Appendix A.

Watershed and Reservoir Physical Description Including Summary of Ecological Health Results for Each Reservoir Sampled in 2000

Kentucky Watershed

Duck Watershed

Pickwick - Wilson Watershed

Wheeler - Elk Watershed

Guntersville - Sequatchie Watershed

Nickajack - Chickamauga Watershed

Hiwassee Watershed

Fort Loudoun Reservoir - Melton Hill - Watts Bar Watershed

Clinch - Powell Watershed

Little Tennessee Watershed

French Broad Watershed

Holston Watershed

KENTUCKY RESERVOIR WATERSHED

The Kentucky Reservoir watershed area includes all streams flowing into the Tennessee River downstream of Pickwick Landing Dam at Tennessee River mile (TRM) 206.7 to the confluence of the Tennessee River with the Ohio River. The one exception is the Duck River which is considered a separate watershed. The Kentucky Reservoir watershed area is relatively large (4590 square miles) and has an average annual discharge of about 67,200 cfs. Of that, about 83 percent (56,000 cfs) comes into Kentucky Reservoir from Pickwick Landing Dam. The Duck River supplies about 6 percent (4075 cfs), with the remaining 11 percent coming from local inflows.

Kentucky Reservoir is the dominant feature of this watershed. There are four monitoring sites on Kentucky Reservoir--forebay, transition zone, inflow, and Big Sandy River embayment

The watershed also includes the seven small reservoirs on the Beech River. The largest, Beech Reservoir, is the only one included in Vital Signs monitoring. Given its small size, the forebay is the only site monitored.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Kentucky Reservoir

Kentucky Reservoir is the largest reservoir on the Tennessee River. The dam is located at Tennessee River Mile (TRM) 22.4, and the reservoir extends 184 miles upstream to Pickwick Dam at TRM 206.7. At full pool the surface area is 160,300 acres, and the shoreline is 2280 miles. Average annual discharge is about 67,200 cfs, which provides an average hydraulic retention time of about 21 days.

The Duck River, a major tributary to the Tennessee River (and Kentucky Reservoir), provides about 6 percent of the total flow through Kentucky Reservoir. The confluence of the Duck River with the Tennessee River is at TRM 110.7.

The transition zone sample location was moved prior to the 1992 sample season from TRM 112.0 to TRM 85.0. Results for 1990 and 1991 at TRM 112.0 indicated that location was more representative of a riverine environment than a transition environment. Results of sampling since then indicate the new transition zone site is correctly located.

Vital Signs monitoring was expanded in 1993 to include a sample site in four of the largest embayments in the Tennessee Valley. One, the Big Sandy River embayment on Kentucky Reservoir, is

the largest embayment in the Tennessee Valley. It covers 15,238 surface acres and has over 93 miles of shoreline. Because its watershed is only 629 square miles, there is very little water exchange.

Beech Reservoir

Beech Reservoir, the largest of seven small flood control projects on the Beech River system in western Tennessee, is formed by Beech Dam at Beech River mile 35.0. Beech Reservoir is only 5.3 miles long and averages only about 12 feet deep. It has no hydropower generating facilities, but is the primary source of water for the city of Lexington. The reservoir is an urban lake with considerable residential lakefront development. Consequently, it receives a large amount of recreational use relative to its small size (about 900 acres). Discharge from Beech Dam averages only about 14 cfs per day, resulting in a long hydraulic residence times of 300 to 400 days.

Reservoir: Beech 2000 Score: 42%

----Previous Scores----
2000 Criteria

1991	n/s
1992	n/s
1993	69[1]
1994	54
1995	50
1996	51
1997	n/s
1998	53
1999	n/s
2000	42

1. no fish

Beech	2000 Results					Change between 1998 and 2000				
	FB	MR	Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	P 1.0				1.0	0.0				0.0
DO	P 1.0				1.0	0.0				0.0
Fish	F 2.0				2.0	-1.0				-1.0
Benthos	F 4.0				4.0	-1.0				-1.0
Sediment	F 1.5				1.5	-0.5				-0.5
Total	9.5				9.5	-2.5				-2.5

Summary/Key Ecological Health Findings for 2000: Beech Reservoir rated poor in 2000. All indicators rated either fair or poor. Chlorophyll rated poor because concentrations were high throughout the study period. DO concentrations were low near bottom from late May through October with anoxia present much of the time, hence the poor rating. The fish assemblage rated fair -- five metrics (sucker species, intolerant species, percent of individuals as omnivores, lithophilic spawning species, and average number of individuals) all received the lowest possible rating; the predominant species was gizzard shad. Benthos rated fair; relatively few intolerant taxa and individuals were collected. Sediment quality rated fair because the concentration of arsenic exceeded the expected background by a small amount.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The overall ecological health score for Beech Reservoir was poor in 1994, 1995, 1996, 1998, and 2000. The score has been quite consistent between 1994 and 1998 with a range of only 50 - 54. The score of 42 for 2000 was the lowest to date for Beech Reservoir. Consistent problems are high chlorophyll concentrations and low DO levels. The fish assemblage usually rates "low-fair" or poor. Absence or low numbers of sucker species, intolerant species, and lithophilic spawning species typically drive the fish assemblage score and rating down. The benthos rating for Beech Reservoir usually rates good and is often one of the highest found among all the reservoirs in the Interior Plateau ecoregion. This needs to be interpreted with caution because the ratings are on a relative system (i.e., compared only to other reservoirs in the same ecoregion). The benthos in all the reservoirs in this ecoregion (including Beech) would be considered poor by most other standards. The benthos rating for 2000 was the lowest to date for Beech because fewer organisms were collected, especially those considered intolerant.

Aquatic Macrophytes in 2000: Not an issue on Beech.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Beech Reservoir. Channel catfish and largemouth bass were collected from Beech Reservoir in autumn 1998. Channel catfish fillets were analyzed for pesticides, PCBs, and metals and largemouth bass fillets for mercury. The results were provided to state agencies in Tennessee. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. Beech Reservoir will be sampled again in 2002.

Status of Swimming Advisories in 2000: There are no State of Tennessee swimming advisories along the Beech River. Three Beech River sites were sampled ten times each for fecal coliform bacteria in 2000. The three sites sampled were: Beech Lake Dam Beach, Beech Lake Campground Beach, and Pine Lake Beach. All of the sites sampled met Tennessee's bacteriological water quality criteria for water contact recreation.

DUCK RIVER WATERSHED

The Duck River Watershed includes all streams flowing into the Duck River. It has an area of 3500 square miles and an average annual discharge of 4075 cfs to Kentucky Reservoir on the Tennessee River. The Duck River basin is underlain almost entirely by limestone, or phosphatic limestone; consequently, waters in the streams draining this basin are fairly hard and contain large concentrations of minerals. Large deposits of phosphate ores permit phosphate mining and refining operations in the basin. Phosphate concentrations in surface and groundwater are significantly higher than in most of the Tennessee Valley. The soils are thin with limestone outcrops at the surface in many places, and sinkholes are common throughout the watershed.

Normandy Reservoir is the only reservoir in this watershed. This is a relatively small reservoir and only the forebay is included in the Vital Signs monitoring program.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on Normandy Reservoir. It also provides planned activities in the future .

Normandy Reservoir

Normandy Reservoir is formed by Normandy Dam at Duck River mile (DRM) 248.6. Normandy Reservoir, constructed primarily for flood control and water supply, has a drainage area of 195 square miles and no electric power generation capacity. One of TVA's smaller reservoirs, Normandy at full pool elevation has about 3200 surface acres, 73 miles of shoreline, and about 17 miles of impounded backwater. The reservoir has an average depth of about 35 feet and an average annual drawdown of about 11 feet. The average annual discharge from Normandy Dam is about 344 cfs, providing an average annual retention time of about 161 days.

Reservoir: Normandy 2000 Score: 55%

---Previous Scores---

2000 Criteria	
1991	n/s
1992	n/s
1993	62
1994	64
1995	59
1996	69
1997	n/s
1998	63
1999	n/s
2000	55

Normandy	2000 Results					Change between 1998 and 2000				
	FB	MR	Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	P 2.9				2.9	0.1				0.1
DO	P 1.0				1.0	0.0				0.0
Fish	G 4.0				4.0	-1.0				-1.0
Benthos	F 2.0				2.0	-1.0				-1.0
Sediment	G 2.5				2.5	0.0				0.0
Total	12.4				12.4	-1.9				-1.9

Summary/Key Ecological Health Findings for 2000: Ecological conditions in Normandy Reservoir rated poor in 2000. The main issue was low DO levels. Typically, much of the water column (generally all but the top few meters) has low DO concentrations throughout most of the summer with extended periods of anoxia near bottom. Normandy has one of the more severe DO problems of all TVA reservoirs. The low DO in turn affects the benthic community which rated a low fair (one point above poor), due to low overall density, a lack of diversity, and being dominated by tolerant taxa. Chlorophyll rated poor because of high concentrations throughout summer. The fish assemblage and sediment quality both rated good in 2000.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: Normandy Reservoir rated poor for the first time in 2000 having rated fair in all previous years. Little variation in reservoir condition was observed during the first four years (1993, 1994, 1995, and 1996). However, this was not the case during the two most recent monitoring periods – 1998 and 2000 (monitoring was changed to an every other year rotation following 1996). Dryer and warmer weather conditions are thought to have played an important role in these differences. Sediment quality and the fish assemblage have rated good during all monitoring periods. However, the other three indicators exhibited a change between 1993-1996 and 1998-2000. For example, good ratings for chlorophyll changed to poor in 1998 and 2000 due to a substantial increase in concentrations. DO continued to rate poor in 1998 and 2000 as it had in the past, but the volume of low-DO water was about half that which existed during the 1993-1996 period. The consistently poor rating for benthos changed to fair in 1998 and 2000 due to collection of a greater variety and abundance of organisms. Increases in chlorophyll concentration have been observed in other reservoirs during recent years and may indicate nutrient over-enrichment. The decrease in volume of low-DO water is interesting. Intuitively, it would seem that the increased algal biomass would have increased oxygen demand for decomposition, which it probably did. However, warm winters during 1998 and 2000 did not cool reservoir temperatures as much as in the earlier years so differences between bottom and surface temperatures were not as great. This reduced stratification would have allowed surface and bottom waters to remain mixed later in the spring/early summer and allow destratification to occur earlier in late summer/early fall. It is possible that the improved rating for benthos is related to improved DO conditions.

Aquatic Macrophytes in 2000: Not an issue on Normandy Reservoir.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Normandy Reservoir. The last time TVA sampled Normandy Reservoir was in autumn 1998. Channel catfish fillets were analyzed for pesticides, PCBs, and metals and largemouth bass fillets for mercury. The results were provided to state agencies in Tennessee. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. Normandy Reservoir will be sampled again in 2002.

Status of Swimming Advisories in 2000: There are no State of Tennessee swimming advisories on Tims Ford Reservoir. Two sites at Tims Ford Reservoir were sampled ten times each for fecal coliform bacteria in 2000. These sites were also analyzed for *E. coli* bacteria using three different methods. Both locations met the state of Tennessee bacteriological water quality criteria for water contact recreation.

PICKWICK RESERVOIR - WILSON RESERVOIR WATERSHED

Pickwick Reservoir and Wilson Reservoir on the Tennessee River are the most notable features of this drainage area. Only a small part of the flow leaving this watershed actually originates within the watershed itself. The average annual discharge from Pickwick Dam is about 56,000 cfs. Of that, 52,500 cfs (94 percent) is the discharge from Wheeler Dam into Wilson Reservoir. About 1840 cfs enters Wilson Reservoir through local tributaries and about 3500 cfs originates in tributaries to Pickwick Reservoir. The streams within this watershed drain an area of about 3230 square miles. The largest tributaries are Bear Creek, a tributary to Pickwick Reservoir with a drainage area of about 945 square miles, and Shoal Creek, a tributary to Wilson Reservoir, with a drainage area of about 445 square miles.

Four small reservoirs were built on Bear Creek in the late 1970s and early 1980s for flood control and recreation. These are Bear Creek, Little Bear Creek, Cedar Creek, and Upper Bear Creek Reservoirs.

Reservoir monitoring activities occur at the forebay, transition zone, and inflow on Pickwick Reservoir and at the forebay and inflow on Wilson Reservoir. Wilson is relatively short and has no definable transition zone. Because of their smaller size, only the forebays of Bear Creek, Little Bear Creek, and Cedar Creek Reservoirs are monitored. No monitoring activities are conducted on Upper Bear Creek because of TVA's program to destratify and oxygenate water in the forebay.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Pickwick Reservoir

Pickwick Reservoir is immediately upstream of Kentucky Reservoir on the Tennessee River. Pickwick Dam is located at TRM 206.7. Like the rest of the mainstream, run-of-the-river reservoirs, Pickwick is much shorter (53 miles long) and smaller (43,100 acres and shoreline of 496 miles) than Kentucky Reservoir. Average annual discharge is about 56,000 cfs, which provides an average hydraulic retention time of about eight days.

A major tributary, Bear Creek, joins the Tennessee River in Pickwick Reservoir at about mile 225. Bear Creek provides, on the average, about 2.5 percent of the flow through Pickwick Reservoir.

Reservoir Monitoring activities were expanded on Pickwick Reservoir in 1993 to include a Vital Signs monitoring site in Bear Creek embayment. This rather large embayment (7200 acres)

extends from the mouth of Bear Creek upstream about 17 miles to the point where flow is not affected by backwater from Pickwick Dam.

Wilson Reservoir

Wilson Reservoir is quite different from other mainstream Tennessee River reservoirs in both length and depth. Wilson Dam is located at TRM 259.4 and Wheeler Dam is at TRM 274.9, providing a length of only 15.5 miles, a shoreline of 154 miles, and surface area of 15,500 acres. Water depth in the forebay is slightly over 100 feet. This short, deep pool, coupled with the largest hydroelectric generating plant in the TVA system, provides for short hydraulic retention times (six days). Average annual discharge from Wilson is 52,500 cfs. Because of the physical characteristics, design, and operation of Wilson Dam (primarily upper strata withdrawal for hydropower generation), low DO conditions develop in deeper strata of the forebay during summer months.

Bear Creek Reservoir

With a surface of only 700 acres, Bear Creek is one of the smallest reservoirs in the TVA system. It is relatively long (16 miles), narrow, and deep (74 feet at the dam). The average annual discharge is 406 cfs providing an average hydraulic retention time of about 12 days. Average annual drawdown is about 11 feet. Bear Creek Reservoir stratifies in the summer and develops hypolimnetic anoxia. Another water quality concern is abandoned strip mines in the watershed.

Little Bear Creek Reservoir

Little Bear Creek Reservoir is relatively short (7.1 miles long) and deep (84 feet at the dam). It has a surface area of 1600 acres. With an average annual discharge of 109 cfs, the hydraulic retention time is 209 days. Compared to Bear Creek Reservoir, the lower flow into the reservoir and larger reservoir volume make the retention time much longer in Little Bear Creek Reservoir. Average annual drawdown is about 12 feet.

Cedar Creek Reservoir

Like the other reservoirs in the Bear Creek watershed, Cedar Creek Reservoir is small (only nine miles long and 4200 acres surface area) and deep (79 feet at the dam). The low average annual discharge from the dam (313 cfs) creates a relatively long average retention time (152 days). This combination of physical features lead to thermal stratification and hypolimnetic anoxia in the summer. Average annual drawdown is about 14 feet.

Reservoir: Pickwick 2000 Score:71%

Previous Scores	2000 Criteria	
1991	77	no embayment
1992	80	no embayment
1993	70	74 if Emb excluded
1994	81	86 if Emb excluded
1995	n/s	
1996	72	76 if Emb excluded
1997	n/s	
1998	74	81 if Emb excluded
1999	n/s	
2000	71	76 if Emb excluded

Pickwick	2000 Results					Change between 1998 and 2000				
	FB	TZ	Emb	Inf	Total	FB	TZ	Emb	Inf	Total
Chlorophyll	P 2.8	P 2.3	P 1.0		6.2	0.1	-2.7	0.0		-2.6
DO	G 4.5	G 5.0	F 4.0		13.5	-0.5	0.0	-0.5		-1.0
Fish	F 3.0	G 4.0	F 4.0	G 4.0	15.0	-1.0	1.0	1.0	0.0	1.0
Benthos	G 4.0	F 3.0	P 2.0	F 4.0	13.0	0.0	-2.0	0.0	1.0	-1.0
Sediment	G 2.5	G 2.5	G 2.5		7.5	0.5	0.5	0.5		1.5
Total	16.8	16.8	13.5	8.0	55.2	-0.9	-3.2	1.0	1.0	-2.1

Summary/Key Ecological Health Findings for 2000: Overall ecological conditions in Pickwick Reservoir rated fair in 2000; the rating was just two points below the good category. Three of the five indicators used to evaluate ecological condition rated good or fair at all locations. The only poor ratings were for chlorophyll and benthos. Chlorophyll rated poor at all three sampling sites where chlorophyll is monitored due to high concentrations during most of the monitoring period. Benthos rated poor at only one site: Bear Creek embayment. The sample site in Bear Creek embayment generally had lower rating for individual indicators than the other sites. Chlorophyll and benthos rated poor; dissolved oxygen and fish rated fair; and only sediment quality rated good. This area receives ample nutrients to stimulate algal growth resulting in high chlorophyll levels and has relatively little water exchange which tends to allow oxygen depletion to occur in lower strata during summer. The consistency of poor chlorophyll ratings was the primary factor which caused the overall ecological condition score for Pickwick Reservoir to be fair rather than good.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The fair, almost good, ecological health score for Pickwick Reservoir in 2000 was generally similar to past years. Scores were good in 1991, 1992, 1994, and 1998 and fair, near the good category, in 1993 and 1996. The factors which seem to dictate whether a good or "high" fair score will occur are chlorophyll ratings at all sites and lower ratings for most indicators in Bear Creek embayment. Years with low reservoir flows such as 2000 tend to allow high chlorophyll concentrations to develop as long as ample nutrients are present, which is typically the case for most reservoirs on the mainstem of the Tennessee River. Fluctuations in chlorophyll levels are particularly evident at the transition zone where a poor rating occurred in 2000 compared to good in 1998, the last time Pickwick was monitored. Higher chlorophyll levels generally occur in this portion of the reservoir during years with low flows.

Aquatic Macrophytes in 2000: Aquatic plants on Pickwick Reservoir in 2000 covered an estimated 400 acres.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Pickwick Reservoir. The last time TVA sampled Pickwick Reservoir was in autumn 1998. Channel catfish and largemouth bass fillets were analyzed for pesticides, PCBs, and metals. The results were provided to the Alabama Department of Public Health. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. Pickwick Reservoir will be sampled again in autumn 2002.

Status of Swimming Advisories in 2000: There are no state swimming advisories on Pickwick Reservoir. Ten sites along Pickwick Reservoir were sampled ten times each for fecal coliform bacteria in 2000. All of the sites sampled met bacteriological water quality criteria for water contact recreation in the state in which they were sampled (Tennessee, Alabama, or Mississippi).

Reservoir: Wilson **2000 Score: 52%**

Previous Scores	2000 Criteria
1991	58
1992	67
1993	76
1994	70
1995	n/s
1996	75
1997	n/s
1998	78
2000	52

Wilson	2000 Results					Change between 1998 and 2000				
	FB	TZ	Emb	Inf	Total	FB	TZ	Emb	Inf	Total
Chlorophyll	P 2.5				2.5	-1.8				-1.8
DO	P 1.0				1.0	-3.0				-3.0
Fish	F 3.0			P 2.0	5.0	-1.0			-2.0	-3.0
Benthos	P 2.0			F 4.0	6.0	0.0			-1.0	-1.0
Sediment	G 2.5				2.5	0.5				0.5
Total	11.0			6.0	17.0	-5.3			-3.0	-8.3

Summary/Key Ecological Health Findings for 2000: Overall, ecological conditions in Wilson Reservoir rated poor in 2000. Only one indicator, sediment quality, received a good rating; all others rated fair or poor. Three indicators (Chlorophyll, DO, and Benthos) received a poor rating at the forebay sample site, and the fish assemblage rate poor the inflow. Dry weather conditions and resulting low reservoir flows were probably the primary contributors to observed conditions in 2000, especially at the forebay. Low flows tend to allow algae to increase as long as ample nutrients are present resulting in relatively high chlorophyll levels. Also, low flows do not provide sufficient energy to mix surface and bottom waters in relatively deep reservoirs like Wilson (90 - 100 feet). When this occurs, oxygen concentrations in lower strata are reduced as natural decomposition processes occur. In absence of mixing with oxygen-rich surface waters, oxygen concentrations in lower strata become progressively lower as the summer progresses. Low oxygen levels, in turn, have a negative affect on benthic macroinvertebrates. The poor rating for fish at the inflow was due to collection of fewer species than in the past, primarily piscivores and lithophilic spawning species. Also, the proportion of fish collected which are tolerant poor water quality conditions was relatively high.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The poor rating for Wilson Reservoir in 2000 was lower than in most preceding years – a poor rating had only occurred once (in 1991), fair rating twice (in 1992 and 1994), and good in three years (1993, 1996, and 1998). Fluctuations in reservoir ratings have generally followed reservoir flow conditions as described above. It is notable that all three indicators (chlorophyll, DO, and benthos) which rated poor at the forebay in 2000 have also rated poor in previous years, generally irrespective of flow conditions; however, all three have not concurrently rated poor in any previous year as they did in 2000. In addition, the fish assemblage rated poor for the first time at the inflow (discussed above). The occurrence of so many poor ratings, in absence of several good ratings as in past years, resulted in the lowest reservoir ecological health score for Wilson observed to date. A return to more normal flow conditions should allow a return to the typical fair-good ecological conditions observed in previous years.

Aquatic Macrophytes in 2000: Only an estimated 10 acres of aquatic plants were present on Wilson in 2000, about the same as the past three to five years.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Wilson Reservoir. The last time TVA sampled Wilson Reservoir was in autumn 1998. Channel catfish and largemouth bass fillets were analyzed for pesticides, PCBs, and metals. The results were provided to the Alabama Department of Public Health. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. Wilson Reservoir will be sampled again in autumn 2002.

Status of Swimming Advisories in 2000: There are no State of Alabama swimming advisories on Wilson Reservoir. Two sites (Fleet Hollow Boat Ramp and Lock Six Day Use Area Boat Ramp) along Wilson Reservoir were sampled ten times each for fecal coliform bacteria in 2000. Both sites met Alabama's bacteriological water quality criteria for water contact recreation.

WHEELER RESERVOIR - ELK RIVER WATERSHED

The Wheeler Reservoir - Elk River watershed drains about 5140 square miles in north central Alabama and south central Tennessee. Wheeler Reservoir is the fourth of nine reservoirs on the Tennessee River. About 24,500 square miles of the Tennessee Valley are upstream of this watershed. Wheeler Reservoir receives an average annual inflow of 41,790 cfs from Guntersville Dam. Discharges from Wheeler Dam average 50,630 cfs on an annual basis leaving 8840 cfs which originate within the watershed.

The largest tributary to Wheeler Reservoir is the Elk River, which has a drainage area of about 2250 square miles and contributes about 3000 cfs. The remaining flow enters from tributaries directly to Wheeler Reservoir.

Wheeler Reservoir is the largest reservoir within this watershed followed by Tims Ford Reservoir on the Elk River. There are four Vital Signs monitoring sites on Wheeler Reservoir--forebay, transition zone, inflow, and the Elk River embayment. Two sites are monitored for Vital Signs on Tims Ford Reservoir--forebay and mid-reservoir. Woods Reservoir on the Elk River is not included in this monitoring program because it is property of the Arnold Engineering Development Center, Arnold Air Force Base.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Wheeler Reservoir

Wheeler Reservoir has the third-largest surface area (67,100 acres) of all reservoirs in the TVA system. It is 74 miles long (dam at TRM 274.9) and has 1063 miles of shoreline. Average annual discharge is about 50,630 cfs which provides an average hydraulic retention time of about 12 days. Information collected in 1990 and 1991 indicated a more riverine than transition environment at TRM 307.5; consequently, in 1992 the transition zone sampling location was relocated further downstream to TRM 295.9. Results since the relocation indicate the new site is at the upstream end of the transition zone area. This means that the site may be too far upstream under moderate to high flow conditions.

The Elk River joins the Tennessee River in the downstream portion of Wheeler Reservoir at about mile 284 and provides, on the average, about 6 percent of the flow through Wheeler Reservoir.

Vital Signs monitoring activities were expanded in 1993 to include a site in the Elk River embayment. The Elk River embayment covers about 4900 acres. Given the relatively high flows in the Elk River (about 3000 cfs annual average), there is substantial water exchange in this embayment.

Tims Ford Reservoir

Tims Ford Reservoir in middle Tennessee is formed by Tims Ford Dam at Elk River mile (ERM) 133.3. The reservoir is 34 miles long at full pool and has a surface area of 10,600 acres. The depth at the dam is 143 feet and the average depth is about 50 feet. Average annual discharges from Tims Ford Dam are about 980 cfs, resulting in a hydraulic residence time of about 270 days. Tims Ford Reservoir is designed for a useful controlled drawdown of 30 feet (895-865 feet MSL) for flood protection; however, annual drawdowns average about 18 feet.

Reservoir: Tims Ford 2000 Score: 49%

---Previous Scores---

2000 Criteria	
1992	63[1]
1993	60
1994	58
1995	56
1996	53
1997	n/s
1998	49
1999	n/s
2000	49

1. only Chl, DO, and Fish

Tims Ford	2000 Results					Change between 1998 and 2000				
	FB	MR	Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	G 5.0	P 2.6			7.6	1.6	0.0			1.6
DO	P 1.0	P 1.0			2.0	0.0	0.0			0.0
Fish	F 3.0	F 3.0			7.0	-1.0	-2.0			-3.0
Benthos	P 1.0	P 1.0			2.0	0.0	0.0			0.0
Sediment	F 2.0	G 2.5			4.5	0.5	1.0			1.5
Total	12.0	10.1			22.1	1.1	-1.0			0.1

Summary/Key Ecological Health Findings for 2000: The overall ecological health rating for Tims Ford Reservoir was poor in 2000. The only good ratings were for chlorophyll at the forebay and sediment quality at the mid-reservoir site. DO and benthos rated poor at both sampling locations. DO levels, as in past years, were less than 2 mg/l throughout most of the lower water column during summer and at or near zero on the bottom from July through October. The poor ratings for the benthos community were probably tied to the low DOs near bottom. Virtually all metrics used to evaluate the benthic community rated poor at both sample locations. Chlorophyll levels were high and rated poor at the mid-reservoir site with lower levels and a good rating at the forebay. Sediment quality rated fair at the forebay and good at the mid-reservoir site. The fair rating at the forebay was due to elevated levels of nickel, which has been found in all previous years of monitoring. The fish assemblage rated fair at both sites.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The overall ecological condition of Tims Ford Reservoir was poor again in 2000; same as in all monitoring years since 1994. Consistent problems for Tims Ford throughout this time period have been low DO concentrations near bottom and a poor benthic community. Chlorophyll concentrations at the forebay in 2000 were within the expected range and rated good; similar to all past years except 1998 when elevated concentrations resulted in a fair rating. Chlorophyll concentrations were again high and rated poor at the mid-reservoir site in 2000, same as in 1998 when this site rated poor for the first time. Fish assemblage scores were lower in 2000 than in most previous years with the lowest score found to date at the mid-reservoir site. This is contrary to observations in 1998 when fish assemblage scores were higher at both sites than they had been in most previous years. The lower scores in 2000 were reflected in eight of the 12 metrics used to evaluate the fish assemblage, but the greatest change was in number of sucker species and number of intolerant species.

Aquatic Macrophytes in 2000: Not an issue on Tims Ford Reservoir.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Tims Ford Reservoir. Channel catfish and largemouth bass were collected autumn 1998. Channel catfish fillets were analyzed for pesticides, PCBs, and metals, and largemouth bass were analyzed for mercury. The results were provided to state agencies in Tennessee. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. Tims Ford will be sampled again in 2002.

Status of Swimming Advisories in 2000: There are no State of Tennessee swimming advisories on Tims Ford Reservoir. Two sites at Tims Ford Reservoir were sampled ten times each for fecal coliform bacteria in 2000. These sites were also analyzed for *E. coli* bacteria using three different methods. Both locations met the State of Tennessee bacteriological water quality criteria for water contact recreation. The sites sampled were Dry Creek Embayment Swimming Beach and Estill Springs Park Boat Ramp.

GUNTERSVILLE RESERVOIR - SEQUATCHIE RIVER WATERSHED

This watershed includes Guntersville Reservoir and all tributaries draining directly to Guntersville Reservoir. As with the other watershed areas on the mainstem of the Tennessee River, most of the water leaving the watershed through Guntersville Dam enters the watershed area through discharges from the upstream dam (Nickajack). About 37,200 cfs enter from Nickajack Dam and about 41,800 cfs is discharged from Guntersville Dam on an annual average basis. The remaining 4600 cfs originates with the Guntersville Reservoir-Sequatchie River watershed area. The largest contributor of this flow is the Sequatchie River (about 800 cfs). The total watershed area is 2669 square miles. The area drained by the Sequatchie River is about 600 square miles.

Guntersville Reservoir is the dominant characteristic of this watershed. There are three Vital Signs monitoring site on Guntersville Reservoir: forebay, transition zone, and inflow.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on Guntersville Reservoir. It also provides planned activities in the future .

Guntersville Reservoir

Guntersville Dam, located at TRM 349.0, creates a 76 mile long reservoir with a surface area of 67,900 acres and a shoreline of 949 miles at full pool. Average annual discharge is about 41,800 cfs, corresponding to an average hydraulic retention time of about 12 days.

Guntersville Reservoir is similar to Wheeler Reservoir in several size characteristics, but it differs in one important feature. The average controlled storage volume of Guntersville is about half that of Wheeler. This is due to the shallow nature of Guntersville Reservoir at the inflow area and extensive shallow overbank areas. As a result, winter drawdown on Guntersville Reservoir is nominal to maintain navigation. The shallow drawdown allows the large overbank areas to be permanently wetted creating good habitat for aquatic macrophytes. Guntersville has the greatest area coverage of aquatic plants of any TVA reservoir.

The Sequatchie River joins the Tennessee River at about TRM 423, in the upstream portion of Guntersville Reservoir, just downstream from Nickajack Dam. On the average the Sequatchie River contributes less than 2 percent to the total flow of the Tennessee River through Guntersville Reservoir.

Data collected in 1990 and 1991, indicated a more riverine than transition environment at TRM 396.8. Consequently, in 1992 the transition zone sampling location was relocated further downstream to TRM 375.2.

Reservoir: Guntersville 2000 Score:77%

-----Previous Scores----
2000 Criteria

1991	84[1]
1992	85
1993	79
1994	81
1995	n/s
1996	86
1997	n/s
1998	82
1999	n/s
2000	77

1. No transition Zone

Guntersville	2000 Results					Change between 1998 and 2000				
	FB	TZ	Emb	Inf	Total	FB	TZ	Emb	Inf	Total
Chlorophyll	F 3.6	G 5.0			8.6	-1.4	0.0			-1.4
DO	G 5.0	G 5.0			10.0	0.0	0.0			0.0
Fish	F 3.0	F 3.0		F 2.0	8.0	0.0	1.0		-1.0	0.0
Benthos	F 3.0	G 5.0		F 4.0	12.0	-2.0	0.0		1.0	-1.0
Sediment	F 1.5	G 2.5			4.0	0.0	0.0			0.0
Total	16.1	20.5		6.0	42.6	-3.4	1.0		0.0	-2.4

Summary/Key Ecological Health Findings for 2000: Guntersville Reservoir received a good ecological condition rating in 2000. All indicators rated either good or fair; there were no poor ratings at any location. The transition zone was the area with the highest ratings; chlorophyll, DO, benthos, and sediment quality all rated good. Ratings were not as good at the forebay where only DO received a good rating, and the other four indicators rated fair. The fair rating for chlorophyll occurred because of slightly elevated concentrations during several sample periods. These higher concentrations were likely related to the low flow conditions during 2000. Low catch rates contributed to fair ratings for the fish and benthos. Sediment quality rated fair because of presence of PCBs. Concentrations were low, just above the laboratory detection limit, similar to that found in 1998 at the same site.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: As in all past years of Vital Signs Monitoring, ecological conditions in Guntersville Reservoir rated good, with ecological condition scores among the highest observed for all TVA reservoirs monitored. Chlorophyll concentrations have varied over the last three monitoring cycles – they were slightly elevated at the forebay and rated fair in 1996 and 2000; whereas in 1998 concentrations were within the expected range and rated good. The fair rating for the benthos at the forebay was the lowest observed to date compared to a consistently good rating in all previous years. Fewer animals, and in particular fewer mayflies, were collected in 2000 than previously found. This affected several characteristics used to evaluate the benthic community and thus resulted in the lower rating. Monitoring in subsequent years will help determine if this was a sampling anomaly or a true change in the community. Ratings for the fish assemblage in 2000 were fair, generally similar to past years.

Aquatic Macrophytes in 2000: Aerial coverage of aquatic macrophytes in 2000 was about 15,000 acres, comparable to 1999 and 1998, and slightly higher than in 1997 (13,000), 1996 (10,500), 1995 (8,800), and 1994 (9,600).

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Guntersville Reservoir. Channel catfish and largemouth bass from Guntersville Reservoir were collected in autumn 2000 for analysis of pesticides, PCBs, and metals. Results are expected to be available in spring 2001. Prior to that, Guntersville was last sampled in autumn 1996. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. The results were provided to the Alabama Department of Public Health.

Status of Swimming Advisories in 2000: There are no State of Alabama swimming advisories on Guntersville Reservoir. Twenty-six sites were sampled ten times each for fecal coliform bacteria in 2000. All sites met the State of Alabama bacteriological water quality criteria for water contact recreation.

NICKAJACK RESERVOIR - CHICKAMAUGA RESERVOIR WATERSHED

Nickajack and Chickamauga Reservoirs are primary features of this watershed. The Hiwassee River is the only sizeable tributary which merges with the Tennessee River within the watershed area. The drainage basin of the Hiwassee River is large enough to be designated a separate watershed. The remaining area drained by tributaries to these two reservoirs is 1780 square miles. On an annual average basis, about 3900 cfs is contributed to the Tennessee River from streams within this watershed. This compares to 27,700 cfs entering the upper end of Chickamauga Reservoir from Watts Bar Dam and 5600 cfs from the Hiwassee River, for a total average annual discharge from Nickajack Dam of 37,200 cfs.

There are two Vital Signs monitoring sites on Nickajack Reservoir, one at the forebay and one at the inflow. There is no transition zone site on Nickajack because the reservoir is short and water exchange is quite rapid. This causes conditions at the location which might be considered the transition zone to be similar to conditions at the forebay. Chickamauga Reservoir has four Vital Signs monitoring sites--the forebay, the transition zone, the inflow, and a new site established in 1993 in the Hiwassee River embayment.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Nickajack Reservoir

Nickajack Reservoir is one of the smallest reservoirs on the mainstem of the Tennessee River. With the dam at TRM 424.7, Nickajack has a length of 46 miles, surface area of 10,370 acres, and a shoreline of 192 miles at full pool. Average annual discharge from Nickajack is approximately 37,200 cfs which provides an average hydraulic retention time of only about three or four days, the shortest retention time among the reservoirs monitored in this program.

Results from the 1990 and 1991 monitoring indicated that both the forebay and transition zone sampling sites had quite similar water quality. This was expected since the two sites are relatively close together (separated by only 7.5 river miles), and Nickajack is a well-mixed, run-of-the-river reservoir. Therefore, sampling at the transition zone in Nickajack Reservoir was discontinued in 1992.

Chickamauga Reservoir

Chickamauga Dam is located at TRM 471.0. The reservoir is 59 miles long, has 810 miles of shoreline, and has a surface area of 35,400 acres at full pool. The average annual discharge is approximately 34,900 cfs which provides an average hydraulic retention of nine to ten days.

The Hiwassee River, a major tributary to the Tennessee River, flows into the middle portion of Chickamauga Reservoir at about TRM 499. The flow from the entire Hiwassee River watershed contributes approximately 16 percent of the flow through Chickamauga Reservoir. About 10 percent of the 16 percent is from the Ocoee River and tributaries in the lower end of the Hiwassee watershed (i.e., downstream of Apalachia Dam).

Vital Signs monitoring activities were expanded in 1993 to include a site in the Hiwassee River embayment, which covers about 6500 acres. Given the relatively high flows in the Hiwassee River (about 5600 cfs annual average), there is substantial water exchange in this embayment, much greater than in any of the other three embayments monitored.

HIWASSEE RIVER WATERSHED

The headwaters of the Hiwassee River extend into the Blue Ridge Mountains in Tennessee, North Carolina, and Georgia. Streams in this watershed have naturally low concentrations of nutrients and dissolved minerals. These streams change from steep gradient, cold water trout streams in the mountains to lower gradient warm water streams in the valley.

The Hiwassee River Watershed has an area of 2700 square miles and an average annual discharge to the Tennessee River of 5640 cfs. The confluence of the Hiwassee River with the Tennessee River is in Chickamauga Reservoir at Tennessee River Mile 499.4. The lower portion of the Hiwassee River is impounded by backwater from Chickamauga Dam. The impounded portion of the Hiwassee River forms a large embayment (about 6500 surface acres) which extends over 20 miles up the Hiwassee River.

The largest tributary to the Hiwassee River is the Ocoee River, with a drainage area of about 640 square miles. Due to past copper mining and industrial activities in the Copperhill area, several streams and reservoirs in the Ocoee River basin have degraded water quality.

There are eight TVA reservoirs in the Hiwassee River. Through 1996, Vital Signs monitoring activities were conducted on only the five largest reservoirs: Hiwassee Reservoir (forebay and mid-reservoir); Chatuge Reservoir (forebay sites on the Hiwassee River and Shooting Creek arms); Nottely Reservoir (forebay and mid-reservoir); Ocoee Reservoir No. 1 (forebay only); and Blue Ridge Reservoir (forebay only). Beginning in 1997, Apalachia (forebay only) was added to the sampling schedule for the full complement of indicators; two indicators (benthic community and fish assemblage had been sampled in 1996). Ocoee No. 2 and Ocoee No. 3 Reservoirs are not included in this monitoring because of their small size.

Vital Signs monitoring also includes a site on the Hiwassee River embayment (at HiRM 10) of Chickamauga Reservoir with results reported with the Chickamauga/Nickajack Watershed.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Apalachia Reservoir

Apalachia Reservoir is formed by Apalachia Dam at Hiwassee River mile 66.0 in western North Carolina near the Tennessee state line. At full pool elevation, the reservoir is 10 miles long, covers 1100 acres, and has a maximum depth of about 110 feet at the dam. Long-term flows from

Apalachia Dam average about 2090 cfs which result in an average hydraulic retention time of about 14 days. The annual drawdown averages about 4 feet on Apalachia Reservoir.

Hiwassee Reservoir

Hiwassee Reservoir, in the southwestern corner of North Carolina, is the second-largest of the five reservoirs in the Hiwassee River watershed included in the Vital Signs monitoring program. Hiwassee Reservoir is impounded by Hiwassee Dam at river mile 75.8. At full pool level, its backwater storage pool is about 22 miles long, 6100 acres in surface area, and has a mean depth of about 69 feet (with a maximum depth of about 255 feet at the dam). It has an average annual discharge of about 2060 cfs and average residence time of about 103 days. Hiwassee Reservoir has an average annual drawdown of 45 feet.

Chatuge Reservoir

Chatuge Reservoir is located on the Georgia-North Carolina state line in northeastern Georgia and is formed by Chatuge Dam at Hiwassee River mile (HiRM) 121.0. At full pool elevation, the reservoir is 13 miles long and has a surface area of about 7000 acres. Its maximum depth at the dam is 124 feet, and it has a mean depth of 33 feet. An average annual discharge of 464 cfs results in an average hydraulic residence time of about 254 days. Chatuge Reservoir has a potential useful controlled storage of 23 feet (1928-1905 feet MSL), however, the annual drawdown averages only ten feet.

Only the forebay of Chatuge Reservoir was monitored prior to 1993. A new monitoring site was added in 1993 in the Shooting Creek arm to further evaluate this rather large part of the lake. Because of its physical features, the Shooting Creek site would be expected to be representative of forebay conditions.

Nottely Reservoir

Nottely Reservoir is formed by Nottely Dam at Nottely River mile 21.0 in northern Georgia. At full pool elevation, the reservoir is 20 miles long, covers 4200 acres, and has a mean depth of 40 feet, with a maximum depth of about 165 feet at the dam. Long-term flows from Nottely Dam average about 420 cfs which result in an average hydraulic retention time of about 205 days. The annual drawdown averages about 24 feet on Nottely Reservoir.

Blue Ridge Reservoir

Blue Ridge Dam impounds the Toccoa River at mile 53.0 in rural northwest Georgia. The watershed is mountainous and forested, with a significant portion of the basin lying within the Chattahoochee National Forest. At full pool, Blue Ridge Reservoir is about 11 miles long, 3300 acres in surface area, and 155 feet deep at the dam, with a average depth of 59 feet. The rate of discharge of water from Blue Ridge Reservoir averages about 615 cfs, which results in an average theoretical residence time of 158 days. The annual drawdown of Blue Ridge Reservoir averages 36 feet.

Ocoee Reservoir No. 1 (Parksville Reservoir)

Ocoee No. 1 Reservoir, also known as Parksville Reservoir, is formed by Ocoee No. 1 Dam at Ocoee River mile 11.9. At full pool elevation, the reservoir has a surface area of about 1900 acres and length of 7.5 miles. Ocoee No. 1 Reservoir is located downstream from the Copper Basin, and decades of erosion have caused significant filling of the reservoir. Ocoee No. 1 Reservoir has lost about 25 percent of its original volume, has an average depth of 45 feet and is about 115 feet deep at the dam. An average annual discharge of about 1426 cfs from Ocoee No. 1 Dam results in a reservoir retention time of approximately 30 days. Although Ocoee No. 1 Reservoir is not operated for flood control (only for peaking power generation), its annual drawdown averages about seven feet.

Reservoir: Apalachia 2000 Score: 68%

----Previous Scores---- 2000 Criteria	
1991	n/s
1992	n/s
1993	n/s
1994	n/s
1995	n/s
1996	60[1]
1997	69
1998	61
1999	59
2000	68

1. only fish and benthos

Apalachia	2000 Results					Change between 1999 and 2000				
	FB	MR	Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	P 2.7				2.7	-0.6				-0.6
DO	F 3.5				3.5	0.0				0.0
Fish	F 2.0				2.0	0.0				0.0
Benthos	G 5.0				5.0	3.0				3.0
Sediment	F 2.0				2.0	-0.5				-0.5
Total	15.2				15.2	1.9				1.9

Summary/Key Ecological Health Findings for 2000: The overall ecological health rating for Apalachia Reservoir was fair in 2000. Benthos was the only indicator to rate good. DO, fish, and sediment rated fair and chlorophyll poor. The good rating for benthos resulted from a good density and variety of organisms. Chlorophyll concentrations were higher than expected for a reservoir in this nutrient poor watershed. The higher chlorophyll concentrations in 2000 may have been related to low reservoirs flows. Apalachia has a short retention time under normal flow conditions. This would tend to limit increases in algal populations and hence chlorophyll. However, during dry years like 2000, low flows occur and retention time is increased thereby allowing algae to reach more of their growth potential. DO rated fair due to a small zone of low DO (<2mg/L) water along the bottom in late summer. The fair rating for the fish assemblage resulted from the collection of relatively few fish, which in turn had a negative effect on several of the characteristics (metrics) used to evaluate the fish community. Sediment rated fair due to slightly elevated concentrations of copper.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The ecological health score for Apalachia has been consistently in the fair category. DO has rated fair each year due to a small zone of low DO water at the bottom in late summer. Chlorophyll concentrations were within the expected range in 1997 and 1998 and rated good. However, elevated concentration in 1999 resulted in a fair rating and even higher concentration in 2000 resulted in a poor rating. Apalachia typically has short retention time, but low flow conditions experienced in 1999 and 2000 could have increased retention time and allowed higher algal productivity. The fish assemblage has rated poor three of the four years due to low fish density and diversity. Sediment quality has fluctuated between good and fair. Low levels of chlordane were detected in 1998 and, in 1999, copper concentration equaled the threshold limit (50 ppm) for expected background levels. Copper concentrations are slightly elevated in much of the Hiwassee watershed due in part to the geology of the area. Interestingly, the benthic community had rated in the poor to low fair range until 2000 when the community received a good rating. The improvement resulted from an increase in the density and diversity of organisms.

Aquatic Macrophytes in 2000: Not an issue on Apalachia.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Apalachia Reservoir. TVA last collected fish from Apalachia Reservoir in autumn 1998. Results were provided to North Carolina agencies. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. Fish from Apalachia will be collected for tissue analysis again in autumn 2002

Status of Swimming Advisories in 2000: There are no swimming advisories on Apalachia Lake. No sites were sampled for fecal coliform bacteria in 2000. The boat launch in the tailwater of Hiwassee Dam was sampled in 1999 and results were well within State of North Carolina guidelines for water contact. This site will be sampled again in summer 2001.

Reservoir: Hiwassee 2000 Score: 69%

---Previous Scores---

2000 Criteria	
1991	72[1]
1992	71[1]
1993	69
1994	62
1995	n/s
1996	62
1997	n/s
1998	67
1999	n/s
2000	69

1. only Chl, DO, and Fish

Hiwassee	2000 Results						Change between 1998 and 2000				
	FB		MR		Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	F	3.9	P	2.6			6.5	-1.0	0.3			-0.7
DO	P	2.5	G	5.0			7.5	-1.0	1.5			0.5
Fish	G	4.0	G	4.0			8.0	0.0	0.0			0.0
Benthos	P	2.0	P	2.0			4.0	0.0	0.0			0.0
Sediment	G	2.5	G	2.5			5.0	0.5	0.5			1.0
Total		14.9		16.1			31.0	-1.5	2.3			0.8

Summary/Key Ecological Health Findings for 2000: The overall ecological condition of Hiwassee Reservoir was fair in 2000. The forebay and mid-reservoir sites rated good for fish and sediments and poor for benthos. Fewer fish were collected at both sites than expected, however, community composition was good; whereas, the benthic communities were composed primarily of tolerant oligochaetes and received poor ratings. DO rated poor at the forebay due to low concentrations (<2 mg/l) in late summer. Although low DO water encompassed only a small percentage of the water column, a large percentage of the bottom was exposed to DOs below 1mg/l resulting in a poor rating. The mid-reservoir location rated good for DO. Chlorophyll rated fair at the forebay due to slightly elevated concentration and poor at the mid-reservoir site.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: Hiwassee has rated fair in all years. The more consistent characteristics (indicators) of the reservoir are a good fish community and poor benthic community (dominated by tolerant oligochaetes). Low DO levels have been a consistent issue in the forebay which usually rates poor. DO received a fair rating in 1998 due to a malfunction of the oxygenation system that influenced near-bottom oxygen levels further upstream in the reservoir than planned. Mid-reservoir has experienced only limited low DO, rating a "high" fair in previous years; 2000 was the first year for DO to rate good. Very low levels of chlordane were detected in 1993 and 1998 at both reservoir locations; no other contaminates have had concentrations of concern. An issue of concern is the apparent increase in chlorophyll at the mid-reservoir site. Chlorophyll has shown a fairly consistent increase at the mid-reservoir site since monitoring began in 1991. This increase has not occurred at the forebay. Chlorophyll concentrations bear watching in future monitoring.

Aquatic Macrophytes in 2000: Not an issue on Hiwassee.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Hiwassee Reservoir. Channel catfish and largemouth bass were last collected in autumn 1996. Channel catfish fillets were analyzed for pesticides, PCBs, and metals and largemouth bass fillets for mercury. All contaminant levels were either below detection levels or below the levels typically used by the states to issue fish consumption advisories. These species were sampled again in autumn 2000 and results are expected in spring 2001.

Status of Swimming Advisories in 2000: There are no State of North Carolina swimming advisories along Hiwassee Reservoir and River. Four locations along Hiwassee Reservoir and River in North Carolina were sampled ten times each for fecal coliform bacteria in 2000. All sites sampled met North Carolina bacteriological water quality criteria for water contact recreation.

Reservoir: Chatuge 2000 Score: 58%

---Previous Scores---
2000 Criteria

1991	59[1]
1992	79[1]
1993	79
1994	72
1995	n/s
1996	78
1997	n/s
1998	49
1999	49
2000	58

Chatuge	2000 Results					Change between 1999 and 2000				
	FB	Sh.Cr.	Emb	Inf	Total	FB	Sh.Cr.	Emb	Inf	Total
Chlorophyll	G 4.8	G 4.5			9.3	0.4	0.7			1.2
DO	F 3.0	P 2.5			5.5	1.5	1.0			2.5
Fish	F 3.0	F 3.0			6.0	0.0	0.0			0.0
Benthos	P 2.0	P 1.0			3.0	1.0	-1.0			0.0
Sediment	F 1.5	P 1.0			2.5	0.0	0.5			0.5
Total	14.3	12.0			26.3	2.9	1.2			4.2

1. FB only and no sediment, no benthos

Summary/Key Ecological Health Findings for 2000: The overall ecological health rating for Chatuge Reservoir was poor in 2000. At both sampling locations, chlorophyll rated good, fish rated fair, and benthos rated poor. The DO levels were slightly better at the forebay (fair) than Shooting Creek (poor); both locations had DOs below 2 mg/l in the lower water column August through October (the greatest volume below 2 mg/l occurring in October). Sediment rated fair at the forebay due to high concentrations of copper and poor at Shooting Creek due to high levels of copper, chromium, and nickel. The poor rating for the benthic macroinvertebrates occurred because very few animals were collected. The fish assemblage rated fair at both monitoring locations—lower catch rates than expected but relatively good species diversity.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The 2000 ecological health score for Chatuge Reservoir was at the upper end of the poor range (58, one point from fair); a nine point increase over 1999 (49) and 1998 (49), but still much lower than the good ratings for previous years when scores were often in the upper 70s. Chatuge had a substantial decrease in ecological health score in 1998 due to low DO levels, relatively high chlorophyll, and poor ratings for the fish assemblage. In addition, elevated levels of nickel were found for the first time at the Shooting Creek location. Similar issues were found in 1999 and 2000; the primary exception being improved ratings for the fish assemblage (fair) yet a decline in ratings for the benthos (poor). Also, anoxic conditions did not occur in 1999 or 2000. DO and chlorophyll scored higher in 2000 as compared to 1998 and 1999, but scores remained below those of earlier years. It was speculated that the unusually dry, hot weather in the late summer of 1998 was a likely contributing factor. This unusual weather pattern occurred again in 1999 and 2000, and Chatuge was again characterized by poor ecological conditions. Chatuge will be monitored again in 2002.

Aquatic Macrophytes in 2000: Not an issue on Chatuge Reservoir.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Chatuge Reservoir. Channel catfish and largemouth bass were last collected in autumn 1996. Channel catfish fillets were analyzed for pesticides, PCBs, and metals and largemouth bass fillets for mercury. The results were provided to state agencies. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. These species were sampled again in autumn 2000 and results are expected in spring 2001.

Status of Swimming Advisories in 2000: There are no swimming advisories along Chatuge Reservoir. Nine locations were sampled ten times each for fecal coliform bacteria in 2000. All sites sampled met the bacteriological water quality criteria for water contact recreation in the state in which they were sampled (North Carolina or Georgia).

WATTS BAR RESERVOIR, FORT LOUDOUN RESERVOIR, AND MELTON HILL RESERVOIR WATERSHED

This watershed area is relatively small (2860 square miles) and includes three reservoirs: Fort Loudoun and Watts Bar Reservoirs on the Tennessee River and Melton Hill Reservoir on the Clinch River. All three are run-of-the-river reservoirs with relatively short retention times and annual pool drawdowns of only a few feet. The inflow of Fort Loudoun Reservoir is actually the origin of the Tennessee River. The Holston and French Broad Rivers merge at that point to form the Tennessee River. The Little Tennessee River, another major tributary to the Tennessee River, enters Fort Loudoun Reservoir near the forebay. Watts Bar Reservoir is immediately downstream of Fort Loudoun. The Clinch River, another major tributary, merges with the Tennessee River upstream of the transition zone on Watts Bar Reservoir. Melton Hill Dam bounds the upper end of Watts Bar Reservoir on the Clinch River and Fort Loudoun Reservoir bounds it on the Tennessee River.

Like the other watershed areas formed around one or more of the reservoirs on the mainstream of the Tennessee River, very little of the water leaving this watershed area originates from within. The average annual discharge through Watts Bar Reservoir is about 27,700 cfs. Of this, about 25 percent (6800 cfs) enters from the French Broad River, 16 percent (4500 cfs) from the Holston River, 21 percent (5700 cfs) from the Little Tennessee River, and 17 percent (4600 cfs) from Norris Dam on the Clinch River. Another five percent (1400 cfs) is contributed by the Emory River, a tributary to the Clinch River near the confluence with the Tennessee River. The remaining 17 percent (4700 cfs) originates from streams which drain directly to one of these reservoirs.

Vital Signs monitoring activities are conducted at the forebays, transition zones, and inflows of all three of these reservoirs. Watt Bar Reservoir has two inflow sites, one near Fort Loudoun Dam and one near Melton Hill Dam.

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Watts Bar Reservoir

Watts Bar Reservoir impounds water from both the Tennessee River and one of the major tributaries to the Tennessee River, the Clinch River. The three dams which bound Watts Bar Reservoir are: Watts Bar Dam located at Tennessee River Mile (TRM) 529.9, Fort Loudoun Dam located at TRM 602.3, and Melton Hill Dam located at Clinch River mile (CRM) 23.1. The total length of Watts Bar Reservoir, including the Clinch River arm is 96 miles, the shoreline length is 783 miles, and the

surface area is 39,000 acres. The average annual discharge from Watts Bar is approximately 27,700 cfs, providing an average hydraulic retention time of about 18 days.

The confluence of the Clinch and Tennessee Rivers is upstream of the transition zone sampling location in Watts Bar, so biological sampling was conducted at the forebay, transition zone, and both the Tennessee River and Clinch River inflows. Water entering Watts Bar from Melton Hill Reservoir is quite cool due to the hypolimnetic withdrawal from Norris Reservoir (a deep storage impoundment) upstream from Melton Hill. Water entering Watts Bar Reservoir from Fort Loudoun Dam is usually warmer and lower in DO during summer months than water entering from Melton Hill Dam.

The Emory River is a major tributary to the Clinch River arm of Watts Bar Reservoir and supplies about 5 percent of the average annual flow through Watts Bar Reservoir. The Tennessee and Little Tennessee Rivers (i.e., discharge from Fort Loudoun Dam) account for about 75 percent of the flow, and the Clinch River (i.e., discharge from Melton Hill Dam) accounts for about 15 percent through Watts Bar Reservoir.

Fort Loudoun Reservoir

Fort Loudoun Reservoir is the ninth and uppermost reservoir on the Tennessee River with the dam located at TRM 602.3. The surface area and shoreline are relatively small (14,600 acres and 360 miles, respectively) considering the length (61 miles), indicating it is mostly a run-of-the-river reservoir. The average annual discharge from Fort Loudoun Dam is 18,900 cfs which provides an average hydraulic retention time of about ten days.

Fort Loudoun Reservoir (and the Tennessee River) is formed by the confluence of the French Broad and Holston Rivers, with both of these rivers having a major reservoir upstream. Douglas Dam, 32.3 miles up the French Broad River, and Cherokee Dam, 52.3 miles up the Holston River, form deep storage impoundments, each having long retention times. Both of these deep storage impoundments become strongly stratified during summer months resulting in the release of cool, low DO, hypolimnetic water during operation of the hydroelectric units. Some warming and reaeration of the water occurs downstream from Cherokee and Douglas Dams, but both temperature and DO levels are sometimes low when the water reaches Fort Loudoun Reservoir. Installation of aeration facilities at both these dams has helped abate this situation.

Fort Loudoun Reservoir also receives surface waters from the Little Tennessee River, via the Tellico Reservoir canal, which connects the forebays of the two reservoirs. (Since Tellico Dam has

no outlet, under most normal conditions, water flows into Fort Loudoun Reservoir from Tellico Reservoir.) Water from Tellico Reservoir (Little Tennessee River) is often cooler and higher in DO, and has a much lower conductivity than water in Fort Loudoun Reservoir (Tennessee River). In 1992, the forebay sampling location on Fort Loudoun Reservoir (originally located at TRM 603.2) was moved upstream to TRM 605.5. This resulted in a better assessment of the water quality conditions of the Tennessee River in the forebay portion of Fort Loudoun Reservoir by minimizing the effects of the Little Tennessee River and Tellico Reservoir on the data gathered in the forebay of Fort Loudoun Reservoir.

Although Fort Loudoun Reservoir is a mainstream reservoir, its complex set of hydrologic conditions (cool water inflows from the Holston, French Broad, and Little Tennessee Rivers) often causes it to exhibit several characteristics that are more typical of a storage impoundment. In fact, analysis of historical fisheries data for the Tennessee Valley indicates the fish community of Fort Loudoun Reservoir is more similar to that in Valley storage impoundments than in other mainstream reservoirs.

Melton Hill Reservoir

Melton Hill Dam is located at mile 23.1 on the Clinch River and is 56.7 miles downstream of Norris Dam. Impounded water extends upstream from Melton Hill Dam about 44 miles. Melton Hill Reservoir has about 170 miles of shoreline and 5690 surface acres at full pool. Average flow through Melton Hill is about 5140 cfs resulting in an average retention time of approximately 12 days. Melton Hill is TVA's only tributary dam with a navigation lock.

The predominant factor influencing the aquatic resources of Melton Hill Reservoir, especially the inflow and mid-reservoir areas, is the cold water entering from Norris Dam discharges. During summer, water discharged from Norris is cold and low in oxygen content. Oxygen concentrations are improved by a re-regulation weir downstream of Norris Dam and by atmospheric reaeration in the river reach between Norris Dam and upper Melton Hill Reservoir. However, water is warmed little and is still quite cool when it enters upper Melton Hill Reservoir. Bull Run Steam Plant, located at about CRM 47, warms the water some, but water temperatures are still marginally low to support warm water biota and marginally warm to support cold water biota.

Reservoir: Watts Bar 2000 Score: 59%

----Previous Scores----
2000 Criteria

1991	72
1992	79
1993	76
1994	72
1995	n/s
1996	68
1997	n/s
1998	64
1999	n/s
2000	59

Watts Bar	2000 Results				
	FB	TZ	TR-Inf	CR-Inf	Total
Chlorophyll	P 2.1	P 2.5			4.6
DO	P 1.5	G 4.5			6.0
Fish	G 4.0	G 4.0	F 4.0	F 4.0	16.0
Benthos	P 2.0	F 3.0	P 2.0	P 2.0	9.0
Sediment	F 1.5	F 1.5			3.0
Total	11.1	15.5	6.0	6.0	38.6

Change between 1998 and 2000				
FB	TZ	TR-Inf	CR-Inf	Total
1.1	0.1			1.2
-3.0	-0.5			-3.5
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.0	0.0			0.0
-1.9	-0.4	0.0	0.0	-2.3

Summary/Key Ecological Health Findings for 2000: Overall, Watts Bar Reservoir had a fair ecological condition rating in 2000, but near the poor range. The biggest issues were elevated chlorophyll at both the forebay and transition zone; low DO at the forebay; and low scores for benthos at three of the four sample sites. Chlorophyll rated poor because concentrations were high, particularly in late summer. Low DO concentrations at the forebay, primarily in July but also in June and September, resulted in a poor rating for DO. Low rainfall amounts and resulting low reservoir flows were the main contributing factors for the low DO levels. Benthos rated poor at the forebay and both inflow sites due to low overall density and the lack of intolerant organisms. Good numbers and diversity of fish were collected at all sites and resulted in good or "high" fair fish scores at all sites. Sediments rated fair due to presence of PCBs and DDTr at the forebay and PCBs and chlordane at the transition zone.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The overall ecological condition score for Watts Bar Reservoir was fair in 2000; the lowest overall score to date and near the poor range. Prior to 1996, Watts Bar had rated good or at least at the upper end of the fair range. Three of the five ecological health indicators have changed substantially over time: chlorophyll, benthos, and sediment quality. The decrease in chlorophyll ratings has occurred because concentrations have increased substantially during this period. Chlorophyll concentrations were high again in 2000, but not as high as in 1998. Ratings for benthos have also decreased as benthic index scores have declined due to collection of fewer organisms and absence of intolerant, long-lived animals. The decrease in sediment quality ratings has resulted from a greater frequency of occurrence of organic chemicals (mostly PCBs and chlordane), probably more due to sampling variability rather than a true increase of these chemicals because of their historical, rather than current, use. The factor which drove the overall rating for Watts Bar Reservoir down in 2000 was a lower rating for DO at the forebay – most probably related to low reservoir flows. Low DOs have occurred at the forebay in the past, usually in drought years like 2000.

