

PROGRESS REPORT

For the Long Branch Basin Management Action Plan

*Developed by Orange County, Florida and the Florida Department of
Environmental Protection, Division of Environmental Assessment and
Restoration, Bureau of Watershed Restoration*

May 2010

TABLE OF CONTENTS

SECTION 1 : INTRODUCTION	1
1.1 Purpose of the Report	1
1.2 Total Maximum Daily Load for the Long Branch Basin	1
1.3 Responsible Parties and Key Stakeholders	3
1.4 BMAP Allocations.....	3
SECTION 2 : STATUS OF BMAP MANAGEMENT ACTIONS	4
2.1 Septic Tank Sanitary Survey	4
2.2 Optical Brightener Testing.....	4
2.3 Speed World Assessment.....	4
2.4 Hydrologic Measurements.....	4
2.5 Water Quality Sampling	5
2.6 Agriculture	8
2.7 Summary of Efforts	8
SECTION 3 : UPCOMING ACTIVITIES.....	12
3.1 Septic Tank Sanitary Survey	12
3.2 Speed World Assessment.....	12
3.3 Hydrologic Measurements.....	12
3.4 Water Quality Sampling	12
3.5 Agriculture	12
APPENDIX A: LONG BRANCH STAGE AND RAINFALL DATA	13

LIST OF FIGURES

FIGURE 1: LOCATION OF THE LONG BRANCH WATERSHED	2
FIGURE 2: MAIN BRANCH (SITE BELB) FECAL COLIFORM DATA, 2005-2009	5
FIGURE 3: LOCATIONS OF THE LONG BRANCH WATER QUALITY SAMPLING STATIONS.....	6
FIGURE 4: AGRICULTURAL BMP IMPLEMENTATION WITHIN THE LONG BRANCH BASIN	9

LIST OF TABLES

TABLE 1: LONG BRANCH TMDLS AND REDUCTION REQUIREMENTS	1
TABLE 2: SAMPLING RESULTS FOR 2008 AND 2009.....	7
TABLE 3: MANAGEMENT ACTIONS SUMMARY.....	10

LIST OF ACRONYMS

BMAP	Basin Management Action Plan
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CFU	Colony-Forming Unit
DNA	Deoxyribonucleic Acid
DO	Dissolved Oxygen
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
LA	Load Allocation
MBAS	Methylene Blue Active Substances
MS4	Municipal Separate Storm Sewer System
OAWP	Office of Agricultural Water Policy
OCEH	Orange County Environmental Health
OCEPD	Orange County Environmental Protection Department
OCSMD	Orange County Stormwater Management Division
RV	Recreational Vehicle
SJRWMD	St. Johns River Water Management District
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
WLA	Wasteload Allocation

SECTION 1: INTRODUCTION

1.1 PURPOSE OF THE REPORT

This is the first progress report for the Long Branch Basin Management Action Plan (BMAP). The information presented includes updates from the time of BMAP adoption in May 2008 through April 30, 2010. In addition, a summary of upcoming efforts is included in **Section 3**.

1.2 TOTAL MAXIMUM DAILY LOAD FOR THE LONG BRANCH BASIN

The Long Branch watershed is located within the Middle St. Johns River Basin. Long Branch is a tributary to the Big Econlockhatchee River and is located in east central Orange County as shown on **Figure 1**. The watershed is generally bounded on the west by the Big Econlockhatchee River, to the south by the Wedgefield Subdivision, to the east by State Road 520, and to the north by Madison Avenue. The area of the watershed is entirely within unincorporated Orange County and comprises approximately 4,511 acres, including a small portion of the unincorporated town of Bithlo. Long Branch consists of a northern tributary that drains the southeastern portion of Bithlo, a southern tributary that drains conservation area, and the mainstem flanked primarily by wetlands. Streamflow in this system is intermittent, and there is typically only flow immediately after a storm event. Times of no flow or stagnant water in Long Branch are common.

In 2006, the Florida Department of Environmental Protection (FDEP) adopted total maximum daily loads (TMDLs) to address elevated fecal coliform and low dissolved oxygen (DO) in Long Branch. For the DO TMDL, three different causative pollutants were found: (1) biochemical oxygen demand (BOD) in the tributaries; (2) total phosphorus (TP) in the tributaries; and (3) total nitrogen (TN) in the mainstem. Thus, the DO TMDL is expressed in terms of these three parameters. **Table 1** lists the TMDLs adopted for Long Branch.

TABLE 1: LONG BRANCH TMDLS AND REDUCTION REQUIREMENTS

PARAMETER	TMDL	ALLOCATION	
		ORANGE COUNTY PERMITTED STORMWATER (PERCENT REDUCTION)	OTHER NONPOINT (PERCENT REDUCTION)
Fecal Coliform	4.64×10^{10} counts/day	32%	32%
BOD (tributaries)	14.96 tons/year	10%	10%
TP (tributaries)	0.74 tons/year	30%	30%
TN (mainstem)	5.20 tons/year	17%	17%

