Bowl Basin Restoration Site
Monitoring Report MY01
DMS Project # 95721
DMS Contract # 005012

Submitted to:

NCDMS, 1652 Mail Service Center, Raleigh, NC 27699-1652

Construction Completed: February 2015
Data Collection: 2015
Submitted: January 2016

Monitoring and Design Firm

Landmark Center II, Suite 220
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Project No: 20122265

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1.0 EXECUTIVE SUMMARY / PROJECT ABSTRACT

The Bowl Basin Restoration Site (BBRS) is a full-delivery project that was developed for the North Carolina Division of Mitigation Services (DMS). Construction was completed in February 2015. The site is within the 03020106 Watershed Cataloging Unit (8-digit HUC) and the Local Watershed Unit (14-digit HUC) 03020106010010. In DMS' most recent publication of excluded and Targeted Local Watersheds/Hydrologic Units, the 03020106010010 14-digit HUC has been identified as a Targeted Local Watershed.

The project goals and objectives are listed below.

Project Goals

- Protect and improve water quality by reducing sediment and nutrient inputs
- The protection of a watershed draining into shellfish harvesting waters
- Provide habitat for aquatic flora and fauna by improving physical structure and vegetative composition
- Increase the local hydroperiod by encouraging both surface and subsurface storage and retention
- Restore and establish a functional and diverse wetland community

Project Objectives

- Fill field ditches to restore surface flow retention and elevate local groundwater levels.
- Redevelop longer wetland flow patterns to increase surface flow retention time.
- Restore a diverse wetland vegetation community through maintenance and germination of existing wetland seed stores, planting of wetland trees and shrubs, and incorporation of a custom wetland seed mix

The project site, which is protected by an 11.7-acre permanent conservation easement held by the State of North Carolina, is situated in Onslow County in the Carolina Flatwoods ecoregion of the Coastal Plains physiographic province. The site is located on a single parcel located off of White Oak River Road approximately 13.5 miles north of Jacksonville, North Carolina.

The BBRS provided mitigation for wetland impacts within Hydrologic Unit 03020106 by restoring 11.7 acres of wetland, generating 11.7 non-riparian wetland mitigation units (WMU's)

The BBRS will be monitored to determine if the project is on-track to meeting jurisdictional wetland status. In the restoration areas, the wetland site will be deemed successful once hydrology is established and vegetation success criteria are met.

2.0 MONITORING RESULTS

The BBRS will be monitored to determine if the project is on-track to meeting jurisdictional wetland status. The wetland restoration area will be deemed successful once hydrology is established and vegetation success criteria are met. The site will be monitored for at least seven years or until the success criteria are achieved.

2.1 VEGETATION MONITORING

The success criteria for the planted species in the mitigation area will be based on survival. The site will demonstrate the re-establishment of targeted vegetative communities based on survival and growth of planted species and volunteer colonization, with an average stem density of 320 stems/acre after three years, 288 stems/acre after four years, 260 stems/acre after five years, and 210 stems/acre after seven years to be considered successful. To determine the success of the planted mitigation area, ten permanent vegetation monitoring plots (10 by 10 meters) have been established in the wetland restoration area at a density that represents the total mitigation acreage. The average density of these plots will determine whether the site meets the success criterion.

The first-year vegetation monitoring was based on the Level 2 CVS-EEP vegetation monitoring protocol. The site's average density for this monitoring period was 791 planted stems/acre. All ten plots had greater than 320 planted stems/acre. Including volunteers, the site averaged 1,934 total stems/acre. In general the site is well vegetated, with widespread herbaceous coverage and healthy planted stems.

2.2 HYDROLOGY MONITORING

Wetland hydrology will be monitored with a series of automatic gauges that record water table depth. The site must present continuous saturated or inundated hydrologic conditions for at least 9% of the growing season with a 50% probability of reoccurrence during normal weather conditions. A "normal" year is based on NRCS climatological data for Onslow County using the 30th to 70th percentile thresholds as the range of normal as documented in the USACE Technical Report "Accessing and Using Meteorological Data to Evaluate Wetland Hydrology, April 2000." The growing season for Onslow County is considered to extend from March 18 to November 16 (243 days). The water table of the restored wetlands must be within 12" of the soil surface continuously for at least 9% (22 days) of the 243-day growing season. Wetland hydrology will be monitored with eight automatic gauges that record water table depth.

Due to the inherent variability in the site's soils and associated drainage characteristics, it is unlikely that the project will exhibit uniform hydrologic conditions across the site, making a single hydrologic performance criterion unrepresentative of the site's performance. As such, the gauge data can be evaluated and presented as a spatial average with each gauge representing the area half the distance to adjacent gauges. The spatial average will be the calculated value for comparison with the performance standard for credit validation.

The wetland gauges will be checked and/or downloaded every other month. Daily data will be collected from the automatic gauges over the 7-year monitoring period.

The daily rainfall data was obtained from a local weather station in Pumpkin Center, NC; provided by the NC State Climate Office. For the 2015 year, the months of January, February, June, October, and November experienced above average rainfall, while May, July, August, and September experienced average rainfall. The months of March and April recorded below average rainfall for the site. Overall, the area experienced average rainfall during the 2015 growing season.

During the site's first growing season, 7 of the 8 gauges had continuous saturation within 12 inches of the ground surface for 9% (22 days) of the 243 day growing season (March 18 to November 16). Since no gauges were below 6.5% continuous saturation, all gauges were used in the analysis to determine the spatial average for the hydrology of the entire site. This analysis is based off percent saturation contours

for the restoration area calculated from the gauge data. Following the method described above and as illustrated in the figure in Appendix D, it is determined that based on the spatial average, the site was continuously saturated for 16.3% of the growing season and met the hydrology success criteria of 9% for the first year of monitoring.

3.0 METHODOLOGY

The CVS-EEP protocol, Level 2 (http://cvs.bio.unc.edu/methods.htm) was used to collect vegetation data from the site. The vegetation monitoring was completed on October 16, 2015.

4.0 REFERENCES

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Version 4.2 (http://cvs.bio.unc.edu/methods.htm)

