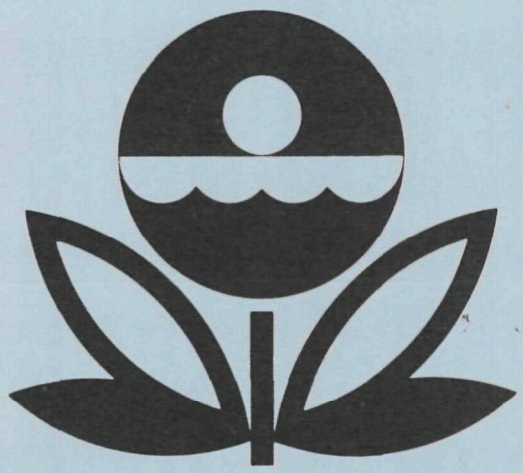
U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES



REPORT

ON

LAKE JESSUP

SEMINOLE COUNTY

FLORIDA

EPA REGION IV

WORKING PAPER No. 260

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

and

ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

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REPORT
ON
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SEMINOLE COUNTY
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WITH THE COOPERATION OF THE

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

AND THE

FLORIDA NATIONAL GUARD

DECEMBER, 1977

CONTENTS

FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Florida Department of Environmental Regulation for professional involvement and to the Florida National Guard for conducting the tributary sampling phase of the Survey.

Joseph W. Landers, Jr., Secretary of the Department of Environmental Regulation; John A Redmond, former Director of the Division of Planning, Technical Assistance, and Grants; and Dr. Tim S. Stuart, Chief of the Bureau of Water Quality, provided invaluable lake documentation and counsel during the survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

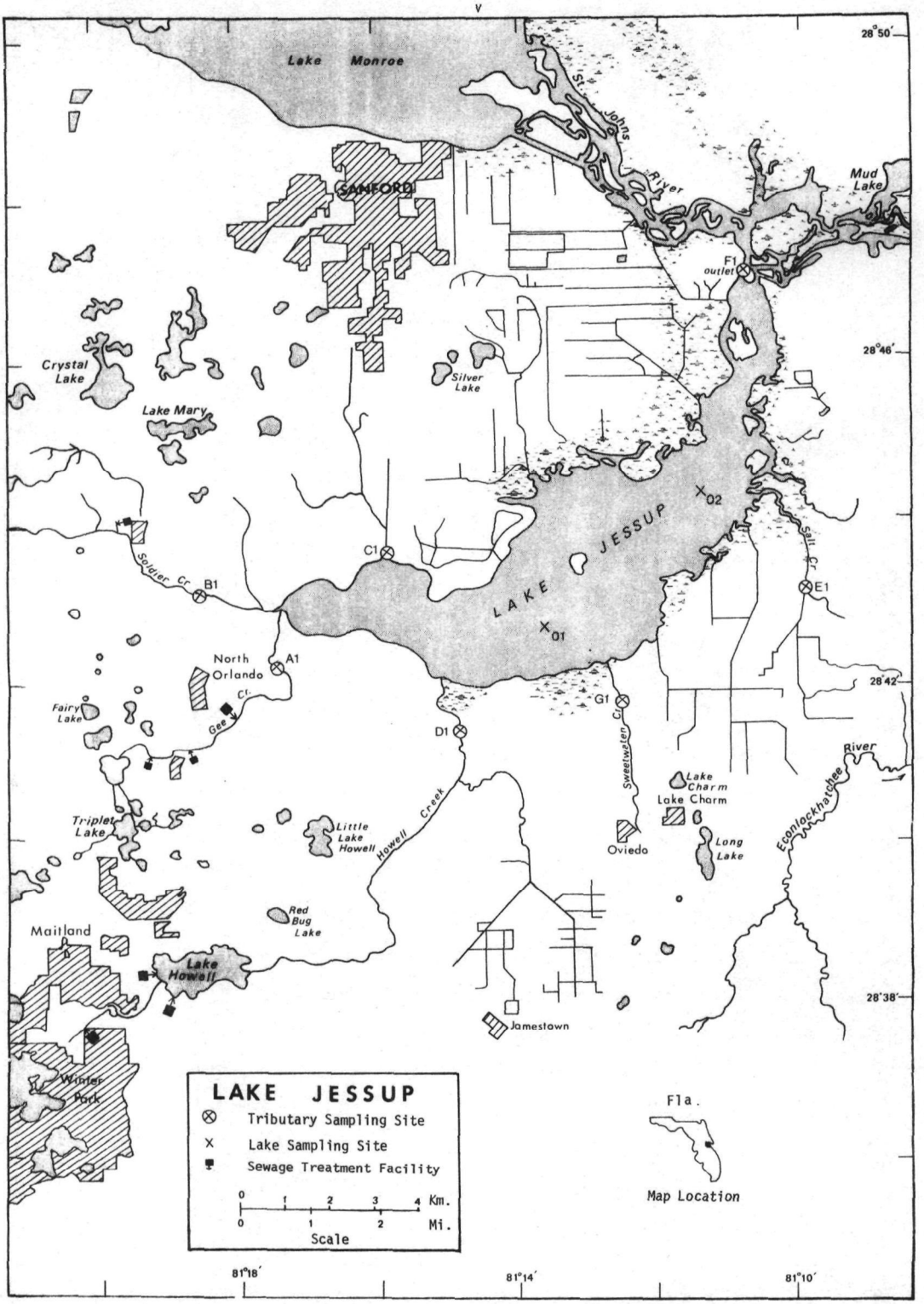
Major General Henry W. McMillan (Retired), then the Adjutant General of Florida, and Project Officer Colonel Hugo F. Windham, who directed the volunteer efforts of the Florida National Guard, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF FLORIDA

LAKE NAME	COUNTY
Alligator	Columbia
Apopka	Lake, Orange
Banana	Polk
Crescent	Flagler, Putnam
Doctors	Clay
Dora	Lake
East Tohopekaliga	Osceola
Effie	Polk
Eloise	Polk
George	Putnam, Volusia
Gibson	Polk
Glenada	Highlands
Griffin	Lake
Haines	Polk
Hancock	Polk
Horseshoe	Seminole
Howell	Orange, Seminole
Istokpoga	Highlands
Jessie	Polk
Jessup	Seminole
Kissimmee	Osceola
Lawne	Orange
Lulu	Polk
Marion	Polk
Minnehaha	Orange
Minneola	Lake
Monroe	Seminole, Volusia
Munson	Leon
Okeechobee	Glades, Hendry, Martin, Okeechobee, Palm Beach
Poinsett	Brevard, Orange, Osceola
Reedy	Polk
Seminole	Jackson, FL; Decatur, Seminole, GA
Seminole	Pinellas
South	Brevard
Talquin	Gadsden, Leon
Tarpon	Pinellas
Thonotosassa	Hillsborough
Tohopekaliga	Osceola
Trout	Lake
Weohyakapka	Polk
Yale	Lake