Aquatic Macrophytes in 2000: Aquatic macrophytes covered about 25 acres in 2000.

Status of Fish Consumption Advisories in 2000: The State of Tennessee has issued several advisories for fish in Watts Bar Reservoir because of PCB contamination. Striped bass, catfish, and striped bass/white bass hybrids caught in the Tennessee River arm of the reservoir should not be eaten. Largemouth bass, white bass, sauger, carp, and smallmouth buffalo caught in the Tennessee River arm and catfish and sauger caught in the Clinch River arm should not be eaten by pregnant women, nursing mothers, and children. Other individuals should limit their consumption to no more than one meal per month. Additional fish were collected in autumn 2000; channel catfish fillets will be analyzed for pesticides, PCBs, and metals and largemouth bass fillets for mercury. Results are expected in spring 2001. Prior to that, fish were last collected in 1998. The results, which were provided to state agencies in Tennessee for appropriate action, were similar to previous years, or slightly lower.

Status of Swimming Advisories in 2000: There are no State of Tennessee swimming advisories on Watts Bar Reservoir. Twenty-seven sites were sampled ten times each for fecal coliform bacteria in 2000. All but one site met the State bacteriological water quality criteria for water contact recreation. Eden on Lake Beach exceeded the state criteria because a single sample exceeded 1,000 colonies per 100 milliliters.

Reservoir: Fort Loudoun 2000 Score: 57%

—Previous Scores—	
	2000 Criteria
1991	
1992	
1993	
1994	62
1995	47
1996	52
1997	57
1998	62
1999	49
2000	57

Ft Loudoun	2000 Results					Change between 1999 and 2000				
	FB	TZ	Emb	Inf	Total	FB	TZ	Emb	Inf	Total
Chlorophyll	P 1.0	P 1.0			2.0	0.0	0.0			0.0
DO	G 4.5	G 5.0			9.5	3.0	0.0			3.0
Fish	G 4.0	G 4.0		G 4.0	12.0	0.0	1.0		0.0	1.0
Benthos	P 1.0	F 3.0		P 1.0	5.0	0.0	0.0		0.0	0.0
Sediment	F 1.5	F 1.5			3.0	0.0	0.5			0.5
Total	12.0	14.5		5.0	31.5	3.0	1.5		0.0	4.5

Summary/Key Ecological Health Findings for 2000: The overall ecological condition of Fort Loudoun Reservoir was poor in 2000. The year was characterized by low flows and increased retention time. Indicators affected most by these conditions responded as expected and resulted in poor ratings. Chlorophyll concentrations were quite high at both monitoring sites and rated poor, whereas, DO concentrations were reduced in bottom strata at the forebay but they did not go below 2 mg/l; the level at which the rating is affected. Benthos rated poor at the forebay and inflow due to low diversity and abundance with only tolerant, short-lived animals present. Sediment quality rated fair at both sample sites due to presence of chlordane. Fish rated good at all three sites due to presence of a good mix of species. This marks the first time that the fish assemblage on Fort Loudoun Reservoir has rated good at all three monitoring sites.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The ecological condition of Fort Loudoun has rated poor during most previous years. Primary issues in Fort Loudoun are consistently high chlorophyll concentrations, low diversity and abundance of benthic macroinvertebrates, presence of one or a combination of the following contaminants in bottom sediments: chlordane, PCBs, or zinc. Ratings for these three indicators reduce the overall ecological health rating each year. The fish assemblage has typically rated in the fair range but has had higher ratings the past few years and even rated good at all three locations for the first time in 2000. The remaining indicator (DO) has consistently rated good at the transition zone as well as at the forebay except during exceptionally low flow years when the DO rates poor at the forebay which was the case in 1995 and 1998. Similarly low flows also occurred in 2000 and DO concentrations were reduced at the forebay, but not to the point that the rating was reduced.

Aquatic Macrophytes in 2000: Only nominal amounts of macrophytes occur on Fort Loudoun (about 25 acres).

Status of Fish Consumption Advisories in 2000: The State of Tennessee advises against eating catfish from Fort Loudoun Reservoir because of PCB contamination. The state also has issued an advisory for largemouth bass that weigh more than two pounds and for all largemouth bass caught in the Little River embayment. The last time TVA analyzed fish from Fort Loudoun Reservoir for a broad array of contaminants was in autumn 1998 when channel catfish fillets were analyzed (pesticides, PCBs, and metals) and largemouth bass fillets were analyzed for mercury. In addition, channel catfish are collected from the middle part of the reservoir annually and the fillets analyzed for selected pesticides and PCBs. The results, which were provided to state agencies for appropriate action, were similar to previous years. The broad array of contaminants will be analyzed again in 2002.

Status of Swimming Advisories in 2000: There are no State of Tennessee swimming advisories on Fort Loudoun Reservoir. Seven sites on Ft. Loudoun Reservoir were sampled ten times each for fecal coliform bacteria in 2000. All sites met State of Tennessee bacteriological water quality criteria for water contact recreation.

Reservoir: Melton Hill **2000 Score: 68%**

-----Previous Scores-----
2000 Criteria

1991	67
1992	65
1993	66
1994	71
1995	61
1996	69
1997	n/s
1998	69
1999	n/s
2000	68

Melton Hill	2000 Results					Change between 1998 and 2000				
	FB	TZ	Emb	Inf	Total	FB	TZ	Emb	Inf	Total
Chlorophyll	P 2.7	G 5.0			7.7	-0.5	0.5			0.0
DO	F 3.0	G 5.0			8.0	-2.0	0.0			-2.0
Fish	G 4.0	G 4.0		F 3.0	11.0	-1.0	0.0		0.0	-1.0
Benthos	P 2.0	P 2.0		P 2.0	6.0	0.0	0.0		1.0	1.0
Sediment	G 2.5	G 2.5			5.0	1.0	1.0			2.0
Total	14.2	18.5		5.0	37.7	-2.5	1.5		1.0	0.0

Summary/Key Ecological Health Findings for 2000: The overall ecological health score for Melton Hill Reservoir was fair in 2000. Only two indicators used to evaluate ecological conditions showed consistent results among sample sites. Sediment quality rated good at both sample sites, whereas the benthos rated poor at all three sample sites (where that indicator was monitored). Otherwise, chlorophyll rated poor at the forebay (due to elevated concentrations) and good at the transition zone; DO rated fair at the forebay (due to low DO concentrations in late spring and early summer) and good at the transition zone; and the fish assemblage rated good at the forebay and transition zone and fair at the inflow site. Dry weather conditions and resulting low reservoir flows significantly affected Melton Hill in 2000. These effects were most evident at the forebay as characterized by high chlorophyll levels and low DO levels in lower strata, neither of which typically occur in Melton Hill.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The fair overall ecological health score for Melton Hill Reservoir was similar to previous years. Although the overall scores have been similar, results for 2000 and, to some extent those for 1998, were vastly differently from previous years. High chlorophyll and low DO concentrations at the forebay during these years are uncharacteristic of this reservoir. For 2000, lower ratings for these indicators were off-set by higher ratings for sediment quality (chlordane had been detected at concentrations near the laboratory detection limit in most previous years) and the fish assemblage. The changes observed and the location where they occurred (the forebay) are the type of changes expected to be related to weather/low flow conditions. Low flows not only increase retention time thereby allowing algae sufficient time to fully utilize available nutrients, but they also do not provide energy to mix upper and lower strata (particularly at the forebay) allowing the reservoir to stratify and oxygen depletion to occur in lower strata. Hopefully, a return to more normal flow conditions in subsequent years will alleviate these issues in Melton Hill.

Aquatic Macrophytes in 2000: Aquatic macrophytes covered an estimated 10 acres on Melton Hill Reservoir in 2000.

Status of Fish Consumption Advisories in 2000: The state of Tennessee advises against eating catfish from Melton Hill Reservoir because of PCB contamination. Channel catfish were collected in autumn 1998 and analyzed for selected pesticides and PCBs. The results, which were provided to state agencies in Tennessee for appropriate action, were similar to previous years. Additional channel catfish and largemouth bass were collected in autumn 2000 for analysis of a broader array of analytes (pesticides, PCBs, and metals). Results from analysis of those fish are expected in spring 2001.

Status of Swimming Advisories in 2000: There are no swimming advisories on Melton Hill Reservoir. Six sites were sampled ten times each for fecal coliform bacteria in 2000. Three of these sites exceeded State of Tennessee bacteriological water quality criteria for water contact recreation either because one sample exceeded 1,000 colonies per 100 milliliters or because the geometric mean of ten samples exceeded 200/100mL. Large numbers of water fowl (Canadian geese) were present, which is a likely source of contamination, at all three sites, and samples with elevated counts typically followed rain events.

CLINCH RIVER AND POWELL RIVER WATERSHED

This long, narrow watershed lies in southwest Virginia and northeast Tennessee. Streams in the watershed have high concentrations of dissolved minerals and generally low concentrations of nutrients.

For management purposes, an artificial ending point of the watershed has been established at Norris Dam, which is near Clinch River mile 80. The remainder of the Clinch River is associated with the Watts Bar, Fort Loudoun, and Melton Hill Reservoir Watershed area. As defined, this watershed drains an area of 2912 square miles and has an average annual discharge of about 4300 cfs. The Clinch and Powell Rivers contribute about 80 percent of this flow.

Norris Reservoir is the only major reservoir in the watershed; essentially all streams upstream from Norris are free flowing. There are three Vital Signs monitoring sites in Norris Reservoir (forebay and mid-reservoir sites on the Clinch and Powell arms).

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on Norris Reservoir. It also provides planned activities in the future .

Norris Reservoir

Norris Reservoir is formed by Norris Dam at Clinch River mile (CRM) 79.8. It is a large, dendritic, tributary storage impoundment of the Clinch and Powell Rivers which flow together about nine miles upstream of the dam. Norris is one of the deeper TVA tributary reservoirs, with depths over 200 feet. Annual drawdown averages about 32 feet. At full pool, the surface area of the reservoir is 34,200 acres, the shoreline is about 800 miles in length, and water is impounded 73 miles upstream on the Clinch River and 53 miles upstream on the Powell River. Norris Reservoir has a long average retention time (about 239 days) and an average annual discharge of approximately 4300 cfs. Due to the great depth and long retention time of Norris Reservoir, significant vertical stratification is expected.

Because of the confluence of the Clinch and Powell Rivers relatively close to the dam, three reservoir sampling locations were established: one forebay site; and two mid-reservoir sites--one on the Clinch River and one on the Powell River.

LITTLE TENNESSEE RIVER WATERSHED

The Little Tennessee River Watershed encompasses 2672 square miles, mostly in Tennessee and North Carolina with a small area in Georgia. Much of the watershed is forested, with the headwaters in the Blue Ridge Mountains. The basin is underlain mostly by crystalline and metasedimentary rocks of the Blue Ridge province. This watershed is home to a large variety of federally listed threatened and endangered species.

Most of the streams in the watershed are steep gradient and generally have low concentrations of both dissolved minerals and nutrients. The two largest tributaries to the Little Tennessee River are the Tuckasegee River which merges with the Little Tennessee in Fontana Reservoir and the Tellico River which merges with the Little Tennessee in Tellico Reservoir.

There are several reservoirs in the watershed but only Fontana Reservoir in the mountainous area and Tellico Reservoir at the lower end of the watershed are monitored. TVA does not monitor the other reservoirs either because of their small size or because they are owned by the Aluminum Company of America (ALCOA).

Two sites are monitored on Tellico Reservoir (the forebay and transition zone) and three sites on Fontana Reservoir (the forebay and mid-reservoir sites on the Little Tennessee River and Tuckasegee River).

Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Tellico Reservoir

Tellico Dam is located on the Little Tennessee River just upstream of the confluence of the Little Tennessee and Tennessee Rivers. It is the last dam completed in the TVA system with dam closure in 1979. Tellico Reservoir is 33 miles long, has a shoreline of 373 miles, and has a surface area of about 16,000 acres at full pool. The average estimated flow through Tellico Reservoir is approximately 6200 cfs which provides an average retention time of about 34 days. Very little of this water is discharged through Tellico Dam. Rather, it is diverted through a navigation canal to Fort Loudoun Reservoir near the dam for hydroelectric power production. Water characteristics in these two reservoirs differ considerably. The hydrodynamics and exchange of water via the inter-connecting canal significantly affect water quality within Tellico Reservoir (and Fort Loudoun Reservoir). The canal is only 20-25 feet deep, but the depth of Tellico Reservoir at the forebay is about 80 feet. Thus, water in deeper strata in the forebay is essentially trapped and becomes anoxic during the summer.

The impounded water of Tellico Reservoir extends upstream of the confluence of the Little Tennessee and Tellico Rivers. The transition zone site selected for sample collection in 1990, 1991, and 1992 was in the Little Tennessee River, just upstream of the confluence with the Tellico River at Little Tennessee River Mile (LTRM) 21.0. Water conditions at that site are largely controlled by discharges from Chilhowee Dam at LTRM 33.6. This water is cold, nutrient poor, and has a low mineral content, conditions that are not conducive to establishing a diverse, abundant aquatic community. In 1993, the transition zone sampling location in Tellico Reservoir was moved six miles downstream to LTRM 15.0, just below the confluence of the Tellico River--a site more characteristic of a transition environment rather than riverine conditions.

Fontana Reservoir

Fontana Reservoir is located in the Blue Ridge Mountains of western North Carolina. Fontana is the deepest reservoir in the TVA system. At full pool it has a maximum depth of 460 feet, a length of 29 miles, a shoreline of 248 miles, and a surface area of 10,640 acres. Fontana Reservoir has a relatively large drawdown, which averages about 64 feet annually. Every fifth year Fontana is drawn even deeper to allow sluice gate access for maintenance.

Fontana Dam is located at Little Tennessee River Mile 61.0. Average annual discharge is 3950 cfs which provides an average hydraulic retention time in the reservoir of 181 days.

Water in Fontana Reservoir is quite clear due to limited photosynthetic activity and a mostly forested watershed. Water entering the reservoir is low in nutrients and dissolved minerals.

Reservoir: Fontana 2000 Score: 70%

---Previous Scores---
2000 Criteria

1991	n/s
1992	n/s
1993	71
1994	77[1]
1995	72[2]
1996	62
1997	n/s
1998	68
1999	n/s
2000	70[3]

Fontana	2000 Results					Change between 1998 and 2000				
	FB	LTR-MR	TkR-MR	Inf	Total	FB	LTR-MR	TkR-MR	Inf	Total
Chlorophyll	G 5.0	P 2.9	F 3.2		11.0	0.0	-1.6	-0.7		-2.3
DO	F 3.5	G 4.5	F 3.0		11.0	0.0	1.0	0.5		1.5
Fish	F 3.0	F 4.0	F 3.0		10.0	0.0	0.0	-1.0		-1.0
Benthos	P 1.0	ns	ns		1.0	0.0				0.0
Sediment	G 2.5	G 2.5	F 2.0		7.0	0.5	0.5	0.0		1.0
Total	15.0	13.9	11.2		40.0	0.5	-0.1	-1.2		-0.8

1. no benthos at forebay
2. no benthos at either mid-res site, no fish at forebay
3. no benthos at either mid-res site

Summary/Key Ecological Health Findings for 2000: The overall ecological condition in Fontana Reservoir was fair in 2000 with a score at the upper end of the fair range. However, this score is somewhat misleading because the indicator which usually rates in the poor category, benthic macroinvertebrate community, could not be sampled at two locations in 2000 due to the extraordinary reservoir draw-down to allow for the scheduled 5-year safety check and maintenance at Fontana Dam. Had that indicator been monitored at all sites and the results comparable to past years, the score would have been several points lower but still in the fair range. Of particular interest in 2000 were elevated chlorophyll levels at the two mid-reservoir sample locations. Chlorophyll rated fair on the Tuckaseege River arm and poor on the Little Tennessee River arm. This poor rating for chlorophyll marks the first time chlorophyll has rated poor at any location on Fontana since this monitoring program began.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: Fontana Reservoir rated fair in 2000, similar to most previous years. The 2000 score was near the upper end of the fair range, but the score would have been lower had all indicators been sampled at all locations as discussed above. The slight increase in chlorophyll concentrations from year-to-year, especially at the mid-reservoir sample sites, continues to be the most notable observation from these monitoring results. These increases have caused chlorophyll to change from a good rating at all locations in the early 1990's to fair and even poor ratings at some sites in 2000. These results may indicate Fontana Reservoir is beginning to change from the expected oligotrophic conditions to a more productive state, possibly due to nutrient enrichment. Another troublesome observation is the increase in low DO volume in lower strata of Fontana which was evident in 1998 and 2000, the two most recent monitoring periods. Both observations (for chlorophyll and DO) bear watching in future years monitoring.

Aquatic Macrophytes in 2000: Aquatic macrophytes are prevented from becoming established on Fontana by the water level drawdown for flood control.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Fontana Reservoir. Channel catfish and largemouth bass were collected in autumn 2000 for analysis of pesticides, PCBs, and metals. Results are expected to be available in spring 2001. Prior to that, Fontana was last sampled in autumn 1996. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories.

Status of Swimming Advisories in 2000: Four locations on Fontana Reservoir were sampled ten times each for fecal coliform bacteria in 2000. All of these sites sampled met the bacteriological water quality criteria for water contact recreation in North Carolina. There are no State of North Carolina swimming advisories along the Blue Ridge Reservoir.

FRENCH BROAD RIVER WATERSHED

The French Broad River watershed is one of the largest (5124 square miles) watersheds in the Tennessee Valley. About half the watershed is in Tennessee and half is in North Carolina. The French Broad River and its two large tributaries (Nolichucky and Pigeon Rivers) originate in the Blue Ridge Mountains. All three of these rivers merge at the upper end of Douglas Reservoir, the only sizable reservoir in the watershed. The water in the French Broad River is moderately hard and relatively high in nutrients.

There are two reservoir Vital Signs monitoring sites on Douglas. Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on Douglas Reservoirs. It also provides planned activities in the future .

Douglas Reservoir

Douglas Reservoir is a deep storage impoundment (tributary reservoir) on the French Broad River. Douglas Dam is located 32.3 miles upstream of the confluence of the French Broad and Holston Rivers which form the Tennessee River. Reservoir drawdown during late summer and autumn is rather large, with an annual average of about 48 feet. The large annual fluctuation in surface water elevation causes other physical characteristics such as surface area, reservoir length, and retention time to vary greatly during the year. At full pool, maximum depth at the dam is 127 feet, surface area is 30,400 acres, the shoreline is 555 miles, and the length is 43 miles. Average annual discharge is approximately 6800 cfs, which provides an average hydraulic retention time of about 104 days.

Lengthy retention times and lack of mixing due to their deep nature tend to cause storage impoundments to have strong thermal stratification during summer months. Undesirable conditions often develop in the hypolimnion due to anoxia, which in most cases extends from the forebay to the mid-reservoir sampling location.

HOLSTON RIVER WATERSHED

The Holston River Watershed encompasses 3776 square miles, mostly in upper east Tennessee and southwest Virginia and a small area in North Carolina. The area is relatively highly populated with substantial industrial development.

Much of the area is underlain with limestone and dolomite which results in high concentrations of dissolved minerals in the streams. There is also substantial zinc mining in the watershed.

There are several reservoirs in the watershed with varying size, depth, flow, and water quality characteristics. The largest is Cherokee Reservoir on the Holston River near the lower end of the watershed. The uppermost reservoirs are Watauga Reservoir on the Watauga River and South Holston Reservoir on the South Fork Holston River. Downstream from these reservoirs, the Watauga and South Holston Rivers merge in Boone Reservoir. Immediately downstream from Boone Dam is Fort Patrick Henry Reservoir, the smallest of the five reservoirs in this watershed included in the Vital Signs Monitoring Program. A few miles downstream from Fort Patrick Henry Dam the South Fork and North Fork Holston Rivers merge to form the Holston River.

The average annual discharge from Cherokee Dam is 4600 cfs. The Holston River merges with the French Broad River at Knoxville to form the Tennessee River.

Vital Signs monitoring activities are conducted at one, two, or three locations depending on reservoir size and characteristics. Table 1 of this appendix identifies the years when Vital Signs Monitoring activities have occurred on reservoirs in this watershed. It also provides planned activities in the future .

Cherokee Reservoir

Cherokee Reservoir is formed by Cherokee Dam at Holston River mile (HRM) 52.3. Like Norris and Douglas Reservoirs, it is a large, relatively deep, tributary storage impoundment with a substantial drawdown which begins in late summer. When the water surface is at full pool, maximum depth at the dam is 163 feet and winter drawdown is 53 feet. However, full pool is not reached most years, and the long-term average drawdown is about 28 feet. At full pool, Cherokee Reservoir is 54 miles long, has a surface area of 30,300 acres, and a shoreline of 393 miles. Average annual discharge is about 4600 cfs which provides an average hydraulic retention time (at full pool) of approximately 162 days.

Like other deep storage impoundments with long retention times, Cherokee Reservoir exhibits strong vertical stratification during summer months. The hypolimnetic oxygen deficit on Cherokee is one of the worst of all Vital Signs monitoring reservoirs and has been well documented in numerous past studies (Iwanski, 1978; Iwanski et al., 1980; Hauser et al., 1987).

Fort Patrick Henry Reservoir

Fort Patrick Henry Reservoir is one of the smaller reservoirs included in the Vital Signs Monitoring Program. It is only ten miles long, has a surface area of about 870 acres, and has a shoreline of 37 miles. Although it is a tributary reservoir, it has characteristics of a run-of-river reservoir, rather than a storage reservoir. Annual fluctuation in elevation is only five feet. Also, retention time is short; with an average discharge of 2690 cfs, the hydraulic retention time is only about five days. Maximum depth is about 80 feet. Fort Patrick Henry Dam is located at South Fork Holston River mile 8.2.

This reservoir had not been sampled as part of this monitoring effort prior to 1993. Because of its small size, only the forebay is monitored for Vital Signs.

Boone Reservoir

Boone Dam is located at South Fork Holston River mile (SFHRM) 18.6, approximately 1.4 miles downstream of the confluence of the South Fork Holston and the Watauga Rivers. At normal maximum pool (1384 feet MSL), Boone Reservoir extends upstream approximately 17.4 miles on the South Fork Holston River and 15.3 miles on the Watauga River for a total reservoir length of approximately 32.7 miles. Boone Reservoir has a surface area of 4300 acres, a shoreline length of approximately 122 miles, an average depth of 44 feet, and a maximum depth of 129 feet near the dam. Annual average discharge from Boone Dam is about 2700 cfs, which results in an average hydraulic residence time of about 37 days. Annual drawdowns of Boone Reservoir usually average about 25 feet.

Three locations were selected for ecological health monitoring in Boone Reservoir, one at the forebay and two mid-reservoir sampling locations, one on the Watauga River arm and one on the South Fork Holston River arm. Sediment and benthic macroinvertebrate sampling were added for the first time in 1993.

South Holston Reservoir

South Holston Reservoir in northeastern Tennessee and southwestern Virginia is created by South Holston Dam, located on the South Fork of the Holston River at mile 49.8. The dam creates a storage pool approximately 24 miles long, over 230 feet deep near the dam, with an average depth of 86.5 feet and approximately 7600 acres in surface area. With an average annual discharge of about 990 cfs from the dam, the average hydraulic residence time is almost one year (334 days)--one of the longest residence times of any TVA reservoir. Average annual drawdown of South Holston Reservoir is about 33 feet.

Two locations are monitored for Vital Signs--the forebay and mid-reservoir. Sediment and benthic macroinvertebrate sampling were added for the first time in 1993.

Watauga Reservoir

Watauga Dam in the northeastern corner of Tennessee impounds the Watauga River at mile 36.7. It forms a pool 16 miles in length, approximately 6400 acres in surface area, about 274 feet deep at the dam, and an average depth of about 89 feet, making it the second-deepest reservoir sampled as part of TVA's Vital Signs Monitoring Program. With an annual average discharge of about 720 cfs, Watauga Reservoir also has the longest hydraulic residence time of any of the Vital Signs reservoirs (about 400 days). Average annual drawdown of Watauga Reservoir is about 26 feet.

Two locations are monitored on Watauga Reservoir, the forebay and mid-reservoir. Sediment quality and benthic macroinvertebrates were examined for the first time in 1993.

Reservoir: Cherokee 2000 Score: 47%

Previous Scores
2000 Criteria

1991	57
1992	57
1993	65
1994	51
1995	54
1996	49--1st year benthos
1997	n/s collected at MR
1998	50
1999	n/s
2000	47

Cherokee	2000 Results					Change between 1998 and 2000				
	FB	MR	Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	P 2.8	P 1.0			3.8	-1.0	0.0			-1.0
DO	P 1.0	P 1.0			2.0	0.0	0.0			0.0
Fish	F 3.0	F 3.0			6.0	0.0	0.0			0.0
Benthos	F 3.0	F 3.0			6.0	0.0	0.0			0.0
Sediment	F 2.0	F 1.5			3.5	0.0	0.0			0.0
Total	11.8	9.5			21.3	-1.0	0.0			-1.0

Summary/Key Ecological Health Findings for 2000: The overall ecological condition of Cherokee Reservoir was poor again in 2000. All ecological indicators rated either poor or fair. High concentrations and therefore a poor rating for chlorophyll at the mid-reservoir site was expected based on previous monitoring, but 2000 was the first time chlorophyll had rated poor at the forebay. Poor ratings for DO at both sites (very low concentrations during summer with anoxic conditions in the lower part of the water column for extended periods) were expected occurrences based on previous monitoring results. The fish assemblage rated fair at both locations – the assemblage was comprised of mostly tolerant species, there was a high percentage of omnivores, and a low percentage of insectivorous individuals. Sediments also rated fair at both locations due to presence of chlordane at the forebay and chlordane and copper at the mid-reservoir site.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: Ecological conditions in Cherokee Reservoir in 2000 were quite similar to those found in previous years. The consistent problems – low DO and high chlorophyll – occurred at both sample sites in 2000 (poor chlorophyll ratings had not previously occurred at the forebay). Cherokee is a relatively deep storage impoundment with a long retention time and plenty of nutrients – all the ingredients necessary to produce the characteristics described above. Copper and chlordane present in the sediments (resulting in fair ratings) have been observed in previous years.

Aquatic Macrophytes in 2000: Aquatic macrophytes are not an issue on Cherokee because of the substantial drawdown in reservoir elevation each winter for flood storage.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Cherokee Reservoir. TVA collected channel catfish and largemouth bass from Cherokee Reservoir in autumn 1998. Fillets from these fish were analyzed for pesticides, PCBs, and metals. The results, which were provided to state agencies in Tennessee for appropriate action, were similar to previous years. Cherokee Reservoir will be sampled again in 2002

Status of Swimming Advisories in 2000: Six sites on Cherokee Reservoir were sampled ten times each for fecal coliform bacteria in 2000. All sites met the State of Tennessee bacteriological water quality criteria for water contact recreation. There are no State of Tennessee swimming advisories on Cherokee Reservoir.

Reservoir: So. Holston 2000 Score: 52%

---Previous Scores---
2000 Criteria

1991	63[1]
1992	59[1]
1993	66
1994	66
1995	n/s
1996	55
1997	n/s
1998	52
1999	n/s
2000	52

1. only Chl, DO, and Fish

So. Holston	2000 Results					Change between 1998 and 2000				
	FB	MR	Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	G 5.0	P 2.9			7.9	0.7	-0.7			0.0
DO	P 1.5	P 1.0			2.5	0.5	0.0			0.5
Fish	F 3.0	F 4.0			7.0	-1.0	1.0			0.0
Benthos	P 1.0	P 1.0			2.0	0.0	-1.0			-1.0
Sediment	G 2.5	F 1.5			4.0	1.0	-0.5			0.5
Total	13.0	10.4			23.4	1.2	-1.2			0.0

Summary/Key Ecological Health Findings for 2000: Overall ecological conditions in South Holston Reservoir were poor in 2000. The only good ratings were for chlorophyll and sediment quality at the forebay. All other indicators rated either fair or poor. DO and benthos rated poor at both sample sites. Low DO levels occurred in portions of the metalimnion and hypolimnion from July through October but these areas never became anoxic. The benthos community received the lowest possible score at the mid-reservoir site. All seven metrics used to evaluate the community received the lowest possible rating of one. Benthic animals collected were tolerant and short-lived; also, several samples had no animals at all. The poor rating for chlorophyll at the mid-reservoir site is possibly the most significant component of the 2000 monitoring results for South Holston Reservoir. The summer average was the highest observed to date for the mid-reservoir site. Chlorophyll concentrations at the forebay were within the expected range and rated good. Sediments rated fair at the mid-reservoir site because chlordane was found just above the detection limit.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The overall ecological health condition for South Holston Reservoir was poor again in 2000, comparable to 1996 and 1998 results. The lake had rated fair in previous years (1993 and 1994). The most notable observations from 2000 results were elevated chlorophyll concentrations at the mid-reservoir site compared to previous years – the highest to date for South Holston. As expected, low DO concentrations and poor benthic macroinvertebrate communities were found in 2000.

Aquatic Macrophytes in 2000: Aquatic macrophytes are not an issue on South Holston Reservoir because the winter drawdown for flood control limits suitable habitat.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on South Holston Reservoir. Channel catfish and largemouth bass from South Holston Reservoir were last collected in autumn 1996. Channel catfish fillets were analyzed for pesticides, PCBs, and metals and largemouth bass fillets for mercury. The results were provided to state agencies in Tennessee. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. These species were sampled again in autumn 2000 and results are expected in spring 2001.

Status of Swimming Advisories in 2000: Four sites along the South Holston River were sampled ten times each for fecal coliform bacteria in 2000. Samples were collected at the Canoe Access Site at the Weir (SHRM 48.3L), Laurel Yacht Club Marina, Painter Creek Dock Swimming Area, and Observation Knob Park Swimming Area. All but one site met the State of Tennessee bacteriological water quality criteria for water contact recreation. The Canoe Access Site at the Weir exceeded the Tennessee bacteriological water quality criteria because a single sample exceeded 1,000 colonies per 100 milliliters. Large numbers of water fowl (Canadian geese) were present at this site, which is a likely source of contamination. There are no State of Tennessee swimming advisories along the South Holston River.

Reservoir: Watauga 2000 Score: 66%

---Previous Scores---
2000 Criteria

1991	75[1]
1992	72[1]
1993	63
1994	63
1995	n/s
1996	72
1997	n/s
1998	58
1999	n/s
2000	66

1. only Chl, DO, and Fish

Watauga	2000 Results					Change between 1998 and 2000				
	FB	MR	Emb	Inf	Total	FB	MR	Emb	Inf	Total
Chlorophyll	G 5.0	G 5.0			10.0	0.0	0.0			0.0
DO	F 4.0	P 1.5			5.5	0.0	0.5			0.5
Fish	P 2.0	F 4.0			6.0	0.0	0.0			0.0
Benthos	P 1.0	F 3.0			4.0	0.0	2.0			2.0
Sediment	G 2.5	F 1.5			4.0	1.0	0.0			1.0
Total	14.5	15.0			29.5	1.0	2.5			3.5

Summary/Key Ecological Health Findings for 2000: The overall ecological rating for Watauga Reservoir was fair in 2000. Chlorophyll was the only indicator to rate good at both sample sites – concentrations were within the expected range for this lake. The only other good rating for any indicator was for sediment quality at the forebay. Sediment quality rated fair at the mid-reservoir site due to presence of low levels of chlordane. The rating for DO was fair at the forebay and poor at the mid-reservoir site. The poor rating at the mid-reservoir site was caused by low summer DO concentrations in a substantial proportion of the hypolimnion. The fish assemblage rated poor at the forebay and fair at the mid-reservoir site. Five of the 12 metrics used to evaluate the fish assemblage received the lowest possible rating of one at the forebay, whereas a greater abundance and diversity of fish at the mid-reservoir site resulted in a fair rating. The rating for benthic organisms was poor at the forebay and fair at the mid-reservoir site. Few organisms were collected at the forebay and those present were short-lived and tolerant of poor conditions. The community at the mid-reservoir site was slightly more diverse and abundant and rated fair.

Explanation of Differences in Ecological Health Scores in 2000 and Previous Years: The fair overall ecological health rating for Watauga Reservoir in 2000 was similar to most previous years. Chlorophyll ratings have been consistently good throughout the monitoring period, whereas the benthos have typically rated poor and the fish assemblage fair. Sediment quality has rated either fair or good depending on presence/absence of chlordane. DO has rated either good or fair at the forebay and fair or poor at the mid-reservoir site. Monitoring results for 2000 matched these past observations in most cases. Two noteworthy observations from the 2000 results were a poor rating for the fish assemblage at the forebay, which represents the first poor rating for this indicator in Watauga Reservoir, and a fair rating for benthos at the mid-reservoir site, which usually rates poor. The poor rating for the fish assemblage is more a mathematical than an environmental change. The fish assemblage score in several past years had been just above the poor-fair cut-off value and it was just below that value in 2000. The higher benthos score in 2000 was due to collection of a slightly greater number and variety of organisms.

Aquatic Macrophytes in 2000: Not an issue on Watauga Reservoir due to winter drawdown.

Status of Fish Consumption Advisories in 2000: There are no fish consumption advisories on Watauga Reservoir. Channel catfish and largemouth bass were last collected in autumn 1996. Channel catfish fillets were analyzed for pesticides, PCBs, and metals and largemouth bass fillets for mercury. The results were provided to state agencies in Tennessee. All contaminant levels were either below detection levels or below the levels used by the state to issue fish consumption advisories. These species were sampled again in autumn 2000 and results are expected in spring 2001.

Status of Swimming Advisories in 2000: There are no State of Tennessee swimming advisories on Watauga Reservoir. One site (Watauga Dam Beach) was sampled ten times for fecal coliform bacteria in 2000. This site met the State of Tennessee bacteriological water quality criteria for water contact recreation.

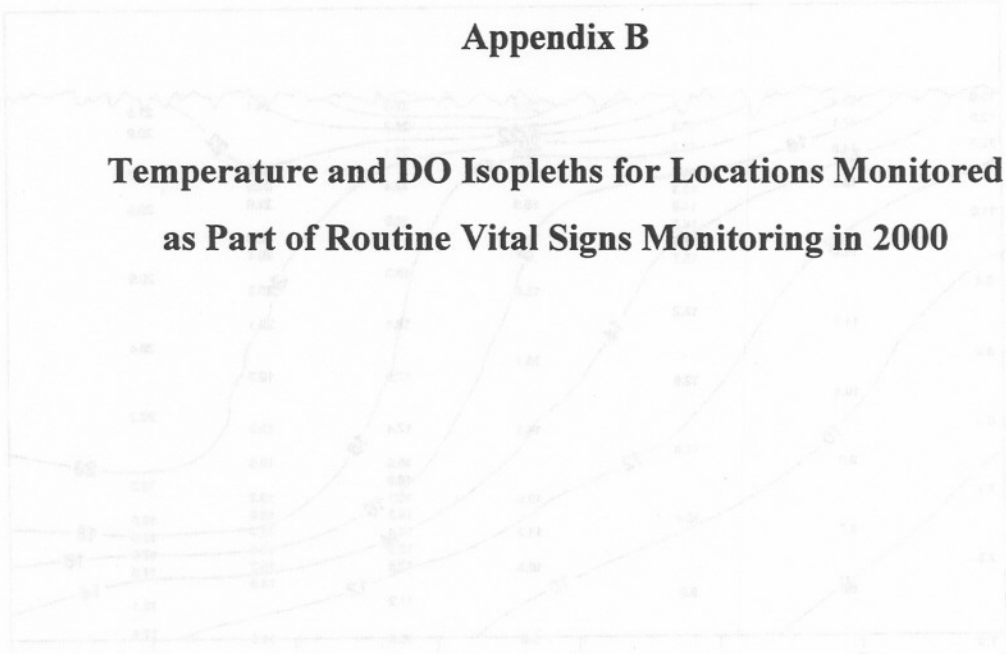
Appendix B.

Temperature and Dissolved Oxygen Isopleths for All Sample Locations Monitored in 2000

Most Locations Were Monitored as Part of Routine Vital Signs Monitoring. Water Quality Measurements Including Temperature and DO Were Taken at Several Additional Locations to Meet Specific Needs. Isopleths for Locations Monitored as Part of Routine Vital Signs Monitoring Are Provided at the Front of This Appendix Followed by Isopleths for the Additional Locations.

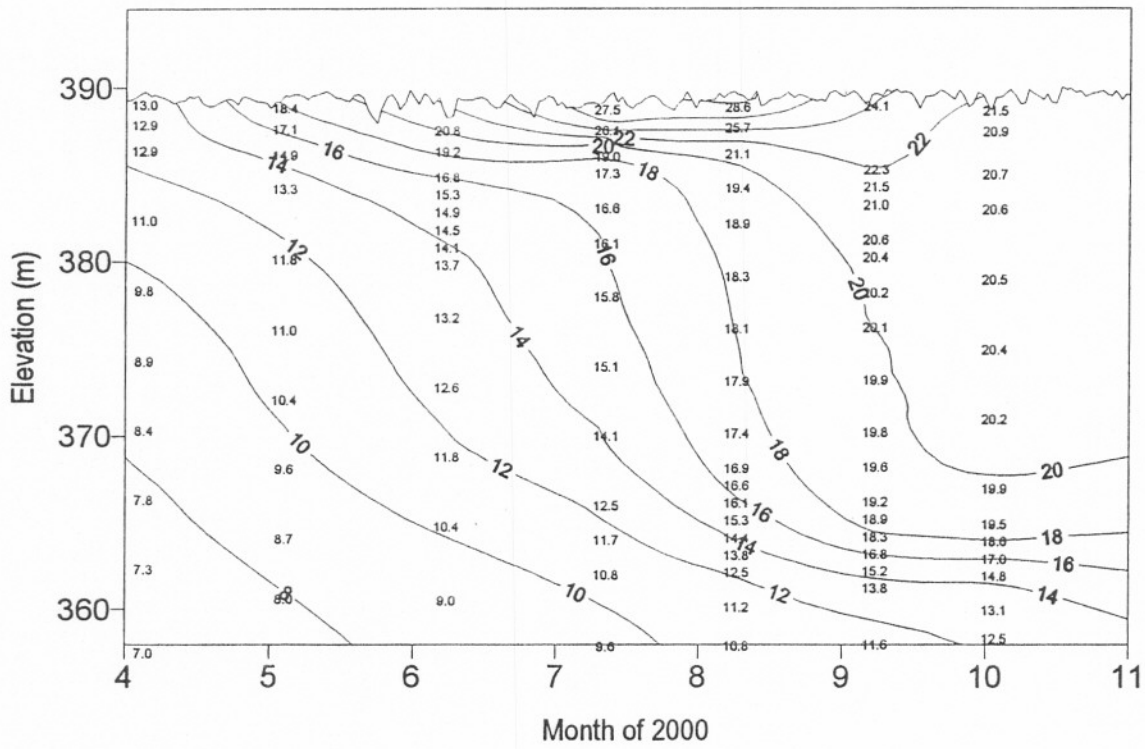
Appendix B

Temperature and DO Isopleths for Locations Monitored as Part of Routine Vital Signs Monitoring in 2000

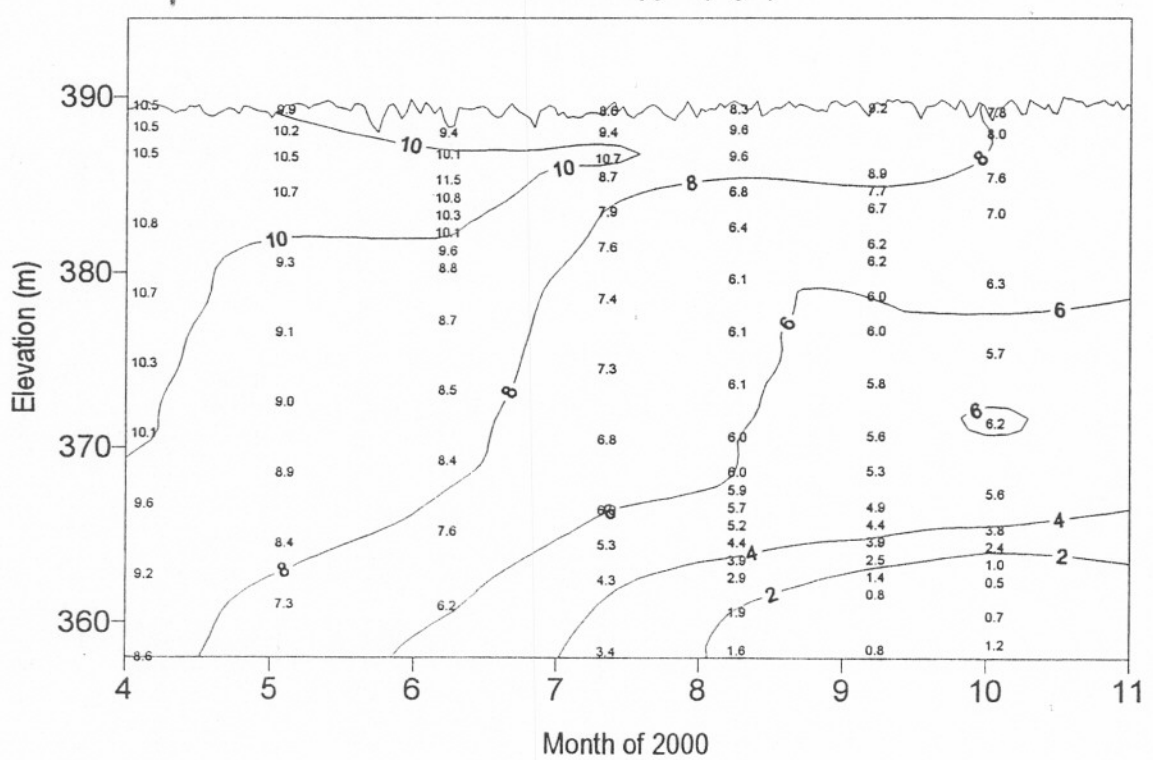


Apalachia Reservoir - HiRM 67.0

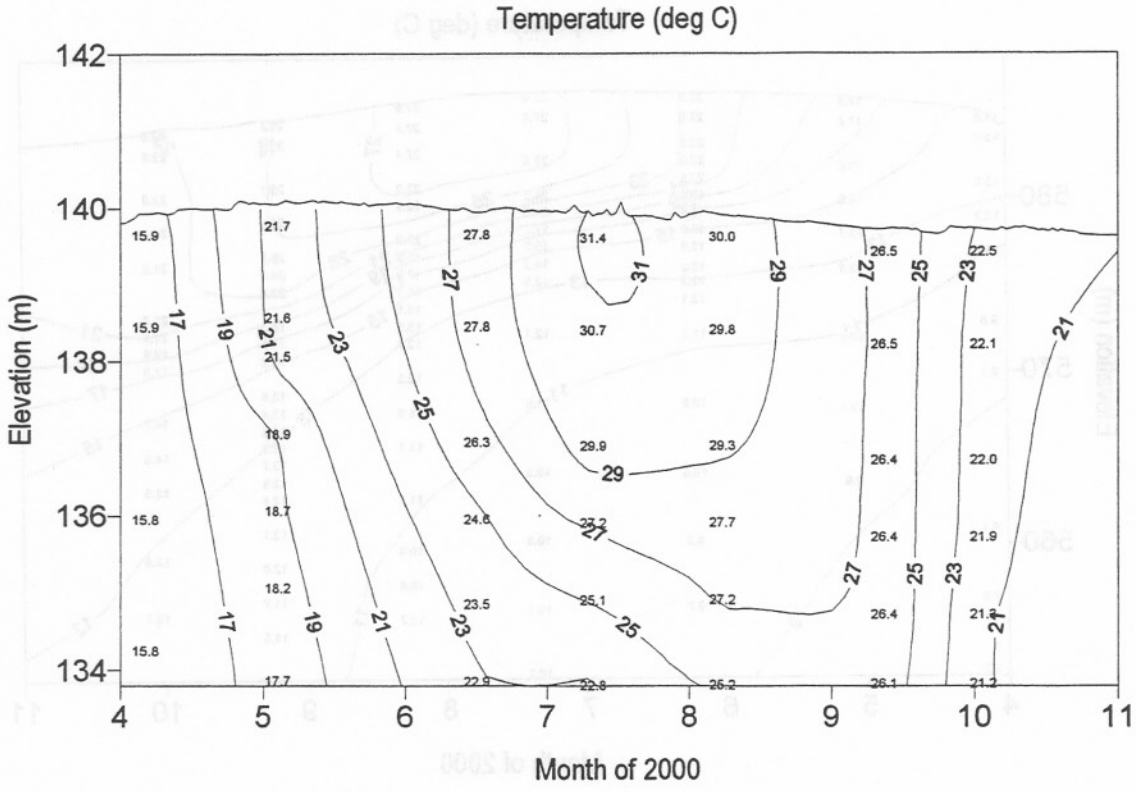
Temperature (deg C)

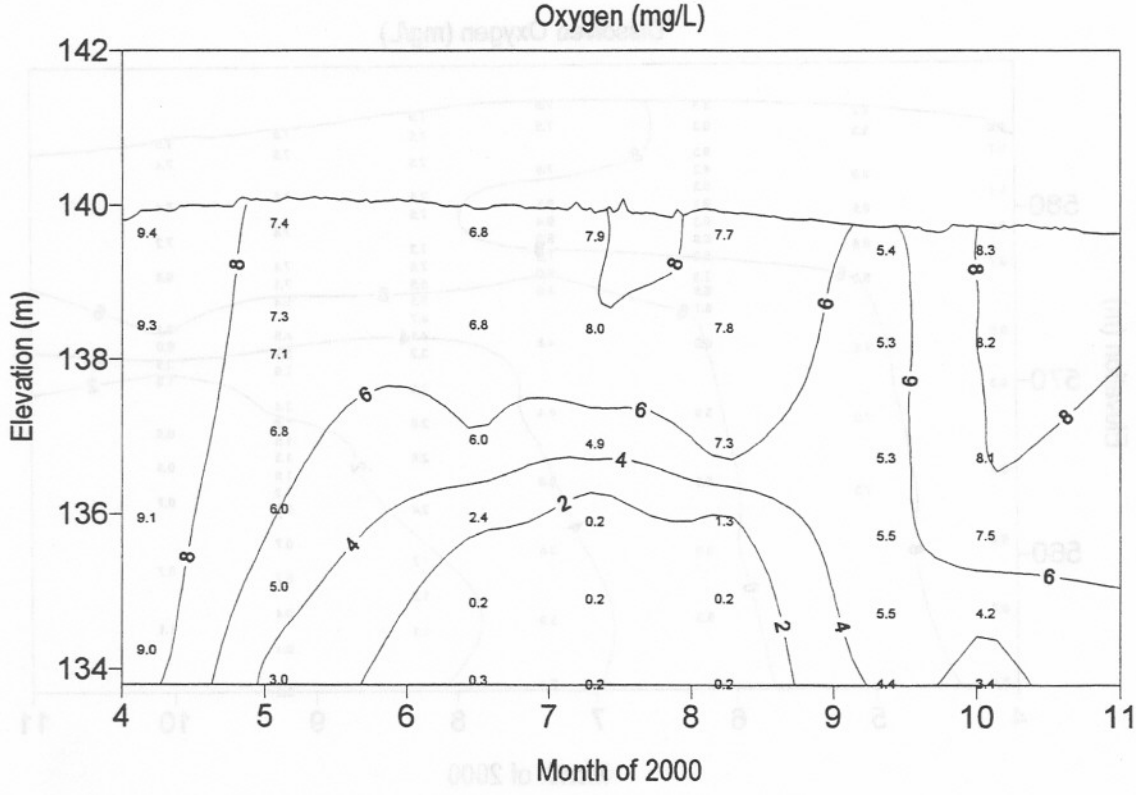


Dissolved Oxygen (mg/L)



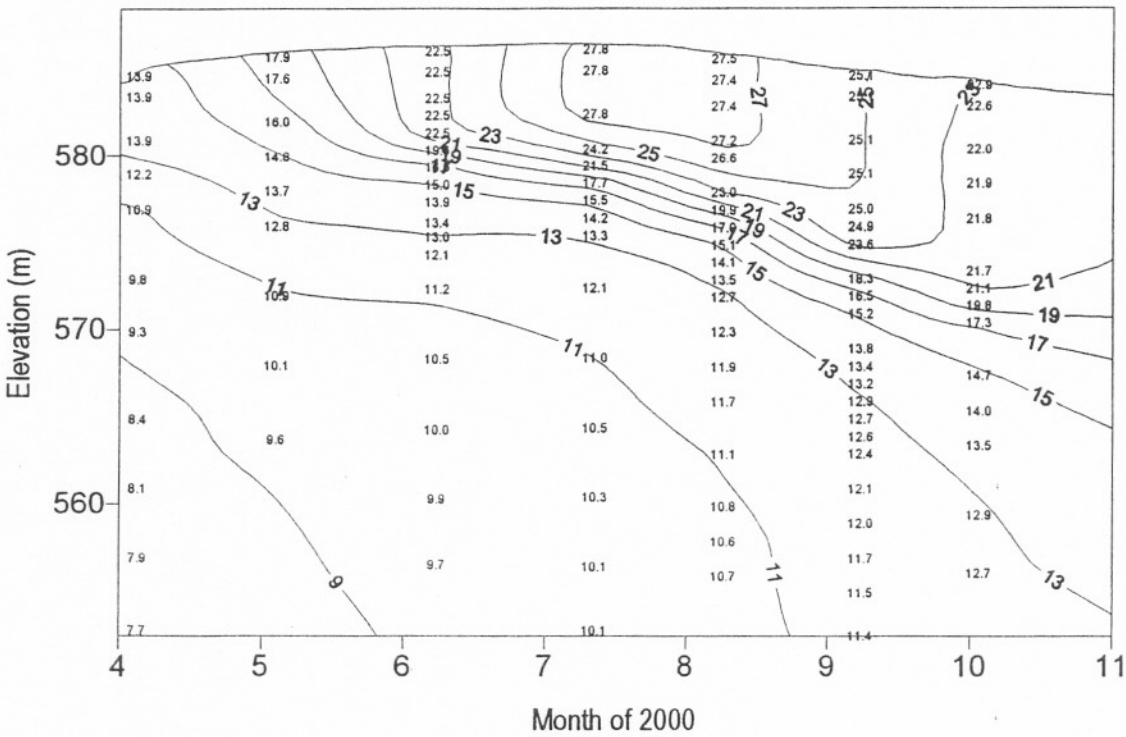
Beech Reservoir - BRM 36.0



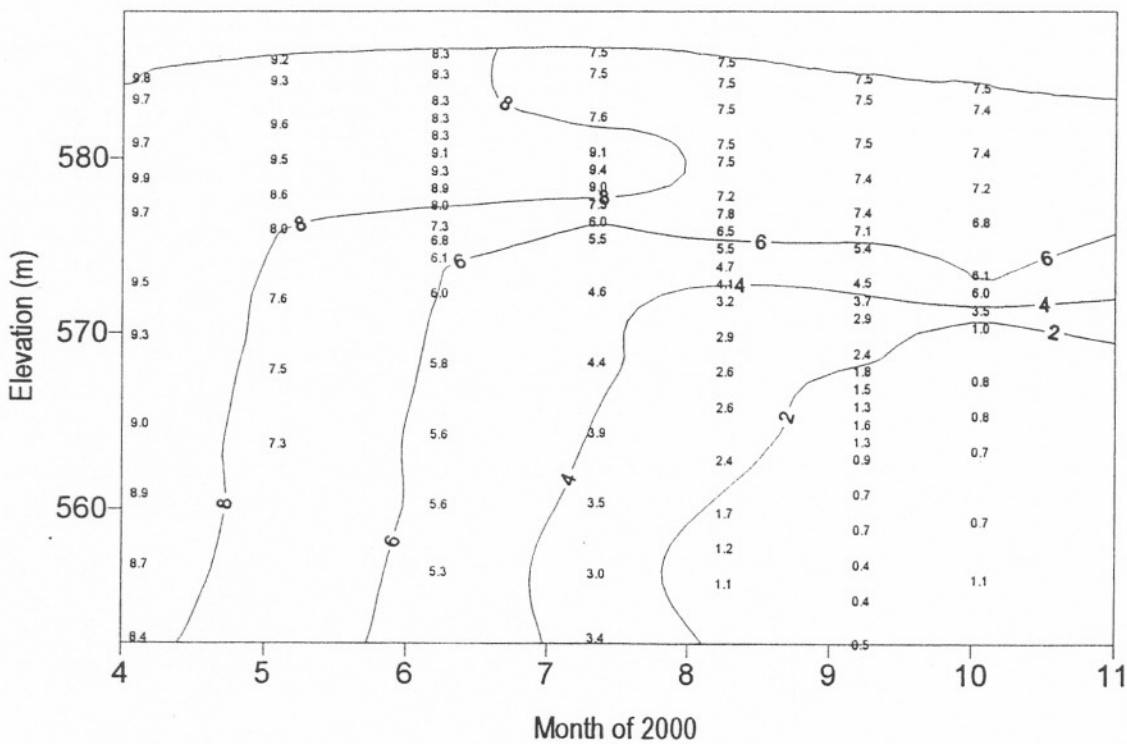


Chatuge Reservoir - HiRM 122.0

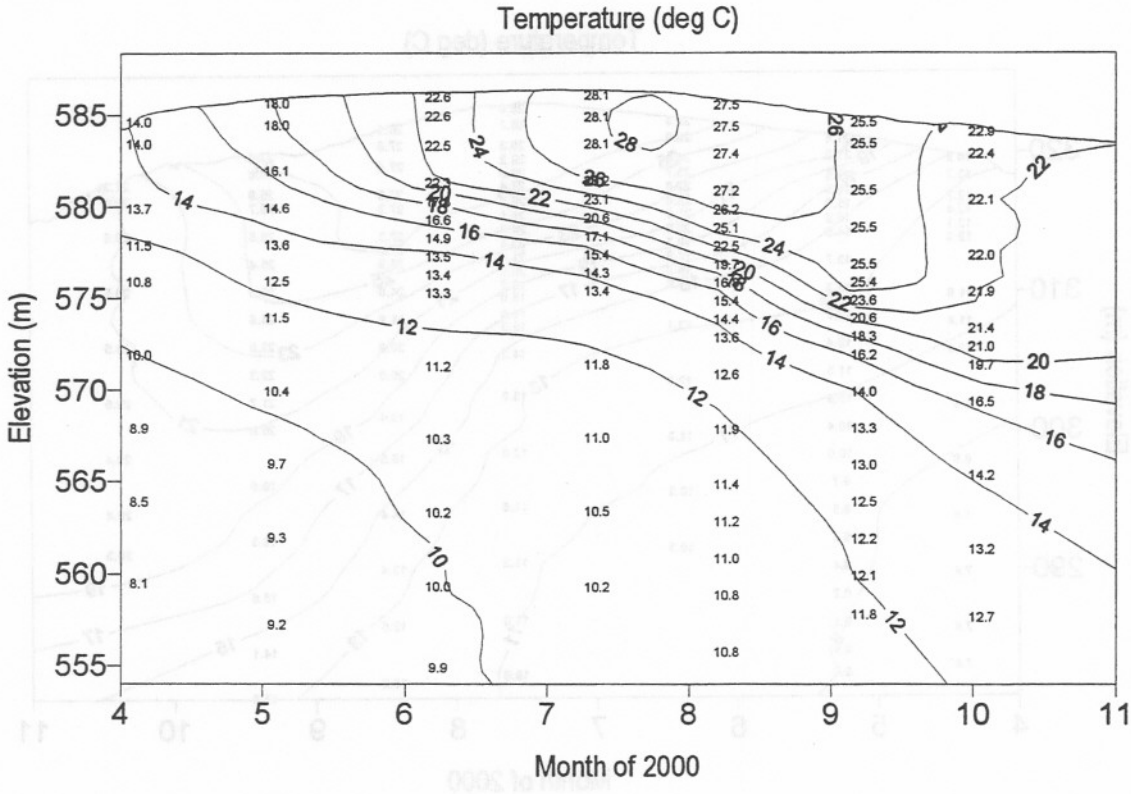
Temperature (deg C)

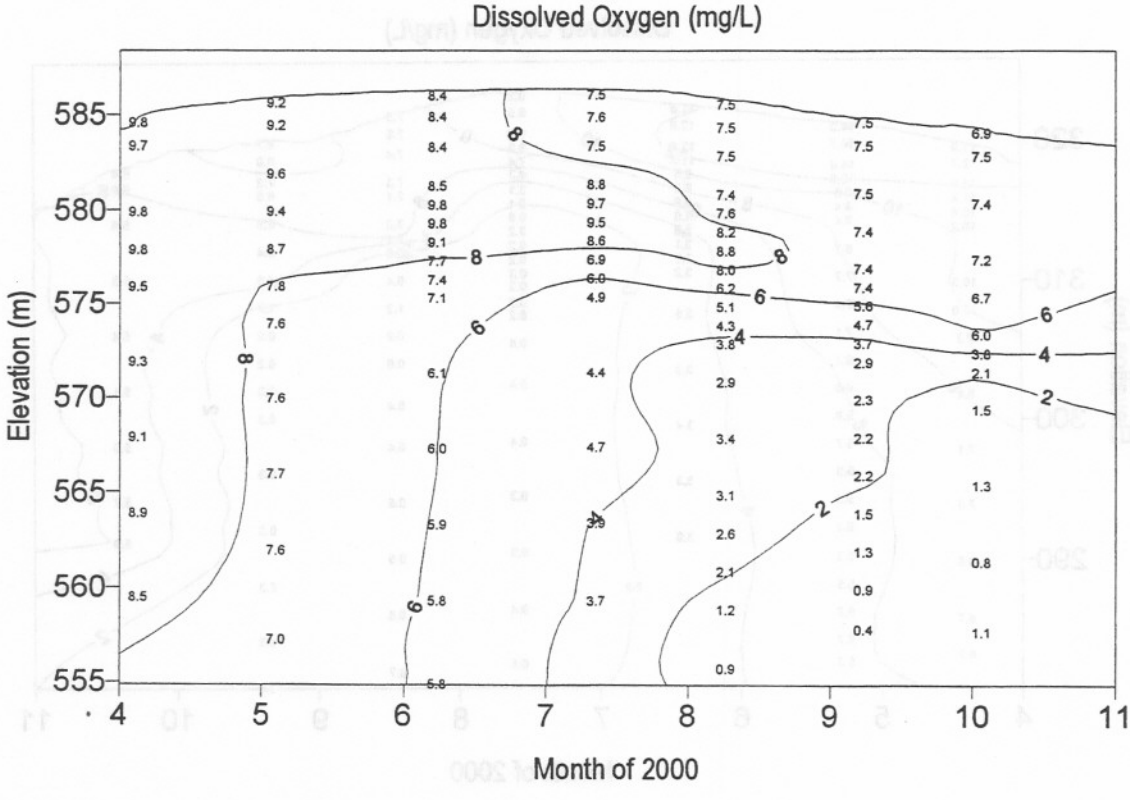


Dissolved Oxygen (mg/L)

