Monitoring Report
Hofler Property
Monitoring Year 3

DMS Project ID #: 95355
DMS Contract #: 004628
USACE AID# SAW-2012-01393
Gates County, North Carolina
Submitted November, 2017

NC Department of Environmental Quality
Division of Mitigation Services
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Table of Contents

1.0: PROJECT SUMMARY

1.1: Project Objectives

The project objectives of the Hofler property per the approved mitigation plan are as follows:

- Enhance water quality by providing shading from forest cover, which will reduce thermal impacts associated with excess algae growth and decreased dissolved oxygen concentrations
- Slow runoff rates and provide storage and desynchronization of overland flow before it reaches Lassiter Swamp, located directly north of the project, by restoring the wetland complex
- Provide nutrient attenuation and uptake by restoring dense vegetation interspersed with shallow diffuse flows, thus improving downstream habitat
- Provide minimal earthwork and disturbance, as determined through preliminary site analyses, to the area to accomplish designed wetland topography
- Impact existing ecological communities as little as possible. No remnant wetland communities exist on site and no impacts to wetlands or riparian buffers will occur due to the restoration project.

1.2: Project Success Criteria

Wetland hydrology data must consistently document the appropriate hydroperiod has been restored for all areas proposed for wetland mitigation. The targeted hydroperiod for the Hofler Property is 6% or greater. Planted vegetation will be considered successful if at least 320 three year-old planted stems/acre are present after year three. At year five, density must be no less than 260 five year-old planted stems/acre. At year 7, density must be no less than 210 seven year-old planted stems/acre. Additionally, planted vegetation must average 10 feet in height in each plot at year 7. Per the recommendations of the NCIRT, the following understory species were incorporated in the planting schedule on the condition they be exempted from the minimum 10-foot height criterion and exempted from the calculation of average height as a measure of that success criterion: Button bush (*C. occidentalis*), Sweet bay (*M. virginiana*), Wax myrtle (*M. cerifera*), and Laurel oak (*Q. laurifolia*). These species will be included in the calculations for the survival criterion. All vegetative monitoring will follow CVS-EEP Protocol for Recording Vegetation-Version 4.0.

Additionally, the project will strive to establish a variety of hydrologic regimes ranging from shallow inundated areas to intermittently saturated conditions, restoring diffuse flow patterns through what will ultimately be a forested wetland. The successful establishment of these conditions, mimicking nearby reference wetlands will help determine the overall success of the project.

1.3: Project Setting

The Hofler property consists of +/- 345 acres, of which 27 acres have been designated for this project. The site consisted of a rectangular tract of land primarily being used for cotton and small grain production. The prior converted wetlands on the site had been extensively ditched and drained, lowering the local water table and diminishing aquatic habitat and water quality. The site drained from south to north to an unnamed tributary of Lassiter Swamp and Bennets Creek upstream of Merchants Mill Pond. The project site along with the surrounding areas has undergone expansive hydrologic alterations and excessive sediment and nutrient inputs from agricultural production resulting in overall water quality degradation. The vicinity map is included with the CCPV in Appendix B. Table 4 in Appendix A contains additional information regarding the project's location and attributes.

1.4: Mitigation Components

The mitigation components are 23 acres of non-riparian wetland restoration with a credit ratio of 1:1 (Restoration:WMU), please refer to Table 1 for more information.

1.5: Project Timeline

Construction commenced on August 12th, 2014 with the installation of recommended erosion control practices and was completed on Oct. 14th, 2014. Planting was officially concluded on May 6th, 2015 (Table 2). Refer to Table 2 in Appendix A for the Project History and Reporting Timeline.

1.6: Design Approach

A natural design approach focused on mimicking nearby wetlands, including non-riparian hardwood flats and swamp forests both in hydrologic regime and vegetative diversity. Grading was specifically formulated to provide storage for overland flow while creating densely vegetated plots interspersed with shallow diffuse flows. All of these features contribute to nutrient and sediment attenuation, improving downstream habitat and promoting diversity of ecological communities. The reference area for this project is a nearby mature pine/hardwood flat with the same soils and topography and similar hydrologic function. Due to poor hydrologic performance at the current reference site, we are searching for a suitable additional reference site, one with a more appropriate species composition, similar to our target community of non-riparian hardwood flat.

1.7: Project Performance

Hydrology was successful over the entire project site despite the loss of data after the end of July. In all nine wells on site, either some or all data was irretrievable during the last three months of the growing season (August 1 through the last download in November). After discussions with the manufacturer, Onset Computer, the reason is still unclear, but

either operator error during the download or the shuttle used to collect the data was suspected. The data loggers themselves appear to be functioning properly, but they will all be pulled and relaunched as a precaution.

Despite the loss of some data, the hydrology patterns appear to be similar to those during the first two years of monitoring. Lack of rainfall during late February and early March caused hydrology to taper off significantly at the beginning of the growing season. Increased rainfall later in March, that continued through the spring and into the summer, kept hydrology patterns favorable. Daily rainfall events were plotted on the chart for gauge 1 to show how well rainfall and hydrology on this site match. The chart is included in Appendix E.

A new reference well was installed in a mature hardwood flat located inside Merchants Millpond State Park. The location is shown on the Vicinity Map. Unfortunately, the well was found in a damaged state with the data logger lying on the ground only a couple of feet from the well location. The data logger has been sent to Onset for possible data recovery.

Rainfall for the period of January through November, 2017, totaled 54.68 inches which was considerably higher than the median of 27.6 inches for the 30 – 70 percent range during the same period. For the period of January through July, the period of valid hydrologic data collection, the total was 39.61 inches, 10.31 inches above the median for that time period. Hydrology within the project area was successful with an average across all nine monitoring gauges of 42% of the growing season (NOTE: Data range is from the start of the growing season through 7/29 only).

In February of 2017, 3,500 trees were added to the site over an area of approximately 12 acres, which equates to 290 stems per acre added (see Figure 1). Most of the stems were swamp chestnut oak *(Q. michauxii)*. During remeasurement in 2017, despite heavy herbaceous cover, the trees appeared to be doing well. Survival of planted stems averaged 387 stems per acre over the site and 402 total stems including the natural red maple *(A. rubrum)* stems that were noted.

Also of note was the number of planted stems that were found this year that were noted as missing last year. Eleven stems were found that could not be found last year due to the dense cover, which might suggest that survival in 2016 was not as poor as noted. The stems are simply very difficult to find until they gain some height.

Vicinity Map

1.8: Methods and References

Monitoring methodology did not differ from the approved Mitigation Plan. Vegetation assessment was done according to the level 2 protocol specified by the Carolina Vegetation Survey. Hydrology monitoring wells were installed per ERDC TN-WRAP-00-02 "Installing Monitoring Wells/Piezometers in Wetlands" dated 2000. Groundwater levels were recorded using the U20-001-01 water level data loggers manufactured by Onset Computer. The loggers were installed in the wells per the manufacturer's instructions.

Appendix A: Background Tables

Table 1. Project Components and Mitigation Credits

Hofler Project #95355, Contract #004628

Mitigation Credit Summations

	Stream	Riparian Wetland	Non-riparian Wetland	Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Overall Credit			23			

Project Components

Project Component -or- Reach	Stationing	Existing Footage or Acreage	Restoration Footage or Acreage	Restoration Level	Restoration or Rest. Equiv.	Mitigation Ratio	Mitigation Credits	Notes
Wetland 1		23	23		Restoration	1:1	23	

Length and Area Summations

Restoration Level	Stream (Linear Feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration			23			
Enhancement						
Enhancement I						
Enhancement II						
Creation						
Preservation						
High Quality Preservation						

BMP Elements

Element	Location	Purpose/Function	Notes

Table 2. Project Activity and Reporting History Hofler Property Wetland Mitigation Project #95355		
Activity, Deliverable or Milestone	**Data Collection Complete**	**Actual Completion or Delivery**
Project Institution	N/A	May-12
Mitigation Plan	May 2014	July 2014
Permits Issued	May 2014	July 2014
Final Design Construction Plans	May 2014	July 2014
Construction	N/A	October 2014
Temporary S & E mix applied to entire project area	N/A	N/A
Permanent seed mix applied to entire project area	N/A	October 2014
Containerized and BR Planting over entire project area	N/A	May 2015
Baseline Monitoring Document (Year 0 Monitoring-baseline)	May 2015	Sept. 2015
Year 1 monitoring	November 2015	November 2015
Year 2 monitoring	November 2016	November 2016
Year 3 monitoring	November 2017	November 2017
Year 4 monitoring		
Year 5 monitoring		

Table 3. Project Contacts Hofler Property Wetland Mitigation Project #95355	
Designer Primary Project design POC	Ecotone, Inc. Scott McGill (410) 420-2600 2120 High Point Rd, Forest Hill, MD 21050
Construction Contractor Construction contractor POC	Jennings Land Development Rodney Jennings (252) 202-6954 156 Trotman Rd. Camden, NC 2791
Planting Contractor Planting contractor POC	Carolina Silvics, Inc. Mary-Margaret McKinney (252-482-8491) 908 Indian Trail Road Edenton, NC 27932
Seeding Contractor Seed planting contractor POC	Woods, Water and Wildlife, Inc. Ed Temple (252) 333-0249 P. O. Box 176, Fairfield, NC 27826
Seed mix sources	Earnst Conservation Seeds, LLP, Meadville, PA
Nursery stock suppliers	Carolina Silvics (from various sources)
Monitoring Performers Wetland and Vegetation POC	Woods, Water and Wildlife, Inc. Ashby Brown (757) 651-3162 P. O. Box 176, Fairfield, NC 27826

Table 4. Project Information and Attributes

Project name	HOFLER PROPERTY		
County	GATES		
Project Area (ac)	27.0 AC		
Project Coordinates (Lat and Long)	+36˚ 25’ 48.44”, -76˚ 39’ 10.91”		
4.1 Project Watershed Summary Information			
Physiographic province	INNER COASTAL PLAIN		
River basin	CHOWAN RIVER BASIN		
USGS Hydrologic Unit 8-digit: 03010203	USGS Hydrologic Unit 14-digit: 03010203040040		
DWQ Sub-basin	BENNETTS CREEK LOCAL WATERSHED		
Project Drainage Area (acres)	103.8		
Project Drainage Area Percentage of Impervious Area	5%		
CGIA Land Use Classification	2.01.01.07 Annual Row Crop Rotation		
4.2 Wetland Summary Information			
Parameters	Wetland 1	Wetland 2	Wetland 3
Size of Wetland (acres)	23.0		
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	Non-riparian		
Mapped Soil Series	BnA & PnA		
Drainage Class	Poorly drained & very poorly drained		
Soil Hydric Status	Hydric		
Source of Hydrology	Surface and Ground		
Hydrologic Impairment	44.8’ to 155.2’		
Native Vegetation Community			
Percent Composition of Exotic Invasive Vegetation	N/A		
4.3 Regulatory Considerations			
Regulation	Applicable?	Resolved?	Supporting Documents
Waters of the United States – Section 404	N	N/A	Appendix F
Waters of the United States – Section 401	N	N/A	Appendix F
Endangered Species Act	N	Y	
Historic Preservation Act	N	Y	
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	N	Y	
FEMA Floodplain Compliance	N	Y	
Essential Fisheries Habitat	N	Y	

Appendix B:

