EFFECT OF LAND USE ON SEDIMENT OXYGEN DEMAND DYNAMICS IN BLACKWATER STREAMS

by

BARBRA J. CROMPTON

(Under the Direction of George Vellidis)

ABSTRACT

Sediment Oxygen Demand (SOD) is believed to be an important process affecting dissolved oxygen concentration in blackwater streams of the southeastern coastal plain. Because very few data on SOD are available, it is common for modelers today to take SOD values from the literature for use with dissolved oxygen (DO) models.

In this study, SOD was measured in seven blackwater streams of the Suwannee River basin within the Georgia coastal plain for approximately 9 months. SOD was measured using four *in-situ* chambers, and was found to vary on average between 0.3-2.3 g O_2/m^2-day for the seven study sites. SOD was found to vary significantly between the river basins within the Suwannee River, however land use was not found to be a driving force behind SOD values.

INDEX WORDS: Sediment oxygen demand, SOD, Benthic oxygen demand, Dissolved oxygen modeling, Land use, Coastal plain, Blackwater streams, Watersheds, Water quality.

EFFECT OF LAND USE ON SEDIMENT OXYGEN DEMAND DYNAMICS IN BLACKWATER STREAMS

by

BARBRA J. CROMPTON

B.S.Ed., University of Georgia, 2003

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GEORGIA

2005

EFFECT OF LAND USE ON SEDIMENT OXYGEN DEMAND DYNAMICS IN BLACKWATER STREAMS

by

BARBRA J. CROMPTON

Major Professor: George Vellidis

Committee: David Bosch
David Gattie

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
August 2005

DEDICATION

For my grandfather, who taught a young girl how to dream.

ACKNOWLEDGEMENTS

I would like to thank my committee, George Vellidis, David Gattie, and David Bosch. Also, I would like to thank the honorary members of my committee Richard Lowrance and Matt Smith for their thoughts and support throughout this project. I am also thankful for the help I received from Herman Henry, Andy Knowlton, Mike Gibbs, and Page Bloodworth in the field throughout this study and in maintaining the chambers. The particle size analysis could not have been completed without the help of Dr. Bob Hubbard and his lab technician, DeeAnn Web. Also, I would like to thank Rodney Hill for his support with the YSI products. Finally, this project would not have been completed without the support of Sam Utley and both our families.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

Page

<u>Chapter 1</u>

Introduction

Background

The tributaries of Georgia's coastal plain's main blackwater river systems (Ochlockonee, Satilla, St. Mary's and Suwannee) regularly violate Georgia Department of Natural Resources dissolved oxygen (DO) standards. These blackwater river systems, named for the black color of their deep water, are tinted by organic acids leached from the swamps on the tributary floodplains. Often DO becomes the most defining parameter of a water body due to its close link to the quality of biotic life in the water and chemical quality of the water itself (Alexander and Stefan, 1983).

Section 303(d) of the Clean Water Act requires states to list impaired waters and establish Total Maximum Daily Load (TMDL) water quality management plans for watersheds that are drained by impaired streams. On Georgia's 2003 303(d) list, 91% of all coastal plain streams listed violated DO standards. Nutrient enrichment from nonpoint source (NPS) pollution is generally attributed as the reason for low DO.

Recent research in Georgia and Louisiana indicates that low DO may be a natural condition for summer months in coastal plain streams (Vellidis et al., 2003; Ice and Sugden, 2003). Without a good understanding of the ecological processes governing DO dynamics in coastal plain streams, it is not possible to address the cause of low DO. However, one of the key ecological processes affecting dissolved oxygen is sediment oxygen demand (SOD), also known as benthic oxygen demand.

Sediment Oxygen Demand

Sediment oxygen demand is a natural phenomena affected by many components within the stream system including sediment and organic loads to the water column. Sedimentation has become a leading cause of surface water quality degradation due to erosion from construction sites (USEPA, 1995) and agricultural NPS pollution (Wang *et. al.*, 2001). Sediment input into streams is a natural occurrence at low levels, but when excessive sediment input occurs it becomes a pollutant and has negative effects on biota (Zimmerman *et. al.,* 2003; Nerbonne and Vondracek, 2001). In addition to sediment, decomposing litterfall from heavily vegetated floodplains and riparian zones as well as organic matter from point sources settles to the stream bottom. Once sediment and organic matter settle to the stream bottom the matrix created facilitates the exertion of chemical and biological demands on the oxygen in the water column as the organic matter is consumed by microorganisms living in the sediment matrix (Caldwell and Doyle, 1995). These cumulative oxygen demands can be characterized as the sediment oxygen demand.

Sediment oxygen demand serves as a critical sink of dissolved oxygen, and can be defined as two separate processes (Wu, 1990; Seiki *et. al.*, 1994). The first process is biological respiration of the living components within the sediment matrix. The second process is the chemical oxidation of reduced substances found within the matrix. Substances can be waste from the biological components or part of the sediment composition itself (Bowman and Delfino, 1980; Matlock *et. al.*, 2003).

Extensive environmental monitoring is difficult and expensive; therefore, mathematical modeling is frequently used to simulate natural systems and make regulatory decisions. Dissolved oxygen models contain many components including temperature, depth, velocity, bio-chemical oxygen demand (BOD), chemical oxygen demand (COD), and sediment oxygen demand (Chaudhury *et. al.*, 1997). Models that do not adequately predict SOD can seriously misrepresent the dissolved oxygen system within the stream. For example, Matlock *et. al.* (2003) found SOD to be responsible for fifty percent of the total oxygen depletion within the stream adding weight to the idea that SOD is one of the most important parameters within the dissolved oxygen (DO) model. A modeling study conducted on the Little River Experimental Watershed in Georgia's coastal plain found that estimating SOD as the remaining oxygen demand in the model, assuming all other parameters were known and measured correctly, can seriously misrepresent the true SOD being exerted on they system (Cathey, 2005).

Objectives

This study is part of an on going project that is trying to determine the natural range of DO concentrations in Georgia coastal plain streams. The overall objective of this study is to obtain a better understanding of SOD dynamics in blackwater streams of the Georgia Coastal Plain. The specific objectives of this study are:

1. Measure *in-situ* SOD rates and investigate stream physical properties affecting these rates.
2. Examine the relationship between land use at the watershed scale and SOD.
3. Provide data to be used in predicting the natural levels of DO in streams located in Georgia's Coastal Plain.

To fulfill these objectives, SOD measurements were made at seven sites throughout the Suwannee River basin (Alapaha, Little River, Withlacoochee, and Upper Suwannee River) from October, 2004 to May, 2005.

Chapter 2

Literature Review

Land Use

Point source pollution has been successfully reduced from municipalities and industries since the passing of the Clean Water Act and associated state legislation; however, cleaning up point source (PS) pollution exposed the magnitude of non-point source (NPS) pollution in the United States (Wang *et. al.*, 2001). NPS pollution runs off of large land areas that intermittently deposit pollutants into surface and ground water (Basnyat *et. al.,* 2000). During a 1992 water assessment, some U.S. states found that NPS pollution from agricultural activities was ranked number one among the nation's top 5 polluters of streams and rivers (Wang *et. al.,* 2001).

Over the last century, land use in Georgia's coastal plain has dramatically changed (Lowrance *et. al.*, 1986). Once a solid long-leaf pine forest, the landscape is now either intensively agricultural or pine plantations. The Tifton-Vidalia upland district of the coastal plain is characterized by undifferentiated Neogene sediments (Wharton, 1978). This area is also subjected to intensive crop production on moderately to well-drained upland soils and riparian forests and wetlands on poorly drained soils along streams (Lowrance and Leonard, 1988). Upland soils range from flat to 12% slopes. Dense dendritic stream networks result in the typical farm being drained by two or three small streams. In contrast to the uplands, the flatwoods district of the coastal plain is characterized by large pine plantations, flat landscapes, and extensive swamps. As soil has eroded from the mountains and piedmont areas and descended upon the coastal plain, the quality of the streams and rivers has declined.

Agricultural practices increase sediment and nutrient loads and stream temperature and alter channel morphology, hydrologic regime, and composition and abundance of riparian vegetation. This has lead to degraded stream ecosystems around the world (Zimmerman *et. al.,* 2003). For example, in the Midwestern United States, row-crop agriculture is currently the leading source of water pollution; 70% of the streams considered impaired in the 1996 National Water Quality Inventory were considered impaired by NPS pollution (US EPA, 1995). Specifically, sediment was the contributing factor for up to 50% of the streams violating their permits (Nerbonne and Vondracek, 2001). Reducing soil erosion and sediment delivery to streams is a major goal of conservation agencies due to the negative effects of sedimentation on fish and invertebrates, and the impact of soil loss on agricultural productivity (Nerbonne and Vondracek, 2001).

Alteration of the structure and function of a stream due to land use practices results in an adverse effect on fish and invertebrate populations (Nerbonne and Vondracek, 2001). For example, changes in fish assemblages often result from reduced habitat heterogeneity. Deep pools can be filled in with fine sediment, and the complexity of stream substrate can decrease due to changes in land use (Zimmerman *et. al.,* 2003). Altering the hydrologic regime in agricultural streams can lead to fish assemblages with species more tolerant to silt in comparison to fish assemblages in stable systems (Poff and Allan, 1995).

Rehabilitating water that has been polluted by non-point sources presents an interesting problem. Traditional treatment procedures used on point sources, such as waste water treatment facilities, are not applicable due to the high cost of collecting all the polluted water and transferring it to a treatment facility. Plus the capital costs associated with building the facility and buying the land are not feasible, especially in small watersheds (Basnyat *et. al.,* 2000).

Therefore, a watershed level strategy should use best management practices (BMP) to reduce pollutants that enter the water column as well as store and treat pollutants removed via natural physical and biological processes (Basnyat *et. al.,* 2000). Basenyat *et. al.* (2000) states that the only ecologically sound, sustainable, and cost-effective approach for restoring water quality conditions in lowland streams is utilizing natural treatments. However, economics still play a part in implementing this treatment strategy, and agriculture dominated ecosystems where land near streams can be converted to forested buffers have the most potential for being successful (Basnyat *et. al.,* 2000).

Riparian Buffers

Riparian ecosystem buffers are a commonly recommended BMP for reducing NPS pollution and restoring stream corridors and stream banks (Lowrance *et. al.*, 2001; Nerbonne and Vondracek, 2001; Clausen *et. al.*, 2000; McKergow *et. al.*, 2003). Water entering the vegetation is slowed down and spread over the surface area of the buffer. Reducing the velocity of the runoff allows for easier infiltration of the soluble pollutants into the soil. Buffers also allow for other physical processes such as filtration, sedimentation, adsorption, and precipitation of solids before entering the stream (Clausen *et. al.*, 2000; McKergow *et. al.*, 2003). Nutrient uptake and denitrification are enhanced by riparian buffers (Clausen *et. al.*, 2000).

Buffers are often greater than 90% efficient in trapping sediment, depending on the size of the sediment, slope, length, channelization, and density of the vegetation (Lee *et. al.*, 2000). Cooper *et. al.* (1987) found that the width of the buffer strips should be proportional to the contributing area, slope, and the cultural practices in the fields above. Additionally, the buffer width needs to increase as one moves downstream taking into account inputs entering higher order streams and the opportunity for deposition decreases while the chances for transport increases (Cooper *et. al.*, 1987).

The standard riparian buffer recommended for controlling NPS pollution and protecting and restoring adjacent aquatic ecosystems in the southeast by the US Forest Service is a multiple zone system (Welsch, 1991). Zone 1 is permanent woody vegetation directly next to the aquatic ecosystem and should be present in all cases at a minimum width of 4.6 m (15 ft). Zone 2 consists of woody vegetation that can be managed for biomass production, is only required when NPS pollution is a problem, and should be a minimum width of 6.1 m (20 ft). Zone 3 is herbaceous vegetation between the woody buffer and the agricultural field and should be present if sediment and NPS pollution are both contributing to water quality degradation with a minimum width of 6.1 m (20 ft) (Lowrance *et. al.*, 2001). Therefore, under USDA standards a riparian buffer management system can range from a minimum of 4.6 m wide one zone buffer to the maximum 51.8 m wide three zone buffer (Lowrance *et. al.*, 2001). Riparian forests are prevalent in the coastal plain of the Georgia and their effect on SOD is not well understood.

Dissolved Oxygen Model

Decades of water quality standards for aquatic ecosystems have been primarily based on dissolved oxygen. As a result, several DO models have been developed. The models stretch from simple diurnal time scales for estimating photosynthetic and respiration rates in streams to complex DO advection/dispersion models with specific compartments for SOD, BOD, algal growth, and nitrification processes (Wang *et. al.*, 2003).

As of the early 1980’s, most water quality models used in determining waste assimilative capacity and waste water discharge permit limitations were not accounting for sediment oxygen uptake (Hatcher, 1980). However, research has shown that SOD is an important sink for DO

(Bowie *et. al.*, 1985; Hatcher, 1986; Murphy and Hicks, 1986; Cathey, 2005). Disregarding SOD is justifiable for some water bodies, but the omission of SOD in other water bodies can lead to severe errors in estimates of stream waste assimilative capacity and in turn effect the design specifications for waste water treatment plants (Hatcher, 1980). Generally, SOD is not measured for a modeling project and values from literature are commonly used. For example, in the "Chesapeake Bay Waste Load Allocation Study" completed in 1975, SOD was not measured for the modeling analysis and literature values were used. The study found that much of the DO deficit in the bay was caused by benthic demand (SOD). However, the confidence of the model results were significantly decreased since the most important parameter was not measured (Hatcher, 1980).

Accurate SOD measurements are important to modeling dissolved oxygen. In some cases the end stream water quality result is extremely sensitive to SOD (Hatcher, 1980). For example, Cathey (2005) modeled DO in Georgia's coastal plain in the Little River Research Watershed. The sensitivity analysis showed that SOD was the most important component to measure accurately in order to predict DO levels in the blackwater streams (Cathey, 2005). Also, the National Council for Air and Stream Improvement (NCASI) has found that measuring SOD actually makes model calibration easier by limiting the degrees of freedom for the de-oxygenation process (NCASI, 1982).

Sediment Oxygen Demand

Theory

Sediment oxygen demand is the rate at which dissolved oxygen is removed from the overlying water column by biochemical processes in the stream bed sediments (Hatcher, 1980). The sediments that make up the benthic zone of the stream originate from natural stream conditions, non-point source runoff, and waste water effluents (Hatcher, 1980; Matlock *et. al.*, 2003). Significant rates of oxygen uptake have been observed in rivers and estuaries that do not receive a large amount of solids from point source pollutants. SOD rates observed under these natural conditions are due to soluble organic substances in the water column, which are derived from naturally occurring sediments containing aquatic plants and animals as well as detritus discharged into the water body from natural runoff (Truax *et. al.*, 1995).

Overtime interest in SOD has increased, allowing for a slow increase in the understanding of the processes affecting SOD. Dissolved oxygen, as a cycle in a water body, is complex and dynamic. There are three main ways for oxygen to enter the water column and come in contact with the sediment-water interface (see Figure 2.1). The two physical means for oxygen to enter the water column comprise the reaeration compartment of a DO model (air-water exchange). The first physical method is diffusion and is often the time limiting step of the system. The second physical method is reaeration due to turbulence of the water column from riffles, cascades, waterfalls, or even man-made structures such as dams and weirs. The third method for oxygen to enter the water column is through the process of biological reaeration. Biological reaeration is provided by algae and aquatic macrophytes photosynthesis. This process is reversed and DO is consumed during the dark periods of the day when the plants are respiring (Wang *et. al.*, 2003).

Biomass reaches the stream sediment from either a source outside the system such as leaf litter (allochthonous material), or it may be generated inside the system through plant growth (autochthonous material) (Bowie *et. al.,* 1985). Biomass also reaches the sediment matrix by being adsorbed to a sediment particle. The biomass that reaches the sediment matrix is fed upon by microorganisms living within the aerobic and anaerobic zones of the sediment. As the organisms within the aerobic zone feed they require oxygen to respire and turn the biomass into energy, therefore placing a demand on oxygen within the sediment-water interface (Bowie *et. al.,* 1985).

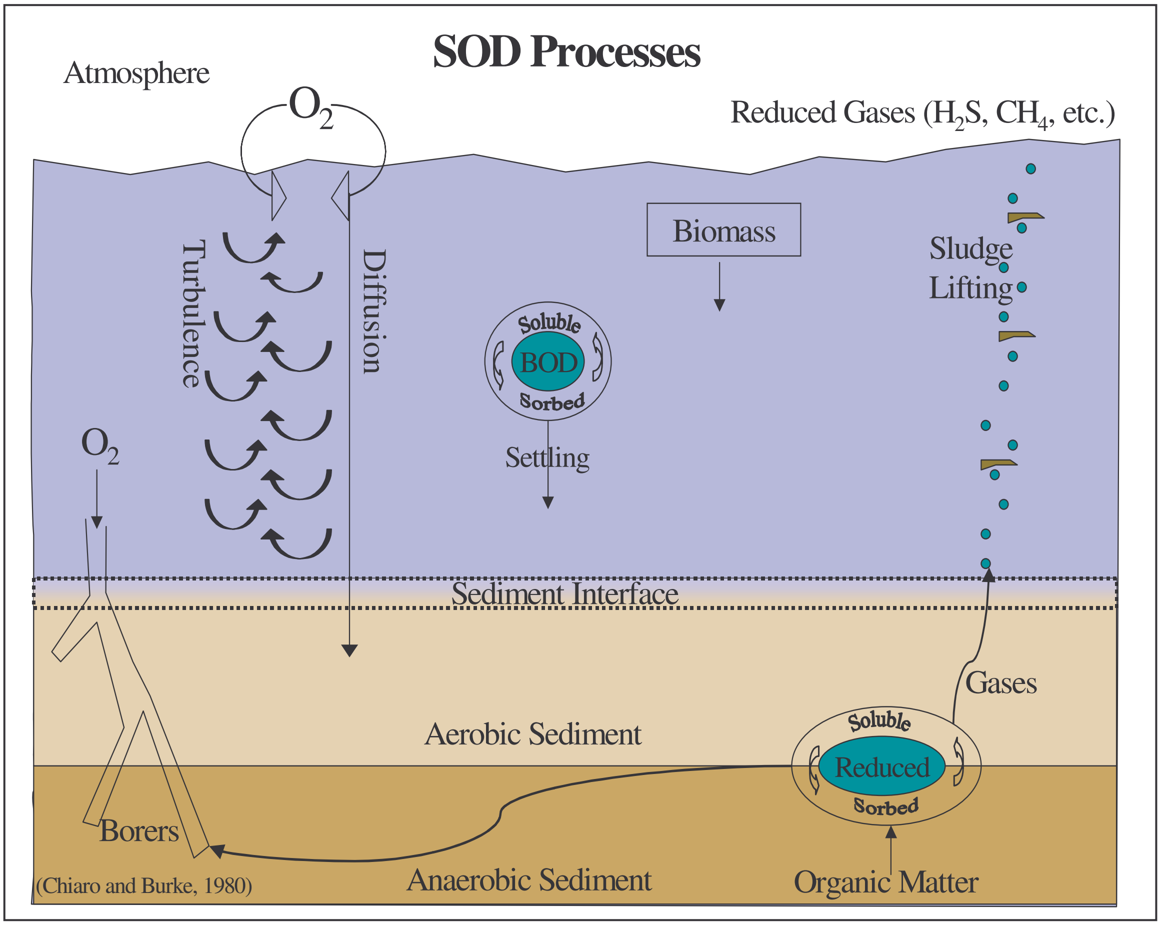

Figure 2.1: SOD processes

Several factors affect SOD rate. Primary focus is often given to the biological components such as organic content of the benthic sediment and microbial concentrations. Two of the most common parameters affecting SOD as described in the literature are temperature near the sediment-water interface and the overlying water velocity (Truax *et. al.*, 1995). It has been found that as velocity increases, the SOD will increase as well. Specifically, SOD increases linearly with velocity at low velocities (< 10 cm/s) but becomes independent at high velocities

(Mackenthun and Stefan, 1998). Therefore, it is important to be as accurate as possible to match stream conditions within the chamber (Truax *et. al.*, 1995). The base SOD rate changes throughout the year due to multiple factors including: DO concentration in the water column, seasonal benthic population changes, mixing rate of the overlying water, presence of toxic chemicals, and changes in temperature. In order to compare SOD rates it is important to correct the rate to a constant temperature, typically 20˚C using the modified van't Hoff form of the Arrehnius equation (2.1) and an appropriate value from literature for the constant θ (Hatcher, 1980; Truax *et. al.*, 1995; Seiki *et. al.*, 1994).

$$SOD_{T_c} = SOD_{20}\theta^{(T-20)} \tag{2.1}$$

SOD_T = SOD rate at temperature T

SOD_{20} = SOD rate at 20˚C

θ = constant chosen from literature

SOD values can be obtained through a variety of methods. The methods range in accuracy and expense. The first and often easiest way to obtain a SOD value is from the literature based on sediment and water body type. Literature values tend to have low accuracy but have no cost. SOD can also be estimated from sediment composition, thickness, and sediment biota populations; this includes a physical and chemical analysis. Estimating SOD via the thickness and biota has a medium accuracy with a medium to low cost. Though the accuracies of the methods are uncertain, SOD values can often be back calculated from model calibrations or estimated from the vertical DO gradient.

SOD values can also be measured through laboratory or *in-situ* methods, and these have the highest accuracy and cost (Hatcher, 1980). *In-situ* techniques have been found to be more accurate in general than laboratory respirometers (Whittemore, 1986b). *In-situ* chambers measure either the drop in DO concentration over time (batch method) or the difference in DO concentration in the inflow and outflow (continuous method) (Lee *et. al.*, 2000).

In-Situ Measurements

The most common method for measuring SOD is the utilization of a batch reactor that encloses a given amount of sediment with a known volume of water and measures oxygen depletion over time (Truax *et. al*., 1995*)*. Measuring SOD in the field requires controlling or understanding many alternate variables. For example, increasing the sediment surface area allows for the integration of micro-habitat patchiness, while decreasing the height of the chamber allows for greater sensitivity to low metabolic rates (Boynton *et. al.*, 1981). In order to minimize complication, the following specifications should be met when designing an *in-situ* chamber (Hatcher, 1980).

1. Chamber shape has a minimum volume to bottom area ratio.
2. Chamber shape facilitates observing and removing trapped air.
3. Chamber shape facilitates efficient mixing
4. Stirrer or pump approximates natural mixing within the chamber
5. DO probe fits into chamber
6. Cutting edge around bottom rim for slicing through the sediments
7. Flange around bottom to stabilize the chamber on the sediment surface
8. Light weight
9. Opaque to prevent photosynthesis within the chamber
10. Non-oxidizable material

Also, a sufficient water column should be present over the sediment to allow the reestablishment of steady-state conditions (Truax *et. al.*, 1995). A basic chamber layout in a stream channel is shown below in Figure 2.2. Once the oxygen depletion data are collected over a given retention time, the SOD rate is calculated based on the area of sediment enclosed, the volume of water contained in the chamber, and the rate of oxygen uptake (Whittemore, 1986a).

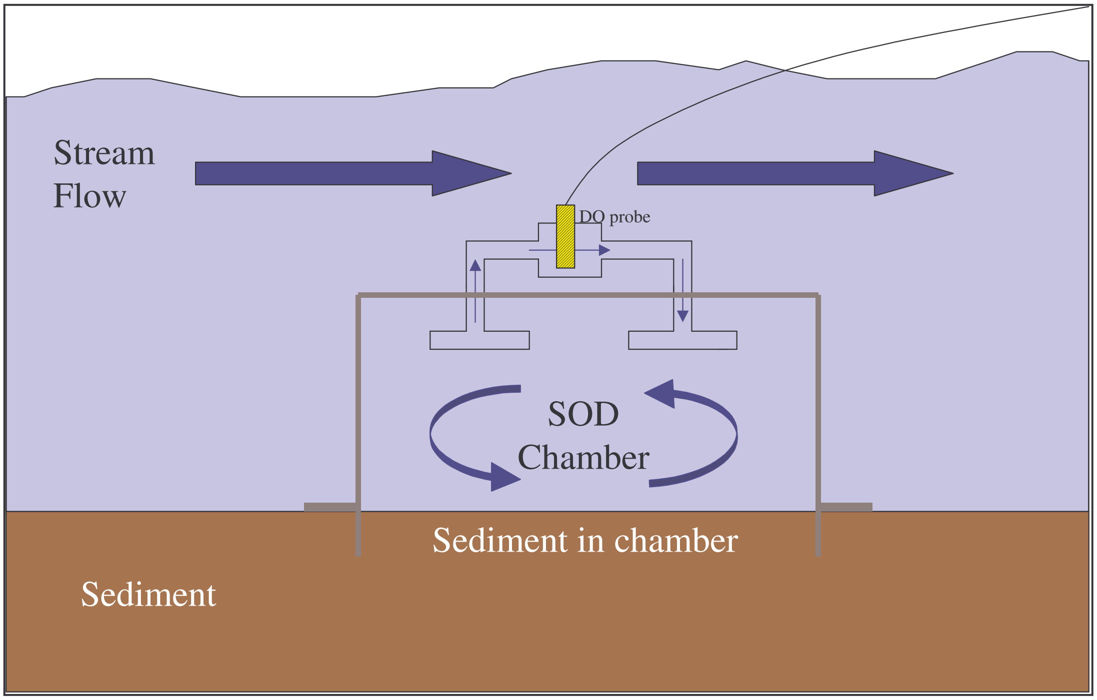

Figure 2.2: Diagram of SOD chamber in stream.

In general, field measurements minimize the manipulation of the sediment and more accurately reflect ambient conditions than do laboratory methods. However, field measurements are conducted under more dynamic ambient conditions which impact the accuracy of the tests. Also, field measurements do not guarantee undisturbed sediments as it is practically impossible not to disturb sediments while deploying the chambers whether this is done via diving or wading out into the stream. Currently, there is not a universally excepted method for measuring SOD in the field making comparisons of data difficult (Chau, 2002).

Laboratory Measurements

Past laboratory methods for measuring SOD have included batch and continuous flow reactors and manometric and electrolysis techniques (Seiki *et. al.*, 1994). One batch reactor method uses bench-scale respirometers. The respirometer circulates a confined volume of water at a controlled rate within a chamber into which an environmental sediment sample whose exposed area has been submerged to an uniform depth (Nolan, 1979). Laboratory methods have been found to meet the acceptability criteria for consistency, reproducibility, and efficiency. Laboratory methods are also more accurate than field methods due to the controlled nature of the tests but suffer from a degree of disturbance due to collecting and transporting the sediment. Special care should be taken to not disturb the sediment cores. Unfortunately, it is often difficult to recreate ambient conditions in the lab because of the delay between collection and testing of the sediment (Chau, 2002).

Modeling SOD

The majority of mathematical models attempt to describe SOD as a function of the overlying water's dissolved oxygen content (Truax *et. al.,* 1995). Consequently, modeling SOD begins with one of the most common DO equations available, the Streeter-Phelps equation (Equation 2.2). Equation 2.2 shows the total DO deficit (D) from the initial DO deficit, deficit from BOD, deficit from nitrogenous biological oxygen demand (NBOD), deficit from SOD demand, and deficit from net algal demand (Hatcher, 1980). One can quickly estimate the impact on dissolved oxygen by SOD with the fourth term in the modified Streeter-Phelps equation (Equation 2.3).

$$TotalD = D_0 e^{-K_a} + L_0\left(\frac{K_d}{K_a - K_r}\right)\left(e^{-K_r T} - e^{-K_a T}\right) + N_0\left(\frac{K_n}{K_a - K_n}\right)\left(e^{-K_n T} - e^{-K_a T}\right) + \frac{S}{K_a H}\left(1 - e^{-K_a T}\right) + \frac{R-P}{K_a}(1 - e^{-K_{aT}}) \quad (2.2)$$

Total D = total dissolved oxygen deficit

D_0 = Initial dissolved oxygen concentration (mg/L)

K_a = Reaeration rate (mg/L/day)

K_d = degradation rate of organic matter

K_r = reaeration time constant (L/day)

N_0 = initial nitrogen concentration (mg/L)

K_n = rate of nitrogen uptake (L/day)

S = Uniform SOD rate (mg*m/l/day)

H = water depth (m)

R = algal respiration

P = algal photosynthesis

$$D = \frac{S}{K_a H}\left(1 - e^{-K_a T}\right) \tag{2.3}$$

Also, D or the deficit in the above equation can be broken into two components:

$$D_1 = \frac{S}{K_a H} \tag{2.4}$$

$$D_2 = \left(1 - e^{-K_a T}\right) \tag{2.5}$$

D_1 represents the "equilibrium" condition or maximum DO deficit caused by SOD, and can be useful for estimating the maximum effect of SOD on the DO deficit. The Streeter-Phelps equation requires the following assumptions (Hatcher, 1980):

1. Zero dispersion rate
2. Uniform steady-state flow
3. An average cross-sectional flow velocity of "U" meters per second
4. A uniform water depth of "H" meters
5. Reaeration rate as the only source of dissolved oxygen
6. Sediment oxygen demand as the only sink of dissolved oxygen
7. A constant, uniform sediment oxygen demand
8. A SOD patch of infinite length

It is important to note that estimating the affect of SOD on the DO deficit in this manner is limited to DO levels above 2.0 mg/L due to the assumption of superposition for all five DO affecting processes included in the Streeter-Phelps equation (Hatcher, 1980). The second part of the equation, represented by D_2, considers the percentage of the maximum DO deficit from SOD which has been attained after time "T". The results for D_2 range from zero at T=0 to one (100 percent) at T=∞. This means that to reach the maximum DO deficit due to SOD, the parcel would have to pass over an infinitely long patch of SOD with the constant rate of "S" (Hatcher, 1980).

To estimate the actual oxygen deficit caused by a uniform patch of SOD with finite length one must (Hatcher, 1980):

1. Estimate a likely range of SOD rates for the stream reach based on literature values and considerations of the water body characteristics
2. Estimate the length "X" of the SOD patch and the water body's physical coefficients: U_0, H, K_a
3. Compute the time of travel "T" over the SOD patch having assumed length of "Y"
4. Using Equation 2.3, calculate the SOD caused DO deficit for a range of likely SOD rate values.

Steps 1-4 represent a preliminary sensitivity analysis of SOD effects on the DO deficit and give modelers an idea of the importance of SOD in their system.

SOD has also been modeled with a kinetic formulation much like the Michaelis-Menten enzyme process, which models SOD rate as a function of maximum SOD rate and the DO concentration (see Equation 2.6) (Truax *et. al.*, 1995). The generally accepted value for the Monod affinity constant, K_{sod}, used in the model is 1.4 mg/L (Truax *et. al.,* 1995).

$$SOD = SOD_{\max}\left(\frac{DO}{K_{SOD} + DO}\right) \qquad (2.6)$$

SOD_{max} = Maximum SOD rate (g O_2/m^2*day)

K_{sod} = Monod affinity constant = 1.4 mg/L

DO = Dissovled oxygen concentration (mg/L)

This approach of modeling must take into account the high DO levels most laboratory research is conducted under. Therefore, equation 2.6 can be estimated by a zero-order kinetic function where SOD equals SOD_{max} (Truax *et. al.*, 1995). This approach does not take into account other environmental parameters that affect SOD such as microbial substrate and nutrient conditions (Truax *et. al.*, 1995). Recent research has tried to increase the accuracy of the models by relating the SOD rate to a biological and chemical oxidation function where the chemical fraction is considered a linear function independent of DO concentration (Truax *et. al.*, 1995).

Marine Sediments

Marine sediments in eutrophic waters, such as Chesapeake Bay, have been studied extensively. Increasing eutrophication has brought these waters under close scrutiny in regards to their water quality and SOD. Anderson *et. al* (1986) found that the shallower the sea, the more important the sediment is compared to the water column in terms of respiration. This relationship was also described by Smith (1978) who had sites set up in shallow and deep waters. He found that seasonal changes in bottom-water temperature and dissolved oxygen concentration were more apparent at the shallow station than the deeper station. Specifically, benthic community respiration decreases by three orders of magnitude with increasing depth along the Gay Head-Bermuda transect following the decrease in benthic animal abundance and biomass observed in this and previous studies for the same area (Smith, 1978).

Studies by Hopkinson *et. al.* (2001), Kemp *et. al.* (1992), Banta *et. al.* (1995), and Dollar *et. al.* (1991) found that oxygen consumption followed the trend in seasonal temperature being lowest in late winter and increasing to a maximum in late summer/early fall. However, the relationship between benthic respiration and temperature was not linear (Hopkinson *et. al.,* 2001; Dollar *et. al.*, 1991). Hopkinson *et. al.* (2001) also stated that throughout the study area (Broad

Sound, Massachusetts Bay, Cape Cod Bay, and Stellwagen Basin) rates of respiration decreased with increasing depth of the water column. The composition of the sediment has also been recorded as affecting sediment oxygen demand. Kristensen *et. al.* (1997) state that temperature appeared to be a significant controlling factor for gross primary production (GPP) at a muddy site in the Wadden Sea while overall control at the two sandy sites was more complex.

SOD measurements for marine sediments have ranged from 0.39 g O_2/m^2-day in the Upper Chesapeake Bay in 1988-1989 to 1.27 g O_2/m^2-day in the lower section of the Chesapeake Bay in 1990-1992 (Borsuk *et. al.*, 2001). Other examples of marine sediment SOD values are 0.45 g O_2/m^2-day in the Ochlocknee Bay, FL, 1.77 g O_2/m^2-day in Boston Harbor, MA, and 0.56 g O_2/m^2-day in Mobile Bay, AL.

Estuary sediments

It has been reported that within shallow portions of estuaries that benthic photosynthesis and respiration are important components of the whole system's metabolism. For example, benthic microalgal production can account for greater than 50% of the whole system's primary production in shallow estuaries and coastal waters (Laursen *et. al.*, 2002). It was also observed that benthic respiration accounted for about 25% of the organic matter respired in various estuaries. Research completed by Pomeroy *et. al.* (2000) stated that respiratory rates in the Georgian estuaries were an order of magnitude lower in the winter months (1.9 $\mu m\ O_2\ day^{-1}$) than the summer months (19.6 $\mu m\ O_2\ day^{-1}$). Water depth has been found to be the controlling factor of benthic respiration (Kemp *et. al.*, 1992). For example, Kemp *et. al.* (1992) found that sediment oxygen consumption dominated community respiration only in water columns of five meters or less.

SOD values measured in estuarine mud on average range from 1.0-2.0 g O_2/m^2-day at 20˚C (Bowie *et. al.*, 1985; Hatcher, 1980). Other studies reported by Murphy and Hicks (1986) measured SOD values in the Calico Creek estuary to range between 2.02 and 2.33 g O_2/m^2-day. Also, SOD values for the Neuse River Estuary have reported from 1.16 g O_2/m^2-day for the lower region and 0.90 g O_2/m^2-day for the middle and upper regions (Borsuk *et. al.*, 2001).

Stream Sediments

Research conducted on streams has found that benthic organic carbon is inversely proportional to the mean annual stream temperature, and benthic respiration is directly proportional to temperature (Sinsabaugh, 1997). Maximum respiration rates, for a blackwater stream in South Georgia, have been recorded during the summer and early autumn, while the minimums were measured during winter and early spring (Meyer *et. al.*, 1997). There was no statistically significant correlation between measured SOD and sediment characteristics in the Williamette River in Oregon (Caldwell and Doyle, 1995). Hill *et. al.* (2002) measured benthic microbial respiration of 0.40 ± 0.05 g O_2/m^2-day in coastal plain streams and 0.40 ± 0.06 g O_2/m^2-day in piedmont steams.

SOD values measured in stream systems vary greatly. For example, in Eastern U.S. rivers, SOD has been measured to be 0.15 ± 0.04 g O_2/m^2-day while Southeastern U.S. rivers have been measured to be around 0.55 ± 0.22 g O_2/m^2-day (Truax *et. al.*, 1995). Rivers downstream from point source pollution have the largest variability in SOD. For example, Truax *et. al.* (1995) stated that values from 0.1 to 33 g O_2/m^2-day have been measured downstream from paper mills in the southeastern U.S. Other studies have reported values for the Williamette River, OR of 1.3-4.1g O_2/m^2-day (Caldwell and Doyle, 1995), 0.15 – 1.36 g O_2/m^2-day for the

Arroyo Colorado River in Arkansas (Matlock *et. al.*, 2003), and 1.2-2.0 g O_2/m^2-day for the Little Dry Fork in Missouri (Borsuk *et. al.*, 2001).

Chapter 3

Methods and Material

Field Study

The SOD field study was conducted between the end of July 2004 and the end of May 2005. August and September, 2004 were dedicated to developing the methodology for the SOD study. Study sites were visited twice per week depending on weather, water levels, and available man power. Regular testing began in October. Samples were taken throughout the winter as long as the ambient temperature was above freezing; the minimum water temperature sampled was around 6˚C. Tests were only conducted in water depths between 30-122 cm (1-4 ft). Water deeper than 122 cm requires masks and diving equipment to successfully seal the chambers, therefore was not tested. The minimum depth was determined by the height of the SOD chambers.

Site Selection

Seven sites were chosen within the Suwannee River Basin: of the seven sites, three were located within the Alapaha River basin, two within the Little River basin, and two within the Upper Suwannee River basin (see Figures 3.1 & 3.2). Two of the study sites were chosen to be in watersheds where 50% or more of the land use is agriculture. The other five study sites were chosen to be in watersheds that have greater than 50% forested land use.

The seven study sites fell within three different ecoregions. First, the two agricultural sites (LRag and ARag) and one forested site (LRfr) are located within the Tifton Uplands. The Tifton uplands are characterized by agriculture, pastures, and some mixed pine/hardwood forests.

The soils are well drained, brownish, and loamy with iron rich or plinthic layers. The soils support crops such as cotton, peanuts, soybeans, and corn. The four other forested sites are located within an area broadly described as the flatwoods. Specifically, three of the four forested study sites ($ARfr_1$, $ARfr_2$, $USfr_1$) are located in the Okefenokee Plains, and the last forested site ($USfr_2$) is located within the Okefenokee Swamp eco region. The Okefenokee Plains are characterized as flat plains and low terraces developed on Pleistocene-Pliocene sands and gravels. The plains have a slightly higher elevations and less standing water than the Okefenokee Swamp region. Also, the plains are most coniferous forest and young pine plantation land cover, with areas of forested wetland.

Land use was determined using ARCView and 1998 land use data collected by the Georgia Department of Natural Resources at the 12-digit HUC scale. Land use data collected after 1998 was not available. All sites have an established riparian buffer. Please see Appendix A for a detailed description of each site.

Potential sites were analyzed using the Arcview GIS software, and watersheds were delineated using AVSWAT 2000 extension for Arcview GIS. The watersheds targeted had an area between 3000-7000 ha (See Appendix B for AVSWAT output). Watersheds of this size were chosen so that streams would be perennial and main river channels could be avoided. Streams of this size are accessible throughout the year except directly after a storm event. Once the initial selection of sites was completed, each site was visited and evaluated based on its suitability for SOD measurements. Suitability was determined by accessibility to the stream channel, bed material, and depth. For example, outcroppings of bedrock or tree roots close to the sediment surface prevent the chamber from properly sealing. (See Appendix B for initial and final listings of experimental sites and map of the study sites.)

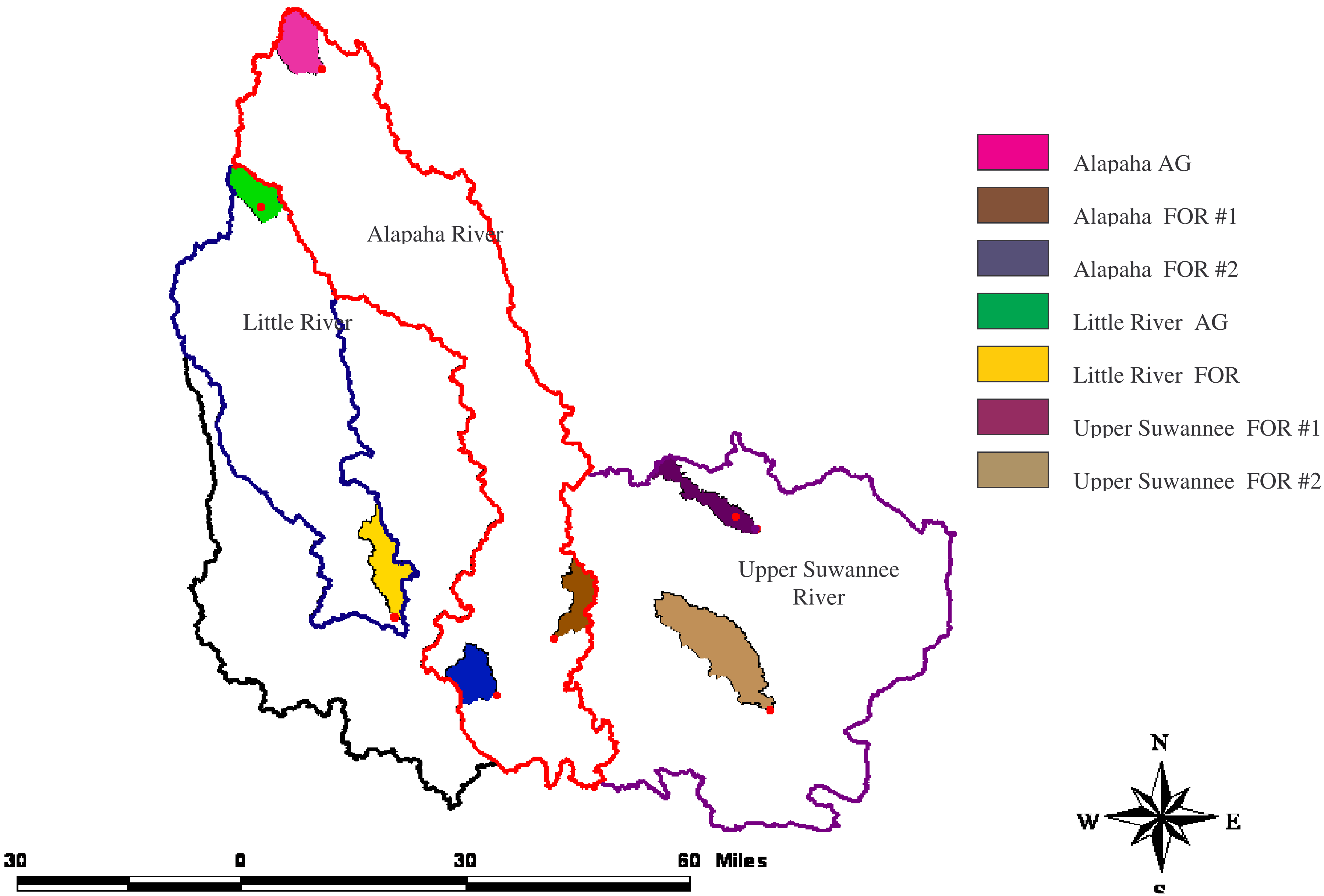

Figure 3.1: Map of study watersheds within the Suwannee River Basin.

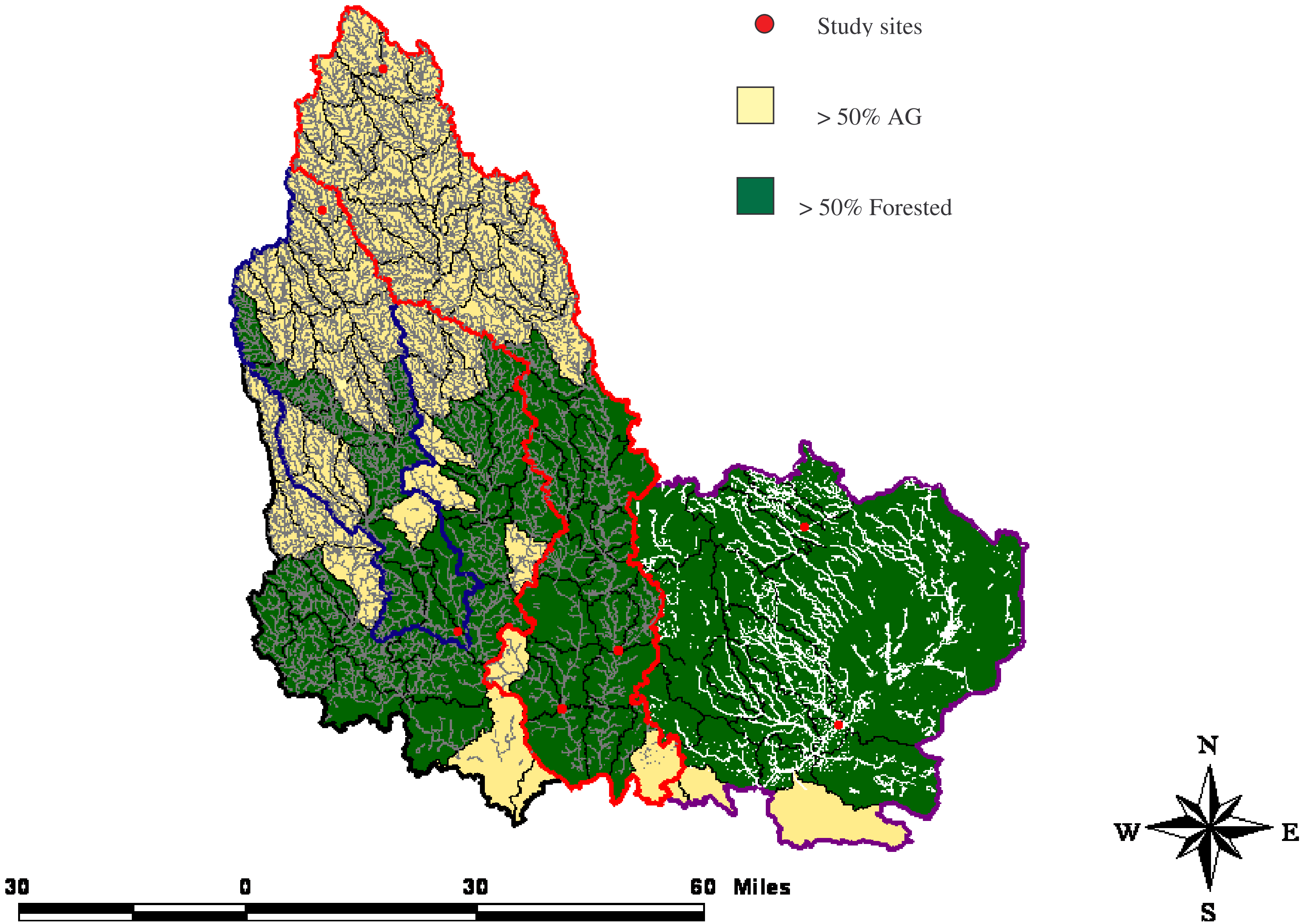

Figure 3.2: Map of seven sites located throughout the Suwannee River basin.

Sediment Particle Size Analysis

A particle size distribution analysis was completed on sediment cores collected from each experimental site. Two inch diameter cores were collected from the top five inches of the sediment. Samples were collected around each of the SOD chambers after deployment, and mixed before being stored in a cooler. Samples were refrigerated after returning to lab until the analysis could be completed. Also, each site was sampled in the late summer and early fall (see Appendix C for procedure and results of the particle size analysis). The hydrometer procedure followed is outlined in the *Methods of Soil Analysis: part 1* by Klute for Particle-size analysis (Gee, 1986). Organic matter in each sample was destroyed using hydrogen peroxide; the percent organic matter was calculated by the difference in the dried sample before and after the hydrogen peroxide treatment. All large debris (sticks) was removed from the sample before mass was recorded and the procedure begun. The particle-size analysis of the sediment collected from the SOD sites was completed to allow for increased accuracy when comparing the data and use of the data in the future (Caldwell *et. al.*, 1995).

Water Quality Measurements

Water temperature, pH, turbidity, oxygen reduction potential (ORP), and DO were measured with YSI model 6820 and 6920 water quality sondes. Data were recorded by a YSI handheld microcomputer (models: 650, 610-D, and 610-DM) at 5 minute intervals. The sondes contained the following probes: 6562 DO probe, 6561 pH probe, 6565 pH/ORP probe, 6560 conductivity/temperature probe, and either a 6036 (non-wiping) or a 6026 (wiping) turbidity probe (see Appendix D for details on YSI equipment). Initial conditions of all parameters listed above were recorded at the beginning of each test in order to record ambient conditions. While the SOD chamber experiments were in use, stream cross-section, depth, and velocity were measured to calculate an average volumetric flowrate during the test. Volumetric flowrate was calculated using the rectangular method of integration. Flow velocity was measured with a Marsh-McBirney, Inc. portable water flowmeter, model 2000 (see Appendix D for more information). All equipment was calibrated regularly by manufacturer specifications.

Sediment Oxygen Demand Chambers

SOD was measured using chambers designed by Murphy and Hicks (1986) and loaned to the University of Georgia by the Georgia Department of Natural Resources Environmental Protection Division. Two or three SOD chambers, depending on the state of the equipment and stream conditions, were deployed simultaneously to measure oxygen depletion over the sediment while an additional chamber was deployed as a control. The control chamber only monitored the depletion of oxygen within the water column. Placement of the chambers depended on the condition of the stream with primary care given to achieving a complete seal. Extreme care was given to minimize sediment resupension upstream once the chambers were in place.

The chambers used, shown in figure 3.3 and 3.4, have a volume of 65.15 liters and cover a surface area of 0.27 m^2 on the stream bottom. The inner radius of the chamber is 30.8 cm, and it has a height of 24.5 cm. Water circulates throughout the chamber via a 12 volt DC submersible pump (March, 893-04), powered by a 14 V submersible, gel-cell, lead acid battery. The pump continuously withdraws water from one diffuser and injects it back into the chamber via the second diffuser (Figure 3.3). The diffusers force the water within the chamber to circulate around the chamber annulus, this promotes continuous mixing. We were not able to successfully measure flow velocity within the chamber.

Between the pump and the diffusers, the water passes through an YSI cup attached to the sonde in order to be analyzed by the YSI probes. The YSI sonde is resting on the lid of the chamber (Figure 3.3). The control chamber differs from the other SOD chambers; the bottom of the chamber is sealed off from the sediment, therefore only the oxygen depletion due to the water column is measured during deployment.

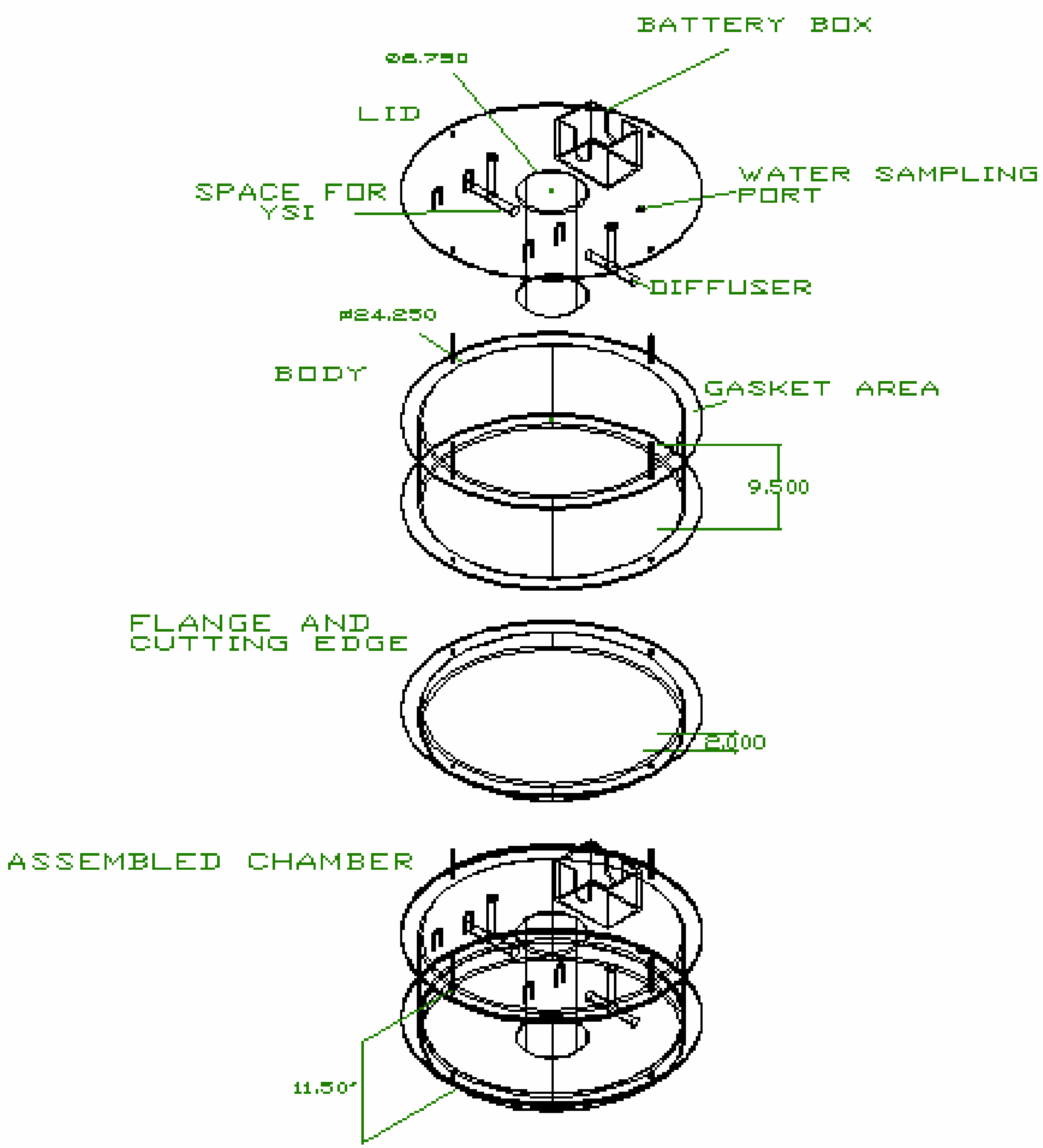

Figure 3.3: Dimensioned Drawing of SOD chambers (inches)

Figure 3.4: Photo of a SOD chamber

Deployment Procedure

One day prior to each field test, all YSI sondes were inspected and calibrated. At the site, the depth of the stream was measured to ensure that it was within our operation parameters. While checking the depth of the stream, the sediment was also checked for bedrock or large quantities of tree roots that may prevent the chamber from sealing completely. Next, the chamber rings were placed in the stream, and the bottom of each chamber was checked to make sure the flange was flush with the stream sediment. It is important to minimize sediment resuspension while making sure to check for any obstacles that may prevent the chamber from sealing.

The stream's current was allowed to wash any suspended sediments downstream from the chambers before the chambers were covered and sealed. The control chamber was installed upstream from the other chambers to minimize the amount of disturbed sediments in suspension around it. Because it was a control, it was important to avoid any sediment deposition in the chamber before it was sealed. After the batteries were attached and the pumps were running, the YSI sondes were attached to the chambers. The YSI sondes are programmed to run for three hours and record data every five minutes. A detailed list of the procedure followed in the field is located in Appendix E.

Calculation of Sediment Oxygen Demand

SOD is derived from the slope of the linear section of the oxygen depletion curve. The small nonlinear section at the beginning of the curve was disregarded when completing the linear regression of the data. This region corresponds to initial re-suspension of the sediment during deployment of the chambers and is not an accurate measurement of the natural rate (Caldwell and Doyle, 1995). On average, this region included the first 10-30 minutes of the test. For example, Figure 3.3 shows data collected on October 5, 2004 at the agricultural site within the Alapaha River watershed. The regression was completed in order to get the largest correlation coefficient (R^2 value) possible, and was normally above 0.9. SOD was calculated using:

$$SOD = 1.44\frac{V}{A}(b_1 - b_2) \quad (3.1)$$

where:

SOD = the sediment oxygen demand in g O_2/m^2-day,

b_1 = the slope from the oxygen depletion curve in mg/L-minute,

b_2 = the slope from the oxygen depletion curve of the control chamber,

V = the volume of the chamber in L,

A = the area of bottom sediment covered by the chamber in m^2, and

1.44 = a units conversion constant (Caldwell and Doyle, 1995.)

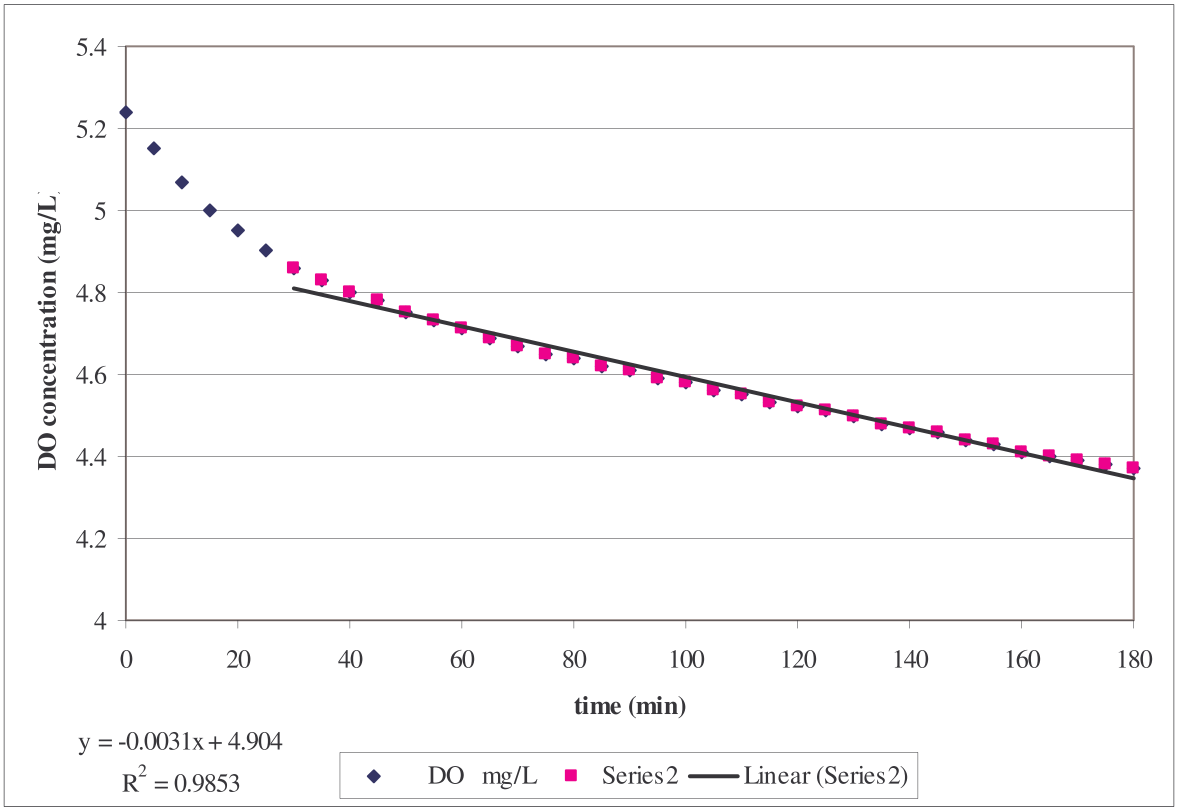

Figure 3.5: Chamber 1 Oxygen Depletion Curve for the agricultural study site within the Alapaha River watershed on 10/5/2004

Once SOD is calculated, it is temperature corrected to 20˚C using a modified van't Hoff form of the Arrehnius equation (Equation 2.1) and an appropriate literature value for the constant θ (Hatcher, 1986; Truax *et. al.*, 1995). Values for θ based on the type DO model, for example the QUAL-II or the Lake Erie Model, are given by Bowie *et. al.* (1985). Because this project was designed to generate SOD data for use in Georgia, a θ of 1.047 was used.

Statistical Analysis

Sediment oxygen demand levels in the Alapaha River, Little River, and Upper Suwannee River basins with forested or agricultural land use were analyzed with ANOVA (Proc Mixed and Proc GLM, SAS Institute 1990). All tests completed in SAS met the requirements of a normal distribution and equal variances. In order to compare agricultural and forested watersheds, the data were log transformed so that data from the agricultural watersheds would meet the assumption of a normal distribution. For the Proc GLM tests land use and the three basins were compared. For the Proc Mixed test, basin and land use areas were treated as fixed effects and sample date was treated as a random effect. Degrees of freedom were adjusted using Satterthwaite approximation method. Means were separated using Tukey-Kramer mean separation procedures.

Chapter 4

Results

Alapaha River Basin

Agricultural Watershed (ARag)

The study site within the agricultural watershed of the Alapaha River basin was visited four times between October 2004 and June 2005 (see Appendix A for pictures and site description). During the study period the river approached flood stage twice, the first during August and September due to hurricanes, and the second during March and early April due to an above average amount of precipitation. As shown in Table 4.1, the flow varied from 0.1 m^3/s to 0.3 m^3/s during the four site visits. The oxygen demand value for the control chamber was below 0.5 g O_2/m^2*day for each visit while SOD varied from a minimum of 0.5 to a maximum of 4.5 g O_2/m^2*day. The average SOD value for the site was 1.7 g O_2/m^2*day (see Figure 4.1 for all site and landuse averages). Water temperature ranged from 21.2˚C at the beginning of October to 7˚C in February. Throughout the study period pH was relatively constant only shifting between 5.5 and 6.5. Dissolved oxygen shifted the most throughout the visits due to the change in water temperature, however the minimum initial DO concentration during a test was 4.2 mg/L during the October 5, 2004 visit, while the minimum final DO concentration during a test was 3.9 mg/L on December 8, 2004. During the first visit sediment was collected for the particle size analysis (PSA), and the study site's stream bottom was found to be 73.2% sand, 7.8% silt, and 18.8% clay with negligible organic matter (see Appendix C for all PSA analysis and data). This was the lowest percent sand measured at any of the study sites.

Table 4.1: Results from the agricultural site in the Alapaha River Basin

Date	Measurement	Deployment Average[1]				Initial	Final	SOD_c[2]	Q
		Temp (˚C)	pH	Cond (mS/cm)	Turb (NTU)	DO (mg/L)	DO (mg/L)	(g O_2/m2-day)	(m^3/s)
10/5/04	Initial Conditions	-	-	-	-	-		-	-
	Control	21.2	6.3	0.1	5.6	5.7	5.0	0.4	
	Chamber 1	21.3	5.5	0.2	20.7	5.2	4.4	0.6	
	Chamber 2	21.3	6.2	0.1	51.6	4.2	4.1	0.5	
	Chamber 3	21.3	6.7	0.1	×	5.8	3.8	1.4	
	Average SOD	-	-	-	-	-	-	**0.8**	
12/8/04	Initial Conditions	17.3	7.5	0.1	×	6.6		-	0.1
	Control	17.6	6.3	0.1	×	6.1	6.0	0.1	
	Chamber 1	17.6	5.7	1.0	94.4	10.1	3.9	2.8	
	Chamber 2	17.5	6.2	0.1	142.5	7.2	6.1	0.8	
	Average SOD	-	-	-	-	-	-	**1.8**	
2/4/05	Initial Conditions	6.8	8.0	0.1	2.7	11.0		-	0.3
	Control	7.4	6.5	0.1	11.0	10.8	10.5	0.1	
	Chamber 1	7.5	6.3	0.1	16.1	12.0	13.5	1.8	
	Chamber 2	7.8	5.6	0.3	118.9	10.8	8.5	4.5	
	Average SOD	-	-	-	-	-	-	**3.1**	
4/15/05	Initial Conditions	14.7	8.1	0.1	×	9.1	-	-	0.2
	Control	15.4	6.5	0.1	×	8.7	8.3	0.2	
	Chamber 1	15.9	5.7	1.0	0.1	7.2	8.0	1.4	
	Chamber 2	15.4	6.3	0.1	15.8	-5.1	-4.9	*	
	Average SOD	-	-	-	-	-	-	**1.4**	

[1] Ambient stream values were taken upon arrival at the study site and do not represent averages.
[2] Temperature corrected SOD = SOD_c
* appears where SOD could not be calculated due to equipment errors.
× appears where turbidity could not be measured due to equipment errors.

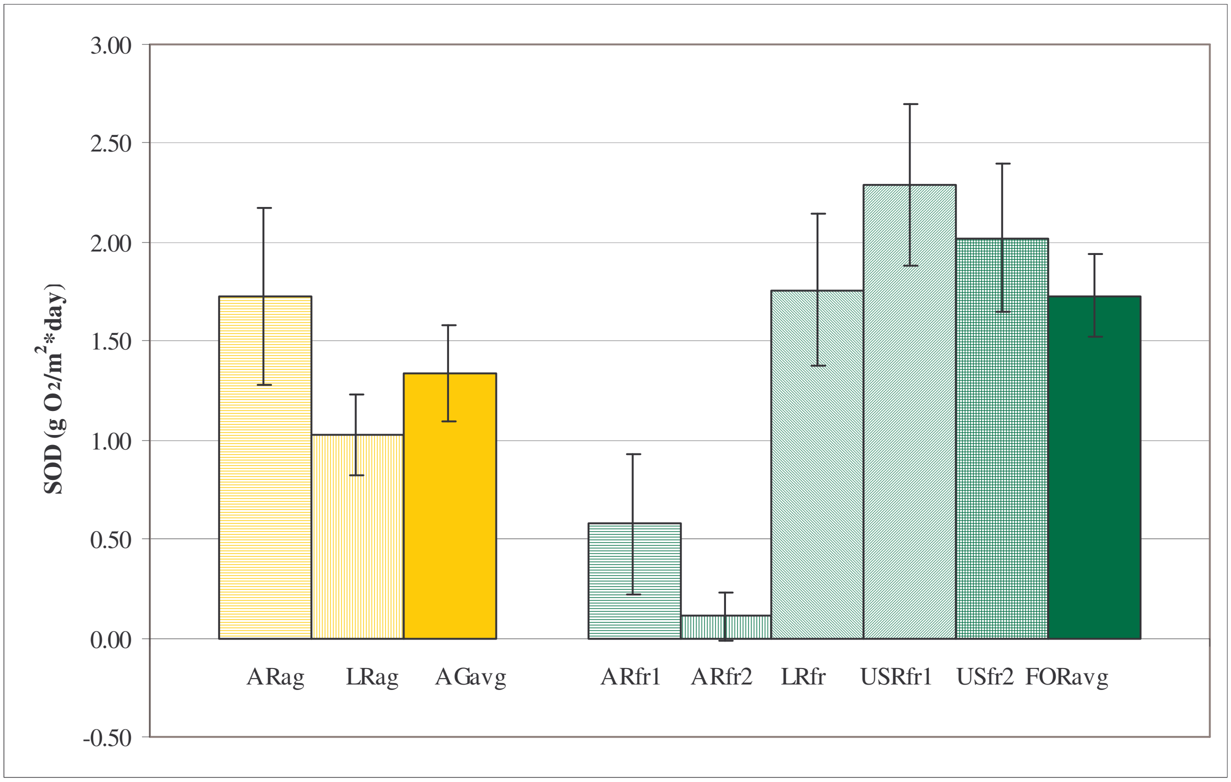

Figure 4.1: Average SOD values and error bars for each study site and land use. AR_{ag} is the Alpaha River agricultural watershed. LR_{ag} is the Little River agricultural watershed. AR_{fr1} and AR_{fr2} are the Alapaha River forested watersheds. LR_{fr} is the Little River forested watershed. US_{fr1} and US_{fr2} are the Upper Suwannee forested watersheds.

Forested Watershed #1 (ARfr$_1$)

The study site within the first forested watershed in the Alapaha River Basin was visited four times between October, 2004 and May, 2005 (see Appendix A for site description and pictures). During these visits, the flow varied between 0.4 m^3/s and 0.8 m^3/s (See Table 4.2). The maximum ambient water temperature was 18.2˚C during the first visit and the minimum was 11.9˚C during the March 1, 2005 visit. The minimum initial and final DO measurements during a test were 4.1 mg/L and 2.9 mg/L and occurred on the April 27, 2005 visit. Oxygen demand values for the control chamber ranged from 0.3 g O_2/m^2-day to 1.2 g O_2/m^2-day causing SOD values from -0.9 g O_2/m^2-day to 1.6 g O_2/m^2-day. Theoretically, a negative SOD value is possible and represents the movement of oxygen from the sediments into the water column however it is highly unlikely. The slope of the oxygen depletion curve for the control chamber was negative, so it was completely sealed. One drawback of monitoring the SOD chamber over a three hour period is the opportunity for instrument drift during the length of the test, something which has been observed for the YSI DO probe during other studies. Instrument drift in combination with low SOD rates could result in zero or negative values. A possible reason for the high oxygen demand within the control chamber on October 25, 2004 is that during deployment of the control chamber excess sediment was resuspended into the water column and enclosed in the control chamber. Also, there may have been a slight leak in the seal of SOD chamber 1 causing a decreased rate of oxygen depletion within the chamber. The average SOD value at the study site was 0.9 g O_2/m^2-day (see Figure 4.1). The PSA for the site was conducted after the October visit and calculated to be 97.9 % sand, 2.0% silt, 0.1% clay, and negligible organic matter (see Appendix C for PSA results). Volumetric flowrate varied between 0.4 m^3/s and 0.8 m^3/s.

Forested Watershed #2 (ARfr$_2$)

The study site for the second forested watershed within the Alapaha River basin was only visited twice throughout the study period due to high water levels from August to October and then again from March to late April (see Table 4.3). This site was affected more from increased precipitation levels given that the deployment site is a deep pool due to a build up of large woody debris down stream (see Appendix A for pictures of the site). The minimum initial and final DO readings at this site were 4.5 mg/L and 4.2 mg/L, both measurements occurred on the November, 2004 visit. Water temperature was around 15˚C during both visits and pH was around 7.

Table 4.2: Results from Forested site #1 within the Alapaha River Basin

Date	Measurement	Deployment Average[1]				Initial	Final	SOD_c[2]	Q
		Temp (˚C)	pH	Cond (mS/cm)	Turb (NTU)	DO (mg/L)	DO (mg/L)	(g O_2/m^2-day)	(m^3/s)
10/25/04	Initial Conditions	18.2	4.0	0.1	×	6.9	-	-	-
	Control	18.3	4.0	0.1	2.9	5.5	6.3	1.2	
	Chamber 1	18.5	3.6	0.1	3.8	4.0	4.0	-0.9	
	Chamber 2	18.4	4.2	0.1	×	4.2	5.8	-	
	Average SOD	-	-	-	-	-	-	**-0.9**	
1/4/05	Initial Conditions	13.3	3.9	0.1	11.9	9.2	-	-	0.8
	Control	13.6	4.0	0.1	10.5	8.6	8.6	0.5	
	Chamber 1	13.4	4.8	0.1	11.1	6.5	6.1	0.9	
	Average SOD	-	-	-	-	-	-	**0.9**	
3/1/05	Initial Conditions	11.9	4.0	0.1	7.8	10.1	-	-	0.5
	Control	12.2	3.9	0.1	8.9	9.5	8.8	0.3	
	Chamber 2	12.4	3.6	0.1	24.6	8.6	9.7	*	
	Chamber 3	12.1	6.3	0.1	17.1	7.8	7.0	1.6	
	Average SOD	-	-	-	-	-	-	**1.6**	
4/27/05	Initial Conditions	16.6	4.0	0.1	×	8.3	-	-	0.4
	Control	16.9	3.9	0.1	×	8.2	7.9	0.3	
	Chamber 2	16.8	6.2	0.2	6.8	4.1	2.9	0.7	
	Chamber 3	17.0	4.8	1.2	9.2	5.1	4.5	0.6	
	Average SOD	-	-	-	-	-	-	**0.6**	

[1] Ambient stream values were taken upon arrival at the study site and do not represent averages.
[2] Temperature corrected SOD = SOD_c
* appears where SOD could not be calculated due to equipment errors.
× appears where turbidity could not be measured due to equipment errors.

The faster rate of oxygen depletion in the chamber than the SOD chamber during the second visit caused another negative SOD value of -0.2 g O_2/m^2-day. As stated in the previous section, resuspended sediment during deployment of the control chamber, a leak in the SOD chamber or instrument drift may have been the cause. The overall average SOD value for this site was 0.3 g O_2/m^2-day (see Figure 4.1). The percent sand calculated via the PSA was 98.9% with 0% silt and 1.1% clay (see Appendix C for PSA procedure and results). Organic matter content was negligible. The volumetric flowrate during the first visit was 0.9 m^3/s and 2.1 m^3/s on the second visit.

Table 4.3: Results from Forested site #2 within the Alapaha River Basin

Date	Measurement	Deployment Average[1]				Initial	Final	SOD$_c$[2]	Q
		Temp (˚C)	pH	Cond (mS/cm)	Turb (NTU)	DO (mg/L)	DO (mg/L)	(g O2/m2*day)	(m^3/s)
11/10/04	Initial Conditions	15.5	7.3	0.2	0.2	8.9	-	-	0.9
	Control	15.6	6.9	0.2	-0.4	7.7	7.4	0.0	
	Chamber 1	15.7	6.5	0.2	7.3	6.3	4.9	0.2	
	Chamber 2	15.9	6.2	0.3	9.2	4.5	4.2	0.3	
	Average SOD	-	-	-	-	-	-	**0.3**	
2/9/05	Initial Conditions	13.9	7.3	0.2	1.6	9.7	-	-	2.1
	Control	15.3	6.9	0.2	2.4	9.7	9.7	0.7	
	Chamber 1	14.1	6.5	0.2	4.7	6.5	6.1	-0.2	
	Chamber 2	14.7	6.1	0.2	4.1	7.9	8.6	*	
	Average SOD	-	-	-	-	-	-	**-0.2**	

[1] Ambient stream values were taken upon arrival at the study site and do not represent averages.
[2] Temperature corrected SOD = SOD$_c$
* appears where SOD could not be calculated due to equipment errors.

Little River Basin

Agricultural Watershed (LRag)

The study site for the agricultural watershed within the Little River Basin was visited four times between July, 2004 and May, 2005 (see Appendix A for site description and pictures). The warmest average water temperature recorded during the four dates was 24.3˚C on July 28, 2004 while the coldest water temperature was 15.2˚C on May 3, 2005 (see Table 4.4). Volumetric flowrates varied between 0.1 m^3/s in July, 2004 and 1.2 m^3/s in May, 2005. The minimum initial and final DO readings during the tests were 3.6 mg/L and 2.2 mg/L and were measured on October 20, 2004. The oxygen demand in the control chamber ranged from 0.1 to 0.8 g O_2/m^2-day while SOD values were calculated between 0.2 and 2.4 g O_2/m^2-day. The average SOD value for this site was 1.03 g O_2/m^2-day (see Figure 4.1). The results from the PSA found the percent sand to be 93.2 with 1.0% silt and 5.8% clay (see Appendix C for PSA procedure and results). The percent organic matter was found to be 0.9.

