APPENDIX A

Maps of the Study Area

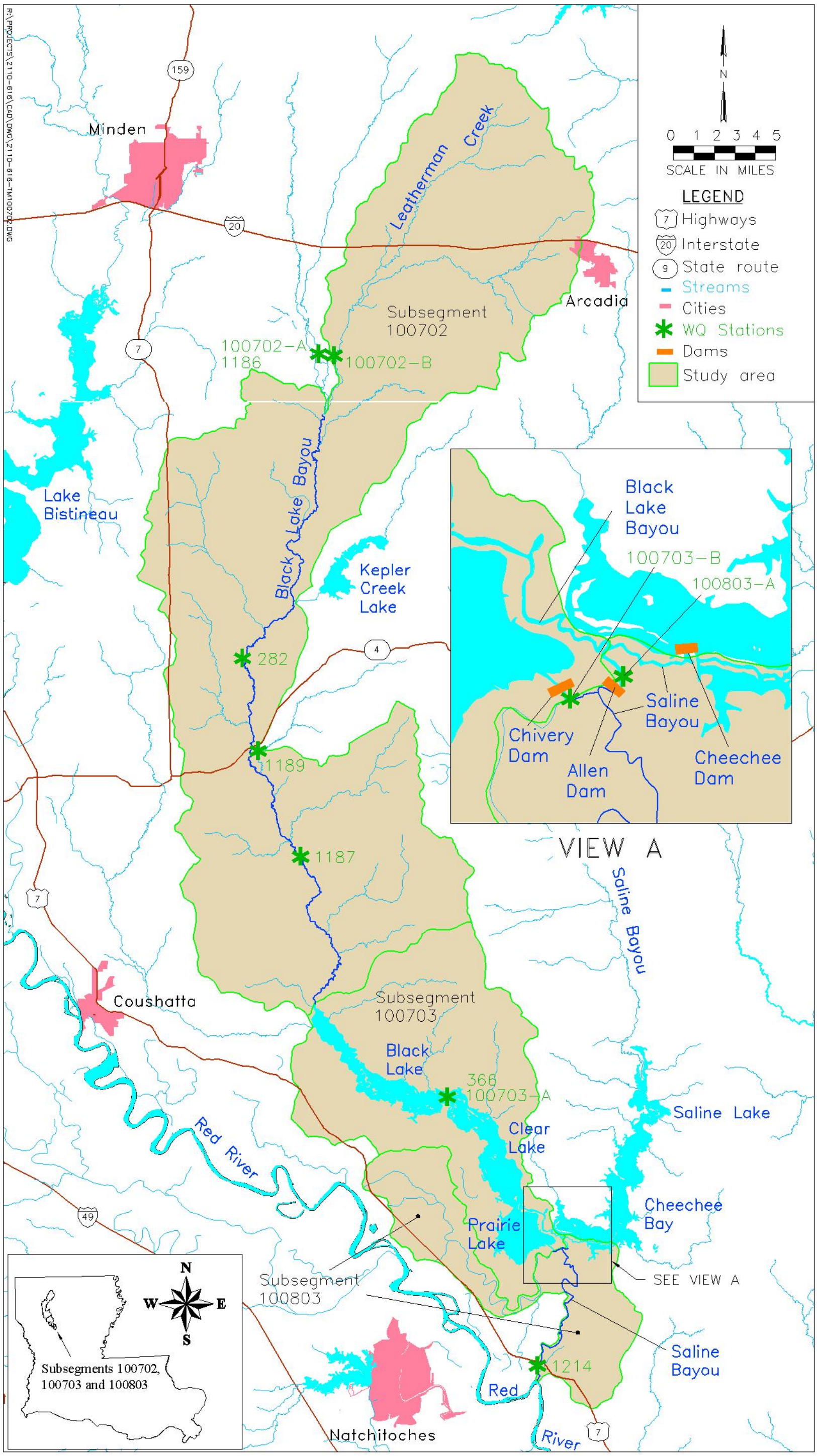

Figure A.1. Map of study area.

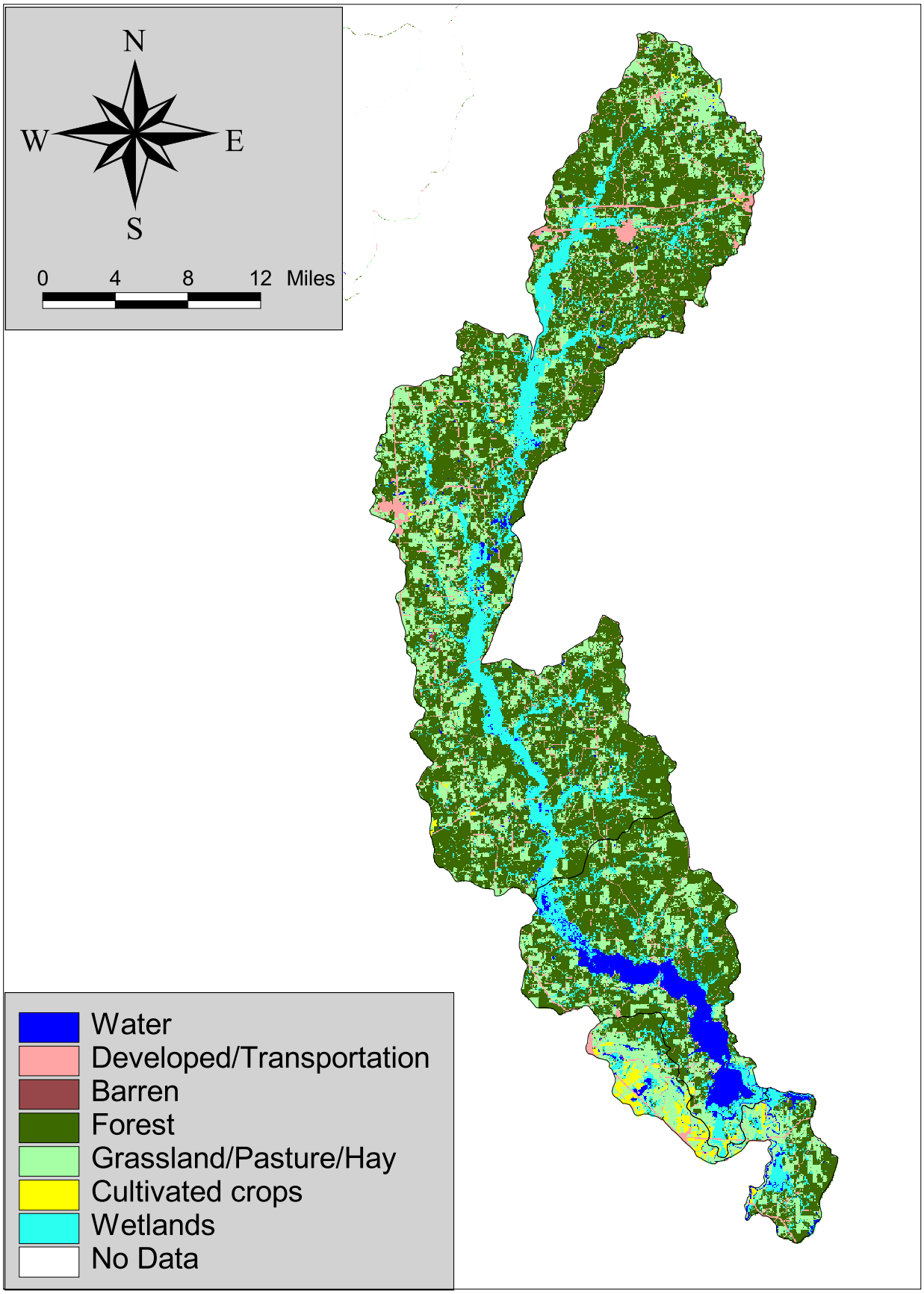

Figure A.2. Land use for subsegments 100702, 100703, and 100803.

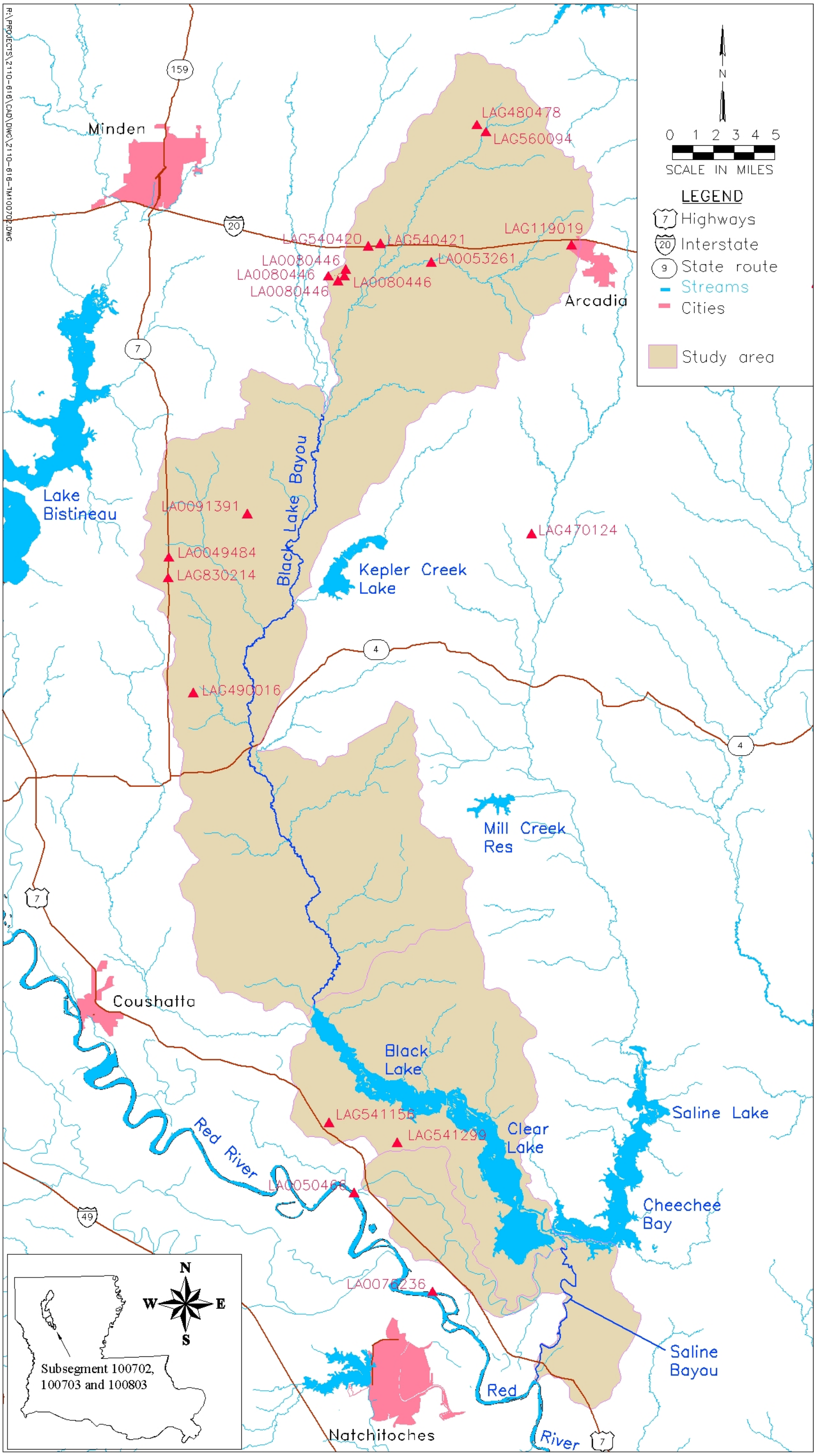

Figure A.3. Point sources in subsegment 100702, 100703 and 100803.

APPENDIX B

LDEQ Routine Monitoring Data

Table B.1. LDEQ historical data collected on Black Lake Bayou southeast of Dubberly (LDEQ Station 1186).

Collection Date	Collection Time	Sample Depth (m)	DO (mg/L)
14-Jan-02	10:53	1	9.57
18-Feb-02	10:15	1	9.58
18-Mar-02	10:16	1	7.23
8-Apr-02	10:34	1	7.53
13-May-02	10:05	1	3.69
10-Jun-02	10:00	0.5	0.76
15-Jul-02	10:30	1	1.12
12-Aug-02	9:45	1	1.70
16-Sep-02	10:00	1	1.67
14-Oct-02	10:25	1	5.16
12-Nov-02	10:00	1	6.00
3-Oct-05		0.25	1.08
9-Jan-06	11:20	0.12	3.65
6-Feb-06	11:25	1	8.69
6-Mar-06	12:30	1	8.60
3-Apr-06	12:04	0.5	5.47
17-Apr-06	12:45	0.61	4.76
1-May-06	12:30	1	5.88
5-Jun-06	11:45	0.15	2.07
19-Jun-06	14:00	0.3	2.10
4-Dec-06	12:20	0.3	3.67

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Table B.2. LDEQ DO data for Black Lake Bayou west of Castor, LA (Station 282).