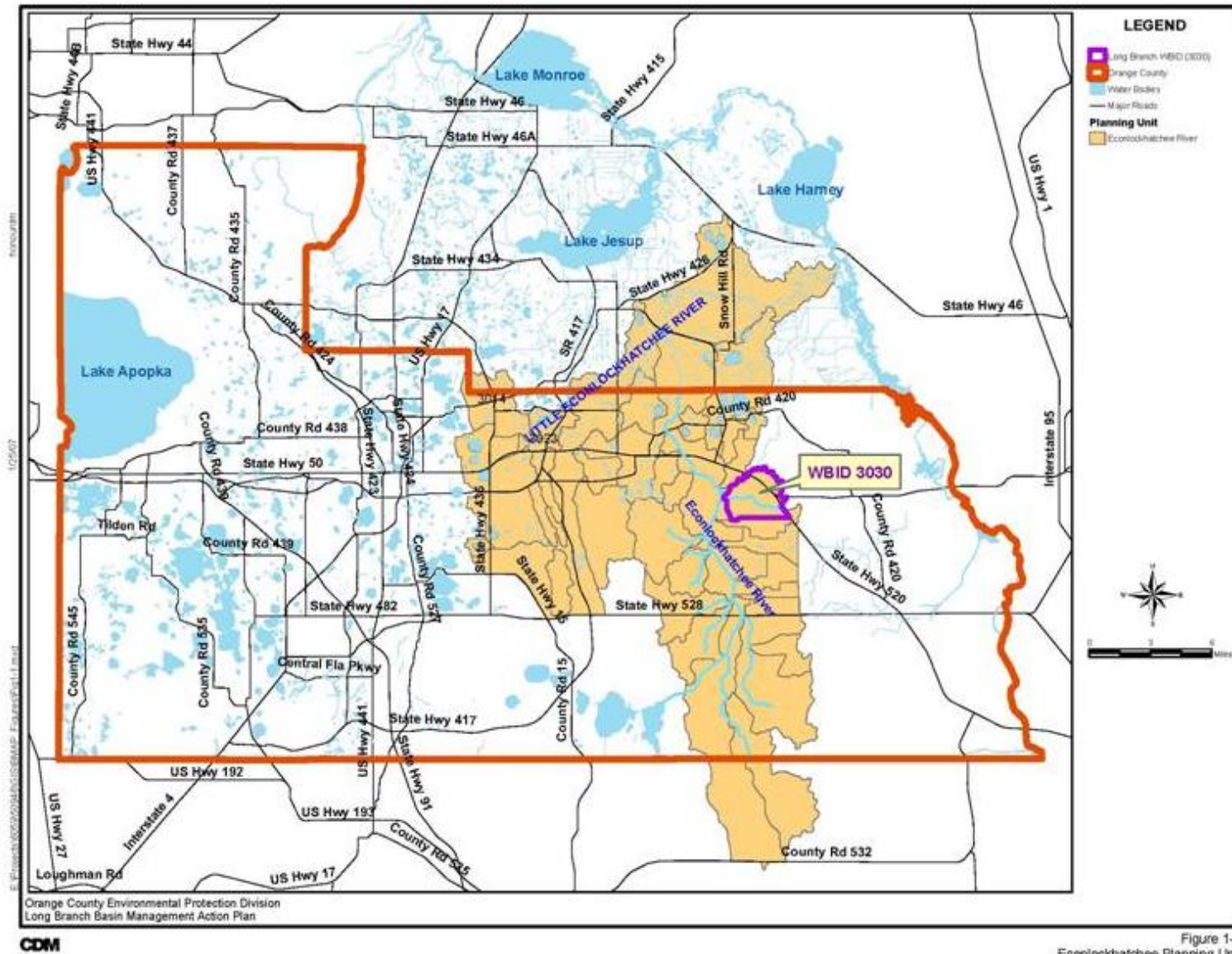


Figure 1-1
Econlockhatchee Planning Unit

FIGURE 1: LOCATION OF THE LONG BRANCH WATERSHED

1.3 RESPONSIBLE PARTIES AND KEY STAKEHOLDERS

The Long Branch BMAP identified the Orange County municipal separate storm sewer system (MS4), other urban stormwater, and agriculture as potential sources of the BOD, TN, TP, and fecal coliform impairments in the basin. Orange County is responsible for the reductions and investigations in the BMAP. Several County departments are involved in these efforts including the Orange County Environmental Protection Division (OCEPD), Orange County Environmental Health Department (OCEH), and Orange County Stormwater Management Division (OCSMD). In addition to these entities, the Florida Department of Agriculture and Consumer Services (FDACS), FDEP, and St. Johns River Water Management District (SJRWMD) are key to the implementation of the BMAP activities.

1.4 BMAP ALLOCATIONS

With only one permitted source in the watershed, the Orange County MS4, there was no need to divide the initial TMDL allocation beyond “permitted nonpoint” [wasteload allocation (WLA)] and “non-permitted nonpoint” [load allocation (LA)]. In addition, fecal coliform counts in the natural environment are variable. Given the unknowns about fecal coliform behavior in Long Branch specifically (e.g. potential for regrowth in the sediment, frequency of extremely low flow, effect of sampling day selection relative to flow), division of the coliform allocation could not be made. Thus, detailed allocations were not developed in the Long Branch BMAP.

SECTION 2: STATUS OF BMAP MANAGEMENT ACTIONS

2.1 SEPTIC TANK SANITARY SURVEY

A field survey was conducted on April 2, 2010 with staff from OCEPD and OCEH. Portions of the Bithlo neighborhoods tributary to Long Branch via roadside swales were driven to assess the general conditions of the septic tanks and drainfields. Selected parcels directly adjacent to Long Branch were observed by walking uplands along the creek. No visible illicit connections from septic systems to the creek were observed. One washing machine connection was noted and OCEH staff spoke with the resident about connection to the septic system. In addition, there are four mobile home parks in close proximity to the Long Branch channel.

2.2 OPTICAL BRIGHTENER TESTING

Optical brightener tests have not been performed in the Long Branch basin. OCEPD did implement optical brightener sampling in Crane Strand and the East Orlando Outfall Canal. Both of these waterbodies are tributaries to the Little Econlockhatchee River, and both are impaired for fecal coliform. In each case the results were inconclusive. Given the flashy nature of the flow in Long Branch and the lack of success at the other two sites, it was decided that optical brightener sampling could not be implemented.

However, as part of the BMAP sampling within Long Branch, Methylene Blue Active Substances (MBAS) was included in the analysis for a sample from Site G (see **Figure 3**) to assess whether detergents were present; the results were negative. Deoxyribonucleic acid (DNA) samples were collected at Site D (see **Figure 3**) in February 2008, and the results were positive for Bacteriodes and Enterococcus, which are human sewage indicators.

2.3 SPEED WORLD ASSESSMENT

OCEPD staff have coordinated with the Speed World owner regarding onsite waste management during events. The existing bathroom facility is adequate for small events; however, for larger multi-day events Speed World provides portable toilets. In addition, pump-out access is provided to recreational vehicle (RV) owners by a private company. From an informational/educational standpoint, OCEPD has made signs stating that onsite discharge of waste is illegal and the signs are posted with the owner's permission in the area where RVs park, which is adjacent to a drainage canal. The signs are visible to Speed World attendees as well as the adjacent property owners.

Water quality sampling following large events at Speed World has been attempted but, if there is no flow, the sampling has not been conducted. One sampling event was conducted in November 2009, with the results showing fecal coliform values between 1,000 and 2,000 colony forming units (CFU)/100ml. While these numbers exceed the state water quality standards, they are not unusual for manmade, upland cut ditches that frequently hold stagnant stormwater. In addition, ditch maintenance was occurring upstream of the sample site that further hindered the collection of a representative sample.

2.4 HYDROLOGIC MEASUREMENTS

OCEPD staff have conducted flow-related measurements at Site G (see **Figure 3**) along County Road 13 since March 2008. An acoustic flow velocity meter and pressure transducer was installed that recorded velocity and stage, respectively. However, due to the shallow water

conditions and often no or minimal flow conditions at the site, the velocity data was not very useful and, as such, the calculation of discharge was based on stage/flow. The stage data did provide good evidence of the flashy nature of the north tributary. This initial effort was discontinued in spring 2010; however new equipment will be installed (see **Section 3.3**). **Appendix A** includes information on the stage and rainfall data collected.