Current Condition Plan View

Table 5. Vegetation Condition Assessment Table

Figure 1. Proposed supplemental planting

Site Photos

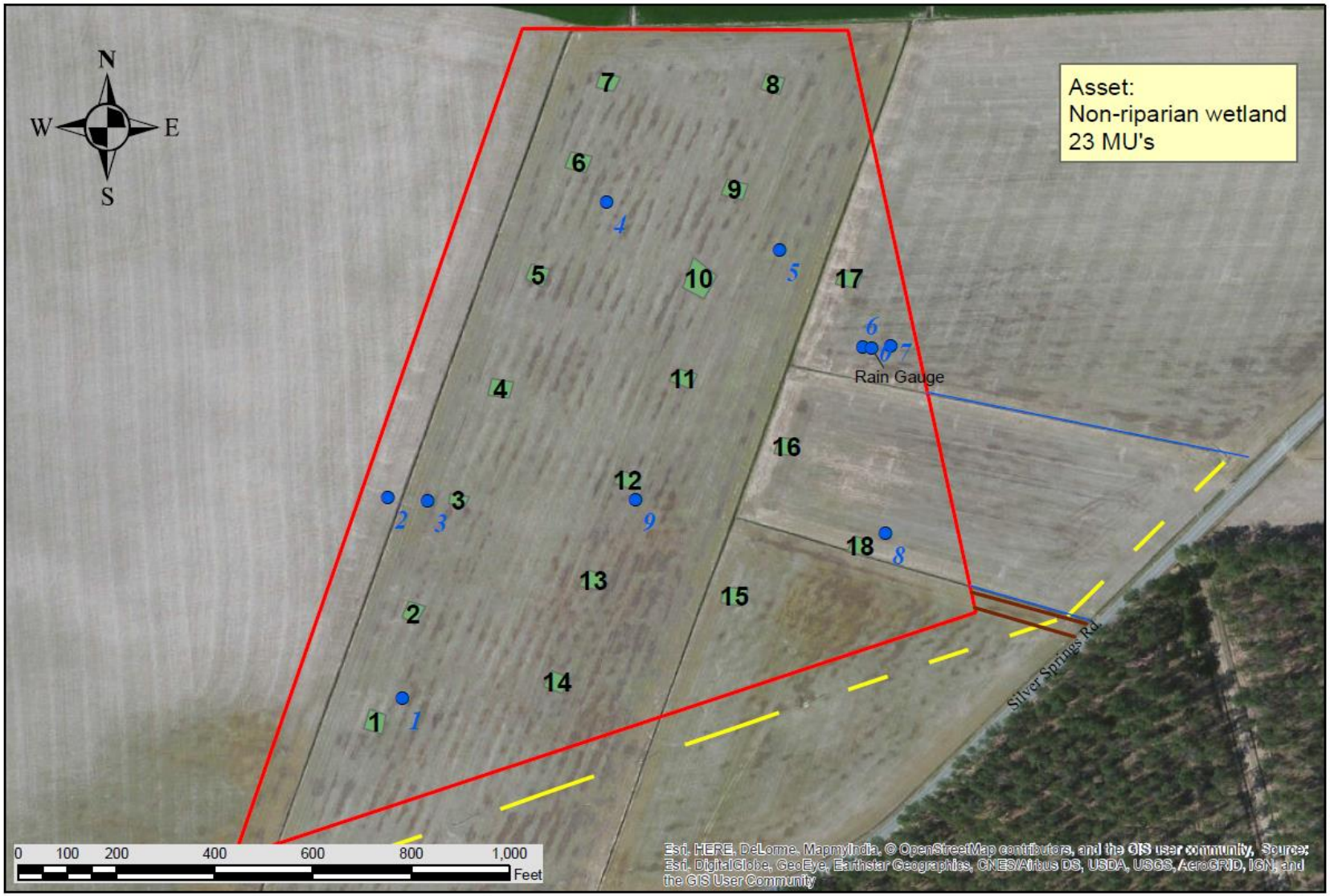

N
W
E
S
Asset:
Non-riparian wetland
23 MU's
Rain Gauge
Silver Springs Rd
0 100 200 400 600 800 1,000
Feet
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Albemarle Restorations, LLC
Wetland Restoration
Stream Restoration
Wildlife Habitat
Hofler Restoration Project
Current Condition Plan View
Project # 95355
Nov. 20, 2017
Legend
Easement Bound.
Ditches
Entrance
Veg Plot
Powerline
Wetland Gauges
YEAR 3 CONDITION:
Vegetation Plots:
Criteria Met
Criteria Unmet
Wetland Gauges:
Hydrology Met
Hydrology Unmet
Hydrology Partially Met
Environmental Quality

Table 5 **Vegetation Condition Assessment**

Planted Acreage[1] **23**

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	None	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	None	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	None	0	23.00	100.0%
			Cumulative Total	0	23.00	100.0%

Easement Acreage[2] **27**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern[4]	Areas or points (if too small to render as polygons at map scale).	1000 SF	None	0	0.00	0.0%
5. Easement Encroachment Areas[3]	Areas or points (if too small to render as polygons at map scale).	none	None	0	0.00	0.0%

Although item 3, Areas of Poor Growth Rates, states that growth is less than desirable, given the intense herbaceous cover, growth rates are probably in line with expectations. Herbaceous competition is the primary cause of poor growth and survival in hardwood plantings and there are few options on this site for herbaceous control.

Figure 1. Area of replanting that was done in winter 2017, shown shaded light red

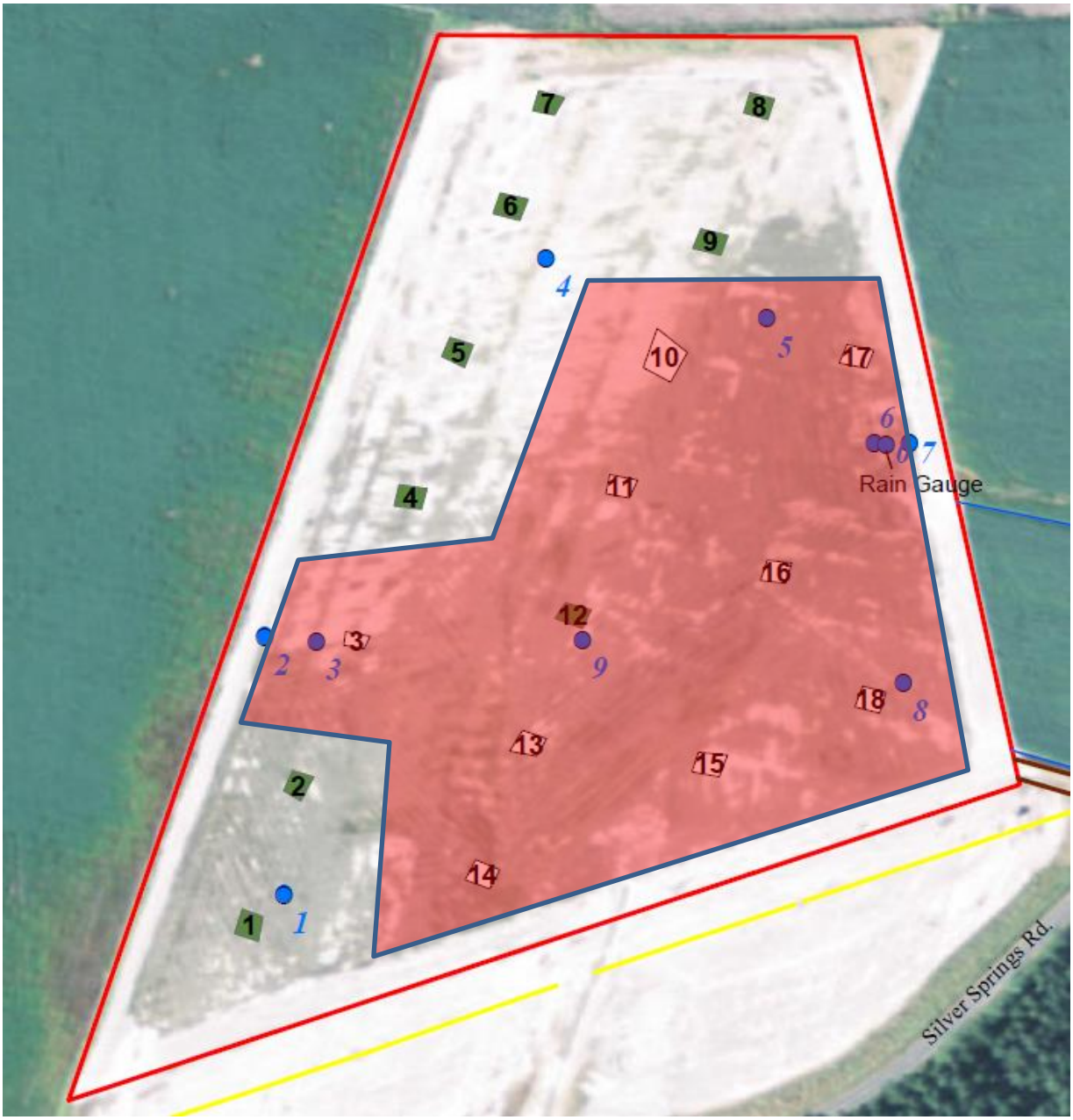


Photo 1. General site vegetation. Head-high cattails and heavy grasses beneath occupy nearly the entire site. Generally the same as in 2016

Photo 2. Water oak that has been rubbed by deer. Some rodent damage was noted during tree measurements.

Reference well found damaged. Appears to have been done by deer.

Photo of additional reference area on Merchants Mill Pond State Park. Hardwood flat.

Appendix C

Vegetation Plot Data

Table 6.

Project Code 95355. Project Name: Hofler																	
			Current Plot Data (MY3 2017)														
			95355-ab-0001			95355-ab-0002			95355-ab-0003			95355-ab-0004			95355-ab-0005		
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
Acer rubrum	red maple	Tree			1			1									1
Cephalanthus occidentalis	common buttonbush	Shrub										4	4	4			
Magnolia virginiana	sweetbay	Tree							1	1	1	1	1	1	4	4	4
Myrica	sweetgale	Shrub										3	3	3			
Quercus bicolor	swamp white oak	Tree	2	2	2	2	2	2	2	2	2						
Quercus laurifolia	laurel oak	Tree															
Quercus michauxii	swamp chestnut oak	Tree	2	2	2	4	4	4	5	5	5	1	1	1	4	4	4
Quercus nigra	water oak	Tree	1	1	1	1	1	1				1	1	1			
Quercus phellos	willow oak	Tree	3	3	3	2	2	2							1	1	1
Taxodium distichum	bald cypress	Tree	1	1	1				1	1	1				1	1	1
		Stem count	9	9	10	9	9	10	9	9	9	10	10	10	10	10	11
		size (ares)	1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02		
		Species count	5	5	6	4	4	5	4	4	4	5	5	5	4	4	5
		Stems per ACRE	364	364	405	364	364	405	364	364	364	405	405	405	405	405	445

Table 6, continued.

Project Code 95355. Project Name: Hofler																	
			Current Plot Data (MY3 2017)														
			95355-ab-0006			95355-ab-0007			95355-ab-0008			95355-ab-0009			95355-ab-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
Acer rubrum	red maple	Tree															
Cephalanthus occidentalis	common buttonbush	Shrub															
Magnolia virginiana	sweetbay	Tree	2	2	2												
Myrica	sweetgale	Shrub				3	3	3	2	2	2	1	1	1			
Quercus bicolor	swamp white oak	Tree	4	4	4	2	2	2				1	1	1			
Quercus laurifolia	laurel oak	Tree							1	1	1						
Quercus michauxii	swamp chestnut oak	Tree	3	3	3	2	2	2	1	1	1	2	2	2	5	5	5
Quercus nigra	water oak	Tree	1	1	1				2	2	2						
Quercus phellos	willow oak	Tree				2	2	2	2	2	2	2	2	2	1	1	1
Taxodium distichum	bald cypress	Tree	3	3	3	1	1	1	2	2	2	3	3	3	3	3	3
		Stem count	13	13	13	10	10	10	10	10	10	9	9	9	9	9	9
		size (ares)	1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02		
		Species count	5	5	5	5	5	5	6	6	6	5	5	5	3	3	3
		Stems per ACRE	526	526	526	405	405	405	405	405	405	364	364	364	364	364	364

Table 6, continued.

Project Code 95355. Project Name: Hofler																	
			Current Plot Data (MY3 2017)														
			95355-ab-0011			95355-ab-0012			95355-ab-0013			95355-ab-0014			95355-ab-0015		
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
Acer rubrum	red maple	Tree															1
Cephalanthus occidentalis	common buttonbush	Shrub				2	2	2									
Magnolia virginiana	sweetbay	Tree															
Myrica	sweetgale	Shrub															
Quercus bicolor	swamp white oak	Tree							2	2	2	2	2	2			
Quercus laurifolia	laurel oak	Tree															
Quercus michauxii	swamp chestnut oak	Tree	7	7	7	3	3	3	4	4	4	4	4	4	6	6	6
Quercus nigra	water oak	Tree	1	1	1	2	2	2				1	1	1			
Quercus phellos	willow oak	Tree	1	1	1	1	1	1							1	1	1
Taxodium distichum	bald cypress	Tree				1	1	1	3	3	3	2	2	2	3	3	3
		Stem count	9	9	9	9	9	9	9	9	9	9	9	9	10	10	11
		size (ares)	1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02		
		Species count	3	3	3	5	5	5	3	3	3	4	4	4	3	3	4
		Stems per ACRE	364	364	364	364	364	364	364	364	364	364	364	364	405	405	445

Table 6, continued.

