Mitigation Project Name	Stanley's Slough Stream and Wetland Site	County	Northampton	USACE Action ID	2012-01918
DMS ID	95356	Date Project Instituted	8/1/2012	NCDWR Permit No	2013-0596
River Basin	Chowan	Date Prepared	5/22/2018		
Cataloging Unit	03010204				

Credit Release Milestone	Stream Credits						Wetland Credits							
	Scheduled Releases (Stream)	Warm	Cool	Cold	Anticipated Release Year (Stream)	Actual Release Date (Stream)	Scheduled Releases (Forested)	Riparian Riverine	Riparian Non-riverine	Non-riparian	Scheduled Releases (Coastal)	Coastal	Anticipated Release Year (Wetland)	Actual Release Year (Wetland)
Potential Credits (Mitigation Plan)		4,274.000						3.120						
Potential Credits (As-Built Survey)		4,274.000						3.120						
1 (Site Establishment)	N/A	N/A			N/A	N/A	N/A	N/A			N/A		N/A	N/A
2 (Year 0 / As-Built)	30%	1,282.200			2014	7/2/2014	30%	0.936			30%		2014	7/2/2014
3 (Year 1 Monitoring)	10%	427.400			2015	4/23/2015	10%	0.312			10%		2015	4/23/2015
4 (Year 2 Monitoring)	10%	427.400			2016	4/28/2016	10%	0.312			15%		2016	4/28/2016
5 (Year 3 Monitoring)	10%	427.400			2017	4/3/2017	15%	0.468			20%		2017	4/3/2017
6 (Year 4 Monitoring)	5%	213.700			2018	4/25/2018	5%	0.156			10%		2018	4/25/2018
7 (Year 5 Monitoring)	10%				2019		15%				15%		2019	
8 (Year 6 Monitoring)	5%				2020		5%				N/A		2020	
9 (Year 7 Monitoring)	10%				2021		10%				N/A		2021	
Stream Bankfull Standard	10%	427.400			2017	4/3/2017	N/A				N/A			
Total Credits Released to Date		3,205.500						2.184						

DEBITS (released credits only)

Ratios	1	1.5	2.5	5	1.15385	3	2	5	1	3	2	5	1	3	2	5
	Stream Restoration	Stream Enhancement I	Stream Enhancement II	Stream Preservation	Riparian Restoration	Riparian Creation	Riparian Enhancement	Riparian Preservation	Nonriparian Restoration	Nonriparian Creation	Nonriparian Enhancement	Nonriparian Preservation	Coastal Marsh Restoration	Coastal Marsh Creation	Coastal Marsh Enhancement	Coastal Marsh Preservation
As-Built Amounts (feet and acres)	4,274.000				3.600											
As-Built Amounts (mitigation credits)	4,274.000				3.120											
Percentage Released	75%				70%											
Released Amounts (feet / acres)	3,205.500				2.520											
Released Amounts (credits)	3,205.500				2.184											
NCDWR Permit / USACE Action ID / Project Name																
Remaining Amounts (feet / acres)	3,205.500				2.520											
Remaining Amounts (credits)	3,205.500				2.184											

Contingencies (if any): None

Signature of Wilmington District Official Approving Credit Release

9/6/18
Date

1 - For DMS, no credits are released during the first milestone
2 - For DMS projects, the second credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the NCIRT by posting it to the NCEEP Portal, provided the following criteria have been met:
1) Approval of the final Mitigation Plan
2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan
4) Reciept of necessary DA permit authorization or written DA approval for porjects where DA permit issuance is not required

3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met

Mitigation Project Name	Stanley's II		County	Northampton		USACE Action ID	2012-01918
DMS ID	95838		Date Project Instituted	4/17/2013		NCDWR Permit No	2013-0596
River Basin	Chowan		Date Prepared	5/22/2018			
Cataloging Unit	03010204						

Credit Release Milestone	Stream Credits						Wetland Credits							
	Scheduled Releases (Stream)	Warm	Cool	Cold	Anticipated Release Year (Stream)	Actual Release Date (Stream)	Scheduled Releases (Forested)	Riparian Riverine	Riparian Non-riverine	Non-riparian	Scheduled Releases (Coastal)	Coastal	Anticipated Release Year (Wetland)	Actual Release Date (Wetland)
Potential Credits (Mitigation Plan)									6.940					
Potential Credits (As-Built Survey)									6.940					
1 (Site Establishment)	N/A				N/A	N/A	N/A		N/A		N/A		N/A	N/A
2 (Year 0 / As-Built)	30%				N/A	N/A	30%		2.082		30%		2014	7/2/2014
3 (Year 1 Monitoring)	10%				N/A	N/A	10%		0.694		10%		2015	4/23/2015
4 (Year 2 Monitoring)	10%				N/A	N/A	10%		0.694		15%		2016	4/28/2016
5 (Year 3 Monitoring)	10%				N/A	N/A	15%		1.041		20%		2017	10/20/2017
6 (Year 4 Monitoring)	5%				N/A	N/A	5%		0.347		10%		2018	4/25/2018
7 (Year 5 Monitoring)	10%				N/A	N/A	15%				15%		2019	
8 (Year 6 Monitoring)	5%				N/A	N/A	5%				N/A		2020	
9 (Year 7 Monitoring)	10%				N/A	N/A	10%				N/A		2021	
Stream Bankfull Standard	10%						N/A				N/A			
Total Credits Released to Date									4.858					

DEBITS (released credits only)

Ratios	1	1.5	2.5	5	1.0951	3	2	5	1	3	2	5	1	3	2	5
	Stream Restoration	Stream Enhancement I	Stream Enhancement II	Stream Preservation	Riparian Restoration	Riparian Creation	Riparian Enhancement	Riparian Preservation	Nonriparian Restoration	Nonriparian Creation	Nonriparian Enhancement	Nonriparian Preservation	Coastal Marsh Restoration	Coastal Marsh Creation	Coastal Marsh Enhancement	Coastal Marsh Preservation
As-Built Amounts (feet and acres)					7.600											
As-Built Amounts (mitigation credits)					6.940											
Percentage Released					0.700											
Released Amounts (feet / acres)					5.320											
Released Amounts (credits)					4.858											
NCDWR Permit / USACE Action ID / Project Name																
Remaining Amounts (feet / acres)					5.320											
Remaining Amounts (credits)					4.858											

Contingencies (if any): None

Signature of Wilmington District Official Approving Credit Release

9/6/18
Date

1 - For DMS, no credits are released during the first milestone
2 - For DMS projects, the second credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the NCIRT by posting it to the NCEEP Portal, provided the following criteria have been met:
1) Approval of the final Mitigation Plan
2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan
4) Reciept of necessary DA permit authorization or written DA approval for porjects where DA permit issuance is not required

3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met

Monitoring Report

Stanley's Slough Stream and Wetland Restoration Site
DMS Contract 004635
DMS Project Number 95356

Stanley's II Wetland Restoration Site
DMS Contract 5151
DMS Project Number 95838

Northampton County, NC
CU# 03010204
DWR# 2013-0596
SAW# 2012-01918

Monitoring Year 05

Prepared for:
NCDMS, 1652 Mail Service Center, Raleigh, NC 27699-1652

Construction Completed: April 2014
Data Collection: 2018
Submitted: December 2018

Design and Monitoring Firm

4505 Falls of Neuse Road
Suite 400
Raleigh, NC 27609
Phone: (919) 278-2514
Fax: (919) 783-9266

Project Contact: Tim Morris
Email: tim.morris@kci.com
KCI Project No: 20122005

KCI ASSOCIATES OF NORTH CAROLINA, PA

ENGINEERS • SCIENTISTS • SURVEYORS • CONSTRUCTION MANAGERS

4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 (919) 783-9214 (919) 783-9266 Fax

MEMORANDUM

Date: January 23, 2019
To: Lindsay Crocker, DMS Project Manager
From: Adam Spiller, Project Manager
KCI Associates of North Carolina, PA
Subject: MY-05 Monitoring Report Comments
Stanley's Slough IMS#95356, Contract 004635
Stanley's Slough II, IMS#95838, Contract 005151
Chowan River Basin CU 03010204
Northampton County, North Carolina

Please find below our responses in italics to the MY-05 Monitoring Report comments from NCDMS received on January 9, 2019, for the Stanley's Slough/Stanley's II Restoration Sites.

- The report meets contract requirements and DMS does not require any changes to the report for submittal. The only question of note is does KCI have any way to salvage the malfunction data for the Gauge 7 which would likely result in that gauge meeting performance because of the wet summer? The only missing digital deliverable is the CVS data file.

➢ *There is no way to salvage the data from Gauge 7. The battery on this gauge died during the growing season and so it stopped recording for the last 69 days of the growing season. The CVS data file has been provided with the updated digital submission.*

Sincerely,

Adam Spiller
Project Manager

Table of Contents

1.0 EXECUTIVE SUMMARY / PROJECT ABSTRACT

The Stanley's Slough Stream and Wetland Restoration Site (SSS) was completed in April 2014 and restored a total of 4,274 linear feet of headwater stream along with restoring 3.6 acres of riparian wetlands. The SSS is a headwater stream and riparian wetland system in the Chowan River Basin (03010204 8-digit HUC) in northern Northampton County, North Carolina, that had been substantially modified to maximize agricultural production. The Stanley's II Wetland Restoration Site (SII) is located directly adjacent to SSS and was also completed in April 2014, restoring a total of 7.6 acres of riparian wetland. The completed SII project restored, enhanced, and protected wetlands within a productive headwater stream/wetland system.

The SSS is protected by a 17.6-acre permanent conservation easement, while SII is protected by a 9.4-acre permanent conservation easement, both held by the State of North Carolina. Both sites are located on two parcels located off of Margarettsville Road, approximately 0.3 mile north of Margarettsville, North Carolina. The project sites are bounded by NC 186 to the south and by agricultural land on all other sides. The sites have a long history of hydrologic modification in order to allow for farming to take place on the property.

The Chowan River Basin Restoration Priorities state the goals for the SSS and SII's 14-digit HUC are to protect and improve water quality throughout the basin by reducing sediment and nutrient inputs into streams and rivers and to support efforts to restore local watersheds (NCDENR EEP, 2009). The project goals for SSS and SII are in line with the basin priorities and include the following:

- Restore streams and riparian buffers to provide shade and temperature control and increase instream woody debris for habitat.
- Restore and protect sensitive aquatic resources to improve habitat and species diversity through the restoration of wetlands, streams, and riparian buffers.
- Implement wetland and stream restoration projects that reduce sources of nutrient pollution and surface runoff by restoring hydrology and vegetation, stabilizing banks, and restoring natural geomorphology where appropriate.

Additional goals for the project include:

- Increase the local hydroperiod by encouraging both surface and subsurface storage and retention.
- Restore and establish a functional and diverse headwater stream/wetland community.

The project goals will be addressed through the following objectives:

- Restore a headwater stream/wetland vegetation community through maintenance and germination of volunteer wetland vegetation from adjacent seed sources, planting of native trees and shrubs, and incorporation of a custom native seed mix.
- Elevate the local groundwater table through the elimination of lateral drainage ditches and modification of existing channelized streams.
- Reconnect site hydrology to historic flow paths.

The mitigation at SSS included approximately 4,274 linear feet of stream restoration, 3.6 acres of riparian wetland restoration, and 0.5 acre of wetland preservation for a total of 4,274 Stream Mitigation Units and 3.1 Wetland Mitigation Units. The mitigation at SII included approximately 7.6 acres of riparian wetland restoration for a total of 6.9 Wetland Mitigation Units.

2.0 MONITORING RESULTS

2.1 Vegetation Monitoring Results

The vegetation monitoring success criterion for the planted mitigation area is a density of 320 stems/acre after the third year of monitoring and an allowance for 10% mortality in the following years for a stem density of 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, twenty permanent vegetation monitoring plots (10 by 10 meters) have been established in the mitigation area at locations that represent all site conditions. Eleven of these plots are in SSS and nine of these are in SII. The site's average density for this monitoring period was 1,012 planted stems/acre. All twenty plots had greater than 260 planted stems/acre. Including volunteers, the site averaged 1,787 total stems/acre. In April 2016, KCI performed a supplemental planting of the site to address areas of low stem density due to prolonged inundation. Gallon and bare root size *Taxodium distichum* and bare root size *Nyssa biflora* were planted throughout the stream rehabilitation portion of the site in areas that have extended periods of standing water. These supplemental planting areas are depicted in the Current Condition Plan View (CCPV).

The CVS-EEP protocol, Level 2 (Lee, et al., 2008) was used to collect vegetation data from the site. The vegetation monitoring was completed on July 17, 2018.

2.2 Hydrology Monitoring Results

Twelve groundwater monitoring gauges were installed in the wetland mitigation areas to measure soil saturation and any surface ponding at the site. Four of these gauges are in SSS and eight of these are in SII. The soil survey for Northampton County estimates that the growing season begins March 28 and ends November 7 (224 days). The success criteria for the site states that the water table of the restored wetlands must be within 12" of the soils surface continuously for at least 9% (20 days) of the 224-day growing season during normal weather conditions. A "normal" year is based on NRCS climatological data for Northampton County, and 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" (Sprecher and Warne, 2000). At the beginning of the 2018 growing season, KCI installed three additional groundwater monitoring gauges in the SSII area of the site.

The daily rainfall data was obtained from a local weather station in Emporia, VA; provided by the NC State Climate Office. For the 2018-year, the months of June, August, October, and November experienced above average rainfall, while April, July, and September experienced average rainfall. The months of January, February, March, and May recorded below average rainfall for the site. Overall, the area experienced average rainfall during the 2018 growing season.

During the site's fifth growing season, thirteen of the fifteen gauges met the success criterion. The gauges that did not meet are Gauges 7 and 20, which had a continuous saturation percentage of 8.0% and 7.1% respectively. These gauges are located in SII. The winter and spring seasons at the beginning of 2018 were particularly dry. During typical climatic years for this site, that time of year is wet and promotes wetland hydrology during the spring part of the growing season. Even with above average rainfall in the second half of the growing season, it is not unsurprising to see that these two gauges did not meet the criteria given how dry the first half of the year was.

2.3 Headwater Stream Performance

SSS will also be monitored to document the development of the headwater stream system. The success criteria for the headwater stream states that it will have continuous surface water flow within the valley,

for at least 30 consecutive days annually. Additionally, the stream must show signs of supporting the restored channel form as documented with photos. These indicators may include evidence of scour, sediment deposition and sorting, multiple flow events, wrack lines and flow over vegetation, leaf litter, or water staining. At a meeting with the IRT in 2018, it was requested that the relic berm along the stream in the wooded portion of SSS be broken up more than it already was, in order to encourage the continued development of a braided system. KCI plans to complete this work in 2019.

In the headwater stream, six automatic recording gauges were installed to document the presence of surface water within the restored channel. Weirs were constructed just downstream of three (Gauges 2, 3 and Gauge 18) of these gauges to provide a known elevation at which the stream could be considered flowing. Using these elevations as the basis for flow, all three gauges achieved at least 30 consecutive days of flow. Gauges 2 and 3 (on T1) averaged 112 consecutive days of flow between them and Gauge 18 (on T2) achieved 41 consecutive days of flow. See Appendix D, Photo 2 for an example of these weirs.

Summary information/data related to the occurrence of items such as encroachment and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Baseline Monitoring Report and in the Mitigation Plan documents available on the DMSs website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

3.0 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)

NCDENR, Ecosystem Enhancement Program. 2009. Chowan River Basin Restoration Priorities 2009. Raleigh, NC. http://www.nceep.net/services/restplans/FINAL_RBRP_Chowan_2009.pdf

Sprecher, S. W., and Warne, A. G. (2000). "Accessing and Using Meteorological Data to Evaluate Wetland Hydrology," ERDC/EL TR-WRAP-00-1, U.S. Army Engineer Research and Development Center, Vicksburg, MS.USACE. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

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

United States Department of Agriculture. 1994. Soil Survey of Northampton County, North Carolina. USDA, NCDENR, SCS. http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/north_carolina/NC131/0/northampton.pdf

Appendix A

Project Vicinity Map and Background Tables

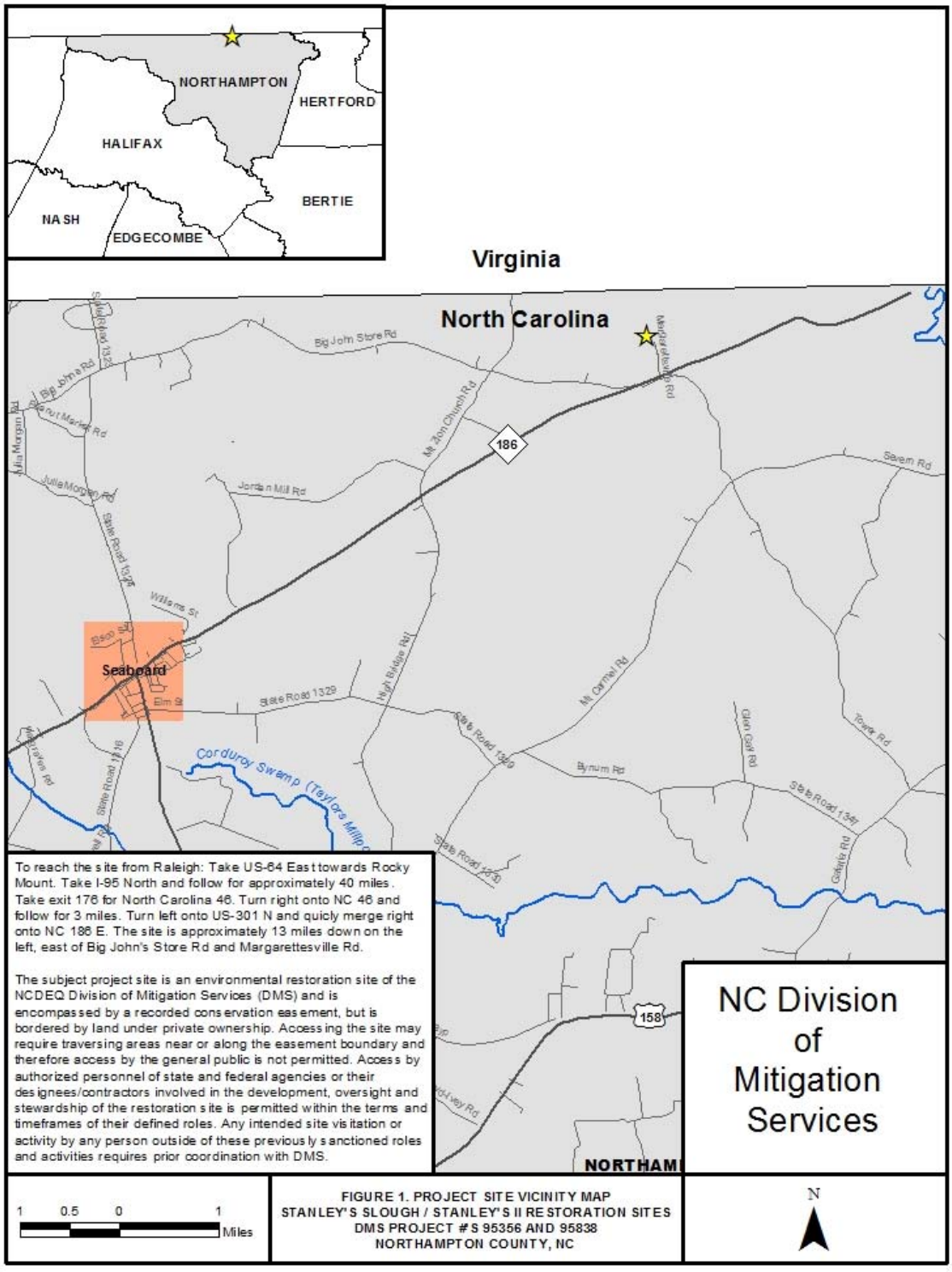


FIGURE 1. PROJECT SITE VICINITY MAP
STANLEY'S SLOUGH / STANLEY'S II RESTORATION SITES
DMS PROJECT #'S 95356 AND 95838
NORTHAMPTON COUNTY, NC