Table 4.4: Results from the agricultural study site within the Little River Basin

Date	Measurement	Deployment Average[1]				Initial	Final	SOD_c[2]	Q
		Temp (˚C)	pH	Cond (mS/cm)	Turb (NTU)	DO (mg/L)	DO (mg/L)	(g O_2/m^2-day)	(m^3/s)
7/28/04	Initial Conditions	23.9	5.1	0.2	63.7	5.5	-	-	0.1
	Control	24.2	5.7	0.1	×	5.3	4.9	0.2	
	Chamber 1	24.3	6.3	0.1	14.1	4.6	4.1	0.5	
	Chamber 2	24.1	6.3	0.1	9.9	5.1	4.5	0.6	
	Chamber 3	24.4	5.5	0.1	9.9	5.6	4.4	1.1	
	Average SOD	-	-	-	-	-	-	**0.7**	
10/20/04	Initial Conditions	20.1	7.0	0.2	10.8	5.8	-	-	0.3
	Control	20.8	6.2	0.1	9.0	6.2	6.1	0.8	
	Chamber 1	20.3	7.4	0.1	98.3	3.6	2.2	0.2	
	Chamber 2	20.3	5.4	0.2	49.4	4.1	2.9	1.0	
	Chamber 3	20.8	6.1	0.1	9.4	5.8	7.0	-	
	Average SOD	-	-	-	-	-	-	**0.6**	
12/7/04	Initial Conditions	16.2	8.5	0.1	4.4	9.8	-	-	0.5
	Control	16.1	6.1	0.1	10.9	7.6	7.4	0.1	
	Chamber 1	16.1	5.5	0.6	10.0	7.9	7.4	0.8	
	Chamber 2	15.9	6.2	0.1	28.5	7.5	6.7	1.6	
	Chamber 3	16.1	5.9	0.1	54.4	6.9	4.4	1.8	
	Average SOD	-	-	-	-	-	-	**1.1**	
5/3/05	Initial Conditions	15.2	7.6	0.1	8.0	8.8	-	-	1.2
	Control	15.9	6.3	0.1	9.5	8.7	8.4	0.5	
	Chamber 2	15.7	6.3	0.1	12.6	8.3	7.9	0.3	
	Chamber 3	15.8	5.5	1.1	73.9	8.5	6.8	2.4	
	Average SOD	-	-	-	-	-	-	**1.4**	

[1] Ambient stream values were taken upon arrival at the study site and do not represent averages.
[2] Temperature corrected SOD = SOD_c
× appears where turbidity could not be measured due to equipment errors.

Forested Watershed (LRfr)

The study site within the forested watershed of Little River Basin was visited three times from November, 2004 to June, 2005 (see Appendix A for site description and pictures). During those visits the minimum average water temperature was 6.9˚C and was measured on January 25, 2005 while the maximum average water temperature was 22.7˚C and was measured on November 3, 2004 (see Table 4.5). The minimum and maximum initial DO readings were 4.7 mg/L and 12.6 mg/L; pH was around 6 throughout every visit. The minimum volumetric flowrate recorded was 0.1 m^3/s while the maximum was 0.7 m^3/s. Oxygen demand for the control chamber ranged between 0.1 g O_2/m^2-day and 2.9 g O_2/m^2-day. Calculated SOD varied from 0.7 g O_2/m^2-day to 3.0 g O_2/m^2-day, and the overall average was 1.8 g O_2/m^2-day (see Figure 4.1). The sediment was 84.5% sand, 9.0% silt, and 6.4% clay (see Appendix C for PSA procedure and results). Organic matter content was 0.8%.

Table 4.5: Results from the Forested study site within the Little River Basin

Date	Measurement	Deployment Average[1]				Initial	Final	SOD_c[2]	Q
		Temp C	pH	Cond (mS/cm)	Turb (NTU)	DO (mg/L)	DO (mg/L)	(g O_2/m^2-day)	(m^3/s)
11/3/04	Initial Conditions	22.3	6.0	0.1	26.5	5.8	-	-	0.4
	Control	22.7	6.0	0.1	9.1	5.3	4.6	0.3	
	Chamber 1	22.6	5.8	0.1	72.8	8.1	4.9	0.9	
	Chamber 2	22.7	5.3	0.2	148.0	4.7	2.7	3.0	
	Average SOD	-	-	-	-	-	-	**2.0**	
1/25/05	Initial Conditions	6.9	6.7	0.1	5.7	10.0	-	-	0.7
	Control	7.7	6.3	0.1	×	11.2	11.1	2.9	
	Chamber 1	7.8	5.5	0.9	47.1	11.6	9.5	2.0	
	Chamber 2	7.0	6.0	0.1	54.3	12.6	12.1	*	
	Chamber 3	7.4	6.2	0.1	22.7	11.8	9.8	3.0	
	Average SOD	-	-	-	-	-	-	**2.5**	
5/25/05	Initial Conditions	21.9	7.1	0.1	17.7	5.2	-	-	0.1
	Control	22.2	6.1	0.1	10.8	4.9	4.8	0.1	
	Chamber 2	22.3	6.1	0.1	68.0	4.8	4.2	0.7	
	Chamber 3	22.3	5.6	0.1	42.0	5.0	4.2	1.0	
	Average SOD	-	-	-	-	-	-	**0.9**	

[1] Ambient stream values were taken upon arrival at the study site and do not represent averages.
[2] Temperature corrected SOD = SOD_c
* Appears where SOD could not be calculated due to equipment errors.
× appears where turbidity could not be measured due to equipment errors.

Upper Suwannee River Basin

Forested Watershed #1 ($USfr_1$)

The study site for the first forested watershed within the Upper Suwannee River Basin was visited four times between November, 2004 and May, 2005 (see Appendix A for site description and pictures). Volumetric flowrate at the study site ranged from a minimum of 0.03 m^3/s to a maximum of 0.5 m^3/s (Table 4.6). Water temperature varied between 24.0˚C and 8.0˚C; initial DO concentration ranged between 5.5 mg/L and 9.9 mg/L while the final DO ranged between 3.3 mg/L and 8.2 mg/L. The pH of the stream was relatively constant during each visit and was around 3.8. Oxygen demand values for the control chamber ranged from 0.04

g O_2/m^2-day to 0.1 g O_2/m^2-day, while the SOD values ranged between 1.1 g O_2/m^2-day and 3.2 g O_2/m^2-day. The average SOD from the four visits was 2.3 g O_2/m^2-day (see Figure 4.1). The percents sand, silt, and clay for the first forested watershed's study site were found to be 90.8%, 5.5%, and 3.7% (see Appendix C for PSA procedure and results). The site was found have 2.08% organic matter.

Table 4.6: Results from Forested site #1 within the Upper Suwannee River Basin

Date	Measurement	Deployment Average[1]				Initial	Final	SOD_c[2]	Q
		Temp C	pH	Cond (mS/cm)	Turb (NTU)	DO (mg/L)	DO (mg/L)	(g O_2/m^2-day)	(m^3/s)
11/11/04	Initial Conditions	24.0	4.6	0.0	0.3	8.1	-	-	0.03
	Control	16.4	4.0	0.1	13.5	6.3	5.6	0.1	
	Chamber 1	16.3	3.7	0.3	45.2	7.0	6.1	1.4	
	Chamber 2	16.4	3.9	0.1	66.1	5.5	3.7	1.7	
	Average SOD	-	-	-	-	-	-	**1.6**	
2/1/05	Initial Conditions	8.3	4.0	0.1	2.0	9.3	-	-	0.2
	Control	8.6	3.8	0.1	28.1	9.4	9.9	0.1	
	Chamber 1	8.8	3.3	1.6	278.1	8.6	7.5	4.7	
	Chamber 2	8.5	4.1	0.1	147.2	8.8	3.3	3.2	
	Average SOD	-	-	-	-	-	-	**3.9**	
3/2/05	Initial Conditions	9.2	4.0	0.1	×	9.4	-	-	0.5
	Control	10.0	3.8	0.1	×	8.7	7.9	0.1	
	Chamber 1	10.4	3.6	0.1	59.1	9.9	7.7	1.1	
	Chamber 2	8.9	4.0	0.1	15.8	8.5	8.2	*	
	Chamber 3	10.0	3.8	0.1	91.2	9.5	7.1	2.7	
	Average SOD	-	-	-	-	-	-	**1.9**	
4/19/05	Initial Conditions	15.8	4.0	0.1	-0.2	6.9	-	-	0.4
	Control	16.9	3.9	0.1	0.5	6.7	6.4	0.0	
	Chamber 2	16.7	3.8	0.1	23.3	6.3	5.1	2.4	
	Chamber 3	16.9	3.1	1.1	0.1	7.1	6.3	1.2	
	Average SOD	-	-	-	-	-	-	**1.8**	

[1] Ambient stream values were taken upon arrival at the study site and do not represent averages.
[2] Temperature corrected SOD = SOD_c
* Appears where SOD could not be calculated due to equipment errors.
× appears where turbidity could not be measured due to equipment errors.

Forested Watershed #2 ($USfr_2$)

The study site for the second forested watershed within the Upper Suwannee River Basin was visited three times between November, 2004 and March, 2005 (see Appendix A for site description and pictures). The volumetric flowrate ranged from 0.1 m^3/s to 0.3 m^3/s, and temperature ranged from 12.7˚C to 14.8˚C. The pH value was between 3 and 4 during each visit. The minimum and maximum initial DO readings were 6.1 mg/L in November, 2004 and 7.7 mg/L on January 5, 2005. The minimum and maximum final DO readings were 4.0 mg/L on November 11, 2004 and 7.9 mg/L on February 17, 2005. The oxygen demand values within the control chamber ranged from 0.2 g O_2/m^2-day to 0.4 g O_2/m^2-day. SOD values were between 1.2 g O_2/m^2-day and 3.3 g O_2/m^2-day, and the overall SOD average was 2.0 g O_2/m^2-day. The PSA for the study site found that 93.8% of the sediment was sand, 2.0% was silt, and 4.2% was clay. The sediment was found to contain 1.2% organic matter (see Appendix C for procedure and results).

Table 4.7: Results from Forested site #2 within the Upper Suwannee River Basin

Date	Measurement	Deployment Average[1]				Initial	Final	SOD_c[2]	Q
		Temp C	pH	Cond (mS/cm)	Turb (NTU)	DO (mg/L)	DO (mg/L)	(g O_2/m^2-day)	(m^3/s)
11/17/04	Initial Condition	12.7	3.6	0.1	2.3	7.0	-	-	0.1
	Control	13.3	3.5	0.1	6.3	6.1	5.9	0.2	
	Chamber 2	13.3	3.6	0.1	88.4	6.1	4.0	2.7	
	Average SOD	-	-	-	-	-	-	**2.7**	
1/5/05	Initial Condition	13.0	3.6	0.1	-3.0	7.3	-	-	0.3
	Control	13.5	3.6	0.1	-0.7	6.9	6.3	0.4	
	Chamber 1	13.2	3.5	0.1	5.9	7.4	5.9	1.6	
	Chamber 3	13.9	3.1	4.3	2.8	7.7	6.3	1.2	
	Average SOD	-	-	-	-	-	-	**1.4**	
2/17/05	Initial Condition	14.8	4.1	0.1	-2.7	10.3	-	-	0.2
	Control	14.7	3.5	0.1	-1.1	7.4	7.9	0.2	
	Chamber 1	14.4	3.6	0.1	40.6	6.3	4.8	3.3	
	Chamber 3	14.7	3.1	0.1	74.5	6.5	6.3	1.4	
	Average SOD	-	-	-	-	-	-	**2.4**	

[1] Ambient stream values were taken upon arrival at the study site and do not represent averages.
[2] Temperature corrected SOD = SOD_c
× appears where turbidity could not be measured due to equipment errors.

Statistical Analysis Results

Two separate statistical tests were performed on the data in SAS. The type of test completed, the factors compared, p-value and resulting significance are shown below in Table 4.8. The Proc GLM analysis assumes balanced experimental design and very little randomness, which does not properly describe the projects experimental design. As a result, a mixed model analysis was also run to look at the interaction between land use and river basin and account for the some of the randomness. These results are summarized below in Table 4.9. Both statistical tests found no statistically significant differences between SOD rates at forested and agricultural sites over the entire Suwannee River basin (p_{value}=0.214 for the proc glm and p_{value} = 0.5391 for the mixed test).

Using Proc GLM and looking at each basin individually with both land use types averaged, the Alapaha River basin was found to be significantly different than the Upper Suwannee River basin (p_{value} = 0.0216) (see Figure 4.2). When just the forested watersheds are compared, the Alapaha River basin forested watersheds are significantly different from the Little River basin (p_{value} = 0.0451) and Upper Suwannee River basin forested watersheds (p_{value} = 0.0014) (see Figure 4.3). The interaction analysis using Proc Mixed Analysis found that there was a significant interaction between basin and land use (p_{value}= 0.0203).

Table 4.8: Statistical tests completed and the significance of the results

SAS Analysis	Test	P-value	Significance
Proc GLM	AG vs Forested	0.214	not signif.
Proc GLM	Alapaha vs. Little	0.8088	not signif.
Proc GLM	**Alapaha vs. Up. Suwanee**	**0.0216**	**Significant**
Proc GLM	Little vs. Up. Suwannee	0.0844	not signif.
Proc GLM	**Forested Alapaha vs. Forested Little River**	**0.0451**	**Significant**
Proc GLM	**Forested Alapaha vs. Forested Up. Suwanee**	**0.0014**	**Significant**
Proc GLM	Forested Little River vs. Forested Up. Suwannee	0.6536	Not signif.
Proc Mixed	Effect of Basin	0.1196	Not signif.
Proc Mixed	Effect of Land use	0.5391	Not signif.
Proc Mixed	**Effect of Basin*land use**	**0.0203**	**Significant**

Table 4.9: Results from the Interaction component of the Proc Mixed Analysis

Basin	Land Use	Basin	Land Use	P-value	Significance
Alapaha	**AG**	**Alapaha**	**FOR**	**0.0320**	**Significant**
Alapaha	AG	Little	AG	0.1363	Not signif.
Alapaha	AG	Little	FOR	0.9344	Not signif.
Alapaha	AG	Up. Suwannee	FOR	0.5200	Not signif.
Alapaha	FOR	Little	AG	0.4176	Not signif.
Alapaha	**FOR**	**Little**	**FOR**	**0.0505**	**Significant**
Alapaha	**FOR**	**Up. Suwannee**	**FOR**	**0.0096**	**Significant**
Little	AG	Little	FOR	0.1876	Not signif.
Little	**AG**	**Up. Suwannee**	**FOR**	**0.0439**	**Significant**
Little	FOR	Up. Suwannee	FOR	0.4988	Not signif.

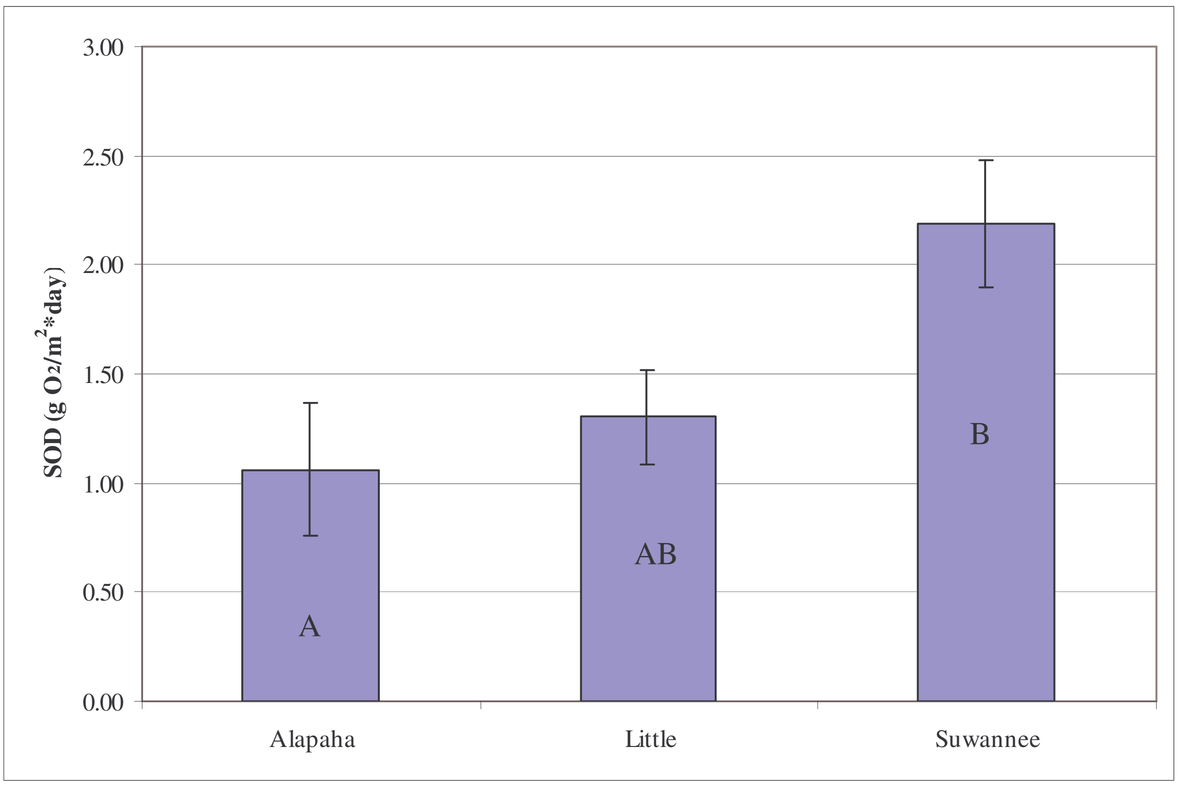

Figure 4.2: Statistical comparison of average river basin SOD rates. Alapaha SOD rates were significantly different from Upper Suwannee SOD rates

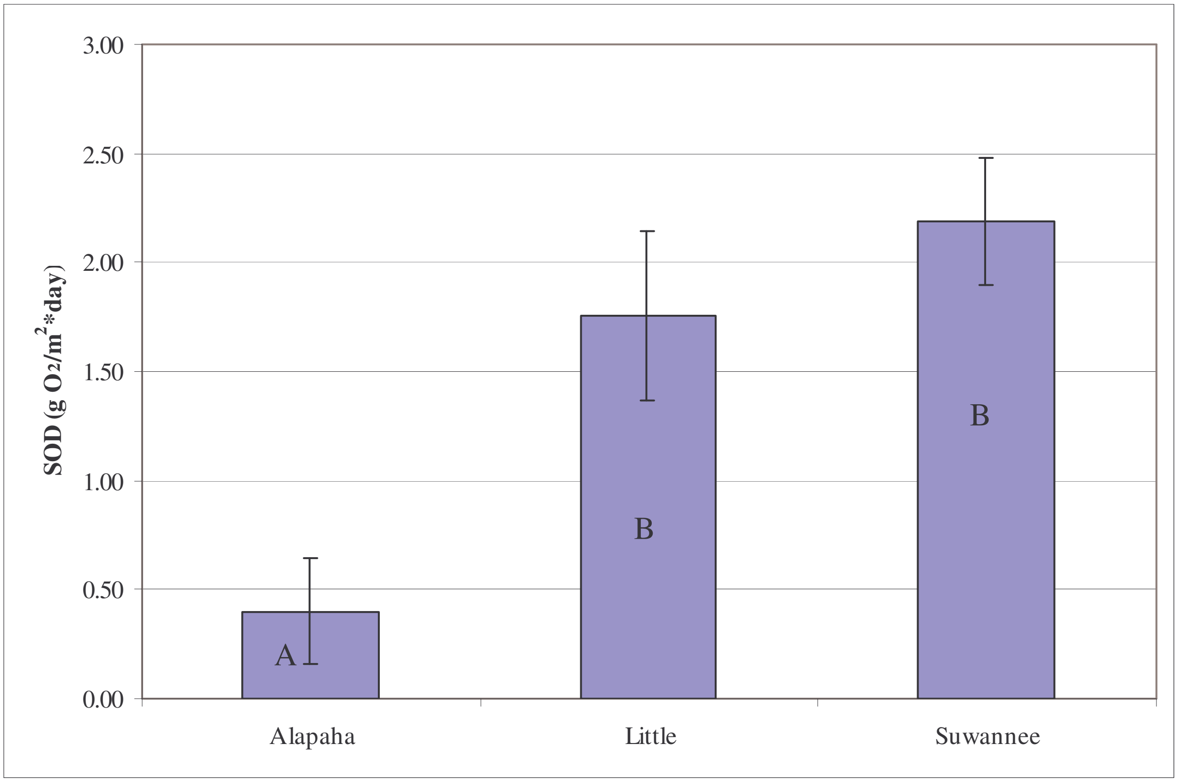

Figure 4.3: Statistical comparison of forested watershed SOD rates across river basins. Alapaha River forested watershed SOD rates were significantly lower than either Little River or Upper Suwannee watershed SOD rates.

A statistical analysis was run to see if there was a significant correlation between percent sand, percent organic matter, and temperature corrected SOD values (see Figures 4.4, 4.5, and 4.6). No significant results were reported for SOD rate and percent sand content ($p_{value} = 0.2115$) or SOD rate and percent organic matter ($p_{value} = 0.0623$).

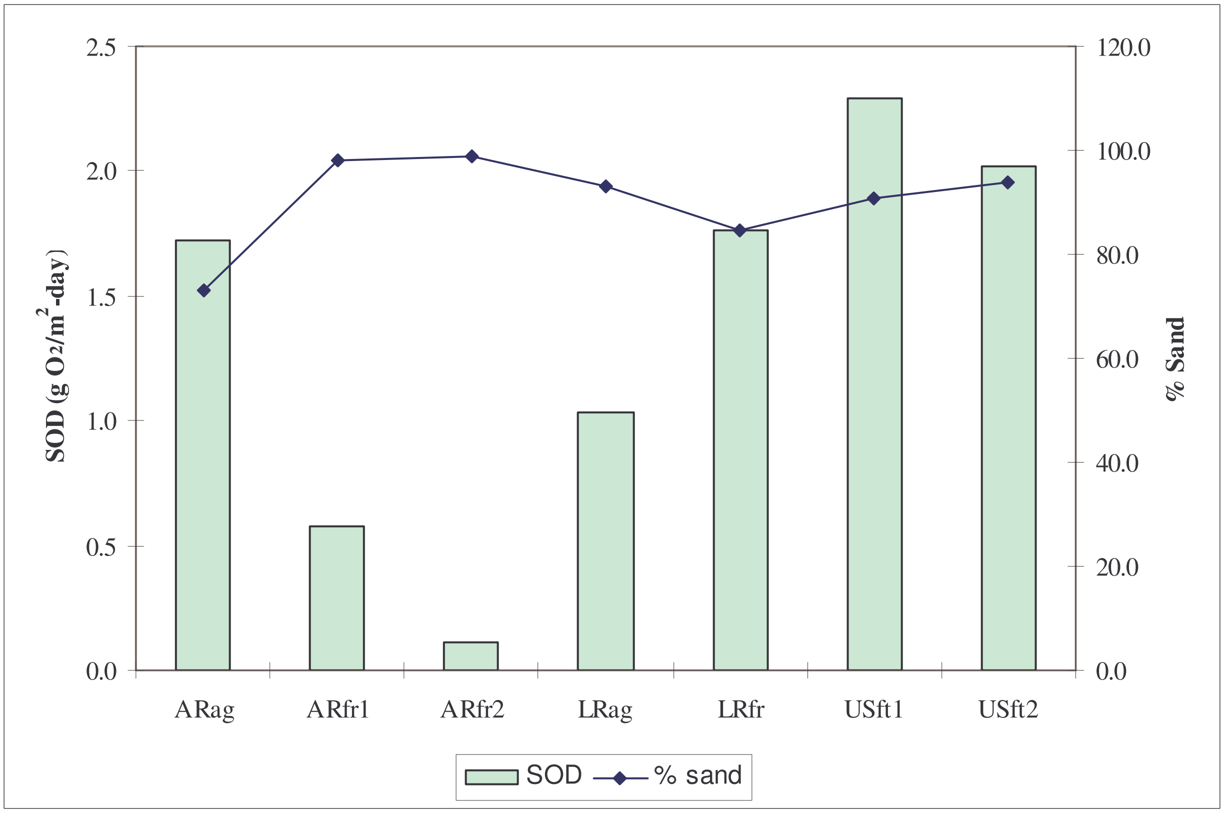

Figure 4.4: Average SOD values and percent sand measured per site.

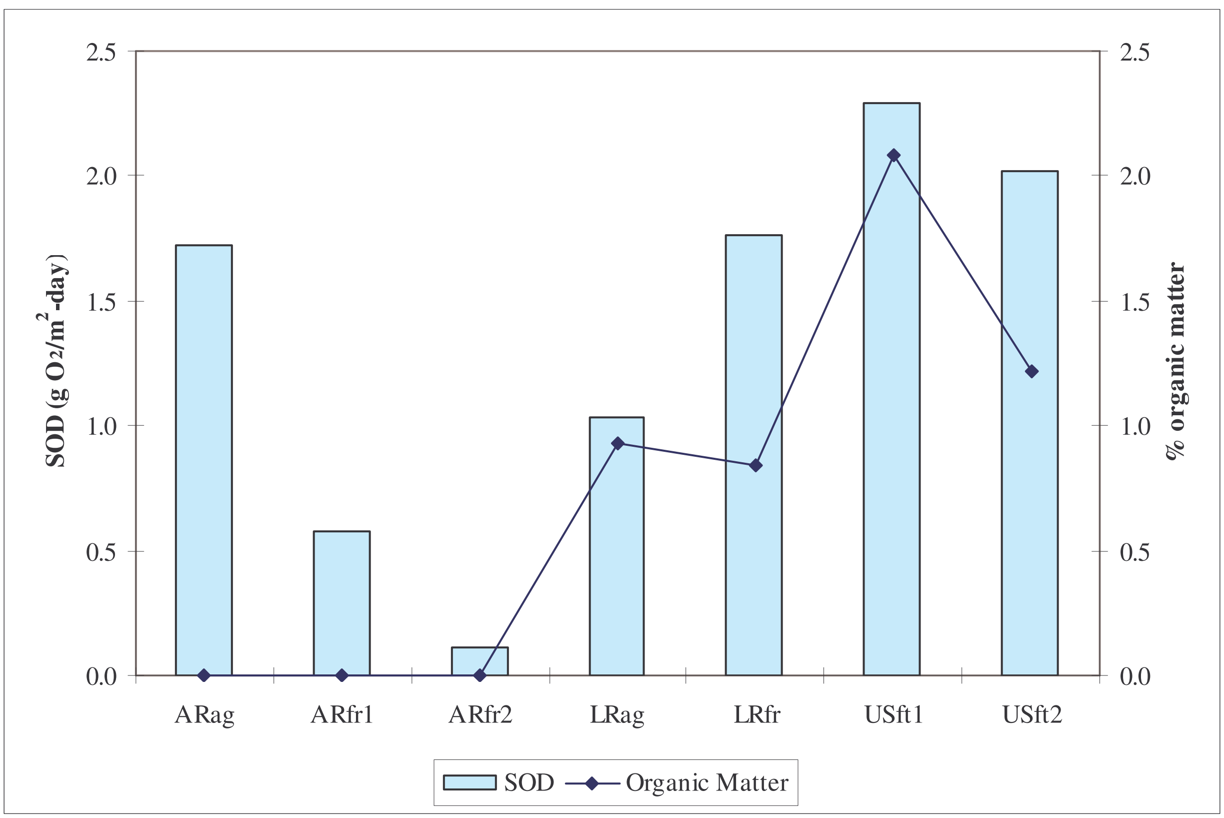

Figure 4.5: Average SOD values and percent organic matter measured per site.

<u>Chapter 5</u>

Discussion

Blackwater streams of Georgia's coastal plain are characterized as slow moving, low dissolved oxygen systems. Ninety one percent of all coastal plain streams on the 2003 303(d) list for Georgia are listed for violating DO standards. Recent research in Louisiana and Georgia suggests that low DO may be a natural condition for summer months in coastal plain streams (Vellidis *et. al.*, 2003; Ice and Sugden, 2003; Bosch *et. al.*, 2002). Due to complex DO dynamics within water bodies, it is important to increase the understanding of the key ecological processes affecting DO. Research has shown that SOD is an important sink of DO (Bowie *et. al.*, 1985; Hatcher, 1986; Murphy and Hicks, 1986; Cathey, 2005).

This study, measured SOD rates *in-situ* and investigated physical in stream and watershed properties affecting these rates. Statistical analysis of the data did not show consistent relationships between land use and SOD, nor river basin and SOD. However, there appeared to be some statistical strength in the interaction between land use and river basin. In other words, there is something intrinsically different in each of the river basins that could be affecting SOD and the low concentration of dissolved oxygen within the blackwater streams. This was best represented within the statistical models as an interaction term between land use and river basin.

Alapaha Agricultural vs. Alapaha Forested watersheds

A significant difference was found between the agricultural and forested watersheds of the Alapaha River basin by the mixed analysis (Table 4.9). There is a large difference between the sites in many aspects. First, spatially the sites are 140 km apart. The agricultural site is located in the Tifton Uplands and receives shallow groundwater recharge from sources rich in dissolved organic carbon (DOC) (Cathey, 2005). The forested sites are located in an ecoregion with karst bed rock conditions, and recharge from deep regional aquifers with less DOC. Second, negative numbers recorded at the forested sites also play a part in increasing the difference between the site averages. The negative values recorded are due to a greater rate of oxygen depletion in the control chamber than in the SOD chambers. Third, the agricultural and forested watersheds of the Alapaha River basin had the greatest difference in percent sand content of the seven sites with 73% in the agricultural site and 98% at the forested sites. All three sites had negligible organic matter. There was no significant correlation between percent sand content and SOD rate.

Little River Agricultural vs. Little River Forested watersheds

There was not a significant difference reported between the agricultural and forested watersheds of the Little River basin. SOD rates at the forested sites were on average higher than the agricultural site. Both study sites were swamp-like with large stream channel widths and trees throughout the stream channel. The sites are 93 km apart, and the forested site is bordered on both sides at the outlet of the watershed by subdivisions. Overall the forested watershed does not have a high urban density.

Little River basin vs. Upper Suwannee River basin

There was no significant difference found between the forested watersheds of the Little River and Upper Suwannee River. The three sites were the only study sites to have measurable organic matter. However, there was a significant difference between the agricultural watershed in the Little River basin and the forested watersheds of the Upper Suwannee basin (p_{value} =

0.0439). Organic matter was not measurable at the agricultural study site in the Little River basin, but all three sites had a percent sand content greater than 90%.

Alapaha River basin vs. Upper Suwannee River basin

There was not a significant difference found between the agricultural watershed in the Alapaha River basin and the forested watersheds of the Upper Suwannee River basin during the mixed analysis. However, a significant difference was found between the forested watersheds of both basins by the Proc GLM (p_{value} = 0.0014) and the Proc Mixed (p_{value} = 0.0096) analyses. Specifically, the average SOD value for forested sites in the Alapaha River basin was 0.6 g O_2/m^2-day and 2.15 g O_2/m^2-day for the forested sites in the Upper Suwannee River basin. The percent sand content at both sites was above 90%, but the percent organic matter for both Upper Suwannee River study sites was greater than 1% while it was negligible at the Alapaha study sites.

Forested Alapaha River watersheds vs. Forested Little River watershed

A significant difference was found by both the Proc GLM (p_{value} = 0.0451) and Proc Mixed (p_{value} = 0.0505) between the forested watershed in the Alapaha River basin and the forested watershed of the Little River basin. The average SOD value for the Alapaha site was 0.6 g O_2/m^2-day while it was 1.8 g O_2/m^2-day at the Little River site. Percent sand content at the Little River site was only around 84% while the sand content at both Alapaha sites was around 98%. However, the Little River site had measurable organic matter content while organic matter was negligible at the Alapaha River sites. Also as mentioned above the Little River forested site is bordered by residential subdivisions on both sides of the stream, while the Alapaha River sites are not near subdivisions.

SOD vs. Organic Matter and % Sand

There was no significant correlation found between percent sand content and SOD rate or organic matter and SOD rate. The results were marginally non-significant at the p=0.05 level. It is possible that with a larger sample size the relationship might be stronger. A graphical comparison of sand content to SOD (Figure 5.1) shows that the two data points from the Upper Suwannee River basin, did not follow the same trend as the remaining data. When the two points from the Upper Suwannee River basin are removed there appears to be an inverse relationship between SOD and % sand. Furthermore, the correlation coefficient for organic matter to SOD was 73.04; therefore, with a larger sample size this trend may have been significant (n=7). Other studies have also found no statistically significant correlations between SOD rates and sediment characteristics (Caldwell and Doyle, 1995; Seiki, 1994).

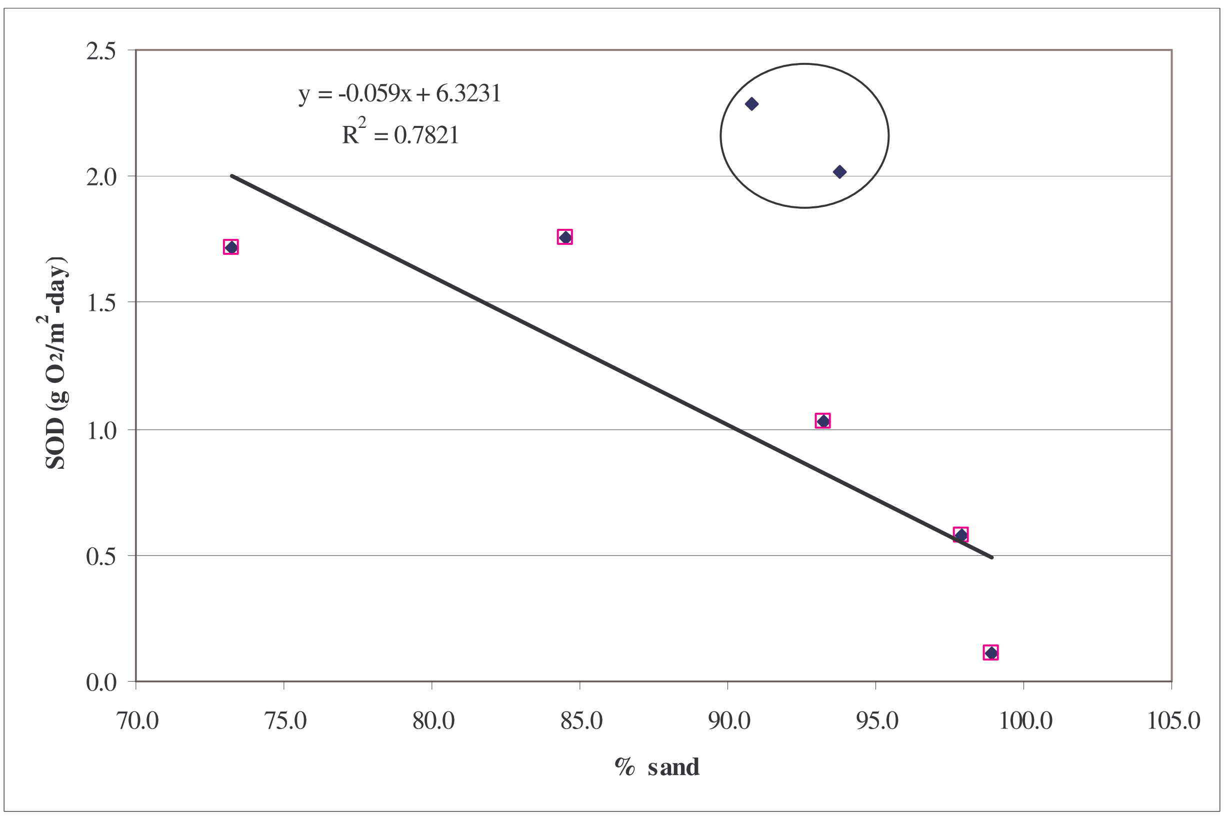

Figure 5.1: Average SOD versus sand content. The circled points have the highest SOD values and the highest organic matter and are located in the Upper Suwannee River basin. Once the points circled are removed from the series a trend is present.

Comparisons to values from Literature

Literature values for SOD vary greatly between types of water systems, for example marine, estuarine, and fresh water systems. SOD also varies spatially, for example Eastern U.S. Rivers vary between 0.11 and 0.19 g O_2/m^2-day while Southeastern U.S. rivers range between 0.33 and 0.77 g O_2/m^2-day (Truax *et. al.*, 1995). SOD values have also been reported by sediment type. For instance, sandy bottoms range between 0.2-1.0 g O_2/m^2-day while mineral soils range between 0.05 and 0.1 g O_2/m^2-day (Bowie *et. al.*, 1985). The values from this study averaged between 0.3 g O_2/m^2-day and 2.3 g O_2/m^2-day. Considering all of the sites are greater than 70% sand, four of study sites are outside of the range for sandy bottom soils on average. Five of the sites analyzed in this study also exceed the range listed for Southeastern U.S. Rivers of 0.33 and 0.77 g O_2/m^2-day (Truax *et. al.*, 1995). The average SOD value per land use exceeds the range listed for Southeastern U.S. Rivers.

Seasonal Trends

There were no discernable trends when SOD was analyzed seasonally throughout the study period. Figure 5.2 shows temperature corrected SOD values recorded at each site during the study period. Four of the study sites had a maximum recorded SOD between January and early March, which was not expected since SOD has been found to be highest in the late summer or early fall and lowest during the early spring (Hopkinson *et. al.*, 2001; Kemp *et. al.,* 1992; Banta *et. al.*, 1995; Dollar *et. al.*, 1991). However, this could be due to scouring of the stream bottoms in the early autumn. The organic matter likely built up over November and December, causing higher SOD rates. This can not be proven since sediment samples were only collected once right after the storms. Flood stage waters occurred again during late March and April throughout the Suwannee River basin and could have flushed the organic matter out again before the late spring measurements were taken in April and May.

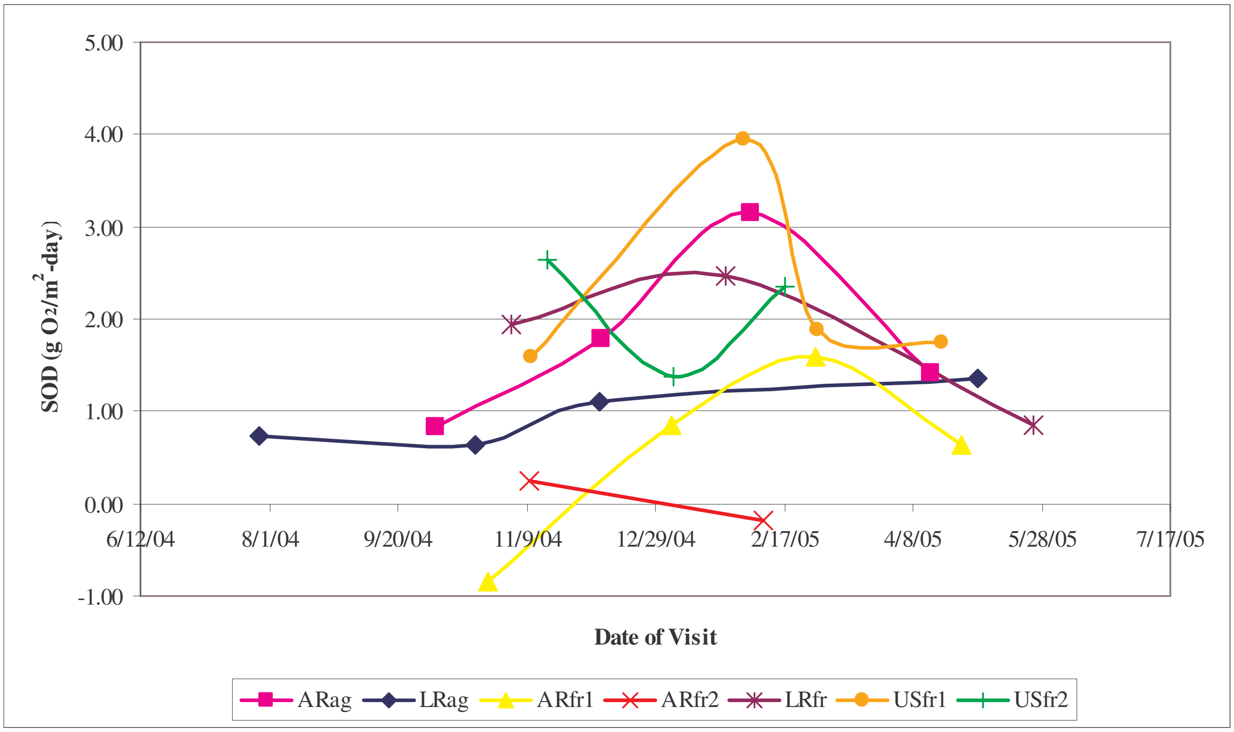

Figure 5.2: Average Temperature Corrected SOD throughout the Study period.

There were some trends present when SOD rates were compared to volumetric flowrates measured during each test. Figure 5.3 shows river basin specific trends and some loose trends to land use. Overall the Upper Suwannee River basin SOD rates decreased with large increases in flowrate. In constrast, within the Alapaha River basin SOD values from two of the three sites increased with increasing flowrate, similarly in the Little River basin, SOD rates from both study sites increased with increasing flowrate. Also, when the study sites are divided by land use it was found that SOD rates from both agricultural study sites increased with increasing flowrate. However, SOD values from only two of the five forested study sites increased with increasing flow. Makenthun and Stefan (1998) found that SOD increased linearly with water velocity at low levels (< 10 cm/s), however at higher levels SOD became independent of water velocity. Statistically, there is no significant correlation between SOD and flowrate from this study.

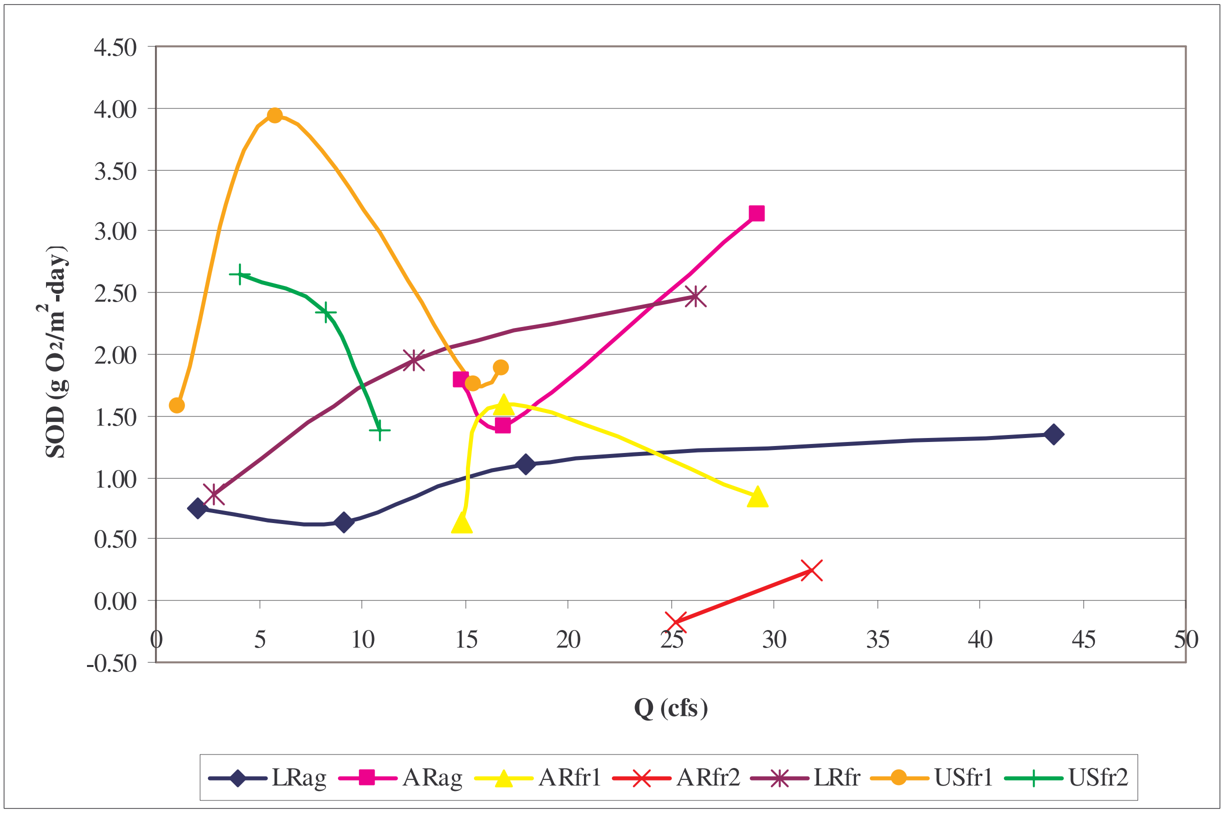

Figure 5.3: SOD versus Volumetric flowrate (cfs).

Uncertainty in Values

SOD values recorded throughout the study only represent brief snap shots of the conditions within a stream reach. However, at the present time these values are the only SOD measurements available for Georgia's coastal plain. Using these values and the relationships found between the river basins will allow the state to begin looking at the importance of SOD within blackwater streams. However, it will be beneficial to continue measuring SOD within the coastal plain and to increase the number of study sites within the Suwannee River basin in order to increase the accuracy of extrapolating from study site to stream reach and on to river basin. Although, the values recorded only ranged from 0.3-2.3 g O_2/m^2-day and are well below SOD values considered high, these values do exceed ranges currently listed for sandy sediments and streams/rivers within the southeastern United States. It is not clear if the measured rates could be responsible for the depletion of dissolved oxygen during summer.

Comparison of Field Values to Modeled Values for the Coastal Plain

Cathey (2005) modeled low DO levels within Georgia's coastal plain, specifically within the Little River Experimental Watershed (LREW). The study used experimental data to calibrate and validate the Georgia DOSAG model. Most parameters within the model were determined from the data collected within the LREW over the last 20 years. However, SOD and reaeration/turbulence data were not available. Standard equations were used to represent the processes of reaeration and turbulence since measured rates were not available within the coastal plain. Therefore, SOD was left as the equilibrating factor for the model, and was modified to calibrate the model. This required a SOD value of around 6 g O_2/m^2-day. During sensitivity analysis, SOD was found to be the most sensitive parameter within the model.

However, since the completion of the SOD study, it appears that SOD values may be much lower than 6 g O_2/m^2-day. This creates an interesting problem for calibrating the model, as it requires an additional sink for DO or redistribution of the excess uptake. Since all parameters except SOD and reaeration were measured, one option for re-balancing the model would be to use a different reaeration equation. The DOSAG model has three options for modeling reearation, the O'Conner Dobbins equation, manual input, or the Tisvoglou equation. Cathey (2005) used the Tisvoglou equation which may have over-predicted rearation, requiring a larger SOD value to balance the model. Another option would be to measure reaeration in the field to see how well the Tisvoglou equation predicted reaeration during low flow events.

Chapter 6

Conclusions

This study provided some unexpected trends. For example, it was expected that on average, agricultural watersheds would have lower SOD values than forested watersheds due to lower rates of incoming organic matter. However, we found that in the Alapaha River watershed, the agricultural sites had higher SOD rates than the forested sites. This may be a consequence of higher levels of nutrients, erosion from farming operations, and legacy effects after decades of anthropogenic interference. In contrast, forested sites produced higher rates in the Little River watershed. The Upper Suwannee, a river basin where the majority of the land is densely forested, had the highest SOD values on average.

Average SOD values within the Alapaha River basin ranged from 0.8 to 3.1 g O_2/m^2-day at the agricultural site and from -0.9 to 1.6 g O_2/m^2-day at the two forested sites. Within the Little River basin, average SOD values for the agricultural watershed ranged from 0.6 to 1.4 g O_2/m^2-day and 0.9 to 2.5 g O_2/m^2-day for the forested study site. Also, the two forested sites within the Upper Suwannee River basin ranged from 1.4 to 3.9 g O_2/m^2-day.

Organic matter was found to be less than 2% for all experimental sites and negligible at many sites. This too was somewhat of a surprise. However, it is possible that a series of hurricanes that passed through our study area during the autumn of 2004 may have flushed much of the benthic organic matter from the tributaries we were studying.

The highest SOD rates and organic matter concentrations were measured near the Okefenokee Swamp – an area dominated by forestry operations. Year round tree harvesting and brush burning, which may contribute additional organic matter to streams, and the presence of swamps, which tend to concentrate organic matter, could be the driving forces for higher SOD rates in the Upper Suwannee River basin. However SOD was not measured relative to tree harvest at either of the study sites within the Upper Suwannee River basin.

It was hypothesized that associating land use to measured SOD rates could help modelers choose more accurate SOD values. Although there is no significant difference between agricultural and forested watersheds with our current sample size there were significant differences between river basins. The finding that environmental parameters are river basin-specific has been reported by other studies in the coastal plain of Georgia (Gregory et al., 1995; Carey et al., 2005).

SOD values for forested watersheds can be more accurately assigned for DO models by looking at the smaller watershed (Little River, Alapaha, Upper Suwannee, and Withlacoochee) rather than the entire river basin (Suwannee). The high sand content at the Alapaha forested sites and the relatively high organic content at the Upper Suwannee forested sites are easily measured factors that can help modelers pick the most accurate SOD value for their model. Also, comparing measured SOD values to those currently available in the literature for sandy bottom streams or streams in the Southeastern U.S. shows the importance of measuring SOD in the region under question instead of choosing a value from literature based on sediment type or region alone.

Dissolved oxygen rates in coastal plain streams have been documented to be well below the state standard during the summer months. We measured SOD from the fall of 2004 through the spring of 2005; however, measurements were not taken during the warmest time of year from late July through late August. It is not clear if the measured rates could be responsible for the depletion of dissolved oxygen during the summer monthes.

SOD rates should continue to be measured in order to build up a database of year round information to be applied to TMDL research and regulatory actions. When and if funds are available, it would be beneficial to study SOD on the main river channels. However, a dive certified team would be required to deploy the chambers most of the time, especially during high flow periods. As the need for quality SOD data continues to grow, we believe a measurement technique that can be left *in-situ* for long periods of time (months to year round) without constant maintenance should be developed. No matter how much care was taken when deploying the chambers at the study sites, the sediment was greatly disturbed. Developing a long term, *in-situ* measurement system could open an important window into the dynamics of SOD and how it is modeled.

References

Alexander, D.D., H.G. Stefan. 1983. Model of Mississippi river pool dissolved oxygen. *J. Enviro. Engrg.* ASCE **109**(5): 1020-1036.

Anderson, L. G., O. J. Hall, A. Iverfeldt, M. M. Rutgers van der Loeff, B. Sundby, and S. F. G. Westerlund. 1986. Benthic Respiration Measured by Total Carbonate Production. *Limnol. Oceanogr*. 31(2), 319-329.

Banta, G.T., A.E. Giblin, J.E. Hobbie, J. Tucker. 1995. Benthic Respiration and Nitrogen Release in Buzzards Bay, Massachusetts. *Journal of Marine Research.* **53:**107-135.

Basnyat, P., L. Teeter, B. G. Lockaby, and K. M. Flynn. 2000. Land Use Characteristics and Water Quality: A Methodology for Valuing of Forested Buffers. *Environmental Managemen*. **26**(2): 153-161.

Bosch, D., R. Lowrance, G. Vellids, J. Sheridan, and R. Williams. 2002. Dissolved oxygen and stream flow rates: Implications for TMDLs. In A. Saleh (ed) *Proceedings of the Total Maximum Daily Load (TMDL) Environmental Regulations Conference.* pp. 92-92. ASAE, St. Joseph, Michigan.

Borsuk, M. E., D. Higdon, C. A. Stow, and K. H. Reckhow. 2001. A Bayesian hierarchical model to predict benthic oxygen demand from organic matter loading in estuaries and coastal zones. *Ecological Modeling*. 143: 165-181.

Bowie, G.L. *et. al.* 1985. Rates, Constants & Kinetic Formulations in Surface Water Quality Modeling, 2nd Ed., EPA Ofc. Of Research and Development, Athens, GA.

Bowman, G. T. and J. J. Delfino. 1980. Sediment Oxygen Demand Techniques: A Review and Comparison of Laboratory and In-situ Systems. *Water Research.* 14: 491-499.

Boynton, W.R., W.M. Kemp, C.G. Osborne, K.R. Kaumeyer and M.C. Jenkins. 1981. Influence of Water Circulation Rate on *in situ* Measurements of Benthic Community Respiration. *Marine Biology* 65, 185-190.

Caldwell, J. M. and M. C. Doyle. 1995. Sediment Oxygen Demand in the Lower Willamette River, Oregon 1994. USGS:Water-Resources Investigations Report 95-4196.

Carey, R., G. Vellidis, R. Lowrance, and C. Pringle. 2005. Nutrient enrichment and stream periphyton growth in the southern coastal plain of Georgia. *ASAE Technical Paper No. 05-2197*. ASAE, St. Joseph, MI. 14 pp.

Cathey, A.M., G. Vellidis, M.C. Smith, R. Lowrance, and R. Burke. 2005. The Calibration Validation and Sensitvity Analysis of Georgia DoSag: An In-Stream Dissolved Oxygen Model. *Proceedings from the Watershed Management to meet Water Quality Standards and Emerging TMDL third Annual Conference.* ASAE.

Chau, K.W. 2002. Field measurements of SOD and sediment nutrient fluxes in a land-locked embayment in Hong Kong. *Advances in Environmental Research* **6**:135-142.

Chaudhury, R. R., J. A. H. Sobrinho, R. M. Wright, and M. Sreenivas. (1997) Dissolved Oxygen Modeling of the Blackstone River (Northeastern United States). *Water Resources* 32(8): 2400-2412.

Clausen, J.C., K. Guillard, C.M. Sigmund, and K. Martin Dors. 2000. Water Quality Changes from Riparian Buffer Restoration in Connecticut. *Journal of Environ. Qual.* 29: 1751-1761.

Cooper, J.R., J.W. Gilliam, R.B. Daniels, and W.P. Robarge. 1987. Riparian Areas as Filters for Agricultural Sediment. *Soil Sci. Soc. Am. J.* 51: 416-420.

Dollar, S.J., S.V. Smith, S.M. Vink, S. Obrebski, J.T. Hollibaugh. 1991. Annual cycle of benthic nutrient fluxes in Tomales Bay, California, and contribution of the benthos to total ecosystem metabolism. *Mar. Ecol. Prog. Ser.* **79**: 115-125.

Gee, G. W. and J. W. Bauder. 1986. Particle Size Analysis. In Methods of Soil Analysis Part I: Physical and Mineralgical Methods. ed. A. L. Page, 383-409. Madison, WI: American Society of Agronomy, Inc.

Gregory, B., C. Pringle, G. Vellidis, and R. Lowrance. 1995. Effects of riparian zone management on water quality and invertebrate community structure in the Tifton Upland region of the Georgia Coastal Plain. *North American Benthological Society*. Keystone, CO.

Hatcher, K. 1980. Sediment Component of Oxygen Demand in Streams. *Institue of Natural Resources, University of Georgia.*

Hatcher, K. 1986. “Introduction to Part 3: Sediment Oxygen Demand Measurement.” Sediment Oxygen Demand: Processes, Modeling, and Measurement. ed Kathryn Hatcher, Institute of Natural Resources, University of Georgia, Athens, GA. 301-305.

Hill, B.H., A.T. Herlihy, P.R. Kaufmann. 2002. Benthic microbial respiration in Appalachian Mountain, Piedmont and Coastal Plains streams of the eastern USA. *Freshwater Biology.* **47**: 185-194.

Hopkinson, C.S., Giblin AE, Tucker J. 2001. Benthic metabolism and nutrient regeneration on the continental shelf of Eastern Massachusetts. *Marine Ecology Progress Series.* 224:1-19.

Ice, G. and B. Sugden. 2003. Summer dissolved oxygen concentrations in forested streams of northern Louisiana. *So. J. Applied For.* **27**(2):92:99.

Kemp, W.M., P.A. Sampou, J. Garber, J. Tuttle, W.R. Boynton. 1992. Seasonal depletion of oxygen from bottom waters of Chesapeake Bay: roles of benthic and planktonic respiration and physical exchange processes. *Mar. Ecol. Prog. Ser.* **35:** 137-152.

Kristensen, E., M.H. Jensen, and K.M. Jensen. 1997. Temporal variations in microbenthic metabolism and inorganic nitrogen fluxes in sandy and muddy sediments of a tidally dominated bay in the northern Wadden Sea. *Helgolander Meeresunters* **51:** 295-320.

Laursen, A.E., S.P. Seitzinger, R. Dekorsev, J.G. Sanders, D.L. Breitburg, R.W. Osman. 2002. Multiple Stressors in an Estuarine System: Effects of Nutrients, Trace Elements, and Trophic Complexity on Benthic Photosynthesis and Respiration. *Estuaries.* Vol. 25, No. 1, pg. 57-69.

Lee, K., T. M. Isenhart, R. C. Shultz, and S. K. Mickelson. (2000) Multispecies Riparian Buffers Trap Sediment and Nutrients during Rainfall Simulations. *J. Environ. Qual*. 29:1200-1205.

Longaker, J. J. and W. L. Poppe. 1986. Laboratory Method for Measuring S.O.D. In Sediment Oxygen Demand: Processes, Modeling, and Measurement. ed Kathryn Hatcher, 324-328. Athens. Institute of Natural Resources, University of Georgia.

Lowrance, R., J.K. Sharpe, and J.M. Sheridan. 1986. Long-term sediment deposition in the riparian zone of a coastal plain watershed. *Journal of Soil and Water Conservation.* (July-August) pp. 266-271.

Lowrance, R. and R.A. Leonard. 1988. Streamflow nutrient dynamics in coastal plain watersheds. *Journal of Environmental Quality.* **17**:734-740.

Lowrance, R., R.G. Williams, S.P. Inamdar, D.D. Basch, and J.M. Sheridan. 2001. Evaluation of Coastal Plain Conservation Buffers using the Riparian Ecosystem management model. *Journal of the American Water Resources Association.* **37**(6): 1445- 1455.

Makenthun, A. A. and H. G. Stefan. 1998. Effect of flow Velocity on Sediment Oxygen Demand: Experiments. *Journal of Environmental Engineering.* 124(3): 222-230.

Matlock, M. D., K. R. Kasprazak, & G. S. Osborn. 2003. Sediment Oxygen Demand in the Arroyo Colorado River. *Journal of the American Water Resources Association.*(JAWRA) 39(2):267-275.

McKergow, L. A., D. M. Weaver, I. P. Prosser, R. B. Grayson, A. E.G. Reed. 2003. Before and after riparian management: sediment and nutrient exports from a small agricultural catchment, Western Australia. *Journal of Hydrology* **270:** 253-272.

Meyer, J.L., A.C. Benke, R.T. Edwards, J.B. Wallace. 1997. Organic matter dynamics in the Ogeechee River, a blackwater river in Georgia, USA. *Journal of the North American Benthological Society.* **16**:82-87.

Murphy, P. and D. Hicks. 1986. "In-situ Method for measuring Sediment Oxygen Demand". Sediment Oxygen Demand: Processes, Modeling, and Measurement. ed Kathryn Hatcher, Institute of Natural Resources, University of Georgia, Athens, GA. 307-323.

NCASI. 1982. A study of the Selection, Calibration, and Verification of Mathematical Water Quality Models. National Council for Air and Stream Improvement, Inc., Research Triangle Park, N.C.

Nerbonne, B. A. and B. Vondracek. 2001. Effects of Local Land Use on Physical Habitat, Benthic Macroinvertebrates, and Fish in the Whitewater River, Minnesota, USA. *Environmental Management* 28(1): 87-99.

Nolan, P. M., A. F. Johnson. 1979. A method for Measuring Sediment Oxygen Demand Using a Bench Model Benthic Respirometer. US EPA REGION I LIBRARY. JFK Federal BLDG. Boston, MA 02203-2211

Poff, N.L., and J.D. Allan. 1995. Functional organization of stream fish assemblages in relation to hydrological variability. *Ecology*. **76:**606-627.

Pomeroy, L.R., J.E. Sheldon, W.M. Sheldon Jr., J.O. Blanton, J. Amft, and F. Peters. 2000. Seasonal Changes in Microbial Processes in Estuarine and Continental Shelf Waters of the South-eastern U.S.A. *Estuarine, Coastal and Shelf Science* **51**: 415-428.

Seiki, T., H. Izawa, E. Date, and H. Sunahara. 1994. Sediment Oxygen Demand in Hiroshima Bay. *Water Resources* **28**(2): 385-393.

Sinsabaugh, R. L. 1997. Large-scale trends for stream benthic respiration. *Journal of the North American Benthological Society.* **16**:119-122.

Smith, K.L. 1978. Benthic Community Respiration in the N.W. Atlantic Ocean: *in situ* Measurements from 40 to 5200 m*. *Marine Biology*. **47**: 337-347.

Truax, D. D., A. Shindala, and H. Sartain. 1995. Comparison of Two Sediment Oxygen Demand Measurement Techniques. *Journal of Environmental Engineering*. 121(9): 619-624.

USEPA. 1995. Water quality conditions in the United States: A profile from the 1994 national water quality inventory report to congress. Publication EPA 841-F-95-010. Office of Water, Washington, DC.

USEPA. 2004. What are Water Quality Standards. Available at: http://www.epa.gov/OST/standards/about/uses.htm

Vellidis, G., R. Lowrance, M.C. Smith, S. Crow, and A. Milton. 2003. Establishing the natural range of dissolved oxygen levels in streams of the southern coastal plain of Georgia. In A. Saleh (ed) *Proceedings of the Total Maximum Daily Load (TMDL) Environmental Regulations Conference.* pp. 414-419. ASAE, St. Joseph, Michigan.

Wang, H., M. Hondzo, C. Xu, V. Poole, A. Spacie. 2003. Dissolved oxygen dynamics of streams draining an urbanized and an agricultural catchment. *Ecological Modelling.* 160: 145-161.

Wang, L., J. Lyons, P. Kanehl, D. Marshall, M. Sorge, B. Goodweiler. 2001. Responses of Stream Habitat, Macroinvertebrate, and Fish to Watershed BMPs: Lessons from Wisconsin. *In Soil Erosion Research for the 21st Century, Proc. Int. Symp. (3-5 January 2001, Honolulu, HI,USA).*

Welsch, D. J. 1991. Riparian forest buffers: Function and design for protection and enhancement of water resources. United States Department of Agriculture Forest Service, Northeastern Area, Radnor, PA, USA. NA-PR-07-91.

Wharton, C. H. 1978. The Natural Environments of Georgia. Geologic and Water Resources Division and Resource Planning Section, Office of Planning and Research Georgia Department of Natural Resources. Atlanta, GA.

Whittemore, R.C. 1986. Recent studies on the comparison of *in-situ* and laboratory sediment oxygen demand techniques. *Tech. Bull. No. 489.* Nat. Council of the Paper Industry for Air and Stream Imporvement, Inc., New York, N.Y.

Whittemore, R.C. 2001. Disscusion of Fluid Mechanics on Triangular Sediment Oxygen Demand Chamber. Journal of Environmental Engineering. December: 1150-1151.

Wu, R.S.S. 1990. A Respirometer for Continuous, In-situ Measurements of Sediment Oxygen Demand. *Water Research*. 24(3):391-394.

Zimmerman, J. K. H., B. Vondracek, and J. Westra. 2003. Agricultrual Land use effects on Sediment Loading and Fish Assemblages in Two Minnesota (USA) Watersheds. Environmental Management **32**(1): 93-105.

Appendix A

Detailed Site Description

Alapaha River Watershed

Agricultural Watershed

The agricultural study site within the Alapaha River basin is located on US highway 280 just west of Pitts, GA. It has a well developed riparian buffer outside of the right-away for the highway. The watershed has an area of 5,959 hectares, and 64.95% percent of the land is used for agriculture. (Lat 30.84735 Lon -83.5613) (Figures A.2-A.4)

Forested Watershed #1

The first forested study site in the Alapaha river basin is located on Cow Creek off of US highway 129 just south of Statenville, GA. There is a dense riparian buffer on both side of the bridge crossing except the in the right-of-way. The watershed has an area of 3,056 hectares, and 86.35% of the land is forested. (Lat 30.73577 Lon -83.0116) (Figures A.5 -A.7)

Forested Watershed #2

The second forested study site within the Alapaha River basin is located on Mud Creek, south of State Highway 94 on Hickory Grove Rd, and the Lowndes/Echols county line. The forested watershed has an area of 2,308 hectares, and 62.5% of the land is forested. (Lat 30.73577 Lon -83.1353) (Figures A.8-A.9) A dense riparian buffer is located on both sides of the bridge crossing.

Little River Watershed

Agricultural Watershed

The agricultural study site in the Little River basin is located on the Little River and US Highway 112, southwest of Ashburn, GA. (Lat 30˚40’28” Lon 83˚ 41’26”) The watershed has an area of 5,000 hectares, and 62.92% of the land within the watershed is used for agriculture. (Figure A.10) There is a dense riparian buffer on the upstream or northern side of the bridge crossing at US highway 112, however downstream of the bridge the riparian buffer decreases in width.

Forested Watershed

The forested study site within the Little River basin is located on Franks Creek at Shiloh Rd, north of Valdosta, and has an area of 5,260 hectares. Also, 68.12% of the land is forested within this watershed. (Lat 30.88083 Lon -83.3671) (Figures A.11-A.12) There is a dense riparian buffer on both side of the bridge on Shiloh rd; however there are subdivisions on the both side of the stream upstream from the site and private residential property to the south of the bridge crossing.

Upper Suwannee

Forested Watershed #1

The first forested site in the Upper Suwannee River basin is located on Suwannee Creek at US Highway 84, southwest of Waycross, GA, and has an area of 5,840 hectares. The first forested watershed in the Upper Suwannee river basin is 72.82% forested. (Lat 31.09118 Lon -82.6066) (Figures A.13-A.14)

Forested Watershed #2

The second forested site in the Upper Suwannee River basin is located on State Highway 177, half way to Stephen Foster State Park on Sweet Water Creek, and has an area of 3,676 hectares. Also, the watershed is 85.56% forested. (Lat 31.09118 Lon -82.6066) (Figures A.15-A.16)

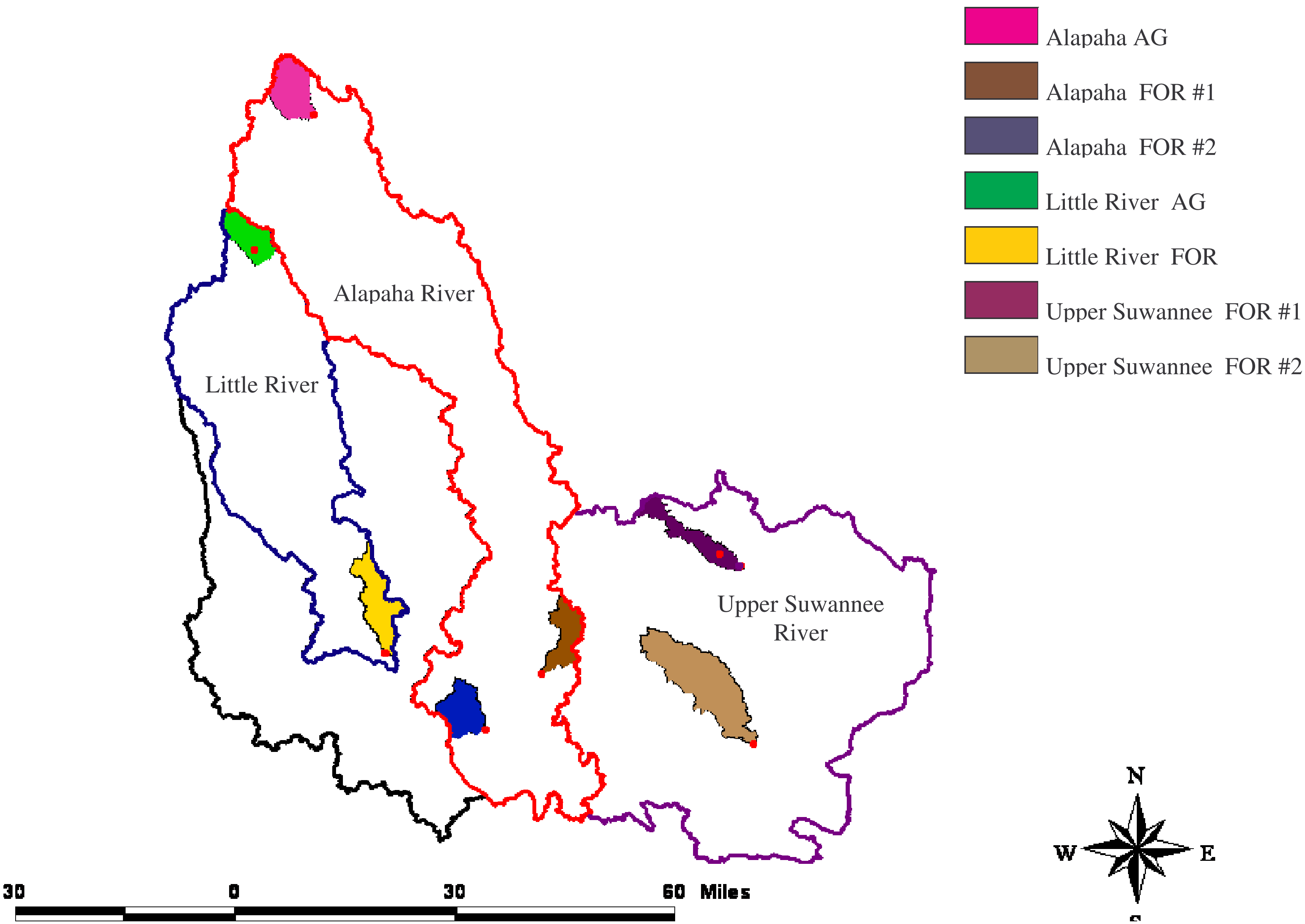

Figure A.1: Map of study watersheds within the Suwannee River Basin.

Figure A.2 : Alapaha Agricultural site

Figure A.3: SOD chambers deployed at the Alapaha Agricultural watershed

Figure A.4: Alapaha Forested Watershed #1

Figure A.5: Alapaha Forested Watershed #1

Figure A.6: Forested Watershed #2 within the Alapaha River basin.

Figure A.7: Forested Watershed #2 within the Alapaha River basin.

Figure A.8: Agricultural watershed within the Little River basin

Figure A.9: Forested watershed within the Little River basin.

Figure A.10: Forested watershed within the Little River basin.

Figure A.11: Forested study site #1 in the Upper Suwannee River Basin.

Figure A.12: Forested study site #1 in the Upper Suwannee River Basin

Figure A.13: Forested study site #2 in the Upper Suwannee River Basin

Appendix B

Swat Output

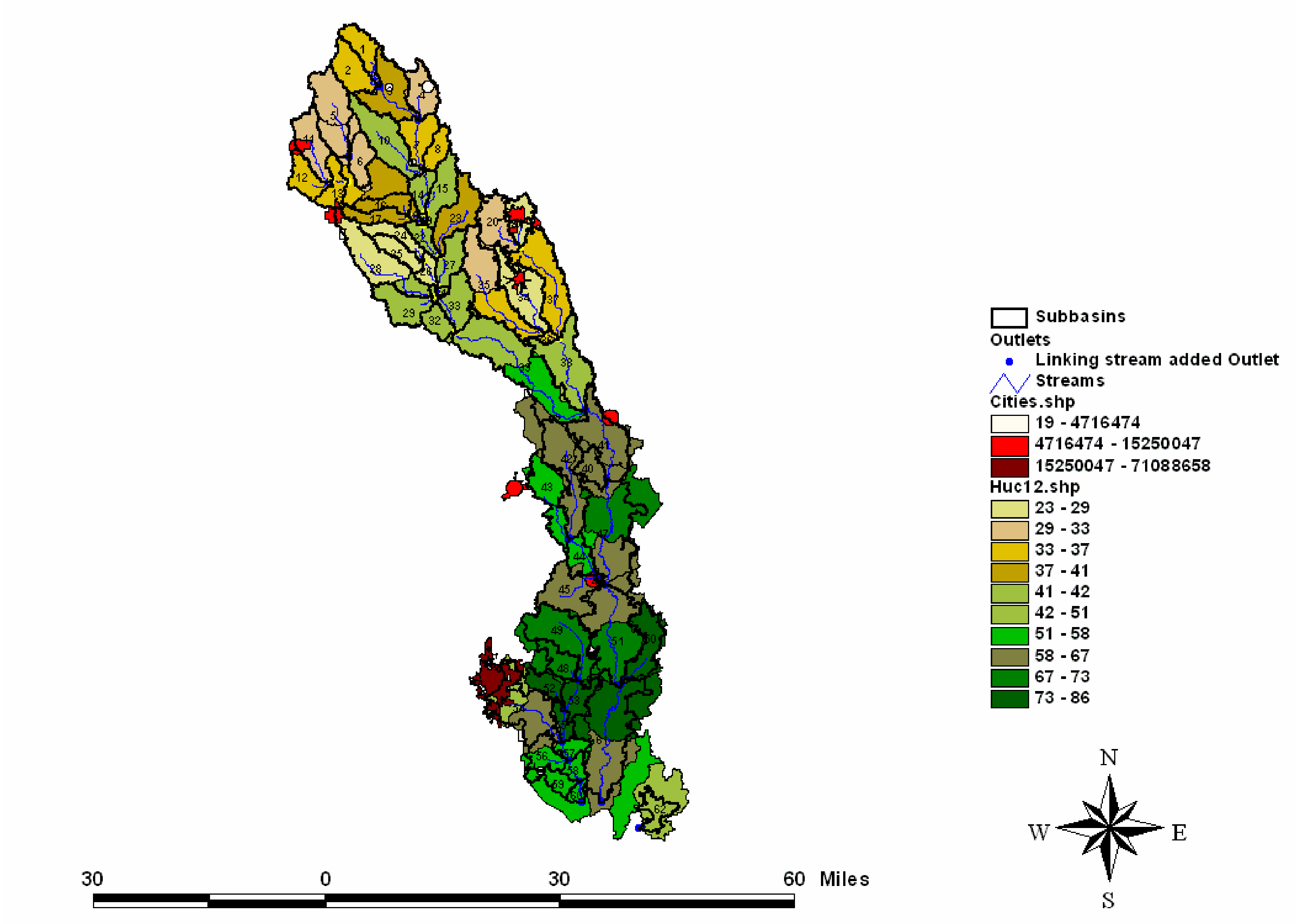

Figure B.1: Initial AVSWAT output for the Alapaha River Basin.