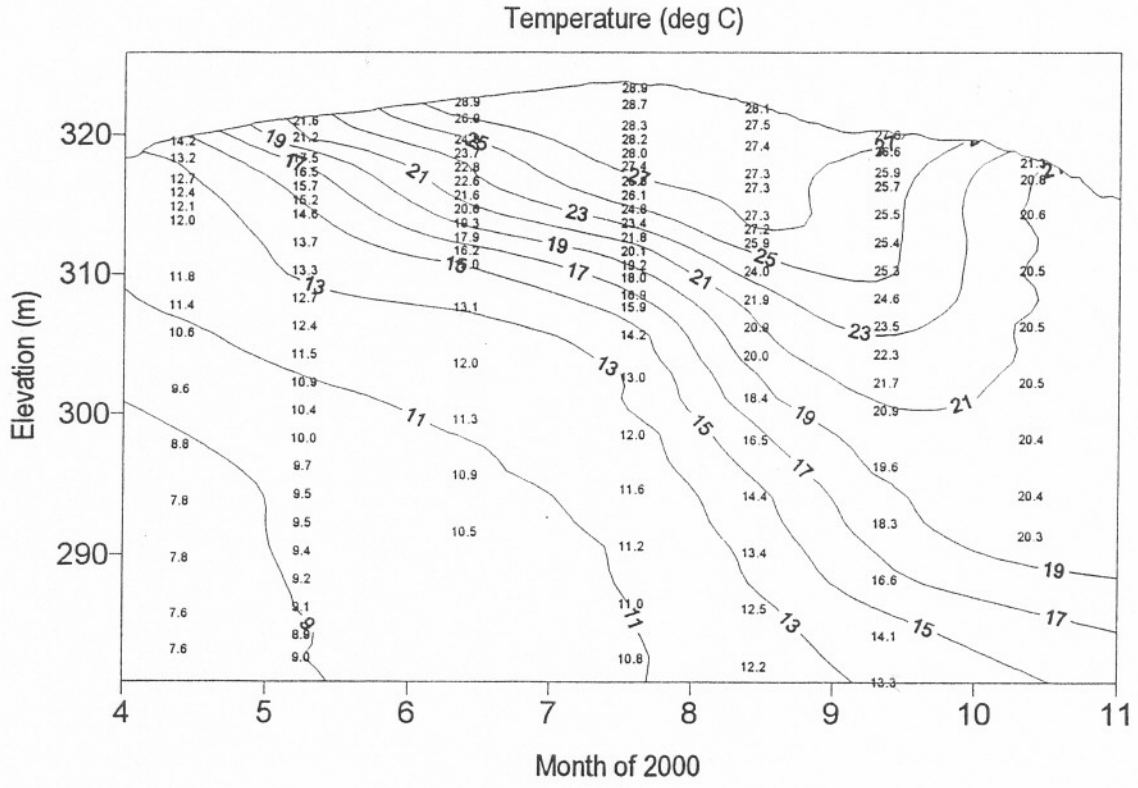


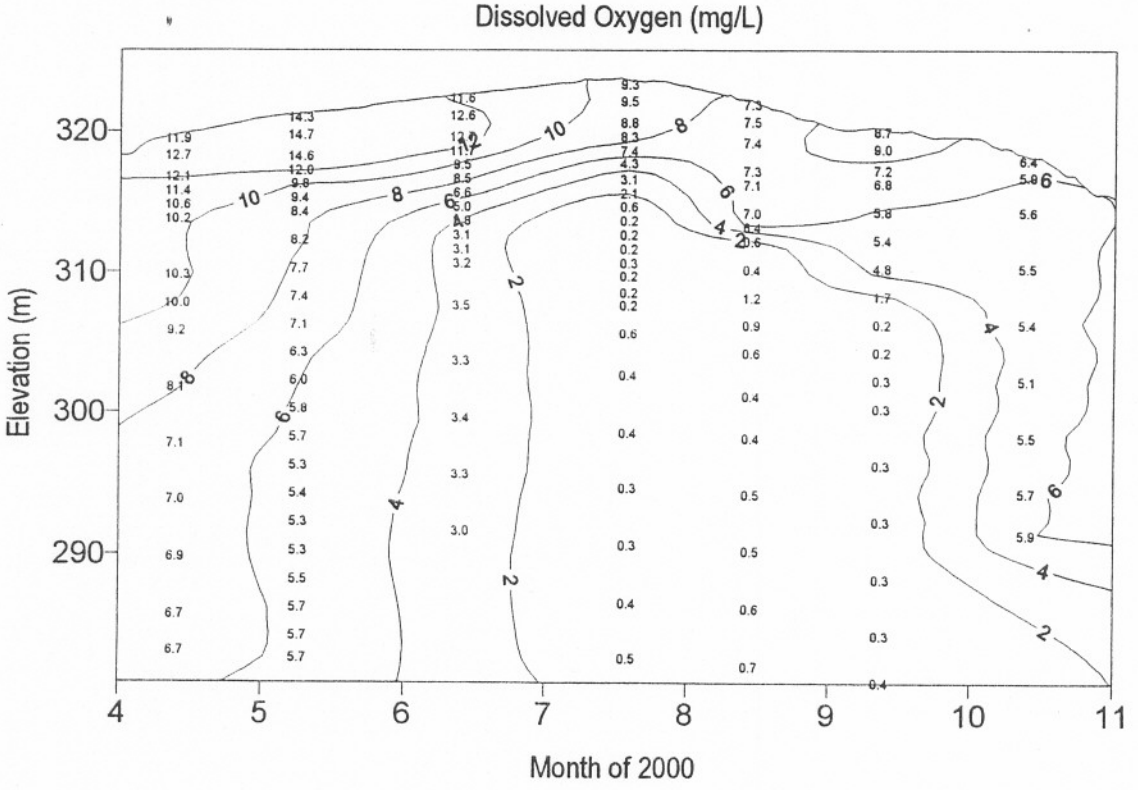
Chatuge Reservoir - Shooting Creek 1.5



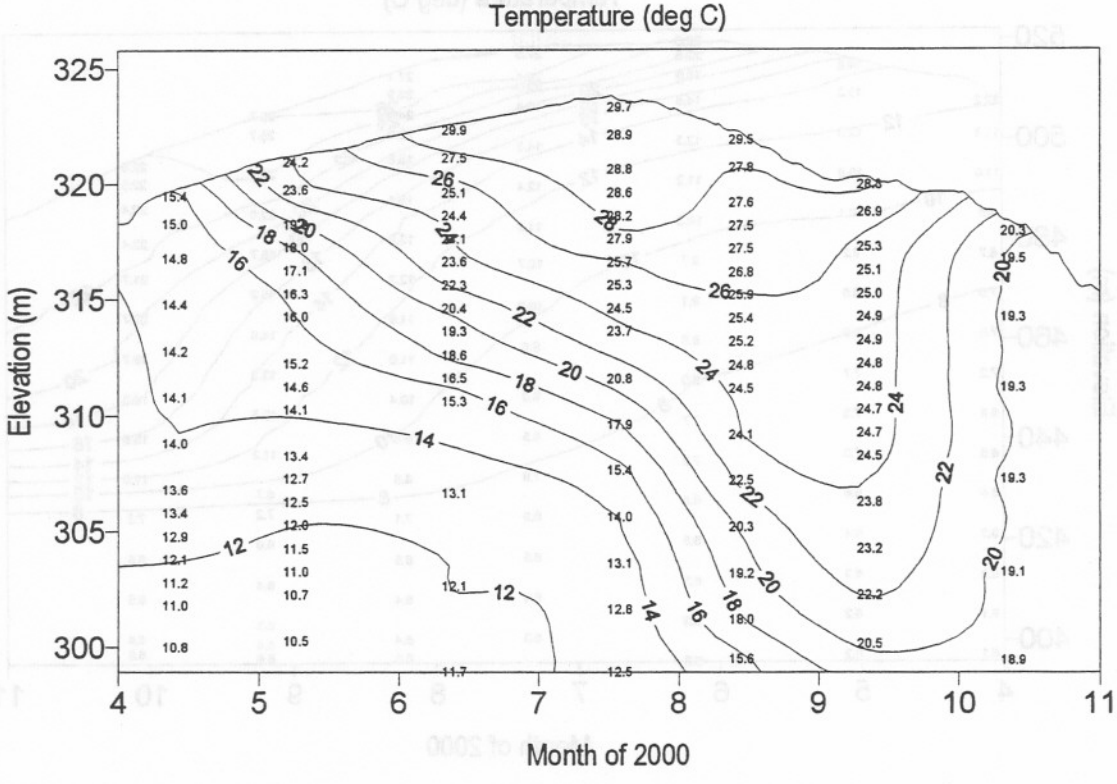


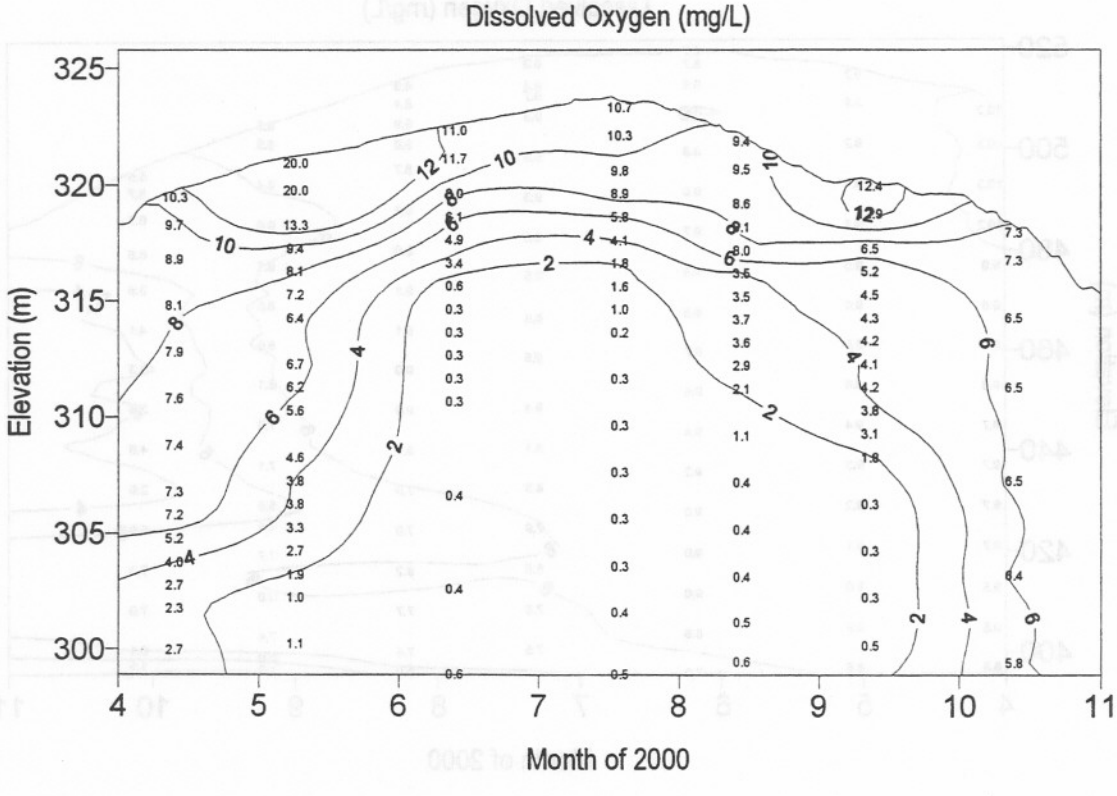
Cherokee Reservoir - HRM 55.0



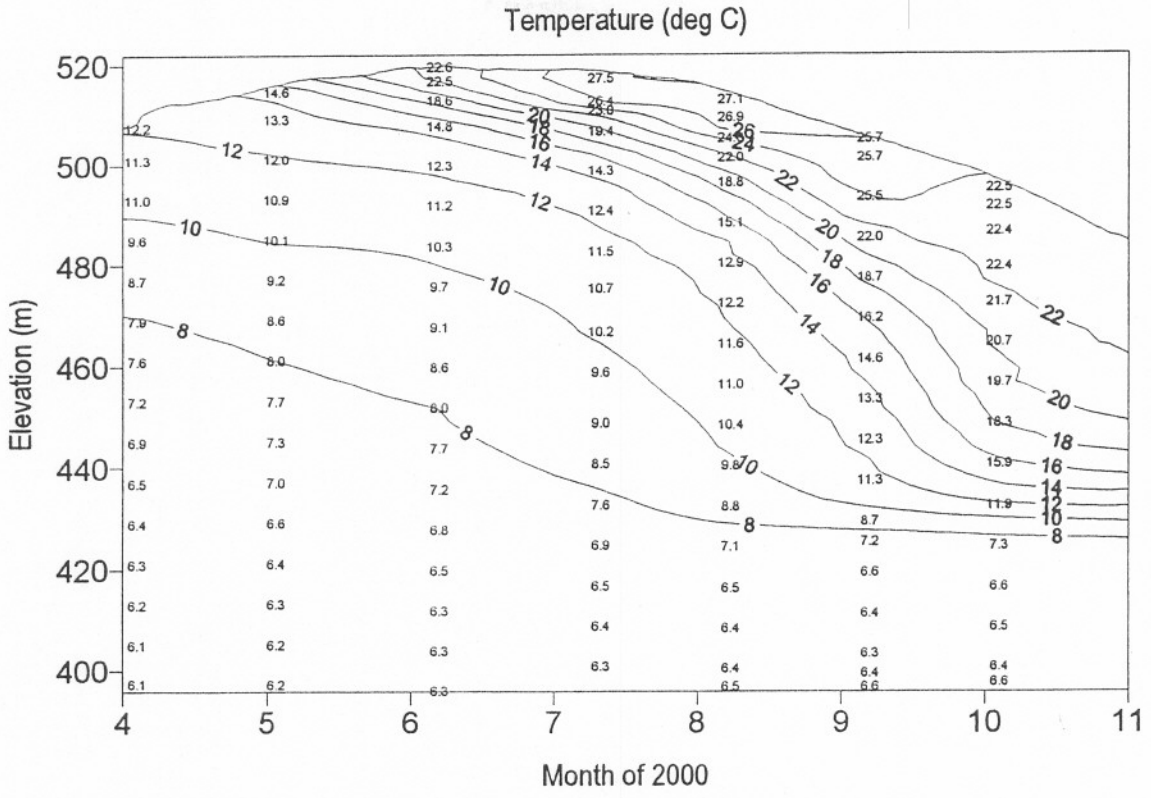


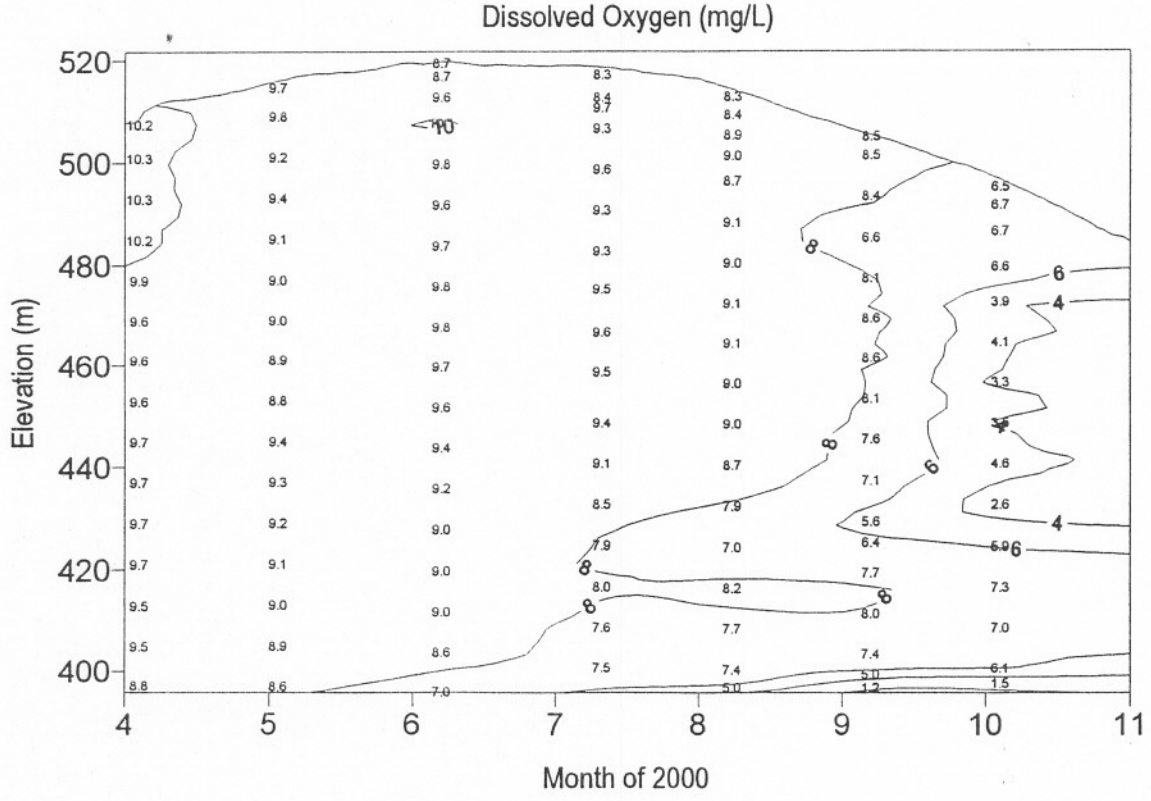
Cherokee Reservoir - HRM 76.0





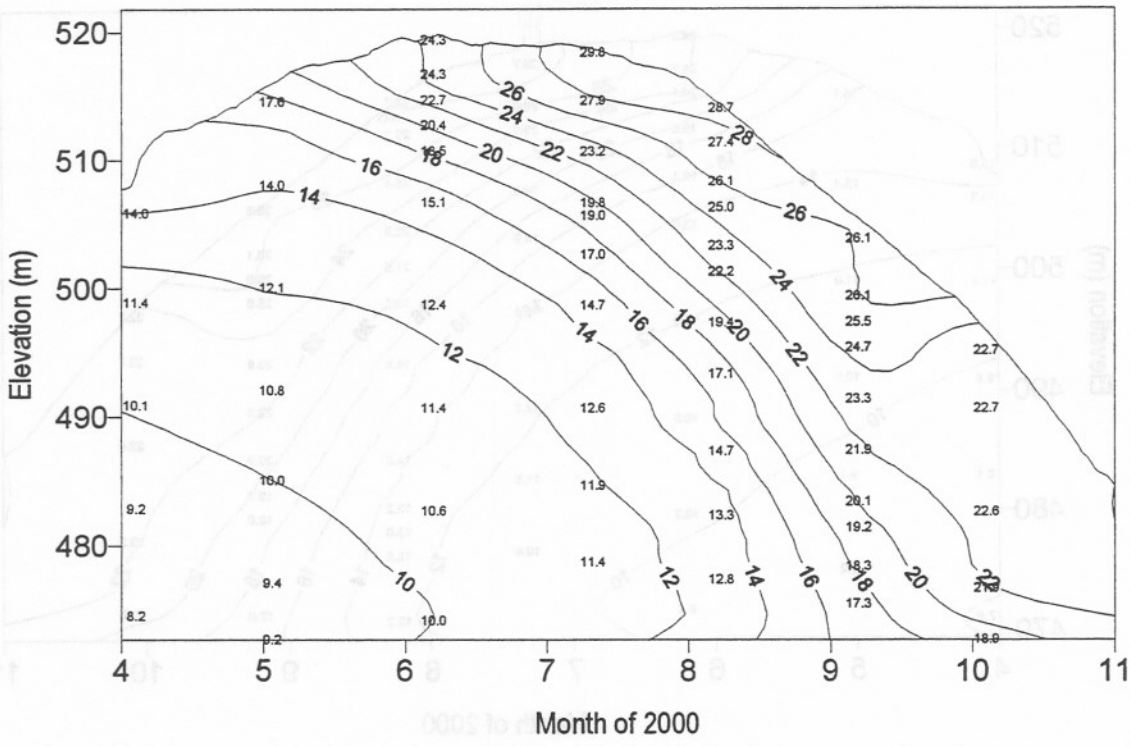
Fontana Reservoir - LTRM 62.0



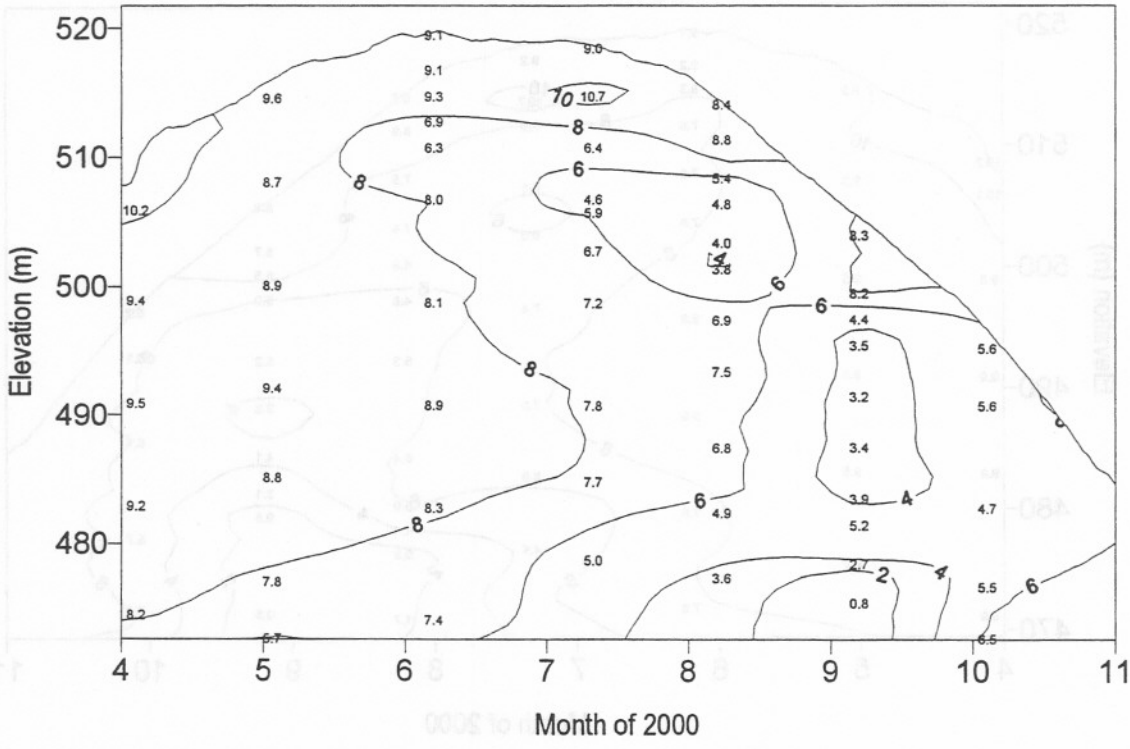


Fontana Reservoir - LTRM 81.5

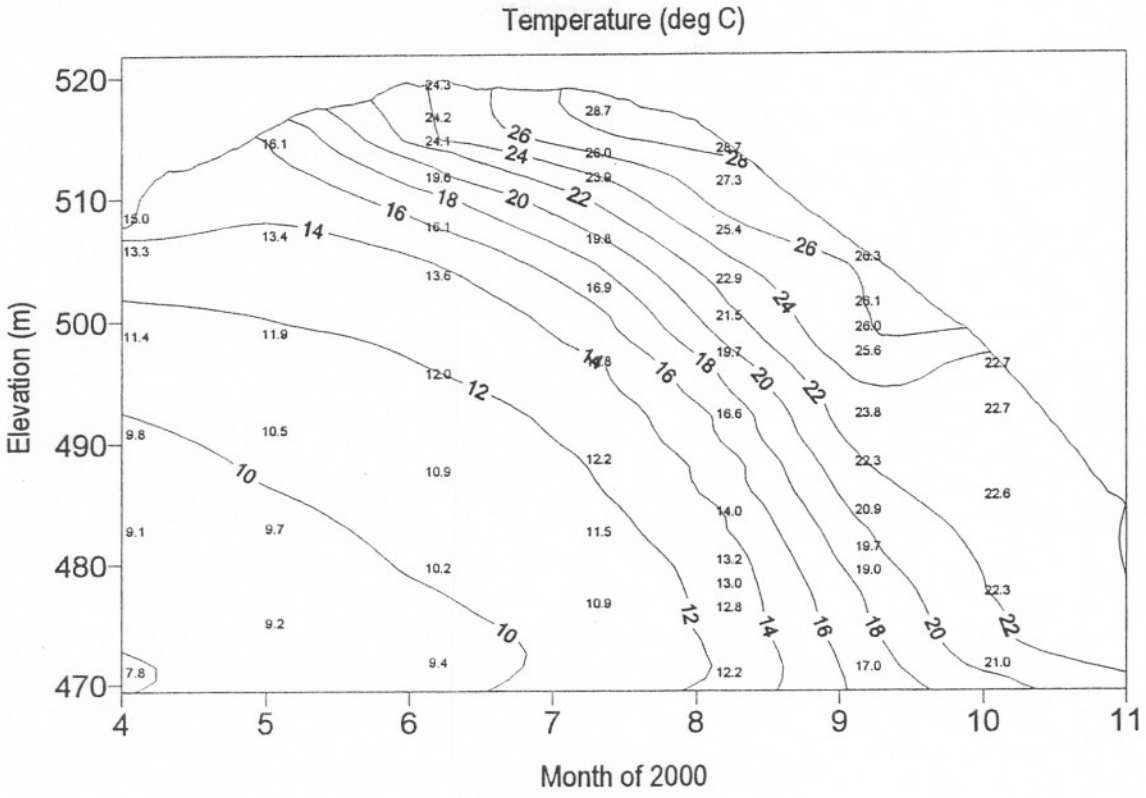
Temperature (deg C)

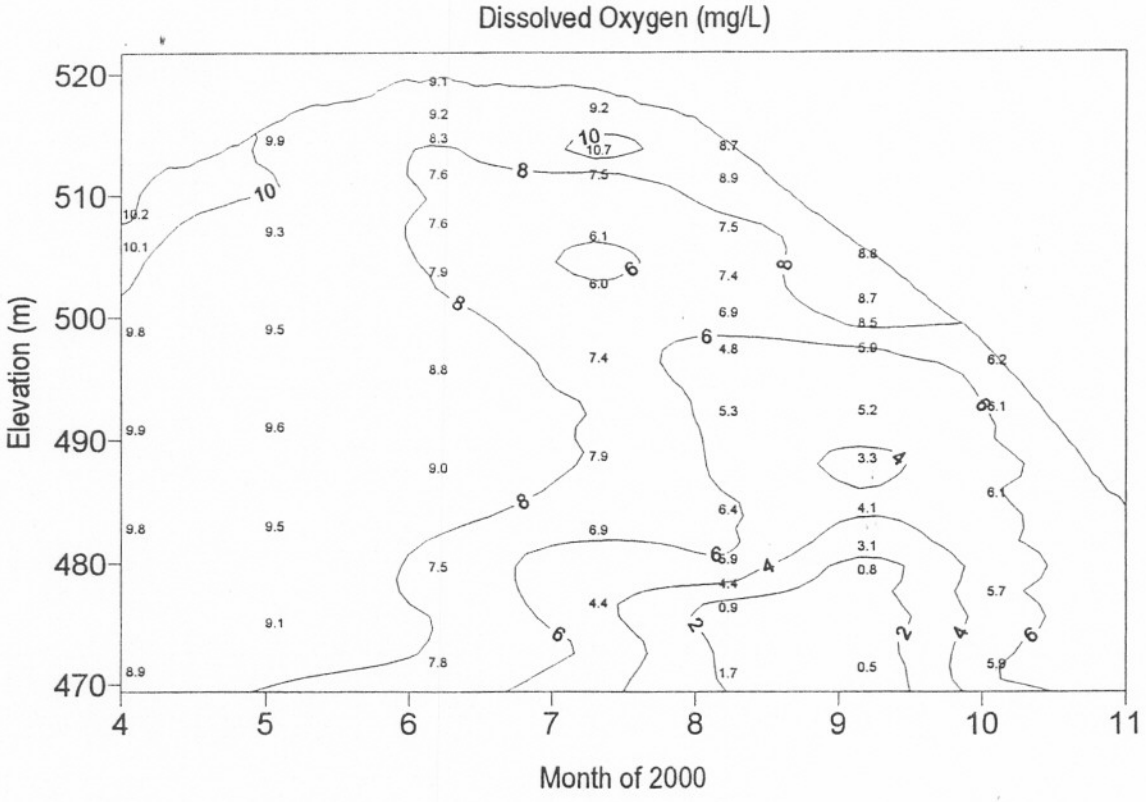


Dissolved Oxygen (mg/L)

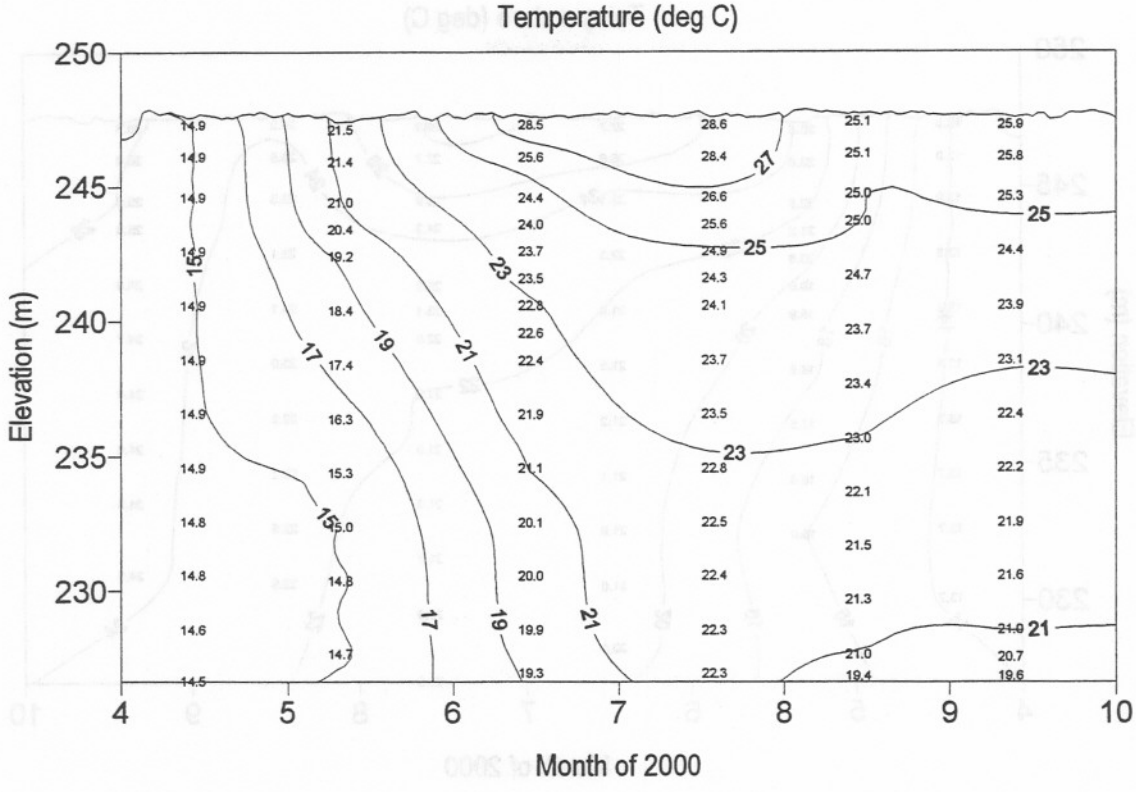


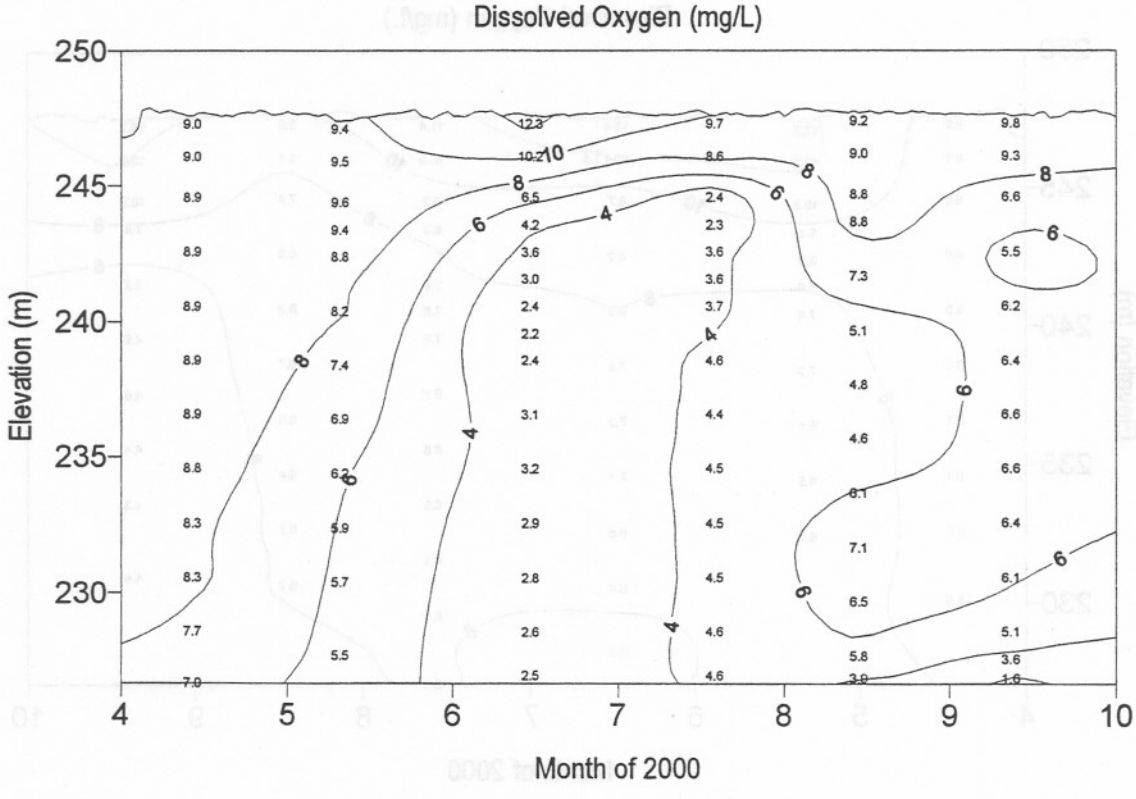
Fontana Reservoir - TkRM 3.0



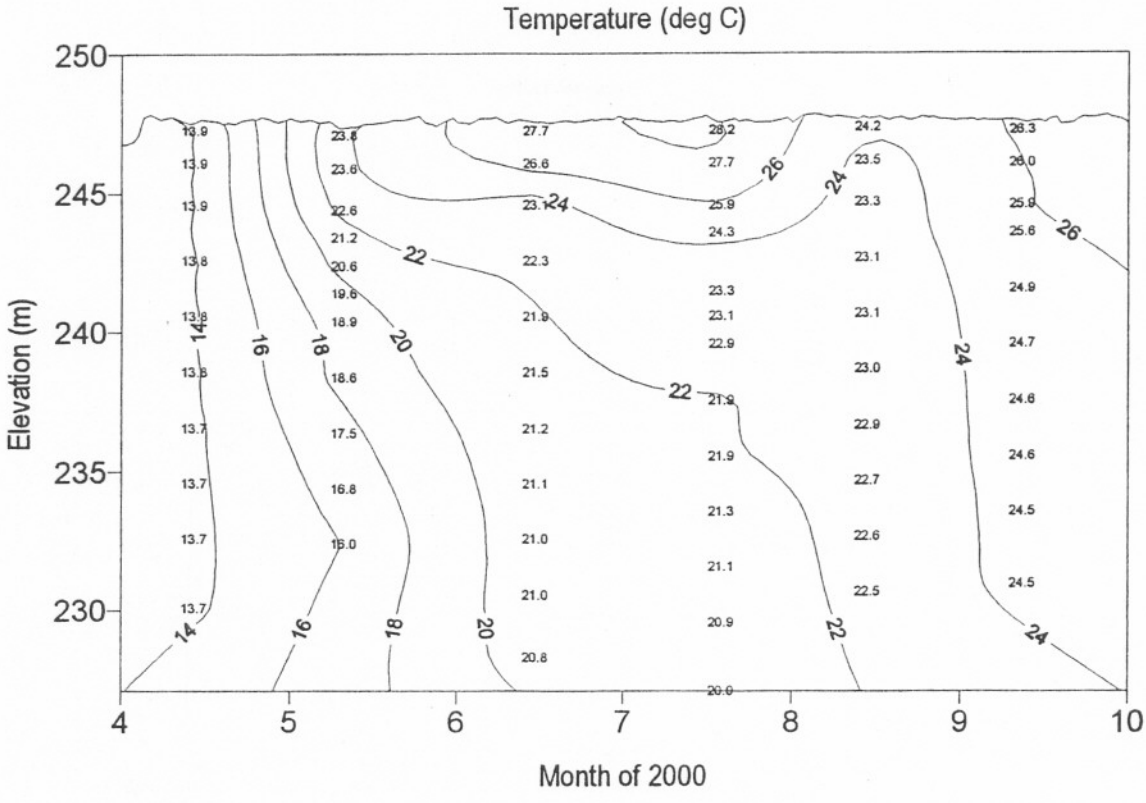


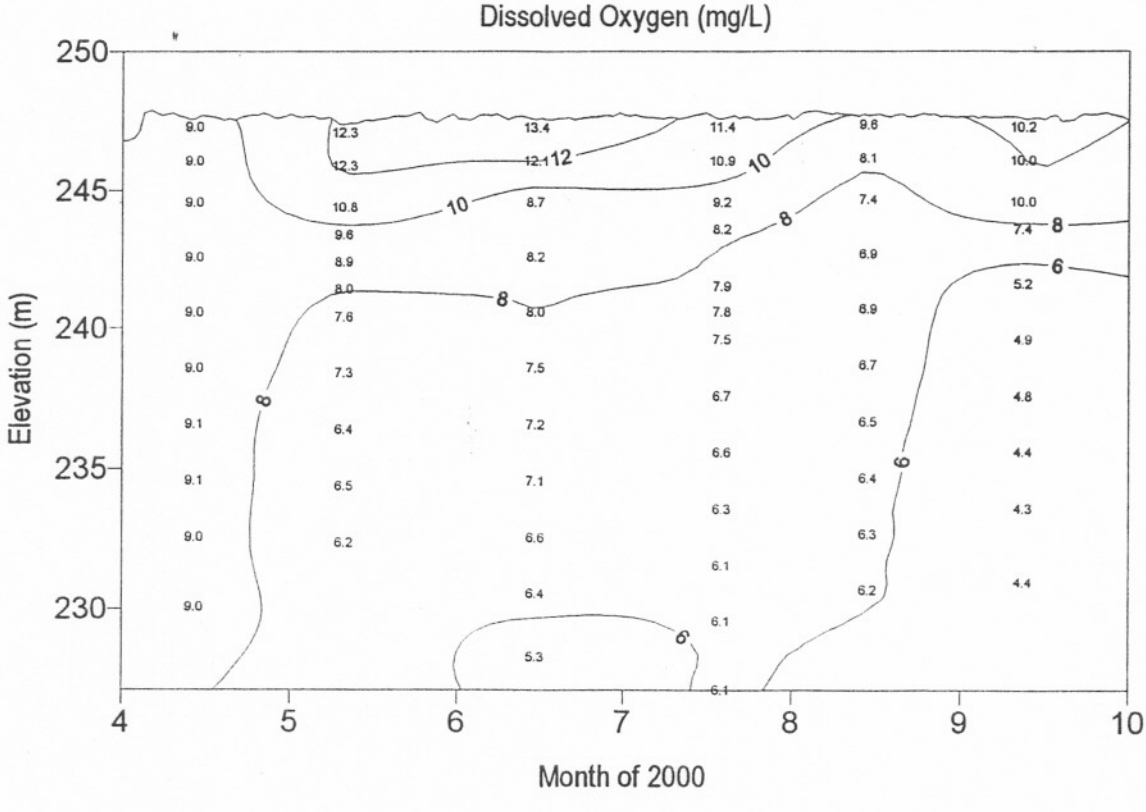
Fort Loudon Reservoir - TRM 605.5



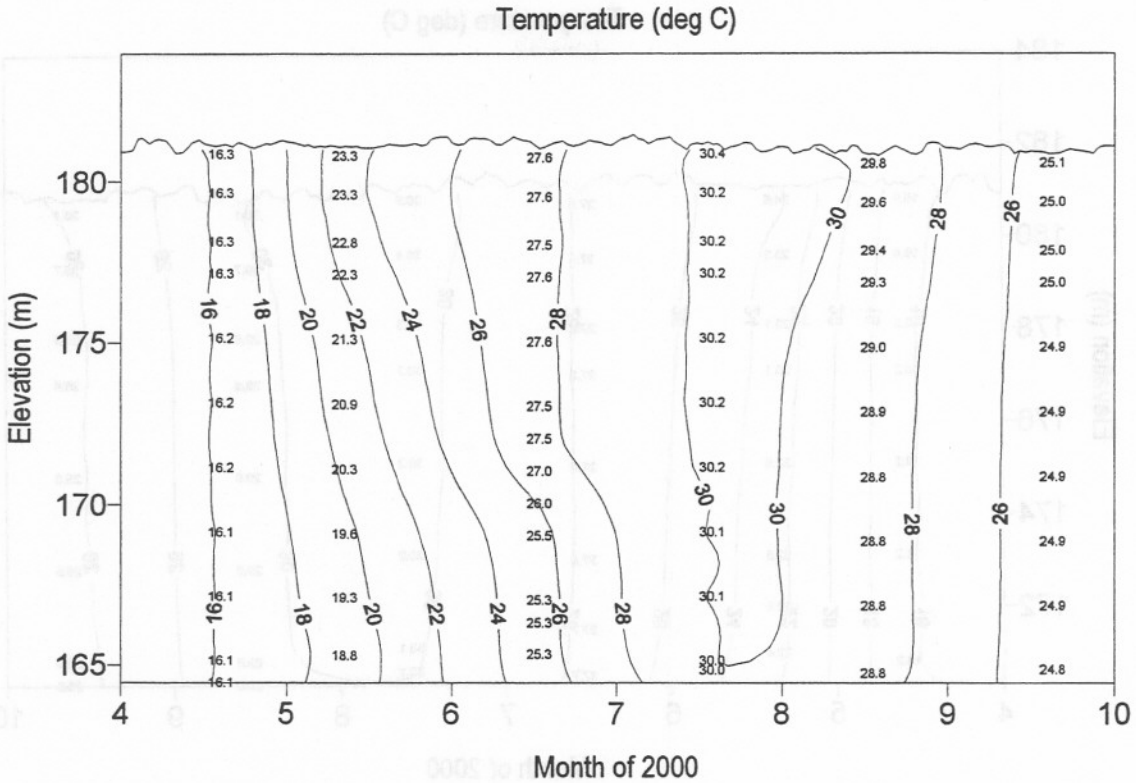


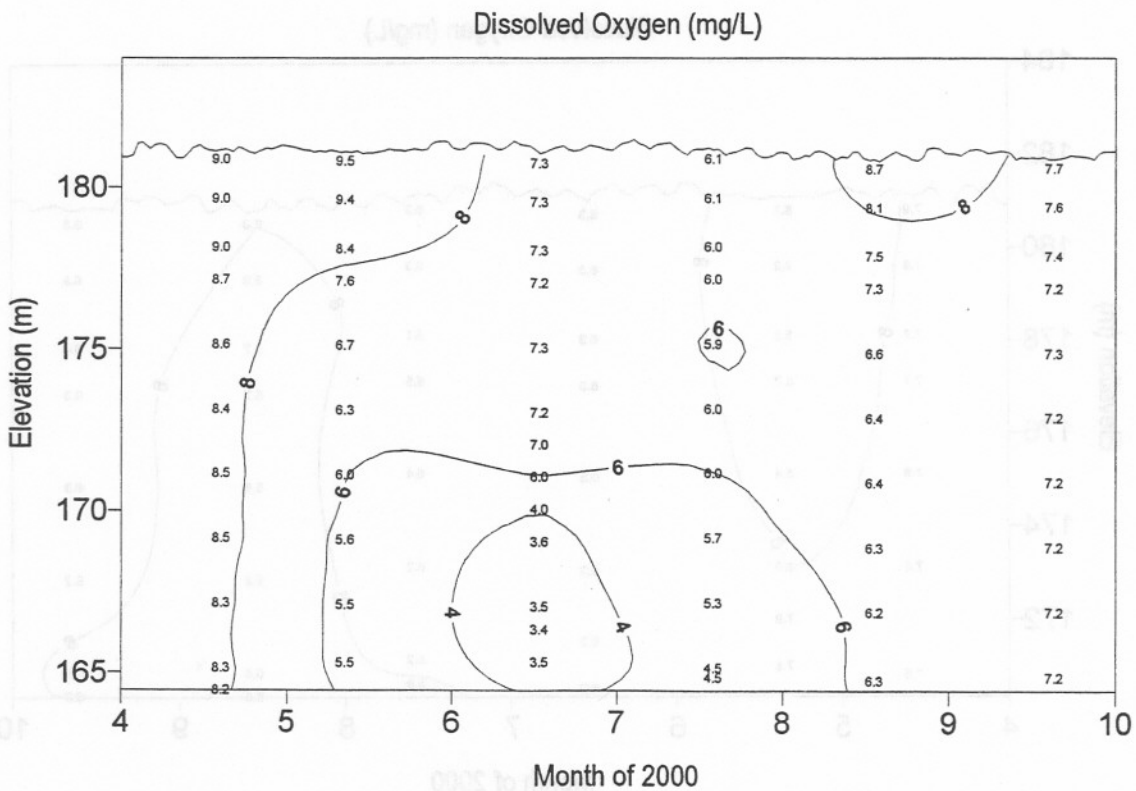
Fort Loudon Reservoir - TRM 624.6



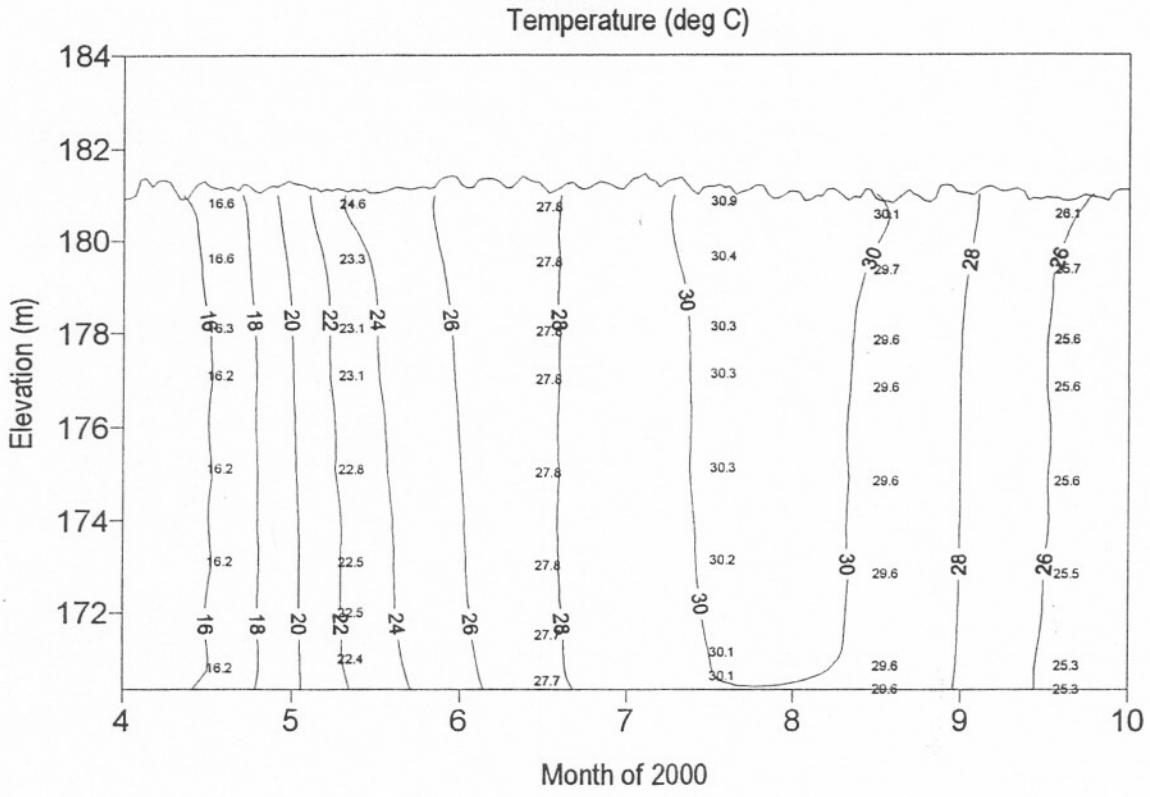


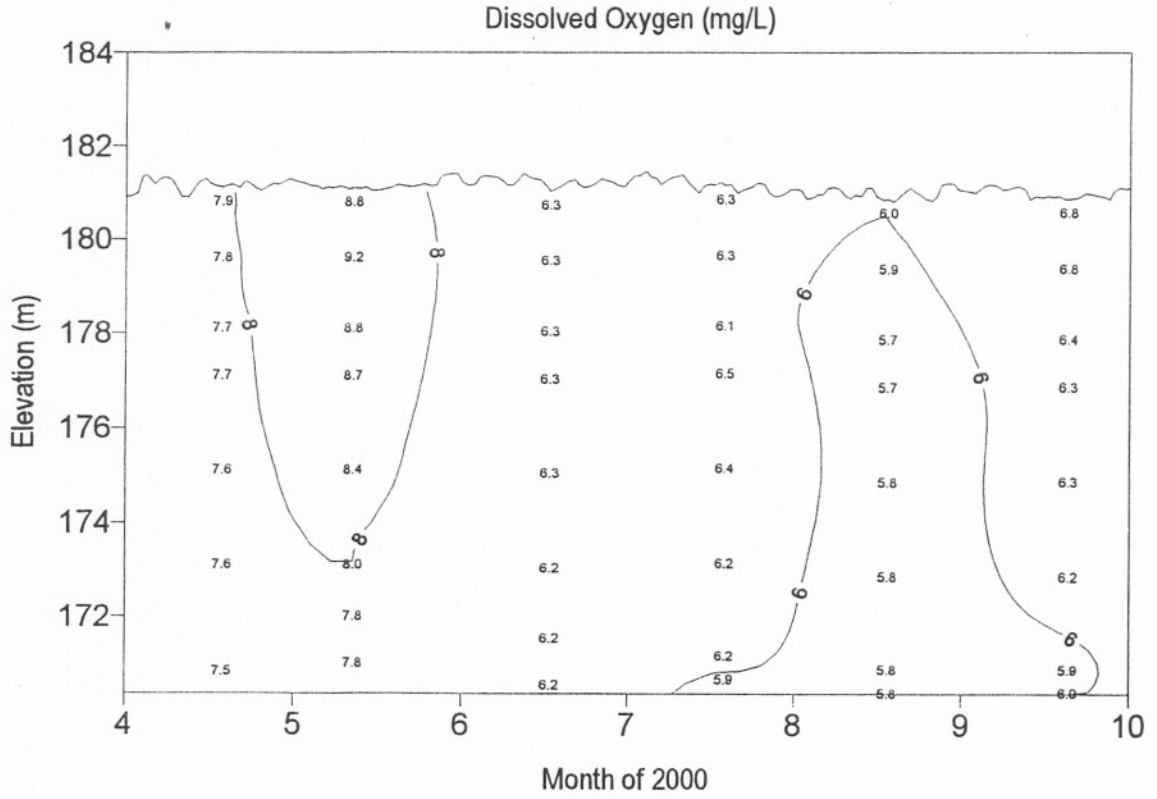
Guntersville Reservoir - TRM 350.0



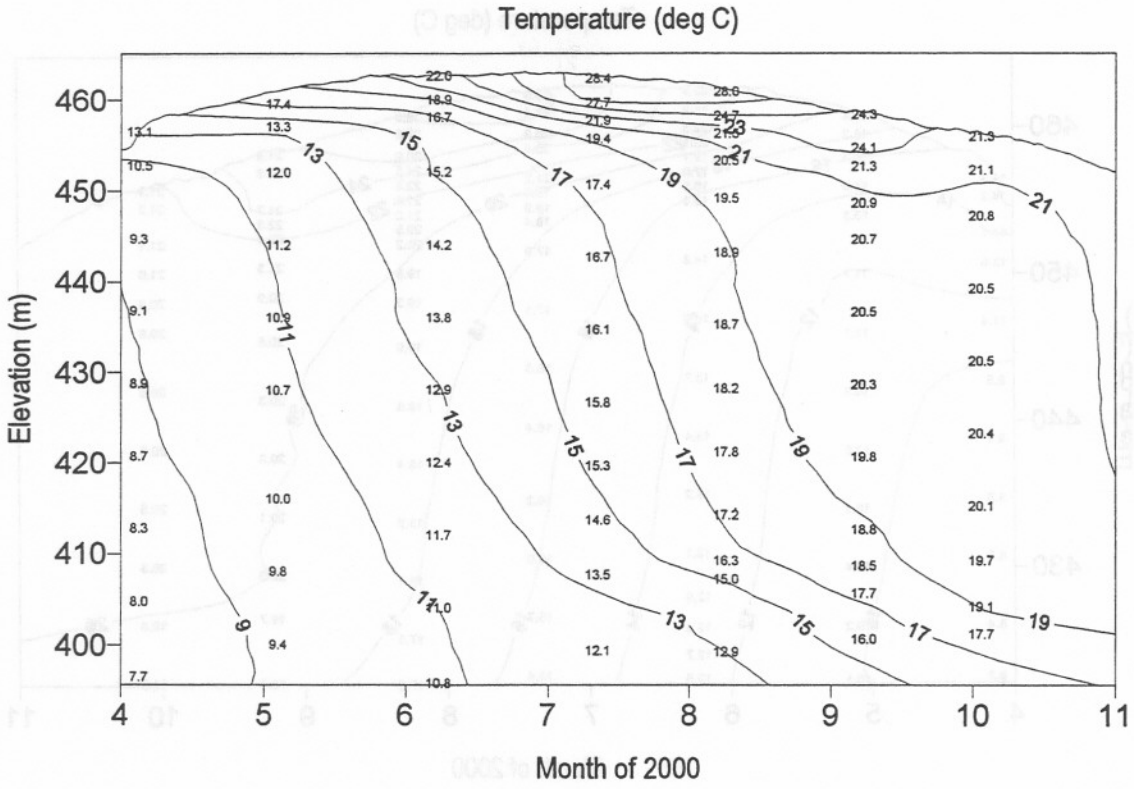


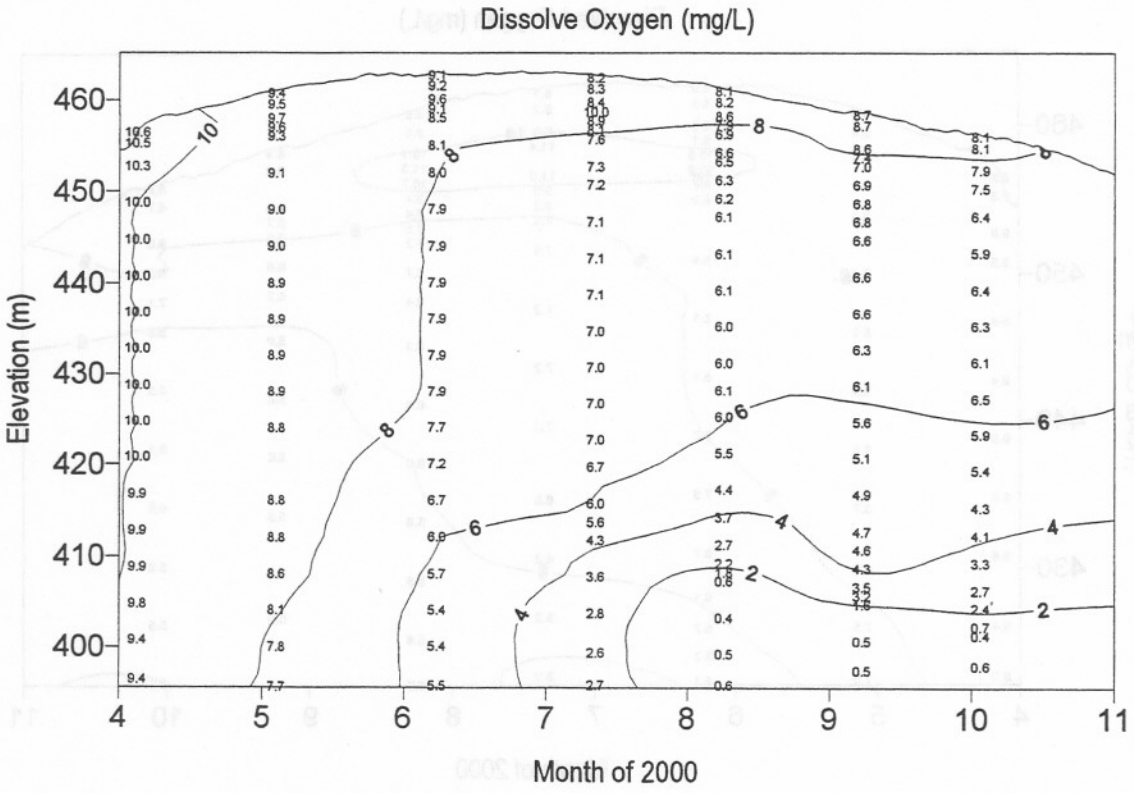
Guntersville Reservoir - TRM 375.2





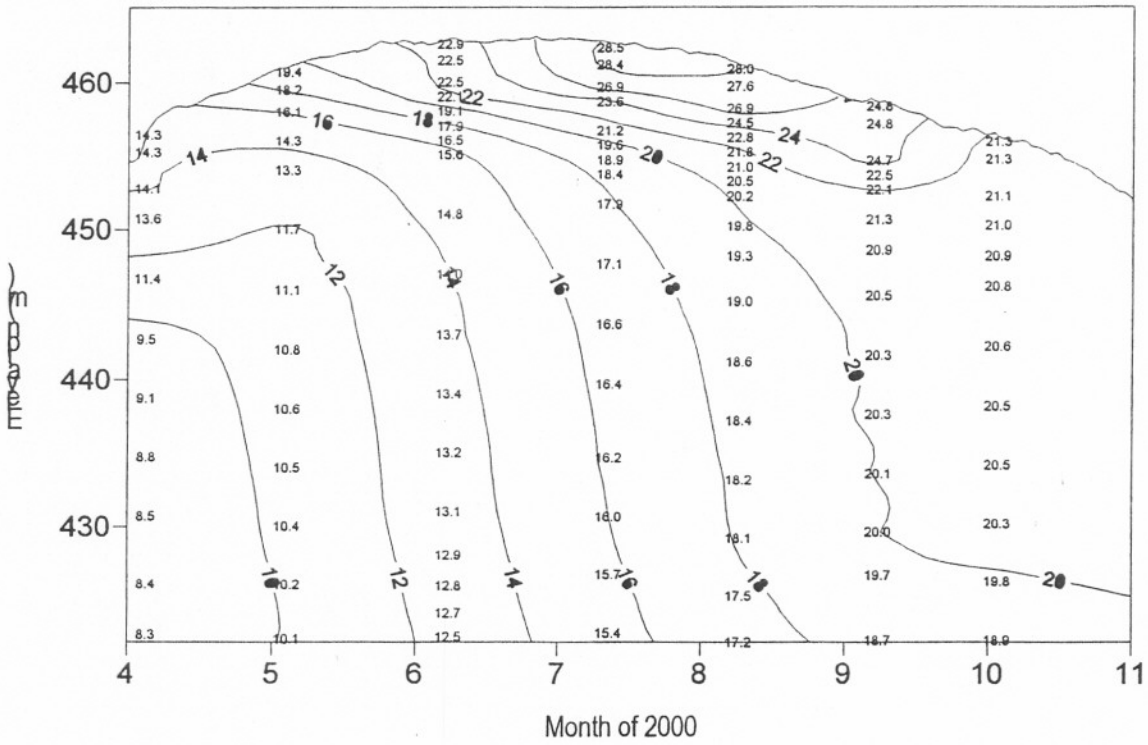
Hiwassee Reservoir - HiRM 77.5



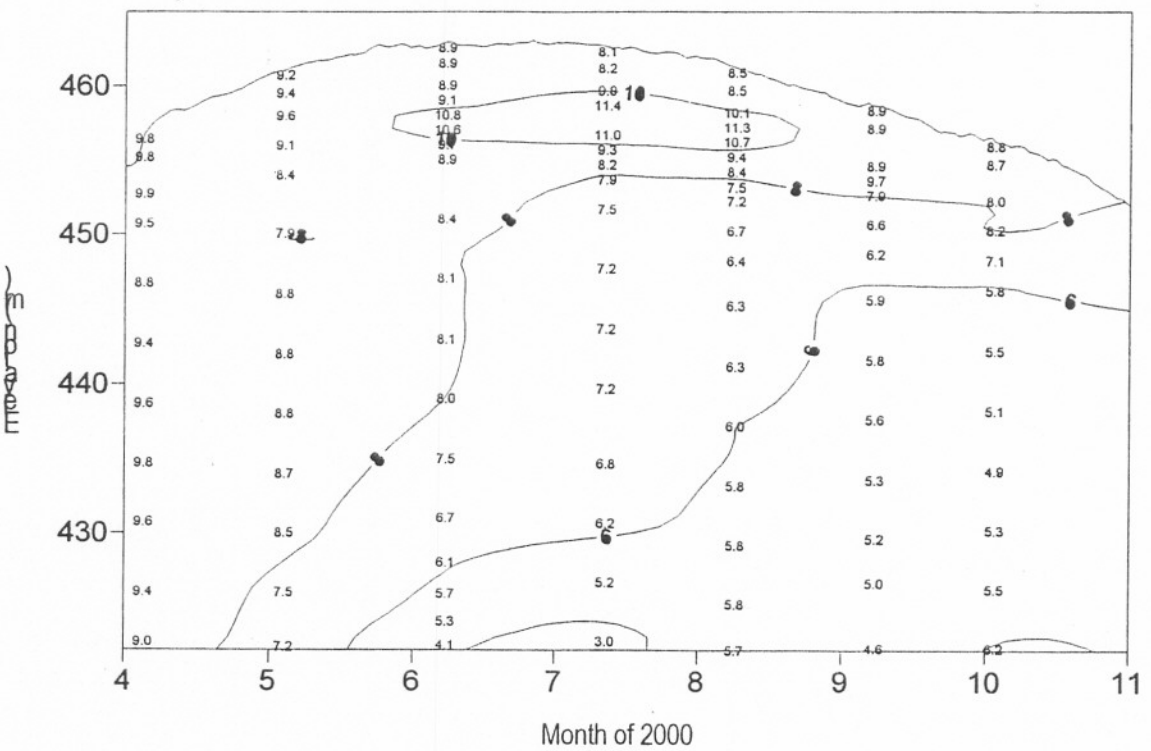


Hiwassee Reservoir - HiRM 85.0

Temperature (deg C)

