x. S-154C Drainage Basin

Background

The S-154C has an area of 3.4 square miles and is located in Okeechobee County north of Lake Okeechobee, about five miles west of the town of Okeechobee.

Land Use

The land use in the basin is agricultural including improved pasture and cattle production. There are citrus groves and dairy operations, as well.

Drainage Features

The major water control structure in the basin is S-154C. The purpose of S-154C is to maintain optimum upstream water control stages and to pass the design flood without exceeding upstream flood design stage. Its downstream flap valve prevents backflow from Lake Okeechobee during excessive stages in the lake caused by flood and wind tides. The S-154C is operated to maintain optimum headwater elevation of 16 feet. The design discharge is intermediate.

Water Quality

The segment of the C-38 Canal located in the S-154C Basin was not on the 1998 303(d) list.

According to the State's Surface Water Quality Standards (Chapter 62-302), dissolved oxygen for this surface water should never fall below 5mg/L. For the time period from 1990 to 1995, 58% (276/474) of the samples exceeded this criteria. Figures,, illustrate dissolved oxygen concentrations over time at stations S154 and S154C on the C-38 Canal.

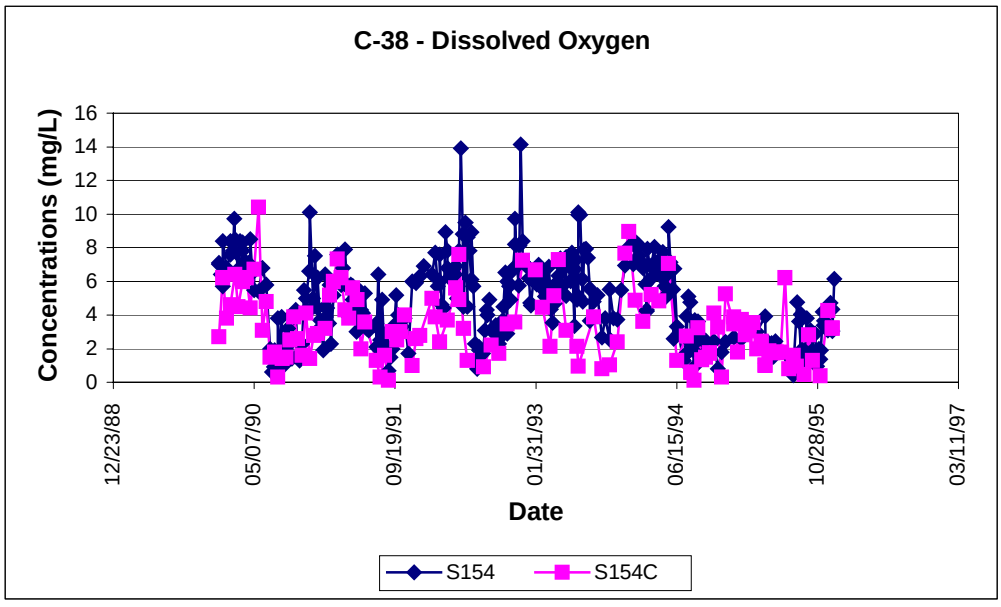

Figure Dissolved Oxygen Concentrations in C-38

Temporal analyses for dissolved oxygen, total nitrogen, total phosphorus and turbidity were conducted on stations S154 and S154C on C-38. The data was analyzed using the Seasonal Kendall Test to see if there were significant changes in the above water quality parameters during the time period from 1990 to 1995.

According to this test, all four parameters are decreasing over time. The decrease in dissolved oxygen is statistically significant at the 95% confidence level and the decrease in turbidity is significant at the 90% confidence level.

Table,, Results of Trend Analyses Using the Seasonal Kendall Test

Parameter	Seasonal Kendall Test Statistic	Significant @ a=0.05	Significant @ a=0.10	Significant @ a=0.20
Dissolved Oxygen	-2.657 mg/L x year	Yes	Yes	Yes
Total Nitrogen	-0.881 mg/L x year	No	No	No
Total Phosphorus	-0.204 mg/L x year	No	No	No
Chlorophyll A	NA	NA	NA	NA
Turbidity	-1.790 mg/L x year	No	Yes	Yes

Figure,, illustrates total nitrogen, total phosphorus and turbidity concentrations at stations S154 and S154C on C-38.

