

Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites: September 1, 2016 through August 31, 2017

Geoffrey E. Pociask, Steven E. Benton, Eric T. Plankell, Keith W. Carr, Jessica R. Ackerman,
Jessica L. B. Monson, Katharine L. Schleich, Joshua J. Richardson, and Audra M. Noyes



Photo: La Grange Wetland Mitigation Bank, Brown County

Wetlands Geology Section
Illinois State Geological Survey
Prairie Research Institute
University of Illinois at Urbana-Champaign

Submitted Under Grant D6099 to:

Illinois Department of Transportation
Bureau of Design and Environment, Wetlands Unit
2300 South Dirksen Parkway
Springfield, Illinois 62764-0002

November 1, 2017

Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites: September 1, 2016 through August 31, 2017

**Geoffrey E. Pociask
Steven E. Benton
Eric T. Plankell
Keith W. Carr
Jessica R. Ackerman
Jessica L. B. Monson
Katharine L. Schleich
Joshua J. Richardson
Audra M. Noyes**

Open File Series 2017-1

Illinois State Geological Survey
Prairie Research Institute
University of Illinois at Urbana-Champaign

615 East Peabody Drive
Champaign, Illinois 61820-6964
<http://www.isgs.illinois.edu/>



**ILLINOIS STATE
GEOLOGICAL SURVEY**
PRAIRIE RESEARCH INSTITUTE

I
ILLINOIS

TABLE OF CONTENTS

INTRODUCTION	1
METHODS	1
Figure 1. General locations of sites monitored by ISGS	2
Table 1. ISGS project numbers and active IDOT wetland mitigation sites	3
Table 2. Summary of wetland hydrology area estimates for the 2017 growing season.....	4
REFERENCES	7
SITE SUMMARIES	
43 Eckmann/Bischoff	10
49 Morris	20
52 La Grange	28
53 Fairmont City.....	40
57 Former Tiernan Property.....	52
74 Sugar Camp Creek	69
77 Pyramid Site EC25.....	86
78 Harrisburg, Site 2	95
80 Max Creek.....	108
81 East Cape Girardeau	116
82 Lawrence County	131
84 North Chicago	144
85 Coles County.....	159
86 Swan Road.....	167
87 Harrisburg, Site 3	175
88 Grant Creek North.....	183
89 Stevens Creek Bikeway	197
90 Thorn Creek Headwaters Preserve.....	210

INTRODUCTION

This report was prepared by the Illinois State Geological Survey (ISGS) to provide the Illinois Department of Transportation (IDOT) with hydrogeologic data collected from sites monitored for IDOT under grants for FY17 and FY18 (grant code D6099), including current and potential wetland mitigation sites and banks. Where appropriate, this report also includes a determination of areas meeting wetland hydrology criteria listed in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and its online updates (Environmental Laboratory 1987), hereafter collectively referred to as the 1987 Manual, as well as areas meeting wetland hydrology criteria as outlined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (U.S. Army Corps of Engineers [USACE] 2010), hereafter referred to as the 2010 Midwest Region Supplement. Additional activities performed under this contract, such as water-quality monitoring, are not included in this report. Other site observations are included where appropriate.

Summaries of 18 wetland mitigation sites are included in this report. Each summary contains a location map, a site map showing field instruments and the extent of area satisfying wetland hydrology criteria, a table indicating whether well locations met wetland hydrology criteria, a table providing gauged surface-water levels that met wetland hydrology criteria, hydrographs from active wells and surface-water gauges, and graphs of local precipitation data for the period. Locations of wetland mitigation sites are shown on Figure 1, and a list of site names is presented in Table 1. Also, a summary of areas meeting wetland hydrology criteria for each site is provided in Table 2. Except where noted, all data included in this report are from September 1, 2016, through August 31, 2017, at IDOT's request.

METHODS

The primary purpose of this report is to present the area within each wetland mitigation site that satisfied the wetland hydrology criteria listed in the 1987 Manual and in the 2010 Midwest Region Supplement. Areas satisfying wetland hydrology criteria were delineated using both methods because both are in use at present, and to compare methodologies. However, to be a wetland, an area must also satisfy soil and vegetation criteria. The Illinois Natural History Survey (INHS) will combine the hydrologic data presented in this report with vegetation and soils data that they collect, determine the total wetland area of each mitigation site, and report it under separate cover. The total wetland area determined by INHS may differ from the area that satisfied the wetland hydrology criteria shown in this report.

An area must be inundated or saturated for no less than 5% of the growing season to satisfy wetland hydrology criteria using the 1987 Manual, or a minimum of 14 consecutive days when using the 2010 Midwest Region Supplement. These areas will be identified as jurisdictional wetlands if vegetation and soils criteria mentioned above are also met. Areas that are inundated or saturated for greater than 12.5% of the growing season satisfy wetland hydrology criteria in a conclusive manner, and strongly indicate wetland conditions, especially where soil and/or vegetation are slow to respond or data from these components are inconclusive after site construction activities. To assist in proper characterization of wetland mitigation sites, this report shows areas that were inundated or saturated for at least 5% and 12.5% of the growing season, using the 1987 Manual. Areas satisfying wetland hydrology criteria in the 2010 Midwest Region Supplement (14 consecutive days during the growing season) are also shown. Inundation occurs when surface water is present at depths no greater than 2 meters (m) (6.6 feet [ft]). Saturation occurs when the water table is no deeper than 30 centimeters (cm) (1 ft) below land surface.

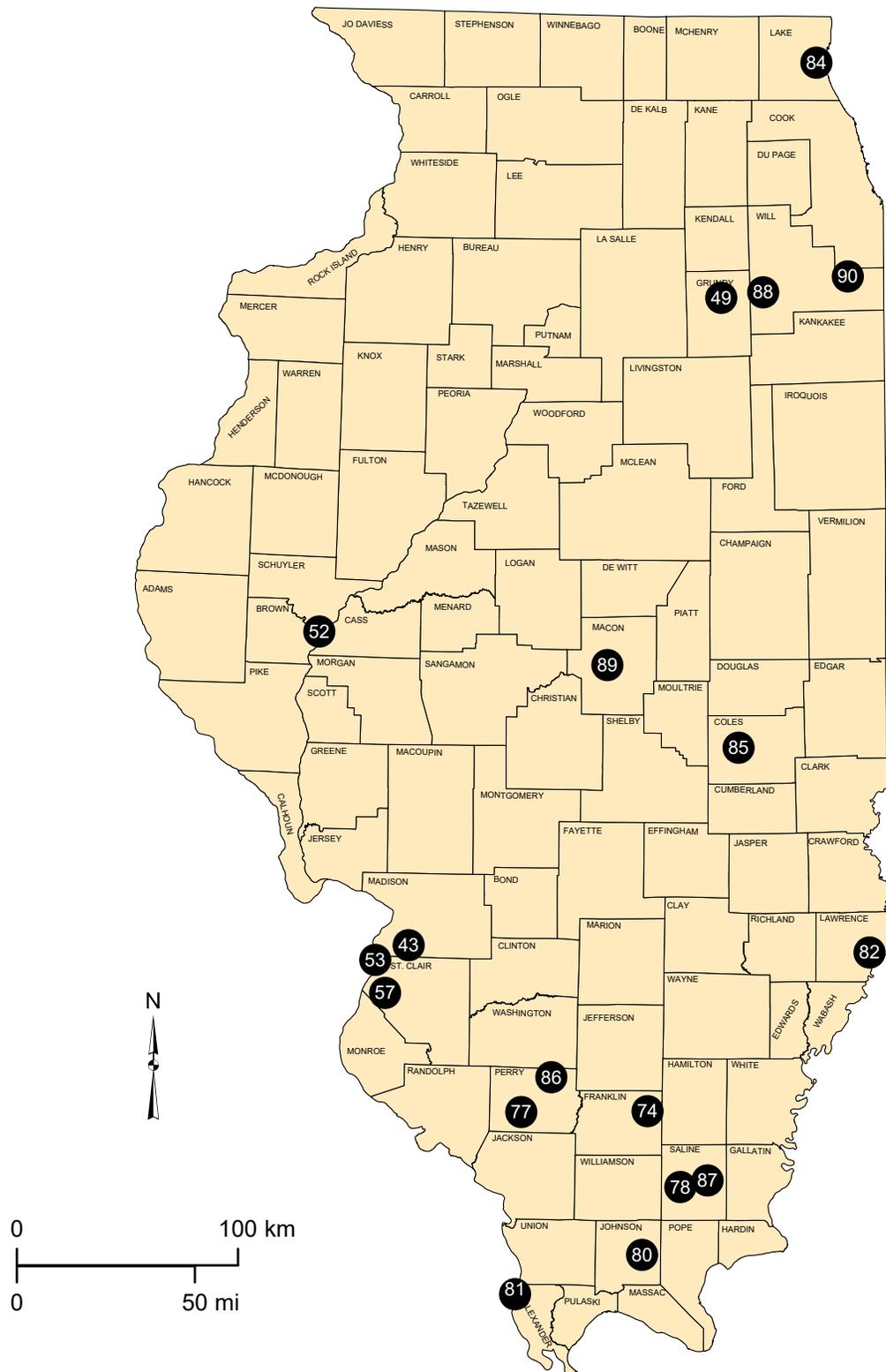


Figure 1. General locations of sites monitored by the ISGS for IDOT from September 1, 2016, through August 31, 2017. Numbers indicate ISGS project numbers listed in Table 1.

Table 1. ISGS project numbers and active IDOT wetland mitigation sites monitored by ISGS from September 1, 2016, through August 31, 2017.

ISGS Number	Site Name	Site Type	Project	FA #	Sequence #	County
43	Eckmann/Bischoff	Wetland Mitigation Site	N/A	FAP 14	27	Madison
49	Morris	Wetland Mitigation Bank	N/A	N/A	1306	Grundy
52	La Grange	Wetland Mitigation Bank	N/A	N/A	9579	Brown
53	Fairmont City	Potential Wetland Mitigation Site	N/A	FAP 14	27	St. Clair
57	Former Tiernan Property	Potential Wetland Mitigation Site	N/A	FAP 14	27	St. Clair
74	Sugar Camp Creek	Wetland and Stream Mitigation Bank	N/A	N/A	9282	Franklin
77	Pyramid Site EC25	Wetland Mitigation Site	Pyatts Blacktop	FAS 864	9778	Perry
78	Harrisburg, Site 2	Wetland Mitigation Site	IL 14	FAP 857	547	Saline
80	Max Creek	Wetland Mitigation Site	IL 147	FAS 932	8717A	Johnson
81	East Cape Girardeau	Wetland Mitigation Site	IL 146	FAP 312	633A	Alexander
82	Lawrence County	Wetland Mitigation Bank	N/A	N/A	14912	Lawrence
84	North Chicago	Wetland Mitigation Site	IL 56/47	FAP 326	13406	Lake
85	Coles County	Wetland Mitigation Site	TR 1000N and TR 41	N/A	1273	Coles
86	Swan Road	Wetland Mitigation Site	TR 222	N/A	12315	Perry
87	Harrisburg, Site 3	Wetland Mitigation Site	US 45	FAP 332	N/A	Saline
88	Grant Creek North	Wetland Mitigation Site	I-55	FAI 55	N/A	Will
89	Stevens Creek Bikeway	Wetland Mitigation Site	Stevens Creek Bikeway	N/A	10630	Macon
90	Thorn Creek Headwaters Preserve	Wetland Mitigation Site	I-57/Stuenkel Road	FAI 57	12558	Will

Table 2. Summary of wetland hydrology area estimates for the 2017 growing season for active IDOT wetland mitigation sites monitored by the IGS from September 1, 2016, through August 31, 2017.

IGS Number	Site Name	Target Compensation Area		>5% of growing season (1987 Manual)		>12.5% of growing season (1987 Manual)		14 days or more (2010 Midwest Region Supplement)	
		ha	ac	ha	ac	ha	ac	ha	ac
43	Eckmann/Bischoff	17.20	42.50	24.28	60.00	24.01	59.33	24.28	60.00
49	Morris	44.11	109.00	17.70	43.74	11.92	29.45	17.70	43.74
52	La Grange	414.40	1,024.00	570.45	1,409.61	563.94	1,393.52	568.53	1,404.86
53	Fairmont City	10.93	27.00	24.32	60.09	23.68	58.51	24.32	60.09
57	Former Tiernan Property	17.04	42.10	18.33	45.30	10.62	26.25	18.13	44.81
74	Sugar Camp Creek	28.00	69.20	29.81	73.66	27.57	68.12	29.85	73.76
77	Pyramid Site EC25	4.57	11.30	5.27	13.03	0.004	0.01	5.24	12.96
78	Harrisburg, Site 2	4.13	10.20	8.79	21.71	8.28	20.46	8.88	21.94
80	Max Creek	0.49	1.20	0.69	1.71	0.61	1.50	1.13	2.79
81	East Cape Girardeau	3.08	7.60	6.17	15.25	6.17	15.25	6.17	15.25
82	Lawrence County	13.62	33.65	13.47	33.28	11.69	28.88	13.47	33.28
84	North Chicago	N/A	N/A	23.69	58.55	19.94	49.28	23.18	57.28
85	Coles County	1.86	4.60	1.05	2.59	0.81	2.00	1.04	2.56
86	Swan Road	0.30	0.73	0.38	0.93	0.00	0.00	0.39	0.97
87	Harrisburg, Site 3	0.69	1.70	0.23	0.56	0.11	0.28	0.18	0.45
88	Grant Creek North	5.99	14.80	32.84	81.15	27.19	67.18	31.42	77.64
89	Stevens Creek Bikeway	6.03	14.89	10.96	27.08	9.47	23.39	10.11	24.97
90	Thorn Creek Headwaters Preserve	12.02	29.70	15.62	38.59	3.79	9.36	24.96	61.68

N/A - denotes that the target compensation area for the mitigation project is not available

The Midwestern Regional Climate Center (MRCC) at the Illinois State Water Survey (ISWS) provides data on the length and beginning and end dates of the growing season (MRCC 2017). In the 1987 Manual, the growing season is defined as the time period between the last occurrence of 28°F (-2.2°C) air temperatures in the spring and the first occurrence of 28°F (-2.2°C) air temperatures in the fall. The median beginning date and length of the growing season are calculated by the MRCC for individual climate observation stations throughout the state. Data from the nearest observation station with an adequate period of record are used for each site. This method is used when determining the areas that satisfy wetland hydrology criteria under the 1987 Manual. The 2010 Midwest Region Supplement provides different methods for determining the growing season. While the above method is allowable, one of the two following site-specific methods is preferred. The first method relies on observations of vegetation growth and development, and defines the start of the growing season as when at least two different species of non-evergreen vascular plants begin to grow (colloquially referred to as “green-up”), as indicated by various features such as emergence of herbaceous plants from the ground, bud burst, emergence or opening of flowers, and others. The second method relies on soil temperatures, with the growing season being the period when soil temperatures at a depth of 30 cm (1 ft) are continuously above 41°F (5°C). Site-specific observations of soil temperatures and vegetation were collected by field staff. The earliest date when either methodology was satisfied was determined to be the beginning of the growing season, and was used when determining areas that satisfy wetland hydrology criteria under the 2010 Midwest Region Supplement. Soil temperatures were collected using analog bimetal thermometers at a depth of 30 cm (12 inches [in.]) during site visits, and some sites were equipped with soil-temperature data loggers for continuous readings. Also, the Illinois State Water Survey operates Illinois Climate Network (ICN) stations throughout the state that measure soil temperatures at 20 cm (8 in.). Those data were obtained from the Water and Atmospheric Resources Monitoring Program (WARM) website and used to supplement on-site readings as needed (WARM 2017).

Wells and surface-water gauges where water levels satisfied wetland hydrology criteria are indicated in tables within the summary for each site. Interpolation between measuring points and extrapolation were used to locate the boundary of the area that satisfied wetland hydrology criteria. Best professional judgment was used to refine the location of this boundary, using observations of saturation, small-scale topographic features, vegetation, soils, and other site features. The areas that satisfied wetland hydrology criteria were mapped using ArcGIS 10.1 geographic information system software. Areas were calculated in acres [ac] in the GIS and converted to hectares [ha] (see Table 2).

The error of each area measurement varies depending on the quality, precision, and scale of the topographic map, and the precision in measuring the location of monitoring devices. The base maps used for these determinations are orthorectified aerial imagery from the U.S. Department of Agriculture-Farm Service Agency (USDA-FSA) National Agricultural Imagery Program (NAIP) or base map imagery provided by Esri (2017). For most sites, detailed site topography was collected by IDOT (e.g., GPS or photogrammetry) or by ISGS (e.g., total station or GPS measurements) and was used for mapping wetland hydrology areas. In some cases, digital elevation models produced from LiDAR measurements (ISGS 2017) were also used to guide delineation of wetland hydrology polygons. The locations of monitoring instruments were measured using GPS devices or a total station. Given the many potential sources of error, estimates of the amount of error are difficult to calculate and are not included.

Water-level data ordinarily were collected monthly throughout the year, and biweekly during March through May, when the highest water levels generally occur in Illinois. As needed, biweekly readings were begun as early as February and/or extended into June and collected outside of the

spring period during floods or heavy precipitation events. Weekly readings were made at some sites to improve or check accuracy.

For sites presented in this report, 5% of the growing season is 10 or 11 days, and 12.5% of the growing season ranges from about 25 to 28 days using the methods of the 1987 Manual. Therefore, two consecutive biweekly manual water-level measurements were required to satisfy wetland hydrology criteria at 5% of the growing season, and three readings were required at 12.5% of the growing season. If fewer readings suggested wetland hydrology, then linear interpolation of the water levels was used to determine total number of days of inundation or saturation. Interpolation between two dates was not used if a water level was not recorded for both dates. Flooding that prevented measurement of any specific instrument was considered sufficient evidence of inundation for that site visit. Manual water-level measurements were often supplemented with various automated data loggers that measured daily or more frequently. These data loggers were used to determine the timing of hydrologic events, such as precipitation or flooding, that occurred between manual measurements. One manual measurement alone was generally considered insufficient to indicate inundation or saturation for a sufficient duration without the identification of a precipitation or flooding event that would have initiated the inundation or saturation. If conflicts occurred between automatic and manually recorded data, best professional judgment was used to solve any conflicts in data, and a specific note was added to the site summary in question. The same methods were used to determine duration of inundation or saturation to satisfy the 14-day requirement of the 2010 Midwest Region Supplement.

Monitoring wells were given an alphanumeric designation based in part on their relative depths. Monitoring wells designated with an 'S' or 'VS' are shallow and were specifically constructed for measuring wetland hydrology in the soil zone. Monitoring wells designated with a 'U' (i.e., upper) have varying depths but are deeper than 'S' wells, and may be used to determine wetland hydrology depending on well construction and hydrogeologic setting, as determined by the project manager. Other types of wells, including those designated with 'M', 'L', or 'D' (i.e., middle, lower, and deep), are deeper wells used to collect other hydrogeologic data and cannot be used to determine wetland hydrology. They are included only to document ISGS activities at the site and are not listed or discussed in the text of this report.

Graphs for each site show water-level elevations at wells and surface-water instruments, and the depth to water below land surface at each well. The graphs follow the summary text for each site, and there may be multiple graphs for each site. Depths are shown as negative values when water levels are above land surface. Elevations are shown relative to the North American Vertical Datum of 1988 (NAVD, 1988) unless otherwise labeled. If no data are shown on the graphs for any specific well or gauge, then the well or gauge was either dry, not read, or the data were removed for quality-control purposes (see below).

At most sites, data loggers were used to monitor water levels at regular intervals ranging from daily to hourly. Various types of loggers were used and each type of instrument has different operations and default values. We have removed readings that result when the instrument sensor was dry (i.e., zero or other default values). Other spurious readings that occurred due to data-logger malfunction or natural conditions that caused inaccuracies (e.g., freezing, vegetation growth, or debris accumulation beneath the logger) were removed after interpretation by ISGS scientists. For some sites, stage data from gauges operated by the U.S. Geological Survey (USGS), USACE, or the U.S. Forest Service (USFS) were obtained from online or other sources (USGS 2017, USACE 2017, USFS 2017) and used to supplement ISGS data in evaluations of hydrologic conditions.

On-site precipitation data were collected by the ISGS using tipping-bucket rain gauges. Due to inherent difficulties in maintaining rain gauges (e.g., clogging, equipment malfunction, timing of

deployments), actual precipitation for each month may be greater than the recorded value. None of the ISGS rain gauges are heated and therefore are not appropriate for recording winter precipitation. However, monthly precipitation data obtained from MRCC climate observation stations are provided to show monthly precipitation throughout the year. The closest weather station with an adequate period of record was used for each site; however, additional stations or data collected by the ISGS at the site may be used to supplement the record if data from the closest station are missing. Normal (i.e., average) precipitation values and above- and below-normal range threshold values were calculated by the National Water and Climate Center (NWCC 2017). Normal and range threshold values were based on a 30-year period, 1971-2000 or 1981-2010. Above- and below-normal thresholds were calculated using a 2-parameter gamma distribution over the 30-year period (NWCC 1995). Precipitation is classified as “above 30% threshold”, or above the normal range, when there is a 30% chance precipitation will be greater than or equal to the value shown. Precipitation is “below 30% threshold”, or below the normal range, when there is a 30% chance that precipitation will be less than or equal to the value shown. Monthly total precipitation is considered to be within the normal range when it is neither above nor below the 30% thresholds. Precipitation also may be described simply as above or below normal, where the above- and below-normal range threshold values are not shown.

This document is intended to be a summary of all hydrologic data collected during the reporting period. Therefore, some details have been omitted that may be necessary to interpret the data for other uses. The primary project manager listed for each site should be contacted for additional information.

Funding provided in whole or in part by the Illinois Department of Transportation. The contents of this document reflect the view of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or the policies of the Illinois Department of Transportation.

REFERENCES

Environmental Laboratory, 1987, Corps of Engineers Wetlands Delineation Manual: U.S. Army Corps of Engineers Technical Report Y-87-1, Washington, D.C., 100 p., available online at www.cpe.rutgers.edu/Wetlands/1987-Army-Corps-Wetlands-Delineation-Manual.pdf

Esri, 2017, World Imagery from Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, available online at http://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer.

Illinois State Geological Survey, 2017, Illinois Height Modernization: LiDAR Derivatives, Illinois Geospatial Data Clearinghouse, Champaign, Illinois, available online at <http://clearinghouse.isgs.illinois.edu/data/elevation>.

Midwestern Regional Climate Center, 2017, MRCC’s Application Tools Environment: Illinois State Water Survey, Champaign, Illinois, available online at <http://mrcc.isws.illinois.edu/CLIMATE/>.

National Water and Climate Center, 1995, WETS Table Documentation: U.S. Department of Agriculture, Natural Resources Conservation Service, available online at http://www.wcc.nrcs.usda.gov/climate/wets_doc.html.

- National Water and Climate Center, 2017, Climate Analysis for Wetlands by County: U.S. Department of Agriculture, Natural Resources Conservation Service, available online at https://efotg.sc.egov.usda.gov/efotg_locator.aspx .
- U.S. Army Corps of Engineers, 2010, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0): J.S. Wakeley, R.W. Lichvar, and C.V. Noble (eds.), ERDC/ELTR-10-16, U.S. Army Engineer Research and Development Center, Vicksburg, MS, 152 p., available on line at www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/erdc-el-tr-10-16.pdf.
- U.S. Army Corps of Engineers, 2017, RiverGages.com: Water Level of Rivers and Lakes, available online at <http://rivergages.mvr.usace.army.mil/WaterControl/new/layout.cfm>.
- U.S. Department of Agriculture-Farm Service Agency, 2012, National Agricultural Imagery Program, Aerial Photography Field Office, Salt Lake City, Utah. available online at <https://qdq.sc.egov.usda.gov/>.
- U.S. Department of Agriculture-Farm Service Agency, 2014, National Agricultural Imagery Program, Aerial Photography Field Office, Salt Lake City, Utah. available online at <https://qdq.sc.egov.usda.gov/>.
- U.S. Department of Agriculture-Farm Service Agency, 2015, National Agricultural Imagery Program, Aerial Photography Field Office, Salt Lake City, Utah. available online at <https://qdq.sc.egov.usda.gov/>.
- U.S. Geological Survey, 1954a, Cahokia quadrangle, Illinois [map]. Photorevised 1993. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1954b, Monks Mound quadrangle, Illinois [map]. Photorevised 1993. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1961, Harrisburg quadrangle, Illinois [map]. Photorevised 1990. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1965a, Lawrenceville quadrangle, Illinois [map]. Photoinspected 1977. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1965b, Vincennes quadrangle, Indiana-Illinois [map]. Photorevised 1989. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1966, Bloomfield quadrangle, Illinois [map]. Photorevised 1990. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1974a, Ewing quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1974b, Pinckneyville quadrangle, Illinois [map]. Photorevised 1982. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1975, Tamaroa quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.

- U.S. Geological Survey, 1980, Cooperstown quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1982, Harristown quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1990, Steger quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1993a, Channahon quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1993b, Libertyville quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1993c, McClure quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1993d, Morris quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1993e, Wilmington quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1998, Waukegan quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 2017, National Water Information System: Web Interface, available online at <http://waterdata.usgs.gov/nwis>.
- U.S. Forest Service, 2017, Unpublished water-level data from former USGS Station #05541130, Grant Creek at West Patrol Road, Midewin National Tallgrass Prairie, Will County, Illinois.
- Water and Atmospheric Resources Monitoring Program, 2017, Illinois Climate Network soil temperature data: Illinois State Water Survey, Champaign, Illinois, available online at <http://www.isws.illinois.edu/warm/soil/>

**ECKMANN/BISCHOFF
WETLAND MITIGATION SITE**

ISGS #43

FAP 14

Sequence #27

Madison County, near Collinsville, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- A level II hydrogeologic investigation was conducted from 2000 to 2004.
- March 2009: IDOT tasked ISGS to resume monitoring of the site.
- April 2009: ISGS installed a monitoring network at the site and resumed data collection.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Eckmann/Bischoff wetland mitigation site is 17.20 ha (42.50 ac). Using the 1987 Manual (Environmental Laboratory 1987), 24.28 ha (60.00 ac) of the total site area of 24.28 ha (60.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 24.01 ha (59.33 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 24.28 ha (60.00 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Belleville, Illinois, is April 4 and the season lasts 204 days (MRCC 2017); 5% of the growing season is 10 days and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, February 7 was the starting date of the 2017 growing season based on soil temperatures measured on site and at the nearby Fairmont City wetland mitigation site (ISGS #53).
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 105% of normal, precipitation in spring 2017 (March through May) was 153% of normal. The wettest month was April with 232% of normal precipitation.
- The period of maximum inundation and saturation during the 2017 growing season occurred in May following an extended period of rainfall totaling 21.97 cm (8.65 in) that started April 26 and ended May 4. A large portion of the site, including the entire former Eckmann property and the eastern portion of the former Bischoff property, is inundated year-round because of a beaver dam in Schneider Ditch. As a result, long duration inundation and saturation occurs.
- In 2017, water levels measured in 10 of 10 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 9 of 10 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. Using the 2010 Midwest Region Supplement, water levels in 10 of 10 soil-zone monitoring wells satisfied wetland

hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring of the site will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	Y	Y	Y
2S	Y	Y	Y
3S	Y	Y	Y
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	N	Y
7S	Y	Y	Y
8S	Y	Y	Y
9S	Y	Y	Y
10S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

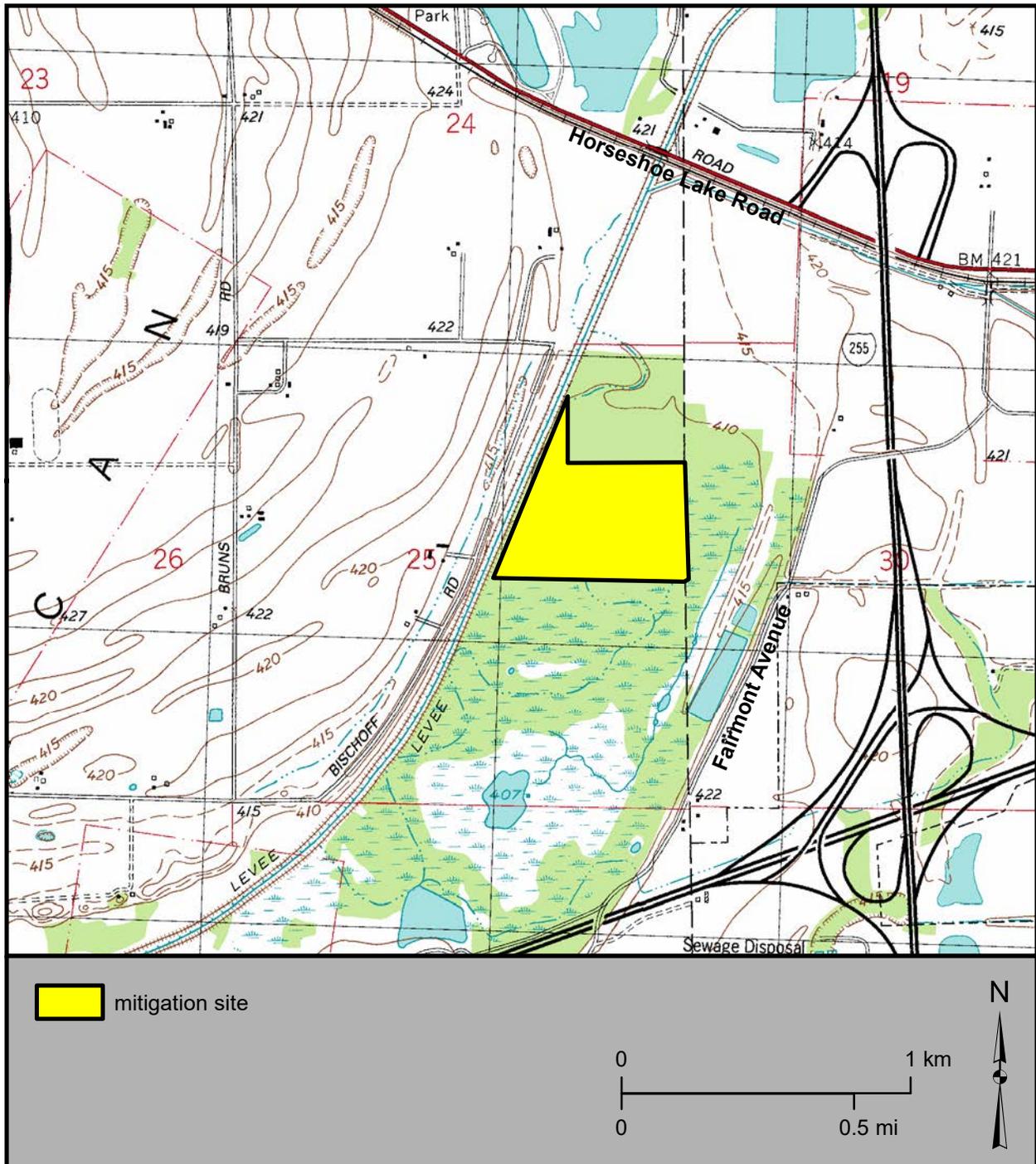
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
A	124.64 m (408.92 ft)	124.48 m (408.40 ft)	124.58 m (408.73 ft)
B	124.64 m (408.92 ft)	124.48 m (408.40 ft)	124.58 m (408.73 ft)
C	124.64 m (408.92 ft)	124.48 m (408.40 ft)	124.58 m (408.73 ft)
D	124.64 m (408.92 ft)	124.48 m (408.40 ft)	124.58m (408.73 ft)
SW1	124.64 m (408.92 ft)	124.48 m (408.40 ft)	124.58 m (408.73 ft)

n/a – insufficient data to determine an elevation

Eckmann/Bischoff Wetland Mitigation Site (FAP 14)

General Study Area and Vicinity

from the USGS Topographic Series, Monks Mound, IL, 7.5-minute quadrangle (USGS 1954b)

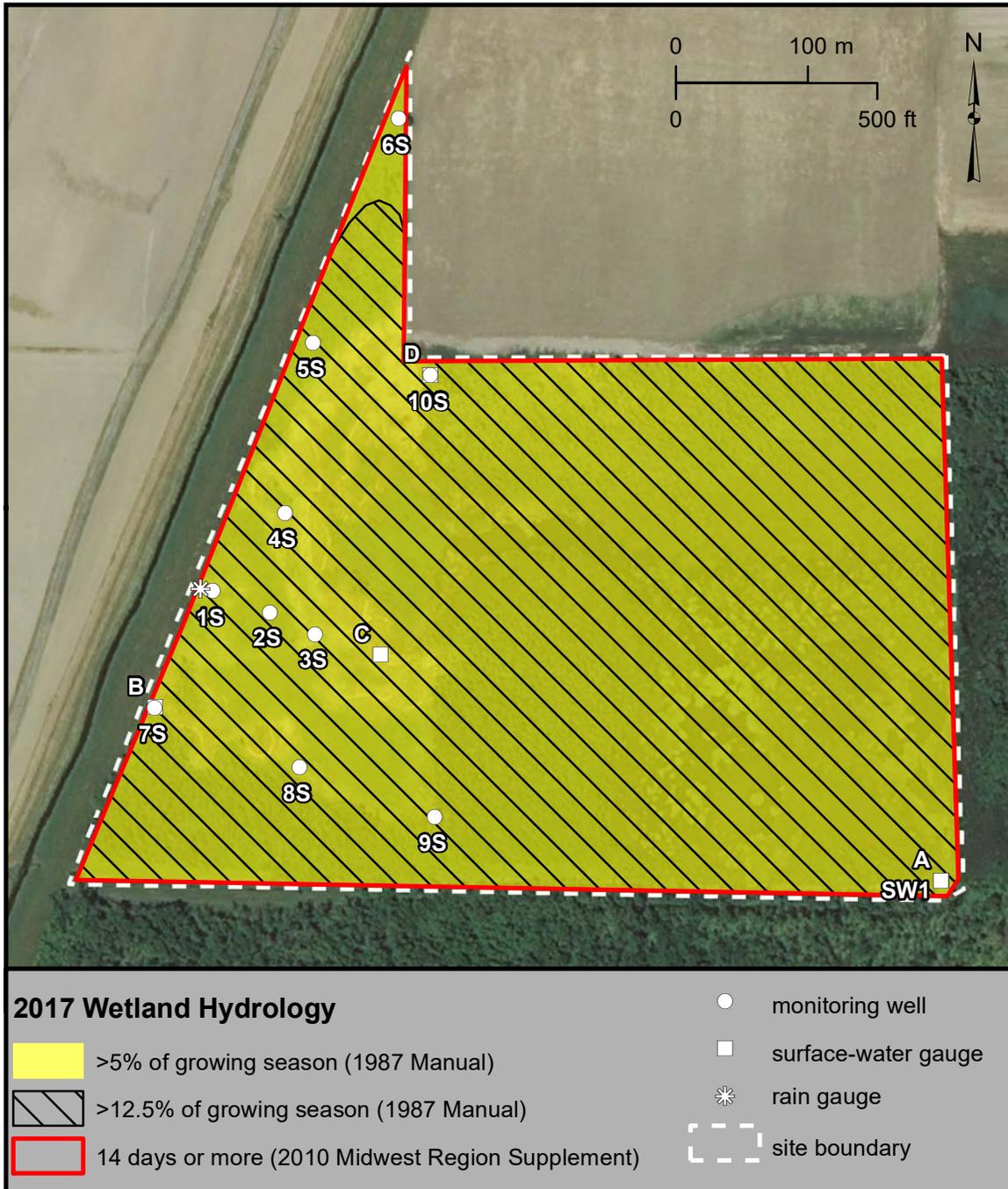


Eckmann/Bischoff Wetland Mitigation Site (FAP 14)

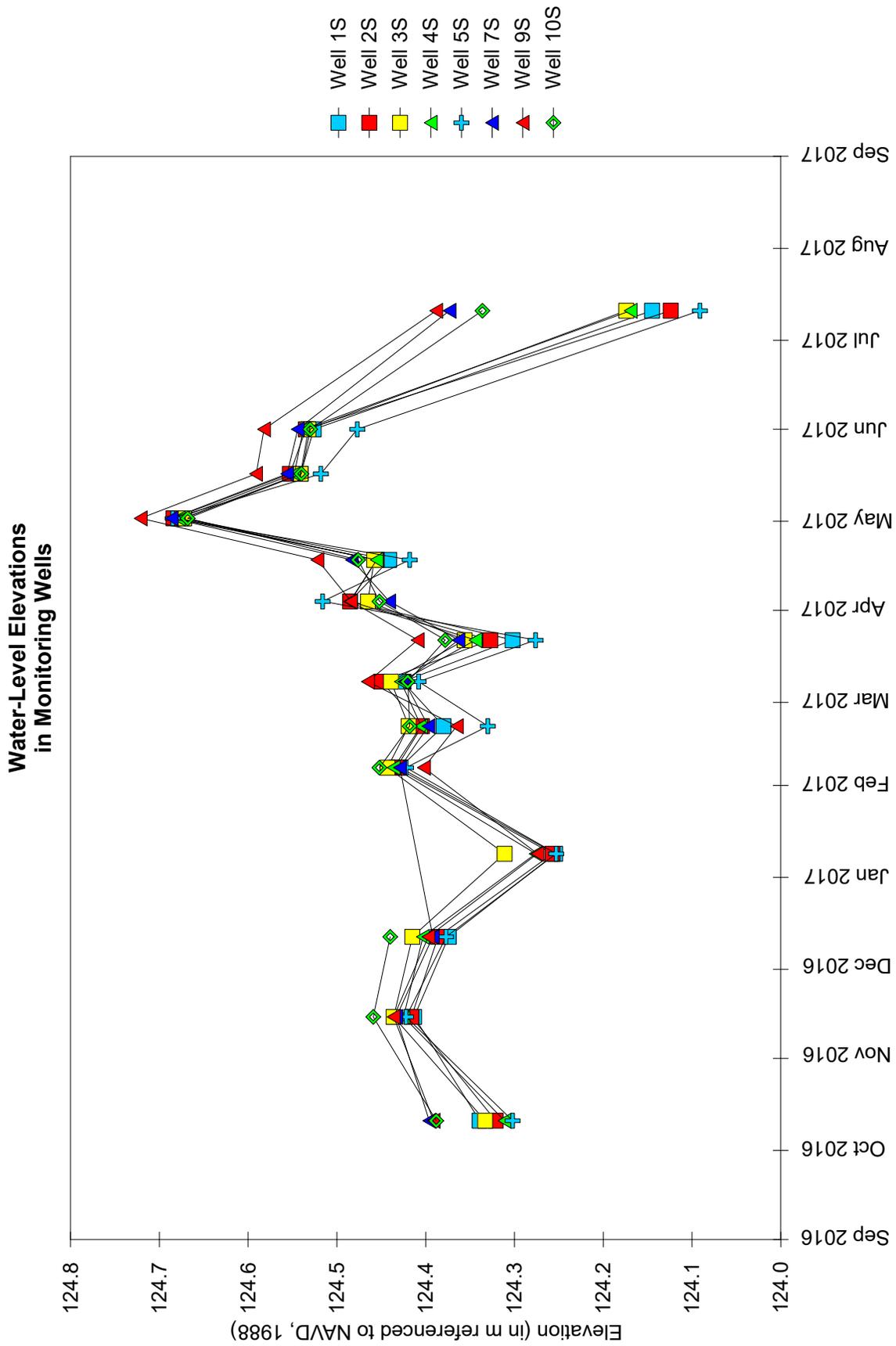
Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

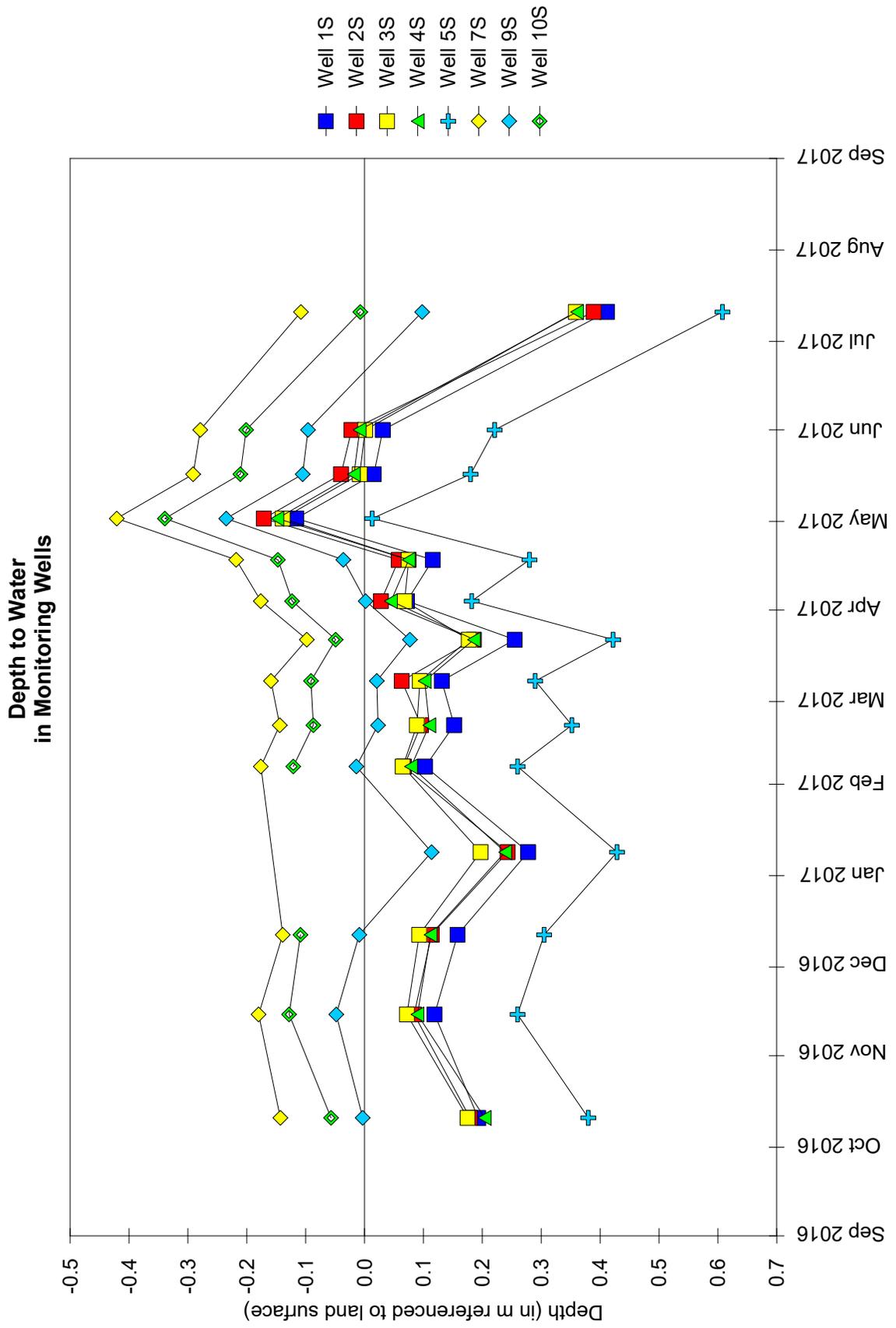
Map based on 2012 Farm Service Agency
digital orthophotography, Madison County, Illinois (USDA-FSA 2012)



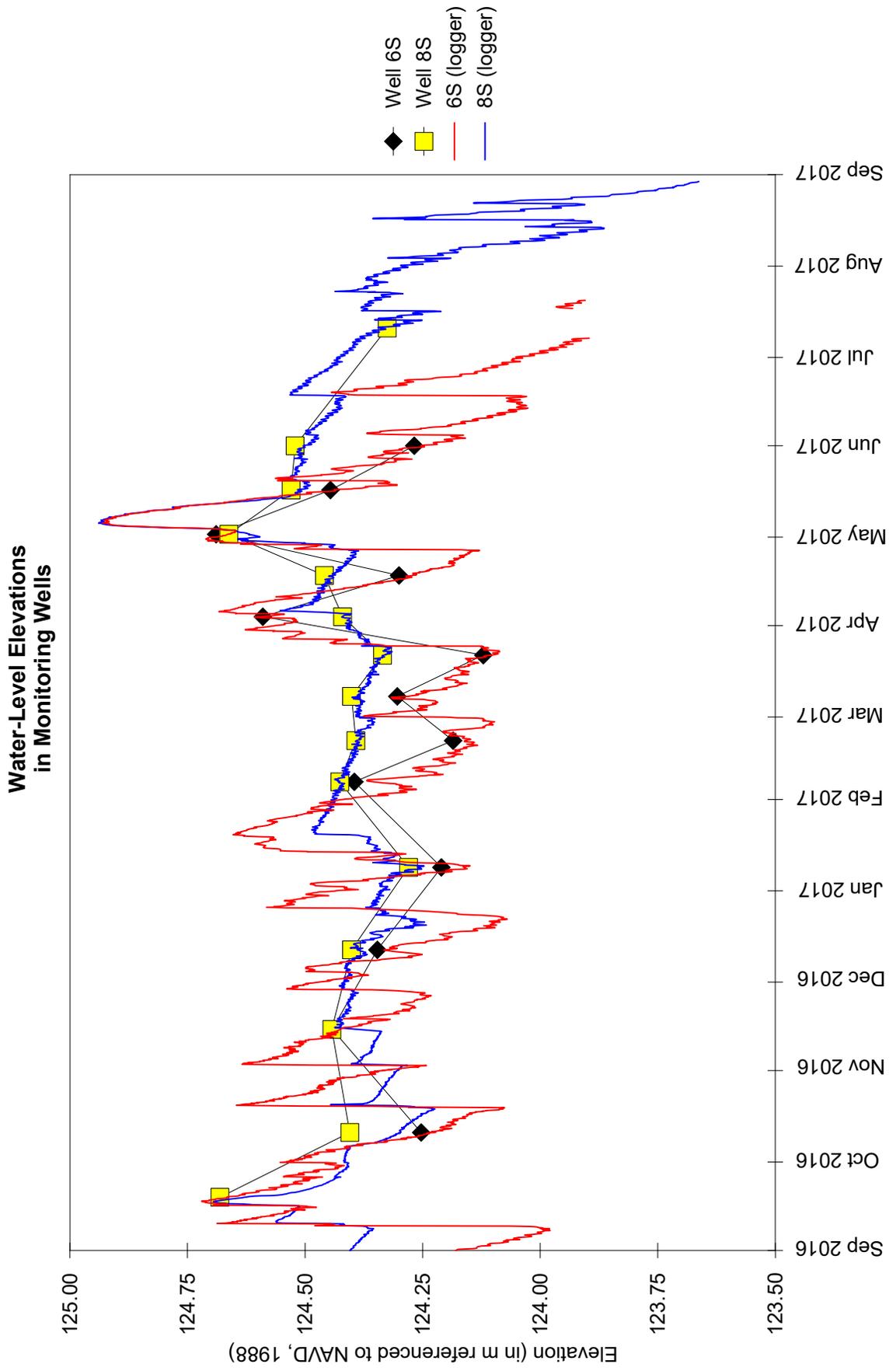
Eckmann/Bischoff Wetland Mitigation Site September 1, 2016 through August 31, 2017



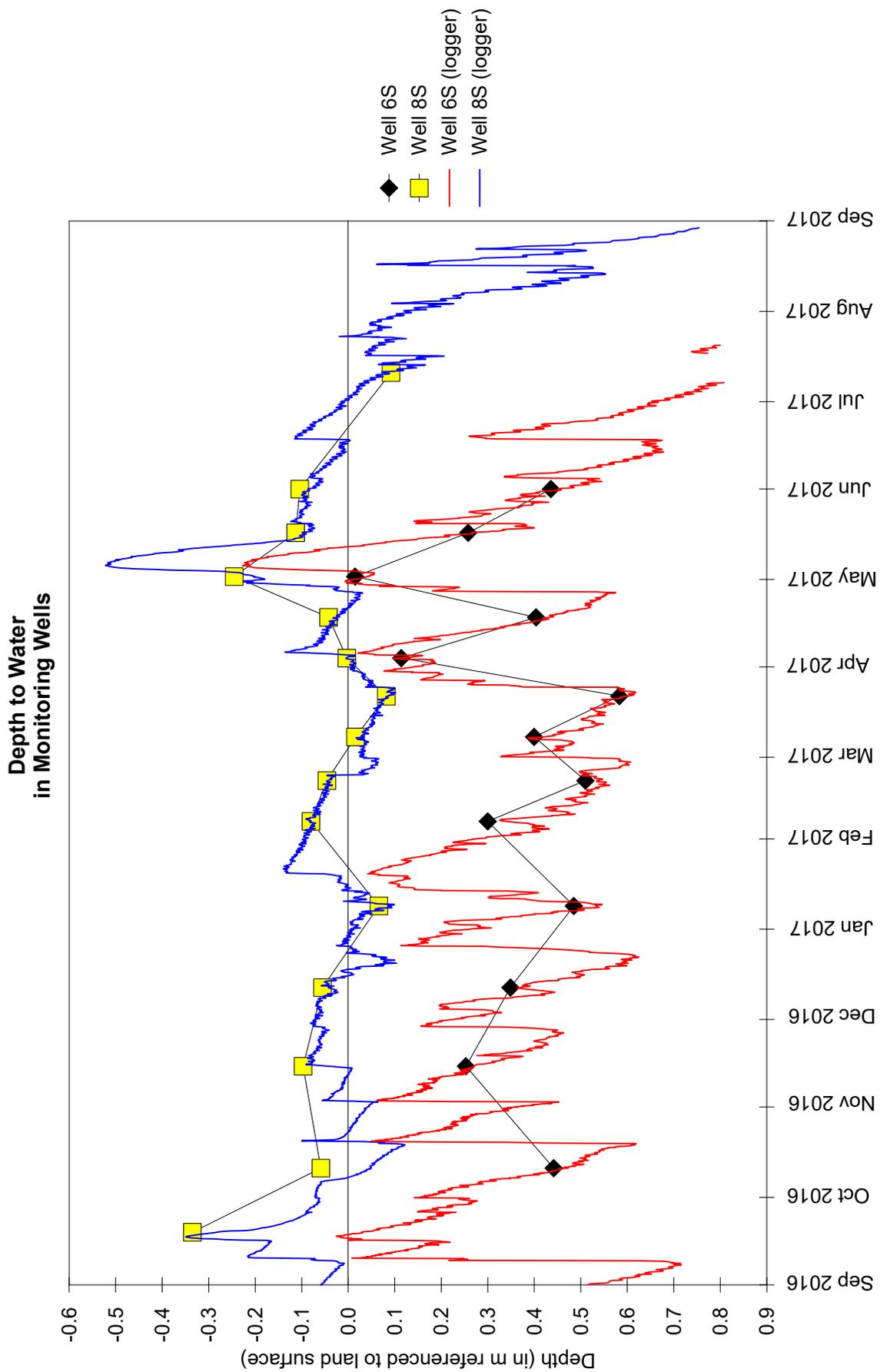
Eckmann/Bischoff Wetland Mitigation Site September 1, 2016 through August 31, 2017



Eckmann/Bischoff Wetland Mitigation Site September 1, 2016 through August 31, 2017

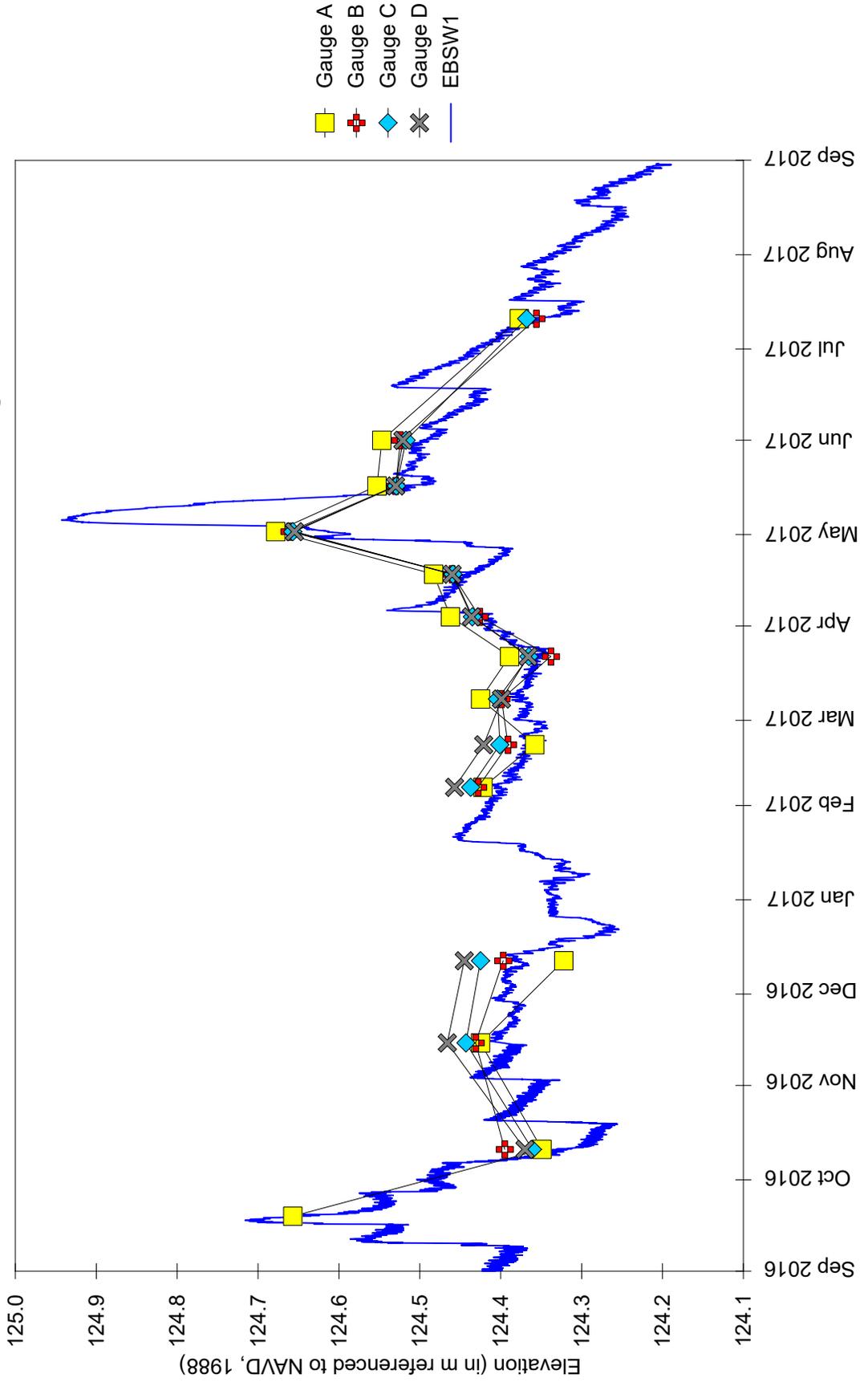


Eckmann/Bischoff Wetland Mitigation Site September 1, 2016 through August 31, 2017



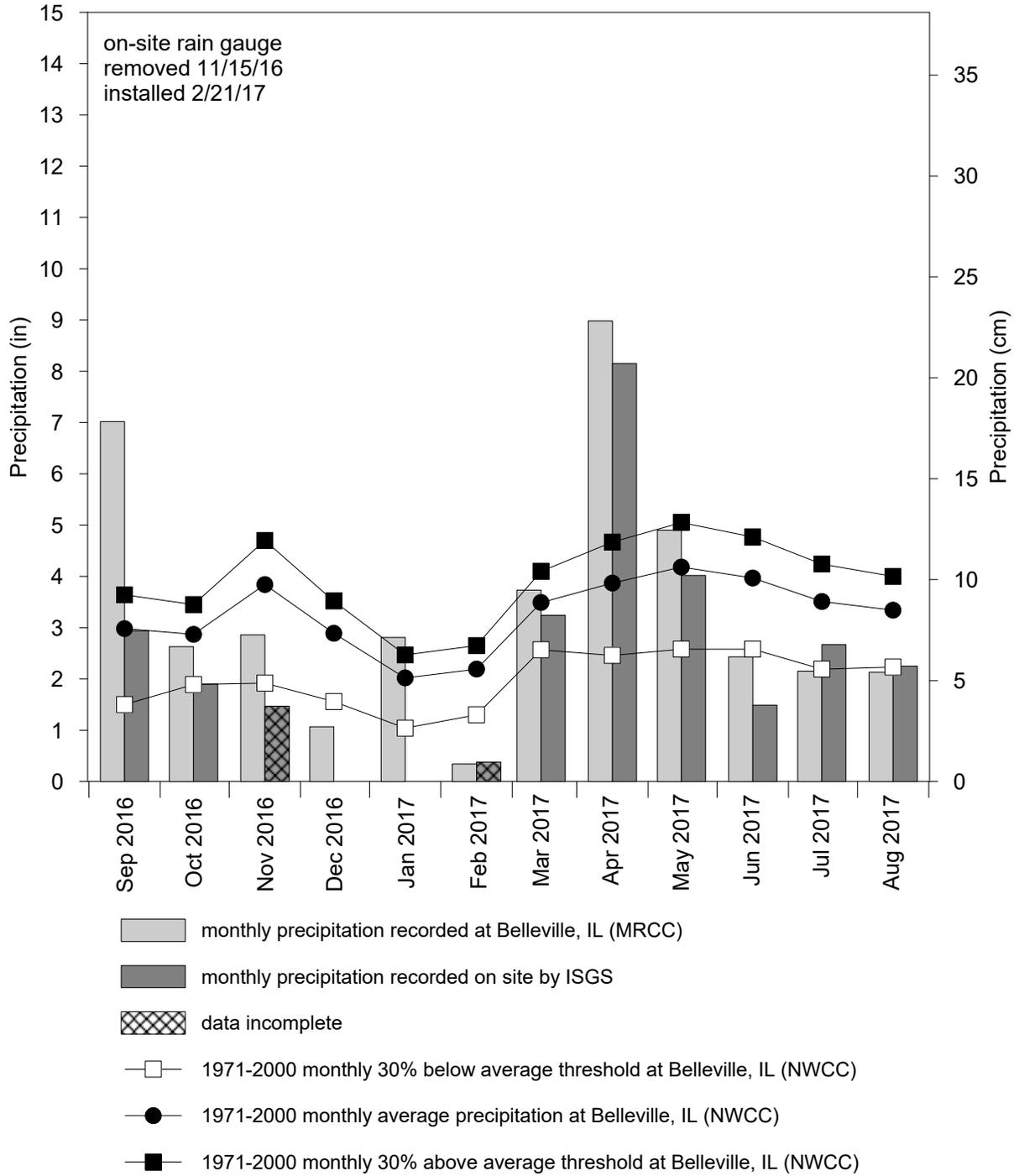
Eckmann/Bischoff Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



Eckmann/Bischoff Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Belleville, IL (MRCC station #110510)**



**MORRIS
WETLAND MITIGATION BANK**

ISGS #49

Sequence #1306

Grundy County, near Morris, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Katharine L. Schleich

SITE HISTORY

- March 1999: ISGS was tasked by IDOT to begin monitoring for a potential wetland banking site.
- March 2007: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2007-03).
- February 2009: IDOT specified that monitoring of surface-water inundation and floodwater storage functions would be limited to an off-site USACE river gauge and on-site data loggers.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Morris wetland mitigation bank is 44.11 ha (109.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 17.70 ha (43.74 ac) of the total site area of 341.56 ha (844.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season, and 11.84 ha (29.26 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 17.70 ha (43.74 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Morris, Illinois, is April 12, and the season lasts 200 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 10 days, and 12.5% of the growing season is 25 days. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Morris, Illinois (MRCC station #115825), was 110% of normal. During spring 2017 (March through May), precipitation was 155% of normal. Rainfall in June, July, and August was below average at 91% of normal.
- The Illinois River flooded portions of the site four times during the 2016-2017 monitoring period, with three floods occurring during the growing season.
- The period of maximum inundation and saturation during the growing season occurred between late April and late May following 11.4 cm (4.5 in.) of rainfall, recorded at the Morris weather station from April 29-May 1, and subsequent flooding of the site by the Illinois River that peaked on May 2.
- The table at the end of this summary lists surface-water gauge elevations that met wetland hydrology criteria.

PLANNED FUTURE ACTIVITIES

- Monitoring of surface water via on-site ISGS data loggers and the off-site USACE river gauge at Morris will continue until no longer required by IDOT. The continued aim will be to watch for significant changes in the on-site wetland hydrology acreage or site functions.

WETLAND HYDROLOGY TABLE FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
42S	Y	Y	Y
44S	Y	Y	Y
64S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

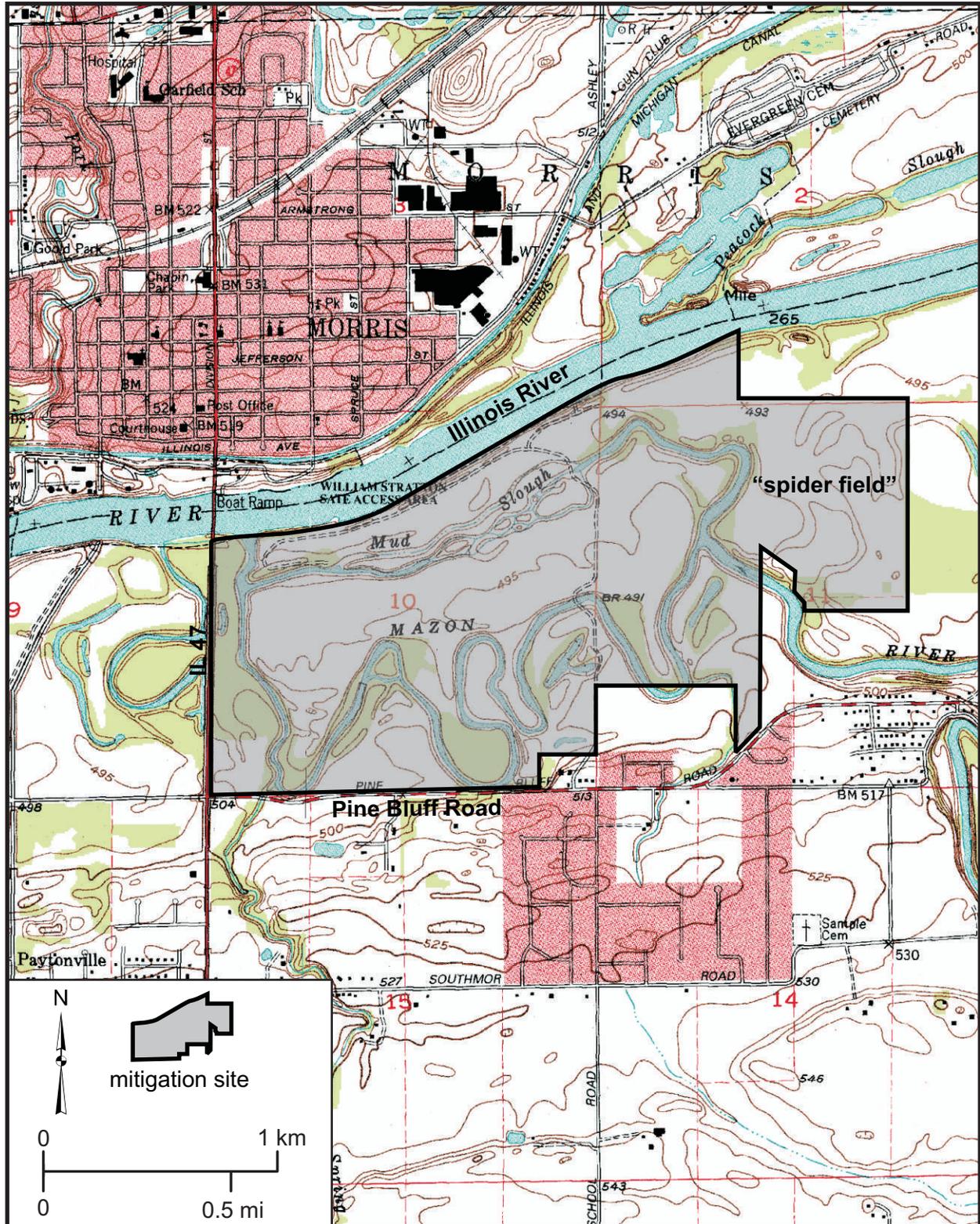
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
SW2A	n/a	n/a	n/a
SW8	150.62 m (494.16 ft)	150.46 m (493.64 ft)	150.62 m (494.16 ft)
SW43	150.61 m (494.13 ft)	150.44 m (493.57 ft)	150.61 m (494.13 ft)
IL River*	148.92 m (488.58 ft)	147.75 m (484.74 ft)	148.92 m (488.58 ft)

n/a – insufficient data to determine an elevation

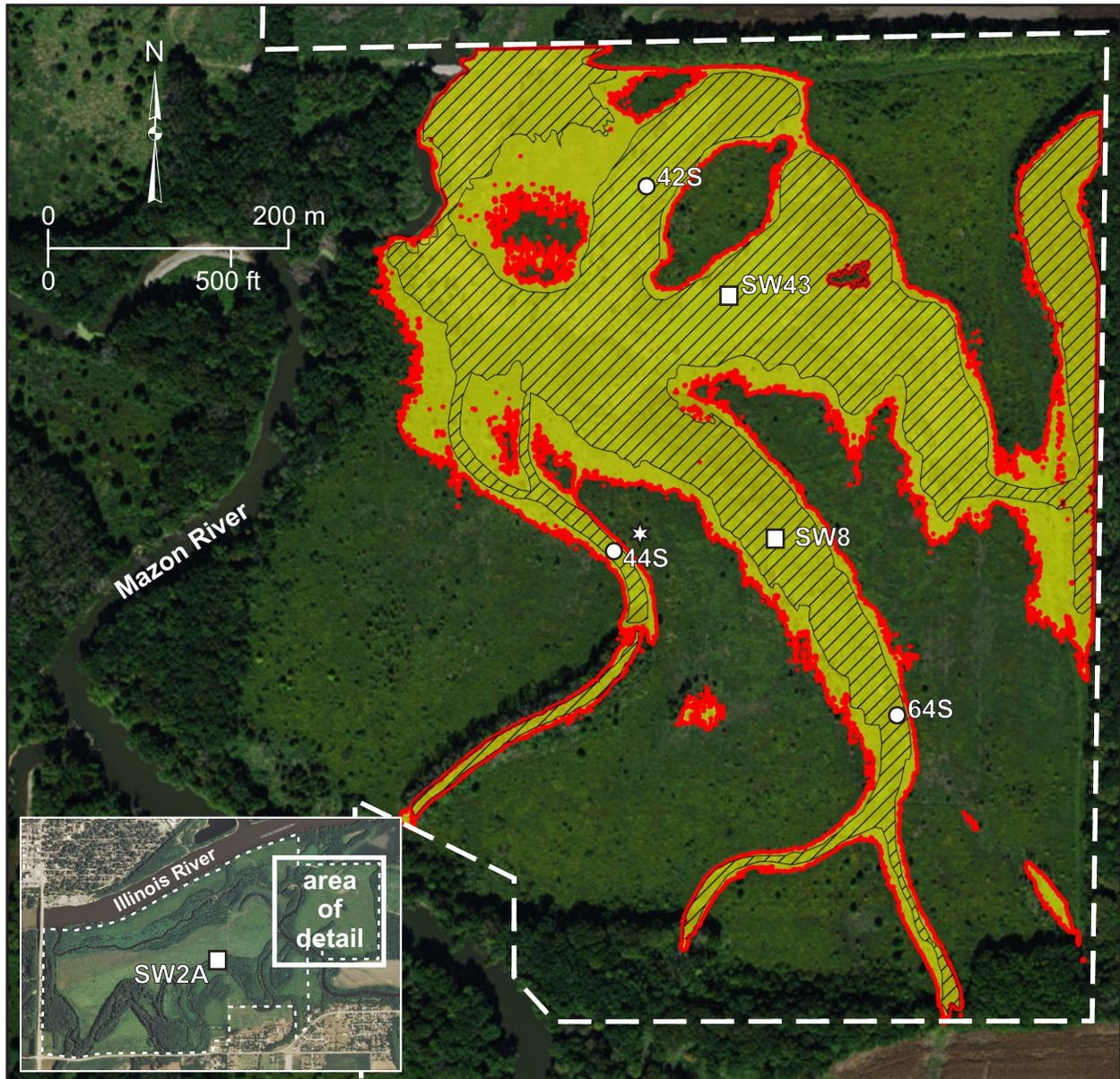
* - Illinois River at Morris (USACE 2017)

Morris Wetland Mitigation Bank General Study Area and Vicinity

from the USGS Topographic Series, Morris, IL, 7.5-minute Quadrangle (USGS 1993d)
contour interval is 5 feet



Morris Wetland Mitigation Bank
Estimated Areal Extent of 2017 Wetland Hydrology
September 1, 2016 through August 31, 2017
 Map based on imagery available from Esri (Esri 2017)



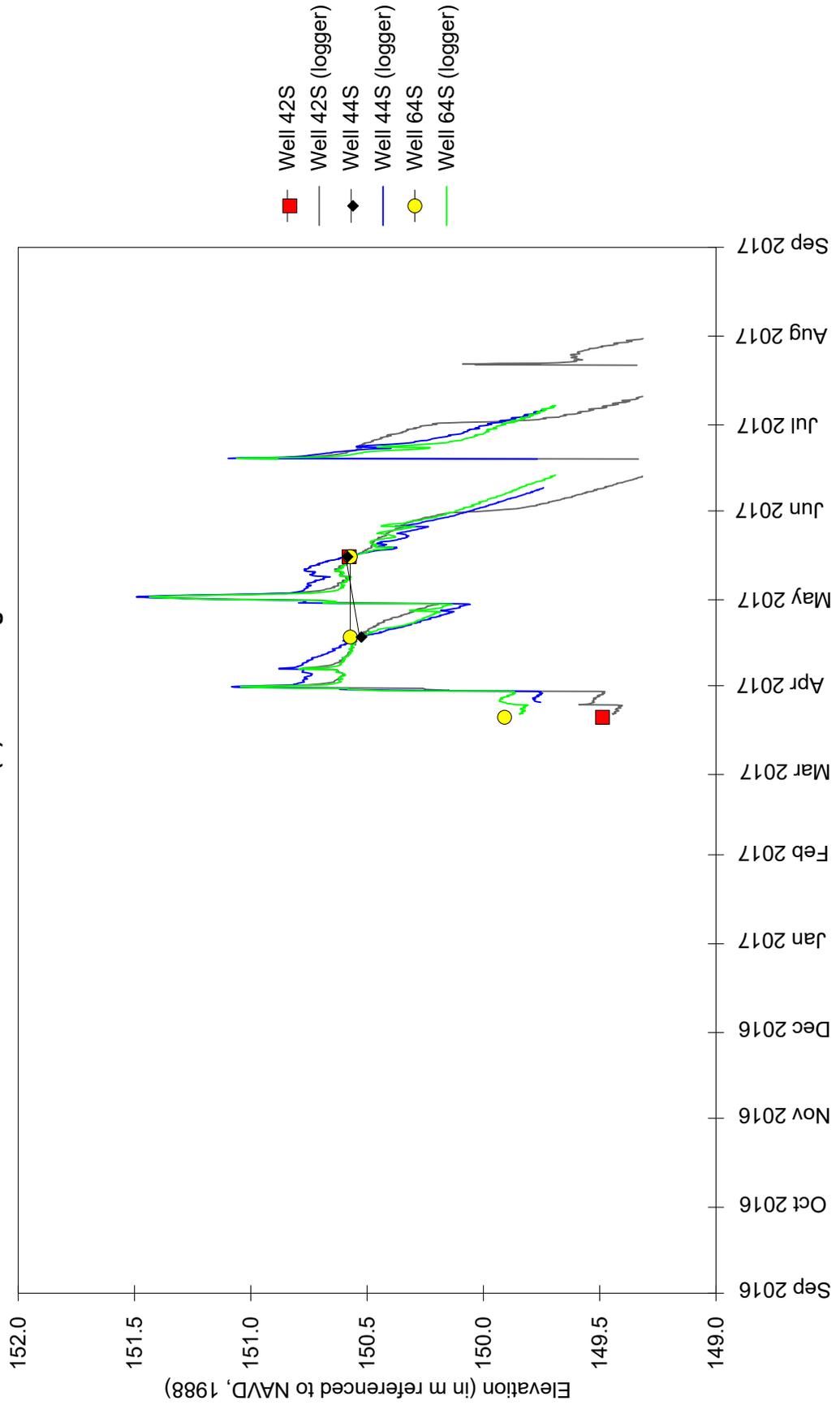
2017 Wetland Hydrology

- >5% of the growing season
(1987 Manual)
- >12.5% of the growing season
(1987 Manual)
- 14 days or more
(2010 Midwest Region Supplement)

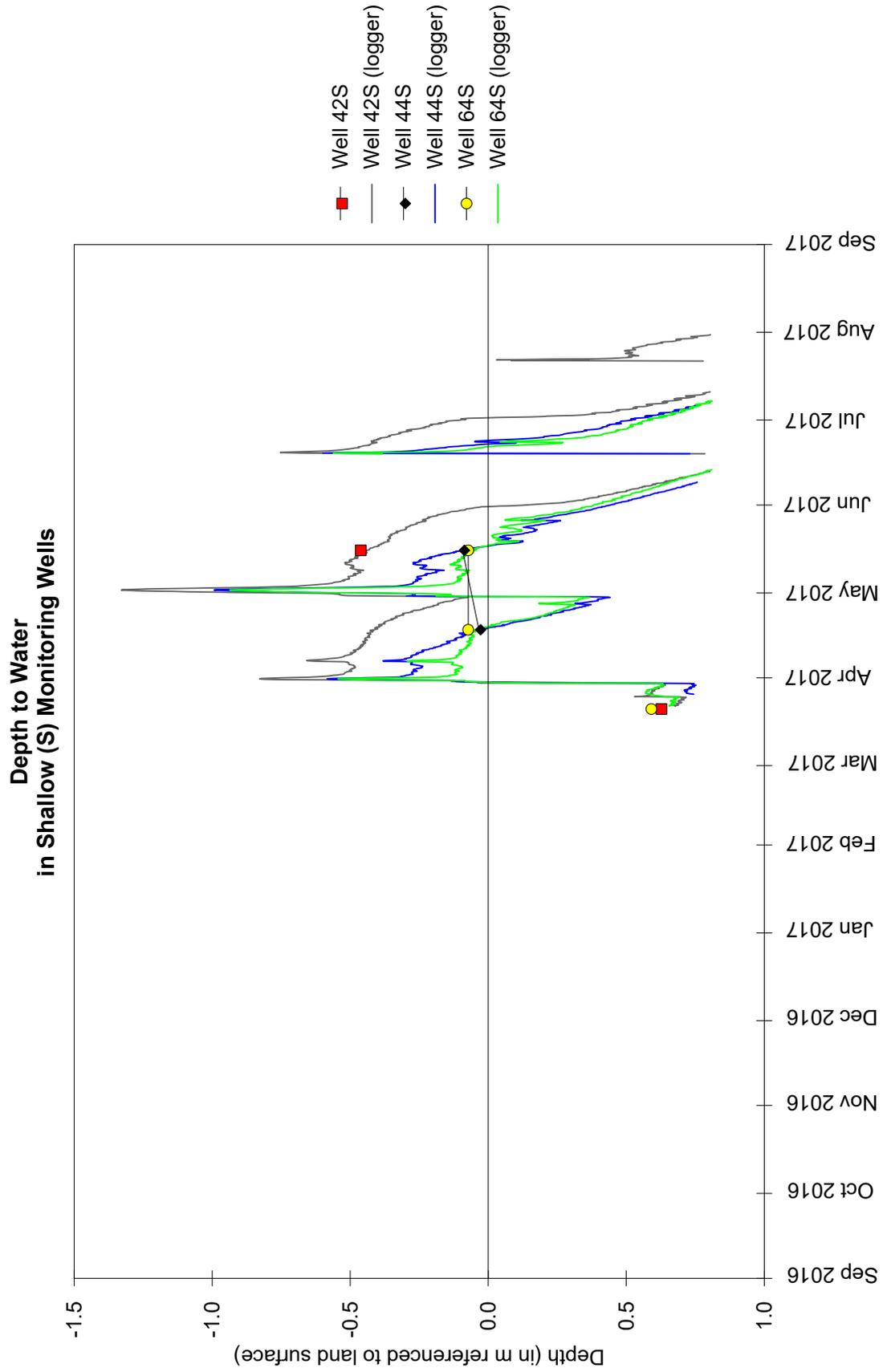
- monitoring well
- surface-water gauge
- rain gauge
- site boundary

Morris Wetland Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations in Shallow (S) Monitoring Wells

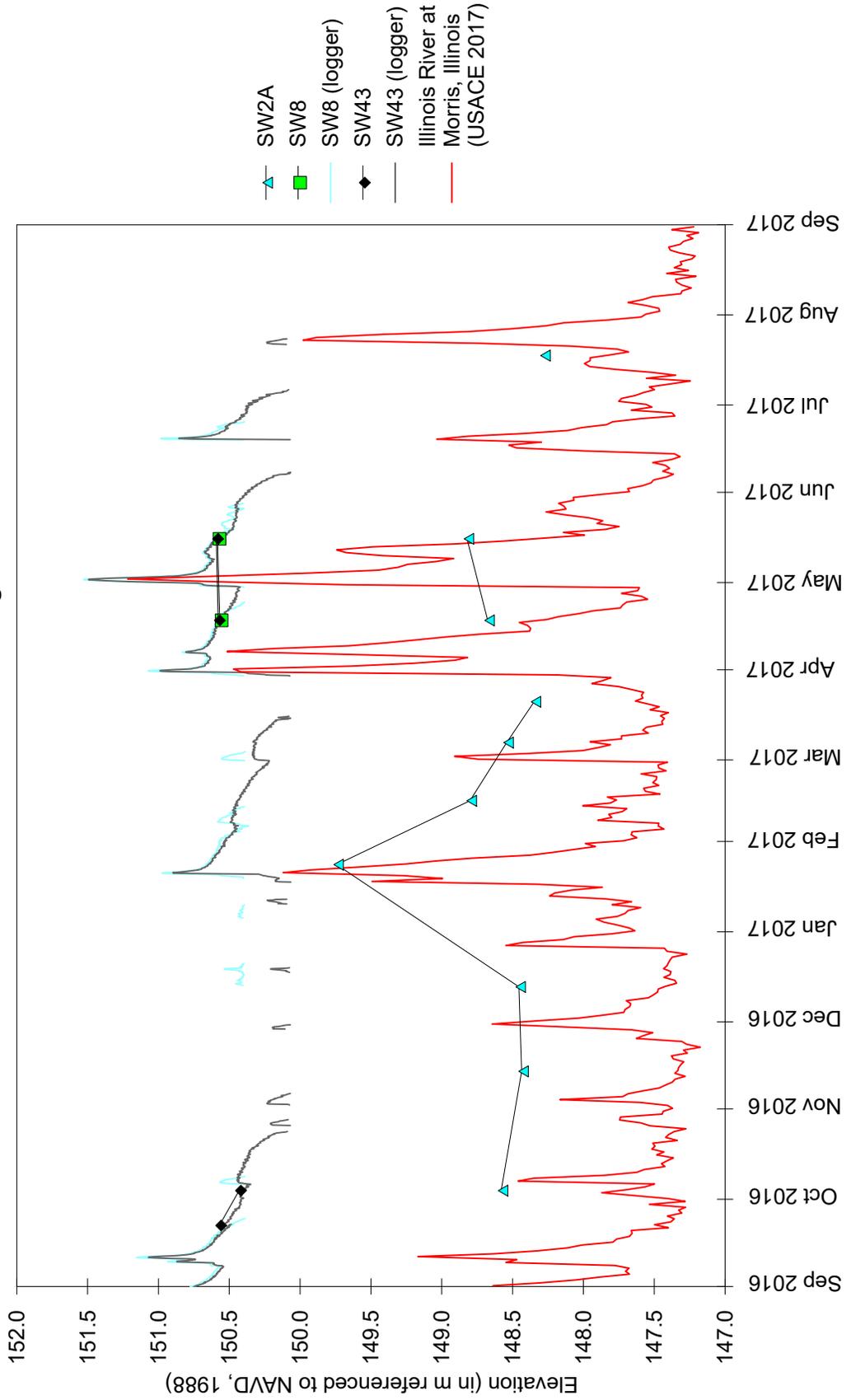


**Morris Wetland Mitigation Bank
September 1, 2016 through August 31, 2017**



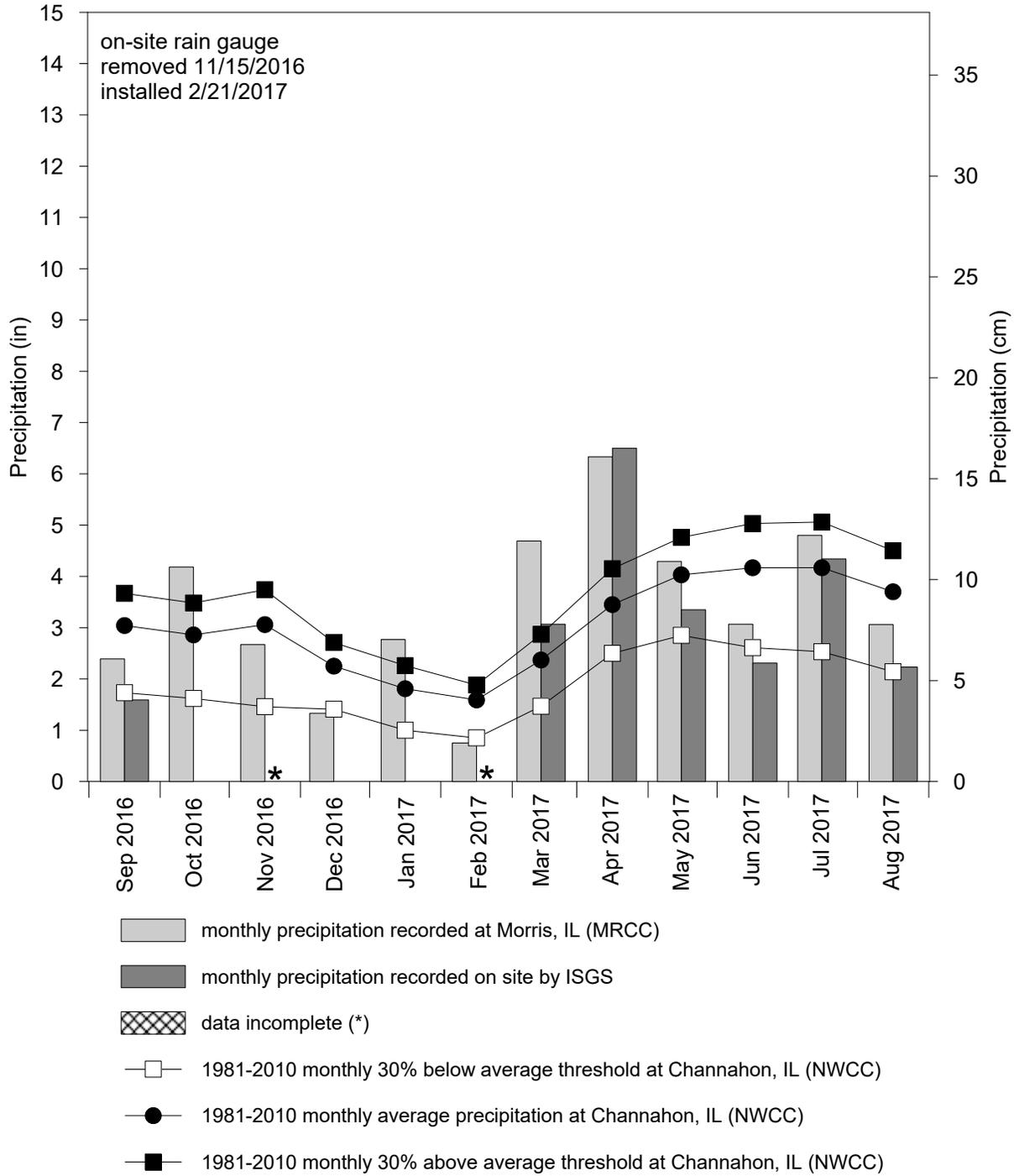
Morris Wetland Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations
at Surface-Water Gauges



Morris Wetland Mitigation Bank September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Morris, IL (MRCC station #115825)**



**LA GRANGE
WETLAND MITIGATION BANK**

ISGS #52

Sequence #9579

Brown County, near La Grange, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Keith W. Carr

SITE HISTORY

- January 2003: ISGS submitted a wetland banking instrument to IDOT.
- January 2005: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2005–02).
- Fall 2005: Construction began at the site.
- Summer/fall 2011: Additional construction was completed at the site. Trees were planted in portions of Fields 12, 13, 14, and 15 and in areas surrounding Amelia Barker Lake.
- Fall 2015: Portions of Fields 12 and 13 were re-planted with trees.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the La Grange wetland mitigation bank is 414.40 ha (1,024.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 570.45 ha (1,409.61 ac) of the total site area of 665.72 ha (1,645.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 563.94 ha (1,393.52 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 568.53 ha (1,404.86 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Rushville, Illinois, is April 5, and the season lasts 212 days (MRCC 2017); 5% of the growing season is 11 days, and 12.5% of the growing season is 27 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Rushville, Illinois (MRCC station #117551), was 93% of normal. During spring 2017 (March through May), precipitation was 164% of normal.
- Although annual precipitation was below normal, excessive rainfall during spring 2017 resulted in an extended period of flooding from early April through early June.
- The period of maximum inundation and saturation during the 2017 growing season at the site occurred during early May due to a major flood that covered most of the site.

