WHITE OAK CREEK MITIGATION SITE

2005 Annual Monitoring Report (Year 4)

Johnson County
EEP Project No. 417
Design Firm: Rummel, Klepper & Kahl, LLP

NCDOT Format

Prepared for:

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2005 Annual Monitoring Report (Year 4)

SUMMARY

The White Oak Creek Mitigation Site (Site) was constructed for "up-front" wetland restoration by the North Carolina Department of Transportation (NCDOT) to be used for compensatory mitigation requirements involving roadway impact to wetlands in the Neuse River Basin. Through an agreement with the Ecosystem Enhancement Program (EEP) to the North Carolina Department of Transportation (NCDOT), EEP has accepted the transfer of all off-site mitigation projects. Therefore, EEP will be responsible for fulfilling the remaining requirements and future remediation for the Site. The NCDOT monitoring report format has been retained for clarity and continuity.

The following report summarizes the monitoring activities that have occurred in the past year at the Site. Site construction was begun in February 2002 and completed in March 2002. The Site was planted in late March 2002. In December 2002, the Site was replanted; therefore vegetation monitoring was restarted beginning in March 2003. The 2005 monitoring report represents the third year of vegetation monitoring and the forth year of hydrological monitoring. The Site must demonstrate both hydrologic and vegetation success for a minimum of five years or until the Site is deemed successful.

The 2005 year represents the fourth year of hydrologic monitoring of the Site. Overall, 17 of the 36 monitoring gauges met the success criteria (groundwater within 12 inches of the surface for at least 12.5 percent of the growing season). Twelve monitoring gauges indicated groundwater within 12 inches of the surface for 1 to 12.5 percent of the growing season. Eight of these 12 monitoring gauges, as well as all other remaining monitoring gauges, were non-functional during some or all of the monitoring period. Many of the gauges that were found to be non-functional during the initial Site visit were repaired and returned to the Site during the final months of the growing season. The final months of the 2005 growing season for Johnston County were dry overall. Therefore, many gauges did not indicate hydrologic success in the fourth year but may have in previous years, and likely will in 2006.

The 2005 vegetation monitoring results revealed an average density of 283 trees per acre of planted species. This average is below the minimum success criteria of 320 trees per acre after the third growing season. Dry conditions at the Site, as well as dry weather, may have contributed to reduced survivorship of planted tree species in all plots by the third year of monitoring. Several plots contain less than 50 percent of the original planted stems. Overall, 58 percent of the stems planted in the eight plots survive.

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Site is located adjacent to the west bank of White Oak Creek, immediately south of Winston Road (SR 1550) and north of Austin Pond, approximately 2.5 miles west of Clayton (Figure 1,

Appendix A). White Oak Creek flows south for approximately 2 miles to the confluence with Swift Creek. The Site is located in hydrologic unit 03020201110040 (USGS). The Site is bordered on the north and west by residential development. The Site's eastern boundary is White Oak Creek, which is buffered by mature swamp and bottomland hardwood forest communities.

The Site comprises approximately 50.7 acres of previously open pasture land that was used for grazing horses. The Site was restored to promote natural plant communities and provide water quality benefits to the area. Construction at the Site was begun in January 2002 and completed in March 2002. Planting of the Site was completed in March 2002. Poor vegetation establishment required a second planting in December of 2002. Monitoring of the Site was restarted in 2003.

1.2 PURPOSE

In order to demonstrate successful wetland mitigation, hydrological and vegetative monitoring must be conducted for a minimum of five consecutive years. Success criteria are based on federal guidelines for wetland mitigation. These guidelines stipulate criteria for both hydrological conditions and vegetation survival. The following report details the results of hydrological and vegetative monitoring at the Site during the 2005 growing season.

Included in this report are analyses of both hydrologic and vegetative monitoring results, as well as local climate conditions throughout the growing season, and site photographs.

1.3 PROJECT HISTORY

January-March 2002	Site Construction
March 2002	Site Planted
August 2002	Vegetation Monitoring (1year)
March-November 2002	Hydrologic Monitoring (1 year)
December 2002	Site Replanted
June 2003	Vegetation Monitoring (Restart 1 year)
March-November 2003	Hydrologic Monitoring (2 year)
June 2004	Vegetation Monitoring (2 year)
March-November 2004	Hydrologic Monitoring (3 year)
October 2005	Vegetation Monitoring (3 year)
March-November 2005	Hydrologic Monitoring (4 year)

2.0 HYDROLOGY

2.1 SUCCESS CRITERIA

In accordance with federal guidelines for wetland mitigation, the success criteria for hydrology state that the restoration areas must be inundated or saturated (within 12 inches of the surface) by surface water or groundwater for at least 12.5 percent of the growing season (consecutive days) during a normal precipitation year. Areas that have between 5 and 12.5 percent of the

growing season may be considered hydric under certain conditions. Areas inundated for less than 5 percent of the growing season are always classified as non-wetlands.

The growing season in Johnson County begins March 21 and ends November 4 (reported in past reports as March 26 to November 10). These dates correspond to a 50 percent probability that temperatures will not drop to 28 degrees Fahrenheit or lower after March 21 and before November 4 (Natural Resources Conservation Service, Soil Survey of Johnston County). The growing season is 228 days (previously reported as 229 days).

2.2 HYDROLOGIC DESCRIPTION

In March 2002, 38 Remote Data Systems (RDS) continuous logging groundwater gauges were installed. Thirty-six of these gauges were installed within the Site and two were installed as reference gauges on an adjacent property. The on-site gauge locations are shown on Figure 2, Appendix A). The monitoring gauges record daily readings of depth to groundwater. This year's data represents the fourth growing season that the gauges have been monitored. The reference gauges are non-functioning and are not currently being monitored. The Site was designed to receive hydrologic inputs from rainfall, groundwater, and surface water from overbanking events.

2.3 RESULTS OF HYDROLOGIC MONITORING

2.3.1 Site Data

The maximum number of consecutive days that groundwater was within 12 inches of the surface was calculated for each monitoring gauge and converted into a percentage of the 228-day growing season (March 21-November 4). The results are presented in Table 1.

Appendix B contains the hydrographs for each monitoring gauge for the current monitoring year. The corresponding rain data collected from the on-site rain gauge is also provided on each hydrograph.

Figure 2 provides a graphical representation of the hydrologic results. Gauges highlighted in green indicate wetland hydrology for more than 12.5 percent of the growing season. Gauges highlighted in yellow are those that had wetland hydrology between 5 and 12.5 percent of the growing season. Gauges highlighted in red are those that had wetland hydrology less than 5 percent of the growing season. Gauges with a black circle are gauges that did not function at all during the growing season. Many of the gauges that were found to be non-functional during

Table 1. White Oak Hydrologic Monitoring Results

Monitoring Gauge	<5%	5-12.5%	>12.5%	Actual %	Success Date
GW-1			✓	14.9	March 21 – April 24
GW-2			✓	15.8	March 21 – April 25
GW-3[1]	✓			2.6	
GW-4[2]			✓	36.8	August 12 – November 4
GW-5[2]			✓	36.8	August 12 – November 4
GW-6			✓	14.0	March 21 – April 21
GW-7		✓		8.8	
GW-8[7]	Non-Functional				
GW-9			✓	100	March 21 – November 4
GW-10			✓	100	March 21 – November 4
GW-11[7]	Non-Functional				
GW-12	✓			0.9	
GW-13[5]			✓	39.5	March 21 – June 18
GW-14			✓	30.3	March 21 – May 28
GW-15	✓			0.4	
GW-16[2]			✓	36.8	August 12 – November 4
GW-17[7]	Non-Functional				
GW-18			✓	43.9	March 21 – June 29
GW-19		✓		11.8	
GW-20[1]	✓			0.4	

GW-21[7]	Non-Functional				
GW-22			✓	14.5	March 21 – April 23
GW-23[6]	✓			2.2	
GW-24			✓	19.7	March 21 – May 4
GW-25[2]	✓			1.3	
GW-26[2]		✓		8.8	
GW-27[7]	Non-Functional				
GW-28[3]		✓		12.3	
GW-29[2]			✓	12.7	October 7 – November 4
GW-30[1]	✓			0.9	
GW-31[4]			✓	56.6	March 21 – July 27
GW-32[7]	Non-Functional				
GW-33		✓		12.3	
GW-34[7]	Non-Functional				
GW-35			✓	39.9	March 21 – June 19
GW-36			✓	100.0	March 21 – November 4

[1] Gauges 3, 20, and 30 were non-functional for much of the growing season due to low battery charge. Batteries were replaced on July 29th, 2005 during the initial site visit.

[2] Gauges 4, 5, 16, 25, 26, and 29 were non-functional for much of the growing season. They were replaced with new gauges on August 11th, 2005.

[3] Gauge 28 ceased to function properly on July 1st and will be replaced prior to the 2006 growing season.

[4] Gauge 31 ceased to function properly on July 27th, 2005 and will be replaced prior to the 2006 growing season.

[5] Gauge 13 ceased to function properly on July 28th, 2005 and will be replaced prior to the 2006 growing season.

[6] Gauge 23 was non-functional for much of the growing season due to low battery charge. Batteries were replaced on July 29th, 2005 during the initial site visit.

[7] Gauges 8, 11, 17, 21, 27, 32, and 34 were completely non-functional in 2005 and will be replaced with new gauges prior to the beginning of the 2006 growing season.

the initial Site visit were repaired and returned to the Site during the final months of the growing season. The final months for the 2005 growing season for Johnston County were very dry. Therefore, many gauges did not indicate hydrologic success in the fourth year but may have in previous years and likely will in year 5. Also, it should be noted from the monthly visits that although gauges 17, 31, 32, and 34 functioned for none or only part of the growing season, all had standing water in the immediate vicinity of the gauge for at least 12.5 percent of the growing season.

2.3.2 Climatic Data

Figure 3 (Appendix A) provides an evaluation of the local climate in comparison with historical data in order to determine whether 2005 was a year with "average" rainfall. The bars are the monthly rainfall totals for the 2005 hydrologic year collected from the on-site rain gauge. Also represented on the figure are the 30th and 70th percentiles of monthly precipitation for the Clayton weather station. The historical data and monthly data were collected by the Southeast Regional Climate Data.

Months with below average rainfall include: January, April, August, and September. The months of February, March, May, June, October, and November experienced average rainfall. July received above average rainfall. Through the end of November, the region has experienced a rain deficit of approximately eight inches. A normal yearly rainfall in the area is approximately 45.7 inches.

2.4 CONCLUSION

The current year represents the fourth year for hydrologic monitoring. In general, water levels showed a typical pattern of flooding during the spring, followed by a late summer and fall draw down period (but with less overall precipitation in early fall 2005), punctuated by peaks associated with precipitation events. Seventeen gauges indicated saturation within 12 inches of the ground surface for greater than 12.5 percent of the growing season. Five gauges indicated saturation within 12 inches of the ground surface for between 5 to 12.5 percent of the growing season. Gauges 3, 7, 12, 15, 19, 20, 23, 25, 26, 28, 29, 30, and 33 malfunctioned during a significant portion of the 2005 growing season (see Table 1). Gauges 8, 11, 17, 21, 27, 32, and 34 did not function at all during the growing season. Based on monthly visual inspections, gauges 17, 32, and 34 had standing water in the immediate vicinity of the gauge for at least 12.5 percent of the growing season.

3.0 VEGETATION

3.1 SUCCESS CRITERIA

The success criteria state that at lease 320 stems per acre must survive after the completion of the third growing season. The required survival criterion will decrease by 10 percent per year after the third year of vegetation monitoring (i.e., for an expected 290 stems per acre for year 4 and 260 stems per acre for year 5). Photograph locations are shown in Figure 4 (Appendix A). Site photographs are provided in Appendix C.

3.2 DESCRIPTION OF SPECIES

The following tree species were planted in the wetland restoration areas (Appendix D):

Zone 1: Wetland Restoration Area (10.03 Acres)

Quercus lyrata, Overcup Oak
Quercus michauxii, Swamp Chestnut Oak
Quercus phellos, Willow Oak
Quercus nigra, Water Oak
Nyssa sylvatica var. *biflora*, Swamp Blackgum
Fraxinus pennsylvanica, Green Ash
Cornus amomum, Silky Dogwood
Sambucus canadensis, Elderberry
Cephalanthus occidentalis, Buttonbush

Zone 2: Wetland Enhancement Area (1.58 Acres)

Quercus lyrata, Overcup Oak
Quercus michauxii, Swamp Chestnut Oak
Quercus phellos, Willow Oak
Quercus nigra, Water Oak
Nyssa sylvatica var. *biflora*, Swamp Blackgum
Fraxinus pennsylvanica, Green Ash
Cornus amomum, Silky Dogwood
Sambucus canadensis, Elderberry
Cephalanthus occidentalis, Buttonbush

Zone 3: Wetland Creation Area (6.59 Acres)

Quercus lyrata, Overcup Oak
Quercus michauxii, Swamp Chestnut Oak
Quercus phellos, Willow Oak
Quercus nigra, Water Oak
Nyssa sylvatica var. *biflora*, Swamp Blackgum
Fraxinus pennsylvanica, Green Ash

3.3 RESULTS OF VEGETATION MONITORING

RESULTS OF VEGETATION MONITORING

The following table lists the densities of planted tree species recorded in each established 0.06 acre (50-foot by 50-foot) plots (Figure 4, Appendix A).

TABLE 2: Vegetation Monitoring Statistics

Plot Number	1	2	3	4	5	6	7	8	Total
Buttonbush *Cephalanthus occidentalis*		2	6				2	4	**14**
Elderberry *Sambucus canadensis*	1		2	3				1	**6**
Green Ash *Fraxinus pennsylvanica*	5	7	3	5	4	6	3	6	**34**
Overcup Oak *Quercus lyrata*		4	3	1		1	1	4	**14**
Silky Dogwood *Cornus amomum*	6	6	4	2	5	1	2		**20**
Swamp Blackgum *Nyssa sylvatica* var. *biflora*	1			1		1			**2**
Swamp Chestnut Oak *Quercus michauxii*	4	2		3	3	1	8	1	**18**
Water Oak *Quercus nigra*	1						3		**3**
Willow Oak *Quercus phellos*	3	1					2	1	**4**
Total (2005, Year 3)	**21**	**22**	**18**	**15**	**12**	**10**	**21**	**17**	**115**
Total (2003, Year 1)	30	28	40	17	31	21	39	22	198
Total (2002, at Planting)	40	38	45	24	37	31	40	32	247
Density (Trees/Acre)	**350**	**367**	**300**	**250**	**200**	**167**	**350**	**283**	
							Average Density (Trees/Acre)		**283**

Stem counts were made of additional, volunteer woody species within the study plots. These are listed in Table 3.

TABLE 3: Volunteer woody stem counts in the study plots.

Plot Number	1	2	3	4	5	6	7	8	TOTAL
Black Willow *Salix nigra*	4	2	18		1	13		1	**39**
Bradford Pear *Pyrus calleryana*				2					**2**
Groundsel Bush *Baccharis halimifolia*	12							1	**13**
Loblolly Pine *Pinus taeda*		2	6		5	1	71	11	**96**
Persimmon *Diospyros virginiana*				6					**6**
Red Maple *Acer rubrum*		46	56	3	1	57	3	84	**250**
Sweetgum *Liquidambar styraciflua*	2	4	12	1				5	**24**
Tulip Poplar *Liriodendron tulipifera*		3							**3**
Wax Myrtle *Morella cerifera*	1	5						2	**8**
Winged Elm *Ulmus alata*				2				1	**3**
TOTAL	**19**	**62**	**92**	**14**	**7**	**71**	**74**	**105**	**444**
Density (Trees/Acre)	317	1033	1533	233	117	1183	1233	1750	
					Average Density (Trees/Acre)				**925**

In addition, herbaceous vegetation and seedlings of woody species were documented by percentage of aerial coverage in the study plots. For example, if a species occupies 125 square feet within a 2500-square-foot plot, its coverage is calculated at 5 percent. These species are listed in Table 4.

Table 4: Herbaceous vegetation and seedlings listed by coverage in the study plots.

Plot Number	1	2	3	4	5	6	7	8	Average Coverage (percent)
Beggar Ticks *Bidens frondosa*			2						2
Blackberry *Rubus argutus*				5				5	5
Broomsedge *Andropogon virginicus*	20				30		2.5		18
Climbing Hempweed *Mikania scandens*			5					5	5
Common Cattail *Typha latifolia*	5	5						5	5
Dog Fennel *Eupatorium capillifolium*	10			5			2.5	15	8
False Nettle *Boehmeria cylindrica*			0.5						1
Fescue *Festuca* sp.				90					90
Goldenrod *Solidago* sp.					2.5		0.5		2
Greenbrier *Smilax rotundifolia*				5					5
Jewelweed *Impatiens capensis*								5	5
Ragweed *Ambrosia artemisiifolia*				2.5					3
Ragwort *Senecio* sp.					2.5				3
Sericea Lespedeza *Lespedeza cuneata*	20				5		30		18
Smartweed *Polygonum* sp.		2.5	5					5	4
Soft Rush *Juncus effusus*		90	85		50	95		40	72
Tearthumb *Polygonum sagittatum*			5					10	8
Trumpet Creeper *Campsis radicans*				20			2.5		11
Woolgrass Bulrush *Scirpus cyperinus*		5	2.5			5			4
Total Coverage	55	103	105	128	90	100	38	90	

3.4 CONCLUSION

Of the 50.7 acres on this site, approximately 18.2 acres involved tree planting. Supplemental tree planting was completed in December 2002. An upland buffer area that consisted of 12.04 acres was also planted. Eight vegetation monitoring plots, 50 by 50 feet (0.06 acre) in size, were established throughout the planting areas. The 2005 vegetation monitoring results revealed an average density of 283 trees per acre of planted species. This average is below the minimum success criteria of 320 trees per acre after the third growing season.

Dry conditions at the site, as well as dry weather, may have contributed to reduced survivorship of planted tree species in all plots by the third year of monitoring. Plots 3, 5, and 6 all include less than 50 percent of the original planted stems. Overall, 58 percent of the stems planted in the eight plots survive.

Nuisance trees such as red maple and loblolly pine occur in significant amounts in some areas of the site, as seen in Plots 2, 3, and 7. The increase in stem counts of these species is likely due to site characteristics and proximity to seed sources. However, these occurrences do not appear to have a direct effect on the survivability of planted species on the plots.