USACE. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

Appendix A

Project Vicinity Map and Background Tables

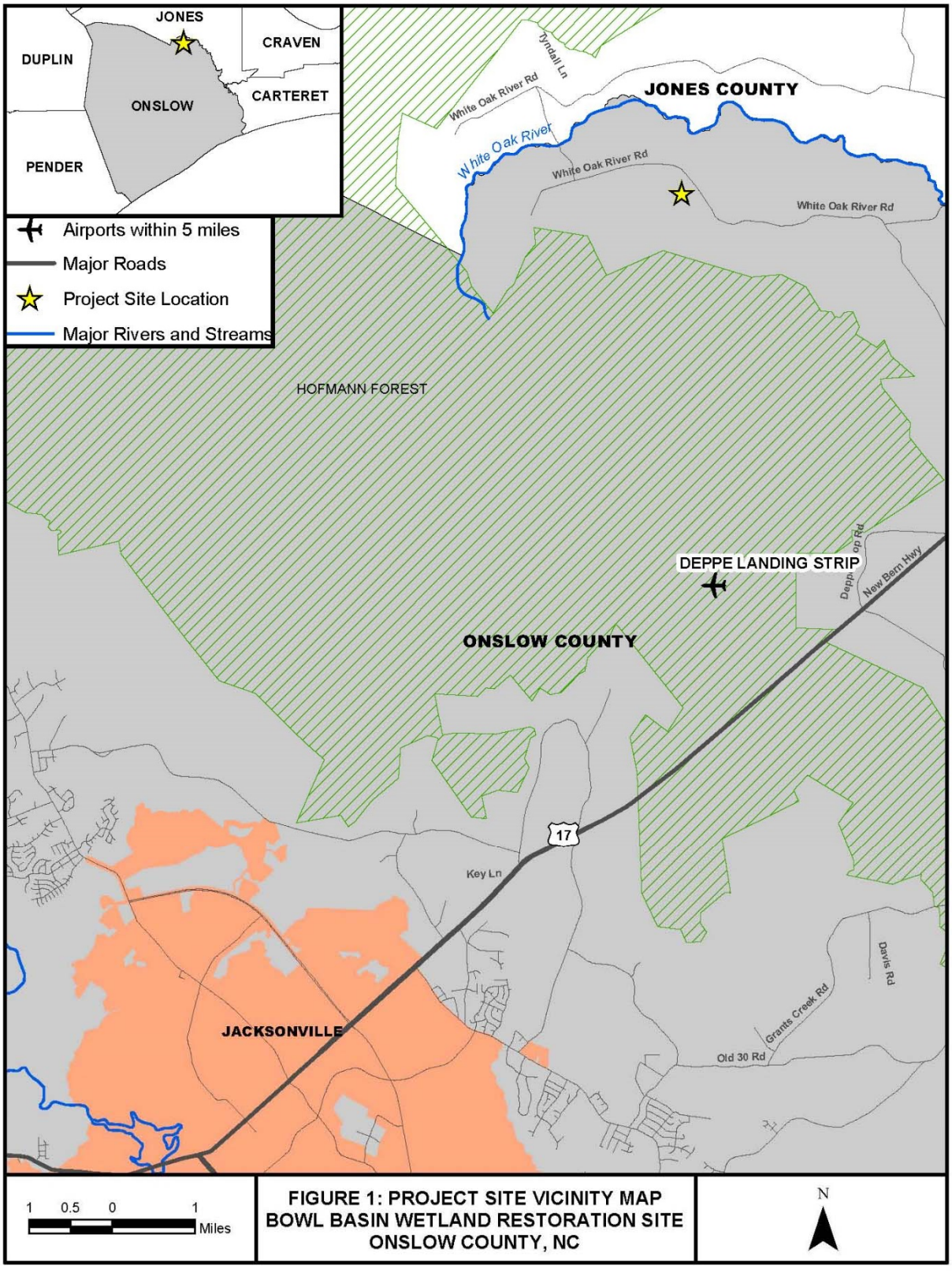

JONES
CRAVEN
DUPLIN
ONSLOW
CARTERET
PENDER
Airports within 5 miles
Major Roads
Project Site Location
Major Rivers and Streams
JONES COUNTY
Tyndall Ln
White Oak River Rd
White Oak River
White Oak River Rd
White Oak River Rd
HOFMANN FOREST
DEPPE LANDING STRIP
New Bern Hwy
ONSLOW COUNTY
17
Key Ln
Davis Rd
Grants Creek Rd
Old 30 Rd
JACKSONVILLE
1 0.5 0 1
Miles
FIGURE 1: PROJECT SITE VICINITY MAP
BOWL BASIN WETLAND RESTORATION SITE
ONSLOW COUNTY, NC
N

FIGURE 2: PROJECT SITE MITIGATION PLAN VIEW
BOWL BASIN WETLAND RESTORATION SITE
ONSLOW COUNTY, NC

Image Source: NC 2010 Statewide Orthoimagery.

Table 1. Project Components
Project Number and Name: 95721 – Bowl Basin Restoration Site

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Acres	-	-	-	-	11.7	-	-	-	-
Credits	-	-	-	-	11.7	-	-	-	-
TOTAL CREDITS	-		-		11.7		-	-	-

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage or Acreage	Mitigation Ratio
Wetland Area	-	11.7 acres	-	Restoration	11.7 acres	1:1

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration				11.7 acres		
Enhancement						
Enhancement I						
Enhancement II						
Creation						
Preservation						
High Quality Preservation						
TOTAL	-	-	-	11.7 acres	-	-

Table 2. Project Activity & Reporting History Project Number and Name: 95721 - Bowl Basin Restoration Site		
Elapsed Time Since Grading Complete: 9 months **Elapsed Time Since Planting Complete: 9 months** **Number of Reporting Years: 1**		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan		Oct 14
Final Design - Construction Plans		Dec 14
Construction		March 15
Planting		March 15
Baseline Monitoring/Report	April 15	May 15
Year 1 Monitoring	Oct 15	Jan 16

Table 3. Project Contacts Project Number and Name: 95721 - Bowl Basin Restoration Site	
Design Firm	KCI Associates of North Carolina, PC Landmark Center II, Suite 220 4601 Six Forks Rd. Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor	KCI Environmental Technologies and Construction, Inc. Landmark Center II, Suite 220 4601 Six Forks Rd. Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Planting Contractor	Bruton Nurseries and Landscapes PO Box 1197 Freemont, NC 27830 Contact: Mr. Charlie Bruton Phone: (919) 242-6555
Monitoring Performers	
MY00-MY01	KCI Associates of North Carolina, PC Landmark Center II, Suite 220 4601 Six Forks Rd. Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266

Table 4. Project Attribute Table **Project Number and Name: 95721 – Bowl Basin Restoration Site**			
County	Onslow County		
Project Area (acres)	11.7 acres		
Project Coordinates (lat. and long.)	34.925365 N , -77.607461 W		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	White Oak		
USGS Hydrologic Unit 8-digit	03020106	**USGS Hydrologic Unit 14-digit**	03020106010010
DWQ Sub-basin	03-05-01b		
Project Drainage Area (acres)	76.0 acres		
Project Drainage Area Percentage of Impervious Area	1%		
CGIA Land Use Classification	94% Cultivated, 4% Forest, and 2% Low-Intensity Development		
Wetland Summary Information			
Parameters	**Wetland Area**		
Size of Wetland (acres)	11.7 acres		
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	Non-riparian		
Mapped Soil Series	Pantego loam by detailed soil investigation		
Drainage class	Poorly drained		
Soil Hydric Status	Drained Hydric		
Source of Hydrology	Groundwater / Precipitation		
Hydrologic Impairment	Ditching and Crops		
Native vegetation community	Crops		
Percent composition of exotic invasive vegetation	0%		

Appendix B

Visual Assessment Data

LEGEND:

- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- VEG PLOT TOTAL / PLANTED STEM DENSITY ····· 1117/983
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION
- PHOTO POINT (PP)
- SOIL TEMPERATURE GAUGE
- FILLED DITCHES
- CONSERVATION EASEMENT = NONRIPARIAN WETLAND RESTORATION = 11.7 ACRES

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

SOIL TEMPERATURE GAUGE
VEG PLOT #1 1174/1093
PP1
GAUGE#1
VEG PLOT #2 1295/971
GAUGE#2
VEG PLOT #3 648/648
VEG PLOT #9 1416/1133
VEG PLOT #10 1093/890
GAUGE#5
GAUGE#8
PP6
PP2
VEG PLOT #8 850/728
PP5
GAUGE#3
VEG PLOT #4 1133/1093
VEG PLOT #7 809/769
GAUGE#7
GAUGE#6
VEG PLOT #6 1740/1578
VEG PLOT #5 1012/931
PP4
GAUGE#4
PP3
CORNWALLIS ROAD

GRID NORTH
-60′ -30′ 0′ 60′ 120′
GRAPHIC SCALE

NO.	BY	DESCRIPTION	DATE
	SWL	REVISIONS	

NCDEQ DIVISION OF MITIGATION SERVICES

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
460 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609