Table 1a. Project Components and Mitigation Credits
Stanley's Slough Restoration Site, DMS Project #95356

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Length	4,274		3.59						
Credits	4,274		3.12						
TOTAL CREDITS	4,274		3.12						

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage/Acreage	Mitigation Ratio
T1	10+00 – 41+55	2,600	Headwater Stream Valley	Restoration	3,054	1:1
T2	50+00 – 62+85	1,220	N/A	Restoration	1,220	1:1
Wetland Reestablishment				Restoration	2.81	1:1
Wetland Rehabilitation				Restoration	0.78	2.5:1
Wetland Preservation				N/A	0.52	NA

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetlands (Acres)	Non-Riparian Wetlands (Acres)	Buffer (square feet)	Upland (Acres)
Restoration	4,274	3.12			
Enhancement I					
Enhancement II					
TOTAL SMU	**4,274**				
TOTAL WMU		**3.12**			

Table 1b. Project Components and Mitigation Credits
Stanley's Slough II Restoration Site, DMS Project #95838

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Length			7.60						
Credits			6.94						
TOTAL CREDITS									

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage/Acreage	Mitigation Ratio
Wetland Reestablishment				Restoration	6.50	1:1
Wetland Rehabilitation				Restoration	1.10	2.5:1

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetlands (Acres)		Non-Riparian Wetlands (Acres)	Buffer (square feet)	Upland (Acres)	
		Riverine	Non-Riverine				
Restoration		-	7.60				
Enhancement I							
Enhancement II							
TOTAL WMU			**6.94**				

Table 2. Project Activity & Reporting History Stanley's Slough & Stanley's II Restoration Sites		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan		Aug 13
Final Design - Construction Plans		Oct 13
Construction		April 14
Planting		April 14
Baseline Monitoring/Report	May 2014	May 2014
Vegetation Monitoring	May 19, 2014	
Photo Points	April 17, 2014	
Year 1 Monitoring	Nov 2014	Dec 2014
Vegetation Monitoring	Oct 23, 2014	
Photo Points	Nov 20, 2014	
Gauge Downloads	Nov 24, 2014	
Year 2 Monitoring	Nov 2015	Dec 2015
Vegetation Monitoring	July 10, 2015	
Photo Points	July 10, 2015	
Gauge Downloads	Nov 10, 2015	
Supplemental Planting		April 2016
Year 3 Monitoring	Dec 2016	Dec 2016
Vegetation Monitoring	July 27, 2016	
Photo Points	Aug 19, 2016	
Gauge Downloads	Dec 13, 2016	
Year 4 Monitoring	Dec 2017	Jan 2018
Photo Points	Dec 12, 2017	
Gauge Downloads	Nov. 27, 2017	
Year 5 Monitoring	Dec 2018	Dec 2018
Vegetation Monitoring	July 17, 2018	
Photo Points	Aug. 31, 2018	
Gauge Downloads	Dec. 6, 2018	

Table 3. Project Contacts Stanley's Slough & Stanley's Slough II Restoration Sites	
Design Firm	KCI Associates of North Carolina, PA 4505 Falls of Neuse Rd. Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor	Wright Contracting, LLC 160 Walker Road Lawndale, NC 28090 Contact: Mr. Stephen James Phone: (704) 692-4633
Planting Contractor	Forestree Management Co. 1280 Maudis Road Bailey, NC 27807 Contact: Mr. Tony Cortez Phone: (252) 243-2513
Monitoring Performers	
	KCI Associates of North Carolina, PA 4505 Falls of Neuse Rd. Suite 400 Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266

Table 4a. Project Information			
Stanley's Slough Restoration Site, DMS Project #95356			
Project Name	Stanley's Slough Restoration Site		
County	Northampton County		
Project Area (acres)	17.6 acres		
Project Coordinates (lat. and long.)	36.539006 N, -77.348222 W		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	Chowan		
USGS Hydrologic Unit 8-digit	03010204	**USGS Hydrologic Unit 14-digit**	03010204180040
DWQ Sub-basin	03-01-02		
Project Drainage Area (acres)	113 acres		
Project Drainage Area Percentage of Impervious Area	<1%		
CGIA Land Use Classification	43.7% forested land, 33.8% rangeland, 22.5% agriculture		

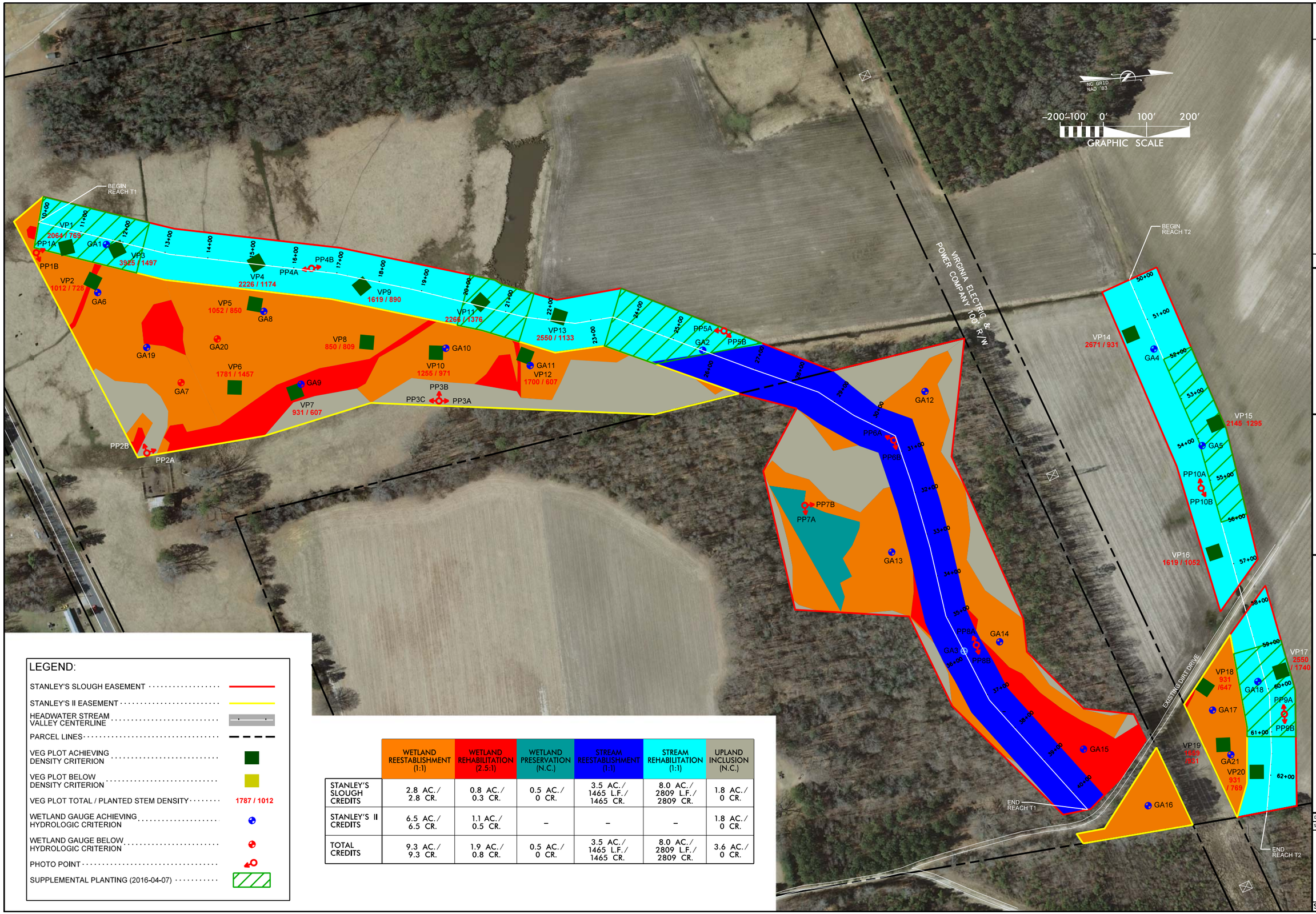
Reach Summery Information (Post Restoration)		
Parameters	**T1**	**T2**
Length of reach (linear feet)	3,054	1,220
Valley classification	Valley Type X	Valley Type X
Drainage area (acres)	84 acres	29 acres
NCDWQ Water Quality Classification	Project Reach Not Classified; Receiving water = Meherrin River (C; NSW)	Project Reach Not Classified; Receiving water = Meherrin River (C; NSW)
Morphological Description (stream type)	Headwater Stream Valley	Headwater Stream Valley
Evolutionary trend	Channelized	Channelized
Mapped Soil Series	Tomotley, Roanoke, Altavista, Wehadkee	Altavista, Roanoke
Drainage class	Poorly drained, poorly drained, moderately well drained, poorly drained	Moderately well drained, poorly drained
Soil Hydric status	Hydric	Hydric
Slope	0.2%	0.06%
FEMA classification	Zone X, parts in Zone AE(backwater of Meherrin River)	Zone X, parts in Zone AE (backwater of Meherrin River)
Native vegetation community	Headwater Forest Community	Headwater Forest Community
Percent composition of exotic invasive vegetation	0%	0%

Wetland Summary Information (Post Restoration)	
Parameters	
Size of Wetland (acres)	3.6 acres
Wetland Type	Riparian
Mapped Soil Series	Roanoke and Tomotley
Drainage class	Poorly drained
Soil Hydric Status	Hydric
Source of Hydrology	Hillside seepage and precipitation
Hydrologic Impairment	Ditching and Cattle damage
Native vegetation community	Headwater Forest Community
Percent composition of exotic invasive vegetation	0%

Table 4b. Project Information			
Stanley's II Restoration Site, DMS Project #95838			
Project Name	Stanley's II Restoration Site		
County	Northampton County		
Project Area (acres)	9.4 acres		
Project Coordinates (lat. and long.)	34.922569 N , -77.319871 W		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	Chowan		
USGS Hydrologic Unit 8-digit	03010204	**USGS Hydrologic Unit 14-digit**	03010204180040
DWQ Sub-basin	03-01-02		
Project Drainage Area (acres)	80 acres		
Project Drainage Area Percentage of Impervious Area	<1%		
CGIA Land Use Classification	53.0% forested land, 34.9% rangeland, 12.1% agriculture		
Wetland Summary Information (Post Restoration)			
Parameters			
Size of Wetland (acres)	7.6 acres		
Wetland Type	Riparian		
Mapped Soil Series	Tomotley, Roanoke		
Drainage class	Poorly Drained		
Soil Hydric Status	Hydric		
Source of Hydrology	Hillside seepage and precipitation		
Hydrologic Impairment	Ditching and Crops		
Native vegetation community	Headwater Forest Community		
Percent composition of exotic invasive vegetation	0%		

Appendix B

Visual Assessment Data



LEGEND:

- STANLEY'S SLOUGH EASEMENT
- STANLEY'S II EASEMENT
- HEADWATER STREAM VALLEY CENTERLINE
- PARCEL LINES
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- VEG PLOT TOTAL / PLANTED STEM DENSITY — 1787 / 1012
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION
- PHOTO POINT
- SUPPLEMENTAL PLANTING (2016-04-07)

	WETLAND REESTABLISHMENT (1:1)	WETLAND REHABILITATION (2.5:1)	WETLAND PRESERVATION (N.C.)	STREAM REESTABLISHMENT (1:1)	STREAM REHABILITATION (1:1)	UPLAND INCLUSION (N.C.)
STANLEY'S SLOUGH CREDITS	2.8 AC. / 2.8 CR.	0.8 AC. / 0.3 CR.	0.5 AC. / 0 CR.	3.5 AC. / 1465 L.F. / 1465 CR.	8.0 AC. / 2809 L.F. / 2809 CR.	1.8 AC. / 0 CR.
STANLEY'S II CREDITS	6.5 AC. / 6.5 CR.	1.1 AC. / 0.5 CR.	–	–	–	1.8 AC. / 0 CR.
TOTAL CREDITS	9.3 AC. / 9.3 CR.	1.9 AC. / 0.8 CR.	0.5 AC. / 0 CR.	3.5 AC. / 1465 L.F. / 1465 CR.	8.0 AC. / 2809 L.F. / 2809 CR.	3.6 AC. / 0 CR.

REVISIONS

SYM.	DESCRIPTION	DATE

NCDEQ DIVISION OF MITIGATION SERVICES

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
4505 FALLS OF NEUSE ROAD
RALEIGH, NORTH CAROLINA 27609

STANLEY'S SLOUGH / STANLEY'S II RESTORATION SITES

DMS PROJECT #95356 & 95838
NORTHAMPTON COUNTY, NORTH CAROLINA

MONITORING YEAR 05

DATE: DEC 2018
SCALE: GRAPHIC

CURRENT CONDITION PLAN VIEW

SHEET 1 OF 1

Table 5a. Vegetation Condition Assessment
Stanley's Slough Restoration Site, DMS Project #95356

Planted Acreage 8.74 **Easement Acreage 17.6**

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 acre	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 acre	Pattern and Color	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 acre	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).	1,000 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%

Table 5b. Vegetation Condition Assessment
Stanley's II Restoration Site, DMS Project #95838

Planted Acreage 8.57 **Easement Acreage 9.4**

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 acre	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 acre	Pattern and Color	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 acre	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).	1,000 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%

Vegetation Monitoring Plot Photos

Plot 1 – MY-05 – 7/17/18

Plot 2 – MY-05 – 7/17/18

Plot 3 – MY-05 – 7/17/18

Plot 4 – MY-05 – 7/17/18

Plot 5 – MY-05 – 7/17/18

Plot 6 – MY-05 – 7/17/18

Plot 7 – MY-05 – 7/17/18

Plot 8 – MY-05 – 7/17/18

Plot 9 – MY-05 – 7/17/18

Plot 10 – MY-05 – 7/17/18

Plot 11 – MY-05 – 7/17/18

Plot 12 – MY-05 – 7/17/18

Plot 13 – MY-05 – 7/17/18

Plot 14 – MY-05 – 7/17/18

Plot 15 – MY-05 – 7/17/18

Plot 16 – MY-05 – 7/17/18

Plot 17 – MY-05 – 7/17/18

Plot 18 – MY-05 – 7/17/18

Plot 19 – MY-05 – 7/17/18

Plot 20 – MY-05 – 7/17/18

Photo Reference Points

PP1a – MY-00 – 4/17/14

PP1a – MY-05 – 8/31/18

PP1b – MY-00 – 4/17/14

PP1b – MY-05 – 8/31/18

PP2a – MY-00 – 4/17/14

PP2a – MY-05 – 8/31/18

PP2b – MY-00 – 4/17/14

PP2b – MY-05 – 8/31/18

PP3a – MY-00 – 4/17/14

PP3a – MY-05 – 8/31/18

PP3b – MY-00 – 4/17/14

PP3b – MY-05 – 8/31/18

PP3c – MY-00 – 4/17/14

PP3c – MY-05 – 8/31/18

PP4a – MY-00 – 4/17/14

PP4a – MY-05 – 8/31/18

PP4b – MY-00 – 4/17/14

PP4b – MY-05 – 8/31/18

PP5a – MY-00 – 4/17/14

PP5a – MY-05 – 8/31/18

PP5b – MY-00 – 4/17/14

PP5b – MY-05 – 8/31/18

PP6a – MY-00 – 4/17/14

PP6a – MY-05 – 8/31/18

PP6b – MY-00 – 4/17/14

PP6b – MY-05 – 8/31/18

PP7a – MY-00 – 4/17/14

PP7a – MY-05 – 12/6/18

PP7b – MY-00 – 4/17/14

PP7b – MY-05 – 12/6/18

PP8a – MY-00 – 4/17/14

PP8a – MY-05 – 12/6/18

PP8b – MY-00 – 4/17/14

PP8b – MY-05 – 12/6/18

PP9a – MY-00 – 4/17/14

PP9a – MY-05 – 8/31/18

PP9b – MY-00 – 4/17/14

PP9b – MY-05 – 8/31/18

PP10a – MY-00 – 4/17/14

PP10a – MY-05 – 8/31/18

PP10b – MY-00 – 4/17/14

PP10b – MY-05 – 8/31/18

Appendix C

Vegetation Plot Data

Table 6. Vegetation Plot Criteria Attainment Stanley's Slough & Stanley's Slough II Restoration Sites			
Vegetation Plot ID	**Vegetation Survival Threshold Met?**	**Monitoring Year 05 Planted Stem Density (stems/acre)**	**Monitoring Year 05 Total Stem Density (stems/acre)**
Stanley's Slough			
1	Yes	769	2,064
3	Yes	1,497	3,925
4	Yes	1,174	2,226
9	Yes	890	1,619
11	Yes	1,376	2,266
13	Yes	1,133	2,550
14	Yes	931	2,671
15	Yes	1,295	2,145
16	Yes	1,052	1,619
17	Yes	1,740	2,550
20	Yes	769	931
Stanley's II			
2	Yes	728	1,012
5	Yes	850	1,052
6	Yes	1,457	1,781
7	Yes	607	931
8	Yes	809	850
10	Yes	971	1,255
12	Yes	607	1,700
18	Yes	648	931
19	Yes	931	1,659