2.5 WATER QUALITY SAMPLING

The sample sites for Long Branch include one site (BELB) that is part of the overall long-term OCEPD sampling program as well as eight sites established to address the unique nature of the Long Branch basin and BMAP related issues (see **Figure 3**). Site BELB reflects flow from both the north and south branches of Long Branch; however, there are access issues for this site. During the first two years of the BMAP, the BELB site was sampled three times. The results show two samples below the 800 CFU/100ml level (600 CFU/100ml and 98 CFU/100ml on October 8, 2008 and January 28, 2009, respectively) and one just above 1,000 CFU/100ml (1,200 CFU/100ml on July 9, 2008). **Figure 2** shows trends from 2005 through 2009.

Three sampling events occurred in 2008 and two in 2009 (see **Table 2** for the sampling results) at the BMAP-related sites. As noted the system is very flashy, so even after a rain event, not all sites had sufficient flow for sampling. The fecal coliform results are above the state standards with two exceptions in 2008. No specific source has been found to date.

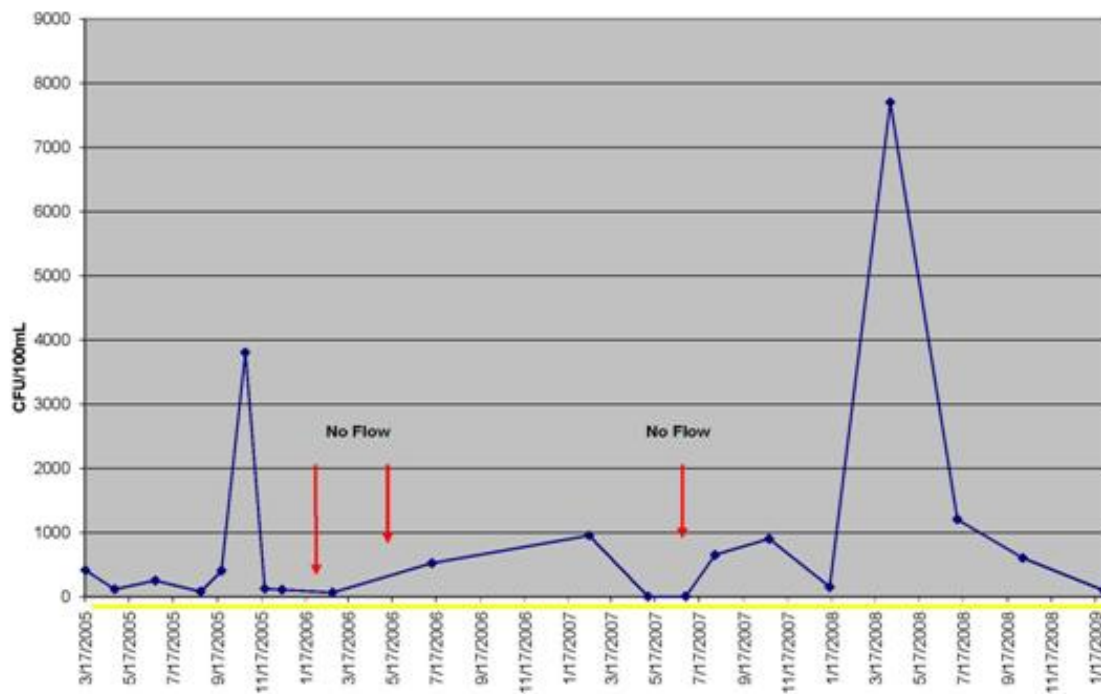


FIGURE 2: MAIN BRANCH (SITE BELB) FECAL COLIFORM DATA, 2005-2009

Long Branch Sampling Sites

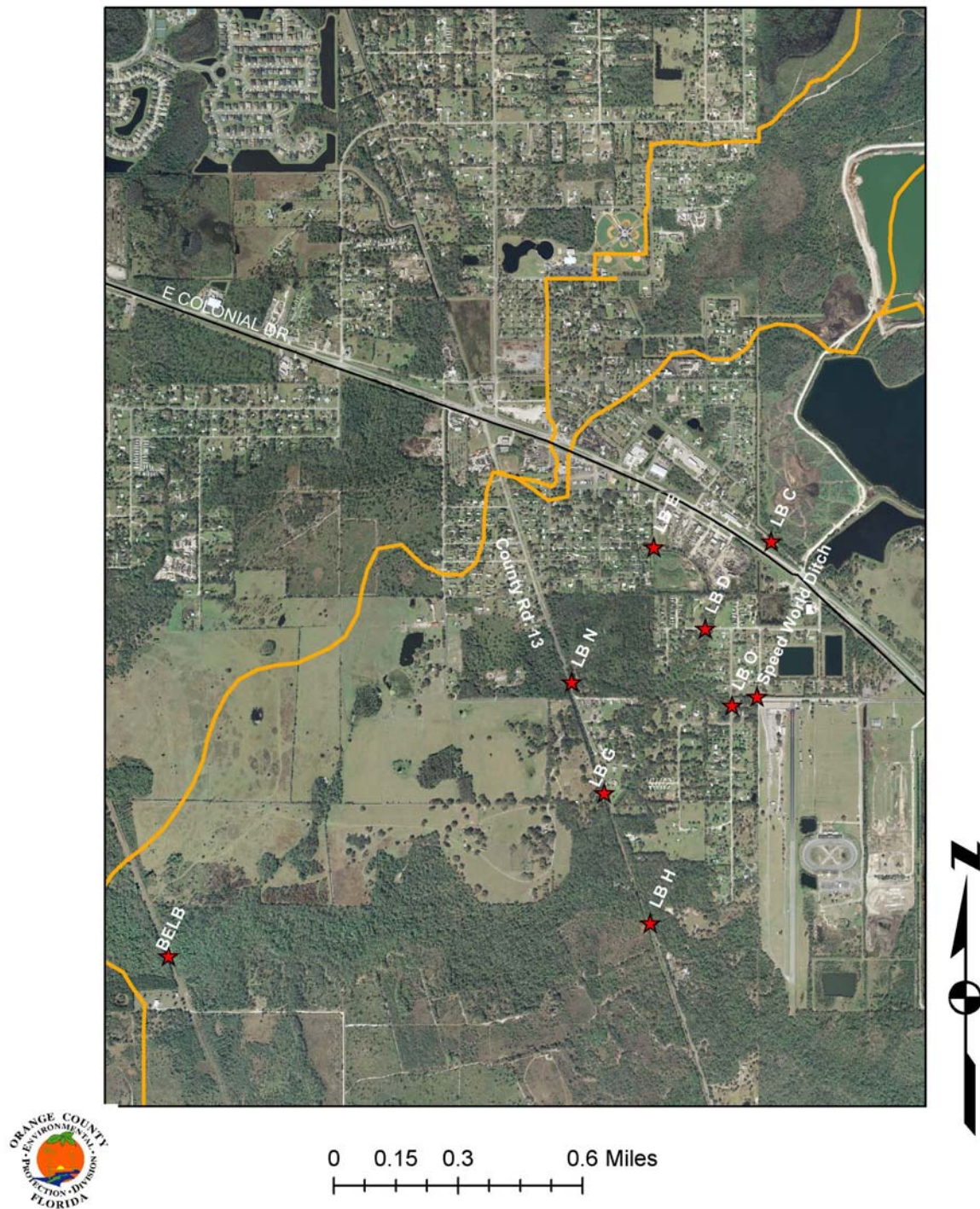


FIGURE 3: LOCATIONS OF THE LONG BRANCH WATER QUALITY SAMPLING STATIONS

TABLE 2: SAMPLING RESULTS FOR 2008 AND 2009

Site	Date	Fecal Coliform (CFU/100 ml)	DO (mg/L)	pH	TP (mg/L)	Ortho P (mg/L)	TN (mg/L)	TKN (mg/L)	NH3 (mg/L)	BOD (mg/L)	Chl A (ug/L)	Color (PCU)	Flow	DNA
Site D	02/27/2008	3,600												Human positive
All sites	04/21/2008	No flow												
Site D	06/03/2008	3,800	5.0	7.1										
Site O	06/03/2008	550	9.3	7.4										
Sites C, E, N, G, H, CR13N1St, M, SpeedWorld, SW ditch	06/03/2008	No flow												
