

**YEAR 1 (2012)**  
**ANNUAL MONITORING REPORT**

**SLIVER MOON NON-RIPARIAN WETLAND MITIGATION SITE**

CRAVEN COUNTY, NORTH CAROLINA  
EEP PROJECT # 95017



PREPARED FOR:



NC Department of Environment & Natural Resources  
Ecosystem Enhancement Program  
Raleigh, North Carolina

PREPARED BY:

Restoration Systems, LLC  
1101 Haynes Street, Suite 211  
Raleigh, NC 27604

**January 2013**

## EXECUTIVE SUMMARY

Restoration Systems, LLC has established the Sliver Moon Non-Riparian Wetland Mitigation Site (Site) that is designed specifically to assist in fulfilling North Carolina Ecosystem Enhancement Program wetland restoration goals. The Site is located approximately 4 miles east of Dover, NC in the western portion of Craven County (Figure 1) and positioned within the Core Creek Targeted Local Watershed (TLW) 03020202080010 of the Neuse River Basin (8-digit HUC 03020202). Core Creek has been assigned a Best Usage Classification of **C; NSW, Sw** and is considered biologically impaired. This report serves as the Year 1 (2012) annual monitoring report.

The 17.1-acre project encompasses 14 acres of non-riparian wetland restoration, for a total for 14 non-riparian wetland mitigation units (WMUs). In general, the overall restoration strategy and approach was to fill and plug perimeter and interior ditches followed by planting the Site with native hardwood understory and canopy species.

In order to avert hydrologic trespassing issues with the property immediately to the west, a meandering shallow swale was constructed through the Site. The swale ultimately connects into the remaining south-eastern ditch (Figure 2, Appendix B). Found during construction activities, the 6" corrugated pipe drained surface water originating from subsurface springs located within the adjacent western property. Elevations were taken of the pipe and throughout the Site to determine the path of least resistance. This approach was taken for two reasons A) to minimize the possible draw down from the swale and; B) maintain and enhance the Site's existing micro-topography, minimizing the amount of cut soil. Filling the western boundary ditch without allowing the surface hydrology to naturally flow through the Site would have undoubtedly inundated the neighbor's road and surrounding land. Ultimately, the additional surface hydrology is a bonus to the Site and will help further the success of the wetland restoration.

The project goals aim to address stressors identified in the Core Creek TLW and include the following:

- Remove non-point sources of pollution associated with vegetation maintenance including:
  - a. the cessation of broadcasting fertilizer, pesticides, and other agricultural chemicals into and adjacent to Site drainage ditches and
  - b. providing a vegetated wetland to aid in the treatment of runoff.
- Restore wetland hydroperiods that satisfy wetland jurisdictional requirements and approximate the Site's natural range and variation.
- Promote floodwater attenuation by filling ditches and enhancing groundwater storage capacity.
- Restore and reestablish natural community structure, habitat diversity, and functional continuity.
- Enhance and protect the Site's full potential of wetland functions and values in perpetuity.

Fourteen vegetation plots (10-meters by 10-meters in size) were established and permanently monumented. These plots were surveyed in September 2012 for the Year 1 (2012) monitoring season following guidelines established in *CVS-EEP Protocol for Recording Vegetation, Version 4.2* (Lee et al. 2006). Vegetation sampling across the Site was above the required average density with 572 planted stems per acre surviving. In addition, each individual plot was above success criteria.

Agricultural encroachment in the southern margins of the Site occurred in the spring of 2012, after site planting had occurred. Carolina Silvics, who originally planted the Site, will replant the encroached area with approximately 50, 1 gallon containerized blackgums (*Nyssa sylvatica*), during the dormant season between 2012 and 2013. Photographic evidence of planting will accompany the 2013 (year 2) monitoring report. Additionally, the southern boundary was marked more visibly to alleviate further encroachment into the Site.

Nine groundwater monitoring gauges were installed at the Site with an additional groundwater gauge

installed in a reference wetland located immediately adjacent to the western boundary of the Site. Eight of the nine monitored gauges were inundated / saturated within 12 inches of the surface for greater than 7.5 percent of the growing season (18 days), which extends from March 18 to November 14 (242 days). Gauge 4 was just shy of success criteria with consecutive inundation/saturation for 5.4 percent of the growing season. Gauge 4 malfunctioned at the beginning of the growing season and began recording on April 9, 2012, missing the early portion of the growing season. Gauge 4 was within 12 inches of the ground surface for 13 days midway through the growing season, then dipped below 12 inches of the ground surface for only 1 day, and was again within 12 inches of the ground surface for 9 days. Gauge 4 met hydrologic criteria for 22 of 23 consecutive days and would be expected to make hydrology success criteria during future monitoring years.

Site vegetation and wetland hydrology met success criteria for Year 1 (2012) monitoring.

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## 1.0 PROJECT BACKGROUND

### 1.1 Location and Setting

Located approximately 4 miles east of Dover, NC in western Craven County, the Site is situated within the Carolina Flatwoods section of the Middle Atlantic Coastal Plain physiographic province of North Carolina, US Geological Survey (USGS) HUC 03020202 (NC Division of Water Quality [NCDWQ] Subbasin Number 03-04-08) of the Neuse River Basin. The Site is situated within an interstream flat north of Core Creek, NCDWQ Stream Index Number 27-90.

Directions to the Site (Figure 1, Appendix A) from the City of Kinston:

- Travel southeast on US 70 Bypass for 7.2 miles
- Turn left at SR 1005/Dover Road
- Continue on Old US Highway 70 for 0.3 mile
- Continue onto West Kornegay Street for 1.3 Miles
- Continue onto Old US Highway 70 for 3.7 miles
- Turn left at Daisy Land
- Point in center of Site: Latitude: 35.205882 °N, Longitude: -77.361332 °W

### 1.2 Project Objectives

Project goals include the following:

- Improving Water Quality
  - Removing non-point sources of pollution associated with agricultural activities, including a) eliminating the application of fertilizer, pesticides, and other agricultural materials into ditches that flow to adjacent streams and wetlands and b) providing a vegetated wetland to aid in the treatment of pollutants such as sediment and/or agricultural pollutants from the adjacent landscape.
  - Reducing sedimentation onsite and in adjacent ditches by a) reducing ditch erosion associated with tillage and b) planting a diverse woody vegetative to reduce runoff.
- Enhancing Flood Attenuation
  - Promoting floodwater attenuation by a) removing ditches to reduce the amount of runoff that occurs during high precipitation; b) restoring wetland hydroperiods that satisfy wetland jurisdictional requirements and approximate the Site's natural range of variation; c) restoring non-riparian wetlands, resulting in increased storage capacity during precipitation events within the Site; d) re-vegetating the Site to reduce sheet flow off the Site.
- Restoring Non-riparian Habitat
  - Restore and reestablish natural community structure, habitat diversity, and functional continuity.
- Enhance and protect the Site's full potential of wetland functions and values in perpetuity.

Project objectives include the following:

- Providing 14 non-riparian WMUs, as calculated in accordance with the requirements stipulated in RFP #16-003571. This will be accomplished by restoring 14 acres of non-riparian wetland through the eliminating of row crop production, filling agricultural ditches, restoring historic water table elevations, redirecting ditches located near the Site to avoid possible draw down, and planting the Site with native non-riparian forest vegetation.
- Protecting the Site in perpetuity with a conservation easement.

### **1.3 Monitoring Plan View**

Monitoring features (vegetation plots and groundwater gauges) are depicted in Figure 2 of Appendix B. Tables 1 through 3 summarize project components and mitigation credits, project activities and reporting history, and project contacts, respectively (Appendix A).

## **2.0 ANNUAL MONITORING**

Monitoring of restoration efforts will be performed for a minimum of 7 years or until success criteria are fulfilled. A detailed visual assessment of the site's current conditions during year 1 monitoring is depicted in Table 5, Appendix B and graphically depicted in Figure 2, Appendix B.

### **2.1 Vegetation**

The monitoring of planted vegetation will follow guidelines outlined in the *Carolina Vegetation Survey (CVS) EEP Protocol for Recording Vegetation* (Lee et al. 2006) and will be conducted annually between June 1 and September 30 until the vegetation success criteria are achieved. Fourteen, 10-meter by 10-meter vegetation plots have been placed within the 14 acres of restored wetlands (Figure 2, Appendix B). Vegetation will receive a visual evaluation on a periodic basis to ascertain the degree of overtopping of planted elements by nuisance species.

Agricultural encroachment in the southern margins of the Site occurred in the spring of 2012, after site planting had occurred. Carolina Silvics, who originally planted the Site, will replant the encroached area with approximately 50, 1 gallon containerized blackgums (*Nyssa sylvatica*), during the dormant season between 2012 and 2013. Photographic evidence of planting will accompany the 2013 (year 2) monitoring report. Additionally, the southern boundary was marked more visibly to alleviate further encroachment into the Site.

#### **2.1.1 Vegetation Success Criteria**

Success criteria are dependent upon the density and growth of living, planted stems throughout the planted areas of the Site, all of which is Non-riverine Wet Hardwood Flat (Schafale and Weakley 1990). The presence of desirable volunteer species will be considered by the US Army Corps of Engineers (USACE) and Interagency Review Team (IRT) in making a determination whether the Site has successfully met the stated goals and objectives. An average density of 320 stems per acre of living, planted stems must be surviving in the first three monitoring years. Subsequently, 260 living, planted stems-per-acre must be surviving in Year 5 and 210 living, planted stems-per-acre in Year 7.