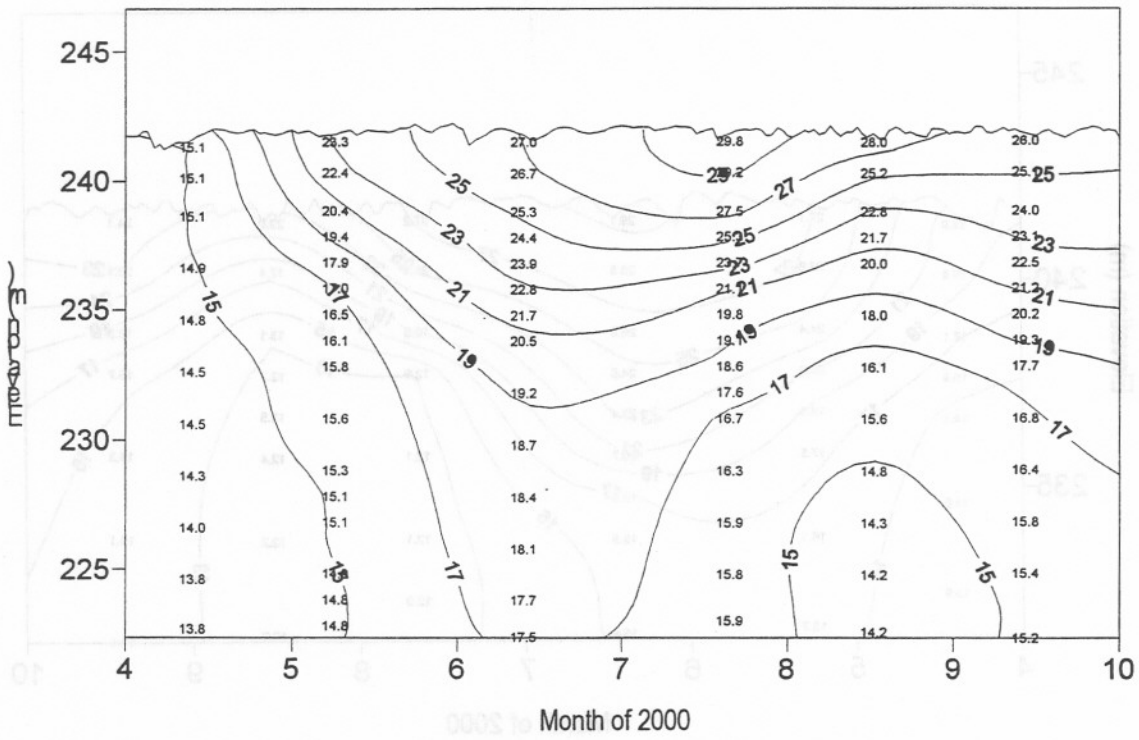


Dissolved Oxygen (mg/L)

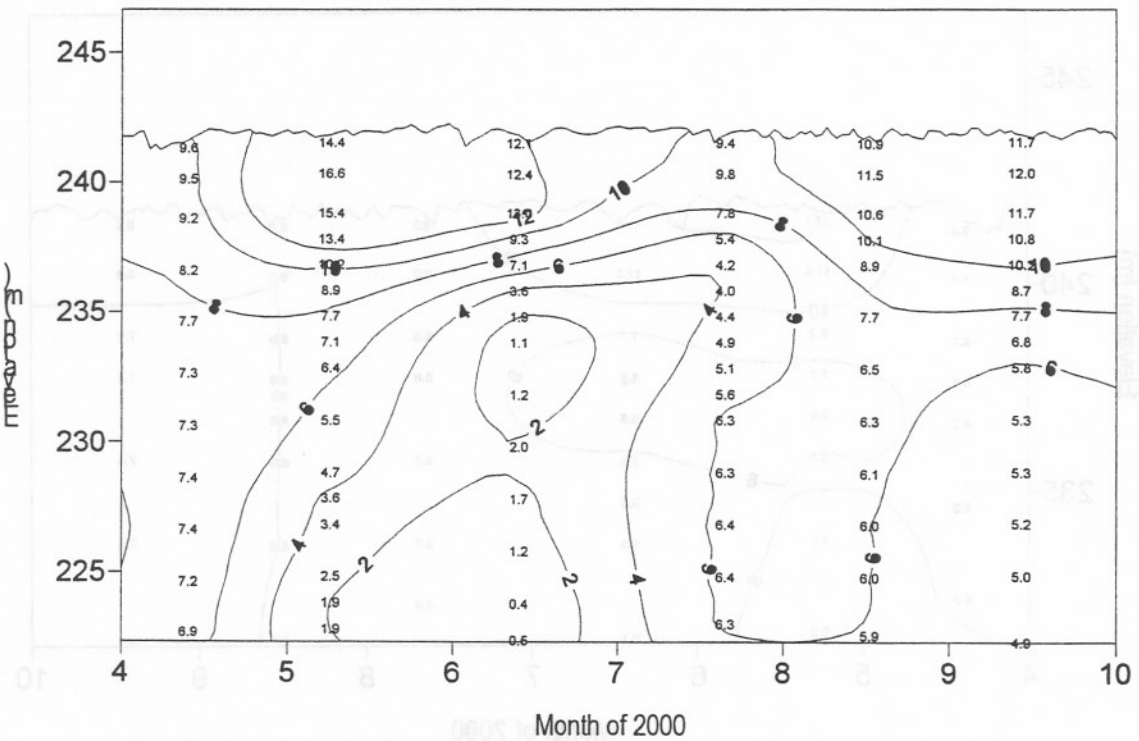


Melton Hill Reservoir - CRM 24.0

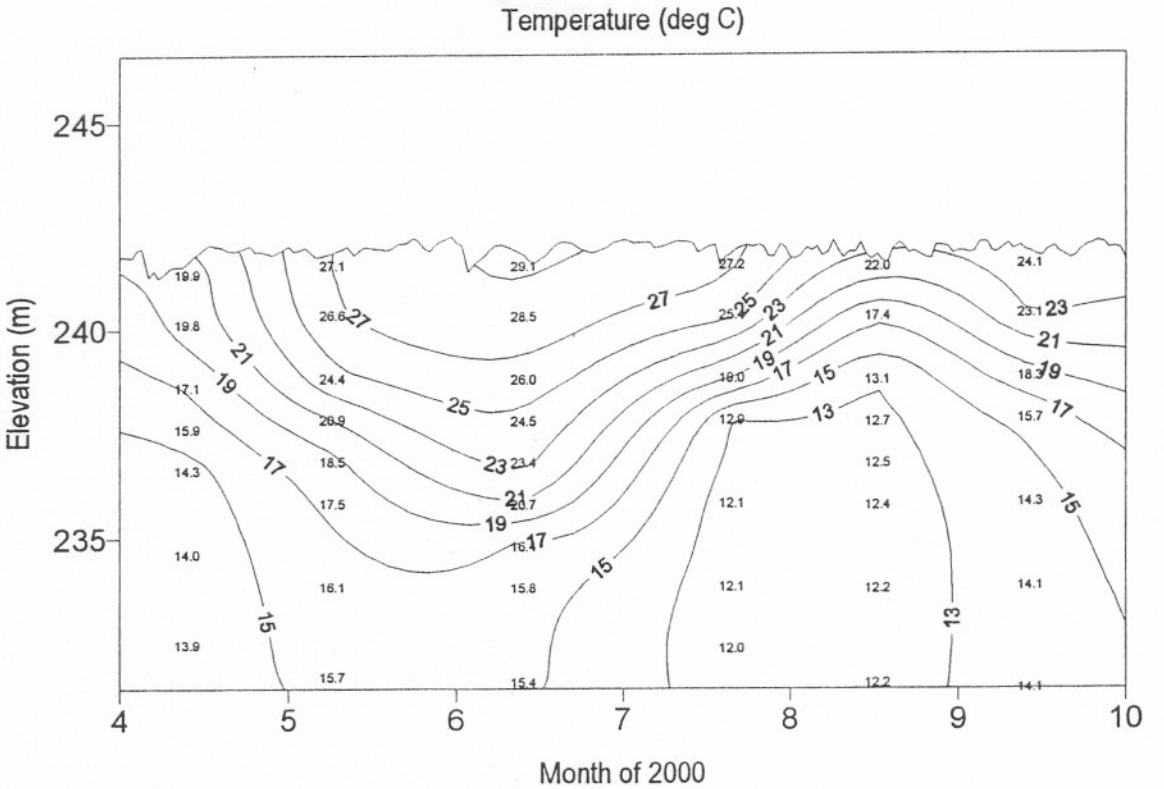
Temperature (deg C)

