Open File Series 2016-3

Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites: September 1, 2015 through August 31, 2016

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

Sugar Camp Creek wetland mitigation bank, photo by Jessica Monson

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

Submitted Under Grants D7129 and D6099 to:

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

November 1, 2016

ILLINOIS STATE GEOLOGICAL SURVEY
PRAIRIE RESEARCH INSTITUTE

Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites: September 1, 2015 through August 31, 2016

Geoffrey E. Pociask
Steven E. Benton
Eric T. Plankell
Keith W. Carr
Kathleen E. Bryant
Jessica R. Ackerman
Jessica L. B. Monson
Colleen M. Long
Katharine L. Schleich
Joshua J. Richardson
Audra M. Hanks

Open File Series 2016-3

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

ILLINOIS

TABLE OF CONTENTS

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 FY16 and FY17 (grant codes D7129 and 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 19 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 selected 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, 2015, through August 31, 2016, 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.

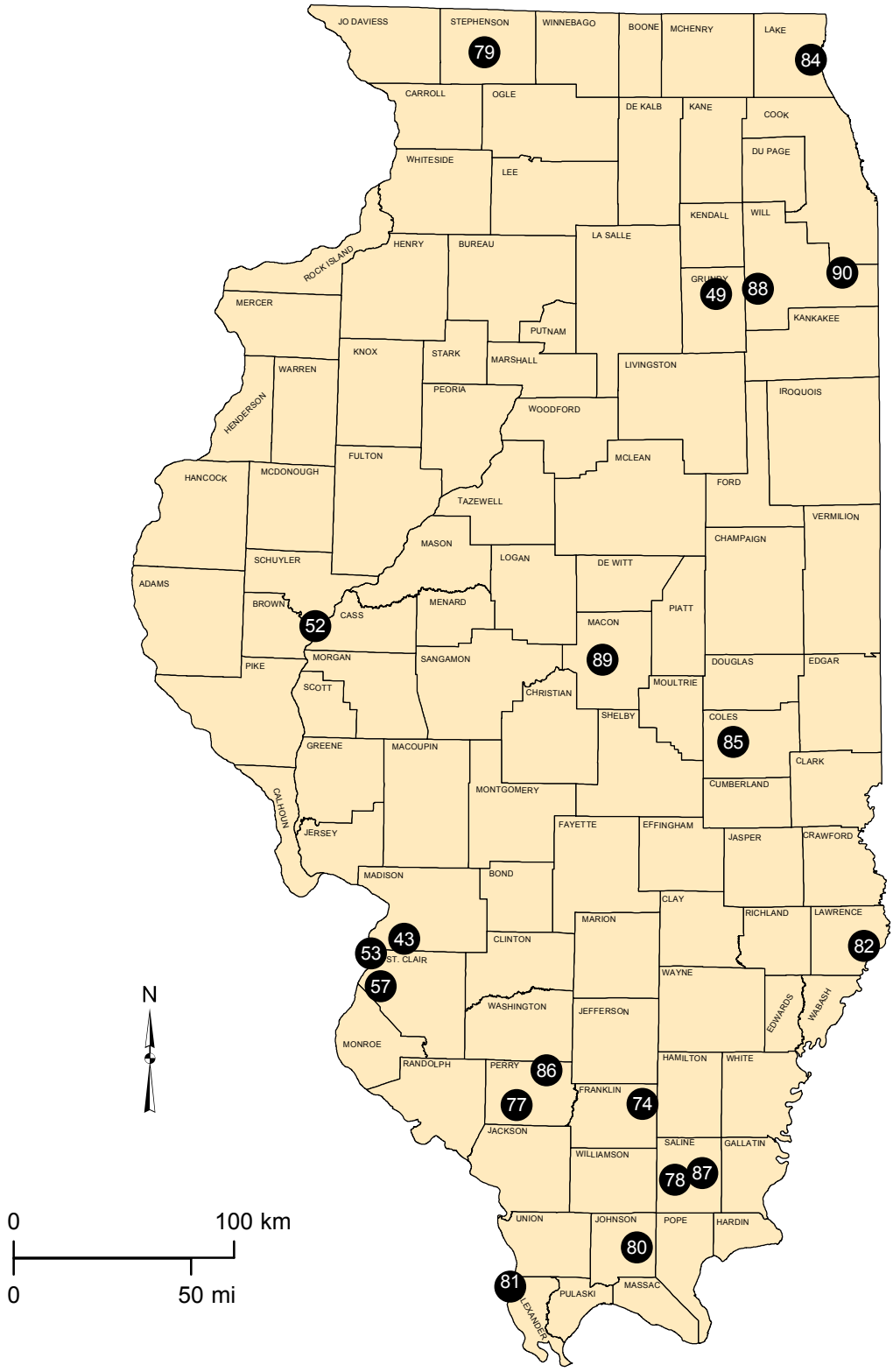


Figure 1. General locations of sites monitored by the ISGS for IDOT from September 1, 2015, through August 31, 2016. Numbers indicate ISGS project numbers listed in Table 1.

Table 1 ISGS project numbers and active IDOT wetland mitigation sites monitored by ISGS from September 1, 2015, through August 31, 2016.

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
79	Former Weber Property	Wetland Mitigation Site	US 20	FAP 301	10487	Stephenson
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 2016 growing season for active IDOT wetland mitigation sites monitored by the ISGS from September 1, 2015, through August 31, 2016.

ISGS 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	7.97	19.70	6.55	16.19	7.97	19.70
52	La Grange	414.40	1,024.00	461.37	1,140.07	307.51	759.88	425.31	1,050.96
53	Fairmont City	10.93	27.00	15.62	38.59	13.89	34.33	15.04	37.17
57	Former Tiernan Property	17.04	42.10	18.30	45.21	16.71	41.29	18.29	45.20
74	Sugar Camp Creek	28.00	69.20	29.42	72.71	26.13	64.57	29.42	72.71
77	Pyramid Site EC25	4.57	11.30	5.23	12.93	2.06	5.10	5.21	12.88
78	Harrisburg, Site 2	4.13	10.20	9.38	23.17	7.06	17.44	9.22	22.78
79	Former Weber Property	1.21	3.00	1.36	3.36	1.08	2.68	1.82	4.49
80	Max Creek	0.49	1.20	1.17	2.90	1.17	2.90	1.17	2.90
81	East Cape Girardeau	3.08	7.60	5.75	14.20	5.59	13.81	5.74	14.19
82	Lawrence County	13.62	33.65	12.21	30.17	11.33	27.99	11.59	28.63
84	North Chicago	N/A	N/A	17.96	44.37	17.37	42.93	17.58	43.44
85	Coles County	1.86	4.60	1.06	2.63	0.98	2.41	1.25	3.10
86	Swan Road	0.29	0.73	0.39	0.97	0.29	0.72	0.39	0.97
87	Harrisburg, Site 3	0.69	1.70	0.11	0.28	0.05	0.13	0.31	0.77
88	Grant Creek North	5.99	14.80	24.94	61.62	15.71	38.83	24.61	60.81
89	Stevens Creek Bikeway	6.03	14.89	10.24	25.30	8.63	21.32	9.97	24.63
90	Thorn Creek Headwaters Preserve	12.02	29.70	15.42	38.10	5.20	12.84	11.12	27.49

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 2016). 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 2016).

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 (2016). 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 2016) 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.

In Illinois, 5% of the growing season ranges from about 9 to 11 days, and 12.5% of the growing season ranges from about 23 to 29 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 USGS, USACE, or the U.S. Forest Service (USFS) were obtained from online or other sources (USGS 2016, USACE 2016, USFS 2016) 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 2016). Normal and range threshold values were based on the 30-year period, 1971-2000. 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 of 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 http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf.

Esri, 2016, 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, 2016, 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, 2016, 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, 2016, Climate Analysis for Wetlands by County: U.S. Department of Agriculture, Natural Resources Conservation Service, available online at http://www.wcc.nrcs.usda.gov/climate/wetlands.html.

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.

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, 2016, 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://gdg.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://gdg.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://gdg.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, 1971, Freeport West quadrangle, Illinois [map]. Photorevised 1978. 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, Channanhon 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, 2016, National Water Information System: Web Interface, available online at http://waterdata.usgs.gov/nwis.

U.S. Forest Service, 2016, 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, 2016, Illinois Climate Network soil temperature data: Illinois State Water Survey, Champaign, Illinois, available online at http://www.isws.illinois.edu/warm/soiltemp.asp.

ECKMANN/BISCHOFF **ISGS #43**
WETLAND MITIGATION SITE
FAP 14
Sequence #27
Madison County, near Collinsville, Illinois
Primary Project Manager: Steven E. Benton
Secondary Project Manager: Audra M. Hanks

SITE HISTORY

- March 2009: The IDOT tasked ISGS to resume monitoring of the site.

- April 2009: The ISGS installed a monitoring network at the site and resumed data collection.

WETLAND HYDROLOGY CALCULATION FOR 2016

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 25.50 ha (63.00 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 2016); 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 7 was the starting date of the 2016 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 110% of normal, precipitation in Spring 2016 (March through May) was 106% of normal, and the wettest month was December 2015 at 267% of normal.

- Peak hydroperiod during the 2016 growing season occurred in May following a heavy rain event (2.49 in.) on May 11. 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, most of the site satisfies all three wetland hydrology criteria each year.

- In 2016, 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 2016

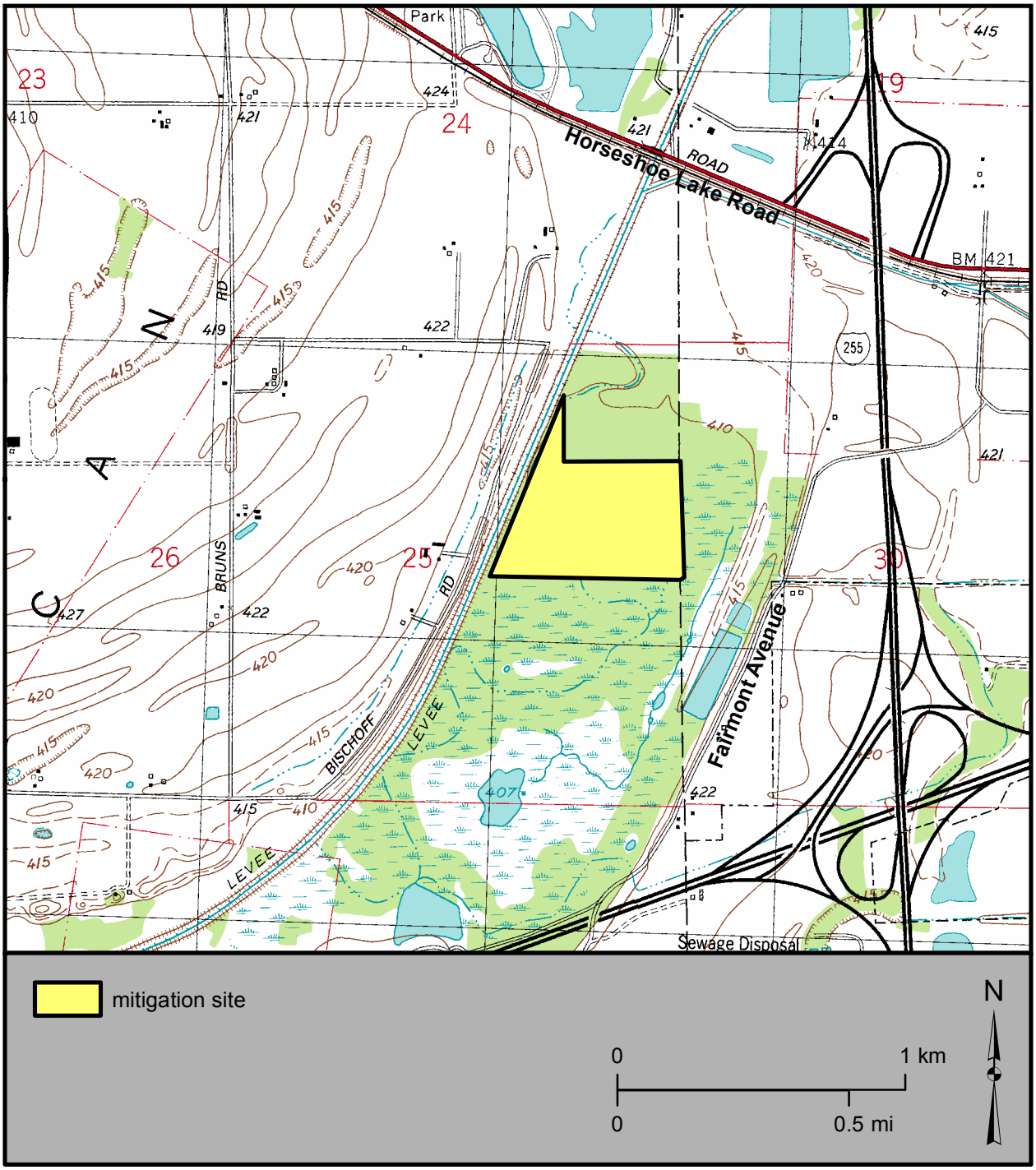
Well locations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
1S	Y	Y	Y
2S	Y	Y	Y
3S	Y	Y	Y
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	N	Y
7S	Y	Y	Y
8S	Y	Y	Y
9S	Y	Y	Y
10S	Y	Y	Y

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***
B	124.43 m (408.24 ft)	124.30 m (407.81 ft)	124.30 m (407.81 ft)
C	124.43 m (408.24 ft)	124.40 m (408.14 ft)	124.40 m (408.14 ft)
D	124.43 m (408.24 ft)	124.41 m (408.17 ft)	124.41 m (408.17 ft)
SW1/A	124.49 m (408.43 ft)	124.36 m (408.01 ft)	124.45 m (408.30 ft)

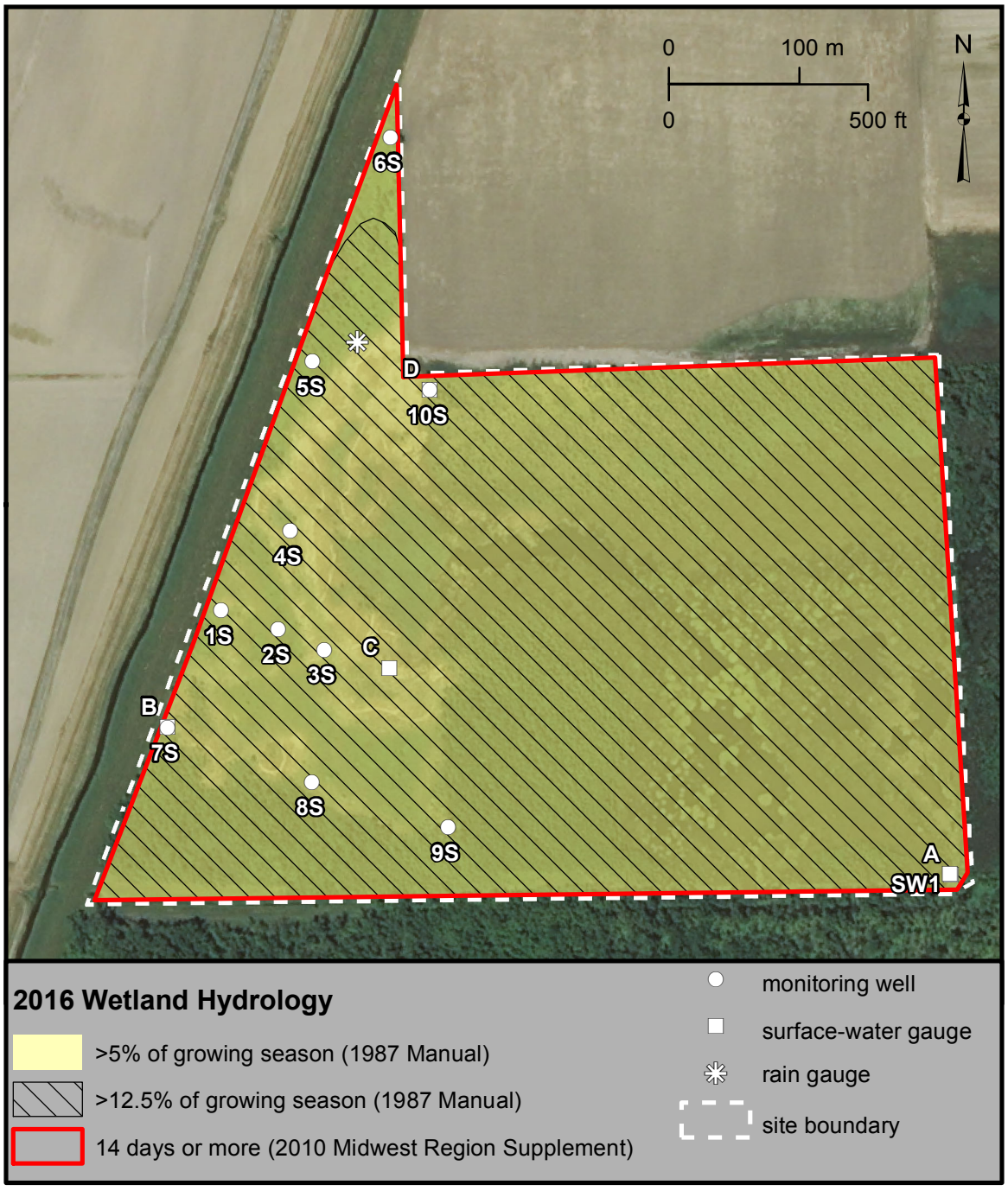
Eckmann/Bischoff Wetland Mitigation Site
(FAP 14)
General Study Area and Vicinity

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



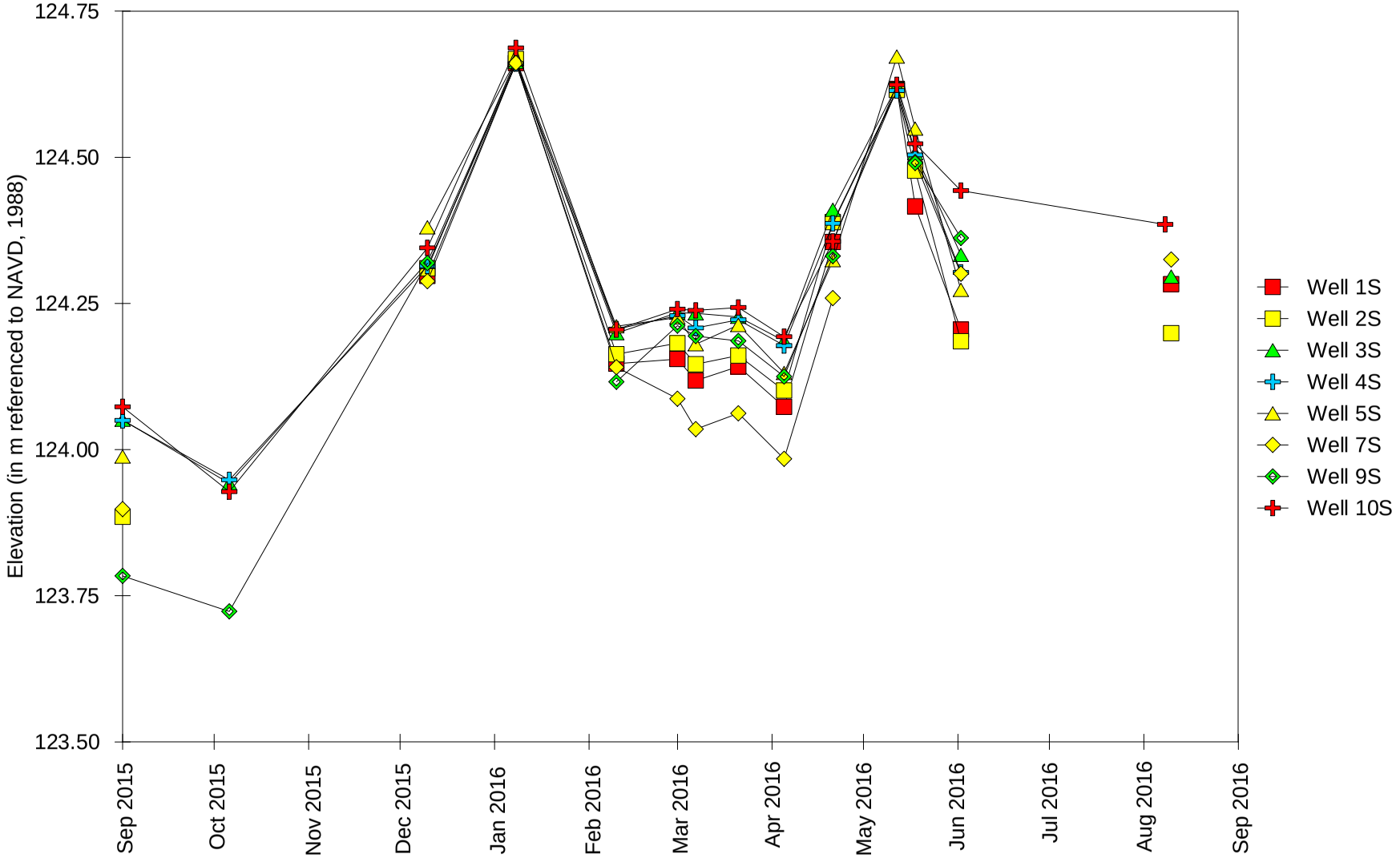
Eckmann/Bischoff Wetland Mitigation Site
(FAP 14)
Estimated Areal Extent of 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016

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



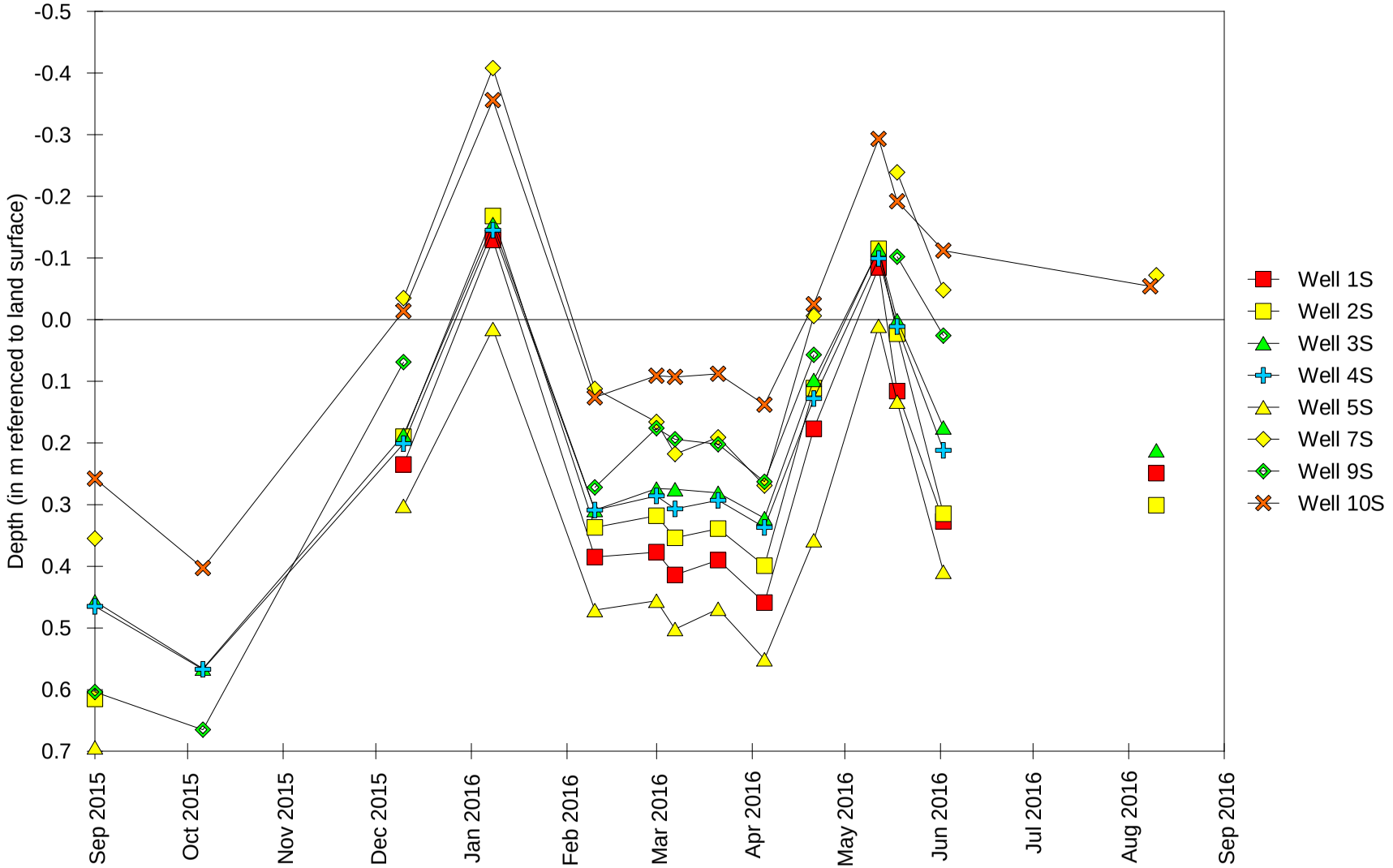
Eckmann/Bischoff Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells



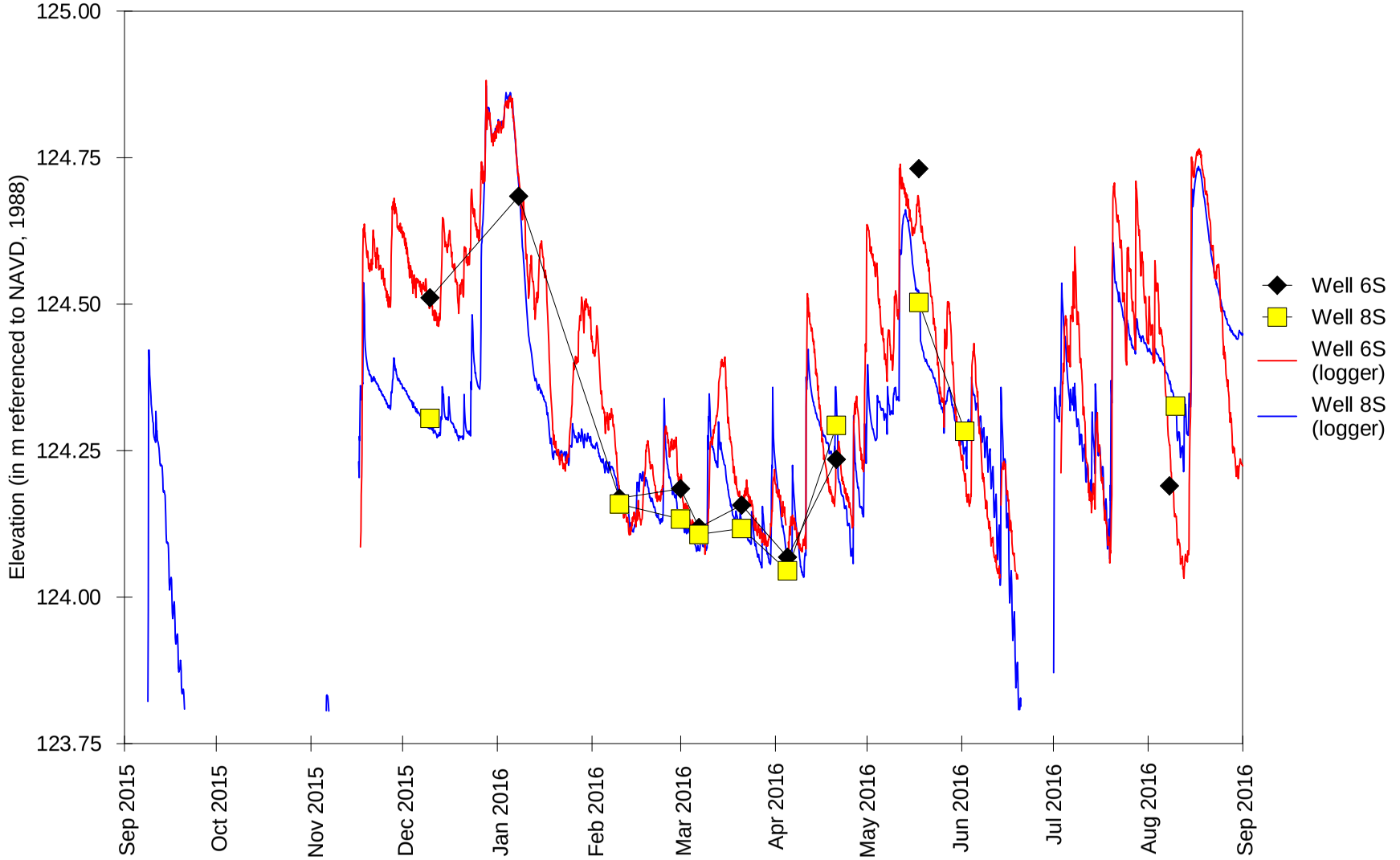
Eckmann/Bischoff Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells



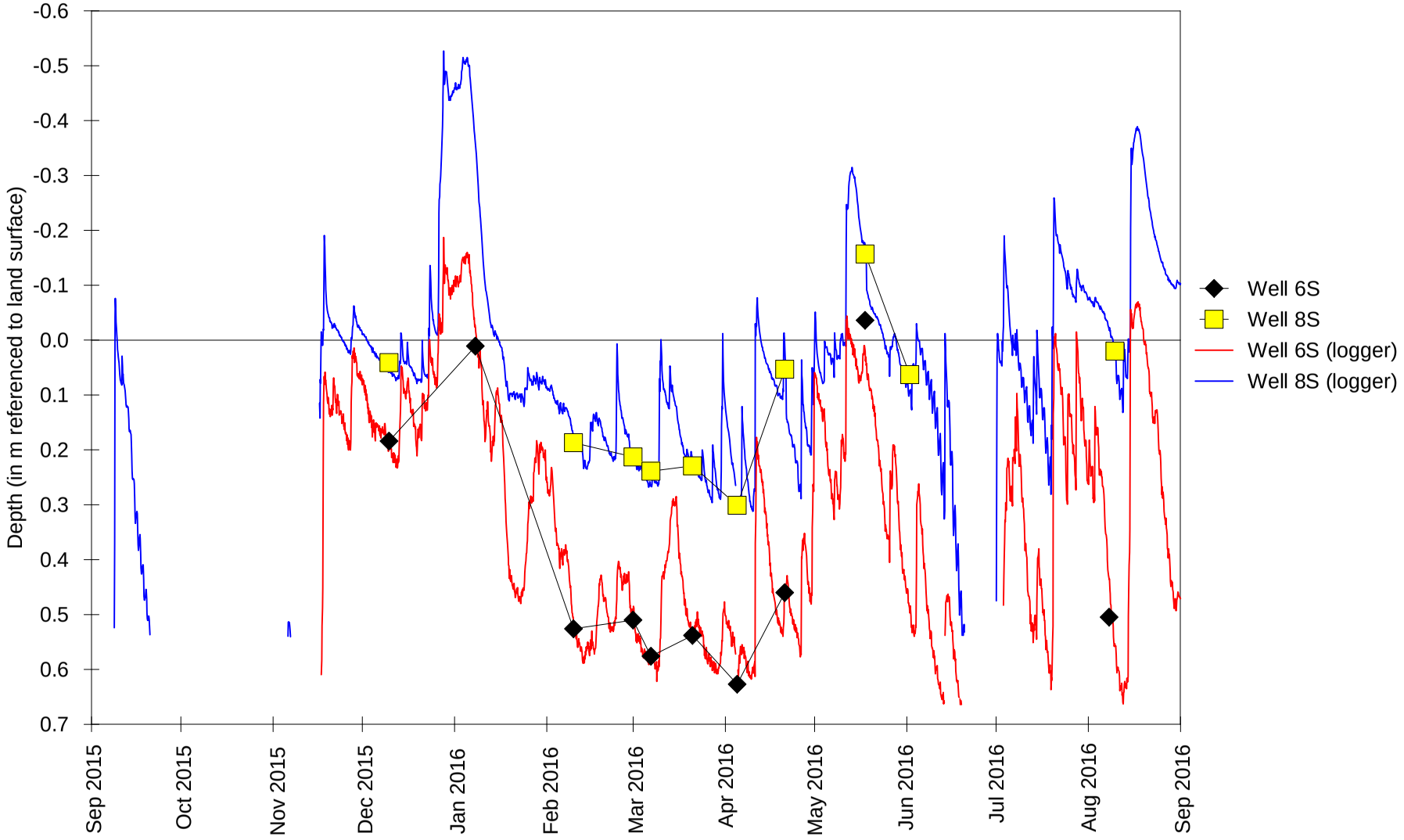
Eckmann/Bischoff Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells



Eckmann/Bischoff Wetland Mitigation Site
September 1, 2015 through August 31, 2016

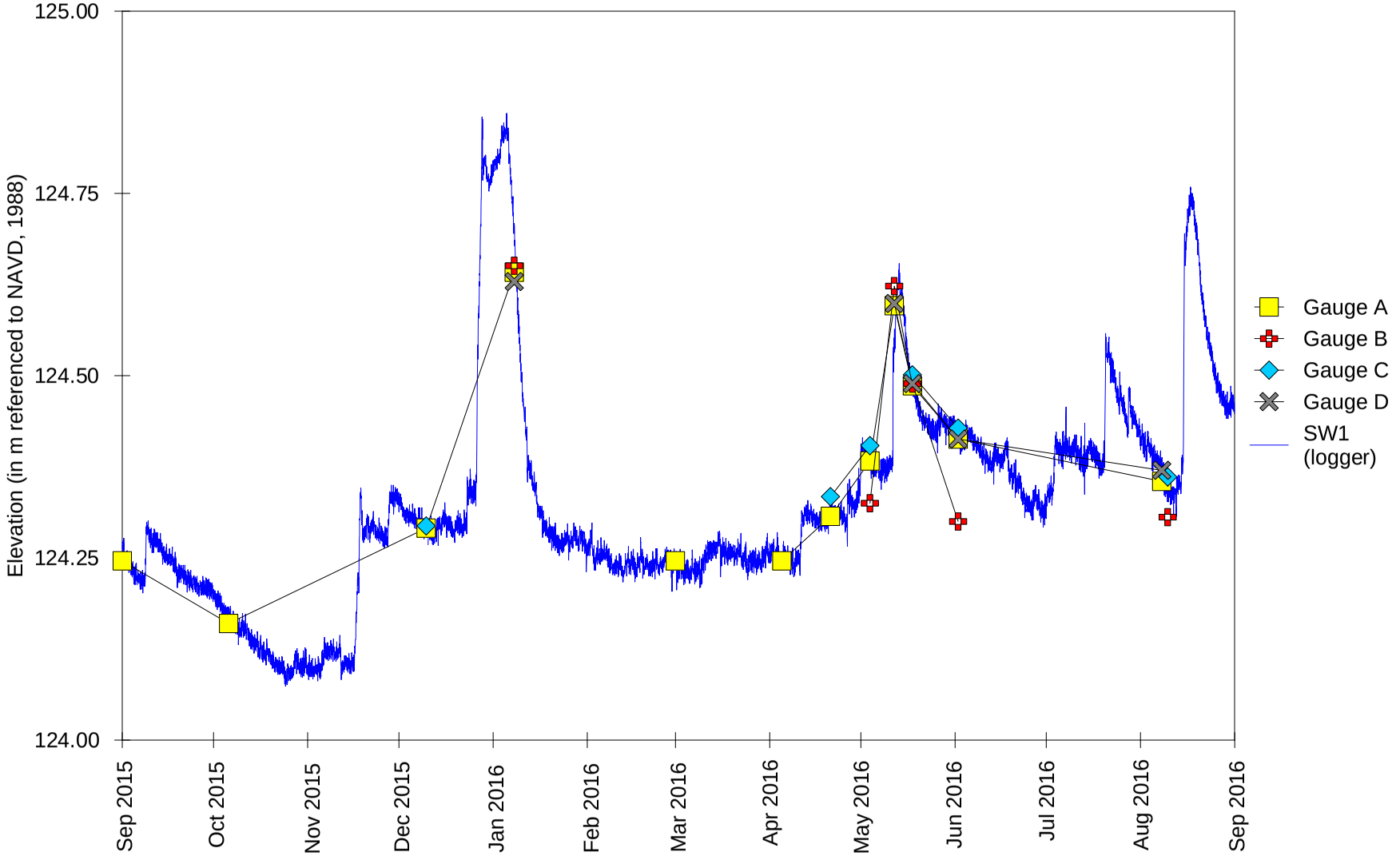
Depth to Water
in Monitoring Wells



Eckmann/Bischoff Potential Wetland Mitigation Site

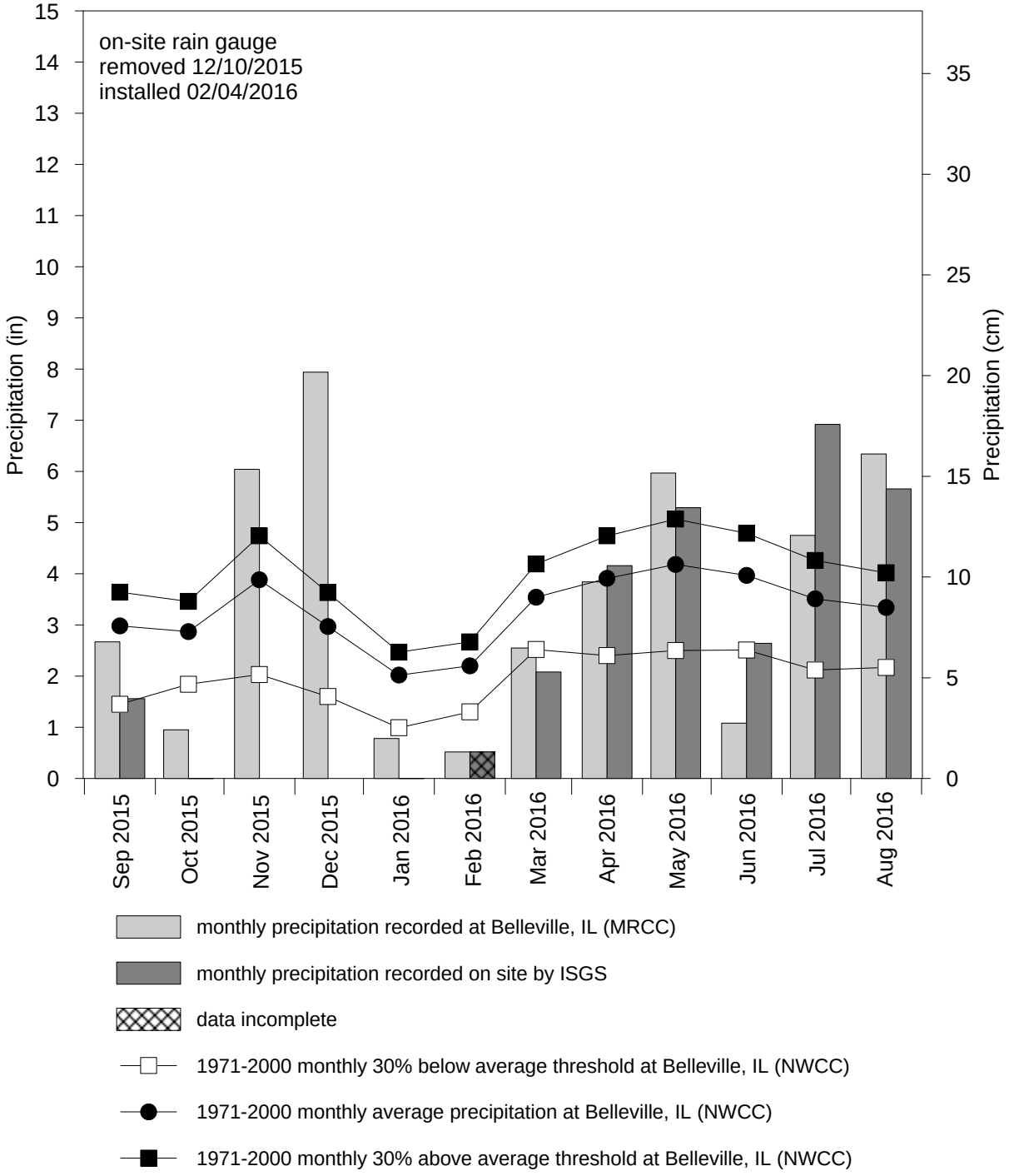
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Eckmann/Bischoff Wetland Mitigation Site
September 2015 through August 2016

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



MORRIS **ISGS #49**
WETLAND MITIGATION BANK
Sequence #1306
Grundy County, near Morris, Illinois
Primary Project Manager: Eric T. Plankell
Secondary Project Manager: Katharine L. Schleich

SITE HISTORY

- March 1999: The 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 2016

The target compensation area for the Morris wetland mitigation bank is 44.11 ha (109.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 7.97 ha (19.70 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 6.55 ha (16.19 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 7.97 ha (19.70 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 2016). 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 6 was the starting date of the 2016 growing season based on soil temperatures measured on site.

- Total precipitation for the monitoring period at Morris, Illinois (MRCC station #115825), was 131% of normal. During Spring 2016 (March through May), precipitation was 100% of normal. Rainfall in June, July, and August was above average with 141% of normal.

- Peak hydroperiod during the growing season occurred from mid to late July for areas satisfying the 5% wetland hydrology criteria following 1.1 in. of rainfall, recorded on site July 17-18, and a flood from the Mazon River that peaked on July 19. Peak hydroperiod during the growing season occurred from late August to late September for areas satisfying the 12.5% and 14-day criteria as a result of 3.0 in. of rainfall recorded on site August 24-30 and a flood from the Mazon River that peaked on August 30.

- 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 2016

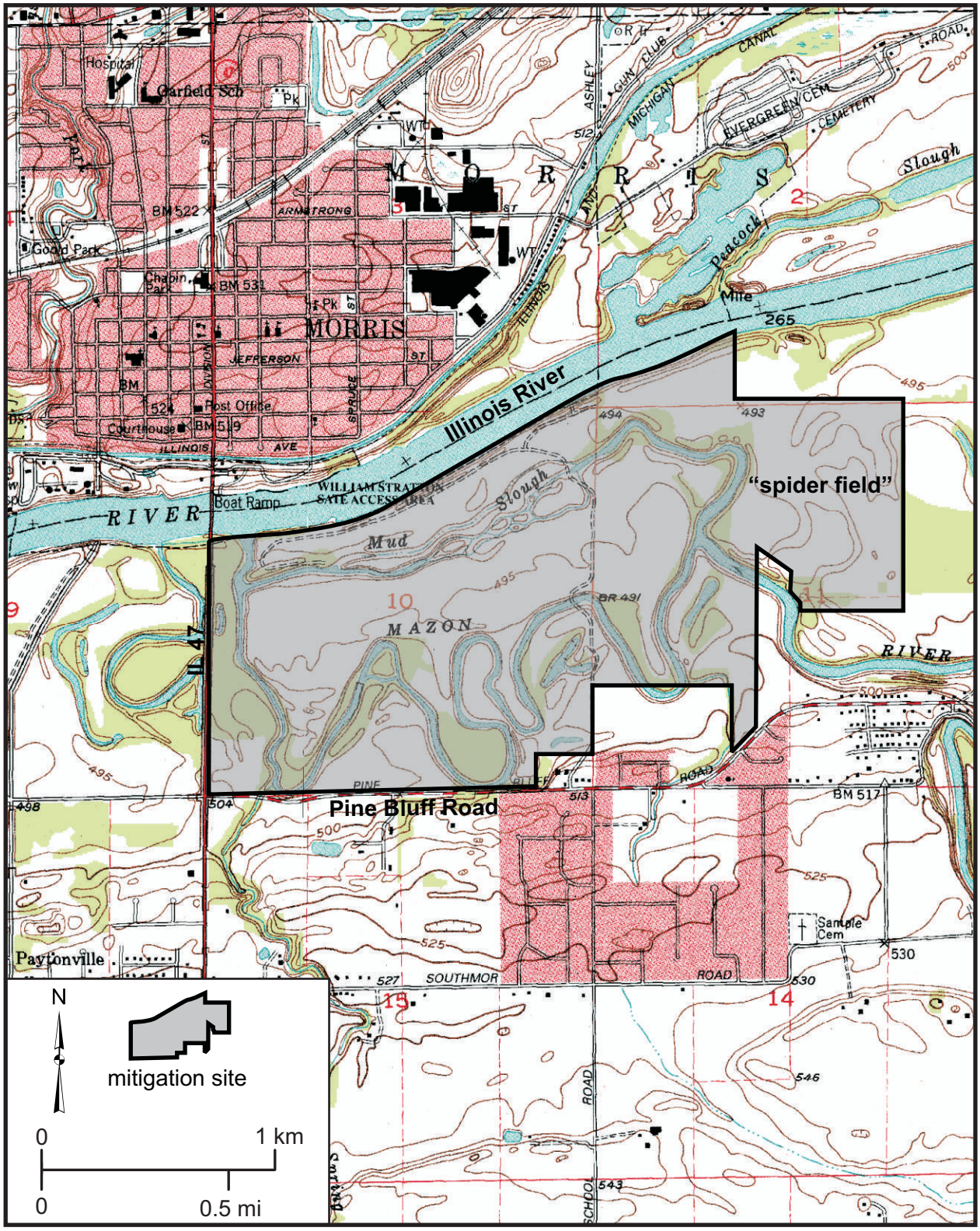
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
SW8	150.64 m (494.23 ft)	150.55 m (493.93 ft)	150.60 m (494.09 ft)
SW43	150.63 m (494.19 ft)	150.53 m (493.86 ft)	150.58 m (494.03 ft)
IL River*	148.64 m (487.66 ft)	147.68 m (484.51 ft)	148.64 m (487.66 ft)

* - Illinois River at Morris (USACE 2016)

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

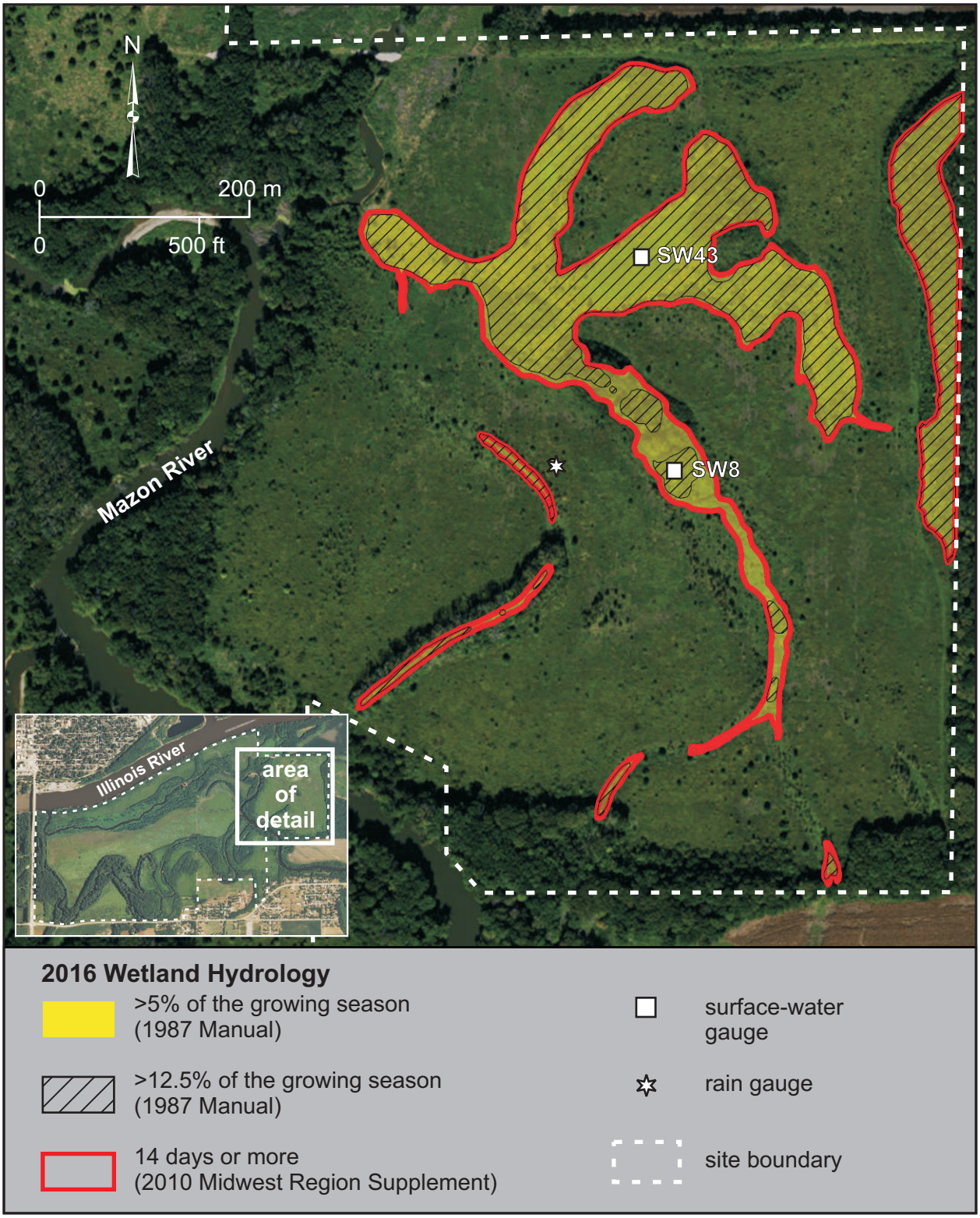


Morris Wetland Mitigation Bank

Estimated Areal Extent of 2016 Wetland Hydrology

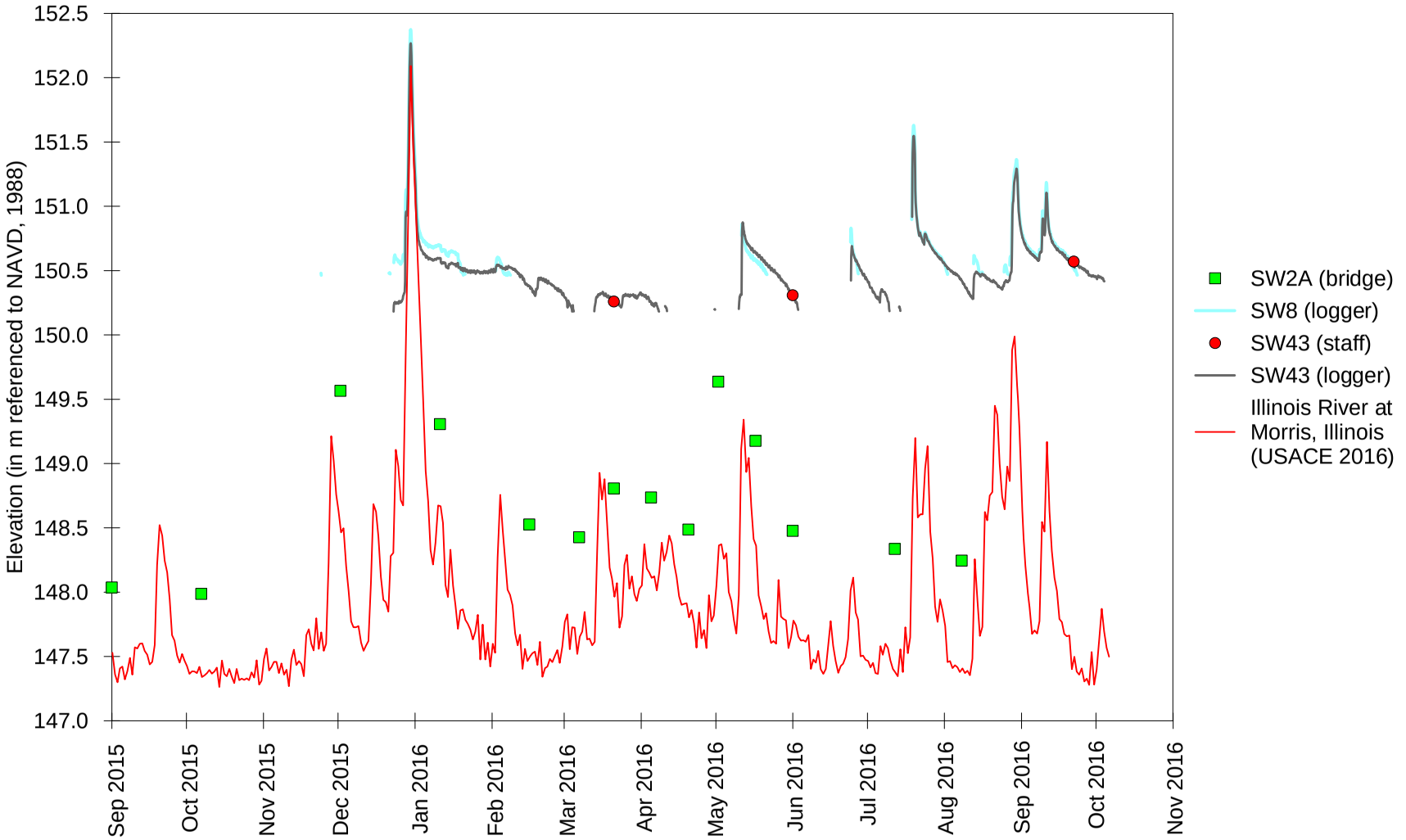
September 1, 2015 through October 4, 2016

Map based on imagery available from Esri (Esri 2016)

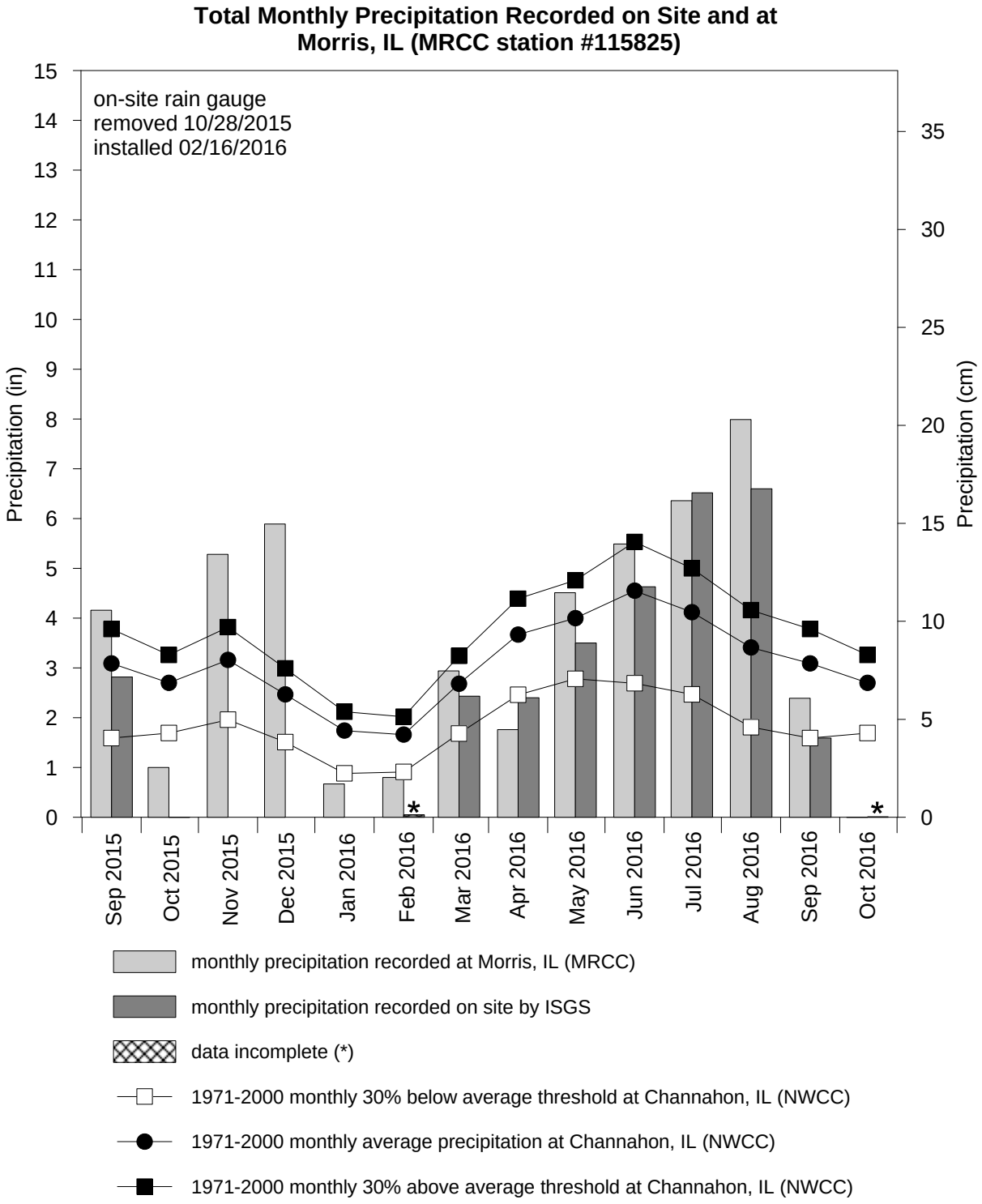


Morris Wetland Mitigation Bank
September 1, 2015 through October 4, 2016

Water-Level Elevations at Surface-Water Gauges



Morris Wetland Mitigation Bank
September 2015 through October 2016



LA GRANGE **ISGS #52**
WETLAND MITIGATION BANK
Sequence #9579
Brown County, near La Grange, Illinois
Primary Project Manager: Geoffrey E. Pociask
Secondary Project Manager: Keith W. Carr

SITE HISTORY

- February 2000: The ISGS was tasked by IDOT to conduct a Level II hydrogeologic characterization of the site.

- January 2003: The 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 2016

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), 461.37 ha (1,140.07 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 307.51 ha (759.88 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 425.31 ha (1,050.96 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 Rushville, Illinois, is April 5, and the season lasts 212 days (MRCC 2016); 5% of the growing season is 11 days, and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, February 27 was the starting date of the 2016 growing season based on soil temperatures measured on site.

- Total precipitation for the monitoring period at Rushville, Illinois (MRCC station #117551), was 105% of normal. During Spring 2016 (March through May), precipitation was 70% of normal.

- Although precipitation was below normal during Spring 2016, peak hydroperiod during the growing season occurred during mid-May in response to a period of intense rainfall during May 8-10. One flood occurred during the growing season (late May) and

inundated areas only within the lake plain surrounding Big Lake (i.e., Fields 1, 2, 3, 6, 8, 9, and 10).

- In 2016, water levels measured in 6 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 2 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 5 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

- Damaged monitoring wells will be replaced during Fall 2016.
- The ISGS will monitor hydrology at this site until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2016

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	N	N	N
41S	N	N	N
45S	Y	N	Y
46S	Y	N	Y
47S	Y	N	N
48S	N	N	N
49S	N	N	N
50S	Y	Y	Y
51S	Y	N	Y
52S	Y	Y	Y

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

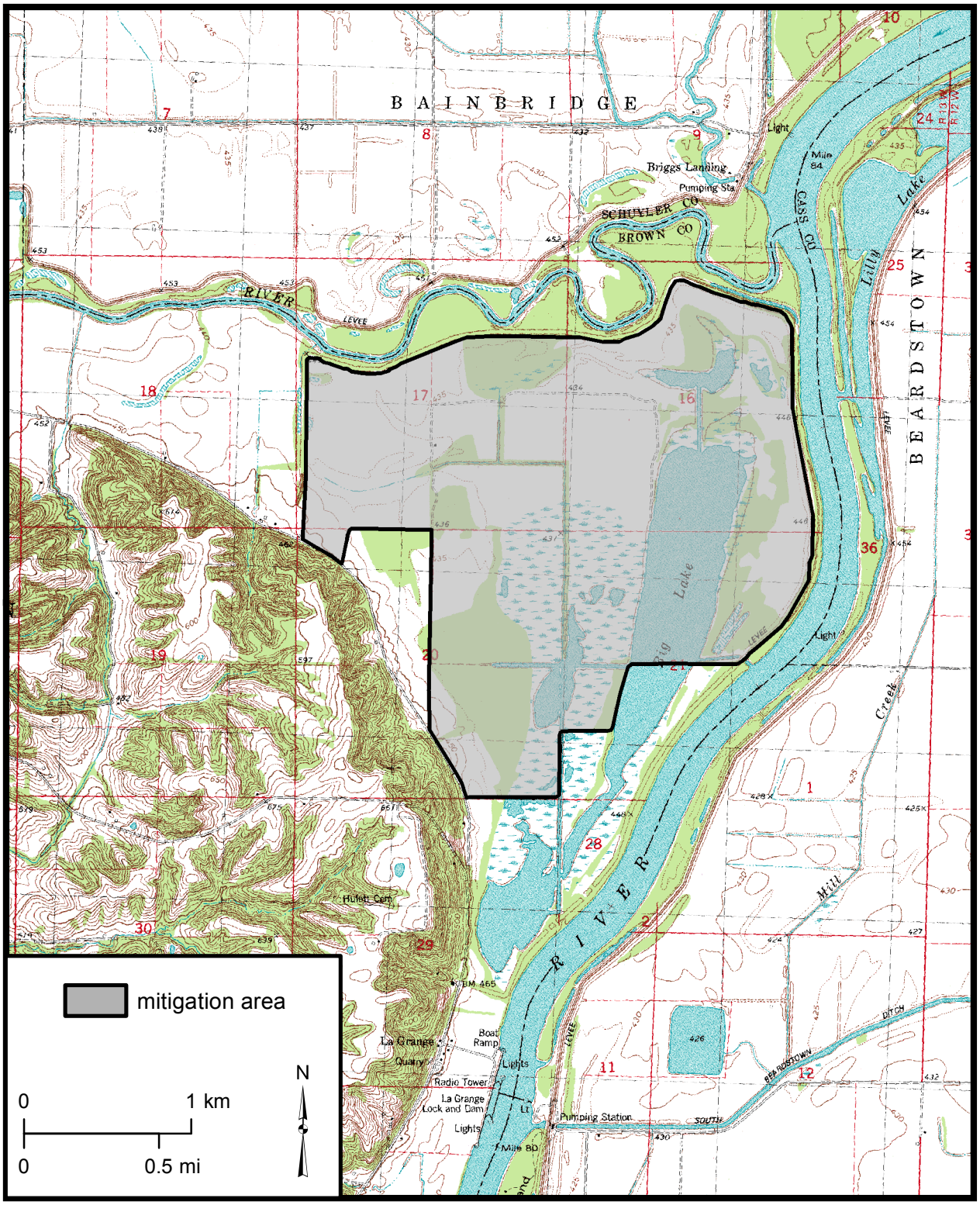
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
SW17	131.72 m (432.15 ft)	131.42 m (431.17 ft)	131.66 m (431.96 ft)
SW19	131.59 m (431.73 ft)	131.32 m (430.84 ft)	131.51 m (431.46 ft)
IL River*	131.66 m (431.96 ft)	131.53 m (431.53 ft)	131.00 m (429.79 ft)

* - Illinois River at New La Grange Lock and Dam (USACE 2016)

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

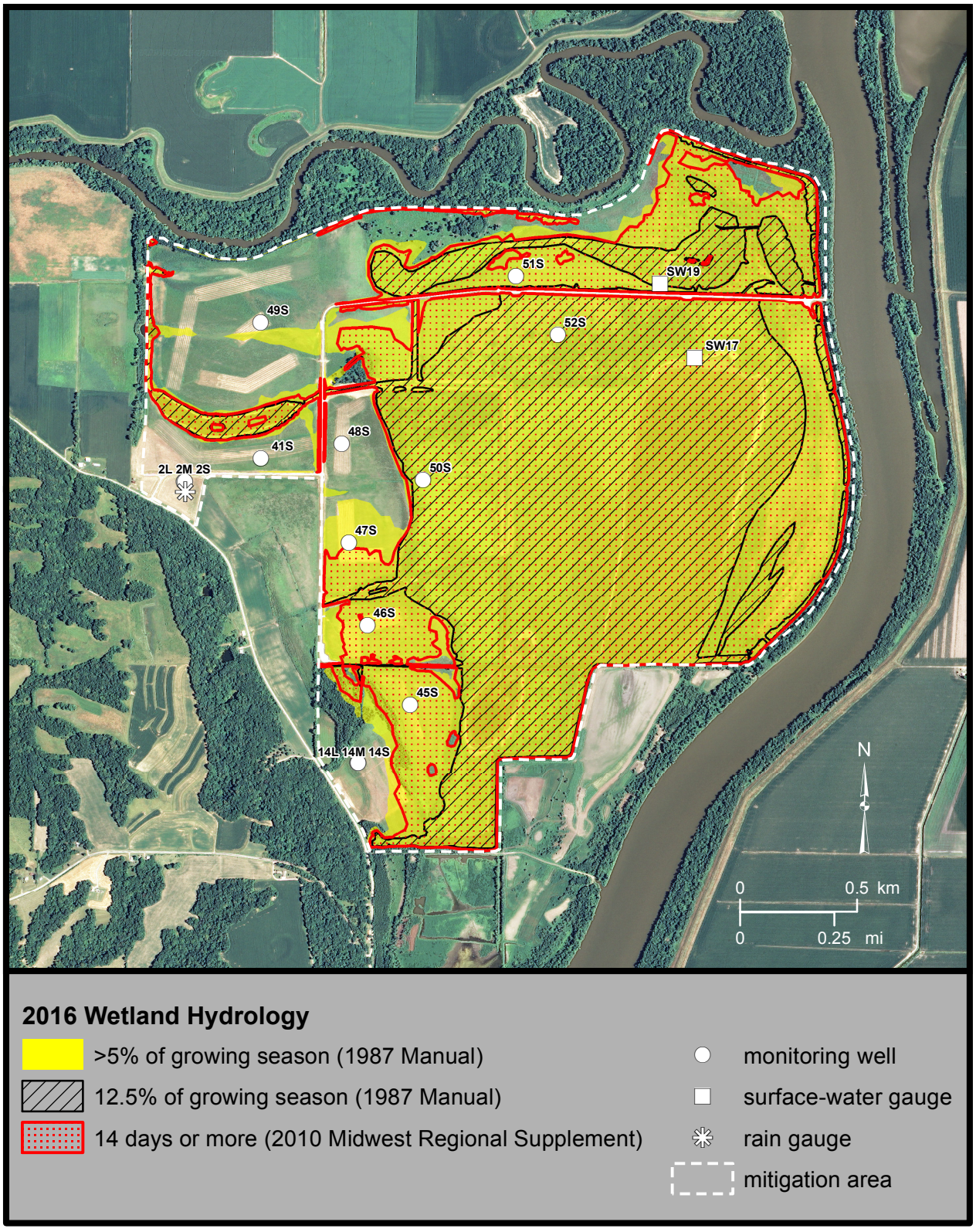
Map based on 2012 Farm Service Agency digital orthophotography, Brown County, Illinois (USDA-FSA 2012)

La Grange Wetland Mitigation Bank

Estimated Areal Extent of 2016 Wetland Hydrology

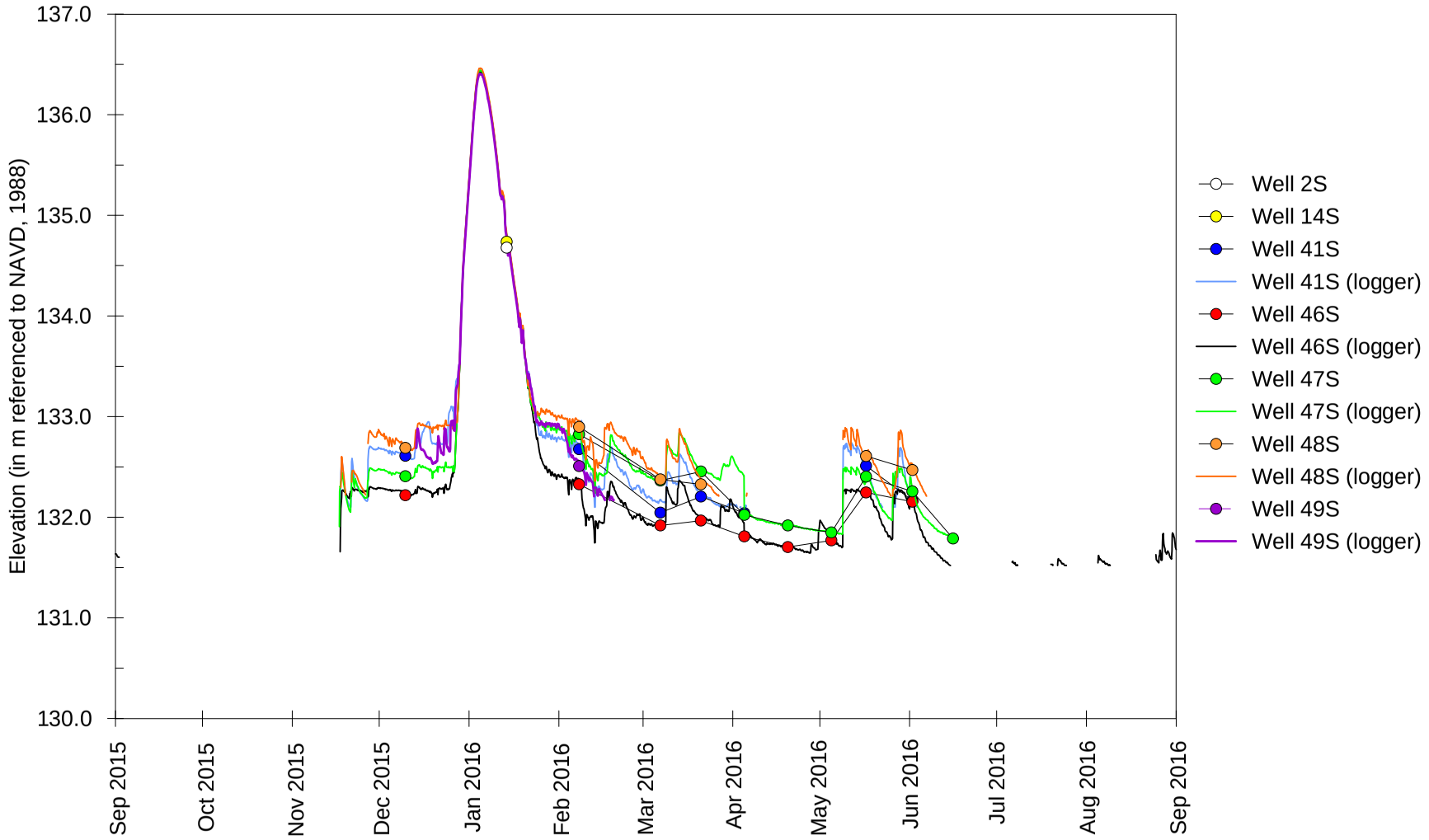
September 1, 2015 through August 31, 2016