#### **2.1.2 Vegetation Monitoring Results**

Fourteen vegetation plots (10-meter by 10-meter in size) were established and permanently monumented. These plots were surveyed in September 2012 for the Year 1 (2012) monitoring period. Vegetation sampled across the Site exceeded the required average density with 572 planted stems-per-acre surviving. In addition, each individual plot exceeded success criteria (see Table on the following page).

Besides the encroachment from agricultural practices, no vegetation problem areas were identified within the Site during the Year 1 (2012) monitoring season.



## Summary of Planted Vegetation Plot Results

Plot	Planted Stems/Acre Counting Towards Success Criteria				
	Year 1 (2012)	Year 2 (2013)	Year 3 (2014)	Year 4 (2015)	Year 5 (2016)
1	688				
2	648				
3	486				
4	567				
5	324				
6	567				
7	607				
8	405				
9	486				
10	607				
11	567				
12	648				
13	769				
14	648				
<b>Average of All Plots (1-14)</b>	<b>572</b>				

## 2.2 Hydrology

Measurement of wetland hydrology were performed in accordance with traditional methods as per the April 2003 USACE Wilmington District Stream Mitigation Guidelines (USACE et al. 2003). Nine continuously recording, groundwater monitoring gauges were installed within the 14 acres of restoration in accordance with specifications in *Installing Monitoring Wells/Piezometers in Wetlands* (NCWRP 1993); in addition, one reference gauge was installed adjacent to the Site and monitored. Year 1 (2012) groundwater data are presented by gauge in Appendix D.

### 2.2.1 Hydrology Success Criteria

Based on the Site's location and hydrology source, target hydrological characteristics include saturation or inundation for 7.5 percent of the growing season at a minimum of 12 inches below ground level during average rainfall conditions for a period of seven years. During growing seasons with atypical climatic conditions, groundwater gauges in reference wetlands may be used by the USACE/IRT to evaluate hydrology success.

The growing season will primarily be determined by the US Department of Agriculture (USDA) Soil Survey of Craven County, North Carolina (USDA 1989). In abnormally seasonable years the growing season may be based on USACE (2010), which states the following:

The growing season has begun on a site in a given year when two or more different non-evergreen vascular plant species growing in the wetland or surrounding areas exhibit one or more of the following indicators of biological activity:

- a. Emergence of herbaceous plants from the ground
- b. Appearance of new growth from vegetative crowns (e.g., in graminoids, bulbs, and corms)
- c. Coleoptile/cotyledon emergence from seed

- d. Bud burst on woody plants (i.e., some green foliage is visible between spreading bud scales)
- 1. Emergence or elongation of leaves of woody plants
- f. Emergence or opening of flowers

The end of the growing season is indicated when woody deciduous species lose their leaves and/or the last herbaceous plants cease flowering and their leaves become dry or brown, generally in the fall due to cold temperatures or reduced moisture availability. Early plant senescence due to the initiation of the summer dry season in some areas does not necessarily indicate the end of the growing season and alternative procedures (e.g., soil temperature) should be used.

### 2.2.2 Hydrology Monitoring Results

Eight of the nine monitored gauges within restoration areas were inundated / saturated within 12 inches of the surface for greater than 7.5 percent of the growing season (18 days), which extends from March 18 to November 14 (242 days). Gauge 4 was just shy of success criteria with consecutive inundation/saturation for 5.4 percent of the growing season. Gauge 4 malfunctioned at the beginning of the growing season and began recording on April 9, 2012, missing the early portion of the growing season. Gauge 4 was within 12 inches of the ground surface for 13 days midway through the growing season, then dipped below 12 inches of the ground surface for only 1 day, and was again within 12 inches of the ground surface for 9 days. Gauge 4 met hydrologic criteria for 22 of 23 consecutive days and would be expected to make hydrology success criteria during future monitoring years.

No hydrology problem areas were identified within the Site during Year 1 (2012) monitoring.

#### Sliver Moon Wetland Restoration Site

Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)				
	Year 1 (2012)*	Year 2 (2013)	Year 3 (2014)	Year 5 (2016)	Year 7 (2018)
1	Yes/25 days (10.3 %)				
2	Yes/117 days (48.3 %)				
3	Yes/117 days (48.3 %)				
4	No/13 days (5.4 %)				
5	Yes/76 days (31. %)				
6	Yes/24 days (9.9 %)				
7	Yes/40 Days (16.5 %)				
8	Yes/97 days (40.1 %)				
9	Yes/42 days (17.4 %)				
Ref	Yes/102 days (42.1 %)				

\* Groundwater gauges were installed at the Site on March 24, six days after the published NRCS growing season (March 18). Therefore, Year 1 (2012) hydrology success criteria is proposed to use the USDA published growing season dates in place of the proposed biological and physical indicators of growing season as described for the Site.



### 3.0 CONCLUSIONS

Vegetation sampling across the Site was above the required average density with 572 planted stems-per-acre surviving. In addition, each individual plot exceeded success criteria. Areas disturbed by agricultural encroachment were planted with 1-gallon, containerized trees, which appear to be surviving and successfully vegetating disturbed areas.

Eight of the nine monitored gauges were inundated/saturated within 12 inches of the surface for greater than 7.5 percent of the growing season (18 days), which extends from March 18 to November 14 (242 days). Gauge 4 was just shy of success criteria with consecutive inundation/saturation for 5.4 percent of the growing season. Gauge 4 malfunctioned at the beginning of the growing season and began recording on April 9, 2012, missing the early portion of the growing season. Gauge 4 was within 12 inches of the ground surface for 13 days midway through the growing season, then dipped below 12 inches of the ground surface for only 1 day, and was again within 12 inches of the ground surface for 9 days. Gauge 4 met hydrologic criteria for 22 of 23 consecutive days and would be expected to make hydrology success criteria during future monitoring years.

Site vegetation and wetland hydrology met success criteria for Year 1 (2012) monitoring.

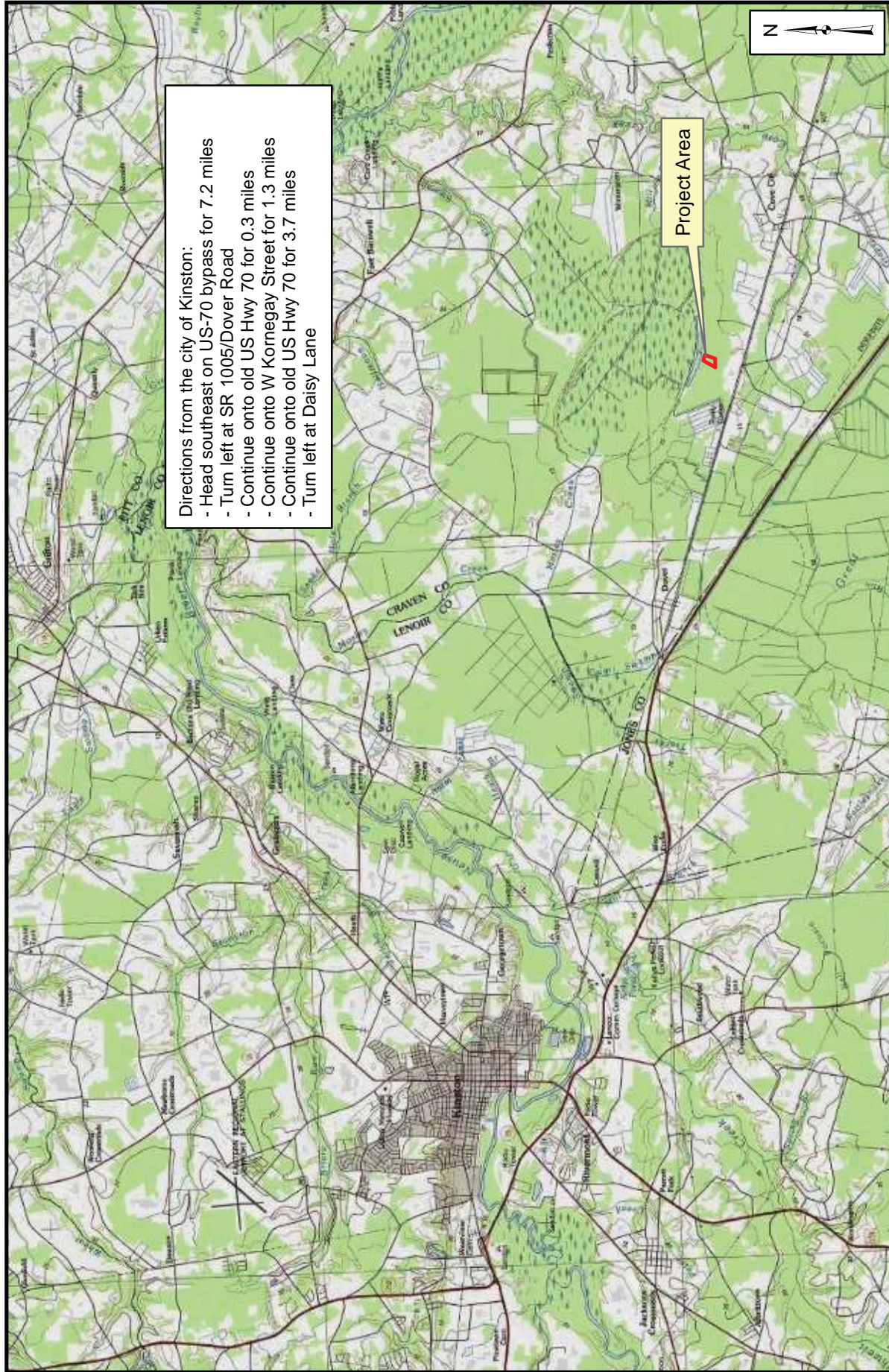
#### 4.0 REFERENCES

- Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2006. CVS-EEP Protocol for Recording Vegetation, Version 4.0. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, North Carolina.
- NC Wetlands Restoration Program (NCWRP). 1993. Installing Monitoring Wells/Piezometers in Wetlands (WRP Technical Note HY-IA-3.1). Department of Environment, Health, and Natural Resources, Raleigh, North Carolina
- Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, North Carolina Department of Environment, Health, and Natural Resources. Raleigh, North Carolina.
- US Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). U.S. Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg, MS. ERDC/EL TR-10-20. 154 pp.
- US Army Corps of Engineers, US Environmental Protection Agency, NC Wildlife Resources Commission, NC Division of Water Quality (USACE et al.). 2003. Stream Mitigation Guidelines.
- US Department of Agriculture (USDA). 1989. Soil Survey of Craven County, North Carolina. Natural Resources Conservation Service.

