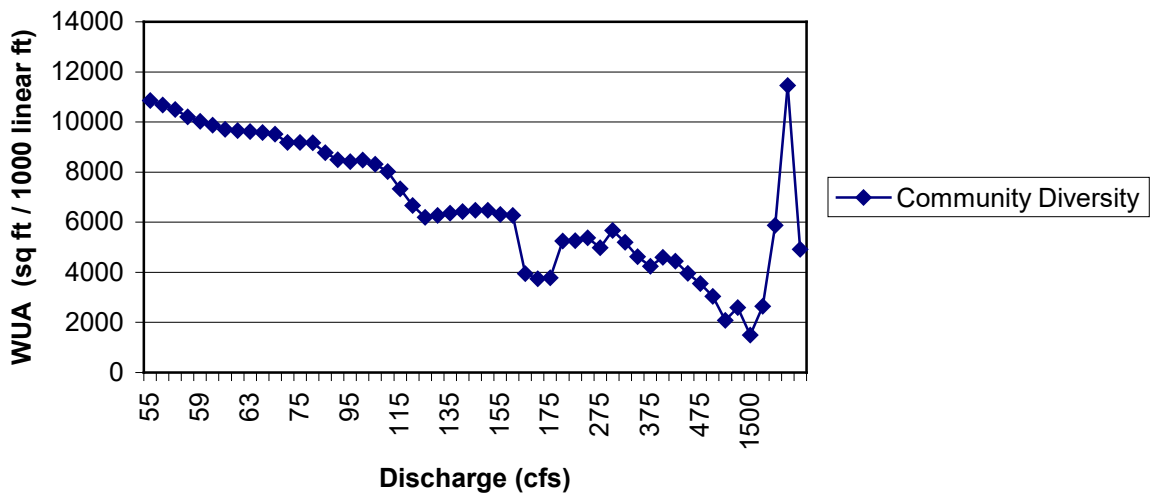
Middle Peace River at Arcadia - Weighted Usable Area versus Discharge for Bluegill Sunfish



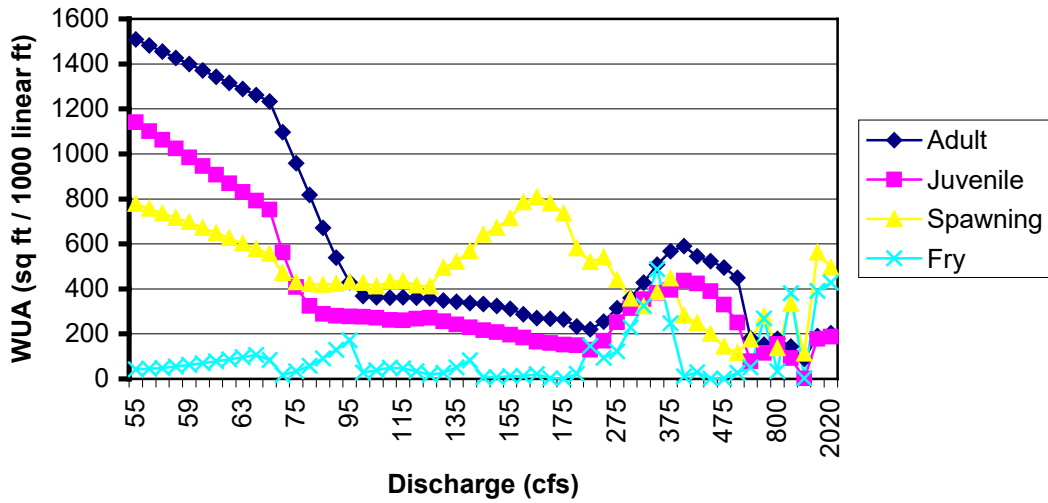
Middle Peace River at Arcadia - Weighted Usable Area versus Discharge for Spotted Sunfish



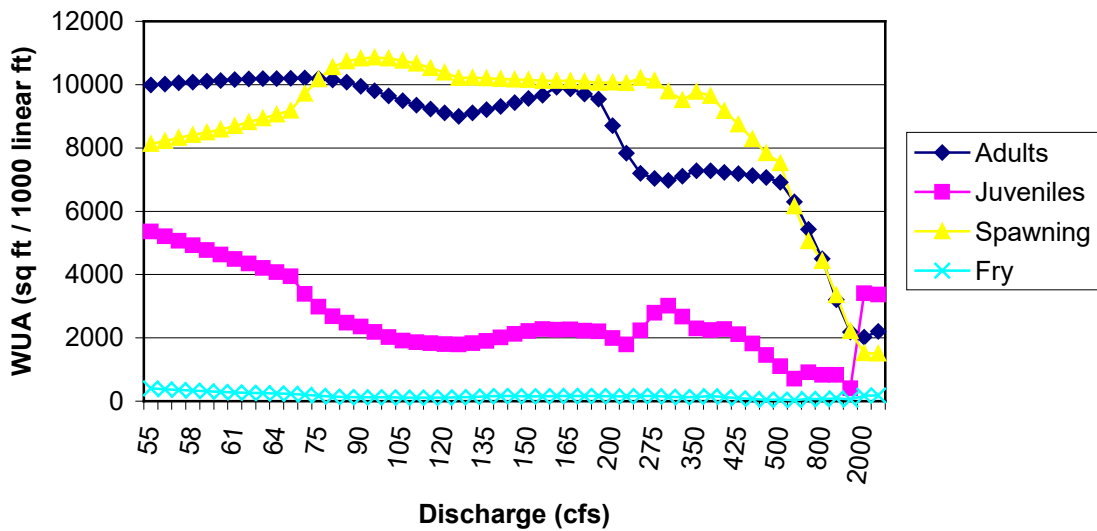
Middle Peace River at Arcadia - Weighted Usable Area versus Discharge for Benthos



**Middle Peace River at Zolfo Springs- Weighted Usable Area vs.
Discharge for Largemouth Bass**



**Middle Peace River at Zolfo Springs- Weighted Usable Area vs.
Discharge for Bluegill Sunfish**

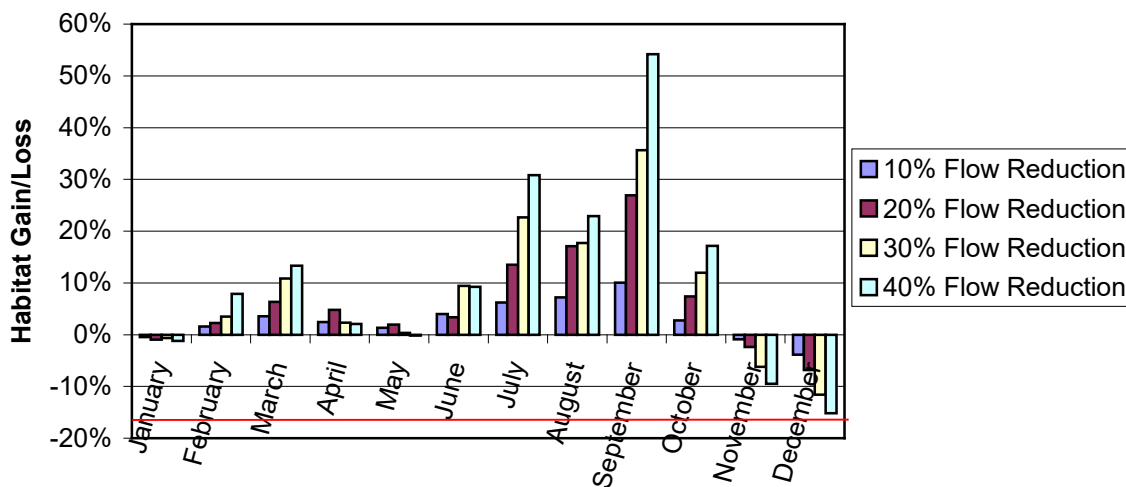


The graph displays the relationship between discharge and WUA for four life stages. The Y-axis represents WUA in square feet per 1000 linear feet, ranging from 0 to 500,000. The X-axis represents discharge in cubic feet per second (cfs), with values 55, 59, 63, 75, 95, 115, 135, 155, 175, 275, 375, 475, 800, and 2020. The 'Adult' stage (dark blue diamonds) shows a significant increase in WUA starting around 175 cfs, peaking at approximately 460,000 sq ft / 1000 linear ft at 2020 cfs. The 'Juvenile' (magenta squares), 'Spawning' (yellow triangles), and 'Fry' (cyan crosses) stages all maintain very low WUA values, near zero, across the entire range of discharge rates.

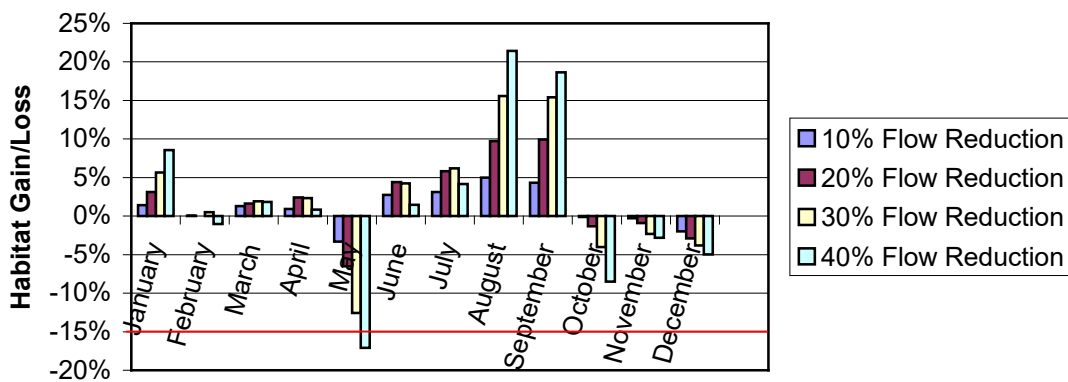
Discharge (cfs)	Adult (sq ft / 1000 linear ft)	Juvenile (sq ft / 1000 linear ft)	Spawning (sq ft / 1000 linear ft)	Fry (sq ft / 1000 linear ft)
55	~10,000	~0	~0	~0
59	~10,000	~0	~0	~0
63	~10,000	~0	~0	~0
75	~10,000	~0	~0	~0
95	~10,000	~0	~0	~0
115	~10,000	~0	~0	~0
135	~10,000	~0	~0	~0
155	~10,000	~0	~0	~0
175	~10,000	~0	~0	~0
275	~80,000	~0	~0	~0
375	~90,000	~0	~0	~0
475	~80,000	~0	~0	~0
800	~110,000	~0	~0	~0
2020	~460,000	~0	~0	~0

Discharge (cfs)	WUA (sq ft / 1000 linear ft)
55	37000
59	37500
63	38500
67	38500
71	38000
75	37000
79	35000
83	32000
87	29000
91	26000
95	23000
99	20000
103	17000
107	14000
111	11000
115	9000
119	7500
123	6500
127	5500
131	4500
135	3500
139	2500
143	1500
147	1000
151	700
155	500
159	300
163	200
167	150
171	100
175	100
179	100
183	100
187	100
191	100
195	100
199	100
203	100
207	100
211	100
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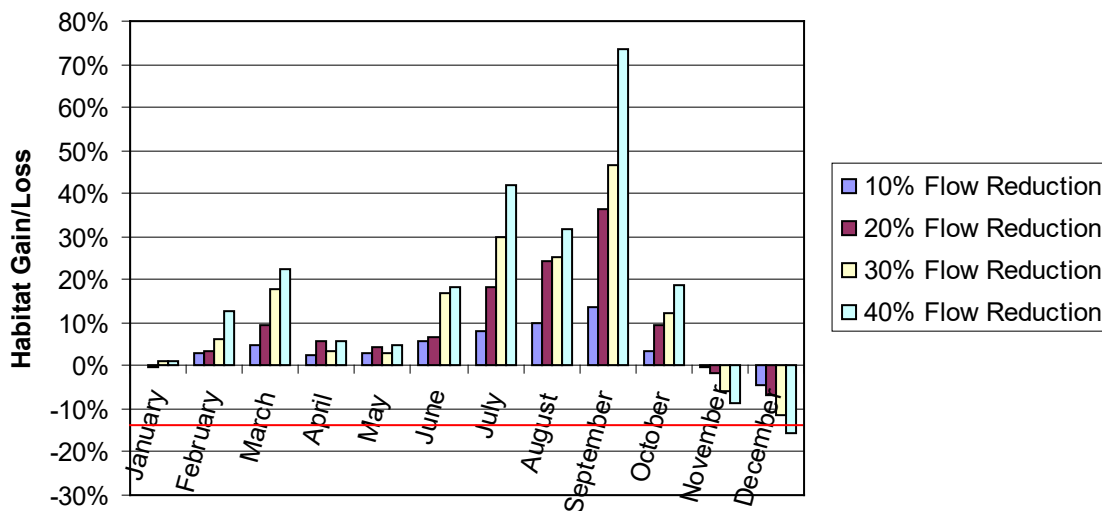
**Predicted Habitat Gain/Loss for Largemouth Bass Adults Based on
Historic Flow Conditions (1940-1966) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Arcadia**



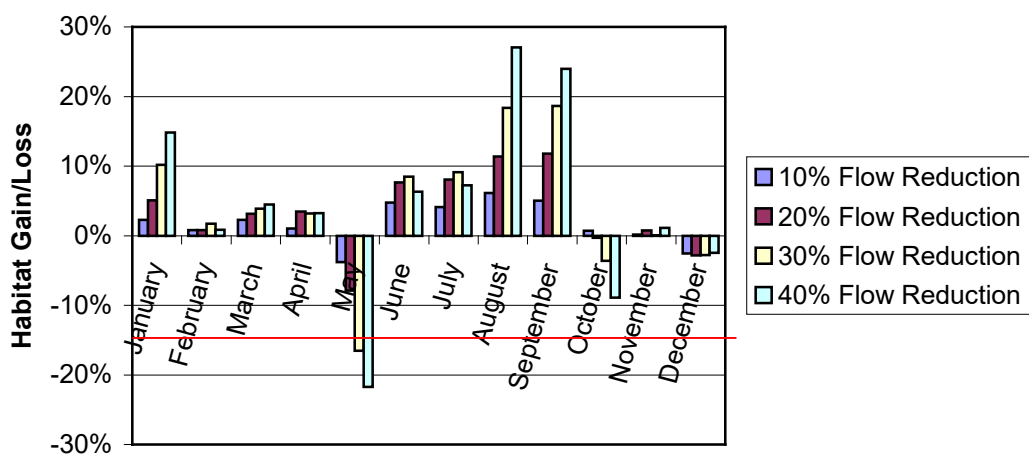
**Predicted Habitat Gain/Loss for Largemouth Bass Adults Based on
Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30,
and 40 percent at Middle Peace River at Arcadia**