Lake Monroe
St. Johns River
SANFORD
Mud Lake
F1
outlet
28°50'
28°46'
28°42'
28°38'
Crystal Lake
Lake Mary
Silver Lake
LAKE JESSUP
O1
O2
C1
B1
Soldier Cr.
Salt Cr.
E1
North Orlando
A1
Fairy Lake
Gee Cr.
D1
G1
Sweetwater Cr.
Lake Charm
Lake Charm
Oviedo
Long Lake
Econlockhatchee River
Triplet Lake
Little Lake Howell
Howell Creek
Red Bug Lake
Maitland
Lake Howell
Winter Park
Jamestown
LAKE JESSUP
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0 1 2 3 4 Km.
0 1 2 Mi.
Scale
Fla.
Map Location
81°18'
81°14'
81°10'

LAKE JESSUP

STORET NO. 1223

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Lake Jessup is hypereutrophic. It ranked thirty-fifth in overall trophic quality when the 41 Florida lakes sampled in 1973 were compared using a combination of six parameters*. Twenty-nine lakes had less median total phosphorus, 30 had less median dissolved phosphorus, 32 had less and one had the same median inorganic nitrogen, 30 had less mean chlorophyll a, and 38 had greater mean Secchi disc transparency.

Survey limnologists noted heavy concentrations of emergent vegetation and algae during the sampling. A mean chlorophyll a concentration of 77 µg/l and high numbers of blue-green algae (see page 6) further indicate the over-enriched condition of the lake.

B. Rate-Limiting Nutrient:

The algal assay results indicate Lake Jessup was limited by nitrogen at the time the assay sample was collected (03/14/73). The lake data indicate nitrogen limitation at the other sampling times as well.

C. Nutrient Controllability:

1. Point sources--It is calculated that during the sampling year, 29.9% of the total phosphorus and 19.0% of the total

* See Appendix A.

nitrogen inputs to Lake Jessup were contributed by the seven wastewater treatment plants which discharge indirectly to the lake.

The sampling year phosphorus loading of 4.24 g/m^2 is almost 9 times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading. However, even complete removal of phosphorus at the point sources considered in this report would still leave a loading of 2.97 $g/m^2/yr$ (six times the eutrophic loading); and although Florida lakes may assimilate phosphorus at higher levels than those suggested by Vollenweider (see page 14), it does not seem likely that the degree of phosphorus reduction attainable by municipal point-source control would result in a significant improvement in the condition of Lake Jessup.

The marked nitrogen limitation during Survey sampling - resulting from moderate concentrations of inorganic nitrogen (median = 0.290 mg/l) and high levels of orthophosphorus (median = 0.288 mg/l) - suggests consideration of nitrogen control to reduce the rate of eutrophication of the lake. However, emphasis during the Survey was on the controllability of phosphorus, and a more intensive study of the nitrogen budget of Lake Jessup is needed to determine the feasibility and probable effect of nitrogen control.

2. Non-point sources--It is estimated that about 70% of the

total phosphorus and 81% of the total nitrogen inputs to Lake Jessup were from non-point sources. The principal contributor was Howell Creek which accounted for 32% of the phosphorus and nearly 24% of the nitrogen. While the mean nutrient exports of five of the tributaries were relatively high (232 kg P and 837 kg $N/km^2/yr$), the exports of Sweetwater Creek were exceptionally high (1,201 kg P and 8,212 kg $N/km^2/yr$; see page 13).

The 1970 photorevised U.S.G.S. Casselberry quadrangle map indicates extensive urban areas in the Lake Jessup drainage and citrus production as a major agricultural land use.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 32.0 kilometers^2.
2. Mean depth: 1.1 meters.
3. Maximum depth: 2.7 meters.
4. Volume: 35.200 x 10^6 m^3.
5. Mean hydraulic retention time: 82 days.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Gee Creek	35.0	0.35
Soldier Creek	60.3	0.22
Unnamed Creek C-1	22.7	0.25
Howell Creek	137.3	2.67
Salt Creek	14.8	0.20
Sweetwater Creek	6.7	0.20
Minor tributaries & immediate drainage -	79.7	1.08
Totals	356.5	4.97

2. Outlet -

to St. Johns River	388.5**	4.97

C. Precipitation***:

1. Year of sampling: 125.4 centimeters.
2. Mean annual: 135.5 centimeters.

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† Table of metric conversions--Appendix B.
†† Brezonik et al. (in prep.).
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Includes area of lake.
***See Working Paper No. 175.

III. WATER QUALITY SUMMARY

Lake Jessup was sampled three times in 1973 by means of a pontoon-equipped Huey helicopter. Each time, near-surface samples for physical and chemical parameters were collected from two stations on the lake (see map, page v). During each visit, a single sample was composited from the stations for phytoplankton identification and enumeration; and during the first visit, a single 18.9-liter sample was composited for algal assays. Also each time, a sample was collected from each of the stations for chlorophyll *a* analysis.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR LAKE JESSUP
STORET CODE 1223