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

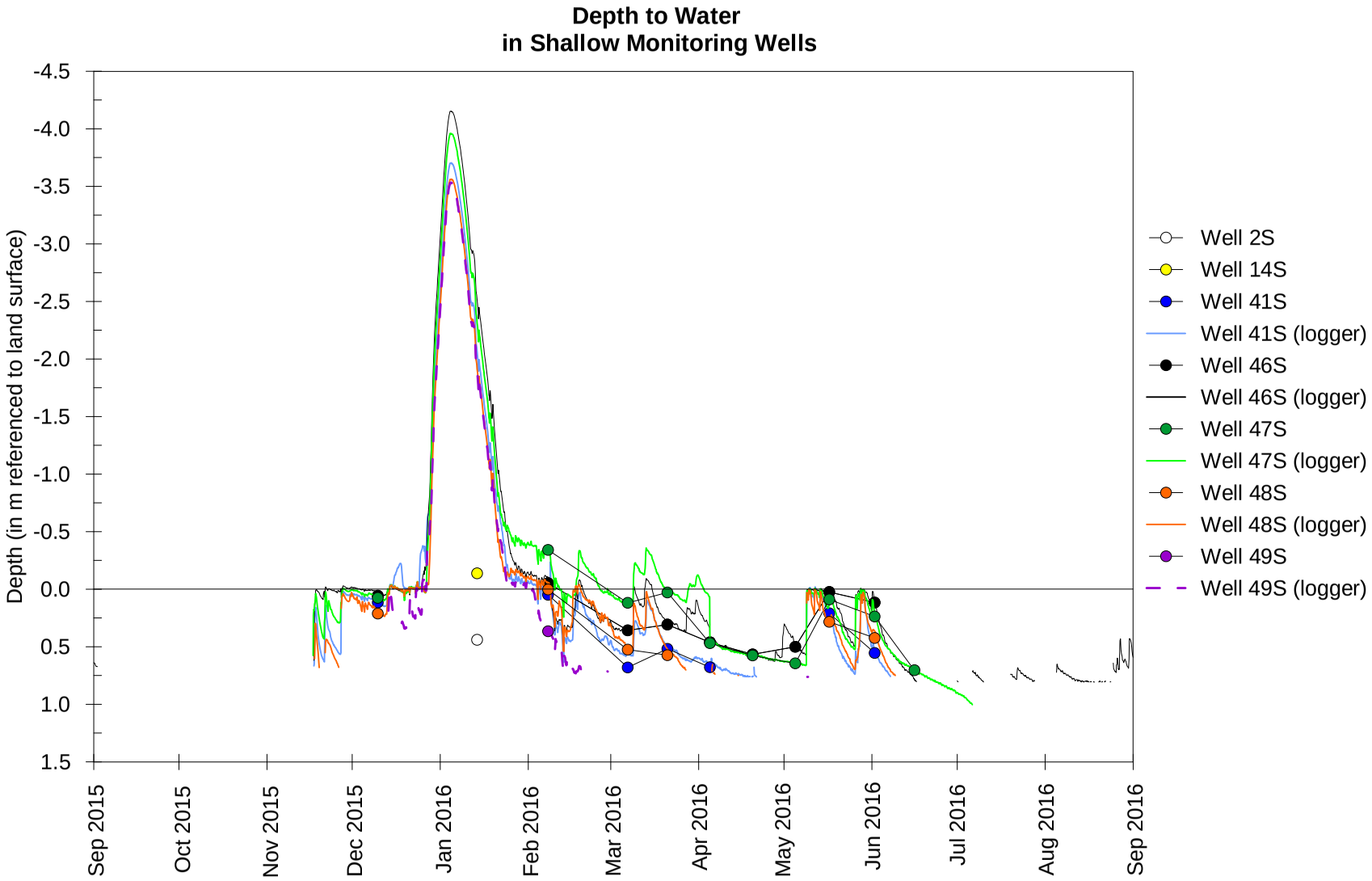


La Grange Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells

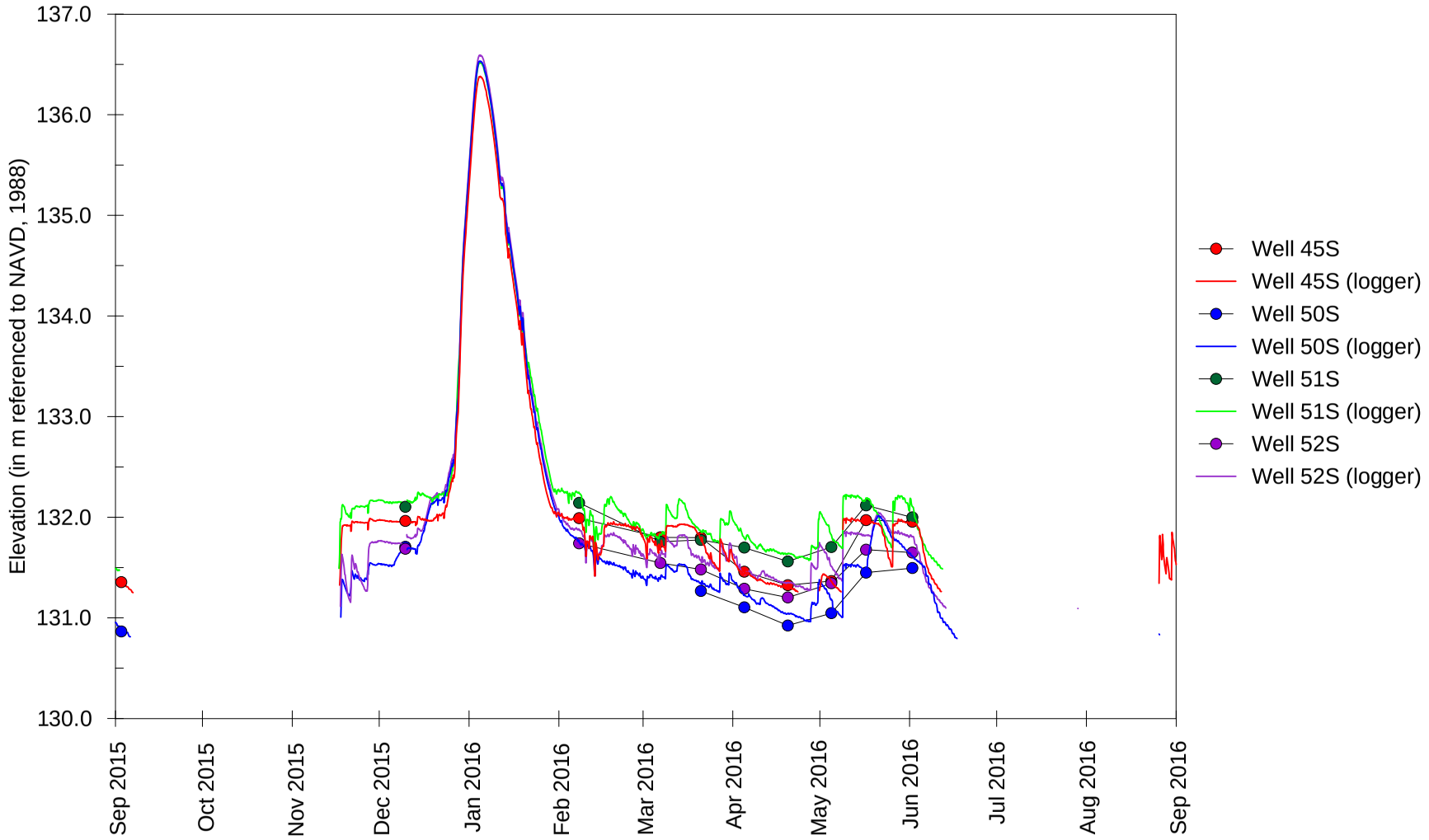


La Grange Wetland Mitigation Bank
September 1, 2015 through August 31, 2016



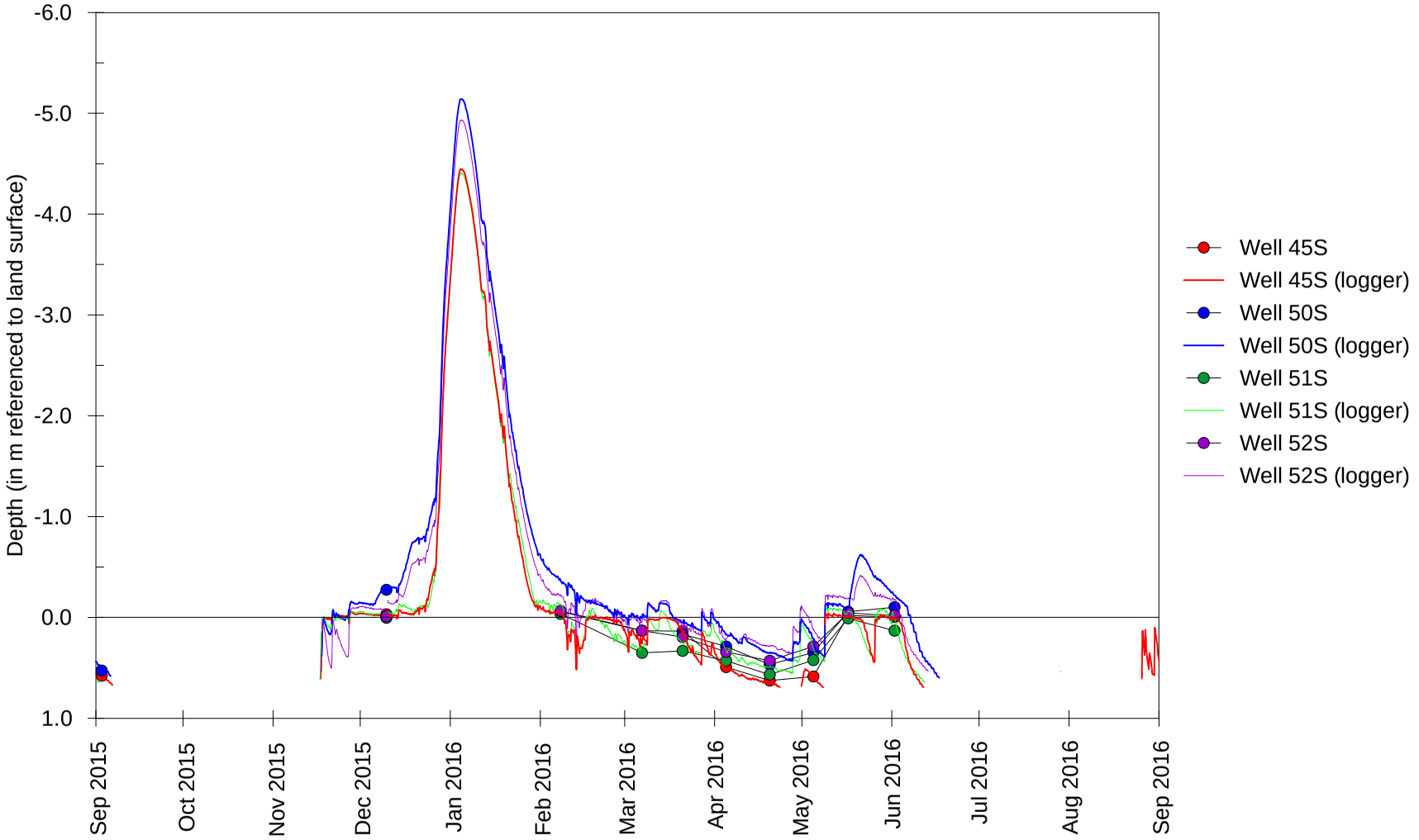
La Grange Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells

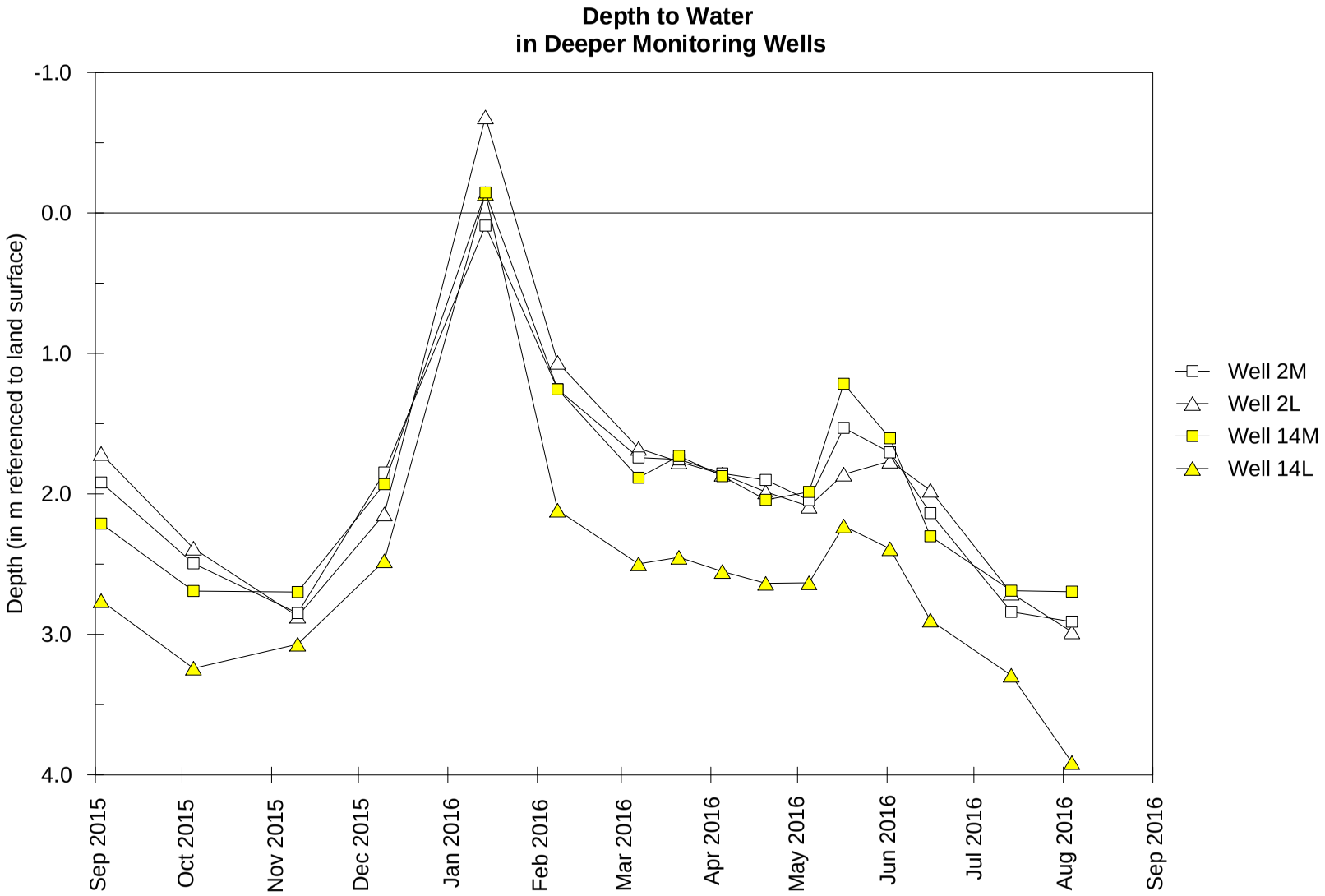


La Grange Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells

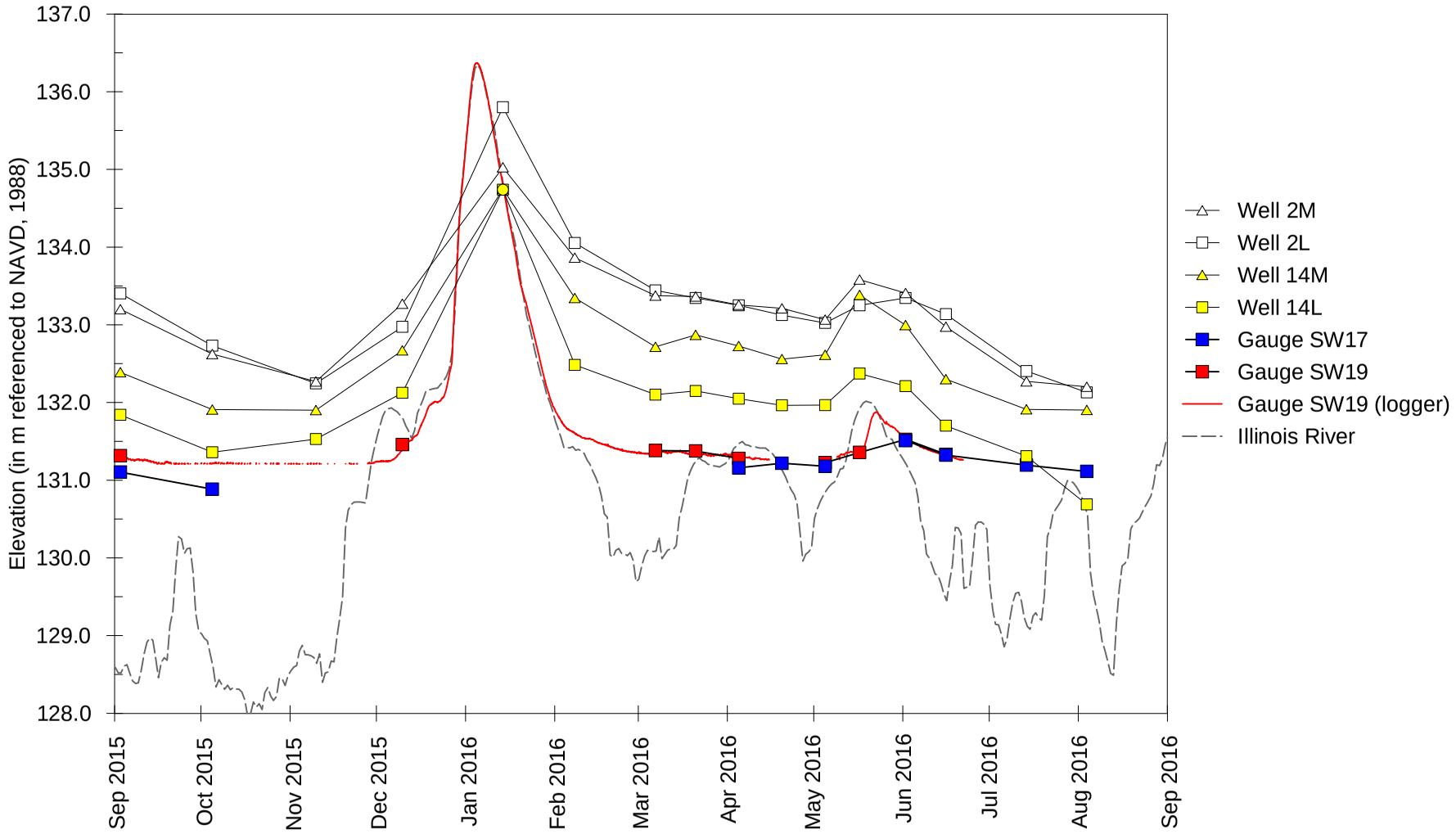


La Grange Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

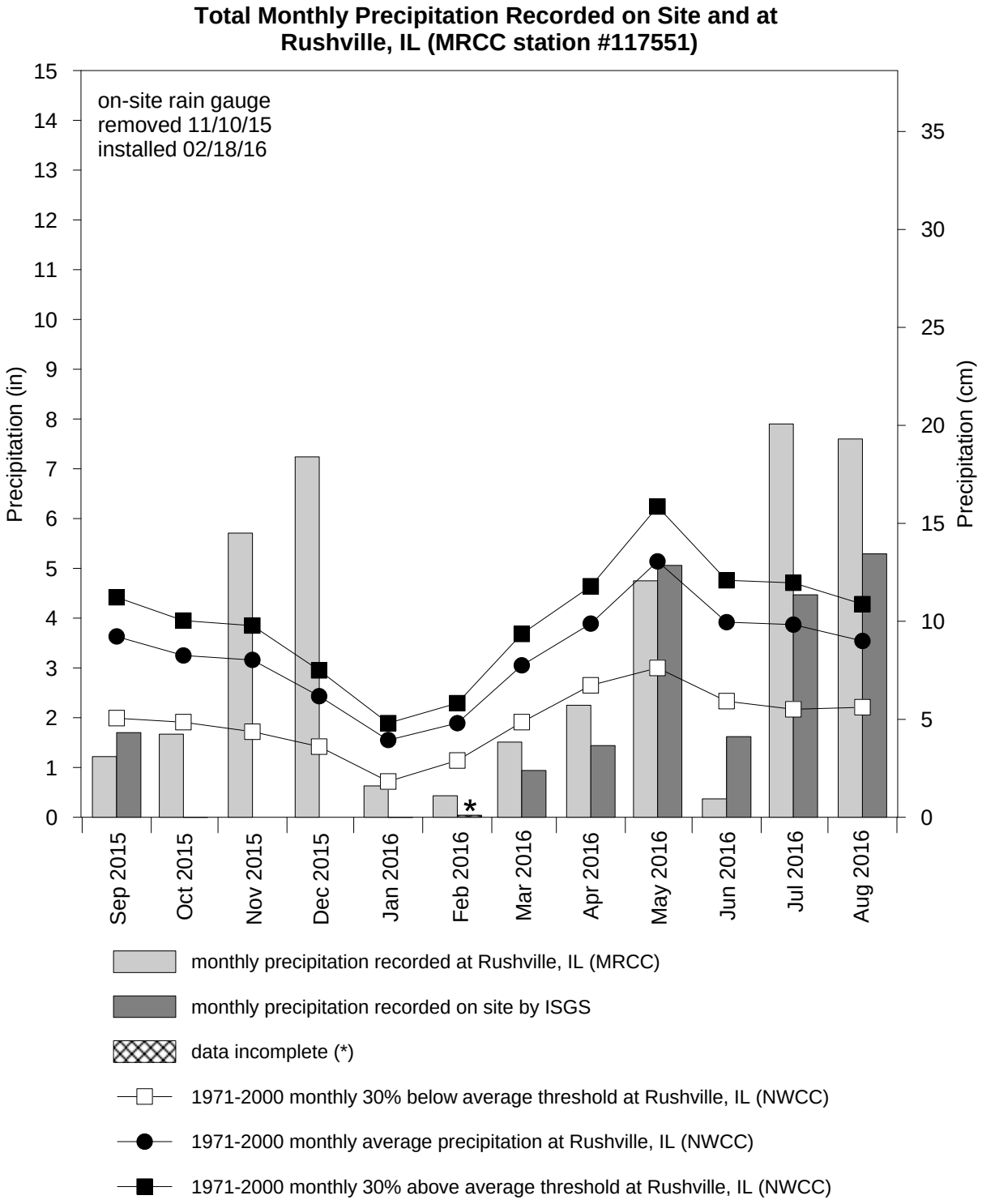


La Grange Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

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



La Grange Wetland Mitigation Bank
September 2015 through August 2016



FAIRMONT CITY **ISGS #53**
POTENTIAL WETLAND MITIGATION SITE
FAP 14
Sequence #27
St. Clair County, near Fairmont City, Illinois
Primary Project Manager: Steven E. Benton
Secondary Project Manager: Audra M. Hanks

SITE HISTORY

- August 1999: The ISGS conducted an initial site evaluation.
- September 2000: The 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 2016

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), 15.62 ha (38.59 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 13.89 ha (34.33 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 15.04 ha (37.17 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 2016); 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 20 was the starting date of the 2016 growing season based on soil temperatures measured at the site.
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 110% of normal, precipitation in Spring 2016 (March through May) was 106% of normal, and the wettest month was December 2015 at 267% of normal.
- Peak hydroperiod during the growing season occurred in March and April through a combination of seasonal high water table and frequent or intense rainfall events. In March it rained on more than half the days of the month, and in April there were three rain events totaling greater than 0.50 in. per day.
- In 2016, water levels measured in 15 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 13 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 15 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 2016

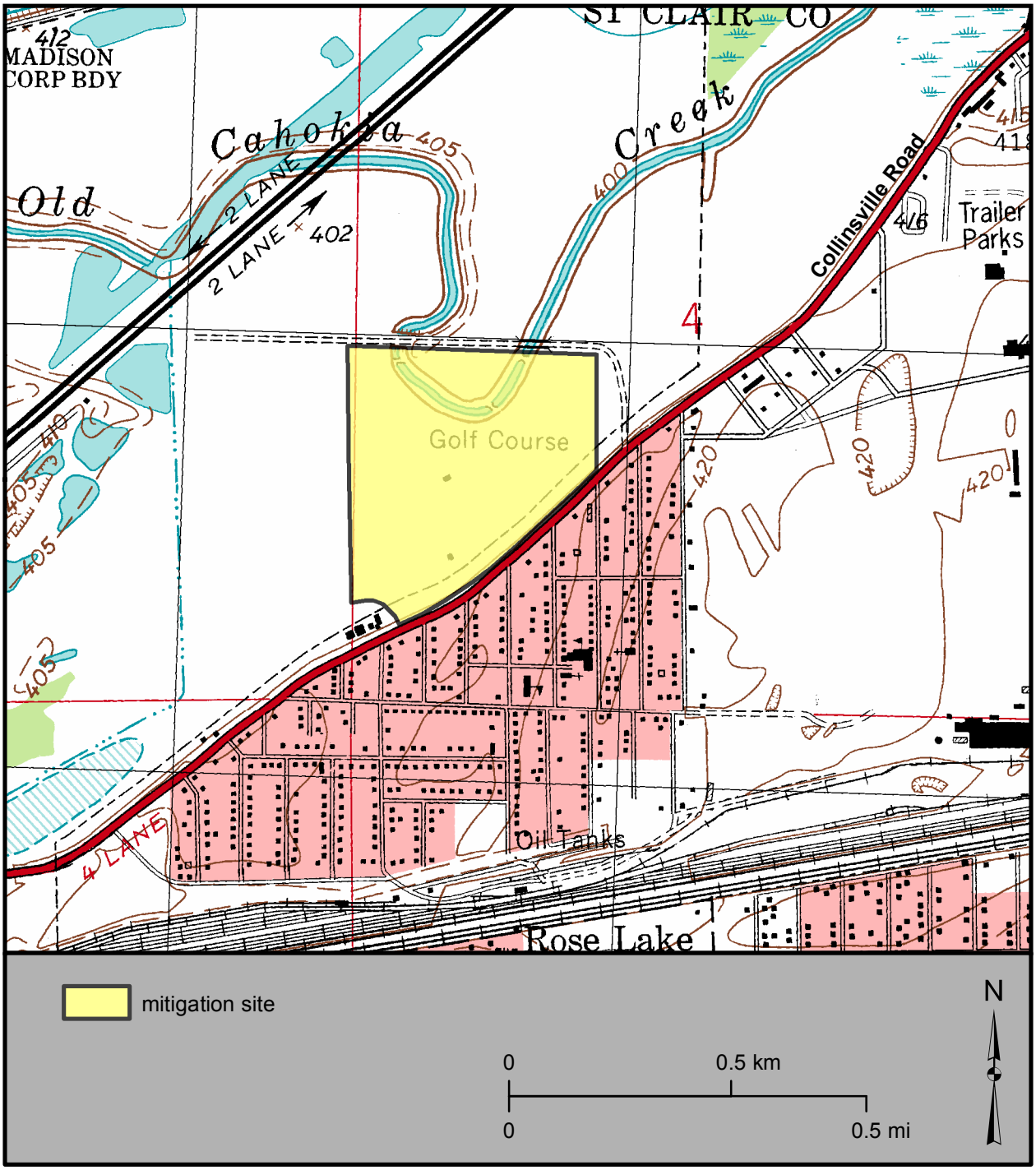
Well locations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
4S	Y	Y	Y
5S	Y	Y	Y
6S	N	N	N
6VS	N	N	N
7S	Y	Y	Y
9S	Y	Y	Y
14S	Y	Y	Y
16S	Y	Y	Y
17S	Y	Y	Y
23S	Y	Y	Y
24S	Y	Y	Y
25S	Y	Y	Y
25VS	Y	Y	Y
26S	Y	Y	Y
27S	Y	Y	Y
28S	N	N	N
29S	Y	N	Y
30S	Y	N	Y
31S	N	N	N
32S	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***
SW Pond/ AR2	122.29 m (401.21 ft)	122.26 m (401.12 ft)	122.28 m (401.18 ft)
BR	122.26 m (401.12 ft)	122.26 m (401.12 ft)	122.26 m (401.12 ft)
E	122.06 m (400.46 ft)	n/a	122.06 m (400.46 ft)
G	122.47 m (401.81 ft)	122.47 m (401.81 ft)	122.47 m (401.81 ft)

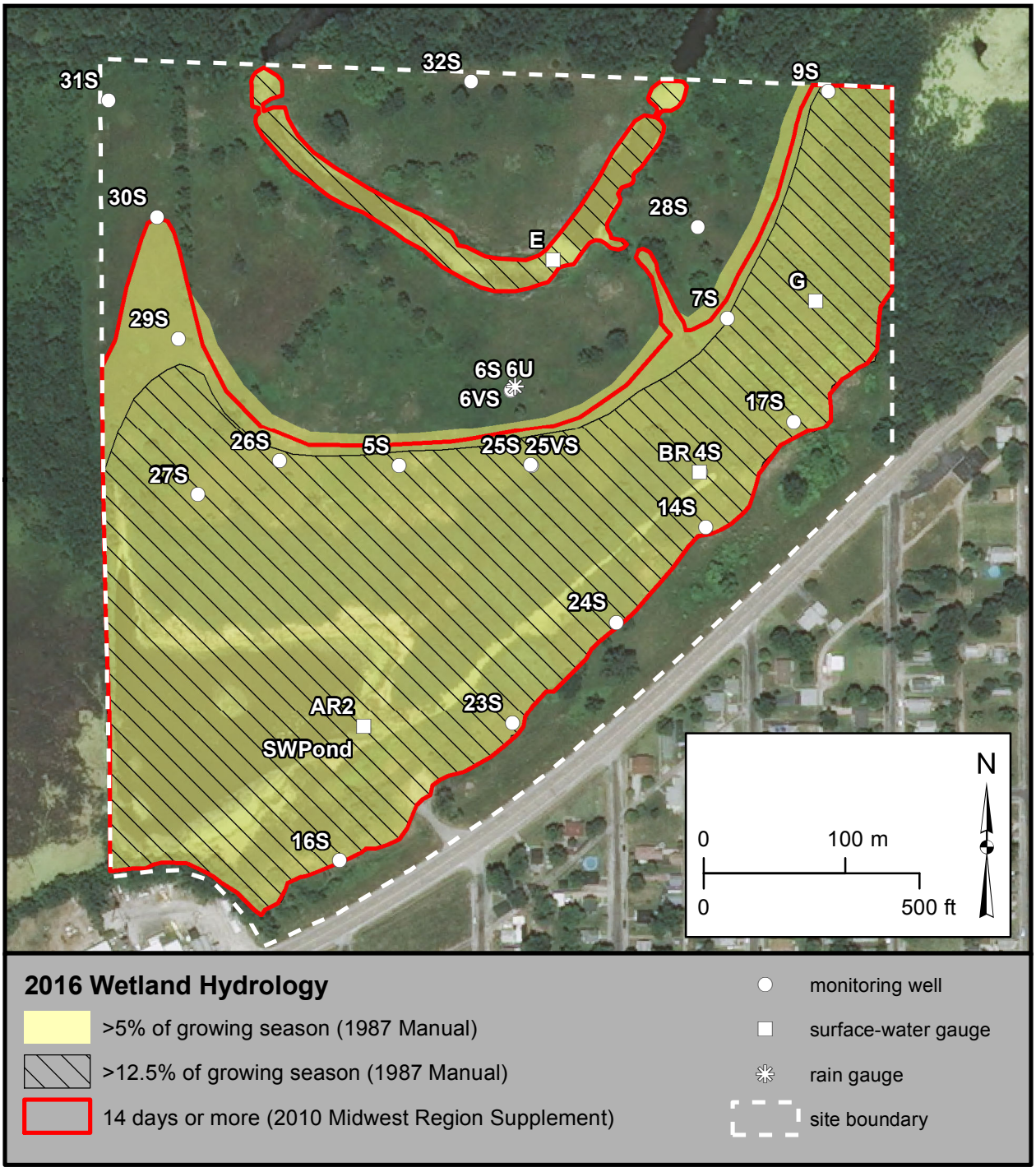
n/a – hydroperiod was not long enough to determine an elevation

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)



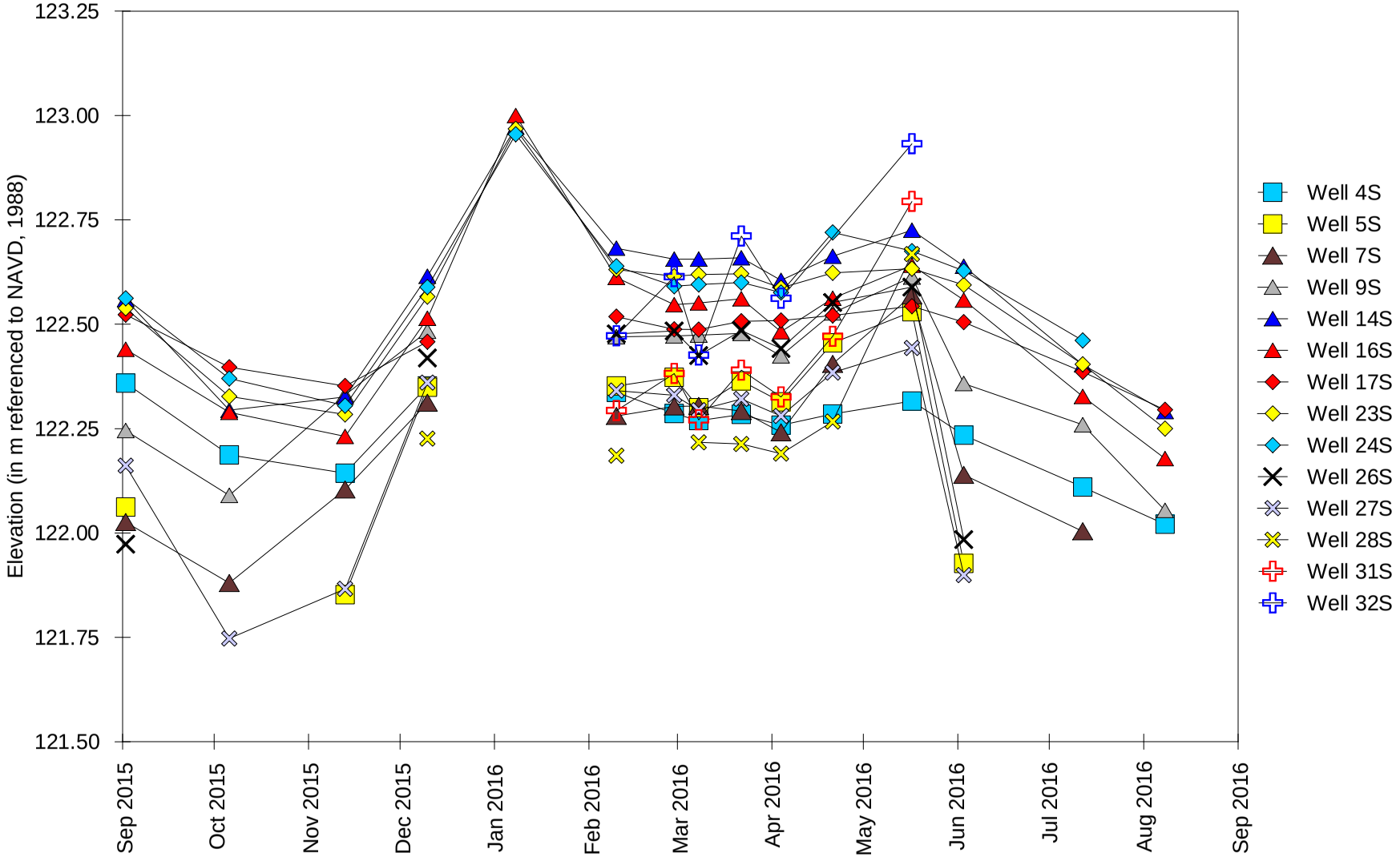
Fairmont City Potential Wetland Mitigation Site
(FAP 14)
Estimated Areal Extent of 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016

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



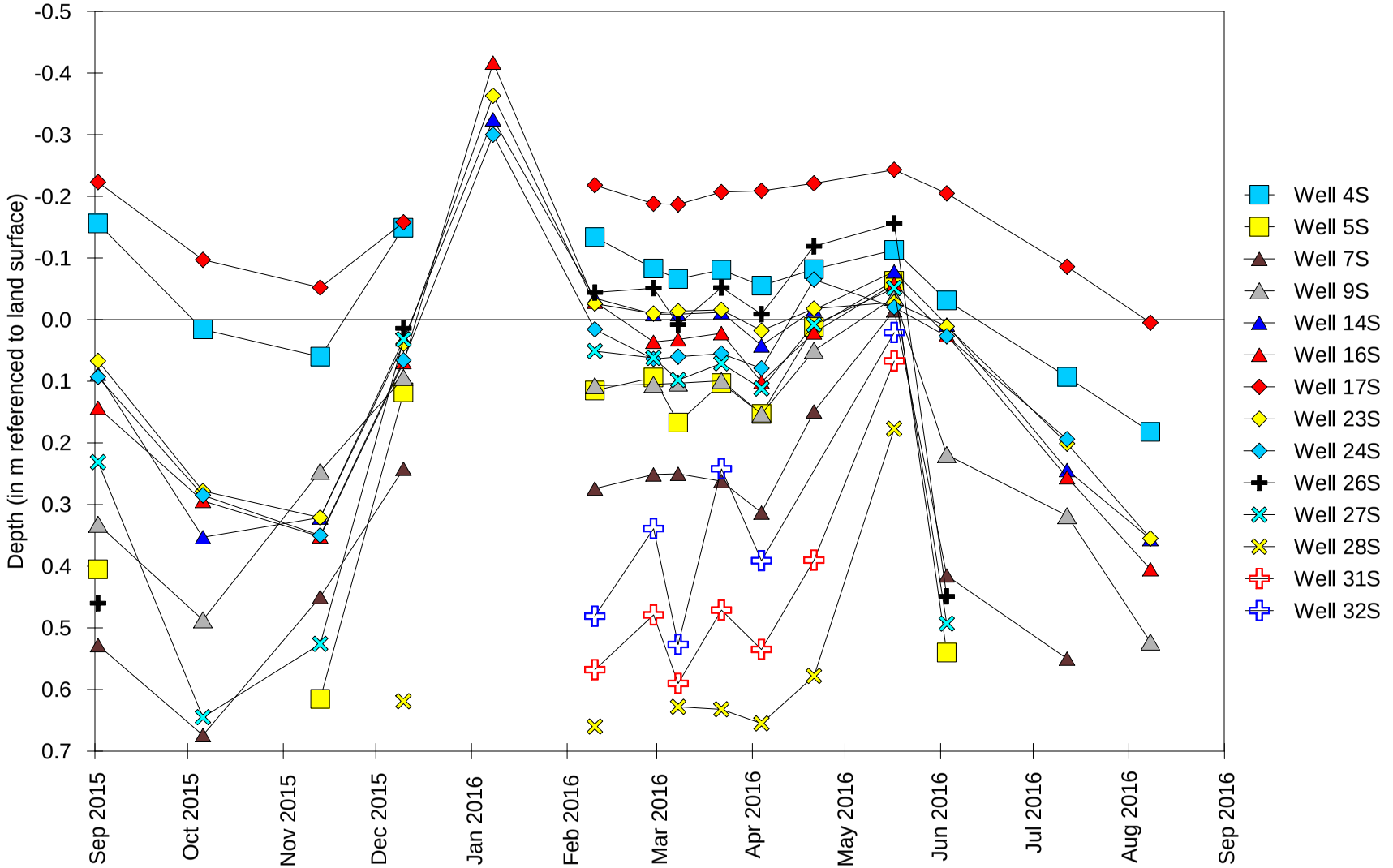
Fairmont City Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells



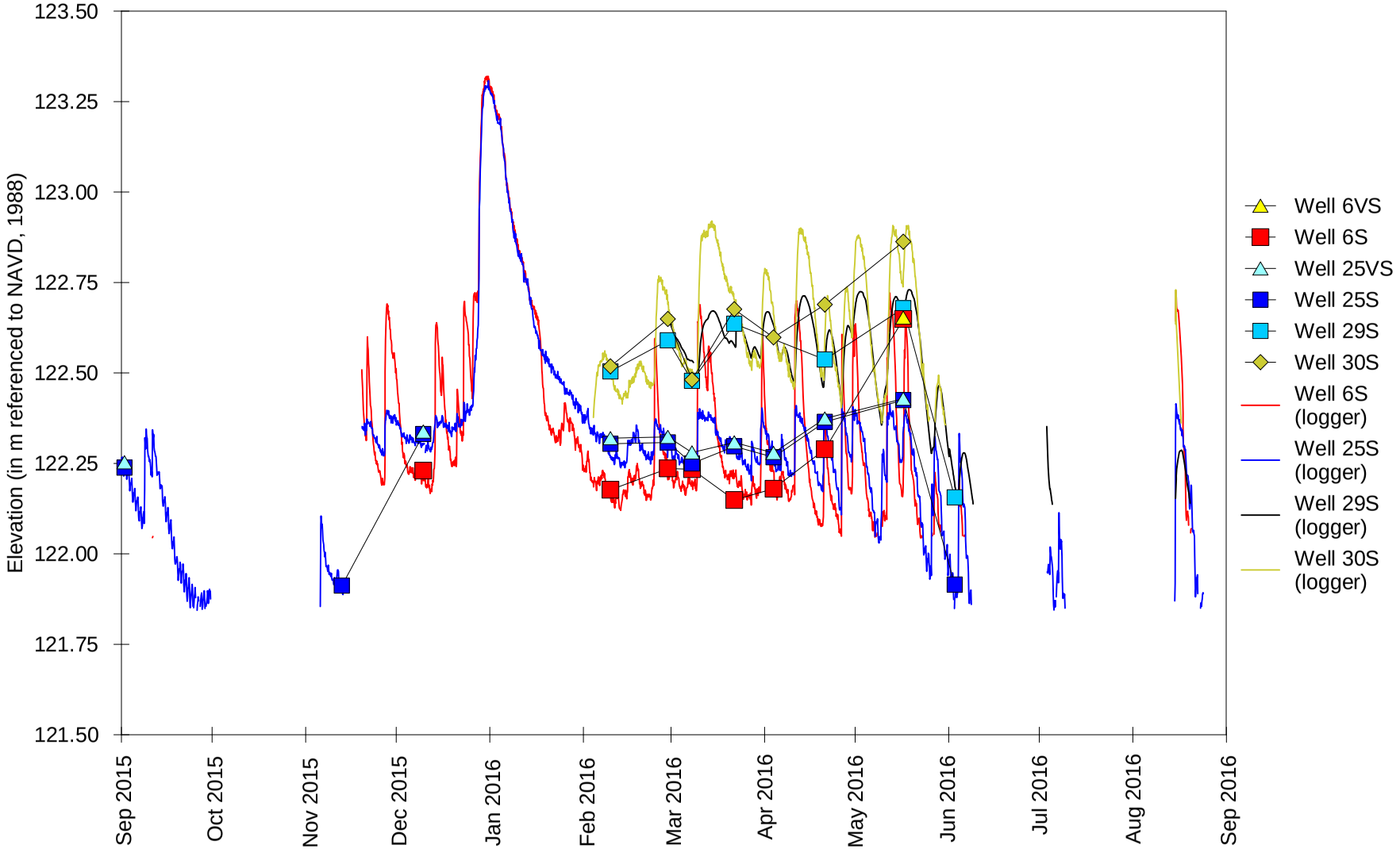
Fairmont City Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells



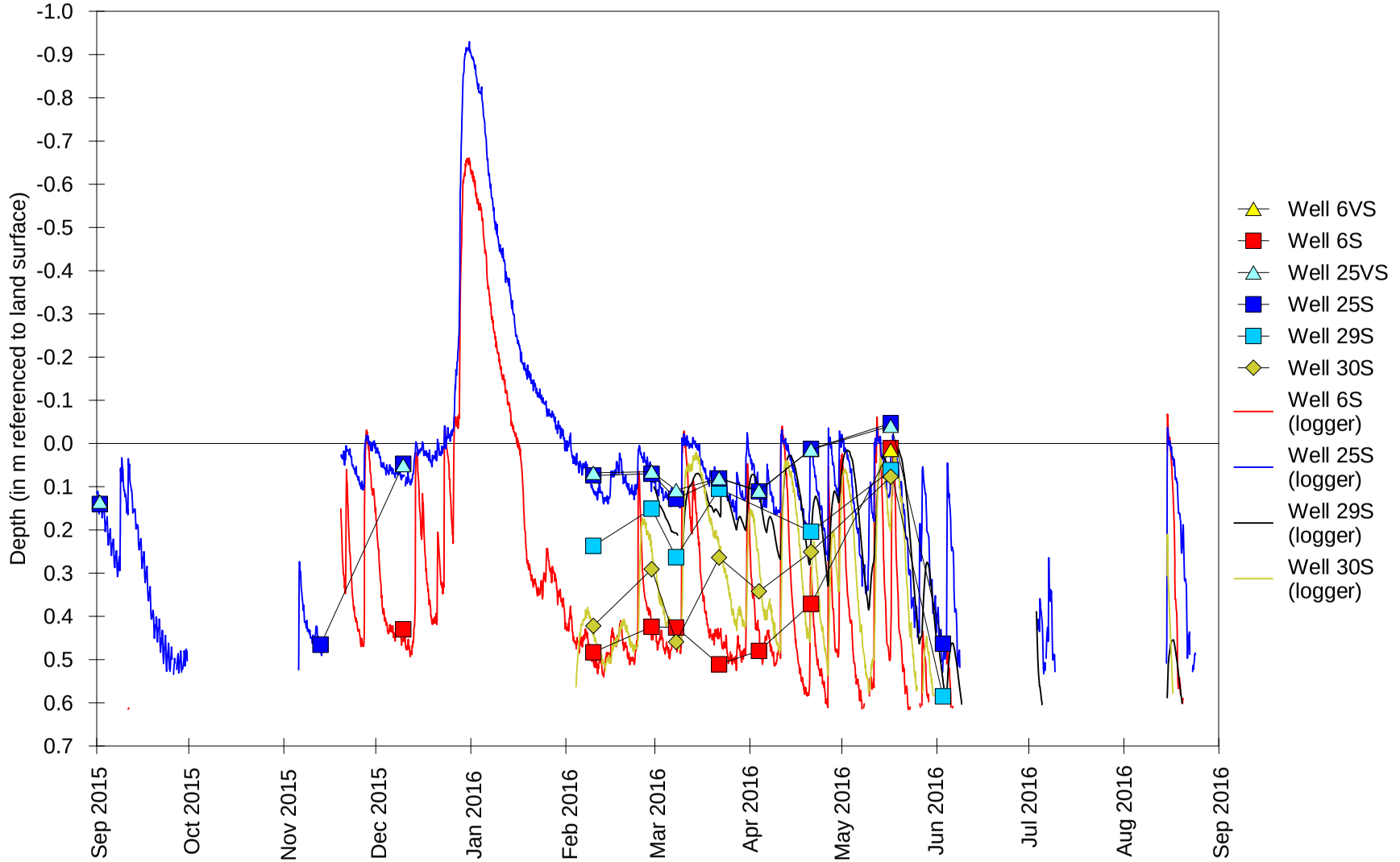
Fairmont City Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells



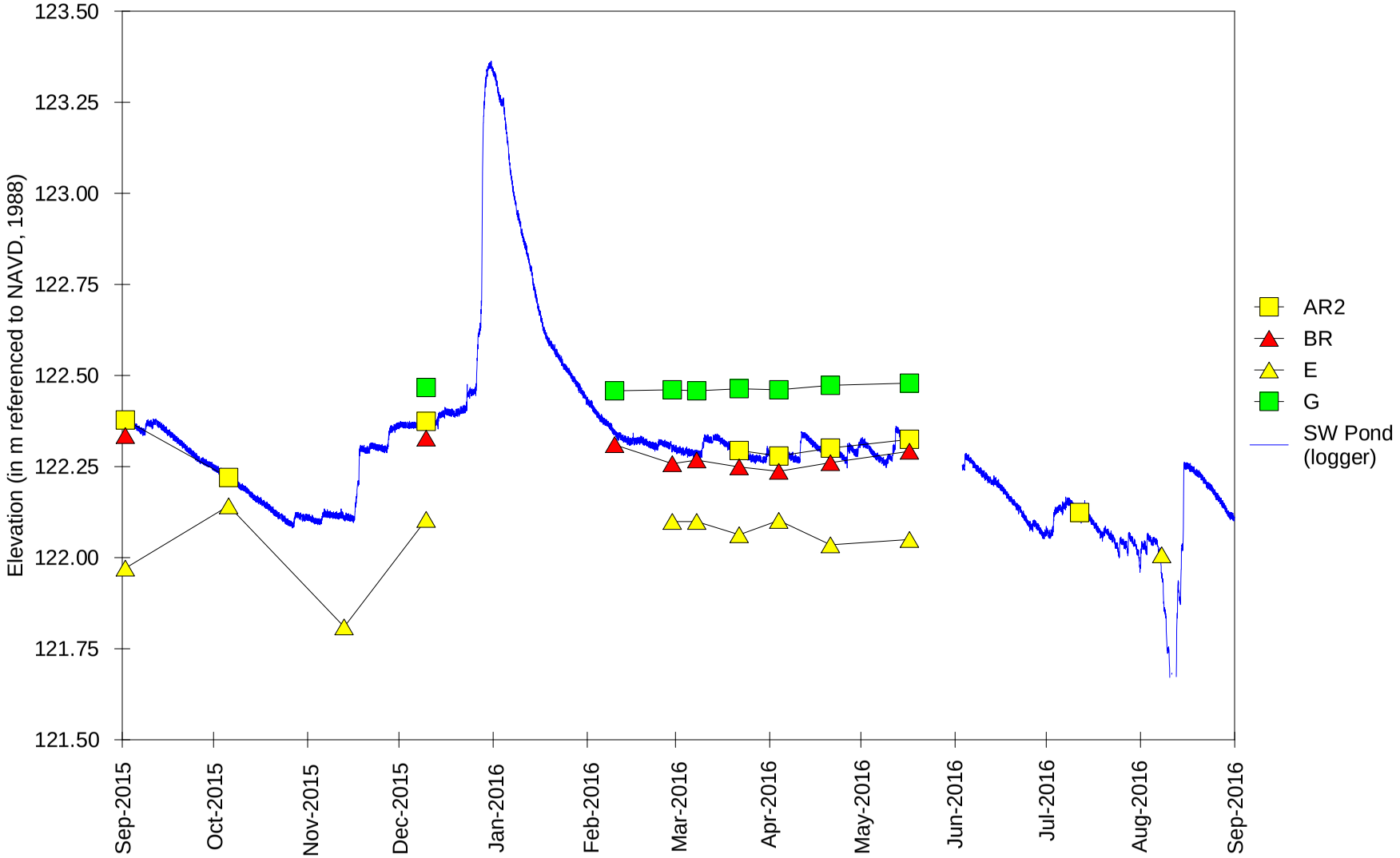
Fairmont City Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells

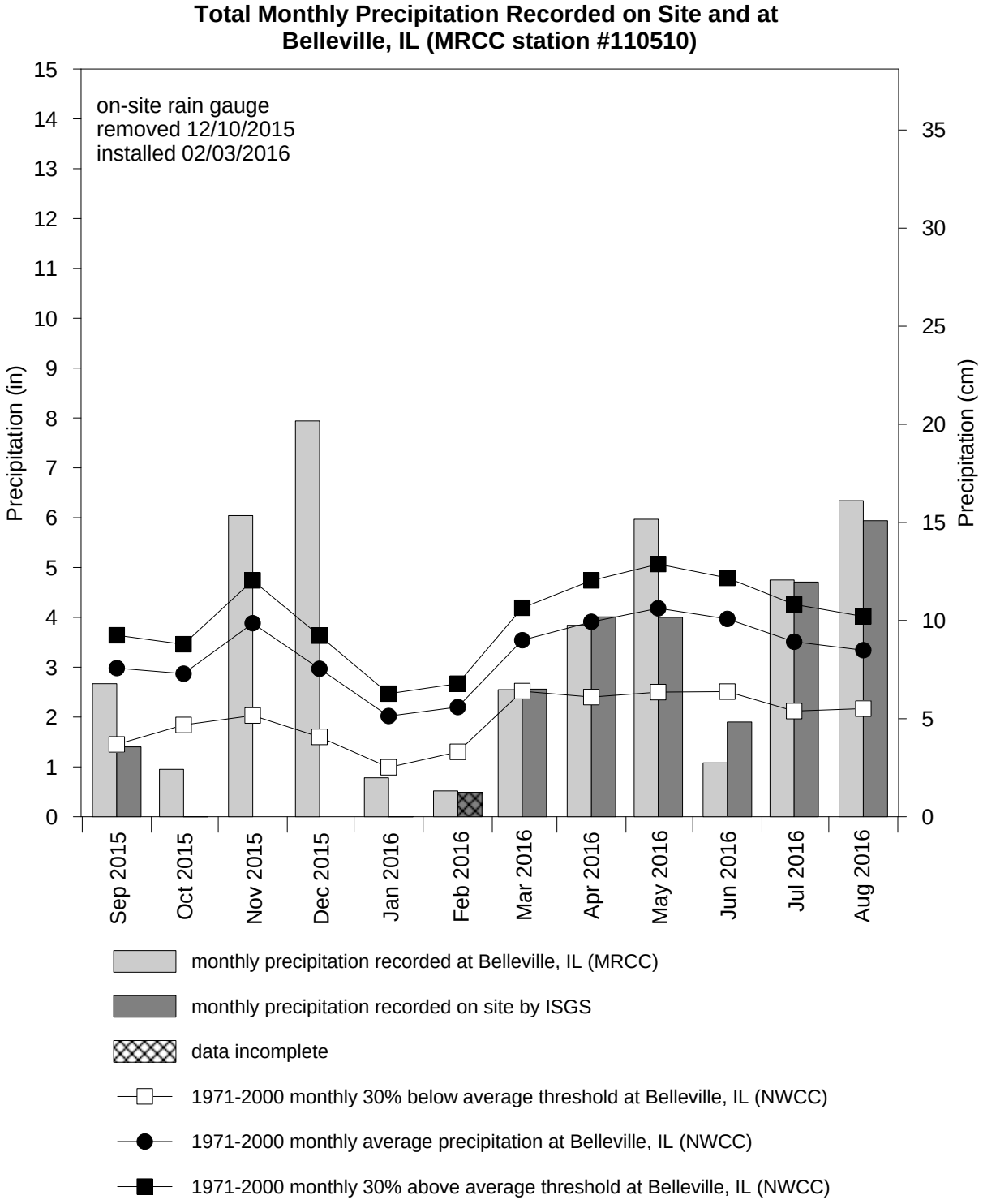


Fairmont City Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Fairmont City Potential Wetland Mitigation Site
September 2015 through August 2016



FORMER TIERNAN PROPERTY **ISGS #57**
POTENTIAL WETLAND MITIGATION SITE
FAP 14
Sequence #27
St. Clair County, near Cahokia, Illinois
Primary Project Manager: Steven E. Benton
Secondary Project Manager: Audra M. Hanks

SITE HISTORY

- July 2000: The 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 2016

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), 18.30 ha (45.21 ac), out of a total site area of 26.43 ha (65.30 ac), satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season and 16.71 ha (41.29 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 18.29 ha (45.20 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 2016); 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 4 was the starting date of the 2016 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 110% of normal. Precipitation in Spring 2016 (March through May) was 106% of normal. The wettest month was December 2015 at 267% of normal.

- Peak hydroperiod during the growing season differed with primary water source and location on the site. In the portion of the site north of well cluster 23, peak hydroperiod occurred in March due to precipitation and perched groundwater, though much of the area was saturated or inundated almost continuously from March through May. In the portion of the site south of well cluster 23, peak hydroperiod occurred in May due to back flooding from Blue Waters Ditch which 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 30 to May 20 and from May 29 to June 6, which corresponded to the presence of surface water on the site (gauges E, F, and G).

- In 2016, 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 25 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 32 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 2016

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
2S	Y	Y	Y
4S	Y	N	Y
5S	Y	N	Y
6S	N	N	N
7S	N	N	N
10S	Y	Y	Y
11SR	Y	N	Y
12S	Y	Y	Y
13S	Y	Y	Y
16S	Y	Y	Y
17S	Y	Y	Y
18S	Y	Y	Y
19S	Y	Y	Y
22S	Y	Y	Y
23S	N	N	N
23VS	N	N	N
24S	Y	Y	Y
24VS	Y	Y	Y
25S	Y	Y	Y
25VS	Y	Y	Y
26S	Y	Y	Y
26VS	Y	Y	Y
27SR2	Y	Y	Y
27VS	Y	Y	Y
28S	N	N	Y
28VS	N	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	Y	Y
33S	Y	N	Y

Well locations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
34S	Y	Y	Y

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

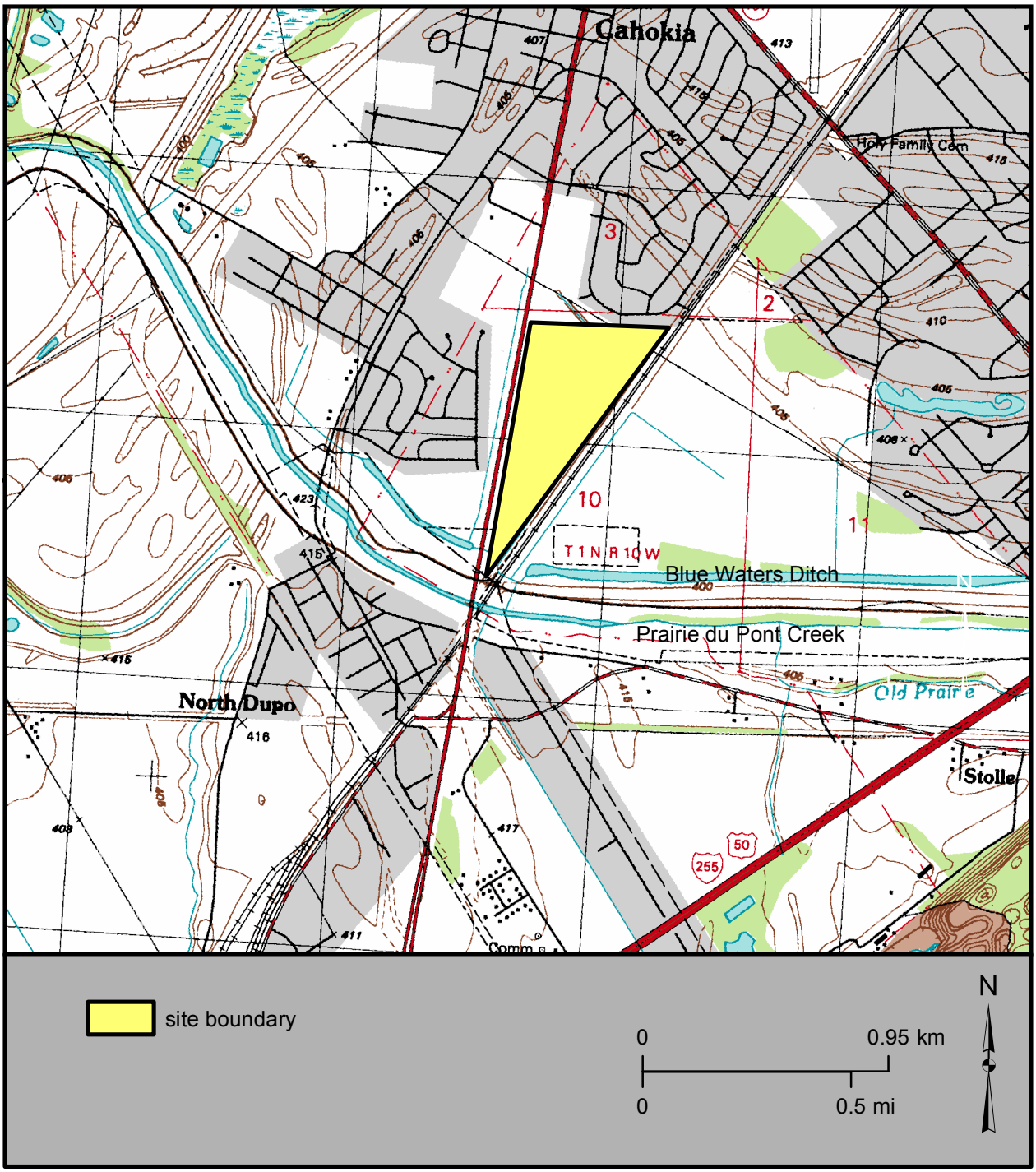
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	*5% of growing season*	*12.5% of growing season*	*14 days during growing season*
E	121.43 m (398.39 ft)	n/a	121.43 m (398.39 ft)
F	121.45 m (398.46 ft)	n/a	121.45 m (398.46 ft)
G	n/a	n/a	n/a
H	121.62 m (399.02 ft)	121.60 m (398.95 ft)	121.62 m (399.02 ft)

n/a – hydroperiod was not long enough 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)

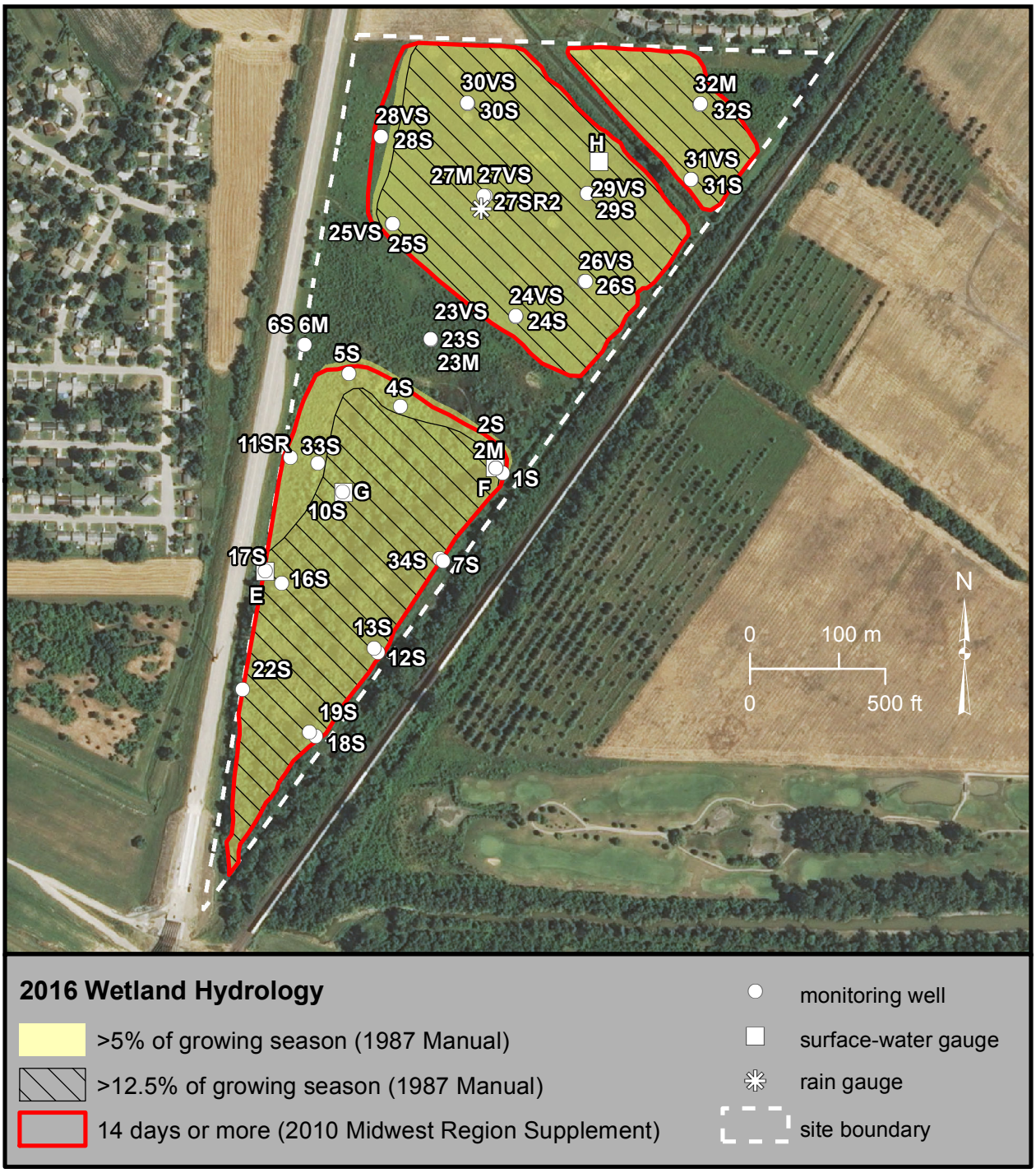


Former Tiernan Property, Potential Wetland Mitigation Site (FAP 14)

Estimated Areal Extent of 2016 Wetland Hydrology

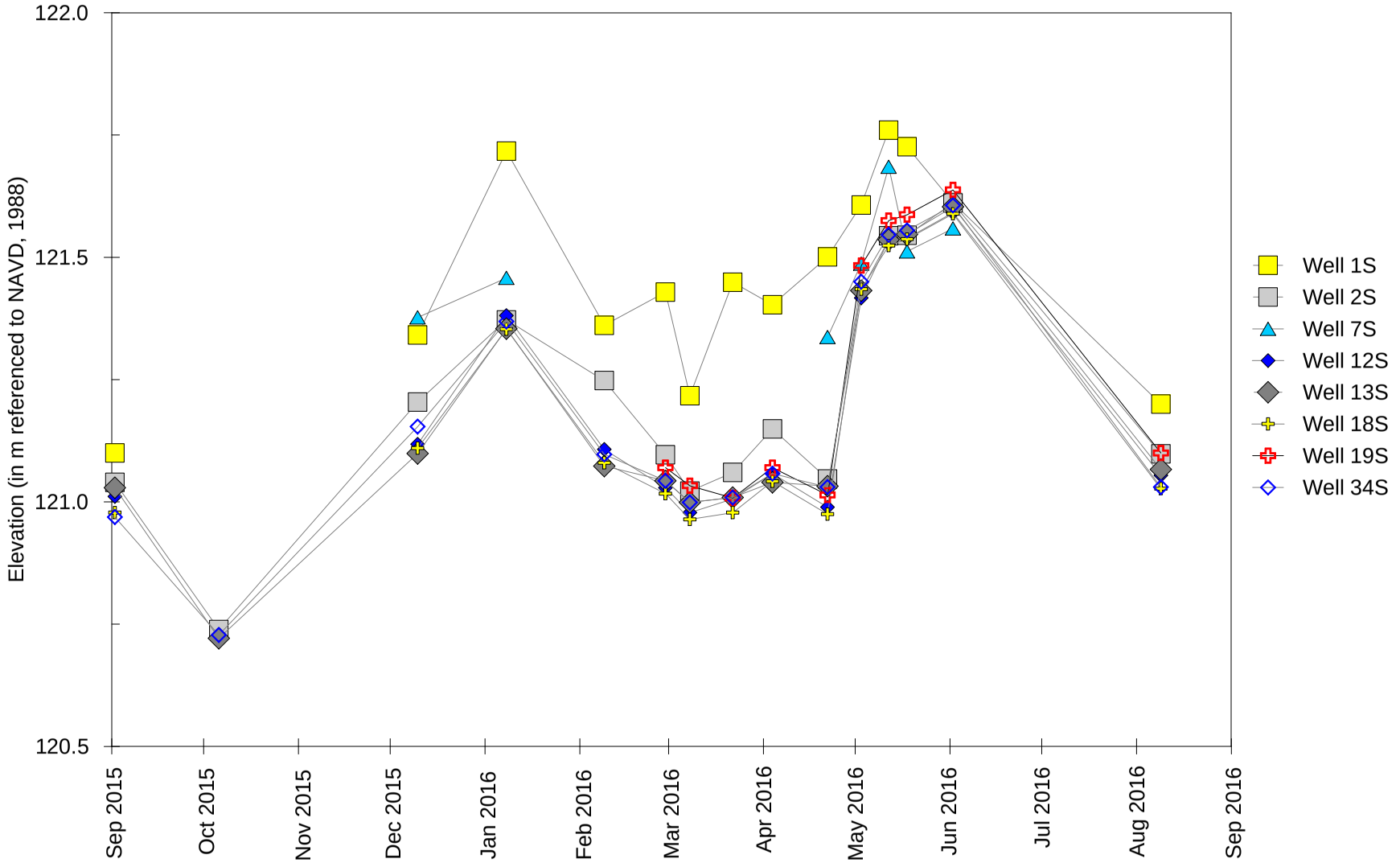
September 1, 2015 through August 31, 2016

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

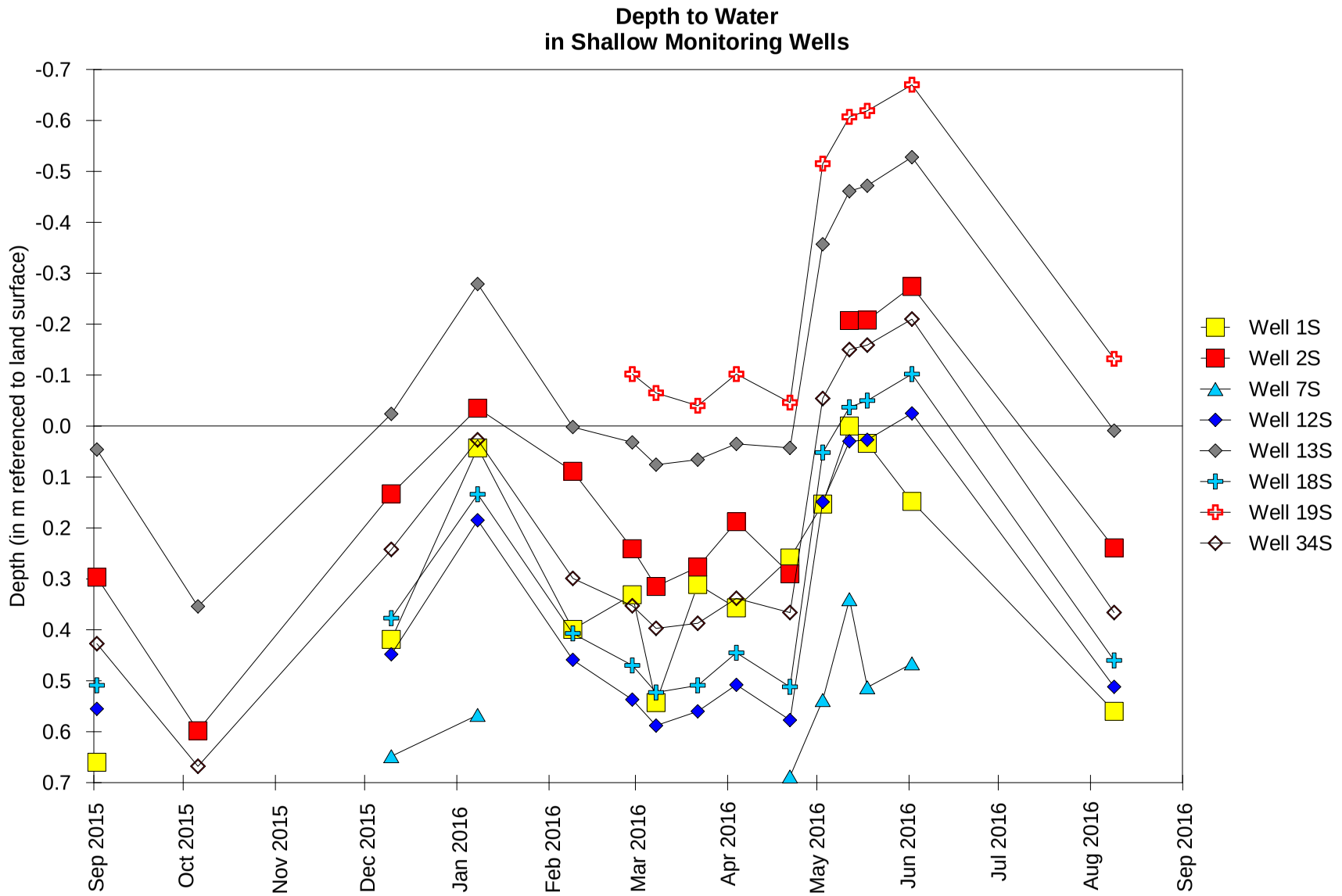


Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells

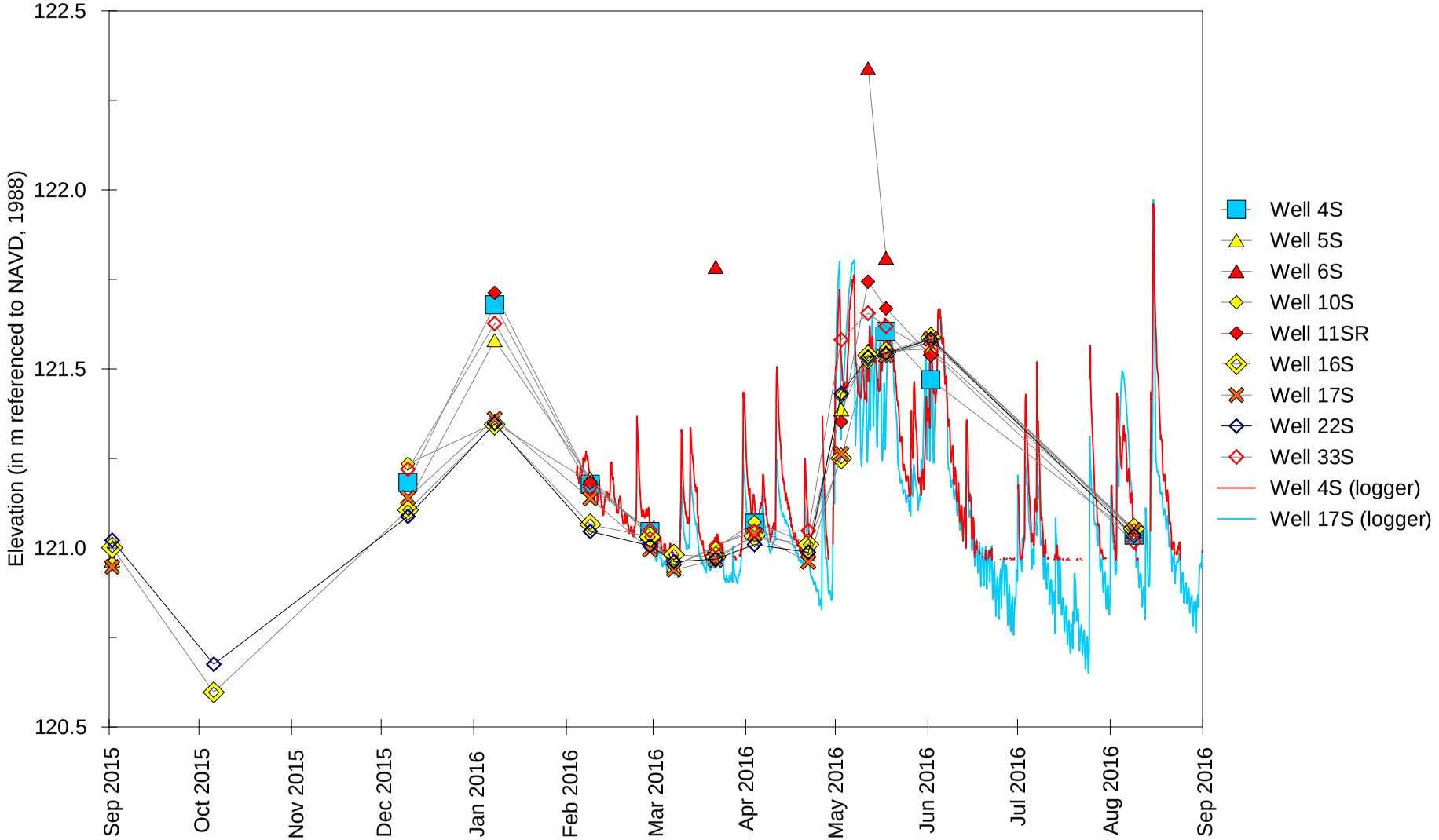


Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016



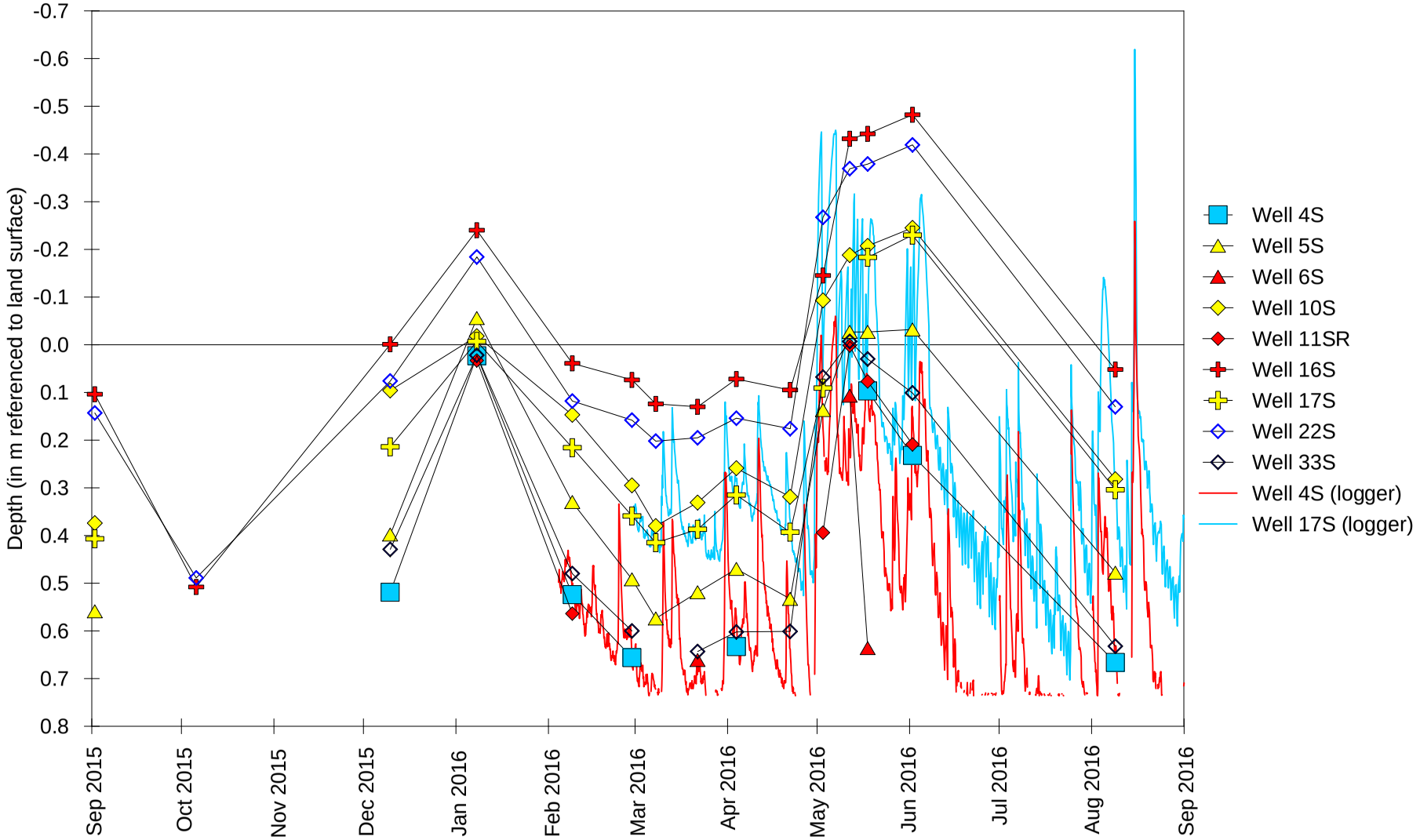
Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells



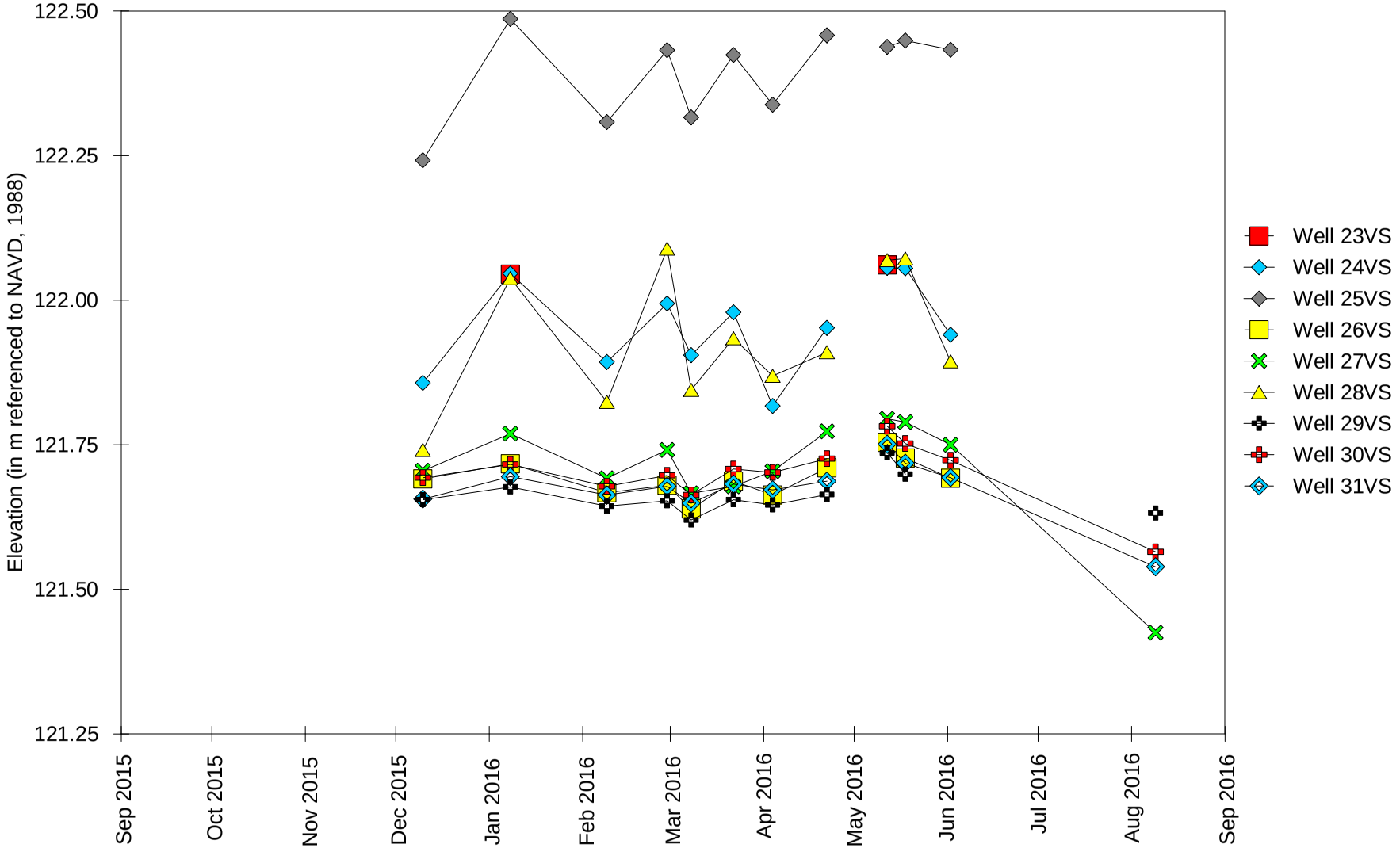
Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells



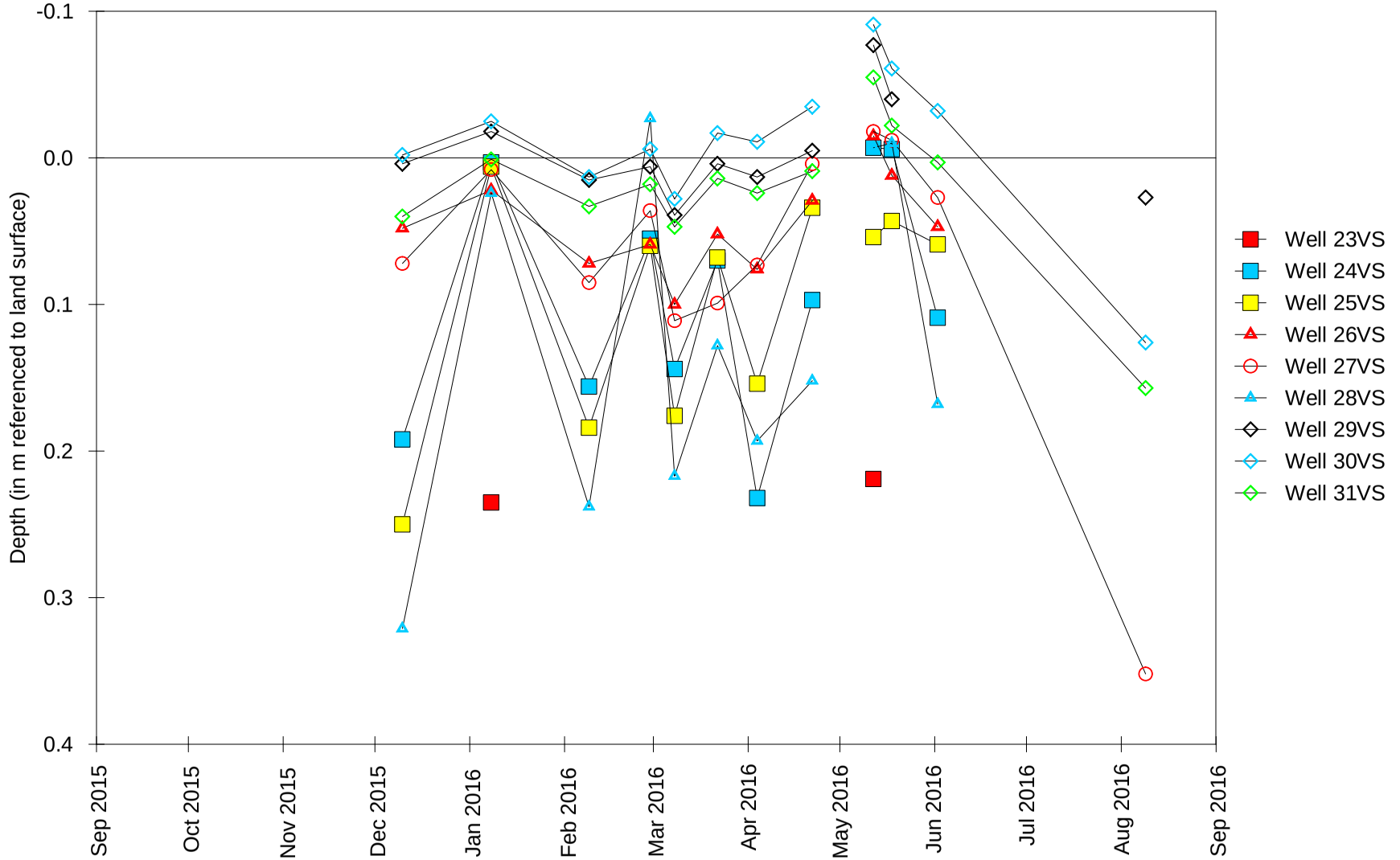
Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Very Shallow Monitoring Wells



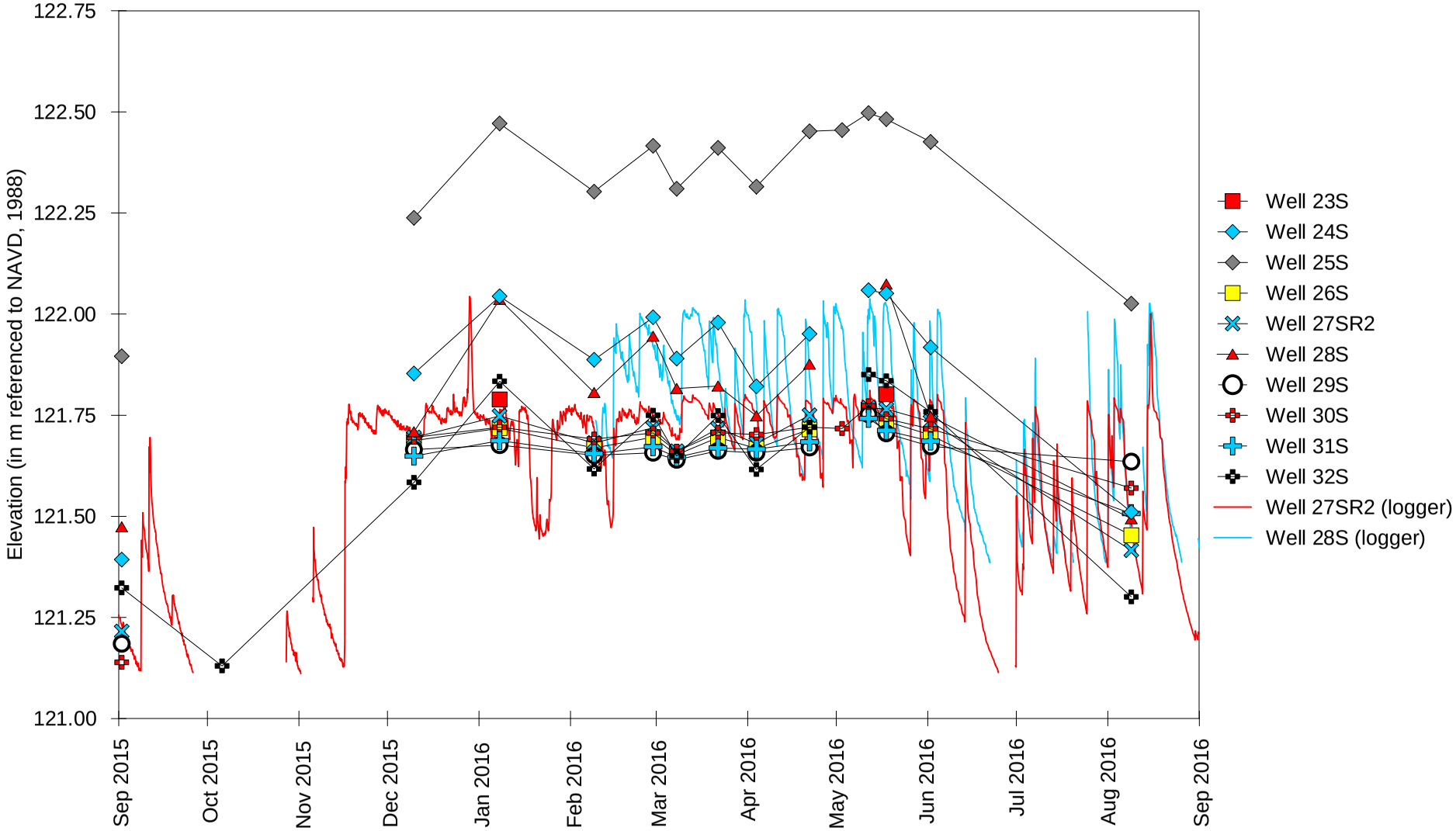
Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Very Shallow Monitoring Wells



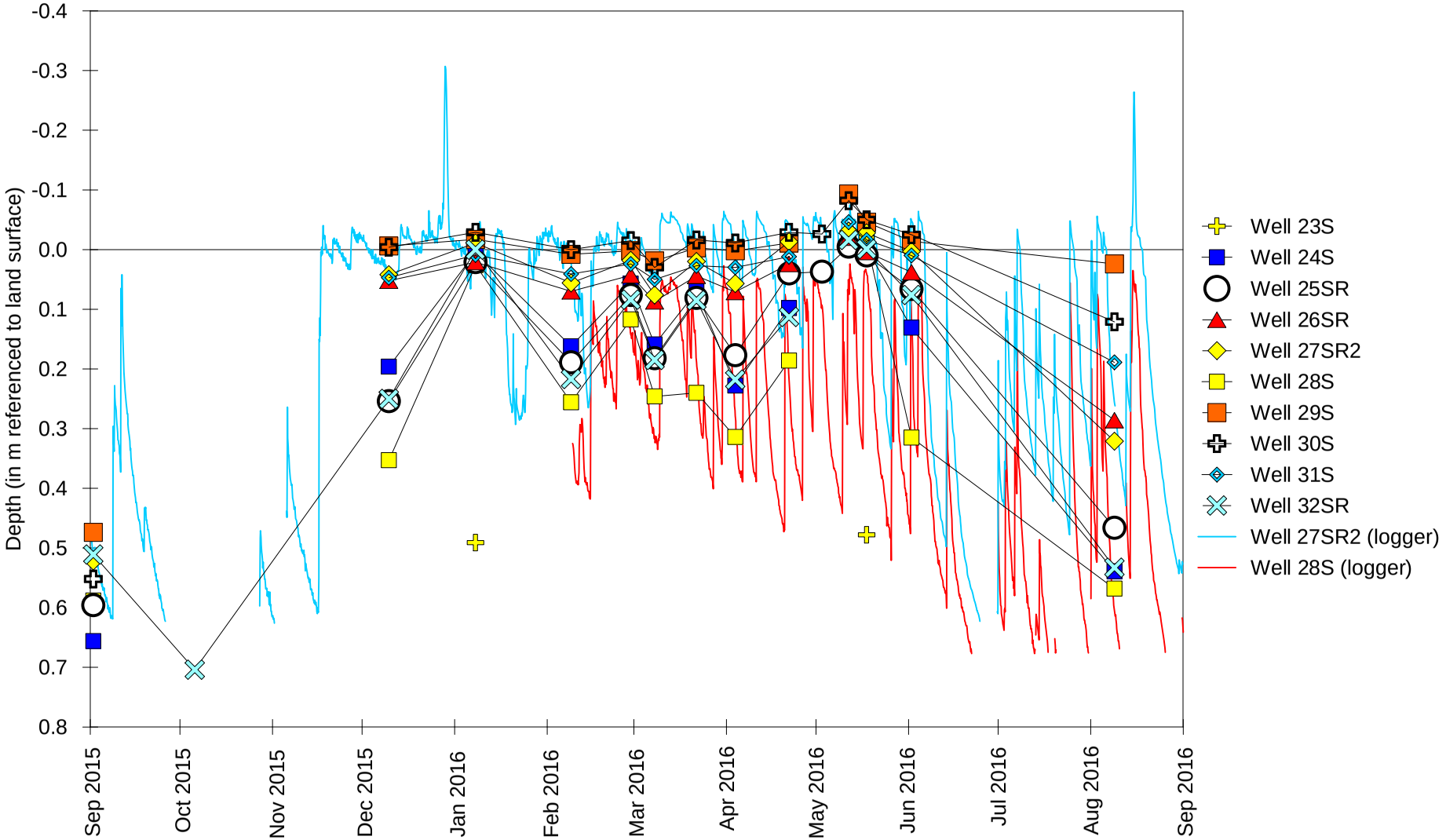
Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells



Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

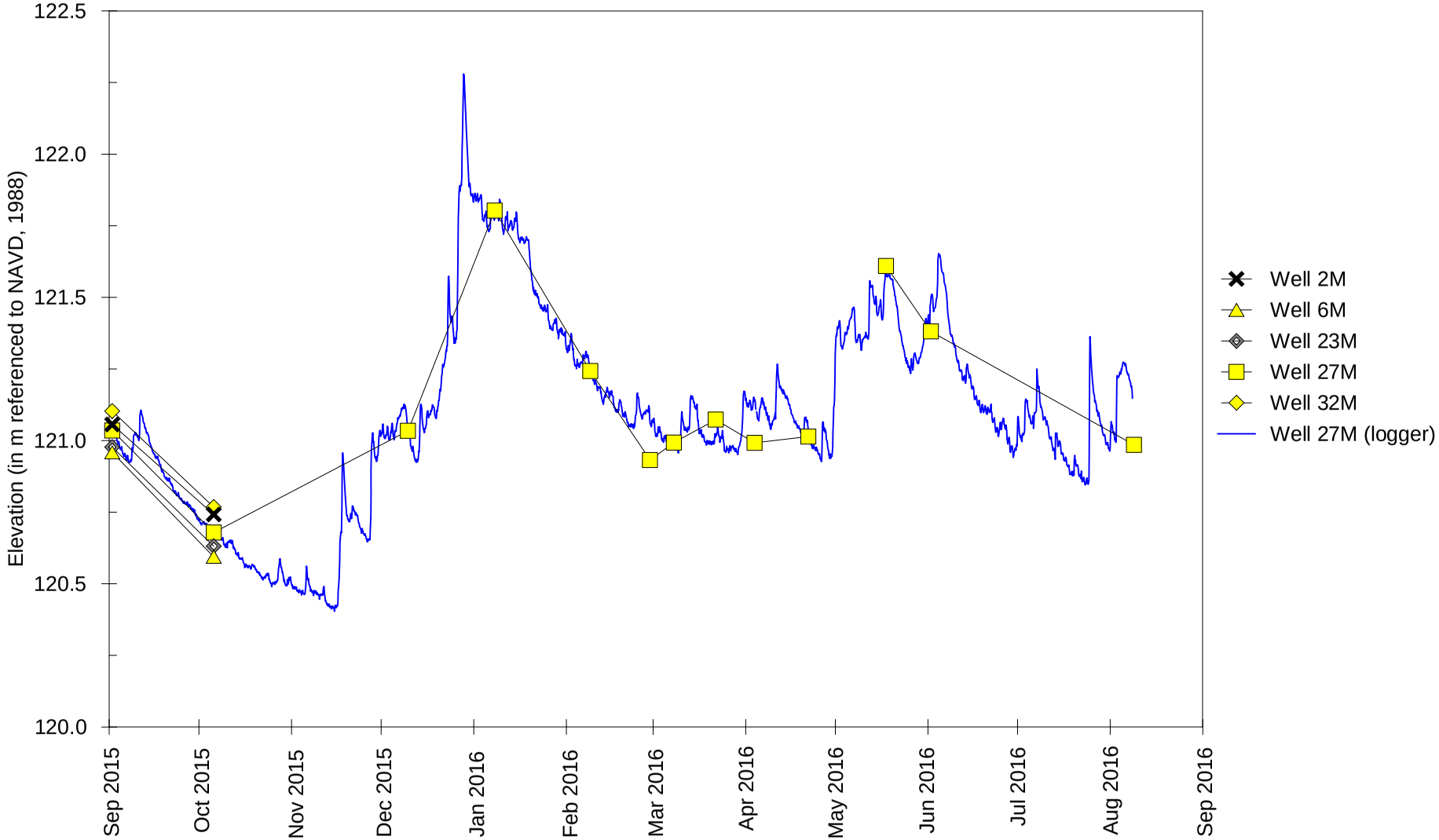
Depth to Water
in Shallow Monitoring Wells



09

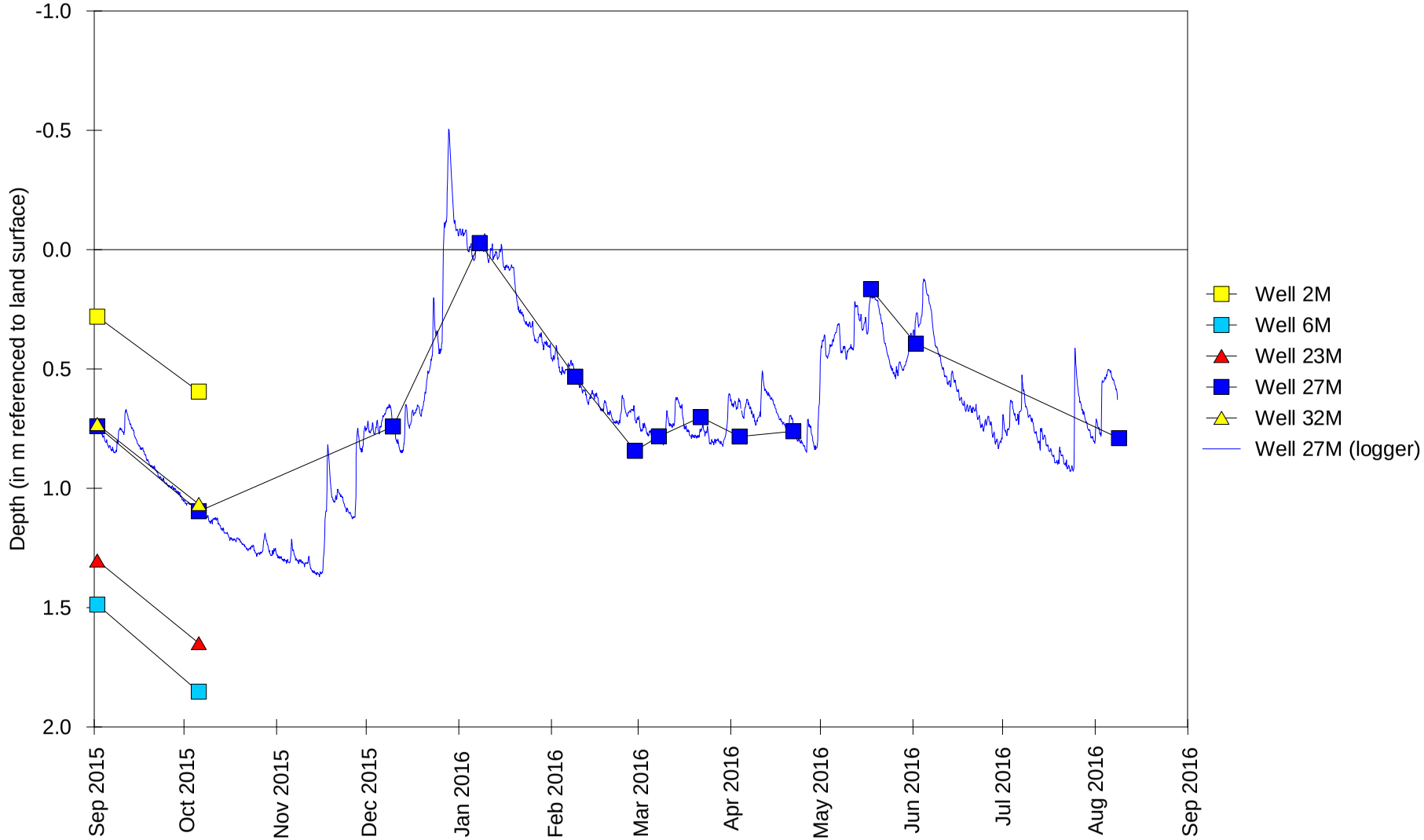
Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Deepest Monitoring Wells



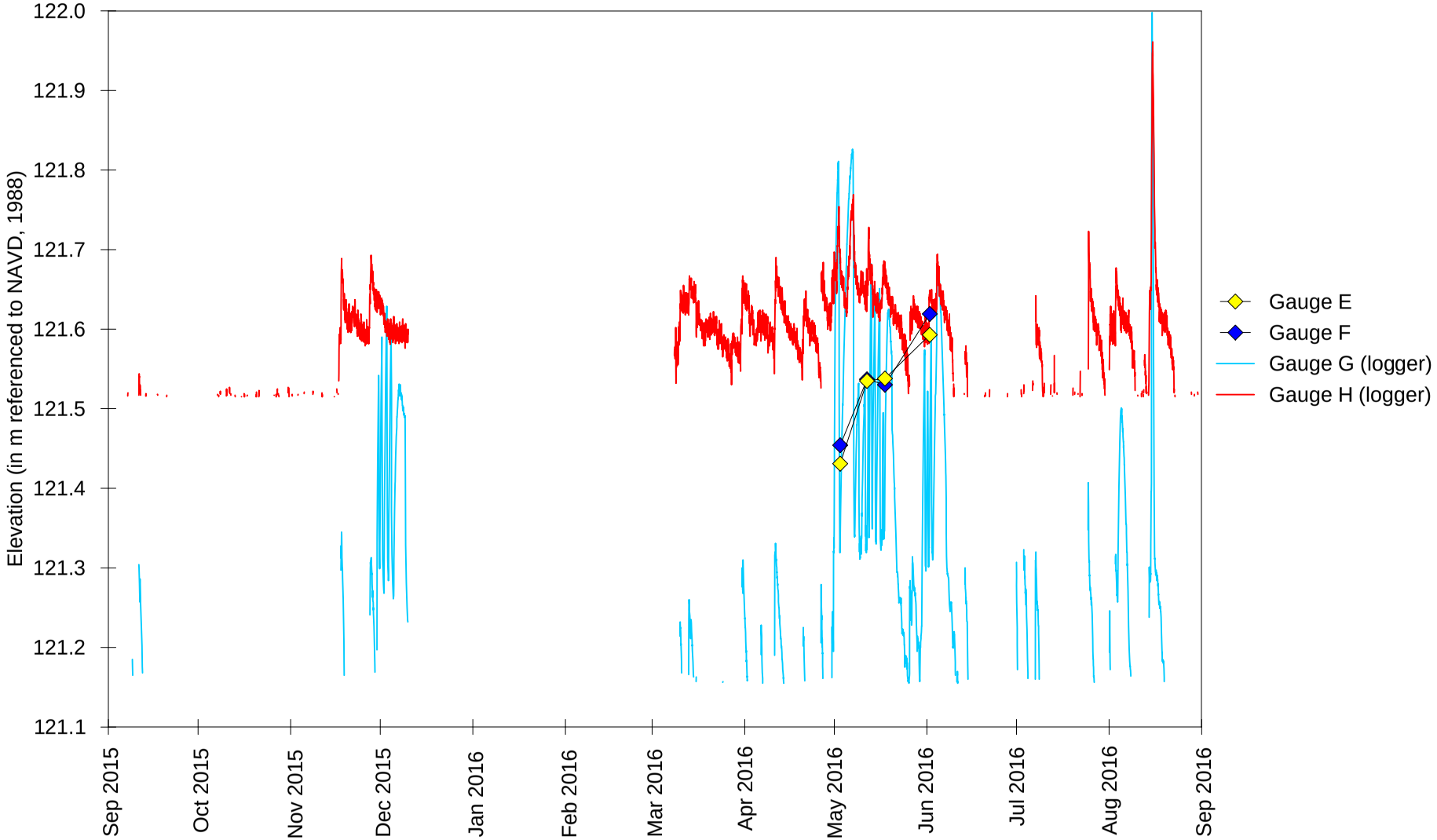
Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Deeper Monitoring Wells

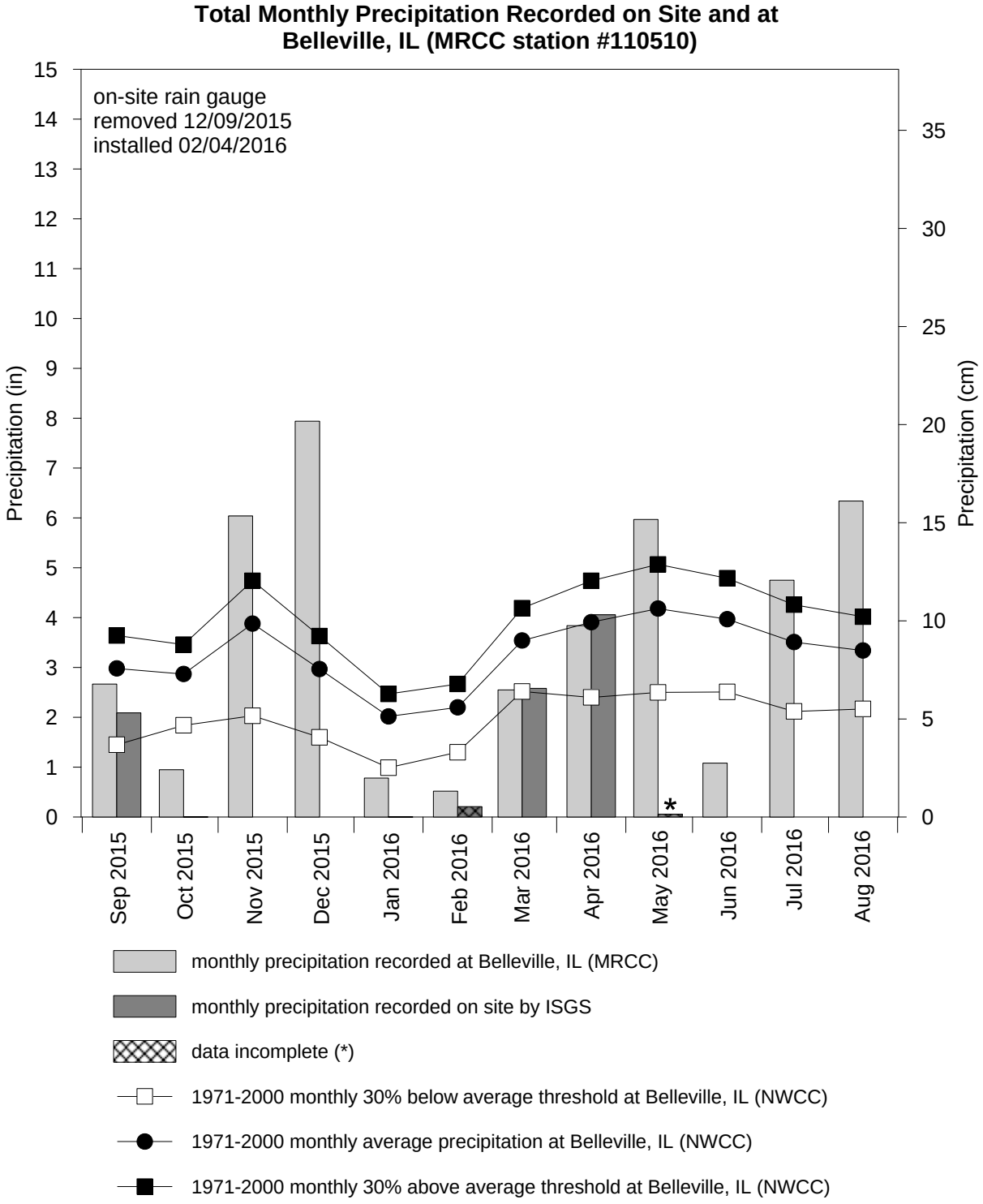


Former Tiernan Property Potential Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Former Tiernan Property Potential Wetland Mitigation Site
September 2015 through August 2016



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: The ISGS submitted an initial site evaluation report to IDOT.
- March 2007: The 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: The 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 2016

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), 29.42 ha (72.71 ac) of the total bank area of 42.57 ha (105.20 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season, and 26.13 ha (64.57 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 29.42 ha (72.71 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 2016). 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 28 was the starting date of the 2016 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 137% of normal, and Spring 2016 (March through May) precipitation was 127% of normal. Precipitation during July and August 2016 was particularly excessive with 308% of normal rainfall.
- Sugar Camp Creek flooded some portion of the site 13 times during the monitoring year with five floods occurring during the growing season. None of these floods lasted long enough to satisfy wetland hydrology criteria.

- Peak hydroperiod during the growing season for Phase 1 occurred in mid-May 2016 due to a combination of frequent rainfall, a flood on May 12 that briefly inundated most if not all of the Phase 1 area, and post-flood inundation. The outlet at the southwest corner of Phase 2 was blocked from mid-November 2015 through late March 2016. As a result, peak hydroperiod during the growing season occurred during March in the southern portion of Phase 2.

- In 2016, 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 21 of 29 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 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 5 and Phase 2 is in year 3 of post-construction monitoring. Therefore, we present wetland hydrology acreage separately for each phase in this section. Using the 1987 Manual (Environmental Laboratory 1987), 14.37 ha (35.50 ac) of Phase 1 and 15.06 ha (37.21 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 5% of the growing season, and 11.88 ha (29.35 ac) of Phase 1 and 14.26 ha (35.23 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement, 14.37 ha (35.50 ac) of Phase 1 and 15.06 ha (37.21 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 2016.

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2016

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

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
43S	Y	N	Y
44S	Y	N	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

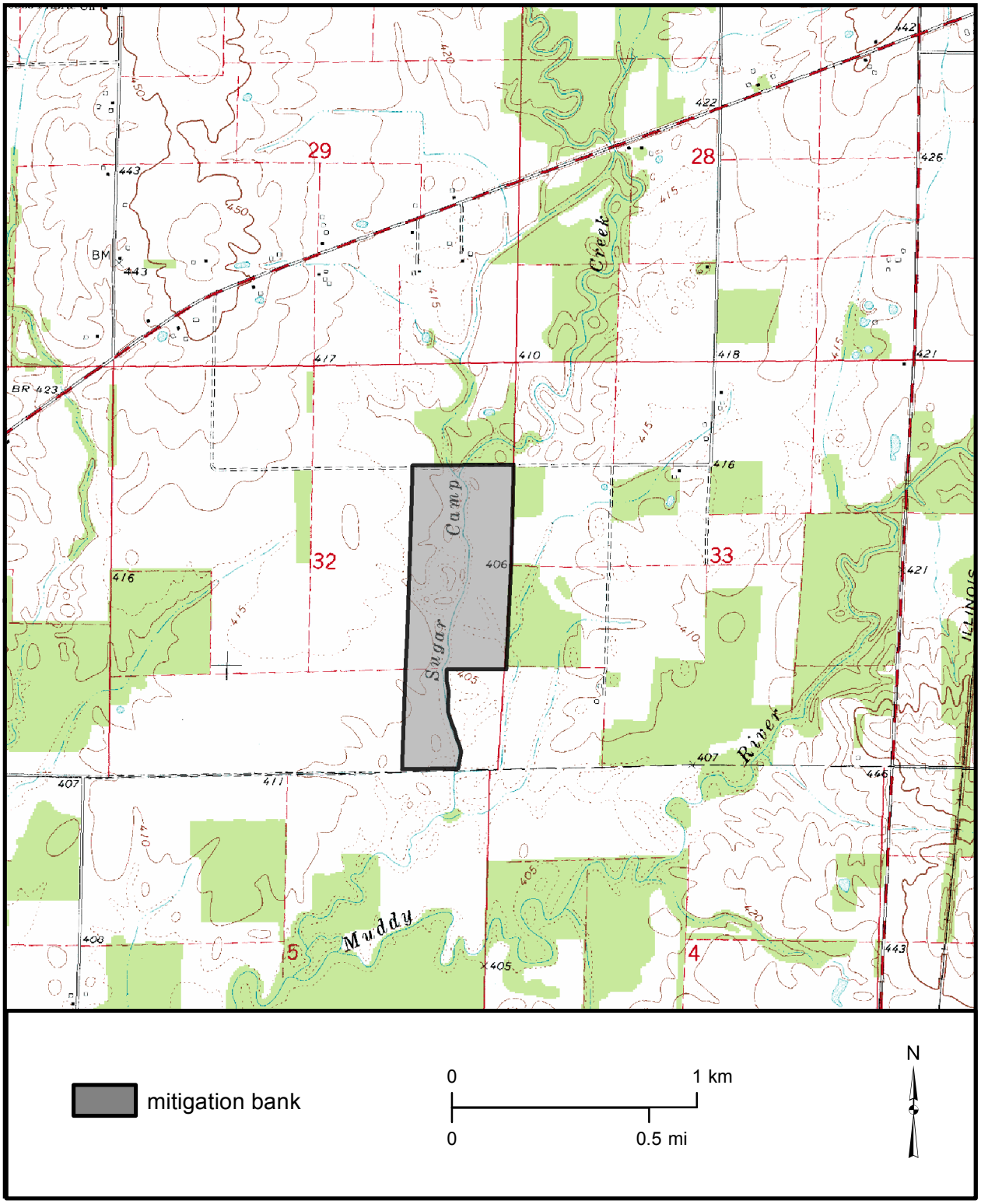
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
A	n/a	n/a	n/a
L	124.06 m (407.02 ft)	124.06 m (407.02 ft)	124.06 m (407.02 ft)
M	123.63 m (405.61 ft)*	123.62 m (405.58 ft)*	123.87 m (406.63 ft)*
N	124.01 m (406.86 ft)	123.94 m (406.63 ft)	123.94 m (406.63 ft)
O	124.14 m (407.28 ft)	124.14 m (407.28 ft)	124.14 m (407.28 ft)
P	124.01 m (406.86 ft)	124.01 m (406.86 ft)	124.01 m (406.86 ft)

* – surface-water levels were elevated due to blockage of the outlet at the southwest corner of the site
n/a – logger was removed during the growing season; not enough 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

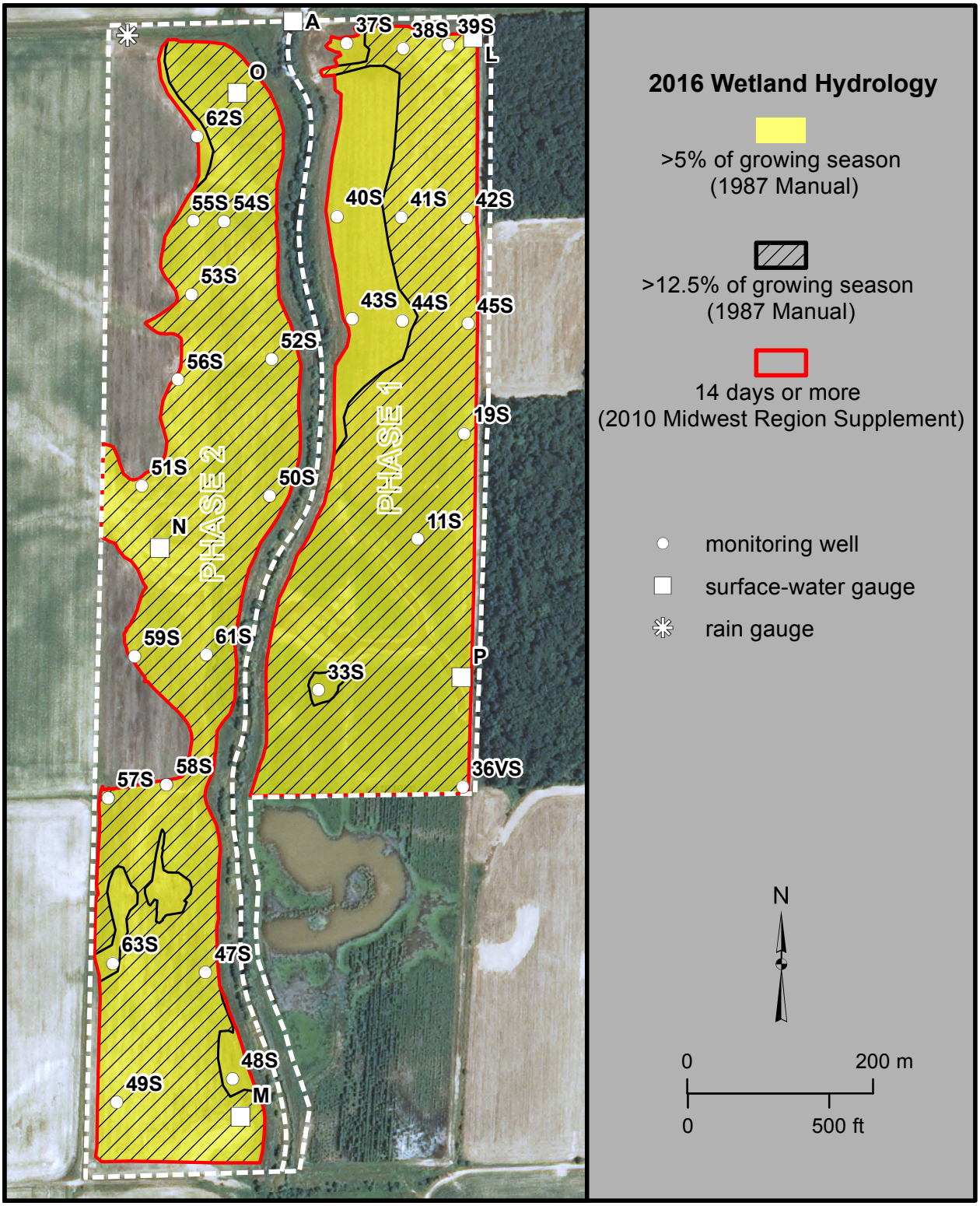


Sugar Camp Creek Wetland and Stream Mitigation Bank

Estimated Areal Extent of 2016 Wetland Hydrology

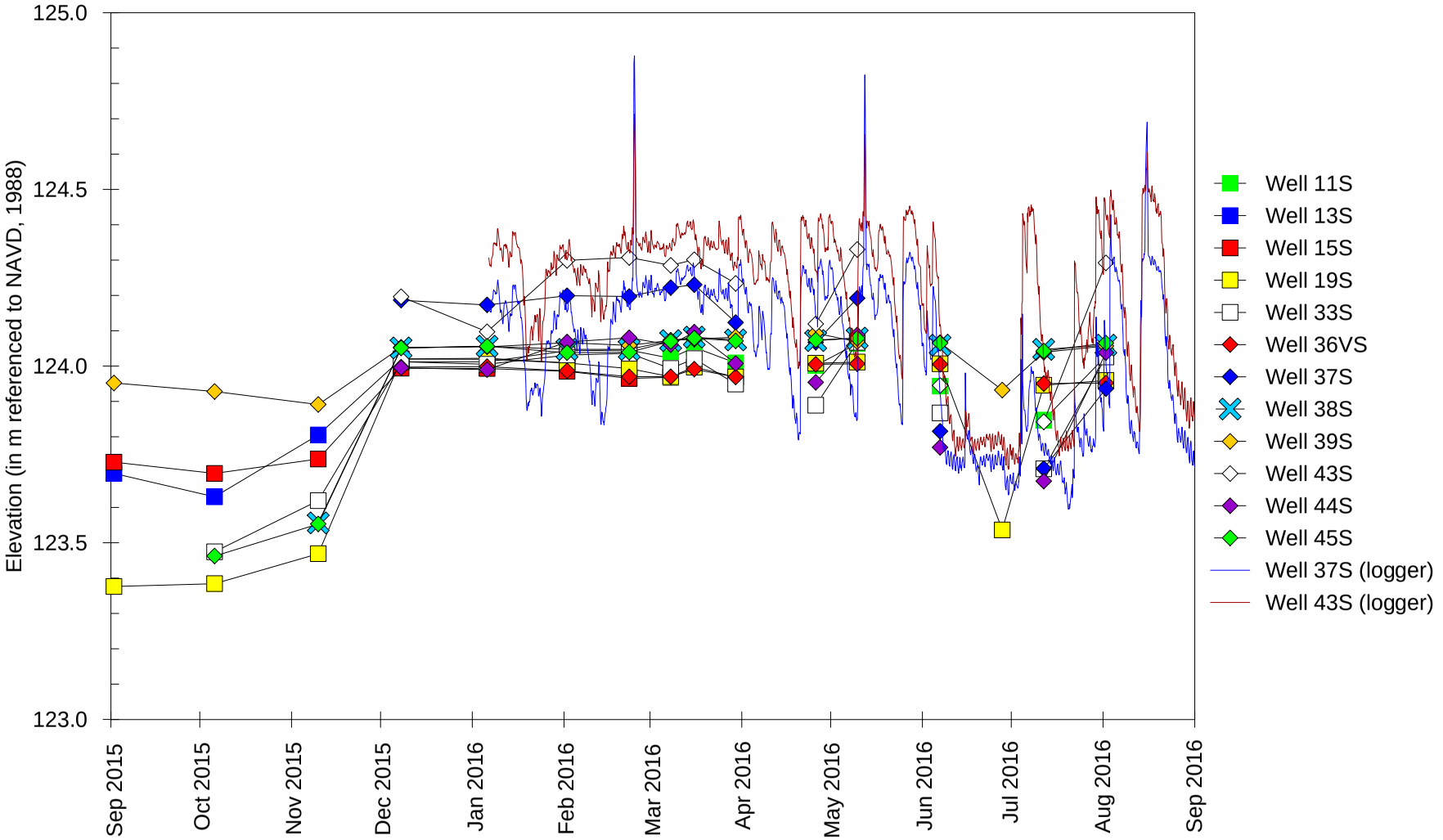
September 1, 2015 through August 31, 2016

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



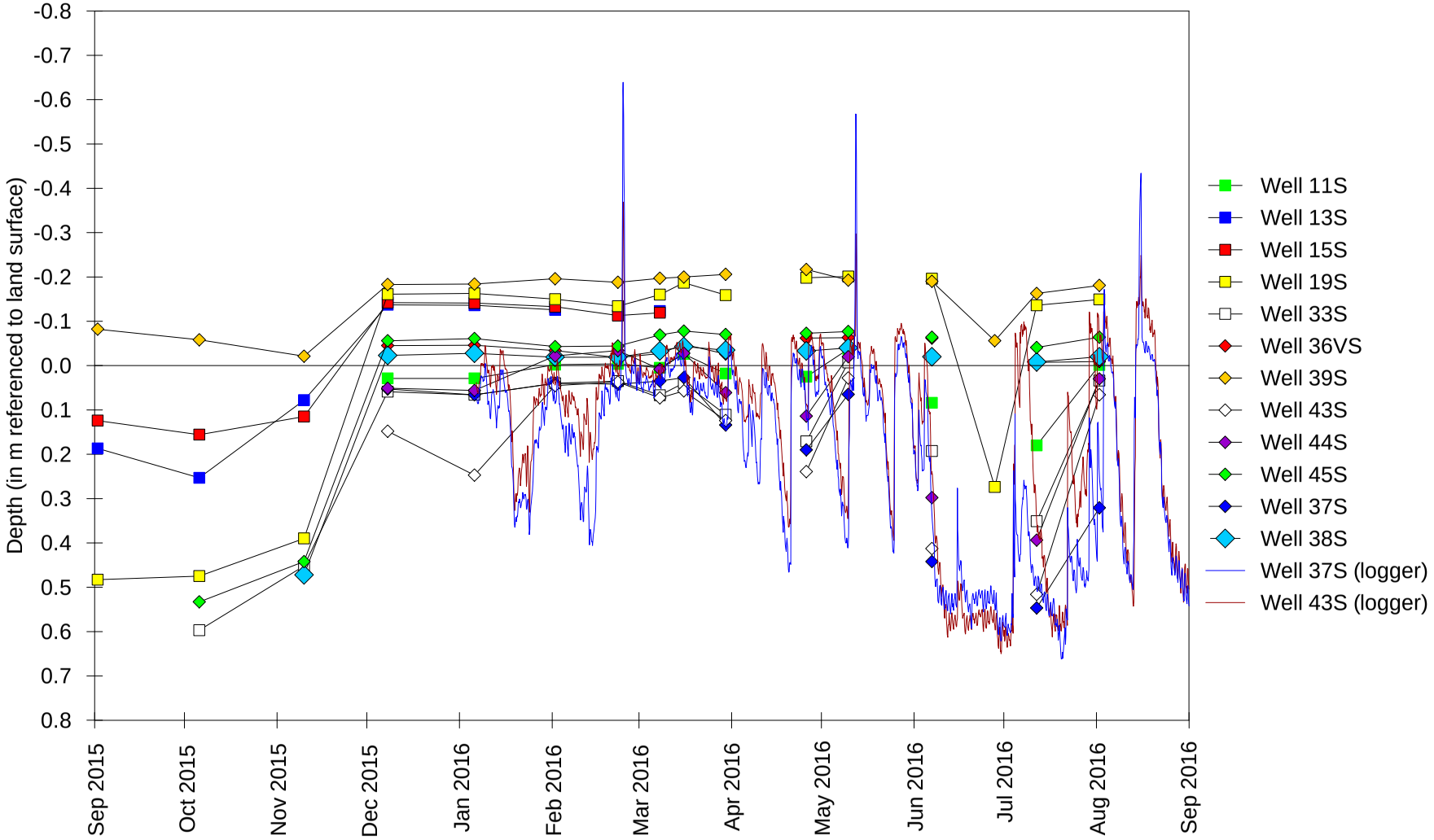
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells in Phase I



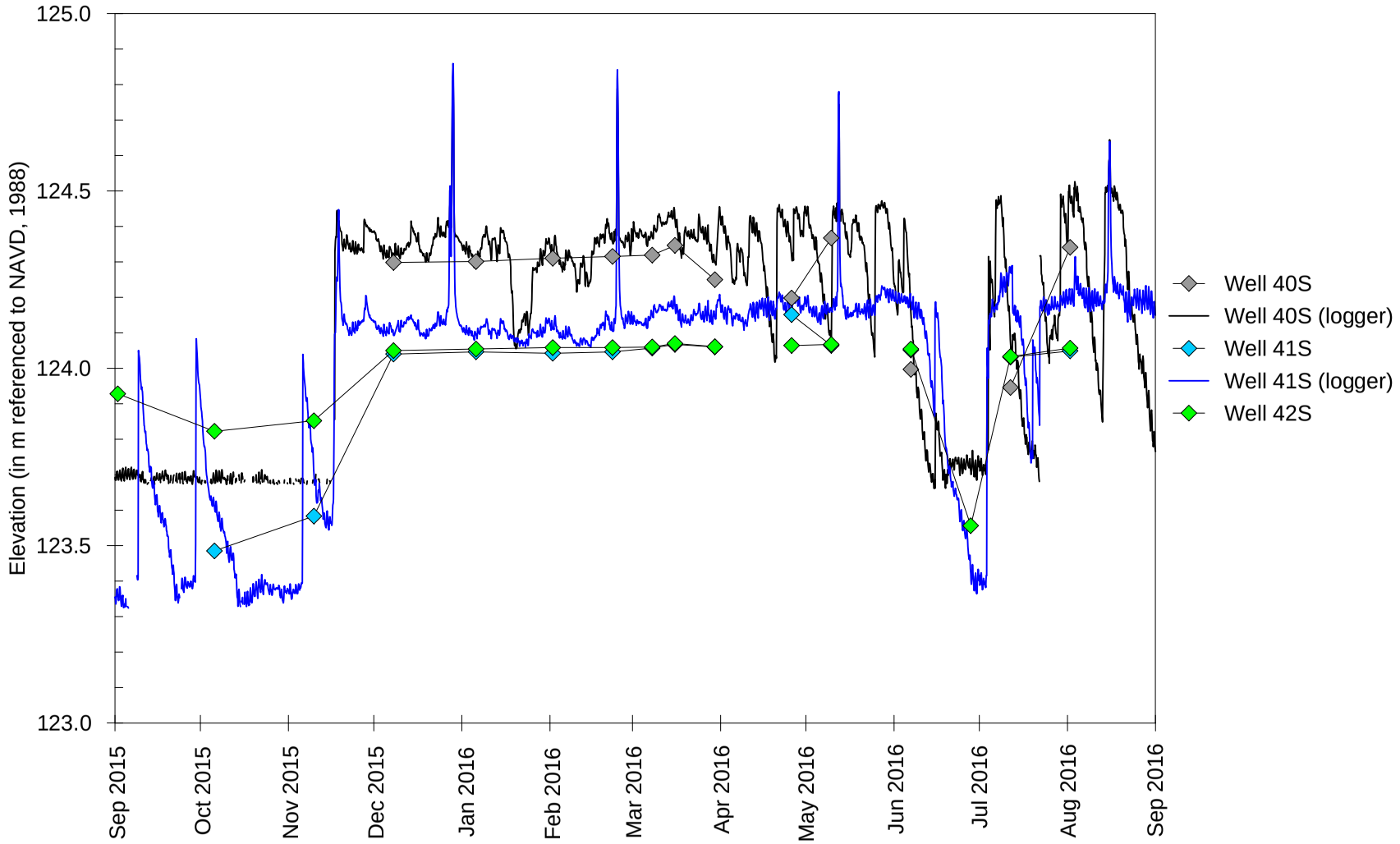
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells in Phase I



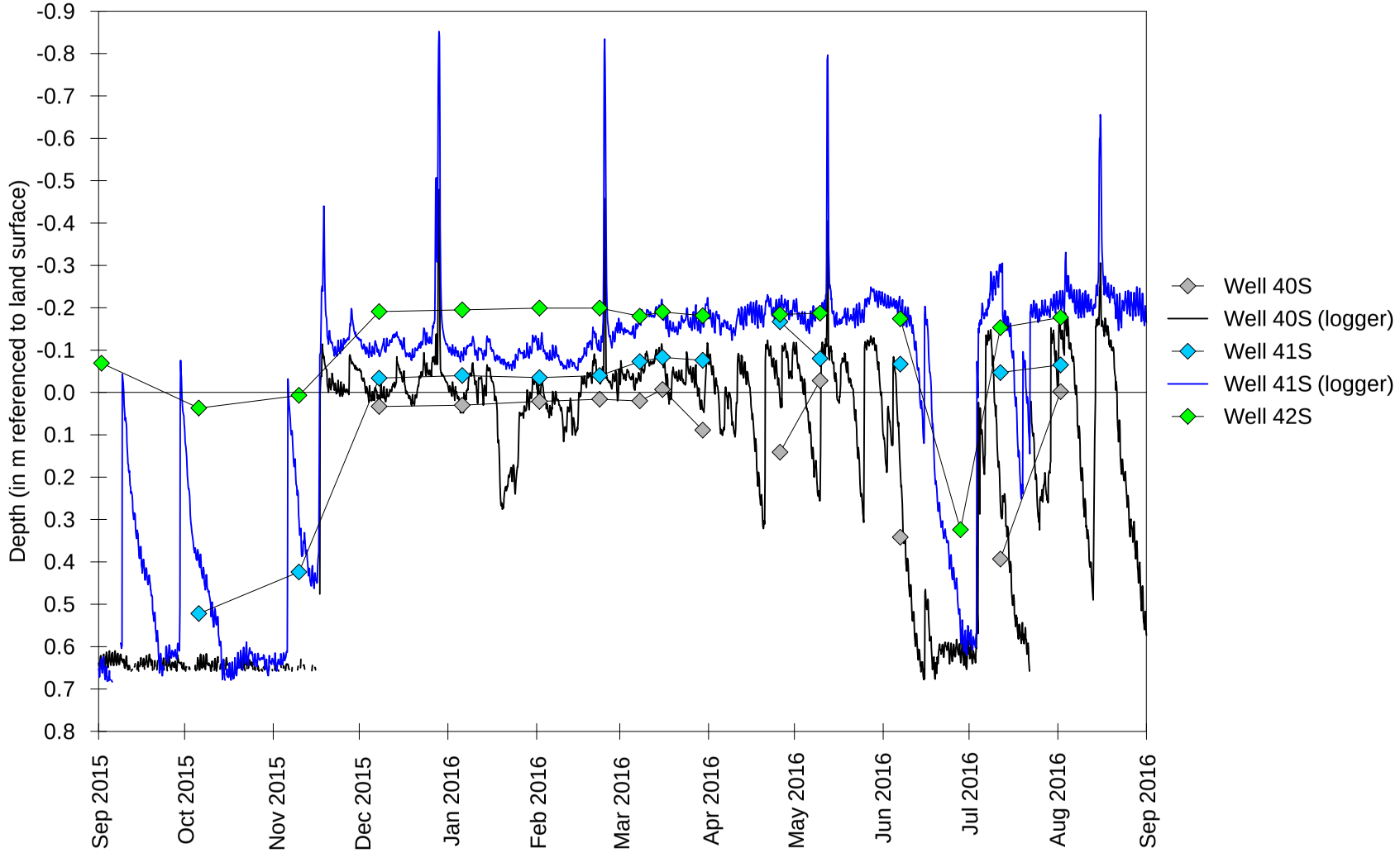
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells in Phase I



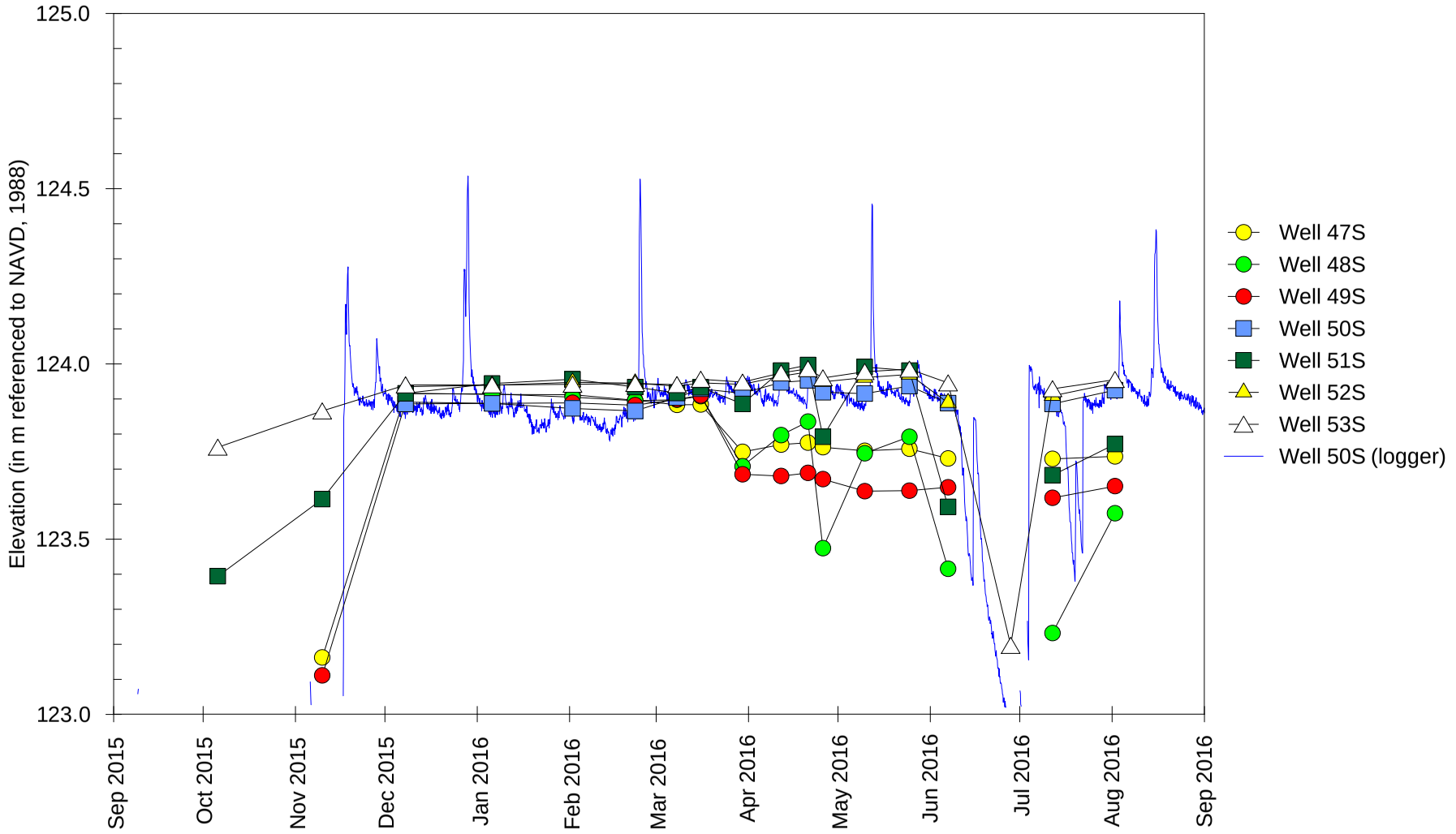
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells in Phase I



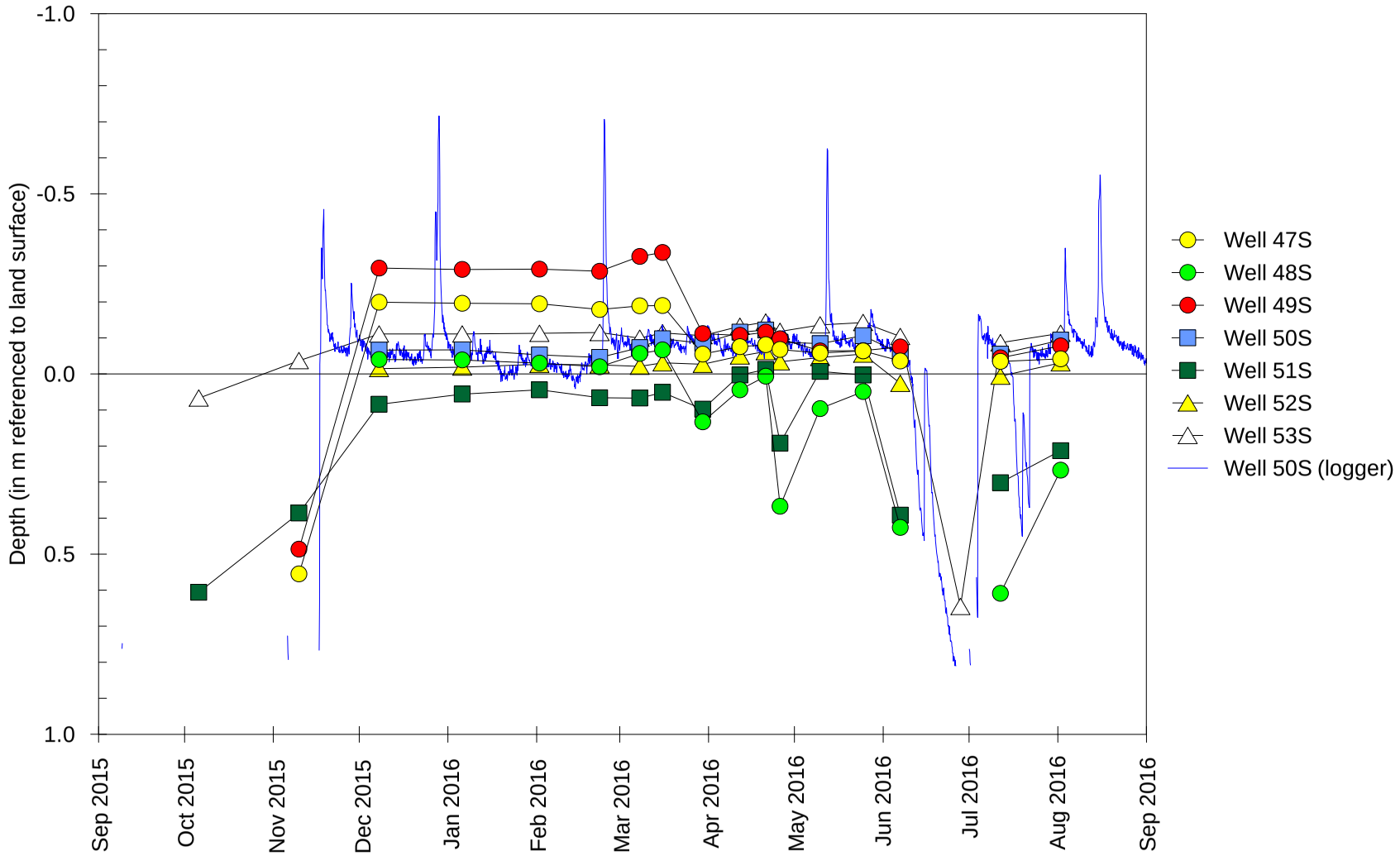
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells in Phase II



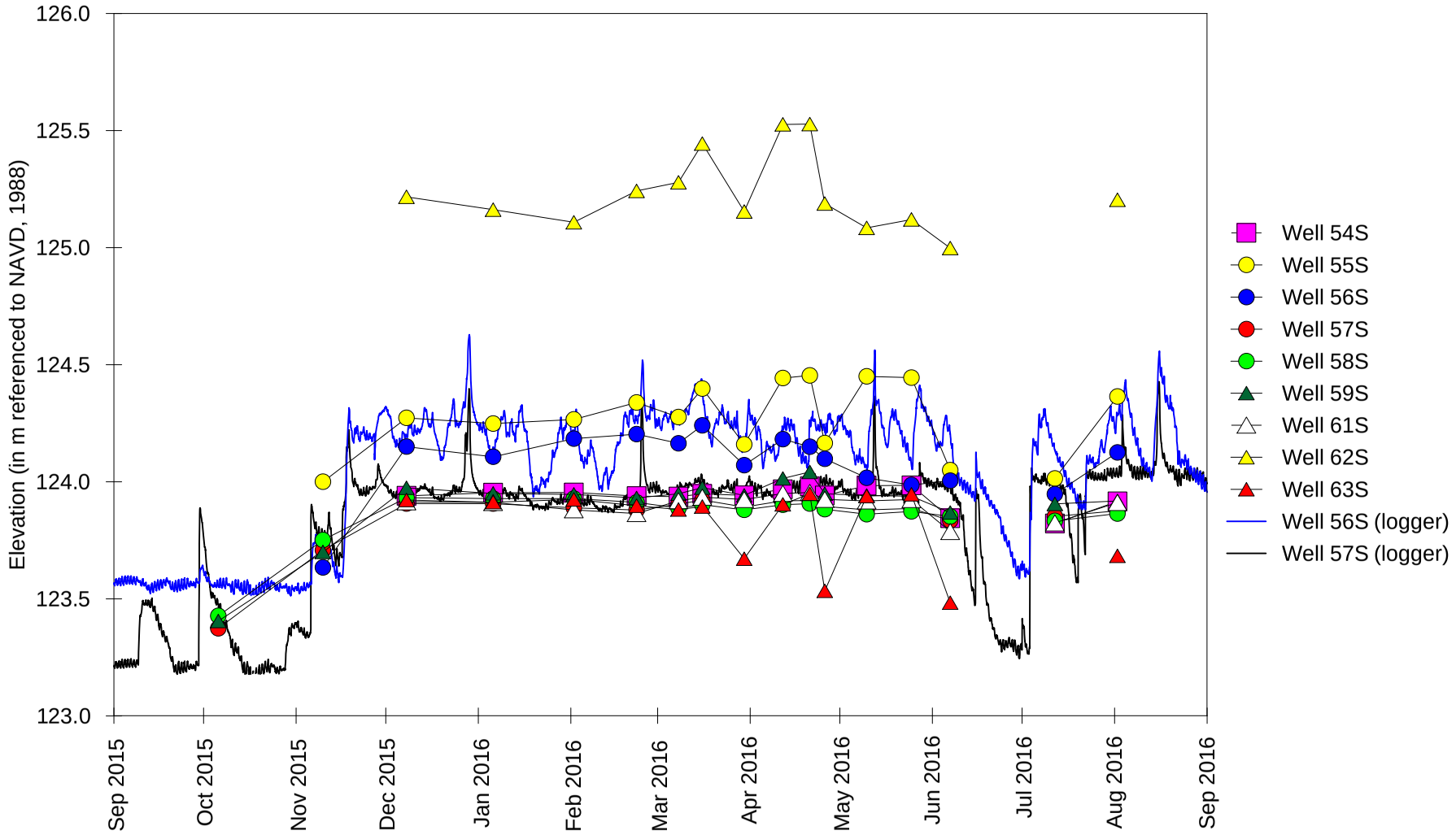
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells in Phase II



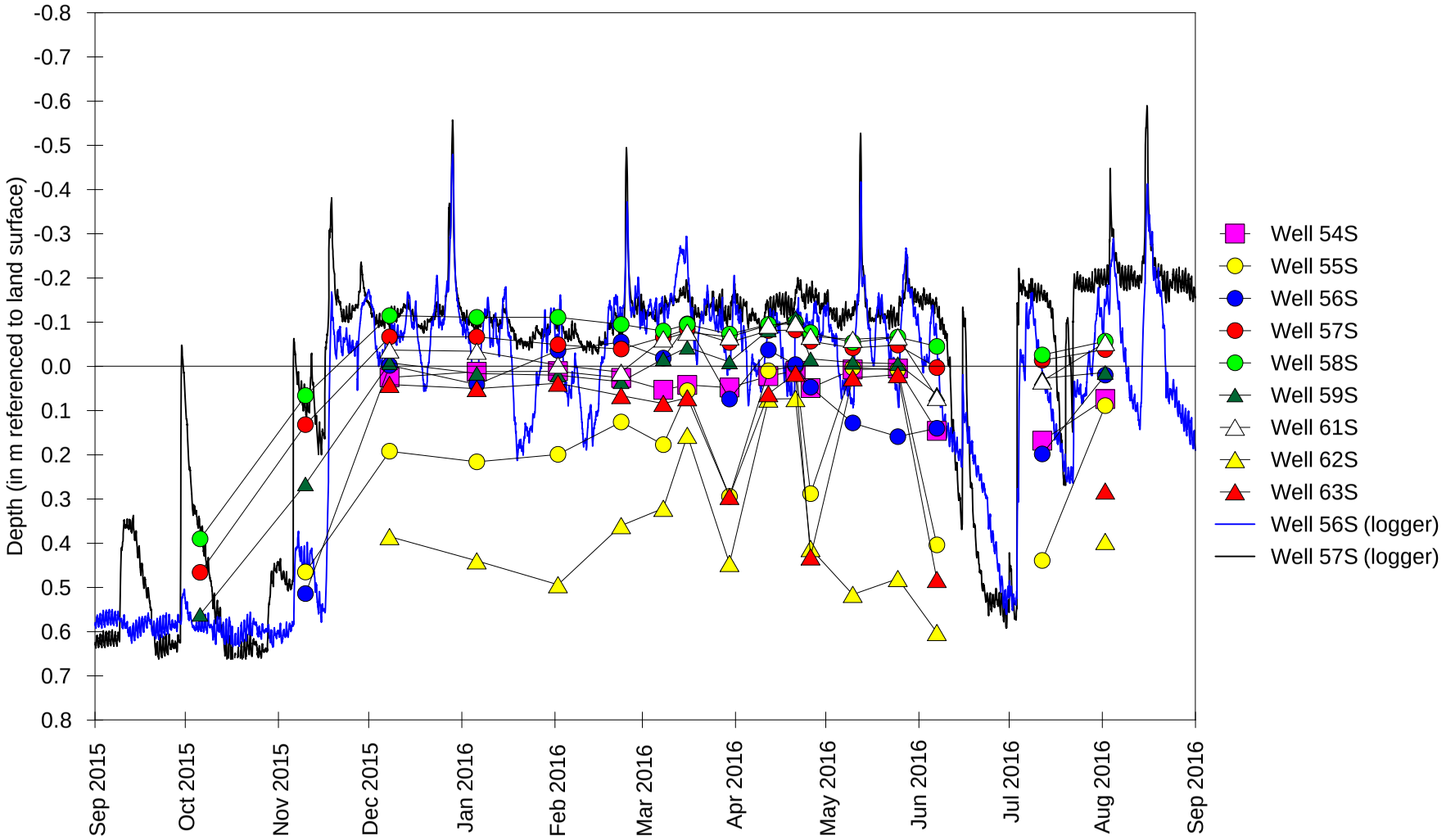
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells in Phase II



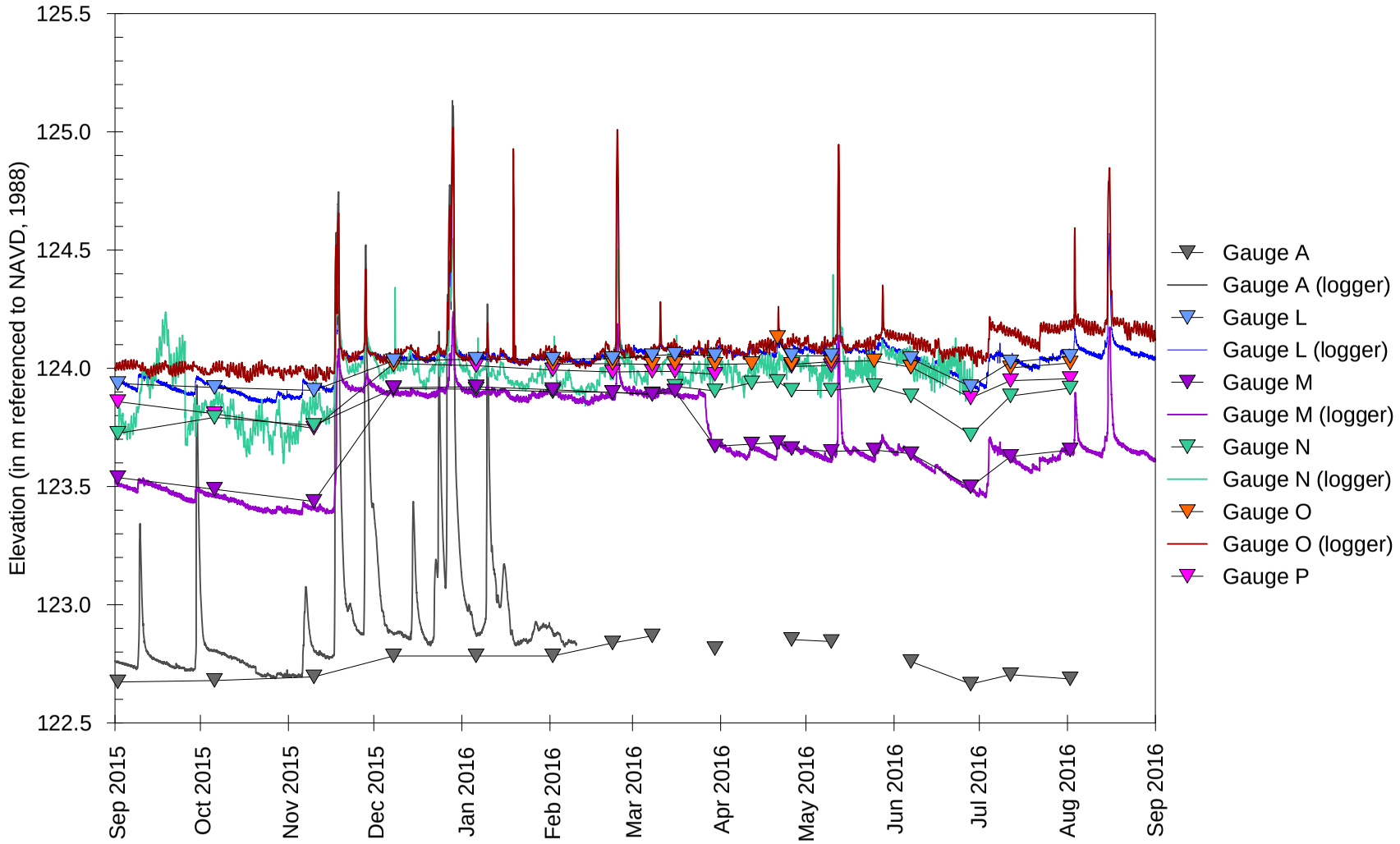
Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells in Phase II

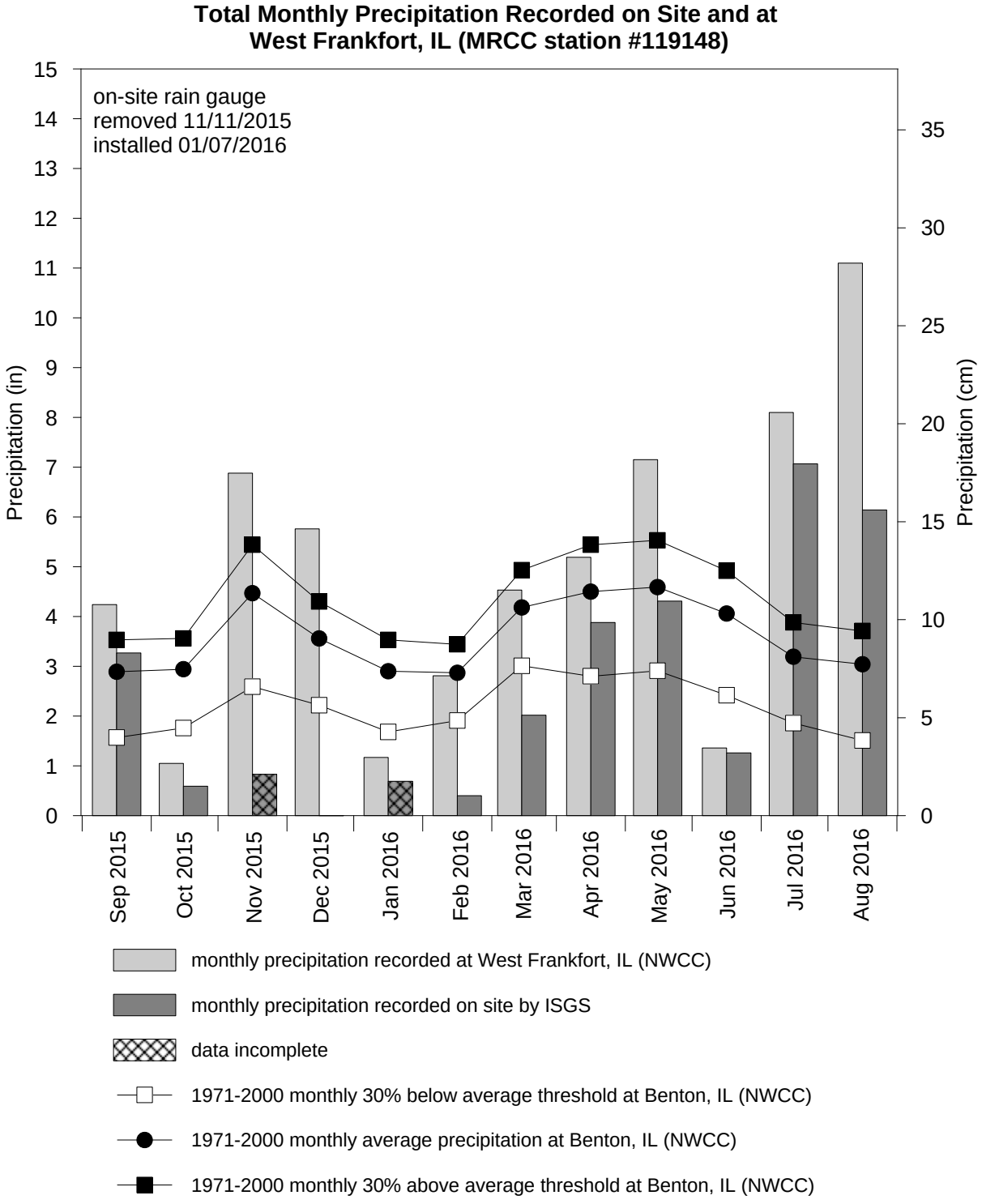


Sugar Camp Creek Wetland and Stream Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Sugar Camp Creek Wetland and Stream Mitigation Bank
September 2015 through August 2016



PYRAMID SITE EC25 **ISGS # 77**
WETLAND MITIGATION SITE
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: The ISGS was tasked by IDOT to monitor wetland hydrology.