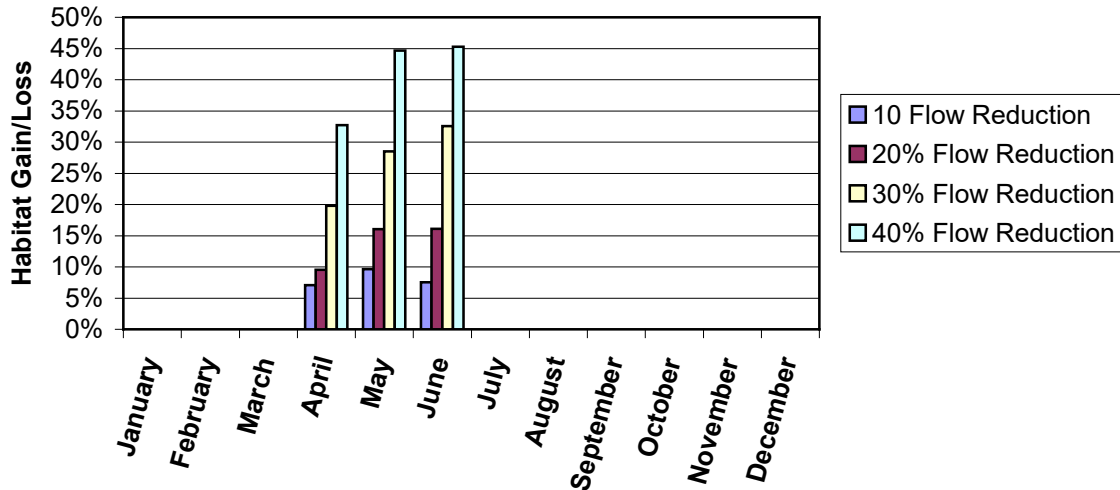
Predicted Habitat Gain/Loss for Largemouth Bass Juveniles Based on Historic Flow Conditions (1940-1966) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



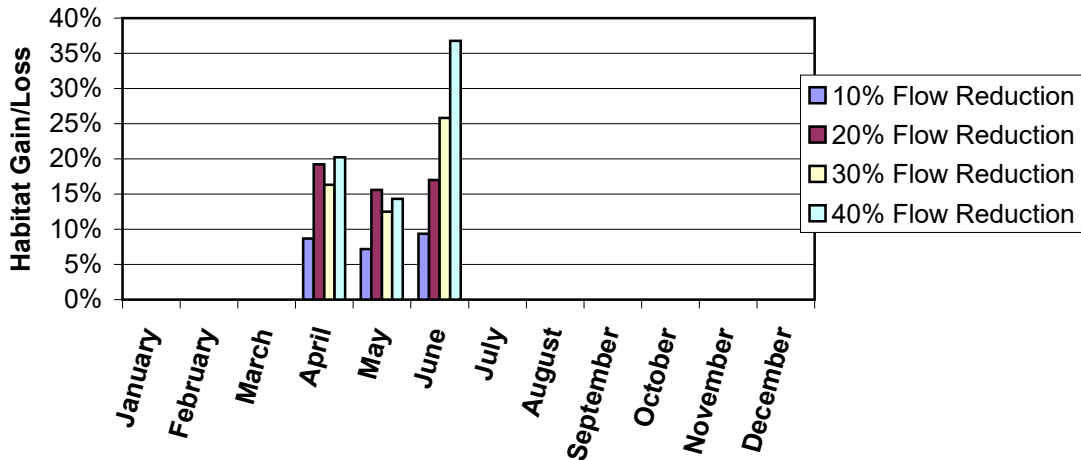
Predicted Habitat Gain/Loss for Largemouth Bass Juveniles Based on Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



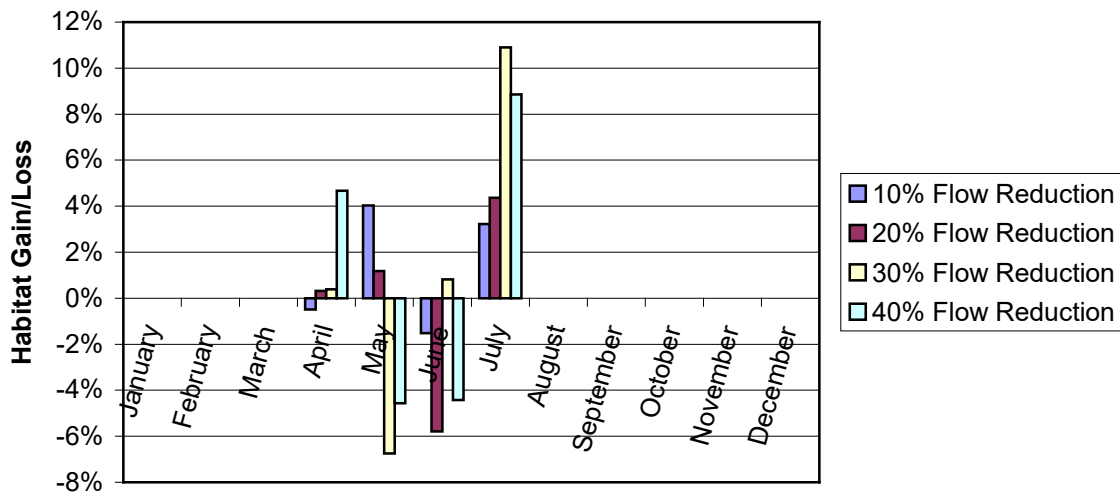
**Predicted Habitat Gain/Loss for Largemouth Bass Spawning Based on
Historic Flow Conditions (1940-1969) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Arcadia**



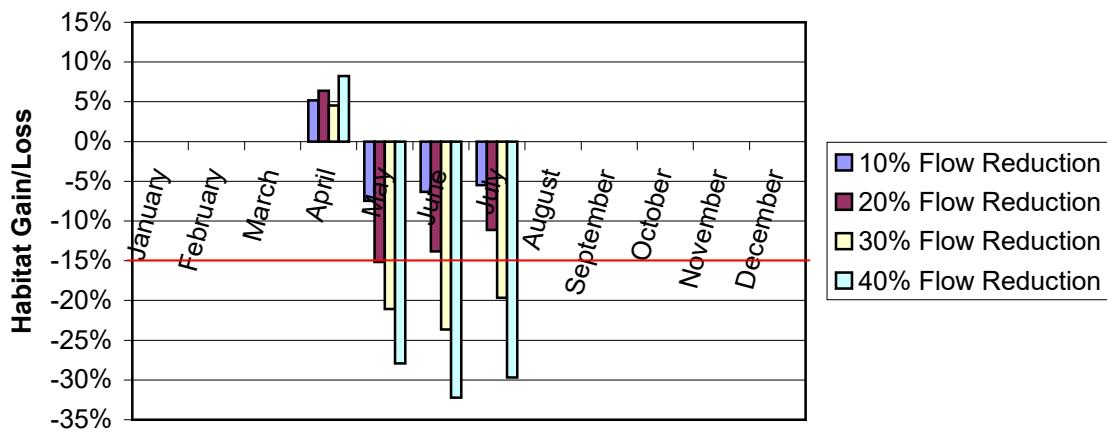
**Predicted Habitat Gain/Loss for Largemouth Bass Spawning Based
on Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30,
and 40 percent at Middle Peace River at Arcadia**



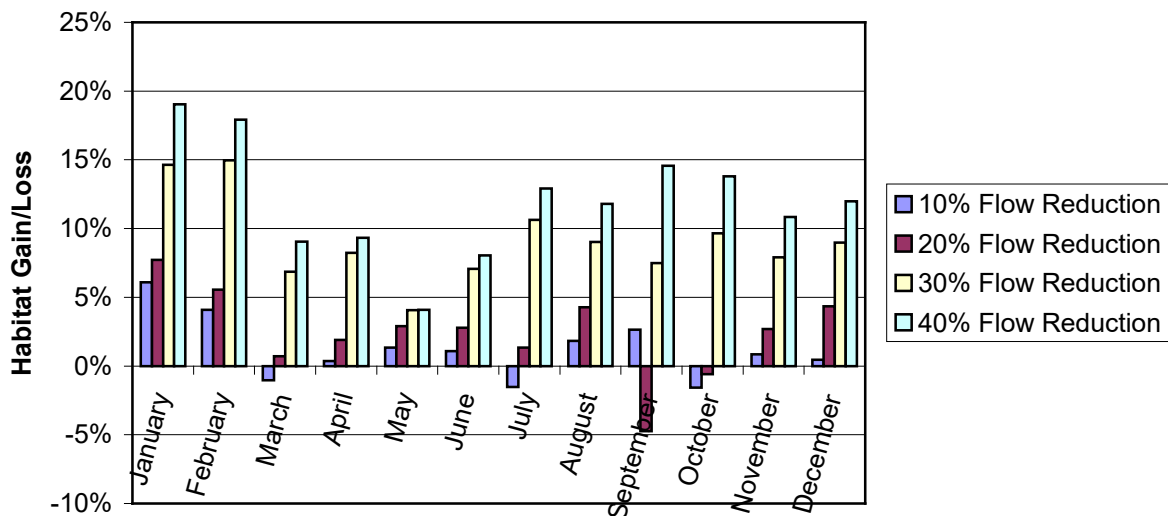
Predicted Habitat Gain/Loss for Largemouth Bass Fry Based on Historic Flow Conditions (1940-1969) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



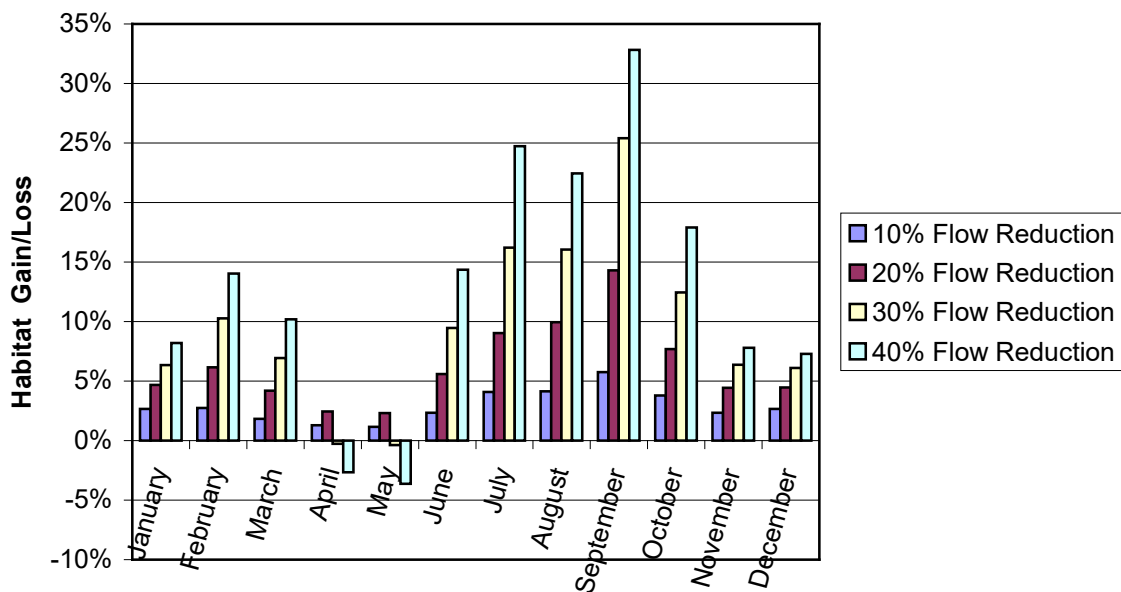
Predicted Habitat Gain/Loss for Largemouth Bass Fry Based on Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



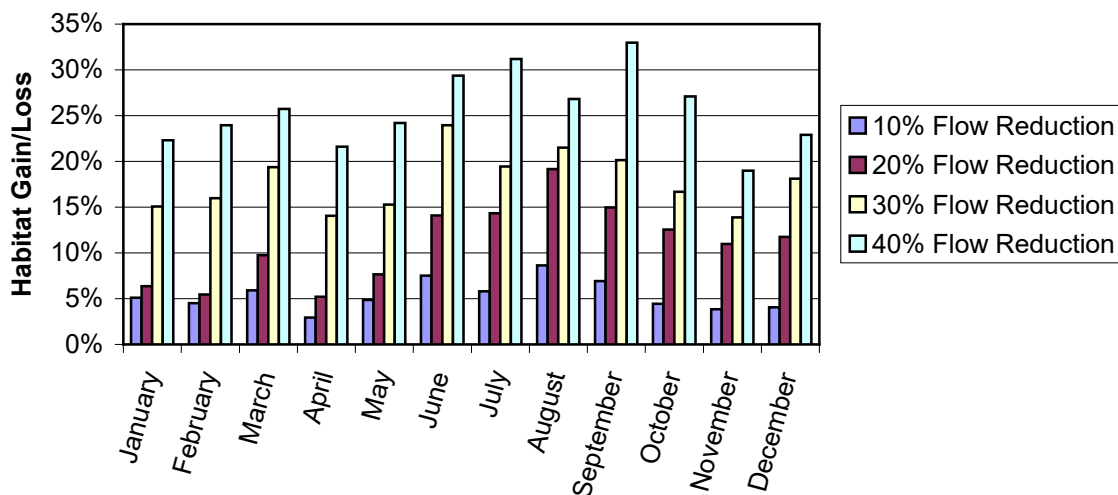
Predicted Habitat Gain/Loss for Bluegill Sunfish Adults Based on Historic Flow Conditions (1940-1969) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



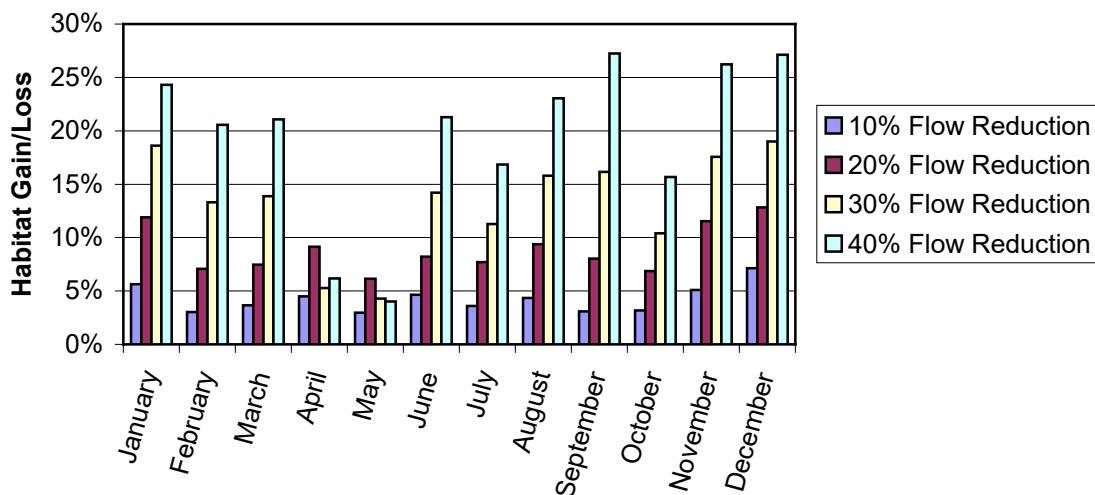
Predicted Habitat Gain/Loss for Bluegill Sunfish Adults Based on Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