APPENDIX A

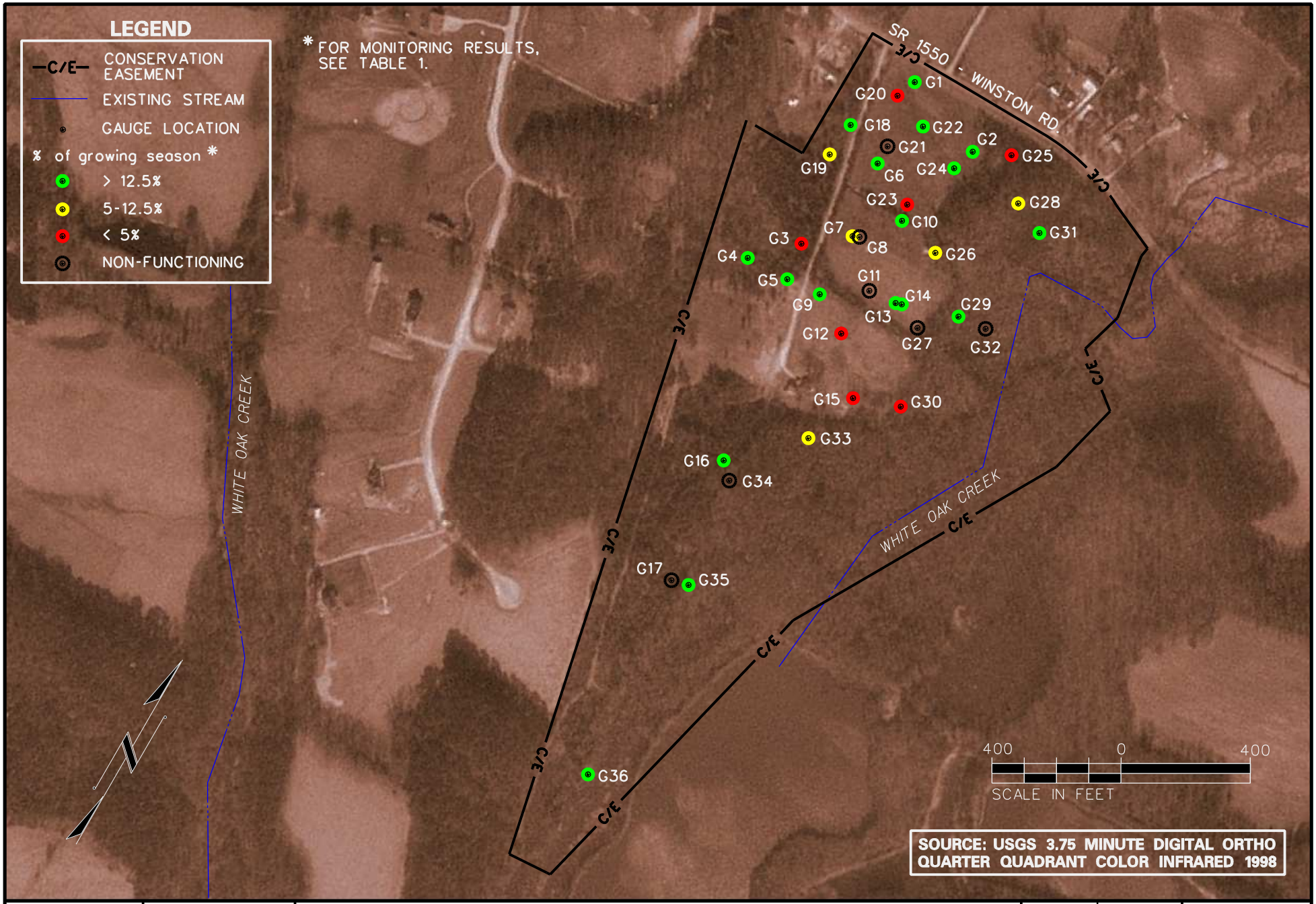
FIGURES

EcoScience Corporation
Raleigh, North Carolina

SITE LOCATION
White Oak Creek Mitigation Site
Johnston County, North Carolina
EEP Project # 417

Dwn. by:	MAF
Ckd by:	JWG
Date:	DEC 2005
Project:	05-243.01

FIGURE 1



EcoScience Corporation
Raleigh, North Carolina

Client: Ecosystem Enhancement Program

Project:

MONITORING GAUGE LOCATIONS AND RESULTS
White Oak Creek Mitigation Site

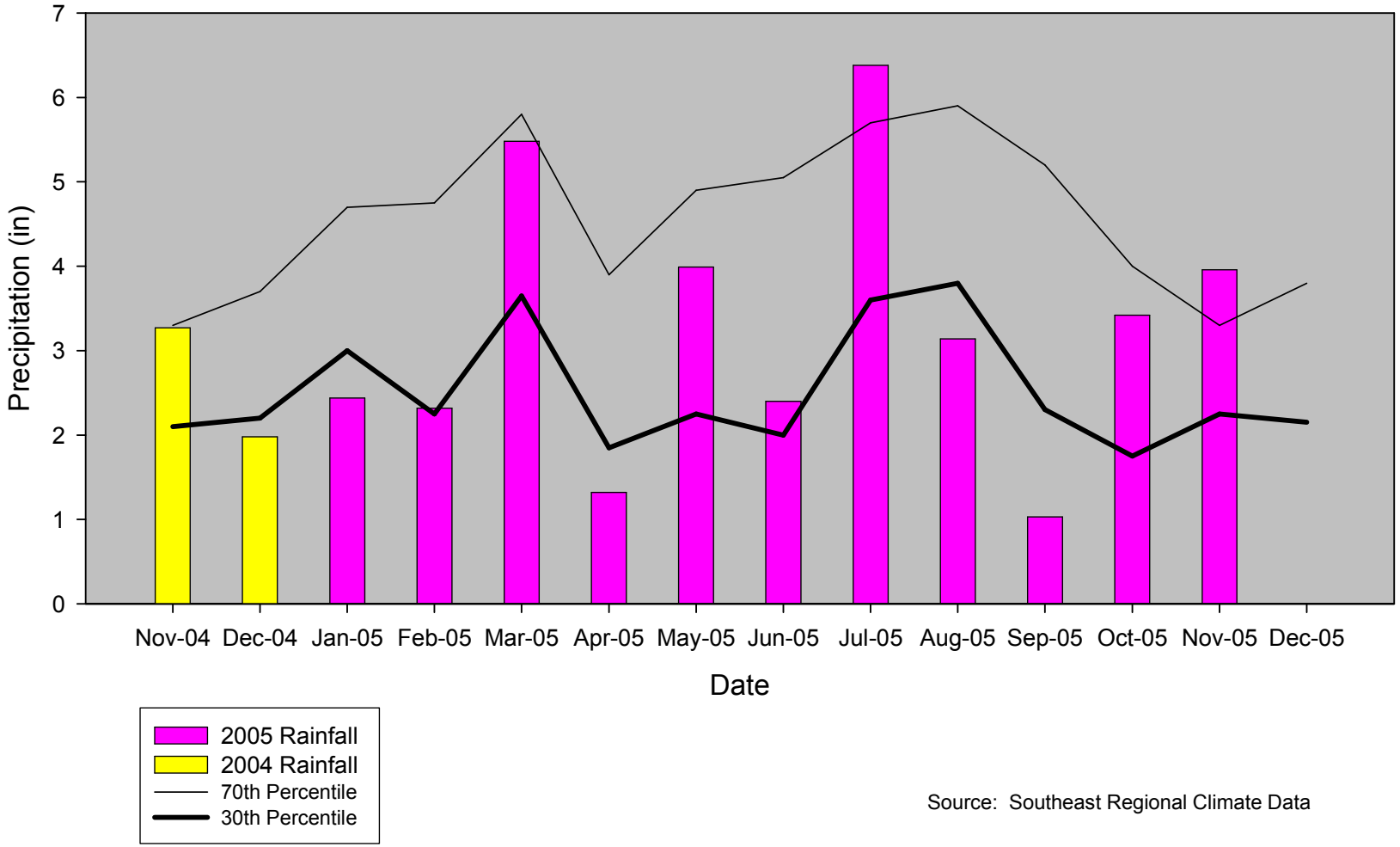
EEP Project No.417

JOHNSTON COUNTY, NORTH CAROLINA

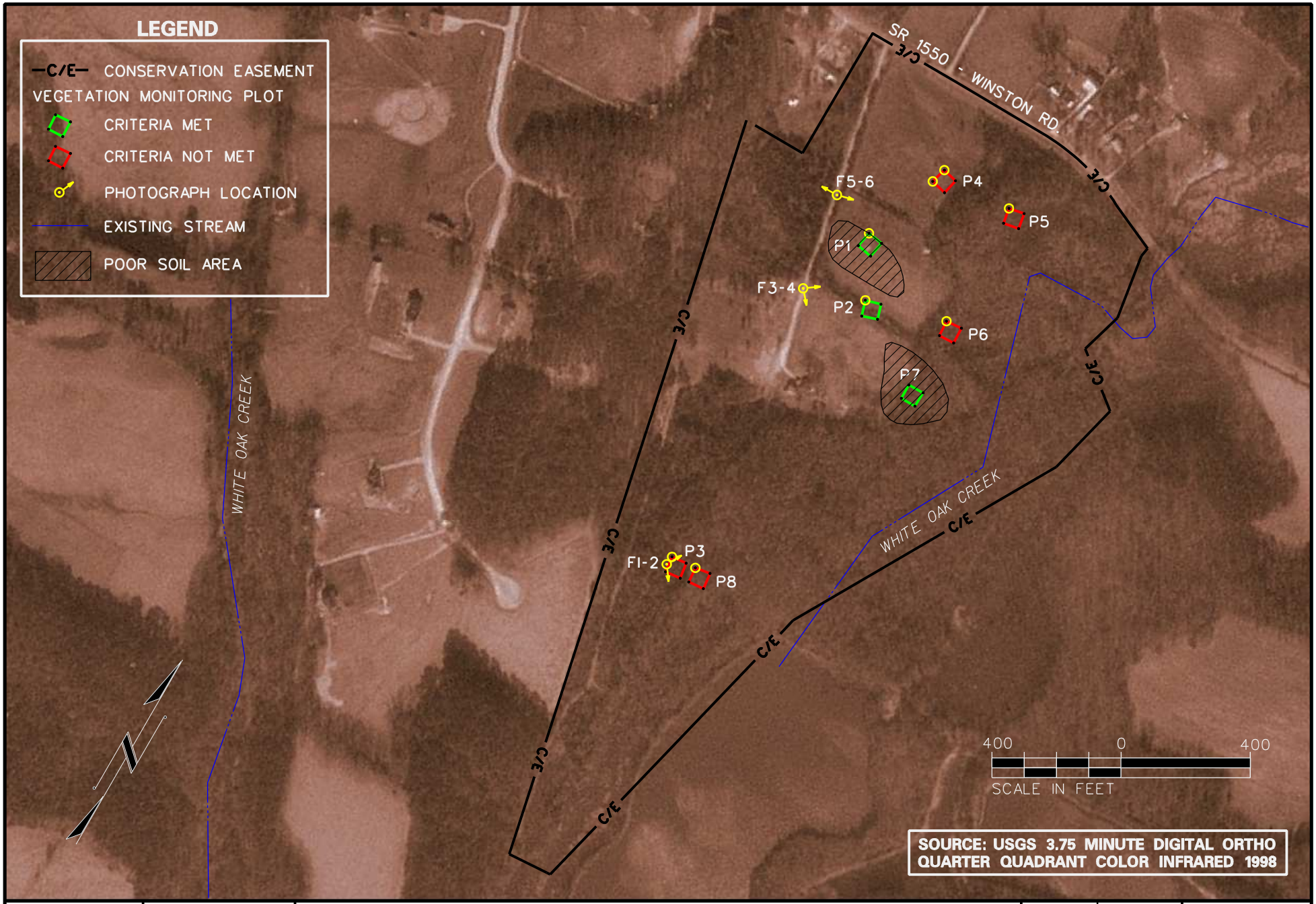
Dwn By: MAF	Date: DEC 2005
Ckd By: JWG	Scale: 1"= 400'
ESC Project No.: 05-243.01	

FIGURE 2

Figure 3. Monthly Rainfall and 30-70 Percentile Graph for Clayton, NC
White Oak Creek Mitigation Site



Source: Southeast Regional Climate Data



EcoScience Corporation
Raleigh, North Carolina

Client: Ecosystem Enhancement Program

Project:
VEGETATION MONITORING PLOTS AND PHOTOGRAPH LOCATIONS
White Oak Creek Mitigation Site

EEP Project No. 417
JOHNSTON COUNTY, NORTH CAROLINA

Dwn By: MAF	Date: DEC 2005
Ckd By: JWG	Scale: 1"= 400'
ESC Project No.: 05-243.01	