**Appendix A.**  
**General Tables and Figures**

- Figure 1. The Site Location Map
- Table 1. Project Components and Mitigation Credits
- Table 2. Project Activity and Reporting History
- Table 3. Project Contacts Table
- Table 4. Project Baseline Information & Attributes Table





Directions from the city of Kinston:

- Head southeast on US-70 bypass for 7.2 miles
- Turn left at SR 1005/Dover Road
- Continue onto old US Hwy 70 for 0.3 miles
- Continue onto W Kornegay Street for 1.3 miles
- Turn left at Daisy Lane

Project Area



**Silver Moon Non-Riparian Wetland Mitigation Site**  
 RFP # 16-003571  
 EEP Project ID # 95017  
 Craven County, North Carolina

Imagery USGS Topographical Map  
 Coordinate System: NAD 1983 NC FEET

**FIGURE 1:  
 SITE LOCATION MAP**

This figure indicates where the Site is physically located along with directions to the Site.

Scale: 1 inch = 10,000 feet  
 Date: Sept 2012  
 Project: Silver Moon

**Axiom Environmental**  
 218 Snow Ave  
 Raleigh, NC 27603

Axiom Environmental, Inc.

**Table 1. Project Components and Mitigation Credits**

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Mitigation Credits									
Type	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
	R	RE	R	RE	R	RE			
Totals					14				
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	
Non-riparian restoration	NA		17.01		NA	Restoration	14	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	0	0	0	14	0	0			
Enhancement		0	0	0	0	0			
Enhancement I	0								
Enhancement II	0								
Creation		0	0	0					
Preservation	0	0	0	0		0			
High Quality Preservation	0	0	0	0		0			

**Table 2. Project Activity and Reporting History**

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Activity or Report	Data Collection Complete	Completion or Delivery
CE Document	NA	October - 2011
Conservation Easement	NA	February - 2012
Mitigation Plan	NA	February - 2012
Construction	NA	March - 2012
Bare Root Planting	NA	March - 2012
Baseline Monitoring Document	April-2012	August 2012
Year 1 Monitoring	October 2012	November 2012
Year 2 Monitoring		
Year 3 Monitoring		
Year 4 Monitoring		
Year 5 Monitoring		
Year 6 Monitoring		
Year 7 Monitoring		



**Table 3. Project Contacts Table**

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

	<b>Firm</b>	<b>POC &amp; Address</b>
<b>Designer:</b>	Restoration Systems, LLC with preliminary consulting by Axiom Environmental, Inc.	Grant Lewis; 919.215.1693 218 Snow Ave. Raleigh, NC 27603
<b>Construction Contractor:</b>	Land Mechanics, Inc.	Lloyd Glover; 919.422.3392 780 Landmark Road Willow Spring, NC 27592-7756
<b>Planting Contractor:</b>	Carolina Silvics	Dwight McKinney 252.482.8491 908 Indian Trail Road Edenton, NC 27932
<b>Seeding Contractor:</b>	Land Mechanics, Inc.	Lloyd Glover; 919.422.3392 780 Landmark Road Willow Spring, NC 27592-7756
<b>Nursery Stock Suppliers:</b>	ArborGen	1.888.888.7158
<b>Baseline Data Collection</b>	Restoration Systems, LLC	Ray Holz; 919.604.9314 1101 Haynes St. Raleigh, NC 27604
<b>Vegetation Monitoring:</b>	Axiom Environmental, Inc.	Grant Lewis; 919.215.1693 218 Snow Avenue Raleigh, NC 27603
<b>Wetland Monitoring:</b>	Axiom Environmental, Inc.	Grant Lewis; 919.215.1693 218 Snow Avenue Raleigh, NC 27603

**Table 4: Project Baseline Information & Attributes Table**

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

<b>Project Information</b>			
Project Name	Sliver Moon		
County	Craven		
Project Area (acres)	17.01		
Project Coordinates (latitude and longitude)	35.204817, -77.360605 (NAD 83/WGS 84)		
<b>Project Watershed Summary Information</b>			
Physiographic Province	Carolina Flatwoods section of the Middle Atlantic Coastal Plain		
River Basin	Neuse		
USGS Hydrologic Unit 8-digit	03020202	USGS Hydrologic Unit 14-digit	03020202080010
DWQ Sub-basin	03-04-08		
Project Drainage Area, Total Outfall (acres)	+/- 130		
Groundwater Treated by Site (acres)	+/- 20		
Project Drainage Area Percentage of Impervious Area	< 1%		
CGIA Land Use Classification	Cropland and Pasture		
<b>Wetland Summary Information</b>			
<b>Parameters</b>		<b>Wetland 1</b>	
Size of Wetland (acres)	14.00		
Wetland Type (non-riparian, riparian riverine or riparian non riverine)	Non-riparian		
Mapped Soil Series	Torhunta & Pantego		
Drainage class	Poorly Drained		
Soil Hydric Status	Class A		
Source of Hydrology	Rain Events		
Hydrologic Impairment	Ditches		
Native vegetation community	Non-Riverine Wet Harwood Forest		
Percent composition of exotic invasive vegetation	0%		
<b>Regulatory Considerations</b>			
<b>Regulation</b>	<b>Applicable?</b>	<b>Resolved?</b>	
Waters of the United States – Section 404	Yes	Yes	
Waters of the United States – Section 401	Yes	Yes	
Endangered Species Act	No		
Historic Preservation Act	No		
Coastal Zone Management Act [CZMA/Coastal Area Management Act (CAMA)]	No		
FEMA Floodplain Compliance	No		
Essential Fisheries Habitat	No		
Sediment & Erosion Control Plan (S&EC)	Yes	Yes	




**APPENDIX B**  
**VISUAL ASSESSMENT DATA**

Figure 2. Current Conditions Plan View  
Table 5 Vegetation Condition Assessment

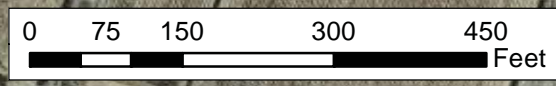


**Legend**

-  Conservation Easement Boundary
-  Wetland Restoration = 14ac
-  Surface Water Swale
-  Vegetation Monitoring Plot
-  Groundwater Gauge
-  Agricultural Encroachment Area

Area of Ag. Encroachment. .35 acres

\*The Reference Monitoring Well's position was re-referenced at the end of the 2012 monitoring season with a more accurate GPS device resulting in a new, more accurate location than what was reported on 'Sheet D: Monitoring Plan' of the Sliver Moon Baseline Monitoring Document and As-Built Report Dated July 2012.




**Axiom Environmental**  
218 Snow Ave  
Raleigh, NC 27603

Axiom Environmental, Inc.

**CURRENT CONDITION PLAN VIEW**  
**SLIVER MOON WETLAND RESTORATION SITE**  
Craven County, North Carolina

Dwn. by. KRJ	<b>FIGURE</b>  <b>2</b>
Date: Dec. 2012	
Project: 10-001	

**Table 5 - Vegetation Condition Assessment**

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Planted Acreage – 17.01 acres (Entire Easement)						
Vegetation Category		Mapped Acreage	CCPV Symbol	Number of Polygons	% of planted Acreage	Plan of Action
Areas of Encroachment	Post planting, the tenant farmer encroached ~ 50' along the southern boundary	.35ac	translucent orange rectangle	1	2%	The area will be replanted during the dormant season with bare root and containerized trees
Areas of Concern	No areas of vegetation concern observed at the Site during 2012 monitoring.	NA	NA	NA	0%	
Exotic Invasive Species	No invasive species observed at the Site during 2012 monitoring.	NA	NA	NA	<1%	

## **APPENDIX C VEGETATION DATA**

- Table 6. 2012 (Year 1) Planted and Total Stems/Acre
- Table 7. Vegetation Plot Criteria Attainment
- Table 8. CVS Vegetation Plot Metadata  
Vegetation Plot Photographs





**Table 7. Vegetation Plot Criteria Attainment**

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

<b>Vegetation Plot ID</b>	<b>Vegetation Survival Threshold Met?</b>	<b>Tract Mean</b>
1	Yes	100%
2	Yes	
3	Yes	
4	Yes	
5	Yes	
6	Yes	
7	Yes	
8	Yes	
9	Yes	
10	Yes	
11	Yes	
12	Yes	
13	Yes	
14	Yes	