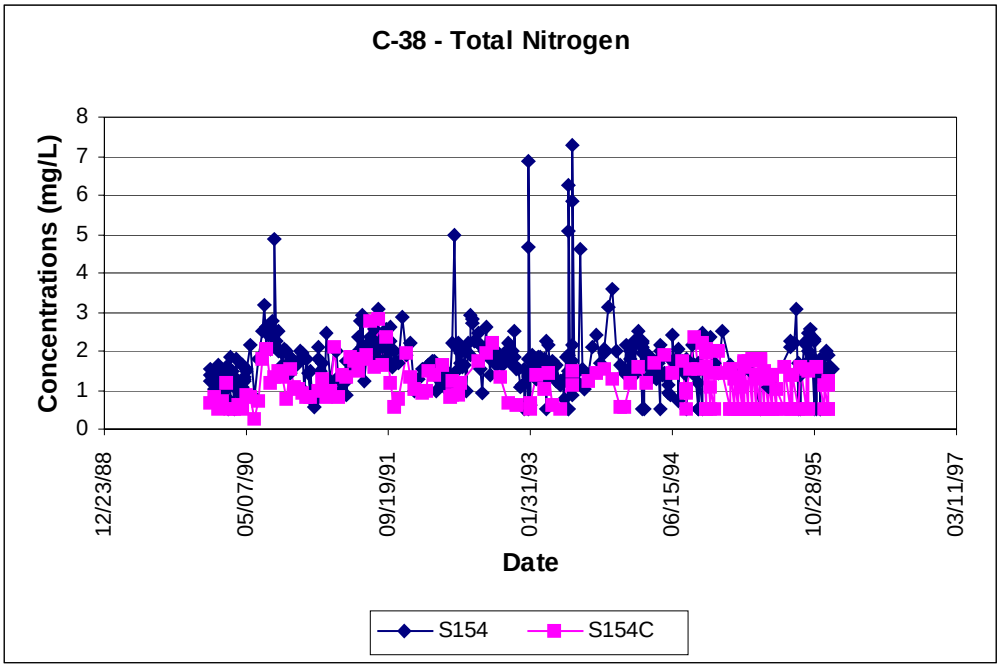

Figure Total Nitrogen Concentrations in C-38

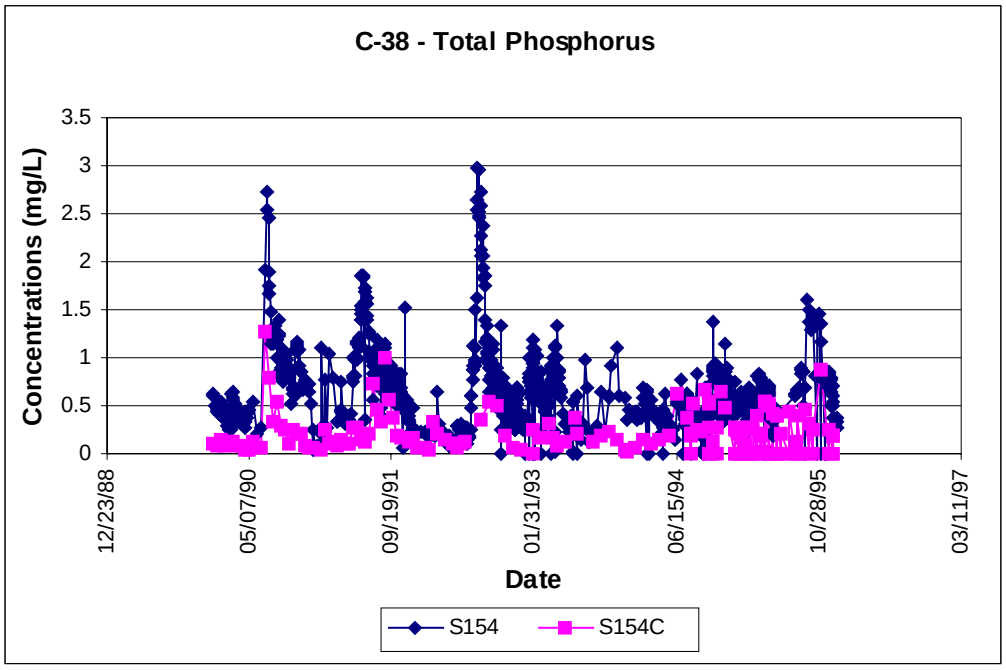

Figure Total Phosphorus Concentrations in C-38

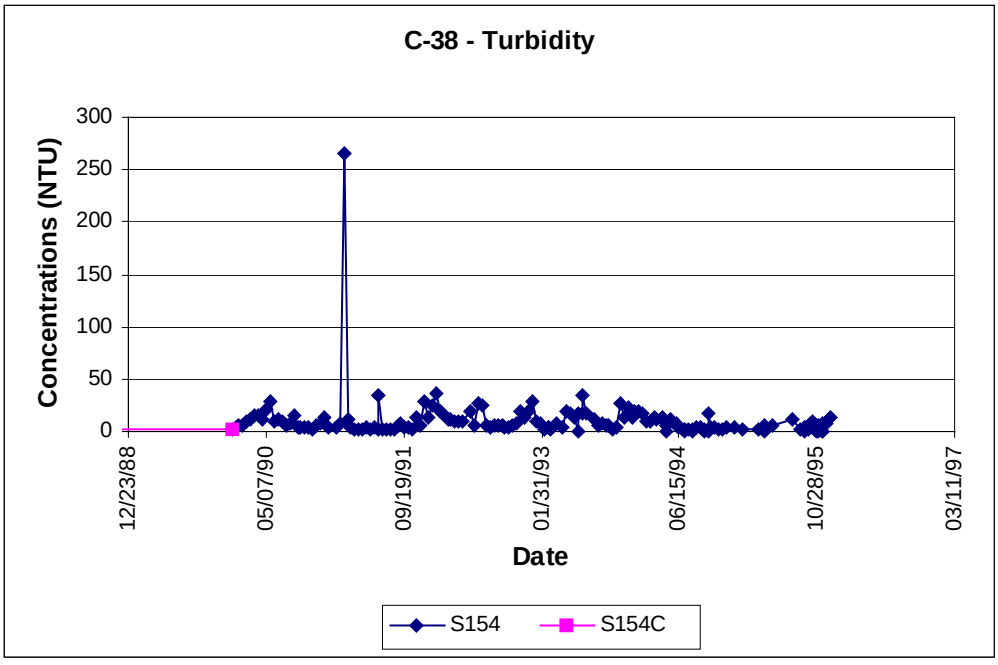

Figure Turbidity Concentrations in C-38

y. L-59E Drainage Basin

Background

The L-59E Basin has an area of 22.5 square miles and it is located in Glades County of the north side of Lake Okeechobee. The L-59 interceptor dike separates this basin from the L-48 Basin. The elevation of interceptor dike L-59E is 23.0 feet NGVD and it has a crown width of 10 feet. The side slope is 1 on 3.

Land Use

The land use in the basin is agricultural, although most of the area is improved pasture for beef cattle production.

Drainage Features

The major structure in this basin is a three-barrel, 96-inch corrugated metal pipe culvert located through the C-38 levee. The purpose of this culvert is to remove excess water from the L-59E Basin and discharge to C-38 (Kissimmee River). L-59 is an interceptor dike which blocks the drainage water of L-59E Basin from passing to the L-48 Basin. Runoff form L-59E Basin collects in the L-59E borrow canal and flows east to C-38 through the culvert.

Water Quality

The segment of the Kissimmee River that runs through the L-59E Basin was on the 1998 303(d) list for dissolved oxygen and nutrients. The development of TMDLs for these parameters is scheduled for the year 2005, according to the Consent Decree with the USEPA. Due to lack of sufficient data, trend analyses were not conducted on this waterbody.

The C-41 Canal was not on the 1998 303(d) list.

According to the State's Surface Water Quality Standards (Chapter 62-302), dissolved oxygen for this surface water should never fall below 5mg/L. For the time period from 1990 to 1995, 21% (93/441) of the samples exceeded this criteria. Figures,, illustrate dissolved oxygen concentrations over time at station S84 on the C-41 Canal.