Table 7. CVS Vegetation Plot Metadata Stanley's Slough & Stanley's Slough II Restoration Sites	
Report Prepared By	Drew Rosso
Date Prepared	7/27/2016 13:58
database name	KCI-2015-S.mdb
database location	M:\2012\20122005 Stanley FDP\Monitoring\Vegetation CVS Database
computer name	12-3ZV4FP1
file size	50548736
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	95356
project Name	Stanley's Slough
Description	Stream and Wetland Restoration Site
River Basin	Chowan
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	20

			Current Plot Data (MY5 2018)																														
			95356-01-0001			95356-01-0002			95356-01-0003			95356-01-0004			95356-01-0005			95356-01-0006			95356-01-0007			95356-01-0008			95356-01-0009			95356-01-0010		
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 negundo	boxelder	Tree																														
Acer rubrum	red maple	Tree										1	1	2				6	6	6			2						1			
Baccharis halimifolia	baccharis	Shrub																														
Betula nigra	river birch	Tree				5	5	5	4	4	4	2	2	2				5	5	5	2	2	2	8	8	9	10	10	10	3	3	3
Celtis laevigata	sugarberry	Tree																														
Diospyros virginiana	common persimmon	Tree				2	2	4																								
Fraxinus pennsylvanica	green ash	Tree				2	2	2				21	21	21	11	11	12	15	15	16	4	4	5	6	6	6				7	7	7
Ilex opaca	American holly	Tree																														1
Juniperus virginiana	eastern redcedar	Tree																														
Liquidambar styraciflua	sweetgum	Tree			12			3			21			9			2			5			5						4			3
Liriodendron tulipifera	tuliptree	Tree																														
Magnolia virginiana	sweetbay	Tree													1	1	1															
Nyssa biflora	swamp tupelo	Tree	1	1	1	6	6	6	2	2	2																					
Nyssa sylvatica	blackgum	Tree																									2	2	2			
Pinus taeda	loblolly pine	Tree			4						36			10															2			1
Platanus occidentalis	American sycamore	Tree			2			1						5			2												4	1	1	2
Populus deltoides	eastern cottonwood	Tree			1																											
Quercus	oak	Tree																														
Quercus falcata	southern red oak	Tree	1	1	1										1	1	1	3	3	3	1	1	1				2	2	2			
Quercus michauxii	swamp chestnut oak	Tree							9	9	9										4	4	4	3	3	3	4	4	4	2	2	2
Quercus nigra	water oak	Tree																														
Quercus pagoda	cherrybark oak	Tree																														
Quercus phellos	willow oak	Tree				1	1	2							8	8	8	3	3	3	3	3	3	3	3	3				11	11	11
Salix nigra	black willow	Tree			3									1						1									7			
Taxodium distichum	bald cypress	Tree	17	17	27	2	2	2	22	22	25	5	5	5				3	3	4	1	1	1				3	3	3			
Ulmus americana	American elm	Tree																														1
Unknown		Shrub or Tree																1	1	1							1	1	1			
		Stem count	19	19	51	18	18	25	37	37	97	29	29	55	21	21	26	36	36	44	15	15	23	20	20	21	22	22	40	24	24	31
		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	3	3	8	6	6	8	4	4	6	4	4	8	4	4	6	7	7	9	6	6	8	4	4	4	6	6	11	5	5	9
		Stems per ACRE	769	769	2064	728	728	1012	1497	1497	3925	1174	1174	2226	850	850	1052	1457	1457	1781	607	607	931	809	809	850	890	890	1619	971	971	1255

Table 8. CVS Stem Count Total and Planted by Plot and Species
Stanley's Slough and Sttanley's Slough II Restoration Sites, DMS Project Number 95356/95838

			Current Plot Data (MY5 2018)																													Annual Means														
			95356-01-0011			95356-01-0012			95356-01-0013			95356-01-0014			95356-01-0015			95356-01-0016			95356-01-0017			95356-01-0018			95356-01-0019			95356-01-0020			MY5 (2018)			MY3 (2016)			MY2 (2015)			MY1 (2014)			MY0 (2014)		
Scientific Name	Common Name	Species Type	PnoL	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	PnoL	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree																																				1								
Acer rubrum	red maple	Tree	2	2	2						1			1									3									9	9	18	10	10	12	8	8	9	9	9	10	11	11	11
Baccharis halimifolia	baccharis	Shrub			1																													1			1								
Betula nigra	river birch	Tree	4	4	4							9	9	9	3	3	3				7	7	7				5	5	5	2	2	2	69	69	70	68	68	68	67	67	67	67	67	67	73	73	73
Celtis laevigata	sugarberry	Tree																																						1			1				
Diospyros virginiana	common persimmon	Tree																														2	2	4												
Fraxinus pennsylvanica	green ash	Tree	5	5	5	8	8	8	1	1	1			1	5	5	5	10	10	10	2	2	3	5	5	5	9	9	9	4	4	5	115	115	121	115	115	119	113	113	116	113	113	113	117	117	117
Ilex opaca	American holly	Tree																																1												
Juniperus virginiana	eastern redcedar	Tree																								1								1			1			1					
Liquidambar styraciflua	sweetgum	Tree			1			18			2			7			1			6			1			2			10			2			114			56			56			32		
Liriodendron tulipifera	tuliptree	Tree																																						1					
Magnolia virginiana	sweetbay	Tree				1	1	1							1	1	1	4	4	4	1	1	1				1	1	1				9	9	9	10	10	10	11	11	11	9	9	9	19	19	19
Nyssa biflora	swamp tupelo	Tree	3	3	3				13	13	14				3	3	3				1	1	3							6	6	6	35	35	38	42	42	42								
Nyssa sylvatica	blackgum	Tree	2	2	2				2	2	2							4	4	4				2	2	2							12	12	12	12	12	12	41	41	41	42	42	42	46	46	46
Pinus taeda	loblolly pine	Tree			14			1			30			32			17			6									1					154			6			2			2		
Platanus occidentalis	American sycamore	Tree				2	2	2				4	4	4	1	1	1	2	2	2						1	2	2	6	1	1	2	13	13	34	13	13	27	13	13	24	15	15	27	19	19	19
Populus deltoides	eastern cottonwood	Tree																								4								5			1								
Quercus	oak	Tree																																						1					
Quercus falcata	southern red oak	Tree	2	2	2				1	1	2	1	1	1				3	3	3	2	2	2							2	2	2	19	19	20	23	23	23	22	22	22	27	27	27	30	30	30
Quercus michauxii	swamp chestnut oak	Tree	2	2	2				4	4	4	6	6	6	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	1	1	1	46	46	46	48	48	49	56	56	56	57	57	57	50	50	50
Quercus nigra	water oak	Tree																																					1	1	1				1	1	1
Quercus pagoda	cherrybark oak	Tree												2															1					3												
Quercus phellos	willow oak	Tree				4	4	4	1	1	1	2	2	2	1	1	1	1	1	1				6	6	6	3	3	3	1	1	1	48	48	49	50	50	52	56	56	62	49	49	49	65	65	65
Salix nigra	black willow	Tree			1			7															10						1					31			17			22			23			
Taxodium distichum	bald cypress	Tree	14	14	19				6	6	6	1	1	1	17	17	20				28	28	31							2	2	2	121	121	146	128	128	132	32	32	36	32	32	32	33	33	33
Ulmus americana	American elm	Tree						1												2														4												
Unknown		Shrub or Tree																														2	2	2	1	1	1	5	5	5	2	2	2	52	52	52
		Stem count	34	34	56	15	15	42	28	28	63	23	23	66	32	32	53	26	26	40	43	43	63	16	16	23	23	23	41	19	19	23	500	500	883	520	520	630	425	425	534	422	422	493	516	516	516
		size (ares)	1			1			1			1			1			1			1			1			1			1			20			20			20			20			20		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.024710538			0.02			0.49			0.49			0.49			0.49			0.49		
		Species count	8	8	12	4	4	8	7	7	10	6	6	11	8	8	10	7	7	10	7	7	10	4	4	7	6	6	11	8	8	9	13	13	22	12	12	19	12	12	19	11	11	15	12	12	12
		Stems per ACRE	1376	1376	2266	607	607	1700	1133	1133	2550	931	931	2671	1295	1295	2145	1052	1052	1619	1740	1740	2550	647	647	931	931	931	1659	769	769	931	1012	1012	1787	1052	1052	1275	860	860	1081	854	854	998	1044	1044	1044

Appendix D

Hydrologic Data

Table 9. Verification of Support for the Restored Channel Stanley's Slough and Stanley's Slough II Restoration Sites, DMS Project Number 95356/95838		
Date of Data Collection	**Verification**	**Photo #**
11/20/14	Vegetation break, evidence of flow	1
11/11/15	Observation of flow, development of multiple channel threads	3
4/7/16	Observation of flow, development of multiple channel threads	4,5