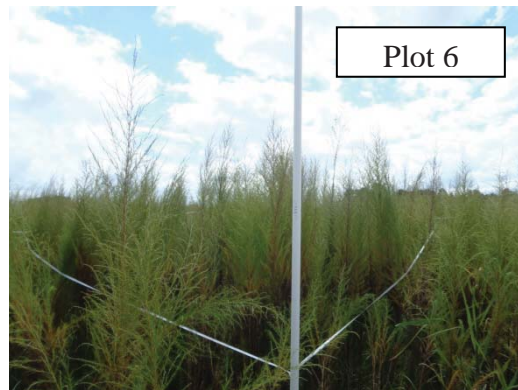
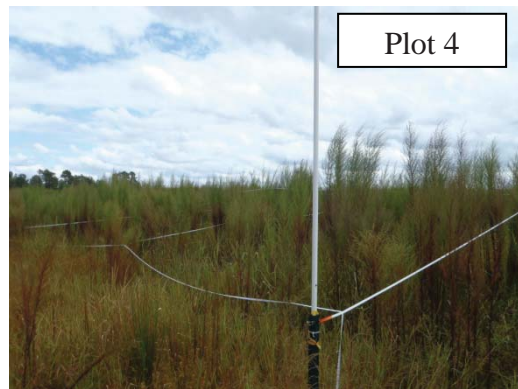
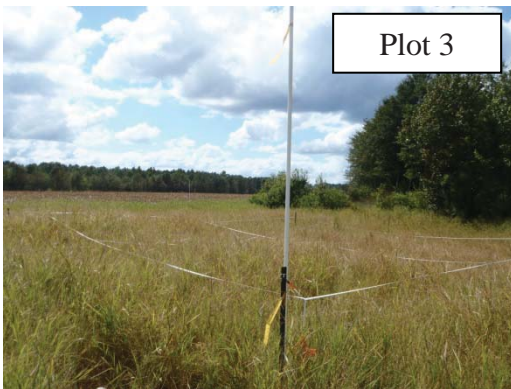
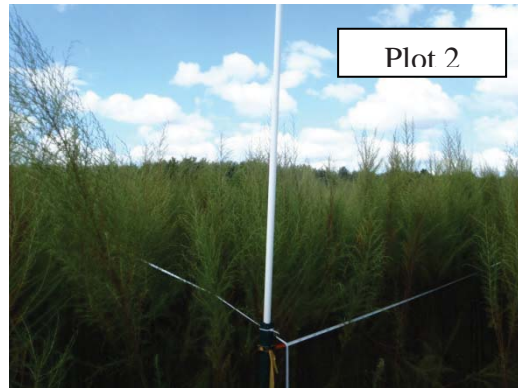
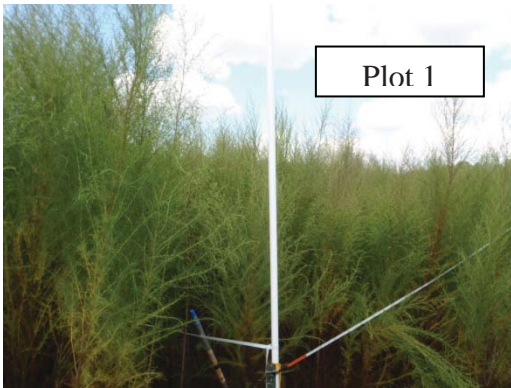
**Table 8. CVS Vegetation Plot Metadata**

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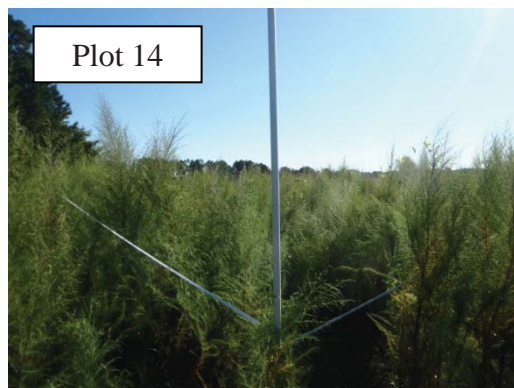
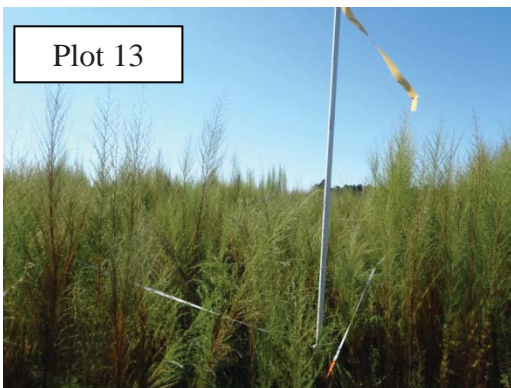
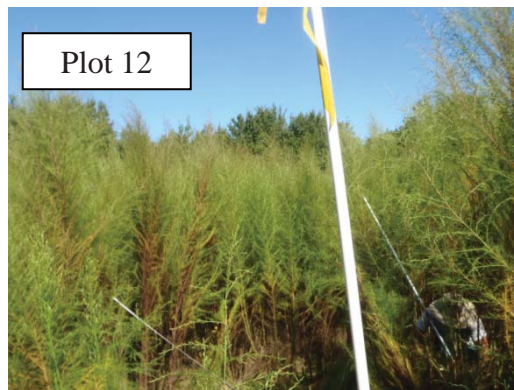
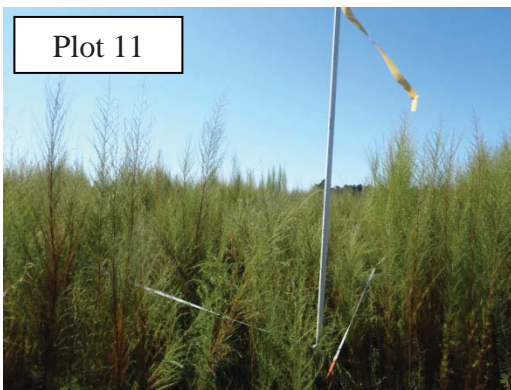
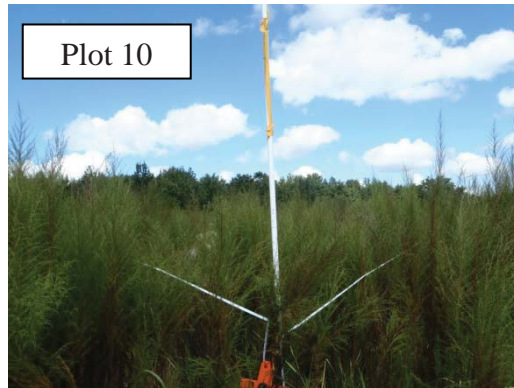
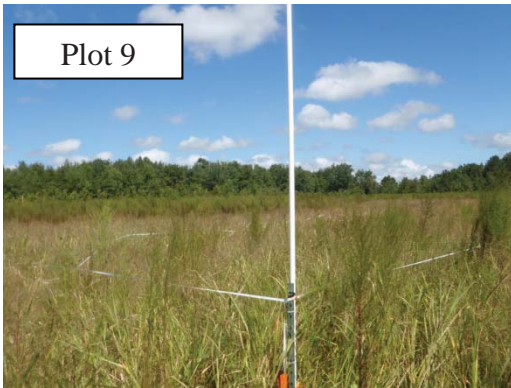
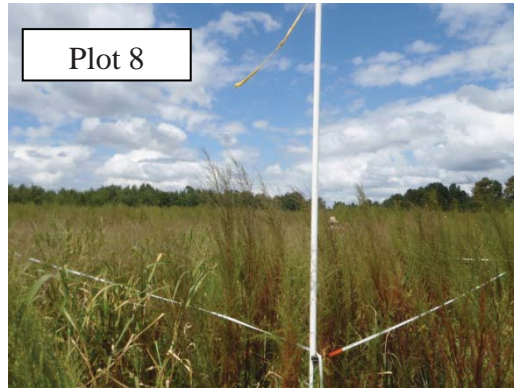
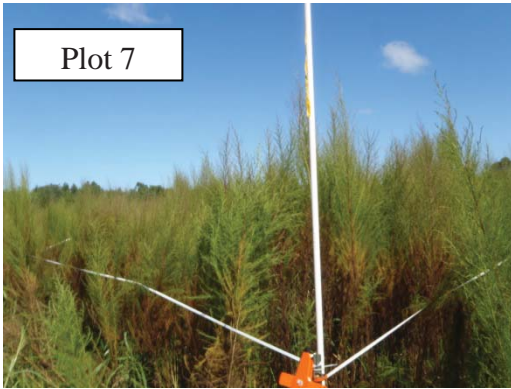
<b>Report Prepared By</b>	Phillip Perkinson
<b>Date Prepared</b>	9/17/2012 16:24
<b>database name</b>	RS 2012 sites CVS Data.mdb
<b>database location</b>	C:\Documents and Settings\ppperkinson\Desktop
<b>computer name</b>	PHILLIP-LT
<b>file size</b>	52633600
<b>DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT-----</b>	
<b>Metadata</b>	Description of database file, the report worksheets, and a summary of project(s) and project data.
<b>Proj, planted</b>	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
<b>Proj, total stems</b>	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.
<b>Plots</b>	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
<b>Vigor</b>	Frequency distribution of vigor classes for stems for all plots.
<b>Vigor by Spp</b>	Frequency distribution of vigor classes listed by species.
<b>Damage</b>	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
<b>Damage by Spp</b>	Damage values tallied by type for each species.
<b>Damage by Plot</b>	Damage values tallied by type for each plot.
<b>Planted Stems by Plot and Spp</b>	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
<b>ALL Stems by Plot and spp</b>	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.
<b>PROJECT SUMMARY-----</b>	
<b>Project Code</b>	Sliver M
<b>project Name</b>	Sliver Moon Non-riparian Wetland Mitigation Site
<b>Description</b>	14 ac. Non-riparian wetland Mitigation Site in the Neuse 01 River Basin
<b>River Basin</b>	Neuse
<b>length(ft)</b>	730
<b>stream-to-edge width (ft)</b>	1100
<b>area (sq m)</b>	56000
<b>Required Plots (calculated)</b>	13
<b>Sampled Plots</b>	0