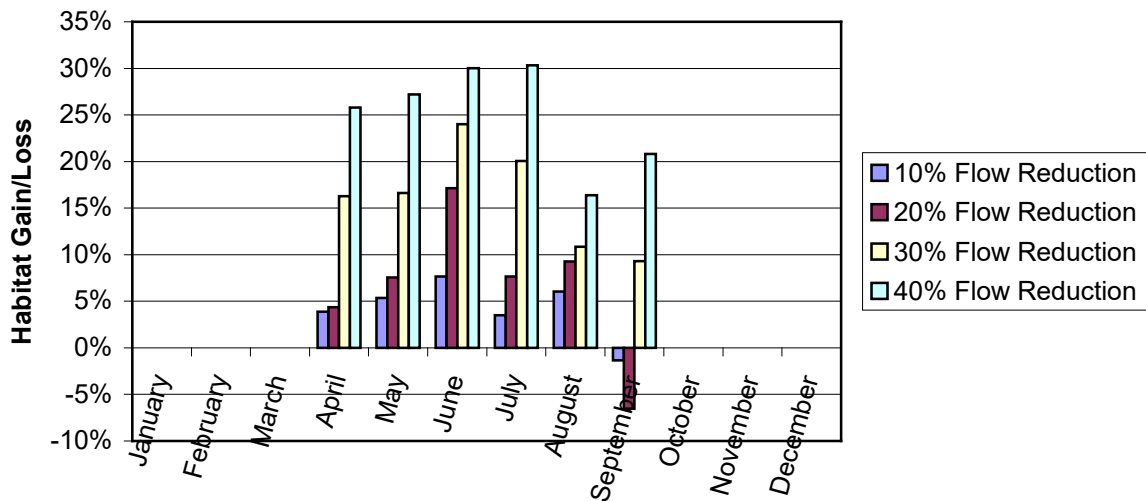
**Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles Based on
Historic Flow Conditions (1940-1969) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Arcadia**



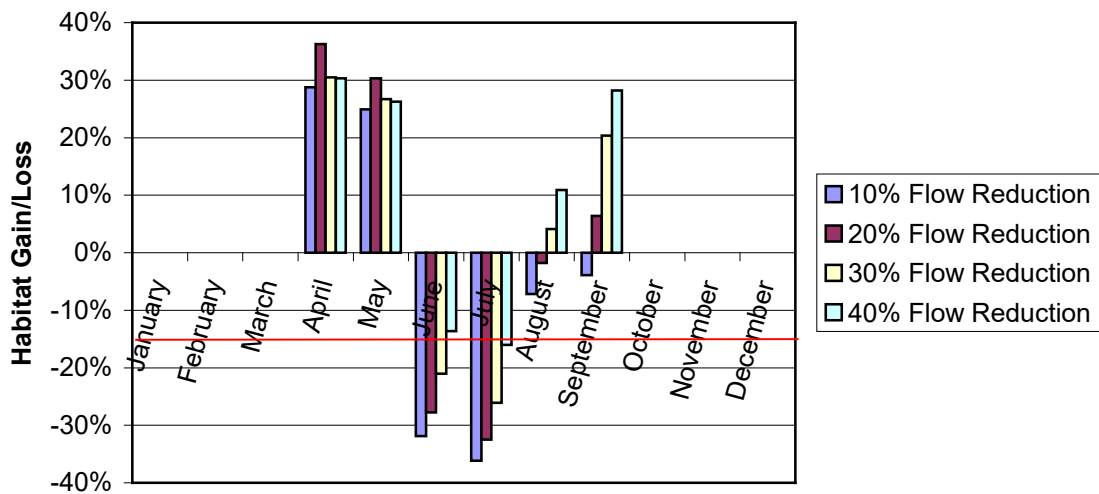
**Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles Based on
Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Arcadia**



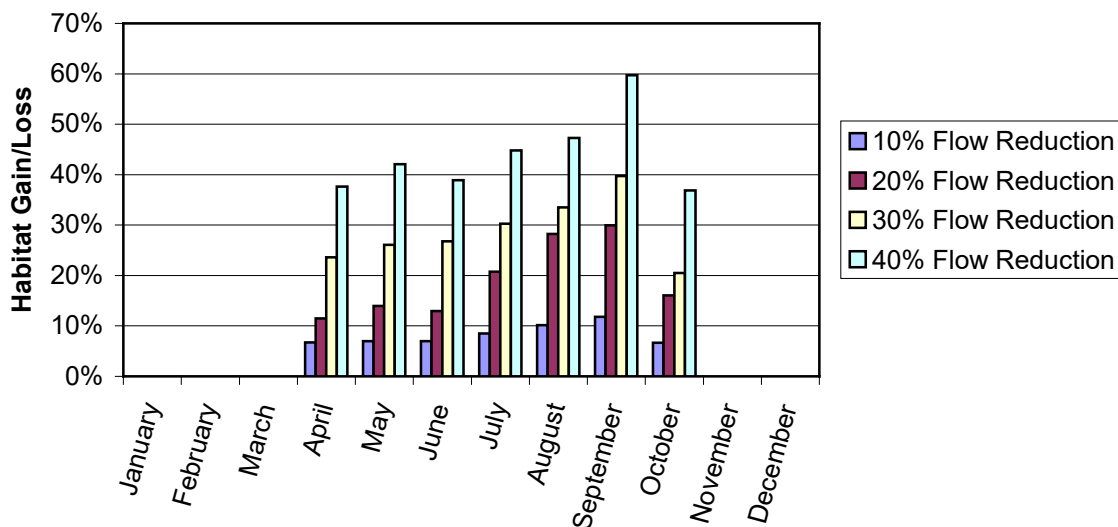
**Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning Based on
Historic Flow Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Arcadia**



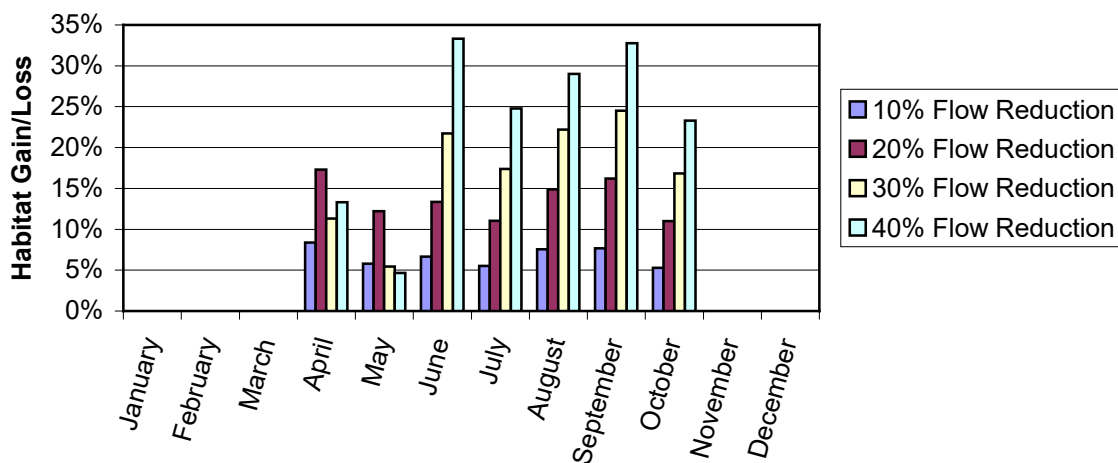
**Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning Based on
Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Arcadia**



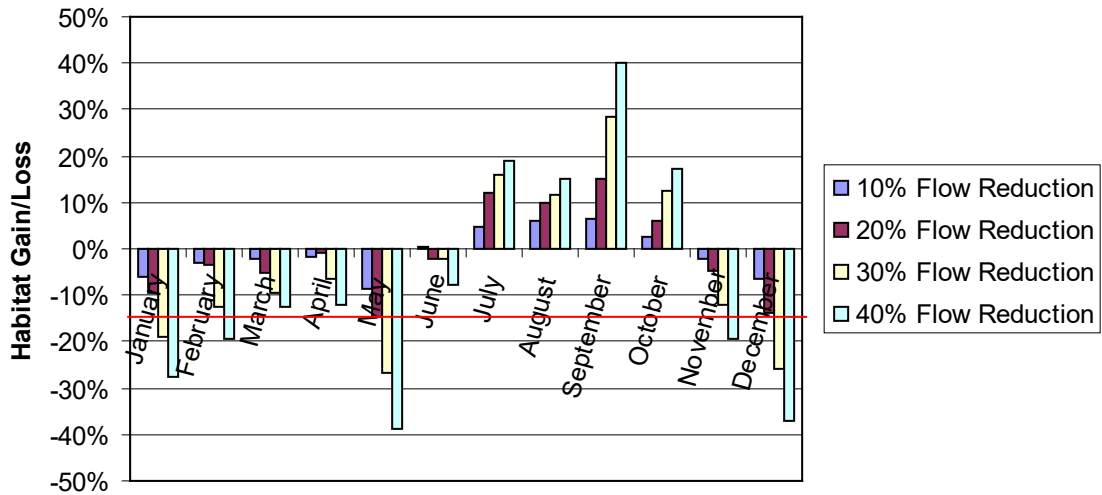
Predicted Habitat Gain/Loss for Bluegill Sunfish Fry Based on Historic Flow Conditions (1940-1969) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



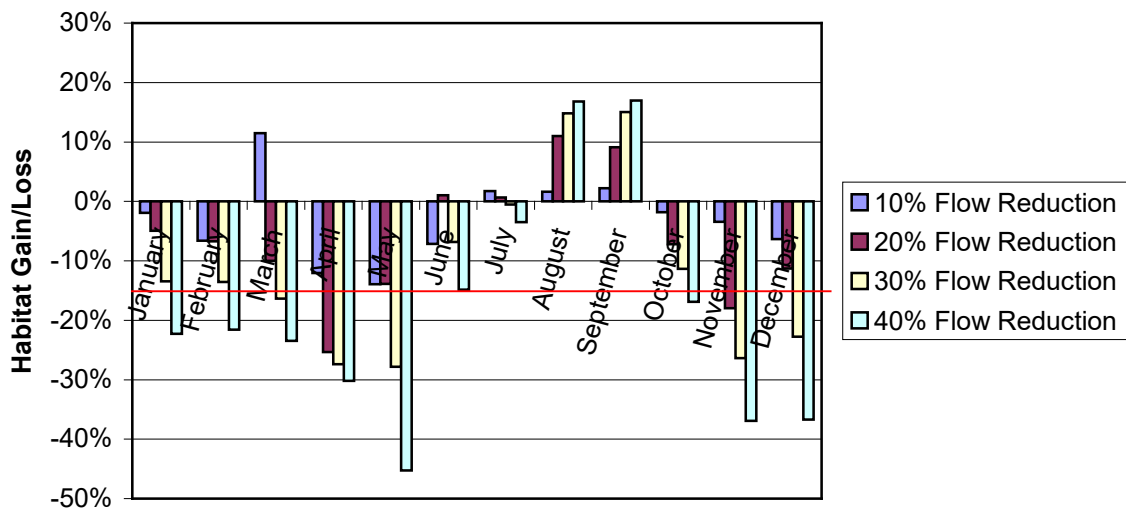
Predicted Habitat Gain/Loss for Bluegill Sunfish Fry Based on Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



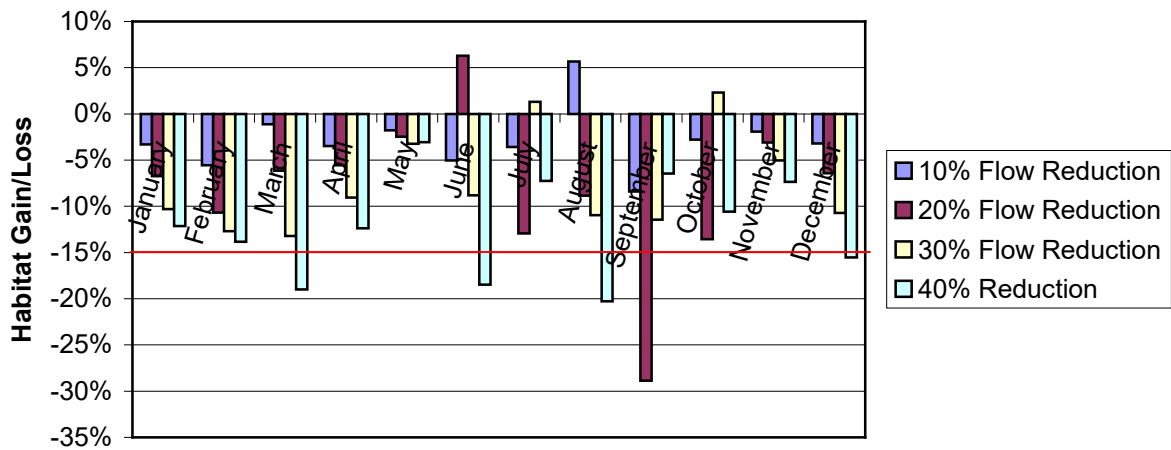
**Predicted Habitat Gain/Loss for Adult Spotted Sunfish Based on
Historic Flow Conditions (1940-1966) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Arcadia**



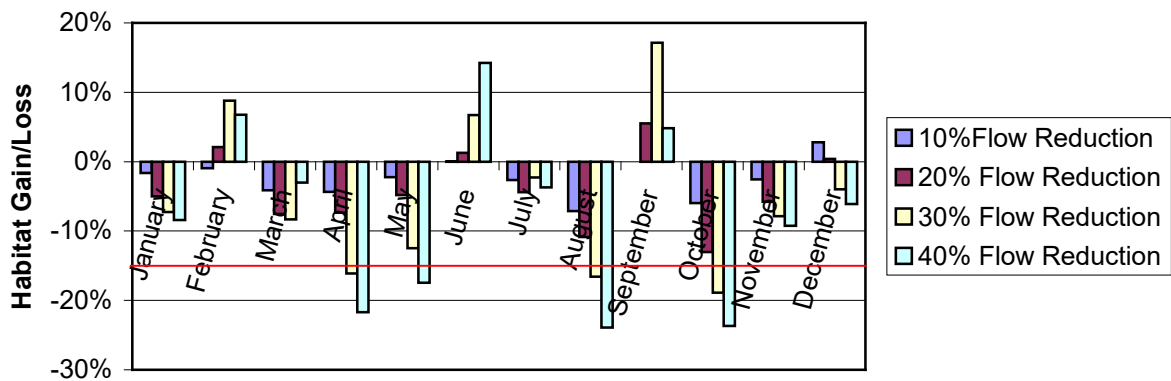
**Predicted Habitat Gain/Loss for Adult Spotted Sunfish Based on Historic
Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Arcadia**