FIGURE
4

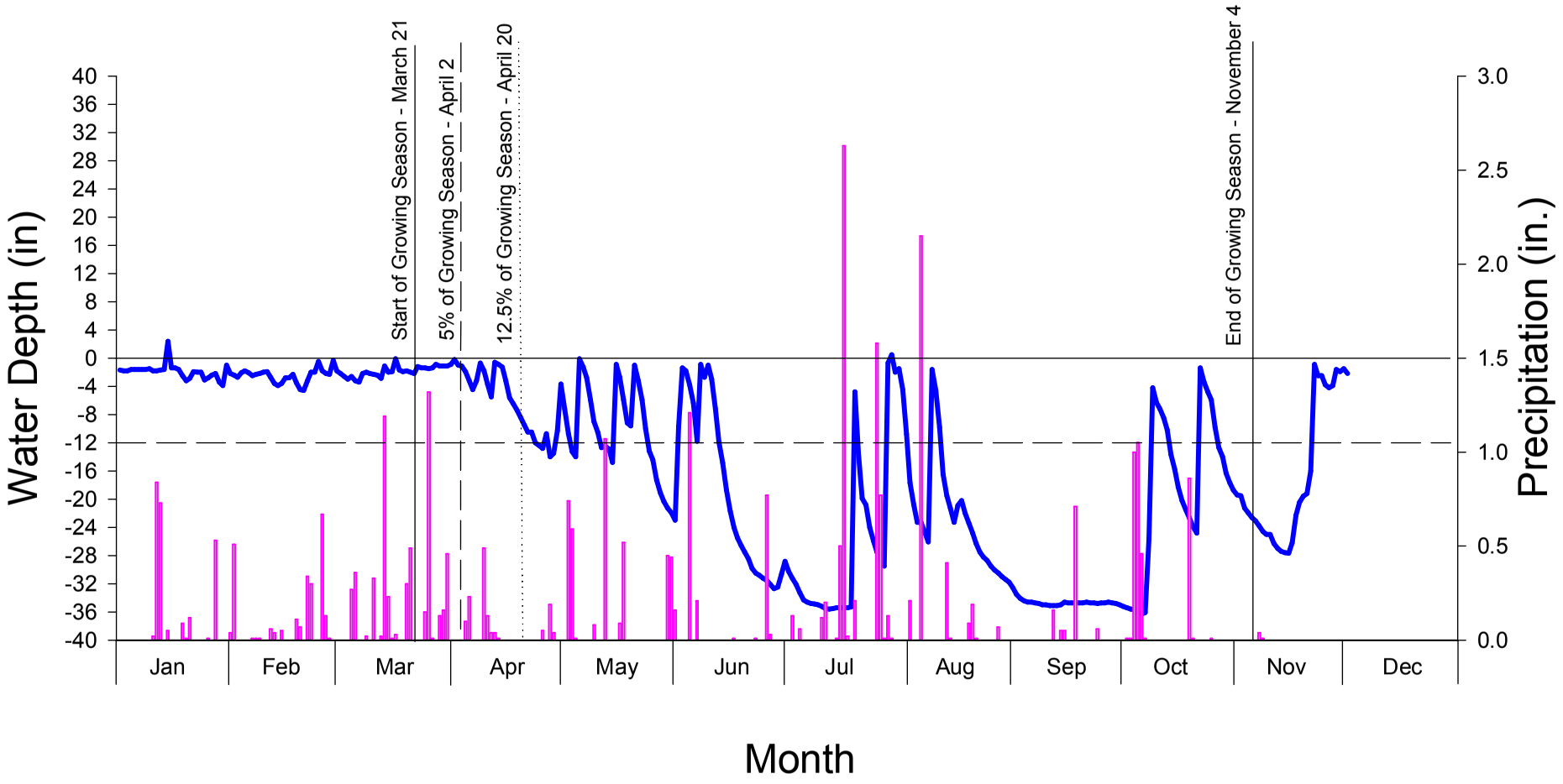
APPENDIX B

GROUNDWATER GAUGE HYDROGRAPHS

White Oak Creek

2005

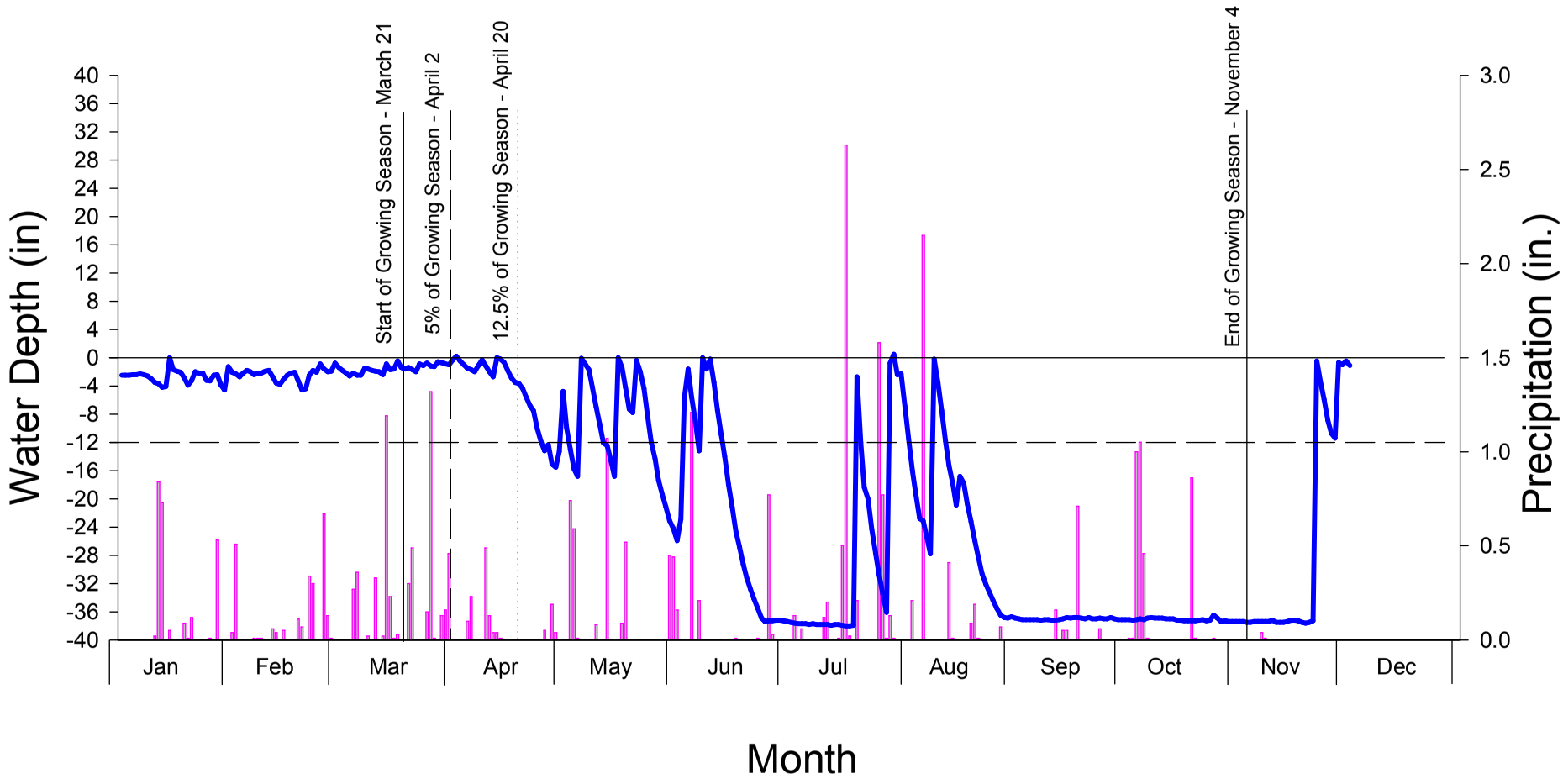
Monitoring Gauge 1 - 9DE4246



White Oak Creek

2005

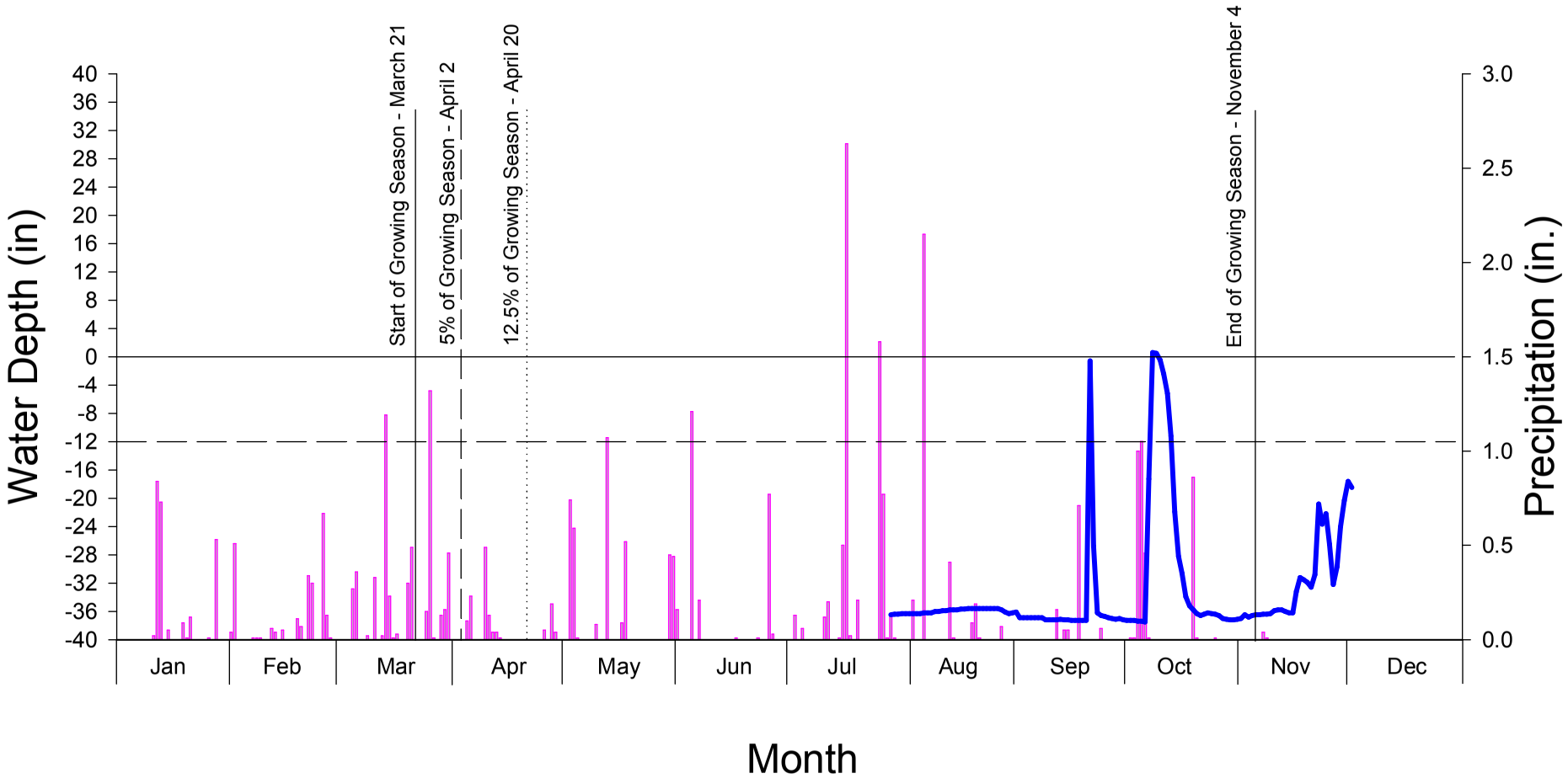
Monitoring Gauge 2 - 9BEBCFA



White Oak Creek

2005

Monitoring Gauge 3 - 8E529FC

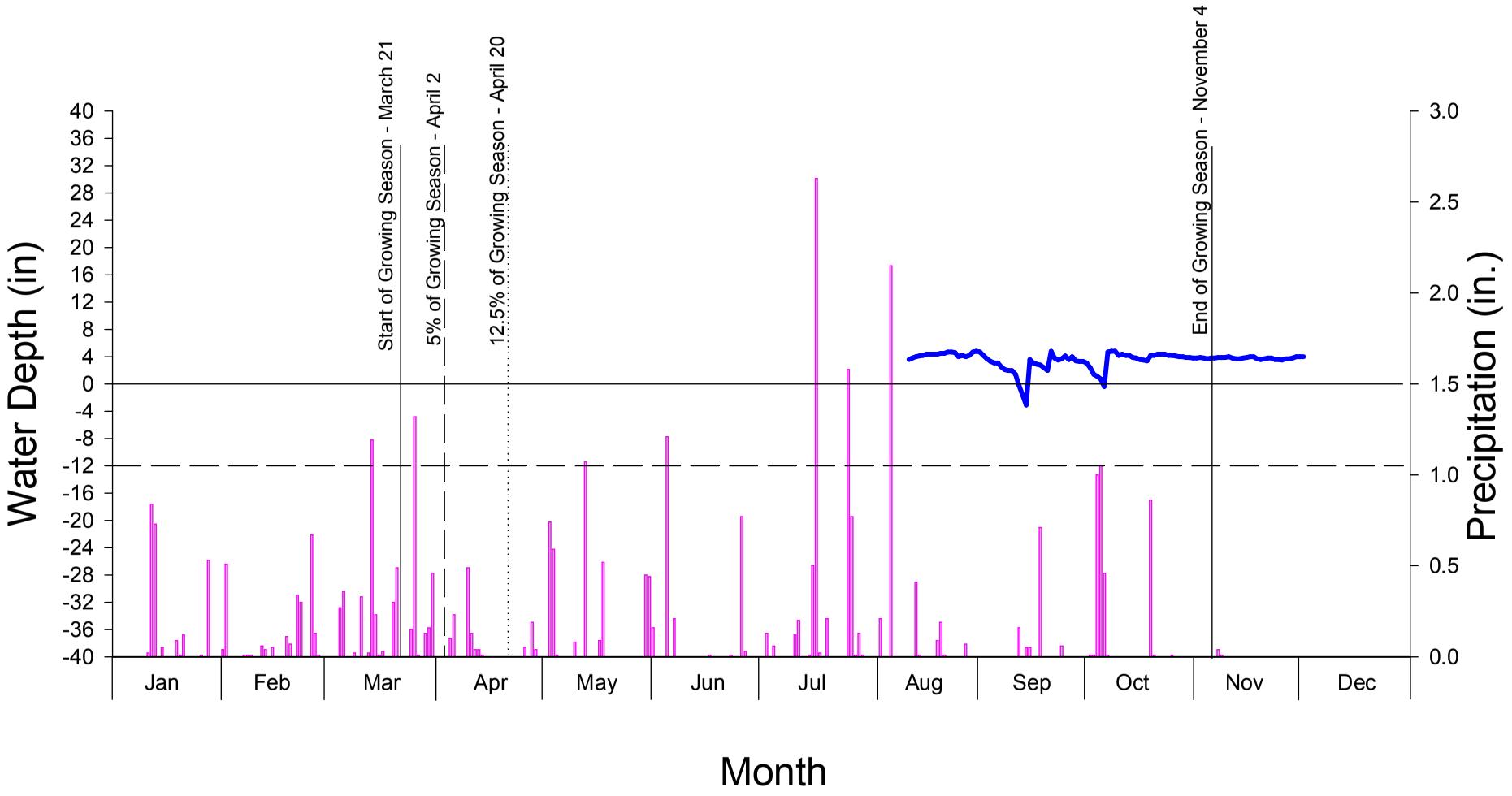


*Prior to July 2005 gauge was not functioning due to low battery charge. Batteries were replaced during first site visit in late July.

White Oak Creek

2005

Monitoring Gauge 4 - B651405

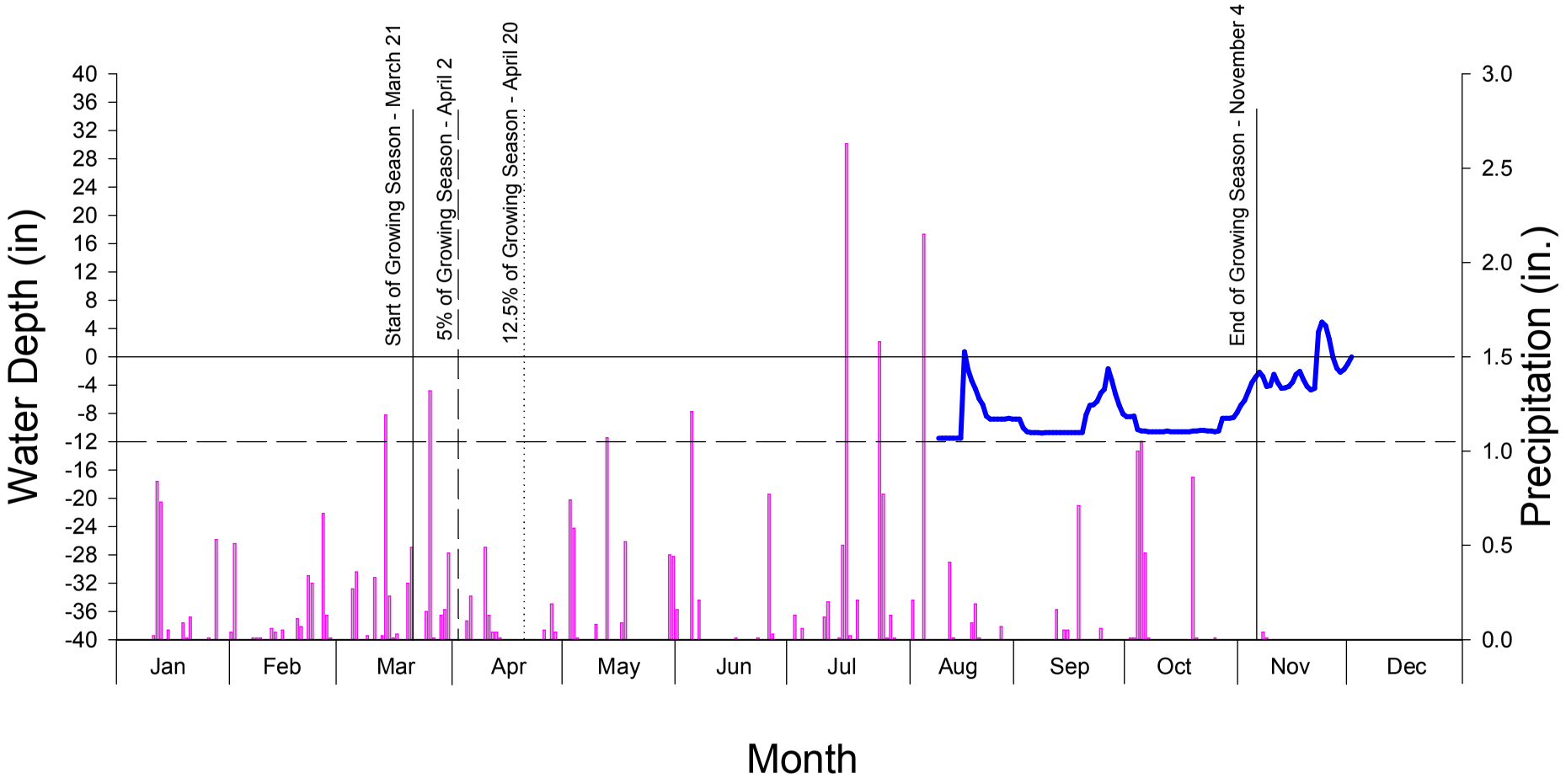


*Gauge was found to be non-functioning during first site visit in July 2005. Gauge was replaced in August 2005.

White Oak Creek

2005

Monitoring Gauge 5 - B65131A

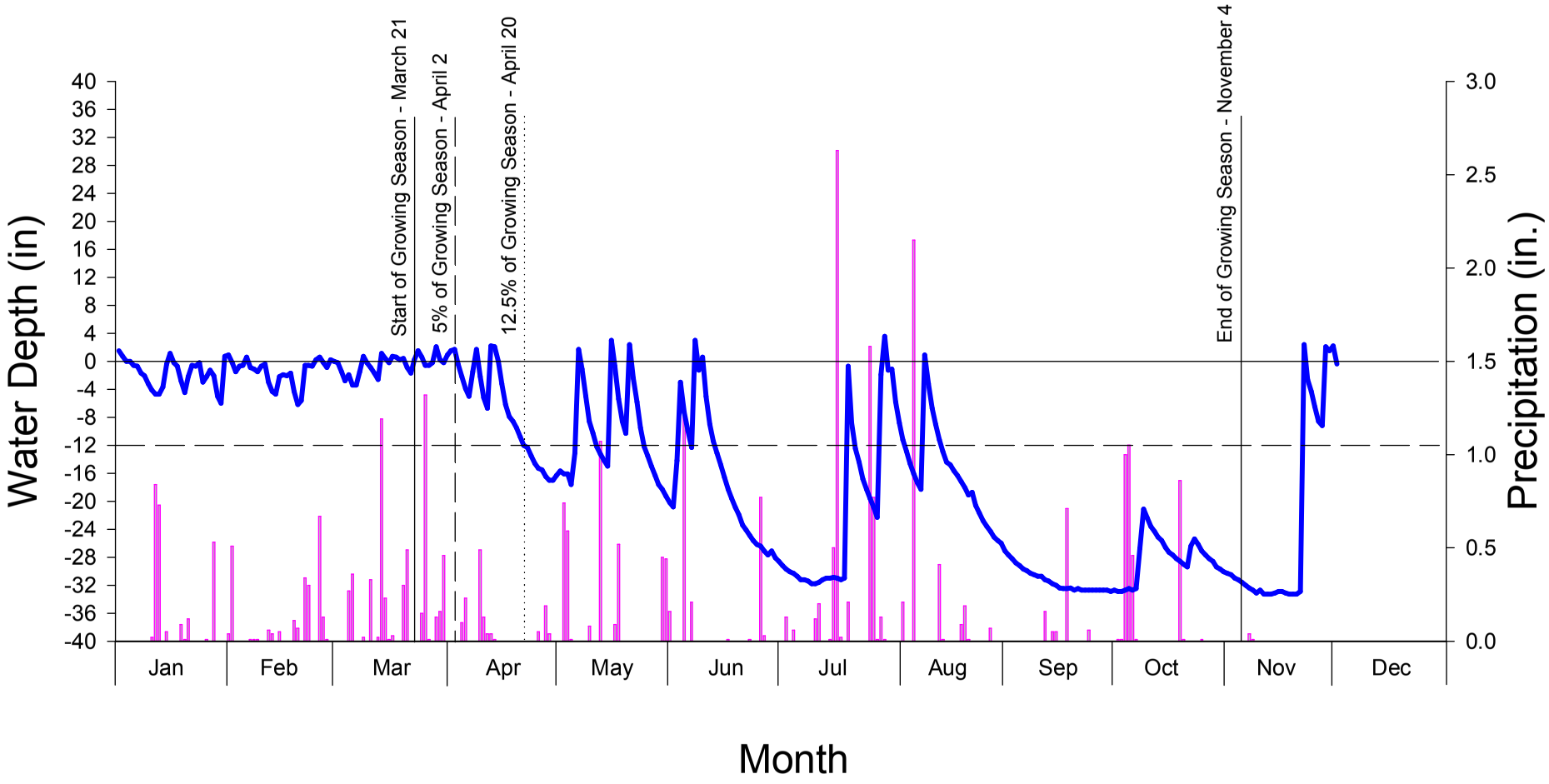


*Gauge was found to be non-functioning during first site visit in July 2005. Gauge was replaced in August 2005.