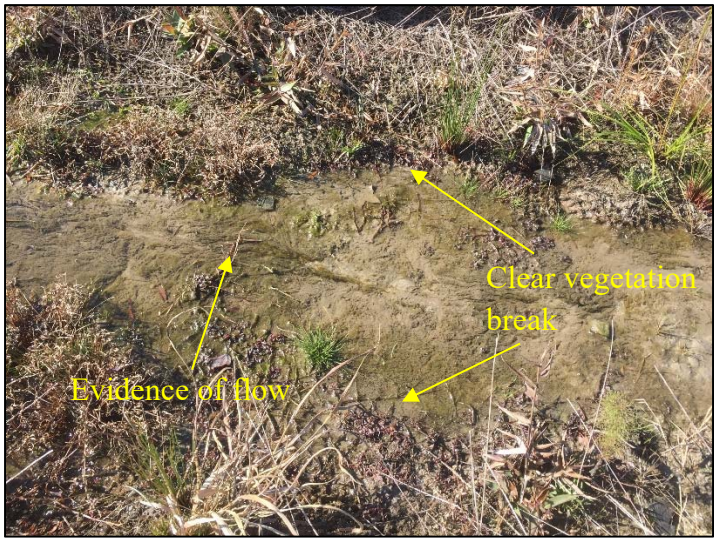


Photo 1. Evidence for support of the restored stream channel


Photo 2. Weir at Gauge 3

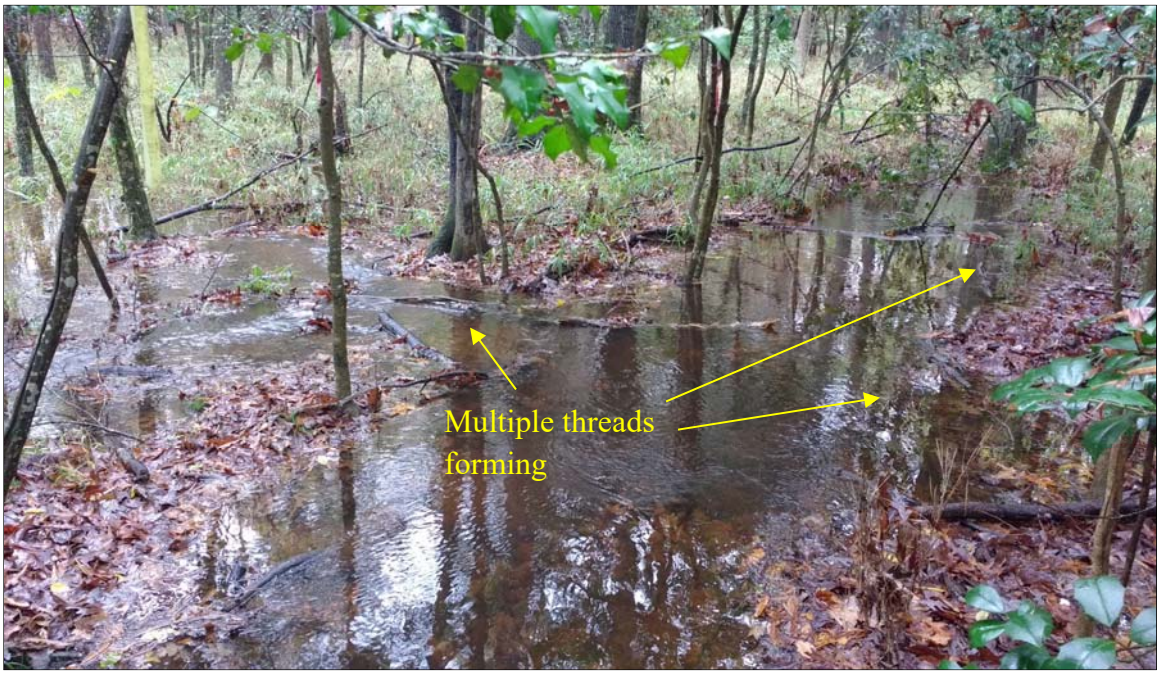


Photo 3. Development of multi-thread channel system

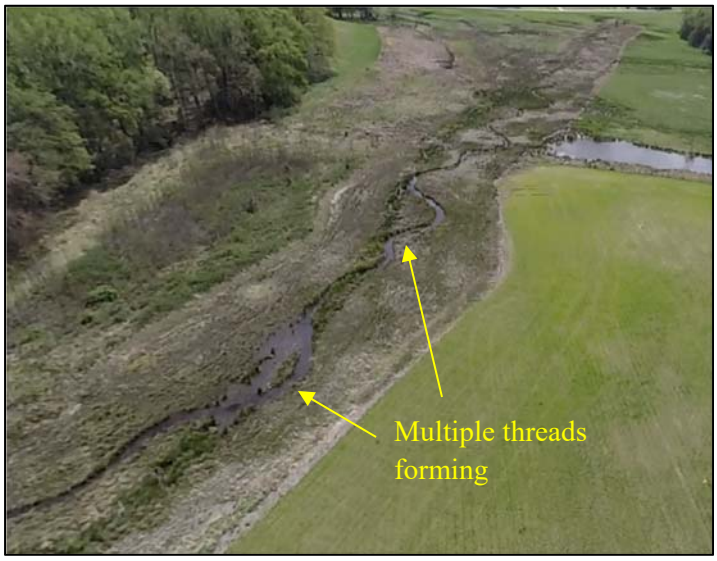
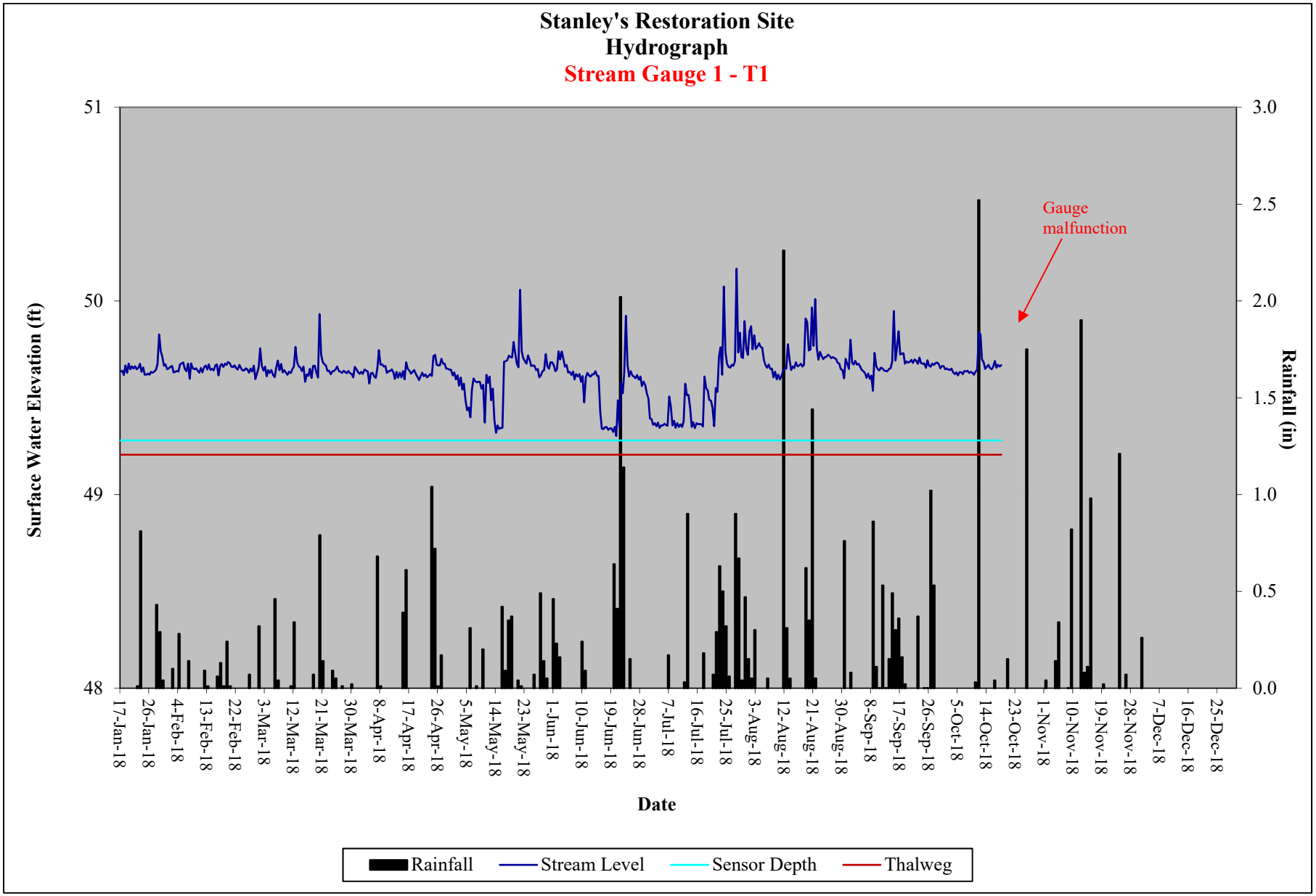
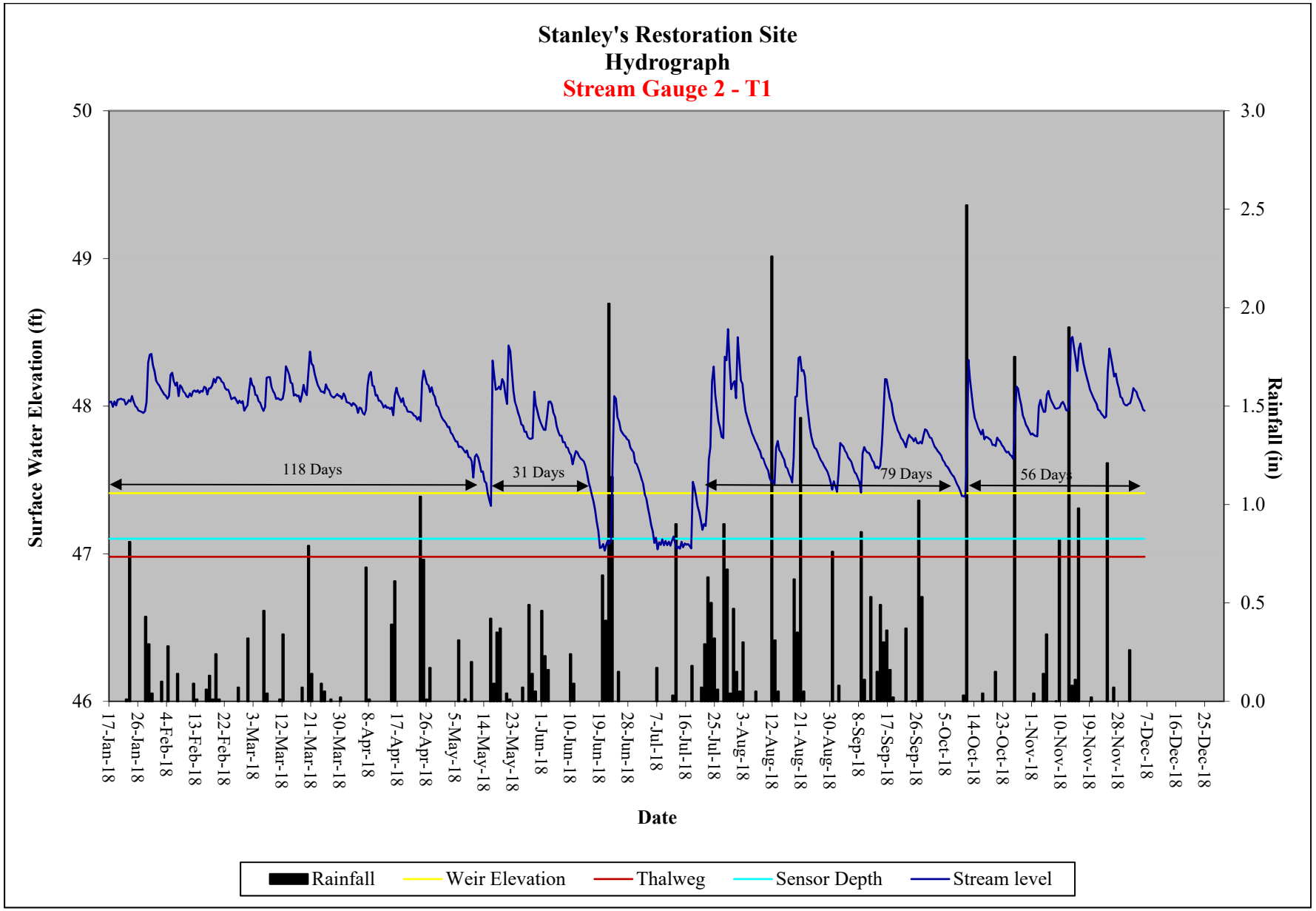
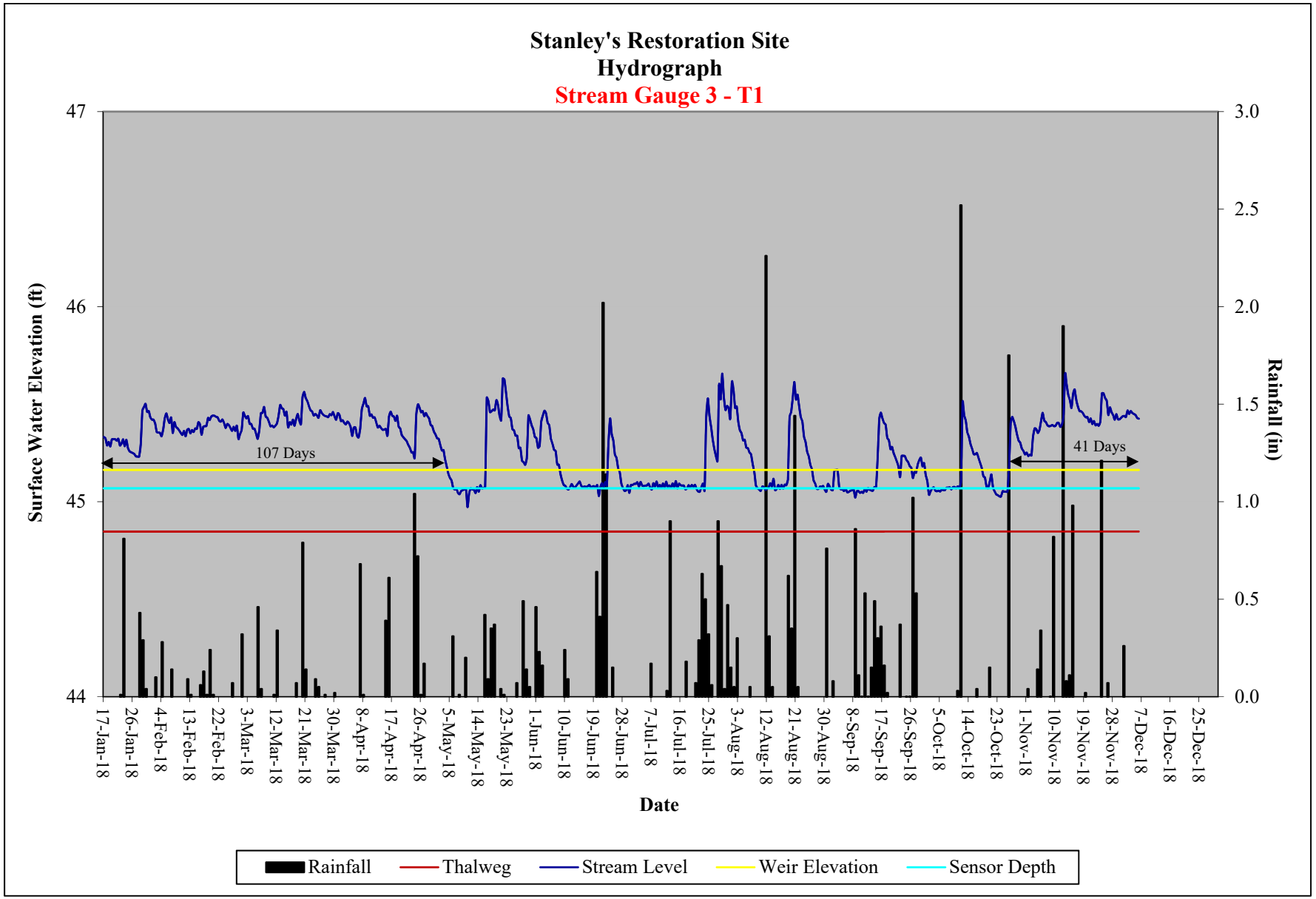


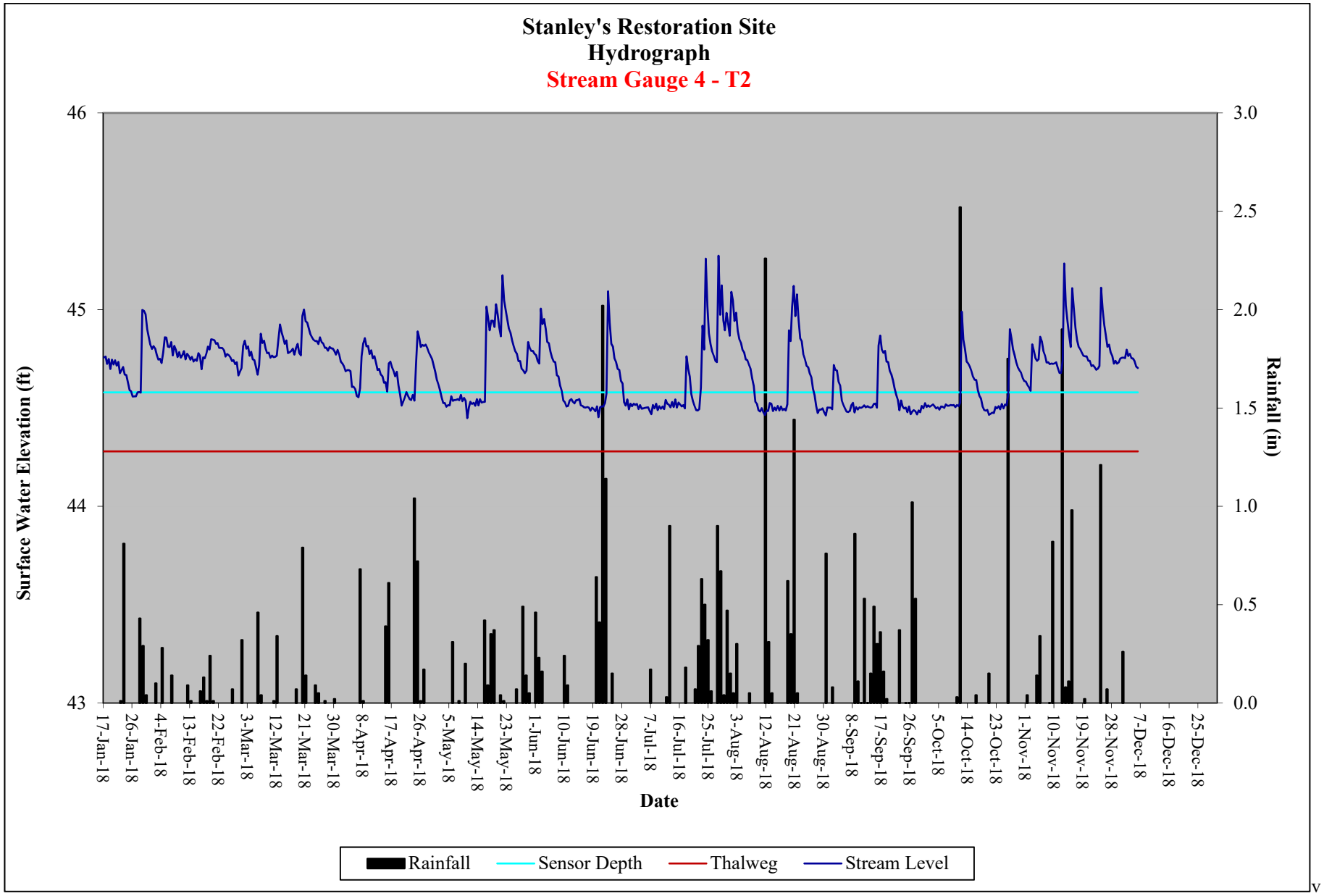
Photo 4. Development of multi-thread channel system on T1

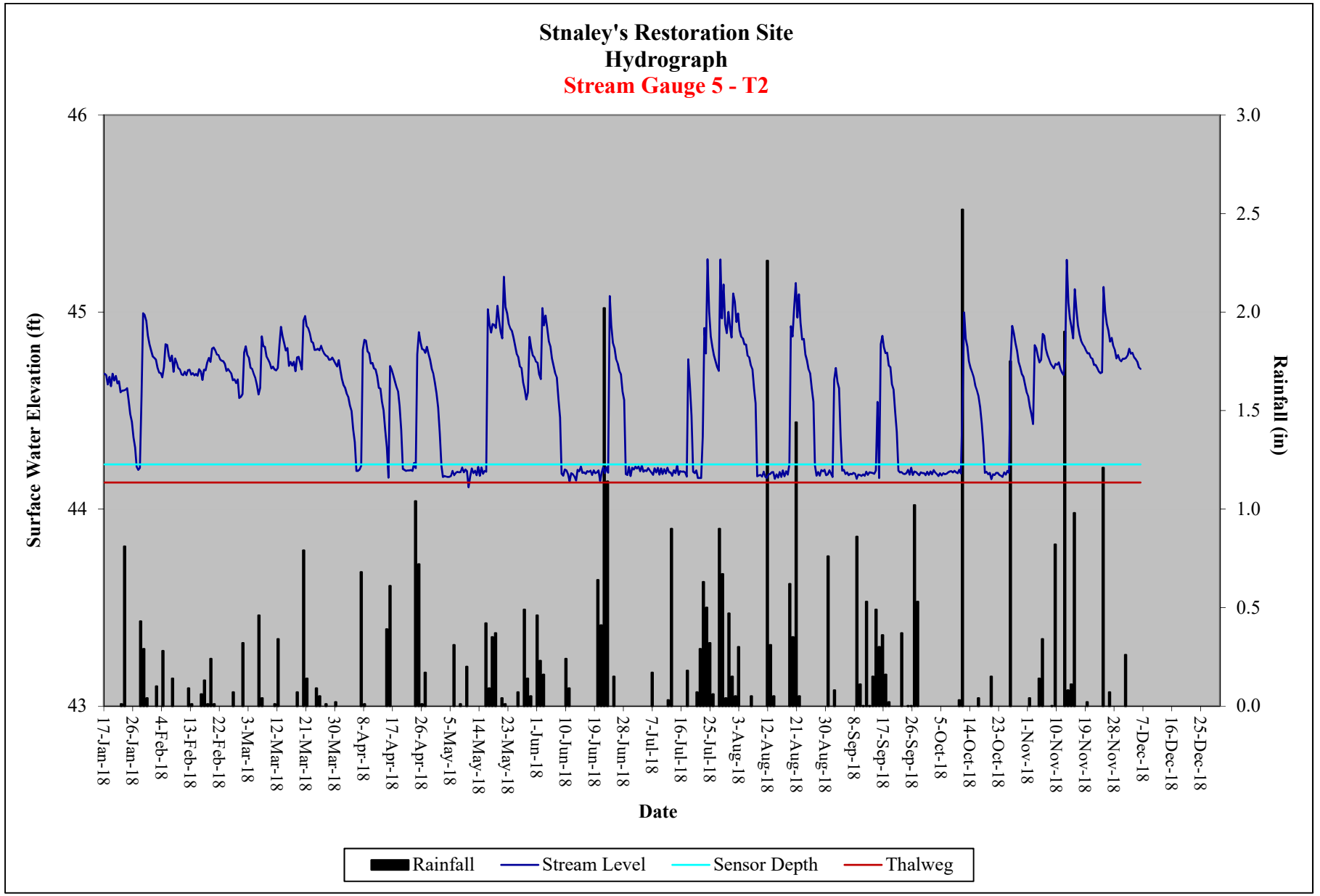
Photo 5. Development of multi thread channel system on T2


Stanley's Restoration Site
Hydrograph
Stream Gauge 1 - T1
Surface Water Elevation (ft)
Rainfall (in)
Gauge malfunction
Date
Rainfall
Stream Level
Sensor Depth
Thalweg


Stanley's Restoration Site
Hydrograph
Stream Gauge 2 - T1
Surface Water Elevation (ft)
Rainfall (in)
Date
118 Days
31 Days
79 Days
56 Days
Rainfall
Weir Elevation
Thalweg
Sensor Depth
Stream level


Stanley's Restoration Site
Hydrograph
Stream Gauge 3 - T1
Surface Water Elevation (ft)
Rainfall (in)
47
46
45
44
3.0
2.5
2.0
1.5
1.0
0.5
0.0
107 Days
41 Days
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Date
Rainfall
Thalweg
Stream Level
Weir Elevation
Sensor Depth


Stanley's Restoration Site
Hydrograph
Stream Gauge 4 - T2
Surface Water Elevation (ft)
Rainfall (in)
Date
46
45
44
43
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Sensor Depth
Thalweg
Stream Level


Stnaley's Restoration Site
Hydrograph
Stream Gauge 5 - T2
Surface Water Elevation (ft)
Rainfall (in)
Date
46
45
44
43
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Stream Level
Sensor Depth
Thalweg