PARAMETER	1ST SAMPLING (3/14/73) 2 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (9/ 5/73) 2 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (11/ 5/73) 2 SITES RANGE	MEAN	MEDIAN
TEMP (C)	26.7 - 26.7	26.7	26.7	27.1 - 30.0	28.5	28.5	23.2 - 23.5	23.3	23.3
DISS OXY (MG/L)	9.8 - 10.9	10.3	10.3	10.0 - 11.2	10.6	10.6	7.4 - 9.0	8.2	8.2
CNDCTVY (MCROMO)	850. - 900.	875.	875.	793. - 842.	818.	818.	633. - 737.	685.	685.
PH (STAND UNITS)	9.5 - 9.6	9.5	9.5	9.1 - 9.4	9.2	9.2	7.9 - 7.9	7.9	7.9
TOT ALK (MG/L)	79. - 81.	80.	80.	63. - 65.	64.	64.	74. - 78.	76.	76.
TOT P (MG/L)	0.485 - 0.500	0.492	0.492	0.417 - 0.475	0.446	0.446	0.564 - 0.588	0.576	0.576
ORTHO P (MG/L)	0.261 - 0.273	0.267	0.267	0.281 - 0.295	0.288	0.288	0.395 - 0.430	0.412	0.412
NO2+NO3 (MG/L)	0.150 - 0.160	0.155	0.155	0.200 - 0.310	0.255	0.255	0.040 - 0.060	0.050	0.050
AMMONIA (MG/L)	0.130 - 0.140	0.135	0.135	0.190 - 0.210	0.200	0.200	0.060 - 0.070	0.065	0.065
KJEL N (MG/L)	2.400 - 2.800	2.600	2.600	3.400 - 3.400	3.400	3.400	1.500 - 1.900	1.700	1.700
INORG N (MG/L)	0.280 - 0.300	0.290	0.290	0.390 - 0.520	0.455	0.455	0.100 - 0.130	0.115	0.115
TOTAL N (MG/L)	2.550 - 2.960	2.755	2.755	3.600 - 3.710	3.655	3.655	1.540 - 1.960	1.750	1.750
CHLRPYL A (UG/L)	70.8 - 82.4	76.6	76.6	108.4 - 122.9	115.6	115.6	33.8 - 41.0	37.4	37.4
SECCHI (METERS)	0.3 - 0.4	0.3	0.3	0.3 - 0.4	0.3	0.3	0.3 - 0.4	0.3	0.3

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal units per ml
03/14/73	1. Chroococcus sp.	48,649
	2. Lyngbya sp.	15,255
	3. Cyclotella sp.	12,973
	4. Flagellates	9,640
	5. Merismopedia sp.	6,306
	Other genera	7,627
	Total	100,450
09/05/73	1. Fragilaria sp.	69,813
	2. Lyngbya sp.	35,163
	3. Nitzschia sp.	17,197
	4. Microcystis sp.	13,604
	5. Anabaenopsis sp.	3,593
	Other genera	13,347
	Total	152,717
11/05/73	1. Flagellates	7,443
	2. Lyngbya sp.	7,187
	3. Microcystis sp.	5,614
	4. Merismopedia sp.	2,695
	5. Chroococcus sp.	2,053
	Other genera	14,534
	Total	39,526

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
03/14/73	1	70.8
	2	82.4
09/05/73	1	122.9
	2	108.4
11/05/73	1	33.8
	2	41.0

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.251	0.559	21.4
0.050 P	0.301	0.559	21.6
0.050 P + 1.0 N	0.301	1.559	41.1
1.0 N	0.251	1.559	48.8

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Lake Jessup was very high at the time the sample was collected (03/14/73). Also, the lack of significant change in yields with increased levels of orthophosphorus until nitrogen was also added indicates the lake was nitrogen limited at that time.

Nitrogen limitation is also indicated by the lake data; i.e., the mean inorganic nitrogen to orthophosphorus ratios were less than 2 to 1 at all sampling times.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Florida National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the month of June when two samples were collected from four of the seven tributaries. Sampling was begun in March, 1973, and was completed in February, 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normilized" or average year were provided by the Florida District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the nutrient loads, in $kg/km^2/yr$, at station E-1 and multiplying by the ZZ area in km^2.

The operators of the Winter Springs, Casselberry, and Country Club Heights wastewater treatment plants provided monthly effluent samples and corresponding flow data (the Winter Springs plant was replaced by a new activated sludge plant after Survey sampling was completed).

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* See Working Paper No. 175.

The operators of the North Orlando Townsites, Winter Park, Maitland, and Howell Park wastewater treatment plants did not participate in the Survey; nutrient loads from these sources were estimated at 1.134 kg P and 3.401 kg N/capita/year, and flows were estimated at 0.3785 m^3/capita/day.

The latter three plants impact upstream Lake Howell, and it is assumed the Lake Howell retained 29% of the phosphorus and 50% of the nitrogen contributed by these plants; i.e., the measured retentions during the sampling year†. The loads attributed to those plants were adjusted accordingly.

A. Waste Sources:

1. Known municipal -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Casselberry*	9,779	act. sludge	3,328.1	Gee Creek
Orlando (Country Club Heights)*	203	stab. pond	75.7	Soldier Creek
Winter Springs*	1,800	tr. filter + pond	1,069.4	Gee Creek
Maitland*	9,000	act. sludge	3,406.5	Lake Howell
Howell Park	550	stab. pond	208.2	Lake Howell
Winter Park**	21,895	act. sludge	8,287.3	Howell Creek
North Orlando Townsites**	1,161	tr. filter	439.4	Gee Creek

2. Known industrial - None

† See Working Paper No. 257, "Report on Lake Howell".
* Treatment plant questionnaires.
** Anonymous, 1971; population shown is 1970 census.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/yr	% of total
a. Tributaries (non-point load) -		
Gee Creek	10,990	8.1
Soldier Creek	1,470	1.1
Unnamed Creek C-1	5,725	4.2
Howell Creek	43,435	32.0
Salt Creek	3,750	2.8
Sweetwater Creek	8,050	5.9
b. Minor tributaries & immediate drainage (non-point load) -	20,165	14.9
c. Known municipal STP's -		
Casselberry	9,495	7.0
Country Club Heights	170	0.1
Winter Springs	4,285	3.2
Winter Park	17,630	13.0
Howell Park	445	0.3
Maitland	7,245	5.3
North Orlando Townsites	1,315	1.0
d. Septic tanks* -	10	< 0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	1,410	1.0
Total	135,590	100.0

2. Outputs -

Lake outlet - to St. Johns River 71,750

3. Net annual P accumulation - 63,840 kg.

* Estimate based on 37 lakeshore dwellings; see Working Paper No. 175.
** Brezonik and Shannon, 1971.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/ yr	% of total
a. Tributaries (non-point load) -		
Gee Creek	35,510	8.3
Soldier Creek	18,710	4.4
Unnamed Creek C-1	26,360	6.2
Howell Creek	100,320	23.5
Salt Creek	14,290	3.3
Sweetwater Creek	55,020	12.9
b. Minor tributaries & immediate drainage (non-point load) -	76,990	18.0
c. Known municipal STP's -		
Casselberry	14,115	3.3
Country Club Heights	320	< 0.1
Winter Springs	9,080	2.1
Winter Park	37,230	8.7
Howell Park	935	0.2
Maitland	15,305	3.6
North Orlando Townsites	3,950	0.9
d. Septic tanks* -	395	0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	18,560	4.4
Total	427,090	100.0

2. Outputs -

Lake outlet - to St. Johns River 438,290

3. Net annual N loss - 11,200 kg.

* Estimate based on 37 lakeshore dwellings; see Working Paper No. 175.
** Brezonik and Shannon, 1971.

D. Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
Gee Creek	314	1,015
Soldier Creek	24	310
Unnamed Creek C-1	252	1,161
Howell Creek	316	731
Salt Creek	253	966
Sweetwater Creek	1,201	8,212

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Note, however, that Florida lakes may be able to assimilate phosphorus at a somewhat higher level than that suggested by Vollenweider (Shannon and Brezonik, 1972).

Essentially, Vollenweider's "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	4.24	2.00	13.3	loss*

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Lake Jessup:

"Dangerous" (eutrophic loading)	0.48
"Permissible" (oligotrophic loading)	0.24

* There was an apparent loss of nitrogen during the sampling year. This may have been due to nitrogen fixation in the lake, solubilization of previously sedimented nitrogen, recharge with nitrogen-rich ground water, unknown and unsampled point sources discharging directly to the lake, or underestimation of the minor tributary and immediate drainage load. Whatever the cause, a similar nitrogen loss has occurred at Shagawa Lake, Minnesota, which has been intensively studied by EPA's former National Eutrophication and Lake Restoration Branch (Malueg et al., 1975).

V. LITERATURE REVIEWED

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VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
1201	ALLIGATOR LAKE	0.620	0.260	474.000	87.733	13.100	0.386
1202	LAKE APOPKA	0.102	0.230	484.176	46.611	8.200	0.019
1203	LAKE BANANA	0.660	0.260	482.667	208.600	3.600	0.293
1206	LAKE CRESCENT	0.065	0.130	473.889	10.211	10.200	0.033
1207	DOCTORS LAKE	0.084	0.120	465.555	27.100	10.600	0.028
1208	LAKE DORA	0.102	0.240	482.889	59.978	7.400	0.022
1209	LAKE EFFIE	1.480	0.410	489.000	261.433	15.000	0.950
1210	LAKE GEORGE	0.129	0.165	469.308	35.000	11.000	0.063
1211	LAKE GIBSON	0.167	0.115	470.000	19.675	10.200	0.069
1212	GLENADA LAKE	0.134	0.165	454.167	27.667	14.700	0.072
1214	LAKE GRIFFIN	0.119	0.260	481.333	66.855	6.600	0.038
1215	LAKE HAINES	0.063	0.115	462.667	26.567	10.600	0.014
1217	LAKE HANCOCK	0.772	0.195	483.500	97.900	5.600	0.158
1219	LAKE HORSESHOE	0.034	0.130	459.000	12.067	11.500	0.023
1220	LAKE HOWELL	1.260	0.285	464.000	54.117	9.000	1.175
1221	LAKE ISTOKPOGA	0.039	0.120	464.222	6.594	8.600	0.010
1223	LAKE JESSUP	0.492	0.290	487.000	76.550	7.600	0.288
1224	LAKE KISSIMMEE	0.034	0.145	463.667	24.142	8.800	0.007
1227	LAKE LULU	1.490	1.065	483.000	276.566	14.300	1.030
1228	LAKE MARION	0.044	0.260	468.833	29.967	7.600	0.016
1229	LAKE MINNEHAHA	0.038	0.080	435.000	8.733	7.700	0.012
1230	LAKE MINNEOLA	0.018	0.070	406.333	3.333	7.400	0.009
1231	LAKE MONROE	0.188	0.300	474.555	14.225	10.800	0.128
1232	LAKE OKEECHOBEE	0.063	0.185	472.366	14.524	9.800	0.010
1234	LAKE POINSETT	0.085	0.150	469.000	6.500	10.600	0.051
1236	LAKE REEDY	0.033	0.330	468.500	34.837	10.600	0.008
1238	LAKE SOUTH	0.074	0.130	464.000	23.167	9.000	0.028
1239	LAKE TALQUIN	0.085	0.290	462.167	9.483	14.400	0.031

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
1240	LAKE THONOTOSASSA	0.695	0.095	466.167	37.700	10.200	0.565
1241	LAKE TOHOPEKALIGA	0.246	0.200	472.917	30.633	10.500	0.152
1242	TROUT LAKE	1.110	0.650	472.000	76.967	12.900	0.970
1243	LAKE WEOHYAKAPKA	0.047	0.080	458.667	7.767	8.200	0.011
1246	LAKE YALE	0.027	0.160	441.000	25.367	7.600	0.014
1247	LAKE MUNSON	1.475	0.925	486.667	140.317	12.200	0.852
1248	LAKE SEMINOLE	0.234	0.175	473.833	102.000	8.600	0.026
1249	LAKE LAWNE	2.560	1.350	494.667	84.900	10.400	0.117
1250	LAKE TARPON	0.041	0.070	400.889	6.867	9.000	0.027
1252	LAKE ELOISE	0.486	0.170	465.333	70.233	12.200	0.339
1258	LAKE JESSIE	0.051	0.090	452.667	26.300	10.800	0.011
1261	EAST LAKE TOHOPEKALIGA	0.042	0.070	440.833	5.167	9.400	0.007
1264	PAYNE'S PRAIRIE LAKE (NO	1.260	0.140	476.000	88.200	7.400	1.210