White Oak Creek

2005

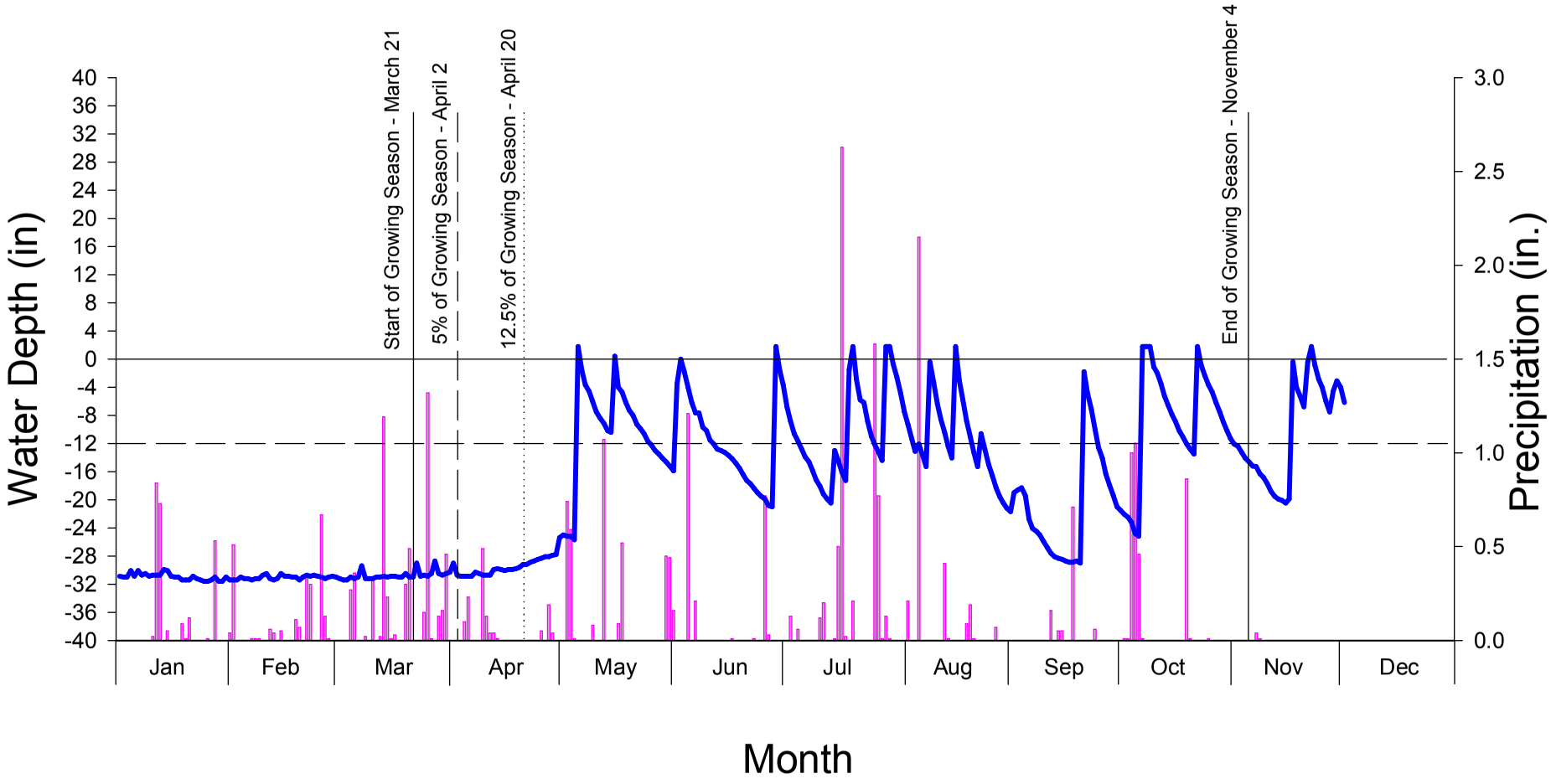
Monitoring Gauge 6 - 04487EB



White Oak Creek

2005

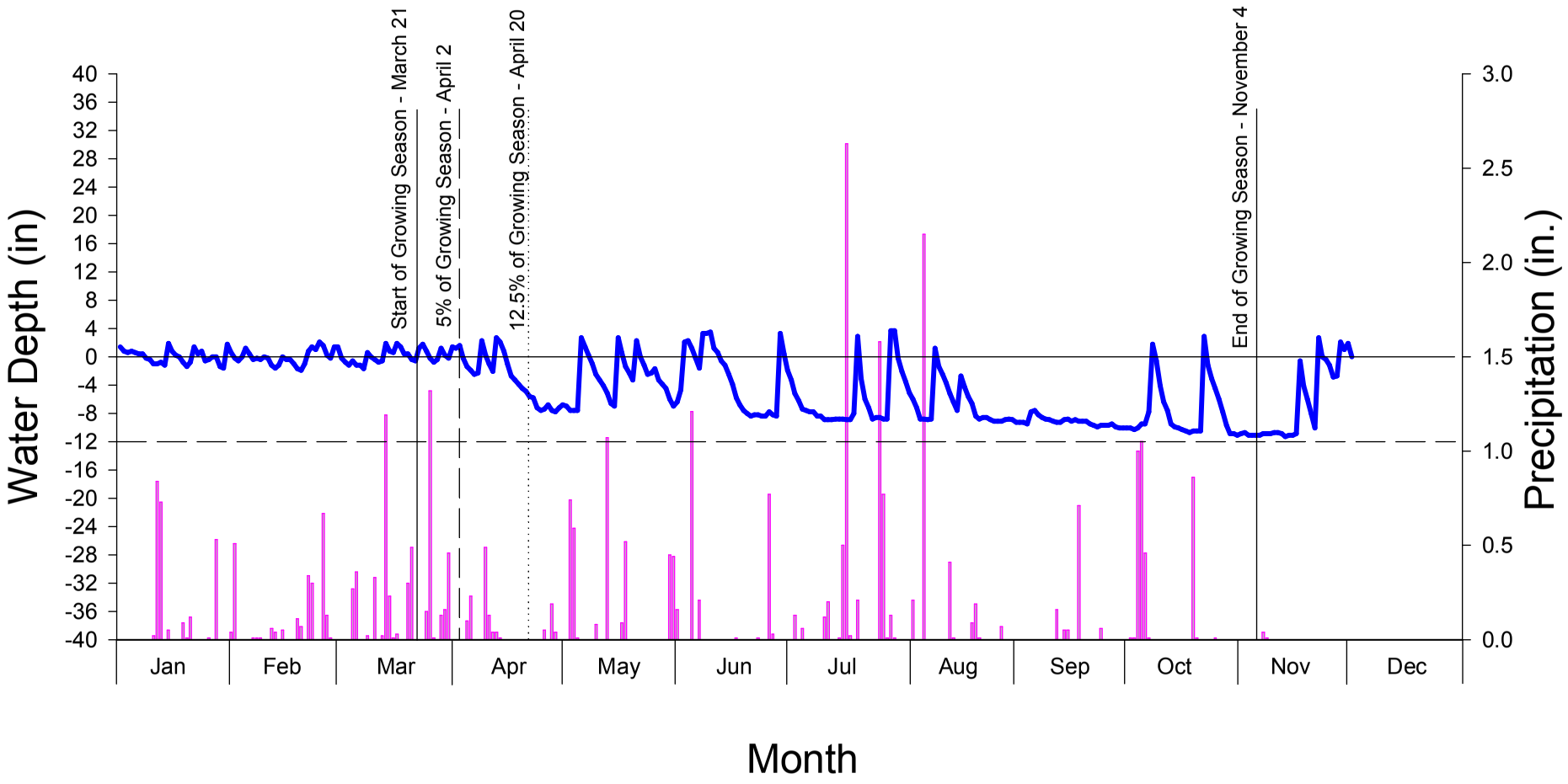
Monitoring Gauge 7 - 0214102



White Oak

2005

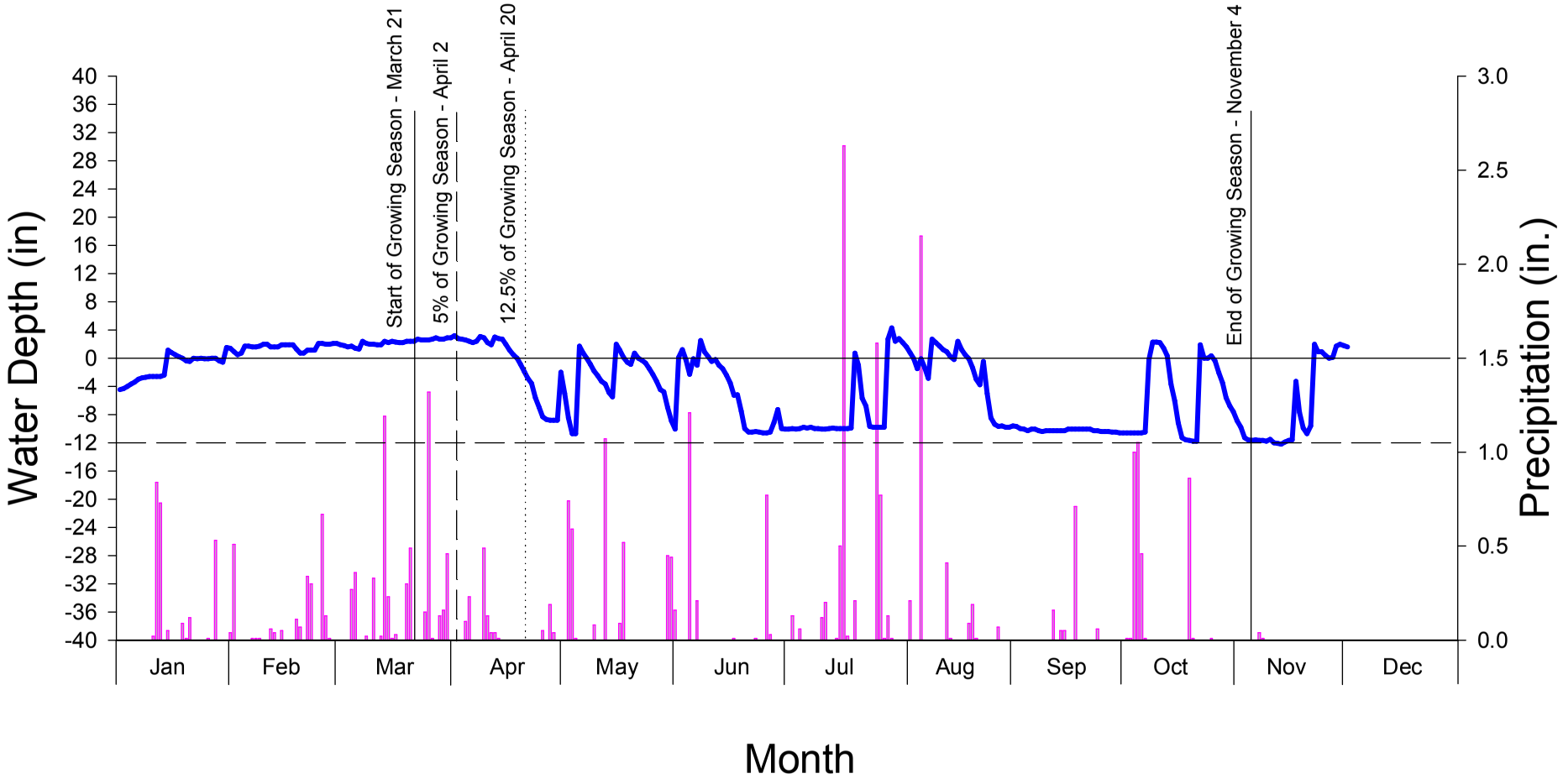
Monitoring Gauge 9 - 0504258



White Oak Creek

2005

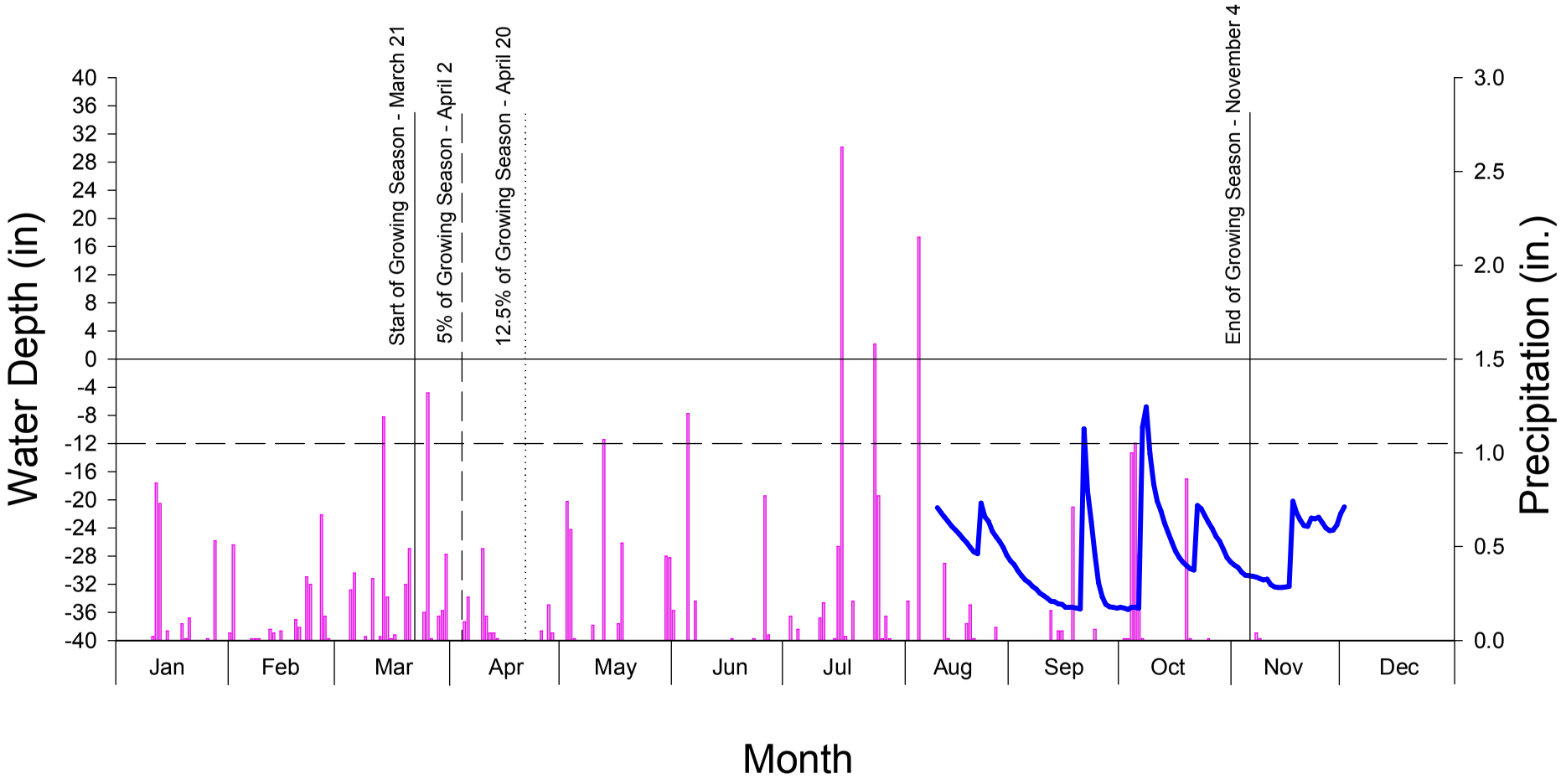
Monitoring Gauge 10 - 9DE5CAE



White Oak Creek

2005

Monitoring Gauge 12 - B65222F

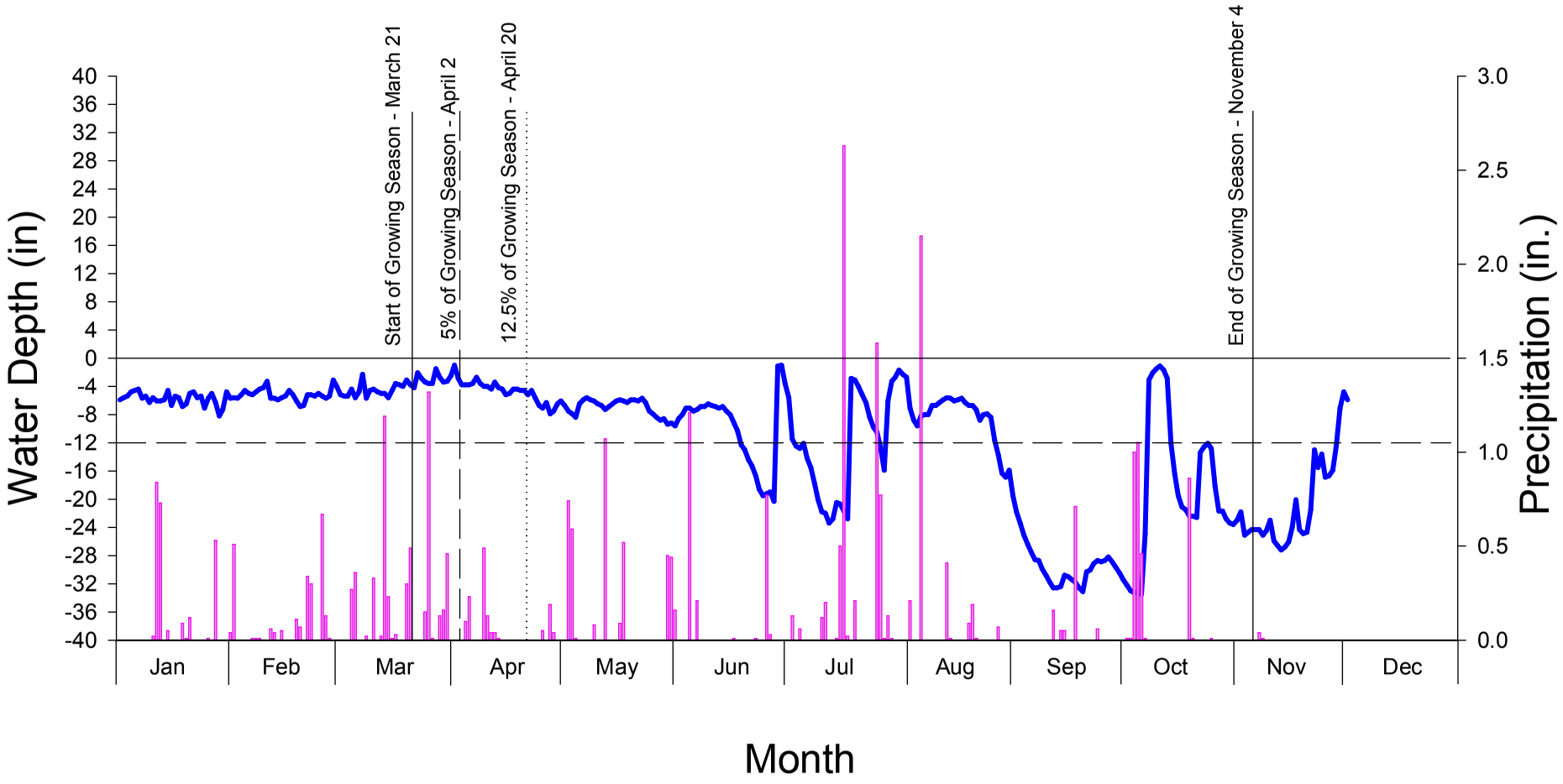


*Gauge was found to be non-functioning during first site visit in July 2005. Gauge was replaced in August 2005.