BOWL BASIN RESTORATION SITE
EEP PROJECT #95721
ONSLOW COUNTY, NORTH CAROLINA
MONITORING YEAR 01

DATE: DEC 2015
SCALE: GRAPHIC

CURRENT CONDITION PLAN VIEW

SHEET 1 OF 1
FIGURE 3

Table 5. Vegetation Condition Assessment

Project Number and Name: 95721 – Bowl Basin Restoration Site

Planted Acreage 11.7 **Easement Acreage 11.7**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	Not Depicted, Covers Most of Restoration Area	0	0.00	0.0%
			Total	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	0	0.00	0.0%

Photo Reference Points

PP1 – MY-01 – 10/16/15

PP2 – MY-01 – 10/16/15

PP3 – MY-01 – 10/16/15

PP4 – MY-01 – 10/16/15

PP5 – MY-01 – 10/16/15

PP6 – MY-01 – 10/16/15

Vegetation Monitoring Plot Photos

Vegetation Plot 1 – MY-01 – 10/16/15

Vegetation Plot 2 – MY-01 – 10/16/15

Vegetation Plot 3 – MY-01 – 10/16/15

Vegetation Plot 4 – MY-01 – 10/16/15

Vegetation Plot 5 – MY-01 – 10/16/15

Vegetation Plot 6 – MY-01 – 10/16/15

Vegetation Plot 7 – MY-01 – 10/16/15

Vegetation Plot 8 – MY-01 – 10/16/15

Vegetation Plot 9 – MY-01 – 10/16/15

Vegetation Plot 10 – MY-01 – 10/16/15

Appendix C

Vegetation Plot Data

Table 6. Vegetation Plot Criteria Attainment
Project Number and Name: 95721 - Bowl Basin Restoration Site

Vegetation Plot ID	Vegetation Survival Threshold Met? (320 planted stems/acre)	Monitoring Year 01 Planted Stem Density (stems/acre)	Monitoring Year 01 Total Stem Density (stems/acre)
1	Yes	769	1,012
2	Yes	850	1,133
3	Yes	769	809
4	Yes	769	3,602
5	Yes	971	8,013
6	Yes	809	1,457
7	Yes	607	769
8	Yes	728	890
9	Yes	445	607
10	Yes	890	1,052

Table 7. CVS Vegetation Plot Metadata Project Number and Name: 95721 - Bowl Basin Wetland Restoration Site	
Report Prepared By	Tommy Seelinger
Date Prepared	12/23/2015 11:09
database name	KCI-2014-95721_Bowl Basin.mdb
database location	M:\2012\20122939 Bowl Basin FDP\Monitoring\Veg Database
computer name	12-927DM12
file size	62001152
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	
project Name	Bowl Basin Wetland Restoration Site
Description	Wetland Restoration Site
River Basin	White Oak
Sampled Plots	

Table 8 CVS Stem Count Total and Planted by Plot and Species
EEP Project Code 95721. Project Name: Bowl Basin

			Current Plot Data (MY1 2015)																												
			95721-01-0001			95721-01-0002			95721-01-0003			95721-01-0004			95721-01-0005			95721-01-0006			95721-01-0007			95721-01-0008			95721-01-0009			95721-01-0010		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree						1																							
Betula nigra	river birch	Tree				1	1	1	1	1	1	7	7	7	1	1	1							7	7	7				10	10	10
Cephalanthus occidentalis	common buttonbush	Shrub																			4	4	4	4	4	4	4	4	4			
Fraxinus pennsylvanica	green ash	Tree	5	5	5	6	6	6	10	10	10	8	8	12	11	11	11	3	3	3	4	4	4				1	1	1	7	7	7
Juglans nigra	black walnut	Tree						2																								
Liquidambar styraciflua	sweetgum	Tree			6			4			1			64			174			16			4			4			3			4
Magnolia virginiana	sweetbay	Tree	2	2	2	1	1	1																			1	1	1			
Nyssa aquatica	water tupelo	Tree													7	7	7															
Nyssa biflora	swamp tupelo	Tree	2	2	2																									3	3	3
Quercus michauxii	swamp chestnut oak	Tree				6	6	6	3	3	3																2	2	2	1	1	1
Quercus pagoda	cherrybark oak	Tree				1	1	1	2	2	2	1	1	1	2	2	2													1	1	1
Quercus phellos	willow oak	Tree				6	6	6				2	2	4	1	1	1															
Quercus shumardii	Shumard's oak	Tree										1	1	1																		
Salix nigra	black willow	Tree																									1	1	2			
Taxodium distichum	bald cypress	Tree	10	10	10				3	3	3				2	2	2	17	17	17	7	7	7	7	7	7	2	2	2			
		Stem count	19	19	25	21	21	28	19	19	20	19	19	89	24	24	198	20	20	36	15	15	19	18	18	22	11	11	15	22	22	26
		size (ares)	1			1			1			1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	4	4	5	6	6	9	5	5	6	5	5	6	6	6	7	2	2	3	3	3	4	3	3	4	6	6	7	5	5	6
		Stems per ACRE	769	769	1012	850	850	1133	769	769	809	769	769	3602	971	971	8013	809	809	1457	607	607	769	728	728	890	445	445	607	890	890	1052

Table 8 CVS Stem Count Total and Planted by Plot and Species
EEP Project Code 95721. Project Name: Bowl Basin

			Annual Means					
			MY1 (2015)			MY0 (2015)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree			1			
Betula nigra	river birch	Tree	27	27	27	22	22	22
Cephalanthus occidentalis	common buttonbush	Shrub	12	12	12	11	11	11
Fraxinus pennsylvanica	green ash	Tree	55	55	59	51	51	51
Juglans nigra	black walnut	Tree			2			
Liquidambar styraciflua	sweetgum	Tree			280			
Magnolia virginiana	sweetbay	Tree	4	4	4	4	4	4
Nyssa aquatica	water tupelo	Tree	7	7	7	7	7	7
Nyssa biflora	swamp tupelo	Tree	5	5	5	3	3	3
Quercus michauxii	swamp chestnut oak	Tree	12	12	12	15	15	15
Quercus pagoda	cherrybark oak	Tree	7	7	7	7	7	7
Quercus phellos	willow oak	Tree	9	9	11	9	9	9
Quercus shumardii	Shumard's oak	Tree	1	1	1	2	2	2
Salix nigra	black willow	Tree	1	1	2			
Taxodium distichum	bald cypress	Tree	48	48	48	45	45	45
		Stem count	188	188	478	176	176	176
		size (ares)	10			10		
		size (ACRES)	0.25			0.25		
		Species count	12	12	15	11	11	11
		Stems per ACRE	761	761	1934	712	712	712

Appendix D

Hydrologic Data

Wetland Gauge Points

Total Planted Acreage (11.7 ac)

Average Percent Saturation for Wetland Restoration Area = 16.35%

Percent Saturation

8 - 9 | 10 - 11 | 12 - 13 | 14 - 15 | 16 - 17 | 18 - 19 | 20 - 21 | 22 - 23 | 24 - 25 | 26 - 27 | 28 - 29 | 30 - 32