Project Code 95355. Project Name: Hofler												
			95355-ab-0016			95355-ab-0017			95355-ab-0018		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree						2			1
Cephalanthus occidentalis	common buttonbush	Shrub	1	1	1						
Magnolia virginiana	sweetbay	Tree									
Myrica	sweetgale	Shrub	1	1	1						
Quercus bicolor	swamp white oak	Tree	1	1	1				1	1	1
Quercus laurifolia	laurel oak	Tree									
Quercus michauxii	swamp chestnut oak	Tree	4	4	4	4	4	4	6	6	6
Quercus nigra	water oak	Tree	1	1	1	1	1	1			
Quercus phellos	willow oak	Tree				2	2	2	1	1	1
Taxodium distichum	bald cypress	Tree	1	1	1	2	2	2	2	2	2
		Stem count	9	9	9	9	9	11	10	10	11
		size (ares)	1			1			1		
		size (ACRES)	0.02			0.02			0.02		
		Species count	6	6	6	4	4	5	4	4	5
		Stems per ACRE	364	364	364	364	364	445	405	405	445

Table 6, continued.

Project Code 95355. Project Name: Hofler														
			Annual Means											
			MY3 (2017)			MY2 (2016)			MY1 (2015)			MY0 (2015)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree			7									
Cephalanthus occidentalis	common buttonbush	Shrub	7	7	7	9	9	9	9	9	9	8	8	8
Magnolia virginiana	sweetbay	Tree	8	8	8	6	6	6	8	8	8	9	9	9
Myrica	sweetgale	Shrub	10	10	10	9	9	9	15	15	15	15	15	15
Quercus bicolor	swamp white oak	Tree	19	19	19	20	20	20	25	25	25	36	36	36
Quercus laurifolia	laurel oak	Tree	1	1	1	1	1	1	5	5	5	7	7	7
Quercus michauxii	swamp chestnut oak	Tree	67	67	67	35	35	35	49	49	49	55	55	55
Quercus nigra	water oak	Tree	12	12	12	13	13	13	23	23	23	34	34	34
Quercus phellos	willow oak	Tree	19	19	19	18	18	18	26	26	26	30	30	30
Taxodium distichum	bald cypress	Tree	29	29	29	31	31	31	31	31	31	35	35	35
		Stem count	172	172	179	142	142	142	191	191	191	229	229	229
		size (ares)	18			18			18			18		
		size (ACRES)	0.44			0.44			0.44			0.44		
		Species count	9	9	10	9	9	9	9	9	9	9	9	9
		Stems per ACRE	387	387	402	319	319	319	429	429	429	515	515	515