- In 2017, water levels measured in 10 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 9 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 9 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- ISGS will monitor hydrology at this site until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
2S	N	N	N
14S	Y	N	N
41S	Y	Y	Y
45S	Y	Y	Y
46S	Y	Y	Y
47S	Y	Y	Y
48S	Y	Y	Y
49S	Y	Y	Y
50S	Y	Y	Y
51S	Y	Y	Y
52S	Y	Y	Y

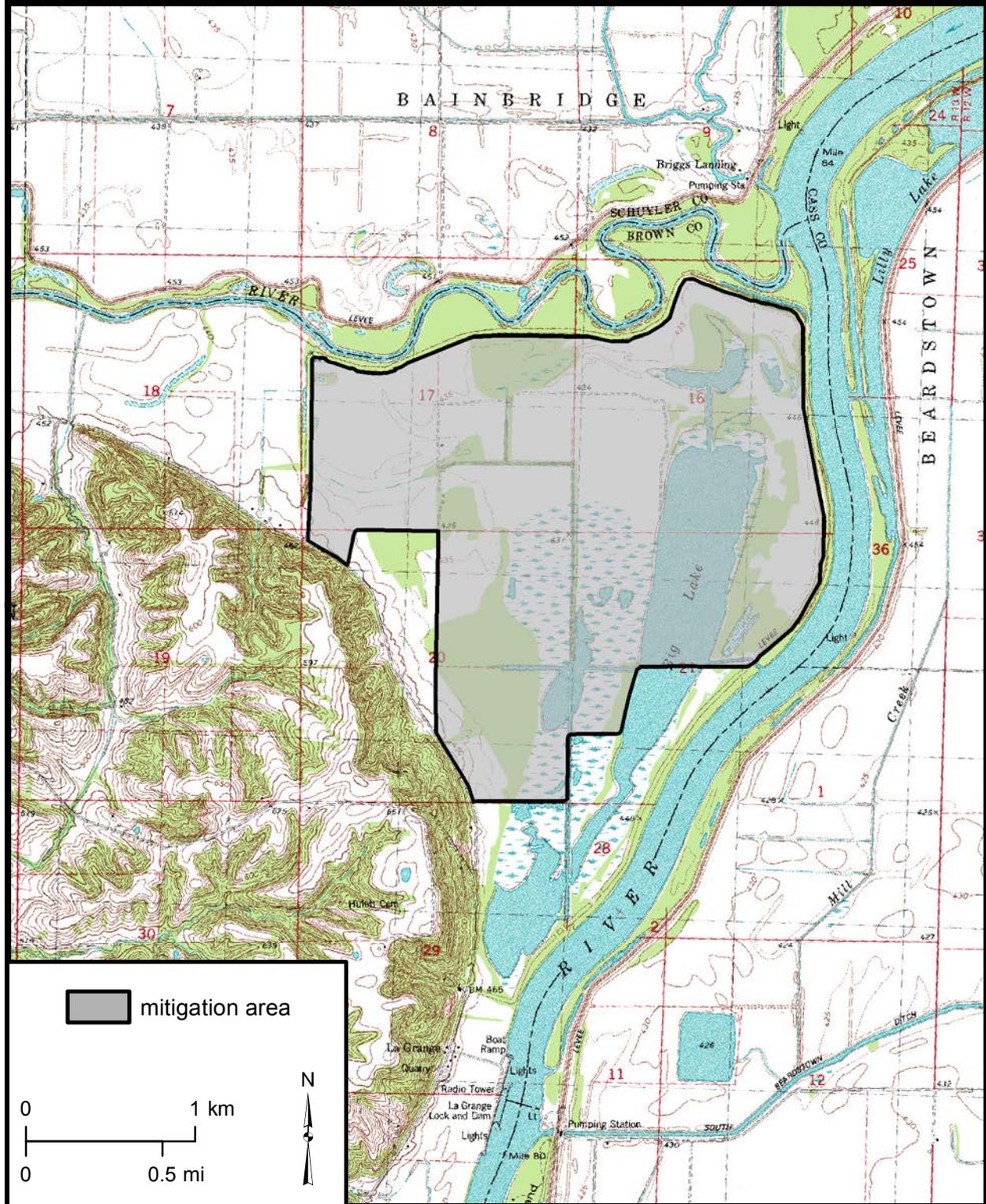
Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
SW17	134.55 m (441.44 ft)	133.76 m (438.85 ft)	134.24 m (440.42 ft)
SW19	134.55 m (441.44 ft)	133.76 m (438.85 ft)	134.24 m (440.42 ft)
IL River*	134.64 m (441.73 ft)	133.85 m (439.13 ft)	134.35 m (440.78 ft)

* - off-site gauge, Illinois River at New La Grange Lock and Dam (USACE 2017)
 n/a – insufficient data to determine an elevation

La Grange Wetland Mitigation Bank General Study Area and Vicinity

from the USGS Topographic Series, Cooperstown, IL, 7.5-minute Quadrangle (USGS 1980)
contour interval is 10 feet



La Grange Wetland Mitigation Bank Management Areas

Map based on 2012 Farm Service Agency digital orthophotography, Brown County, Illinois (USDA-FSA 2012)



La Grange Wetland Mitigation Bank

Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

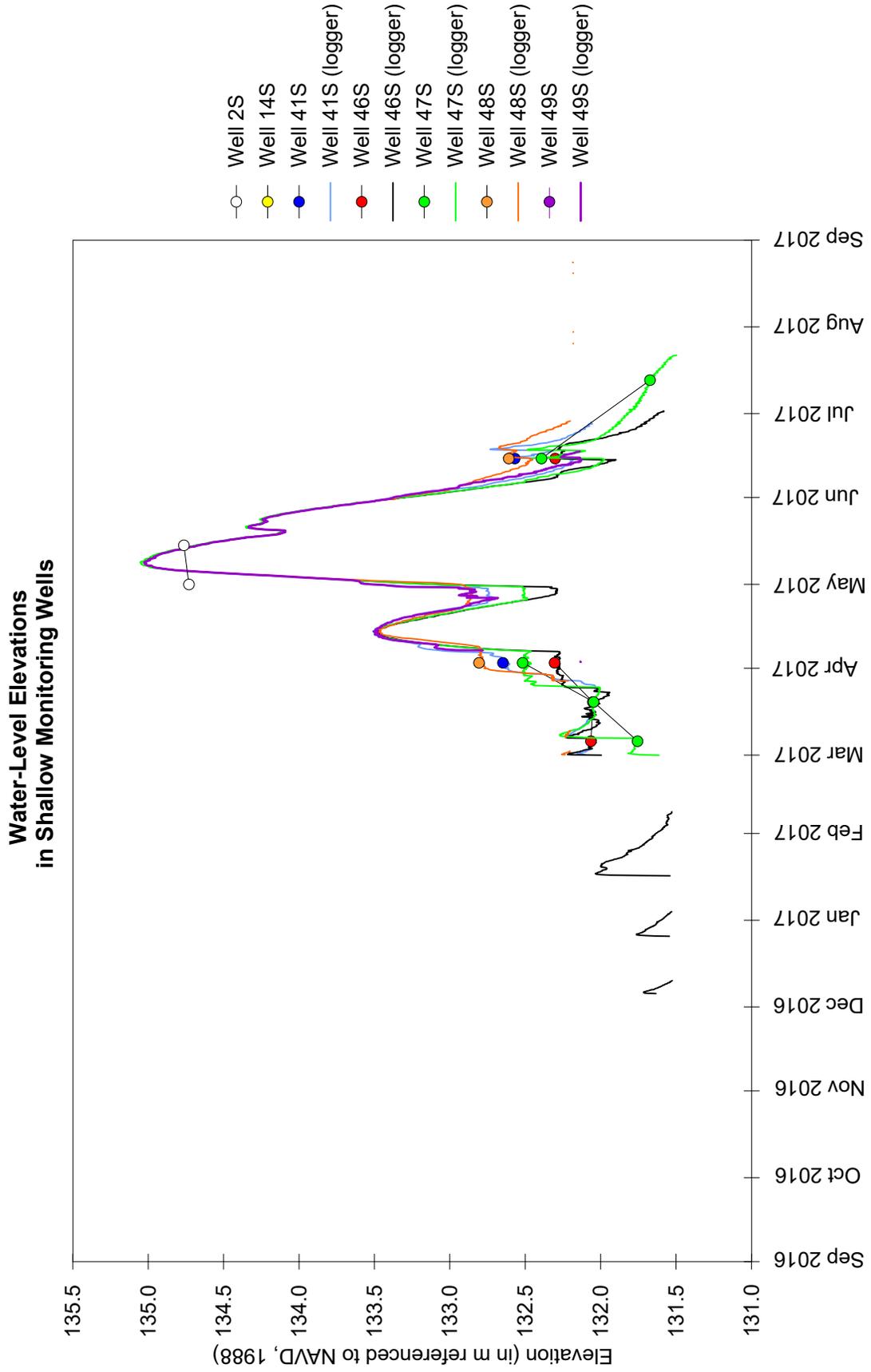
Map based on 2012 Farm Service Agency digital orthophotography, Brown County, Illinois (USDA-FSA 2012)



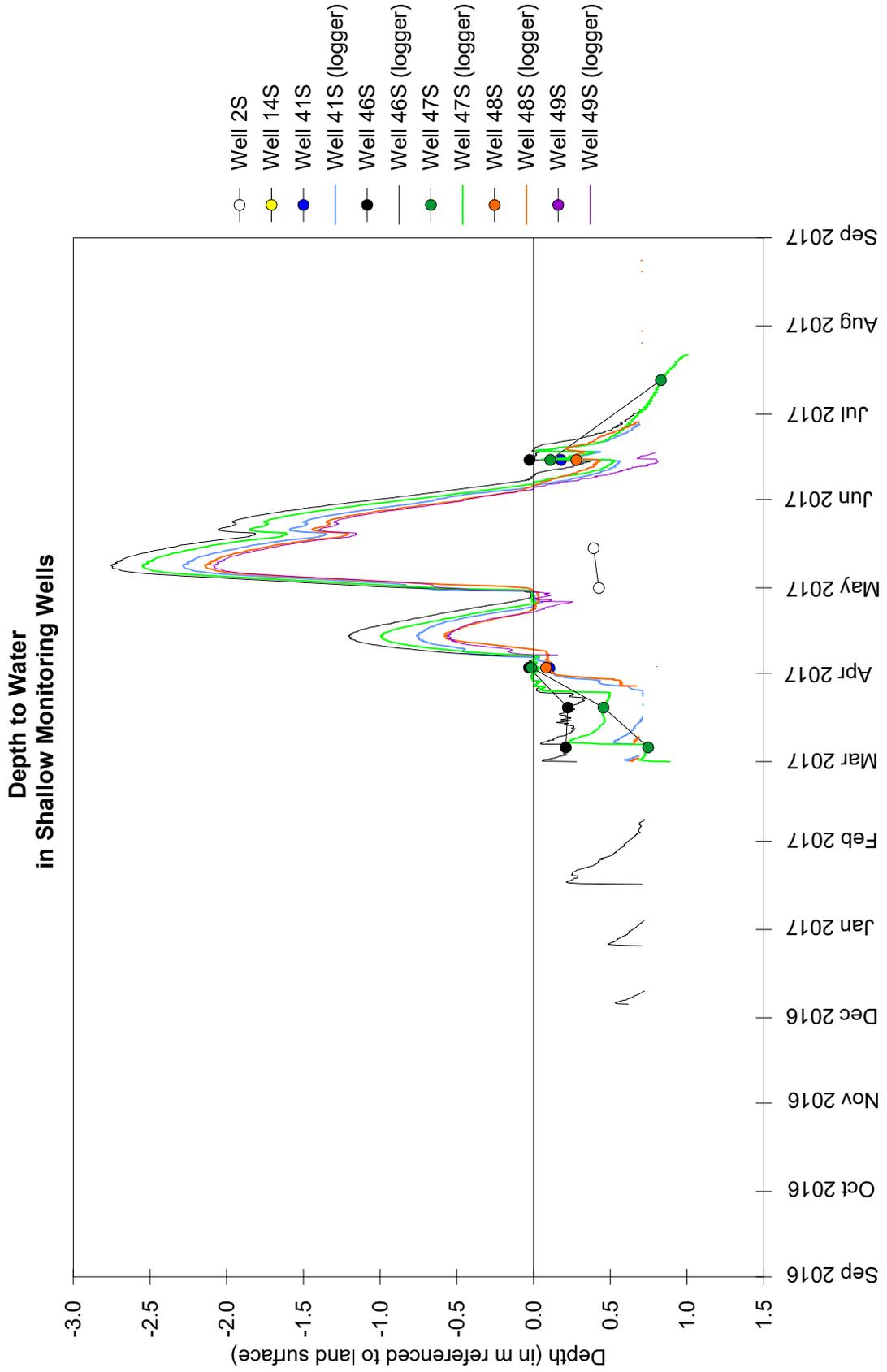
2017 Wetland Hydrology

- | | |
|--|--|
| <ul style="list-style-type: none"> >5% of growing season (1987 Manual) >12.5% of growing season (1987 Manual) 14 days or more (2010 Midwest Region Supplement) | <ul style="list-style-type: none"> monitoring well surface-water gauge * rain gauge mitigation area |
|--|--|

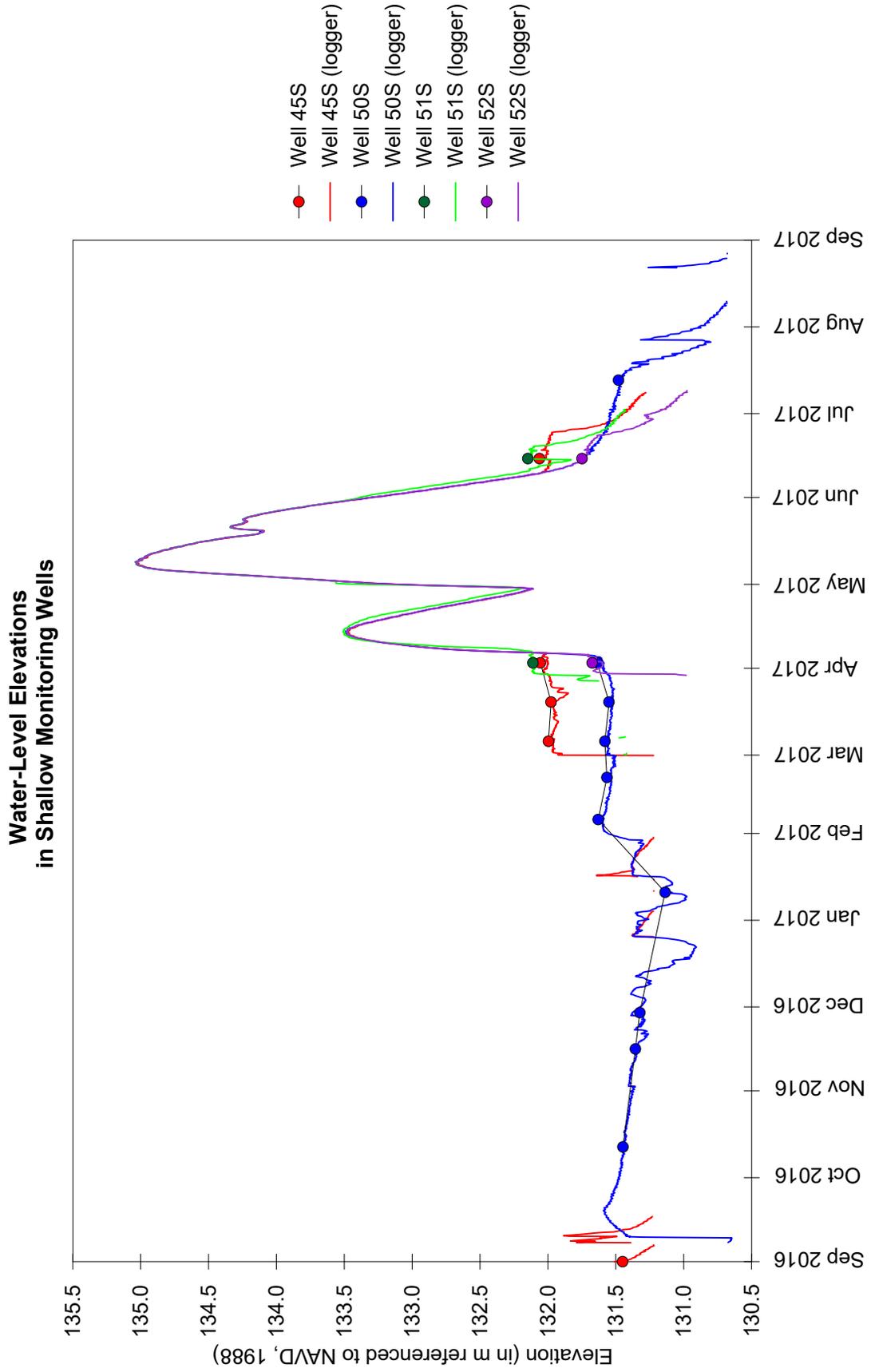
La Grange Wetland Mitigation Bank September 1, 2016 through August 31, 2017



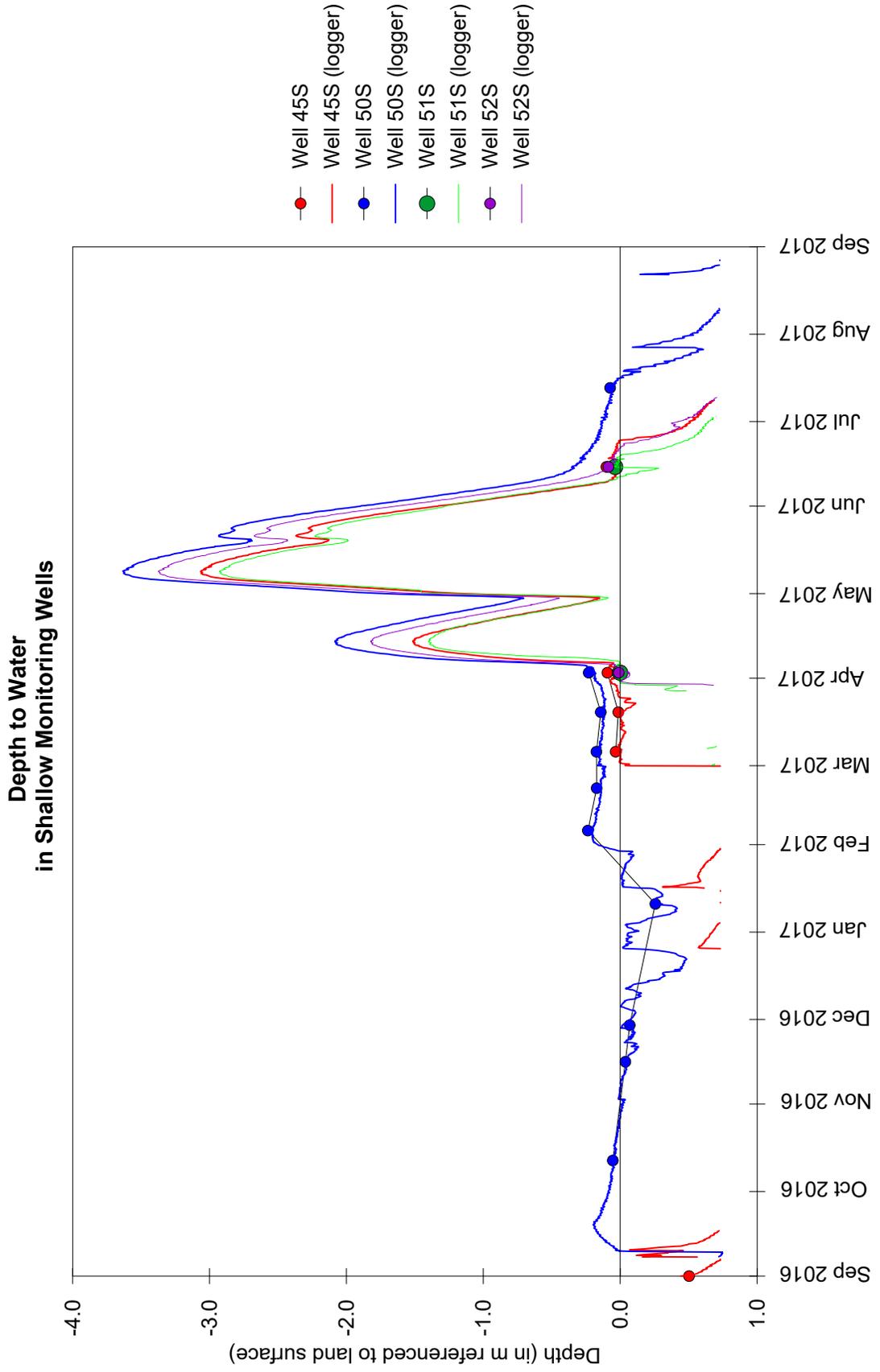
La Grange Wetland Mitigation Bank September 1, 2016 through August 31, 2017



La Grange Wetland Mitigation Bank September 1, 2016 through August 31, 2017

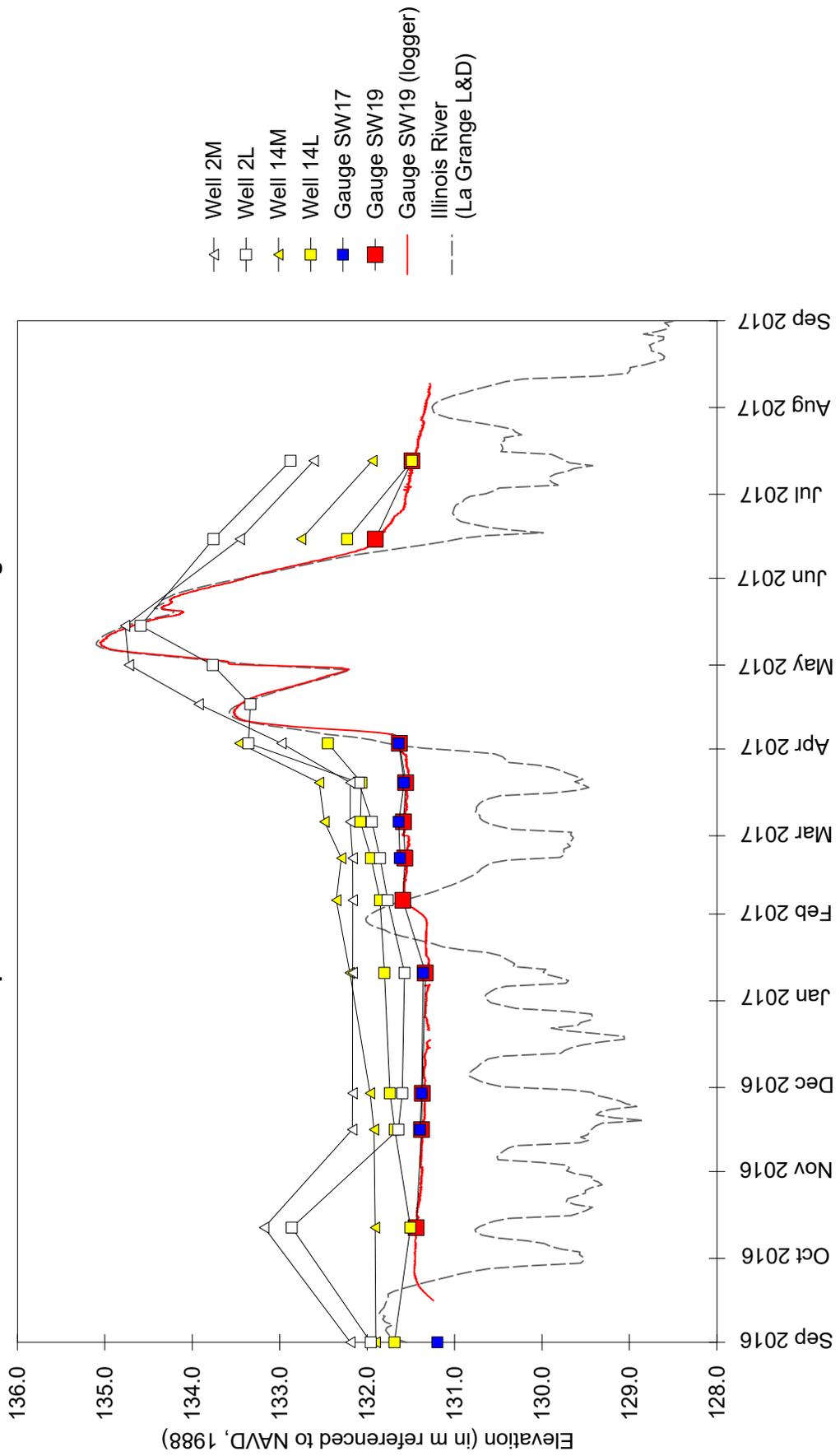


La Grange Wetland Mitigation Bank September 1, 2016 through August 31, 2017

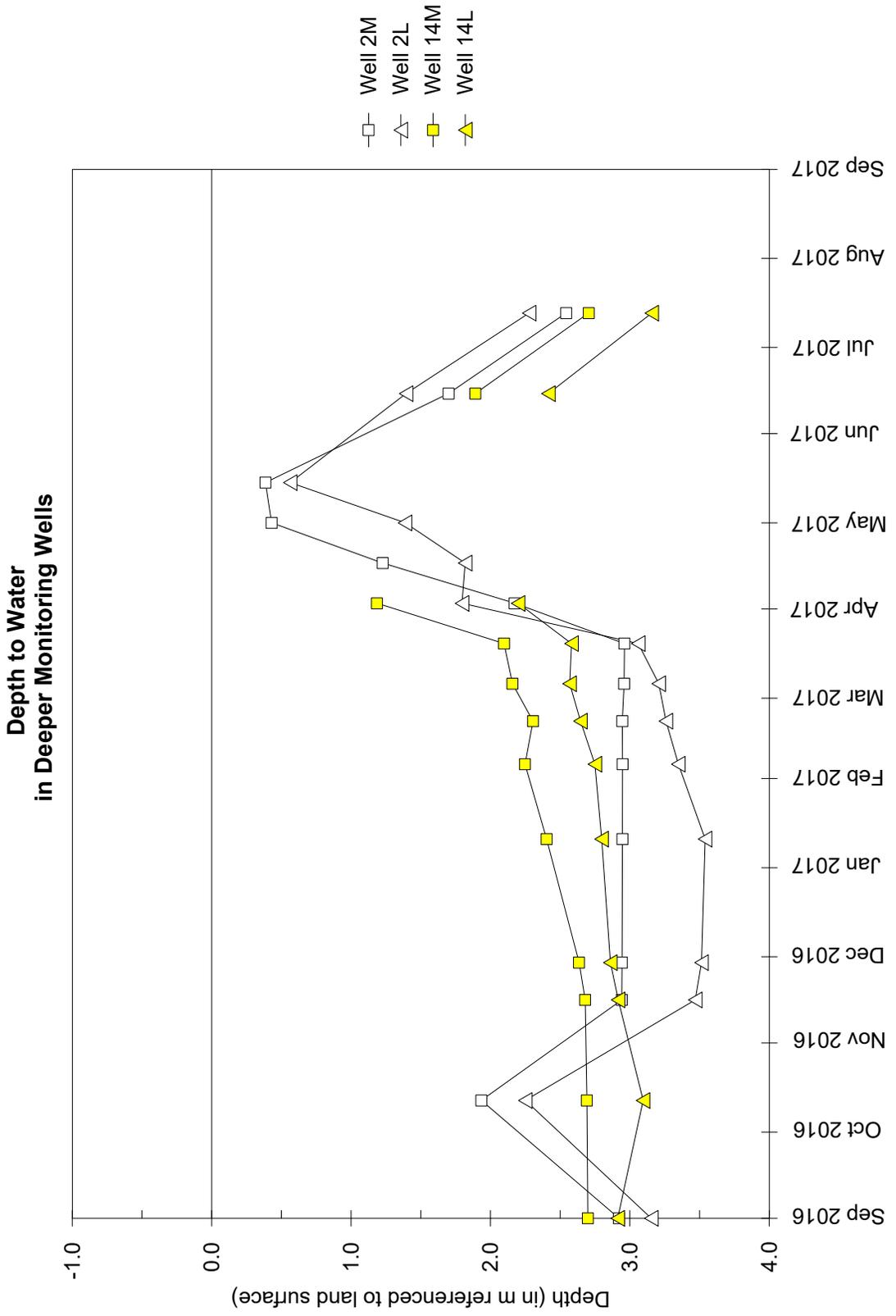


La Grange Wetland Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations in Deeper Wells and at Surface-Water Gauges

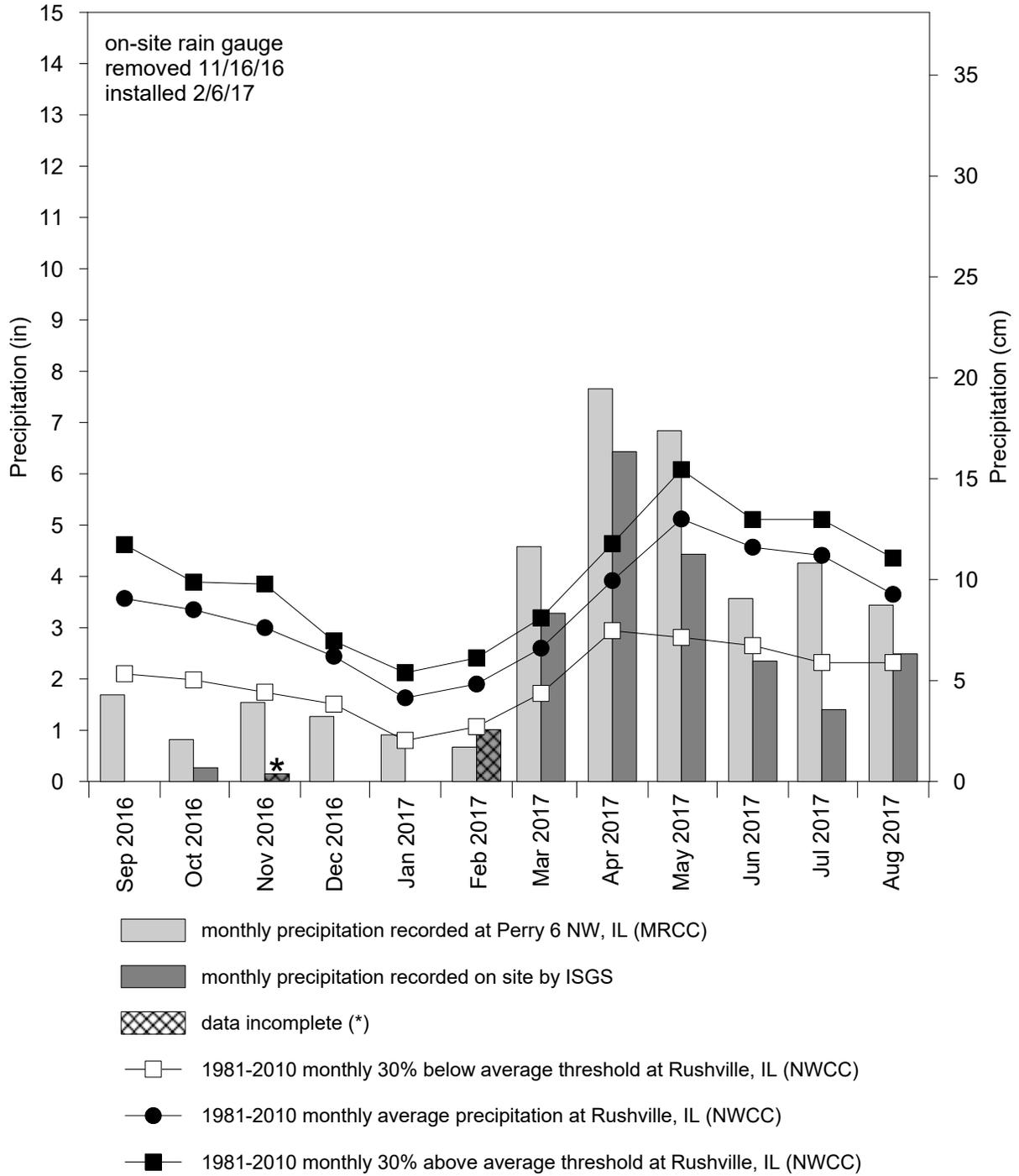


La Grange Wetland Mitigation Bank September 1, 2016 through August 31, 2017



La Grange Wetland Mitigation Bank September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Perry 6 NW, IL (MRCC station #116738)**



**FAIRMONT CITY
POTENTIAL WETLAND MITIGATION SITE**

ISGS #53

FAP 14

Sequence #27

St. Clair County, near Fairmont City, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- August 1999: ISGS conducted an initial site evaluation.
- September 2000: ISGS began monitoring groundwater and surface-water levels.
- March 2003: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2003–04).
- August 2014: Ownership of the site was transferred from IDOT to Fairmont City, Illinois.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Fairmont City wetland mitigation site is 10.93 ha (27.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 24.32 ha (60.09 ac) of the total site area of 27.11 ha (67.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 23.68 ha (58.51 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 24.32 ha (60.09 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Belleville, Illinois, is April 4 and the season lasts 204 days (MRCC 2017); 5% of the growing season is 10 days and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, February 7 was the starting date of the 2017 growing season based on soil temperatures measured at the site and at the Belleville SIU Research Station.
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 105% of normal, precipitation in spring 2017 (March through May) was 153% of normal. The wettest month was April with 232% of normal precipitation.
- The period of maximum inundation and saturation during the 2017 growing season occurred in May following an extended period of heavy precipitation. The result was that the area satisfying wetland hydrology criteria was nearly double of past years. The on-site rain gauge recorded a total of 22.23 cm (8.75 in.) of rain from April 26, 2017 through May 4, 2017, and the Mississippi River at St. Louis (USGS gauge #07010000) crested on May 6 at 12.71 m (41.70 ft), which was the 6th highest crest on record for this gauge.
- In 2017, water levels measured in 20 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured

in 19 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. Using the 2010 Midwest Region Supplement, water levels in 20 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	Y	Y
6VS	Y	Y	Y
7S	Y	Y	Y
9S	Y	Y	Y
14S	Y	Y	Y
16S	Y	Y	Y
17S	Y	Y	Y
23S	Y	Y	Y
24S	Y	Y	Y
25S	Y	Y	Y
25VS	Y	Y	Y
26S	Y	Y	Y
27S	Y	Y	Y
28S	Y	N	Y
29S	Y	Y	Y
30S	Y	Y	Y
31S	Y	Y	Y
32S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

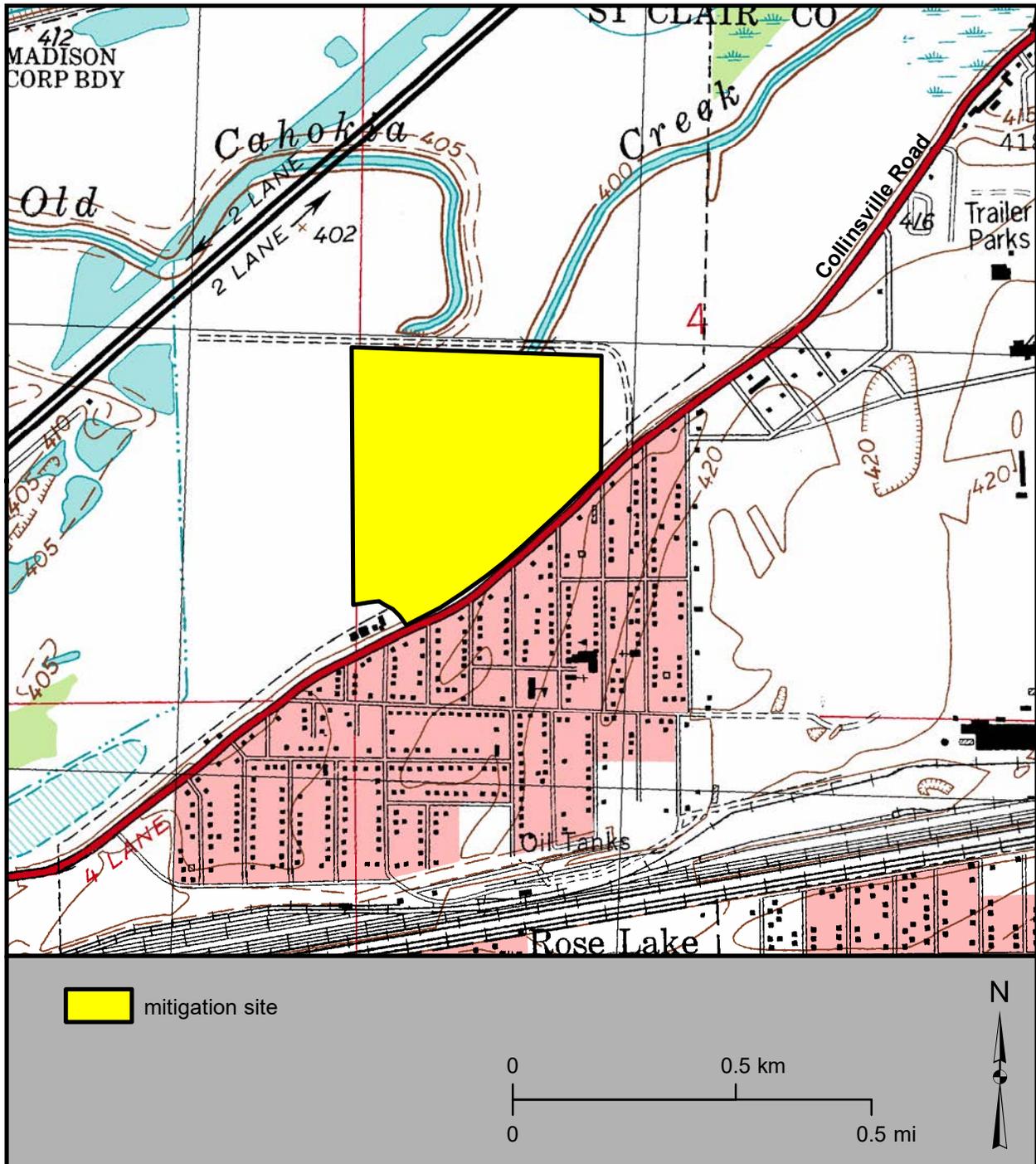
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
AR2	123.09 m (403.84 ft)	122.50 m (401.90 ft)	122.84 m (403.02 ft)
BR	123.09 m (403.84 ft)	122.50 m (401.90 ft)	122.84 m (403.02 ft)
E	n/a	n/a	n/a
G	122.81 m (402.92 ft)	122.46 m (401.77ft)	122.81 m (402.92 ft)
SW Pond	123.09 m (403.84 ft)	122.50 m (401.90 ft)	122.84 m (403.02 ft)

n/a – insufficient data to determine an elevation

Fairmont City Potential Wetland Mitigation Site (FAP 14)

General Study Area and Vicinity

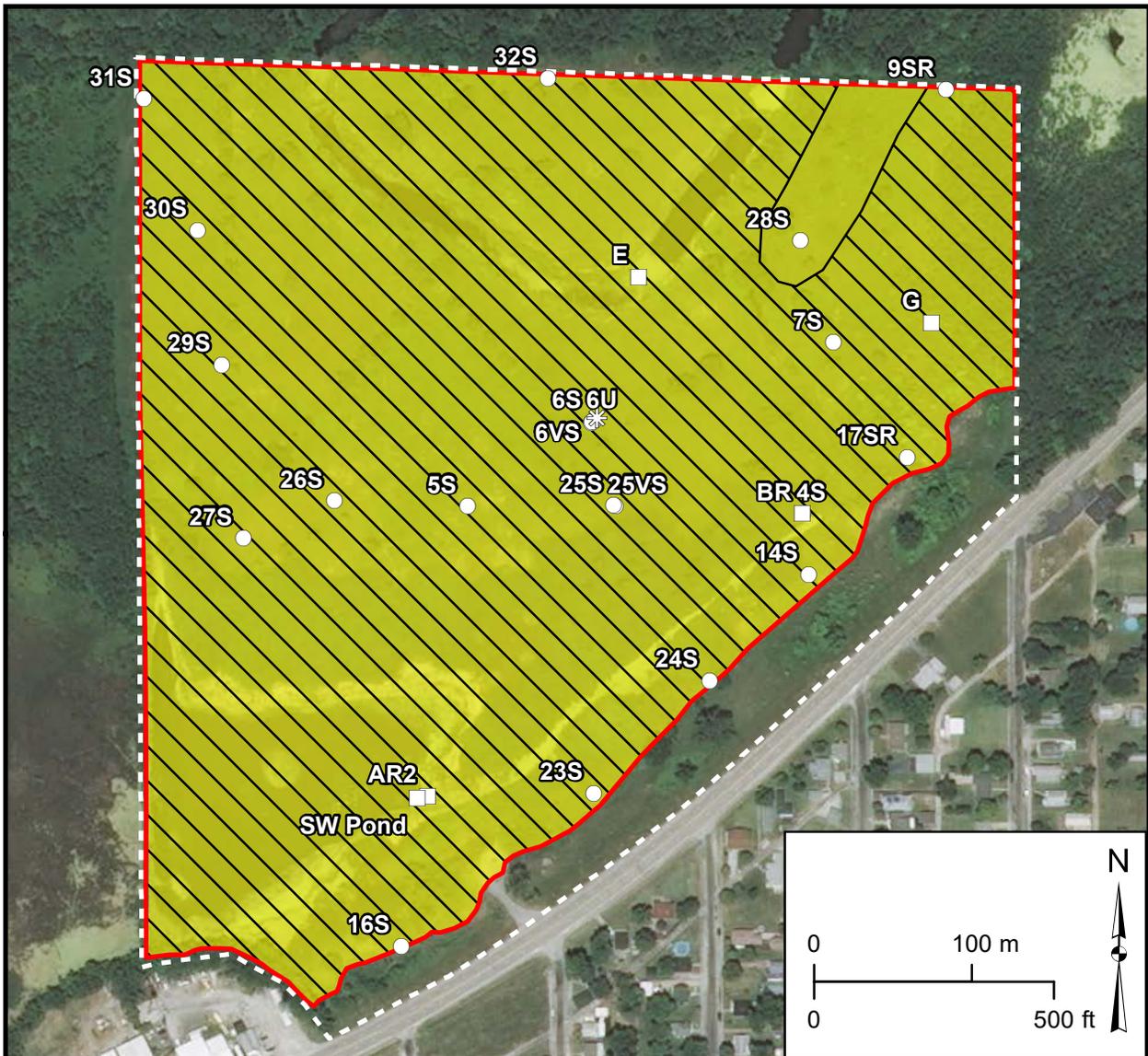
from the USGS Topographic Series, Monks Mound, IL, 7.5-minute quadrangle (USGS 1954b)



Fairmont City Potential Wetland Mitigation Site (FAP 14)

Estimated Areal Extent of 2017 Wetland Hydrology
September 1, 2016 through August 31, 2017

Map based on 2012 Farm Service Agency digital orthophotography, St. Clair County, Illinois (USDA-FSA 2012)



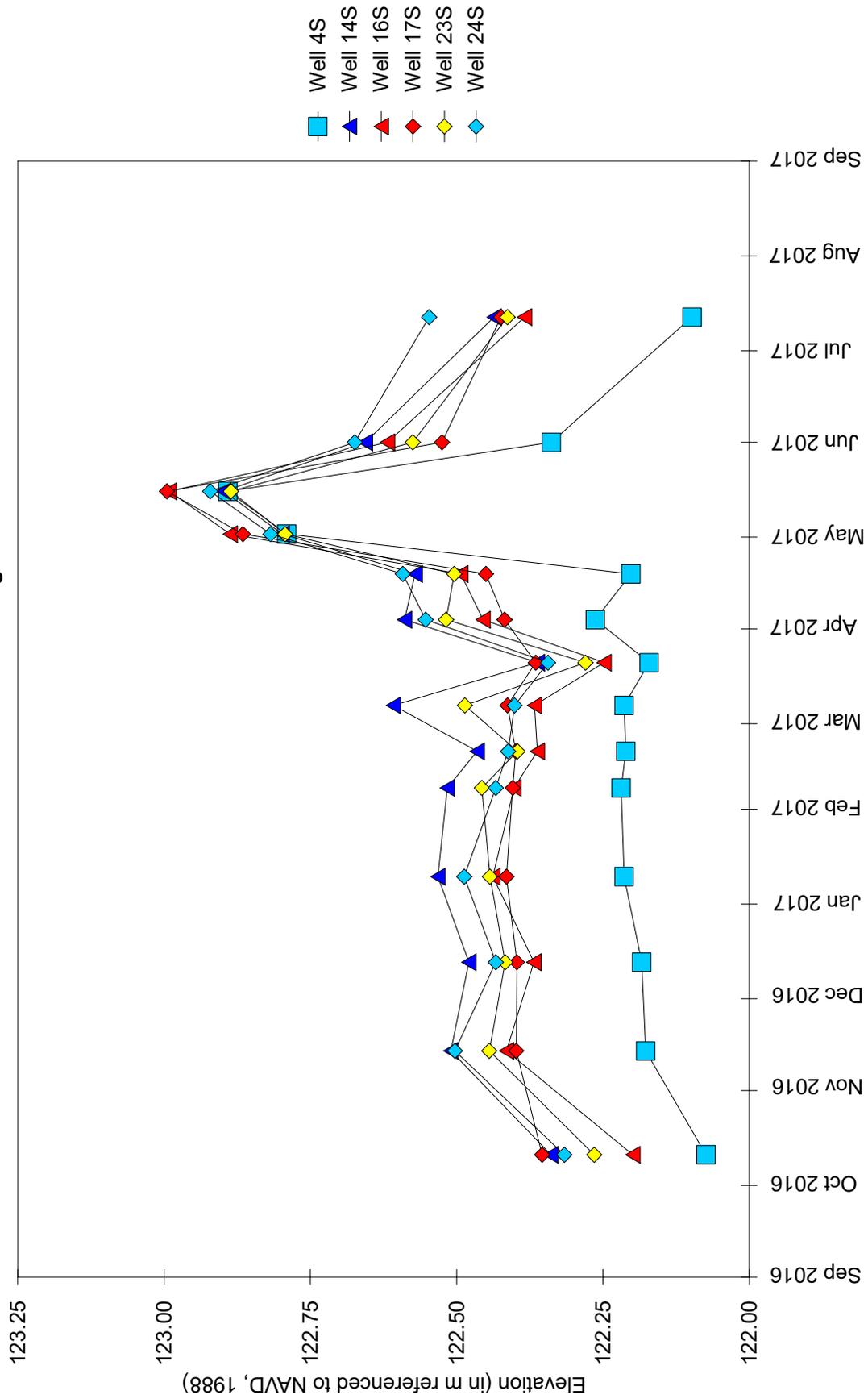
2017 Wetland Hydrology

- >5% of growing season (1987 Manual)
- >12.5% of growing season (1987 Manual)
- 14 days or more (2010 Midwest Region Supplement)

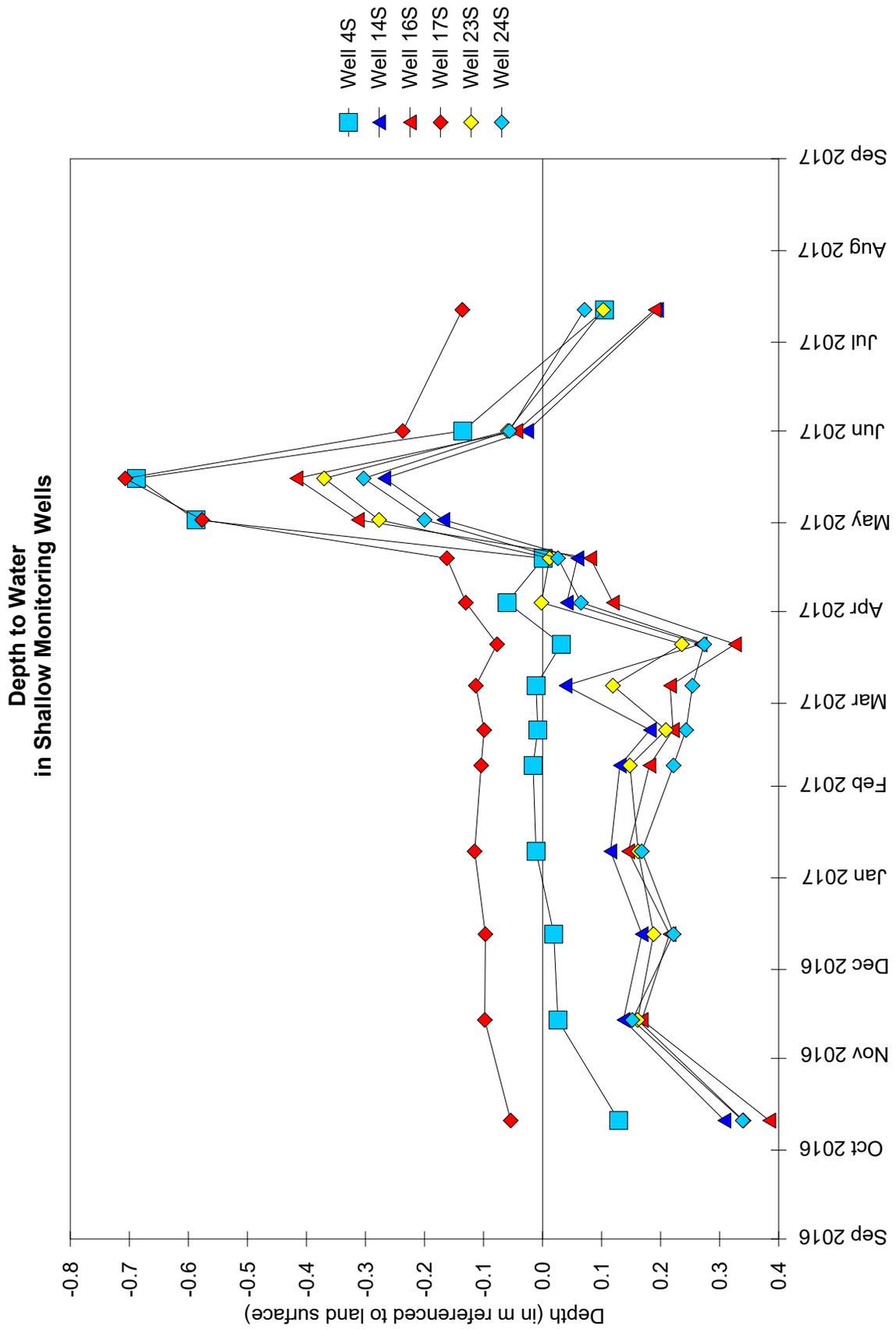
- monitoring well
- surface-water gauge
- * rain gauge
- site boundary

Fairmont City Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Shallow Monitoring Wells

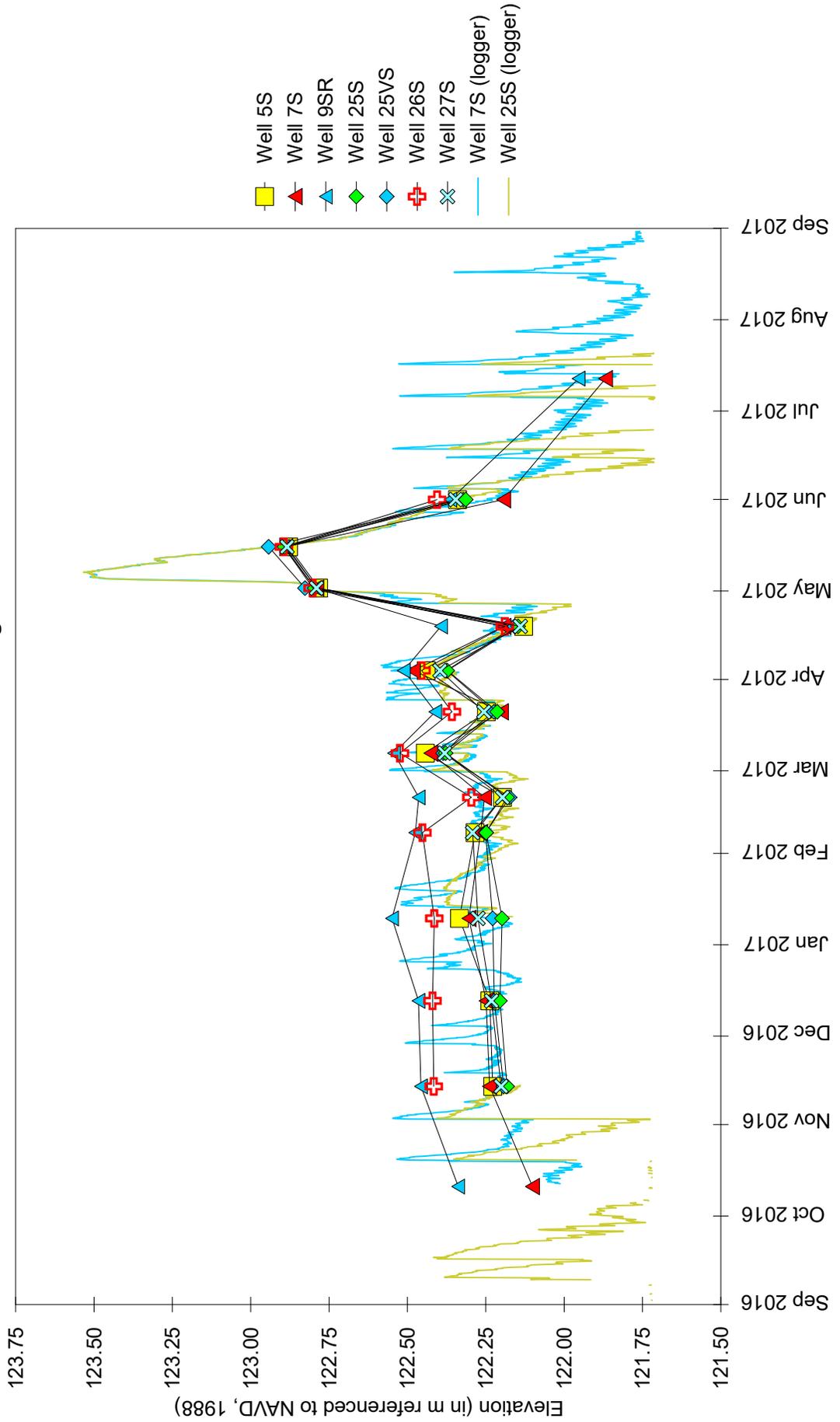


Fairmont City Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

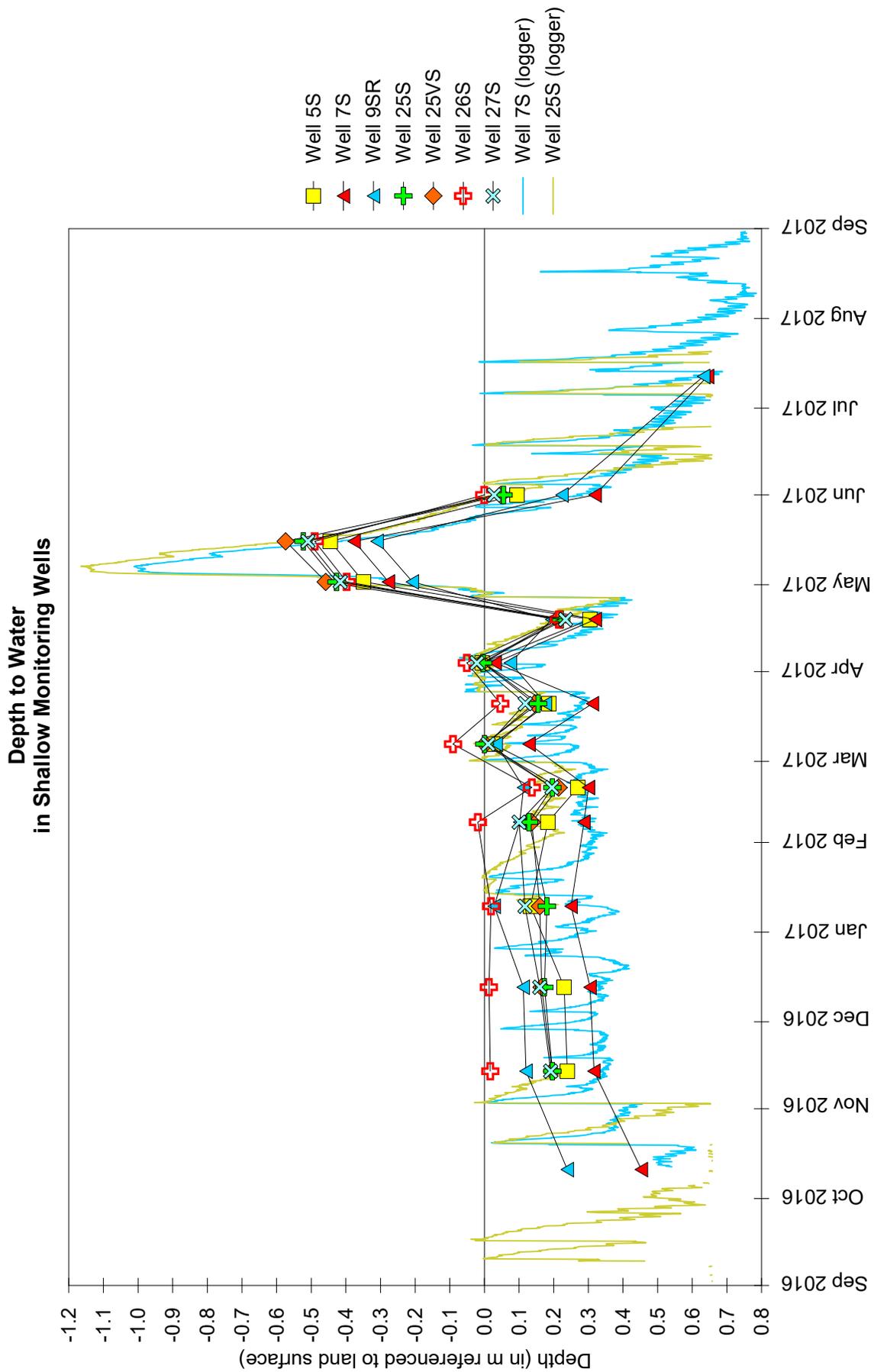


Fairmont City Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Shallow Monitoring Wells

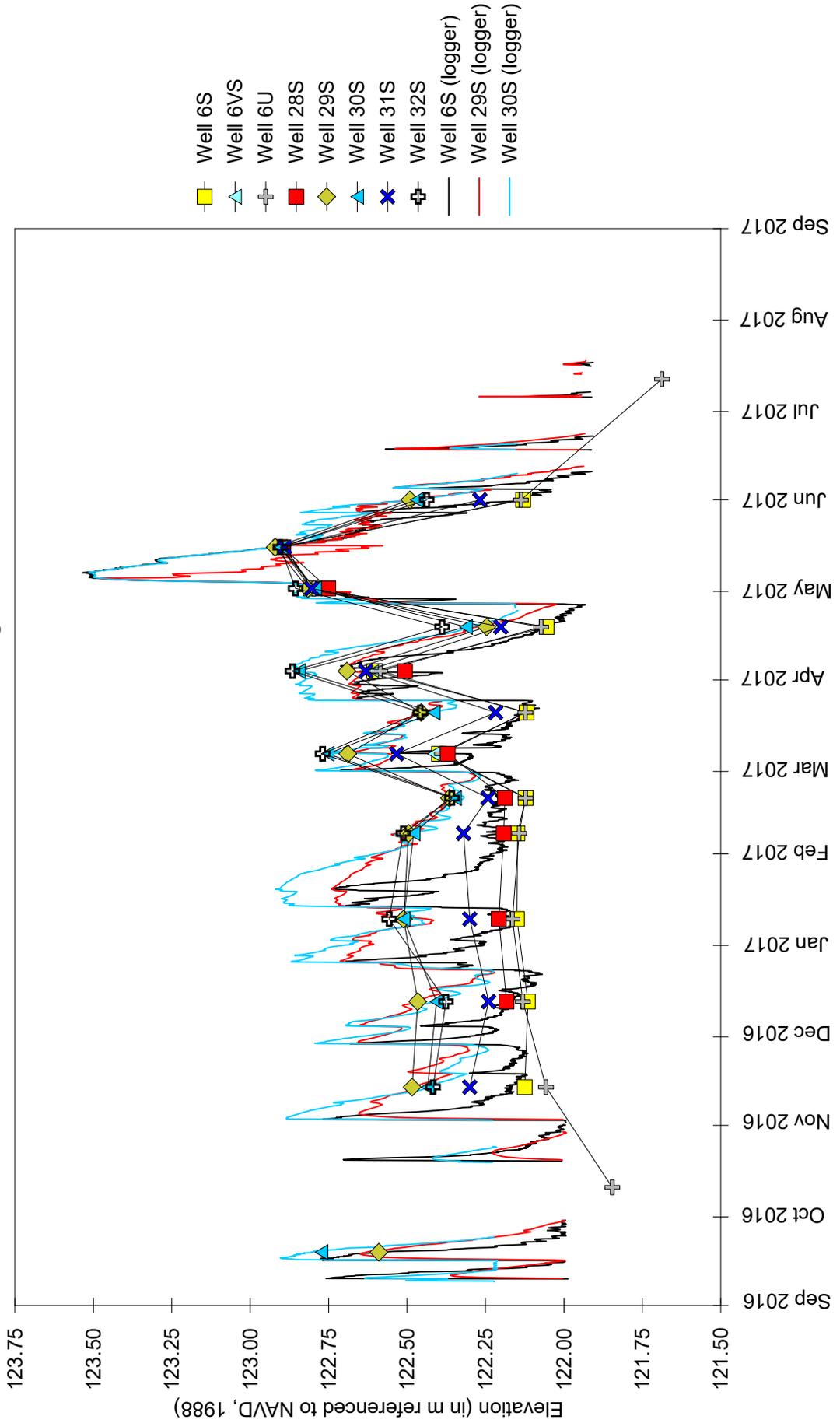


Fairmont City Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

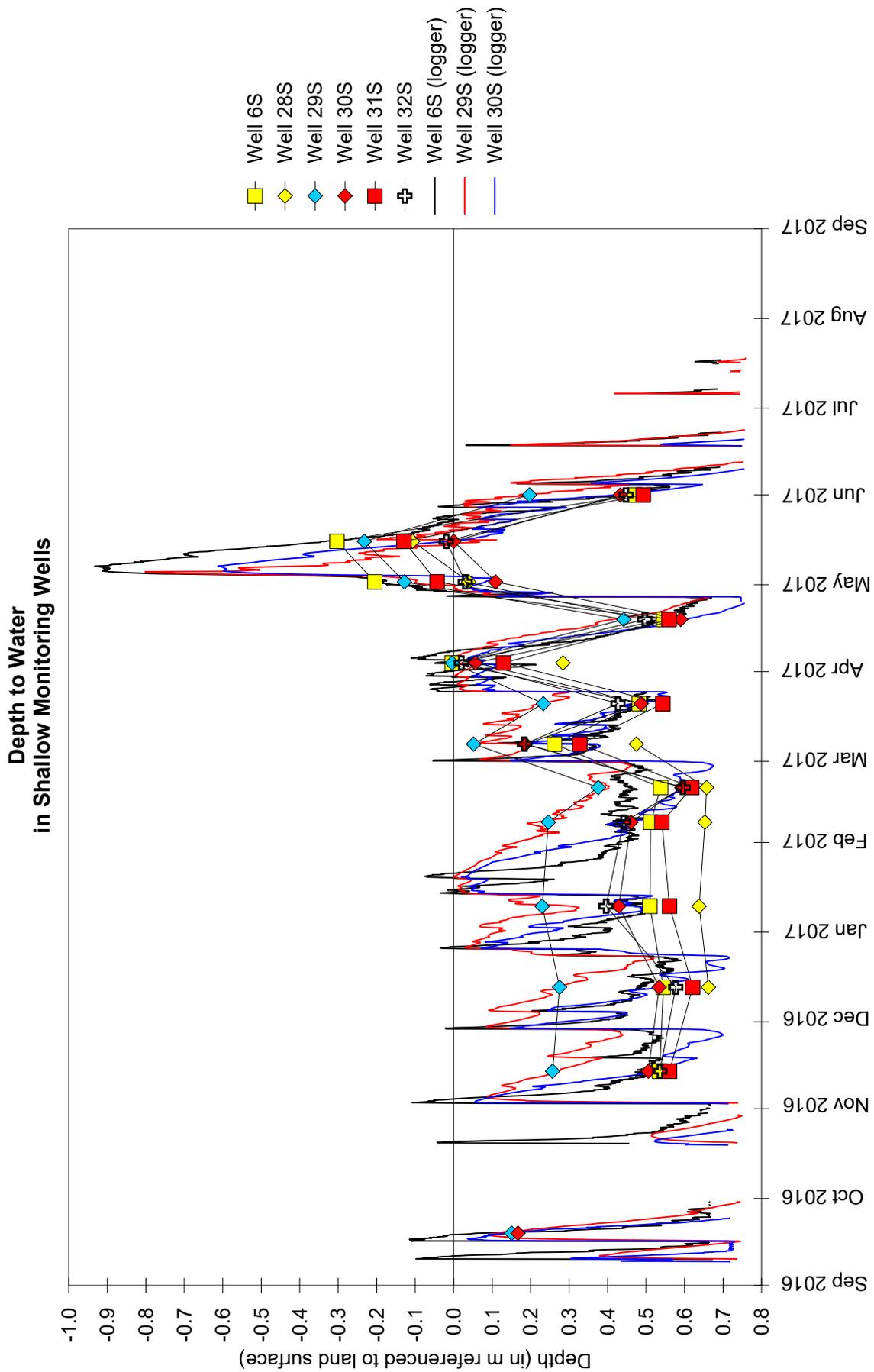


Fairmont City Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Shallow Monitoring Wells



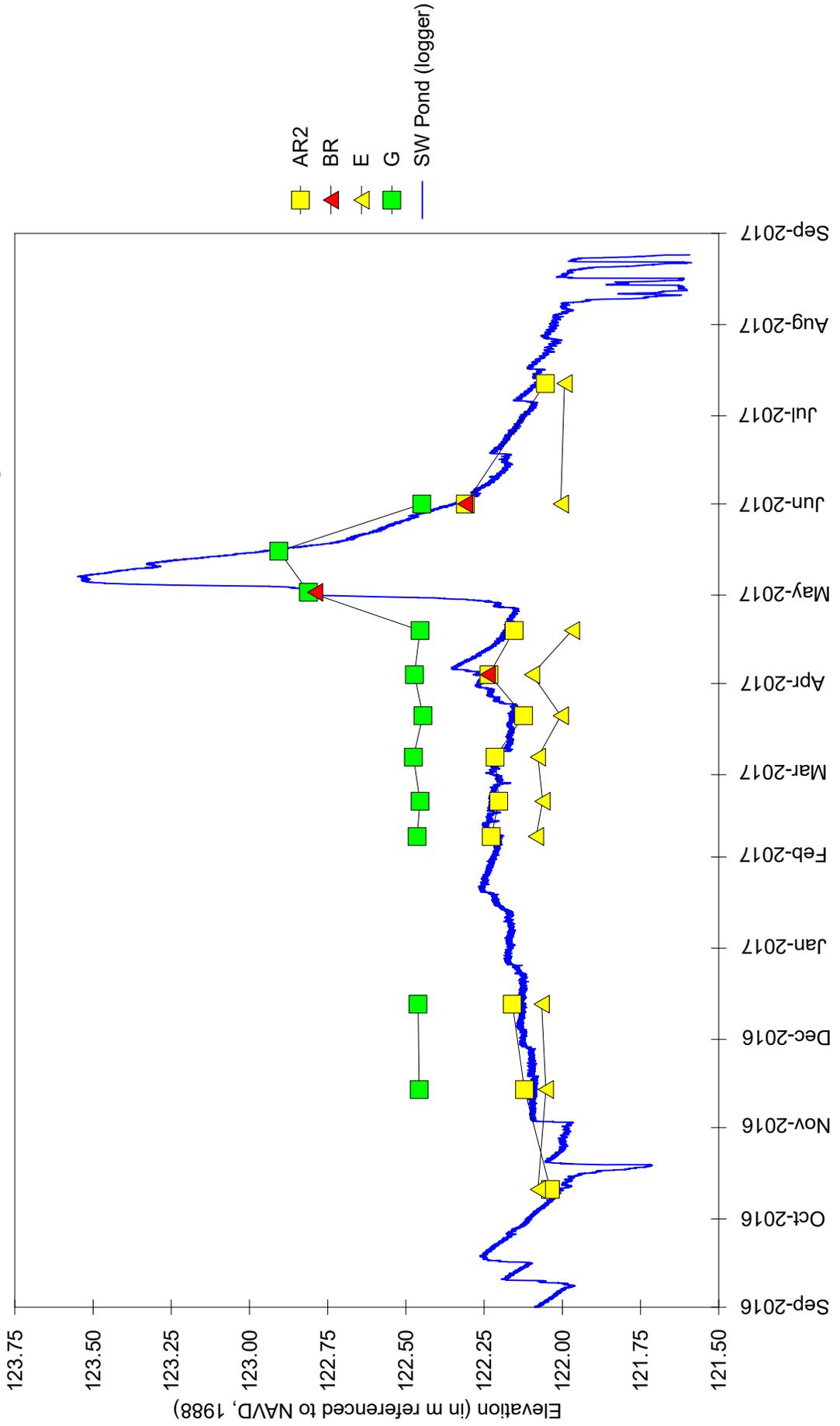
Fairmont City Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017



Fairmont City Potential Wetland Mitigation Site

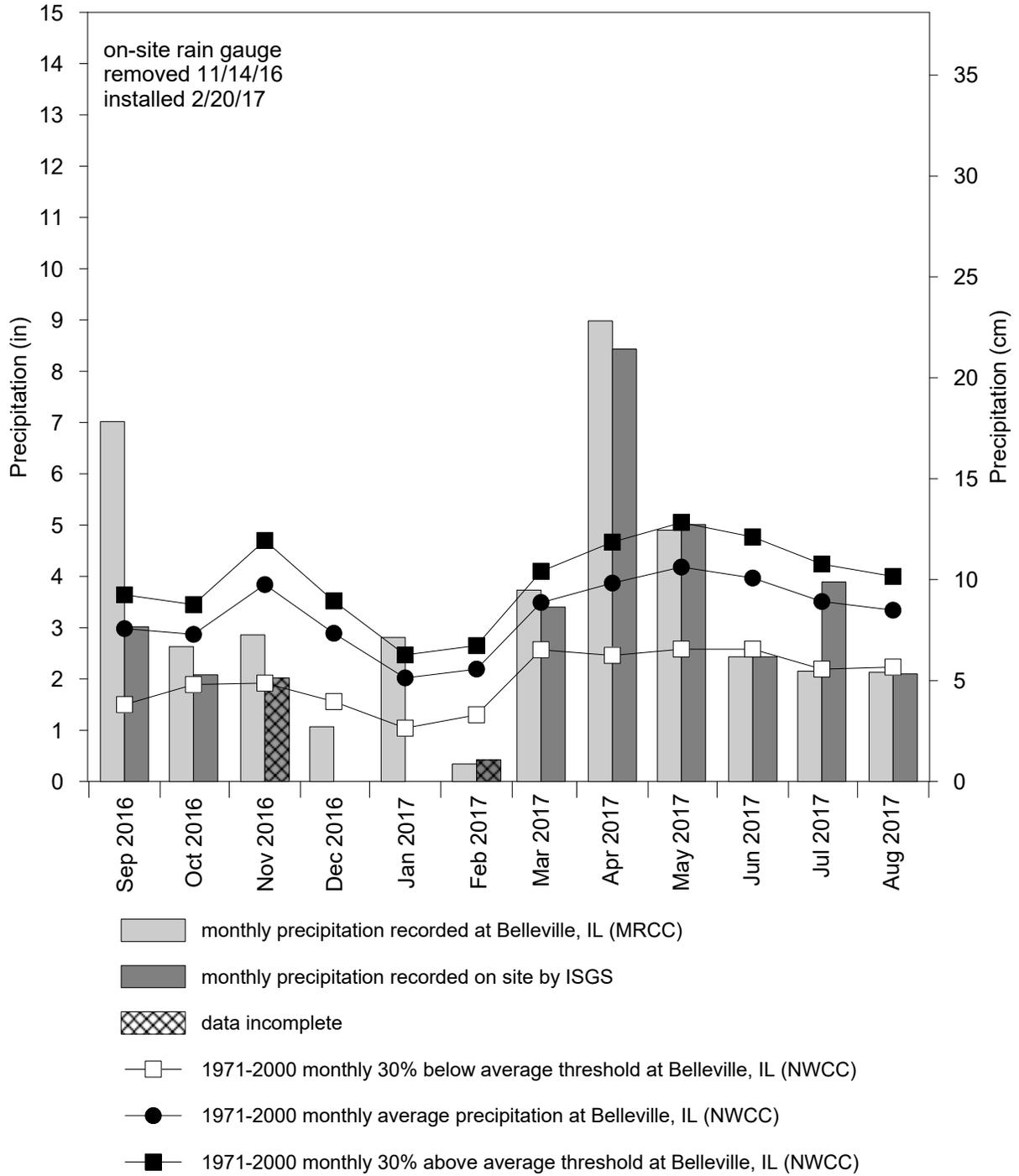
September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



Fairmont City Potential Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Belleville, IL (MRCC station #110510)**



**FORMER TIERNAN PROPERTY
POTENTIAL WETLAND MITIGATION SITE**

ISGS #57

FAP 14

Sequence #27

St. Clair County, near Cahokia, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- July 2000: ISGS was tasked to perform a Level II hydrogeologic assessment of the site.
- July 2005: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2005–11).

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Former Tiernan Property wetland mitigation site is 17.04 ha (42.10 ac). Using the 1987 Manual (Environmental Laboratory 1987), 18.33 ha (45.30 ac), out of a total site area of 26.43 ha (65.30 ac), satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season and 10.62 ha (26.25 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 18.13 ha (44.81 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Belleville, Illinois, is April 4 and the season lasts 204 days (MRCC 2017); 5% of the growing season is 10 days and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, February 7 was the starting date of the 2017 growing season based on soil temperatures measured on site and at the Belleville SIU Research Station.
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 105% of normal. Precipitation in spring 2017 (March through May) was 153% of normal. The wettest month was April at 232% of normal.
- The period of maximum inundation and saturation during the growing season differed due to differing water sources. In the portion of the site north of well cluster 23, the wettest period occurred in March due to precipitation and perched groundwater, though portions of the area were saturated or inundated almost continuously from March through May. In the portion of the site south of well cluster 23, the wettest period occurred in May due to a flood event on the Mississippi River that began April 30, 2017 and ended May 27, 2017. However, inundation began earlier in April due to back flooding from Blue Waters Ditch which typically occurs when the Mississippi River at St. Louis reaches a stage of about 6.1 m (20.0 ft). The river was at or above that stage from April 2 to June 16, which corresponded to the presence of surface water in this portion of the site (gauges E, F, and G).

- In 2017, water levels measured in 30 of 36 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 16 of 36 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 29 of 36 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	N	N	N
2S	Y	Y	Y
4S	Y	N	Y
5S	Y	Y	Y
6S	N	N	N
7S	N	N	N
10S	Y	Y	Y
11SR	Y	N	Y
12S	Y	N	Y
13S	Y	Y	Y
16S	Y	Y	Y
17S	Y	Y	Y
18S	Y	Y	Y
19SR	Y	Y	Y
22S	Y	Y	Y
23S	N	N	N
23VS	N	N	N
24S	Y	N	N
24VS	Y	N	Y
25S	Y	N	Y
25VS	N	N	Y
26S	Y	N	Y
26VS	Y	N	Y
27SR2	Y	N	Y
27VS	Y	N	Y
28S	Y	N	N
28VS	Y	N	Y
29S	Y	Y	Y
29VS	Y	Y	Y
30S	Y	Y	Y
30VS	Y	Y	Y
31S	Y	Y	Y
31VS	Y	Y	Y
32S	Y	N	Y
33S	Y	N	Y
34S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

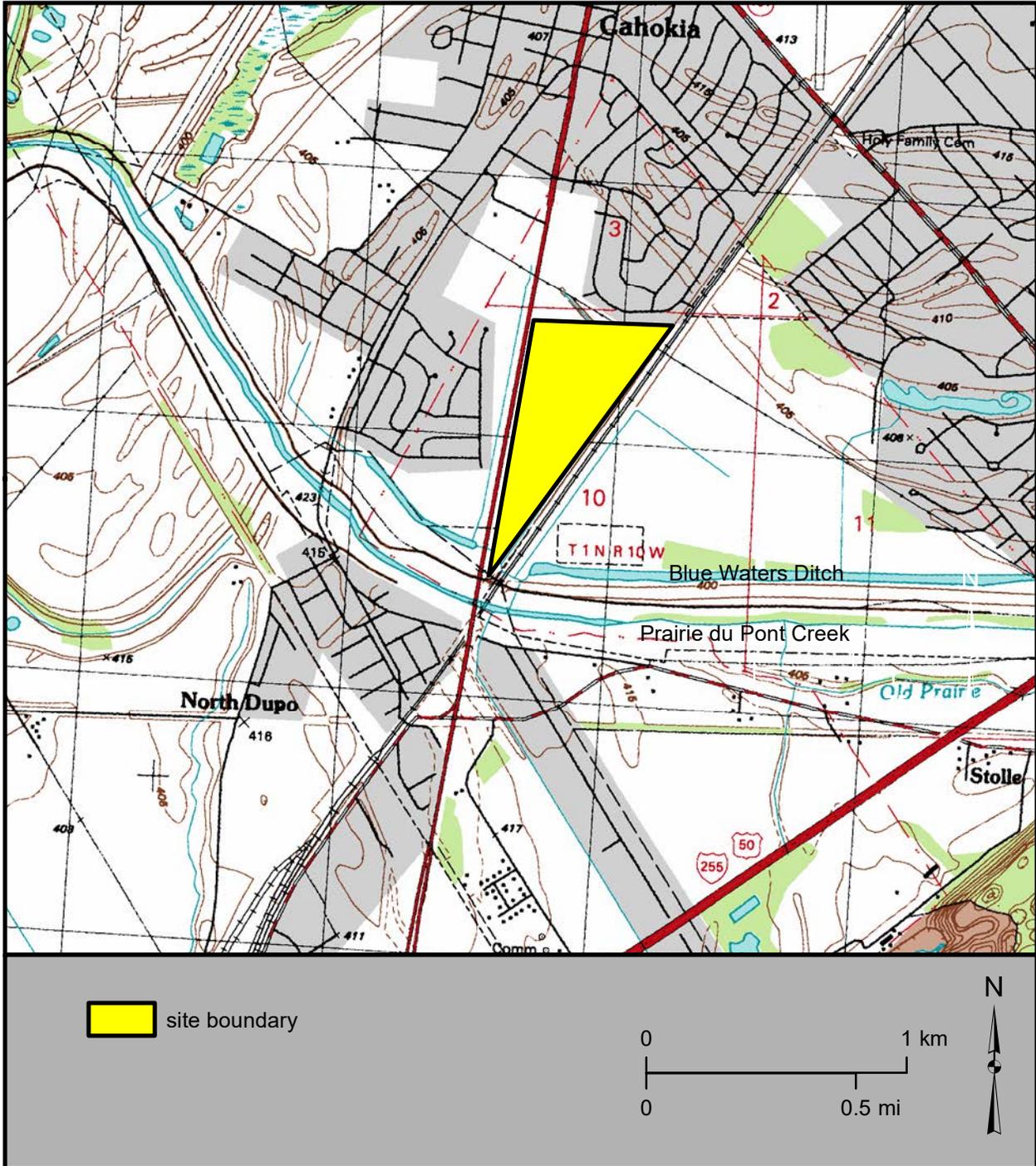
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
E	121.36 m (398.16 ft)	121.34 m (398.10 ft)	121.35 m (398.13 ft)
F	121.36 m (398.16 ft)	121.34 m (398.10 ft)	121.35 m (398.13 ft)
G	121.36 m (398.16 ft)	121.34 m (398.10 ft)	121.35 m (398.13 ft)
H	121.67 m (399.18 ft)	n/a	121.62 m (399.02 ft)

n/a – insufficient data to determine an elevation

Former Tiernan Property, Potential Wetland Mitigation Site (FAP 14)

General Study Area and Vicinity

from the USGS Topographic Series, Cahokia, IL, 7.5-minute quadrangle (USGS 1954a)



Former Tiernan Property, Potential Wetland Mitigation Site (FAP 14)

Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

Map based on 2012 Farm Service Agency digital orthophotography, St. Clair County, Illinois (USDA-FSA 2012)



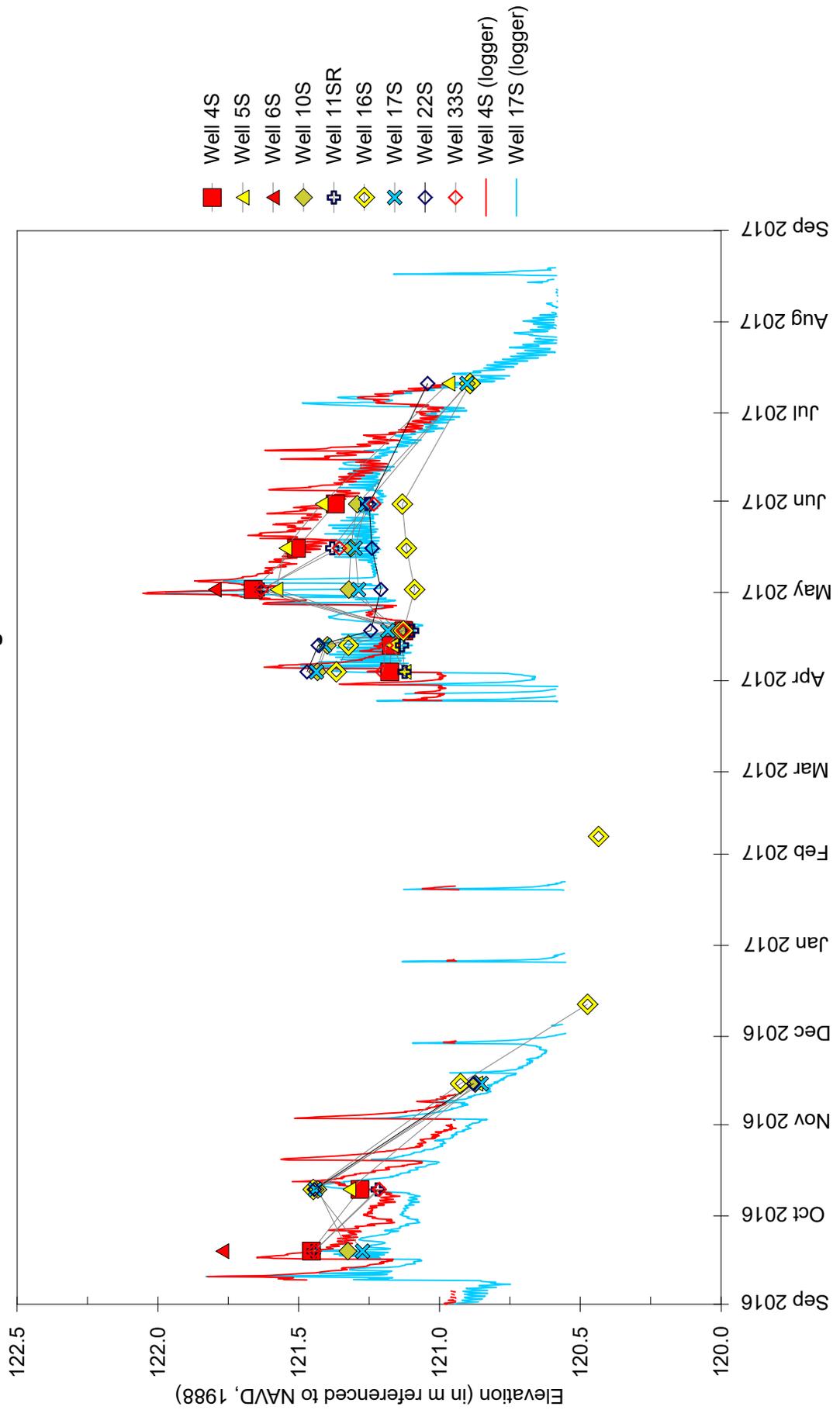
2017 Wetland Hydrology

- >5% of growing season (1987 Manual)
- >12.5% of growing season (1987 Manual)
- 14 days or more (2010 Midwest Region Supplement)

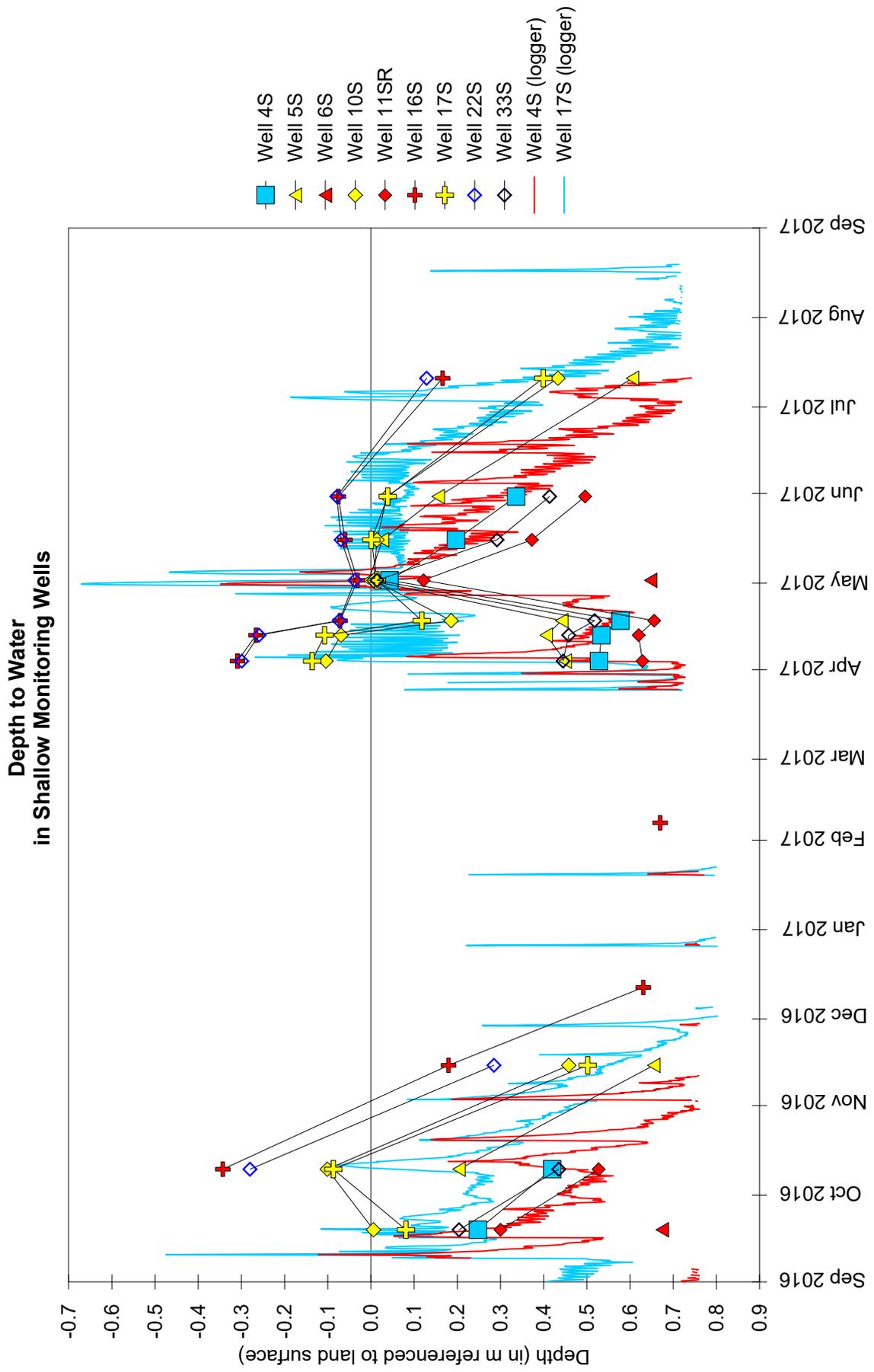
- monitoring well
- surface-water gauge
- * rain gauge
- site boundary

Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

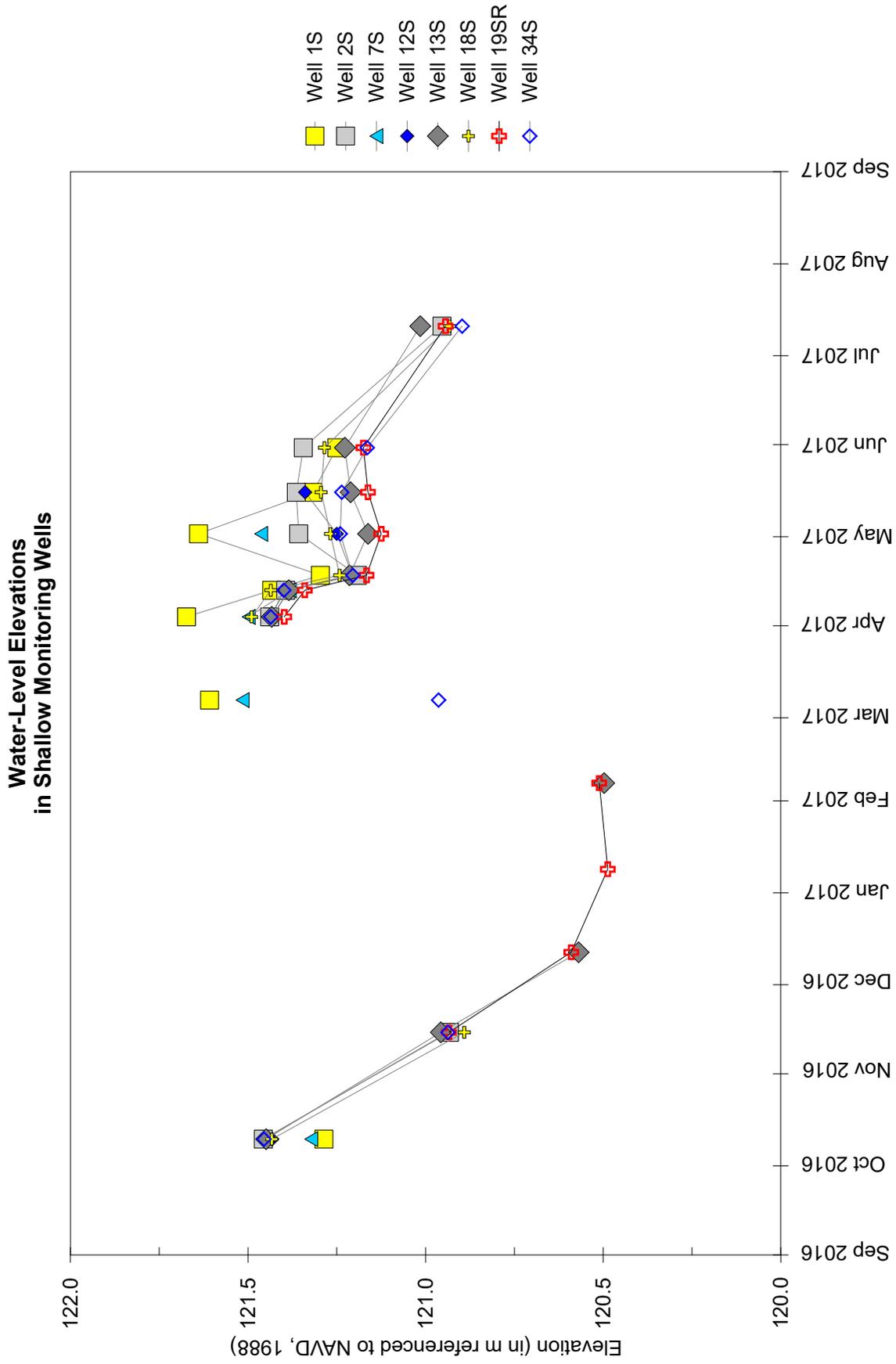
Water-Level Elevations in Shallow Monitoring Wells