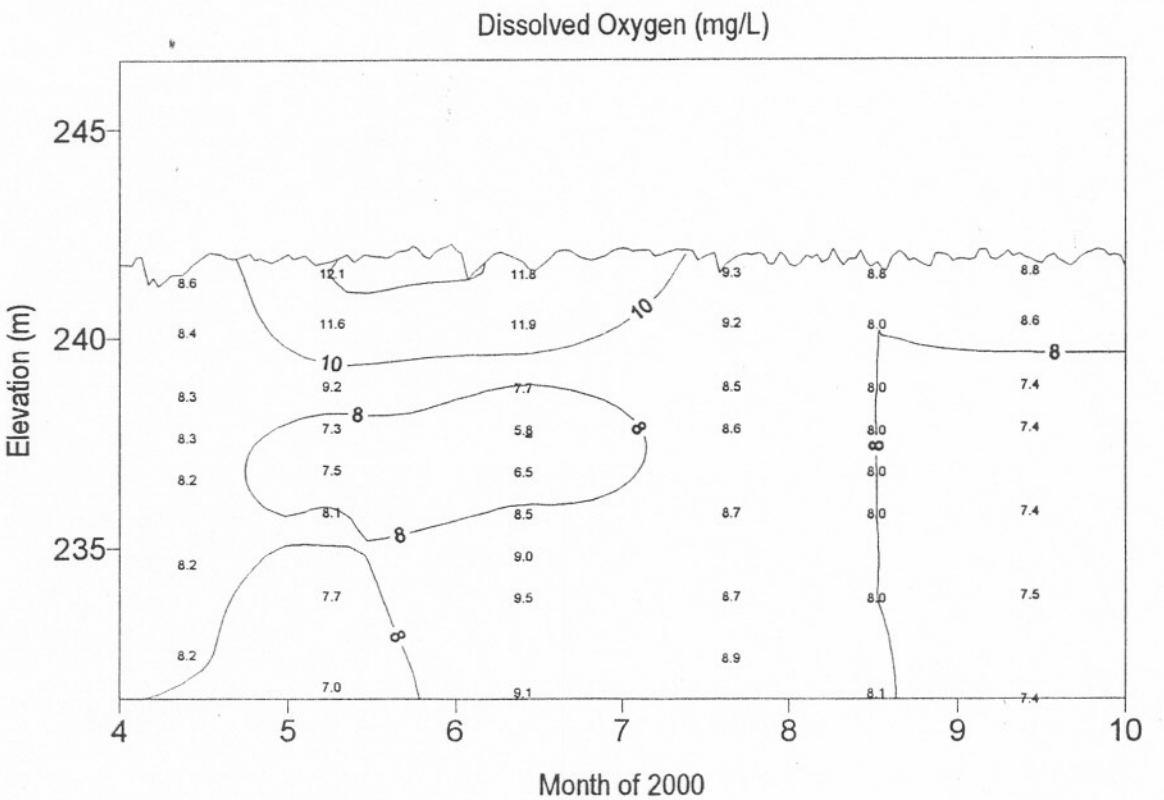


Dissolved Oxygen

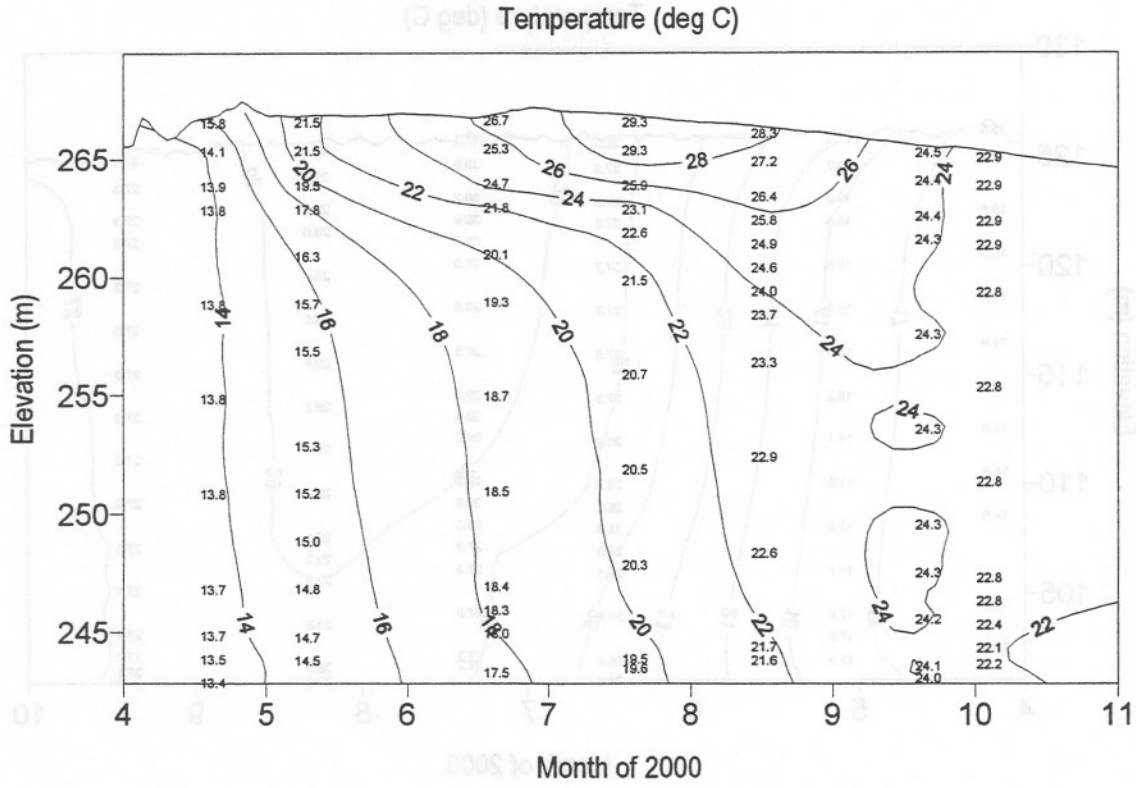


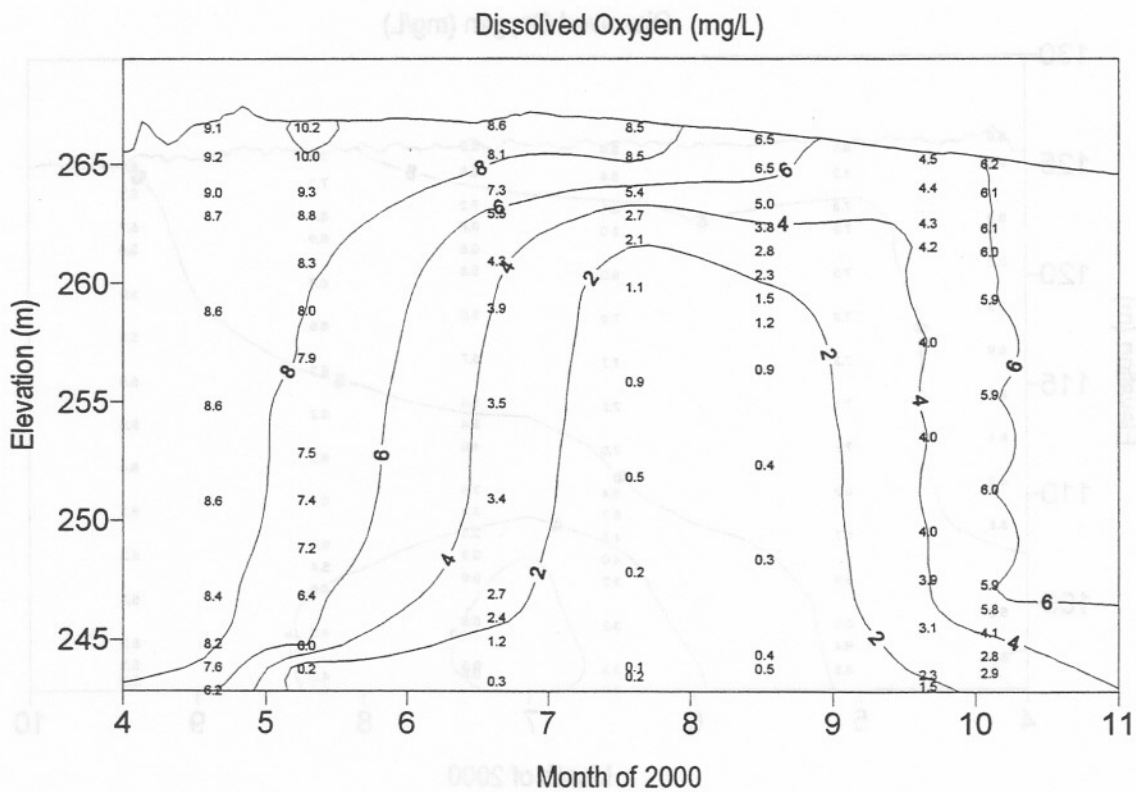
Melton Hill Reservoir - CRM 45.0



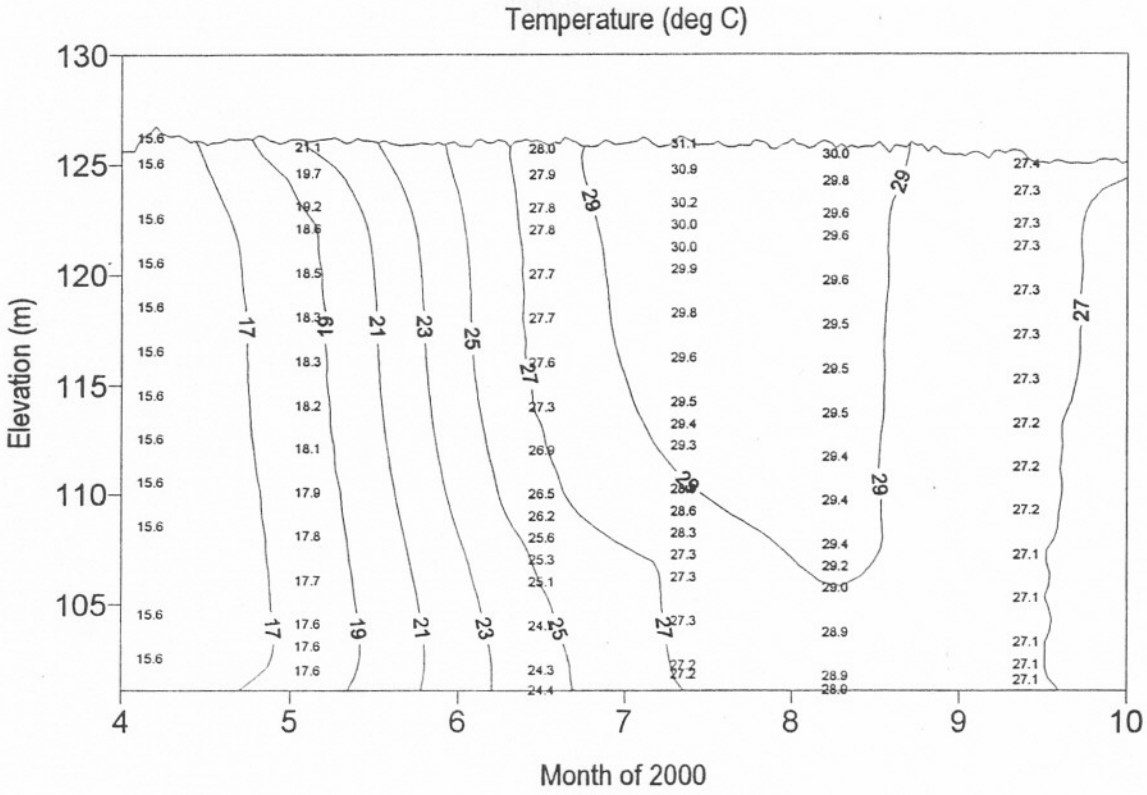


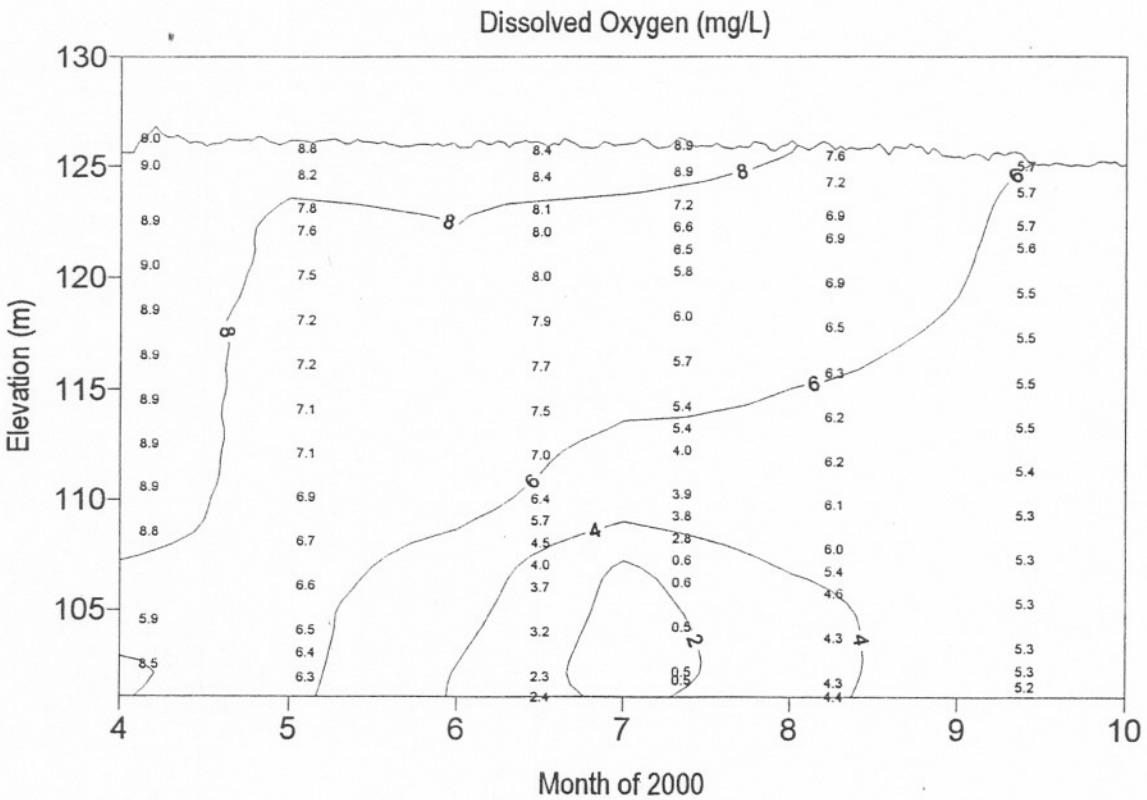
Normandy Forebay - DRM 249.5



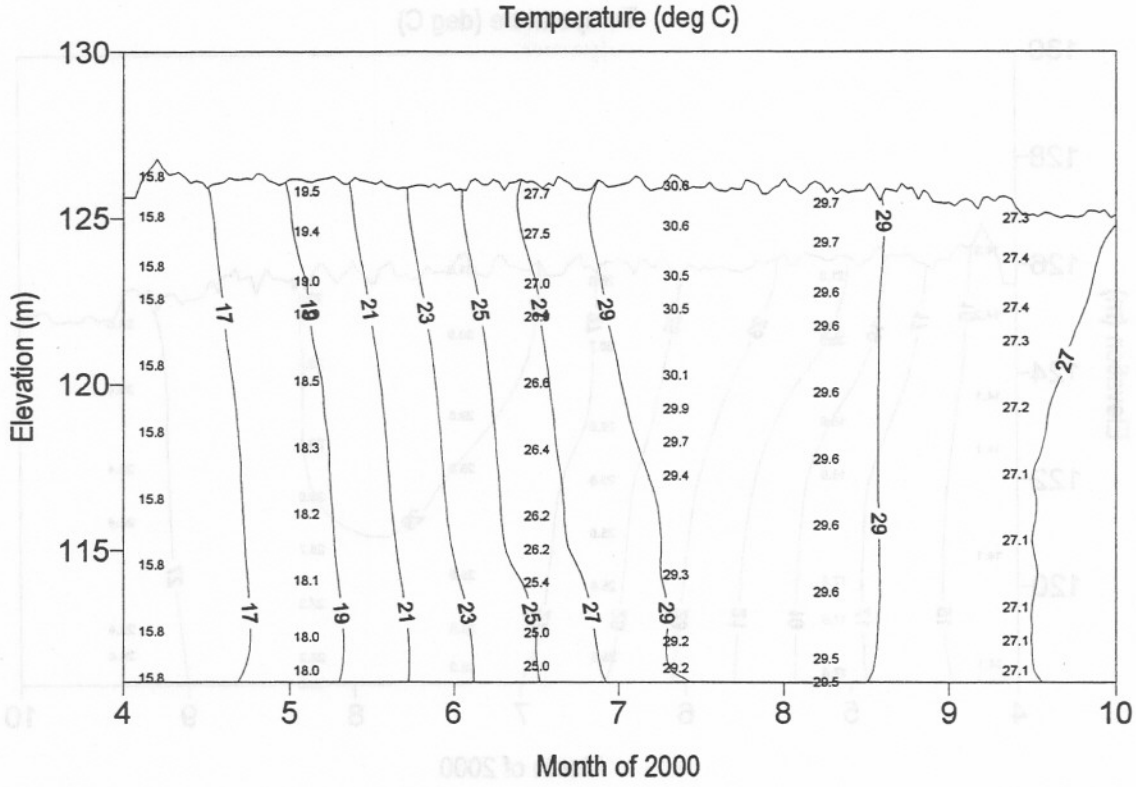


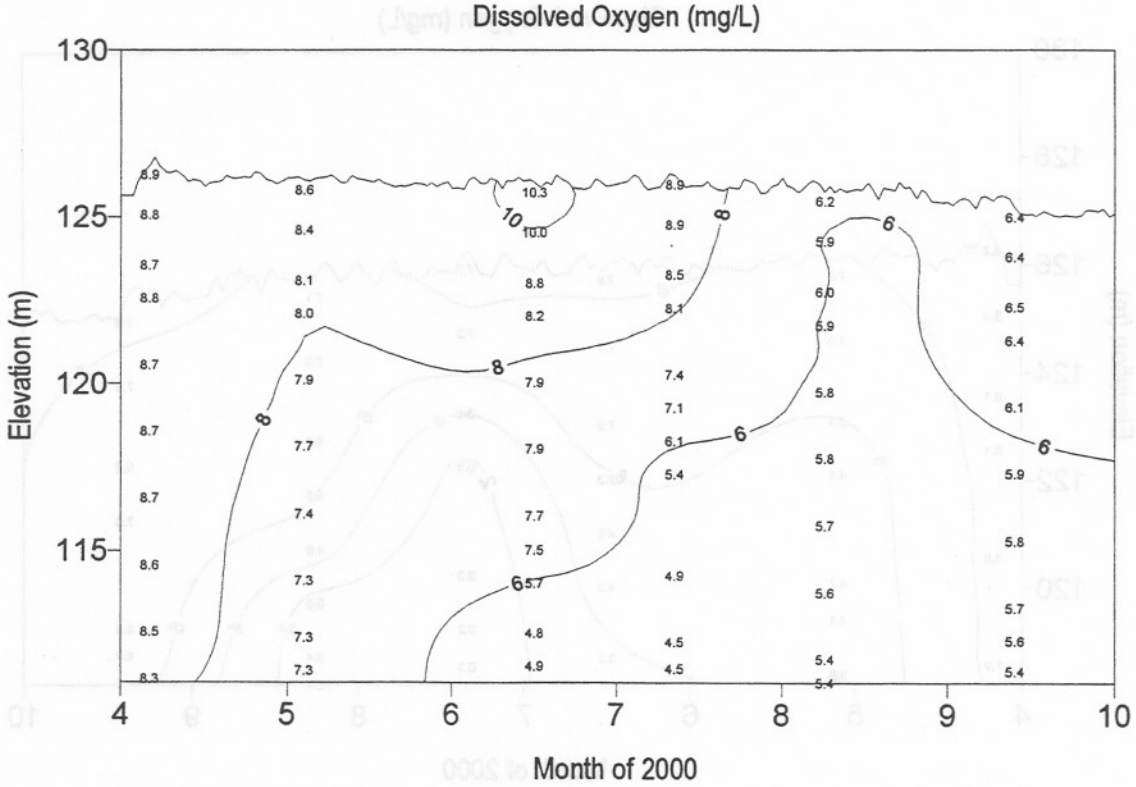
Pickwick Reservoir - TRM 207.3



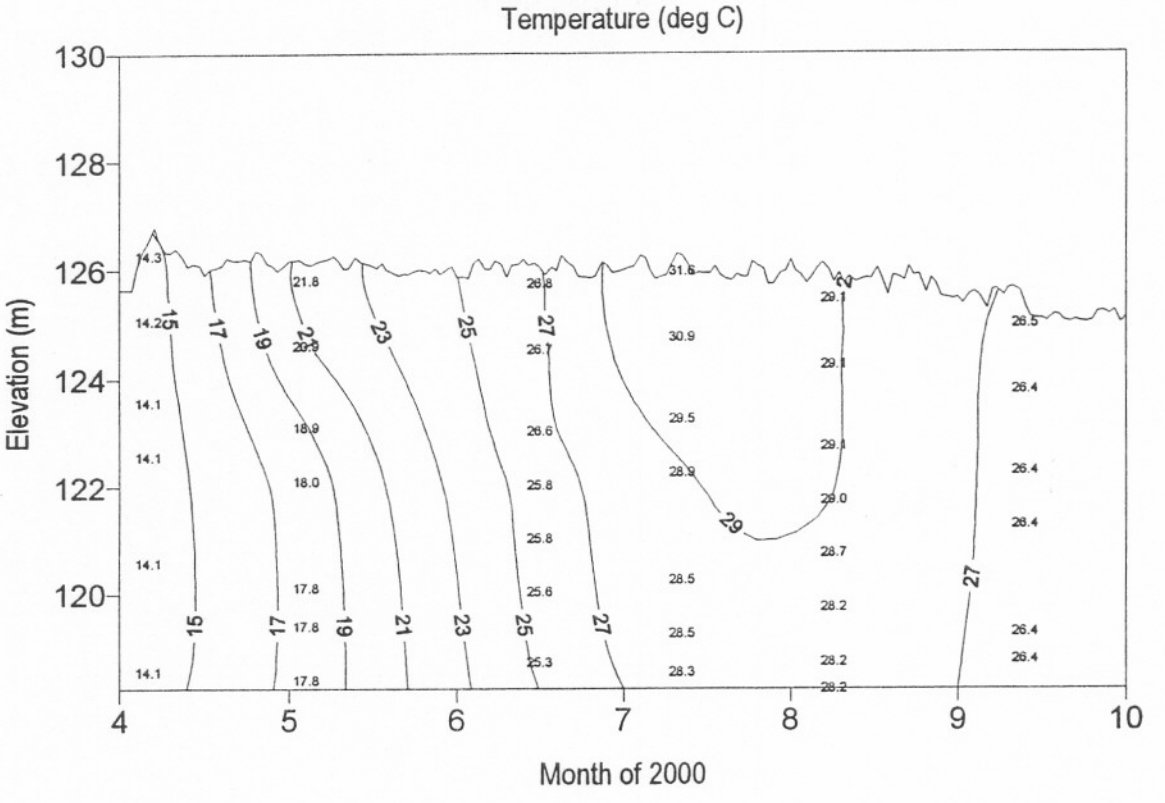


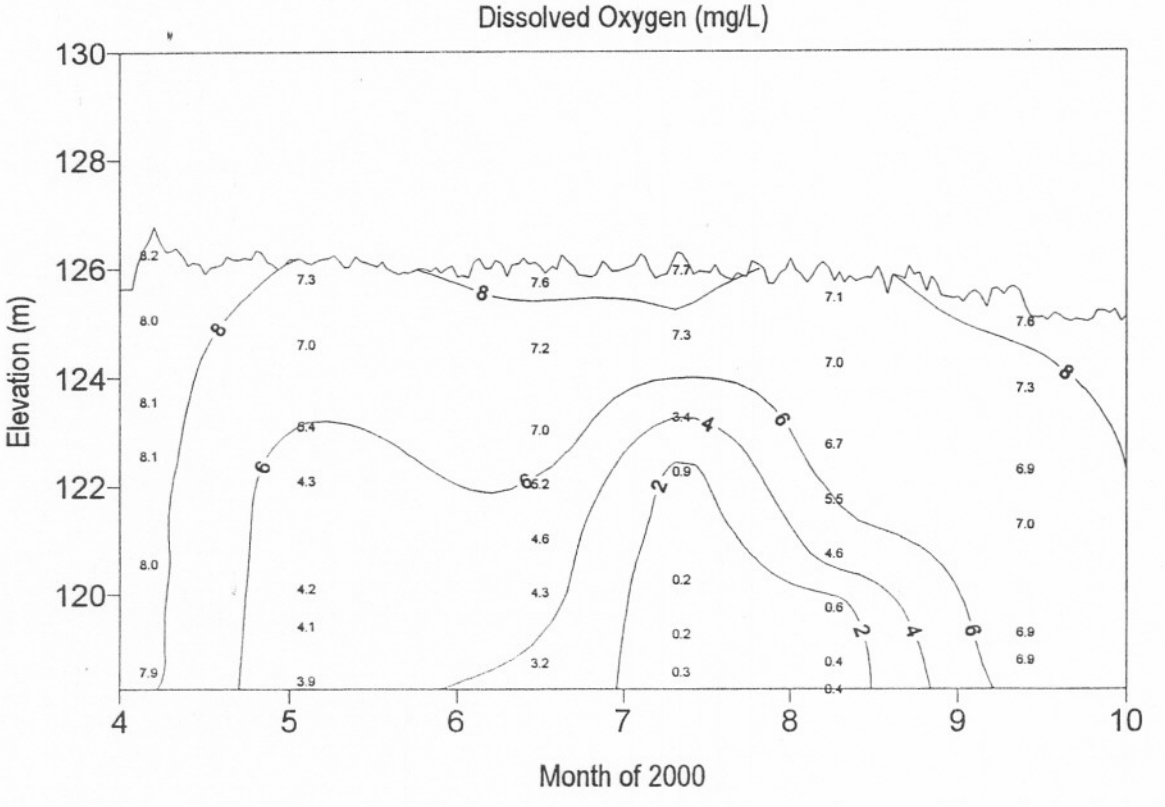
Pickwick Reservoir - TRM 230.0



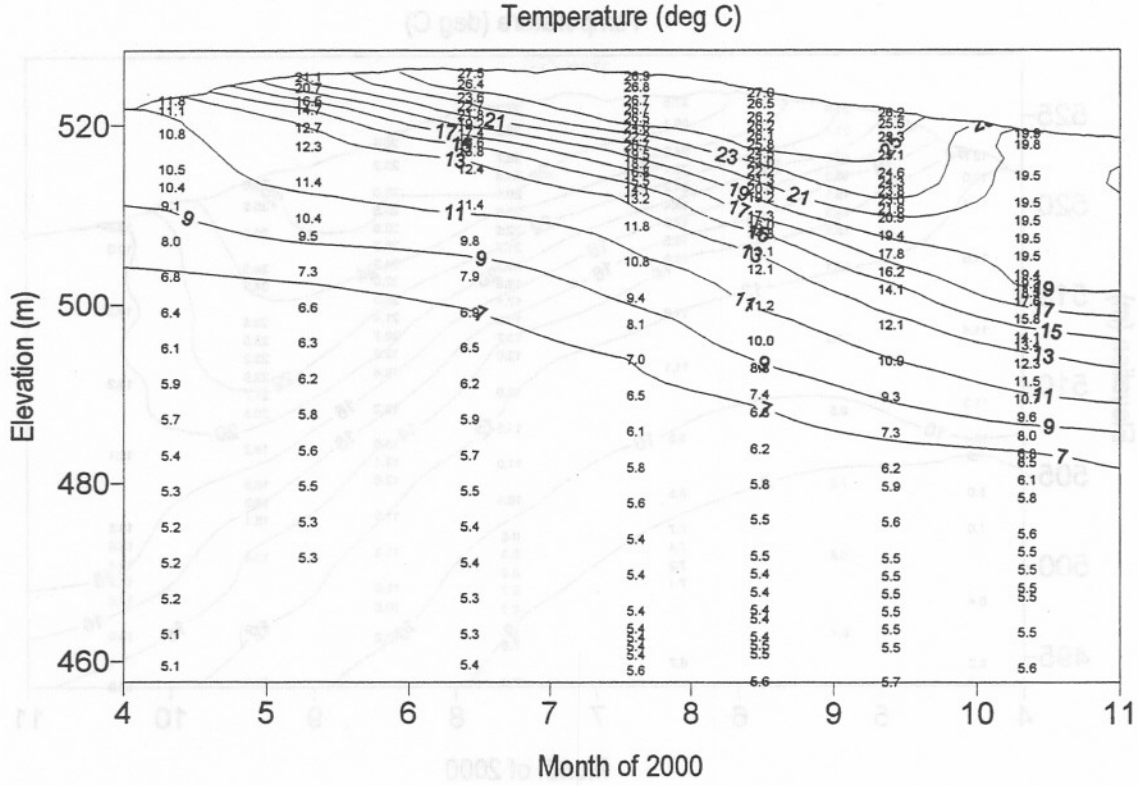


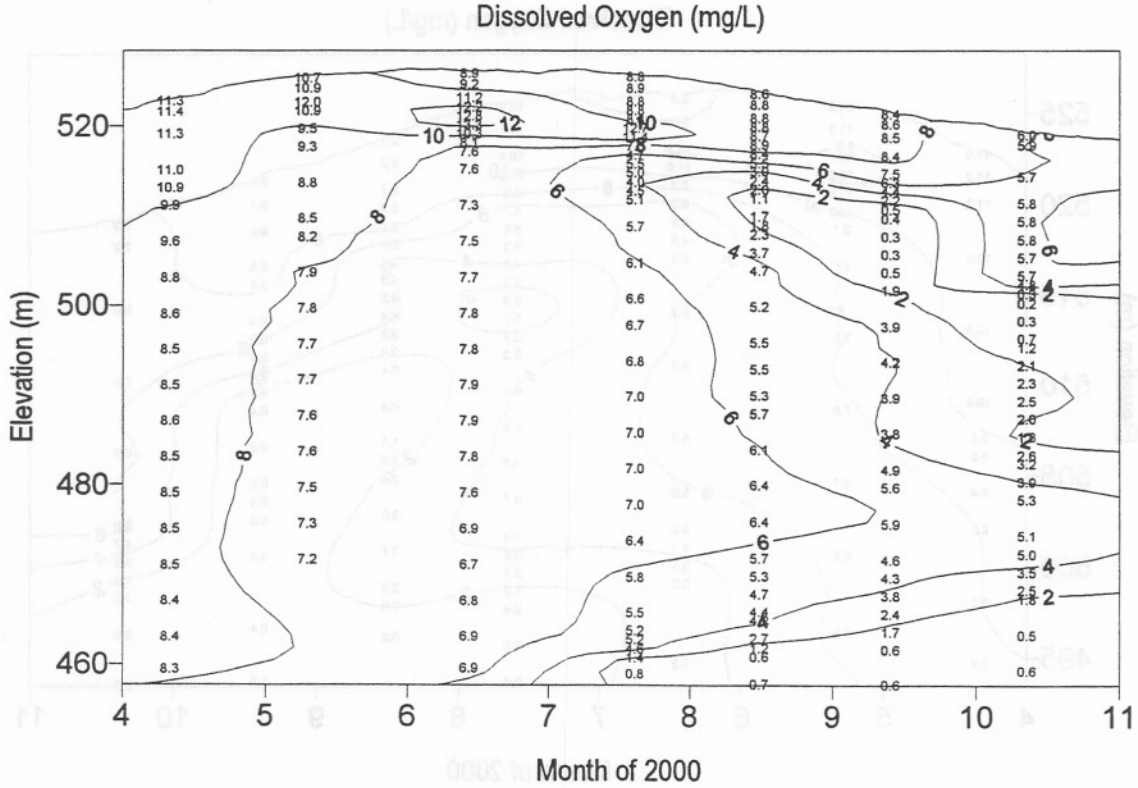
Pickwick Reservoir - BCM 8.4



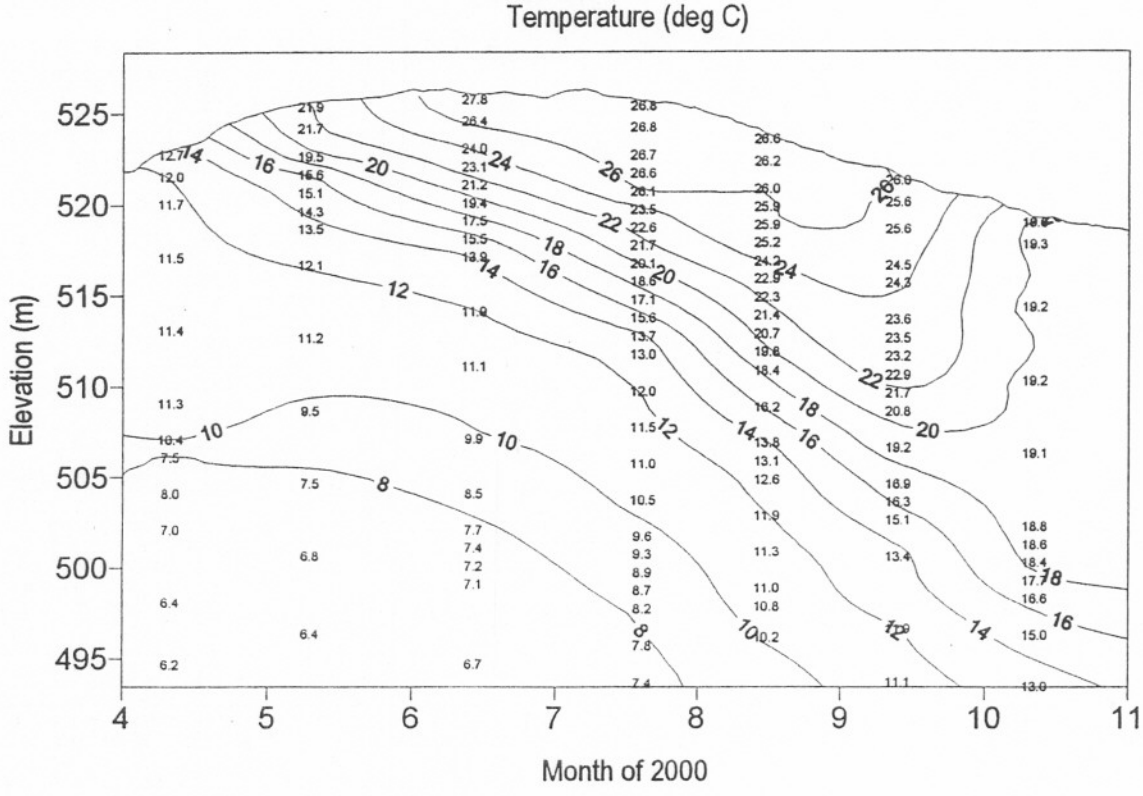


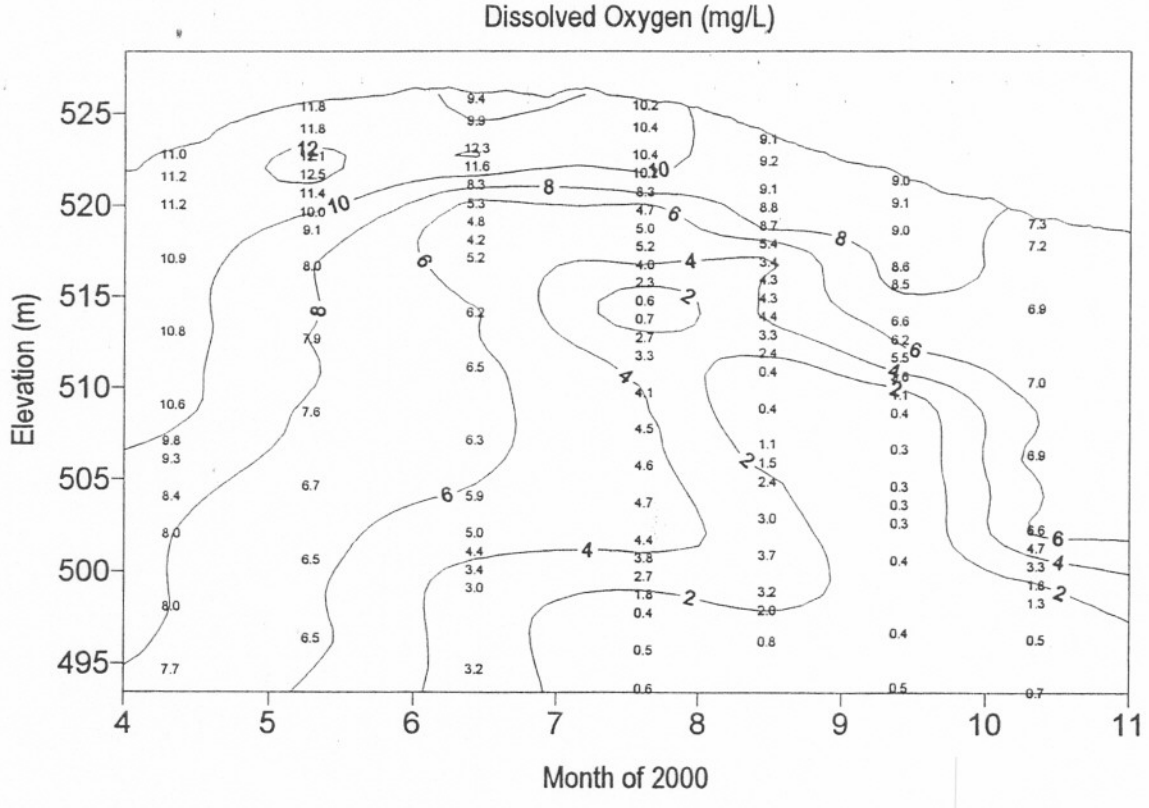
South Holston Reservoir - SFHRM 51.0



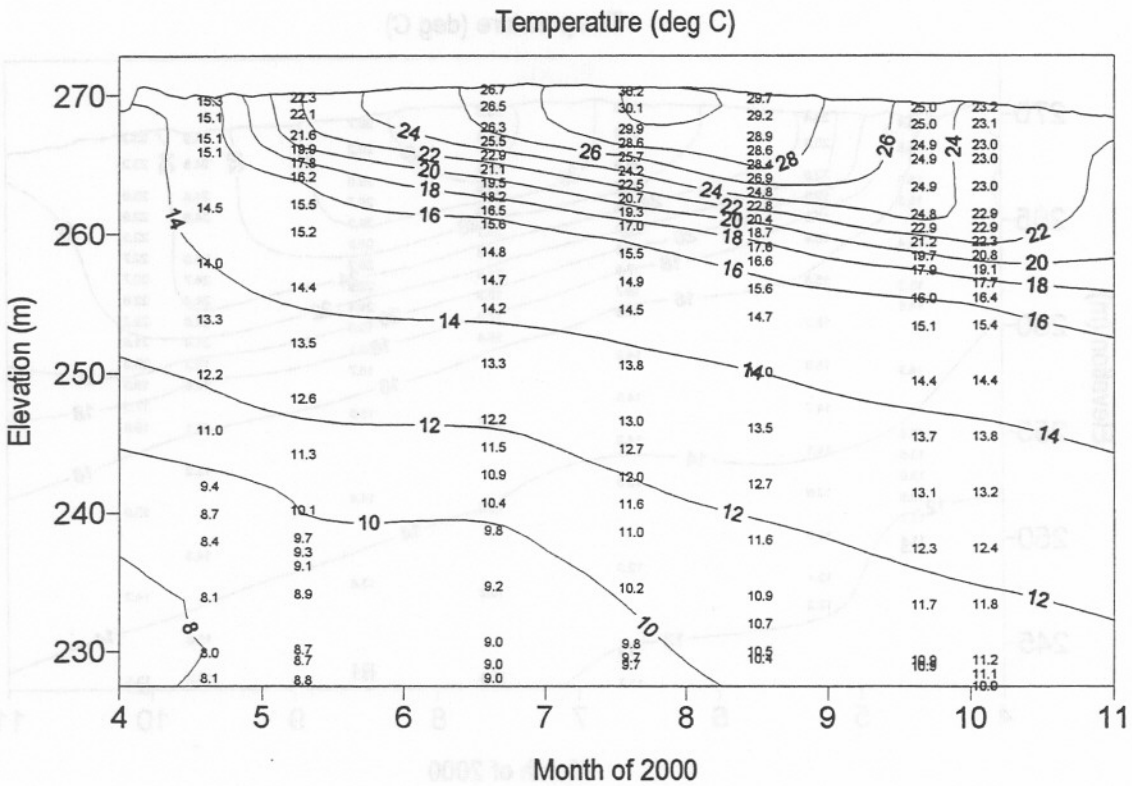


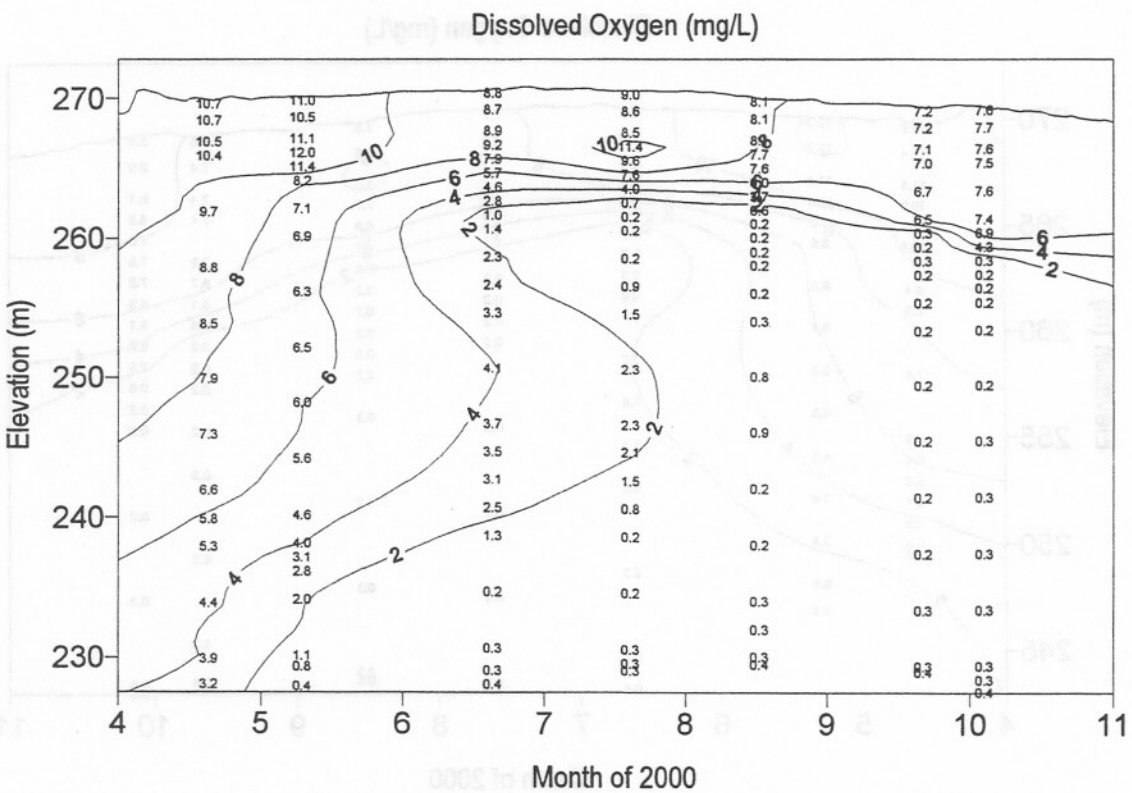
South Holston Reservoir - SFHRM 62.5



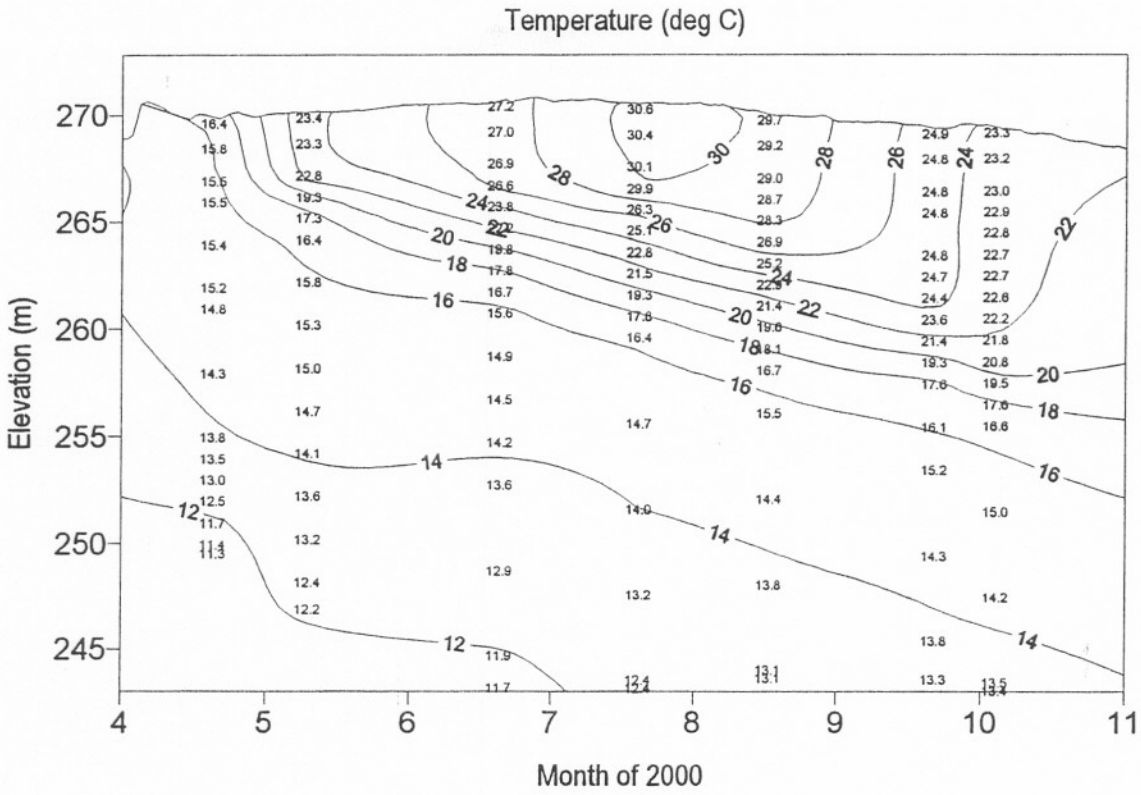


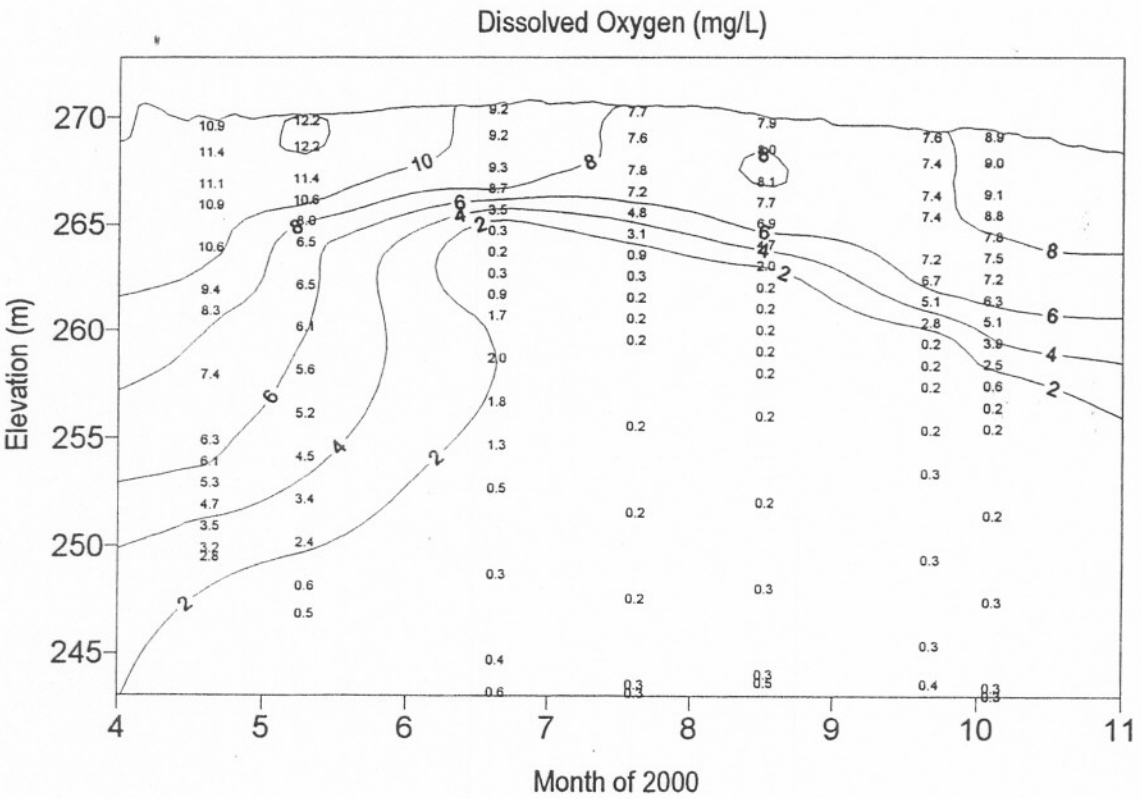
Tims Ford Reservoir - ERM 135.0





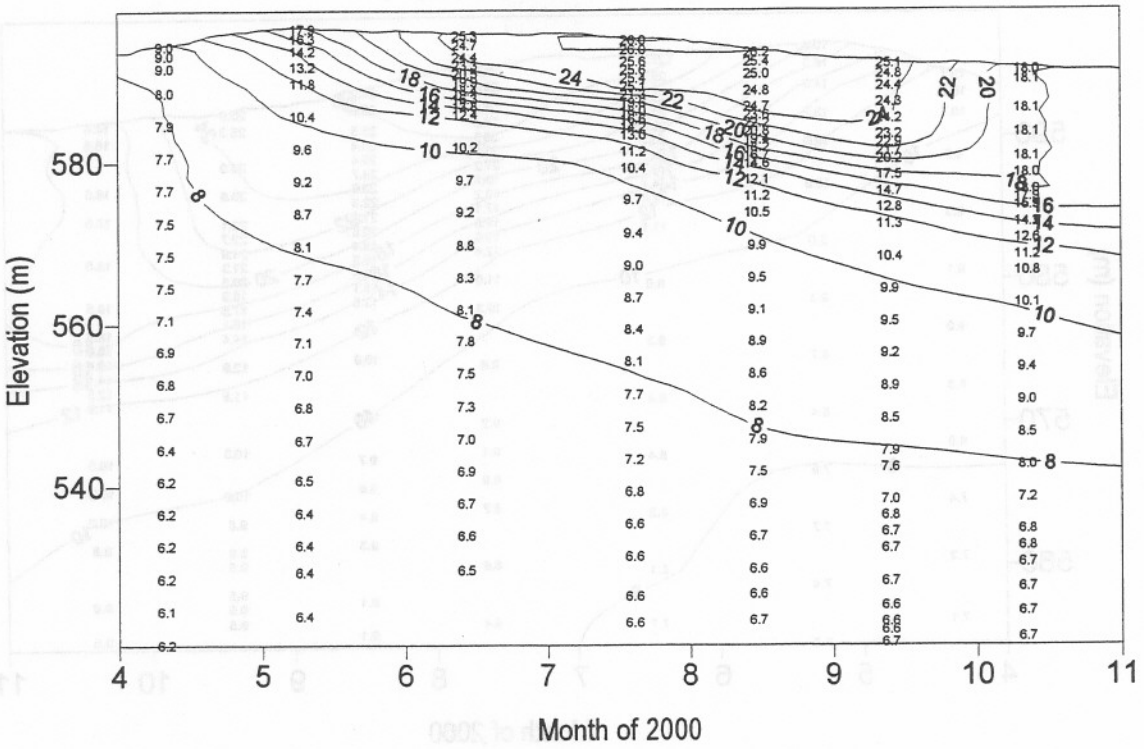
Tims Ford Reservoir - ERM 150.0



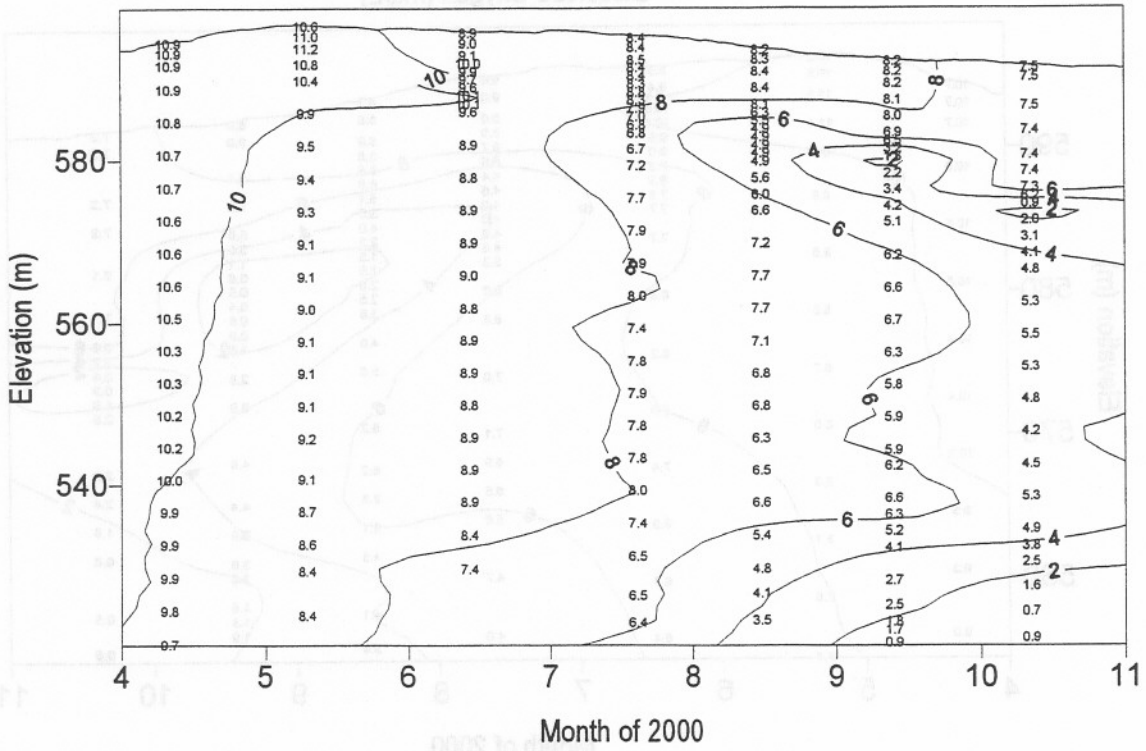


Watauga Reservoir - WRM 37.4

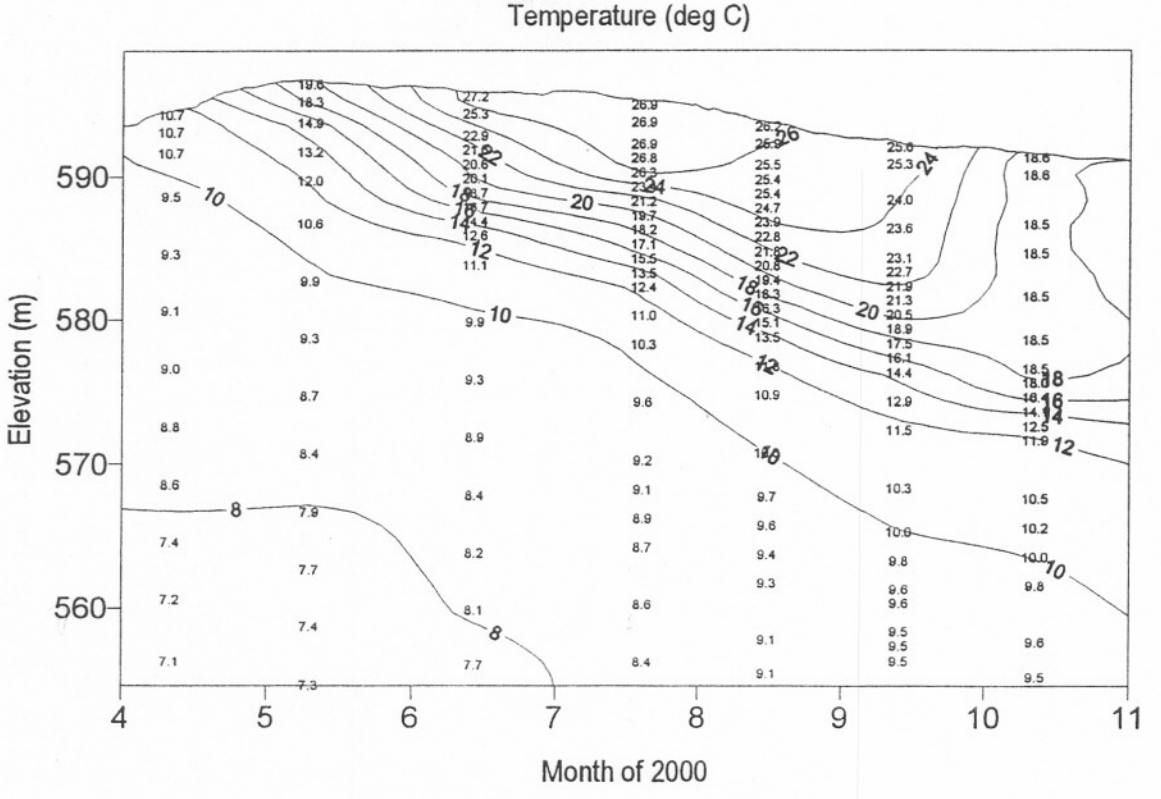
Temperature (deg C)

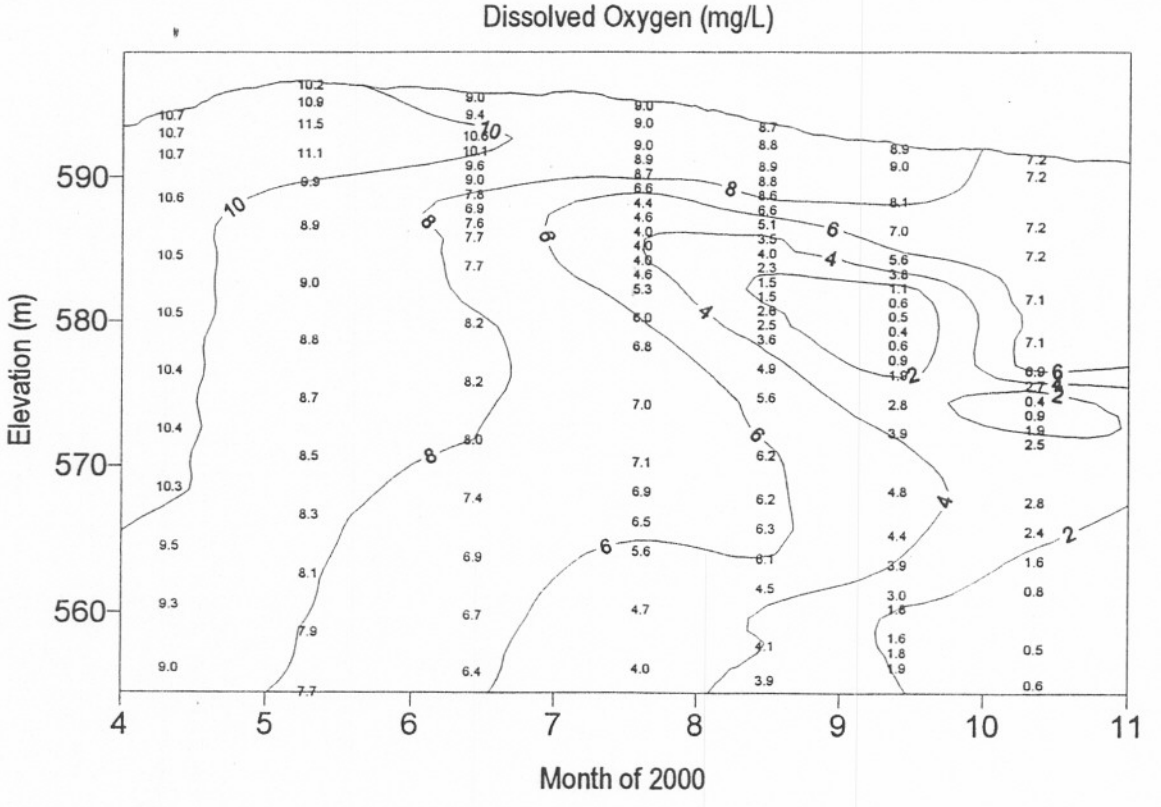


Dissolved Oxygen (mg/L)

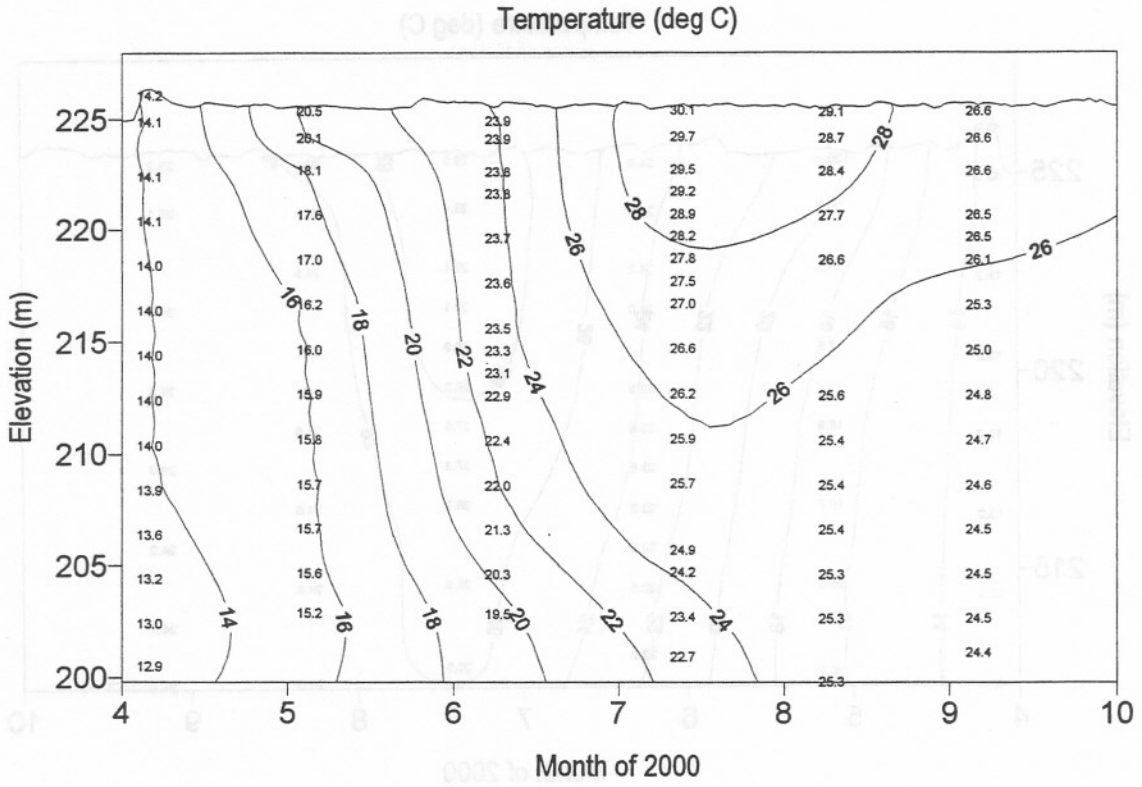


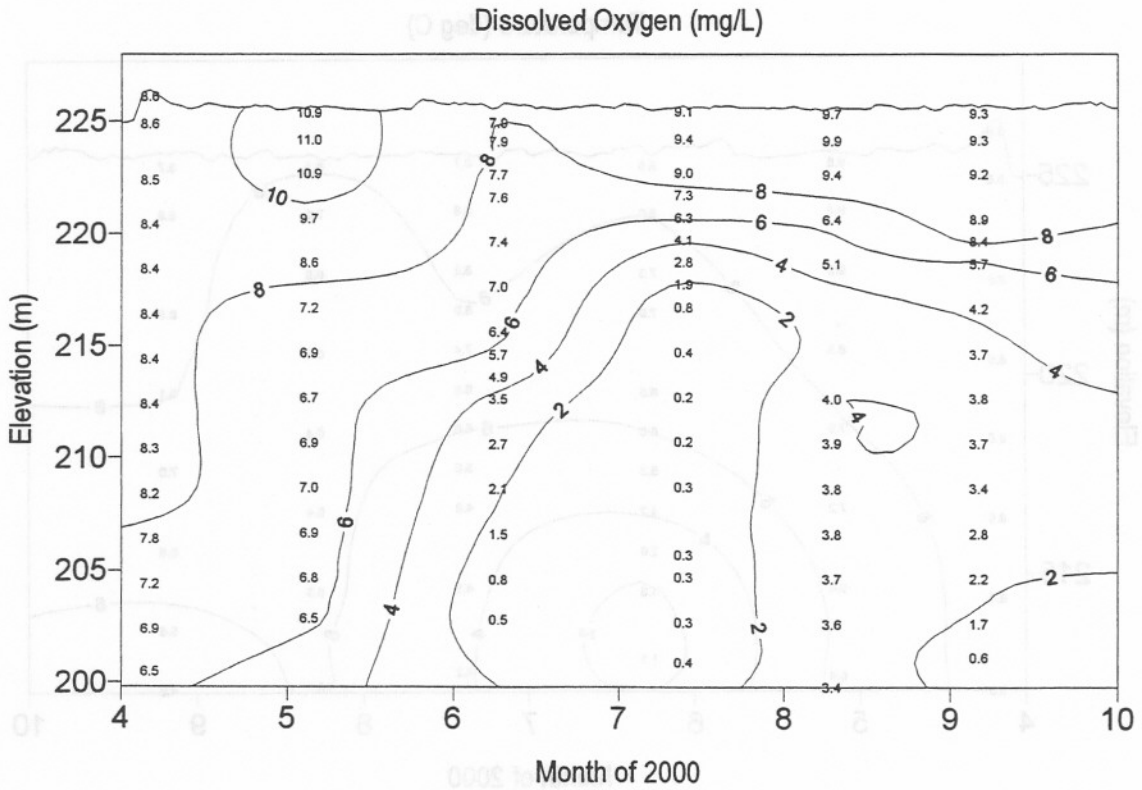
Watauga Reservoir - WRM 45.5



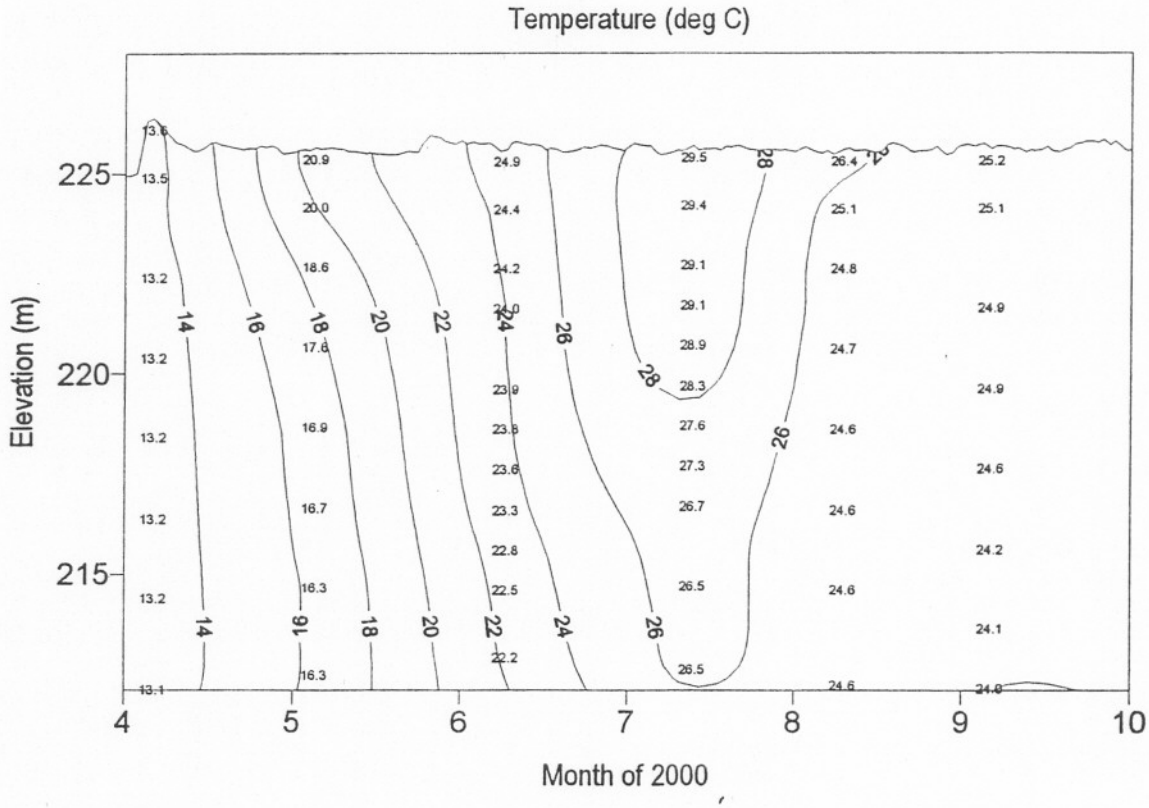


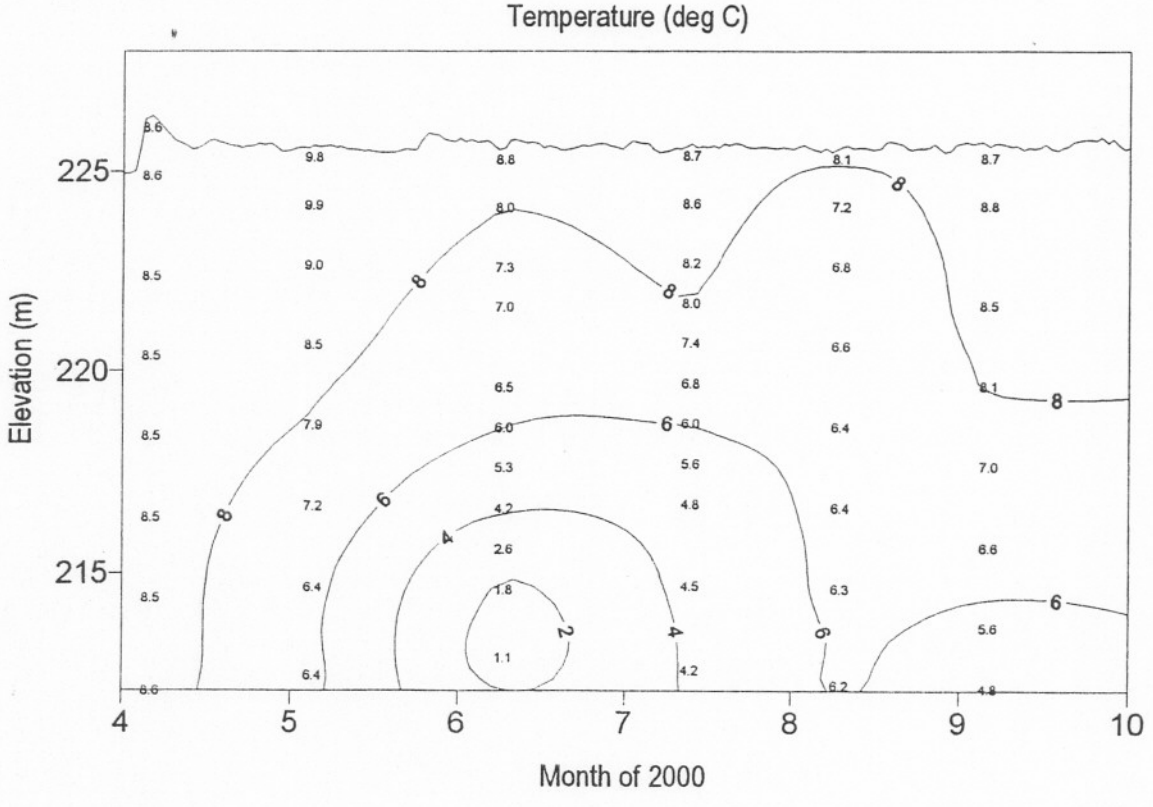
Watts Bar Reservoir - TRM 532.5



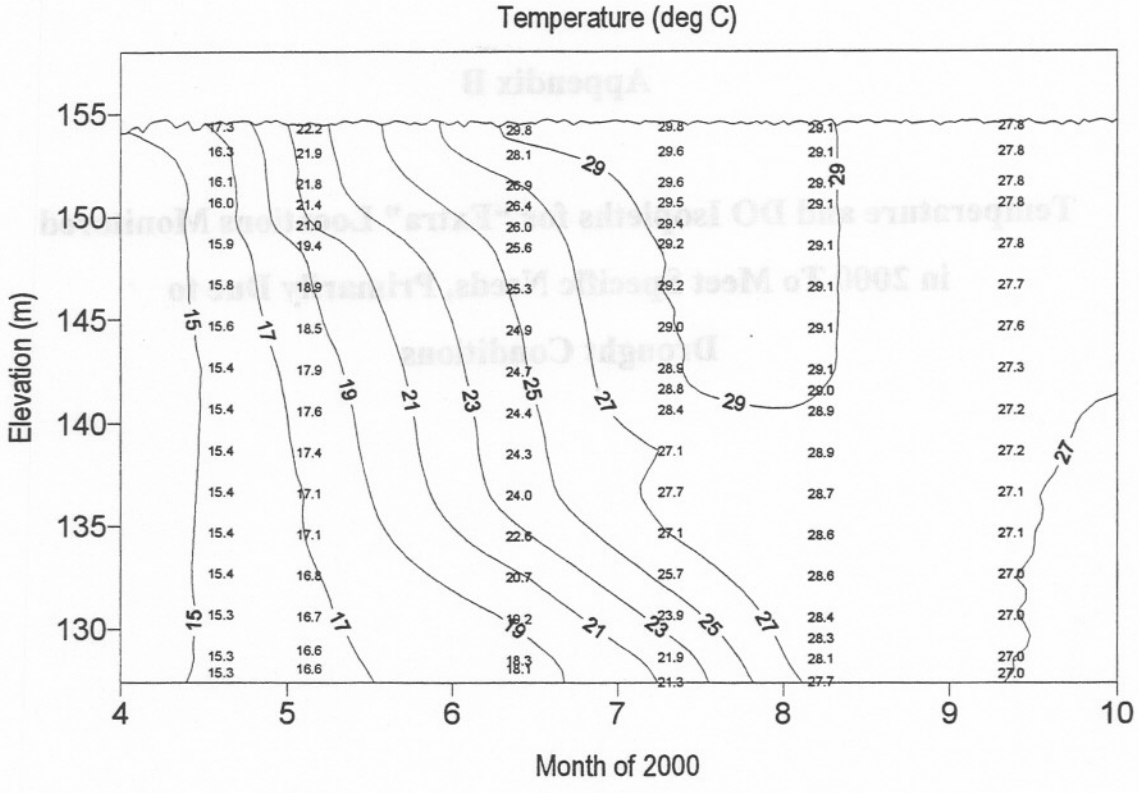


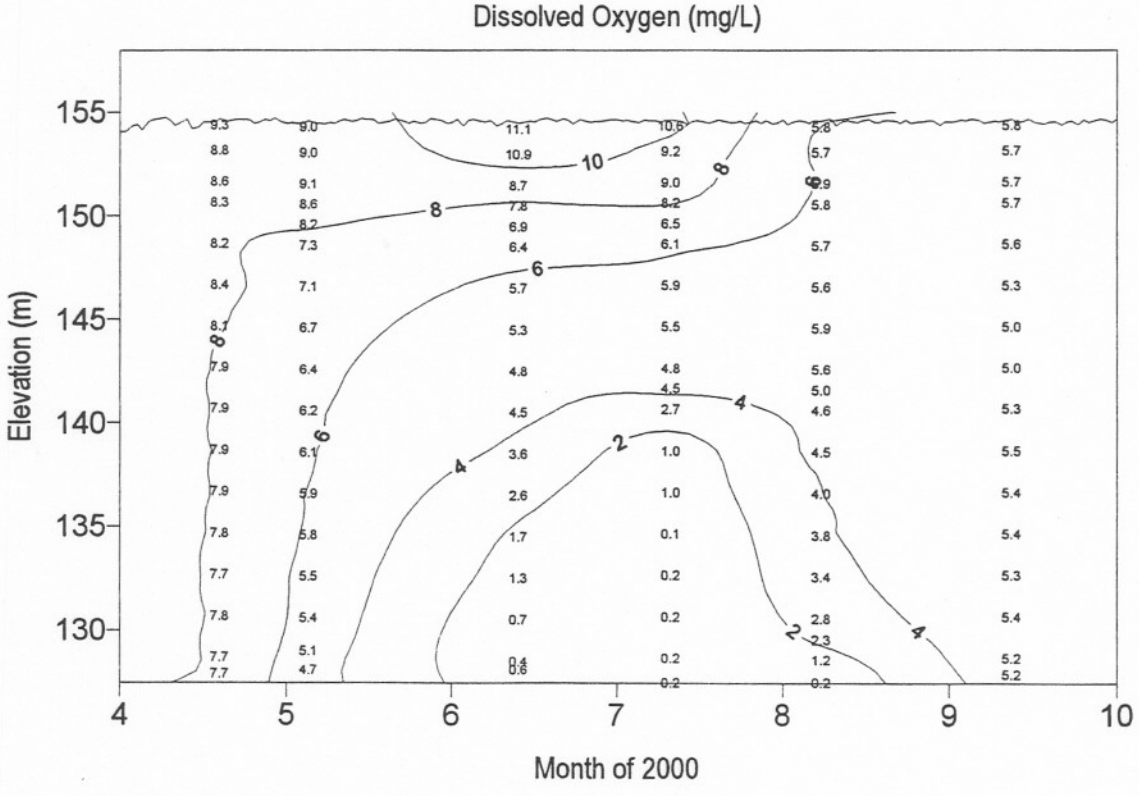
Watts Bar Reservoir - TRM 560.8





Wilson Reservoir - TRM 260.8

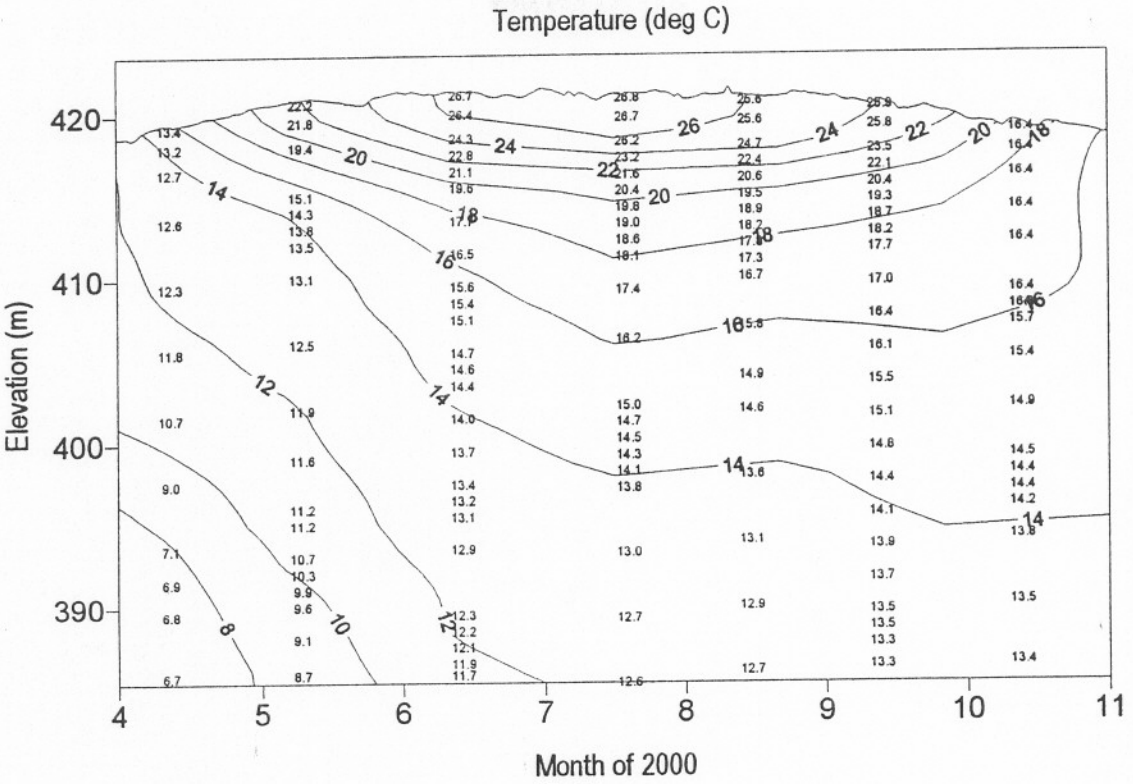


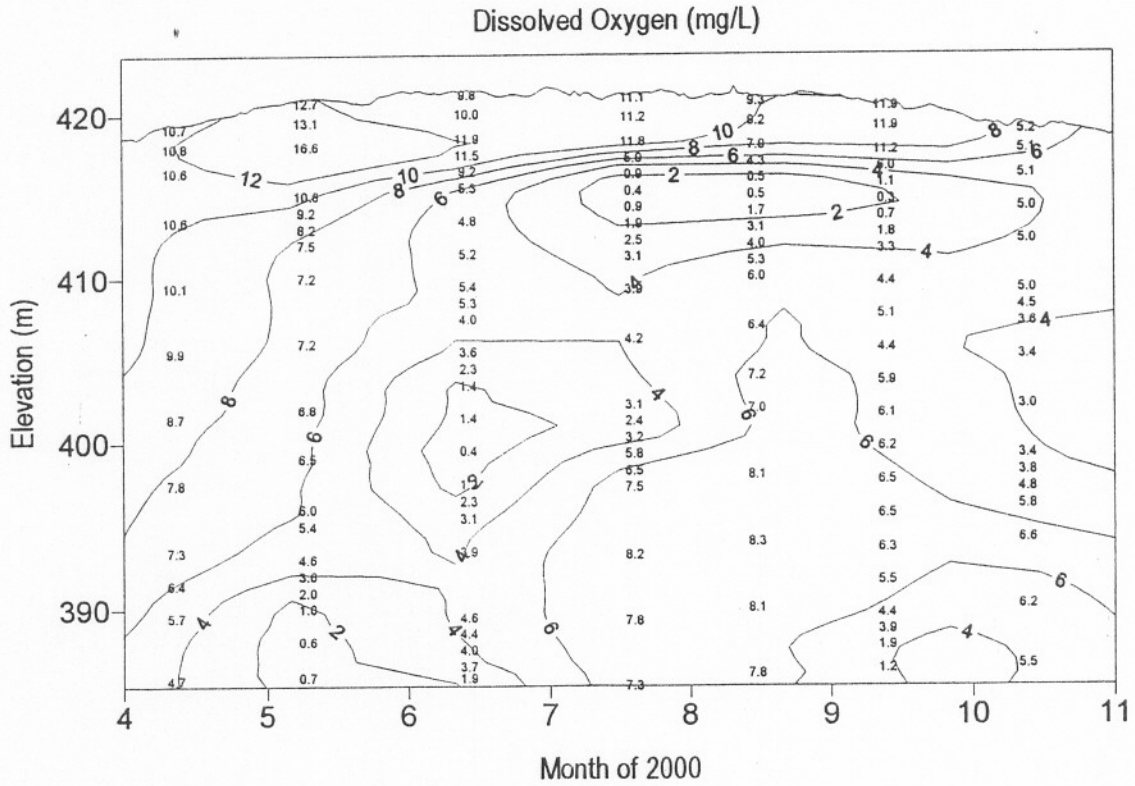


Appendix B

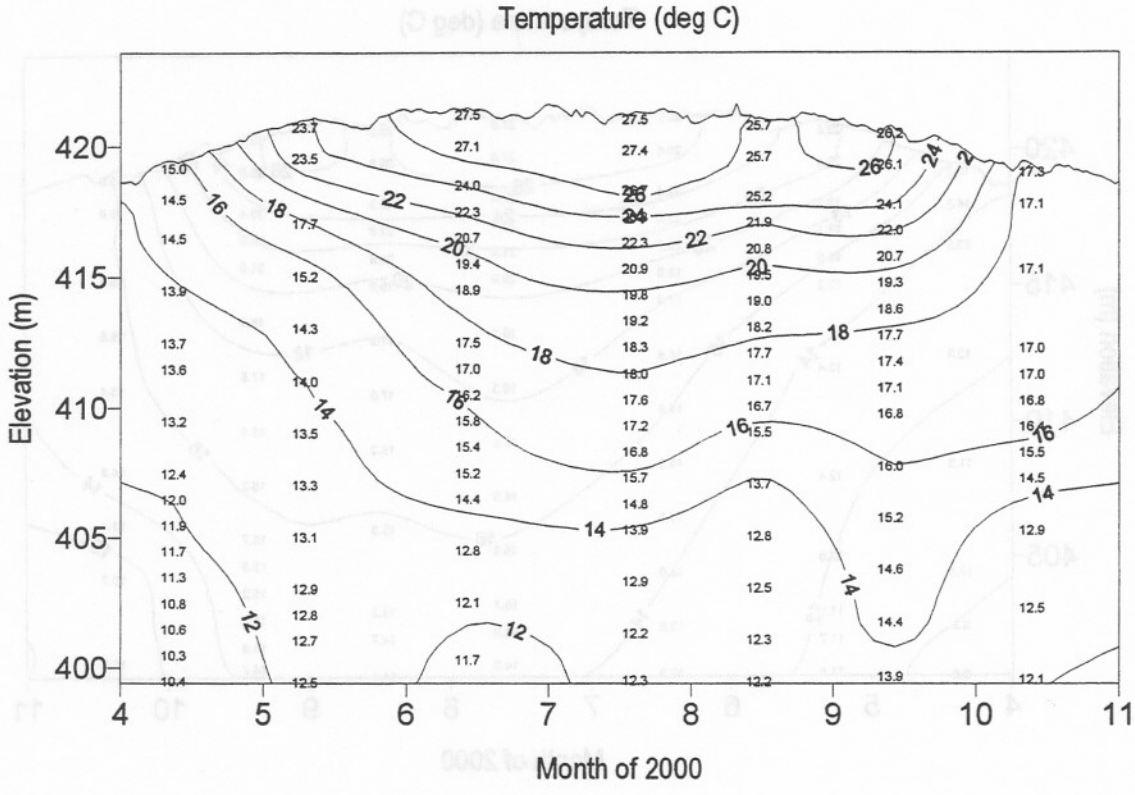
Temperature and DO Isopleths for "Extra" Locations Monitored in 2000 To Meet Specific Needs, Primarily Due to Drought Conditions