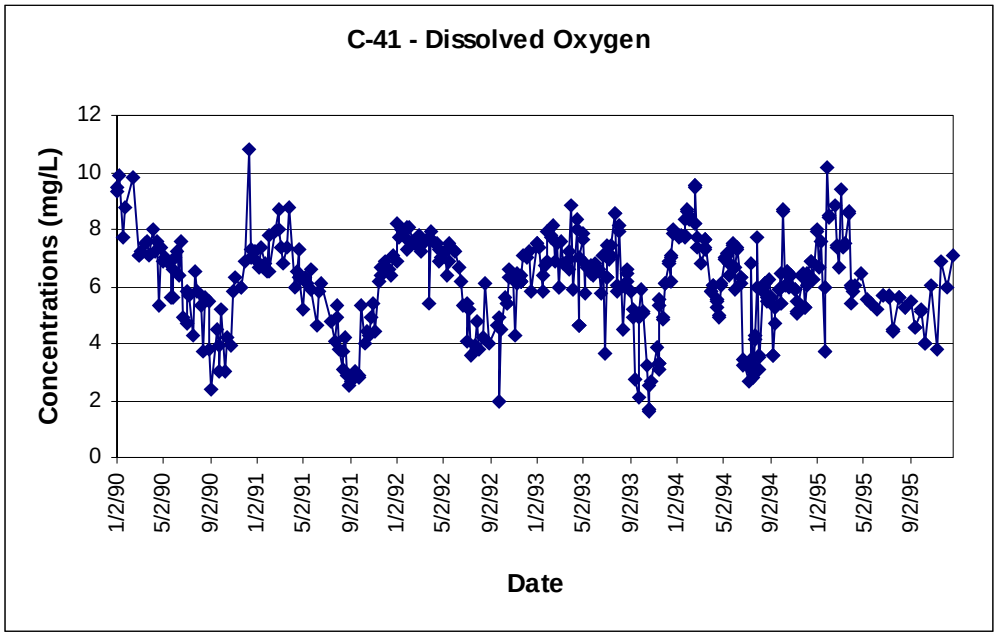

Figure Dissolved Oxygen Concentrations in C-41

Temporal analyses for dissolved oxygen, total nitrogen, total phosphorus and turbidity were conducted on station S84 on the C-41 Canal. The data was analyzed using the Seasonal Kendall Test to see if there were significant changes in the above water quality parameters during the time period from 1990 to 1995.

According to this test, all four parameters are decreasing over time. With the exception of dissolved oxygen, the decreases in these parameters are statistically significant at the95% confidence level.

Table,, Results of Trend Analyses Using the Seasonal Kendall Test

Parameter	Seasonal Kendall Test Statistic	Significant @ a=0.05	Significant @ a=0.10	Significant @ a=0.20
Dissolved Oxygen	-1.247 mg/L x year	No	No	No
Total Nitrogen	-4.415 mg/L x year	Yes	Yes	Yes
Total Phosphorus	-3.974 mg/L x year	Yes	Yes	Yes
Chlorophyll A	NA	NA	NA	NA
Turbidity	-2.866 mg/L x year	Yes	Yes	Yes

Figures,, illustrate total nitrogen, total phosphorus and turbidity concentrations over time at station S84.