Collection Date	Collection Time	Sample Depth (m)	DO (mg/L)
13-Feb-90	10:10	1	7.60
9-Apr-90	10:45	1	7.90
13-Aug-90	10:45	1	4.80
15-Oct-90	10:30	1	6.30
10-Dec-90	10:45	1	9.80
4-Feb-91	10:45	1	9.10
16-Apr-91	11:00	1	6.40
10-Jun-91	01:00	1	4.70
12-Aug-91	10:45	1	3.70
14-Oct-91	11:15	1	5.70
9-Dec-91	11:00	1	7.80
10-Feb-92	10:45	1	10.20
6-Apr-92	10:45	1	8.20
15-Jun-92	10:45	1	5.10
10-Aug-92	11:15	1	4.40
12-Oct-92	10:55	0.7	6.20
14-Dec-92	11:00	1	9.40
9-Feb-93	11:20	1	9.60
12-Apr-93	11:10	1	5.90
14-Jun-93	11:30	1	3.00
10-Aug-93	10:30	1	4.70
11-Oct-93	01:00	1	6.40
13-Dec-93	11:30	1	8.00
7-Feb-94	11:45	1	7.90
11-Apr-94	12:30	1	6.00

Collection Date	Collection Time	Sample Depth (m)	DO (mg/L)
13-Jun-94	11:30	1	4.60
8-Aug-94	10:50	1	4.80
10-Oct-94	01:15	1	6.40
13-Dec-94	10:00	1	8.50
13-Feb-95	03:00	1	10.10
3-Apr-95	03:15	1	6.70
12-Jun-95	12:30	1	3.70
14-Aug-95	11:50	0.6	4.10
9-Oct-95	12:00	0.3	6.20
11-Dec-95	11:30	1	8.70
12-Feb-96	11:30	1	8.80
8-Apr-96	02:50	1	8.20
10-Jun-96	02:30	1	5.01
12-Aug-96	12:00	1	4.99
14-Oct-96	02:15	1	7.03
9-Dec-96	12:35	1	8.15
17-Feb-97	02:15	1	9.40
14-Apr-97	01:00	1	7.70
9-Jun-97	02:30	1	4.72
11-Aug-97	03:00	1	5.28
13-Oct-97	02:00	1	5.81
8-Dec-97	01:30	1	9.61
9-Feb-98	01:00	1	9.75
13-Apr-98	01:00	1	6.69

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Table B.3. LDEQ historical data for Castor Creek at Highway 507, southwest of Castor, LA (Station 1189).

Collection Date	Collection Time	Sample Depth (m)	DO (mg/L)
14-JAN-2002	11:55	1	20.78
18-FEB-2002	12:00	1	10.50
18-MAR-2002	12:15	0.3	7.92
09-APR-2002	11:00	1	7.43
13-MAY-2002	12:35	0.5	6.14
10-JUN-2002	12:05	0.6	6.09
15-JUL-2002	12:04		6.21
12-AUG-2002	12:20	0.3	6.09
16-SEP-2002	12:05		6.63
14-OCT-2002	12:25	1	8.14
12-NOV-2002	12:00	0.5	7.88

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Table B.4. LDEQ historical water quality data for Black Lake Bayou at Highway 155, east of Martin, LA (Station 1187).

Collection Date	Collection Time	Sample Depth (m)	DO (mg/L)
14-JAN-2002	11:10	1	8.8
18-FEB-2002	11:30	1	9.6
18-MAR-2002	11:05	1.39	6.2
09-APR-2002	10:25	1	6.9
13-MAY-2002	11:15	1	4.4
10-JUN-2002	11:20	1	4.5
15-JUL-2002	10:55	1	6.4
12-AUG-2002	11:20	1	3.7
16-SEP-2002	11:25	1	4.2
14-OCT-2002	11:27	1	6.4
12-NOV-2002	11:10	1	6.5
10-JAN-2006	9:55	1	9.5
7-FEB-06	11:48	1	8.2
7-MAR-06	11:30	1	6.2
4-APR-06	13:20	1	5.0
10-MAY-06	13:15	1	5.4
25-MAY-06	10:15	1	4.7
1-AUG-06	10:45	1	5.3
9-AUG-06	11:00	1	5.4
27-SEP-06	10:40	1	6.2
18-OCT-06	12:30	1	6.8
15-NOV-06	9:30	1	7.3

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Table B.5. LDEQ historical water quality data for Black Lake north of Natchitoches, LA (Station 0366).

Collection Date	DO (mg/L)
08-Jan-02	6.4
04-Feb-02	6.1
04-Mar-02	7.5
01-Apr-02	6.7
06-May-02	5.8
03-Jun-02	6.6
08-Jul-02	6.2
05-Aug-02	4.3
09-Sep-02	4.2
07-Oct-02	5.5
20-Nov-02	5.7
02-Dec-02	7.5
18-Jan-06	10.7
14-Feb-06	7.8
14-Mar-06	7.6
11-Apr-06	7.2
25-Apr-06	7.4
10-May-06	5.4
13-Jun-06	5.7
26-Jul-06	5.4
29-Aug-06	6.3
31-Oct-06	7.6
14-Nov-06	7.4

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Table B.6. LDEQ historical water quality data for Saline Bayou southeast of Clarence, Louisiana (Station 1214).

Collection Date	Collection Time	Sample Depth (m)	DO (mg/L)
28-Jan-02	12:25	1	10.5
25-Feb-02	01:25	1	8.7
25-Mar-02	12:15	1	9.1
15-Apr-02	02:35	1	5.6
20-May-02	12:55	1	3.7
17-Jun-02	11:06	1	6.5
22-Jul-02	11:45	1	7.8
19-Aug-02	11:42	1	7.5
23-Sep-02	11:29	1	5.8
21-Oct-02	01:45	1	3.8
19-Nov-02	11:10	1	8.4
4-Oct-05		1	6.9
17-Jan-06	13:15	1	8.1
13-Feb-06	12:20	1	9.7

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Figure B.1. DO for Black Lake Bayou at Highway 793, southeast of Dubberly, LA (1186)

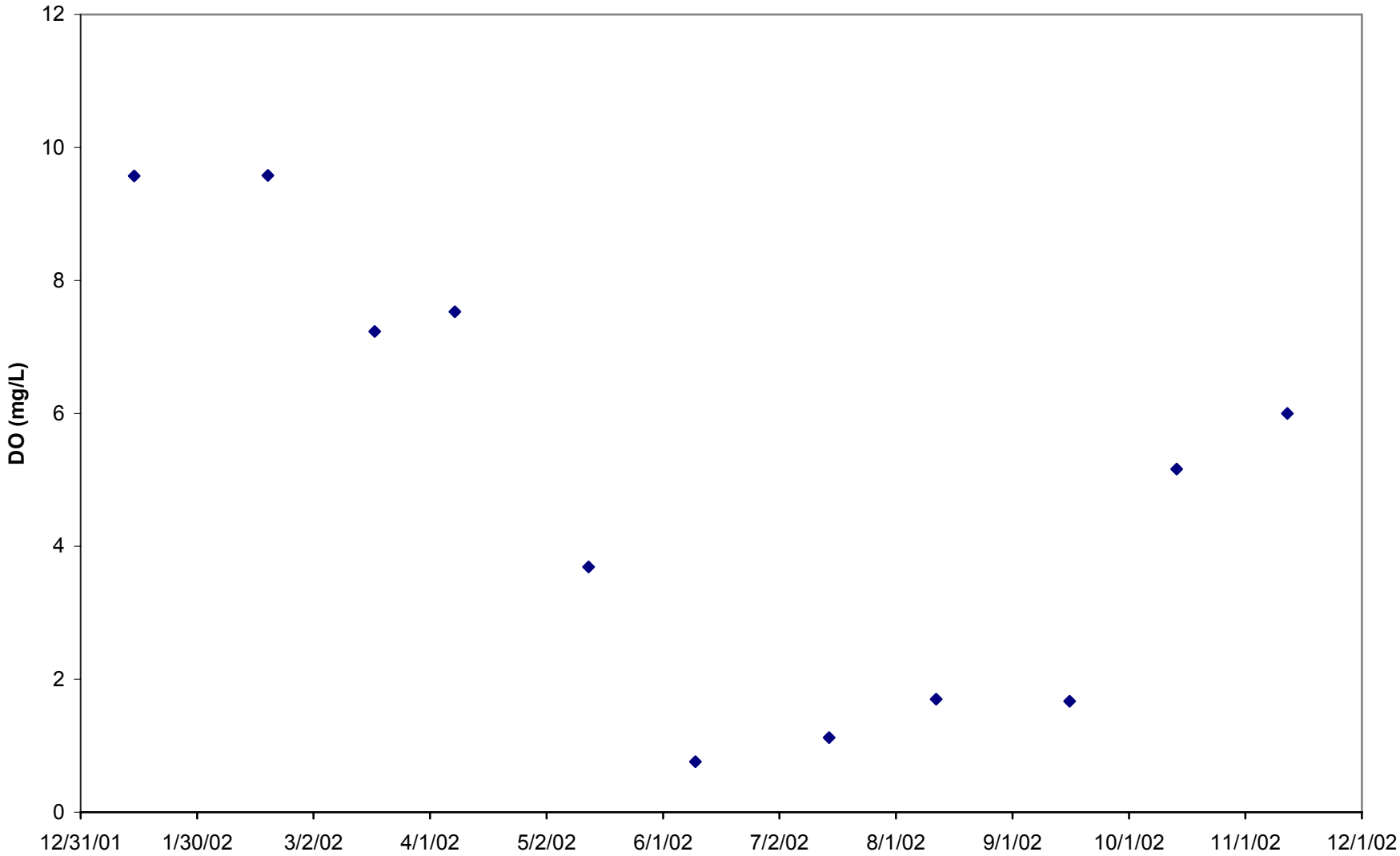


Figure B.2. DO for Black Lake Bayou west of Castor, LA (0282)

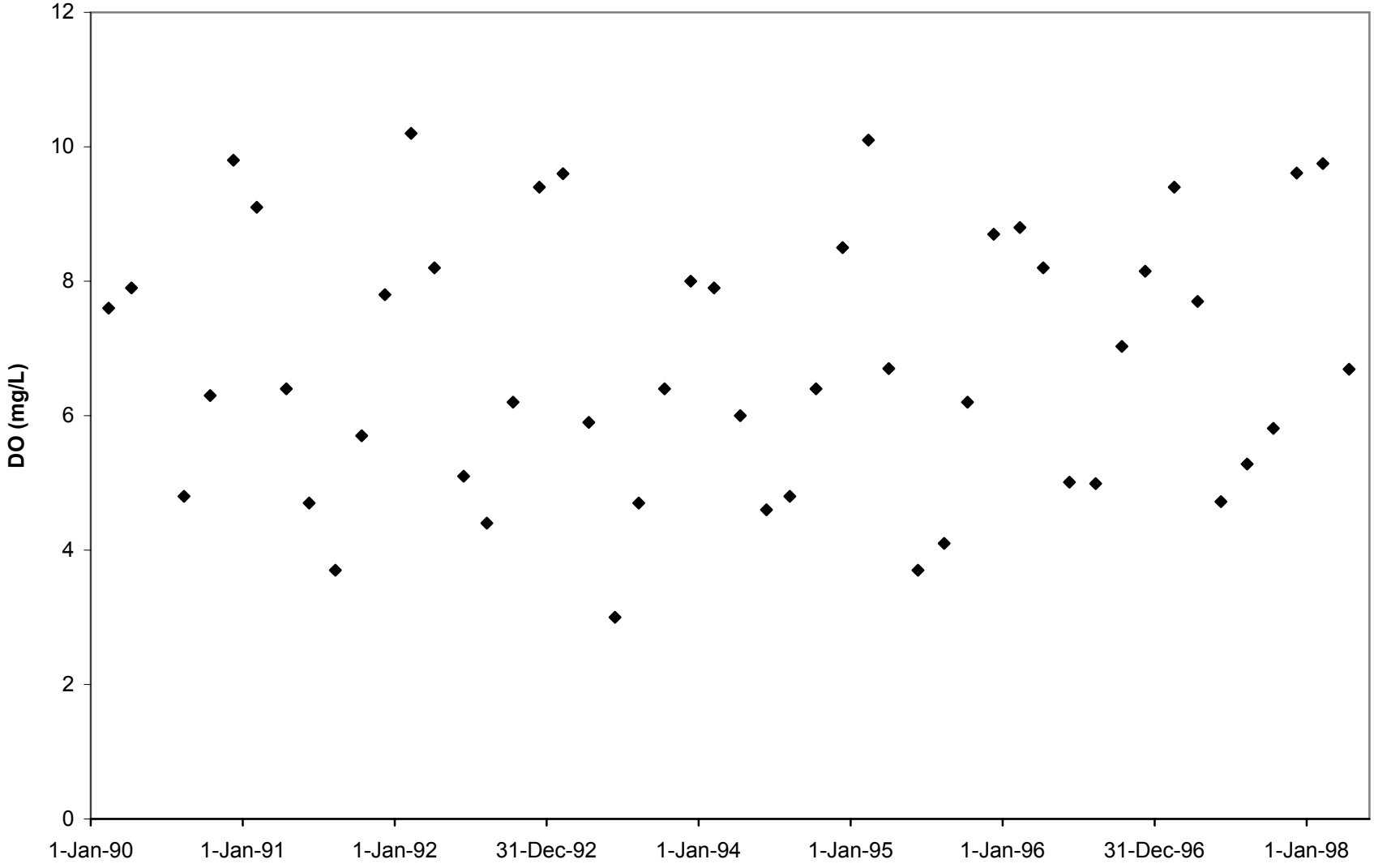


Figure B.3. DO for Black Lake Bayou at Highway 155, east of Martin, LA (1187)