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
1201	ALLIGATOR LAKE	25 (10)	29 (10)	30 (12)	18 (7)	10 (4)	18 (7)	130
1202	LAKE APOPKA	50 (20)	38 (15)	10 (4)	38 (15)	74 (29)	70 (28)	280
1203	LAKE BANANA	23 (9)	29 (10)	20 (8)	5 (2)	100 (40)	23 (9)	200
1206	LAKE CRESCENT	65 (26)	70 (27)	33 (13)	80 (32)	48 (18)	50 (20)	346
1207	DOCTORS LAKE	60 (24)	76 (30)	60 (24)	55 (22)	34 (12)	56 (22)	341
1208	LAKE DORA	53 (21)	35 (14)	18 (7)	33 (13)	90 (35)	68 (27)	297
1209	LAKE EFFIE	5 (2)	10 (4)	3 (1)	3 (1)	0 (0)	10 (4)	31
1210	LAKE GEORGE	45 (18)	54 (21)	48 (19)	43 (17)	23 (9)	43 (17)	256
1211	LAKE GIBSON	40 (16)	81 (32)	45 (18)	70 (28)	48 (18)	40 (16)	324
1212	GLENADA LAKE	43 (17)	54 (21)	85 (34)	53 (21)	3 (1)	38 (15)	276
1214	LAKE GRIFFIN	48 (19)	29 (10)	23 (9)	30 (12)	95 (38)	48 (19)	273
1215	LAKE HAINES	70 (28)	81 (32)	75 (30)	58 (23)	34 (12)	78 (31)	396
1217	LAKE HANCOCK	18 (7)	43 (17)	13 (5)	13 (5)	98 (39)	28 (11)	213
1219	LAKE HORSESHOE	93 (37)	70 (27)	80 (32)	78 (31)	20 (8)	65 (26)	406
1220	LAKE HOWELL	11 (4)	23 (9)	69 (27)	35 (14)	60 (23)	3 (1)	201
1221	LAKE ISTOKPOGA	85 (34)	76 (30)	65 (26)	93 (37)	69 (27)	89 (35)	477
1223	LAKE JESSUP	28 (11)	18 (7)	5 (2)	25 (10)	83 (32)	25 (10)	184
1224	LAKE KISSIMMEE	90 (36)	63 (25)	73 (29)	65 (26)	65 (26)	99 (39)	455
1227	LAKE LULU	3 (1)	3 (1)	15 (6)	0 (0)	8 (3)	5 (2)	34
1228	LAKE MARION	78 (31)	29 (10)	53 (21)	50 (20)	83 (32)	73 (29)	366
1229	LAKE MINNEHAHA	88 (35)	91 (36)	95 (38)	85 (34)	78 (31)	80 (32)	517
1230	LAKE MINNEOLA	100 (40)	98 (38)	98 (39)	100 (40)	90 (35)	93 (37)	579
1231	LAKE MONROE	38 (15)	15 (6)	28 (11)	75 (30)	26 (10)	33 (13)	215
1232	LAKE OKEECHOBEE	68 (27)	45 (18)	40 (16)	73 (29)	53 (21)	89 (35)	368
1234	LAKE POINSETT	58 (23)	60 (24)	50 (20)	95 (38)	34 (12)	45 (18)	342
1236	LAKE REEDY	95 (38)	13 (5)	55 (22)	45 (18)	34 (12)	95 (38)	337
1238	LAKE SOUTH	63 (25)	70 (27)	69 (27)	68 (27)	60 (23)	56 (22)	386
1239	LAKE TALQUIN	55 (22)	20 (8)	78 (31)	83 (33)	5 (2)	53 (21)	294

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
1240	LAKE THONOTOSASSA	20 (8)	85 (34)	58 (23)	40 (16)	48 (18)	15 (6)	266
1241	LAKE TOHOPEKALIGA	33 (13)	40 (16)	38 (15)	48 (19)	40 (16)	30 (12)	229
1242	TROUT LAKE	15 (6)	8 (3)	43 (17)	23 (9)	13 (5)	8 (3)	110
1243	LAKE WEOHYAKAPKA	75 (30)	91 (36)	83 (33)	88 (35)	74 (29)	84 (33)	495
1246	LAKE YALE	98 (39)	58 (23)	90 (36)	63 (25)	83 (32)	75 (30)	467
1247	LAKE MUNSON	8 (3)	5 (2)	8 (3)	8 (3)	16 (6)	13 (5)	58
1248	LAKE SEMINOLE	35 (14)	48 (19)	35 (14)	10 (4)	69 (27)	63 (25)	260
1249	LAKE LAWNE	0 (0)	0 (0)	0 (0)	20 (8)	43 (17)	35 (14)	98
1250	LAKE TARPON	83 (33)	98 (38)	100 (40)	90 (36)	60 (23)	60 (24)	491
1252	LAKE ELOISE	30 (12)	50 (20)	63 (25)	28 (11)	16 (6)	20 (8)	207
1258	LAKE JESSIE	73 (29)	88 (35)	88 (35)	60 (24)	26 (10)	84 (33)	419
1261	EAST LAKE TOHOPEKALIGA	80 (32)	98 (38)	93 (37)	98 (39)	55 (22)	99 (39)	523
1264	PAYNE'S PRAIRIE LAKE (NO	11 (4)	65 (26)	25 (10)	15 (6)	90 (35)	0 (0)	206

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	1230	LAKE MINNEOLA	579
2	1261	EAST LAKE TOHOPEKALIGA	523
3	1229	LAKE MINNEHAHA	517
4	1243	LAKE WEOHYAKAPKA	495
5	1250	LAKE TARPON	491
6	1221	LAKE ISTOKPOGA	477
7	1246	LAKE YALE	467
8	1224	LAKE KISSIMMEE	455
9	1258	LAKE JESSIE	419
10	1219	LAKE HORSESHOE	406
11	1215	LAKE HAINES	396
12	1238	LAKE SOUTH	386
13	1232	LAKE OKEECHOBEE	368
14	1228	LAKE MARION	366
15	1206	LAKE CRESCENT	346
16	1234	LAKE POINSETT	342
17	1207	DOCTORS LAKE	341
18	1236	LAKE REEDY	337
19	1211	LAKE GIBSON	324
20	1208	LAKE DORA	297
21	1239	LAKE TALQUIN	294
22	1202	LAKE APOPKA	280
23	1212	GLENADA LAKE	276
24	1214	LAKE GRIFFIN	273
25	1240	LAKE THONOTOSASSA	266
26	1248	LAKE SEMINOLE	260
27	1210	LAKE GEORGE	256
28	1241	LAKE TOHOPEKALIGA	229

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
29	1231	LAKE MONROE	215
30	1217	LAKE HANCOCK	213
31	1252	LAKE ELOISE	207
32	1264	PAYNE'S PRAIRIE LAKE (NO	206
33	1220	LAKE HOWELL	201
34	1203	LAKE BANANA	200
35	1223	LAKE JESSUP	184
36	1201	ALLIGATOR LAKE	130
37	1242	TROUT LAKE	110
38	1249	LAKE LAWNE	98
39	1247	LAKE MUNSON	58
40	1227	LAKE LULU	34
41	1209	LAKE EFFIE	31

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 - cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR FLORIDA 8/25/75

LAKE CODE 1223 LAKE JESSUP

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 388.5

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1223A1	35.0	0.24	0.36	0.49	0.12	0.06	0.22	0.44	0.63	0.88	0.40	0.18	0.14	0.35
1223B1	60.3	0.15	0.22	0.31	0.07	0.04	0.14	0.27	0.39	0.55	0.25	0.11	0.09	0.22
1223C1	22.7	0.17	0.26	0.36	0.08	0.04	0.16	0.31	0.46	0.63	0.29	0.13	0.10	0.25
1223D1	137.3	3.28	3.17	2.89	1.44	0.57	0.76	2.78	3.17	4.08	3.96	3.14	2.83	2.67
1223E1	14.8	0.14	0.20	0.28	0.08	0.04	0.13	0.25	0.35	0.49	0.23	0.10	0.09	0.20
1223F1	388.5	5.01	4.02	7.16	4.59	-0.59	-0.40	5.35	4.62	5.72	8.86	8.18	6.91	4.97
1223G1	6.7	0.17	0.20	0.23	0.14	0.13	0.16	0.22	0.26	0.32	0.21	0.16	0.15	0.20
1223ZZ	77.7	0.74	1.10	1.53	0.37	0.18	0.68	1.36	1.98	2.75	1.25	0.54	0.45	1.08