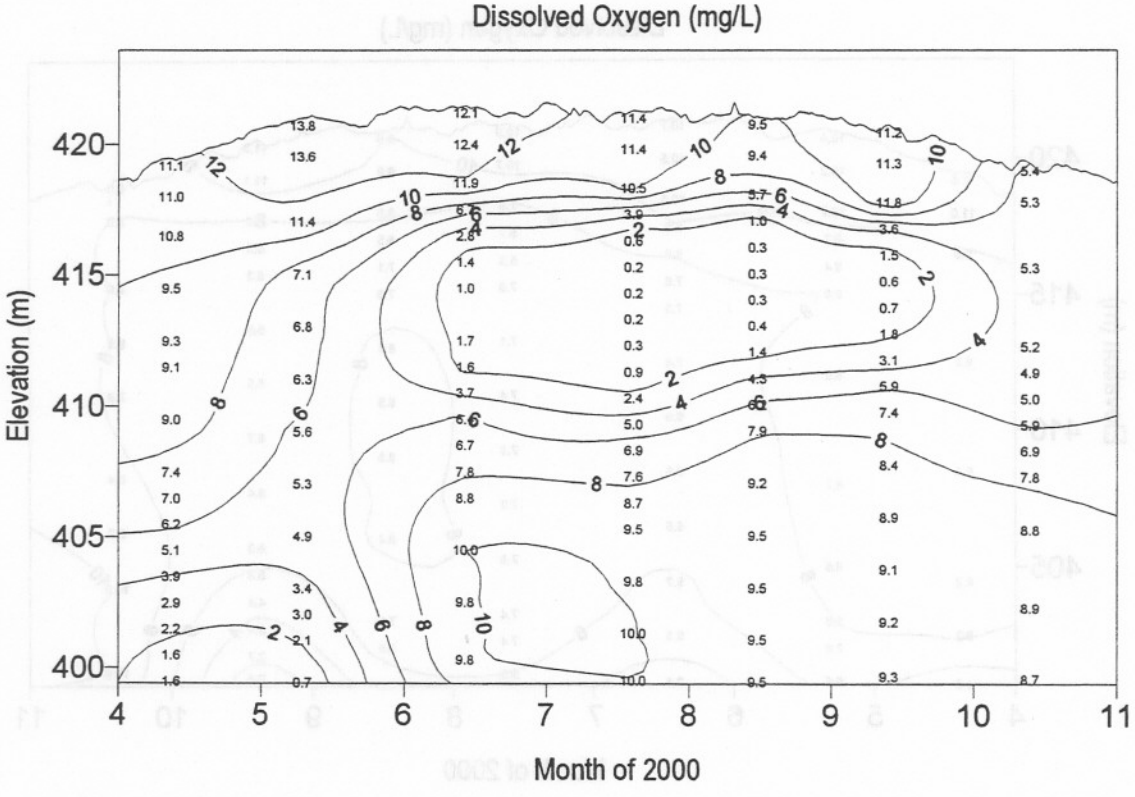
Boone Reservoir - SFHRM 19.0



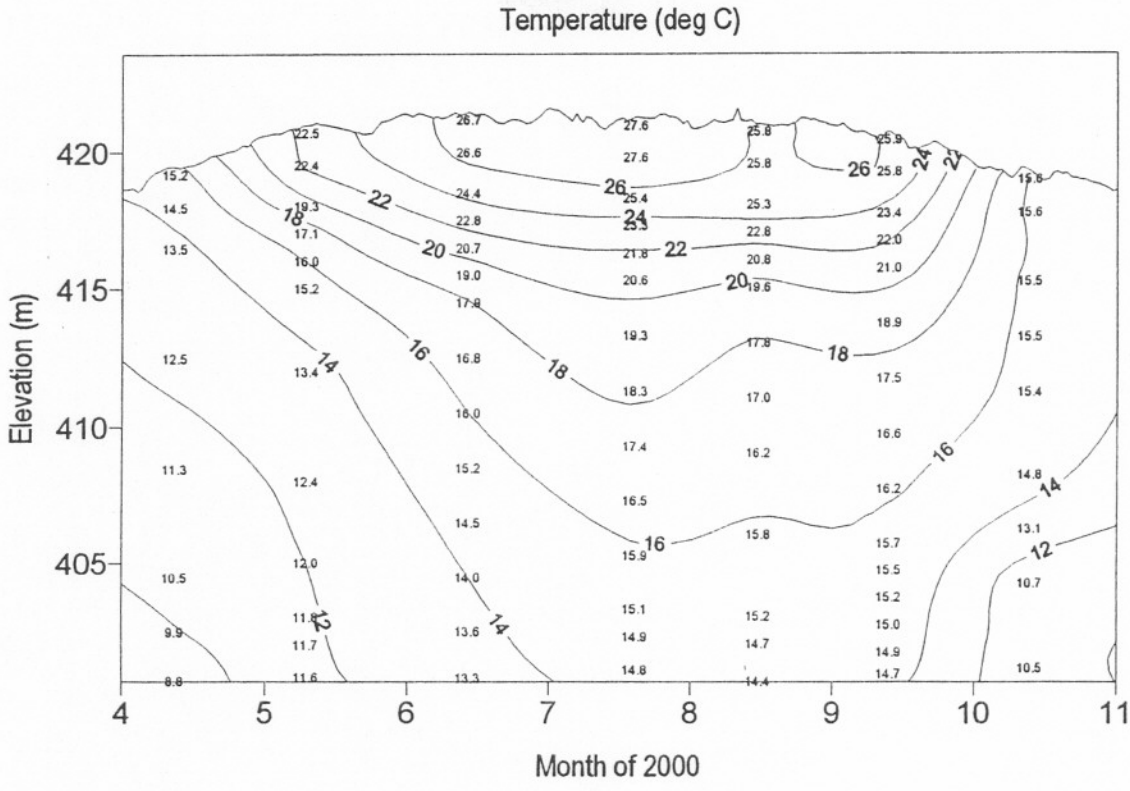


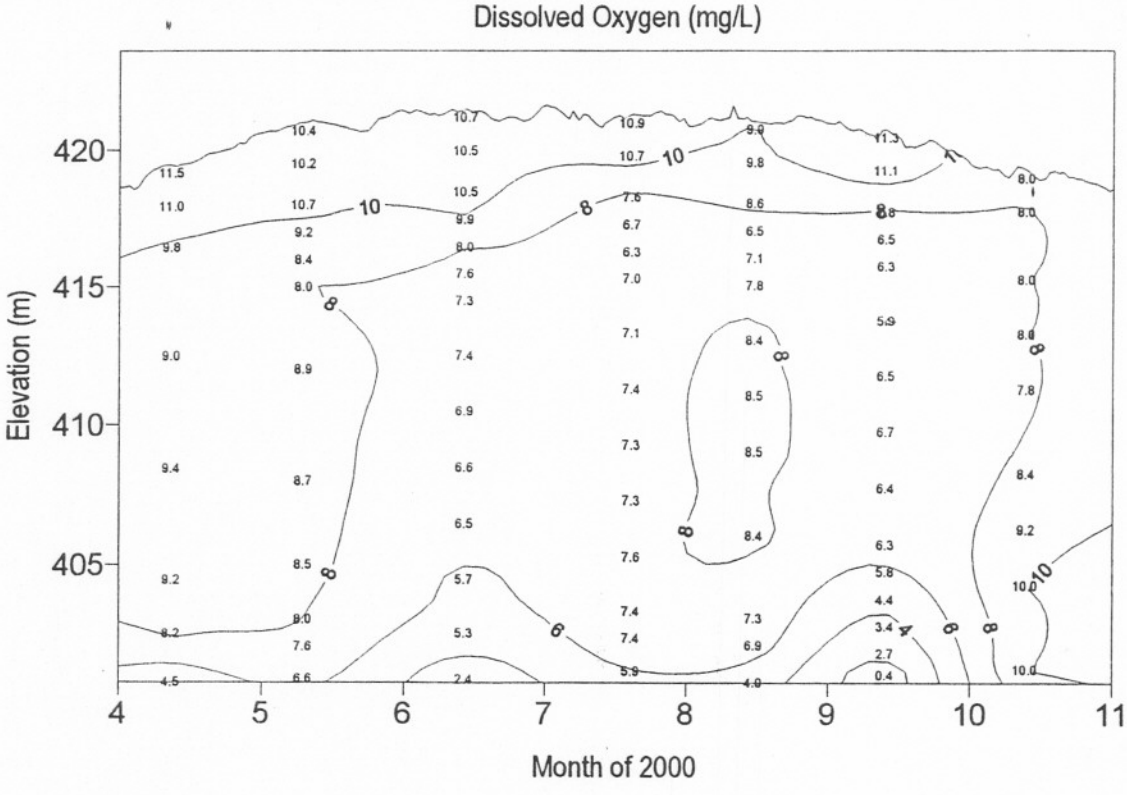
Boone Reservoir - SFHRM 27.0



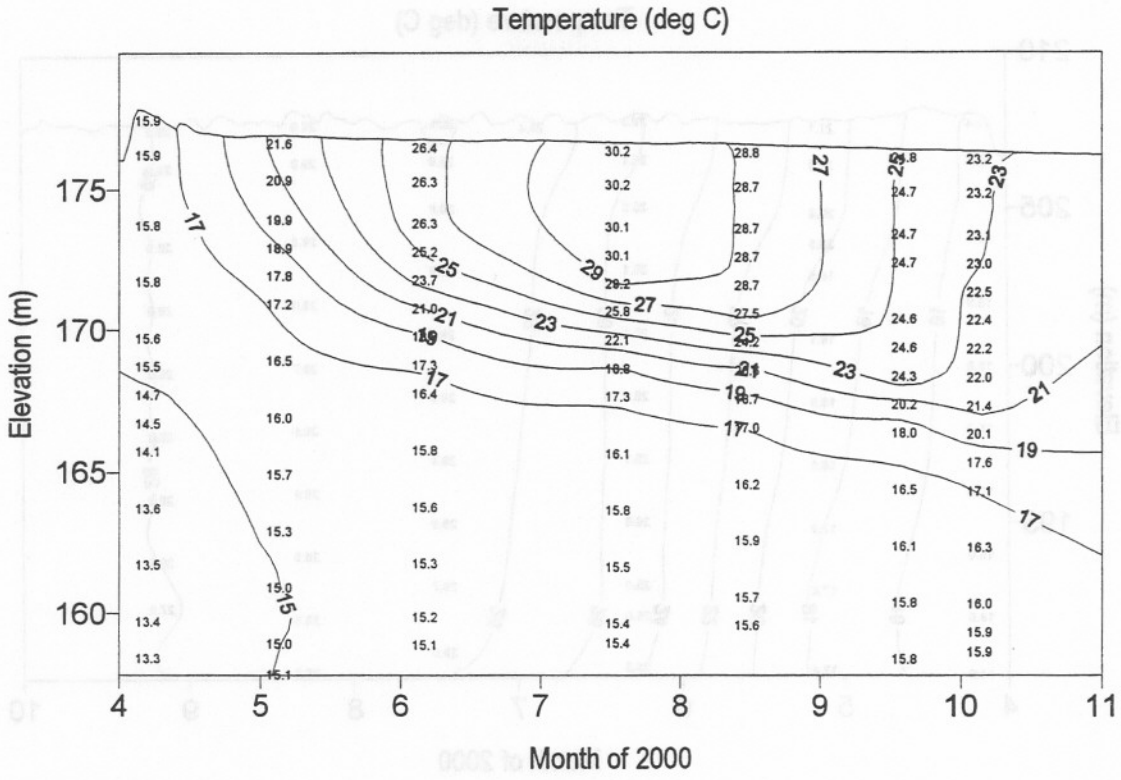


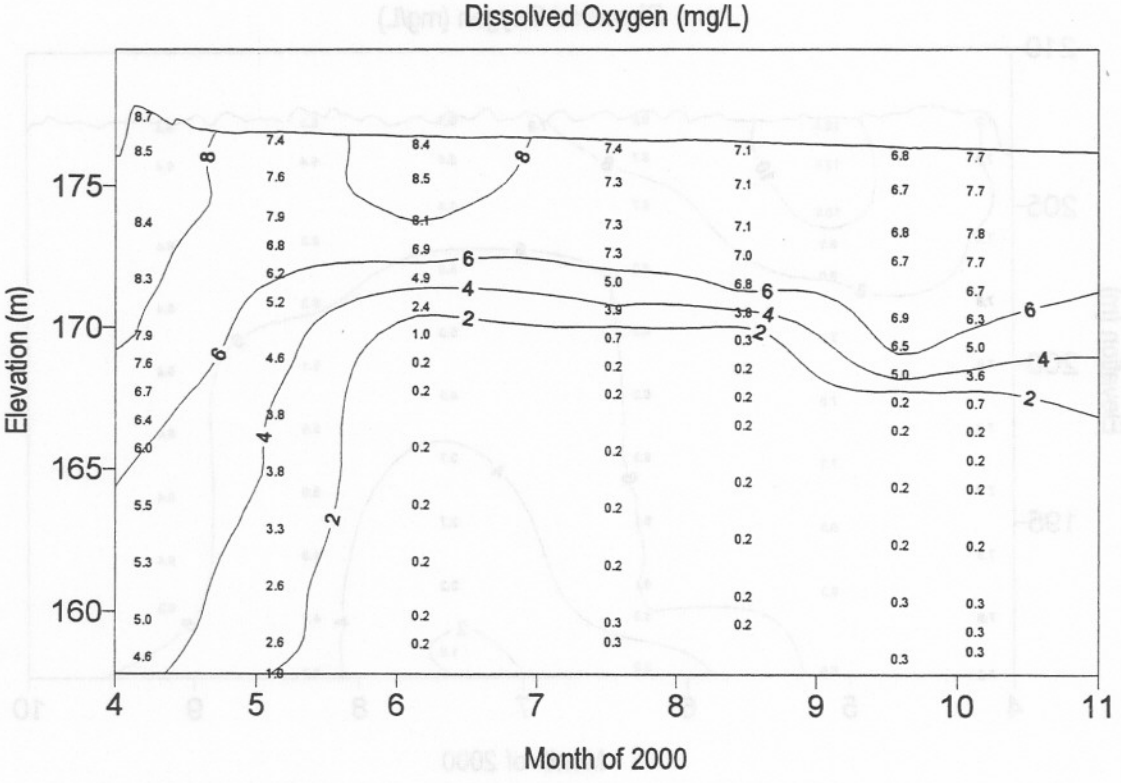
Boone Reservoir - WRM 6.5



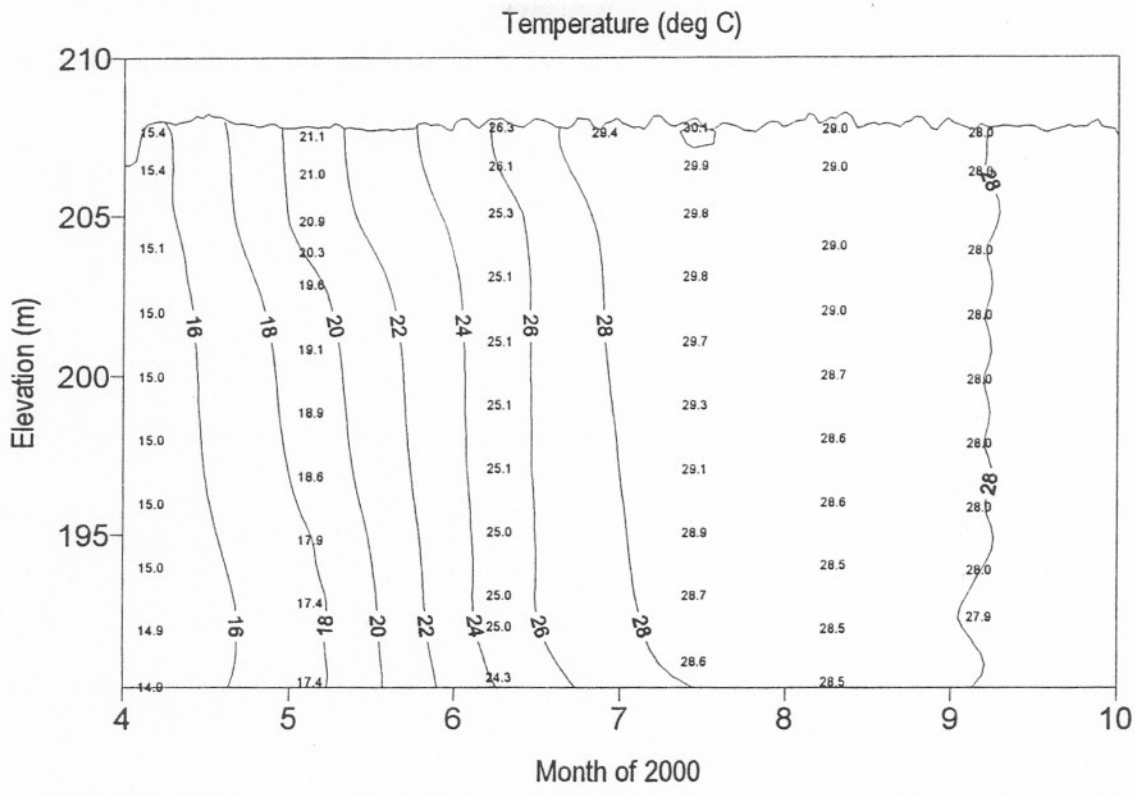


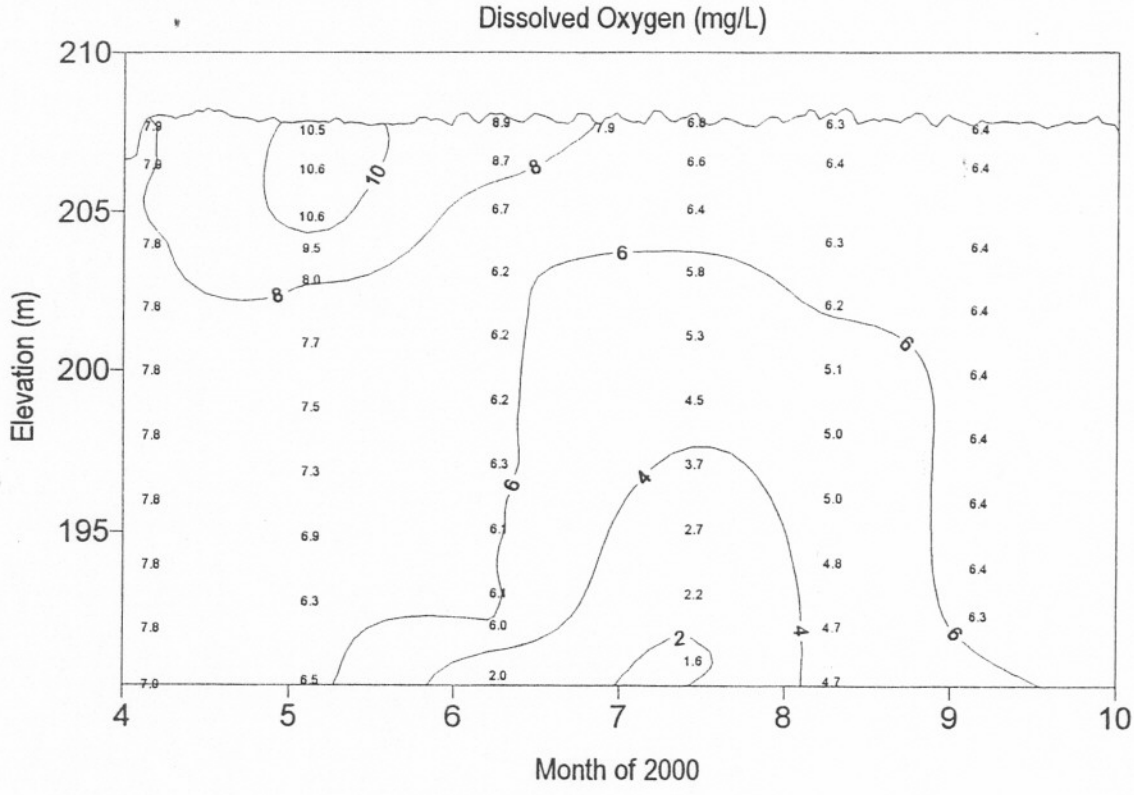
Cedar Creek Reservoir - CCM 25.2



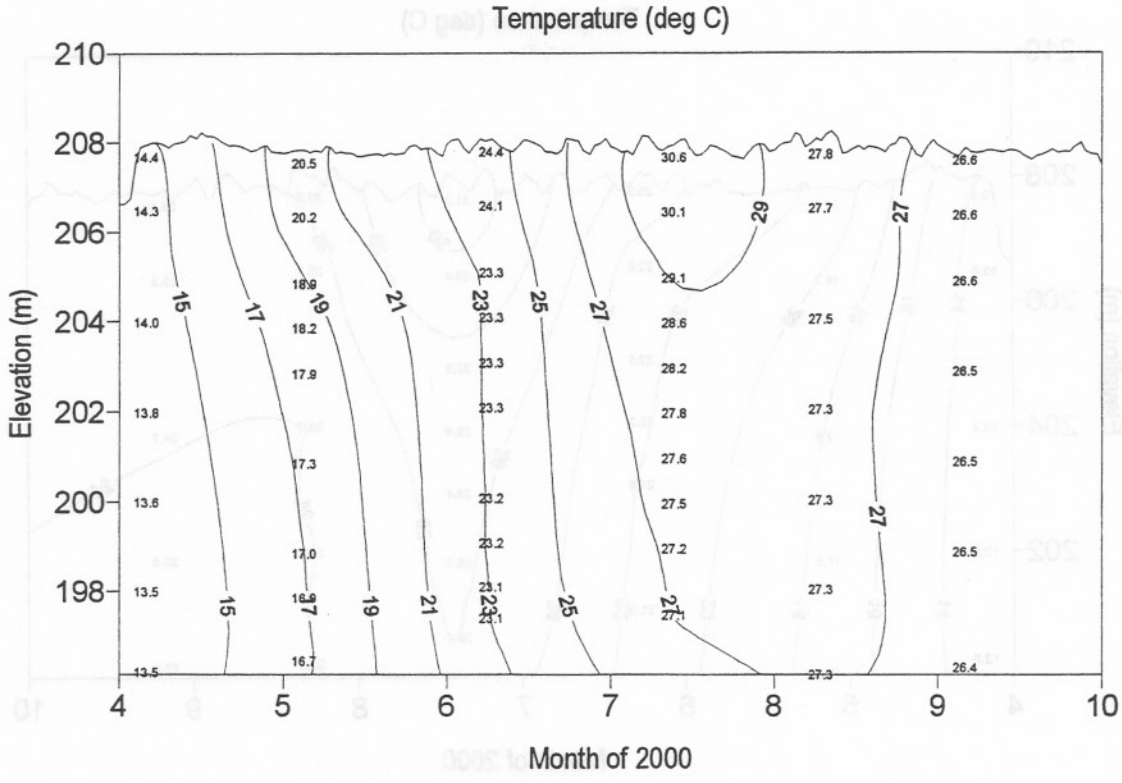


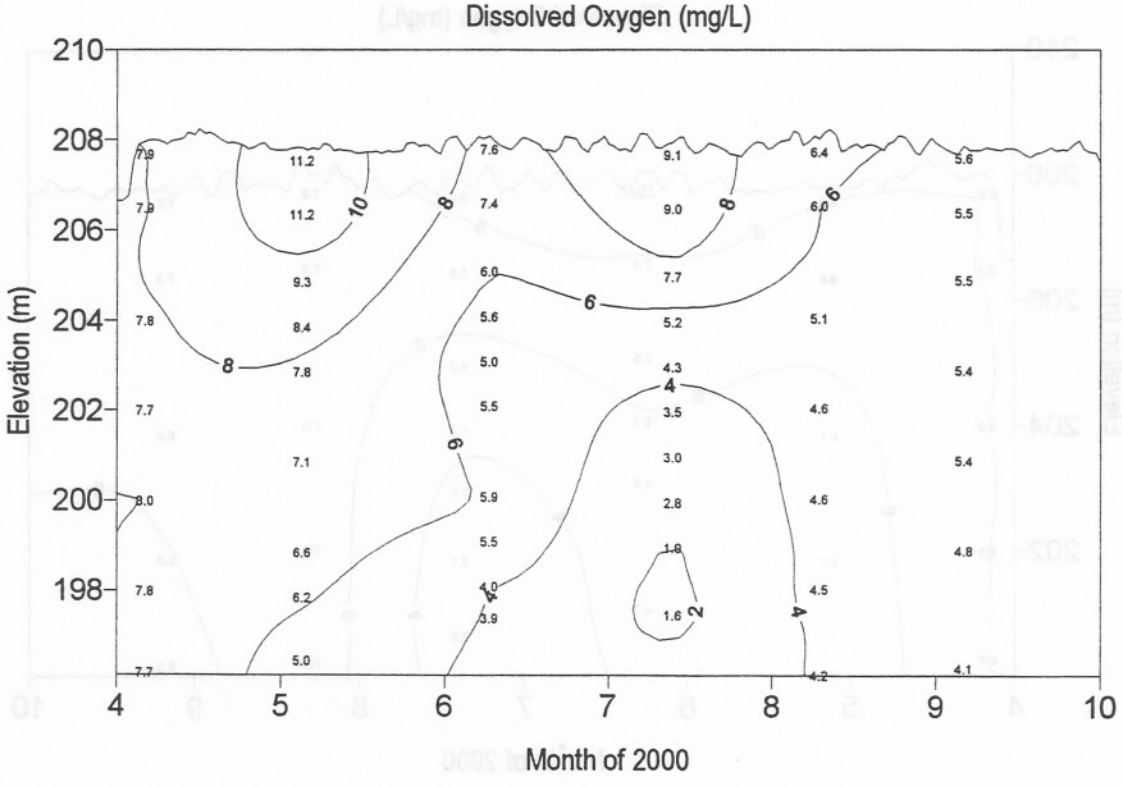
Chickamauga Reservoir - TRM 472.3



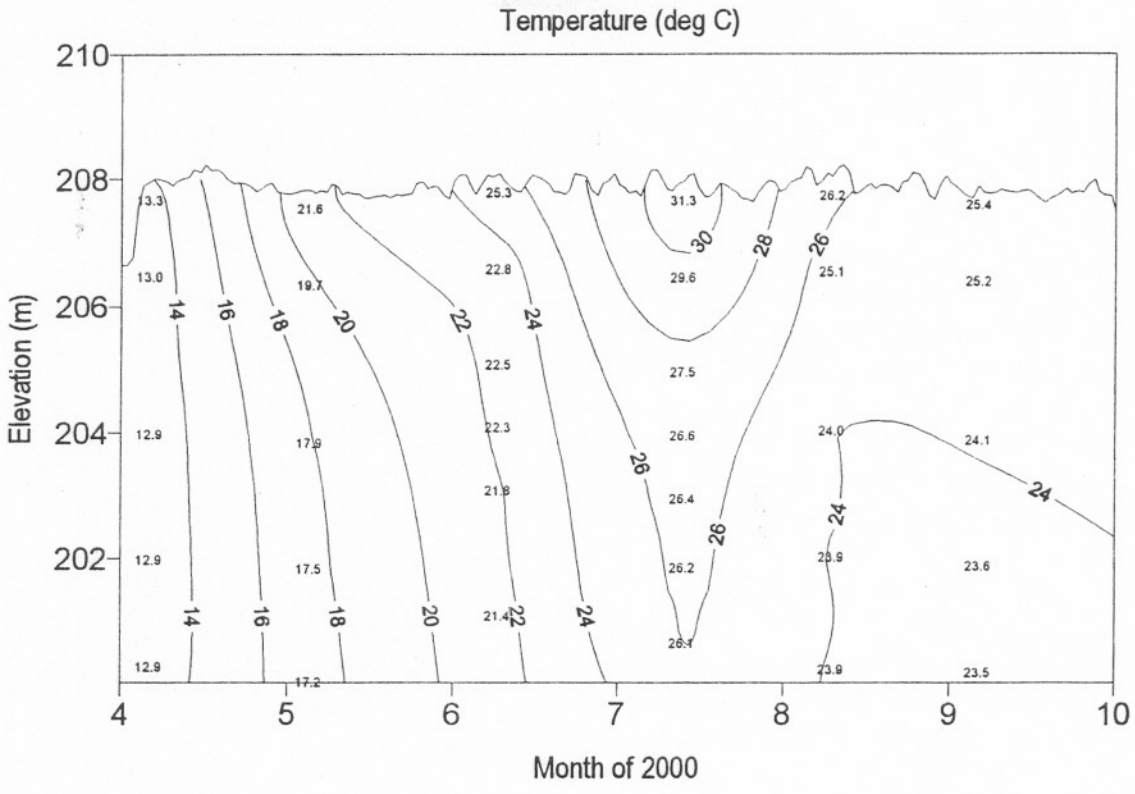


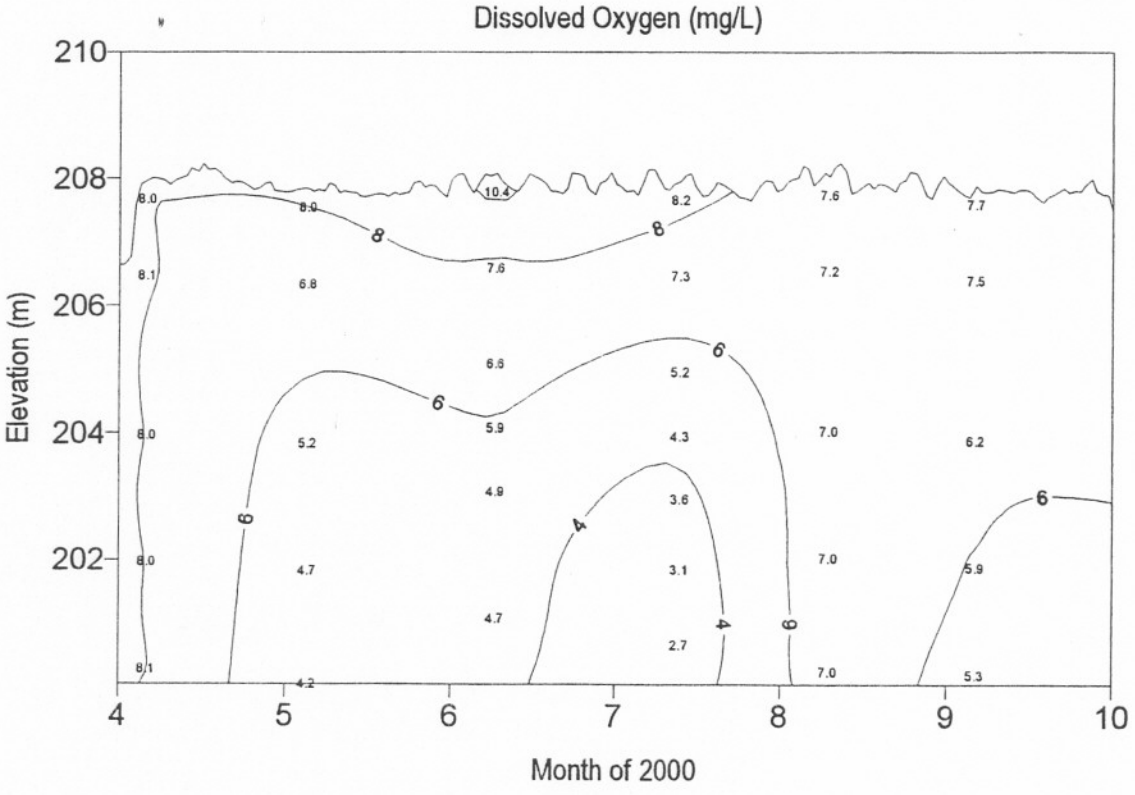
Chickamauga Reservoir - TRM 490.5





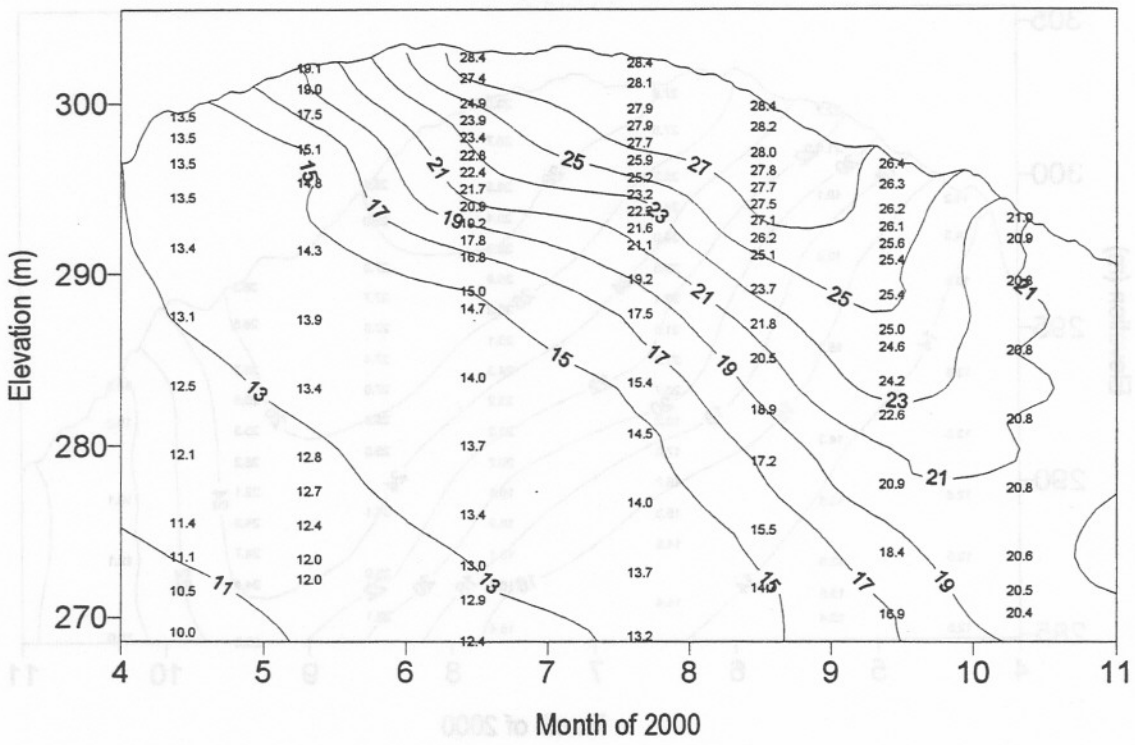
Chickamauga Reservoir - HiRM 8.5



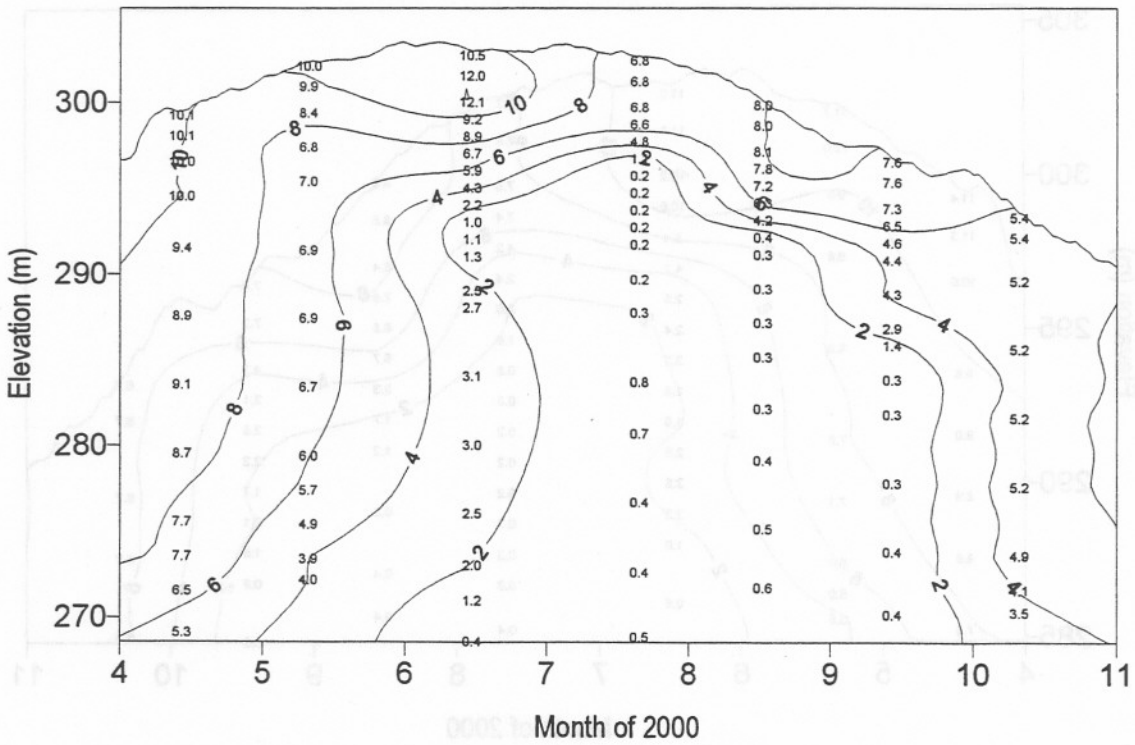


Douglas Reservoir - FBRM 34.5

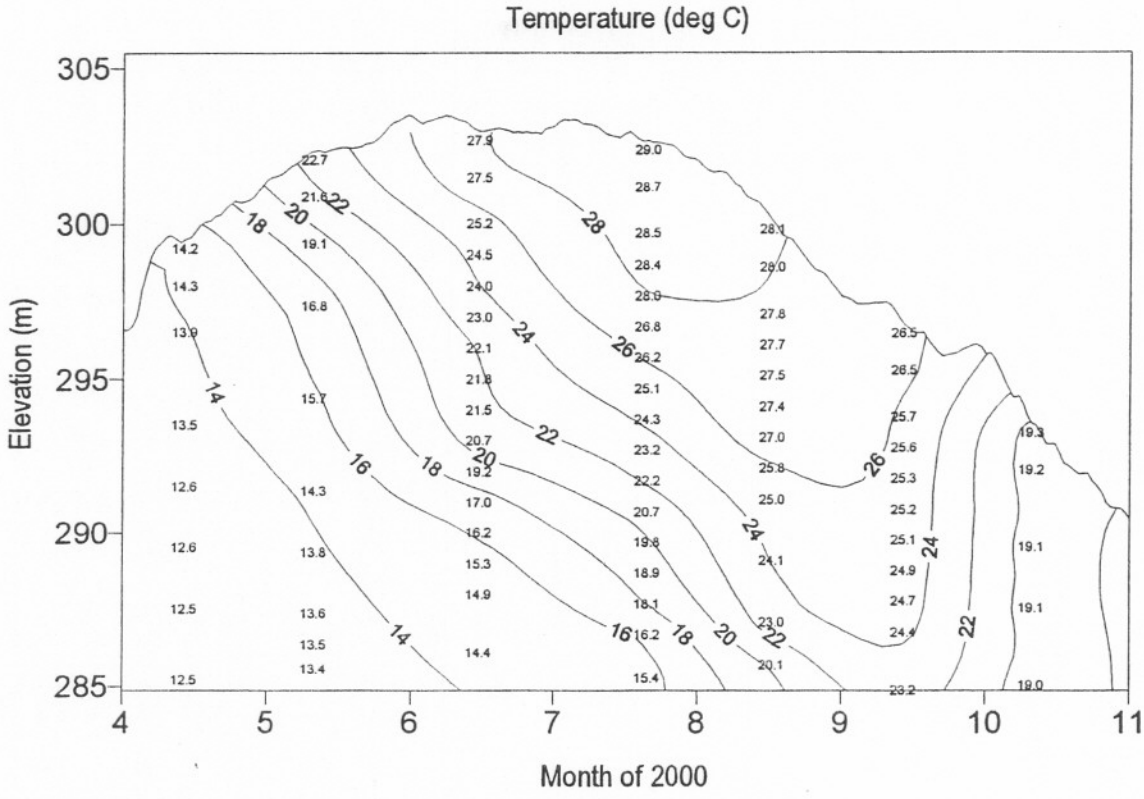
Temperature (deg C)

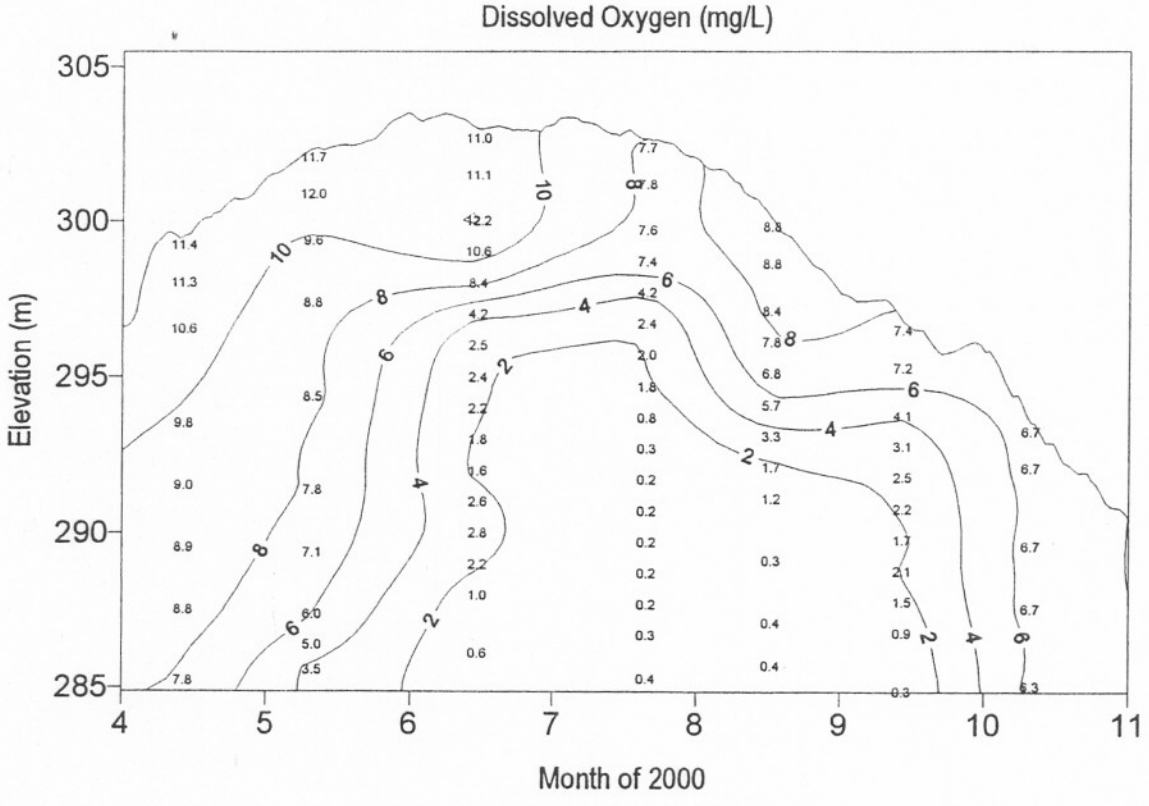


Dissolved Oxygen (mg/L)

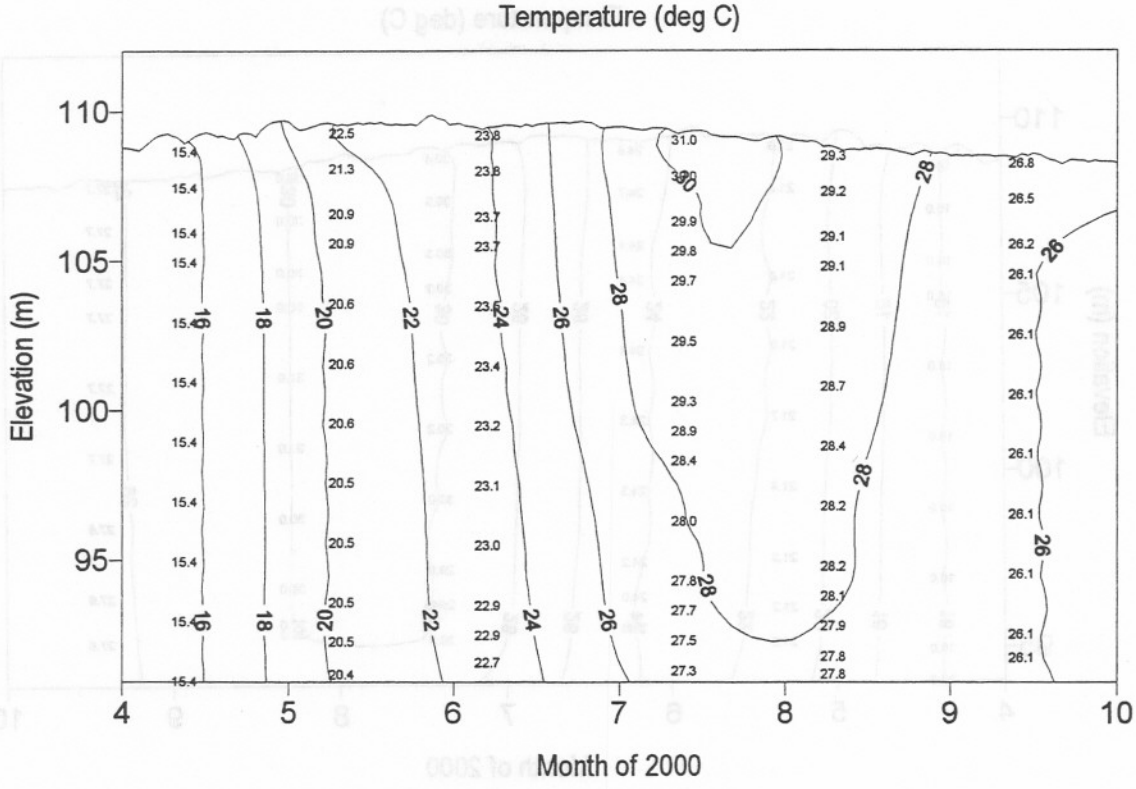


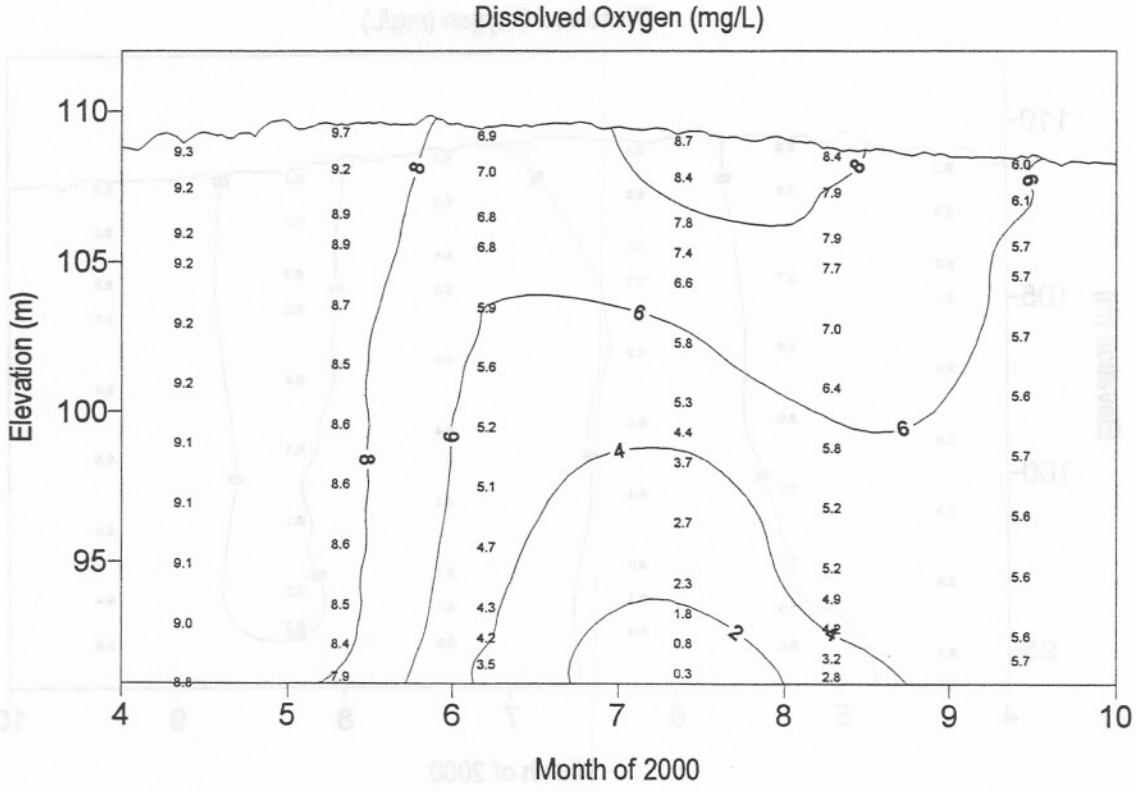
Douglas Reservoir - FBRM 51.0



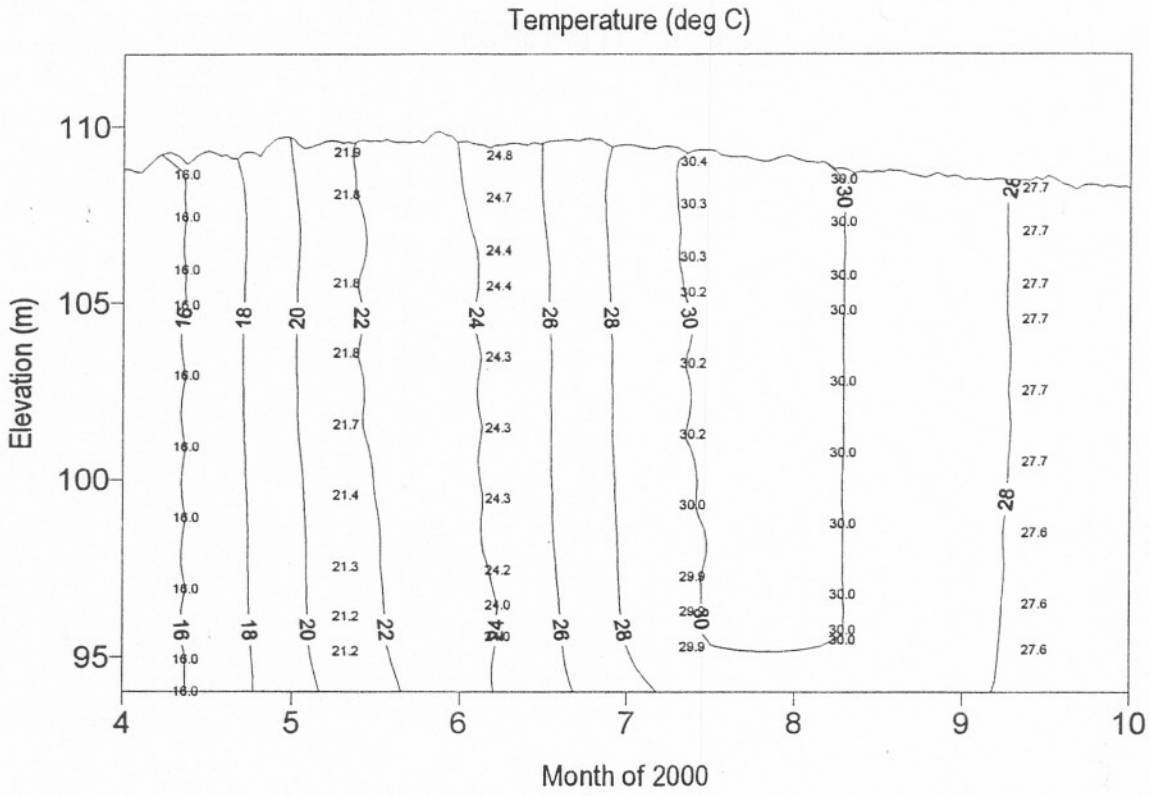


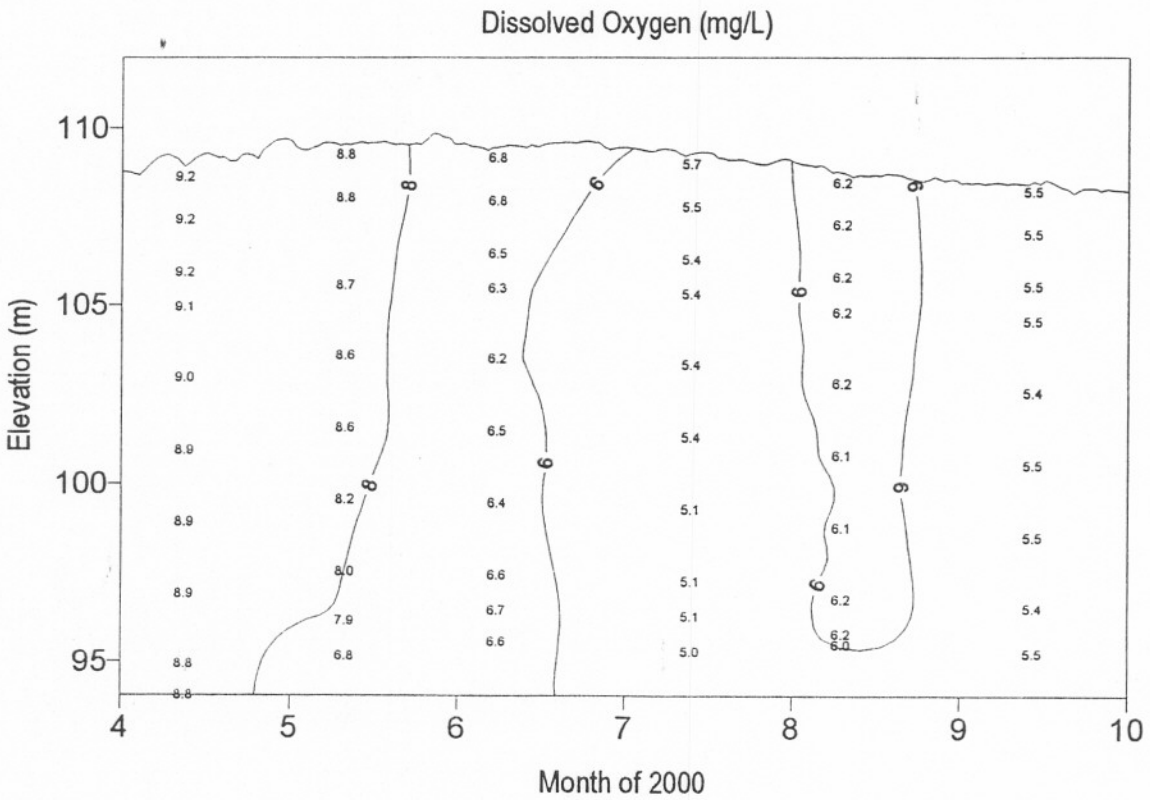
Kentucky Reservoir - TRM 23.0



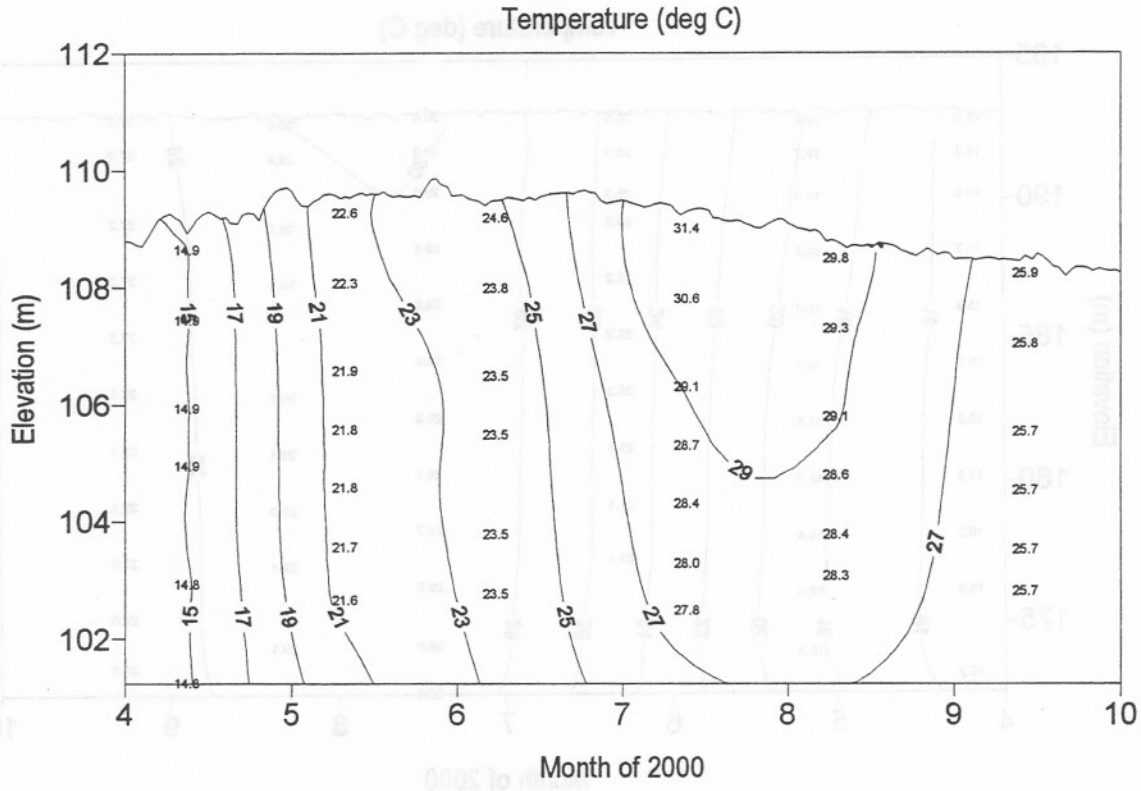


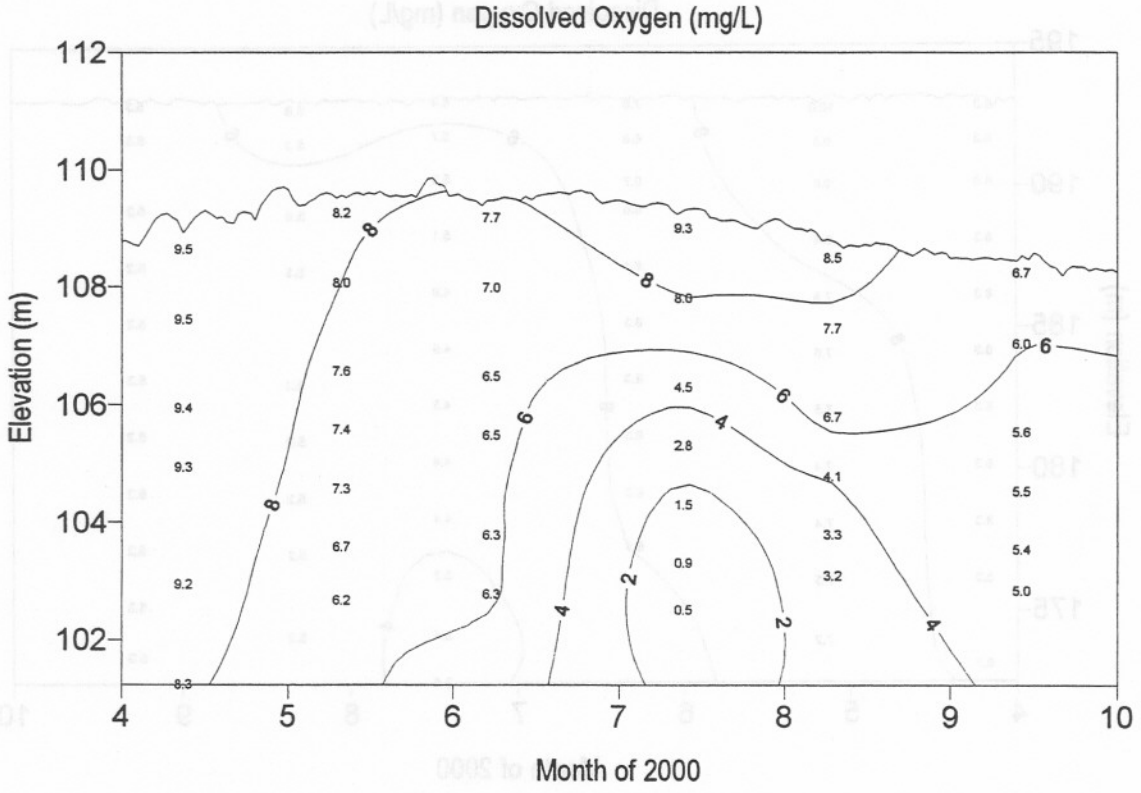
Kentucky Reservoir - TRM 85.0



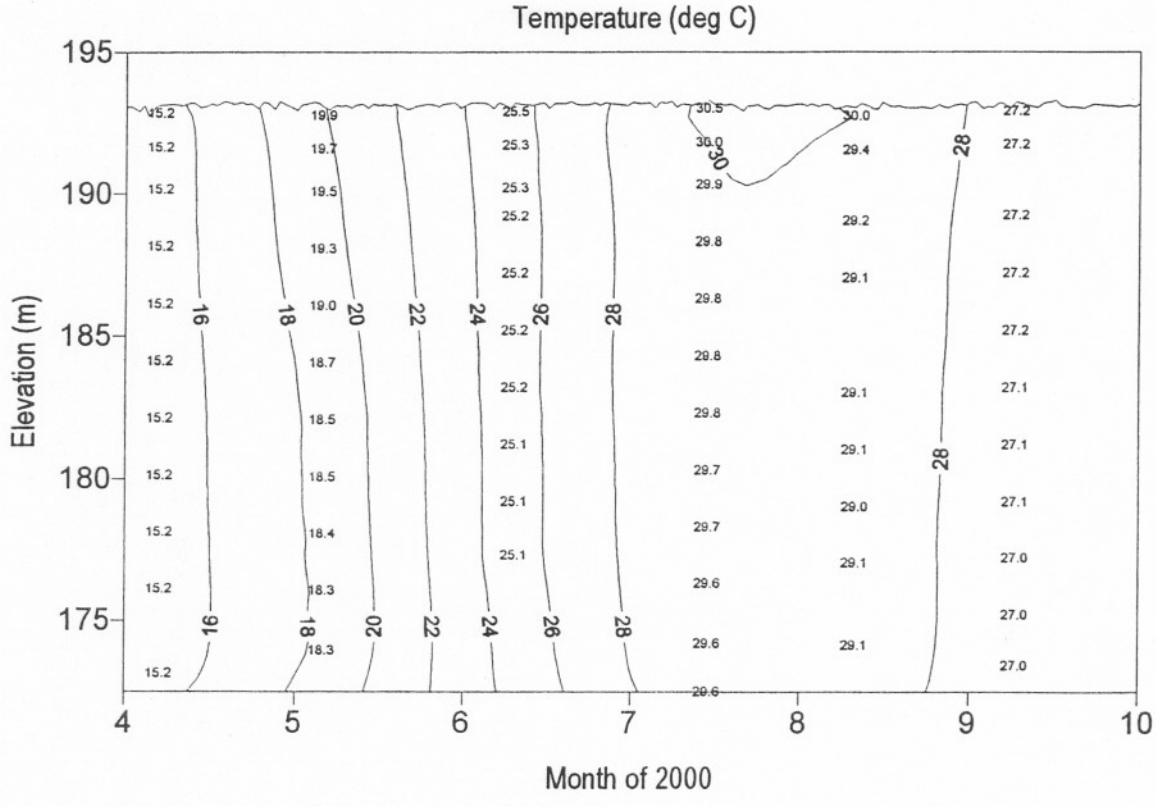


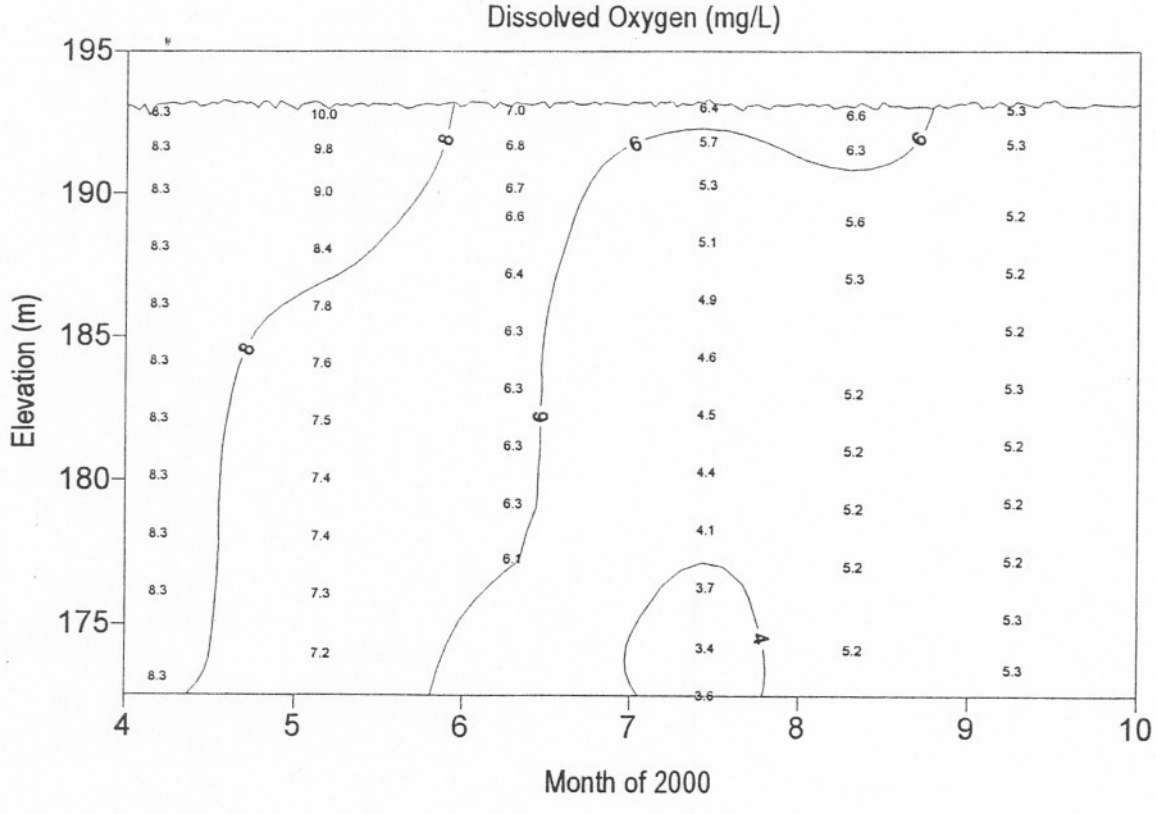
Kentucky Reservoir - Big Sandy 7.4





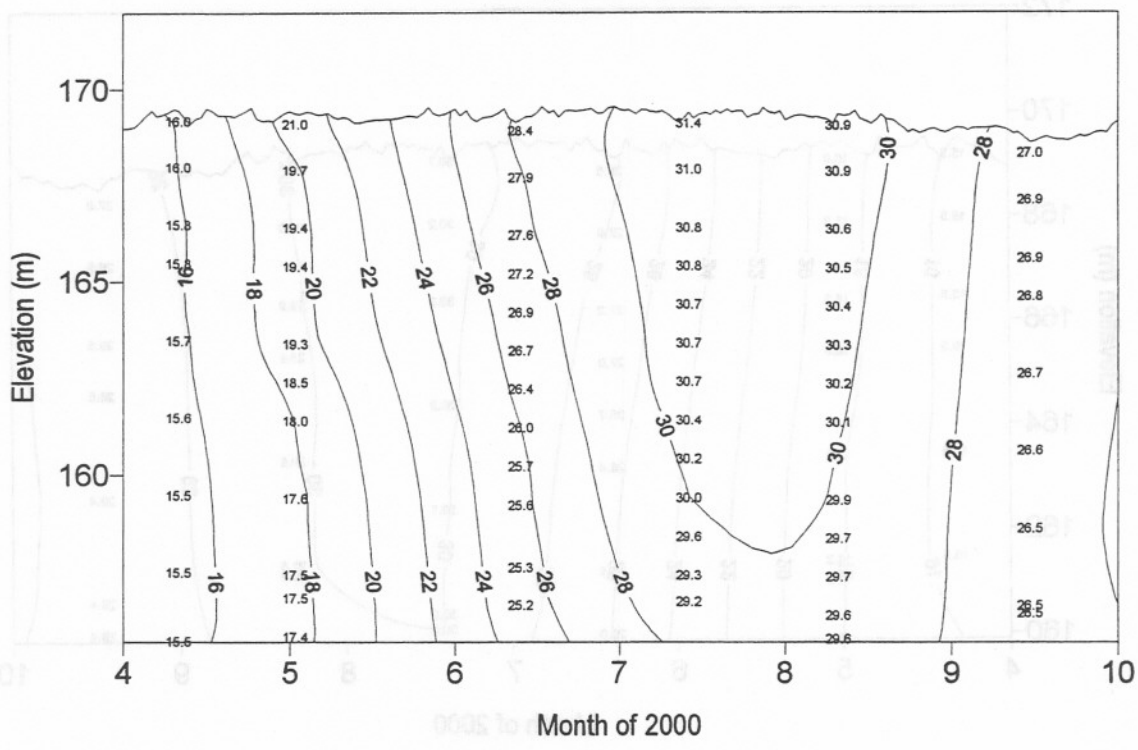
Nickajack Reservoir - TRM 425.5



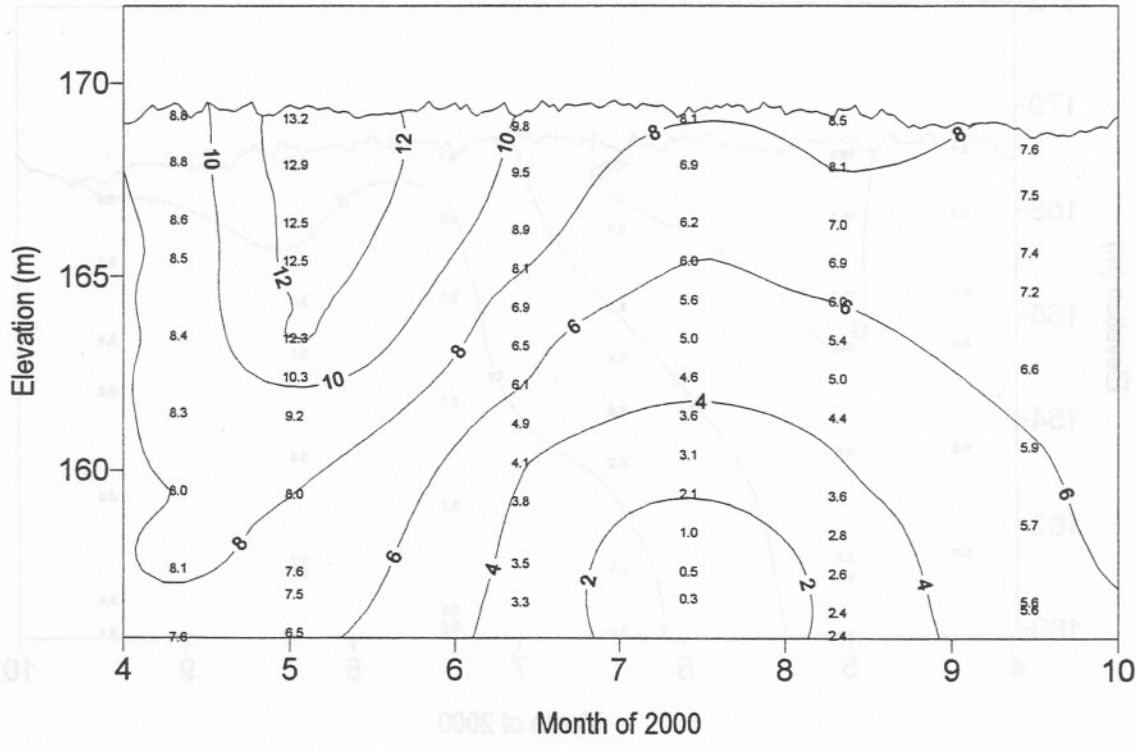


Wheeler Reservoir - TRM 277.0

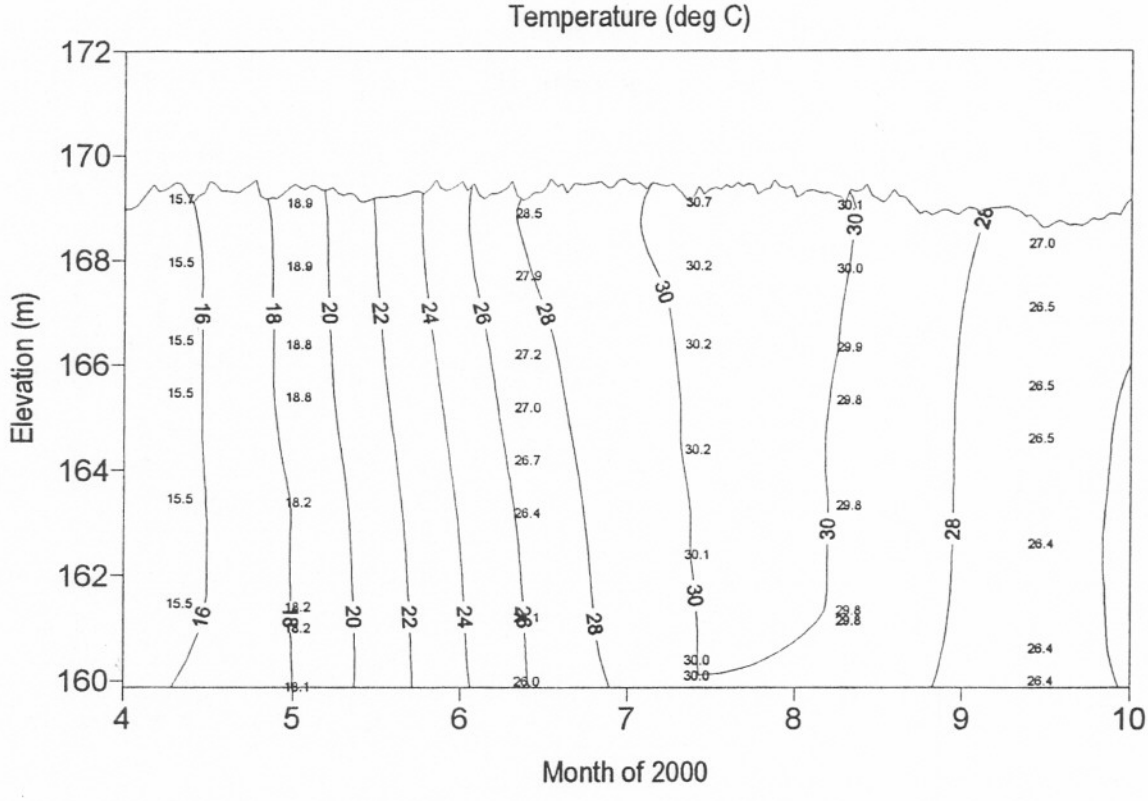
Temperature (deg C)

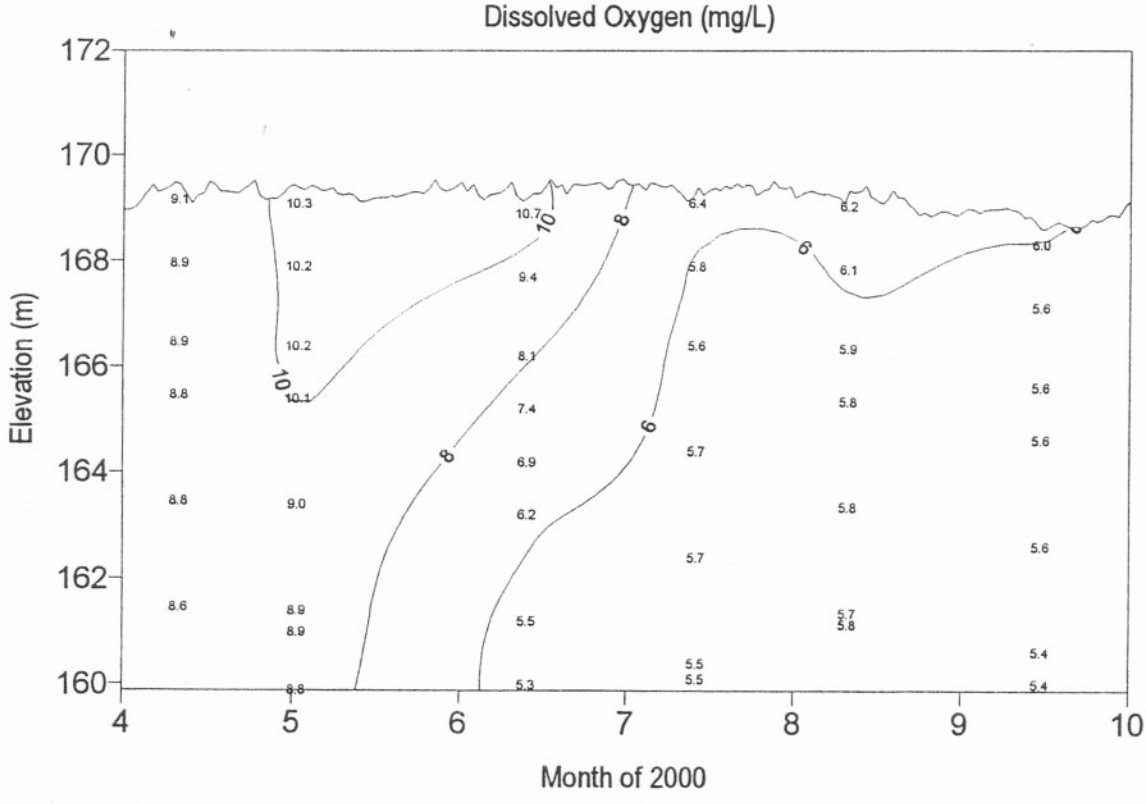


Dissolved Oxygen (mg/L)

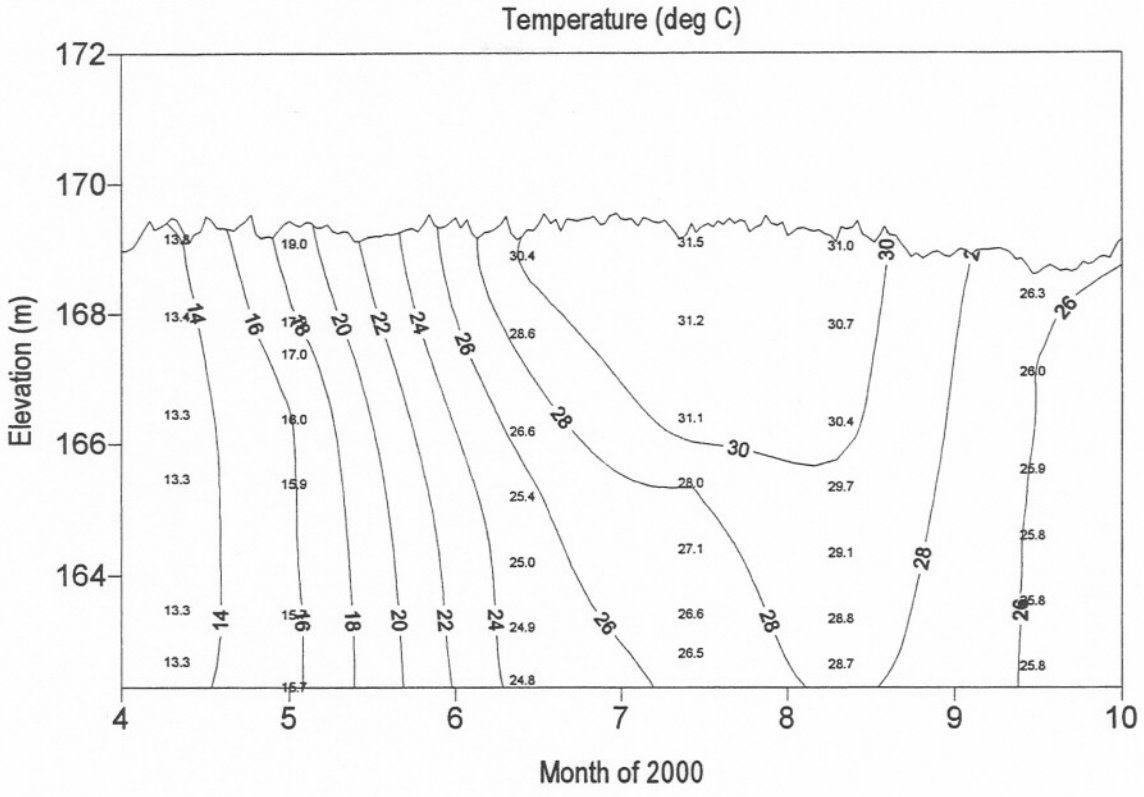


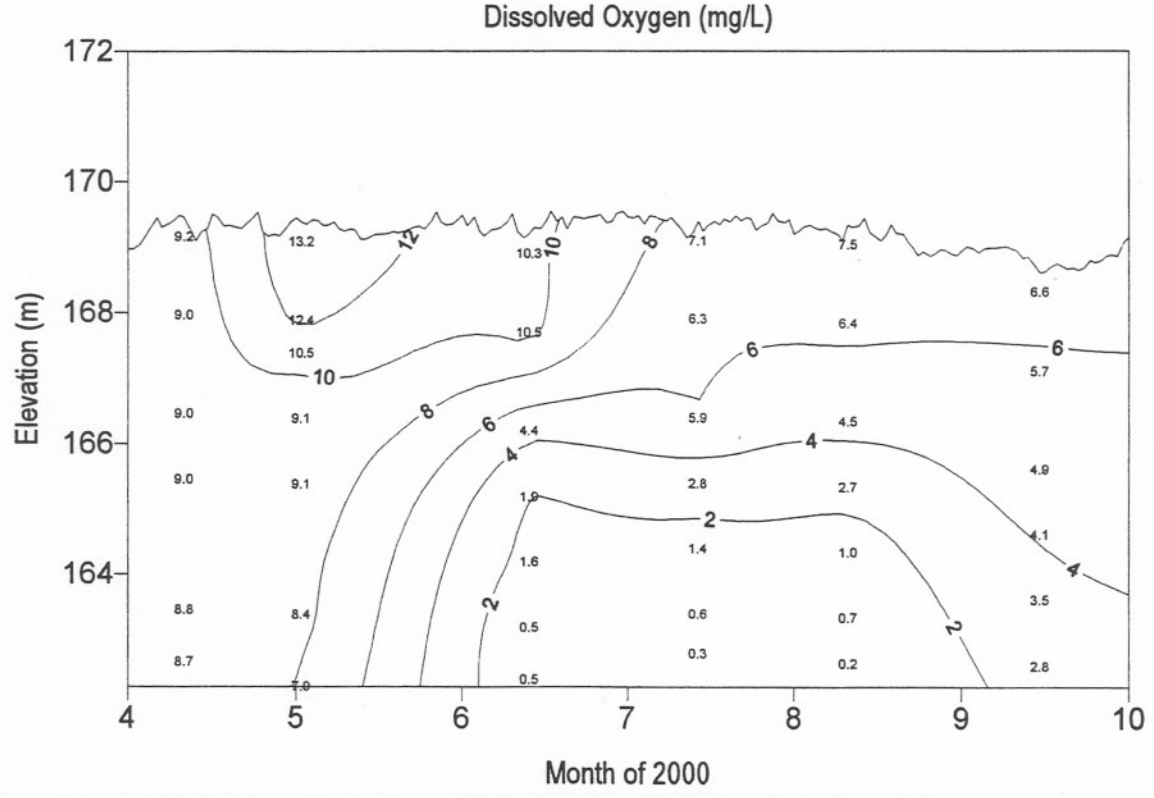
Wheeler Reservoir - TRM 295.9





Wheeler Reservoir - ERM 6.0





Appendix C.