NC Division of Mitigation Services

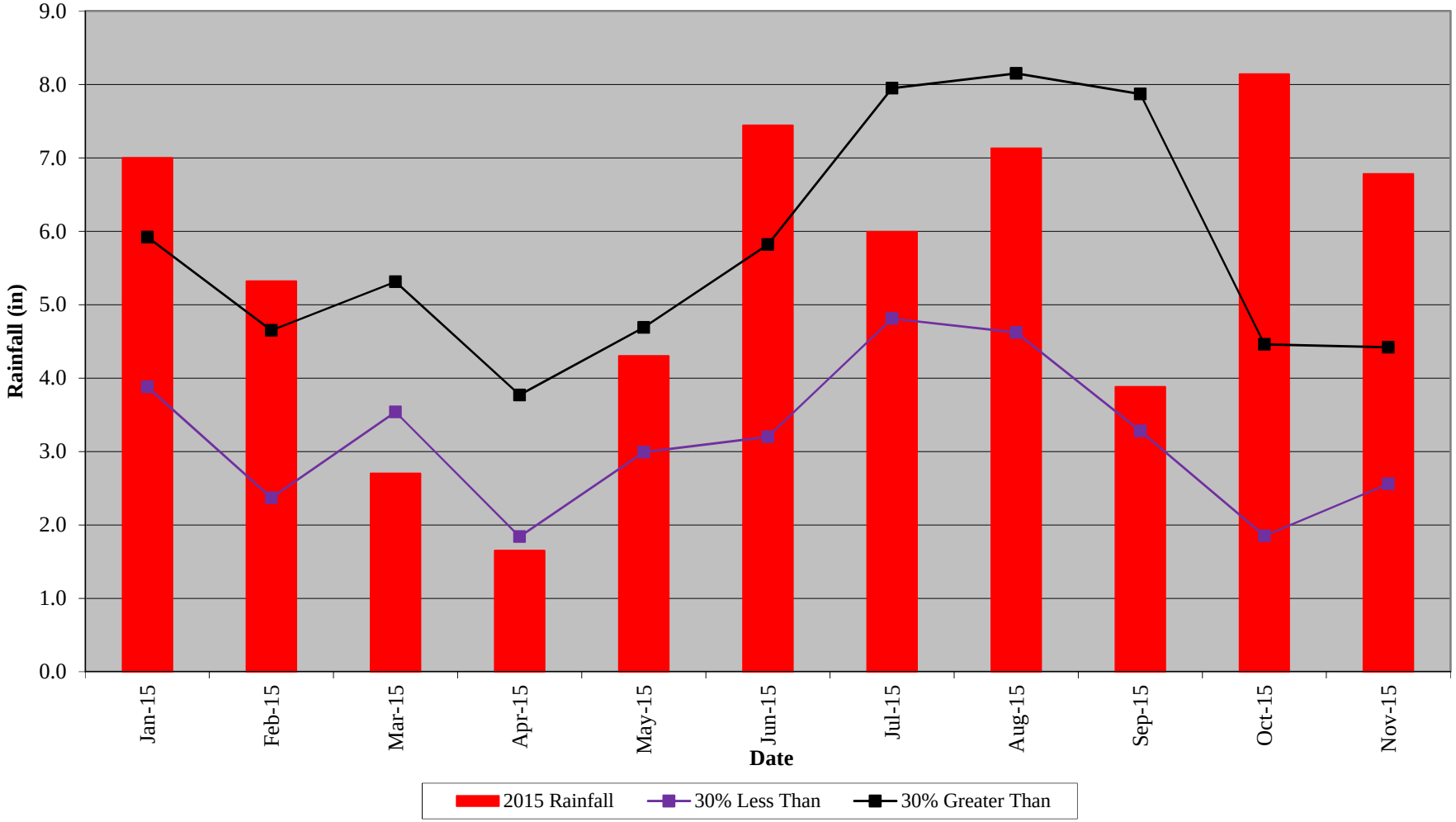
200 100 0 200 Feet

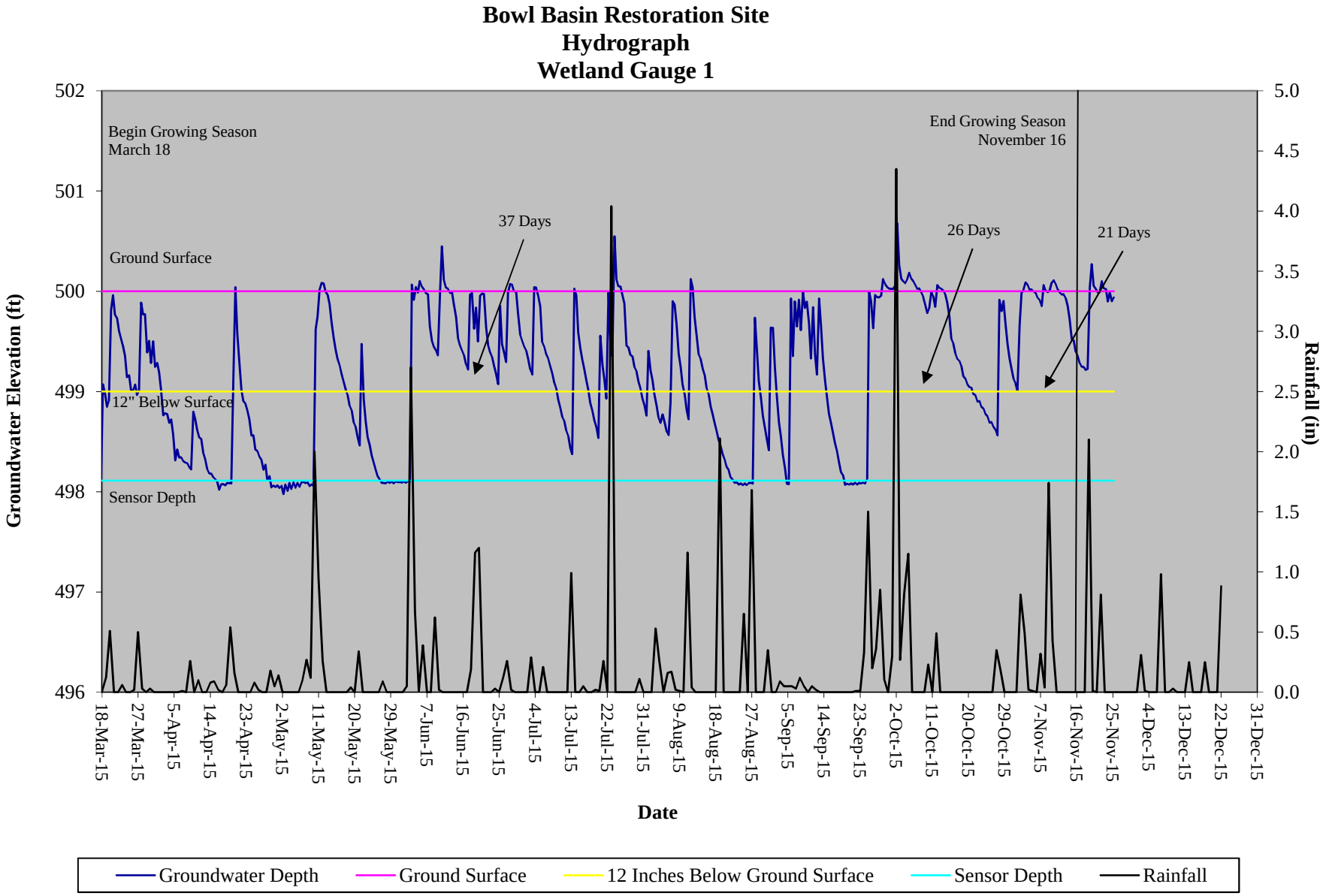
BOWL BASIN PERCENT SATURATION BOWL BASIN RESTORATION SITE
DMS PROJECT #95721, ONSLOW COUNTY, NC

Image Source: NC 2010 Statewide Orthoimagery.