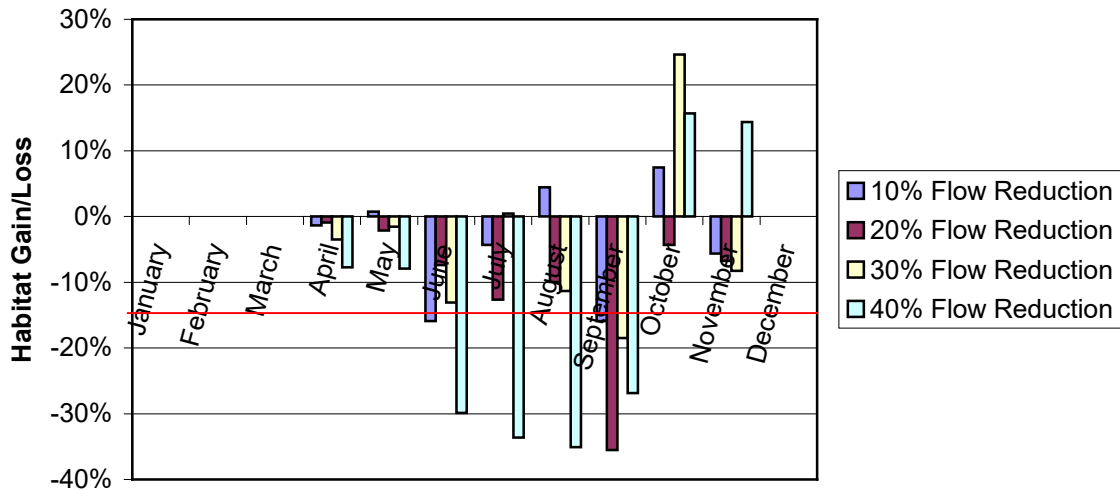
**Predicted Habitat Gain/Loss for Spotted Sunfish Juveniles Based on
Historic Flow Conditions (1940-1966) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Arcadia**



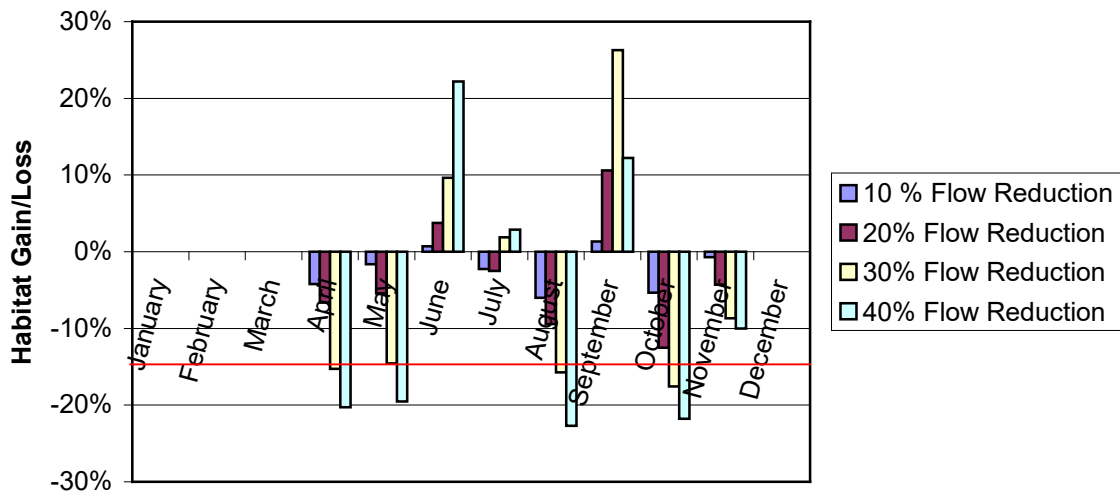
**Predicted Habitat Gain/Loss for Spotted Sunfish Juveniles Based on
Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Arcadia**



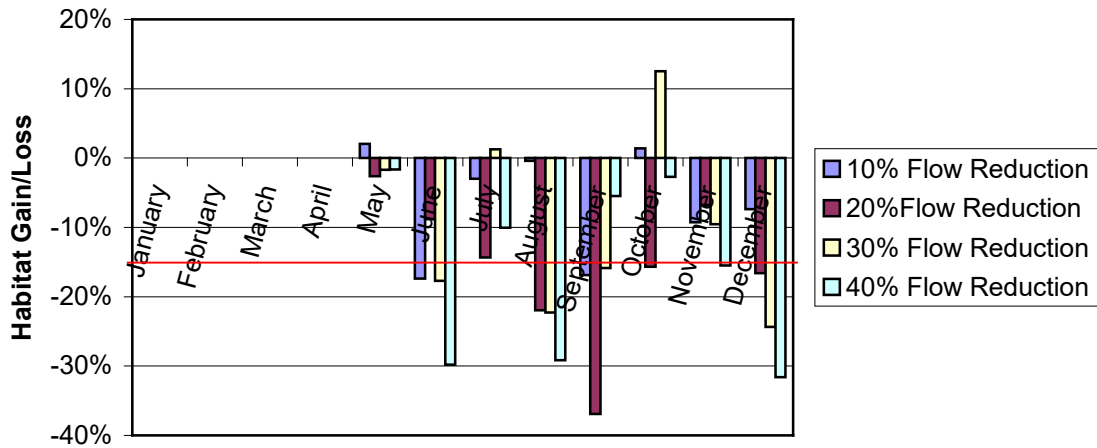
**Predicted Habitat Gain/Loss for Spotted Sunfish Spawning Based on
Historic Flow Conditions (1940-1966) being reduced by 10, 20, 30, and
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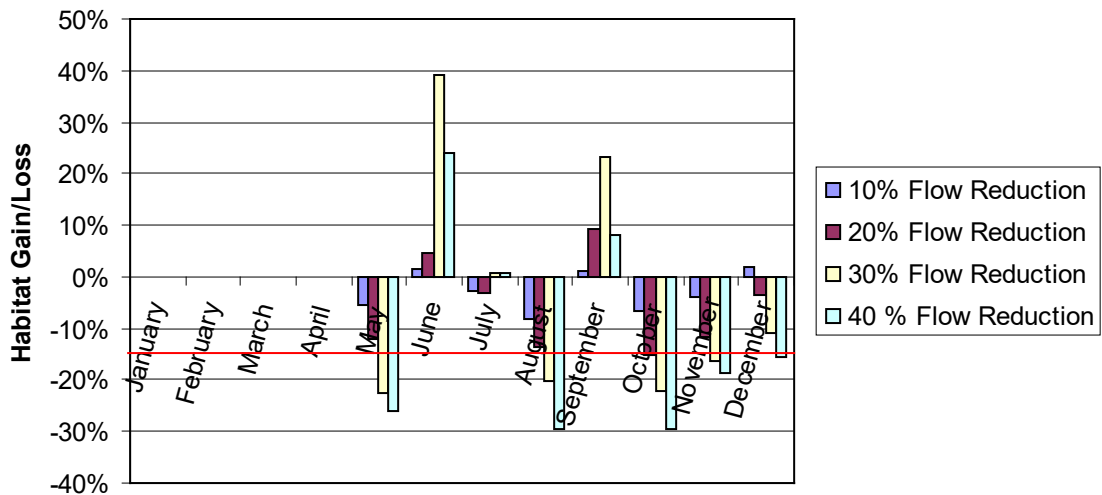
**Predicted Habitat Gain/Loss for Spotted Sunfish Spawning Based on
Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Arcadia**



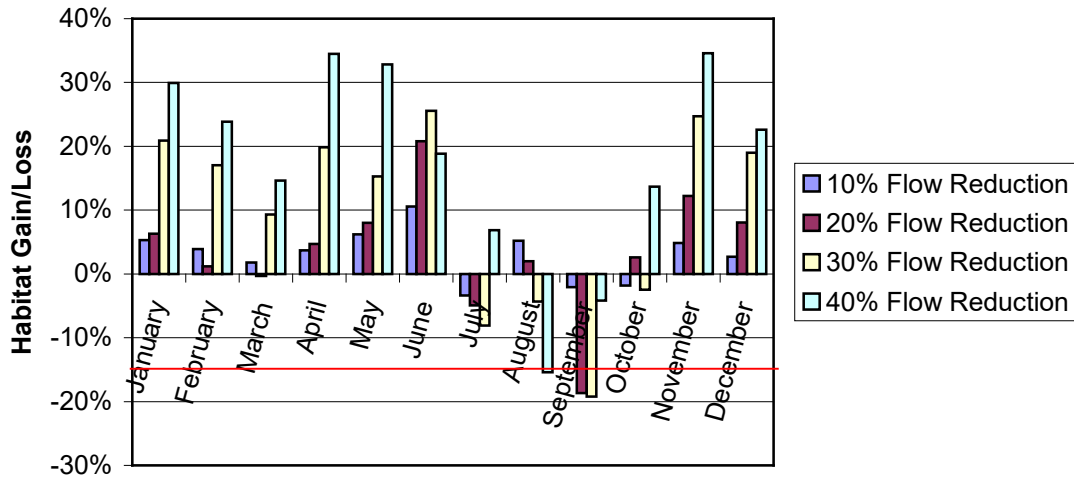
Predicted Habitat Gain/Loss for Spotted Sunfish Fry Based on Historic Flow Conditions (1940-1966) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



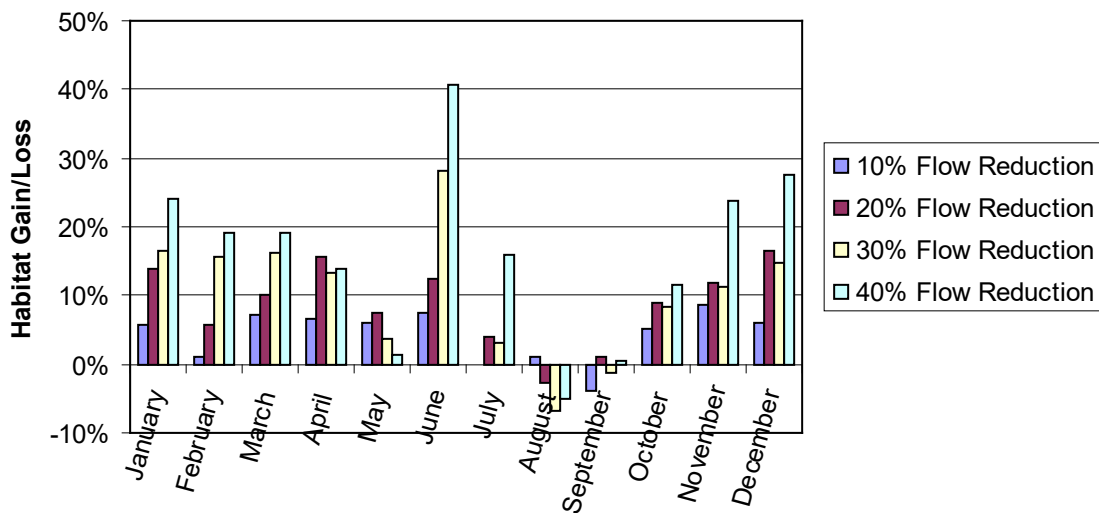
Predicted Habitat Gain/Loss for Spotted Sunfish Fry Based on Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



Predicted Habitat Gain/Loss for Benthic Macroinvertebrates Based on Historic Flow Conditions (1940-1966) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia



Predicted Habitat Gain/Loss for Benthic Macroinvertebrates Based on Historic Flow Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Arcadia