Site C	08/20/2008	1 Z	2.4	6.5	0.135	0.039	1.96	1.95	0.03	15	6.4	258.1	0.680	
Site D	08/20/2008	1 Z	4.8	6.9	0.149	0.047	1.77	1.75	0.03		5.8		0.600	
Site E	08/20/2008	5,100	4.8	6.9							1.8	164.6	0.780	
Site O	08/20/2008	1,800	7.0	6.6	0.029	0.005	0.68	0.66	0.03	2	7.9	42.6	0.340	
Site G	08/20/2008	1 Z	3.2	6.9	0.192	0.102	1.32	1.32	0.03	6	3.4	129.5	0.160	
Site H	08/20/2008	4,700	6.9	6.9	0.085	0.029	1.37	1.36	0.03	4	1.2	238.7	0.346	
SW ditch	08/20/2008	650 B	7.3	6.5	0.029	0.003	0.64	0.62	0.03	2	6.4	29.9	0.310	
Sites N, CR13N1St, M, SpeedWorld	08/20/2008	No flow												
Site O	05/14/2009	5,200	3.9	6.5	0.044	0.015	0.59	0.59	0.03	4	2.6	25.3		
Sites B2, C, D, E, N, G, H, CR13N1St, M, SpeedWorld, SW ditch	05/14/2009	No flow												
Site D	08/03/2009	5,900	5.7	6.6	0.082	0.029	1.52	1.48	0.15	2	1.2	431		
Site O	08/03/2009	1,800 B	5.9	6.5	0.018	0.002	0.44	0.43	0.03	2	3.3	20.6		
Site H	08/03/2009	3,500	5.6	6.5	0.051	0.016	1.13	1.11	0.02	2	1.0	287.1		
Sites C, E, N, G, CR13N1St, M, SpeedWorld, SW ditch	08/03/2009	No flow												

Notes:

B = Results based on colony counts outside the acceptable range

Z = Overgrowth of colonies

2.6 AGRICULTURE

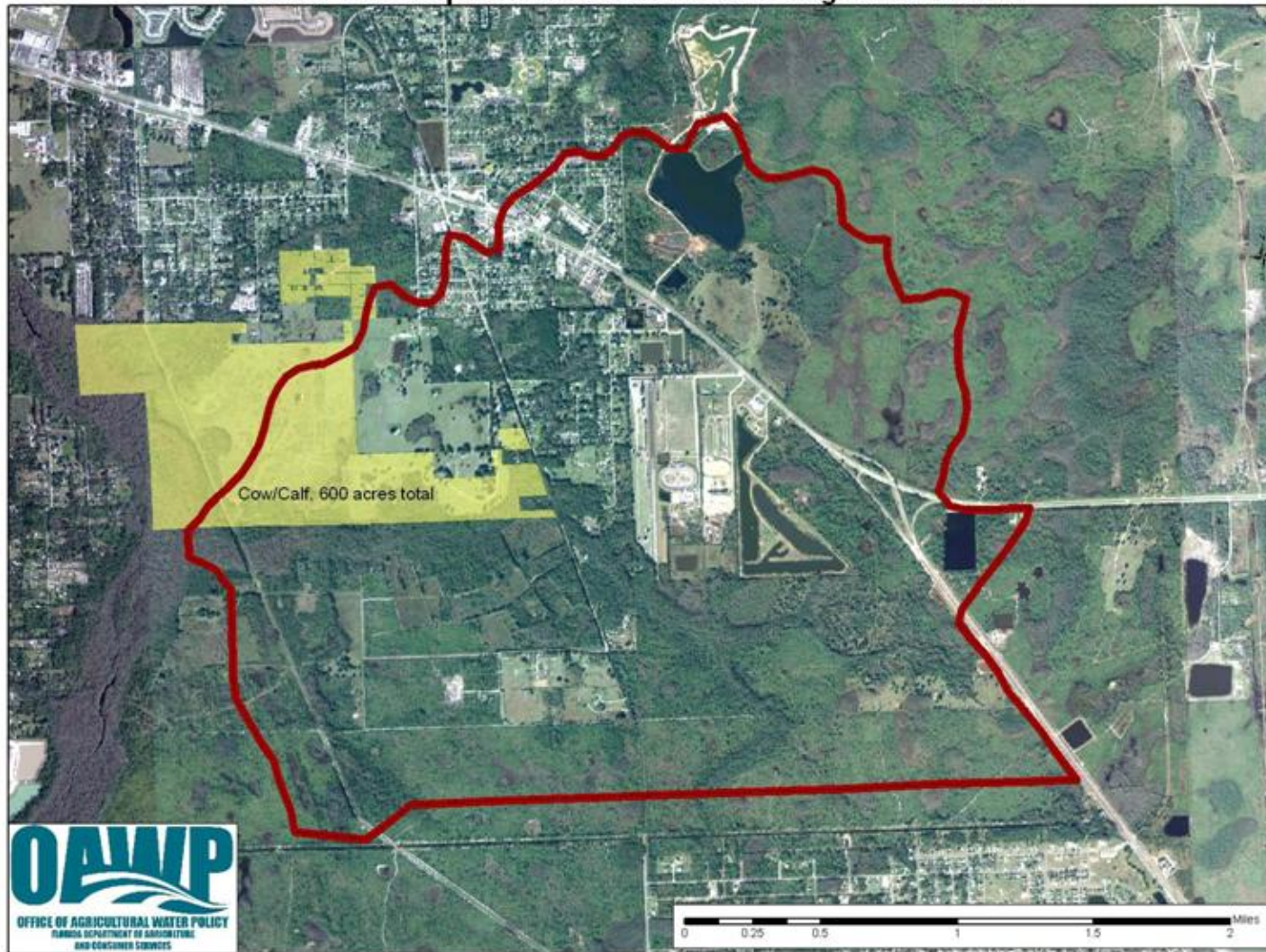
The FDACS Office of Agricultural Water Policy (OAWP) adopted the manual, Water Quality Best Management Practices for Florida Cow/Calf Operations (2008 edition) in 2009. Subsequently, OAWP staff participated in events held by the Florida Cattlemen's Association and the University of Florida Institute of Food and Agricultural Sciences in the Orange County area, to provide information on cow/calf best management practices (BMPs) and schedule enrollment visits. In addition, OAWP has directed its contractor in the region, East Central Florida Resource Conservation and Development Council, to increase their focus on assisting cow/calf operations with BMP enrollment and implementation.