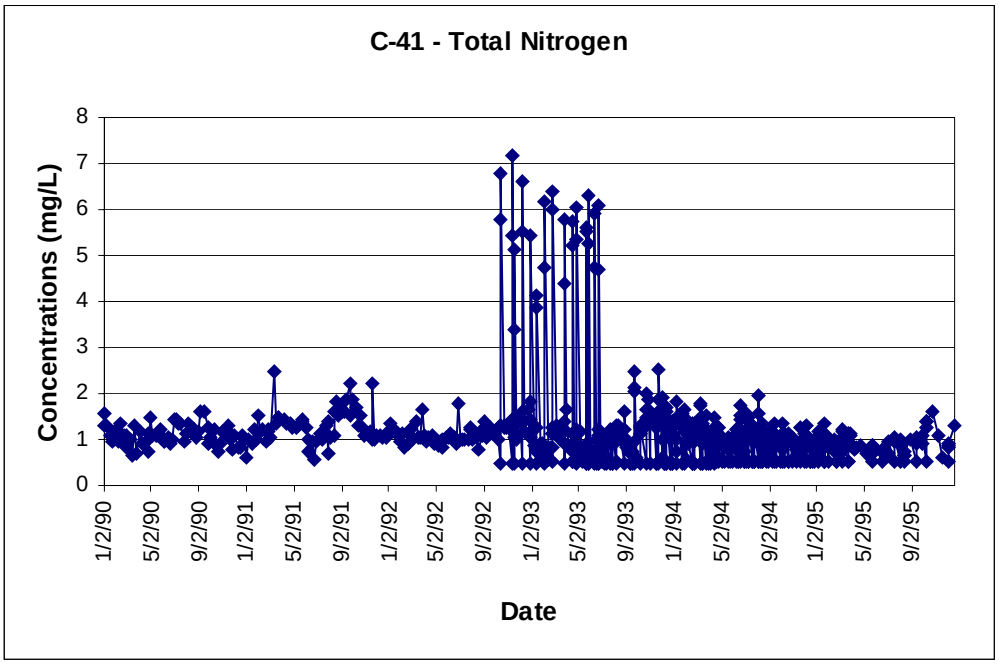

Figure Total Nitrogen Concentrations in C-41

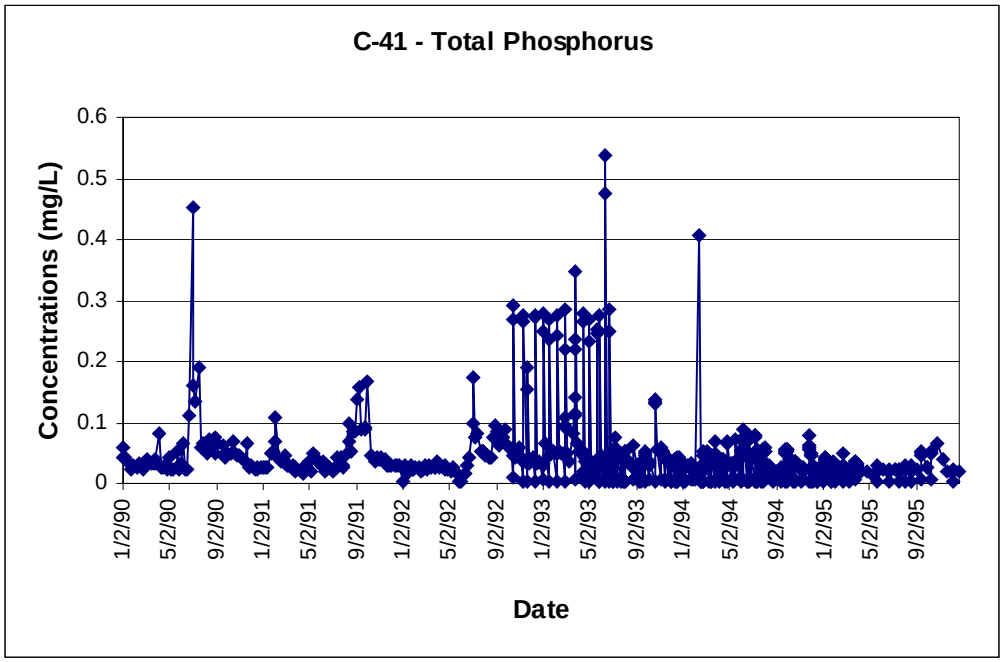

Figure Total Phosphorus Concentrations in C-41

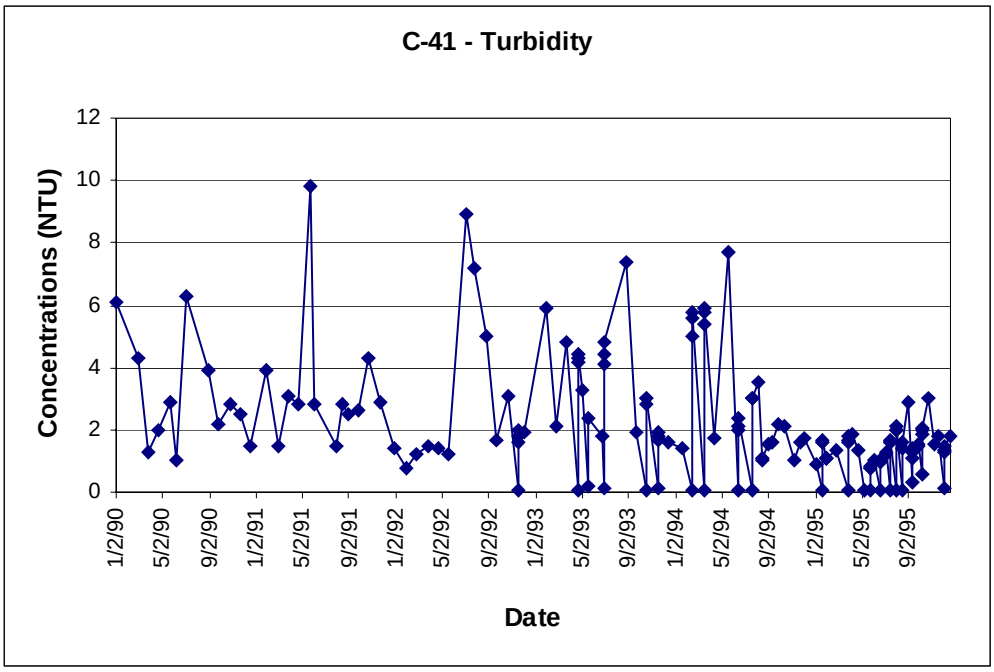

Figure Turbidity Concentrations in C-41

The C-38 Canal was not on the 1998 303(d) list.

According to the State's Surface Water Quality Standards (Chapter 62-302), dissolved oxygen for this surface water should never fall below 5mg/L. For the time period from 1990 to 1995, 21% (93/441) of the samples exceeded this criteria. Figures,, illustrate dissolved oxygen concentrations over time at stations C38W, KREA35 and S65E on the C-38 Canal.

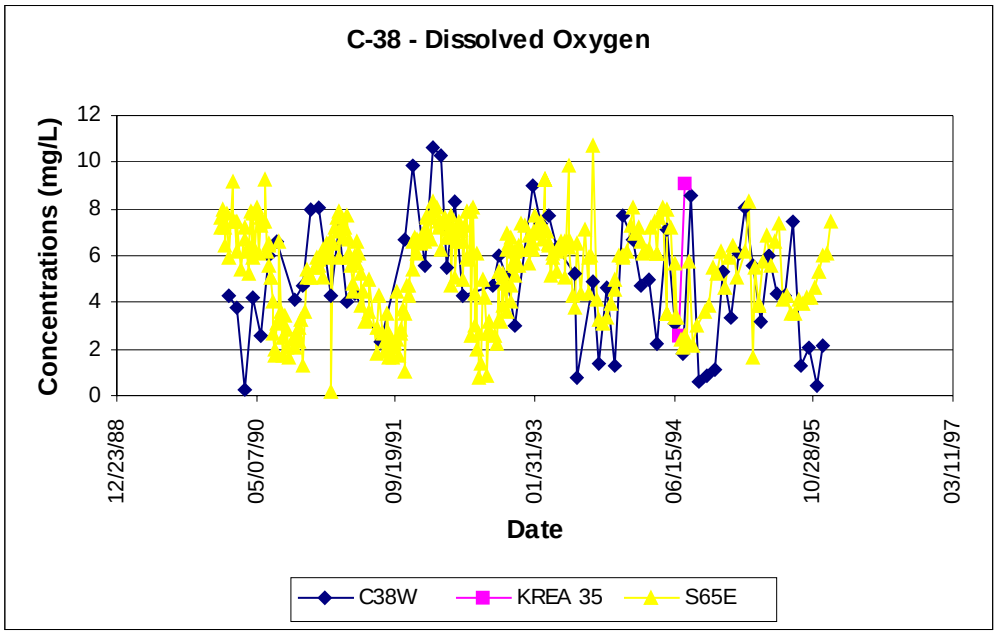

Figure Dissolved Oxygen Concentrations in C-38

Temporal analyses for dissolved oxygen, total nitrogen, total phosphorus and turbidity were conducted on stations C38W, KREA35 and S65E on the C-38 Canal. The data was analyzed using the Seasonal Kendall Test to see if there were significant changes in the above water quality parameters during the time period from 1990 to 1995.

According to this test, dissolved oxygen and total phosphorus are decreasing over time, while total nitrogen and turbidity are increasing. The decrease in total phosphorus is statistically significant at the 95% confidence level. The increase in total nitrogen is statistically significant at the 80% confidence level.

Table,, Results of Trend Analyses Using the Seasonal Kendall Test

Parameter	Seasonal Kendall Test Statistic	Significant @ a=0.05	Significant @ a=0.10	Significant @ a=0.20
Dissolved Oxygen	-0.813 mg/L x year	No	No	No
Total Nitrogen	1.343 mg/L x year	No	No	Yes
Total Phosphorus	-4.266 mg/L x year	Yes	Yes	Yes
Chlorophyll A	NA	NA	NA	NA
Turbidity	0.271 mg/L x year	No	No	No

Figures,,, illustrate total nitrogen, total phosphorus and turbidity concentrations over time at stations C38W, KREA35 and S65E on the C-38 Canal.