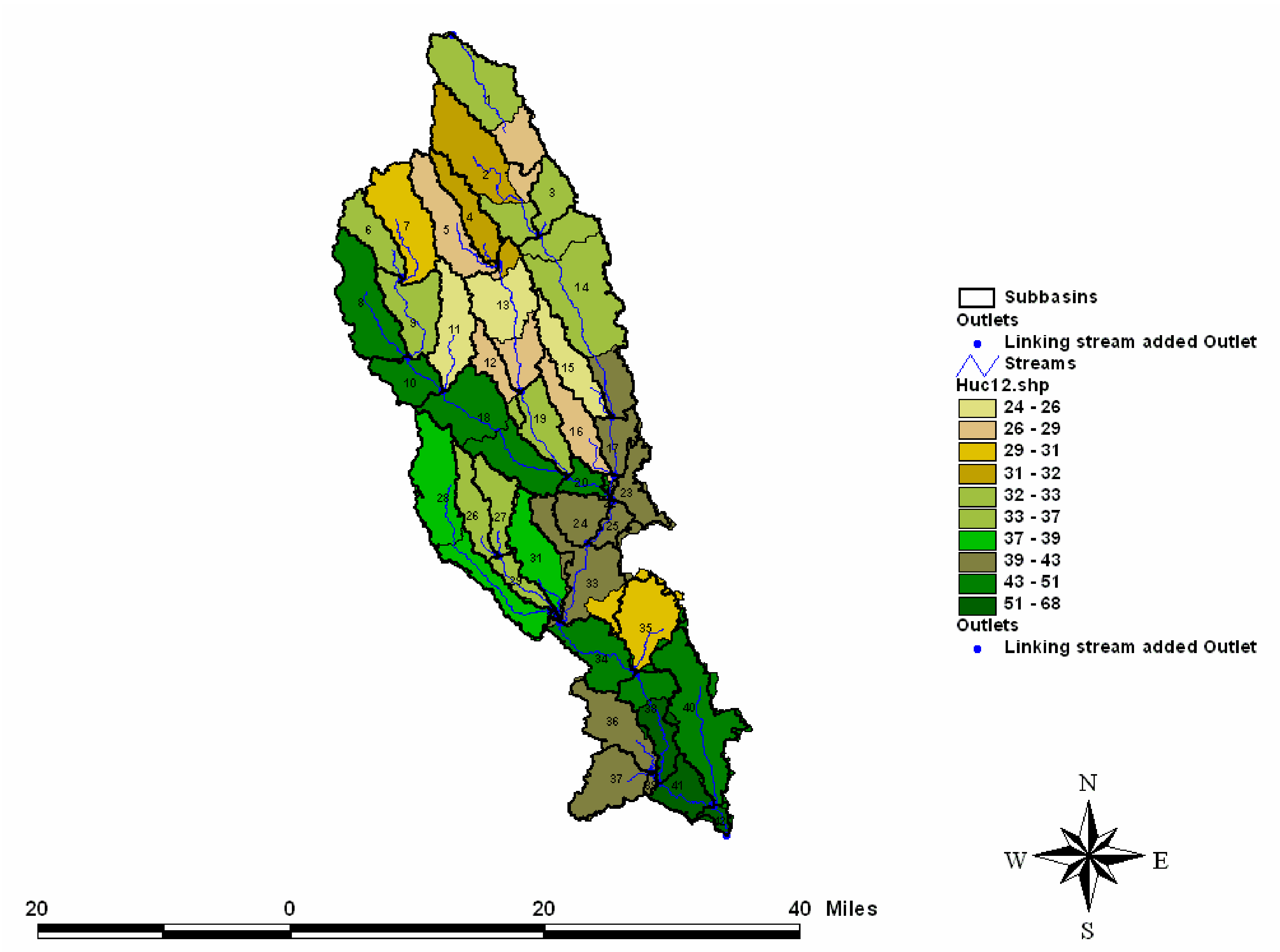

Figure B.2: Initial AVSWAT out put for the Little River

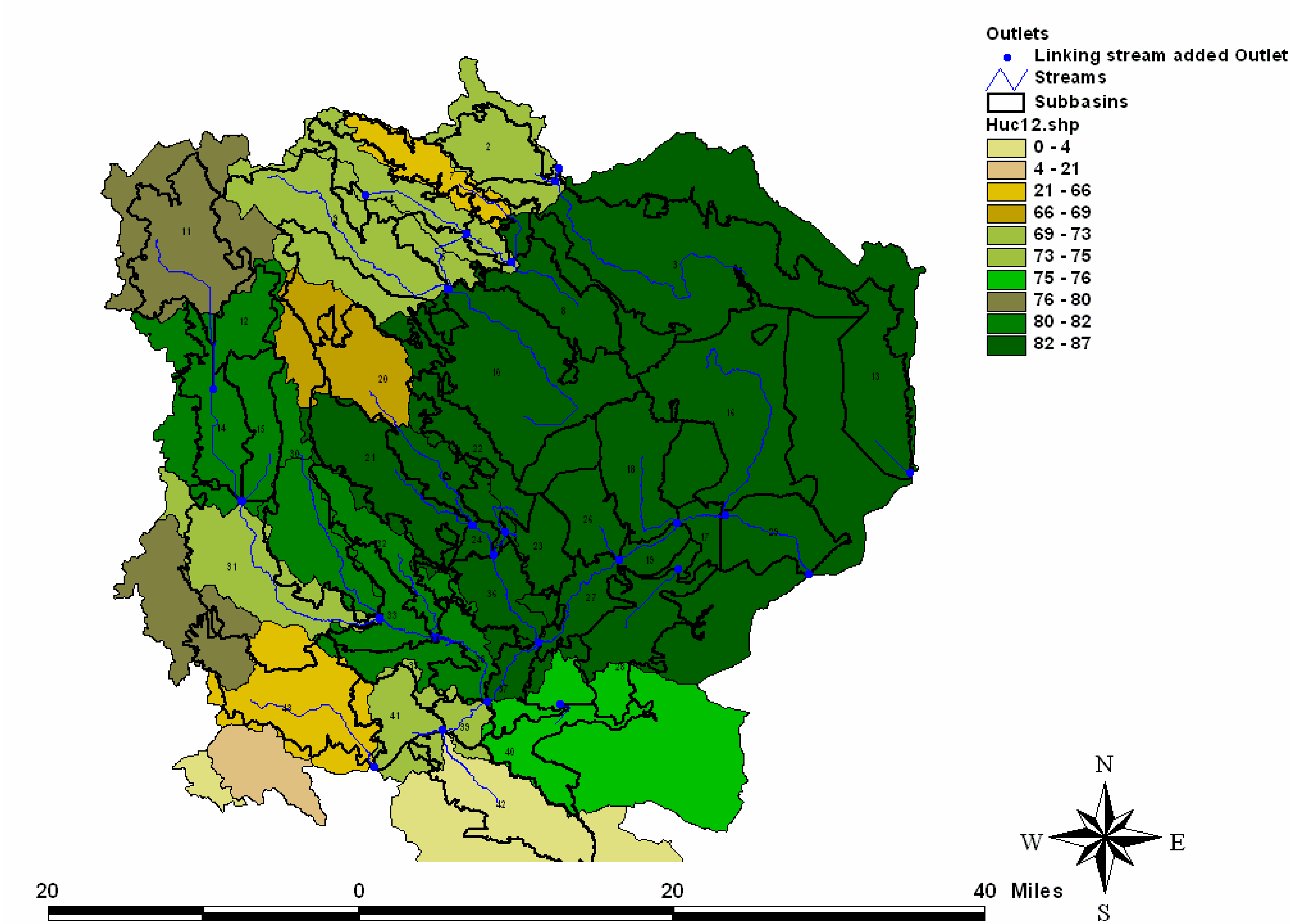

Figure B.3: Initial AVSWAT output for the Upper Suwannee River

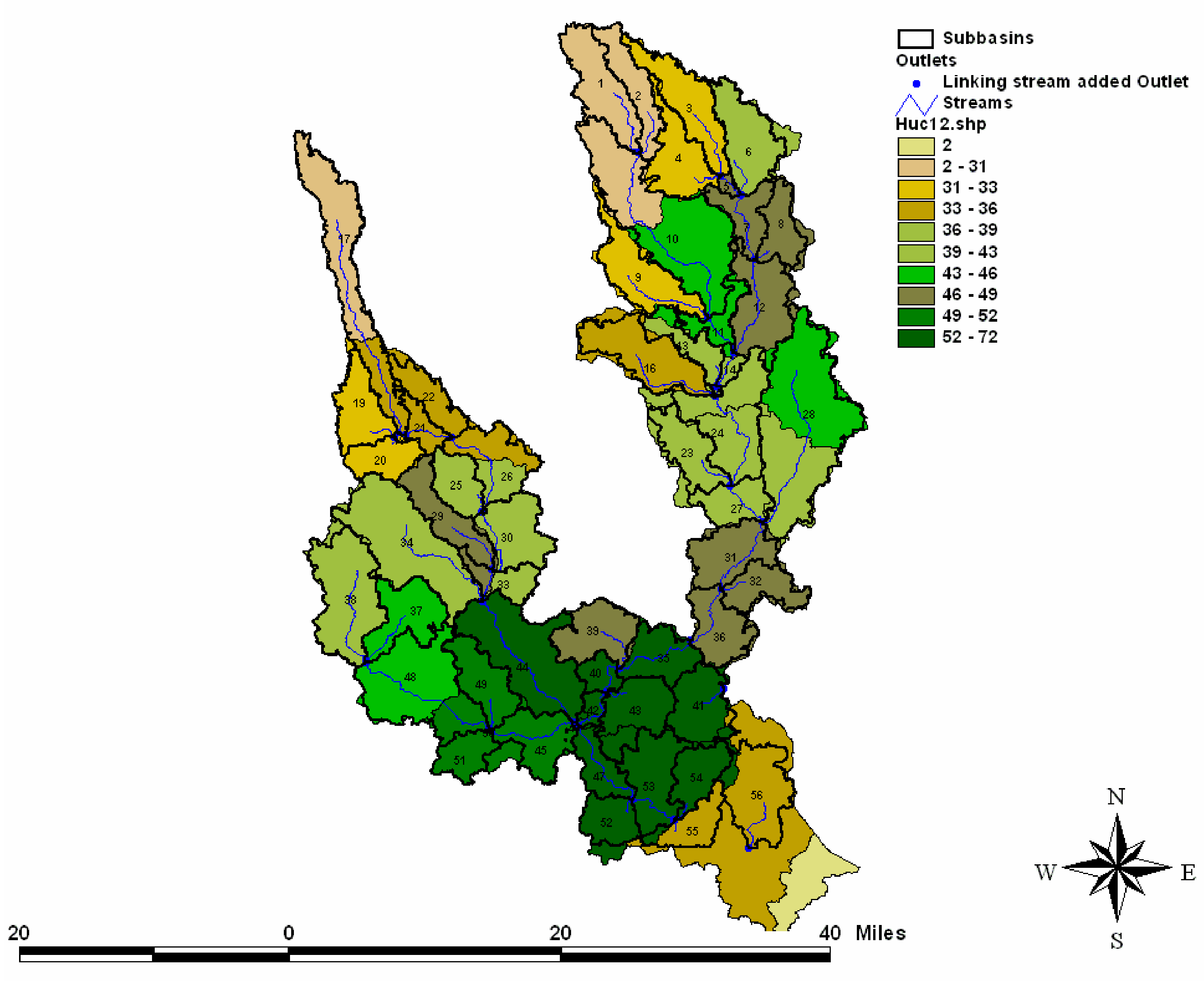

Figure B.4: Initial AVSWAT output for the Withlacoochee River

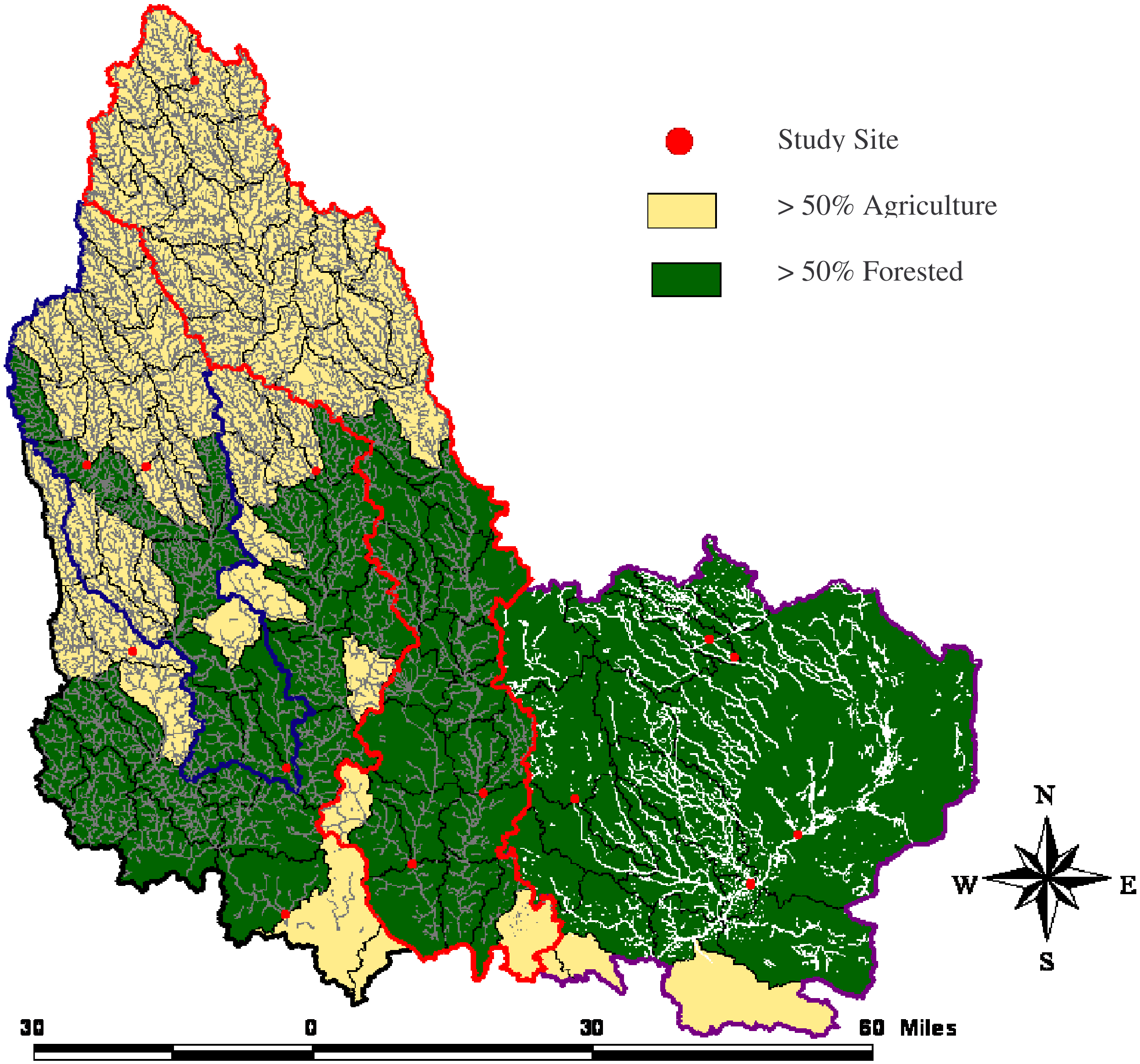

Figure B.5: Arcview map of the initial 20 sites throughout the Suwannee River basin.

Table B.1: Sites in the Alapaha River Basin that were considered for study sites.

Pointid	Lat	Long	Grid_code	ID	Comments	Landuse
1	31.9469	-83.561	1	1	Hwy 280/ 7th Ave in Pitts; AG+;shallow at bridge but good access; can access above railroad tracks (1st bridge coming from Cordele)	Ag
2	31.9466	-83.562	2	2	Hwy 280/ 7th Ave in Pitts; AG+; 2nd bridge; shallow at bridge but good access up or down (2pics)	Ag
6	31.8131	-83.624	7	6	Waterloo-Rebecca Rd upstream from site; bad access but doable; actually flowing; 1st bridge from Rebecca; Good site when flowing; TOO DEEP	AG
14	31.7134	-83.455	11	14	Willis Creek; Dry but good site; good access	AG
28	31.5589	-83.437	25	28	Good spot, tough access; flowing; Hunt club land but Dwanye is a member; Hat Creek; Whitewater Rd; can access from field;BAD SPOT COULD NOT SEAL CHAMBERS DUE TO ROOTS IN STREAM CHANNEL	AG
51	30.8473	-83.012	48	51	North of MayDay; Cow Crk by Wayfare Primitive Bapist Church; forestry or hunting club note said talk with Cliff; Good bridge crossing just upstream on hwy 129 (2pics)	FOR
55	30.7358	-83.135	56	55	Mud Creek; Private Property; OK site with some trash (2 pics) on Lowndes/Echols county line North of Lake Park/ Hickory Grove Rd	FOR

Table B.2: Sites in the Little River Basin that were considered for Study sites.

Pointid	Lat	Long	Grid_code	Id	Comments	Landuse
11	31.3448	-83.739	12	11	Sumner Rd; 2 miles upstream; good access; Oakride Farms or Quail Ridge Farms has an access road; Worth County; SCOURED OUT POOL, TOO DEEP	AG
12	31.3464	-83.634	15	12	CR 57; Widdington RD/ Flat Ford RD; Good sight but bad access would need to deploy from bridge; 0.3 miles downstream; Ty Ty creek; or go to site 12a on GPS; 2 miles up stream from site; Good Access; Check new area; AG+; deep enough now; near Salem Bap. Ch; HAVE BEEN WAITING FOR WATER LEVEL TO DROP TO VISIT THE SITE;	AG
41	30.8808	-83.367	41	41	Good site 0.8 miles upstream from site. Exit 22 off of I-75/ Shiloh RD (2 pics); busy bridge would need to watch depth	FOR

Table B.3: Sites considered in the Withlacoochee River Basin as Study sites.

Pointid	Lat	Long	Type	Id	Comments	Landuse
4	31.3446	-83.323	L	4	Hardy Mill Crk; AG(-); Good access/ Good spot; Cows have access to stream.;TOO DEEP DOWN STREAM/UPSTREAM HAS BARBED WIRE FENCE	AG
55	30.6539	-83.363	L	55	PineRidge Farm on PineMill Crk; Hunting land; look into getting permission!	FOR
22	31.0574	-83.649	L	22	Perry Rd; deep pools/ entrenched banks; USGS gaging station on Okilpaco/ Quitman; could lower from bridge when water is low; Weather station 76; TOO DEEP/VERY CHANNELIZED	AG
41	30.7956	-83.304	L	41	Mud Creek right below Mud Swamp; Indian Ford/ 0.58 miles upstream from site; decent access;TOO DEEP AT LAST VISIT, WILL VISIT AGAIN	FOR

Table B.4: Sites considered in the Upper Suwannee River Basin as Study sites.

Pointid	Lat	Long	Type	Id	Comments	Landuse
5	31.0912	-82.607	L	5	Ok access; probably too small under normal conditions; not steep; too busy on hwy 84 would have to find alternate location	FOR
7	31.0655	-82.558	L	7	check at low flow (Kite Rd?); tough access; Scrub Island Hunt Club; 1.5 miles upstream from site; TOO DEEP/BRUSH IS TOO THICK TO GET AWAY FROM BRIDGE WHERE THERE IS A LARGE POOL	FOR
15	30.8406	-82.845	L	15	Too big at bridge on hwy 187 after Swanoochee and Sweetwater join; look into Rainier Hunt Club (912-530-8470)	FOR
26	30.7919	-82.439	L	26	Bay Cr entering Suwannee; Road closed; Controlled by wildlife refuge; RD=Suwannee River Sill	FOR
36	30.7146	-82.523	L	36	Road closed; Rayonier land; contact Jesup GA: SE forest resources	FOR
37	30.7141	-82.523	L	37	Road closed; Rayonier land; contact Jesup GA: SE forest resources; Easy access from Stephen Foster State park	FOR

Appendix C

Particle Size Analysis Procedure and Results

Materials

100 g sample of dried sediment
150 mL Sodium hexametaphosphate (HMP) solution
De-ionized water (DI water)
2 1500 mL Graduated Cylinders
Hydrometer (ASTM 152H)
Thermometer
Stop-watch
Sieves (18, 35, 60, 80, 140, 270, and pan)

Methods

1. Dry sediment overnight in an oven at 92˚C
2. Place a little over a 100 g of dried sediment in Beaker
3. Add Hydrogen Peroxide (H_2O_2) to the sample until reaction begins
4. Continue to add H_2O_2 until reaction no longer persists
5. Dry in oven at 92˚C over night
6. Weigh the dried sample for percent organics
7. Put 100 g of sample into mixing cup
8. Add 150 mL of sodium hexametaphosphate and a squirt of DI water
9. Mix solution for 5 minutes
10. Add mixture to 1500 mL Graduated cylinder, use DI water to clean the mixing cup, ensuring the entire sample is transferred.
11. Fill Graduated cylinder up to 1130 mL line with DI water
12. Mix with plunge until all sediment sample is suspended
13. Insert Hydrometer
14. Record start time
15. Take readings at 30 sec, 1 min, 3 min, 10 min, 30 min, 60 min, 90 min, 120 min, 300 min, and 1440 min.
16. Take blank reading in second 1500 mL graduated cylinder filled with 1130 ml of sodium hexametaphosphate solution while waiting for 10 min reading.
17. Record temperature of the both the blank cylinder and the test cylinder
18. After taking 24 hour reading, remove sample from the graduate cylinder and dry at 92 ˚C overnight.
19. Weigh sample
20. Set up shake to sieve the sample through 18, 35, 60, 80, 140, and 270 mm sieves, leaving the remaining sample in the pan.
21. Weigh out sample trapped in each sieve and record.

Results

Alapaha Agricultural Site

Table C.1: Data from Particle Size Analysis for Alapaha Agricultural Site

Time	**Readings R**	**Reading Correction Rx_0**	**S_x**
30 sec	30	26.8	26.78
1 min	29	25.8	25.78
3 min	26	22.8	22.78
10 min	25	21.8	21.78
30 min	23	19.8	19.78
60 min	22	18.8	18.78
90 min	22	18.8	18.78
120 min	22	18.8	18.78
300 min	20	16.8	16.78
1440 min	18	14.8	14.79

Blank Reading	5	**P_{sand}**	**73.22**
Temperature	77	**P_{silt}**	**7.99**
Temp Correction	9	**P_{clay}**	**18.78**
Total oven Dry wgt (g)	100.09		

Alapaha Forested Site #1

Table C.2: Data from Particle Size Analysis for Alapaha Forested Site #1

Time	**Readings R**	**Reading Correction Rx_0**	**S_x**
30 sec	6	2.1	2.097
1 min	6	2.1	2.097
3 min	6	2.1	2.097
10 min	7	3.1	3.096
30 min	7.5	3.6	3.596
60 min	7.5	3.6	3.596
90 min	8	4.1	4.095
120 min	8	4.1	4.095
300 min	7	3.1	3.096
1440 min	8	4.1	4.095

Blank Reading	6	**P_{sand}**	**97.90**
Temperature	78.5	**P_{silt}**	**2.00**
Temp Correction	10.5	**P_{clay}**	**0.10**
Total oven Dry wgt (g)	100.12	**$P_{organics}$**	**0.00**

Alapaha Forested Site #2

Table C.3: Data from Particle Size Analysis for Alapaha Forested Site #2

Time	**Readings R**	**Reading Correction Rx_0**	**S_x**
30 sec	6.5	1.1	1.100
1 min	6.5	1.1	1.100
3 min	7	1.6	1.600
10 min	6	0.6	0.600
30 min	6	0.6	0.600
60 min	6	0.6	0.600
90 min	6.5	1.1	1.100
120 min	6.5	1.1	1.100
300 min	6.5	1.1	1.100
1440 min	6.9	1.5	1.500

Blank Reading	6.5	**P_{sand}**	**98.90**
Temperature	73.5	**P_{silt}**	**0.00**
Temp Correction	5.5	**P_{clay}**	**1.10**
Total oven Dry wgt (g)	100.03	**$P_{organic}$**	**0.00**

Little River Agricultural Site

Table C.4: Data from Particle Size Analysis for the Little River Agricultural Site

Time	**Readings R**	**Reading Correction Rx_0**	**S_x**
30 sec	11	6.76	6.758
1 min	11	6.76	6.758
3 min	10.7	6.46	6.458
10 min	10.7	6.46	6.458
30 min	10.2	5.96	5.958
60 min	10	5.76	5.758
90 min	10	5.76	5.758
120 min	10	5.76	5.758
300 min	10	5.76	5.758
1440 min	9.7	5.46	5.458

Blank Reading	6	**P_{sand}**	**93.24**
Temperature	76.8	**P_{silt}**	**1.00**
Temp Correction	8.8	**P_{clay}**	**5.76**
Total oven Dry wgt (g)	100.03	**$P_{organics}$**	**0.93**

Little River Forested Site

Table C.5: Data from Particle Size Analysis for the Little River Forested Site

Time	**Readings R**	**Reading Correction Rx_0**	**S_x**
30 sec	21	13.7	15.447
1 min	20	12.7	14.320
3 min	16	8.7	9.809
10 min	15.5	8.2	9.246
30 min	14	6.7	7.554
60 min	13.5	6.2	6.991
90 min	13	5.7	6.427
120 min	13	5.7	6.427
300 min	11.5	4.2	4.736
1440 min	8	0.7	0.789

Blank Reading	8.5	**P_{sand}**	**84.55**
Temperature	74	**P_{silt}**	**9.02**
Temp Correction	6	**P_{clay}**	**6.43**
Total oven Dry wgt (g)	88.69	**$P_{organic}$**	**0.84**

Upper Suwannee Forested Site #1

Table C.6: Data from Particle Size Analysis for Upper Suwanee Forested Site #1

Time	**Readings R**	**Reading Correction Rx_0**	**S_x**
30 sec	16	9.2	9.164
1 min	13	6.2	6.176
3 min	12	5.2	5.180
10 min	11.5	4.7	4.682
30 min	11	4.2	4.184
60 min	10.5	3.7	3.686
90 min	10.5	3.7	3.686
120 min	10	3.2	3.188
300 min	10	3.2	3.188
1440 min	9	2.2	2.191

Blank Reading	8	**P_{sand}**	**90.84**
Temperature	74	**P_{silt}**	**5.48**
Temp Correction	6	**P_{clay}**	**3.69**
Total oven Dry wgt (g)	100.39	**$P_{organic}$**	**2.08**

Upper Suwannee Forested Site #2

Table C.7: Data from Particle Size Analysis for Upper Suwannee Forested Site #2

Time	**Readings R**	**Reading Correction Rx_0**	**S_x**
30 sec	13	6.2	6.198
1 min	12.7	5.9	5.898
3 min	12.5	5.7	5.698
10 min	12	5.2	5.198
30 min	11.7	4.9	4.898
60 min	11	4.2	4.198
90 min	11	4.2	4.198
120 min	10.5	3.7	3.699
300 min	10	3.2	3.199
1440 min	9	2.2	2.199

Blank Reading	8.00	**P_{sand}**	**93.80**
Temperature	74.00	**P_{silt}**	**2.00**
Temp Correction	6.00	**P_{clay}**	**4.20**
Total oven Dry wgt (g)	100.04	**$P_{organic}$**	**1.22**

Appendix D

YSI Equipment Specifications

6920&6820 Sondes

Medium: Fresh, Sea, and Polluted Water
Temperature: -5 to 45 ˚C
Depth: 0-200 ft (61 m)

Temperature (model 6560)

Type:	Thermistor
Range:	-5 to 45 ˚C
Accuracy:	± 0.15 ˚C
Resolution:	0.01 ˚C

Dissolved Oxygen, % Saturation (model 6562)

Type:	Rapid Pulse – Clark type, polarographic
Range:	0 to 500% air saturation
Accuracy:	0-200% air saturation, ±2 % of the reading or 2% of air saturation, whichever is greater 200-500 % air saturation, ±6% of reading.
Resolution:	0.1% air saturation
Depth:	200 meters

Dissolved Oxygen, mg/L (model 6562)

Calculated from % air saturation, temperature, and salinity

Type:	Rapid Pulse - Clark type, polarographic
Range:	0 to 50 mg/L
Accuracy:	0 to 20 mg/L, ± 2% of the reading or 0.2 mg/L, whichever is greater 20 to 50 mg/L, ±6% of the reading
Resolution	0.01 mg/L

Salinity (model 6560)

Type:	Calculated from conductivity and temperature
Range:	0 to 70 ppt
Accuracy:	±1.0% of reading or 0.1 ppt, whichever is greater
Resolution:	0.01 ppt

pH (model 6561 or 6565)

Type:	Glass combination electrode
Range:	0 to 14 units
Accuracy:	±0.2 units
Resolution:	0.01 units

ORP (model 6565)

Type:	Platinum button
Range:	-999 to 999 mV
Accuracy:	±20 mV
Resolution:	0.1 mV

Turbidity (model 6036 or 6026)

Type:	Optical, 90˚ scatter, with mechanical cleaning
Range:	0 to 1000 NTU
Accuracy:	± 5% reading or 2 NTU (whichever is greater)
Resolution:	0.1 NTU

Conductivity

Type:	4 electrode cell with autoranging
Range:	0 to 100 mS/cm
Accuracy:	±0.5% of reading + 0.001 mS/cm
Resolution:	0.001 mS/cm to 0.1 mS/cm (range dependent)

Appendix E

Steps for SOD chamber deployments

Materials

4 batteries
3 SOD chambers
1 Control chamber
4 YSI sondes (extra batteries)
    Probes: pH, turbidity, specific conductivity, ORP, DO
    4 C batteries for 650-MS
4 pumps
Battery Leads (check wires and leads on battery)
Gloves
Camera
Velocity Meter

Methods

1. Calibrate all probes, and check quality of DO membrane
2. Check depth across the stream, the water needs to be at 1.5 feet deep and no more than 4 feet deep
3. Check for outcroppings of bedrock or large quantities of tree roots
4. Remove chamber lids
5. Place chamber rings in the stream
6. Feel around the bottom of the ring to make sure the flange is flush with the sediment. Try to disturb the sediment as little as possible
7. Wait for the stream to flush out any suspended sediments
8. Start attaching lids to chambers, begin with the chamber farthest down stream.
9. Sink control chamber upstream from the rest to prevent as much sediment as possible from settling in the control chamber
10. Attach batteries to leads of the pumps
11. Make sure no air is present in the sample lines
12. Program YSI sondes to run for three hours and sample every 5 minutes
13. Attach the first 3 sondes to the chambers
14. Before attaching control sonde take an ambient reading of the stream
15. Double check all sondes are logging
16. Run cross section string
17. Take depth and velocity measurements across the stream at 1 or 2 foot interval depending on width of the stream.
18. Take sediment cores, make sure to store in a cooler
19. After completion of the three hours, remove batteries and sondes
20. Remove chambers and drain control chamber

Appendix F

Oxygen Depletion & SOD Data

Alapaha River Basin

Agricultural Site

Table F.1: YSI Data from Chamber 1 on 10/05/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
10:40:40	0	20.94	0.179	58.8	5.24	41	6.34	343.6	19.4
10:45:40	5	20.97	0.161	57.8	5.15	41	5.69	342.3	16.7
10:50:40	10	20.99	0.148	56.9	5.07	41	5.52	342.5	17.5
10:55:40	15	21.01	0.144	56.1	5	39.8	5.46	343.7	18.3
11:00:40	20	21.03	0.141	55.6	4.95	39.8	5.43	345	18.6
11:05:40	25	21.05	0.141	55	4.9	39.8	5.41	345.9	18.7
11:10:40	30	21.08	0.141	54.7	4.86	41	5.41	344.8	19.4
11:15:40	35	21.09	0.141	54.3	4.83	39.8	5.41	346.6	20
11:20:40	40	21.11	0.142	54	4.8	39.8	5.42	347.8	20.2
11:25:40	45	21.13	0.142	53.7	4.78	39.8	5.42	349.1	20.3
11:30:40	50	21.15	0.142	53.4	4.75	39.8	5.43	349.6	20.3
11:35:40	55	21.17	0.143	53.2	4.73	39.8	5.44	349.9	20.8
11:40:40	60	21.19	0.143	53	4.71	38.7	5.44	350.5	21
11:45:40	65	21.21	0.143	52.8	4.69	39.8	5.44	350.3	21.1
11:50:40	70	21.23	0.144	52.7	4.67	38.7	5.45	349.6	20.8
11:55:40	75	21.25	0.144	52.5	4.65	38.7	5.45	348.3	21.3
12:00:40	80	21.27	0.144	52.3	4.64	38.7	5.46	347.7	21.2
12:05:40	85	21.29	0.145	52.2	4.62	38.7	5.46	349.4	21.3
12:10:40	90	21.31	0.145	52	4.61	38.7	5.46	349.2	21.7
12:15:40	95	21.32	0.146	51.8	4.59	38.7	5.46	351.2	21.5
12:20:40	100	21.33	0.146	51.7	4.58	39.8	5.46	352.6	21.4
12:25:40	105	21.35	0.146	51.5	4.56	38.7	5.47	353.4	21.4
12:30:40	110	21.36	0.149	51.4	4.55	38.7	5.47	353.6	21.6
12:35:40	115	21.38	0.15	51.2	4.53	38.7	5.47	353.8	21.1
12:40:40	120	21.4	0.151	51.1	4.52	38.7	5.47	354.3	21.4
12:45:40	125	21.42	0.151	51	4.51	38.7	5.46	354.1	20.7
12:50:40	130	21.43	0.152	50.9	4.5	37.5	5.47	353.9	21.6
12:55:40	135	21.45	0.152	50.7	4.48	37.5	5.48	354.1	21.4
13:00:40	140	21.46	0.153	50.6	4.47	38.7	5.48	354.5	21.6
13:05:40	145	21.47	0.153	50.5	4.46	38.7	5.47	355.5	21.6
13:10:40	150	21.48	0.153	50.3	4.44	37.5	5.48	355.8	21.9
13:15:40	155	21.49	0.154	50.2	4.43	38.7	5.48	356.6	21.4
13:20:40	160	21.5	0.154	50	4.41	38.7	5.48	357.2	21.7
13:25:40	165	21.51	0.155	49.9	4.4	38.7	5.47	357.5	21.7
13:30:40	170	21.52	0.156	49.8	4.39	37.5	5.48	357.6	21.8
13:35:40	175	21.53	0.157	49.7	4.38	37.5	5.47	357.8	21.3
13:40:40	180	21.54	0.157	49.5	4.37	37.5	5.48	357.7	21.9
Averages		21.28	0.15	52.51	4.65	39.05	5.49	351.00	20.69

slope	0.0031
V (L)	65.15
A (m^2)	0.27
OD (g/m^2*day)	1.08
SOD (g/m^2*day)	**0.63**

Table F.2: YSI data for Chamber 2 Oxygen Depletion on 10/05/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp mV	Turbid NTU
10:45:48	0	20.95	0.071	46.6	4.16	48	6.24	878.5	21.1
10:50:40	5	20.99	0.071	44.1	3.93	46.9	6.23	855.8	45.1
10:55:40	10	21.03	0.071	42.9	3.83	46.9	6.24	841.6	45.4
11:00:21	15	21.05	0.071	44.1	3.93	46.9	6.23	822	47.6
11:05:21	20	21.07	0.071	48.2	4.29	46.9	6.24	867.7	48.9
11:10:21	25	21.09	0.07	49	4.36	45.7	6.24	873.7	50.3
11:15:21	30	21.12	0.07	49.3	4.39	45.7	6.25	873.7	49.3
11:20:21	35	21.14	0.07	49.6	4.41	45.7	6.25	871.1	52.2
11:25:21	40	21.16	0.07	49.6	4.41	46.9	6.25	869.9	49.7
11:30:21	45	21.18	0.07	49.7	4.41	45.7	6.25	868.2	52
11:35:21	50	21.2	0.07	49.4	4.39	45.7	6.25	867.1	51
11:40:21	55	21.22	0.07	49.3	4.38	45.7	6.25	866	52.1
11:45:21	60	21.24	0.07	49.5	4.39	45.7	6.25	864.7	52.4
11:50:21	65	21.26	0.07	49.4	4.38	45.7	6.25	864.3	51.8
11:55:21	70	21.28	0.07	49.3	4.37	45.7	6.24	863.4	52.4
12:00:21	75	21.3	0.07	49.5	4.39	45.7	6.24	861.7	54.2
12:05:21	80	21.31	0.07	48.5	4.3	45.7	6.24	860.3	55.6
12:10:21	85	21.33	0.07	48.6	4.31	44.5	6.24	859.7	55.9
12:15:21	90	21.35	0.07	48.5	4.29	44.5	6.24	859	53.5
12:20:21	95	21.36	0.07	49.1	4.34	44.5	6.24	858.5	53
12:25:21	100	21.38	0.07	48.4	4.29	45.7	6.24	858.3	55.2
12:30:21	105	21.4	0.07	48.1	4.25	45.7	6.24	858.7	53.8
12:35:21	110	21.42	0.07	47.9	4.24	44.5	6.24	858.7	54.9
12:40:21	115	21.43	0.07	46.4	4.1	45.7	6.24	859.6	54.3
12:45:21	120	21.44	0.07	48.1	4.25	45.7	6.23	859.5	52.9
12:50:21	125	21.45	0.07	47.8	4.22	45.7	6.23	859.2	54.2
12:55:21	130	21.46	0.07	47	4.16	44.5	6.23	859.4	54.8
13:00:21	135	21.47	0.07	46.8	4.14	44.5	6.23	859.9	54.8
13:05:21	140	21.48	0.07	47.1	4.16	45.7	6.23	860.7	54.6
13:10:21	145	21.49	0.07	46.9	4.14	44.5	6.23	861.1	53.6
13:15:21	150	21.5	0.07	46.9	4.14	45.7	6.23	861.4	55.6
13:20:21	155	21.51	0.07	46.7	4.13	45.7	6.23	861.5	55.1
13:25:21	160	21.52	0.07	46.6	4.11	44.5	6.22	861.6	55.1
Averages		21.29	0.07	47.85	4.24	45.66	6.24	861.41	51.59

slope	0.0028
V (L)	65.15
A (m^2)	0.27
OD (g/m^2*day)	0.97
SOD (g/m^2*day)	**0.52**

Table F.3:YSI data from Chamber 3 on 10/05/2004

Time (Min)	Temp (˚C)	SpCond (mS/cm)	DO % (%)	DO Conc (mg/L)	DO Charge	pH	Turbidity (NTU)
0	20.87	0.077	65.3	5.84	63	7.14	1575.6
5	20.9	0.077	59.3	5.3	61	6.88	1575.4
10	20.93	0.077	57.5	5.13	61	6.86	1575.3
15	20.96	0.077	56.2	5.01	60	6.82	1575.2
20	20.98	0.077	55.1	4.92	60	6.81	1575.2
25	21.01	0.077	54.2	4.83	60	6.83	1575.2
30	21.03	0.077	53.5	4.77	60	6.8	1575.2
35	21.06	0.076	52.8	4.7	60	6.78	1575.2
40	21.08	0.076	52.3	4.66	59	6.78	1575.3
45	21.09	0.076	51.7	4.6	60	6.76	1575.3
50	21.11	0.076	51.3	4.56	59	6.77	1575.4
55	21.13	0.076	50.8	4.52	59	6.74	1575.5
60	21.15	0.076	50.5	4.49	59	6.75	1575.5
65	21.17	0.076	50.3	4.47	59	6.72	1575.6
70	21.19	0.076	49.9	4.44	59	6.73	1575.7
75	21.21	0.076	49.7	4.41	59	6.69	1575.8
80	21.23	0.076	49.5	4.39	59	6.71	1575.9
85	21.25	0.076	48.9	4.34	58	6.69	1576
90	21.26	0.076	48.2	4.28	59	6.71	1576
95	21.28	0.076	47.9	4.25	58	6.69	1576.1
100	21.29	0.076	47.8	4.23	58	6.69	1576.2
105	21.31	0.076	47.3	4.19	58	6.65	1576.2
110	21.32	0.076	47	4.17	57	6.65	1576.3
115	21.34	0.076	46.9	4.15	58	6.65	1576.4
120	21.36	0.076	46.8	4.14	58	6.64	1576.5
125	21.38	0.076	46.6	4.12	58	6.64	1576.6
130	21.39	0.076	46.3	4.1	58	6.62	1576.7
135	21.41	0.076	46.1	4.07	57	6.63	1576.8
140	21.42	0.076	45.6	4.03	57	6.61	1576.8
145	21.43	0.076	45.2	4	57	6.57	1576.8
150	21.44	0.076	45.1	3.99	58	6.51	1576.9
155	21.45	0.076	45.1	3.98	57	6.53	1576.9
160	21.46	0.076	44.8	3.96	57	6.5	1577
165	21.47	0.076	44.6	3.94	57	6.5	1577.1
170	21.48	0.076	44.4	3.92	57	6.5	1577.1
175	21.49	0.076	44.3	3.91	57	6.48	1577.1
180	21.5	0.076	44.1	3.89	57	6.46	1577.2
185	21.5	0.076	43.9	3.87	57	6.49	1577.2
190	21.51	0.076	43.6	3.84	57	6.49	1577.3
195	21.52	0.076	43.4	3.83	57	6.47	1577.3
200	21.52	0.076	43.1	3.8	57	6.46	1577.3
Avg	21.27	0.08	48.95	4.34	58.44	6.67	1576.20

b	0.0057
V (L)	65.15
A (m^2)	0.27
OD (g/m^2*day)	1.98
SOD (g/m^2*day)	**1.53**

Table F.4: YSI data from the Control chamber on 10/05/2004

Time (hh:mm:ss)	Time (Min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:20:40	0	20.88	0.082	64.2	5.73	41	6.41	541.2	5.6
11:25:39	5	20.91	0.082	62.9	5.61	41	6.29	530.5	5.7
11:30:39	10	20.93	0.082	61.8	5.51	41	6.27	520.2	5.9
11:35:39	15	20.95	0.082	60.9	5.43	41	6.27	506.3	5.8
11:40:39	20	20.97	0.082	60.2	5.37	41	6.26	499.5	5.8
11:45:40	25	20.99	0.082	59.6	5.32	41	6.26	494.9	5.8
11:50:39	30	21.01	0.082	59.2	5.28	41	6.26	491.4	5.8
11:55:39	35	21.03	0.082	58.8	5.24	41	6.26	488.5	5.8
12:00:40	40	21.05	0.082	58.5	5.21	39.8	6.26	486.3	5.8
12:05:39	45	21.07	0.082	58.3	5.19	41	6.26	484.8	5.9
12:10:39	50	21.09	0.082	58.1	5.17	41	6.26	483.2	5.6
12:15:40	55	21.11	0.082	58	5.15	41	6.26	482.3	5.7
12:20:39	60	21.13	0.082	57.8	5.14	41	6.26	481.3	5.7
12:25:39	65	21.15	0.082	57.7	5.13	41	6.26	480.4	5.6
12:30:40	70	21.17	0.082	57.6	5.12	41	6.26	479.7	5.7
12:35:39	75	21.18	0.082	57.5	5.11	41	6.26	479.7	5.6
12:40:39	80	21.2	0.082	57.4	5.1	41	6.26	478.5	5.6
12:45:40	85	21.21	0.082	57.3	5.09	41	6.26	477.8	5.6
12:50:39	90	21.23	0.082	57.3	5.08	41	6.26	477.5	5.6
12:55:39	95	21.25	0.082	57.2	5.07	39.8	6.26	477	5.6
13:00:40	100	21.27	0.082	57.2	5.07	41	6.26	476.7	5.5
13:05:39	105	21.28	0.082	57.1	5.06	39.8	6.26	476.1	5.6
13:10:40	110	21.29	0.082	57.1	5.06	41	6.26	476.1	5.6
13:15:39	115	21.31	0.082	57.1	5.06	41	6.26	475.6	5.5
13:20:39	120	21.31	0.082	57	5.05	41	6.26	475.3	5.4
13:25:39	125	21.32	0.082	57	5.05	41	6.25	474.9	5.6
13:30:40	130	21.33	0.082	56.9	5.04	41	6.26	474.7	5.6
13:35:39	135	21.34	0.082	56.8	5.03	41	6.25	474.5	5.5
13:40:39	140	21.35	0.082	56.8	5.03	41	6.25	474.6	5.4
13:45:39	145	21.36	0.082	56.8	5.03	41	6.25	474.2	5.4
13:50:39	150	21.37	0.082	56.7	5.02	41	6.25	474	5.4
13:55:40	155	21.37	0.082	56.7	5.02	41	6.25	473.9	5.4
14:00:39	160	21.38	0.082	56.7	5.01	41	6.25	473.9	5.4
14:05:39	165	21.39	0.082	56.6	5.01	41	6.25	473.8	5.4
14:10:39	170	21.39	0.082	56.6	5.01	41	6.25	473.7	5.5
14:15:39	175	21.4	0.082	56.6	5	39.8	6.25	473.8	5.4
14:20:39	180	21.4	0.082	56.6	5	39.8	6.25	473.6	5.4
Averages		21.20	0.08	58.02	5.15	40.84	6.26	484.06	5.60

b	0.0013
V (L)	65.15
A (m^2)	0.27
OD (g/m^2*day)	**0.45**

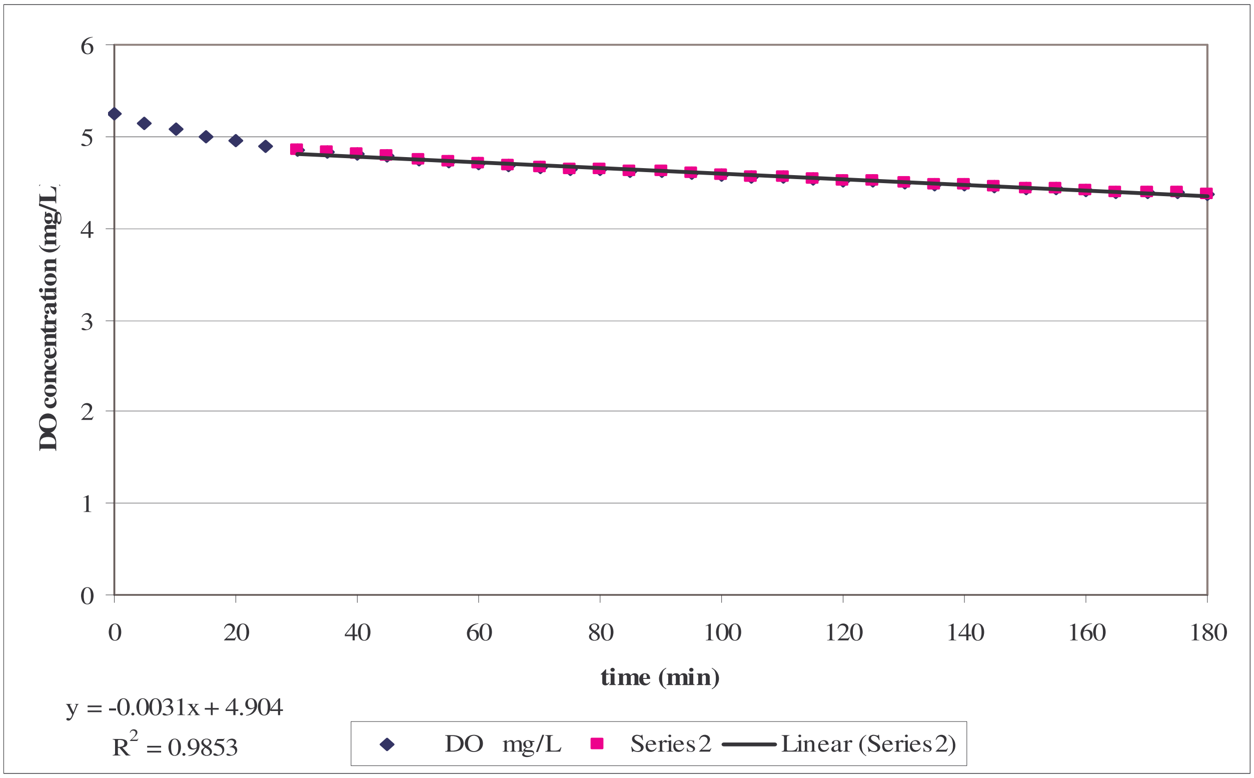

Figure F.1: Oxygen Depletion curve for Chamber 1 on 10/05/2004 at the agricultural study site within the Alapaha River Basin

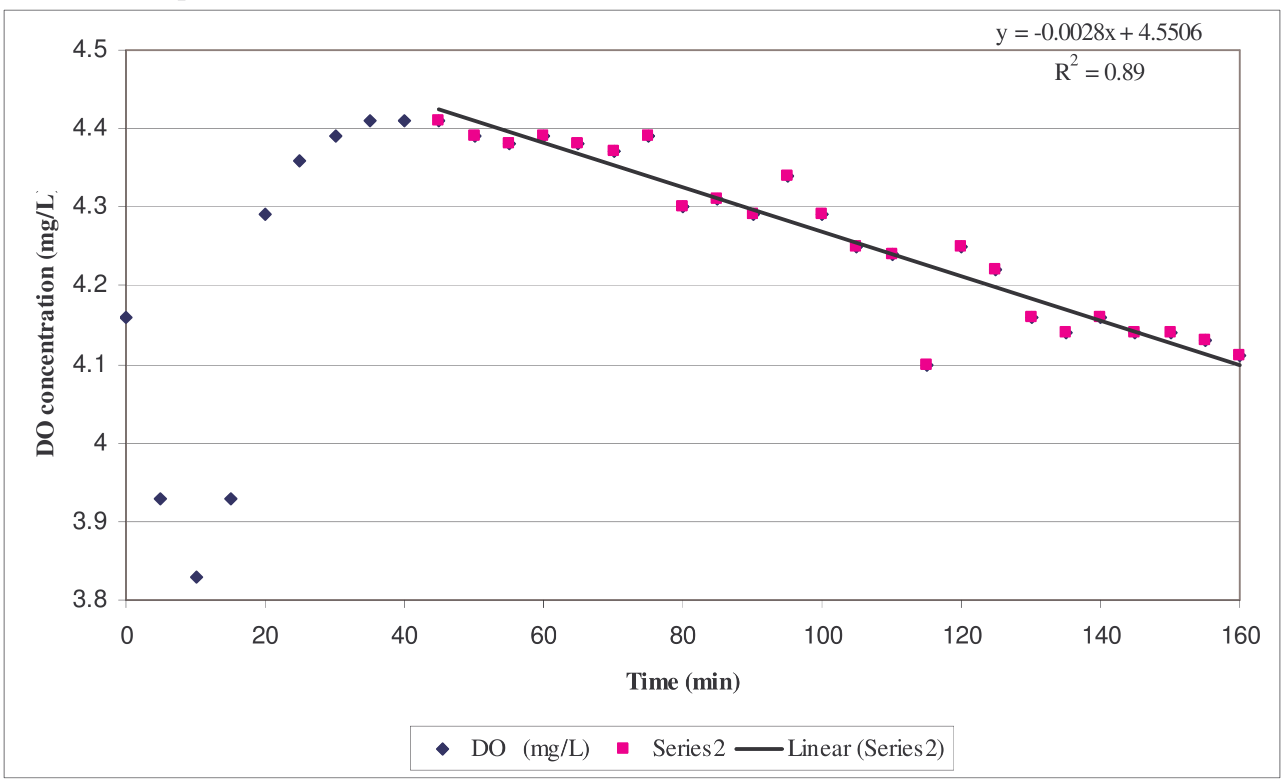

Figure F.2: Oxygen Depletion curve for Chamber 2 on 10/05/2004 at the agricultural study site within the Alapaha River Basin.

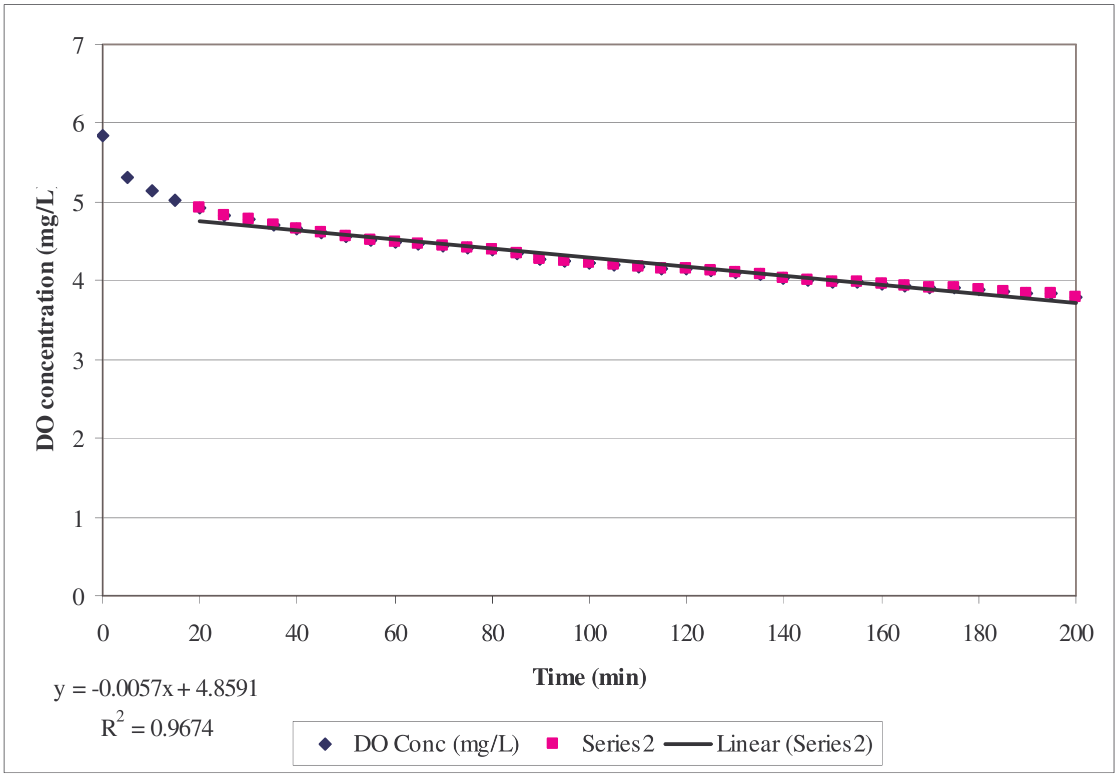

Table F.3: Oxygen Depletion curve for Chamber 3 on 10/05/2004 at the agricultural study site within the Alapaha River Basin.

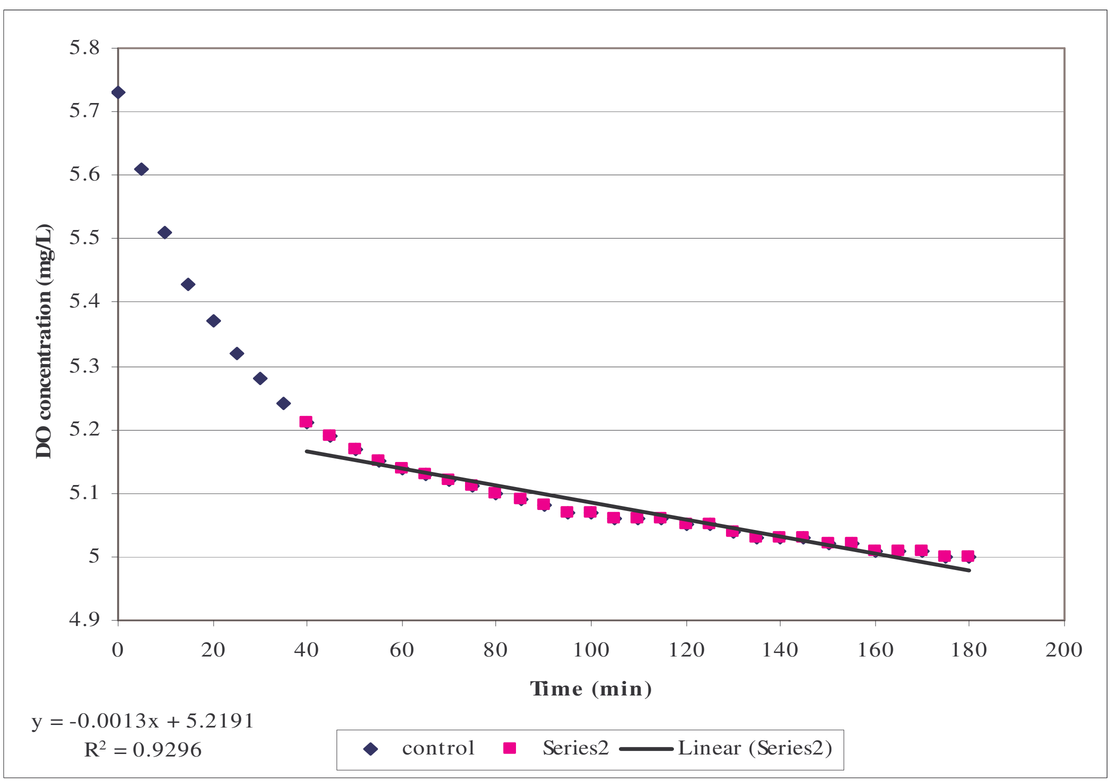

Figure F.4: Oxygen Depletion curve for the Control Chamber on 10/05/2004 at the agricultural study site within the Alapaha River Basin.

Table F.5: YSI data from Chamber 1 on 12/08/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:00:40	0	19.04	0.337	109	10.1	41.6	6.34	281.4	-3.5
12:05:40	5	17.41	1.046	59.7	5.71	38.7	6.01	269.9	105.9
12:10:40	10	17.41	1.039	57.6	5.5	38.7	5.78	289.1	109.9
12:15:40	15	17.42	1.038	55.8	5.33	37.5	5.73	301.1	109.6
12:20:40	20	17.44	1.036	54.4	5.19	37.5	5.7	312.3	110.4
12:25:40	25	17.45	1.035	53.2	5.08	36.9	5.68	323.6	108.5
12:30:40	30	17.44	1.031	52.2	4.98	36.9	5.67	334.8	108.1
12:35:40	35	17.39	1.017	51.3	4.9	36.9	5.68	345.6	105.2
12:40:40	40	17.4	1.016	50.5	4.82	37.5	5.68	357.5	104.8
12:45:40	45	17.42	1.012	49.9	4.76	36.9	5.67	368.3	103.8
12:50:40	50	17.44	1.009	49.3	4.7	37.5	5.67	376.9	102.1
12:55:40	55	17.46	1.007	48.7	4.65	36.9	5.67	382.6	101.8
13:00:40	60	17.48	1.004	48.3	4.6	36.9	5.67	386.5	99.7
13:05:40	65	17.5	1.002	47.8	4.56	36.9	5.68	388.7	100.4
13:10:40	70	17.51	1	47.4	4.52	36.9	5.68	390.1	98.7
13:15:40	75	17.52	0.997	47	4.48	36.9	5.67	391.8	97.4
13:20:40	80	17.53	0.997	46.7	4.44	35.7	5.67	393.2	97.3
13:25:40	85	17.55	0.993	46.3	4.41	35.7	5.68	393.7	97.4
13:30:40	90	17.56	0.992	46	4.38	35.7	5.68	394.3	96
13:35:40	95	17.57	0.991	45.6	4.34	36.9	5.68	394.8	96.2
13:40:40	100	17.59	0.989	45.3	4.31	36.9	5.68	395.3	94.9
13:45:40	105	17.61	0.988	45	4.28	35.7	5.68	395.7	94.4
13:50:40	110	17.62	0.985	44.7	4.25	35.7	5.68	395.6	92.9
13:55:40	115	17.64	0.984	44.4	4.22	36.9	5.68	395.8	95.2
14:00:40	120	17.65	0.982	44.1	4.19	36.9	5.68	395.8	91.9
14:05:40	125	17.67	0.982	43.8	4.16	36.9	5.68	395.8	93.1
14:10:40	130	17.69	0.983	43.5	4.13	35.7	5.68	395.7	90.5
14:15:40	135	17.71	1.006	43.2	4.1	35.7	5.69	395.4	91.1
14:20:40	140	17.73	1.004	43	4.08	36.9	5.69	395.1	92.4
14:25:40	145	17.75	1.002	42.7	4.05	35.7	5.69	394.8	89.7
14:30:40	150	17.76	1.001	42.4	4.02	34.6	5.69	394.7	89.4
14:35:40	155	17.78	0.999	42.2	4	35.7	5.69	394.8	88.9
14:40:40	160	17.8	0.996	41.9	3.97	36.9	5.69	394.7	89.4
14:45:40	165	17.82	0.995	41.6	3.94	35.7	5.69	394.6	88.1
14:50:40	170	17.84	0.993	41.3	3.91	35.7	5.69	394.2	87.8
14:55:40	175	17.86	0.991	41.1	3.89	35.7	5.69	394.1	86.3
15:00:40	180	17.89	0.99	40.8	3.86	35.7	5.69	393.9	87
Averages		17.63	0.99	48.59	4.62	36.71	5.71	372.7	94.40

slope	0.0074
V (L)	65.15
A (m^2)	0.27
OD (g O_2/ m^2*day)	2.57
SOD (g O_2/ m^2*day)	**2.57**

Table F.6: YSI data from Chamber 2 on 12/08/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:46:03	0	17.28	0.085	74.8	7.19	46.9	6.68	934.1	153
11:50:40	5	17.28	0.085	69.4	6.67	46.9	6.28	658.2	188.5
11:55:40	10	17.3	0.085	68.8	6.6	46.9	6.23	618.9	182.3
12:00:40	15	17.31	0.085	68.4	6.57	46.9	6.21	587.5	183.9
12:05:40	20	17.32	0.085	67.9	6.52	46.9	6.21	574.2	176.2
12:10:40	25	17.33	0.085	67.4	6.47	46.9	6.2	563.2	172.8
12:15:40	30	17.34	0.085	67.3	6.46	46.9	6.21	555.2	173.5
12:20:40	35	17.35	0.085	67.1	6.43	46.9	6.21	548.6	169.5
12:25:40	40	17.36	0.085	66.7	6.4	46.9	6.21	544.7	165.7
12:30:40	45	17.38	0.085	66.7	6.4	46.9	6.21	538.8	167.4
12:35:40	50	17.4	0.085	66.4	6.37	45.7	6.21	534.9	164.3
12:40:40	55	17.42	0.085	66.5	6.37	46.9	6.21	531.2	159.9
12:45:40	60	17.43	0.085	66.4	6.36	46.9	6.21	528.2	158.7
12:50:40	65	17.45	0.085	66.4	6.35	46.9	6.21	525.9	154.8
12:55:40	70	17.47	0.085	66.2	6.34	46.9	6.21	522.9	153.4
13:00:40	75	17.47	0.085	66.2	6.33	46.9	6.21	520.6	150.8
13:05:40	80	17.49	0.085	66	6.31	45.7	6.21	518.5	144.9
13:10:40	85	17.5	0.085	65.9	6.3	46.9	6.21	517	143.6
13:15:40	90	17.51	0.085	66	6.31	46.9	6.21	515.3	139.2
13:20:40	95	17.53	0.085	66	6.31	46.9	6.21	513.9	139.3
13:25:40	100	17.55	0.085	65.9	6.29	46.9	6.21	512.2	134.4
13:30:40	105	17.56	0.085	65.8	6.28	46.9	6.21	511.1	134.2
13:35:40	110	17.58	0.085	65.7	6.27	46.9	6.21	510	131.5
13:40:40	115	17.6	0.085	65.6	6.26	45.7	6.21	508.9	130
13:45:40	120	17.62	0.085	65.5	6.25	45.7	6.21	508.1	128.6
13:50:40	125	17.63	0.085	65.4	6.24	45.7	6.21	507	123.9
13:55:40	130	17.65	0.085	65.2	6.22	46.9	6.21	506.3	122.9
14:00:40	135	17.67	0.085	65.1	6.21	45.7	6.21	506.6	120.9
14:05:40	140	17.68	0.085	65.1	6.2	46.9	6.21	504.8	117.8
14:10:40	145	17.7	0.085	64.9	6.19	46.9	6.21	503.9	116
14:15:40	150	17.71	0.086	64.8	6.17	45.7	6.21	503.3	114.9
14:20:40	155	17.73	0.085	64.8	6.16	46.9	6.21	502.9	115.1
14:25:40	160	17.76	0.086	64.7	6.15	46.9	6.21	502.6	110.2
14:30:40	165	17.78	0.085	64.6	6.14	45.7	6.2	502.3	110.5
14:35:40	170	17.81	0.085	64.5	6.13	45.7	6.21	502	109.9
14:40:40	175	17.83	0.085	64.5	6.12	45.7	6.21	501.6	105.8
14:45:40	180	17.85	0.086	64.3	6.11	46.9	6.2	501.5	104.4
Averages		17.53	0.09	66.29	6.34	46.58	6.22	539.11	142.51

slope	0.0022
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.76
SOD (g O_2/m^2*day)	**0.76**

Table F.7: YSI data from the Control Chamber on 12/08/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
0:10:07	0	17.31	0.091	63.9	6.13	49	6.44	1607.8
0:15:07	5	17.33	0.091	62.6	6.01	50	6.35	1607.7
0:20:07	10	17.34	0.091	62.3	5.98	49	6.34	1607.7
0:25:07	15	17.36	0.091	62.2	5.96	49	6.33	1607.6
0:30:07	20	17.37	0.091	62.1	5.95	49	6.33	1607.6
0:35:07	25	17.38	0.091	62	5.95	48	6.33	1607.6
0:40:07	30	17.4	0.091	62	5.94	48	6.33	1607.6
0:45:07	35	17.42	0.091	62.1	5.95	49	6.33	1607.7
0:50:07	40	17.44	0.091	62.1	5.94	48	6.33	1607.7
0:55:07	45	17.46	0.091	62.1	5.94	48	6.33	1607.8
1:00:07	50	17.48	0.091	62.1	5.94	48	6.33	1607.9
1:05:07	55	17.5	0.091	62.1	5.94	47	6.33	1608
1:10:07	60	17.51	0.091	62.1	5.94	48	6.33	1608
1:15:07	65	17.52	0.091	62.1	5.94	47	6.33	1608.1
1:20:07	70	17.53	0.091	62.2	5.94	48	6.33	1608.1
1:25:07	75	17.54	0.091	62.2	5.94	47	6.33	1608.2
1:30:07	80	17.56	0.091	62.2	5.95	47	6.33	1608.2
1:35:07	85	17.57	0.091	62.2	5.94	47	6.33	1608.3
1:40:07	90	17.59	0.091	62.3	5.95	47	6.33	1608.4
1:45:07	95	17.6	0.091	62.3	5.95	47	6.32	1608.5
1:50:07	100	17.62	0.091	62.4	5.95	47	6.33	1608.5
1:55:07	105	17.64	0.091	62.4	5.95	47	6.33	1608.6
2:00:07	110	17.65	0.091	62.4	5.95	47	6.33	1608.7
2:05:07	115	17.67	0.091	62.5	5.95	47	6.33	1608.8
2:10:07	120	17.69	0.091	62.5	5.95	46	6.33	1608.9
2:15:07	125	17.71	0.091	62.5	5.95	47	6.32	1609
2:20:07	130	17.73	0.091	62.6	5.96	46	6.32	1609.1
2:25:07	135	17.74	0.091	62.6	5.96	46	6.32	1609.2
2:30:07	140	17.76	0.091	62.7	5.96	46	6.32	1609.3
2:35:07	145	17.78	0.091	62.7	5.96	46	6.32	1609.4
2:40:07	150	17.8	0.091	62.8	5.96	46	6.32	1609.5
2:45:07	155	17.82	0.091	62.8	5.96	47	6.32	1609.6
2:50:07	160	17.84	0.091	62.8	5.96	46	6.32	1609.7
2:55:07	165	17.87	0.091	62.9	5.97	46	6.32	1609.8
3:00:07	170	17.9	0.091	62.9	5.97	47	6.32	1610
Averages		17.58	0.09	62.42	5.96	47.34	6.33	1608.47

slope		0.0002
V (L)		65.15
A (m^2)		0.27
OD (g O_2/m^2*day)		**0.07**

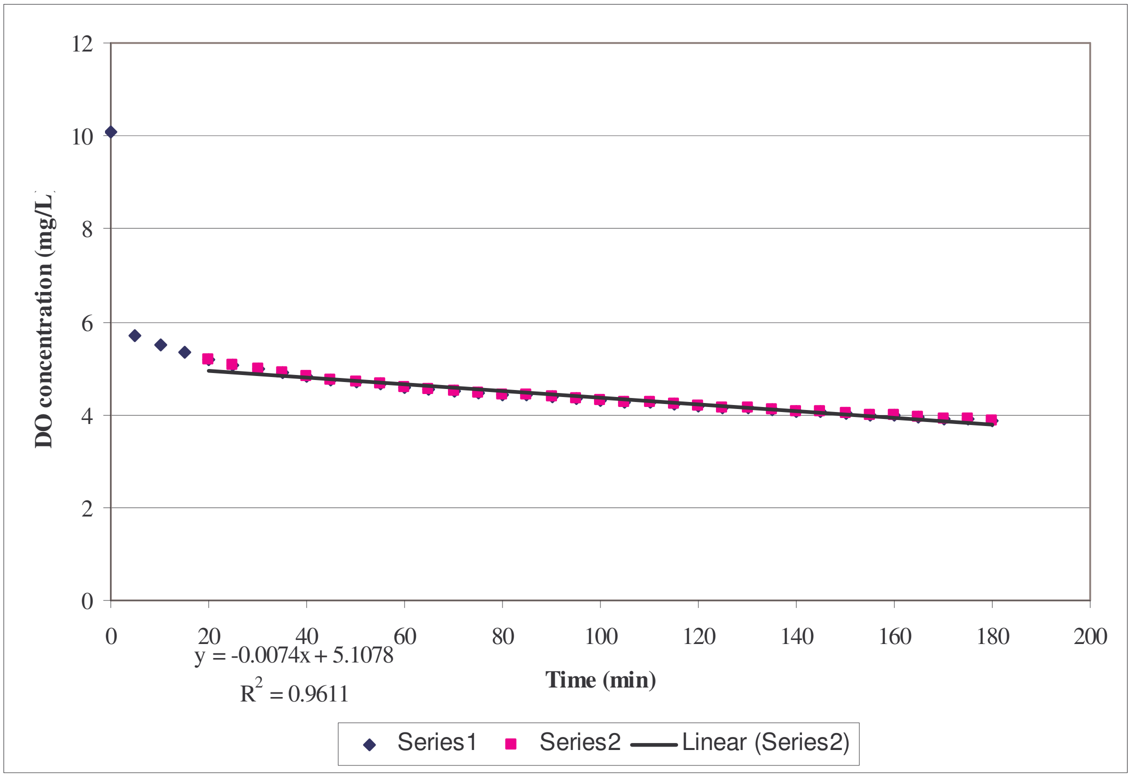

Figure F.5: Oxygen Depletion curve for Chamber 1 on 12/08/2004 at the agricultural study site within the Alapaha River Basin

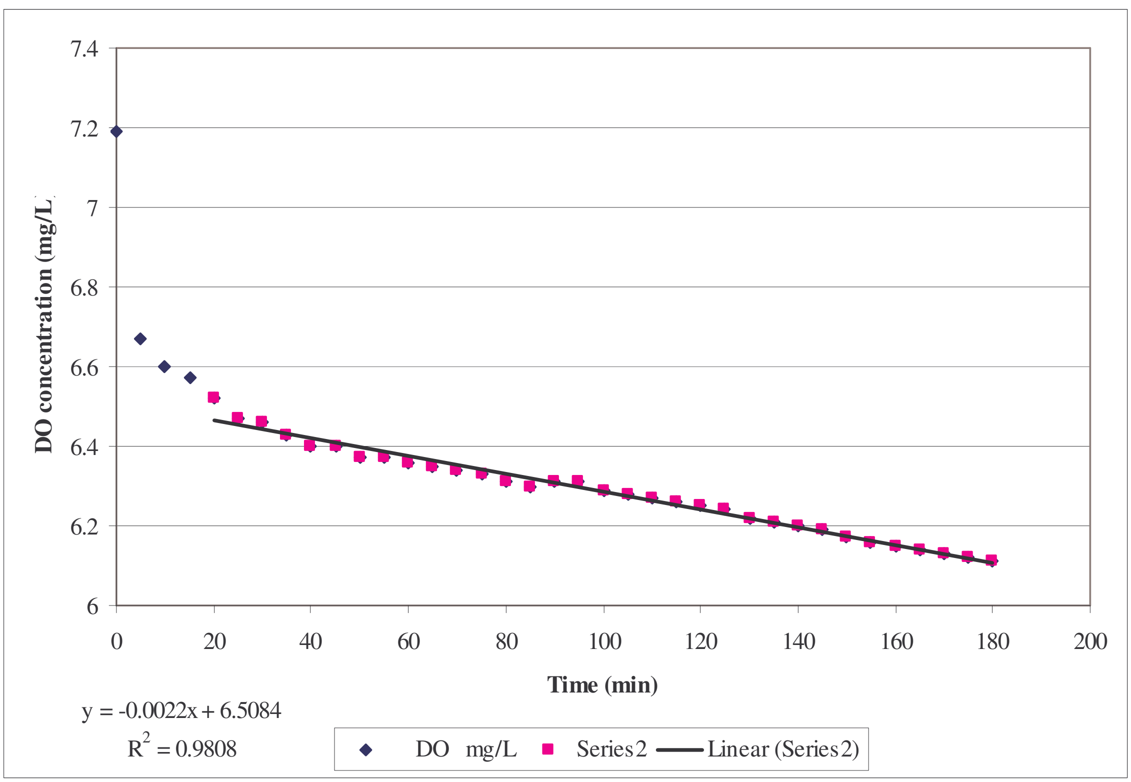

Figure F.6: Oxygen Depletion curve for Chamber 2 on 12/08/2004 at the agricultural study site within the Alapaha River Basin.

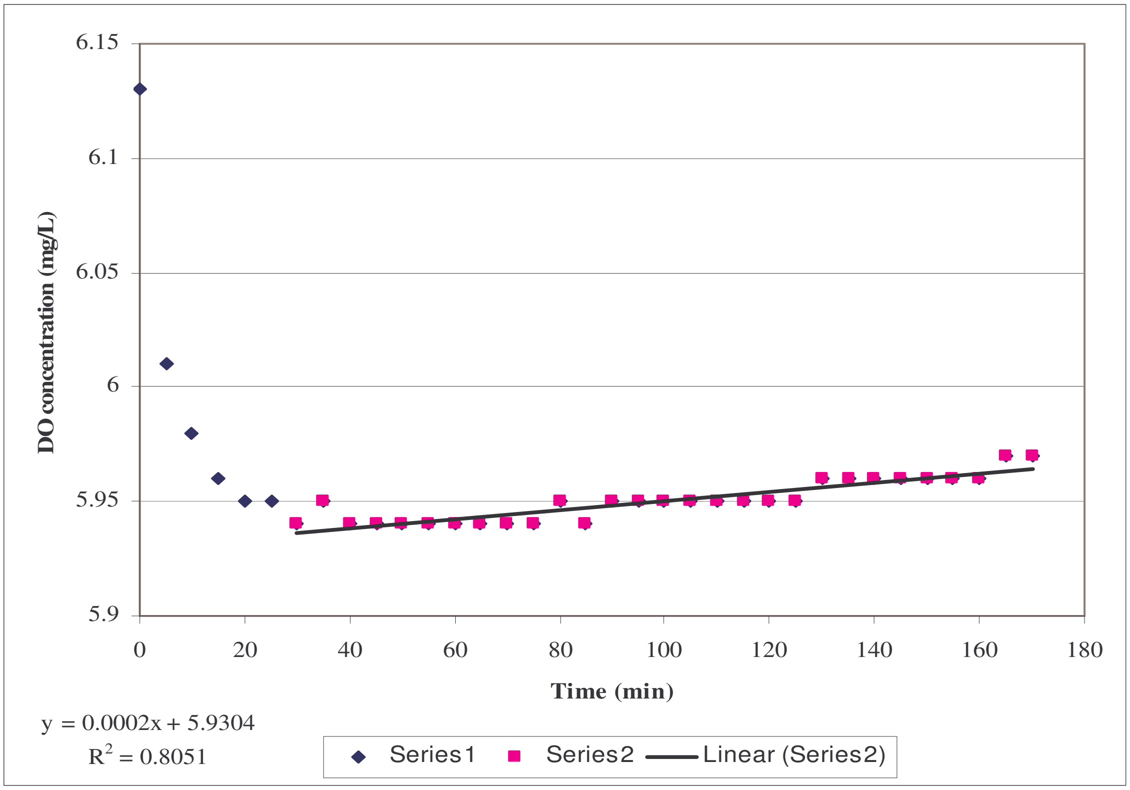

Figure F.7: Oxygen Depletion curve for the Control chamber on 12/08/2004 at the agricultural study site within the Alapaha River Basin.