The largest agricultural operation in the Long Branch basin, which is a 600-acre cow/calf operation (see **Figure 4**), enrolled in the BMP program in the spring of 2010. About half of the operation resides inside the basin. Based on aerial photos, there appears to be very little other agriculture in the basin, if any. However, OAWP will determine whether there are other agricultural operations in the basin that would fall under adopted BMP programs.

2.7 SUMMARY OF EFFORTS

Table 3 summarizes the basin-specific management actions that were described above, as well as other broad-based actions, which should also contribute to water quality improvements in the Long Branch basin.

OAWP BMP Implementation within the Long Branch BMAP



Disclaimer: This map/information represents an estimate of the amount and/or location of agricultural acreage enrolled in FDACS/OAWP BMP programs for specific commodities and/or regions of the state. It is not binding, and does not otherwise affect the interests of any persons, including any vested rights or existing uses of real property. The accuracy and reliability of this map/information are not guaranteed, and are affected by continual changes in land use, crop production, and other socioeconomic factors.

FIGURE 4: AGRICULTURAL BMP IMPLEMENTATION WITHIN THE LONG BRANCH BASIN

TABLE 3: MANAGEMENT ACTIONS SUMMARY

MANAGEMENT ACTION	DESCRIPTION	TIMELINE	RESPONSIBLE PARTY
<i>Basin-Specific Management Actions</i>			
Hydrologic Measurements	Flow-related measurements have occurred at Site G along County Road 13 since March 2008. An acoustic flow velocity meter and pressure transducer was installed that recorded velocity and stage, respectively. More sensitive equipment will be installed late spring 2010 that will be able to capture smaller velocities in order to document the low to no flow conditions.	Ongoing	OCEPD
Sanitary Survey	A field survey was conducted on April 2, 2010 and no visible illicit connections from septic systems to the creek were observed. OCEH will follow up on one washing machine connection, past inspections for the mobile home parks, and septic tank repair records for Bithlo. OCEPD will determine if flooding may be an issue for septic tanks in the area.	Ongoing	OCEH
Optical Brightener Testing	Optical brightener tests have not been performed in the Long Branch basin. Use in other waterbodies provided inconclusive results. However, MBAS testing was conducted to determine whether detergents were present; the results were negative. DNA samples at Site D came back positive for human sewage indicators.	Completed	OCEPD
Speed World Wastewater Field Visits and Follow-up	Staff coordinated with the Speed World owner regarding onsite waste management during events. OCEPD has posted signs stating that onsite discharge of waste is illegal. Staff will attend future Speed World events to observe how waste is handled.	Ongoing	OCEPD
<i>Broad-Based Management Actions</i>			
MS4 Permit Implementation	Orange County is a Phase I MS4 (Permit No. FLS000011) responsible for developing and implementing a stormwater management program that reduces pollutants in stormwater to the maximum extent practicable. This involves a broad range of activities from public education through erosion control, stormwater system and facility inspections, and system inventories.	Ongoing	OCEPD
Public Education and Outreach	To help citizens develop a commitment to the environment's health and well being, the County conducts two types of public outreach efforts: those intended to change behavior and those intended to inform the public about water resources. These efforts include implementation of the Florida Yards and Neighborhoods Program, the Orange County Water Atlas www.orange.wateratlas.org , CLIP program, brochures, public presentations, school programs, Earth Day activities, and other outreach efforts.	Ongoing	Orange County
Econlockhatchee River Protection Program	Orange County has established special criteria for development within the Big Econlockhatchee River Basin, which are defined in Chapter 15 of the County's Code of Ordinances. Within this basin, Orange County regulations require pollution abatement, recharge where possible, and flood protection.	Ongoing	OCEPD
Parks Total Phosphorus Removal	Implementation of a program for Parks Department landscape contractors to utilize fertilizer labeled with 0% phosphorus for all turf fertilizer applications. In addition, no fertilizers are applied within 10 feet of waterbodies or wetlands.	Ongoing	OCEPD and Parks and Recreation Division
Pollution Abatement Swale Design Criteria	The County is currently researching the possibility of developing more specific criteria for the design, construction and maintenance of environmental berms and swales on properties abutting lakes and streams. The County has identified specific deficiencies in the current code that require modification. These modifications would apply to new development and redevelopment.	Program under development	Orange County
Environmental Control Regulations (Ch. 15, Article X, Orange County Code)	Orange County has established environmental regulations for development within Orange County. These regulations require pollution abatement, flood protection, and wetland habitat preservation.	Ongoing	Orange County

MANAGEMENT ACTION	DESCRIPTION	TIMELINE	RESPONSIBLE PARTY
Stormwater Regulations (Ch. 38, Zoning, Orange County Code)	In the zoning code, Orange County established stormwater regulations for development within Orange County. These regulations require pollution abatement, recharge criteria, and flood protection.	Ongoing	Orange County
Environmental Resource Permit	Activities that exceed SJRWMD permitting thresholds must be authorized by an Environmental Resource Permit from the District, which incorporates both stormwater treatment and mitigation of any wetland impacts.	Ongoing	SJRWMD
Agricultural BMPs	FDACS develops, adopts, and implements BMPs to reduce water quality impacts from agricultural discharges and enhance water conservation. FDACS is working with private landowners to implement the appropriate BMPs.	Ongoing	FDACS and Private Landowners

SECTION 3: UPCOMING ACTIVITIES

3.1 SEPTIC TANK SANITARY SURVEY

As a follow up to the field survey, OCEH will contact the resident with the illicit washing machine connection to confirm that the connection is properly redirected to the septic system. OCEH staff will also review the past two inspections for each mobile home complex to confirm that the septic systems are functioning per code. In addition, OCEH will be reviewing septic tank repair records for Bithlo to determine if there have been failing systems or repairs in close proximity to the Long Branch channel.