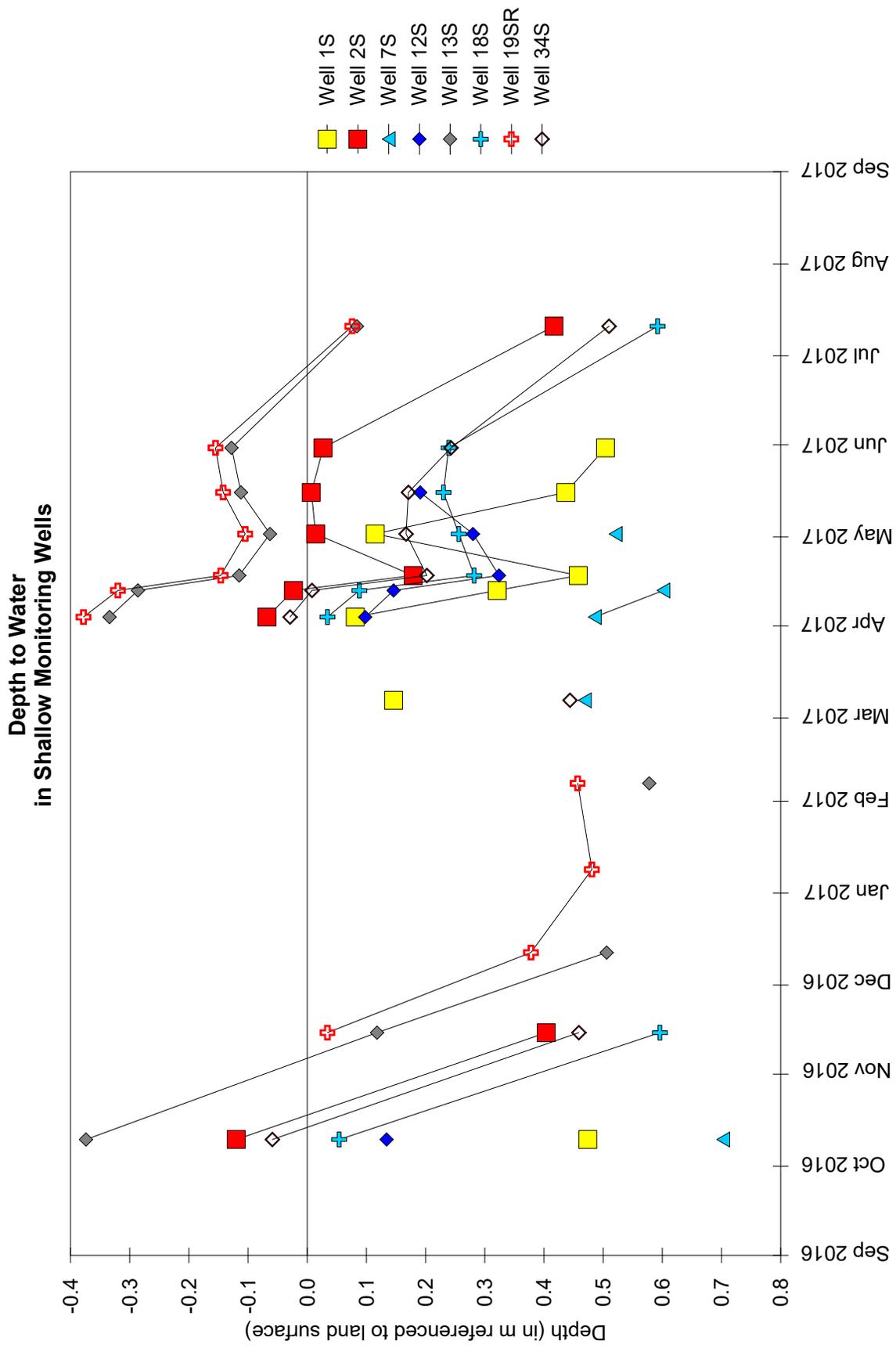
Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017



Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

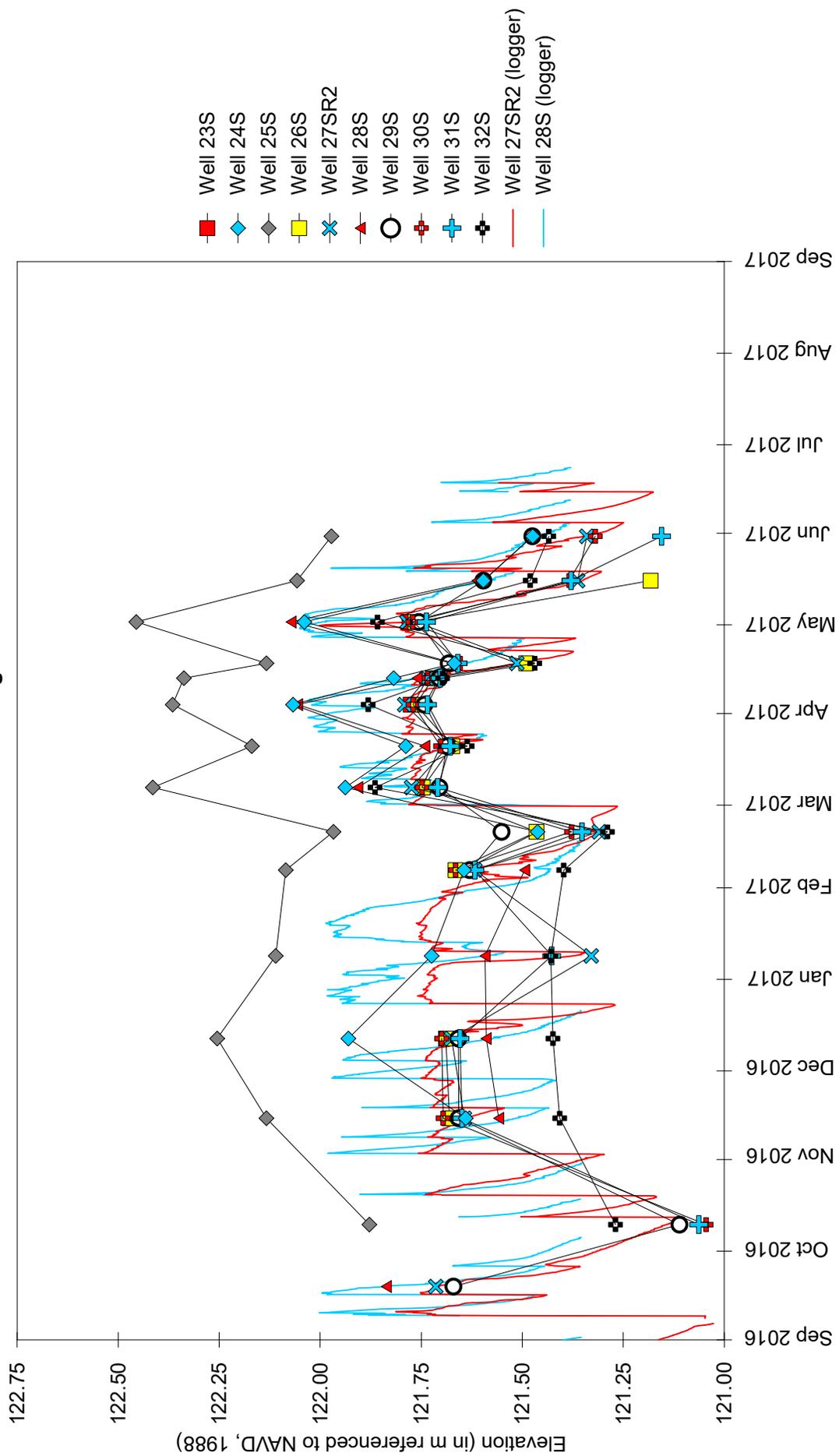


Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017



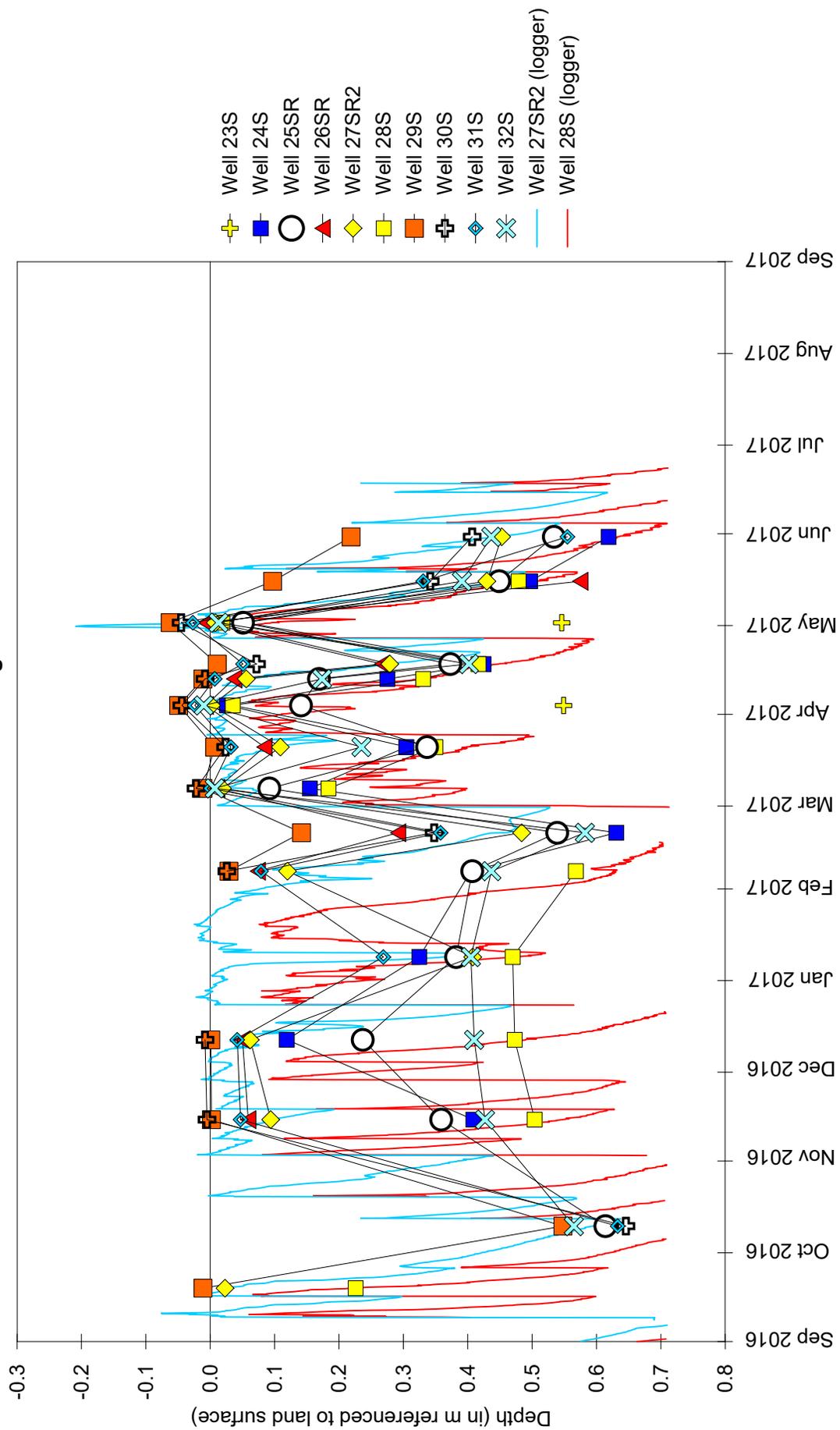
Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Shallow Monitoring Wells



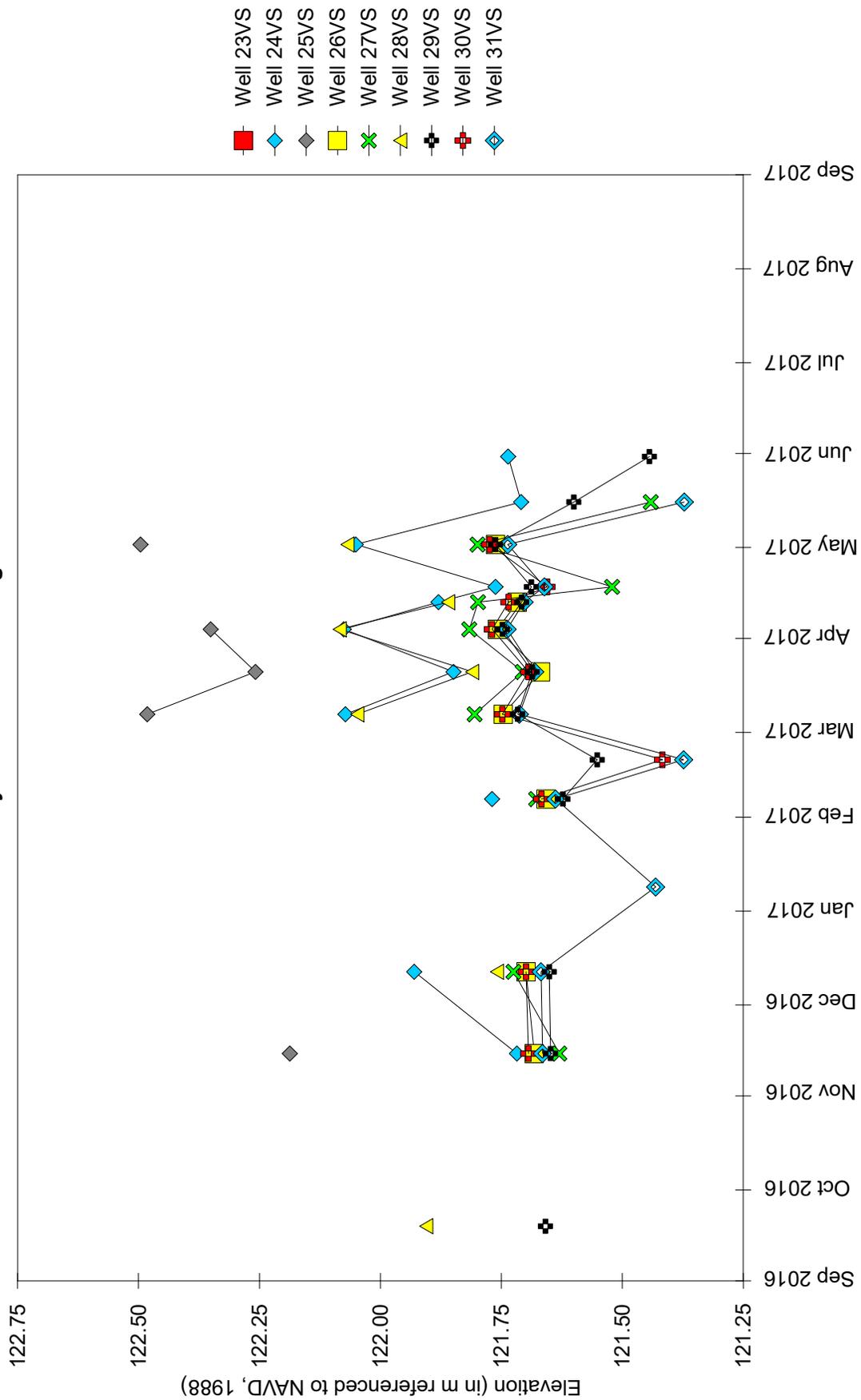
Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Depth to Water
in Shallow Monitoring Wells

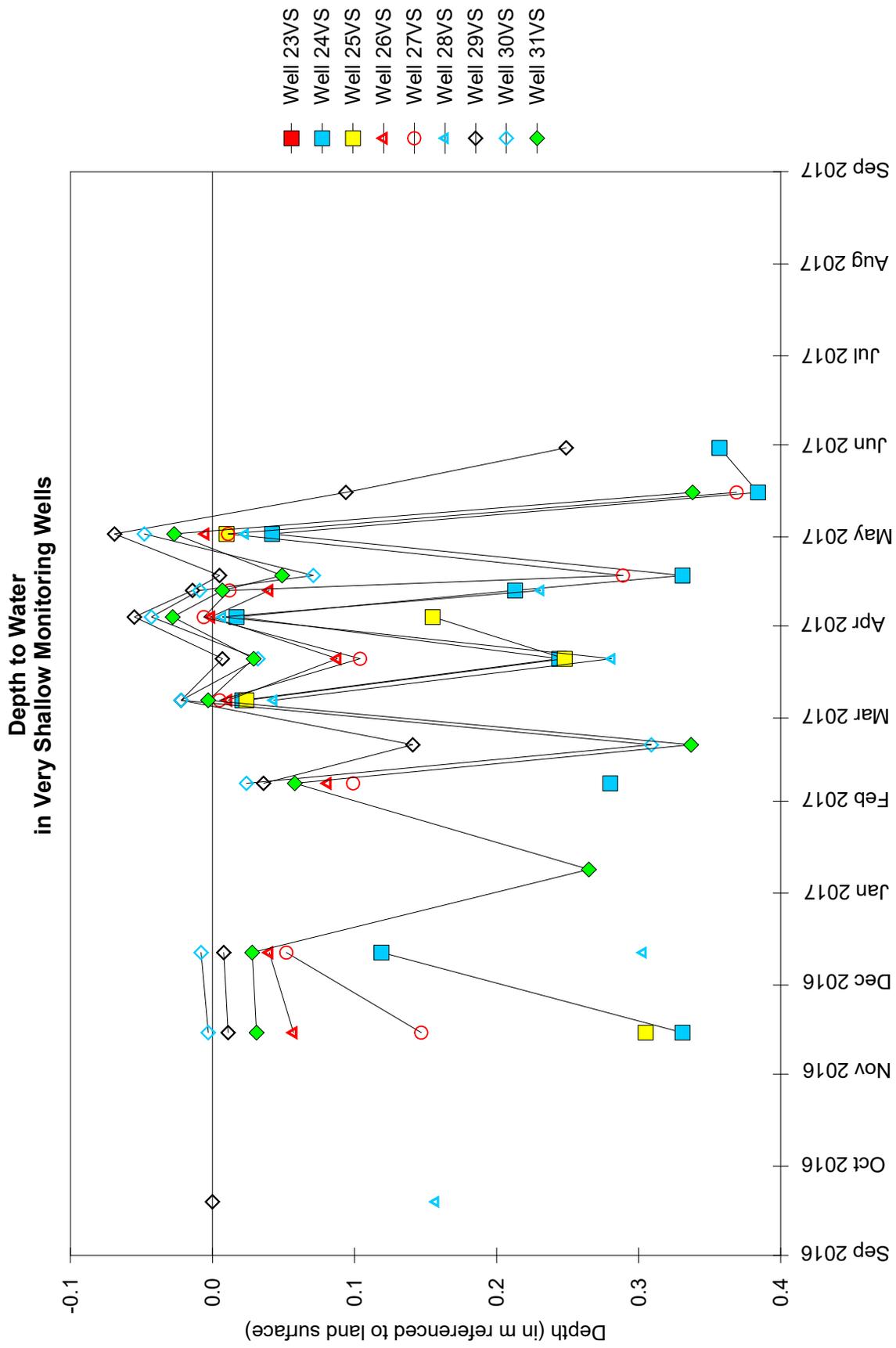


Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Very Shallow Monitoring Wells

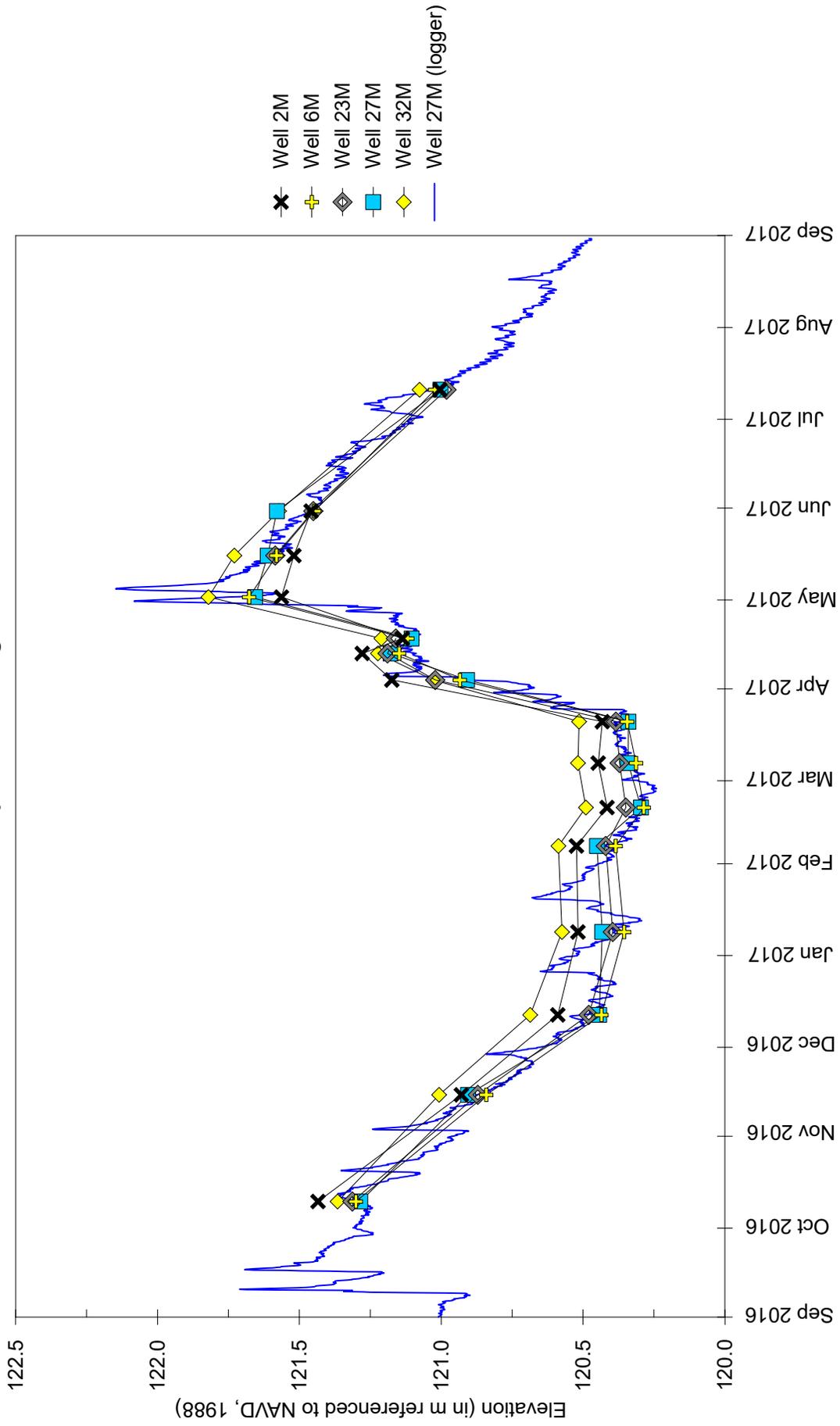


Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

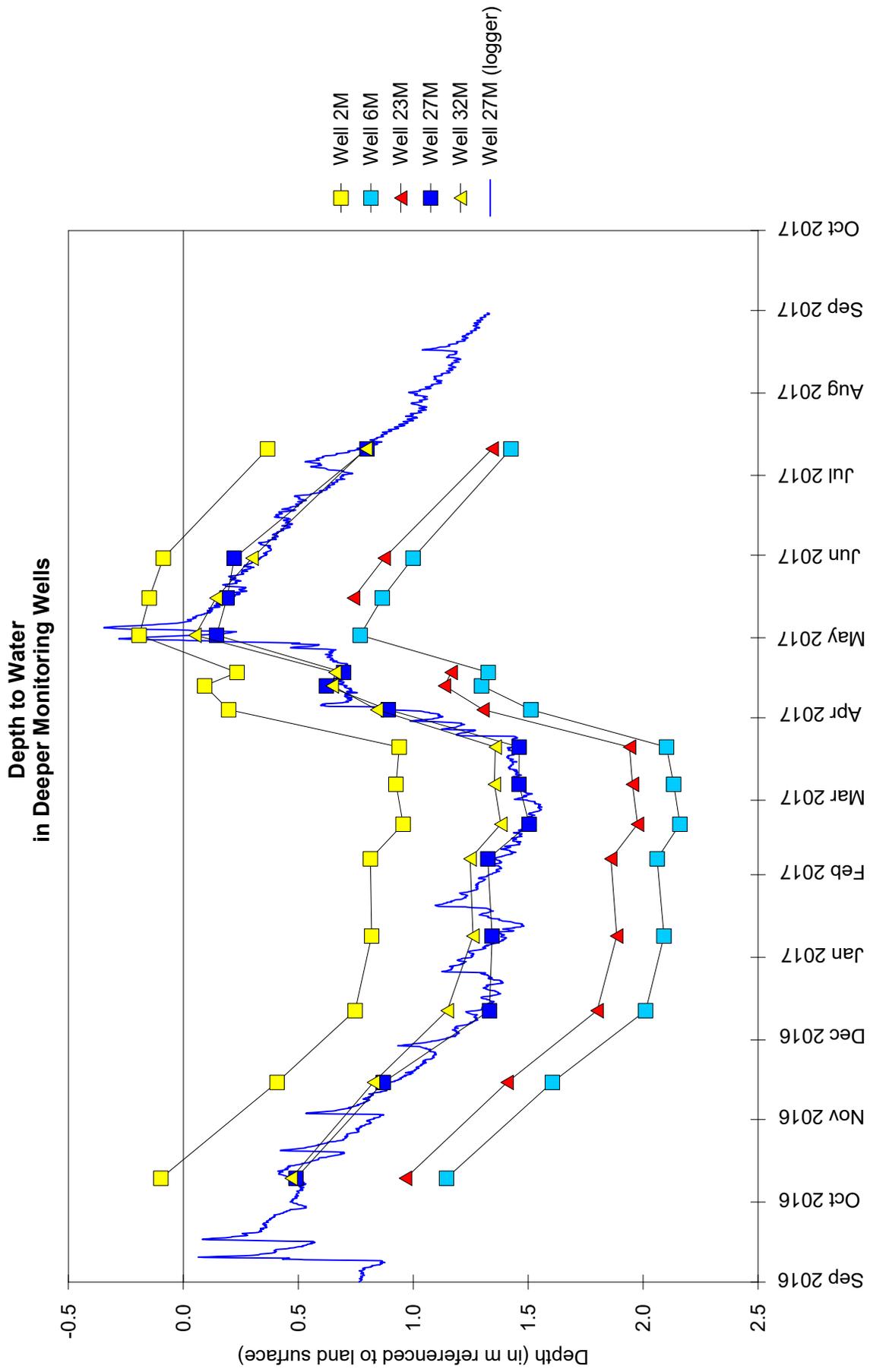


Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Deepest Monitoring Wells

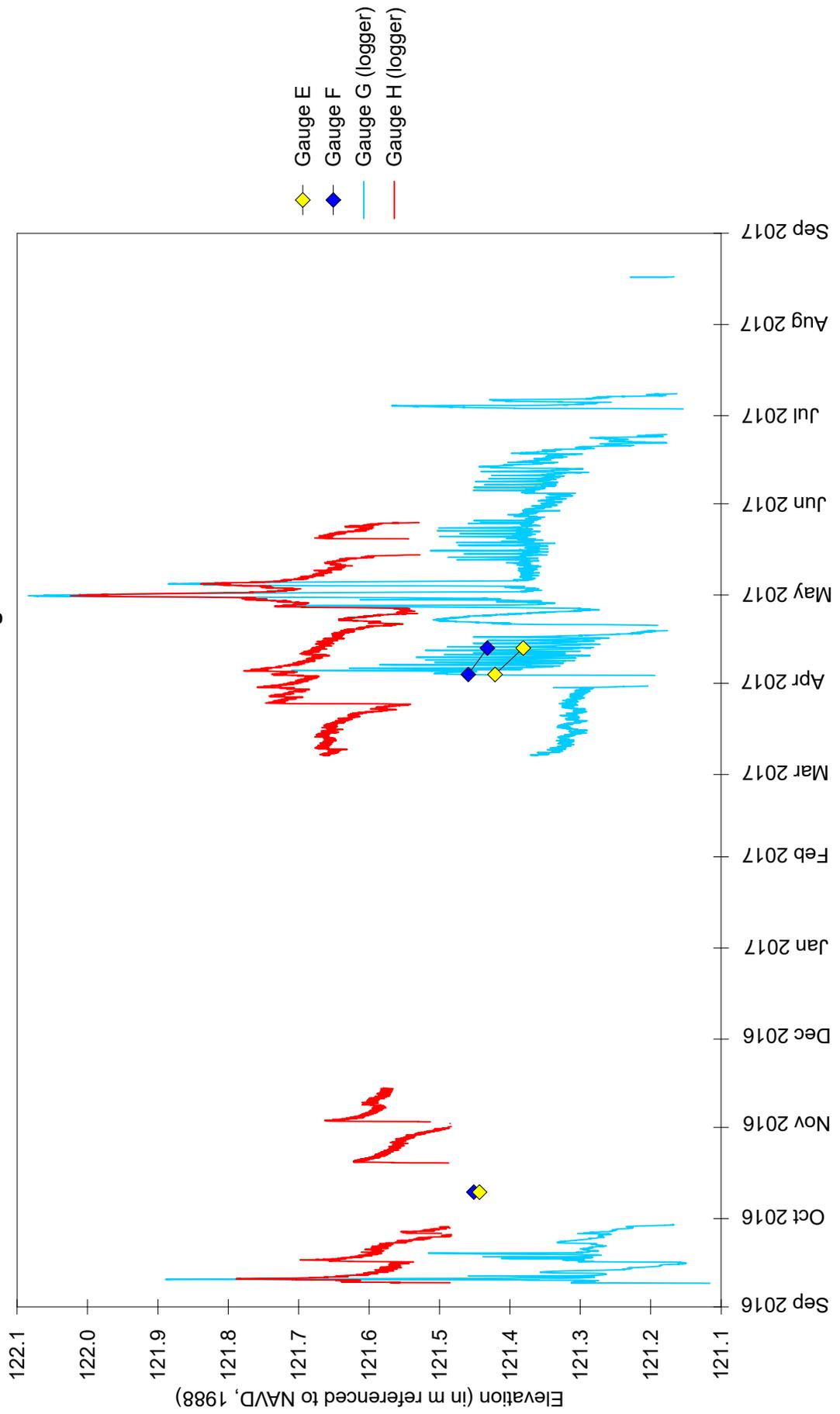


Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017



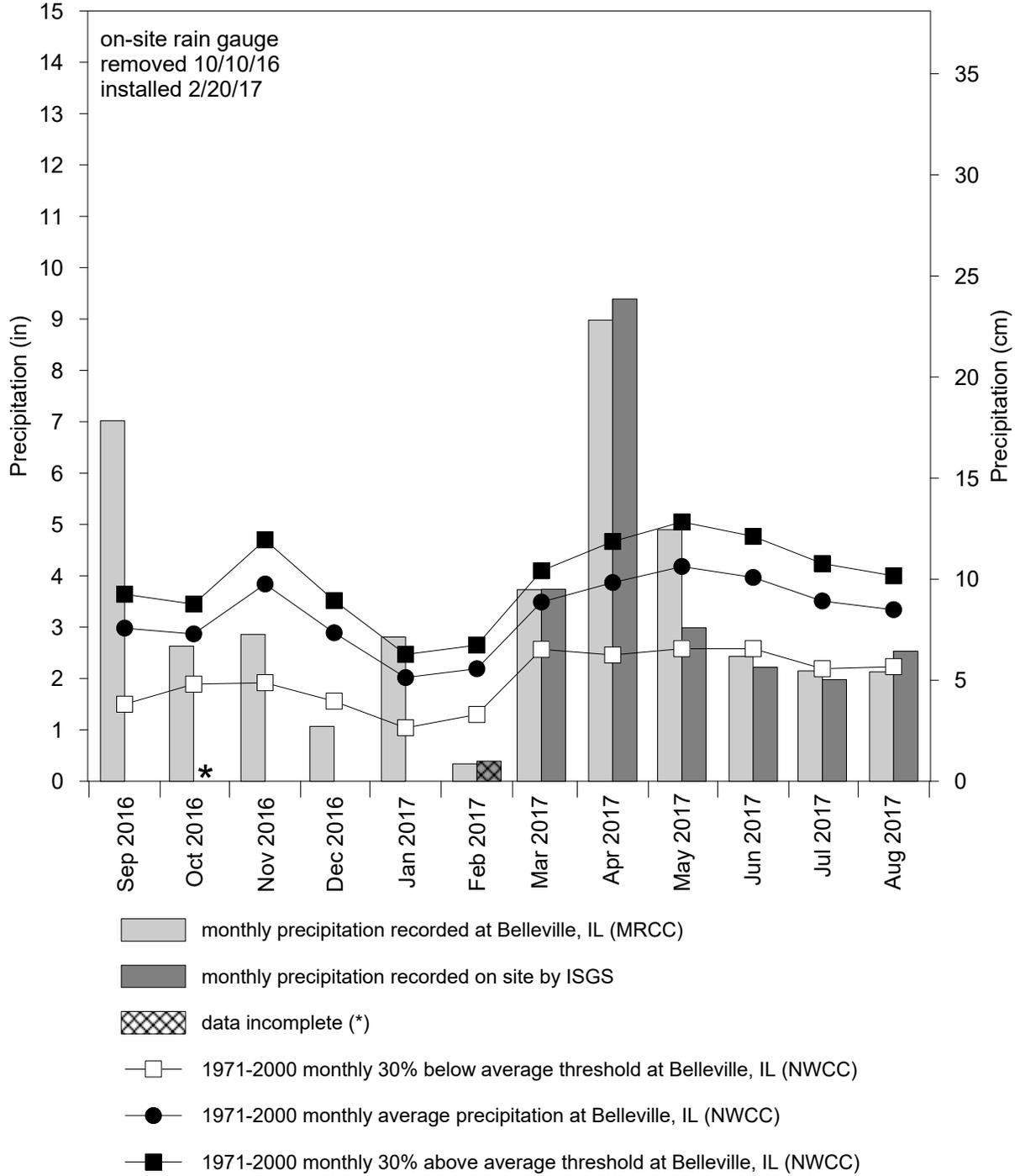
Former Tiernan Property Potential Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



Former Tiernan Property Potential Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Belleville, IL (MRCC station #110510)**



SUGAR CAMP CREEK

ISGS #74

WETLAND AND STREAM MITIGATION BANK

Sequence #9282

Franklin County, Northern Township, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Joshua J. Richardson

SITE HISTORY

- December 2004: ISGS submitted an initial site evaluation report to IDOT.
- March 2007: ISGS submitted the Level II hydrogeologic characterization report to IDOT (ISGS Open-File Series 2007-02).
- June 2009: A wetland and stream mitigation banking instrument was approved by the Interagency Review Team.
- August 2011: IDOT tasked ISGS to monitor Phase 1 of the Sugar Camp Creek Wetland and Stream Mitigation Bank for performance standards.
- Summer 2013: Trees were planted in Phase 2.

WETLAND HYDROLOGY CALCULATION FOR 2017

The total target compensation area, including Phase 1 and Phase 2 of the Sugar Camp Creek wetland mitigation bank, is 28.00 ha (69.20 ac). Using the 1987 Manual (Environmental Laboratory 1987), 29.81 ha (73.66 ac) of the total bank area of 42.57 ha (105.20 ac) satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season, and 27.57 ha (68.12 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 29.85 ha (73.76 ac) of the wetland bank satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. The areas that satisfied wetland hydrology criteria within each phase of the mitigation bank can be found in the 'Additional Information' section below. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Du Quoin, Illinois, is March 30, and the season lasts 217 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured on site and at the nearby Harrisburg, Site 3, wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at nearby West Frankfort, Illinois (MRCC #119148), was 108% of normal, and spring 2017 (March through May) precipitation was 160% of normal. Precipitation during April 2017 was particularly excessive with 314% of normal rainfall.
- Sugar Camp Creek flooded portions of the site four times during the growing season. None of these floods lasted long enough to satisfy wetland hydrology criteria.

- The period of maximum inundation and saturation during the 2017 growing season occurred during late April into early May in response to a combination of intense rainfall in late April and flooding from Sugar Camp Creek. During April 26-30 a total of 19.46 cm (7.66 in.) precipitation was recorded at the site. Also, three brief flood events covered portions of the site on April 27, April 29, and May 4.
- In 2017, water levels measured in 29 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 22 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. Using the 2010 Midwest Region Supplement, water levels in 29 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Phase 1 of the wetland mitigation bank is in year 6 and Phase 2 is in year 4 of post-construction monitoring. Therefore, we present wetland hydrology acreage separately for each phase in this section. Using the 1987 Manual (Environmental Laboratory 1987), 14.58 ha (36.02 ac) of Phase 1 and 15.23 ha (37.64 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 5% of the growing season, and 13.29 ha (32.83 ac) of Phase 1 and 14.28 ha (35.29 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement, 14.62 ha (36.12 ac) of Phase 1 and 15.23 ha (37.64 ac) of Phase 2 satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season.

PLANNED FUTURE ACTIVITIES

- Data logger replacements are planned for fall 2017.
- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
11S	Y	Y	Y
19S	Y	Y	Y
33S	Y	N	Y
36VS	Y	Y	Y
37S	Y	N	Y
38S	Y	Y	Y
39S	Y	Y	Y
40S	Y	N	Y
41S	Y	Y	Y
42S	Y	Y	Y
43S	Y	N	Y
44S	Y	Y	Y
45S	Y	Y	Y
47S	Y	Y	Y
48S	Y	N	Y
49S	Y	Y	Y
50S	Y	Y	Y
51S	Y	Y	Y
52S	Y	Y	Y
53S	Y	Y	Y
54S	Y	Y	Y
55S	Y	Y	Y
56S	Y	Y	Y
57S	Y	Y	Y
58S	Y	Y	Y
59S	Y	Y	Y
61S	Y	Y	Y
62S	Y	N	Y
63S	Y	N	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

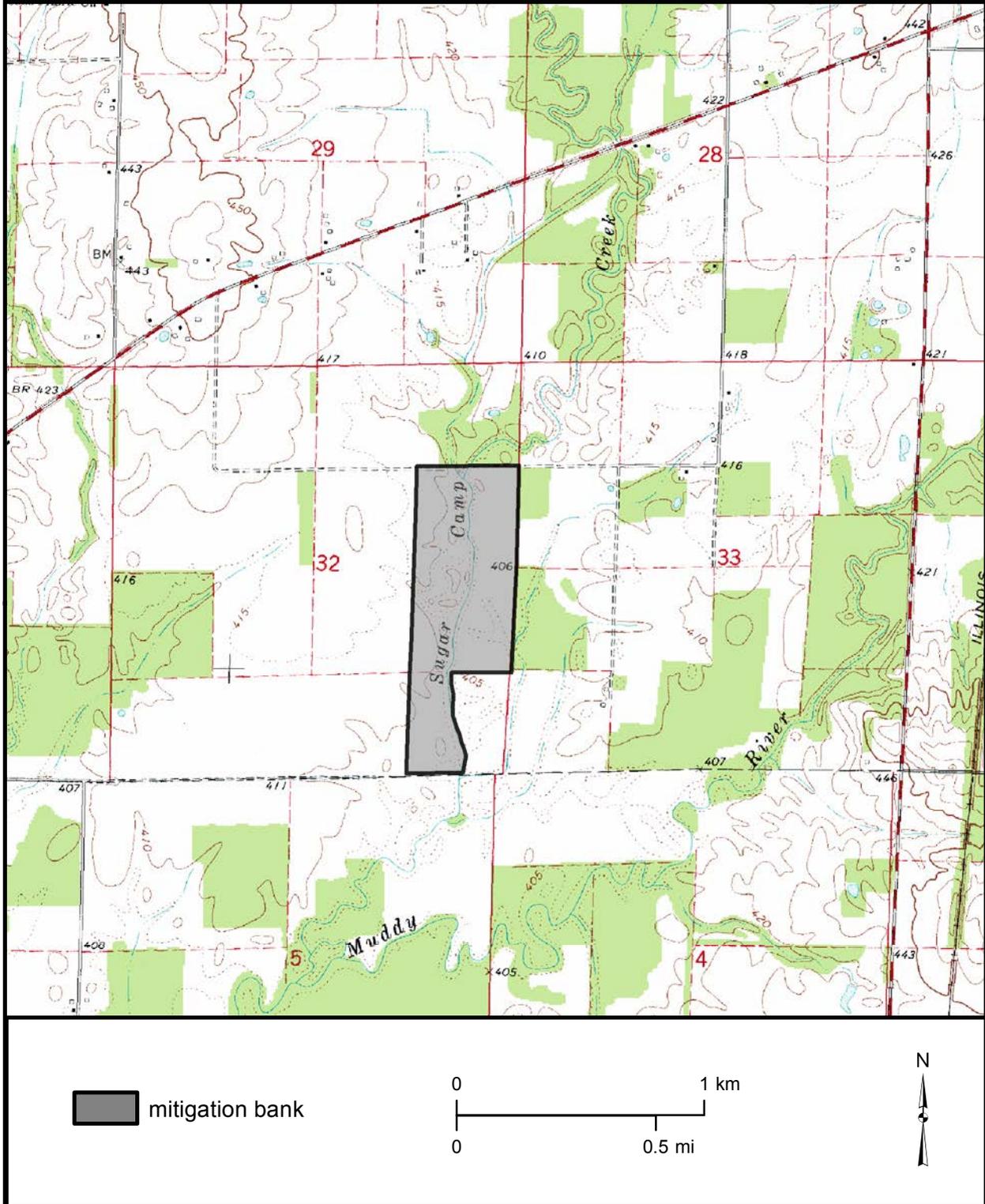
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
A	122.70 m (402.56 ft)	122.62 m (402.30 ft)	122.67 m (402.46 ft)
L	124.02 m (406.89 ft)	123.98 m (406.76 ft)	124.00 m (406.82 ft)
M	123.65 m (405.68 ft)	123.58 m (405.45 ft)	123.61 m (405.54 ft)
N	123.95 m (406.66 ft)	123.93 m (406.59 ft)	123.94 m (406.63 ft)
O	124.09 m (407.12 ft)	124.07 m (407.05 ft)	124.08 m (407.09 ft)
P	123.96 m (406.69 ft)	123.94 m (406.63 ft)	123.96 m (406.69 ft)

n/a – insufficient data to determine an elevation

Sugar Camp Creek Wetland and Stream Mitigation Bank

General Study Area and Vicinity

from the USGS Topographic Series, Ewing, IL, 7.5-minute Quadrangle (USGS 1974a)
contour interval is 10 feet

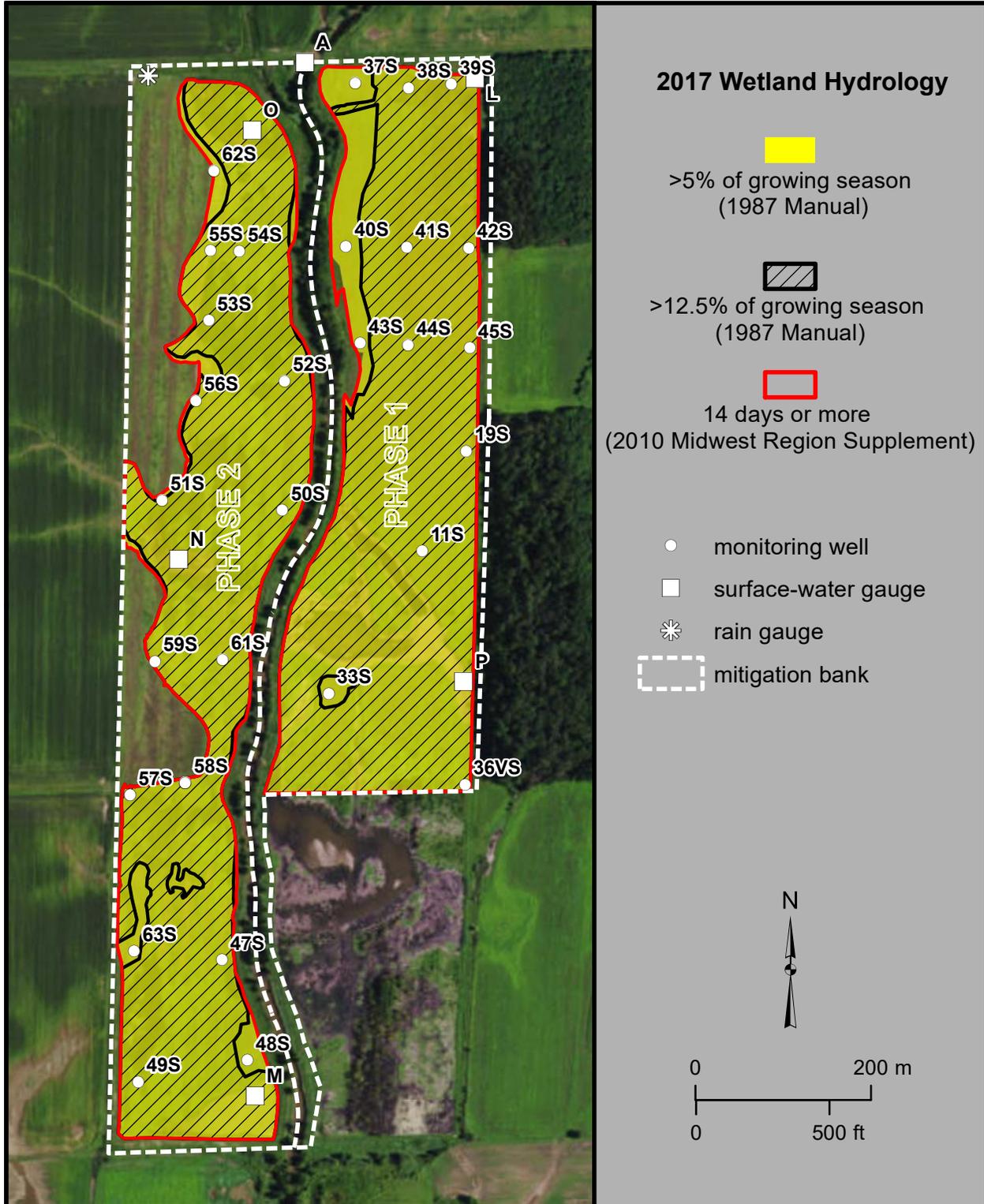


Sugar Camp Creek Wetland and Stream Mitigation Bank

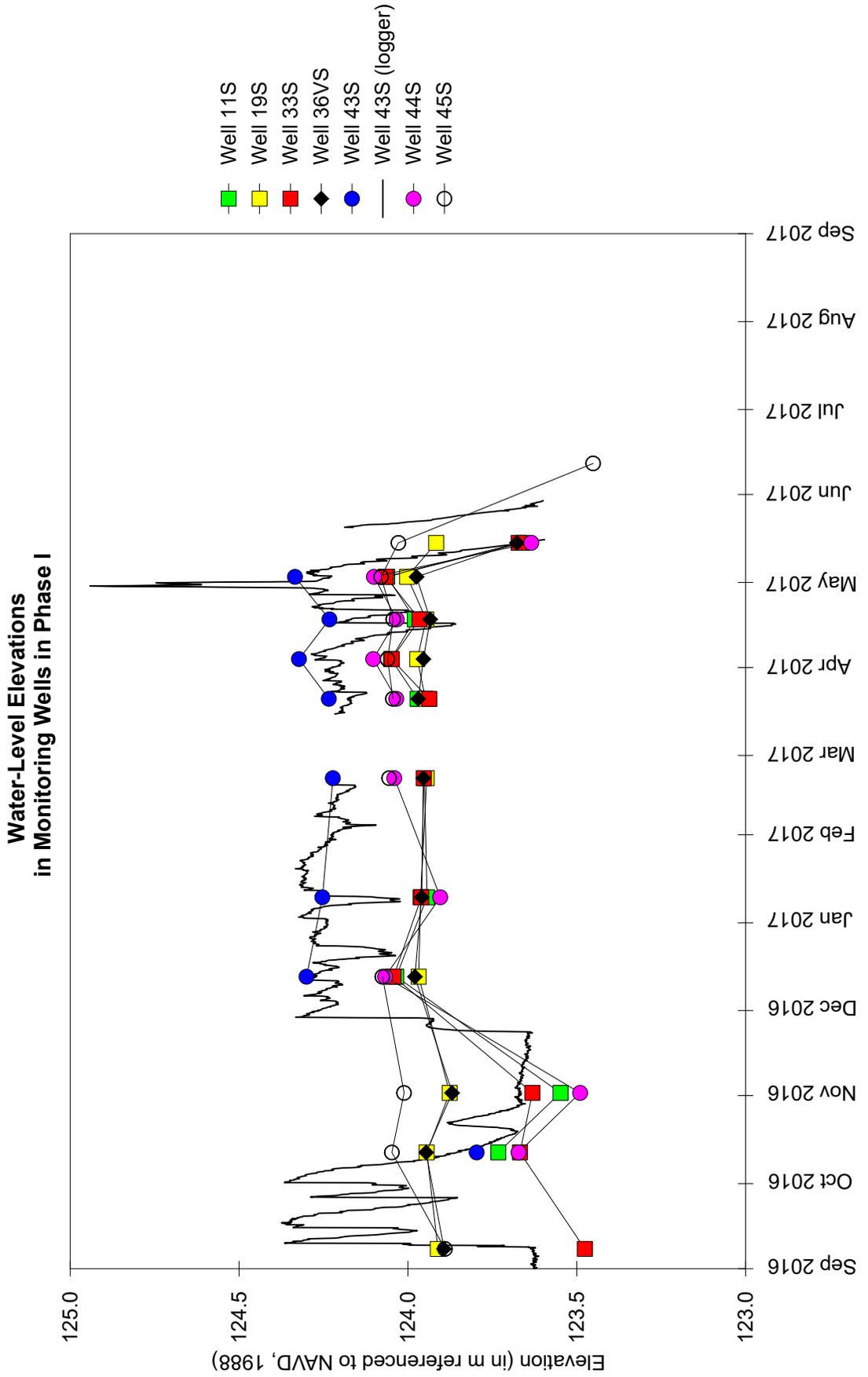
Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

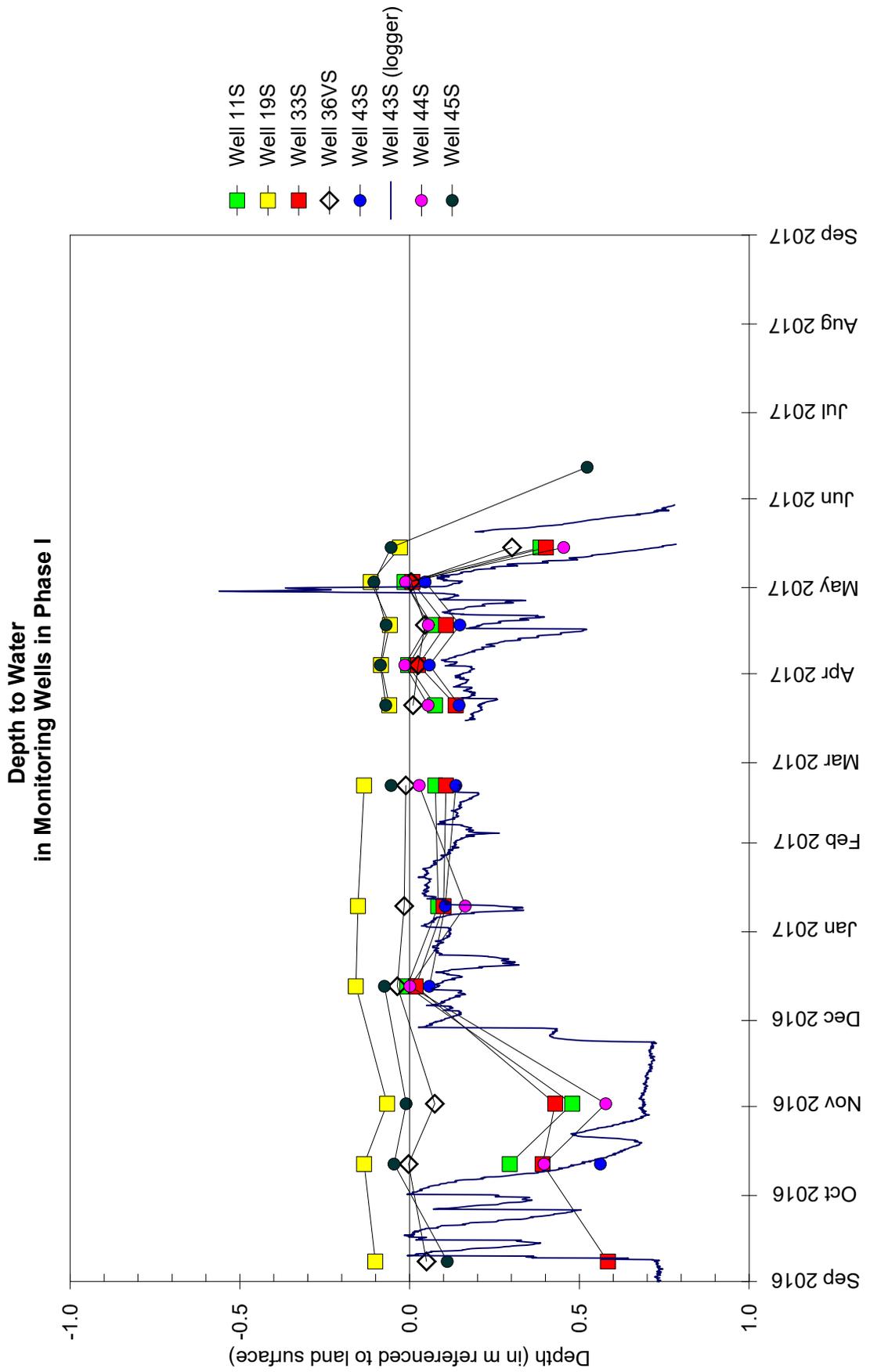
Map based on imagery available from Esri (Esri 2017)



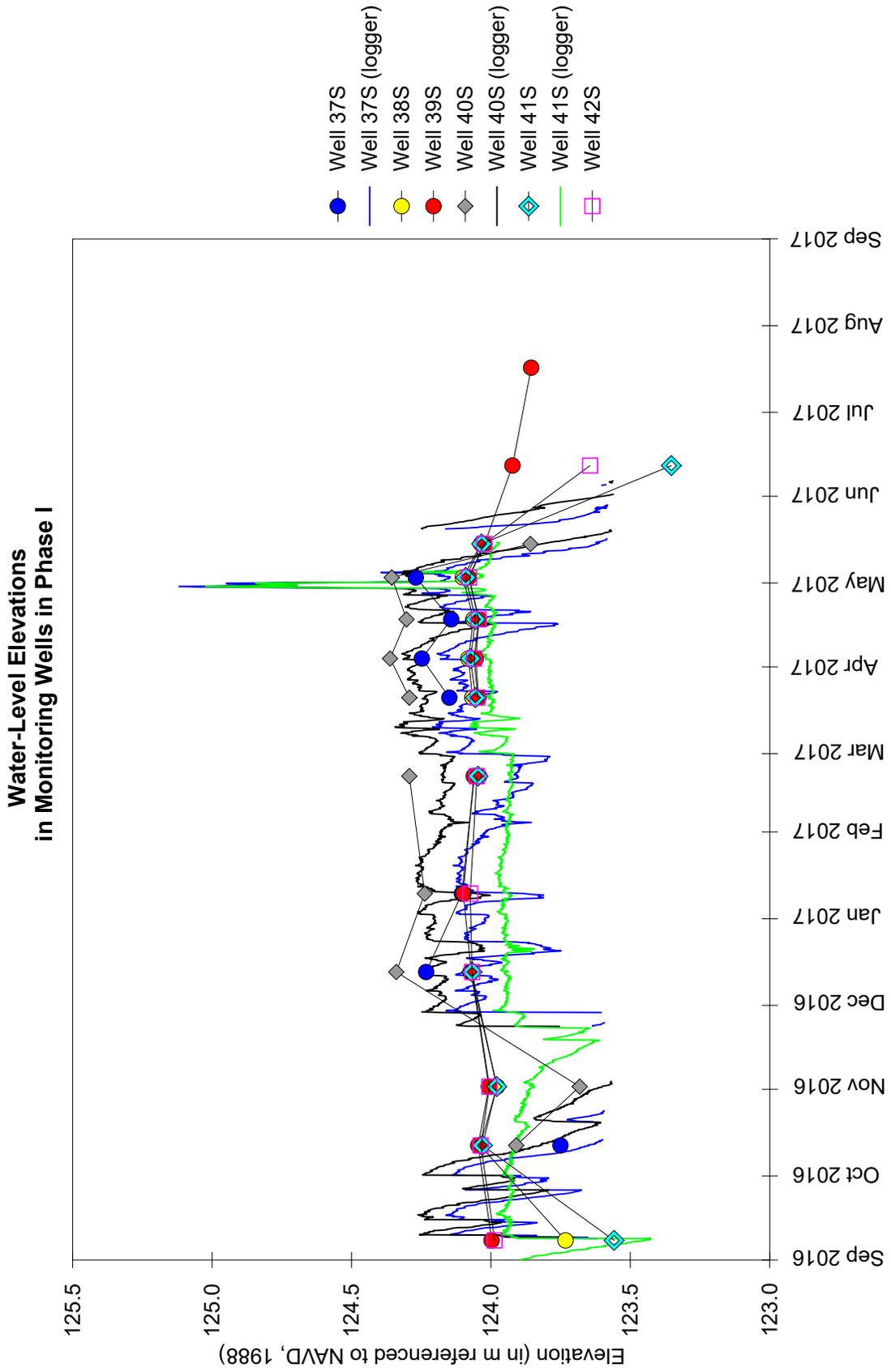
Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017



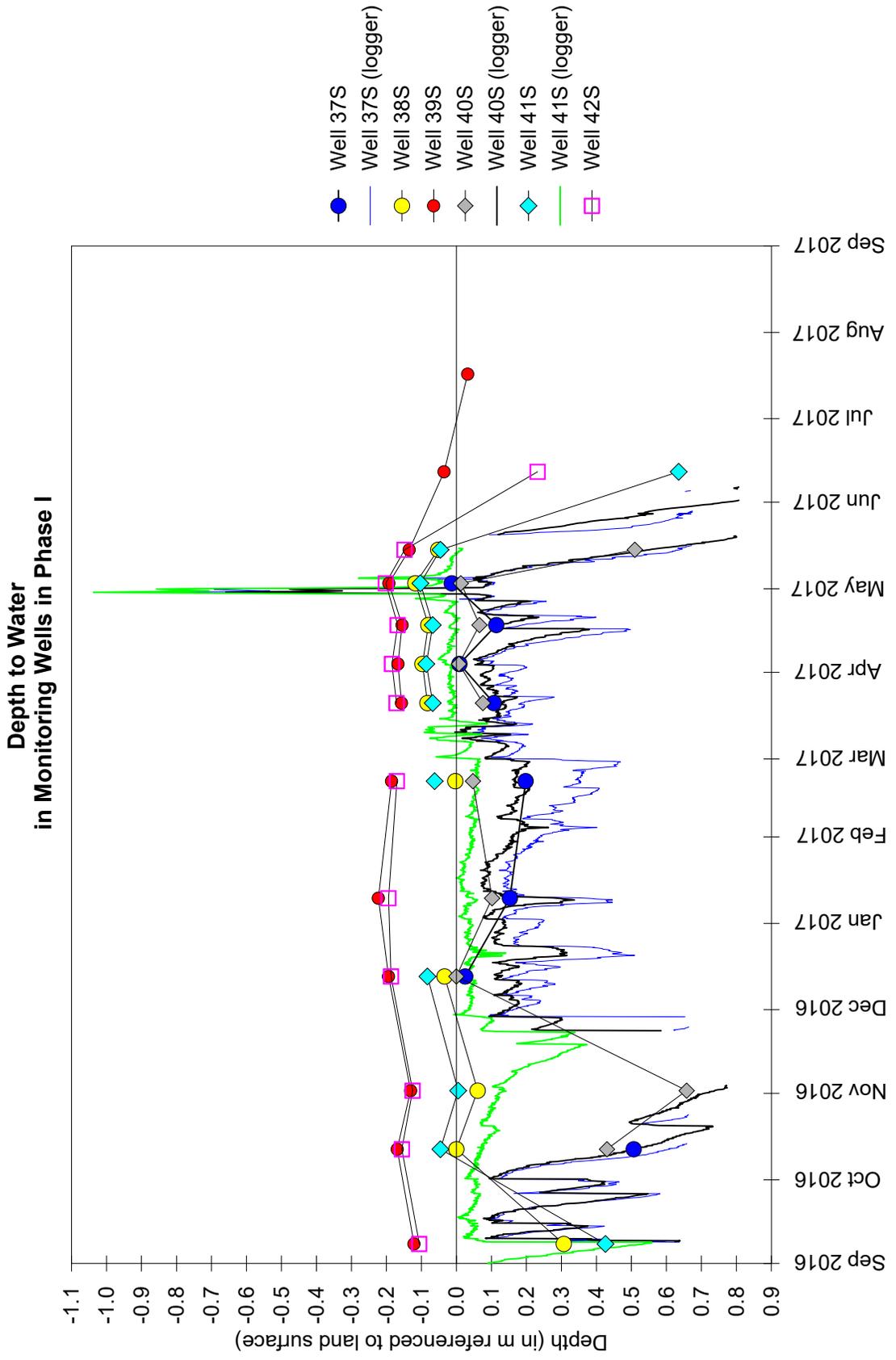
Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017



Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017

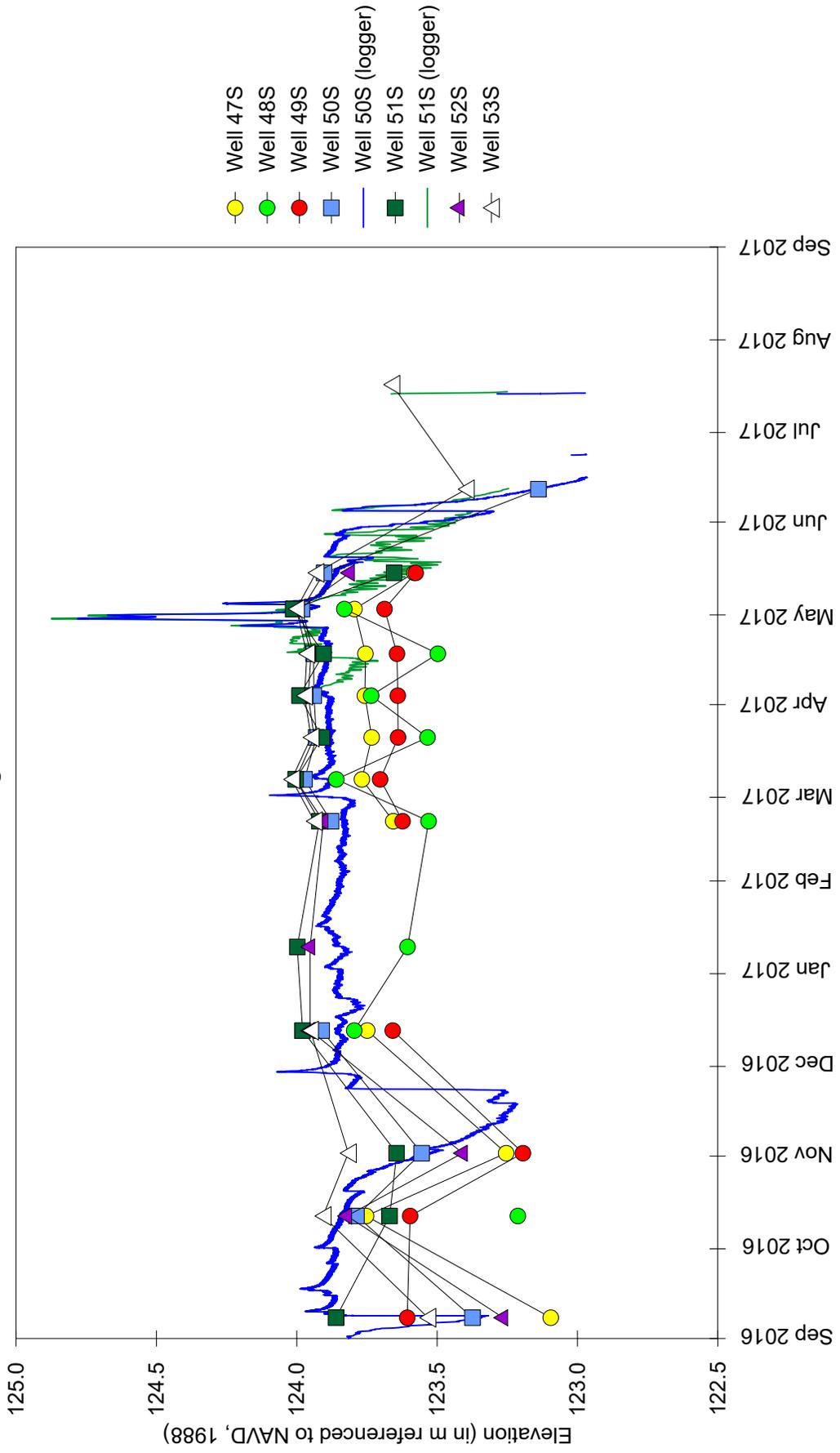


Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017

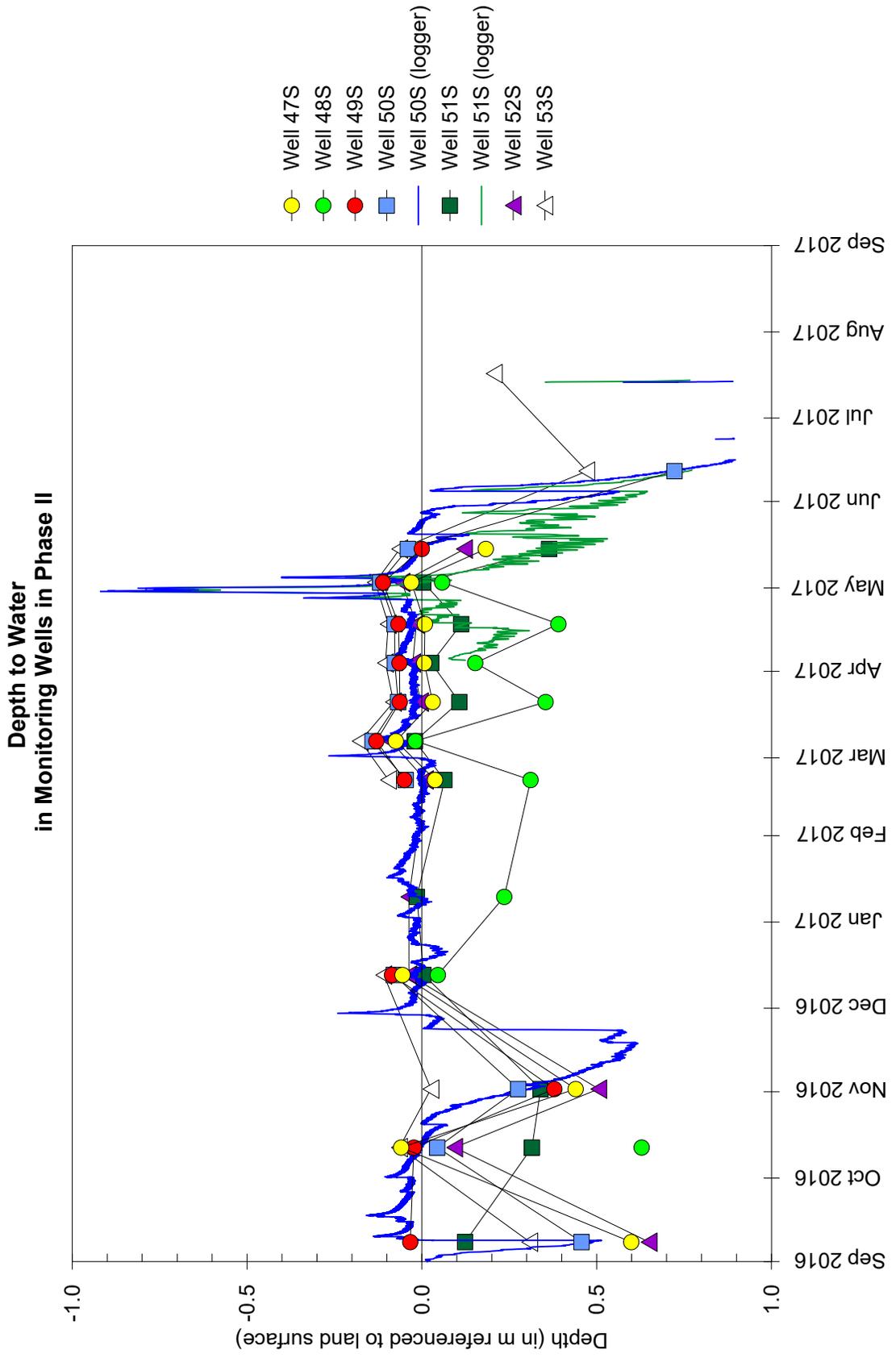


Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017

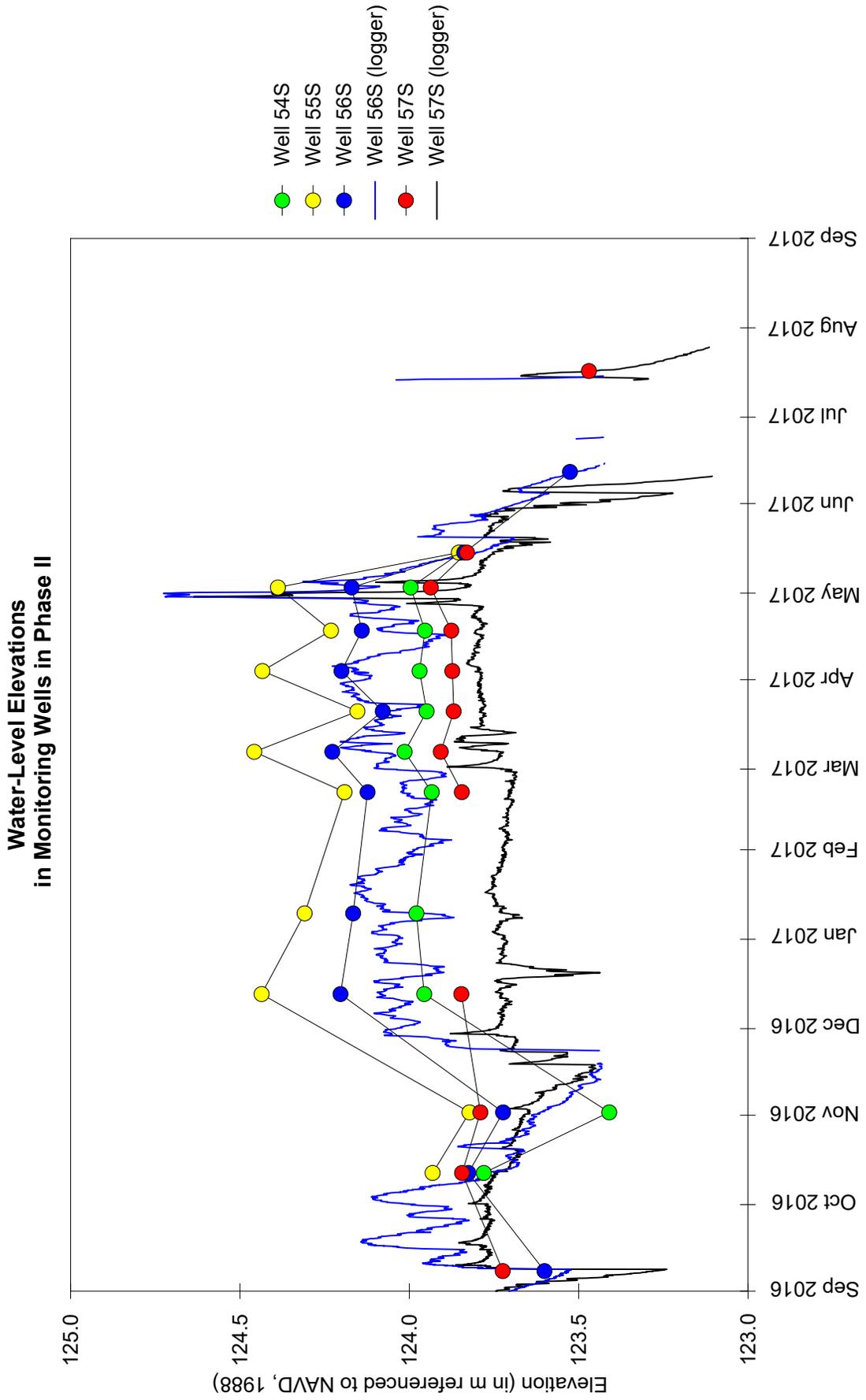
Water-Level Elevations
in Monitoring Wells in Phase II



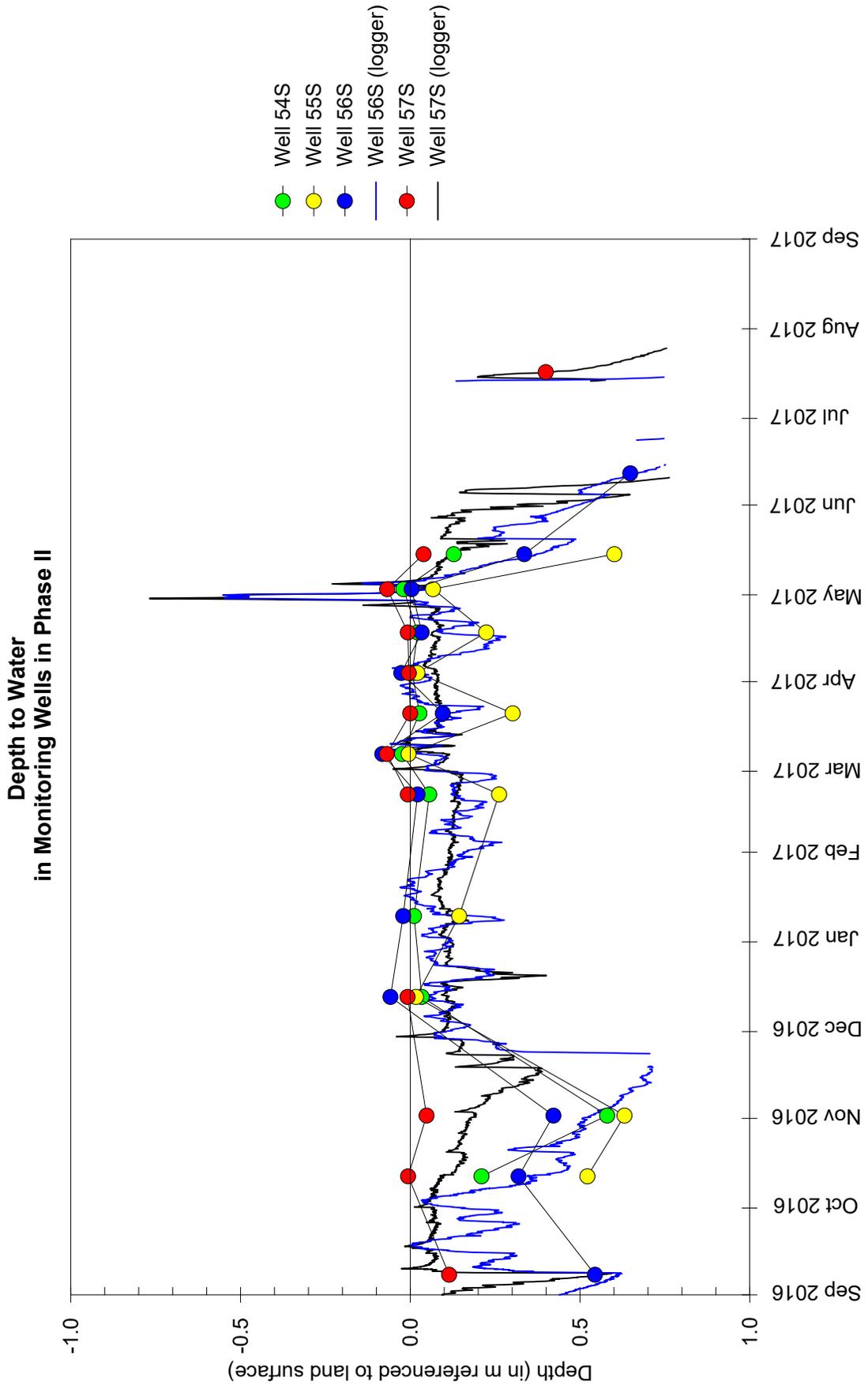
Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017



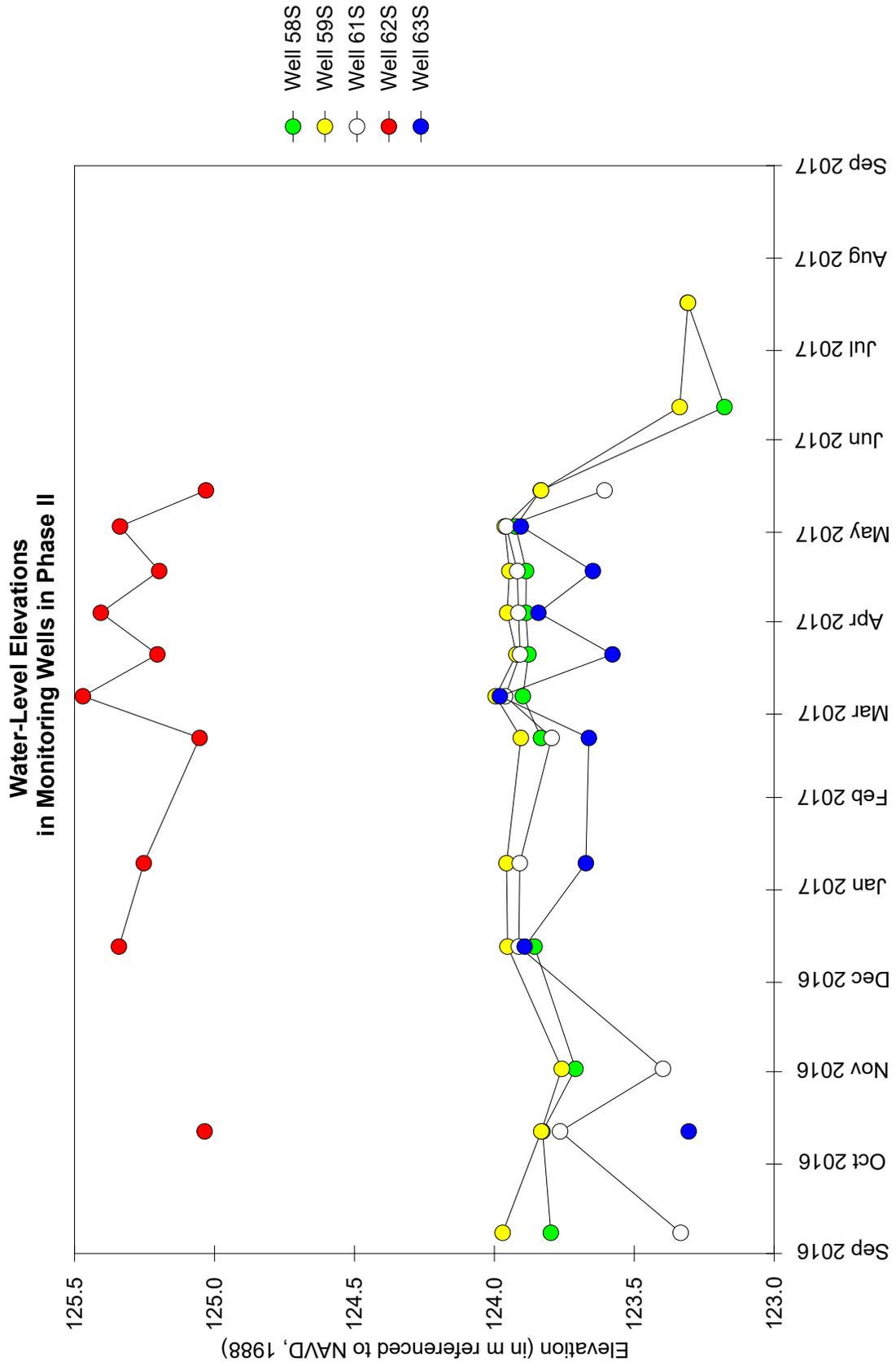
Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017



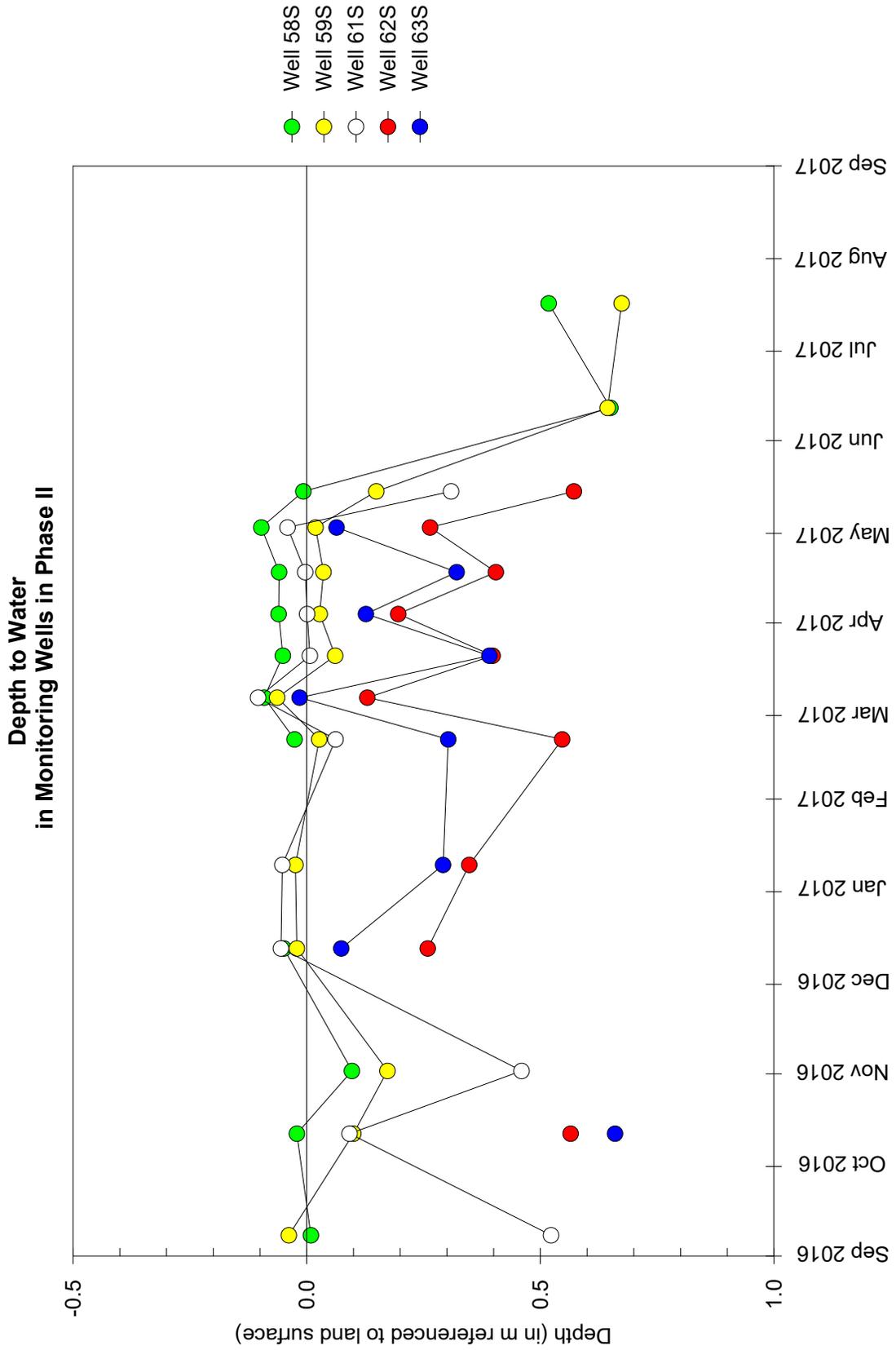
Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017



Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017

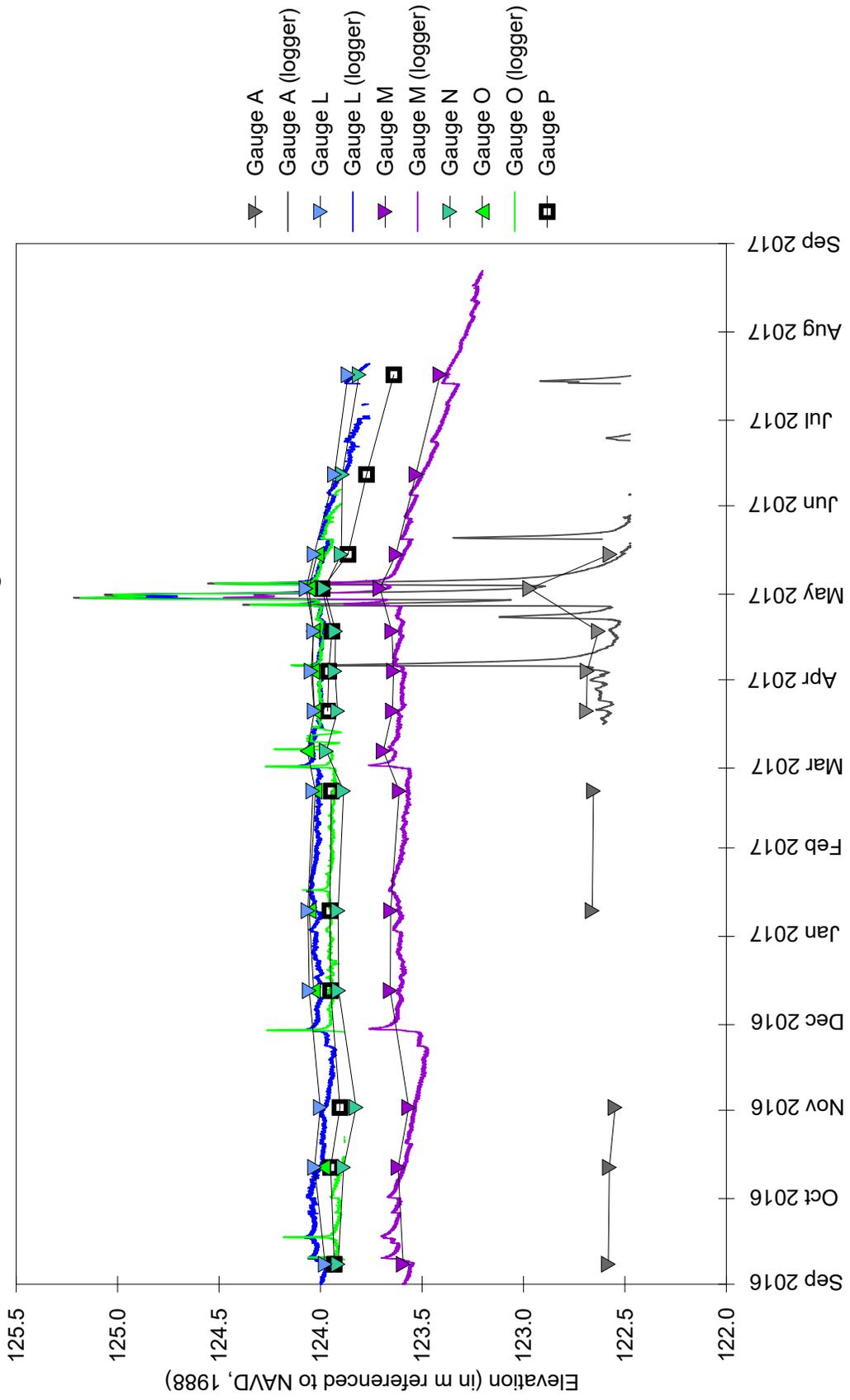


Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017



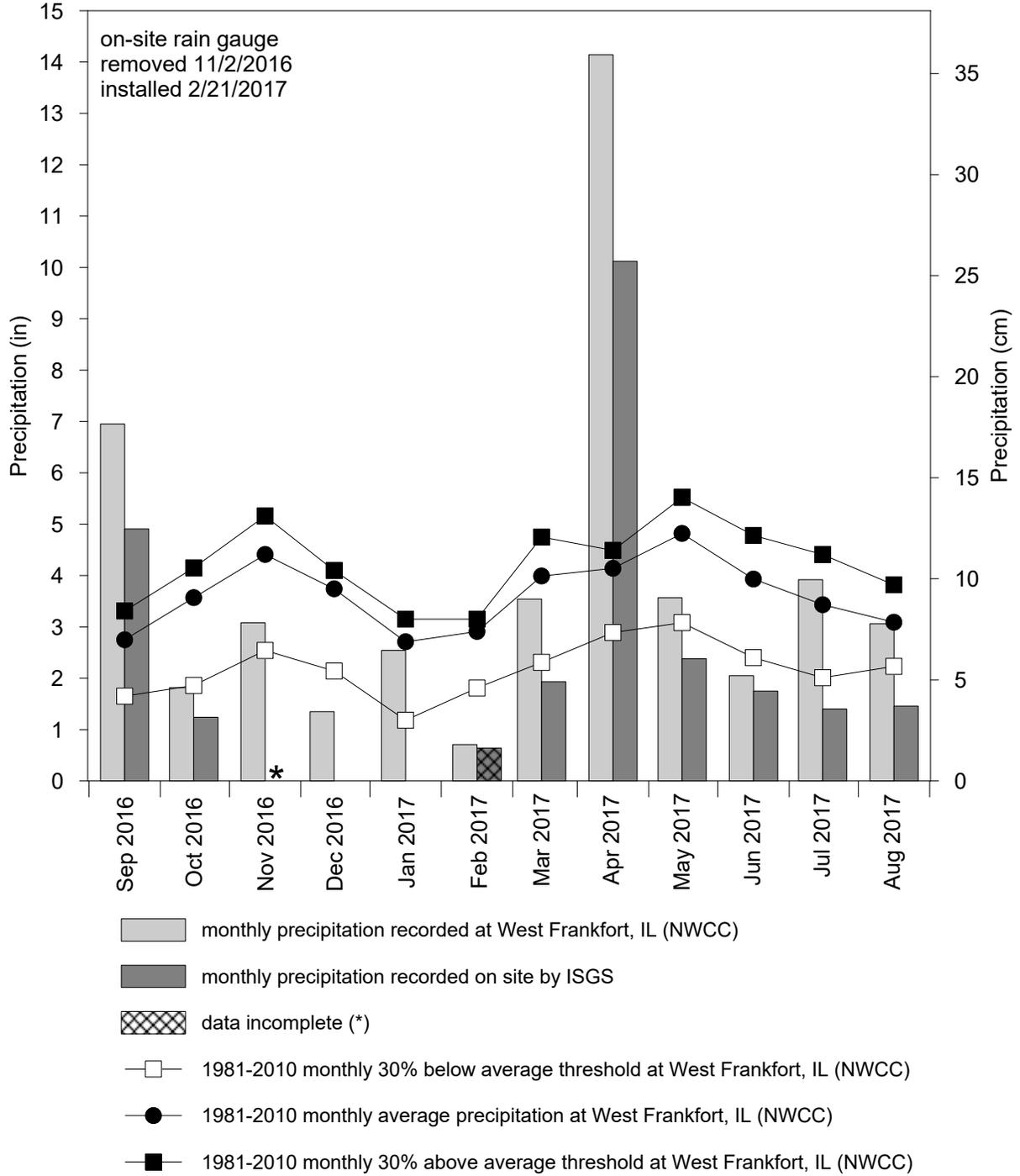
Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations
at Surface-Water Gauges



Sugar Camp Creek Wetland and Stream Mitigation Bank September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
West Frankfort, IL (MRCC station #119148)**



**PYRAMID SITE EC25
WETLAND MITIGATION SITE**

ISGS # 77

Pyatts Blacktop
FAS 864

Sequence #9778

Perry County, near Pinckneyville, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Joshua J. Richardson

SITE HISTORY

- June 2007: ISGS was tasked by IDOT to monitor wetland hydrology.
- April 2008: ISGS began on-site monitoring.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Pyramid Site EC25 wetland mitigation site is 4.57 ha (11.30 ac). Using the 1987 Manual (Environmental Laboratory 1987), 5.27 ha (13.03 ac) of the total site area of 5.30 ha (13.10 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 0.004 ha (0.01 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 5.24 ha (12.96 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Du Quoin, Illinois, is March 30, and the season lasts 217 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days, and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, February 6 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Du Quoin, Illinois (MRCC station #112483), was 96% of normal. During spring 2017 (March through May), precipitation was 130% of normal.
- The period of maximum inundation and saturation during the 2017 growing season occurred between late March and mid-April due to frequent rainfall.
- In 2017, water levels measured in 17 of 18 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 1 of 18 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 17 of 18 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Four additional data loggers were added to the monitoring network in April 2017 to support the determination of areas satisfying the wetland hydrology criteria.
- Well 12VS is situated in a localized depression, and the topographic data available does not allow for expanding the area satisfying the 12.5% wetland hydrology criteria beyond what is shown.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue at the site until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1VS	Y	N	Y
2S	Y	N	Y
2VS	Y	N	Y
3VS	Y	N	Y
4S	Y	N	Y
4VS	Y	N	Y
5SR	Y	N	Y
6S	Y	N	Y
7S	Y	N	Y
7VS	Y	N	Y
8VS	Y	N	Y
9VS	Y	N	Y
10S	Y	N	Y
10VS	N	N	N
11S	Y	N	Y
12VS	Y	Y	Y
14VS	Y	N	Y
15VS	Y	N	Y

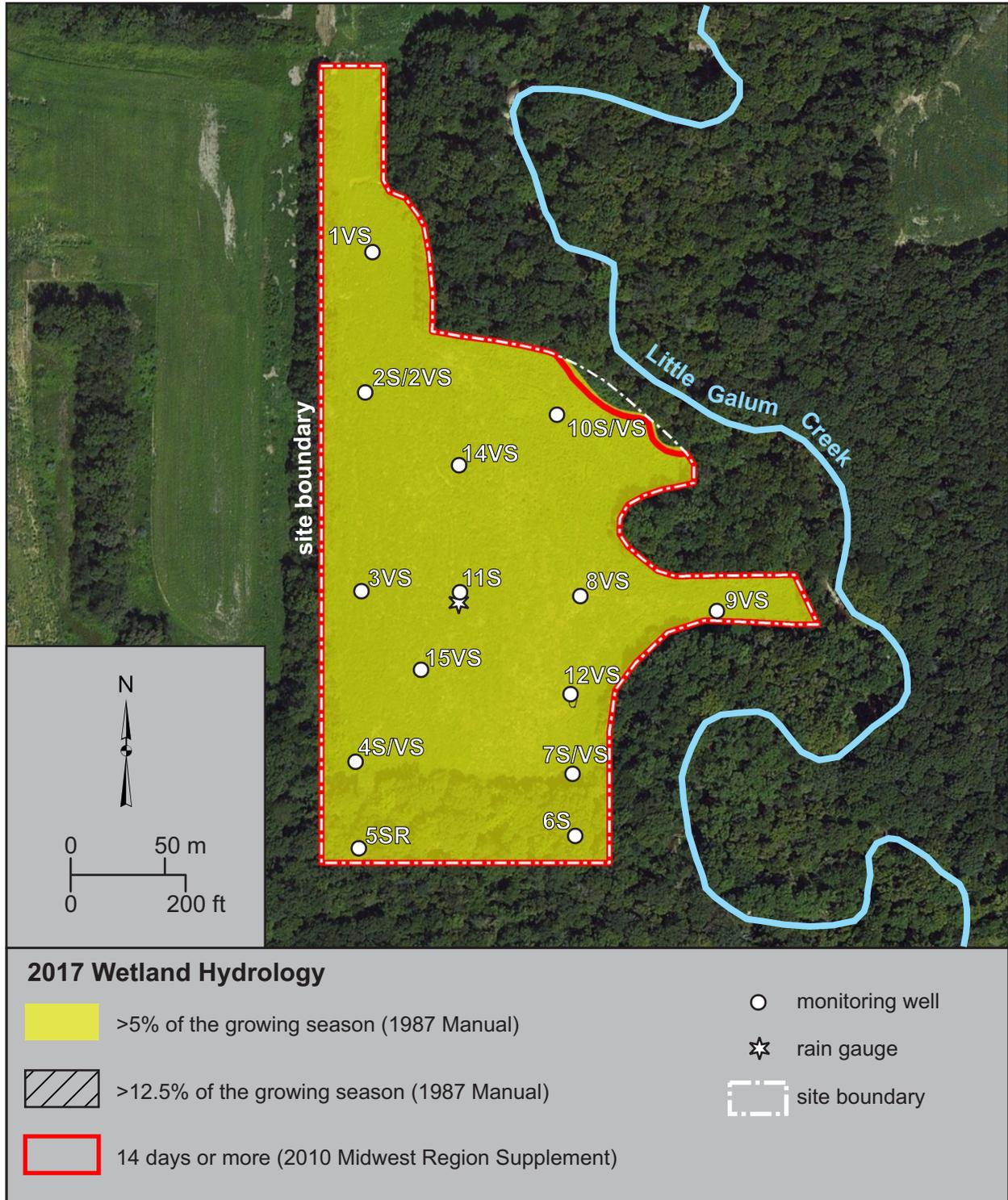
Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

**Pyramid Site EC25 Wetland Mitigation Site
(Pyatts Blacktop, FAS 864)**

Estimated Areal Extent of 2017 Wetland Hydrology

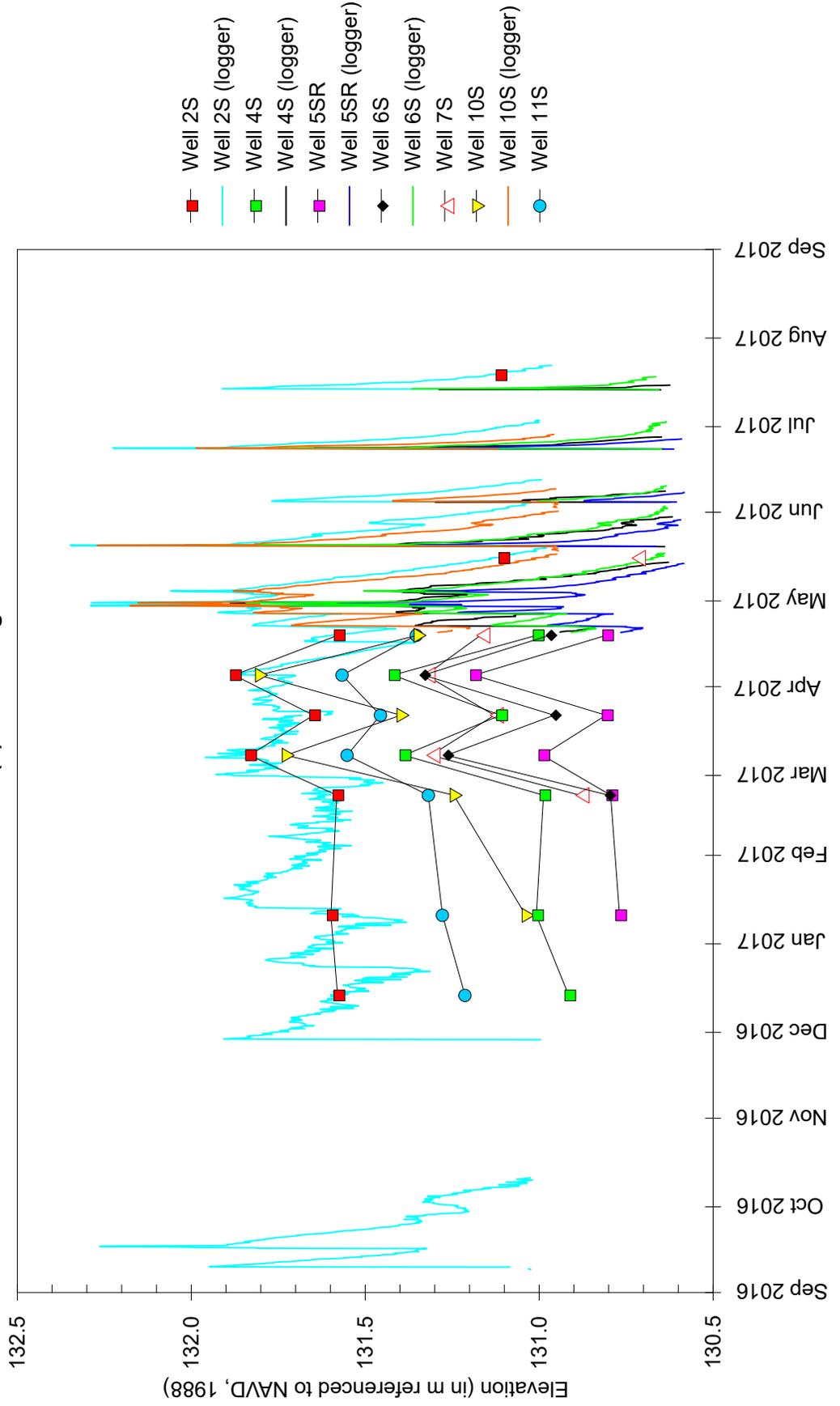
September 1, 2016 through August 31, 2017

Map based on imagery available from Esri (Esri 2017)

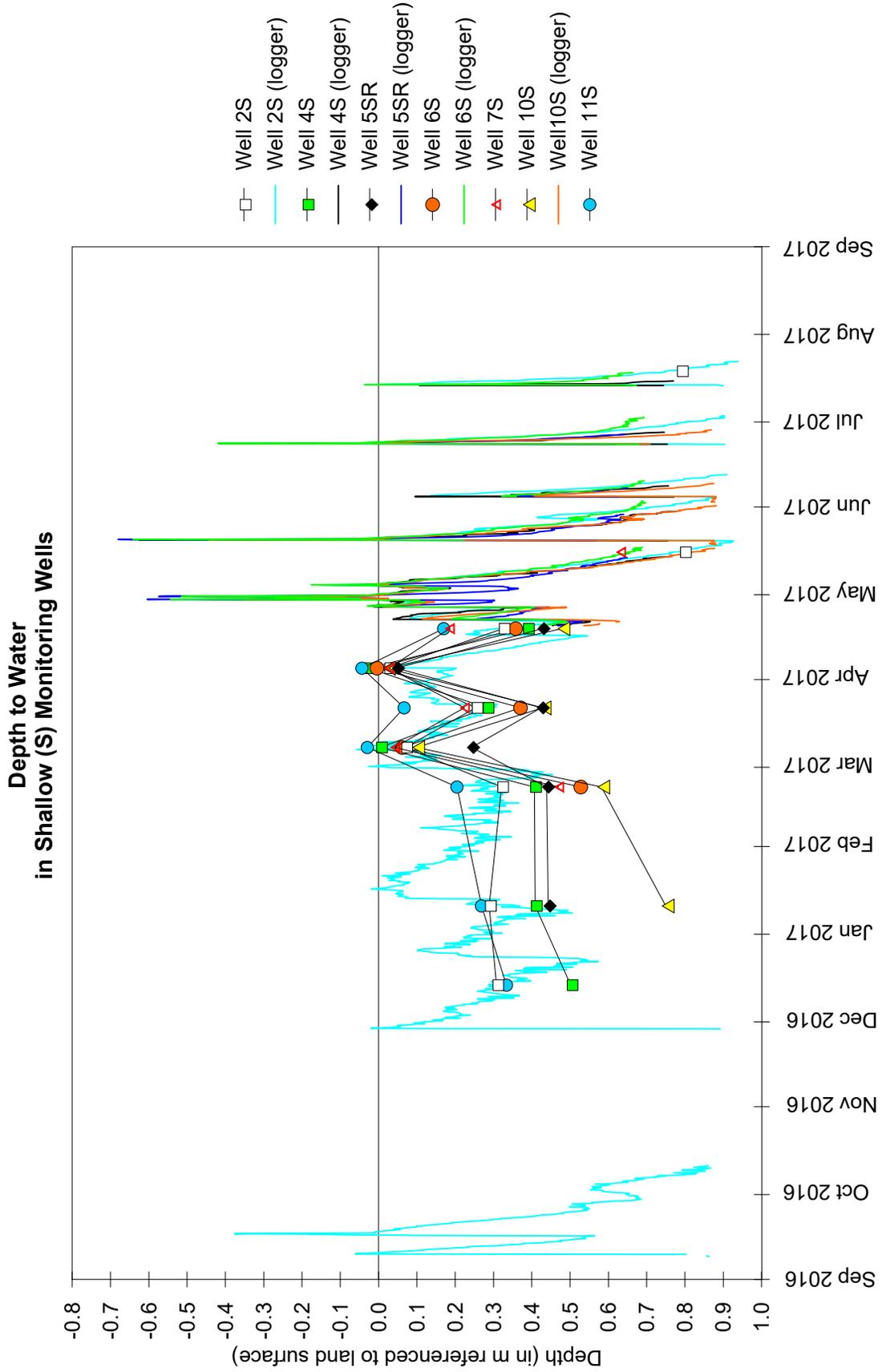


Pyramid Site EC25 Wetland Mitigation Site
September 1, 2016 through August 31, 2017

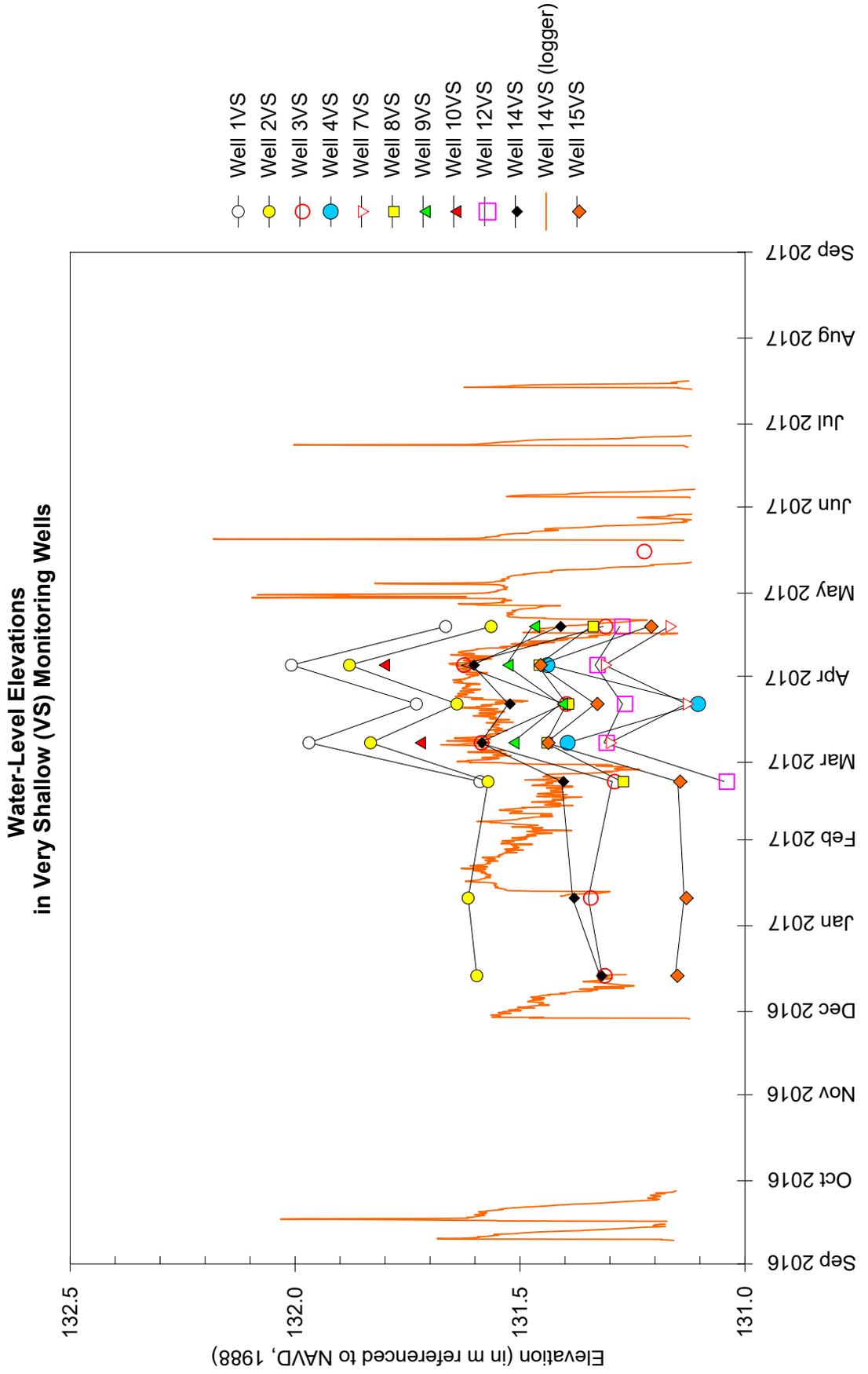
**Water-Level Elevations
in Shallow (S) Monitoring Wells**



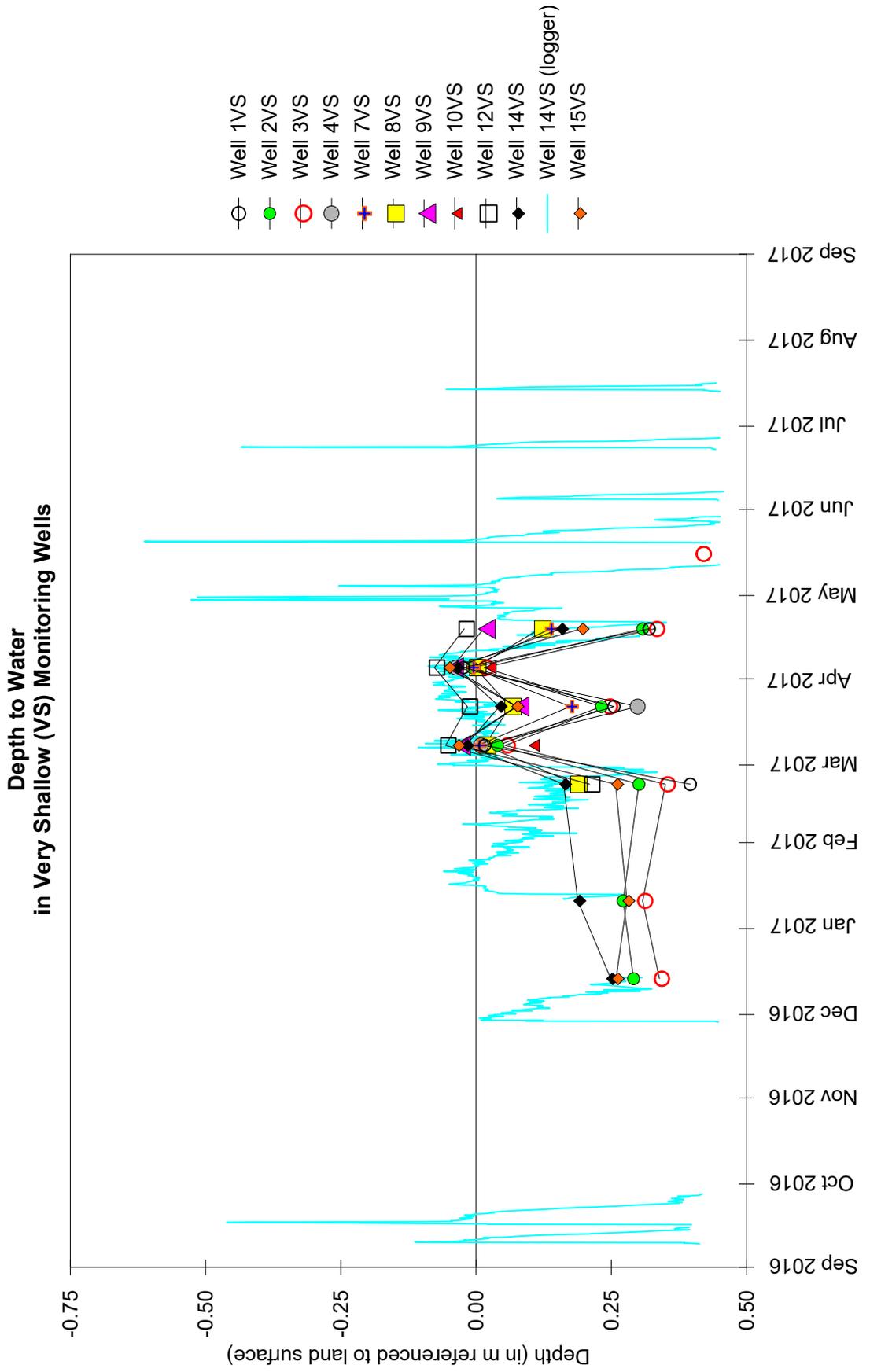
Pyramid Site EC25 Wetland Mitigation Site September 1, 2016 through August 31, 2017



Pyramid Site EC25 Wetland Mitigation Site September 1, 2016 through August 31, 2017

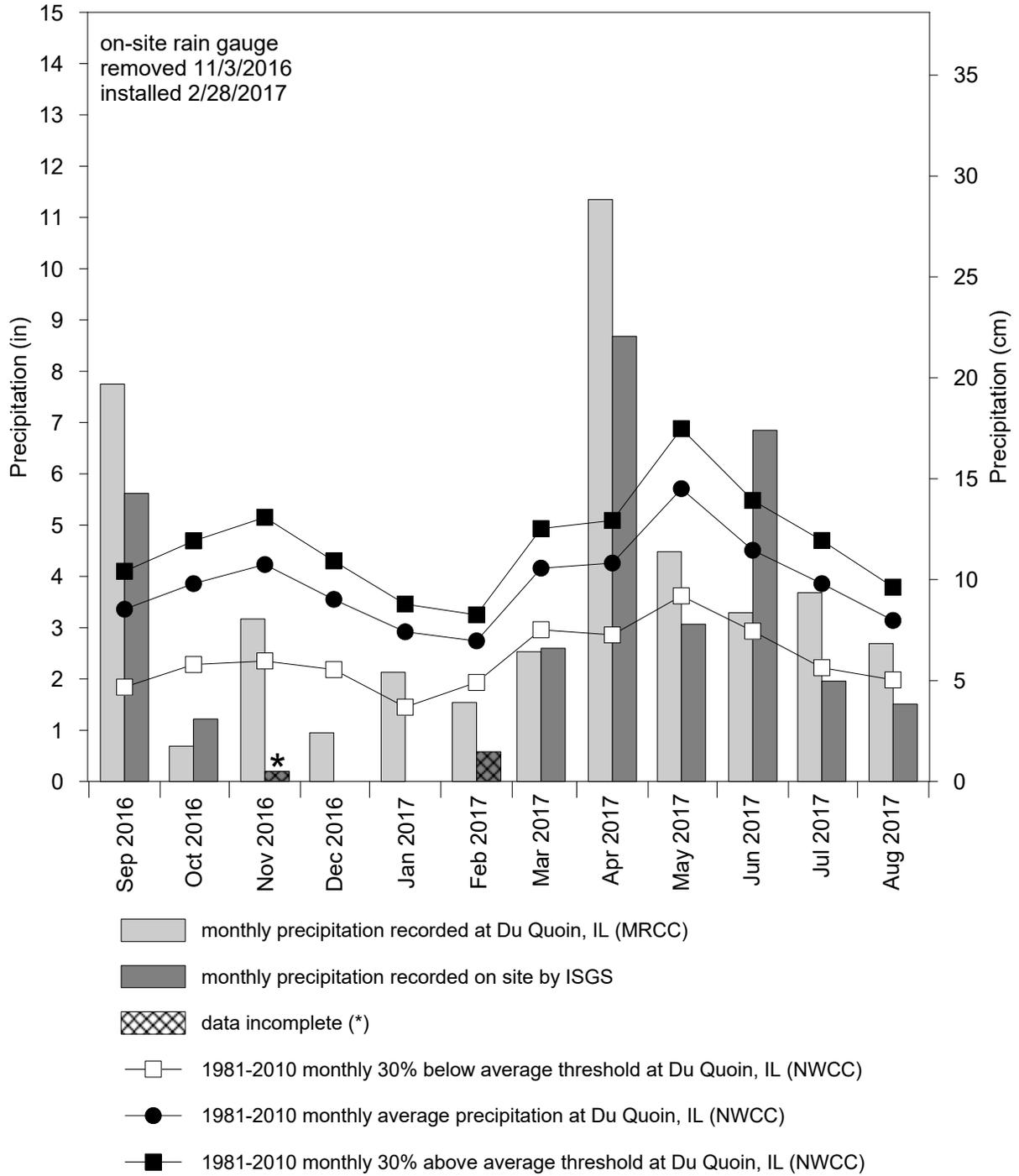


**Pyramid Site EC25 Wetland Mitigation Site
September 1, 2016 through August 31, 2017**



Pyramid Site EC25 Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Du Quoin, IL (MRCC station #112483)**



HARRISBURG, SITE 2
WETLAND MITIGATION SITE

ISGS #78

IL 14

FAP 857

Sequence #547

Saline County, near Harrisburg, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Joshua J. Richardson

SITE HISTORY

- October 2007: Construction began at the wetland mitigation site.
- March 2008: ISGS was tasked by IDOT to monitor the site for performance standards as outlined in the wetland mitigation plan, and post-construction water-level monitoring was initiated.
- May 2008: Construction at the wetland mitigation site was completed.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Harrisburg, Site 2 wetland mitigation site is 4.13 ha (10.20 ac). Using the 1987 Manual (Environmental Laboratory 1987), 8.79 ha (21.71 ac) out of a total site area of approximately 14.16 ha (35.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season, and 8.28 ha (20.46 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 8.88 ha (21.94 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Du Quoin, Illinois, is March 30 and the season lasts 217 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured on site and at the Harrisburg, Site 3 wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at Du Quoin, Illinois (MRCC #112483), was 96% of normal, and spring 2017 (March through May) precipitation was 130% of normal. Precipitation during April 2017 was particularly excessive with 266% of normal rainfall.
- The period of maximum inundation and saturation during the 2017 growing season occurred during late April into early May, mainly in response to frequent and intense rainfall. Rainfall was recorded at the site each day from April 26 to May 6 with a total of 18.16 cm (7.15 in.) over this period including three events in excess of 2.54 cm (1 in.). Gauge B in the ditch indicated that the stop-log structure in the center portion of the site elevated water levels by 0.31 m (1.0 ft) above the spillway threshold during January through early March. Further, several brief floods occurred during April and May in response to frequent and intense rainfall. However, these floods only inundated areas immediately adjacent to the ditch and none lasted more than three days.

- In 2017, water levels measured in 27 of 27 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 27 of 27 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Water-level monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	Y	Y	Y
1VS	Y	Y	Y
2S	Y	Y	Y
2VS	Y	Y	Y
3S	Y	Y	Y
3VS	Y	Y	Y
4S	Y	Y	Y
4VS	Y	Y	Y
5S	Y	Y	Y
5VS	Y	Y	Y
6S	Y	Y	Y
7S	Y	Y	Y
8S	Y	Y	Y
9S	Y	Y	Y
10S	Y	Y	Y
11S	Y	Y	Y
12S	Y	Y	Y
13S	Y	Y	Y
14S	Y	Y	Y
15S	Y	Y	Y
16VS	Y	Y	Y
17VS	Y	Y	Y
18VS	Y	Y	Y
19VS	Y	Y	Y
20VS	Y	Y	Y
21VS	Y	Y	Y
23VS	Y	Y	Y

Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

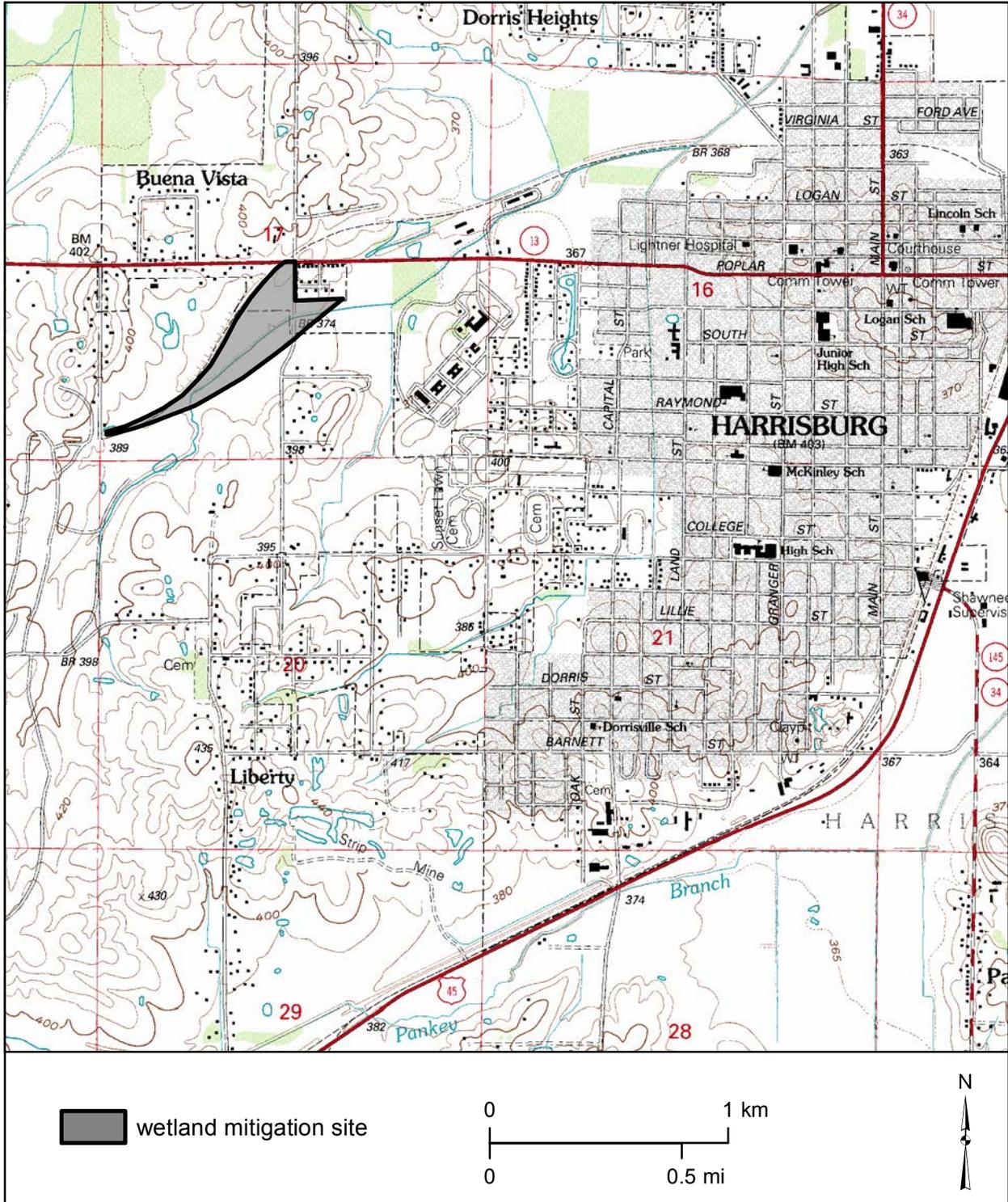
Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
B	112.63 m (369.52 ft)	112.53 m (369.19 ft)	112.59 m (369.39 ft)
H	113.13 m (371.16 ft)	113.13 m (371.16 ft)	113.13 m (371.16 ft)

n/a – insufficient data to determine an elevation

Harrisburg, Site 2 Wetland Mitigation Site (IL 14, FAP 857)

General Study Area and Vicinity

from the USGS Topographic Series, Harrisburg, IL, 7.5-minute Quadrangle (USGS 1961)
contour interval is 5 feet



Harrisburg, Site 2 Wetland Mitigation Site (IL 14, FAP 857)

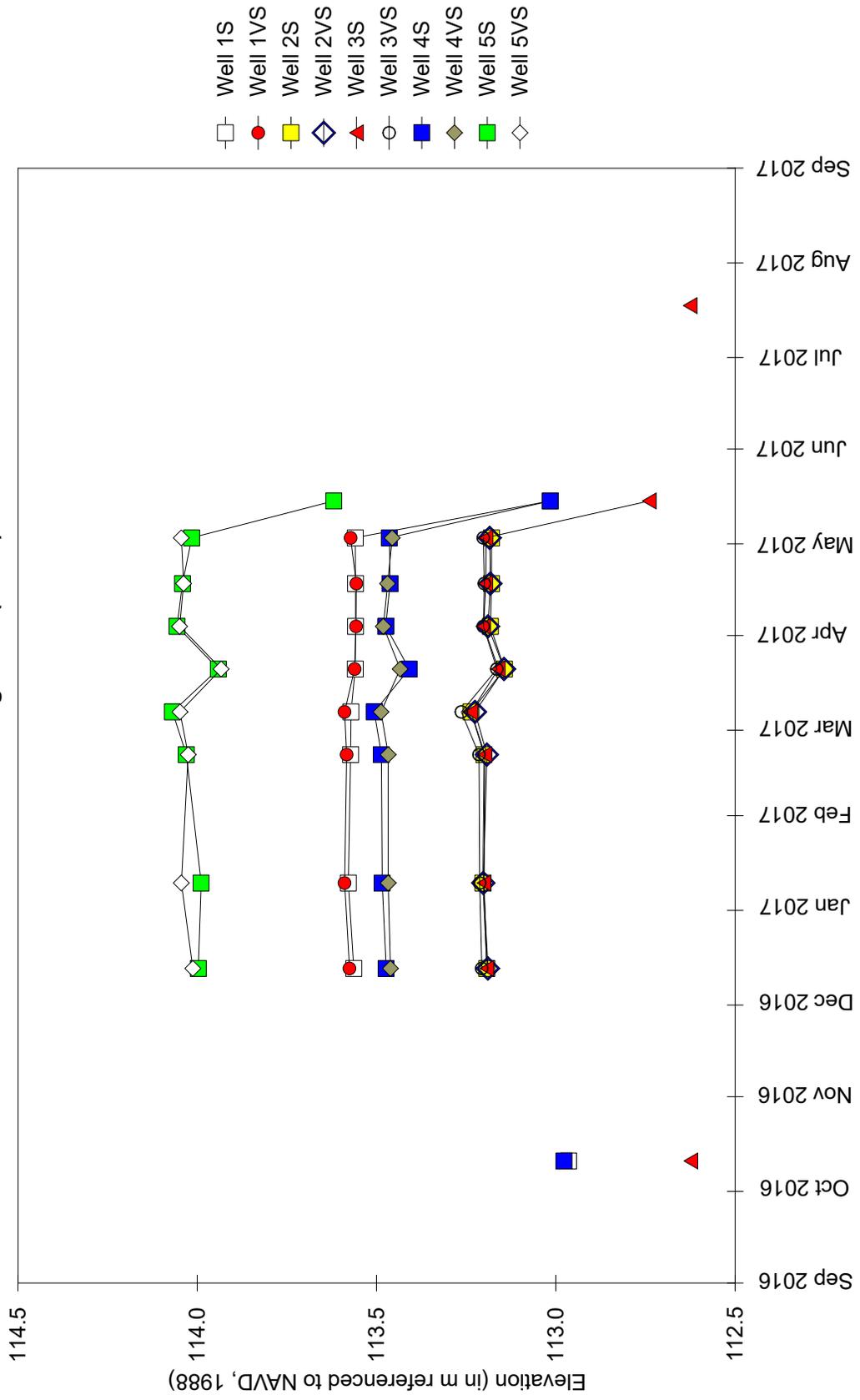
Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017
Map based on imagery available from Esri (Esri 2017)

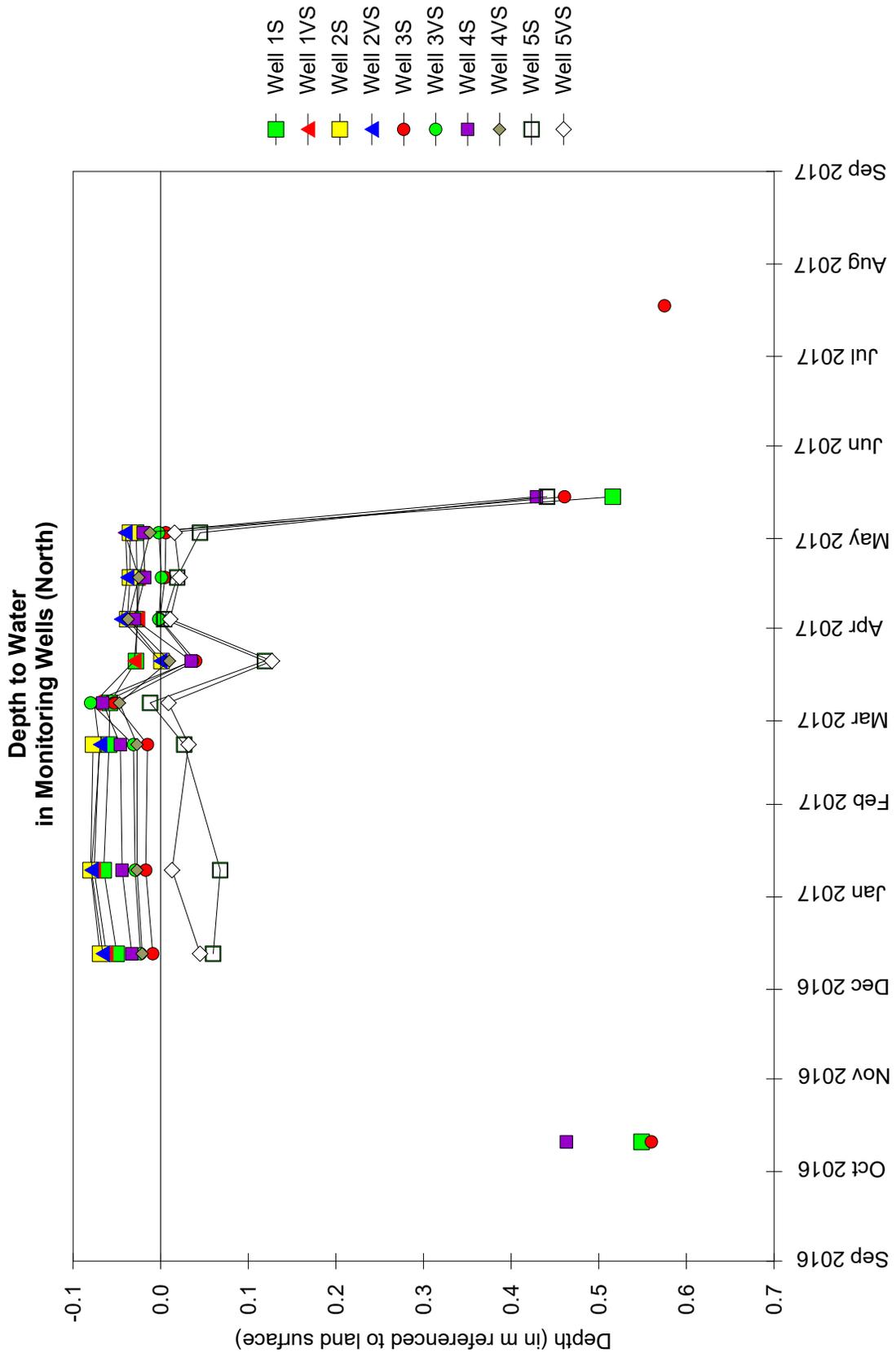


Harrisburg, Site 2 Wetland Mitigation Site September 1, 2016 through August 31, 2017

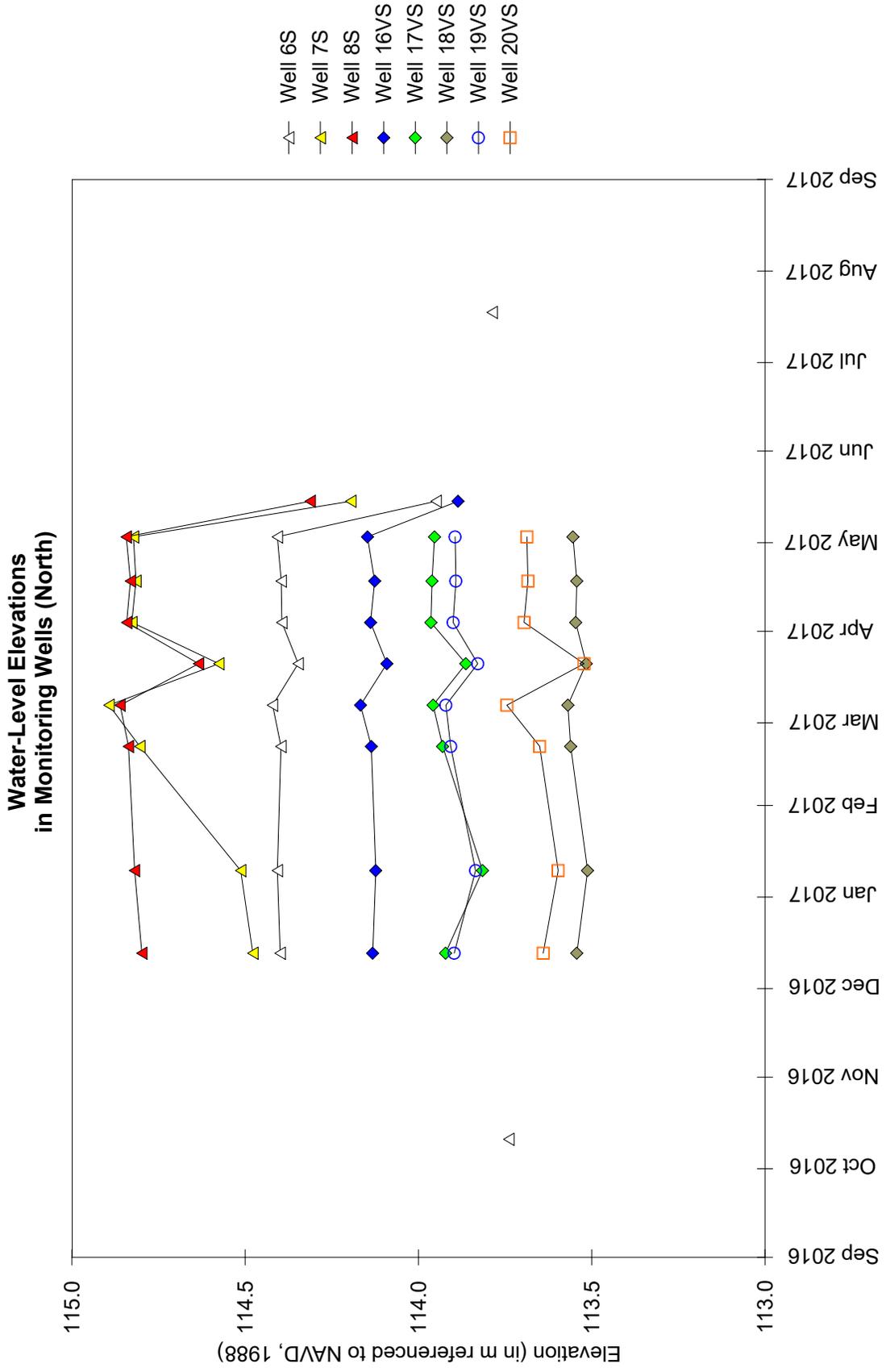
Water-Level Elevations in Monitoring Wells (North)



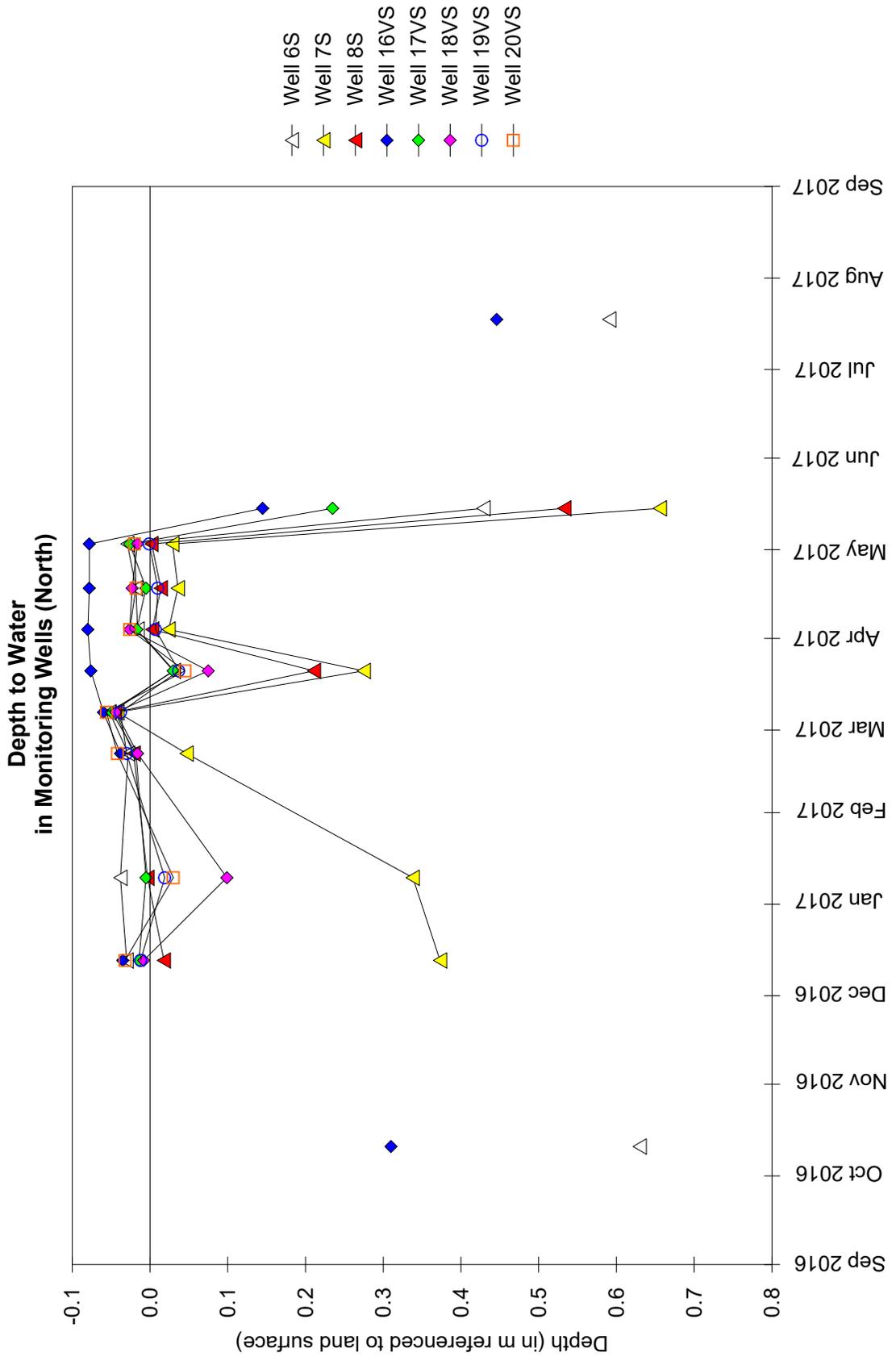
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2016 through August 31, 2017



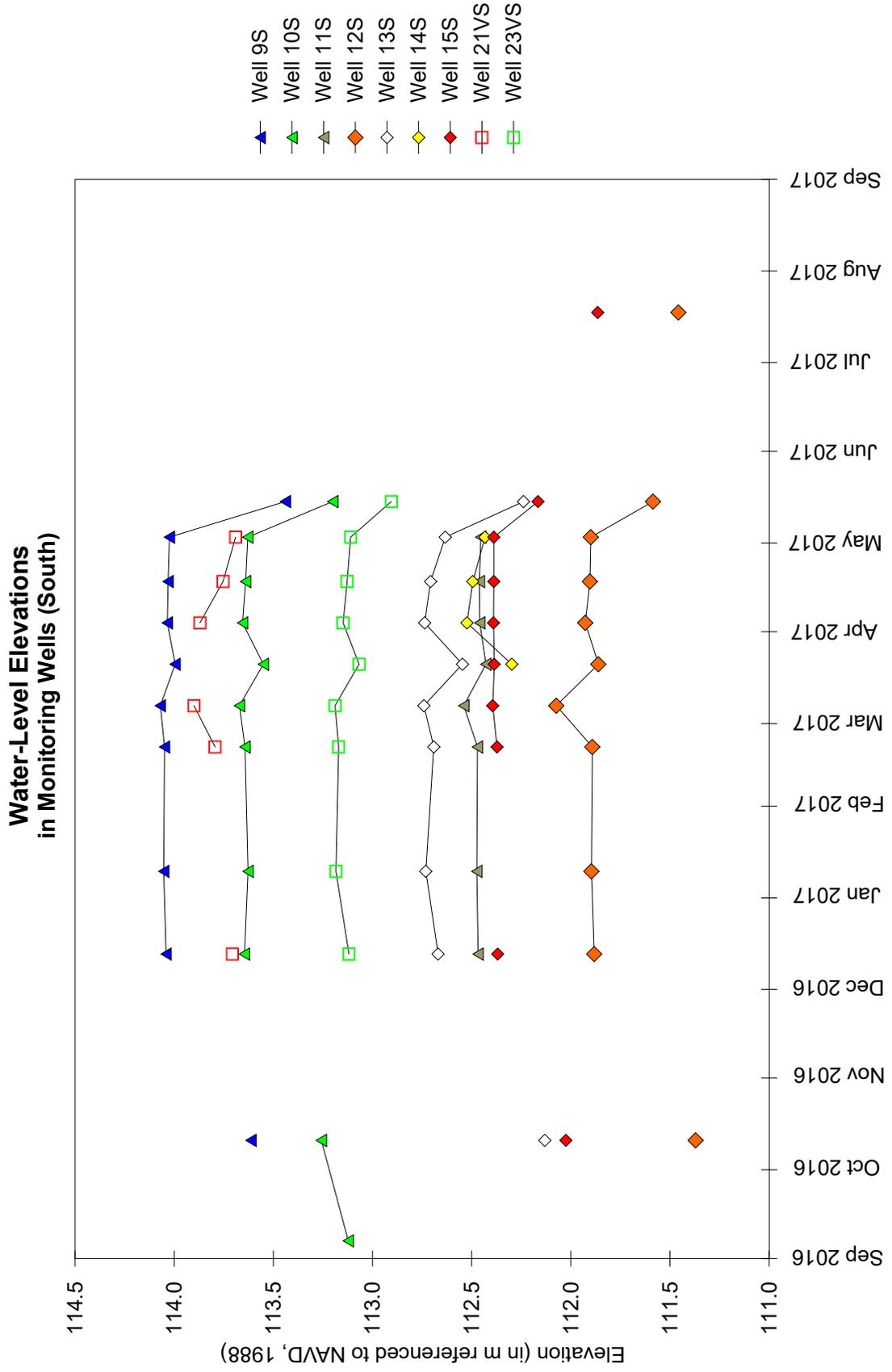
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2016 through August 31, 2017



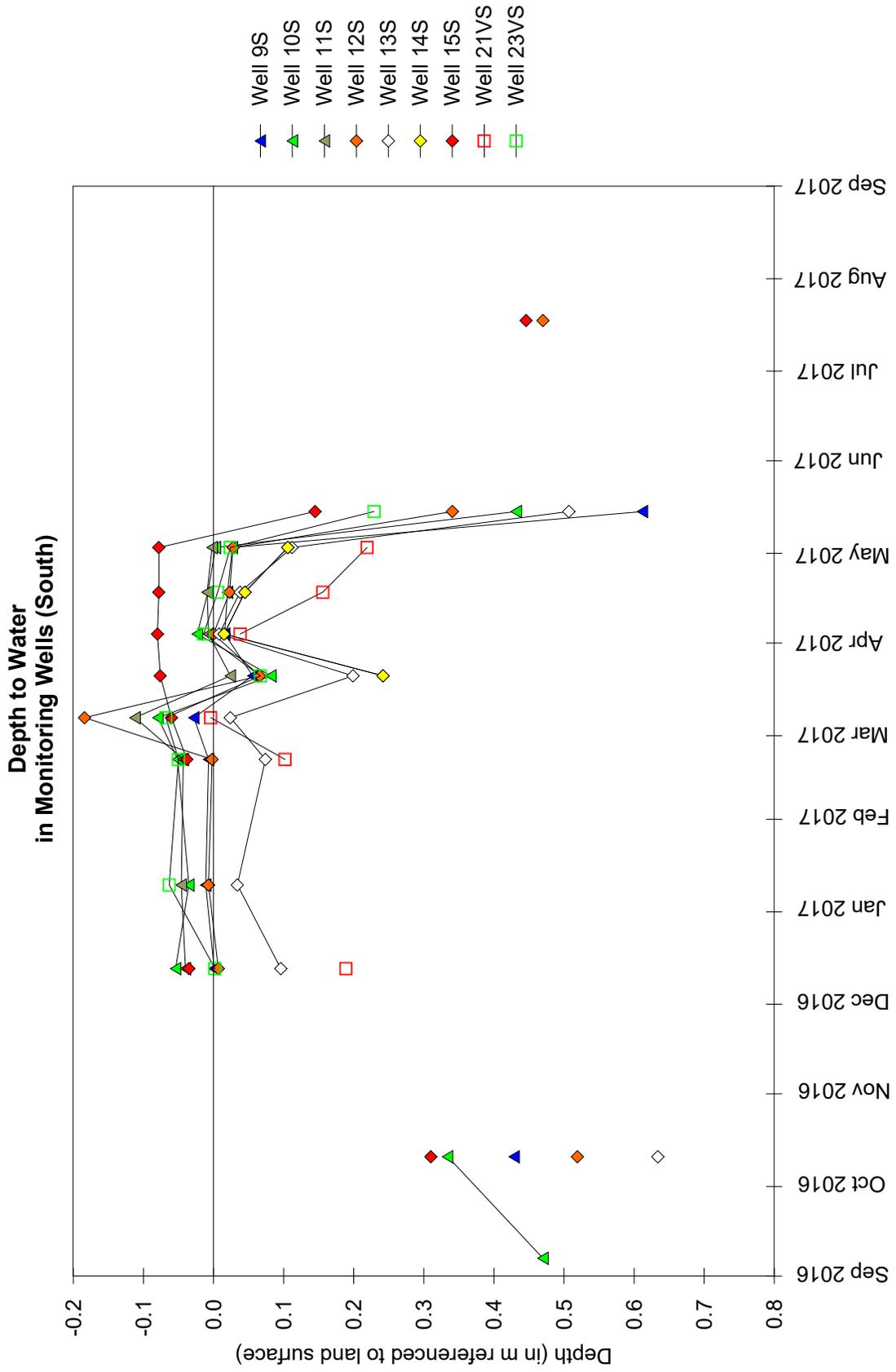
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2016 through August 31, 2017



Harrisburg, Site 2 Wetland Mitigation Site September 1, 2016 through August 31, 2017

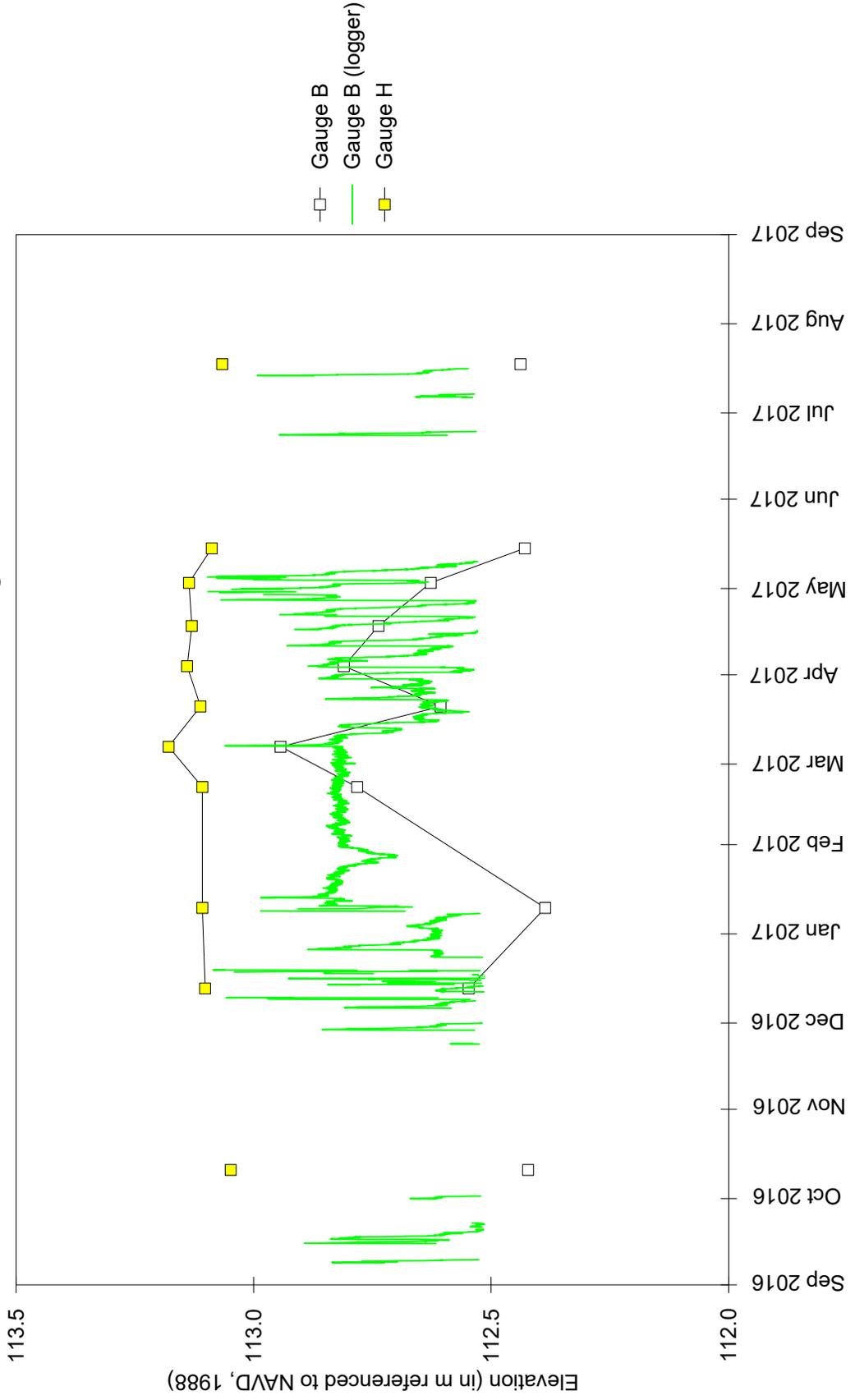


Harrisburg, Site 2 Wetland Mitigation Site September 1, 2016 through August 31, 2017



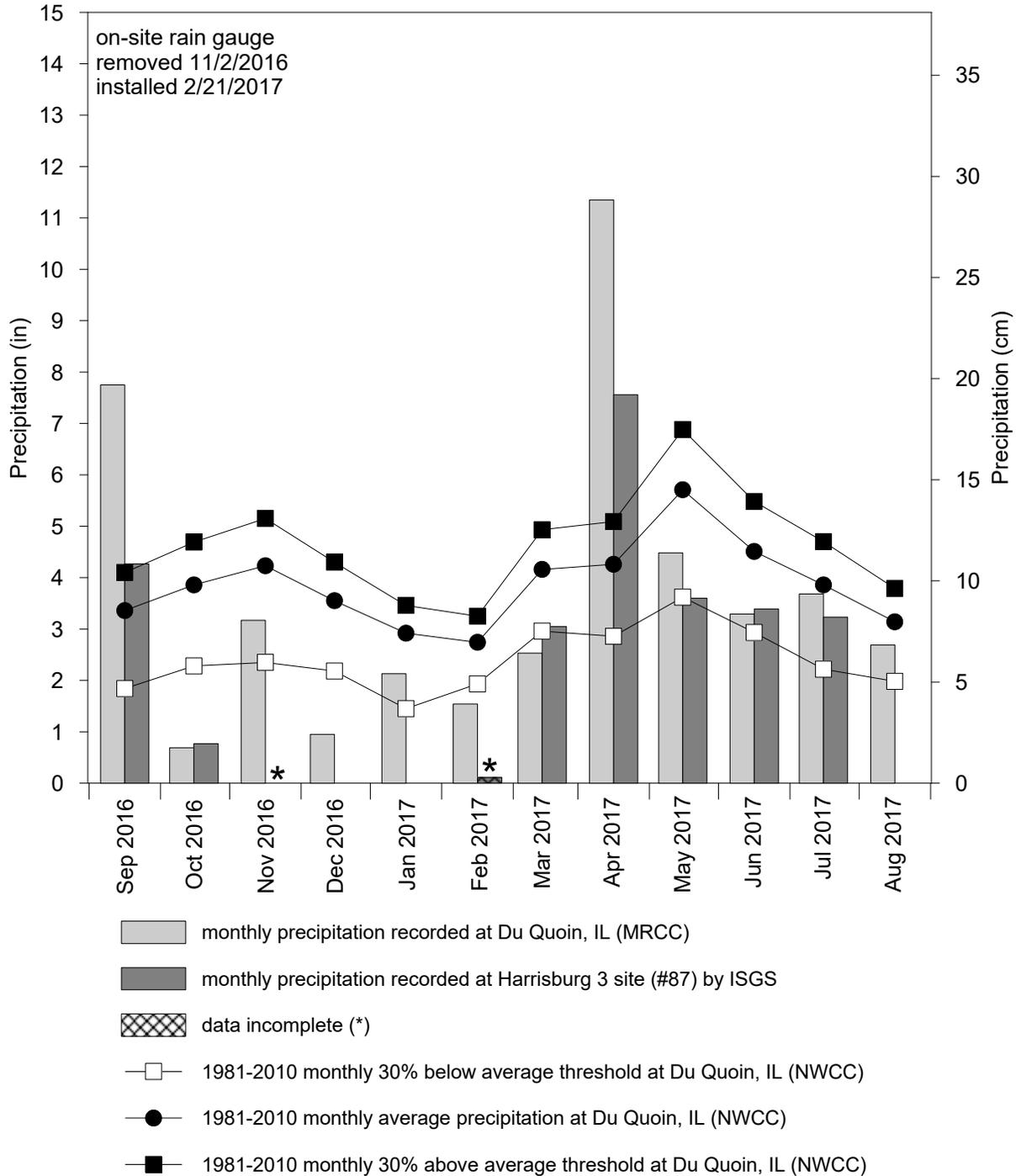
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



Harrisburg Site 2 Wetland Mitigation Site September 2016 through August 2017

Total Monthly Precipitation Recorded on Site and at Du Quoin, IL (MRCC station #112483)



**MAX CREEK
WETLAND MITIGATION SITE**

ISGS #80

IL 147

FAS 932

Sequence #8717A

Johnson County, near Simpson, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Joshua J. Richardson

SITE HISTORY

- December 2008: Water-level monitoring was initiated.
- August 2009: Construction at the wetland mitigation site began.
- Spring 2011: ISGS was notified by IDOT to begin post-construction monitoring.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Max Creek wetland mitigation site is 0.49 ha (1.20 ac). Using the 1987 Manual (Environmental Laboratory 1987), 0.69 ha (1.71 ac) out of a total site area of approximately 1.21 ha (3.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 0.61 ha (1.50 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 1.13 ha (2.79 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Anna, Illinois, is April 2, and the season lasts 215 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured on site and at the nearby Harrisburg, Site 3 wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at Rosiclare, Illinois (MRCC station #117487), was 86% of normal. During spring 2017 (March through May), precipitation was 123% of normal.
- Max Creek flooded the site four times during the monitoring period with three floods occurring during the growing season. However, none of these floods persisted longer than one day.
- The period of maximum inundation and saturation during the 2017 growing season occurred in late April due to a combination of seasonal high water table, three floods from Max Creek, and four rainfall events in excess of 0.31 m (1 in.) that occurred between April 21 and April 30.
- In 2017, water levels measured in 3 of 6 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season and for greater than 12.5% of the growing season using the 1987 Manual. Using the 2010 Midwest Region

Supplement, water levels in 5 of 6 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Water-level monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1VS	N	N	Y
2VS	N	N	Y
9S	Y	Y	Y
10S	Y	Y	Y
11S	Y	Y	Y
12S	N	N	N

Y- met wetland hydrology criteria
 N - did not meet wetland hydrology criteria

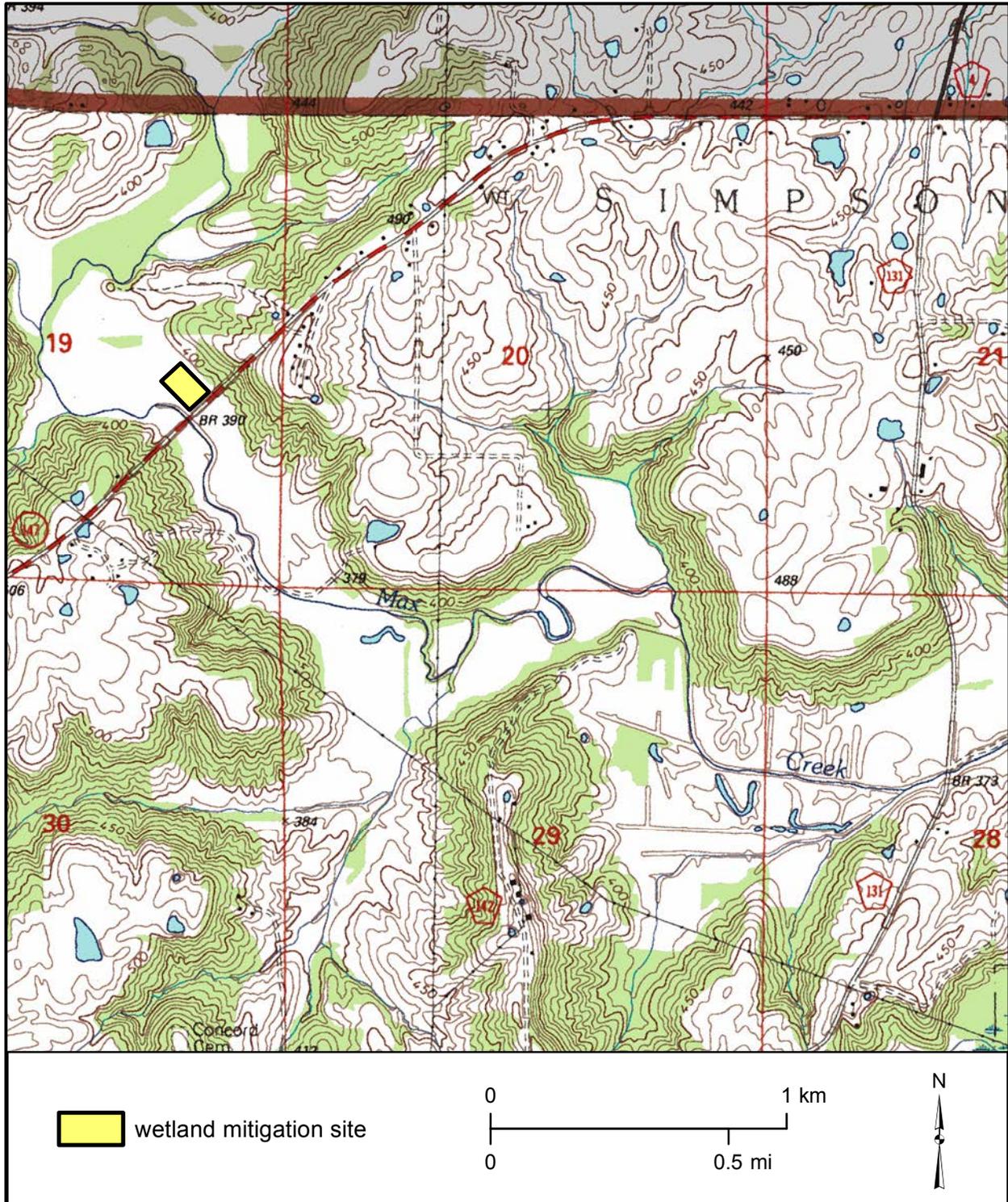
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
A	113.77 m (373.26 ft)	113.65 m (372.87 ft)	113.80 m (373.36 ft)
E	115.71 m (379.63 ft)	115.64 m (379.40 ft)	115.68 m (379.53 ft)

n/a – insufficient data to determine an elevation

Max Creek Wetland Mitigation Site (IL 147, FAS 932)

General Study Area and Vicinity

from the USGS Topographic Series, Bloomfield, IL 7.5-minute Quadrangle (USGS 1966)
contour interval is 10 feet



Max Creek Wetland Mitigation Site (IL 147, FAS 932)

Estimated Areal Extent of 2017 Wetland Hydrology
September 1, 2016 through August 31, 2017

Map based on 2012 Farm Service Agency digital orthophotography, Johnson County, Illinois (USDA-FSA 2012)

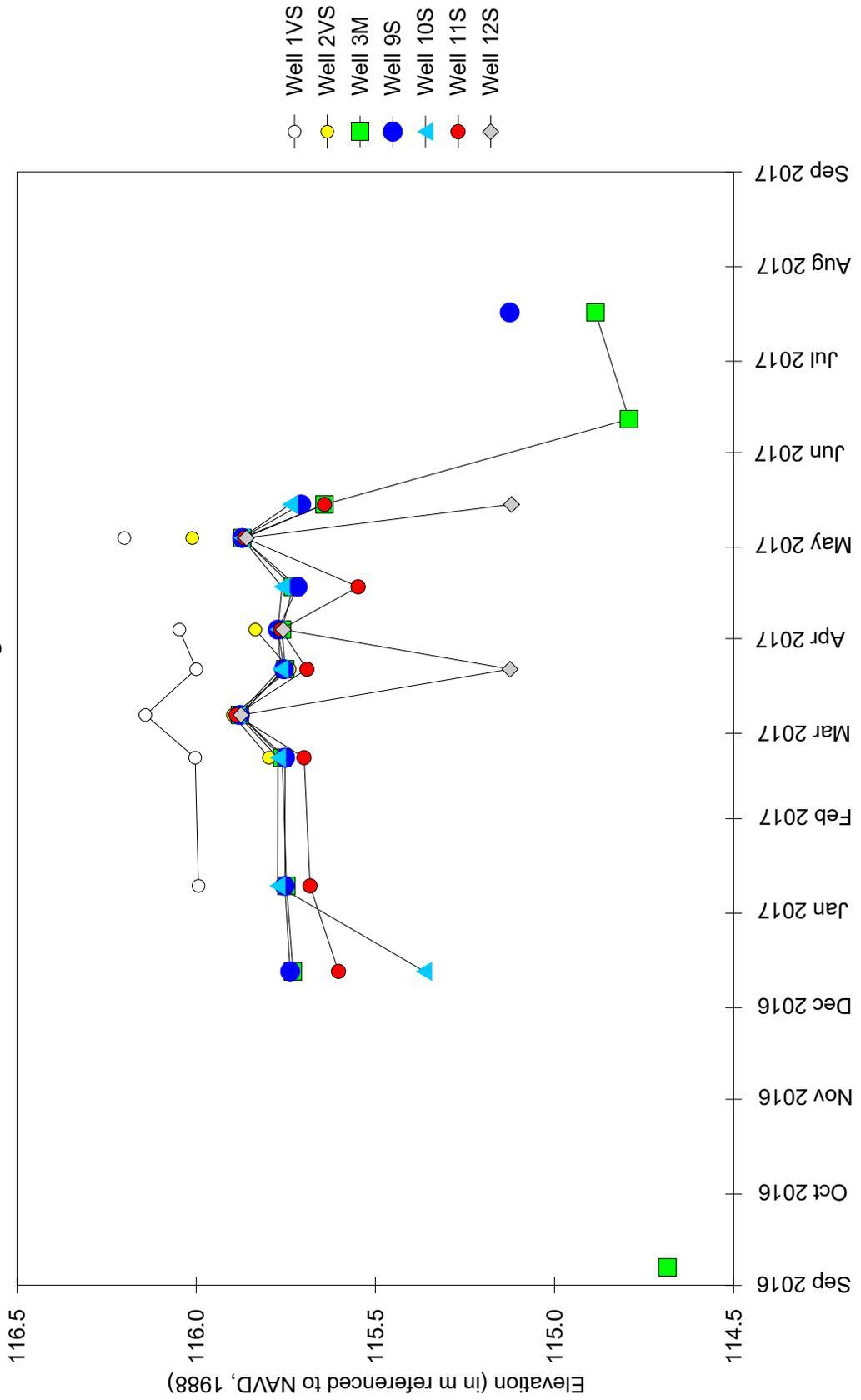


2017 Wetland Hydrology

- | | | | |
|---|--|---|---------------------|
|  | >5% of growing season (1987 Manual) |  | monitoring well |
|  | >12.5% of growing season (1987 Manual) |  | surface-water gauge |
|  | 14 days or more (2010 Midwest Region Supplement) |  | rain gauge |
| | |  | site boundary |

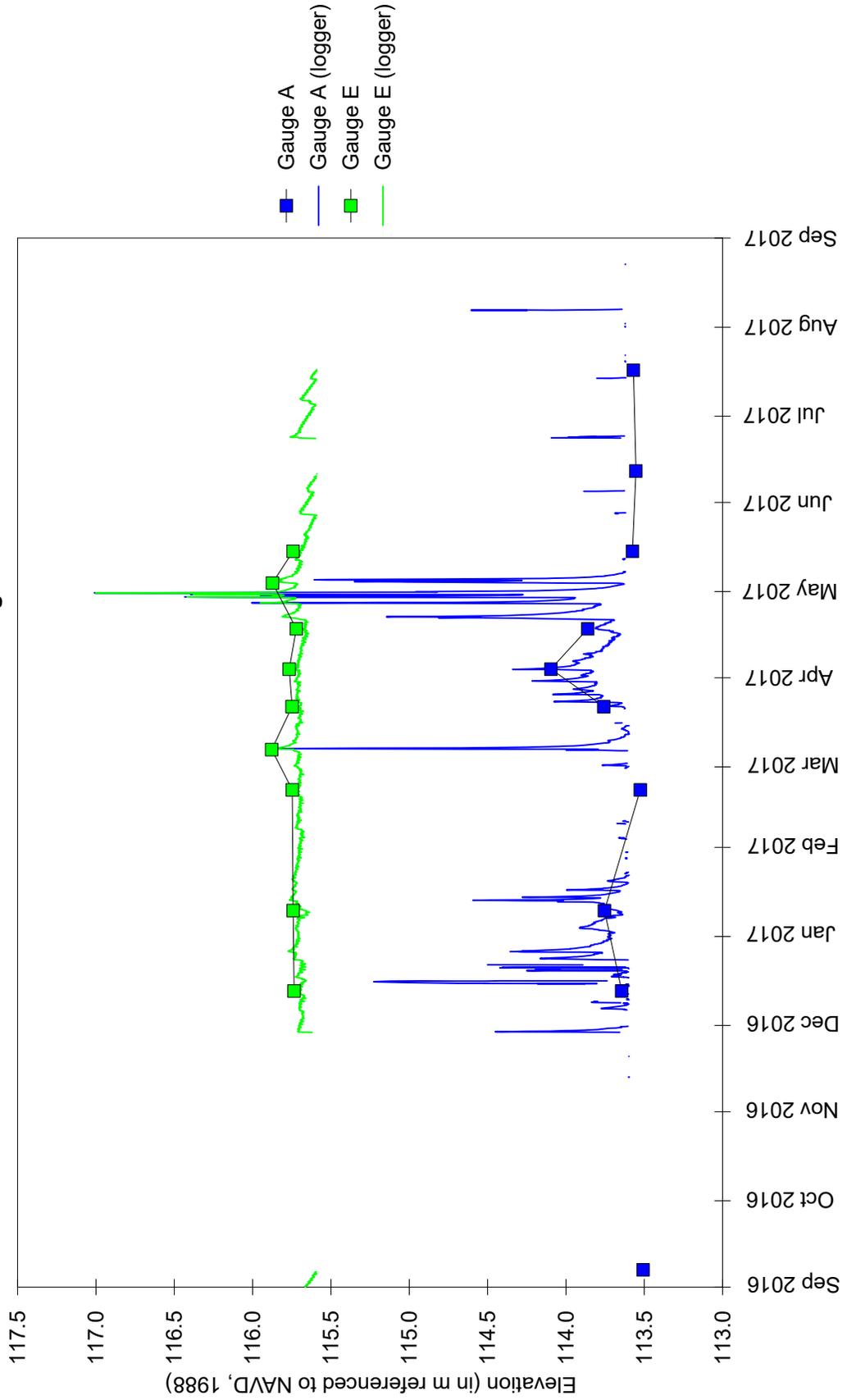
Max Creek Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Monitoring Wells

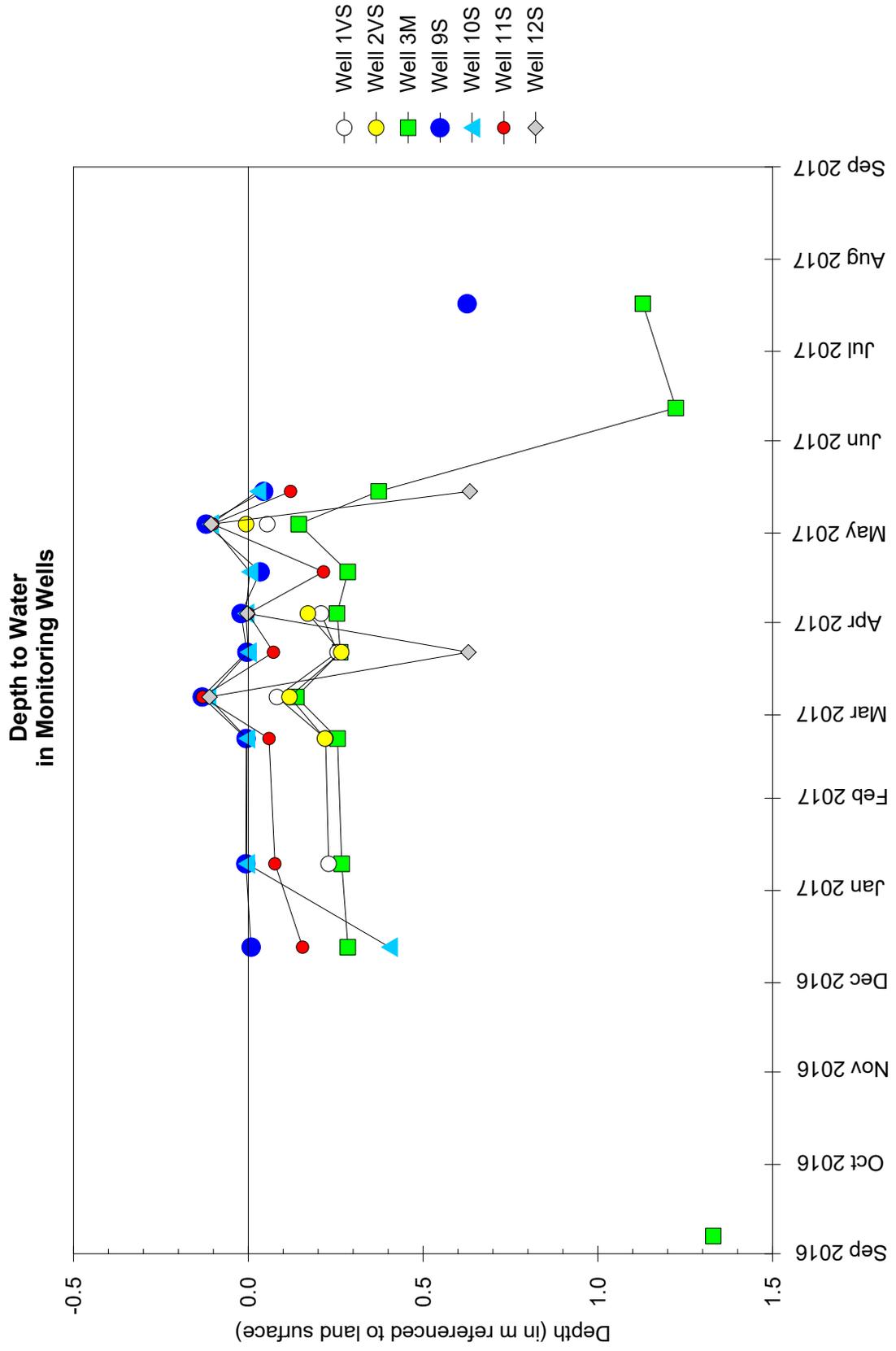


Max Creek Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges

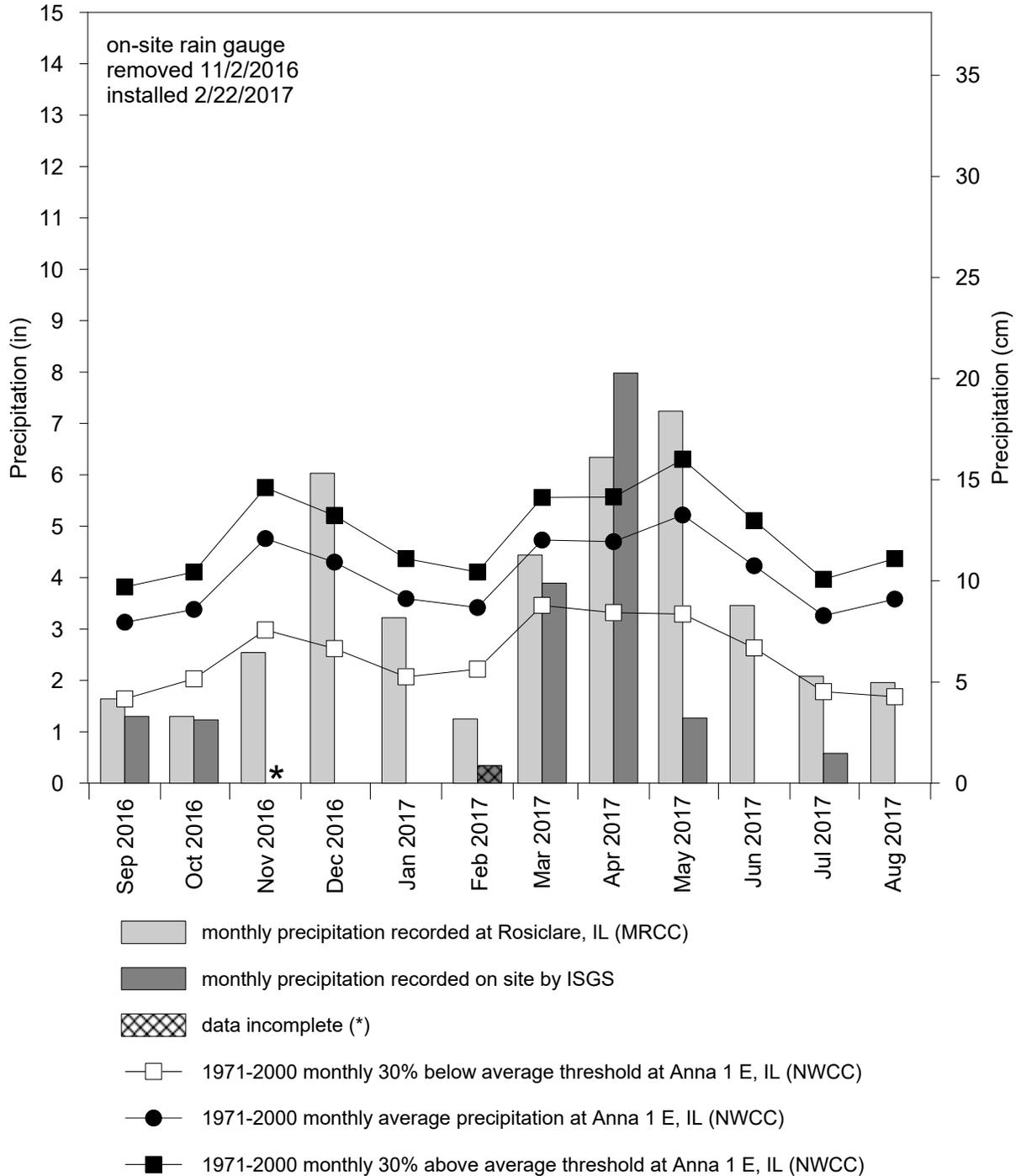


Max Creek Wetland Mitigation Site September 1, 2016 through August 31, 2017



Max Creek Wetland Mitigation Site September 2016 through August 2017

Total Monthly Precipitation Recorded on Site and at Rosiclare, IL (MRCC station #117487)



**EAST CAPE GIRARDEAU
WETLAND MITIGATION SITE**

ISGS #81

IL 146

FAP 312

Sequence #633A

Alexander County, near East Cape Girardeau, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Manager: Eric T. Plankell

SITE HISTORY

- Fall 2009: Wetland construction began.
- March 2010: ISGS submitted a Level II hydrogeologic characterization report to IDOT (ISGS Open-File Series 2010-3).
- August 2011: IDOT reported the site had been graded and drainage control structures were completed. ISGS was tasked by IDOT to monitor the site for performance criteria outlined in the wetland compensation plan, and post-construction water-level monitoring was initiated.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the East Cape Girardeau wetland mitigation site is 3.08 ha (7.60 ac). Using the 1987 Manual (Environmental Laboratory 1987), 6.17 ha (15.25 ac) of the total site area of 6.17 ha (15.25 ac) satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season and 6.17 ha (15.25 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010) to the 1987 Manual, 6.17 ha (15.25 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Cape Girardeau, Missouri, is March 21, and the season lasts 227 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days, and 12.5% of the growing season is 28 days. Using the 2010 Midwest Region Supplement, February 7 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Cape Girardeau Municipal Airport, Missouri (MRCC station #231289), was 82% of normal. During spring 2017 (March through May), precipitation was 114% of normal.
- The period of maximum inundation and saturation during the 2017 growing season began in mid-May and lasted through late June during a backflood event, which occurred in response to several rainfall events on April 20-23 (7.72 cm [3.04 in.]), April 26-May 5 (12.42 cm [4.89 in.]), June 18-19 (2.57 cm [1.01 in.]), and June 22-23 (3.76 cm [1.48 in.]) (see Additional Information).
- In 2017, water levels measured in 22 of 22 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured

in 22 of 22 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 22 of 22 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Beaver dams along the south and southeast site perimeter caused elevated water levels in the east basin surrounding Gauge B and led to overflow into the southwest basin surrounding Gauge E. According to surface-water data, the main flood event at the control structure (G) occurred after onsite flooding, suggesting that the flood may have been sustained by the East Cape Main Ditch, but was initiated by onsite precipitation and runoff impounded by the beaver dams.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue at the site until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
11S	Y	Y	Y
11VS	Y	Y	Y
12S	Y	Y	Y
12VS	Y	Y	Y
13S	Y	Y	Y
13VS	Y	Y	Y
14S	Y	Y	Y
14VS	Y	Y	Y
15S	Y	Y	Y
15VS	Y	Y	Y
16S	Y	Y	Y
16VS	Y	Y	Y
17S	Y	Y	Y
17VS	Y	Y	Y
18S	Y	Y	Y
18VS	Y	Y	Y
19S	Y	Y	Y
19VS	Y	Y	Y
20S	Y	Y	Y
20VS	Y	Y	Y
21S	Y	Y	Y
21VS	Y	Y	Y

Y - met wetland hydrology criteria
 N - did not meet wetland hydrology criteria

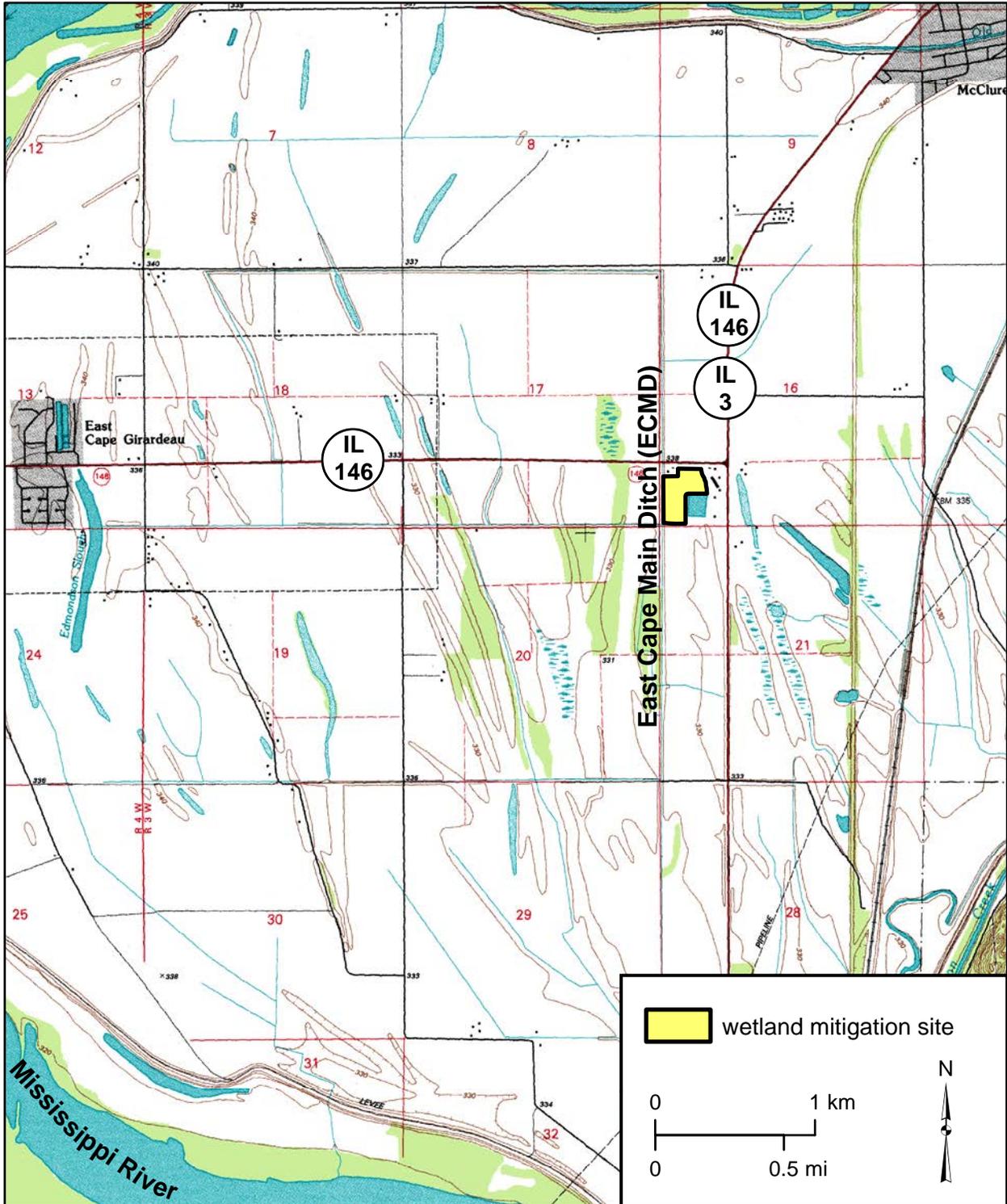
Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
B	101.69 m (333.63 ft)	101.53 m (333.10 ft)	101.68 m (333.60 ft)
E	101.61 m (333.37 ft)	101.45 m (332.84 ft)	101.60 m (333.33 ft)
F	101.61 m (333.37 ft)	101.45 m (332.84 ft)	101.59 m (333.30 ft)
G	101.57 m (333.23 ft)	101.51 m (333.04 ft)	101.56 m (333.20 ft)

n/a – insufficient data to determine an elevation

East Cape Girardeau Wetland Mitigation Site (IL 146, FAP 312)

General Study Area and Vicinity

from the USGS Topographic Series, McClure, IL-MO, 7.5-minute Quadrangle (USGS 1993c)
contour interval is 20 feet, with supplementary contour interval of 10 feet



East Cape Girardeau Wetland Mitigation Site (IL 146, FAP 312)

Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

Map based on 2015 Farm Service Agency digital orthophotography, Alexander County, Illinois
(USDA-FSA 2015)

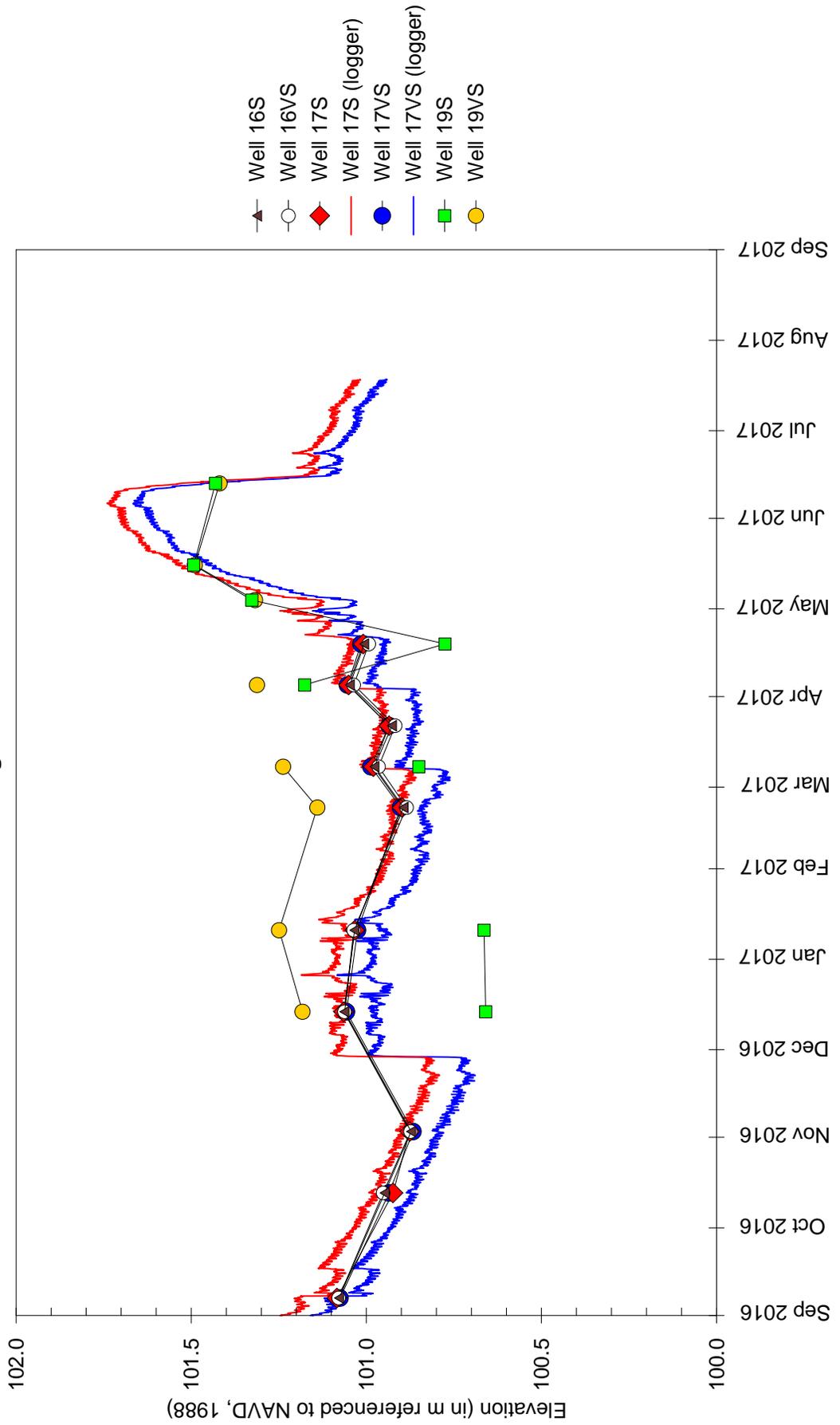


2017 Wetland Hydrology

- | | | | |
|---|--|---|---------------------|
|  | >5% of growing season (1987 Manual) |  | monitoring well |
|  | >12.5% of growing season (1987 Manual) |  | surface-water gauge |
|  | 14 days or more (2010 Midwest Region) |  | rain gauge |
| | |  | site boundary |

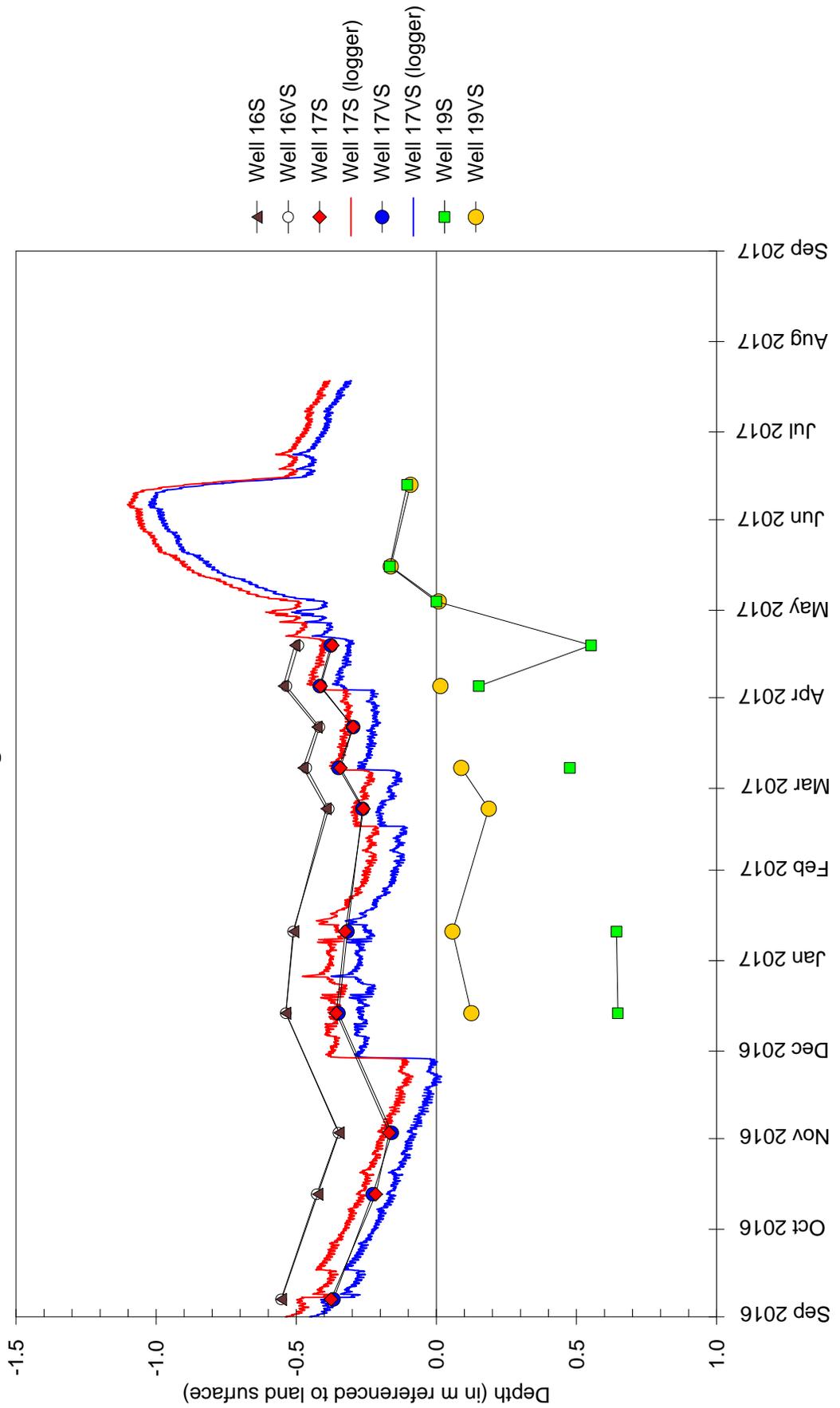
East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Monitoring Wells - Northeast



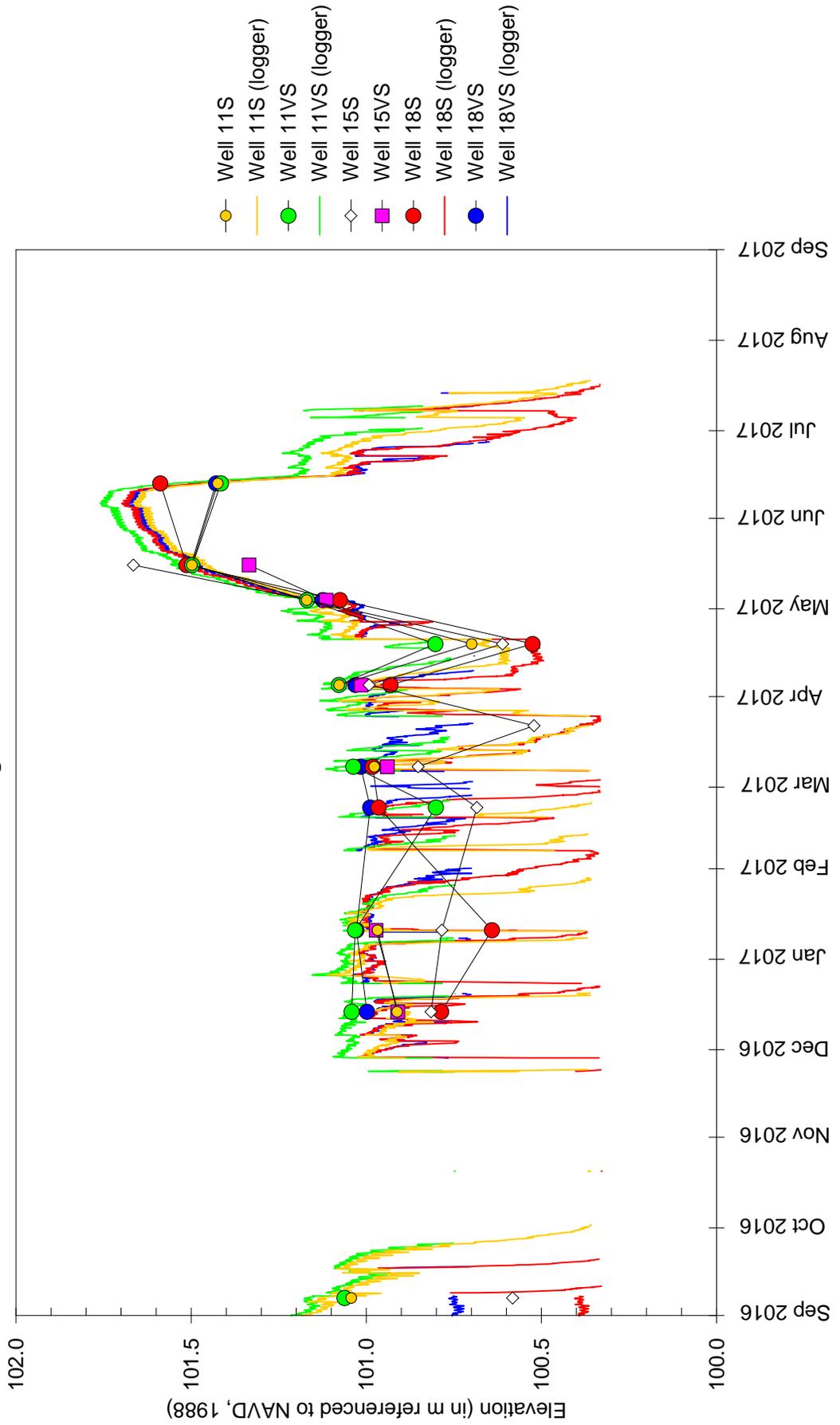
East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017

Depth to Water
in Monitoring Wells - Northeast

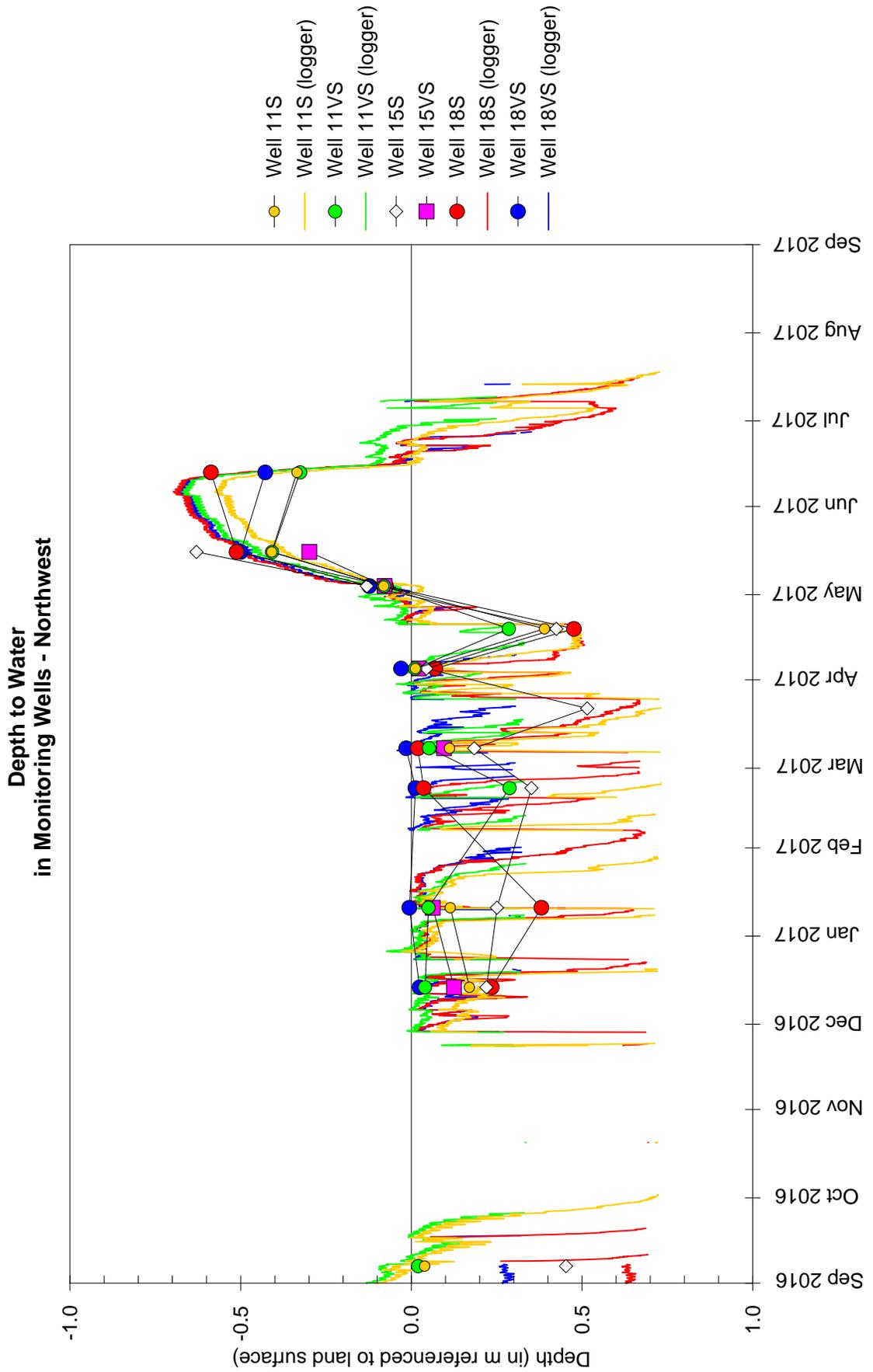


East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Monitoring Wells - Northwest

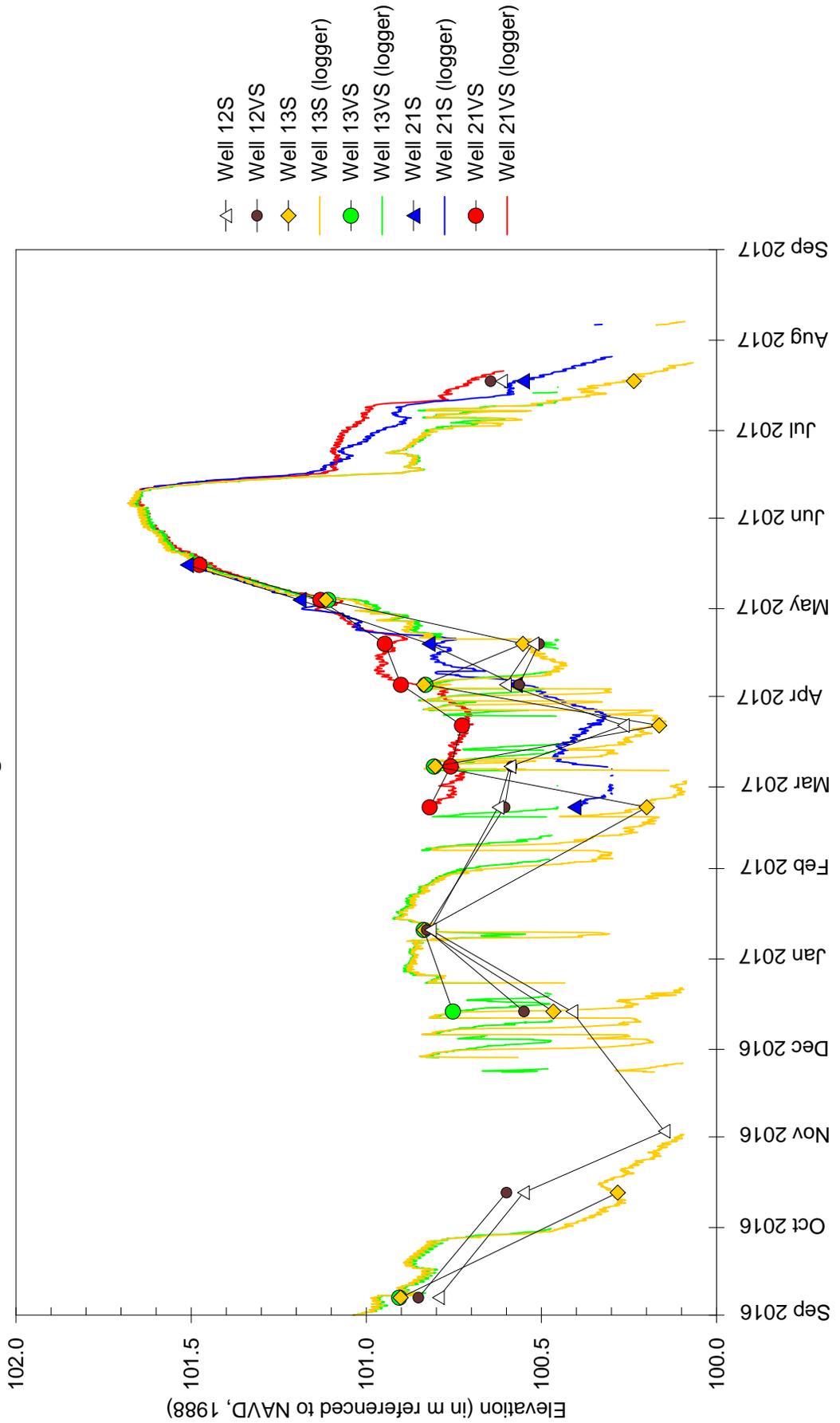


East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017



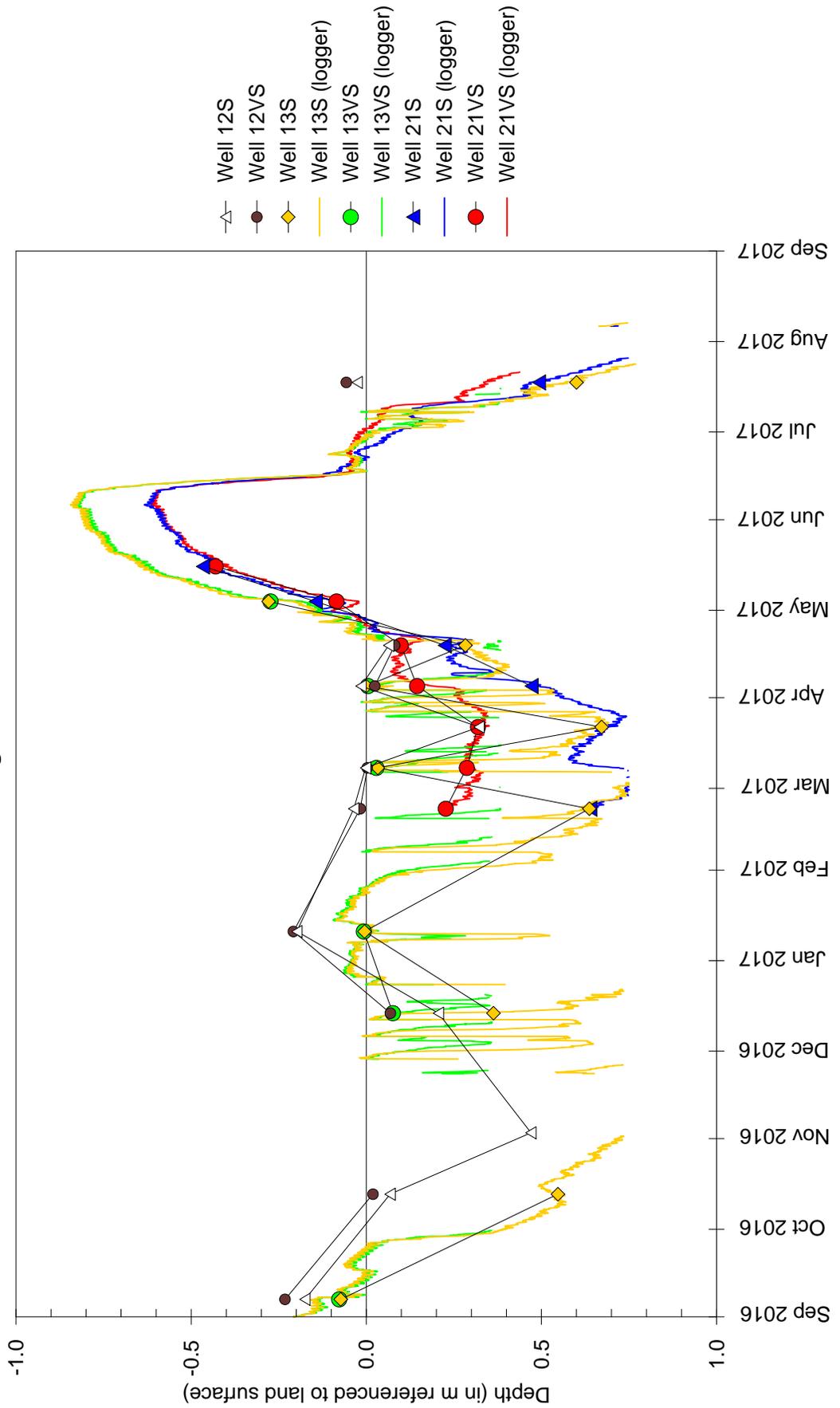
East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Monitoring Wells - Southeast



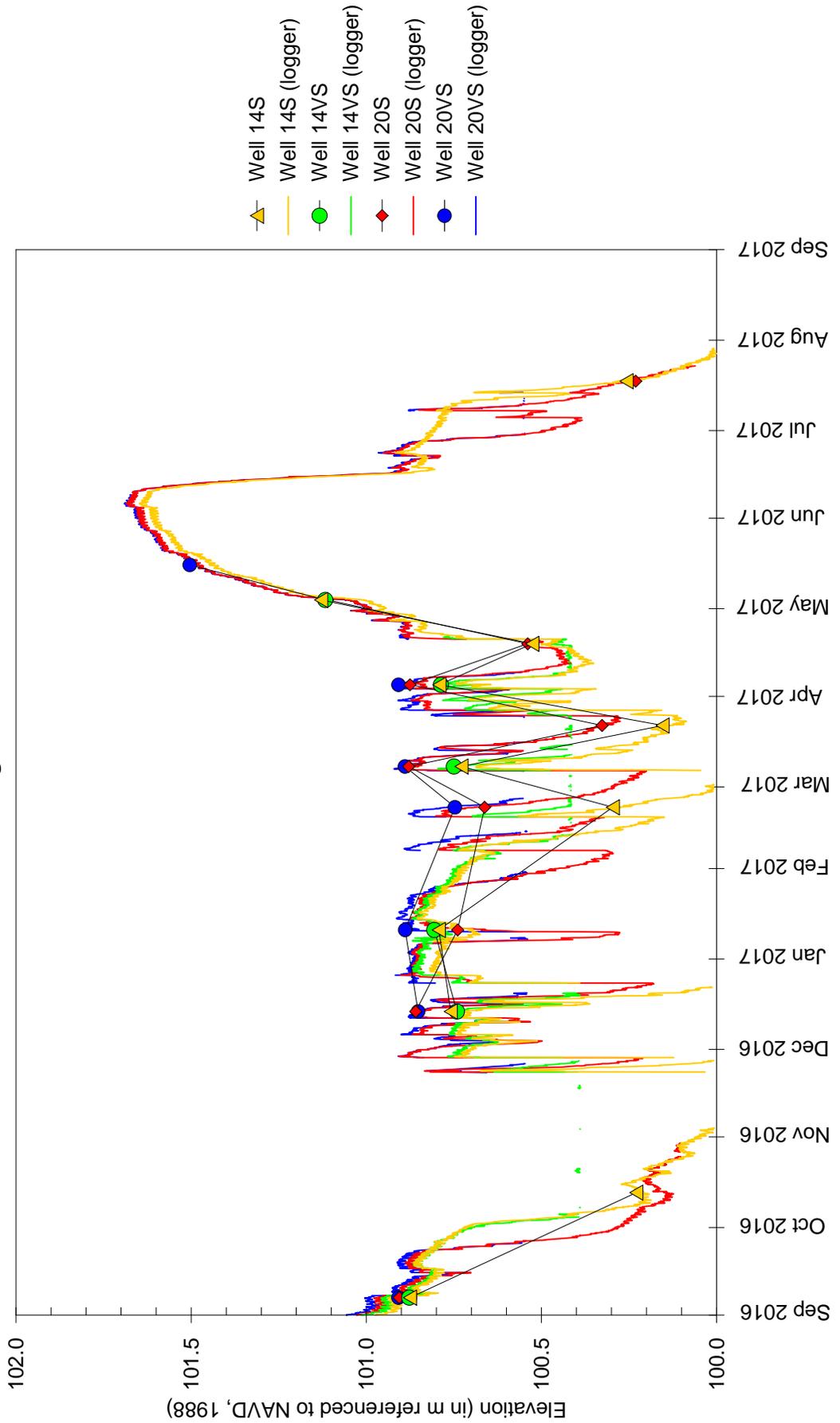
East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017

Depth to Water
in Monitoring Wells - Southeast

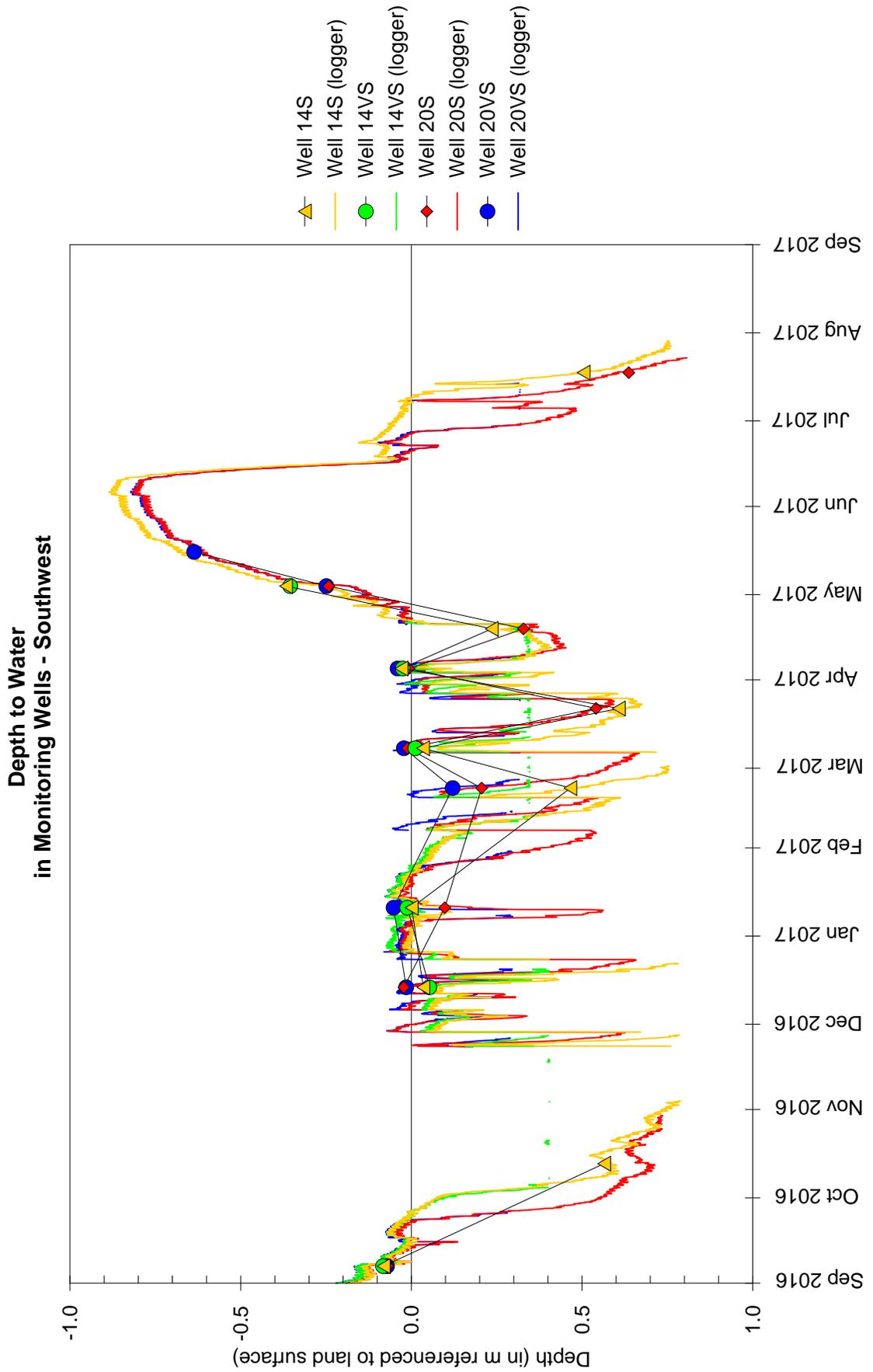


East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Monitoring Wells - Southwest

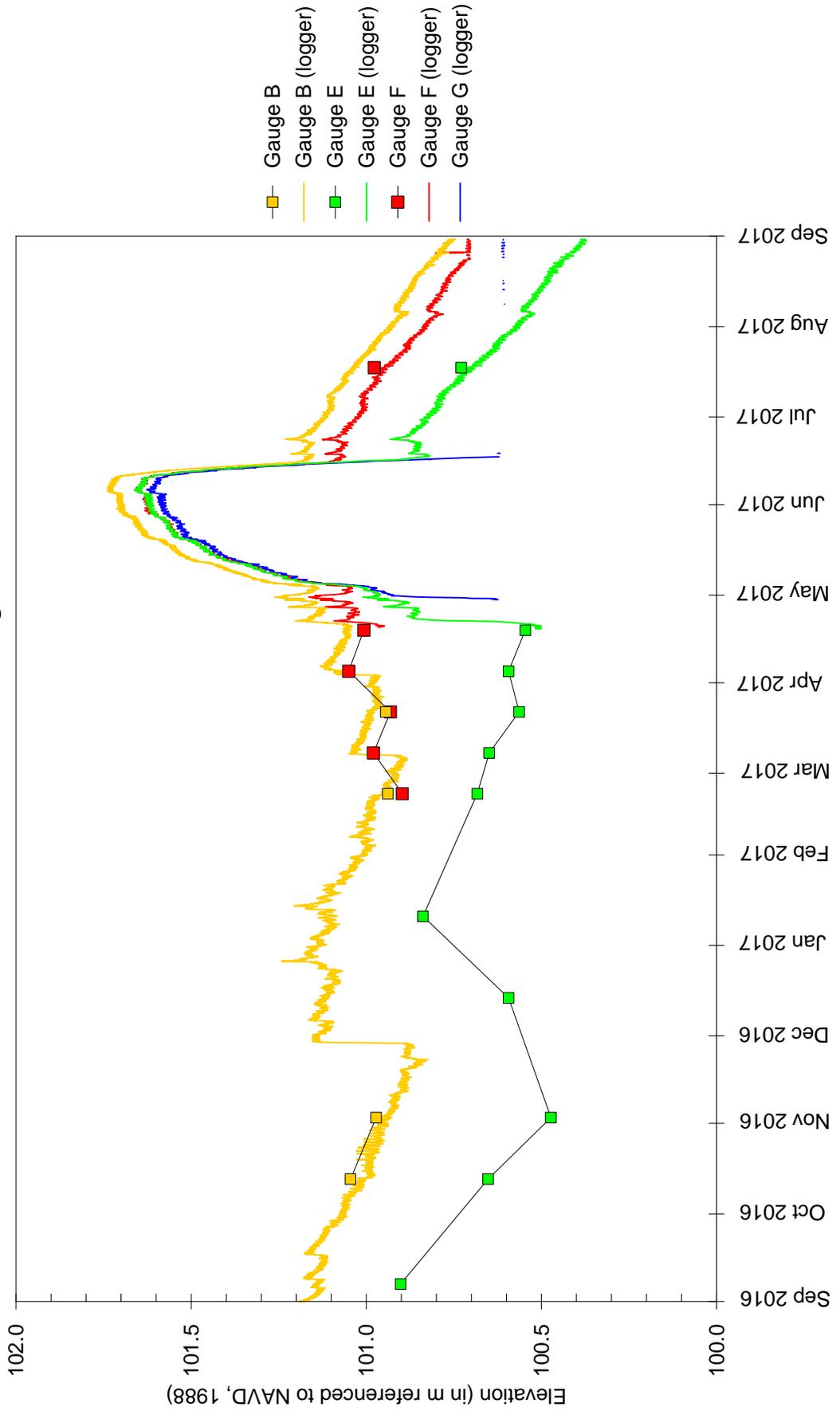


East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017



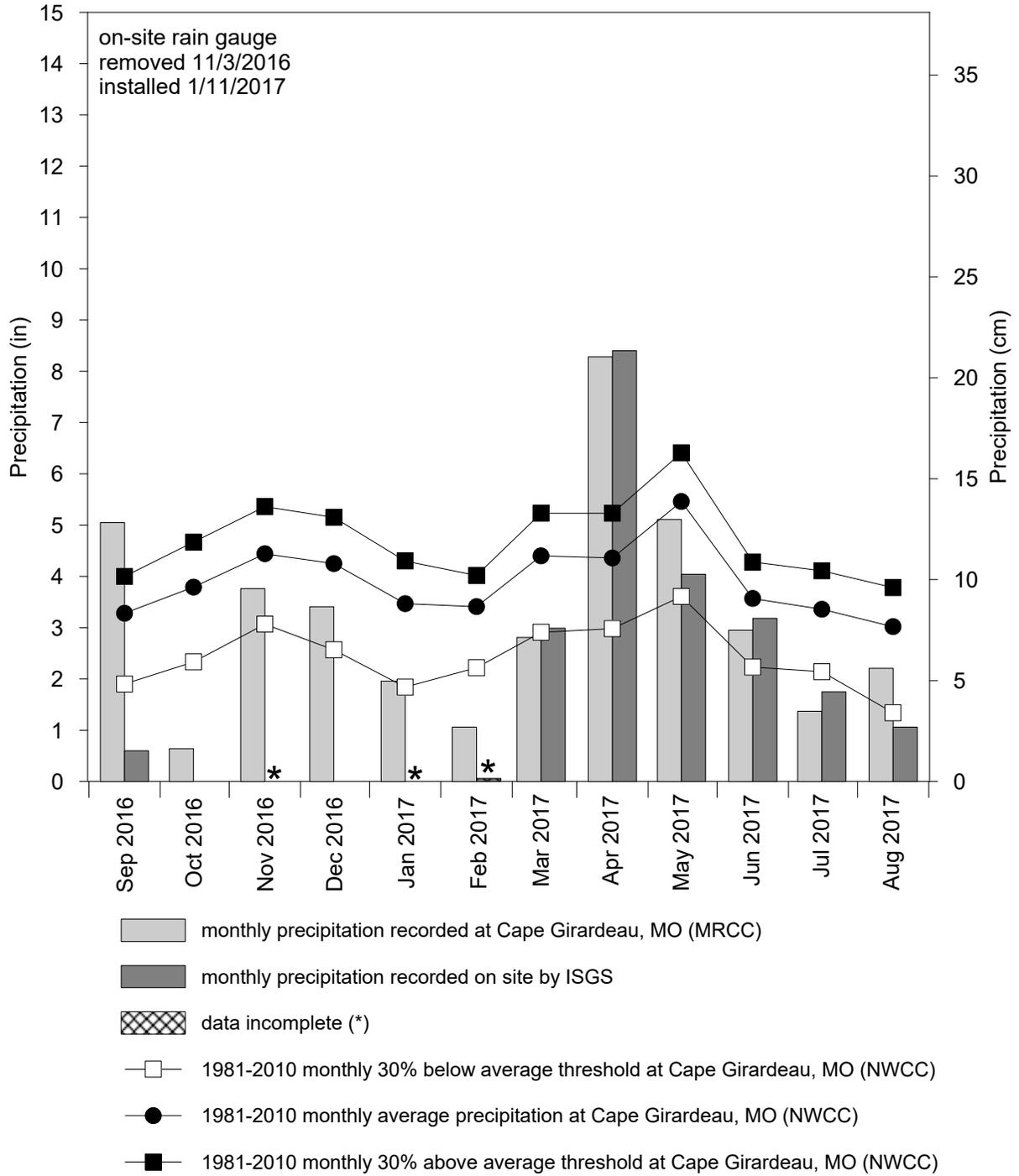
East Cape Girardeau Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
at Surface-Water Gauges



East Cape Girardeau Wetland Mitigation Site September 2016 through August 2017

Total Monthly Precipitation Recorded on Site and at Cape Girardeau, MO (MRCC station #231289)



**LAWRENCE COUNTY
WETLAND MITIGATION BANK**

ISGS #82

Sequence #14912

Lawrence County, near Lawrenceville, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Joshua J. Richardson

SITE HISTORY

- June 2009: An Initial Site Evaluation report was submitted to IDOT on June 18, 2009.
- December 2011: A Level II hydrologic characterization report (ISGS Open-File Series 2011-4) was submitted to IDOT.
- April 2013: The wetland banking instrument for the Lawrence County Wetland Mitigation Bank was approved.
- November 2013: Construction of the wetland bank was completed.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Lawrence County Wetland Mitigation Bank is 13.62 ha (33.65 ac). Using the 1987 Manual (Environmental Laboratory 1987), 13.47 ha (33.28 ac) of a total site area of 25.71 ha (63.52 ac), satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season, and 11.69 ha (28.88 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 13.47 ha (33.28 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins at Lawrenceville, Illinois is March 30, and the season lasts 221 days (MRCC 2017); 5% of the growing season is 11 days, and 12.5% of the growing season is 28 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, February 20 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period, recorded at Lawrenceville International Airport (MRCC station #13809), was 75% of normal. Precipitation in spring 2017 (March through May) was 100% of normal.
- The period of maximum inundation and saturation during the 2017 growing season occurred in May due to a flood event on the Embarras River starting April 29 and ending May 19 that caused Beaver Pond Ditch to overflow its banks.
- In 2017, water levels measured in 14 of 23 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 10 of 23 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 14 of 23 soil-zone monitoring wells satisfied

wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Water was detected in the monitoring wells along the eastern boundary of the site during the flood event in May. There were three brief periods of groundwater saturation at Well 19S, but the longest lasted less than 3½ days. At Well 31S and Gauge D, saturation and inundation together likely persisted long enough to satisfy both the 5% and 14-day wetland hydrology criteria. Water was also detected in the other monitoring wells along the eastern boundary, but the depth to groundwater was >0.305 m.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue at the site until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	Y	Y	Y
3S	Y	Y	Y
4SR	N	N	N
6S	Y	Y	Y
7S	Y	Y	Y
9S	Y	Y	Y
13S	Y	Y	Y
15S	Y	Y	Y
17S	N	N	N
19S	N	N	N
20S	Y	N	Y
21S	N	N	N
22S	N	N	N
23S	N	N	N
24S	Y	Y	Y
25S	N	N	N
26S	Y	N	Y
27SR	N	N	N
28S	Y	Y	Y
29S	Y	N	Y
30S	N	N	N
31S	Y	N	Y
32S	Y	Y	Y

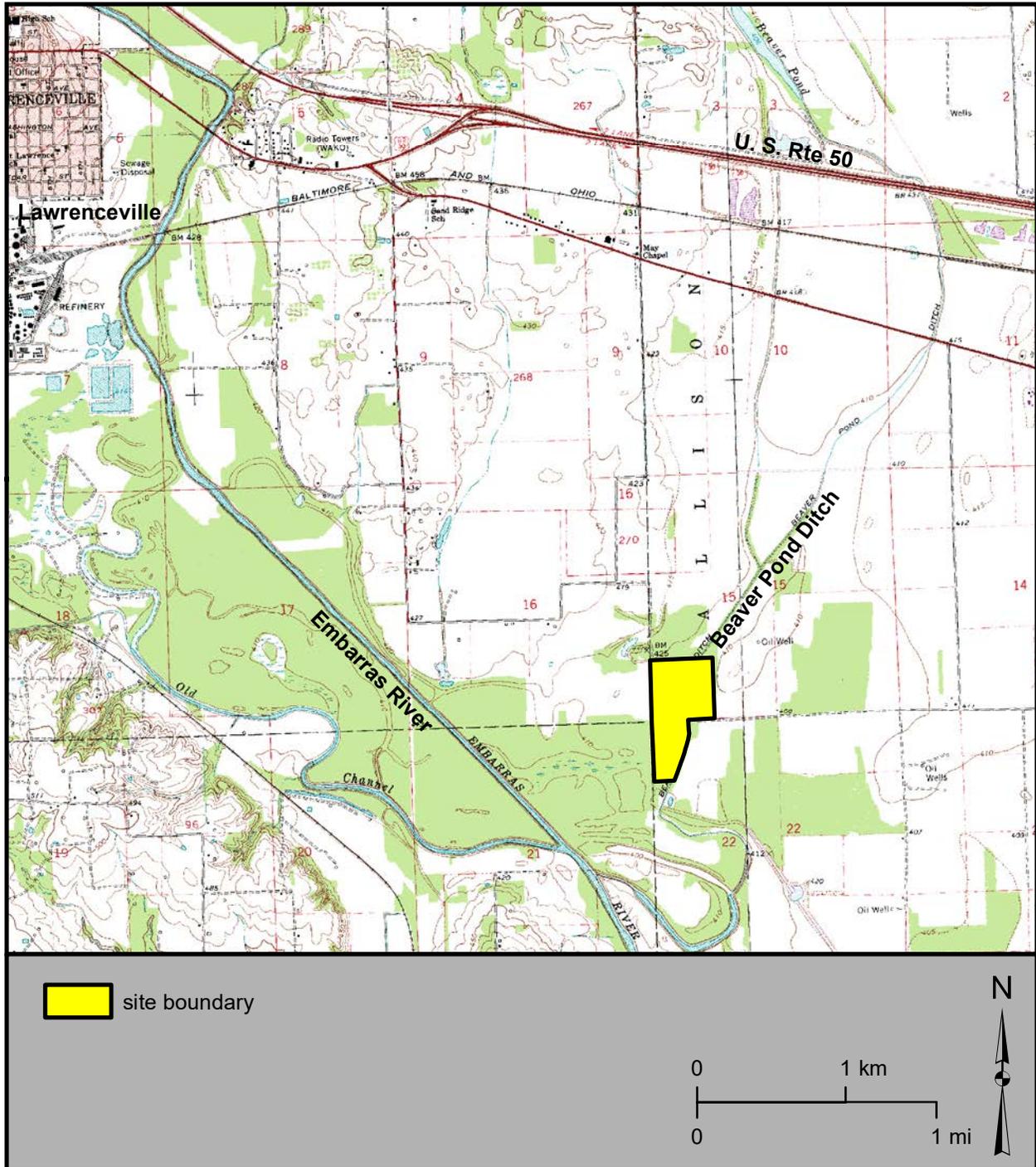
Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
B	124.69 m (409.09 ft)	124.28 m (407.74 ft)	124.69 m (409.09 ft)
D	n/a	n/a	n/a
E	124.25 m (407.64 ft)	124.20 m (407.48 ft)	124.25 m (407.64 ft)
F	124.53 m (408.56 ft)	124.46 m (408.33 ft)	124.51 m (408.50 ft)
G	124.67 m (409.02 ft)	124.64 m (408.92 ft)	124.67 m (409.02 ft)
H	124.53 m (408.56 ft)	124.46 m (408.33 ft)	124.51 m (408.50 ft)

n/a – insufficient data to determine an elevation

Lawrence County Wetland Mitigation Bank General Study Area and Vicinity

from the USGS Topographic Series, Lawrenceville, IL,
and Vincennes, IN-IL, 7.5-minute quadrangles (USGS 1965a, 1965b)

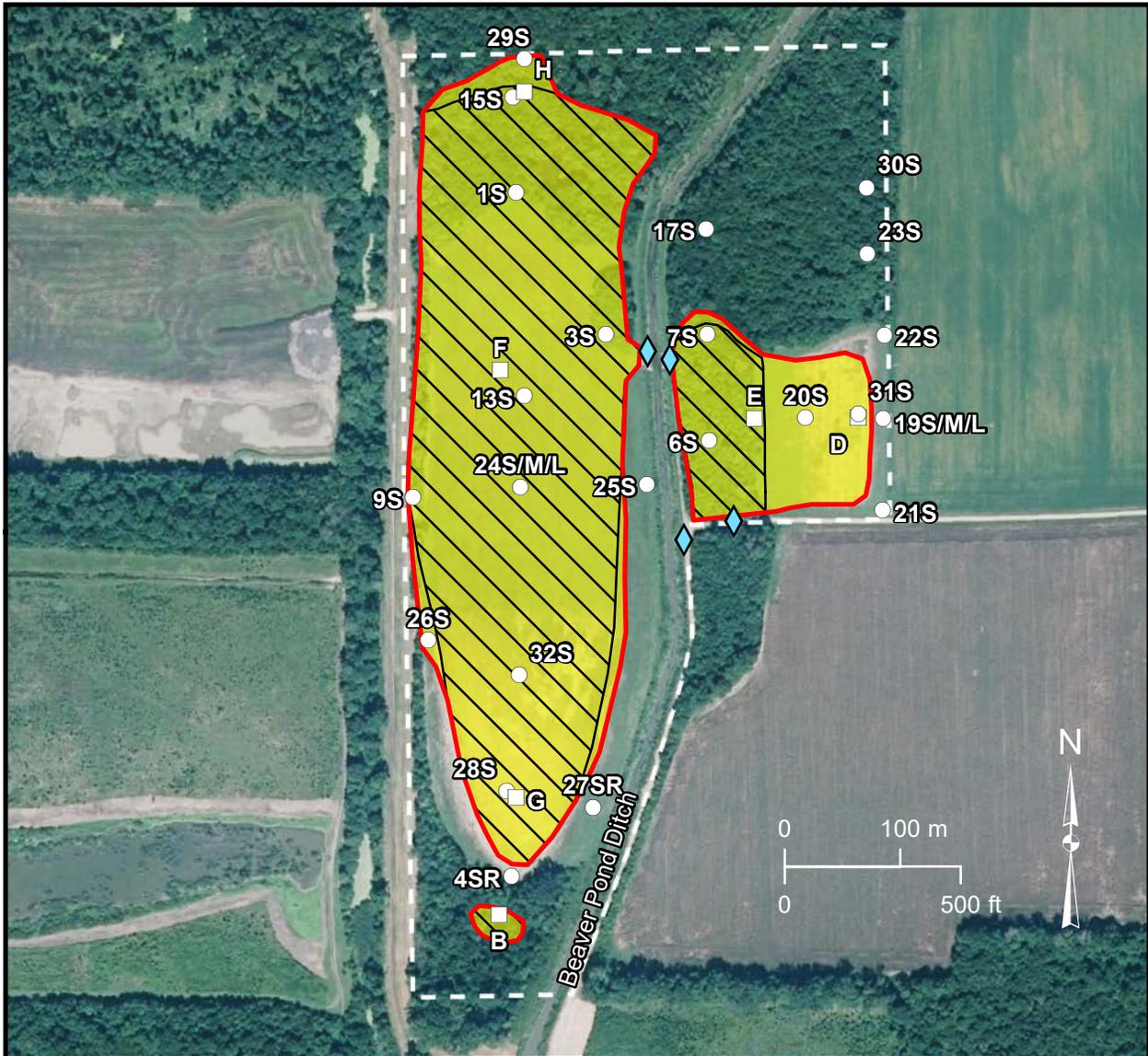


Lawrence County Wetland Mitigation Bank

Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

Map based on 2014 Farm Service Agency digital orthophotography, Lawrence County, Illinois (USDA-FSA 2014)



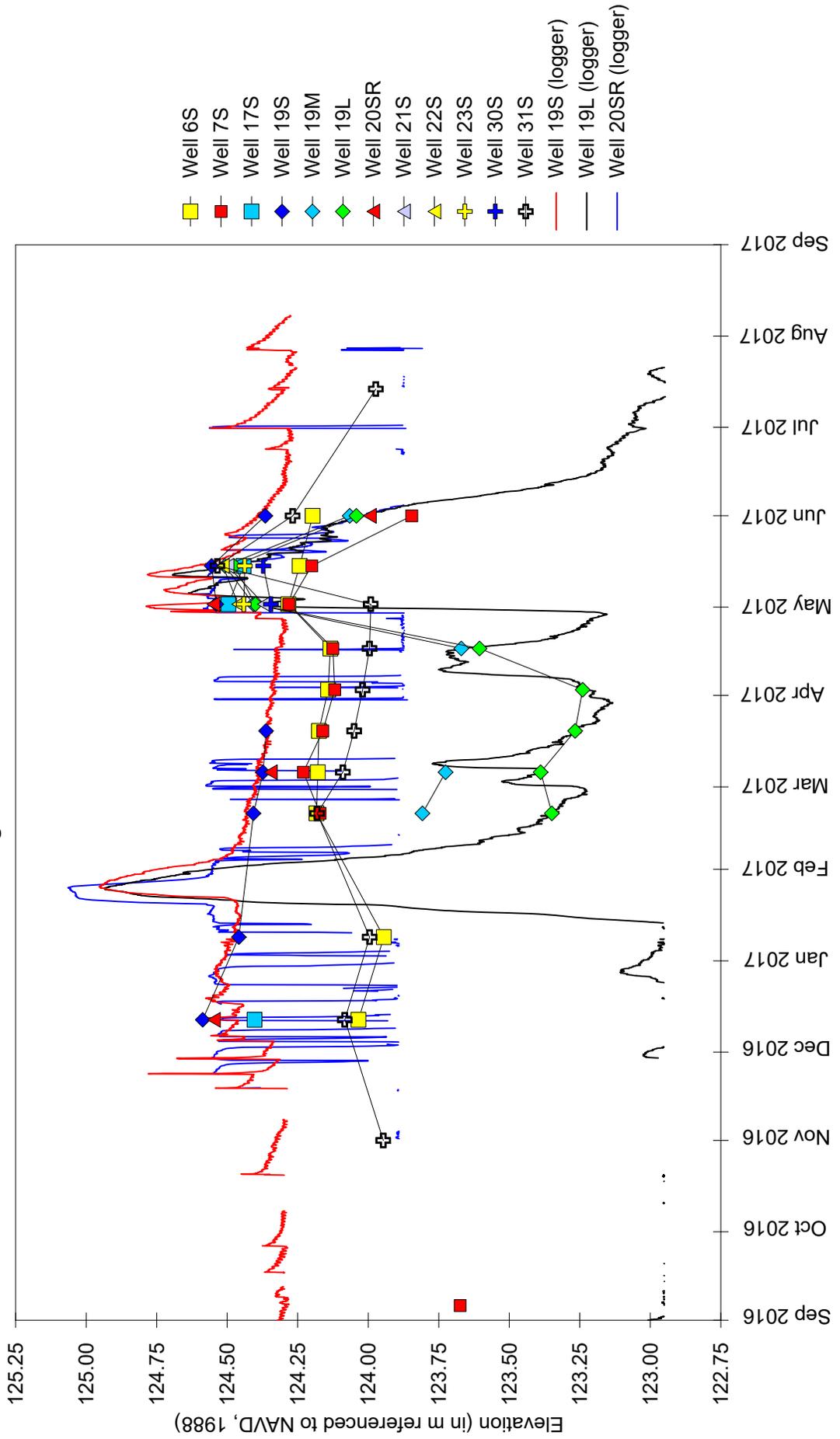
2017 Wetland Hydrology

- >5% of growing season (1987 Manual)
- >12.5% of growing season (1987 Manual)
- 14 days or more (2010 Midwest Region Supplement)

- monitoring well
- surface-water gauge
- water-control structures
- site boundary

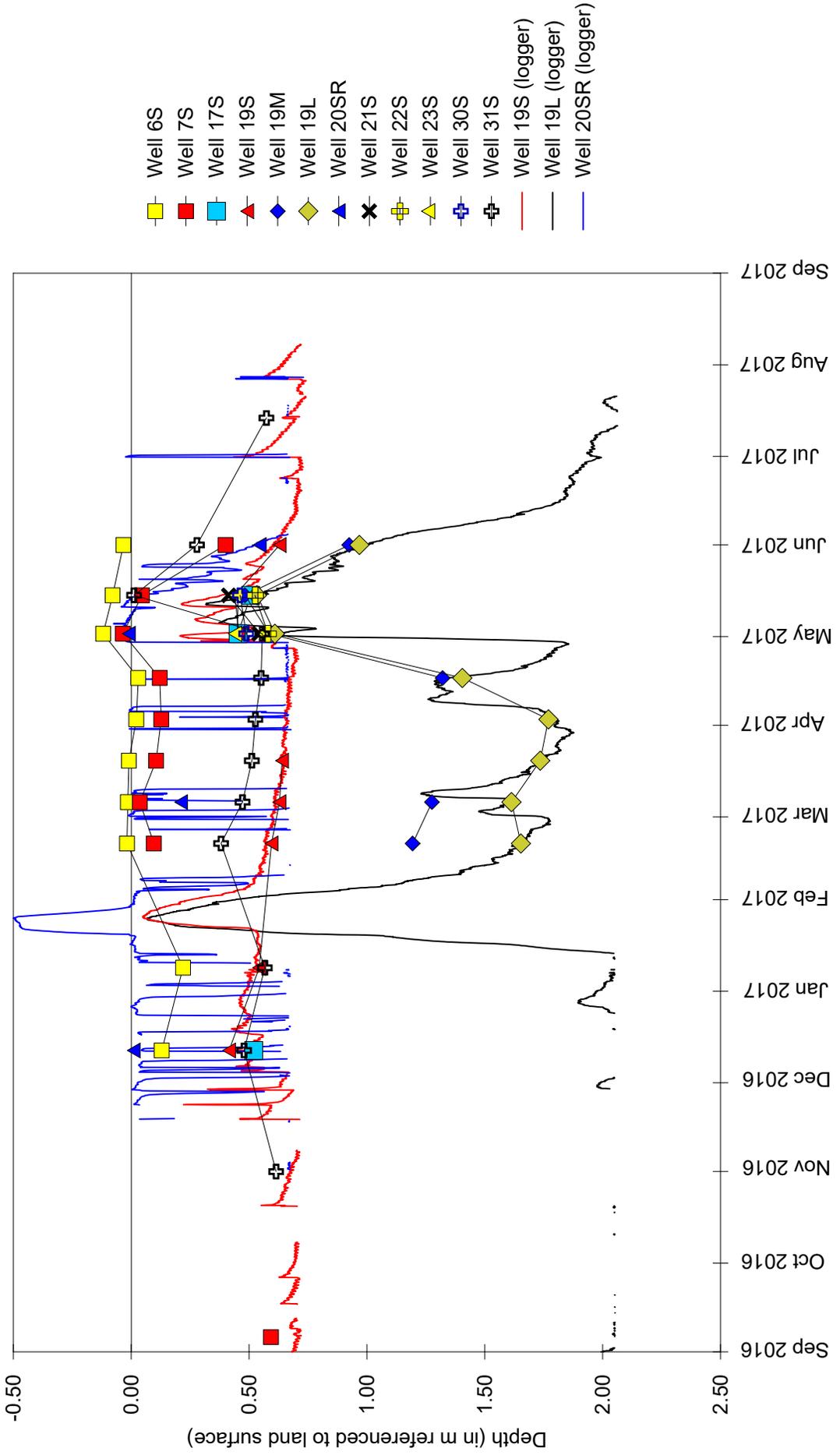
Lawrence County Wetland Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations in Monitoring Wells East of Beaver Pond Ditch



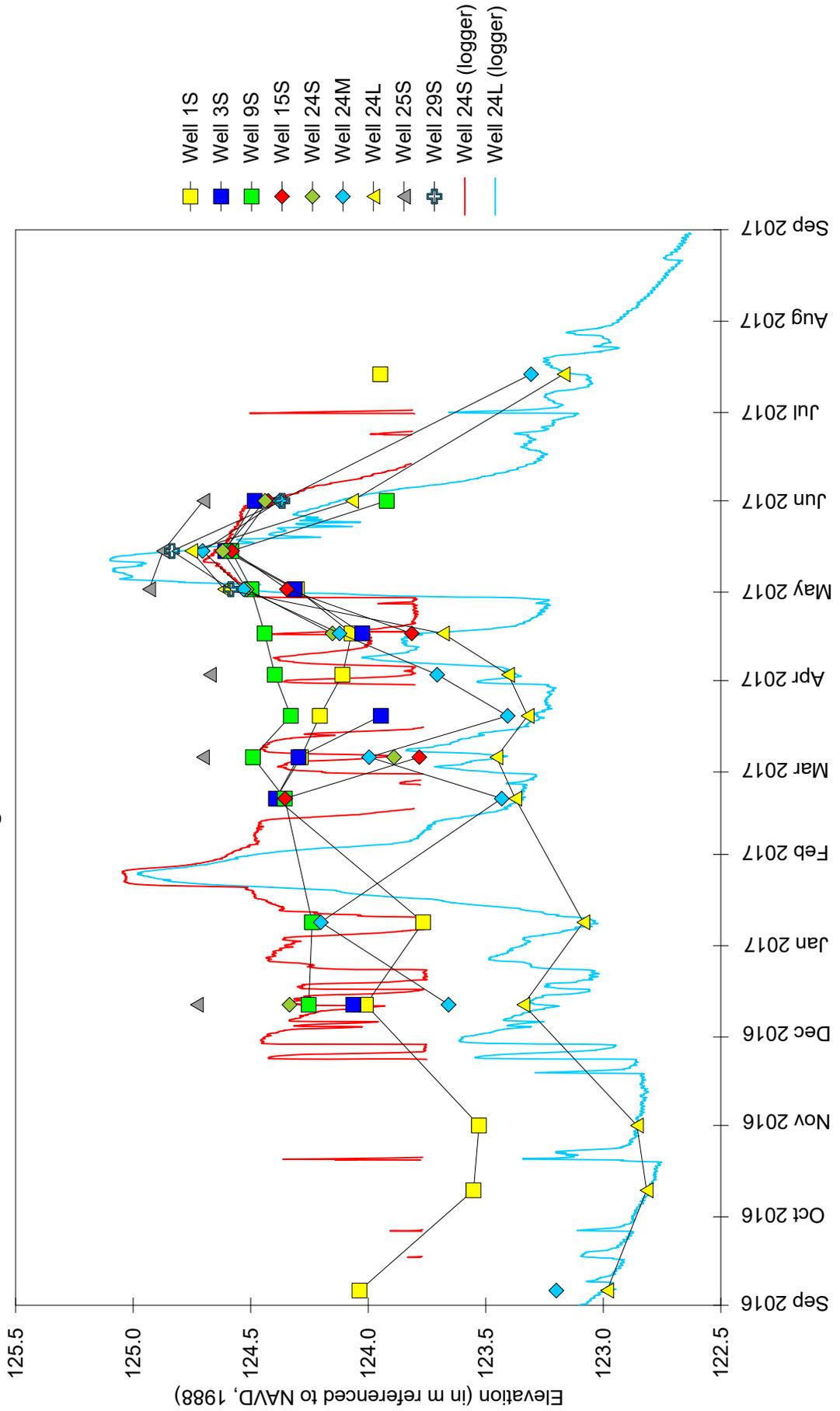
**Lawrence County Wetland Bank
September 1, 2016 through August 31, 2017**

**Depth to Water
in Monitoring Wells East of Beaver Pond Ditch**

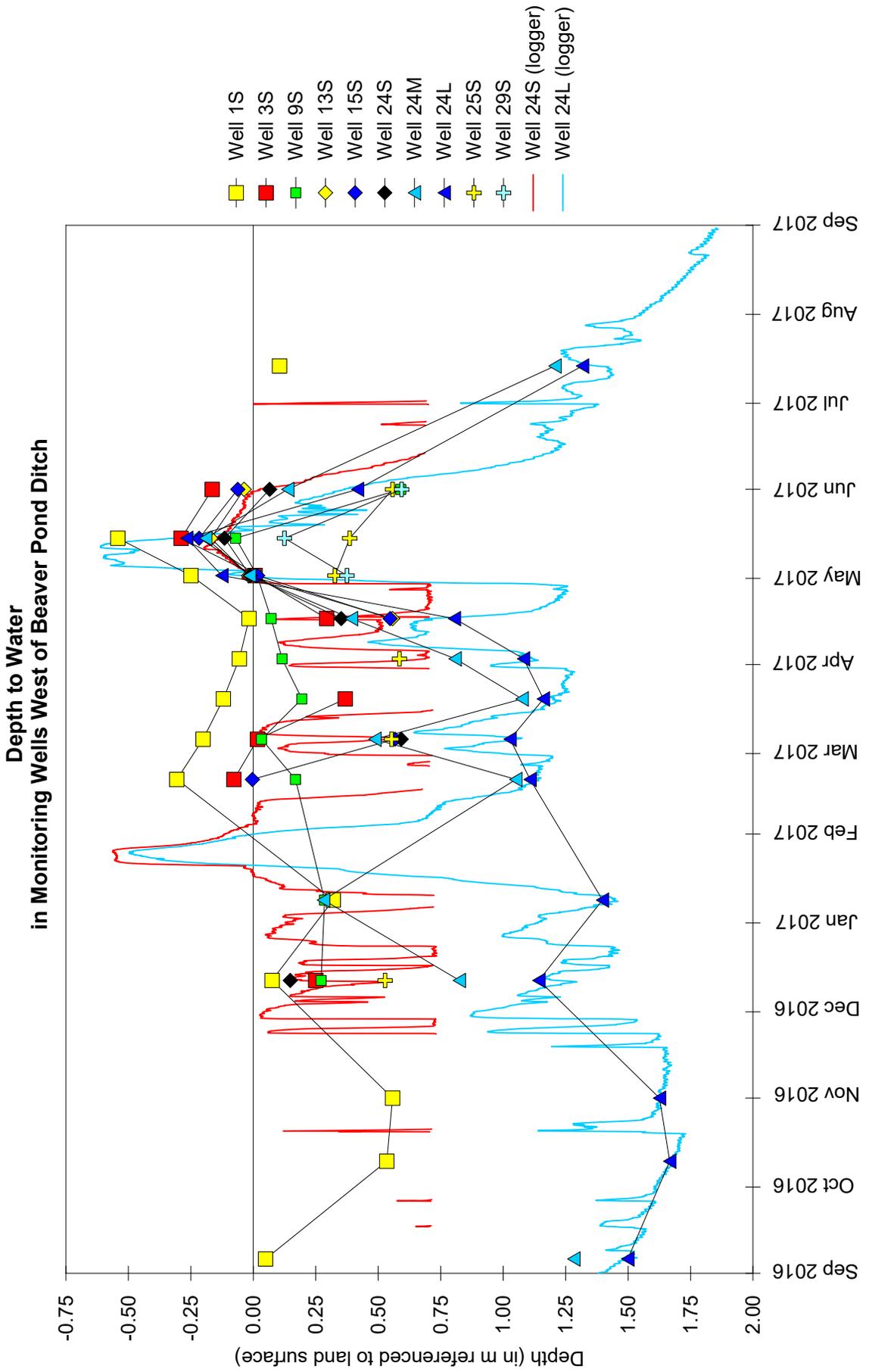


Lawrence County Wetland Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations in Monitoring Wells West of Beaver Pond Ditch

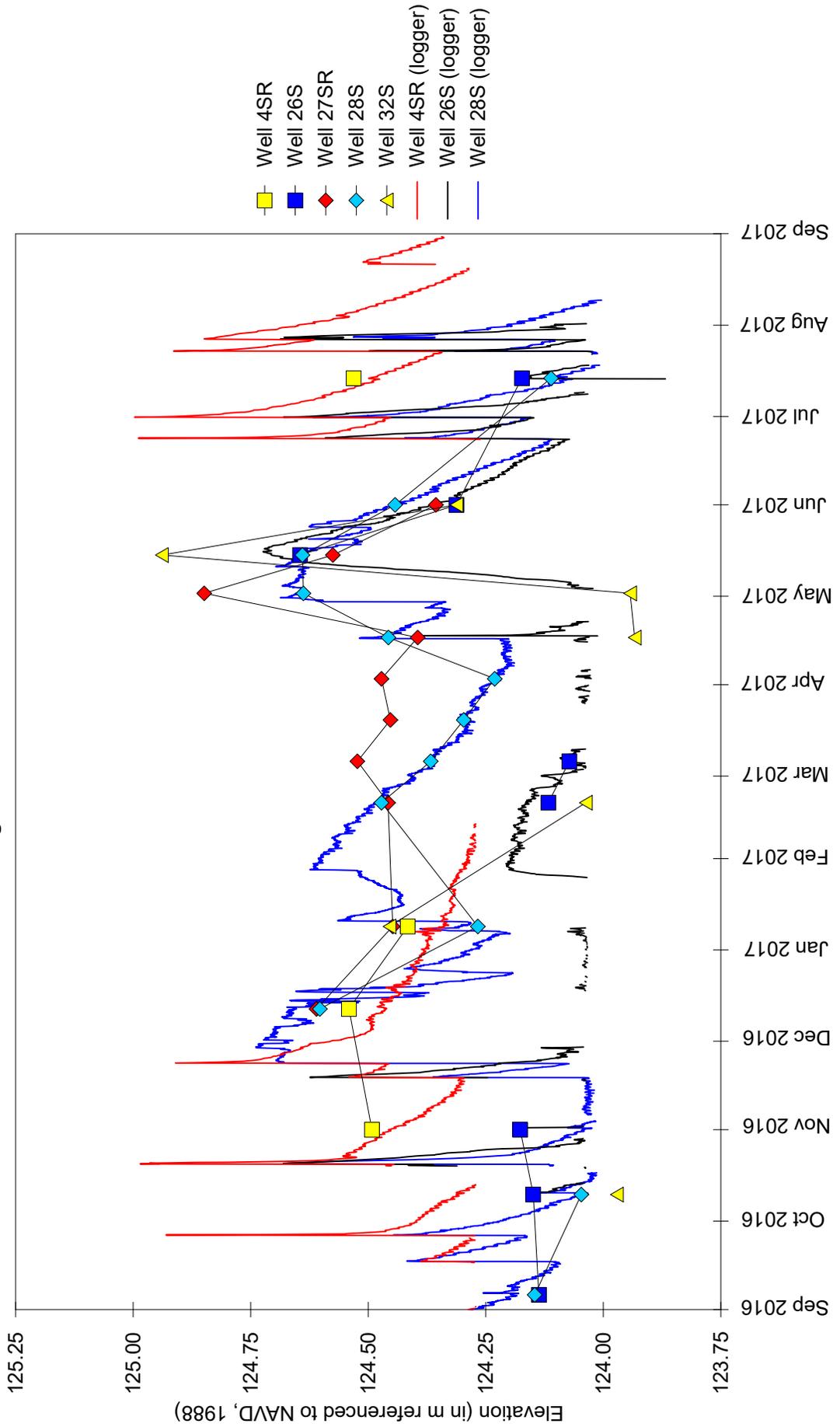


**Lawrence County Wetland Mitigation Bank
September 1, 2016 through August 31, 2017**



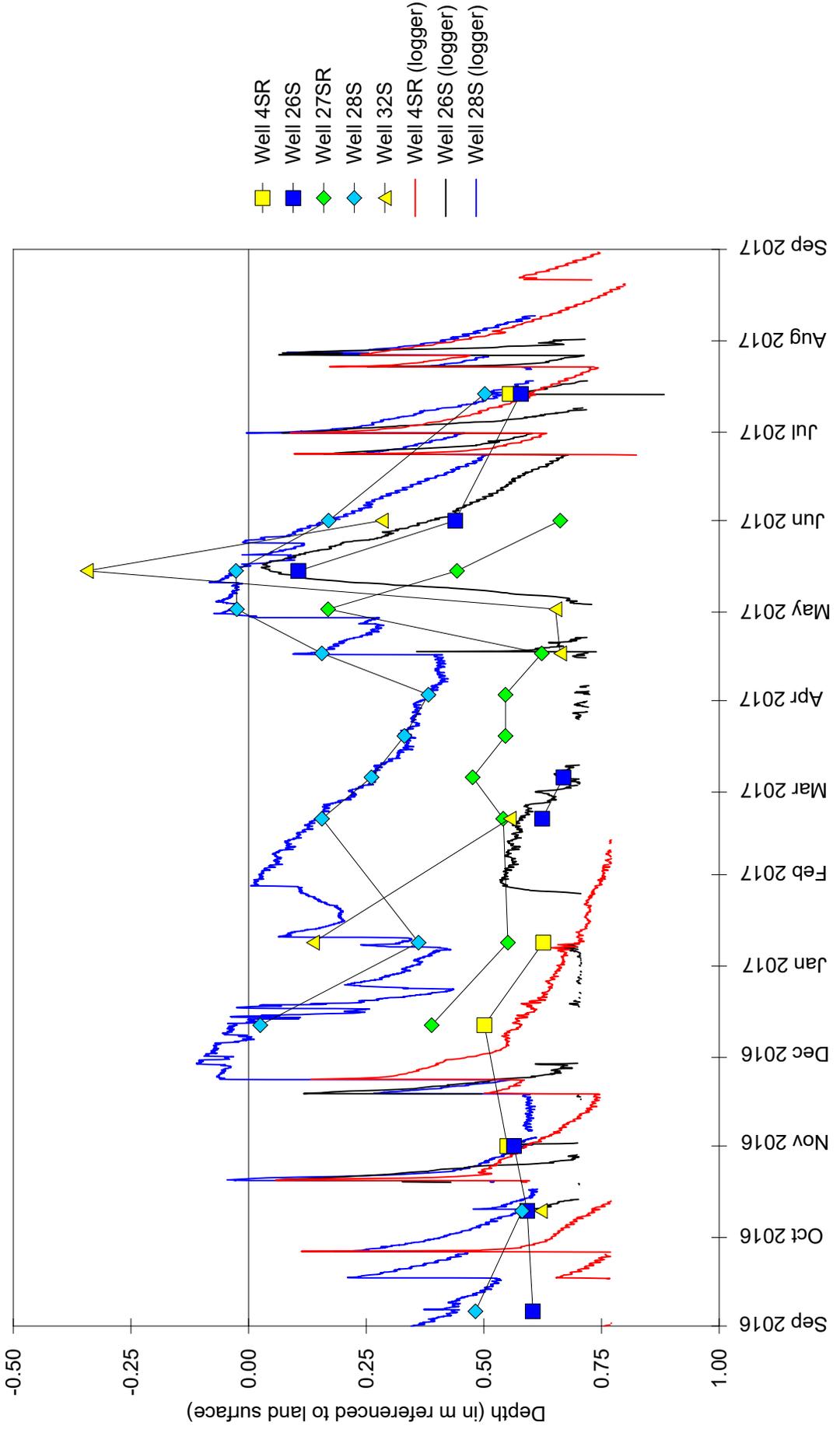
Lawrence County Wetland Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations in Monitoring Wells West of Beaver Pond Ditch



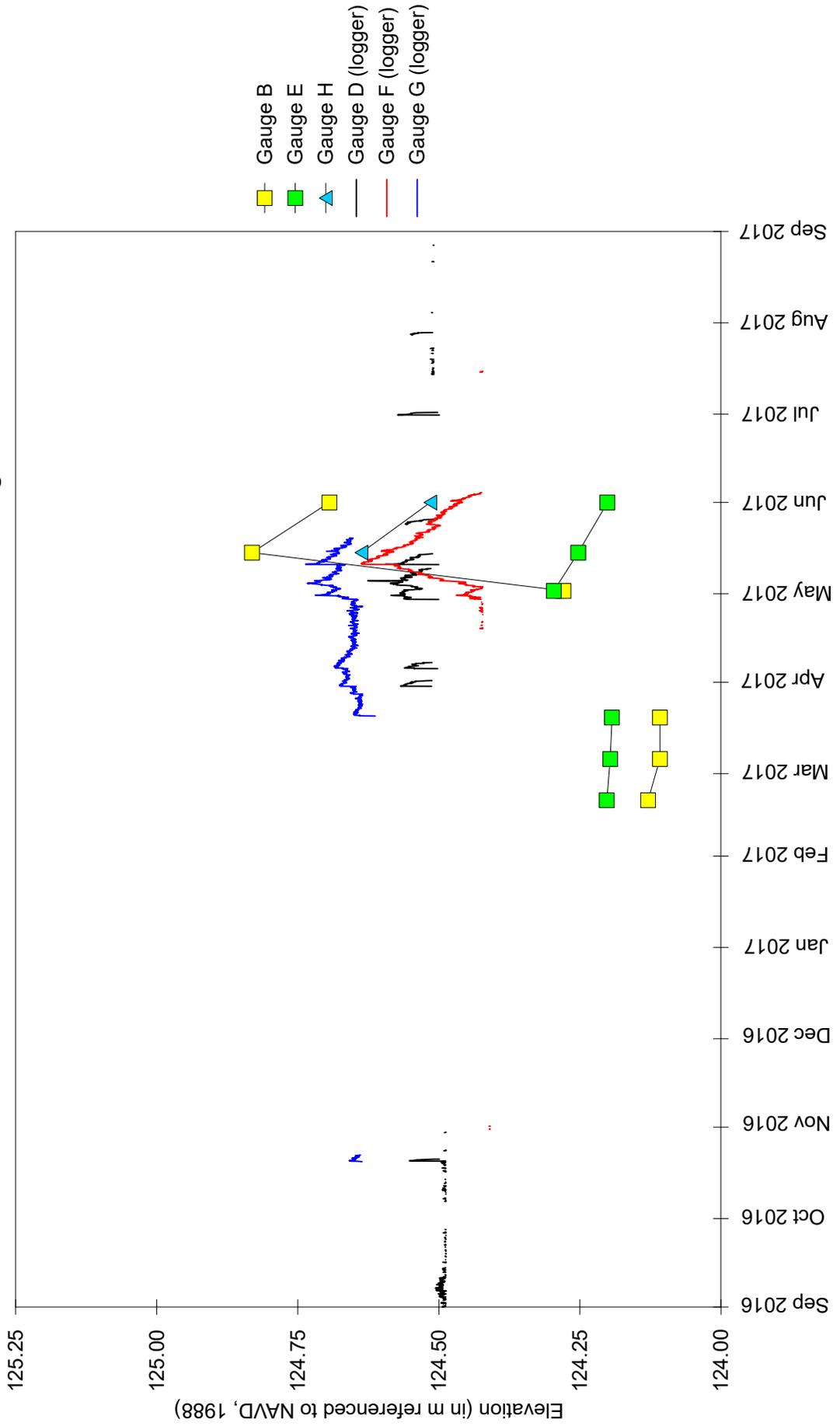
**Lawrence County Wetland Bank
September 1, 2016 through August 31, 2017**

**Depth to Water
in Monitoring Wells West of Beaver Pond Ditch**



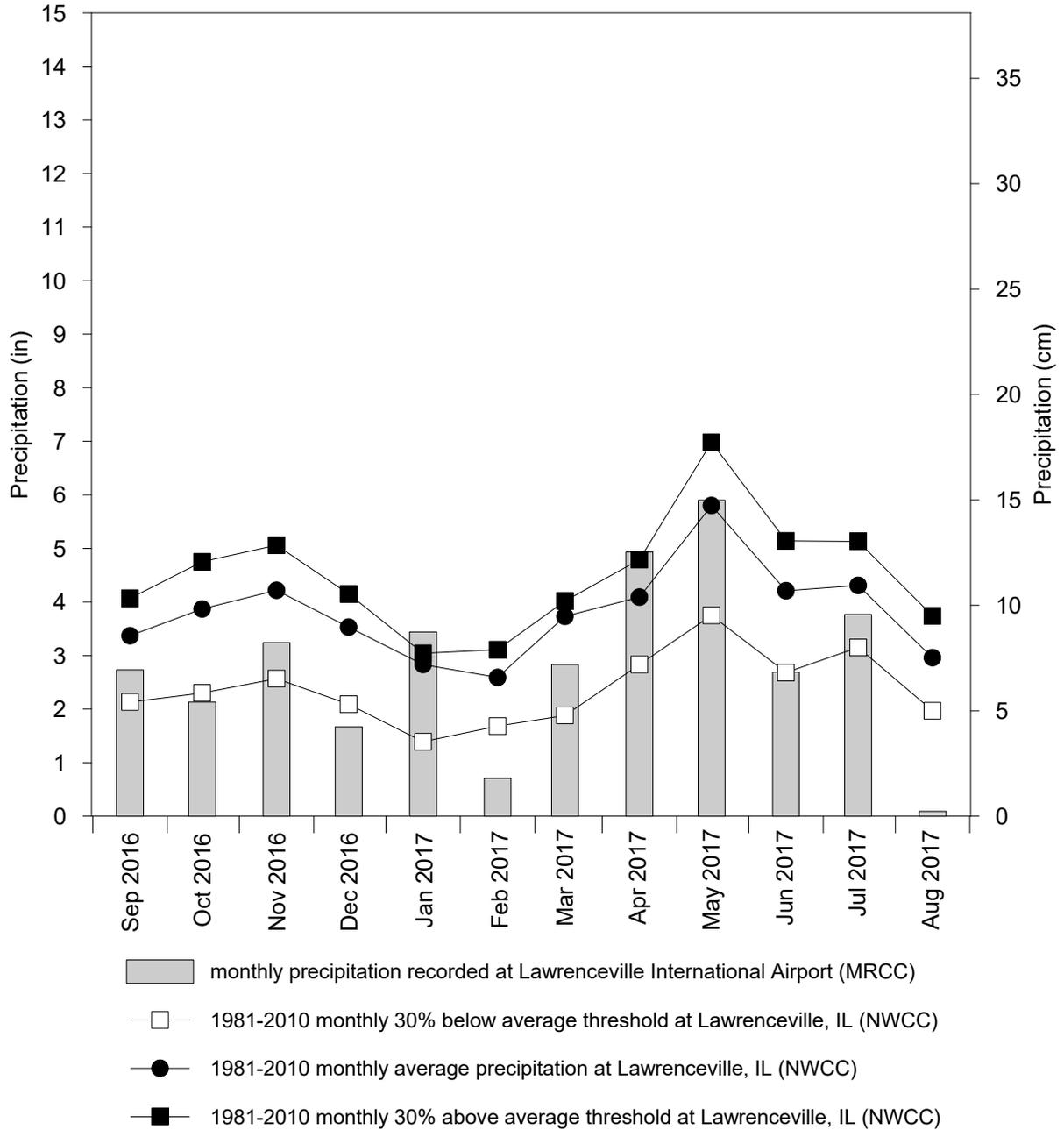
Lawrence County Wetland Mitigation Bank September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



Lawrence County Wetland Mitigation Bank September 2016 through August 2017

**Total Monthly Precipitation Recorded at
Lawrenceville International Airport (MRCC station #13809)**



**NORTH CHICAGO
WETLAND MITIGATION SITE**

ISGS #84

IL 56/IL 47

FAP 326

Sequence #13406

Lake County, North Chicago, Illinois

Primary Project Managers: Jessica L. B. Monson

Secondary Project Manager: Keith W. Carr

SITE HISTORY

- Spring 2009: IDOT tasked ISGS to resume targeted monitoring. Eight monitoring wells were installed in the northernmost part of the site.
- Spring and summer 2010: Drain tiles and invasive vegetation were removed.
- Spring and winter 2015: Four monitoring wells were installed across central and southern portions of the site.
- Spring 2017: Two monitoring wells were installed in the southwest portion of the site.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the North Chicago wetland mitigation site is not available. Using the 1987 Manual (Environmental Laboratory 1987), 23.69 ha (58.55 ac), of a total site area of 65.10 ha (160.87 ac), satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season, and 19.94 ha (49.28 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 23.18 ha (57.28 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Glencoe, Illinois, is April 8, and the season lasts 200 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 10 days, and 12.5% of the growing season is 25 days. Using the 2010 Midwest Region Supplement, April 2 was the starting date of the 2017 growing season based on soil-temperature measurements on site.
- Total precipitation for the monitoring period at Chicago O'Hare Airport, Illinois (MRCC station #111549), was 110% of normal. During spring 2017 (March through May), precipitation was 144% of normal.
- The period of maximum inundation and saturation during the 2017 growing season began in mid-March and continued through late April. Inundation and saturation during this period was mainly in response to a seasonally elevated water table and two intense rainfall events that occurred March 29-30 and April 29-30, which produced 4.47 cm (1.76 in.) and 6.00 cm (2.36 in.), respectively.
- In 2017, water levels measured in 31 of 32 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 28 of 32 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than

12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 30 of 32 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring of hydrology will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
9-01VS	Y	Y	Y
9-02VS	Y	Y	Y
9-03VS	Y	N	Y
9-04VS	N	N	N
9-05S	Y	Y	Y
9-06S	Y	Y	Y
9-07S	Y	Y	Y
9-08VS	Y	Y	Y
11-1VS	Y	Y	Y
11-2VS	Y	Y	Y
11-3VS	Y	Y	Y
11-4VS	Y	Y	Y
11-5VS	Y	Y	Y
11-6VS	Y	Y	Y
14-07S	Y	Y	Y
14-08VS	Y	Y	Y
14-09VS	Y	Y	Y
14-10VS	Y	Y	Y
14-11VS	Y	Y	Y
14-12VS	Y	Y	Y
14-13S	Y	Y	Y
14-14VS	Y	Y	Y
14-15VS	Y	Y	Y
14-16VS	Y	Y	Y
14-17VS	Y	Y	Y
14-18VS	Y	Y	Y
15-19VS	Y	N	Y
15-20VS	Y	Y	Y
15-21VS	Y	Y	Y
15-22S	Y	Y	Y
17-23S	Y	N	N
17-24S	Y	Y	Y

Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
A	209.89 m (688.62 ft)	209.87 m (688.55 ft)	209.88 m (688.58 ft)
O1	208.56 m (684.25 ft)	208.52 m (684.12 ft)	208.55 m (684.22 ft)

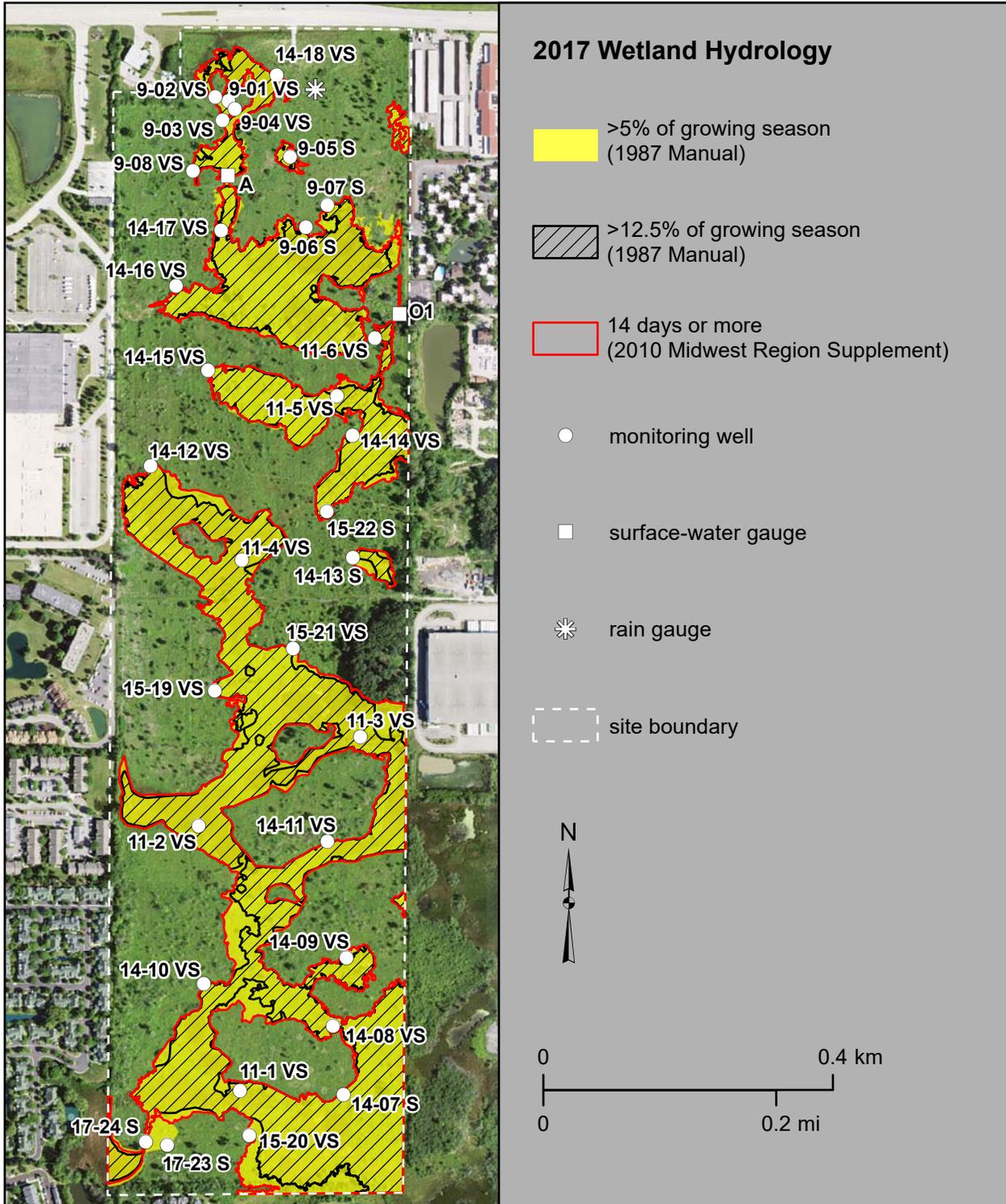
n/a – insufficient data to determine an elevation

North Chicago Wetland Mitigation Site (IL 56/IL 47, FAP 326)

Estimated Areal Extent of 2017 Wetland Hydrology

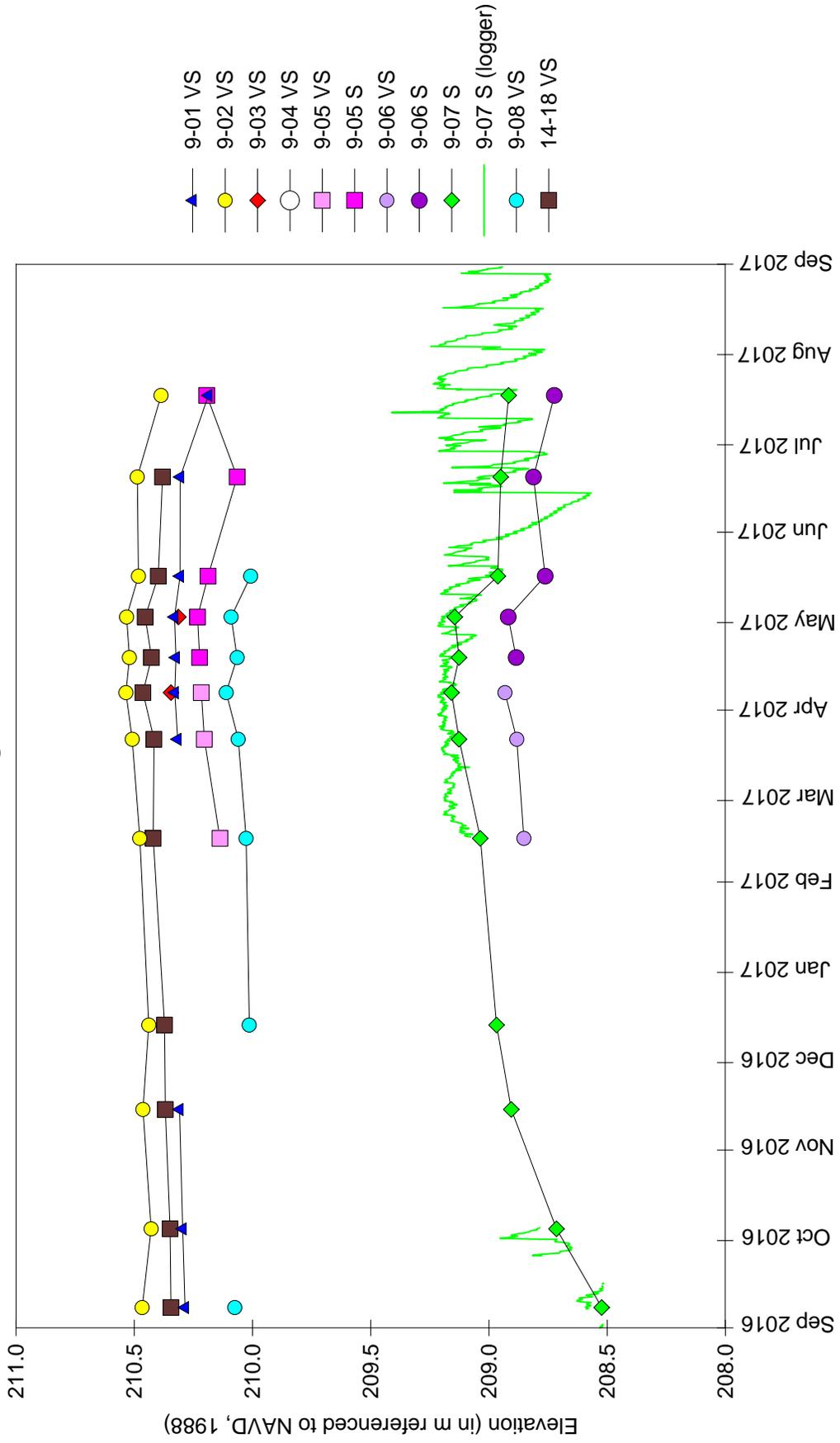
September 1, 2016 through August 31, 2017

Map based on 2015 Farm Service Agency digital orthophotography, Lake County, Illinois (USDA-FSA 2015)

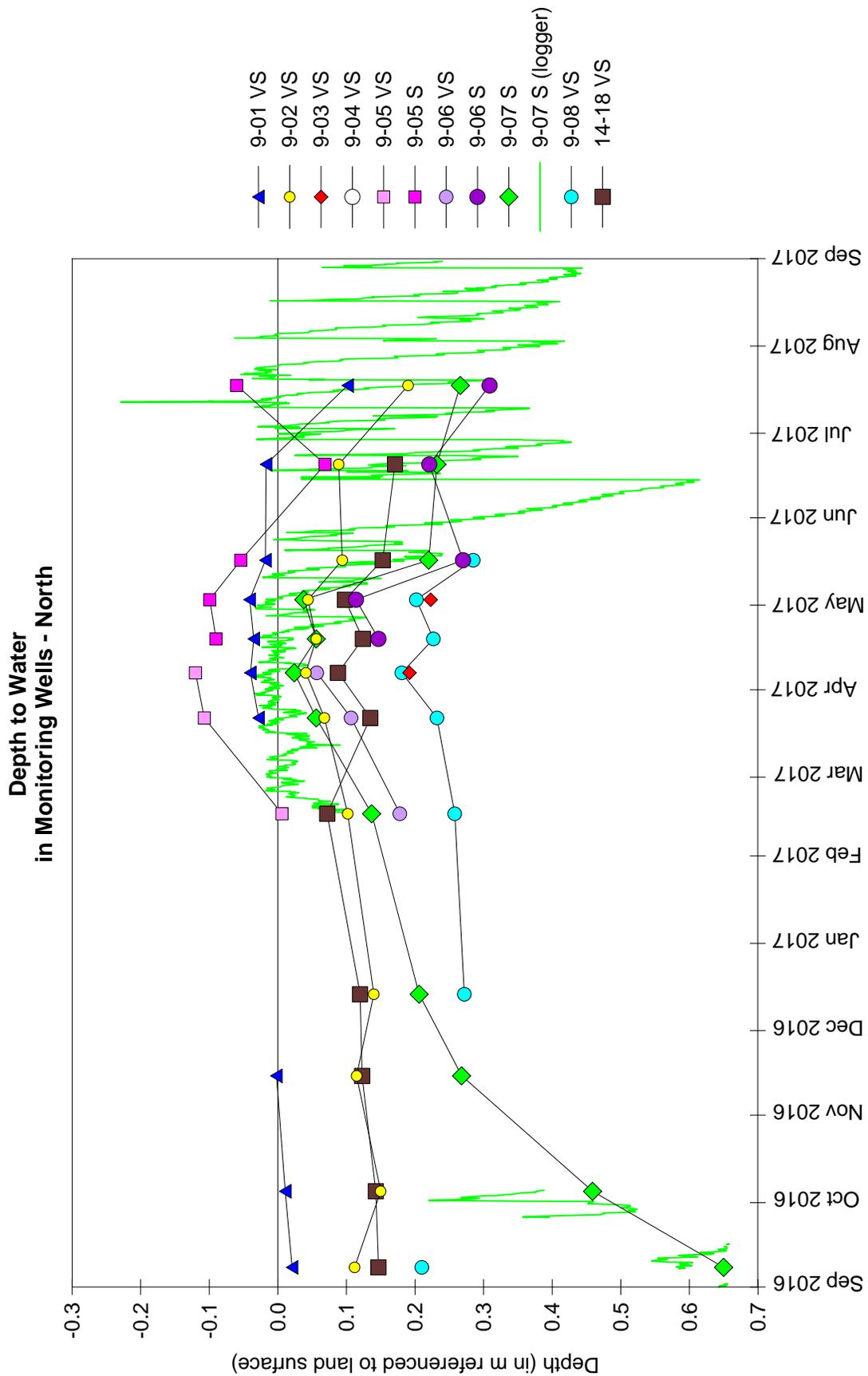


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Monitoring Wells - North

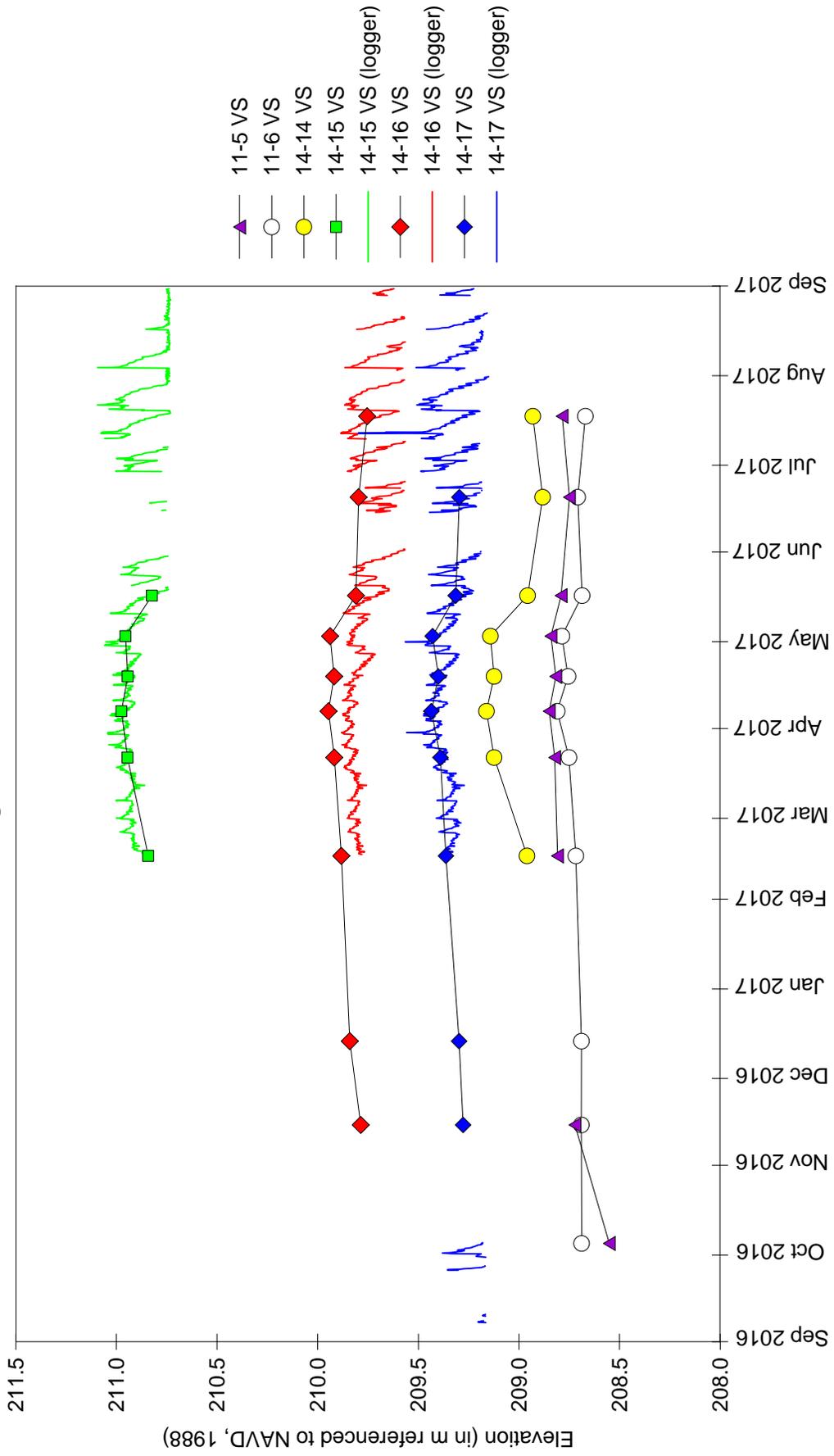


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

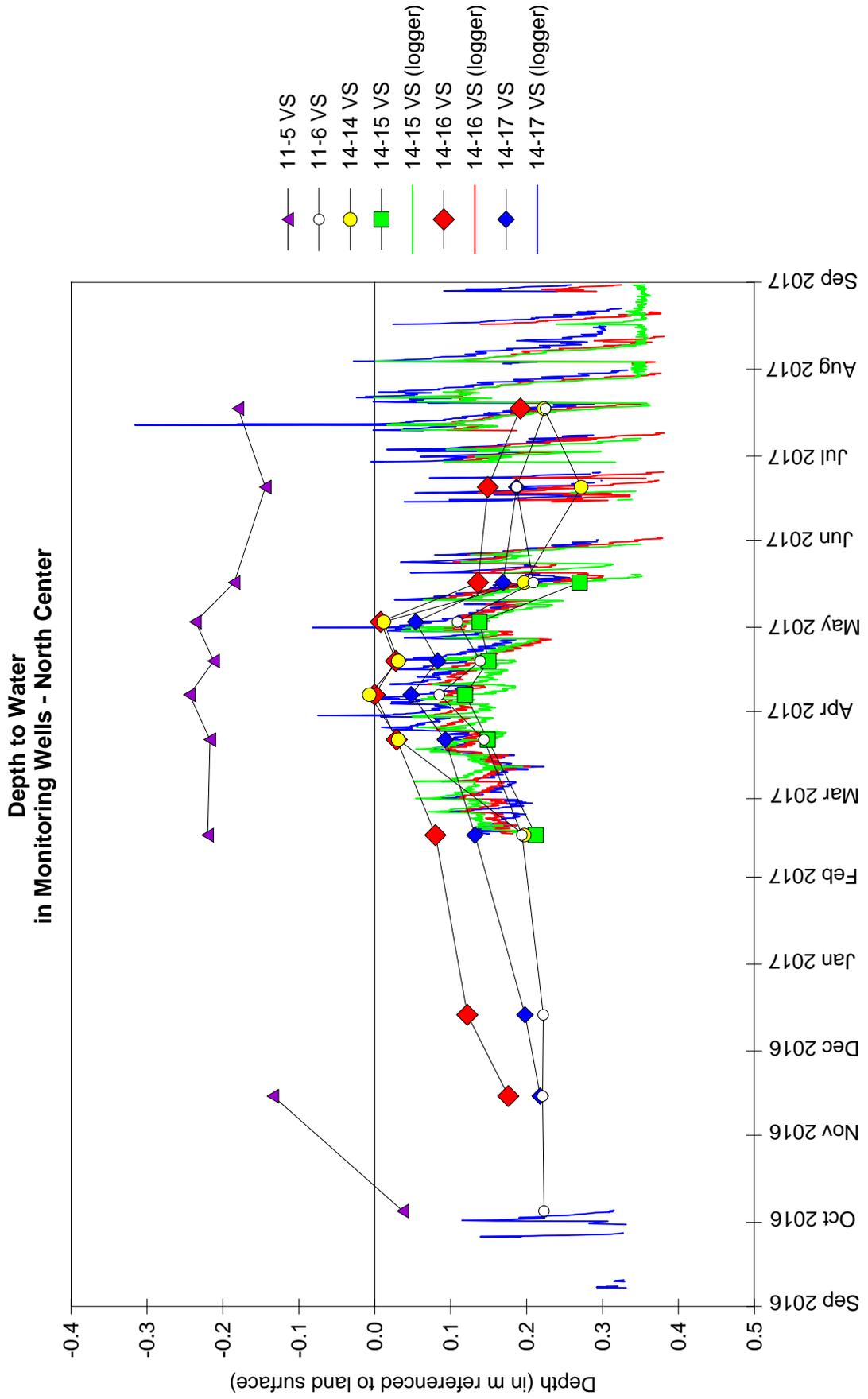


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Monitoring Wells - North Center

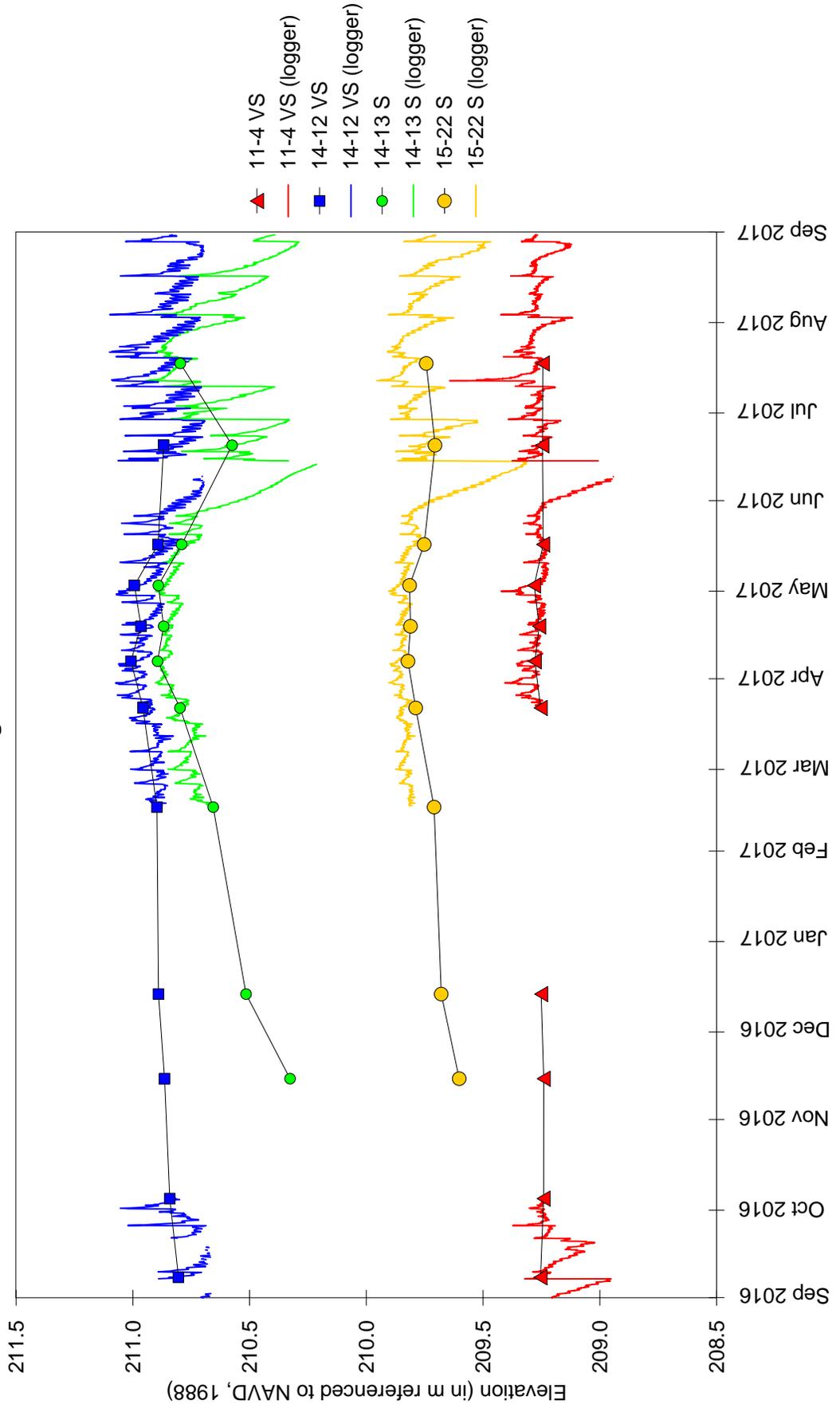


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

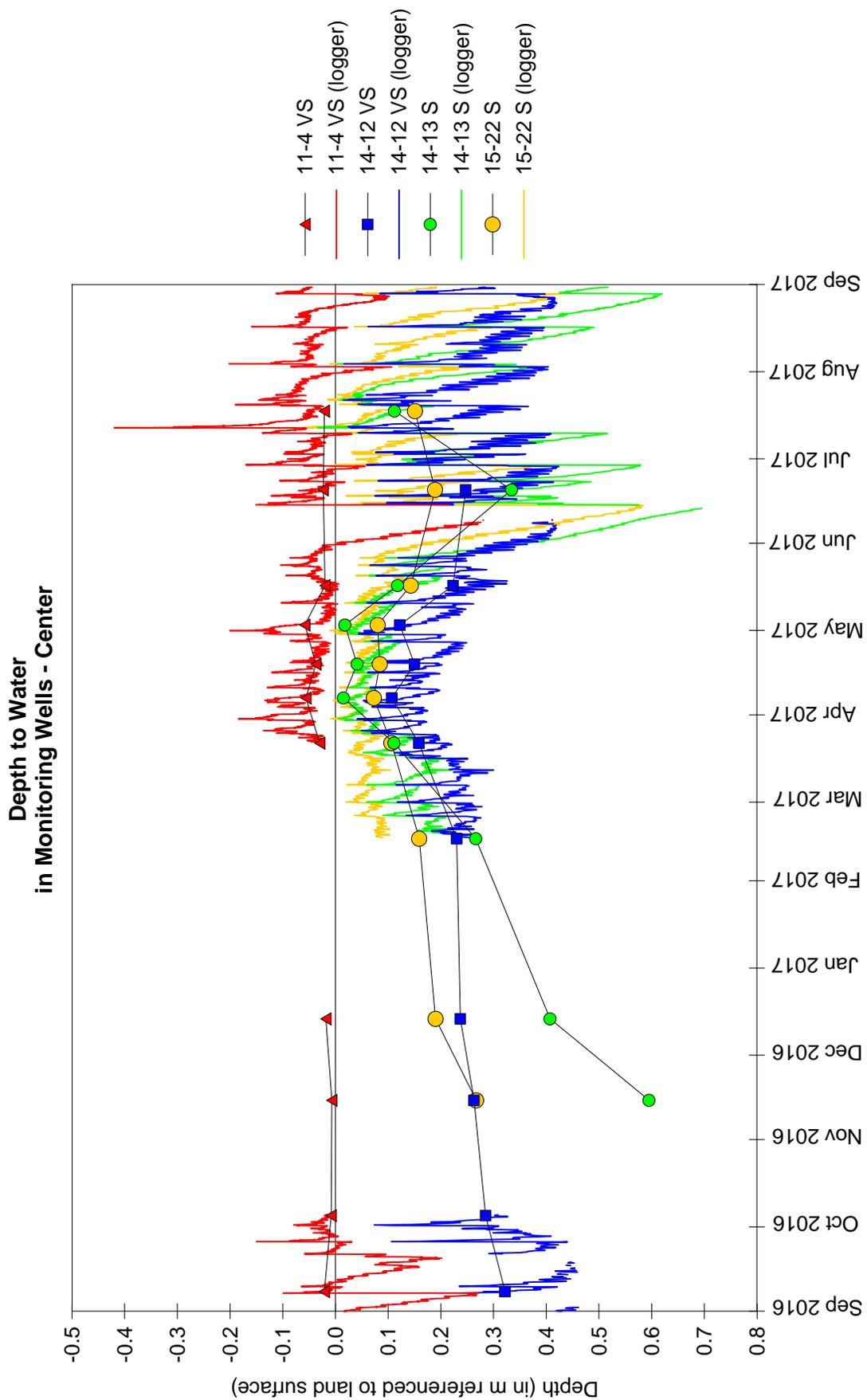


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Monitoring Wells - Center

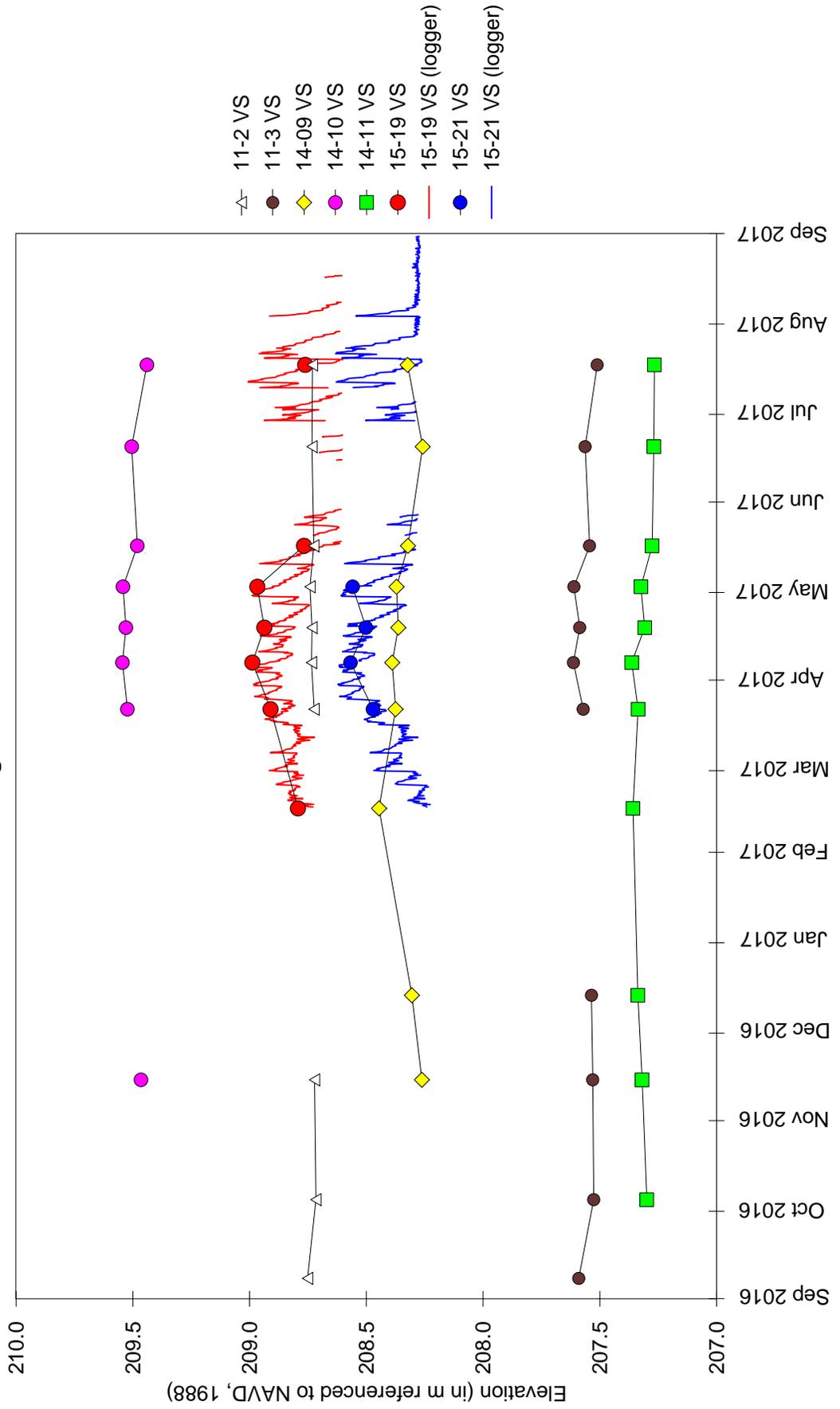


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

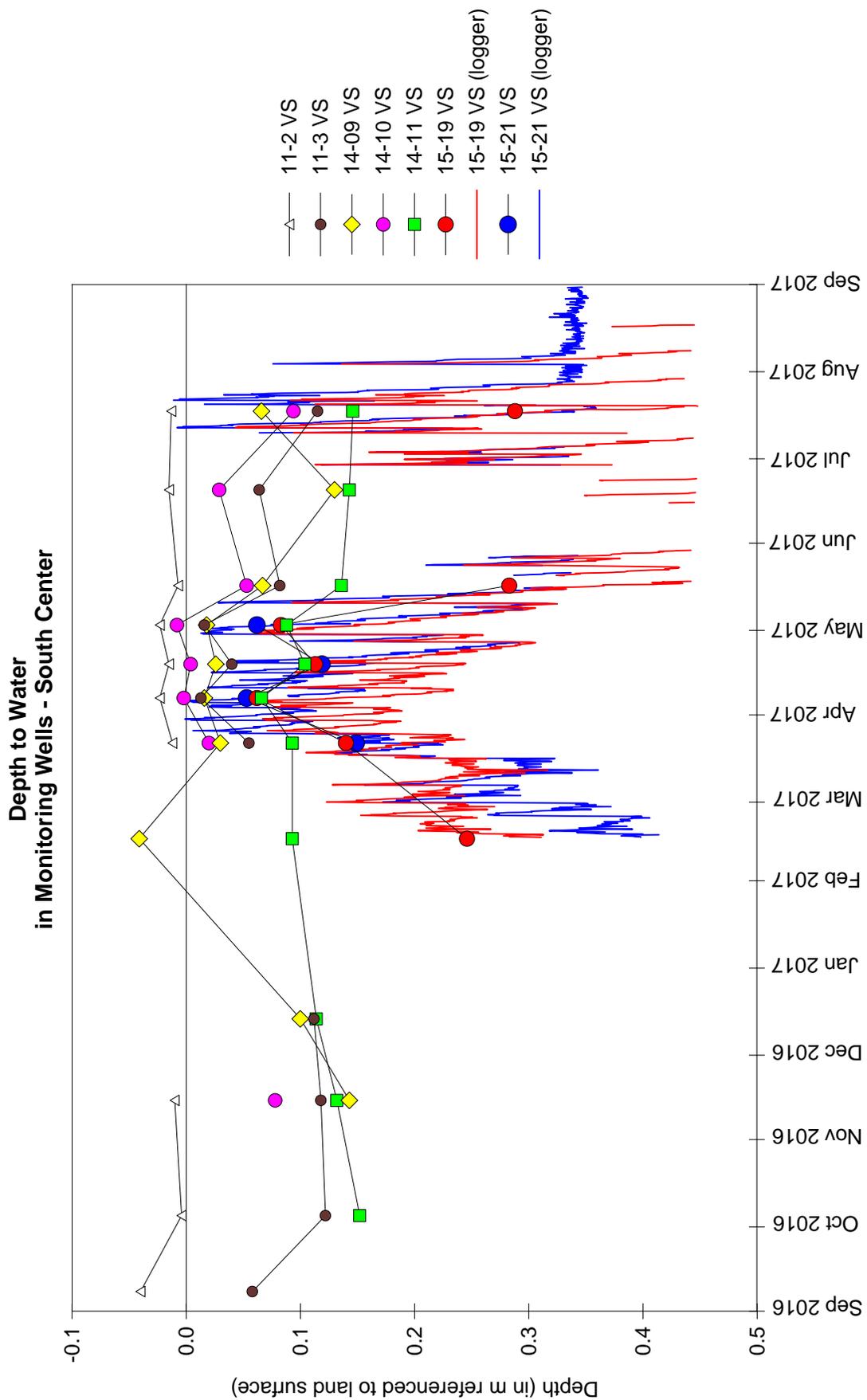


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Monitoring Wells - South Center

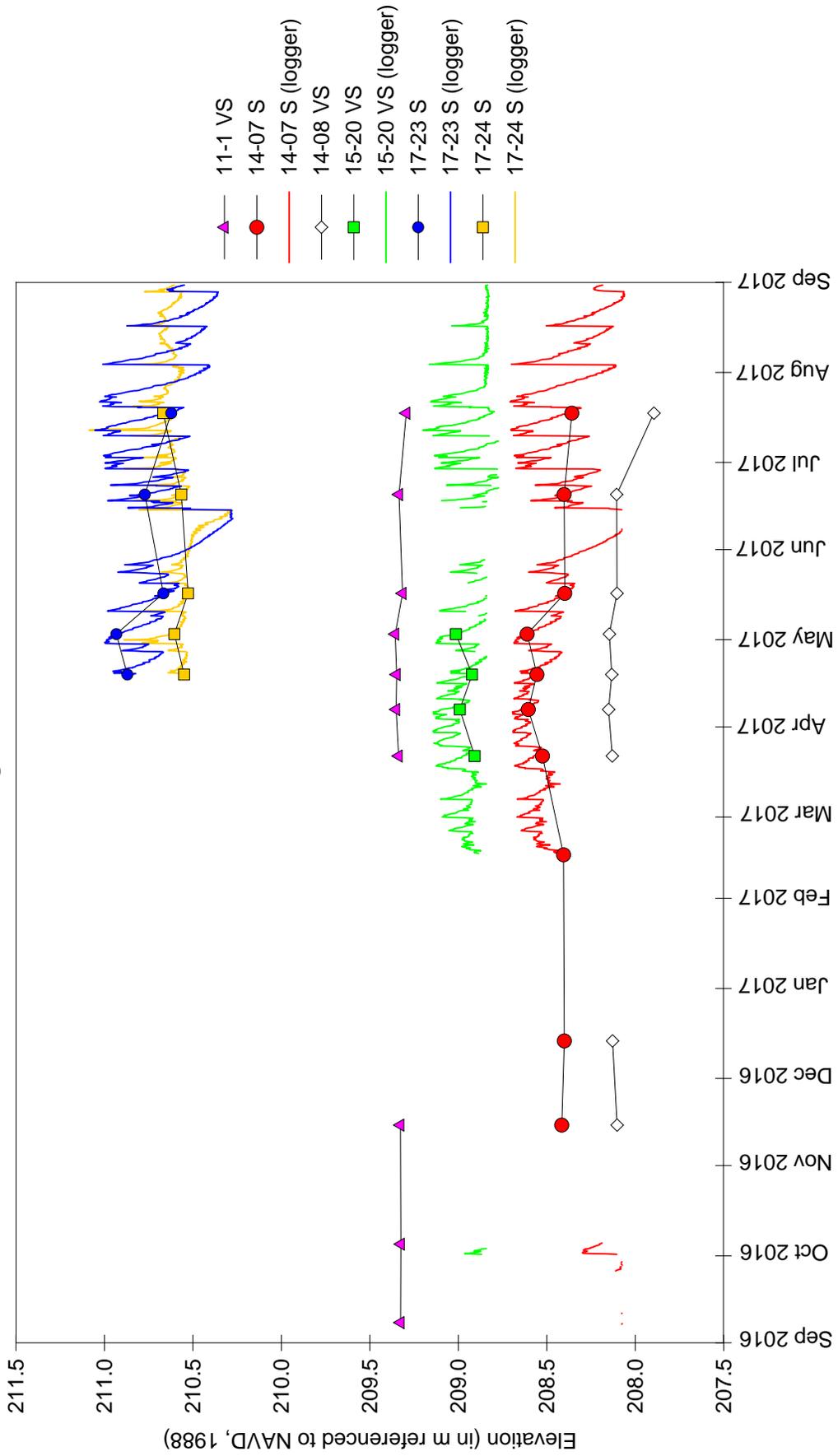


North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017



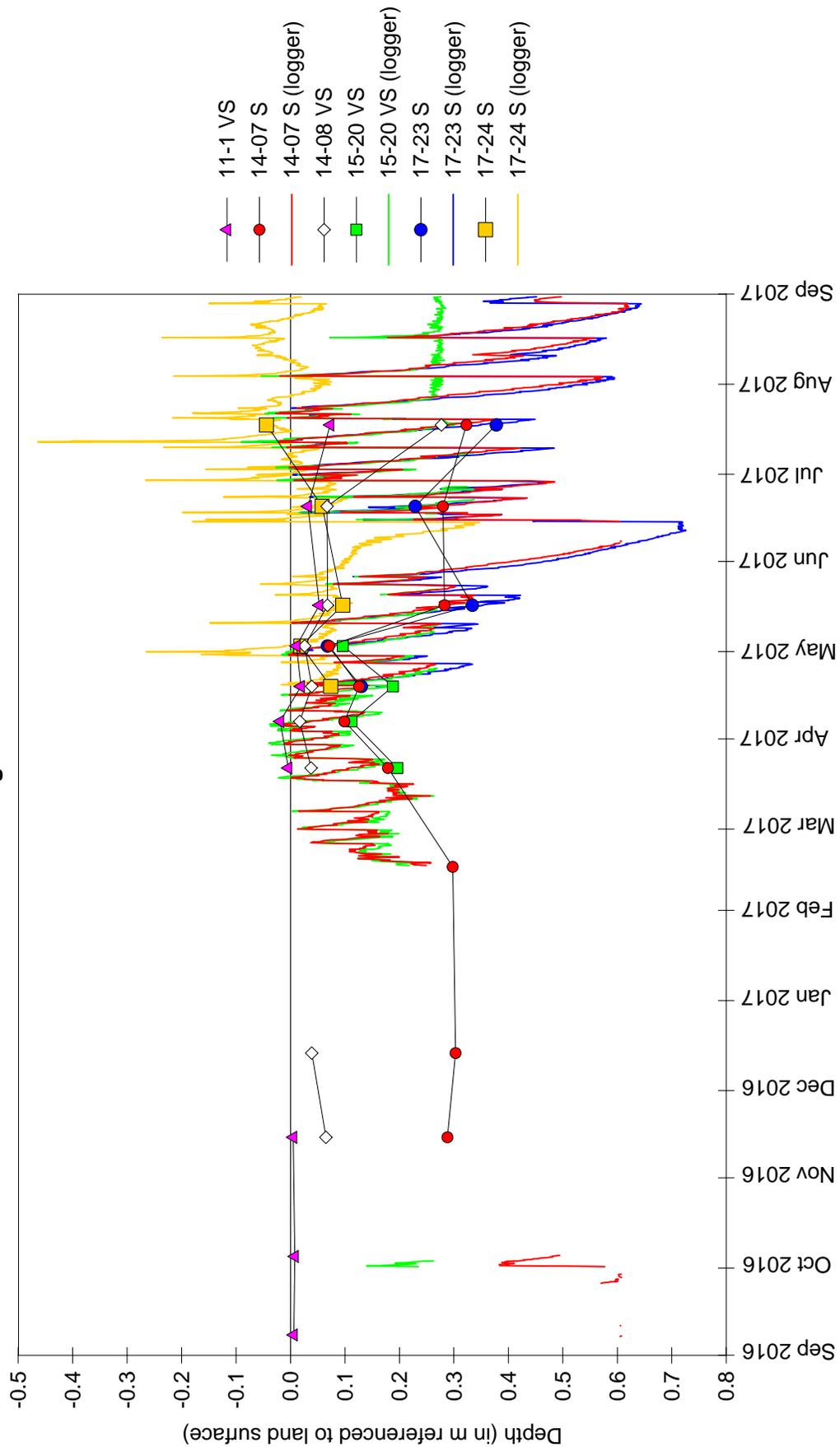
North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
in Monitoring Wells - South



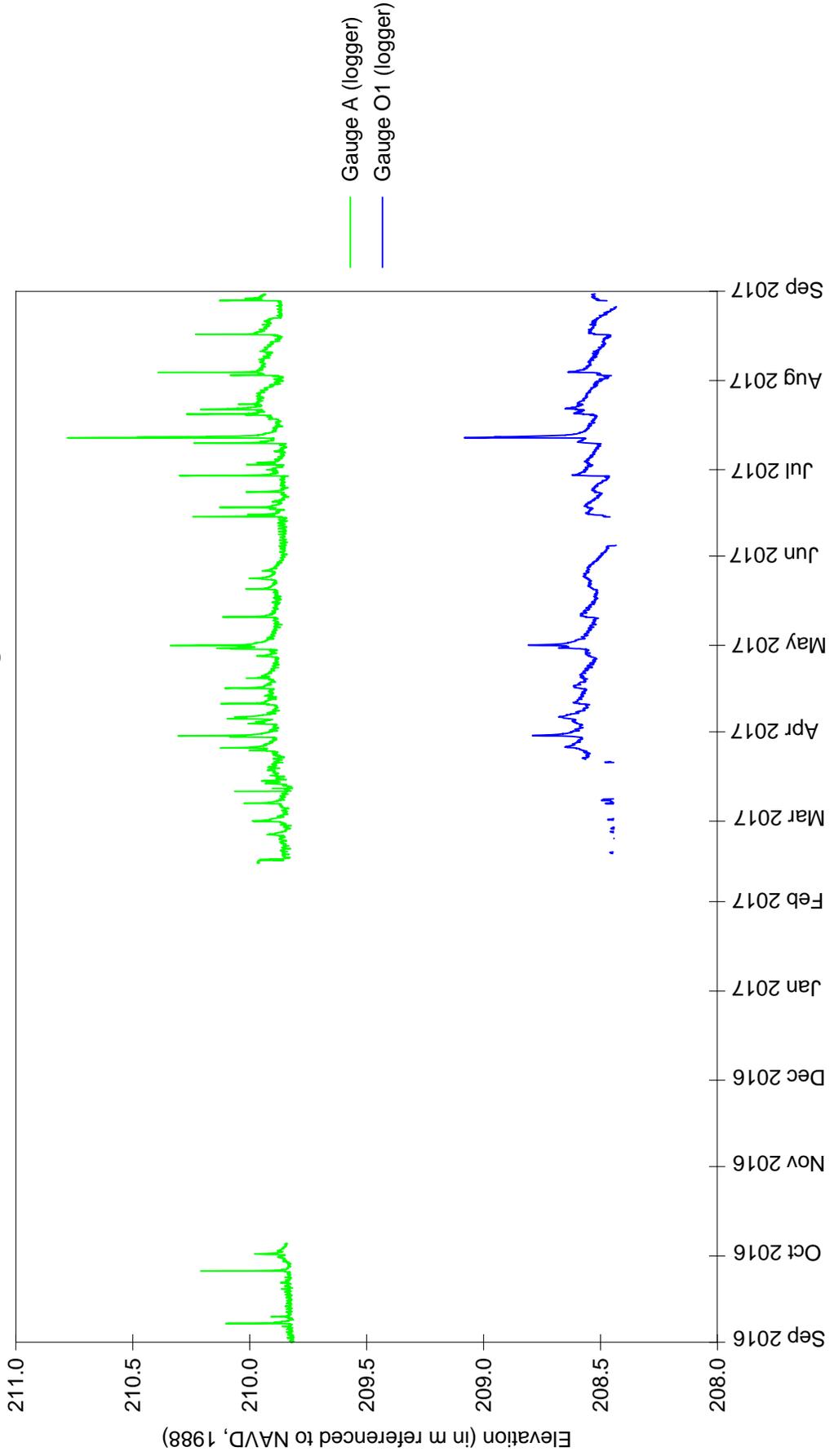
North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

Depth to Water
in Monitoring Wells - South



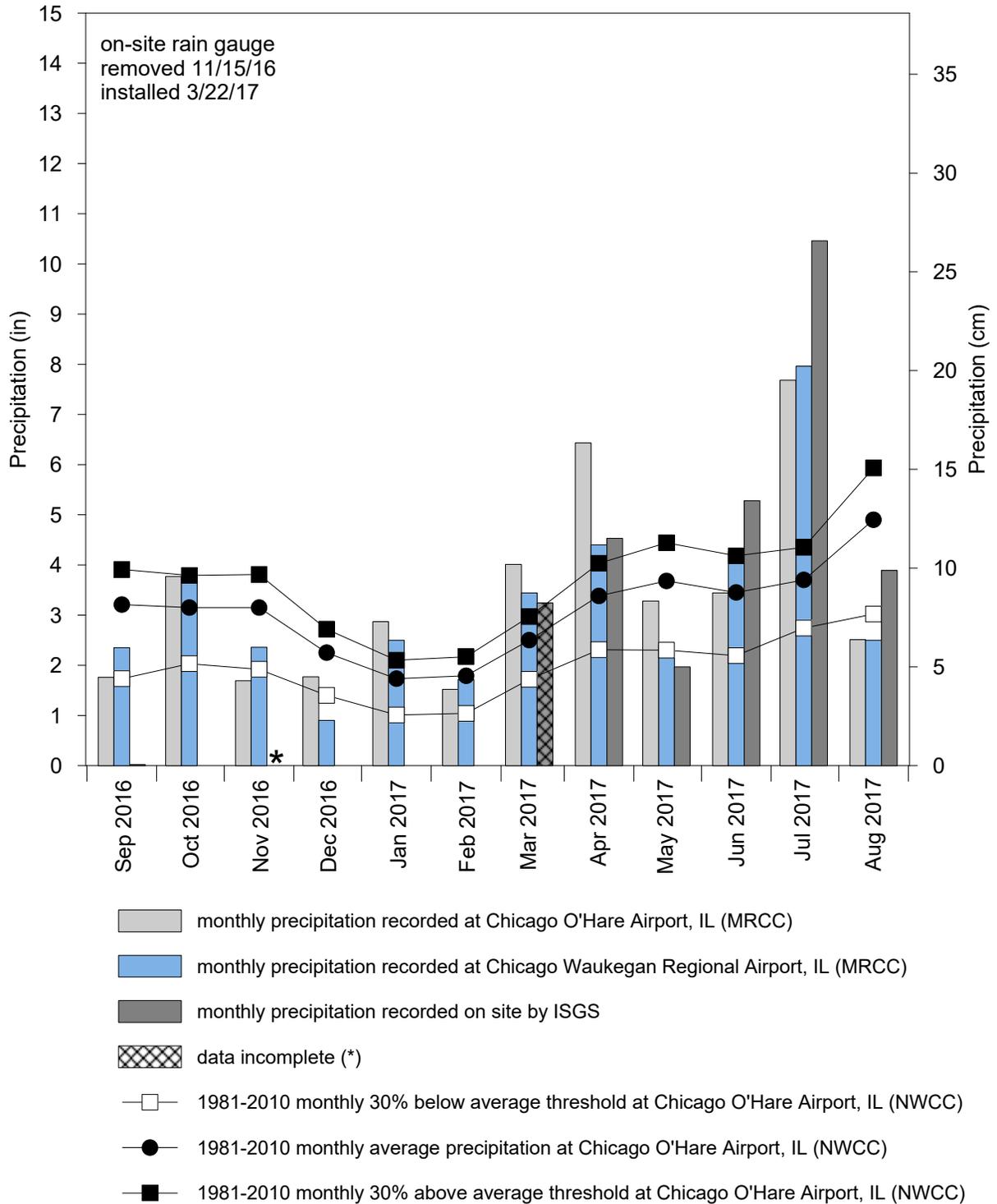
North Chicago Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



North Chicago Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at Chicago, IL
(MRCC station #111549) and Waukegan, IL (MRCC station #14880)**



**COLES COUNTY
WETLAND MITIGATION SITE**

ISGS #85

TR 1000N and TR 41

Sequence #1273

Coles County, near Mattoon, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- March 2008: Wetland construction was completed.
- August 2010: ISGS was tasked by IDOT to monitor the site for performance criteria outlined in the wetland compensation plan.
- March 2011: ISGS installed a monitoring network.
- June 2017: ISGS was informed by IDOT that monitoring of the site was no longer required.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Coles County wetland mitigation site is 1.86 ha (4.60 ac). Using the 1987 Manual (Environmental Laboratory 1987), 1.05 ha (2.59 ac) of the total site area of 2.08 ha (5.13 ac) satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season, and 0.81 ha (2.00 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 1.04 ha (2.56 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Mattoon, Illinois, is April 6, and the season lasts 211 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days, and 12.5% of the growing season is 26 days. Using the 2010 Midwest Region Supplement, February 10 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Mattoon, Illinois (MRCC station #115430), was 88% of normal. During spring 2017 (March through May), precipitation was 146% of normal.
- Using the 1987 Manual, the period of maximum inundation and saturation during the 2017 growing season occurred between April 26 and May 8 due to four rainfall events totaling 21.26 cm (8.37 in) measured by the Mattoon MRCC station. Using the 2010 Midwest Region Supplement, the period of maximum inundation and saturation occurred between March 28 and April 9 due to several rainfall events totaling 6.20 cm (2.44 in.) measured at the Mattoon MRCC station.
- In 2017, water levels measured in 2 of 7 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in none of the 7 soil-zone monitoring wells satisfied wetland hydrology criteria for greater

than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 1 of 7 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Remove wells from site when required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1VS	N	N	N
2S	Y	N	N
3S	N	N	N
4S	N	N	N
5S	Y	N	Y
6S	N	N	N
7S	N	N	N

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

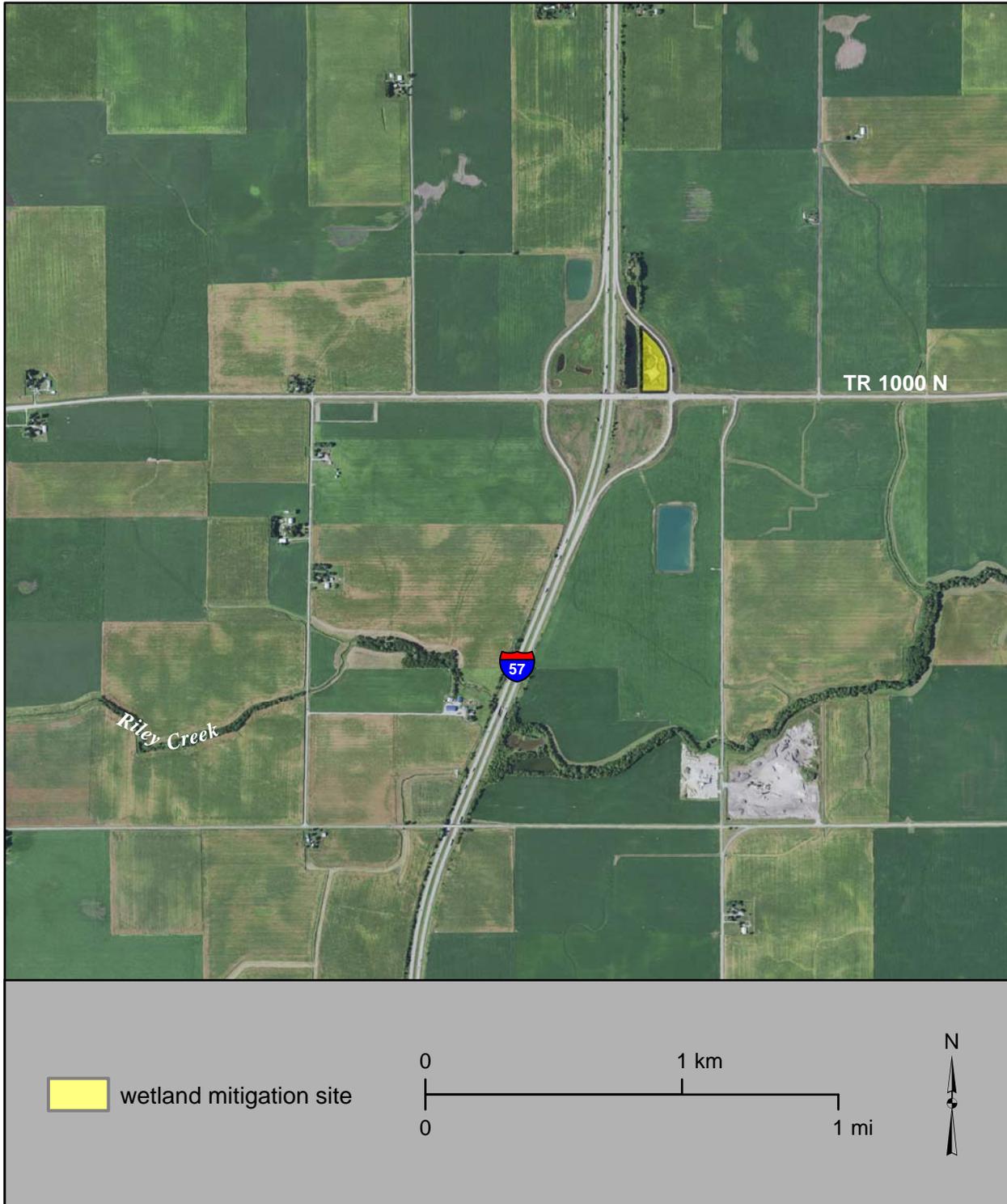
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
A	207.03 m (679.23 ft)	207.00 m (679.13 ft)	207.02 m (679.20 ft)

n/a – insufficient data to determine an elevation

Coles County Wetland Mitigation Site (TR 1000N and TR 41)

General Study Area and Vicinity

Map based on 2015 Farm Service Agency digital orthophotography, Coles County, Illinois (USDA-FSA 2015)

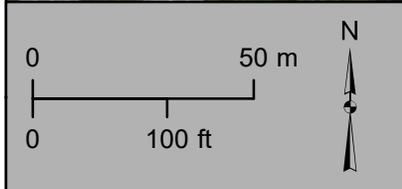
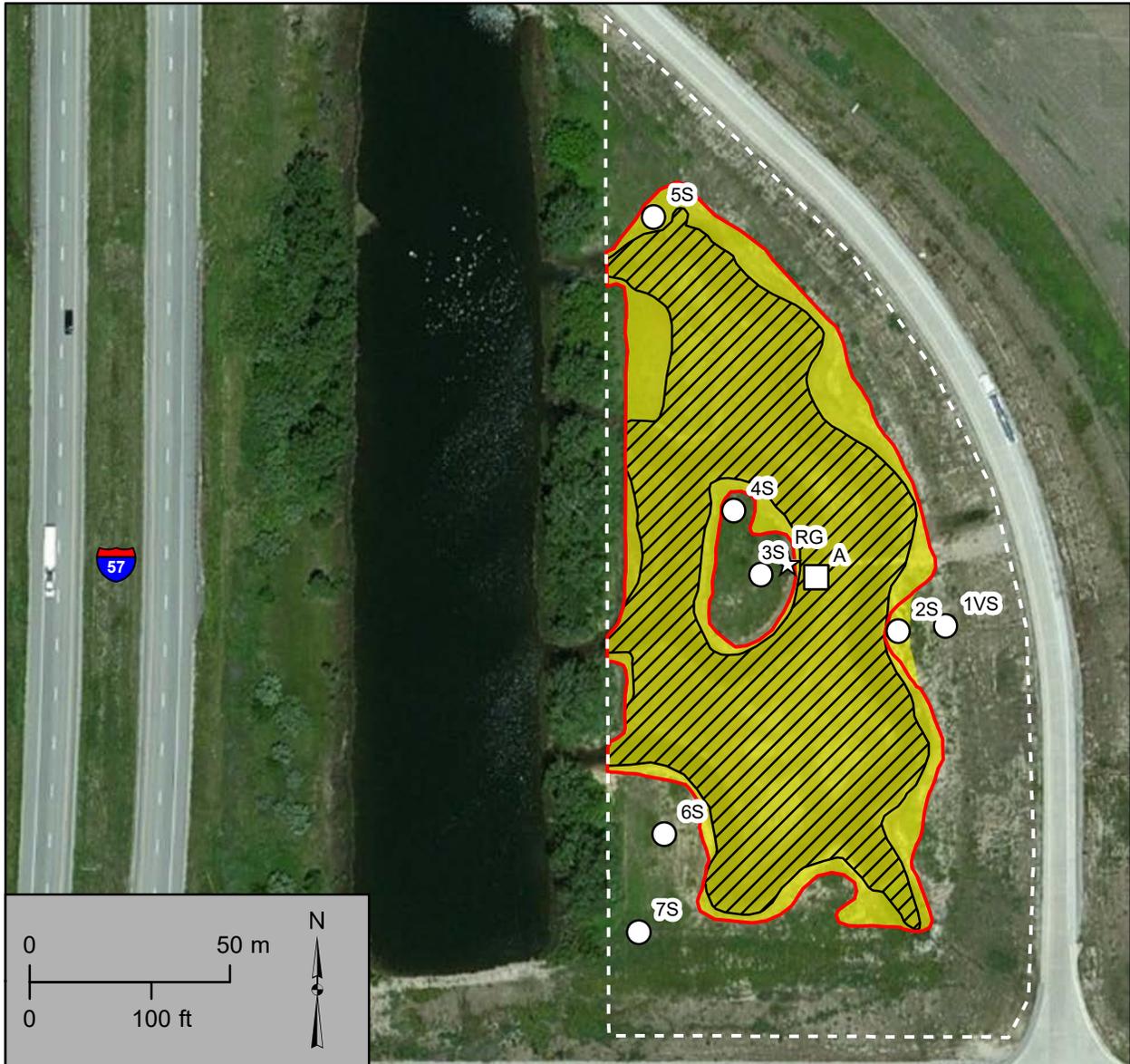


Coles County Wetland Mitigation Site (TR 1000N and TR 41)

Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

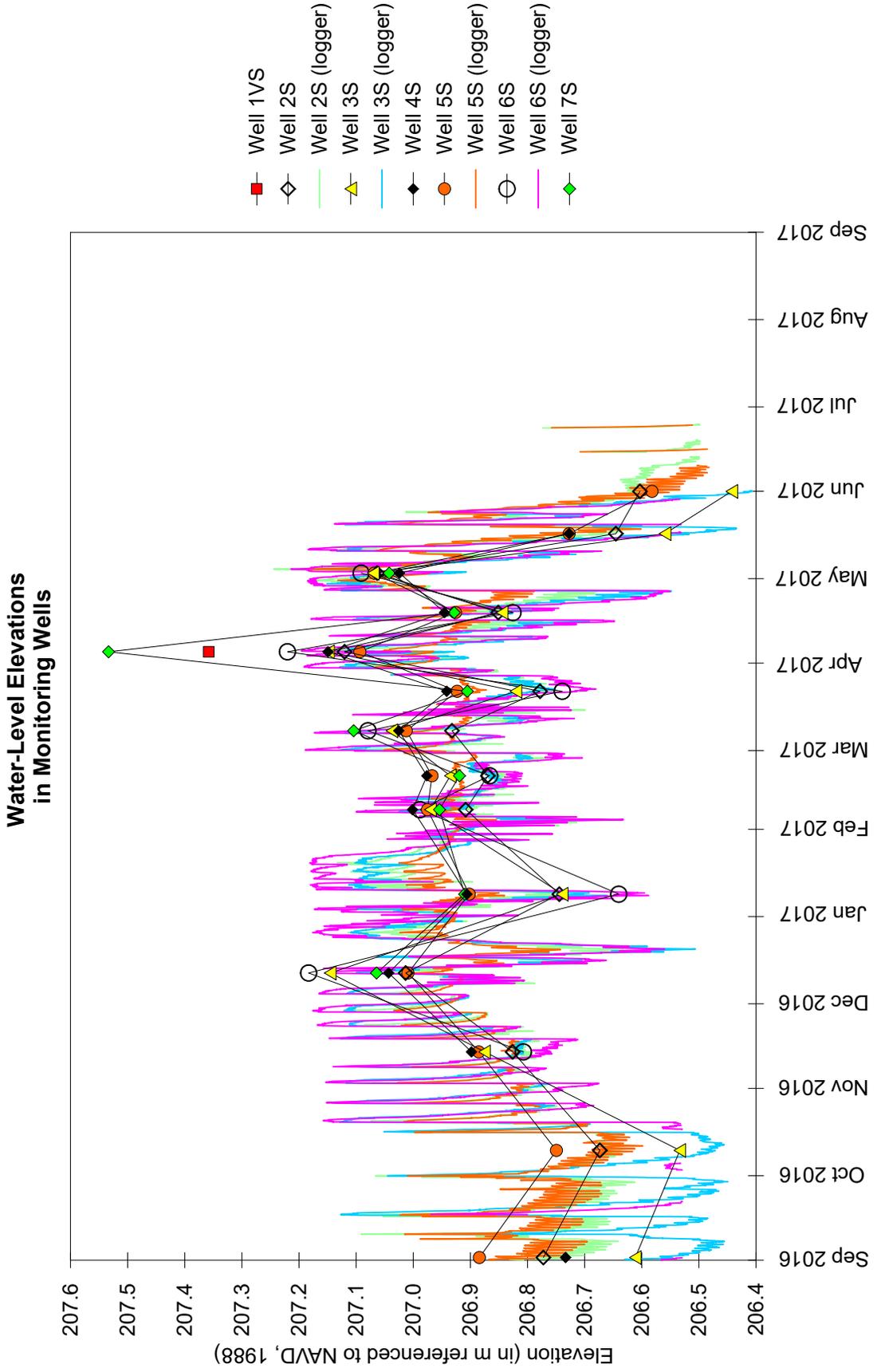
Map based on imagery available from Esri (Esri 2017)



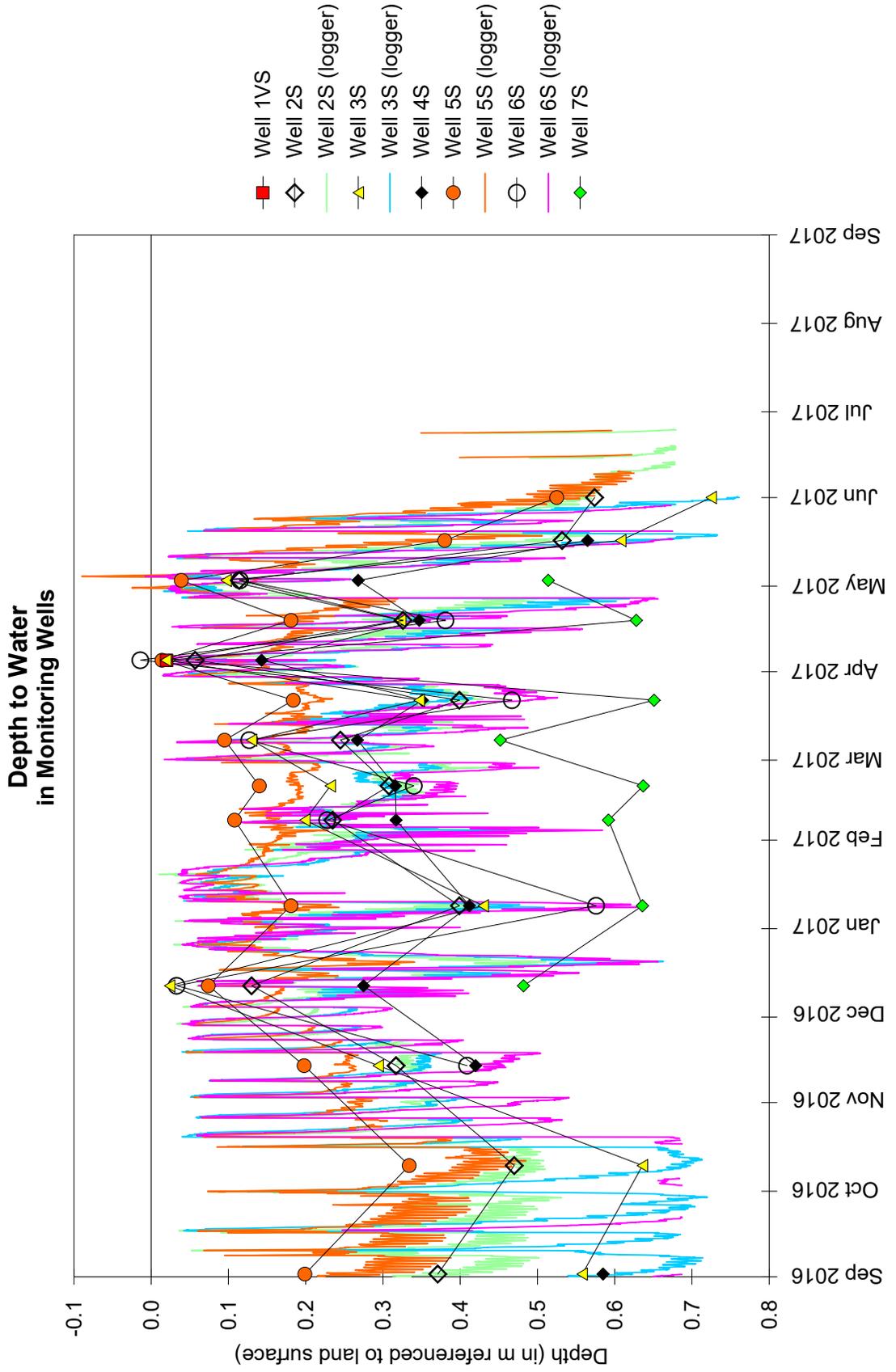
2017 Wetland Hydrology

- | | | | |
|---|--|---|---------------------|
|  | >5% of growing season (1987 Manual) |  | monitoring well |
|  | >12.5% of growing season (1987 Manual) |  | surface-water gauge |
|  | 14 days or more (2010 Midwest Region Supplement) |  | rain gauge |
| | |  | site boundary |

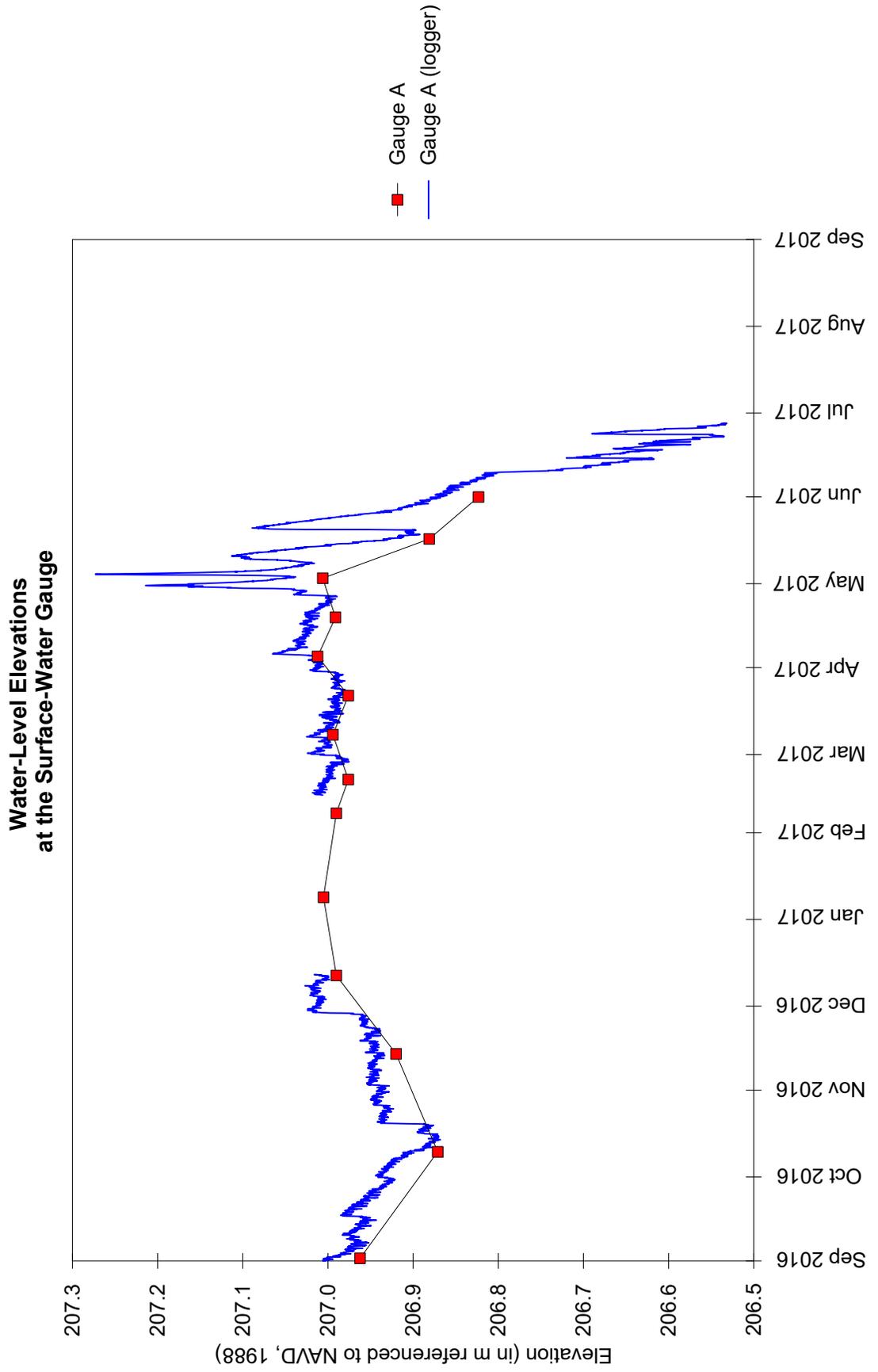
Coles County Wetland Mitigation Site September 1, 2016 through August 31, 2017



Coles County Wetland Mitigation Site September 1, 2016 through August 31, 2017

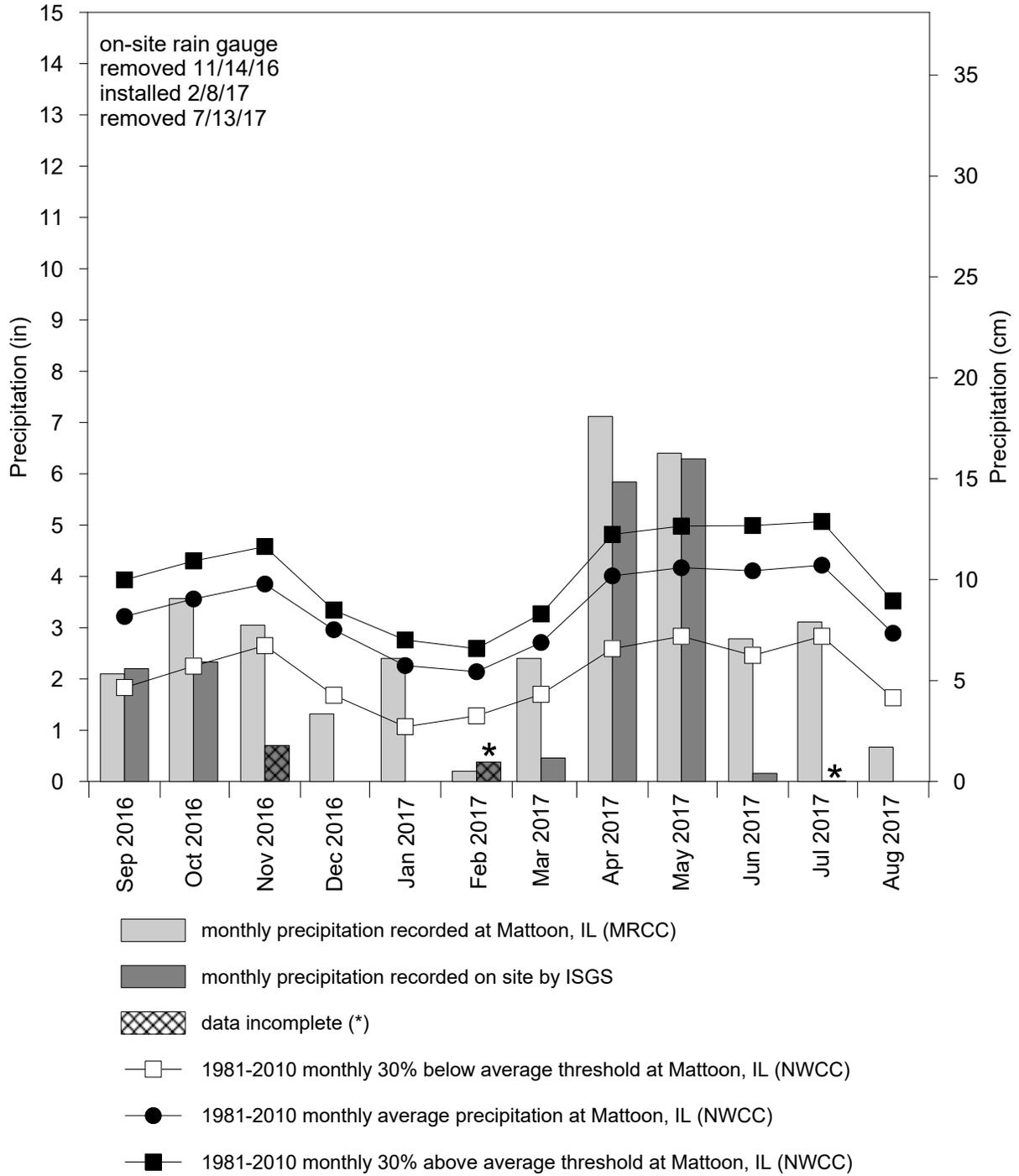


Coles County Wetland Mitigation Site September 1, 2016 through August 31, 2017



Coles County Wetland Mitigation Site September 2016 through August 2017

Total Monthly Precipitation Recorded on Site and at Mattoon, IL (MRCC station #115430)



**SWAN ROAD
WETLAND MITIGATION SITE**

ISGS #86

TR 222

Sequence #12315

Perry County, near Tamaroa, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Manager: Eric T. Plankell

SITE HISTORY

- April 2011: ISGS was tasked to monitor wetland hydrology at the site.
- May 2011: Water-level monitoring was initiated.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Swan Road wetland mitigation site is 0.30 ha (0.73 ac). Using the 1987 Manual (Environmental Laboratory 1987), 0.38 ha (0.93 ac) of the total site area of 0.43 ha (1.06 ac) satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season however no portion of the site satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 0.39 ha (0.97 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Du Quoin, Illinois, is March 30, and lasts 217 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days, and 12.5% of the growing season is 27 days. According to the 2010 Midwest Region Supplement, March 18 was the starting date of the 2017 growing season based on soil temperatures measured on site and at the nearby Pyramid Site EC25 wetland mitigation site (ISGS #77).
- Total precipitation for the monitoring period at Du Quoin, Illinois (MRCC #112483), was 96% of normal, and spring 2017 (March through May) precipitation was 130% of normal.
- The period of maximum inundation and saturation during the 2017 growing season began in mid-March and lasted through early April in response to a seasonally elevated water table, persistent rain in late March, and one intense rain event that occurred on April 5-6, which produced 3.02 cm (1.19 in.) of rain. The site was flooded 13 times during the monitoring year and six of these floods occurred during the growing season. None of these flood events lasted long enough to satisfy wetland hydrology criteria.
- In 2017, water levels measured in 6 of 7 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 0 of 7 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 6 of 7 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Excavation took place around the site’s northeast parcel just prior to the beginning of the growing season for this monitoring year. This activity lowered surrounding land elevations, which will increase surface drainage offsite, which could also locally reduce wetland hydrology in the northeast parcel.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue at the site until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1SR	Y	N	Y
2S	Y	N	Y
3S	Y	N	Y
4S	Y	N	Y
5S	N	N	N
6S	Y	N	Y
7S	Y	N	Y

Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

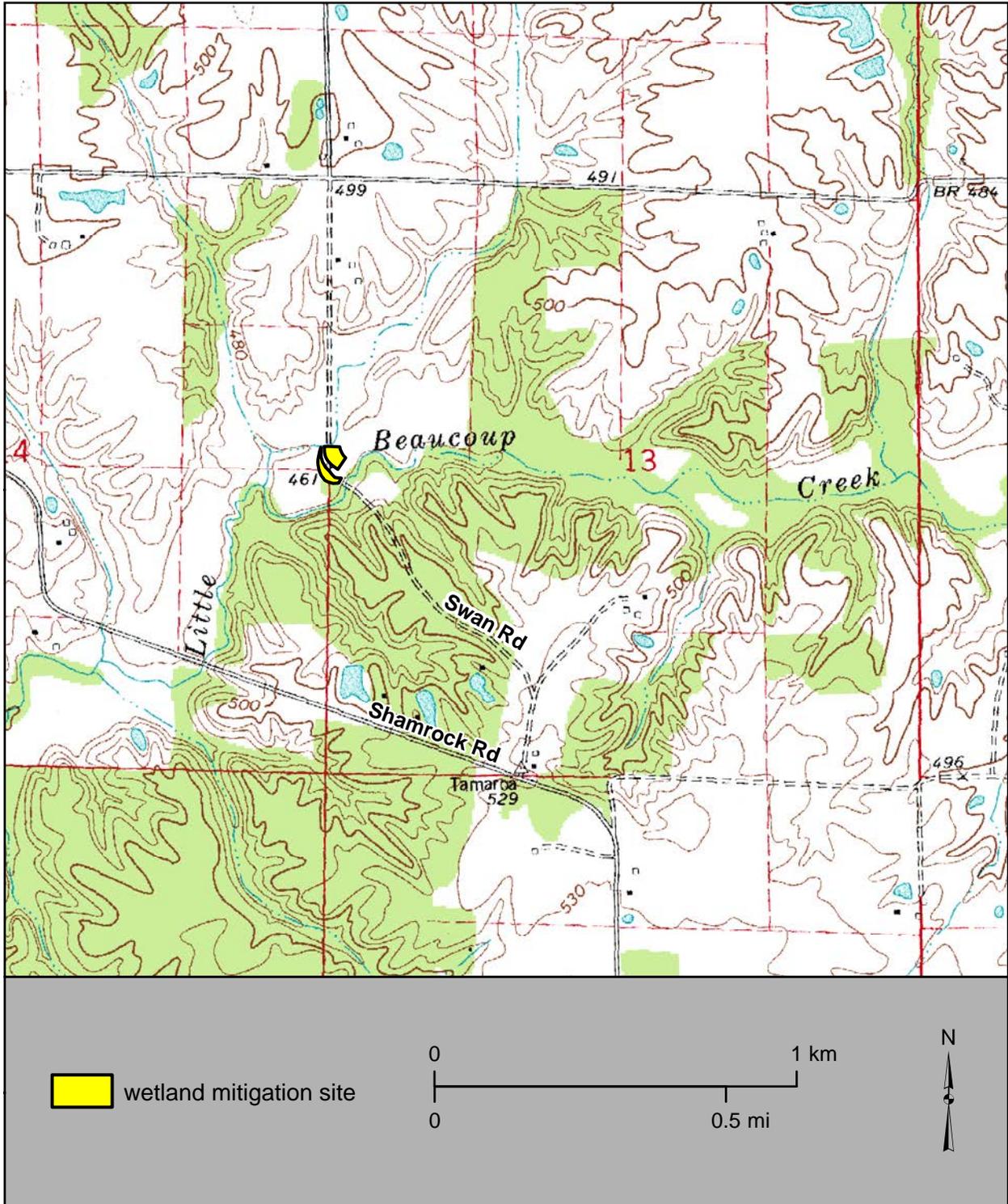
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
A	n/a	n/a	n/a

n/a – insufficient data to determine an elevation

Swan Road Wetland Mitigation Site (TR222, Swan Road)

General Study Area and Vicinity

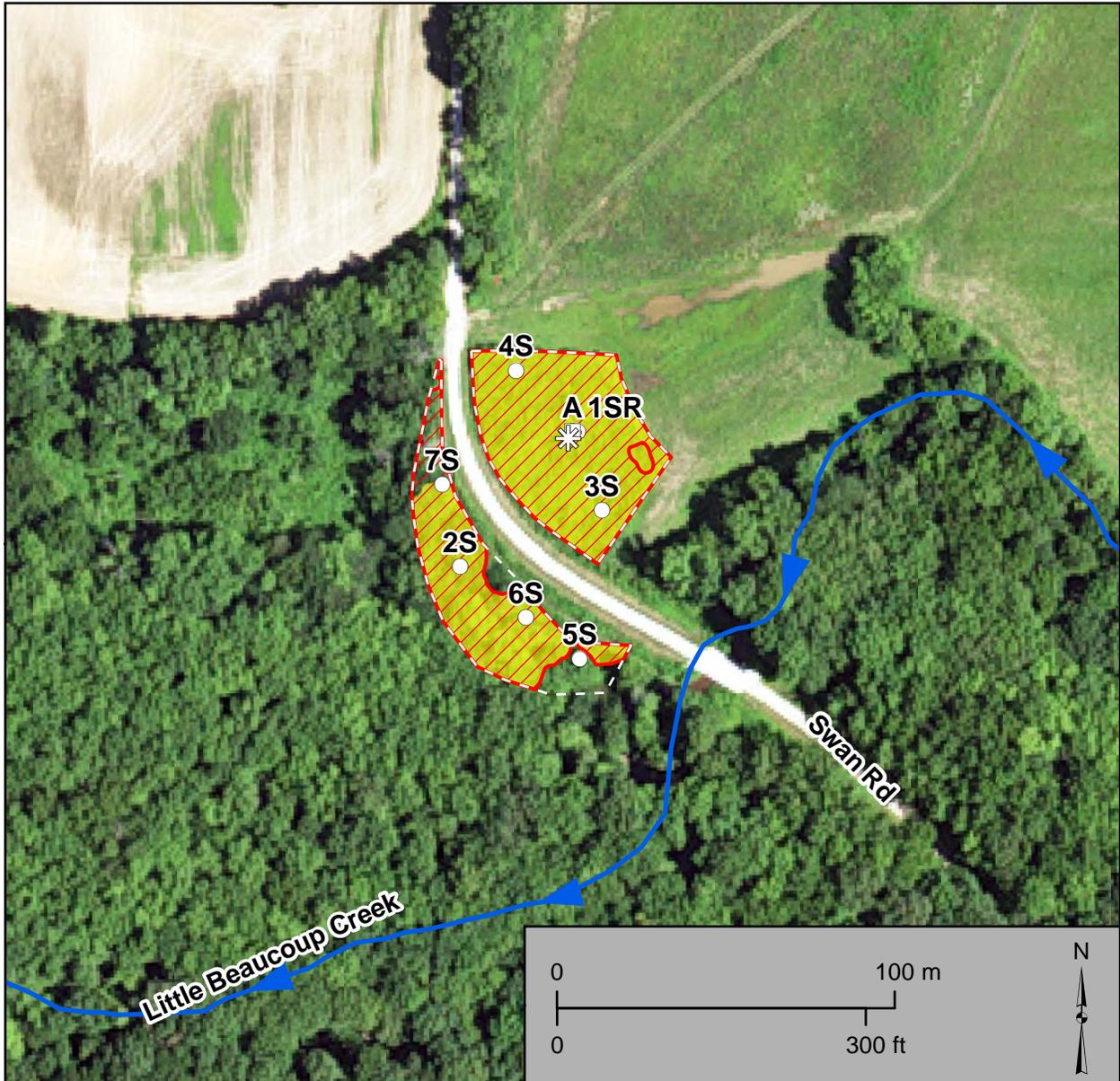
from the USGS Topographic Series, Tamaroa, IL, 7.5-minute Quadrangle (USGS 1975)
contour interval is 10 feet



Swan Road Wetland Mitigation Site (TR222, Swan Road)

Estimated Areal Extent of 2017 Wetland Hydrology
September 1, 2016 through August 31, 2017

Map based on 2015 Farm Service Agency digital orthophotography, Perry County, Illinois
(USDA-FSA 2015)

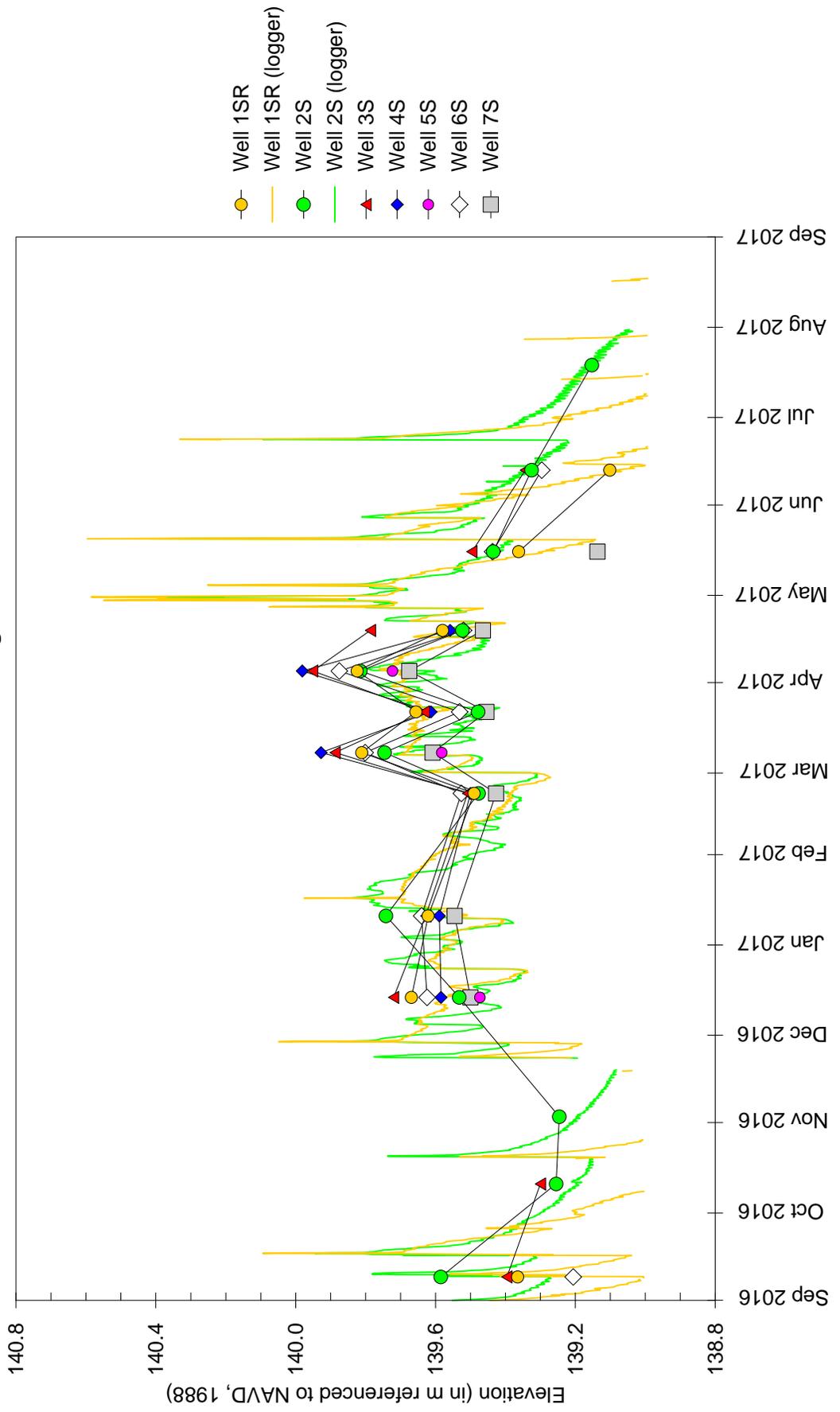


2017 Wetland Hydrology

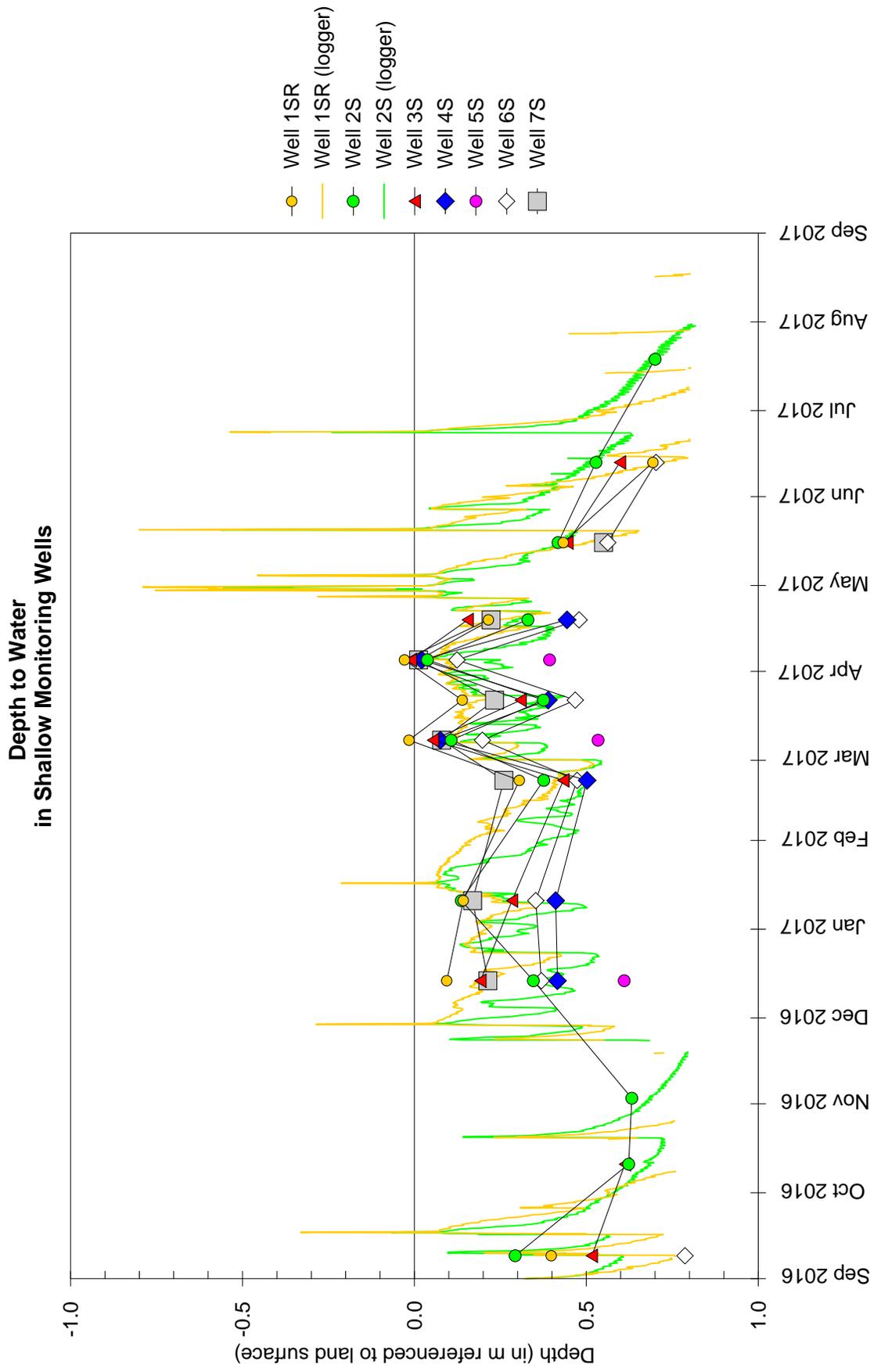
- | | | | |
|---|--|---|---------------------|
|  | >5% of growing season (1987 Manual) |  | monitoring well |
|  | >12.5% of growing season (1987 Manual) |  | surface-water gauge |
|  | 14 days or more (2010 Midwest Region Supplement) |  | rain gauge |
| | |  | site boundary |

Swan Road Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations in Shallow Monitoring Wells

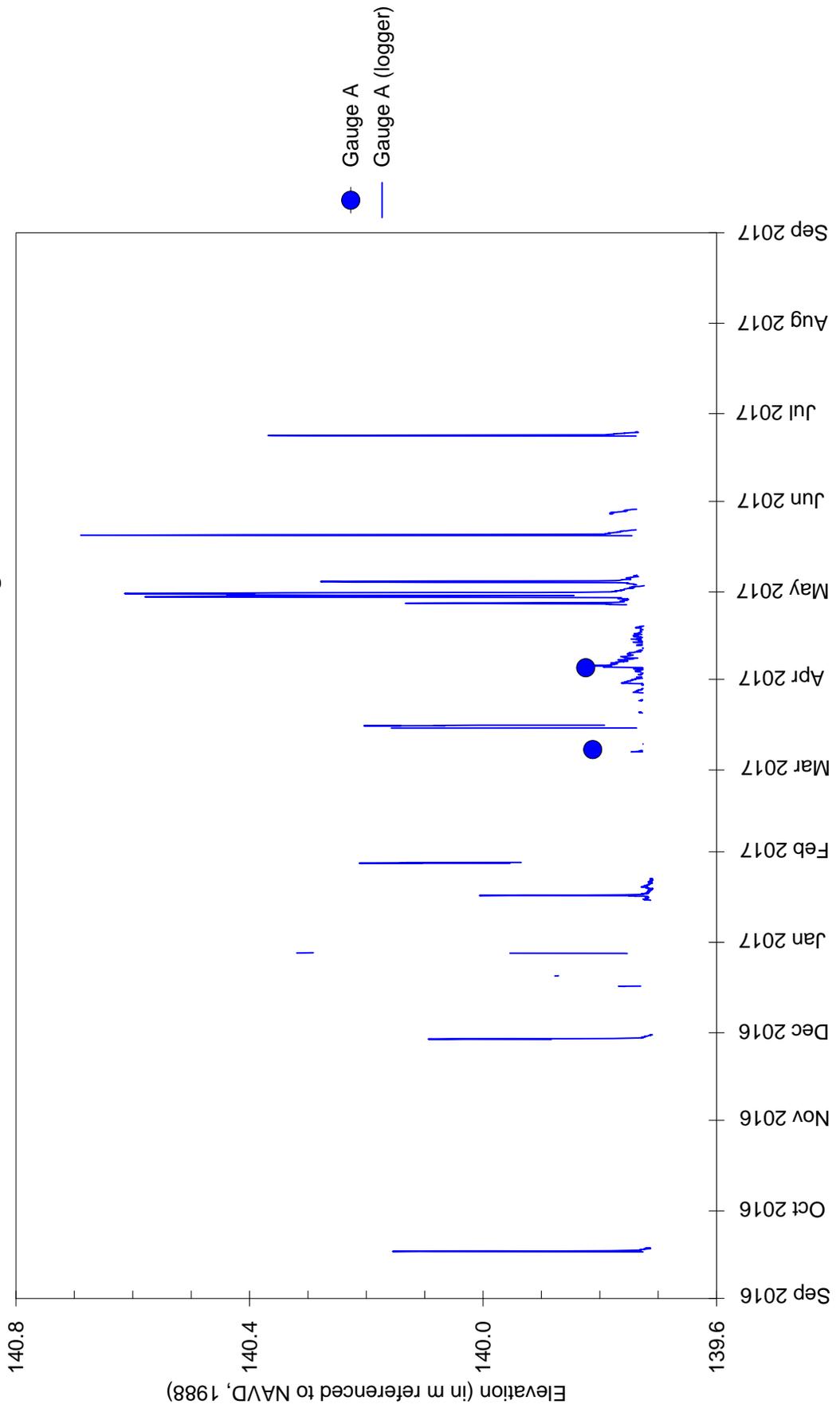


Swan Road Wetland Mitigation Site September 1, 2016 through August 31, 2017



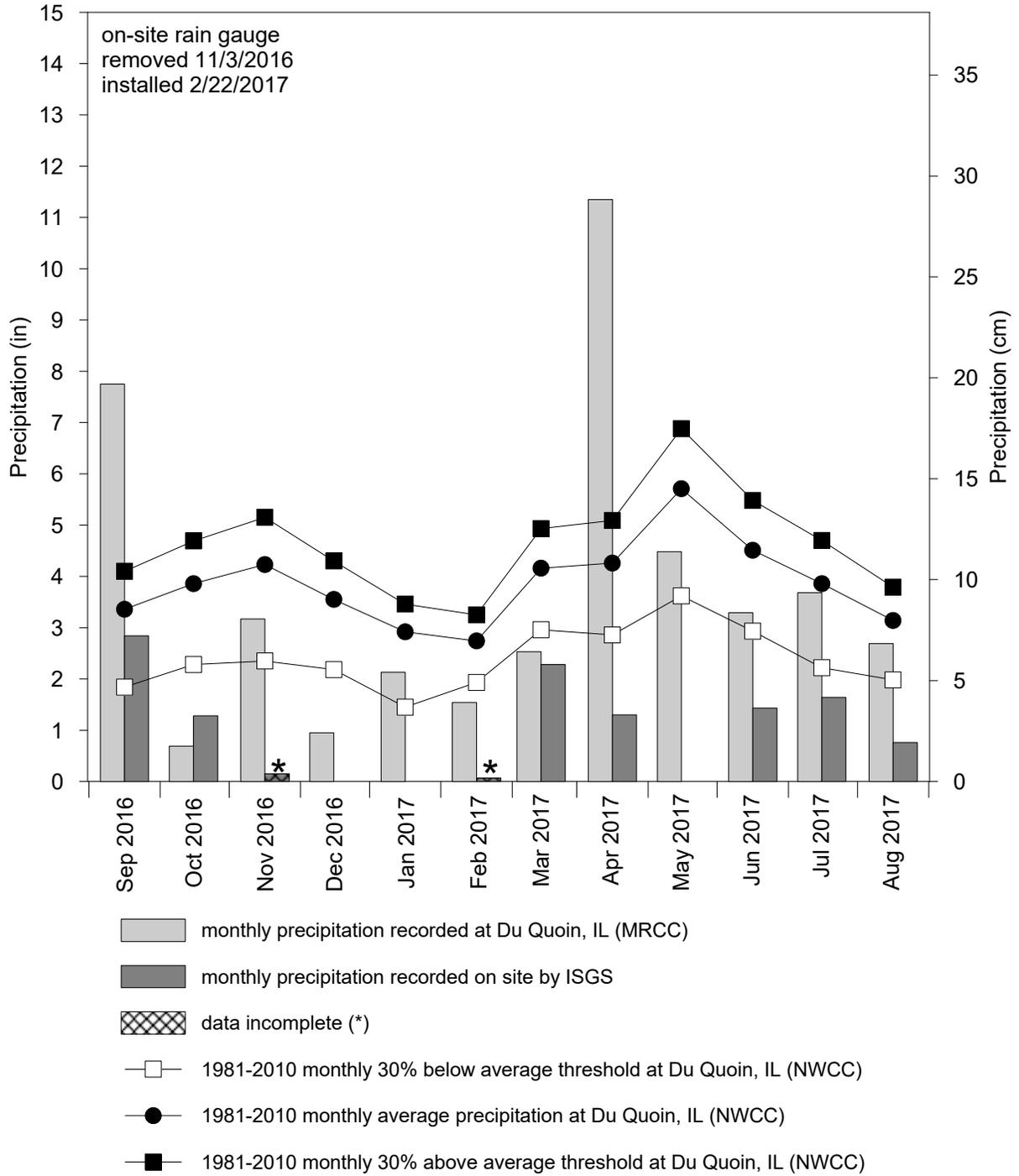
Swan Road Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations
at the Surface-Water Gauge



Swan Road Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Du Quoin, IL (MRCC station #112483)**



**HARRISBURG, SITE 3
WETLAND MITIGATION SITE**

ISGS #87

US 45

FAP 332

Saline County, near Harrisburg, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Manager: Geoffrey E. Pociask

SITE HISTORY

- August 2011: ISGS was tasked by IDOT to monitor the site for performance standards as outlined in the wetland compensation plan.
- February 2012: Post-construction water-level monitoring was initiated.
- April 2013 and December 2014: Trees were planted at the mitigation site.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Harrisburg, Site 3 wetland mitigation site is 0.69 ha (1.70 ac). Using the 1987 Manual (Environmental Laboratory 1987), 0.23 ha (0.56 ac) of the 0.81-ha (2.00-ac) mitigation site satisfied wetland hydrology criteria for greater than 5% of the growing season, and 0.11 ha (0.28 ac) of the site satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 0.18 ha (0.45 ac) of the site satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Du Quoin, Illinois, is March 30, and the season lasts 217 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Du Quoin, Illinois (MRCC #112483), was 96% of normal, and spring 2017 (March through May) precipitation was 130% of normal.
- Using the 1987 Manual, the period of maximum inundation and saturation during the 2017 growing season began in mid-April and lasted through early May in response to a seasonally elevated water table and one intense rainfall event that occurred April 26-May 6, which produced 18.16 cm (7.15 in.). However, using the 2010 Midwest Region Supplement, the period of maximum inundation and saturation during the growing season began in late March and lasted through mid-April in response to a seasonally high water table and one rainfall event that occurred March 6-7, which produced 3.53 cm (1.39 in.). The ditch flooded the site twice during the growing season in late April. However, the April flood event did not persist long enough to satisfy wetland hydrology criteria.
- In 2017, water levels measured in 3 of 8 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured

in 2 of 8 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 3 of 8 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- For the entire monitoring period, boards were missing from the stop-log structure at the box culvert toward the northeast part of the site. Placing stop-logs in the structure would elevate water levels in the ditch and promote wetland hydrology at the site.

PLANNED FUTURE ACTIVITIES

- Water-level monitoring is expected to continue through 2020 or until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	N	N	N
2S	Y	N	N
3S	N	N	N
4S	N	N	Y
5S	N	N	N
6S	Y	Y	Y
7S	Y	Y	Y
8S	N	N	N

Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

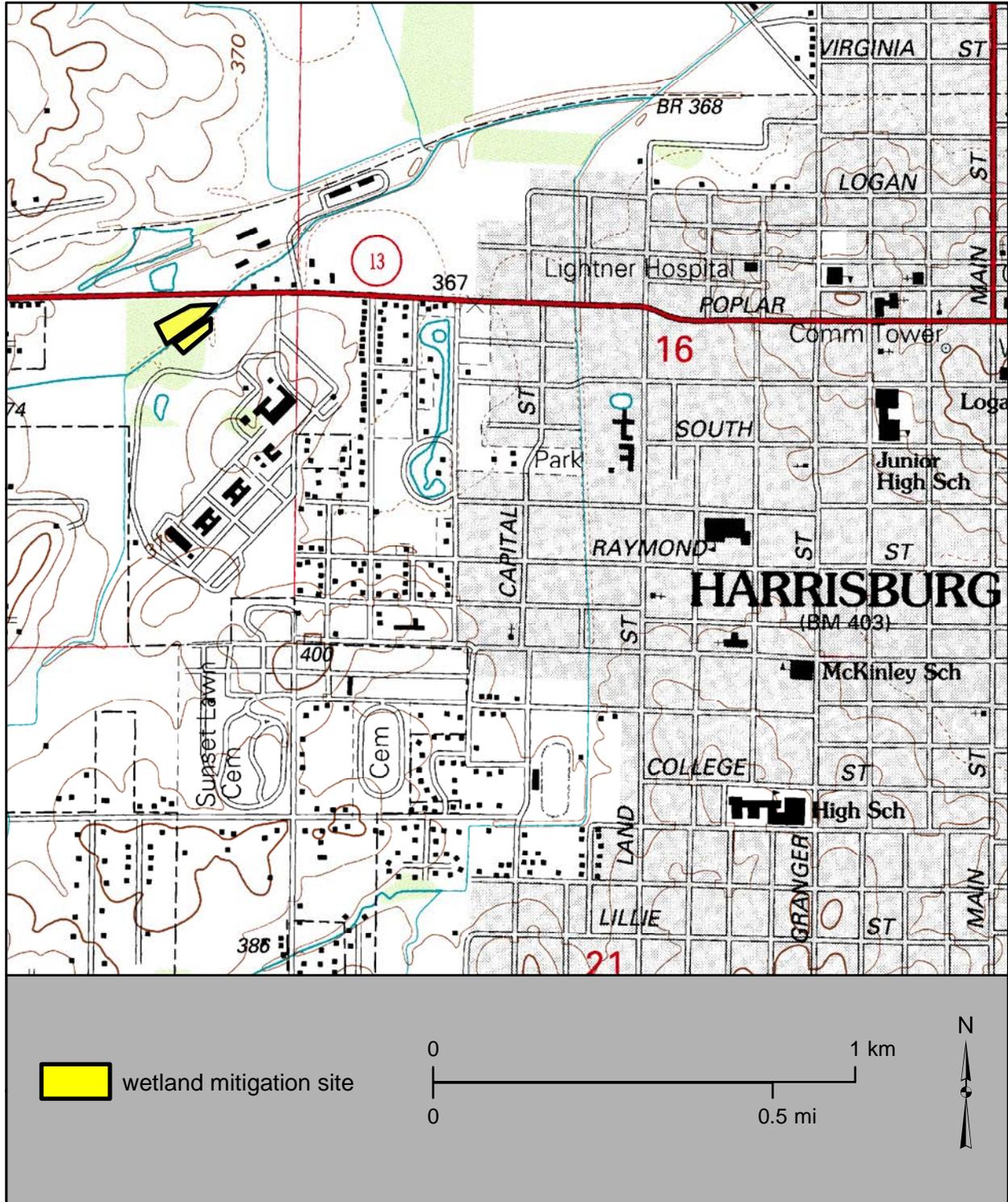
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
AR	110.58 m (362.80 ft)	110.54 m (362.66 ft)	110.58 m (362.80 ft)
B	110.34 m (362.01 ft)	110.34 m (362.01 ft)	110.34 m (362.01 ft)

n/a – insufficient data to determine an elevation

Harrisburg, Site 3 Wetland Mitigation Site (US 45, FAP 332)

General Study Area and Vicinity

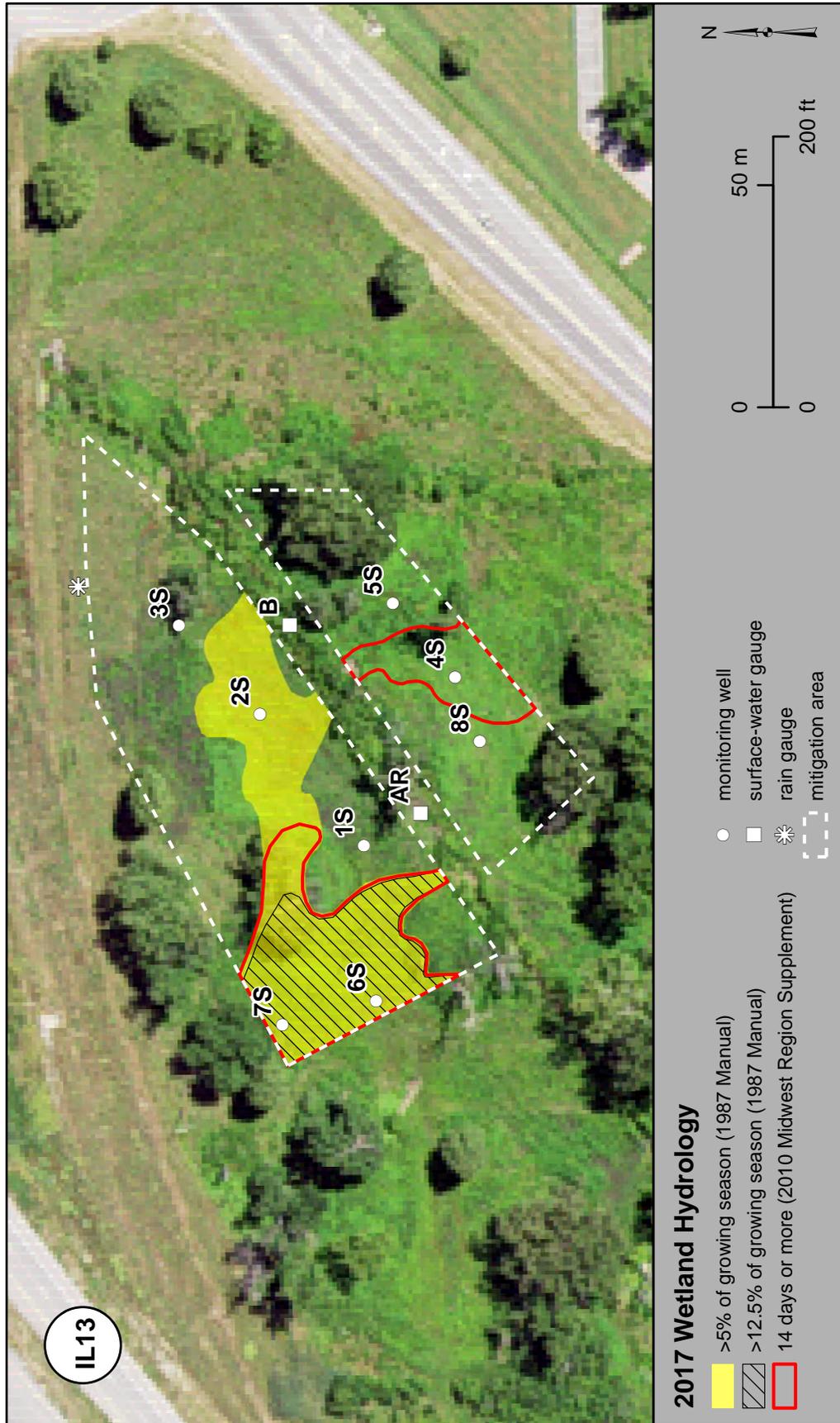
from the USGS Topographic Series, Harrisburg, IL, 7.5-minute Quadrangle (USGS 1961)
contour interval is 5 feet



Harrisburg, Site 3 Wetland Mitigation Site (US 45, FAP 332)

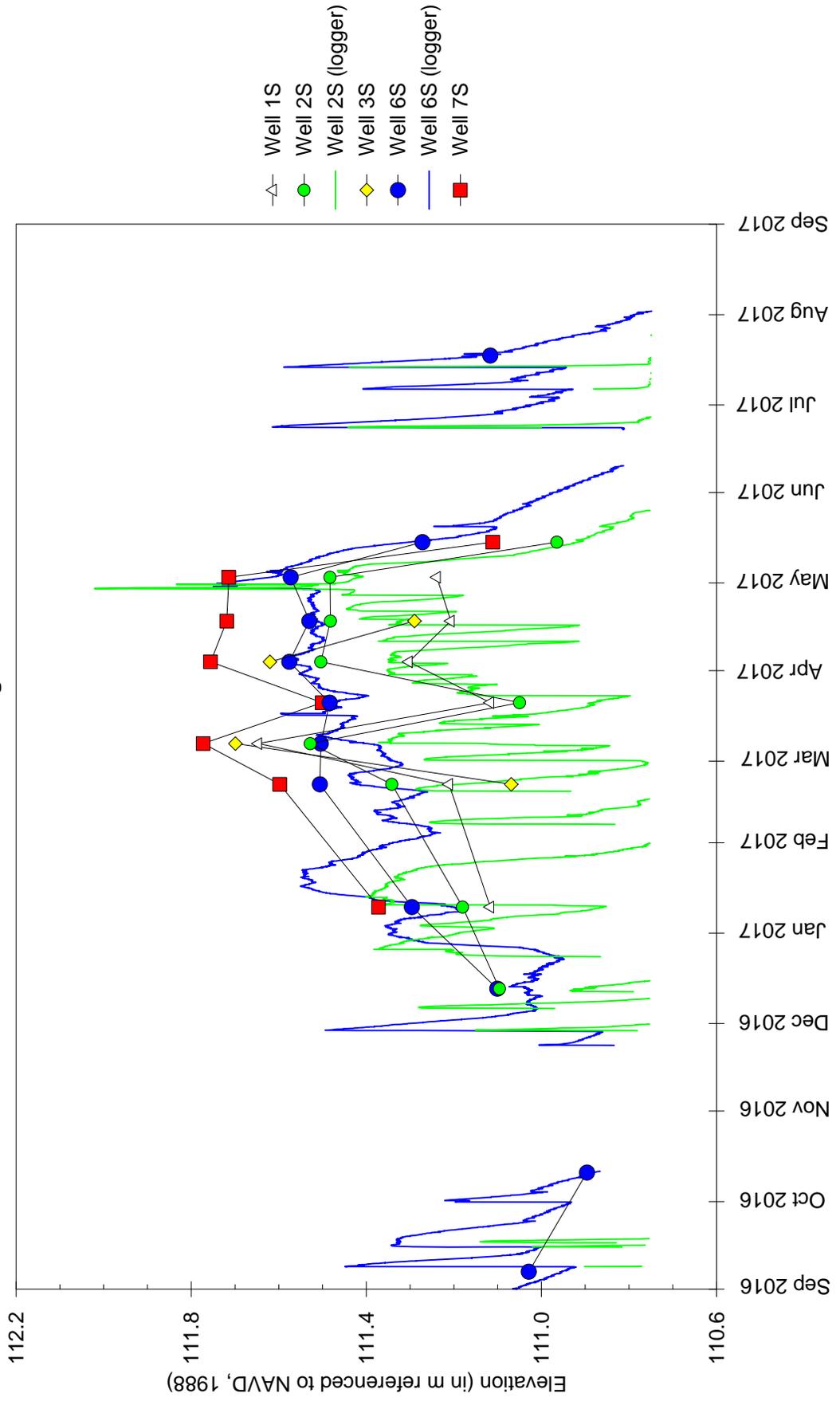
Estimated Areal Extent of 2017 Wetland Hydrology September 1, 2016 through August 31, 2017

Map based on 2015 Farm Service Agency digital orthophotography, Saline County, Illinois (USDA-FSA 2015)

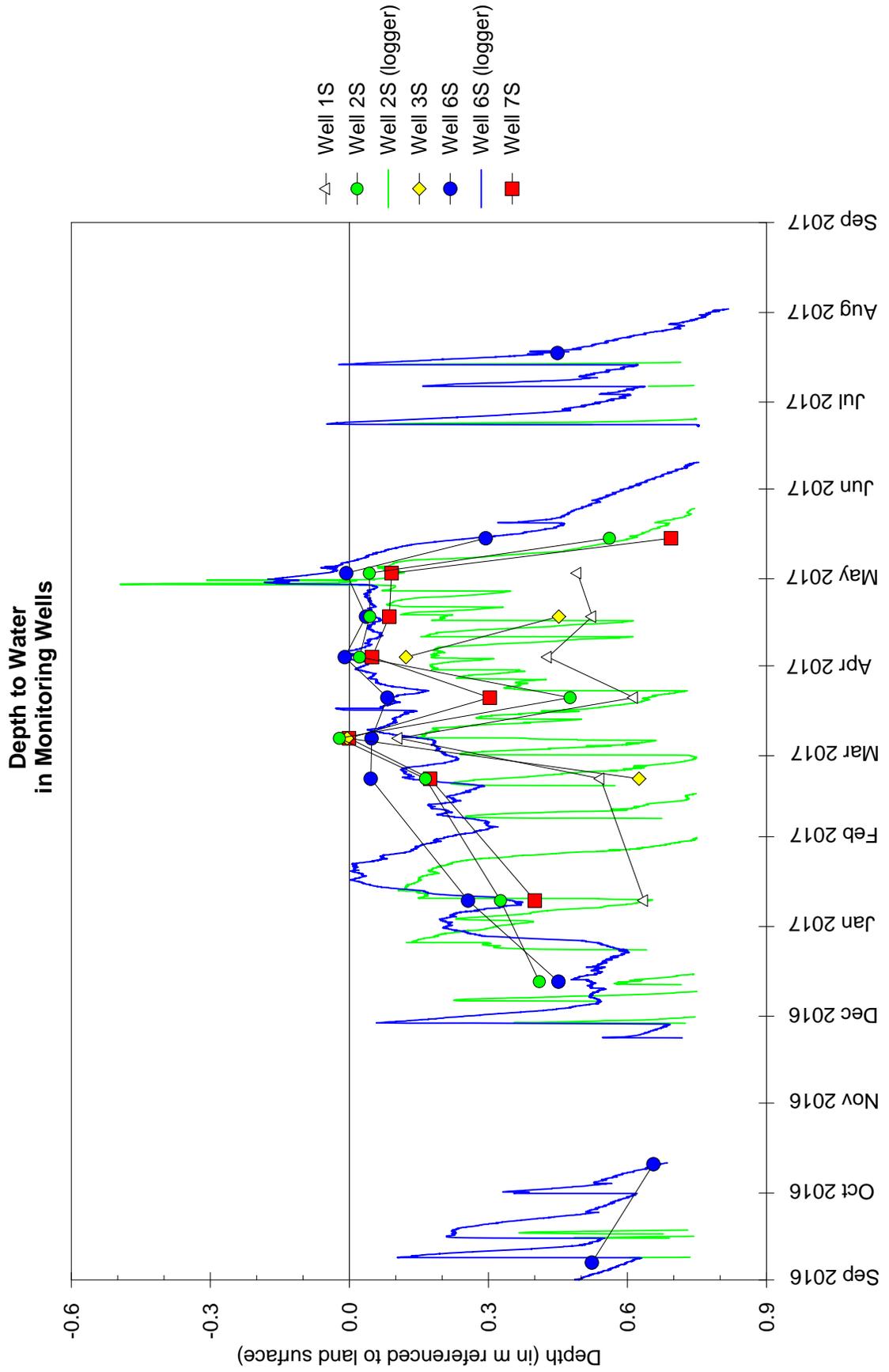


Harrisburg, Site 3 Wetland Mitigation Site September 1, 2016 through August 31, 2017

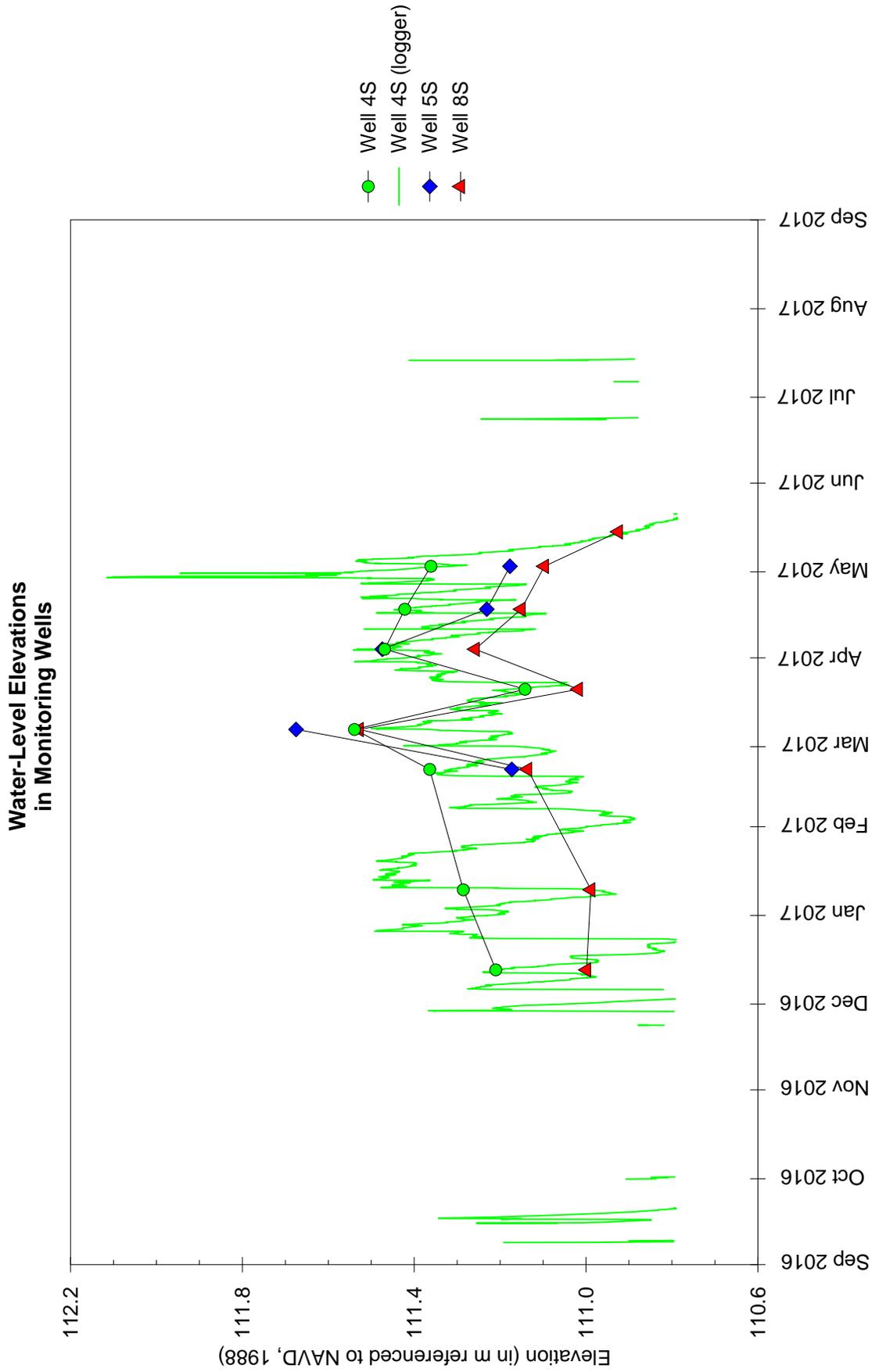
Water-Level Elevations
in Monitoring Wells



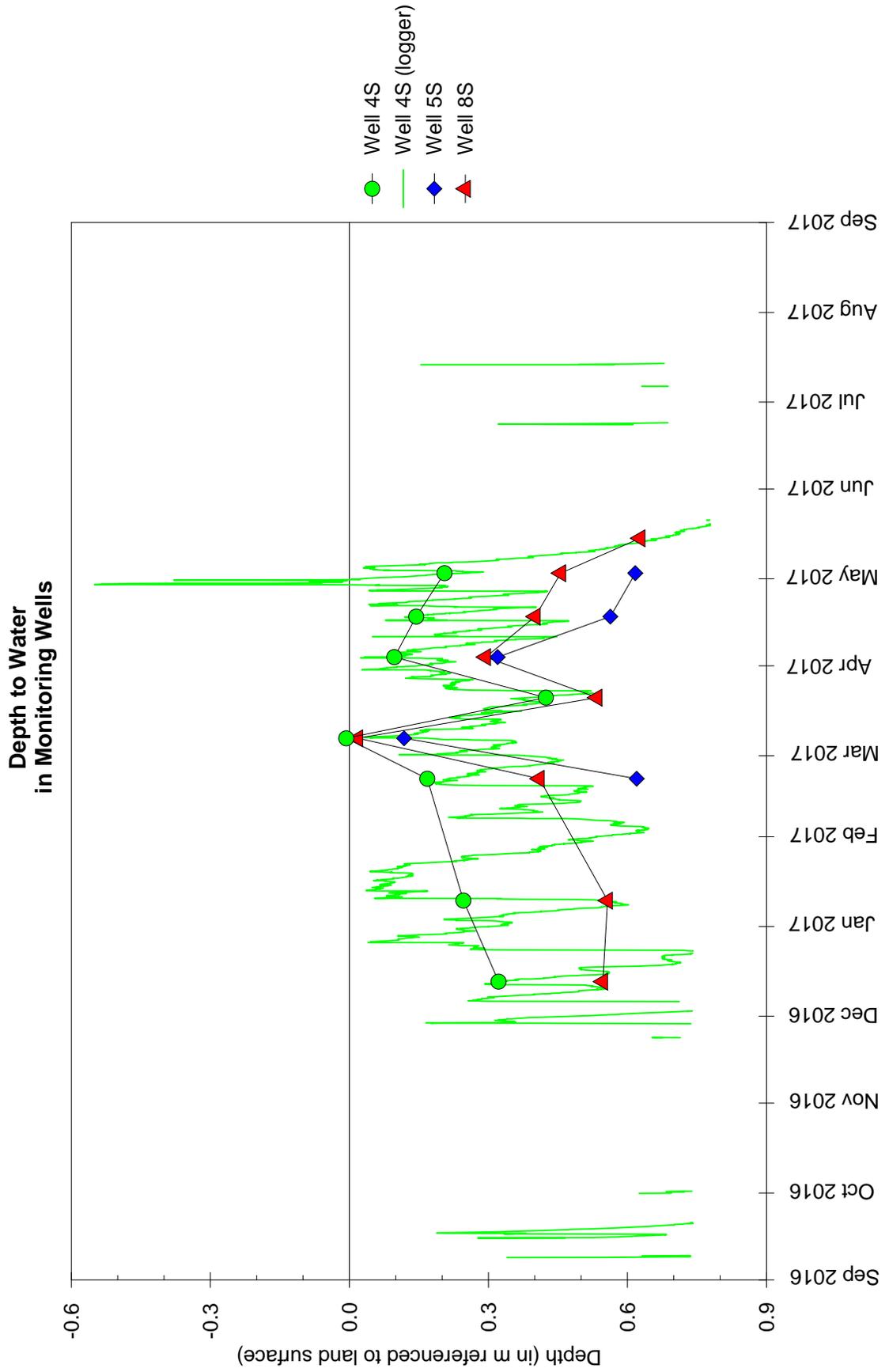
Harrisburg, Site 3 Wetland Mitigation Site
September 1, 2016 through August 31, 2017



Harrisburg, Site 3 Wetland Mitigation Site September 1, 2016 through August 31, 2017

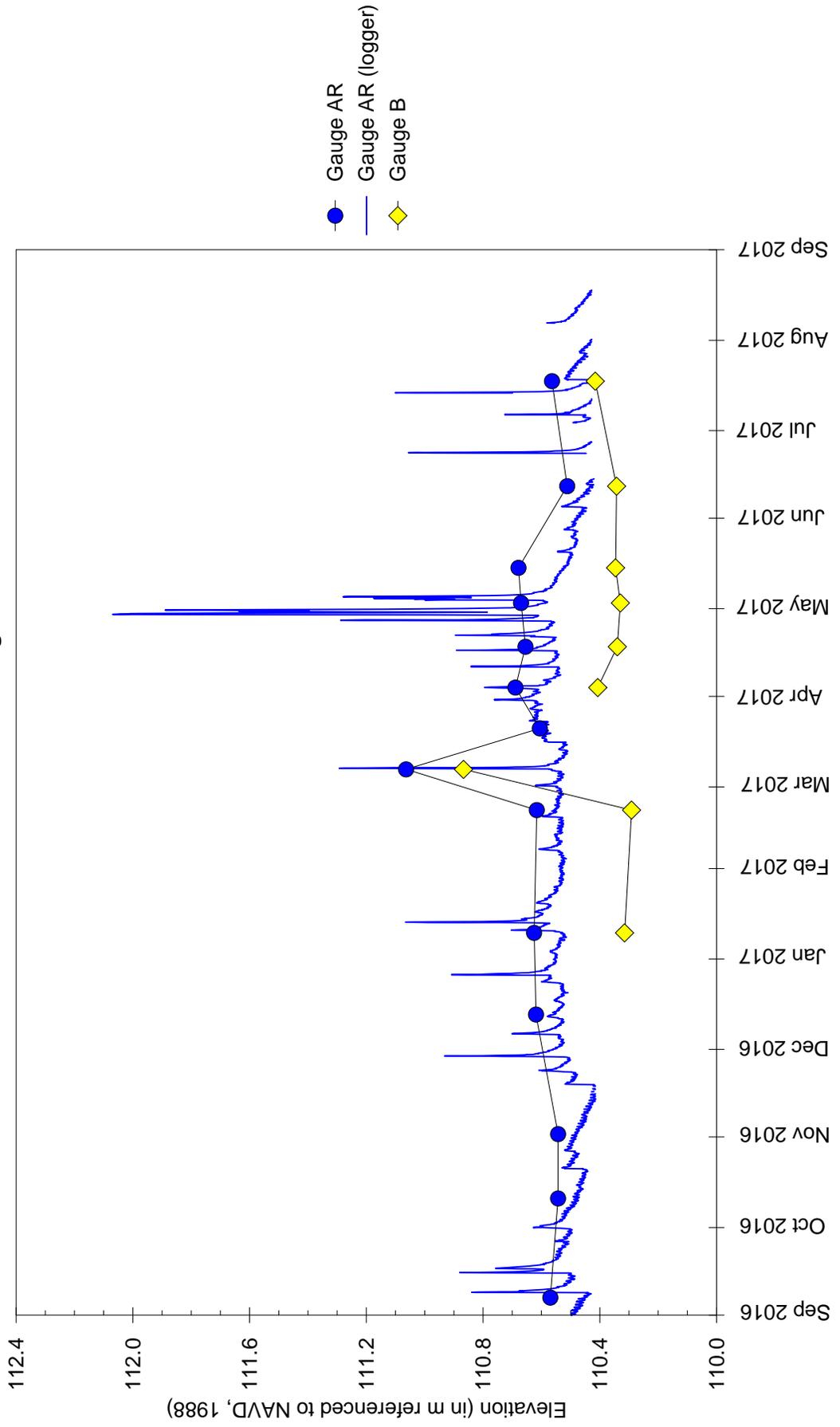


Harrisburg, Site 3 Wetland Mitigation Site
September 1, 2016 through August 31, 2017



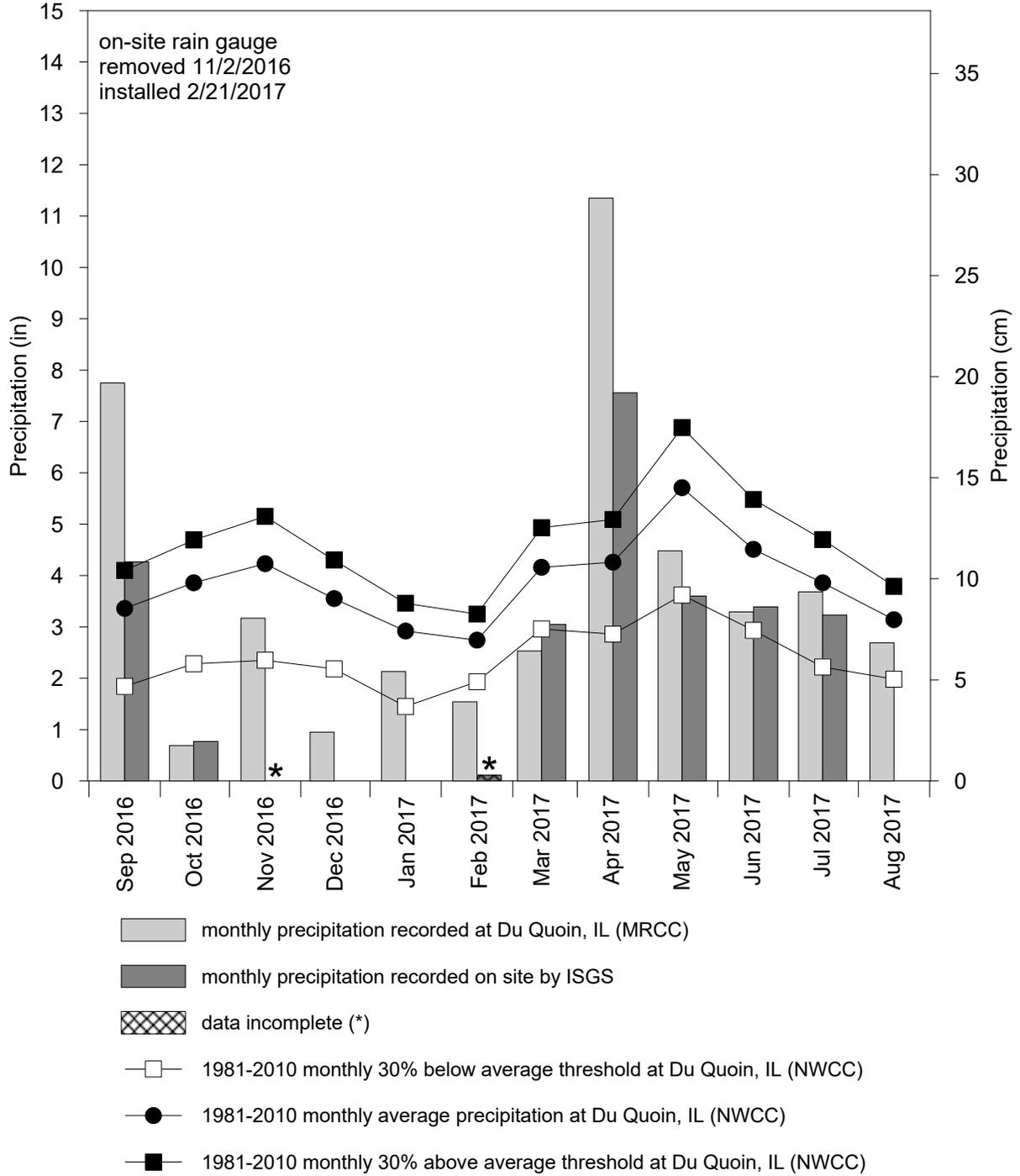
Harrisburg, Site 3 Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



Harrisburg Site 3 Wetland Mitigation Site September 2016 through August 2017

Total Monthly Precipitation Recorded on Site and at Du Quoin, IL (MRCC station #112483)



**GRANT CREEK NORTH
WETLAND MITIGATION SITE**

ISGS #88

I-55

FAI 55

Will County, near Wilmington, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Jessica R. Ackerman

SITE HISTORY

- February 2012: ISGS was tasked by IDOT to monitor wetland hydrology.
- April 2012: ISGS installed a monitoring network.
- September 2012: Huddleston-McBride Land Drainage Company installed gate valves at strategic positions along active drainage tiles underlying the site.
- July 2017: Huddleston-McBride Land Drainage Company permanently sealed all drainage tile gate valves at the site with cement and bentonite.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Grant Creek North wetland mitigation site is 5.99 ha (14.80 ac). Using the 1987 Manual (Environmental Laboratory 1987), 32.84 ha (81.15 ac) of the total site area of 62.73 ha (155.00 ac) satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season, and 27.19 ha (67.18 ac) of the site satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 31.42 ha (77.64 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Joliet, Illinois, is April 5, and the season lasts 213 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 11 days, and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured at the nearby Morris Wetland Mitigation Bank (ISGS #49).
- Total precipitation for the monitoring period at Joliet, Illinois, (MRCC station #114530) was 114% of normal. During spring 2017 (March through May), precipitation was 155% of normal.
- Two periods of maximum inundation and saturation occurred during the 2017 growing season: from early April through early June for areas satisfying the 5% and 12.5% wetland hydrology criteria, and from late March to mid-April for wells satisfying the 14-day wetland hydrology criteria. Both periods were primarily the result of precipitation.
- In 2017, water levels measured in 22 of 27 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 15 of 27 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than

12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 22 of 27 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Gate valves were installed along existing tile drains at the site in September 2012. Four additional gate valves were installed in September 2014 on the property immediately west of the site to aid control of water levels in the western portion of the Grant Creek North site. All gate valves, except two along a main drainage tile line in the northeastern quadrant of the site, were in the closed position through the entire 2016-2017 reporting period. Valves #128 and #130 (reference wetland hydrology figure) were observed in the open position during valve sealing activities conducted in July 2017, and it is believed that these valves were inadvertently left open following their installation in 2012. Valves located upstream, downstream, and in between these two valves were in the closed position. It is not known what effect, if any, the permanent sealing of these two valves will have on the near-surface hydrology in the northeastern quadrant of the site.
- 2018 is the last year Openlands will fund stewardship and monitoring at the site.
- Stantec's final Management and Monitoring Report is expected to be sent to the Army Corps of Engineers and U.S. Forest Service's Midewin National Tallgrass Prairie in January or February 2019.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	Y	N	Y
2VS	Y	N	Y
3VS	Y	Y	Y
5VS	Y	Y	Y
6VS	N	N	N
7S	N	N	N
8S	Y	Y	Y
9VS	N	N	N
10S	Y	Y	Y
11VS	N	N	N
12S	Y	Y	Y
13S	Y	Y	Y
15S	Y	Y	Y
16S	Y	N	Y
16VS	Y	N	Y
17VS	Y	Y	Y
18S	Y	Y	Y
19S	Y	Y	Y
19VS	N	N	N
20VS	Y	Y	Y
21VS	Y	Y	Y
22VS	Y	Y	Y
23VS	Y	Y	Y
24VS	Y	N	Y
25S	Y	N	Y
26S	Y	Y	Y
27S	Y	N	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

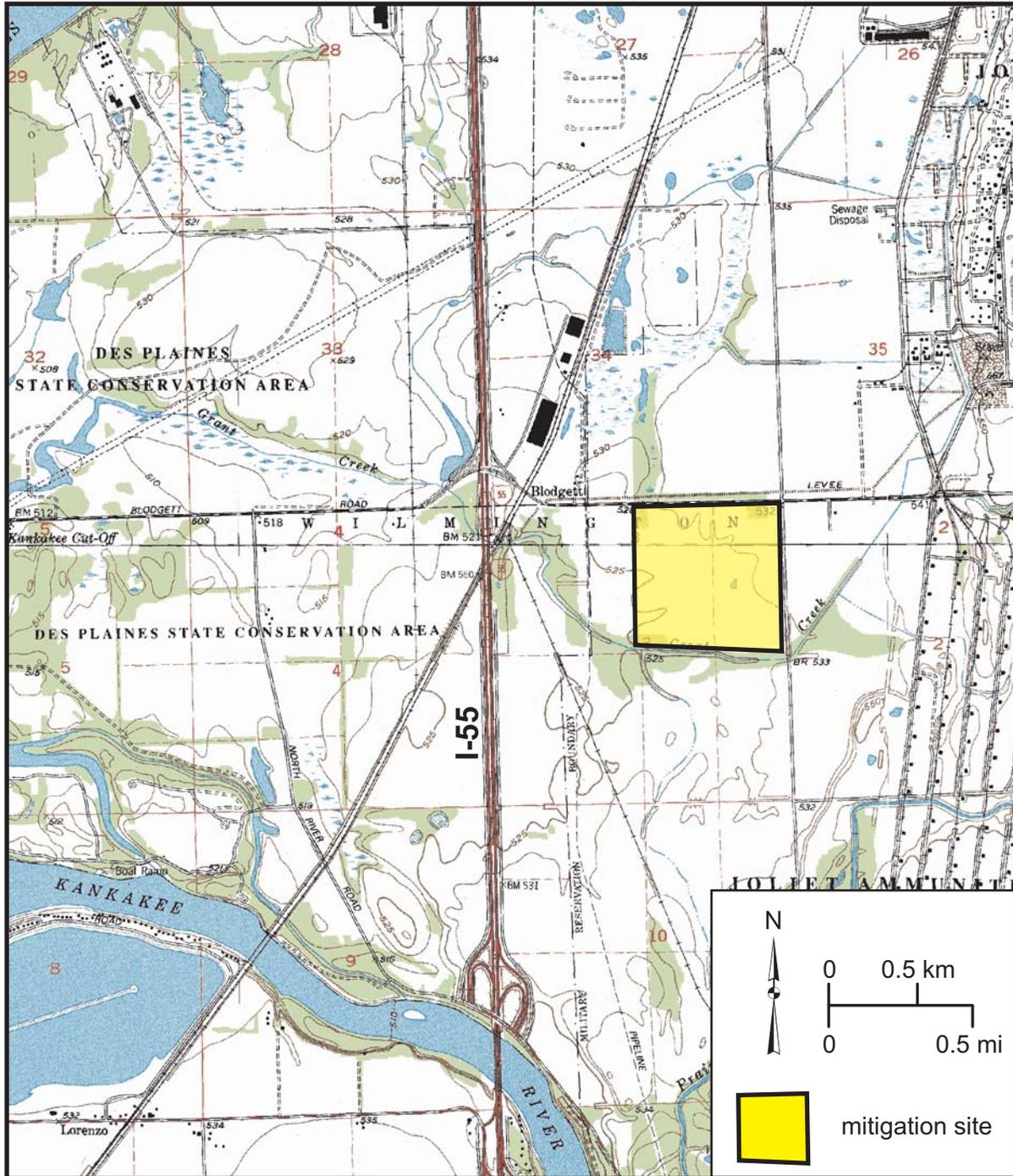
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
A	159.87 m (524.51 ft)	159.70 m (523.95 ft)	159.85 m (524.44 ft)
B	159.44 m (523.10 ft)	159.35 m (522.80 ft)	159.41 m (523.00 ft)
C	159.90 m (524.61 ft)	159.80 m (524.28 ft)	159.88 m (524.54 ft)

n/a – insufficient data to determine an elevation

Grant Creek North Wetland Mitigation Site (I-55, FAI 55)

General Study Area and Vicinity

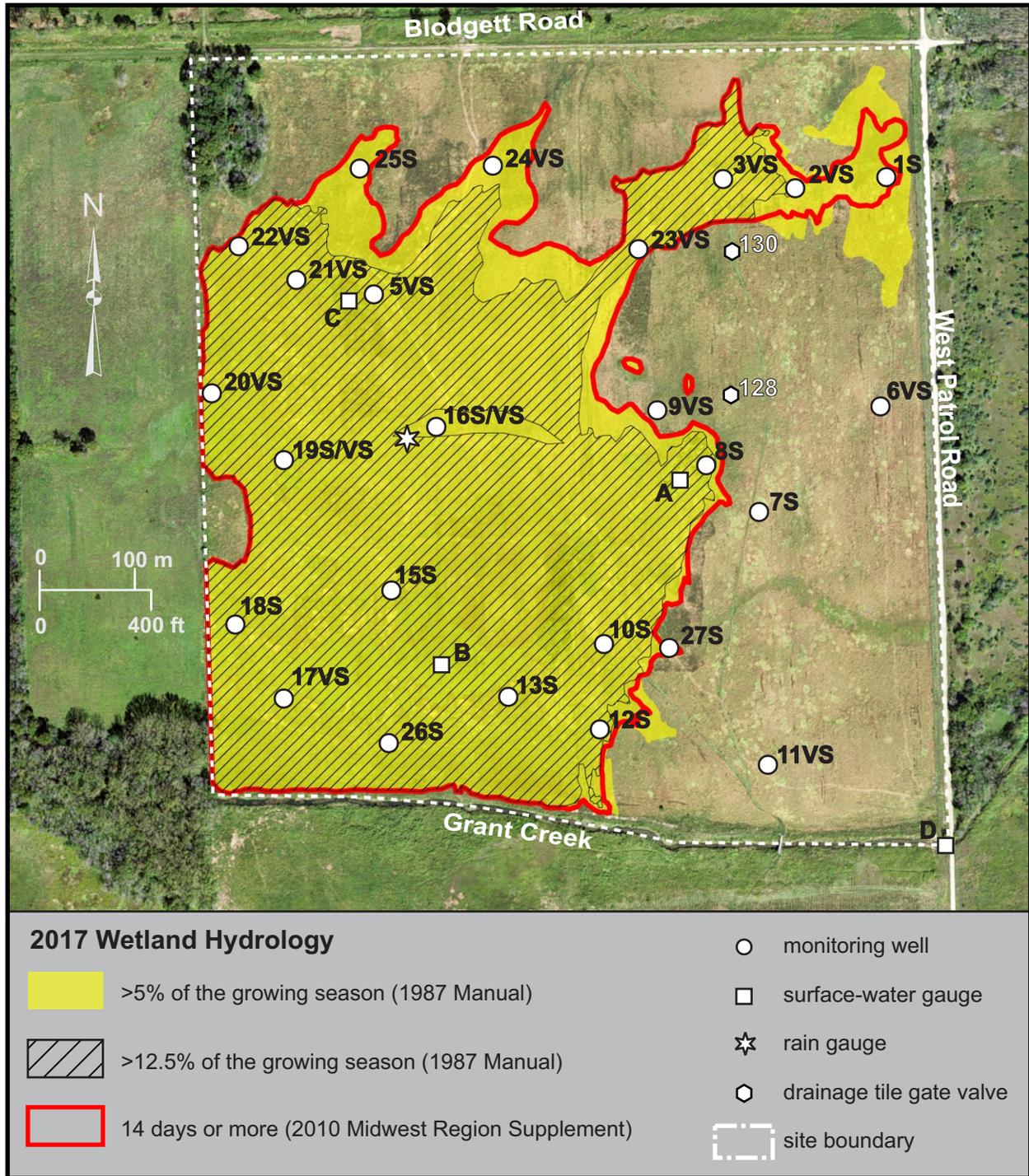
from the USGS Topographic Series, Channahon, IL, and Wilmington, IL, 7.5-minute Quadrangles (USGS 1993a, 1993e). Contour intervals are 10 feet and 5 feet, respectively.



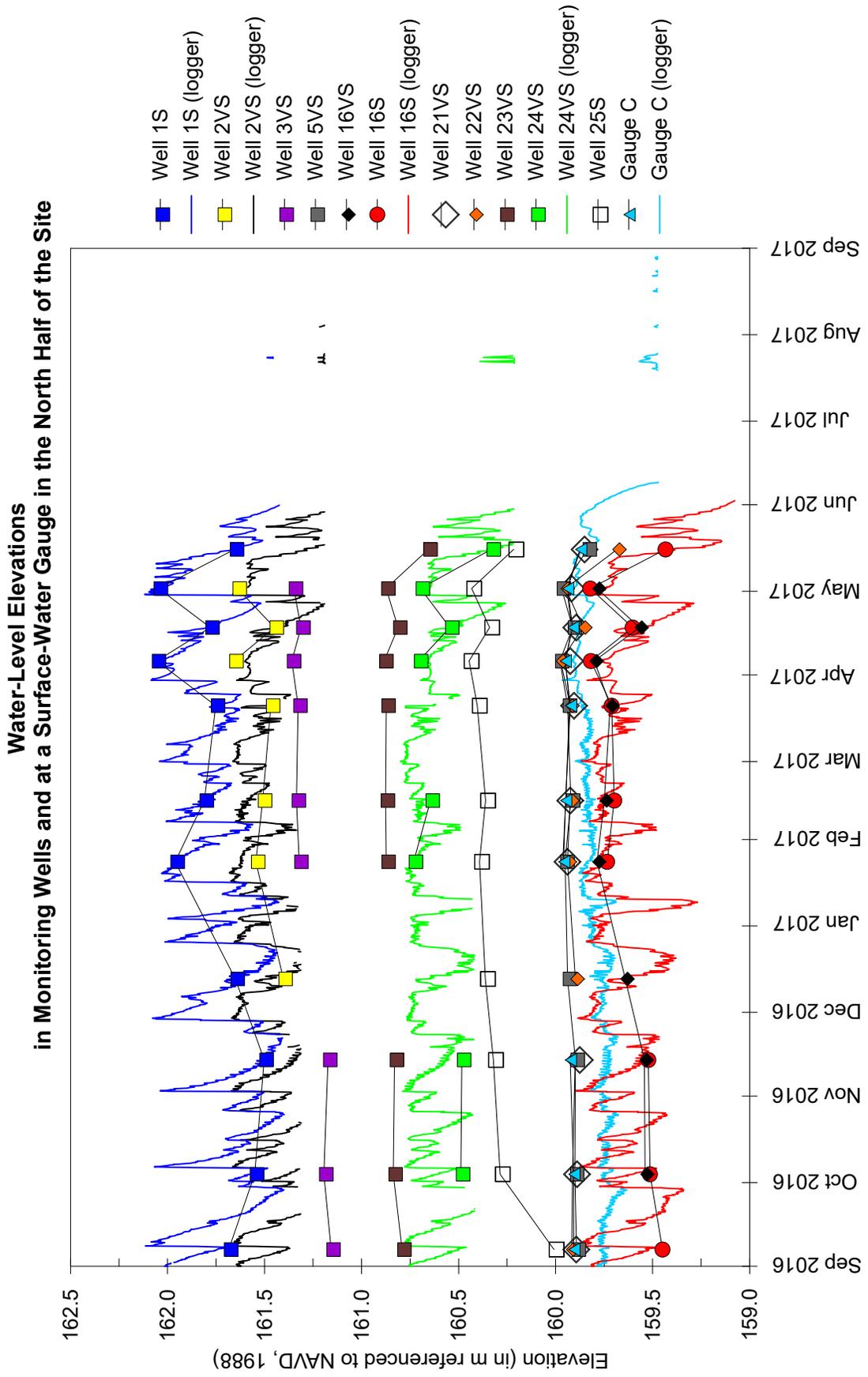
Grant Creek North Wetland Mitigation Site (I-55, FAI 55)

Estimated Areal Extent of 2017 Wetland Hydrology
September 1, 2016 through August 31, 2017

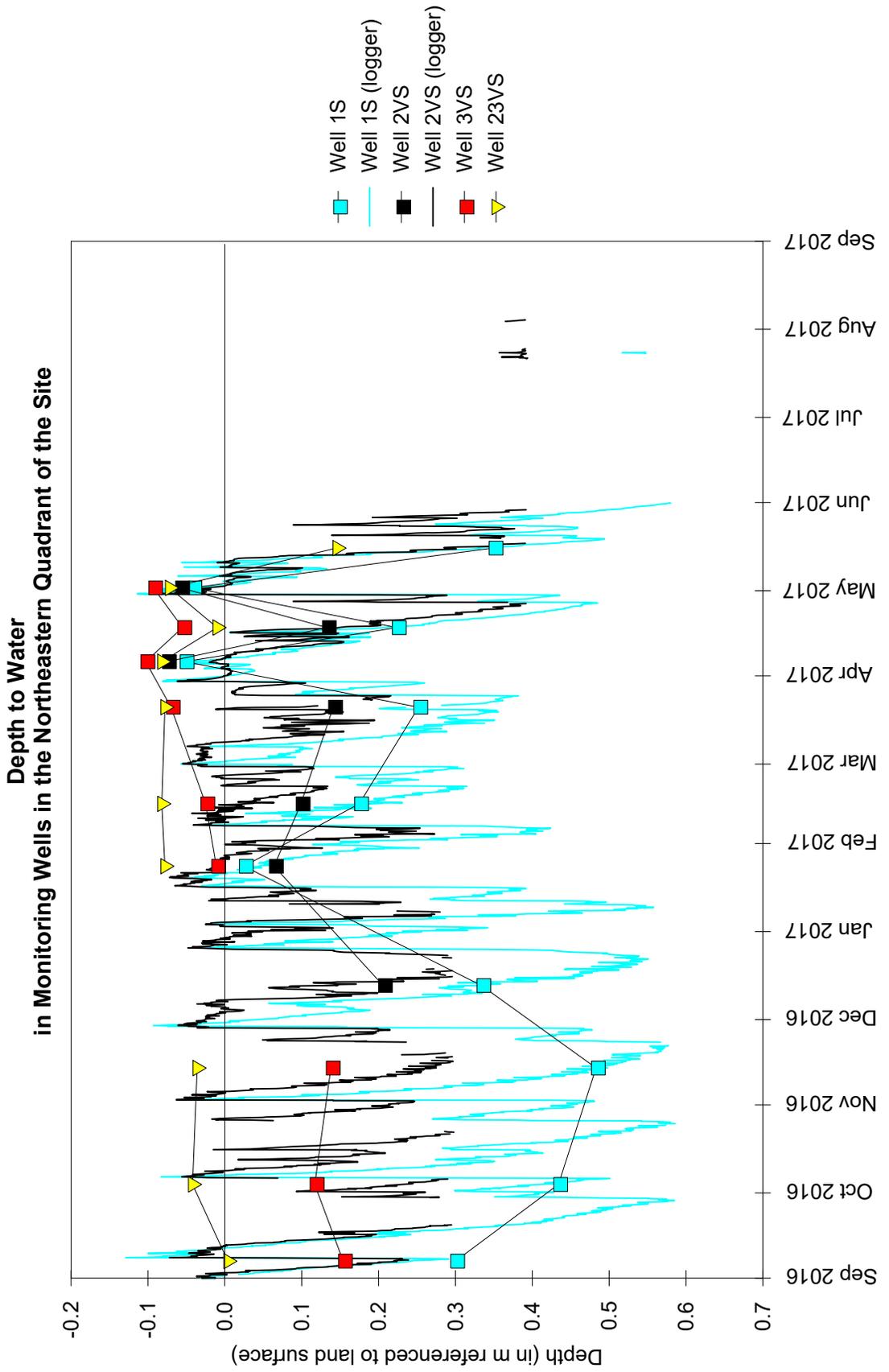
Map based on 2015 Farm Service Agency digital orthophotography, Will County, Illinois (USDA-FSA 2015)



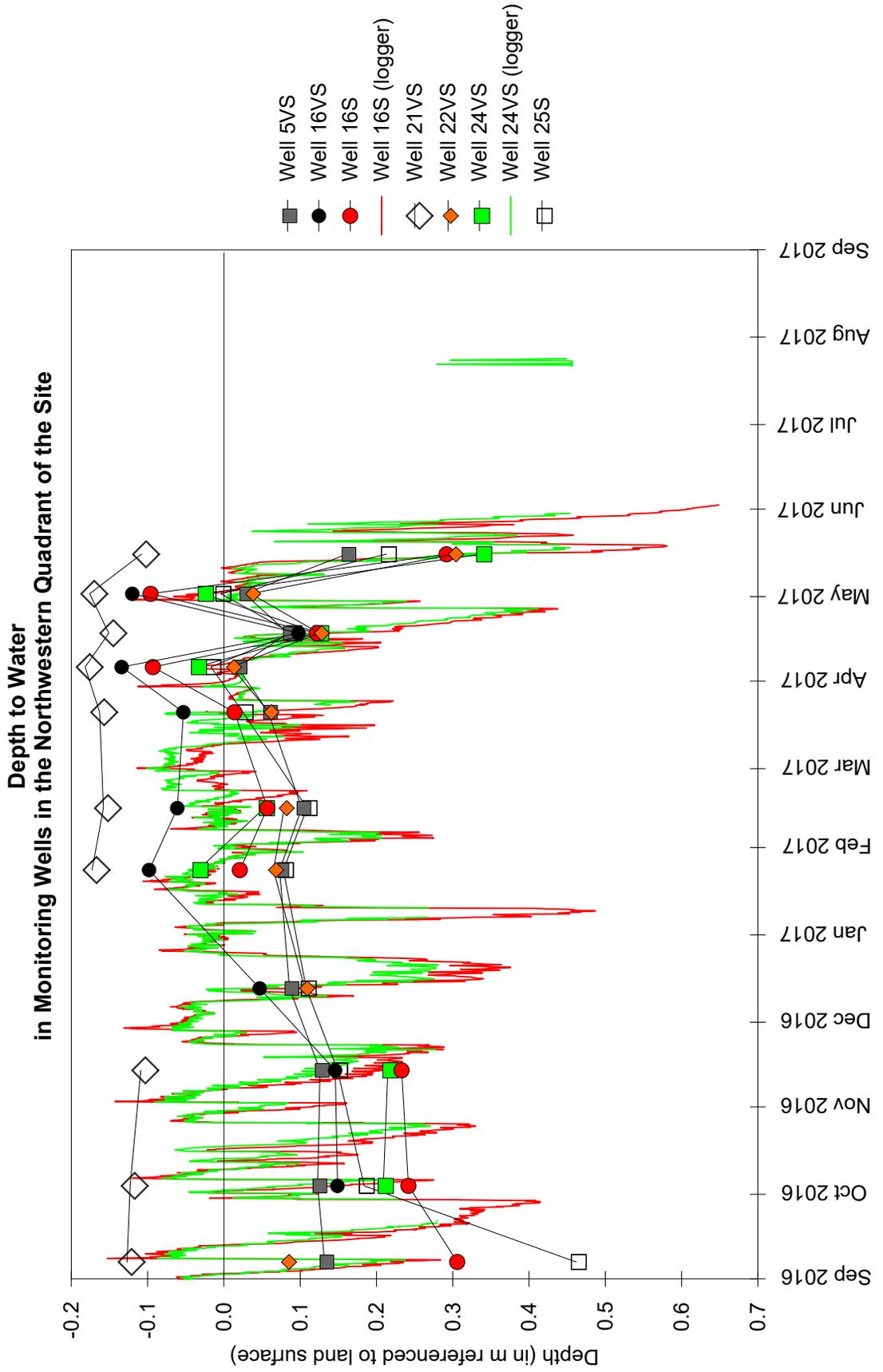
Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017



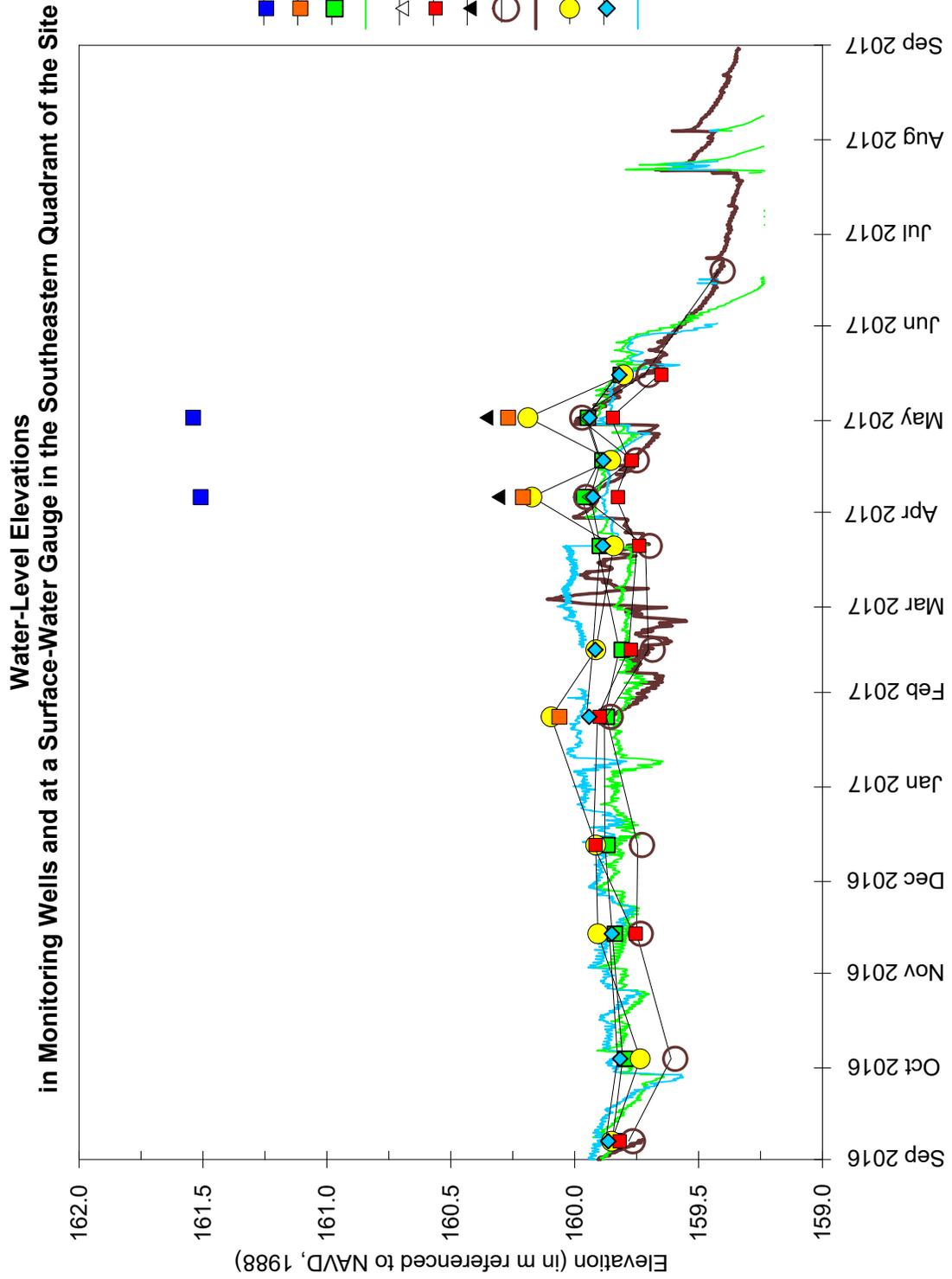
Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017



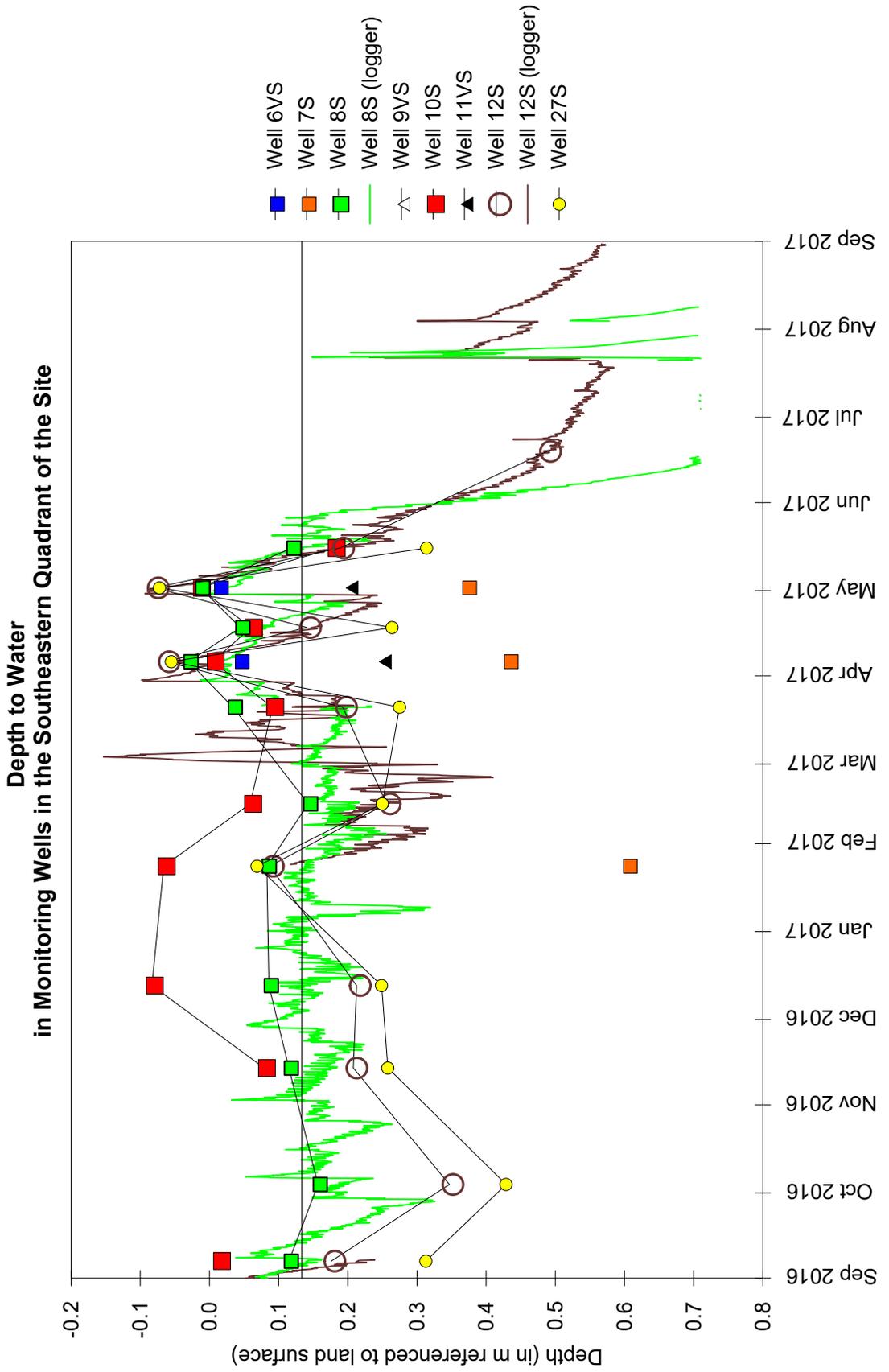
Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017



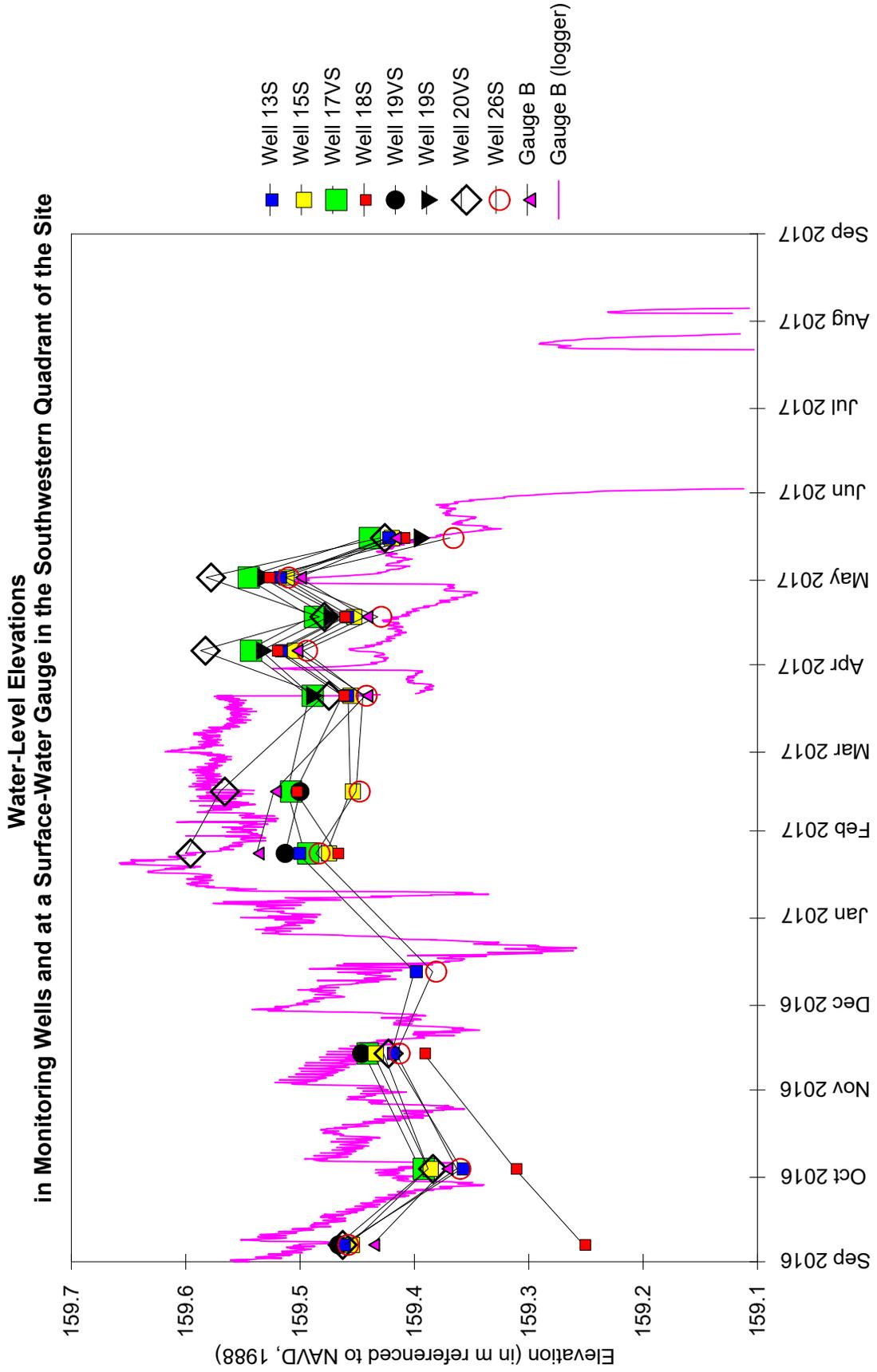
Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017



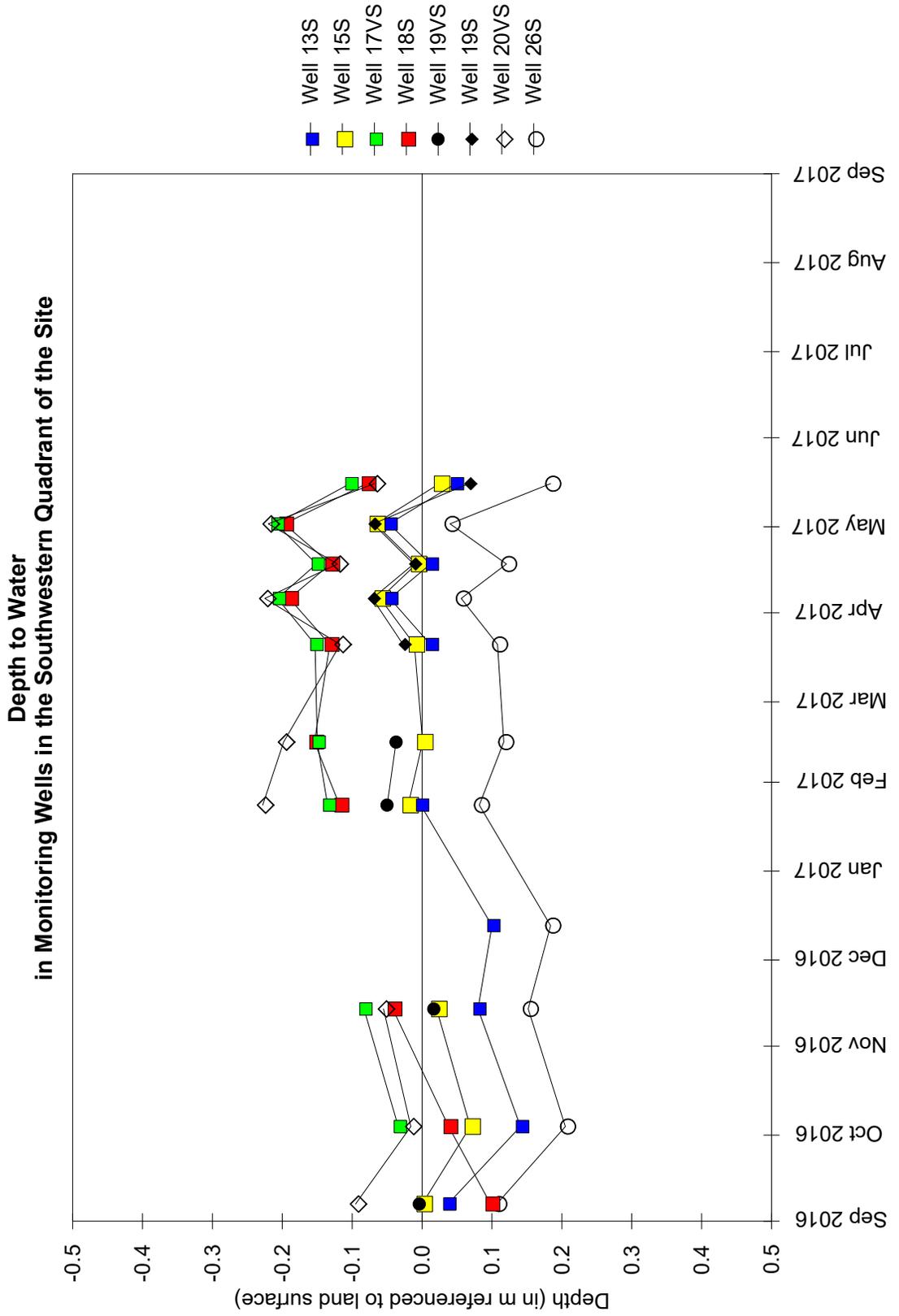
Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017



Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017

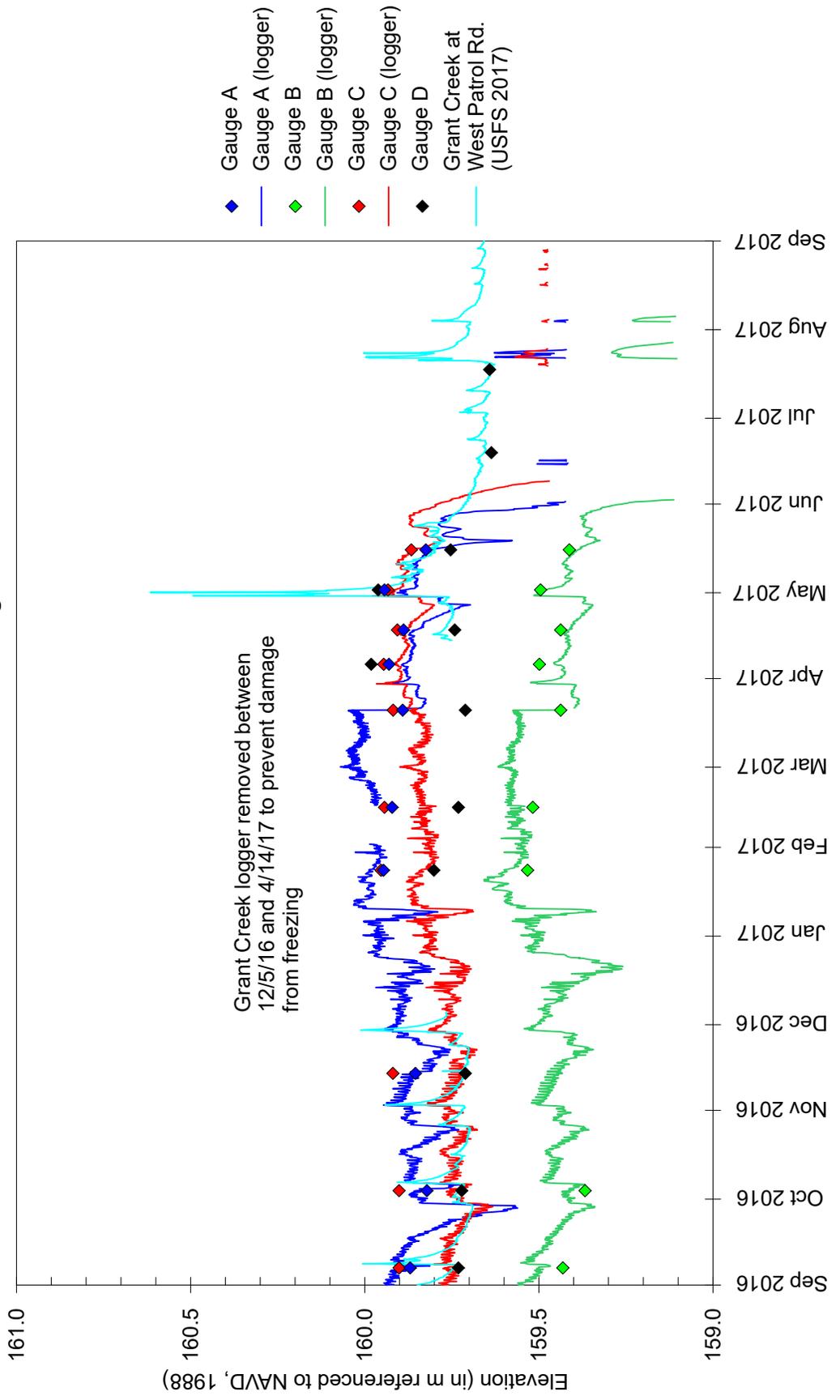


Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017



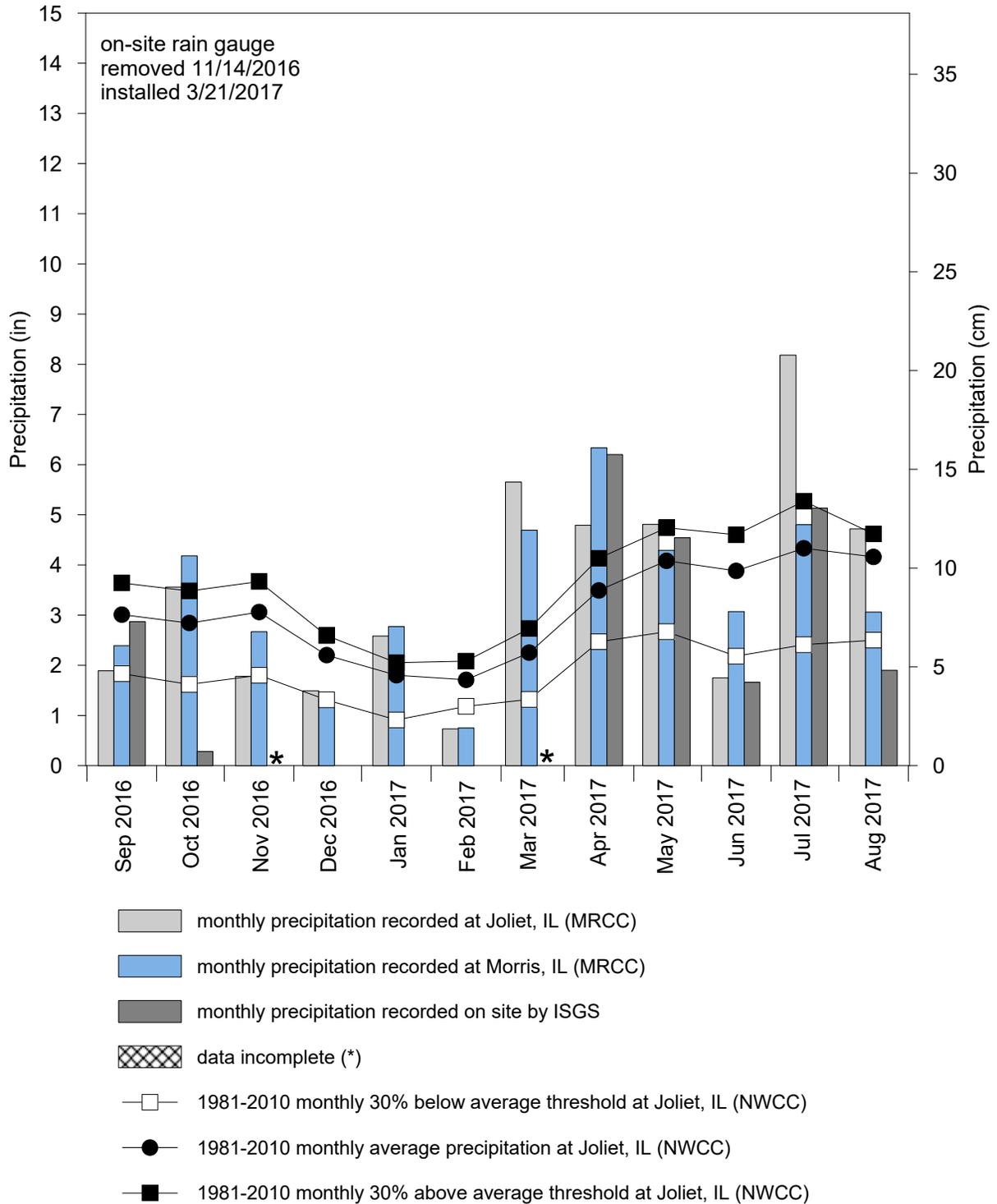
Grant Creek North Wetland Mitigation Site September 1, 2016 through August 31, 2017

Water-Level Elevations at Surface-Water Gauges



Grant Creek North Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at Joliet, IL
(MRCC station #114530) and at Morris, IL (MRCC station #115825)**



**STEVENS CREEK BIKEWAY
WETLAND MITIGATION SITE**

ISGS #89

Stevens Creek Bikeway
Sequence #10630
Macon County, Decatur, Illinois
Primary Project Manager: Steven E. Benton
Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- September 2012: ISGS was tasked by IDOT to monitor wetland hydrology.
- December 2012: A monitoring network was installed on the site.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Stevens Creek Bikeway wetland mitigation site is 6.03 ha (14.89 ac). Using the 1987 Manual (Environmental Laboratory 1987), 10.96 ha (27.08 ac) of the total site area of 18.66 ha (46.10 ac) satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season, and 9.47 ha (23.39 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 10.11 ha (24.97 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Decatur, Illinois, is April 5, and the season lasts 205 days (MRCC 2017); 5% of the growing season is 10 days, and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, March 17 was the starting date of the 2017 growing season based on soil temperatures measured at the Decatur, Illinois, ICN station (WARM 2017).
- Total precipitation for the monitoring period, recorded at Decatur, Illinois (MRCC station #112193), was 99% of normal, and precipitation in spring 2017 (March through May) was 159% of normal.
- The period of maximum inundation and saturation during the 2017 growing season was in May. Precipitation was 201% of normal, and Stevens Creek overflowed its banks four times resulting in widespread inundation of the site that persisted for several weeks.
- In 2017, water levels measured in 28 of 32 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 20 of 32 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 23 of 32 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- A portion of the site was graded to create closely-spaced parallel ridges and swales. Data collected from pairs of wells installed in adjacent ridges and swales (4S/27S),

20S/28S, and 25S/29S) during this monitoring period found that all of the swale wells (4S, 20S, and 25S) satisfied at least two wetland hydrology criteria, but only one of the ridge wells (27S) satisfied at least two criteria. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	Y	Y	Y
2S	Y	Y	Y
3S	Y	Y	Y
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	Y	Y
7S	Y	Y	Y
8S	Y	Y	Y
9S	N	N	N
10S	N	N	N
11S	Y	Y	Y
12S	Y	Y	Y
13S	Y	Y	Y
14S	N	N	N
15S	Y	Y	Y
16S	Y	Y	Y
17S	Y	Y	Y
18S	Y	Y	Y
19S	Y	N	N
20S	Y	N	Y
21S	Y	Y	Y
22S	Y	Y	Y
23S	Y	Y	Y
24SR	Y	Y	Y
25S	Y	N	Y
26SR	Y	N	N
27S	Y	Y	Y
28S	N	N	N
29S	Y	N	N
30S	Y	N	Y
31S	Y	N	N
32S	Y	N	N

Y – met wetland hydrology criteria

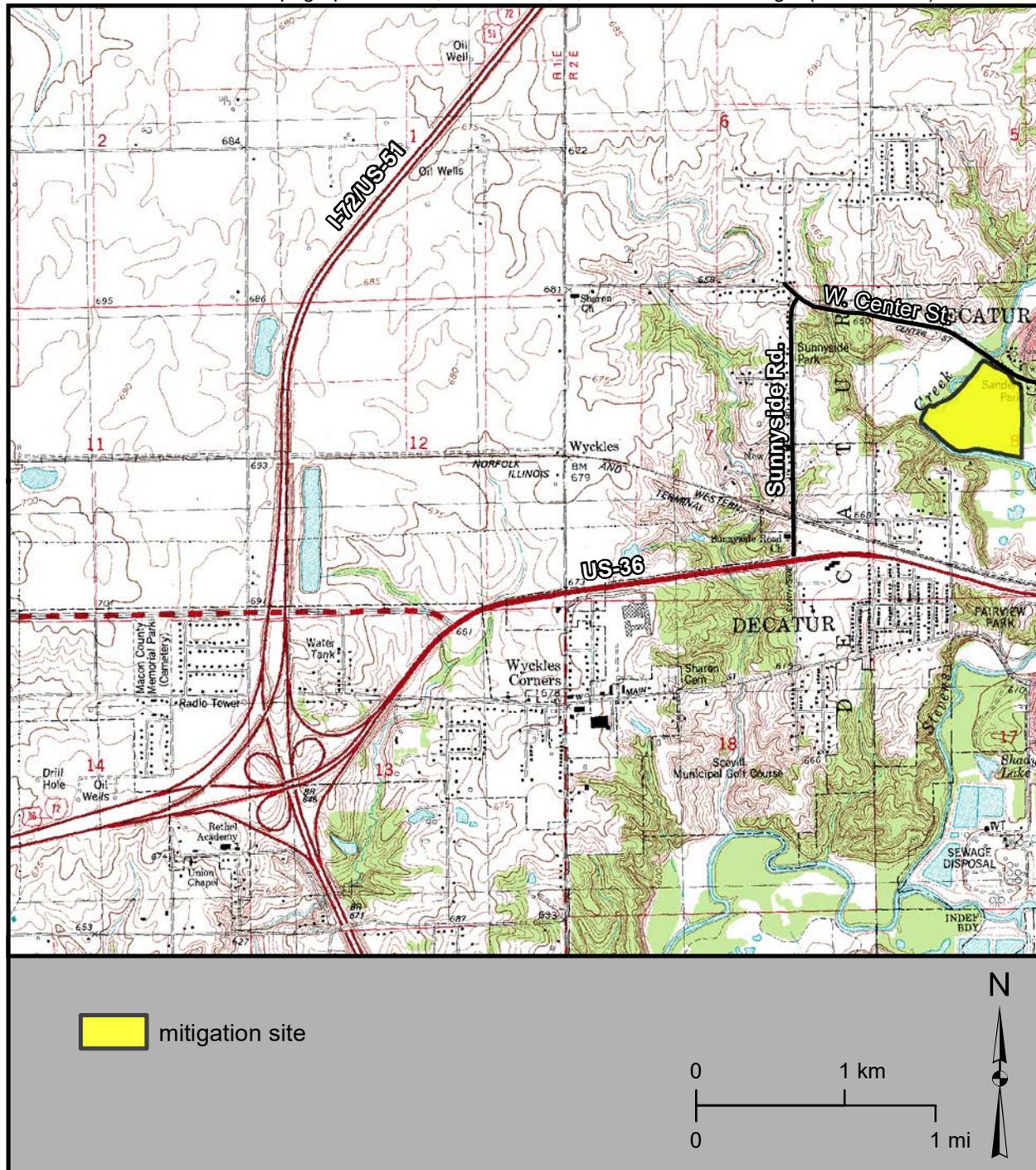
N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
A	184.12 m (604.07 ft)	184.00 m (603.67 ft)	184.10 m (604.00 ft)
B	n/a	n/a	n/a
C	184.16 (604.20 ft)	184.01 m (603.71 ft)	184.12 m (604.07 ft)

n/a – insufficient data to determine an elevation

Stevens Creek Bikeway Wetland Mitigation Site General Study Area and Vicinity

from the USGS Topographic Series, Harristown, IL, 7.5-minute Quadrangle (ISGS 2015b)

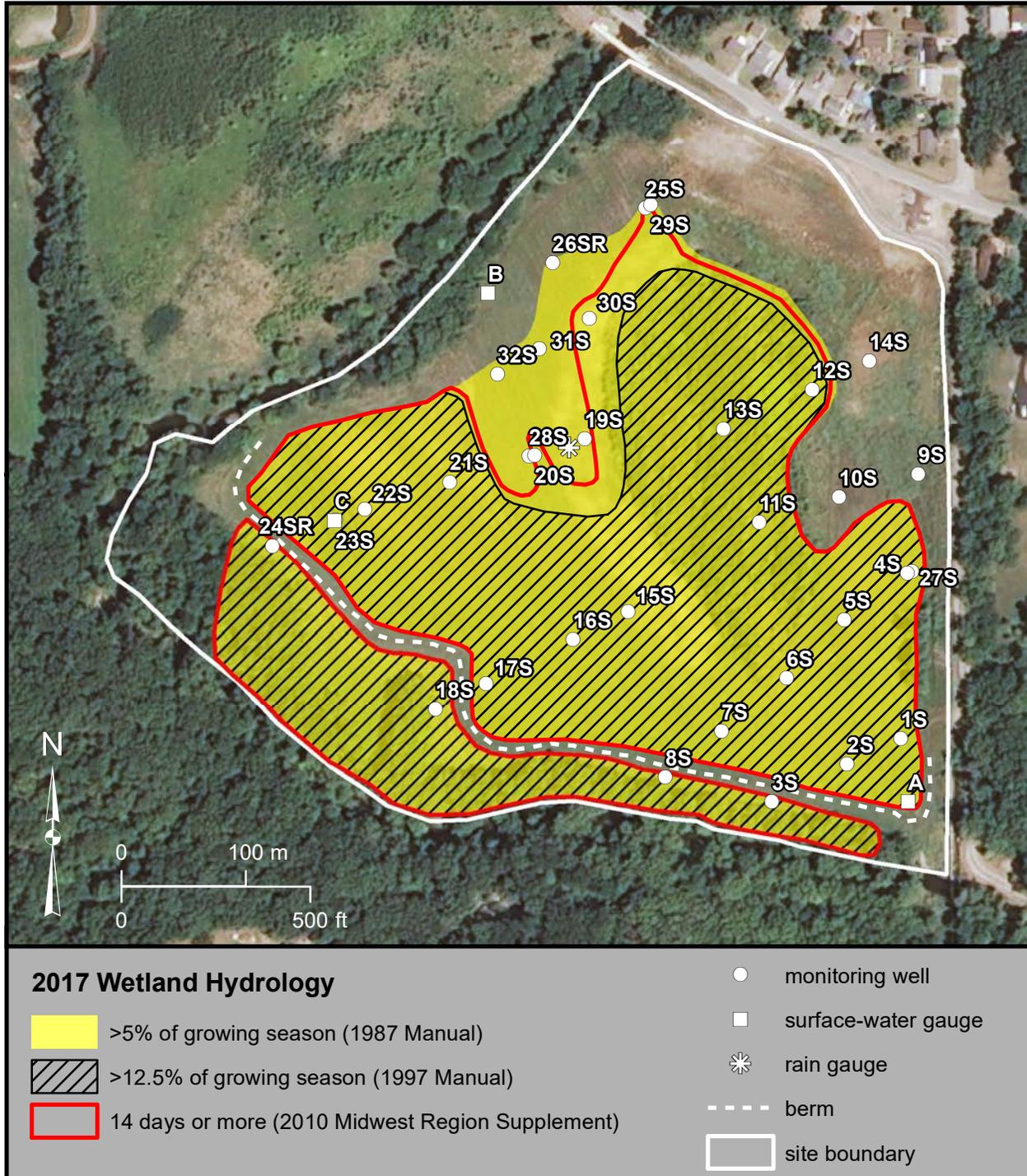


Stevens Creek Bikeway Wetland Mitigation Site

Estimated Areal Extent of 2017 Wetland Hydrology

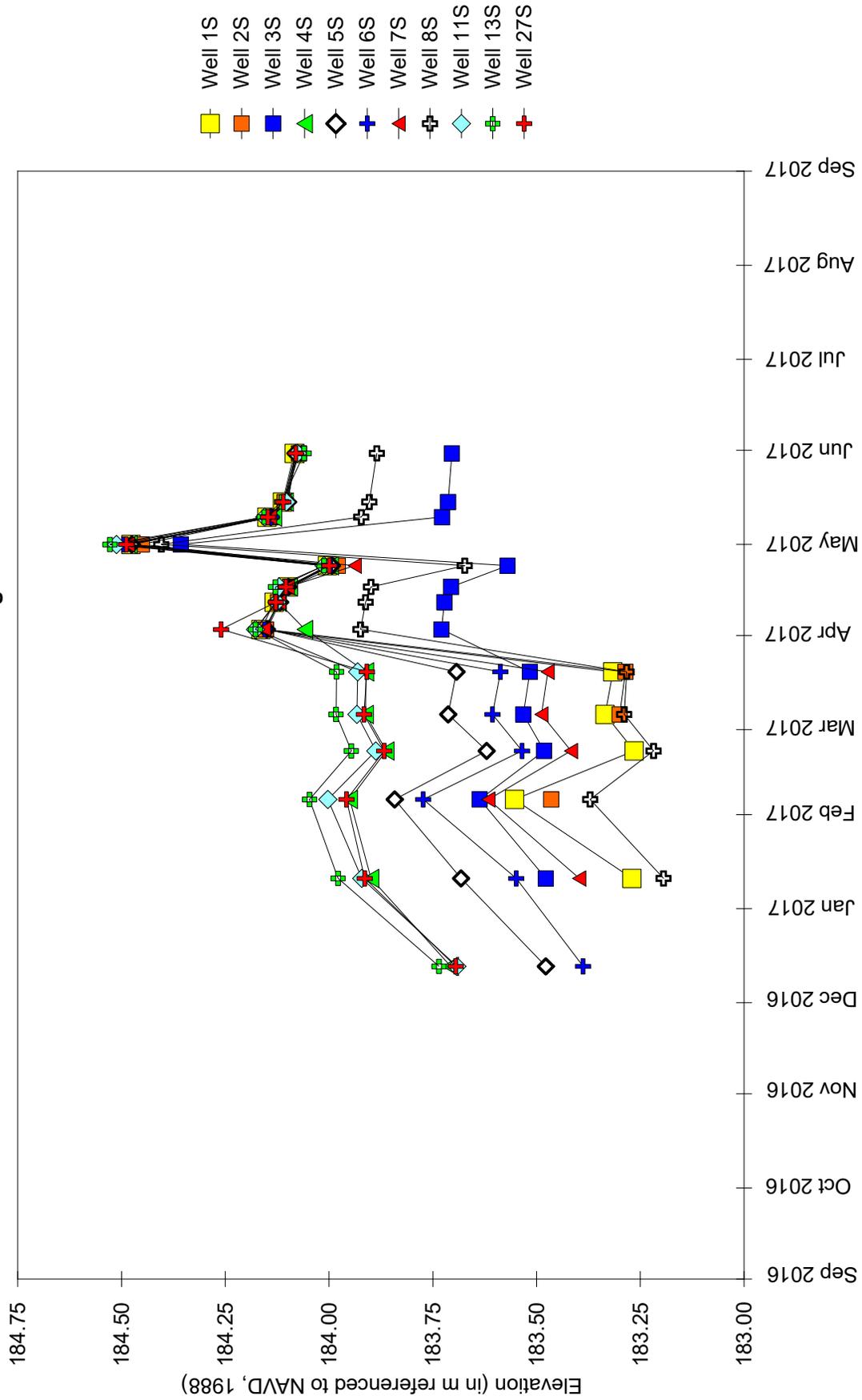
September 1, 2016 through August 31, 2017

Map based on 2012 Farm Service Agency digital orthophotography, Macon County, Illinois (USDA-FSA 2012)

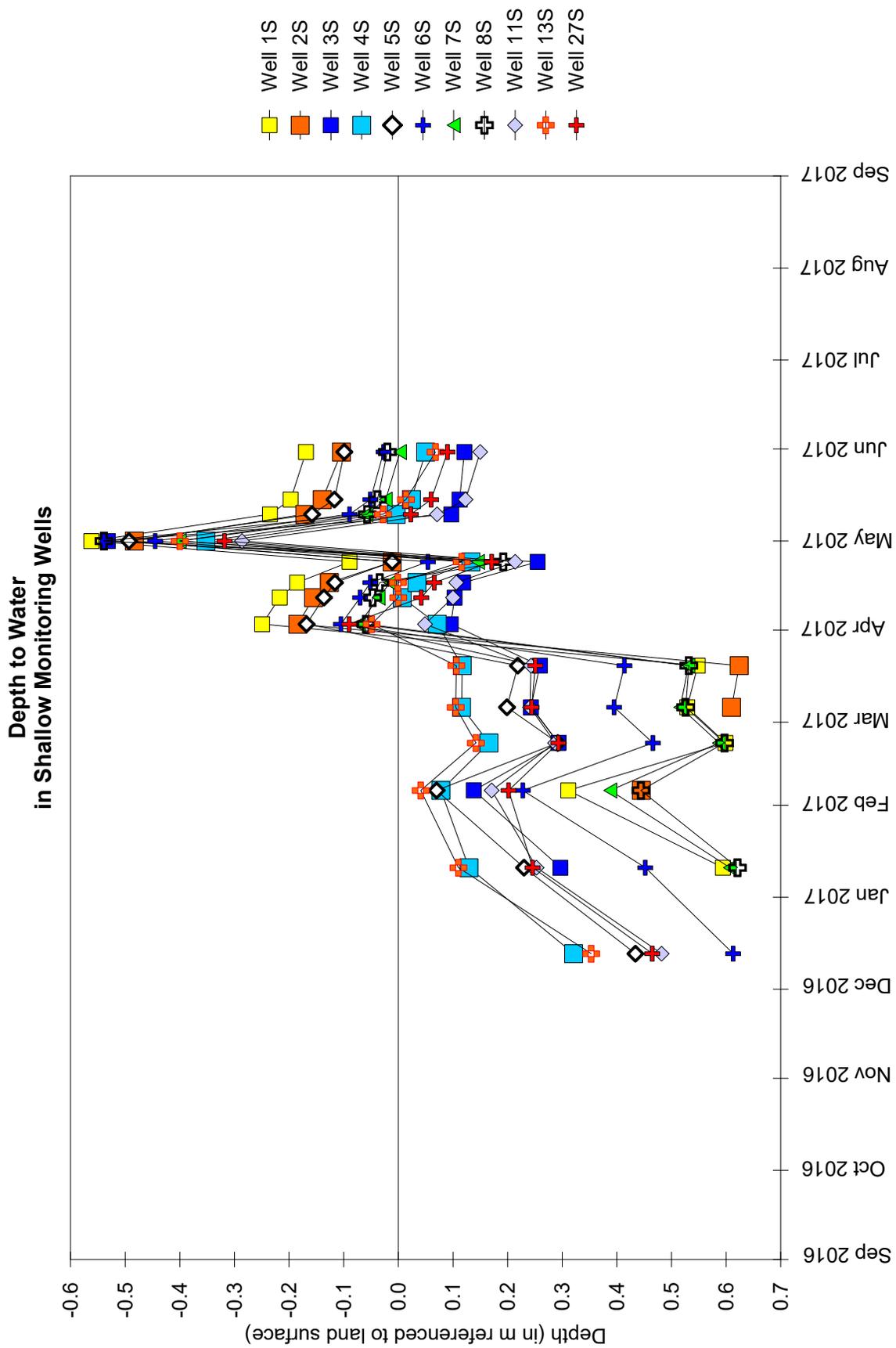


Stevens Creek Bikeway Wetland Mitigation Site September 1, 2016 through August 31, 2017

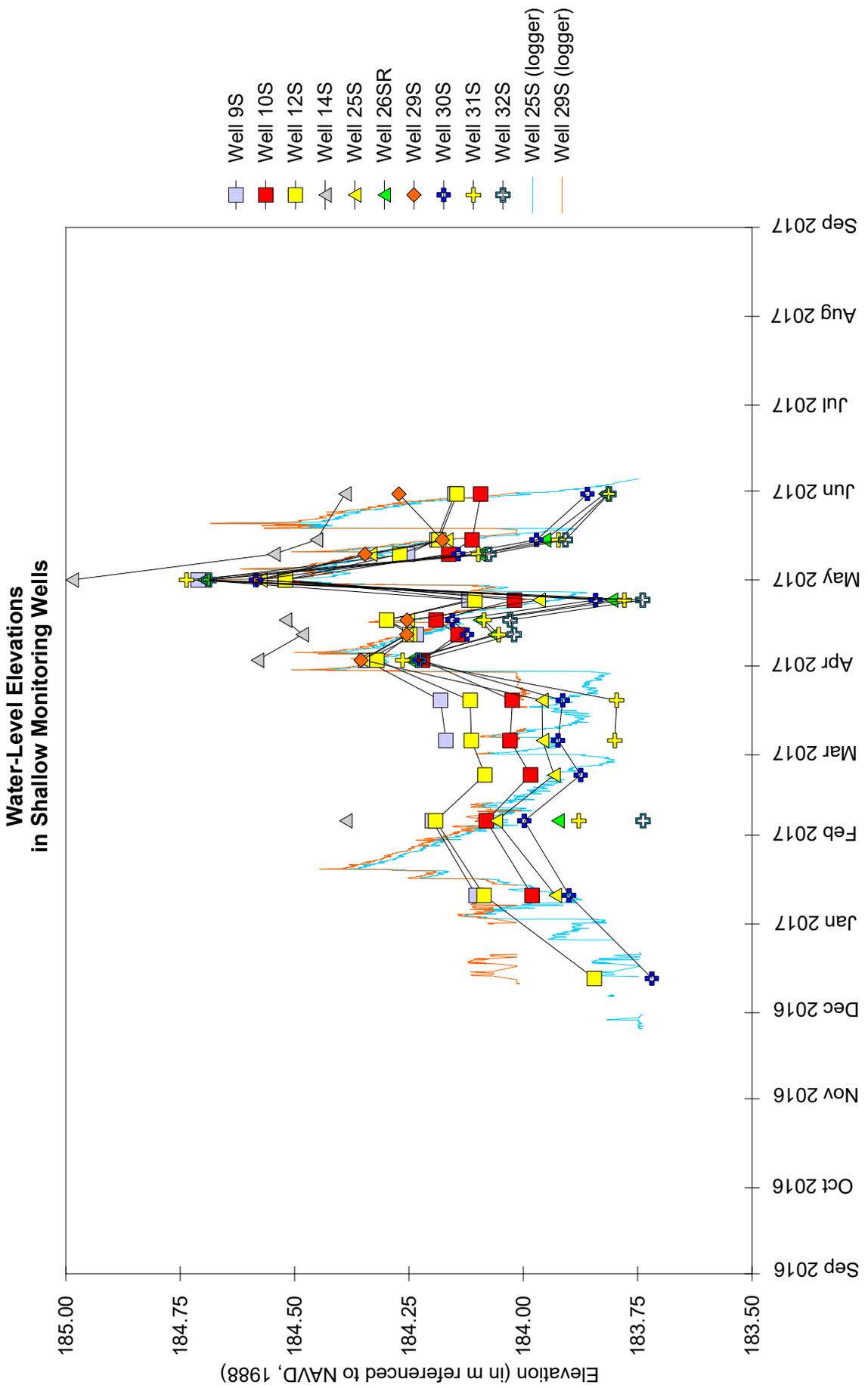
Water-Level Elevations in Shallow Monitoring Wells



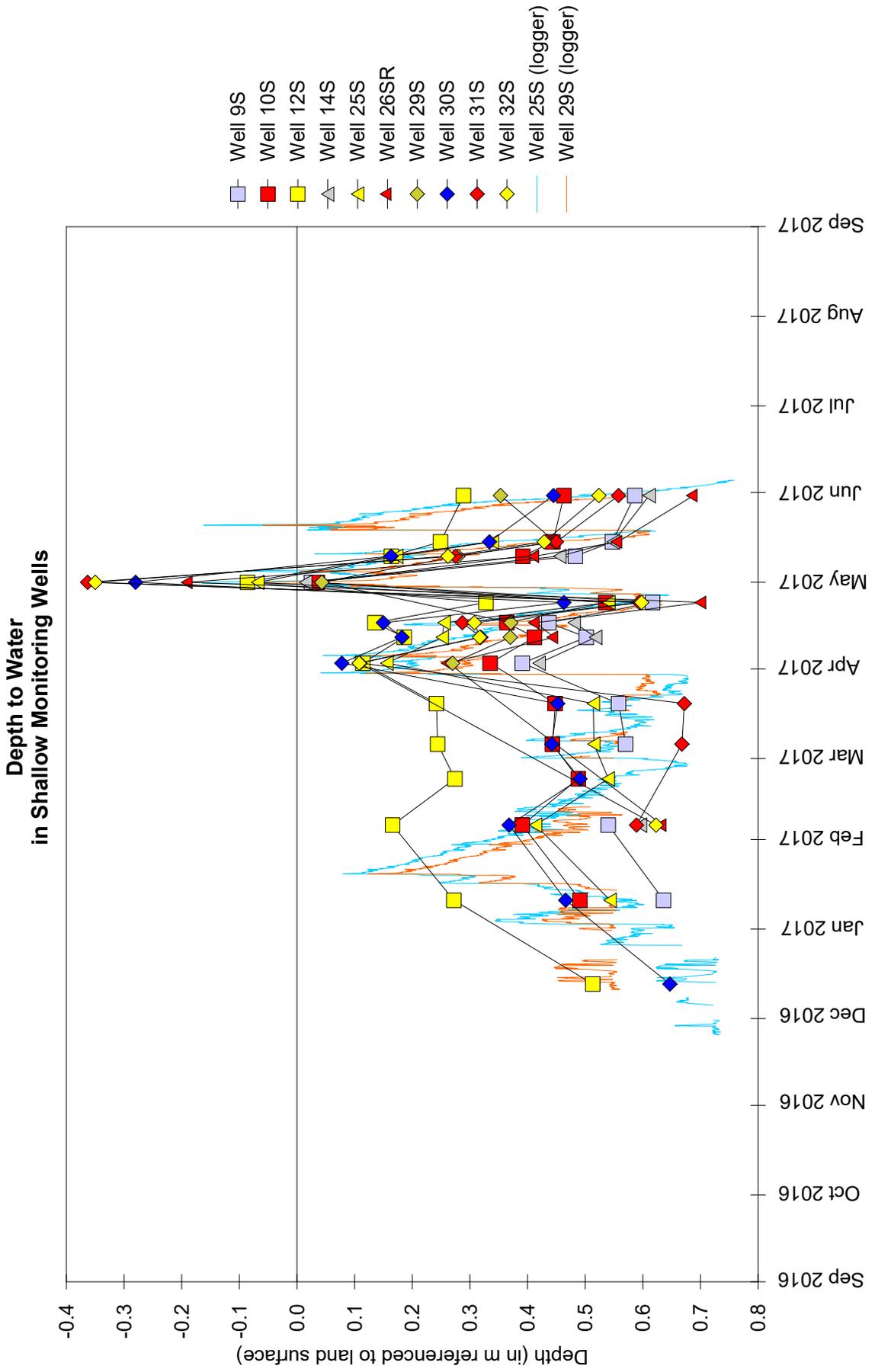
Stevens Creek Bikeway Wetland Mitigation Site September 1, 2016 through August 31, 2017



Stevens Creek Bikeway Wetland Mitigation Site September 1, 2016 through August 31, 2017

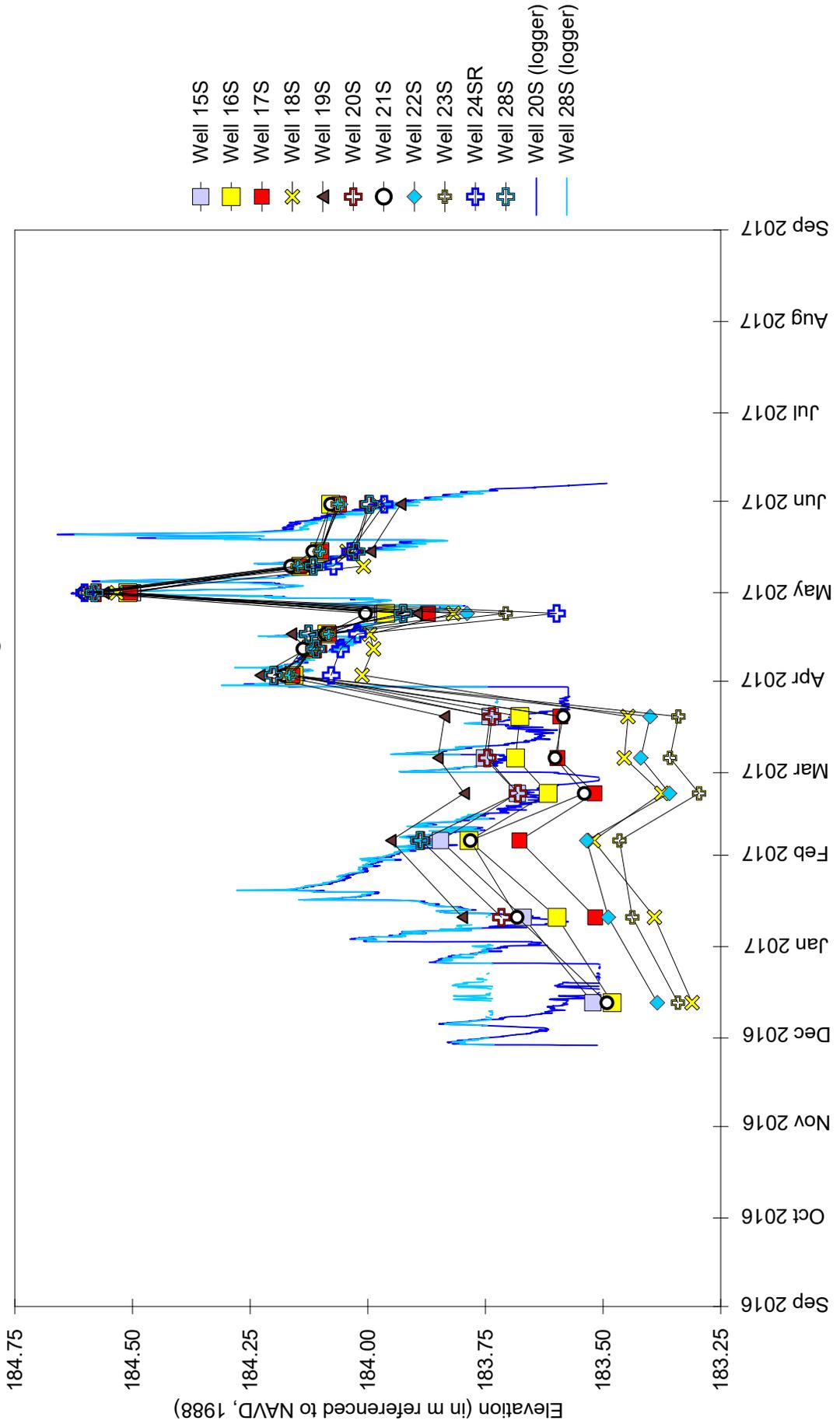


Stevens Creek Bikeway Wetland Mitigation Site September 1, 2016 through August 31, 2017

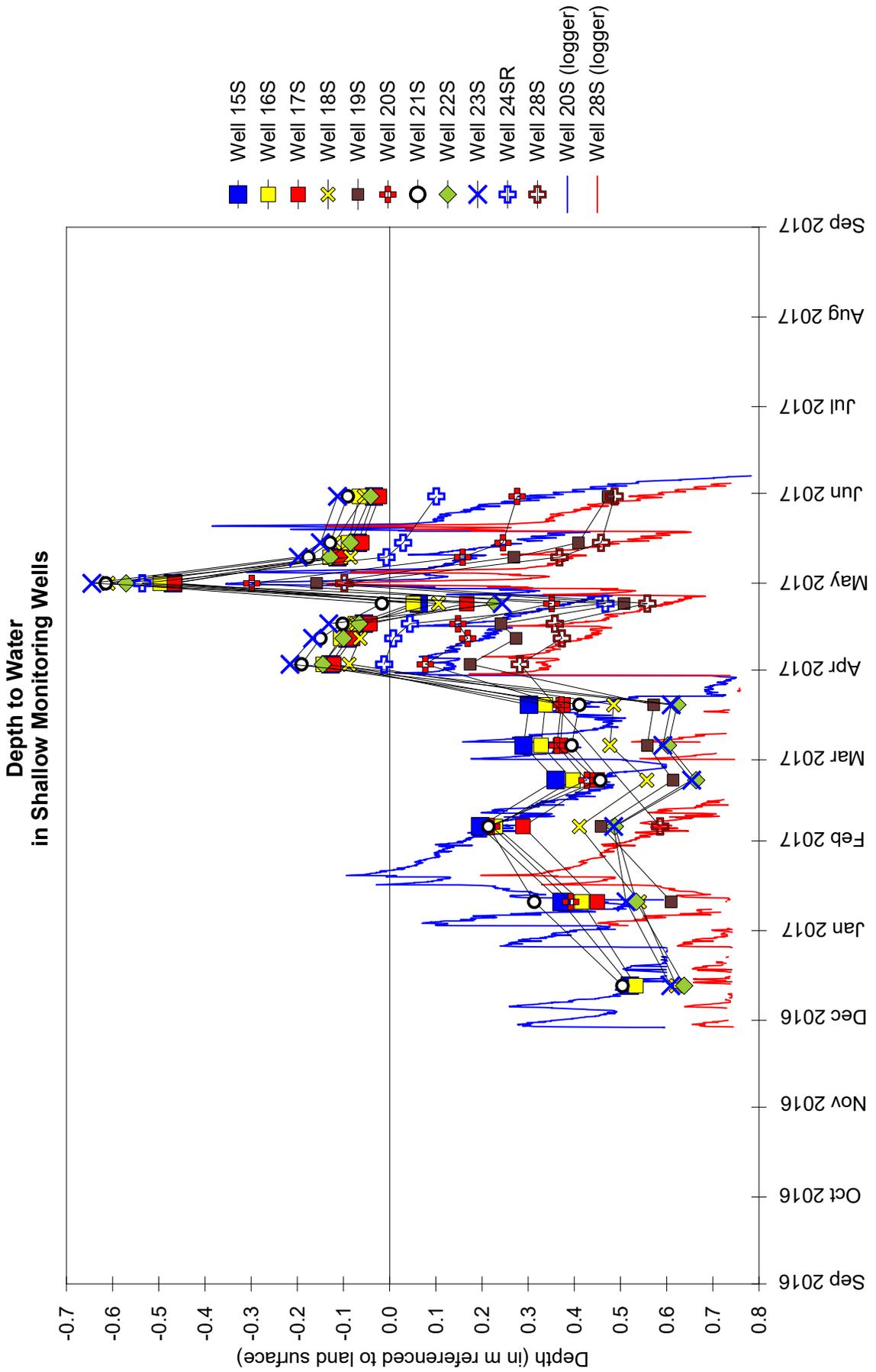


Stevens Creek Bikeway Wetland Mitigation Site September 1, 2016 through August 31, 2017

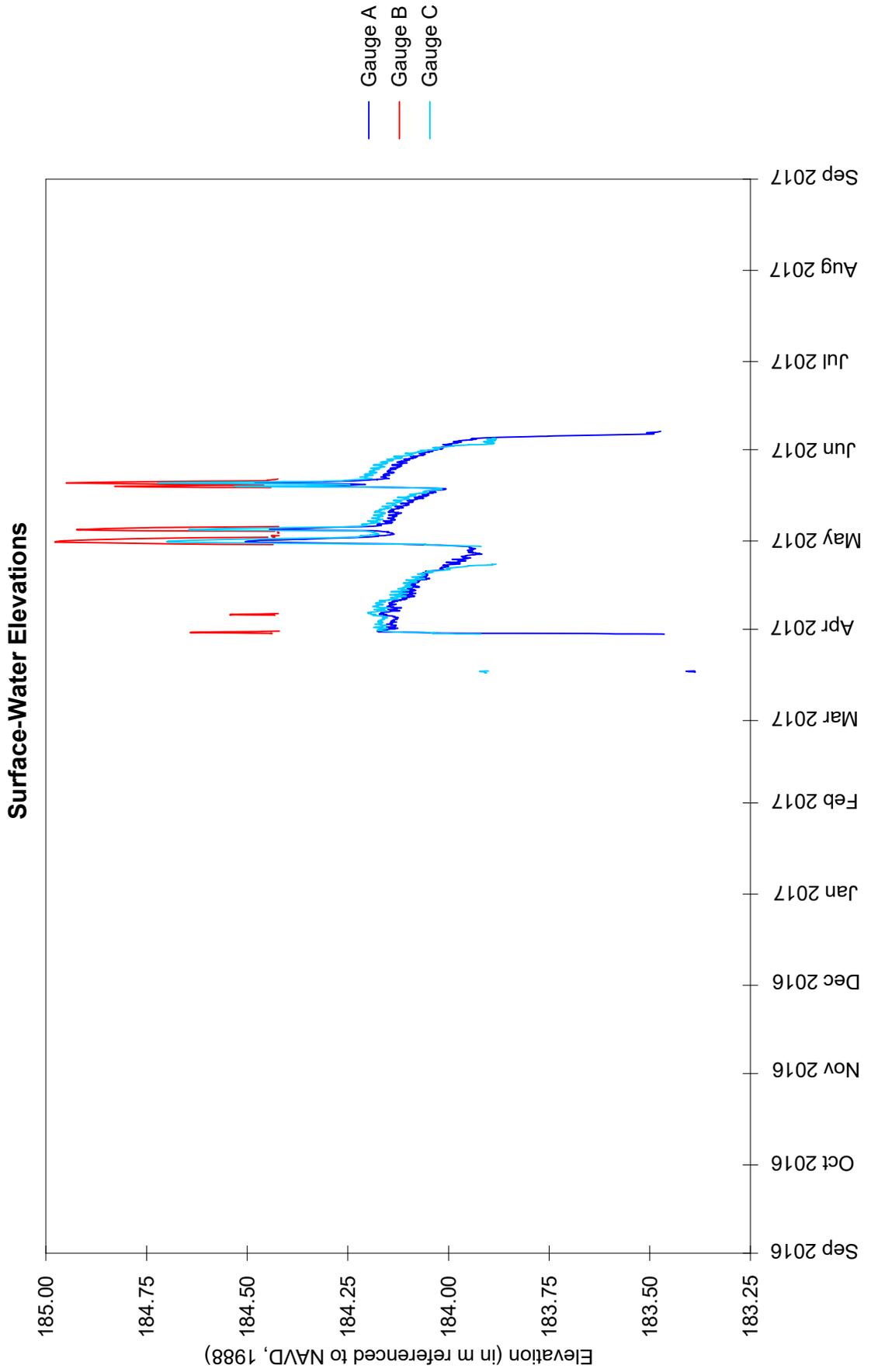
Water-Level Elevations
in Shallow Monitoring Wells



Stevens Creek Bikeway Wetland Mitigation Site September 1, 2016 through August 31, 2017

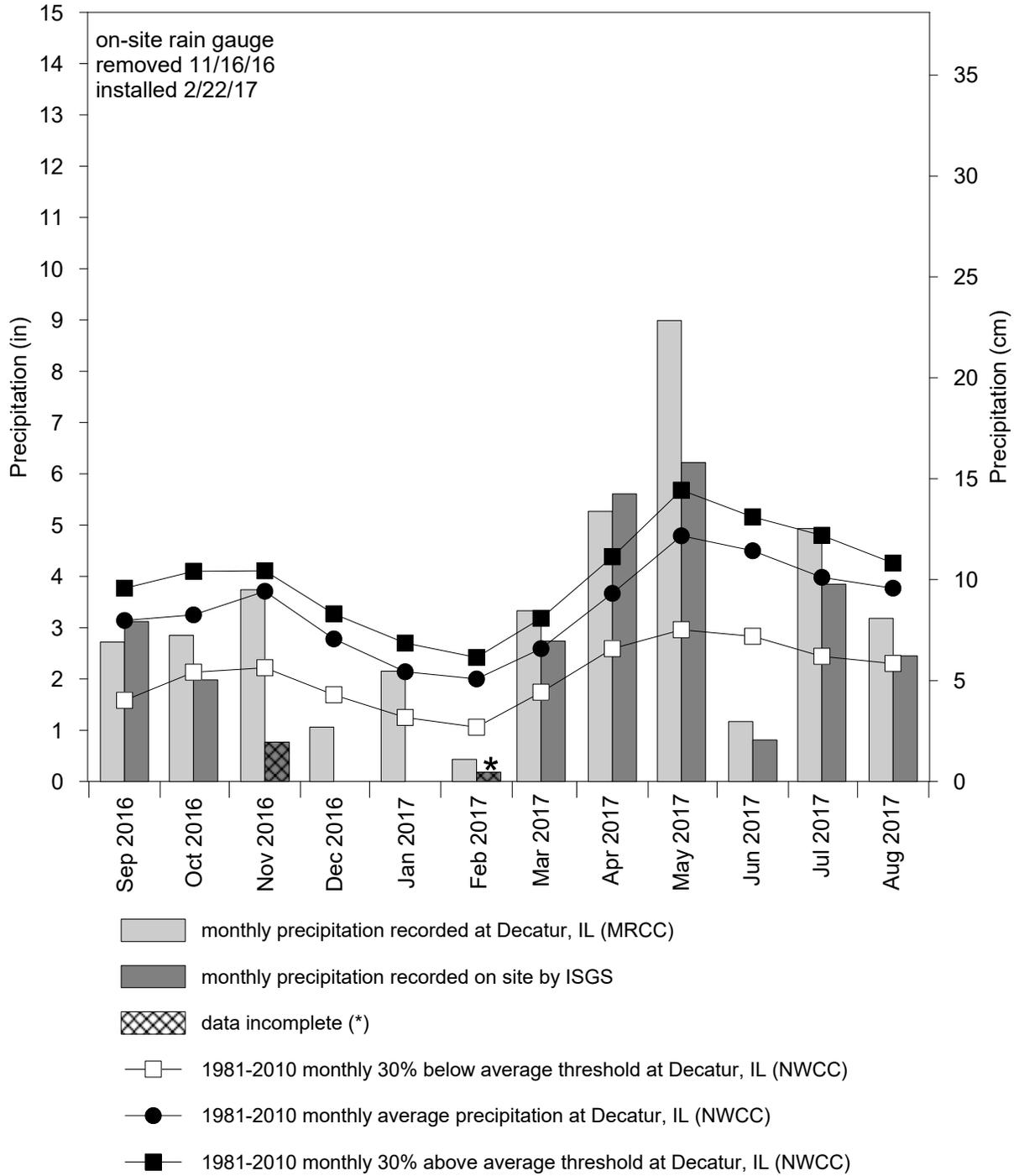


Stevens Creek Bikeway Wetland Mitigation Site September 1, 2016 through August 31, 2017



Steven's Creek Bikeway Wetland Mitigation Site September 2016 through August 2017

**Total Monthly Precipitation Recorded on Site and at
Decatur, IL (MRCC station #112193)**



**THORN CREEK HEADWATERS PRESERVE
WETLAND MITIGATION SITE**

ISGS #90

I-57/Stuenkel Road
Sequence #12558
FAI 57

Will County, near University Park, Illinois
Primary Project Manager: Geoffrey E. Pociask
Secondary Project Manager: Katharine L. Schleich

SITE HISTORY

- September 2012: ISGS was tasked by IDOT to monitor wetland hydrology.
- March 2013: ISGS installed a monitoring network at the site.
- Winter 2013-14: Drainage tile were broken and the site was broadcast seeded.
- Winter 2016-17: A drainage tile blowout was filled in the eastern portion of the site.

WETLAND HYDROLOGY CALCULATION FOR 2017

The target compensation area for the Thorn Creek Headwaters Preserve wetland mitigation site is 12.02 ha (29.70 ac). Using the 1987 Manual (Environmental Laboratory 1987), 15.62 ha (38.59 ac) of the total site area of 37.54 ha (92.77 ac) satisfied wetland hydrology criteria for greater than 5% of the 2017 growing season, and 3.79 ha (9.36 ac) of the site satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 24.96 ha (61.68 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Park Forest, Illinois, is April 8, and the season lasts 209 days (MRCC 2017). Using the 1987 Manual, 5% of the growing season is 10 days, and 12.5% of the growing season is 26 days. Using the 2010 Midwest Region Supplement, March 23 was the starting date of the 2017 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Park Forest, Illinois (MRCC station #116616), was 105% of normal, and spring 2017 (March through May) precipitation was 143% of normal. Precipitation for March 2017 was particularly excessive with 244% of normal.
- Using the 2010 Midwest Region Supplement, the period of maximum inundation and saturation during the 2017 growing season at the site occurred during late March and early April due much above normal precipitation (rain and snow) during March, subsequent snowmelt, and two rain events in excess of one inch that occurred on March 31 (3.05 cm [1.20 in.]) and April 6 (3.5 cm [1.40 in.]). Using the 1987 Manual, the period of maximum inundation and saturation during the growing season occurred during early May due to a period of frequent rainfall between April 27 and May 11 when rainfall was recorded on 12 of 15 days and totaled 14.53 cm (5.72 in.).

- In 2017, water levels measured in 16 of 30 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 6 of 30 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 27 of 30 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Surface water currently drains from the western portion of the site through a storm sewer located along the west margin of the site (between wells 1S and 30S) and a small swale that has been partially blocked (between wells 30S and 3S). Blocking these outlets would prolong and expand ponding in the western portion of the site if necessary to achieve wetland restoration goals. However, appropriate threshold elevations should be determined before outlets are blocked.
- During late winter 2017, wells were installed in the vicinity of the repaired tile blowout in the east portion of the site to evaluate water levels after the repair.

PLANNED FUTURE ACTIVITIES

- Replacement of damaged wells is planned for fall or winter 2017-18. Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2017

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
1S	Y	Y	Y
3S	N	N	Y
4S	N	N	Y
5S	N	N	Y
6S	Y	N	Y
10S	Y	N	Y
11S	Y	N	Y
12S	N	N	Y
13S	Y	Y	Y
15S	Y	Y	Y
16S	Y	N	Y
17S	N	N	Y
18S	N	N	Y
19S	Y	N	Y
20S	Y	N	Y
21S	Y	N	Y
22S	Y	N	Y
23S	N	N	N
24S	N	N	Y
25S	Y	Y	Y
26S	N	N	N
27S	N	N	Y
28S	N	N	Y
29S	N	N	N
30S	Y	Y	Y
31S	N	N	Y
32S	Y	Y	Y
33S	Y	N	Y
34S	Y	N	Y
35S	N	N	Y

Y – met wetland hydrology criteria
 N – did not meet wetland hydrology criteria

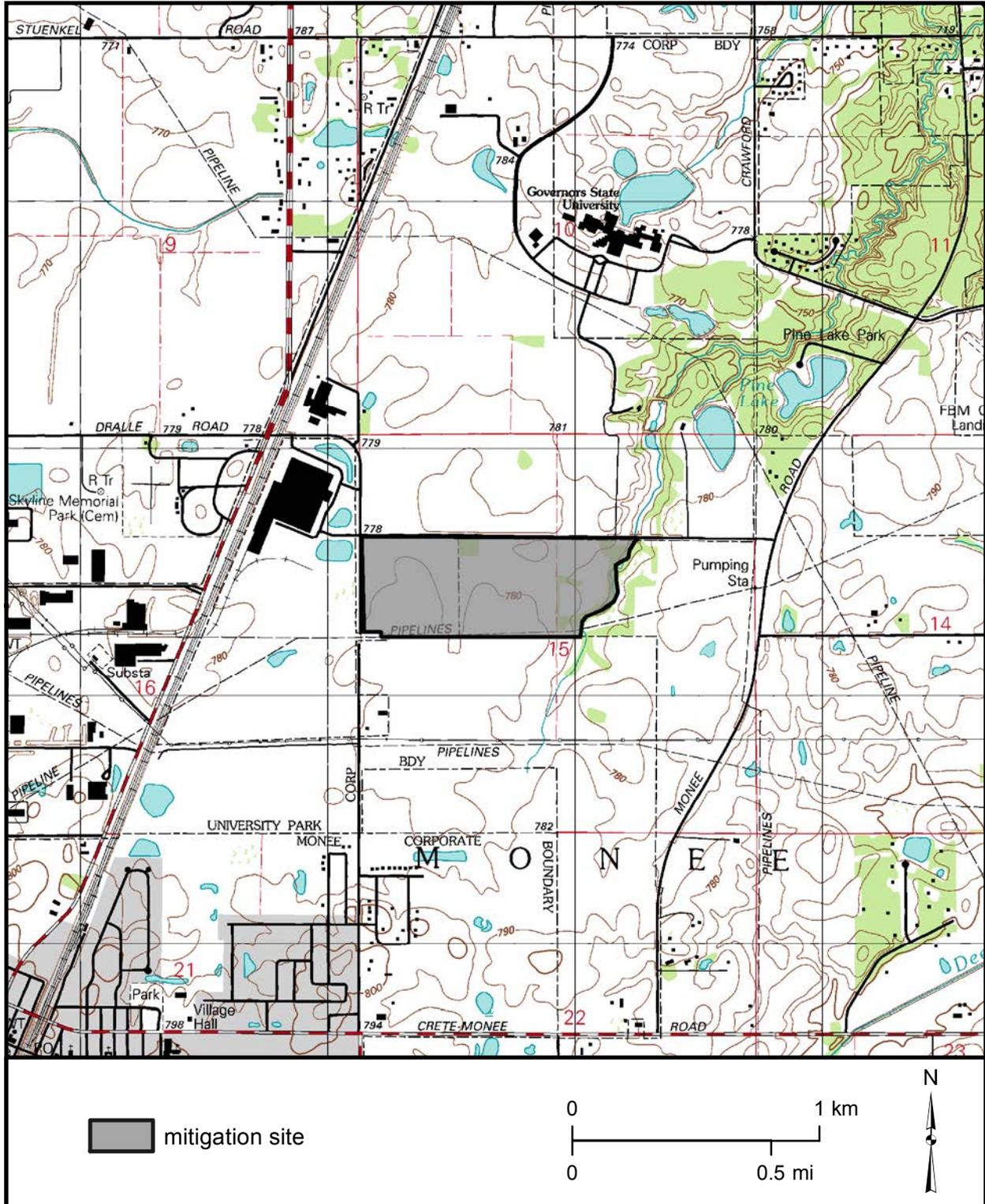
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
B	236.63 m (776.35 ft)	236.63 m (776.35 ft)	236.63 m (776.35 ft)
C	233.38 m (765.68 ft)	n/a	233.40 m (765.75 ft)

n/a – insufficient data to determine an elevation

Thorn Creek Headwaters Preserve Wetland Mitigation Site (I-57 at Stuenkel Road, FAI 57)

General Study Area and Vicinity

from the USGS Topographic Series, Steger, IL, 7.5-minute Quadrangle (USGS 1990)
contour interval is 10 feet

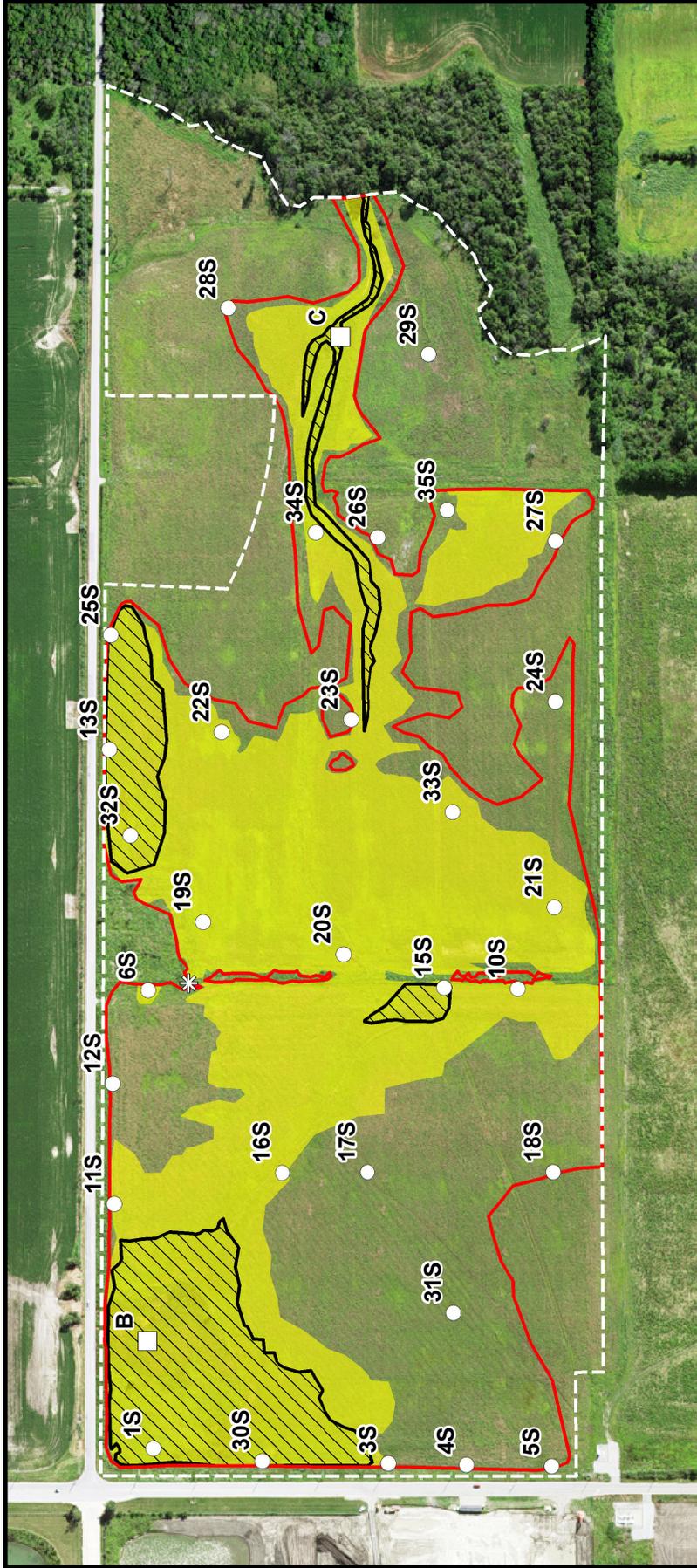


Thorn Creek Headwaters Preserve Wetland Mitigation Site (I-57 at Stuenkel Road, FAI 57)

Estimated Areal Extent of 2017 Wetland Hydrology

September 1, 2016 through August 31, 2017

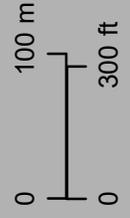
Map based on 2015 Farm Service Agency digital orthophotography, Will County, Illinois (USDA-FSA 2015)



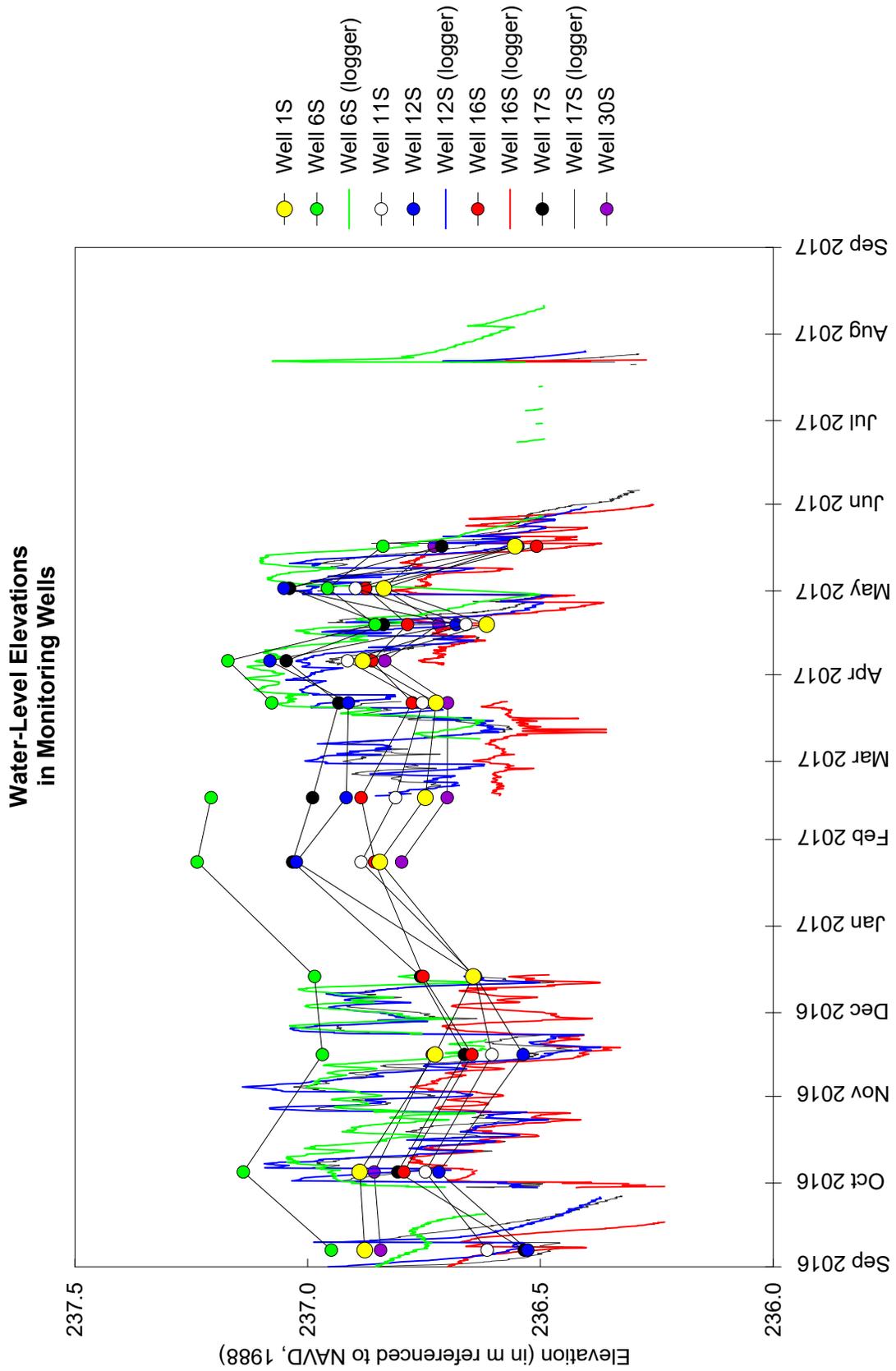
2017 Wetland Hydrology

- >5% of growing season (1987 Manual)
- >12.5% of growing season (1987 Manual)
- 14 days or more (Midwest Region Supplement 2010)

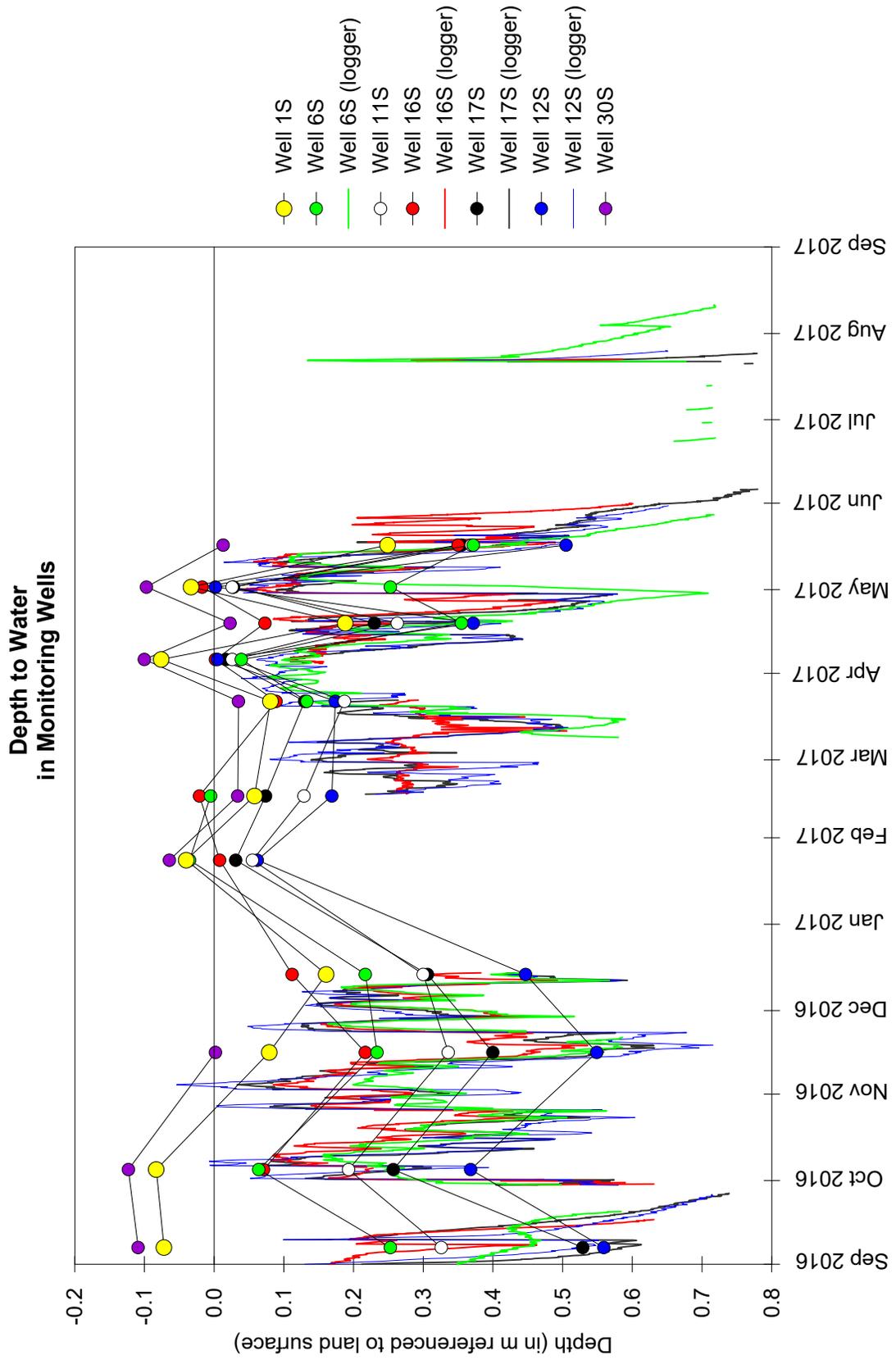
- monitoring well
- surface-water gauge
- rain gauge
- mitigation site



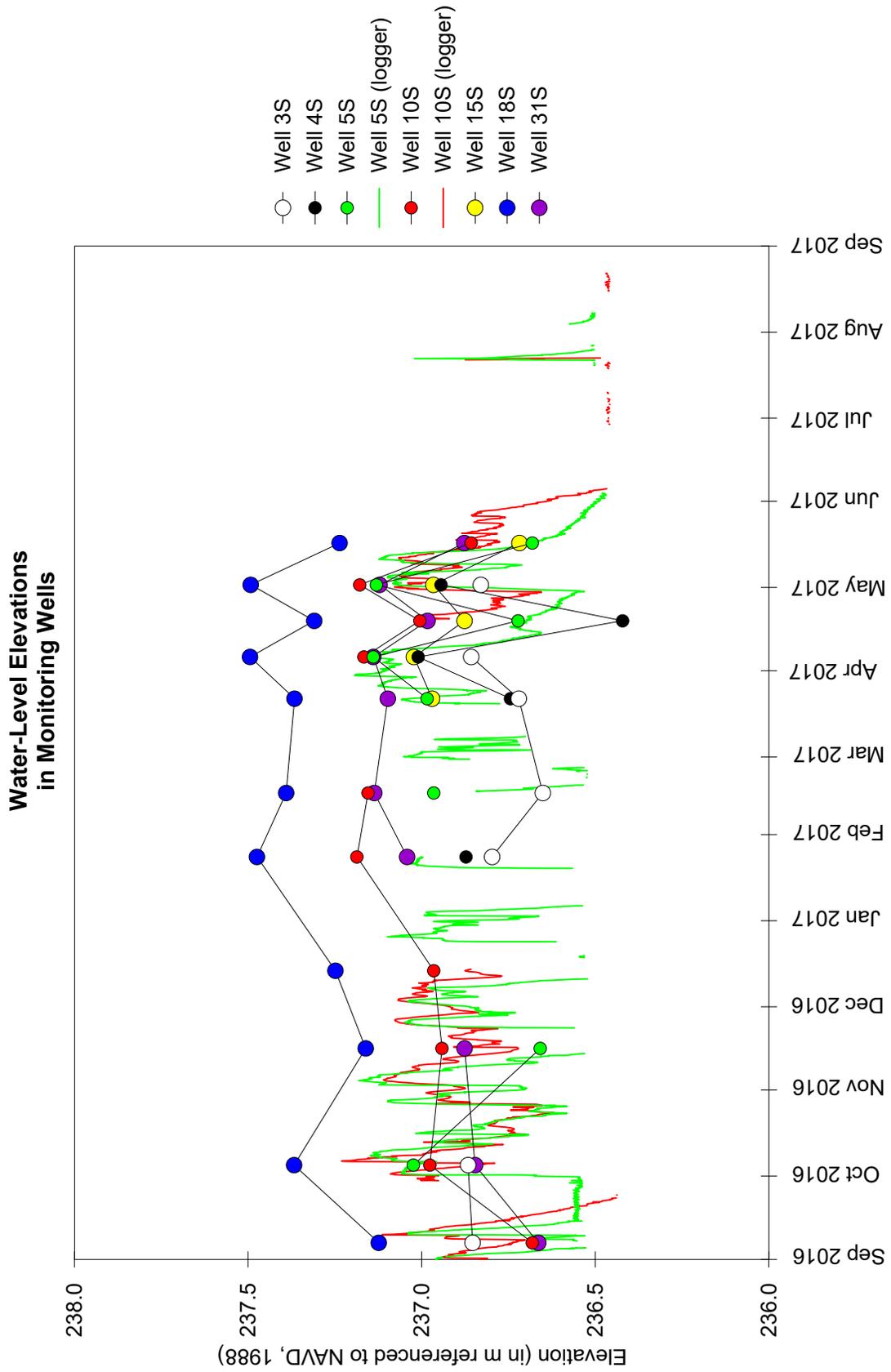
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



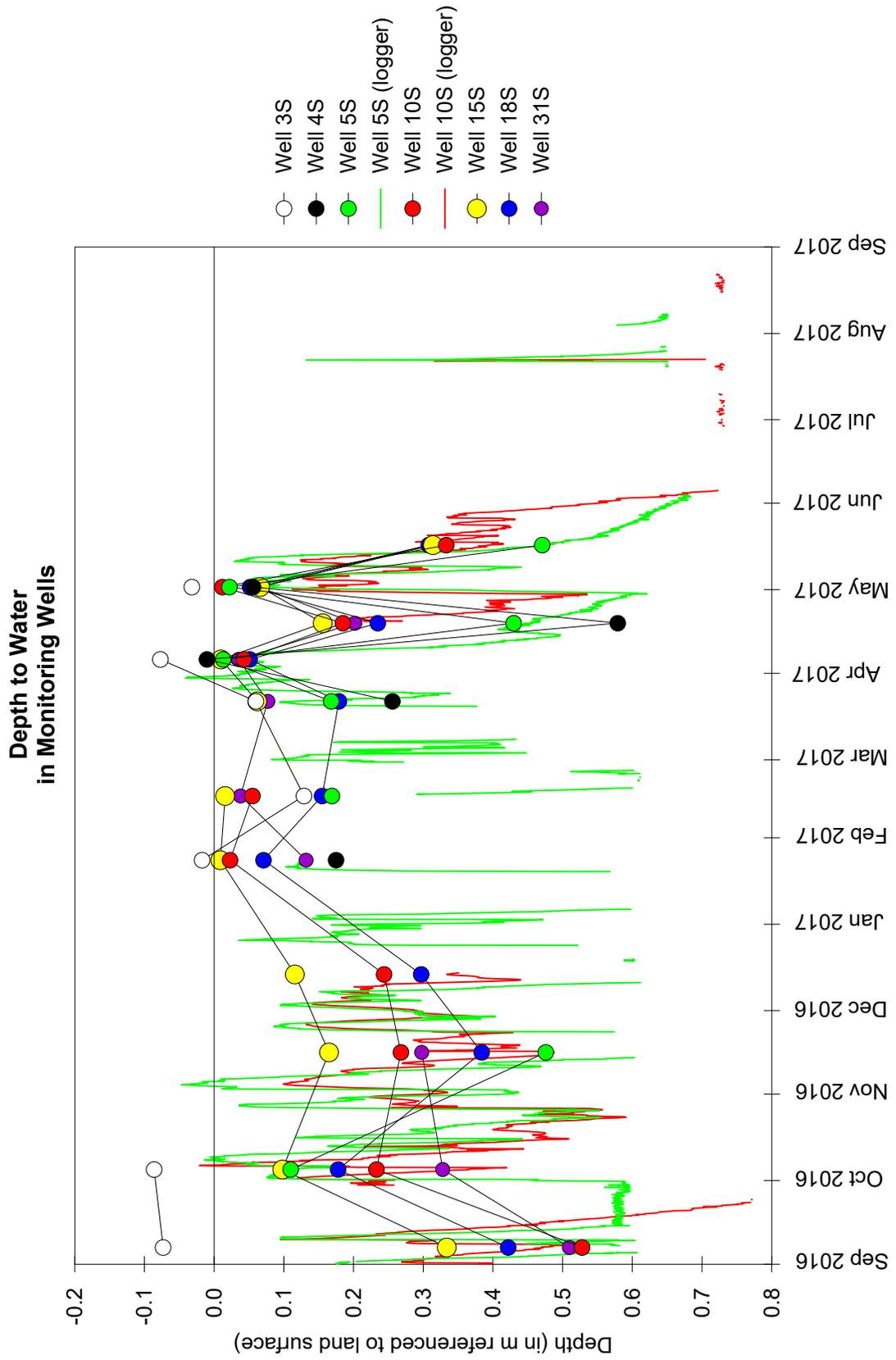
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



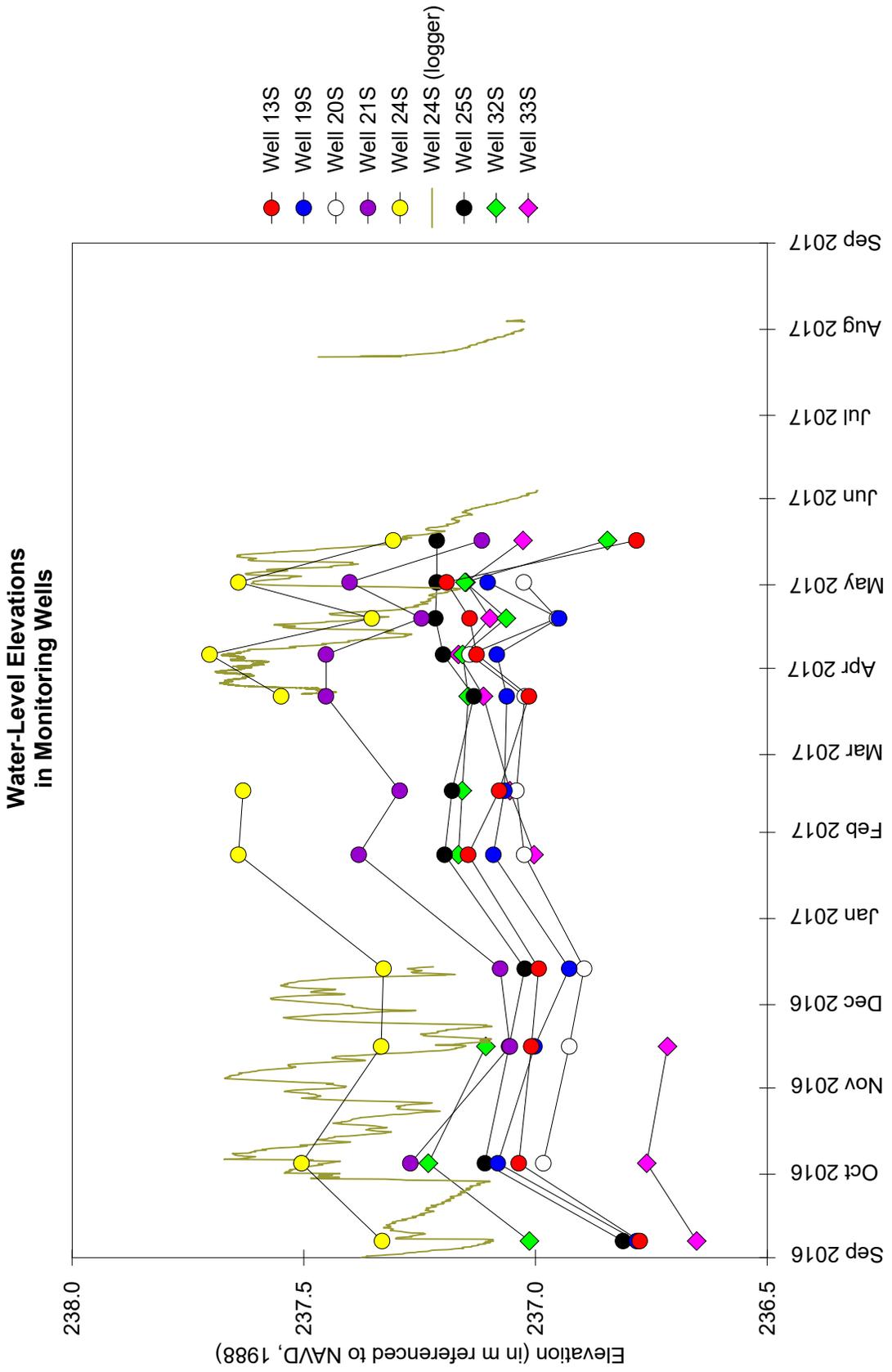
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



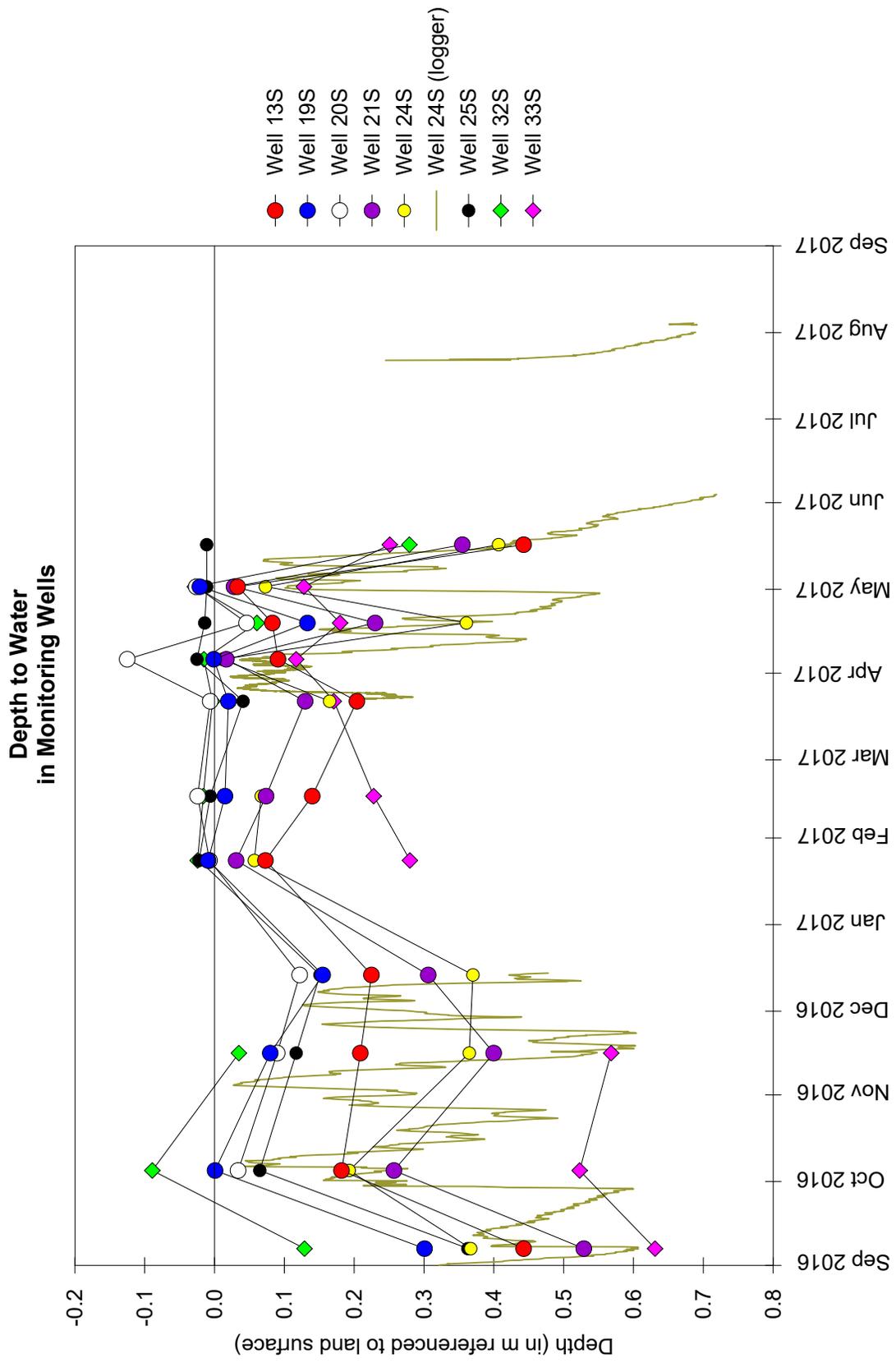
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



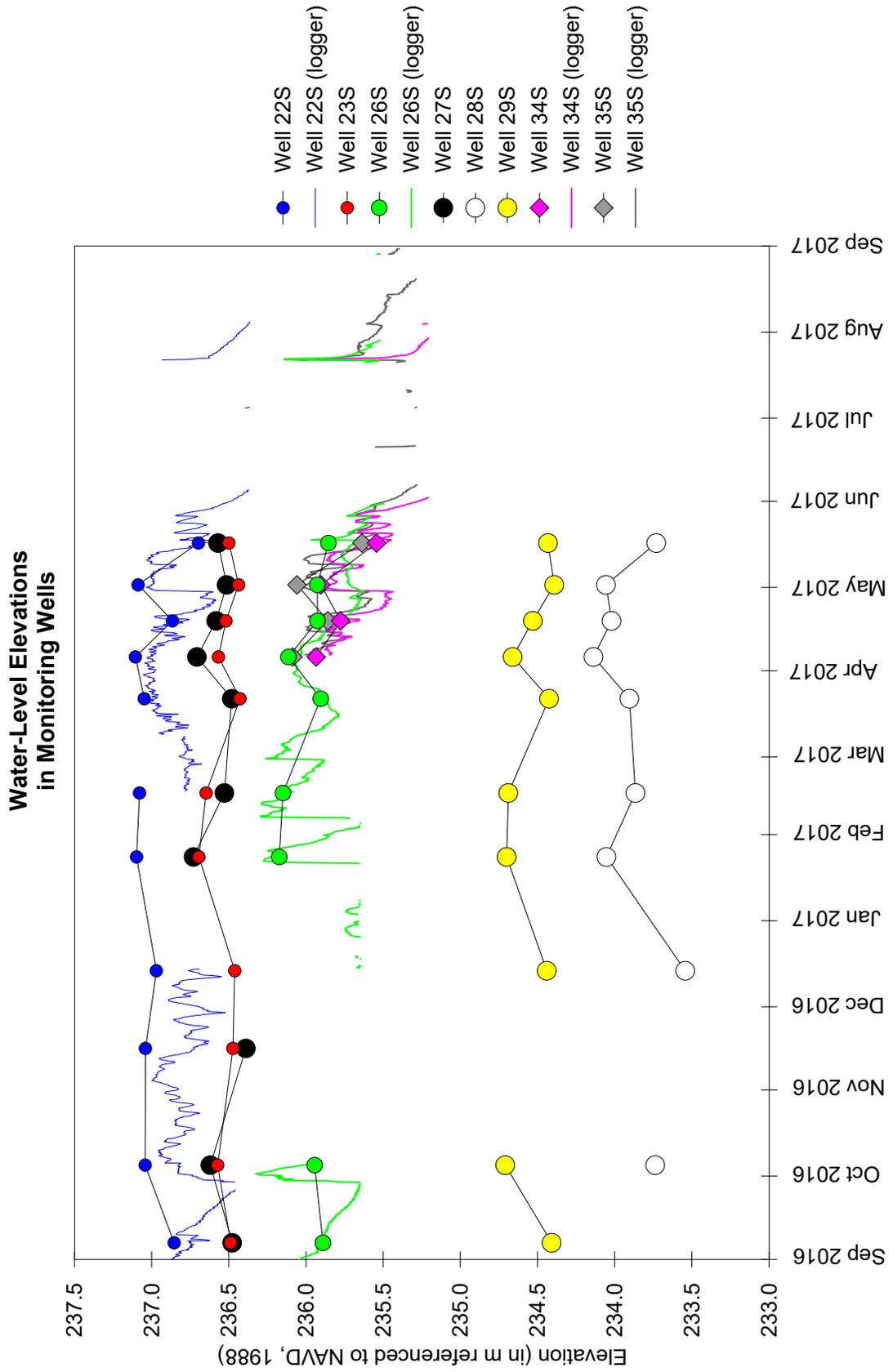
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



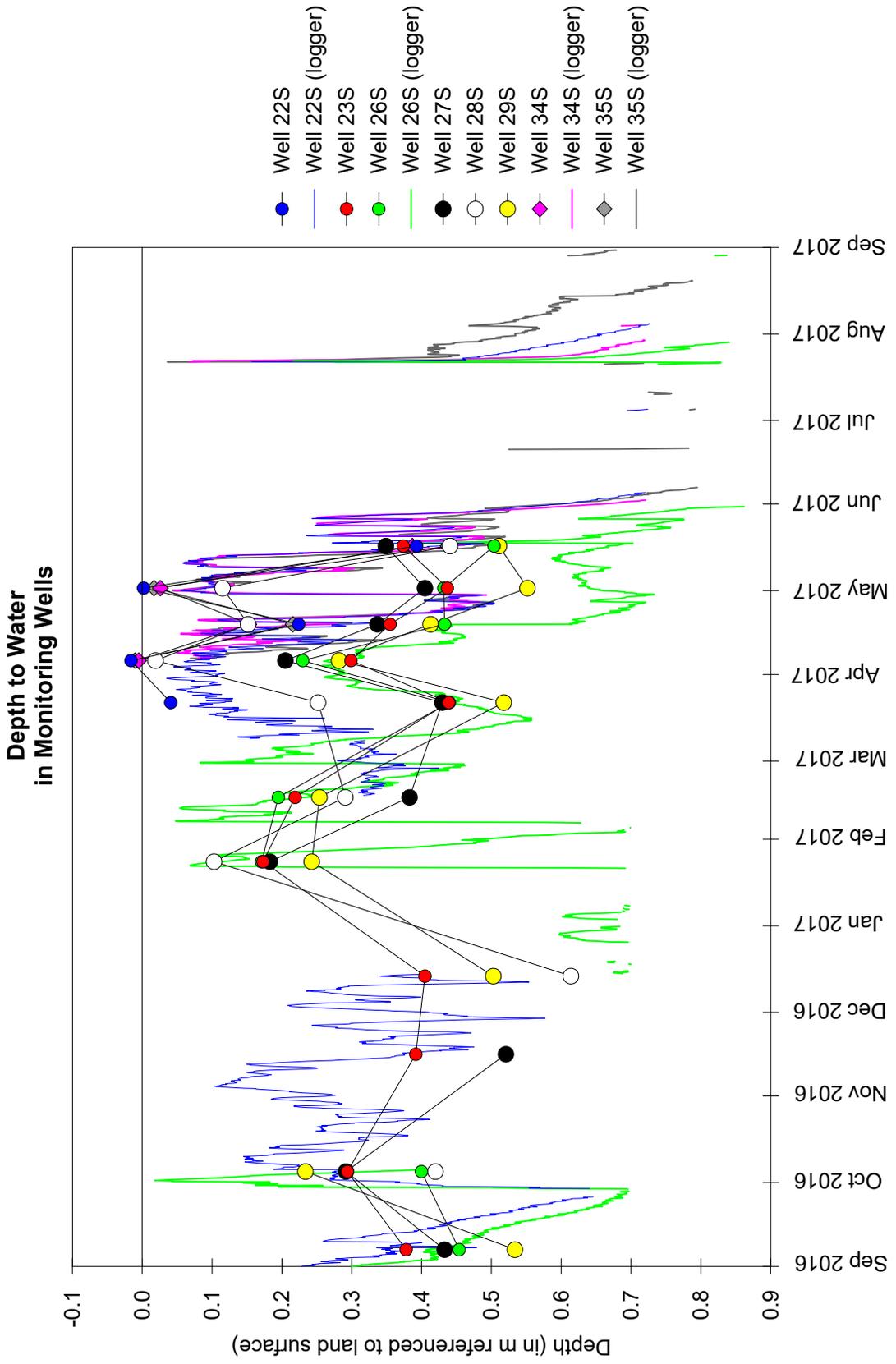
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



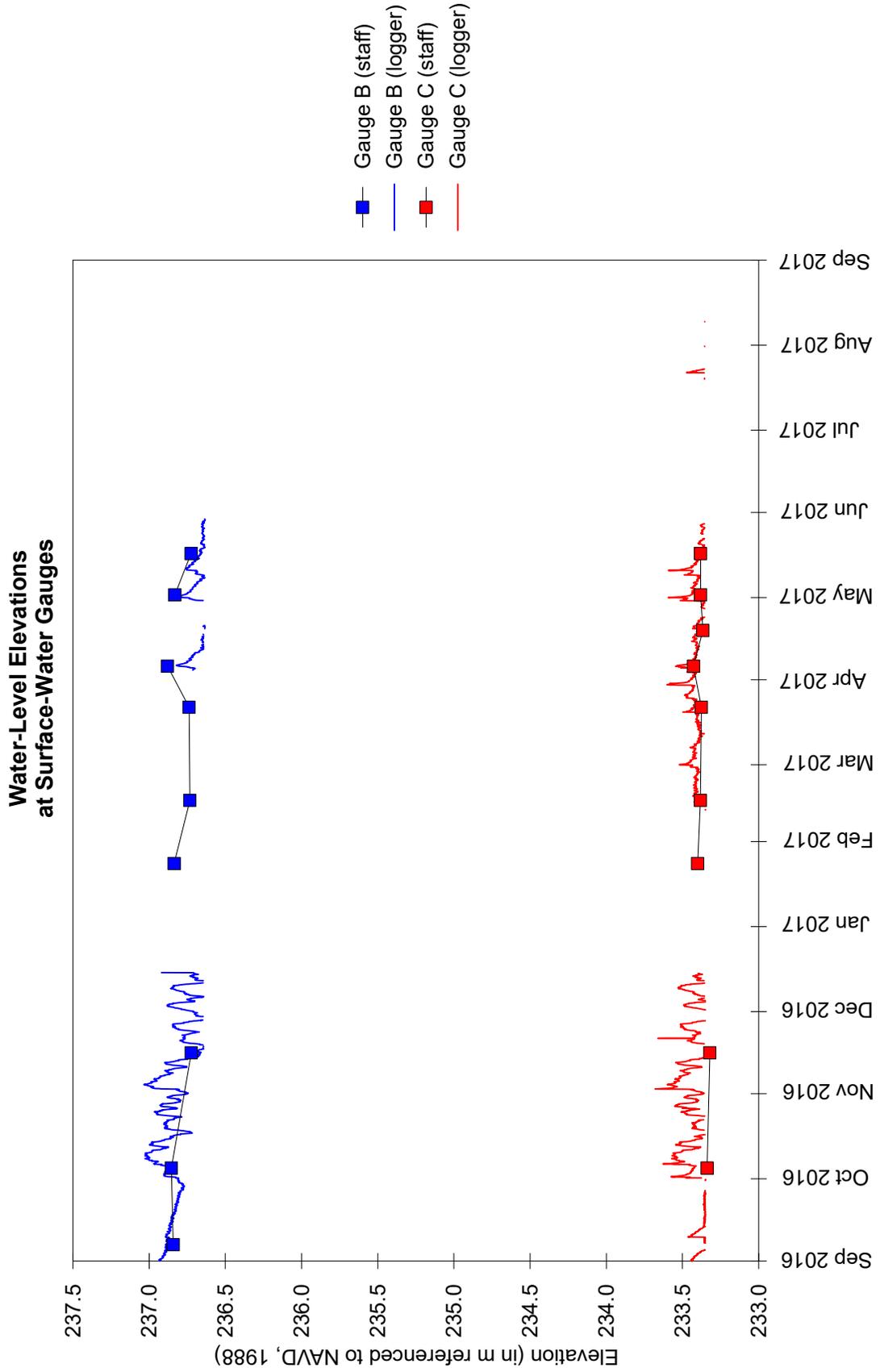
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2016 through August 31, 2017



Thorn Creek Wetland Mitigation Site September 2016 through August 2017

Total Monthly Precipitation Recorded on Site and at Park Forest, IL (MRCC station #116616)