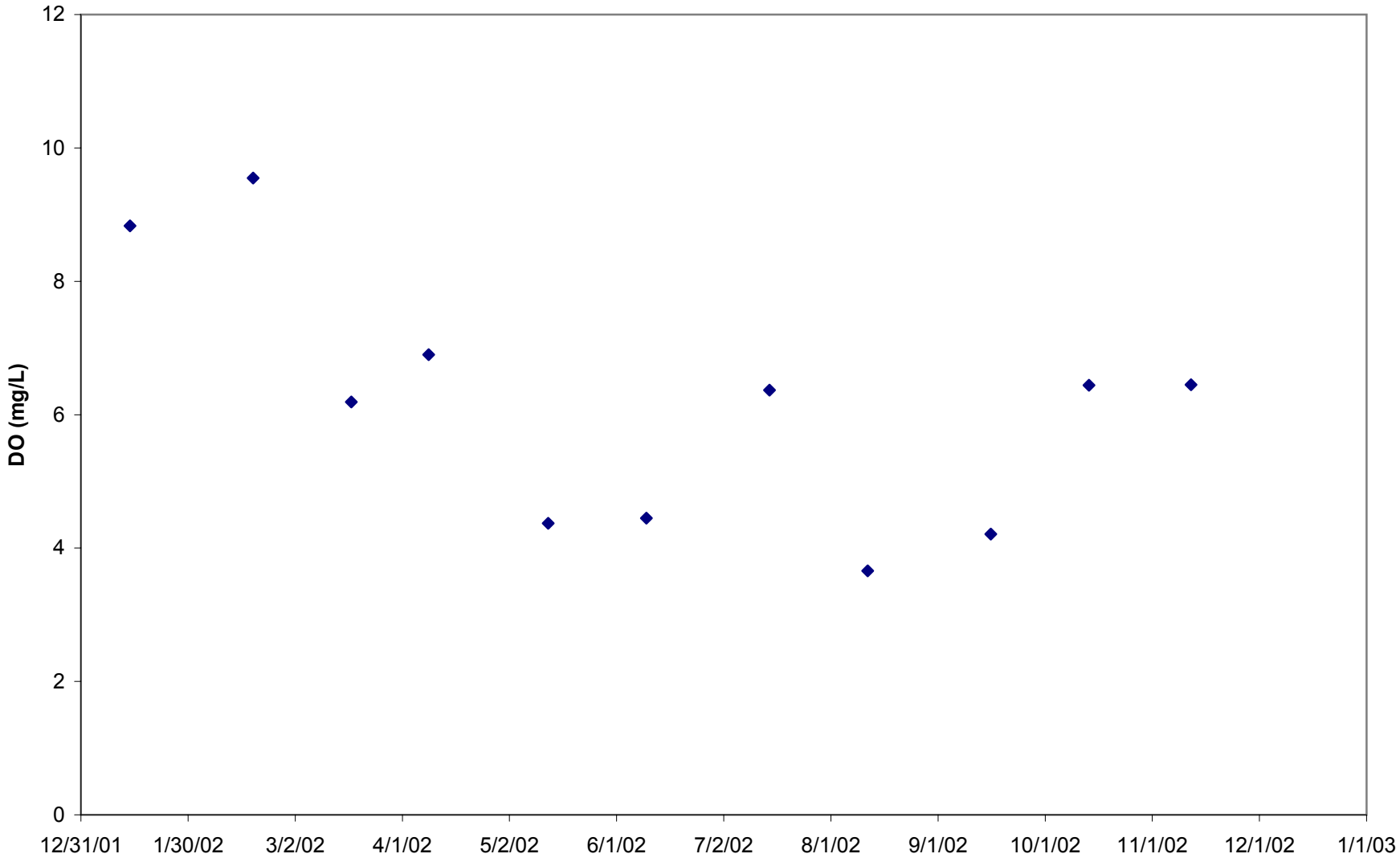
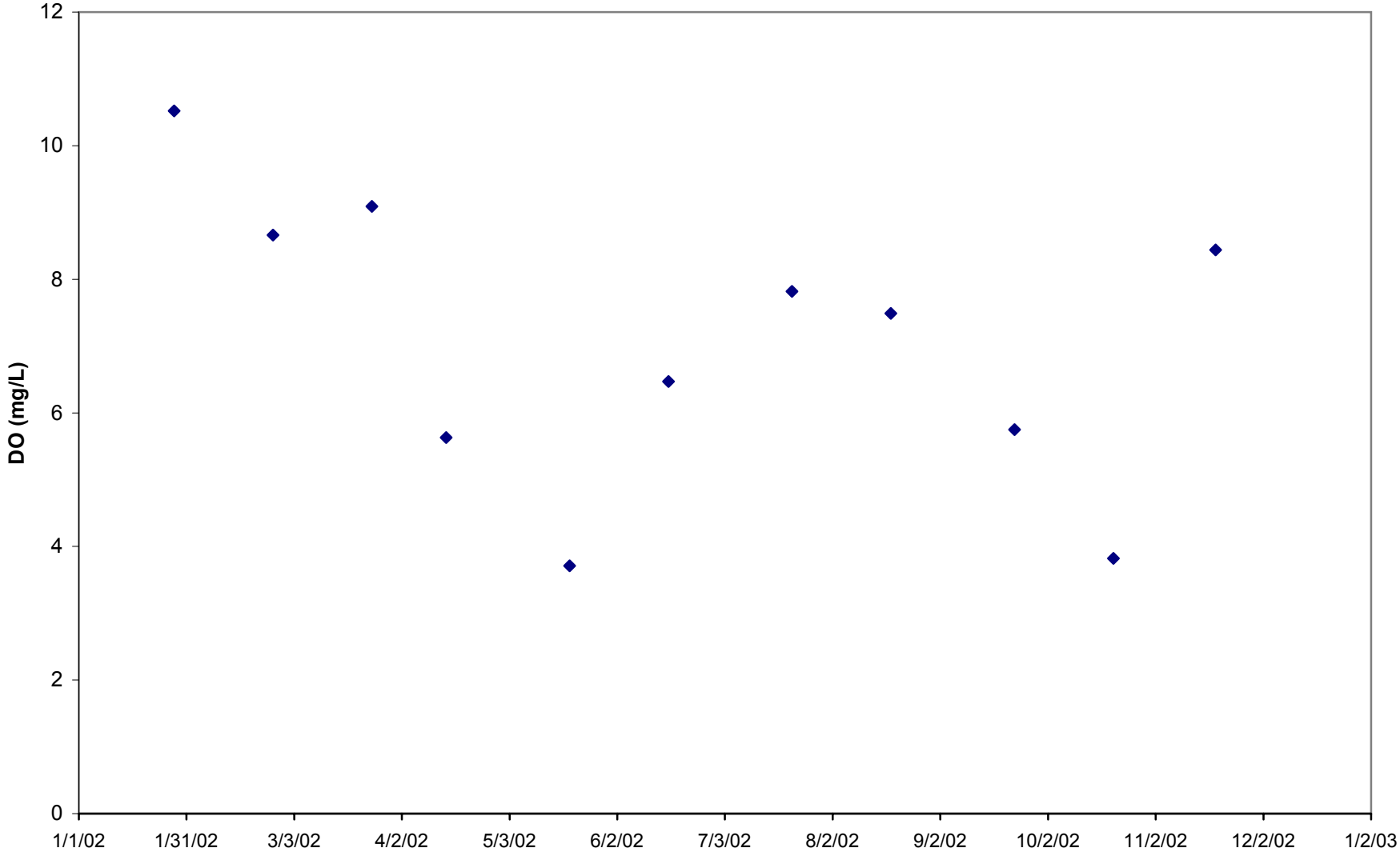


Figure B.4. DO for Saline Bayou southeast of Clarence, LA (1214)



APPENDIX C

FTN Field Survey Data

Table C.1. Field data collection sites for FTN Field survey for Red and Sabine basins.

SUBSEG. NUMBER	SITE NO.	SITE NAME	DIRECTIONS	TYPE OF DATA COLLECTED
Red River basin				
100404	100404-A	Cypress Bayou Reservoir at upper end	At LA Hwy 162 bridge east of Benton	In situ
100404	1181	Cypress Bayou Reservoir southeast of Benton, LA	At spillway on Parks Road, 3.1 miles southeast of Benton, 3.5 miles southwest of Bellevue, 9.1 miles north of Bossier	In situ, sample
100405	100405-A	Black Bayou near Benton, LA	At LA Hwy 162 on east edge of Benton	In situ, sample
100405	1182	Black Bayou Reservoir at Linton Road, southeast of Benton, LA	4.4 miles southeast of Benton, 3.2 miles northeast of Dukedale, 4.3 miles southwest of Linton	In situ, sample
100406	363	Flat River Drainage Canal north of Bossier City, LA	At Airline Drive bridge, 4.0 miles south-southeast of Benton, LA	In situ, sample, flow, width
100406	389	Flat River Drainage Canal northeast of Bossier City, LA	At Swan Lake Road bridge 7.5 miles north-northeast of City Hall in Bossier City, LA	In situ, width, flow
100406	390	Flat River Drainage Canal NE of Shreveport	At Deer Point Road bridge 5.75 miles southeast of Benton, LA	In situ, width
100406	272	Flat River east of Taylortown, LA	At State Highway 527 bridge, 13 miles southeast of Shreveport, LA	In situ, flow, width, contin.
100406	100406-A	Flat River east of Poole, LA	At Poole Rd, 3 miles southeast of intersection of Poole Rd and US Hwy 71	In situ, flow, width
100501	100501-A	Bayou Dorcheat south of AR state line	At LA Hwy 157 several miles south of AR state line, east of Springhill, LA	In situ, sample, flow, width
100501	100501-B	Bayou Dorcheat NE of Cotton Valley	At LA Hwy 160 about 4-5 miles northeast of Cotton Valley, LA	In situ, sample, flow, width
100501	61	Bayou Dorcheat west of Minden, LA	At bridge on US Hwy 80, 3.0 miles west of Minden	In situ, flow, width
100501	274	Bayou Dorcheat west of Sibley, LA	At State Highway 164 bridge, 2.0 miles west of Sibley, LA, 6.0 miles southwest of Minden, LA	In situ, flow, width,
100601	100601-A	Wallace Bayou upstream of Bayou Pierre	At White Springs Rd, about 4 miles southwest of Gayles, LA, about 2 miles downstream of Wallace Lake	In situ, sample, flow, width
100601	278	Bayou Pierre near Shreveport, LA	At State Highway 526 bridge, 0.75 mile northeast of Forbing, LA, 8.0 miles south of Shreveport, LA	In situ, sample, flow, width
100601	1183	Bayou Pierre at Ellerbee Road, S of Gayles	3.2 miles south of Gayles, 2.4 miles southwest of Cecile, 5 miles northeast of Frierson	In situ, sample, flow, width
100601	100601-B	Bayou Pierre southwest of Williams, LA	At highway 509, about 4 miles southwest of Williams, LA, about 9 miles south of Caddo/Red River Parish line	In situ, flow, width
100602	100602-A	Boggy Bayou SE of Hicks Crossing, LA	At LA Hwy 169, about 2-3 miles southeast of Hicks Crossing	In situ, sample, flow, width
100602	1207	Boggy Bayou southwest of Shreveport, LA	6.4 miles southwest of Shreveport, 3.1 miles north of Keithville, 2.9 miles southeast of Reservoir	In situ, sample, flow, width
100702	100702-A	Black Lake Bayou west of Mt. Lebanon	At LA Hwy 793 about 5-6 miles west of Mt. Lebanon (in 100701)	In situ, flow, width
100702	100702-B	Leatherman Creek west of Mt. Lebanon	At LA Hwy 793 about 4 miles west of Mt. Lebanon	In situ, sample, flow, width