OCEPD will coordinate with OCSMD to determine if there have been flooding complaints or events within the Long Branch basin. If there have been events, they will be reviewed to determine if flooding may be problematic for septic tank system operation.

3.2 SPEED WORLD ASSESSMENT

OCEPD staff will attend future Speed World events to observe how waste is handled. If any issues are observed, staff will coordinate with the owner to ensure the problem is resolved.

3.3 HYDROLOGIC MEASUREMENTS

OCEPD staff will install more sensitive equipment in late spring 2010 that will be able to capture smaller velocities in order to document the low to no flow conditions. Independent event measurements will also be collected to compare to the data collected by the logger (see **Appendix A**). This equipment will help provide more information about the hydrology of the Long Branch watershed.

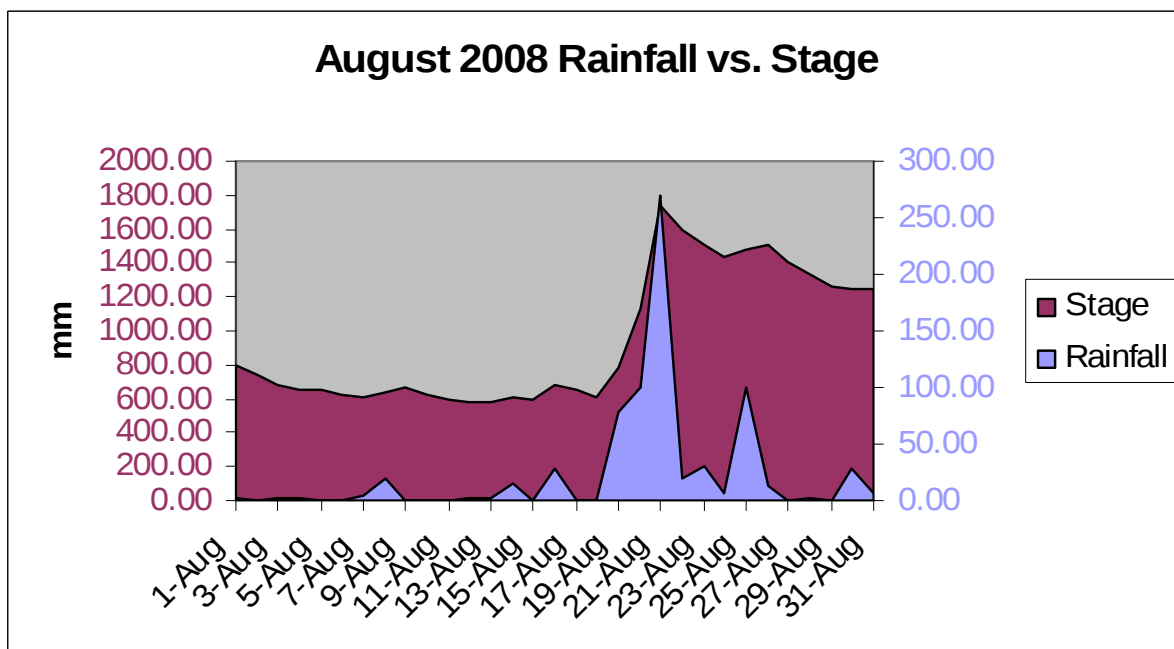
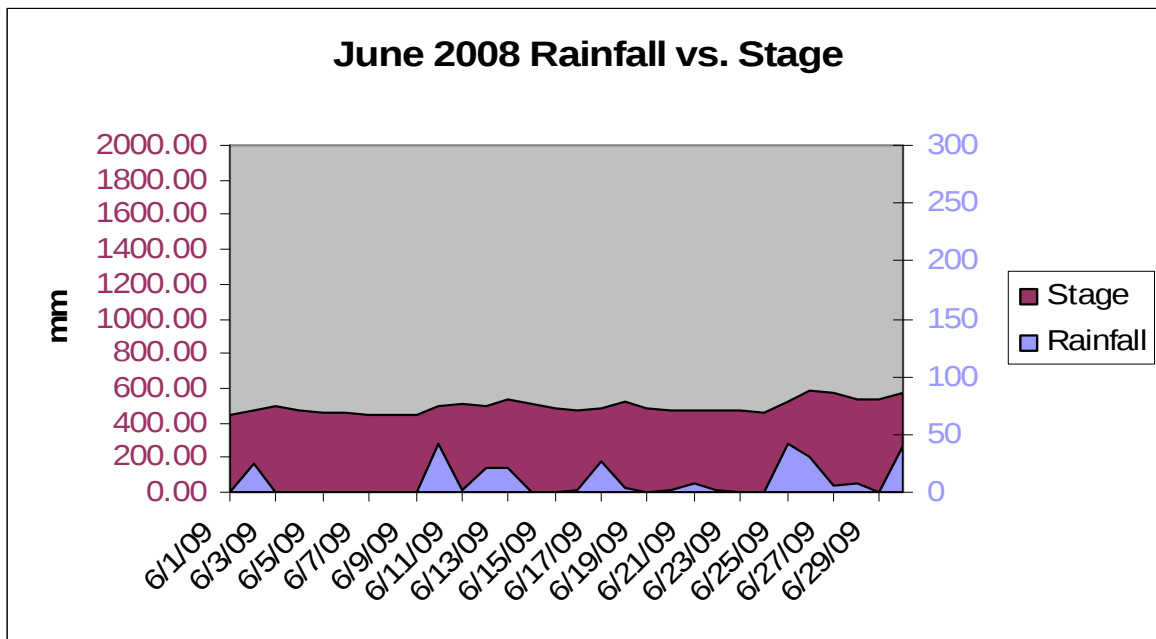
3.4 WATER QUALITY SAMPLING

OCEPD will continue to sample the eight sites (see **Figure 3**) that are part of the Long Branch BMAP monitoring plan. The system is very flashy, which may prohibit sampling at some of the sites if there is not sufficient flow.

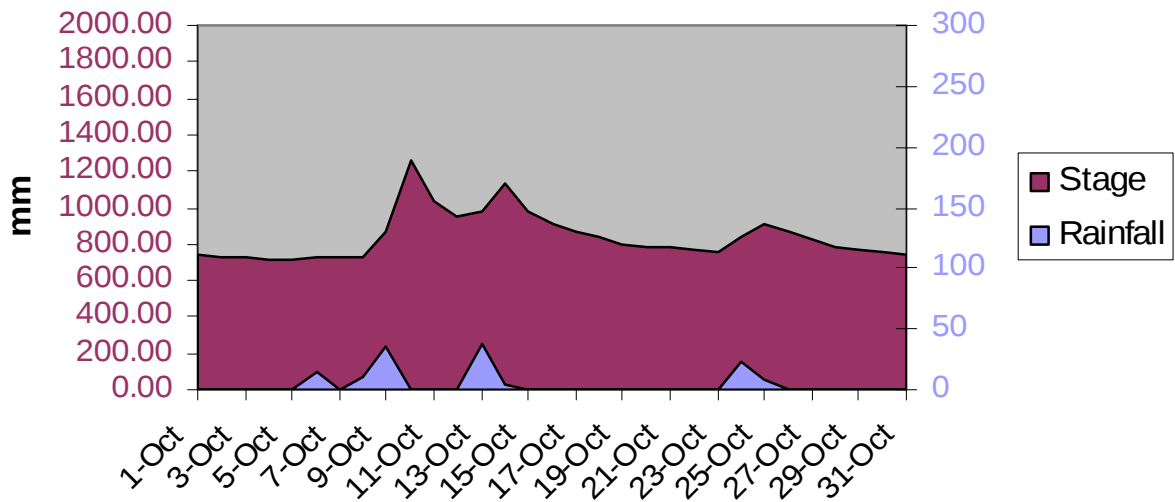
3.5 AGRICULTURE

OAWP will determine whether there are other agricultural operations in the basin that would fall under adopted BMP programs and enroll those operations for the appropriate BMPs. Adopted programs include citrus, vegetables and row crops, container nurseries, cow/calf operations, and sod operations. FDACS OAWP currently is developing BMP manuals for equine operations and specialty fruit and nut operations; however, these manuals may not be relevant in this basin. The target for adoption of these manuals is December 2010.

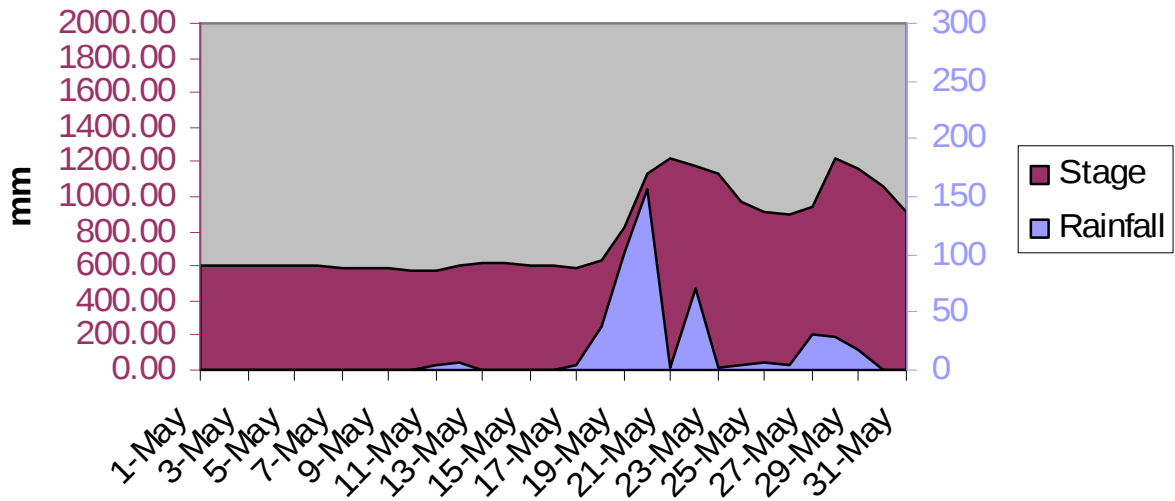
APPENDIX A: LONG BRANCH STAGE AND RAINFALL DATA