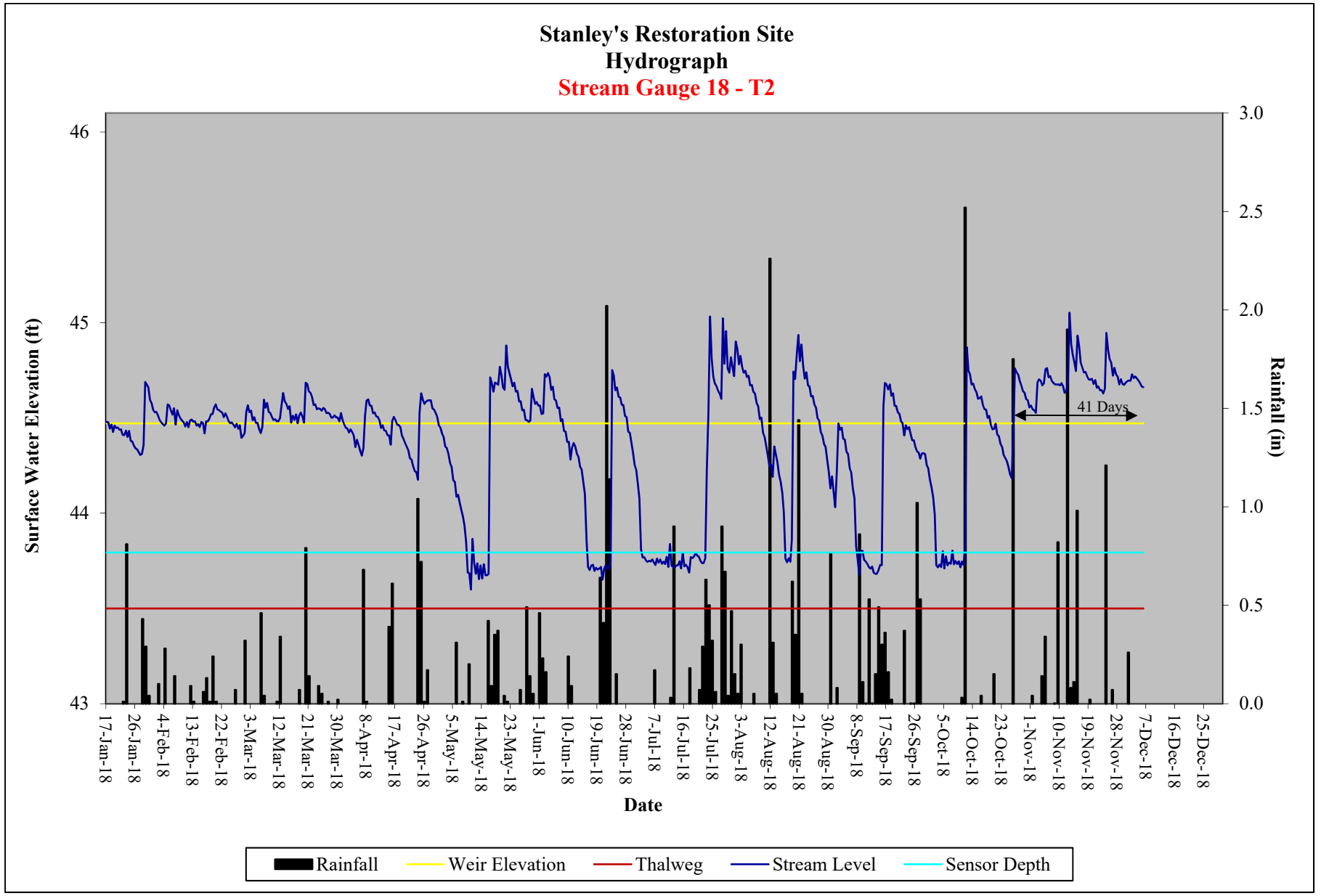
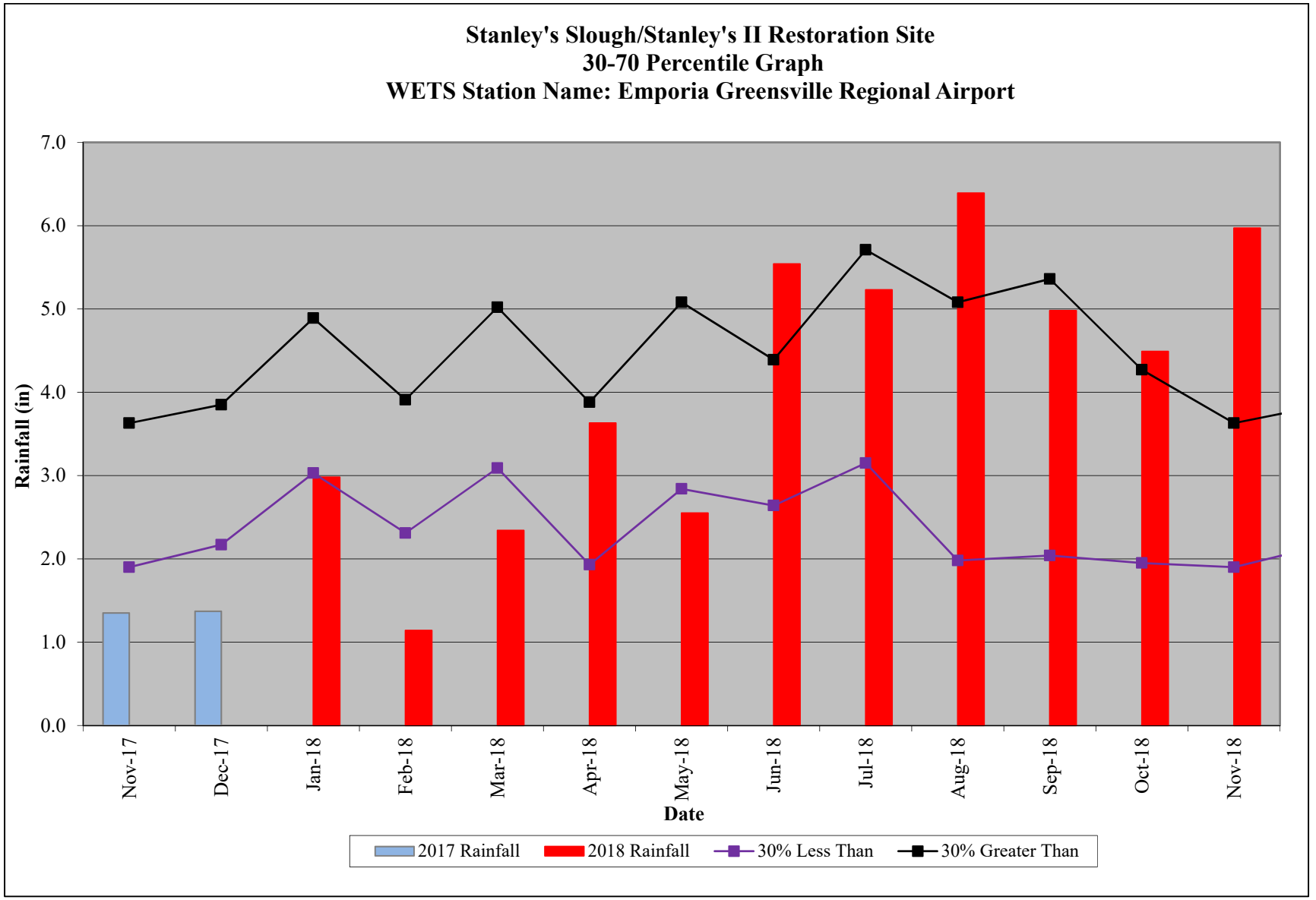
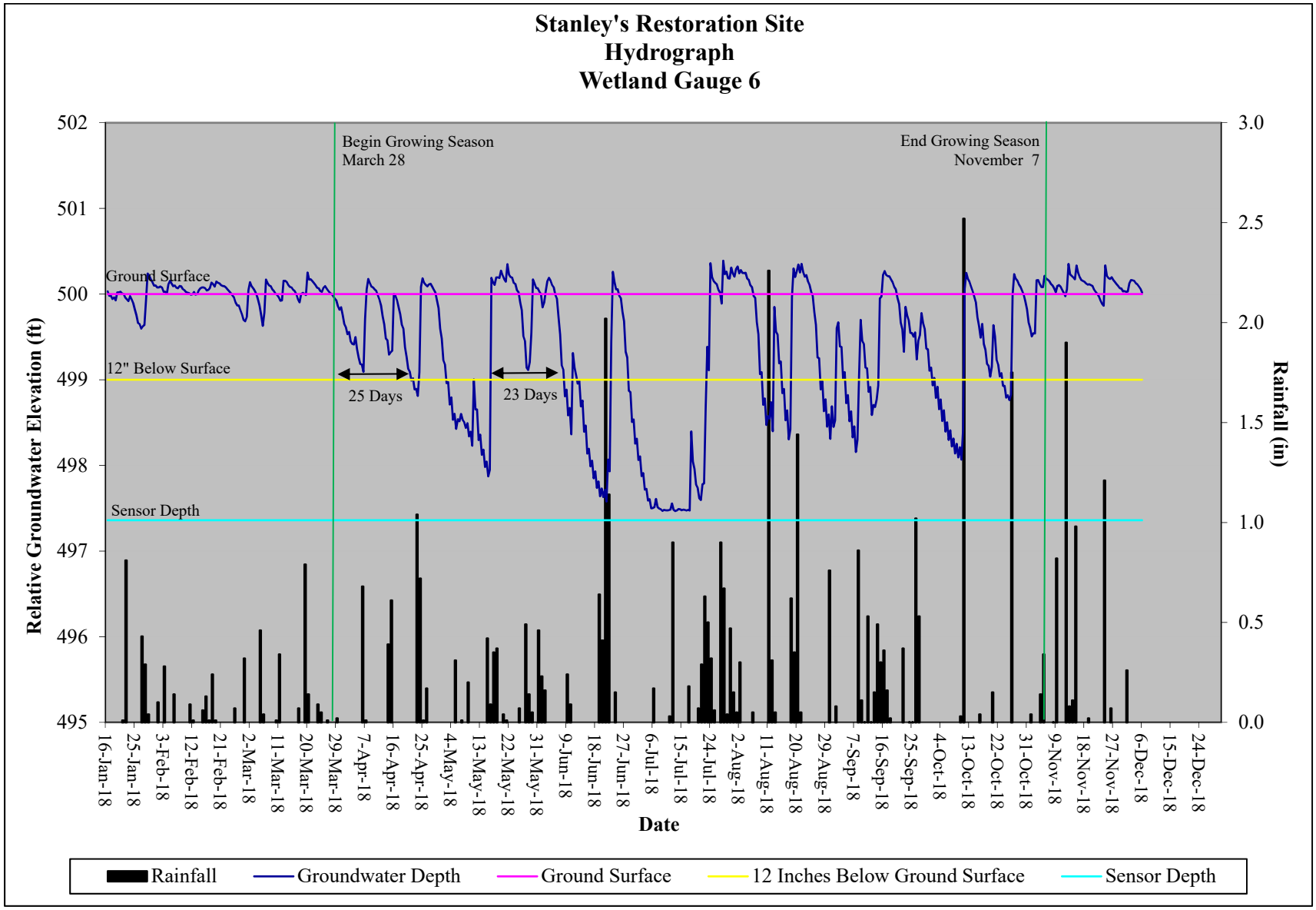
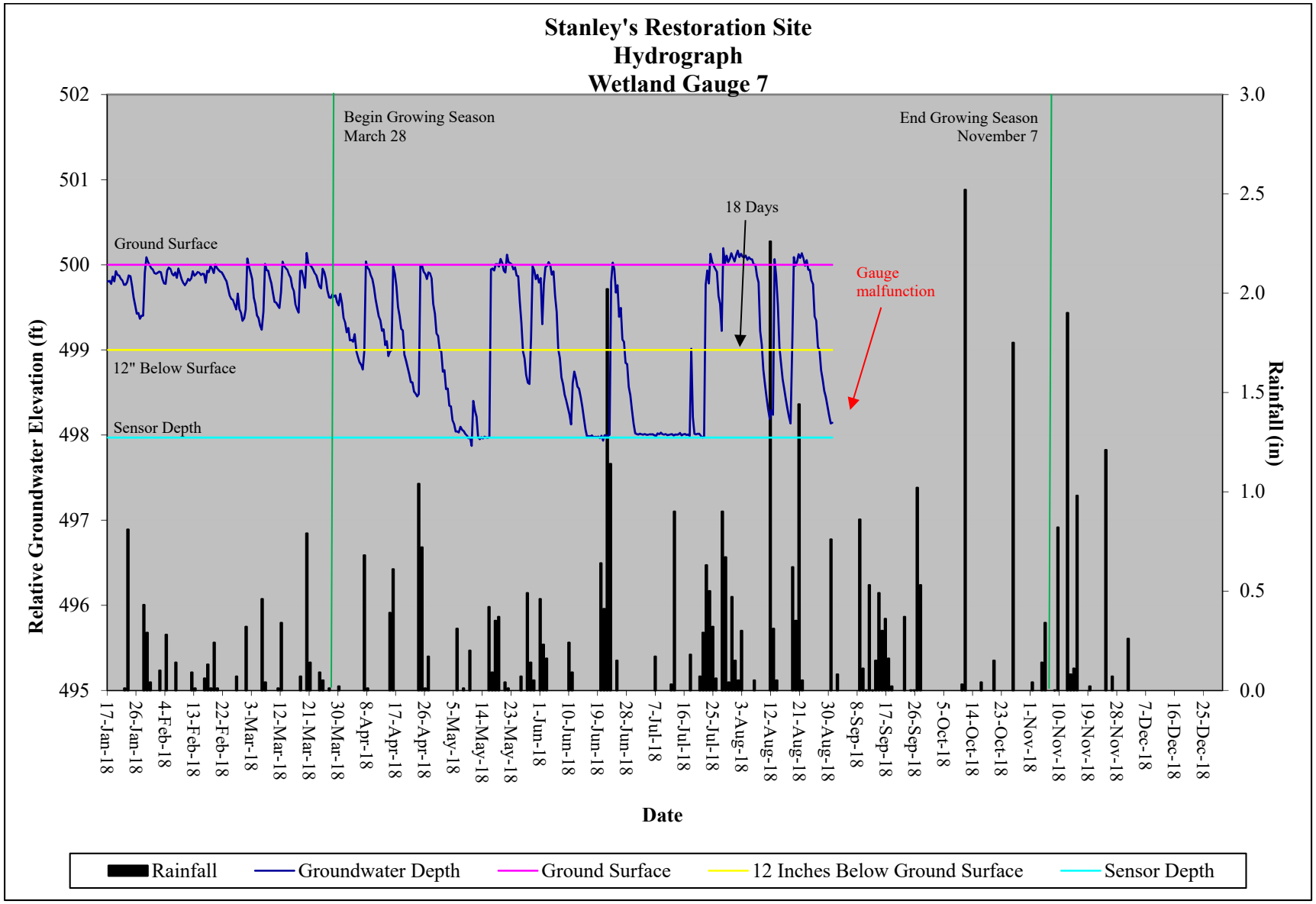

Stanley's Restoration Site
Hydrograph
Stream Gauge 18 - T2
Surface Water Elevation (ft)
Rainfall (in)
Date
41 Days
Rainfall
Weir Elevation
Thalweg
Stream Level
Sensor Depth

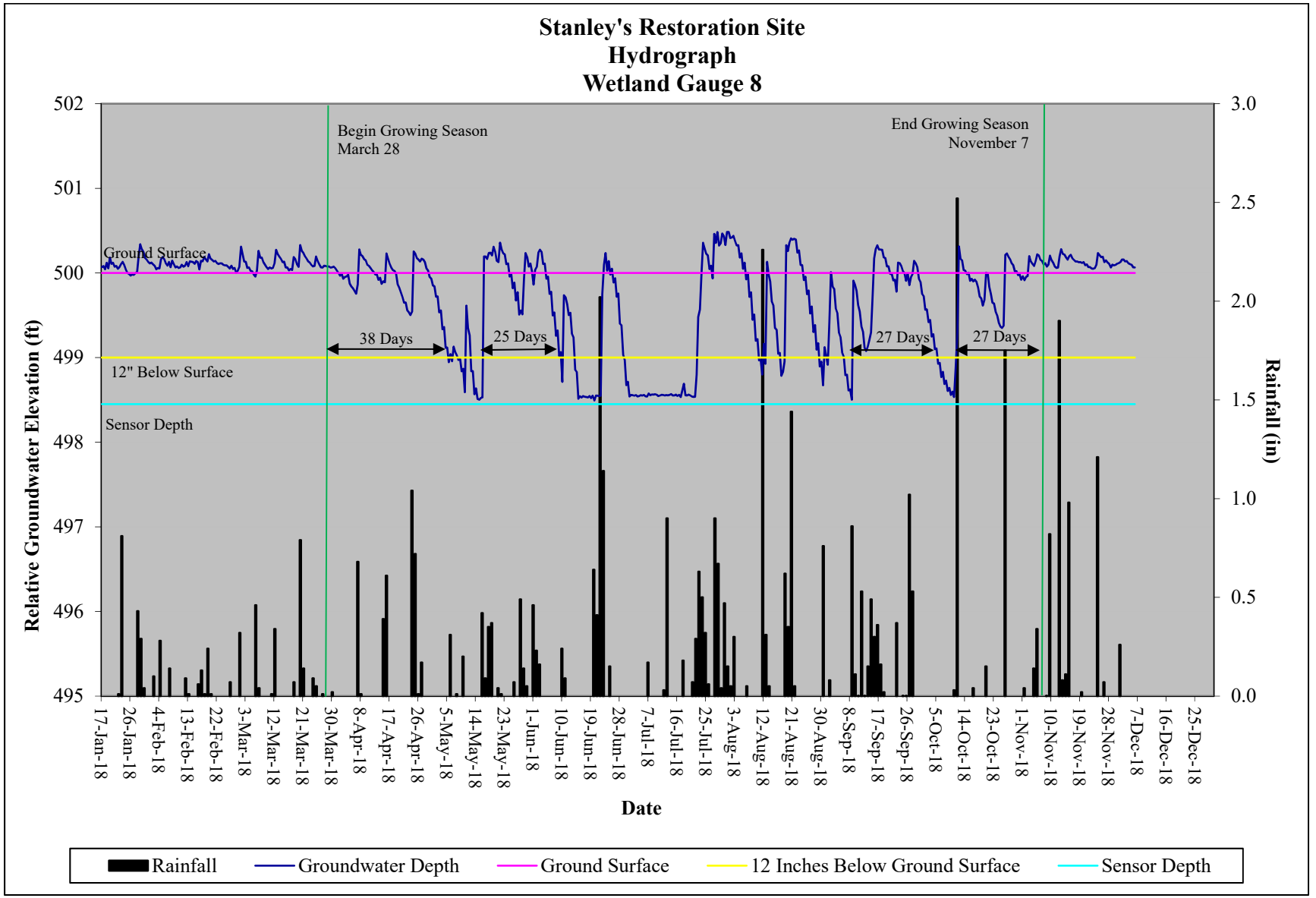
Table 10. Wetland Hydrology Criteria Attainment Stanley's Slough and Stanley's Slough II Restoration Sites, DMS Project Number 95356/95838								
		Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)						
Location	Gauge	MY01 (2014)	MY02 (2015)	MY03 (2016)	MY04 (2017)	MY05 (2018)	MY06 (2019)	MY07 (2020)
SII Res.	6	No/10 (4.2%)	Yes/39 (17.2%)	Yes/34 (15.2%)	No/16 (7.1%)	Yes/25 (10.9%)		
SII Res.	7	No/12 (5.1%)	No/8 (3.3%)	Yes/33 (14.5%)	No/10 (4.5%)	No/18 (8.0%)		
SII Res.	8	Yes/44 (19.4%)	Yes/43 (19.0%)	Yes/48 (21.4%)	Yes/51 (22.8%)	Yes/38 (17.0%)		
SII Reh.	9	Yes/62 (27.5%)	Yes/80 (35.7%)	Yes/79 (35.0%)	Yes/68 (30.4%)	Yes/73 (32.4%)		
SII Res.	10	Yes/48 (21.2%)	Yes/47 (21.0%)	Yes/50 (22.3%)	No/19 (8.3%)	Yes.36 (16.1%)		
SII Res.	11	Yes/44 (19.4%)	Yes/28 (12.5%)	Yes/23 (10.3%)	No/5 (2.2%)	Yes/24 (10.5%)		
SSS Res.	12	Yes/44 (19.4%)	Yes/38 (16.7%)	Yes/33 (14.7%)	No/18 (8.0%)	Yes/37 (16.5%)		
SSS Res.	13	Yes/58 (25.7%)	Yes/46 (20.3%)	Yes/61 (27.0%)	Yes/36 (16.1%)	Yes/37 (16.5%)		
SSS Res.	14	Yes/44 (19.4%)	Yes/37 (16.5%)	Yes/23 (10.0%)	No/17 (7.6%)	Yes/25 (11.2%)		
SSS Reh.	15	Yes/61 (27.2%)	Yes/52 (23.0%)	Yes/116 (51.8%)	Yes/80 (35.5%)	Yes/82 (36.6%)		
SII Res.	16	Yes/56 (24.8%)	Yes/47 (20.8%)	Yes/80 (35.5%)	Yes/51 (22.8%)	Yes/45 (20.1%)		
SII Res.	17	Yes/47 (20.8%)	Yes/39 (17.2%)	No/18 (8.0%)	No/11 4.7%	Yes/22 (9.8%)		
SII Res.	19	-	-	-	-	Yes/25 (10.9%)		
SII Res.	20	-	-	-	-	No/16 (7.1%)		
SII Res.	21	-	-	-	-	Yes/30 (13.4%)		
Reference	Reference	-	Yes/43 (19.2%)	Yes/60 (26.8%)	Yes/20 (9.1%)	Yes/37 (16.3%)		