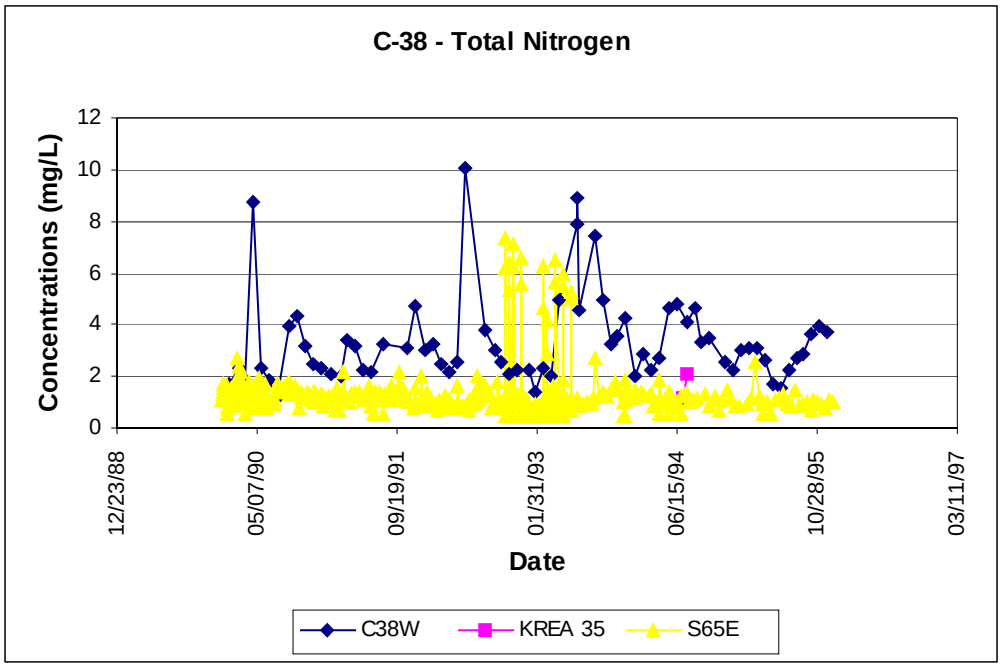

Figure Total Nitrogen Concentrations in C-38

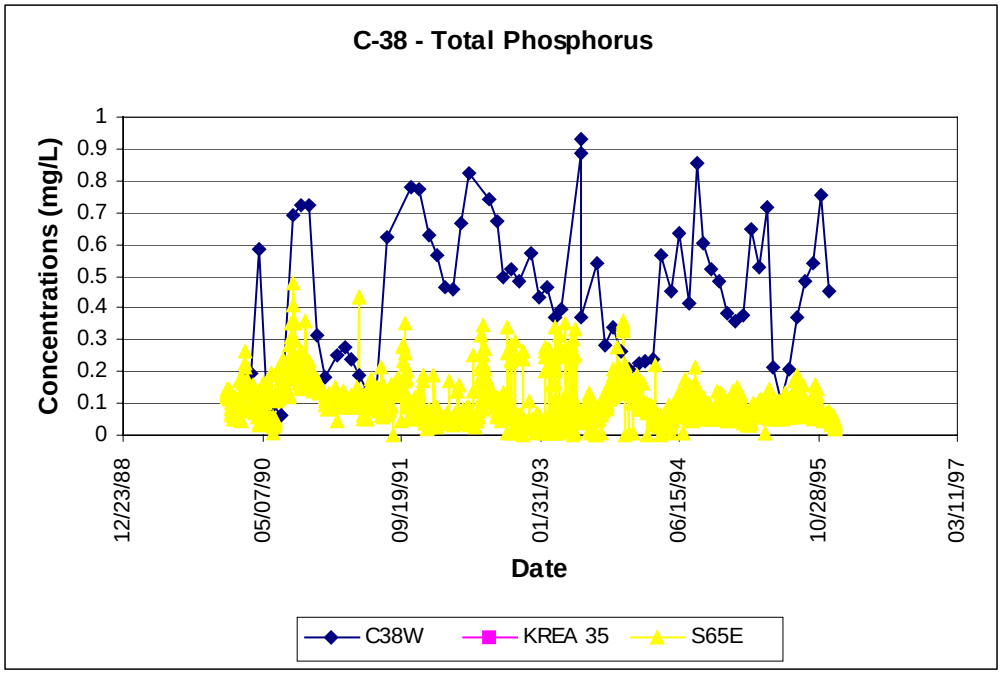

Figure Total Phosphorus Concentrations in C-38

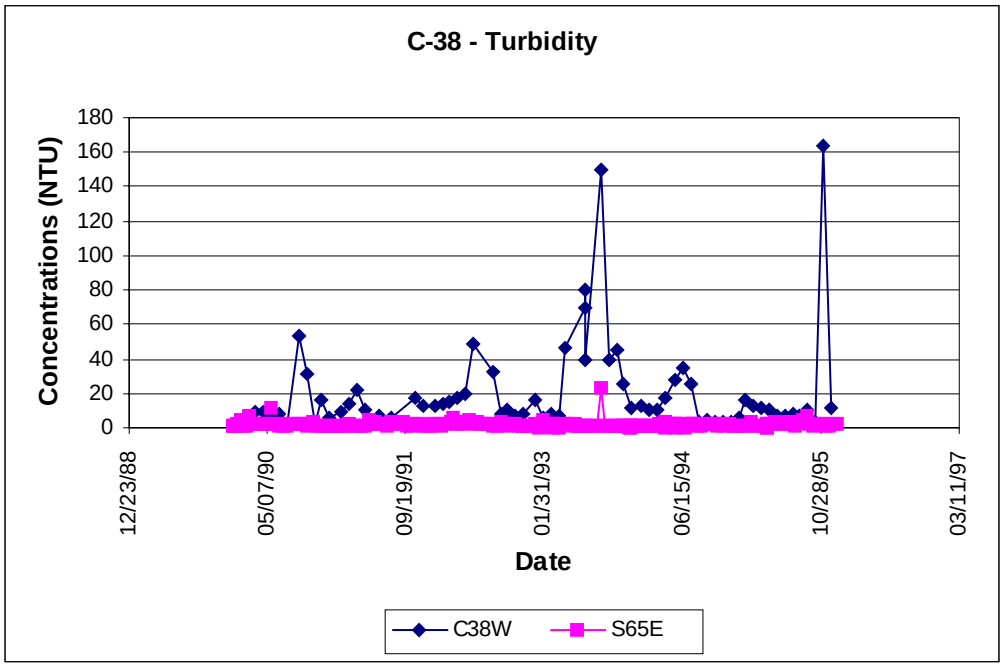

Figure Turbidity Concentrations in C-38

z. L-48 Drainage Basin

Background

The L-48 basin has an area of 32.5 square miles and is located in Glades County on the north side of Lake Okeechobee. It is a basin that is completely surrounded by levees with L-48 on three sides and interceptor dike L-59 on the west side. L-48 is 8.6 miles long with a design grade of 32.2 feet NGVD. Interceptor dike L-59 has an elevation of 23.0 feet NGVD and a crown width of 10 feet.

Land Use

Land use is primarily beef cattle production. On the eastern corner of the basin there is a small town, Buckhead Ridge. Like the rest of the shore-side communities, there is fishing and tourism. There is a lock structure which allows access to Lake Okeechobee for recreational boats.

Drainage Features

The major structures in this basin are the S-127 pump station and the navigation lock. S-127 is located on the northwest shore of Lake Okeechobee in the alignment of L-48, 12 miles southwest of the town of Okeechobee just south of State Road 78. There is a 96-inch culvert to control flows that bypass the pump. The purpose of this structure is to remove impounded water from the basin during wet periods.

The northwest shore levees of Lake Okeechobee, together with high lake stages, restrict natural drainage of the L-48 basin into the lake. Runoff from the basin drains to the L-48

borrow canal where there is continuous stage monitoring. The S-127 pump system is designed to remove as much as .75 inches of runoff from the drainage area in a day. The spillway is used to allow gravity discharge during periods when Lake Okeechobee stage is below 13 feet. During drought conditions , when the lake stage is higher than the canal water level, water is drawn from the lake into the basin through the pipe spillway.

Normally, pumping is initiated when the headwater elevation reaches 13.5 feet and is terminated when it falls to 13 feet. If heavy rainfall is predicted, however and headwater is expected to rise above 14 feet, all pumps are activated and the stage lowered to and maintained at 13 feet until the storm passes. Whenever the lake level is above intake canal water level, the pipe spillway is closed unless there is an irrigation water demand.