White Oak Creek

2005

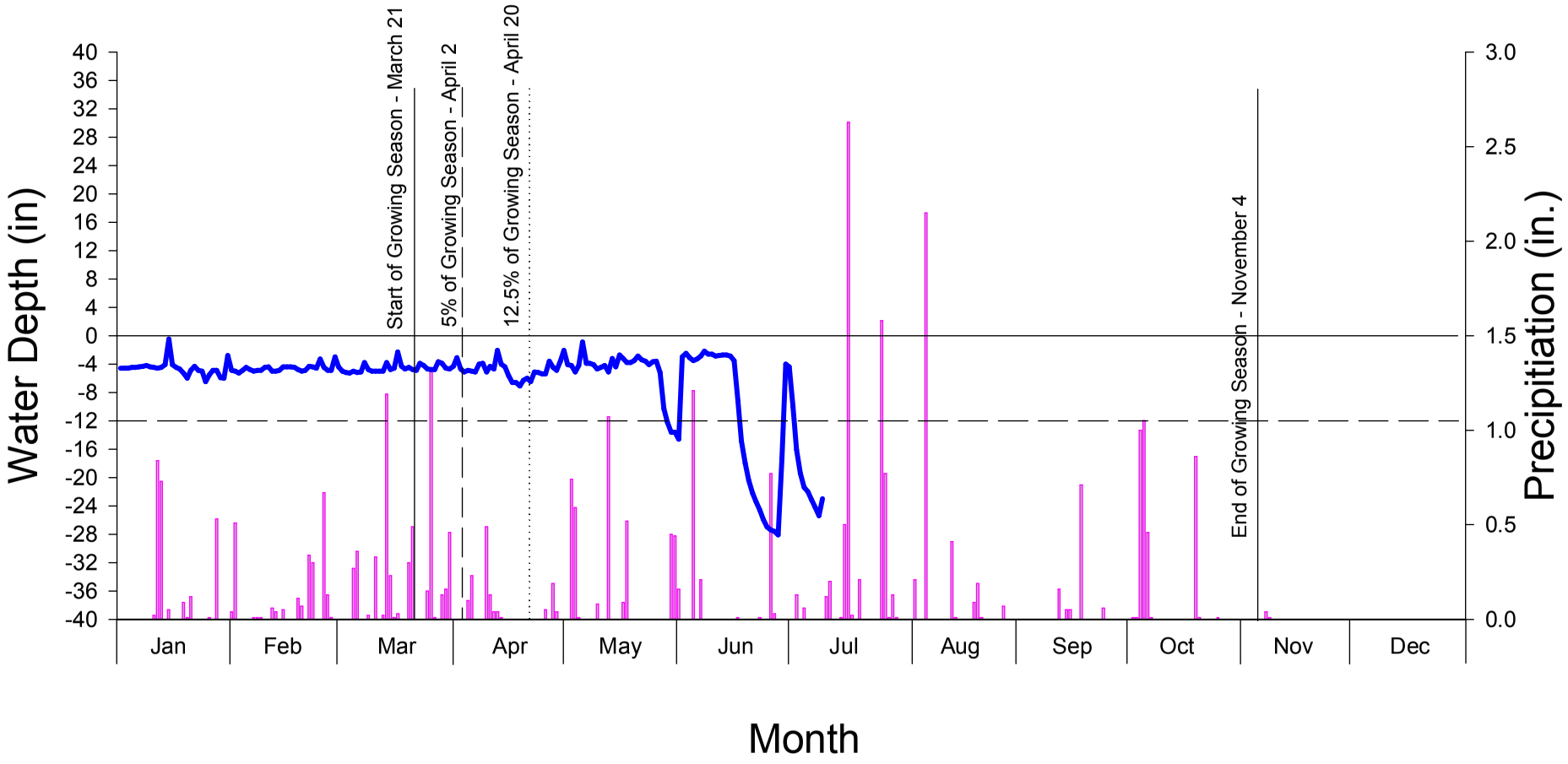
Monitoring Gauge 13 - 04941F4



White Oak Creek

2005

Monitoring Gauge 14 - 9D7ECE7

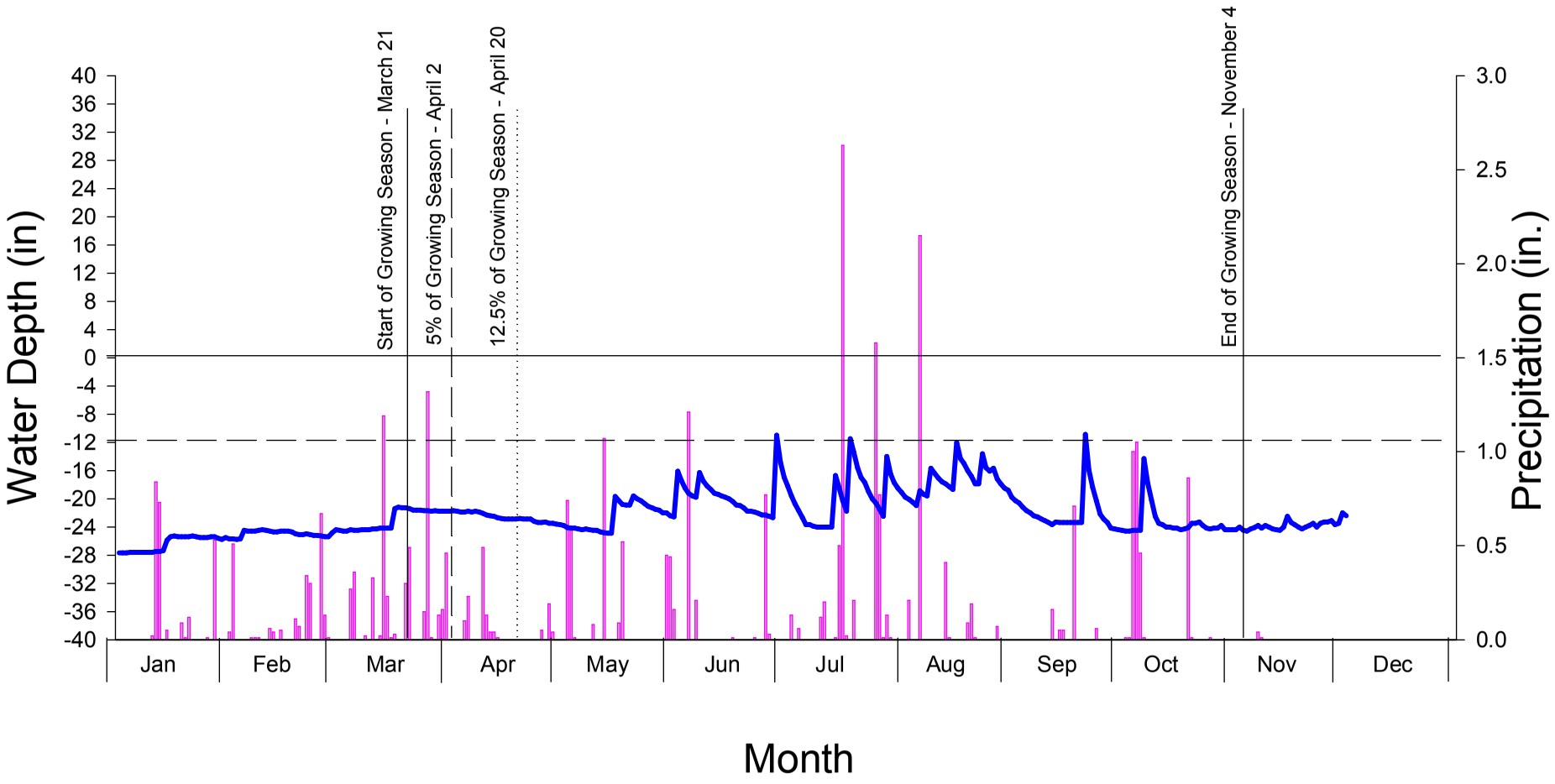


*Gauge was found to be non-functioning during first site visit in July 2005. Prior attained data was retrievable , although attempts to repair the gauge failed. Gauge will be replaced prior to 2006 growing season.

White Oak Creek

2005

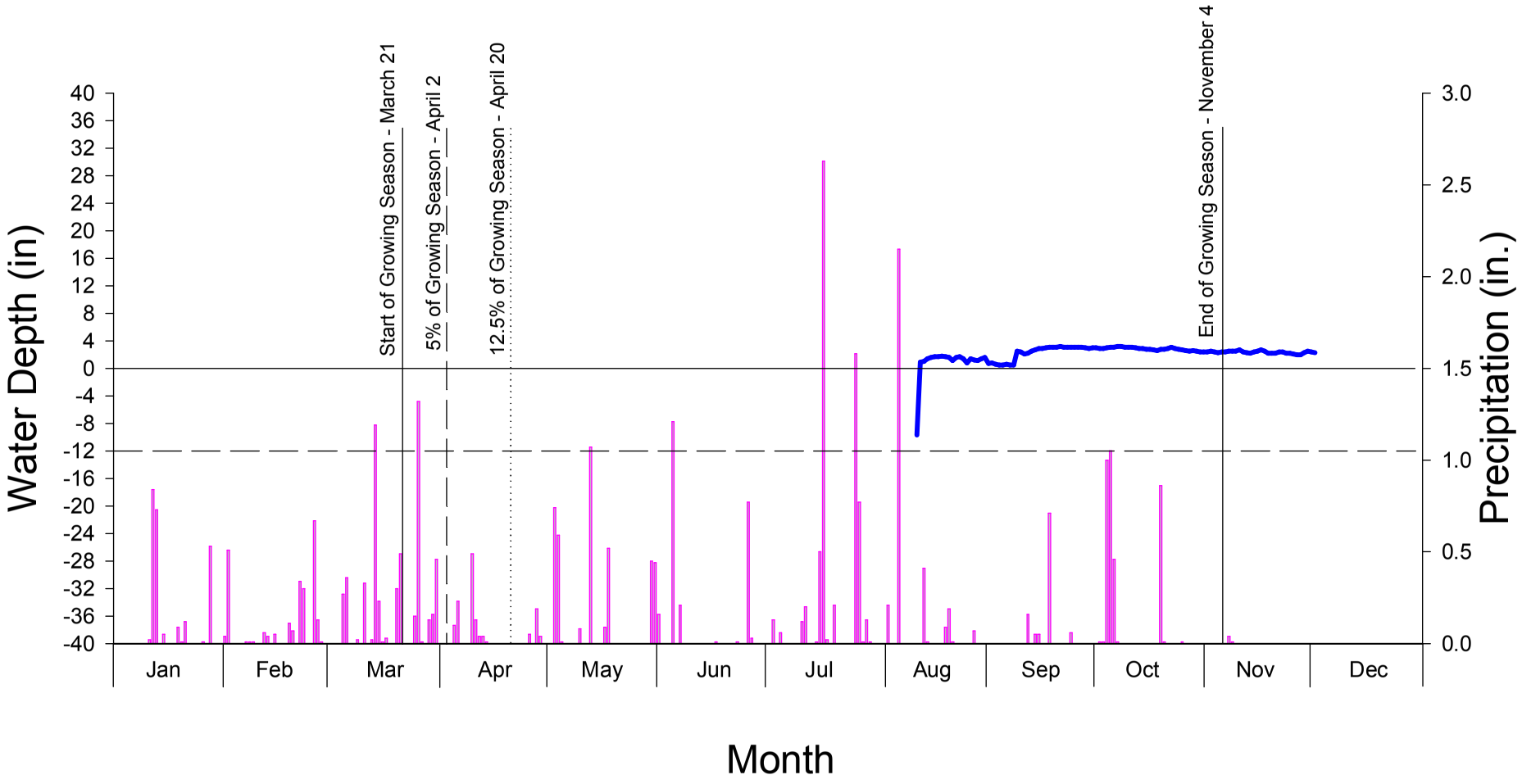
Monitoring Gauge 15 - 9DE497E



White Oak Creek

2005

Monitoring Gauge 16 - B6513D9

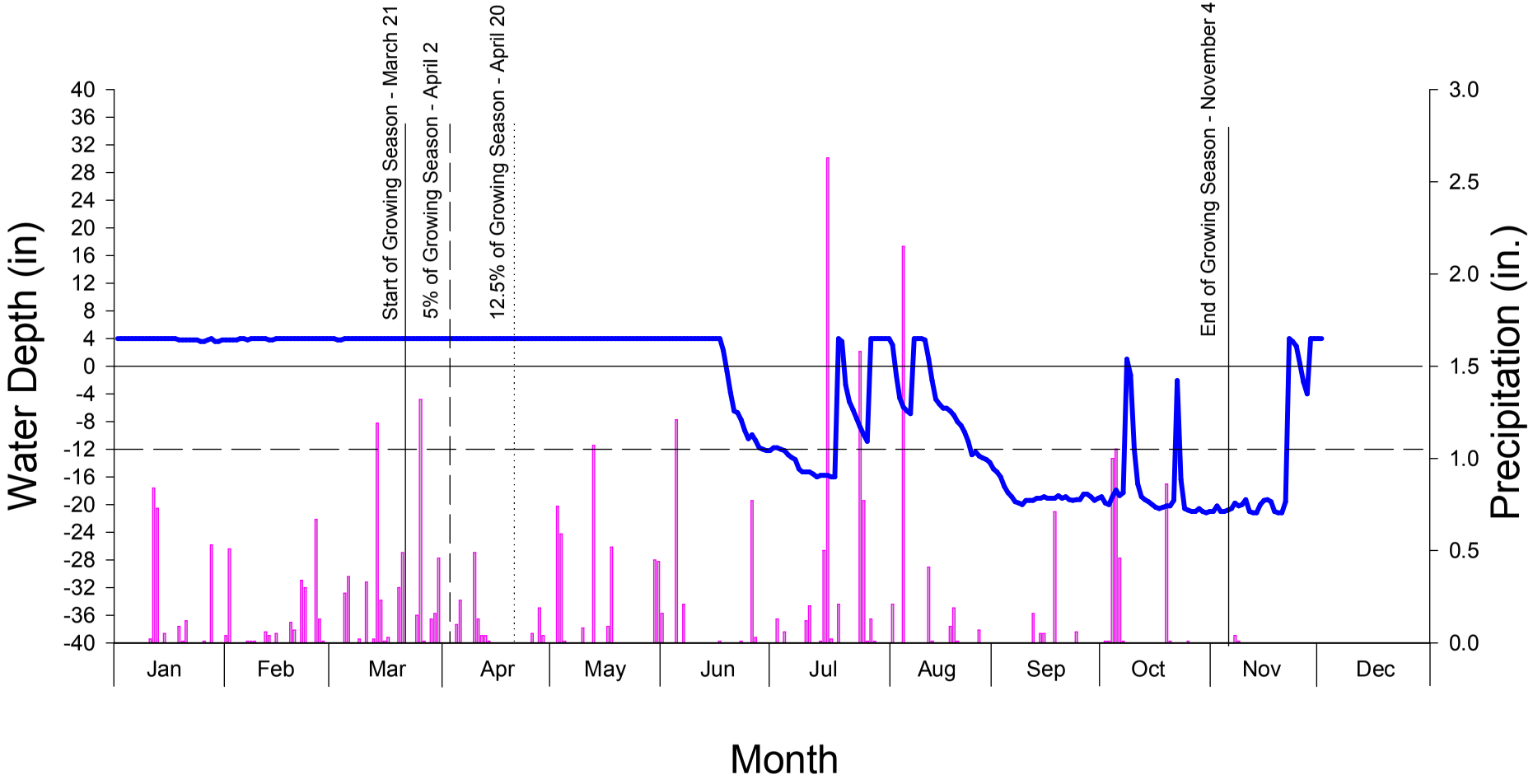


*Gauge was found to be non-functioning during first site visit in July 2005. Gauge was replaced in August 2005.