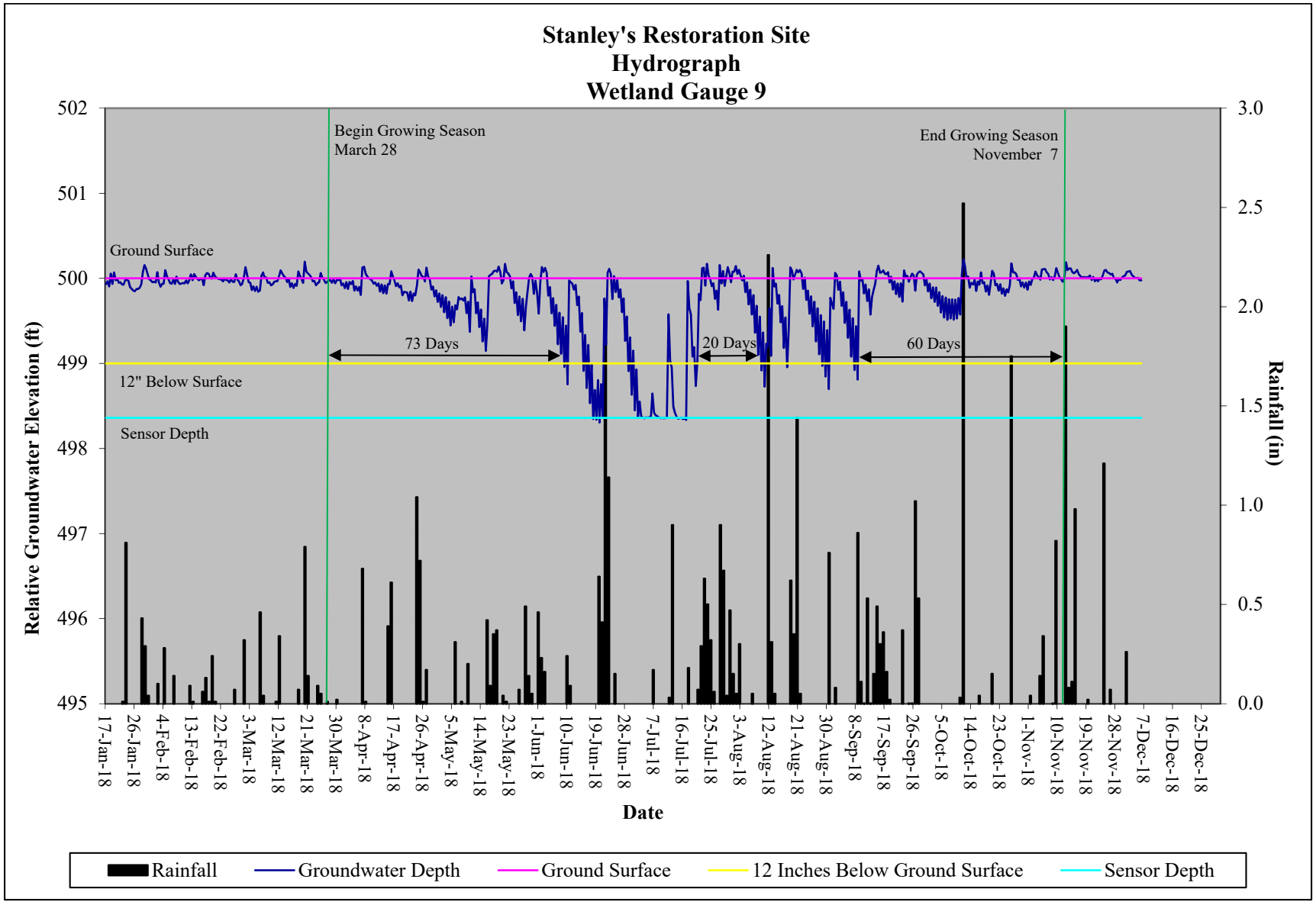
Res. = Wetland Reestablishment, Reh. = Wetland Rehabilitation

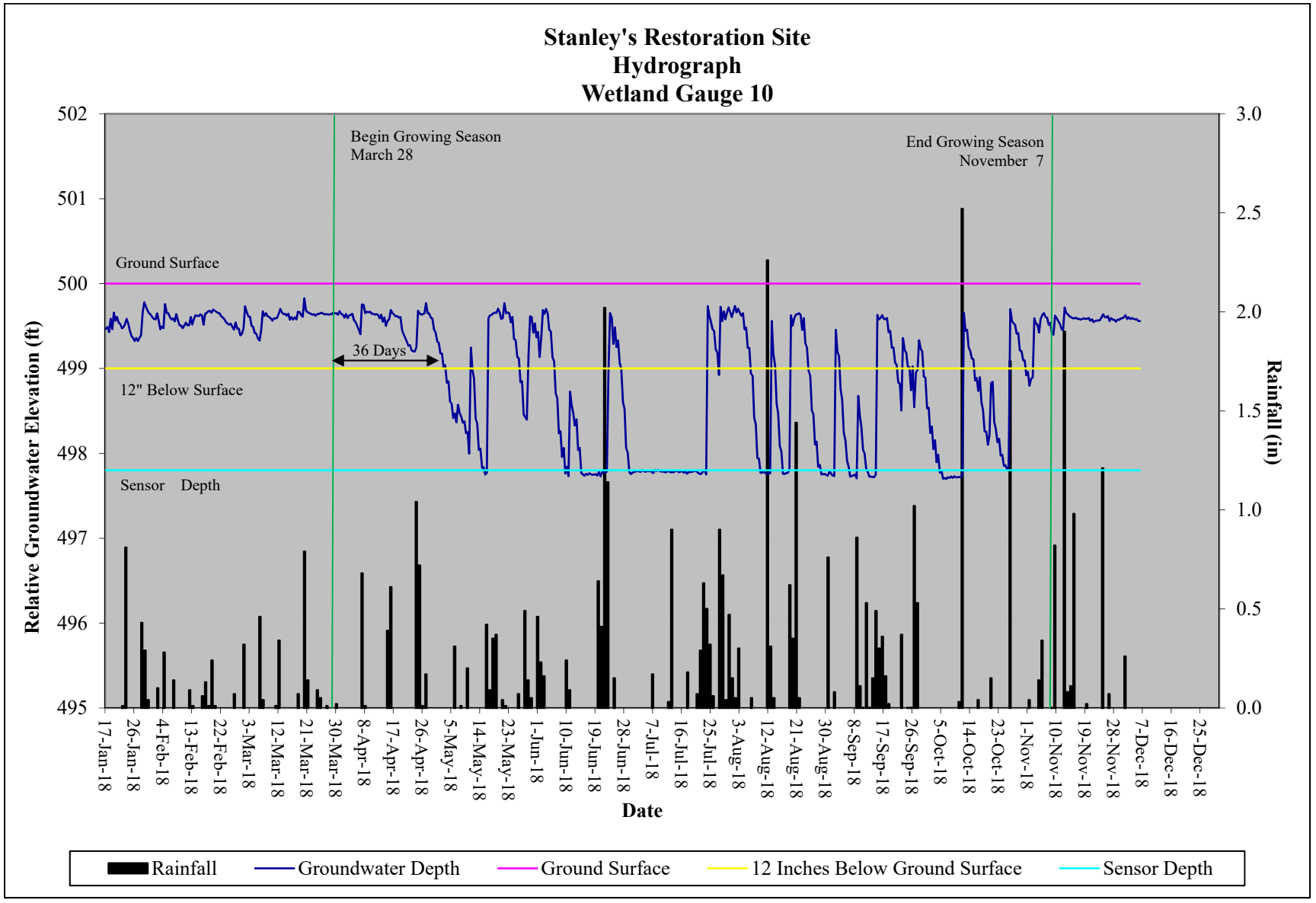

Stanley's Slough/Stanley's II Restoration Site
30-70 Percentile Graph
WETS Station Name: Emporia Greensville Regional Airport
Rainfall (in)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Date
2017 Rainfall
2018 Rainfall
30% Less Than
30% Greater Than

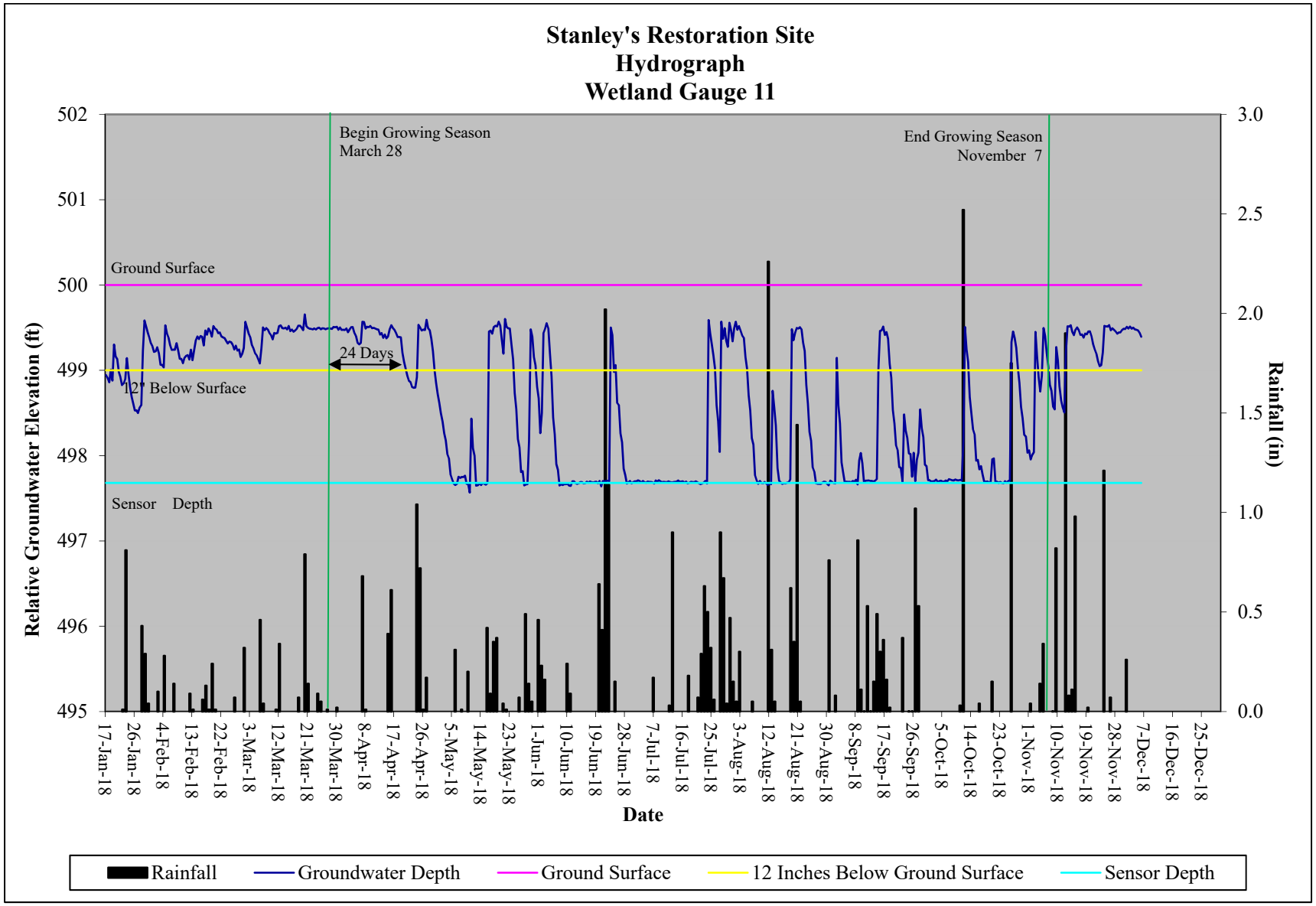

Stanley's Restoration Site
Hydrograph
Wetland Gauge 6
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
25 Days
23 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
16-Jan-18
25-Jan-18
3-Feb-18
12-Feb-18
21-Feb-18
2-Mar-18
11-Mar-18
20-Mar-18
29-Mar-18
7-Apr-18
16-Apr-18
25-Apr-18
4-May-18
13-May-18
22-May-18
31-May-18
9-Jun-18
18-Jun-18
27-Jun-18
6-Jul-18
15-Jul-18
24-Jul-18
2-Aug-18
11-Aug-18
20-Aug-18
29-Aug-18
7-Sep-18
16-Sep-18
25-Sep-18
4-Oct-18
13-Oct-18
22-Oct-18
31-Oct-18
9-Nov-18
18-Nov-18
27-Nov-18
6-Dec-18
15-Dec-18
24-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

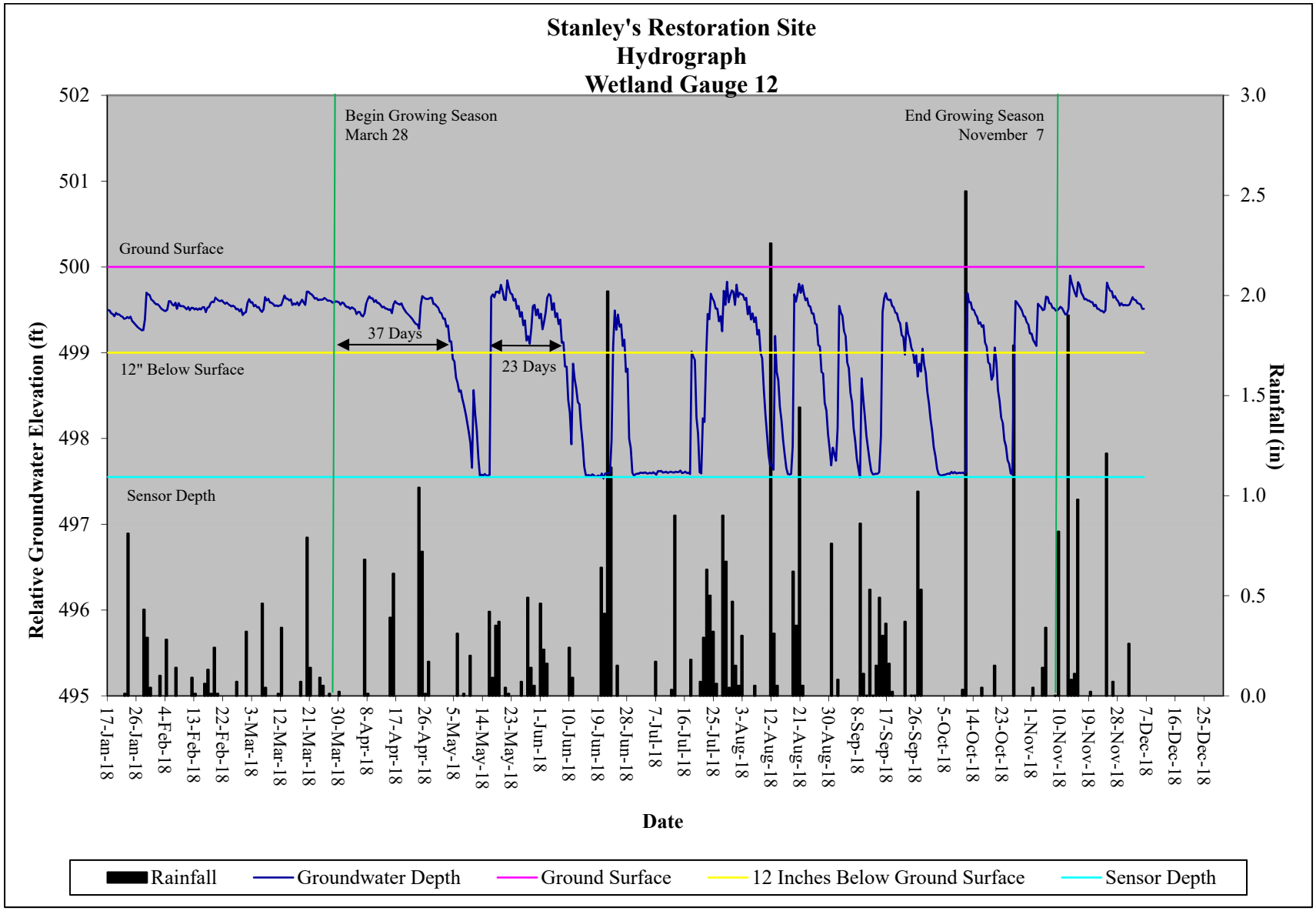

Stanley's Restoration Site
Hydrograph
Wetland Gauge 7
Begin Growing Season
March 28
End Growing Season
November 7
18 Days
Ground Surface
12" Below Surface
Sensor Depth
Gauge
malfunction
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