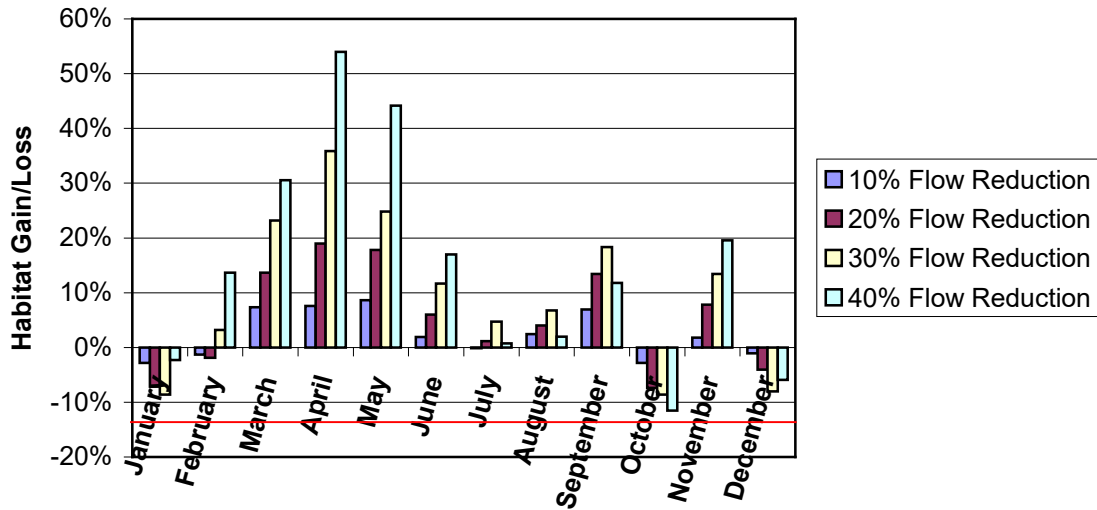


BIOLOGICAL RESTRICTIONS ON FLOW REDUCTIONS ON THE MIDDLE PEACE RIVER AT ARCADIA

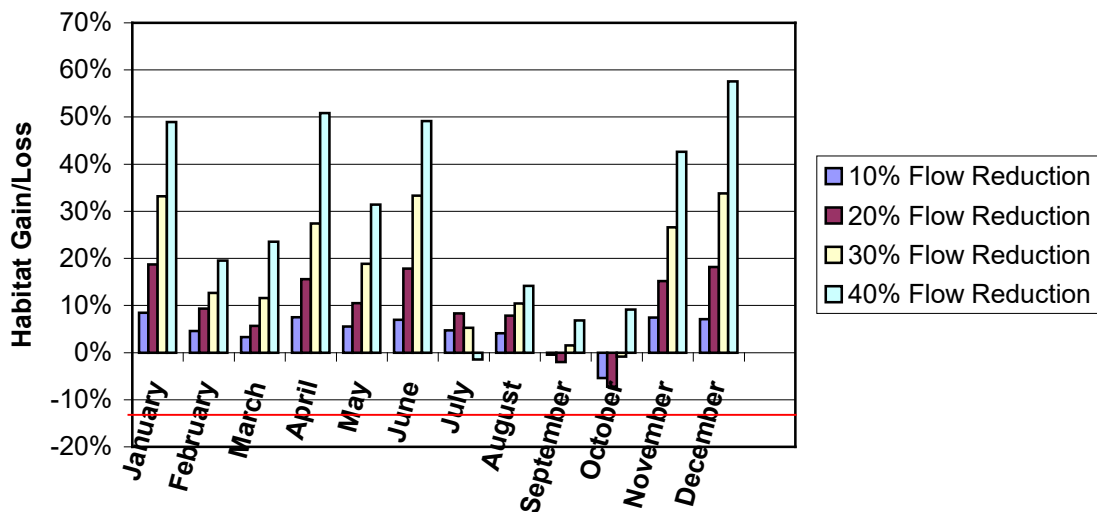
(1970-1999) FLOW RECORDS			(1940-1969) FLOW RECORDS		
Month	Restriction*	Overriding Consideration	Month	Restriction*	Overriding Consideration
January	30% Flow Reduction	Spotted Sunfish Adults	January	20% Flow Reduction	Spotted Sunfish Adults
February	30% Flow Reduction	Spotted Sunfish Adults	February	30% Flow Reduction	Spotted Sunfish Adults
March	30% Flow Reduction	Spotted Sunfish Adults	March	30% Flow Reduction	Spotted Sunfish Juveniles
April	10% Flow Reduction	Spotted Sunfish Adults	April	None	
May	20% Flow Reduction	Largemouth Bass Fry	May	20% Flow Reduction	Spotted Sunfish Adults
June	No Flow Reductions	Bluegill Sunfish Spawning	June	No Flow Reductions	Spotted Sunfish Spawning & Fry
July	No Flow Reductions	Bluegill Sunfish Spawning	July	30% Flow Reduction	Spotted Sunfish Spawning
August	20% Flow Reduction	Spotted Sunfish Fry	August	10% Flow Reduction	Spotted Sunfish Fry
September	None		September	No Flow Reductions	Spotted Sunfish Spawning & Fry
October	20% Flow Reduction	Spotted Sunfish Fry	October	None	
November	10% Flow Reduction	Spotted Sunfish Adults	November	30% Flow Reduction	Spotted Sunfish Adults
December	20% Flow Reduction	Spotted Sunfish Adults	December	10% Flow Reduction	Spotted Sunfish Fry

***Maximum Flow reduction; If "None" is entered, a maximum 50% reduction is assumed**

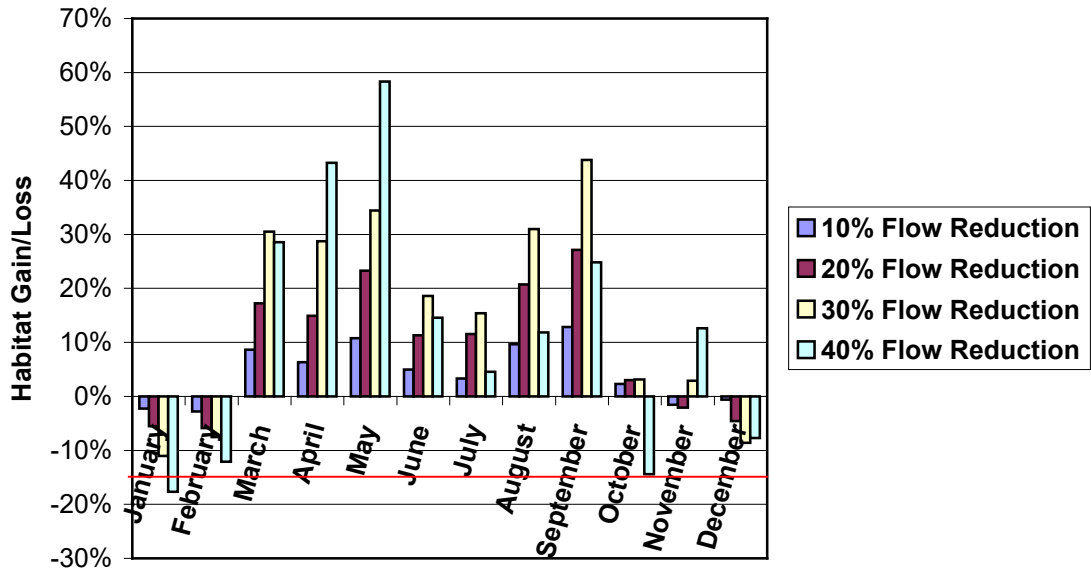
**Predicted Habitat Gain/Loss for Largemouth Bass Adults Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



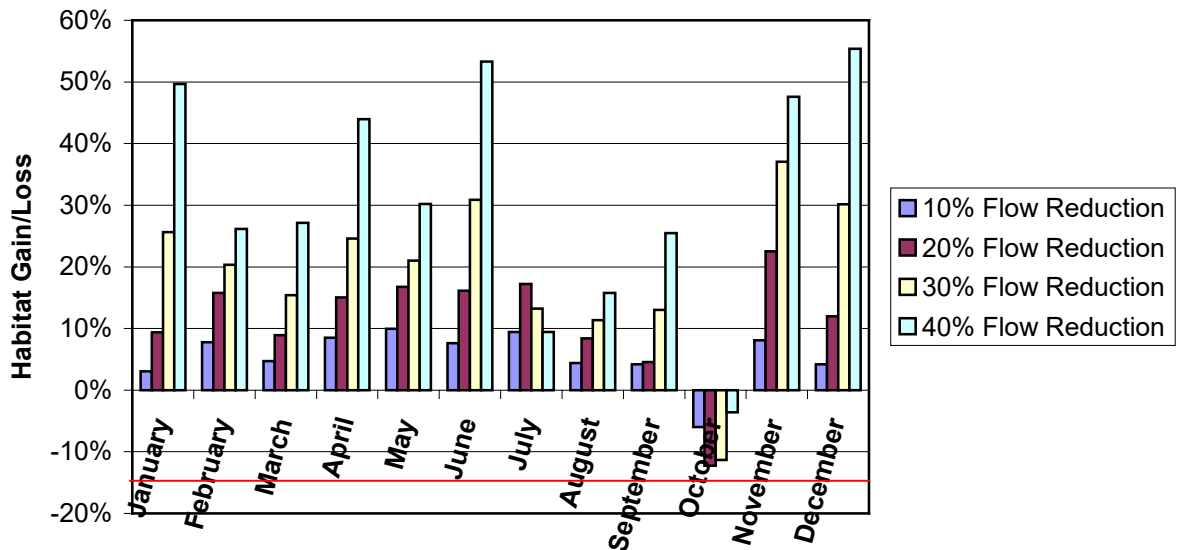
**Predicted Habitat Gain/Loss for Largemouth Bass Adults Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



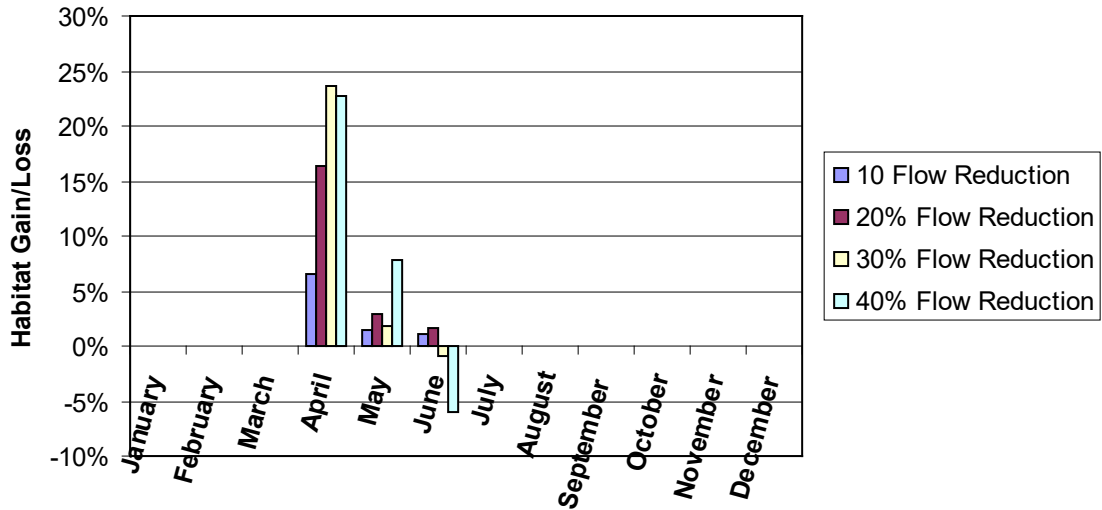
**Predicted Habitat Gain/Loss for Largemouth Bass Juveniles Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



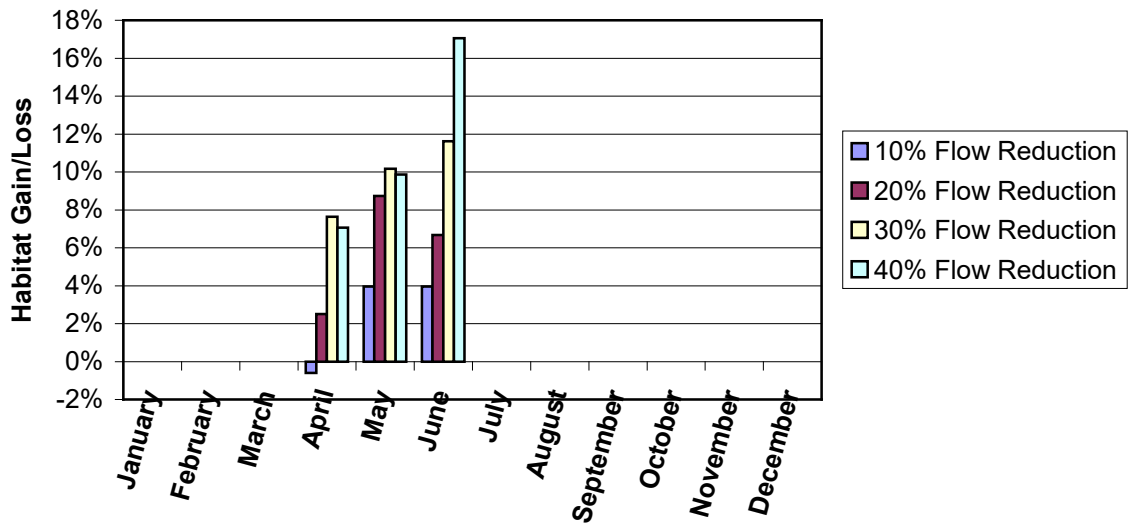
**Predicted Habitat Gain/Loss for Largemouth Bass Juveniles Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent
at Middle Peace River at Zolfo Springs**



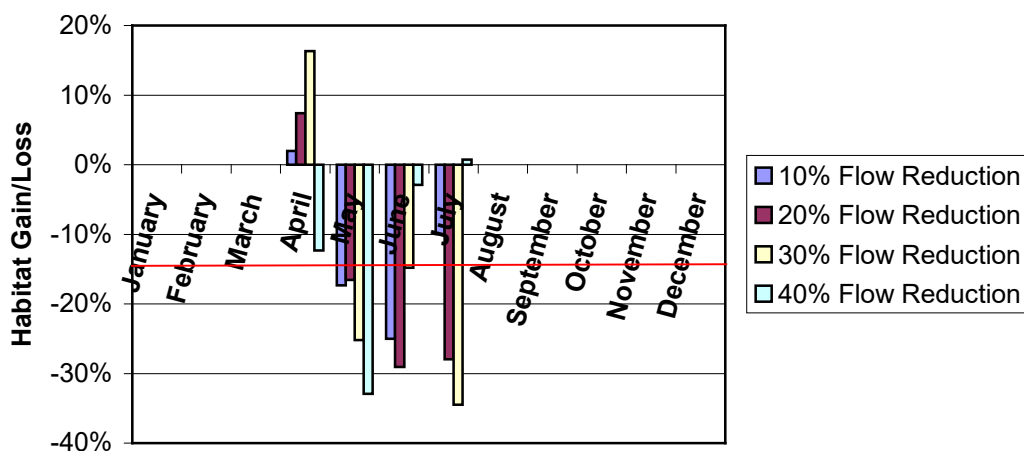
**Predicted Habitat Gain/Loss for Largemouth Bass Spawning Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



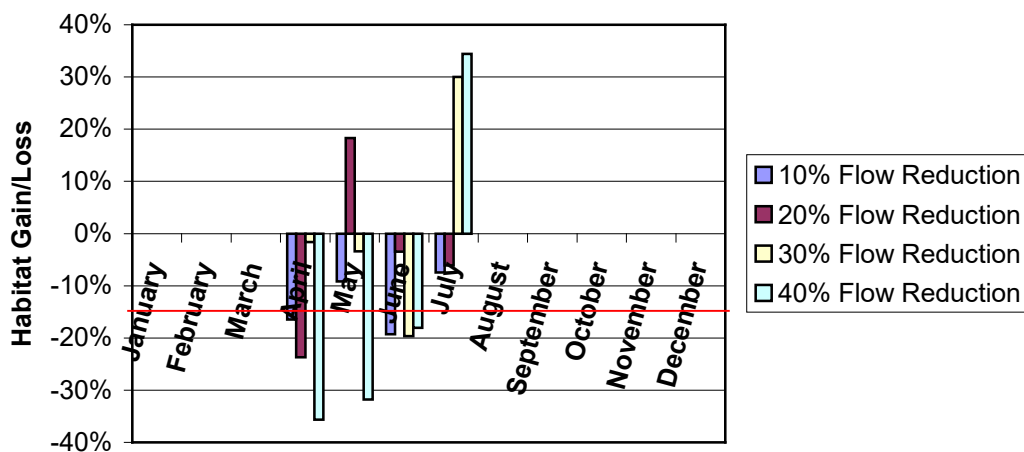
**Predicted Habitat Gain/Loss for Largemouth Bass Spawning Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