White Oak Creek

2005

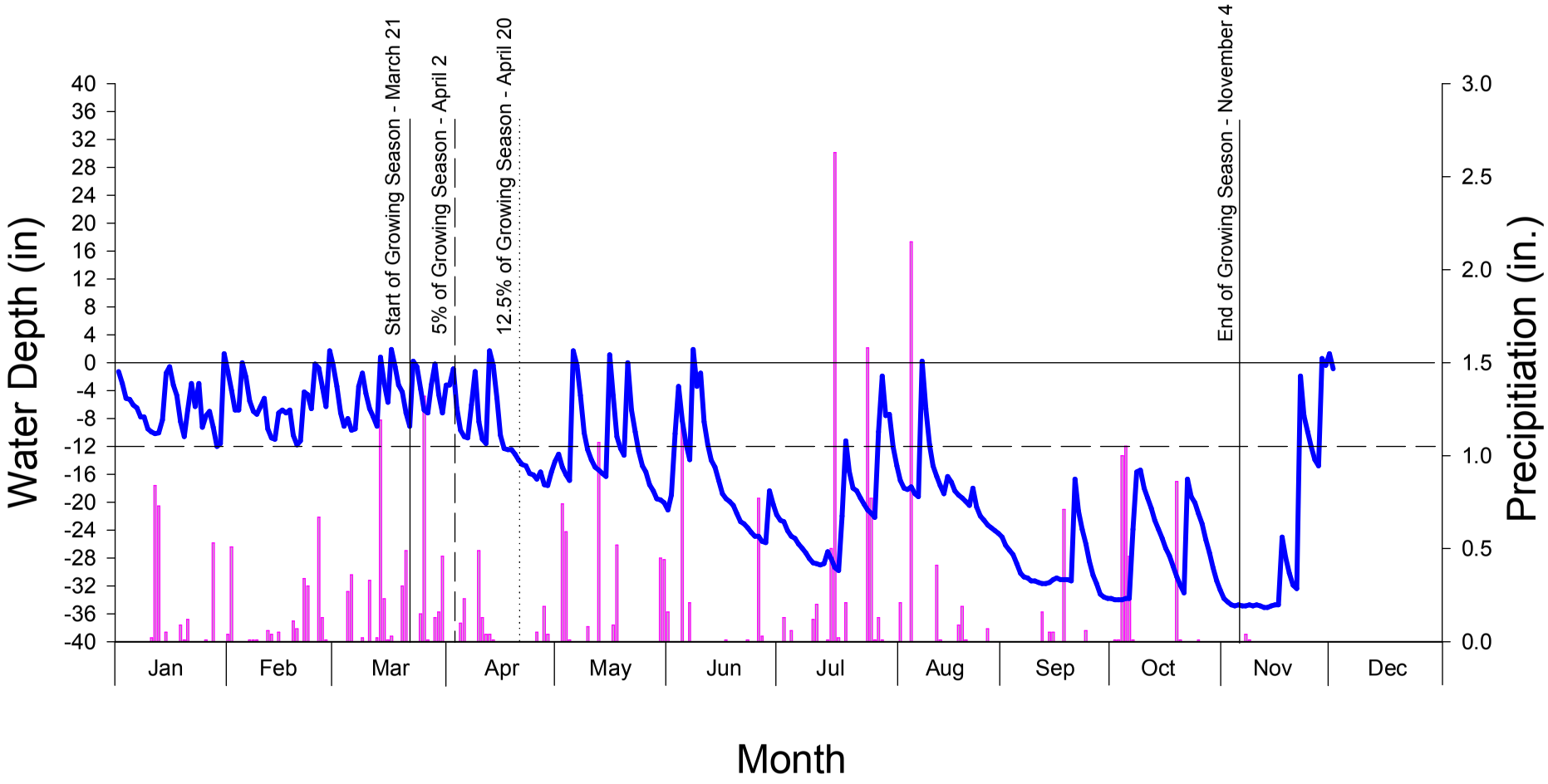
Monitoring Gauge 18 - 04489A2



White Oak Creek

2005

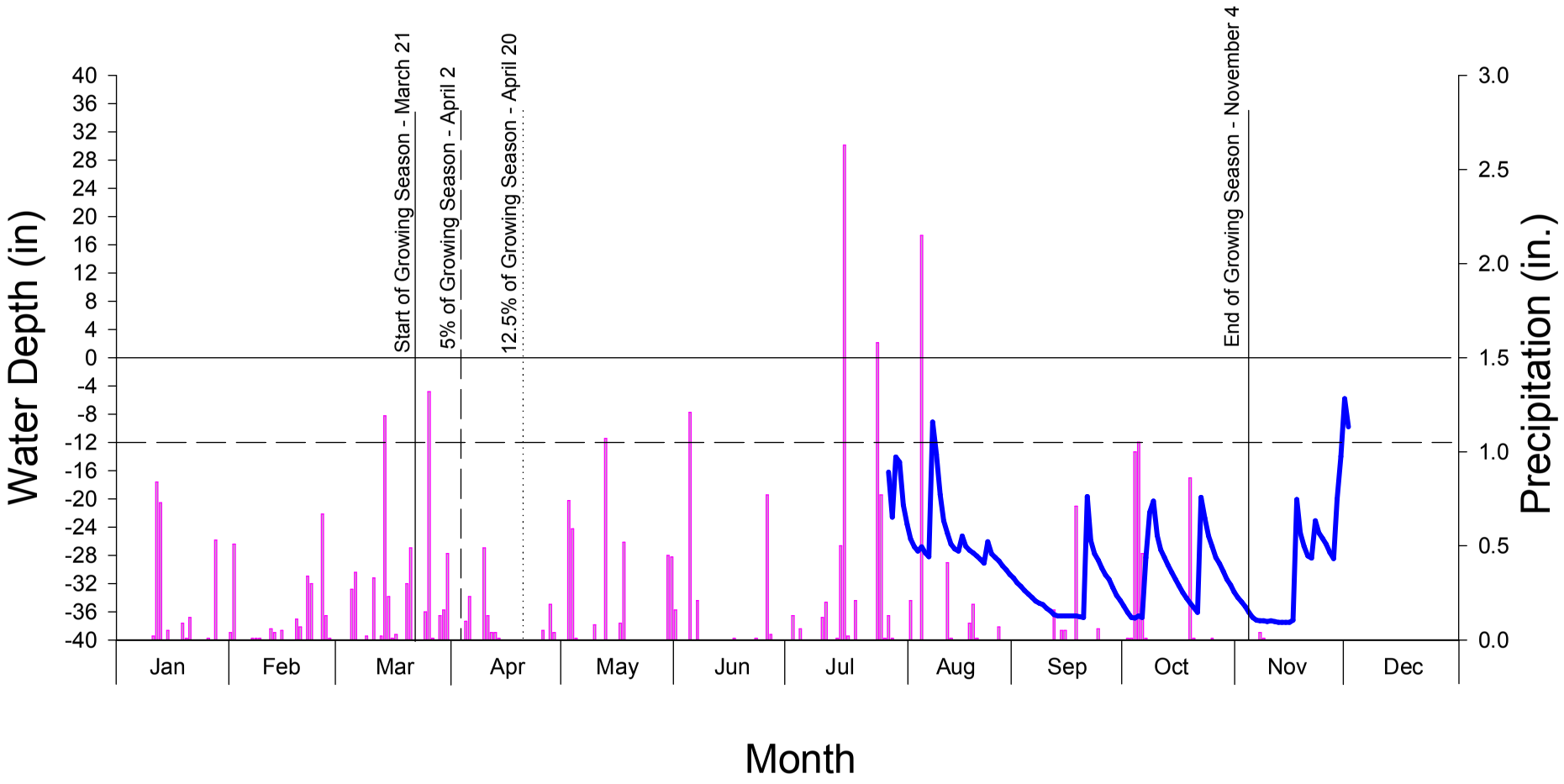
Monitoring Gauge 19 - 04CFF90



White Oak Creek

2005

Monitoring Gauge 20 - 9DE4B47

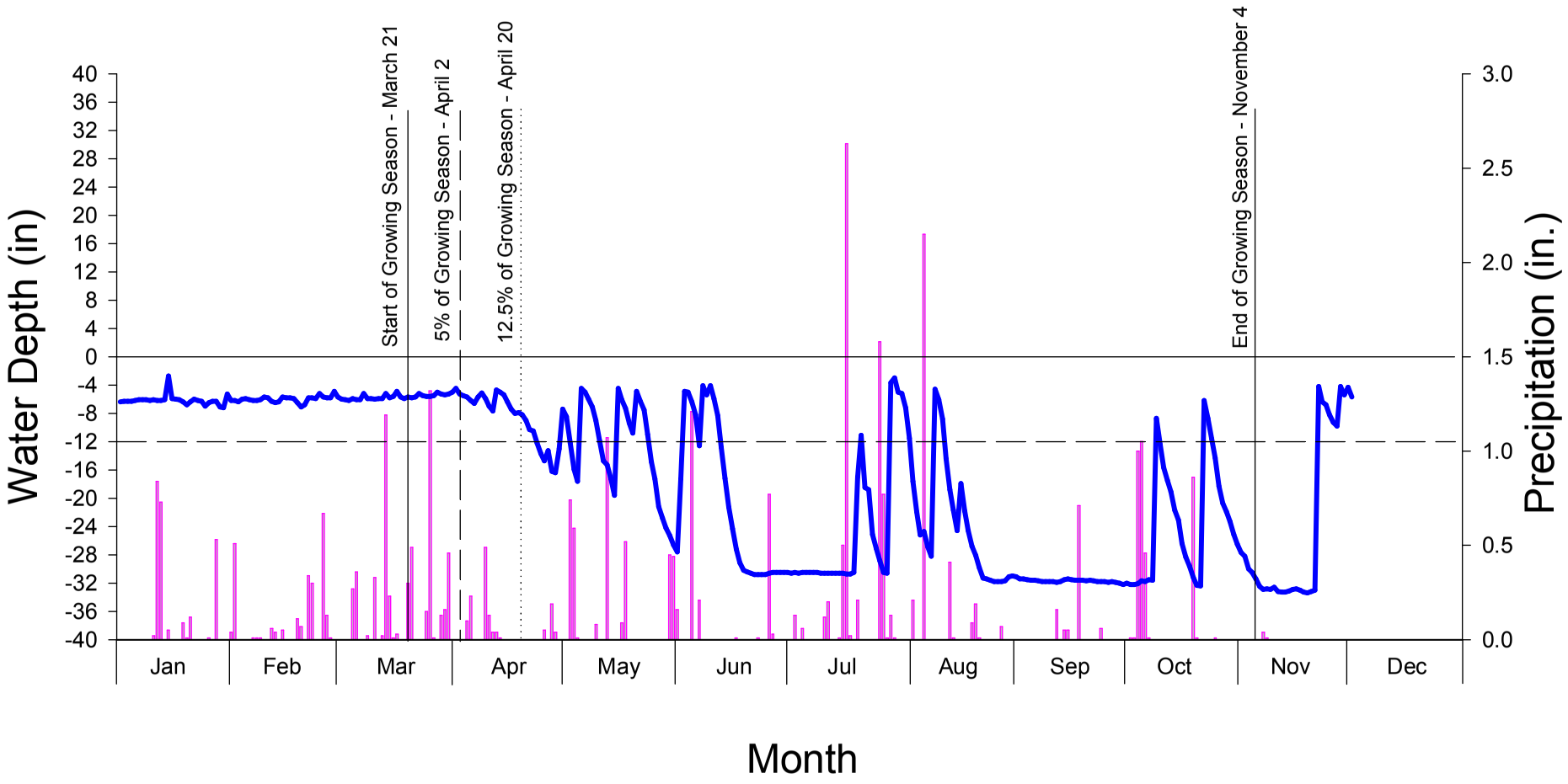


*Prior to July 2005 gauge was not functioning due to low battery charge. Batteries were replaced during first site visit in late July.

White Oak Creek

2005

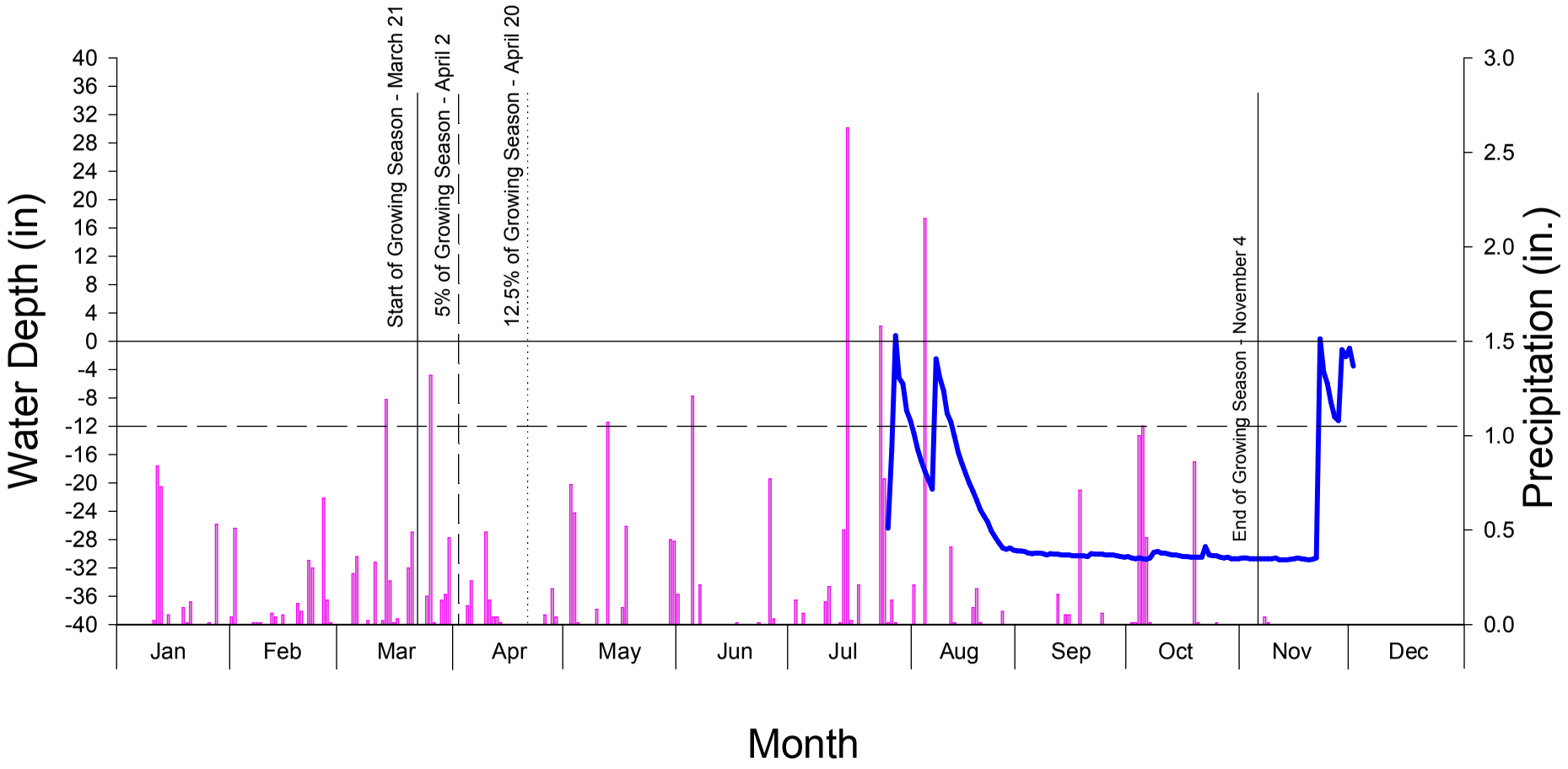
Monitoring Gauge 22 - 9DE4889



White Oak Creek

2005

Monitoring Gauge 23 - 8E546A7

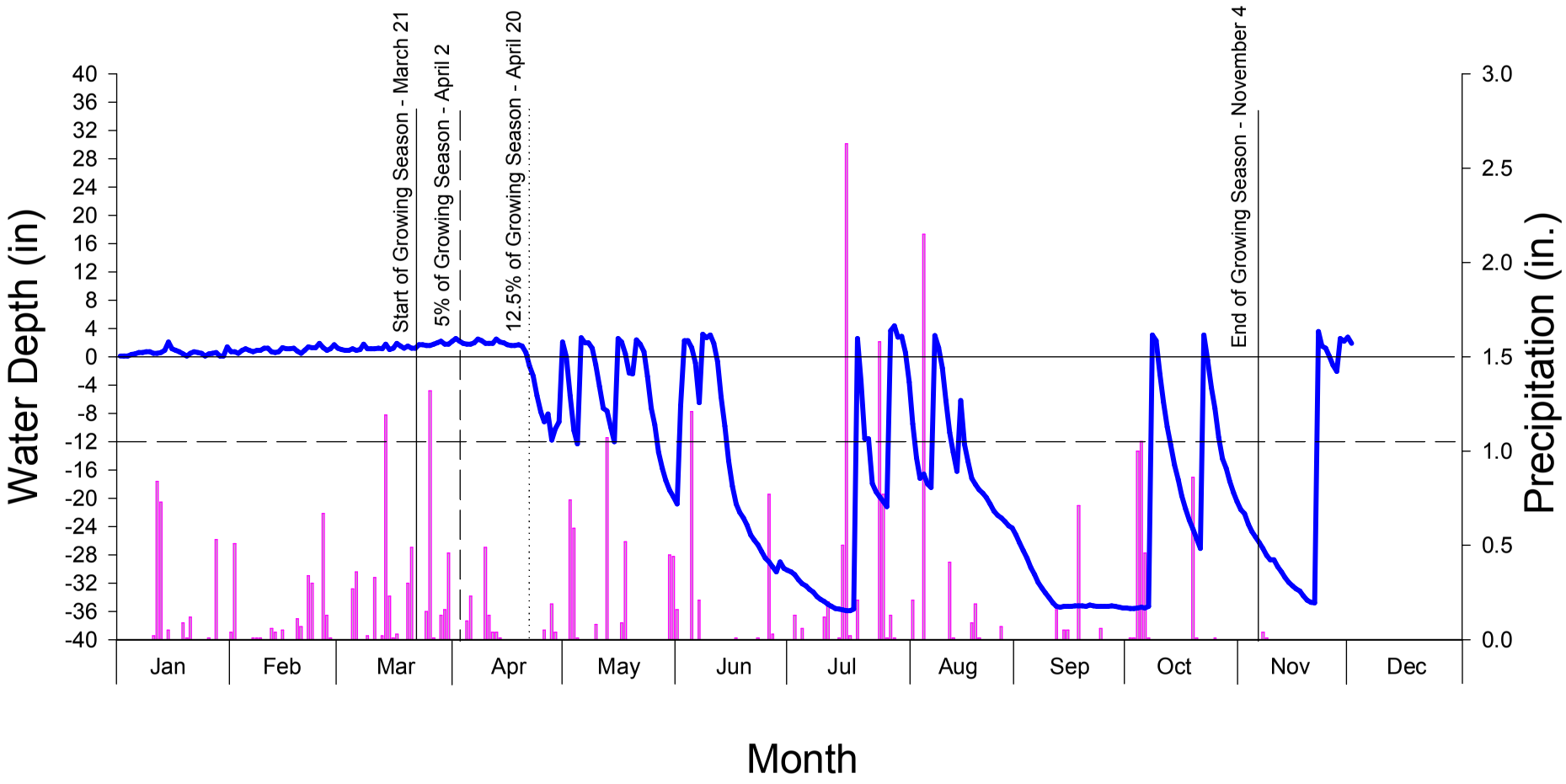


*Prior to July 2005 gauge was not functioning due to low battery charge. Batteries were replaced during first site visit in late July.