- April 2008: The ISGS began on-site monitoring.

WETLAND HYDROLOGY CALCULATION FOR 2016

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), 5.23 ha (12.93 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 2.06 ha (5.10 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 5.21 ha (12.88 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 2016). 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 27 was the starting date of the 2016 growing season based on soil temperatures measured on site.

- Total precipitation for the monitoring period at Du Quoin, Illinois (MRCC station #112483), was 128% of normal. During Spring 2016 (March through May), precipitation was also 128% of normal.

- Using the 1987 Manual, the peak hydroperiod during the growing season occurred between late March and late April due to frequent rainfall, including 1.24 in. of precipitation recorded on site March 30-31, and a flood on Little Galum Creek on March 31. Using the 2010 Midwest Region Supplement, the peak hydroperiod occurred from early to mid-March, as a result of frequent precipitation. Little Galum Creek flooded portions of the site 12 times during the monitoring year, and seven of these floods occurred during the growing season. None of these floods lasted long enough to satisfy wetland hydrology criteria.

- In 2016, water levels measured in 18 of 18 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 8 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 18 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.

PLANNED FUTURE ACTIVITIES

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

WETLAND HYDROLOGY TABLES FOR 2016

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	Y	Y
7VS	Y	Y	Y
8VS	Y	Y	Y
9VS	Y	Y	Y
10S	Y	N	Y
10VS	Y	N	Y
11S	Y	Y	Y
12VS	Y	Y	Y
14VS	Y	Y	Y
15VS	Y	Y	Y

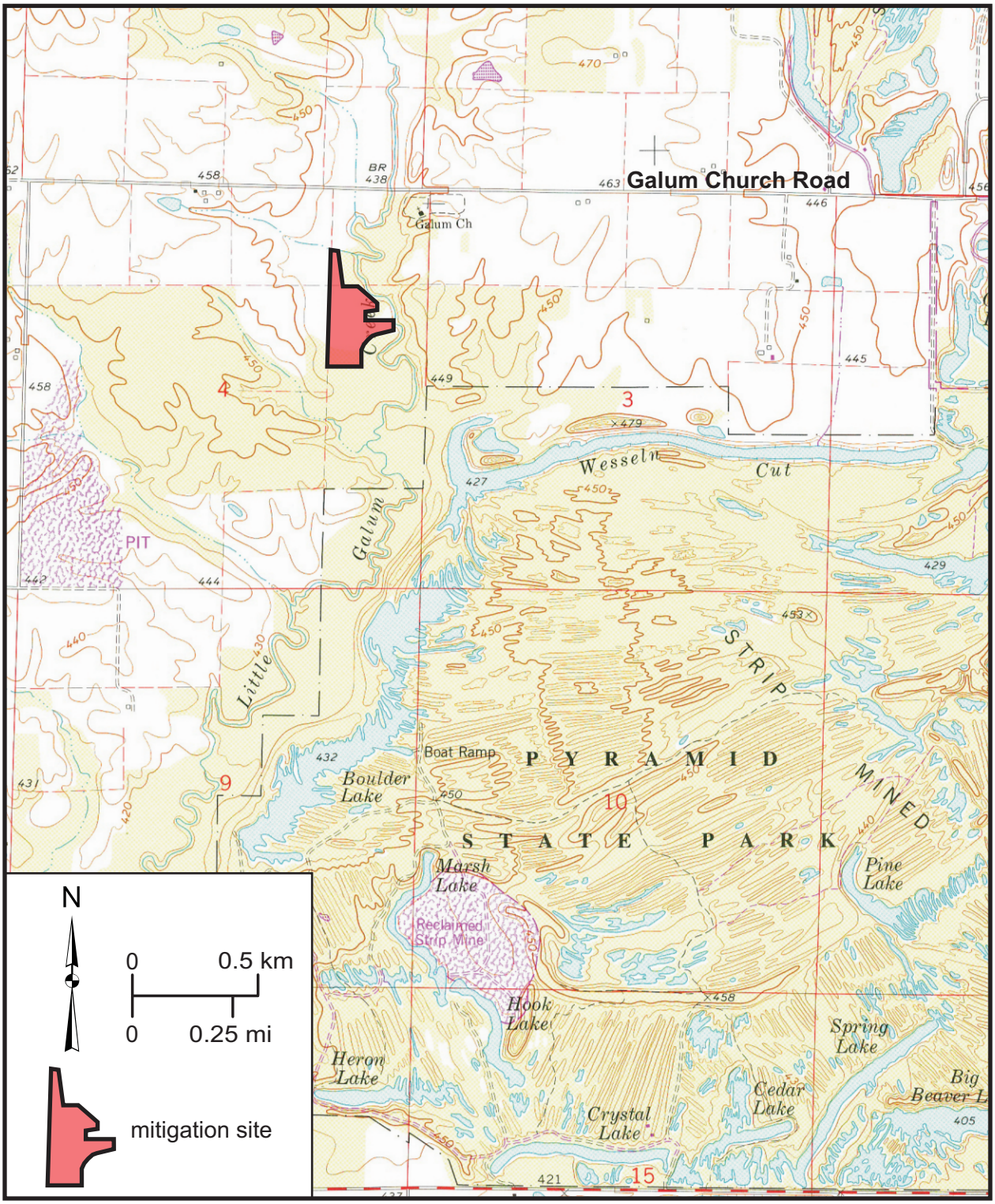
Y – met wetland hydrology criteria
N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
BR	131.65 m (431.92 ft)*	131.58 m (431.69 ft)*	131.67 m (431.99 ft)*

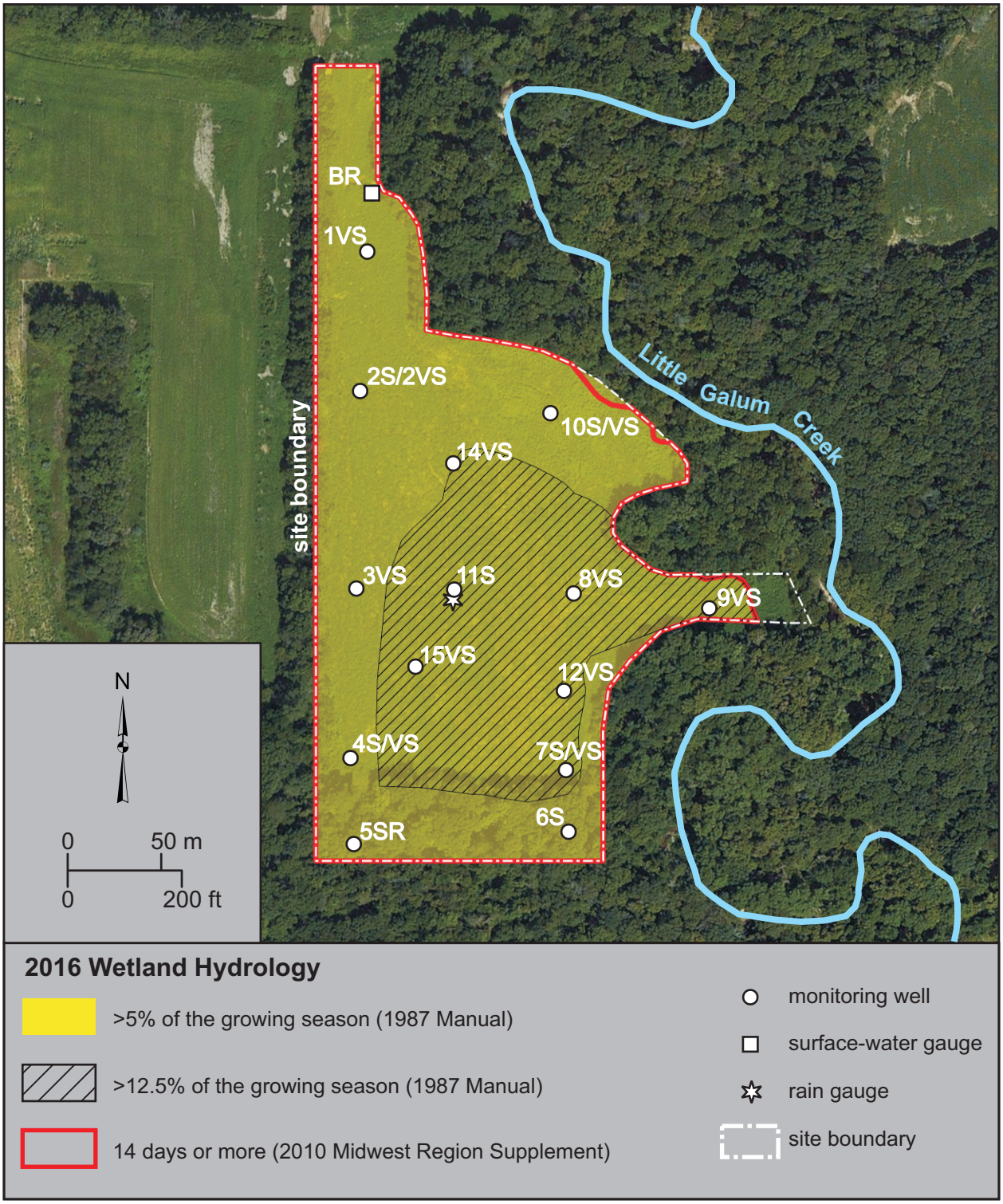
* These elevations represent hydrology in a small, isolated depression surrounding the gauge; the reported elevations do not represent the hydrology of the remainder of the site.

Pyramid Site EC25 Wetland Mitigation Site
(Pyatts Blacktop, FAS 864)
General Study Area and Vicinity

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

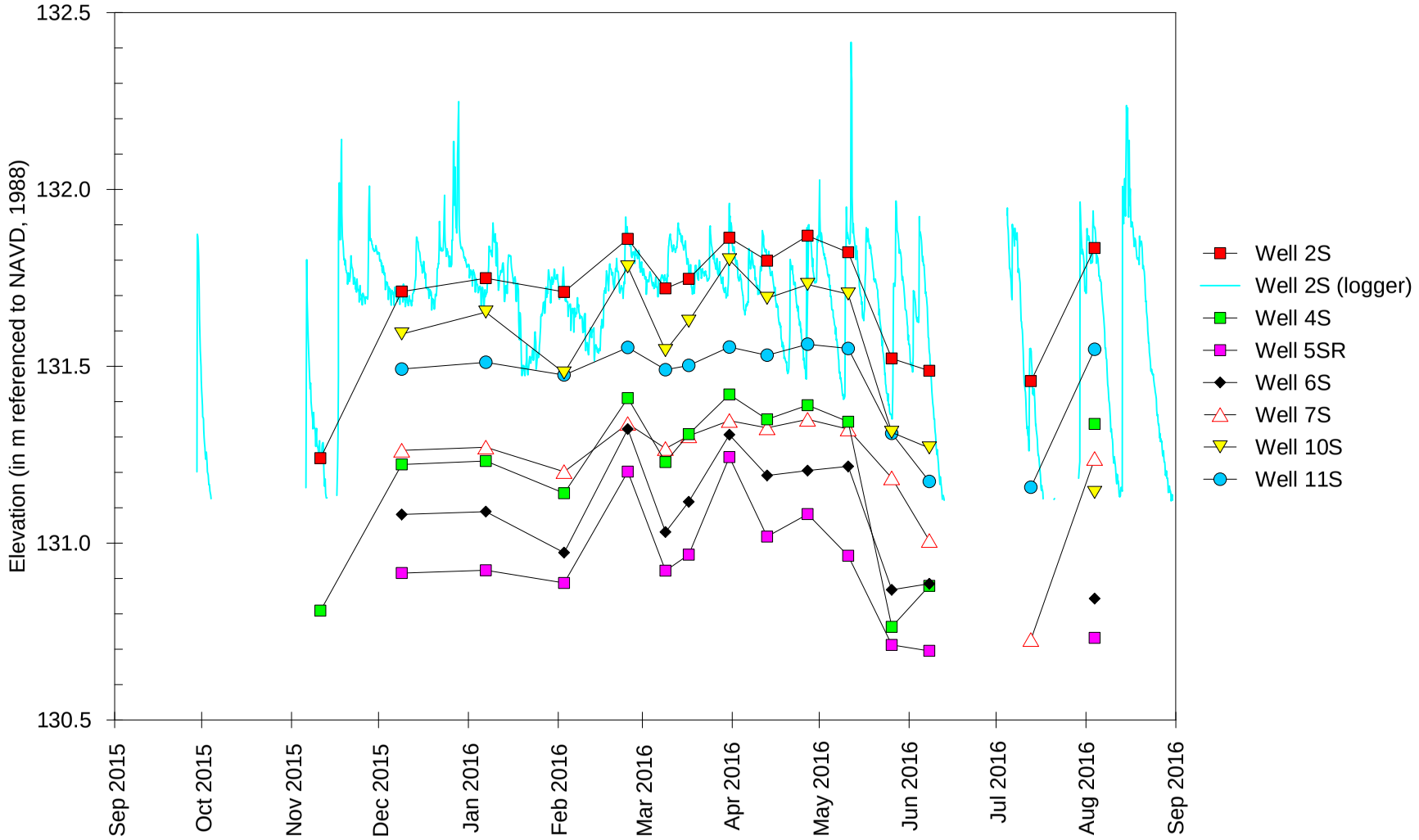


Pyramid Site EC25 Wetland Mitigation Site
(Pyatts Blacktop, FAS 864)
Estimated Areal Extent of 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016
Map based on imagery available from Esri (Esri 2016)



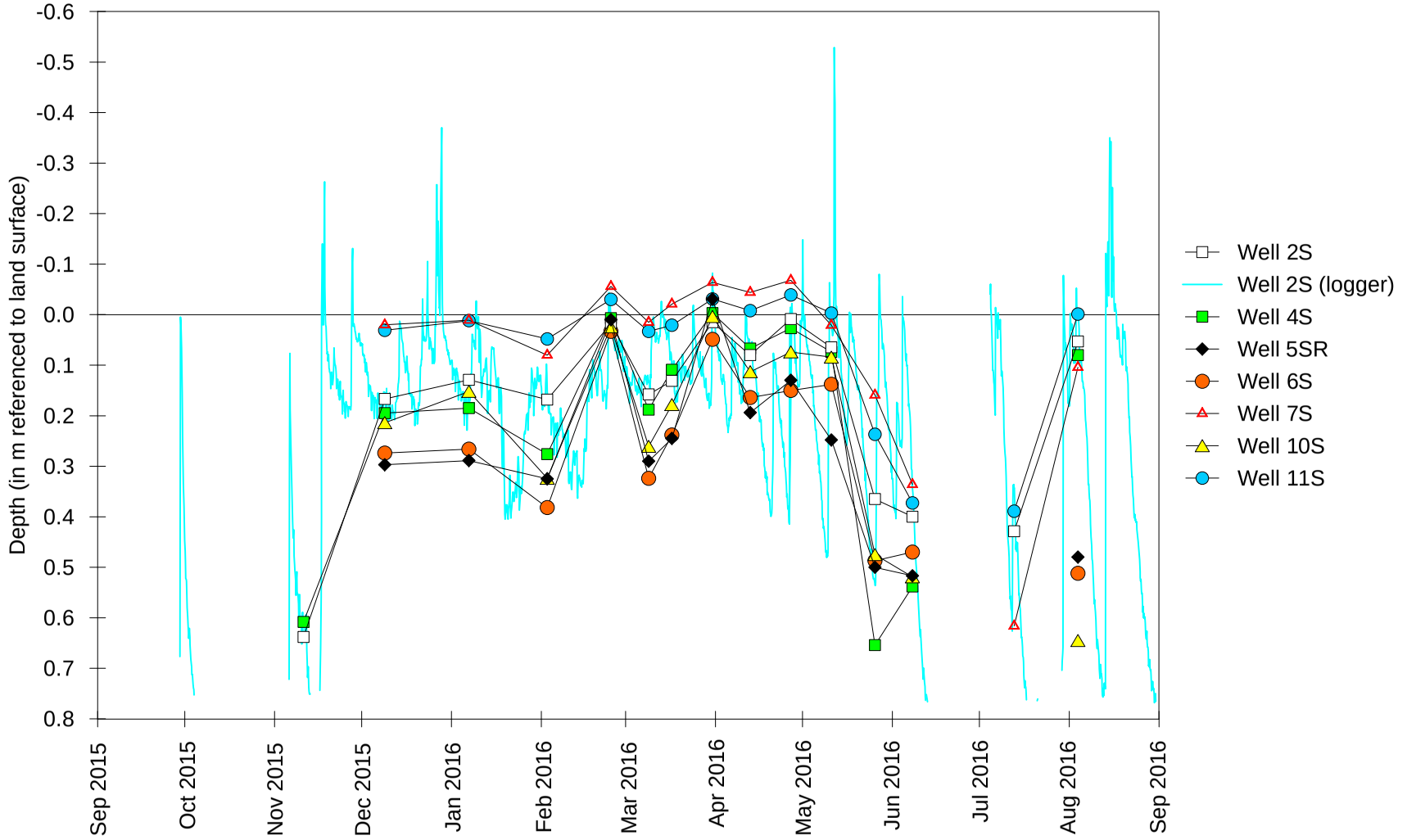
Pyramid Site EC25 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow (S) Monitoring Wells



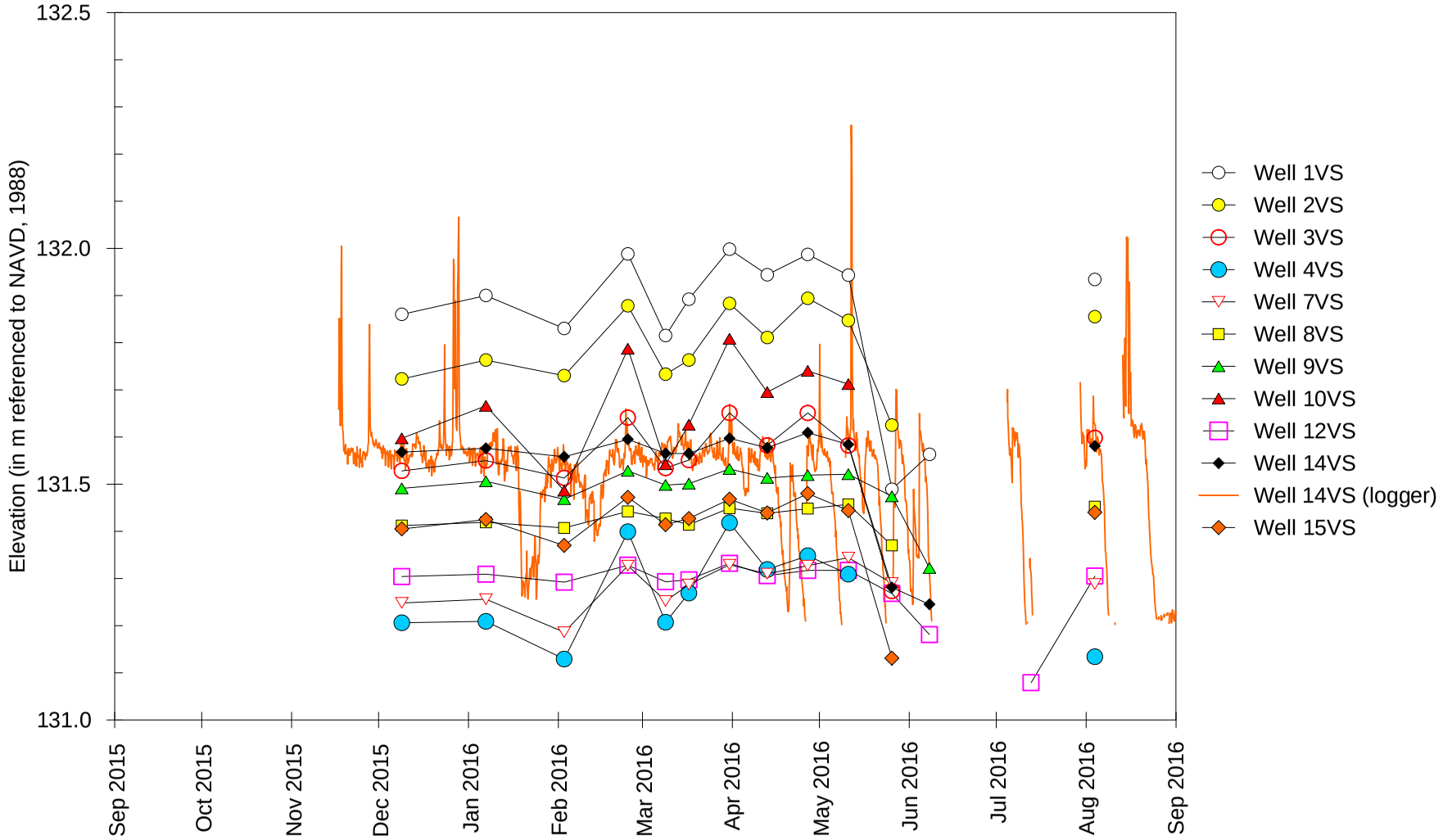
Pyramid Site EC25 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow (S) Monitoring Wells



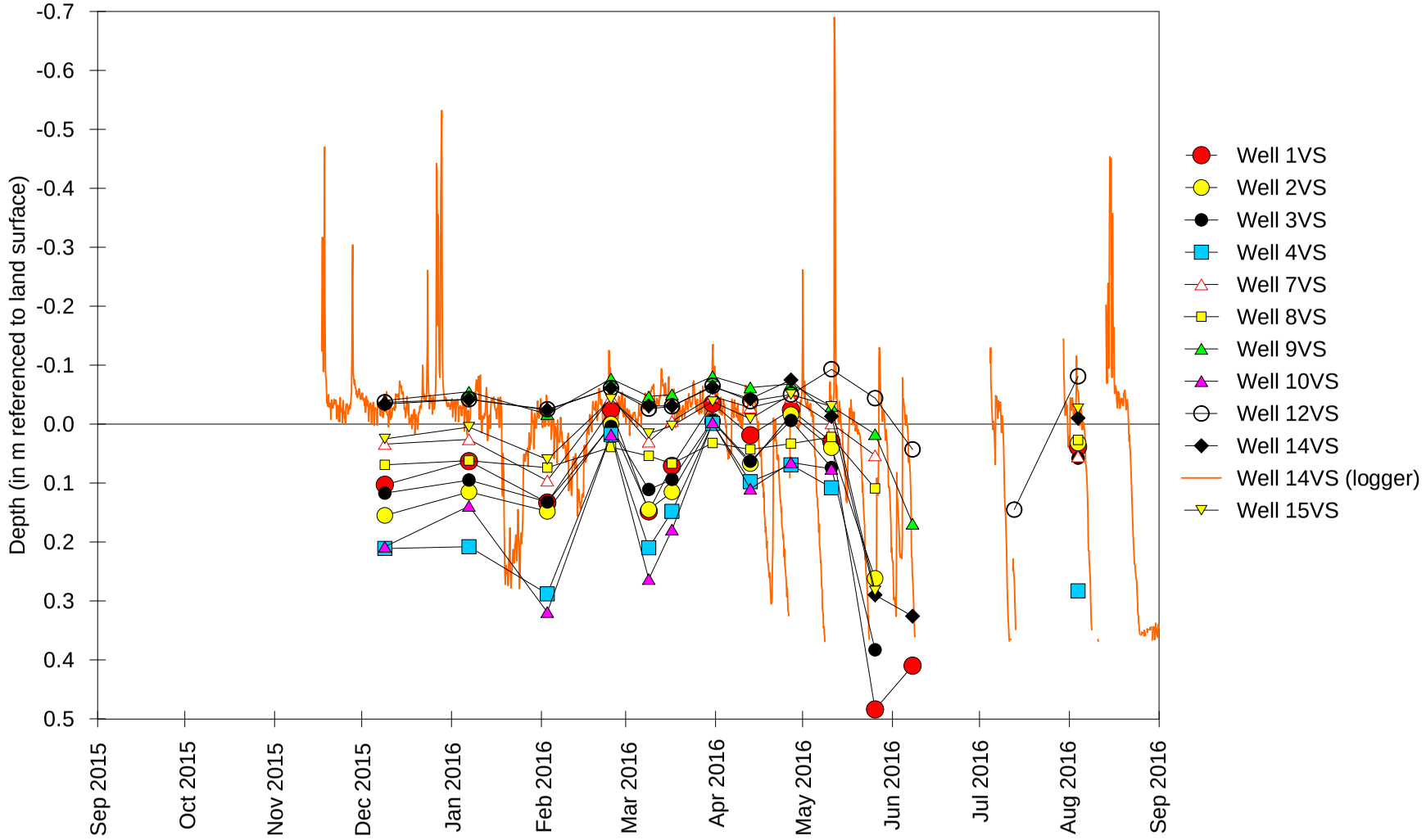
Pyramid Site EC25 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations
in Very Shallow (VS) Monitoring Wells



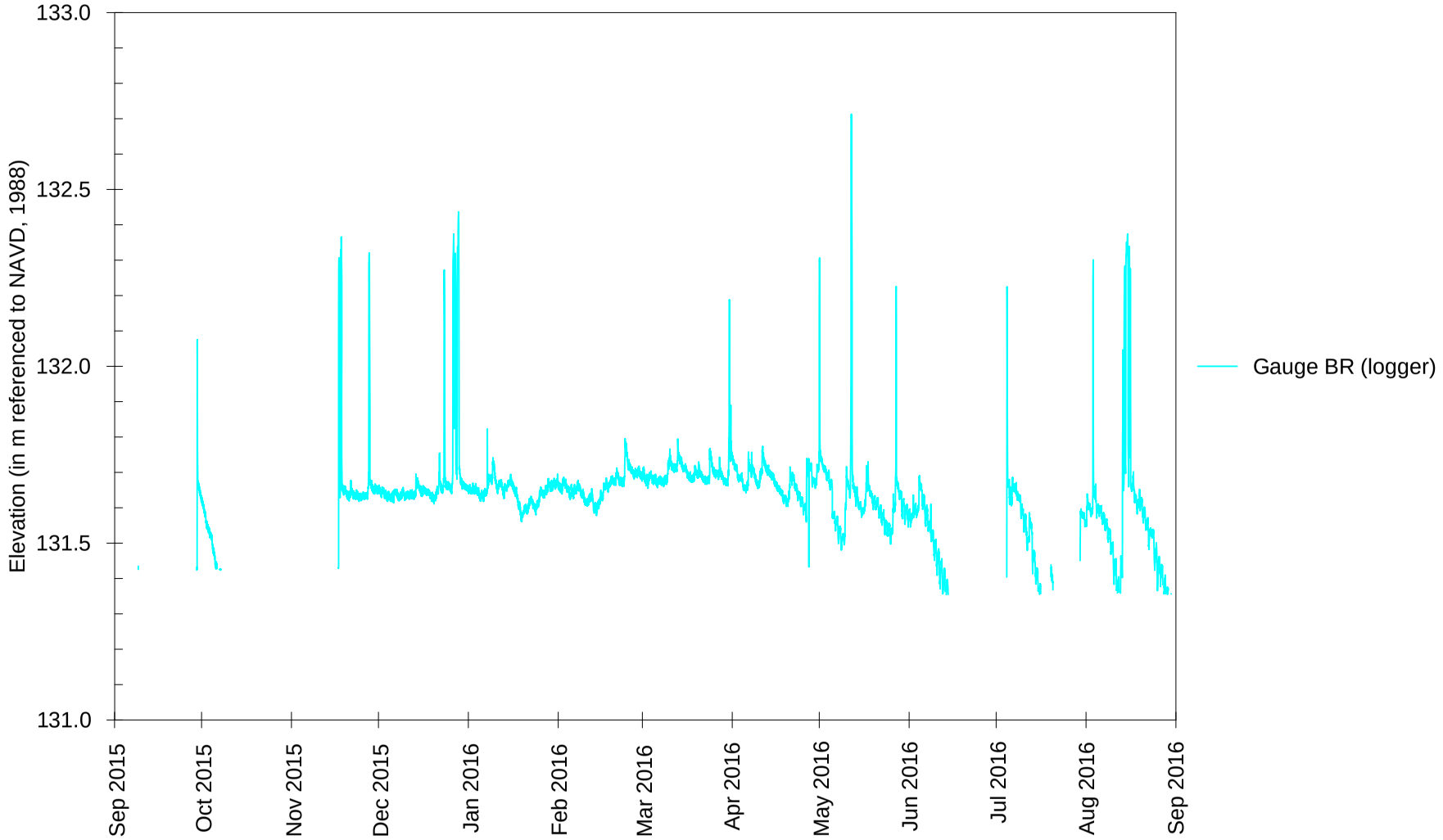
Pyramid Site EC25 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Very Shallow (VS) Monitoring Wells



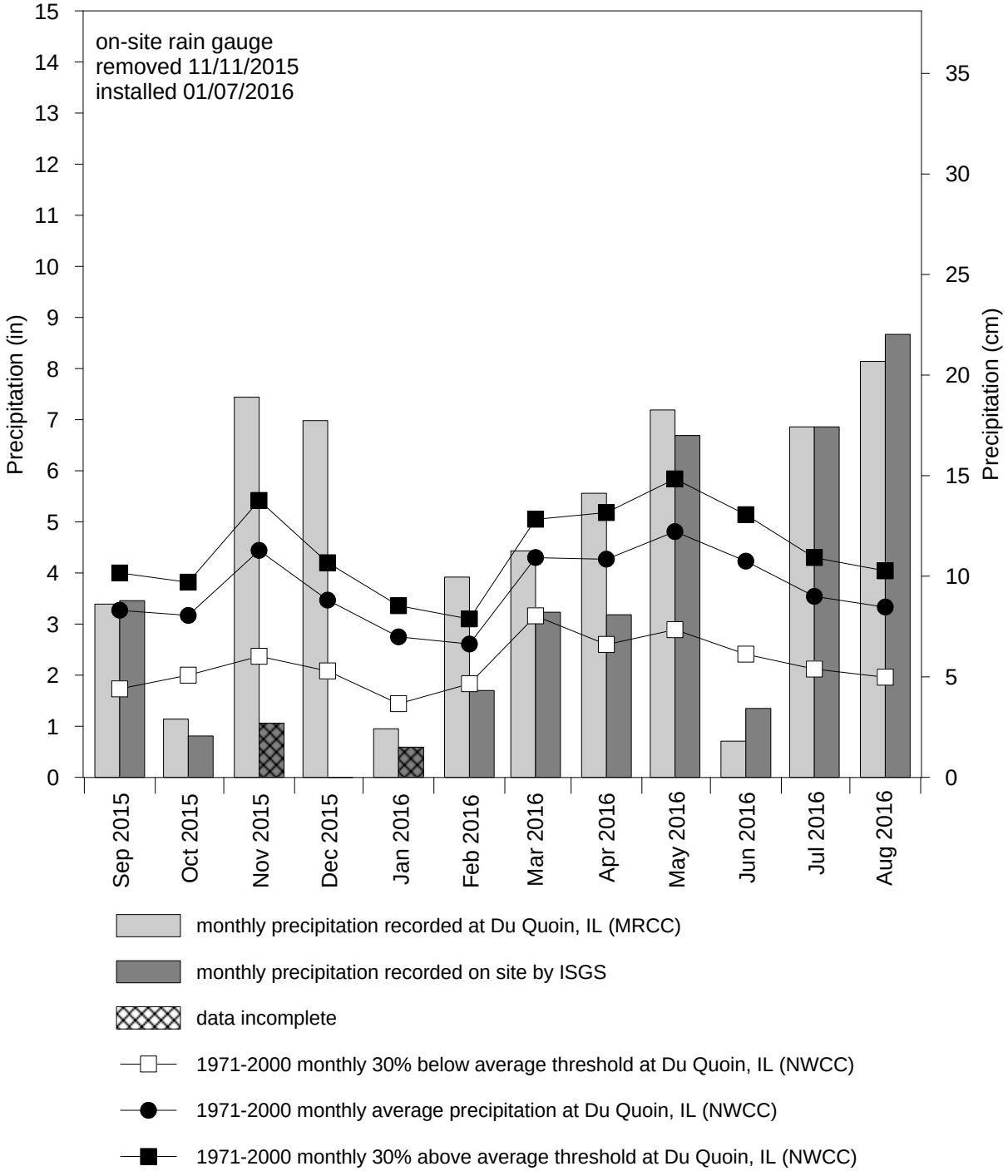
Pyramid Site EC25 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at the Surface-Water Gauge



Pyramid Site EC25 Wetland Mitigation Site
September 2015 through August 2016

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



HARRISBURG, SITE 2 **ISGS #78**
WETLAND MITIGATION SITE
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: The 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 2016

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), 9.38 ha (23.17 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, whereas 7.06 ha (17.44 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 9.22 ha (22.78 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 2016). 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 28 was the starting date of the 2016 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 128% of normal, and Spring 2016 (March through May) precipitation was 128% of normal. Precipitation during July and August 2016 was particularly excessive with 218% of normal rainfall.

- Peak hydroperiod during the growing season occurred in early April. Inundation and saturation during this period was mainly in response to seasonal high water table and an intense rainfall event that occurred during March 30-31 that totaled 1.35 in. Gauge B in the ditch on site indicated that brief, frequent floods during the growing season occurred from late February through late May and during July and August. However, these floods covered a relatively small portion of the site and only inundated areas immediately adjacent to the ditch. None of these floods lasted more than 4 days.

- In 2016, water levels measured in 27 of 27 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 22 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 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 2016

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	N	Y
6S	Y	Y	Y
7S	Y	N	Y
8S	Y	N	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	N	Y
18VS	Y	Y	Y
19VS	Y	Y	Y
20S	Y	N	Y
21S	Y	Y	Y
23S	Y	Y	Y

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

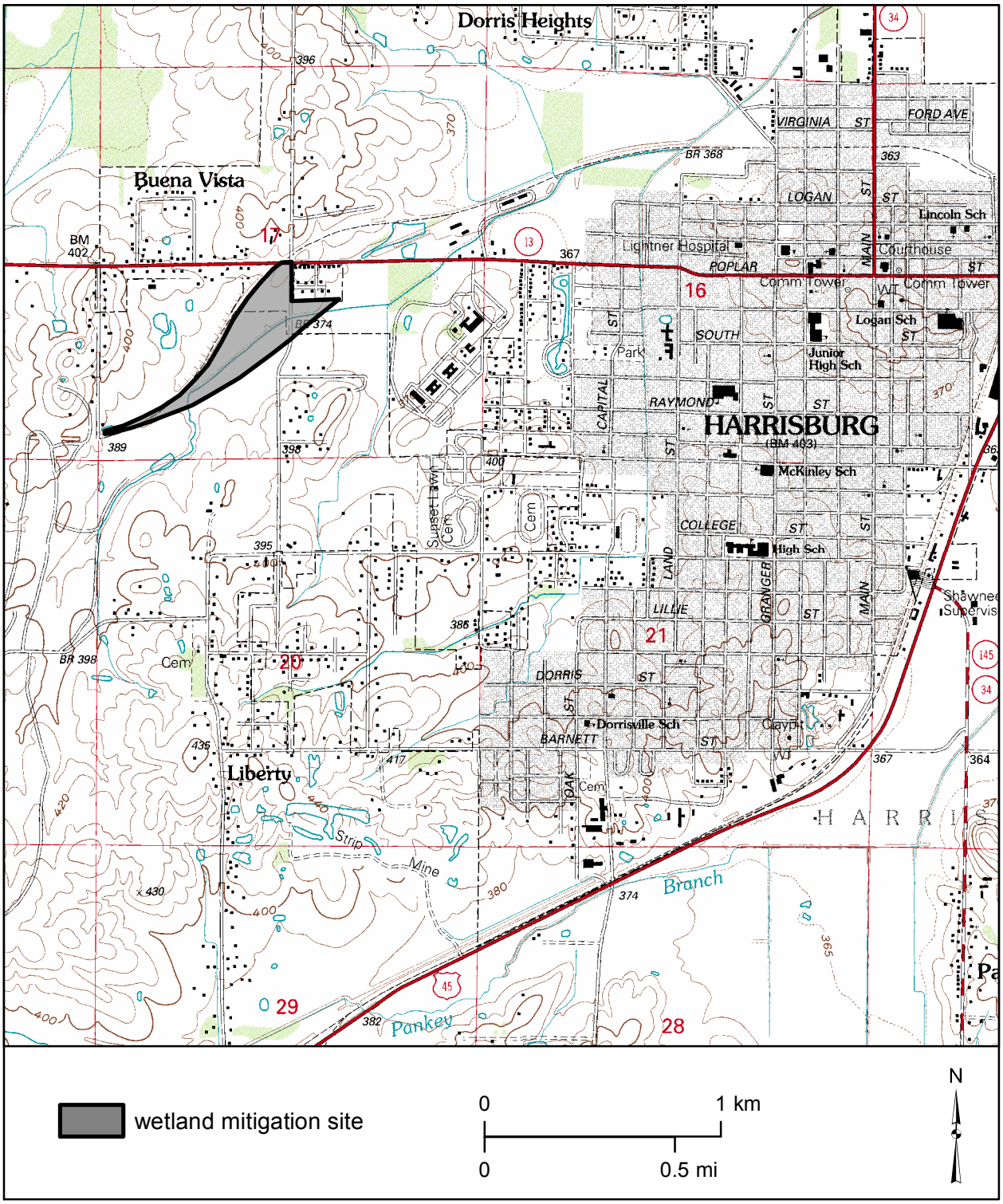
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
B	112.45 m (368.93 ft)	112.45 m (368.93 ft)	112.45 m (368.93 ft)
E	114.67 m (376.21 ft)	n/a	114.70 m (376.31 ft)
H	113.12 m (371.13 ft)	113.09 m (371.03 ft)	113.12 m (371.13 ft)

n/a – hydroperiod was not long enough to determine an elevation

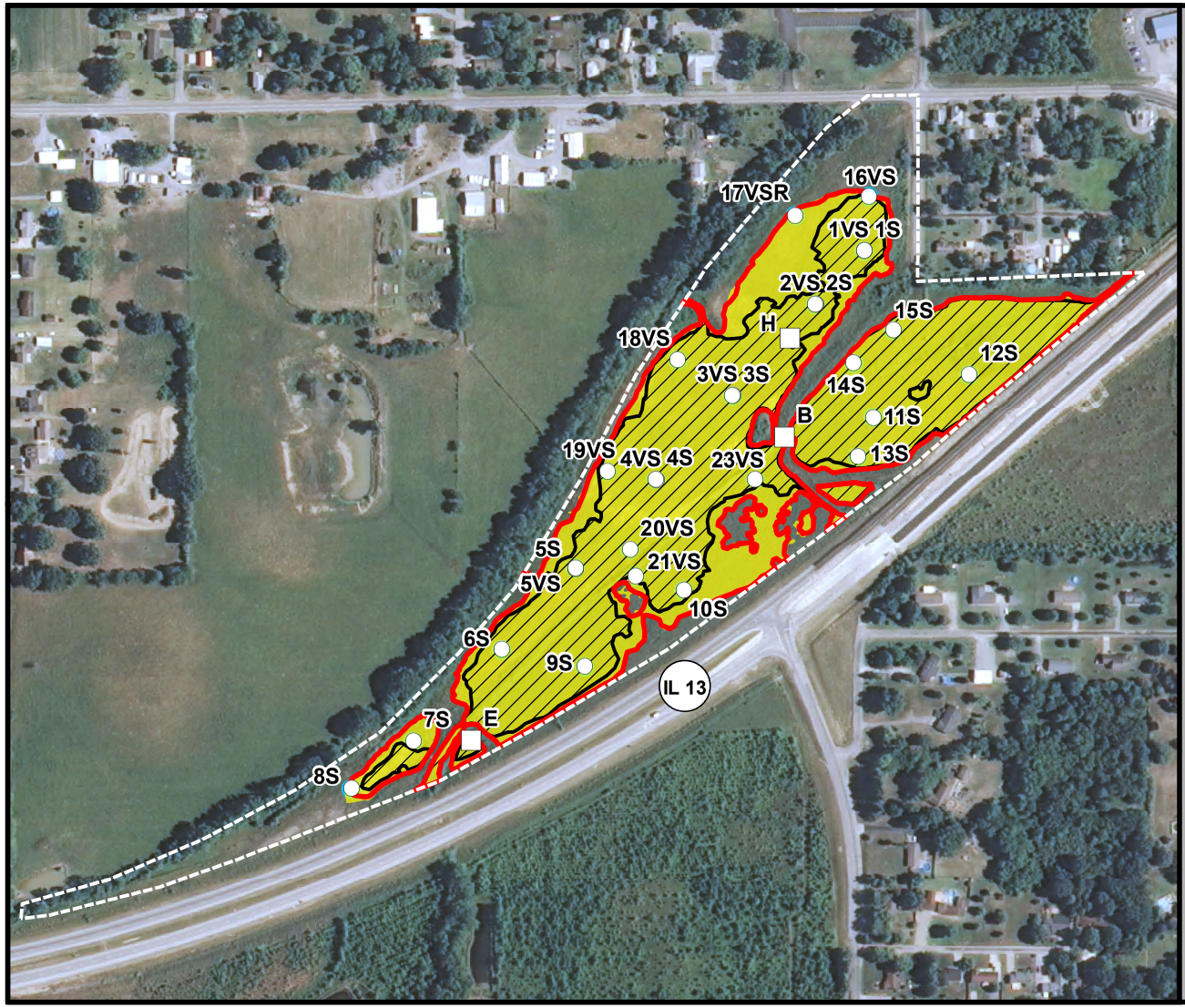
Harrisburg, Site 2 Wetland Mitigation Site
(IL 14, FAP 857)

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 2016 Wetland Hydrology
September 1, 2015 though August 31, 2016
Map based on 2012 Farm Service Agency digital orthophotography, Saline County, Illinois (USDA-FSA 2012)



2016 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

site boundary

0 200 m

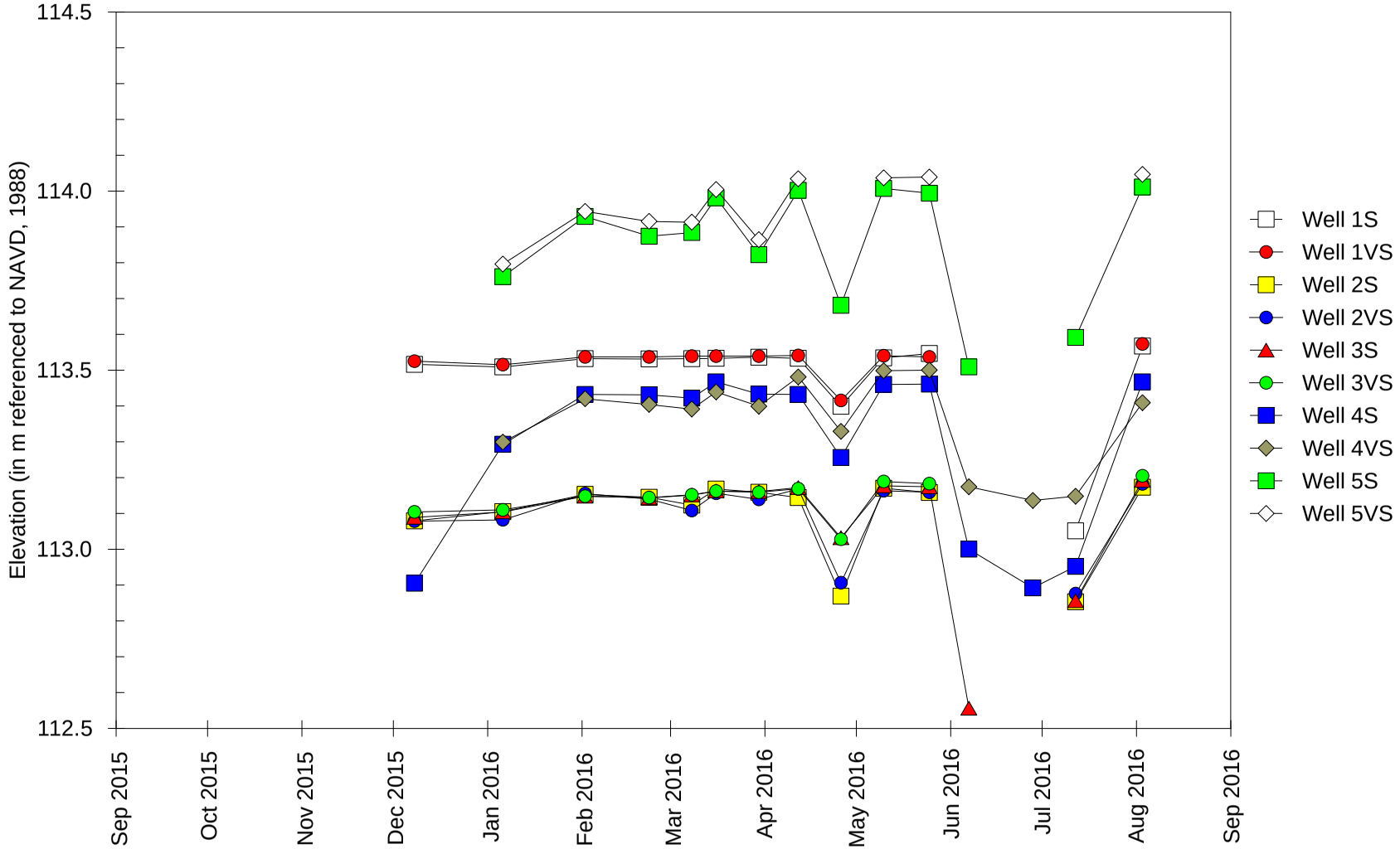
0 600 ft

N

Note: The ISGS rain gauge is located at the Harrisburg, Site 3 wetland mitigation site (ISGS #87)

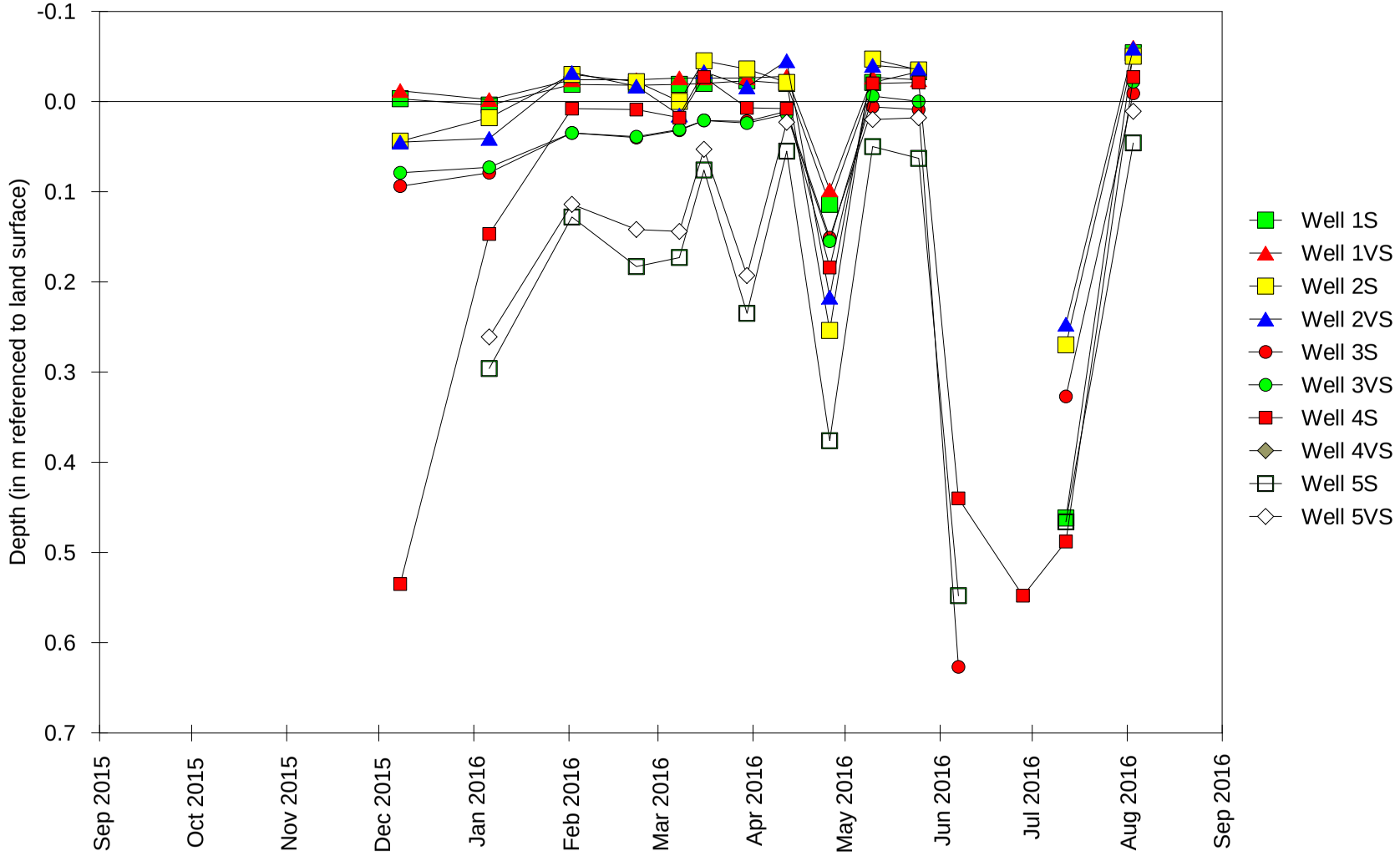
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations
in Monitoring Wells (North)



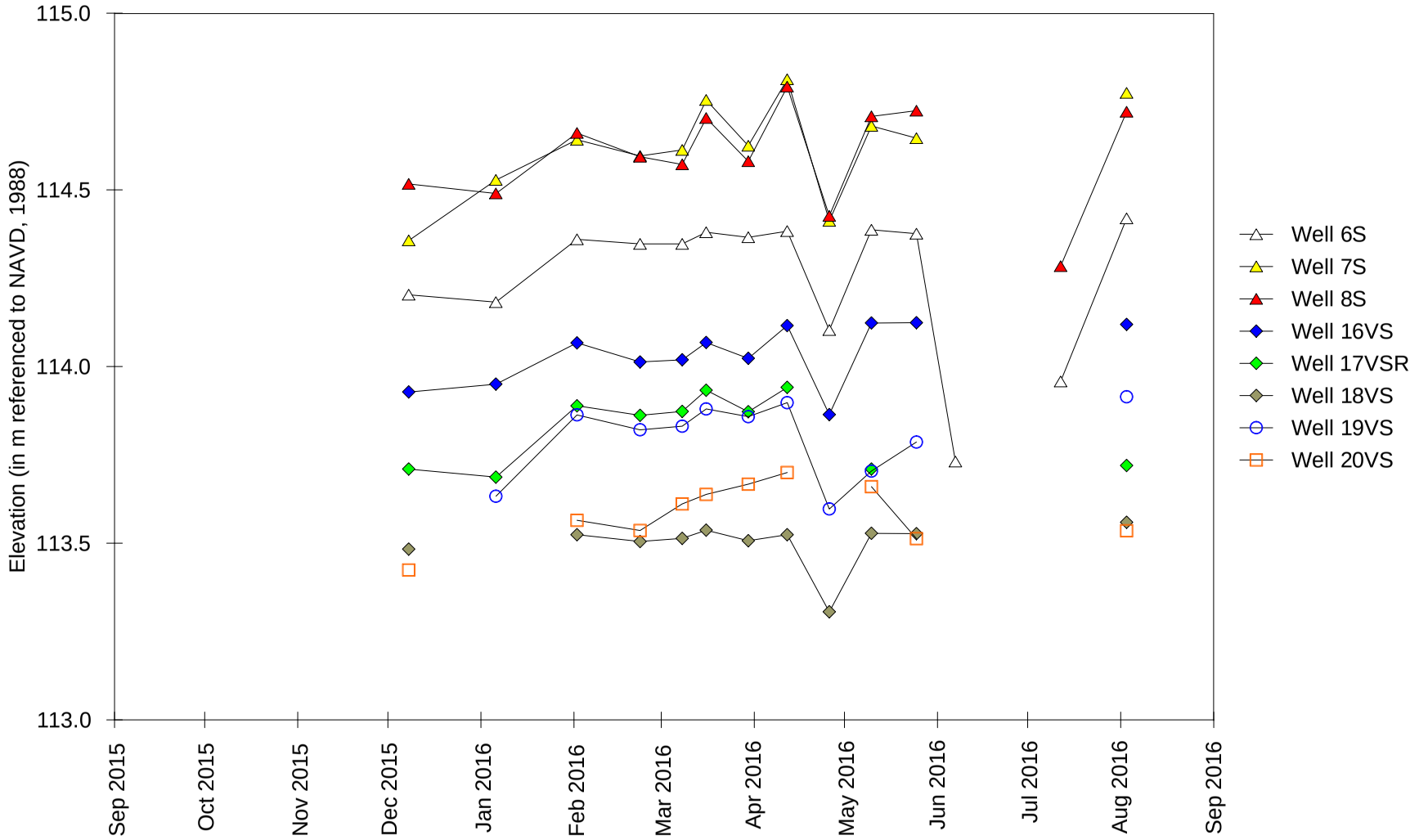
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells (North)



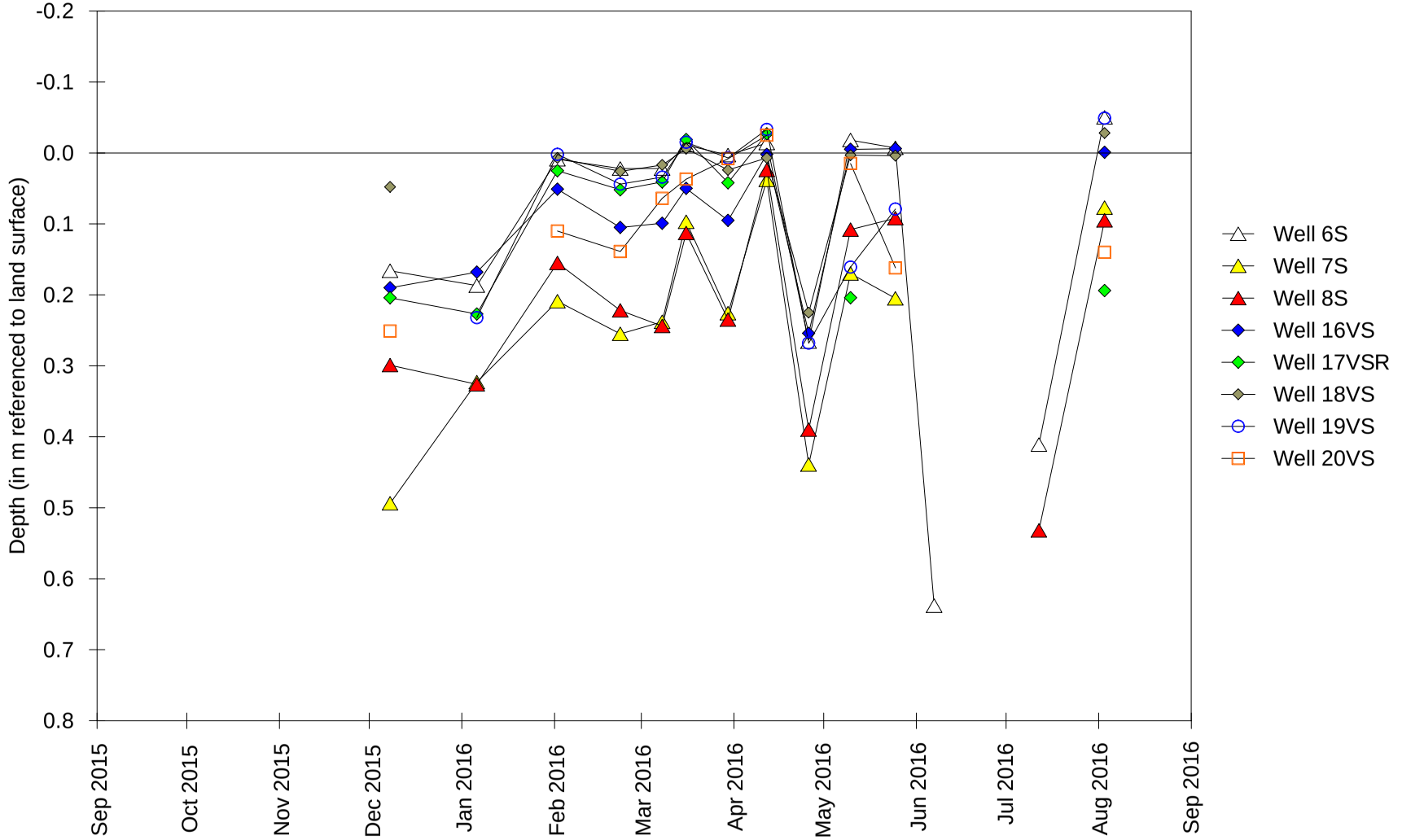
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells (North)



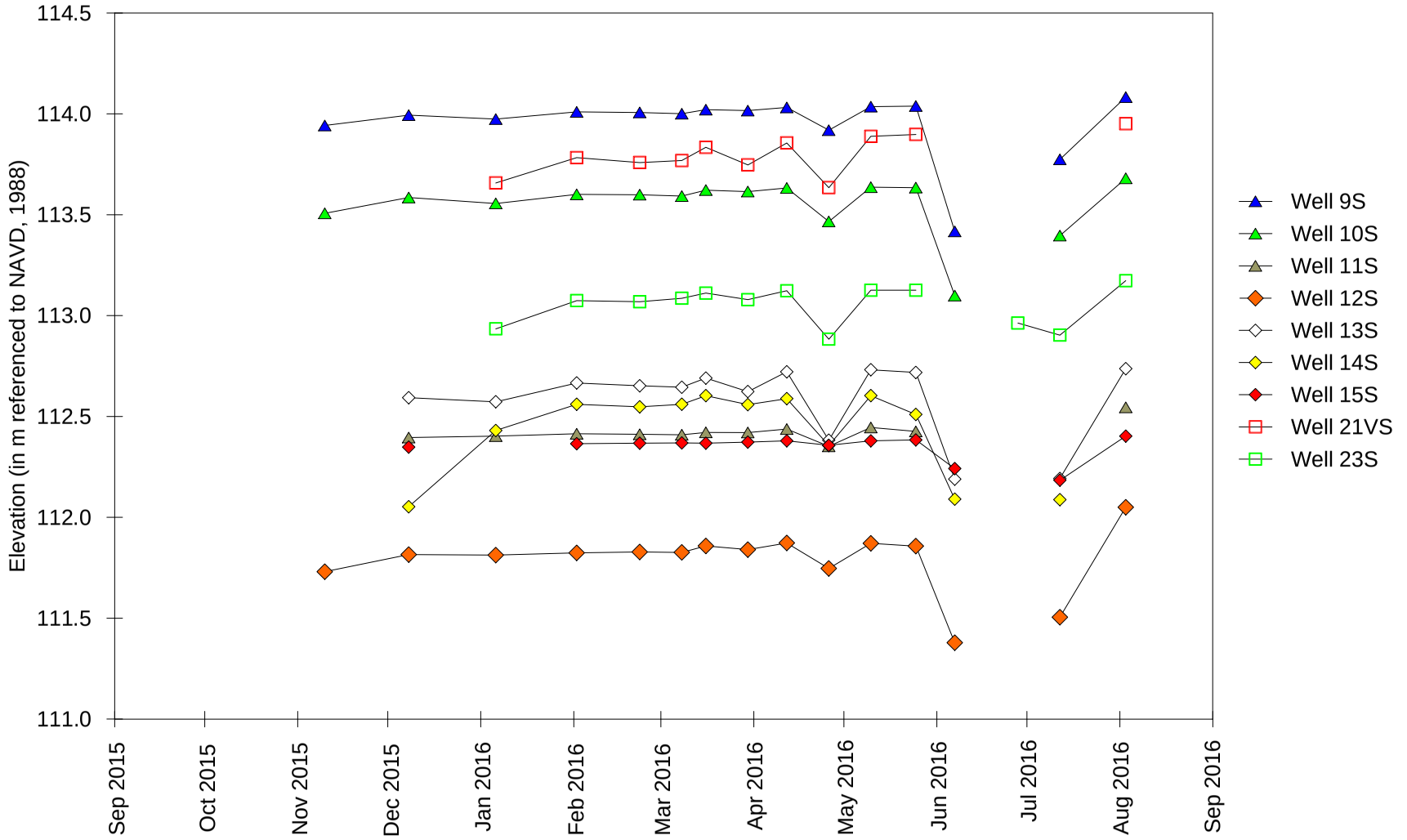
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells (North)



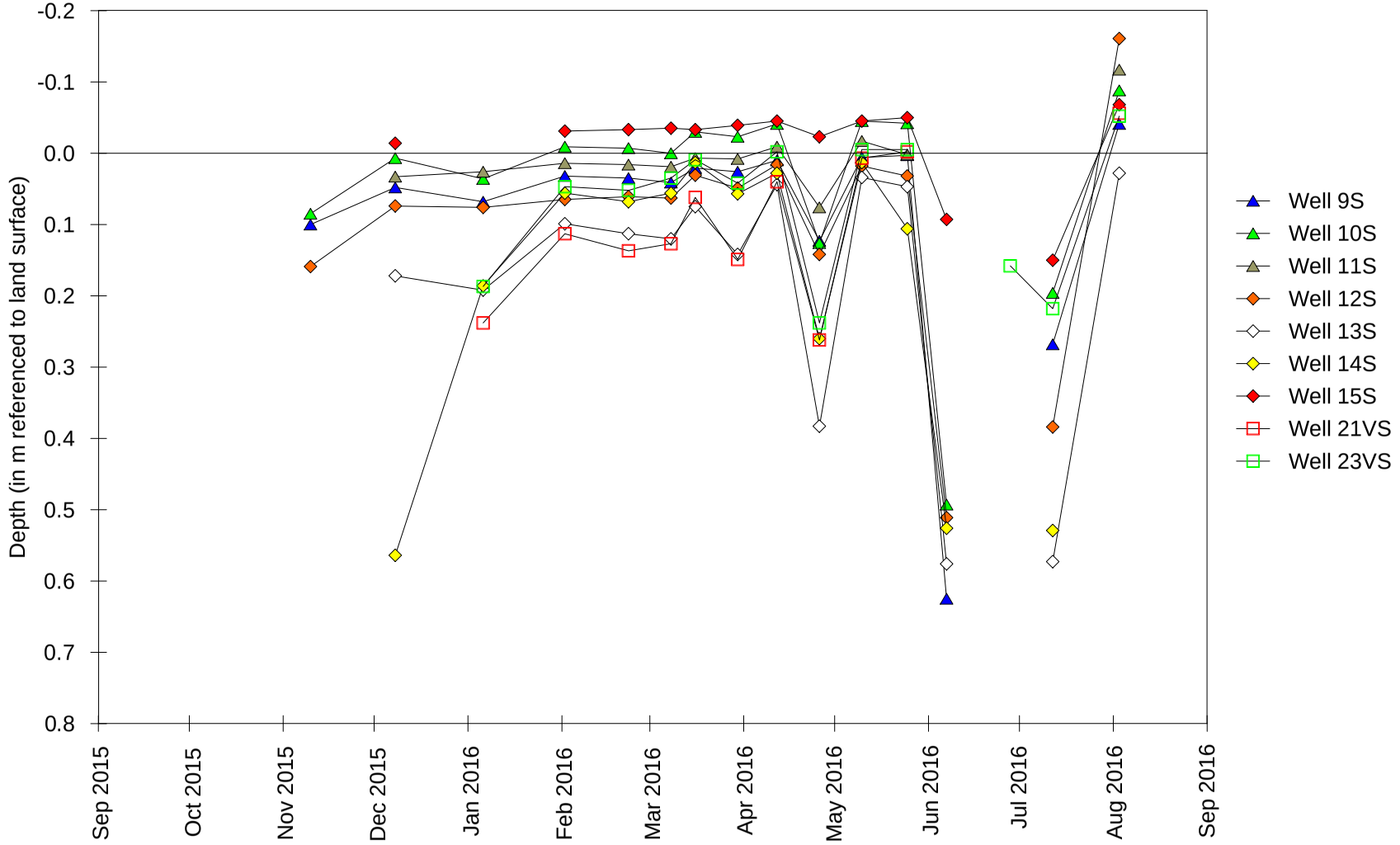
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations
in Monitoring Wells (South)



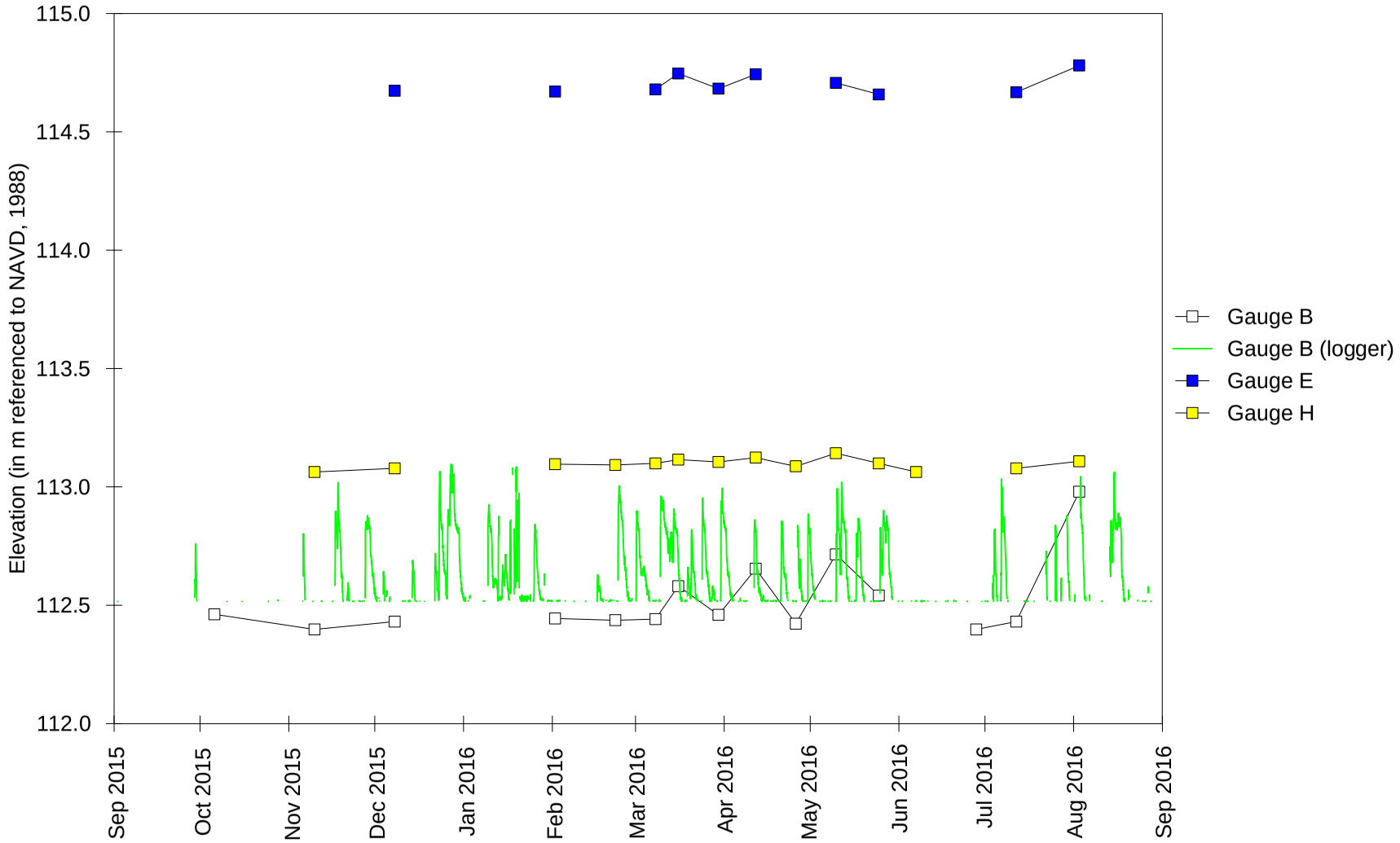
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells (South)



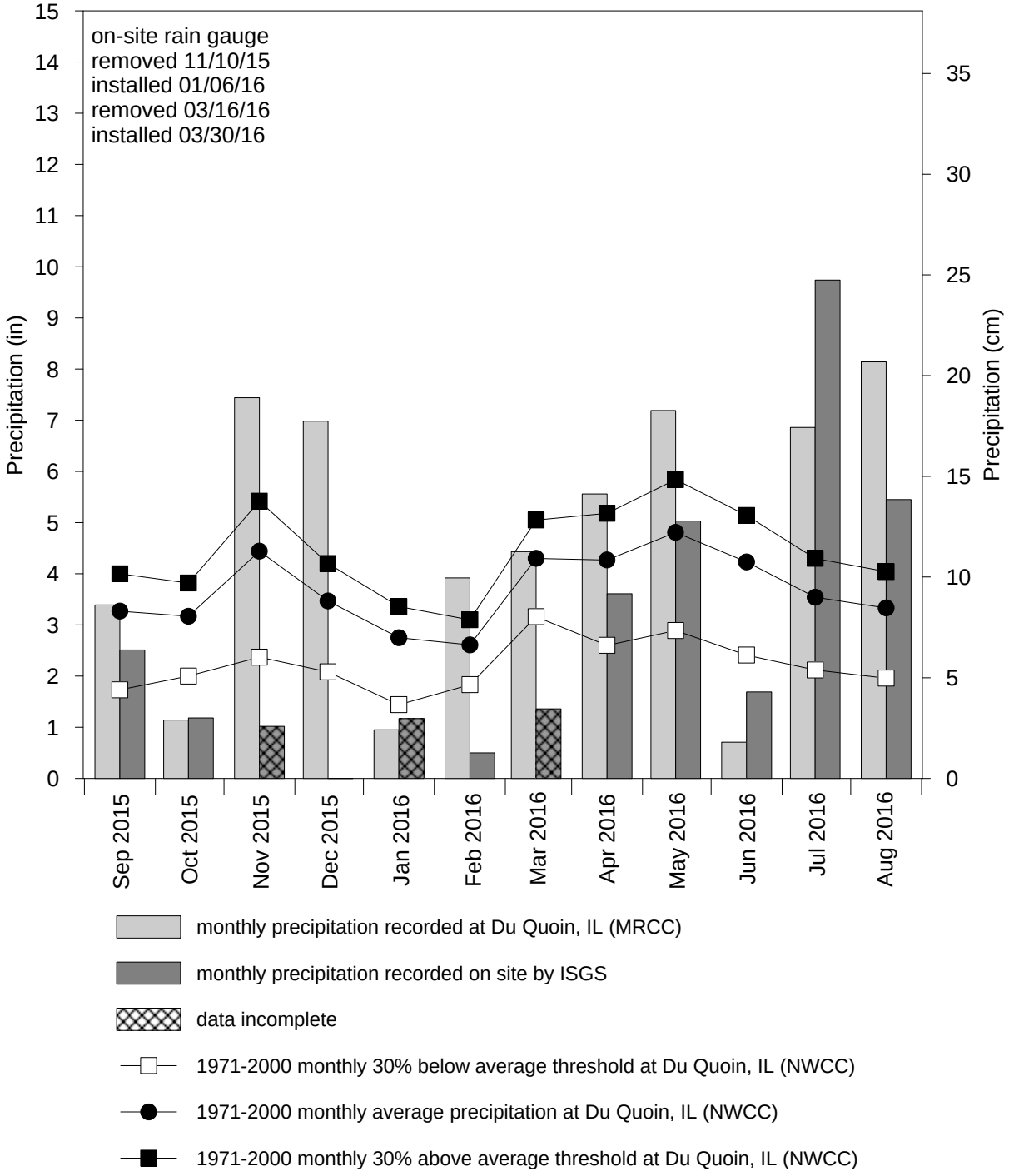
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Harrisburg Site 2 Wetland Mitigation Site
September 2015 through August 2016

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



FORMER WEBER PROPERTY **ISGS #79**
WETLAND MITIGATION SITE
US 20
FAP 301
Sequence #10487
Stephenson County, near Freeport, Illinois
Primary Project Manager: Katharine L. Schleich
Secondary Project Manager: Eric T. Plankell

SITE HISTORY

- September 2010: IDOT District 2 requested that ISGS prepare conceptual plans for wetland creation, and plans were provided by ISGS.