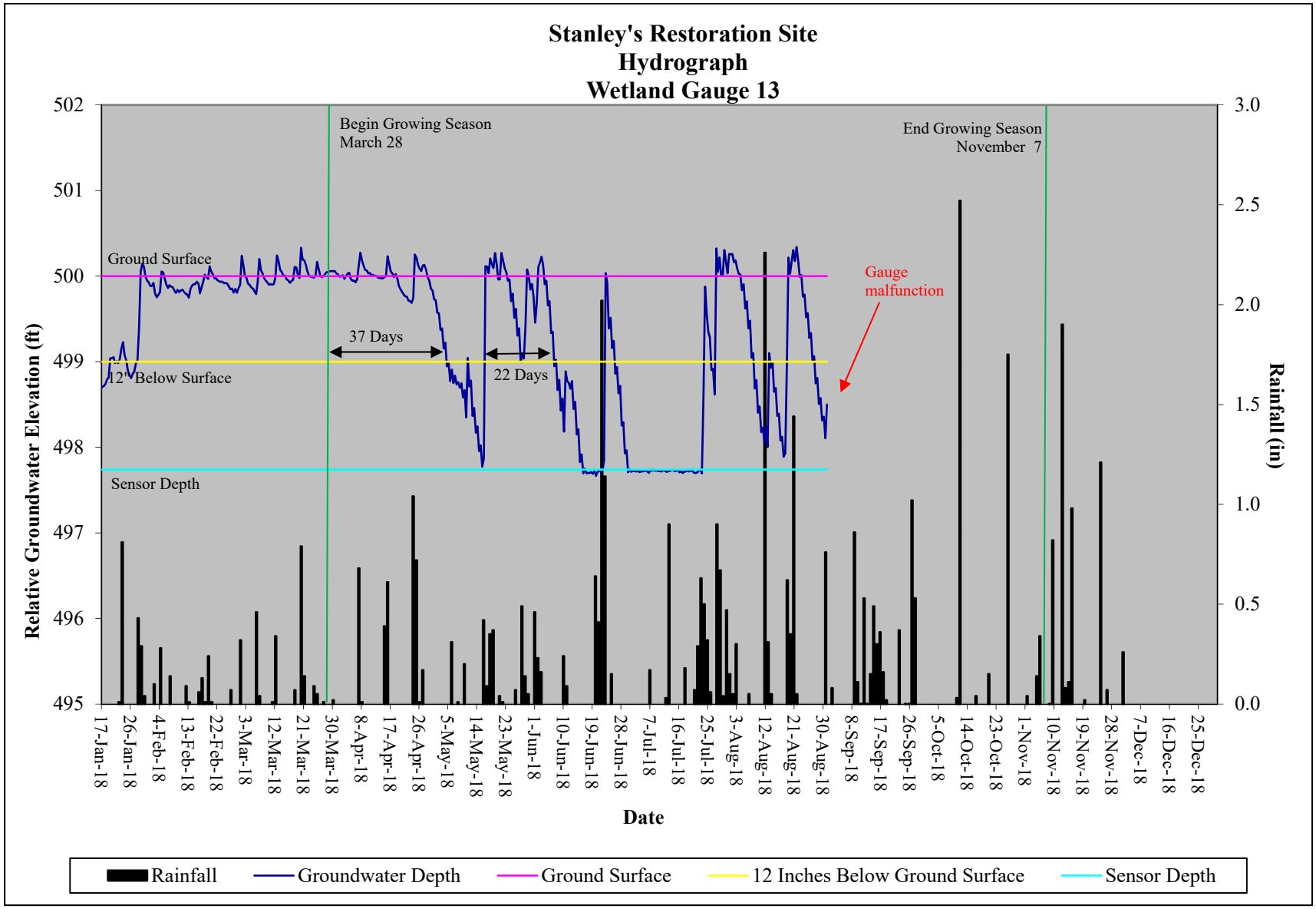

Stanley's Restoration Site
Hydrograph
Wetland Gauge 8
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
38 Days
25 Days
27 Days
27 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

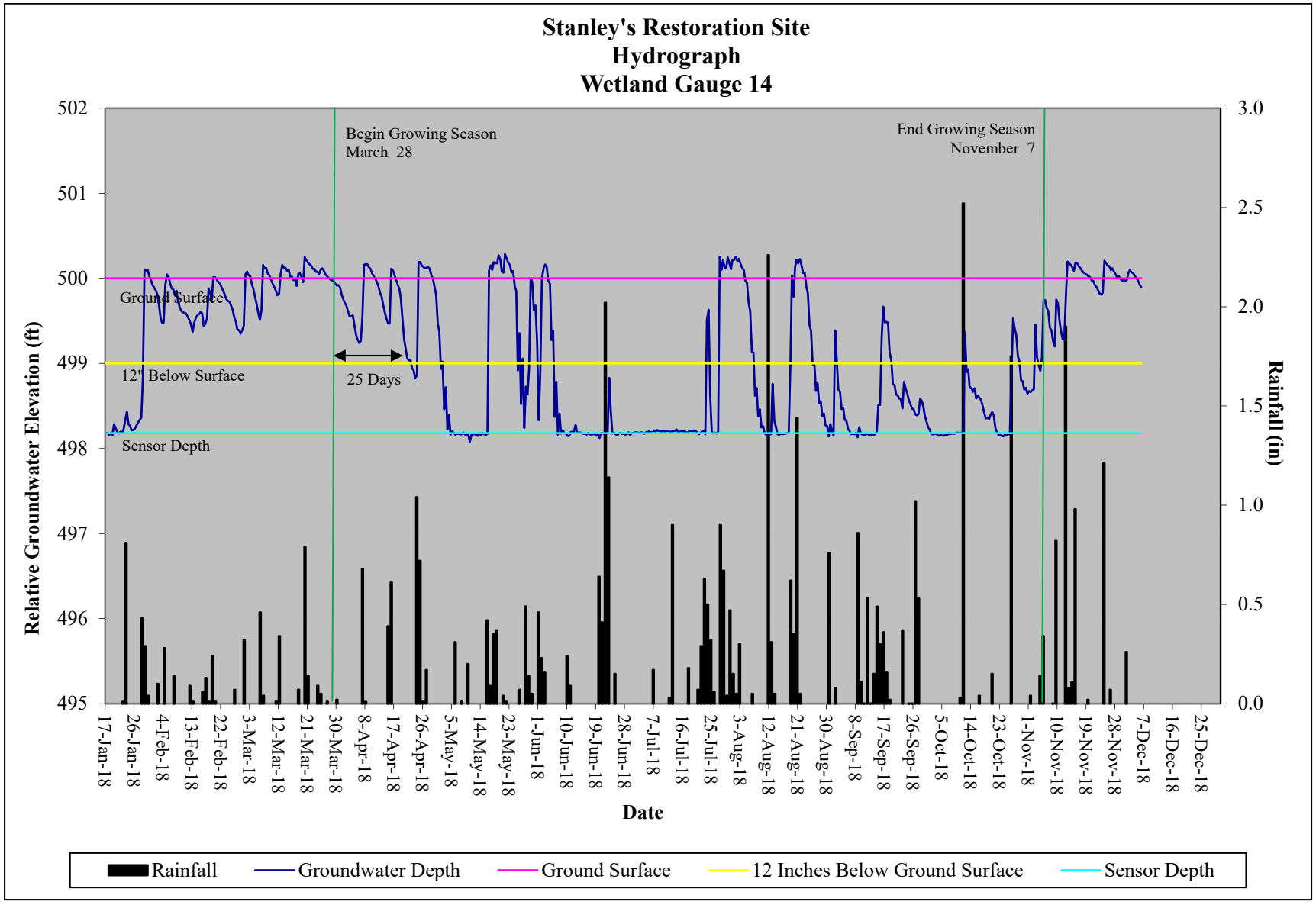

Stanley's Restoration Site
Hydrograph
Wetland Gauge 9
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
73 Days
20 Days
60 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

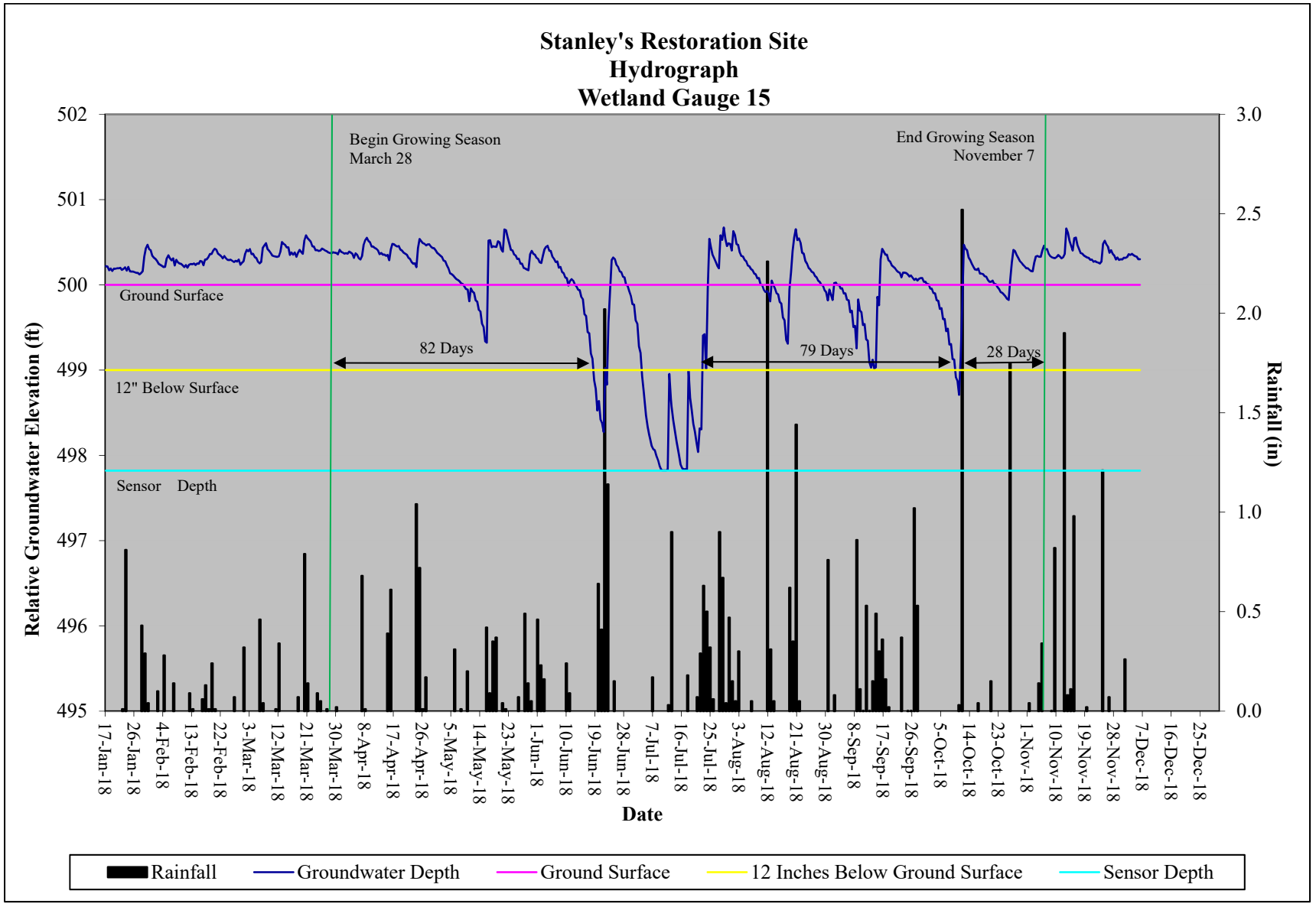

Stanley's Restoration Site
Hydrograph
Wetland Gauge 10
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
36 Days
12" Below Surface
Sensor Depth
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

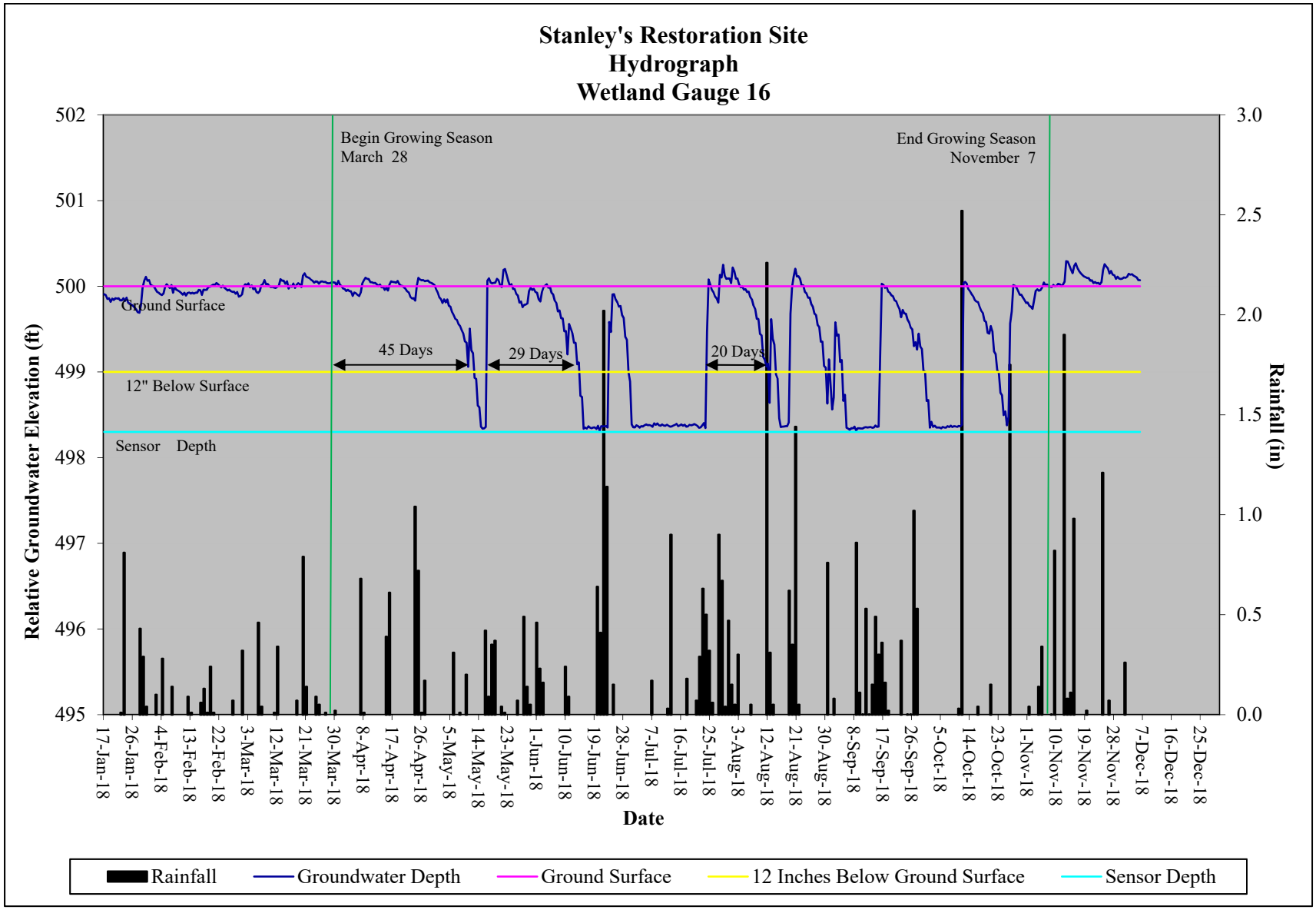

Stanley's Restoration Site
Hydrograph
Wetland Gauge 11
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
24 Days
12" Below Surface
Sensor Depth
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