SUBSEG. NUMBER	SITE NO.	SITE NAME	DIRECTIONS	TYPE OF DATA COLLECTED
100702	282	Black Lake Bayou west of Castor, LA	At LA Highway 4, 2.5 miles west of Castor, LA, 18.5 miles northeast of Coushatta, LA	In situ, sample, flow, width
100702	1187	Black Lake Bayou at Hwy 155, E of Martin	At bridge on State Hwy 155, 3.5 miles east of Martin, 6.2 miles west of Skidder, 5 miles SW of Ashland	In situ, sample, flow, width
100703	100703-A	Black Lake northeast of Campti, LA	On LA Hwy 9 bridge about 6 miles northeast of Campti, LA	In situ, sample
100703	100703-B	Clear Lake outlet northeast of Clarence, LA	At LA Hwy 1226, just downstream of Chivery Dam at outlet of Clear Lake, about 5 miles northeast of Clarence	In situ, sample, flow, width
100803	100803-A	Saline Bayou northeast of Clarence, LA	Access point at end of LA Hwy 1227 at Allen Dam, about 5.5 miles NE of Clarence	In situ, sample, flow, width
100803	1214	Saline Bayou southeast of Clarence, LA	At US Hwy 71, 7 miles east of Natchitoches, 5.1 miles southeast of Clarence, 3.4 miles south of Trichell	In situ, sample, flow, width, contin.
101301	556	Cress Creek west of Oak Grove, LA	At bridge on LA Hwy 8, 2.8 miles W of Oak Grove, 4 miles S of Fairfield, 3.7 miles N of Bagdad	In situ, sample
101301	101301-A	Rigolette Bayou WNW of Bagdad, LA	At LA Hwy 492, about 1 mile WNW of Bagdad, about 7 miles southeast of Colfax	In situ, sample, flow, width
101301	1220	Rigolette Bayou northwest of Pineville, LA	Bridge on Rigolette Rd., 4.8 miles NW of Pineville, 1.6 miles NE of Barrett, 3.9 miles SW of Tio	In situ, sample, flow, width, contin.
101302	101302-A	Iatt Creek near upstream end of Iatt Lake	At LA Hwy 122 about 10 miles east of Montgomery, LA	In situ, sample
101302	570	Beaver Creek south of Faircloth, LA	0.35 miles west of Faircloth, 2 miles northwest of Fairfield, 4.5 miles southwest of Wilhana	In situ, sample
101302	1221	Iatt Lake southwest of Fairfield, LA	Public boat launch near spillway, 4.4 miles southwest Fairfield, 7.1 miles northwest of Oak Grove, 3.7 miles northeast	In situ, sample
101503	371	Saline Bayou east of Alexandria, LA	9.0 miles east of Buckeye, LA, 1.5 mile northeast of Saline Lake, 0.5 mile south of entrance to Bushyhead Bayou	In situ
101503	101503-A	Saline Bayou southeast of Saline Lake	At local road about 1-2 miles southeast of east end of Saline Lake	In situ, sample
101604	1231	Lake Concordia at Ferriday, LA	Sportsman's Marina, 1.7 miles NW of Ridgecrest, 6.8 miles S of Clayton, 16 miles E of Jonesville	In situ, sample
101604	101604-A	Bayou Cocodrie at Ferriday, LA	At US Hwy 65 bridge, about 0.5 miles SW of Lake Concordia	In situ, width, xcs
Sabine River basin				
110401	110401-A	Toro Creek southeast of Florien, LA	At Plainview Road, about 3-4 miles southeast of Florien, LA	In situ, sample, flow, width
110401	1160	Bayou Toro northeast of Toro, LA	At LA Hwy 473, about 2 miles northeast of Toro, LA	In situ, sample, flow, width

Note: “contin.” = continuous in situ monitoring

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Table C.2. In situ data for FTN field survey in Red River and Sabine River basins.

Subsegment Number	Site No.	Site Name	Date	Time	Water Temp. (C)	DO (mg/L)	Conductivity (umhos/cm)	pH (su)
100404	1181	Cypress Bayou Reservoir southeast of Benton	09/01/05	10:44	30.8	7.3	54	7.3
	100404-A	Cypress Bayou Reservoir @ Hwy 162	09/01/05	11:20	30.4	6.1	51	7.0
100405	1182	Black Bayou Reservoir @ Linton Rd	09/01/05	10:20	29.8	5.5	75	7.2
	100405-A	Black Bayou @ Hwy 162	09/01/05	11:45	24.9	1.0	440	6.9
100406	272	Flat River @ Hwy 527	09/02/05	08:15	25.5	2.9	811	7.1
	363	Flat River Airline Dr. bridge	09/01/05	09:30	29.3	5.2	90	7.1
	389	Flat River Dr. Canal Swan L. Rd.	09/01/05	07:54	26.9	1.4	336	7.6
	390	Flat River @ Deer Pt. Road	09/01/05	08:40	27.1	0.4	179	7.2
	100406-A	Flat River @ Swan Lake Bridge	08/31/05	19:00	30.6	5.3	888	7.3
100501	61	Bayou Dorcheat @ Hwy 80	09/01/05	18:45	32.6	7.1	127	6.7
	274	Bayou Dorcheat @ Hwy 164	09/02/05	09:40	29.1	6.2	193	7.6
	100501-A	Bayou Dorcheat	09/01/05	14:35	27.1	3.2	418	7.1
	100501-B	Bayou Dorcheat @ Hwy 160	09/01/05	15:55	31.8	5.9	76	7.2
100601	278	Bayou Pierre nr Shreveport	08/31/05	12:20	31.0	6.8	498	7.0
	1183	Bayou Pierre @ Ellerbee Rd	08/31/05	10:10	25.0	3.7	476	7.2
	100601-A	Wallace Bayou	08/31/05	11:10	29.5	5.9	214	7.6
	100601-B	Bayou Pierre	08/31/05	08:45	26.6	4.9	338	7.4
100602	1207	Boggy Bayou Hwy 171	08/31/05	14:40	31.5	5.2	156	7.1
	100602-A	Boggy Bayou @ Hwy 169	08/31/05	13:45	27.2	4.4	208	7.1
100702	282	Black Lake Bayou Hwy 4	09/07/05	09:20	24.7	5.3	35	6.1
	1187	Black Lake Bayou Hwy 155	09/07/05	10:25	24.9	5.3	40	6.3
	100702-A	Black Lake Bayou Hwy 793	09/07/05	07:20	23.4	2.9	167	6.3
	100702-B	Leatherman Creek	09/07/05	08:05	23.3	3.4	54	6.3
100703	100703-A	Black Lake @ Hwy 9	09/07/05	11:20	27.6	5.3	71	6.4
	100703-B	Clear Lake outlet	09/07/05	12:40	29.8	6.9	96	6.9
100803	1214	Saline Bayou @ Hwy 71	09/07/05	14:40	30.2	5.4	105	6.8
	100803-A	Saline Bayou @ Allen Dam	09/07/05	13:40	30.6	8.3	82	7.8
101301	556	Cress Creek @ Hwy 8	09/08/05	11:30	21.7	7.5	22	6.5
	1220	Rigolette Bayou @ Rig. Road	09/08/05	09:35	27.4	4.3	108	6.8
	101301-A	Rigolette Bayou @ hwy 492	09/08/05	10:20	24.2	5.0	54	6.6
101302	570	Beaver Creek	09/08/05	12:30	20.3	8.3	29	6.5
	1221	Iatt Lake	09/08/05	11:05	26.5	3.2	6	6.3
	101302-A	Iatt Creek @ Hwy 122	09/08/05	12:05	24.2	1.2	129	6.4
101503	101503-A	Saline Bayou on Farm Rd.	09/09/05	07:05	24.0	3.3	179	6.9
101504	371	Saline Bayou @ WMA boatramp	09/08/05	15:30	30.6	8.3	47	8.0
101604	1231	Lake Concordia @ Sportmans Lodge	09/09/05	08:45	28.9	7.5	251	8.3
	101604-A	Bayou Cocodrie @ Hwy 65	09/09/05	08:30	27.2	2.2	282	6.9
110401	1160	Bayou Toro @ Hwy 473	09/08/05	07:30	24.4	4.8	99	6.4
	110401-A	Toro Creek @ Plainview Rd.	09/08/05	06:40	21.8	1.3	81	6.3

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Table C.3. Analytical laboratory results from samples collected in FTN field survey for Red River and Sabine River basins.

Subsegment Number	Site Number	Site Name	Sampling Date	TSS (mg/L)	TKN (mg/L)	Total Phos. (mg/L)	TOC (mg/L)	Chlorophyll a (mg/L)	Ammonia as N (mg/L)	NO_3+NO_2-N (mg/L)
100404	1181	Cypress Bayou Reservoir nr Benton	09/01/05	7.7	1.8	0.045	9.1	0.035	0.24	<0.05
100405	1182	Black Bayou Reservoir nr Linden Rd	09/01/05	8	1.9	0.061	10	0.051	0.14	<0.05
	100405-A	Black Bayou nr Benton	09/01/05	8.4	2.4	0.082	12	<0.02	0.56	<0.05
100406	363-1	Flat River Dr. Canal nr Bossier City	09/01/05	26	2.5	0.093	10	0.027	0.39	<0.05
	363-2	Flat River Dr. Canal nr Bossier City	09/01/05	26	2.2	0.074	11	0.03	0.36	<0.05
100501	100501-A	Bayou Dorcheat nr AR line	09/01/05	11	1.6	0.15	5.7	<0.02	0.2	0.26
	100501-B	Bayou Dorcheat NE Cotton Valley	09/01/05	4.4	1.7	0.048	8.3	0.021	0.18	<0.05
100601	278	Bayou Pierre nr Shreveport	08/31/05	9.8	1.4	0.25	7.6	<0.02	0.13	<0.05
	1183	Bayou Pierre at Ellerbee Rd.	08/31/05	16	2.3	0.22	2.6	<0.02	0.22	0.39
	100601-A-1	Wallace Bayou u/s B. Pierre	08/31/05	19	1.6	0.085	6.8	<0.02	<0.1	<0.05
	100601-A-2	Wallace Bayou u/s B. Pierre	08/31/05	18	1.8	0.085	6.7	<0.02	<0.1	0.06
100602	1207	Boggy Bayou SW of Shreveport	08/31/05	19	1.5	0.14	6.1	<0.02	<0.1	<0.05
	100602-A	Boggy Bayou SE of Hicks Crossing	08/31/05	78	1.8	0.15	8.1	<0.02	<0.1	<0.05
100702	100702-B	Leatherman Creek	09/07/05	18	2.4	0.11	7.5	0.076	0.32	<0.05
	282	Black Lake Bayou w of Castor	09/07/05	4.8	1.6	0.048	5.9	<0.02	0.22	0.064
	1187	Black Lake Bayou @ Hwy 155	09/07/05	5.2	1.7	0.064	6	<0.02	0.17	0.096
100703	100703-A-1	Black Lake NE Campti	09/07/05	73	1.7	0.048	7.7	<0.02	0.17	<0.05
	100703-A-2	Black Lake NE Campti	09/07/05	4.4	1.9	0.05	7.8	<0.02	0.17	<0.05
	100703-B	Clear Lake outlet	09/07/05	16	1.9	0.12	9.2	0.1	0.25	<0.05
100803	1214	Saline Bayou SE of Clarence	09/07/05	22	1.9	0.08	8.6	0.034	0.23	<0.05
	100803-A	Saline Bayou NE of Clarence	09/07/05	16	3	0.098	8.7	0.05	0.21	<0.05
101301	556	Cress Creek	09/08/05	<4	<1	<0.02	3.1	<0.02	0.16	<0.05
	1220	Rigolette Bayou NE of Pineville	09/08/05	13	1.1	0.082	4.9	<0.02	0.12	<0.05
	570	Beaver Creek	09/08/05	6.2	<1	<0.02	1.5	<0.02	<0.1	0.1
	101301-A	Rigolette Bayou WNW of Bagdad	09/08/05	41	1.3	0.08	3.2	<0.02	0.19	<0.05
101302	1221	Iatt Lake	09/08/05	<4	<1	<0.02	9	<0.02	0.19	<0.05
	101302-A-1	Iatt Creek	09/08/05	5.4	1.4	0.048	11	<0.02	0.22	0.059
	101302-A-2	Iatt Creek	09/08/05	5.2	<1	0.048	11	<0.02	0.14	<0.05
101503	101503-A	Saline Bayou SE of Saline L.	09/09/05	280	2.2	0.15	6.8	0.026	0.58	0.068
101604	1231	Lake Concordia	09/09/05	12	1.9	0.15	7.9	0.049	0.23	<0.05
110401	1160	Bayou Toro NE of Toro	09/08/05	16	1.7	0.1	6.4	<0.02	0.14	<0.05
	110401-A	Toro Creek	09/08/05	6.8	1.4	0.11	7.3	<0.02	0.16	<0.05

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Table C.4. Summary of CBOD time series data from FTN field survey of Red River and Sabine River basins.