White Oak Creek

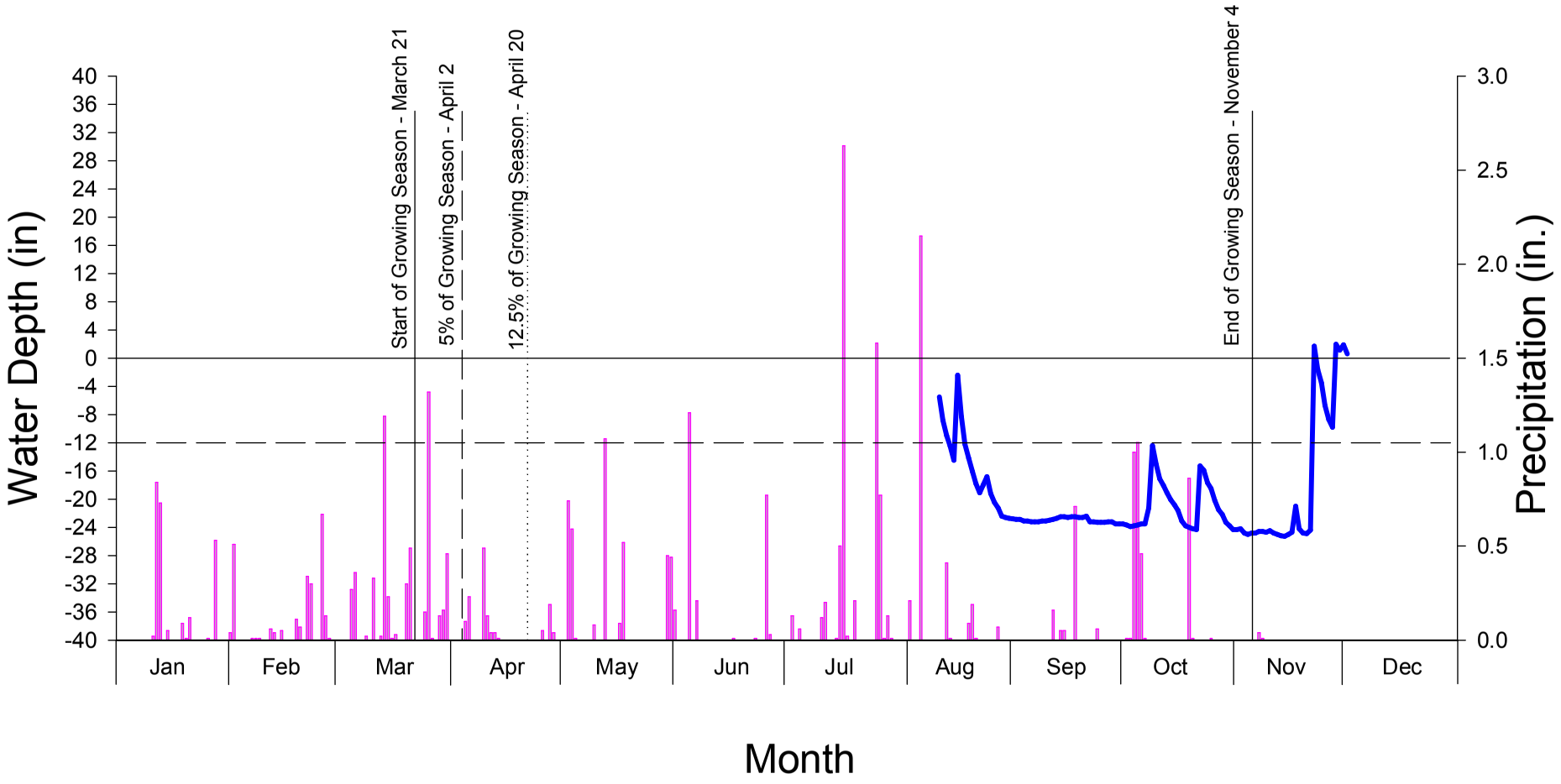
2005

Monitoring Gauge 24 - 9DE55A7



White Oak Creek

2005
Monitoring Gauge 25 - B652202

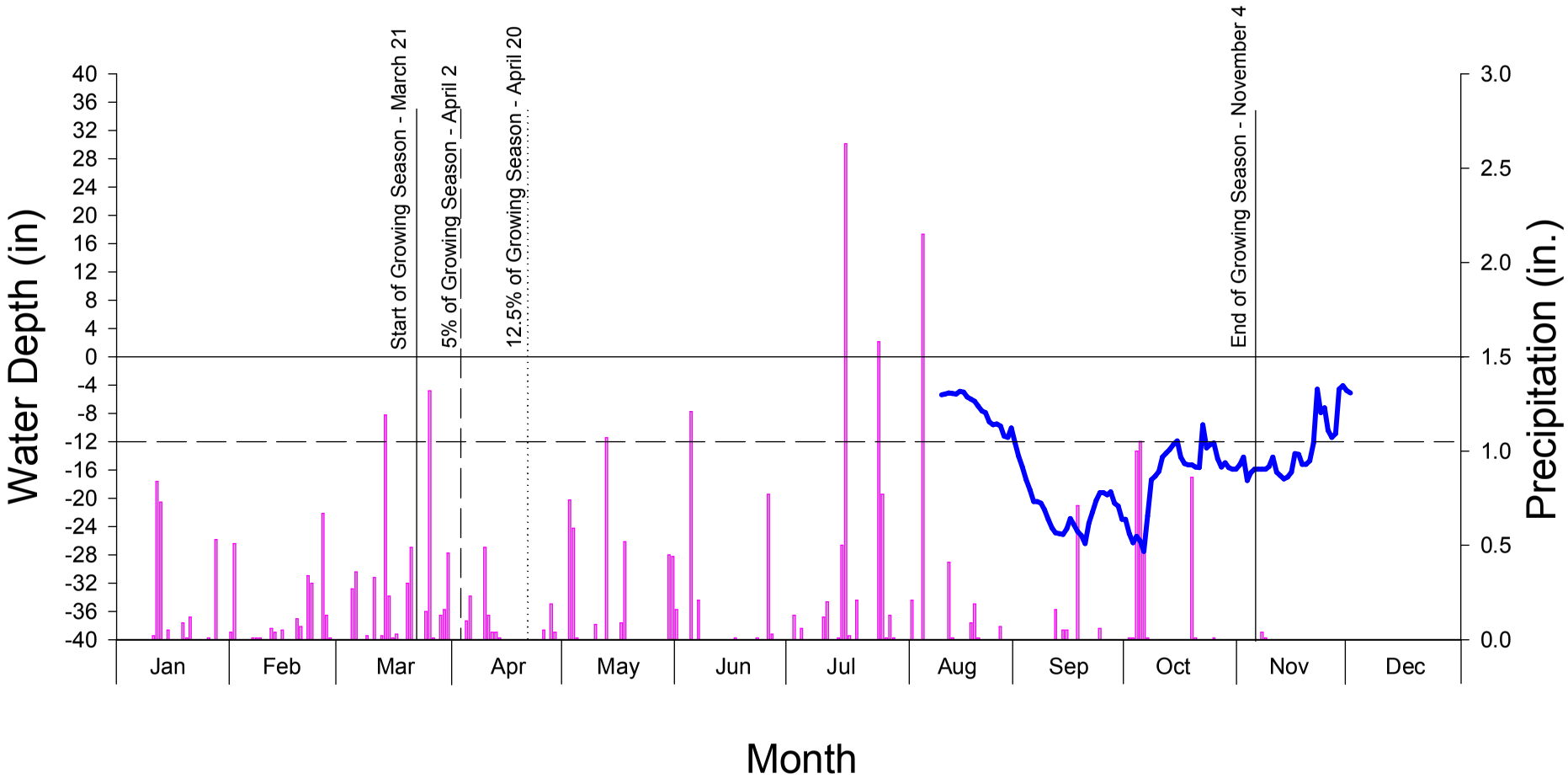


*Gauge was found to be non-functioning during first site visit in July 2005. Gauge was replaced in August 2005.

White Oak Creek

2005

Monitoring Gauge 26 - B651934

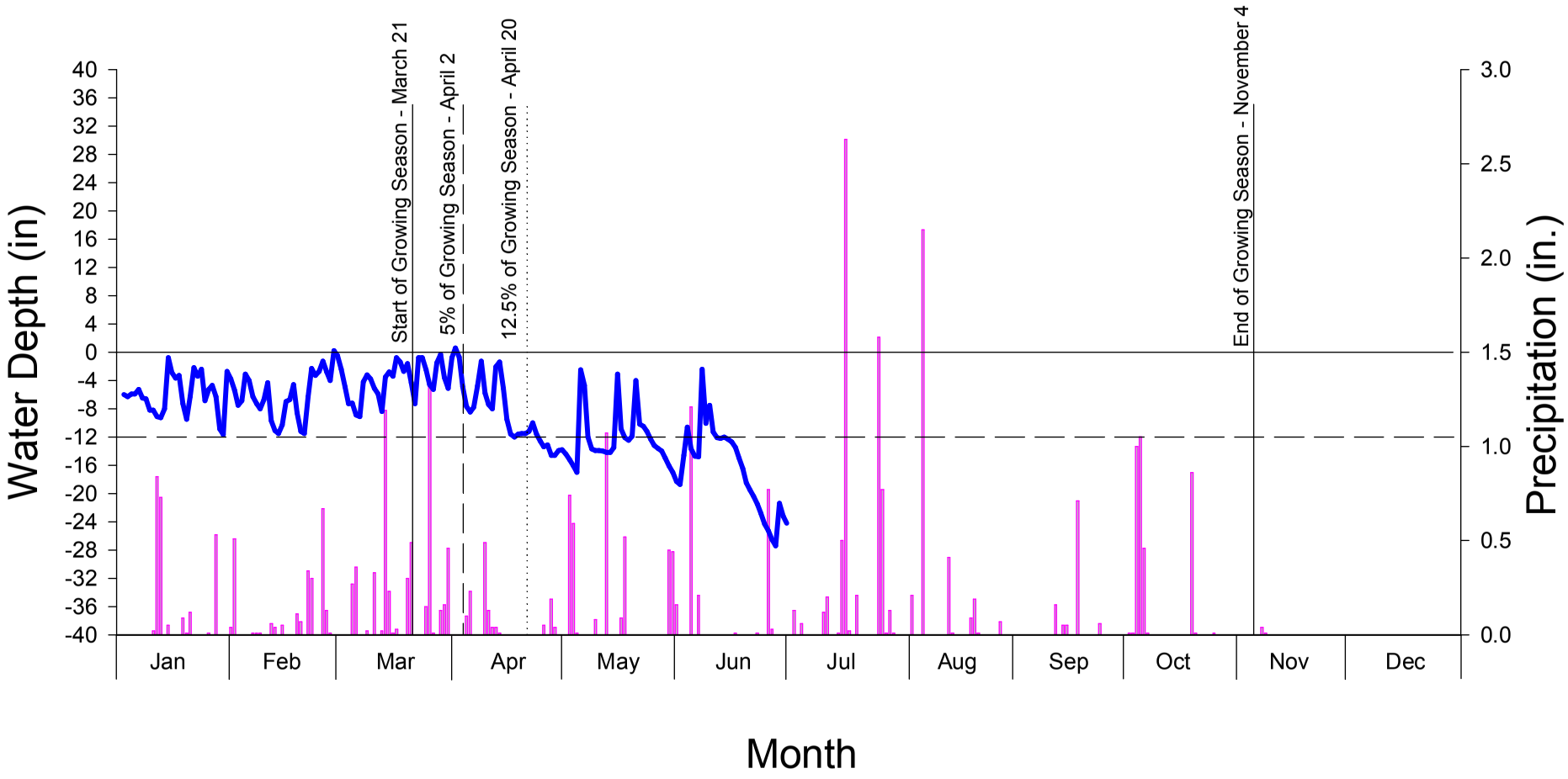


*Gauge was found to be non-functioning during first site visit in July 2005. Gauge was replaced in August 2005.

White Oak Creek

2005

Monitoring Gauge 28 - 8E52E9F

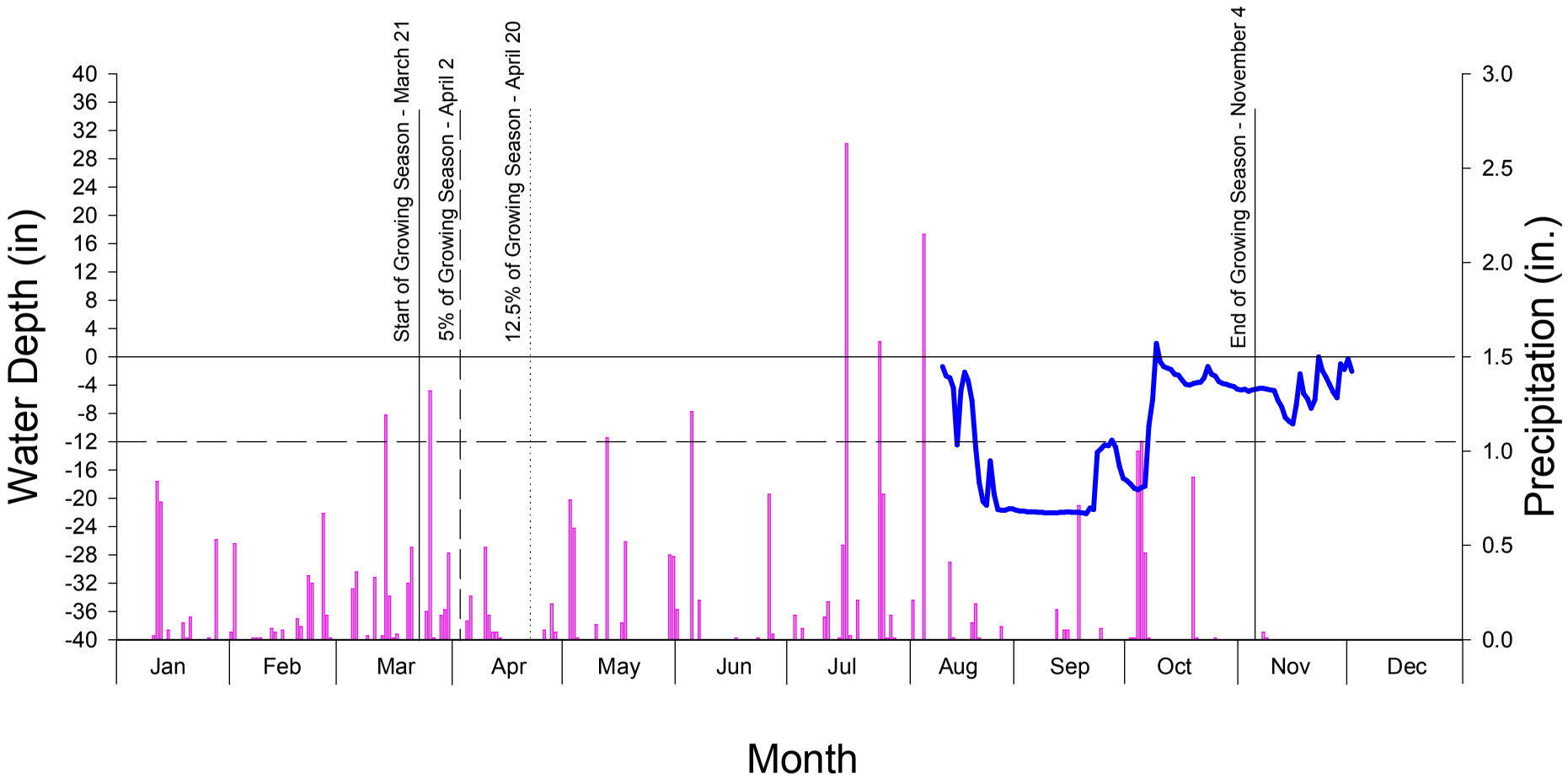


*Gauge was found to be non-functioning during first site visit in July 2005. Prior attained data was retrievable , although attempts to repair the gauge failed. Gauge will be replaced prior to 2006 growing season.

White Oak Creek

2005

Monitoring Gauge 29 - B65238F

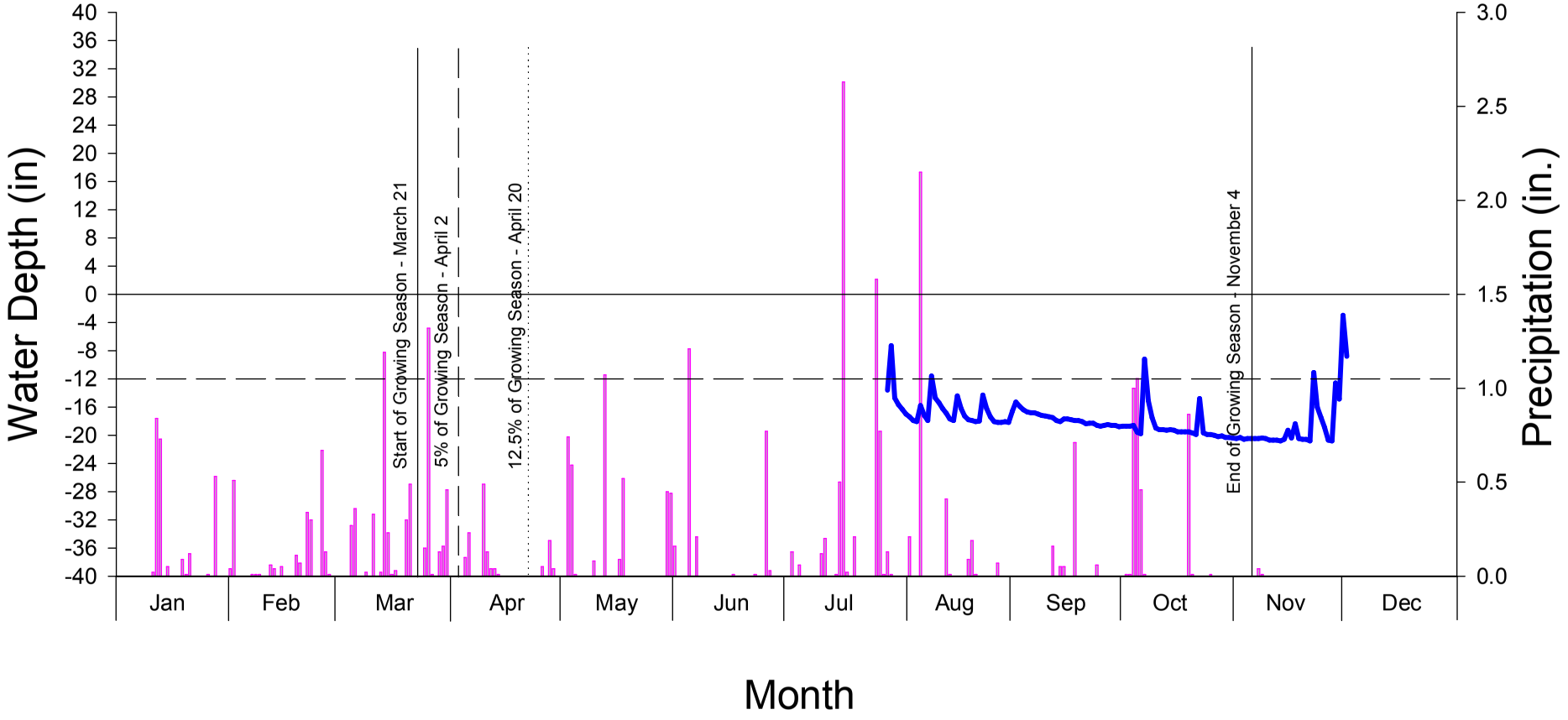


*Gauge was found to be non-functioning during first site visit in July 2005. Gauge was replaced in August 2005.

White Oak Creek

2005

Monitoring Gauge 30 - 8E556CA

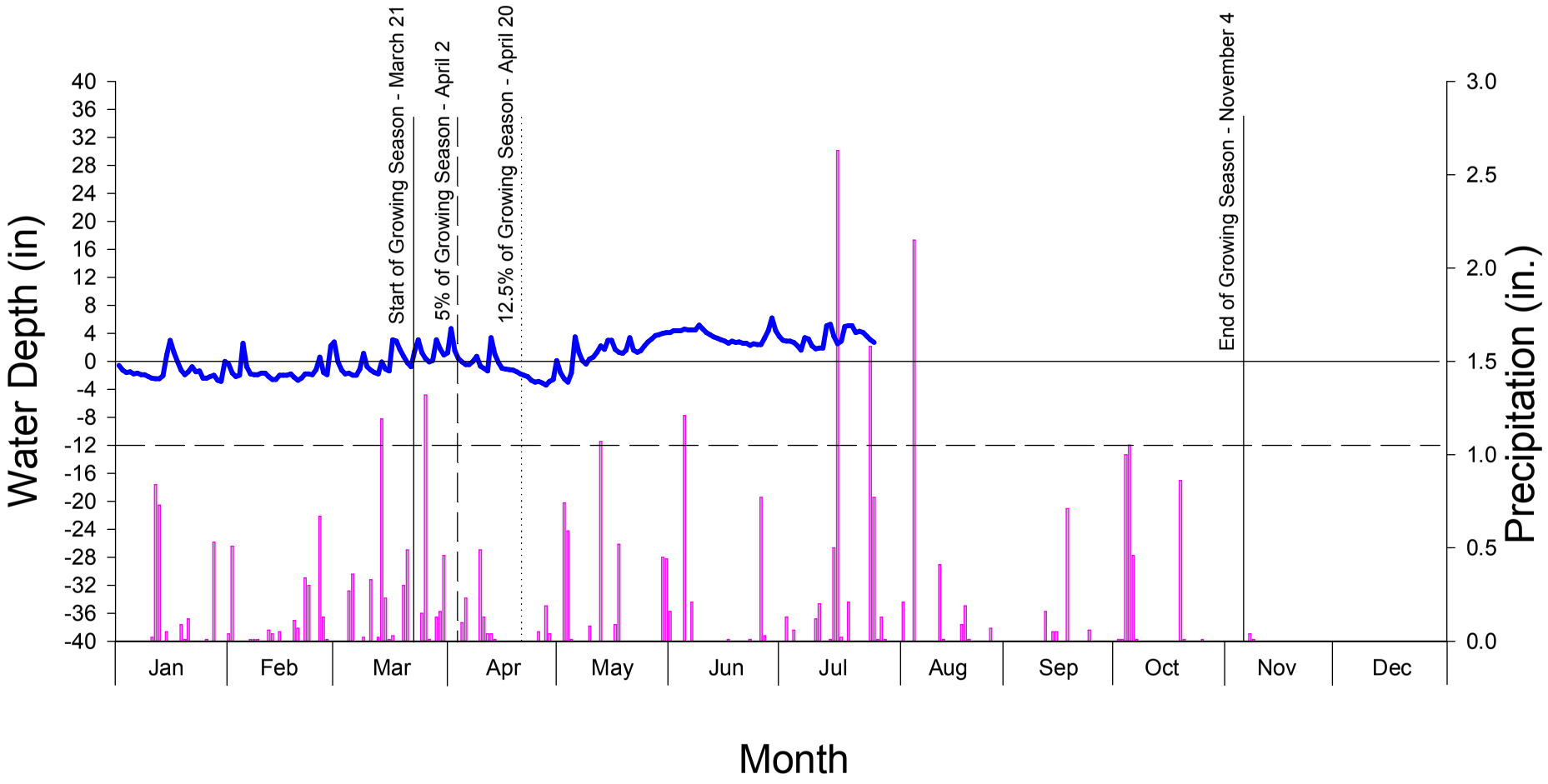


*Prior to July 2005 gauge was not functioning due to low battery charge. Batteries were replaced during first site visit in late July.