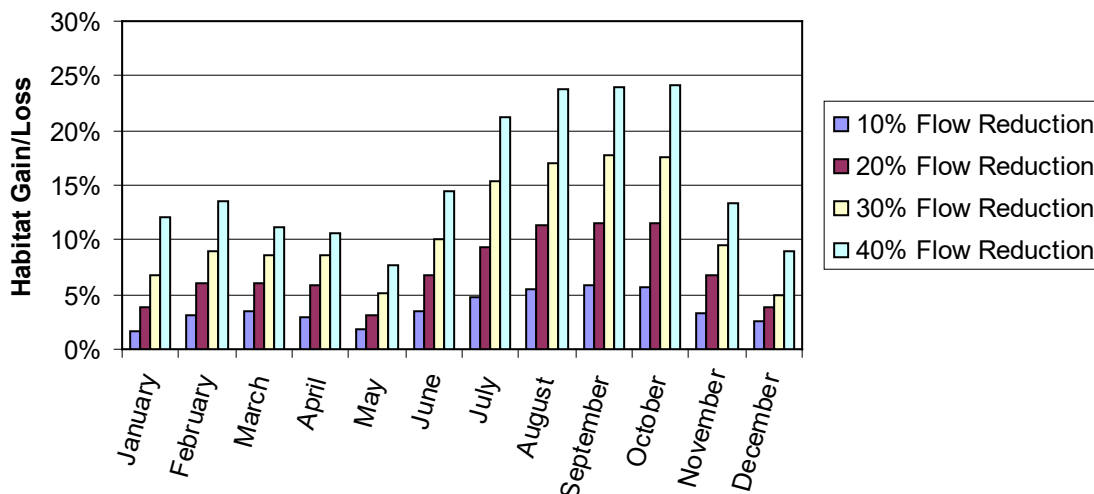
**Predicted Habitat Gain/Loss for Largemouth Bass Fry Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Zolfo Springs**



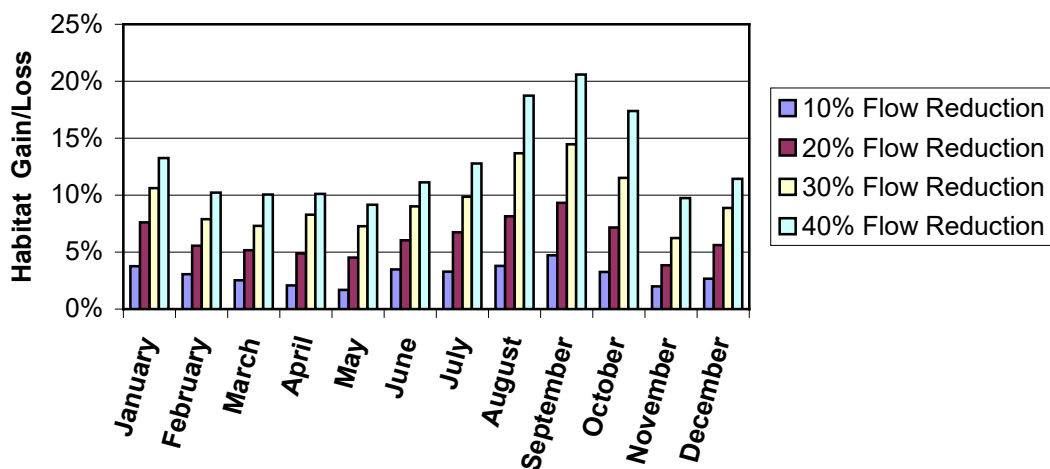
**Predicted Habitat Gain/Loss for Largemouth Bass Fry Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and
40 percent at Middle Peace River at Zolfo Springs**



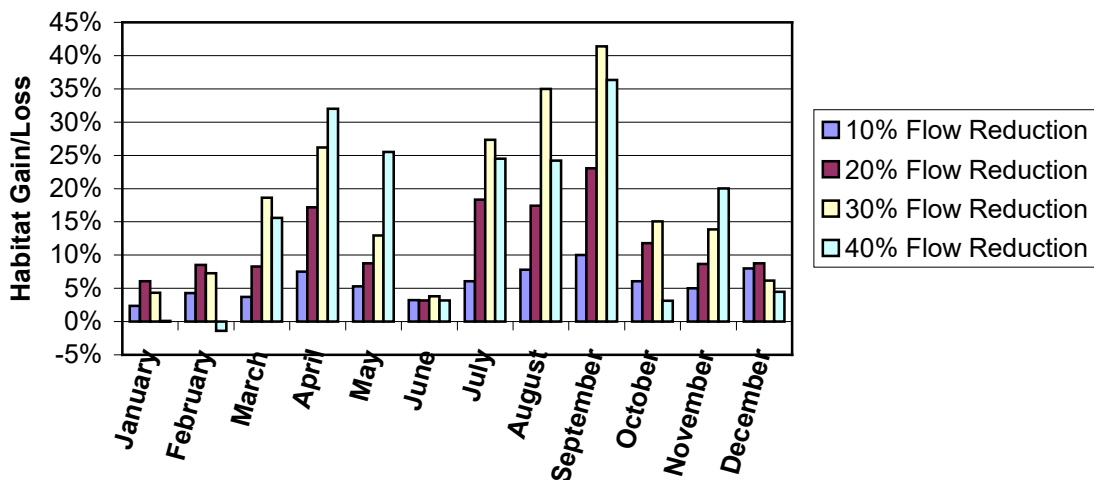
**Predicted Habitat Gain/Loss for Bluegill Sunfish Adults Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



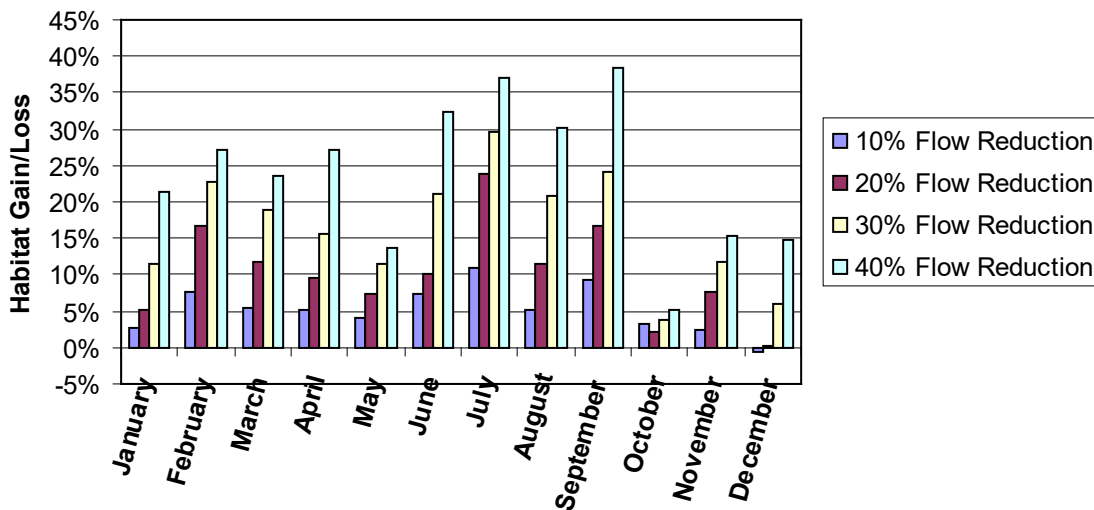
**Predicted Habitat Gain/Loss for Bluegill Sunfish Adults Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



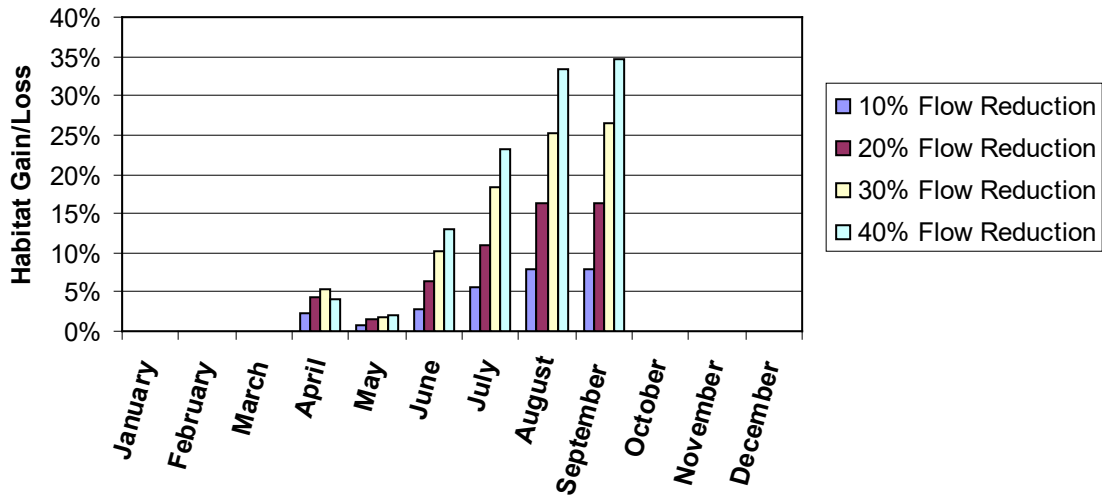
**Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



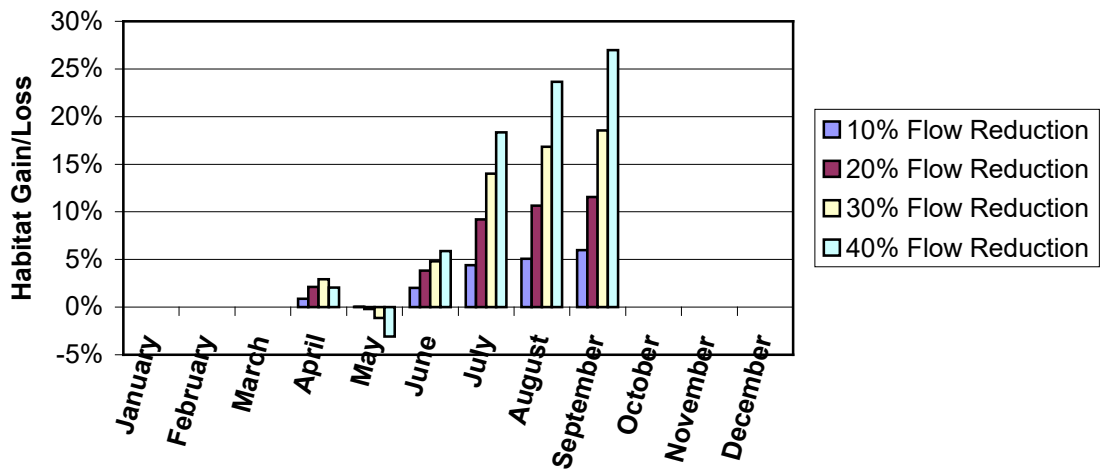
**Predicted Habitat Gain/Loss for Bluegill Sunfish Juveniles Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



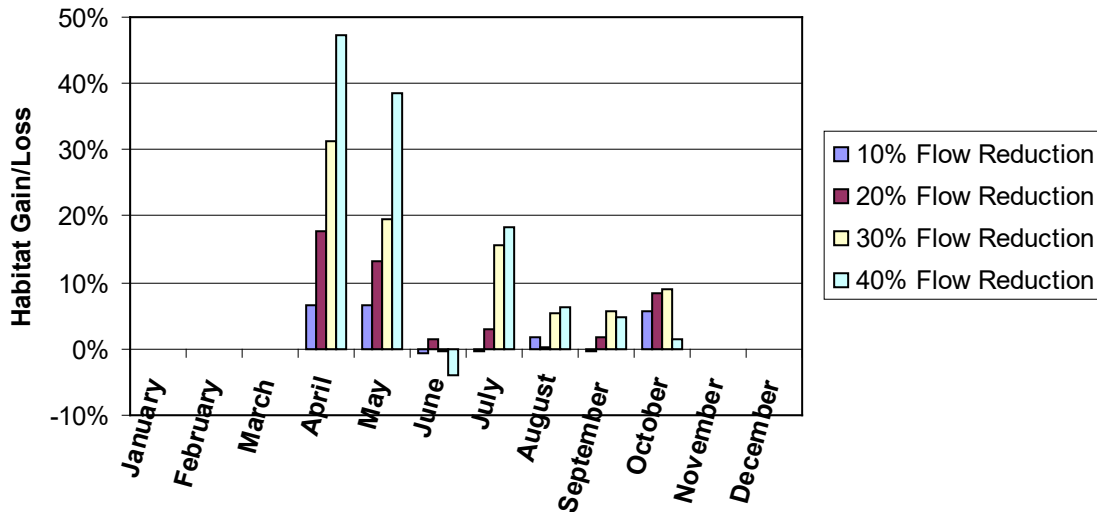
**Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



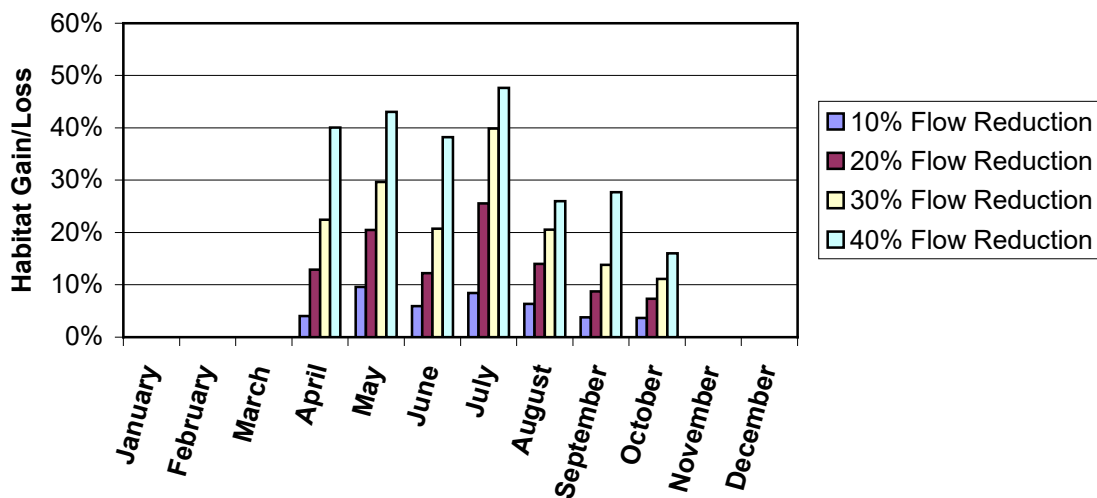
**Predicted Habitat Gain/Loss for Bluegill Sunfish Spawning Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