**Sliver Moon  
2012 (Year 1) Vegetation Monitoring Photographs  
Taken June 2012**



**Sliver Moon  
2012 (Year 1) Vegetation Monitoring Photographs  
Taken June 2012  
(continued)**



**APPENDIX D**  
**HYDROLOGY DATA**

Table 9. Wetland Gauge Attainment Data  
2012 Groundwater Gauge Graphs

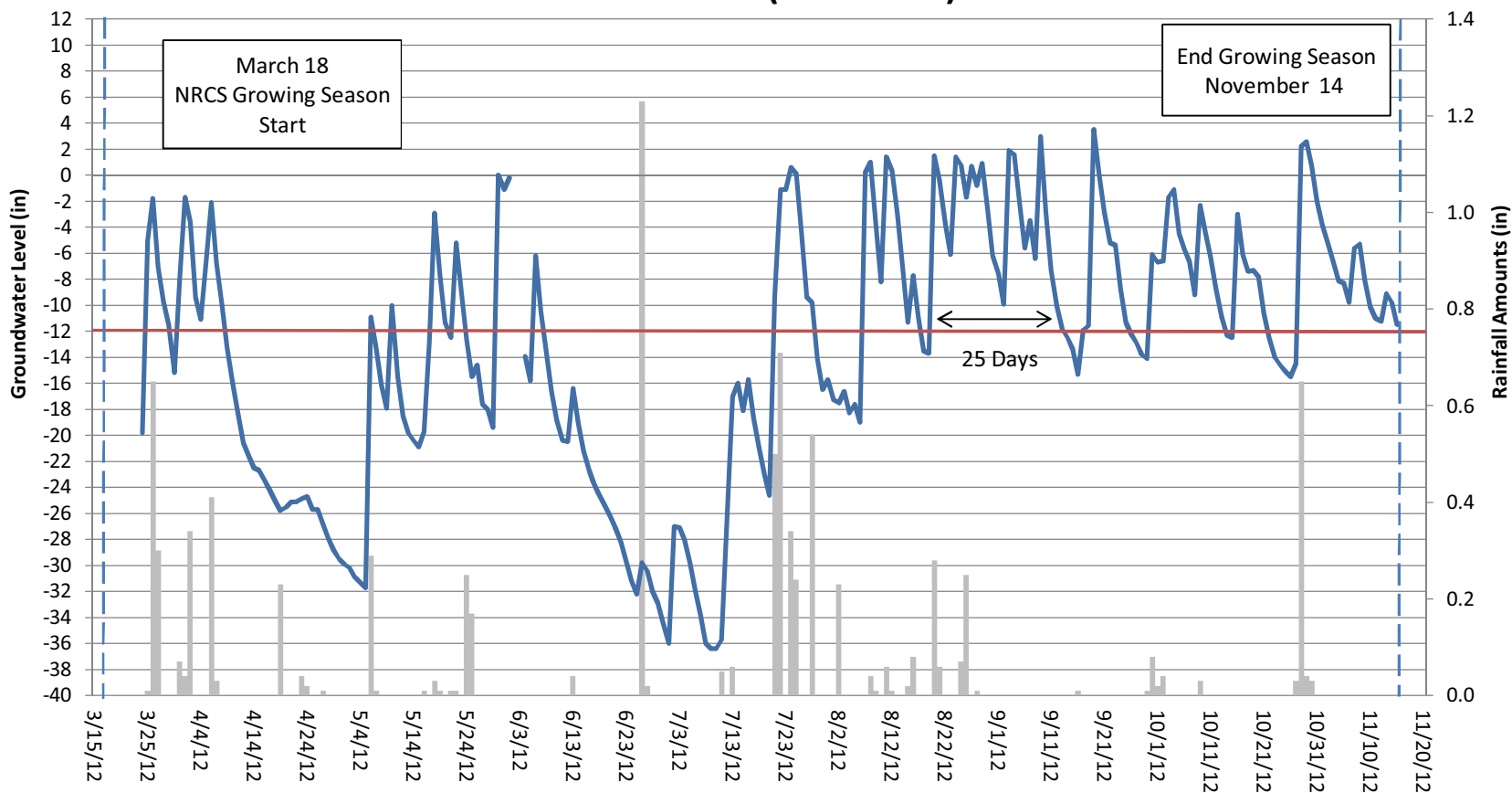


**Table 9. Wetland Gauge Attainment Data**

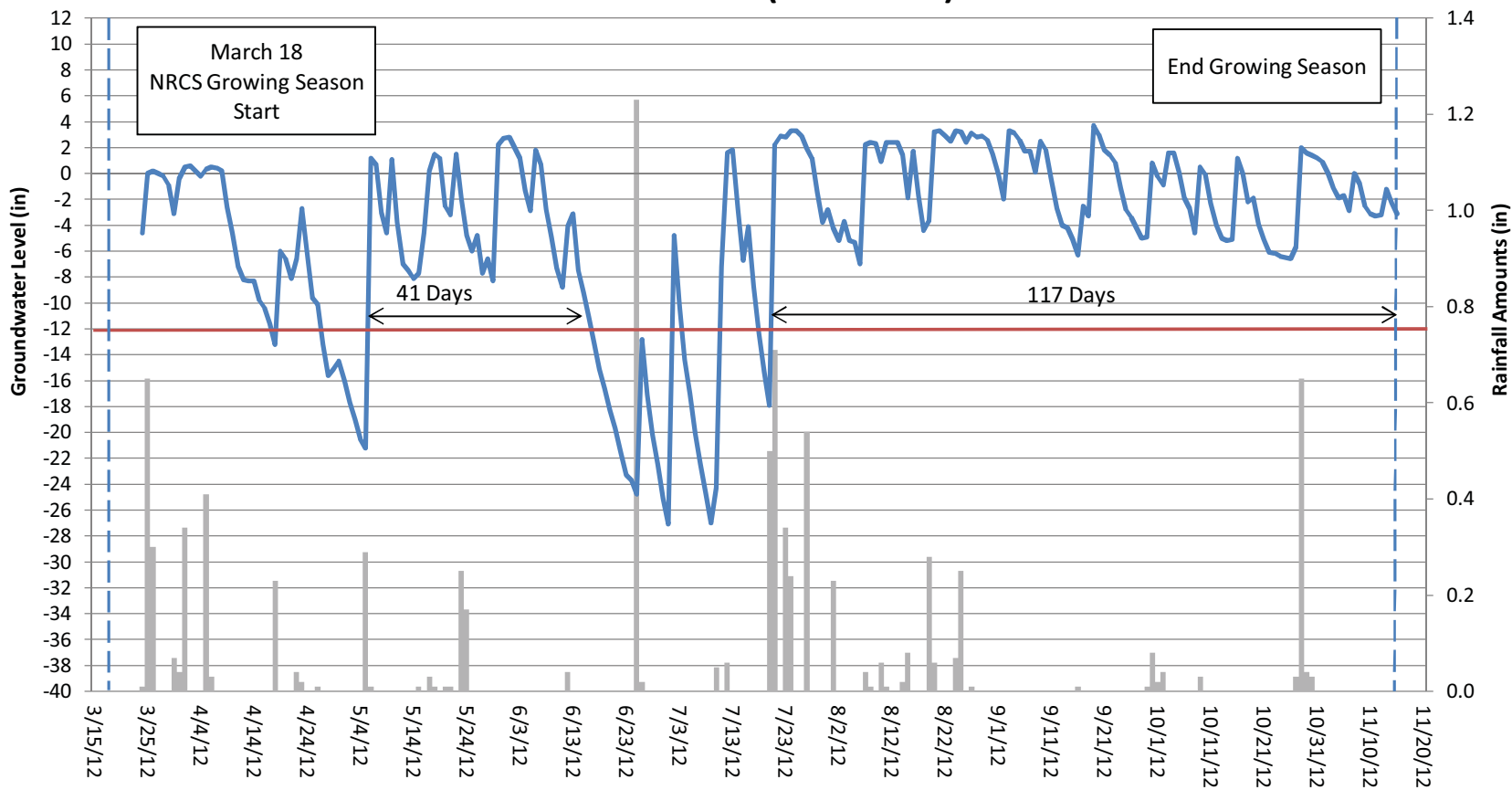
Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)				
	Year 1 (2012)	Year 2 (2013)	Year 3 (2014)	Year 5 (2016)	Year 7 (2018)
1	Yes/25 days (10.3 percent)				
2	Yes/117 days (48.3 percent)				
3	Yes/117 days (48.3 percent)				
4	No/13 days (5.4 percent)				
5	Yes/76 days (31.4 percent)				
6	Yes/24 days (9.9 percent)				
7	Yes/40 Days (16.5 percent)				
8	Yes/97 days (40.1 percent)				
9	Yes/42 days (17.4 percent)				
Ref	Yes/102 days (42.1 percent)				