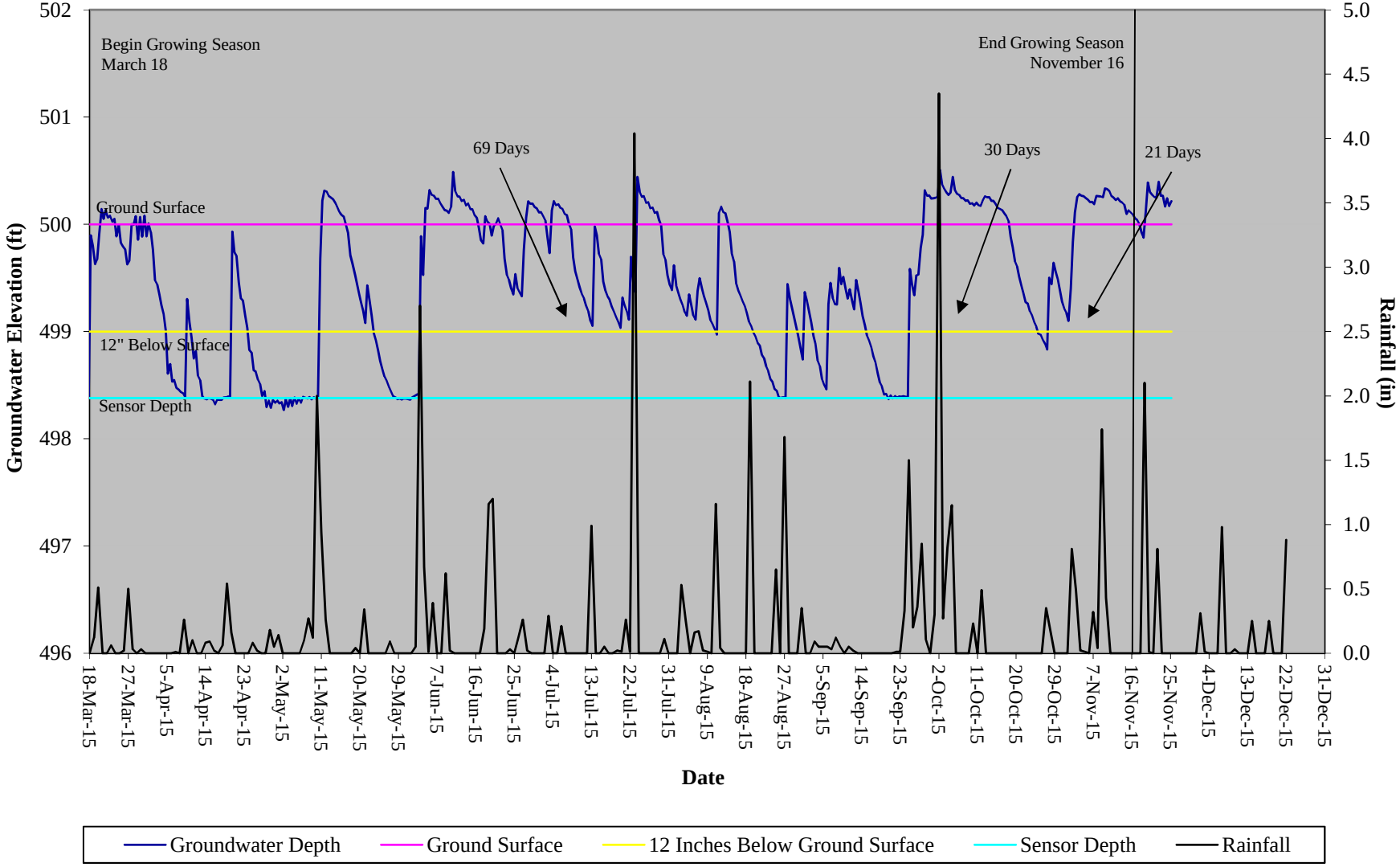
N

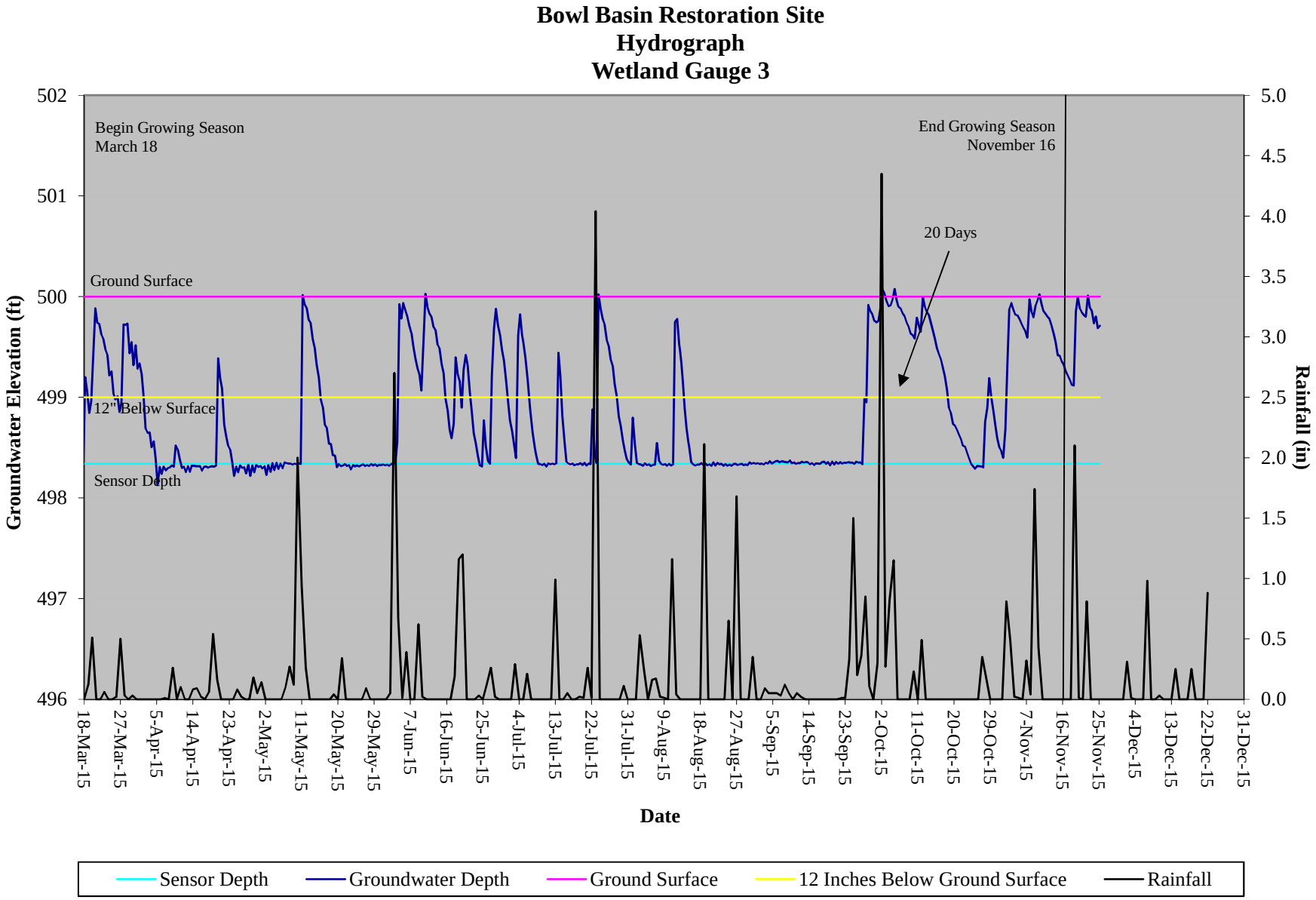
Bowl Basin Wetland Restoration Site
30-70 Percentile Graph
WETS Station Name: NHOF - Hoffman Forest