Water Quality Summary
The L-48 Basin does not contain any 1998 303(d) listed waterbodies.

The C-40 Canal was not on the 1998 303(d) list.

According to the State's Surface Water Quality Standards (Chapter 62-302), dissolved oxygen for this surface water should never fall below 5mg/L. For the time period from 1990 to 1995, 70% (61/87) of the samples exceeded this criteria. Figures,, illustrate dissolved oxygen concentrations over time at station S72 on the C-40 Canal.

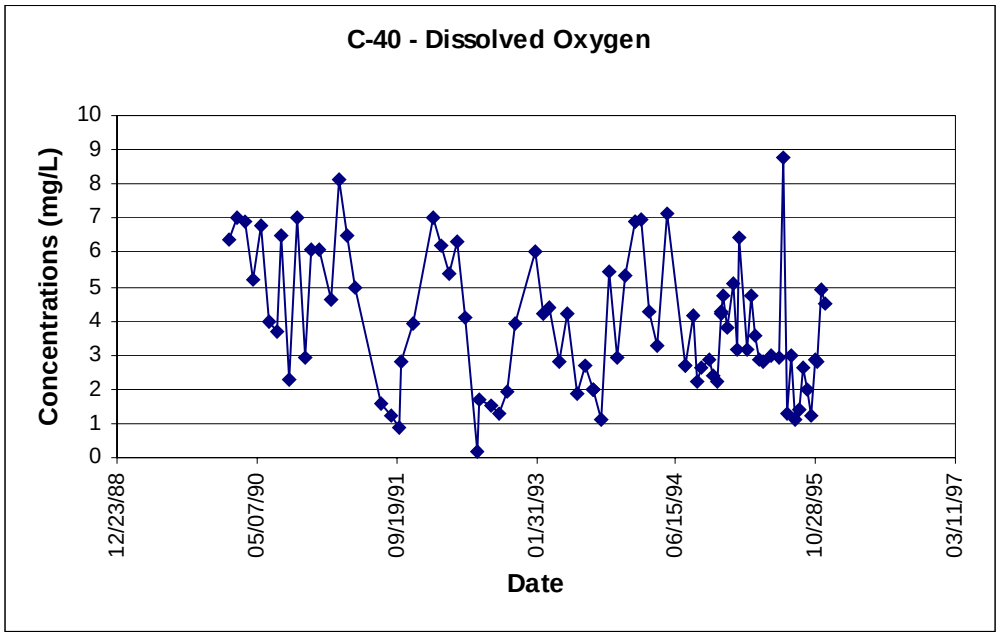

Figure Dissolved Oxygen Concentrations in C-40

Temporal analyses for dissolved oxygen, total nitrogen, total phosphorus and turbidity were conducted on station S72 on the C-40 Canal. The data was analyzed using the Seasonal Kendall Test to see if there were significant changes in the above water quality parameters during the time period from 1990 to 1995.

According to this test, dissolved oxygen and turbidity are decreasing over time, while total nitrogen and total phosphorus are increasing. The decrease in dissolved oxygen is statistically significant at the 95 % confidence level and the decrease in turbidity is significant at the 90% confidence level. The increase in total nitrogen is statistically significant at the 80% confidence.

Table „ Results of Trend Analyses Using the Seasonal Kendall Test

Parameter	Seasonal Kendall Test Statistic	Significant @ a=0.05	Significant @ a=0.10	Significant @ a=0.20
Dissolved Oxygen	-2.732 mg/L x year	Yes	Yes	Yes
Total Nitrogen	1.337 mg/L x year	No	No	Yes
Total Phosphorus	0.580 mg/L x year	No	No	No
Chlorophyll A	NA	NA	NA	NA
Turbidity	-1.802 mg/L x year	No	Yes	Yes