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 388.5
SUM OF SUB-DRAINAGE AREAS = 354.5
TOTAL FLOW IN = 59.45
TOTAL FLOW OUT = 59.44

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1223A1	3	73	0.28	18	0.18				
	4	73	0.28	7	0.28	8	0.68		
	5	73	0.13	13	0.12				
	6	73	0.25	3	0.11	17	0.12	26	0.51
	7	73	0.76	7	0.27				
	8	73	0.74	5	1.08	20	0.37	21	0.37
	9	73	1.42	8	0.99	9	0.91		
	10	73	0.65	14	0.68				
	11	73	0.25	3	0.34	4	0.34		
	12	73	0.21	8	0.18	9	0.18	15	0.18
	1	74	0.18	6	0.20	12	0.18		
	2	74	0.15	2	0.13	3	0.12		
1223B1	3	73	0.18	18	0.06				
	4	73	0.21	7	0.22	8	0.93		
	5	73	0.05	13	0.04				
	6	73	0.14	3	0.06	17	0.04	26	0.62
	7	73	0.48	7	0.07				
	8	73	0.57	5	0.88	20	0.18	21	0.15
	9	73	1.42	8	0.91	9	0.59		
	10	73	0.45	14	0.45				
	11	73	0.09	3	0.12	4	0.11		
	12	73	0.12	8	0.12	9	0.14	15	0.10
	1	74	0.11	6	0.14	12	0.11		
	2	74	0.16	2	0.08	3	0.08		

LAKE CODE 1223 LAKE JESSUP

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1223C1	3	73	0.14	18	0.05				
	4	73	0.17	7	0.18	8	0.74		
	5	73	0.04	13	0.03				
	6	73	0.11	3	0.05	17	0.03	26	0.48
	7	73	0.37	7	0.05				
	8	73	0.40	5	0.59	20	0.12	21	0.10
	9	73	0.91	8	0.59	9	0.40		
	10	73	0.28	14	0.28				
	11	73	0.05	3	0.07	4	0.06		
	12	73	0.07	8	0.07	9	0.08	15	0.06
	1	74	0.07	6	0.10	12	0.07		
	2	74	0.10	2	0.06	3	0.06		
1223D1	3	73	1.13	18	1.08				
	4	73	1.47	7	1.56	8	2.18		
	5	73	0.79	13	0.79				
	6	73	1.02	3	0.74	17	1.19	26	1.30
	7	73	3.99	7	2.21				
	8	73	3.17	5	3.40	20	2.41	21	2.21
	9	73	4.47	8	3.77	9	3.62		
	10	73	3.31	14	3.54				
	11	73	1.36	3	1.30	4	1.30		
	12	73	0.96	8	0.91	9	0.91	15	0.91
	1	74	1.19	6	1.33	12	1.30		
	2	74	0.88	2	0.91	3	0.91		
1223E1	3	73	0.03	18	0.01				
	4	73	0.03	7	0.03	8	0.20		
	5	73	0.01	13	0.01				
	6	73	0.02	3	0.01	17	0.01	26	0.24
	7	73	0.09	7	0.01				
	8	73	0.11	5	0.18	20	0.02	21	0.02
	9	73	0.31	8	0.19	9	0.12		
	10	73	0.09	14	0.12				
	11	73	0.01	3	0.01	4	0.01		
	12	73	0.01	8	0.01	9	0.01	15	0.01
	1	74	0.01	6	0.02	12	0.01		
	2	74	0.02	2	0.01	3	0.01		
1223F1	3	73	6.06	18	0.0				
	4	73	4.93	7	0.0	8	0.0		
	5	73	1.64	13	0.0				
	6	73	-0.48	3	0.0	17	0.0	26	0.0
	7	73	6.68	7	0.0				
	8	73	3.94	5	0.0	20	0.0	21	0.0
	9	73	10.31	8	0.0	9	0.0		
	10	73	5.52	14	0.0				
	11	73	6.91	3	0.0	4	0.0		
	12	73	5.41	8	0.0	9	0.0		
	1	74	3.82	6	0.0	12	0.0		
	2	74	0.14	2	0.0	3	0.0		

TRIBUTARY FLOW INFORMATION FOR FLORIDA 8/25/75

LAKE CODE 1223 LAKE JESSUP

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1223G1	3	73	0.14	18	0.14				
	4	73	0.18	7	0.19	8	0.25		
	5	73	0.10	13	0.10				
	6	73	0.14	3	0.11	17	0.16	26	0.16
	7	73	0.45	7	0.27				
	8	73	0.37	5	0.40	20	0.28	21	0.27
	9	73	0.48	8	0.42	9	0.40		
	10	73	0.37	14	0.40				
	11	73	0.15	3	0.15	4	0.14		
	12	73	0.09	8	0.08	9	0.08	15	0.08
	1	74	0.12	6	0.20	12	0.14		
	2	74	0.08	2	0.08	3	0.08		
1223ZZ	3	73	0.54	18	0.42				
	4	73	0.65	8	0.68	7	1.39		
	5	73	0.31	13	0.31				
	6	73	0.48	3	0.31	17	0.42	26	0.93
	7	73	1.73	7	0.82				
	8	73	1.50	5	1.84	20	0.93	21	0.88
	9	73	2.52	8	1.93	9	1.70		
	10	73	1.44	14	1.53				
	11	73	0.54	3	0.57	4	0.57		
	12	73	0.42	8	0.40	9	0.40	15	0.37
	1	74	0.48	6	0.57	12	0.51		
	2	74	0.40	2	0.37	3	0.37		

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/08/25

122301
28 42 40.0 081 13 40.0
LAKE JESSUP
12117 FLORIDA

11EPALES 2111202
3 0007 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/03/14	16 30	0000	26.7	9.8	15	850	9.50	81	0.130	2.400	0.150	0.273
73/09/05	13 40	0000	30.0	11.2	10	842	9.40	63	0.210	3.400	0.310	0.281
73/11/05	11 30	0000	23.5	9.0	15	633	7.90	74	0.060	1.500	0.040	0.430