Table F.8: YSI data for Chamber 1 from 02/04/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:06:02	0	6.97	0.08	98.6	11.98	56.8	7.01	1999.9	13
11:10:40	5	6.99	0.081	107.4	13.03	56.3	6.25	1999.9	16.7
11:15:40	10	7.01	0.081	109.2	13.25	56.3	6.08	1999.9	18.9
11:20:40	15	7.03	0.081	110.6	13.41	56.3	6.07	1999.9	18.7
11:25:40	20	7.07	0.081	110.9	13.44	56.8	6.12	1878	19.2
11:30:40	25	7.09	0.081	111.6	13.52	56.3	6.15	1646.2	19.1
11:35:40	30	7.12	0.081	111.8	13.53	56.3	6.18	1473.8	19.1
11:40:40	35	7.15	0.081	112.2	13.57	56.3	6.21	1338.9	18.9
11:45:40	40	7.18	0.081	112.6	13.61	56.3	6.23	1229.1	18.9
11:50:40	45	7.2	0.081	113.3	13.68	56.3	6.23	1129.9	18.9
11:55:40	50	7.23	0.081	113.2	13.65	55.1	6.24	1056.6	18.3
12:00:40	55	7.25	0.081	114.3	13.79	56.3	6.25	992.5	18
12:05:40	60	7.28	0.081	114.7	13.83	56.3	6.25	938.2	17.5
12:10:40	65	7.29	0.081	115	13.86	56.3	6.25	887.6	17.5
12:15:40	70	7.32	0.081	114.8	13.83	56.3	6.25	842.2	17.2
12:20:40	75	7.34	0.081	115	13.85	55.1	6.25	797.2	17
12:25:40	80	7.37	0.081	114.6	13.78	55.1	6.24	759.6	16.7
12:30:40	85	7.4	0.081	115	13.81	56.3	6.24	720.5	16.9
12:35:40	90	7.43	0.081	114.7	13.77	56.3	6.24	687.4	16.3
12:40:40	95	7.46	0.081	114.7	13.77	55.1	6.26	668.5	16.2
12:45:40	100	7.5	0.081	114.3	13.71	56.3	6.25	643	16.1
12:50:40	105	7.53	0.081	114.4	13.71	56.3	6.25	620.5	15.8
12:55:40	110	7.56	0.081	115.8	13.87	56.3	6.26	604.7	15.9
13:00:40	115	7.59	0.081	115.2	13.78	56.3	6.26	590.4	15.7
13:05:40	120	7.62	0.081	115.1	13.75	55.1	6.26	578.3	15.5
13:10:40	125	7.66	0.081	114.5	13.67	56.3	6.26	563	15.4
13:15:40	130	7.7	0.081	114.2	13.62	56.3	6.25	548.5	15.1
13:20:40	135	7.75	0.081	114.3	13.62	56.3	6.25	538.1	14.9
13:25:40	140	7.79	0.081	114.2	13.59	56.3	6.25	528.4	15.1
13:30:40	145	7.84	0.081	114.7	13.64	55.1	6.26	519.2	14.7
13:35:40	150	7.88	0.081	115	13.65	55.1	6.25	509.4	14.9
13:40:40	155	7.92	0.081	114.8	13.62	56.3	6.25	501.8	14.5
13:45:40	160	7.96	0.081	114.7	13.6	55.1	6.25	494.8	13.9
13:50:40	165	8	0.081	114.5	13.56	56.3	6.24	487.8	13.9
13:55:40	170	8.04	0.081	113.7	13.44	55.1	6.24	479.6	14.1
14:00:40	175	8.09	0.081	114.2	13.49	56.3	6.25	477.8	13.9
14:05:40	180	8.13	0.081	114.2	13.48	55.1	6.24	472.5	13.4
14:10:40	185	8.17	0.081	114.3	13.48	56.3	6.25	468.9	13.3
14:15:40	190	8.21	0.081	114.6	13.51	56.3	6.25	465.6	13
14:20:40	195	8.25	0.081	114.5	13.48	56.3	6.25	461.1	13
Averages		7.53	0.08	113.39	13.58	56.03	6.25	889.98	

slope	0.0031
V (L)	65.15
A (m^2)	0.27
OD (g O_2/ m^2*day)	1.08
SOD (g O_2/ m^2 *day)	**1.01**

Table F.9: YSI data for Chamber 2 on 02/04/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:25:28	0	11.68	0.571	100	10.83	41.6	6.2	327	1559.3
11:30:40	5	7.41	0.836	85.2	10.2	41	5.85	240.8	97.7
11:35:40	10	7.38	0.841	84.2	10.09	41	5.73	266.4	96.4
11:40:40	15	7.38	0.735	83.2	9.97	41	5.71	276.2	95.3
11:45:40	20	7.37	0.602	82.2	9.86	41	5.69	283.8	92
11:50:40	25	7.38	0.508	81.3	9.75	41	5.68	290.3	90.3
11:55:40	30	7.39	0.444	80.3	9.64	41.6	5.67	296.6	89.1
12:00:40	35	7.41	0.397	79.6	9.55	41.6	5.65	302.6	86.7
12:05:40	40	7.42	0.362	79	9.47	41	5.64	308	85.8
12:10:40	45	7.44	0.334	78.4	9.4	41	5.64	313.8	84.6
12:15:40	50	7.45	0.312	77.9	9.33	41	5.63	318.5	83.2
12:20:40	55	7.48	0.294	77.4	9.27	41.6	5.62	323.4	83.1
12:25:40	60	7.5	0.28	77	9.22	41	5.61	328.4	82
12:30:40	65	7.52	0.262	76.6	9.17	41.6	5.61	333.3	81
12:35:40	70	7.54	0.252	76.2	9.12	41.6	5.6	338.3	79.2
12:40:40	75	7.56	0.243	75.8	9.07	42.8	5.6	343.2	78.9
12:45:40	80	7.58	0.236	75.6	9.04	41.6	5.59	348.3	78.3
12:50:40	85	7.61	0.23	75.4	9.01	41.6	5.59	353.1	76.7
12:55:40	90	7.63	0.224	75.1	8.96	41.6	5.59	357.8	76.1
13:00:40	95	7.66	0.22	74.9	8.94	41.6	5.58	362.9	75.5
13:05:40	100	7.69	0.215	74.8	8.91	42.8	5.58	367.6	75.1
13:10:40	105	7.72	0.212	74.5	8.88	42.8	5.58	372.1	75.1
13:15:40	110	7.75	0.208	74.3	8.85	42.8	5.58	376.4	72.9
13:20:40	115	7.78	0.206	74.2	8.83	41.6	5.58	380.4	73.3
13:25:40	120	7.82	0.203	74.2	8.82	41.6	5.58	383.8	71.9
13:30:40	125	7.85	0.201	74	8.79	41	5.58	386.6	71.4
13:35:40	130	7.89	0.199	74	8.77	41.6	5.58	388.9	71.6
13:40:40	135	7.94	0.198	73.8	8.75	41.6	5.58	390.4	71.2
13:45:40	140	7.98	0.196	73.7	8.73	42.8	5.58	391.7	71.7
13:50:40	145	8.02	0.194	73.6	8.71	41	5.58	392.8	71.9
13:55:40	150	8.06	0.193	73.5	8.68	42.8	5.58	393.6	71.9
14:00:40	155	8.1	0.192	73.3	8.65	41	5.58	393.9	73.7
14:05:40	160	8.14	0.19	73.3	8.64	41.6	5.58	394.5	72.3
14:10:40	165	8.19	0.189	73.1	8.61	41.6	5.58	394.5	72.8
14:15:40	170	8.23	0.188	73	8.59	42.8	5.58	394.8	71.9
14:20:40	175	8.27	0.187	72.8	8.56	41	5.59	394.5	71.3
14:25:40	180	8.31	0.186	72.7	8.54	41.6	5.58	394.9	69.3
Averages		7.83	0.31	76.98	9.14	41.62	5.63	348.76	118.93

slope	0.0076
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	2.64
SOD (g O_2/m^2*day)	**2.57**

Table F.10: YSI data for the Control chamber on 02/04/2005

Time (h:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
23:25:50	0	6.86	0.083	88.9	10.83	42	7.57	14
23:30:50	5	6.88	0.083	87.8	10.69	43	6.73	14
23:35:50	10	6.9	0.083	87.6	10.66	42	6.57	13.7
23:40:50	15	6.93	0.083	87.4	10.63	41	6.52	13.5
23:45:50	20	6.95	0.083	87.4	10.62	41	6.5	13.2
23:50:50	25	6.97	0.083	87.4	10.61	42	6.49	12.4
23:55:50	30	6.99	0.083	87.1	10.57	41	6.49	12.4
0:00:50	35	7.01	0.083	87.1	10.57	42	6.48	12
0:05:50	40	7.04	0.083	87	10.55	42	6.48	12.1
0:10:50	45	7.06	0.083	87	10.55	41	6.48	13.5
0:15:50	50	7.09	0.083	87.1	10.55	42	6.48	11.7
0:20:50	55	7.12	0.083	87.1	10.54	41	6.48	11.3
0:25:50	60	7.14	0.083	87.2	10.55	42	6.47	11.8
0:30:50	65	7.17	0.083	87.2	10.53	42	6.47	11.2
0:35:50	70	7.2	0.083	87.3	10.54	42	6.47	11
0:40:50	75	7.23	0.083	87.4	10.54	42	6.47	11.2
0:45:50	80	7.25	0.083	87.3	10.53	42	6.47	10.9
0:50:50	85	7.28	0.083	87.4	10.53	41	6.46	10.7
0:55:50	90	7.31	0.083	87.4	10.52	42	6.46	10.6
1:00:50	95	7.35	0.083	87.5	10.53	42	6.46	11.9
1:05:50	100	7.37	0.083	87.6	10.53	42	6.46	10.4
1:10:50	105	7.4	0.083	87.6	10.53	42	6.46	10.3
1:15:50	110	7.44	0.083	87.7	10.53	43	6.46	10.2
1:20:50	115	7.48	0.083	87.9	10.54	43	6.46	10.1
1:25:50	120	7.52	0.083	87.8	10.52	43	6.46	10
1:30:50	125	7.55	0.083	87.9	10.52	43	6.46	11.3
1:35:50	130	7.59	0.083	88	10.52	42	6.46	10
1:40:50	135	7.64	0.083	88.1	10.52	42	6.45	9.9
1:45:50	140	7.69	0.083	88.2	10.52	41	6.45	9.7
1:50:50	145	7.72	0.083	88.3	10.53	42	6.45	9.8
1:55:50	150	7.76	0.083	88.4	10.53	43	6.45	9.8
2:00:50	155	7.81	0.083	88.5	10.53	42	6.45	9.6
2:05:50	160	7.84	0.083	88.5	10.52	42	6.45	9.7
2:10:50	165	7.89	0.083	88.6	10.52	42	6.45	9.5
2:15:50	170	7.94	0.083	88.7	10.53	43	6.45	9.7
2:20:50	175	7.98	0.083	88.7	10.51	43	6.44	9.5
2:25:50	180	8.02	0.083	88.9	10.52	43	6.45	9.3
2:30:50	185	8.06	0.083	88.9	10.51	43	6.44	9.2
2:35:50	190	8.1	0.083	88.9	10.5	43	6.44	9.2
Average		7.40	0.08	87.82	10.55	42.10	6.50	11.03
	Slope		0.0002					
	V (L)		65.15					
	A (m^2)		0.27					
	OD (g O_2/m^2*day)		**0.07**					

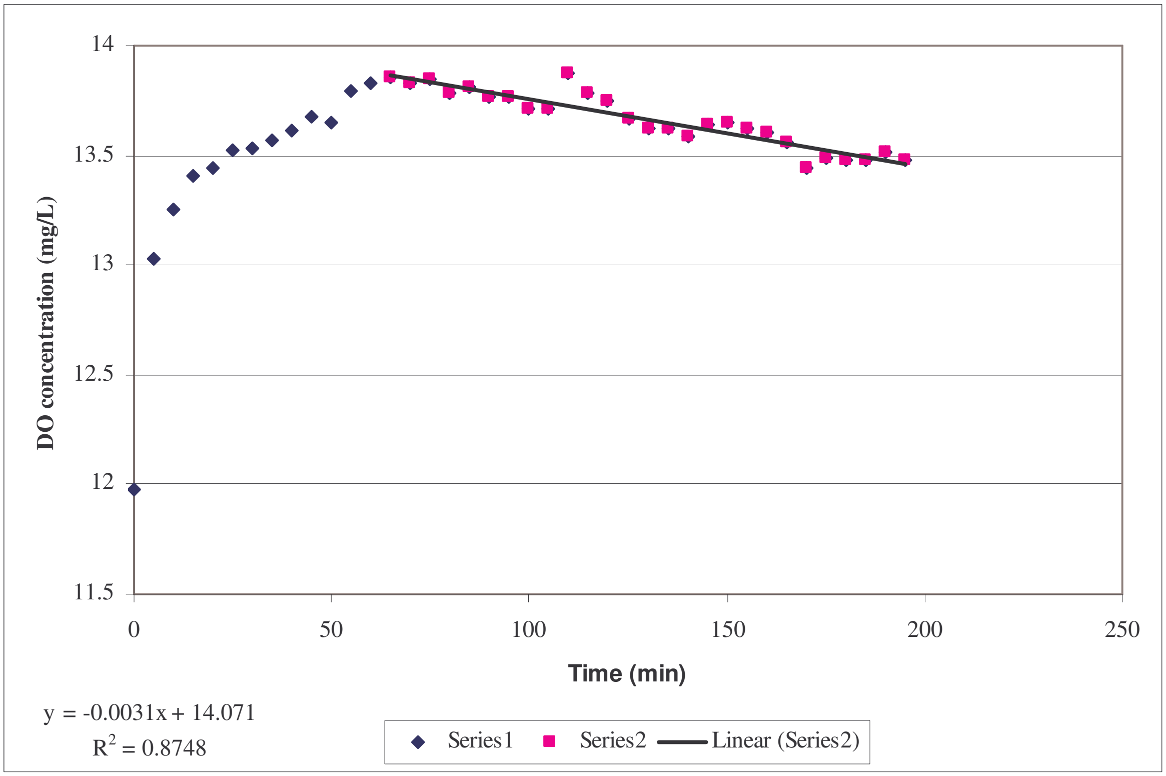

Figure F.8: Oxygen Depletion curve for Chamber 1 on 2/04/2005 at the agricultural study site within the Alapaha River Basin

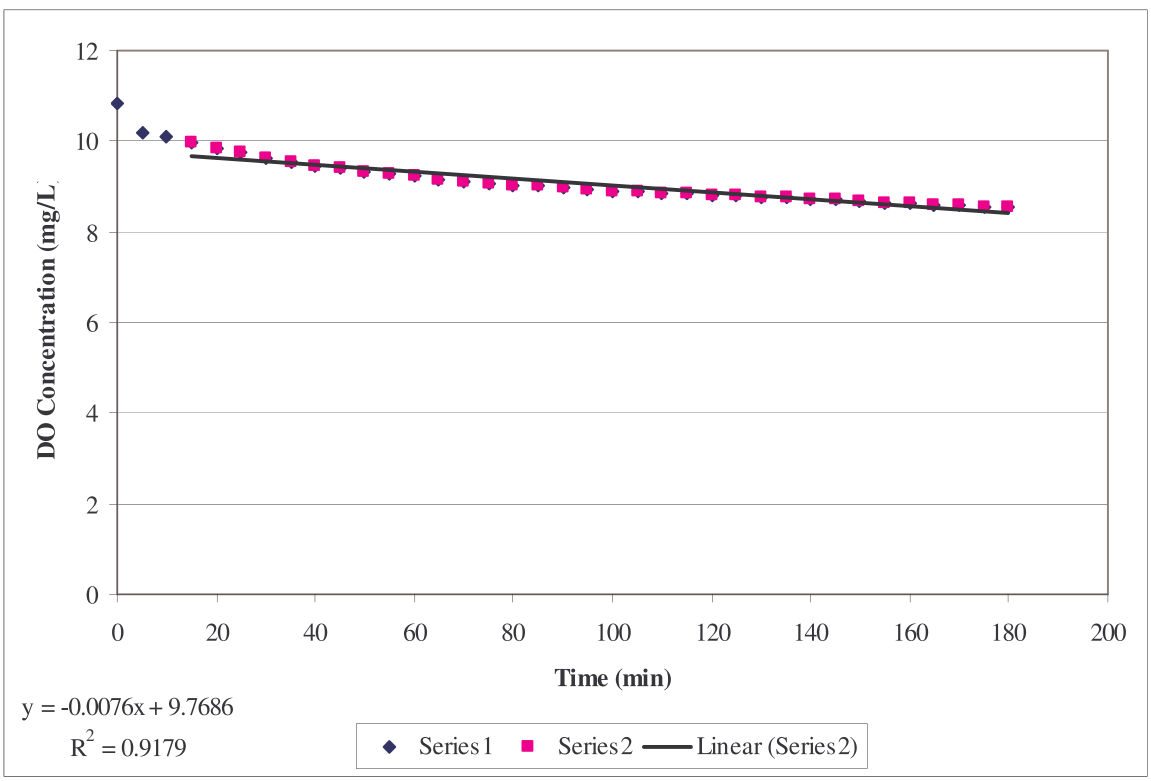

Figure F.9: Oxygen Depletion curve for Chamber 2 on 02/04/2005 at the agricultural study site within the Alapaha River Basin.

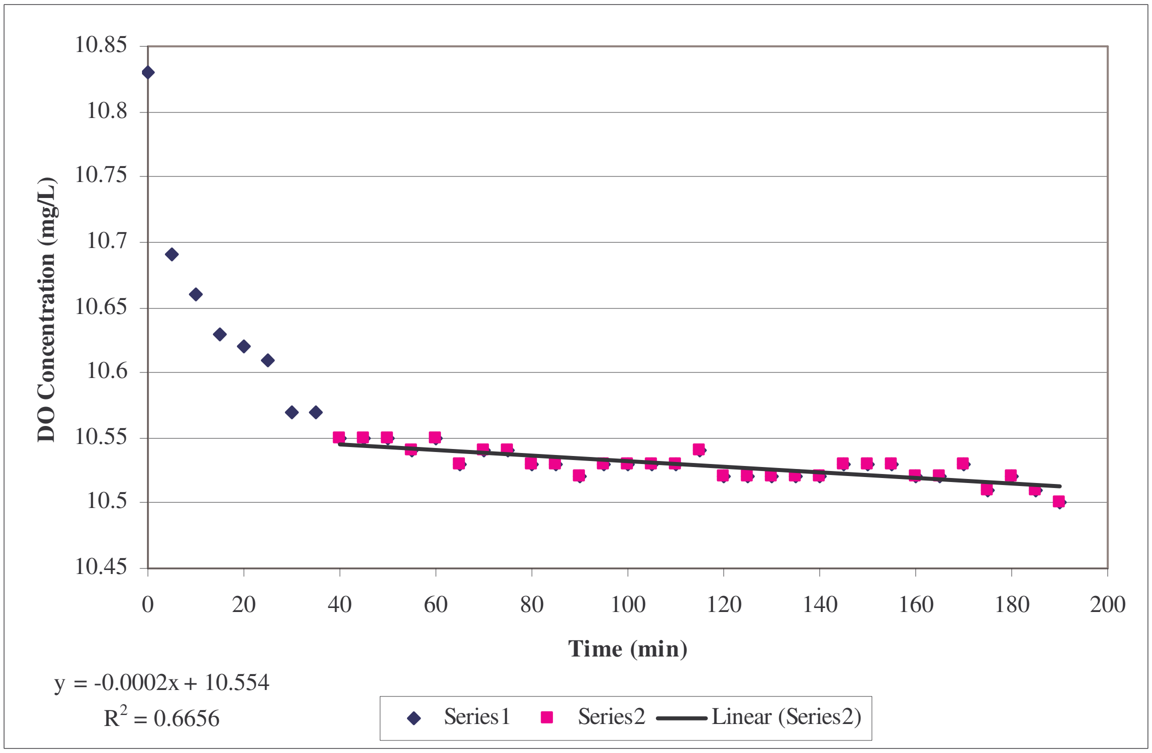

Figure F.10: Oxygen Depletion curve for the Control chamber on 02/04/2005 at the agricultural study site within the Alapaha River Basin.

Table F.11: YSI data for Chamber 1 on 04/15/2005

Time (min)	Time (hh:mm:ss)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
0	11:05:39	30.71	3.88	97.3	7.19	34.6	7.53	186.5	-0.1
5	11:10:40	14.73	1.039	86	8.69	32.8	5.84	208.9	-0.2
10	11:15:40	14.77	0.995	85.6	8.65	32.8	5.64	226.7	-0.1
15	11:20:40	14.8	0.975	85.4	8.62	34.6	5.61	238.8	0
20	11:25:40	14.84	0.964	85.4	8.61	34.6	5.61	250.7	0
25	11:30:40	14.89	0.957	85.4	8.6	33.4	5.61	261.7	0.1
30	11:35:40	14.92	0.952	85.3	8.58	32.8	5.61	271.8	0
35	11:40:40	14.97	0.948	85.2	8.56	34.6	5.61	280.2	0.1
40	11:45:40	15.01	0.945	85.2	8.56	33.4	5.62	286.9	0.1
45	11:50:40	15.06	0.941	85	8.53	32.8	5.63	292.1	0.1
50	11:55:40	15.1	0.939	84.9	8.52	30.5	5.63	295.5	0.1
55	12:00:40	15.15	0.939	84.9	8.5	30.5	5.64	298.1	0.1
60	12:05:40	15.19	0.937	84.9	8.5	37.5	5.64	300	0.1
65	12:10:40	15.23	0.945	84.7	8.47	32.8	5.65	302.4	0.1
70	12:15:40	15.29	0.945	84.6	8.44	33.4	5.65	303.8	0.1
75	12:20:40	15.34	0.944	84.4	8.42	33.4	5.65	305.1	0.1
80	12:25:40	15.38	0.943	84.3	8.41	34.6	5.66	306.2	0.1
85	12:30:40	15.43	0.943	84.2	8.38	34.6	5.66	307.5	0.1
90	12:35:40	15.48	0.943	84.2	8.37	35.7	5.67	308	0.1
95	12:40:40	15.53	0.94	84	8.34	32.8	5.66	309.2	0.1
100	12:45:40	15.58	0.943	83.9	8.33	32.8	5.67	310.3	0.1
105	12:50:40	15.63	0.943	83.8	8.31	34.6	5.67	310.8	0.1
110	12:55:40	15.68	0.943	83.6	8.28	33.4	5.67	311.6	0.1
115	13:00:40	15.74	0.944	83.7	8.28	34.6	5.67	312	0.1
120	13:05:40	15.79	0.943	83.5	8.25	33.4	5.67	313	0.1
125	13:10:40	15.84	0.944	83.5	8.24	35.7	5.67	313.4	0.1
130	13:15:40	15.9	0.945	83.2	8.2	32.8	5.67	314	0.1
135	13:20:40	15.95	0.945	83.1	8.18	32.8	5.67	314.8	0.1
140	13:25:40	16	0.946	83	8.16	34.6	5.67	315.9	0.1
145	13:30:40	16.06	0.946	82.8	8.13	34.6	5.67	316.3	0.1
150	13:35:40	16.11	0.947	82.7	8.11	37.5	5.67	316.8	0.1
155	13:40:40	16.16	0.948	82.4	8.08	33.4	5.67	317.7	0.1
160	13:45:40	16.21	0.949	82.4	8.07	33.4	5.67	318.5	0.1
165	13:50:40	16.26	0.949	82.3	8.05	33.4	5.67	318.7	0.1
170	13:55:40	16.31	0.949	82.2	8.04	37.5	5.67	319	0.1
175	14:00:40	16.35	0.949	81.9	8	37.5	5.67	318.8	0.1
180	14:05:40	16.41	0.95	81.8	7.98	33.4	5.67	319.3	0.1
Averages		15.94	1.0296	84.343	8.314	33.9892	5.71	294.6	0.073

slope	0.004
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.36
SOD (g O_2/m^2*day)	**1.18**

Table F.12: YSI data for the Control chamber on 4/15/2005.

Time (h:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
10:23:20	0	14.59	0.07	85.4	8.68	38	7.47	1674.1
10:28:20	5	14.63	0.07	84	8.53	37	6.82	1674.1
10:33:20	10	14.66	0.07	83.5	8.48	37	6.67	1674
10:38:20	15	14.7	0.07	83.2	8.44	37	6.6	1673.9
10:43:20	20	14.73	0.07	83	8.42	37	6.57	1673.9
10:48:20	25	14.77	0.07	83	8.41	37	6.54	1674
10:53:20	30	14.82	0.07	82.9	8.39	37	6.52	1674.2
10:58:20	35	14.86	0.07	82.9	8.38	37	6.51	1674.3
11:03:20	40	14.9	0.07	82.9	8.38	38	6.51	1674.5
11:08:20	45	14.95	0.07	82.9	8.37	38	6.5	1674.7
11:13:20	50	15	0.07	83	8.37	38	6.49	1674.9
11:18:20	55	15.05	0.07	83	8.36	38	6.49	1675.1
11:23:20	60	15.09	0.07	83	8.36	38	6.48	1675.3
11:28:20	65	15.14	0.07	83.1	8.36	38	6.48	1675.6
11:33:20	70	15.19	0.07	83.1	8.35	38	6.48	1675.8
11:38:20	75	15.24	0.07	83.2	8.35	38	6.48	1676.1
11:43:20	80	15.29	0.07	83.3	8.35	38	6.48	1676.3
11:48:20	85	15.34	0.07	83.4	8.34	38	6.48	1676.6
11:53:20	90	15.39	0.07	83.4	8.34	38	6.47	1676.9
11:58:20	95	15.45	0.07	83.5	8.34	38	6.47	1677.1
12:03:20	100	15.5	0.07	83.6	8.34	39	6.47	1677.4
12:08:20	105	15.55	0.07	83.7	8.34	38	6.47	1677.7
12:13:20	110	15.61	0.07	83.7	8.33	39	6.47	1678
12:18:20	115	15.66	0.07	83.8	8.33	38	6.47	1678.3
12:23:20	120	15.71	0.07	83.9	8.33	39	6.47	1677.6
12:28:20	125	15.76	0.07	84	8.33	38	6.47	1678.8
12:33:20	130	15.82	0.07	84	8.33	38	6.47	1679.1
12:38:20	135	15.87	0.07	84.1	8.33	38	6.46	1679.4
12:43:20	140	15.92	0.07	84.2	8.32	39	6.47	1679.7
12:48:20	145	15.97	0.07	84.3	8.32	39	6.46	1680
12:53:20	150	16.03	0.07	84.3	8.32	39	6.46	1680.2
12:58:20	155	16.08	0.07	84.4	8.32	39	6.46	1680.5
13:03:20	160	16.13	0.07	84.5	8.32	38	6.46	1680.8
13:08:20	165	16.18	0.07	84.6	8.32	39	6.46	1681.1
13:13:20	170	16.23	0.07	84.7	8.31	39	6.46	1681.4
Average		15.366	0.07	83.64	8.368286	38.06	6.53	1676.897

slope		0.0005
V (L)		65.15
A (m^2)		0.27
OD (g O_2/m^2*day)		**0.17**

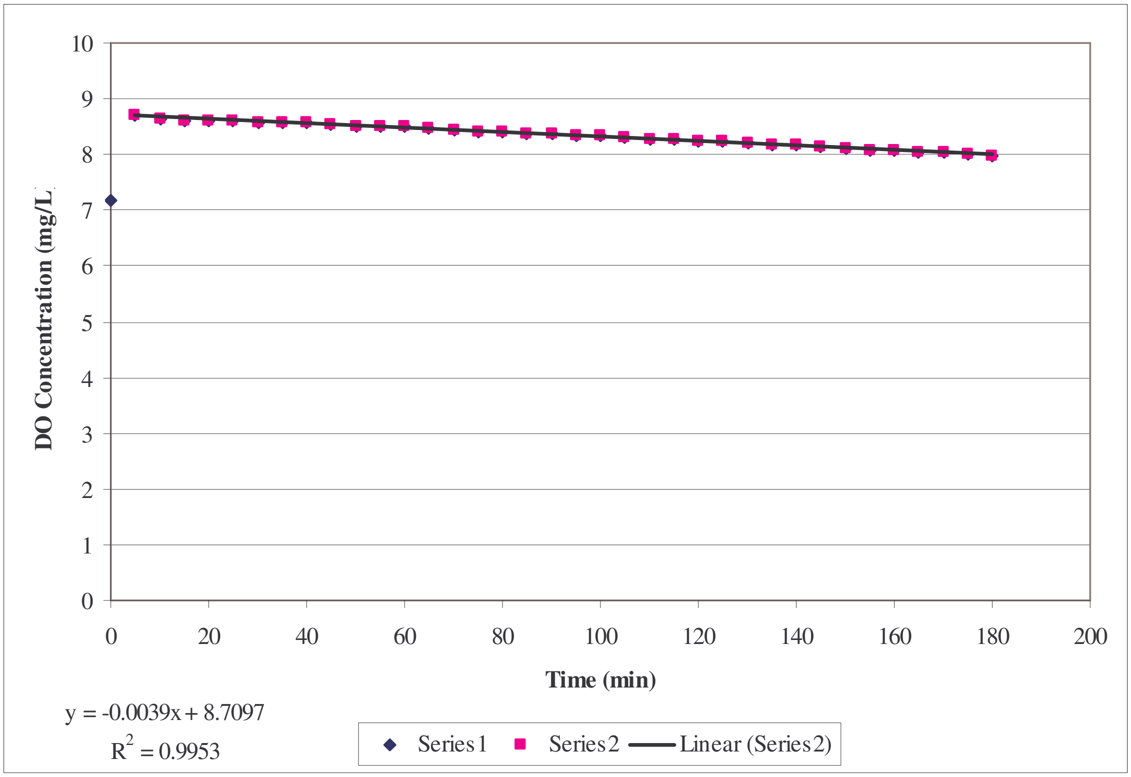

Figure F.11: Oxygen Depletion curve for Chamber 1 on 4/15/2005 at the agricultural study site within the Alapaha River Basin.

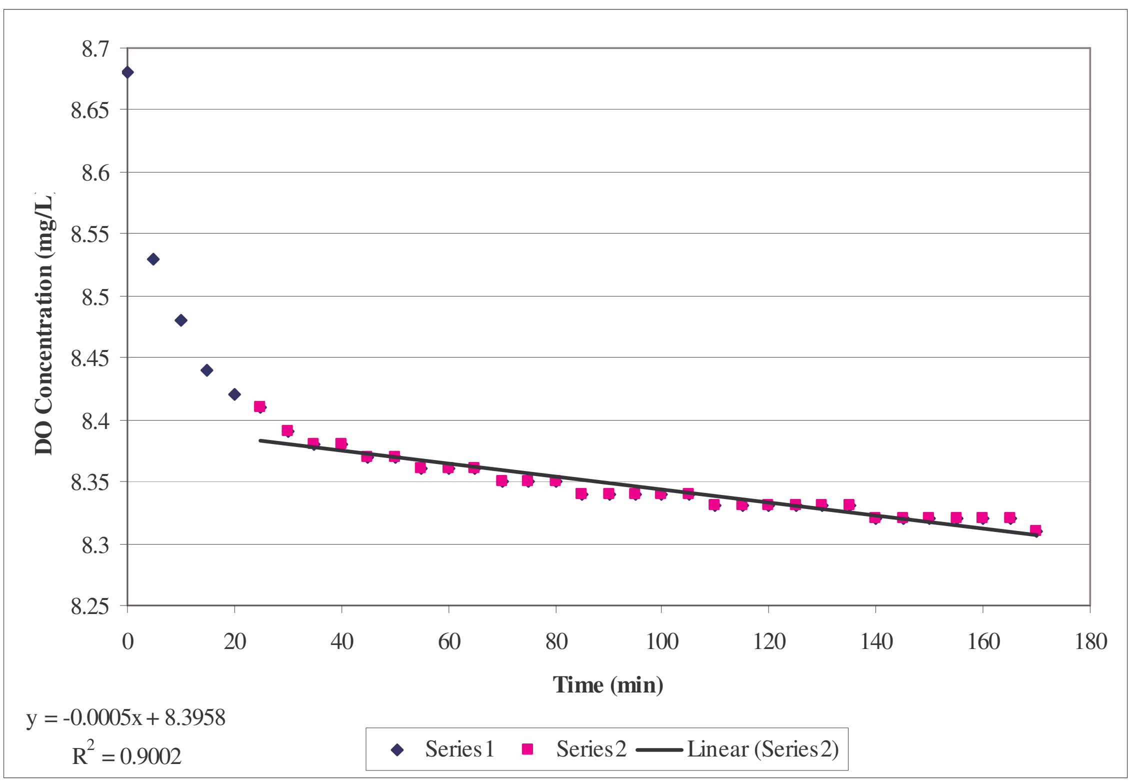

Figure F.12: Oyxgen Depletion curve for the Control chamber on 4/15/2005 at the agricultural study site within the Alapaha River Basin.

Alapaha Forested Site #1

Table F.13: YSI data for Chamber 1 on 03/01/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
11:35:40	0	11.92	0.092	72.4	7.81	43.9	6.14	18.1
11:40:40	5	11.91	0.092	71.3	7.7	42.8	6.17	17.8
11:45:40	10	11.9	0.092	70.3	7.59	42.8	6.21	18
11:50:40	15	11.9	0.092	69.4	7.49	43.9	6.23	17.6
11:55:40	20	11.9	0.092	68.6	7.41	42.8	6.25	17.6
12:00:40	25	11.9	0.092	68	7.34	42.8	6.26	17.3
12:05:40	30	11.91	0.093	67.5	7.28	41.6	6.26	17.3
12:10:40	35	11.91	0.093	67	7.23	41.6	6.27	17.3
12:15:40	40	11.92	0.093	66.6	7.19	42.8	6.27	17.3
12:20:40	45	11.93	0.093	66.2	7.14	41.6	6.27	17.4
12:25:40	50	11.94	0.093	65.8	7.1	41.6	6.28	17.3
12:30:40	55	11.95	0.093	65.5	7.07	41.6	6.28	17.5
12:35:40	60	11.97	0.094	65.3	7.04	42.8	6.28	17
12:40:40	65	11.97	0.094	65.1	7.01	42.8	6.28	17.5
12:45:40	70	12	0.094	64.9	6.99	41	6.28	17.2
12:50:40	75	12.01	0.094	64.8	6.98	41.6	6.29	17.3
12:55:40	80	12.03	0.094	64.6	6.96	41.6	6.28	17.3
13:00:40	85	12.05	0.094	64.5	6.94	41	6.28	17.2
13:05:40	90	12.06	0.094	64.4	6.93	41.6	6.28	17.5
13:10:40	95	12.08	0.094	64.3	6.92	41.6	6.29	16.2
13:15:40	100	12.1	0.093	64.2	6.9	42.8	6.29	16.4
13:20:40	105	12.12	0.093	64.1	6.89	42.8	6.29	16.3
13:25:40	110	12.14	0.093	64	6.88	41.6	6.29	16.4
13:30:40	115	12.16	0.093	64	6.87	41.6	6.28	16.4
13:35:40	120	12.18	0.093	63.9	6.86	41.6	6.28	16.3
13:40:40	125	12.2	0.093	63.9	6.85	42.8	6.29	16.6
13:45:40	130	12.22	0.093	63.9	6.85	41.6	6.29	16.7
13:50:40	135	12.23	0.093	63.8	6.84	41	6.28	16.6
13:55:40	140	12.25	0.093	63.8	6.83	41.6	6.28	17
14:00:40	145	12.27	0.093	63.7	6.82	41.6	6.28	17
14:05:40	150	12.3	0.092	63.8	6.83	41.6	6.28	16.7
14:10:40	155	12.32	0.092	63.9	6.83	41.6	6.28	17.1
14:15:40	160	12.34	0.091	64.2	6.87	41.6	6.27	17.5
14:20:40	165	12.36	0.089	64.5	6.9	41.6	6.26	17.2
14:25:40	170	12.38	0.088	64.8	6.93	41.6	6.25	16.8
14:30:40	175	12.4	0.087	65.2	6.96	41.6	6.24	17.1
Averages		12.09	0.09	65.62	7.06	42.01	6.27	17.11

Slope	0.0037
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.29
SOD (g O_2/m^2*day)	1.11

Table F.14: YSI data for the Control chamber on 03/01/2005

Time (h:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO Sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
11:36:49	0	11.92	0.075	88.4	9.54	41	3.91	8.8
11:41:49	5	11.93	0.075	85.2	9.19	41	3.92	9
11:46:49	10	11.94	0.075	84	9.06	41	3.91	9.1
11:51:49	15	11.96	0.075	83.3	8.98	41	3.91	9.4
11:56:49	20	11.97	0.074	82.8	8.93	41	3.91	9.1
12:01:49	25	11.98	0.074	82.5	8.89	41	3.91	9.1
12:06:49	30	12	0.074	82.3	8.87	41	3.91	9.2
12:11:49	35	12.01	0.074	82.2	8.85	41	3.91	9.1
12:16:49	40	12.02	0.074	82	8.83	41	3.91	9.1
12:21:49	45	12.04	0.074	82	8.83	42	3.91	9.1
12:26:49	50	12.05	0.074	81.9	8.81	41	3.91	9.1
12:31:49	55	12.07	0.074	81.9	8.81	41	3.91	9.1
12:36:49	60	12.08	0.074	81.8	8.8	41	3.91	9
12:41:49	65	12.1	0.074	81.8	8.79	42	3.91	9.1
12:46:49	70	12.12	0.073	81.8	8.79	41	3.92	9.1
12:51:49	75	12.13	0.073	81.8	8.79	42	3.92	9.2
12:56:49	80	12.15	0.073	81.8	8.78	41	3.91	8.9
13:01:49	85	12.17	0.073	81.8	8.78	42	3.91	9
13:06:49	90	12.19	0.073	81.8	8.78	41	3.91	8.9
13:11:49	95	12.21	0.073	81.8	8.78	41	3.92	8.9
13:16:49	100	12.23	0.073	81.9	8.78	42	3.92	8.8
13:21:49	105	12.25	0.073	81.9	8.77	41	3.92	8.9
13:26:49	110	12.27	0.073	81.9	8.77	42	3.92	8.9
13:31:49	115	12.29	0.073	81.9	8.77	41	3.92	8.9
13:36:49	120	12.31	0.073	82	8.77	41	3.92	8.9
13:41:49	125	12.33	0.073	81.9	8.76	42	3.92	8.9
13:46:49	130	12.35	0.073	82	8.76	42	3.92	8.6
13:51:49	135	12.38	0.073	82	8.76	42	3.92	8.7
13:56:49	140	12.4	0.073	82.1	8.76	41	3.92	8.9
14:01:49	145	12.42	0.073	82.1	8.76	42	3.92	8.8
14:06:49	150	12.44	0.073	82.1	8.76	41	3.92	8.7
14:11:49	155	12.46	0.073	82.1	8.76	41	3.92	8.5
14:16:49	160	12.49	0.073	82.2	8.76	41	3.92	8.7
14:21:49	165	12.51	0.072	82.2	8.75	41	3.92	8.6
14:26:49	170	12.54	0.072	82.3	8.76	41	3.92	8.9
14:31:49	175	12.56	0.072	82.3	8.75	41	3.92	8.9
Average		12.20	0.07	82.38	8.84	41.28	3.92	8.94
Slope		0.0005						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.17**						

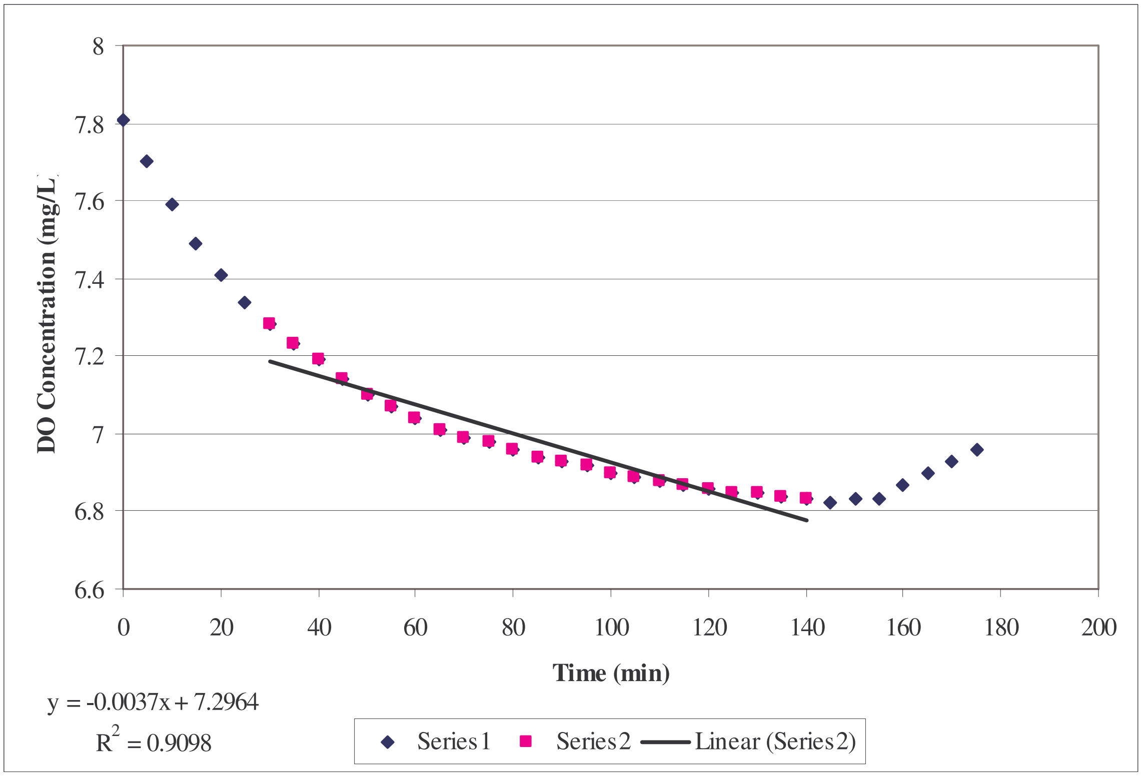

Figure F.13: Oxygen Depletion curve for Chamber 3 on 3/01/2005 at the first forested study site within the Alapaha River Basin.

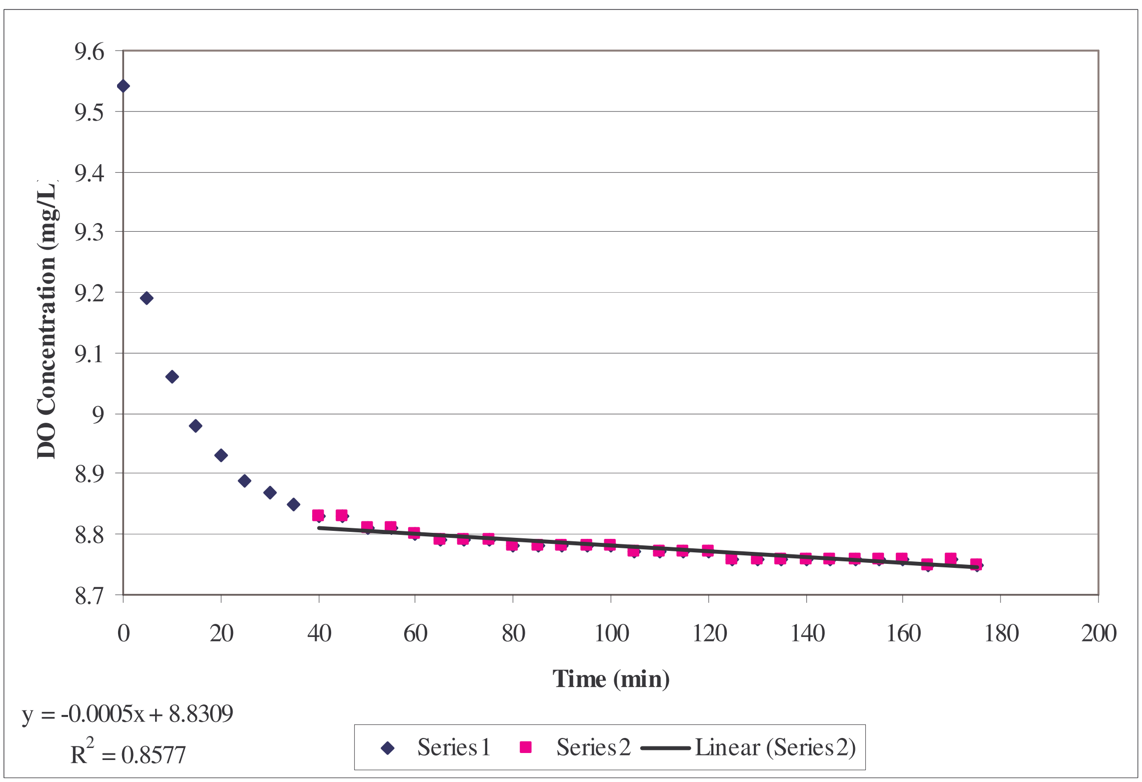

Figure F.14: Oxygen Depletion curve for the Control chamber on 3/01/2005 at the first forested study site within the Alapaha River Basin.

Table F.15: YSI data for Chamber 2 on 04/27/2005

Time (hh:mm:ss)	**Time (min)**	**Temp (˚C)**	**SpCond (mS/cm)**	**DOsat (%)**	**DO (mg/L)**	**DOchrg**	**pH**	**Turbid (NTU)**
11:55:40	0	16.37	0.159	41.8	4.09	39.8	5.62	5.8
12:00:40	5	16.4	0.159	39.3	3.84	39.8	5.91	6.1
12:05:40	10	16.42	0.158	37.6	3.68	39.8	6.05	6.4
12:10:40	15	16.45	0.158	36.3	3.55	39.8	6.13	7.7
12:15:40	20	16.47	0.158	35.3	3.45	39.8	6.17	6.4
12:20:40	25	16.49	0.157	34.5	3.37	38.7	6.2	6.5
12:25:40	30	16.51	0.157	33.8	3.3	38.7	6.22	6.6
12:30:40	35	16.53	0.157	33.3	3.25	38.7	6.23	6.4
12:35:40	40	16.55	0.156	32.8	3.2	39.8	6.24	6.5
12:40:40	45	16.57	0.156	32.5	3.17	38.7	6.24	6.4
12:45:40	50	16.59	0.156	32.1	3.13	38.7	6.25	6.8
12:50:40	55	16.61	0.155	31.8	3.1	38.7	6.25	6.5
12:55:40	60	16.63	0.155	31.6	3.08	38.7	6.25	6.5
13:00:40	65	16.65	0.155	31.4	3.06	38.7	6.25	6.6
13:05:40	70	16.68	0.154	31.2	3.04	38.7	6.25	6.5
13:10:40	75	16.7	0.154	31.1	3.02	38.7	6.25	6.5
13:15:40	80	16.72	0.153	30.9	3.01	38.7	6.25	6.7
13:20:40	85	16.74	0.152	30.8	2.99	38.7	6.25	6.6
13:25:40	90	16.77	0.151	30.7	2.98	38.7	6.25	6.7
13:30:40	95	16.79	0.151	30.6	2.97	41	6.24	6.8
13:35:40	100	16.81	0.151	30.5	2.96	38.7	6.25	6.8
13:40:40	105	16.83	0.15	30.5	2.95	38.7	6.24	6.7
13:45:40	110	16.86	0.15	30.4	2.94	38.7	6.25	7
13:50:40	115	16.88	0.15	30.3	2.94	38.7	6.24	7
13:55:40	120	16.9	0.149	30.2	2.93	38.7	6.24	6.8
14:00:40	125	16.92	0.149	30.2	2.92	37.5	6.24	7.1
14:05:40	130	16.95	0.149	30.2	2.92	38.7	6.24	6.9
14:10:40	135	16.97	0.149	30.1	2.91	38.7	6.24	7.1
14:15:40	140	16.99	0.148	30.1	2.91	39.8	6.24	7
14:20:40	145	17.01	0.148	30	2.9	37.5	6.23	7.2
14:25:40	150	17.03	0.148	30	2.9	37.5	6.23	7.2
14:30:40	155	17.06	0.147	29.9	2.89	37.5	6.23	7.2
14:35:40	160	17.08	0.147	29.9	2.88	38.7	6.23	7.2
14:40:40	165	17.1	0.147	29.9	2.88	38.7	6.23	7.2
14:45:40	170	17.12	0.147	29.8	2.87	38.7	6.23	7.3
14:50:40	175	17.14	0.146	29.8	2.87	38.7	6.23	7.3
Averages		16.758	0.152	31.978	3.107	38.844	6.203	6.778

Slope	0.0023
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.80
SOD (g O_2/m^2*day)	**0.56**

Table F.16: YSI data for Chamber 3 on 04/27/2005

Time (hh:mm:ss)	**Time (min)**	**Temp (˚C)**	**Cond (mS/cm)**	**DOsat (%)**	**DO (mg/L)**	**DOchrg**	**pH**	**Orp (mV)**	**Turbid (NTU)**
11:39:40	0	16.65	1.455	52.5	5.08	45.7	4.37	145.6	8.2
11:44:40	5	16.66	1.329	52.2	5.06	44.5	4.51	121.9	9.5
11:49:40	10	16.68	1.286	51.4	4.98	44.5	4.59	114.7	9.7
11:54:40	15	16.69	1.249	50.9	4.93	44.5	4.65	113.2	9.8
11:59:40	20	16.7	1.219	50.6	4.9	44.5	4.69	114	10.3
12:04:40	25	16.71	1.196	50.3	4.87	44.5	4.71	116.4	9.9
12:09:40	30	16.72	1.181	50	4.84	44.5	4.73	118.8	10
12:14:40	35	16.72	1.167	49.7	4.81	44.5	4.74	121.1	9.7
12:19:40	40	16.74	1.156	49.5	4.79	44.5	4.75	124.5	9.7
12:24:40	45	16.75	1.148	49.3	4.77	44.5	4.76	127.6	9.5
12:29:40	50	16.78	1.141	49	4.74	44.5	4.77	130.7	9.6
12:34:40	55	16.78	1.135	49	4.73	44.5	4.78	133.8	9.5
12:39:40	60	16.8	1.131	48.7	4.71	44.5	4.79	136.5	9.5
12:44:40	65	16.83	1.128	48.6	4.69	44.5	4.79	139.2	9.4
12:49:40	70	16.86	1.125	48.5	4.68	44.5	4.79	141.8	9.4
12:54:40	75	16.87	1.122	48.3	4.66	44.5	4.8	144.2	9.3
12:59:40	80	16.89	1.12	48.2	4.65	44.5	4.8	145.1	9.2
13:04:40	85	16.91	1.119	48.1	4.64	44.5	4.81	147.8	9.1
13:09:40	90	16.93	1.118	47.9	4.62	45.7	4.81	150.4	9.2
13:14:40	95	16.95	1.118	47.8	4.61	43.9	4.82	150	8.9
13:19:40	100	16.98	1.117	47.7	4.6	45.7	4.81	151.3	9
13:24:40	105	17	1.117	47.7	4.59	44.5	4.82	151.2	9.1
13:29:40	110	17.01	1.116	47.6	4.58	44.5	4.82	150.6	9.2
13:34:40	115	17.03	1.116	47.5	4.57	44.5	4.82	150.9	8.9
13:39:40	120	17.06	1.117	47.5	4.56	44.5	4.82	151.6	9
13:44:40	125	17.08	1.117	47.3	4.55	43.9	4.82	151.6	8.9
13:49:40	130	17.1	1.117	47.4	4.55	44.5	4.82	153.1	9
13:54:40	135	17.12	1.117	47.3	4.54	44.5	4.83	153.4	8.7
13:59:40	140	17.14	1.117	47.2	4.53	44.5	4.83	154.3	8.7
14:04:40	145	17.16	1.118	47.2	4.52	43.9	4.83	152.1	8.7
14:09:40	150	17.19	1.118	47.1	4.52	43.9	4.83	156.6	8.7
14:14:40	155	17.21	1.119	47	4.51	43.9	4.84	158.3	8.7
14:19:40	160	17.23	1.119	46.9	4.5	43.9	4.84	159.9	8.7
14:24:40	165	17.25	1.12	46.9	4.49	43.9	4.84	160.3	8.6
14:29:40	170	17.27	1.121	46.8	4.48	44.5	4.83	162	8.7
14:34:40	175	17.29	1.122	46.8	4.48	43.9	4.84	163.7	8.7
14:39:40	180	17.31	1.122	46.8	4.48	43.9	4.84	165.3	8.8
Averages		16.947	1.153	48.465	4.671	44.451	4.771	142.797	9.176

Slope	0.0023
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.80
SOD (g O_2/m^2*day)	**0.56**

Table F.17: YSI data for the Control chamber on 04/27/2005

Time (hh:mm)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
11:52	0	16.56	0.006	84.1	8.21	36	3.98	1599.3
11:57	5	16.55	0.064	82.9	8.08	37	3.87	1598.7
12:02	10	16.57	0.064	82.4	8.04	37	3.86	1598.3
12:07	15	16.58	0.064	82.2	8.02	37	3.86	1598
12:12	20	16.6	0.064	82.1	8	37	3.87	1597.9
12:17	25	16.62	0.063	81.9	7.98	37	3.87	1597.7
12:22	30	16.64	0.063	81.9	7.97	37	3.88	1597.7
12:27	35	16.65	0.063	81.8	7.97	37	3.88	1597.6
12:32	40	16.67	0.063	81.7	7.95	37	3.89	1597.7
12:37	45	16.69	0.063	81.7	7.95	37	3.89	1597.7
12:42	50	16.71	0.063	81.7	7.95	37	3.89	1597.7
12:47	55	16.73	0.063	81.7	7.94	37	3.9	1597.8
12:52	60	16.75	0.063	81.7	7.93	38	3.9	1597.9
12:57	65	16.77	0.063	81.7	7.93	37	3.9	1597.9
13:02	70	16.8	0.063	81.7	7.93	37	3.9	1598
13:07	75	16.82	0.063	81.7	7.92	38	3.9	1598.1
13:12	80	16.84	0.062	81.7	7.92	37	3.91	1598.2
13:17	85	16.86	0.062	81.7	7.92	37	3.91	1598.3
13:22	90	16.88	0.062	81.7	7.92	38	3.91	1598.4
13:27	95	16.9	0.062	81.7	7.91	38	3.91	1598.5
13:32	100	16.93	0.062	81.7	7.91	38	3.91	1598.6
13:37	105	16.95	0.062	81.7	7.91	37	3.91	1598.7
13:42	110	16.97	0.062	81.7	7.9	37	3.91	1598.8
13:47	115	16.99	0.062	81.7	7.9	37	3.91	1598.9
13:52	120	17.01	0.062	81.7	7.9	37	3.91	1599
13:57	125	17.03	0.062	81.7	7.89	38	3.91	1599.2
14:02	130	17.06	0.062	81.8	7.89	37	3.91	1599.3
14:07	135	17.08	0.062	81.8	7.89	38	3.91	1599.4
14:12	140	17.1	0.062	81.8	7.89	37	3.91	1599.5
14:17	145	17.13	0.062	81.8	7.88	38	3.91	1599.6
14:22	150	17.15	0.062	81.8	7.88	38	3.91	1599.7
14:27	155	17.17	0.062	81.8	7.88	38	3.91	1599.8
14:32	160	17.19	0.062	81.8	7.88	38	3.91	1599.9
14:37	165	17.21	0.062	81.9	7.88	38	3.91	1600
14:42	170	17.23	0.062	81.9	7.87	37	3.91	1600.2
14:47	175	17.25	0.062	81.9	7.87	38	3.92	1600.3
14:52	180	17.27	0.062	81.9	7.87	38	3.92	1600.4
14:57	185	17.29	0.062	81.9	7.87	38	3.92	1600.5
15:02	190	17.31	0.062	81.9	7.86	38	3.91	1600.6
15:07	195	17.33	0.062	81.9	7.86	37	3.91	1600.7
15:12	200	17.35	0.062	81.9	7.86	37	3.92	1600.8
Averages		16.93	0.06	81.90	7.93	37.37	3.90	1598.91
Slope		0.0007						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.24**						

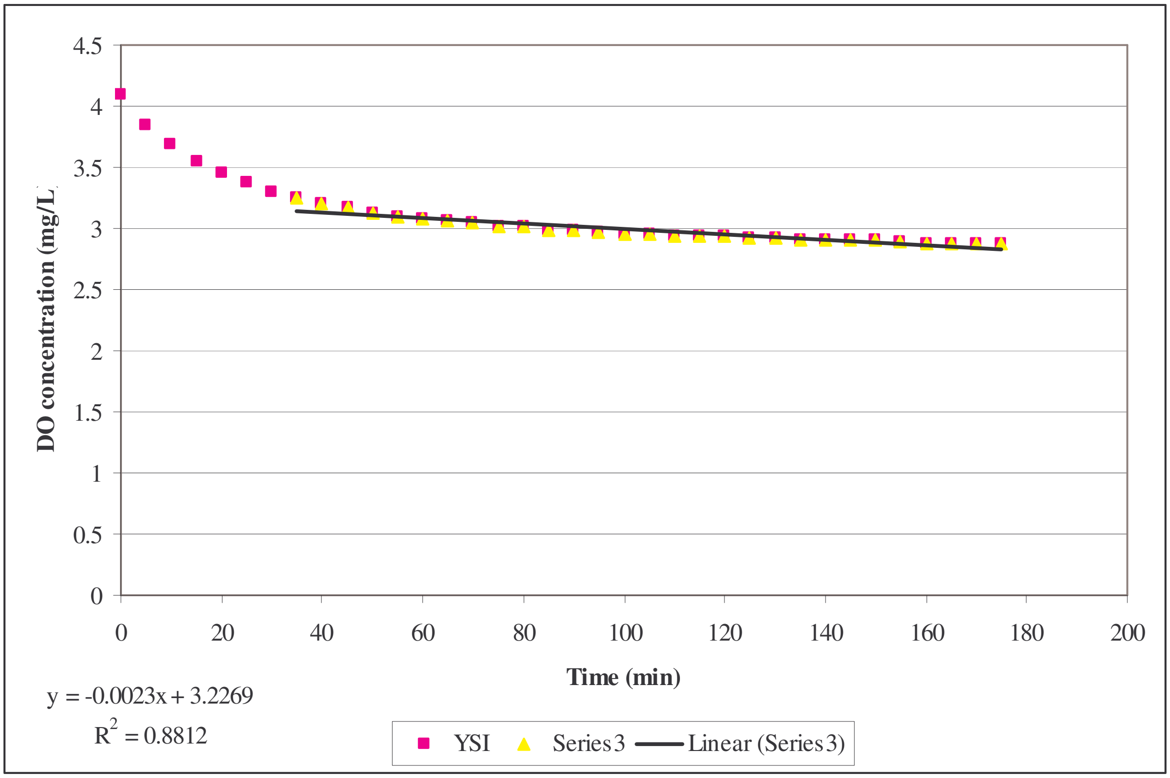

Figure F.15: Oxygen Depletion Curve for Chamber 2 on 04/27/2005 at the first forested study site within the Alapaha River Basin.

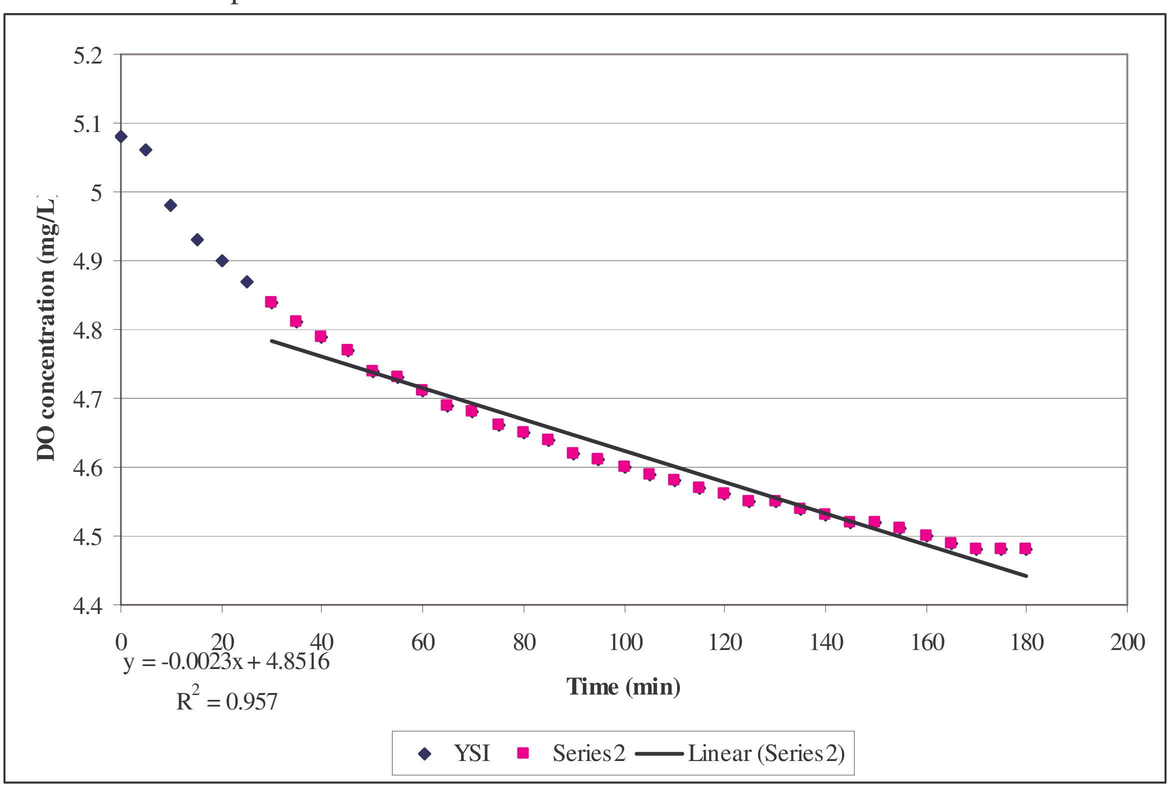

Figure F.16: Oxygen Depletion Curve for Chamber 3 on 04/27/2005 at the first forested study site within the Alapaha River Basin.

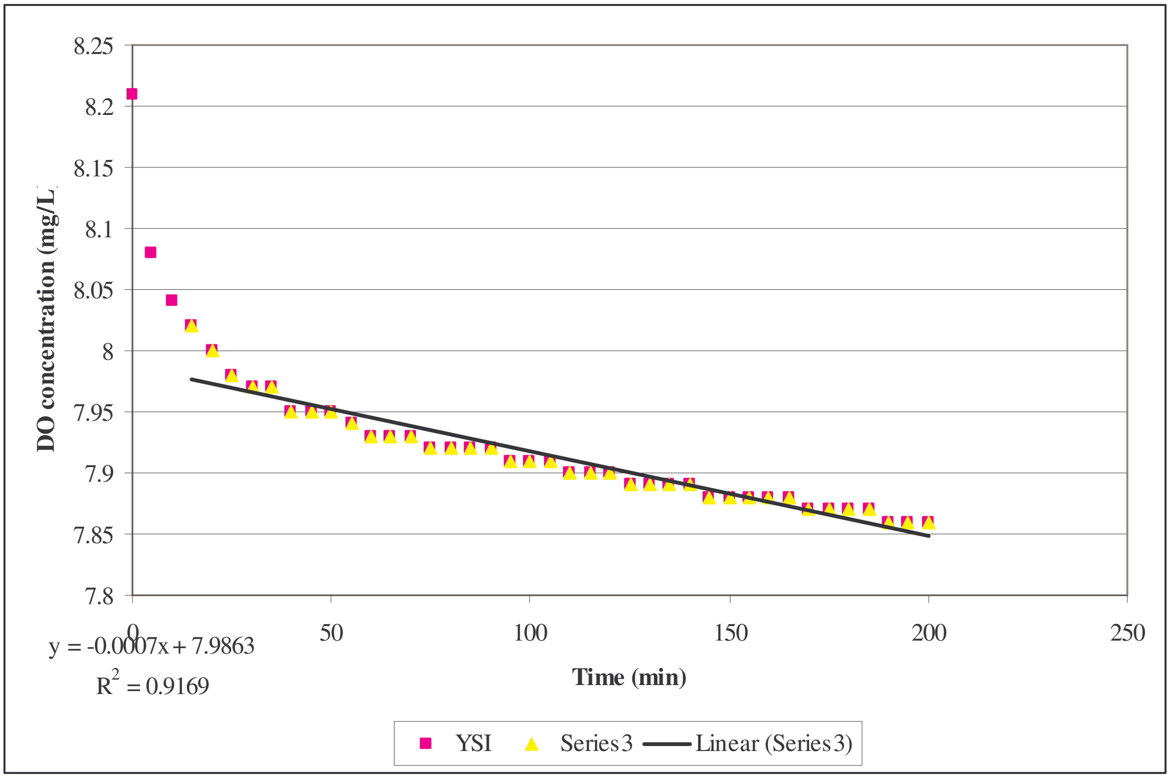

Figure F.17: Oxygen Depletion Curve for the Control chamber on 04/27/2005 at the first forested study site within the Alapaha River Basin.

Alapaha Forested Site #2

Table F.18: YSI data for Chamber 1 on 11/10/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:23:39	0	15.6	0.213	63.2	6.29	52.1	6.56	621.7	7.3
12:25:40	5	15.59	0.213	57.4	5.71	52.1	6.54	633.2	7.5
12:30:40	10	15.57	0.213	58.5	5.82	51	6.53	572.4	7.8
12:35:40	15	15.55	0.213	57.8	5.75	51	6.53	546	7.9
12:40:40	20	15.54	0.213	57.4	5.71	49.8	6.53	527.2	7.8
12:45:40	25	15.53	0.213	57.1	5.69	49.8	6.53	506.5	7.6
12:50:40	30	15.53	0.213	56.9	5.67	49.8	6.53	498	7.8
12:55:21	35	15.53	0.213	54	5.38	51	6.53	509.8	7.8
13:00:21	40	15.53	0.213	50.3	5.01	48.6	6.53	615.2	7.8
13:05:21	45	15.54	0.213	49.8	4.97	48.6	6.53	643.2	7.5
13:10:21	50	15.55	0.213	49.5	4.94	49.8	6.53	653.7	7.5
13:15:21	55	15.55	0.213	49.4	4.92	48.6	6.53	658.4	7.5
13:20:21	60	15.56	0.213	49.3	4.91	48.6	6.53	660.6	7.5
13:25:21	65	15.57	0.213	49.3	4.91	49.8	6.53	661.9	7.3
13:30:21	70	15.57	0.213	49.2	4.89	48.6	6.53	662.4	7.6
13:35:21	75	15.58	0.213	49.3	4.9	48.6	6.54	662.6	7.6
13:40:21	80	15.59	0.213	49.1	4.89	48.6	6.54	662.7	7.3
13:45:21	85	15.6	0.213	49.1	4.89	48.6	6.54	662.8	7.7
13:50:21	90	15.61	0.213	49.1	4.88	48	6.54	662.8	7.5
13:55:21	95	15.62	0.213	49	4.87	48.6	6.54	662.8	7.5
14:00:21	100	15.63	0.213	49.1	4.88	48.6	6.54	662.8	7.2
14:05:21	105	15.64	0.213	49	4.87	48.6	6.54	662.7	7.3
14:10:21	110	15.64	0.213	49.2	4.89	48.6	6.54	662.8	7.5
14:15:21	115	15.65	0.213	49	4.87	48	6.54	662.8	7.3
14:20:21	120	15.66	0.213	48.9	4.86	48.6	6.54	662.8	7.3
14:25:22	125	15.67	0.213	48.9	4.86	48.6	6.54	663	7.2
14:30:21	130	15.68	0.213	49.5	4.92	48	6.54	662.4	7
14:35:21	135	15.69	0.213	49.3	4.89	48	6.54	661.8	7.2
14:40:21	140	15.7	0.213	49.1	4.88	48	6.54	661.7	7.2
14:45:22	145	15.71	0.213	49.2	4.88	48	6.54	662	7.3
14:50:22	150	15.72	0.213	49.1	4.87	48	6.54	662.1	7.1
14:55:21	155	15.73	0.213	49	4.86	48.6	6.54	661.9	7.3
15:00:21	160	15.73	0.213	49.1	4.87	48.6	6.54	661.9	7.1
15:05:21	165	15.74	0.213	49	4.86	48.6	6.54	662	7.2
15:10:21	170	15.75	0.213	49	4.86	48.6	6.54	662	6.8
15:15:21	175	15.76	0.213	49	4.86	48	6.54	662.2	7.2
15:20:21	180	15.76	0.213	49	4.86	48	6.54	662.3	7.1
15:25:21	185	15.77	0.213	48.9	4.85	48.6	6.54	662.4	7.3
15:30:21	190	15.78	0.213	49.1	4.86	48.6	6.54	662.7	6.9
15:35:21	195	15.78	0.213	48.9	4.84	48	6.54	662.8	7.2
15:40:21	200	15.79	0.213	48.9	4.85	48	6.54	663.1	6.8
15:45:21	205	15.79	0.213	48.9	4.84	48.6	6.54	663.3	7
15:50:21	210	15.8	0.213	48.8	4.84	48.6	6.54	663.3	6.8
15:55:21	215	15.8	0.213	49	4.86	48	6.54	663.5	7
16:00:21	220	15.81	0.213	48.9	4.85	48.6	6.54	663.6	6.9
Averages		15.66	0.21	50.68	5.04	48.89	6.54	641.06	7.33
Slope		0.0005							

V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.17
SOD (g O_2/m^2*day)	**0.16**

Table F.19: YSI data for Chamber 2 on 11/10/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:45:40	0	16.09	0.319	45.8	4.5	41	6.76	273.3	10.3
12:50:40	5	16.16	0.313	47	4.62	41	6.53	285.2	9.8
12:55:40	10	16.15	0.309	46.9	4.61	41	6.4	285.7	10.5
13:00:40	15	16.11	0.307	46.4	4.56	41	6.34	289.1	9.5
13:05:40	20	16.05	0.305	45.4	4.48	41	6.3	295.8	9.2
13:10:40	25	16	0.303	44.7	4.41	41	6.25	303.7	9.8
13:15:40	30	15.96	0.298	44.2	4.36	41	6.23	308.2	9.3
13:20:40	35	15.91	0.296	43.9	4.34	39.8	6.22	311.3	9.1
13:25:40	40	15.88	0.294	43.8	4.33	39.8	6.2	316	9.7
13:30:40	45	15.86	0.293	43.7	4.32	39.8	6.19	317.2	9
13:35:40	50	15.85	0.293	43.4	4.29	39.8	6.19	318.6	9.2
13:40:40	55	15.83	0.292	43.1	4.26	38.7	6.18	320.4	9.4
13:45:40	60	15.81	0.291	43.1	4.26	39.8	6.18	322.1	9.6
13:50:40	65	15.79	0.29	43	4.26	38.7	6.17	324.5	9.7
13:55:40	70	15.78	0.29	42.9	4.25	39.8	6.16	327.7	9
14:00:40	75	15.77	0.289	42.8	4.24	39.8	6.16	330	9
14:05:40	80	15.77	0.289	42.7	4.23	38.7	6.17	331.8	9.5
14:10:40	85	15.76	0.289	42.7	4.24	38.7	6.17	334.4	9.1
14:15:40	90	15.76	0.288	42.8	4.24	38.7	6.17	337.6	9.1
14:20:40	95	15.76	0.288	42.7	4.24	38.7	6.16	341.2	9
14:25:40	100	15.76	0.288	42.8	4.24	38.7	6.16	344	9.2
14:30:40	105	15.76	0.288	42.7	4.24	38.7	6.16	346.3	9
14:35:40	110	15.77	0.288	43	4.26	38.7	6.16	347.3	9
14:40:40	115	15.78	0.287	43	4.26	38.7	6.16	347.7	9.2
14:45:40	120	15.78	0.287	43	4.26	37.5	6.16	348.1	9.3
14:50:40	125	15.79	0.287	42.9	4.25	37.5	6.16	348.8	9
14:55:40	130	15.8	0.287	42.9	4.25	38.7	6.16	348.7	8.8
15:00:40	135	15.81	0.287	42.8	4.24	37.5	6.16	348.1	8.9
15:05:40	140	15.81	0.287	42.8	4.23	37.5	6.16	348.7	9.1
15:10:40	145	15.82	0.287	42.8	4.24	38.7	6.16	350.6	8.9
15:15:40	150	15.82	0.286	42.8	4.24	38.7	6.16	352.3	8.9
15:20:40	155	15.82	0.286	42.7	4.23	38.7	6.16	354	8.9
15:25:40	160	15.82	0.286	42.6	4.22	38.7	6.16	354.9	9.1
15:30:40	165	15.83	0.286	42.5	4.21	37.5	6.16	355.2	8.8
15:35:40	170	15.83	0.286	42.5	4.21	37.5	6.16	355.7	8.7
15:40:40	175	15.84	0.286	42.5	4.21	37.5	6.16	356	8.7
15:45:40	180	15.85	0.286	42.6	4.21	37.5	6.17	356.9	8.3
Averages		15.86	0.29	43.46	4.30	39.08	6.21	330.73	9.21

Slope	0.0008
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.28
SOD (g O_2/m^2*day)	**0.26**

Table F.20: YSI data for the Control chamber on 11/10/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
12:02:08	0	15.42	0.241	76.7	7.67	56	6.85	-0.2
12:07:08	5	15.43	0.24	75.4	7.53	55	6.84	-0.5
12:12:08	10	15.44	0.241	74.9	7.48	54	6.84	-0.4
12:17:08	15	15.45	0.241	74.6	7.44	55	6.84	-0.4
12:22:08	20	15.46	0.24	74.4	7.42	55	6.84	-0.1
12:27:08	25	15.47	0.241	74.2	7.4	55	6.84	-0.2
12:32:08	30	15.49	0.241	74.1	7.39	54	6.84	-0.2
12:37:08	35	15.5	0.24	74.1	7.38	54	6.84	-0.3
12:42:09	40	15.51	0.241	74	7.38	55	6.84	-0.3
12:47:09	45	15.52	0.241	74	7.37	54	6.84	0
12:52:09	50	15.53	0.241	73.9	7.36	55	6.84	-0.3
12:57:09	55	15.55	0.241	73.9	7.36	54	6.84	-0.4
13:02:09	60	15.56	0.241	73.9	7.36	55	6.84	-0.2
13:07:09	65	15.57	0.24	73.9	7.36	54	6.84	0.4
13:12:09	70	15.58	0.241	73.9	7.36	54	6.84	-0.3
13:17:09	75	15.59	0.24	73.9	7.35	54	6.84	-0.3
13:22:09	80	15.6	0.241	73.9	7.36	54	6.84	-0.4
13:27:09	85	15.61	0.241	73.9	7.35	54	6.84	-0.4
13:32:09	90	15.63	0.241	73.9	7.35	54	6.85	-0.5
13:37:09	95	15.64	0.24	74	7.35	54	6.85	-0.5
13:42:09	100	15.65	0.241	74	7.35	54	6.85	-0.4
13:47:09	105	15.66	0.241	73.9	7.35	54	6.85	-0.5
13:52:09	110	15.67	0.241	74	7.35	54	6.85	-0.6
13:57:09	115	15.68	0.241	74	7.35	54	6.85	-0.2
14:02:09	120	15.69	0.24	74	7.35	54	6.85	-0.4
14:07:09	125	15.7	0.241	74	7.35	54	6.85	-0.5
14:12:09	130	15.71	0.241	74	7.35	54	6.85	-0.6
14:17:09	135	15.72	0.241	74	7.35	54	6.85	-0.5
14:22:09	140	15.73	0.241	74.1	7.35	54	6.85	-0.5
14:27:09	145	15.73	0.241	74.1	7.35	54	6.85	-0.5
14:32:09	150	15.74	0.241	74.1	7.35	54	6.85	-0.5
14:37:09	155	15.75	0.241	74.1	7.35	54	6.85	-0.5
14:42:09	160	15.76	0.24	74.1	7.35	54	6.85	-0.5
14:47:09	165	15.76	0.241	74.1	7.35	54	6.85	-0.3
14:52:09	170	15.77	0.241	74.1	7.35	54	6.85	-0.5
14:57:09	175	15.78	0.241	74.2	7.35	53	6.85	-0.6
15:02:09	180	15.78	0.241	74.1	7.35	54	6.85	-0.5
15:07:09	185	15.79	0.241	74.2	7.35	54	6.85	-0.5
15:12:09	190	15.79	0.241	74.2	7.35	54	6.85	-0.6
15:17:09	195	15.8	0.24	74.2	7.35	53	6.85	-0.5
15:22:09	200	15.81	0.241	74.2	7.35	54	6.85	-0.5
15:27:09	205	15.81	0.241	74.2	7.35	54	6.85	-0.5
15:32:09	210	15.82	0.241	74.3	7.35	54	6.85	-0.5
Averages		15.64	0.24	74.18	7.37	54.16	6.85	-0.39

Slope	0.00005
V (L)	65.15
A (m2)	0.27
OD (g O2/m2*day)	**0.02**

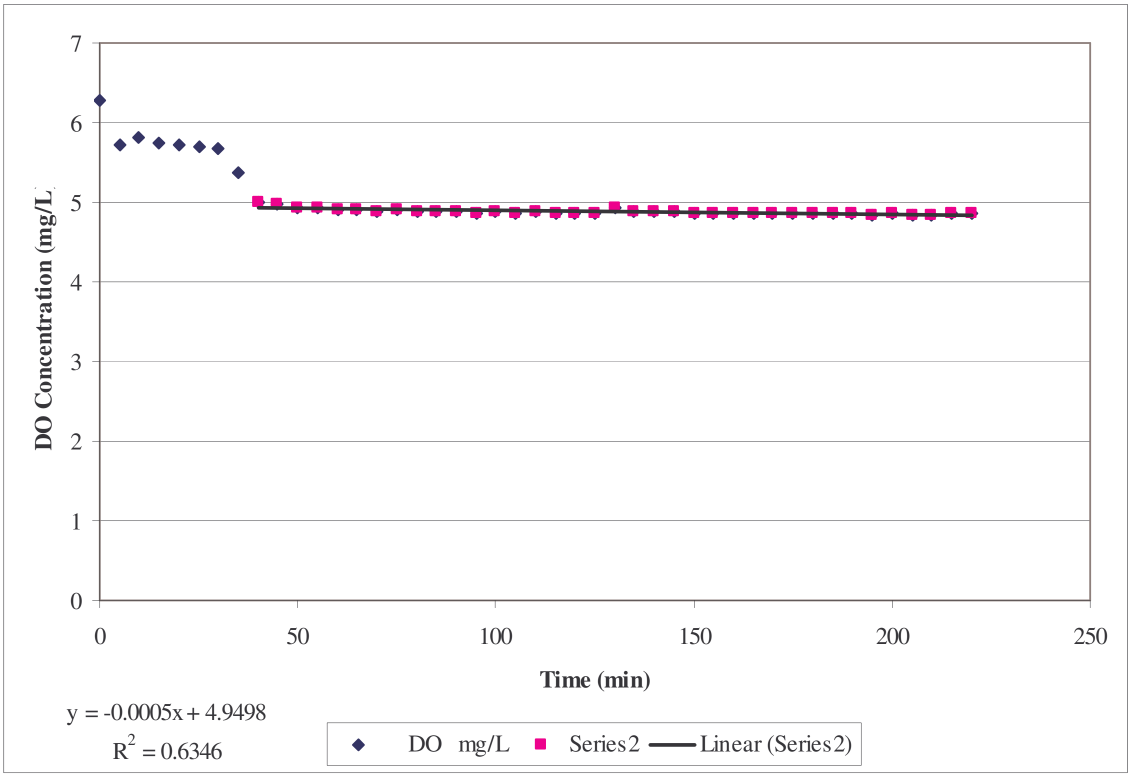

Figure F.18: Oxygen Depletion Curve for Chamber 1 on 11/10/2004 at the second forested study site within the Alapaha River Basin.