Subsegment Number	Sample No.	CBOD 1, 2-day	CBOD 2, 5-day	CBOD 3, 9-day	CBOD 4, 14-Day	CBOD 5, 20-day	k rate (1/day)	CBODu (mg/L)
100404	1181	<2	3.3	5	5.3	5.2	0.22	5.49
100405	1182	2.9	4.8	6.7	8.1	12	0.06	15.61
	100405-A	<2	<2	3.3	5.1	6.9	0.05	12.47
100406	363-1	<2	<2	4.3	5.7	6.6	0.12	7.50
	363-2	<2	<2	4.2	5.8	6.8	0.12	7.69
100501	100501-A	2.4	3.2	3.9	4.2	4.8	0.30	4.43
	100501-B	5.2	6.5	7.6	7.9	12	0.21	10.13
100601	278	<2	<2	2.3	4.6	6.8	0.04	13.85
	1183	<2	<2	<2	5.1	3.9	0.60	4.50
	100601-A-1	<2	<2	<2	2.8	4.4	0.16	5.38
	100601-A-2	<2	2.1	2.3	4.1	5.4	0.04	9.83
100602	1207	<2	<2	2.1	3.4	6	0.04	13.05
	100602-A	2.7	3.9	5	7.8	9.4	0.07	11.99
100702	282	<2	<2	<2	<2	2.2	--	--
	1187	<2	<2	<2	<2	<2	--	--
	100702-B	<2	2.1	3.7	4.6	6.2	0.05	9.62
100703	100703-A-1	<2	<2	<2	2.5	4	0.05	8.69
	100703-A-2	<2	<2	<2	2.3	3.1	0.05	5.60
	100703-B	2.4	5.9	8.9	9.6	14	0.08	16.99
100803	1214	<2	2.7	7.1	7.3	8.9	0.31	8.42
	100803-A	<2	<2	3.9	4.8	6.6	0.05	10.75
101301	556	<2	<2	<2	<2	<2	--	--
	1220	<2	<2	<2	3.1	3.9	0.15	4.43
	101301-A	<2	<2	<2	<2	<2	--	--
101302	570	<2	<2	<2	<2	<2	--	--
	1221	<2	<2	<2	<2	2.2	--	--
	101302-A-1	<2	<2	2.7	3.6	4.3	0.10	5.04
	101302-A-2	<2	<2	<2	2.5	3.4	0.05	5.75
101503	101503-A	<2	<2	3.6	6.2	6.9	0.22	7.29
101604	1231	<2	3.6	7.3	9.9	12	0.06	18.50
110401	1160	<2	<2	<2	<2	2	--	--
	110401-A	<2	<2	<2	<2	2.3	--	--

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Table C.5 Continuous DO data collected at Station 1214.

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Estimation of daily mean DO values at other stations: Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/06/05 19:50	7.0											
9/06/05 20:05	6.4											
9/06/05 20:20	6.3											
9/06/05 20:35	6.2											
9/06/05 20:50	6.1											
9/06/05 21:05	5.9											
9/06/05 21:20	5.7											
9/06/05 21:35	5.5											
9/06/05 21:50	5.3											
9/06/05 22:05	5.3											
9/06/05 22:20	5.1											
9/06/05 22:35	5.1											
9/06/05 22:50	5.0											
9/06/05 23:05	4.7											
9/06/05 23:20	4.7											
9/06/05 23:35	4.7											
9/06/05 23:50	4.5	1.030133		2.368421								
9/07/05 00:05	4.3	0.984349		2.263158								
9/07/05 00:20	4.4	1.007241		2.315789								
9/07/05 00:35	4.3	0.984349		2.263158								
9/07/05 00:50	4.2	0.961458		2.210526								
9/07/05 01:05	4.0	0.915674		2.105263								
9/07/05 01:20	3.9	0.892782		2.052632								
9/07/05 01:35	4.0	0.915674		2.105263								
9/07/05 01:50	4.0	0.915674		2.105263								
9/07/05 02:05	4.1	0.938566		2.157895								
9/07/05 02:20	3.9	0.892782		2.052632								
9/07/05 02:35	3.7	0.846998		1.947368								
9/07/05 02:50	3.8	0.86989		2								
9/07/05 03:05	3.7	0.846998		1.947368								
9/07/05 03:20	3.6	0.824107		1.894737								
9/07/05 03:35	3.1	0.709647		1.631579								
9/07/05 03:50	2.9	0.663864		1.526316								
9/07/05 04:05	2.9	0.663864		1.526316								
9/07/05 04:20	2.9	0.663864		1.526316								
9/07/05 04:35	2.7	0.61808		1.421053								
9/07/05 04:50	2.7	0.61808		1.421053								
9/07/05 05:05	2.5	0.572296		1.315789								

Estimation of daily mean DO values at other stations

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/07/05 05:20	2.5	0.572296		1.315789								
9/07/05 05:35	2.4	0.549404		1.263158								
9/07/05 05:50	2.3	0.526512		1.210526								
9/07/05 06:05	2.2	0.503621		1.157895								
9/07/05 06:20	2.0	0.457837		1.052632								
9/07/05 06:35	1.9	0.434945		1								
9/07/05 06:50	2.2	0.503621		1.157895								
9/07/05 07:05	2.1	0.480729		1.105263								
9/07/05 07:20	2.1	0.480729		1.105263		100702-A	9/7/2005	7:20	2.85	5.93	2.58	3.58
9/07/05 07:35	2.0	0.457837		1.052632								
9/07/05 07:50	2.0	0.457837		1.052632								
9/07/05 08:05	2.0	0.457837		1.052632		100702-B	9/7/2005	8:05	3.35	7.32	3.18	4.18
9/07/05 08:20	2.0	0.457837		1.052632								
9/07/05 08:35	2.2	0.503621		1.157895								
9/07/05 08:50	2.1	0.480729		1.105263								
9/07/05 09:05	2.1	0.480729		1.105263								
9/07/05 09:20	2.1	0.480729		1.105263		282	9/7/2005	9:20	5.33	11.09	4.82	5.82
9/07/05 09:35	2.2	0.503621		1.157895								
9/07/05 09:50	2.4	0.549404		1.263158								
9/07/05 10:05	2.4	0.549404		1.263158								
9/07/05 10:20	2.5	0.572296		1.315789		1187	9/7/2005	10:25	5.34	9.33	4.06	5.06
9/07/05 10:35	2.7	0.61808		1.421053								
9/07/05 10:50	2.8	0.640972		1.473684								
9/07/05 11:05	2.9	0.663864		1.526316								
9/07/05 11:20	3.2	0.732539		1.684211		100703-A	9/7/2005	11:20	5.25	7.17	3.12	4.12
9/07/05 11:35	3.4	0.778323		1.789474								
9/07/05 11:50	3.3	0.755431		1.736842								
9/07/05 12:05	3.8	0.86989		2								
9/07/05 12:20	3.9	0.892782		2.052632								
9/07/05 12:35	3.5	0.801215		1.842105		100703-B	9/7/2005	12:40	6.93	8.65	3.76	4.76
9/07/05 12:50	4.2	0.961458		2.210526								
9/07/05 13:05	4.6	1.053025		2.421053								
9/07/05 13:20	4.5	1.030133		2.368421								
9/07/05 13:35	4.7	1.075917		2.473684								
9/07/05 13:50	5.3	1.213268		2.789474		100803-A	9/7/2005	13:40	8.34	6.87	2.99	3.99
9/07/05 14:05	4.9	1.121701		2.578947								
9/07/05 14:20	5.2	1.190376		2.736842								
9/07/05 14:35	5.0	1.144592		2.631579								
9/07/05 14:50	5.5	1.259052		2.894737								
9/07/05 15:05	5.4	1.23616		2.842105								

Table C.5. Continuous DO data collected at Station 1214.

Estimation of daily mean DO values at other stations

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/07/05 15:20	5.4	1.23616		2.842105								
9/07/05 15:35	6.1	1.396403		3.210526								
9/07/05 15:50	6.3	1.442186		3.315789								
9/07/05 16:05	6.1	1.396403		3.210526								
9/07/05 16:20	6.0	1.373511		3.157895								
9/07/05 16:35	6.5	1.48797		3.421053								
9/07/05 16:50	6.4	1.465078		3.368421								
9/07/05 17:05	6.8	1.556646		3.578947								
9/07/05 17:20	6.8	1.556646		3.578947								
9/07/05 17:35	6.7	1.533754		3.526316								
9/07/05 17:50	6.4	1.465078		3.368421								
9/07/05 18:05	7.3	1.671105		3.842105								
9/07/05 18:20	6.5	1.48797		3.421053								
9/07/05 18:35	6.9	1.579537		3.631579								
9/07/05 18:50	6.8	1.556646		3.578947								
9/07/05 19:05	6.9	1.579537		3.631579								
9/07/05 19:20	6.7	1.533754		3.526316								
9/07/05 19:35	6.6	1.510862		3.473684								
9/07/05 19:50	6.7	1.533754		3.526316								
9/07/05 20:05	6.5	1.48797		3.421053								
9/07/05 20:20	6.3	1.442186		3.315789								
9/07/05 20:35	6.4	1.465078		3.368421								
9/07/05 20:50	6.4	1.465078		3.368421								
9/07/05 21:05	6.2	1.419295		3.263158								
9/07/05 21:20	6.1	1.396403		3.210526								
9/07/05 21:35	6.0	1.373511		3.157895								
9/07/05 21:50	5.8	1.327727		3.052632								
9/07/05 22:05	5.7	1.304835		3								
9/07/05 22:20	5.9	1.350619		3.105263								
9/07/05 22:35	5.8	1.327727		3.052632								
9/07/05 22:50	5.6	1.281943		2.947368								
9/07/05 23:05	5.5	1.259052		2.894737								
9/07/05 23:20	5.5	1.259052		2.894737								
9/07/05 23:35	5.4	1.23616		2.842105								
9/07/05 23:50	5.3	1.213268		2.789474								
9/08/05 00:05	5.2	1.190376		2.736842								
9/08/05 00:20	5.1		1.014769		2.42857							
9/08/05 00:35	5.1		1.014769		2.42857							
9/08/05 00:50	5.0		0.994872		2.38095							
9/08/05 01:05	4.9		0.974974		2.33333							

Table C.5. Continuous DO data collected at Station 1214.

Estimation of daily mean DO values at other stations

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/08/05 01:20	5.0		0.994872		2.38095							
9/08/05 01:35	4.9		0.974974		2.33333							
9/08/05 01:50	4.5		0.895385		2.14286							
9/08/05 02:05	4.4		0.875487		2.09524							
9/08/05 02:20	4.4		0.875487		2.09524							
9/08/05 02:35	4.5		0.895385		2.14286							
9/08/05 02:50	4.5		0.895385		2.14286							
9/08/05 03:05	4.2		0.835692		2							
9/08/05 03:20	4.1		0.815795		1.95238							
9/08/05 03:35	3.8		0.756103		1.80952							
9/08/05 03:50	3.9		0.776		1.85714							
9/08/05 04:05	3.7		0.736205		1.7619							
9/08/05 04:20	3.3		0.656615		1.57143							
9/08/05 04:35	3.2		0.636718		1.52381							
9/08/05 04:50	2.8		0.557128		1.33333							
9/08/05 05:05	2.8		0.557128		1.33333							
9/08/05 05:20	2.6		0.517333		1.2381							
9/08/05 05:35	2.8		0.557128		1.33333							
9/08/05 05:50	2.7		0.537231		1.28571							
9/08/05 06:05	2.5		0.497436		1.19048							
9/08/05 06:20	2.2		0.437744		1.04762							
9/08/05 06:35	2.3		0.457641		1.09524							
9/08/05 06:50	2.3		0.457641		1.09524							
9/08/05 07:05	2.1		0.417846		1							
9/08/05 07:20	2.3		0.457641		1.09524							
9/08/05 07:35	2.2		0.437744		1.04762							
9/08/05 07:50	2.1		0.417846		1							
9/08/05 08:05	2.1		0.417846		1							
9/08/05 08:20	2.2		0.437744		1.04762							
9/08/05 08:35	2.2		0.437744		1.04762							
9/08/05 08:50	2.2		0.437744		1.04762							
9/08/05 09:05	2.1		0.417846		1							
9/08/05 09:20	2.1		0.417846		1							
9/08/05 09:35	2.2		0.437744		1.04762							
9/08/05 09:50	2.3		0.457641		1.09524							
9/08/05 10:05	2.5		0.497436		1.19048							
9/08/05 10:20	2.6		0.517333		1.2381							
9/08/05 10:35	2.9		0.577026		1.38095							
9/08/05 10:50	3.0		0.596923		1.42857							
9/08/05 11:05	3.3		0.656615		1.57143							

Table C.5. Continuous DO data collected at Station 1214.

Estimation of daily mean DO values at other stations

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/08/05 11:20	3.5		0.69641		1.66667							
9/08/05 11:35	3.7		0.736205		1.7619							
9/08/05 11:50	3.0		0.596923		1.42857							
9/08/05 12:05	3.9		0.776		1.85714							
9/08/05 12:20	4.3		0.85559		2.04762							
9/08/05 12:35	4.3		0.85559		2.04762							
9/08/05 12:50	4.5		0.895385		2.14286							
9/08/05 13:05	4.5		0.895385		2.14286							
9/08/05 13:20	4.6		0.915282		2.19048							
9/08/05 13:35	4.8		0.955077		2.28571							
9/08/05 13:50	4.8		0.955077		2.28571							
9/08/05 14:05	5.6		1.114256		2.66667							
9/08/05 14:20	5.1		1.014769		2.42857							
9/08/05 14:35	6.2		1.233641		2.95238							
9/08/05 14:50	5.9		1.173949		2.80952							
9/08/05 15:05	6.8		1.353026		3.2381							
9/08/05 15:20	6.9		1.372923		3.28571							
9/08/05 15:35	6.5		1.293333		3.09524							
9/08/05 15:50	7.1		1.412718		3.38095							
9/08/05 16:05	7.4		1.47241		3.52381							
9/08/05 16:20	7.1		1.412718		3.38095							
9/08/05 16:35	7.2		1.432615		3.42857							
9/08/05 16:50	7.4		1.47241		3.52381							
9/08/05 17:05	7.3		1.452513		3.47619							
9/08/05 17:20	7.7		1.532103		3.66667							
9/08/05 17:35	7.8		1.552		3.71429							
9/08/05 17:50	7.7		1.532103		3.66667							
9/08/05 18:05	7.7		1.532103		3.66667							
9/08/05 18:20	7.8		1.552		3.71429							
9/08/05 18:35	8.0		1.591795		3.80952							
9/08/05 18:50	7.8		1.552		3.71429							
9/08/05 19:05	7.9		1.571897		3.7619							
9/08/05 19:20	8.0		1.591795		3.80952							
9/08/05 19:35	8.1		1.611692		3.85714							
9/08/05 19:50	8.1		1.611692		3.85714							
9/08/05 20:05	7.9		1.571897		3.7619							
9/08/05 20:20	7.8		1.552		3.71429							
9/08/05 20:35	7.6		1.512205		3.61905							
9/08/05 20:50	7.6		1.512205		3.61905							
9/08/05 21:05	7.5		1.492308		3.57143							

Table C.5. Continuous DO data collected at Station 1214.