- November 2010: Wetland construction was completed, and ISGS was tasked by IDOT to monitor wetland hydrology.

- May 2011: ISGS installed a post-construction monitoring network.

- August 2016: ISGS was notified by IDOT to discontinue monitoring.

WETLAND HYDROLOGY CALCULATION FOR 2016

The target compensation area for the Former Weber Property wetland mitigation site is 1.21 ha (3.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 1.36 ha (3.36 ac) of the total site area of 5.79 ha (14.30 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season and 1.08 ha (2.68 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 1.82 ha (4.49 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 Freeport, Illinois, is April 11, and the season lasts 192 days (MRCC 2016). Using the 1987 Manual, 5% of the growing season is 10 days, and 12.5% of the growing season is 24 days. Using the 2010 Midwest Region Supplement, March 8 was the starting date of the 2016 growing season based on soil temperatures measured on site and at the Freeport, Illinois, ICN station (WARM 2016).

- Total precipitation for the monitoring period at Freeport, Illinois, (MRCC station #113262) was 129% of normal. During Spring 2016 (March through May), precipitation was 82% of normal.

- Peak hydroperiod during the growing season began in mid-March and continued through mid-April. Data from Gauge D indicated that the Pecatonica River inundated portions of the site in mid-March. The duration of the flood was not long enough to satisfy wetland hydrology criteria but the post-flood inundation contributed to portions of the site satisfying wetland hydrology criteria.

- In 2016, water levels measured in 1 of 8 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured

in 1 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.

PLANNED FUTURE ACTIVITIES

- Monitoring of this site was discontinued in August 2016. The monitoring network will be removed from the site.

WETLAND HYDROLOGY TABLES FOR 2016

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
3S	N	N	N
4S	N	N	N
7S	Y	Y	Y
8S	N	N	Y
9S	N	N	Y
10S	N	N	N
10VS	N	N	N

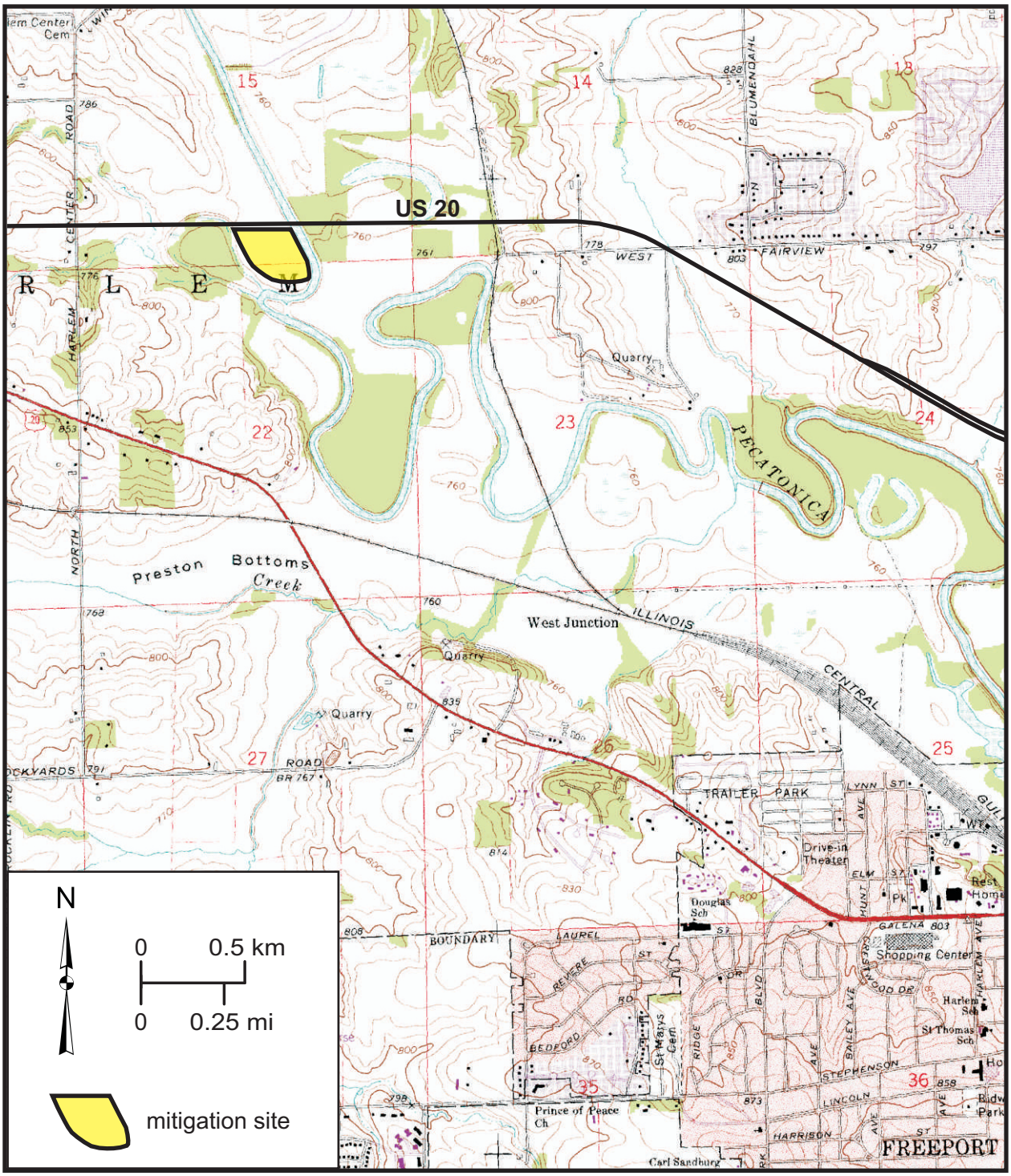
Y – met wetland hydrology criteria
N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
A	230.33 m (755.68 ft)	230.22 m (755.32 ft)	230.43 m (756.00 ft)
C	229.61 m (753.31 ft)	n/a	n/a
D	n/a	n/a	n/a
E	230.41 m (755.94 ft)	230.32 m (755.64 ft)	230.58 m (756.50 ft)
F	n/a	n/a	n/a

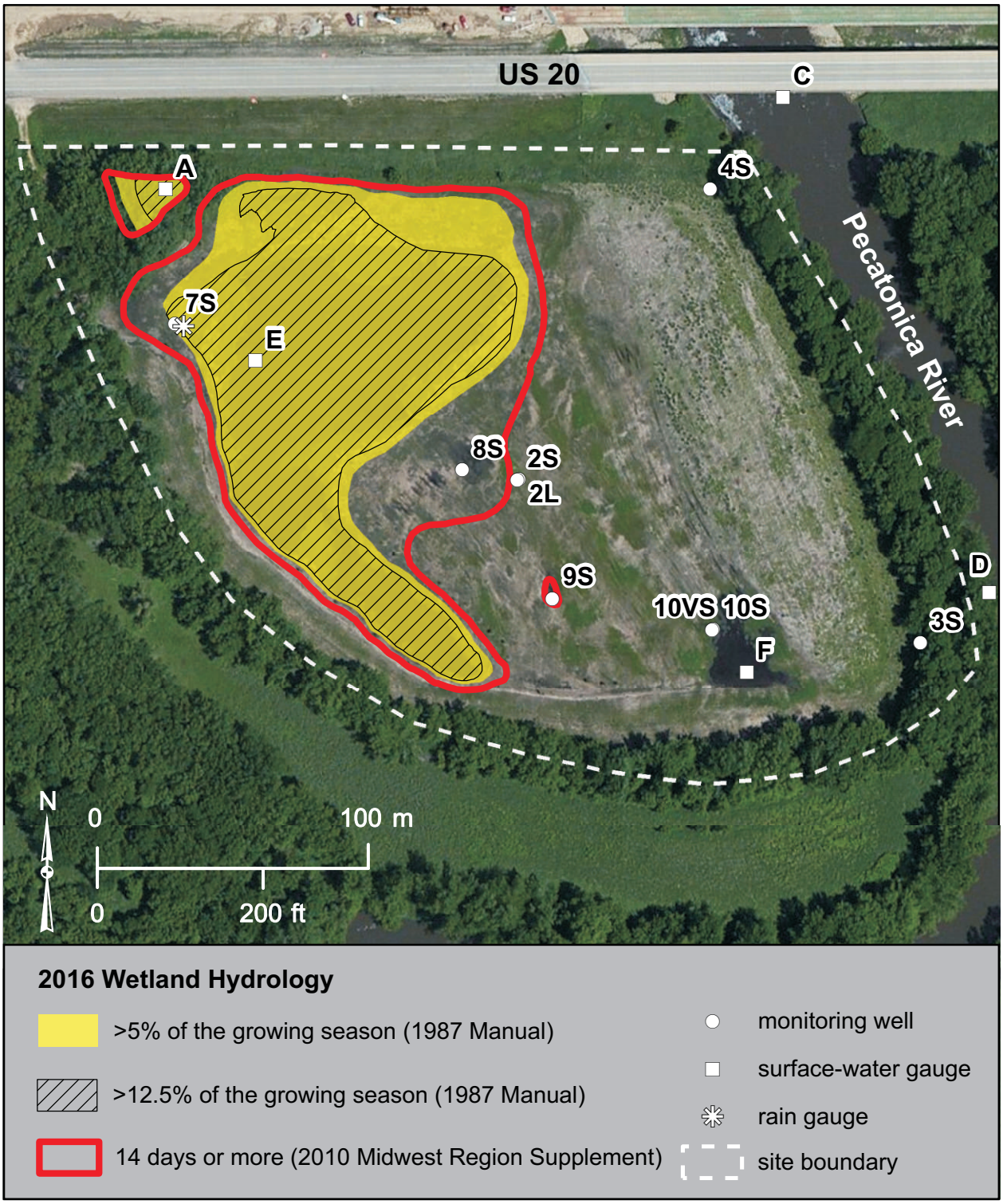
n/a – hydroperiod was not long enough to determine an elevation

Former Weber Property Wetland Mitigation Site
(US 20, FAP 301)
General Study Area and Vicinity

from the USGS Topographic Series, Freeport West, IL, 7.5-minute Quadrangle (USGS 1971)
contour interval is 10 feet

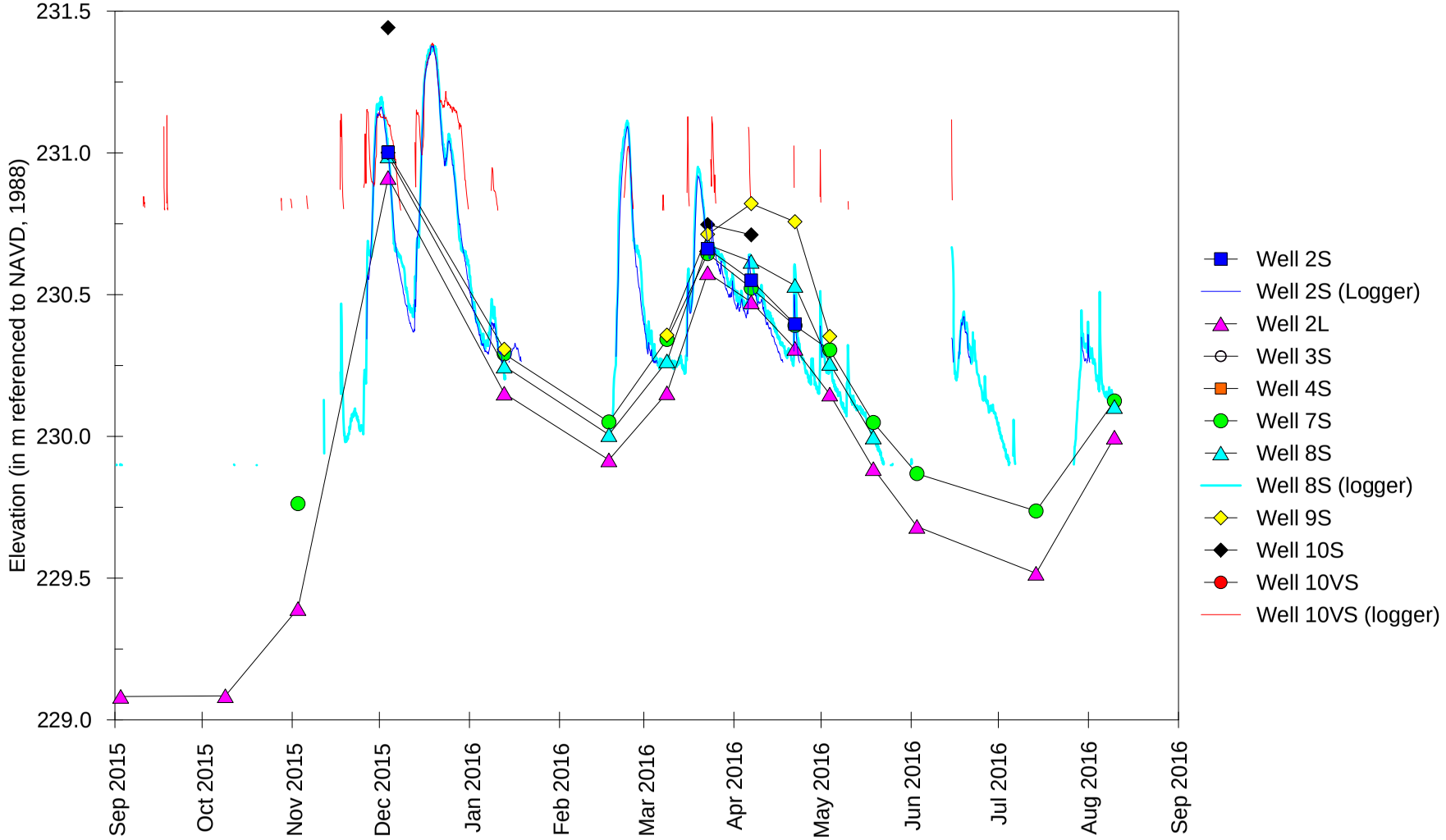


Former Weber Property Wetland Mitigation Site
(US 20, FAP 301)
Estimated Areal Extent of 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016
Map based on imagery available from Esri (Esri 2016)

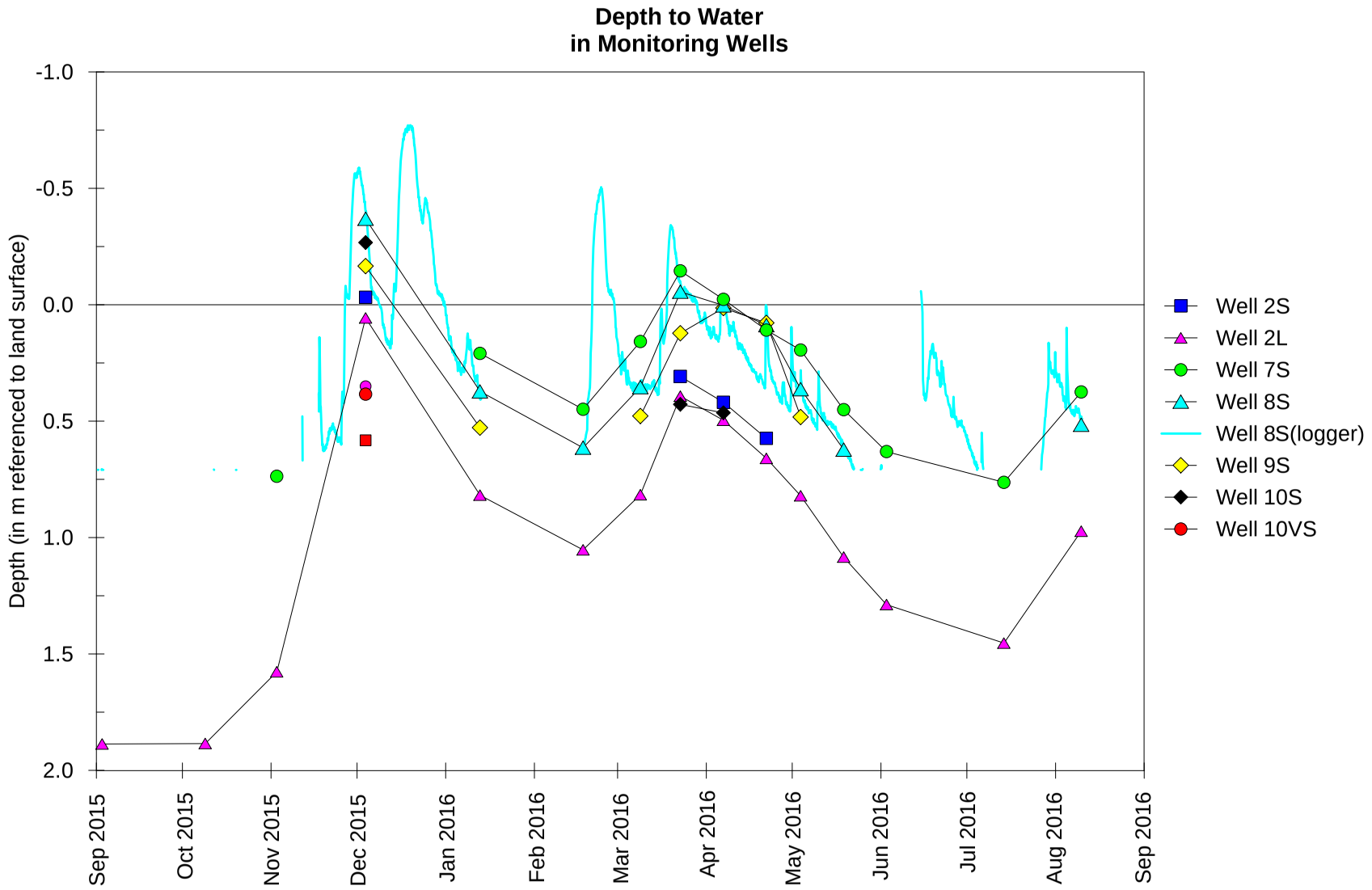


Former Weber Property Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells

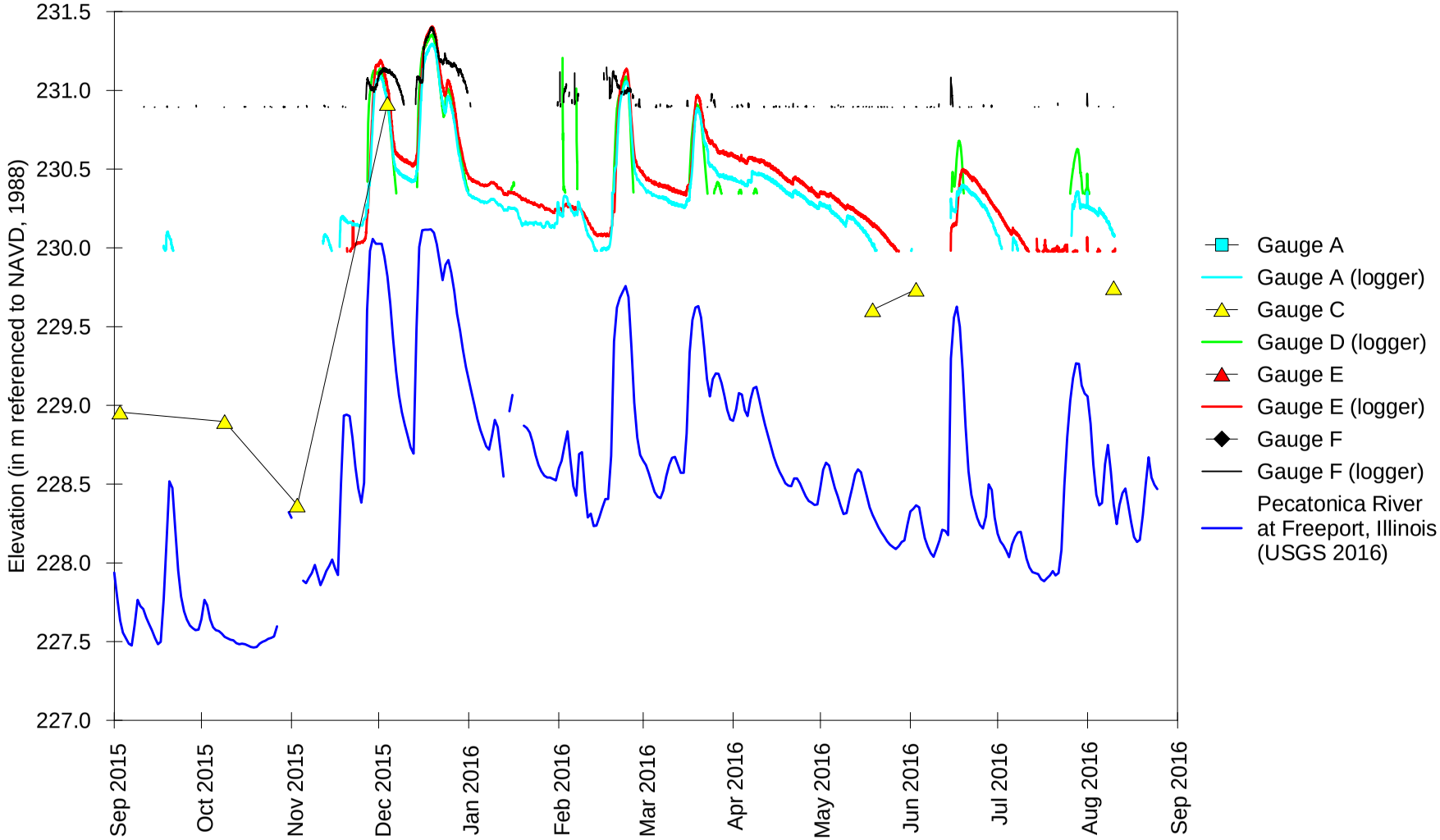


Former Weber Property Wetland Mitigation Site
September 1, 2015 through August 31, 2016



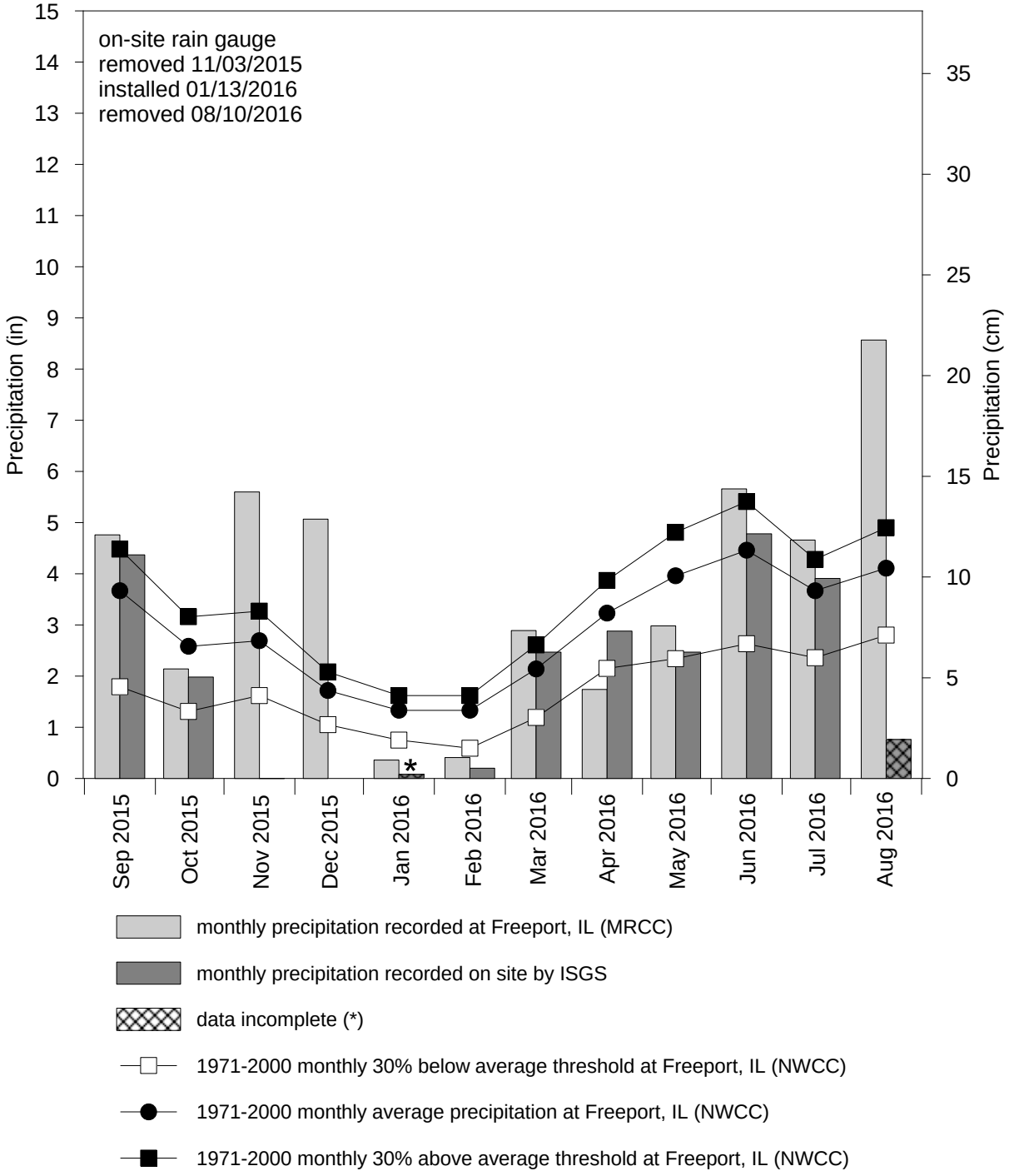
Former Weber Property Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Former Weber Property Wetland Mitigation Site
September 2015 through August 2016

Total Monthly Precipitation Recorded on Site and at Freeport, IL (MRCC station #113262)



MAX CREEK **ISGS #80**
WETLAND MITIGATION SITE
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

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

WETLAND HYDROLOGY CALCULATION FOR 2016

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), 1.17 ha (2.90 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 1.17 ha (2.90 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 1.17 ha (2.90 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 2016). 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 11 was the starting date of the 2016 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 Cape Girardeau, Missouri (MRCC station #231289), was 106% of normal. During Spring 2016 (March through May), precipitation was 126% of normal. Precipitation for July 2016 was particularly excessive, with 453% of normal rainfall.
- Max Creek flooded the site nine times during the monitoring period with six floods during the growing season. However, none of these floods persisted long enough to satisfy wetland hydrology criteria.
- Peak hydroperiod during the growing season occurred in early April. Inundation and saturation during this period was the result of a combination of seasonal high water table, a brief flood from Max Creek, and an intense rainfall event that occurred on March 30-31 that totaled 2.04 in.

- In 2016, water levels measured in 6 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 6 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 is expected to continue through 2016 or until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2016

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

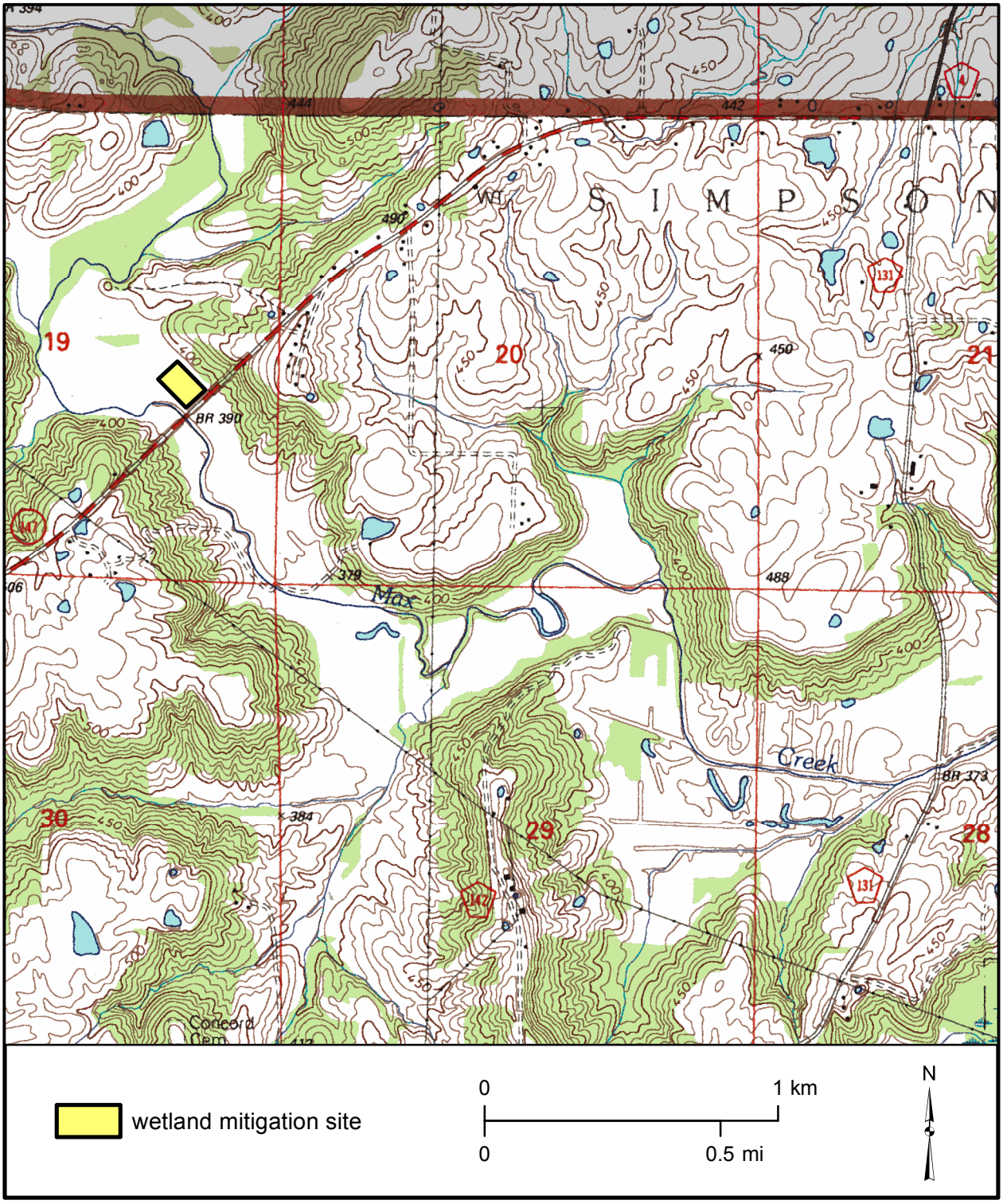
Y- met wetland hydrology criteria
N - did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
A	113.64 m (372.85 ft)	113.63 m (405.67 ft)	113.73 m (373.13 ft)
E	115.72 m (379.66 ft)	115.70 m (379.59 ft)	115.74 m (379.72 ft)

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

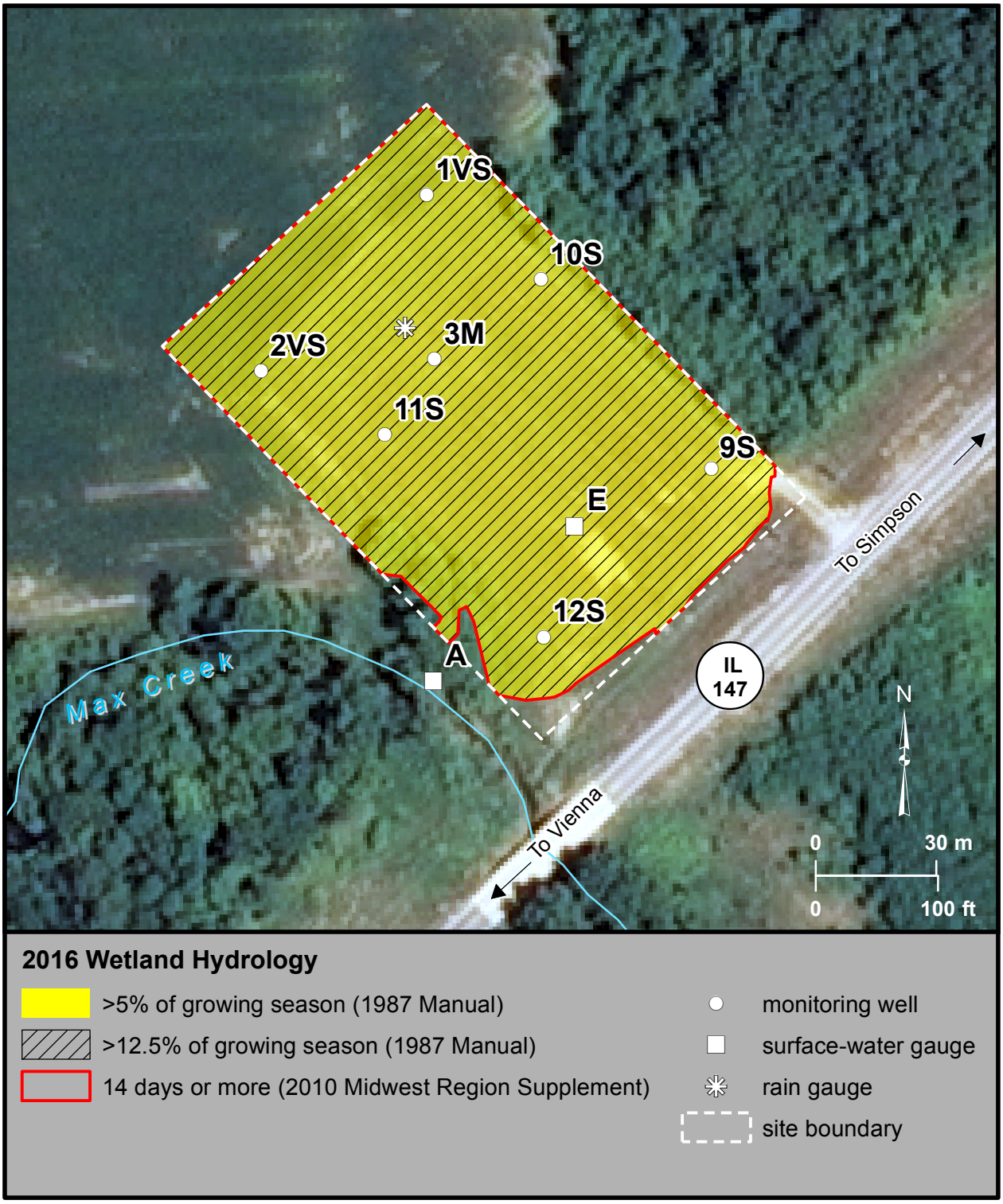


Max Creek Wetland Mitigation Site
(IL 147, FAS 932)

Estimated Areal Extent of 2016 Wetland Hydrology

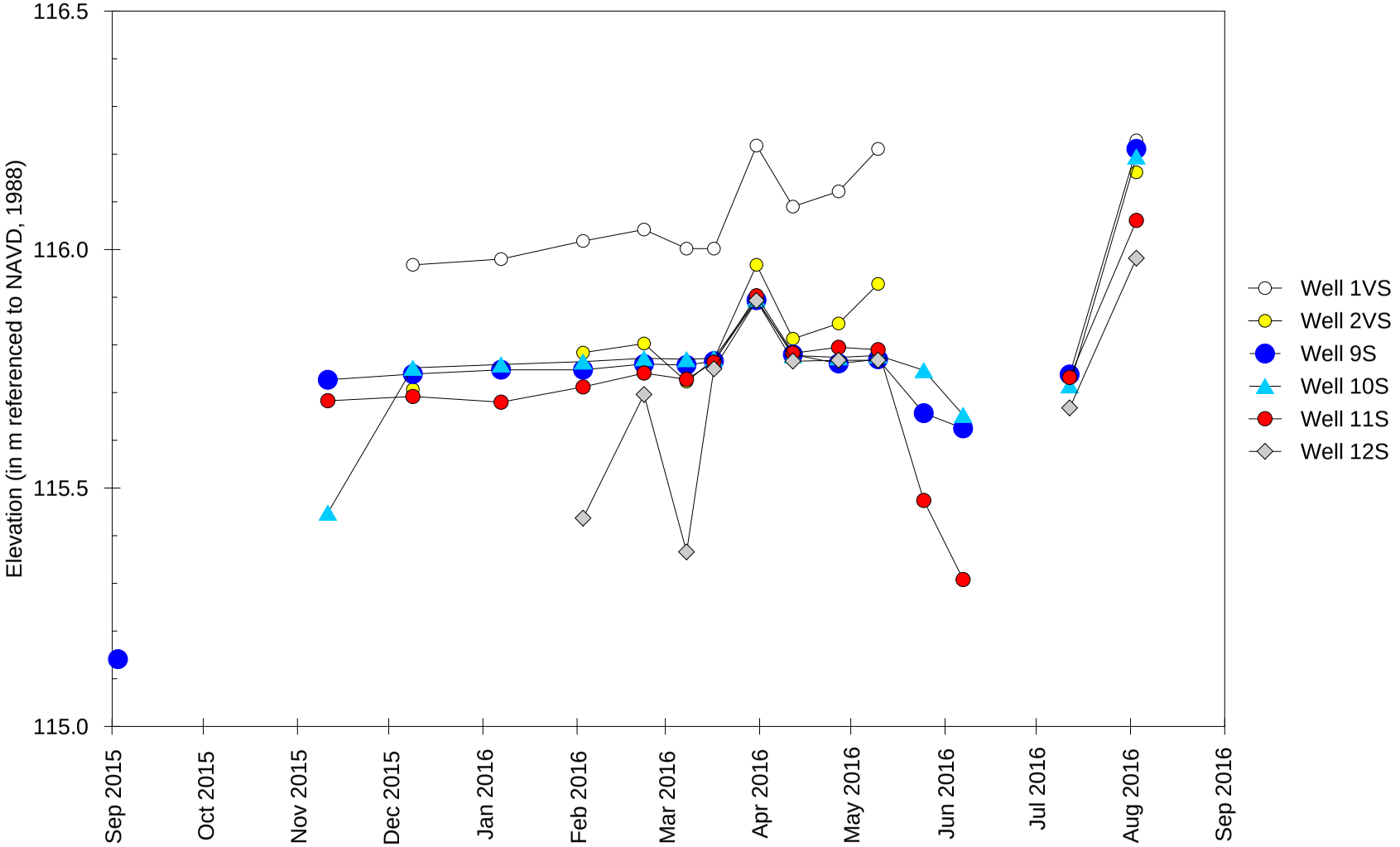
September 1, 2015 through August 31, 2016

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



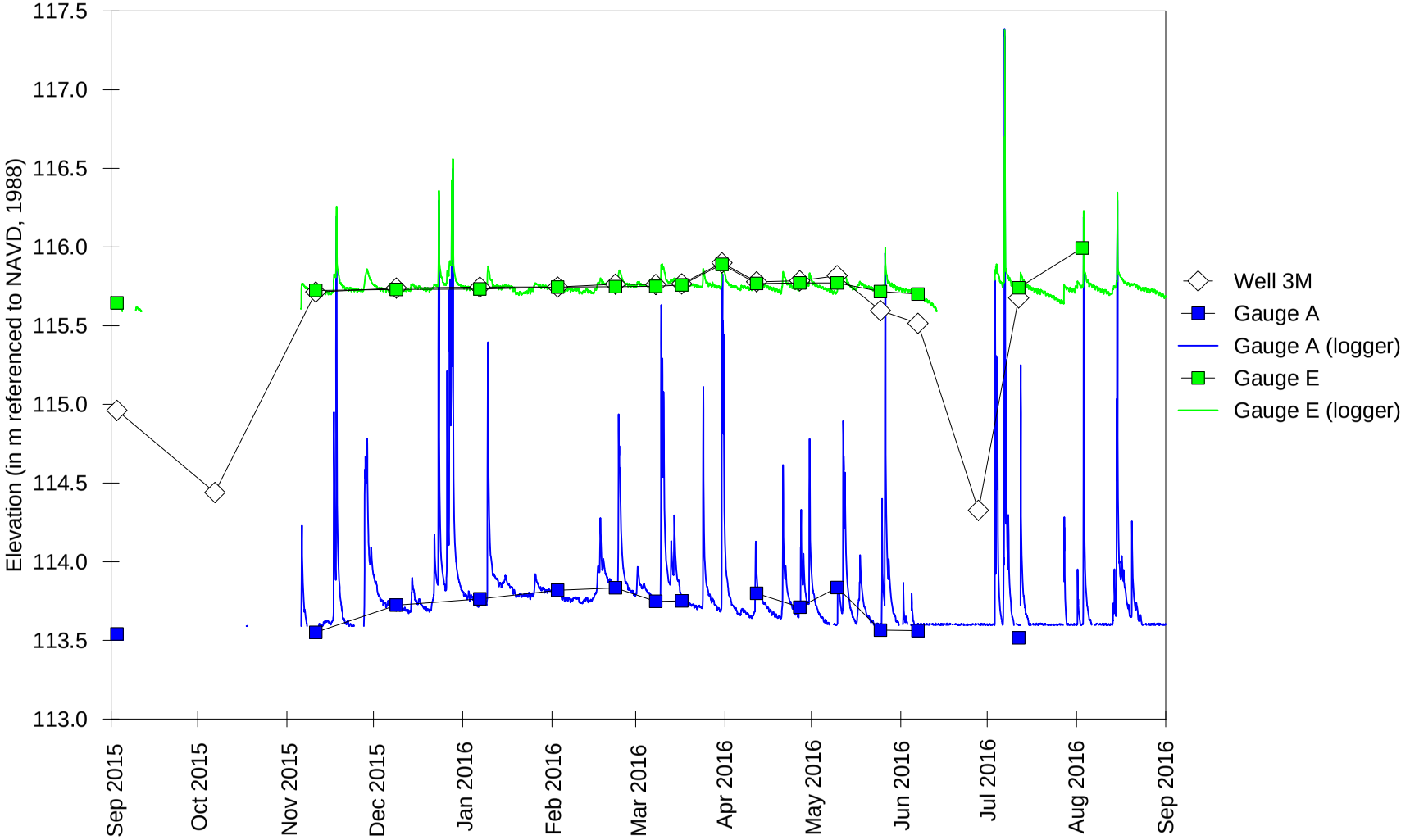
Max Creek Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells

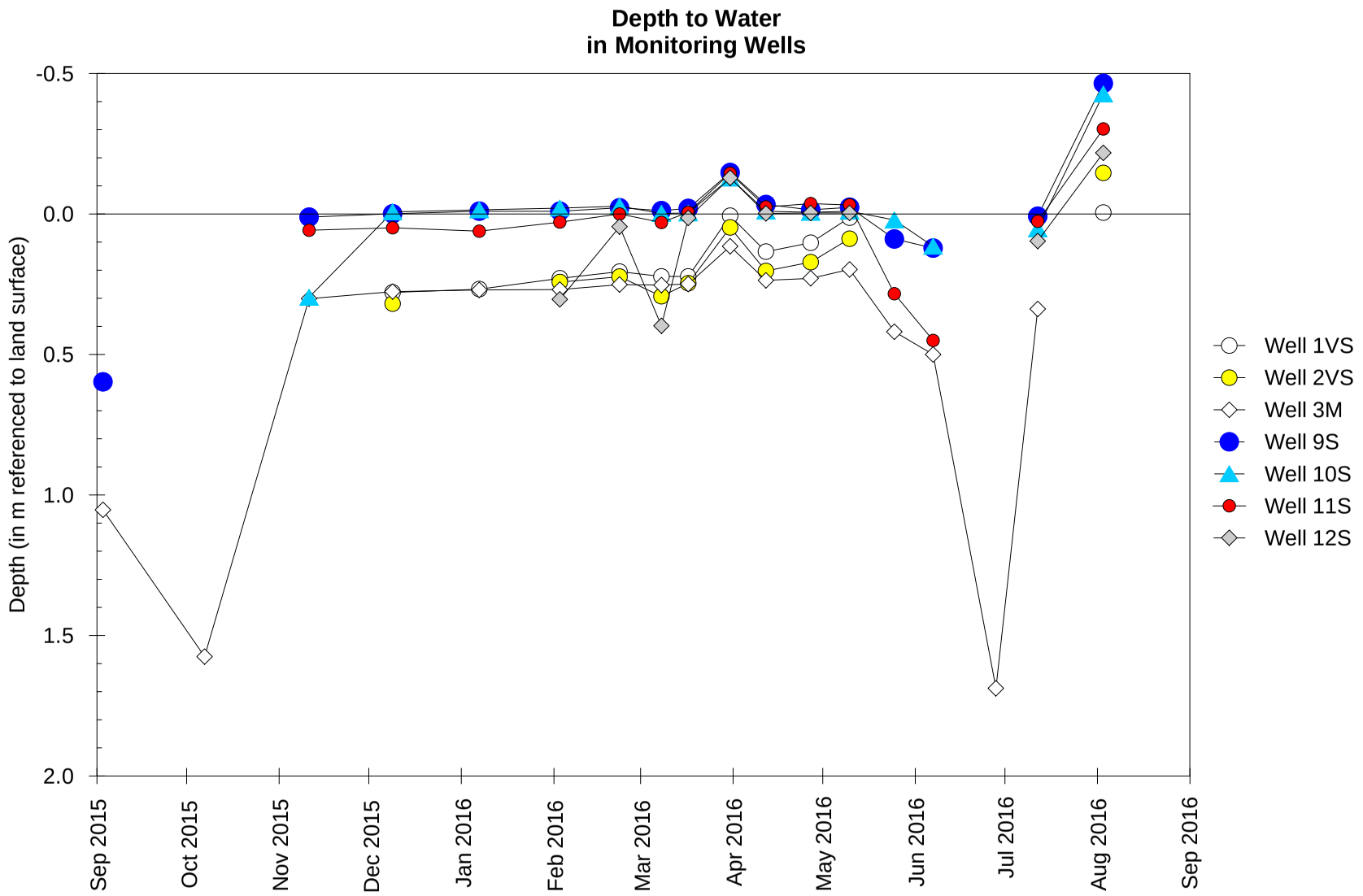


Max Creek Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations
in Well 3M and at Surface-Water Gauges

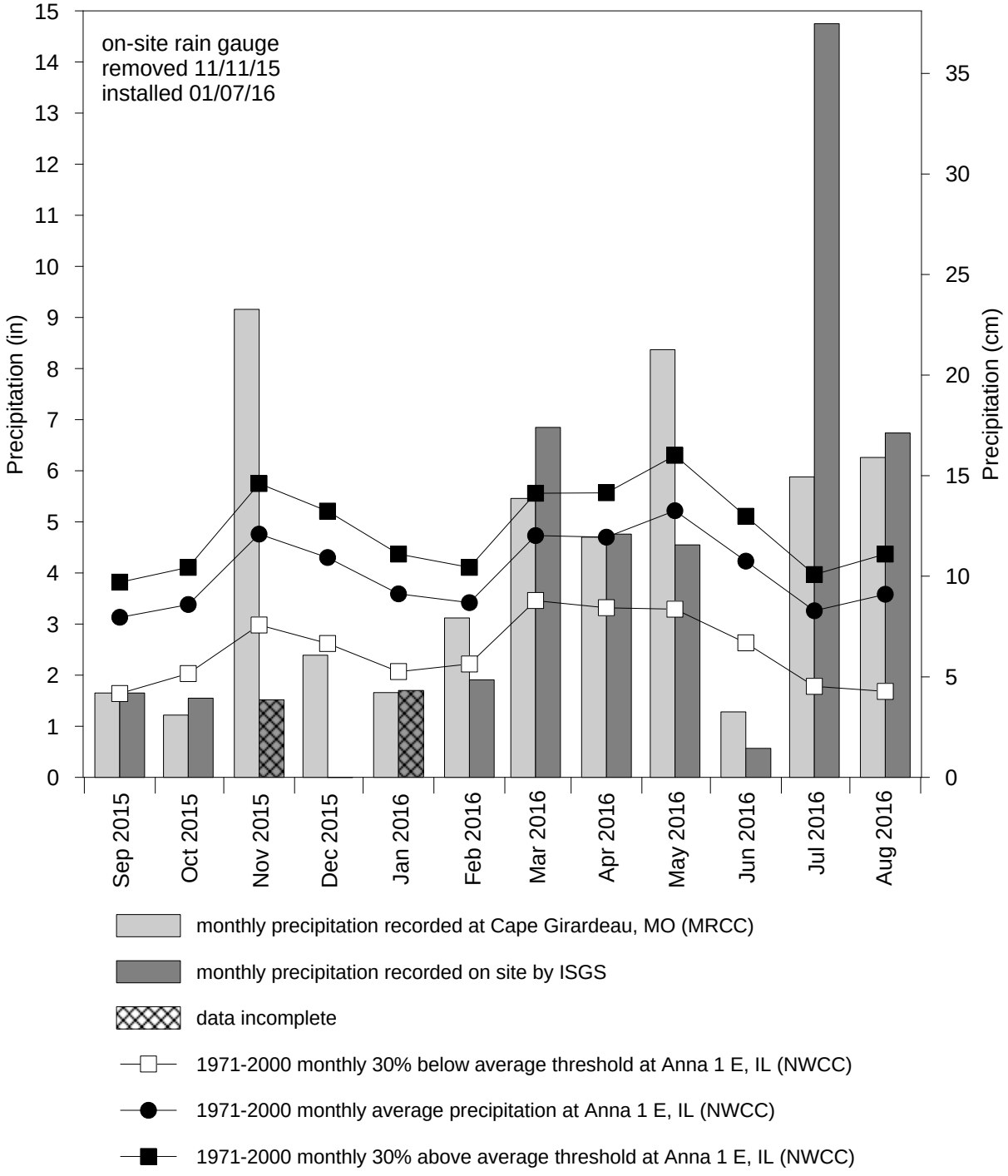


Max Creek Wetland Mitigation Site
September 1, 2015 through August 31, 2016



Max Creek Wetland Mitigation Site
September 2015 through August 2016

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



EAST CAPE GIRARDEAU **ISGS #81**
WETLAND MITIGATION SITE
IL 146
FAP 312
Sequence #633A
Alexander County, near East Cape Girardeau, Illinois
Primary Project Manager: Jessica L. B. Monson
Secondary Project Managers: 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 2016

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), 5.75 ha (14.20 ac) of the total site area of 6.20 ha (15.20 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season and 5.59 ha (13.81 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, 5.74 ha (14.19 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 2016). 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 20 was the starting date of the 2016 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 110% of normal. During Spring 2016 (March through May), precipitation was 132% of normal. Precipitation during July and August was well above average at 180% of normal.

- Using the 1987 Manual, peak hydroperiod during the growing season began in early August and lasted through early September in response to several rainfall events that occurred on August 3 (1.01 in.), August 5 (1.72 in.), and August 13-16 (3.26 in.). However, using the 2010 Midwest Region Supplement, peak hydroperiod during the growing season began in late February and lasted through early March in northeast, northwest, and southeast parts of the site in response to two rain events February 15-16

(0.55 in.) and one intense rain event during February 23-24 (2.61 in.). The East Cape Main Ditch was not a major source of flooding for this monitoring period.

- In 2016, water levels measured in 19 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 14 of 20 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 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.

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.

PLANNED FUTURE ACTIVITIES

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

WETLAND HYDROLOGY TABLES FOR 2016

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	N	Y
15VS	Y	N	Y
16S	Y	Y	Y
16VS	Y	Y	Y
17S	Y	Y	Y
17VS	Y	Y	Y
18S	Y	N	Y
18VS	N	N	Y
19S	Y	N	Y
19VS	Y	N	Y
20S	Y	Y	Y
20VS	Y	Y	Y

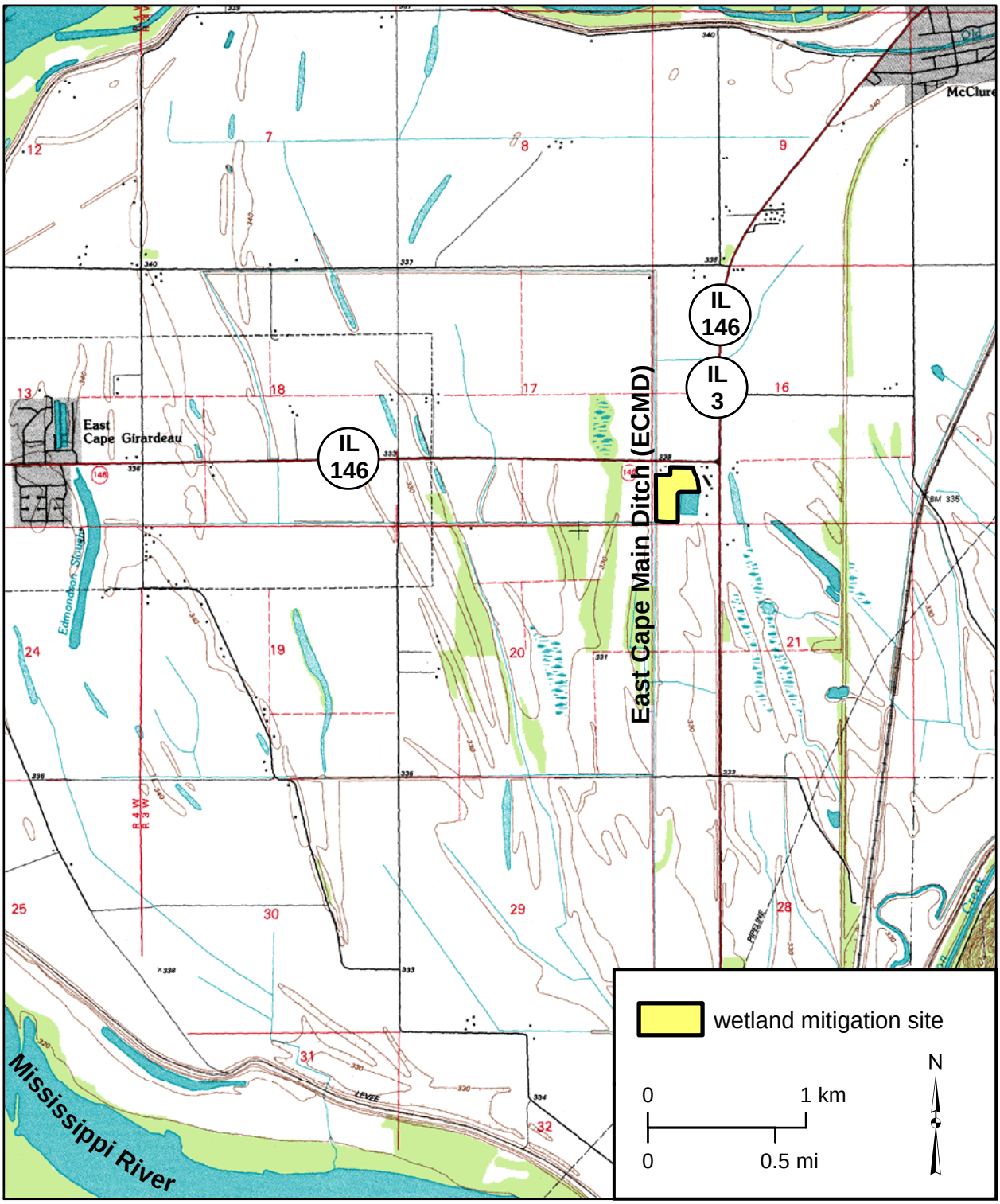
Y- met wetland hydrology criteria
N - did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
B	101.17 m (331.92 ft)	101.16 m (331.89 ft)	101.17 m (331.92 ft)
E	100.87 m (330.94 ft)	100.84 m (330.84 ft)	100.86 m (330.91 ft)

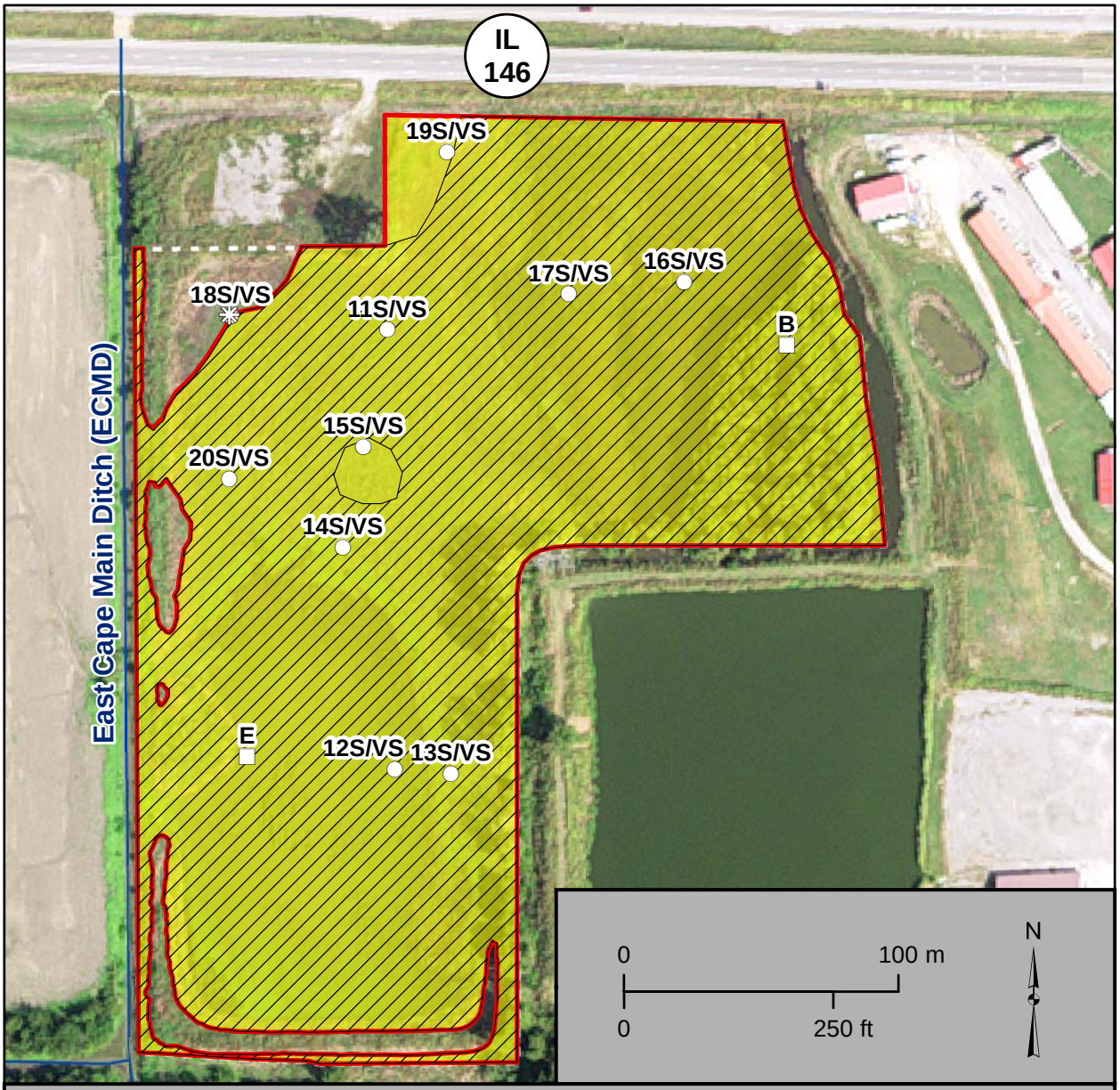
East Cape Girardeau Wetland Mitigation Site
(IL 146, FAP 312)

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 2016 Wetland Hydrology
September 1, 2015 through September 30, 2016
Map based on 2015 Farm Service Agency digital orthophotography, Alexander County, Illinois
(USDA-FSA 2015)

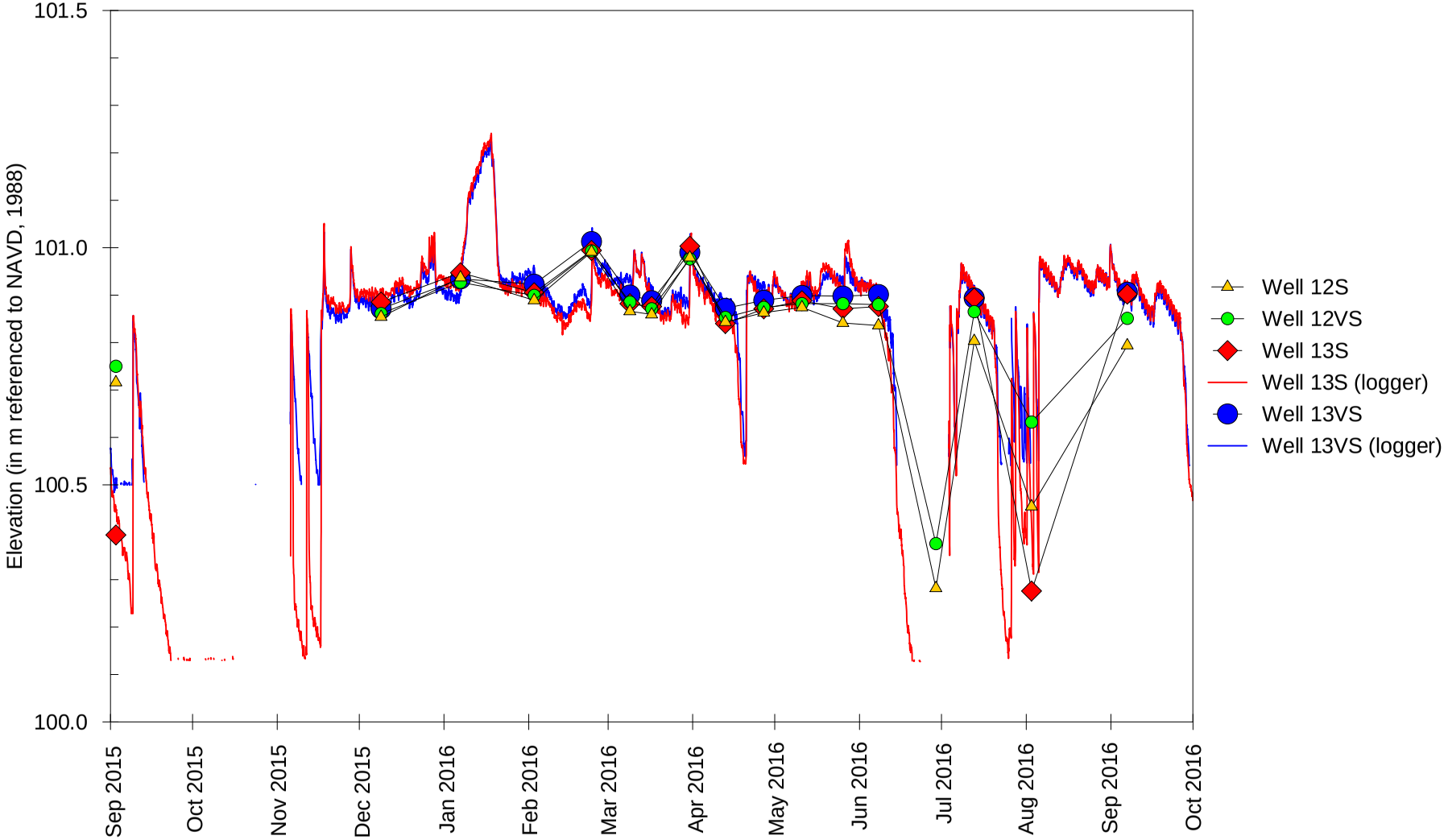


2016 Wetland Hydrology

- >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

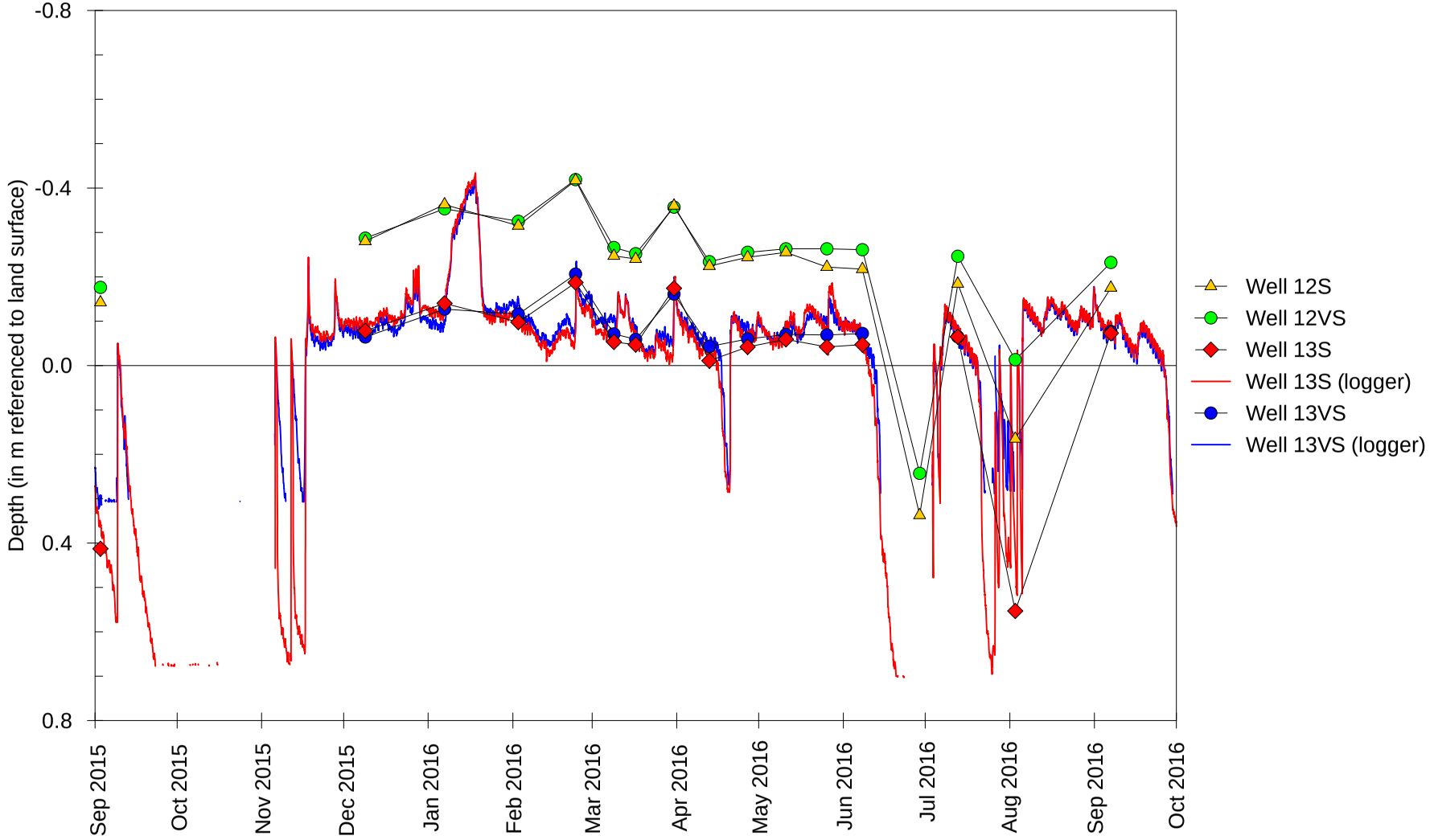
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Water-Level Elevations in Monitoring Wells (South)