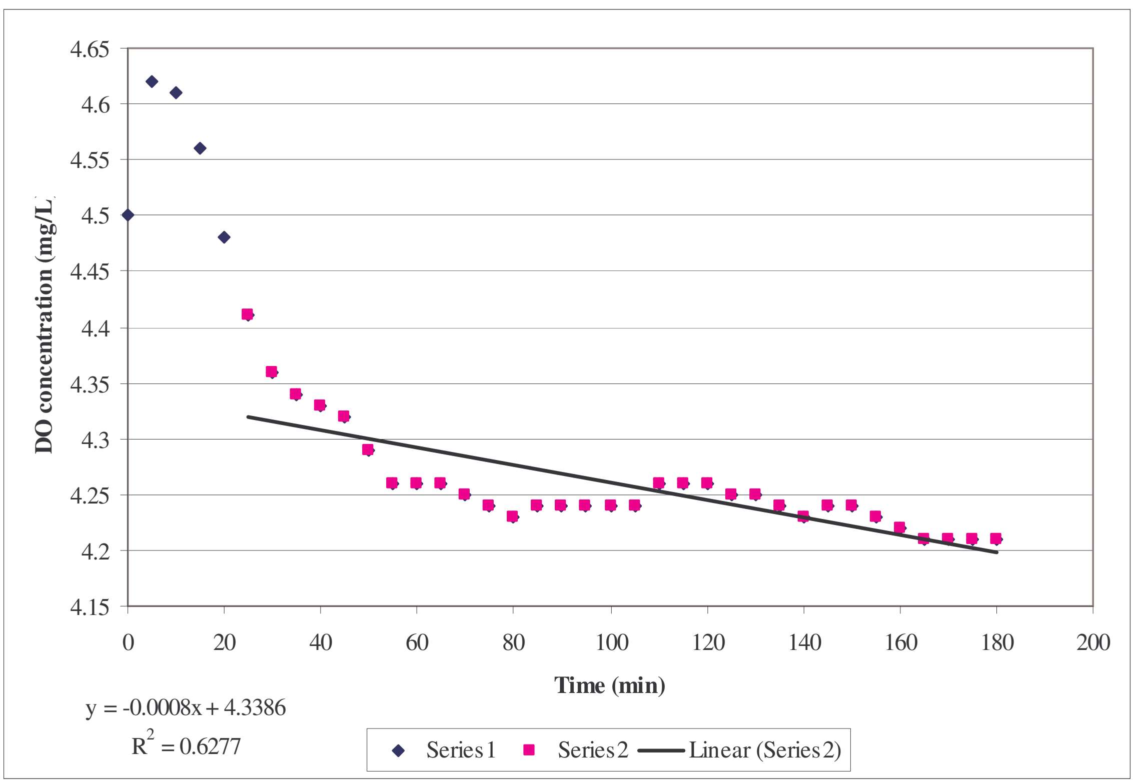

Figure F.19: Oxygen Depletion Curve for Chamber 2 on 11/10/2004 at the second forested study site within the Alapaha River Basin

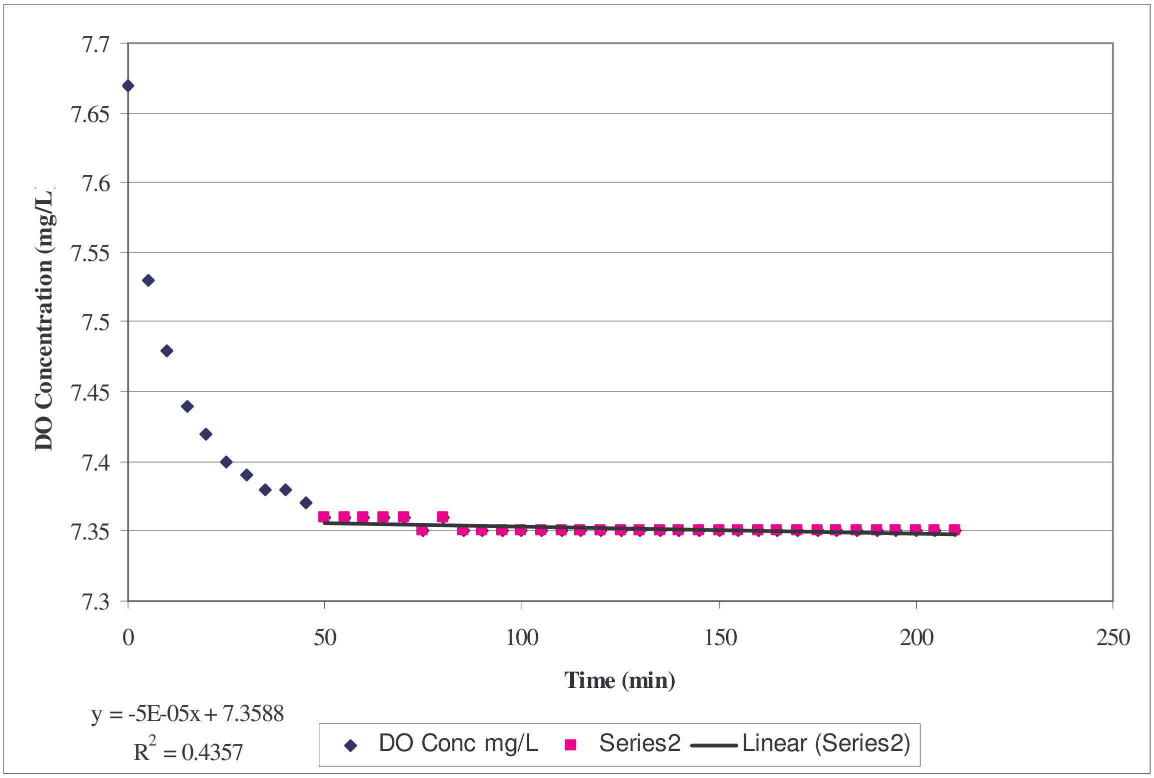

Figure F.20: Oxygen Depletion Curve for the Control chamber on 11/10/2004 at the second forested study site within the Alapaha River Basin.

Table F.21: YSI data for Chamber 1 on 02/09/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
11:05:40	0	13.54	0.183	62.1	6.46	39.8	6.39	4.9
11:10:40	5	13.59	0.183	61.8	6.43	39.8	6.43	4.9
11:15:40	10	13.64	0.183	61.5	6.39	41	6.46	4.8
11:20:40	15	13.68	0.183	61.1	6.34	39.8	6.48	5
11:25:40	20	13.71	0.183	60.8	6.3	39.8	6.49	4.9
11:30:40	25	13.74	0.183	60.4	6.25	38.7	6.51	4.9
11:35:40	30	13.77	0.183	60.5	6.26	39.8	6.51	4.8
11:40:40	35	13.8	0.183	60.2	6.23	38.7	6.52	4.8
11:45:40	40	13.83	0.183	60.2	6.22	39.8	6.52	4.8
11:50:40	45	13.86	0.183	60.1	6.22	39.8	6.52	4.7
11:55:40	50	13.89	0.183	60	6.19	38.7	6.52	4.7
12:00:40	55	13.92	0.183	60	6.2	39.8	6.53	4.7
12:05:40	60	13.94	0.183	60.1	6.19	39.8	6.53	4.7
12:10:40	65	13.97	0.183	60.2	6.21	38.7	6.53	4.7
12:15:40	70	14	0.183	60	6.19	39.8	6.53	4.7
12:20:40	75	14.02	0.183	59.9	6.17	39.8	6.53	4.7
12:25:40	80	14.04	0.183	60.1	6.18	39.8	6.53	4.7
12:30:40	85	14.07	0.183	60	6.17	39.8	6.53	4.7
12:35:40	90	14.1	0.183	60.1	6.18	39.8	6.53	4.6
12:40:40	95	14.13	0.183	60.1	6.17	39.8	6.53	4.7
12:45:40	100	14.15	0.183	60	6.16	38.7	6.53	4.6
12:50:40	105	14.18	0.183	60.2	6.17	39.8	6.53	4.7
12:55:40	110	14.2	0.183	59.9	6.14	41	6.53	4.6
13:00:40	115	14.23	0.183	59.9	6.14	38.7	6.53	4.5
13:05:40	120	14.25	0.183	59.8	6.13	38.7	6.53	4.6
13:10:40	125	14.28	0.183	59.9	6.13	38.7	6.53	4.6
13:15:40	130	14.3	0.183	59.9	6.13	38.7	6.52	4.5
13:20:40	135	14.31	0.183	59.8	6.12	38.7	6.53	4.5
13:25:40	140	14.33	0.183	59.9	6.13	39.8	6.52	4.5
13:30:40	145	14.35	0.183	59.9	6.12	38.7	6.52	4.5
13:35:40	150	14.36	0.183	59.7	6.1	37.5	6.52	4.6
13:40:40	155	14.38	0.183	59.6	6.09	38.7	6.52	4.5
13:45:40	160	14.39	0.183	59.7	6.1	38.7	6.52	4.5
13:50:40	165	14.4	0.183	59.8	6.1	38.7	6.52	4.4
13:55:40	170	14.42	0.183	59.6	6.08	38.7	6.52	4.4
14:00:40	175	14.43	0.183	59.6	6.08	38.7	6.52	4.4
Averages		14.06	0.18	60.18	6.19	39.31	6.51	4.66

Slope	0.0011
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.38
SOD (g O_2/m^2*day)	**-0.14**

Table F.22: YSI data for the Control Chamber on 02/09/2005

DateTime (M/D/Y)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
2/9/2005 23:41	0	13.92	0.185	94.1	9.71	59	7.09	1.9
3/24/2000 23:46	5	14.44	0.185	89.9	9.17	58	6.91	2.1
3/24/2000 23:51	10	14.7	0.185	88.8	9.01	59	6.86	2.6
3/24/2000 23:56	15	14.76	0.185	88.9	9	58	6.84	3.1
3/25/2000 0:01	20	14.76	0.186	88.6	8.98	58	6.82	1.8
3/25/2000 0:06	25	14.73	0.186	88.2	8.94	58	6.83	2.4
3/25/2000 0:11	30	14.72	0.186	89	9.02	57	6.83	1.9
3/25/2000 0:16	35	14.73	0.186	88.3	8.95	59	6.83	1.8
3/25/2000 0:21	40	14.76	0.186	88.1	8.93	58	6.84	2
3/25/2000 0:26	45	14.77	0.186	88	8.92	57	6.83	2.3
3/25/2000 0:31	50	14.77	0.186	88	8.91	57	6.83	2.5
3/25/2000 0:36	55	14.82	0.186	88	8.91	57	6.85	1.8
3/25/2000 0:41	60	14.88	0.186	87.9	8.88	58	6.84	2.3
3/25/2000 0:46	65	14.93	0.186	87.6	8.84	57	6.83	1.8
3/25/2000 0:51	70	14.98	0.187	87.6	8.83	58	6.83	2.1
3/25/2000 0:56	75	15.02	0.187	87.7	8.83	57	6.83	1.8
3/25/2000 1:01	80	15.07	0.187	87.5	8.8	58	6.83	2.4
3/25/2000 1:06	85	15.08	0.187	87.4	8.8	58	6.83	1.5
3/25/2000 1:11	90	15.12	0.188	87.5	8.8	58	6.83	1.7
3/25/2000 1:16	95	15.16	0.188	87.4	8.78	59	6.83	2
3/25/2000 1:21	100	15.21	0.188	87.4	8.77	58	6.83	1.6
3/25/2000 1:26	105	15.23	0.188	87.3	8.75	57	6.83	1.9
3/25/2000 1:31	110	15.21	0.188	87.3	8.76	57	6.82	1.7
3/25/2000 1:36	115	15.26	0.188	87.2	8.74	58	6.83	1.8
3/25/2000 1:41	120	15.26	0.188	87.3	8.75	58	6.82	1.4
3/25/2000 1:46	125	15.25	0.188	87.1	8.73	57	6.81	2.3
3/25/2000 1:51	130	15.25	0.188	87.9	8.81	58	6.82	1.6
3/25/2000 1:56	135	15.22	0.188	86.9	8.71	57	6.81	1.3
3/25/2000 2:01	140	15.16	0.188	86.8	8.72	57	6.81	1.7
3/25/2000 2:06	145	15.14	0.188	86.8	8.72	58	6.82	1.3
3/25/2000 2:11	150	15.13	0.188	87	8.75	57	6.81	1.3
3/25/2000 2:16	155	15.1	0.188	86.8	8.72	57	6.81	1.6
3/25/2000 2:21	160	15.09	0.188	86.6	8.72	57	6.81	1.5
3/25/2000 2:26	165	15.09	0.188	86.6	8.71	57	6.81	1.3
3/25/2000 2:31	170	15.08	0.188	86.7	8.72	56	6.81	1.4
3/25/2000 2:36	175	15.07	0.188	86.5	8.7	57	6.81	1.5
3/25/2000 2:41	180	15.04	0.188	86.5	8.71	57	6.81	1.2
3/25/2000 2:46	185	15.02	0.188	86.6	8.72	57	6.81	1.5
3/25/2000 2:51	190	17.7	0.002	106.8	10.17	61	6.91	4.5
3/25/2000 2:56	195	19.22	0.001	107.2	9.9	61	7.07	18.1
3/25/2000 3:01	200	20.11	0.001	106.4	9.65	63	7.13	5.2
Average		15.27	0.17	89.13	8.93	57.88	6.85	2.38
slope		0.002						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.52**						

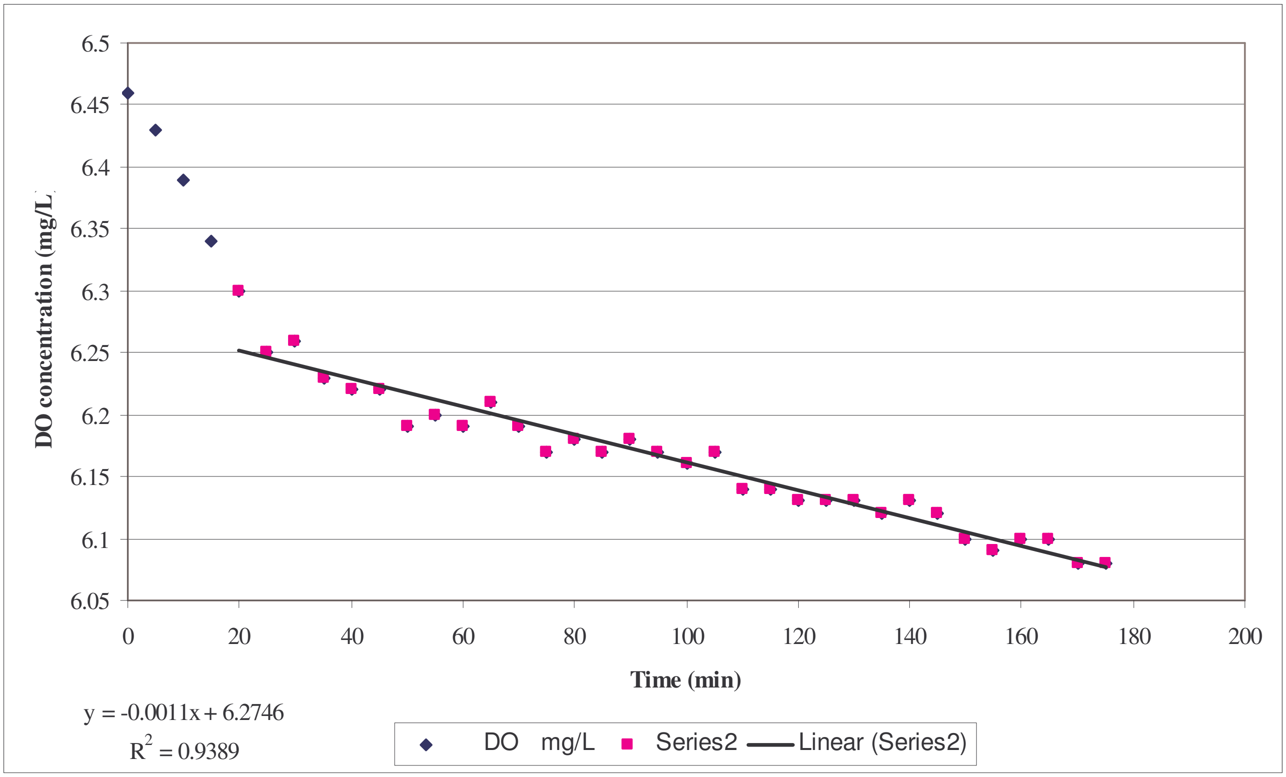

Figure F.21: Oxygen Depletion Curve for Chamber 1 on 02/09/2005 at the second forested study site within the Alapaha River Basin.

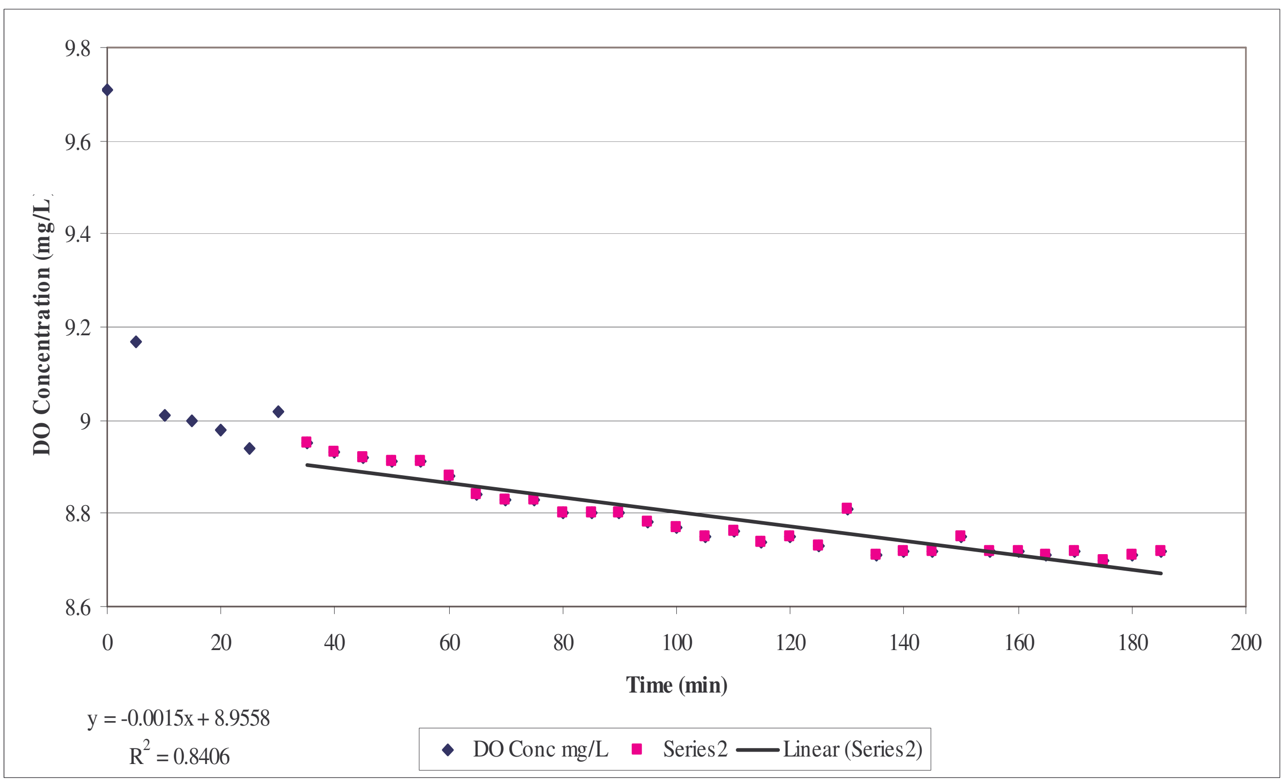

Figure F.22: Oxygen Depletion Curve for the Control chamber on 02/09/2005 at the second forested study site within the Alapaha River Basin.

Little River Basin

Agricultural Site

Table F.23: YSI data for Chamber 1 on 07/28/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
11:15:21	0	23.9	0.06	54.4	4.59	41.6	6.32	17.5
12:20:26	5	24.13	0.06	49.2	4.13	41	6.32	15.3
12:25:21	10	24.15	0.06	51.9	4.35	41	6.31	15.1
12:30:21	15	24.17	0.06	52	4.37	41.6	6.31	14.8
12:35:21	20	24.18	0.06	51.9	4.36	41	6.31	15
12:40:21	25	24.2	0.06	51.8	4.34	41.6	6.31	15
12:45:21	30	24.22	0.06	51.7	4.33	41.6	6.31	14.6
12:50:21	35	24.23	0.06	51.5	4.32	41.6	6.31	14.5
12:55:21	40	24.25	0.06	51.8	4.34	41	6.31	14.1
13:00:21	45	24.27	0.06	51.3	4.29	41	6.31	14.2
13:05:21	50	24.28	0.06	51.1	4.28	41.6	6.31	14.1
13:10:21	55	24.3	0.06	51	4.27	41	6.3	14.2
13:15:21	60	24.32	0.06	50.8	4.25	41.6	6.3	13.9
13:20:21	65	24.33	0.06	50.7	4.24	41.6	6.3	13.7
13:25:21	70	24.35	0.06	50.6	4.23	41.6	6.3	13.8
13:30:21	75	24.37	0.06	50.3	4.21	41	6.3	13.6
13:35:21	80	24.38	0.06	50.1	4.19	41.6	6.3	13.6
13:40:21	85	24.4	0.06	50	4.18	41.6	6.3	13.4
13:45:21	90	24.42	0.06	50.5	4.22	41.6	6.3	13.4
13:50:21	95	24.43	0.06	49.8	4.16	41	6.29	13.5
13:55:21	100	24.45	0.06	49.6	4.14	41	6.29	13.3
14:00:21	105	24.47	0.06	49.4	4.12	41.6	6.29	13.3
14:05:21	110	24.48	0.06	49.3	4.11	41	6.29	13.2
14:10:21	115	24.5	0.06	49	4.09	41.6	6.29	13.2
14:15:21	120	24.51	0.06	49.1	4.09	41	6.29	13.1
14:20:21	125	24.53	0.06	48.8	4.07	41.6	6.28	13
14:25:21	130	24.54	0.06	48.6	4.05	41.6	6.28	12.9
Averages		24.32	0.06	50.60	4.23	41.36	6.30	14.05

Slope	0.003
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.94
SOD (g O_2/m^2*day)	**0.66**

Table F.24: YSI data for Chamber 2 on 07/28/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
2:21:25	0	23.78	0.068	60.1	5.08	44	6.38	11.2
2:26:25	5	23.8	0.068	59.6	5.04	44	6.37	11.1
2:31:25	10	23.82	0.068	59.5	5.02	44	6.36	10.7
2:36:25	15	23.83	0.068	59.4	5.01	45	6.36	10.5
2:41:25	20	23.85	0.068	59.2	5	45	6.35	10.7
2:46:25	25	23.87	0.068	59.1	4.99	45	6.35	10.5
2:51:25	30	23.88	0.068	59	4.98	44	6.35	11.4
2:56:25	35	23.9	0.068	58.8	4.96	44	6.35	12
3:01:25	40	23.92	0.068	58.7	4.95	44	6.35	11.4
3:06:25	45	23.94	0.068	58.6	4.94	45	6.34	11.6
3:11:25	50	23.95	0.068	58.4	4.92	44	6.34	11.8
3:16:25	55	23.97	0.068	58.3	4.91	44	6.34	10.2
3:21:25	60	23.99	0.068	58.1	4.89	44	6.34	9.9
3:26:25	65	24.01	0.068	58	4.88	44	6.34	9.9
3:31:25	70	24.02	0.068	57.8	4.86	44	6.34	10
3:36:25	75	24.04	0.068	57.7	4.85	43	6.33	10
3:41:25	80	24.06	0.068	57.5	4.83	44	6.33	10.2
3:46:25	85	24.08	0.068	57.4	4.82	44	6.33	9.9
3:51:25	90	24.09	0.068	57.2	4.81	44	6.33	9.8
3:56:25	95	24.11	0.068	57.1	4.79	44	6.33	9.4
4:01:25	100	24.13	0.068	56.9	4.78	44	6.33	9.6
4:06:25	105	24.15	0.068	56.8	4.77	44	6.32	9.7
4:11:25	110	24.17	0.068	56.6	4.75	44	6.32	9.4
4:16:25	115	24.18	0.068	56.5	4.74	44	6.32	9.7
4:21:25	120	24.2	0.068	56.3	4.72	44	6.32	9.5
4:26:25	125	24.22	0.068	56.2	4.71	44	6.32	9.5
4:31:25	130	24.24	0.068	56	4.7	44	6.32	9.5
4:36:25	135	24.25	0.068	55.9	4.68	44	6.32	9
4:41:25	140	24.27	0.068	55.7	4.67	43	6.31	9.1
4:46:25	145	24.29	0.068	55.6	4.65	44	6.31	9.2
4:51:25	150	24.31	0.068	55.4	4.64	44	6.31	9.1
4:56:25	155	24.32	0.068	55.3	4.63	44	6.31	9.1
5:01:25	160	24.34	0.068	55.1	4.61	43	6.31	8.8
5:06:25	165	24.36	0.068	55	4.6	43	6.31	8.8
5:11:25	170	24.37	0.068	54.8	4.58	44	6.31	9.4
5:16:25	175	24.39	0.068	54.7	4.57	43	6.31	9
5:21:25	180	24.41	0.068	54.5	4.56	44	6.3	8.8
5:26:25	185	24.42	0.068	54.4	4.54	44	6.3	8.9
5:31:25	190	24.44	0.068	54.3	4.53	44	6.3	9.1
5:36:25	195	24.46	0.068	54.1	4.51	43	6.3	8.7
Averages		24.12	0.07	56.99	4.79	43.95	6.33	9.90

Slope	0.0028
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.97
SOD (g O_2/m^2*day)	**0.69**

Table F.25: YSI data for Chamber 3 on 07/28/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:15:40	0	23.97	0.148	65.9	5.55	86.7	5.23	403.4	15.9
11:20:40	5	23.98	0.143	64.8	5.46	85.5	5.28	404.8	16.1
11:25:40	10	24	0.138	63.9	5.38	85.5	5.32	406.8	15.5
11:30:40	15	24.02	0.125	63.2	5.32	84.4	5.35	408.4	15.2
11:35:40	20	24.03	0.114	62.6	5.26	83.8	5.37	409.2	15.3
11:40:40	25	24.05	0.107	62	5.22	83.8	5.39	410.2	14.9
11:45:40	30	24.07	0.096	61.5	5.17	81.4	5.4	410.8	14.7
11:50:40	35	24.09	0.09	61.1	5.14	81.4	5.42	410.9	14.5
11:55:40	40	24.11	0.088	60.7	5.1	81.4	5.43	411.4	14.5
12:00:40	45	24.13	0.087	60.4	5.07	81.4	5.44	411.7	14.4
12:05:40	50	24.15	0.083	60	5.04	81.4	5.46	410.8	14.1
12:10:40	55	24.17	0.082	59.8	5.02	81.4	5.46	411.5	14.2
12:15:40	60	24.19	0.081	59.5	4.99	80.3	5.47	411.9	14.2
12:20:40	65	24.21	0.078	59.1	4.96	79.7	5.48	412.2	14.3
12:25:40	70	24.23	0.074	58.8	4.93	79.7	5.48	412.4	14.3
12:30:40	75	24.24	0.073	58.5	4.9	78.5	5.48	412.4	13.9
12:35:40	80	24.26	0.073	58.2	4.88	79.7	5.49	412.8	13.8
12:40:40	85	24.28	0.072	57.9	4.85	79.7	5.49	412.3	13.8
12:45:40	90	24.3	0.072	57.7	4.83	79.7	5.49	412	14.1
12:50:40	95	24.32	0.07	57.5	4.81	79.7	5.5	411.7	13.8
12:55:40	100	24.34	0.07	57.3	4.79	78.5	5.49	412.2	13.7
13:00:40	105	24.36	0.07	57.1	4.77	78.5	5.5	412.4	13.7
13:05:40	110	24.38	0.07	56.8	4.75	77.3	5.5	412.7	13.4
13:10:40	115	24.39	0.07	56.5	4.72	77.3	5.5	412.7	13.4
13:15:40	120	24.41	0.07	56.3	4.7	77.3	5.5	412.8	13.7
13:20:40	125	24.43	0.07	56	4.68	77.3	5.5	412.8	13.5
13:25:40	130	24.44	0.07	55.8	4.66	77.3	5.5	412.7	13.3
13:30:40	135	24.46	0.07	55.5	4.64	77.3	5.5	412.9	13.4
13:35:40	140	24.48	0.069	55.3	4.62	77.3	5.5	412.9	13.3
13:40:40	145	24.5	0.07	55.1	4.6	76.2	5.5	412.6	13.3
13:45:40	150	24.51	0.069	54.9	4.58	77.3	5.5	412.5	13.3
13:50:40	155	24.53	0.069	54.7	4.56	77.3	5.5	412.5	13.2
13:55:40	160	24.55	0.069	54.4	4.53	77.3	5.5	412.2	13.4
14:00:40	165	24.56	0.069	54.2	4.52	78.5	5.5	412	13.4
14:05:40	170	24.58	0.069	54	4.5	77.3	5.5	412.1	13.3
14:10:40	175	24.6	0.069	53.8	4.48	76.2	5.5	412.4	13.2
14:15:40	180	24.61	0.069	53.5	4.45	76.2	5.5	412.4	13.1
14:20:40	185	24.63	0.069	53.3	4.44	76.2	5.5	412.2	13.3
14:25:40	190	24.65	0.069	53.1	4.42	76.2	5.5	412.1	13.1
14:30:40	195	24.66	0.069	52.9	4.4	76.2	5.5	412.2	13.1
14:35:40	200	24.68	0.069	52.7	4.38	75.6	5.5	412.2	13.1
14:40:40	205	25.03	0.03	94.4	7.8	80.3	5.93	426.4	255.2
Averages		24.35	0.08	58.59	4.90	79.38	5.47	411.80	19.69

Slope	0.0047
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.63
SOD (g O_2/m^2*day)	**1.36**

Table F.26: YSI data for the Control chamber on 07/28/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
10:55:00	0	23.9	0.059	62.3	5.26	76	6.27	1919.1
11:00:00	5	23.9	0.059	61.4	5.18	76	6.11	1918.9
11:05:00	10	23.93	0.059	61.1	5.15	76	6.04	1918.8
11:10:00	15	23.95	0.059	60.8	5.12	76	5.97	1918.8
11:15:00	20	23.97	0.059	60.7	5.11	76	5.93	1918.9
11:20:00	25	23.99	0.059	60.5	5.09	76	5.89	1918.9
11:25:00	30	24.01	0.059	60.3	5.08	76	5.86	1919
11:30:00	35	24.03	0.059	60.3	5.07	76	5.85	1919.1
11:35:00	40	24.05	0.059	60.2	5.06	76	5.82	1919.1
11:40:00	45	24.07	0.059	60.1	5.06	76	5.79	1919.2
11:45:00	50	24.09	0.059	58.5	4.92	75	5.73	1919.6
11:50:00	55	24.11	0.059	59.2	4.97	76	5.76	1919.5
11:55:00	60	24.13	0.059	59.6	5.01	76	5.74	1919.6
12:00:00	65	24.15	0.06	59.7	5.01	76	5.73	1919.6
12:05:00	70	24.16	0.06	59.8	5.02	76	5.73	1919.7
12:10:00	75	24.18	0.06	59.8	5.01	76	5.71	1919.8
12:15:00	80	24.2	0.06	59.8	5.01	76	5.71	1919.9
12:20:00	85	24.22	0.06	59.7	5.01	76	5.68	1920
12:25:00	90	24.24	0.06	59.7	5	76	5.68	1920.1
12:30:00	95	24.25	0.06	59.7	5	76	5.66	1920.2
12:35:00	100	24.27	0.06	59.6	4.99	76	5.66	1920.3
12:40:00	105	24.29	0.06	59.6	4.99	76	5.63	1920.4
12:45:00	110	24.31	0.06	59.6	4.99	76	5.64	1920.5
12:50:00	115	24.32	0.06	59.6	4.98	76	5.63	1920.6
12:55:00	120	24.34	0.06	59.5	4.98	77	5.63	1920.8
13:00:00	125	24.36	0.06	59.5	4.97	76	5.62	1920.8
13:05:00	130	24.38	0.06	59.4	4.97	76	5.62	1921
13:10:00	135	24.39	0.06	59.4	4.96	76	5.61	1921.1
13:15:00	140	24.41	0.06	59.3	4.96	76	5.61	1921.2
13:20:00	145	24.43	0.06	59.3	4.95	76	5.59	1921.3
13:25:00	150	24.45	0.06	59.3	4.95	76	5.6	1921.4
13:30:00	155	24.46	0.06	59.2	4.94	76	5.59	1921.5
13:35:00	160	24.48	0.06	59.3	4.94	76	5.59	1921.6
13:40:00	165	24.5	0.06	59.2	4.94	76	5.58	1921.7
13:45:00	170	24.51	0.06	59.2	4.94	75	5.57	1921.8
13:50:00	175	24.53	0.06	59.2	4.93	76	5.56	1921.9
13:55:00	180	24.55	0.06	59.1	4.93	76	5.55	1922
Averages		24.23	0.06	59.80	5.01	75.97	5.73	1920.21

Slope	0.0008
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	**0.28**

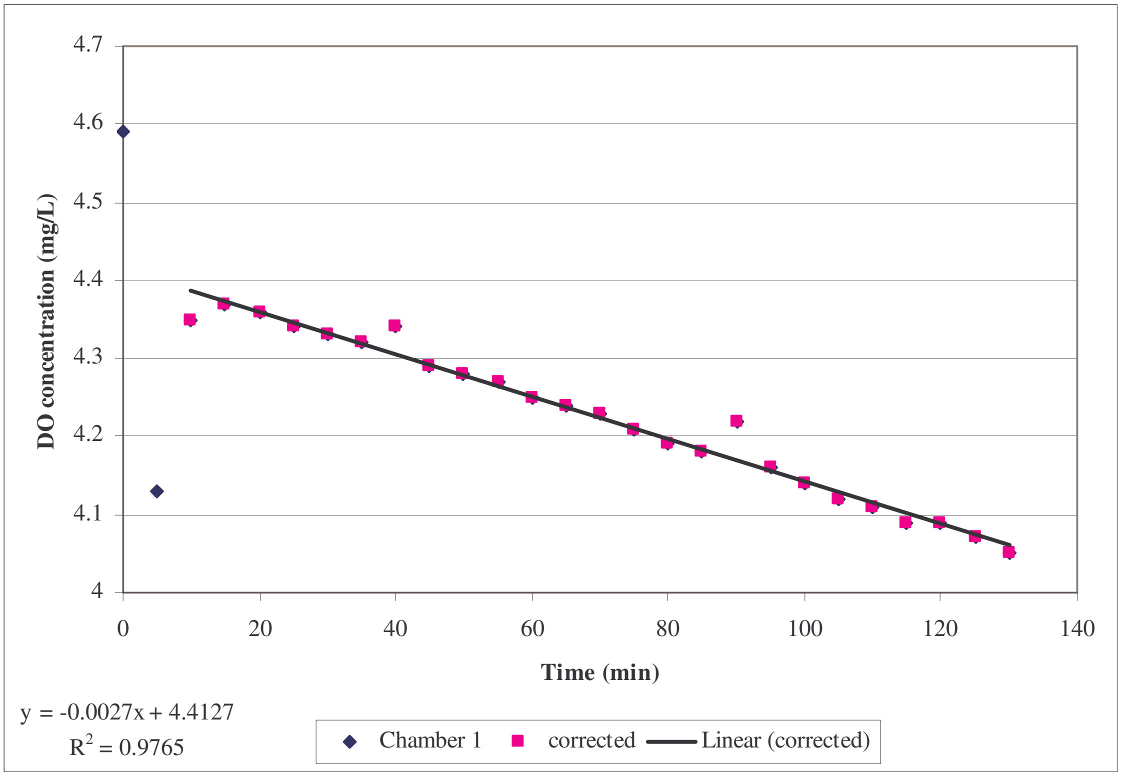

Figure F.23: Oxygen Depletion Curve for Chamber 1 on 07/28/2004 at the agricultural study site within the Little River Basin.

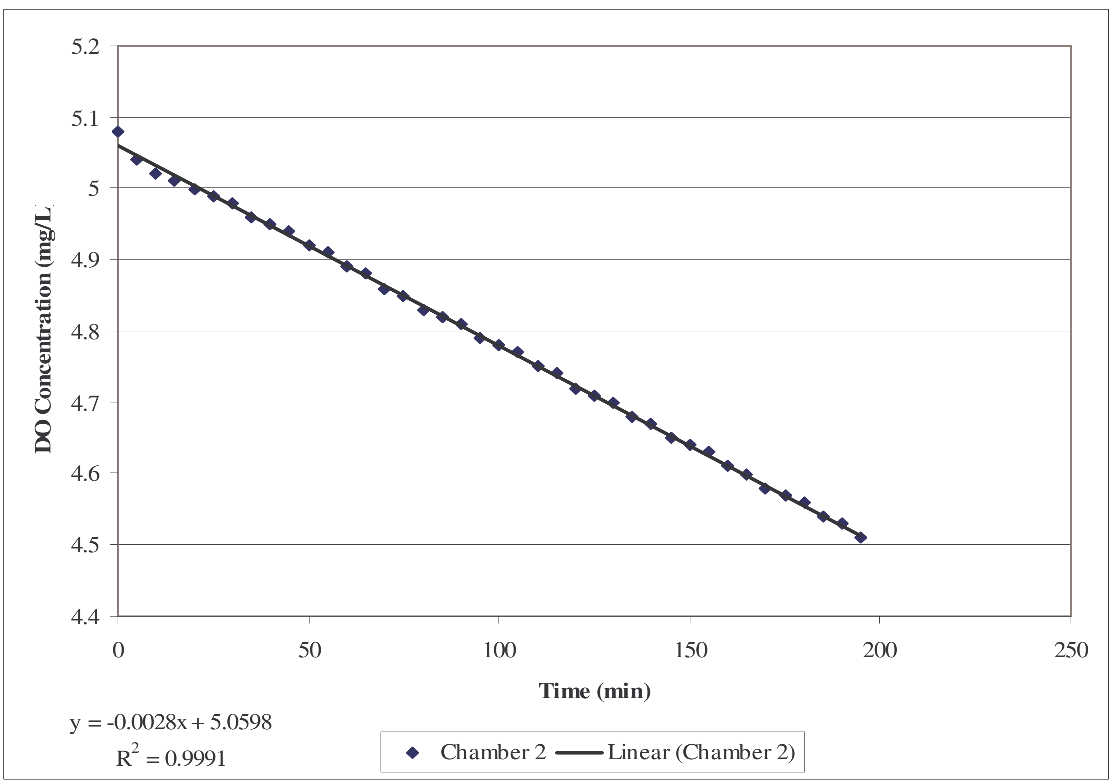

Figure F.24: Oxygen Depletion Curve for Chamber 2 on 07/28/2004 at the agricultural study site within the Little River Basin.

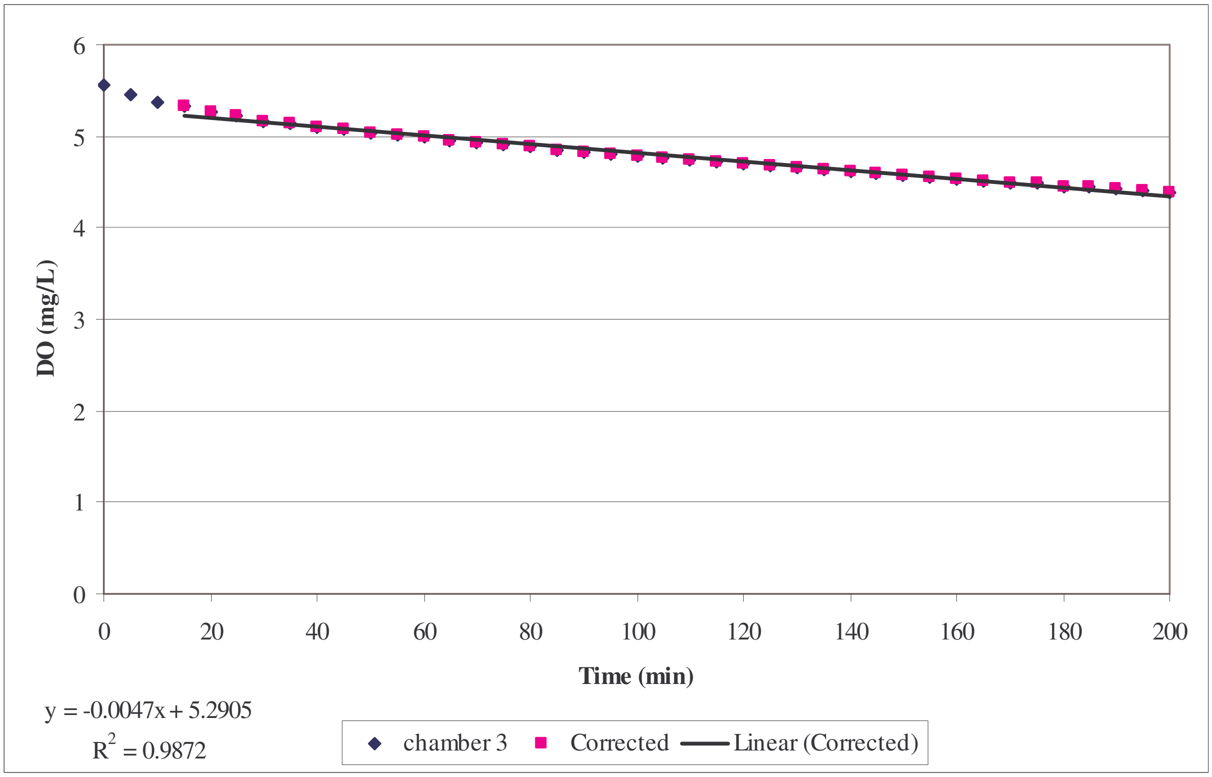

Figure F.25: Oxygen Depletion Curve for Chamber 3 on 07/28/2004 at the agricultural study site within the Little River Basin.

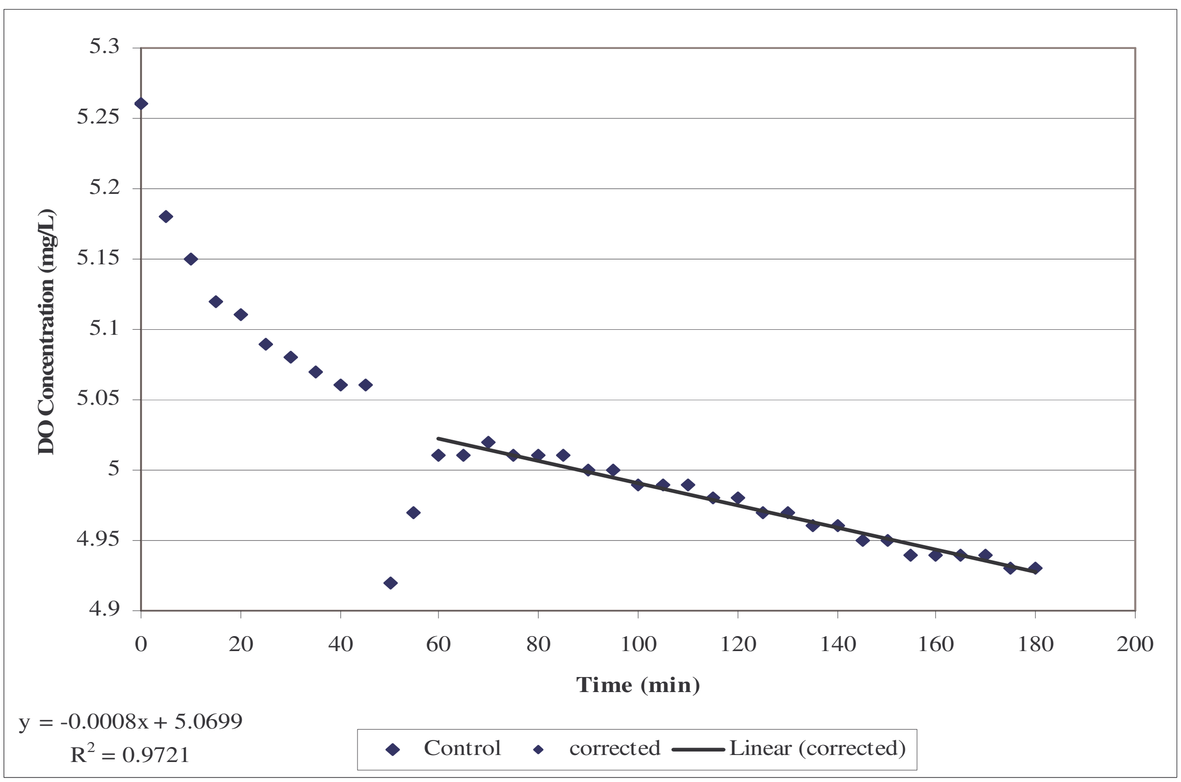

Figure F.26: Oxygen Depletion Curve for the Control chamber on 07/28/2004 at the agricultural study site within the Little River Basin.

Table F.27: YSI data for Chamber 1 on 10/20/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
9:30:02	0	20.01	0.084	39.2	3.57	53	7.93	103.9
9:35:02	5	20.03	0.084	33.5	3.05	52	7.85	120.5
9:40:02	10	20.06	0.083	32.1	2.92	52	7.81	115.7
9:45:02	15	20.08	0.083	31.2	2.83	52	7.77	112.1
9:50:02	20	20.09	0.083	30.5	2.77	52	7.74	109.5
9:55:02	25	20.11	0.083	29.9	2.71	52	7.71	108.9
10:00:02	30	20.13	0.083	29.5	2.67	52	7.67	106.7
10:05:02	35	20.14	0.083	29.1	2.64	52	7.61	105.2
10:10:02	40	20.16	0.083	28.9	2.62	51	7.54	104.6
10:15:02	45	20.17	0.083	28.6	2.59	51	7.5	103.8
10:20:02	50	20.18	0.083	28.3	2.57	51	7.47	103.2
10:25:02	55	20.19	0.083	28.1	2.55	52	7.44	102.3
10:30:02	60	20.2	0.083	27.9	2.53	51	7.42	101.7
10:35:02	65	20.21	0.083	27.7	2.51	51	7.4	100.4
10:40:02	70	20.22	0.083	27.5	2.49	51	7.38	99.1
10:45:02	75	20.23	0.083	27.3	2.47	51	7.36	98.8
10:50:02	80	20.25	0.083	27.2	2.46	51	7.34	97.7
10:55:02	85	20.26	0.083	27	2.44	51	7.32	97.6
11:00:02	90	20.27	0.083	26.8	2.43	51	7.3	97.6
11:05:02	95	20.29	0.083	26.7	2.41	51	7.3	97
11:10:02	100	20.3	0.082	26.5	2.4	51	7.28	96.4
11:15:02	105	20.32	0.083	26.4	2.39	51	7.26	95.9
11:20:02	110	20.34	0.082	26.2	2.37	51	7.25	95.6
11:25:02	115	20.36	0.082	26.1	2.36	51	7.24	94.8
11:30:02	120	20.38	0.082	26	2.34	51	7.23	94.3
11:35:02	125	20.41	0.082	25.9	2.33	51	7.23	93.6
11:40:02	130	20.43	0.082	25.7	2.32	51	7.22	93.8
11:45:02	135	20.45	0.082	25.6	2.31	51	7.21	93.7
11:50:02	140	20.48	0.082	25.5	2.29	51	7.2	93.3
11:55:02	145	20.5	0.082	25.3	2.28	51	7.19	93.2
12:00:02	150	20.52	0.082	25.2	2.27	51	7.18	91.8
12:05:02	155	20.54	0.082	25.1	2.26	51	7.16	91.7
12:10:02	160	20.56	0.082	25	2.25	51	7.15	91.1
12:15:02	165	20.58	0.082	24.9	2.24	51	7.14	91.6
12:20:02	170	20.6	0.082	24.8	2.22	50	7.14	91.2
12:25:02	175	20.62	0.082	24.6	2.21	51	7.13	91.3
12:30:02	180	20.64	0.082	24.5	2.2	51	7.12	90.2
12:35:02	185	20.66	0.082	24.4	2.19	51	7.12	90.6
12:40:02	190	20.68	0.082	24.3	2.18	50	7.12	90.2
12:45:02	195	20.7	0.082	24.2	2.17	51	7.11	90.2
12:50:02	200	20.72	0.082	24.1	2.16	51	7.1	89.3
Average		20.343	0.083	27.251	2.46	51	7.357	98.3

Slope	0.003
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.04
SOD (g O_2/m^2*day)	0.24

Table F.28: YSI data for Chamber 2 on 10/20/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
10:10:40	0	20.03	0.204	44.8	4.07	36.9	5.75	262.6	54.5
10:15:40	5	20.06	0.197	44.1	4.01	36.9	5.55	275.1	53.2
10:20:40	10	20.08	0.193	43.4	3.94	37.5	5.46	285	52.3
10:25:40	15	20.1	0.191	42.8	3.89	36.9	5.43	293.7	51.7
10:30:40	20	20.12	0.19	42.2	3.83	36.9	5.4	302.5	51.2
10:35:40	25	20.13	0.188	41.6	3.77	37.5	5.38	311.6	51.5
10:40:40	30	20.15	0.187	41	3.72	36.9	5.37	321	50.9
10:45:40	35	20.16	0.186	40.5	3.66	36.9	5.37	331.3	50.1
10:50:40	40	20.17	0.185	39.9	3.61	36.9	5.36	343	49.9
10:55:40	45	20.19	0.183	39.4	3.56	36.9	5.35	355.9	49.7
11:00:40	50	20.2	0.182	38.9	3.52	36.9	5.35	369.3	49.8
11:05:40	55	20.21	0.181	38.4	3.48	36.9	5.35	381	50.2
11:10:40	60	20.22	0.18	38	3.44	36.9	5.34	389.2	49.7
11:15:40	65	20.23	0.179	37.7	3.41	36.9	5.34	394.2	49.3
11:20:40	70	20.24	0.179	37.4	3.38	36.9	5.34	397.4	49.2
11:25:40	75	20.25	0.178	37.1	3.36	35.7	5.34	399.8	49.4
11:30:40	80	20.27	0.177	36.8	3.33	36.9	5.34	401.4	49.1
11:35:40	85	20.28	0.177	36.5	3.3	36.9	5.34	402.5	49
11:40:40	90	20.29	0.176	36.3	3.28	36.9	5.34	403.6	49.1
11:45:40	95	20.3	0.176	36	3.25	36.9	5.34	404.2	49
11:50:40	100	20.31	0.176	35.7	3.23	36.9	5.34	404.9	48.3
11:55:40	105	20.33	0.176	35.6	3.21	36.9	5.35	405.2	49.2
12:00:40	110	20.35	0.175	35.3	3.19	35.7	5.35	405.3	49
12:05:40	115	20.37	0.175	35.1	3.17	35.7	5.35	405.7	48.4
12:10:40	120	20.39	0.175	34.8	3.14	36.9	5.35	405.9	48.5
12:15:40	125	20.42	0.175	34.7	3.13	36.9	5.35	406	48.2
12:20:40	130	20.44	0.175	34.5	3.1	36.9	5.35	406.1	48.2
12:25:40	135	20.46	0.175	34.2	3.08	36.9	5.35	406.6	48.1
12:30:40	140	20.49	0.174	34	3.06	36.9	5.35	406.7	48.5
12:35:40	145	20.51	0.174	33.8	3.04	36.9	5.35	406.7	48.3
12:40:40	150	20.53	0.174	33.6	3.02	36.9	5.35	406.7	47.6
12:45:40	155	20.55	0.174	33.5	3.01	36.9	5.35	406.9	47.7
12:50:40	160	20.57	0.174	33.2	2.99	35.7	5.35	407	48.2
12:55:40	165	20.59	0.174	33.1	2.97	36.9	5.35	407	47.7
13:00:40	170	20.62	0.174	32.8	2.95	36.9	5.35	407.2	48
13:05:40	175	20.64	0.174	32.6	2.93	35.7	5.35	407.3	47.4
13:10:40	180	20.66	0.174	32.4	2.91	35.7	5.35	407.5	47.7
Average		20.32	0.18	37.07	3.35	36.74	5.37	376.57	49.40

Slope	0.0053
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.84
SOD (g O_2/m^2*day)	**1.04**

Table F.29: YSI data for the Control chamber on 10/20/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
10:06:59	0	20.47	0.083	68.8	6.2	48.6	6.23	861.5	9
10:10:40	5	20.91	0.084	67.4	6.02	48.6	6.2	839.5	10.7
10:15:40	10	20.92	0.084	67.8	6.05	48.6	6.18	806.1	9
10:20:40	15	20.94	0.084	67.5	6.02	48	6.19	779.3	9
10:25:40	20	20.95	0.084	67.6	6.03	48.6	6.19	755.9	8.7
10:30:40	25	20.98	0.085	63.5	5.66	48.6	6.19	735.7	9.5
10:35:40	30	20.96	0.084	66.7	5.95	48.6	6.19	705.6	9.4
10:40:40	35	20.82	0.085	66.6	5.96	48.6	6.19	703.6	9
10:45:40	40	20.76	0.085	66.9	5.99	48.6	6.2	679.3	9.4
10:50:40	45	20.71	0.085	67.5	6.05	48	6.2	667.7	9.4
10:55:40	50	20.67	0.085	67	6.02	48.6	6.2	658.8	9.2
11:00:40	55	20.63	0.085	67	6.02	48	6.2	651.1	9.2
11:05:40	60	20.6	0.085	67.2	6.04	48	6.2	657.3	9.2
11:10:40	65	20.58	0.085	67.6	6.08	48.6	6.2	651.6	9.2
11:15:40	70	20.56	0.085	67.8	6.09	48.6	6.2	646.5	9.2
11:20:40	75	20.55	0.085	68.3	6.14	48.6	6.2	642	9.2
11:25:40	80	20.56	0.085	68.3	6.15	48	6.2	637.9	8.9
11:30:40	85	20.57	0.085	68.3	6.14	48.6	6.2	634.6	9.1
11:35:40	90	20.6	0.085	68	6.11	48.6	6.2	631.6	9.1
11:40:40	95	20.64	0.085	68.1	6.11	48	6.2	629.2	9
11:45:40	100	20.74	0.086	68.1	6.1	48	6.2	627.1	9.1
11:50:40	105	20.82	0.086	68.1	6.09	48.6	6.2	625.1	9
11:55:40	110	20.89	0.086	68.7	6.14	48.6	6.2	623.1	8.7
12:00:40	115	20.87	0.086	69	6.17	48.6	6.2	621.6	9
12:05:40	120	20.87	0.086	69.4	6.21	49.8	6.2	620.4	8.7
12:10:40	125	20.88	0.086	69.2	6.19	48.6	6.2	619.2	8.7
12:15:40	130	20.9	0.087	69.2	6.18	48.6	6.2	617.6	8.7
12:20:40	135	20.91	0.087	69.5	6.21	48.6	6.2	616.8	8.7
12:25:40	140	20.91	0.087	69.6	6.22	48.6	6.2	615.5	8.7
12:30:40	145	20.94	0.087	69.5	6.2	48	6.2	614.5	8.7
12:35:40	150	20.96	0.087	70	6.25	48.6	6.2	614.1	8.7
12:40:40	155	20.97	0.087	70.1	6.25	48.6	6.2	613.1	8.7
12:45:40	160	20.98	0.087	70.2	6.26	48.6	6.2	612.4	8.7
12:50:40	165	20.96	0.087	70.8	6.32	48.6	6.2	611.7	8.7
12:55:40	170	20.96	0.087	70.3	6.28	48.6	6.2	611.1	8.8
13:00:40	175	20.98	0.087	71.2	6.34	48.6	6.2	610.6	8.7
13:05:40	180	20.99	0.087	71	6.33	48	6.2	610.3	8.7
13:10:40	185	21.01	0.087	71.1	6.33	48.6	6.2	609.8	8.7
13:15:40	190	21.06	0.087	71.5	6.37	48	6.2	609.5	8.6
Averages		20.82	0.09	68.57	6.14	48.48	6.20	658.4	8.99

Slope	0.0023
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	**0.80**

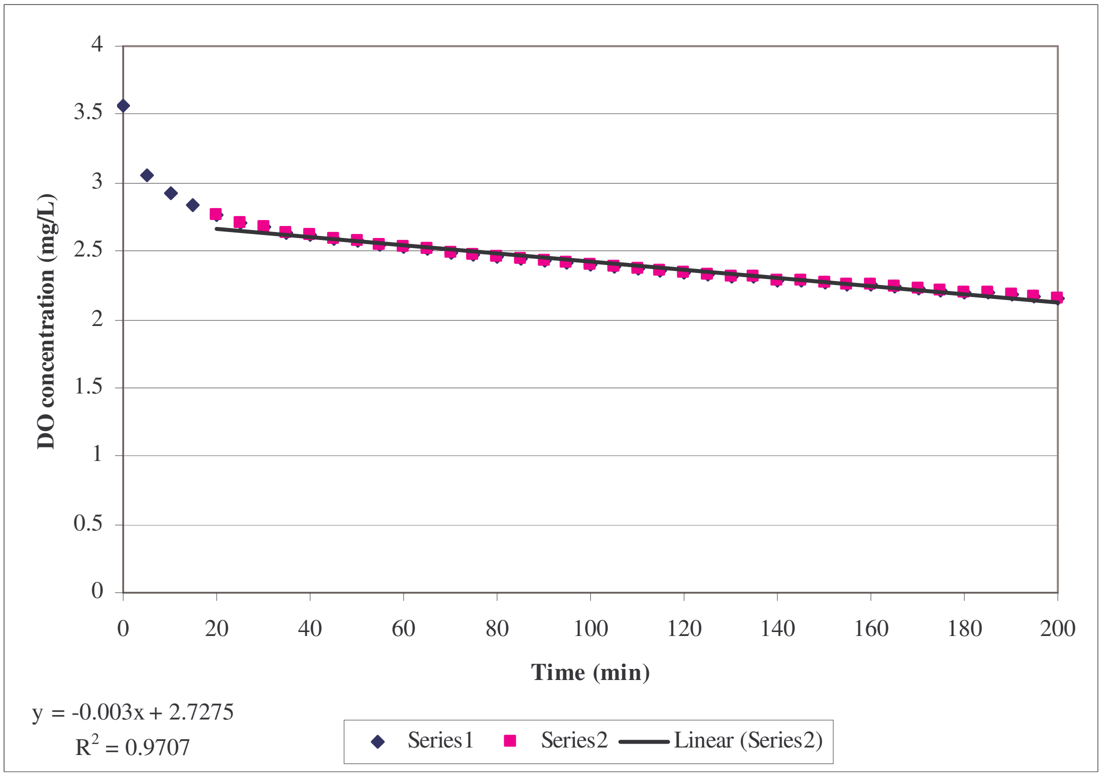

Figure F.27: Oxygen Depletion Curve for Chamber 1 on 10/20/2004 at the agricultural study site within the Little River Basin.

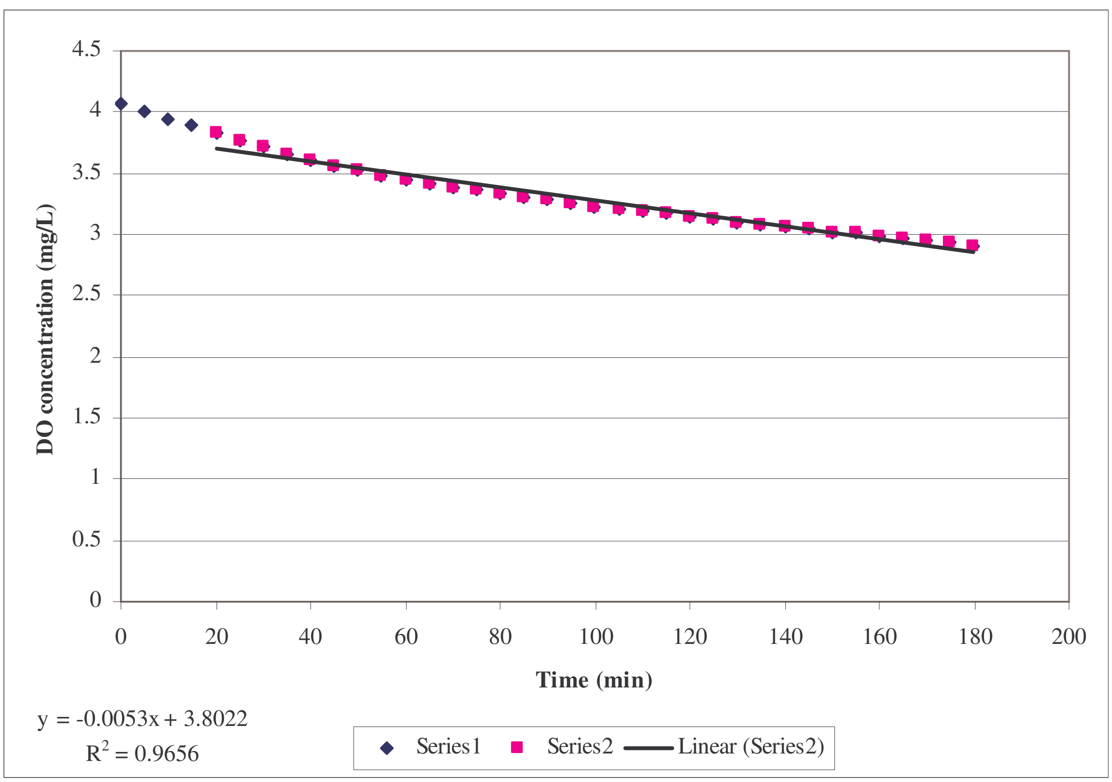

Figure F.28: Oxygen Depletion Curve for Chamber 2 on 10/20/2004 at the agricultural study site within the Little River Basin.

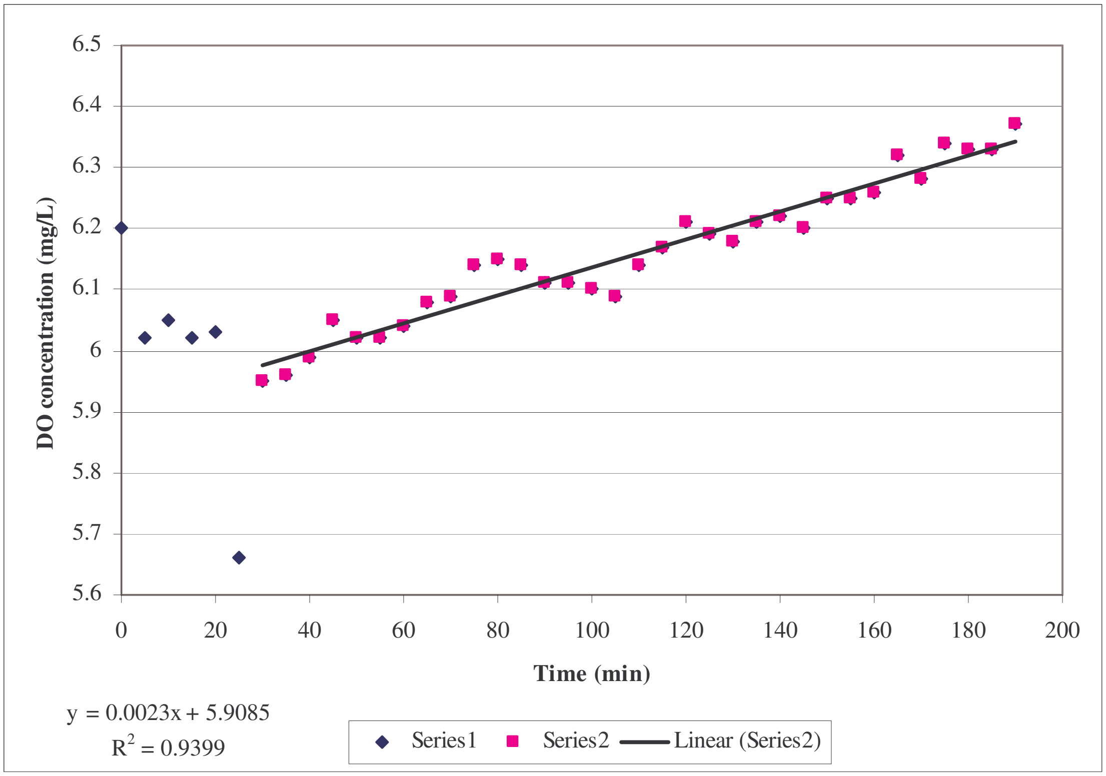

Figure F.29: Oxygen Depletion Curve for the Control chamber on 10/20/2004 at the agricultural study site within the Little River Basin.