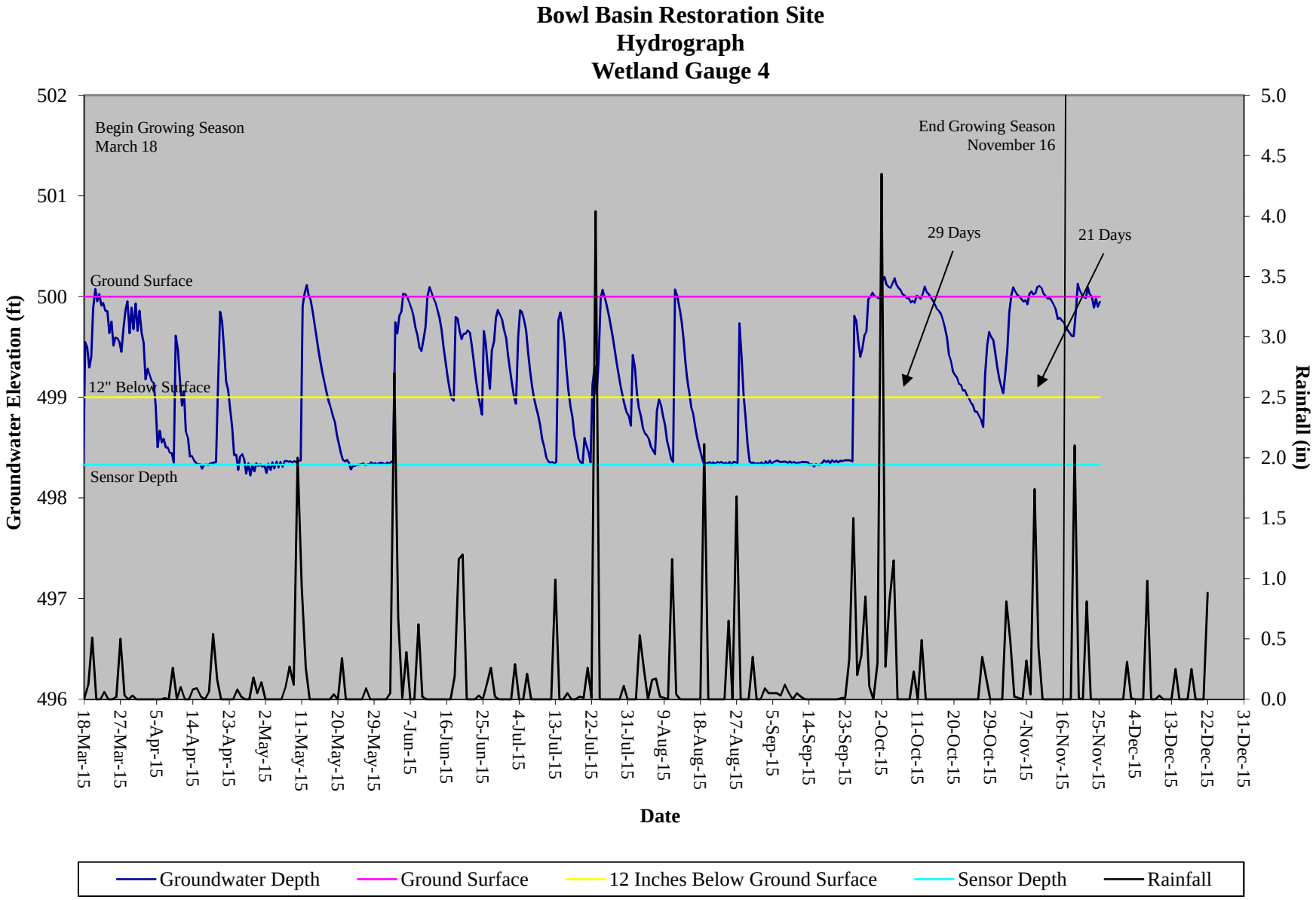


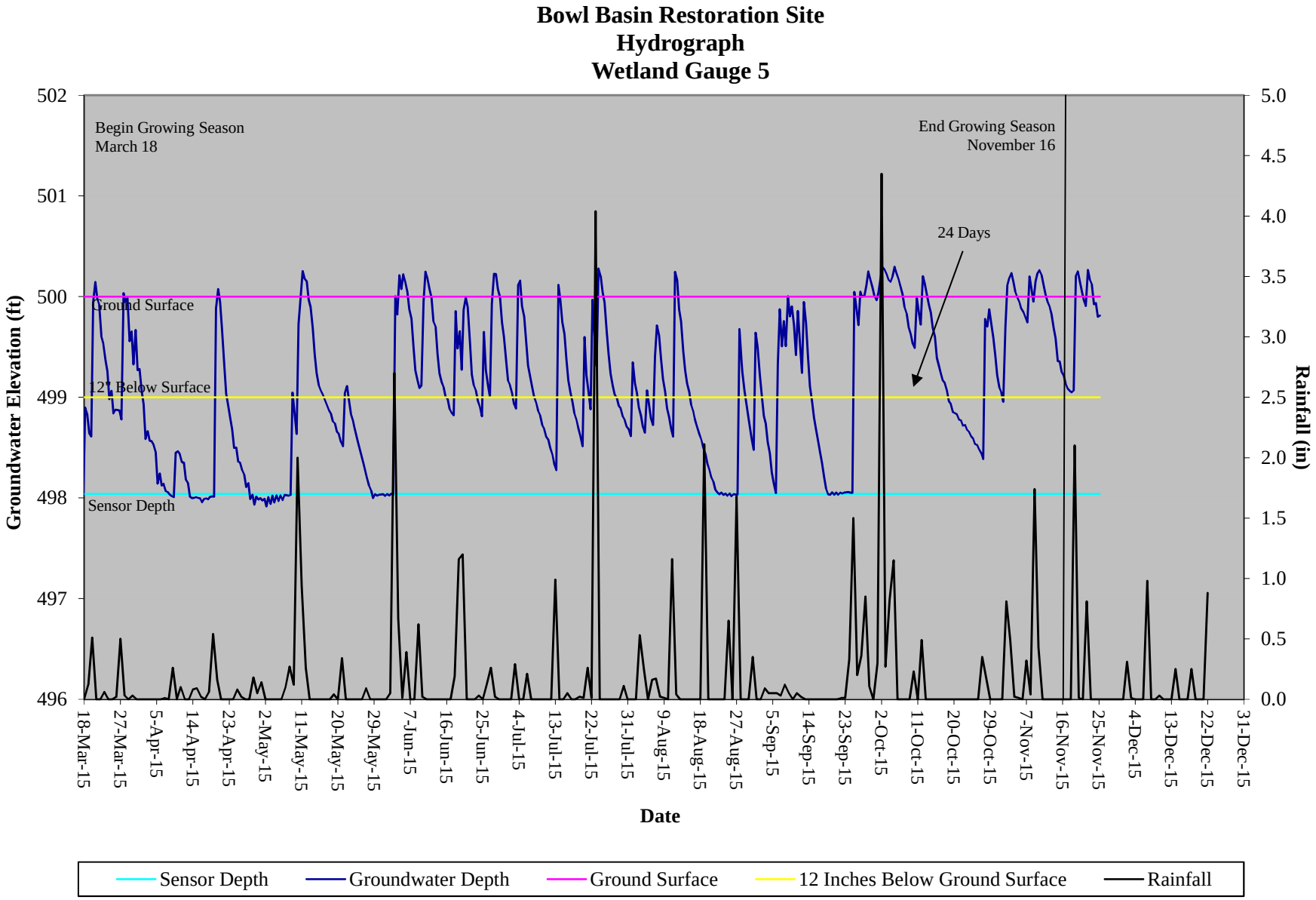

Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 1
Groundwater Elevation (ft)
Rainfall (in)
Date
Begin Growing Season
March 18
End Growing Season
November 16
37 Days
26 Days
21 Days
Ground Surface
12" Below Surface
Sensor Depth
502
501
500
499
498
497
496
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
18-Mar-15
27-Mar-15
5-Apr-15
14-Apr-15
23-Apr-15
2-May-15
11-May-15
20-May-15
29-May-15
7-Jun-15
16-Jun-15
25-Jun-15
4-Jul-15
13-Jul-15
22-Jul-15
31-Jul-15
9-Aug-15
18-Aug-15
27-Aug-15
5-Sep-15
14-Sep-15
23-Sep-15
2-Oct-15
11-Oct-15
20-Oct-15
29-Oct-15
7-Nov-15
16-Nov-15
25-Nov-15
4-Dec-15
13-Dec-15
22-Dec-15
31-Dec-15
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth
Rainfall