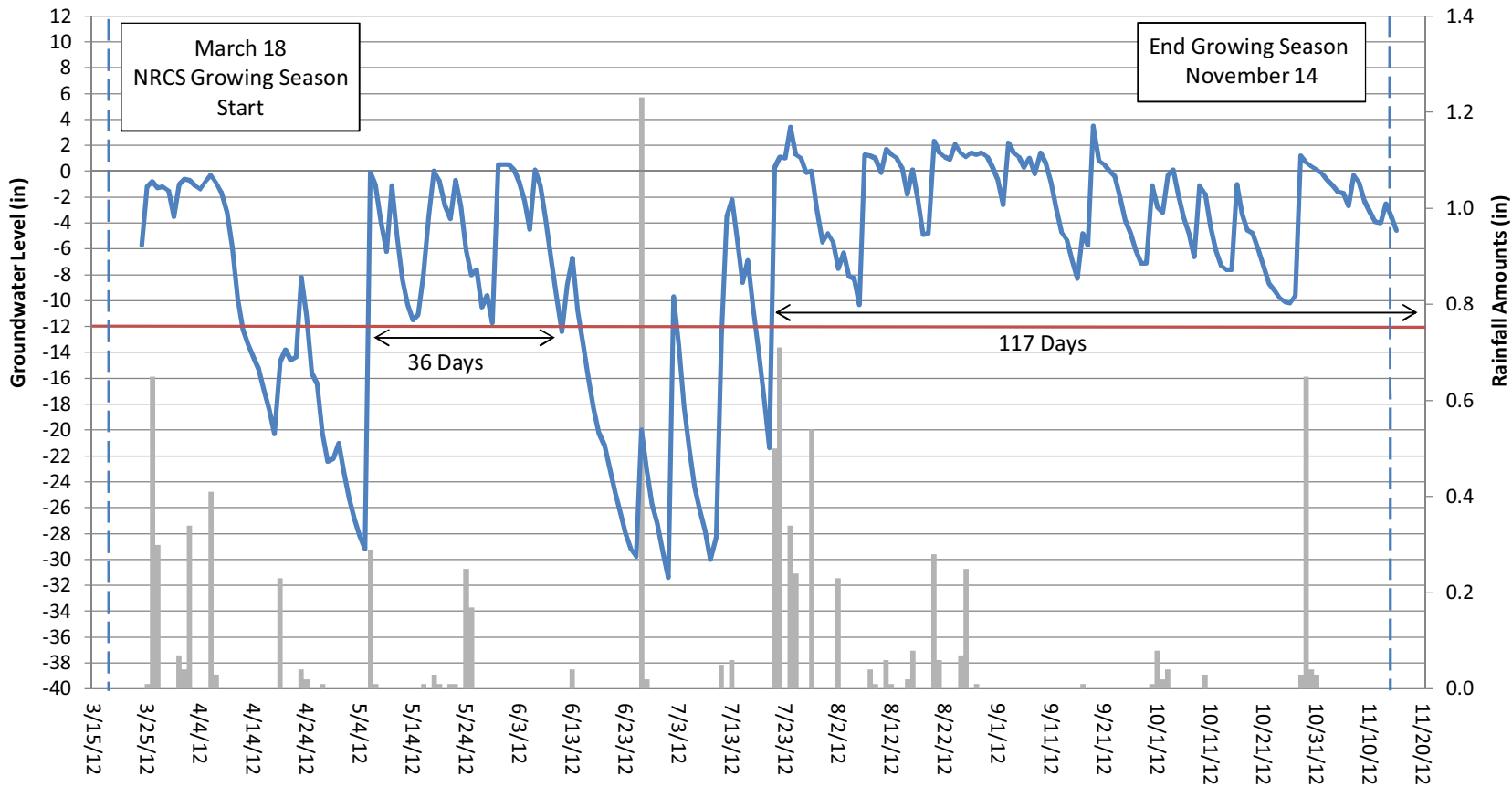
# Sliver Moon Groundwater Gauge 1 Year 1 (2012 Data)