Estimation of daily mean DO values at other stations

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/08/05 21:20	7.4		1.47241		3.52381							
9/08/05 21:35	7.4		1.47241		3.52381							
9/08/05 21:50	7.2		1.432615		3.42857							
9/08/05 22:05	7.1		1.412718		3.38095							
9/08/05 22:20	7.0		1.392821		3.33333							
9/08/05 22:35	6.9		1.372923		3.28571							
9/08/05 22:50	6.6		1.313231		3.14286							
9/08/05 23:05	6.7		1.333128		3.19048							
9/08/05 23:20	6.6		1.313231		3.14286							
9/08/05 23:35	6.4		1.273436		3.04762							
9/08/05 23:50	6.4		1.273436		3.04762							
9/09/05 00:05	6.2		1.233641		2.95238							
9/09/05 00:20	6.3		1.253538		3							
9/09/05 00:35	5.9											
9/09/05 00:50	6.0											
9/09/05 01:05	6.0											
9/09/05 01:20	5.8											
9/09/05 01:35	5.6											
9/09/05 01:50	5.5											
9/09/05 02:05	5.5											
9/09/05 02:20	5.4											
9/09/05 02:35	5.2											
9/09/05 02:50	5.1											
9/09/05 03:05	4.9											
9/09/05 03:20	4.8											
9/09/05 03:35	4.9											
9/09/05 03:50	4.7											
9/09/05 04:05	4.5											
9/09/05 04:20	4.3											
9/09/05 04:35	4.5											
9/09/05 04:50	3.8											
9/09/05 05:05	3.6											
9/09/05 05:20	3.2											
9/09/05 05:35	3.2											
9/09/05 05:50	3.1											
9/09/05 06:05	2.6											
9/09/05 06:20	2.5											
9/09/05 06:35	2.7											
9/09/05 06:50	2.5											
9/09/05 07:05	2.4											

Table C.5. Continuous DO data collected at Station 1214.

Estimation of daily mean DO values at other stations

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/09/05 07:20	2.3											
9/09/05 07:35	2.2											
9/09/05 07:50	2.1											
9/09/05 08:05	2.1											
9/09/05 08:20	2.1											
9/09/05 08:35	2.1											
9/09/05 08:50	2.1											
9/09/05 09:05	2.2											
9/09/05 09:20	2.3											
9/09/05 09:35	2.5											
9/09/05 09:50	2.6											
9/09/05 10:05	2.7											
9/09/05 10:20	2.8											
9/09/05 10:35	3.2											
9/09/05 10:50	2.7											
9/09/05 11:05	3.9											
9/09/05 11:20	4.1											
9/09/05 11:35	7.5											
9/09/05 11:50	7.5											
9/09/05 12:05	7.3											
9/09/05 12:20	7.2											
9/09/05 12:35	7.1											
9/09/05 12:50	7.4											
9/09/05 13:05	7.3											
9/09/05 13:20	7.1											
9/09/05 13:35	7.3											
9/09/05 13:50	7.1											
9/09/05 14:05	7.1											
9/09/05 14:20	7.0											
9/09/05 14:35	7.0											
9/09/05 14:50	7.0											
9/09/05 15:05	6.9											
9/09/05 15:20	6.9											
9/09/05 15:35	6.9											
9/09/05 15:50	6.8											
9/09/05 16:05	6.8											
9/09/05 16:20	6.8											
9/09/05 16:35	6.8											
9/09/05 16:50	6.8											
9/09/05 17:05	6.7											

Table C.5. Continuous DO data collected at Station 1214.

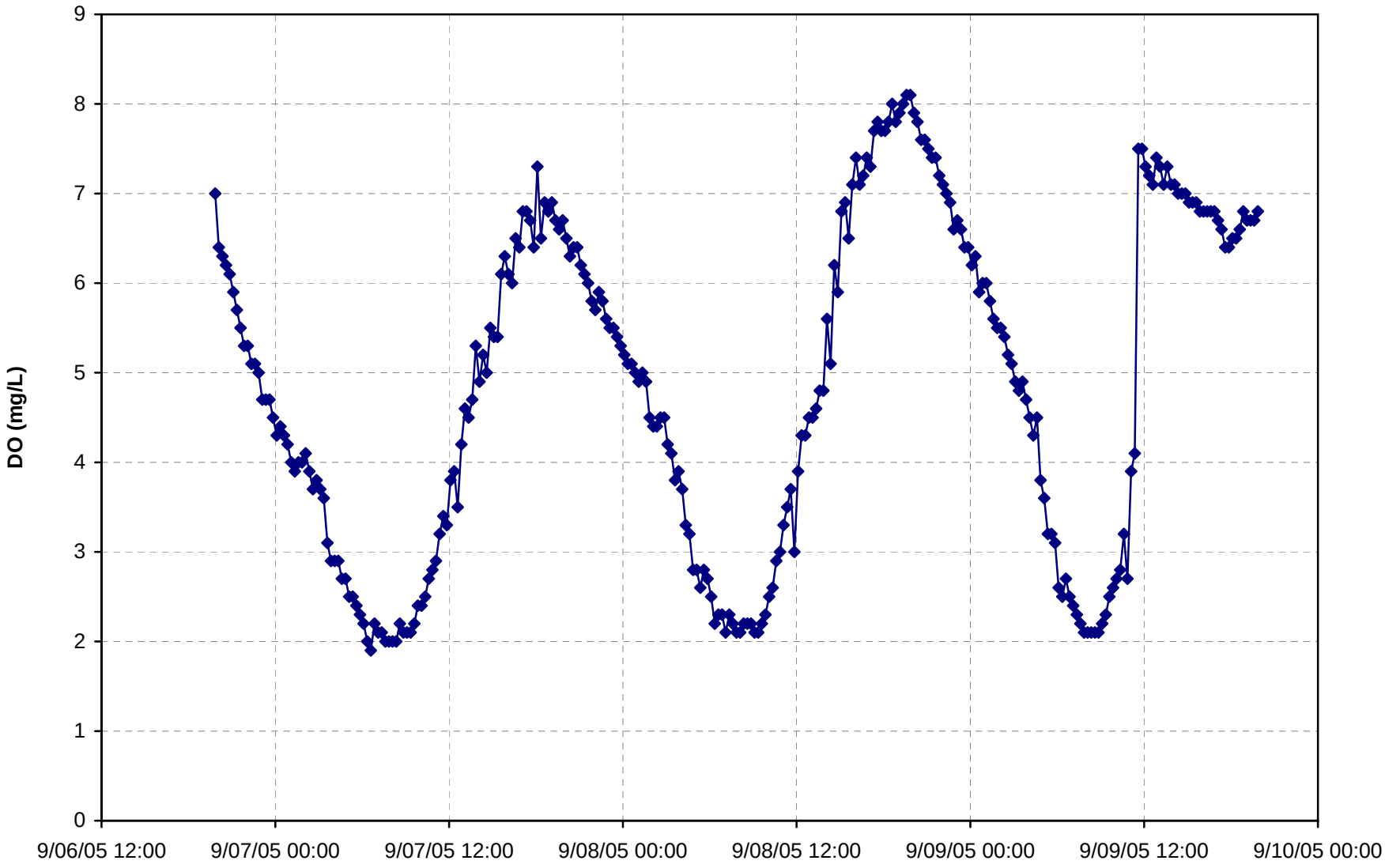
Estimation of daily mean DO values at other stations

Date and time	DO mg/L	Ratio of instantaneous DO to daily mean DO For 9/07	Ratio of instantaneous DO to daily mean DO For 9/08	Ratio of instantaneous DO to daily min DO For 9/07	Ratio of instantaneous DO to daily min DO For 9/08	Station	Date	Time	DO at time of measurement (mg/L)	Estimated daily mean DO (mg/L)	Estimated daily min DO (mg/L)	Estimated daily min DO + 1 (mg/L)
9/09/05 17:20	6.6											
9/09/05 17:35	6.4											
9/09/05 17:50	6.4											
9/09/05 18:05	6.5											
9/09/05 18:20	6.5											
9/09/05 18:35	6.6											
9/09/05 18:50	6.8											
9/09/05 19:05	6.7											
9/09/05 19:20	6.7											
9/09/05 19:35	6.7											
9/09/05 19:50	6.8											

R:\WP_FILES\2110-616\BLACK CLEAR COMPLEX REPORT\WORD FILES\APPENDICES\APPENDIX C (FTN SURVEY DATA)\APPENDIX C FILES\EST MIN DO CONTIN_MONITOR_1214-BLACK CLEAR SALINE REPORT.XLS

Table C.5. Continuous DO data collected at Station 1214.

Figure C.1. Continuous DO at Station 1214 (Saline Bayou Southeast of Clarence, LA)



FIELD SHEETS ARE AVAILABLE FROM EPA UPON REQUEST.

APPENDIX D

LA-QUAL Vector Diagram

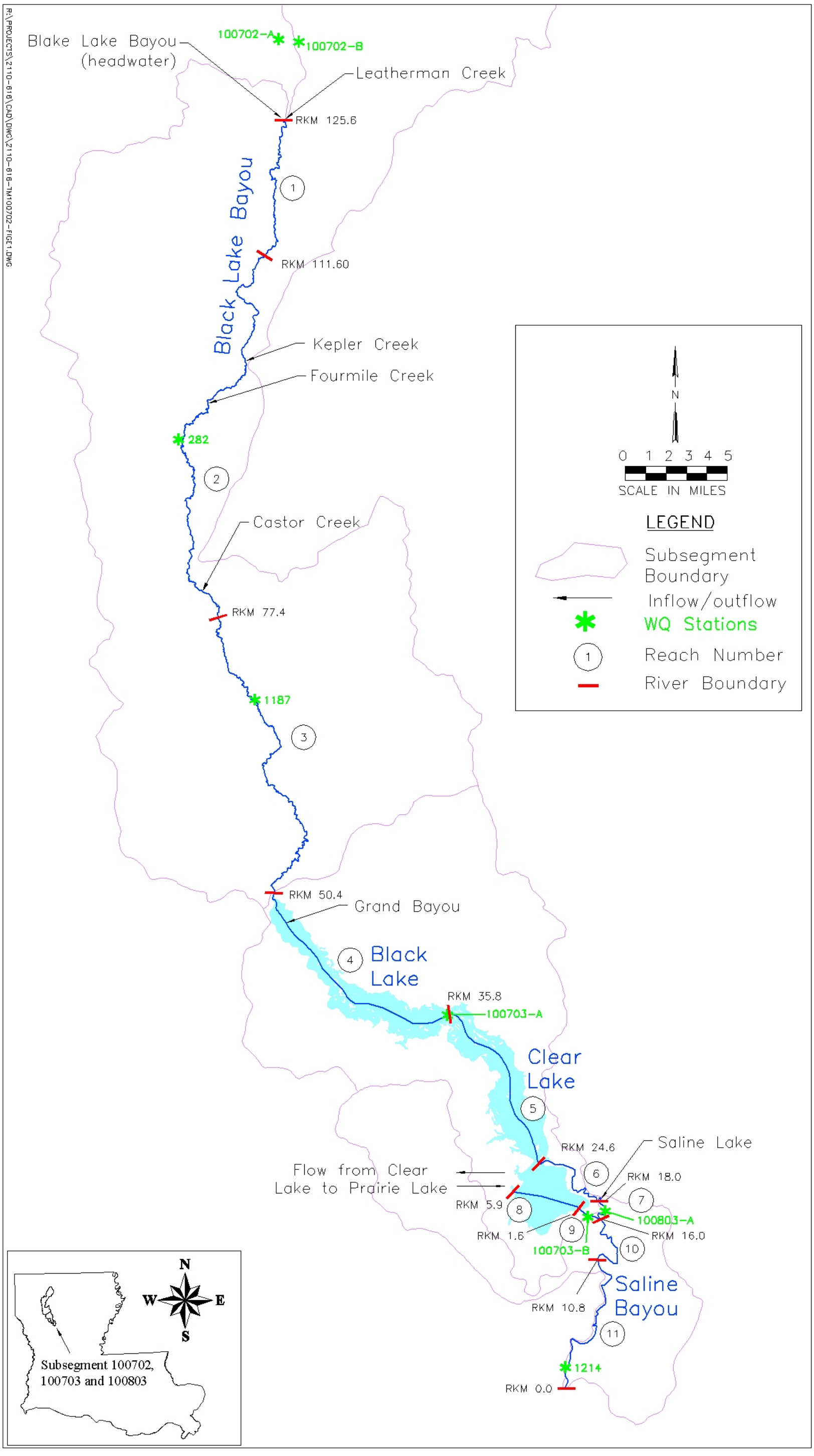


Figure D.1. LA-QUAL vector diagram for Black Lake, Clear Lake and Saline Bayou.