White Oak Creek

2005

Monitoring Gauge 31- 8E576F0

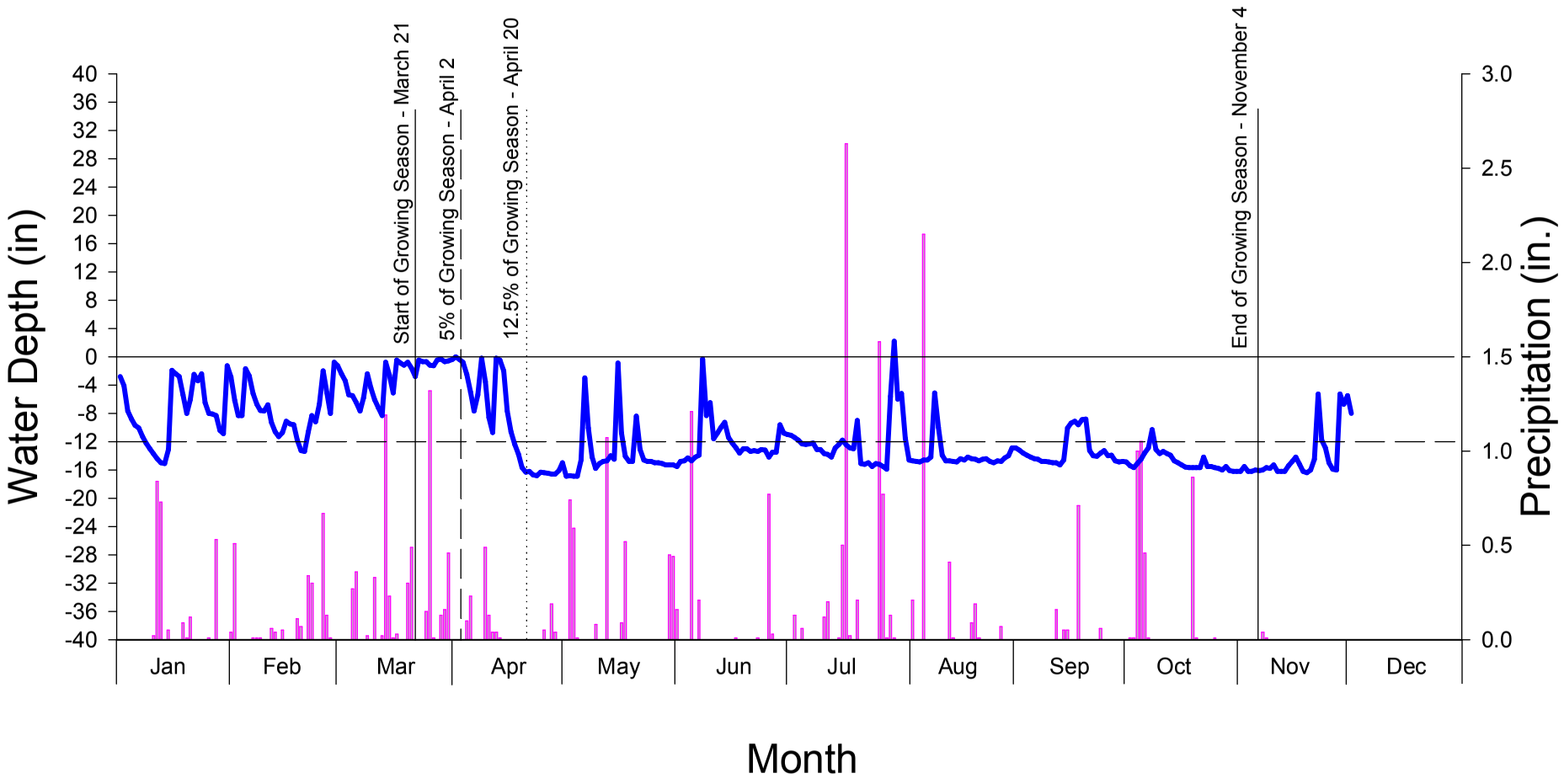


*Gauge was found to be non-functioning during first site visit in July 2005. Prior attained data was retrievable , although attempts to repair the gauge failed. Gauge will be replaced prior to 2006 growing season.

White Oak Creek

2005

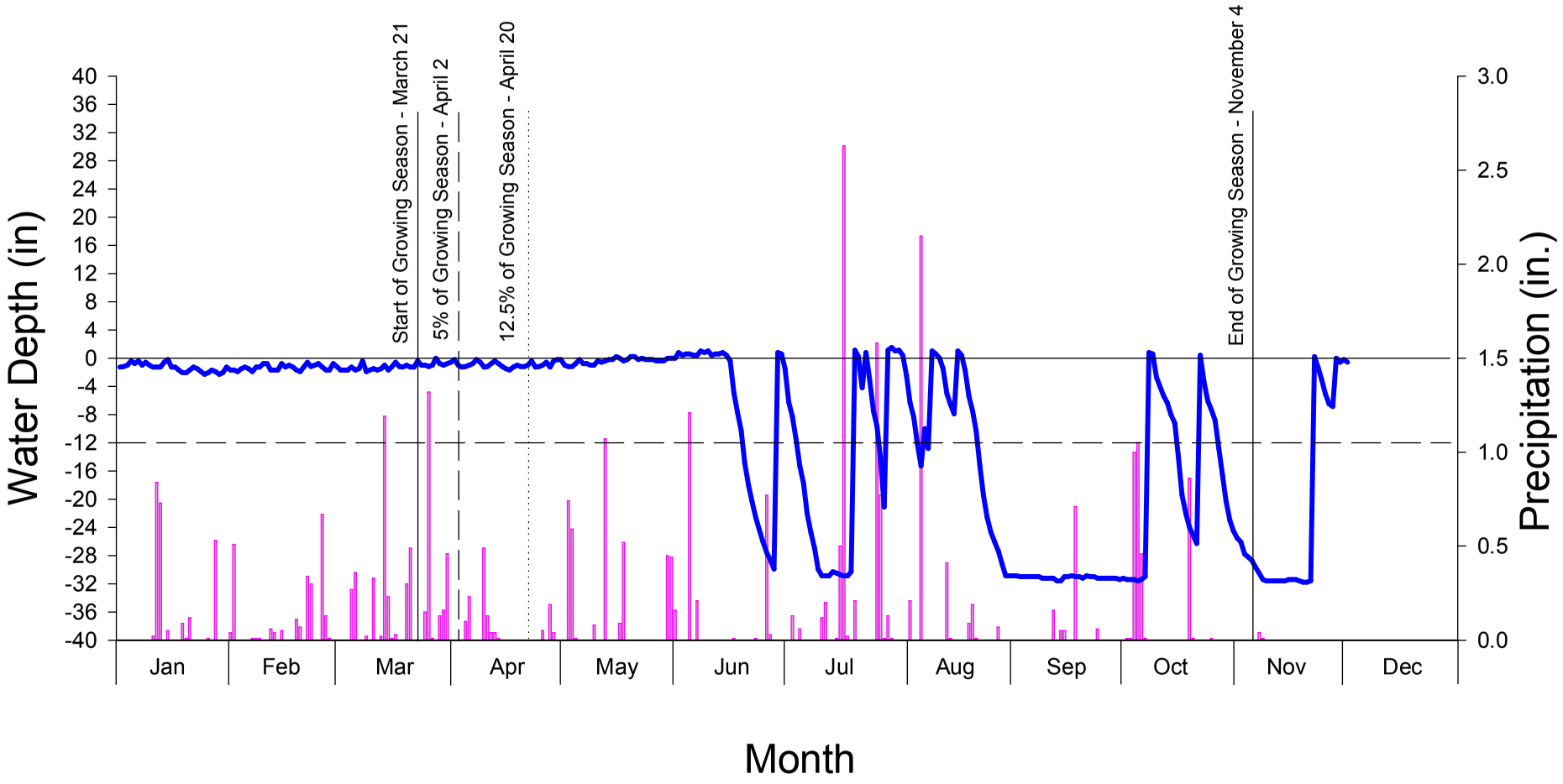
Monitoring Gauge 33 - 9BEBE36



White Oak Creek

2005

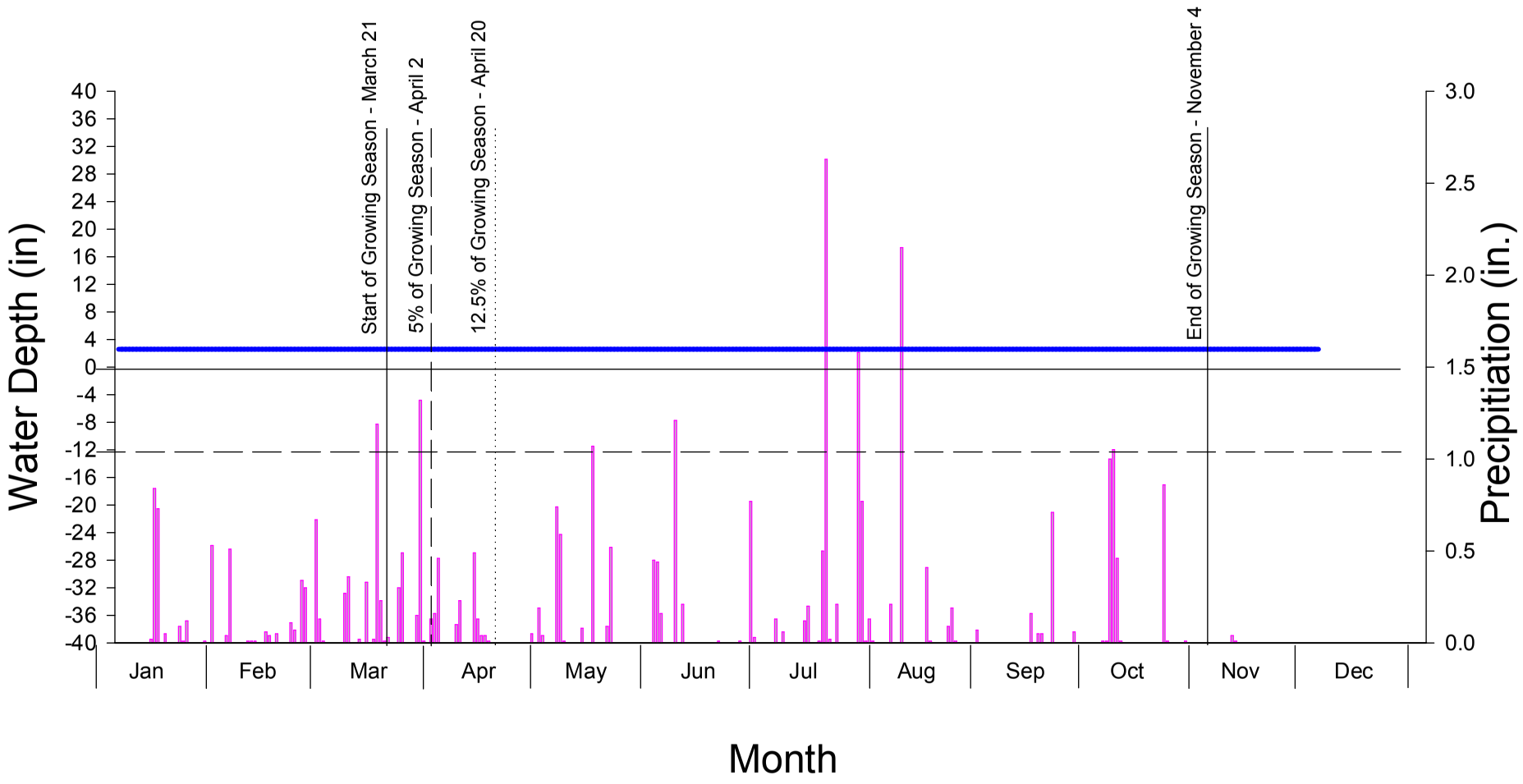
Monitoring Gauge 35 - 04CFEA0



White Oak Creek

2005

Monitoring Gauge 36 - 031FA53



APPENDIX C

SITE PHOTOS

White Oak Creek
Fixed Photo Stations
October 17, 2005 – Year 3 of 5

Photo Plot 1

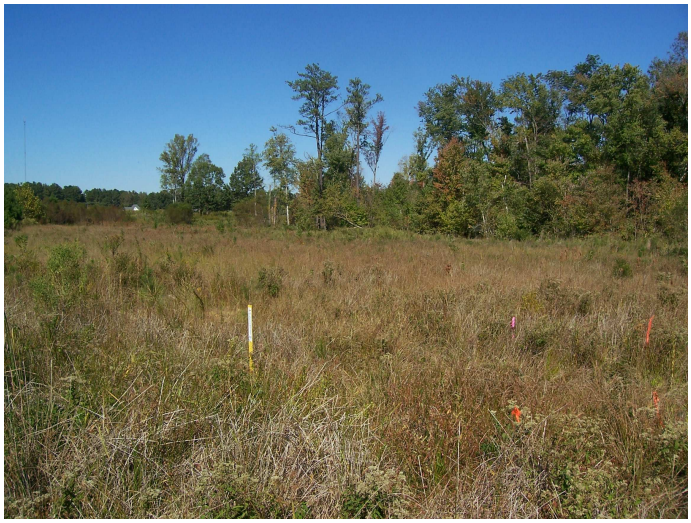


Photo Plot 2

Photo Plot 3

Photo Plot 4

Photo Plot 5

Photo Plot 6

White Oak Creek
Vegetation Plot Photos
October 17, 2005 – Year 3 of 5

Vegetation Plot 1 looking southeast

Vegetation Plot 2 looking southeast

Vegetation Plot 3 looking south

Vegetation Plot 4 looking southeast

Vegetation Plot 5 looking southeast

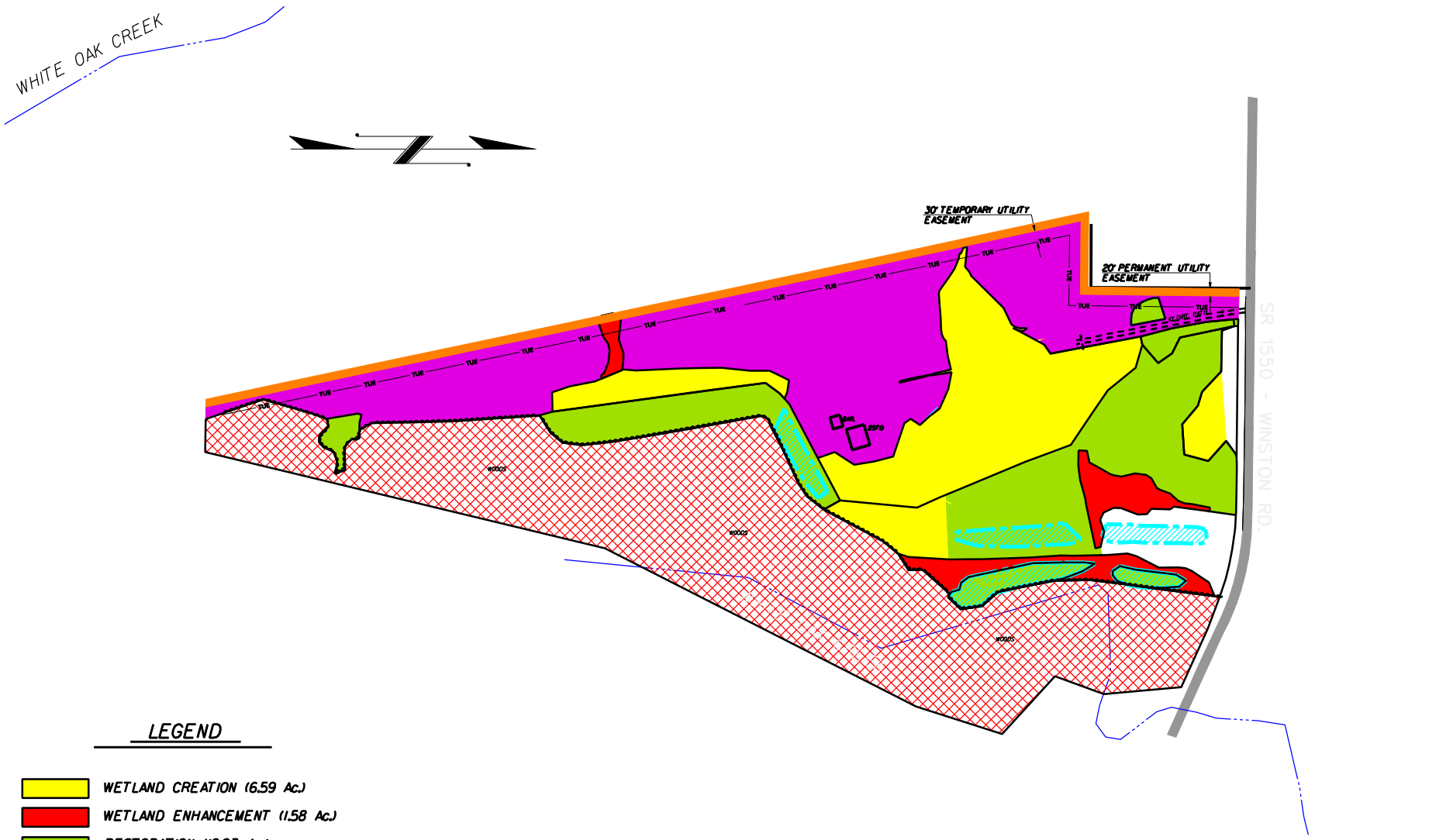
Vegetation Plot 6 looking southeast

Vegetation Plot 7 looking south

Vegetation Plot 8 looking south

APPENDIX D

RESTORATION AREA



LEGEND

- WETLAND CREATION (6.59 Ac.)
- WETLAND ENHANCEMENT (1.58 Ac.)
- RESTORATION (10.03 Ac.)
- WETLAND PRESERVATION (19.08 Ac.)
- UPLAND BUFFER RESTORATION (12.04 Ac.)
- UTILITY EASEMENT EXCLUDING E2 & R1 OVERLAP (1.37 Ac.)
  (TOTAL EASEMENT = 1.40 AC.)

TOTAL AREA (50.69 Ac.)

400 0 400

SCALE IN FEET

EcoScience Corporation
Raleigh, North Carolina

Client: Ecosystem Enhancement PROGRAM

Project:

RESTORATION PLAN
White Oak Creek Mitigation Site

EEP Project No. 417

JOHNSTON COUNTY, NORTH CAROLINA

Dwn By:	Date:
MAF	DEC 2005
Ckd By:	Scale:
JWG	1"= 400'
ESC Project No.:	
05-243.01	

APPENDIX

D