### Sliver Moon Groundwater Gauge 2 Year 1 (2012 Data)

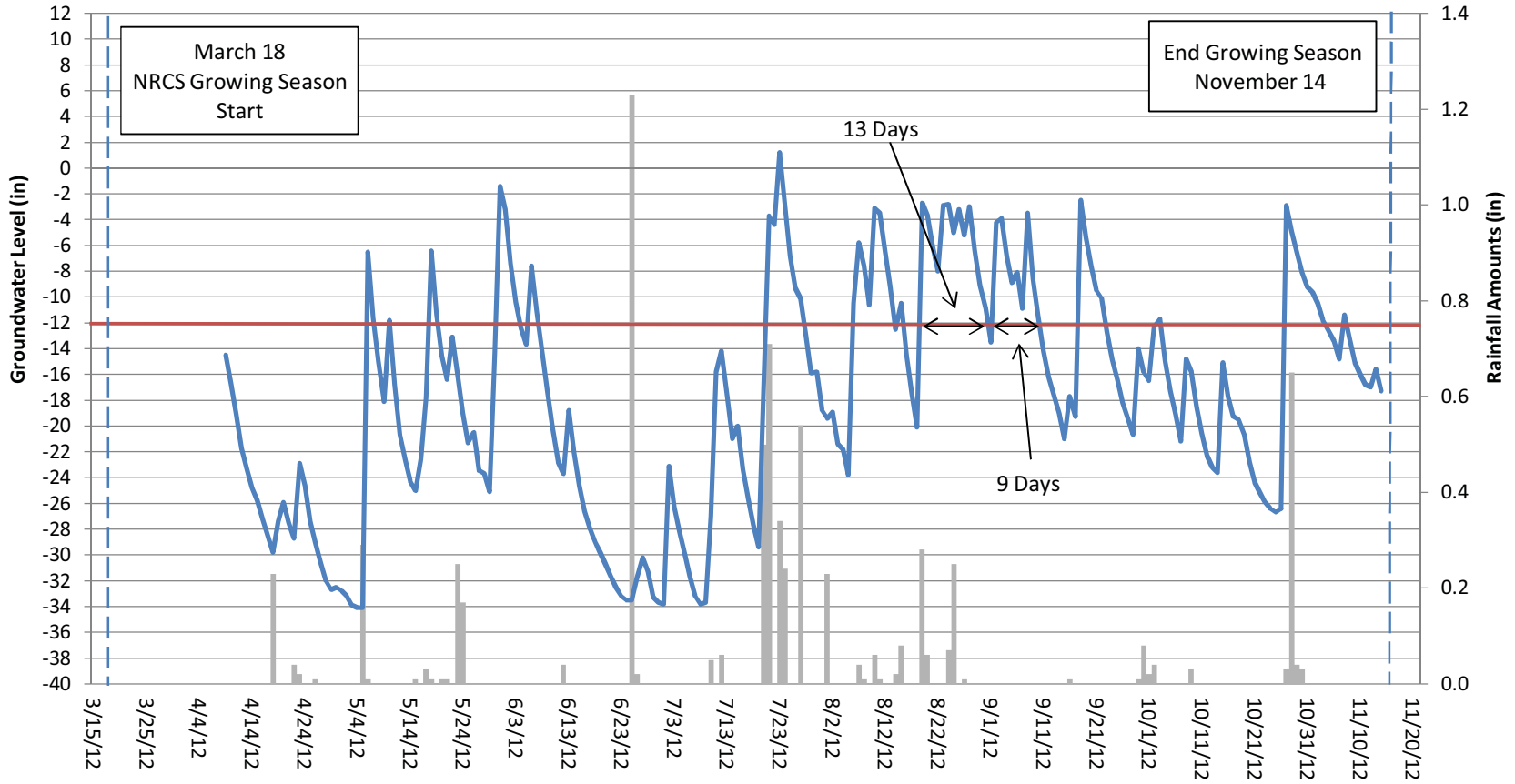


### Sliver Moon Groundwater Gauge 3 Year 1 (2012 Data)

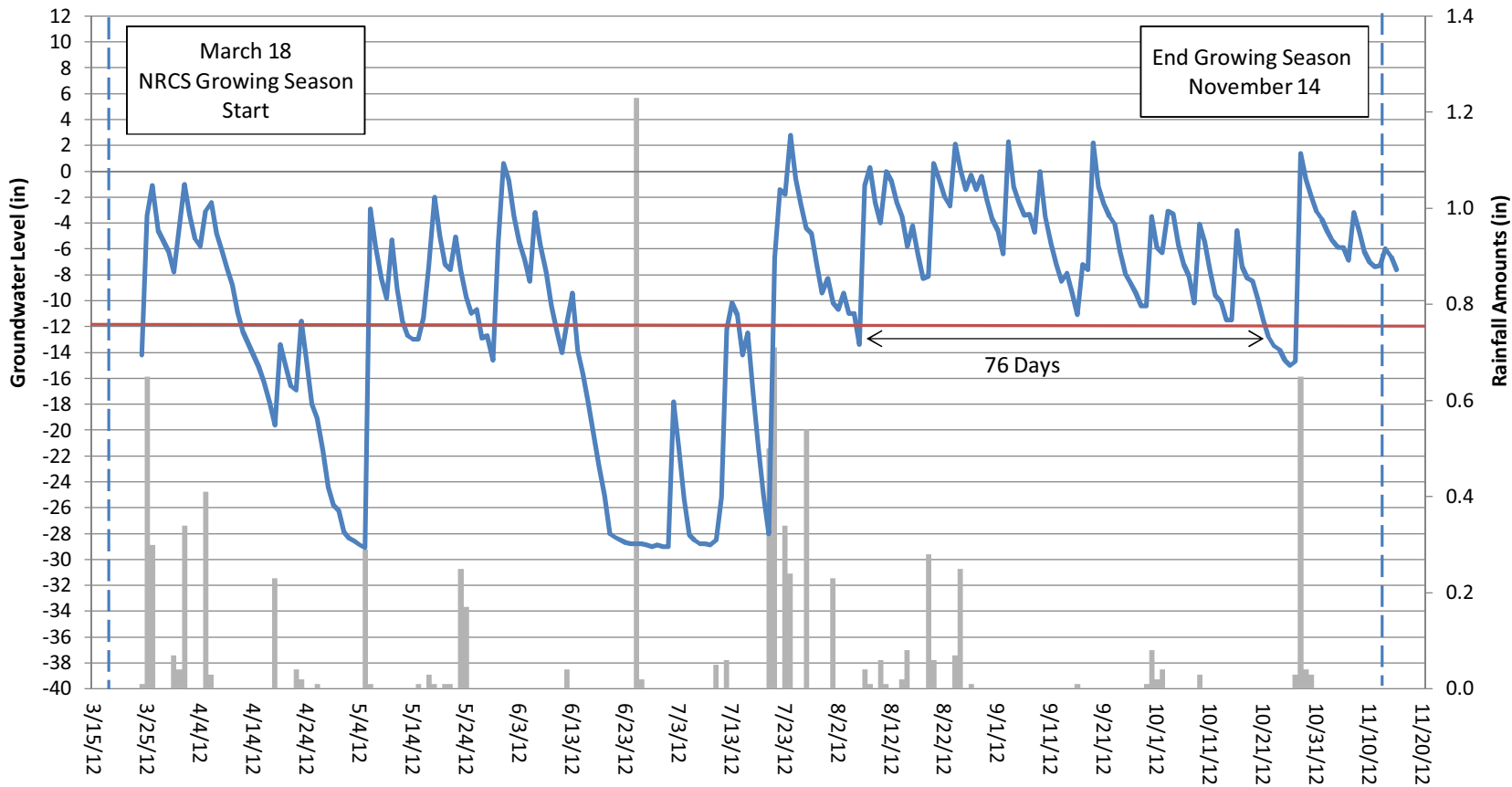




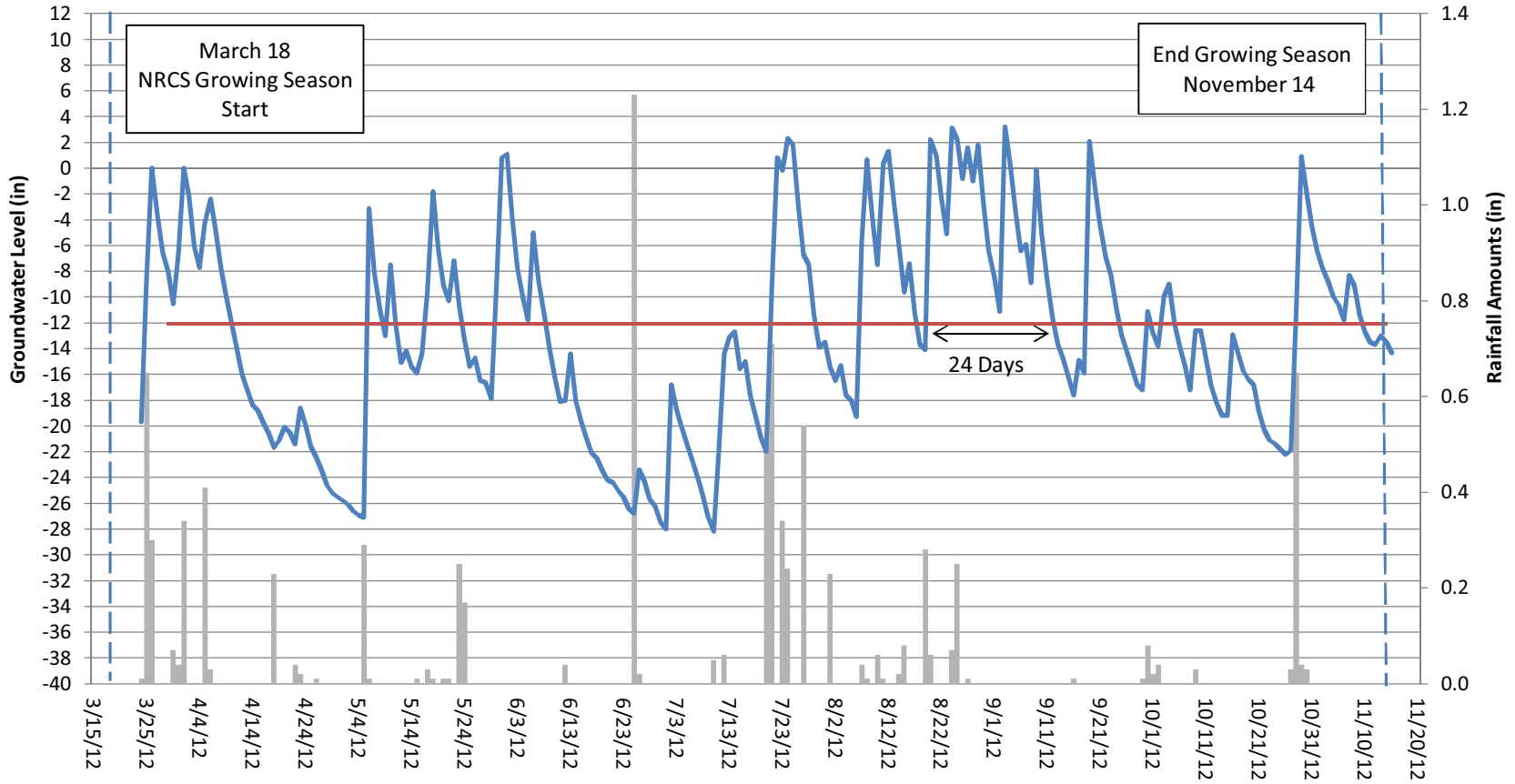
# Sliver Moon Groundwater Gauge 4 Year 1 (2012 Data)



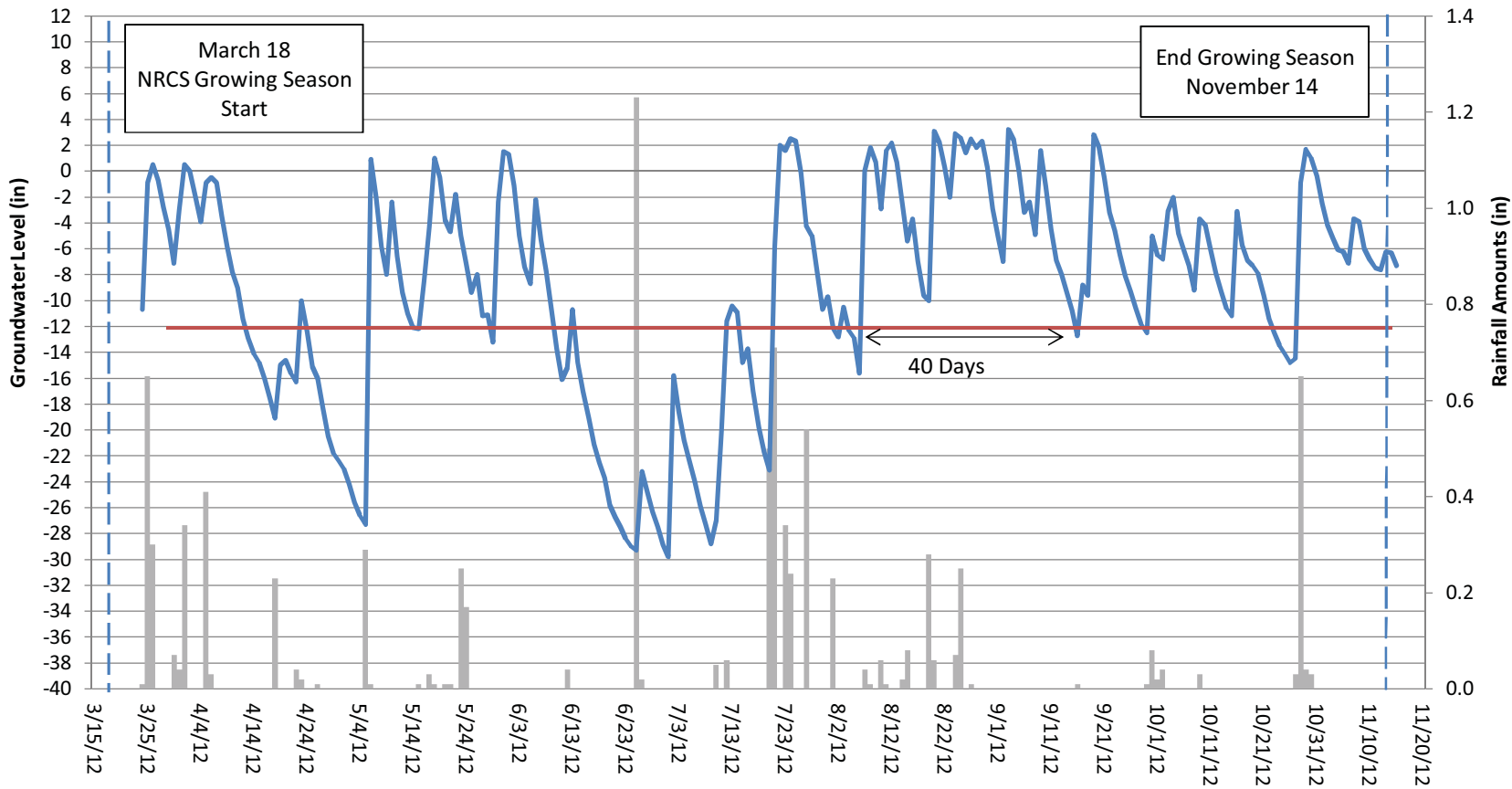
### Sliver Moon Groundwater Gauge 5 Year 1 (2012 Data)