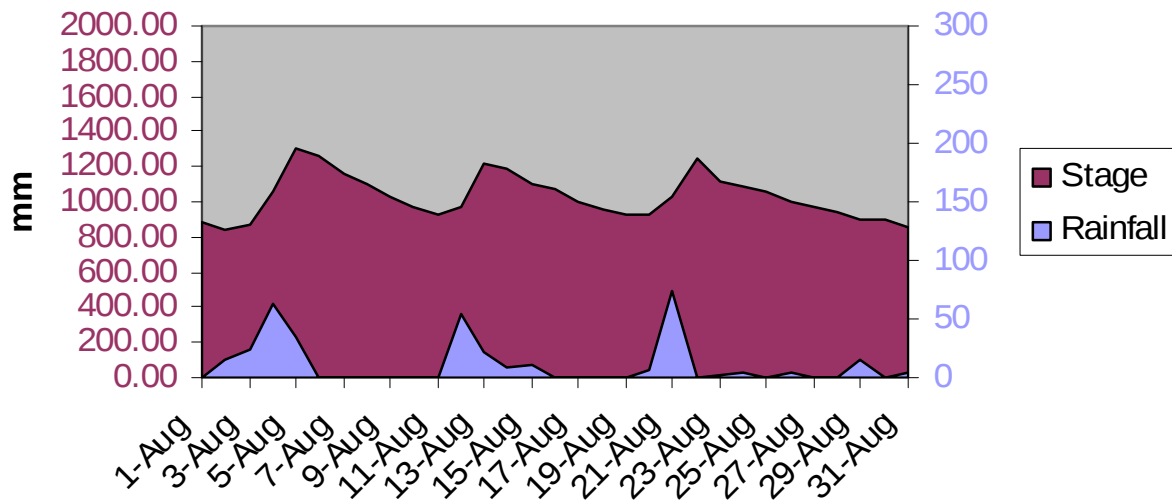
October 2008 Rainfall vs. Stage



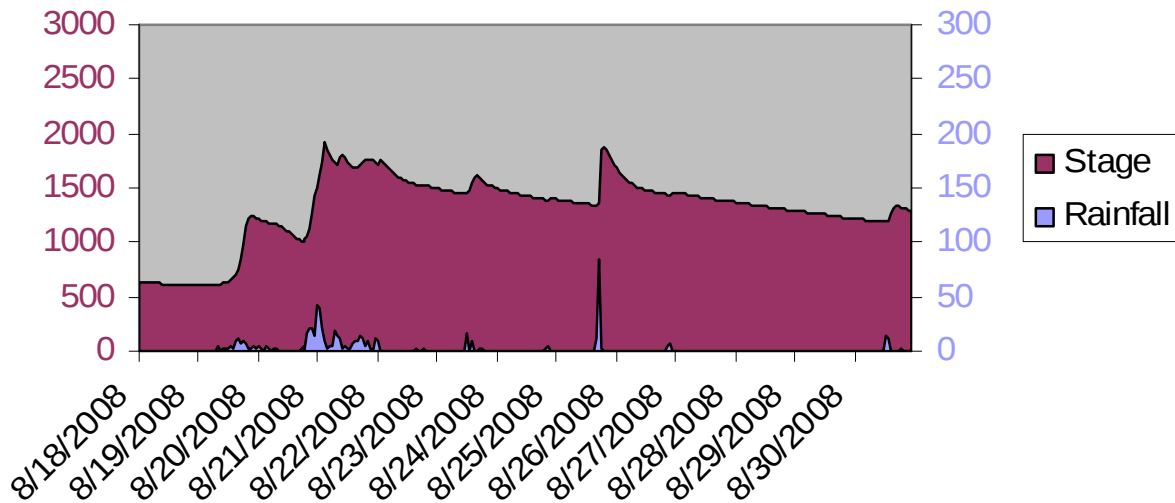
May 2009 Rainfall vs. Stage



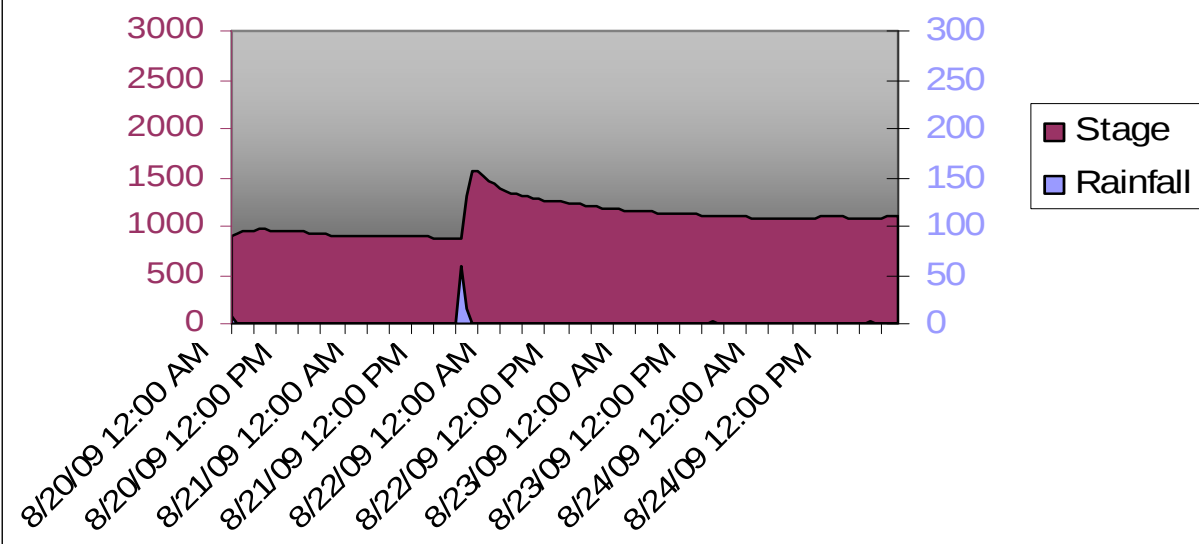
August 2009 Rainfall vs. Stage



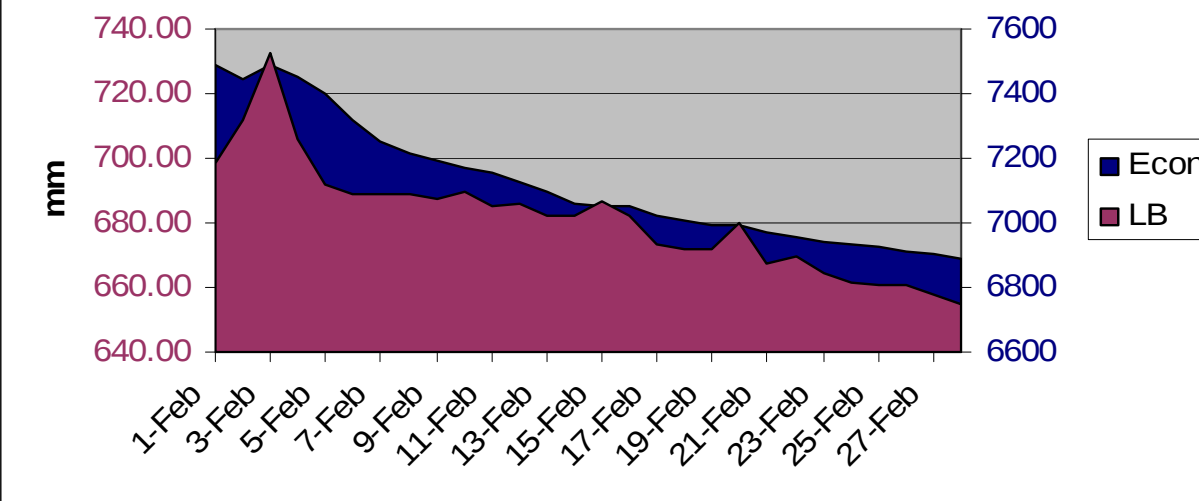
Focused Rainfall vs. Stage August 2008



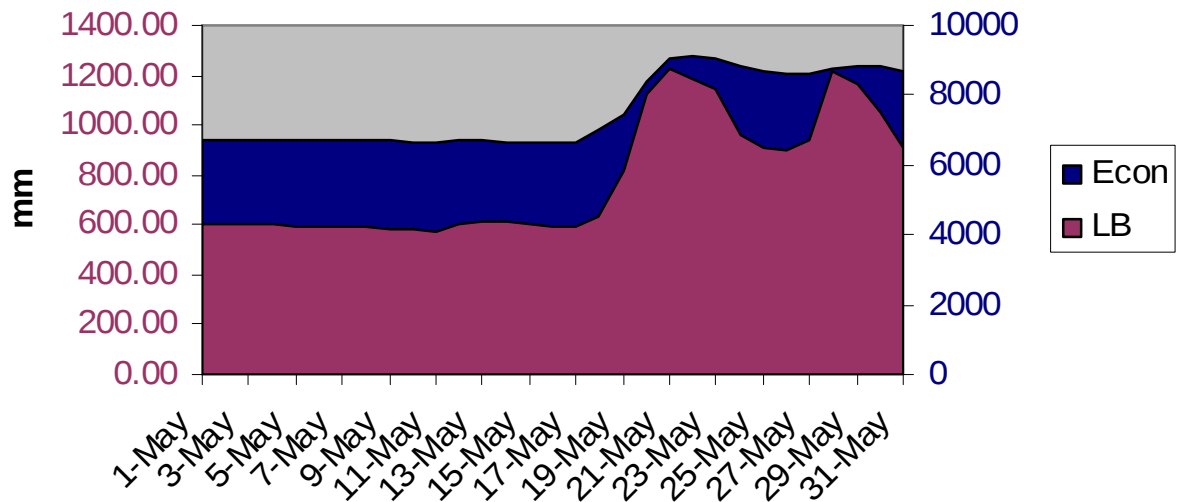
Focused Rainfall vs. Stage August 2009



Long Branch/Econ Stage Comparison February 2009



Long Branch/Econ Stage Comparison May 2009



Long Branch vs. Econ Stage Data August 2009