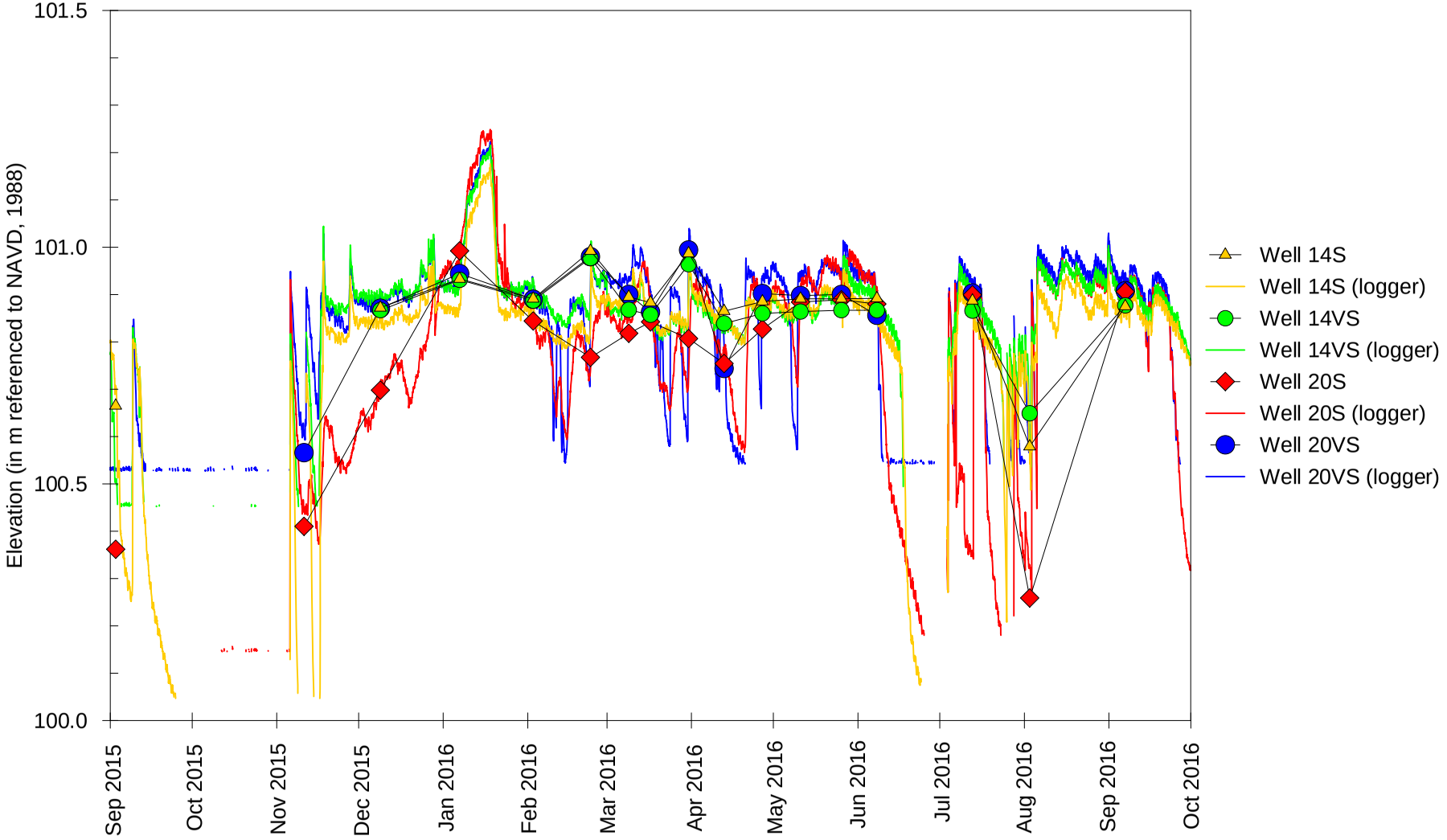
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Depth to Water
in Monitoring Wells (South)



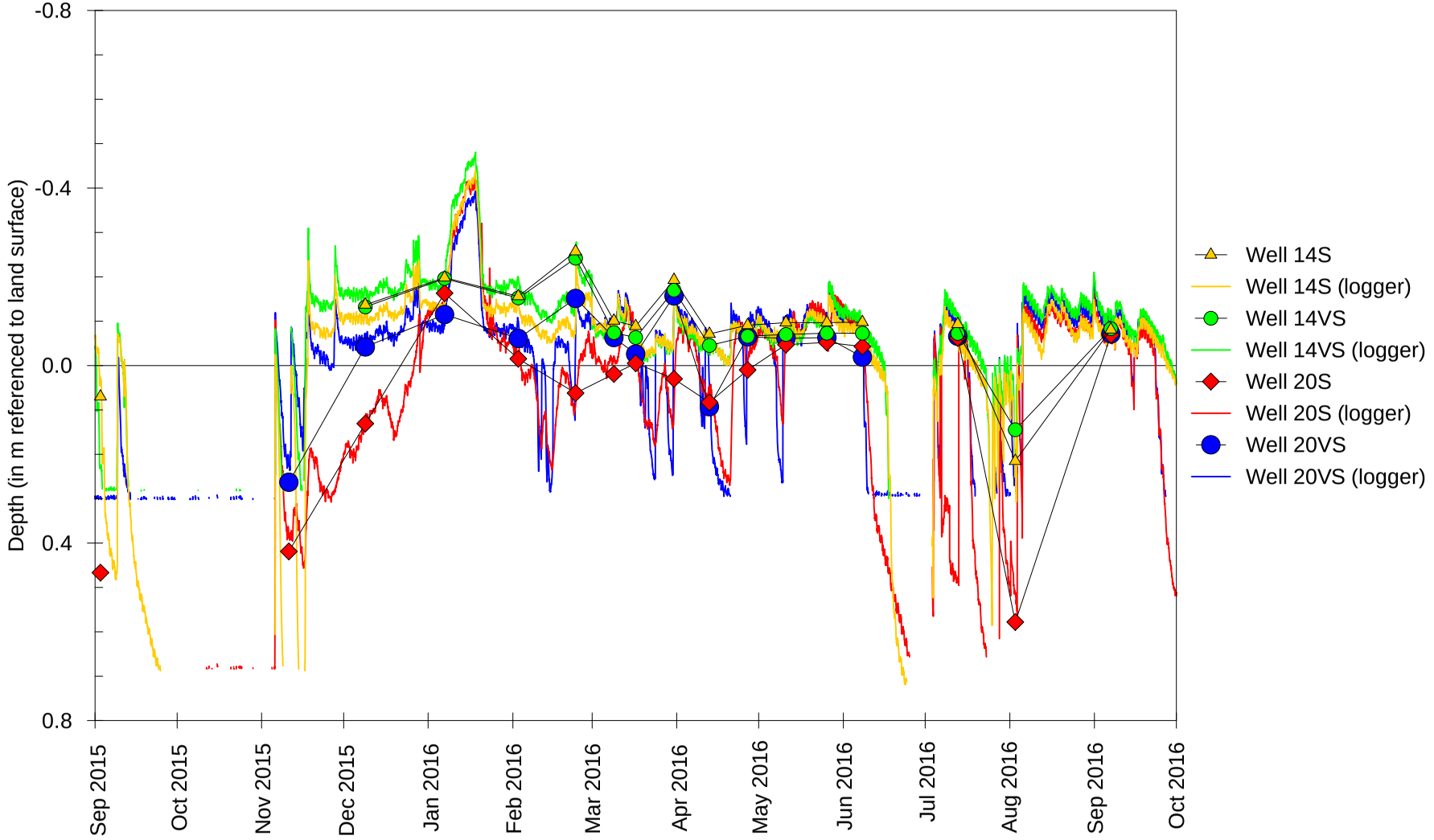
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Water-Level Elevations in Monitoring Wells (Southcentral)



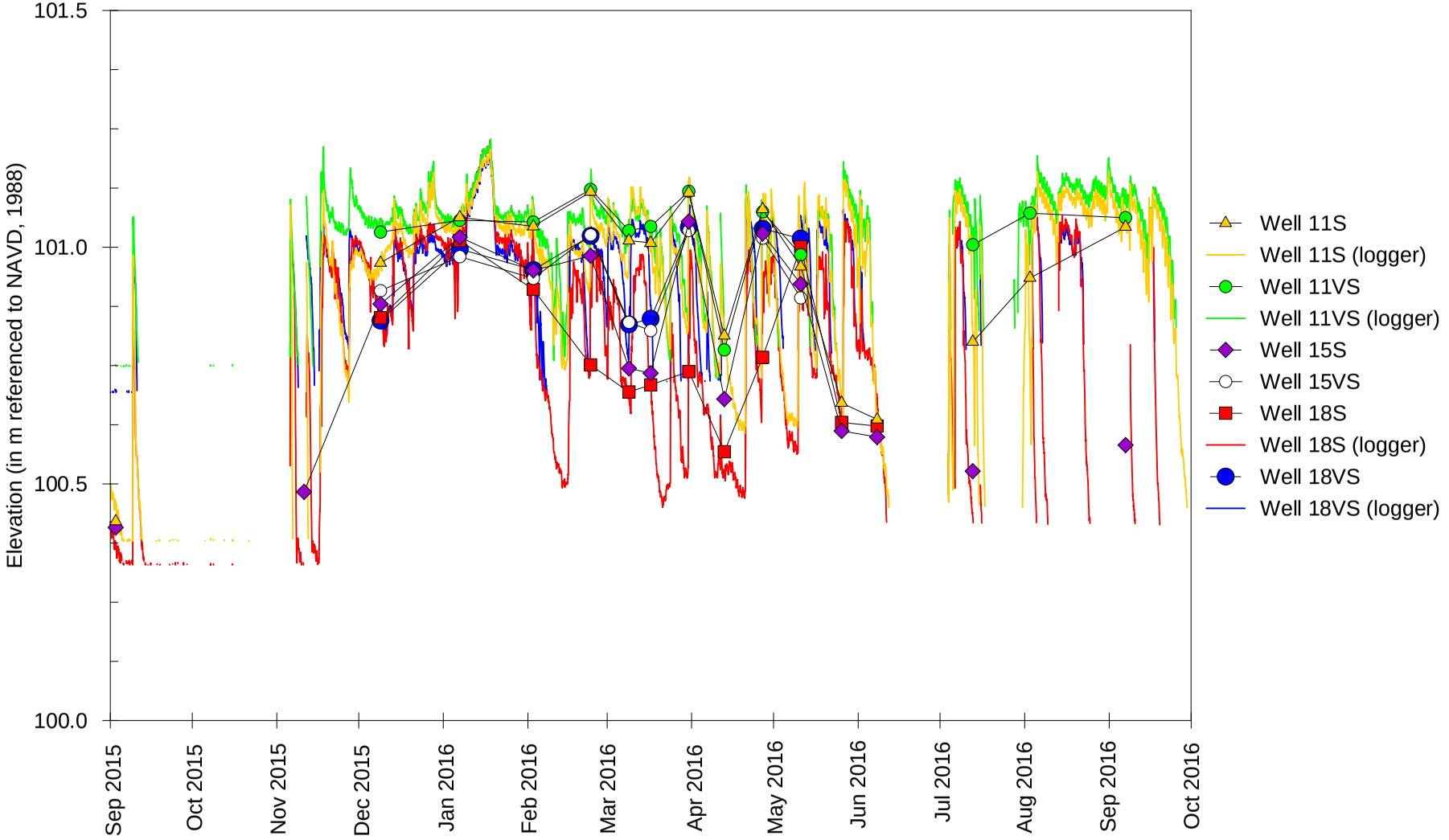
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Depth to Water
in Monitoring Wells (Southcentral)



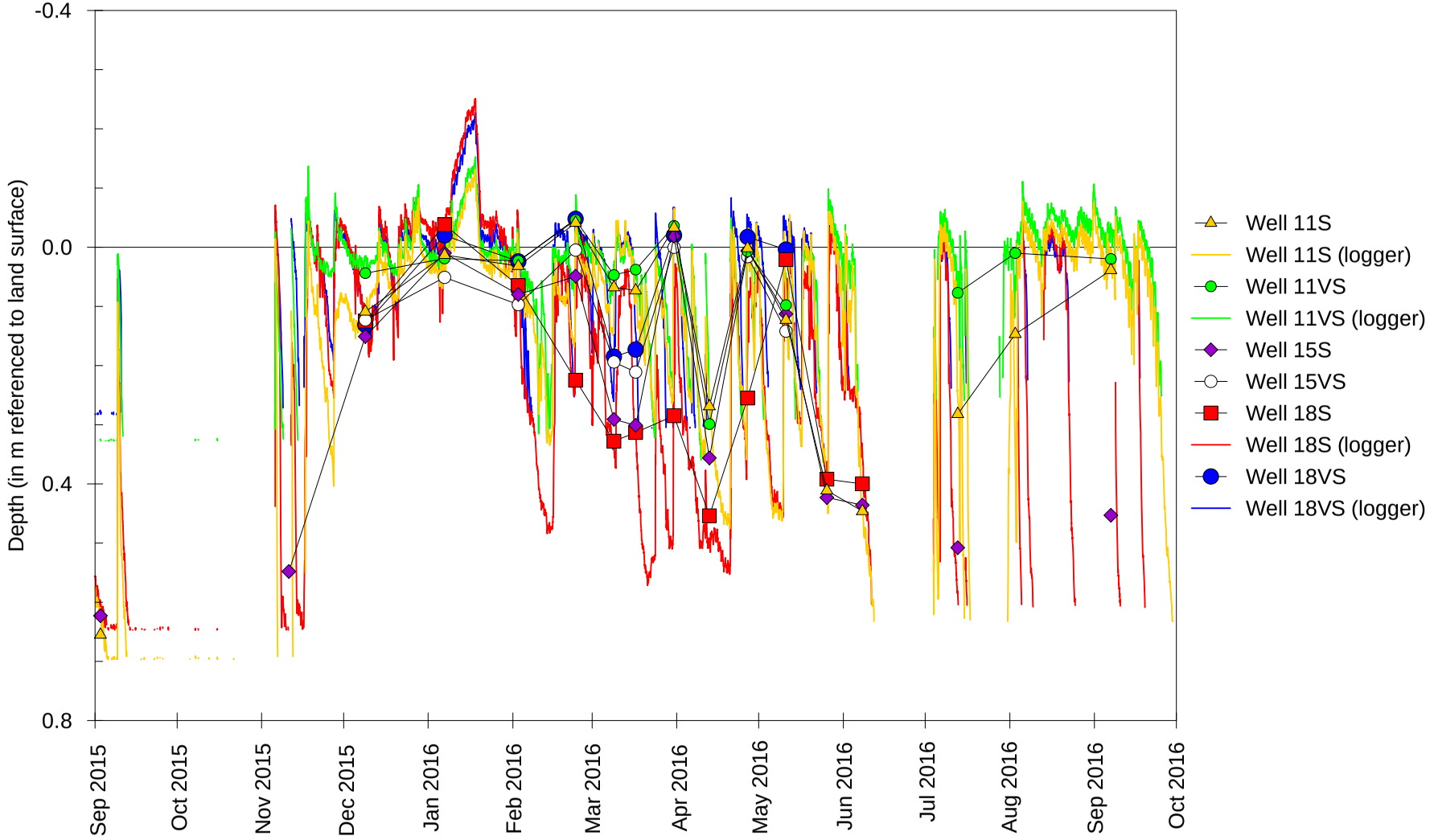
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Water-Level Elevations in Monitoring Wells (Northwest)



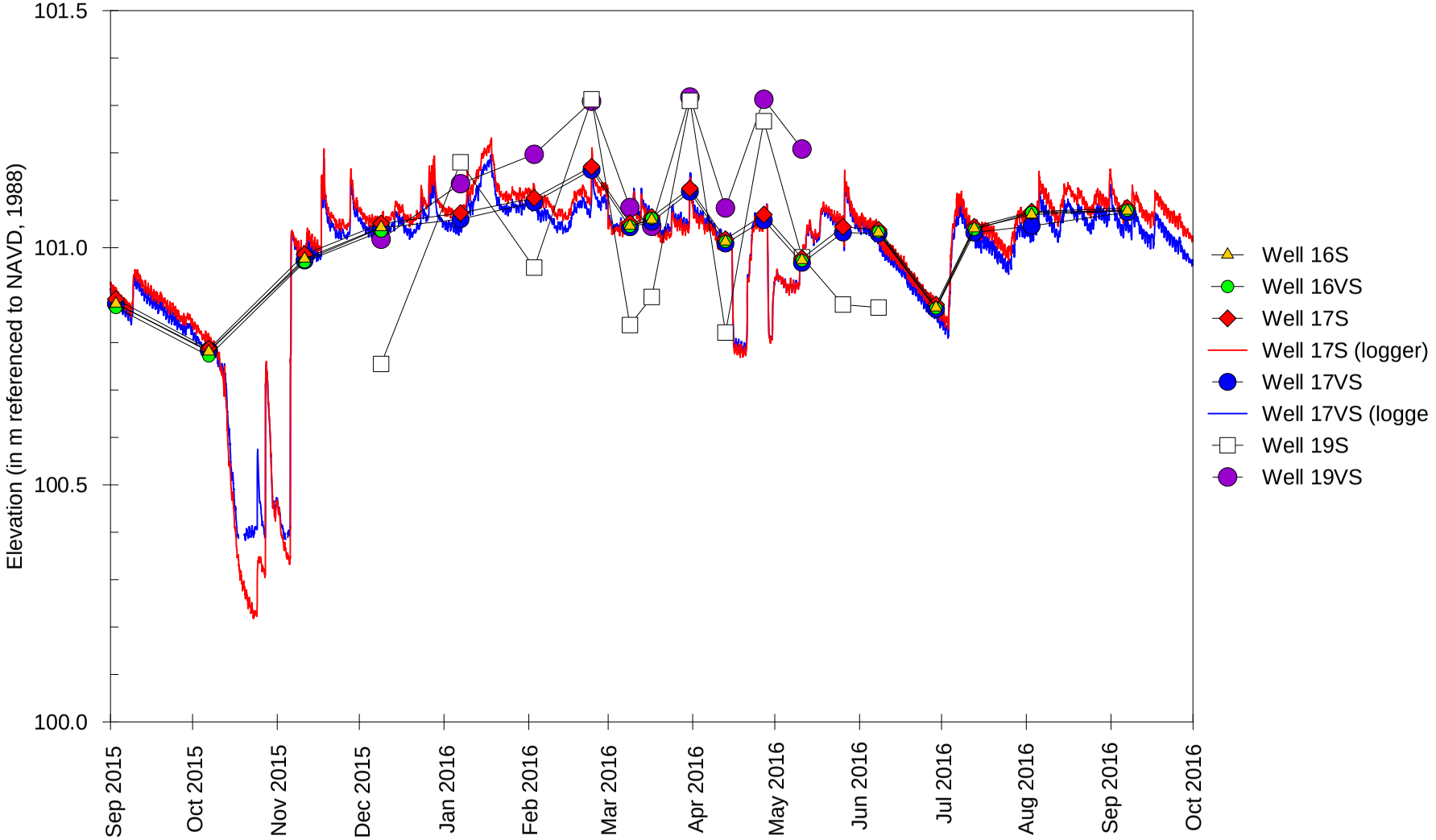
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Depth to Water
in Monitoring Wells (Northwest)



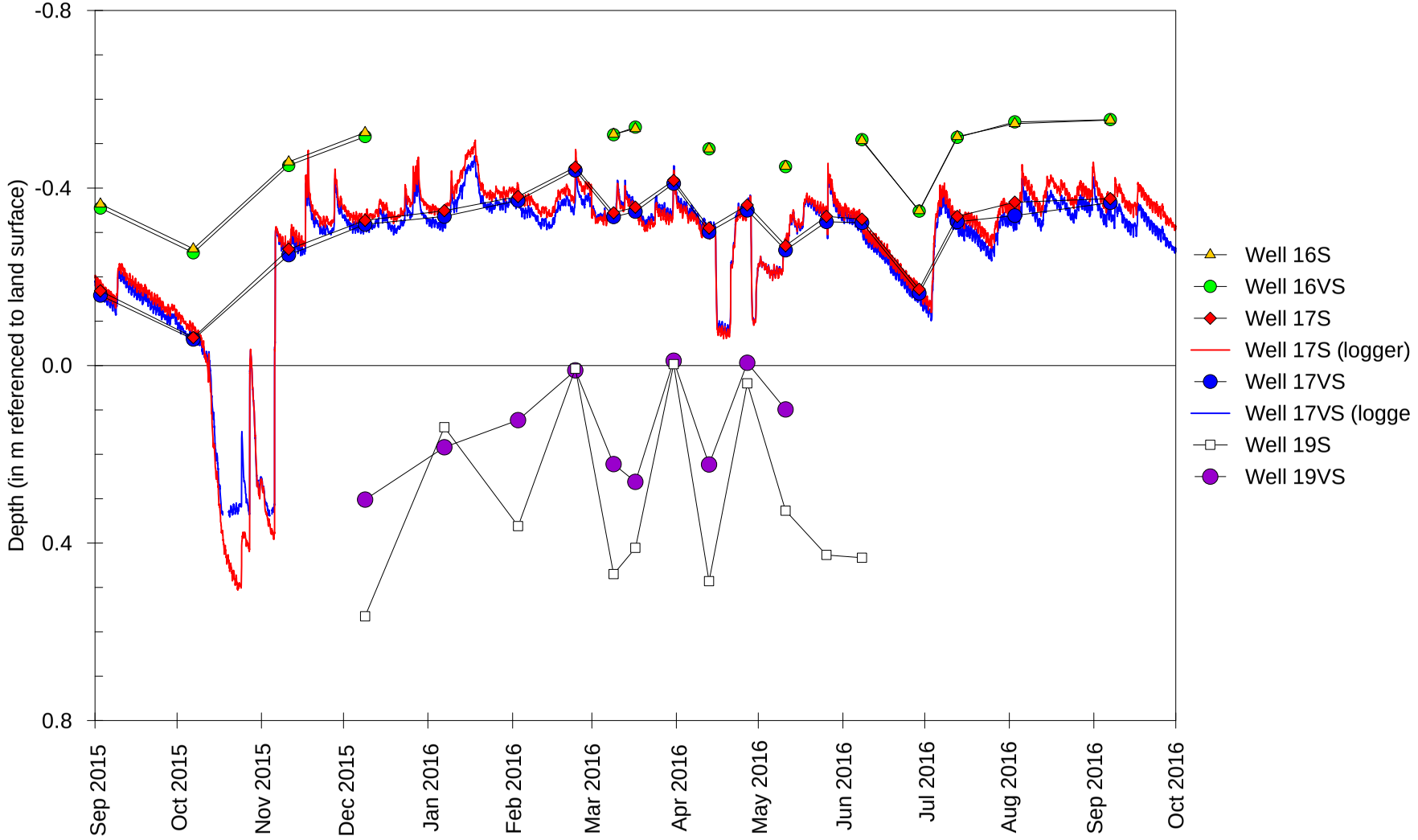
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Water-Level Elevations in Monitoring Wells (Northeast)



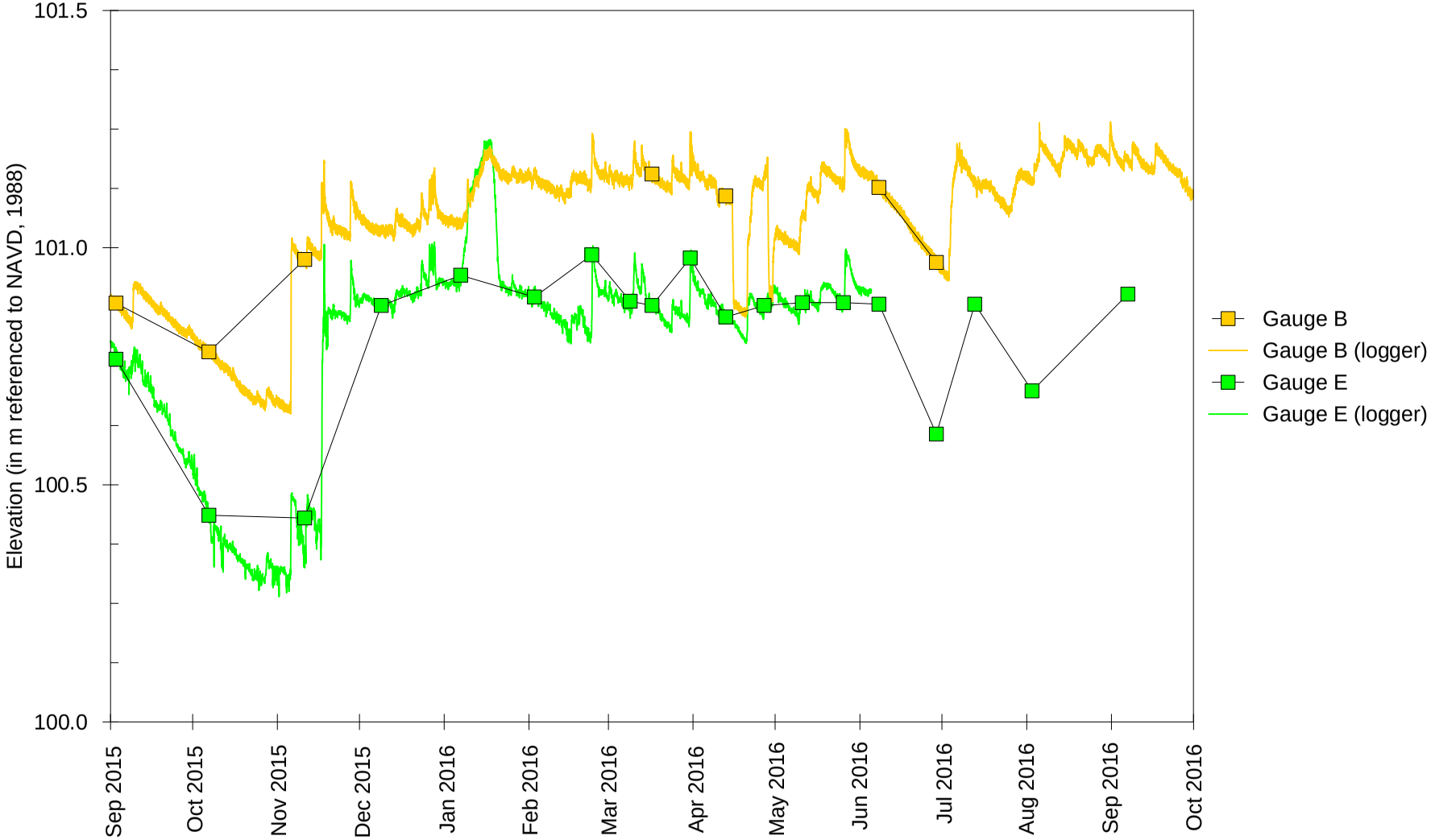
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Depth to Water
in Monitoring Wells (Northeast)



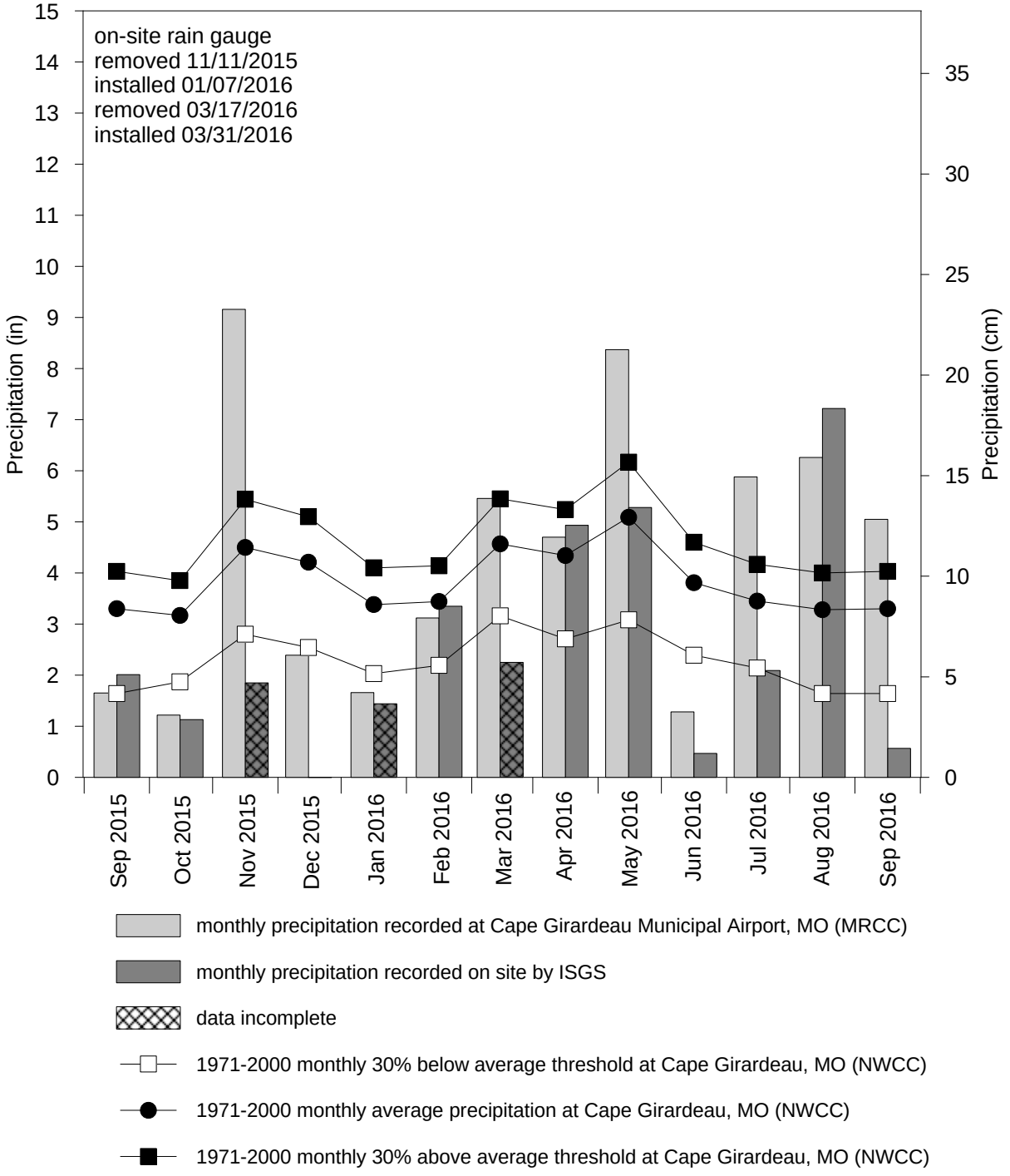
East Cape Girardeau Wetland Mitigation Site
September 1, 2015 through September 30, 2016

Water-Level Elevations at Surface-Water Gauges



East Cape Girardeau Wetland Mitigation Site
September 2015 through September 2016

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



LAWRENCE COUNTY **ISGS #82**
WETLAND MITIGATION BANK
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 2016

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), 12.21 ha (30.17 ac), of a total site area of 25.71 ha (63.52 ac), satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season, and 11.33 ha (27.99 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 11.59 ha (28.63 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 2016); 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 2016 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period, recorded at Lawrenceville International Airport (MRCC station #13809), was 104% of normal. Precipitation in Spring 2016 (March through May) was 99% of normal. August 2016 was particularly wet, with 210% of normal rainfall.
- Peak hydroperiod during the growing season occurred in April due to a flood event on the Embarras River during April 12-15 that caused a backup on Beaver Pond Ditch which flooded the site, and seven rainfall events from March 30 through April 11, including 3.02 cm (1.19 in.) on April 11.
- In 2016, water levels measured in 10 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 10 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

- Monitoring wells 19S, 21S, 22S, 23S and Gauge D were installed to monitor saturation and inundation along the eastern boundary of the site. During the growing season, there was only one flood event that caused extensive inundation in this portion of the site (Gauge D), but the highest surface-water elevation was still lower than ground surface elevation along the site boundary. There were also several periods of saturation during the growing season (Well 19S), but the longest was only about 24 hours.

PLANNED FUTURE ACTIVITIES

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

WETLAND HYDROLOGY TABLES FOR 2016

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
4S	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	N	N	N
21S	N	N	N
22S	N	N	N
23S	N	N	N
24S	Y	Y	Y
25S	N	N	N
26S	N	N	N
27S	N	N	N
28S	Y	Y	Y
29S	N	N	N
30S	N	N	N
31S	N	N	N
32S	Y	Y	Y

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

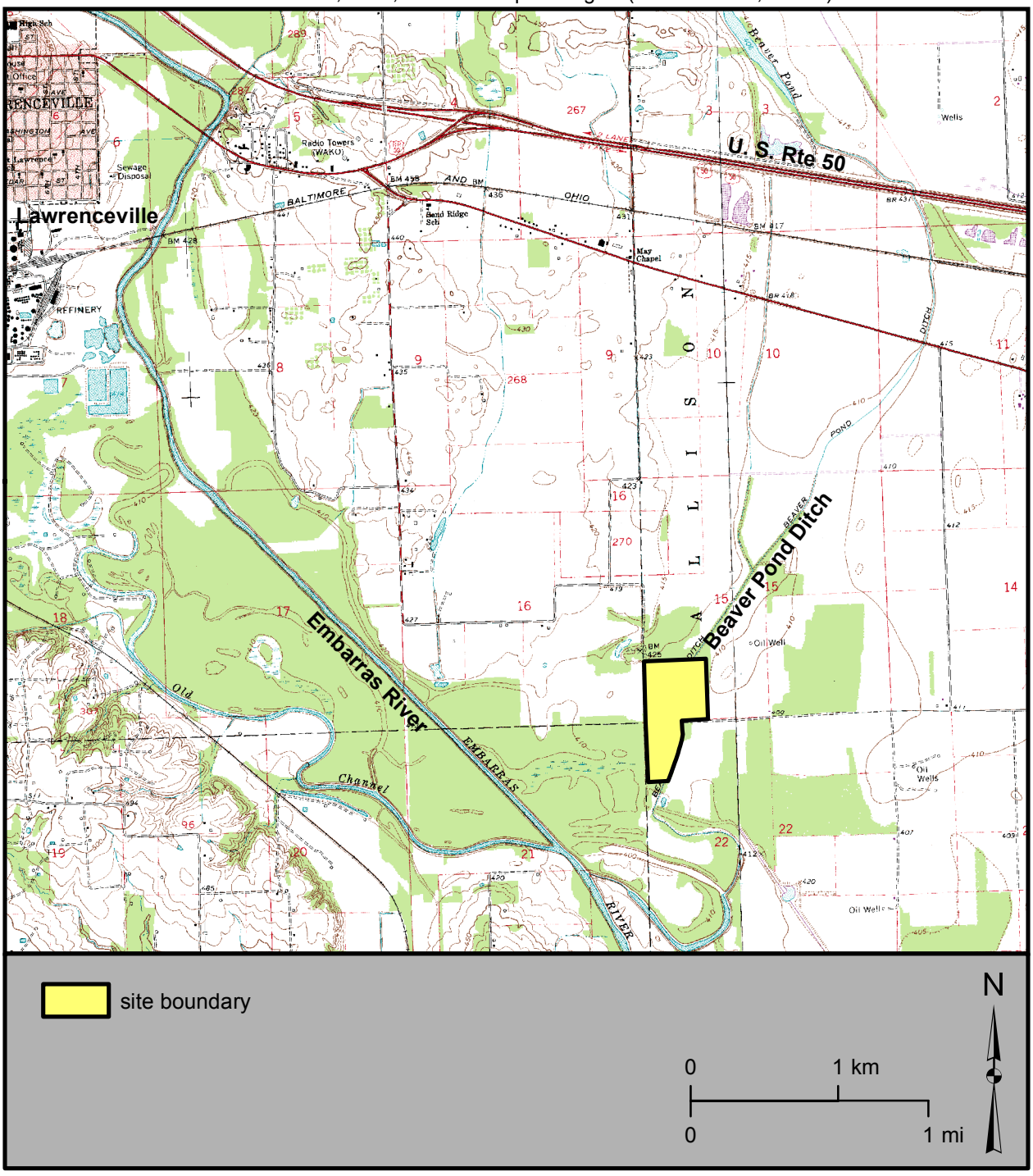
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
B	124.79 m (409.42 ft)	124.78 m (409.38 ft)	124.79 m (409.38 ft)
D	124.57 m (408.69 ft)	n/a	n/a
E	124.26 m (407.68 ft)	124.24 m (407.61 ft)	124.26 m (407.68 ft)
F	124.53 m (408.56 ft)	124.48 m (408.40 ft)	124.51 m (408.50 ft)
G	124.74 m (409.25 ft)	124.74 m (409.25 ft)	124.74 m (409.25 ft)
H	124.50 m (408.46 ft)	124.44 m (408.27 ft)	124.50 m (408.46 ft)

n/a – hydroperiod was not long enough 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)

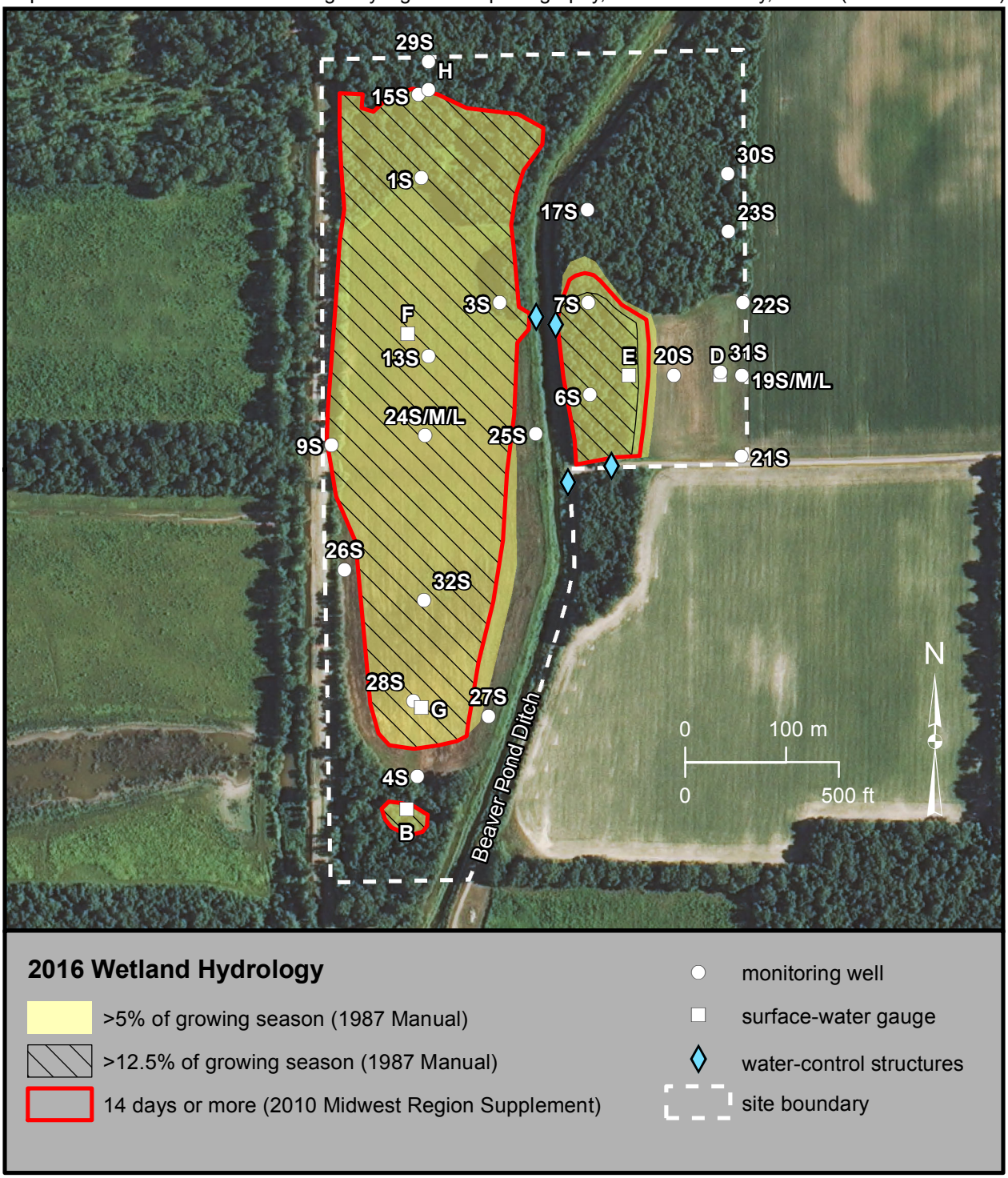


Lawrence County Wetland Mitigation Bank

Estimated Areal Extent of 2016 Wetland Hydrology

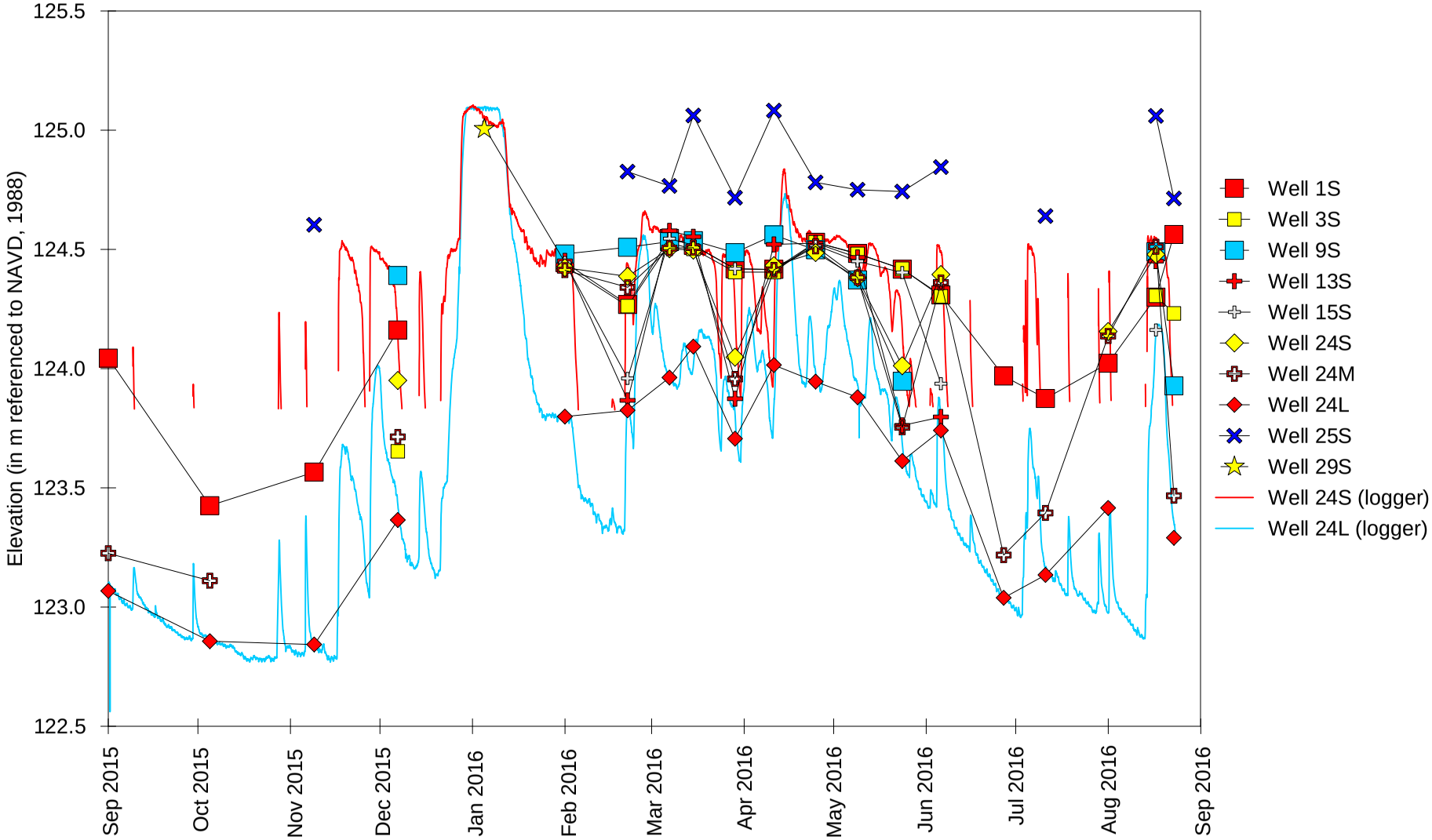
September 1, 2015 through August 31, 2016

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



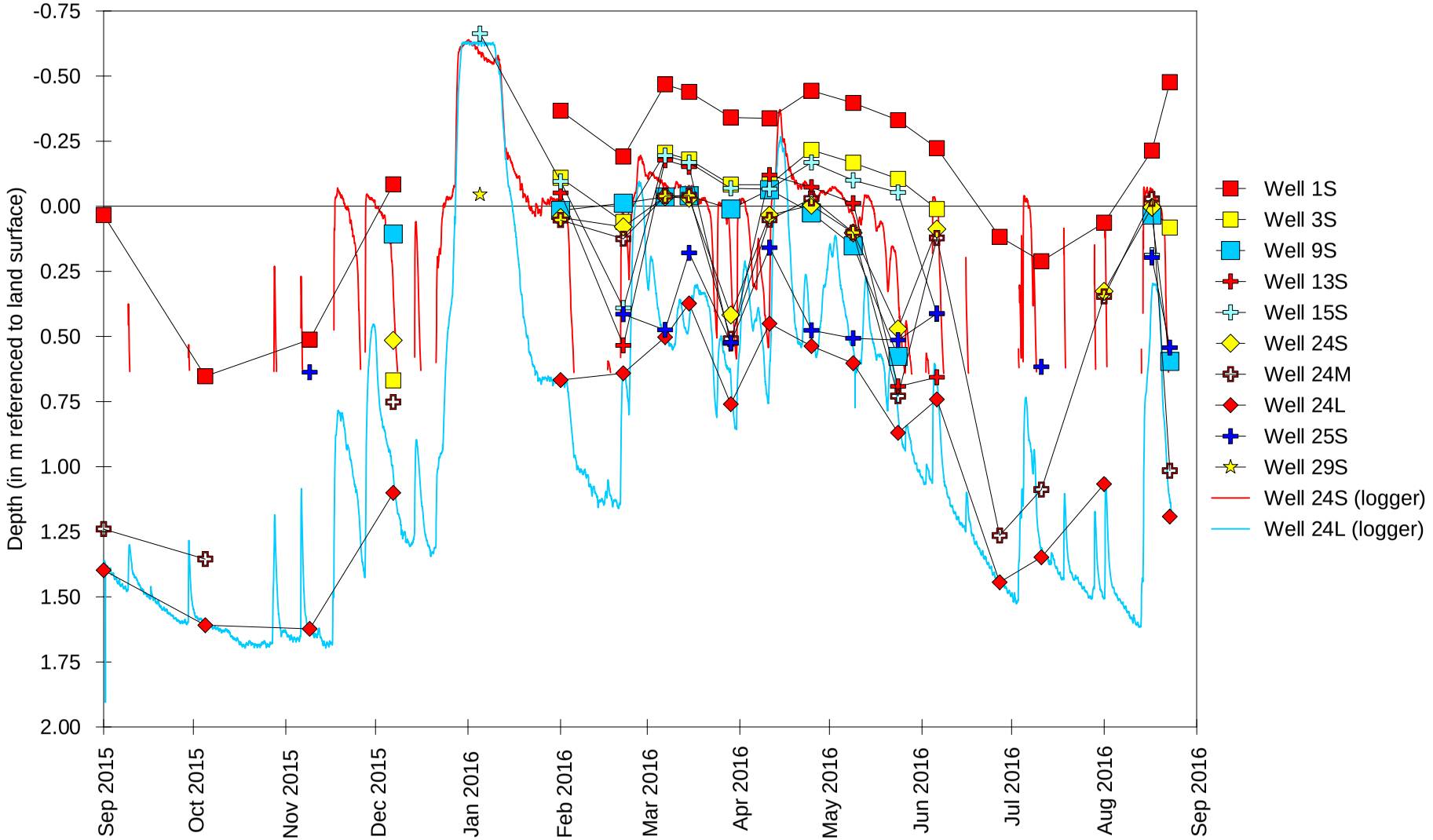
Lawrence County Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

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



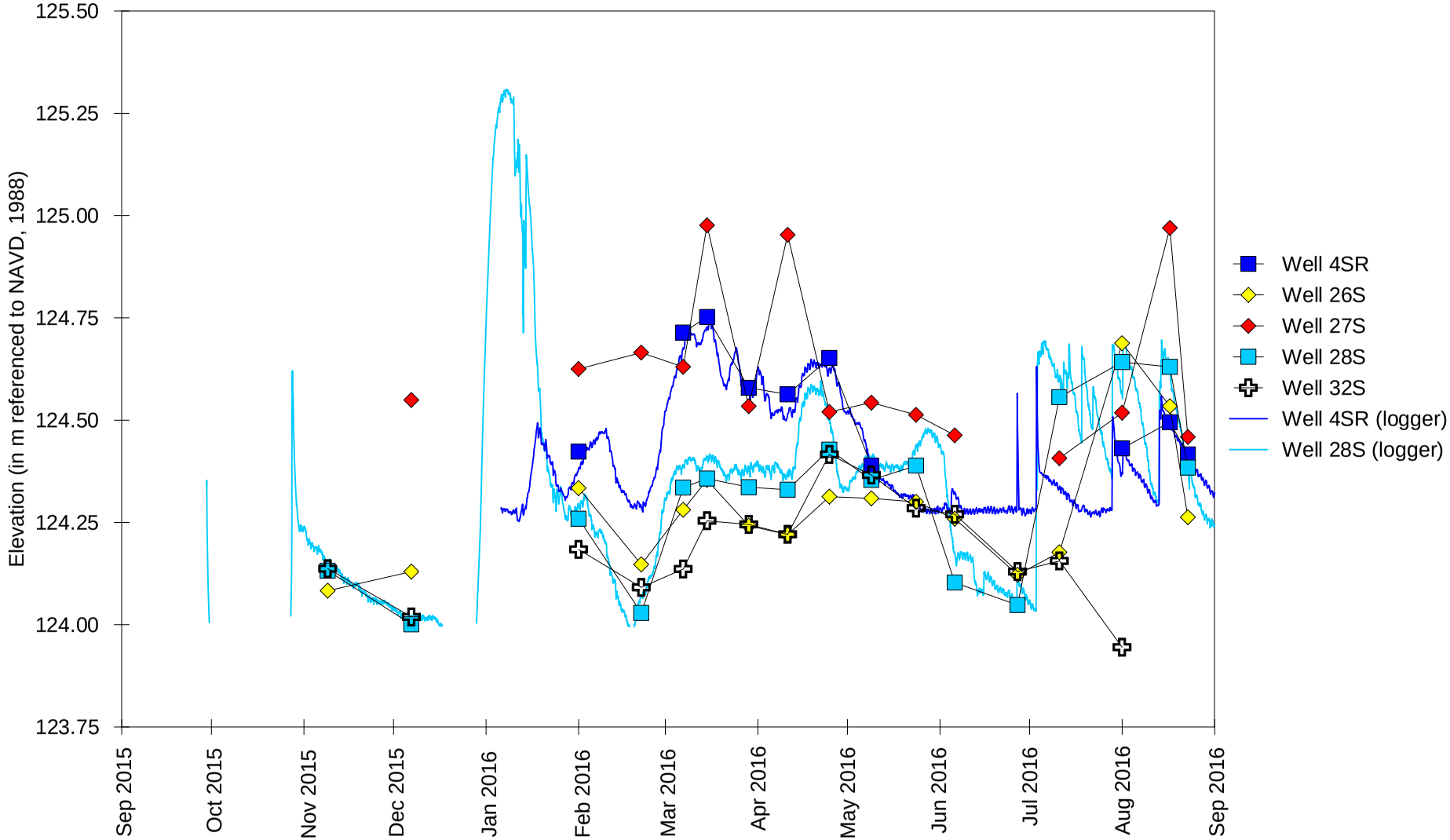
Lawrence County Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells West of Beaver Pond Ditch



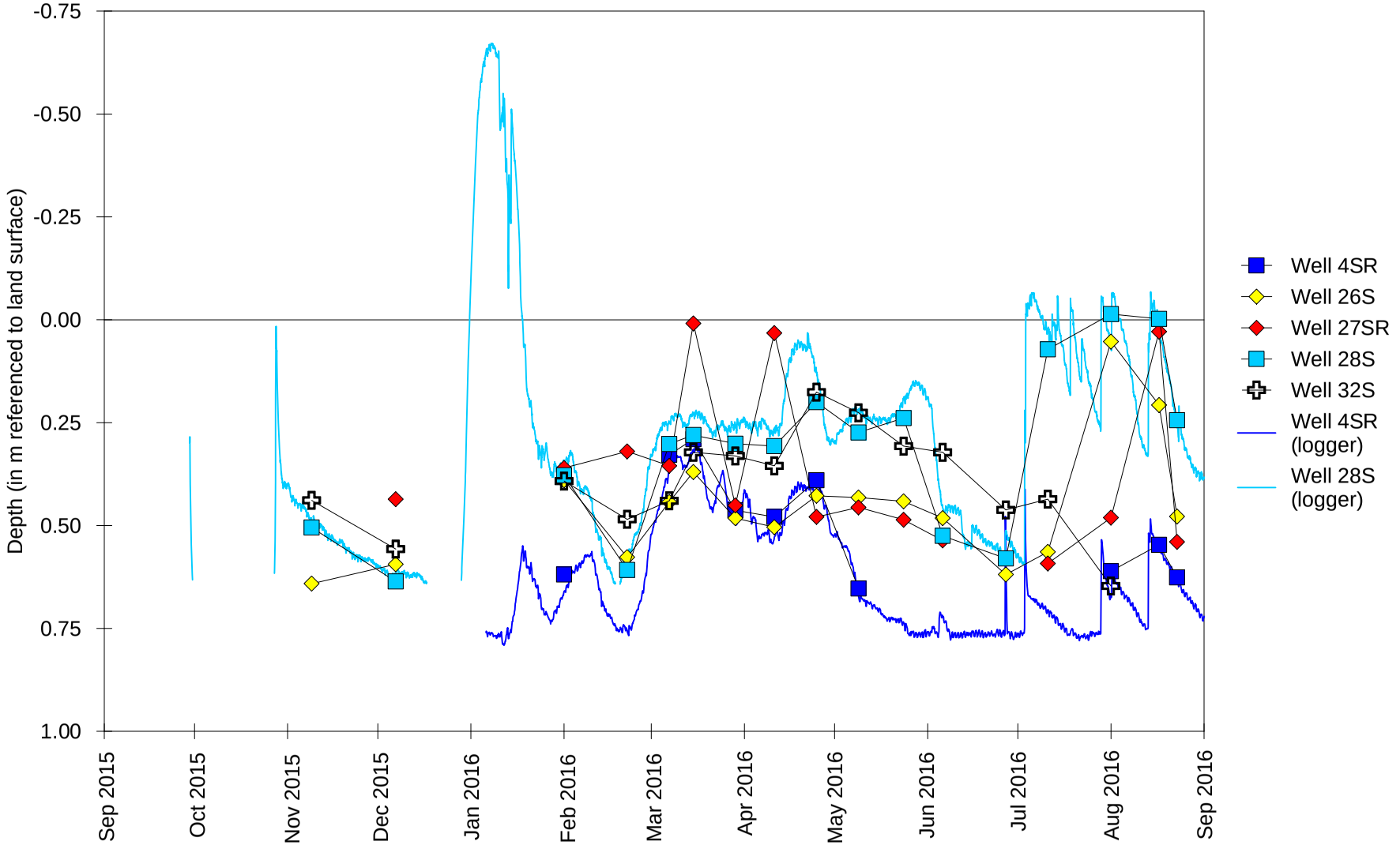
Lawrence County Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

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



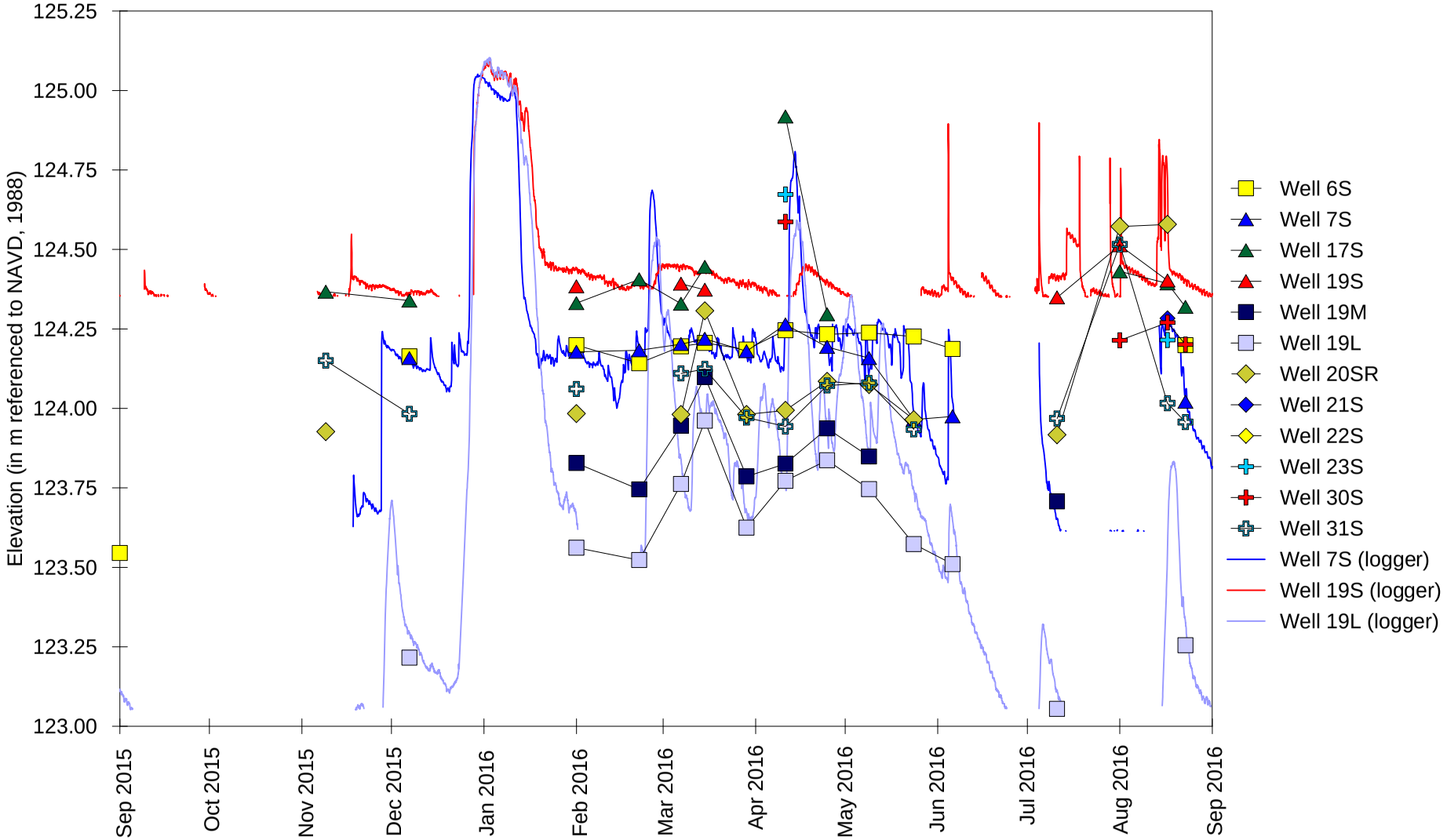
Lawrence County Wetland Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells West of Beaver Pond Ditch



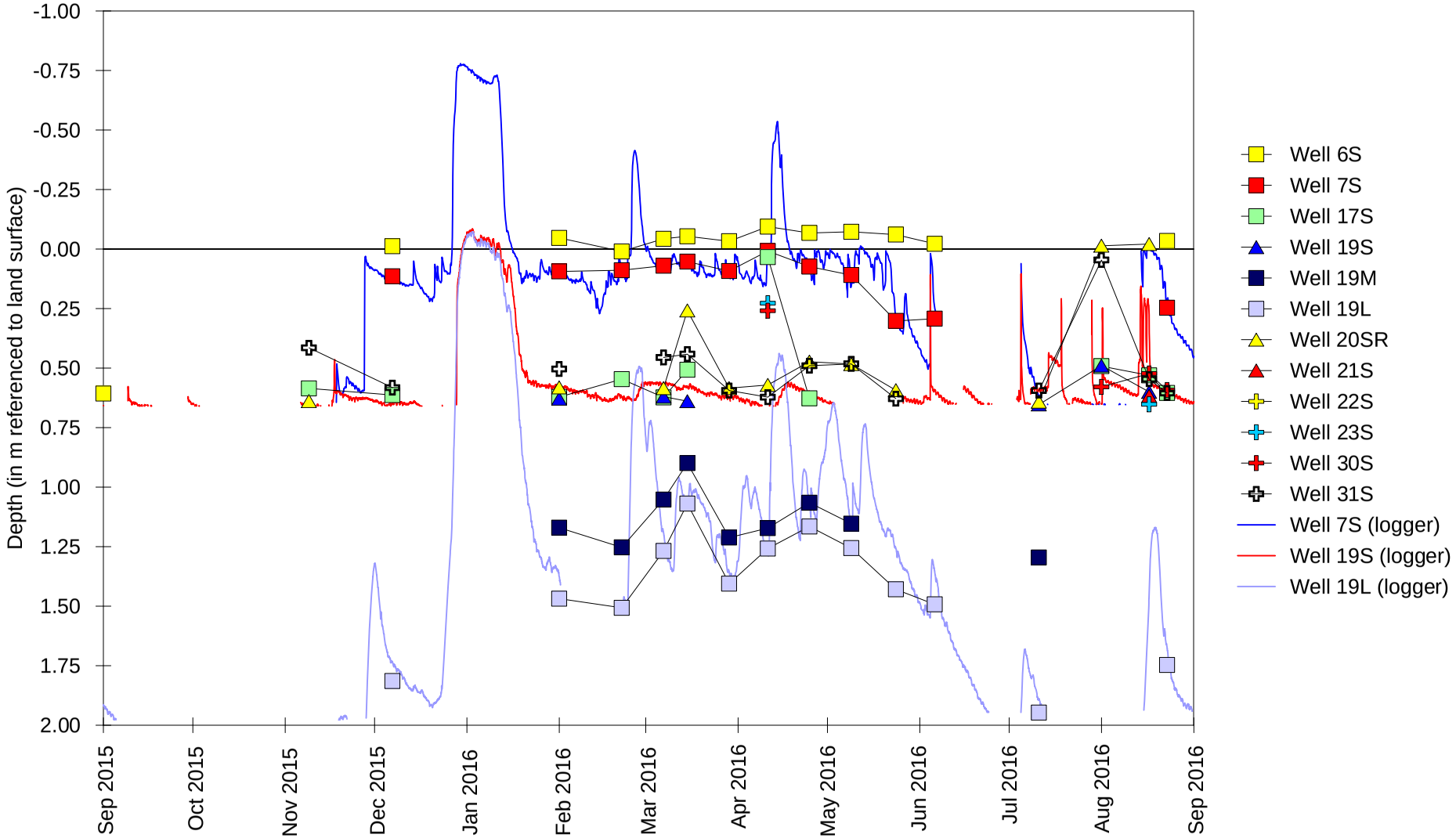
Lawrence County Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

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



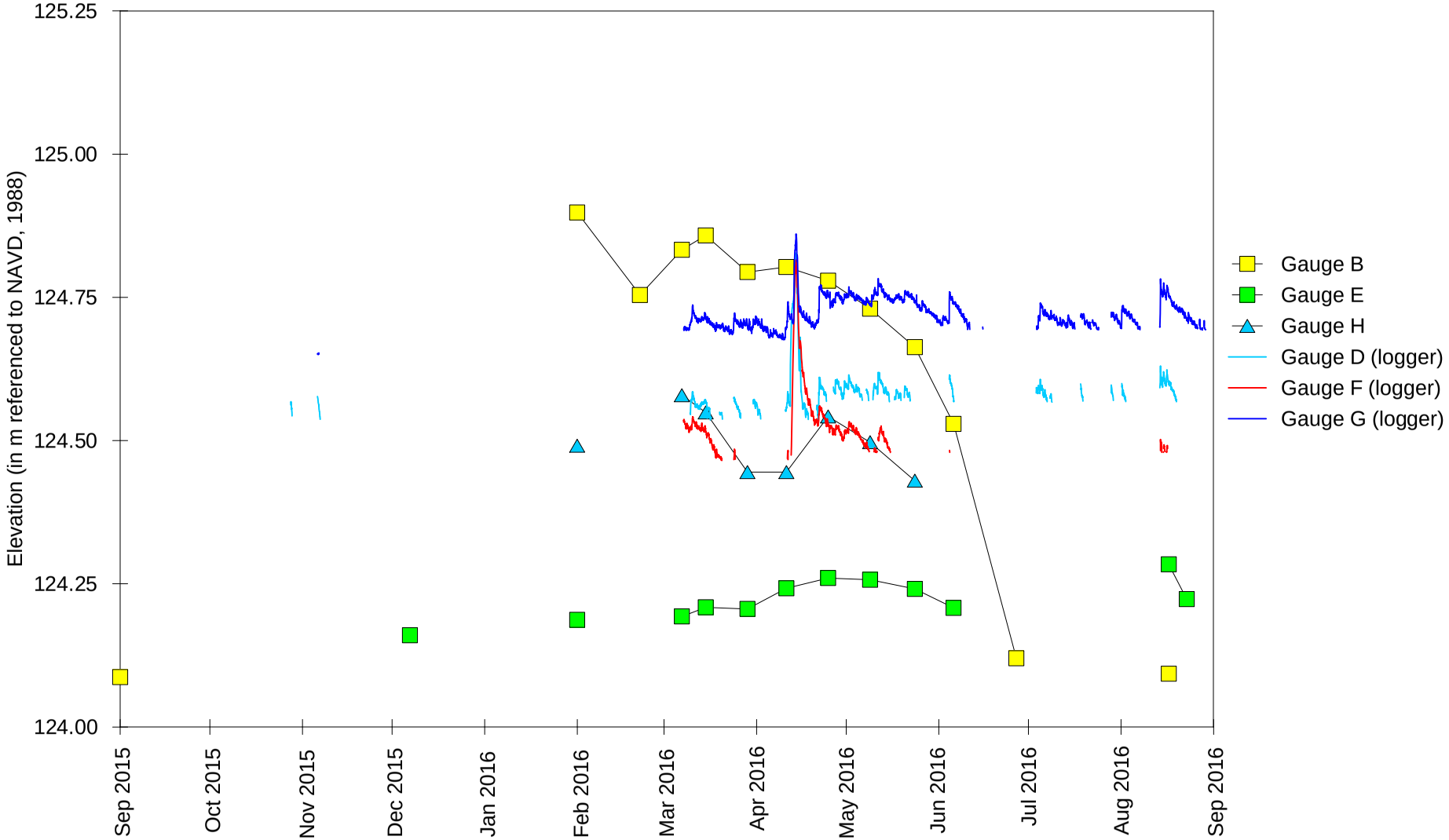
Lawrence County Wetland Bank
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells East of Beaver Pond Ditch

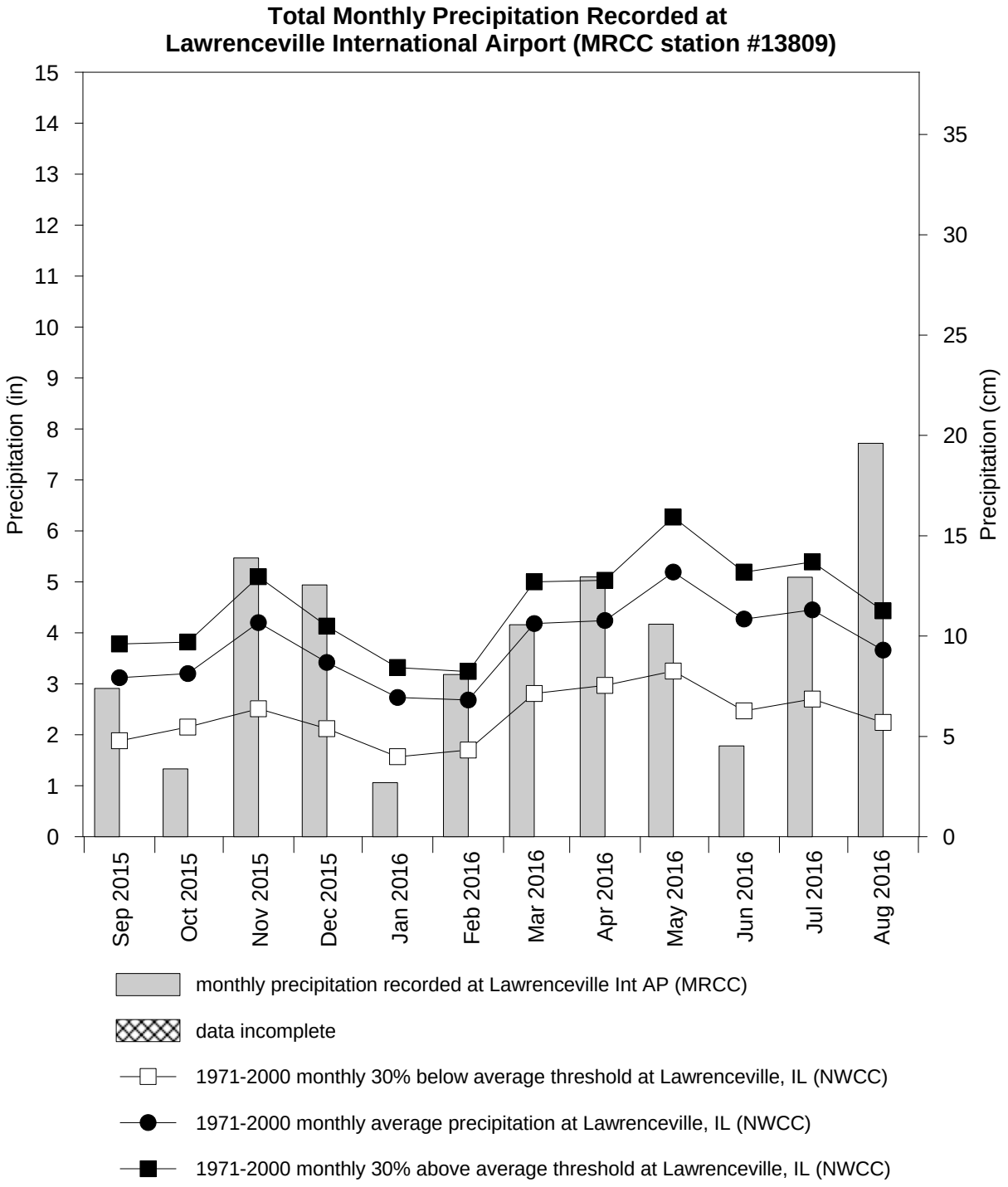


Lawrence County Wetland Mitigation Bank
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Lawrence County Wetland Mitigation Bank
September 2015 through August 2016



NORTH CHICAGO **ISGS #84**
WETLAND MITIGATION SITE
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: The 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.

WETLAND HYDROLOGY CALCULATION FOR 2016

The target compensation area for the North Chicago wetland mitigation site is not available. Using the 1987 Manual (Environmental Laboratory 1987), 17.96 ha (44.37 ac), of a total site area of 65.10 ha (160.87 ac), satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season, and 17.37 ha (42.93 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 17.58 ha (43.44 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 2016). 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 11 was the starting date of the 2016 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 119% of normal. During Spring 2016 (March through May), precipitation was 119% of normal. Precipitation in December was well above average at 200% of normal. July precipitation was also above average at 177% of normal.

- Peak hydroperiod during the growing season began in late April and continued through mid-May. Inundation and saturation during this period was mainly in response to two intense rainfall events that occurred April 28-30 and May 9-10, which produced 1.14 in. and 1.44 in., respectively.