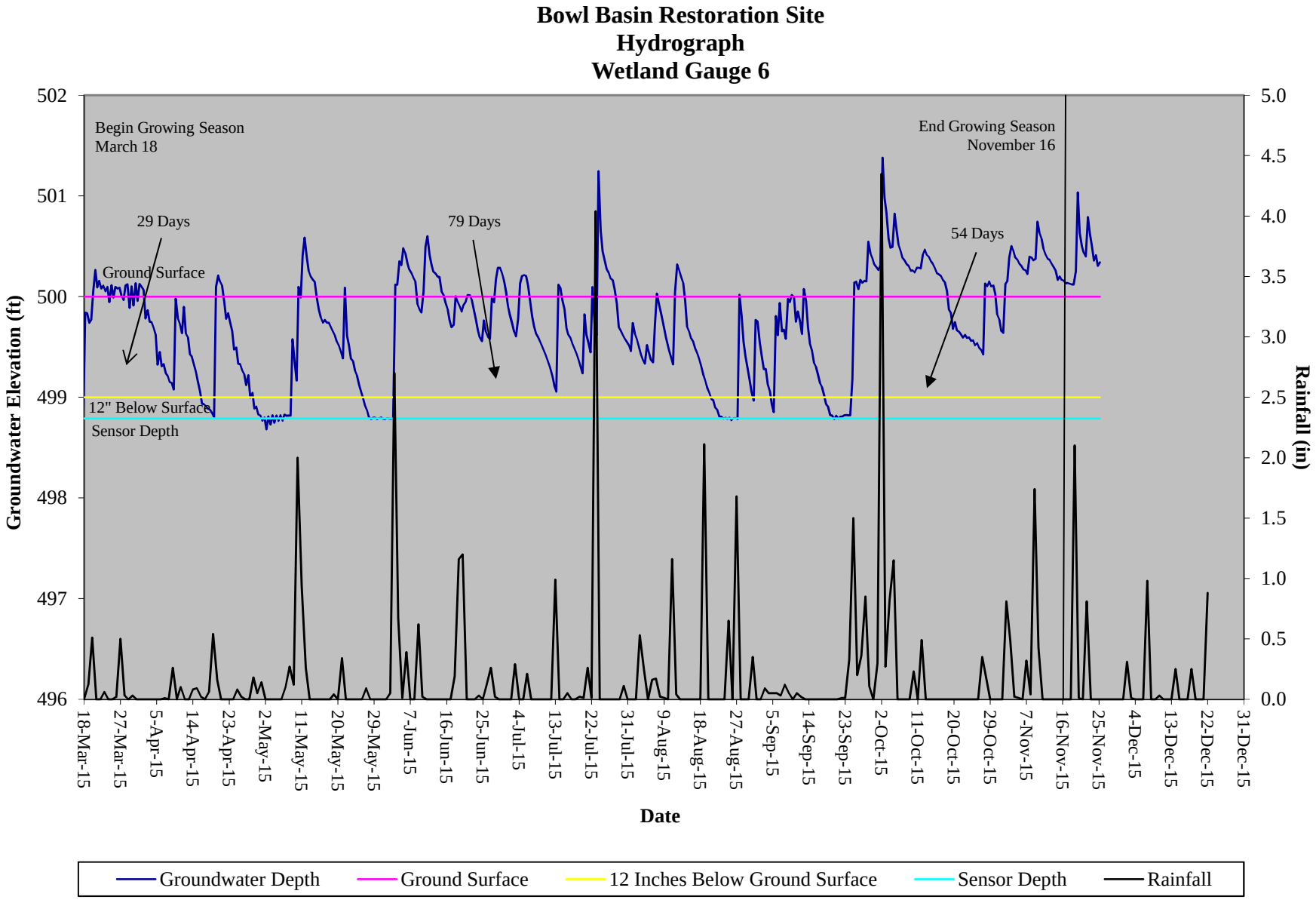
Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 2