Table F.30: YSI data for Chamber 1 on 12/07/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:00:40	0	15.56	0.657	79.2	7.88	36.9	6.67	338.7	11.7
12:05:40	5	15.55	0.627	79.1	7.87	35.7	5.93	342.7	11.4
12:10:40	10	15.58	0.62	78.9	7.84	35.7	5.7	349.2	11.3
12:15:40	15	15.61	0.616	78.6	7.8	35.7	5.6	354.9	11.1
12:20:40	20	15.64	0.612	78.3	7.78	35.7	5.54	356.6	10.5
12:25:40	25	15.67	0.608	78.1	7.75	35.7	5.5	360	10.4
12:30:40	30	15.68	0.594	78	7.73	36.9	5.52	360.5	10.2
12:35:40	35	15.71	0.592	77.8	7.72	35.7	5.51	362.5	10
12:40:40	40	15.74	0.591	77.7	7.7	36.9	5.5	363.2	9.8
12:45:40	45	15.77	0.589	77.6	7.68	36.9	5.49	364.4	9.8
12:50:40	50	15.8	0.588	77.5	7.67	35.7	5.48	365.6	10.3
12:55:40	55	15.83	0.588	77.4	7.66	35.7	5.48	366.1	10.1
13:00:40	60	15.86	0.587	77.4	7.64	36.9	5.48	367	9.8
13:05:40	65	15.89	0.587	77.3	7.63	36.9	5.48	368.3	10
13:10:40	70	15.91	0.587	77.2	7.62	36.9	5.48	369.1	9.9
13:15:40	75	15.94	0.586	77.2	7.61	36.9	5.48	369	9.7
13:20:40	80	15.97	0.586	77.1	7.6	35.7	5.48	370.3	9.7
13:25:40	85	16	0.586	77.1	7.59	36.9	5.48	370.7	9.5
13:30:40	90	16.03	0.586	77	7.58	35.7	5.48	371.9	9.7
13:35:40	95	16.07	0.586	77	7.57	36.9	5.48	372.6	9.7
13:40:40	100	16.1	0.587	77	7.57	36.9	5.49	372	9.7
13:45:40	105	16.14	0.587	77	7.56	36.9	5.48	372.1	9.7
13:50:40	110	16.18	0.587	77	7.55	35.7	5.48	372.9	9.7
13:55:40	115	16.22	0.588	76.9	7.54	35.7	5.48	372.7	9.7
14:00:40	120	16.26	0.588	76.9	7.53	35.7	5.48	373	9.7
14:05:40	125	16.3	0.589	76.8	7.52	35.7	5.48	372.7	9.7
14:10:40	130	16.35	0.589	76.8	7.51	36.9	5.48	372.7	10
14:15:40	135	16.39	0.589	76.8	7.5	35.7	5.48	374.6	9.8
14:20:40	140	16.43	0.59	76.8	7.5	35.7	5.49	374.8	9.7
14:25:40	145	16.48	0.59	76.8	7.49	35.7	5.48	376.5	9.7
14:30:40	150	16.51	0.591	76.7	7.48	35.7	5.49	376.7	9.7
14:35:40	155	16.55	0.591	76.7	7.47	35.7	5.48	376.8	9.8
14:40:40	160	16.59	0.591	76.6	7.46	35.7	5.49	377.7	9.8
14:45:40	165	16.63	0.592	76.6	7.45	35.7	5.48	378.1	9.8
14:50:40	170	16.69	0.603	76.5	7.43	35.7	5.46	380.9	9.7
14:55:40	175	16.69	0.593	76.5	7.43	36.9	5.47	380.9	9.7
15:00:40	180	16.72	0.593	76.5	7.42	35.7	5.48	380.7	9.9
Averages		16.08	0.59	77.31	7.60	36.15	5.54	368.35	10.01

Slope	0.002
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.69
SOD (g O_2/ m^2*day)	**0.63**

Table F.31: YSI data for Chamber 2 on 12/07/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
11:25:40	0	15.33	0.071	74.8	7.49	42.8	6.12	31.8
11:30:40	5	15.35	0.071	74.2	7.42	42.8	6.11	30.5
11:35:40	10	15.38	0.071	73.7	7.37	42.8	6.14	30.4
11:40:40	15	15.41	0.071	73.4	7.33	43.9	6.15	30
11:45:40	20	15.44	0.071	73	7.29	42.8	6.16	29.7
11:50:40	25	15.48	0.071	72.8	7.26	43.9	6.17	29.9
11:55:40	30	15.51	0.071	72.5	7.23	43.9	6.17	29.2
12:00:40	35	15.54	0.071	72.3	7.2	43.9	6.17	29.2
12:05:40	40	15.57	0.071	72	7.18	42.8	6.18	29.6
12:10:40	45	15.6	0.071	71.8	7.15	42.8	6.18	29
12:15:40	50	15.63	0.071	71.7	7.13	43.9	6.18	28.6
12:20:40	55	15.66	0.071	71.5	7.11	42.8	6.17	28.8
12:25:40	60	15.69	0.071	71.3	7.09	42.8	6.17	28.9
12:30:40	65	15.72	0.071	71.2	7.06	42.8	6.17	28.5
12:35:40	70	15.75	0.071	71	7.04	42.8	6.17	28.6
12:40:40	75	15.78	0.071	70.8	7.02	43.9	6.17	28.5
12:45:40	80	15.81	0.071	70.7	7	43.9	6.17	28.4
12:50:40	85	15.84	0.071	70.5	6.98	42.8	6.17	28.1
12:55:40	90	15.87	0.071	70.4	6.97	42.8	6.16	28.3
13:00:40	95	15.9	0.071	70.3	6.95	42.8	6.16	28.2
13:05:40	100	15.94	0.071	70.1	6.93	42.8	6.16	28
13:10:40	105	15.98	0.071	70	6.91	43.9	6.16	28.1
13:15:40	110	16.02	0.071	69.9	6.9	43.9	6.16	27.8
13:20:40	115	16.06	0.071	69.8	6.88	42.8	6.15	28.1
13:25:40	120	16.1	0.071	69.7	6.86	43.9	6.15	27.9
13:30:40	125	16.15	0.071	69.6	6.85	43.9	6.15	27.4
13:35:40	130	16.19	0.071	69.4	6.83	43.9	6.15	27.5
13:40:40	135	16.23	0.071	69.3	6.81	42.8	6.15	27.4
13:45:40	140	16.27	0.071	69.2	6.79	43.9	6.14	27.4
13:50:40	145	16.31	0.071	69.1	6.77	42.8	6.14	27.3
13:55:40	150	16.35	0.071	68.9	6.75	42.8	6.14	27.5
14:00:40	155	16.38	0.071	68.8	6.73	42.8	6.14	27.4
14:05:40	160	16.42	0.071	68.7	6.72	43.9	6.14	27.5
14:10:40	165	16.45	0.071	68.5	6.7	42.8	6.14	27.3
14:15:40	170	16.49	0.071	68.4	6.68	43.9	6.13	27.6
14:20:40	175	16.52	0.071	68.2	6.66	42.8	6.13	27.4
Averages		15.89	0.07	70.76	7.00	43.26	6.15	28.49
Slope		0.0039						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		1.36						
SOD (g O_2/m^2*day)		**1.29**						

Table F.32: YSI data for Chamber 2 on 12/07/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:50:55	0	15.41	0.067	69.2	6.92	48.6	7.01	752.3	40.4
11:55:40	5	15.4	0.067	62.3	6.23	48	6.02	560.5	56.8
12:00:21	10	15.44	0.067	55.4	5.54	46.9	5.96	642.7	56.5
12:05:21	15	15.49	0.066	53.4	5.33	45.7	5.93	673.8	57.8
12:10:21	20	15.52	0.066	52.5	5.23	46.9	5.91	678.5	58.7
12:15:21	25	15.57	0.066	51.8	5.16	46.9	5.9	678.9	56.5
12:20:21	30	15.61	0.066	51.4	5.11	45.7	5.9	677.5	56.5
12:25:21	35	15.65	0.066	51	5.07	46.9	5.9	676	56.8
12:30:21	40	15.69	0.066	50.7	5.03	46.9	5.9	674.3	56.2
12:35:21	45	15.72	0.066	50.3	5	45.7	5.89	673	56
12:40:21	50	15.76	0.066	50.1	4.97	45.7	5.89	672	55.7
12:45:21	55	15.79	0.066	49.9	4.95	45.7	5.89	670.9	55.6
12:50:21	60	15.82	0.066	49.6	4.92	45.7	5.89	670.3	55.4
12:55:21	65	15.85	0.066	49.4	4.89	44.5	5.89	669.8	55.4
13:00:21	70	15.88	0.066	49.2	4.87	45.7	5.89	669.5	55.6
13:05:21	75	15.91	0.066	49	4.84	45.7	5.89	669.4	55.2
13:10:21	80	15.94	0.066	48.8	4.82	45.7	5.88	669.3	55.6
13:15:21	85	15.98	0.066	48.6	4.79	45.7	5.88	669.9	54.9
13:20:21	90	16.01	0.066	48.3	4.77	44.5	5.88	670.2	55.8
13:25:21	95	16.05	0.066	48.2	4.76	44.5	5.88	670.4	54.6
13:30:21	100	16.08	0.066	48.1	4.74	45.7	5.88	670.8	54.4
13:35:21	105	16.12	0.066	47.9	4.71	44.5	5.88	671.3	54.8
13:40:21	110	16.16	0.066	47.7	4.69	45.7	5.88	672.1	54.6
13:45:21	115	16.2	0.066	47.5	4.67	45.7	5.88	672.8	54.3
13:50:21	120	16.25	0.066	47.4	4.65	44.5	5.87	673.5	53.7
13:55:21	125	16.29	0.066	47.3	4.64	44.5	5.87	674.3	54.2
14:00:21	130	16.33	0.066	47.1	4.62	44.5	5.87	674.9	53.6
14:05:21	135	16.37	0.066	46.9	4.6	45.7	5.87	675.8	53.4
14:10:21	140	16.41	0.066	46.8	4.58	45.7	5.87	676.7	54.4
14:15:21	145	16.45	0.066	46.6	4.56	44.5	5.87	677.5	53.6
14:20:21	150	16.49	0.066	46.5	4.54	45.7	5.87	678.5	53.2
14:25:21	155	16.53	0.066	46.3	4.52	44.5	5.86	679.4	53.4
14:30:21	160	16.56	0.066	46.2	4.5	44.5	5.86	680.2	54.1
14:35:21	165	16.6	0.066	46	4.48	44.5	5.86	681	52.8
14:40:21	170	16.63	0.066	45.8	4.46	44.5	5.86	681.8	52.6
14:45:21	175	16.66	0.066	45.7	4.45	44.5	5.86	682.6	52.4
14:50:21	180	16.7	0.066	45.5	4.43	45.7	5.85	683.6	52.5
14:55:21	185	16.73	0.066	45.4	4.41	44.5	5.85	684.5	52.1
15:00:21	190	16.76	0.066	45.2	4.39	44.5	5.85	685.4	51.6
Averages		16.07	0.07	49.36	4.87	45.53	5.91	673.48	54.40

Slope	0.0045
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.56
SOD (g O_2/m^2*day)	**1.49**

Table F.33: YSI data for the Control chamber on 12/07/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
0:14:14	0	15.52	0.071	76.6	7.63	48	6.15	12
0:19:14	5	15.55	0.071	74.7	7.45	49	6.11	11.7
0:24:14	10	15.59	0.071	74.6	7.43	48	6.11	11.5
0:29:14	15	15.62	0.071	74.5	7.42	48	6.11	12.4
0:34:14	20	15.65	0.071	74.5	7.41	48	6.11	10.8
0:39:14	25	15.69	0.071	74.6	7.41	48	6.1	11.5
0:44:14	30	15.72	0.071	74.5	7.4	48	6.1	10.5
0:49:14	35	15.75	0.071	74.6	7.41	48	6.1	11.2
0:54:14	40	15.78	0.071	74.7	7.4	48	6.1	10.7
0:59:14	45	15.81	0.071	74.7	7.4	47	6.1	10.4
1:04:14	50	15.84	0.071	74.7	7.4	47	6.1	11.5
1:09:14	55	15.87	0.071	74.8	7.4	47	6.1	10.4
1:14:14	60	15.9	0.071	74.9	7.4	47	6.1	10.5
1:19:14	65	15.93	0.071	74.9	7.41	47	6.1	10.4
1:24:14	70	15.96	0.071	74.9	7.4	47	6.1	10.9
1:29:14	75	15.99	0.071	75	7.4	47	6.1	11
1:34:14	80	16.02	0.071	75.1	7.41	47	6.1	11.3
1:39:14	85	16.05	0.071	75.2	7.41	47	6.1	10.3
1:44:14	90	16.09	0.071	75.3	7.41	47	6.1	11.5
1:49:14	95	16.13	0.071	75.3	7.41	47	6.1	10.8
1:54:14	100	16.16	0.071	75.4	7.41	47	6.1	10.3
1:59:14	105	16.2	0.071	75.5	7.42	47	6.1	12.1
2:04:14	110	16.24	0.071	75.5	7.41	47	6.1	10.8
2:09:14	115	16.28	0.071	75.6	7.42	47	6.1	10.5
2:14:14	120	16.31	0.071	75.7	7.42	47	6.1	11.4
2:19:14	125	16.36	0.071	75.7	7.42	46	6.1	10.8
2:24:14	130	16.4	0.071	75.9	7.43	47	6.1	10.4
2:29:14	135	16.44	0.071	75.9	7.43	47	6.1	10.5
2:34:14	140	16.47	0.071	76	7.42	46	6.1	10.9
2:39:14	145	16.52	0.071	76	7.42	47	6.1	10.9
2:44:14	150	16.55	0.071	76.2	7.43	47	6.1	11
2:49:14	155	16.59	0.071	76.2	7.43	47	6.1	11
2:54:14	160	16.62	0.071	76.3	7.43	47	6.1	10.2
2:59:14	165	16.65	0.071	76.4	7.43	46	6.1	10.7
3:04:14	170	16.69	0.071	76.4	7.43	47	6.09	10.5
3:09:14	175	16.72	0.071	76.4	7.43	46	6.1	10.5
3:14:14	180	16.75	0.071	76.5	7.43	46	6.1	10.6
3:19:14	185	16.78	0.071	76.6	7.43	47	6.1	10.6
Averages		16.14	0.07	75.43	7.42	47.13	6.10	10.92
Slope		0.0002						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.07**						

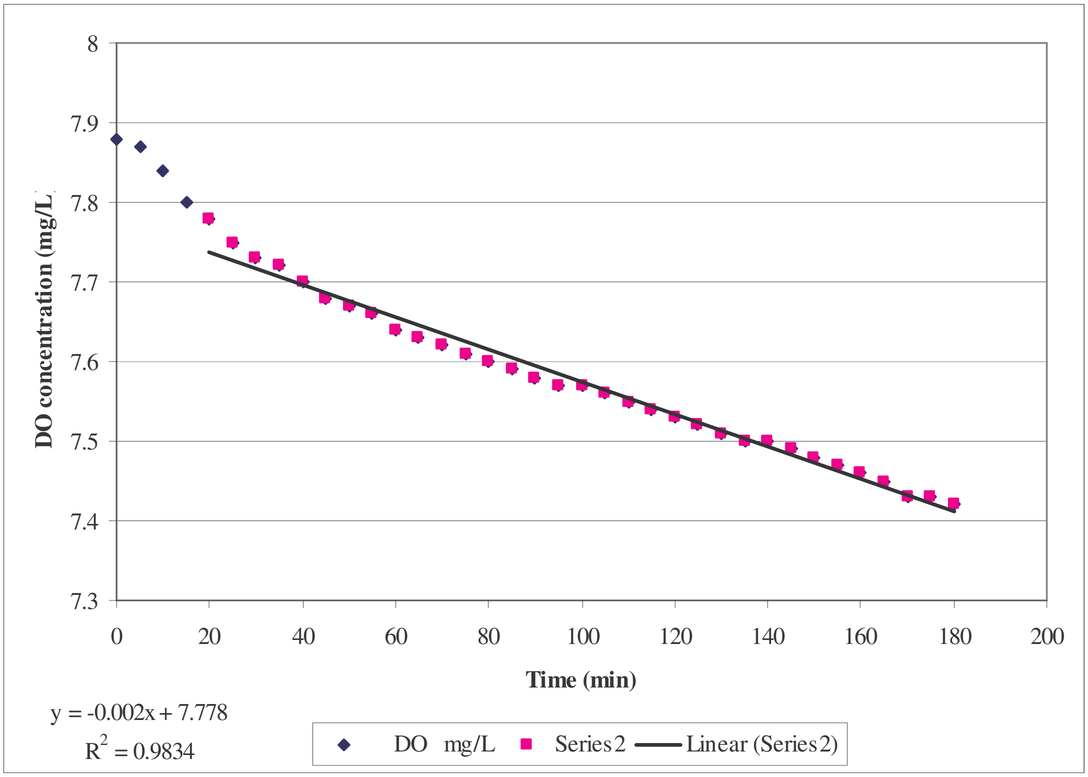

Figure F.30: Oxygen Depletion Curve for Chamber 1 on 12/07/2004 at the agricultural study site within the Little River Basin.

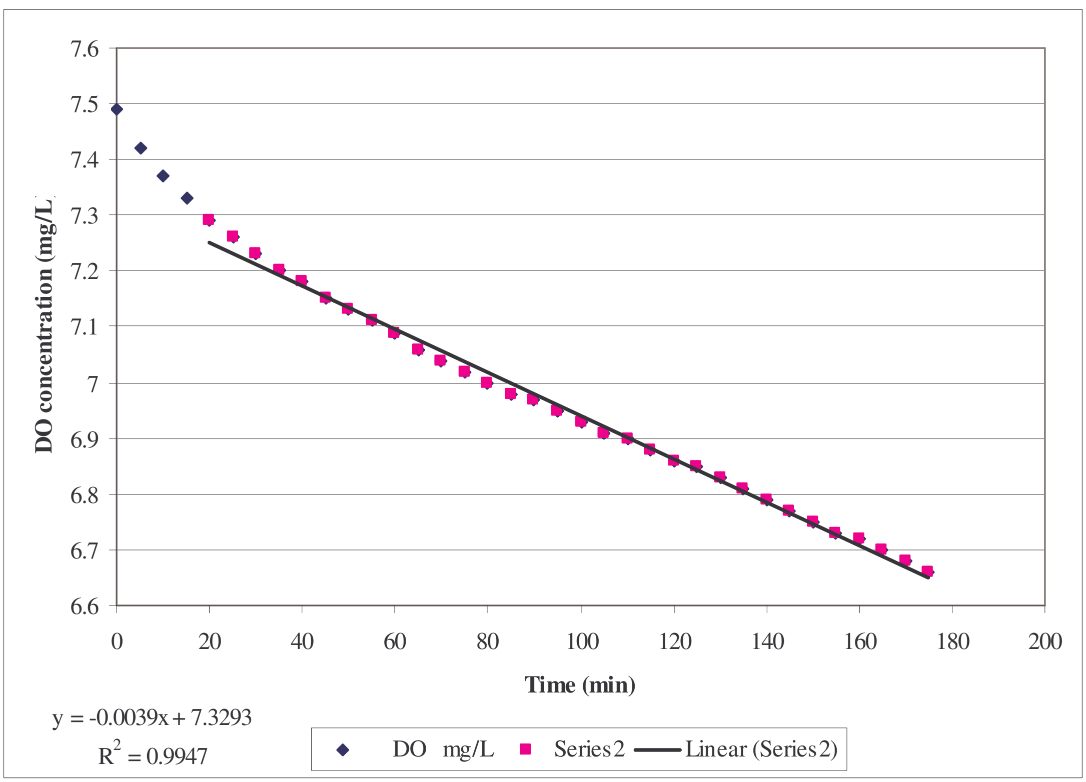

Figure F.31: Oxygen Depletion Curve for Chamber 2 on 12/07/2004 at the agricultural study site within the Little River Basin.

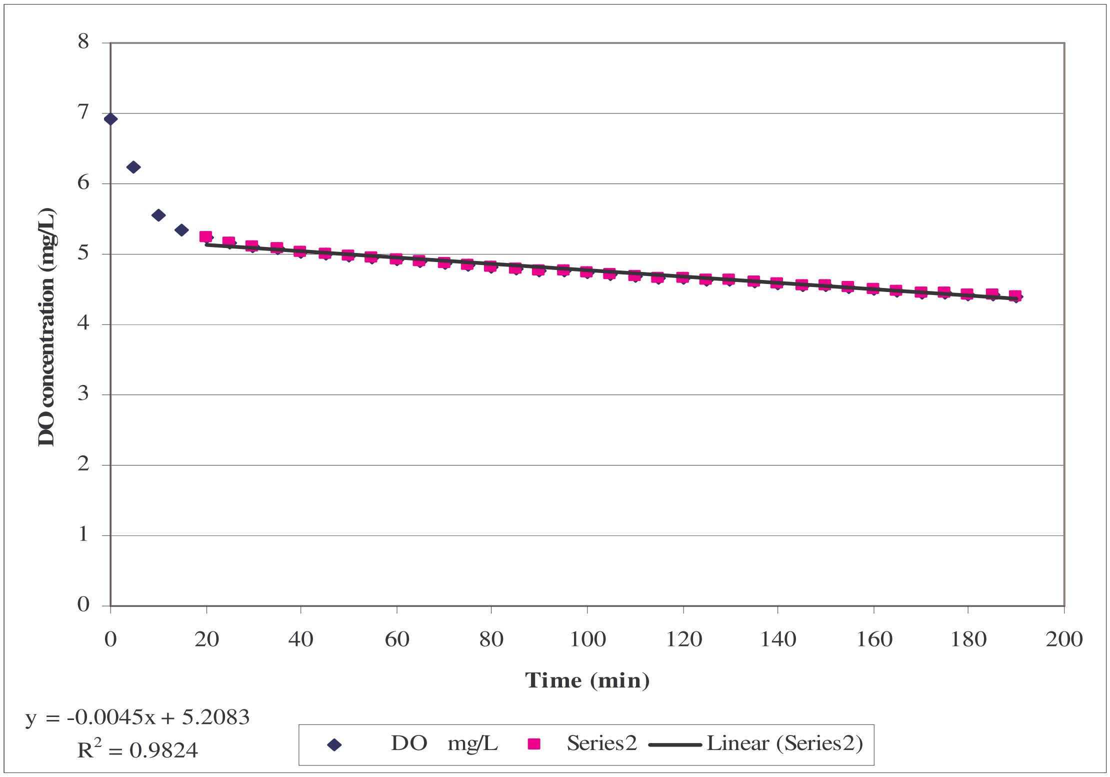

Figure F.32: Oxygen Depletion Curve for Chamber 3 on 12/07/2004 at the agricultural study site within the Little River Basin.

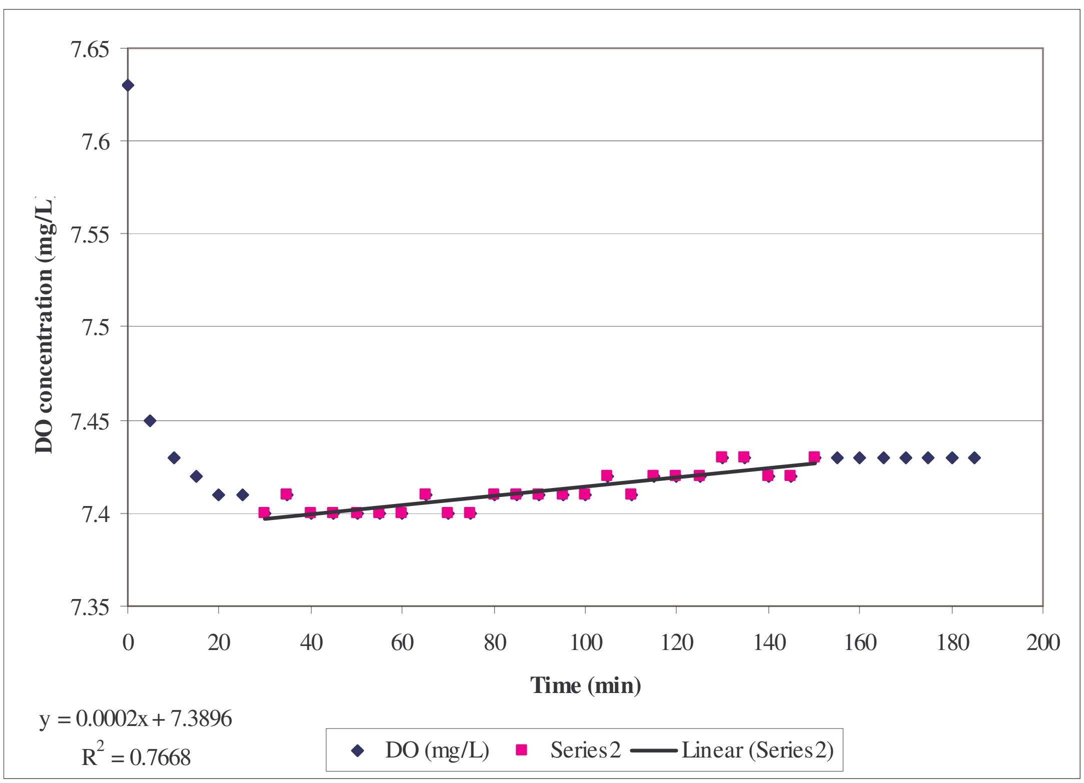

Figure F.33: Oxygen Depletion Curve for the Control chamber on 12/07/2004 at the agricultural study site within the Little River Basin.

Table F.34: YSI data for Chamber 2 on 05/03/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
10:50:40	0	15.09	0.064	82.5	8.3	42.8	6.32	14.1
10:55:40	5	15.11	0.064	82.2	8.27	41.6	6.32	14.1
11:00:40	10	15.13	0.064	81.9	8.24	41.6	6.32	14.1
11:05:40	15	15.16	0.064	81.7	8.21	42.8	6.31	13.7
11:10:40	20	15.18	0.064	81.6	8.19	42.8	6.32	13.6
11:15:40	25	15.21	0.064	81.5	8.18	41.6	6.31	13.6
11:20:40	30	15.24	0.064	81.3	8.16	42.8	6.32	13.3
11:25:40	35	15.27	0.064	81.2	8.14	42.8	6.31	13.2
11:30:40	40	15.3	0.064	81.2	8.13	41.6	6.31	13.3
11:35:40	45	15.33	0.064	81.1	8.12	42.8	6.31	13
11:40:40	50	15.36	0.064	81	8.1	42.8	6.3	12.8
11:45:40	55	15.39	0.064	80.9	8.09	42.8	6.3	12.8
11:50:40	60	15.42	0.064	80.9	8.08	41.6	6.3	12.8
11:55:40	65	15.46	0.064	80.8	8.07	42.8	6.3	12.6
12:00:40	70	15.49	0.064	80.8	8.06	41.6	6.3	12.6
12:05:40	75	15.53	0.064	80.8	8.05	41.6	6.3	12.6
12:10:40	80	15.57	0.064	80.8	8.04	42.8	6.3	12.3
12:15:40	85	15.6	0.064	80.7	8.03	41.6	6.29	12.3
12:20:40	90	15.63	0.064	80.7	8.02	42.8	6.29	12.4
12:25:40	95	15.67	0.064	80.6	8.01	42.8	6.29	12.3
12:30:40	100	15.71	0.064	80.6	8	41.6	6.29	12.2
12:35:40	105	15.75	0.064	80.6	7.99	42.8	6.29	12.2
12:40:40	110	15.79	0.064	80.6	7.99	41.6	6.29	12
12:45:40	115	15.83	0.064	80.5	7.98	43.9	6.29	12.2
12:50:40	120	15.87	0.064	80.5	7.97	43.9	6.29	12
12:55:40	125	15.91	0.064	80.5	7.96	42.8	6.28	12
13:00:40	130	15.95	0.064	80.5	7.95	42.8	6.28	12.1
13:05:40	135	15.99	0.064	80.5	7.94	42.8	6.28	11.9
13:10:40	140	16.04	0.064	80.4	7.93	42.8	6.28	11.9
13:15:40	145	16.08	0.064	80.4	7.92	41.6	6.28	11.8
13:20:40	150	16.12	0.064	80.4	7.91	41.6	6.27	11.8
13:25:40	155	16.16	0.064	80.4	7.91	42.8	6.28	11.9
13:30:40	160	16.2	0.064	80.4	7.9	42.8	6.28	11.7
13:35:40	165	16.25	0.064	80.3	7.89	42.8	6.27	11.9
13:40:40	170	16.29	0.064	80.3	7.88	42.8	6.27	11.7
13:45:40	175	16.33	0.064	80.3	7.87	42.8	6.27	11.9
Averages		15.650	0.064	80.872	8.041	42.461	6.295	12.575
Slope		0.002						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		0.69						
SOD (g O_2/m^2*day)		**0.28**						

Table F.35: YSI data for Chamber 3 on 05/03/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
10:40:40	0	15.25	1.276	85.5	8.53	43.9	7.29	147.3	43.2
10:45:40	5	15.29	1.197	75.6	7.55	44.5	6.3	185.6	88.1
10:50:40	10	15.3	1.172	76	7.59	43.9	5.97	201.7	85.6
10:55:40	15	15.35	1.151	76.9	7.66	43.9	5.82	209.1	86.3
11:00:40	20	15.37	1.134	77.6	7.73	44.5	5.73	210.8	85
11:05:40	25	15.39	1.121	78.1	7.78	44.5	5.65	211.3	84.7
11:10:40	30	15.42	1.111	78.2	7.79	43.9	5.6	211.7	83.1
11:15:40	35	15.44	1.103	78.2	7.78	44.5	5.55	213	83.4
11:20:40	40	15.46	1.096	77.9	7.75	43.9	5.52	215.5	81.4
11:25:40	45	15.48	1.091	77.7	7.72	44.5	5.49	217.7	80.8
11:30:40	50	15.51	1.086	77.4	7.69	44.5	5.47	219.3	79.9
11:35:40	55	15.55	1.082	77	7.64	44.5	5.45	221.2	80.5
11:40:40	60	15.58	1.079	76.6	7.6	44.5	5.43	223	77.7
11:45:40	65	15.61	1.076	76.3	7.56	44.5	5.41	225.3	77.8
11:50:40	70	15.63	1.073	75.9	7.52	44.5	5.39	213.5	77.2
11:55:40	75	15.67	1.071	75.5	7.48	44.5	5.38	209.5	76.7
12:00:40	80	15.69	1.07	75.3	7.45	43.9	5.37	207.6	76.1
12:05:40	85	15.73	1.068	74.9	7.4	44.5	5.36	206.5	75
12:10:40	90	15.77	1.068	74.6	7.37	44.5	5.34	205.6	75.7
12:15:40	95	15.81	1.067	74.3	7.34	43.9	5.34	205.4	73.5
12:20:40	100	15.84	1.065	74	7.3	44.5	5.33	205.7	72.9
12:25:40	105	15.88	1.064	73.7	7.26	44.5	5.32	205.1	72
12:30:40	110	15.91	1.064	73.4	7.23	44.5	5.31	204	71.7
12:35:40	115	15.95	1.063	73	7.19	43.9	5.31	203.9	71.2
12:40:40	120	15.99	1.063	72.8	7.16	43.9	5.3	204.8	71
12:45:40	125	16.03	1.063	72.5	7.13	43.9	5.3	204.2	69.9
12:50:40	130	16.06	1.063	72.2	7.09	44.5	5.29	204.9	69.7
12:55:40	135	16.11	1.063	72	7.06	42.8	5.29	204.9	68.1
13:00:40	140	16.15	1.063	71.7	7.03	45.7	5.28	205.2	67.7
13:05:40	145	16.18	1.063	71.6	7.01	43.9	5.28	205.3	67.2
13:10:40	150	16.22	1.063	71.3	6.98	43.9	5.28	205.2	66.8
13:15:40	155	16.26	1.064	71.1	6.95	44.5	5.27	204.9	66.4
13:20:40	160	16.31	1.064	70.9	6.92	44.5	5.26	204.6	66.4
13:25:40	165	16.35	1.064	70.7	6.9	43.9	5.26	204.2	66.1
13:30:40	170	16.39	1.065	70.4	6.87	43.9	5.26	203.9	65.1
13:35:40	175	16.43	1.065	70.2	6.85	43.9	5.26	203.4	64.3
13:40:40	180	16.47	1.066	70	6.81	43.9	5.25	203.7	64.2
Averages		15.81	1.09	74.62	7.37	44.23	5.48	206.45	73.85

Slope	0.0068
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	2.36
SOD (g O_2/m^2*day)	**1.95**

Table F.36: YSI data for the Control chamber on 05/03/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
10:47:02	0	15.24	0.058	87.1	8.74	37	6.67	9.9
10:52:02	5	15.26	0.058	86.9	8.71	37	6.47	9.7
10:57:02	10	15.28	0.058	86.7	8.69	37	6.39	9.8
11:02:02	15	15.3	0.058	86.6	8.68	37	6.35	9.9
11:07:02	20	15.33	0.058	86.5	8.66	37	6.33	10.8
11:12:02	25	15.35	0.058	86.4	8.64	37	6.31	10.4
11:17:02	30	15.38	0.058	86.3	8.63	37	6.3	9.7
11:22:02	35	15.41	0.058	86.2	8.62	38	6.29	9.8
11:27:02	40	15.44	0.058	86.2	8.61	37	6.29	9.7
11:32:02	45	15.47	0.058	86.2	8.6	38	6.28	9.6
11:37:02	50	15.5	0.058	86.2	8.59	37	6.28	10.6
11:42:02	55	15.54	0.058	86.2	8.59	37	6.28	9.8
11:47:02	60	15.57	0.058	86.1	8.58	38	6.28	9.4
11:52:02	65	15.61	0.058	86.1	8.57	38	6.28	9.5
11:57:02	70	15.64	0.058	86.1	8.57	38	6.27	9.5
12:02:02	75	15.68	0.058	86.2	8.57	38	6.27	9.8
12:07:02	80	15.71	0.058	86.2	8.56	38	6.27	10.3
12:12:02	85	15.75	0.058	86.2	8.55	37	6.27	9.9
12:17:02	90	15.79	0.058	86.2	8.55	37	6.27	9.5
12:22:02	95	15.82	0.058	86.2	8.54	37	6.27	9.5
12:27:02	100	15.86	0.058	86.3	8.54	38	6.27	9.5
12:32:02	105	15.91	0.058	86.3	8.53	37	6.27	9.5
12:37:02	110	15.95	0.058	86.3	8.53	37	6.27	9.4
12:42:02	115	15.98	0.058	86.3	8.52	38	6.26	9.3
12:47:02	120	16.02	0.058	86.3	8.52	38	6.26	9.3
12:52:02	125	16.06	0.058	86.3	8.51	37	6.26	9.5
12:57:02	130	16.1	0.058	86.4	8.5	37	6.26	9.3
13:02:02	135	16.15	0.058	86.4	8.5	38	6.26	9.3
13:07:02	140	16.19	0.058	86.4	8.5	37	6.26	9.3
13:12:02	145	16.23	0.058	86.5	8.49	38	6.26	9.2
13:17:02	150	16.27	0.058	86.5	8.49	38	6.26	9.2
13:22:02	155	16.31	0.058	86.5	8.48	38	6.26	9.2
13:27:02	160	16.35	0.058	86.5	8.48	38	6.26	9.4
13:32:02	165	16.4	0.058	86.6	8.47	38	6.26	9.2
13:37:02	170	16.44	0.058	86.6	8.47	38	6.26	9.2
13:42:02	175	16.48	0.058	86.6	8.46	37	6.26	9.1
13:47:02	180	16.53	0.058	86.7	8.46	38	6.26	9.1
13:52:02	185	16.57	0.058	86.7	8.45	38	6.26	9.1
13:57:02	190	16.61	0.058	86.7	8.45	38	6.25	9.1
14:02:02	195	16.65	0.058	86.8	8.45	38	6.25	9.1
14:07:02	200	16.68	0.058	86.8	8.44	37	6.25	9
14:12:02	205	16.72	0.058	86.8	8.44	38	6.25	9.1
14:17:02	210	16.76	0.058	86.8	8.43	37	6.25	9.1
Averages		15.94	0.06	86.44	8.54	37.51	6.29	9.53
Slope			0.0012					
V (L)			65.15					
A (m^2)			0.27					
OD (g O_2/m^2*day)			**0.42**					

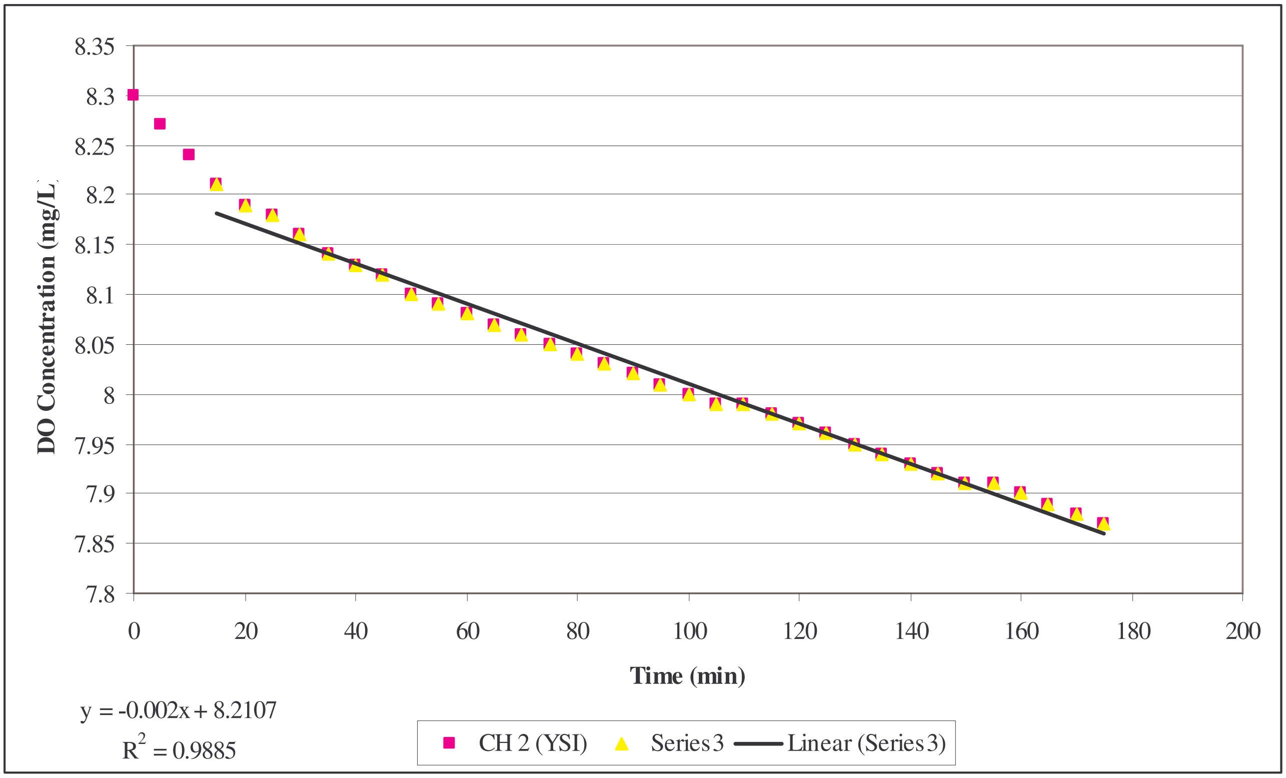

Figure F.34: Oxygen Depletion Curve for Chamber 2 on 05/03/2005 at the agricultural study site within the Little River Basin.

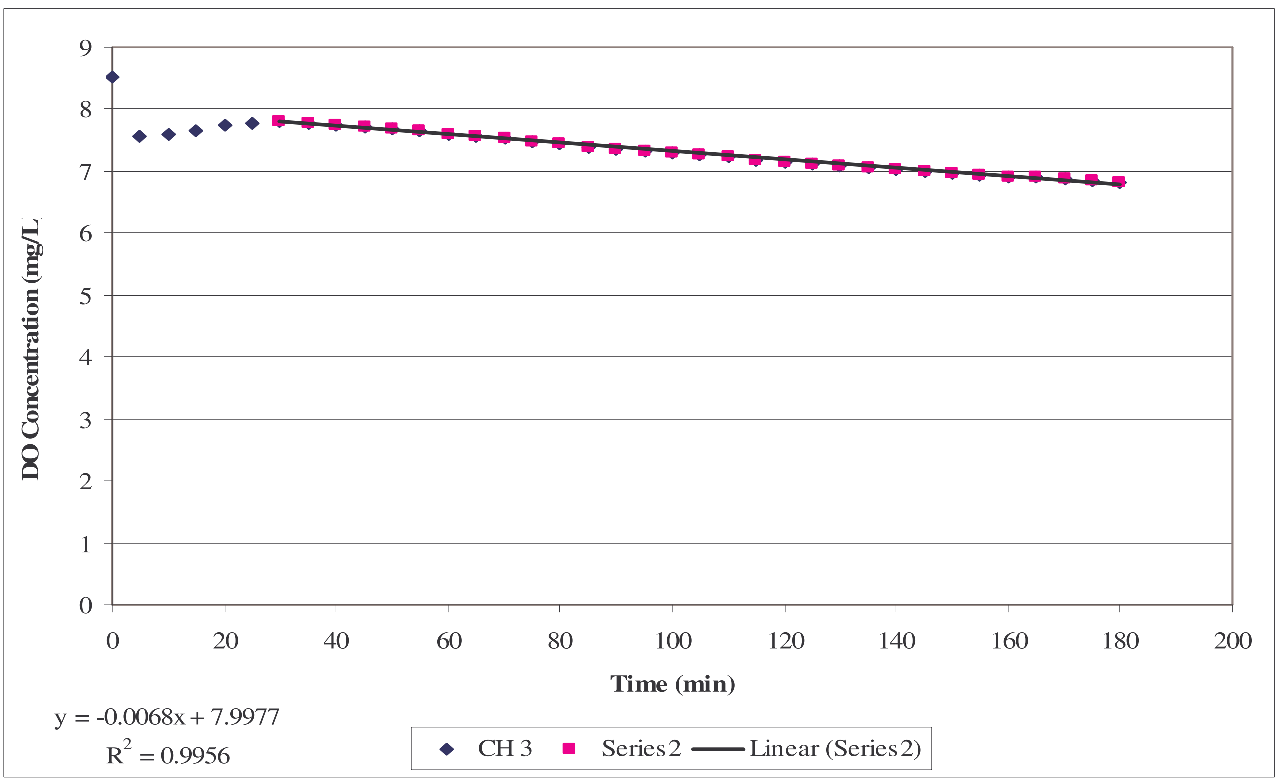

Figure F.35: Oxygen Depletion Curve for Chamber 3 on 05/03/2005 at the agricultural study site within the Little River Basin.

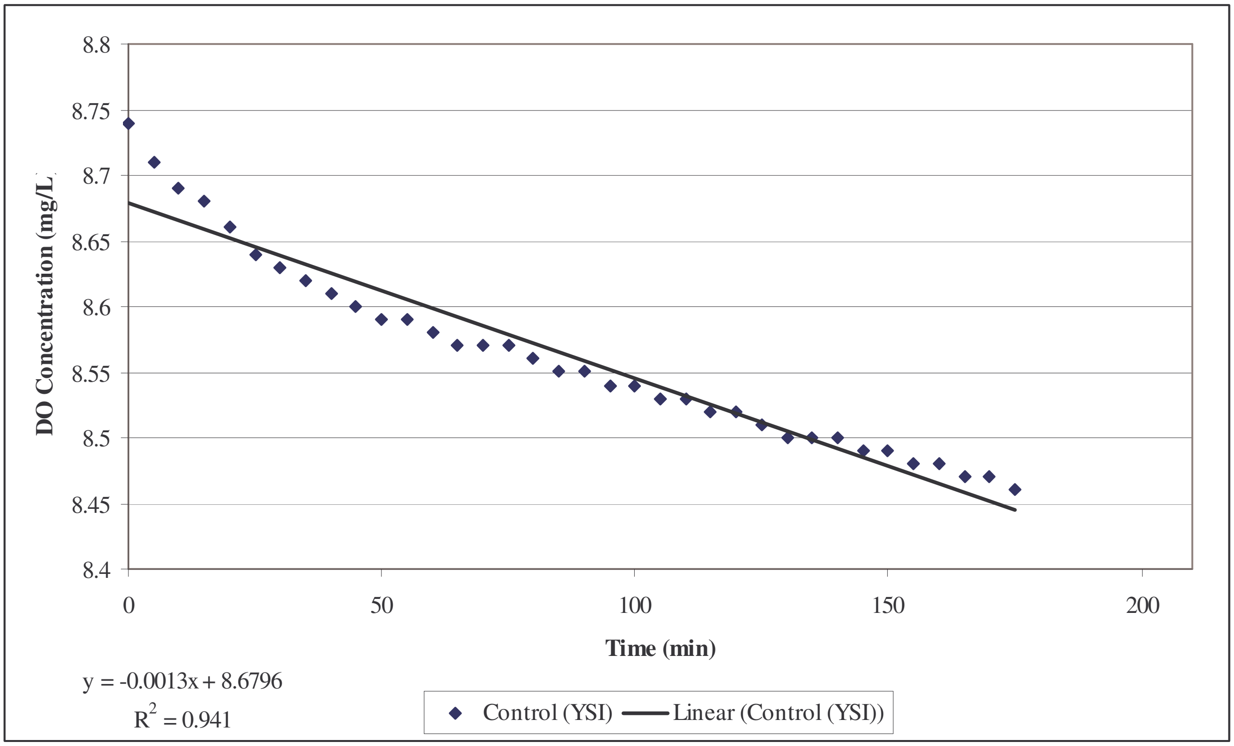

Figure F.36: Oxygen Depletion Curve for the Control chamber on 05/03/2005 at the agricultural study site within the Little River Basin.

Little River Forested Site

Table F.37: YSI data for Chamber 1 on 11/03/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
13:00:40	0	22.6	0.06	93.8	8.11	79.7	6.79	759.4	1.7
13:05:40	5	22.21	0.061	61.4	5.34	67.4	5.78	876.5	72.7
13:10:40	10	22.24	0.061	62.6	5.44	65	5.79	867.2	76.2
13:15:40	15	22.28	0.061	61.1	5.31	64.5	5.8	852.8	78.3
13:20:40	20	22.31	0.061	61.2	5.32	64.5	5.8	834.5	79.2
13:25:21	25	22.33	0.061	62.3	5.42	64.5	5.81	882.2	79.1
13:30:21	30	22.37	0.061	62.5	5.43	63.3	5.81	883.2	79
13:35:20	35	22.4	0.061	62.6	5.43	62.1	5.82	880.6	79.8
13:40:21	40	22.43	0.061	62.1	5.38	63.3	5.82	875.1	80.3
13:45:21	45	22.45	0.061	62.2	5.39	63.3	5.82	871.2	78.9
13:50:21	50	22.48	0.061	62.1	5.38	62.1	5.83	867.8	79.7
13:55:21	55	22.5	0.061	61.7	5.35	62.1	5.83	864.6	78.4
14:00:21	60	22.53	0.061	61.6	5.33	62.1	5.83	862.3	78.6
14:05:21	65	22.56	0.061	61.3	5.3	62.1	5.83	860.6	76.9
14:10:21	70	22.58	0.061	61	5.28	60.9	5.83	858.4	76.1
14:15:21	75	22.6	0.061	60.9	5.26	62.1	5.83	856.8	76.3
14:20:21	80	22.62	0.061	60.6	5.23	62.1	5.83	855.5	77.2
14:25:21	85	22.64	0.061	60.3	5.21	60.9	5.83	854.8	75.4
14:30:21	90	22.66	0.061	60	5.18	62.1	5.83	853.6	75.9
14:35:21	95	22.68	0.061	59.8	5.17	62.1	5.83	852.5	75.1
14:40:21	100	22.7	0.061	59.6	5.14	60.9	5.82	852.5	74.6
14:45:21	105	22.72	0.061	59.4	5.12	62.1	5.82	851.8	71.4
14:50:21	110	22.73	0.061	59.2	5.1	60.9	5.82	851.1	74
14:55:21	115	22.75	0.061	58.9	5.08	62.1	5.82	851.1	74.4
15:00:21	120	22.77	0.061	58.7	5.06	60.9	5.82	850.3	72.9
15:05:21	125	22.79	0.061	58.6	5.05	60.9	5.82	850.2	76.5
15:10:21	130	22.81	0.061	58.3	5.02	60.9	5.82	850.1	73.3
15:15:21	135	22.83	0.061	58	4.99	60.9	5.82	849.9	71.5
15:20:21	140	22.85	0.061	57.8	4.97	60.9	5.81	850	70.8
15:25:21	145	22.86	0.061	57.7	4.96	60.9	5.81	849.8	72.5
15:30:21	150	22.88	0.061	57.5	4.94	60.9	5.81	849.9	70.5
15:35:21	155	22.9	0.061	57.2	4.92	60.4	5.81	850	70
15:40:21	160	22.91	0.061	57	4.9	60.9	5.81	850.2	71.3
15:45:21	165	22.93	0.061	56.8	4.88	60.9	5.8	849.9	69.3
15:50:21	170	22.94	0.061	56.6	4.86	60.4	5.8	850.3	69.3
15:55:20	175	22.95	0.061	56.2	4.82	60.4	5.8	849.5	69.2
16:00:40	180	22.96	0.061	57.3	4.92	60.4	5.8	790.5	68.7
Averages		22.64	0.06	60.70	5.24	62.48	5.84	853.15	72.84

Slope	0.0041
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.42
SOD (g O_2/m^2*day)	**1.04**

Table F.38: YSI data for Chamber 2 on 11/03/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
13:25:40	0	22.33	0.282	54.6	4.74	17	4.86	334	158.6
13:30:40	5	22.35	0.249	53.7	4.66	17	4.85	358.5	159.9
13:35:40	10	22.37	0.237	53.9	4.68	16.4	4.95	369.7	159.5
13:40:40	15	22.4	0.233	51.5	4.46	16.4	5.04	378.8	158.5
13:45:40	20	22.43	0.226	47.3	4.1	16.4	5.09	387.9	157.7
13:50:40	25	22.45	0.225	48.4	4.19	16.4	5.13	396.1	154.6
13:55:40	30	22.48	0.225	49.7	4.3	17	5.16	402.3	155.7
14:00:40	35	22.5	0.226	42	3.63	16.4	5.19	406.8	154.7
14:05:40	40	22.53	0.228	48.9	4.23	16.4	5.21	409.7	154
14:10:40	45	22.54	0.226	46.9	4.06	16.4	5.21	411.9	153.1
14:15:40	50	22.57	0.224	46.6	4.03	16.4	5.22	412.9	151.1
14:20:40	55	22.6	0.223	45.5	3.93	16.4	5.24	413.5	151.1
14:25:40	60	22.62	0.222	43.2	3.73	16.4	5.26	413.9	149.4
14:30:40	65	22.64	0.222	39.6	3.42	16.4	5.26	414.6	150.1
14:35:40	70	22.66	0.222	43.5	3.75	15.2	5.27	414.6	148.6
14:40:40	75	22.68	0.222	42	3.62	16.4	5.28	414.7	149.5
14:45:40	80	22.7	0.222	42.1	3.63	16.4	5.29	414.4	147.7
14:50:40	85	22.72	0.222	37.2	3.2	15.2	5.3	414.5	147.1
14:55:40	90	22.74	0.223	37.8	3.26	16.4	5.31	414.4	147.4
15:00:40	95	22.76	0.224	42.7	3.68	16.4	5.32	414.2	148.2
15:05:40	100	22.78	0.225	37.9	3.26	15.2	5.33	413.8	146.4
15:10:40	105	22.79	0.226	38.5	3.31	15.2	5.34	413.5	145.2
15:15:40	110	22.81	0.228	42.2	3.64	16.4	5.34	413.1	144.2
15:20:40	115	22.83	0.23	37.4	3.22	15.2	5.35	412.6	144.2
15:25:40	120	22.85	0.231	35.4	3.04	15.2	5.36	412.3	143.5
15:30:40	125	22.87	0.232	36.3	3.12	15.2	5.38	411.5	143.2
15:35:40	130	22.89	0.233	33.5	2.88	15.2	5.37	411.6	143.1
15:40:40	135	22.9	0.236	35.6	3.05	14.1	5.39	410.9	142.8
15:45:40	140	22.92	0.236	34.7	2.98	15.2	5.4	410.2	143.3
15:50:40	145	22.94	0.236	34	2.92	15.2	5.41	409.7	142
15:55:40	150	22.95	0.236	34.8	2.99	14.1	5.41	409.6	140.5
16:00:40	155	22.96	0.238	33.6	2.88	15.2	5.42	409	140.1
16:05:40	160	22.98	0.238	35.1	3.01	14.1	5.43	408.2	141.2
16:10:40	165	22.99	0.238	32.5	2.79	15.2	5.43	408.1	140.7
16:15:40	170	23	0.237	31.2	2.67	14.1	5.44	407.8	139.5
16:20:40	175	23.01	0.238	31.5	2.7	15.2	5.46	406.9	140.7
16:25:40	180	23.02	0.237	31	2.66	15.2	5.46	406.5	140.5
Average		22.72	0.23	40.87	3.52	15.75	5.27	404.67	148.04

Slope	0.0108
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	3.75
SOD (g O_2/m^2*day)	**3.37**

Table F.39: YSI data for the Control chamber on 11/03/2004

Time (hh:mm:ss)	Time (min)	Temp C	SPCond (mS/cm)	Dosat (%)	DO (mg/L)	DO charge	pH	Turbidity (NTU)
12:39	0	22.34	0.063	60.6	5.27	57.4	5.97	11
12:44	5	22.25	0.064	63.4	5.52	58.4	5.97	8.6
12:49	10	22.29	0.064	57.8	5.03	56.3	5.97	9.2
12:54	15	22.33	0.064	56	4.87	57.4	5.98	9.3
12:59	20	22.37	0.064	55	4.78	57.4	5.98	9.3
13:04	25	22.4	0.064	54.5	4.72	56.3	5.98	9.2
13:09	30	22.43	0.064	54	4.69	56.3	5.98	9.2
13:14	35	22.46	0.064	53.8	4.66	56.3	5.98	9.2
13:19	40	22.49	0.064	53.6	4.64	56.3	5.98	9.2
13:24	45	22.51	0.064	53.5	4.63	56.3	5.99	9.2
13:29	50	22.54	0.064	53.3	4.62	56.3	5.99	9.3
13:34	55	22.57	0.064	53.3	4.61	56.3	5.99	9.2
13:39	60	22.59	0.064	53.3	4.6	56.3	5.99	9.1
13:44	65	22.61	0.064	53.2	4.6	56.3	5.99	9.1
13:49	70	22.63	0.064	53.2	4.6	56.3	5.99	9
13:54	75	22.65	0.064	53.2	4.6	56.3	5.99	9.1
13:59	80	22.67	0.064	53.3	4.6	56.3	5.99	9.1
14:04	85	22.69	0.064	53.3	4.59	56.3	5.99	9.1
14:09	90	22.71	0.064	53.3	4.6	56.3	5.99	9.1
14:14	95	22.73	0.064	53.3	4.6	56.3	5.99	9.1
14:19	100	22.75	0.064	53.3	4.6	56.3	5.99	9
14:24	105	22.77	0.064	53.4	4.6	56.3	5.99	9
14:29	110	22.79	0.064	53.4	4.6	56.3	5.99	9
14:34	115	22.81	0.064	53.4	4.6	56.3	5.99	8.9
14:39	120	22.83	0.064	53.5	4.6	56.3	5.99	8.9
14:44	125	22.84	0.064	53.5	4.6	56.3	5.99	8.8
14:49	130	22.86	0.064	53.6	4.61	56.3	5.99	8.9
14:54	135	22.88	0.064	53.6	4.61	56.3	5.99	8.8
14:59	140	22.9	0.064	53.6	4.61	56.3	5.99	8.8
15:04	145	22.91	0.064	53.7	4.61	56.3	5.99	8.8
15:09	150	22.93	0.064	53.7	4.61	56.3	5.99	8.8
15:14	155	22.94	0.064	53.7	4.62	56.3	5.99	8.7
15:19	160	22.95	0.064	53.8	4.62	56.3	5.99	8.7
15:24	165	22.96	0.064	53.8	4.62	56.3	5.99	8.8
15:29	170	22.97	0.064	53.9	4.62	56.3	5.99	8.7
15:34	175	22.99	0.064	53.9	4.62	56.3	5.99	8.7
Averages		22.68	0.06	54.24	4.68	56.45	5.99	9.05
Slope		0.0011						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.38**						

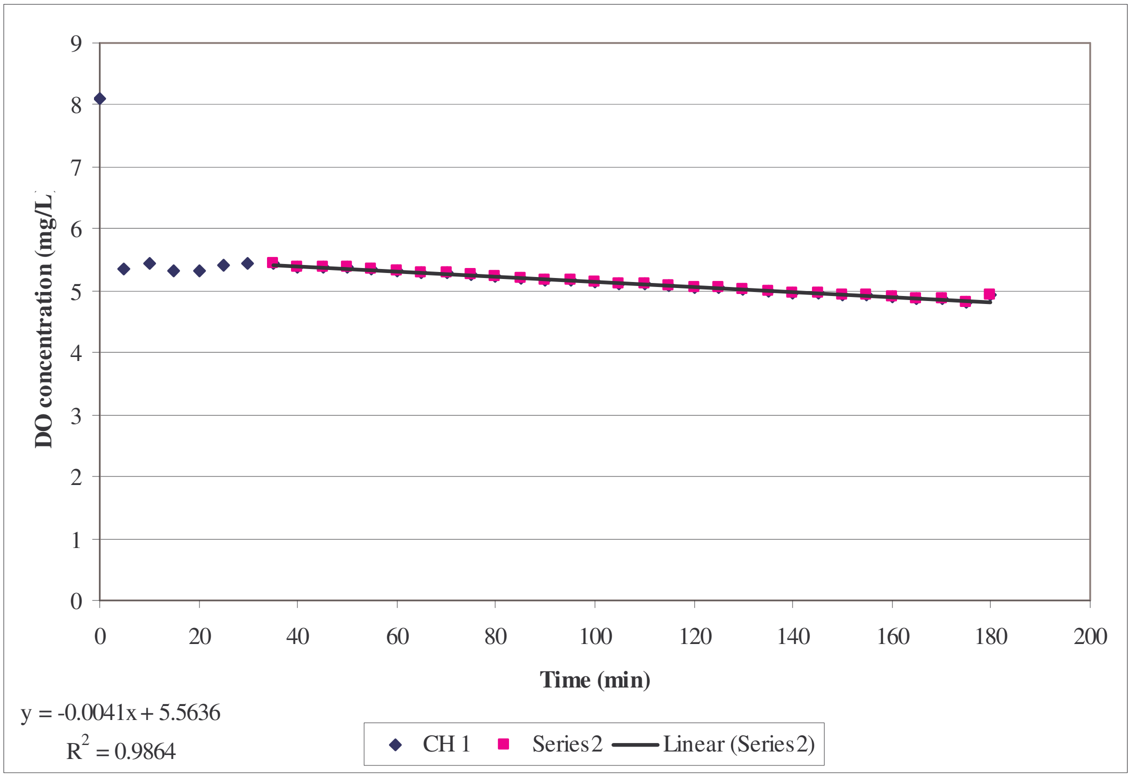

Figure F.37: Oxygen Depletion Curve for Chamber 1 on 11/03/2004 at the forested study site within the Little River Basin.

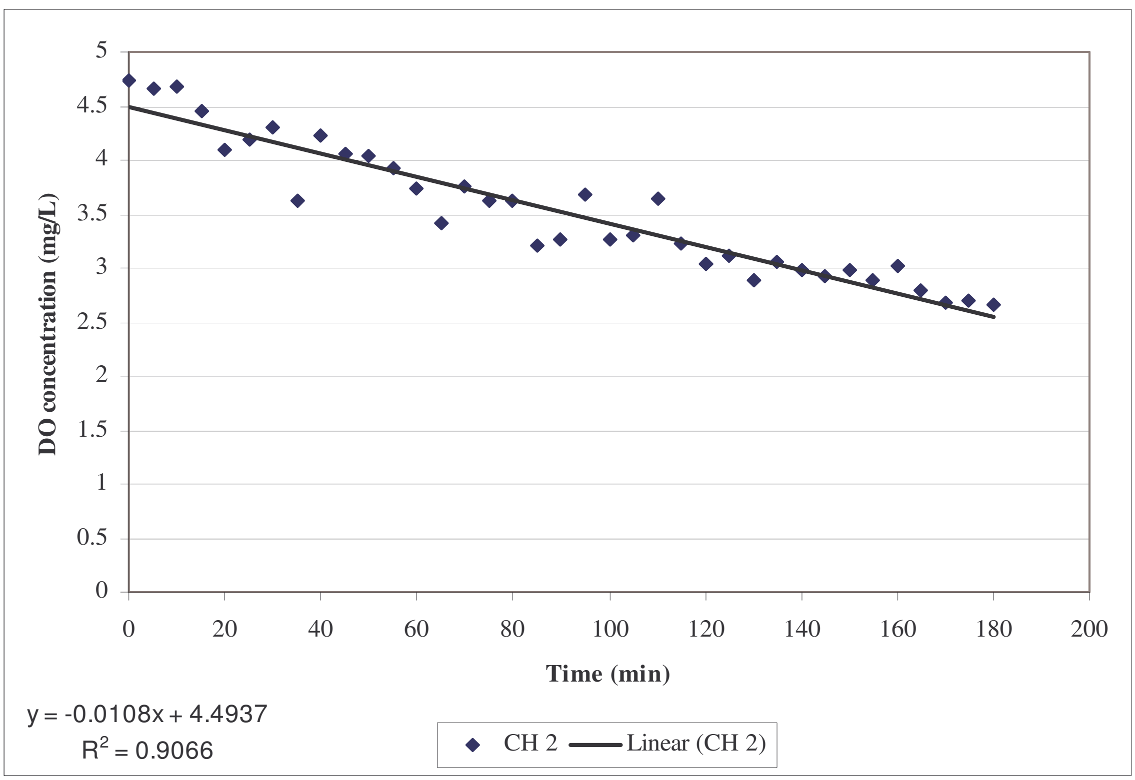

Figure F.38: Oxygen Depletion Curve for Chamber 2 on 11/03/2004 at the forested study site within the Little River Basin.

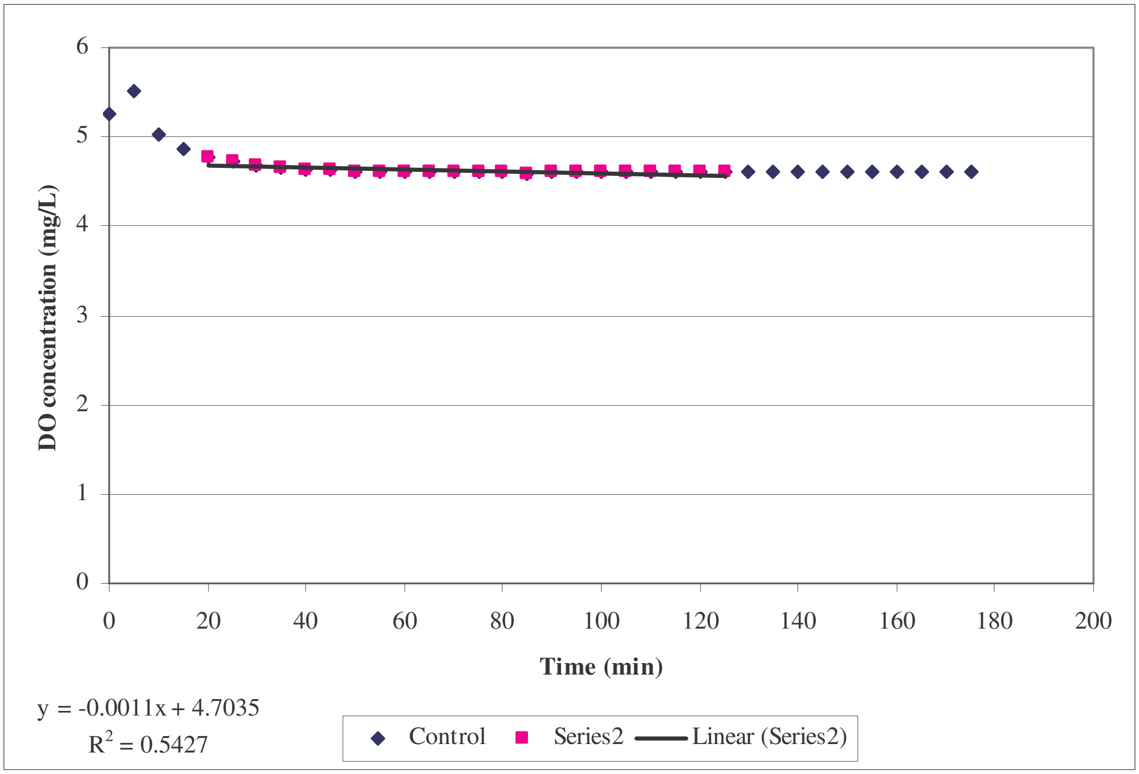

Figure F.39: Oxygen Depletion Curve for the Control chamber on 11/03/2004 at the forested study site within the Little River Basin.

Table F.40: YSI data for Chamber 1 on 01/25/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:10:20	0	18.78	-28.1	107.6	8.9	41.6	6.31	243.6	-1.9
12:15:40	5	6.77	1.789	95.8	11.59	38.7	6.58	230.4	45.4
12:20:40	10	6.76	1.353	91.2	11.07	37.5	5.69	286.2	56.7
12:25:40	15	6.78	1.243	90.3	10.95	38.7	5.44	303.3	55.6
12:30:40	20	6.82	1.164	89.5	10.85	38.7	5.33	316.2	55.9
12:35:40	25	6.83	1.787	88.9	10.74	38.7	5.27	327.6	55.8
12:40:40	30	6.87	1.787	88.5	10.68	38.7	5.24	336.3	54.5
12:45:40	35	6.92	1.787	88.1	10.61	38.7	5.23	343.1	54.5
12:50:40	40	6.95	1.787	87.7	10.56	38.7	5.22	348.4	53.5
12:55:40	45	7	1.786	87.4	10.51	37.5	5.22	352.4	51.9
13:00:40	50	7.03	1.786	87.1	10.46	38.7	5.23	356	51.6
13:05:40	55	7.08	1.786	86.8	10.42	37.5	5.25	358.2	51
13:10:40	60	7.13	1.786	86.5	10.37	38.7	5.25	359.9	50.4
13:15:40	65	7.18	1.786	86.2	10.33	37.5	5.3	359.6	50
13:20:40	70	7.22	1.786	86.1	10.29	38.7	5.36	358.6	50.1
13:25:40	75	7.26	1.786	85.8	10.25	37.5	5.4	358.5	49.5
13:30:40	80	7.31	1.786	85.6	10.22	38.7	5.43	358.2	48.8
13:35:40	85	7.36	1.786	85.3	10.17	38.7	5.46	357.8	48.4
13:40:40	90	7.41	1.786	85.1	10.14	38.7	5.47	358	48.7
13:45:40	95	7.46	1.786	84.9	10.1	38.7	5.48	358.9	47.1
13:50:40	100	7.51	1.786	84.7	10.06	37.5	5.5	359.4	47.1
13:55:40	105	7.55	1.786	84.5	10.03	38.7	5.51	360.7	46.9
14:00:40	110	7.6	1.786	84.3	9.99	38.7	5.52	361	46.3
14:05:40	115	7.65	1.786	84	9.95	37.5	5.53	361.4	46.3
14:10:40	120	7.69	1.786	83.8	9.91	38.7	5.53	362.4	46.2
14:15:40	125	7.74	1.786	83.7	9.88	38.7	5.54	363.7	46
14:20:40	130	7.78	1.786	83.4	9.84	38.7	5.54	364.8	45.6
14:25:40	135	7.83	1.786	83.2	9.81	37.5	5.54	365.4	44.9
14:30:40	140	7.87	1.786	83	9.77	38.7	5.54	366.3	45.1
14:35:40	145	7.92	1.786	82.8	9.74	37.5	5.55	366.1	44.8
14:40:40	150	7.95	1.786	82.6	9.71	37.5	5.54	367.4	44.9
14:45:40	155	8	1.786	82.4	9.67	38.7	5.55	368.3	44.5
14:50:40	160	8.04	1.786	82.2	9.64	38.7	5.54	369.2	44.1
14:55:40	165	8.08	1.786	81.9	9.6	37.5	5.54	370.1	43.6
15:00:40	170	8.13	1.786	81.8	9.57	38.7	5.54	369.8	43.5
15:05:40	175	8.17	1.786	81.5	9.53	37.5	5.55	369.9	43.6
15:10:40	180	8.2	1.786	81.3	9.5	37.5	5.55	371.5	43.4
Averages		7.75	0.94	86.09	10.15	38.36	5.49	348.34	47.14

Slope	0.0079
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	2.74
SOD (g O_2/m^2*day)	**1.11**

Table F.41: YSI data for Chamber 3 on 01/25/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
11:45:40	0	6.55	0.069	95.8	11.76	42.8	6.25	20.3
11:50:40	5	6.59	0.069	95.3	11.69	42.8	6.25	20.5
11:55:40	10	6.64	0.069	94.4	11.56	42.8	6.26	21.1
12:00:40	15	6.69	0.069	93.5	11.43	42.8	6.27	21.4
12:05:40	20	6.73	0.069	92.6	11.32	41	6.27	21.3
12:10:40	25	6.78	0.069	91.9	11.21	41.6	6.27	21.8
12:15:40	30	6.83	0.069	91.2	11.11	41.6	6.27	22.1
12:20:40	35	6.88	0.069	90.6	11.03	41	6.27	22.4
12:25:40	40	6.93	0.069	90.1	10.95	42.8	6.27	22.4
12:30:40	45	6.98	0.069	89.6	10.88	41.6	6.26	22.5
12:35:40	50	7.02	0.069	89.1	10.81	41.6	6.26	22.7
12:40:40	55	7.07	0.069	88.7	10.74	41.6	6.25	22.8
12:45:40	60	7.12	0.069	88.3	10.69	41.6	6.25	22.8
12:50:40	65	7.17	0.069	87.9	10.63	41.6	6.25	23
12:55:40	70	7.22	0.069	87.6	10.58	41.6	6.25	23
13:00:40	75	7.27	0.069	87.3	10.53	41.6	6.24	23.3
13:05:40	80	7.32	0.069	87	10.48	41.6	6.24	22.9
13:10:40	85	7.37	0.069	86.8	10.44	41.6	6.24	23
13:15:40	90	7.42	0.069	86.5	10.39	41.6	6.23	22.8
13:20:40	95	7.46	0.069	86.2	10.35	41.6	6.23	23
13:25:40	100	7.51	0.069	86	10.31	41	6.22	23
13:30:40	105	7.55	0.069	85.8	10.27	41	6.22	23
13:35:40	110	7.6	0.069	85.5	10.23	41.6	6.22	23.1
13:40:40	115	7.64	0.069	85.3	10.19	41.6	6.21	23
13:45:40	120	7.68	0.069	85.1	10.15	41.6	6.21	23.2
13:50:40	125	7.73	0.069	84.9	10.12	41.6	6.21	23.3
13:55:40	130	7.77	0.069	84.6	10.08	41.6	6.21	23.4
14:00:40	135	7.82	0.069	84.5	10.05	41.6	6.2	23.4
14:05:40	140	7.87	0.069	84.2	10.01	41.6	6.2	23.4
14:10:40	145	7.91	0.069	84.1	9.98	41.6	6.2	23.2
14:15:40	150	7.95	0.069	83.8	9.94	41.6	6.19	23.3
14:20:40	155	7.99	0.069	83.6	9.91	41.6	6.19	23.3
14:25:40	160	8.03	0.069	83.4	9.87	41	6.19	23.3
14:30:40	165	8.06	0.069	83.2	9.84	41	6.19	23.2
14:35:40	170	8.1	0.069	83	9.81	41	6.18	23.1
14:40:40	175	8.13	0.069	82.8	9.77	41	6.18	23.7
Averages		7.37	0.07	87.51	10.53	41.63	6.23	22.69

Slope	0.0095
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	3.30
SOD (g O_2/m^2*day)	**1.67**

Table F.42: YSI data for the Control chamber on 01/25/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	Dosat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
0:47:32	0	6.84	0.061	91.6	11.17	37	6.28	1690.8
0:52:32	5	6.89	0.061	83.7	10.19	37	6.28	1691
0:57:32	10	6.95	0.061	83.9	10.19	37	6.28	1691.2
1:02:32	15	7.01	0.061	84.1	10.21	37	6.28	1691.3
1:07:32	20	7.06	0.061	84.7	10.27	38	6.28	1691.5
1:12:32	25	7.11	0.061	85.3	10.33	37	6.28	1691.7
1:17:32	30	7.15	0.061	85.7	10.37	37	6.28	1691.9
1:22:32	35	7.21	0.061	86.1	10.4	37	6.28	1692.1
1:27:32	40	7.27	0.061	86.8	10.47	37	6.28	1692.4
1:32:32	45	7.31	0.061	87.3	10.51	37	6.28	1692.6
1:37:32	50	7.36	0.061	87.5	10.53	37	6.28	1692.9
1:42:32	55	7.41	0.061	87.9	10.56	37	6.28	1693.1
1:47:32	60	7.46	0.061	88.2	10.59	37	6.28	1693.4
1:52:32	65	7.52	0.061	88.6	10.61	37	6.28	1693.7
1:57:32	70	7.56	0.061	88.9	10.64	37	6.28	1693.9
2:02:32	75	7.61	0.061	89.1	10.65	37	6.28	1694.2
2:07:32	80	7.66	0.061	89.6	10.7	37	6.28	1694.5
2:12:32	85	7.71	0.061	90	10.73	37	6.28	1694.7
2:17:32	90	7.75	0.061	90.1	10.73	37	6.28	1694.9
2:22:32	95	7.79	0.061	90.5	10.77	37	6.28	1695.2
2:27:32	100	7.84	0.061	90.8	10.79	37	6.28	1695.4
2:32:32	105	7.88	0.061	91.1	10.82	37	6.28	1695.7
2:37:32	110	7.93	0.061	91.3	10.83	37	6.28	1695.9
2:42:32	115	7.98	0.061	91.7	10.87	37	6.28	1696.2
2:47:32	120	8.02	0.061	92.1	10.89	37	6.28	1696.4
2:52:32	125	8.06	0.061	92.2	10.9	38	6.28	1696.6
2:57:32	130	8.1	0.061	92.4	10.92	38	6.28	1696.9
3:02:32	135	8.14	0.061	92.7	10.94	37	6.28	1697.1
3:07:32	140	8.18	0.061	93	10.97	37	6.28	1697.3
3:12:32	145	8.22	0.061	93.2	10.98	37	6.28	1697.5
3:17:32	150	8.25	0.061	93.1	10.96	37	6.28	1697.7
3:22:32	155	8.28	0.061	93.6	11.01	37	6.28	1697.8
3:27:32	160	8.31	0.061	93.7	11.02	37	6.28	1698
3:32:32	165	8.34	0.061	94	11.04	38	6.28	1698.2
3:37:32	170	8.36	0.061	94.2	11.06	38	6.28	1698.3
3:42:32	175	8.39	0.061	94.4	11.07	37	6.28	1698.5
3:47:32	180	8.41	0.061	94.5	11.08	38	6.28	1698.6
Averages		7.71	0.06	89.94	10.72	37.16	6.28	1694.84
Slope		0.005						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**1.63**						

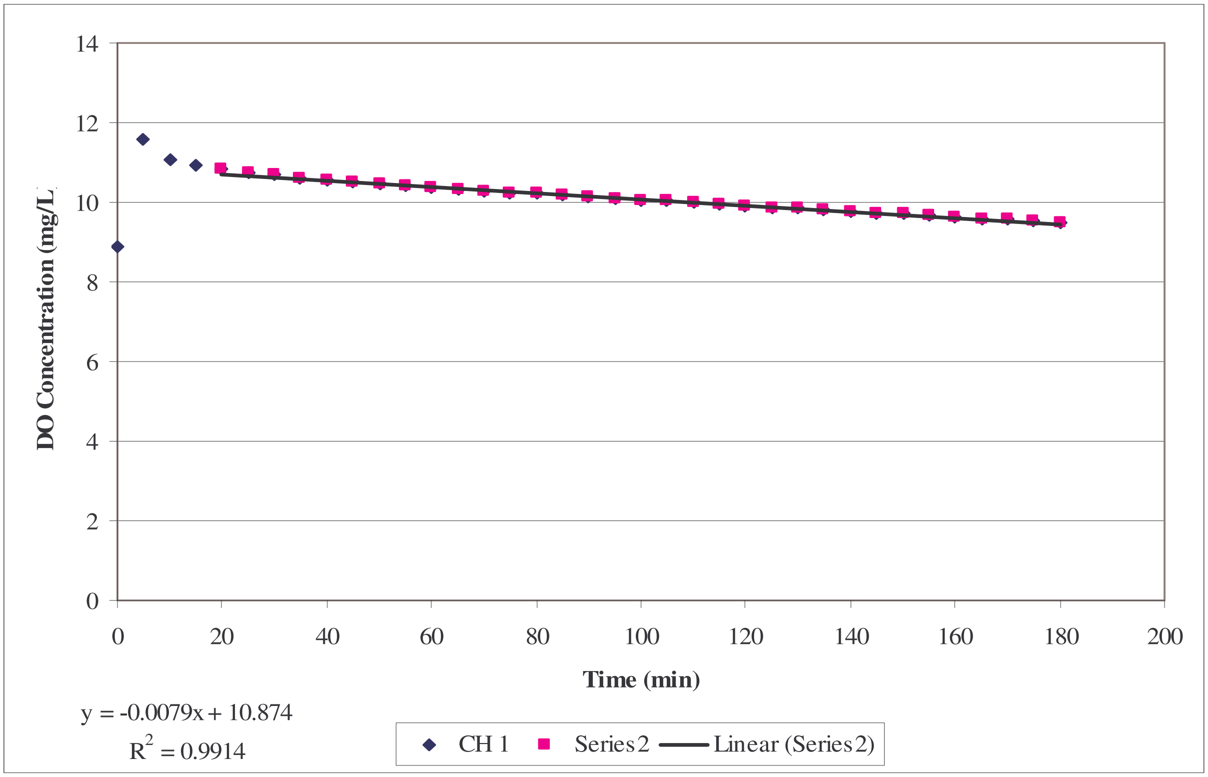

Figure F.40: Oxygen Depletion Curve for Chamber 1 on 01/25/2005 at the forested study site within the Little River Basin.

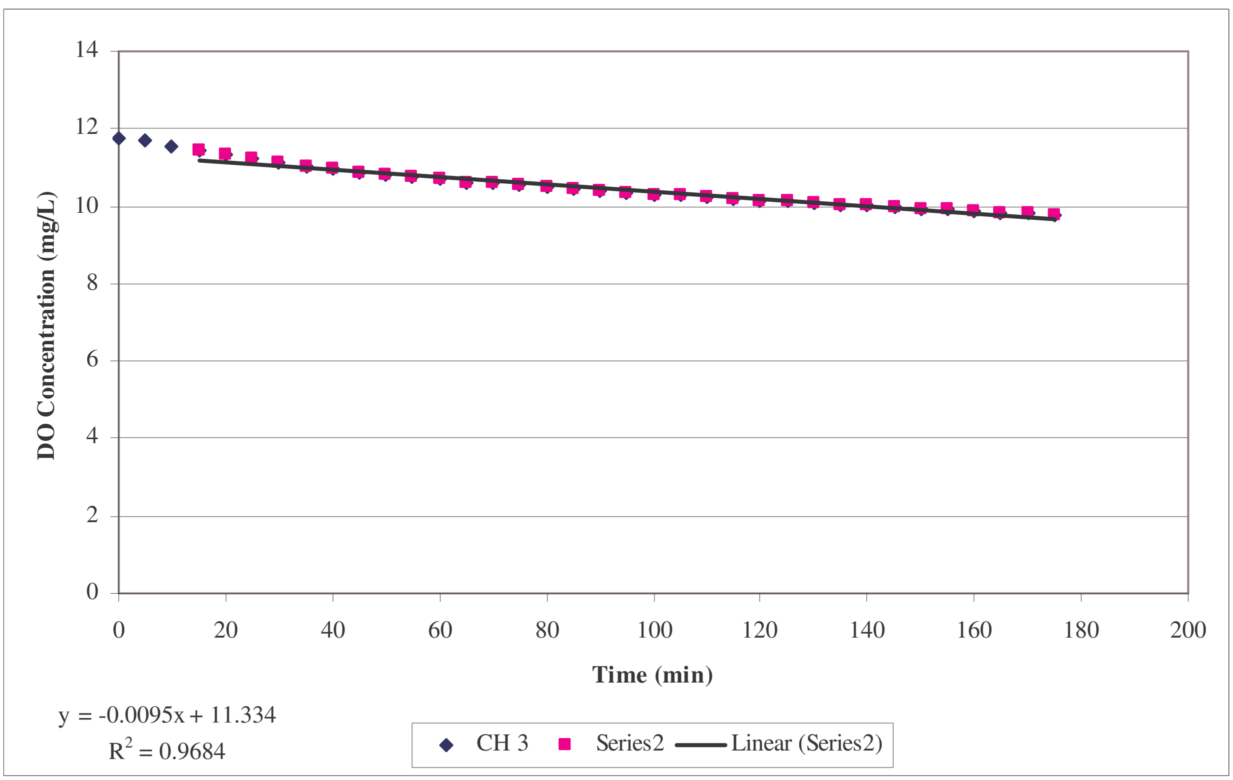

Figure F.41: Oxygen Depletion Curve for Chamber 2 on 01/25/2005 at the forested study site within the Little River Basin.

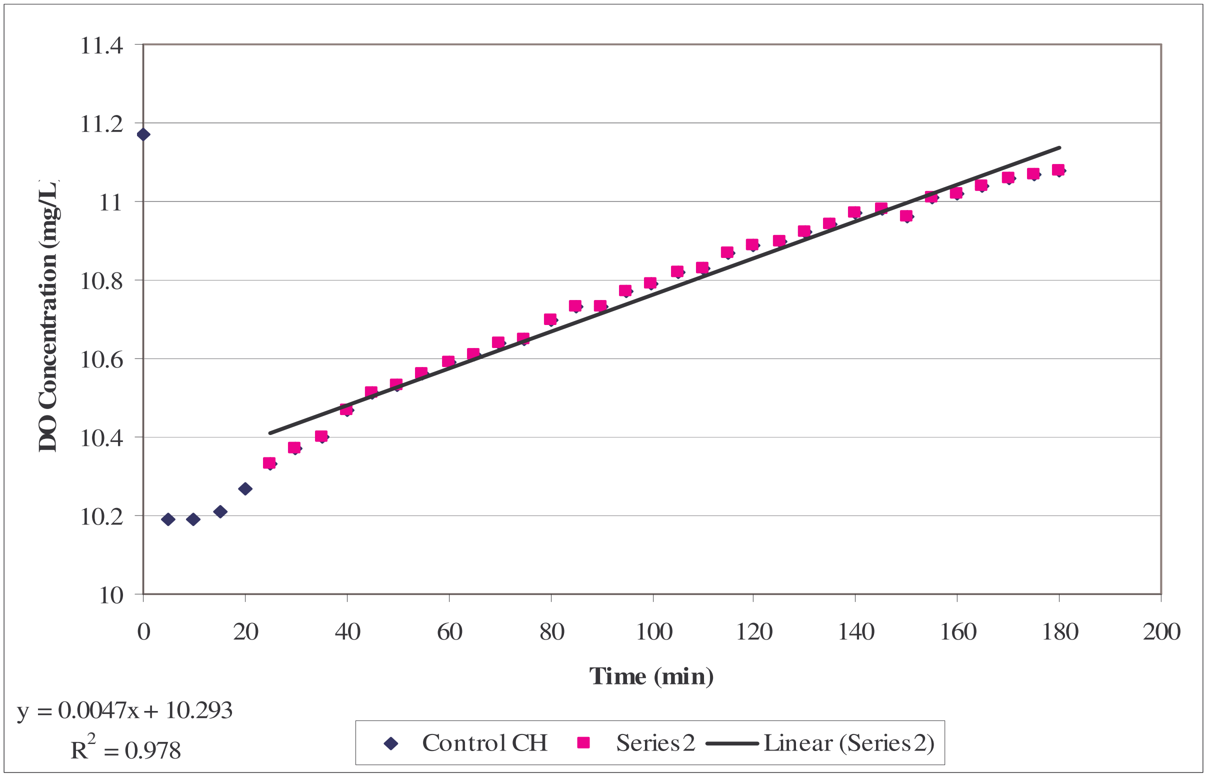

Figure F.42: Oxygen Depletion Curve for the Control chamber on 01/25/2005 at the forested study site within the Little River Basin.