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/03/14	16 30	0000	0.485	70.8
73/09/05	13 40	0000	0.417	122.9
73/11/05	11 30	0000	0.588	33.8

STORET RETRIEVAL DATE 75/08/25

122302
28 44 19.0 081 11 28.0
LAKE JESSUP
12117 FLORIDA

11EPALES
3

2111202
0004 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/03/14	17 00	0000	26.7	10.9	12	900	9.60	79	0.140	2.800	0.160	0.261
73/09/05	13 50	0000	27.1	10.0	14	793	9.10	65	0.190	3.400	0.200	0.295
73/11/05	11 25	0000	23.2	7.4	12	737	7.90	78	0.070	1.900	0.060	0.395

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/03/14	17 00	0000	0.500	82.4
73/09/05	13 50	0000	0.475	108.4
73/11/05	11 25	0000	0.564	41.0

APPENDIX E

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 75/08/25

1223A1
28 42 30.0 081 17 30.0
GEE CREEK
12055 7.5 CASSELBERRY
T/LAKE JESSUP
HWY 419 BRDG 1 MI SW OF NORTH ORLANDO
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/18	11	18	0.086	12.600	7.000	2.800	4.000
73/04/08	10	18	0.230	5.100	1.680	1.000	1.500
73/05/13	09	05	0.110	12.000	9.000	4.500	4.900
73/06/03	09	10	0.330	11.000	6.720	3.800	4.300
73/06/26	08	30	0.280	5.200	3.100	1.800	2.000
73/07/07	09	15	0.280	4.500	3.000	1.890	2.100
73/08/21	08	30	0.132	1.600	0.078	0.180	0.290
73/09/09	09	05	0.620	1.890	0.370	0.890	1.050
73/10/14	11	14	0.610	1.900	0.280	0.820	0.990
73/11/03	15	20	1.180	2.000	0.630	1.440	1.700
73/12/09	09	15	1.600	3.300	1.400	2.300	2.500
74/01/06	09	00	0.588	2.400	1.350	2.750	3.150
74/02/02	10	10	1.200	3.400	1.900	2.000	2.400

STORET RETRIEVAL DATE 75/08/25

122381
28 43 00.0 081 18 30.0
SOLDIER CREEK
12 7.5 CASSELBERRY
T/LAKE JESSUP
ST HWY 419 BRDG DOWNSTREAM LANGWOOD STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/18	11 05		0.200	1.000	0.110	0.105	0.200
73/04/08	10 23		0.089	2.100	0.013	0.082	0.240
73/05/13	09 10		0.150	4.400	1.160	0.095	0.250
73/06/03	09 25		2.160	1.290	0.470	0.084	0.250
73/06/26	08 15		0.170	1.890	0.138	0.120	0.280
73/07/07	09 25		0.320	3.570	0.920	0.154	0.290
73/08/20	11 35		0.036	1.500	0.310	0.025	0.055
73/09/09	09 12		0.100	5.700	0.105	0.132	0.240
73/10/14	10 20		0.110	1.900	0.088	0.240	0.310
73/11/03	15 30		0.216	3.750	0.940	0.128	0.210
73/12/09	09 20		0.168	1.800	0.470	0.176	0.230
74/01/06	09 15		0.176	1.800	0.070	0.160	0.250
74/02/02	10 18		0.288	1.300	0.180	0.210	0.310

STORET RETRIEVAL DATE 75/08/25

1223C1
28 43 30.0 081 16 00.0
UNNAMED CREEK
12 7.5 CASSELBERRY
T/LAKE JESSUP
DIRT RD BRDG OFF SANFORD AVE NEAR COOPER
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/18	12 00		0.048	2.400	0.058	0.340	0.620
73/04/08	10 55		0.290	3.570	0.198	0.460	0.705
73/05/13	09 25		0.010K	5.900	0.154	0.300	0.540
73/06/03	09 30		0.060	5.400	0.240	0.210	0.410
73/06/26	08 45		0.022	2.900	0.069	0.685	0.980
73/07/07	09 35		0.017	5.400	0.195	0.520	0.780
73/08/20	10 30		0.010K	2.520	0.082	0.350	0.545
73/10/14	11 35		0.115	1.580	0.100	0.480	0.595
73/11/03	15 45		0.860	1.350	0.044	0.510	
73/12/09	09 40		0.450	1.800	0.350	0.770	0.880
74/01/06	09 25		0.064	2.200	0.113	0.581	0.840
74/02/02	13 40		0.024	2.500	0.035	0.680	0.980

STORET RETRIEVAL DATE 75/08/25

122301
28 41 30.0 081 15 00.0
HOWELL CREEK
12 7.5 OVIEDO
T/LAKE JESSUP
ST HWY 419 BRDG 1 MI SW OF CLIFTON SPRGS
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/18	11 45		0.231	0.880	0.081	0.760	0.820
73/04/07	14 15		0.138	1.100	0.042	0.820	0.930
73/05/13	11 45		0.330	0.980	0.092	0.294	
73/06/17	12 08		0.273	4.900	0.054	0.620	0.720
73/07/07	12 00		0.320	1.470	0.069	0.950	1.000
73/08/21	08 35		0.510	3.200	2.000	1.550	1.700
73/09/09	14 30		0.210	1.100	0.052	0.790	0.860
73/11/04	09 00		0.208	1.250	0.240	0.136	0.175
73/12/08	11 35		0.400	0.600	0.044	0.680	0.760
73/12/15	12 00		0.430	0.700	0.036	0.704	0.740
74/01/12	12 30		0.124	1.100	0.060	0.076	0.140
74/02/03	11 15		0.288	0.800	0.022	0.915	1.000

STORET RETRIEVAL DATE 75/08/25

1223E1
28 43 00.0 081 10 00.0
SALT CREEK
12 7.5 OVIEDO
T/LAKE JESSUP
BANK WHERE ACCESSIBLE FROM FISH HATCHERY
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/18	12 40		0.160	1.600	0.180	0.320	0.360
73/04/07	13 50		0.270	2.300	0.250	0.270	0.470
73/05/13	11 15		0.126	2.400	0.140	0.560	0.700
73/06/17	11 45		0.130	1.300	1.040	0.630	0.700
73/07/07	12 35		0.078	2.400	0.810	0.320	0.390
73/08/05	13 15		0.010K	2.800	0.198	0.083	0.900
73/09/09	09 25		0.010K	1.470	0.056	0.378	0.530
73/11/04	08 50		1.180	2.600	1.010	1.700	1.880
73/12/08	11 45		0.064	1.200	0.490	0.116	0.147
73/12/15	11 20		0.052	2.100	0.504	0.132	0.200
74/01/12	12 00		0.096	1.500	0.276	0.160	0.230
74/02/03	10 45		0.052	2.400	0.360	0.240	0.420