Reservoir Benthic Macroinvertebrates -- Mean Density of Each Taxon at Each Sample Location in 2000 Including Results for Both Field Processed and Lab Processed Samples

Appendix C.

Reservoir Benthic Macroinvertebrates -- Mean Density Results for Field Processed Samples in 2000

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Apalachia Reservoir	HiRM
	67.0
Species	
Tubellaria	
Tricladida	
Planariidae	.
Oligocheata	
Oligochaetes	72
Hirudinea	.
Crustacea	
Amphipoda	7
Isopoda	.
Insecta	
Ephemeroptera	
Mayflies	.
Ephemeridae	
Hexagenia (<=10 mm)	.
Hexagenia (>10 mm)	5
Megaloptera	.
Sialidae	
Sialis sp.	
Odonata	
Anisoptera	.
Zygoptera	.
Trichoptera	
Caddisflies	.
Coeleoptera	7
Diptera	
Ceratopogonidae	.
Chironomidae	
Chironomids	217
Gastropoda	
Snails	.
Basommatophora	
Ancylidae	
Ferrissia sp.	.
Bivalvia	
Unionoida	
Unionidae	
Mussels	.
Veneroida	
Corbiculidae	
Corbicula (<=10mm)	.
Corbicula (>10mm)	.
Sphaeriidae	
Fingernail clams	55
Dreissenidae	
Dreissena polymorpha	.
Number of samples	10
Sum	362
Sum	0.60

VS 99 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Beech Reservoir	BRM
Species	
Tubellaria	36
Tricladida	
Planariidae	.
Oligocheata	
Oligochaetes	57
Hirudinea	.
Crustacea	
Amphipoda	.
Isopoda	.
Insecta	
Ephemeroptera	
Mayflies	.
Ephemeridae	
Hexagenia (<=10 mm)	.
Hexagenia (>10 mm)	.
Megaloptera	.
Sialidae	
Sialis sp.	
Odonata	
Anisoptera	.
Zygoptera	.
Trichoptera	
Caddisflies	.
Coeleoptera	.
Diptera	
Ceratopogonidae	3
Chironomidae	
Chironomids	230
Gastropoda	
Snails	.
Basommatophora	
Ancylidae	
Ferrissia sp.	.
Bivalvia	
Unionoida	
Unionidae	
Mussels	.
Veneroida	
Corbiculidae	
Corbicula (<=10mm)	2
Corbicula (>10mm)	.
Sphaeriidae	
Fingernail clams	.
Dreissenidae	
Dreissena polymorpha	.
Number of samples	10
Sum	292
Sum	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Chatuge Reservoir	SCM	HiRM	
	1.5	122	122QA
Species			
Tubellaria			
Tricladida			
Planariidae	.	.	.
Oligocheata			
Oligochaetes	33	25	48
Hirudinea	.	.	.
Crustacea			
Amphipoda	.	.	.
Isopoda	.	.	.
Insecta			
Ephemeroptera			
Mayflies	.	.	.
Ephemeridae			
Hexagenia (<=10 mm)	.	.	.
Hexagenia (>10 mm)	3	5	12
Megaloptera	.	.	.
Sialidae			
Sialis sp.			
Odonata			
Anisoptera	2	.	.
Zygoptera	.	.	.
Trichoptera			
Caddisflies	.	.	.
Coeleoptera	.	.	.
Diptera			
Ceratopogonidae	.	.	.
Chironomidae			
Chironomids	7	20	32
Gastropoda			
Snails	.	.	.
Basommatophora			
Ancylidae			
Ferrissia sp.	.	.	.
Bivalvia			
Unionoida			
Unionidae			
Mussels	.	.	.
Veneroida			
Corbiculidae			
Corbicula (<=10mm)	.	.	2
Corbicula (>10mm)	.	.	3
Sphaeriidae			
Fingernail clams	.	.	.
Dreissenidae			
Dreissena polymorpha	.	.	.
Number of samples	10	10	10
Sum	45	50	97
Sum	0.60	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Cherokee Reservoir	HiRM	
	55	76
Species		
Tubellaria		
Tricladida		
Planariidae	.	.
Oligocheata		
Oligochaetes	35	28
Hirudinea	.	.
Crustacea		
Amphipoda	.	.
Isopoda	.	.
Insecta		
Ephemeroptera		
Mayflies	.	.
Ephemeridae		
Hexagenia (<=10 mm)	.	.
Hexagenia (>10 mm)	.	.
Megaloptera	.	.
Sialidae		
Sialis sp.		
Odonata		
Anisoptera	.	.
Zygoptera	.	.
Trichoptera		
Caddisflies	.	.
Coeleoptera		
Diptera		
Ceratopogonidae	.	.
Chironomidae		
Chironomids	320	708
Gastropoda		
Snails	.	.
Basommatophora		
Ancylidae		
Ferrissia sp.	.	.
Bivalvia		
Unionoida		
Unionidae		
Mussels	.	.
Veneroida		
Corbiculidae		
Corbicula (<=10mm)	.	.
Corbicula (>10mm)	.	.
Sphaeriidae		
Fingernail clams	.	.
Dreissenidae		
Dreissena polymorpha	.	.
Number of samples	10	10
Sum	355	737
Sum	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Fontana Reservoir	LTRM
	62
Species	
Tubellaria	
Tricladida	
Planariidae	.
Oligocheata	
Oligochaetes	23
Hirudinea	.
Crustacea	
Amphipoda	2
Isopoda	.
Insecta	
Ephemeroptera	
Mayflies	.
Ephemeridae	
Hexagenia (<=10 mm)	.
Hexagenia (>10 mm)	.
Megaloptera	.
Sialidae	
Sialis sp.	
Odonata	
Anisoptera	.
Zygoptera	.
Trichoptera	
Caddisflies	.
Coeleoptera	.
Diptera	
Ceratopogonidae	.
Chironomidae	
Chironomids	12
Gastropoda	
Snails	.
Basommatophora	
Ancylidae	
Ferrissia sp.	.
Bivalvia	
Unionoida	
Unionidae	
Mussels	.
Veneroida	
Corbiculidae	
Corbicula (<=10mm)	.
Corbicula (>10mm)	.
Sphaeriidae	
Fingernail clams	.
Dreissenidae	
Dreissena polymorpha	.
Number of samples	10
Sum	37
Sum	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Fort Loudoun Reservoir	TRM		
	605.5	624.6	652
Species			
Tubellaria			
Tricladida			
Planariidae	.	.	.
Oligocheata			
Oligochaetes	230	55	55
Hirudinea	.	.	.
Crustacea			
Amphipoda	.	.	2
Isopoda	.	.	.
Insecta			
Ephemeroptera			
Mayflies	.	.	.
Ephemeridae			
Hexagenia (<=10 mm)	.	.	.
Hexagenia (>10 mm)	.	22	.
Megaloptera	.	.	.
Sialidae			
Sialis sp.			
Odonata			
Anisoptera	.	.	2
Zygoptera	.	.	2
Trichoptera			
Caddisflies	.	.	.
Coeleoptera	.	.	.
Diptera			
Ceratopogonidae	.	5	.
Chironomidae			
Chironomids	152	388	205
Gastropoda			
Snails	.	.	.
Basommatophora			
Ancylidae			
Ferrissia sp.	.	.	.
Bivalvia			
Unionoida			
Unionidae			
Mussels	.	.	.
Veneroida			
Corbiculidae			
Corbicula (<=10mm)	5	2	13
Corbicula (>10mm)	.	.	2
Sphaeriidae			
Fingernail clams	.	22	.
Dreissenidae			
Dreissena polymorpha	.	.	.
Number of samples	10	10	10
Sum	387	493	280
Sum	0.60	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Guntersville Reservoir	TRM			
	350	375.2	420	420QA
Species				
Tubellaria				
Tricladida				
Planariidae	.	.	55	57
Oligocheata				
Oligochaetes	40	70	32	27
Hirudinea	2	2	10	.
Crustacea				
Amphipoda	.	65	42	88
Isopoda	.	.	.	.
Insecta				
Ephemeroptera				
Mayflies	.	.	13	20
Ephemeridae				
Hexagenia (<=10 mm)	.	17	.	.
Hexagenia (>10 mm)	12	67	.	2
Megaloptera	.	.	5	.
Sialidae				
Sialis sp.				
Odonata				
Anisoptera	.	5	3	2
Zygoptera	.	.	2	3
Trichoptera				
Caddisflies	.	.	2	2
Coeleoptera	.	2	.	.
Diptera				
Ceratopogonidae	.	.	.	.
Chironomidae				
Chironomids	515	138	10	15
Gastropoda				
Snails	20	22	37	30
Basommatophora				
Ancylidae				
Ferrissia sp.	.	.	8	13
Bivalvia				
Unionoida				
Unionidae				
Mussels	5	.	.	.
Veneroida				
Corbiculidae				
Corbicula (<=10mm)	13	88	267	410
Corbicula (>10mm)	27	230	475	348
Sphaeriidae				
Fingernail clams	3	32	.	.
Dreissenidae				
Dreissena polymorpha	.	.	2	2
Number of samples	10	10	10	10
Sum	637	737	962	1018
Sum	0.60	0.60	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Hiwassee Reservoir	HiRM		
	77	85	85QA
Species			
Tubellaria			
Tricladida			QA
Planariidae	.	.	.
Oligocheata			
Oligochaetes	342	708	473
Hirudinea	.	.	.
Crustacea			
Amphipoda	.	2	.
Isopoda	8	.	.
Insecta			
Ephemeroptera			
Mayflies	.	.	.
Ephemeridae			
Hexagenia (<=10 mm)	.	.	.
Hexagenia (>10 mm)	.	.	.
Megaloptera	.	.	.
Sialidae			
Sialis sp.			
Odonata			
Anisoptera	.	.	.
Zygoptera	.	.	.
Trichoptera			
Caddisflies	.	.	.
Coeleoptera	.	.	.
Diptera			
Ceratopogonidae	.	.	.
Chironomidae			
Chironomids	62	208	155
Gastropoda			
Snails	.	.	.
Basommatophora			
Ancylidae			
Ferrissia sp.	.	.	.
Bivalvia			
Unionoida			
Unionidae			
Mussels	.	.	.
Veneroida			
Corbiculidae			
Corbicula (<=10mm)	.	.	.
Corbicula (>10mm)	.	.	.
Sphaeriidae			
Fingernail clams	18	.	.
Dreissenidae			
Dreissena polymorpha	.	.	.
Number of samples	10	10	10
Sum	430	918	628
Sum	0.60	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Melton Hill Reservoir	CRM		
	24	45	58.8
Species			
Tubellaria			
Tricladida			
Planariidae	.	.	.
Oligocheata			
Oligochaetes	62	37	42
Hirudinea	.	.	.
Crustacea			
Amphipoda	.	.	.
Isopoda	.	.	.
Insecta			
Ephemeroptera			
Mayflies	.	.	.
Ephemeridae			
Hexagenia (<=10 mm)	.	22	.
Hexagenia (>10 mm)	2	82	.
Megaloptera	.	.	.
Sialidae			
Sialis sp.			
Odonata			
Anisoptera	.	.	.
Zygoptera	.	.	.
Trichoptera			
Caddisflies	.	.	.
Coeleoptera	.	.	.
Diptera			
Ceratopogonidae	.	.	.
Chironomidae			
Chironomids	270	27	77
Gastropoda			
Snails	.	.	.
Basommatophora			
Ancylidae			
Ferrissia sp.	.	.	.
Bivalvia			
Unionoida			
Unionidae			
Mussels	.	.	.
Veneroida			
Corbiculidae			
Corbicula (<=10mm)	5	.	8
Corbicula (>10mm)	.	5	.
Sphaeriidae			
Fingernail clams	.	107	.
Dreissenidae			
Dreissena polymorpha	.	.	.
Number of samples	10	10	10
Sum	338	278	127
Sum	0.60	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Normandy Reservoir	DRM
Species	
Tubellaria	249.5
Tricladida	
Planariidae	.
Oligocheata	
Oligochaetes	50
Hirudinea	.
Crustacea	
Amphipoda	.
Isopoda	.
Insecta	
Ephemeroptera	
Mayflies	.
Ephemeridae	
Hexagenia (<=10 mm)	.
Hexagenia (>10 mm)	.
Megaloptera	.
Sialidae	
Sialis sp.	
Odonata	
Anisoptera	.
Zygoptera	.
Trichoptera	
Caddisflies	.
Coeleoptera	.
Diptera	
Ceratopogonidae	.
Chironomidae	
Chironomids	260
Gastropoda	
Snails	.
Basommatophora	
Ancylidae	
Ferrissia sp.	.
Bivalvia	
Unionoida	
Unionidae	
Mussels	.
Veneroida	
Corbiculidae	
Corbicula (<=10mm)	.
Corbicula (>10mm)	2
Sphaeriidae	
Fingernail clams	.
Dreissenidae	
Dreissena polymorpha	.
Number of samples	10
Sum	312
Sum	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Pickwick Reservoir	TRM				BCM
	207.3	207.3QA	230	253.2	8.4
Species					
Tubellaria					
Tricladida		QA			
Planariidae	.	.	.	353	.
Oligocheata					
Oligochaetes	28	25	42	5	107
Hirudinea	.	.	2	5	3
Crustacea					
Amphipoda	.	.	.	.	.
Isopoda	.	8	.	2	.
Insecta					
Ephemeroptera					
Mayflies	.	.	.	17	.
Ephemeridae					
Hexagenia (<=10 mm)	.	.	2	.	.
Hexagenia (>10 mm)	15	8	5	.	2
Megaloptera	.	.	.	.	.
Sialidae					
Sialis sp.					
Odonata					
Anisoptera	.	.	.	.	.
Zygoptera	.	.	.	.	.
Trichoptera					
Caddisflies	.	.	.	3	.
Coeleoptera	.	.	2	.	.
Diptera					
Ceratopogonidae	.	.	.	.	.
Chironomidae					
Chironomids	170	157	183	2	533
Gastropoda					
Snails	10	8	2	87	2
Basommatophora					
Ancylidae					
Ferrissia sp.	.	.	.	.	.
Bivalvia					
Unionoida					
Unionidae					
Mussels	2	2	2	3	.
Veneroida					
Corbiculidae					
Corbicula (<=10mm)	10	23	3	47	.
Corbicula (>10mm)	112	23	167	.	.
Sphaeriidae					
Fingernail clams	28	2	3	2	2
Dreissenidae					
Dreissena polymorpha	.	.	.	.	.
Number of samples	10	10	10	10	10
Sum	375	257	412	525	648
Sum	0.60	0.60	0.60	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

South Holston Reservoir	SFHR	
	51	62.5
Species		
Tubellaria		
Tricladida		
Planariidae	.	.
Oligocheata		
Oligochaetes	60	170
Hirudinea	.	.
Crustacea		
Amphipoda	.	.
Isopoda	.	.
Insecta		
Ephemeroptera		
Mayflies	.	.
Ephemeridae		
Hexagenia (<=10 mm)	.	.
Hexagenia (>10 mm)	.	.
Megaloptera	.	.
Sialidae		
Sialis sp.		
Odonata		
Anisoptera	.	.
Zygoptera	.	.
Trichoptera		
Caddisflies	.	.
Coeleoptera	.	.
Diptera		
Ceratopogonidae	.	.
Chironomidae		
Chironomids	22	10
Gastropoda		
Snails	.	.
Basommatophora		
Ancylidae		
Ferrissia sp.	.	.
Bivalvia		
Unionoida		
Unionidae		
Mussels	.	.
Veneroida		
Corbiculidae		
Corbicula (<=10mm)	.	.
Corbicula (>10mm)	.	.
Sphaeriidae		
Fingernail clams	.	.
Dreissenidae		
Dreissena polymorpha	.	.
Number of samples	10	10
Sum	82	180
Sum	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Tims Ford Reservoir	ERM		
	135	135QA	150
Species			
Tubellaria			
Tricladida		QA	
Planariidae	.	.	.
Oligocheata			
Oligochaetes	33	55	7
Hirudinea	.	.	.
Crustacea			
Amphipoda	.	.	.
Isopoda	.	.	.
Insecta			
Ephemeroptera			
Mayflies	.	.	.
Ephemeridae			
Hexagenia (<=10 mm)	.	.	.
Hexagenia (>10 mm)	.	.	.
Megaloptera	.	.	.
Sialidae			
Sialis sp.			
Odonata			
Anisoptera	.	.	.
Zygoptera	.	.	.
Trichoptera			
Caddisflies	.	.	.
Coeleoptera	.	.	.
Diptera			
Ceratopogonidae	.	.	.
Chironomidae			
Chironomids	.	.	58
Gastropoda			
Snails	2	.	.
Basommatophora			
Ancylidae			
Ferrissia sp.	.	.	.
Bivalvia			
Unionoida			
Unionidae			
Mussels	.	.	.
Veneroida			
Corbiculidae			
Corbicula (<=10mm)	.	.	.
Corbicula (>10mm)	.	3	.
Sphaeriidae			
Fingernail clams	.	.	.
Dreissenidae			
Dreissena polymorpha	.	.	.
Number of samples	10	10	10
Sum	35	58	65
Sum	0.60	0.60	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Watts Bar Reservoir	TRM				CRM
	532.5	560.8	560.8(QA)	600	19
Species					
Tubellaria					
Tricladida					
Planariidae	.	.	.	578	.
Oligocheata					
Oligochaetes	108	18	32	.	2
Hirudinea	.	.	.	2	1
Crustacea					
Amphipoda	.	.	.	2	.
Isopoda	.	.	.	.	.
Insecta					
Ephemeroptera					
Mayflies	.	.	.	5	.
Ephemeridae					
Hexagenia (<=10 mm)	.	12	3	.	.
Hexagenia (>10 mm)	.	7	.	.	.
Megaloptera	.	.	.	.	.
Sialidae					
Sialis sp.					
Odonata					
Anisoptera	.	.	.	.	.
Zygoptera	.	.	.	.	.
Trichoptera					
Caddisflies	.	.	.	52	.
Coeleoptera	.	.	.	.	.
Diptera					
Ceratopogonidae	.	.	.	.	.
Chironomidae					
Chironomids	173	330	318	5	6
Gastropoda					
Snails	.	2	2	5	4
Basommatophora					
Ancylidae					
Ferrissia sp.	.	.	.	43	.
Bivalvia					
Unionoida					
Unionidae					
Mussels	.	.	.	.	.
Veneroida					
Corbiculidae					
Corbicula (<=10mm)	2	2	2	15	34
Corbicula (>10mm)	.	.	.	.	.
Sphaeriidae					
Fingernail clams	10	157	100	.	.
Dreissenidae					
Dreissena polymorpha	.	.	.	2	.
Number of samples	10	10	10	10	10
Sum	293	527	457	708	46
Sum	0.60	0.60	0.60	0.60	0.75

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Watauga Reservoir	WRM
	37.4
Species	
Tubellaria	
Tricladida	
Planariidae	.
Oligocheata	
Oligochaetes	520
Hirudinea	.
Crustacea	
Amphipoda	.
Isopoda	.
Insecta	
Ephemeroptera	
Mayflies	.
Ephemeridae	
Hexagenia (<=10 mm)	.
Hexagenia (>10 mm)	.
Megaloptera	.
Sialidae	
Sialis sp.	
Odonata	
Anisoptera	.
Zygoptera	.
Trichoptera	
Caddisflies	.
Coeleoptera	.
Diptera	
Ceratopogonidae	.
Chironomidae	
Chironomids	18
Gastropoda	
Snails	.
Basommatophora	
Ancylidae	
Ferrissia sp.	.
Bivalvia	
Unionoida	
Unionidae	
Mussels	.
Veneroida	
Corbiculidae	
Corbicula (<=10mm)	.
Corbicula (>10mm)	.
Sphaeriidae	
Fingernail clams	.
Dreissenidae	
Dreissena polymorpha	.
Number of samples	10
Sum	538
Sum	0.60

VS 2000 RAPID BIOASSESSMENT
MeanDensity/SQMeter

Wilson Reservoir	TRM	
	260.8	273
Species		
Tubellaria		
Tricladida		
Planariidae	.	.
Oligocheata		
Oligochaetes	143	7
Hirudinea	5	3
Crustacea		
Amphipoda	.	15
Isopoda	.	.
Insecta		
Ephemeroptera		
Mayflies	.	.
Ephemeridae		
Hexagenia (<=10 mm)	.	5
Hexagenia (>10 mm)	.	12
Megaloptera	.	.
Sialidae		
Sialis sp.		
Odonata		
Anisoptera	.	.
Zygoptera	.	.
Trichoptera		
Caddisflies	.	.
Coeleoptera	.	.
Diptera		
Ceratopogonidae	.	.
Chironomidae		
Chironomids	610	12
Gastropoda		
Snails	2	45
Basommatophora		
Ancylidae		
Ferrissia sp.	.	.
Bivalvia		
Unionoida		
Unionidae		
Mussels	.	5
Veneroida		
Corbiculidae		
Corbicula (<=10mm)	.	97
Corbicula (>10mm)	.	633
Sphaeriidae		
Fingernail clams	3	22
Dreissenidae		
Dreissena polymorpha	.	.
Number of samples	10	10
Sum	763	855
Sum	0.60	0.60

Appendix C.

Reservoir Benthic Macroinvertebrates -- Mean Density Results for Lab Processed Samples in 2000

VS 2000 LAB PROCESSED
MEAN DENSITY/SQMETER

Chatuge Reservoir	122.0

Species	Mean Density	Occurrence Per Site
Nematoda	5	2
Oligocheata		
Tubificidae	33	5
Limnodrilus hoffmeisteri	3	1
Insecta		
Ephemeroptera		
Ephemeridae		
Hexagenia limbata <10mm	2	1
Hexagenia limbata >10mm	3	1
Megaloptera		
Sialidae		
Sialis sp.	2	1
Diptera		
Ceratopogonidae		
Bezzia sp.	2	1
Chironomidae		
Chironomus sp.	7	3
Cladotanytarsus sp.	8	2
Coelotanypus sp.	3	1
Cryptochironomus fulvus	7	2
Polypedilum illinoense	3	1
Procladius sp.	23	3
Pseudochironomus sp.	15	1
Zalutschia zalutschicola	215	10
Bivalvia		
Veneroida		
Corbiculidae		
Corbicula fluminea (<10mm)	2	1
Sphaeriidae		
Musculium transversum	2	1
Sphaerium sp.	2	1
Number of samples	10	
Sum	337	
Number of taxa	16	
Number of EPT taxa	1	
Sum of area sampled	0.60	

VS 2000 LAB PROCESSED
MEAN DENSITY/SQMETER

Guntersville Reservoir TRM 420.0

Species	Mean Density	Occurrence Per Site
Turbellaria		
Tricladida		
Planariidae		
Dugesia tigrina	120	9
Oligocheata		
Naididae		
Pristina sp.	2	1
Tubificidae	40	5
Branchiura sowerbyi	8	1
Limnodrilus hoffmeisteri	5	2
Lumbricidae	2	1
Lumbriculidae	2	1
Coelenterata		
Hydra americana	2	1
Hirudinea	2	1
Erpobdellidae	13	1
Glossiphoniidae	2	1
Helobdella sp.	3	2
Crustacea		
Amphipoda		
Corophium lacustre		
Talitridae		
Hyalella azteca	7	1
Gammaridae		
Gammarus sp.	90	8
Insecta		
Odonata		
Gomphus sp.	5	2
Ephemeroptera		
Heptageniidae	7	1
Stenacron interpunctatum	22	4
Tricorythodes sp.	3	2
Stenonema sp.	7	3
Trichoptera		
Psychomyiidae		
Cyrnellus fraternus	2	1
Leptoceridae		
Ceraclea sp.	7	3
Megaloptera		
Sialidae		
Sialis sp.	2	1

Guntersville Reservoir TRM 420.0 (continued)		
Diptera		
Chironomidae		
Ablabesmyia mallochi	2	1
Chironomus sp.	12	2
Coelotanypus tricolor	10	2
Cricotopus sp.	3	2
Cryptochironomus fulvus	22	6
Dicrotendipes sp.	10	3
Nanocladius sp.	2	1
Polypedilum convictum	2	1
Polypedilum halterale	2	1
Pseudochironomus sp.	20	3
Stictochironomus sp.	2	1
Synorthocladius semivires	2	1
Coleoptera		
Elmidae		
Stenelmis sp.	2	1
Gastropoda		
Ancylidae		
Ferrissia rivularis	7	2
Planorbidae		
Menetus dilatatus	5	1
Pleuroceridae		
Pleurocera canaliculata	20	1
Lithasia verrucosa	8	3
Bulimidae		
Somatogyrus sp.	13	4
Mesogastropoda		
Viviparidae		
Campeloma decisum	2	1
Bivalvia		
Veneroida		
Corbiculidae		
Corbicula fluminea (<10mm)	265	8
Corbicula fluminea (>10mm)	425	8
Dressenidae		
Dreissena polymorpha	7	3
Number of samples	10	
Sum	1190	
Number of taxa	38	
Number of EPT taxa	5	
Sum of area sampled	0.60	

VS 2000 LAB PROCESSED
MEAN DENSITY/SQMETER

Hiwassee Reservoir HiRM 85.0

Species	Mean Density	Occurrence Per Site
Oligocheata		
Tubificidae	1120	10
Limnodrilus hoffmeisteri	63	4
Crustacea		
Isopoda		
Caecidotea sp.	2	1
Insecta		
Diptera		
Ceratopogonidae		
Bezzia sp.	2	1
Chironomidae		
Chironomus sp.	182	8
Polypedilum flavum	2	1
Procladius sp.	72	8
Bivalvia		
Veneroida		
Sphaeriidae	13	2
Musculium transversum	7	2
Acari		
Parasitengonia		
Acariformes	2	1
Number of samples	10	
Sum	1463	
Number of taxa	8	
Number of EPT taxa	0	
Sum of area sampled	0.60	

VS 2000 LAB PROCESSED
MEAN DENSITY/SQMETER

Pickwick Reservoir TRM 207.3

Species	Mean Density	Occurrence Per Site
Oligocheata		
Tubificidae	55	6
Limnodrilus hoffmeisteri	3	1
Lumbricidae	5	2
Crustacea		
Amphipoda		
Corophium lacustre	2	1
Insecta		
Ephemeroptera		
Ephemeridae		
Hexagenia limbata >10mm	13	5
Trichoptera		
Leptoceridae		
Oecetis sp.	2	1
Diptera		
Chironomidae		
Ablabesmyia annulata	12	2
Chironomus sp.	5	2
Coelotanypus tricolor	188	9
Mollusca		
Gastropoda		
Mesogastropoda		
Viviparidae		
Viviparus Georgianus	40	3
Pelecypoda		
Unionidae	3	1
Bivalvia		
Veneroida		
Corbiculidae		
Corbicula fluminea (<10mm)	12	3
Corbicula fluminea (>10mm)	113	6
Sphaeriidae	2	1
Musculium transversum	3	2
Number of samples	10	
Sum	458	
Number of taxa	11	
Number of EPT taxa	2	
Sum of area sampled	0.60	

VS 2000 LAB PROCESSED
MEAN DENSITY/SQMETER

Tims Ford Reservoir ERM 135.0

Species	Mean Density	Occurrence Per Site
Oligocheata		
Tubificidae	112	6
Gastropoda		
Mesogastropoda		
Bulimidae		
Somatogyrus sp.	2	1
Bivalvia		
Veneroida		
Corbiculidae		
Corbicula fluminea (<10mm)	2	1
Sphaeriidae	2	1
Number of samples	10	
Sum	117	
Number of taxa	4	
Number of EPT taxa	0	
Sum of area sampled	0.60	

VS 2000 LAB PROCESSED
MEAN DENSITY/SQMETER

Watauga Reservoir WRM 37.4

Species	Mean Density	Occurrence Per Site
Oligocheata		
Tubificidae	652	7
Limnodrilus hoffmeisteri	2	1
Insecta		
Diptera		
Chironomidae		
Chironomus sp.	17	4
Procladius sp.	2	1
Tanytarsus sp.	5	3
Bivalvia		
Veneroida		
Corbiculidae		
Corbicula fluminea (<10mm)	5	2
Sphaeriidae	3	1
Number of samples	10	
Sum	685	
Number of taxa	6	
Number of EPT taxa	0	
Sum of area sampled	0.60	

VS 2000 LAB PROCESSED
MEAN DENSITY/SQMETER

Watts Bar Reservoir TRM 560.8

Species	Mean Density	Occurrence Per Site
Nematoda	2	1
Oligocheata		
Tubificidae	15	5
Limnodrilus hoffmeisteri	3	2
Insecta		
Ephemeroptera		
Ephemeridae		
Hexagenia limbata <10mm	2	1
Hexagenia limbata >10mm	17	5
Diptera		
Chironomidae		
Ablabesmyia annulata	12	5
Chironomus sp.	72	10
Coelotanypus tricolor	243	10
Gastropoda		
Planorbidae		
Menetus dilatatus	2	1
Bivalvia		
Veneroida		
Corbiculidae		
Corbicula fluminea (<10mm)	5	3
Sphaeriidae		
Musculium transversum	97	6
Number of samples	10	
Sum	468	
Number of taxa	9	
Number of EPT taxa	1	
Sum of area sampled	0.60	

Appendix D.

Results and Ratings for Individual Metrics and Final RAFI Score for Each Sample Location in 2000 Including Both Regular and Repeat QA Sampling

Appendix D.

Results and Ratings for Individual Metrics and Final RAFI Score for Each Sample Location in 2000 Regular Sampling

Table 1. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Apalachia - - 2000

Metric		Forebay HiRM 66.5 Obs	Score
A. Species richness and composition			
1. Number of species		**15**	**3**
2. Number of sunfish species		**3**	**3**
3. Number of sucker species		**0**	**1**
4. Number of intolerant species		**0**	**1**
5. Percent tolerant individuals	Electro Fishing	**44.7**	**0.5**
	Gill Netting	**25.0**	**0.5**
6. Percent dominance *	Electro Fishing	**21.3**	**2.5**
	Gill Netting	**17.5**	**2.5**
7. Number of piscivore species		**7**	**5**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**21.3**	**0.5**
	Gill Netting	**37.5**	**0.5**
9. Percent insectivores	Electro Fishing	**42.6**	**0.5**
	Gill Netting	**10.0**	**2.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**1**	**1**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**3.1**	**0.5**
	Gill Netting	**4.0**	**0.5**
12. Percent anomalies		**0.0**	**5**
RFAI			**30**
			Poor

* Percent composition of the most abundant species

Table 2. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Beech - - 2000

Metric		Obs	Beech 36.0 Score
A. Species richness and composition			
1. Number of species		**11**	**3**
2. Number of sunfish species		**4**	**5**
3. Number of sucker species		**1**	**1**
4. Number of intolerant species		**1**	**1**
5. Percent tolerant individuals	Electro Fishing	**28.9**	**1.5**
	Gill Netting	**34.2**	**1.5**
6. Percent dominance*	Electro Fishing	**28.9**	**2.5**
	Gill Netting	**36.8**	**1.5**
7. Number of piscivore species		**3**	**3**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**32.9**	**0.5**
	Gill Netting	**71.1**	**0.5**
9. Percent insectivores	Electro Fishing	**38.6**	**0.5**
	Gill Netting	**3.9**	**1.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**1**	**1**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**15.2**	**0.5**
	Gill Netting	**7.6**	**0.5**
12. Percent anomalies		**0.0**	**5**
RFAI			**30**
			Poor

*Percent composition of the most abundant species

Table 3 Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Chatuge - - 2000

		Forebay HiRM 122.0		Transition Shooting Cr 1.5	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**15**	**3**	**14**	**3**
2. Number of sunfish species		**4**	**5**	**3**	**3**
3. Number of sucker species		**0**	**1**	**1**	**1**
4. Number of intolerant species		**0**	**1**	**1**	**1**
5. Percent tolerant individuals	Electro Fishing	**5.4**	**2.5**	**18.8**	**1.5**
	Gill Netting	**2.6**	**2.5**	**17.5**	**1.5**
6. Percent dominance *	Electro Fishing	**76.4**	**0.5**	**38.3**	**2.5**
	Gill Netting	**51.9**	**0.5**	**45.6**	**1.5**
7. Number of piscivore species		**6**	**5**	**5**	**3**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**0.2**	**2.5**	**2.7**	**2.5**
	Gill Netting	**9.1**	**2.5**	**21.1**	**1.5**
9. Percent insectivores	Electro Fishing	**85.2**	**2.5**	**73.8**	**0.5**
	Gill Netting	**2.6**	**0.5**	**0.0**	**0.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**2**	**1**	**3**	**3**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**31.1**	**1.5**	**9.9**	**0.5**
	Gill Netting	**7.7**	**0.5**	**5.7**	**0.5**
12. Percent anomalies		**16.6**	**1**	**1.9**	**5**
RFAI			**33**		**32**
			Fair		**Fair**

* Percent composition of the most abundant species

Table 4. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Cherokee - - 2000

		Forebay HRM 53.0		Transition HRM 76.0	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**22**	**5**	**25**	**5**
2. Number of sunfish species		**1**	**1**	**4**	**5**
3. Number of sucker species		**4**	**3**	**3**	**3**
4. Number of intolerant species		**0**	**1**	**1**	**1**
5. Percent tolerant individuals	Electro Fishing	**19.2**	**1.5**	**42.5**	**0.5**
	Gill Netting	**17.7**	**2.5**	**28.3**	**2.5**
6. Percent dominance *	Electro Fishing	**48.6**	**1.5**	**39.8**	**2.5**
	Gill Netting	**20.8**	**2.5**	**16.2**	**2.5**
7. Number of piscivore species		**8**	**5**	**10**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**22.5**	**1.5**	**41.0**	**0.5**
	Gill Netting	**70.0**	**0.5**	**55.5**	**1.5**
9. Percent insectivores	Electro Fishing	**61.1**	**1.5**	**24.2**	**0.5**
	Gill Netting	**2.3**	**0.5**	**0.0**	**0.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**3**	**3**	**2**	**1**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**24.0**	**0.5**	**29.5**	**0.5**
	Gill Netting	**13.0**	**0.5**	**17.3**	**1.5**
12. Percent anomalies		**1.2**	**5**	**1.0**	**5**
RFAI			**36**		**38**
			Fair		**Fair**

*Percent Composition of the most abundant species

Table 5. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Fontana - - 2000

Metric		Forebay LTRM 62.0 Obs	Score	Transition LTRM 81.5 Obs	Score	Transition TKRM 3.0 Obs	Score
A. Species richness and							
1. Number of species		**15**	**3**	**18**	**5**	**15**	**3**
2. Number of sunfish species		**2**	**3**	**2**	**3**	**2**	**3**
3. Number of sucker species		**1**	**1**	**4**	**5**	**3**	**3**
4. Number of intolerant species		**1**	**1**	**1**	**1**	**1**	**1**
5. Percent tolerant individuals	Electro	**8.3**	**2.5**	**34.3**	**0.5**	**50.9**	**0.5**
	Gill Netting	**4.4**	**2.5**	**26.3**	**0.5**	**26.1**	**0.5**
6. Percent dominance *	Electro	**46.9**	**1.5**	**32.8**	**2.5**	**50.9**	**1.5**
	Gill Netting	**35.3**	**1.5**	**21.2**	**2.5**	**29.6**	**2.5**
7. Number of piscivore species		**6**	**5**	**7**	**5**	**7**	**5**
B. Trophic composition							
8. Percent omnivores	Electro	**1.4**	**2.5**	**1.5**	**2.5**	**1.9**	**2.5**
	Gill Netting	**5.9**	**2.5**	**27.7**	**1.5**	**28.2**	**1.5**
9. Percent insectivores	Electro	**76.6**	**1.5**	**65.0**	**0.5**	**68.9**	**0.5**
	Gill Netting	**1.5**	**0.5**	**10.9**	**2.5**	**12.0**	**2.5**
C. Reproductive composition							
10. Number of Lithophilic spawning		**5**	**5**	**7**	**5**	**5**	**5**
D. Fish abundance and health							
11. Average number of individuals	Electro	**9.7**	**0.5**	**9.1**	**0.5**	**7.1**	**0.5**
	Gill Netting	**13.6**	**1.5**	**13.7**	**1.5**	**15.8**	**1.5**
12. Percent anomalies		**1.1**	**5**	**1.8**	**5**	**0.0**	**5**
RFAI			**40**		**44**		**39**
			Fair		**Good**		**Fair**

* Percent composition of the most abundant species

Table 6. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Fort Loudon - - 2000

		Forebay TRM 605.5		Transition TRM 624.6		Inflow TRM 652.0	
Metric		**Obs**	**Score**	**Obs**	**Score**	**Obs**	**Score**
A. Species richness and							
1. Number of species		**30**	**5**	**31**	**5**	**29**	**5**
2. Number of sunfish species		**4**	**3**	**4**	**3**	**5**	**5**
3. Number of sucker species		**6**	**3**	**6**	**3**	**5**	**3**
4. Number of intolerant species		**3**	**3**	**3**	**3**	**3**	**3**
5. Percent tolerant individuals	Electro	**28.4**	**1.5**	**25.0**	**1.5**	**29.7**	**5**
	Gill Netting	**9.6**	**2.5**	**18.1**	**2.5**	**0**	**0**
6. Percent dominance*	Electro	**38.0**	**2.5**	**38.5**	**2.5**	**22.6**	**5**
	Gill Netting	**34.7**	**1.5**	**18.1**	**2.5**	**0.0**	**0**
7. Number of piscivore species		**9**	**5**	**9**	**5**	**7**	**3**
B. Trophic composition							
8. Percent omnivores	Electro	**26.8**	**1.5**	**25.0**	**1.5**	**28.6**	**5**
	Gill Netting	**19.7**	**2.5**	**29.5**	**2.5**	**0**	**0**
9. Percent insectivores	Electro	**47.7**	**1.5**	**53.2**	**1.5**	**53.0**	**5**
	Gill Netting	**3.2**	**0.5**	**19.0**	**2.5**	**0**	**0**
C. Reproductive composition							
10. Number of Lithophilic spawning		**8**	**5**	**8**	**5**	**7**	**3**
D. Fish abundance and health							
11. Average number of individuals	Electro	**48.1**	**0.5**	**37.1**	**0.5**	**17.7**	**1**
	Gill Netting	**31.4**	**1.5**	**10.5**	**0.5**	**0**	**0**
12. Percent anomalies		**0.9**	**5**	**1.4**	**5**	**0.4**	**5**
RFAI			**45**		**47**		**48**
			Good		**Good**		**Good**

* Percent composition of the most abundant species

Table 7. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Guntersville - - 2000

		Forebay TRM 350.0		Transition TRM 375.2		Inflow TRM 424.0	
Metric		**Obs**	**Score**	**Obs**	**Score**	**Obs**	**Score**
A. Species richness and							
1. Number of species		**25**	**3**	**18**	**3**	**20**	**3**
2. Number of sunfish species		**3**	**3**	**3**	**3**	**4**	**3**
3. Number of sucker species		**2**	**1**	**0**	**1**	**3**	**3**
4. Number of intolerant species		**3**	**3**	**1**	**1**	**2**	**3**
5. Percent tolerant individuals	Electro	**51.9**	**0.5**	**48.4**	**1.5**	**56.8**	**1**
	Gill Netting	**15.0**	**2.5**	**7.9**	**2.5**	**0**	**0**
6. Percent dominance	Electro	**51.6**	**1.5**	**47.6**	**1.5**	**48.4**	**3**
	Gill Netting	**40.0**	**1.5**	**31.5**	**1.5**	**0.0**	**0**
7. Number of piscivore species		**10**	**5**	**8**	**5**	**7**	**3**
B. Trophic composition							
8. Percent omnivores	Electro	**52.4**	**0.5**	**48.4**	**1.5**	**60.4**	**1**
	Gill Netting	**20.0**	**2.5**	**12.6**	**2.5**	**0**	**0**
9. Percent insectivores	Electro	**28.5**	**0.5**	**33.7**	**1.5**	**21.6**	**1**
	Gill Netting	**2.5**	**0.5**	**7.1**	**1.5**	**0**	**0**
C. Reproductive composition							
10. Number of Lithophilic spawning		**5**	**3**	**2**	**1**	**4**	**3**
D. Fish abundance and health							
11. Average number of individuals	Electro	**24.8**	**0.5**	**23.5**	**0.5**	**25.6**	**1**
	Gill Netting	**12.0**	**0.5**	**12.7**	**0.5**	**0**	**0**
12. Percent anomalies		**0.0**	**5**	**0.0**	**5**	**0.5**	**5**
RFAI			**34**		**34**		**30**
			Fair		**Fair**		**Poor**

* Percent composition of the most abundant species

Table 8. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Hiwassee - - 2000

		Forebay HIRM 77.0		Transition HIRM 85.0	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**17**	**5**	**20**	**5**
2. Number of sunfish species		**3**	**3**	**3**	**3**
3. Number of sucker species		**4**	**5**	**6**	**5**
4. Number of intolerant species		**1**	**1**	**2**	**3**
5. Percent tolerant individuals	Electro Fishing	**30.0**	**1.5**	**16.8**	**1.5**
	Gill Netting	**14.6**	**1.5**	**12.7**	**1.5**
6. Percent dominance *	Electro Fishing	**38.6**	**2.5**	**38.9**	**2.5**
	Gill Netting	**41.7**	**1.5**	**25.4**	**2.5**
7. Number of piscivore species		**6**	**5**	**7**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**0.7**	**2.5**	**0.0**	**2.5**
	Gill Netting	**25.0**	**1.5**	**16.9**	**1.5**
9. Percent insectivores	Electro Fishing	**78.6**	**1.5**	**64.1**	**0.5**
	Gill Netting	**22.9**	**2.5**	**32.4**	**2.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**6**	**5**	**8**	**5**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**9.3**	**0.5**	**11.1**	**0.5**
	Gill Netting	**4.8**	**0.5**	**7.1**	**0.5**
12. Percent anomalies		**1.6**	**5**	**0.4**	**5**
RFAI			**45**		**47**
			Good		**Good**

* Percent composition of the most abundant species

Table 9. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Melton Hill - - 2000

		Forebay CRM 24.0		Transition CRM 45.0		Inflow CRM 66.0	
Metric		**Obs**	**Score**	**Obs**	**Score**	**Obs**	**Score**
A. Species richness and							
1. Number of species		**37**	**5**	**35**	**5**	**18**	**3**
2. Number of sunfish species		**5**	**5**	**5**	**5**	**4**	**3**
3. Number of sucker species		**8**	**5**	**7**	**3**	**5**	**3**
4. Number of intolerant species		**4**	**3**	**2**	**3**	**3**	**3**
5. Percent tolerant individuals	Electro	**8.6**	**2.5**	**41.5**	**1.5**	**59.3**	**1**
	Gill Netting	**22.4**	**1.5**	**15.9**	**2.5**	**0**	**0**
6. Percent dominance *	Electro	**45.8**	**1.5**	**32.6**	**2.5**	**56.9**	**3**
	Gill Netting	**19.2**	**2.5**	**15.0**	**2.5**	**0.0**	**0**
7. Number of piscivore species		**14**	**5**	**10**	**5**	**5**	**3**
B. Trophic composition							
8. Percent omnivores	Electro	**7.8**	**2.5**	**39.3**	**1.5**	**61.0**	**1**
	Gill Netting	**44.2**	**1.5**	**54.0**	**0.5**	**0**	**0**
9. Percent insectivores	Electro	**41.8**	**1.5**	**33.8**	**1.5**	**27.6**	**3**
	Gill Netting	**6.4**	**1.5**	**18.6**	**2.5**	**0**	**0**
C. Reproductive composition							
10. Number of Lithophilic spawning		**9**	**5**	**8**	**5**	**5**	**3**
D. Fish abundance and health							
11. Average number of individuals	Electro	**49.7**	**0.5**	**26.8**	**0.5**	**8.2**	**1**
	Gill Netting	**15.6**	**1.5**	**11.3**	**0.5**	**0**	**0**
12. Percent anomalies		**3.7**	**3**	**1.9**	**5**	**0.0**	**5**
RFAI			**48**		**47**		**32**
			Good		**Good**		**Fair**

* Percent composition of the most abundant species

Table 10. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Normandy - - 2000

Metric		Forebay DRM 249.5 Obs	Score
A. Species richness and composition			
1. Number of species		**26**	**5**
2. Number of sunfish species		**4**	**5**
3. Number of sucker species		**5**	**3**
4. Number of intolerant species		**5**	**5**
5. Percent tolerant individuals	Electro Fishing	**66.4**	**0.5**
	Gill Netting	**21.7**	**1.5**
6. Percent dominance *	Electro Fishing	**60.0**	**1.5**
	Gill Netting	**22.5**	**2.5**
7. Number of piscivore species		**10**	**5**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**66.0**	**0.5**
	Gill Netting	**27.5**	**2.5**
9. Percent insectivores	Electro Fishing	**24.2**	**0.5**
	Gill Netting	**9.4**	**2.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**8**	**5**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**17.7**	**0.5**
	Gill Netting	**13.8**	**1.5**
12. Percent anomalies		**0.0**	**5**
RFAI			**47**
			Good

* Percent composition of the most abundant species

Table 11. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Pickwick - - 2000

		Embayment BCM 8.4		Inflow TRM 259.0	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**29**	**5**	**28**	**5**
2. Number of sunfish species		**4**	**3**	**4**	**3**
3. Number of sucker species		**6**	**3**	**7**	**3**
4. Number of intolerant species		**5**	**5**	**6**	**3**
5. Percent tolerant individuals	Electro Fishing	**57.9**	**0.5**	**12.6**	**5**
	Gill Netting	**18.9**	**2.5**	**0**	**0**
6. Percent dominance *	Electro Fishing	**56.1**	**1.5**	**14.2**	**5**
	Gill Netting	**62.8**	**0.5**	**0.0**	**0**
7. Number of piscivore species		**10**	**5**	**9**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**59.1**	**0.5**	**20.4**	**5**
	Gill Netting	**21.1**	**2.5**	**0**	**0**
9. Percent insectivores	Electro Fishing	**28.9**	**0.5**	**50.1**	**5**
	Gill Netting	**6.8**	**0.5**	**0**	**0**
C. Reproductive composition					
10. Number of Lithophilic spawning		**9**	**5**	**9**	**5**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**22.8**	**0.5**	**24.9**	**1**
	Gill Netting	**35.5**	**2.5**	**0**	**0**
12. Percent anomalies		**0.1**	**5**	**0.5**	**5**
RFAI			**43**		**50**
			Good		**Good**

* Percent composition of the most abundant species

Table 12. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Pickwick - - 2000

		Forebay TRM 207.3		Transition TRM 230.0	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**25**	**3**	**30**	**5**
2. Number of sunfish species		**4**	**3**	**3**	**3**
3. Number of sucker species		**4**	**3**	**7**	**3**
4. Number of intolerant species		**3**	**3**	**4**	**3**
5. Percent tolerant individuals	Electro Fishing	**69.6**	**0.5**	**18.3**	**2.5**
	Gill Netting	**37.9**	**1.5**	**17.4**	**2.5**
6. Percent dominance *	Electro Fishing	**68.4**	**0.5**	**61.6**	**0.5**
	Gill Netting	**37.9**	**1.5**	**14.3**	**2.5**
7. Number of piscivore species		**8**	**5**	**10**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**69.4**	**0.5**	**21.3**	**2.5**
	Gill Netting	**46.4**	**0.5**	**32.9**	**1.5**
9. Percent insectivores	Electro Fishing	**25.3**	**0.5**	**72.4**	**2.5**
	Gill Netting	**2.9**	**0.5**	**13.0**	**1.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**6**	**3**	**9**	**5**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**26.3**	**0.5**	**22.2**	**0.5**
	Gill Netting	**14.0**	**0.5**	**16.1**	**1.5**
12. Percent anomalies		**0.2**	**5**	**0.0**	**5**
RFAI			**32**		**47**
			Fair		**Good**

* Percent composition of the most abundant species

Table 13. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

South Holston - - 2000

Metric		Forebay SFHRM 51.0 Obs	Forebay SFHRM 51.0 Score	Transition SFHRM 62.5 Obs	Transition SFHRM 62.5 Score
A. Species richness and composition					
1. Number of species		**17**	**3**	**20**	**3**
2. Number of sunfish species		**2**	**3**	**3**	**3**
3. Number of sucker species		**3**	**3**	**6**	**3**
4. Number of intolerant species		**3**	**5**	**3**	**5**
5. Percent tolerant individuals	Electro Fishing	**14.3**	**2.5**	**23.2**	**1.5**
	Gill Netting	**17.0**	**2.5**	**32.0**	**1.5**
6. Percent dominance *	Electro Fishing	**47.7**	**1.5**	**34.1**	**2.5**
	Gill Netting	**48.0**	**1.5**	**38.4**	**1.5**
7. Number of piscivore species		**7**	**5**	**6**	**3**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**16.5**	**1.5**	**23.2**	**1.5**
	Gill Netting	**25.0**	**2.5**	**44.8**	**1.5**
9. Percent insectivores	Electro Fishing	**66.9**	**1.5**	**62.9**	**1.5**
	Gill Netting	**2.0**	**0.5**	**3.5**	**1.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**4**	**3**	**7**	**5**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**17.7**	**0.5**	**22.7**	**0.5**
	Gill Netting	**10.0**	**0.5**	**17.2**	**1.5**
12. Percent anomalies		**2.7**	**3**	**0.8**	**5**
RFAI			**40**		**42**
			Fair		**Good**

* Percent composition of the most abundant species

Table 14. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Tims Ford - - 2000

		Forbay ERM 135.0		Transition ERM 150.0	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**22**	**5**	**19**	**5**
2. Number of sunfish species		**3**	**3**	**2**	**3**
3. Number of sucker species		**3**	**3**	**4**	**1**
4. Number of intolerant species		**2**	**3**	**1**	**1**
5. Percent tolerant individuals	Electro Fishing	**25.3**	**1.5**	**22.4**	**1.5**
	Gill Netting	**21.6**	**1.5**	**39.6**	**0.5**
6. Percent dominance *	Electro Fishing	**34.9**	**2.5**	**48.0**	**1.5**
	Gill Netting	**25.5**	**2.5**	**32.8**	**1.5**
7. Number of piscivore species		**10**	**5**	**7**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**25.3**	**0.5**	**21.4**	**1.5**
	Gill Netting	**33.3**	**2.5**	**59.0**	**1.5**
9. Percent insectivores	Electro Fishing	**42.2**	**0.5**	**58.2**	**1.5**
	Gill Netting	**2.0**	**0.5**	**0.7**	**0.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**5**	**3**	**4**	**3**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**5.5**	**0.5**	**6.5**	**0.5**
	Gill Netting	**5.1**	**0.5**	**13.4**	**1.5**
12. Percent anomalies		**0.0**	**5**	**0.0**	**5**
RFAI			**40**		**35**
			Fair		**Fair**

* Percent composition of the most abundant species

Table 15. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Watauga - - 2000

		Forebay WRM 37.4		Transition WRM 45.5	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**14**	**3**	**17**	**5**
2. Number of sunfish species		**1**	**1**	**1**	**1**
3. Number of sucker species		**0**	**1**	**3**	**3**
4. Number of intolerant species		**1**	**1**	**3**	**5**
5. Percent tolerant individuals	Electro Fishing	**15.7**	**1.5**	**29.4**	**1.5**
	Gill Netting	**7.9**	**2.5**	**8.9**	**2.5**
6. Percent dominance *	Electro Fishing	**49.7**	**1.5**	**29.0**	**2.5**
	Gill Netting	**68.5**	**0.5**	**68.8**	**0.5**
7. Number of piscivore species		**8**	**5**	**6**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**27.9**	**0.5**	**44.8**	**0.5**
	Gill Netting	**9.0**	**2.5**	**11.6**	**2.5**
9. Percent insectivores	Electro Fishing	**58.5**	**0.5**	**39.9**	**0.5**
	Gill Netting	**0.0**	**0.5**	**2.7**	**0.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**1**	**1**	**4**	**3**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**25.1**	**0.5**	**35.6**	**1.5**
	Gill Netting	**8.9**	**0.5**	**11.2**	**1.5**
12. Percent anomalies		**3.0**	**3**	**1.4**	**5**
RFAI			**26**		**41**
			Poor		**Good**

* Percent composition of the most abundant species

Table 16. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Watts Bar - - 2000

		Inflow CRM 22.0		Inflow TRM 601.0	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**20**	**3**	**33**	**5**
2. Number of sunfish species		**3**	**3**	**5**	**5**
3. Number of sucker species		**4**	**3**	**6**	**3**
4. Number of intolerant species		**4**	**3**	**5**	**3**
5. Percent tolerant individuals	Electro Fishing	**3.5**	**5**	**35.0**	**3**
	Gill Netting	**0**	**0**	**0**	**0**
6. Percent dominance *	Electro Fishing	**18.4**	**5**	**29.6**	**5**
	Gill Netting	**0.0**	**0**	**0.0**	**0**
7. Number of piscivore species		**5**	**3**	**11**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**6.1**	**5**	**33.6**	**3**
	Gill Netting	**0**	**0**	**0**	**0**
9. Percent insectivores	Electro Fishing	**71.1**	**5**	**42.3**	**3**
	Gill Netting	**0**	**0**	**0**	**0**
C. Reproductive composition					
10. Number of Lithophilic spawning		**4**	**3**	**9**	**5**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**7.6**	**1**	**33.7**	**1**
	Gill Netting	**0**	**0**	**0**	**0**
12. Percent anomalies		**4.4**	**3**	**4.0**	**3**
RFAI			**42**		**44**
			Good		**Good**

* Percent compostion of the most abundant species

Table 17. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Watts Bar - - 2000

		Forebay TRM 531.0		Transition TRM 560.8	
Metric		**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition					
1. Number of species		**33**	**5**	**34**	**5**
2. Number of sunfish species		**5**	**5**	**6**	**5**
3. Number of sucker species		**5**	**3**	**4**	**3**
4. Number of intolerant species		**3**	**3**	**3**	**3**
5. Percent tolerant individuals	Electro Fishing	**21.6**	**1.5**	**17.5**	**2.5**
	Gill Netting	**33.5**	**1.5**	**24.0**	**1.5**
6. Percent dominance *	Electro Fishing	**46.7**	**1.5**	**35.3**	**2.5**
	Gill Netting	**31.8**	**1.5**	**28.6**	**2.5**
7. Number of piscivore species		**10**	**5**	**12**	**5**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**15.3**	**2.5**	**19.1**	**2.5**
	Gill Netting	**39.4**	**1.5**	**29.5**	**2.5**
9. Percent insectivores	Electro Fishing	**75.9**	**2.5**	**65.5**	**2.5**
	Gill Netting	**8.5**	**1.5**	**2.3**	**0.5**
C. Reproductive composition					
10. Number of Lithophilic spawning		**6**	**3**	**5**	**3**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**47.0**	**0.5**	**48.1**	**0.5**
	Gill Netting	**34.0**	**1.5**	**21.7**	**1.5**
12. Percent anomalies		**1.0**	**5**	**1.5**	**5**
RFAI			**45**		**48**
			Good		**Good**

* Percent composition of the most abundant species

Table 18. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Wilson - - 2000

Metric		Forebay TRM 260.8 Obs	Forebay TRM 260.8 Score	Inflow TRM 274.0 Obs	Inflow TRM 274.0 Score
A. Species richness and composition					
1. Number of species		**22**	**3**	**16**	**3**
2. Number of sunfish species		**4**	**3**	**3**	**3**
3. Number of sucker species		**2**	**1**	**4**	**3**
4. Number of intolerant species		**4**	**3**	**3**	**3**
5. Percent tolerant individuals	Electro Fishing	**36.8**	**1.5**	**57.9**	**1**
	Gill Netting	**19.7**	**2.5**	**0**	**0**
6. Percent dominance *	Electro Fishing	**36.1**	**2.5**	**57.9**	**3**
	Gill Netting	**35.8**	**1.5**	**0**	**0**
7. Number of piscivore species		**9**	**5**	**2**	**1**
B. Trophic composition					
8. Percent omnivores	Electro Fishing	**38.6**	**1.5**	**59.0**	**1**
	Gill Netting	**23.4**	**2.5**	**0**	**0**
9. Percent insectivores	Electro Fishing	**40.4**	**1.5**	**35.5**	**3**
	Gill Netting	**2.9**	**0.5**	**0**	**0**
C. Reproductive composition					
10. Number of Lithophilic spawning		**4**	**3**	**3**	**1**
D. Fish abundance and health					
11. Average number of individuals	Electro Fishing	**19.0**	**0.5**	**39.9**	**1**
	Gill Netting	**13.7**	**0.5**	**0**	**0**
12. Percent anomalies		**0.2**	**5**	**0.3**	**5**
RFAI			**38**		**28**
			Fair		**Poor**

* Percent composition of the most abundant species

Appendix D.