Table F.43: YSI data for Chamber 2 on 05/25/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
10:51:24	0	22.19	0.062	55.3	4.82	44.5	6.44	78.5
10:55:40	5	22.19	0.062	54.6	4.76	43.9	6.28	76.7
11:00:40	10	22.19	0.062	54.1	4.71	43.9	6.21	75.6
11:05:40	15	22.2	0.063	53.8	4.68	42.8	6.17	74.1
11:10:40	20	22.2	0.063	53.5	4.66	43.9	6.15	73.6
11:15:40	25	22.2	0.062	53.3	4.64	42.8	6.14	72.8
11:20:40	30	22.2	0.062	53	4.62	43.9	6.13	71.7
11:25:40	35	22.2	0.062	52.8	4.6	43.9	6.12	71.5
11:30:40	40	22.19	0.062	52.7	4.59	42.8	6.12	71.4
11:35:40	45	22.2	0.062	52.5	4.57	43.9	6.11	70.4
11:40:40	50	22.2	0.062	52.3	4.56	43.9	6.11	69.3
11:45:40	55	22.2	0.062	52.2	4.54	42.8	6.1	69.7
11:50:40	60	22.21	0.062	52	4.53	42.8	6.1	69.2
11:55:40	65	22.21	0.062	52	4.52	42.8	6.1	68.7
12:00:40	70	22.22	0.062	51.9	4.51	42.8	6.1	68.4
12:05:40	75	22.24	0.062	51.7	4.5	42.8	6.09	68.1
12:10:40	80	22.25	0.062	51.6	4.49	42.8	6.09	67.9
12:15:40	85	22.26	0.062	51.5	4.48	42.8	6.09	67.6
12:20:40	90	22.27	0.062	51.3	4.46	42.8	6.09	67.3
12:25:40	95	22.29	0.062	51.2	4.45	42.8	6.09	67
12:30:40	100	22.3	0.062	51.1	4.44	42.8	6.09	66.4
12:35:40	105	22.31	0.062	50.8	4.42	42.8	6.08	66.7
12:40:40	110	22.32	0.062	50.6	4.4	42.8	6.08	66.2
12:45:40	115	22.33	0.062	50.5	4.39	42.8	6.08	65.8
12:50:40	120	22.33	0.062	50.4	4.38	42.8	6.08	65.7
12:55:40	125	22.34	0.063	50.3	4.37	42.8	6.08	65.6
13:00:40	130	22.36	0.062	50.2	4.36	42.8	6.08	64.8
13:05:40	135	22.37	0.062	50.2	4.36	42.8	6.08	65.5
13:10:40	140	22.38	0.062	50.2	4.35	42.8	6.08	65.2
13:15:40	145	22.39	0.062	50	4.34	42.8	6.08	65
13:20:40	150	22.4	0.062	50	4.34	42.8	6.07	64.8
13:25:40	155	22.41	0.062	49.9	4.33	42.8	6.07	64.2
13:30:40	160	22.42	0.062	49.8	4.32	42.8	6.07	63.9
13:35:40	165	22.43	0.062	49.6	4.3	42.8	6.07	63.4
13:40:40	170	22.45	0.062	49.5	4.29	42.8	6.07	63.4
13:45:40	175	22.47	0.062	49.4	4.28	42.8	6.07	63.9
13:50:40	180	22.48	0.062	49.1	4.25	42.8	6.07	63.4
13:55:40	185	22.5	0.062	48.9	4.24	42.8	6.07	63.4
14:00:40	190	22.51	0.063	48.8	4.23	41.6	6.07	63.2
Averages		22.30	0.06	51.35	4.46	43.01	6.11	67.95

slope	0.0026
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.90
SOD (g O_2/m^2*day)	**0.80**

Table F.44: YSI data for Chamber 3 on 05/25/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
10:50:20	0	21.99	0.009	100.2	8.77	41.6	7.58	87.9	458
10:55:40	5	22.24	0.057	56.8	4.95	37.5	6.46	151.6	27.5
11:00:40	10	22.24	0.057	55.8	4.86	36.9	5.93	159.7	28
11:05:40	15	22.24	0.057	55.1	4.79	37.5	5.75	162.8	28.8
11:10:40	20	22.24	0.057	54.4	4.74	38.7	5.66	164.2	29.1
11:15:40	25	22.24	0.056	54	4.7	36.9	5.61	165.2	30.6
11:20:40	30	22.24	0.057	53.6	4.66	38.7	5.57	165.8	30.9
11:25:40	35	22.24	0.057	53.3	4.63	37.5	5.55	166.3	31.7
11:30:40	40	22.24	0.056	52.9	4.61	37.5	5.54	166.6	32.5
11:35:40	45	22.24	0.057	52.7	4.59	37.5	5.52	167.1	33
11:40:40	50	22.25	0.057	52.5	4.57	37.5	5.51	167.4	34.3
11:45:40	55	22.25	0.057	52.3	4.55	37.5	5.5	167.4	35.8
11:50:40	60	22.25	0.057	52.1	4.54	38.7	5.49	167.2	27.4
11:55:40	65	22.26	0.057	51.9	4.52	37.5	5.49	167.2	28
12:00:40	70	22.27	0.057	51.8	4.5	36.9	5.48	167.7	28.3
12:05:40	75	22.27	0.057	51.6	4.49	37.5	5.48	168	26.9
12:10:40	80	22.28	0.057	51.4	4.47	37.5	5.48	168	27.8
12:15:40	85	22.29	0.057	51.3	4.46	37.5	5.47	168.3	27.9
12:20:40	90	22.3	0.057	51.1	4.44	37.5	5.47	168.5	28.1
12:25:40	95	22.31	0.057	51	4.43	37.5	5.47	168.9	29.1
12:30:40	100	22.32	0.057	50.8	4.42	38.7	5.47	169	29.9
12:35:40	105	22.33	0.057	50.7	4.4	37.5	5.47	169.1	29.6
12:40:40	110	22.34	0.057	50.5	4.39	38.7	5.47	169.1	30.7
12:45:40	115	22.36	0.057	50.4	4.37	38.7	5.46	169.8	31.3
12:50:40	120	22.37	0.057	50.2	4.36	36.9	5.46	169.7	29.2
12:55:40	125	22.37	0.057	50.1	4.35	37.5	5.46	169.8	29.6
13:00:40	130	22.38	0.057	50	4.34	37.5	5.46	170	30.3
13:05:40	135	22.39	0.057	49.8	4.32	37.5	5.46	169.7	30.9
13:10:40	140	22.4	0.057	49.7	4.31	36.9	5.46	169.9	31
13:15:40	145	22.42	0.057	49.5	4.3	35.7	5.46	169.6	31.6
13:20:40	150	22.43	0.058	49.4	4.28	36.9	5.46	169.5	32.4
13:25:40	155	22.44	0.058	49.3	4.27	36.9	5.46	168.3	32.3
13:30:40	160	22.45	0.058	49.1	4.26	35.7	5.46	168.5	32.5
13:35:40	165	22.47	0.058	49	4.25	38.7	5.46	168.8	31.7
13:40:40	170	22.49	0.058	48.9	4.23	37.5	5.46	168.8	33.3
13:45:40	175	22.5	0.058	48.8	4.22	37.5	5.46	168.9	32.3
13:50:40	180	22.52	0.058	48.6	4.21	36.9	5.46	168.9	32.8
Averages		22.32	0.06	52.72	4.58	37.61	5.59	165.22	42.03
Slope		0.0035							
V (L)		65.15							
A (m2)		0.27							
OD (g O_2/m^2*day)		1.22							
SOD (g O_2/m^2*day)		**1.11**							

Table F.45: YSI data for the Control chamber on 05/25/2005

Time (h:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO Sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
10:59:52	0	21.95	0.072	55.8	4.88	40	6.39	12.2
11:04:52	5	21.96	0.072	55.6	4.87	40	6.26	11.8
11:09:52	10	21.96	0.072	55.5	4.86	41	6.21	11.8
11:14:52	15	21.97	0.072	55.4	4.85	42	6.18	11.8
11:19:52	20	21.98	0.072	55.3	4.84	41	6.16	11.4
11:24:52	25	21.99	0.072	55.3	4.84	42	6.15	11.4
11:29:52	30	22	0.072	55.3	4.83	42	6.14	11.4
11:34:52	35	22.01	0.072	55.2	4.83	41	6.13	11.3
11:39:52	40	22.02	0.072	55.2	4.83	42	6.12	11.2
11:44:52	45	22.03	0.072	55.2	4.82	42	6.12	11.3
11:49:52	50	22.06	0.072	55.2	4.82	41	6.12	11.1
11:54:52	55	22.08	0.072	55.2	4.82	41	6.12	11.2
11:59:52	60	22.1	0.072	55.2	4.82	42	6.11	11
12:04:52	65	22.12	0.072	55.2	4.82	41	6.11	11
12:09:52	70	22.14	0.072	55.2	4.82	42	6.11	10.9
12:14:52	75	22.15	0.072	55.2	4.81	41	6.11	10.9
12:19:52	80	22.16	0.072	55.2	4.81	41	6.11	10.8
12:24:52	85	22.17	0.072	55.2	4.81	42	6.11	10.7
12:29:52	90	22.18	0.072	55.2	4.81	42	6.1	10.8
12:34:52	95	22.19	0.072	55.2	4.81	41	6.1	10.6
12:39:52	100	22.19	0.072	55.2	4.81	41	6.1	10.9
12:44:52	105	22.21	0.072	55.2	4.81	41	6.1	10.6
12:49:52	110	22.22	0.072	55.2	4.81	41	6.1	10.5
12:54:52	115	22.24	0.072	55.2	4.8	42	6.09	10.5
12:59:52	120	22.25	0.072	55.2	4.8	41	6.1	10.6
13:04:52	125	22.27	0.072	55.2	4.8	41	6.1	10.5
13:09:52	130	22.28	0.072	55.2	4.8	41	6.1	10.4
13:14:52	135	22.3	0.072	55.2	4.8	41	6.1	10.5
13:19:52	140	22.31	0.072	55.2	4.8	42	6.09	10.2
13:24:52	145	22.33	0.072	55.3	4.8	41	6.09	10.4
13:29:52	150	22.34	0.072	55.2	4.8	42	6.09	10.3
13:34:52	155	22.36	0.072	55.2	4.8	42	6.1	10.3
13:39:52	160	22.37	0.072	55.2	4.8	42	6.09	10.1
13:44:52	165	22.39	0.072	55.2	4.79	41	6.09	10.1
13:49:52	170	22.41	0.072	55.2	4.79	42	6.09	9.9
13:54:52	175	22.43	0.072	55.2	4.79	41	6.09	9.8
13:59:52	180	22.44	0.072	55.2	4.79	42	6.09	10.1
Averages		22.18	0.07	55.25	4.82	41.38	6.12	10.82

slope	0.0003
V (L)	65.15
A (m^2)	0.27
OD (g O_2/ m^2*day)	**0.10**

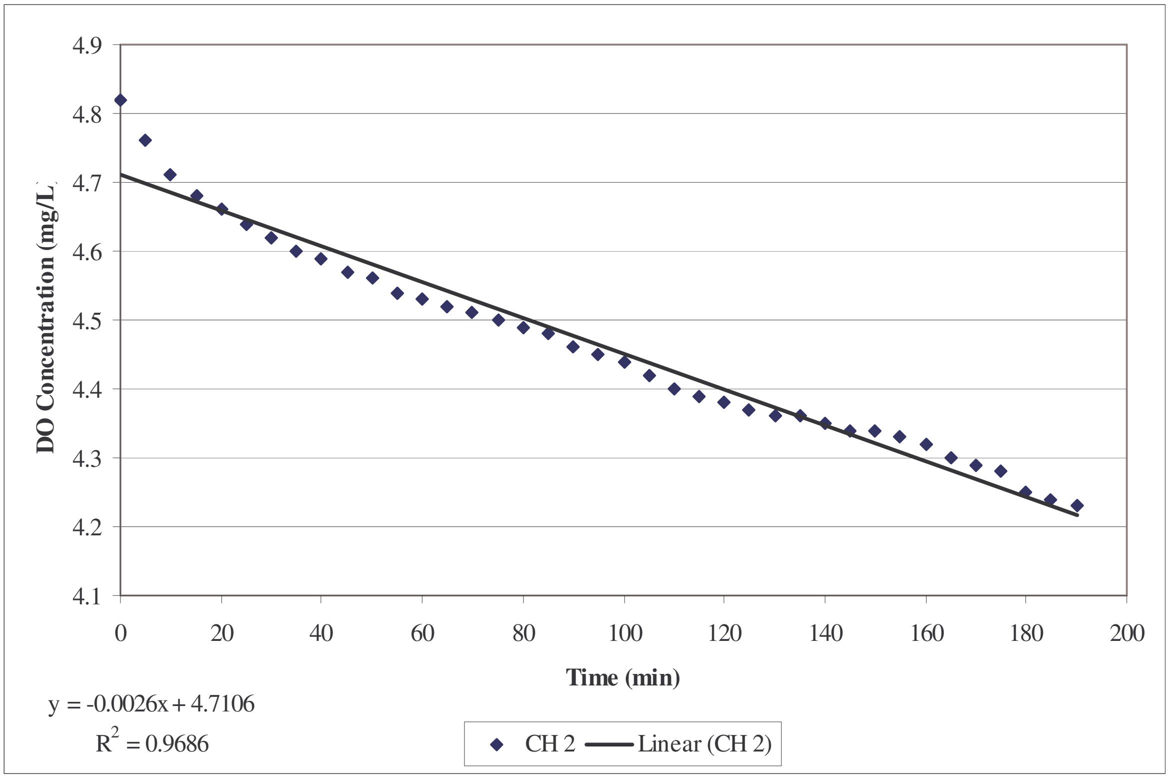

Figure F.43: Oxygen Depletion Curve for Chamber 2 on 05/25/2005 at the forested study site within the Little River Basin.

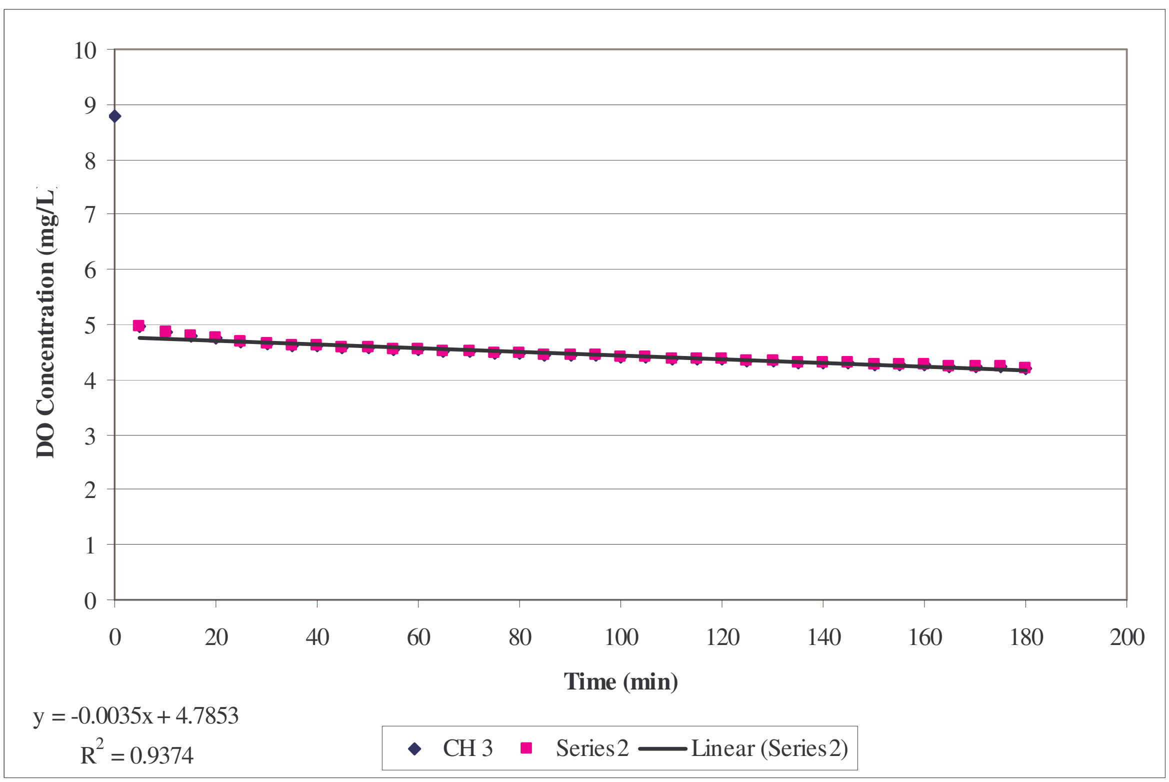

Figure F.44: Oxygen Depletion Curve for Chamber 3 on 05/25/2005 at the forested study site within the Little River Basin.

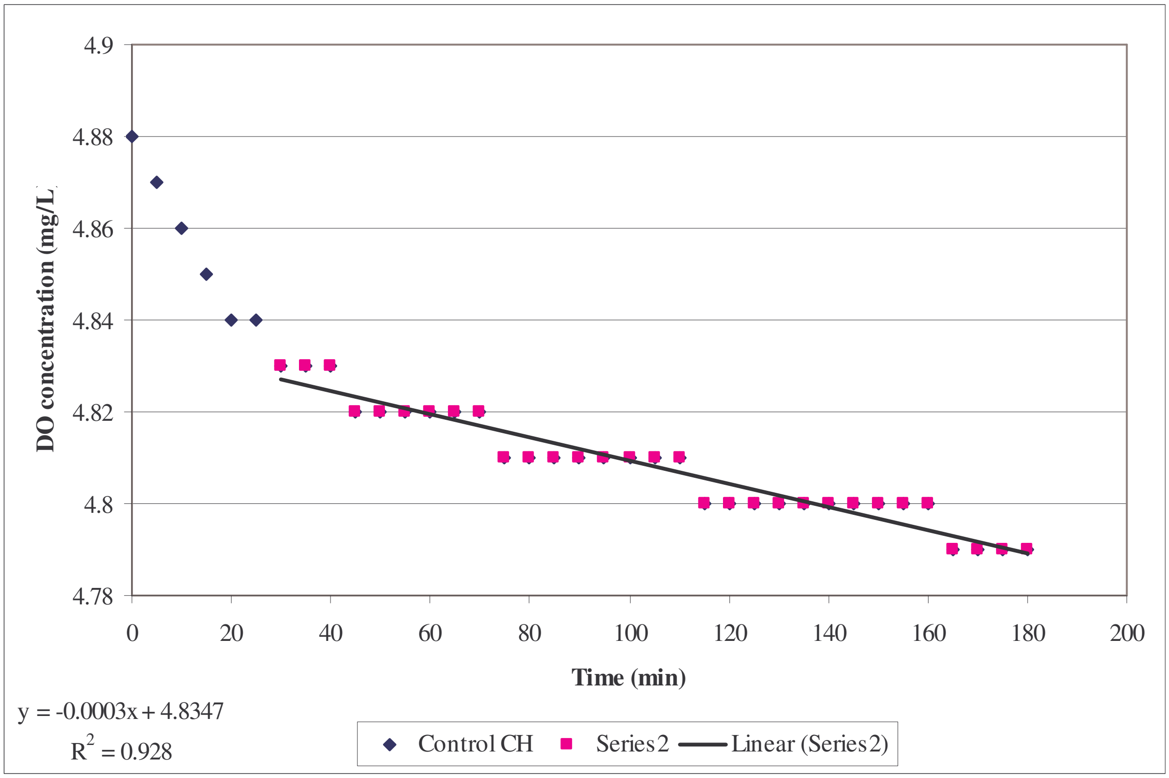

Figure F.45: Oxygen Depletion Curve for the Control chamber on 05/25/2005 at the forested study site within the Little River Basin.

Upper Suwannee River Basin

Forested Site #1

Table F.46: YSI data for Chamber 1 on 11/11/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:40:40	0	15.56	0.325	70.4	7.01	39.8	3.34	515	71.2
12:45:40	5	15.58	0.314	69.7	6.93	39.8	3.41	514.5	67.6
12:50:40	10	15.61	0.307	69	6.86	38.7	3.49	513	64.8
12:55:40	15	15.64	0.304	68.5	6.8	41	3.56	512	62
13:00:40	20	15.67	0.303	68	6.75	38.7	3.61	510.7	58.7
13:05:40	25	15.71	0.302	67.6	6.71	39.8	3.64	509.8	57.9
13:10:40	30	15.75	0.301	67.3	6.67	39.8	3.69	507.8	55.6
13:15:40	35	15.8	0.3	67	6.64	38.7	3.71	506.8	54.8
13:20:40	40	15.85	0.3	66.8	6.61	39.8	3.73	506.2	52.8
13:25:40	45	15.9	0.299	66.6	6.58	39.8	3.74	505.7	51.6
13:30:40	50	15.95	0.299	66.4	6.55	39.8	3.75	505.1	50.4
13:35:40	55	16	0.299	66.2	6.53	38.7	3.76	504.5	48.4
13:40:40	60	16.05	0.299	66	6.5	39.8	3.76	504.5	47.5
13:45:40	65	16.09	0.299	65.8	6.48	38.7	3.76	504.4	46.5
13:50:40	70	16.14	0.299	65.7	6.46	38.7	3.75	504.6	45.8
13:55:40	75	16.18	0.299	65.6	6.44	38.7	3.75	504.4	44.9
14:00:40	80	16.23	0.299	65.4	6.42	38.7	3.75	504.3	43.5
14:05:40	85	16.27	0.3	65.3	6.4	38.7	3.74	504.2	43.2
14:10:40	90	16.32	0.3	65.2	6.38	38.7	3.74	503.8	42.1
14:15:40	95	16.36	0.3	65.1	6.37	41	3.74	503.6	41.8
14:20:40	100	16.41	0.3	65	6.35	38.7	3.74	503.2	41.1
14:25:40	105	16.46	0.301	64.8	6.33	38.7	3.74	503	40.3
14:30:40	110	16.5	0.301	64.8	6.32	39.8	3.74	502.6	39.7
14:35:40	115	16.54	0.301	64.6	6.3	38.7	3.74	502.3	38.8
14:40:40	120	16.59	0.302	64.5	6.28	38.7	3.73	502.2	38.2
14:45:40	125	16.63	0.302	64.5	6.27	38.7	3.73	501.9	37.9
14:50:40	130	16.67	0.303	64.3	6.25	38.7	3.73	501.3	37.1
14:55:40	135	16.71	0.303	64.2	6.24	38.7	3.73	500.9	36.5
15:00:40	140	16.74	0.304	64.1	6.22	38.7	3.73	500.1	35.8
15:05:40	145	16.78	0.304	64	6.21	38.7	3.74	499.1	35.5
15:10:40	150	16.82	0.304	63.9	6.19	38.7	3.74	498.4	35
15:15:40	155	16.86	0.305	63.8	6.18	39.8	3.74	497.8	34.7
15:20:40	160	16.9	0.311	63.7	6.17	38.7	3.74	497.2	34.7
15:25:40	165	16.94	0.313	63.6	6.15	38.7	3.75	496.5	33.8
15:30:40	170	16.99	0.313	63.5	6.13	39.8	3.75	495.8	33.8
15:35:40	175	17.03	0.314	63.4	6.12	38.7	3.75	495.2	33.1
15:40:40	180	17.07	0.314	63.3	6.1	38.7	3.75	494.6	33.3
Averages		16.31	0.30	65.61	6.43	39.15	3.70	503.70	45.15

Slope	0.0037
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.29
SOD (g O_2/m^2*day)	**1.22**

Table F.47: YSI data for Chamber 2 on 11/11/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:22:21	0	15.57	0.073	55.3	5.5	49.8	3.92	928	94.8
12:25:40	5	15.59	0.073	51.8	5.16	48	3.89	776.5	85.9
12:30:40	10	15.62	0.073	53.6	5.33	48.6	3.88	692.1	83.7
12:35:21	15	15.64	0.073	50.1	4.98	48	3.87	692.6	81.6
12:40:21	20	15.68	0.073	45.3	4.5	46.9	3.86	787.7	76.3
12:45:21	25	15.72	0.073	44.4	4.41	48	3.86	794.5	74.5
12:50:21	30	15.76	0.073	43.8	4.35	48	3.86	793.2	75
12:55:21	35	15.81	0.073	43.5	4.31	46.9	3.86	790.9	72.4
13:00:21	40	15.87	0.073	43.2	4.27	46.9	3.86	788.3	73.1
13:05:21	45	15.92	0.073	42.9	4.25	46.9	3.86	785.9	70.4
13:10:21	50	15.97	0.073	42.6	4.21	46.9	3.86	784.1	70.1
13:15:21	55	16.02	0.073	42.5	4.19	45.7	3.86	782.2	68.3
13:20:21	60	16.07	0.073	42.2	4.16	46.9	3.86	780.2	67.5
13:25:21	65	16.12	0.073	42	4.14	48	3.86	778.5	67.2
13:30:21	70	16.16	0.073	41.8	4.12	46.9	3.86	776.7	65.6
13:35:21	75	16.21	0.073	41.6	4.09	46.9	3.86	775.8	65.4
13:40:21	80	16.25	0.073	41.5	4.07	46.9	3.86	774.7	64.3
13:45:21	85	16.3	0.073	41.3	4.05	46.9	3.87	773.7	63.9
13:50:21	90	16.34	0.073	41.1	4.03	46.9	3.86	773	63.9
13:55:21	95	16.39	0.073	41	4.01	46.9	3.86	772.3	63.1
14:00:21	100	16.44	0.073	40.7	3.98	45.7	3.87	771.8	62
14:05:21	105	16.49	0.073	40.6	3.96	46.9	3.87	771.3	61.6
14:10:21	110	16.53	0.073	40.4	3.94	46.9	3.87	771.1	61.8
14:15:21	115	16.57	0.073	40.2	3.92	46.9	3.87	771	61.7
14:20:21	120	16.62	0.073	40	3.9	46.9	3.87	770.7	60.6
14:25:21	125	16.65	0.073	39.9	3.88	46.9	3.87	770.6	60.3
14:30:21	130	16.69	0.073	39.7	3.86	45.7	3.87	770.6	60.2
14:35:21	135	16.73	0.073	39.5	3.84	46.9	3.87	770.6	59.7
14:40:21	140	16.77	0.073	39.4	3.82	45.7	3.87	770.6	59.6
14:45:21	145	16.81	0.073	39.2	3.81	46.9	3.87	770.8	58.5
14:50:21	150	16.85	0.073	39	3.78	45.7	3.87	771	57.5
14:55:21	155	16.88	0.073	38.9	3.77	45.7	3.87	771.2	58.1
15:00:21	160	16.93	0.073	38.7	3.75	45.7	3.87	771.7	57.5
15:05:21	165	16.97	0.073	38.5	3.73	46.9	3.87	772	57.7
15:10:21	170	17.01	0.073	38.4	3.71	45.7	3.87	772.4	57.4
15:15:21	175	17.05	0.073	38.2	3.69	45.7	3.87	772.8	57.3
15:20:21	180	17.09	0.073	38.1	3.67	44.5	3.87	773.4	56.8
15:25:21	185	17.13	0.073	37.9	3.65	45.7	3.87	773.4	56.5
Average		16.35	0.07	42.07	4.13	46.79	3.87	776.00	66.10

Slope	0.0044
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.53
SOD (g O_2/m^2*day)	**1.46**

Table F.48: YSI data for Chamber 2 on 11/11/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	Dosat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
11:59:15	0	15.59	0.079	63	6.28	54	3.95	19.1
12:04:15	5	15.62	0.079	59.2	5.89	53	3.94	19.2
12:09:15	10	15.65	0.079	58.2	5.79	54	3.94	18
12:14:15	15	15.69	0.079	57.8	5.74	53	3.94	17.5
12:19:15	20	15.73	0.079	57.5	5.7	53	3.95	16.7
12:24:15	25	15.77	0.079	57.3	5.68	53	3.95	16.6
12:29:15	30	15.82	0.079	57.2	5.67	53	3.95	15.8
12:34:15	35	15.87	0.079	57.1	5.65	53	3.95	15.4
12:39:15	40	15.93	0.079	57.1	5.65	53	3.95	15.2
12:44:15	45	15.97	0.079	57.1	5.64	53	3.95	15
12:49:15	50	16.02	0.079	57.1	5.63	53	3.95	14.5
12:54:15	55	16.07	0.079	57.1	5.62	53	3.95	14.2
12:59:15	60	16.11	0.079	57.1	5.62	52	3.95	14.5
13:04:15	65	16.16	0.079	57.1	5.62	53	3.95	13.6
13:09:15	70	16.2	0.079	57.1	5.62	52	3.95	13.5
13:14:15	75	16.25	0.079	57.2	5.62	53	3.95	13.3
13:19:15	80	16.29	0.079	57.2	5.61	52	3.95	13.2
13:24:15	85	16.34	0.079	57.3	5.61	53	3.96	12.9
13:29:15	90	16.38	0.079	57.3	5.61	53	3.96	12.9
13:34:15	95	16.43	0.079	57.4	5.61	52	3.96	12.7
13:39:15	100	16.48	0.079	57.4	5.61	53	3.96	12.5
13:44:15	105	16.52	0.079	57.4	5.61	52	3.96	12.1
13:49:15	110	16.56	0.079	57.5	5.61	52	3.96	12
13:54:15	115	16.61	0.078	57.5	5.61	53	3.96	11.9
13:59:15	120	16.64	0.078	57.6	5.6	53	3.96	11.8
14:04:15	125	16.68	0.078	57.6	5.61	53	3.96	11.7
14:09:15	130	16.72	0.078	57.7	5.61	53	3.96	11.6
14:14:15	135	16.76	0.078	57.7	5.61	53	3.96	11.4
14:19:15	140	16.8	0.078	57.7	5.6	53	3.96	11.4
14:24:15	145	16.84	0.078	57.8	5.61	53	3.96	11.2
14:29:15	150	16.88	0.078	57.9	5.6	53	3.96	11.2
14:34:15	155	16.92	0.078	57.9	5.6	52	3.96	12.4
14:39:15	160	16.96	0.078	57.9	5.6	52	3.96	10.9
14:44:15	165	17.01	0.078	58	5.6	53	3.96	10.8
14:49:15	170	17.05	0.078	58	5.6	52	3.96	10.6
14:54:15	175	17.09	0.078	58.1	5.6	52	3.96	10.5
14:59:15	180	17.14	0.078	58.1	5.6	52	3.97	10.7
Average		16.37	0.08	57.71	5.65	52.76	3.95	13.47
Slope		0.0002						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.07**						

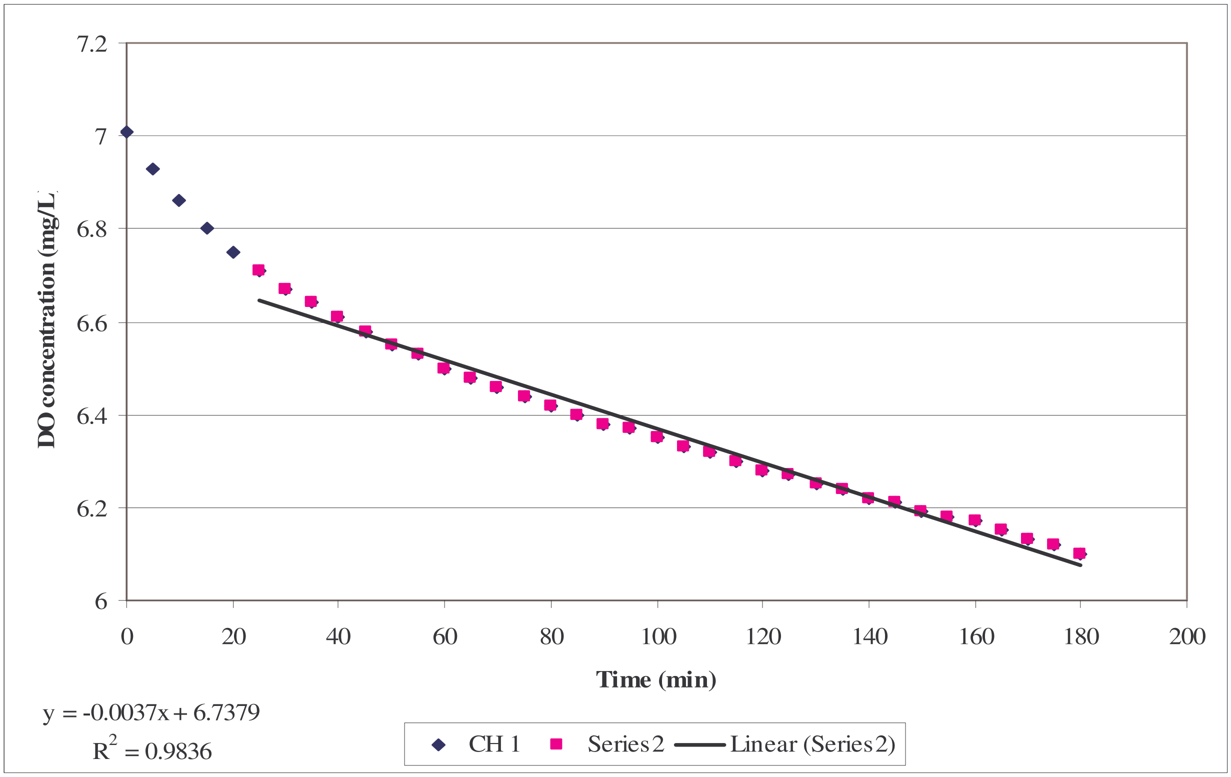

Figure F.46: Oxygen Depletion Curve for Chamber 1 on 11/11/2004 at the first forested study site within the Upper Suwannee River Basin.

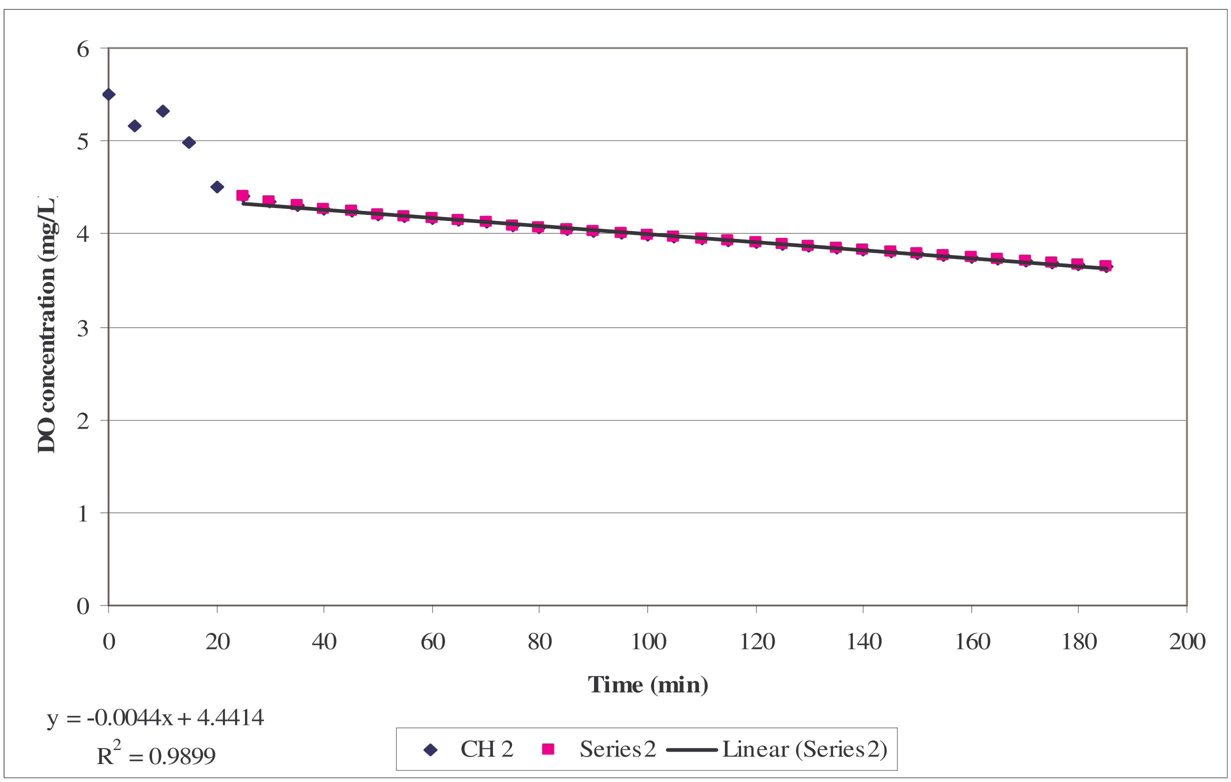

Figure F.47: Oxygen Depletion Curve for Chamber 2 on 11/11/2004 at the first forested study site within the Upper Suwannee River Basin.

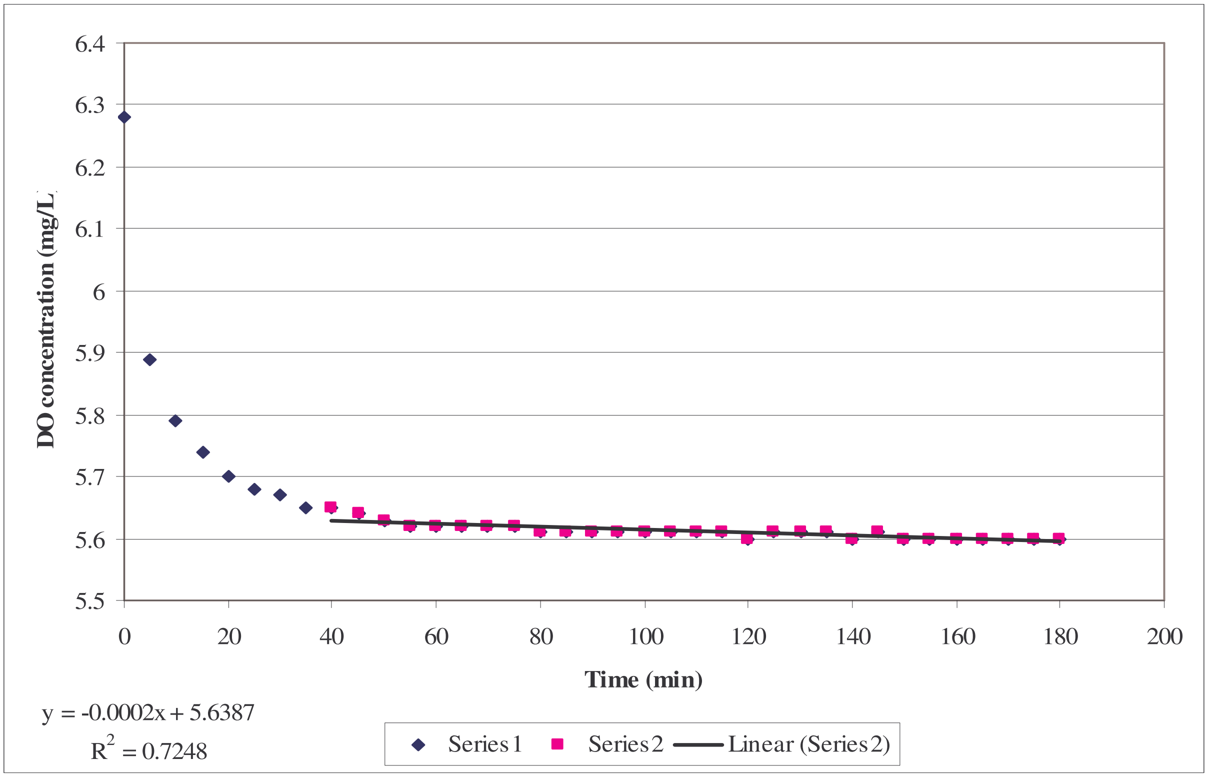

Figure F.48: Oxygen Depletion Curve for the Control chamber on 11/11/2004 at the first forested study site within the Upper Suwannee River Basin.

Table F.49: YSI data for Chamber 1 on 02/01/2005

Time (hh:mm:ss)	**Time (min)**	**Temp (˚C)**	**Cond (mS/cm)**	**DOsat (%)**	**DO (mg/L)**	**DOchrg**	**pH**	**Orp (mV)**	**Turbid (NTU)**
12:00:40	0	9.11	5.162	76.5	8.59	44.5	3.23	352.6	280
12:05:40	5	8.98	6.411	69.8	7.81	44.5	3.12	361.6	333.8
12:10:40	10	8.91	6.209	69	7.74	44.5	3.2	362.4	334
12:15:40	15	8.85	6.685	68.1	7.63	44.5	3.25	363.3	316.3
12:20:40	20	8.8	5.535	67.2	7.59	44.5	3.28	364.4	308.5
12:25:40	25	8.77	4.319	66.5	7.57	43.9	3.3	365.4	305.6
12:30:40	30	8.74	3.49	65.8	7.52	43.9	3.32	366.2	300
12:35:40	35	8.72	2.797	65.3	7.49	43.9	3.33	367	297.6
12:40:40	40	8.71	2.082	64.6	7.44	43.9	3.34	367.8	293.7
12:45:40	45	8.7	1.703	64.5	7.45	43.9	3.34	368.5	291.8
12:50:40	50	8.7	1.428	65.5	7.58	44.5	3.35	369	288.3
12:55:40	55	8.7	1.193	66.9	7.75	44.5	3.36	369.4	300.4
13:00:40	60	8.7	1.032	68.1	7.89	43.9	3.36	370.2	283.6
13:05:40	65	8.7	0.804	69	8	43.9	3.36	370.7	285.2
13:10:40	70	8.7	0.721	69.6	8.08	43.9	3.36	371	285.2
13:15:40	75	8.7	0.646	70	8.13	44.5	3.37	371.2	277.8
13:20:40	80	8.71	0.594	70.2	8.15	43.9	3.37	371.7	273.7
13:25:40	85	8.72	0.545	70.2	8.16	43.9	3.37	372.1	295.1
13:30:40	90	8.72	0.509	70.2	8.15	44.5	3.37	372.5	291
13:35:40	95	8.72	0.478	70.1	8.14	44.5	3.38	372.8	288.5
13:40:40	100	8.73	0.454	70	8.12	44.5	3.38	373.3	264.7
13:45:40	105	8.81	0.468	69.7	8.08	43.9	3.35	375.2	268.5
13:50:40	110	8.82	0.45	69.5	8.05	44.5	3.36	375.2	274.5
13:55:40	115	8.83	0.426	69.1	8.01	44.5	3.36	375.5	275
14:00:40	120	8.84	0.41	68.6	7.95	44.5	3.36	375.7	267.9
14:05:40	125	8.85	0.398	68.1	7.89	43.9	3.37	375.9	266.6
14:10:40	130	8.86	0.388	67.6	7.83	43.9	3.37	376.2	256.7
14:15:40	135	8.87	0.377	67.2	7.78	43.9	3.37	376.5	261.7
14:20:40	140	8.89	0.367	66.9	7.74	43.9	3.37	376.8	257.4
14:25:40	145	8.9	0.357	66.6	7.71	43.9	3.38	376.7	249.8
14:30:40	150	8.91	0.349	66.3	7.67	44.5	3.38	377.3	247.8
14:35:40	155	8.92	0.342	66	7.64	43.9	3.38	377.6	249.6
14:40:40	160	8.94	0.335	65.8	7.61	43.9	3.38	377.9	246.5
14:45:40	165	8.95	0.328	65.5	7.57	44.5	3.39	378.1	244.1
14:50:40	170	8.96	0.322	65.2	7.53	44.5	3.39	378.3	243.2
14:55:40	175	8.97	0.317	64.9	7.5	43.9	3.39	378.8	240.4
15:00:40	180	8.98	0.311	64.6	7.47	42.8	3.39	379.1	244.6
Averages		8.82	1.59	67.80	7.81	44.15	3.34	371.73	278.08

Slope	0.0082
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	2.85
SOD (g O_2/m^2*day)	**2.81**

Table F.50: YSI data for Chamber 2 on 02/01/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
0:04:28	0	8.55	0.069	75.2	8.79	40	4.1	113.2
0:09:28	5	8.58	0.069	38.9	4.54	39	4.09	165.5
0:14:28	10	8.55	0.069	37.2	4.35	39	4.08	162.5
0:19:28	15	8.52	0.069	36.3	4.25	39	4.08	161.3
0:24:28	20	8.49	0.069	35.7	4.18	39	4.08	161.4
0:29:28	25	8.47	0.069	35.2	4.12	38	4.08	157.9
0:34:28	30	8.46	0.07	34.8	4.07	39	4.09	157.5
0:39:28	35	8.45	0.07	34.5	4.04	39	4.09	156
0:44:28	40	8.45	0.07	34.1	4	38	4.09	156
0:49:28	45	8.45	0.07	33.8	3.96	40	4.08	154.2
0:54:28	50	8.45	0.07	33.6	3.93	39	4.08	153.4
0:59:28	55	8.45	0.07	33.3	3.9	39	4.08	152.2
1:04:28	60	8.46	0.07	33	3.87	39	4.08	152.1
1:09:28	65	8.46	0.07	32.8	3.84	38	4.08	150.7
1:14:28	70	8.47	0.07	32.5	3.81	38	4.08	150.7
1:19:28	75	8.48	0.07	32.3	3.78	39	4.08	148.7
1:24:28	80	8.48	0.07	32.1	3.75	39	4.08	148.1
1:29:28	85	8.49	0.07	31.8	3.73	39	4.07	147.3
1:34:28	90	8.5	0.07	31.6	3.7	39	4.07	147.7
1:39:28	95	8.5	0.07	31.4	3.68	39	4.07	147.8
1:44:28	100	8.51	0.07	31.2	3.65	39	4.07	145.6
1:49:28	105	8.52	0.07	31	3.62	38	4.07	143.8
1:54:28	110	8.53	0.07	30.7	3.59	39	4.07	144.8
1:59:28	115	8.54	0.07	30.6	3.57	38	4.06	144
2:04:28	120	8.55	0.07	30.3	3.54	39	4.06	141.8
2:09:28	125	8.57	0.07	30.1	3.52	38	4.06	143.5
2:14:28	130	8.58	0.07	29.9	3.5	38	4.06	141
2:19:28	135	8.59	0.07	29.7	3.47	39	4.06	142.6
2:24:28	140	8.6	0.07	29.5	3.45	38	4.06	140.9
2:29:28	145	8.61	0.07	29.3	3.42	39	4.06	141.3
2:34:28	150	8.62	0.07	29.1	3.4	39	4.06	141.1
2:39:28	155	8.63	0.07	28.9	3.38	37	4.05	139.7
2:44:28	160	8.64	0.07	28.8	3.35	38	4.05	139.8
2:49:28	165	8.65	0.07	28.5	3.32	39	4.05	137.8
2:54:28	170	8.66	0.07	28.3	3.3	38	4.05	138.9
2:59:28	175	8.67	0.07	28.2	3.28	38	4.05	137.5
3:04:28	180	8.68	0.07	28	3.26	38	4.05	137.2
Averages		8.54	0.07	33.03	3.86	38.65	4.07	147.18

Slope	0.006
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.91
SOD (g O_2/m^2*day)	**1.88**

Table F.51: YSI data for the Control chamber on 02/01/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:45:51	0	8.41	0.071	80	9.38	52.7	3.84	547	39.7
11:50:40	5	8.41	0.071	82.7	9.7	52.7	3.81	486.1	38.3
11:55:21	10	8.42	0.071	81.7	9.58	52.7	3.79	458.4	39.1
12:00:40	15	8.43	0.071	83.9	9.83	52.7	3.78	451.7	36.6
12:05:40	20	8.44	0.071	84	9.85	52.1	3.78	446.9	34.9
12:10:40	25	8.45	0.071	83.9	9.83	52.1	3.78	439.5	33.7
12:15:40	30	8.46	0.071	84.1	9.84	52.7	3.78	435.9	33
12:20:40	35	8.47	0.071	84	9.83	52.1	3.78	432.7	33
12:25:40	40	8.48	0.071	84.1	9.84	52.1	3.78	430	31.1
12:30:40	45	8.49	0.071	84.1	9.84	52.1	3.78	427.6	30.7
12:35:40	50	8.51	0.071	84.1	9.84	52.1	3.78	424.6	30.6
12:40:40	55	8.52	0.071	84.4	9.87	52.7	3.79	425	29.9
12:45:40	60	8.53	0.071	84.5	9.88	52.1	3.8	425.1	31.6
12:50:40	65	8.55	0.071	84.7	9.9	52.7	3.79	420.3	28.5
12:55:40	70	8.56	0.071	84.5	9.88	52.7	3.78	414.6	28.5
13:00:40	75	8.57	0.071	84.5	9.87	52.1	3.79	412.8	27.9
13:05:40	80	8.59	0.071	84.7	9.89	52.7	3.79	411.4	27.1
13:10:40	85	8.6	0.071	84.9	9.9	52.7	3.79	408.5	27.1
13:15:40	90	8.61	0.071	85	9.92	52.1	3.79	407.9	26.8
13:20:40	95	8.62	0.071	84.8	9.9	52.1	3.79	406.1	26.4
13:25:40	100	8.63	0.071	84.8	9.88	52.7	3.79	405.5	26
13:30:40	105	8.64	0.071	84.7	9.88	52.7	3.79	405	25.7
13:35:40	110	8.65	0.071	84.9	9.89	52.7	3.79	403.4	25.5
13:40:40	115	8.66	0.071	84.8	9.88	52.1	3.8	403.3	28.2
13:45:40	120	8.67	0.071	84.9	9.89	52.1	3.8	401.5	25
13:50:40	125	8.68	0.071	84.9	9.88	52.1	3.8	400.1	24.8
13:55:40	130	8.69	0.071	84.9	9.89	52.7	3.8	400.5	24.7
14:00:40	135	8.7	0.071	84.8	9.88	52.7	3.8	399.2	24.5
14:05:40	140	8.71	0.071	85.1	9.9	52.1	3.8	398.6	23.9
14:10:40	145	8.72	0.071	84.9	9.88	52.7	3.8	398.3	24.2
14:15:40	150	8.73	0.071	84.9	9.87	52.1	3.8	397	23.6
14:20:40	155	8.74	0.071	84.9	9.87	52.7	3.8	396.5	23.3
14:25:40	160	8.75	0.071	85.1	9.9	52.7	3.8	395.8	23.6
14:30:40	165	8.76	0.071	85	9.88	52.1	3.81	395.8	25.3
14:35:40	170	8.77	0.07	85	9.88	52.7	3.8	395	22.7
14:40:40	175	8.78	0.07	85	9.88	52.1	3.81	395.6	22.6
14:45:40	180	8.79	0.07	85.1	9.88	52.1	3.81	395.3	22.8
14:50:40	185	8.8	0.07	85	9.87	52.1	3.8	394.7	22.5
14:55:40	190	8.81	0.07	85	9.87	52.1	3.81	394.3	22.4
Averages		8.61	0.07	84.42	9.85	52.39	3.79	417.63	28.10

Slope	0.0001
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	**0.03**

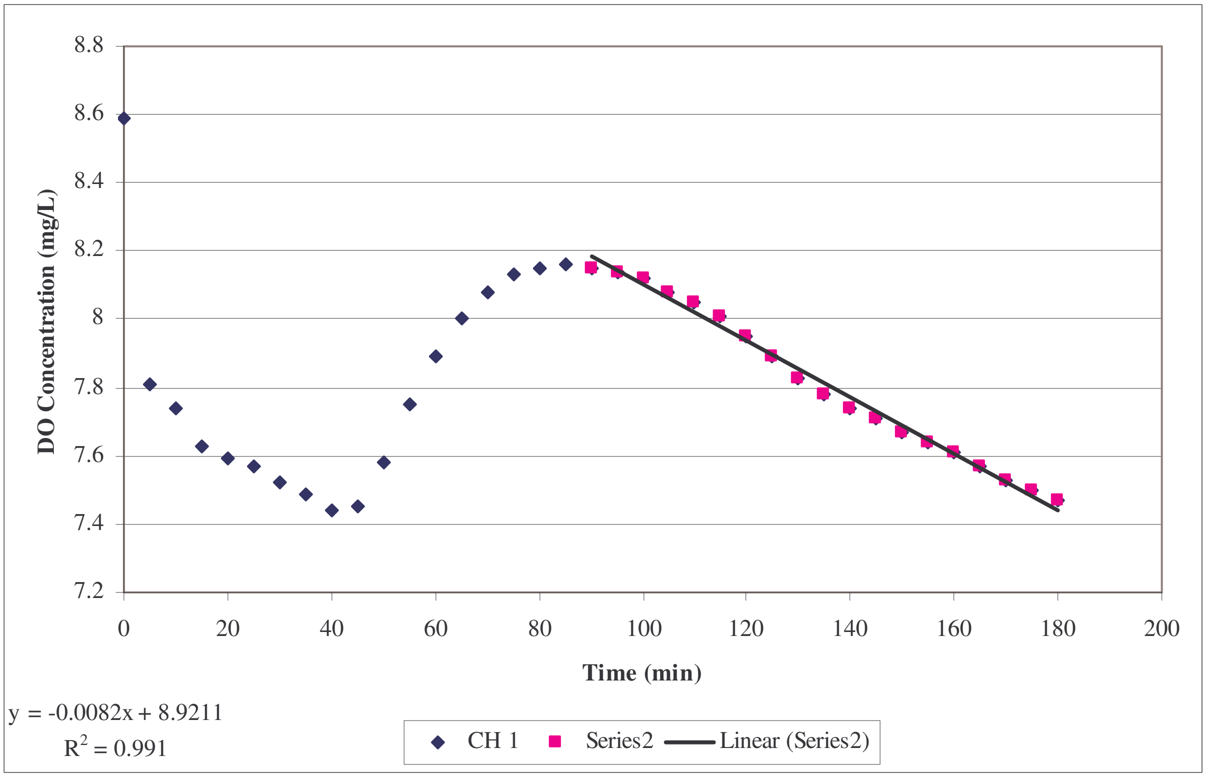

Figure F.49: Oxygen Depletion Curve for Chamber 1 on 02/01/2005 at the first forested study site within the Upper Suwannee River Basin.

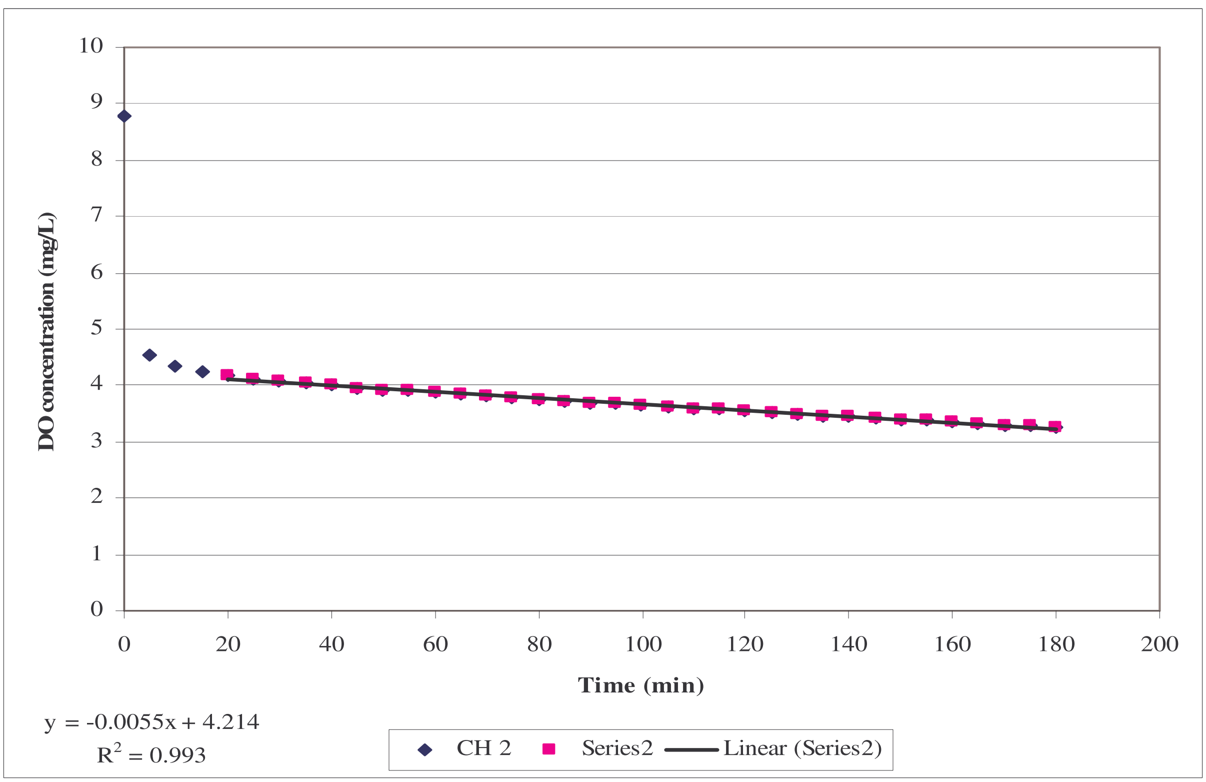

Figure F.50: Oxygen Depletion Curve for Chamber 2 on 02/01/2005 at the first forested study site within the Upper Suwannee River Basin.

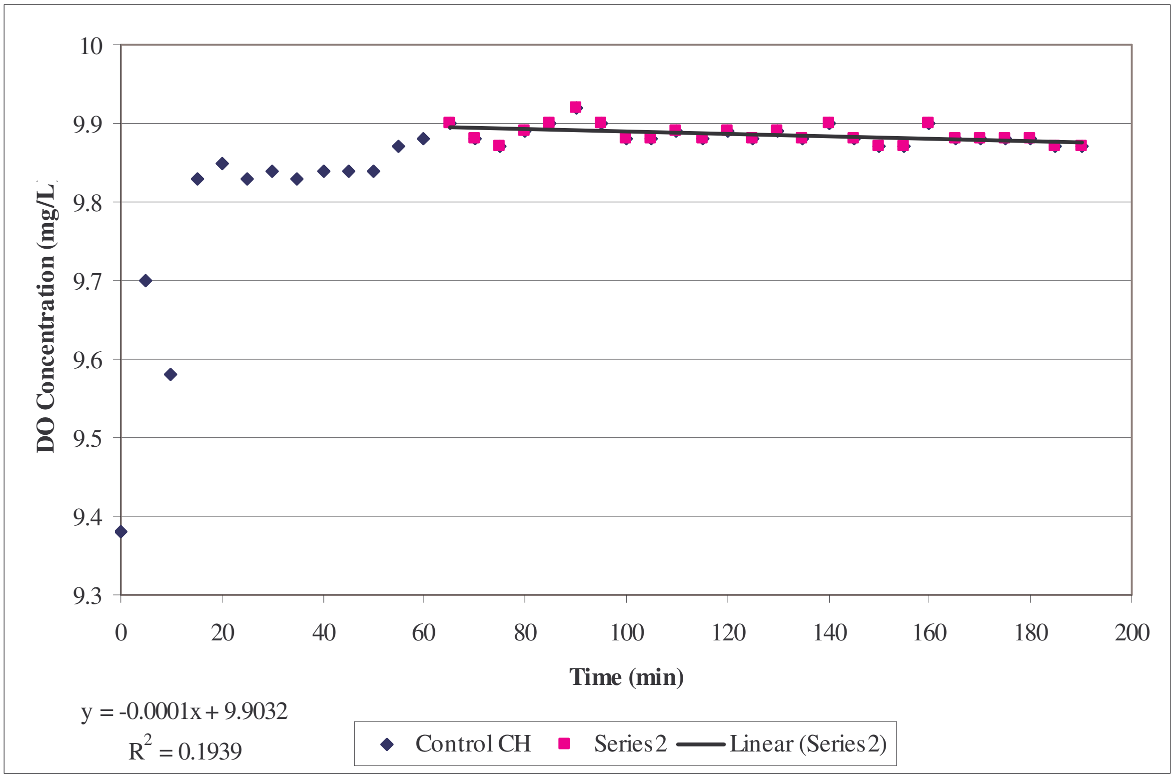

Figure F.51: Oxygen Depletion Curve for the Control Chamber on 02/01/2005 at the first forested study site within the Upper Suwannee River Basin.

Table F.52: YSI data for Chamber 1 on 03/02/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:40:40	0	16	0.185	100.2	9.88	42.8	6.35	365.5	47.1
11:45:40	5	15.91	0.209	99.5	9.83	42.8	6.34	362.7	21.9
11:50:40	10	15.91	0.188	99.8	9.87	42.8	6.26	356.3	3.8
11:55:40	15	9.19	0.105	72	8.28	39.8	3.23	397.6	76.3
12:00:40	20	9.22	0.101	69.9	8.03	39.8	3.2	404.1	83
12:05:40	25	9.25	0.1	69.7	8.01	39.8	3.24	403.9	82.4
12:10:40	30	9.29	0.099	69.7	8	39.8	3.28	402.8	82.1
12:15:40	35	9.33	0.096	69.7	7.99	39.8	3.3	402.2	78
12:20:40	40	9.37	0.087	69.7	7.98	39.8	3.31	402	76.7
12:25:40	45	9.41	0.086	69.6	7.97	39.8	3.33	401.2	74.8
12:30:40	50	9.45	0.083	69.6	7.96	39.8	3.34	400.9	72.5
12:35:40	55	9.5	0.081	69.5	7.94	41	3.34	400.9	71.9
12:40:40	60	9.55	0.079	69.5	7.93	39.8	3.35	400.6	67.6
12:45:40	65	9.59	0.077	69.4	7.91	41	3.36	400.5	67.6
12:50:40	70	9.64	0.076	69.4	7.9	39.8	3.36	400.5	65.4
12:55:40	75	9.69	0.075	69.5	7.9	41	3.38	400	64.2
13:00:40	80	9.75	0.074	69.4	7.88	39.8	3.38	400.3	63.2
13:05:40	85	9.8	0.073	69.4	7.86	39.8	3.38	400.3	62.5
13:10:40	90	9.85	0.072	69.3	7.85	41	3.39	400.1	61.4
13:15:40	95	9.9	0.071	69.3	7.84	39.8	3.39	400.3	61.5
13:20:40	100	9.96	0.071	69.4	7.84	41	3.39	400.3	59.3
13:25:40	105	10.02	0.07	69.3	7.82	39.8	3.4	400.3	60.1
13:30:40	110	10.07	0.07	69.3	7.81	41	3.4	400.3	57.6
13:35:40	115	10.13	0.069	69.3	7.8	39.8	3.4	400.5	56.3
13:40:40	120	10.19	0.069	69.3	7.79	39.8	3.41	400.5	55.2
13:45:40	125	10.24	0.069	69.3	7.78	39.8	3.41	400.7	54.9
13:50:40	130	10.3	0.068	69.3	7.77	41	3.41	400.6	53.6
13:55:40	135	10.35	0.068	69.3	7.76	41	3.42	400.6	51.5
14:00:40	140	10.4	0.068	69.3	7.75	39.8	3.42	400.8	53.2
14:05:40	145	10.46	0.068	69.3	7.74	39.8	3.42	401	52.2
14:10:40	150	10.51	0.068	69.3	7.73	41	3.42	401.2	51.7
14:15:40	155	10.56	0.067	69.3	7.72	41	3.42	401.5	50.3
14:20:40	160	10.61	0.067	69.3	7.71	41	3.43	401.2	50.2
14:25:40	165	10.65	0.067	69.2	7.7	39.8	3.43	401.5	49.9
14:30:40	170	10.7	0.067	69.3	7.69	39.8	3.43	401.7	49.1
14:35:40	175	10.75	0.067	69.3	7.68	39.8	3.43	401.9	48.7
14:40:40	180	10.8	0.067	69.2	7.67	41	3.43	402	48.7
Averages		10.44	0.086	71.95	8.015	40.43	3.61	397.8	59.09

Slope	0.002
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	0.76
SOD (g O_2/m^2*day)	**0.69**

Table F.53: YSI data for Chamber 3 on 03/02/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:47:06	0	8.87	0.073	81.5	9.45	49.8	3.92	1999.9	87.3
11:50:40	5	8.96	0.073	70.5	8.16	48.6	3.83	1999.9	139.5
11:55:40	10	9.01	0.073	67	7.74	48.6	3.8	1999.9	118.1
12:00:40	15	9.07	0.073	66	7.62	48.6	3.8	1999.9	116.8
12:05:40	20	9.13	0.073	65.4	7.53	48.6	3.79	1999.9	112.9
12:10:40	25	9.19	0.073	65.3	7.51	48.6	3.79	1817	110.7
12:15:40	30	9.25	0.073	62.9	7.23	48.6	3.79	1583.6	107.6
12:20:40	35	9.31	0.073	64.9	7.44	48.6	3.79	1399.7	105.3
12:25:40	40	9.37	0.073	63.2	7.24	48.6	3.79	1255.9	103.4
12:30:40	45	9.43	0.073	64	7.32	49.8	3.79	1140.5	101.2
12:35:40	50	9.49	0.073	63.1	7.21	48.6	3.79	1044.5	100.2
12:40:40	55	9.54	0.073	62.9	7.18	48.6	3.79	967.2	97.4
12:45:40	60	9.6	0.073	62.4	7.12	49.8	3.79	902.3	96.8
12:50:40	65	9.66	0.073	64.9	7.38	48.6	3.79	850.2	94.8
12:55:40	70	9.72	0.073	62.9	7.15	48.6	3.79	806.8	93.5
13:00:40	75	9.78	0.073	61.8	7.01	48.6	3.79	769.7	92
13:05:40	80	9.84	0.073	64.1	7.27	48.6	3.79	739.8	90.5
13:10:40	85	9.9	0.073	66.7	7.54	48.6	3.8	715.4	89.6
13:15:40	90	9.96	0.073	64.3	7.26	48.6	3.8	693.6	87.1
13:20:40	95	10.02	0.073	63.9	7.21	49.8	3.8	676	86.7
13:25:40	100	10.09	0.073	64.5	7.26	48.6	3.8	660.9	86.8
13:30:40	105	10.14	0.073	63.7	7.17	48.6	3.8	646.3	84.9
13:35:40	110	10.2	0.073	66	7.41	48.6	3.8	636	84.4
13:40:40	115	10.26	0.073	64.1	7.19	49.8	3.79	626.1	83.3
13:45:40	120	10.32	0.073	66	7.4	49.8	3.8	618.2	82.3
13:50:40	125	10.37	0.073	65.4	7.31	49.8	3.8	611	81.7
13:55:40	130	10.44	0.073	64.5	7.21	49.8	3.8	605.5	79.4
14:00:40	135	10.49	0.073	62.9	7.02	49.8	3.79	598.4	79.5
14:05:40	140	10.55	0.073	65.6	7.31	49.8	3.8	594.6	79.1
14:10:40	145	10.6	0.073	66.5	7.4	48.6	3.8	589.4	77.9
14:15:40	150	10.66	0.073	64	7.11	48.6	3.8	584.5	76.9
14:20:40	155	10.71	0.073	64.6	7.17	49.8	3.8	581.8	76.5
14:25:40	160	10.76	0.073	65	7.21	48.6	3.8	579.3	75.7
14:30:40	165	10.81	0.073	65.2	7.22	49.8	3.8	576.4	75.1
14:35:40	170	10.86	0.073	65.1	7.2	48.6	3.8	574.5	74.9
14:40:40	175	10.91	0.073	66.3	7.32	49.8	3.8	571.5	72.8
14:45:40	180	10.95	0.073	64.4	7.11	49.8	3.8	568.5	72.8
Averages		9.95	0.073	65.18	7.37	49.05	3.80	961.75	91.23

Slope	0.005
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.77
SOD (g O_2/m^2*day)	**1.70**

Table F.54: YSI data for the Control chamber on 03/02/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond mS/cm	DO sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
11:25:37	0	9.04	0.085	74.9	8.65	39	3.95	1547
11:30:37	5	9.09	0.085	68.7	7.93	39	3.86	1547.2
11:35:37	10	9.14	0.085	68.5	7.89	39	3.85	1547.3
11:40:37	15	9.19	0.085	68.4	7.88	39	3.84	1547.5
11:45:37	20	9.23	0.085	68.4	7.86	39	3.84	1547.6
11:50:37	25	9.28	0.085	68.4	7.86	39	3.84	1547.8
11:55:37	30	9.33	0.085	68.5	7.85	39	3.84	1548
12:00:37	35	9.38	0.085	68.6	7.85	39	3.84	1548.2
12:05:37	40	9.44	0.086	68.6	7.85	39	3.84	1548.4
12:10:37	45	9.49	0.085	68.7	7.85	39	3.84	1548.7
12:15:37	50	9.55	0.086	68.8	7.85	39	3.84	1548.9
12:20:37	55	9.61	0.086	68.9	7.85	39	3.84	1549.2
12:25:37	60	9.67	0.086	69	7.85	40	3.84	1549.5
12:30:37	65	9.73	0.086	69.1	7.85	39	3.84	1549.8
12:35:37	70	9.79	0.086	69.2	7.85	40	3.84	1550.1
12:40:37	75	9.84	0.086	69.3	7.85	40	3.84	1550.4
12:45:37	80	9.91	0.086	69.4	7.85	40	3.84	1550.7
12:50:37	85	9.97	0.086	69.6	7.86	39	3.84	1551
12:55:37	90	10.02	0.086	69.6	7.86	40	3.84	1551.3
13:00:37	95	10.08	0.086	69.7	7.86	40	3.84	1551.6
13:05:37	100	10.14	0.086	69.9	7.86	40	3.84	1551.9
13:10:37	105	10.2	0.086	70	7.86	39	3.84	1552.2
13:15:37	110	10.26	0.084	70.1	7.86	40	3.84	1552.5
13:20:37	115	10.31	0.084	70.2	7.86	40	3.84	1552.7
13:25:37	120	10.37	0.084	70.3	7.86	40	3.84	1553
13:30:37	125	10.42	0.084	70.4	7.86	39	3.84	1553.3
13:35:37	130	10.48	0.084	70.5	7.87	40	3.84	1553.6
13:40:37	135	10.53	0.084	70.6	7.87	40	3.84	1553.8
13:45:37	140	10.58	0.084	70.7	7.87	40	3.84	1554.1
13:50:37	145	10.63	0.084	70.8	7.87	40	3.84	1554.3
13:55:37	150	10.69	0.084	70.9	7.87	40	3.84	1554.6
14:00:37	155	10.74	0.084	71	7.87	40	3.84	1554.9
14:05:37	160	10.78	0.084	71	7.87	40	3.84	1555.1
14:10:37	165	10.82	0.084	71.1	7.88	40	3.84	1555.3
14:15:37	170	10.87	0.084	71.2	7.88	40	3.84	1555.5
14:20:37	175	10.91	0.083	71.3	7.88	40	3.84	1555.7
14:25:37	180	10.95	0.083	71.4	7.88	40	3.84	1555.9
Averages		10.01	0.08	69.88	7.89	39.57	3.84	1551.31

Slope	0.0002
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	**0.07**

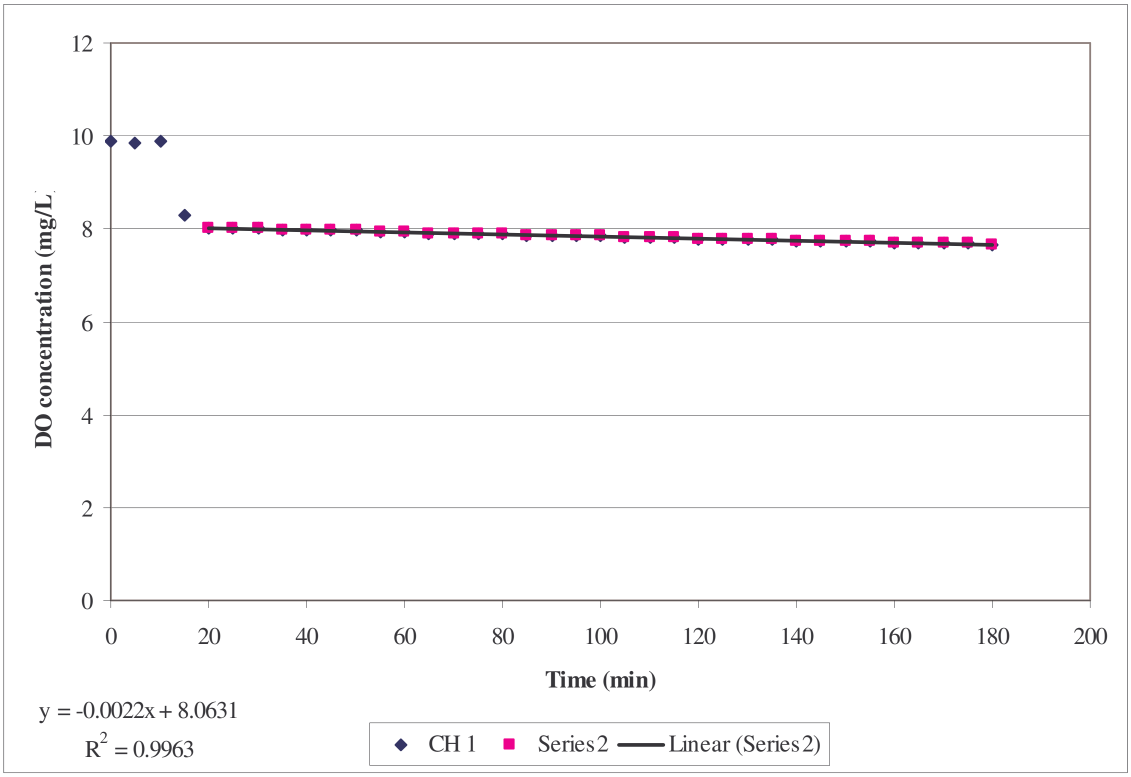

Figure F.52: Oxygen Depletion Curve for Chamber 1 on 03/02/2005 at the first forested study site within the Upper Suwannee River Basin.

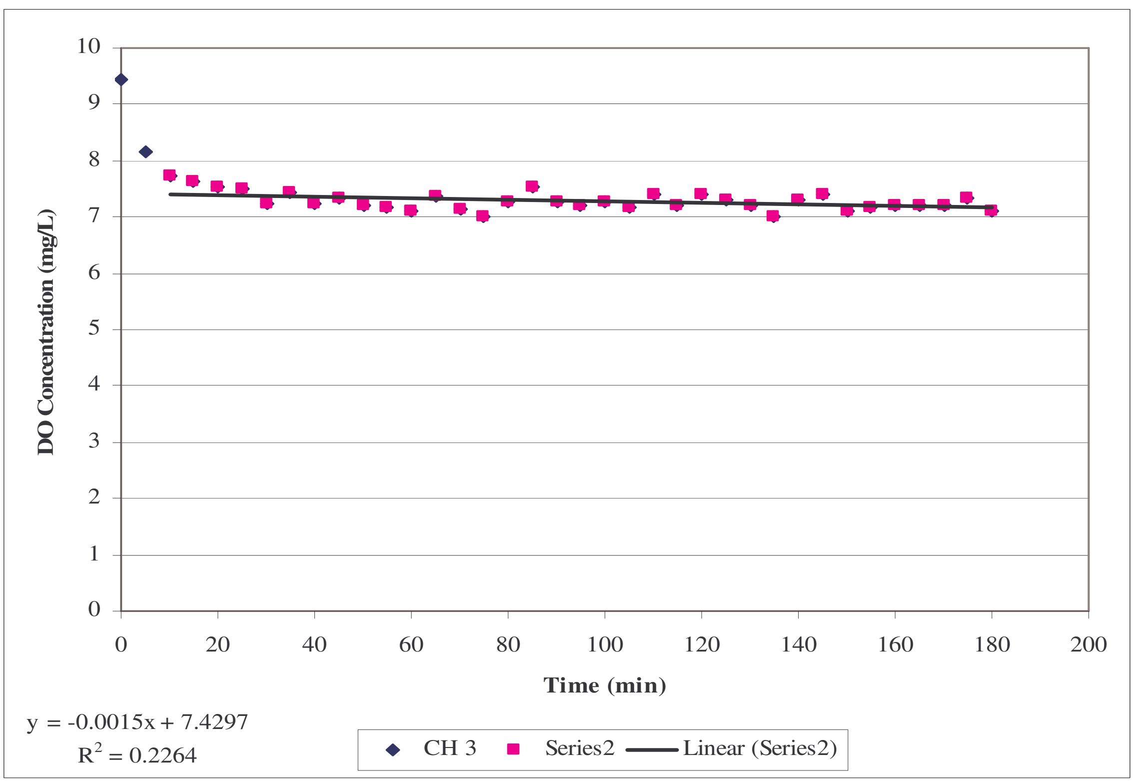

Figure F.53: Oxygen Depletion Curve for Chamber 3 on 03/02/2005 at the first forested study site within the Upper Suwannee River Basin.