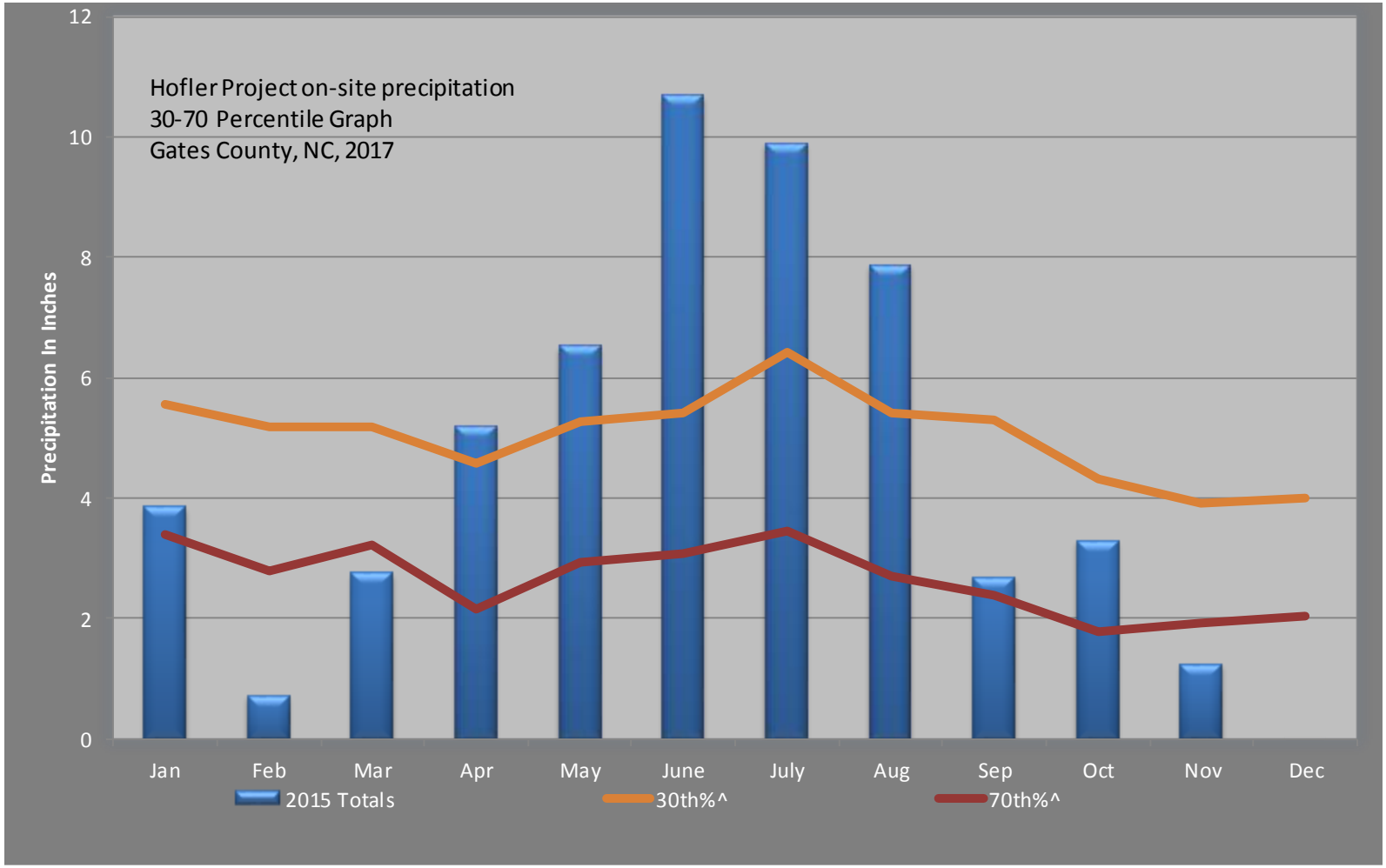
Appendix E

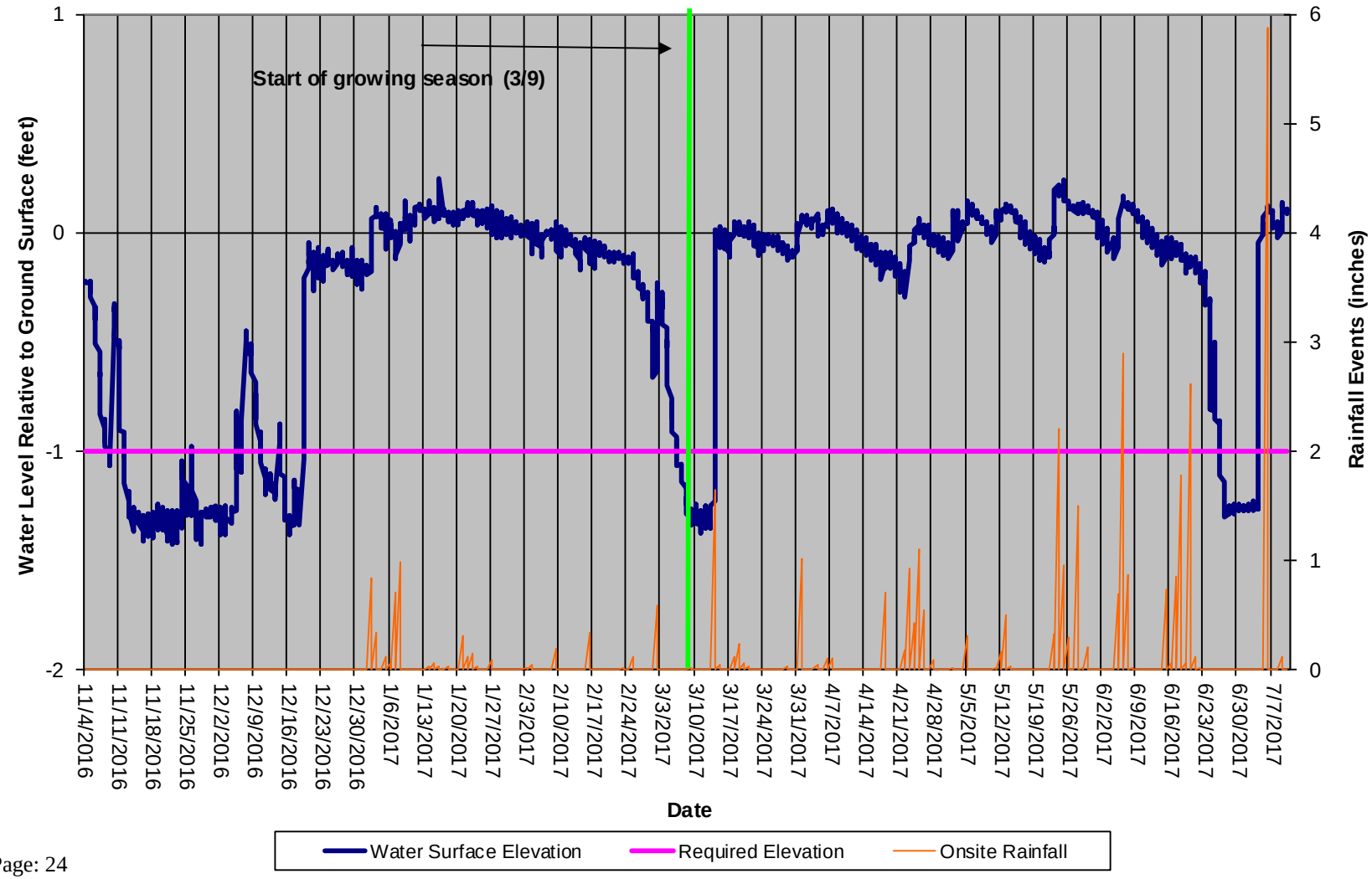
Hydrologic Data

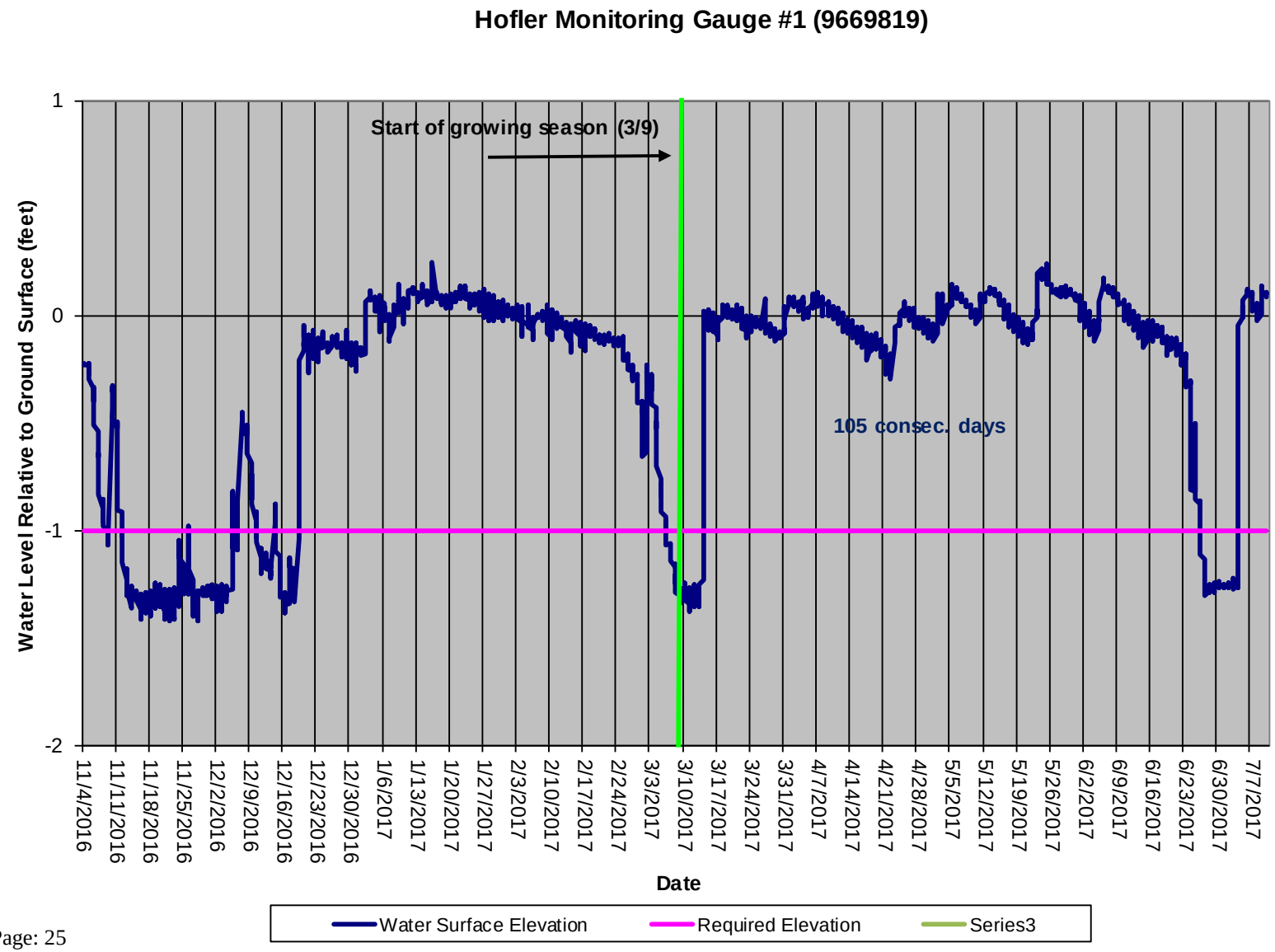
Precipitation Records

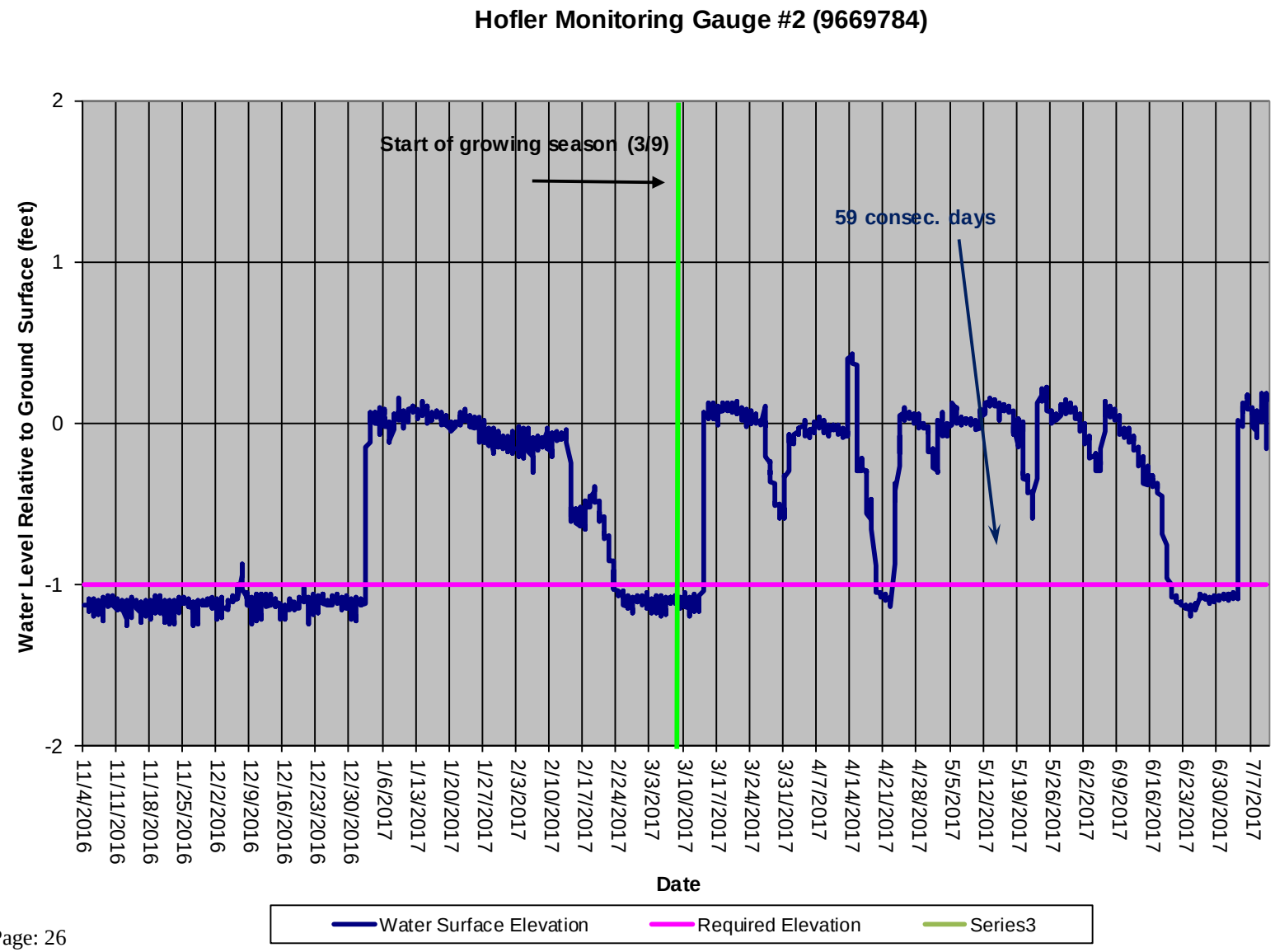
Hydrographs

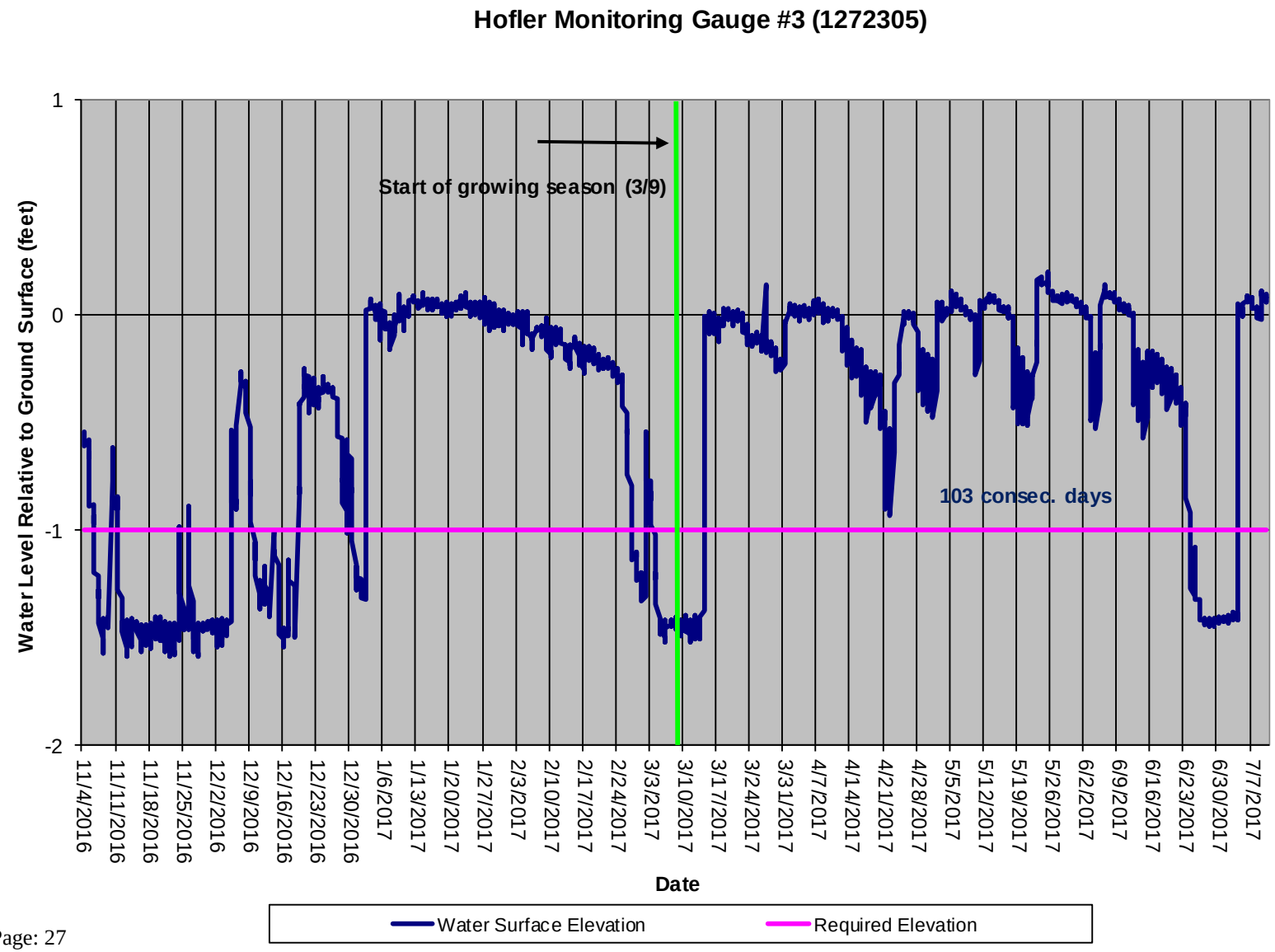
Hydroperiods

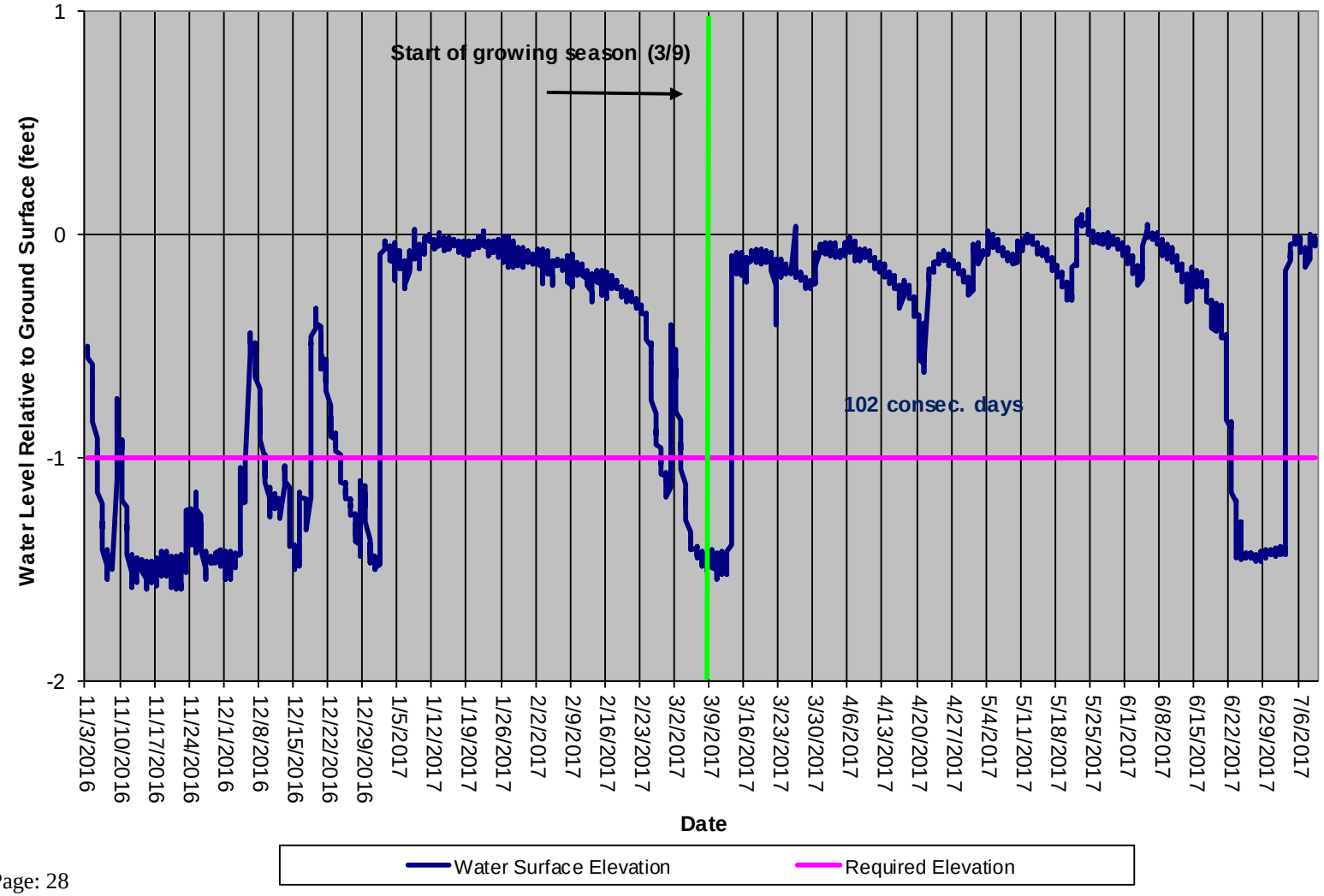

Hofler Project on-site precipitation
30-70 Percentile Graph
Gates County, NC, 2017
Precipitation In Inches
12
10
8
6
4
2
0
Jan
Feb
Mar
Apr
May
June
July
Aug
Sep
Oct
Nov
Dec
2015 Totals
30th%^
70th%^