APPENDIX E

Calculations For Algal Productivity

	Begin (RM)	End (RM)	Length (miles)	Surface Area (mi^2)	Surface Area (acres)	Average Width (mi)	Depth (ft)	Volume (acre-ft)	Average Width (m)	Average Depth (m)
Black	31.3	22.3	9	7.25	4,641.86	0.81	5.00	23,209.30	1296.872419	1.523925632
Clear	22.3	15.3	7	7.39	4,730.32	1.06	16.30	77,091.05	1699.182673	4.967150729
Praire	3.8	1	2.8	4.53	2,899.88	1.62	3.00	8,699.65	2604.175107	0.914355379
Total			18.8	19.18	12,272.06	3.48		109,000.00		

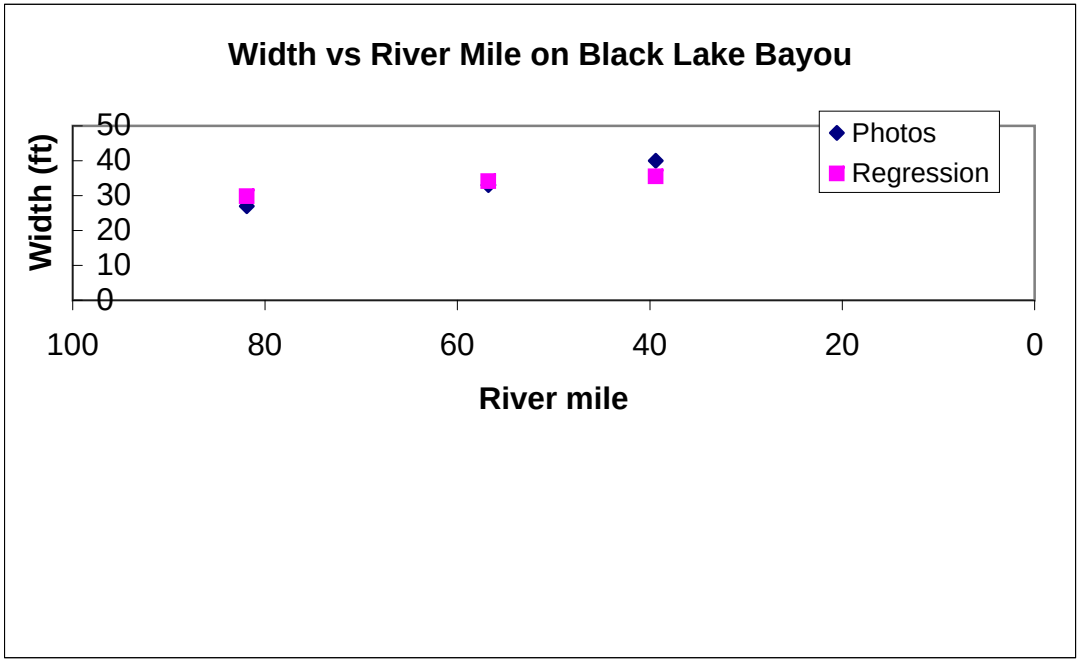
Calculate the depth of Clear Lake

Total volume	109,000.00	acre-ft
Black	-23,209.30	acre-ft
Prairie	-8,699.65	acre-ft
volume Clear Lake	77,091.05	acre-ft

depth Clear Lake = 16.29722154 ft

Station #	RM	River KM	Width (ft)	Width (m)	Depth (ft)	Depth (m)
100702-A	81.9	131.8	27	8.23	2.05	0.62
282	56.8	91.4	33	10.06	2.65	0.81
1187	39.4	63.4	40	12.19	3.39	1.03

Depths calculated here are based on depth-width correlation developed for Saline Bayou.



These coefficients will make the predicted depths and widths match exactly the ones in rows 2-4

	Width Coefficient	Depth Coefficient
	11.096921	1.9170782
	11.8621135	1.4992154
	13.8047419	1.645868
Avg	12.2545921	1.6873872

Station #	Flow (cfs)	Flow (cms)	Width Coefficient	Power	Width (m)	Width (ft)	Depth Coefficient	Power	Depth (m)	Depth (ft)
100702-A	2.924	0.083	12.254592	0.12	9.09	29.82	1.68738721	0.45	0.55	1.80
282	8.931	0.253	12.254592	0.12	10.39	34.09	1.68738721	0.45	0.91	2.98
1187	12.538	0.355	12.254592	0.12	10.82	35.51	1.68738721	0.45	1.06	3.47

Black Lake Bayou

flow per unit area = 0.023864254 cfs/mi^2, average of two stations from FTN survey

	Location	Drainage Area (mi^2)	Flow (cfs)	Flow (cms)	Cumulative Flow (cfs)	Cumulative Flow (cms)
Headwater	Black Lake Bayou at mouth of Leatherman	122.52	2.924	0.083	2.924	0.083
Trib	Leatherman Creeak at Mouth	127.68	3.047	0.086	5.971	0.169
Trib	Kepler Creek at mouth (RM 63.3)	51.68	1.233	0.035	7.204	0.204
Trib	Fourmile Bayou at mouth (RM 60.6)	35.35	0.844	0.024	8.048	0.228
Trib	Castor Creek at mouth RM (49.5)	40.56	0.968	0.027	9.016	0.255
Trib	Grand Bayou at mouth*** (RM 30)	135.84	3.242	0.092	12.258	0.347
	TOTAL	513.63	12.258	0.347		
end	Black Lake Bayou at Mouth	908.34	21.677	0.614		

	Drainage Area (mi^2)	(cfs)
Black Lake Bayou at mouth of Kepler	384.99	9.187
Black Lake Bayou at mouth of Fournile	424.46	10.129
Black Lake Bayou at Mouth of Castor	509.88	12.168
Black Lake Bayou at mouth of Black Lake	630.35	15.043

63.6	102.3493
60.6	97.52149
49.5	79.65864
30	48.27796

Incremental inflow = 9.419 cfs, from begining of model to end of Clear Lake

0.151672408 cfs/mi, Black Lake Bayou to Clear Lake (78.1-15.3 = 62.8)

Flow @ 100702-A = 2.924 cfs, RM 81.9

Flow @ 282 = 8.930977435 cfs, RM 56.8

Flow @ 1187 = 12.53807733 cfs, RM 39.4

**** The inflow at Grand Bayou is shown in the drainage area book to be entering Black Lake itself and not Black Lake Bayou.

Saline Bayou

Flow on 9/7/05 =	6.2	cfs at USGS 07352000 Saline Bayou near Lucky, Louisiana
Drainage area =	154	mi^2
flow per unit area =	0.040	cfs/mi^2
Saline By. @ mouth of Black Lk By.	1325.410	mi^2
Black Lake bayou at mouth	908.340	mi^2
Saline Bayou at Lake	417.070	mi^2
Saline Lake inflow	16.791	cfs
Saline Bayou Flow	38.468	cfs, this is Black Lake Bayou at mouth flow and Saline Lake inflow

	begin (RM)	end (RM)	avg width (ft)	avg depth (ft)	vel (ft/sec)
Saline Bayou_R1	15.3	6.7	165.90	15	0.015458015
Saline Bayou_R2	6.7	0	201.85	15	0.012705238

Avg Depth (ft)	R1 Velocity (ft)	R2 Velocity (ft)
1	0.231870218	0.190578573
2	0.115935109	0.095289286
3	0.077290073	0.063526191
4	0.057967554	0.047644643
5	0.046374044	0.038115715
6	0.038645036	0.031763095
7	0.033124317	0.02722551
8	0.028983777	0.023822322
9	0.025763358	0.021175397
10	0.023187022	0.019057857
11	0.021079111	0.017325325
12	0.019322518	0.015881548
13	0.017836171	0.01465989
14	0.016562158	0.013612755
15	0.015458015	0.012705238
16	0.014491889	0.011911161
17	0.013639425	0.011210504
18	0.012881679	0.010587698
19	0.012203696	0.010030451
20	0.011593511	0.009528929
21	0.011041439	0.00907517
22	0.010539555	0.008662662
23	0.010081314	0.008286025
24	0.009661259	0.007940774
25	0.009274809	0.007623143
26	0.008918085	0.007329945
27	0.008587786	0.007058466
28	0.008281079	0.006806378
29	0.007995525	0.006571675
30	0.007729007	0.006352619

Incremental Inflows

Reach	Length (km)	Length (miles)	Flow (cfs)		Flow (cms)
1	14	8.699621212	1.319492496		0.037358397
2	34.2	21.25193182	3.223331669		0.091261227
3	27	16.77784091	2.544735528		0.072048337
4	14.6	9.072462121	1.376042174		0.038959471
5	11.2	6.95969697	1.055593997		0.029886718
Total	101	62.76155303	9.519195863		0.26951415

STEADY STATE CALCULATION OF NET DO FROM PHOTOSYNTHESIS AND RESPIRATION

Value and units	Description of parameter	Data source / comments
36 ug/L	Chlorophyll a concentration	Average of values in all 11 LA-QUAL reaches
60	Carbon to chlorophyll ratio	Table 6-4 in Rates, Constants, Kinetics manual
1.04 /day	Algal growth rate at solar noon	"Calibrated" to maintain steady state chl a conc. (within range of values in Table 6-5 in Rates, Constants, Kinetics manual)
0.15 /day	Algal respiration rate	"Calibrated" to maintain steady state chl a conc. (within range of values in Table 6-18 in Rates, Constants, Kinetics manual)
0.19 m/day	Algal settling rate	"Calibrated" to maintain steady state chl a conc. (within range of values in Table 6-19 in Rates, Constants, Kinetics manual
1.56 m	Depth of photic zone	Equations 7.27 and 7.28 of Thomann and Mueller (1987) and assumed secchi depth of 2.0 ft
2.67 g O2 / g C	Oxygen produced per unit of algal growth	Table 3-29 in Rates, Constants, Kinetics manual (consistent with stoichiometric ratio of 1 mole O2 per mole C in photosynthesis)
2.00 g O2 / g C	Oxygen depleted per unit of algal respiration	Table 3-30 in Rates, Constants, Kinetics manual
6:52 AM	Time of sunrise	For date of field data collection (9/07/05) for Natchitoches, LA
7:28 PM	Time of sunset	For date of field data collection (9/07/05) for Natchitoches, LA

Notes:

1. Limitation of algal growth due to sunlight was assumed to vary during the day as a triangular function between sunrise and sunset.
2. Algae conc (mg/L of C) = Chl a conc (ug/L) / 1000 (ug/L per mg/L) * Carbon:Chl a ratio (mg/L C per mg/L chl a)
3. Algal growth (mg/L of C per day) = Max growth rate (1/day) * limitation of max growth rate * Algae conc. (mg/L of C)
4. Algal respiration (mg/L of C per day) = Respiration rate (1/day) * Algae conc. (mg/L of C)
5. Algal settling (mg/L of C per day) = Settling rate (m/day) / Photic zone depth (m) * Algae conc. (mg/L of C)
6. Photic zone depth (m) = 4.61 / Light extinction coefficient (1/m)
7. Light extinction coefficient (1/m) = 1.8 / Secchi depth (m)
8. Rate of O2 produced from photosynthesis = Algal growth (mg/L of C per day) * 2.67 g O2 / g C
9. Rate of O2 consumed from respiration = Algal respiration (mg/L of C per day) * 2.00 g O2 / g C

Time of day	Limitation of max. algal growth due to sunlight	Algal growth (mg/L of C per day)	Algal respiration (mg/L of C per day)	Algal settling (mg/L of C per day)	Rate of O2 production by photosynth. (mg/L/day)	Rate of O2 consumption by respiration (mg/L/day)
12:00 AM	0	0	0.32	0.26	0	0.65
12:30 AM	0	0	0.32	0.26	0	0.65
1:00 AM	0	0	0.32	0.26	0	0.65