Results and Ratings for Individual Metrics and Final RAFI Score for Each Sample Location in 2000 Repeat QA Sampling

Table 1. Scoring result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Chatuge - QA - 2000

Metric		Forebay HiRM 122 Obs	Score
A. Species richness and composition			
1. Number of species		**10**	**3**
2. Number of sunfish species		**3**	**3**
3. Number of sucker species		**0**	**1**
4. Number of intolerant species		**0**	**1**
5. Percent tolerant individuals	Electro Fishing	**6.3**	**2.5**
	Gill Netting	**34.4**	**0.5**
6. Percent dominance *	Electro Fishing	**45.0**	**1.5**
	Gill Netting	**40.6**	**1.5**
7. Number of piscivore species		**4**	**3**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**1.3**	**2.5**
	Gill Netting	**46.9**	**0.5**
9. Percent insectivores	Electro Fishing	**52.5**	**0.5**
	Gill Netting	**0.0**	**0.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**1**	**1**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**5.3**	**0.5**
	Gill Netting	**3.2**	**0.5**
12. Percent anomalies		**0.0**	**5**
RFAI			**28**
			Poor

* Percent composition of the most abundant species

Table 2. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Guntersville - QA - 2000

Metric		Inflow TRM 424.0 Obs	Score
A. Species richness and composition			
1. Number of species		**28**	**5**
2. Number of sunfish species		**5**	**5**
3. Number of sucker species		**6**	**3**
4. Number of intolerant species		**3**	**3**
5. Percent tolerant individuals	Electro Fishing	**17.6**	**5**
	Gill Netting	**0**	**0**
6. Percent dominance *	Electro Fishing	**15.9**	**5**
	Gill Netting	**0.0**	**0**
7. Number of piscivore species		**7**	**3**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**13.6**	**5**
	Gill Netting	**0**	**0**
9. Percent insectivores	Electro Fishing	**59.3**	**5**
	Gill Netting	**0**	**0**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**9**	**5**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**39.3**	**1**
	Gill Netting	**0**	**0**
12. Percent anomalies		**3.1**	**3**
RFAI			**48**
			Good

* Percent composition of the most abundant species

Table 3. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Hiwassee - QA - 2000

Metric		Obs	Transition HIRM 85.0 Score
A. Species richness and composition			
1. Number of species		**15**	**3**
2. Number of sunfish species		**2**	**3**
3. Number of sucker species		**4**	**5**
4. Number of intolerant species		**2**	**3**
5. Percent tolerant individuals	Electro Fishing	**6.8**	**2.5**
	Gill Netting	**15.9**	**1.5**
6. Percent dominance *	Electro Fishing	**34.1**	**2.5**
	Gill Netting	**22.7**	**2.5**
7. Number of piscivore species		**6**	**5**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**0.0**	**2.5**
	Gill Netting	**20.5**	**1.5**
9. Percent insectivores	Electro Fishing	**34.1**	**0.5**
	Gill Netting	**25.0**	**2.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**6**	**5**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**2.9**	**0.5**
	Gill Netting	**4.4**	**0.5**
12. Percent anomalies		**0.0**	**5**
RFAI			**46**
			Good

Percent composition of the most abundant species

Table 4. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Pickwick - QA - 2000

Metric		Forebay TRM 207.3 Obs	Score
A. Species richness and composition			
1. Number of species		**29**	**5**
2. Number of sunfish species		**4**	**3**
3. Number of sucker species		**4**	**3**
4. Number of intolerant species		**4**	**3**
5. Percent tolerant individuals	Electro Fishing	**26.6**	**1.5**
	Gill Netting	**38.6**	**1.5**
6. Percent dominance	Electro Fishing	**25.4**	**2.5**
	Gill Netting	**38.6**	**1.5**
7. Number of piscivore species		**8**	**5**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**26.6**	**1.5**
	Gill Netting	**44.7**	**1.5**
9. Percent insectivores	Electro Fishing	**56.7**	**1.5**
	Gill Netting	**4.5**	**0.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**5**	**3**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**41.1**	**0.5**
	Gill Netting	**13.2**	**0.5**
12. Percent anomalies		**1.2**	**5**
RFAI			**40**
			Fair

Table 5. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Tims Ford - QA - 2000

Metric		Forebay ERM135 Obs	Score
A. Species richness and composition			
1. Number of species		**23**	**5**
2. Number of sunfish species		**5**	**5**
3. Number of sucker species		**3**	**3**
4. Number of intolerant species		**2**	**3**
5. Percent tolerant individuals	Electro Fishing	**3.6**	**2.5**
	Gill Netting	**41.4**	**0.5**
6. Percent dominance *	Electro Fishing	**74.4**	**0.5**
	Gill Netting	**34.3**	**1.5**
7. Number of piscivore species		**10**	**5**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**1.1**	**2.5**
	Gill Netting	**28.6**	**2.5**
9. Percent insectivores	Electro Fishing	**94.9**	**2.5**
	Gill Netting	**0.0**	**0.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**3**	**3**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**50.6**	**1.5**
	Gill Netting	**7.0**	**0.5**
12. Percent anomalies		**0.8**	**5**
RFAI			**44**
			Good

* Percent composition of the most abundant species

Table 6. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Watauga - QA - 2000

Metric		Forebay WRM 37.4 Obs	Score
A. Species richness and composition			
1. Number of species		**11**	**3**
2. Number of sunfish species		**1**	**1**
3. Number of sucker species		**0**	**1**
4. Number of intolerant species		**1**	**1**
5. Percent tolerant individuals	Electro Fishing	**73.2**	**0.5**
	Gill Netting	**7.6**	**2.5**
6. Percent dominance *	Electro Fishing	**73.2**	**0.5**
	Gill Netting	**65.2**	**0.5**
7. Number of piscivore species		**6**	**5**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**73.2**	**0.5**
	Gill Netting	**8.7**	**2.5**
9. Percent insectivores	Electro Fishing	**7.0**	**0.5**
	Gill Netting	**0.0**	**0.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**1**	**1**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**4.7**	**0.5**
	Gill Netting	**9.2**	**0.5**
12. Percent anomalies		**0.0**	**5**
			26
			Poor

* Percent composition of the most abundant species

Table 7. Scoring Result for the Twelve Metrics and Overall Reservoir Fish Assemblage Index (RFAI)

Watts Bar - QA - 2000

Metric		Transition TRM 560.8 Obs	Score
A. Species richness and composition			
1. Number of species		**26**	**3**
2. Number of sunfish species		**5**	**5**
3. Number of sucker species		**3**	**1**
4. Number of intolerant species		**3**	**3**
5. Percent tolerant individuals	Electro Fishing	**53.1**	**0.5**
	Gill Netting	**10.7**	**2.5**
6. Percent dominance *	Electro Fishing	**51.2**	**1.5**
	Gill Netting	**67.6**	**0.5**
7. Number of piscivore species		**9**	**5**
B. Trophic composition			
8. Percent omnivores	Electro Fishing	**52.6**	**0.5**
	Gill Netting	**15.5**	**2.5**
9. Percent insectivores	Electro Fishing	**33.3**	**1.5**
	Gill Netting	**2.0**	**0.5**
C. Reproductive composition			
10. Number of Lithophilic spawning species		**5**	**3**
D. Fish abundance and health			
11. Average number of individuals	Electro Fishing	**28.0**	**0.5**
	Gill Netting	**59.9**	**2.5**
12. Percent anomalies		**0.3**	**5**
RFAI			**38**
			Fair

* Percent composition of the most abundant species

Appendix E.

Mean Catch Per Effort by Species For Electrofishing and Gill Netting Efforts at Each Location in 2000 Including Both Regular and Repeat QA Sampling

Appendix E.

Mean Catch Per Effort by Species
For Electrofishing and Gill Netting Efforts
at Each Location in 2000 for Regular Sampling

Table 1. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Apalachia - - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Names	Forebay HiRM 67.0	Forebay HiRM 67.0	Forebay HiRM 67.0
Gizzard shad	0.47	2.77	0.70
Common carp	0.07	0.40	0.30
Channel catfish	0.13	0.79	0.50
Flathead catfish	0.13	0.79	.
Redbreast sunfish	0.53	3.16	.
Green sunfish	0.33	1.98	.
Bluegill	0.47	2.77	0.30
Smallmouth bass	.	.	0.60
Spotted bass	0.33	1.98	0.20
Largemouth bass	0.67	3.95	0.40
White crappie	.	.	0.10
Black crappie	.	.	0.10
Yellow perch	.	.	0.10
Walleye	.	.	0.50
Blueback herring	.	.	0.20
Total	3.13	18.59	4
Number Samples	15		10
Number Collected	47		40
Species Collected	9		12

Table 2. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Beech - - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Names	Forebay BRM 36.0	Forebay BRM 36.0	Forebay BRM 36.0
Gizzard shad	4.40	27.16	2.10
Common carp	.	.	0.50
Lake chubsucker	0.07	0.41	.
Channel catfish	0.60	3.70	2.80
Yellow bass	0.47	2.88	1.50
Warmouth	0.07	0.41	.
Bluegill	3.53	21.81	0.10
Longear sunfish	0.20	1.23	.
Redear sunfish	2.00	12.35	0.20
Largemouth bass	3.53	21.81	0.40
Black crappie	0.33	2.06	.
Total	15.2	93.82	7.6
Number Samples	15		10
Number Collected	228		76
Species Collected	10		7

Table 3. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Chatuge - - 2000

Common Names	Electrofishing Forebay HiRM 122.0	Electrofishing Catch Rate Per Hour Forebay HiRM 122.0	Gill Netting Forebay HiRM 122.0	Electrofishing Transition Shooting Cr 1.5	Electrofishing Catch Rate Per Hour Transition Shooting Cr 1.5	Gill Netting Transition Shooting Cr 1.5
Gizzard shad	.	.	0.20	0.27	1.56	0.80
Common carp	0.07	0.37	.	.	.	0.20
Whitetail shiner	0.07	0.37	.	0.67	3.91	.
Channel catfish	.	.	0.50	.	.	0.20
Snail bullhead	0.20	1.12	.	0.20	1.17	.
White bass	.	.	0.20	.	.	0.70
Hybrid striped x white bass	.	.	0.60	.	.	0.10
Warmouth	0.60	3.36	.	0.87	5.08	.
Nortern hog sucker	.	.	.	0.13	0.78	.
Redbreast sunfish	1.60	8.96	.	1.60	9.38	.
Bluegill	23.67	132.46	0.10	3.80	22.27	.
Redear sunfish	0.13	0.75	0.10	.	.	.
Hybrid sunfish	0.13	0.75	.	0.07	0.39	.
Smallmouth bass	.	.	0.70	0.07	0.39	.
Spotted bass	3.27	18.28	4.00	1.07	6.25	2.60
Largemouth bass	1.20	6.72	0.10	1.20	7.03	0.10
ck crappie	0.07	0.37	.	.	.	.
ileye	.	.	1.20	.	.	1.00
Total	31.01	173.51	7.7	9.95	58.21	5.7
Number Samples	15		10	15		10
Number Collected	466		77	149		57
Species Collected	11		10	11		8

Table 4. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights

Cherokee - - 2000

Common Name	Electrofishing Forebay HRM 53.0	Electrofishing Catch Rate Per Hour Forebay HRM 53.0	Gill Netting Forebay HRM 53.0	Electrofishing Transition HRM 76.0	Electrofishing Catch Rate Per Hour Transition HRM 76.0	Gill Netting Transition HRM 76.0
Longnose gar	.	.	0.10	.	.	0.50
Gizzard shad	4.47	24.63	1.50	11.73	65.92	2.80
Threadfin shad	*	.	.	3.13	17.60	.
Common carp	0.13	0.74	0.70	0.33	1.87	1.60
Spotfin shiner	2.93	16.18	.	0.20	1.12	0
Bluntnose minnow	0.80	4.41	.	.	.	.
River carpsucker	.	.	2.30	.	.	0.70
Quillback	.	.	2.70	.	.	2.70
Smallmouth buffalo	.	.	0.30	.	.	0.80
Golden redhorse	0.07	0.37	.	.	.	.
Blue catfish	.	.	0.10	.	.	0.10
Channel catfish	.	.	1.50	.	.	0.90
Flathead catfish	0.07	0.37	0.70	.	.	1.00
White bass	0.07	0.37	0.50	1.47	8.24	2.50
Striped bass	.	.	1.20	.	.	1.60
Bluegill	11.67	64.34	0.10	6.27	35.21	.
Smallmouth bass	0.33	1.84	0.60	0.20	1.12	0.20
Spotted bass	0.20	1.10	.	0.67	3.75	.
Largemouth bass	2.27	12.50	0.20	3.13	17.60	0.40
White crappie	.	.	.	.	.	0.10
Black crappie	1.00	5.51	0.10	1.53	8.61	1.10
Walleye	.	.	0.20	.	.	0.20
Hybrid striped x white bass	.	.	.	.	.	0.10
Rock bass	.	.	.	0.07	0.37	.
Warmouth	.	.	.	.	.	.
Green sunfish	.	.	.	0.47	2.62	.
Redear sunfish	.	.	.	0.13	0.75	.
Freshwater drum	.	.	0.20	0.07	0.37	.
Total	24.01	132.36	13	29.4	165.15	17.3
Number Samples	15		10	15		10
Number Collected	360		130	442		173
Species Collected	12		17	14		17

* Indicates only young of the year collected

Table 5. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Fontana - - 2000

Common Name	Electrofishing Transition LTRM 81.5	Electrofishing Catch Rate Per Hour Transition LTRM 81.5	Gill Netting Transition LTRM 81.5	Electrofishing Transition TKRM 3.0	Electrofishing Catch Rate Per Hour Transition TKRM 3.0	Gill Netting Transition TKRM 3.0
Gizzard shad	0.13	0.69	2.90	.	.	3.40
Common carp	.	.	0.70	.	.	0.30
Whitetail shiner	0.07	0.35	.	.	.	.
Silver redhorse	.	.	0.80	.	.	.
Shorthead redhorse	0.20	1.04	0.10	.	.	1.10
River redhorse	.	.	0.30	0.07	0.40	.
Golden redhorse	0.20	1.04	0.20	.	.	0.60
Channel catfish	.	.	0.20	0.13	0.80	0.30
Flathead catfish	0.53	2.78	1.90	0.73	4.40	0.80
White bass	.	.	0.90	.	.	1.20
Green sunfish	3.00	15.63	.	3.60	21.60	.
Bluegill	2.27	11.81	0.10	1.13	6.80	.
Hybrid sunfish	.	.	.	0.07	0.40	.
Smallmouth bass	0.60	3.13	1.40	0.47	2.80	0.50
Spotted bass	0.07	0.35	0.10	.	.	.
Largemouth bass	1.67	8.68	1.30	0.87	5.20	0.90
›brid bass	0.07	0.35	.	.	.	.
..hite crappie	.	.	.	.	.	0.50
Black crappie	.	.	0.60	.	.	0.40
Tangerine darter	0.20	1.04	.	.	.	.
Walleye	0.13	0.69	2.20	.	.	4.20
Total	9.14	47.58	13.7	7.07	42.4	14.2
Number Samples	15		10	15		9
Number Collected	137		137	106		142
Species Collected	13		15	8		12

Table 5 Cont'. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Fontana - - 2000

	Electrofishing	Electrofishing Catch Rate Per hour	Gill Netting
Common Name	Forebay LTRM 62.0	Forebay LTRM 62.0	Forebay LTRM 62.0
Gizzard shad	.	.	0.60
Whitetail shiner	0.67	3.37	.
Silver shiner	0.53	2.69	.
Spotfin shiner	1.20	6.06	.
Golden redhorse	.	.	0.10
Channel catfish	0.13	0.67	0.20
Flathead catfish	0.27	1.35	1.00
White bass	.	.	2.20
Rock bass	0.13	0.67	.
Green sunfish	0.80	4.04	.
Bluegill	4.53	22.90	0.10
Smallmouth bass	0.87	4.38	4.20
Largemouth bass	0.33	1.68	0.40
Tangerine darter	0.20	1.01	.
Walleye	.	.	4.80
Total	9.66	48.82	13.6
Number Samples	15		10
Number Collected	145		136
Species Collected	11		9

Table 6. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Fort Loudoun - - 2000

Common Name	Electrofishing Forebay TRM 605.5	Electrofishing Catch Rate Per Hour Forebay TRM 605.5	Gill Netting Forebay TRM 605.5	Electrofishing Transition TRM 624.6	Electrofishing Catch Rate Per Hour Forebay TRM 624.6	Gill Netting Forebay TRM 624.6
Skipjack herring	.	.	5.90	.	.	1.90
Gizzard shad	11.27	56.71	2.30	7.00	34.31	1.30
Threadfin shad	*	.	.	0.07	0.33	.
Common carp	1.27	6.38	0.70	1.67	8.17	0.60
Golden shiner	.	.	.	0.07	0.33	.
Emerald shiner	.	.	.	1.20	5.88	.
Spotfin shiner	1.53	7.72	.	0.53	2.61	.
Northern hog sucker	0.40	2.01	.	0.13	0.65	0.10
Smallmouth buffalo	0.20	1.01	1.40	0.13	0.65	0.20
Black buffalo	.	.	0.10	0.13	0.65	.
Spotted sucker	0.13	0.67	0.10	0.33	1.63	.
Silver redhorse	.	.	0.50	.	.	1.10
Golden redhorse	.	.	0.10	0.07	0.33	.
Blue catfish	.	.	1.30	.	.	0.80
Channel catfish	0.13	0.67	0.40	0.27	1.31	0.20
Flathead catfish	0.07	0.34	0.50	0.27	1.31	0.80
'hite bass	0.13	0.67	4.60	0.13	0.65	0.30
ellow bass	.	.	10.90	.	.	0.70
Striped bass	.	.	0.90	.	.	0.10
Warmouth	0.13	0.67	.	0.27	1.31	.
Redbreast sunfish	0.40	2.01	.	.	.	.
Green sunfish	0.73	3.69	.	0.53	2.61	.
Bluegill	18.27	91.95	0.20	14.27	69.93	0.40
Redear sunfish	.	.	.	0.27	1.31	.
Hybrid sunfish	.	.	.	0.07	0.33	.
Smallmouth bass	1.27	6.38	0.10	1.20	5.88	.
Largemouth bass	10.47	52.68	0.10	6.07	29.74	.
White crappie	0.13	0.67	.	0.13	0.65	0.20
Black crappie	0.13	0.67	0.10	0.07	0.33	.
Yellow perch	0.33	1.68	.	.	.	.
Logperch	0.20	1.01	.	0.07	0.33	.
Sauger	0.07	0.34	1.10	0.13	0.65	1.40
Freshwater drum	0.13	0.67	0.10	0.13	0.65	0.40
Brook silverside	0.67	3.36	.	1.87	9.15	.
Total	48.06	241.96	31.4	37.08	181.68	10.5
Number Samples	15		10	15		10
Number Collected	721		314	556		105
Species Collected	22		20	27		16

* Indicates only young of the year collected

Table 6 Cont'. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Fort Loudoun - - 2000

Common Name	Electrofishing Inflow TRM 652.0	Electrofishing Catch Rate Per Hour Inflow TRM 652.0
American brook lamprey	0.07	0.38
Gizzard shad	4.00	22.64
Threadfin shad	*	.
Common carp	0.67	3.77
Emerald shiner	4.00	22.64
Spotfin shiner	1.33	7.55
Bluntnose minnow	0.13	0.75
Northern hog sucker	0.07	0.38
Black buffalo	0.20	1.13
Spotted sucker	0.20	1.13
Silver redhorse	0.07	0.38
Golden redhorse	0.93	5.28
Channel catfish	0.07	0.38
American eel	0.07	0.38
Yellow bass	0.07	0.38
Rock bass	0.60	3.40
Warmouth	0.13	0.75
Redbreast sunfish	0.47	2.64
Green sunfish	0.13	0.75
Bluegill	1.47	8.30
Redear sunfish	0.33	1.89
Smallmouth bass	0.47	2.64
Spotted bass	0.80	4.53
Largemouth bass	1.13	6.42
White crappie	0.07	0.38
Snubnose darter	0.07	0.38
Logperch	0.07	0.38
Freshwater drum	0.07	0.38
Brook silverside	0.07	0.38
Total	17.76	100.39
Number Samples	15	
Number Collected	266	
Species Collected	28	

* Indicates only young of the year collected

Table 7. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Guntersville - - 2000

Common Name	Electrofishing Forebay TRM 350.0	Electrofishing Catch Rate Per Hour Forebay TRM 350.0	Gill Netting Forebay TRM 350.0	Electrofishing Transition TRM 375.2	Electrofishing Catch Rate Per Hour Transition TRM 375.2	Gill Netting Transition TRM 375.2
Spotted gar	0.33	1.99	.	0.60	3.66	.
Longnose gar	.	.	.	.	.	0.10
Skipjack herring	.	.	4.80	.	.	2.50
Gizzard shad	12.80	76.49	1.70	11.20	68.29	0.80
Threadfin shad	*	.	.	*	.	.
Common carp	0.07	0.40	0.10	0.07	0.41	0.10
Smallmouth buffalo	0.07	0.40	0.10	.	.	.
Spotted sucker	0.07	0.40	.	.	.	.
Blue catfish	.	.	0.10	.	.	.
Emerald shiner	.	.	.	6.73	41.06	.
Channel catfish	0.07	0.40	0.40	0.13	0.81	0.70
Flathead catfish	0.47	2.79	.	.	.	.
Yellow bass	.	.	0.90	.	.	4.00
Striped bass	0.13	0.80	0.30	.	.	.
Hybrid striped x white bass	.	.	1.00	.	.	.
Redbreast sunfish	.	.	.	0.13	0.81	.
·egill	2.40	14.34	0.10	0.53	3.25	0.20
·ngear sunfish	0.27	1.59	.	.	.	.
Redear sunfish	0.60	3.59	0.20	0.47	2.85	0.40
Smallmouth bass	0.07	0.40	.	.	.	.
Spotted bass	0.27	1.59	0.70	0.07	0.41	1.40
Largemouth bass	3.40	20.32	.	3.53	21.54	0.60
Black crappie	.	.	.	.	.	0.20
White crappie	.	.	0.30	.	.	.
Yellow perch	0.07	0.40	.	0.07	0.41	.
Logperch	0.07	0.40	.	.	.	.
Sauger	0.07	0.40	1.20	.	.	1.40
Walleye	.	.	0.10	.	.	.
Freshwater drum	0.13	0.80	.	.	.	0.30
Brook silverside	3.47	20.72	.	.	.	.
Total	24.83	148.22	12	23.53	143.5	12.7
Number Samples	15		10	15		10
Number Collected	372		120	353		127
Species Collected	19		15	11		13

*-Indicates only young of the year collected

Table 7 Cont'. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Guntersville - - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour
Common Name	Inflow TRM 424.0	Inflow TRM 424.0
Spotted gar	0.13	0.79
Longnose gar	1.27	7.54
Gizzard shad	12.40	73.81
Common carp	0.13	0.79
Emerald shiner	1.47	8.73
Smallmouth buffalo	1.27	7.54
Spotted sucker	0.13	0.79
Golden redhorse	0.13	0.79
Blue catfish	0.67	3.97
Channel catfish	1.00	5.95
Flathead catfish	0.07	0.40
Yellow bass	0.47	2.78
Redbreast sunfish	0.73	4.37
Bluegill	0.87	5.16
Longear sunfish	0.53	3.17
Redear sunfish	1.33	7.94
Hybrid sunfish	0.07	0.40
Spotted bass	1.20	7.14
Largemouth bass	1.33	7.94
Sauger	0.13	0.79
Freshwater drum	0.27	1.59
Total	25.6	152.38
Number Samples	15	
Number Collected	384	
Species Collected	21	

Table 8. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Hiwassee - - 2000

Common Name	Electrofishing Forebay HiRM 77.0	Electrofishing Catch Rate Per Hour Forebay HiRM 77.0	Gill Netting Forebay HiRM 77.0	Electrofishing Transition HiRM 85.0	Electrofishing Catch Rate Per Hour Transition HiRM 85.0	Gill Netting Transition HiRM 85.0
Muskellunge	.	.	.	.	.	0.10
Gizzard shad	0.07	0.38	0.30	.	.	0.60
Common carp	.	.	0.40	.	.	0.30
Whitetail shiner	0.53	3.04	.	0.07	0.35	.
Northern hog sucker	0.33	1.90	0.10	0.47	2.48	.
Silver redhorse	.	.	0.60	.	.	1.80
Shorthead redhorse	.	.	.	0.07	0.35	.
River redhorse	.	.	.	0.20	1.06	.
Golden redhorse	.	.	0.10	.	.	0.20
Sicklefin redhorse	0.13	0.76	0.30	0.13	0.71	0.30
Channel catfish	.	.	0.50	.	.	0.30
Flathead catfish	.	.	0.20	0.33	1.77	.
White bass	.	.	0.10	.	.	0.30
Redbreast sunfish	0.60	3.42	.	0.13	0.71	.
Green sunfish	2.13	12.17	.	1.73	9.22	.
Bluegill	3.60	20.53	.	4.33	23.05	.
ıallmouth bass	0.60	3.42	0.20	0.73	3.90	1.20
,otted bass	1.00	5.70	.	1.93	10.28	0.20
Largemouth bass	0.33	1.90	.	1.00	5.32	.
Walleye	.	.	2.00	.	.	1.80
Total	9.32	53.22	4.8	11.12	59.2	7.1
Number Samples	15		10	15		10
Number Collected	140		48	167		71
Species Collected	10		11	12		11

Table 9. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Melton Hill - - 2000

Common Name	Electrofishing Forebay CRM 24.0	Electrofishing Catch Rate Per Hour Forebay CRM 24.0	Gill Netting Forebay CRM 24.0	Electrofishing Transition CRM 45.0	Electrofishing Catch Rate Per Hour Transition CRM 45.0	Gill Netting Transition CRM 45.0
Spotted gar	.	.	.	0.07	0.36	.
Longnose gar	.	.	0.20	.	.	.
Skipjack herring	.	.	1.00	.	.	0.70
Gizzard shad	1.80	9.22	2.80	8.73	46.95	1.40
Threadfin shad	*	.	.	*	.	.
Brown trout	.	.	.	.	.	0.10
Hybrid shad	0.13	0.68	.	.	.	.
Common carp	1.07	5.46	0.50	1.40	7.53	0.40
Spotfin shiner	0.13	0.68	.	0.73	3.94	.
Bluntnose minnow	0.47	2.39	.	0.13	0.72	.
River carpsucker	.	.	1.00	0.13	0.72	1.00
Quillback	.	.	1.40	0	.	1.00
Northern hog sucker	0.07	0.34	.	.	.	.
Smallmouth buffalo	0.13	0.68	0.30	0	.	0.40
Black buffalo	0.33	1.71	0.40	0	.	0.20
Spotted sucker	.	.	0.10	0.27	1.43	0.10
Silver redhorse	.	.	0.70	.	.	0.20
Golden redhorse	0.07	0.34	.	0.40	2.15	0.10
Blue catfish	.	.	0.10	.	.	.
Channel catfish	0.07	0.34	0.40	0.13	0.72	1.70
Flathead catfish	.	.	0.20	.	.	.
White bass	0.73	3.75	1.80	0	0	0.90
Yellow bass	0.07	0.34	3.00	0.07	0.36	1.10
Striped bass	.	.	0.70	.	.	0.10
Hybrid striped x white bass	.	.	0.20	.	.	.
Rock bass	0.07	0.34	.	.	.	.
Warmouth	0.13	0.68	.	0.53	2.87	.
Redbreast sunfish	0.40	2.05	.	0.80	4.30	.
Green sunfish	1.00	5.12	.	0.20	1.08	.
Bluegill	17.73	90.78	.	4.93	26.52	0.20
Redear sunfish	0.33	1.71	.	0.53	2.87	.
Hybrid sunfish	0.07	0.34	.	0.13	0.72	.
Smallmouth bass	0.67	3.41	0.10	0.27	1.43	.
Spotted bass	.	.	.	0.53	2.87	.
Largemouth bass	22.80	116.72	.	5.87	31.54	.
White crappie	0.33	1.71	.	0.27	1.43	0.10
Black crappie	0.27	1.37	.	0.13	0.72	.
Snubnose darter	.	.	.	0.07	0.36	.
Yellow perch	.	.	.	0.07	0.36	0.20
Logperch	0.07	0.34	.	0.20	1.08	.
Sauger	.	.	0.10	.	.	0.20
Walleye	.	.	0.40	.	.	.
Freshwater drum	.	.	0.20	0.07	0.36	1.20
Brook silverside	0.80	4.10	.	0.13	0.72	.
Total	49.74	254.6	15.6	26.79	144.11	11.3
Number Samples	15		10	15		10
Number Collected	746		156	402		113
Species Collected	25		21	26		20

* Indicates only young of year collected

Table 9. Cont'. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Melton Hill - - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour
Common Name	Inflow CRM 66.0	Inflow CRM 66.0
Gizzard shad	4.67	24.91
Rainbow trout	0.20	1.07
White sucker	0.33	1.78
Northern hog sucker	0.13	0.71
Spotted sucker	0.33	1.78
Black redhorse	0.07	0.36
Golden redhorse	0.67	3.56
White bass	0.20	1.07
Striped bass	0.07	0.36
Redbreast sunfish	0.13	0.71
Green sunfish	0.07	0.36
Bluegill	0.73	3.91
Redear sunfish	0.07	0.36
Largemouth bass	0.07	0.36
White crappie	0.13	0.71
Black crappie	0.27	1.42
Banded sculpin	0.07	0.36
Total	8.21	43.79
Number Samples	15	
Number Collected	123	
Species Collected	17	

Table 10. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Normandy - - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Name	Forebay DRM 249.5	Forebay DRM 249.5	Forebay DRM 249.5
Gizzard shad	10.60	63.35	1.00
Threadfin shad	*	.	.
Central stoneroller	0.07	0.40	.
Common carp	1.00	5.98	2.00
Spotfin shiner	0.20	1.20	.
Northern hog sucker	0.07	0.40	.
Spotted sucker	0.27	1.59	.
Silver redhorse	.	.	0.70
Black redhorse	.	.	0.20
Golden redhorse	.	.	0.20
Blue catfish	0	0	0.20
Channel catfish	0.07	0.40	0.60
Flathead catfish	0.07	0.40	1.60
White bass	.	.	0.40
Rock bass	.	.	0.30
Green sunfish	0.13	0.80	.
Bluegill	1.60	9.56	0.20
Longear sunfish	1.93	11.55	.
Redear sunfish	0.07	0.40	.
Smallmouth bass	0.27	1.59	3.10
Spotted bass	0.60	3.59	.
Largemouth bass	0.73	4.38	1.60
White crappie	.	.	1.20
Black crappie	.	.	0.30
Sauger	.	.	0.10
Walleye	.	.	0.10
Total	17.68	105.59	13.8
Number Samples	15		10
Number Collected	265		138
Species Collected	15		17

* Indicates only young of year collected

Table 11. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Pickwick - - 2000

Common Name	Electrofishing Embayment BCM 8.4	Electrofishing Catch Rate Per Hour Embayment BCM 8.4	Gill Netting Embayment BCM 8.4	Electrofishing Inflow TRM 259.9	Electrofishing Catch Rate Per Hour Inflow TRM 259.9
Spotted gar	.	.	0.10	0.07	0.40
Skipjack herring	.	.	2.10	.	.
Gizzard shad	12.80	80.33	6.60	1.40	8.47
Threadfin shad	.	.	22.30	.	.
Common carp	0.40	2.51	0.10	1.67	10.08
Emerald shiner	.	.	.	.	.
Spotfin shiner	.	.	.	0.07	0.40
River carpsucker	.	.	.	0.07	0.40
Northern hog sucker	0.47	2.93	.	0.20	1.21
Smallmouth buffalo	0.13	0.84	0.30	0.40	2.42
Spotted sucker	1.87	11.72	1.00	1.13	6.85
Silver redhorse	0.33	2.090	.	0.40	2.42
River redhorse	0.80	5.02	.	1.00	6.05
Golden redhorse	0.27	1.26	.	1.00	6.05
Blue catfish	.	.	0.30	0.47	2.82
Channel catfish	0.13	0.84	0.30	1.07	6.45
Flathead catfish	.	.	0.10	0.20	1.21
White bass	0.20	1.26	.	0.67	4.03
Yellow bass	0.60	3.77	.50	2.47	14.92
Striped bass	.	.	0.10	1.00	6.05
Rock bass	.	.	.	0.13	0.81
Green sunfish	.	.	.	0.07	0.40
Warmouth	0.70	0.42	.	.	.
Bluegill	1.00	6.28	.	3.53	21.37
Longear sunfish	0.60	3.77	.	1.60	9.68
Redear sunfish	0.27	1.67	.	1.07	6.45
Smallmouth bass	0.40	2.51	.	0.40	2.42
Spotted bass	0.07	0.42	.	1.00	6.05
Largemouth bass	1.33	8.37	.	1.27	7.66
Logperch	0.20	1.26	.	0.27	1.61
Sauger	0.07	0.42	0.20	0.13	0.81
Freshwater drum	0.60	3.77	1.40	2.13	12.90
Brook silverside	0.13	0.84	.	.	.
Total	22.81	143.13	35.5	24.89	150.39
Number Samples	15		10	15	
Number Collected	342		355	373	
Species Collected	23		15	28	

Table 12. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Pickwick - - 2000

Common Name	Electrofishing Forebay TRM 207.3	Electrofishing Catch Rate Per Hour Forebay TRM 207.3	Gill Netting Forebay TRM 207.3	Electrofishing Forebay TRM 230.0	Electrofishing Catch Rate Per Hour Forebay TRM 230.0	Gill Netting Forebay TRM 230.0
Spotted gar	0.07	0.41	.	0.13	0.84	.
Longnose gar	.	.	.	.	.	0.20
Skipjack herring	.	.	3.20	.	.	2.30
Gizzard shad	18.00	111.11	5.30	4.07	25.52	2.30
Threadfin shad	.	.	2.00	.	.	0.40
Common carp	0.13	0.82	.	.	.	0.30
Emerald shinner	.	.	.	13.67	85.77	.
Spotfin shinner	.	.	.	0.13	0.84	.
River carpsucker	.	.	.	0.13	0.84	.
Northern hog sucker	.	.	.	0.13	0.84	.
Smallmouth buffalo	0.07	0.41	0	0.13	0.84	0.50
Spotted sucker	0.73	4.53	0.20	0.53	3.35	.
Silver redhorse	.	.	.	.	.	0.50
Shorthead redhorse	.	.	0.10	.	.	0.40
River redhorse	.	.	.	.	.	.
Golden redhorse	0.07	0.41	.	.	.	0.40
Blue catfish	.	.	0.80	.	.	1.90
Channel catfish	0.07	0.41	0.40	0.40	2.51	0.30
Flathead catfish	0.07	0.41	0.70	0.07	0.42	0.40
White bass	.	.	.	.	.	1.70
Yellow bass	.	.	0.10	.	.	0.60
Striped bass	.	.	0.30	.	.	.
Hybrid striped x white bass	.	.	0.10	.	.	0.60
Warmouth	.	.	.	.	.	.
Green sunfish	0.20	1.23	.	.	.	.
Bluegill	1.47	9.05	.	0.53	3.35	0.10
Longear sunfish	2.53	15.64	.	0.07	0.42	.
Redear sunfish	0.67	4.12	.	0.33	2.09	0.30
Smallmouth bass	0.20	1.23	0.30	0.13	0.84	0.40
Spotted bass	0.13	0.82	.	.	.	1.10
Largemouth bass	0.93	5.76	0.10	1.07	6.69	0.30
White crappie	.	.	.	.	.	.
Yellow perch	0.07	0.41	.	0.13	0.84	.
Logperch	0.33	2.06	.	0.27	1.67	.
Sauger	.	.	0.30	.	.	0.70
Freshwater drum	0.60	3.70	0.10	0.27	1.67	0.40
Total	26.34	162.53	14	22.19	139.34	16.1
Number Samples	15		10	15		10
Number Collected	395		140	333		161
Species Collected	18		15	18		22

Table 13. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

South Holston - - 2000

Common Name	Electrofishing Forebay SFHR 51.0	Electrofishing Catch Rate Per Hour Forebay SFHR 51.0	Gill Netting Forebay SFHR 51.0	Electrofishing Forebay SFHR 62.5	Electrofishing Catch Rate Per Hour Forebay SFHR 62.5	Gill Netting Forebay SFHR 62.5
Gizzard shad	2.27	13.88	1.00	4.93	27.51	3.90
Threadfin shad	.	.	.	.	.	0.10
Common carp	0.27	1.63	0.70	0.33	1.86	1.60
Silver shiner	.	.	.	0.47	2.60	.
Spotfin shiner	2.93	17.96	.	5.33	29.74	.
River carpsucker	.	.	.	.	.	0.40
Bluntnose minnow	0.40	2.45	.	.	.	.
Quillback	.	.	0.50	.	.	1.20
Northern hog sucker	0.07	0.41	.	0.27	1.49	.
River redhorse	0.20	1.22	0.10	0.47	2.60	0.20
Black redhorse	.	.	.	0.20	1.12	0.10
Golden redhorse	.	.	.	0.07	0.37	.
Channel catfish	.	.	0.30	.	.	0.60
Flathead catfish	0.13	0.82	0.40	.	.	0.80
White bass	.	.	0.20	.	.	0.10
Rock bass	0.87	5.31	0.40	.	.	.
White bass	.	.	.	.	.	0.10
Warmouth	0.20	1.22	.	0.13	0.74	.
Bluegill	8.47	51.84	0.10	7.73	43.12	0.30
Smallmouth bass	1.87	11.43	1.10	2.07	11.52	0.80
Largemouth bass	0.07	0.41	.	0.53	2.97	0.10
Black crappie	.	.	0.40	.	.	0.40
Walleye	.	.	4.80	0.07	0.37	6.60
Total	17.75	108.58	10	22.67	126.38	17.2
Number Samples	15		10	15		10
Number Collected	266		100	340		172
Species Collected	12		12	14		15

Table 14. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Tims Ford - - 2000

Common Name	Electrofishing Forebay ERM 135.05	Electrofishing Catch Rate Per Hour Forebay ERM 135.05	Gill Netting Forebay ERM 135.05	Electrofishing Transition ERM 150.0	Electrofishing Catch Rate Per Hour Transition ERM 150.0	Gill Netting Transition ERM 150.0
Longnose gar	.	.	0.60	.	.	.
Gizzard shad	0.93	5.65	0.20	0.47	2.82	4.40
Threadfin shad	*	.	.	*	.	.
Common carp	0.40	2.42	0.30	0.93	5.65	0.90
Spotfin shiner	0.07	0.40	.	0.47	2.82	.
Quillback	.	.	0.30	.	.	1.50
Smallmouth buffalo	.	.	0.70	.	.	0.90
Black redhorse	.	.	0.10	.	.	0.10
Golden redhorse	.	.	.	0.07	0.40	.
Channel catfish	0.07	0.40	0.20	.	.	0.20
Flathead catfish	0.20	1.21	1.30	0.07	0.40	0.40
White bass	.	.	0.30	.	.	.
Yellow bass	.	.	0.30	.	.	2.70
Striped bass	.	.	0.20	.	.	0.90
Green sunfish	0.07	0.40	.	0.07	0.40	.
Bluegill	1.93	11.69	.	3.13	18.95	.
Longear sunfish	0.27	1.61	.	0.33	2.02	0.40
Smallmouth bass	0.27	1.61	0.10	.	.	.
Spotted bass	0.20	1.21	.	.	.	.
Largemouth bass	0.33	2.02	0.10	0.80	4.84	0.40
White crappie	.	.	.	.	.	0.10
Black crappie	0.80	4.84	.	0.07	0.40	.
Sauger	.	.	0.10	.	.	.
Walleye	.	.	0.30	0.07	0.40	0.50
Freshwater drum	.	.	.	0.07	0.40	.
Total	5.54	33.46	5.1	6.55	39.5	13.4
Number Samples	15		10	15		10
Number Collected	83		51	98		134
Species Collected	12		15	12		13

* Indicates only young of year collected

Table 15. Species Listing and Catch per unit Effort During Fall Electrofishing and Gillnetting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Watauga - - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Nmae	Forebay WRM 37.7	Forebay WRM 37.7	Forebay WRM 37.7	Transition WRM 45.5	Transition WRM 45.5	Transition WRM 45.5
Alewife	.	.	.	.	.	.
Gizzard shad	3.73	22.13	0.60	9.67	57.77	0.60
Brown trout	.	.	.	.	.	0.10
Common carp	0.20	1.19	0.10	0.80	4.78	0.40
Spotfin shiner	2.20	13.04	.	3.60	21.51	.
Bluntnose minnow	3.00	17.79	.	5.40	32.27	.
River redhorse	.	.	.	0.07	0.40	.
Black redhorse	.	.	.	0.13	0.80	0.10
Golden redhorse	.	.	.	0.07	0.40	0.10
Channel catfish	0.07	0.40	0.10	0.07	0.40	0.30
Flathead catfish	.	.	0.30	0.07	0.40	0.20
Rock bass	0.47	2.77	0.20	1.13	6.77	0.20
Bluegill	12.47	73.91	.	10.33	61.75	.
Smallmouth bass	1.40	8.30	1.20	3.33	19.92	1.30
Spotted bass	0.13	0.79	0.10	0.33	1.99	0.10
Largemouth bass	0.93	5.53	0.20	0.40	2.39	.
Black crappie	0.40	2.37	.	.	.	.
Freshwater drum	.	.	.	.	.	0.10
leye	0.07	0.40	6.10	0.20	1.20	7.70
Total	25.07	148.62	8.9	35.6	212.75	11.2
Number Samples	15		10	15		10
Number Collected	376		89	534		112
Species Collected	12		9	15		12

Table 16. Species Listing and Catch per unit Effort During Fall Electrofishing and Gillnetting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Watts Bar - - 2000

Common Name	Electrofishing Inflow CRM 22.0	Electrofishing Catch Rate Per Hour Inflow CRM 22.0	Electrofishing Inflow TRM 601.0	Electrofishing Catch Rate Per Hour Inflow TRM 601.0
Spotted gar	.	.	0.07	0.35
Longnose gar	.	.	0.07	0.35
Gizzard shad	11.33	64.89	10.00	52.08
Threadfin shad	0.07	0.38	0.07	0.35
Common carp	0.07	0.38	0.67	3.47
Emerald shiner	.	.	1.93	10.07
Bluntnose minnow	1.20	6.87	.	.
Spotfin shiner	.	.	1.20	6.25
Northern hog sucker	0.07	0.38	0.13	0.69
Smallmouth buffalo	.	.	0.33	1.74
Spotted sucker	0.47	2.67	0.47	2.43
River redhorse	.	.	0.27	1.39
Black redhorse	0.47	2.67	0.33	1.74
Golden redhorse	0.27	1.53	0.40	2.08
Channel catfish	.	.	0.33	1.74
Flathead catfish	0.07	0.38	.	.
White bass	0.33	1.91	0.33	1.74
Yellow bass	0.40	2.29	0.67	3.47
Striped bass	0.20	1.15	0.33	1.74
Rock bass	0.27	1.53	0.13	0.69
Warmouth	.	.	0.13	0.69
Redbreast sunfish	.	.	0.60	3.13
Green sunfish	0.07	0.38	0.47	2.43
Bluegill	1.20	6.87	5.87	30.56
Redear sunfish	0.27	1.53	1.60	8.33
Hybrid sunfish	.	.	0.07	0.35
Smallmouth bass	0.07	0.38	0.60	3.13
Spotted bass	.	.	0.73	3.82
Largemouth bass	0.53	3.05	1.40	7.29
White crappie	0.27	1.53	1.00	5.21
Black crappie	.	.	2.60	13.54
Yellow perch	0.40	2.29	0.20	1.04
Logperch	0.07	0.38	0.07	0.35
Sauger	0.07	0.38	0.13	0.69
Freshwater drum	0.07	0.38	0.40	2.08
Brook silverside	.	.	0.13	0.69
Total	18.24	104.2	33.73	175.7
Number Samples	15		15	
Number Collected	273		506	
Species Collected	23		34	

Table 17. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Watts Bar - - 2000

Common Name	Electrofishing Forebay TRM 531.0	Electrofishing Catch Rate Per Hour Forebay TRM 531.0	Gill Netting Forebay TRM 531.0	Electrofishing Transition TRM 560.8	Electrofishing Catch Rate Per Hour Transition TRM 560.8	Gill Netting Transition TRM 560.8
Spotted gar	.	.	.	0.07	0.34	0
Longnose gar	.	.	.	.	.	0.10
Skipjack herring	.	.	0.50	.	.	4.30
Gizzard shad	5.27	27.15	10.50	7.20	37.24	4.70
Threadfin shad	.	.	0.10	.	.	1.50
Common carp	0.73	3.78	0.90	0.40	2.07	0.40
Golden shiner	0.33	1.72	.	0.07	0.34	.
Emerald shiner	.	.	.	3.80	19.66	.
Spotfin shiner	4.40	22.68	.	4.60	23.79	.
Steelcolor shiner	0.07	0.34	.	.	.	.
Striped shiner	0.07	0.34	.	.	.	.
Bluntnose minnow	0.60	3.09	.	0.87	4.48	.
River carpsucker	.	.	.	.	.	0.20
Quillback	.	.	.	0.07	0.34	.
Smallmouth buffalo	0.07	0.34	0.30	.	.	.
Bigmouth buffalo	0.07	0.34	.	.	.	.
Black buffalo	.	.	0.10	.	.	.
Spotted sucker	0.40	2.06	1.00	.	.	0.40
ck redhorse	0.07	0.34	.	.	.	.
Blue catfish	.	.	0.80	.	.	.
Channel catfish	0.13	0.69	0.80	0.07	0.34	0.60
Flathead catfish	0.40	2.06	1.50	0.13	0.69	0.70
White bass	.	.	0.20	0.13	0.69	.
Yellow bass	.	.	10.80	0.07	0.34	6.20
Striped bass	.	.	0.40	.	.	.
Hybrid striped x white bass	.	.	0.30	.	.	.
Warmouth	0.20	1.03	.	0.33	1.72	.
Redbreast sunfish	2.33	12.03	.	0.20	1.03	.
Green sunfish	1.40	7.22	.	0.53	2.76	.
Bluegill	21.93	113.06	0.10	17.00	87.93	0.10
Longear sunfish	.	.	.	0.40	2.07	.
Redear sunfish	2.93	15.12	.	1.67	8.62	.
Smallmouth bass	1.13	5.84	.	1.47	7.59	.
Spotted bass	1.07	5.50	.	0.20	1.03	.
Largemouth bass	1.00	5.15	1.30	5.13	26.55	0.30
White crappie	.	.	2.00	0.07	0.34	0.60
Black crappie	0.47	2.41	0.20	0.13	0.69	.
Sauger	.	.	0.40	.	.	1.10
Logperch	.	.	.	0.07	0.34	
Freshwater drum	0.33	1.72	1.80	0.53	2.76	0.30
Brook silverside	1.60	8.25	.	2.27	11.72	.
Total	47	242.26	34	48.14	248.92	21.7
Number Samples	15		10	15		10
nber Collected	705		340	722		217
cies Collected	24		20	28		17

Table 18. Species Listing and Catch per unit Effort During Fall Electrofishing and Gillnetting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Wilson - - 2000

Common Name	Electrofishing Forebay TRM 260.8	Electrofishing Catch Rate Per Hour Forebay TRM 260.8	Gill Netting Forebay TRM 260.8	Electrofishing Inflow TRM 274.0	Electrofishing Catch Rate Per Hour Inflow TRM 274.0
Spotted gar	0.93	5.56	.	.	.
Longnose gar	0.07	0.40	.	.	.
Skipjack herring	.	.	4.90	.	.
Gizzard shad	6.87	40.87	2.70	23.07	137.85
Threadfin shad	.	.	3.00	*	.
Emerald shiner	.	.	.	3.33	19.92
Smallmouth buffalo	.	.	.	0.07	0.40
Spotted sucker	0.07	0.40	.	0.40	2.39
River redhorse	0.13	0.79	.	0.53	3.19
Golden redhorse	.	.	.	0.33	1.99
Blue catfish	.	.	0.50	0.07	0.40
Channel catfish	0.47	2.78	.	0.33	1.99
Flathead catfish	.	.	0.50	.	.
White bass	0.13	0.79	0.10	.	.
Yellow bass	.	.	0.20	.	.
Striped bass	0.07	0.40	.	.	.
Hybrid striped x white bass	.	.	0.10	.	.
Green sunfish	0.07	0.40	.	.	.
Bluegill	2.67	15.87	0.10	2.07	12.35
Longear sunfish	0.20	1.19	.	0.80	4.78
Redear sunfish	0.60	3.57	.	0.47	2.79
Smallmouth bass	1.40	8.33	0.10	1.27	7.57
Spotted bass	.	.	0.90	.	.
Largemouth bass	1.40	8.33	0.30	0.93	5.58
Freshwater drum	0.60	3.57	0.30	1.20	7.17
Brook silverside	3.33	19.84	.	5.00	29.88
Total	19.01	113.09	13.7	39.87	238.25
Number Samples	15		10	15	
Number Collected	285		137	598	
Species Collected	16		13	15	

* Indicates only young of year collected

Appendix E.

Mean Catch Per Effort by Species
For Electrofishing and Gill Netting Efforts
at Each Location in 2000 for Repeat QA Sampling

Table 1. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Chatuge - QA - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Names	Forebay HiRM 122.0	Forebay HiRM 122.0	Forebay HiRM 122.0
Gizzard shad	.	.	1.00
Common carp	.	.	0.10
Channel catfish	0.07	0.44	0.40
Flathead catfish	.	.	0.10
Redbreast sunfish	0.33	2.19	.
Bluegill	2.40	15.79	.
Redear sunfish	0.07	0.44	.
Spotted bass	1.87	12.28	1.30
Largemouth bass	0.60	3.95	.
Walleye	.	.	0.30
Total	5.34	35.09	3.2
Number Samples	15		10
Number Collected	80		32
Species Collected	6		6

Table 2. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Guntersville - QA - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour
Common Name	Inflow TRM 424.0	Inflow TRM 424.0
Longnose gar	0.33	1.89
Gizzard shad	2.07	11.70
Emerald shiner	4.00	22.64
Spotfin shiner	1.07	6.04
Channel shiner	1.87	10.57
Smallmouth buffalo	0.07	0.38
Black buffalo	0.40	2.26
Spotted sucker	0.33	1.89
Shorthead redhorse	0.07	0.38
Black redhorse	0.13	0.75
Golden redhorse	0.13	0.75
Blue catfish	1.27	7.17
Channel catfish	1.53	8.68
White bass	0.07	0.38
Yellow bass	1.73	9.81
Redbreast sunfish	4.07	23.02
Green sunfish	0.47	2.64
Bluegill	6.27	35.47
Longear sunfish	2.87	16.23
Redear sunfish	2.40	13.58
Spotted bass	4.93	27.92
Largemouth bass	1.53	8.68
Black crappie	0.13	0.75
Logperch	1.07	6.04
Sauger	0.07	0.38
Freshwater drum	0.20	1.13
Brook silverside	0.20	1.13
Inland silverside	0.07	0.38
Total	39.35	222.64
Number Samples	15	
Number Collected	590	
Species Collected	28	

Table 3. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Hiwassee - QA- 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Name	Transition HiRM 85.0	Transition HiRM 85.0	Transition HiRM 85.0
Gizzard shad	.	.	0.50
Common carp	.	.	0.20
Northern hog sucker	0.07	0.40	0
Silver redhorse	.	.	0.30
Black redhorse	.	.	0.10
Golden redhorse	0.07	0.40	0.70
Channel catfish	.	.	0.20
Flathead catfish	.	.	0.40
White bass	.	.	0.30
Green sunfish	0.20	1.20	.
Bluegill	0.67	4.00	.
Smallmouth bass	0.27	1.60	0.60
Spotted bass	1.00	6.00	0.10
Largemouth bass	0.67	4.00	.
Walleye	.	.	1.00
Total	2.95	17.6	4.4
Number Samples	15		10
Number Collected	44		44
Species Collected	7		11

Table 4. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Pickwick - QA - 2000

	Electofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Name	Forebay TRM 207.3	Forebay TRM 207.3	Forebay TRM 207.3
Skipjack herring	.	.	2.70
Gizzard shad	10.33	59.62	5.10
Threadfin shad	2.53	14.62	2.60
Central stoneroller	0.07	0.38	.
Common carp	0.20	1.15	.
Emerald shiner	0.27	1.54	.
Spotfin shiner	0.13	0.77	.
Northern hog sucker	0.07	0.38	.
Smallmouth buffalo	.	.	0.10
Bigmouth buffalo	0.07	0.38	.
Spotted sucker	0.73	4.23	0.30
Blue catfish	.	.	0.10
Channel catfish	0.40	2.31	0.60
Flathead catfish	1.80	10.38	0.10
Yellow bass	0.13	0.77	0.60
Striped bass	.	.	0.10
Green sunfish	0.40	2.31	.
Bluegill	3.73	21.54	.
Longear sunfish	10.47	60.38	.
Redear sunfish	0.53	3.08	0.10
Smallmouth bass	1.20	6.92	0.10
Spotted bass	0.20	1.15	.
Largemouth bass	0.80	4.62	.
White crappie	.	.	0.10
Yellow perch	0.07	0.38	.
Logperch	0.27	1.54	.
Sauger	0.07	0.38	0.40
Freshwater drum	1.07	6.15	0.20
Inland silverside	5.53	31.92	.
Totals	41.07	236.9	13.2
Number Samples	15		10
Number Fish Collected	617		132
Number Species Collected	24		15

Table 5. Species Listing and Catch per unit Effort During Fall Electrofishing and Gill netting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Tims Ford - QA - 2000

Common Name	Electrofishing Forebay ERM 135.05	Electrofishing Catch Rate Per Hour Forebay ERM 135.05	Gill Netting Forebay ERM 135.05
Longnose gar	0.07	0.37	2.40
Gizzard shad	.	.	0.40
Common carp	0.40	2.24	0.10
Spotfin shiner	2.80	15.67	.
River carpsucker	.	.	0.20
Quillback	.	.	0.20
Smallmouth buffalo	.	.	0.70
Channel catfish	0.13	0.75	0.40
Flathead catfish	0.27	1.49	0.80
White bass	.	.	0.10
Yellow bass	.	.	0.50
Striped bass	.	.	0.50
Rock bass	.	.	0.10
Warmouth	0.20	1.12	.
Green sunfish	1.33	7.46	.
Bluegill	37.67	210.82	.
Longear sunfish	5.93	33.21	.
Hybrid sunfish	0.07	0.37	.
Smallmouth bass	0.53	2.99	.
Spotted bass	0.40	2.24	.
Largemouth bass	0.40	2.24	.
Black crappie	0.40	2.24	.
Walleye	.	.	0.60
Total	50.6	283.21	7
Number Samples	15		10
Number Collected	759		70
Species Collected	14		13

Table 6. Species Listing and Catch per unit Effort During Fall Electrofishing and Gillnetting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Watauga - QA - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Nmae	Forebay WRM 37.7	Forebay WRM 37.7	Forebay WRM 37.7
Gizzard shad	3.47	20.80	0.30
Rainbow trout	0.07	0.40	.
Common carp	.	.	0.30
Channel catfish	.	.	0.10
Flathead catfish	.	.	0.40
Rock bass	.	.	0.20
Rock bass	0.13	0.80	.
Bluegill	0.33	2.00	.
Smallmouth bass	0.27	1.60	1.80
Largemouth bass	0.33	2.00	.
Walleye	0.13	0.80	6.00
Total	4.73	28.4	9.2
Number Samples	15		10
Number Collected	71		92
Species Collected	7		7

Table 7. Species Listing and Catch per unit Effort During Fall Electrofishing and Gillnetting (Electrofishing Effort = 300 Meters of Shoreline and Gill netting Effort = net-nights)

Watts Bar - QA - 2000

	Electrofishing	Electrofishing Catch Rate Per Hour	Gill Netting
Common Name	Transition TRM 560.8	Transition TRM 560.8	Transition TRM 560.8
Skipjack herring	.	.	1.20
Gizzard shad	14.33	87.40	5.90
Threadfin shad	.	.	0.10
Common carp	0.33	2.03	0.50
Emerald shiner	2.40	14.63	.
Smallmouth buffalo	0.07	0.41	0.50
Spotted sucker	0.20	1.22	0.60
Golden redhorse	0.07	0.41	.
Blue catfish	.	.	2.10
Channel catfish	.	.	0.30
Flathead catfish	.	.	0.50
White bass	0.07	0.41	40.50
Yellow bass	.	.	3.10
Striped bass	.	.	0.90
Redbreast sunfish	0.13	0.81	.
Green sunfish	0.07	0.41	.
Bluegill	2.93	17.89	0.10
Longear sunfish	0.13	0.81	.
Redear sunfish	1.80	10.98	.
Smallmouth bass	1.53	9.35	.
Largemouth bass	2.20	13.41	.
White crappie	.	.	0.70
Black crappie	0.13	0.81	.
Sauger	.	.	2.40
Freshwater drum	0.27	1.63	0.50
Brook silverside	1.33	8.13	.
Total	27.99	170.74	59.9
Number Samples	15		10
Number Collected	420		599
Species Collected	17		16