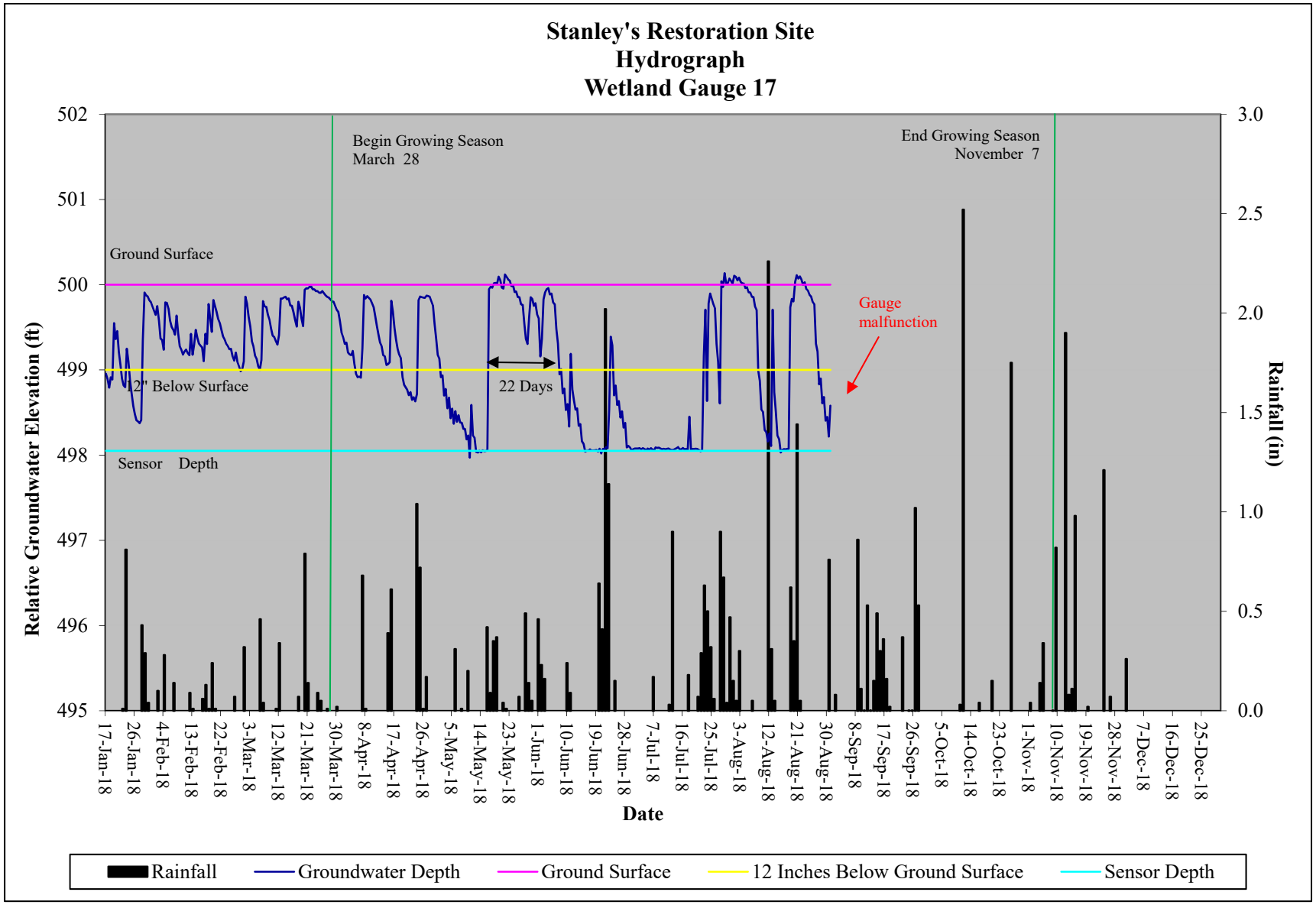

Stanley's Restoration Site
Hydrograph
Wetland Gauge 12
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
37 Days
23 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 13
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
37 Days
22 Days
Gauge
malfunction
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 14
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
25 Days
Sensor Depth
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 15
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
82 Days
79 Days
28 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 16
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
45 Days
29 Days
20 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 17
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
22 Days
Gauge
malfunction
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
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7-Jul-18
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3-Aug-18
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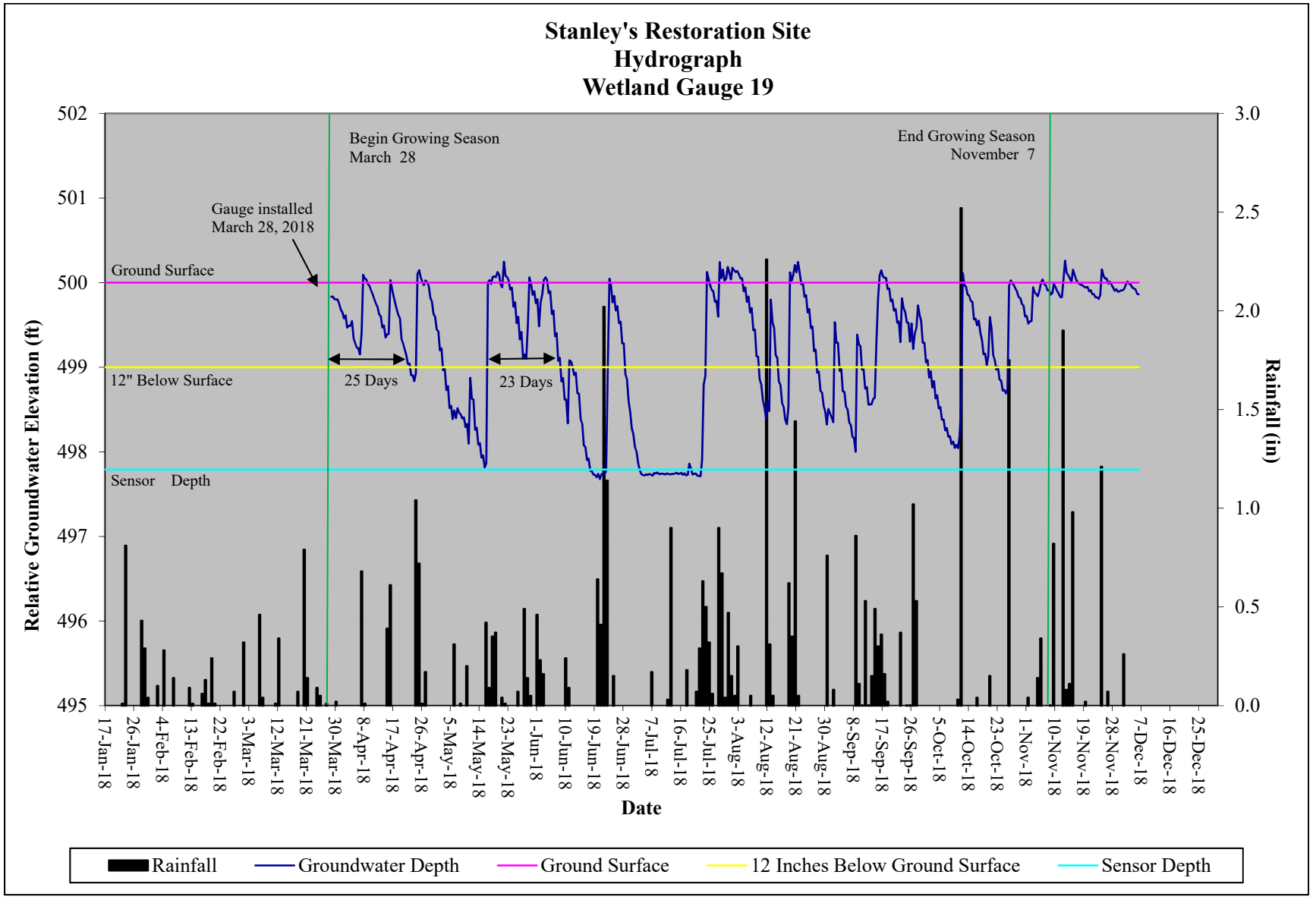
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 19
Begin Growing Season
March 28
End Growing Season
November 7
Gauge installed
March 28, 2018
Ground Surface
12" Below Surface
Sensor Depth
25 Days
23 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
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28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
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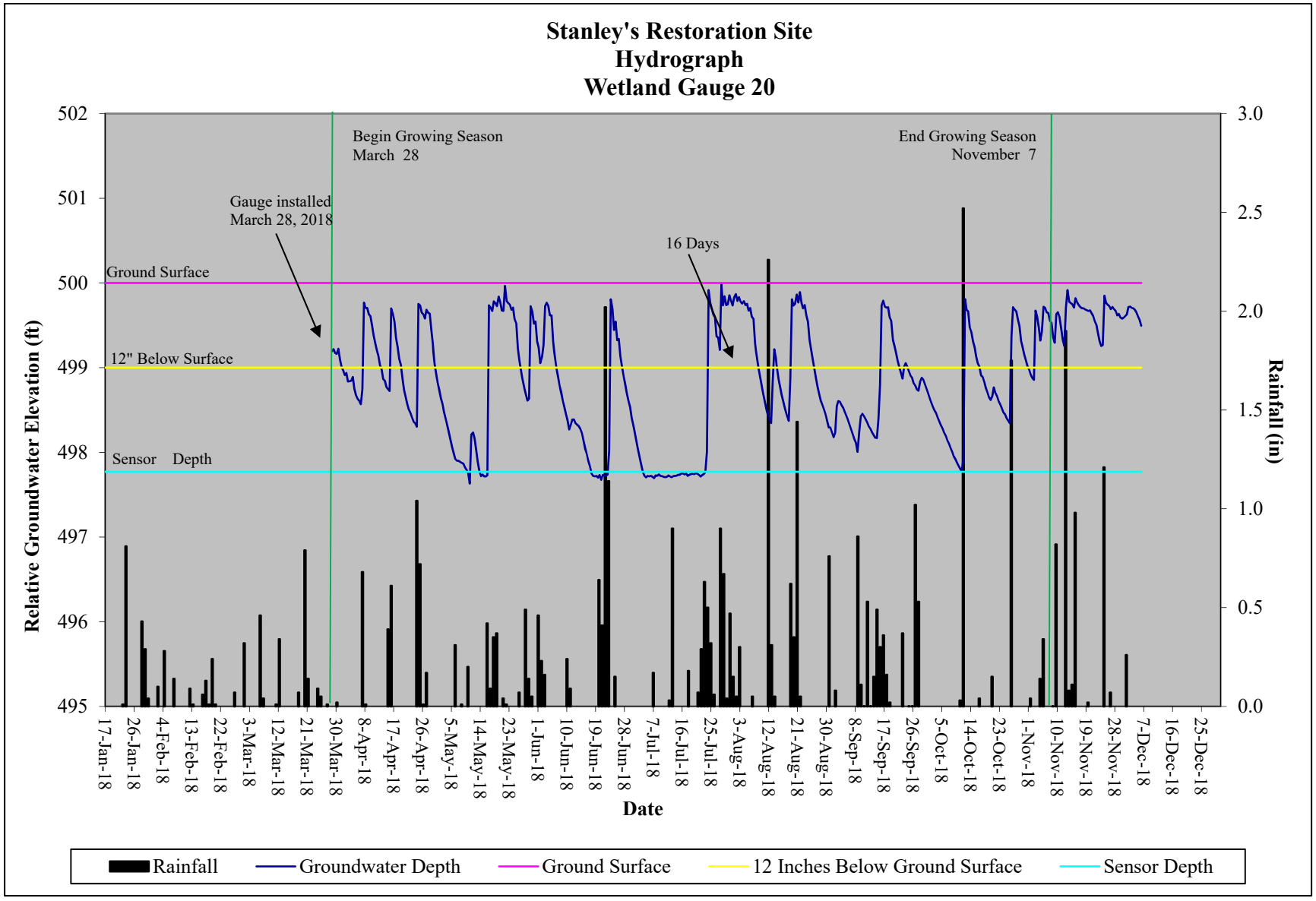
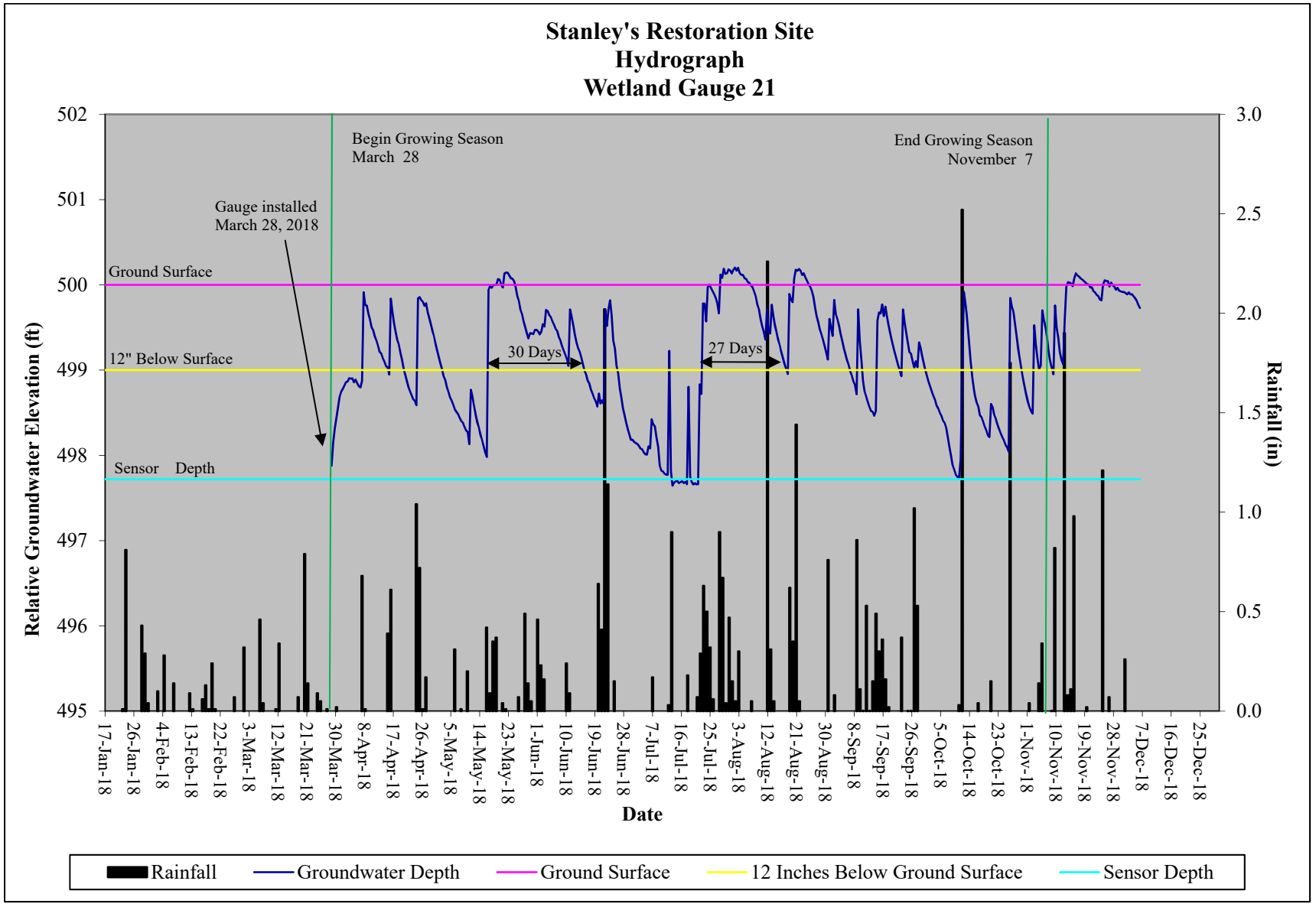
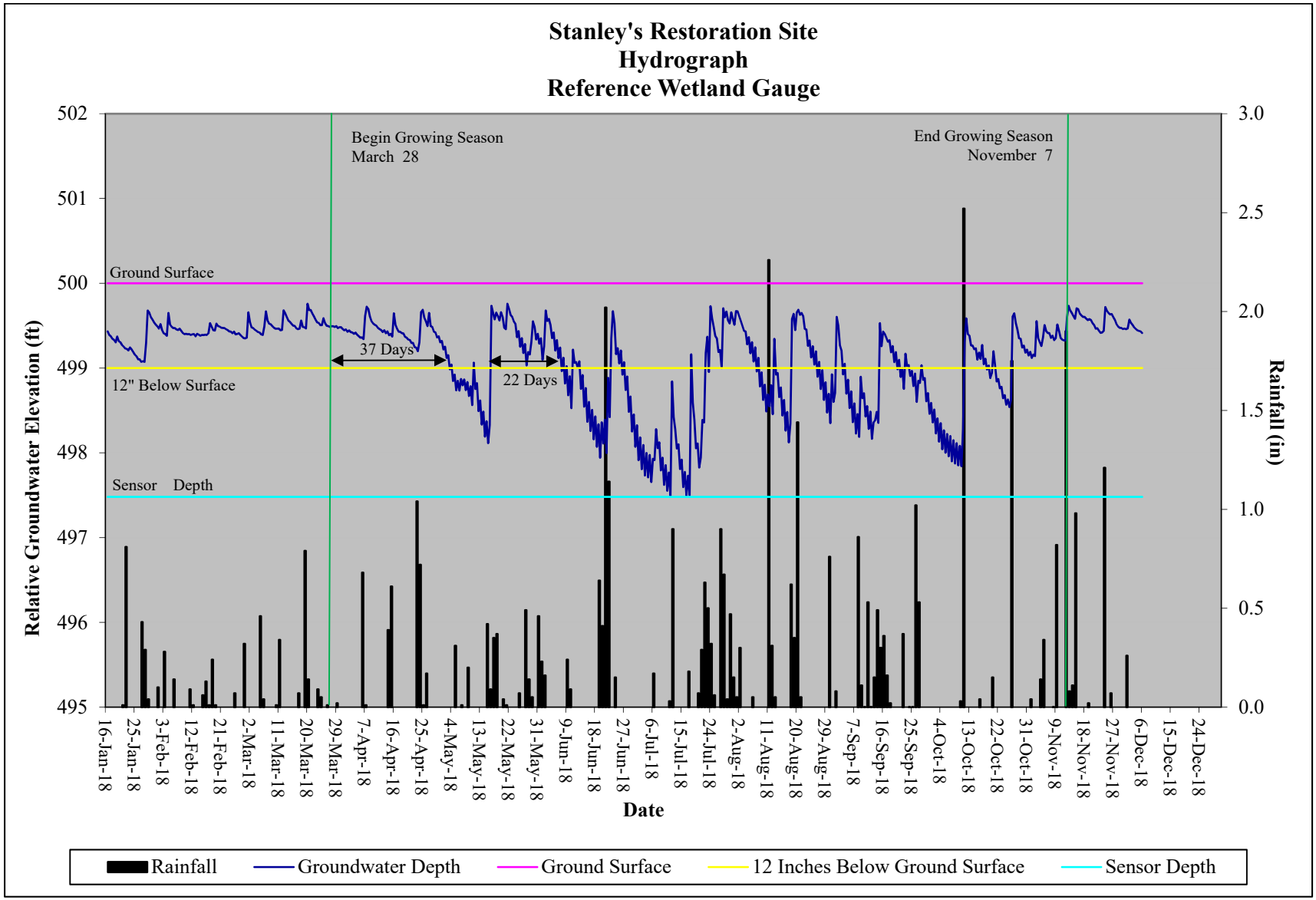
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 20
Begin Growing Season
March 28
End Growing Season
November 7
Gauge installed
March 28, 2018
16 Days
Ground Surface
12" Below Surface
Sensor Depth
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
17-Jan-18
26-Jan-18
4-Feb-18
13-Feb-18
22-Feb-18
3-Mar-18
12-Mar-18
21-Mar-18
30-Mar-18
8-Apr-18
17-Apr-18
26-Apr-18
5-May-18
14-May-18
23-May-18
1-Jun-18
10-Jun-18
19-Jun-18
28-Jun-18
7-Jul-18
16-Jul-18
25-Jul-18
3-Aug-18
12-Aug-18
21-Aug-18
30-Aug-18
8-Sep-18
17-Sep-18
26-Sep-18
5-Oct-18
14-Oct-18
23-Oct-18
1-Nov-18
10-Nov-18
19-Nov-18
28-Nov-18
7-Dec-18
16-Dec-18
25-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 21
Begin Growing Season
March 28
End Growing Season
November 7
Gauge installed
March 28, 2018
Ground Surface
12" Below Surface
Sensor Depth
30 Days
27 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Reference Wetland Gauge
Begin Growing Season
March 28
End Growing Season
November 7
Ground Surface
12" Below Surface
Sensor Depth
37 Days
22 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
502
501
500
499
498
497
496
495
3.0
2.5
2.0
1.5
1.0
0.5
0.0
16-Jan-18
25-Jan-18
3-Feb-18
12-Feb-18
21-Feb-18
2-Mar-18
11-Mar-18
20-Mar-18
29-Mar-18
7-Apr-18
16-Apr-18
25-Apr-18
4-May-18
13-May-18
22-May-18
31-May-18
9-Jun-18
18-Jun-18
27-Jun-18
6-Jul-18
15-Jul-18
24-Jul-18
2-Aug-18
11-Aug-18
20-Aug-18
29-Aug-18
7-Sep-18
16-Sep-18
25-Sep-18
4-Oct-18
13-Oct-18
22-Oct-18
31-Oct-18
9-Nov-18
18-Nov-18
27-Nov-18
6-Dec-18
15-Dec-18
24-Dec-18
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth