UT to Lilliput Creek (Hog Branch Ponds)
Stream and Wetland Restoration Project

SCO No. 07-07155-01
DENR Contract No. D08049S
EEP Project No. 290
Brunswick County North Carolina

Year 2 of 5 Monitoring Report
Data Collection: January through December 2011
Submission Date: February 29, 2012

Prepared for:

North Carolina Department of Environment and Natural Resources
Ecosystem Enhancement Program
2728 Capital Boulevard, Suite 1H-103 Raleigh, NC 27606

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Prepared by:

Land Management Group, Inc.
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3.0 EXECUTIVE SUMMARY/PROJECT ABSTRACT

The UT to Lilliput Creek (Hog Branch Ponds) Stream and Wetland Restoration Site is located in Boiling Spring Lakes, Brunswick County. The restoration project is located on a 516.73 acre tract. The purchase of the site (fee simple) was funded by both the State of North Carolina Ecosystem Enhancement Program and North Carolina Department of Agriculture and Consumer Sciences Plant Conservation Program in December 2004. The UT Lilliput Stream and Wetland Restoration Site was previously owned by International Paper and used in rotation as a pine plantation. Pine plantations in southeastern North Carolina are typically characterized by major site alterations constructed to provide sufficient surface and groundwater drainage in wet conditions which allows planted pine trees to grow and cultivate. Site alterations also destroy ecological function, decrease water quality and disrupts habitat for wildlife, including federally threatened and endangered species.

The goal for the UT to Lilliput Creek (Hog Branch Ponds) Stream and Wetland Restoration Site is to restore ecological function, improve overall water quality, and enhance native wildlife habitat. This goal will be accomplished by two main objectives. The first objective is restoration of channelized tributaries to the headwater outer coastal plain stream type, as described in the "Information Regarding Stream Restoration in the Outer Coastal Plain of North Carolina" guidance document (COE 2005). The stream restoration will re-establish the riparian vegetation zone, re-connect flood plain areas, and enhance wildlife habitat. These ecological functions have been non-existent for decades due to the previous ditch and drainage regime. The second objective is to restore and enhance the altered wetlands. The restoration and enhancement of wetlands onsite will generate longer soil saturation periods and the result is improved water quality. Restoring the native hydrologic characteristics will also restore the conditions that are beneficial for the long-leaf pine community type that previously dominated the site before human intervention. The long-leaf pine forest will also restore native habitat for the red-cockaded woodpecker.

The UT to Lilliput Creek (Hog Branch Ponds) Stream and Wetland Restoration Site was previously a pine plantation. Pine plantations in southeastern North Carolina are typically characterized by major site alterations that were made to eliminate much of the wet conditions. When modified, these sites provide sufficient surface and groundwater drainage that allow planted loblolly pine (*Pinus taeda*) and long-leaf pine (*P. palustris*) trees to be cultivated. Foresters typically perform two major site alterations in preparation for a pine plantation: channelization of natural stream channels and bedding. These site alterations were utilized extensively throughout the project site. Restoring these alterations back to natural condition was key in both project design and implementation.

Stream restoration and stream preservation are both components of this project (Table 1). Stream restoration for UT to Lilliput Creek (Hog Branch Ponds) Stream and Wetland Restoration Site is divided into two tributaries. The North Tributary (**1,535 linear feet**)

and South Tributary (**1,703 linear feet**) were constructed utilizing the previous referenced guidance entitled "Information Regarding Stream Restoration in the Outer Coastal Plain of North Carolina" (COE 2005). The referenced document states that restoration of dimension, pattern and profile in accordance with the typical natural channel design is often not appropriate in environments similar to the project site. For zero to first order headwater stream restoration, a width of 100 feet centered along the resulting valley will determine the area that can be considered for stream restoration (COE 2005). A total of **3,238 linear feet** of stream restoration will be provided in accordance with the enclosed plans. Stream preservation areas will consist of **5,332 linear feet** (See Table 1 for Project Components and Figure 1a for Component Location).

The wetland component of the UT to Lilliput Creek (Hog Branch Ponds) Stream and Wetland Restoration Site consists of non-riparian wetland preservation, restoration, enhancement, and riparian preservation. The non-riparian wetland preservation areas total **87.74 acres** and riparian wetland preservation areas total **20.45 acres**. These areas were delineated using guidelines described in the Corps of Engineers 1987 Manual (COE 1987). Non-riparian wetland enhancement totaling **96.46 acres** makes up the bulk of the project effort. Non-riparian wetland restoration totals **7.83 acres**. Vegetative enhancement was utilized by planting with native species and the hydrology enhanced through the stream restoration process. (See Table 1 for Project Components and Figure 1a for Component Location)

Fifteen (15) permanent vegetation plots and one (1) total stem count for Site 6 were established and used in annual vegetation monitoring. The vegetative success criteria are based on the US Army Corps of Engineers Stream Mitigation Guidelines (COE 2003). Based on MY2 monitoring data, the site is meeting the minimum success requirement with an observed mean stem density of 510 stems per acre. MY1 reported a mean stem density of 639 stems per acre. As per the mitigation plan, the final vegetative success criterion will be the survival of 260 5-year old planted woody stems per acre at the end of the year 5 monitoring period. Vegetation plot locations are identified in Figure 2.

With the consent of the EEP, stream morphological monitoring was not conducted during MY2 (2011). Monitoring of the stream in MY1 (2010) found the UT to Lilliput Creek (Hog Branch Ponds) Stream and Wetland Restoration Site restored channel dimension and pattern to be similar to as-built conditions. Visual and survey evidence exhibited the "braided" stream type featured in the Zero to First Order outer coastal plain stream morphology. No areas of significant degradation or rill erosion were noted.

The UT to Lilliput Creek (Hog Branch Ponds) Stream and Wetland Restoration Site is currently being monitored for hydrology using forty-one (41) water level monitoring gauges (28 groundwater monitoring gauges, 8 surface flow monitoring gauges, and 5 reference gauges). Some of these gauges were installed after the original restoration work occurred. Eight groundwater monitoring gauges were installed in December of 2010. Additionally, three reference gauges were installed in June of 2011.

Several of surface water gauges (S3, S5, and S8) malfunctioned in MY2 (2011) and data could not be obtained. This appears to be due to the metal support rods that were used to install the gauges. LMG removed these rods on February 2, 2012 and reprogrammed the malfunctioning gauges.

Twenty-two of the 28 groundwater monitoring gauges located within the restoration site exhibited groundwater within 12 inches of the soil surface for a duration in excess of the 12% hydrologic success criterion. Six gauges (12, 13, 21, 22, 26, and 27) did not meet the success criterion and exhibited groundwater within 12 inches of the soil surface for between 7% and 9% of the growing season. The hydrographs of these six gauges show groundwater levels were within 12 inches of the soil surface for much of the 2011 growing season. However, water levels were spiky and occasionally fell below 12 inches so that the criterion of 33 consecutive days was not achieved. Three of the six gauges that did not meet the success criterion were positioned on the shoulder of the stream valley (#21, #26, and #27). Groundwater is continuously being discharged to the low part of the valley, resulting in fluctuating water levels. Please see Figure 2 for gauge locations.

A comparison between pre-construction monitoring data (2005) and post-construction monitoring data (2011) demonstrated an increase in hydroperiod within the enhancement areas. Gauge 11 exhibited 106 consecutive days (40% of the growing season) of groundwater within 12 inches of the soil surface in 2011. By comparison, the pre-construction monitoring (2005) gauge located in this area exhibited 14 consecutive days (6% of the growing season). Gauge 17 exhibited 99 consecutive days (37% of the growing season) in MY2 while 2005 pre-construction monitoring data exhibited 11 consecutive days (5% of the growing season) in the same location.

Four transects that each contain three gauges were installed perpendicular to the two stream channels on site (Figure 2). Pre-construction and post-construction data from these gauges have been compared to document the hydrologic improvement along and outward from the restored stream channel. For each transect, one gauge is located within a stream restoration area and the other two are located within a wetland enhancement area. The post-construction hydroperiod for all four gauges located within the stream restoration area (#1, #4, #6, & #8) was significantly longer than the gauges' pre-construction hydroperiod. In 2011, these gauges exhibited groundwater within 12 inches of the soil surface for between 108 and 126 consecutive days while the 2005 pre-construction hydroperiod ranged from 1 day to 35 consecutive days. Of the eight gauges located within the wetland enhancement area, six demonstrated a longer post-construction hydroperiod (ranged between 19 and 116 consecutive days) than the pre-construction hydroperiod (ranged between 10 and 58 consecutive days). Only gauges #26 and #28 exhibited groundwater within 12 inches of the soil surface for fewer consecutive days post-construction compared to pre-construction (#26: 25 days in 2011 vs. 58 days in 2005; #28: 40 days in 2011 vs. 43 days in 2005). It is important to note that 2005 was an exceptionally wet year and experienced above-normal rainfall (Appendix D). In comparison, 2011 was fairly dry, except for a hurricane that elevated groundwater levels

in August. The fact that ten of the twelve gauges located within these four transects demonstrated a longer hydroperiod in a dry post-construction year compared to hydrology in a relatively wet pre-construction year indicates that mitigation activities have enhanced wetland hydrology within the site.

As per the monitoring success criteria, surface water monitoring gauges must exhibit similar conditions to the on-site reference gauge and clearly show fluctuation in flow. For MY2 (2011), all surface water monitoring gauges exhibited fluctuations in water levels and extended periods of above-ground flow that were similar to patterns of the reference gauge (Appendix D). Additionally, indicators of an ordinary high water mark, such as wrack lines, changes in plant community, and water staining, were observed the extent of both valleys (Appendix B).

Summary information/data related to the occurrence of items such as beaver or 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 mitigation and restoration plan documents available on EEP's website. All raw data supporting the tables and figures in the appendices are available from EEP upon request.

4.0 METHODOLOGY

Fifteen (15) permanent vegetation plots and one (1) total stem count for Site 6 are used for vegetation monitoring. All vegetation monitoring was completed in October 2011 utilizing the Carolina Vegetation Survey (CVS) – EEP protocol Level 1 (version 4.1) for fifteen (15) vegetation monitoring plots. A total stem count was utilized for Site 6.

With the consent of the EEP, stream morphological monitoring was not conducted in MY2. Stream morphological monitoring will resume in MY3 (2012).

For MY2 2011, hydrology was monitored through a series of forty-one (41) water level monitoring gauges (28 groundwater monitoring gauges, 8 surface flow monitoring gauges, and 5 reference gauges). All gauges, including reference, were downloaded monthly utilizing Remote Data Systems data loggers and software.

Photo monitoring was conducted by walking the entire site. A digital camera was used to take photos at each predetermined photo point location.

5.0 REFERENCES

NCEEP. 2006. UT to Lilliput Stream and Wetland Restoration Project Restoration Plan. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 3, October 16, 2006.

NCEEP. 2010. Content, Format and Data Requirements for EEP Baseline Monitoring

Report. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 2.0 October 14, 2010.

NCEEP. 2010. Procedural Guidance and Content Requirements for EEP Monitoring Reports. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 1.3 January 15, 2010.

NCEEP. 2008. CVS-EEP Vegetation Sampling Protocol. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 4.2, 2008.

Army Corps. Of Engineers. 1987. U.S. Army Corps. of Engineers. Tech Report Y-87-1, 1987 Wetland Delineation Manual, Washington, DC. AD/A176.

Army Corps. Of Engineers. 2005. U.S. Army Corps. of Engineers. Information Regarding Stream Restoration in the Outer Coastal Plain of North Carolina, Wilmington Regulatory Field Office.

6.0 PROJECT CONDITION AND MONITORING DATA APPENDICES

Appendix A.
Project Vicinity Map and Background Tables

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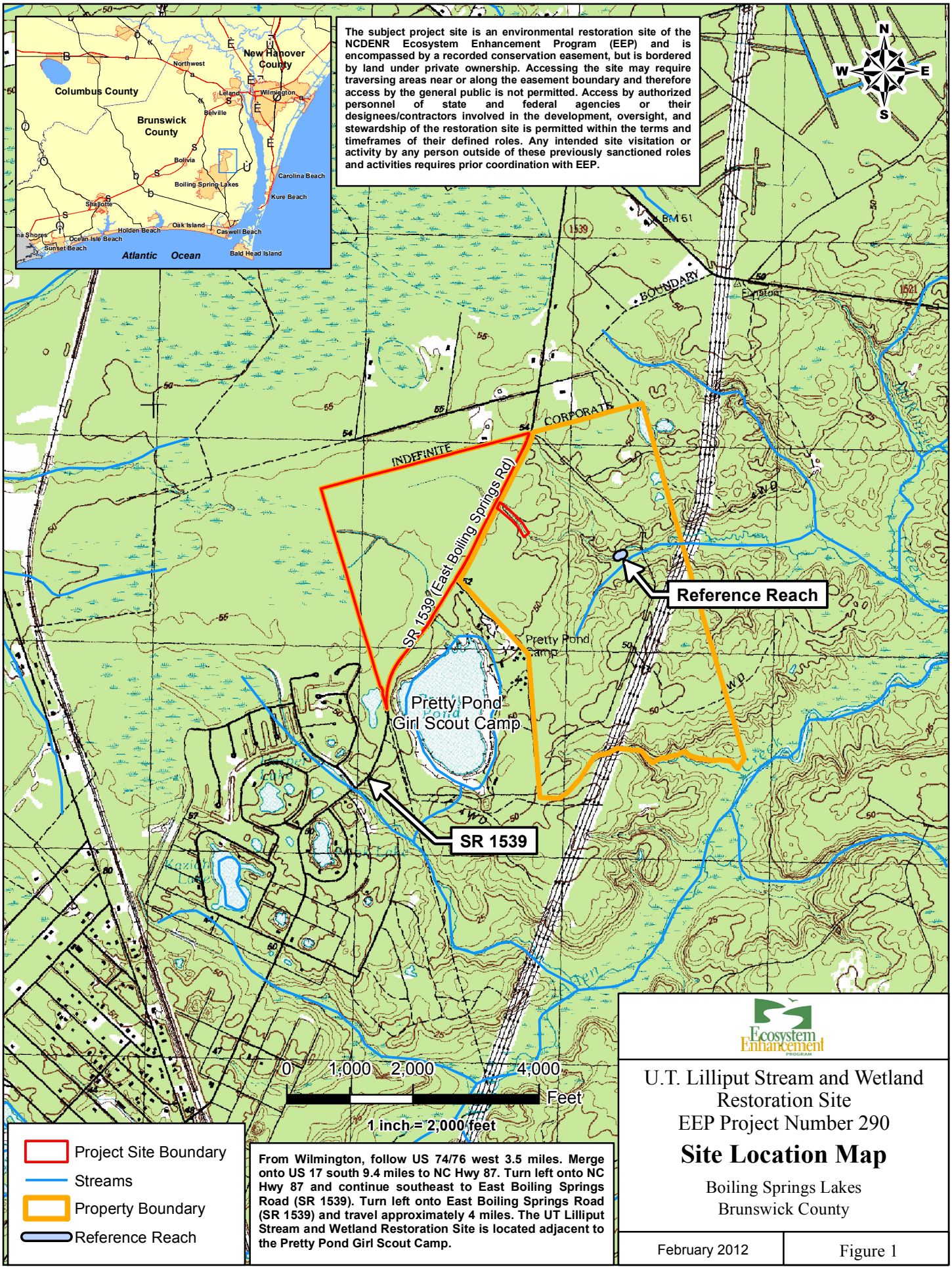

Source: USGS 7.5 Minute Quadrangle, Funston, NC

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FIGURE 1a.

Project Components

U.T. to Lilliput Creek
(Hog Branch Ponds)
Stream and Wetland Restoration Site
Project No: D05053S
EEP No. 290

Brunswick County

Legend

Restoration Plan Component

- Property Boundary
- Stream Restoration (7.23 Ac., 3238 LF.)
- Wetland Restoration (7.83 Ac.)
- Wetland Enhancement (96.46 Ac.)
- Wetland Preservation (87.74 Ac.)
- Riverine Wetland Preservation (20.45 Ac.)
- Wetland in Powerline ROW (4.54 Ac.)
- Stream Preservation (100' buffer, 8.67 Ac., 5332 LF)

N
W E
S

0 250 500 1,000
Feet

Ecosystem Enhancement Program

February 2012

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Table 1. Project Components and Mitigation Credits

UT Lilliput Stream and Wetland Restoration Project, EEP No. 290

Mitigation Credits

	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorus Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	3,238	1,066		4.09	7.83	65.778			

Project Components

Project Component	Stationing/ Location	Existing Footage/ Acreage	Approach	Restoration or Restoration Equivalent	Restoration Footage or Acreage	Mitigation Ratio
0 to 1st Order Stream Restoration	Northern Tributary	1,535 LF	0 to 1st Order Stream Restoration	Restoration	1,535 LF	1:1
0 to 1st Order Stream Restoration	Southern Tributary	1,703 LF	0 to 1st Order Stream Restoration	Restoration	1,703 LF	1:1
Stream Preservation	See Figure 1a	5,332 LF	Preservation	Preservation (RE)	5,332 LF	5:1
Non-Riparian Wetland Restoration	See Figure 1a	7.83 ac	Restoration	Restoration	7.83 ac	1:1
Non-Riparian Wetland Enhancement	See Figure 1a	96.46 ac	Enhancement	Enhancement (RE)	96.46 ac	2:1
Non-Riparian Wetland Preservation	See Figure 1a	87.74 ac	Preservation	Preservation (RE)	87.74 ac	5:1
Riparian Wetland Preservation	See Figure 1a	20.45 ac	Preservation	Preservation (RE)	20.45 ac	5:1

Component Summation

Restoration Level	Stream (lf)	Riparian Wetland (ac)	Non-Riparian Wetland (ac)	Buffer (sq ft)	Upland (ac)
Restoration	3,238 LF		7.83 ac		
Enhancement			96.46 ac		
Enhancement I					
Enhancement II					
Creation					
Preservation	5,332 LF	20.45 ac	87.74 ac		
HQ Preservation					

BMP Elements*

Element	Location	Purpose/Function	Notes
n/a	n/a	n/a	n/a

*BMP Elements are not part of the UT Lilliput Project

Table 2. Project Activity and Reporting History UT Lilliput Stream and Wetland Restoration Project -EEP Project No. 290		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Restoration Plan	NA	Oct-06
Final Design – Construction Plans	NA	Apr-08
Construction	NA	Feb-10
Temporary S&E mix applied to entire project area	NA	Mar-09
Permanent seed mix applied to entire project area	NA	Mar-09
Containerized and B&B plantings	NA	Feb-10
Baseline Monitoring Document (Year 0 Monitoring -baseline)	Dec-10	Dec-10
Year 1 Monitoring	Dec-10	Jan-11
Year 2 Monitoring	Dec-11	Dec-11
Year 3 Monitoring		
Year 4 Monitoring		
Year 5 Monitoring		

Table 3. Project Contacts Table UT Lilliput Stream and Wetland Restoration Project	
EEP Project No. 290	
Designer Primary project design POC	Rummel, Klepper, and Kahl Engineers 900 Ridgefield Drive Suite 350; Raleigh, NC 27609 Pete Stafford (919) 878-9560
Construction Contractor Construction contractor POC	River Works Inc. 8000 Regency Parkway Cary, NC 27518 Mike Pedersen (919) 459-9001
Planting Contractor Planting Contractor POC	River Works Inc. 8000 Regency Parkway Cary, NC 27518 Mike Pedersen (919) 459-9001
Seeding Contractor Seeding Contractor POC	River Works Inc. 8000 Regency Parkway Cary, NC 27518 Mike Pedersen (919) 459-9001
Seed Mix Sources	Contact River Works Inc.
Nursery Stock Suppliers	Contact River Works Inc.
Monitoring Performers (MY1) Stream Monitoring POC Vegetation Monitoring POC Wetland Monitoring POC	Rummel, Klepper, and Kahl, LLP 900 Ridgefield Drive Suite 250; Raleigh, NC 27609 Pete Stafford (919) 878-9560 Pete Stafford (919) 878-9560 Pete Stafford (919) 878-9560
Monitoring Performers (MY2) Vegetation Monitoring POC Wetland Monitoring POC	Land Management Group, Inc. P.O. Box 2522; Wilmington, NC 28402 Kim Williams (910) 452-0001 Kim Williams (910) 452-0001

Table 4. Project Baseline Information and Attributes		
UT Lilliput Stream and Wetland Restoration Project		
EEP Project No. 290		
Project Information		
Project Name	UT Lilliput Stream and Wetland Restoration Project	
Project County	Brunswick	
Project Area	600 acres	
Project Coordinates (Lat and Long)	34.078043,-78.026662	
Project Watershed Summary Information		
Physiographic Region	Coastal Plain	
River Basin	Cape Fear	
USGS HUC 8 Digit 03020103	USGS HUC 14 Digit 03030005070010	
NCDWQ Subbasin	3/6/2017	
Project Drainage Area	N/A	
Project Drainage impervious cover estimate (%)	< 5%	
CGIA Land Use Classification		
Reach Summary Information		
Parameters	**North Tributary**	**South Tributary**
Length of Reach	1,535 LF	1,703 LF
Valley Classification	0 to 1st order	0 to 1st order
Drainage Area	52.49 acres	66.94 acres
NCDWQ Stream Identification Score	N/A	N/A
NCDWQ Water Quality Classification	CNSW	CNSW
Morphological Description (stream type)	0 to 1st order	0 to 1st order
Evolutionary Trend	N/A	N/A
Underlying Mapped Soils	Leon	Murville
Drainage Class	Poorly Drained	Poorly Drained
Soil Hydric Status	Hydric A	Hydric A
Slope	0.001	0.001
FEMA Classification	Zone X	Zone X
Native Vegetation Community	N/A	N/A
Percent Composition Exotic Invasive Vegetation	< 1%	< 1%
Wetland Summary Information		
Parameter	**Wetland 1**	**Wetland 2**
Size (acres)	87.74	22.45
Wetland Type	Non-Riparian	Riparian
Mapped Soils Series	Murville and Leon	Muckalee
Drainage Class	Very poorly drained, poorly drained	Very poorly drained
Soil Hydric Status	A	A
Source of Hydrology	Groundwater	Groundwater
Hydrologic Impairment	N/A	N/A
Native Vegetation Community	Long Leaf Pine	Coastal Plain Blackwater Small Stream
Percent of Exotic/Invasive Veg	<1%	<1%

Table 4. Contd.			
Regulatory Considerations			
Regulation	**Applicable ?**	**Resolved?**	**Supporting Documentation**
Waters of the US – Section 404	Yes	Yes	Upon Request
Waters of the US – Section 401	Yes	Yes	Upon Request
Endangered Species Act	Yes	Yes	Upon Request
Historic Preservation Act	Yes	Yes	Upon Request
Coastal Zone Management Act (CZMA) Coastal Area Management Act (CAMA)	Yes	Yes	Upon Request
FEMA Floodplain Compliance	Yes	Yes	Upon Request
Essential Fisheries Habitat	No		

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Appendix B.
Visual Assessment Data

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FIGURE 2

Current Conditions Plan View

U.T. to Lilliput Creek
(Hog Branch Ponds)
Stream and Wetland
Restoration Site
Project No: D05053S
EEP No. 290

Brunswick County

Legend

Vegetation Monitoring Counts

- Less Than 320 Stems per Acre
- More Than 320 Stems per Acre

Gauge Success Criteria

- < 12%
- > 12%

Restoration Plan Component

- Stream Restoration (7.23 Ac., 3238 LF.)
- Wetland Restoration (7.83 Ac.)
- Wetland Enhancement (96.46 Ac.)
- Property Boundary
- Wetland Preservation (87.74 Ac.)
- Riverine Wetland Preservation (20.45 Ac.)
- Wetland in Powerline ROW (4.54 Ac.)
- Stream Preservation
(100' buffer, 8.67 Ac., 5332 LF)

N W E S

0 200 400 800 Feet

Ecosystem Enhancement PROGRAM

February 2012

SR 1539 (East Boiling Springs Rd)

Pretty Pond
Girl Scout Camp

FIGURE 3

Monitoring Plan Features

U.T. Lilliput Stream and Wetland Restoration Site
Project No: D05053S
EEP No. 290

Brunswick County

Legend

- Vegetation Monitoring Plot
- Brunswick County Soils Survey

Monitoring Gauges

- Surface Gauges 2010
- Groundwater Gauges 2010/2011

Restoration Plan Component

- Stream Restoration (7.23 Ac., 3238 LF.)
- Wetland Restoration (7.83 Ac.)
- Wetland Preservation (87.74 Ac.)
- Riverine Wetland Preservation (11.78 Ac.)
- Wetland in Powerline ROW (4.54 Ac.)
- Wetland Enhancement (96.46 Ac.)
- Property Boundary
- Surveyed Cross Sections
- Surveyed Longitudinal Profile

N
W E
S

0 250 500 1,000 Feet

Ecosystem Enhancement Program

February 2012

Ground Water Reference Gauge #2
LL = 34.075853, -78.024191

Ground Water Reference Gauge #3
LL = 34.075372, -78.02357

Ground Water Reference Gauge #1
LL = 34.074693, -78.018181

Surface Reference Gauge #1
LL = 34.074636, -78.018321

Gauges could not be located in MY2

Ground Water Reference Gauge #4
LL = 34.070643, -78.020757

SR 1539 (East Boiling Springs Rd)

Pretty Pond
Girl Scout Camp

Table 5a. Visual Stream Morphological Stability Assessment
Reach ID - Northern Tributary
Assessed Length - 1535 LF

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	1. Aggradation			N/A	N/A	N/A			
		2. Degradation			N/A	N/A	N/A			
	2. Riffle Condition	1. Texture/Substrate	N/A	N/A			N/A			
	3. Meander Pool Condition	1. Depth	N/A	N/A			N/A			
		2. Length	N/A	N/A			N/A			
	4. Thalweg Condition	1. Thalweg at upstream of meander bend	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander	N/A	N/A			N/A			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover from poor growth and/or scour and erosion			0	0	100%	N/A	N/A	100%
	2. Undercut	Banks undercut/overhanging			N/A	N/A	N/A	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	N/A	N/A	100%
				TOTALS	0	0	100%	N/A	N/A	100%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	9	9			100%			
	2. Grade Control	Grade control exhibiting maintenance of grade across the sill	1	1			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining- Max Pool Depth: Mean Bankfull Depth Ratio >= 1.6 Rootwads/logs providng some cover at base flow	N/A	N/A			N/A			

Table 5b. Visual Stream Morphological Stability Assessment
Reach ID - Southern Tributary
Assessed Length - 1703 LF

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	1. Aggradation			N/A	N/A	N/A			
		2. Degradation			N/A	N/A	N/A			
	2. Riffle Condition	1. Texture/Substrate	N/A	N/A			N/A			
	3. Meander Pool Condition	1. Depth	N/A	N/A			N/A			
		2. Length	N/A	N/A			N/A			
	4. Thalweg Condition	1. Thalweg at upstream of meander bend	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander	N/A	N/A			N/A			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover from poor growth and/or scour and erosion			0	0	100%	N/A	N/A	100%
	2. Undercut	Banks undercut/overhanging			N/A	N/A	N/A	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	N/A	N/A	100%
				TOTALS	0	0	100%	N/A	N/A	100%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	9	9			100%			
	2. Grade Control	Grade control exhibiting maintenance of grade across the sill	1	1			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining- Max Pool Depth: Mean Bankfull Depth Ratio >= 1.6 Rootwads/logs providng some cover at base flow	N/A	N/A			N/A			

Table 6. Vegetation Condition Assessment Table

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	No bare areas located onsite for MY2 2011	N/A	N/A	N/A	N/A
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria	No areas of low stem densities	N/A	N/A	N/A	N/A
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year	No areas of poor growth rates or vigor on-site for MY2 2011	N/A	N/A	N/A	N/A

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Appendix B - Stream and Cross Section Photos (all photos recorded on December 20, 2011)

Photo Station 1. Southern Tributary Station 15+00 - SCX4 - Looking Upstream

Photo Station 2. Southern Tributary Station 15+00 - SCX4 - Looking downstream

Photo Station 3. Southern Tributary Station 23+00 - SCX3 - Looking upstream

Photo Station 4. Southern Tributary Station 23+00 - SCX2 - Looking downstream

Photos recorded on December 20, 2011

Photo Station 5. Southern Tributary Station 29+00 - SCX1 - Looking upstream

Photo Station 6. Southern Tributary Station 29+00 - SCX1 - Looking downstream

Photos recorded on December 20, 2011

Photo Station 7. Northern Tributary Station 14+00 - NCX4 - Looking downstream

Photo Station 8. Northern Tributary Station 21+00 - NCX3 - Looking upstream

Photos recorded on December 20, 2011

Photo Station 9. Northern Tributary Station 21+00 - NCX2 - Looking downstream

Photo Station 10. Northern Tributary Station 28+25 - NCX1 - Looking upstream

Photos recorded on December 20, 2011

Photo Station 11. Northern Tributary Station 28+25 - NCX1 - Looking downstream

Photos recorded on December 20, 2011

Appendix B - Wetland and General Site Photos (all photos recorded on December 20, 2011)

Photo Station 12. Site 1 - Looking West

Photo Station 13. Site 2 - Looking West

Photos recorded on December 20, 2011

Photo Station 14. Site 3 - Looking West

Photo Station 15. Site 4 - Looking North

Photos recorded on December 20, 2011

Photo Station 16. Site 5- Looking Northeast

Photo Station 17. Site 6 - Looking Northeast

Photos recorded on December 20, 2011

Photo Station 18. Site 7 - Looking West

Photo Station 19. Northern Headwater Wetland - North Prong

Photos recorded on December 20, 2011

Photo Station 20. Northern Headwater Wetland - South Prong

Photo Station 21. Southern Headwater Wetland - North Prong

Photos recorded on December 20, 2011

Photo Station 22. Southern Headwater Wetland - South Prong

Photo Station 23. General Site View - Wetland Enhancement Area

Photos recorded on December 20, 2011

Photo Station 24. General Site View - Wetland Enhancement Area

Photo Station 25. General Site View - Wetland Enhancement Area

Photos recorded on December 20, 2011

Vegetation Plot Photos (all photos recorded on October 24 and 25, 2011)

Vegetation Plot 1

Vegetation Plot 2

Photos recorded on October 24 and 25, 2011

Vegetation Plot 3

Vegetation Plot 4

Photos recorded on October 24 and 25, 2011

Vegetation Plot 5

Vegetation Plot 6

Photos recorded on October 24 and 25, 2011

Vegetation Plot 7

Vegetation Plot 8

Photos recorded on October 24 and 25, 2011

Vegetaton Plot 9

Vegetation Plot 10

Photos recorded on October 24 and 25, 2011

Vegetation Plot 11

Vegetation Plot 12

Photos recorded on October 24 and 25, 2011

Vegetation Plot 13

Vegetation Plot 14

Photos recorded on October 24 and 25, 2011

Vegetation Plot 15

Site 6 - Total Stem Count

Photos recorded on October 24 and 25, 2011

View of OHWM near Gauge 6 (Northside & facing Southwest) - North Tributary

View of OHWM near Gauge 7S (Southside & facing Southwest) - North Tributary

View of OHWM near Photostation 10 (Northside & facing Southwest) - North Tributary

Close-up View of Wracking & Shelving (Southside of North Tributary) - North Tributary

View of OHWM near Gauge 2 (Westside & facing North) - South Tributary

View of OHWM near Gauge 2S (Eastside & facing South) - South Tributary

View of OHWM near Photostation 21 (Northside & facing East) - South Tributary

Close-up of OHWM near Gauge 23 (Westside & facing West) - South Tributary

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Appendix C.
Vegetation Plot Data

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Table 7. Vegetation Plot Criteria Attainment			
Tract	Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
Southern Tributary	VP1	Y	100%
Southern Tributary	VP2	Y	
Southern Tributary	VP3	Y	
Southern Headwater Wetland	VP4	Y	
Site 2	VP5	Y	
Northern Tributary	VP6	Y	
Northern Tributary	VP7	Y	
Northern Tributary	VP8	Y	
Northern Headwater Wetland	VP9	Y	
Wetland Enhancement	VP10	Y	
Wetland Enhancement	VP11	Y	
Site 1	VP12	Y	
Wetland Enhancement	VP13	Y	
Wetland Enhancement	VP14	Y	
Wetland Enhancement	VP15	Y	
Site 6	Site 6 (Total Count)	Y	

Table 8. CVS Vegetation Plot Metadata UT to Lilliput Creek EEP No. 290	
Report Prepared By	Kim Williams
Date Prepared	2/29/2012 9:30
Database Name	UTLilliput_290 _MY2_2011.mdb
Database Location	L:\Wetlands\2008\UT to Lilliput\Annual Monitoring Report\Year 2
Computer Name	KWILLIAMS
Description Worksheets in This Document	
Metadata	Description of database file, the report worksheets, and a summary of project and project data.
Proj Planted	Each project is listed with its PLANTED stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
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.
Project Summary	
Project Code	290
Project Name	UT Lilliput
Description	Stream and Wetland Restoration Project
River Basin	Cape Fear
Length (ft)	3238
Stream-to-Edge Width (ft)	
Area (sq m)	
Required Plots (calculated)	16

Table 9. Planted and total stem counts in 2011 (species by plot with annual means).

CURRENT DATA MY2 (2011)																															ANNUAL MEANS	
			PLOT 1		PLOT 2		PLOT 3		PLOT 4		PLOT 5		PLOT 6		PLOT 7		PLOT 8		PLOT 9		PLOT 10		PLOT 11		PLOT 12		PLOT 13		PLOT 14		PLOT 15		Current Means MY2 (2011)	
Scientific Name	Common Name	Type	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T
Magnolia virginiana	sweetbay	tree	6	6	2	2	2	1							6	3	3	3	2	1													21	16
Nyssa biflora	swamp tupelo	tree															1	1															1	1
Pinus palustris	longleaf pine	tree									7	5	8	3							20	16	18	10	12	9	18	10	17	9	18	9	118	71
Pinus serotina	pond pine	tree	7	5	7	6	7	7	3	2	6	5	12	12	6	6	12	8	4	4					9	9							73	64
Quercus sp.	oak sp.	tree	4		5		9	1	9						7	2	7	3	6														47	6
Quercus laurifolia	laurel oak	tree				2		2		1								1															0	6
Quercus lyrata	overcup oak	tree		3		3		4		7						2		1	3	5													3	25
	Plot Area (ac)		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025			
Type = Tree or Shrub P = Planted, T = Total	Species Count		3	3	3	4	3	5	2	3	2	2	2	2	3	4	4	6	4	3	1	1	1	1	2	2	1	1	1	1	1	1		
	Stem Count		17	14	14	13	18	15	12	10	13	10	20	15	19	13	23	17	15	10	20	16	18	10	21	18	18	10	17	9	18	9	263	189
	Stems/Ac		687.48	566.16	566.16	525.72	727.92	606.6	485.28	404.4	525.72	404.4	808.8	606.6	768.36	525.72	930.12	687.48	606.6	404.4	808.8	647.04	727.92	404.4	849.24	727.92	727.92	404.4	687.48	363.96	727.92	363.96	710.1	**510.3**

Site	Species	Planted	MY2 Total
Site 6	*Taxodium distichum*	40	34*

*Plot boundaries could not be identified

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Appendix D.
Hydrologic Data

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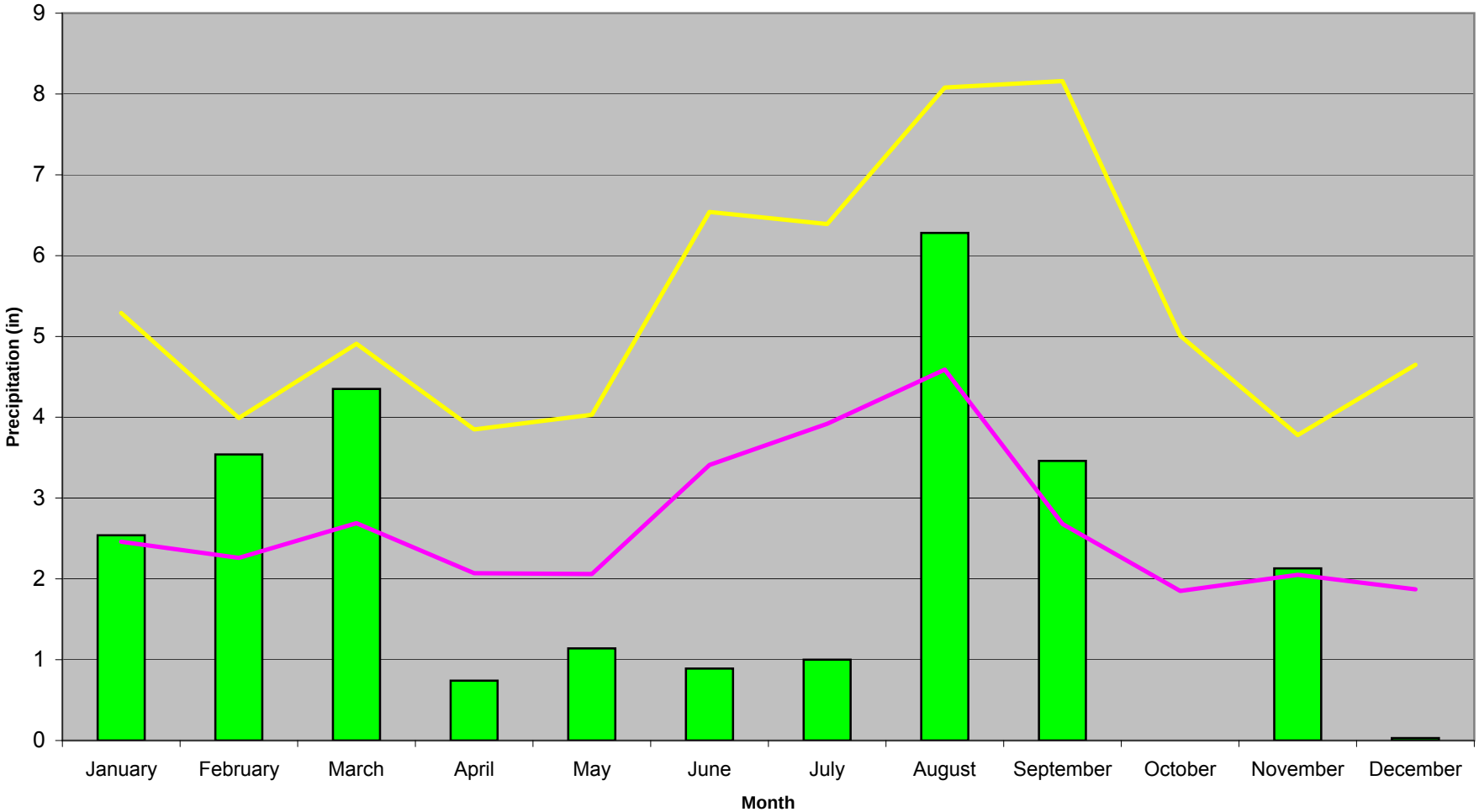
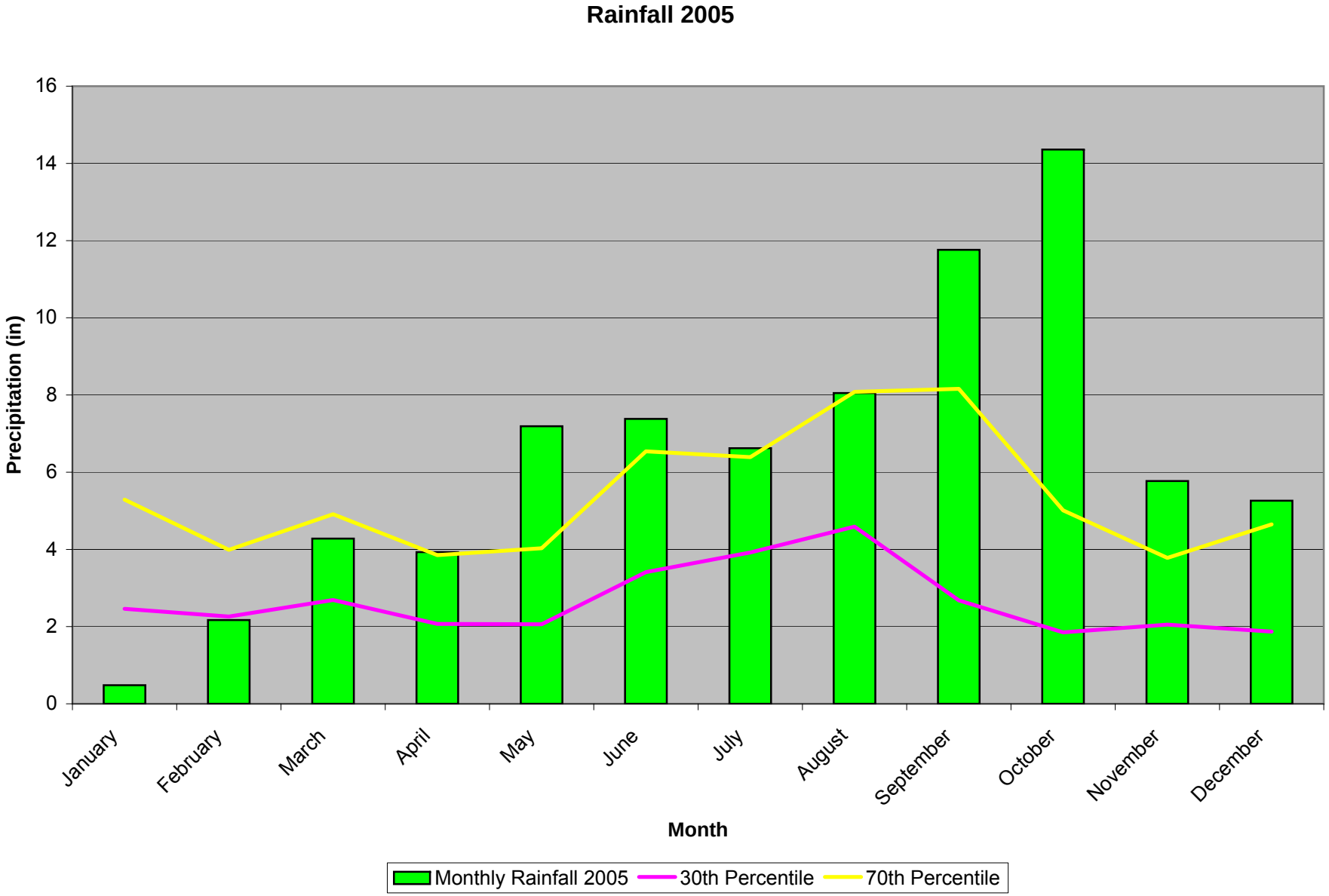
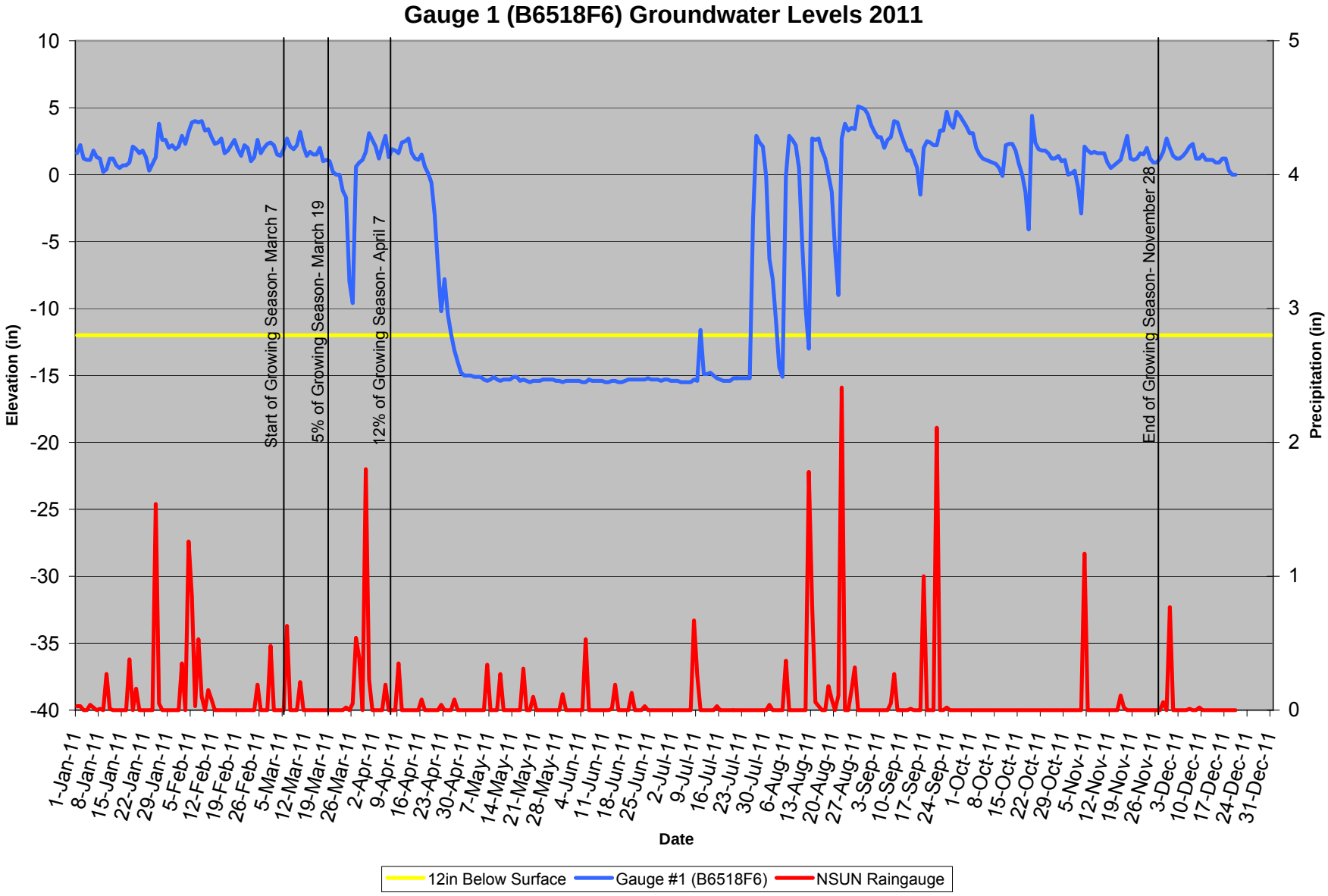
UT to Lilliput Stream and Wetland Restoration Project
30 & 70 Percentile Graph for Rainfall in 2011

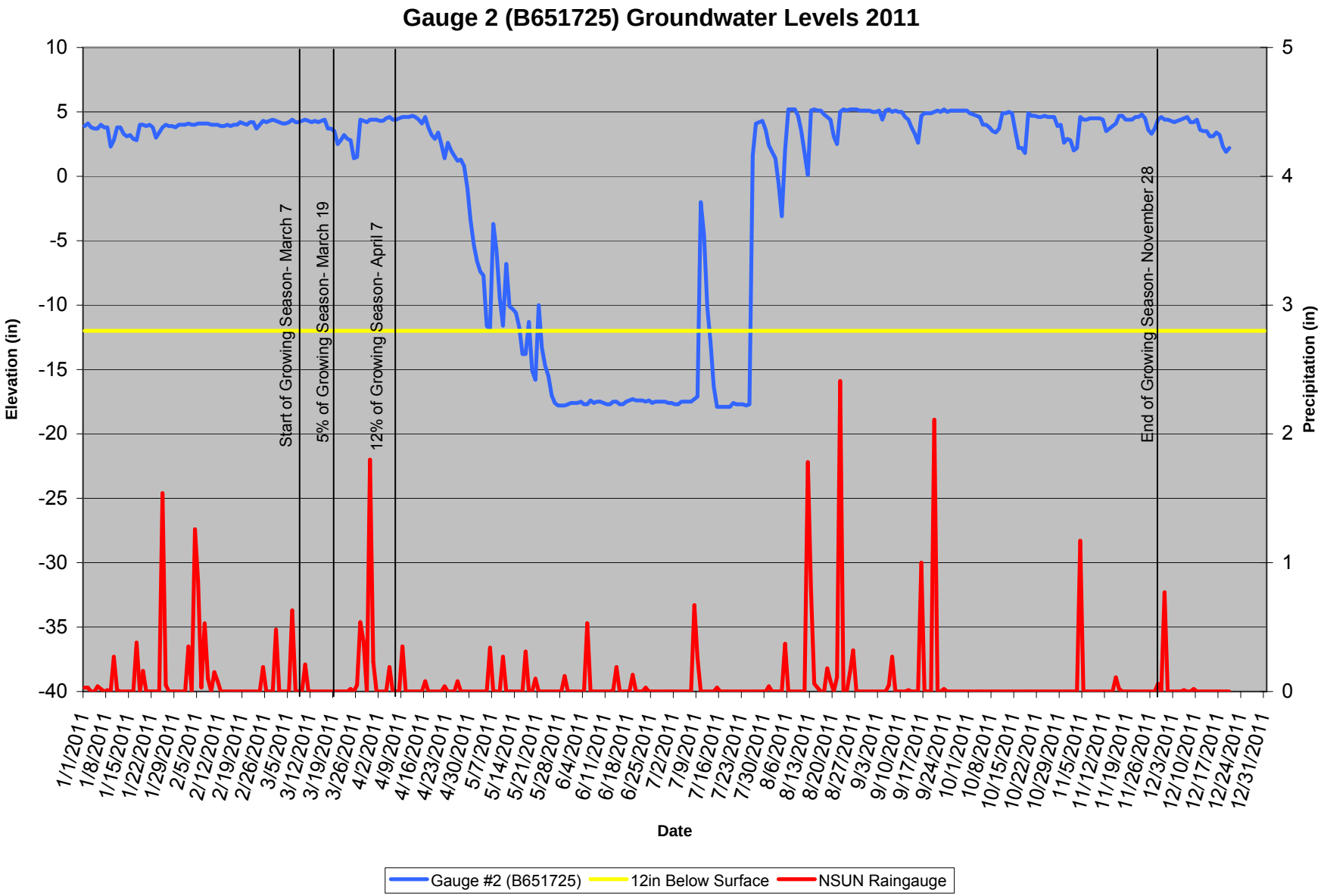


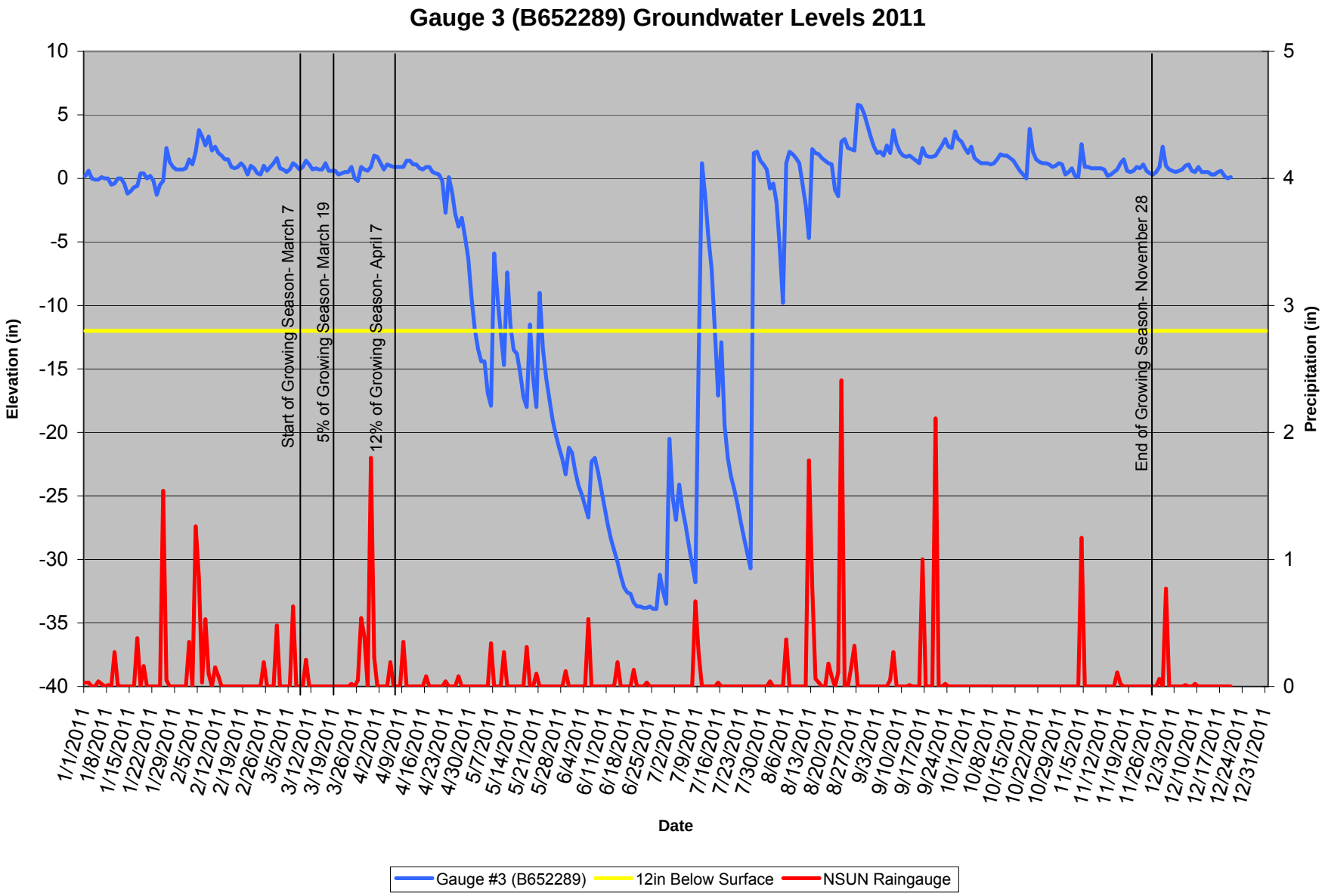
Precipitation data obtained from:
Military Ocean Terminal at Sunny Point -
station NSUN (www.nc-climate.ncsu.edu)

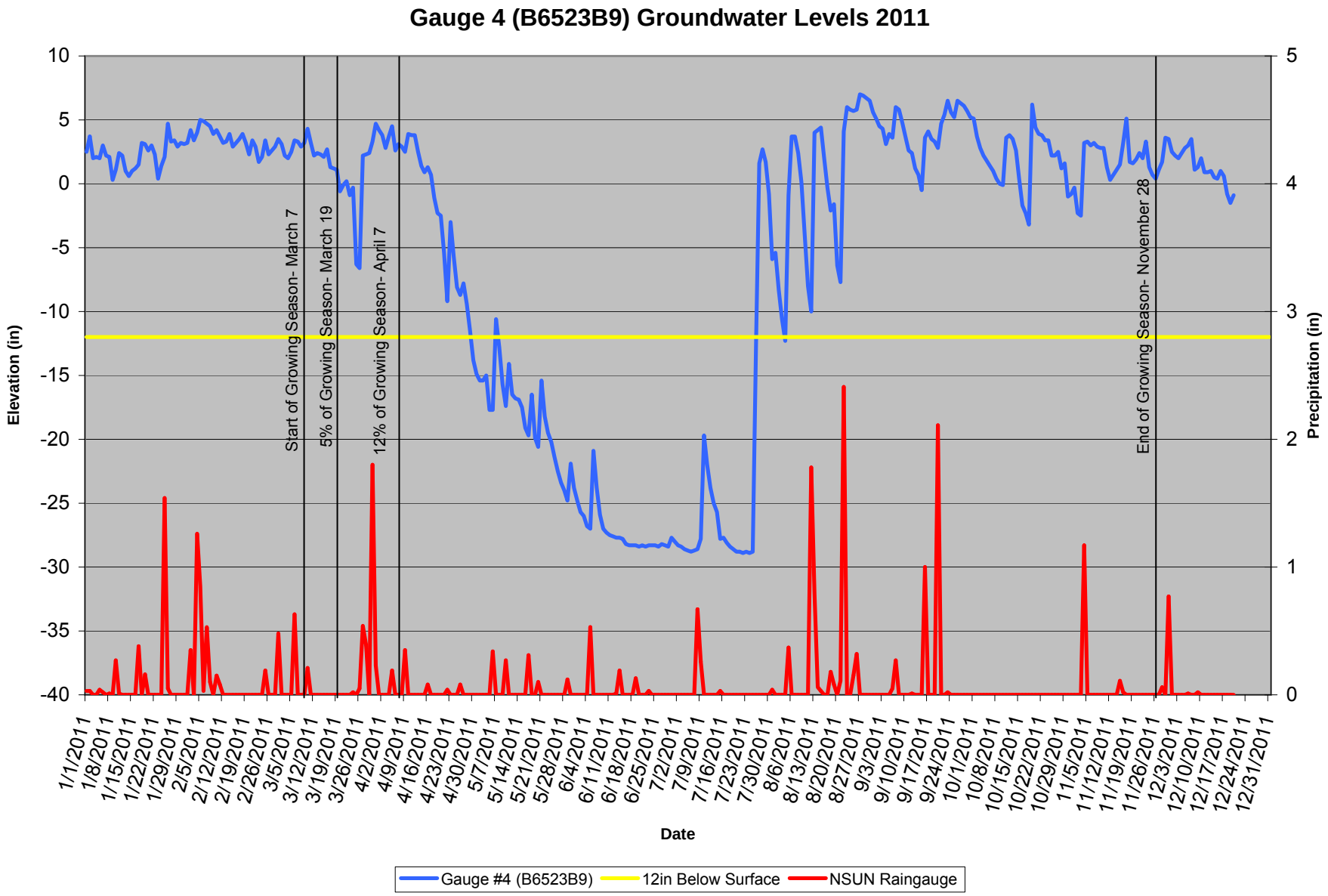
30% & 70% precipitation data obtained from
Brunswick County - Longwood WETS
Station NC5116 1978-2009
(wcc.nrcs.usda.gov)

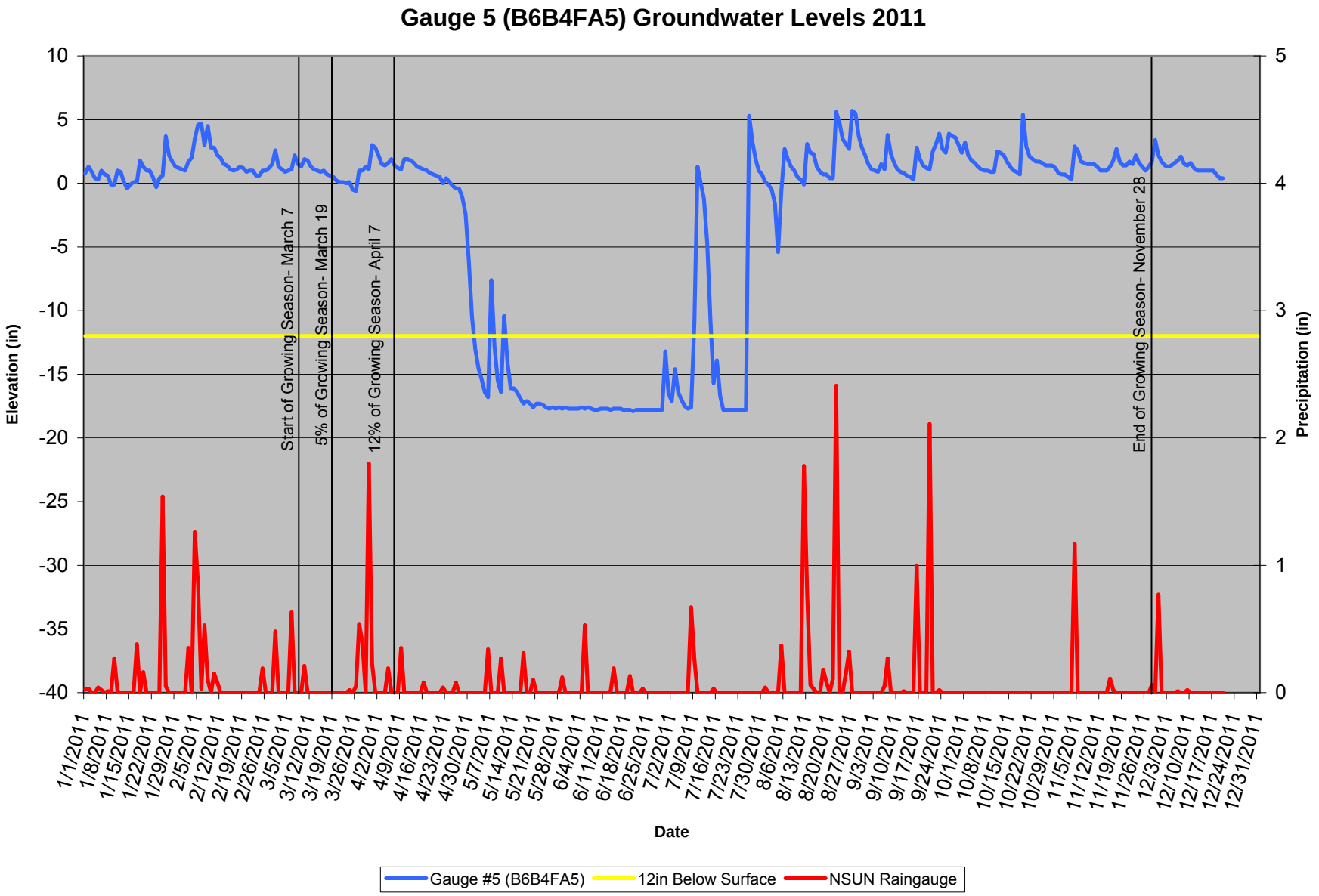

Rainfall 2005
Precipitation (in)
16
14
12
10
8
6
4
2
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
Monthly Rainfall 2005
30th Percentile
70th Percentile

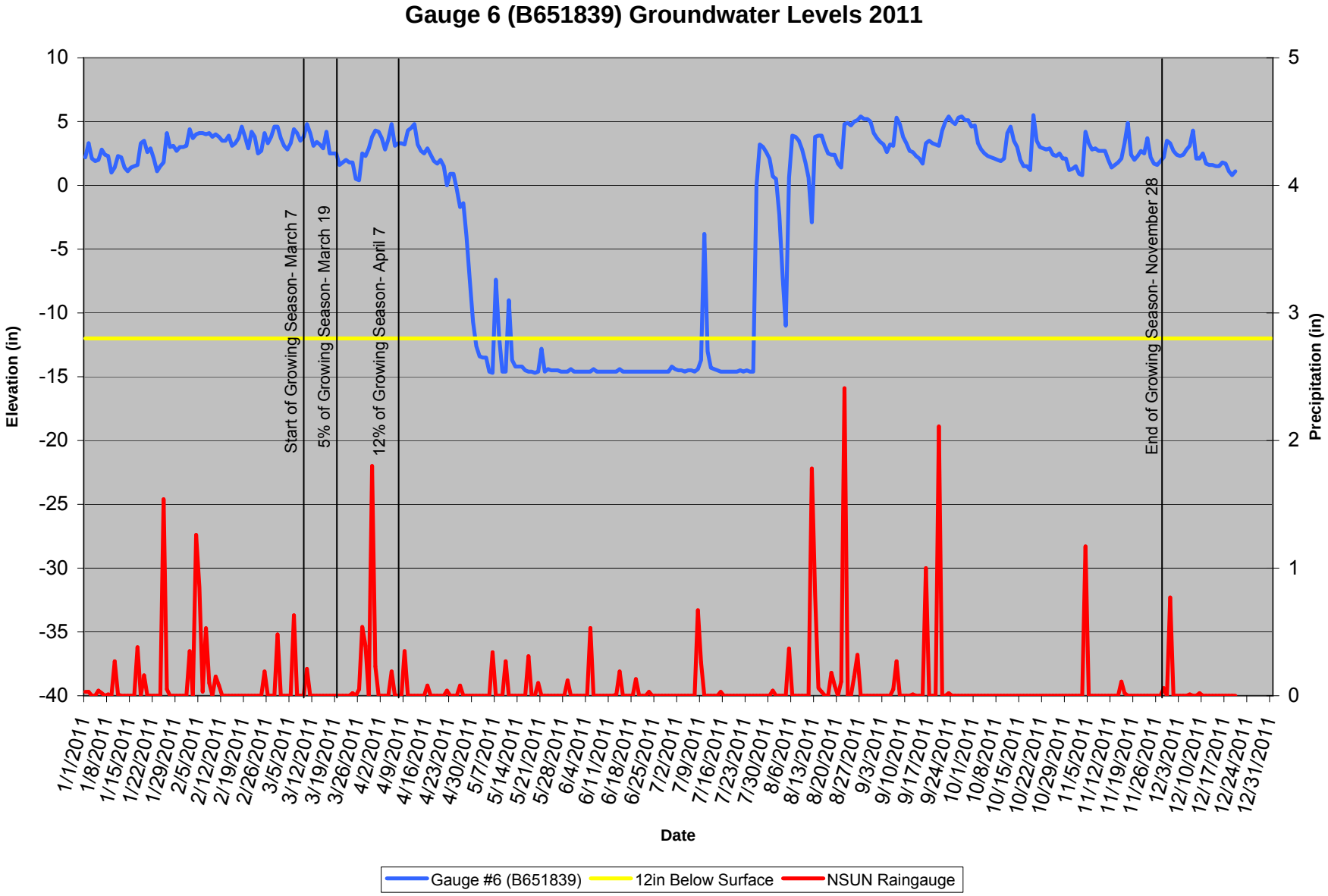

Gauge 1 (B6518F6) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
12in Below Surface
Gauge #1 (B6518F6)
NSUN Raingauge

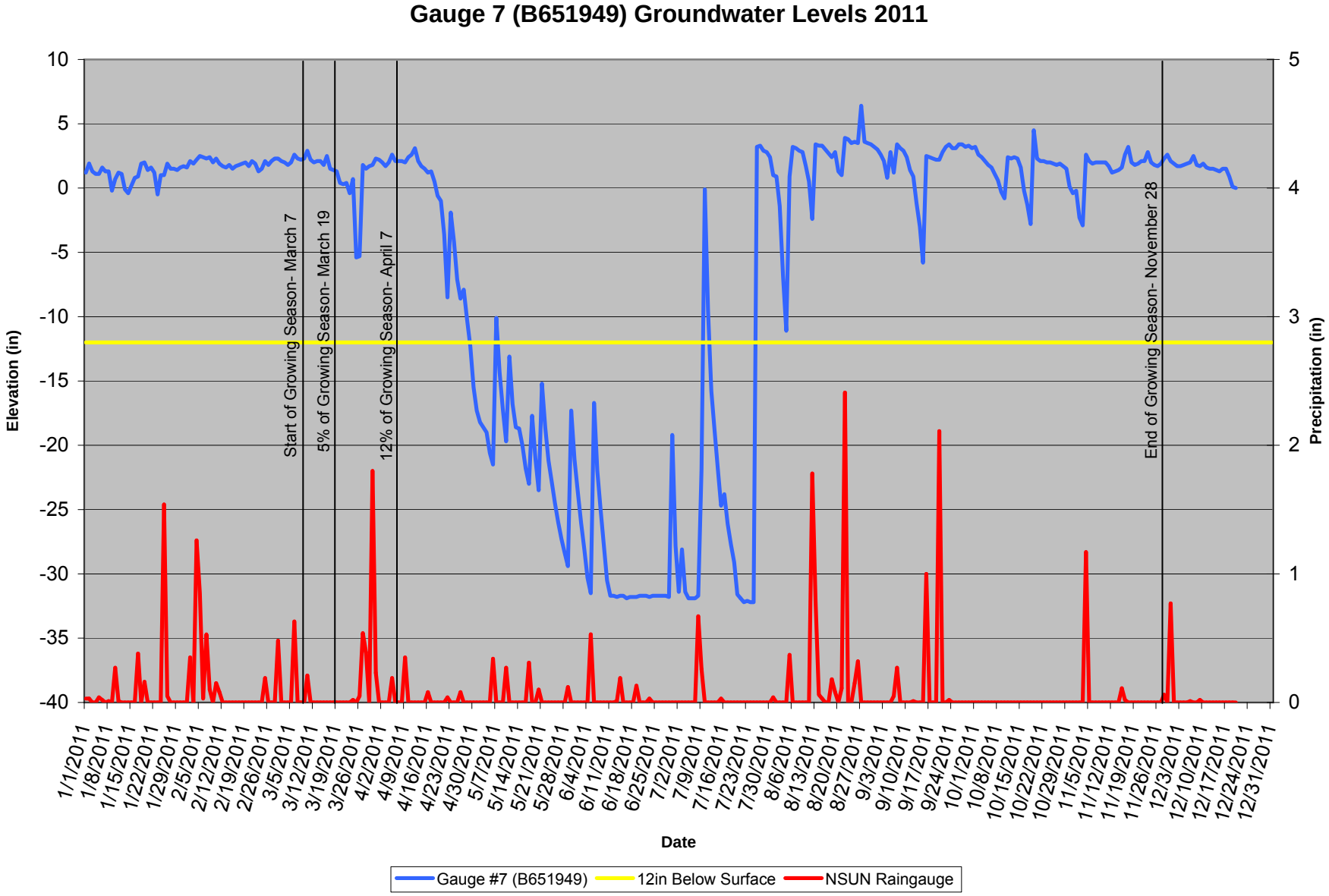

Gauge 2 (B651725) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #2 (B651725)
12in Below Surface
NSUN Raingauge

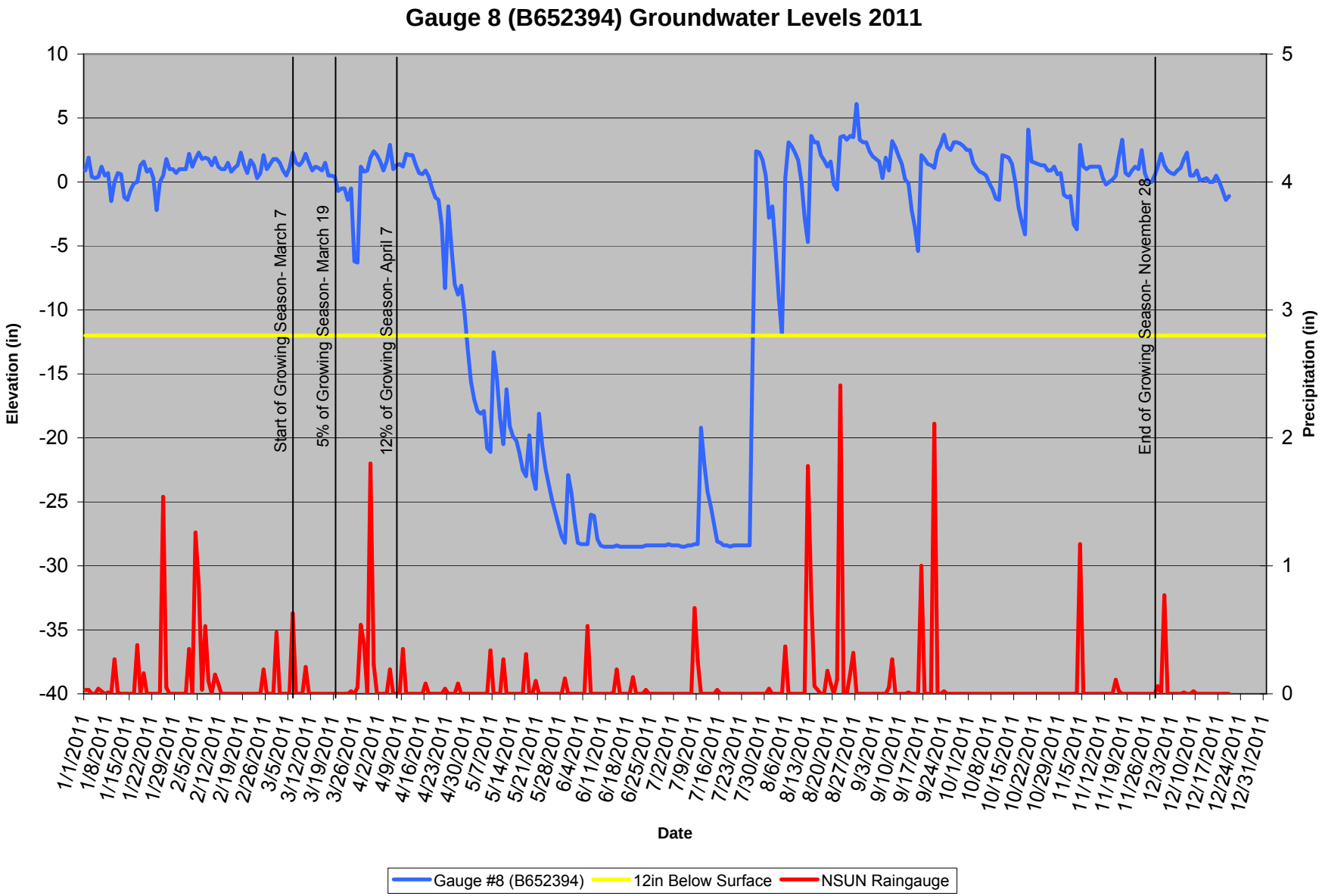

Gauge 3 (B652289) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #3 (B652289)
12in Below Surface
NSUN Raingauge

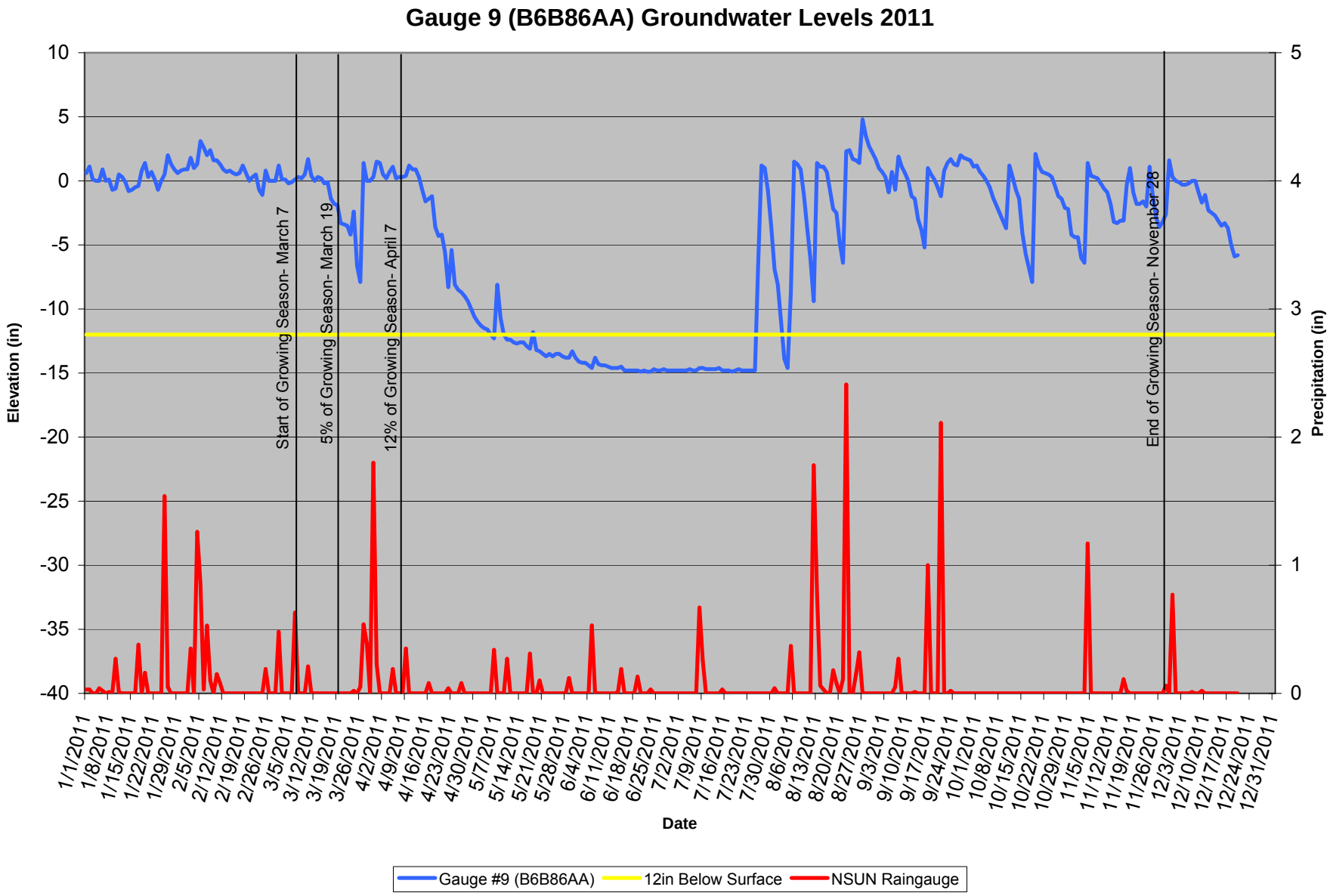

Gauge 4 (B6523B9) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #4 (B6523B9)
12in Below Surface
NSUN Raingauge

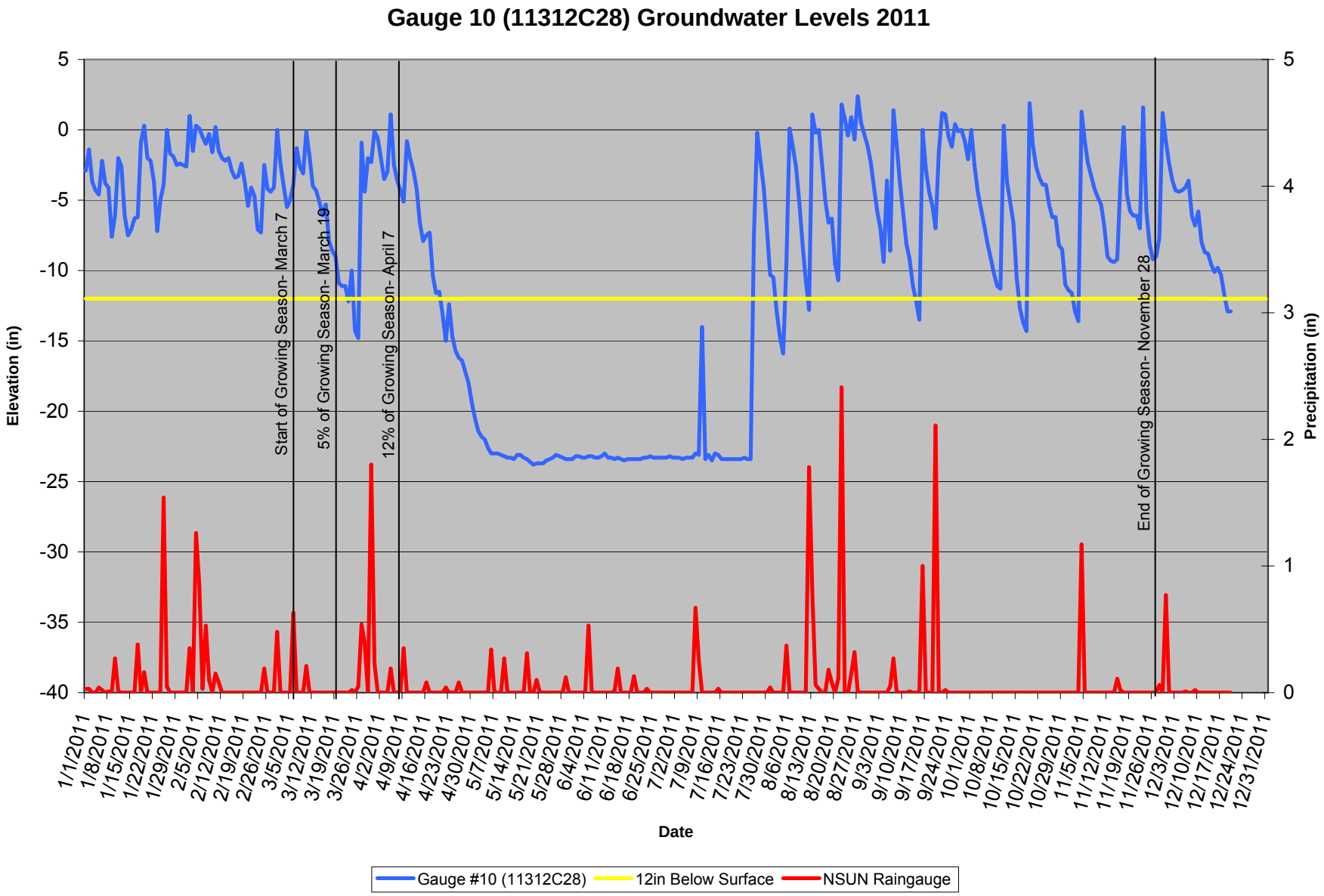

Gauge 5 (B6B4FA5) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #5 (B6B4FA5)
12in Below Surface
NSUN Raingauge

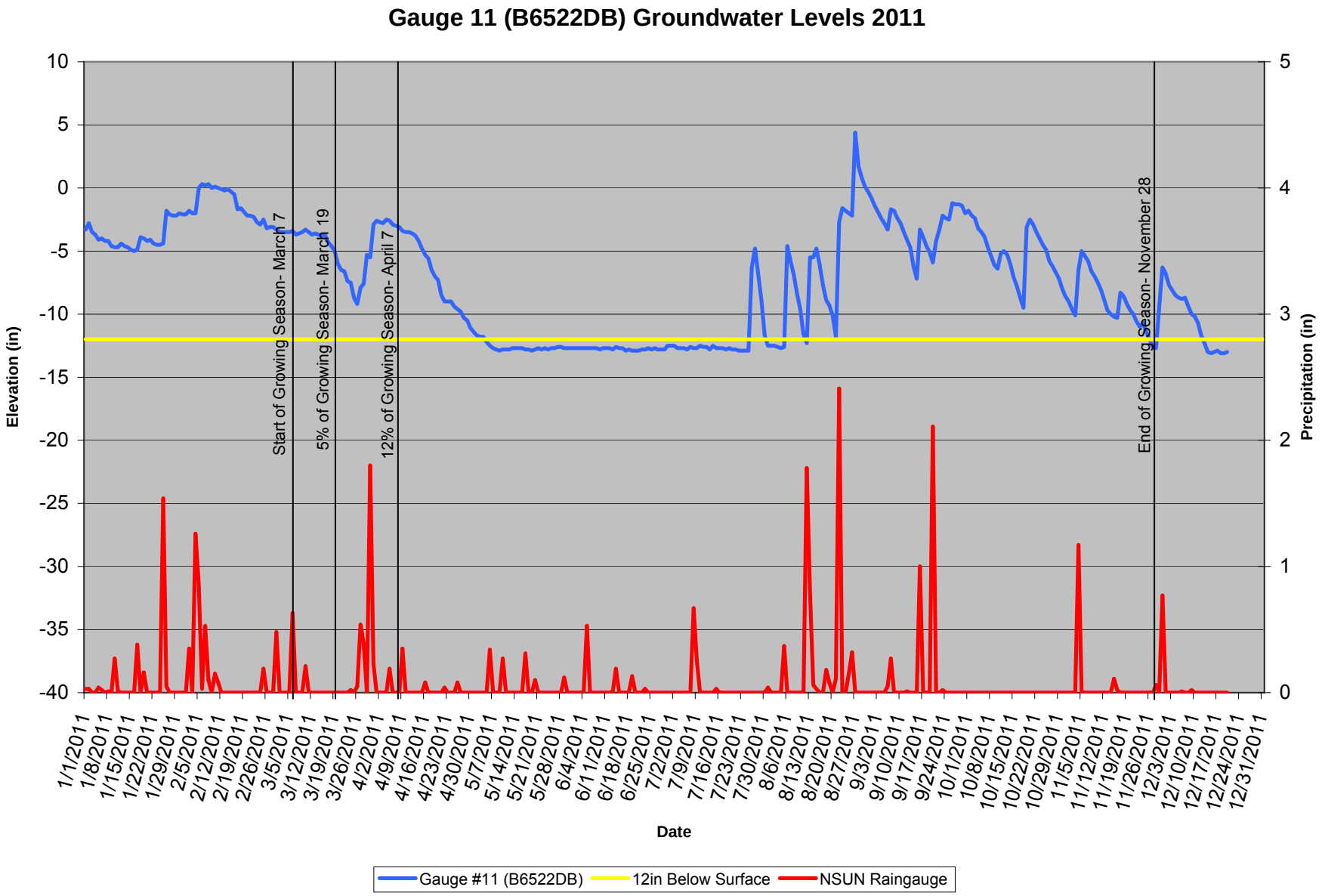

Gauge 6 (B651839) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #6 (B651839)
12in Below Surface
NSUN Raingauge

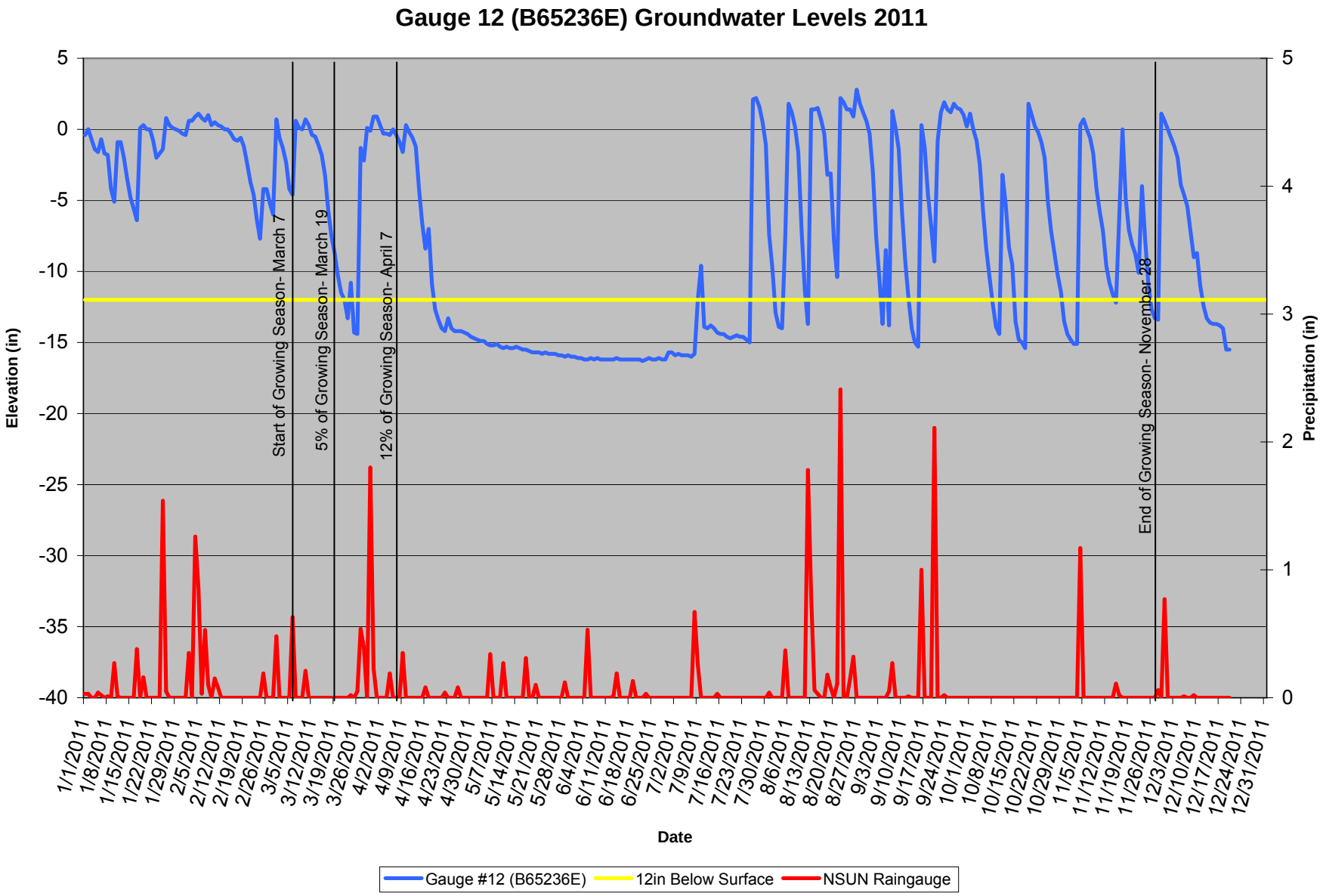

Gauge 7 (B651949) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #7 (B651949)
12in Below Surface
NSUN Raingauge


Gauge 8 (B652394) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #8 (B652394)
12in Below Surface
NSUN Raingauge

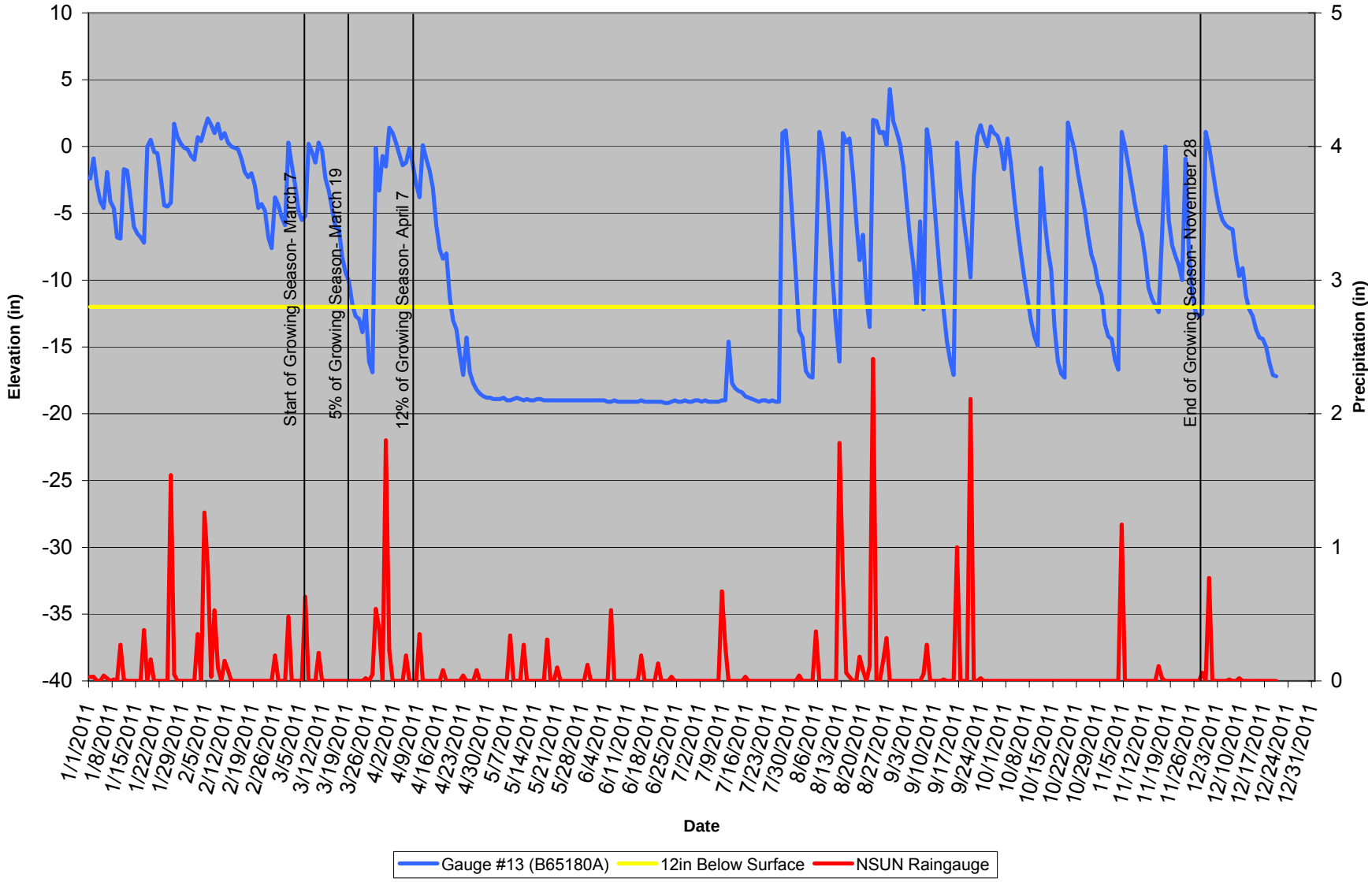

Gauge 9 (B6B86AA) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #9 (B6B86AA)
12in Below Surface
NSUN Raingauge

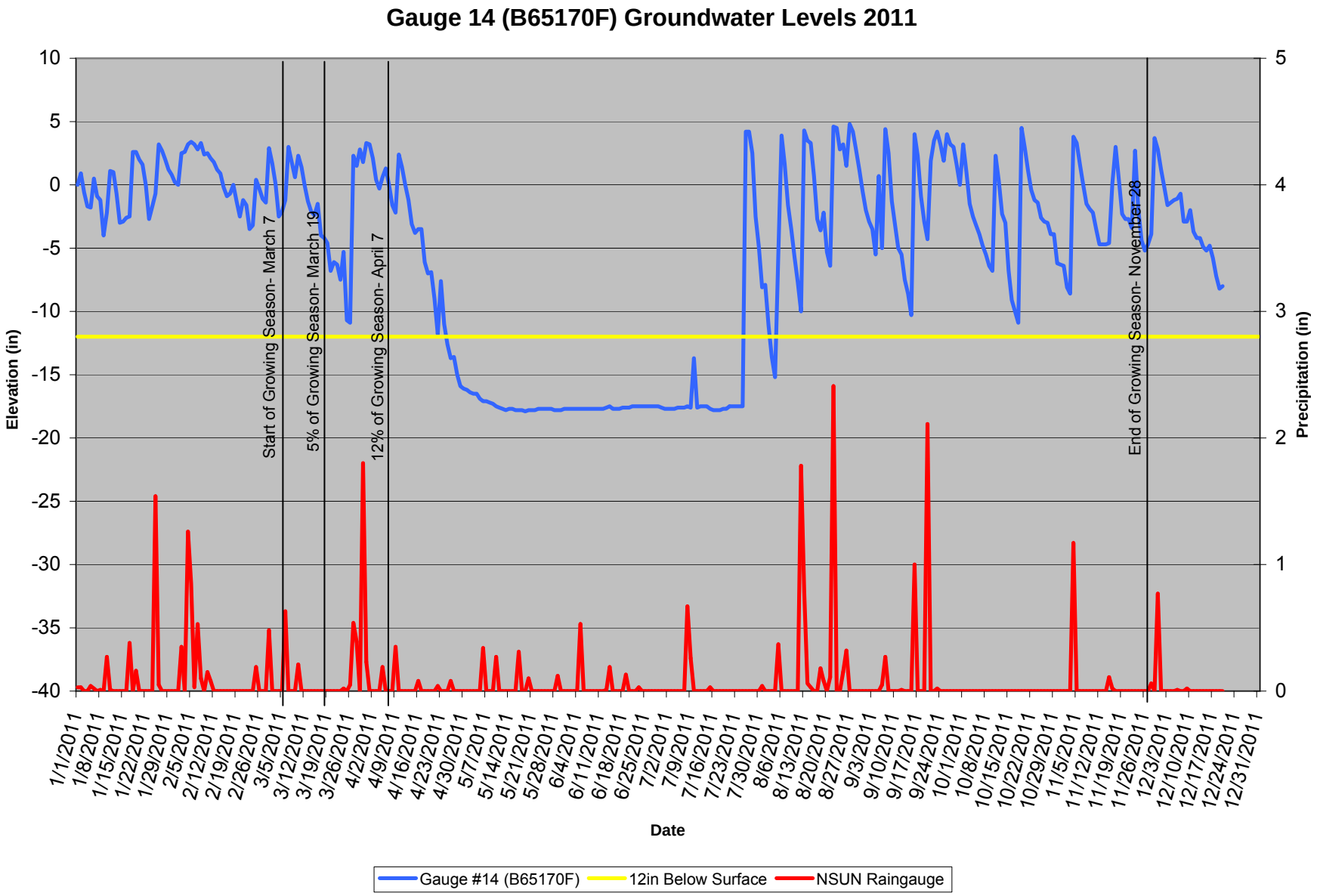

Gauge 10 (11312C28) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #10 (11312C28)
12in Below Surface
NSUN Raingauge

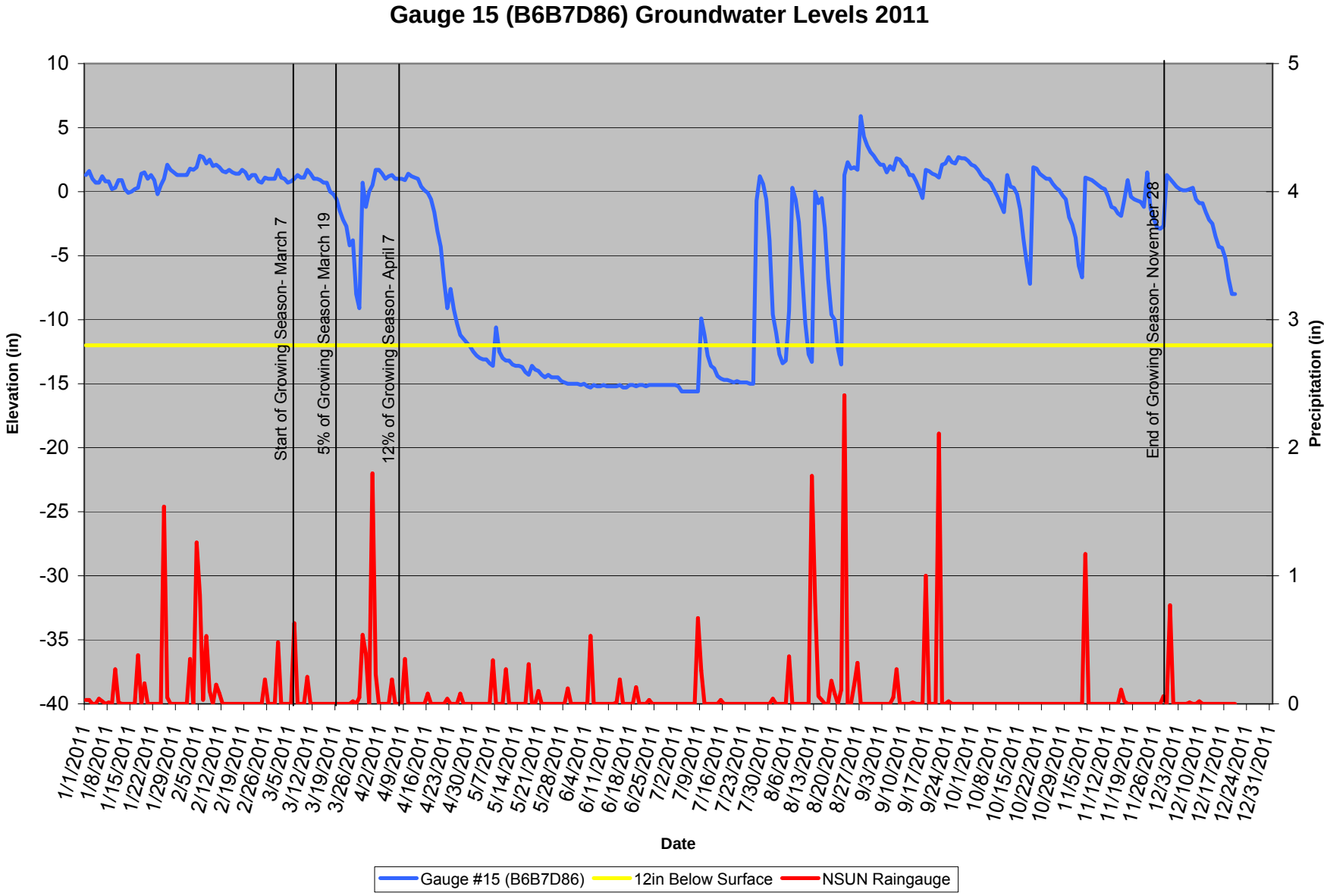

Gauge 11 (B6522DB) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #11 (B6522DB)
12in Below Surface
NSUN Raingauge

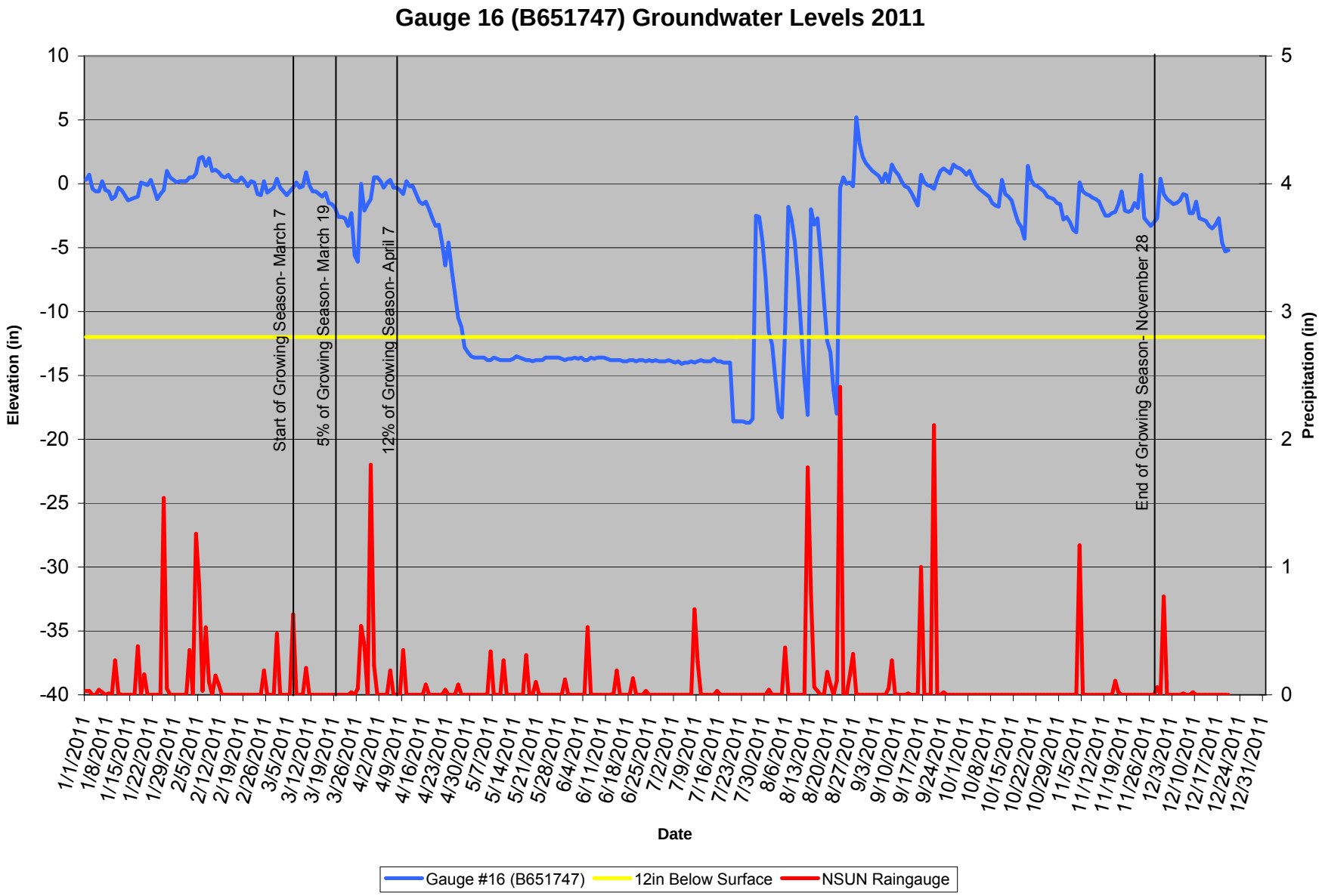

Gauge 12 (B65236E) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #12 (B65236E)
12in Below Surface
NSUN Raingauge

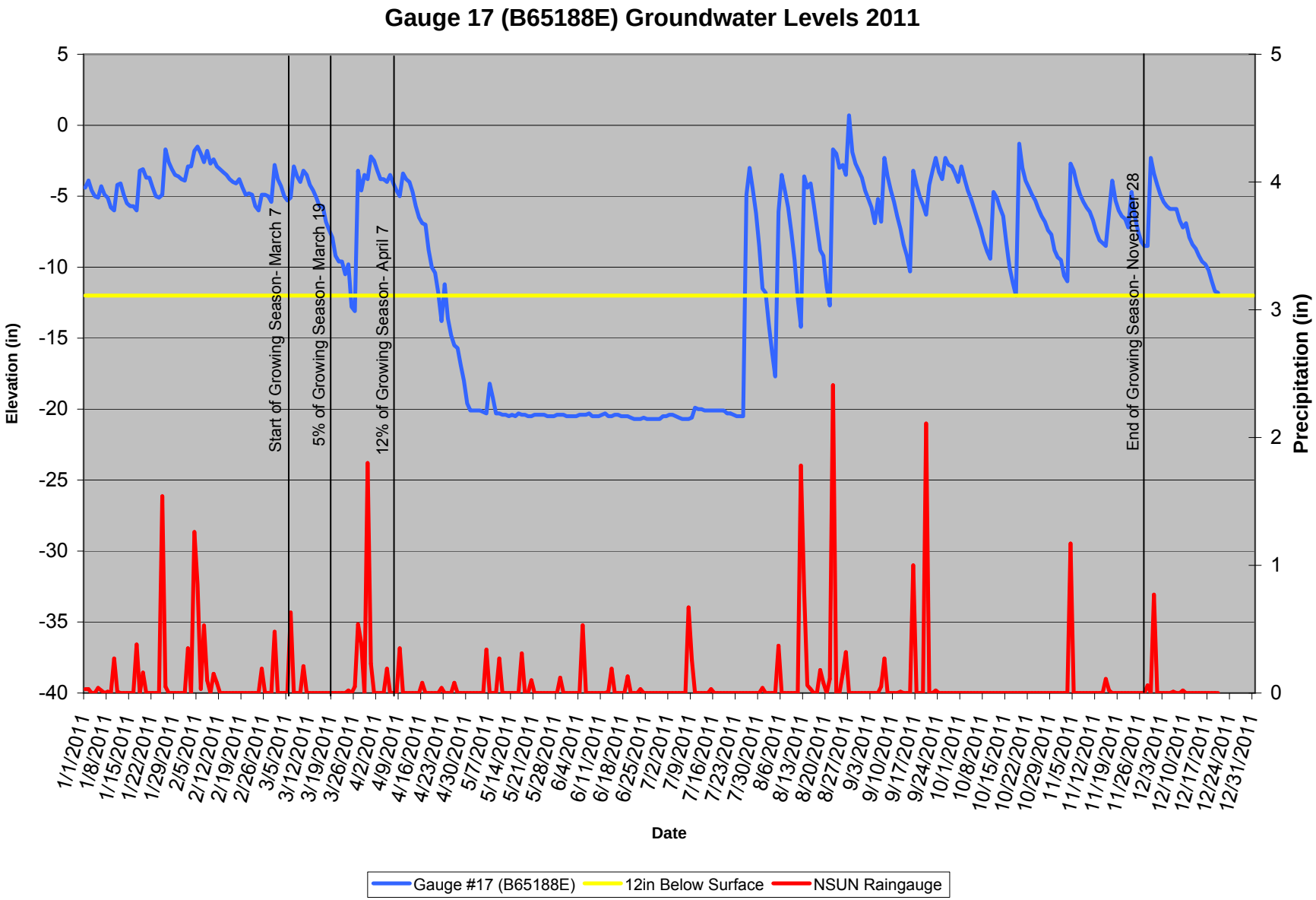
Gauge 13 (B65180A) Groundwater Levels 2011

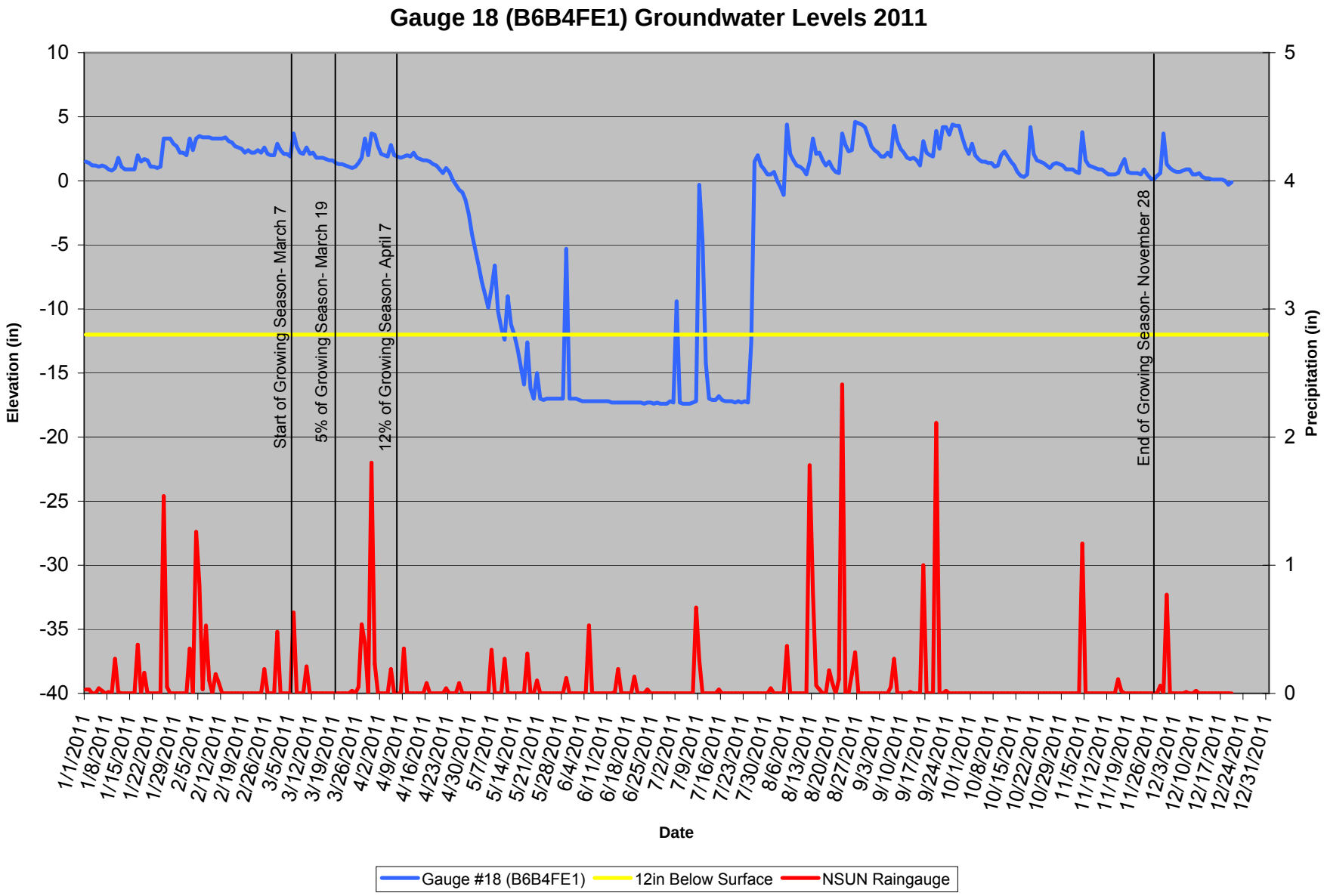


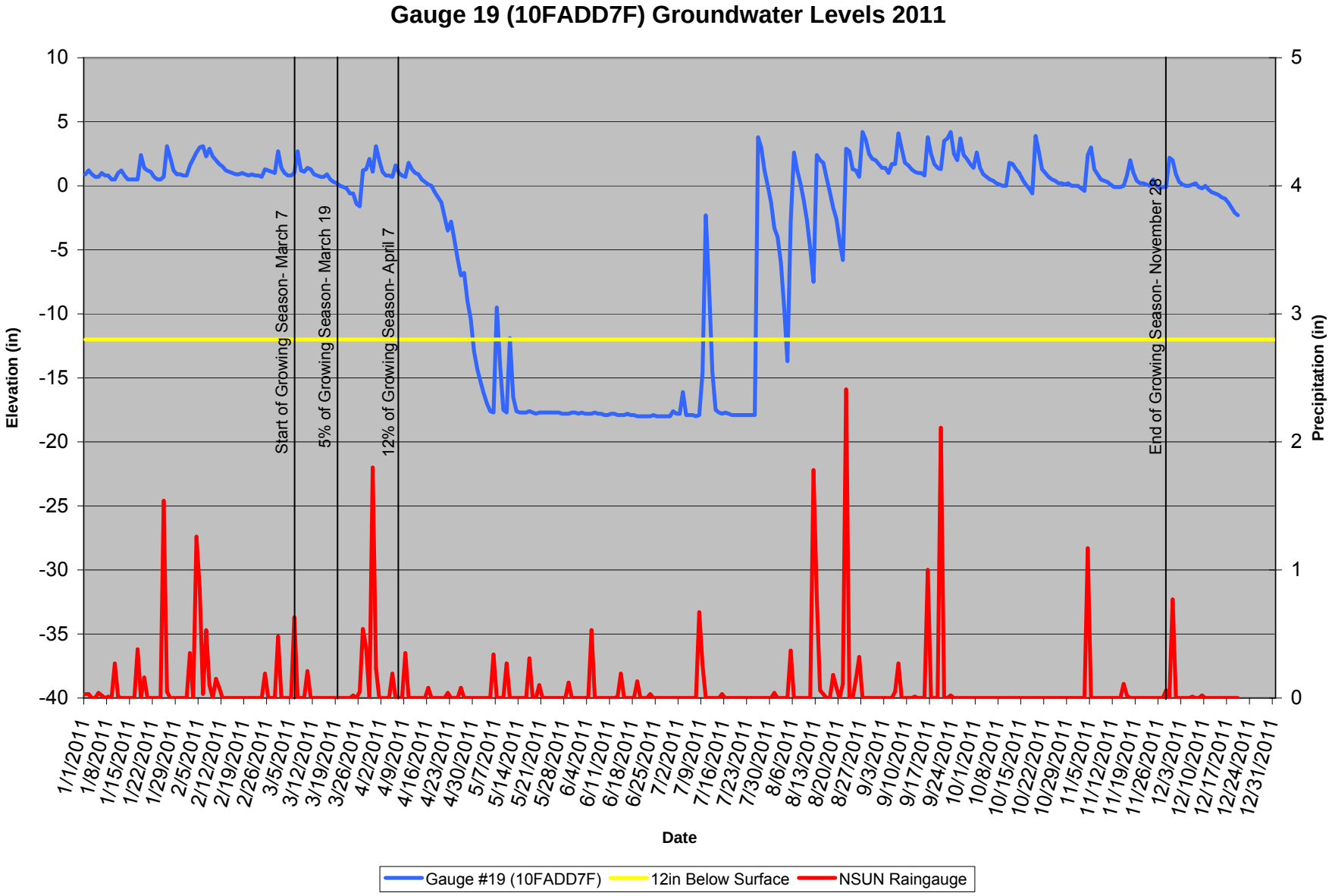

Gauge 14 (B65170F) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #14 (B65170F)
12in Below Surface
NSUN Raingauge

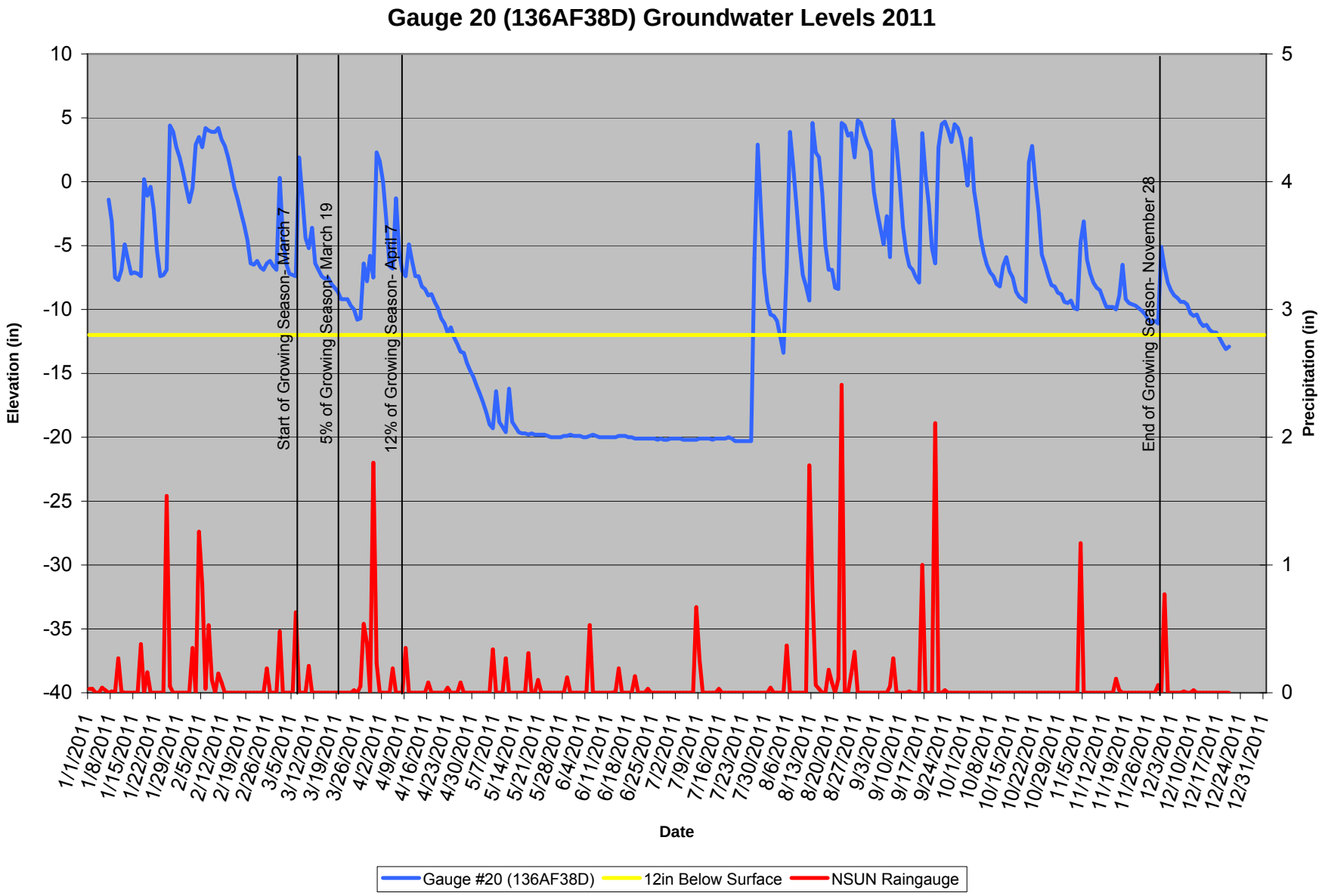

Gauge 15 (B6B7D86) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #15 (B6B7D86)
12in Below Surface
NSUN Raingauge

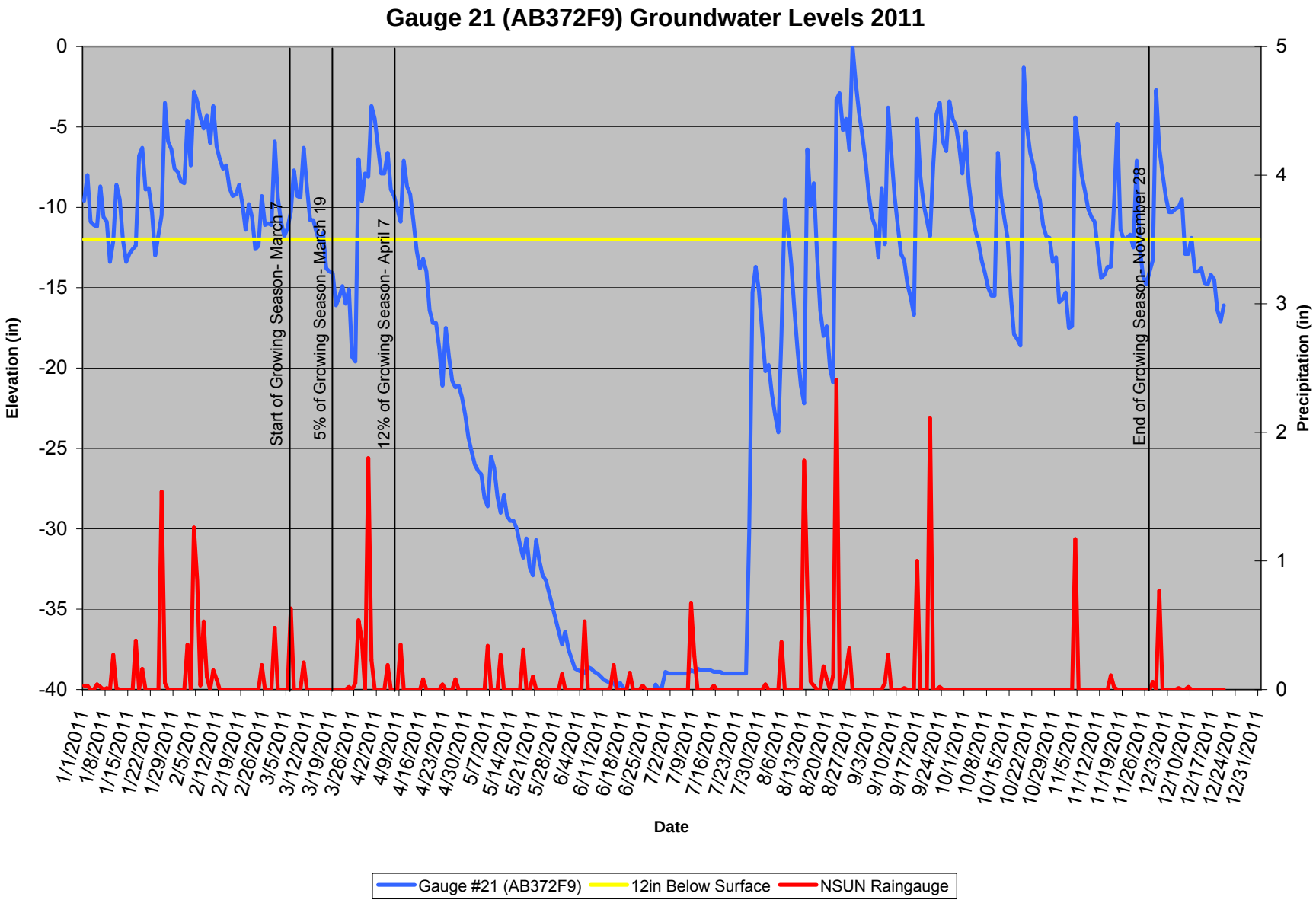

Gauge 16 (B651747) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #16 (B651747)
12in Below Surface
NSUN Raingauge

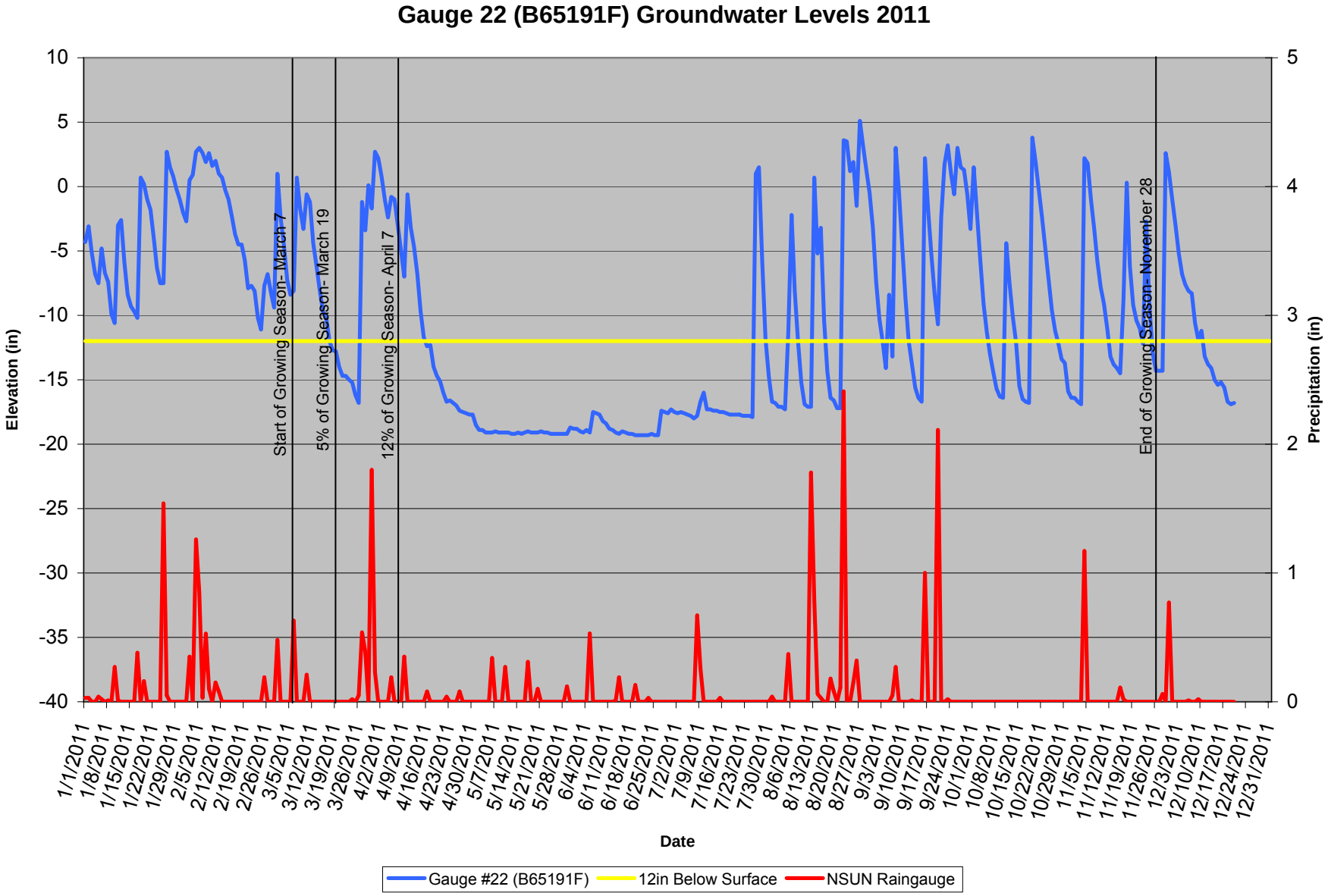

Gauge 17 (B65188E) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #17 (B65188E)
12in Below Surface
NSUN Raingauge

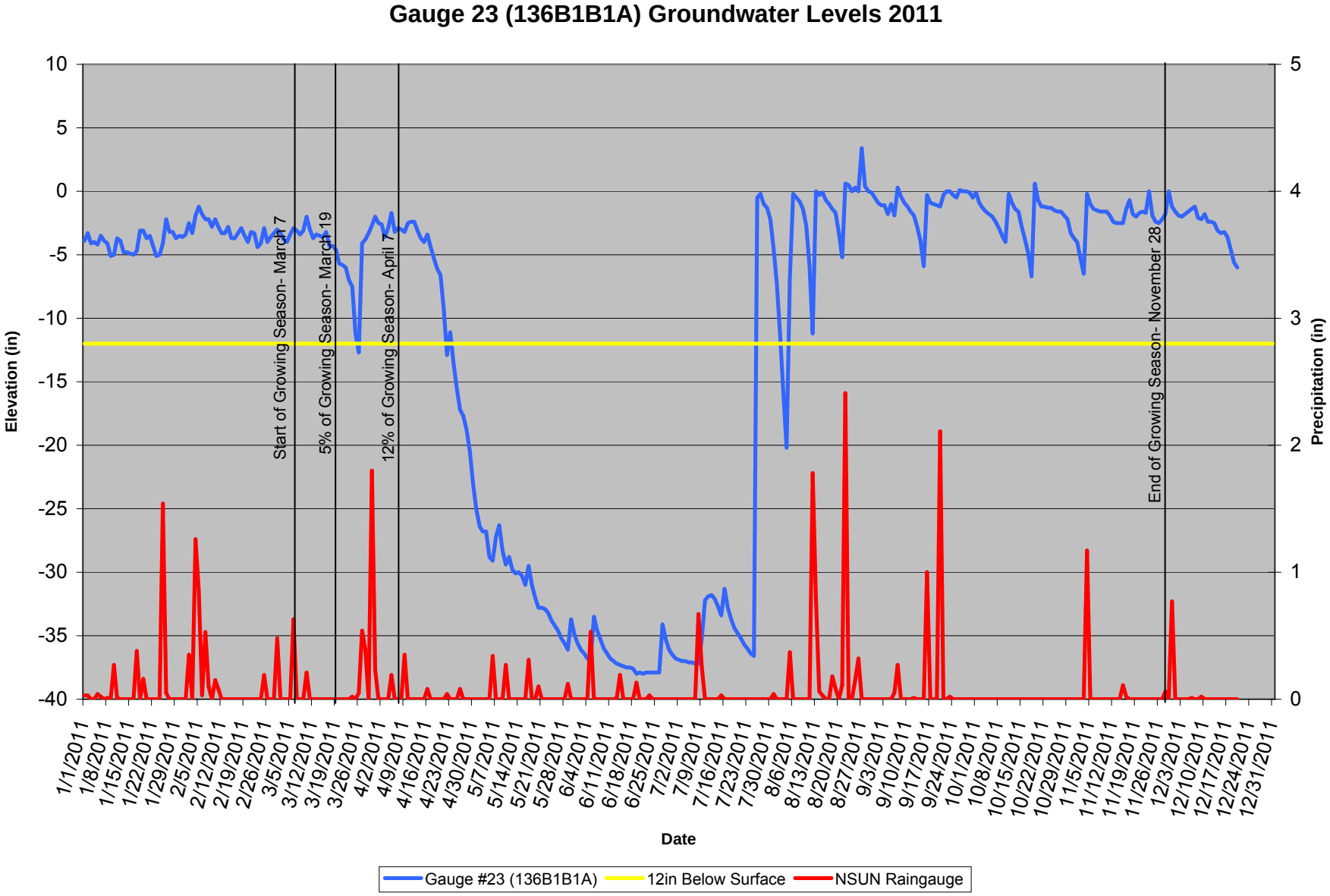

Gauge 18 (B6B4FE1) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #18 (B6B4FE1)
12in Below Surface
NSUN Raingauge

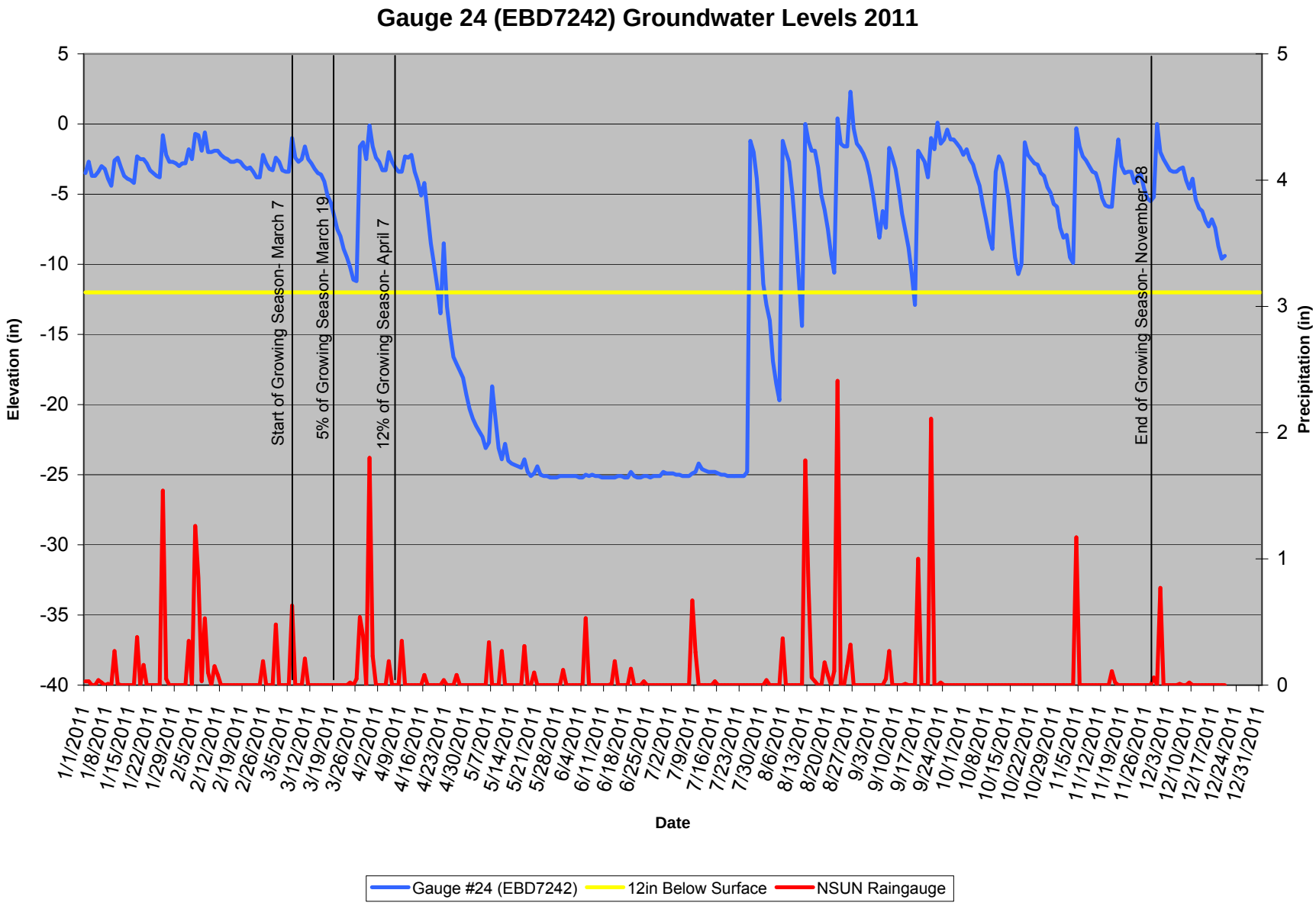

Gauge 19 (10FADD7F) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #19 (10FADD7F)
12in Below Surface
NSUN Raingauge

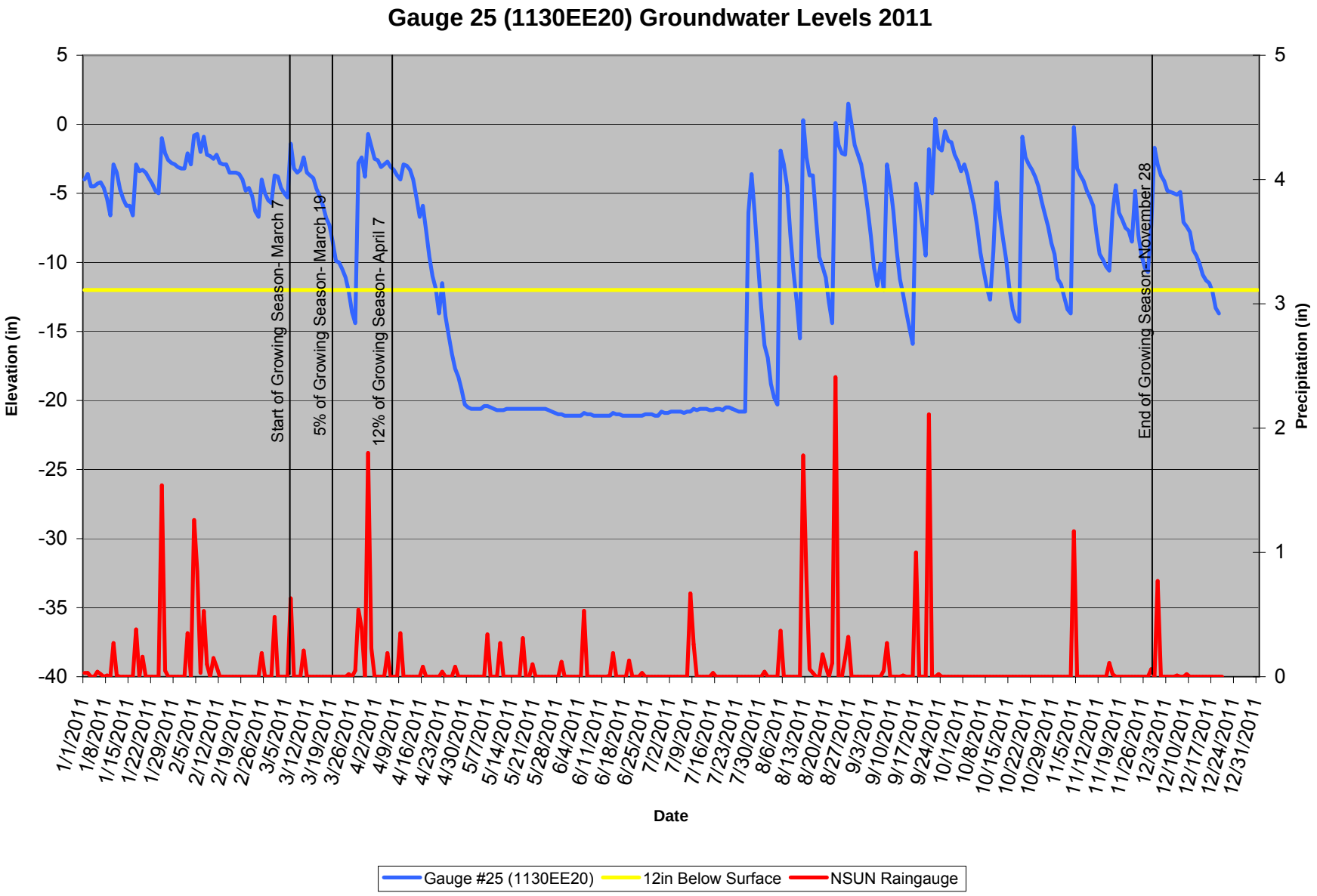

Gauge 20 (136AF38D) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #20 (136AF38D)
12in Below Surface
NSUN Raingauge

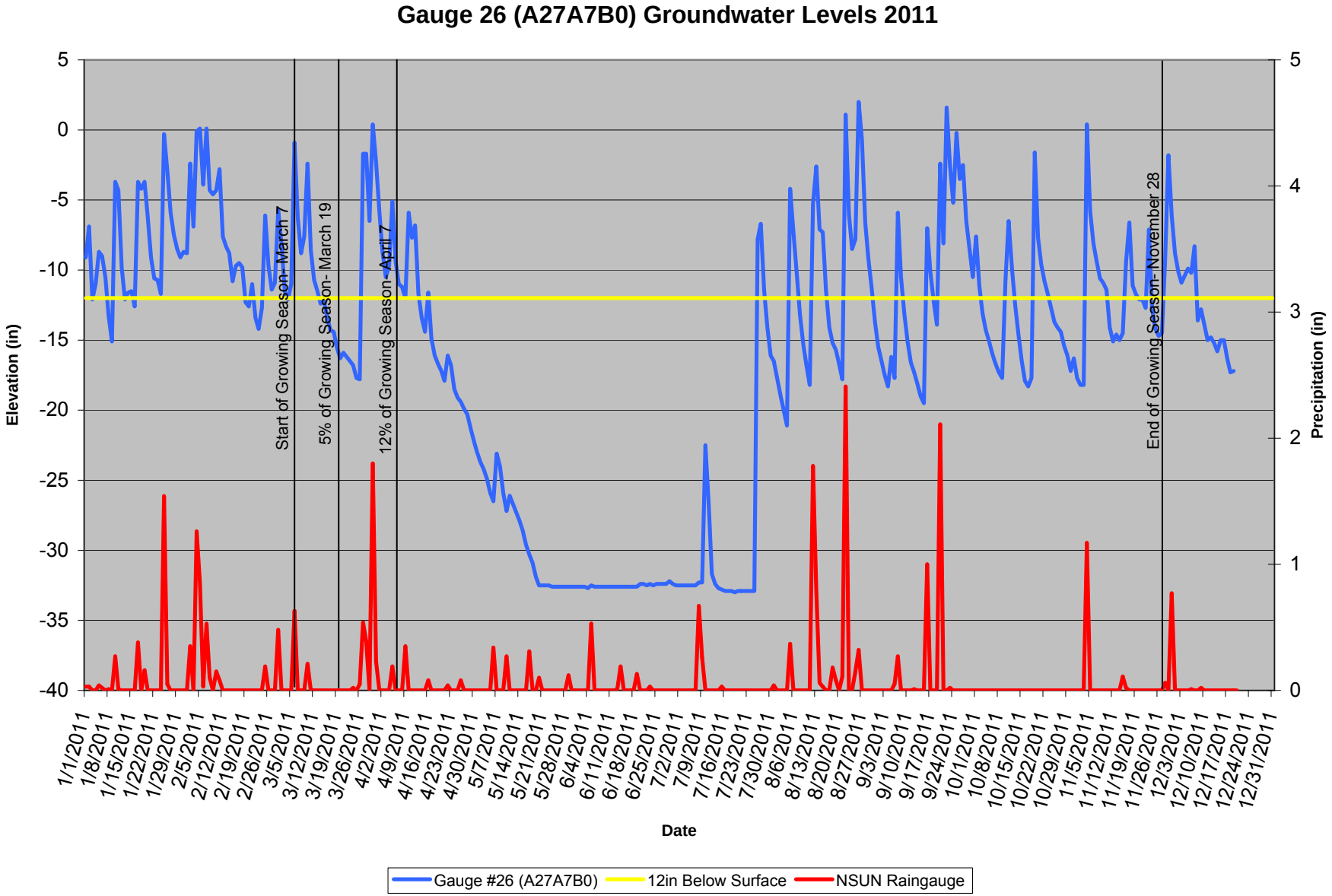

Gauge 21 (AB372F9) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #21 (AB372F9)
12in Below Surface
NSUN Raingauge

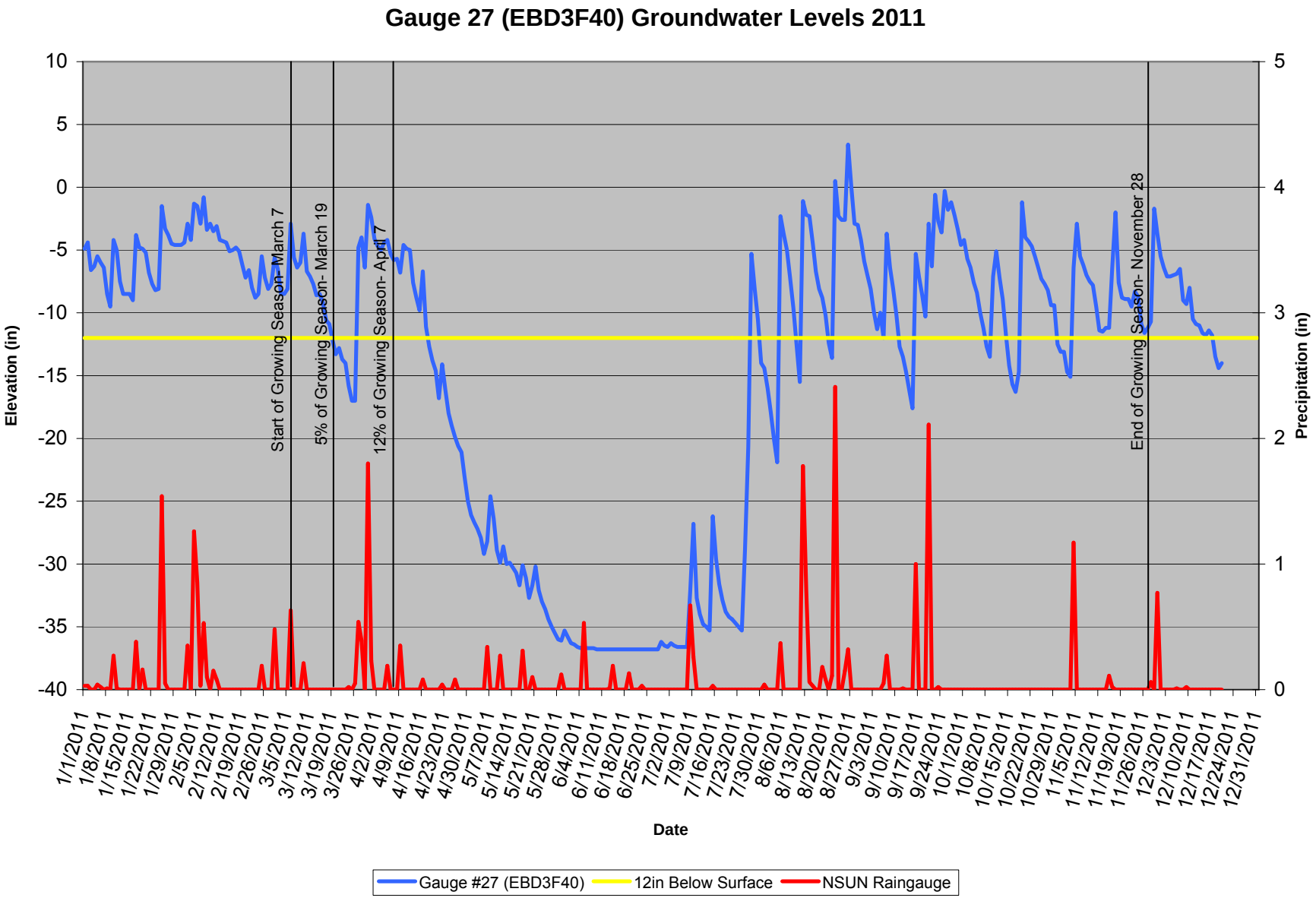

Gauge 22 (B65191F) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #22 (B65191F)
12in Below Surface
NSUN Raingauge

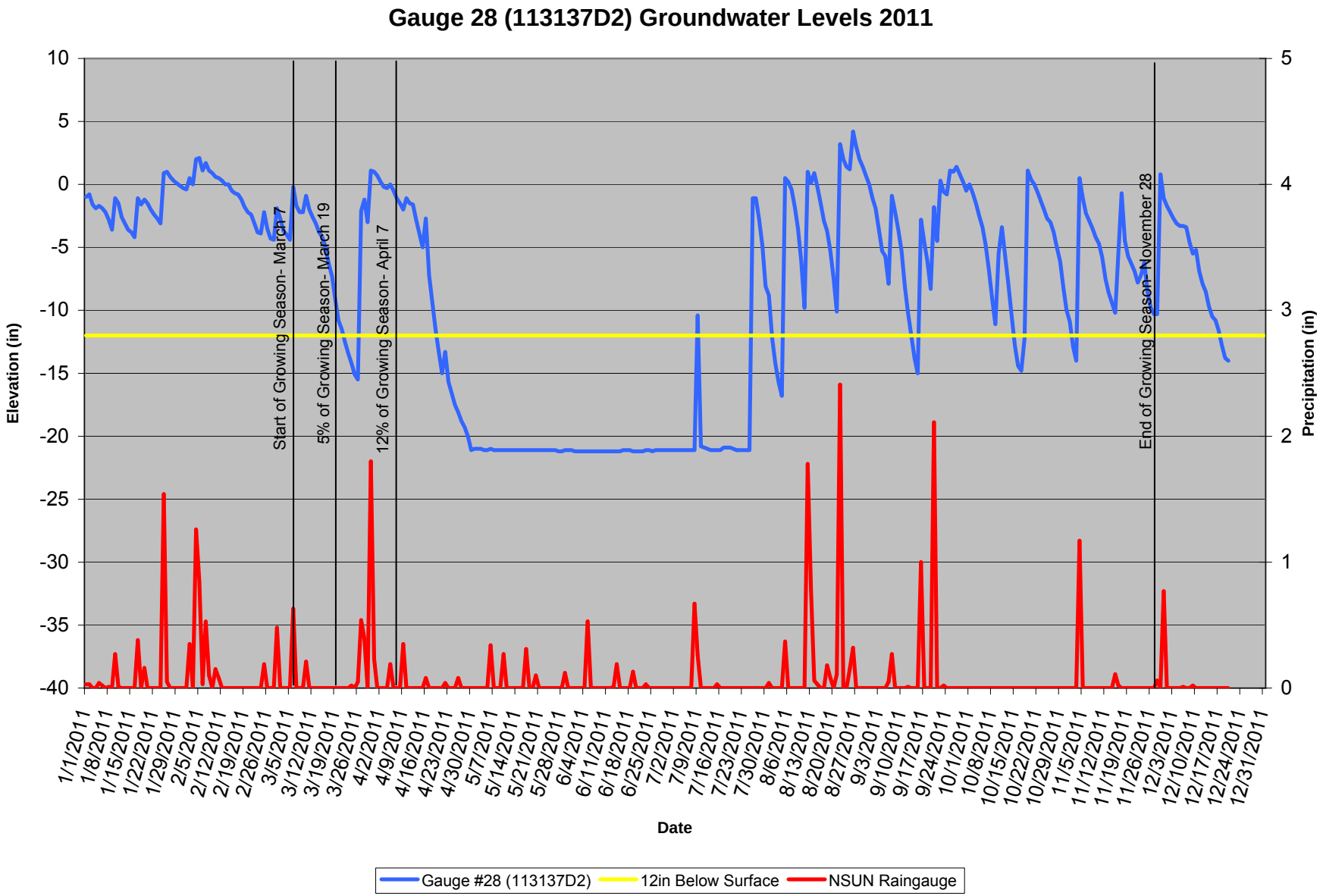

Gauge 23 (136B1B1A) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #23 (136B1B1A)
12in Below Surface
NSUN Raingauge


Gauge 24 (EBD7242) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #24 (EBD7242)
12in Below Surface
NSUN Raingauge

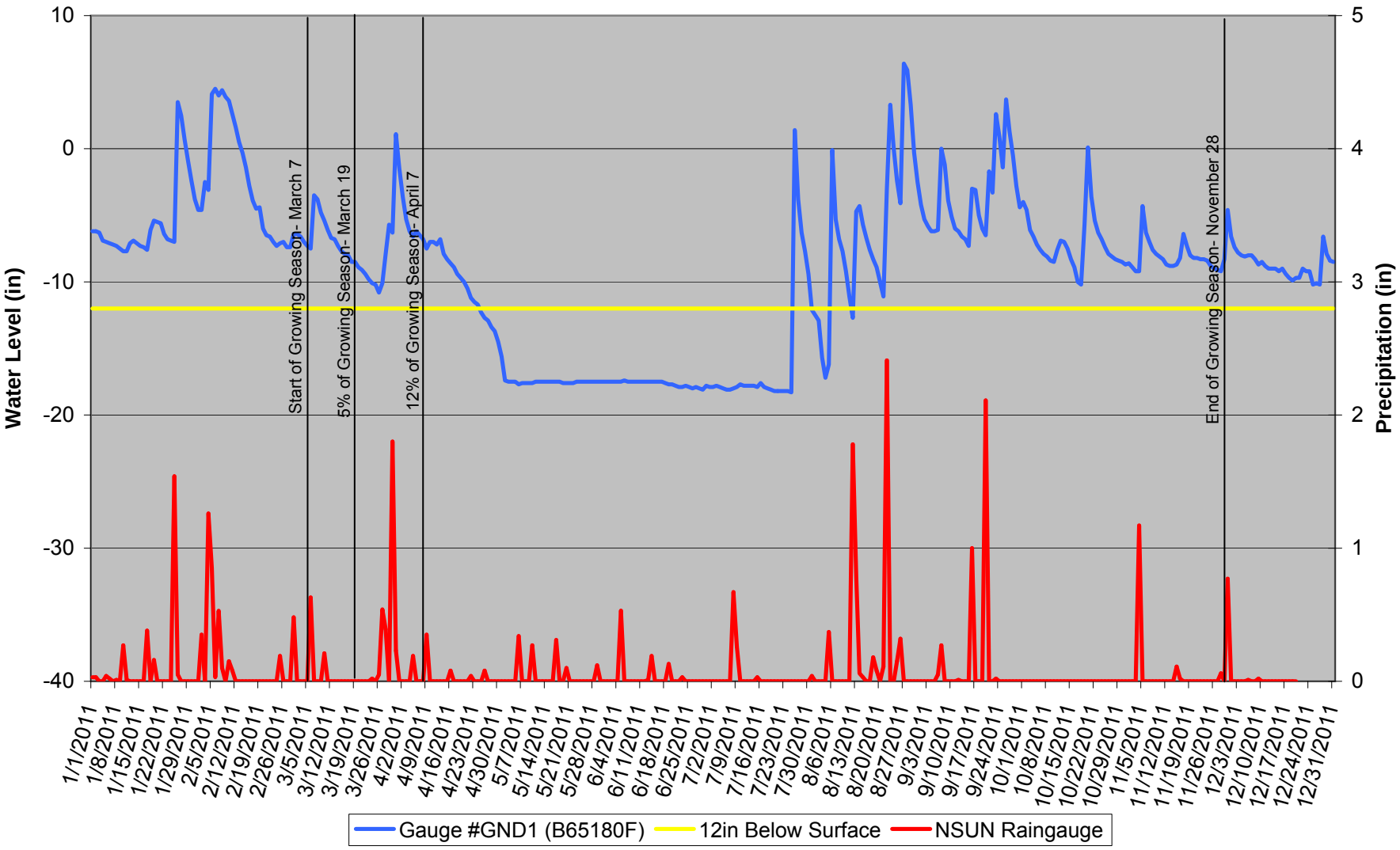

Gauge 25 (1130EE20) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #25 (1130EE20)
12in Below Surface
NSUN Raingauge

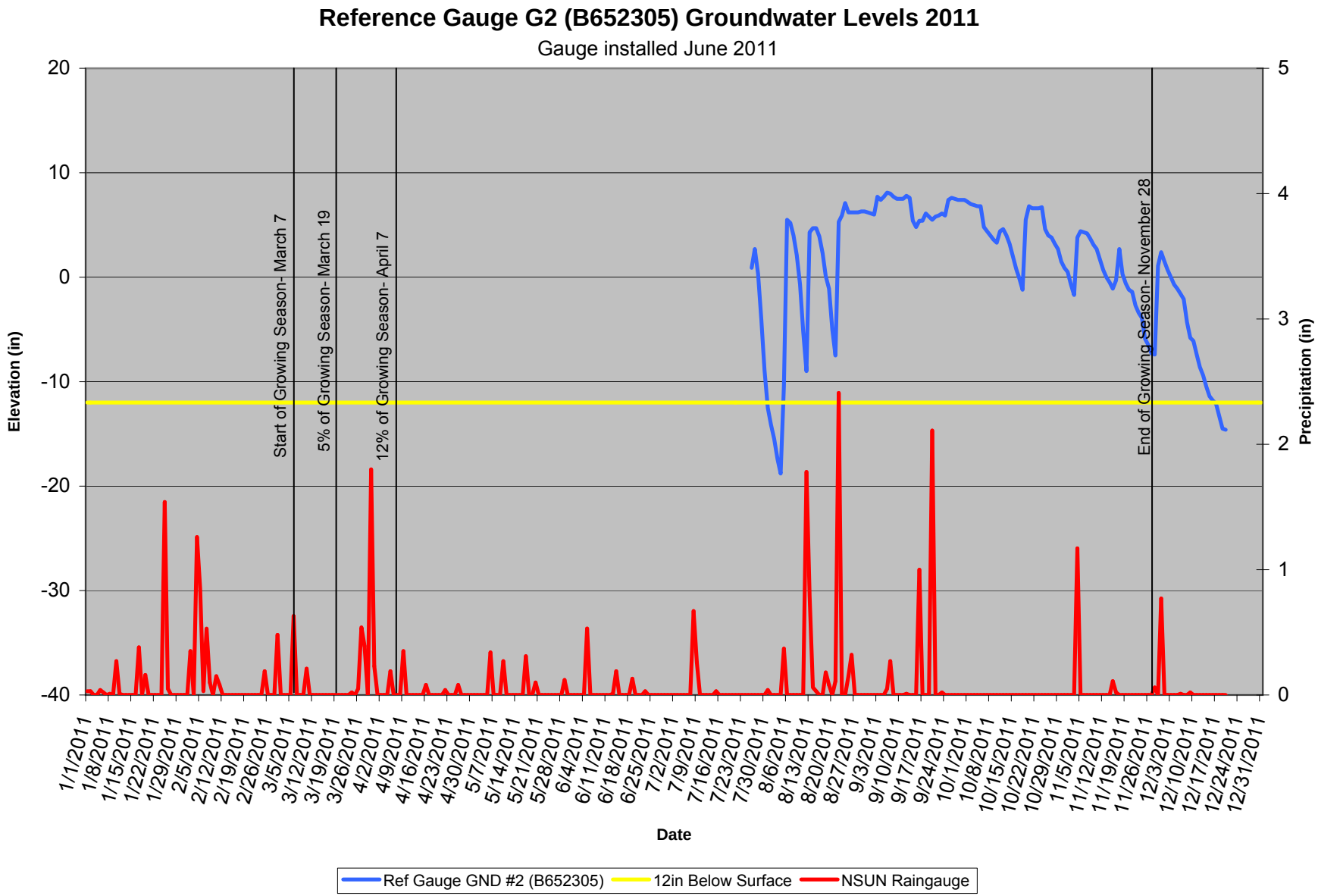

Gauge 26 (A27A7B0) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Date
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Gauge #26 (A27A7B0)
12in Below Surface
NSUN Raingauge


Gauge 27 (EBD3F40) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #27 (EBD3F40)
12in Below Surface
NSUN Raingauge


Gauge 28 (113137D2) Groundwater Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Gauge #28 (113137D2)
12in Below Surface
NSUN Raingauge

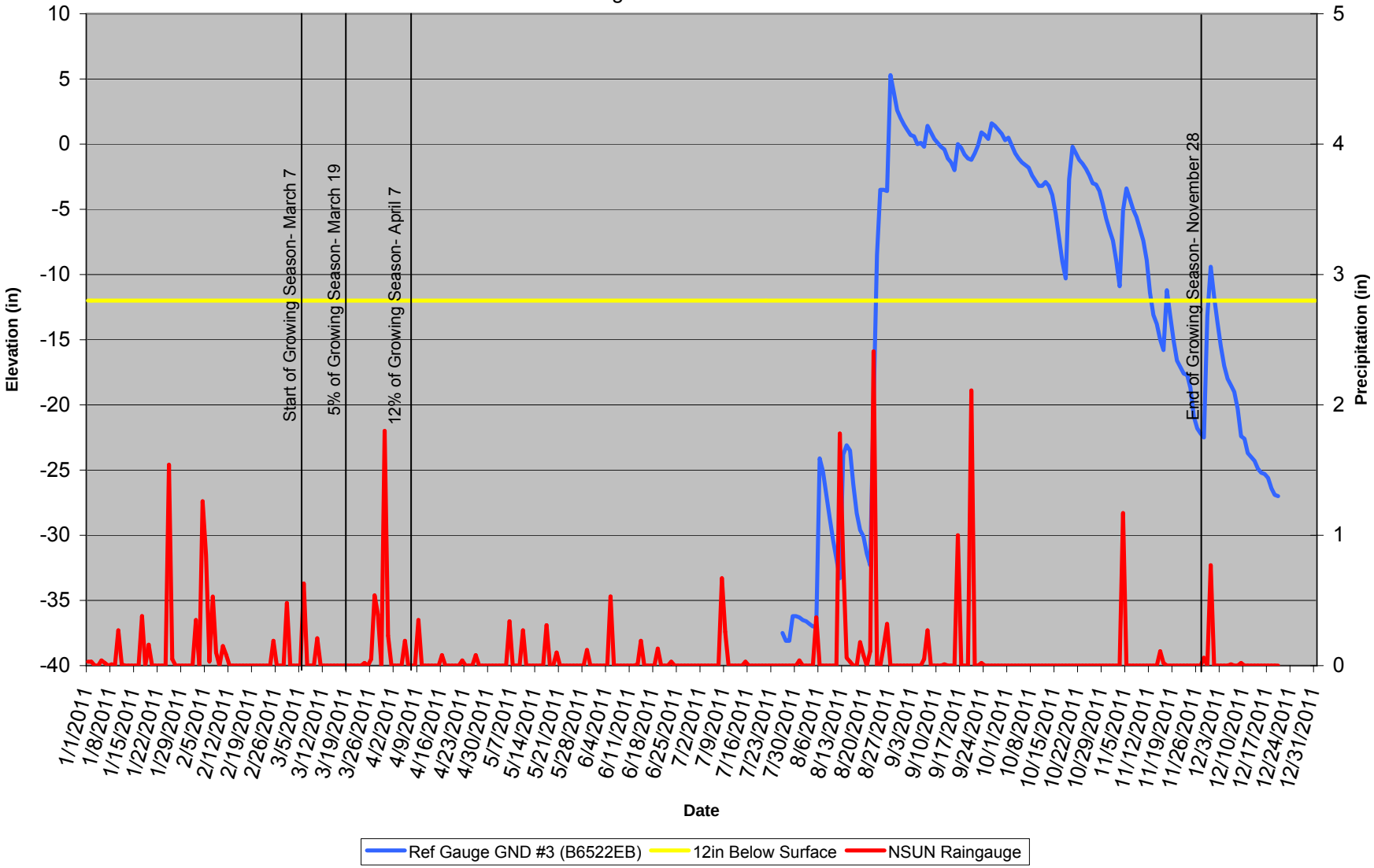
Groundwater Reference Gauge 1 (B65180F) Groundwater Levels 2011




Reference Gauge G2 (B652305) Groundwater Levels 2011
Gauge installed June 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Ref Gauge GND #2 (B652305)
12in Below Surface
NSUN Raingauge

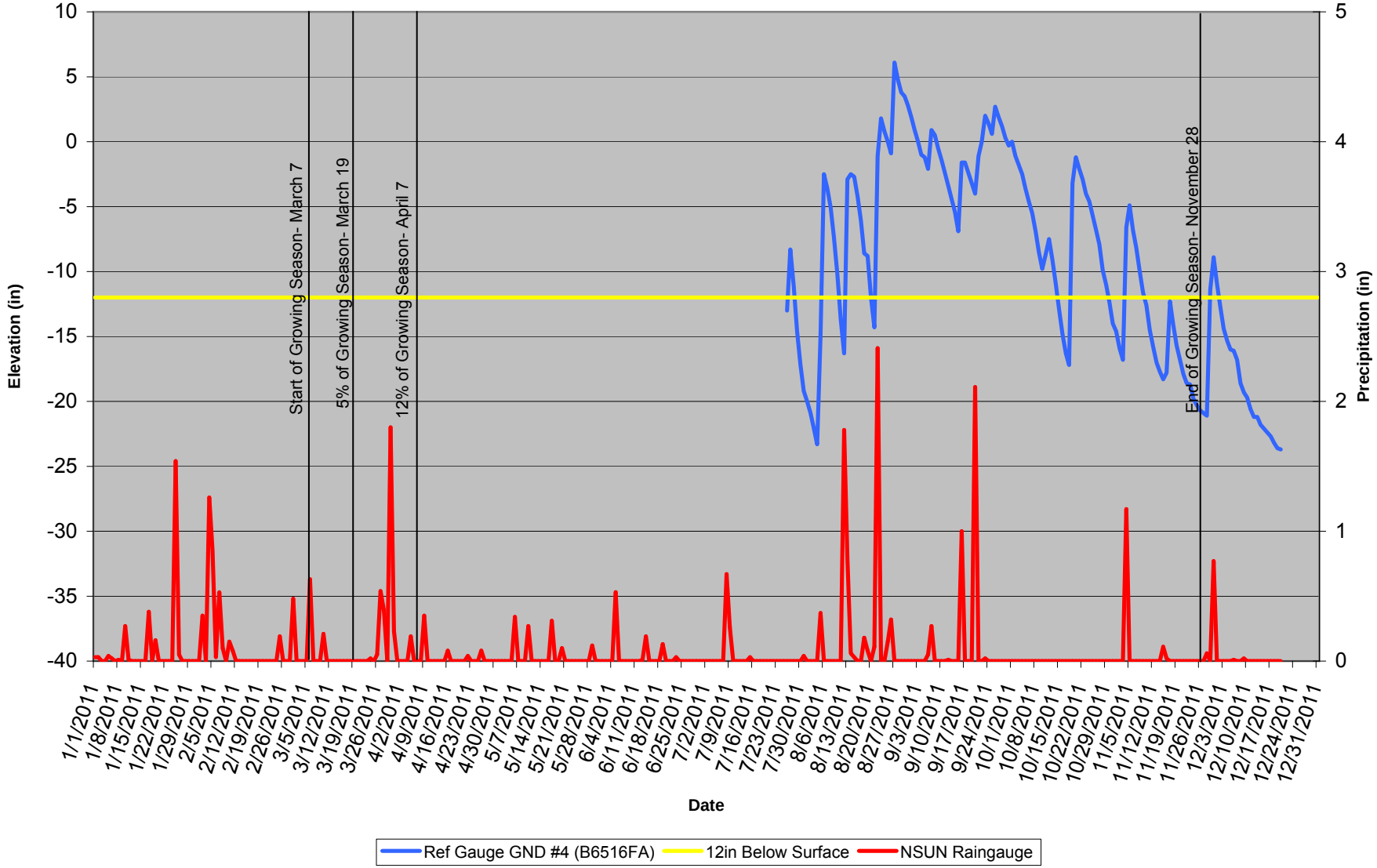
Reference Gauge G3 (B6522EB) Groundwater Levels 2011

Gauge installed June 2011

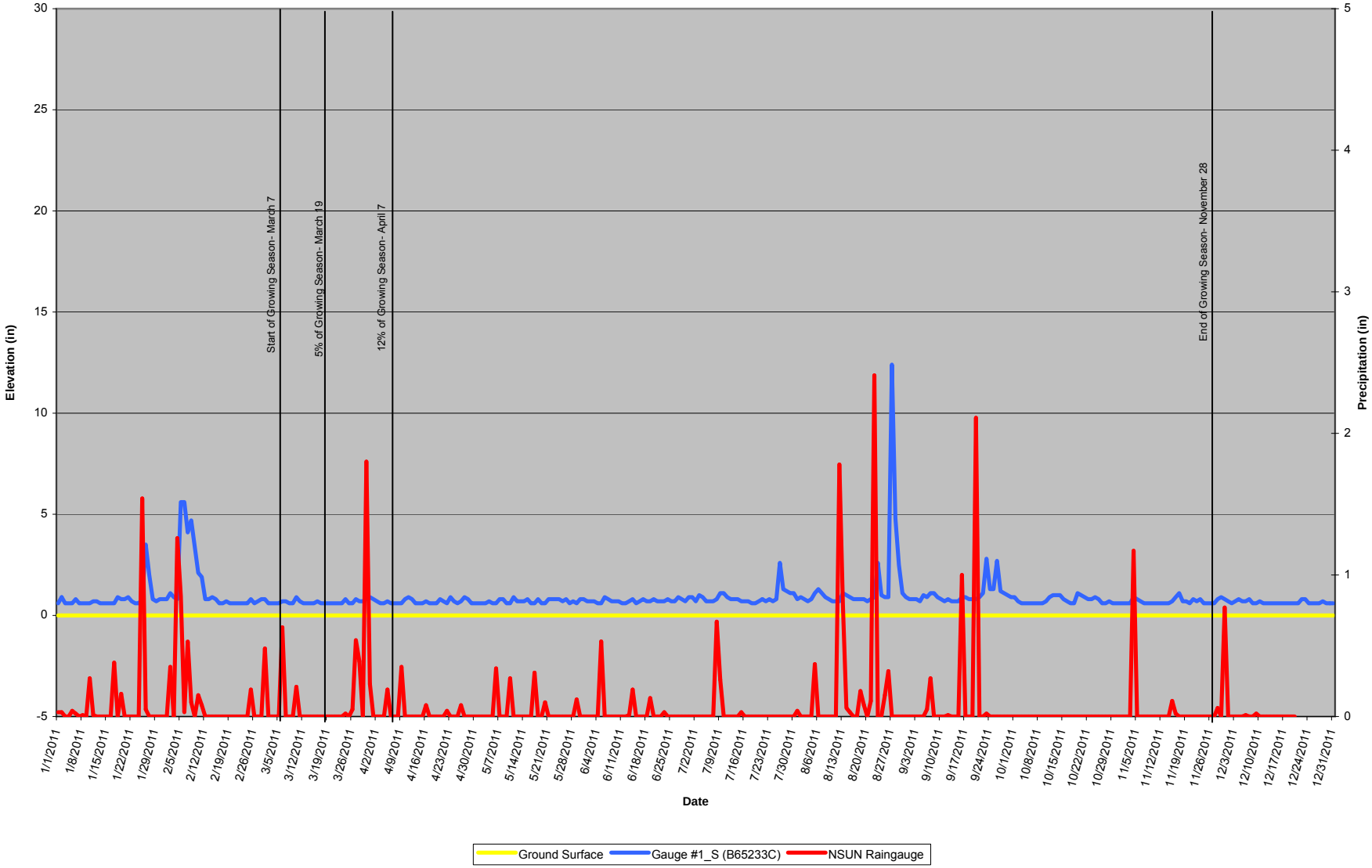


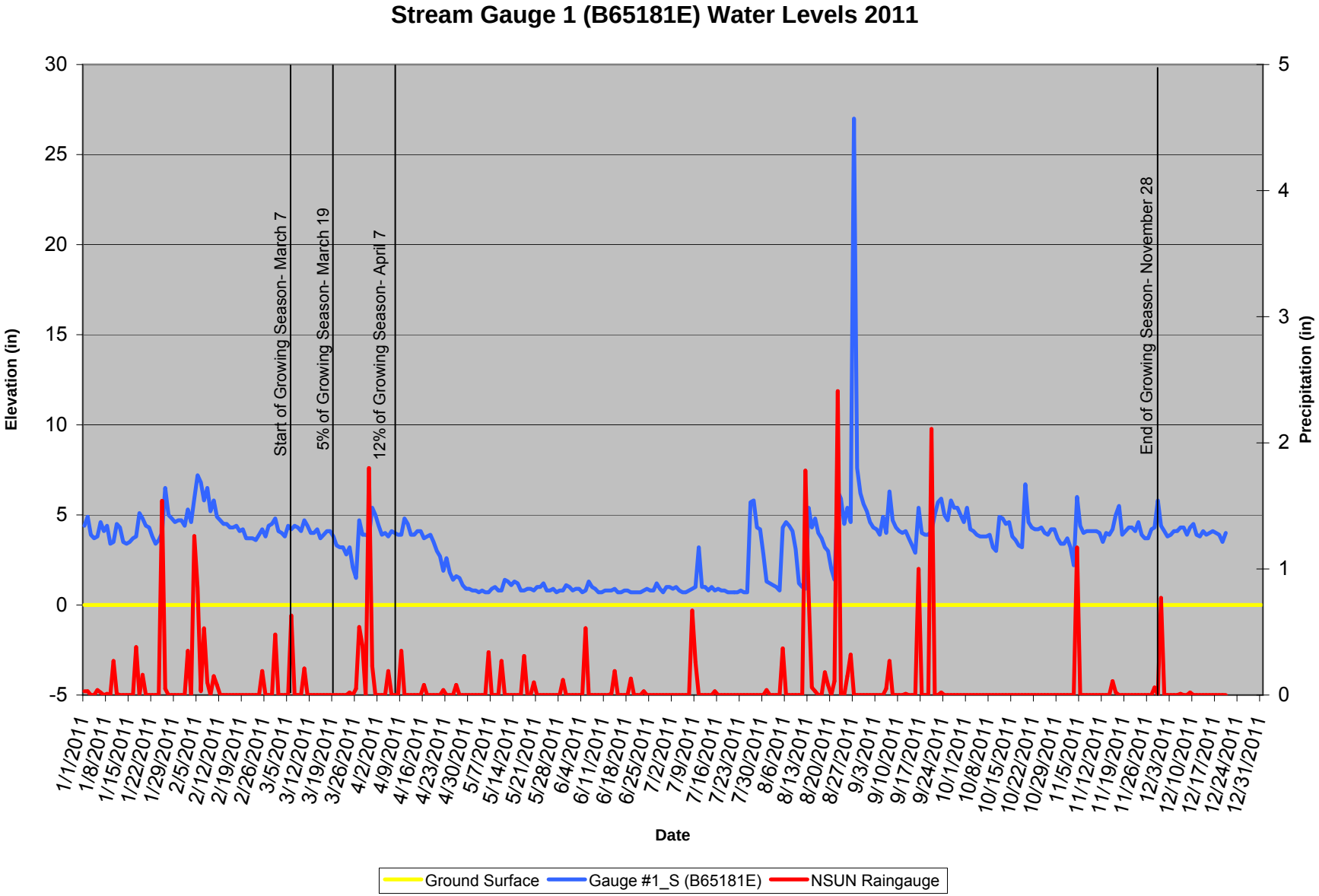
Reference Gauge G4 (B6516FA) Groundwater Levels 2011

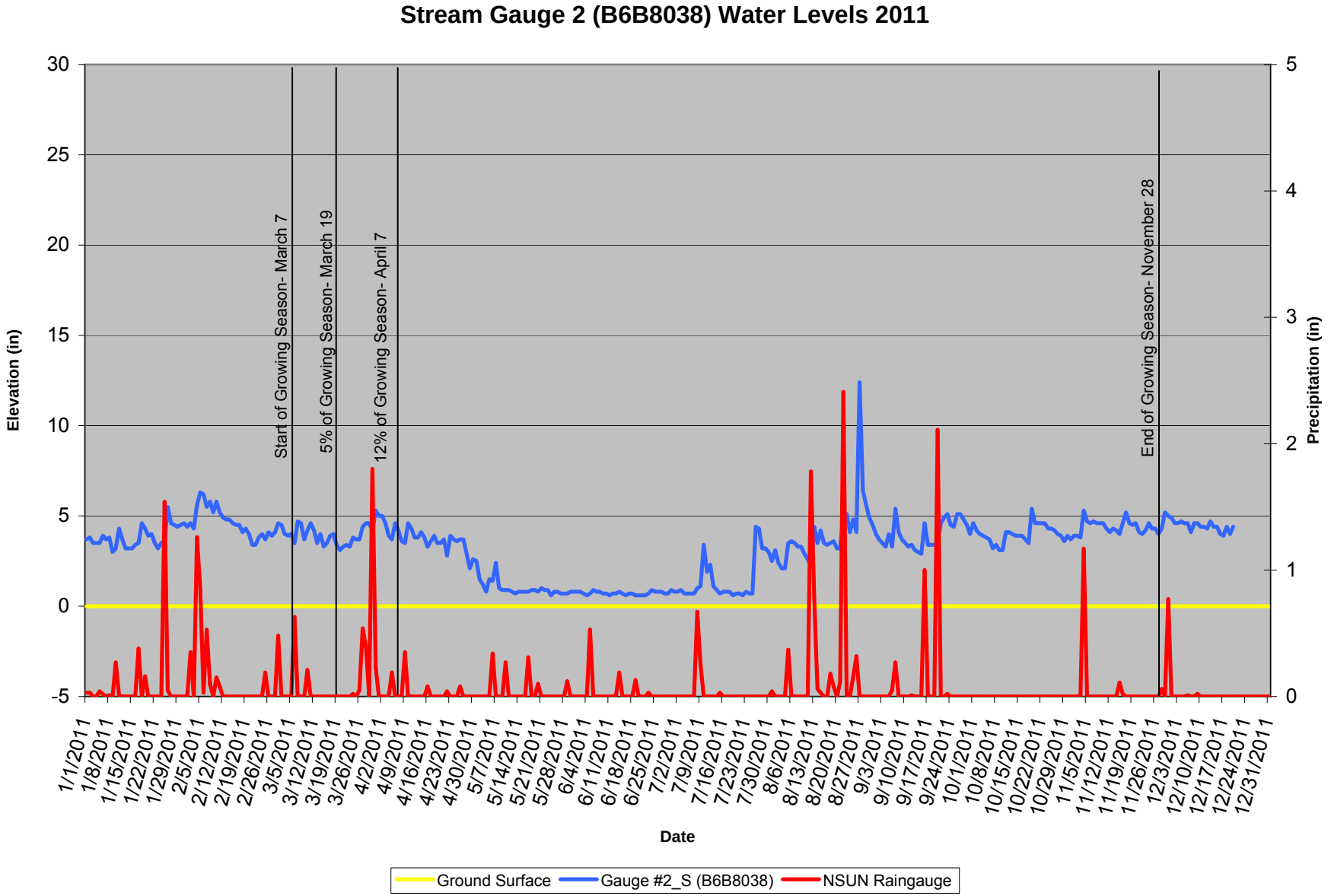
Gauge installed June 2011



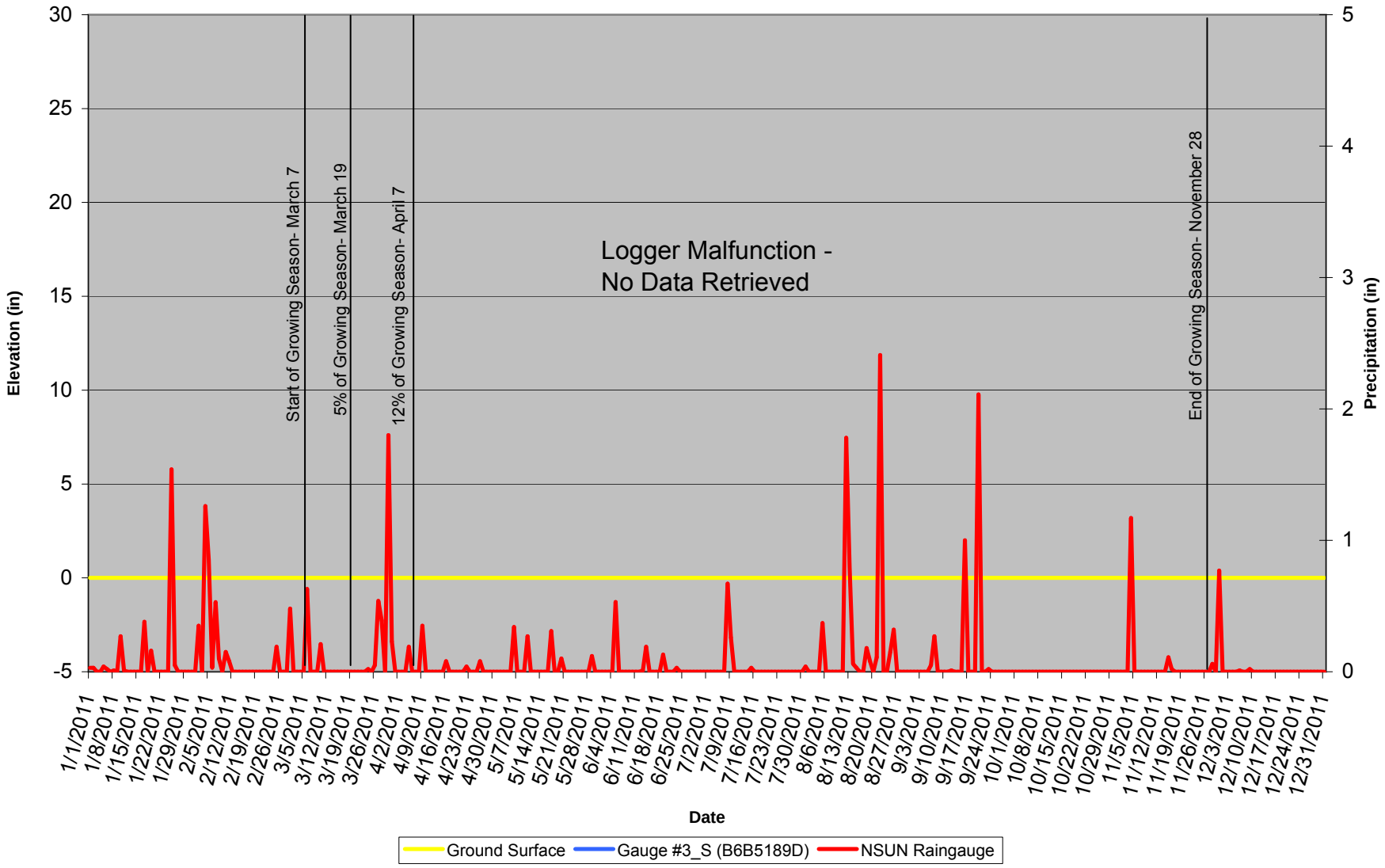
Stream Reference Gauge (B65233C) Water levels 2011