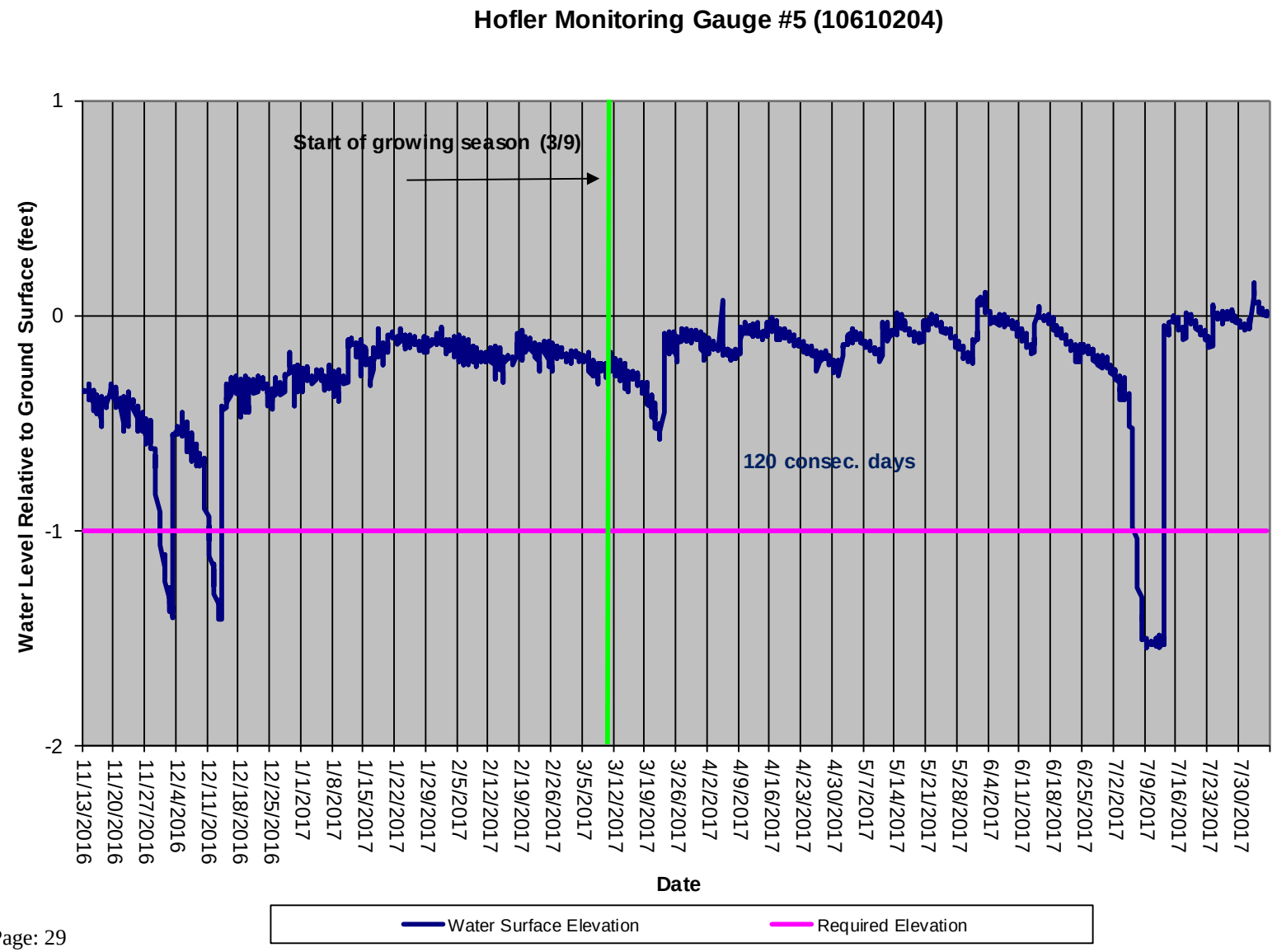

Hofler Monitoring Gauge #1 with daily rainfall events (9669819)
Start of growing season (3/9)
Water Level Relative to Ground Surface (feet)
Rainfall Events (inches)
1
0
-1
-2
6
5
4
3
2
1
0
11/4/2016
11/11/2016
11/18/2016
11/25/2016
12/2/2016
12/9/2016
12/16/2016
12/23/2016
12/30/2016
1/6/2017
1/13/2017
1/20/2017
1/27/2017
2/3/2017
2/10/2017
2/17/2017
2/24/2017
3/3/2017
3/10/2017
3/17/2017
3/24/2017
3/31/2017
4/7/2017
4/14/2017
4/21/2017
4/28/2017
5/5/2017
5/12/2017
5/19/2017
5/26/2017
6/2/2017
6/9/2017
6/16/2017
6/23/2017
6/30/2017
7/7/2017
Date
Water Surface Elevation
Required Elevation
Onsite Rainfall

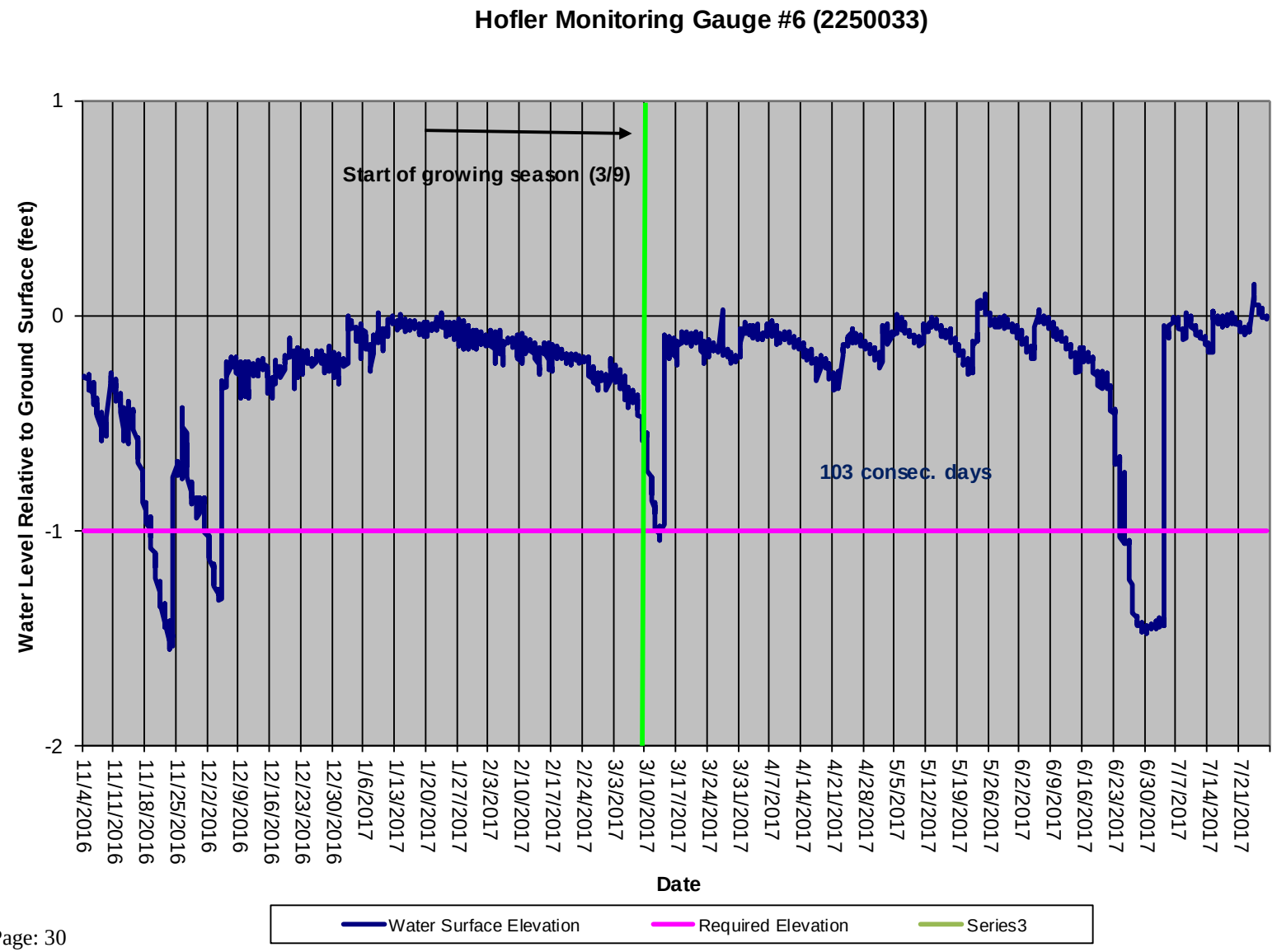

Hofler Monitoring Gauge #1 (9669819)
Start of growing season (3/9)
105 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/4/2016
11/11/2016
11/18/2016
11/25/2016
12/2/2016
12/9/2016
12/16/2016
12/23/2016
12/30/2016
1/6/2017
1/13/2017
1/20/2017
1/27/2017
2/3/2017
2/10/2017
2/17/2017
2/24/2017
3/3/2017
3/10/2017
3/17/2017
3/24/2017
3/31/2017
4/7/2017
4/14/2017
4/21/2017
4/28/2017
5/5/2017
5/12/2017
5/19/2017
5/26/2017
6/2/2017
6/9/2017
6/16/2017
6/23/2017
6/30/2017
7/7/2017
Date
Water Surface Elevation
Required Elevation
Series3