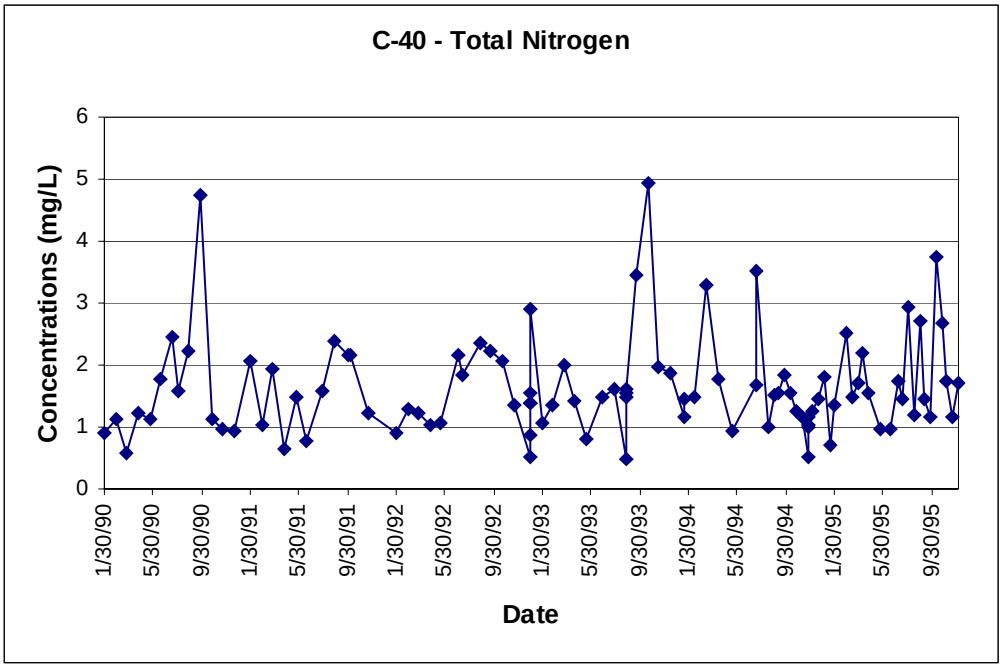

Figure Total Nitrogen Concentrations in C-40

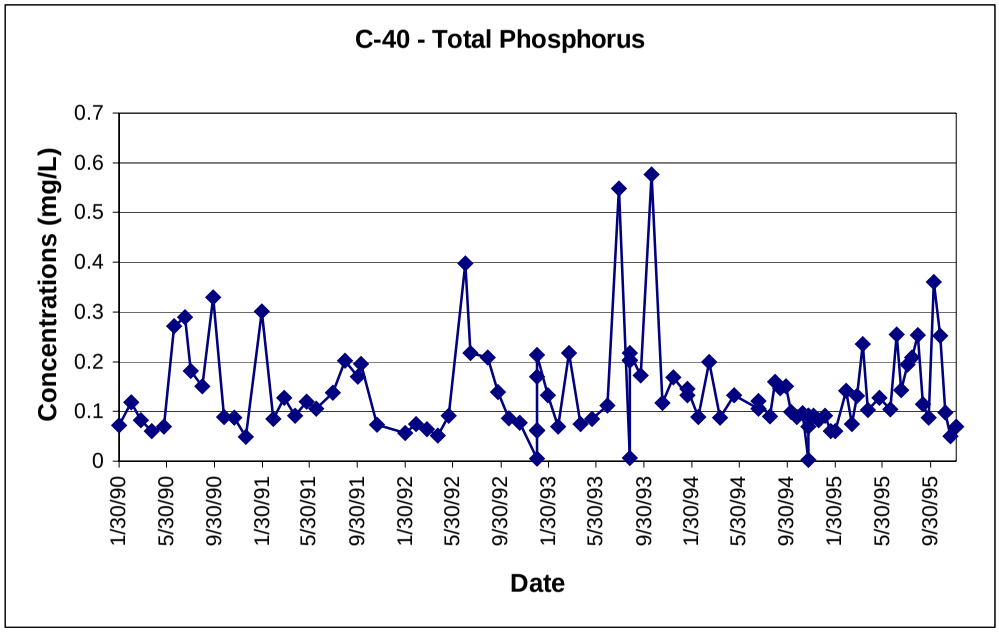

Figure Total Phosphorus Concentrations in C-40

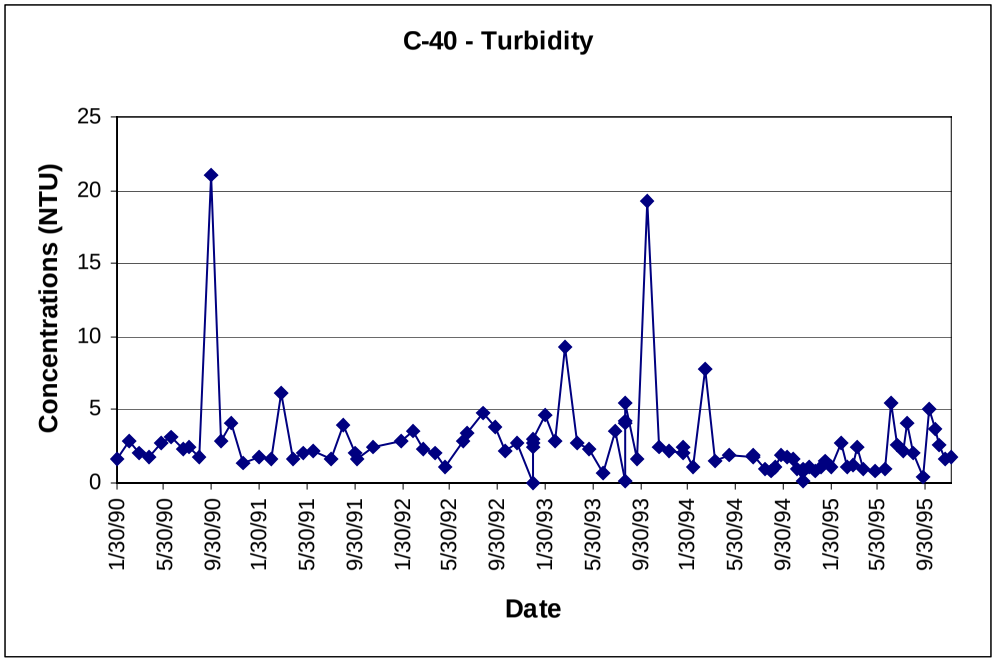

Figure Turbidity Concentrations in C-40

The L-59W Canal was not on the 1998 303(d) list.

According to the State's Surface Water Quality Standards (Chapter 62-302), dissolved oxygen for this surface water should never fall below 5mg/L. For the time period from 1990 to 1995, 74% (52/70) of the samples exceeded this criteria. Figures,, illustrate dissolved oxygen concentrations over time at station L59W on the L-59 W Canal.

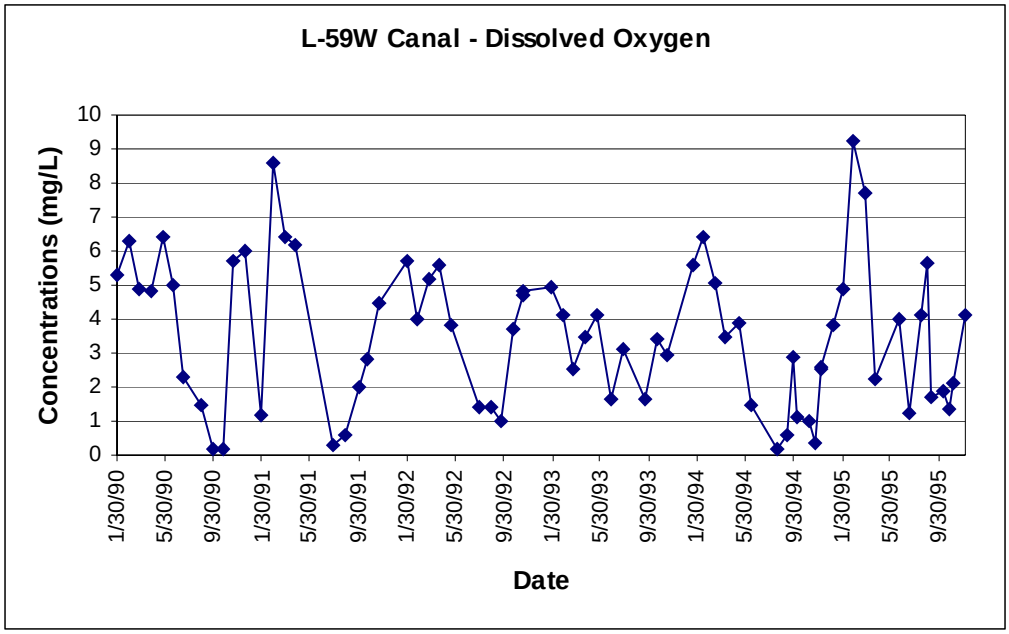

Figure Dissolved Oxygen Concentrations in L-59W Canal

Temporal analyses for dissolved oxygen, total nitrogen, total phosphorus and turbidity were conducted on station L59W on the L-59W Canal. The data was analyzed using the Seasonal Kendall Test to see if there were significant changes in the above water quality parameters during the time period from 1990 to 1995.

According to this test, dissolved oxygen and turbidity are decreasing over time, while total nitrogen and total phosphorus are increasing. The changes in these parameters are not statistically significant.

Table,, Results of Trend Analyses Using the Seasonal Kendall Test

Parameter	Seasonal Kendall Test Statistic	Significant @ a=0.05	Significant @ a=0.10	Significant @ a=0.20
Dissolved Oxygen	-1.097 mg/L x year	No	No	No
Total Nitrogen	1.118 mg/L x year	No	No	No
Total Phosphorus	1.174 mg/L x year	No	No	No
Chlorophyll A	NA	NA	NA	NA
Turbidity	-1.269 mg/L x year	No	No	No

Figures,, illustrate total nitrogen, total phosphorus and turbidity concentrations over time at station L59W.