1:30 AM	0	0	0.32	0.26	0	0.65
2:00 AM	0	0	0.32	0.26	0	0.65
2:30 AM	0	0	0.32	0.26	0	0.65
3:00 AM	0	0	0.32	0.26	0	0.65
3:30 AM	0	0	0.32	0.26	0	0.65
4:00 AM	0	0	0.32	0.26	0	0.65
4:30 AM	0	0	0.32	0.26	0	0.65
5:00 AM	0	0	0.32	0.26	0	0.65
5:30 AM	0	0	0.32	0.26	0	0.65
6:00 AM	0	0	0.32	0.26	0	0.65
6:30 AM	0	0	0.32	0.26	0	0.65
7:00 AM	0.021	0.05	0.32	0.26	0.13	0.65
7:30 AM	0.101	0.23	0.32	0.26	0.60	0.65
8:00 AM	0.180	0.40	0.32	0.26	1.08	0.65
8:30 AM	0.259	0.58	0.32	0.26	1.55	0.65
9:00 AM	0.339	0.76	0.32	0.26	2.03	0.65
9:30 AM	0.418	0.94	0.32	0.26	2.50	0.65
10:00 AM	0.497	1.12	0.32	0.26	2.98	0.65
10:30 AM	0.577	1.30	0.32	0.26	3.45	0.65
11:00 AM	0.656	1.47	0.32	0.26	3.93	0.65
11:30 AM	0.735	1.65	0.32	0.26	4.41	0.65
12:00 PM	0.815	1.83	0.32	0.26	4.88	0.65
12:30 PM	0.894	2.01	0.32	0.26	5.36	0.65
1:00 PM	0.974	2.19	0.32	0.26	5.83	0.65
1:30 PM	0.947	2.13	0.32	0.26	5.67	0.65
2:00 PM	0.868	1.95	0.32	0.26	5.20	0.65
2:30 PM	0.788	1.77	0.32	0.26	4.72	0.65
3:00 PM	0.709	1.59	0.32	0.26	4.25	0.65
3:30 PM	0.630	1.41	0.32	0.26	3.77	0.65
4:00 PM	0.550	1.24	0.32	0.26	3.30	0.65
4:30 PM	0.471	1.06	0.32	0.26	2.82	0.65
5:00 PM	0.392	0.88	0.32	0.26	2.35	0.65
5:30 PM	0.312	0.70	0.32	0.26	1.87	0.65
6:00 PM	0.233	0.52	0.32	0.26	1.39	0.65
6:30 PM	0.153	0.34	0.32	0.26	0.92	0.65
7:00 PM	0.074	0.17	0.32	0.26	0.44	0.65
7:30 PM	0	0	0.32	0.26	0	0.65

8:00 PM	0	0	0.32	0.26	0	0.65
8:30 PM	0	0	0.32	0.26	0	0.65
9:00 PM	0	0	0.32	0.26	0	0.65
9:30 PM	0	0	0.32	0.26	0	0.65
10:00 PM	0	0	0.32	0.26	0	0.65
10:30 PM	0	0	0.32	0.26	0	0.65
11:00 PM	0	0	0.32	0.26	0	0.65
11:30 PM	0	0	0.32	0.26	0	0.65
24-hour averages =		0.59	0.32	0.26	1.57	0.65

Net rate of change in algal biomass = 0.59 – 0.32 – 0.26 = 0.00 mg/L of C per day (zero means steady state)

Net rate of change in DO over 24 hrs = 1.57 – 0.65 = 0.92 mg/L of O2 per day

Net DO added to water per unit of chlorophyll over 24 hrs = 0.92 / 36 = 0.026 mg/L of O2 per day per ug/L of chl a

APPENDIX F

NBOD Decay Rates For Forested Subsegments

Table F.1. LDEQ intensive survey data for subsegments in the Ouachita and Calcasieu basins with at least 70% forest.

Subseg #	Sample No.	CBOD Decay Rate	UCBOD (mg/L)	Initial TOC (mg/L)	NBOD Decay Rate	UNBOD (mg/L)	Ratio CBODu / TOC
030401	Mill Creek @ Highway 112	0.07	6.49	6.10	0.06	1.20	1.06
	Mill Creek @ iron bridge	0.04	13.22	15.30	0.08	1.84	0.86
	Mill Creek @ Oakdale Road	0.06	5.49	7.80	0.06	0.80	0.70
	Mill Creek @ Tower Road	0.04	16.42	18.00	0.09	2.18	0.91
	Mill Creek Just above the confluence with Calcasieu	0.04	10.37	12.10	0.05	0.64	0.86
030807	BCH1 / Bear Head Creek @ Hwy. 110 SE of Merryville	0.05	15.60	10.80	0.18	1.42	1.44
	BCH2 / Bear Head Creek @ Hwy. 109 SW of Singer	0.04	21.35	15.90	0.06	1.05	1.34
	BCH3 / Bear Head Creek @ Hwy. 389 E of Fields	0.06	18.37	17.90	0.17	1.71	1.03
	BCH4 / Bear Head Creek @ Green Island Rd. N of Starks	0.04	20.43	20.10	0.06	1.61	1.02
	BCH5 / Bear Head Creek @ Hwy. 12 NE of Starks	0.05	21.49	16.40	0.13	1.53	1.31
	BCH6 / Bear Head Creek @ Creek Rd.	0.04	14.90	2.00	0.09	1.29	7.45
081501	CC1 / Castor Creek @ Hwy. 124 above spillway	0.03	9.58	12.10	0.09	0.62	0.79
	CC2 / Castor Creek @ Hwy. 127	0.03	10.13	11.80	0.03	1.17	0.86
	CC3 / Castor Creek @ Hwy. 506	0.03	9.19	14.00	0.15	0.84	0.66
	CC4 / Castor Creek @ Hwy. 126	0.04	14.15	15.30	0.09	1.76	0.92
	CC5 / Castor Creek @ Hwy. 846	0.03	16.37	16.10	0.11	0.92	1.02
	CC6 / Castor Creek @ Hwy. 4	0.07	11.74	14.40	0.17	2.04	0.82
	CC7 / Castor Creek @ Hwy. 34	0.03	14.85	14.70	0.18	0.67	1.01
	CC8 / Castor Creek @ Chatham Cemetery Road	0.04	14.74	14.50	0.04	0.58	1.02
081401	DR10 / Dugdemona River Smurfit-Stone outfall canal sampling sit	0.05	37.90	29.00	0.10	5.87	1.31
	DR12 / Dugdemona River @ LA 4 located W. of Jonesboro	0.03	20.91	26.90	0.06	1.39	0.78
	DR13 / Dugdemona River @ Parish Rd. W of Evergreen Rd. S. of LA	0.03	13.83	22.60	0.05	0.91	0.61
	DR14 / Dugdemona River @ LA 126 located just E of Brewtons Mill	0.03	11.15	21.70	0.09	0.78	0.51
	DR15 / Dugdemona River @ Carter Crossing Rd. located off Hwy. 5	0.03	7.21	15.40	0.03	0.67	0.47
	DR16 / Dugdemona River just past Restriction below Big Creek do	0.03	7.39	14.40	0.04	0.65	0.51
	DR19 / Dugdemona River Cypress Creek in Jackson-Bienville Wildl	0.05	6.59	6.60	0.04	0.89	1.00
	DR32 / Dugdemona River Little Dugdemona River @ Hwy. 167 betwee	0.05	9.07	2.00	0.07	1.33	4.53
	DR41 / Dugdemona River Big Creek @ LA 505 SW of Dodson	0.05	11.13	12.00	0.05	0.96	0.93
	DR5 / Dugdemona River @ Union Church Rd. (Parish Rd. 122)	0.03	6.72	2.00	0.04	0.52	3.36
	DR6 / Dugdemona River located just W. of Quitman	0.04	7.12	8.00	0.04	0.69	0.89
	DR7 / Dugdemona River located just W. of Hodge	0.05	9.32	8.00	0.03	0.87	1.16
	DR9 / Dugdemona River "In canal, upstream of Smurfit-Stone outf"	0.04	135.26	51.30	0.13	29.26	2.64
	DR25 / Dugdemona River Madden Creek/Redwine Creek @ Turner Rd.	0.03	6.72	7.50	0.03	0.85	0.90
081504	FLCR1 / Flat Creek @ Hwy. 147	0.04	15.66	20.30	0.04	3.79	0.77
	FLCR2 / Flat Creek @ Hwy. 127	0.03	14.71	15.70	0.05	1.18	0.94
	FLCR3 / Flat Creek @ confluence with Castor Creek-~ 3 miles	0.05	8.75	12.80	0.09	1.30	0.68
	Count	36	36	36	36	36	36
	Min	0.03	5.49	2.00	0.03	0.52	0.47
	Average	0.04	16.51	14.76	0.08	2.11	1.31
	Median	0.04	12.48	14.45	0.06	1.11	0.93
	Max	0.07	135.26	51.30	0.18	29.26	7.45

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APPENDIX G

Literature Values for Mineralization Rates

TABLE 5-3. RATE COEFFICIENTS FOR NITROGEN TRANSFORMATIONS

PON → DON		DON → NH_3		PON → NH_3		NH_3 → NO_2		NH_3 → NO_3		NO_2 → NO_3		SEDM → NH_3		References
K	θ	K	θ	K	θ	K	θ	K	θ	K	θ	K	θ	
								Calibration Values						
				0.035	(linear)			0.04	(linear)					Thomann et al. (1975)
				0.03**	1.08									Thomann et al. (1979)
				0.03***	1.08			0.12***	1.08			0.0025	1.08	Di Toro & Connolly (1980)
				0.03***	1.08			0.20	1.08					Di Toro & Matystik (1980)
				0.075	1.08			0.09-0.13***	1.08			0.0004	1.08	Thomann & Fitzpatrick (1982)
								0.025***	1.08					O'Connor et al. (1981)
				0.14	(linear)									Salas & Thomann (1978)
				0.001	1.02	0.003-0.03	1.02			0.09	1.02	0.001	1.02	Chen & Orlob (1972, 1975)
0.020	(linear)	0.020	(linear)					0.060	(linear)					Scavia et al. (1976)
0.020	(linear)	0.020	(linear)					0.1	(linear)					Scavia (1980)
0.02	1.020	0.02	1.020					0.1	1.020					Bowie et al. (1980)
0.02	(linear)	0.024	(linear)					0.16	(linear)					Canale et al. (1976)
				0.003	1.020	0.02	1.047			0.25	1.047	0.0015	1.047	Tetra Tech (1980)
				0.1	1.047	0.02	1.047			0.25	1.047	0.0015	1.047	Porcella et al. (1983)
				0.01**	NI							0.95-1.8***	1.14	Nyholm (1978)
				0.005**	1.08									Bierman et al. (1980)
				0.1**	1.02									Jorgensen (1976)
				0.2**	1.072									Jorgensen et al. (1978)

(continued)

APPENDIX H

Calibration Model Water Balance

Appendix H.Calibration Flow Calculations.

Black Lake Bayou

Flow per unit area = 0.023864254 cfs/mi^2, average of two stations (282 and 1187) from FTN survey where flow data was taken

Flow Type	Location	Drainage area (mi^2)	Flow (cfs)	Flow (cms)	Cumulative flow (cfs)	Cumulative flow (cms)
Headwater	Black Lake Bayou at mouth of Leatherman	122.52	2.924	0.083	2.924	0.083
Trib	Leatherman Creak at Mouth	127.68	3.047	0.086	5.971	0.169
Trib	Kepler Creek at mouth (RM 63.3)	51.68	1.233	0.035	7.204	0.204
Trib	Fourmile Bayou at mouth (RM 60.6)	35.35	0.844	0.024	8.048	0.228
Trib	Castor Creek at mouth RM (49.5)	40.56	0.968	0.027	9.016	0.255
Trib	Grand Bayou at mouth[1] (RM 30)	135.84	3.242	0.092	12.258	0.347
	TOTAL =	513.63	12.258	0.347		
	Black Lake Bayou at Mouth of Black Lake	908.34	21.677	0.614		

Incremental inflow = 9.419 cfs, from beginning of model to end of Clear Lake
0.151672408 cfs/mi, Black Lake Bayou to Clear Lake (78.1-15.3 = 62.8)

Flow @ 100702-A = 2.924 cfs, RM 81.9
Flow @ 282 = 8.930977435 cfs, RM 56.8
Flow @ 1187 = 12.53807733 cfs, RM 39.4

NOTE: 1. The inflow at Grand Bayou is shown in the drainage area book to be entering Black Lake itself and not Black Lake Bayou.

Saline Bayou

Flow on 9/7/05 = 6.2 cfs, from USGS 07352000 Saline Bayou near Lucky, Louisiana
Drainage area = 154 mi^2
Flow per unit area = 0.040 cfs/mi^2

Saline Bayou at mouth of Black Lake Bayou	1,325.410	mi^2
Black Lake bayou at mouth	908.340	mi^2
Saline Bayou at Lake	417.070	mi^2
Saline Lake inflow	16.791	cfs
Saline Bayou Flow	38.468	cfs, this is Black Lake Bayou at mouth flow and Saline Lake inflow

	begin (RM)	end (RM)	avg width (ft)	avg depth (ft)	vel (ft/sec)
Saline Bayou Reach 1	15.3	6.7	165.90	15	0.015458015
Saline Bayou Reach 2	6.7	0	201.85	15	0.012705238

Incremental Inflows

Reach	Length (km)	Length (miles)	Flow (cfs)	Flow (cms)
1	14	8.699621212	1.319492496	0.037358397
2	34.2	21.25193182	3.223331669	0.091261227
3	27	16.77784091	2.544735528	0.072048337
4	14.6	9.072462121	1.376042174	0.038959471
5	11.2	6.95969697	1.055593997	0.029886718
total =	101	62.76155303	9.519195863	0.26951415

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