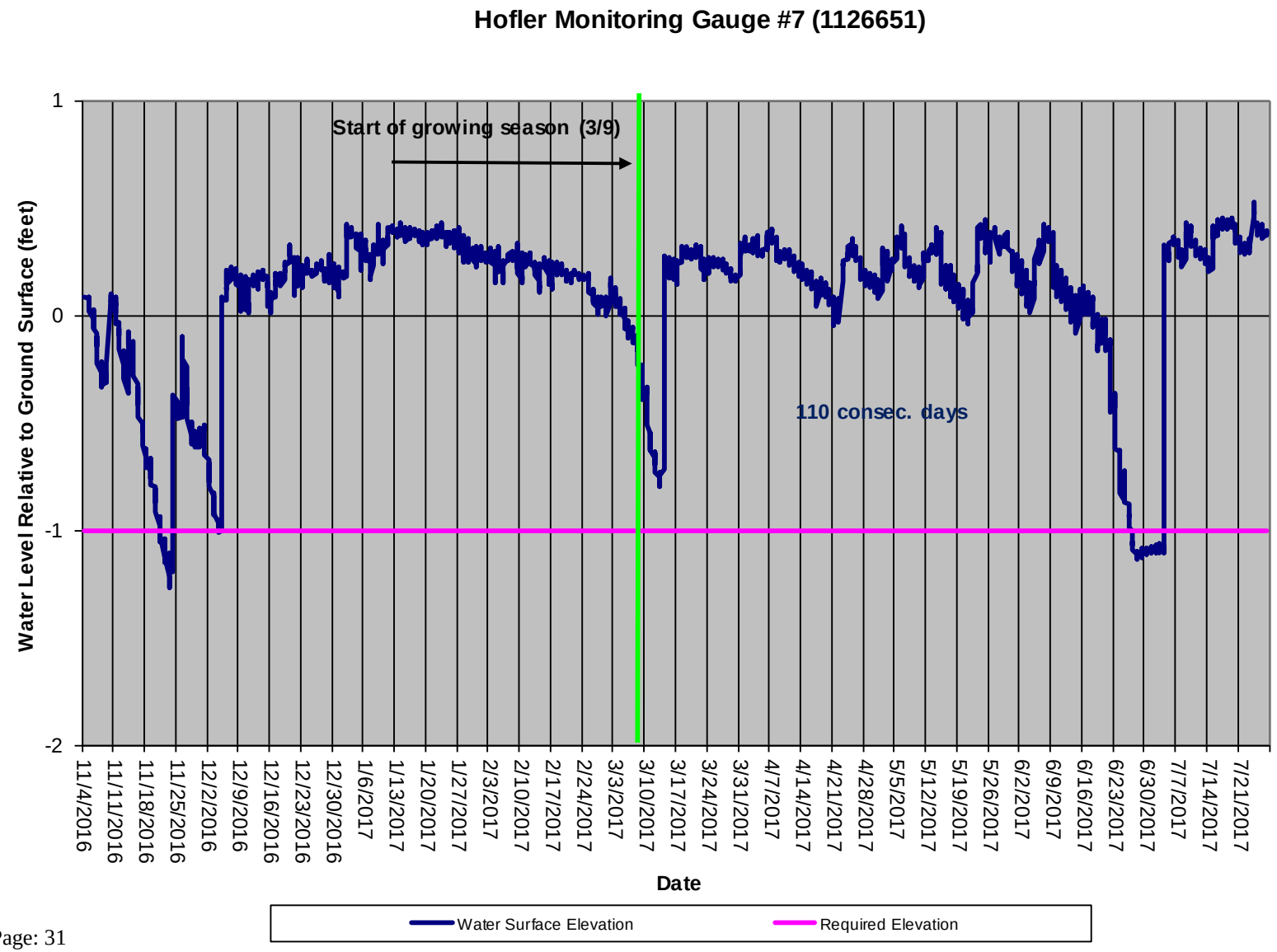

Hofler Monitoring Gauge #2 (9669784)
Start of growing season (3/9)
59 consec. days
Water Level Relative to Ground Surface (feet)
2
1
0
-1
-2
11/4/2016
11/11/2016
11/18/2016
11/25/2016
12/2/2016
12/9/2016
12/16/2016
12/23/2016
12/30/2016
1/6/2017
1/13/2017
1/20/2017
1/27/2017
2/3/2017
2/10/2017
2/17/2017
2/24/2017
3/3/2017
3/10/2017
3/17/2017
3/24/2017
3/31/2017
4/7/2017
4/14/2017
4/21/2017
4/28/2017
5/5/2017
5/12/2017
5/19/2017
5/26/2017
6/2/2017
6/9/2017
6/16/2017
6/23/2017
6/30/2017
7/7/2017
Date
Water Surface Elevation
Required Elevation
Series3

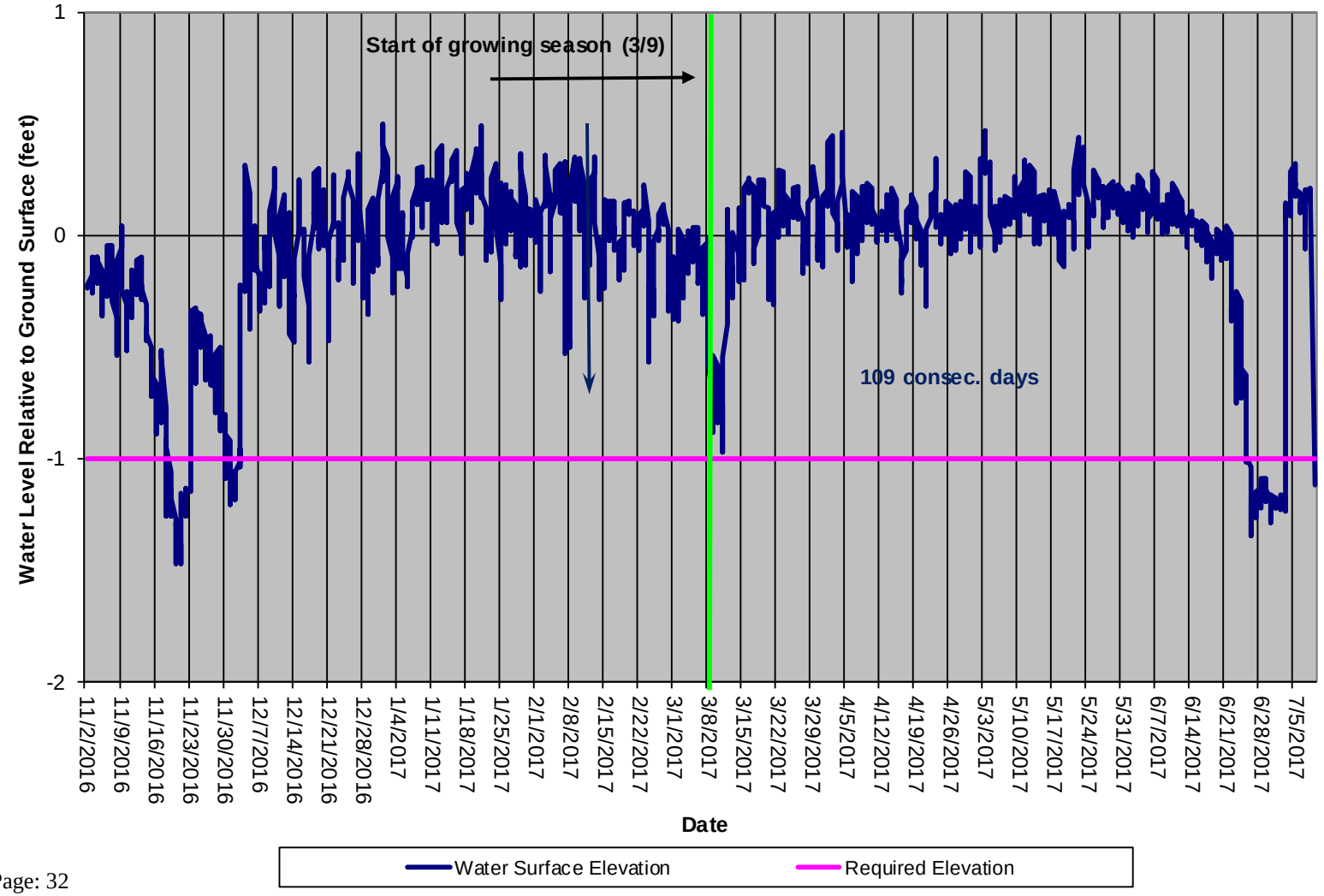

Hofler Monitoring Gauge #3 (1272305)
Start of growing season (3/9)
103 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/4/2016
11/11/2016
11/18/2016
11/25/2016
12/2/2016
12/9/2016
12/16/2016
12/23/2016
12/30/2016
1/6/2017
1/13/2017
1/20/2017
1/27/2017
2/3/2017
2/10/2017
2/17/2017
2/24/2017
3/3/2017
3/10/2017
3/17/2017
3/24/2017
3/31/2017
4/7/2017
4/14/2017
4/21/2017
4/28/2017
5/5/2017
5/12/2017
5/19/2017
5/26/2017
6/2/2017
6/9/2017
6/16/2017
6/23/2017
6/30/2017
7/7/2017
Date
Water Surface Elevation
Required Elevation

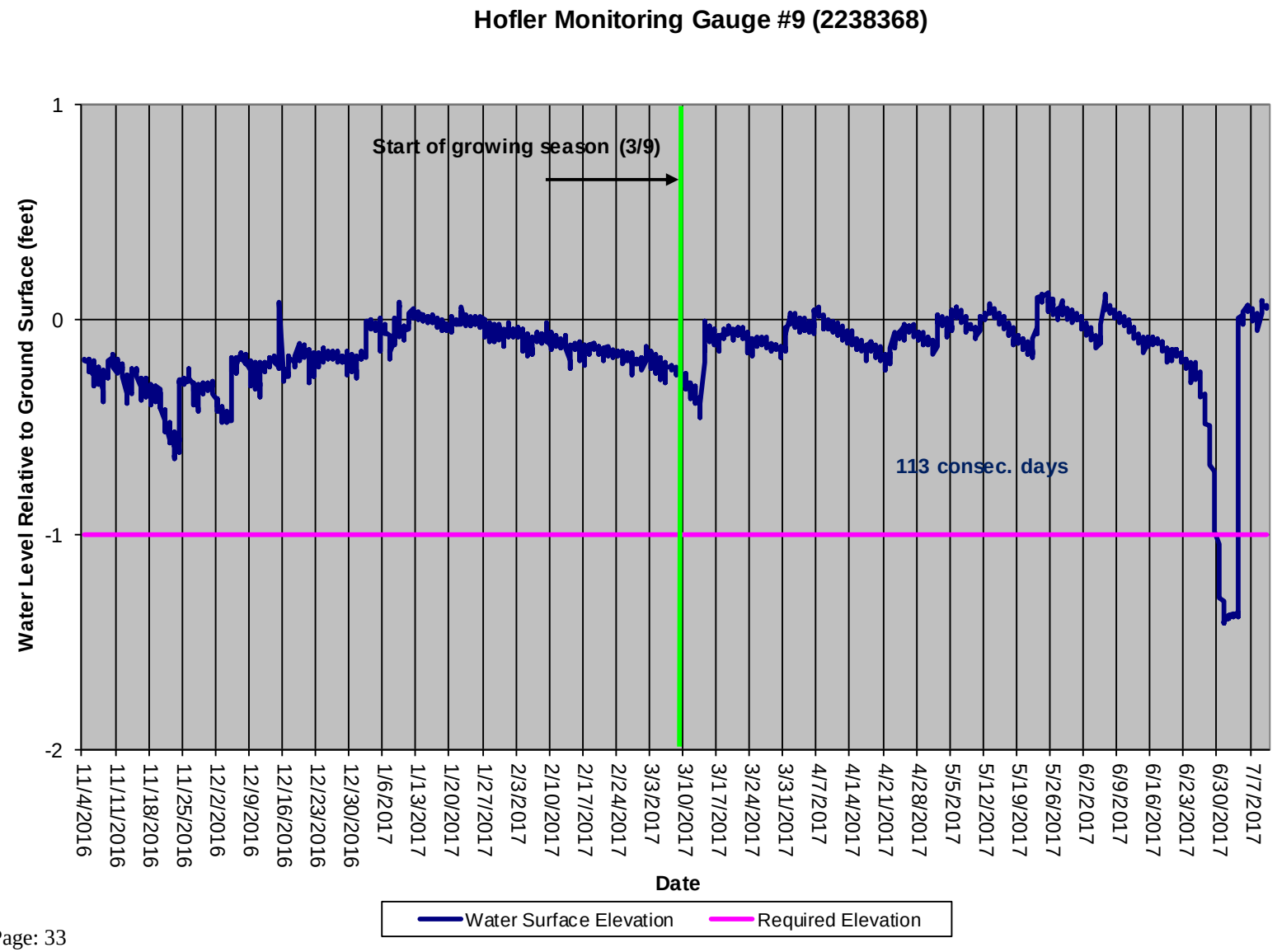

Hofler Monitoring Gauge #4 (1303319)
Start of growing season (3/9)
102 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/3/2016
11/10/2016
11/17/2016
11/24/2016
12/1/2016
12/8/2016
12/15/2016
12/22/2016
12/29/2016
1/5/2017
1/12/2017
1/19/2017
1/26/2017
2/2/2017
2/9/2017
2/16/2017
2/23/2017
3/2/2017
3/9/2017
3/16/2017
3/23/2017
3/30/2017
4/6/2017
4/13/2017
4/20/2017
4/27/2017
5/4/2017
5/11/2017
5/18/2017
5/25/2017
6/1/2017
6/8/2017
6/15/2017
6/22/2017
6/29/2017
7/6/2017
Date
Water Surface Elevation
Required Elevation