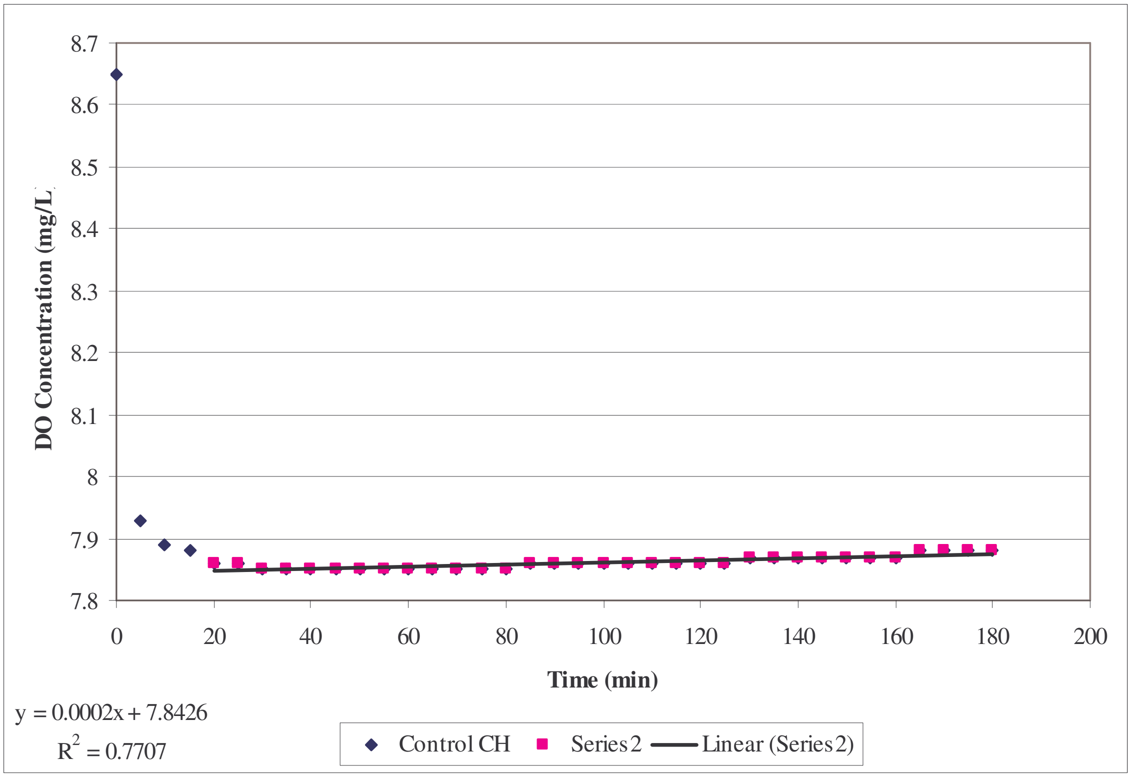

Figure F.54: Oxygen Depletion Curve for the Control chamber on 03/02/2005 at the first forested study site within the Upper Suwannee River Basin.

Table F.55: YSI data for Chamber 2 on 04/19/2005

Time (hh:mm:ss)	**Time (min)**	**Temp (˚C)**	**SpCond (mS/cm)**	**DOsat (%)**	**DO (mg/L)**	**DOchrg**	**pH**	**Turbid (NTU)**
10:45:40	0	15.48	0.078	63.1	6.3	41	3.78	40.1
10:50:40	5	15.55	0.078	62.2	6.2	41.6	3.78	36.1
10:55:40	10	15.61	0.078	61.5	6.12	42.8	3.79	33.6
11:00:40	15	15.68	0.078	61	6.06	41	3.8	30.8
11:05:40	20	15.75	0.078	60.5	6	41.6	3.8	30.2
11:10:40	25	15.82	0.078	60.1	5.95	41	3.8	28.9
11:15:40	30	15.9	0.078	59.7	5.91	39.8	3.81	28
11:20:40	35	15.97	0.078	59.4	5.87	41	3.81	26.3
11:25:40	40	16.04	0.078	59.1	5.83	41	3.81	26.3
11:30:40	45	16.11	0.078	58.8	5.79	41.6	3.81	25
11:35:40	50	16.18	0.078	58.5	5.75	41.6	3.82	24.7
11:40:40	55	16.25	0.078	58.2	5.72	41.6	3.81	24
11:45:40	60	16.32	0.078	58	5.68	39.8	3.82	23.4
11:50:40	65	16.39	0.078	57.7	5.65	41	3.82	23
11:55:40	70	16.46	0.078	57.5	5.62	41	3.82	22.4
12:00:40	75	16.53	0.078	57.3	5.59	41	3.82	22.2
12:05:40	80	16.61	0.078	57	5.56	41.6	3.82	22.1
12:10:40	85	16.68	0.078	56.9	5.53	41	3.82	21.7
12:15:40	90	16.74	0.078	56.6	5.5	41	3.82	21.3
12:20:40	95	16.81	0.078	56.4	5.47	41.6	3.82	20.9
12:25:40	100	16.88	0.078	56.2	5.44	41	3.81	20.9
12:30:40	105	16.95	0.078	56	5.42	41.6	3.82	20.3
12:35:40	110	17.01	0.078	55.8	5.39	41.6	3.81	20.5
12:40:40	115	17.07	0.078	55.6	5.36	41	3.81	20
12:45:40	120	17.13	0.078	55.4	5.34	41	3.82	19.4
12:50:40	125	17.19	0.078	55.1	5.31	41.6	3.81	19.8
12:55:40	130	17.25	0.078	54.9	5.28	41.6	3.82	19.3
13:00:40	135	17.31	0.078	54.8	5.26	41	3.82	19.2
13:05:40	140	17.37	0.078	54.6	5.23	41	3.81	19
13:10:40	145	17.42	0.078	54.4	5.21	41.6	3.81	18.8
13:15:40	150	17.47	0.078	54.2	5.18	41.6	3.81	18.6
13:20:40	155	17.52	0.077	53.9	5.16	41.6	3.82	18.2
13:25:40	160	17.56	0.077	53.7	5.13	41	3.82	18.3
13:30:40	165	17.6	0.077	53.5	5.11	41	3.82	18.2
13:35:40	170	17.64	0.077	53.3	5.08	39.8	3.82	18.2
13:40:40	175	17.69	0.077	53.1	5.06	41	3.82	18.1
Averages		16.67	0.08	57.06	5.56	41.18	3.81	23.27
Slope		0.0059						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		2.05						
SOD (g O_2/m^2*day)		**2.02**						

Table F.56: YSI data for Chamber 2 on 04/19/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
11:25:40	0	15.8	1.175	72.4	7.14	48	4.87	389.5	0
11:30:40	5	15.8	1.095	66	6.52	45.7	2.98	409.3	0
11:35:40	10	15.86	1.086	65.9	6.5	44.5	2.93	411.1	0.1
11:40:40	15	15.92	1.084	66.4	6.54	48	2.96	410.2	0
11:45:40	20	15.99	1.075	66.9	6.58	45.7	2.98	409.7	0.1
11:50:40	25	16.04	1.064	67.4	6.62	42.8	2.99	409.2	0.1
11:55:40	30	16.11	1.057	67.8	6.65	44.5	3.01	408.9	0
12:00:40	35	16.17	1.051	68	6.67	48	3.01	408.9	0.1
12:05:40	40	16.24	1.047	68.2	6.67	44.5	3.02	408.7	0.1
12:10:40	45	16.3	1.044	68.3	6.68	44.5	3.03	408.4	0.1
12:15:40	50	16.36	1.044	68.4	6.67	44.5	3.03	408.2	0.1
12:20:40	55	16.43	1.042	68.4	6.67	44.5	3.04	408.3	0.1
12:25:40	60	16.5	1.041	68.4	6.65	48	3.04	408.3	0.1
12:30:40	65	16.56	1.041	68.3	6.64	48	3.04	408.3	0.1
12:35:40	70	16.62	1.041	68.3	6.63	44.5	3.05	408	0.1
12:40:40	75	16.69	1.04	68.2	6.61	44.5	3.05	408.1	0.1
12:45:40	80	16.75	1.041	68.2	6.6	44.5	3.06	407.8	0.1
12:50:40	85	16.83	1.04	68.1	6.58	44.5	3.06	408	0.1
12:55:40	90	16.89	1.042	68	6.57	44.5	3.07	407.4	0.1
13:00:40	95	16.96	1.042	68	6.55	45.7	3.06	407.8	0.1
13:05:40	100	17.04	1.041	67.9	6.53	44.5	3.07	407.9	0.1
13:10:40	105	17.1	1.044	67.8	6.52	45.7	3.07	407.7	0.1
13:15:40	110	17.16	1.043	67.7	6.5	44.5	3.07	407.7	0.1
13:20:40	115	17.23	1.044	67.6	6.48	48	3.08	407.6	0.1
13:25:40	120	17.3	1.044	67.6	6.47	48	3.09	407.3	0.1
13:30:40	125	17.35	1.046	67.5	6.45	48	3.08	407.8	0.1
13:35:40	130	17.41	1.047	67.4	6.43	48	3.08	407.7	0.1
13:40:40	135	17.47	1.048	67.3	6.42	48	3.09	407.7	0.1
13:45:40	140	17.54	1.05	67.3	6.41	44.5	3.09	407.5	0.1
13:50:40	145	17.59	1.051	67.2	6.39	42.8	3.09	407.6	0.1
13:55:40	150	17.63	1.053	67.1	6.38	42.8	3.09	407.6	0.1
14:00:40	155	17.7	1.053	67	6.36	42.8	3.09	408	0.1
14:05:40	160	17.74	1.054	67	6.35	42.8	3.1	407.7	0.1
14:10:40	165	17.79	1.055	66.9	6.34	44.5	3.09	407.9	0.1
14:15:40	170	17.81	1.057	66.8	6.33	46.9	3.1	407.7	0.1
14:20:40	175	17.86	1.057	66.7	6.31	44.5	3.1	408	0.1
14:25:40	180	17.89	1.058	66.6	6.3	42.8	3.1	407.8	0
Averages		16.88	1.06	67.65	6.53	45.36	3.10	407.71	0.09

Slope	0.003
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.04
SOD (g O_2/m^2*day)	1.01

Table F.57: YSI data for the Control chamber on 04/19/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DO sat (%)	DO (mg/L)	DO Charge	pH	Turbidity (NTU)
10:43:34	0	15.83	0.064	67.3	6.67	37	3.94	0.2
10:48:34	5	15.73	0.064	64.7	6.42	37	3.89	0.6
10:53:34	10	15.78	0.064	64.6	6.41	36	3.88	0.8
10:58:34	15	15.84	0.064	64.5	6.39	36	3.87	0.6
11:03:34	20	15.9	0.064	64.5	6.38	37	3.87	0.8
11:08:34	25	15.95	0.064	64.6	6.38	37	3.87	0.7
11:13:34	30	16.02	0.064	64.6	6.38	37	3.87	0.6
11:18:34	35	16.08	0.064	64.6	6.37	37	3.87	0.6
11:23:34	40	16.15	0.063	64.7	6.37	37	3.88	0.6
11:28:34	45	16.22	0.063	64.8	6.36	36	3.88	0.6
11:33:34	50	16.28	0.063	64.8	6.36	37	3.88	0.6
11:38:34	55	16.36	0.063	64.9	6.36	37	3.88	0.6
11:43:34	60	16.42	0.063	65	6.36	37	3.88	0.6
11:48:34	65	16.48	0.063	65.1	6.36	37	3.88	0.6
11:53:34	70	16.56	0.063	65.2	6.36	37	3.88	0.5
11:58:34	75	16.62	0.063	65.3	6.36	37	3.88	0.5
12:03:34	80	16.7	0.063	65.4	6.36	37	3.88	0.5
12:08:34	85	16.76	0.063	65.5	6.36	37	3.88	0.5
12:13:34	90	16.83	0.063	65.5	6.35	37	3.88	0.5
12:18:34	95	16.9	0.063	65.7	6.37	37	3.88	0.4
12:23:34	100	16.97	0.063	65.8	6.37	37	3.88	0.5
12:28:34	105	17.04	0.063	65.9	6.37	37	3.88	0.4
12:33:34	110	17.1	0.063	66	6.37	37	3.88	0.4
12:38:34	115	17.16	0.063	66.1	6.37	37	3.88	0.4
12:43:34	120	17.22	0.063	66.2	6.36	37	3.88	0.4
12:48:34	125	17.28	0.063	66.2	6.36	37	3.88	0.4
12:53:34	130	17.35	0.063	66.3	6.36	37	3.88	0.4
12:58:34	135	17.41	0.063	66.4	6.36	38	3.88	0.3
13:03:34	140	17.46	0.063	66.4	6.36	37	3.88	0.3
13:08:34	145	17.52	0.063	66.5	6.36	37	3.88	0.3
13:13:34	150	17.56	0.063	66.5	6.36	37	3.88	0.3
13:18:34	155	17.61	0.063	66.6	6.35	37	3.88	0.3
13:23:34	160	17.65	0.063	66.6	6.35	37	3.88	0.3
13:28:34	165	17.7	0.063	66.7	6.35	37	3.88	0.7
13:33:34	170	17.73	0.063	66.7	6.35	37	3.88	0.3
13:38:34	175	17.78	0.063	66.8	6.35	37	3.88	0.3
13:43:34	180	17.82	0.063	66.8	6.35	37	3.88	0.3
13:48:34	185	17.86	0.063	66.9	6.35	37	3.88	0.3
13:53:34	190	17.9	0.063	67	6.35	37	3.88	0.3
13:58:34	195	17.94	0.063	67	6.35	37	3.88	0.2
14:03:34	200	17.98	0.063	67.1	6.35	37	3.88	0.4
Averages		16.91	0.06	65.80	6.37	36.95	3.88	0.46
Slope		0.0001						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.03**						

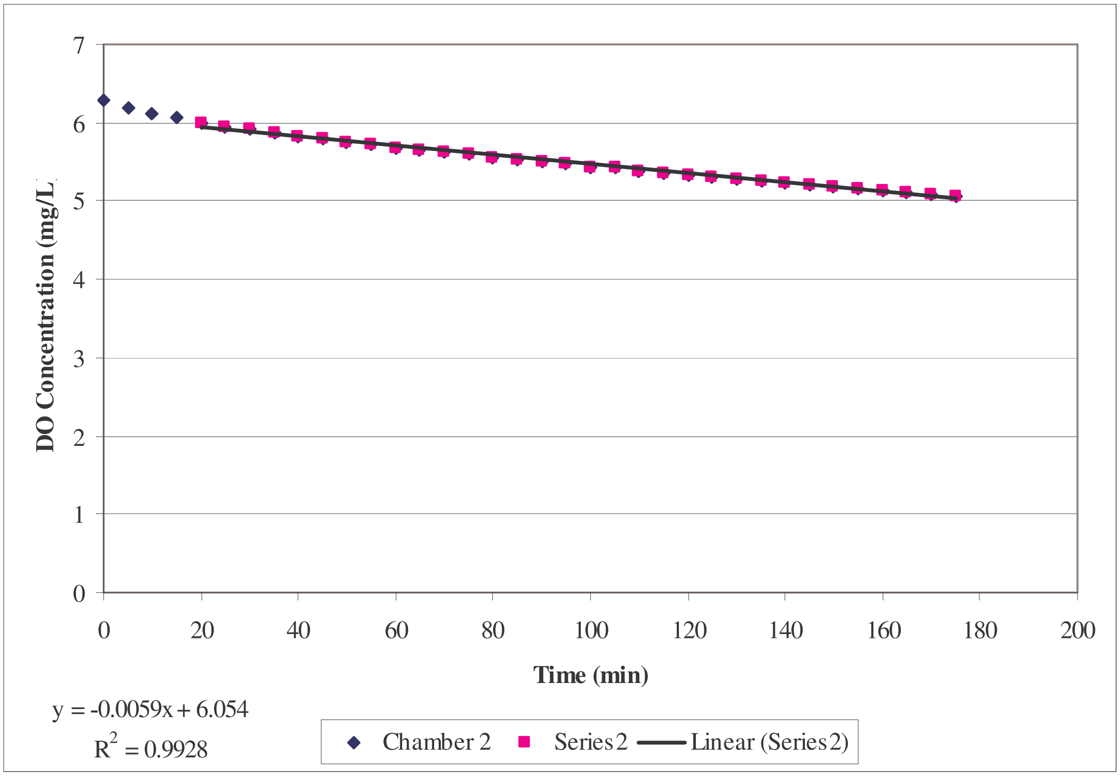

Figure F.55: Oxygen Depletion Curve for Chamber 2 on 04/19/2005 at the first forested study site within the Upper Suwannee River Basin.

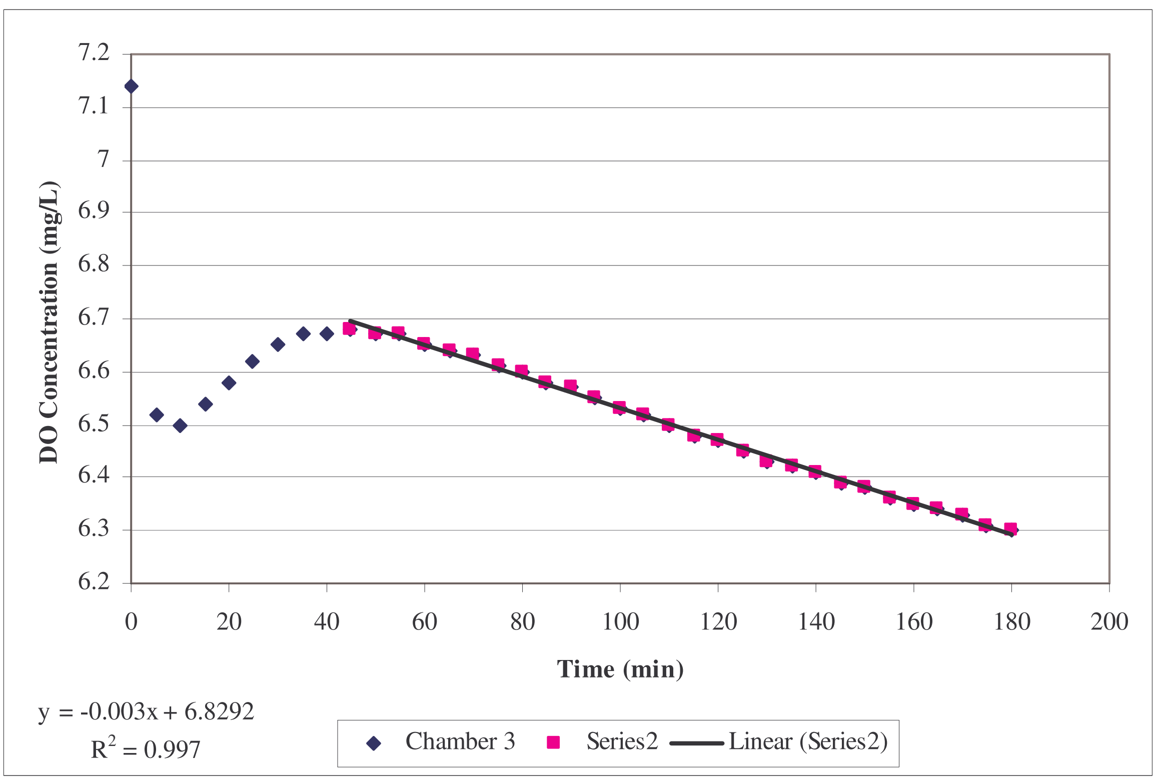

Figure F.56: Oxygen Depletion Curve for Chamber 3 on 04/19/2005 at the first forested study site within the Upper Suwannee River Basin.

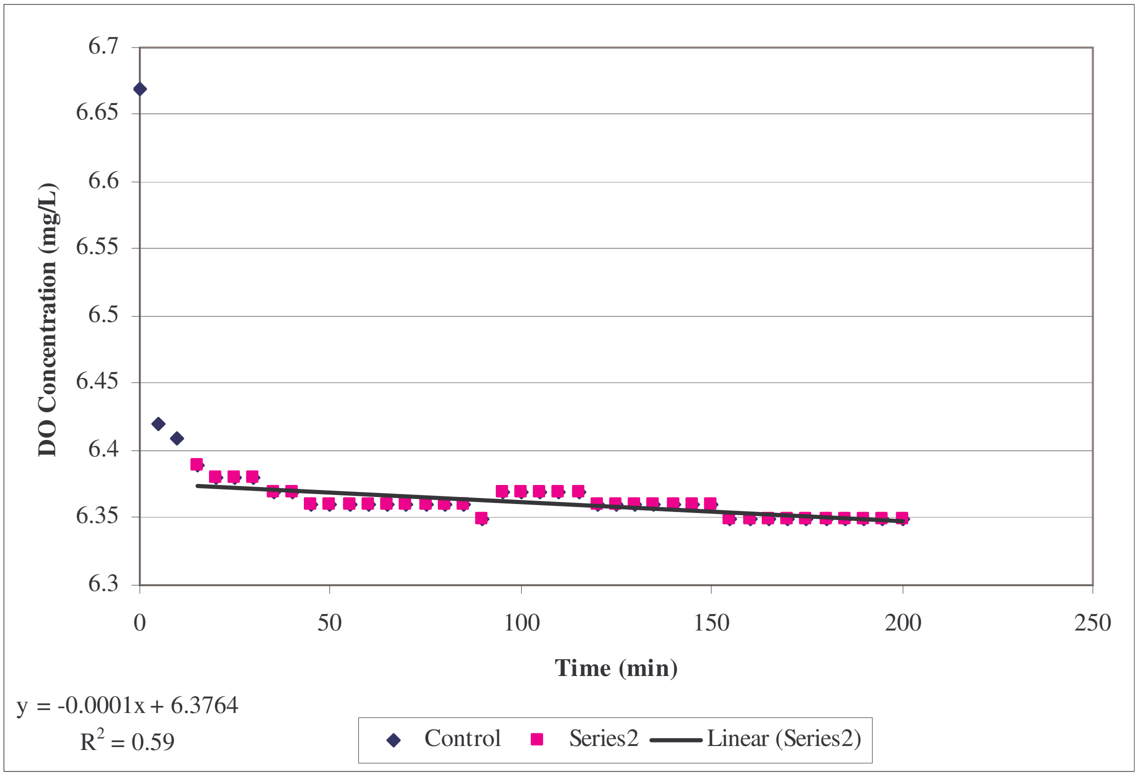

Figure F.57: Oxygen Depletion Curve for the Control chamber on 04/19/2005 at the first forested study site within the Upper Suwannee River Basin.

Forested Site #2

Table F.58: YSI data for Chamber 2 on 11/17/2004

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
11:35:41	0	12.57	0.113	57.8	6.14	52.1	3.59	85.9
11:40:00	5	12.6	0.113	50.8	5.4	51	3.6	89.3
11:45:22	10	12.63	0.113	49.5	5.26	51	3.6	91.5
11:50:22	15	12.66	0.112	48.9	5.19	51	3.6	96.9
11:55:22	20	12.7	0.112	48.4	5.14	51	3.6	94.2
12:00:22	25	12.74	0.112	48	5.09	49.8	3.61	94.6
12:05:22	30	12.77	0.112	47.7	5.05	51	3.61	94.2
12:10:22	35	12.82	0.112	47.4	5.01	49.8	3.61	94
12:15:22	40	12.85	0.112	47.1	4.97	49.8	3.61	95.5
12:20:22	45	12.89	0.112	46.8	4.94	49.8	3.61	94.1
12:25:22	50	12.93	0.112	46.5	4.91	49.8	3.61	92.5
12:30:22	55	12.97	0.112	46.2	4.87	49.8	3.61	92.3
12:35:22	60	13.01	0.112	46	4.84	49.8	3.61	90.7
12:40:22	65	13.04	0.112	45.6	4.8	48.6	3.61	95.7
12:45:22	70	13.08	0.112	45.4	4.77	48.6	3.61	92.1
12:50:22	75	13.12	0.112	45.2	4.74	48.6	3.61	92.4
12:55:22	80	13.16	0.112	44.9	4.71	48.6	3.61	90.8
13:00:22	85	13.19	0.112	44.6	4.68	48.6	3.62	88.3
13:05:22	90	13.23	0.112	44.4	4.65	49.8	3.62	91.1
13:10:22	95	13.26	0.112	44.1	4.62	49.8	3.62	89.2
13:15:22	100	13.3	0.112	43.9	4.59	48.6	3.62	88.1
13:20:22	105	13.33	0.112	43.6	4.56	48.6	3.62	88.1
13:25:22	110	13.37	0.112	43.4	4.53	48.6	3.62	89.9
13:30:22	115	13.4	0.112	43.1	4.5	48.6	3.62	80.6
13:35:22	120	13.43	0.111	42.9	4.48	48.6	3.62	87.7
13:40:22	125	13.46	0.111	42.6	4.45	48.6	3.62	87.2
13:45:22	130	13.49	0.111	42.4	4.42	48.6	3.62	88.1
13:50:22	135	13.52	0.111	42.1	4.39	48.6	3.62	88.5
13:55:22	140	13.55	0.111	41.9	4.36	48.6	3.62	85.1
14:00:22	145	13.57	0.111	41.7	4.34	48.6	3.62	83.3
14:05:22	150	13.6	0.111	41.4	4.31	48.6	3.62	84.8
14:10:22	155	13.62	0.111	41.2	4.28	48.6	3.62	83.9
14:15:22	160	13.64	0.111	40.9	4.25	48	3.62	84.2
14:20:22	165	13.66	0.111	40.7	4.22	48.6	3.62	85.7
14:25:22	170	13.68	0.111	40.4	4.19	48	3.62	83.4
14:30:22	175	13.7	0.111	40.2	4.17	48.6	3.62	82.8
14:35:22	180	13.72	0.111	39.9	4.14	48.6	3.62	86.7
14:40:22	185	13.74	0.111	39.7	4.11	48.6	3.62	84
14:45:22	190	13.76	0.111	39.4	4.08	48	3.62	81.1
14:50:22	195	13.77	0.111	39.2	4.06	48.6	3.62	82.2
14:55:22	200	13.79	0.111	39	4.03	48	3.62	82.1
15:00:22	205	13.8	0.111	38.8	4.01	48.6	3.62	79
Averages		13.26	0.11	44.14	4.63	49.17	3.61	88.38

Slope	0.006
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	2.08
SOD (g O_2/m^2*day)	**1.95**

Table F.59: YSI data for the Control chamber on 11/17/2004

Time (hh:mm:ss)	**Time (min)**	**Temp (˚C)**	**SpCond (mS/cm)**	**DO sat (%)**	**DO (mg/L)**	**DO Chrg**	**pH**	**ORP (mV)**	**Turbidity (NTU)**
0:15:44	0	12.56	0.126	56.8	6.05	46	3.5	1190	11.1
0:20:44	5	12.59	0.126	54.9	5.84	46	3.49	1037	10.3
0:25:44	10	12.63	0.126	54.5	5.79	45	3.49	1010	8.7
0:30:44	15	12.66	0.126	54.3	5.77	45	3.49	992	8.4
0:35:44	20	12.7	0.126	54.3	5.75	45	3.5	978	8.1
0:40:44	25	12.74	0.126	54.3	5.76	45	3.5	963	7.6
0:45:44	30	12.78	0.126	54.5	5.77	45	3.5	954	6.8
0:50:44	35	12.82	0.126	54.6	5.77	45	3.5	944	7.2
0:55:44	40	12.86	0.126	54.7	5.77	44	3.5	934	6.9
1:00:44	45	12.91	0.126	54.7	5.78	45	3.5	932	7
1:05:44	50	12.95	0.126	54.8	5.78	45	3.5	926	6.8
1:10:44	55	12.98	0.126	54.9	5.78	45	3.5	919	6.8
1:15:44	60	13.02	0.126	54.9	5.79	44	3.5	912	6.1
1:20:44	65	13.06	0.126	55	5.79	44	3.52	906	6.7
1:25:44	70	13.1	0.126	55	5.79	45	3.51	899	6.5
1:30:44	75	13.13	0.126	55.2	5.8	45	3.51	895	6.3
1:35:44	80	13.17	0.125	55.3	5.8	45	3.5	889	6.5
1:40:44	85	13.21	0.125	55.3	5.8	45	3.51	885	6
1:45:44	90	13.24	0.125	55.4	5.81	45	3.51	881	5.8
1:50:44	95	13.28	0.125	55.5	5.81	45	3.5	878	6.1
1:55:44	100	13.31	0.125	55.4	5.8	45	3.5	874	5.8
2:00:44	105	13.35	0.125	55.5	5.8	45	3.51	870	5.6
2:05:44	110	13.38	0.125	55.6	5.81	45	3.51	867	5.6
2:10:44	115	13.42	0.125	55.6	5.8	45	3.51	864	6.3
2:15:44	120	13.45	0.125	55.7	5.81	45	3.51	861	5.9
2:20:44	125	13.48	0.125	55.7	5.81	45	3.51	859	5.4
2:25:44	130	13.51	0.125	55.8	5.82	45	3.51	856	5.4
2:30:44	135	13.53	0.125	55.8	5.81	45	3.51	853	5.4
2:35:44	140	13.56	0.125	55.9	5.82	44	3.51	852	5.4
2:40:44	145	13.59	0.125	56	5.82	45	3.51	849	5.5
2:45:44	150	13.61	0.125	56.1	5.83	45	3.51	847	5.3
2:50:44	155	13.63	0.125	56.4	5.86	45	3.5	844	5.4
2:55:44	160	13.65	0.125	56.7	5.88	44	3.5	842	5.4
3:00:44	165	13.67	0.125	56.5	5.87	45	3.5	838	5.5
3:05:44	170	13.69	0.125	56.5	5.86	44	3.5	838	5.5
3:10:44	175	13.71	0.125	56.6	5.87	45	3.5	836	5.2
3:15:44	180	13.73	0.125	56.6	5.86	45	3.5	834	5.2
3:20:44	185	13.75	0.125	56.7	5.87	44	3.5	833	5.2
3:25:44	190	13.77	0.125	56.6	5.86	45	3.5	831	5.1
3:30:44	195	13.78	0.125	56.6	5.86	45	3.5	830	5
3:35:44	200	13.79	0.124	56.7	5.87	44	3.5	828	5
3:40:44	205	13.81	0.124	56.7	5.87	45	3.5	827	5
3:45:44	210	13.82	0.124	56.7	5.87	44	3.5	826	4.9
Averages		13.29	0.13	55.61	5.82	44.84	3.50	892.63	6.27

Slope	0.0004
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	**0.14**

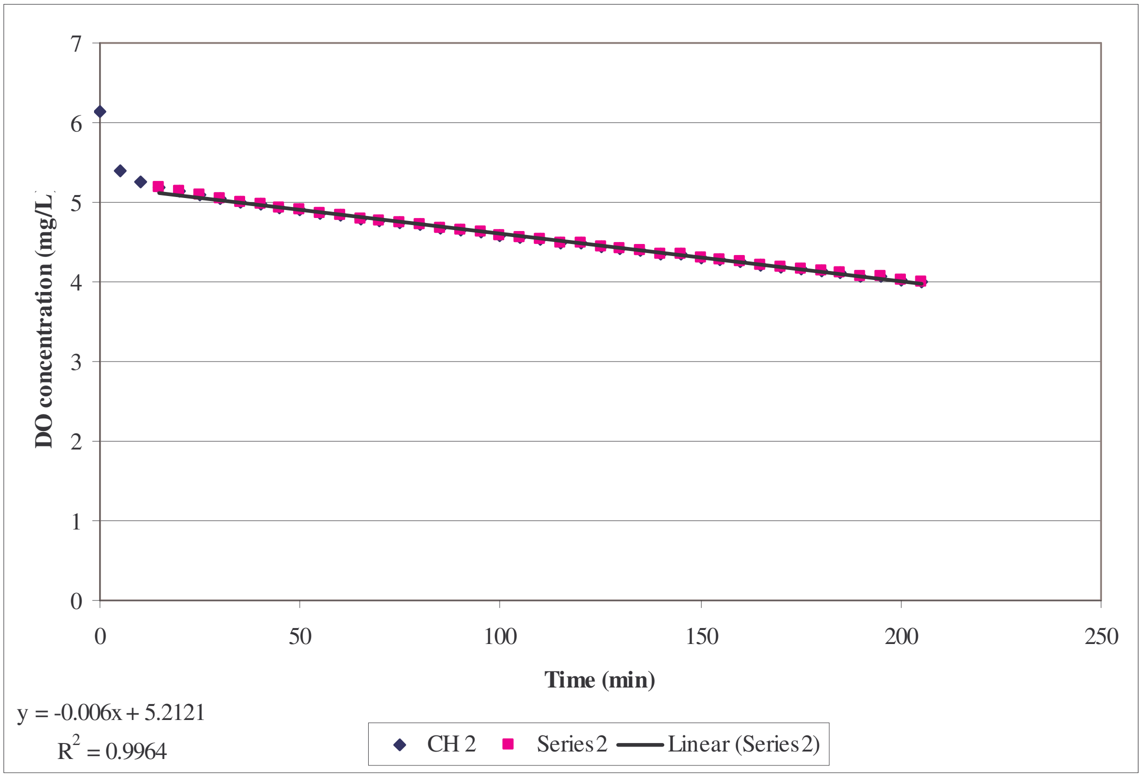

Figure F.58: Oxygen Depletion Curve for Chamber 2 on 11/17/2004 at the second forested study site within the Upper Suwannee River Basin.

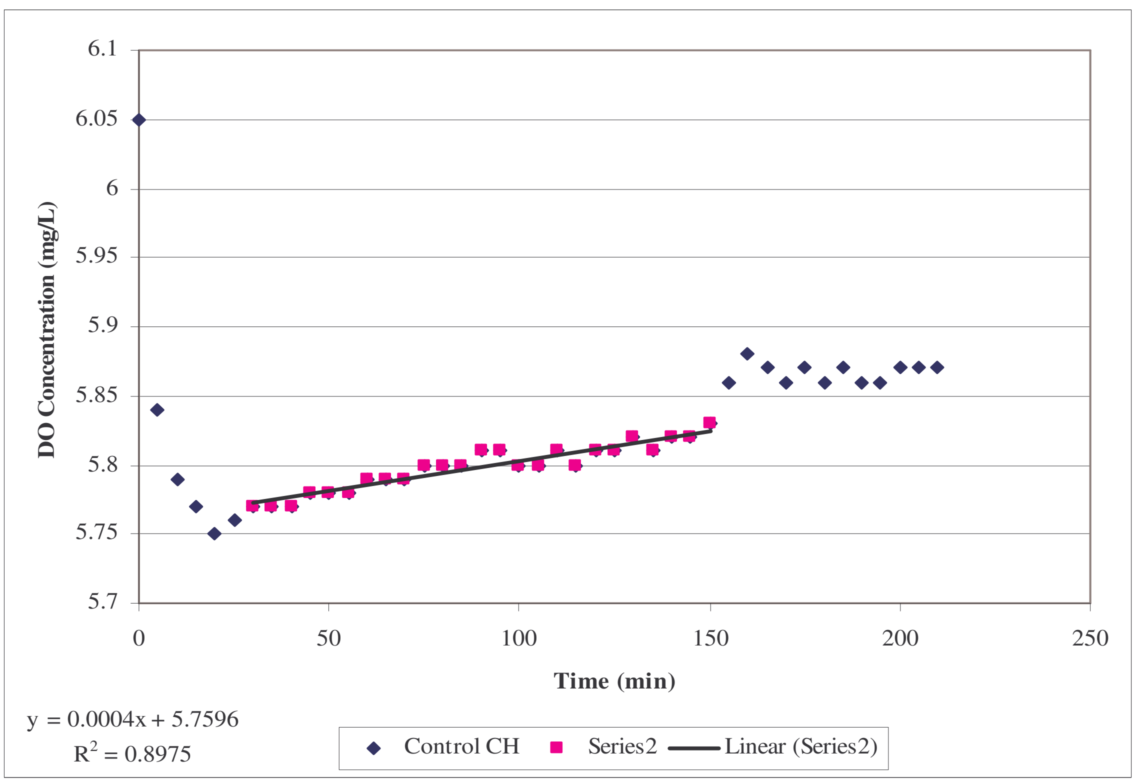

Figure F.59: Oxygen Depletion Curve for the Control chamber on 11/17/2004 at the second forested study site within the Upper Suwannee River Basin.

Table F.60: YSI data for Chamber 1 on 01/05/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
12:20:40	0	12.83	0.112	69.5	7.35	41.6	3.16	8.6
12:25:40	5	12.85	0.112	67.7	7.16	41	3.31	7.5
12:30:40	10	12.87	0.112	66.2	7	41	3.38	7.1
12:35:25	15	12.89	0.112	61.8	6.53	41	3.34	7
12:40:40	20	12.91	0.112	63.4	6.69	41	3.45	6.8
12:45:40	25	12.93	0.112	62.7	6.62	41	3.48	6.5
12:50:40	30	12.96	0.112	61.7	6.51	41	3.48	6.4
12:55:40	35	12.97	0.112	61.4	6.47	41.6	3.5	6.7
13:00:40	40	13	0.112	61	6.43	41.6	3.5	6.5
13:05:40	45	13.02	0.112	60.6	6.38	41	3.51	6.1
13:10:40	50	13.05	0.112	60.3	6.35	41	3.51	6.4
13:15:40	55	13.07	0.112	60	6.31	41	3.51	6.1
13:20:40	60	13.1	0.112	59.8	6.28	41	3.51	6.1
13:25:40	65	13.13	0.112	59.6	6.26	41	3.51	5.8
13:30:40	70	13.16	0.112	59.4	6.23	41	3.52	5.9
13:35:40	75	13.18	0.112	59.1	6.2	41.6	3.51	5.6
13:40:40	80	13.2	0.112	59	6.18	41	3.52	5.8
13:45:40	85	13.22	0.112	58.8	6.16	41	3.52	5.7
13:50:40	90	13.24	0.112	58.6	6.14	41	3.52	5.6
13:55:40	95	13.26	0.112	58.5	6.13	41	3.52	5.6
14:00:40	100	13.28	0.112	58.4	6.11	41	3.52	5.6
14:05:40	105	13.29	0.111	58.2	6.1	41.6	3.52	5.5
14:10:40	110	13.32	0.111	58.1	6.08	41	3.52	5.6
14:15:40	115	13.34	0.111	58	6.07	41	3.52	5.4
14:20:40	120	13.37	0.111	57.9	6.05	41	3.52	5.6
14:25:40	125	13.38	0.111	57.8	6.04	41.6	3.52	5.4
14:30:40	130	13.4	0.111	57.7	6.02	41	3.52	5.4
14:35:40	135	13.42	0.111	57.6	6.01	41.6	3.52	5.4
14:40:40	140	13.44	0.111	57.5	6	41	3.52	5.3
14:45:40	145	13.46	0.111	57.4	5.99	41	3.52	5.2
14:50:40	150	13.48	0.111	57.4	5.98	41	3.52	5.3
14:55:40	155	13.49	0.111	57.2	5.96	41	3.52	5.3
15:00:40	160	13.5	0.111	57.2	5.95	41	3.52	5.3
15:05:40	165	13.52	0.111	57.1	5.94	41	3.52	5.4
15:10:40	170	13.53	0.111	57	5.93	41	3.52	5.3
15:15:40	175	13.54	0.111	56.9	5.92	39.8	3.52	5.1
Averages		13.21	0.11	59.74	6.26	41.08	3.49	5.94

Slope	0.0042
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.46
SOD (g O_2/m^2*day)	**1.18**

Table F.61: YSI data for Chamber 3 on 01/05/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp (mV)	Turbid (NTU)
12:55:20	0	29.16	2.326	100.9	7.69	38.7	4.9	351.1	3.5
13:00:40	5	13.09	5.036	72.5	7.45	34.6	3.04	458.2	9
13:05:40	10	13.09	4.641	71	7.31	34.6	2.88	470.5	7.9
13:10:40	15	13.1	4.517	69.6	7.17	33.4	2.87	468.3	7
13:15:40	20	13.11	4.475	68.4	7.05	33.4	2.91	465.4	6.2
13:20:40	25	13.13	4.445	67.4	6.94	33.4	2.94	462.9	5.8
13:25:40	30	13.15	4.426	66.6	6.86	33.4	2.96	460.8	4.8
13:30:40	35	13.17	4.402	65.9	6.79	33.4	2.98	459	4.8
13:35:40	40	13.2	4.387	65.4	6.73	33.4	2.99	457.5	4.3
13:40:40	45	13.22	4.379	64.9	6.68	32.8	3	456.4	3.8
13:45:40	50	13.24	4.365	64.5	6.63	34.6	3.02	455.1	3.5
13:50:40	55	13.27	4.349	64.2	6.6	33.4	3.03	454.1	3.1
13:55:40	60	13.29	4.354	63.9	6.56	34.6	3.03	453.2	3.1
14:00:40	65	13.32	4.339	63.7	6.54	33.4	3.04	452.1	2.8
14:05:40	70	13.35	4.335	63.5	6.51	33.4	3.05	451.2	2.5
14:10:40	75	13.38	4.341	63.2	6.48	33.4	3.05	450.8	2.4
14:15:40	80	13.4	4.328	63.1	6.47	33.4	3.06	450	2.1
14:20:40	85	13.42	4.328	63	6.45	32.8	3.06	449.5	2.3
14:25:40	90	13.44	4.322	62.8	6.43	33.4	3.07	449	2
14:30:40	95	13.46	4.313	62.7	6.42	32.8	3.08	448.2	1.8
14:35:40	100	13.47	4.304	62.6	6.41	33.4	3.08	447.8	1.8
14:40:40	105	13.49	4.304	62.5	6.4	32.8	3.08	447.1	1.7
14:45:40	110	13.51	4.3	62.5	6.39	33.4	3.09	446.7	1.5
14:50:40	115	13.53	4.299	62.4	6.37	33.4	3.09	446.4	1.4
14:55:40	120	13.55	4.298	62.3	6.37	33.4	3.1	445.7	1.4
15:00:40	125	13.57	4.297	62.2	6.36	33.4	3.1	445.4	1.4
15:05:40	130	13.6	4.297	62.1	6.34	34.6	3.1	444.9	1.3
15:10:40	135	13.62	4.295	62.1	6.34	33.4	3.1	444.7	1.1
15:15:40	140	13.63	4.278	62	6.33	32.8	3.1	444.4	1
15:20:40	145	13.65	4.277	62	6.32	33.4	3.11	443.8	1
15:25:40	150	13.67	4.278	61.9	6.31	33.4	3.11	443.8	0.9
15:30:40	155	13.69	4.278	61.9	6.3	33.4	3.11	443.5	0.9
15:35:40	160	13.7	4.277	61.8	6.3	33.4	3.11	443.4	0.9
15:40:40	165	13.72	4.276	61.8	6.29	34.6	3.11	443.2	0.8
15:45:40	170	13.73	4.276	61.7	6.28	33.4	3.12	442.6	0.8
15:50:40	175	13.74	4.275	61.7	6.28	32.8	3.11	442.6	0.7
15:55:40	180	13.75	4.273	61.6	6.27	33.4	3.11	442.5	0.9
Averages		13.85	4.31	64.93	6.58	33.64	3.10	448.16	2.76

Slope	0.0033
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.15
SOD (g O_2/m^2*day)	**0.87**

Table F.62: YSI data for the Control chamber on 01/05/2005

Time (min)	Temp (˚C)	SpCond (mS/cm)	DO sat (%)	DO (mg/L)	DO Chrg	pH	Turbidity (NTU)
0	12.99	0.111	65.6	6.92	45	3.56	-0.4
5	13.02	0.111	61.4	6.47	46	3.57	-1
10	13.06	0.111	61.3	6.45	45	3.58	-0.5
15	13.09	0.111	61.3	6.45	45	3.58	-0.7
20	13.12	0.111	61.1	6.41	45	3.59	-0.8
25	13.15	0.111	61.3	6.44	45	3.59	-0.3
30	13.18	0.111	61.2	6.42	45	3.59	-0.6
35	13.2	0.111	61.2	6.41	45	3.6	-0.5
40	13.23	0.111	61.2	6.41	45	3.6	-0.5
45	13.26	0.11	61.2	6.4	45	3.6	-0.6
50	13.29	0.11	61.1	6.4	45	3.6	-0.7
55	13.32	0.11	61.1	6.39	44	3.6	-0.1
60	13.35	0.11	61.1	6.39	45	3.61	-0.7
65	13.38	0.11	60.9	6.36	44	3.61	-0.7
70	13.41	0.11	60.8	6.35	45	3.61	-0.6
75	13.43	0.11	61	6.36	45	3.61	-0.8
80	13.45	0.11	60.9	6.35	44	3.61	-0.4
85	13.47	0.11	61.2	6.38	45	3.61	-0.8
90	13.48	0.109	60.9	6.35	45	3.61	-0.7
95	13.51	0.109	61	6.36	45	3.61	-0.8
100	13.53	0.109	60.9	6.34	44	3.61	-0.8
105	13.55	0.109	61.1	6.36	44	3.61	0
110	13.57	0.109	61	6.34	44	3.61	-0.8
115	13.59	0.109	61.1	6.35	45	3.61	-0.7
120	13.62	0.109	61	6.33	45	3.61	-0.8
125	13.63	0.109	61.2	6.35	45	3.61	-0.8
130	13.65	0.109	61.2	6.35	44	3.61	-0.9
135	13.68	0.109	61.3	6.36	44	3.62	-0.7
140	13.7	0.109	61.2	6.35	44	3.62	-0.8
145	13.72	0.109	61.2	6.34	44	3.62	-0.7
150	13.73	0.109	61.2	6.34	44	3.62	-0.8
155	13.74	0.109	60.9	6.31	44	3.62	-0.9
160	13.76	0.109	60.7	6.29	45	3.62	-0.8
165	13.77	0.109	60.9	6.31	44	3.62	-0.7
170	13.78	0.108	60.7	6.29	44	3.62	-0.8
175	13.79	0.108	60.8	6.29	45	3.62	-0.7
180	13.8	0.108	60.8	6.29	44	3.62	-0.7
185	13.81	0.108	60.9	6.3	44	3.62	-0.9
190	13.82	0.108	60.9	6.3	44	3.62	-0.9
Averages	13.48	0.11	61.17	6.38	44.59	3.61	-0.68
Slope		0.0008					
V (L)		65.15					
A (m^2)		0.27					
OD (g O_2/m^2*day)		**0.28**					

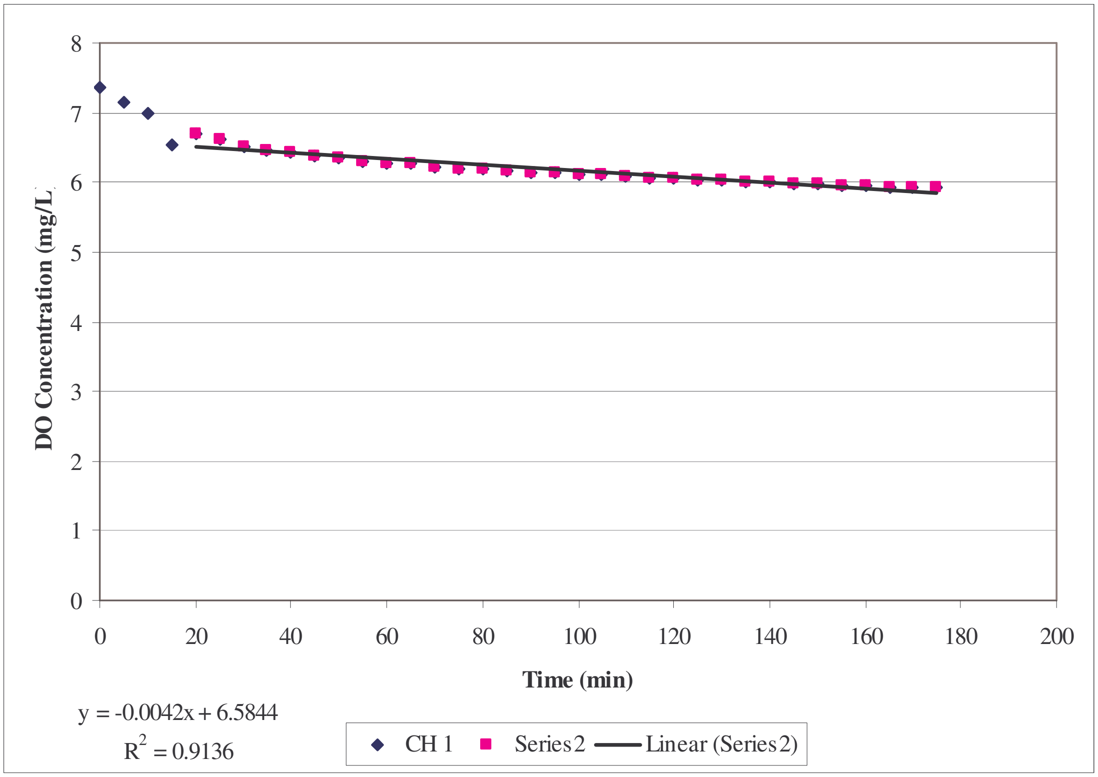

Figure F.60: Oxygen Depletion Curve for Chamber 1 on 01/05/2005 at the second forested study site within the Upper Suwannee River Basin.

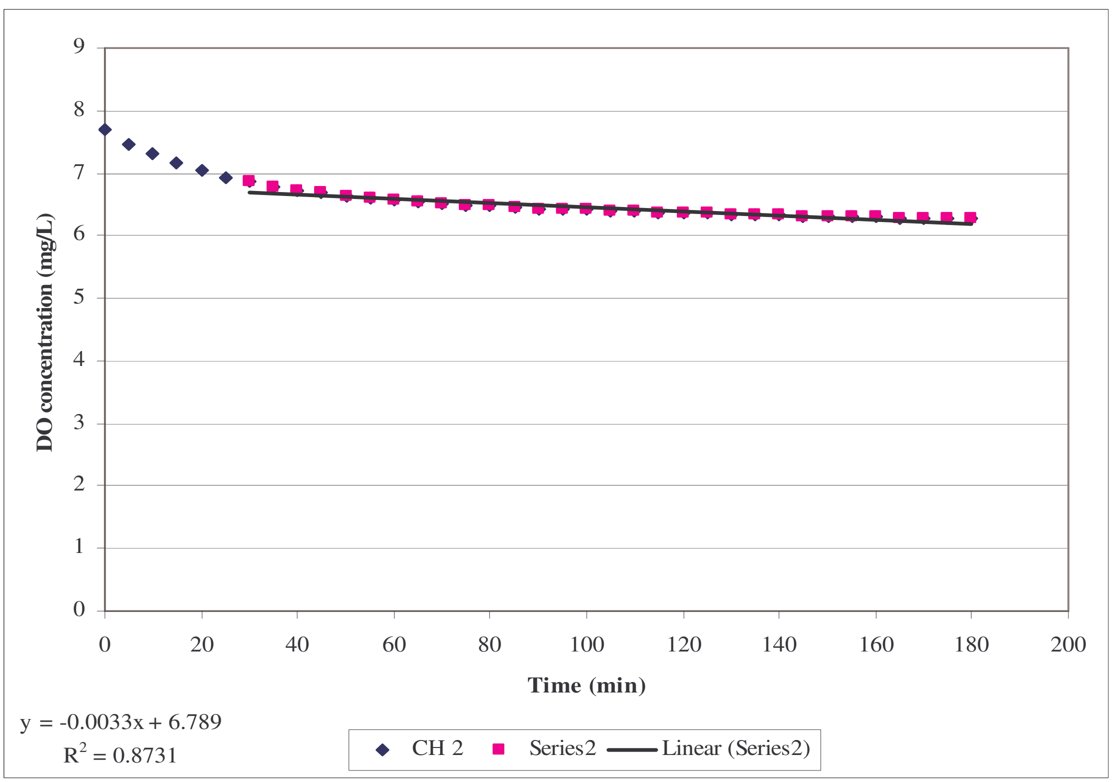

Figure F.61: Oxygen Depletion Curve for Chamber 3 on 01/05/2005 at the second forested study site within the Upper Suwannee River Basin.

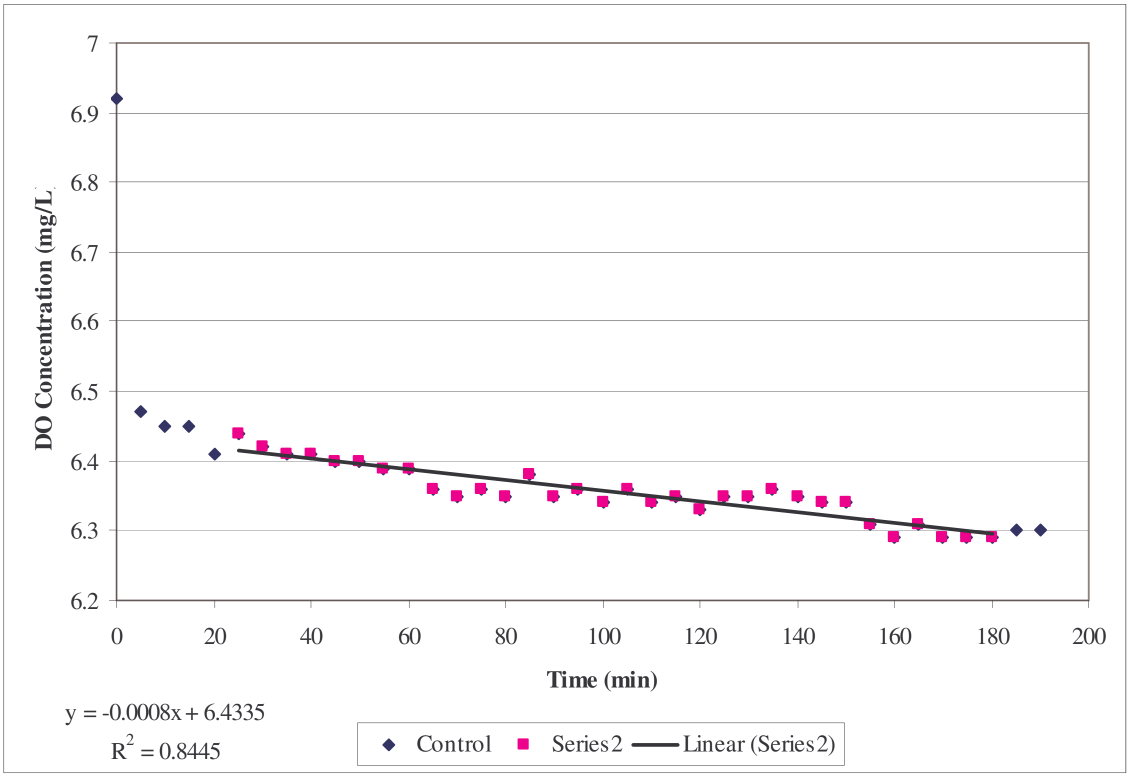

Figure F.62: Oxygen Depletion Curve for the Control chamber on 01/05/2005 at the second forested study site within the Upper Suwannee River Basin.

Table F.63: YSI data for Chamber 1 on 02/17/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	SpCond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Turbid (NTU)
12:15:40	0	14.08	0.116	61.4	6.32	34.6	3.56	31.8
12:20:40	5	14.11	0.116	60.5	6.22	35.7	3.58	34.9
12:25:40	10	14.13	0.116	59.5	6.11	34.6	3.6	36.8
12:30:40	15	14.16	0.116	58.7	6.03	34.6	3.6	38.3
12:35:40	20	14.18	0.116	58.5	6.01	35.7	3.61	38.3
12:40:40	25	14.2	0.116	58.1	5.96	33.4	3.61	39.8
12:45:40	30	14.23	0.116	57.7	5.92	34.6	3.62	40.3
12:50:40	35	14.26	0.116	57.3	5.88	35.7	3.62	40.5
12:55:40	40	14.28	0.116	56.9	5.83	34.6	3.62	40.5
13:00:40	45	14.31	0.116	56.6	5.79	35.7	3.62	41
13:05:40	50	14.32	0.116	56.1	5.74	33.4	3.62	41.1
13:10:40	55	14.34	0.116	55.8	5.71	33.4	3.62	41.5
13:15:40	60	14.36	0.116	55.7	5.69	35.7	3.62	41.6
13:20:40	65	14.38	0.116	55.1	5.63	33.4	3.62	41.5
13:25:40	70	14.39	0.116	54.9	5.61	34.6	3.62	42.1
13:30:40	75	14.41	0.116	54.3	5.55	34.6	3.62	41.8
13:35:40	80	14.42	0.116	53.9	5.5	33.4	3.62	41.5
13:40:40	85	14.44	0.116	53.8	5.49	33.4	3.62	41.6
13:45:40	90	14.45	0.116	53.3	5.43	33.4	3.62	41.8
13:50:40	95	14.47	0.116	53	5.4	34.6	3.62	41.5
13:55:40	100	14.48	0.116	52.5	5.35	33.4	3.62	41.9
14:00:40	105	14.49	0.116	52.1	5.31	33.4	3.62	41.1
14:05:40	110	14.5	0.116	51.9	5.28	33.4	3.62	41.8
14:10:40	115	14.51	0.116	51.5	5.25	33.4	3.62	41.3
14:15:40	120	14.52	0.116	51.1	5.2	33.4	3.62	41.6
14:20:40	125	14.54	0.116	50.7	5.17	32.8	3.62	41.6
14:25:40	130	14.55	0.116	50.4	5.13	33.4	3.62	42.1
14:30:40	135	14.56	0.116	49.9	5.08	32.8	3.62	41.3
14:35:40	140	14.57	0.116	49.6	5.05	32.8	3.62	41.1
14:40:40	145	14.59	0.116	49.3	5.02	33.4	3.62	41.2
14:45:40	150	14.6	0.116	49	4.98	33.4	3.62	41.6
14:50:40	155	14.61	0.116	48.6	4.94	33.4	3.62	41.2
14:55:40	160	14.62	0.116	48.3	4.91	33.4	3.62	41.7
15:00:40	165	14.63	0.116	48	4.87	32.8	3.62	41.8
15:05:40	170	14.64	0.116	47.6	4.83	32.8	3.62	41.8
15:10:40	175	14.65	0.116	47.3	4.81	32.8	3.62	41.3
Averages		14.42	0.12	53.58	5.47	33.89	3.62	40.63
Slope		0.0078						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		2.71						
SOD (g O_2/m^2*day)		**2.57**						

Table F.64: YSI data for Chamber 3 on 02/17/2005

Time (hh:mm:ss)	Time (min)	Temp (˚C)	Cond (mS/cm)	DOsat (%)	DO (mg/L)	DOchrg	pH	Orp mV	Turbid (NTU)
12:55:40	0	14.43	0.166	63.6	6.49	39.8	2.98	439.1	69.2
13:00:40	5	14.45	0.162	63	6.43	39.8	3	437.7	72.9
13:05:40	10	14.46	0.147	63.7	6.5	38.7	3.04	434.9	74.7
13:10:40	15	14.47	0.142	64.6	6.59	39.8	3.06	433.4	74.8
13:15:40	20	14.48	0.135	65.2	6.64	39.8	3.07	432.3	77.1
13:20:40	25	14.5	0.129	65.6	6.68	39.8	3.08	430.9	75.7
13:25:40	30	14.51	0.125	65.9	6.71	39.8	3.08	430.4	76.4
13:30:40	35	14.53	0.123	66	6.73	39.8	3.09	429.7	77.3
13:35:40	40	14.55	0.121	66.1	6.73	39.8	3.1	429.1	76
13:40:40	45	14.56	0.119	66.1	6.73	39.8	3.1	428.8	75.4
13:45:40	50	14.58	0.117	66.1	6.73	41	3.1	428.5	75.9
13:50:40	55	14.59	0.116	66	6.71	41	3.1	428	76.7
13:55:40	60	14.61	0.115	66.1	6.72	39.8	3.11	427.7	76.1
14:00:40	65	14.63	0.114	65.8	6.69	41	3.11	427.4	77.5
14:05:40	70	14.65	0.114	65.8	6.68	39.8	3.11	427	76
14:10:40	75	14.66	0.113	65.6	6.66	38.7	3.11	426.9	76.5
14:15:40	80	14.68	0.113	65.5	6.65	39.8	3.12	426.5	75.1
14:20:40	85	14.7	0.112	65.3	6.62	38.7	3.12	426.4	74.2
14:25:40	90	14.72	0.112	65.3	6.62	39.8	3.12	426	75.6
14:30:40	95	14.74	0.111	65.1	6.6	41	3.12	425.9	74.9
14:35:40	100	14.75	0.111	65	6.59	39.8	3.13	425.7	74.2
14:40:40	105	14.77	0.111	64.8	6.57	39.8	3.13	425.6	74.1
14:45:40	110	14.78	0.111	64.7	6.55	38.7	3.13	425.4	74.2
14:50:40	115	14.81	0.11	64.6	6.54	41	3.14	424.9	74
14:55:40	120	14.83	0.11	64.3	6.51	38.7	3.14	424.6	75.1
15:00:40	125	14.84	0.11	64.2	6.49	38.7	3.14	424.6	74.7
15:05:40	130	14.85	0.11	64	6.48	39.8	3.15	424.2	73.5
15:10:40	135	14.86	0.11	63.9	6.46	38.7	3.15	423.9	74.2
15:15:40	140	14.88	0.11	63.7	6.44	38.7	3.15	423.6	73.1
15:20:40	145	14.9	0.11	63.5	6.42	38.7	3.16	423.5	74.2
15:25:40	150	14.93	0.11	63.4	6.4	38.7	3.16	423.5	72.4
15:30:40	155	14.99	0.109	63.1	6.36	37.5	3.16	423.1	72.9
15:35:40	160	15.06	0.11	63.1	6.35	38.7	3.18	422.5	72.6
15:40:40	165	15.07	0.11	62.9	6.33	38.7	3.21	420.8	73
15:45:40	170	15.09	0.109	62.8	6.32	38.7	3.23	419.5	72.2
15:50:40	175	15.1	0.11	62.7	6.3	38.7	3.25	418.6	72.5
15:55:40	180	15.1	0.11	62.6	6.29	38.7	3.27	417.6	72.8
Averages		14.73	0.12	64.59	6.55	39.45	3.12	426.71	74.53

Slope	0.0035
V (L)	65.15
A (m^2)	0.27
OD (g O_2/m^2*day)	1.22
SOD (g O_2/m^2*day)	**1.08**

Table F.65: YSI data for the Control chamber on 02/17/2005

Time (min)	Temp (˚C)	SpCond (mS/cm)	DO sat (%)	DO (mg/L)	DO Chg	pH	ORP (mV)	Turbidity (NTU)
0	14.36	0.118	72	7.36	54	3.51	727	-1.5
5	14.39	0.118	75.1	7.67	52	3.45	607	-1
10	14.43	0.118	74.7	7.63	53	3.45	601	-1.2
15	14.44	0.118	75.6	7.72	52	3.45	592	-1.1
20	14.48	0.118	75.7	7.72	52	3.45	585	-0.8
25	14.49	0.118	76.5	7.8	52	3.46	579	-0.7
30	14.53	0.118	76.1	7.75	52	3.46	573	-1
35	14.54	0.118	76.9	7.83	52	3.46	566	-1.2
40	14.56	0.118	77.2	7.86	52	3.46	561	-1.2
45	14.58	0.117	77.3	7.87	52	3.46	558	-0.2
50	14.6	0.117	77.3	7.86	52	3.46	555	-1
55	14.62	0.117	77.2	7.84	52	3.46	553	-0.8
60	14.64	0.117	77.4	7.86	52	3.47	551	-1.1
65	14.65	0.117	77.6	7.88	51	3.46	549	-1.2
70	14.66	0.117	77.6	7.89	51	3.46	547	-1.2
75	14.68	0.117	77.3	7.85	51	3.46	545	-1.2
80	14.69	0.117	77.5	7.86	51	3.46	544	-1.3
85	14.7	0.117	77.7	7.88	52	3.46	542	-1.2
90	14.72	0.117	77.7	7.89	52	3.46	542	-1.3
95	14.73	0.117	77.7	7.88	52	3.46	541	-0.9
100	14.74	0.117	77.9	7.9	52	3.46	541	-0.2
105	14.75	0.117	77.9	7.89	52	3.46	541	-1.3
110	14.76	0.117	78.1	7.91	52	3.46	541	-1.3
115	14.77	0.117	77.8	7.88	52	3.47	541	-0.8
120	14.79	0.117	77.5	7.85	52	3.47	541	-0.9
125	14.81	0.117	77.5	7.84	53	3.47	541	-1.1
130	14.82	0.117	77.8	7.88	52	3.47	541	-1.4
135	14.82	0.117	78.5	7.95	52	3.47	541	-0.9
140	14.83	0.117	78.2	7.91	52	3.47	541	-1.4
145	14.85	0.117	77.8	7.87	52	3.47	543	-1
150	14.86	0.117	77.9	7.88	52	3.47	544	-1.3
155	14.87	0.116	78.1	7.89	52	3.47	544	-1.4
160	14.88	0.116	78	7.89	53	3.47	545	-1.1
165	14.89	0.117	78	7.88	51	3.47	545	-1.4
170	14.9	0.116	78.2	7.9	52	3.47	545	-1.4
175	14.91	0.116	78.4	7.92	52	3.48	546	-1.2
180	14.91	0.116	78.5	7.93	52	3.48	547	-1.2
185	14.91	0.116	78.3	7.91	51	3.48	547	-1.3
190	14.92	0.116	78.4	7.92	51	3.48	547	-1.3
Averages	14.70	0.12	77.31	7.84	51.95	3.47	557.44	-1.10
Slope		0.0004						
V (L)		65.15						
A (m^2)		0.27						
OD (g O_2/m^2*day)		**0.14**						

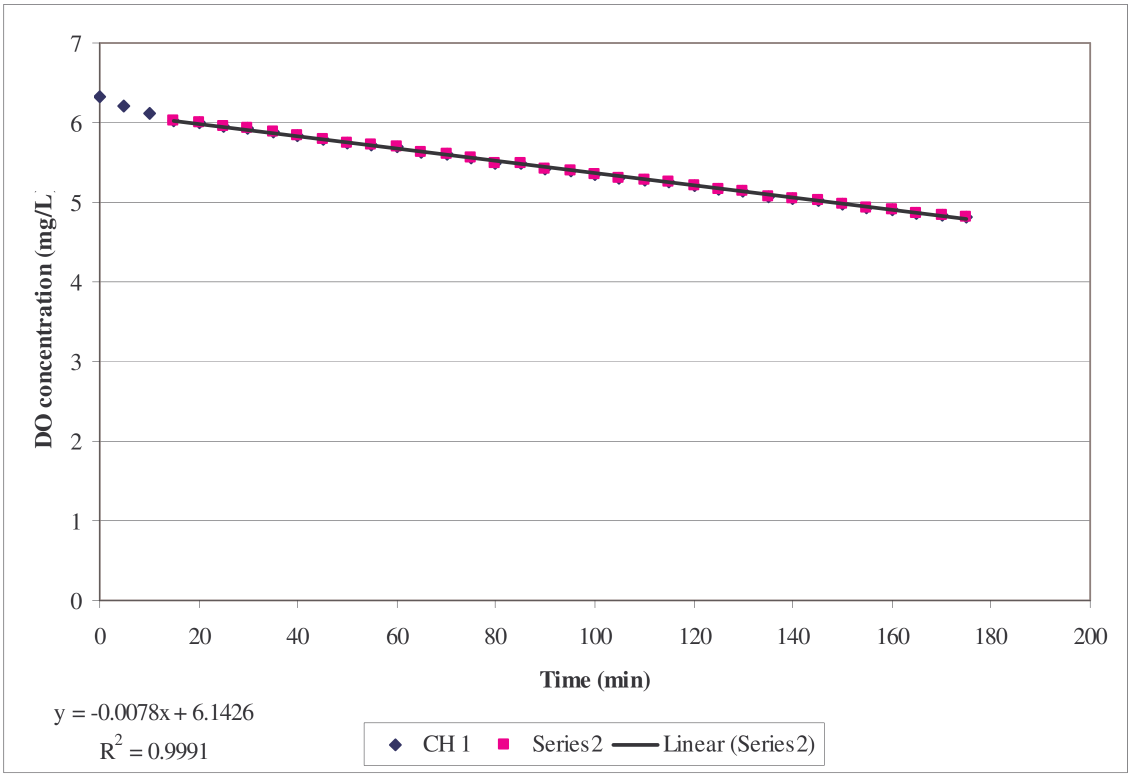

Figure F.63: Oxygen Depletion Curve for Chamber 1 on 02/17/2005 at the second forested study site within the Upper Suwannee River Basin.

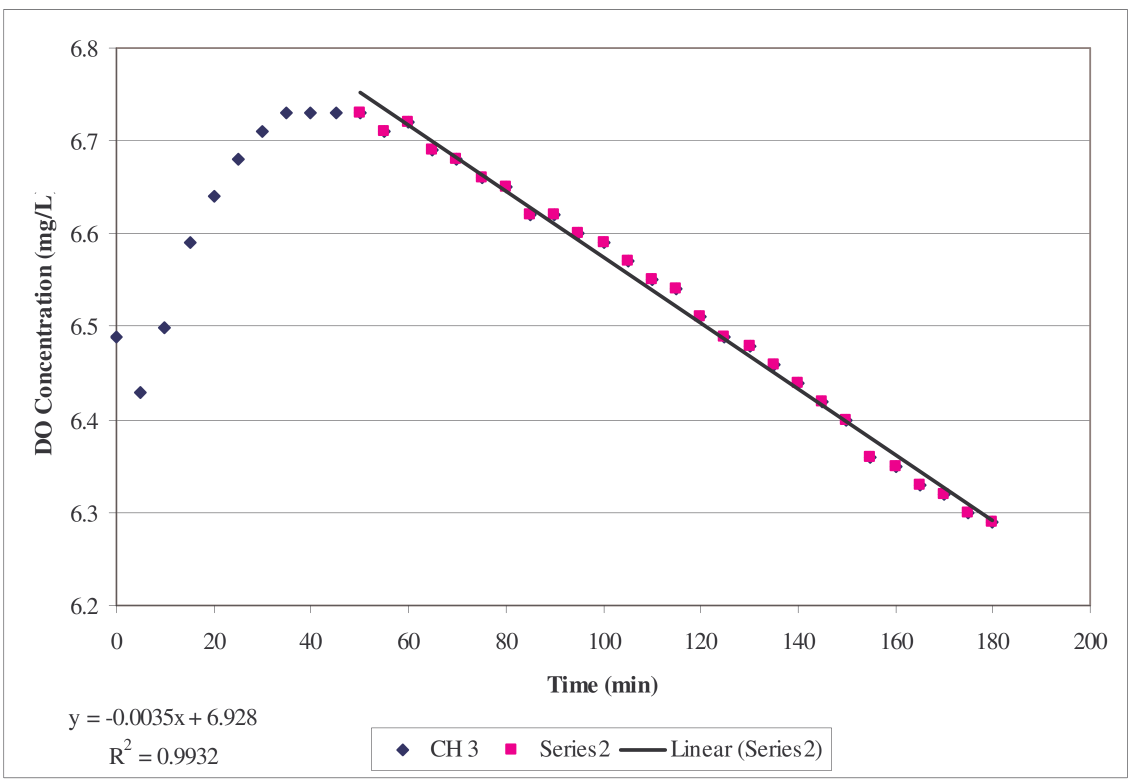

Figure F.64: Oxygen Depletion Curve for Chamber 3 on 02/17/2005 at the second forested study site within the Upper Suwannee River Basin.

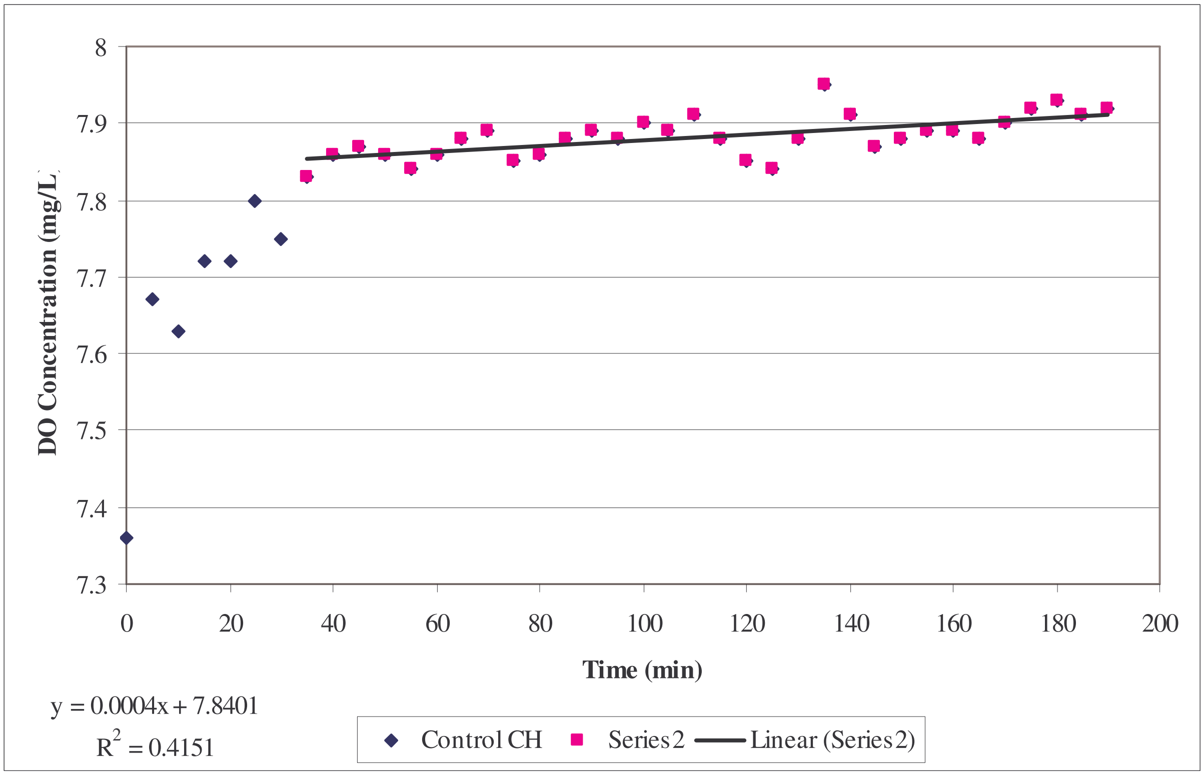

Figure F.65: Oxygen Depletion Curve for the Control chamber on 02/17/2005 at the second forested study site within the Upper Suwannee River Basin.