- In 2016, water levels measured in 31 of 33 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 26 of 33 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 33 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 2016

Well locations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
09-01VS	Y	Y	Y
09-02VS	Y	Y	Y
09-03VS	N	N	N
09-04VS	N	N	N
09-05VS	Y	Y	Y
09-06VS	Y	Y	Y
09-07S	Y	Y	Y
09-07VS	Y	Y	Y
09-08VS	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	N	N
14-07VS	Y	N	N
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
14-13VS	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	N	N
15-21VS	Y	N	N
15-22S	Y	Y	Y

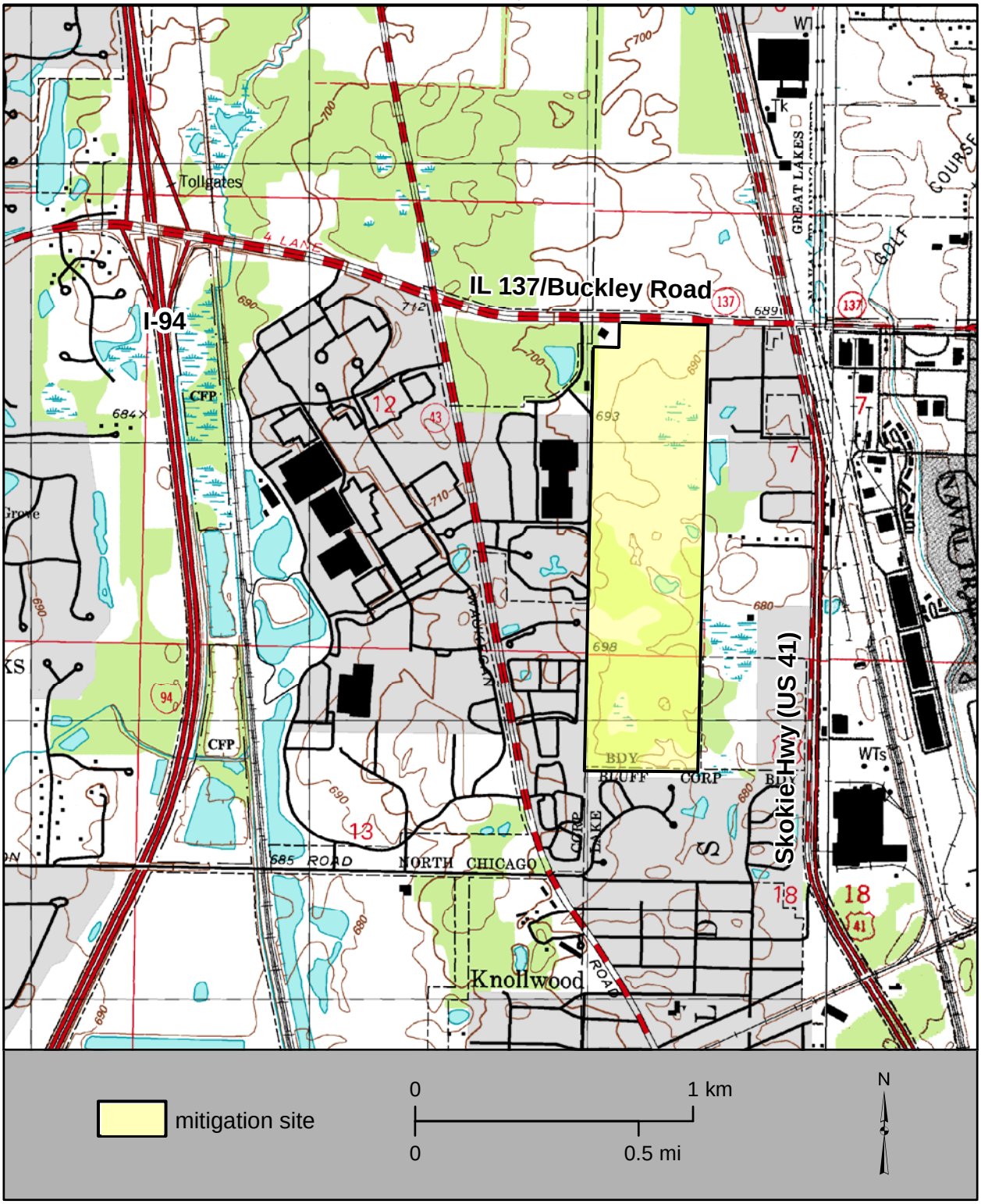
Y – met wetland hydrology criteria
N – did not meet wetland hydrology criteria

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

n/a – hydroperiod was not long enough to determine an elevation

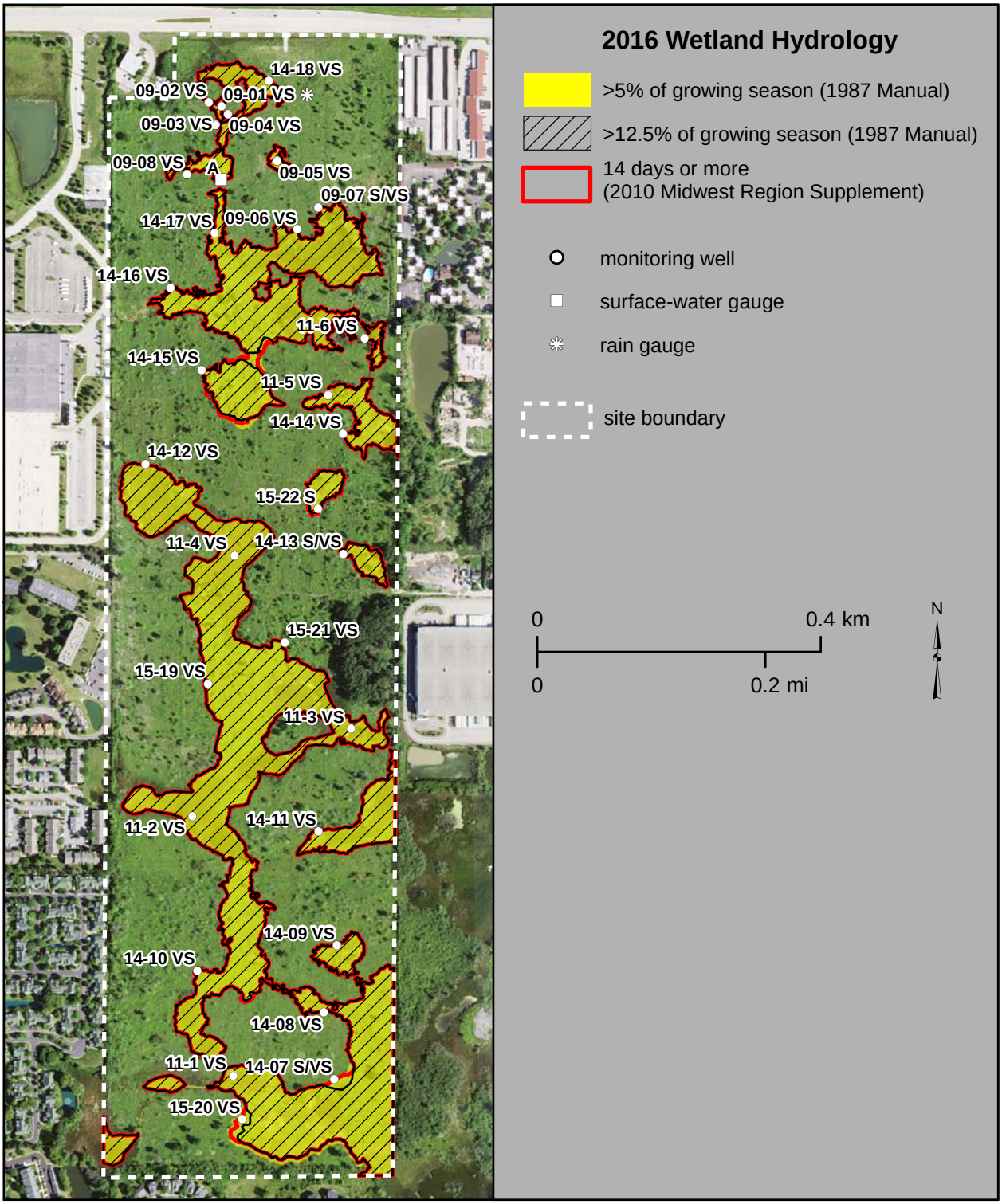
North Chicago Wetland Mitigation Site
(IL 56/IL47, FAP 326)
General Study Area and Vicinity

from the USGS Topographic Series, Libertyville and Waukegan, IL (USGS 1993b and 1998)
7.5-minute quadrangles



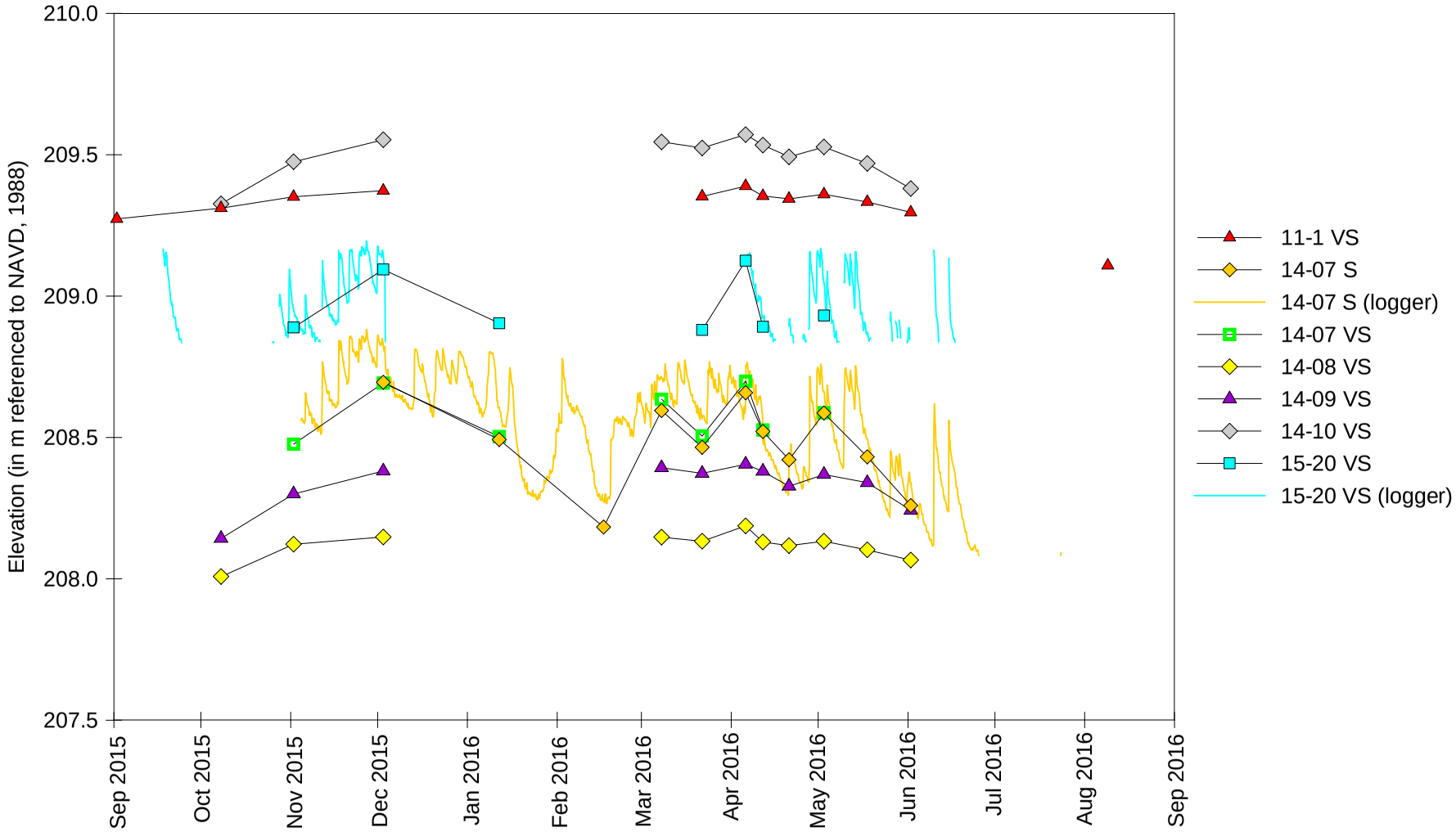
North Chicago Wetland Mitigation Site
(IL 56/IL47, FAP 326)
Estimated Areal Extent of 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016

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



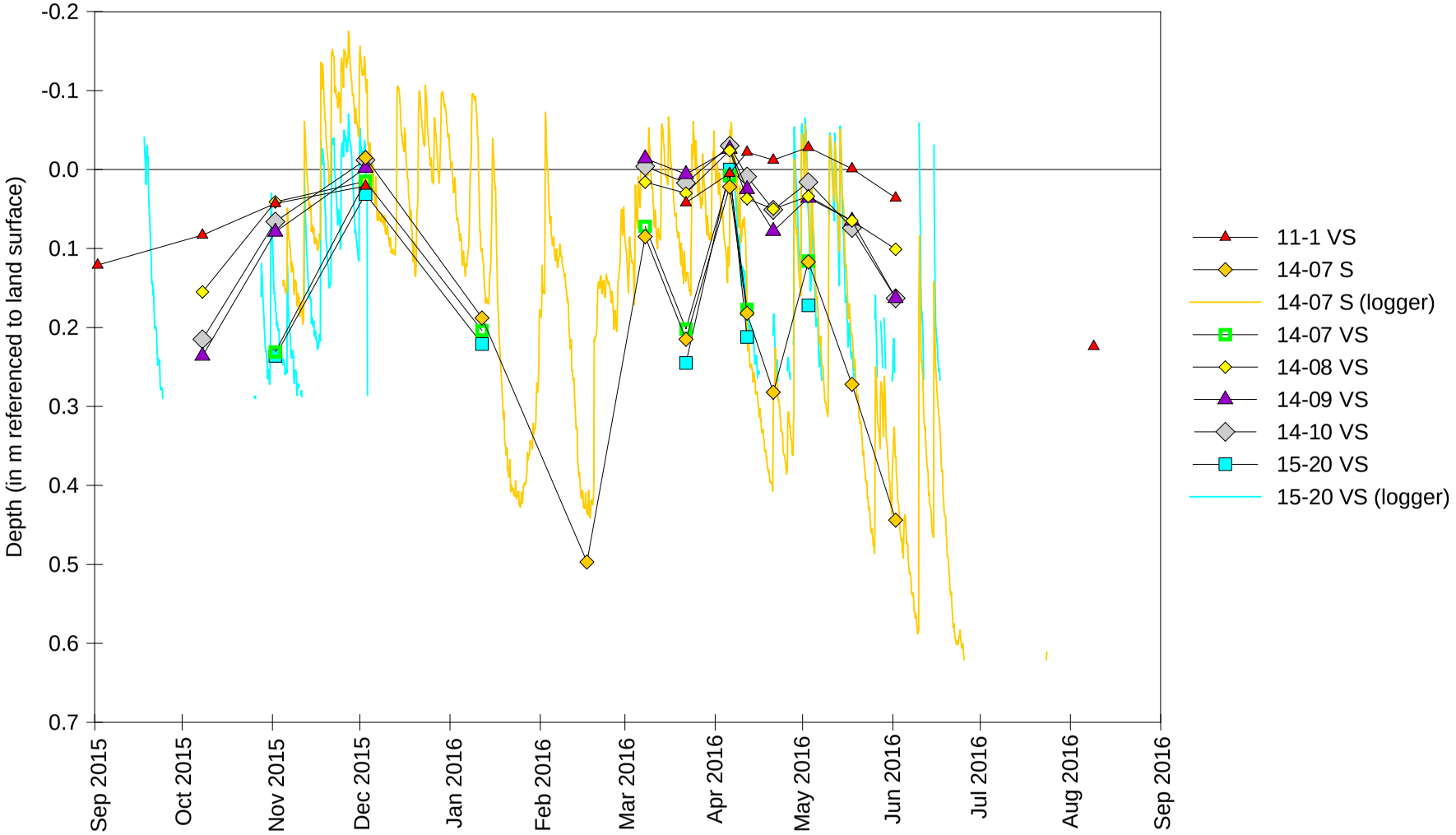
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells - South



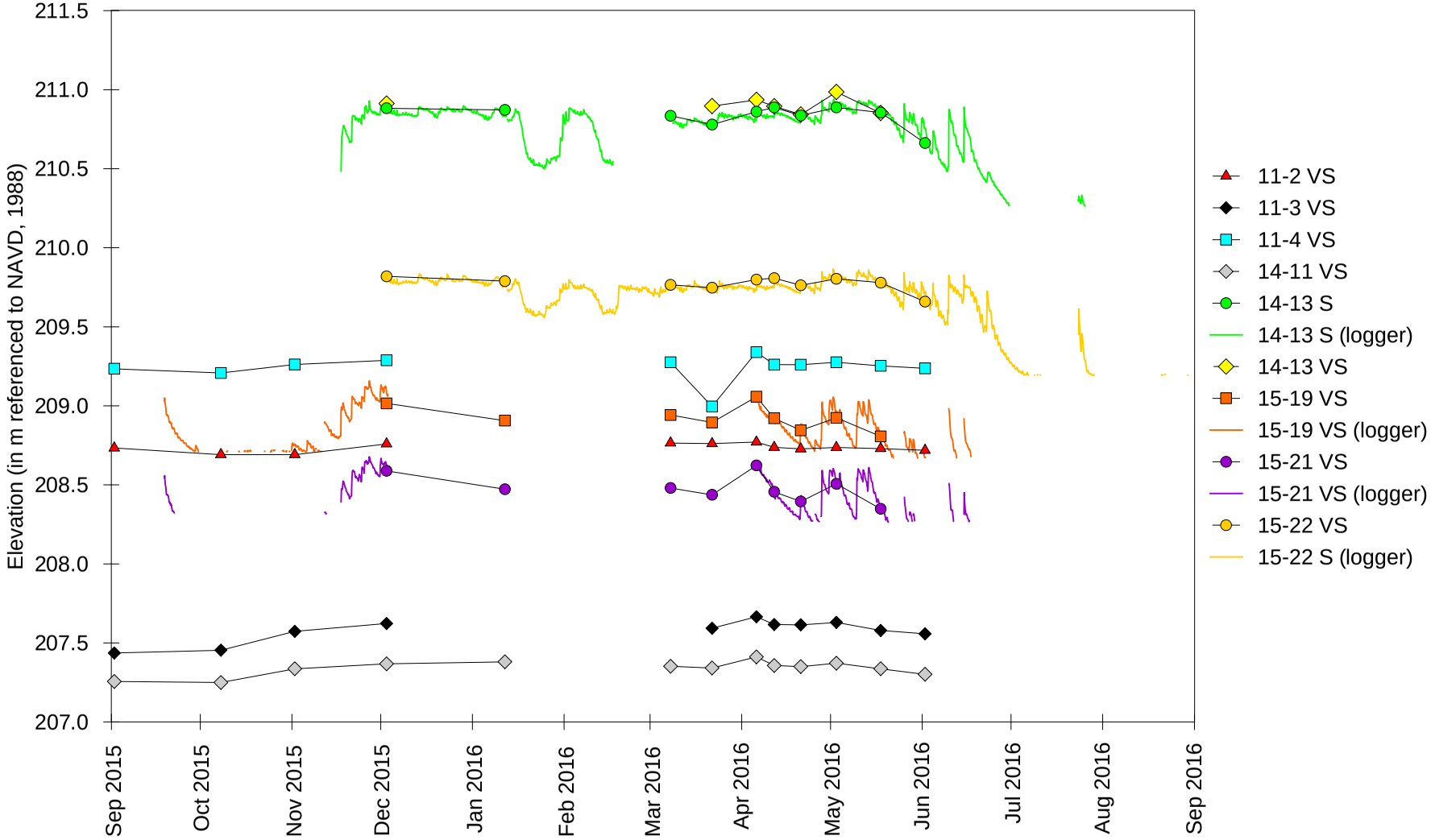
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells - South



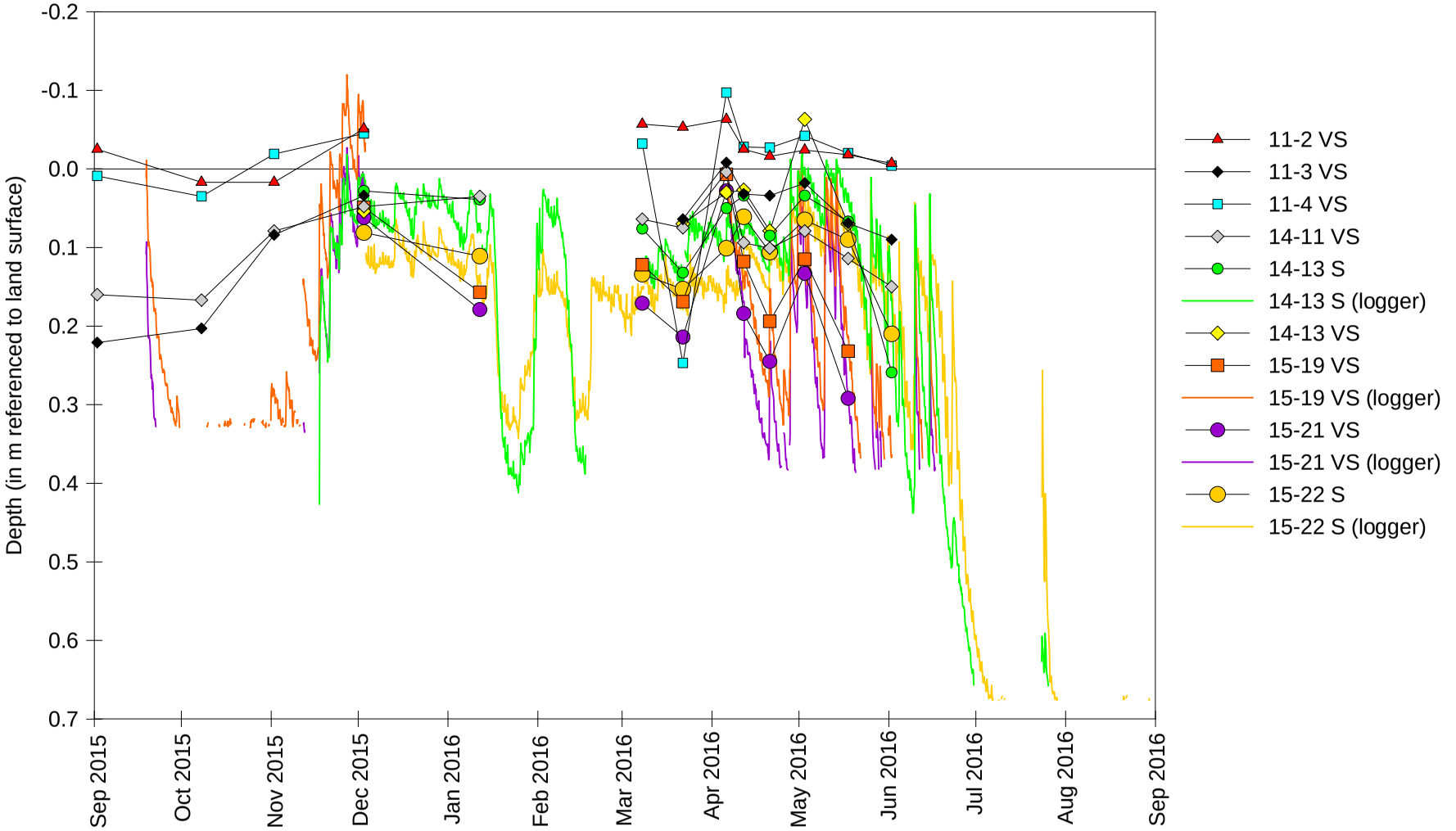
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells - Mid-South



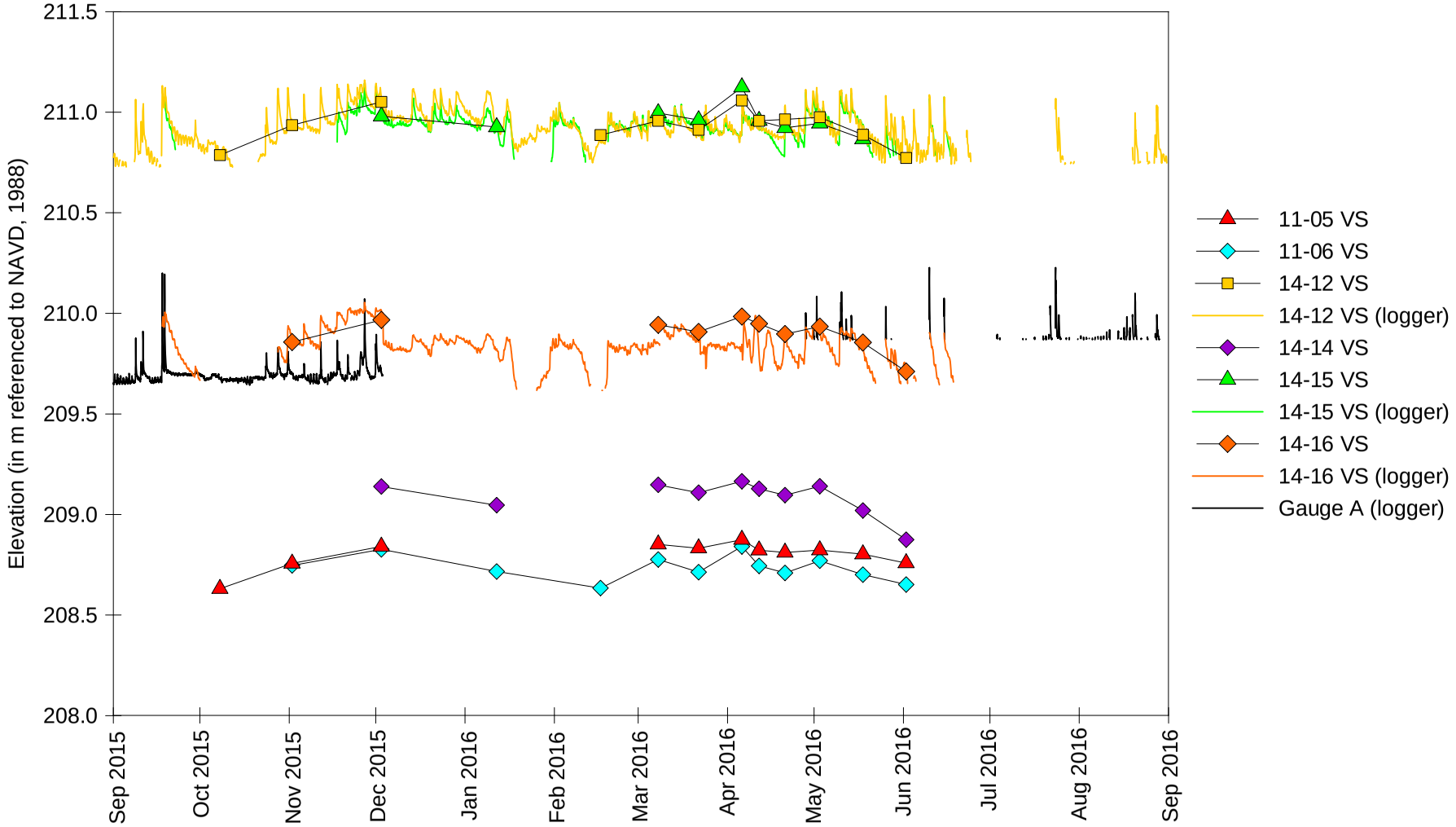
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells - Mid-South



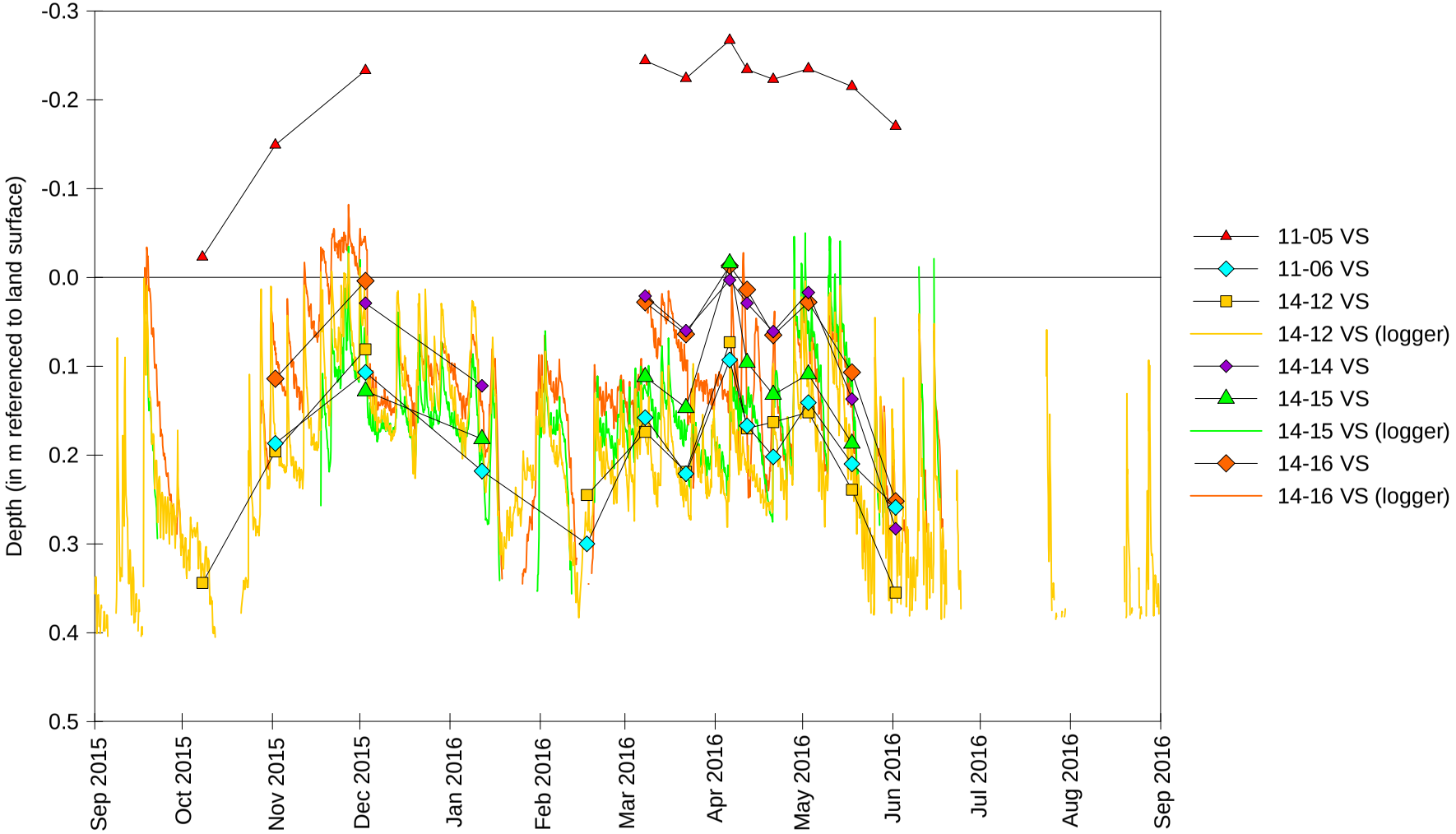
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations
in Monitoring Wells - Mid-North



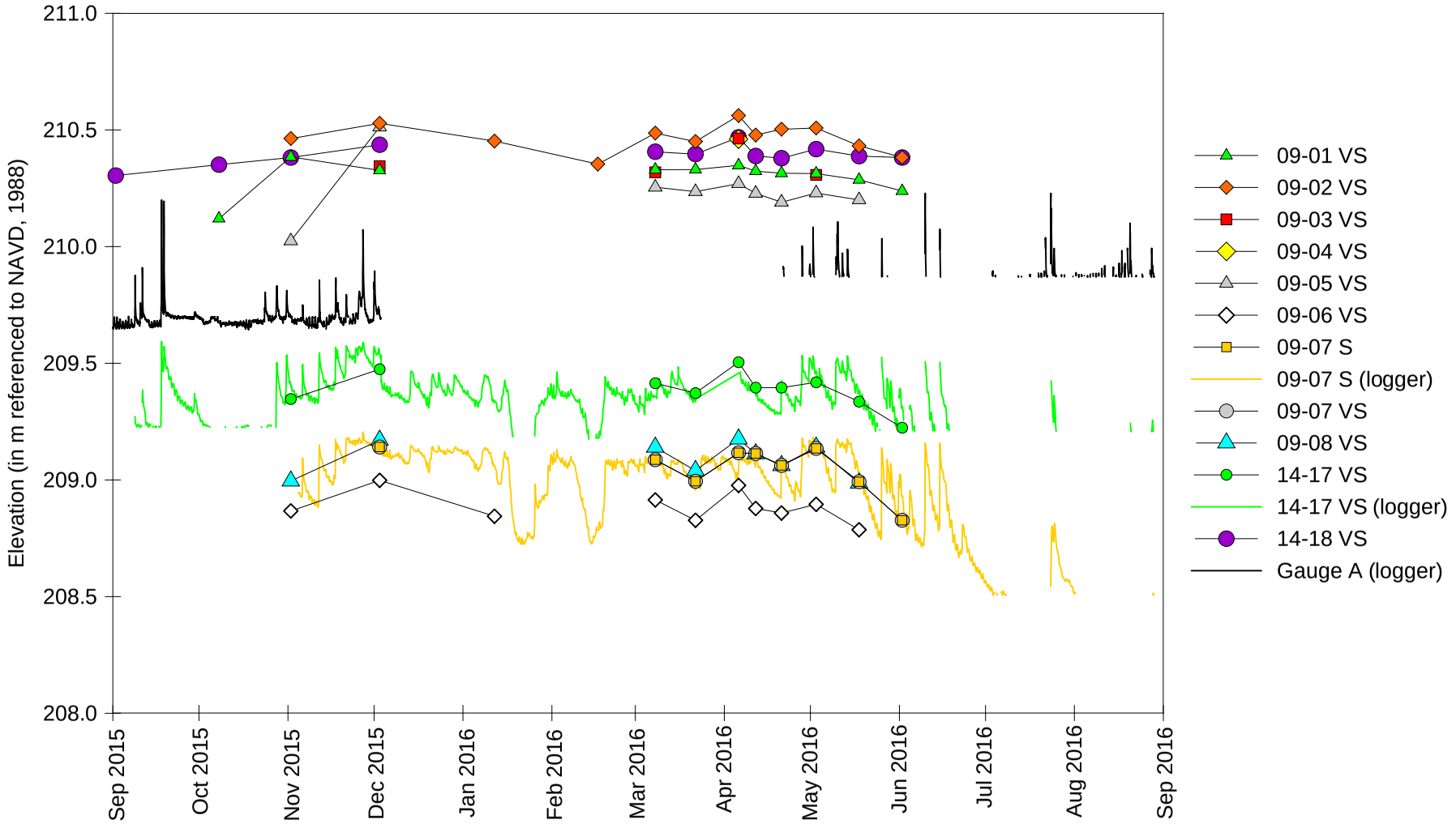
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells - Mid-North



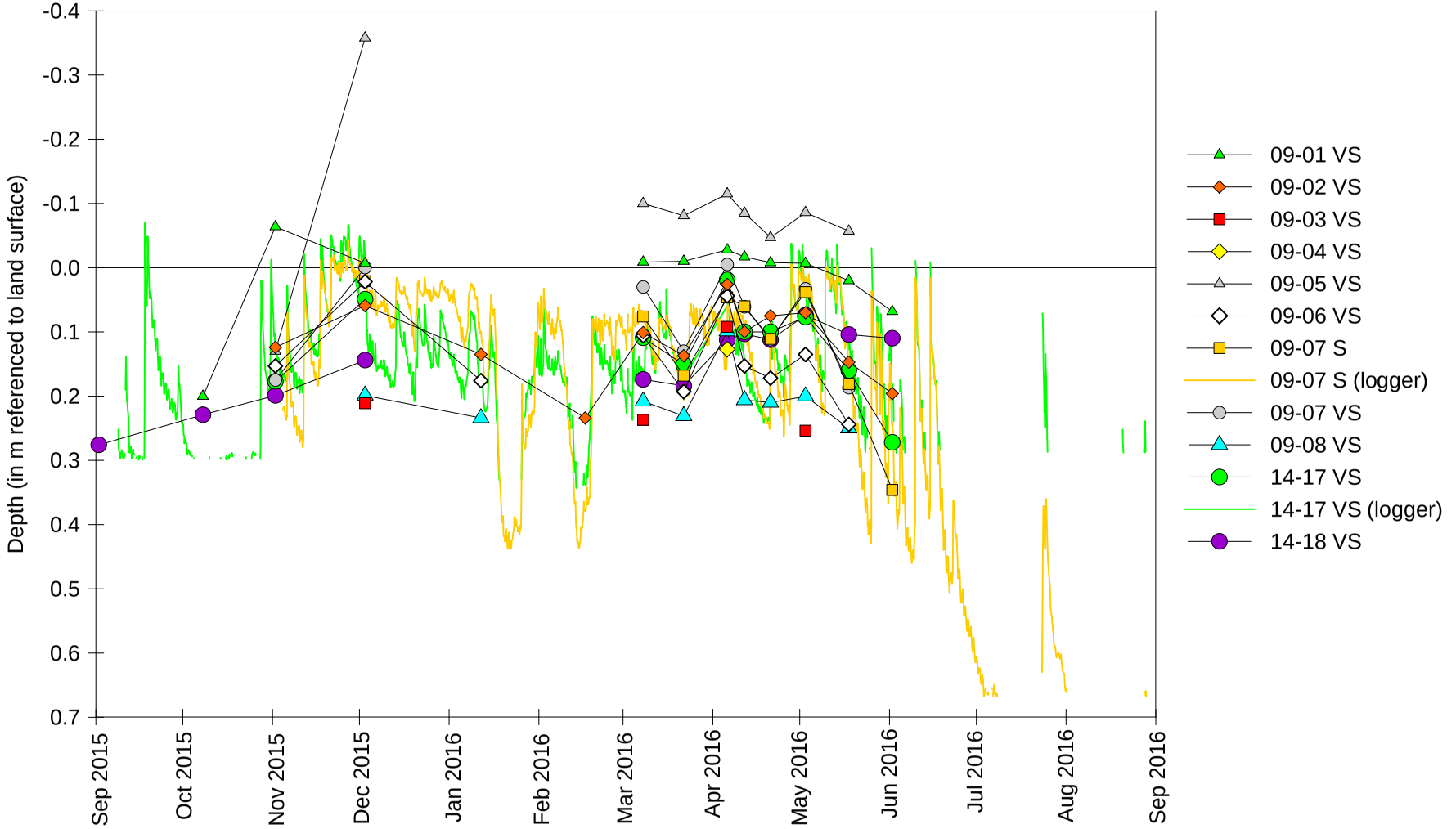
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells - North



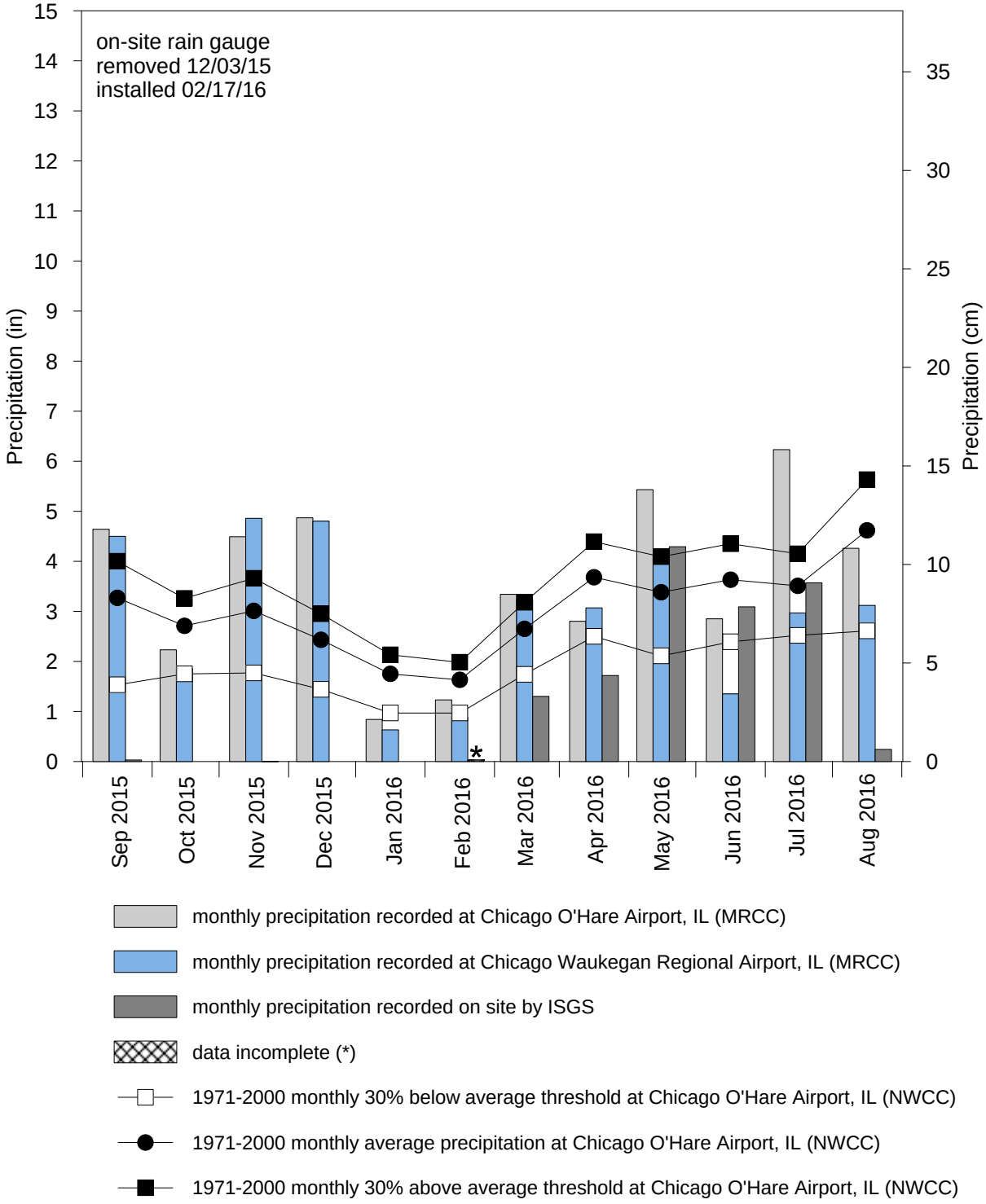
North Chicago Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells - North



North Chicago Wetland Mitigation Site
September 2015 through August 2016

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



COLES COUNTY **ISGS #85**
WETLAND MITIGATION SITE
TR 1000N and TR 41
Sequence #1273
Coles County, near Mattoon, Illinois
Primary Project Manager: Eric T. Plankell
Secondary Project Manager: Audra M. Hanks

SITE HISTORY

- March 2008: Wetland construction was completed.
- August 2010: The ISGS was tasked by IDOT to monitor the site for performance criteria outlined in the wetland compensation plan.
- March 2011: The ISGS installed a monitoring network.

WETLAND HYDROLOGY CALCULATION FOR 2016

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), 1.06 ha (2.63 ac) of the total site area of 2.06 ha (5.10 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season, and 0.98 ha (2.41 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 1.25 ha (3.10 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 2016). 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 27 was the starting date of the 2016 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Mattoon, Illinois (MRCC station #115430), was 115% of normal. During Spring 2016 (March through May), precipitation was 79% of normal.
- Using the 1987 Manual, the peak hydroperiod during the growing season occurred between April 26 and May 19 due to frequent rainfall at the site totaling 2.35 in. Using the 2010 Midwest Region Supplement, the peak hydroperiod occurred between March 2 and March 19 due to frequent rainfall at the site totaling 1.52 in.
- In 2016, 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 4 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

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

WETLAND HYDROLOGY TABLES FOR 2016

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	Y
3S	N	N	Y
4S	N	N	N
5S	Y	N	Y
6S	N	N	Y
7S	N	N	N

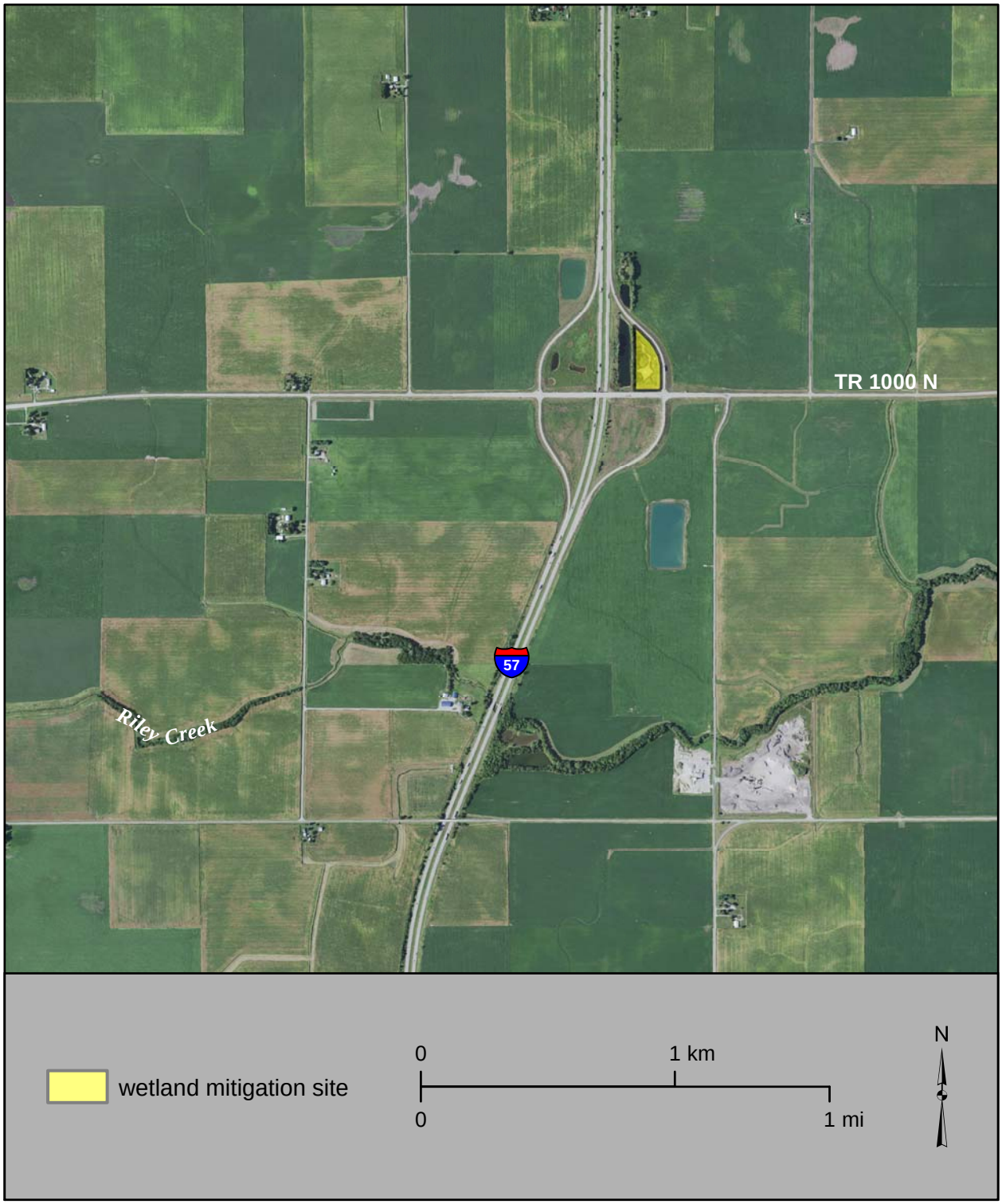
Y – met wetland hydrology criteria
N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
A	207.02 m (679.20 ft)	207.00 m (679.13 ft)	207.01 m (679.17 ft)

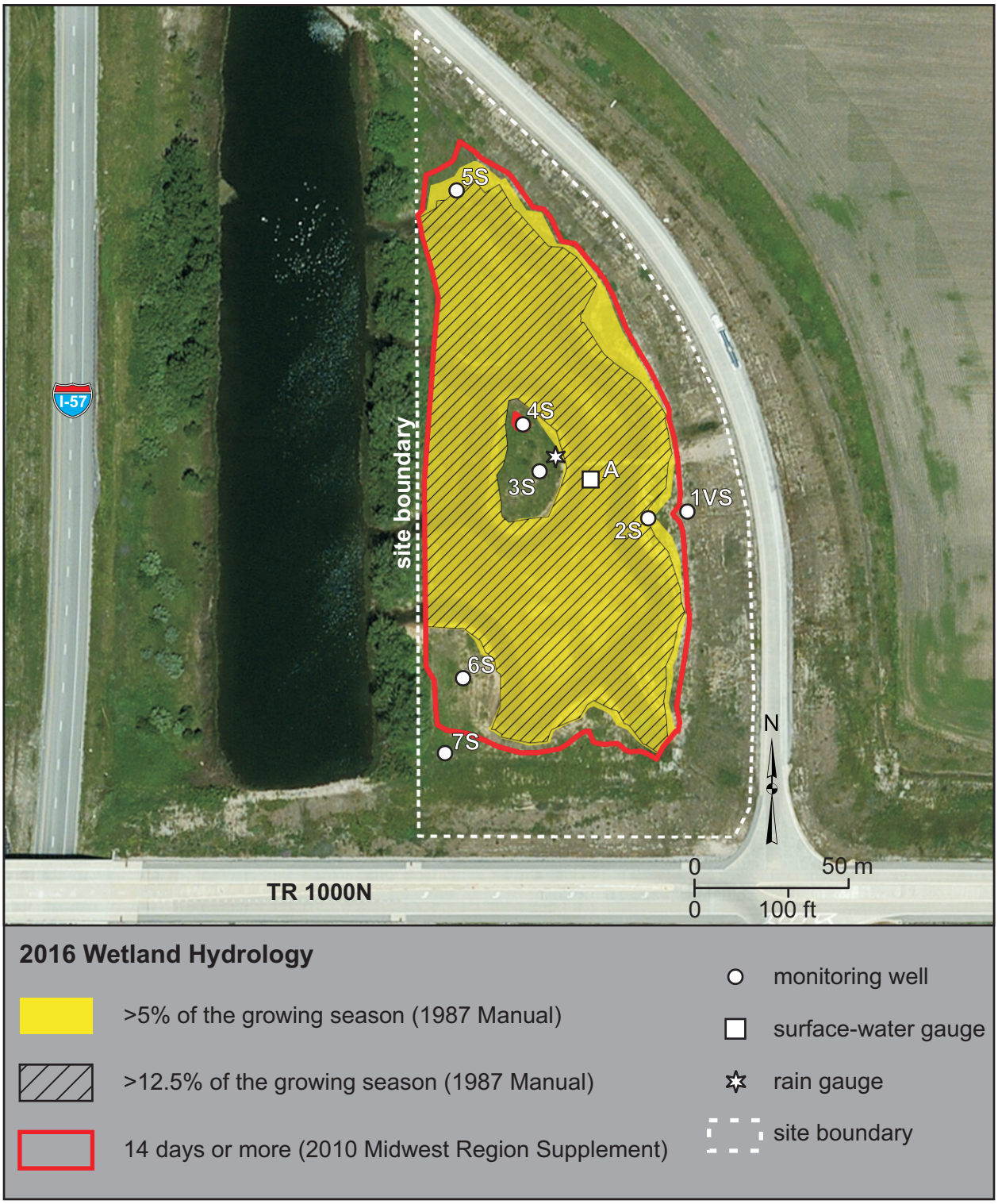
Coles County Wetland Mitigation Site
(TR 1000N and TR 41)

General Study Area and Vicinity

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

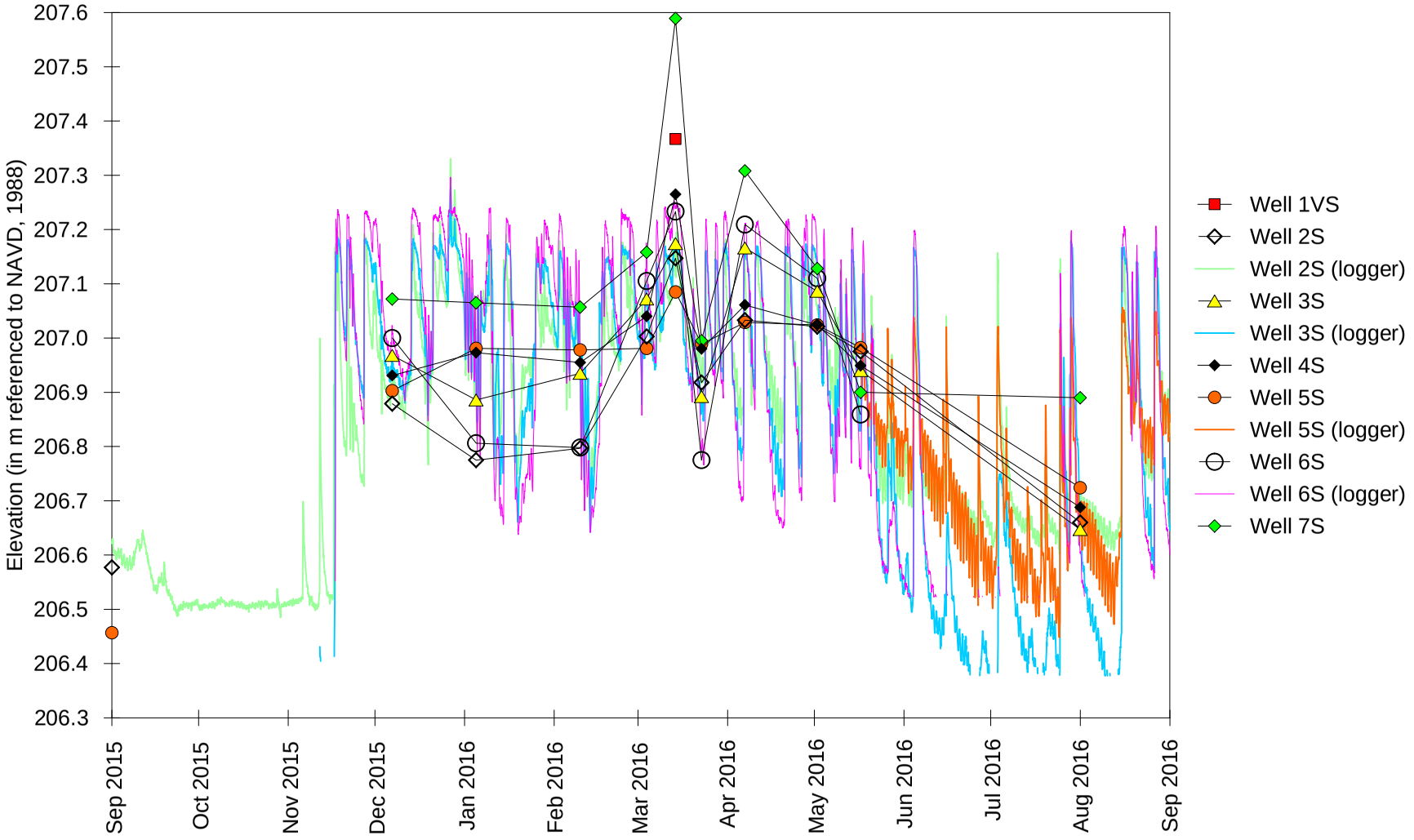


Coles County Wetland Mitigation Site
(TR 1000N and TR 41)
Estimated Areal Extent of 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016
Map based on imagery available from Esri (Esri 2016)



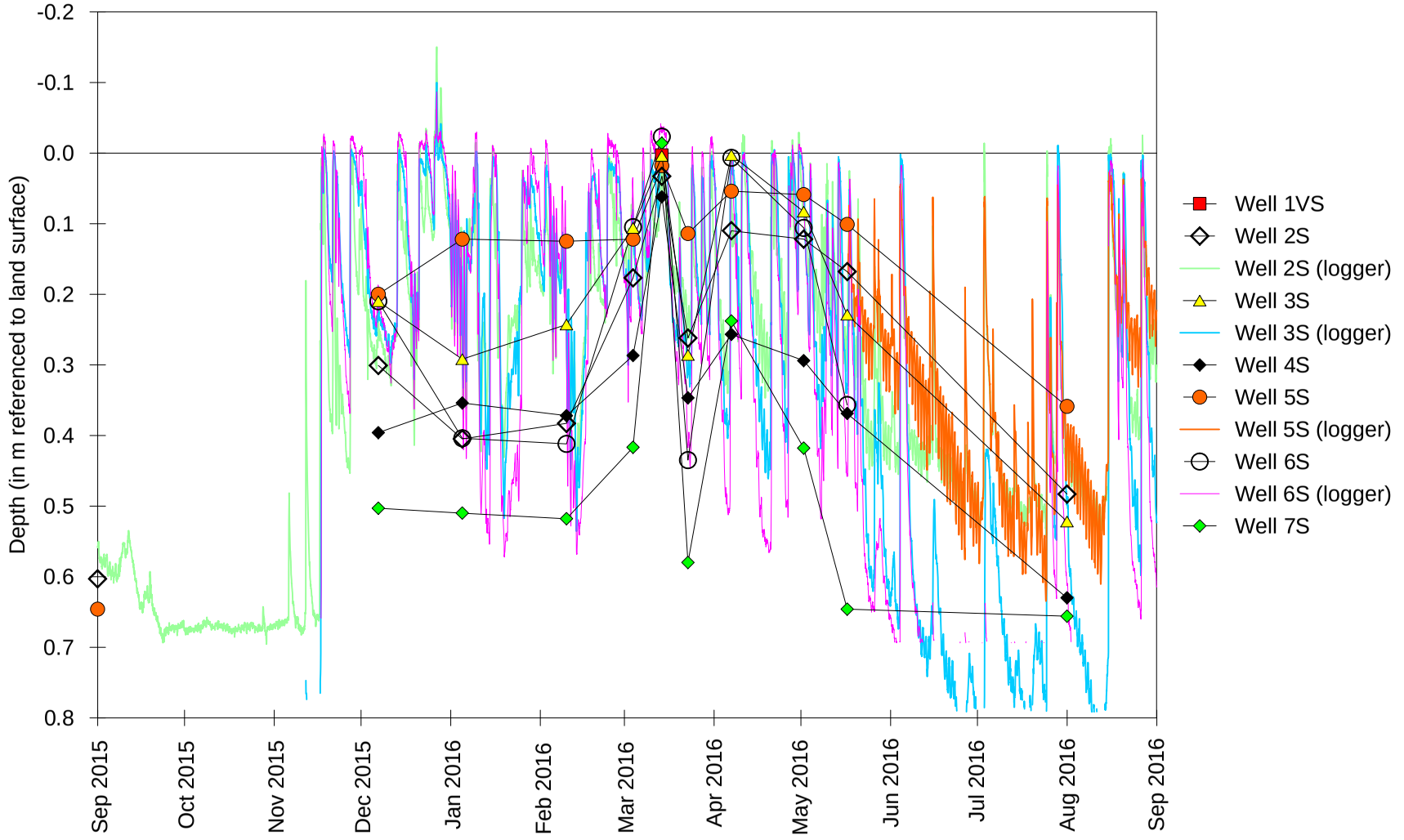
Coles County Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells



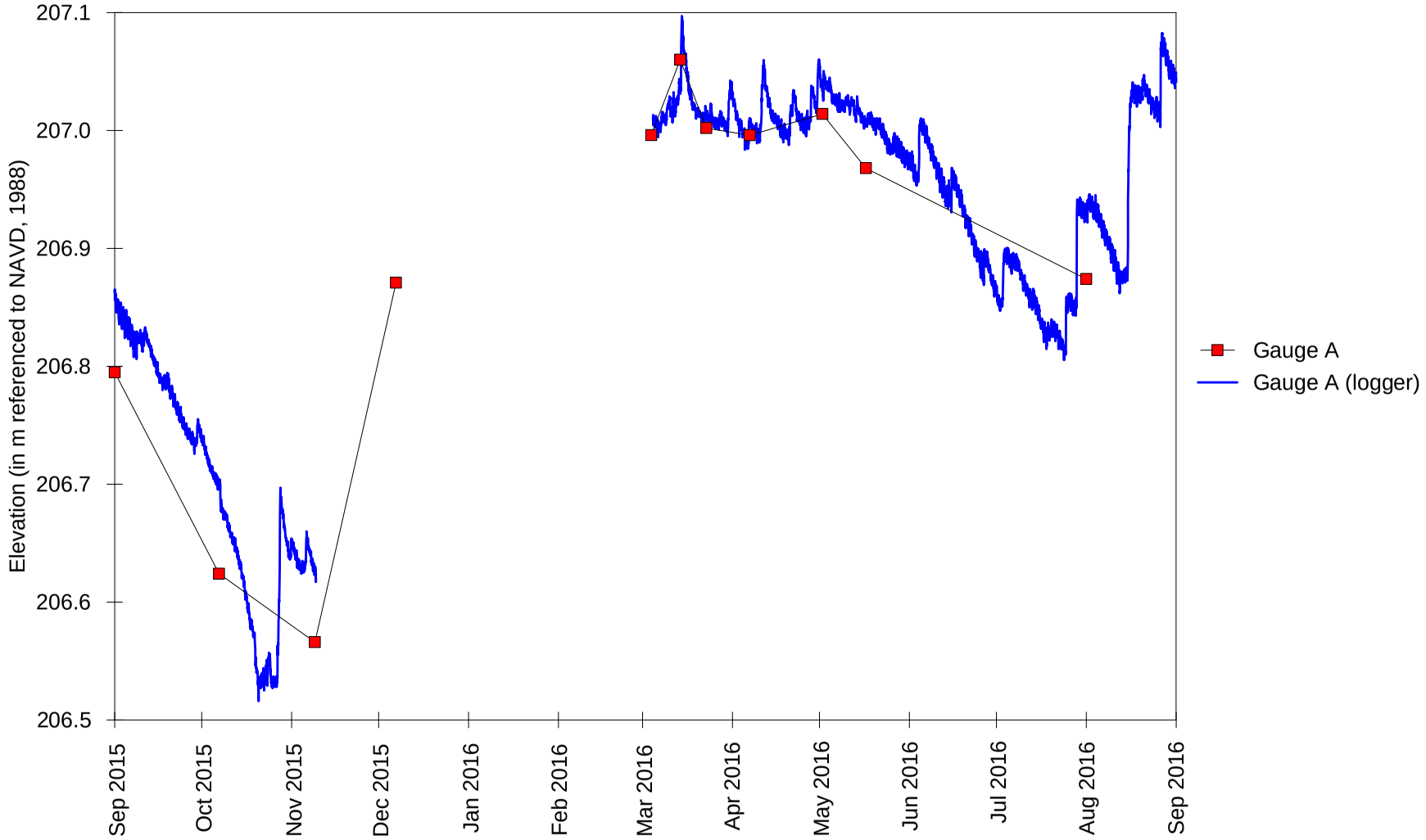
Coles County Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Monitoring Wells



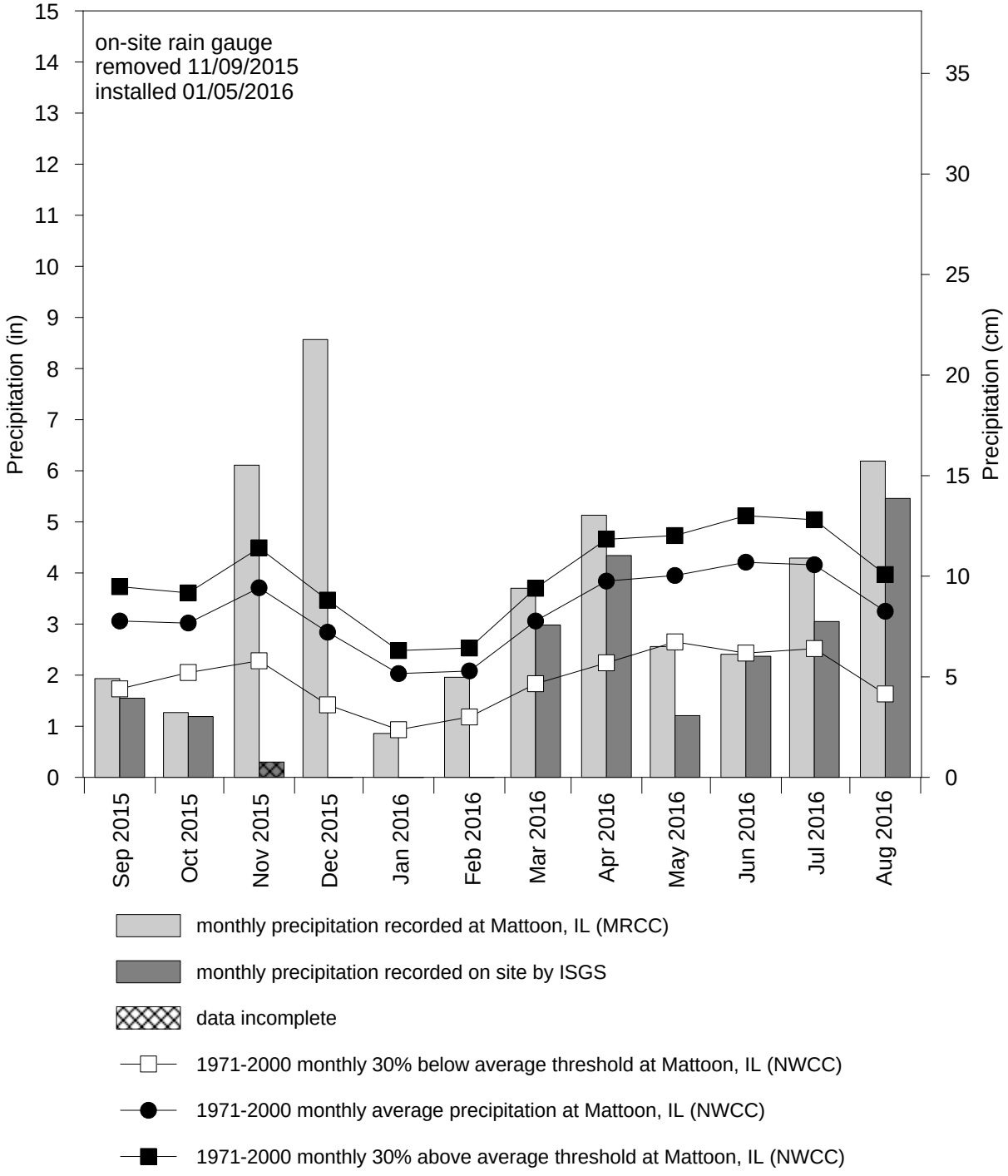
Coles County Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at the Surface-Water Gauge



Coles County Wetland Mitigation Site
September 2015 through August 2016

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



SWAN ROAD **ISGS #86**
WETLAND MITIGATION SITE
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 2016

The target compensation area for the Swan Road wetland mitigation site is 0.29 ha (0.73 ac). Using the 1987 Manual (Environmental Laboratory 1987), 0.39 ha (0.97 ac) of the total site area of 0.43 ha (1.06 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season while 0.29 ha (0.72 ac) of the total 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 2016). 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, February 28 was the starting date of the 2016 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 128% of normal, and Spring 2016 (March through May) precipitation was 128% of normal. Precipitation during July and August was well above average at 218% of normal.

- Using the 1987 Manual, peak hydroperiod during the growing season began in late April and lasted through early May in response to one flood event on May 1, and six rain events from April 30-May 12, which produced 2.52 in. However, using the 2010 Midwest Region Supplement, peak hydroperiod during the growing season began in late February and lasted through early March in southwest portions of the site in response to a seasonally elevated water table, two flood events on February 24 and 25, and 1.99 in. of rainfall during February 24-25 as measured at Pinckneyville, Illinois (MRCC #116779). The site was flooded 11 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 2016, 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 4 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.