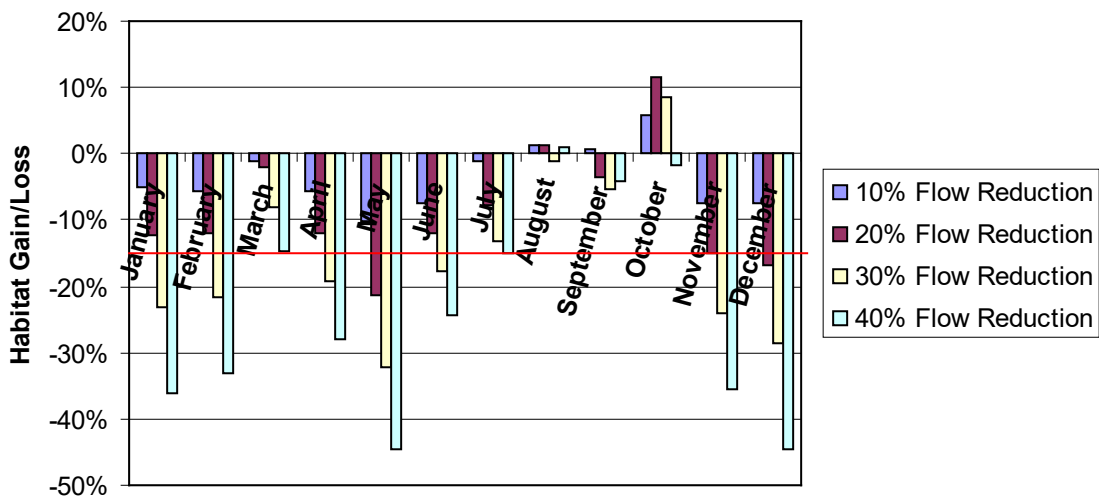
Predicted Habitat Gain/Loss for Bluegill Sunfish Fry Based on Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Zolfo Springs



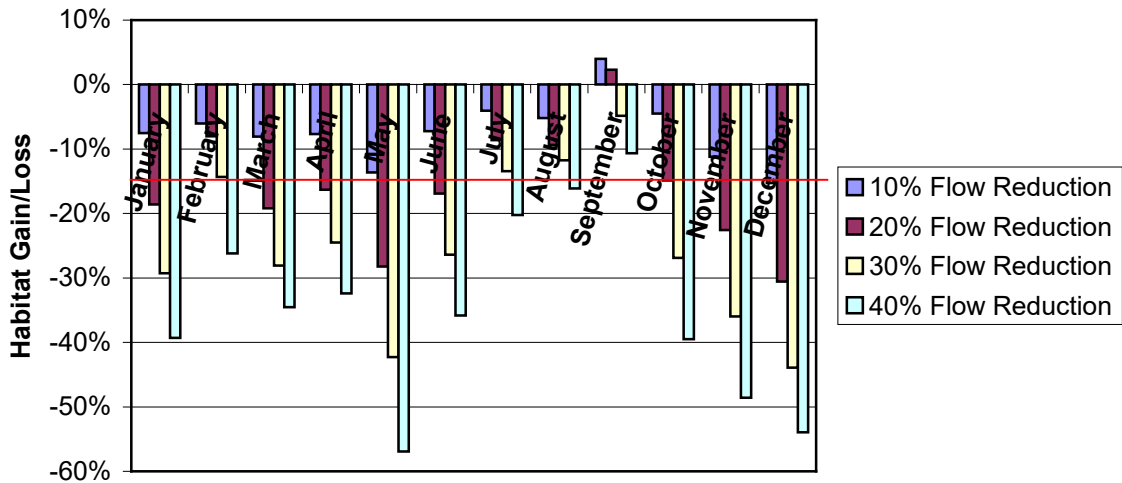
Predicted Habitat Gain/Loss for Bluegill Sunfish Fry Based on Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Zolfo Springs



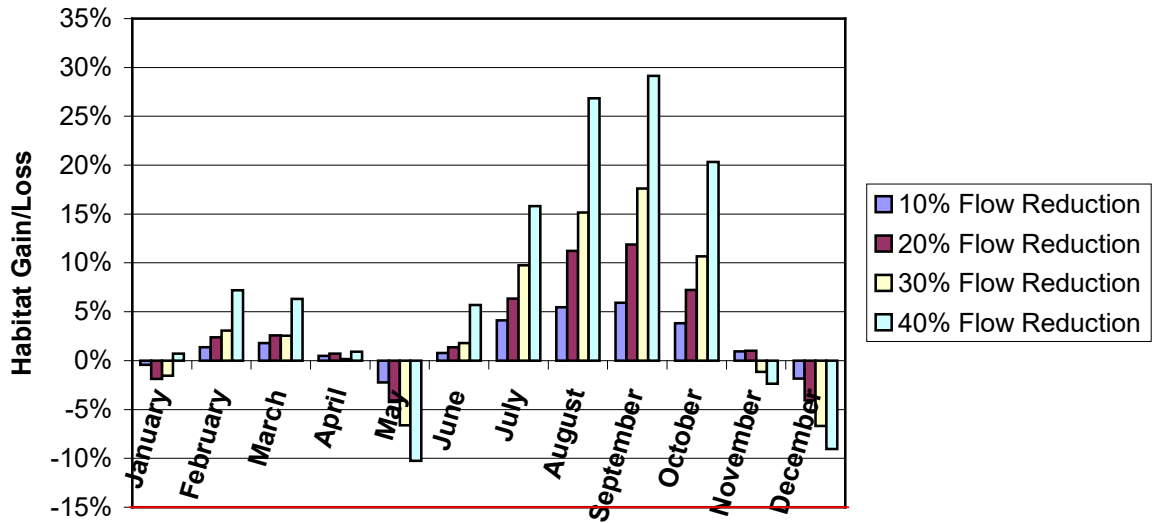
**Predicted Habitat Gain/Loss for Adult Spotted Sunfish Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



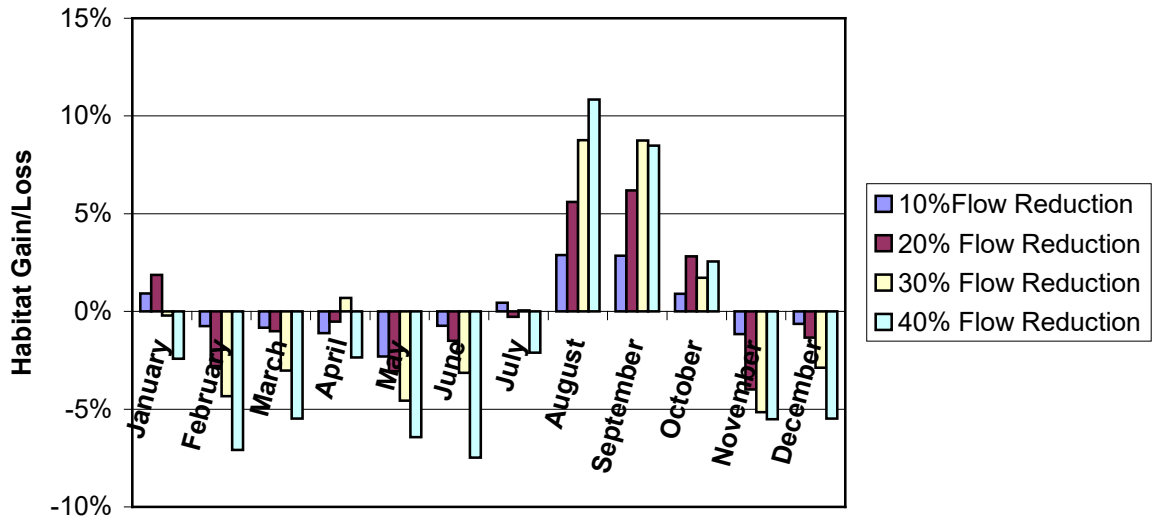
**Predicted Habitat Gain/Loss for Spotted Sunfish Adults Based on Historic
Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at
Middle Peace River at Zolfo Springs**



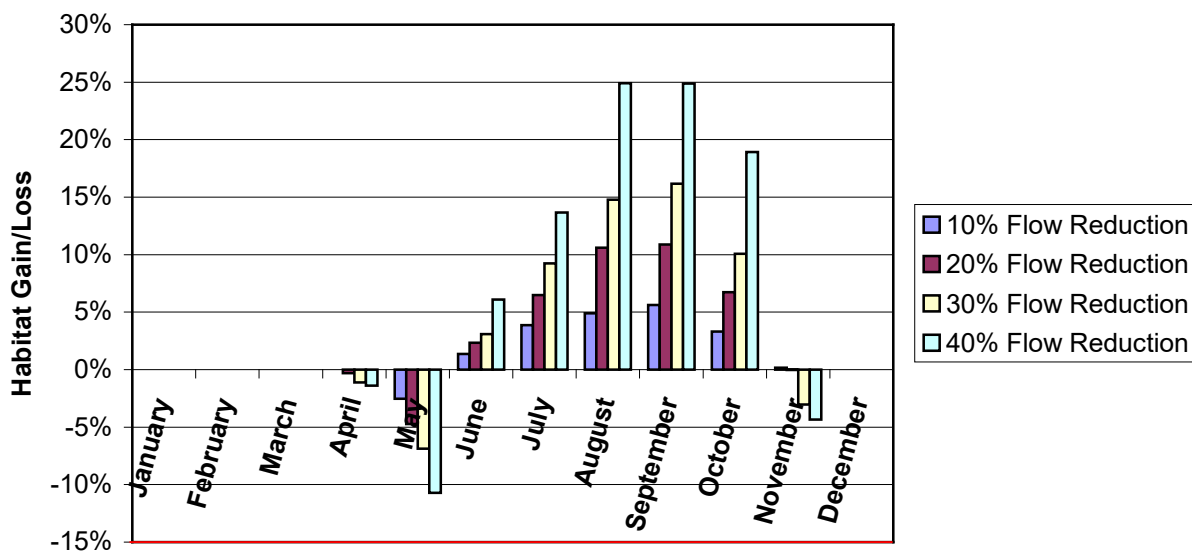
**Predicted Habitat Gain/Loss for Juvenile Spotted Sunfish Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



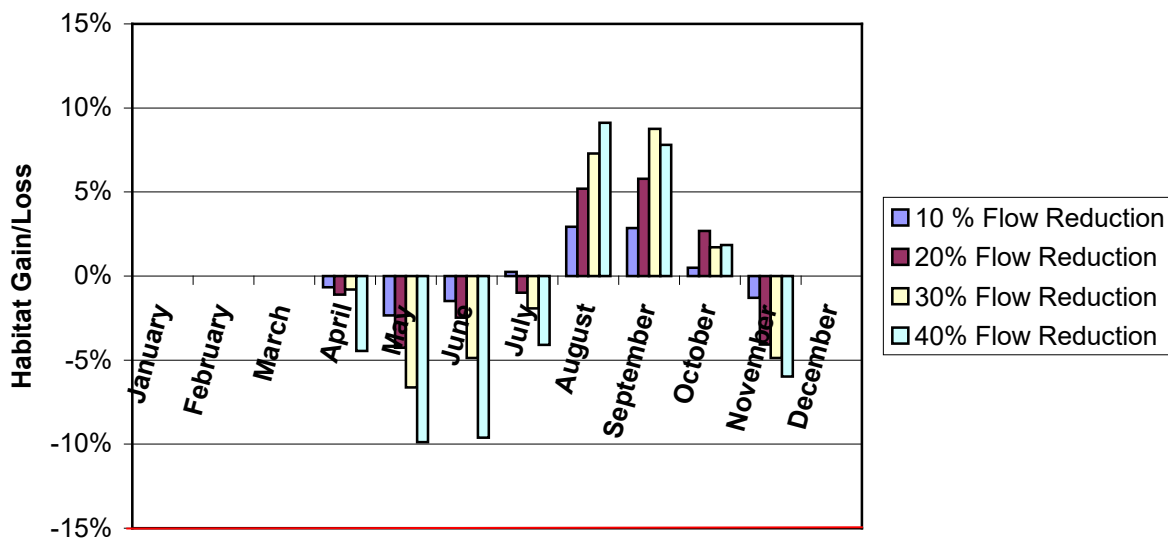
**Predicted Habitat Gain/Loss for Juvenile Spotted Sunfish Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



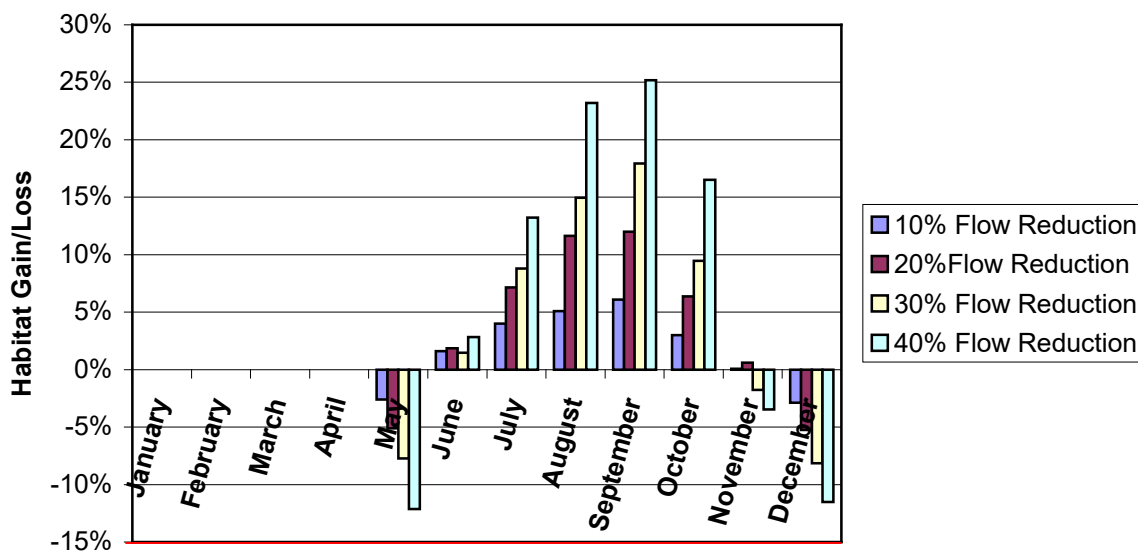
**Predicted Habitat Gain/Loss for Spawning Spotted Sunfish Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40 percent
at Middle Peace River at Zolfo Springs**