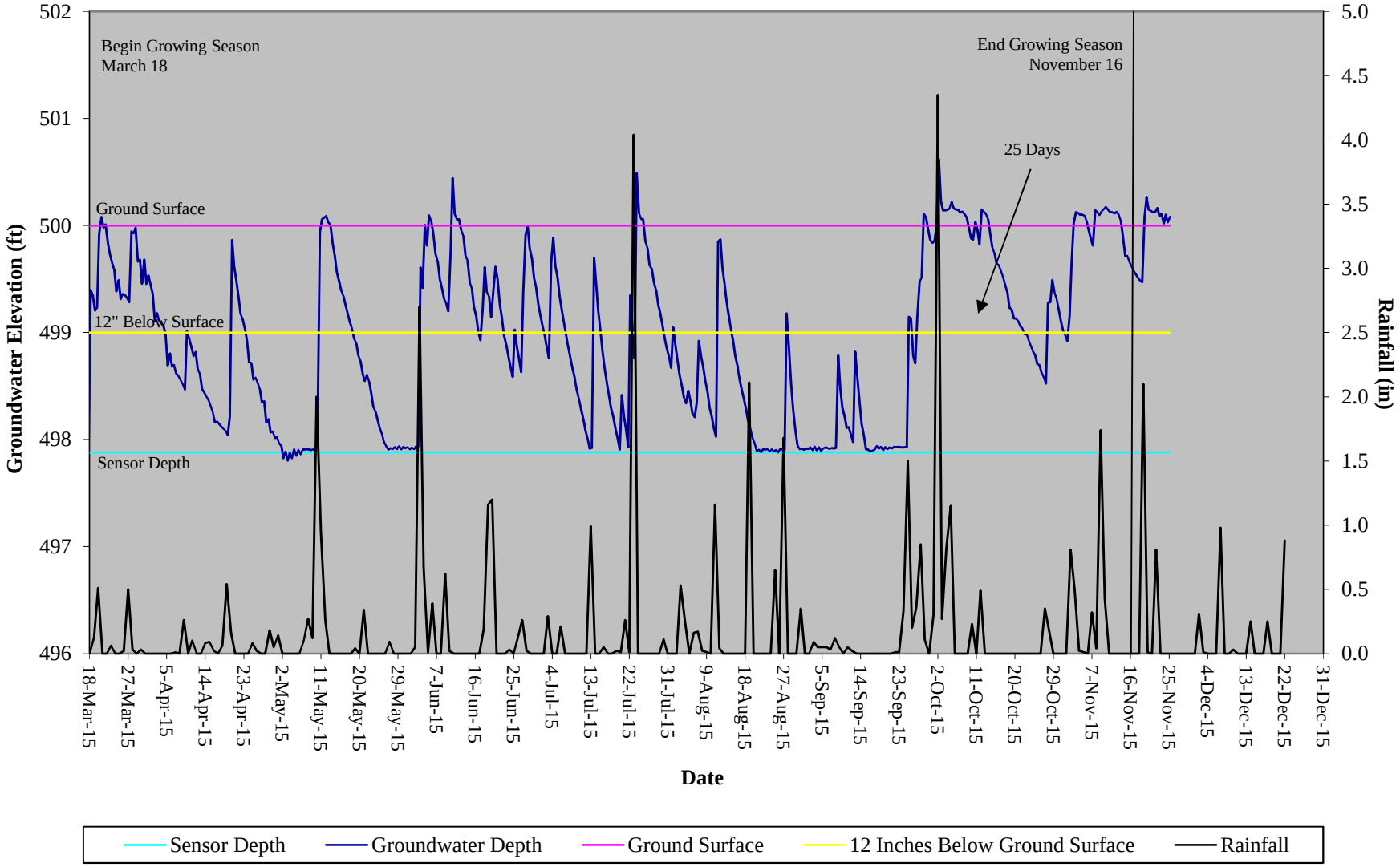

Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 3
Begin Growing Season
March 18
End Growing Season
November 16
20 Days
Ground Surface
12" Below Surface
Sensor Depth
Groundwater Elevation (ft)
Rainfall (in)
Date
Sensor Depth
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Rainfall


Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 4
Begin Growing Season
March 18
End Growing Season
November 16
29 Days
21 Days
Ground Surface
12" Below Surface
Sensor Depth
Groundwater Elevation (ft)
Rainfall (in)
Date
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth
Rainfall


Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 5
Begin Growing Season
March 18
End Growing Season
November 16
24 Days
Ground Surface
12" Below Surface
Sensor Depth
Groundwater Elevation (ft)
Rainfall (in)
Date
Sensor Depth
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Rainfall


Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 6
Begin Growing Season
March 18
End Growing Season
November 16
29 Days
79 Days
54 Days
Ground Surface
12" Below Surface
Sensor Depth
Groundwater Elevation (ft)
Rainfall (in)
Date
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth
Rainfall

Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 7



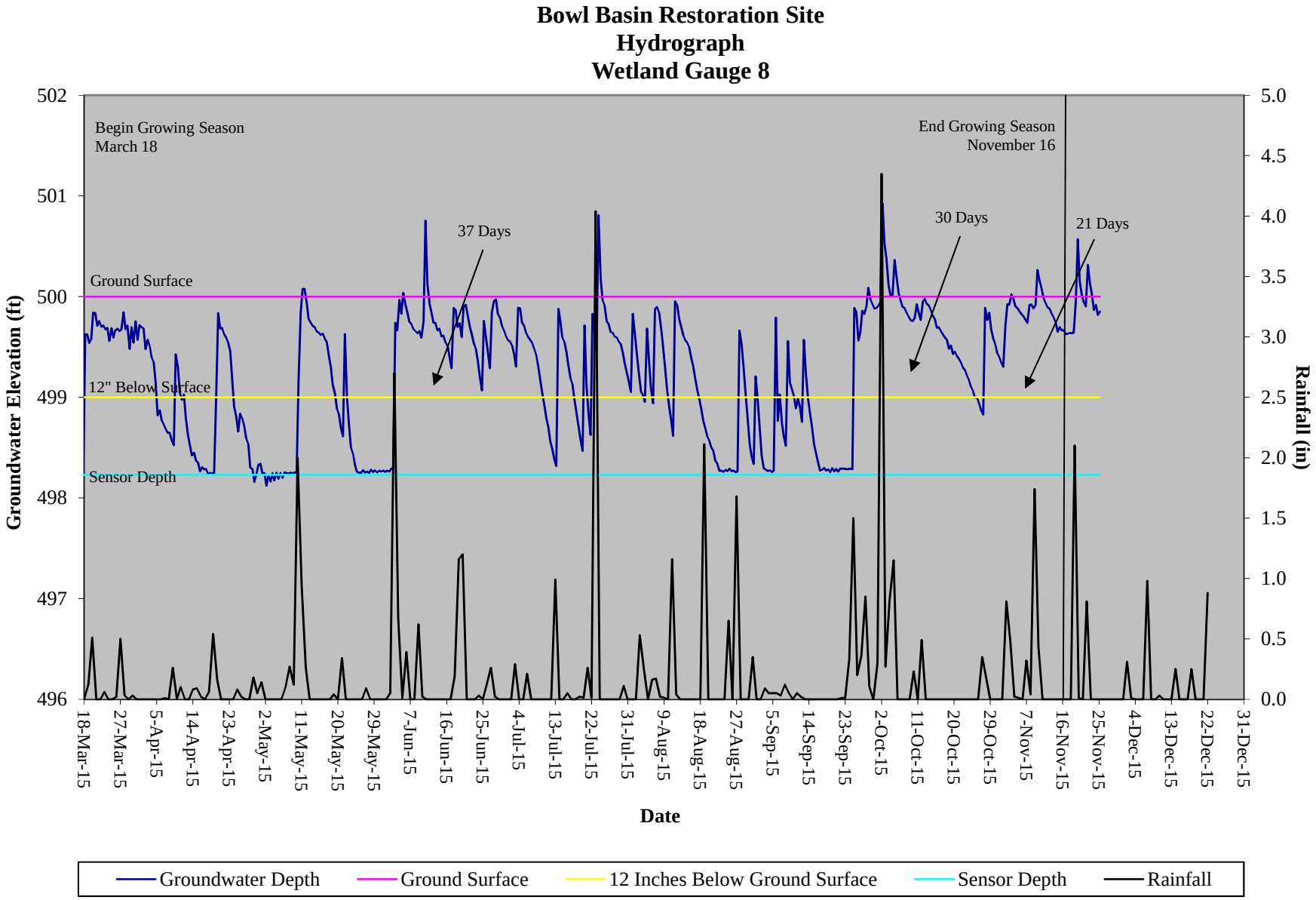

Bowl Basin Restoration Site
Hydrograph
Wetland Gauge 8
Begin Growing Season
March 18
End Growing Season
November 16
37 Days
30 Days
21 Days
Ground Surface
12" Below Surface
Sensor Depth
Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
18-Mar-15
27-Mar-15
5-Apr-15
14-Apr-15
23-Apr-15
2-May-15
11-May-15
20-May-15
29-May-15
7-Jun-15
16-Jun-15
25-Jun-15
4-Jul-15
13-Jul-15
22-Jul-15
31-Jul-15
9-Aug-15
18-Aug-15
27-Aug-15
5-Sep-15
14-Sep-15
23-Sep-15
2-Oct-15
11-Oct-15
20-Oct-15
29-Oct-15
7-Nov-15
16-Nov-15
25-Nov-15
4-Dec-15
13-Dec-15
22-Dec-15
31-Dec-15
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth
Rainfall

Table 9. Wetland Hydrology Criteria Attainment Table Project Number and Name: 95721 - Bowl Basin Restoration Site							
	Success Criteria Achieved / Max Consecutive Days During Growing Season (Percentage)						
Non-Riparian Gauges Success Criteria (22 Days) (9%)	**MY-01 2015**	**MY-02**	**MY-03**	**MY-04**	**MY-05**	**MY-06**	**MY-07**
Gauge 1	Yes/37 (15.0%)						
Gauge 2	Yes/69 (28.4%)						
Gauge 3	No/20 (8.2%)						
Gauge 4	Yes/29 (11.7%)						
Gauge 5	Yes/24 (9.7%)						
Gauge 6	Yes/79 (32.3%)						
Gauge 7	Yes/25 (10.3%)						
Gauge 8	Yes/37 (15.2%)						