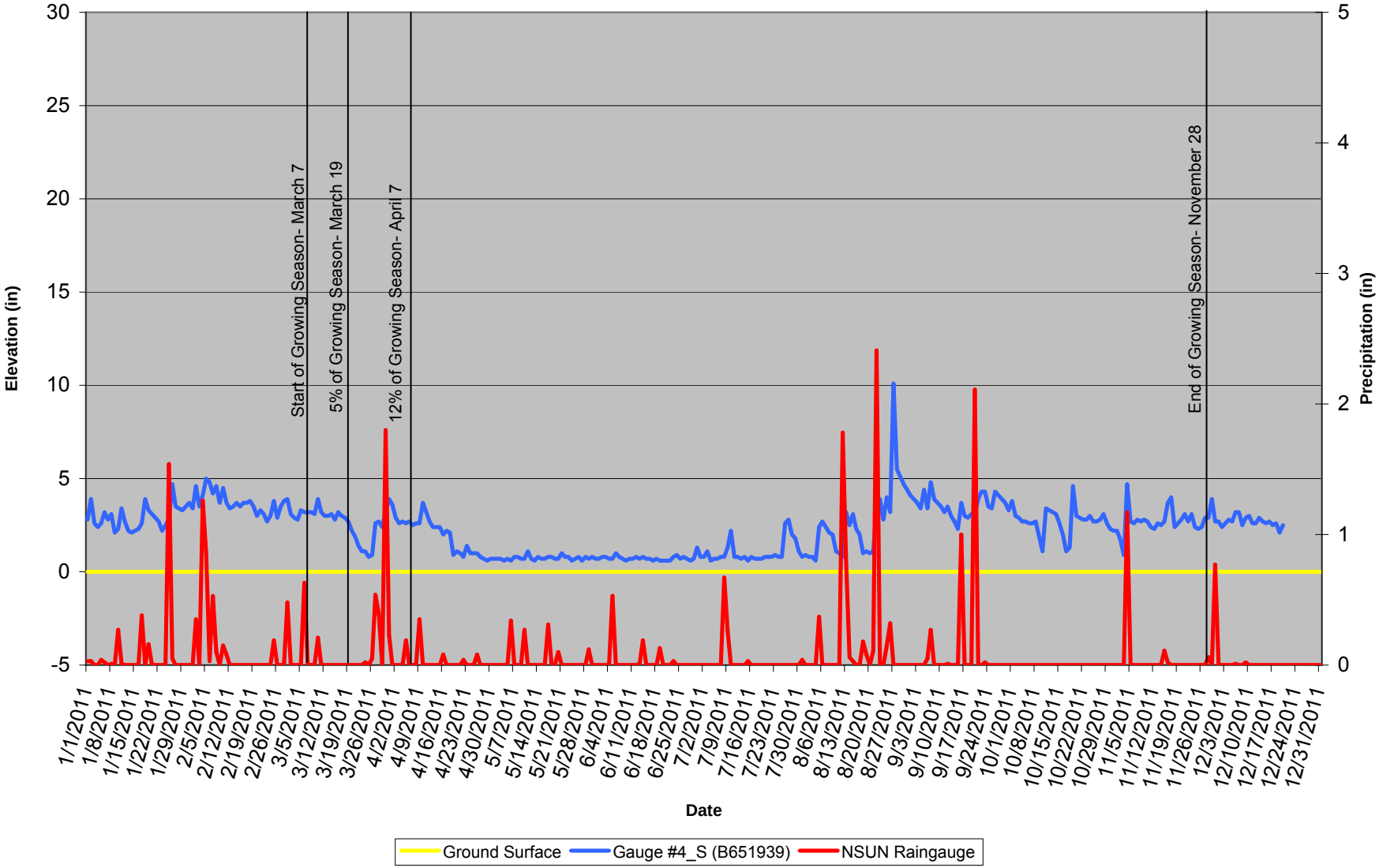

Stream Gauge 1 (B65181E) Water Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Ground Surface
Gauge #1_S (B65181E)
NSUN Raingauge


Stream Gauge 2 (B6B8038) Water Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Ground Surface
Gauge #2_S (B6B8038)
NSUN Raingauge

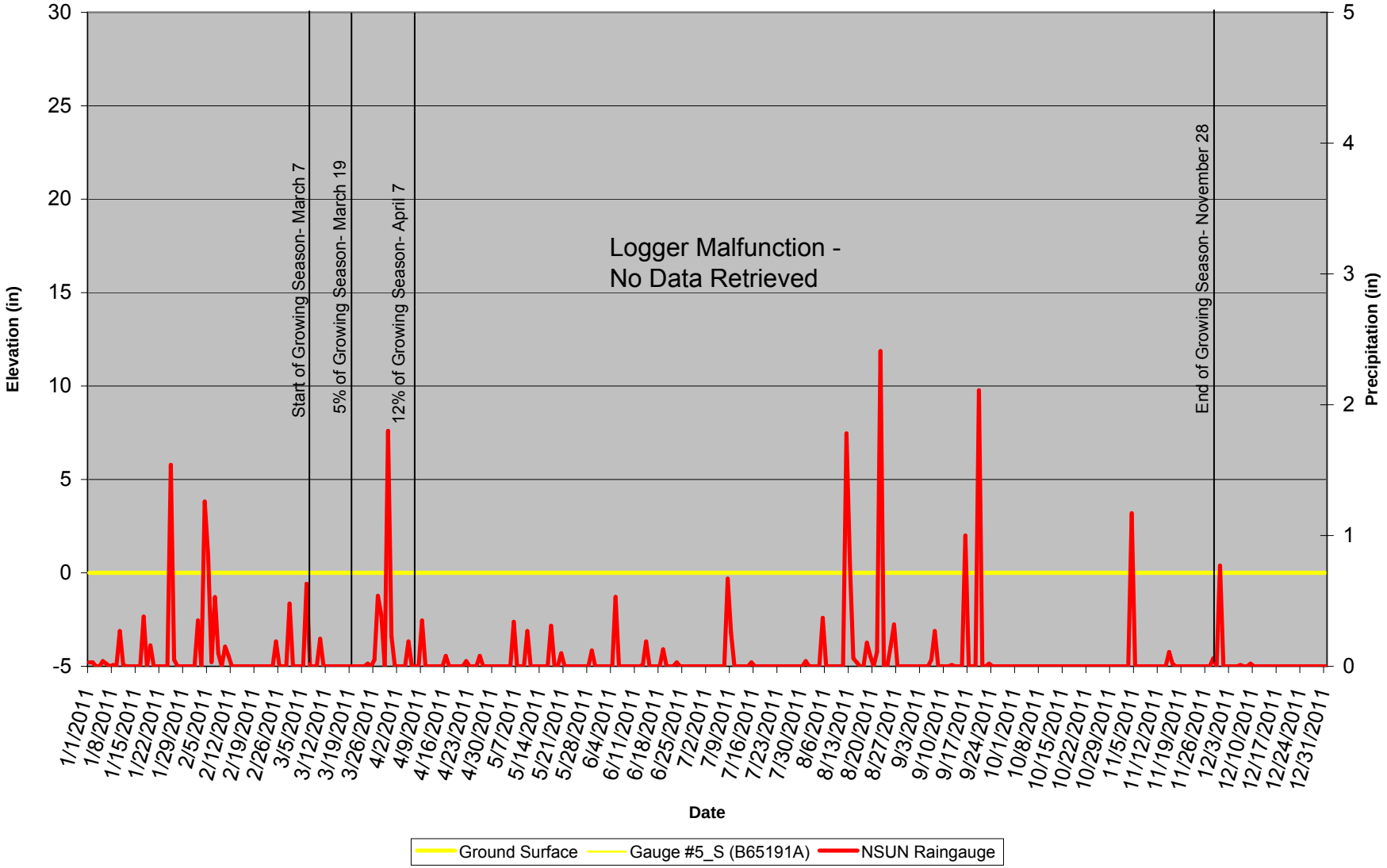
Stream Gauge 3 (B6B5189D) Water Levels 2011



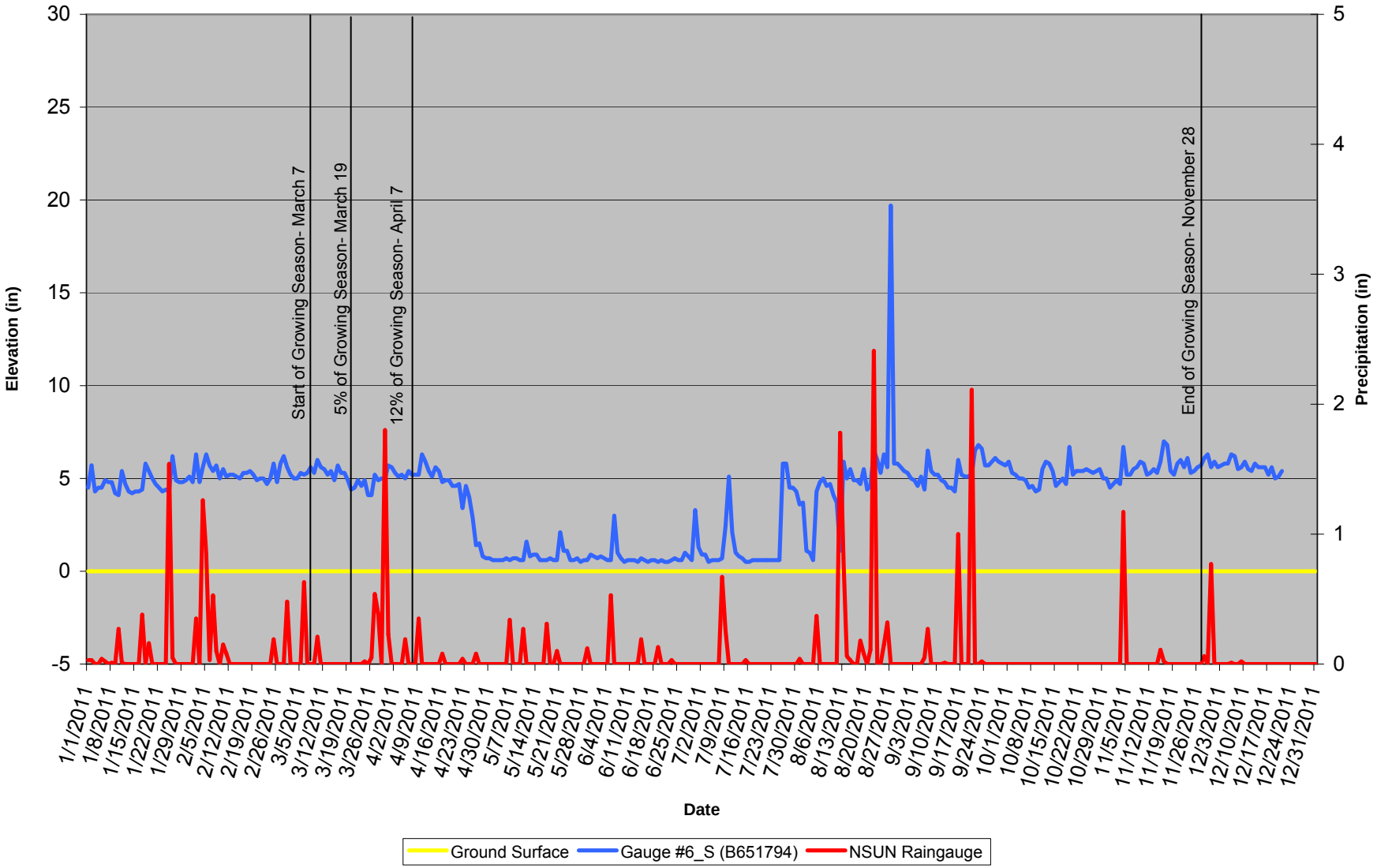
Stream Gauge 4 (B651939) Water Levels 2011

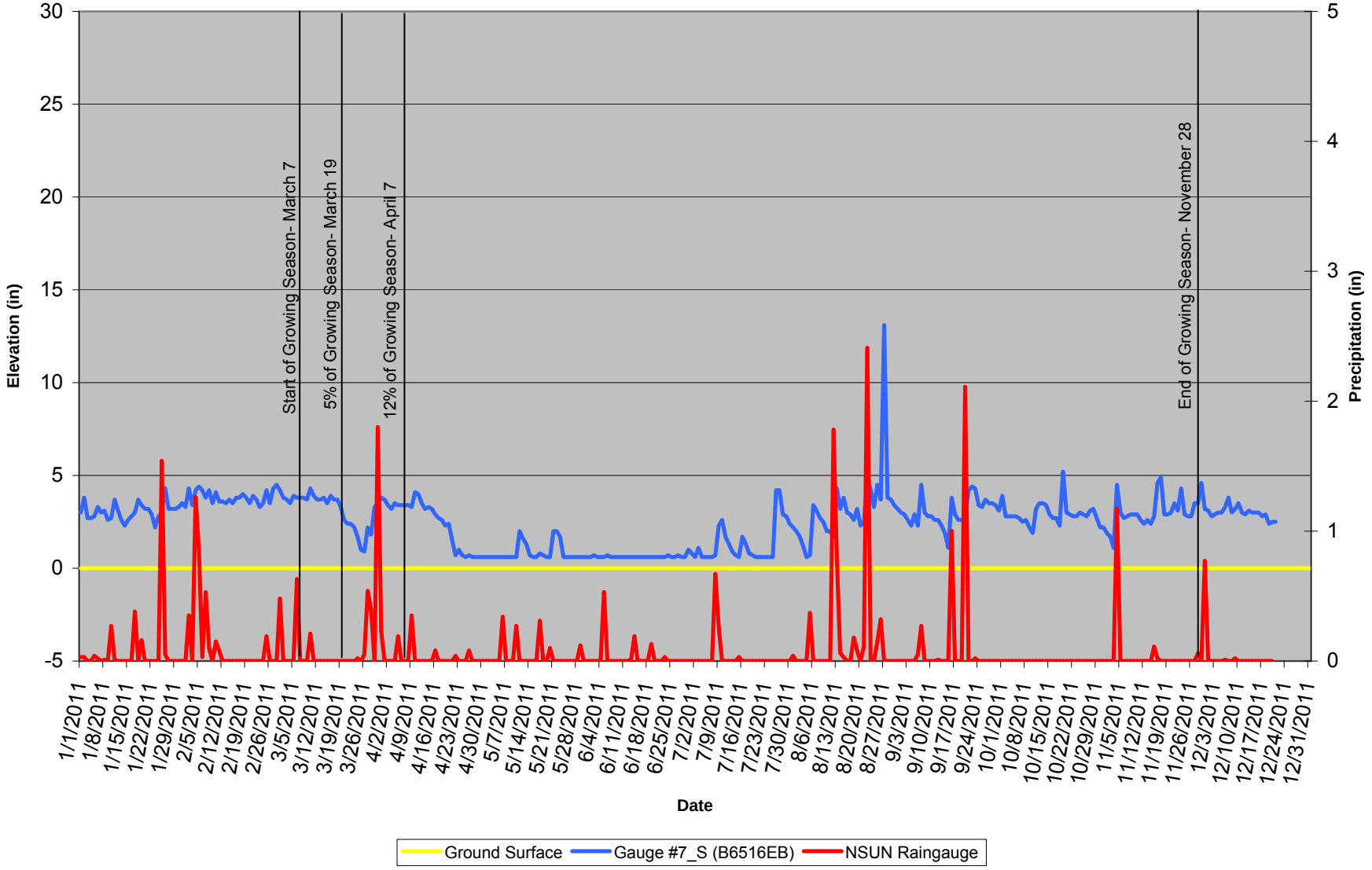


Stream Gauge 5 (B65191A) Water Levels 2011



Stream Gauge 6 (B651794) Water Levels 2011




Stream Gauge 7 (B6516eB) Water Levels 2011
Elevation (in)
Precipitation (in)
Start of Growing Season- March 7
5% of Growing Season- March 19
12% of Growing Season- April 7
End of Growing Season- November 28
Date
Ground Surface
Gauge #7_S (B6516EB)
NSUN Raingauge

Stream Gauge 8 (B6518D8) Water Levels 2011

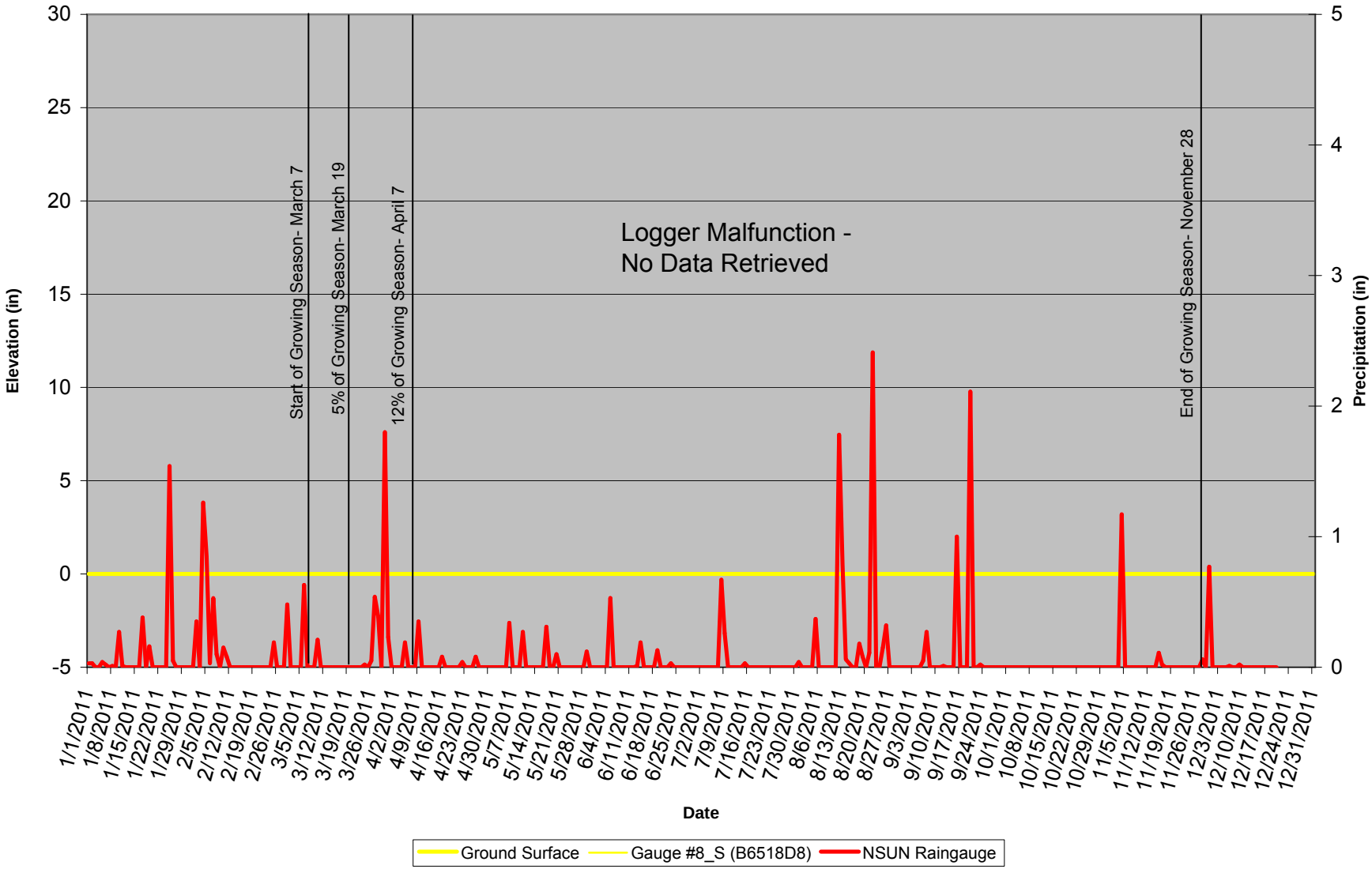


Table 10. Wetland gauge attainment data

Summary of Groundwater Gauge Results for Years 1 through 5					
Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)				
	Year 1 (2010)	Year 2 (2011)	Year 3 (2012)	Year 4 (2013)	Year 5 (2014)
1	Yes/43 days (16%)	Yes/108 days (40%)			
2	Yes/68 days (25%)	Yes/126 days (47%)			
3	Yes/44 days (16%)	Yes/127 days (47%)			
4	Yes/43 days (16%)	Yes/126 days (47%)			
5	Yes/43 days (16%)	Yes/126 days (47%)			
6	Yes/63 days (24%)	Yes/126 days (47%)			
7	Yes/42 days (16%)	Yes/126 days (47%)			
8	Yes/42 days (16%)	Yes/125 days (47%)			
9	Yes/58 days (22%)	Yes/125 days (47%)			
10	Yes/36 days (14%)	Yes/33 days (12%)			
11	Yes/57 days (22%)	Yes/106 days (40%)			
12	Yes/33 days (13%)	No/23 days (9%)			
13	Yes/36 days (13%)	No/23 days (9%)			
14	Yes/40 days (16%)	Yes/116 days (43%)			
15	Yes/41 days (16%)	Yes/126 days (47%)			
16	Yes/57 days (22%)	Yes/99 days (37%)			
17	Yes/43 days (16%)	Yes/99 days (37%)			
18	Yes/126 days (47%)	Yes/126 days (47%)			
19	Yes/63 days (24%)	Yes/126 days (47%)			
20	Yes/32 days (13%)	Yes/116 days (43%)			
21	Installed 12/10	No/19 days (7%)			
22	Installed 12/10	No/19 days (7%)			
23	Installed 12/10	Yes/116 days (43%)			
24	Installed 12/10	Yes/109 days (41%)			
25	Installed 12/10	Yes/74 days (28%)			
26	Installed 12/10	No/25 days (9%)			
27	Installed 12/10	No/25 days (9%)			
28	Installed 12/10	Yes/40 days (15%)			