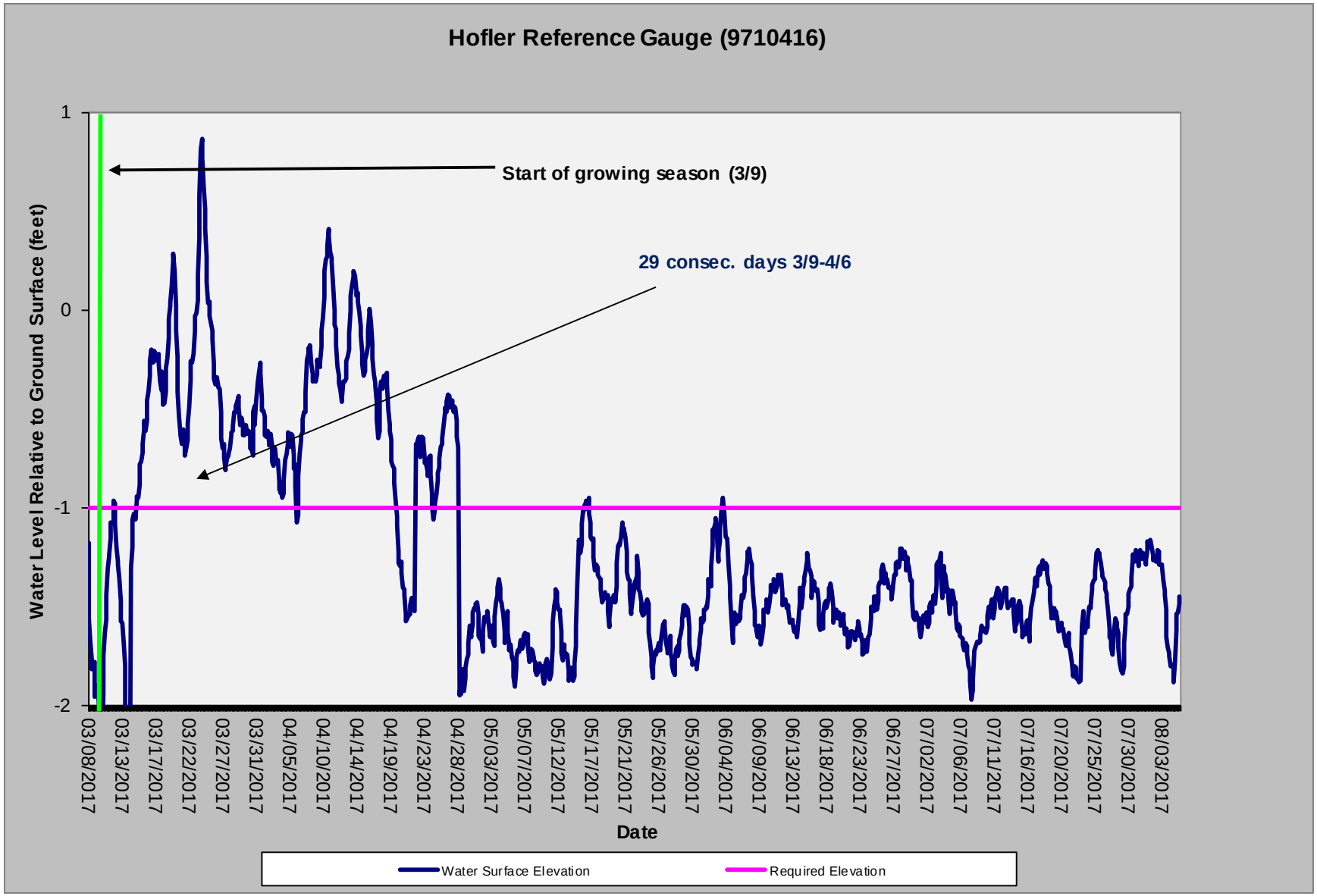

Hofler Monitoring Gauge #5 (10610204)
Start of growing season (3/9)
120 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/13/2016
11/20/2016
11/27/2016
12/4/2016
12/11/2016
12/18/2016
12/25/2016
1/1/2017
1/8/2017
1/15/2017
1/22/2017
1/29/2017
2/5/2017
2/12/2017
2/19/2017
2/26/2017
3/5/2017
3/12/2017
3/19/2017
3/26/2017
4/2/2017
4/9/2017
4/16/2017
4/23/2017
4/30/2017
5/7/2017
5/14/2017
5/21/2017
5/28/2017
6/4/2017
6/11/2017
6/18/2017
6/25/2017
7/2/2017
7/9/2017
7/16/2017
7/23/2017
7/30/2017
Date
Water Surface Elevation
Required Elevation


Hofler Monitoring Gauge #6 (2250033)
Start of growing season (3/9)
103 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/4/2016
11/11/2016
11/18/2016
11/25/2016
12/2/2016
12/9/2016
12/16/2016
12/23/2016
12/30/2016
1/6/2017
1/13/2017
1/20/2017
1/27/2017
2/3/2017
2/10/2017
2/17/2017
2/24/2017
3/3/2017
3/10/2017
3/17/2017
3/24/2017
3/31/2017
4/7/2017
4/14/2017
4/21/2017
4/28/2017
5/5/2017
5/12/2017
5/19/2017
5/26/2017
6/2/2017
6/9/2017
6/16/2017
6/23/2017
6/30/2017
7/7/2017
7/14/2017
7/21/2017
Date
Water Surface Elevation
Required Elevation
Series3


Hofler Monitoring Gauge #7 (1126651)
Start of growing season (3/9)
110 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/4/2016
11/11/2016
11/18/2016
11/25/2016
12/2/2016
12/9/2016
12/16/2016
12/23/2016
12/30/2016
1/6/2017
1/13/2017
1/20/2017
1/27/2017
2/3/2017
2/10/2017
2/17/2017
2/24/2017
3/3/2017
3/10/2017
3/17/2017
3/24/2017
3/31/2017
4/7/2017
4/14/2017
4/21/2017
4/28/2017
5/5/2017
5/12/2017
5/19/2017
5/26/2017
6/2/2017
6/9/2017
6/16/2017
6/23/2017
6/30/2017
7/7/2017
7/14/2017
7/21/2017
Date
Water Surface Elevation
Required Elevation


Hofler Monitoring Gauge #8 (1126652)
Start of growing season (3/9)
109 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/2/2016
11/9/2016
11/16/2016
11/23/2016
11/30/2016
12/7/2016
12/14/2016
12/21/2016
12/28/2016
1/4/2017
1/11/2017
1/18/2017
1/25/2017
2/1/2017
2/8/2017
2/15/2017
2/22/2017
3/1/2017
3/8/2017
3/15/2017
3/22/2017
3/29/2017
4/5/2017
4/12/2017
4/19/2017
4/26/2017
5/3/2017
5/10/2017
5/17/2017
5/24/2017
5/31/2017
6/7/2017
6/14/2017
6/21/2017
6/28/2017
7/5/2017
Date
Water Surface Elevation
Required Elevation


Hofler Monitoring Gauge #9 (2238368)
Start of growing season (3/9)
113 consec. days
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
11/4/2016
11/11/2016
11/18/2016
11/25/2016
12/2/2016
12/9/2016
12/16/2016
12/23/2016
12/30/2016
1/6/2017
1/13/2017
1/20/2017
1/27/2017
2/3/2017
2/10/2017
2/17/2017
2/24/2017
3/3/2017
3/10/2017
3/17/2017
3/24/2017
3/31/2017
4/7/2017
4/14/2017
4/21/2017
4/28/2017
5/5/2017
5/12/2017
5/19/2017
5/26/2017
6/2/2017
6/9/2017
6/16/2017
6/23/2017
6/30/2017
7/7/2017
Date
Water Surface Elevation
Required Elevation


Hofler Reference Gauge (9710416)
Water Level Relative to Ground Surface (feet)
1
0
-1
-2
Start of growing season (3/9)
29 consec. days 3/9-4/6
03/08/2017
03/13/2017
03/17/2017
03/22/2017
03/27/2017
03/31/2017
04/05/2017
04/10/2017
04/14/2017
04/19/2017
04/23/2017
04/28/2017
05/03/2017
05/07/2017
05/12/2017
05/17/2017
05/21/2017
05/26/2017
05/30/2017
06/04/2017
06/09/2017
06/13/2017
06/18/2017
06/23/2017
06/27/2017
07/02/2017
07/06/2017
07/11/2017
07/16/2017
07/20/2017
07/25/2017
07/30/2017
08/03/2017
Date
Water Surface Elevation
Required Elevation

Monitoring Gauge Number	Max Consecutive Hydroperiod: Saturation within 12 Inches of Soil Surface: Percent of growing season and Dates																	
	WETS Table: Murfreesboro, NC Growing Season 3/9 - 11/6 (243 days)																	
	2015	Dates	% G.S.	2016	Dates	% G.S.	2017	Dates	% G.S.	2018	Dates	2019	Dates	2020	Dates	2021	Dates	Mean
9669819 (1)	14.0	4/11-5/14	5.8	97	3/9-6/13	39.9	103	3/14-6/26	42.4									**71.3**
9669784 (2)	9.1	4/15-5/6	3.7	53	9/3-10/25	21.8	59	4/23-6/20	24.3									**40.4**
1272305 (3)	12.8	6/25-7/25	5.2	64	9/1-11/3	26.3	103	3/14-6/24	42.4									**59.9**
1303319 (4)	12.8	6/25-7/25	5.2	65	8/30-11/2	26.7	102	3/13-6/22	42.0									**59.9**
10610204 (5)	24.7	6/4-8/2	10.2	99	3/9-6/15	40.7	120	3/9-7/6	49.4									**81.2**
2250033 (6)	14.0	6/25-7/28	5.8	97	3/9-6/13	39.9	103	3/14-6/24	42.4									**71.3**
1126651 (7)	23.5	6/2-7/28	9.7	98	3/9-6/14	40.3	110	3/9-6/26	45.3									**77.2**
1126652 (8)	14.0	6/25-7/28	5.8	98	3/9-6/14	40.3	109	3/9-6/25	44.9									**73.7**
2238368 (9)	11.5	4/15-5/12	4.7	98	3/9-6/14	40.3	113	3/9-6/29	46.5									**74.2**
2238372 (Ref)	1.2	6/4-6/6	0.5	2	10/2-10/3	0.8	29	3/9-4/6	12.0									**1.1**
Precip Total	30.02			63.84			54.68											
Within 30%/70% Range?	**Y**			**N**			**N**											

30/70 Range adjusted to match data collection period.

Meets or exceeds success criteria

N/A Not available - Gage pulled or yet to be installed by this phase

M Malfunction, Data Overwritten or Unretrievable

Appendix F

Year 3 Comments and Responses
USACE Permit Needs Determination

ROY COOPER
Governor

MICHAEL REGAN
Secretary

Mitigation Services
ENVIRONMENTAL QUALITY

Ashby Brown
ALBEMARLE RESTORATIONS, LLC
P.O. Box 176
Fairfield, NC 27826

12/5/2017
Sent via e-mail (ashbybrown@woodswaterandwildlife.com)

RE: Hofler MY3
Contract #004628
Project # 95355

Ashby,

On November 27, 2017, the Division of Mitigation Services (DMS) received the Draft Monitoring Report for Hofler. A site visit will occur later in the 2018-19 growing season when I am in the area.