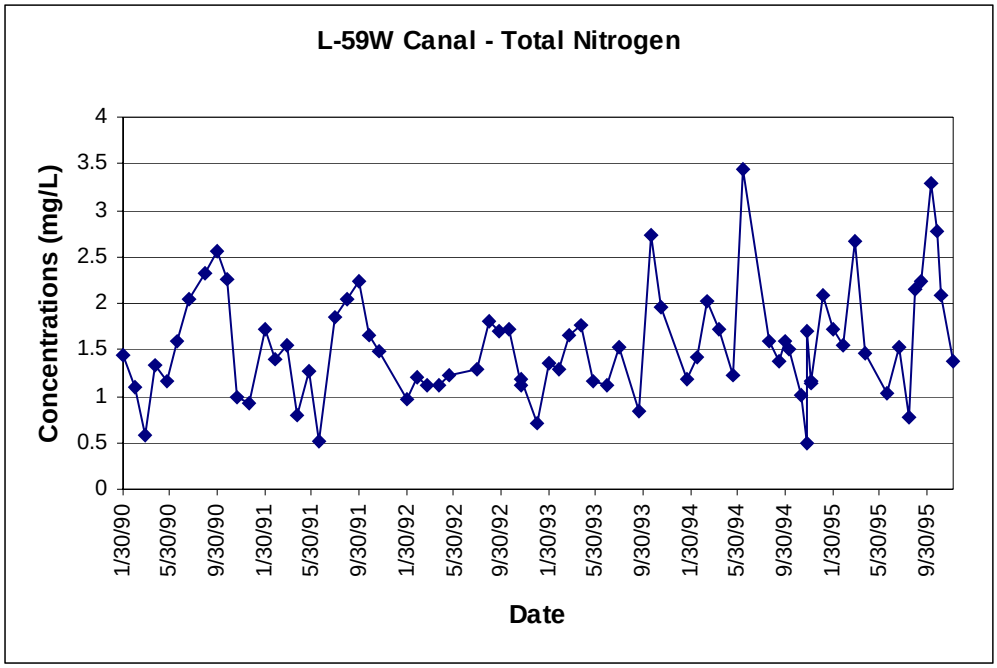

Figure Total Nitrogen Concentrations in L-59W Canal

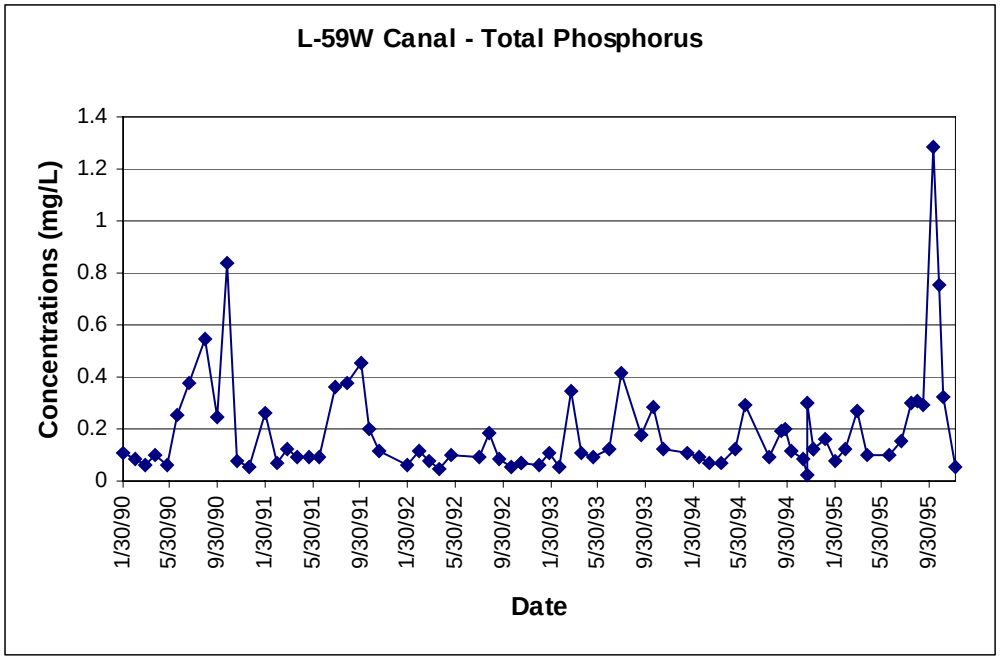

Figure Total Phosphorus Concentrations in L-59W Canal

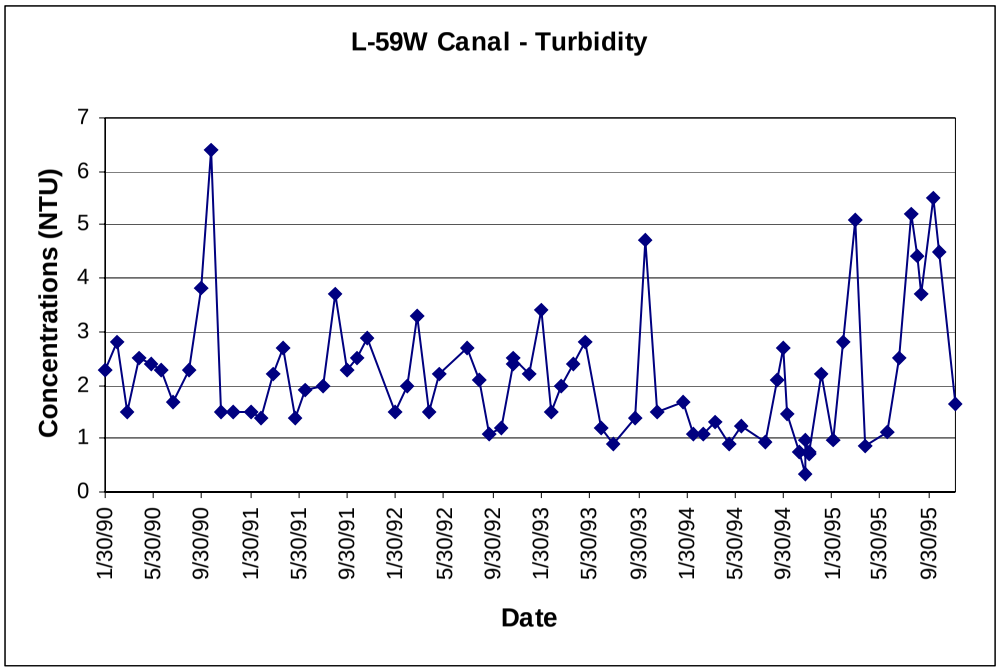

Figure Turbidity Concentrations in L-59W Canal