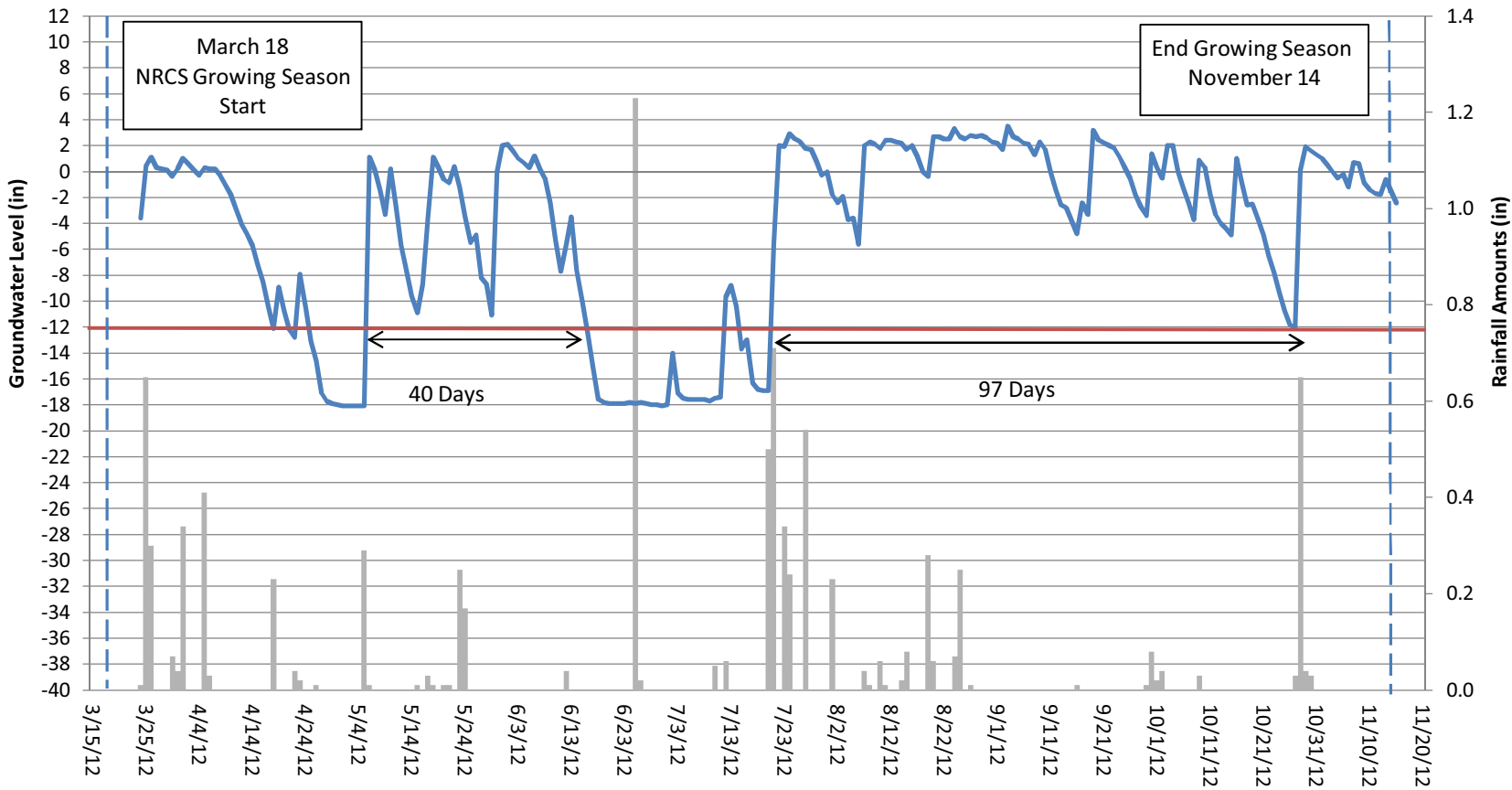
# Sliver Moon Groundwater Gauge 6 Year 1 (2012 Data)



# Sliver Moon Groundwater Gauge 7 Year 1 (2012 Data)

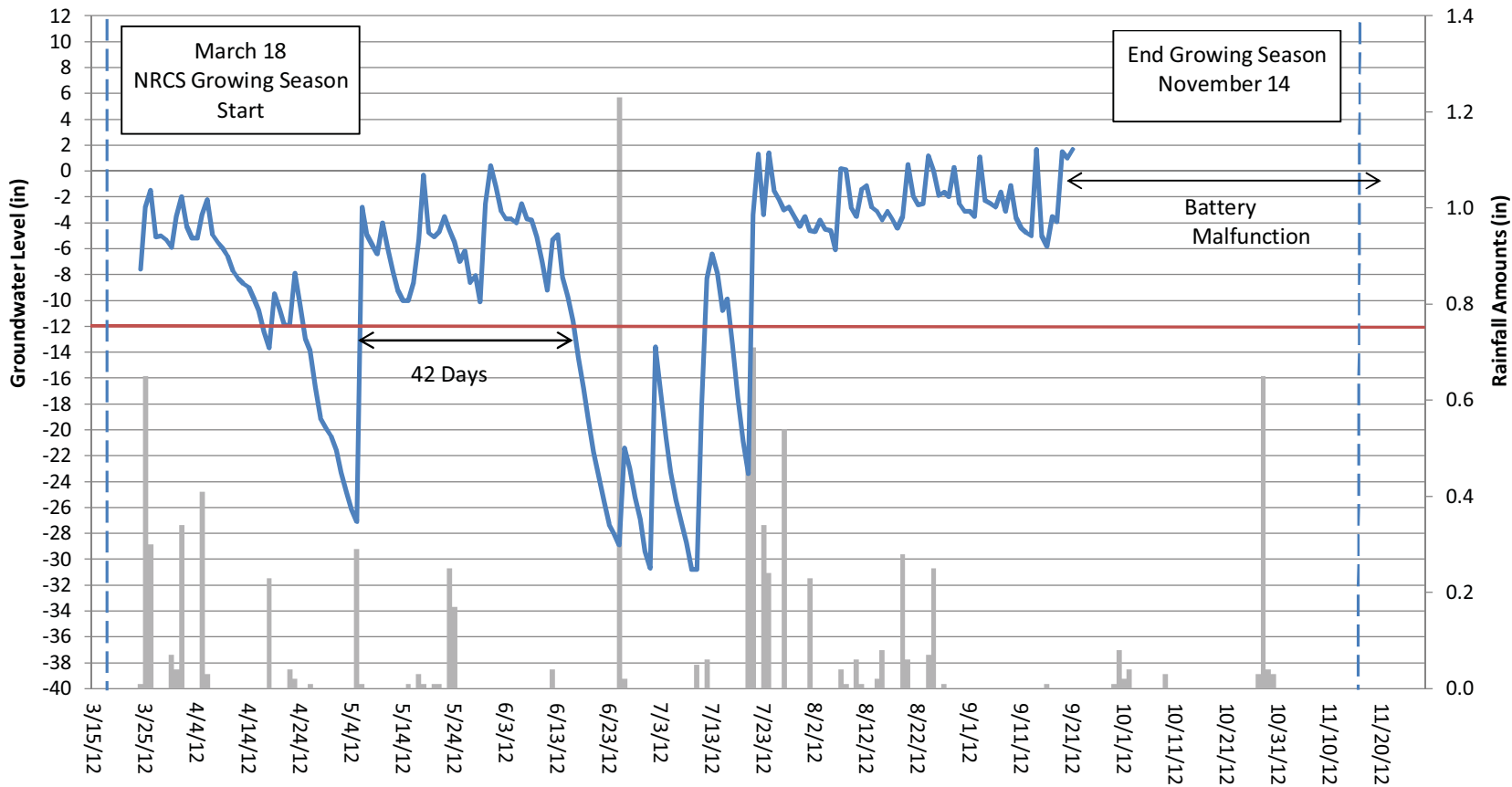


### Sliver Moon Groundwater Gauge 8 Year 1 (2012 Data)





### Sliver Moon Groundwater Gauge 9 Year 1 (2012 Data)



# Sliver Moon Groundwater Gauge Reference Year 1 (2012 Data)