After reviewing the document, please provide a written response to comment and make the relevant updates. You may submit 3 copies of the updated deliverable when complete:

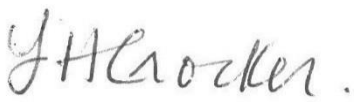
- Update our Agency name to 'Department of Environmental Quality' on the cover page.
- *The change has been made.*
- As a note to the provider, the Goals listed in your Monitoring Report are only one portion of the Goals listed in your Mitigation Plan. May want to include all goals OR just list the project objectives which are more specific to the project in the future.
- *The monitoring report has been edited to state the project objectives as suggested.*
- Page 2. Reference Gauge description in Design Approach, it was noted in the two previous DMS comment letters that a suitable non-riparian hardwood or wetland flat reference gauge would be desirable. Because Albermarle has abandoned the initial pine flat reference gauge because it did not meet wetland hydrology and the alternative location for a wetland reference was vandalized, suggest re-installing reference and checking gauges at least every 2 months. It is highly recommended that the provider download these gauges at shorter frequency. Check with the manufacturer to see if reference gauge data can be captured and insert into report if possible.
- *All gauges, including the reference gauge, are typically downloaded on a quarterly basis. The data from the reference gauge at Merchant's Millpond was recovered and appears to be valid. It was corrected and plotted from 3/8/17 when it was deployed, until 8/6/17, the end of valid air pressure data available for correction of the raw gauge data. The chart is included in the final report.*
- Page 2. Project Performance paragraph 2- You describe that the hydrology matches the rainfall data which is not the case. All gauges met hydrology in the first part of the growing season as it typical of a wetland system due to antecedent non-growing season conditions. Please remove statement or update to indicate hydrology was met in early part of growing season and decreased in summer.
- *(This is now the second paragraph on page 3) During the period prior to the growing season, Jan-March, rainfall was below average as shown on the rainfall chart on page 23. Most of the gauges reflected this in a fall-off of water level during February and a sharp drop at or near the end of March. Rainfall picked up in April and the gauges show a quick turn-around. Rainfall remained above average for the spring through mid-summer and the hydrology matches that pattern. Rainfall*

in June tapered off to a total of .13" after the 20th of the month and the gauges reflect that sharp fall off. A nearly 6" rainfall event on July 6th recharged the groundwater, which again is reflected by the hydrographs by a sharp increase in water levels at that time. Included after these comments is the chart for Gauge 1 with daily rainfall events added, which shows just how sensitive water levels are to rainfall and how closely hydrology and rainfall match. Wording in the report has been edited to help clarify this relationship.

- Appendix E. Hydrologic data. Please update all years to include hydroperiod percentages (you can do this by providing one extra column in each year to show hydrology).
- *The requested data has been added to the Hydrology Summary Table in Appendix E.*
- Hydrology Data: Appendix E only includes data up until 7/10/2017. The provider is contracted to monitor each gauge the entire growing season. As such, this deliverable is incomplete. Please coordinate with gauge company to determine how to retrieve all the relevant data. If it is irretrievable, then DMS will need to evaluate how the IRT will view this growing season without a full year's worth of data. It is noted and favorable that the site met hydrologic criteria without the entire growing season.
- *The data sets beyond the end of July were either mostly incomplete or were empty, i.e. there was no usable data recovered. Discussions with Onset were inconclusive, but suggest the proper download procedure may not have been followed in July which prevented a proper relaunch of the loggers.*
- When the gauges are re-launched, please set them up to read only one time per day.
- *The gauges will be set to take one reading per 24-hour period.*

Although the provider was paid for the MY2 task in 2016, site credit was withheld during the 2017 IRT credit release meeting. As such, DMS will withhold payment for the MY3 task until the 2018 credit release meeting when the IRT release of MY2 and MY3 credits will determine how the provider may invoice for MY3 task, per RFP 16-004103.

Thank you for your work!



Lindsay Crocker
DMS

High Concern:				Low/Moderate Concern:	
Vines	**Genus/Species**	**Shrubs/Herbs**	**Genus/Species**	**Shrubs/Herbs**	**Genus/Species**
Kudzu	*Pueraria lobata*	*Japanese Knotweed*	Polygonum cuspidatum	Japanese Privet	Ligustrum Japonicum
Porcelain Berry	Ampelopsis brevipeduncu	Oriental Bittersweet	Celastrus orbiculatus	Glossy Privet	Ligustrum lucidum
Japanese Honeysuckle	Lonicera japonica	Multiflora Rose	Rosa multiflora	Fescue	Festuca spp.
Japanese Hops	Humulus japonicus	Russian olive	Elaeagnus angustifolia	English Ivy	Hedera helix
Wisterias	Wisteria spp.	Chinese Privet	Ligustrum sinense	Microstegium	Microstegium vimineum
Winter Creeper	Euonymus fortunei	Chinese Silvergrass	Miscanthus sinensis	Burning Bush	Euonymus alatus
Bush Killer (Watch List)	Cayratia japonica	Phragmites	Phragmites australis	Johnson Grass	Sorghum halepense
		Bamboos	Phyllostachys spp	Bush Honeysuckles	Lonicera, spp.
Trees		Sericea Lespedeza	Sericea Lespedeza	Periwinkles	Vinca minor
Tree of Heaven	Ailanthus altissima	Garlic Mustard (Watch List)	Alliaria petiolata	Morning Glories	Morning Glories
Mimosa	Albizia julibrissin	Cogon Grass (Watch List)	Imperata cylindrica	Bicolor Lespedeza (Watch List)	Lespedeza bicolor
Princess Tree	Paulownia tomentosa	Giant Reed (Watch List)	Arundo donax	Chinese Yams (Watch List)	Dioscorea oppositifolia
China Berry	Melia azedarach	Tropical Soda Apple (Watch List)	Solanum viarum	Air Potato (Watch List)	Dioscorea bulbifera
Callery Pear	Pyrus calleryana	Japanese Spirea (Watch List)	Spiraea japonica	Japanese Climbing Fern (Watch List)	Lygodium japonicum
White Mulberry	Morus alba	Japanese Barberry (Watch List)	Berberis thunbergii		
Tallow Tree (Watch List)	Triadica sebifera				

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

July 21, 2014

Regulatory Division

Re: NCIRT Review and USACE Approval of the Hofler Property Wetland Mitigation Site Plan; SAW-2012-01393; NCEEP Project # 95355

Mr. Tim Baumgartner
North Carolina Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Dear Mr. Baumgartner:

The purpose of this letter is to provide the North Carolina Ecosystem Enhancement Program (NCEEP) with all comments generated by the North Carolina Interagency Review Team (NCIRT) during the 30-day comment period for the the Hofler Property Wetland Mitigation Site Plan, which was reposted and closed on April 5, 2014. These comments are attached for your review.

This mitigation plan was originally posted in January, 2014. Comments posted identified numerous concerns with the projects (see attached memo). Because of these comments, the plan was revised in March 2014, and reposted on March 6, 2014 for a second review. The deadline for comments was April 5, 2014. An initial review of the comments revealed that many of the comments from the first round of comments had not been addressed in the March mitigation plan revision.

Prior to making a determination as to whether to approve this project, a third copy of the mitigation plan, dated May 2014, was received on May 29, 2014. This plan has subsequently been reviewed in light of the comments provided by NCIRT members during the review. Most of the comments have been addressed in the recent version of the plan, including concerns regarding well placement, vegetation plots, appropriate hydroperiod, and the proposed species list for planting. Based on these modifications, we have determined that major concerns identified with the Draft Mitigation Plan have been addressed, and the mitigation plan is considered approved with this correspondence.

Nevertheless, we believe it is important to note that the location and method of construction at the proposed site are not preferred, and effort should be made to avoid this type of project in the future. As a general rule, we do not believe that building berms around a restored wetland is an appropriate way to reestablish hydrology on a site. To begin with, this is not true restoration as you are establishing an entirely new hydrology regime on the site. Water flow into and out of the wetland is severely restricted by the berms, and the outflow elevation for the entire site is controlled by "ditch plugs/check dams" (see discussion on page 23 of the mitigation plan dated May 2014). In addition, there is the potential that

berms may be breached in the future though natural or anthropogenic means, which could affect the hydrology of the entire site. Lastly, constructing a wetland site in the middle of an agricultural field is not ideal as it drastically limits the connection between the site and forested wetlands adjacent to or downstream from the project. In this case, water flowing from the site must travel through more than ¼ mile of ditch before it reaches the forested headwaters of Lassiter Swamp, limiting the benefit of the project and the ability of the site to fully achieve the stated goals of the mitigation plan.

The Final Mitigation Plan is to be submitted with the Preconstruction Notification (PCN) Application for Nationwide permit approval of the project along with a copy of this letter. All changes made to the Final Mitigation Plan should be summarized in an errata sheet included at the beginning of the document. As it was determined that the project does not contain jurisdictional waters of the U.S., construction for the project does not require a Department of the Army permit; however, you must still provide a copy of the Final Mitigation Plan, along with a copy of this letter, to the appropriate USACE field office at least 30 days in advance of beginning construction of the project. Please note that this approval does not preclude the inclusion of permit conditions in the permit authorization for the project. Additionally, this letter provides initial approval for the Mitigation Plan, but this does not guarantee that the project will generate the requested amount of mitigation credit. As you are aware, unforeseen issues may arise during construction or monitoring of the project that may require maintenance or reconstruction that may lead to reduced credit.

Thank you for your prompt attention to this matter, and if you have any questions regarding this letter, the mitigation plan review process, or the requirements of the Mitigation Rule, please call me at 919-846-2564.

Sincerely,

TUGWELL.TODD.JASON.1048429293
2014.07.21 14:23:23 -04'00'

Todd Tugwell
Special Projects Manager

Enclosures

Electronic Copies Furnished:

NCIRT Distribution List
NCEEP/Heather Smith
NCEEP/Lin Xu

Ed Temple

From: Smith, Heather [heather.c.smith@ncdenr.gov]
Sent: Monday, July 21, 2014 3:24 PM
To: edtemple@vol.com
Subject: FW: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Categories: Red Category

Ed,

Here is the clarification email.

Sincerely,

Heather Smith
Eastern Project Manager
Ecosystem Enhancement Program
919-707-8496
heather.c.smith@ncdenr.gov

Physical Address:
217 West Jones St., 3rd Floor, Suite 3000A, Raleigh, N.C. 27603

Mailing address:
1652 Mail Service Center, Raleigh, N.C. 27699-1652.

Parking and visitor access information is available on the EEP website.

-----Original Message-----
From: Tugwell, Todd SAW [mailto:Todd.Tugwell@usace.army.mil]
Sent: Monday, July 21, 2014 3:17 PM
To: Baumgartner, Tim
Cc: Smith, Heather
Subject: RE: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

No, that was an oversight. No need for a PCN.

Todd

-----Original Message-----
From: Baumgartner, Tim [mailto:tim.baumgartner@ncdenr.gov]
Sent: Monday, July 21, 2014 3:02 PM
To: Tugwell, Todd SAW
Cc: Smith, Heather
Subject: [EXTERNAL] RE: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Todd,

Thanks for the letter. We are a little confused. The last paragraph of the letter says to submit a PCN. There is no PCN needed for the project because the site is not currently jurisdictional. Do they submit a PCN anyway or was this an oversight?

Thanks
Tim

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Tim Baumgartner, CPESC

Deputy Director of Operations

Ecosystem Enhancement Program

Department of Environment and Natural Resources

Office - 919-707-8543

Cell - 919-218-2557

From: Tugwell, Todd SAW [mailto:Todd.Tugwell@usace.army.mil]
Sent: Monday, July 21, 2014 2:43 PM
To: Baumgartner, Tim
Cc: Xu, Lin; Smith, Heather; Fritz Rohde (Fritz.Rohde@noaa.gov); Chapman, Amy; Baker, Virginia; Beter, Dale E SAW; Biddlecome, William J SAW; bowers.todd@epa.gov; Crumbley, Tyler SAW; Karoly, Cyndi; Cox, David R.; Hall, Dolores; Emily Jernigan@fws.gov; Alsmeyer, Eric C SAW; Kulz, Eric; Gibby, Jean B SAW; Greer, Emily C SAW; Jones, Scott SAW; Higgins, Karen; Kathryn Matthews@fws.gov; Marella Buncick (Marella Buncick@fws.gov); McLendon, Scott C SAW; Gledhill-earley, Renee; Sollod, Steve; Wilson, Travis W.; Wheeler, Tracey L SAW; Wicker, Henry M JR SAW
Subject: NCEEP Draft Mitigation Plan Approval Letter with Comment Memo / Hofler Property Wetland Mitigation Project / Gates County / SAW-2012-01393 (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

Mr. Baumgartner,

Attached is the approval letter for the Draft Mitigation Plan for the Hofler Mitigation Project, along with all the comments that were generated during the IRT's review of the project on the Mitigation Plan Review Portal. Please note that this letter approves the Draft Mitigation Plan. The site was determined to have no waters of the U.S., so a permit is not required for construction; however, a copy of the final mitigation plan should be provided at least 30 days prior to construction on site. Also, please ensure that the Final Mitigation Plan is posted to NCEEP's documents portal so that all members of the IRT have access to the Final plan.

Please let me know if you have any questions about the process or the attached letter.

Todd Tugwell

Special Projects Manager

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Wilmington District

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(919) 846-2564

Classification: UNCLASSIFIED

Caveats: NONE

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