STORET RETRIEVAL DATE 75/08/25

1223F1
28 47 00.0 081 11 00.0
ST JOHNS RIVER
12 7.5 OSTEEN
0/LAKE JESSUP
ST HWY 46 BRDG (GENEVA BRDG)
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/18	08	45	0.160	1.320	0.110	0.140	0.165
73/04/08	09	50	0.220	1.510	0.160	0.132	0.170
73/05/13	09	45	0.075	6.300	0.340	0.140	0.170
73/06/03	09	50	0.031	5.100	0.220	0.150	0.190
73/06/26	08	00	0.073	2.900	0.240	0.210	0.245
73/07/07	09	50	0.016	4.500	0.147	0.290	0.610
73/08/20	10	00	0.016	3.700	0.078	0.430	0.640
73/09/09	09	50	0.010K	1.680	0.039	0.370	0.550
73/10/14	12	01	0.010K	1.300	0.044	0.340	0.440
73/11/04	09	45	0.032	2.200	0.064	0.352	0.430
73/12/09	10	00	0.088	2.300	0.096	0.252	0.315
74/01/06	09	50	0.012	2.500	0.040	0.550	0.720
74/02/02	11	05	0.020	2.000	0.022	0.525	0.700

STORET RETRIEVAL DATE 75/08/25

122361
28 42 00.0 081 12 30.0
SWEETWATER CREEK
12 7.5 OVIEDO
T/LAKE JESSUP
ALONG SECONDARY RD S OF JONES LANDING
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/18	12 00		12.000	4.700	2.300	0.520	0.550
73/04/07	13 25		17.200	3.570	1.370	0.560	0.660
73/05/13	11 50		4.400	1.400	0.550	0.540	0.560
73/06/17	11 08		9.700	1.800	0.990	0.340	1.100
73/07/07	11 07		10.900	4.400	3.000	3.600	3.900
73/08/05	12 00		0.020	2.700	0.357	0.350	0.525
73/09/08	14 30		1.700	1.600	0.138	0.590	0.630
73/11/04	09 20		0.092	1.550	0.104	0.570	0.690
73/12/08	11 15		6.500	4.400	2.640	1.840	2.600
73/12/15	11 30		6.600	5.400	3.640	1.900	2.400
74/01/12	12 15		1.440	1.700	0.300	0.960	1.100
74/02/03	10 30		0.530	2.000	0.230	0.770	0.840

STORET RETRIEVAL DATE 75/08/25

1223AA TF1223AA P001800
28 41 00.0 081 19 00.0
WINTER SPRINGS
12055 7.5 CASSELBERRY
T/LAKE JESSUP
GEE CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/02/20	07 30								
CP(T)-			0.045	18.900	5.400	7.300	9.100	0.246	0.269
73/02/20	16 30								
73/03/20	00 00								
CP(T)-			0.185	28.000	6.400	9.850	10.000	0.252	0.276
73/03/20	08 00								
73/04/26	00 00								
CP(T)-			0.195	21.000	3.900	8.750	10.000	0.194	0.308
73/04/26	08 00								
73/05/22	00 00								
CP(T)-			0.040	20.500	5.800	8.600	9.900	0.223	0.238
73/05/22	08 00								
73/07/03	00 00								
CP(T)-			0.320	15.400	4.100	7.430	9.300	0.215	0.250
73/07/03	08 00								
73/11/29	08 00								
CP(T)-			0.080	26.000	8.700	10.000	11.500	0.248	0.294
73/11/29	16 00								
73/12/30	08 00								
CP(T)-			0.320	31.000	13.200	10.400	12.500	0.295	0.279
73/12/30	17 00								
74/01/29	08 00								
CP(T)-			0.040	29.000	8.100	6.500	13.500	0.297	0.281
74/01/29	16 00								
74/02/25	08 00								
CP(T)-			0.120	24.000	10.500	9.450	12.000	0.310	0.310
74/02/25	15 00								
74/03/27	08 00								
CP(T)-			0.040	15.000	4.800	7.900	10.500	0.320	0.320
74/03/27	17 00								

STORET RETRIEVAL DATE 75/08/25

1223AB AS1223AB P009779
28 41 00.0 081 19 30.0
CASSELBERRY
12 7.5 CASSELBERRY
T/LAKE JESSUP
GEE CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/03/07	08	00							
CP(T)-			0.010K	24.000	11.000	6.200	7.000	0.811	0.847
73/03/07	17	00							
73/04/03	08	00							
CP(T)-			0.075	17.600	6.300	4.400	6.200	0.760	0.765
73/04/03	17	00							
73/12/27			6.400	1.800	0.094	9.600	10.500	1.050	0.720
74/01/29			1.320	14.000	4.900	8.900	9.300	1.140	1.040
74/02/14	00	00							
CP(T)-			1.840	5.700	0.890	8.500	8.500	1.080	1.080
74/02/14	24	00							
74/04/29	08	00							
CP(T)-			3.000	3.300	0.270	10.500	11.500	0.780	0.859
74/04/29	24	00							
74/06/19	08	00							
CP(T)-			2.450	1.900	0.150	7.100	7.500	0.872	0.801
74/06/19	24	00							
74/07/23	08	00							
CP(T)-			14.300	1.000K	0.420	5.600	6.000	0.963	0.997
74/07/23	24	00							
74/09/10	08	00							
CP(T)-			6.650	1.000	0.210	4.350	4.850	1.110	0.881
74/09/10	24	00							
74/11/29	14	40	8.000	4.200	0.150	5.250	6.500	0.727	0.802

STORET RETRIEVAL DATE 75/08/25

1223BA PD1223BA P000203
28 44 00.0 081 16 00.0
COUNTRY CLUB HEIGHTS
12 1:250000 ORLANDO
T/LAKE JESSUP
SOLDIER CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/07/12	08 00								
CP(T)-			0.140	6.600	0.430	2.800	4.200	0.020	0.020
73/07/12	15 00								
73/08/07	08 00								
CP(T)-			0.330	11.500	1.280	5.700	7.900	0.020	0.020
73/08/07	16 00								
73/09/25	11 00								
CP(T)-			0.050	16.100	1.200	5.500	6.600		0.020
73/09/25	16 00								