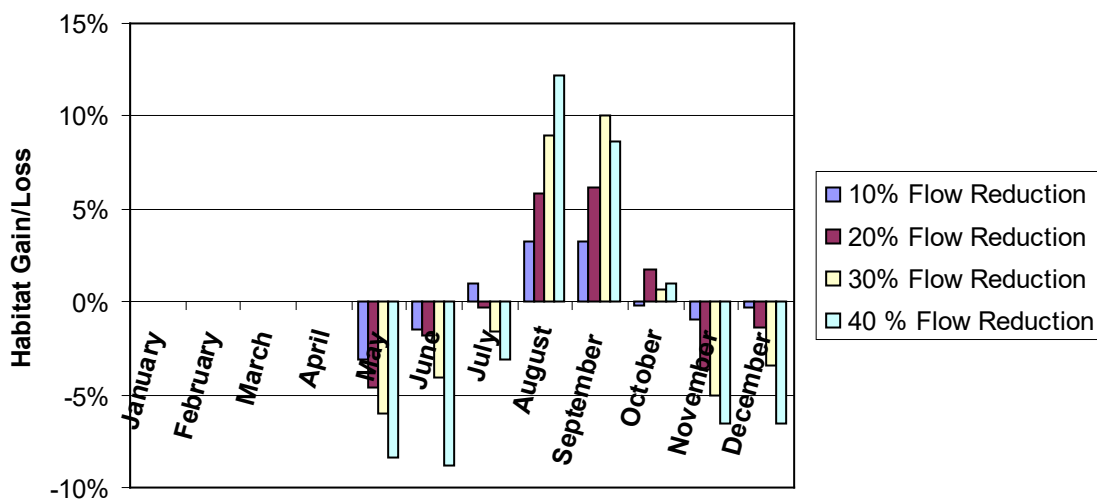
**Predicted Habitat Gain/Loss for Spawning Spotted Sunfish Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent
at Middle Peace River at Zolfo Springs**



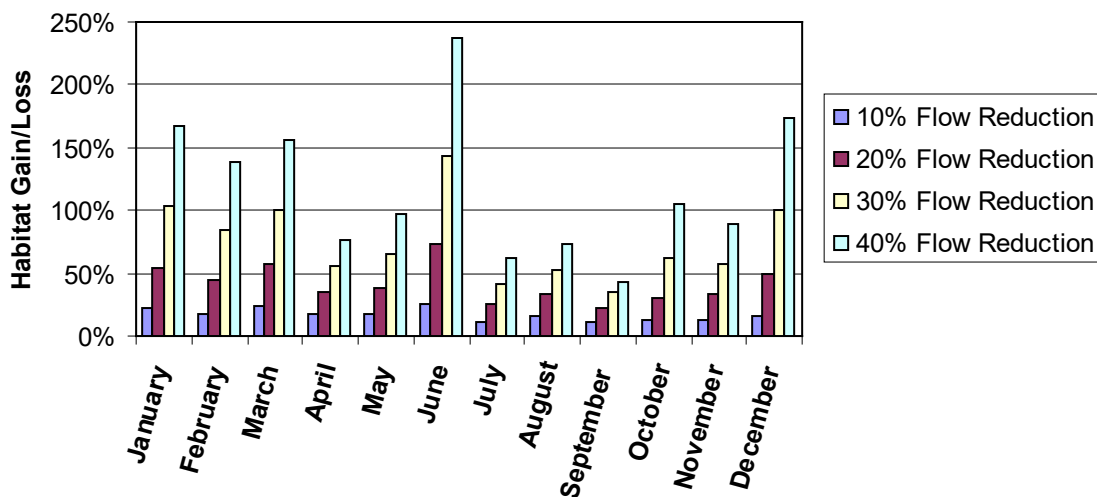
Predicted Habitat Gain/Loss for Spotted Sunfish Fry Based on Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Zolfo Springs



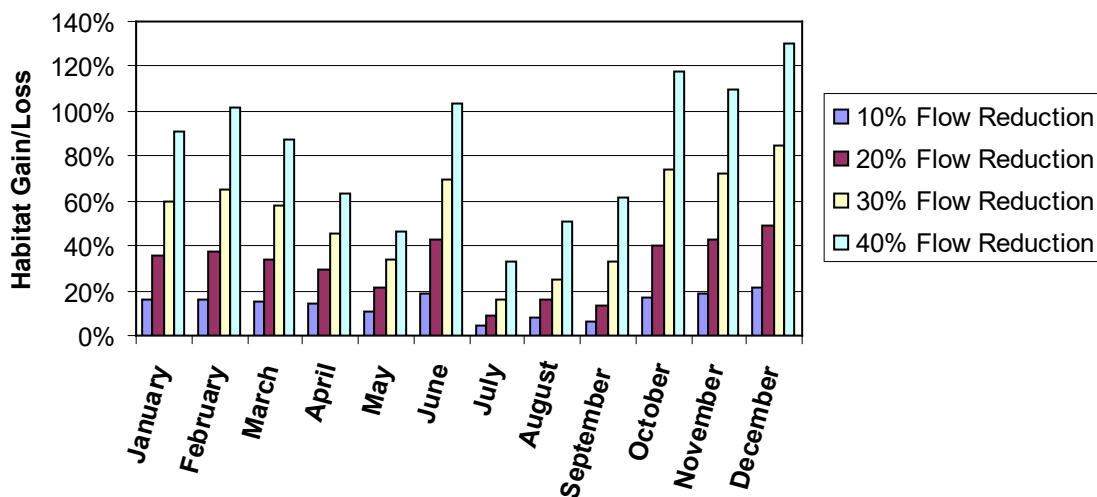
Predicted Habitat Gain/Loss for Spotted Sunfish Fry Based on Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40 percent at Middle Peace River at Zolfo Springs



**Predicted Habitat Gain/Loss for Benthic Macroinvertebrates Based on
Historic Conditions (1940-1969) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



**Predicted Habitat Gain/Loss for Benthic Macroinvertebrates Based on
Historic Conditions (1970-1999) being reduced by 10, 20, 30, and 40
percent at Middle Peace River at Zolfo Springs**



BIOLOGICAL RESTRICTIONS ON FLOW REDUCTIONS ON THE MIDDLE PEACE RIVER AT ZOLFO SPRINGS

(1970-1999) FLOW RECORDS			(1940-1969) FLOW RECORDS		
Month	Restriction*	Overriding Consideration	Month	Restriction*	Overriding Consideration
January	20% flow reduction	Spotted Sunfish Adults	January	30%flow reduction	Spotted Sunfish Adults
February	30% flow reduction	Spotted Sunfish Adults	February	30% flow reduction	Spotted Sunfish Adults
March	20% flow reduction	Spotted Sunfish Adults	March	40% flow reduction	Spotted Sunfish Adults
April	10% flow reduction	Largemouth Bass Fry	April	30% flow reduction	Spotted Sunfish Adults
May	10% flow reduction	Spotted Sunfish Adults	May	10% flow reduction	Largemouth Bass Fry
June	10% flow reduction	Largemouth Bass Fry	June	5% flow reduction	Largemouth Bass Fry
July	40% flow reduction	Spotted Sunfish Adults	July	15% flow reduction	Largemouth Bass Fry
August	40% flow reduction	Spotted Sunfish Adults	August	None	
September	None		September	None	
October	20% flow reduction	Spotted Sunfish Adults	October	40% flow reduction	Largemouth Bass Juveniles
November	20% flow reduction	Spotted Sunfish Adults	November	20% flow reduction	Spotted Sunfish Adults
December	10% flow reduction	Spotted Sunfish Adults	December	20% flow reduction	Spotted Sunfish Adults
* Maximum Flow restriction; If 'None' is entered, a maximum 50% reduction is assumed					

APPENDIX RH

Riparian Habitats – RH

This appendix contains a number of tables related to critical floodplain elevations on the Middle Peace River as described below.

Figures and Tables	PAGE
Table 1. Floodplain Critical Elevations – based on mean elevation of river terrace vegetation zone.	RH - 2
Table 2. Floodplain Critical Elevations – based on mean elevation of wet hardwood hammock vegetation zone.	RH - 2
Table 3. Floodplain Critical Elevations – based on mean elevation of cypress vegetation zone.	RH - 3
Table 4. Floodplain Critical Elevations – based on mean elevation of hardwood swamp vegetation zone.	RH - 3
Table 5. Floodplain Critical Elevations – based on mean elevation of mucky soils.	RH - 4
Table 6. Floodplain Critical Elevations – based on inundating lowest bank top elevation to put water over one side of the floodplain.	RH - 4
Table 7. Floodplain Critical Elevations – based on inundating the lowest bank top elevation to put water over both sides of the floodplain.	RH - 5
Table 8. Floodplain Critical Elevations – based on inundating the 90 th percentile elevation of the river terrace vegetation zone.	RH - 5
Table 9. Floodplain Critical Elevations – based on inundating the 90 th percentile elevation of the wet hardwood hammock vegetation zone.	RH - 6

Table 1. Floodplain Critical Elevations – based on mean elevation of river terrace vegetation zone.

Study Site	River Terrace Mean Elevation (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	46.2	5142	Arcadia	2.7
2AR	42.2	2381	Arcadia	12.3
3C	36.5	5493	Arcadia	2.2
13	36.6	8020	Arcadia	0.3
4A	30.4	2058	Arcadia	15.6
5B	27.4	3022	Arcadia	7.9
11	-	-	Arcadia	-
7	-	-	Arcadia	-
8D	13.2	1715	Arcadia	19.4
12	-	-	Arcadia	-

Mean = 3975.9 8.6
Std. Dev. = 2318.8 7.4

Table 2. Floodplain Critical Elevations – based on mean elevation of wet hardwood hammock vegetation zone.

Study Site	Mean Wet Hardwood Hammock Elevation (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	48.6	9139	Arcadia	<.3
2AR	45.2	4966	Arcadia	2.7
3C	37.3	6963	Arcadia	0.8
13	34.6	4984	Arcadia	2.7
4A	31.5	2810	Arcadia	9
5B	-	-	Arcadia	-
11	28.3	3792	Arcadia	4.9
7	21.8	6856	Arcadia	1.1
8D	-	-	Arcadia	-
12	-	-	Arcadia	-

Mean = 5644.3 3.5
Std. Dev. = 2151.8 3.1

Table 3. Floodplain Critical Elevations – based on mean elevation of cypress vegetation zone.

Study Site	Mean Cypress Elevation (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	-	-	Arcadia	-
2AR	-	-	Arcadia	-
3C	35.3	3718	Arcadia	5.2
13	32.7	2936	Arcadia	8.5
4A	-	-	Arcadia	-
5B	25.0	1983	Arcadia	16.4
11	-	-	Arcadia	-
7	-	-	Arcadia	-
8D	-	-	Arcadia	-
12	-	-	Arcadia	-
Mean =		2879		10.0
Std. Dev. =		868.9		5.8

Table 4. Floodplain Critical Elevations – based on mean elevation of hardwood swamp vegetation zone.

Study Site	Mean Hardwood Swamp Elevation (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	-	-	Arcadia	-
2AR	44.7	4409	Arcadia	3.55
3C	-	-	Arcadia	-
13	-	-	Arcadia	-
4A	-	-	Arcadia	-
5B	24.5	1799	Arcadia	18.3
11	24.8	2093	Arcadia	15.3
7	18.1	3437	Arcadia	6.0
8D	-	-	Arcadia	-
12	-	-	Arcadia	-
Mean =		2934.5		10.8
Std. Dev. =		1214.4		7.1

Table 5. Floodplain Critical Elevations – based on mean elevation of mucky soils.

Study Site	Mean Mucky Soils Elevation (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	42.6	1288	Arcadia	26.0
2AR	44.1	3807	Arcadia	4.6
3C	-	-	Arcadia	-
13	-	-	Arcadia	-
4A	-	-	Arcadia	-
5B	24.4	1764	Arcadia	18.9
11	27.9	3552	Arcadia	5.7
7	16.2	2360	Arcadia	12.6
8D	12.1	1316	Arcadia	25.4
12	-	-	Arcadia	-

Mean = 2347.8 15.5
Std. Dev. = 1105.3 9.4

Table 6. Floodplain Critical Elevations – based on inundating lowest bank top elevation to put water over one side of the floodplain.

Study Site	Lowest LOW BANK Elevation (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	47	6347	Arcadia	1.4
2AR	43.4	3197	Arcadia	7.1
3C	38.9	10312	Arcadia	< .2
13	33.8	4022	Arcadia	4.37
4A	28.6	1158	Arcadia	28.7
5B	27.4	3023	Arcadia	7.9
11	28.5	3918	Arcadia	4.6
7	18	3362	Arcadia	6.3
8D	12.7	1529	Arcadia	22.1
12	7.7	NA*	Arcadia	NA*

Mean = 4096.4 10.3
Std. Dev. = 2771.8 9.7

* - modeled flows were outside the bounds of mean elevations of floodplain criteria

Table 7. Floodplain Critical Elevations – based on inundating the lowest bank top elevation to put water over both sides of the floodplain.

Study Site	Highest LOW BANK Elevation (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	48.8	9524	Arcadia	< .2
2AR	46.2	6231	Arcadia	1.4
3C	41.6	NA*	Arcadia	NA*
13	34.8	5247	Arcadia	2.5
4A	31.3	2660	Arcadia	10.1
5B	27.8	3228	Arcadia	6.8
11	30.8	5648	Arcadia	1.9
7	20.9	5796	Arcadia	1.9
8D	19.7	6234	Arcadia	1.4
12	10.5	NA*	Arcadia	NA*

Mean = 5571 3.7

Std. Dev. = 2091.7 3.4

* - modeled flows were outside the bounds of mean elevations of floodplain criteria

Table 8. Floodplain Critical Elevations – based on inundating the 90th percentile elevation of the river terrace vegetation zone.

Study Site	90th Percentile Elevation of River Terrace (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	47.5	7165	Arcadia	0.8
2AR	44.4	4099	Arcadia	4.2
3C	36.8	6018	Arcadia	1.7
13	41.9	NA*	Arcadia	NA*
4A	31.2	2587	Arcadia	10.7
5B	29.1	4009	Arcadia	4.4
11	27.5	3327	Arcadia	6.6
7	20.2	5078	Arcadia	2.7
8D	14.8	2368	Arcadia	12.6
12	10.0	NA*	Arcadia	NA*

Mean = 4331.4 5.5

Std. Dev. = 1668.9 4.2

* - modeled flows were outside the bounds of mean elevations of floodplain criteria

Table 9. Floodplain Critical Elevations – based on inundating the 90th percentile elevation of the wet hardwood hammock vegetation zone.

Study Site	90th Percentile Elevation of Wet Hardwood Hammock (ft NGVD)	Corresponding Flow at Gage (cfs)	Gage	% Exceedance Flow
1BR2	48.9	9719	Arcadia	< .2
2AR	46.1	6096	Arcadia	1.6
3C	37.8	7998	Arcadia	< .2
13	36.0	7014	Arcadia	0.9
4A	32.2	3386	Arcadia	6.3
5B	-	-	Arcadia	-
11	29.2	4389	Arcadia	3.8
7	23.5	10062	Arcadia	< .2
8D	-	-	Arcadia	-
12	-	-	Arcadia	-

Mean = 6952 3.1
Std. Dev. = 2531.3 2.4