PLANNED FUTURE ACTIVITIES

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

WETLAND HYDROLOGY TABLES FOR 2016

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

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

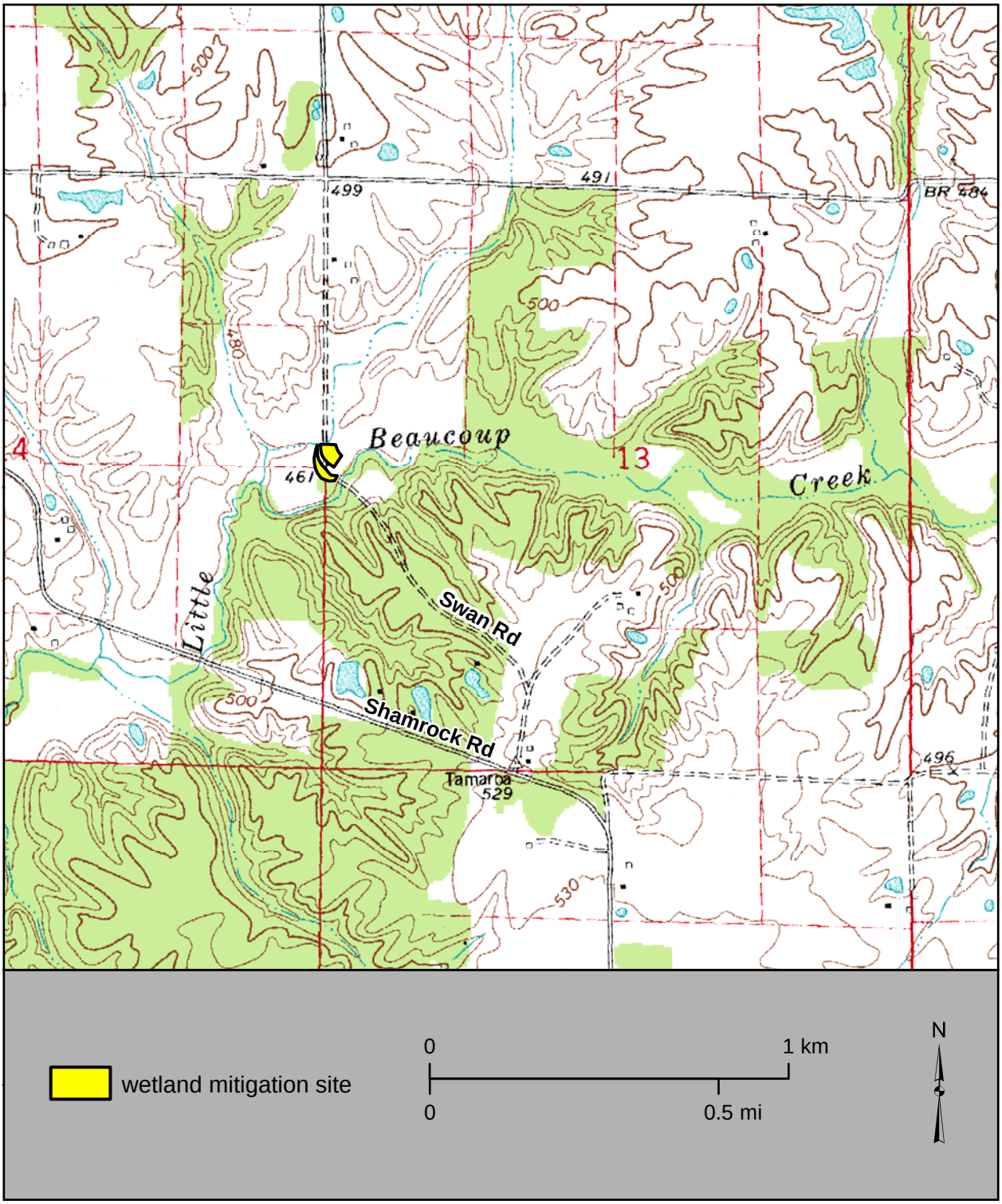
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
A	n/a	n/a	139.80 m (458.66 ft)

n/a – hydroperiod was not long enough to determine an elevation

Swan Road Wetland Mitigation Site
(TR222, Swan Road)

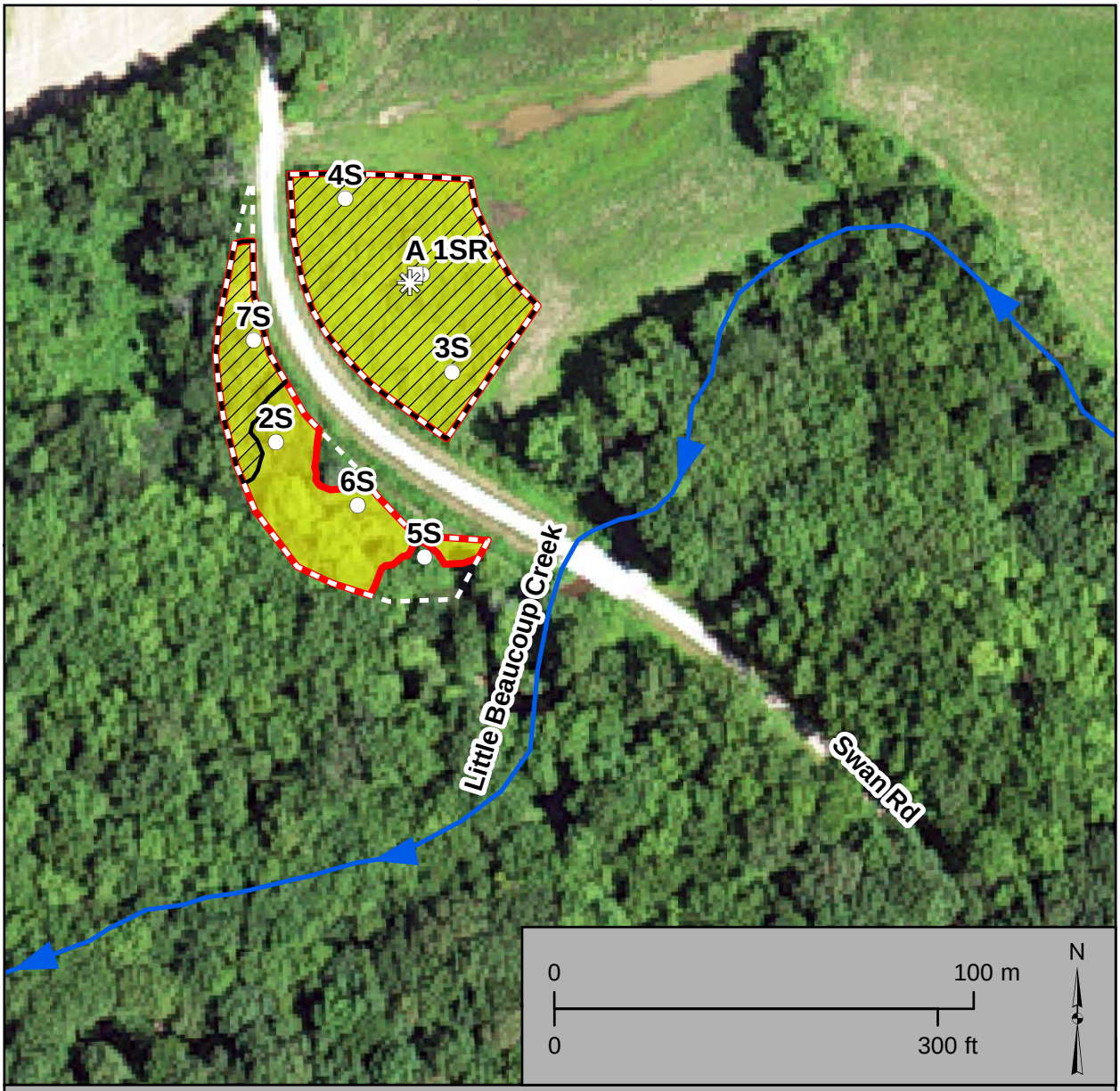
General Study Area and Vicinity

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 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016

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

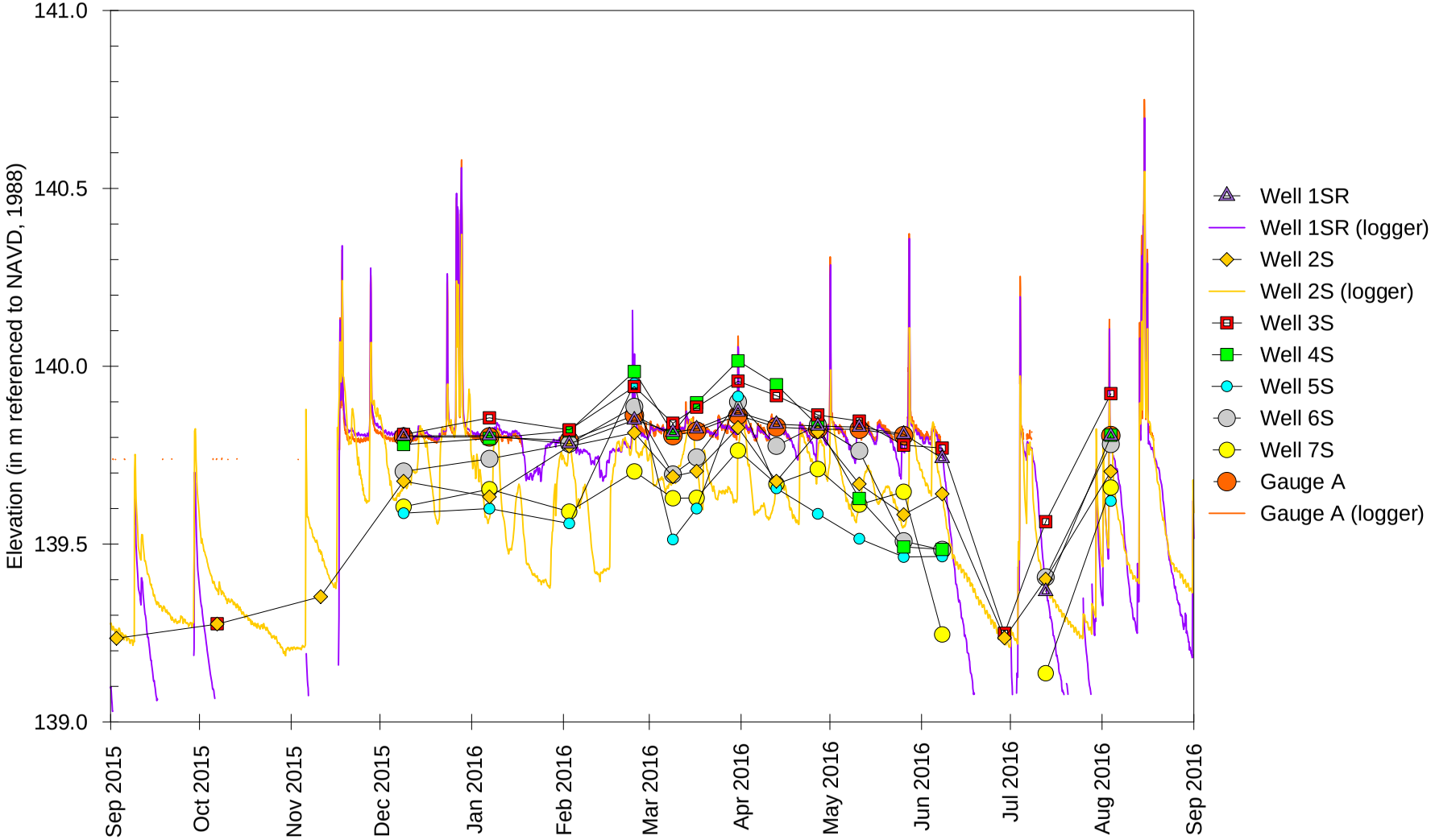


2016 Wetland Hydrology

- >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

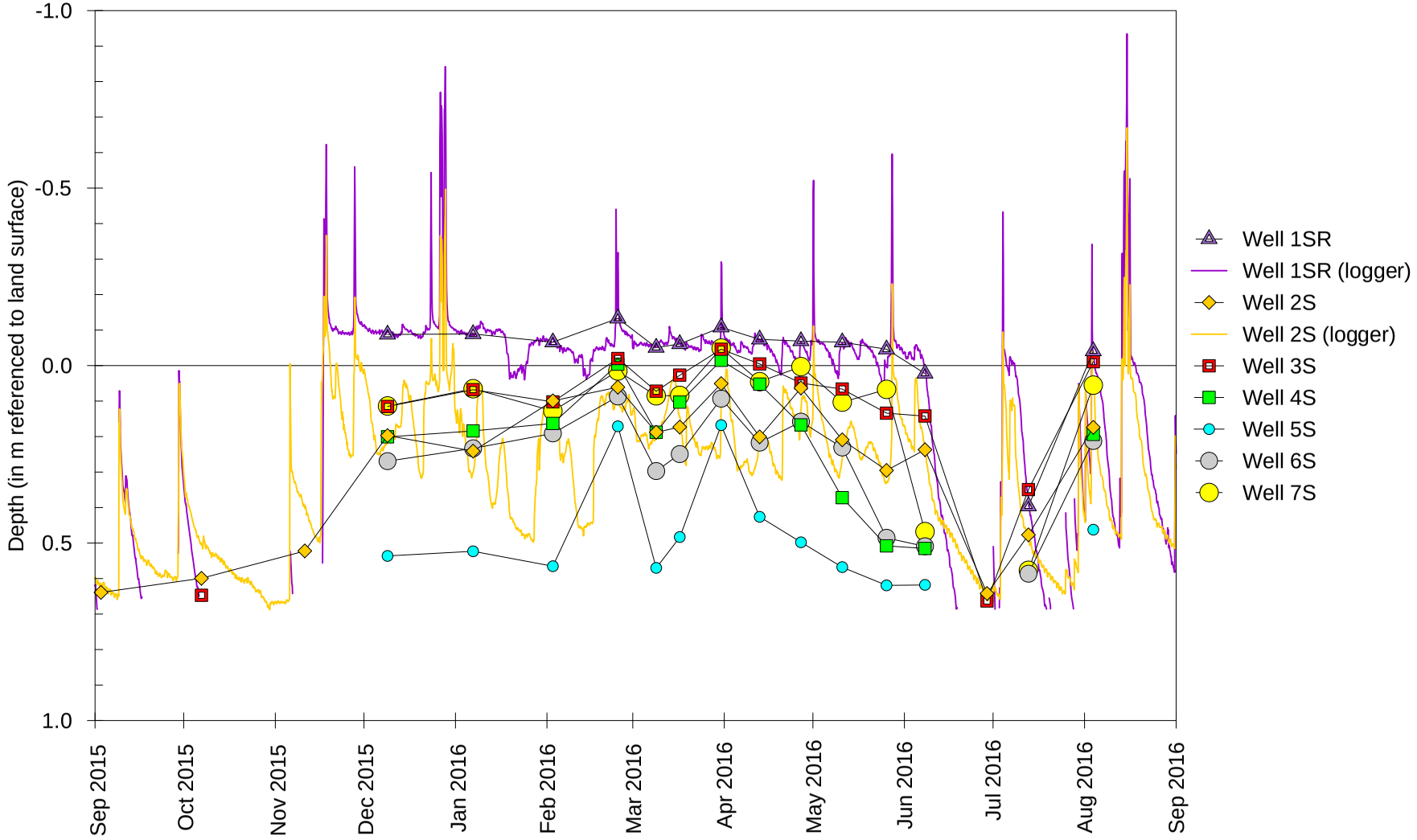
Swan Road Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations
in Shallow Monitoring Wells and at the Surface-Water Gauge



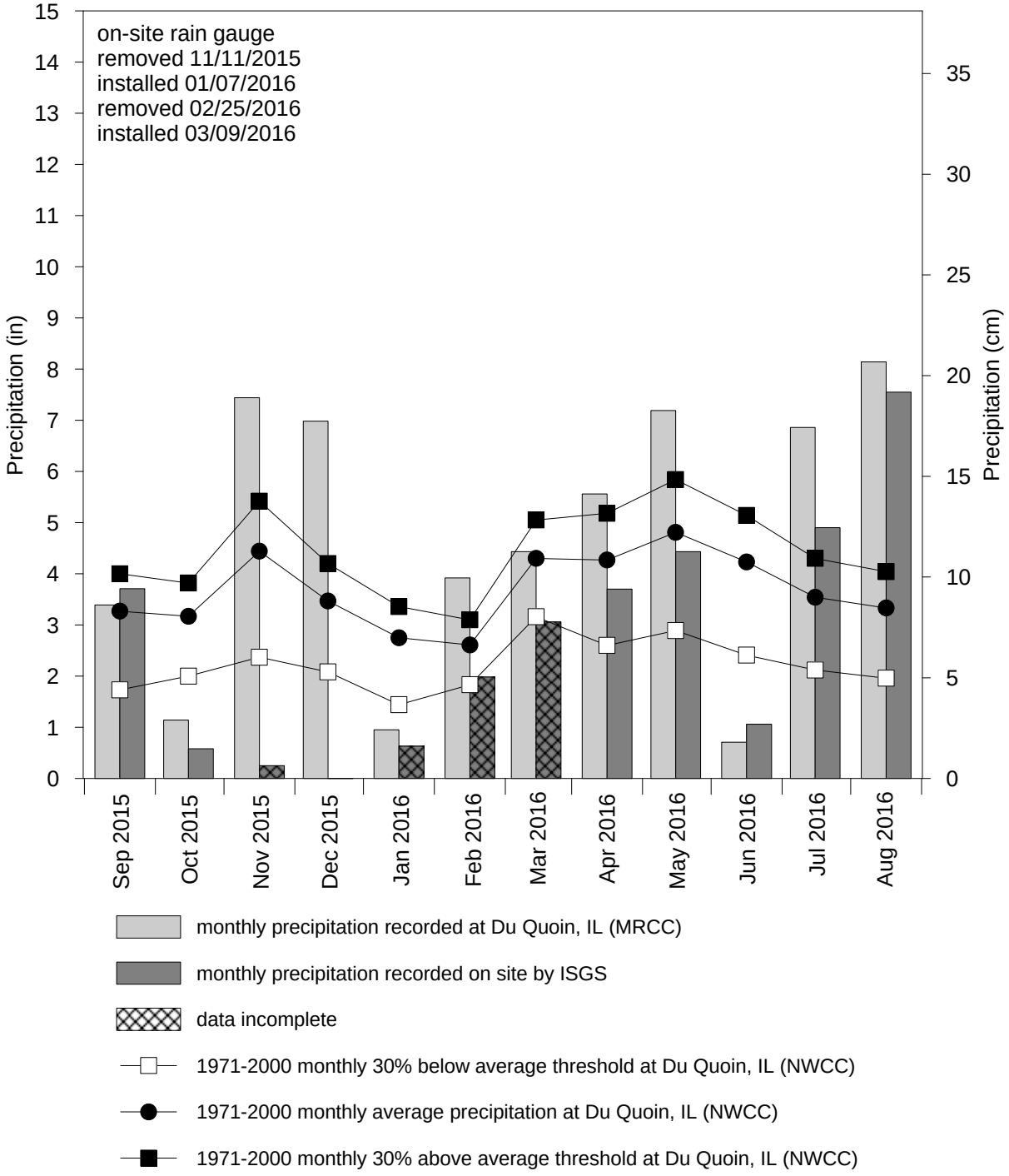
Swan Road Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells



Swan Road Wetland Mitigation Site
September 2015 through August 2016

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



HARRISBURG, SITE 3 **ISGS #87**
WETLAND MITIGATION SITE
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: The 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 2016

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), 0.11 ha (0.28 ac) of the 0.81-ha (2.00-ac) mitigation site satisfied wetland hydrology criteria for greater than 5% of the growing season, and 0.05 ha (0.13 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), 0.31 ha (0.77 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 2016). 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 29 was the starting date of the 2016 growing season based on soil temperatures measured on site.

- Total precipitation for the monitoring period at Du Quoin, Illinois (MRCC #112483), was 128% of normal, and Spring 2016 (March through May) precipitation was 128% of normal. Precipitation during July and August was well above average at 218% of normal.

- Using the 1987 Manual, peak hydroperiod during the growing season occurred during late March through early April due to rainfall, including one event (March 30-31), which produced 1.35 in. However, using the 2010 Midwest Region Supplement, peak hydroperiod during the growing season began in mid-March and ended in early April in central portions of the site due to intense and frequent rain events in mid-March. The ditch flooded the site twice during the monitoring period, once during the growing season in early July. However, the July flood event did not persist long enough to satisfy wetland hydrology criteria.

- In 2016, water levels measured in 1 of 8 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured

in 1 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 4 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.

- Beaver dams were present along the ditch early in the growing season at the southwest and northeast corners of the site, and likely contributed to elevated water levels in the ditch during the early growing season. Upon visiting the site on June 7, both dams and bank vegetation were removed, which likely also allowed flooding to draw down more rapidly during the remainder of the monitoring period.

PLANNED FUTURE ACTIVITIES

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

WETLAND HYDROLOGY TABLES FOR 2016

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	N	N	Y
3S	N	N	N
4S	N	N	Y
5S	N	N	N
6S	Y	Y	Y
7S	N	N	Y
8S	N	N	N

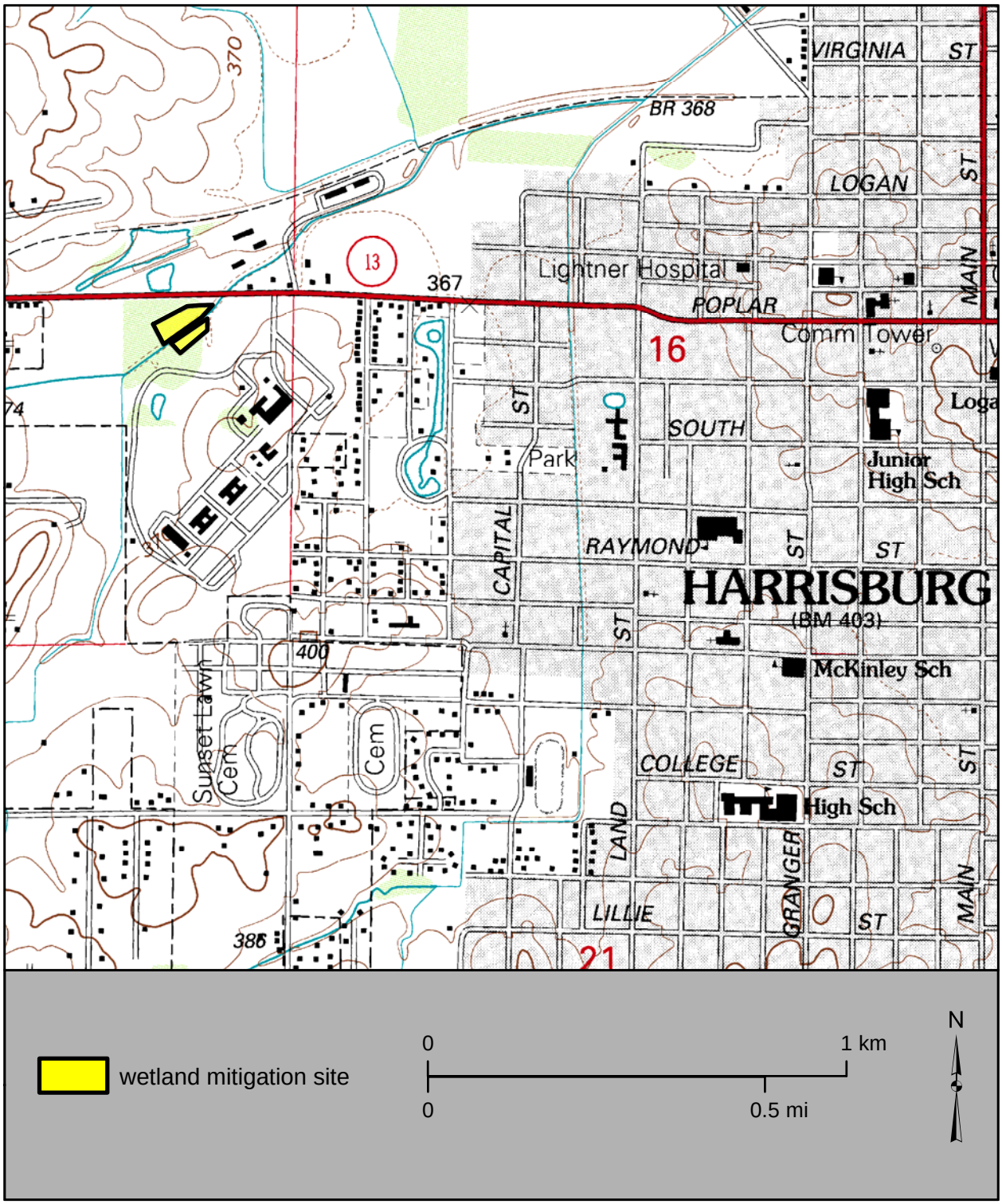
Y – met wetland hydrology criteria
N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
AR	110.73 m (363.29 ft)	110.68 m (363.12 ft)	110.72 m (363.25 ft)
B	110.76 m (363.39 ft)	110.76 m (363.39 ft)	110.76 m (363.39 ft)

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

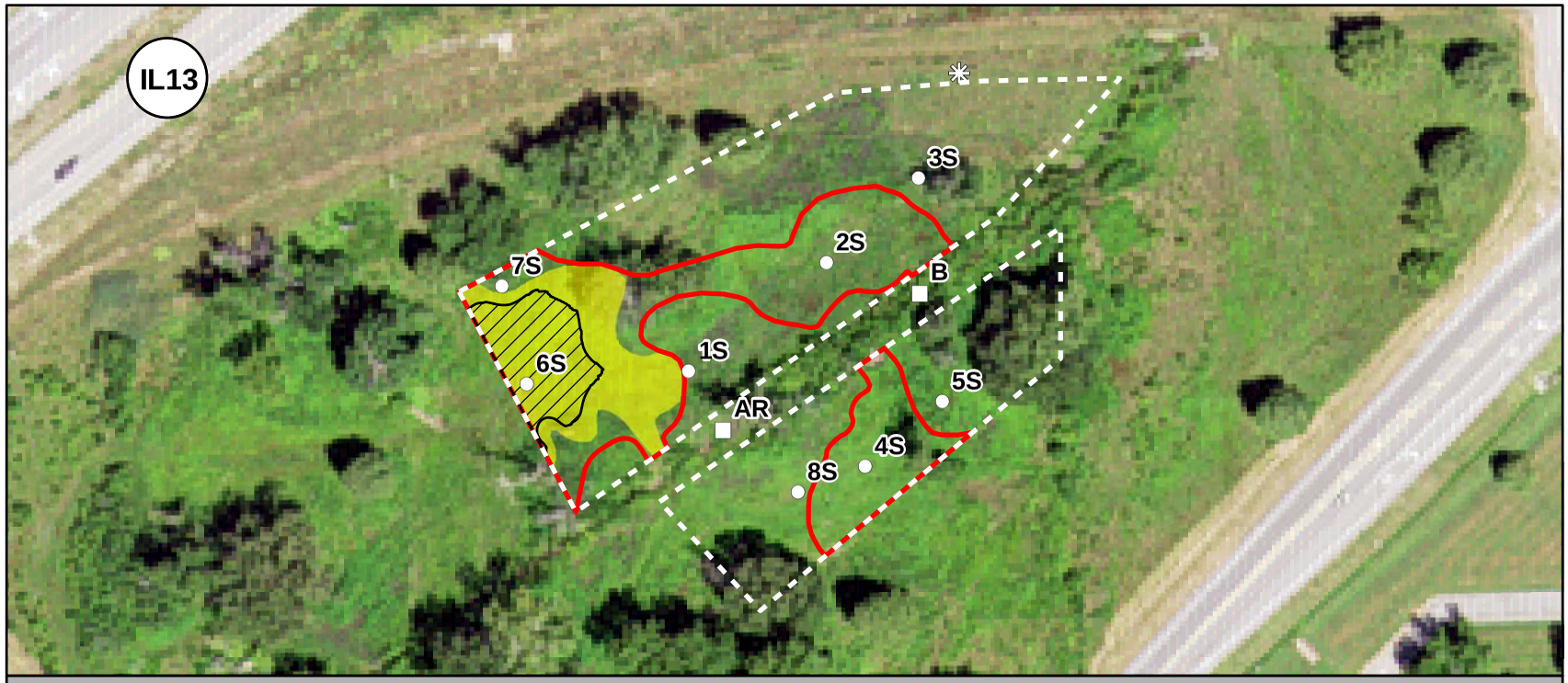


Harrisburg, Site 3 Wetland Mitigation Site
(US 45, FAP 332)

Estimated Areal Extent of 2016 Wetland Hydrology

September 1, 2015 through August 31, 2016

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



2016 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
- mitigation area

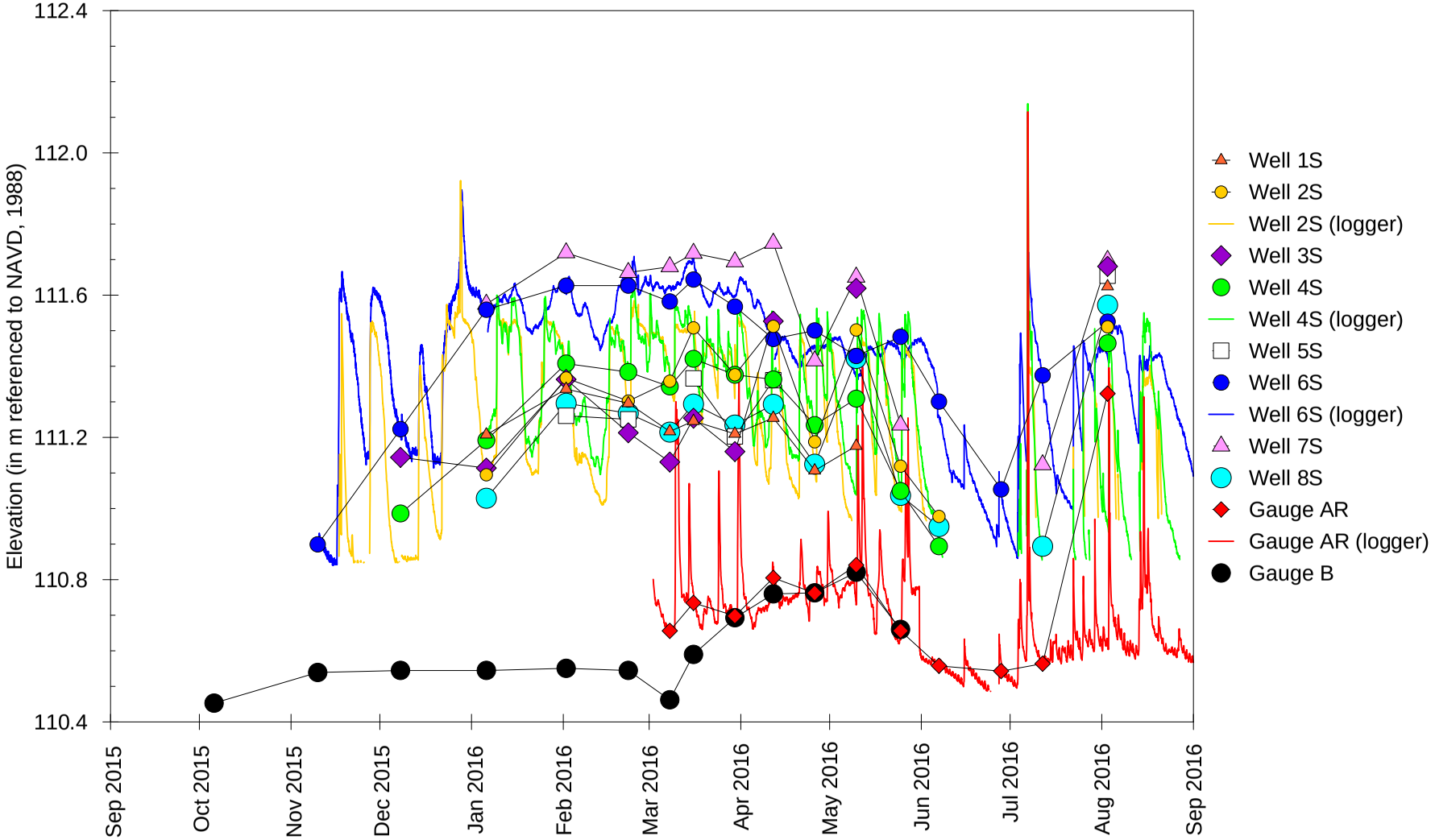
0 50 m

0 200 ft

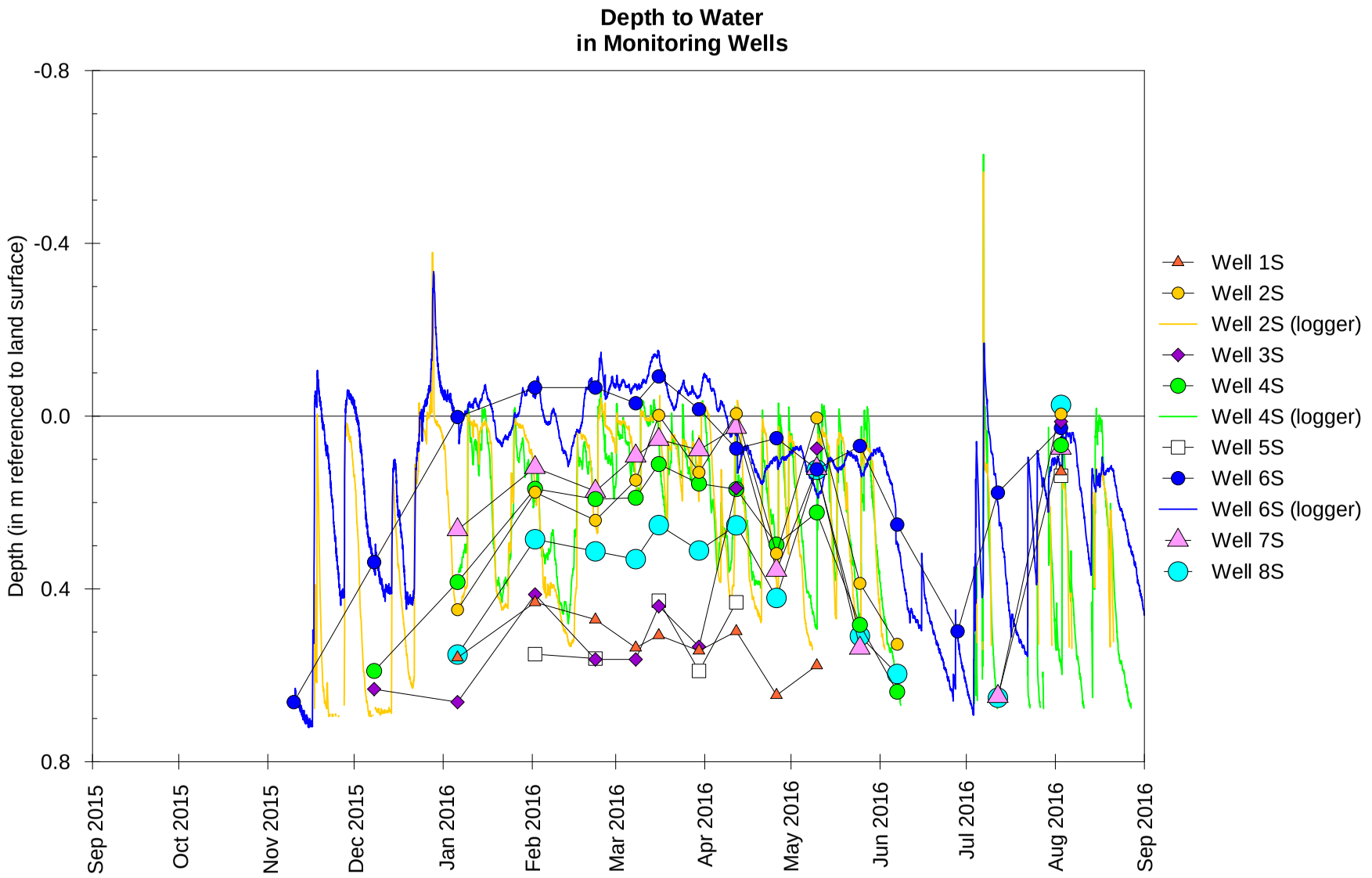
N

Harrisburg, Site 3 Wetland Mitigation Site
September 1, 2015 through August 31, 2016

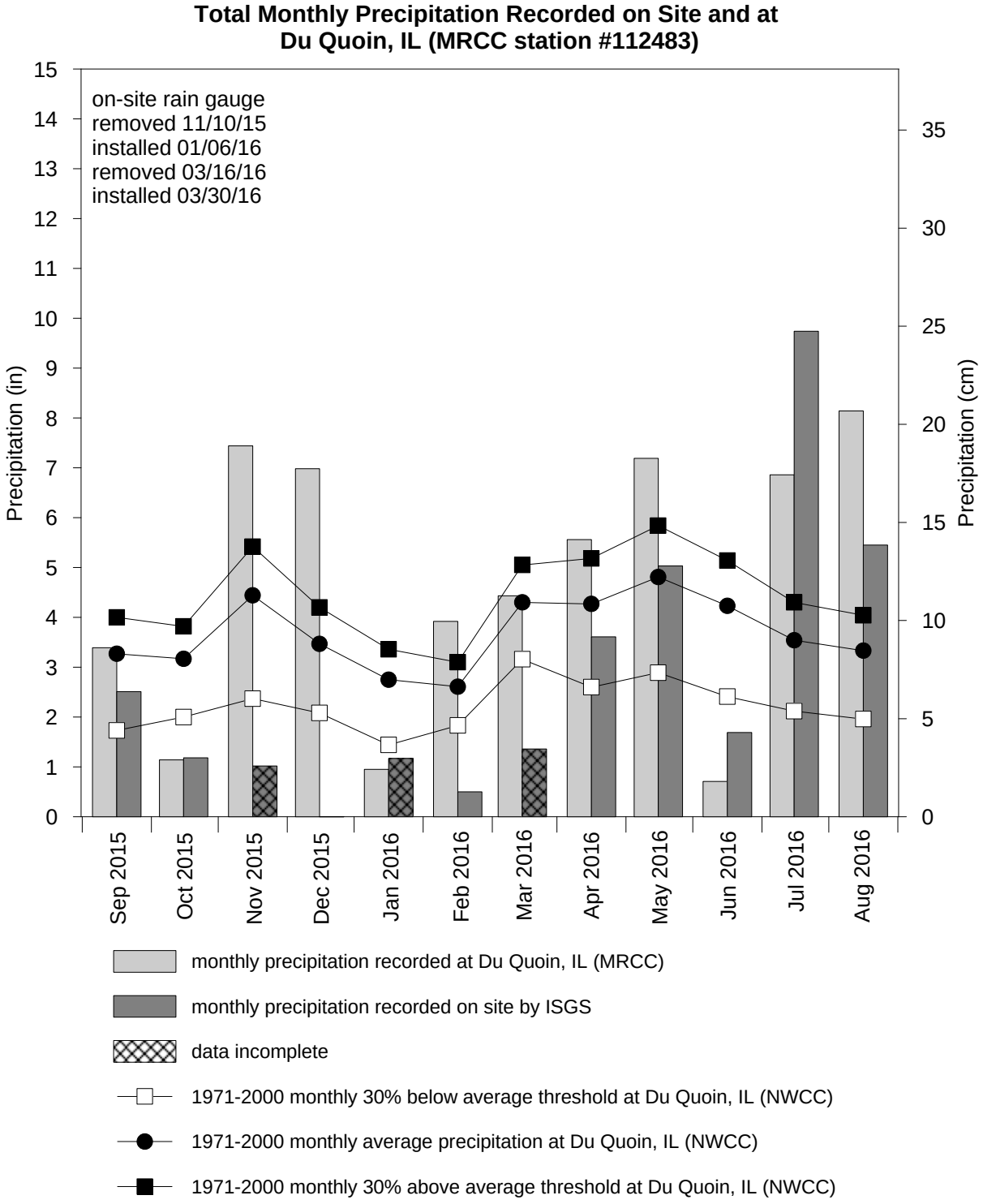
Water-Level Elevations
in Monitoring Wells and at Surface-Water Gauges



Harrisburg, Site 3 Wetland Mitigation Site
September 1, 2015 through August 31, 2016



Harrisburg Site 3 Wetland Mitigation Site
September 2015 through August 2016



GRANT CREEK NORTH **ISGS #88**
WETLAND MITIGATION SITE
I-55
FAI 55
Will County, near Wilmington, Illinois
Primary Project Manager: Jessica R. Ackerman
Secondary Project Manager: Eric T. Plankell

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.

WETLAND HYDROLOGY CALCULATION FOR 2016

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), 24.94 ha (61.62 ac) of the total site area of 62.73 ha (155.00 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season, and 15.71 ha (38.83 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), 24.61 ha (60.81 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 Joliet, Illinois, is April 5, and the season lasts 213 days (MRCC 2016). 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, April 10 was the starting date of the 2016 growing season based on soil temperatures measured on-site.
- Total precipitation for the monitoring period at Joliet, Illinois, (MRCC station #114530) was 120% of normal. During Spring 2016 (March through May), precipitation was 88% of normal. During the April/May period, 5 rain events occurred totaling 6.27 in. at Morris, IL, and 5.58 in. at Joliet, IL. July and August were particularly wet months with totals of 14.35 in. of rainfall at Morris, IL, and 14.59 in. at Joliet, IL.
- Peak hydroperiod during the growing season occurred two times: during late April through late May, and in July and August (see totals above). These peaks were primarily the result of precipitation.
- In 2016, water levels measured in 22 of 26 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 18 of 26 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 26 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 were kept in the closed position through the entire 2015-2016 reporting period.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2016

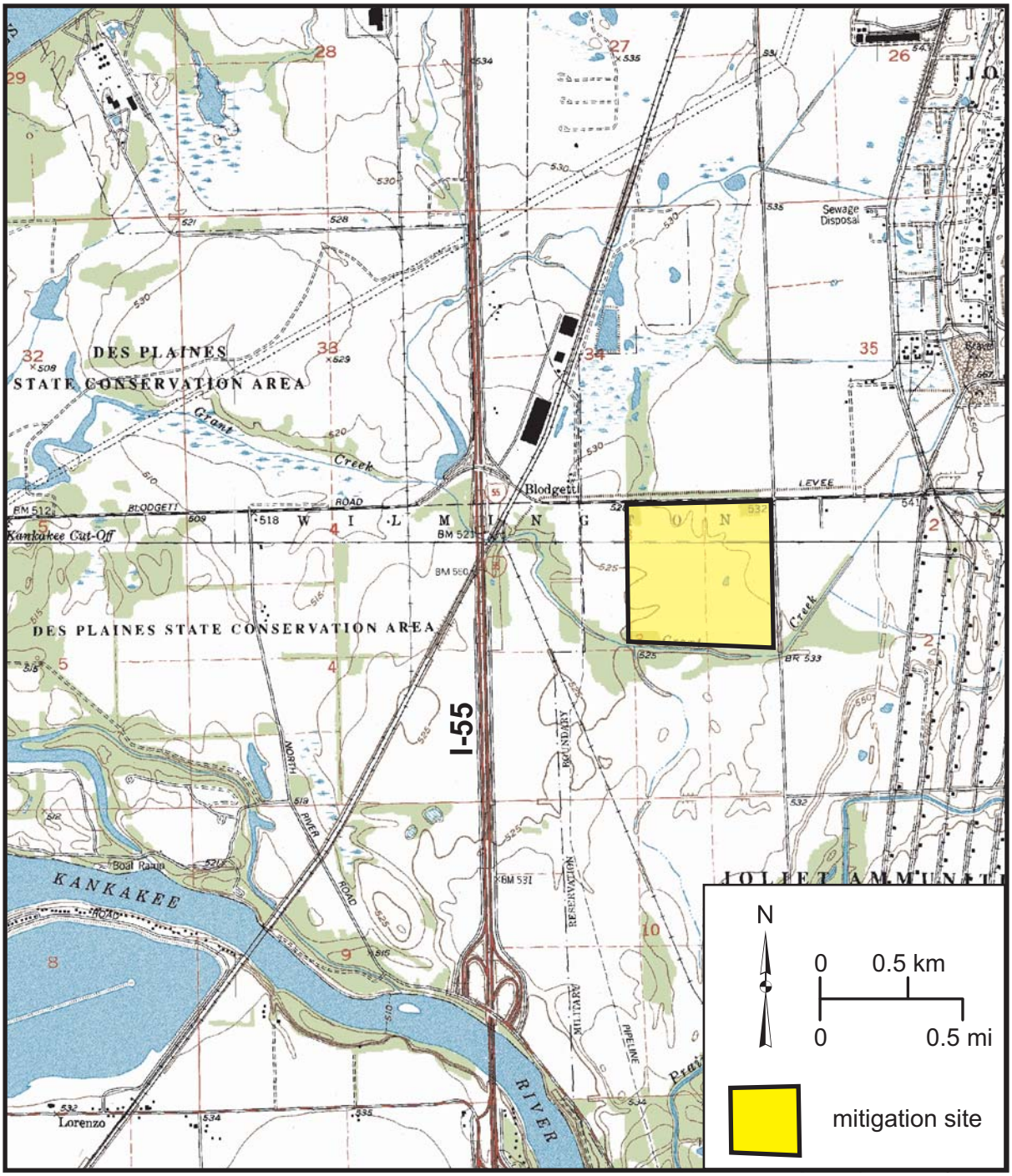
Well locations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
1S	Y	Y	Y
2VSR	Y	Y	Y
3VS	Y	Y	Y
5VS	Y	Y	Y
6VS	N	N	N
7S	N	N	N
8S	Y	Y	Y
9VS	N	N	N
10S	Y	Y	Y
11VS	N	N	N
12S	Y	Y	Y
13S	Y	Y	Y
15S	Y	Y	Y
16S	Y	Y	Y
16VS	Y	Y	Y
17VS	Y	Y	Y
18S	Y	Y	Y
19VS	Y	Y	Y
20VS	Y	Y	Y
21VS	Y	Y	Y
22VS	Y	N	Y
23VSR	Y	Y	Y
24VSR	Y	Y	Y
25S	Y	Y	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	159.92 m (524.67 ft)	159.83 m (524.38 ft)	159.91 m (524.64 ft)
B	159.54 m (523.42 ft)	159.50 m (523.30 ft)	159.53 m (523.41 ft)
C	159.77 m (524.19 ft)	159.76 m (524.15 ft)	159.77 m (524.17 ft)

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.

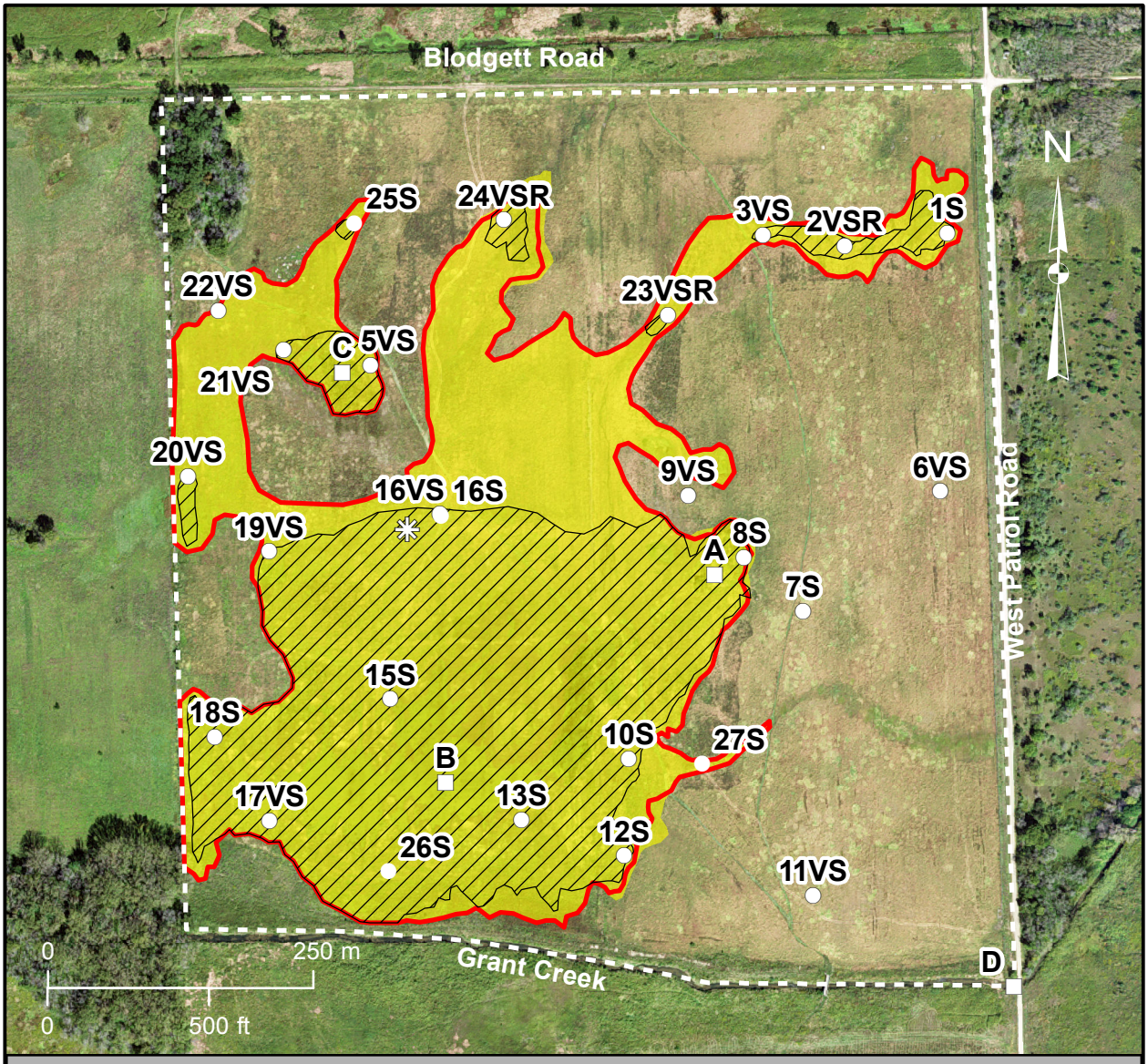


Grant Creek North Wetland Mitigation Site
(I-55, FAI 55)

Estimated Areal Extent of 2016 Wetland Hydrology

September 1, 2015 through October 4, 2016

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

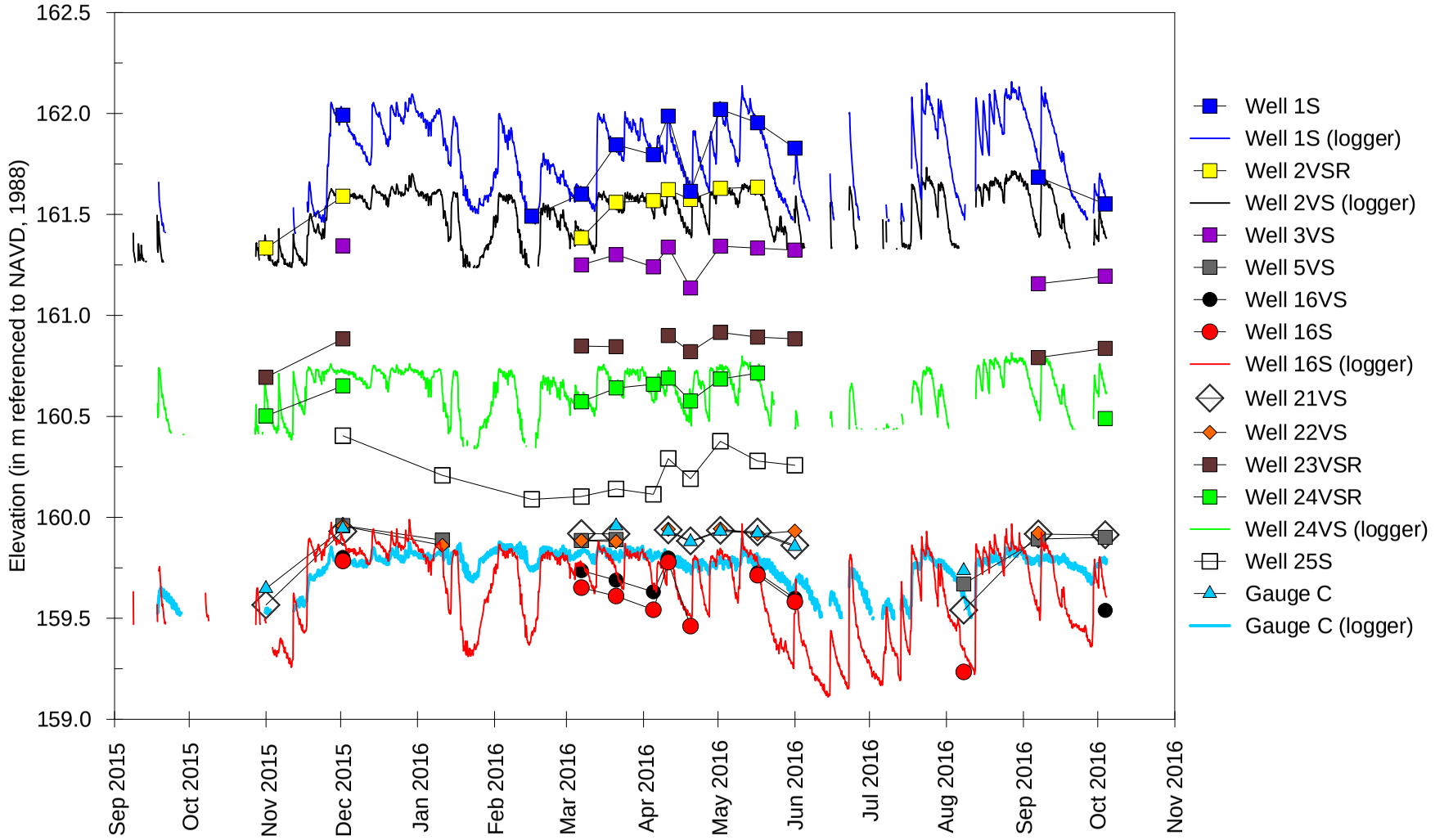


2016 Wetland Hydrology

- >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

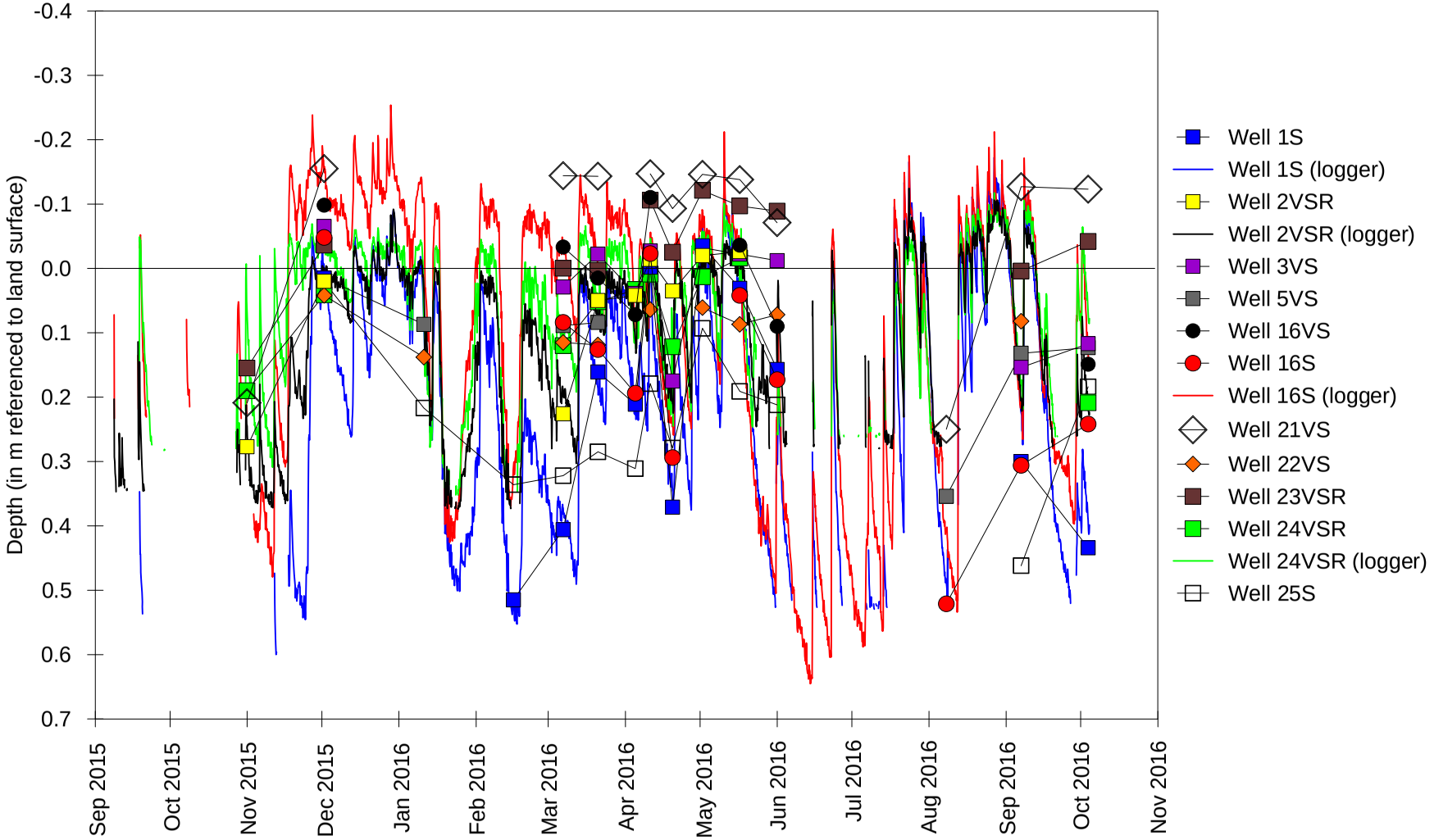
Grant Creek North Wetland Mitigation Site
September 1, 2015 through October 4, 2016

Water-Level Elevations
in Monitoring Wells and at a Surface-Water Gauge in the North Half of the Site



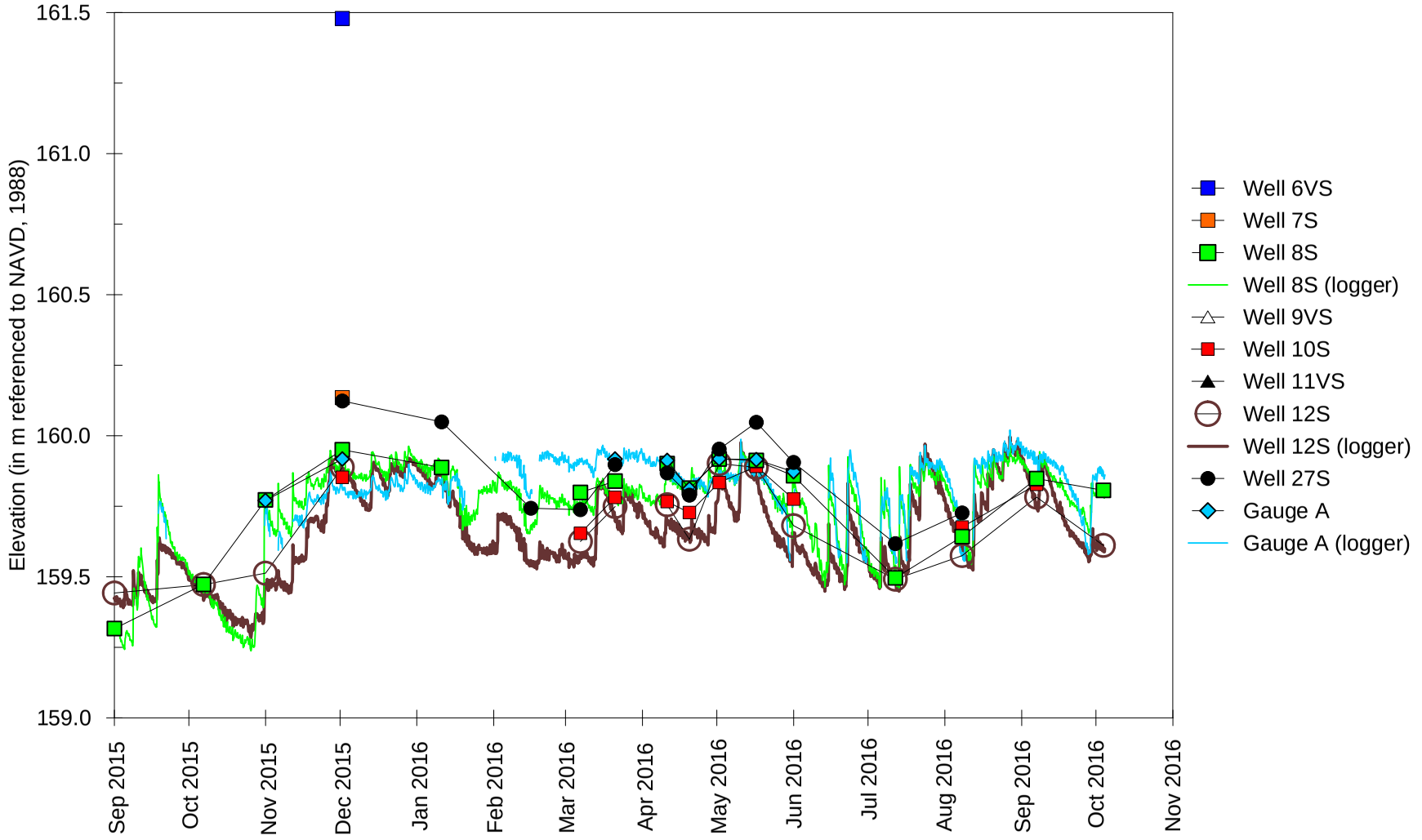
Grant Creek North Wetland Mitigation Site
September 1, 2015 through October 4, 2016

Depth to Water
in Monitoring Wells in the North Half of the Site



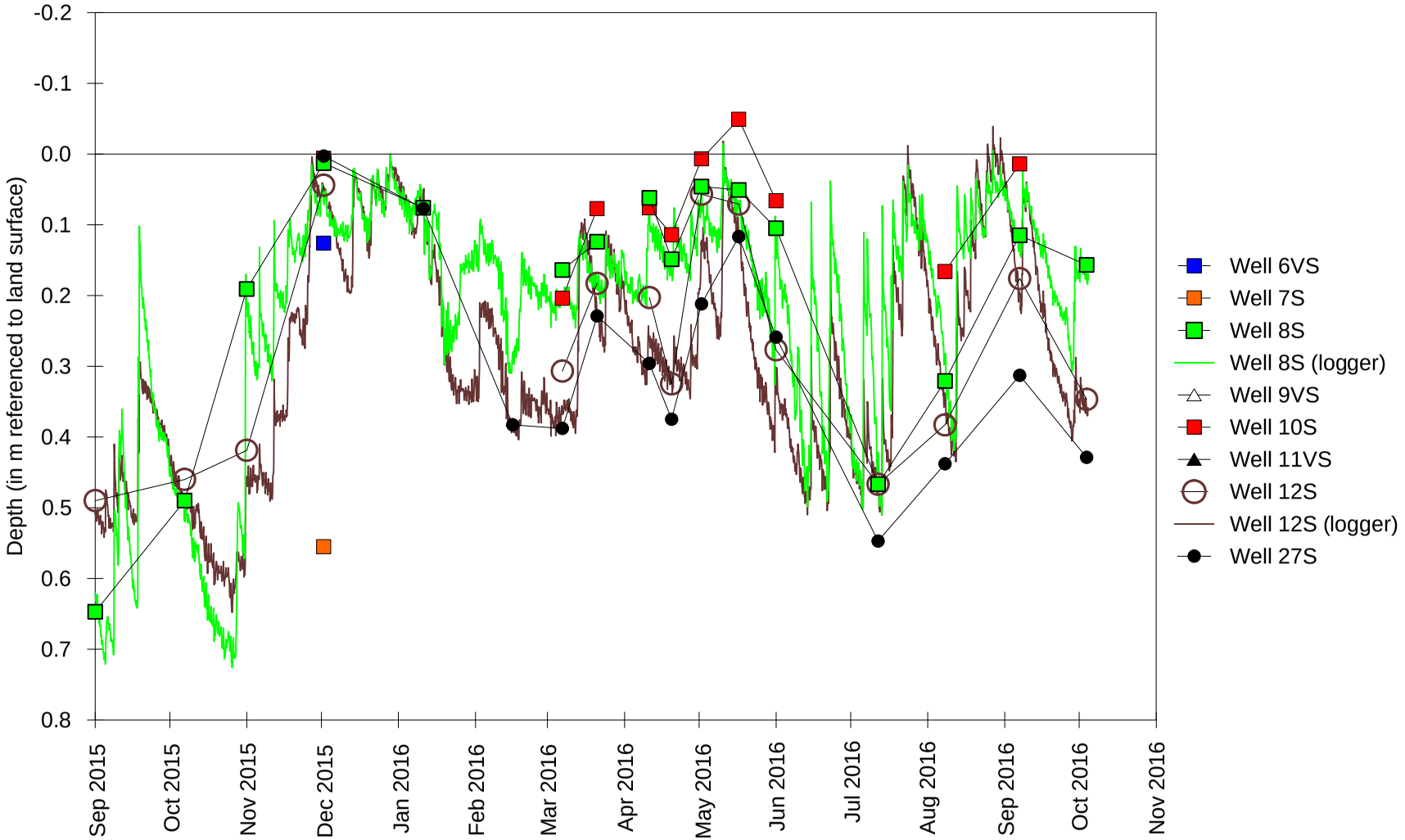
Grant Creek North Wetland Mitigation Site
September 1, 2015 through October 4, 2016

Water-Level Elevations
in Monitoring Wells and at a Surface-Water Gauge in the Southeastern Quadrant of the Site



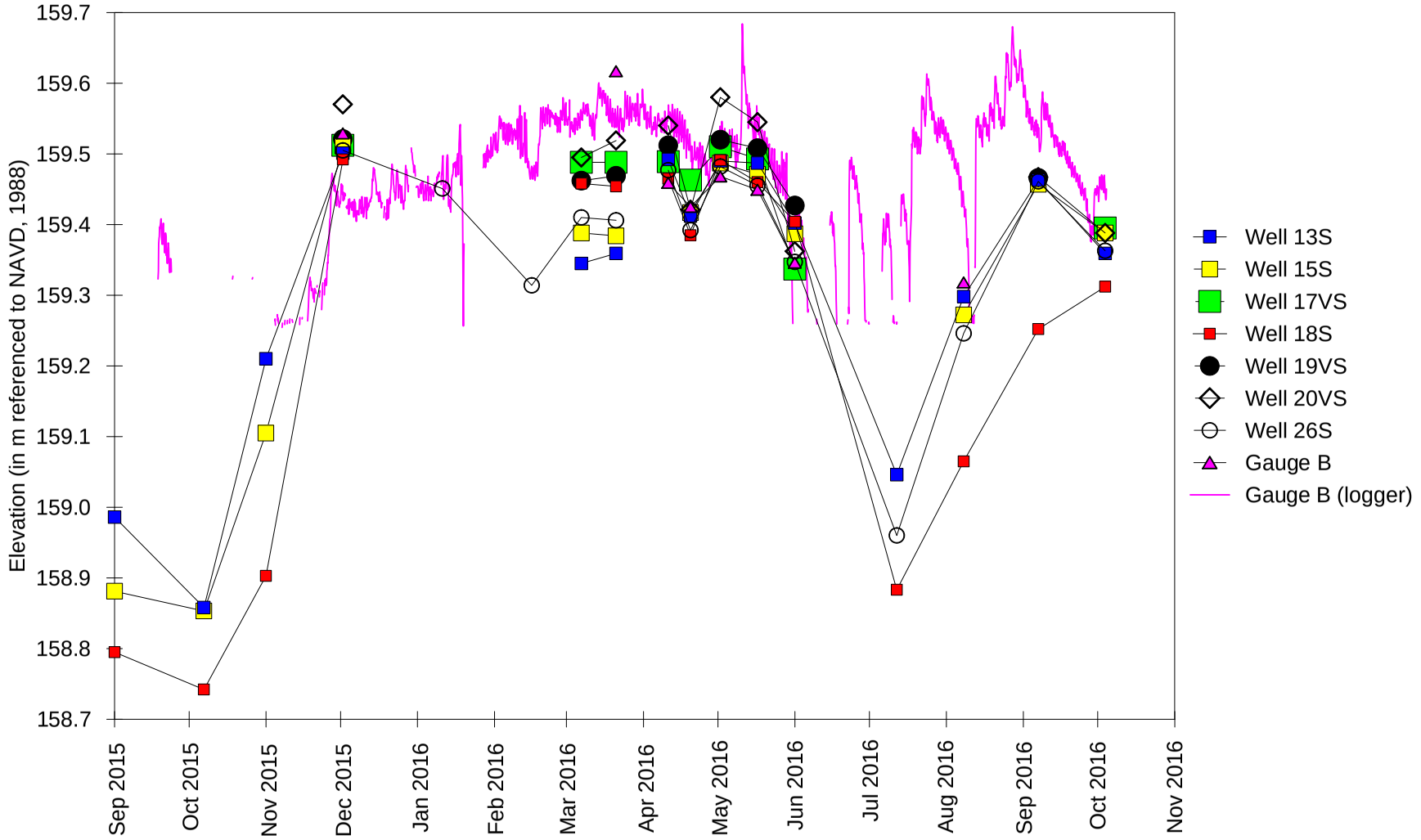
Grant Creek North Wetland Mitigation Site
September 1, 2015 through October 4, 2016

Depth to Water
in Monitoring Wells in the Southeastern Quadrant of the Site



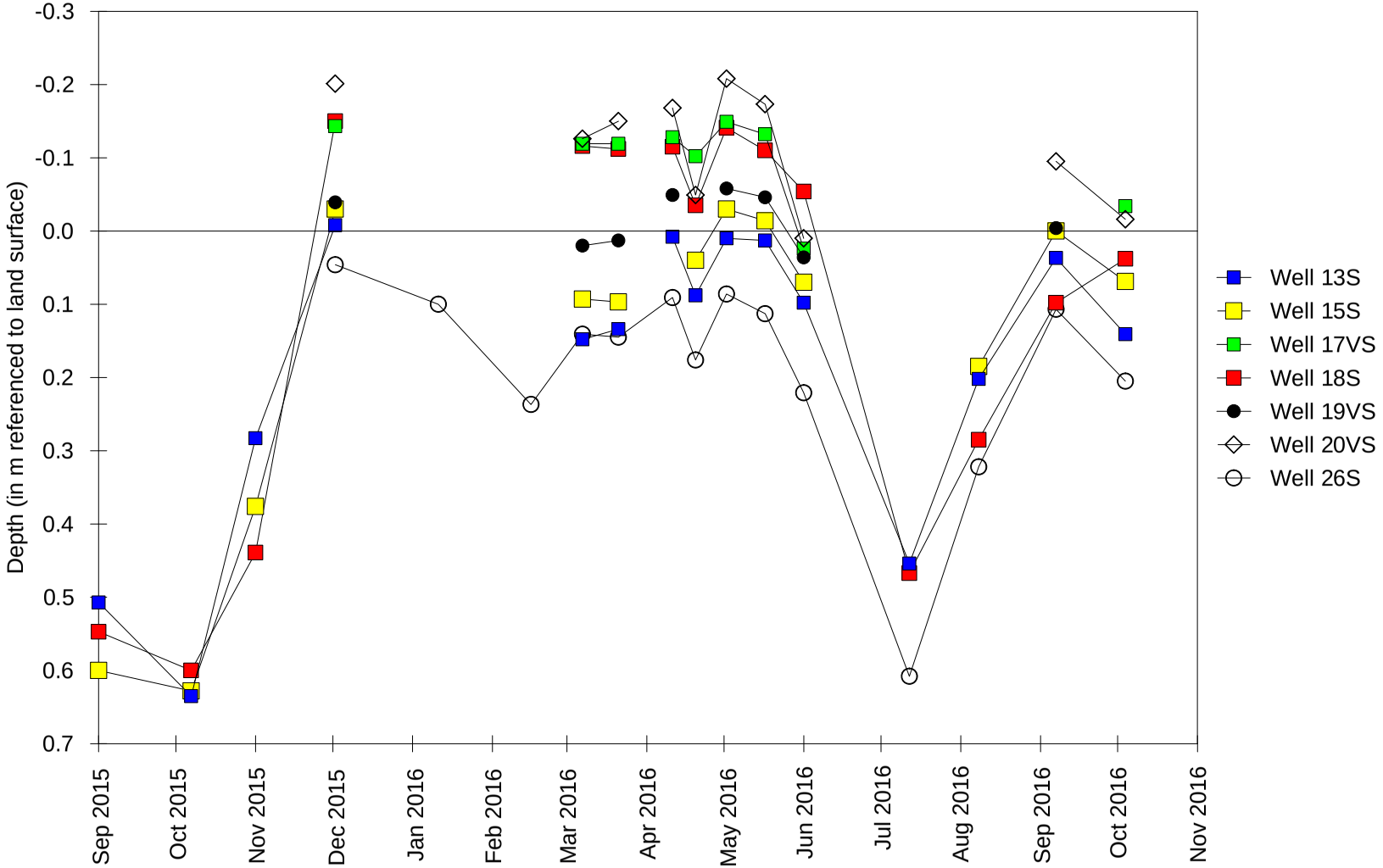
Grant Creek North Wetland Mitigation Site
September 1, 2015 through October 4, 2016

Water-Level Elevations
in Monitoring Wells and at a Surface-Water Gauge in the Southwestern Quadrant of the Site



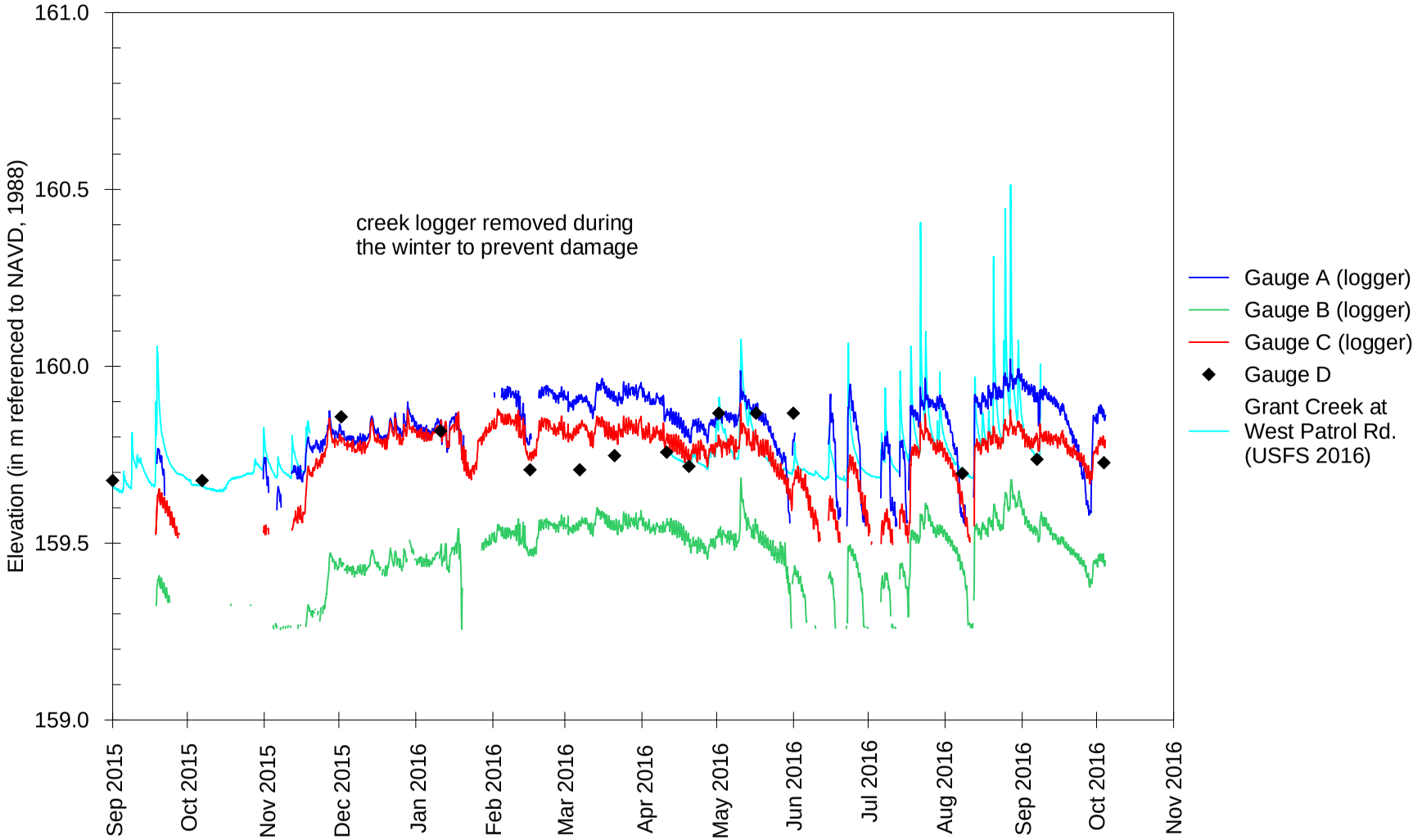
Grant Creek North Wetland Mitigation Site
September 1, 2015 through October 4, 2016

Depth to Water
in Monitoring Wells in the Southwestern Quadrant of the Site



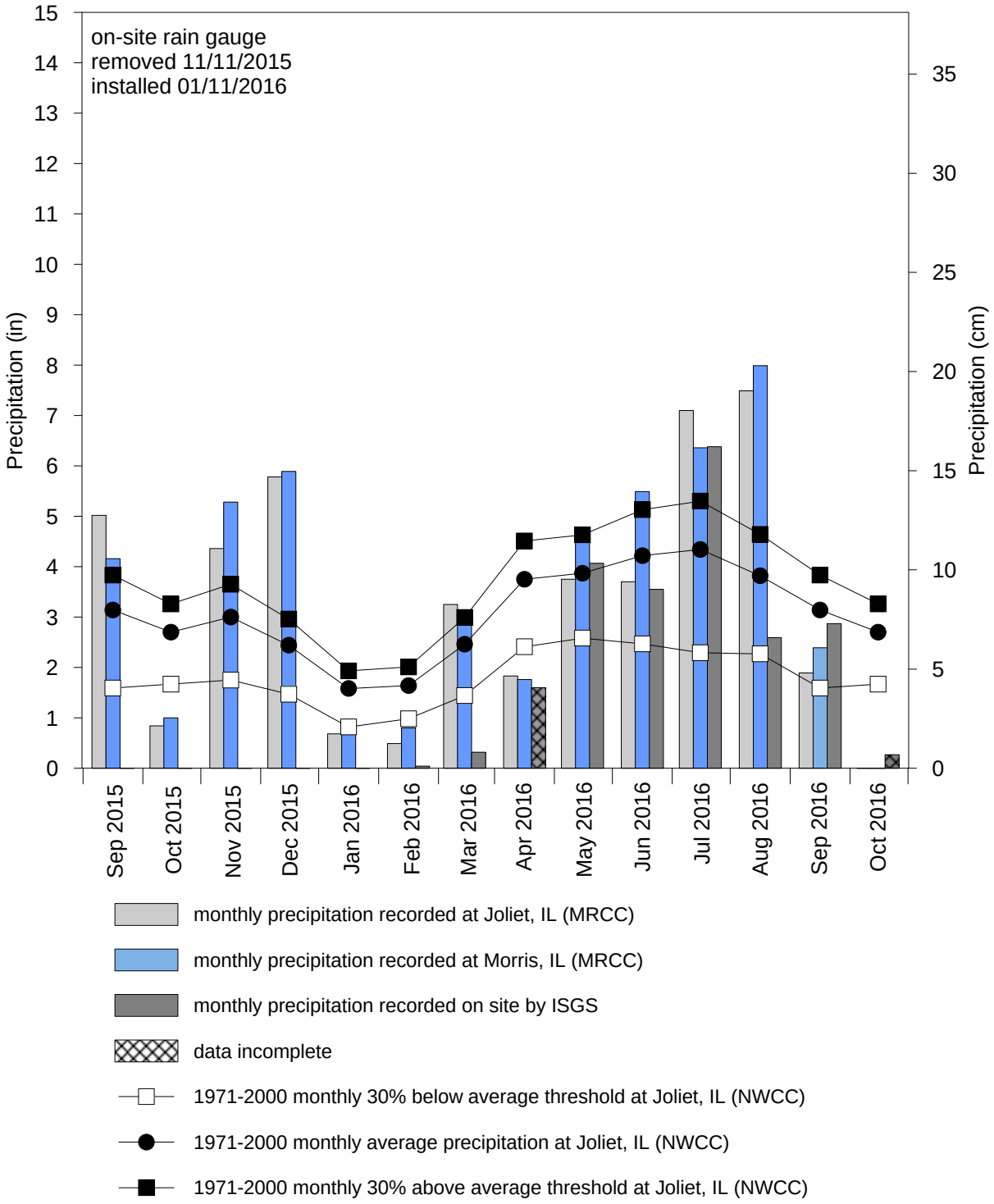
Grant Creek North Wetland Mitigation Site
September 1, 2015 through October 4, 2016

Water-Level Elevations at Surface-Water Gauges



Grant Creek North Wetland Mitigation Site
September 2015 through October 2016

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



STEVENS CREEK BIKEWAY **ISGS #89**
WETLAND MITIGATION SITE
Stevens Creek Bikeway
Sequence #10630
Macon County, Decatur, Illinois
Primary Project Manager: Steven E. Benton
Secondary Project Manager: Audra M. Hanks

SITE HISTORY

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

WETLAND HYDROLOGY CALCULATION FOR 2016

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), 10.24 ha (25.30 ac) of the total site area of 18.67 ha (46.10 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season, and 8.63 ha (21.32 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 9.97 ha (24.63 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 2016); 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 4 was the starting date of the 2016 growing season based on soil temperatures measured at the Decatur, Illinois, ICN station (WARM 2016).
- Total precipitation for the monitoring period, recorded at Decatur, Illinois (MRCC station #112193), was 102% of normal, and precipitation in Spring 2016 (March through May) was 91% of normal.
- Peak hydroperiod during the growing season was in mid- to late May, following a period of rainfall from May 8 to 11 that totaled 1.35 in. with an additional 0.37 in. on May 13. In addition, Gauge B shows that Stevens Creek flooded a portion of the site on May 12.
- In 2016, water levels measured in 23 of 32 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 18 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 21 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) reveals that jurisdictional wetland hydrology can occur at the ridge well (27S) if the adjacent swales are inundated for some period of time during the growing season. On the other hand, while saturation alone can result in a swale well satisfying one or more jurisdictional wetland hydrology criteria (20S and 25S), the adjacent ridge well (28S and 29S) likely will not satisfy any criteria.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2016

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	N	N	N
20S	Y	Y	Y
21S	Y	Y	Y
22S	Y	N	Y
23S	Y	N	Y
24SR	Y	N	N
25S	Y	N	N
26SR	N	N	N
27S	Y	Y	Y
28S	N	N	N
29S	N	N	N
30S	Y	N	Y
31S	N	N	N
32S	N	N	N

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

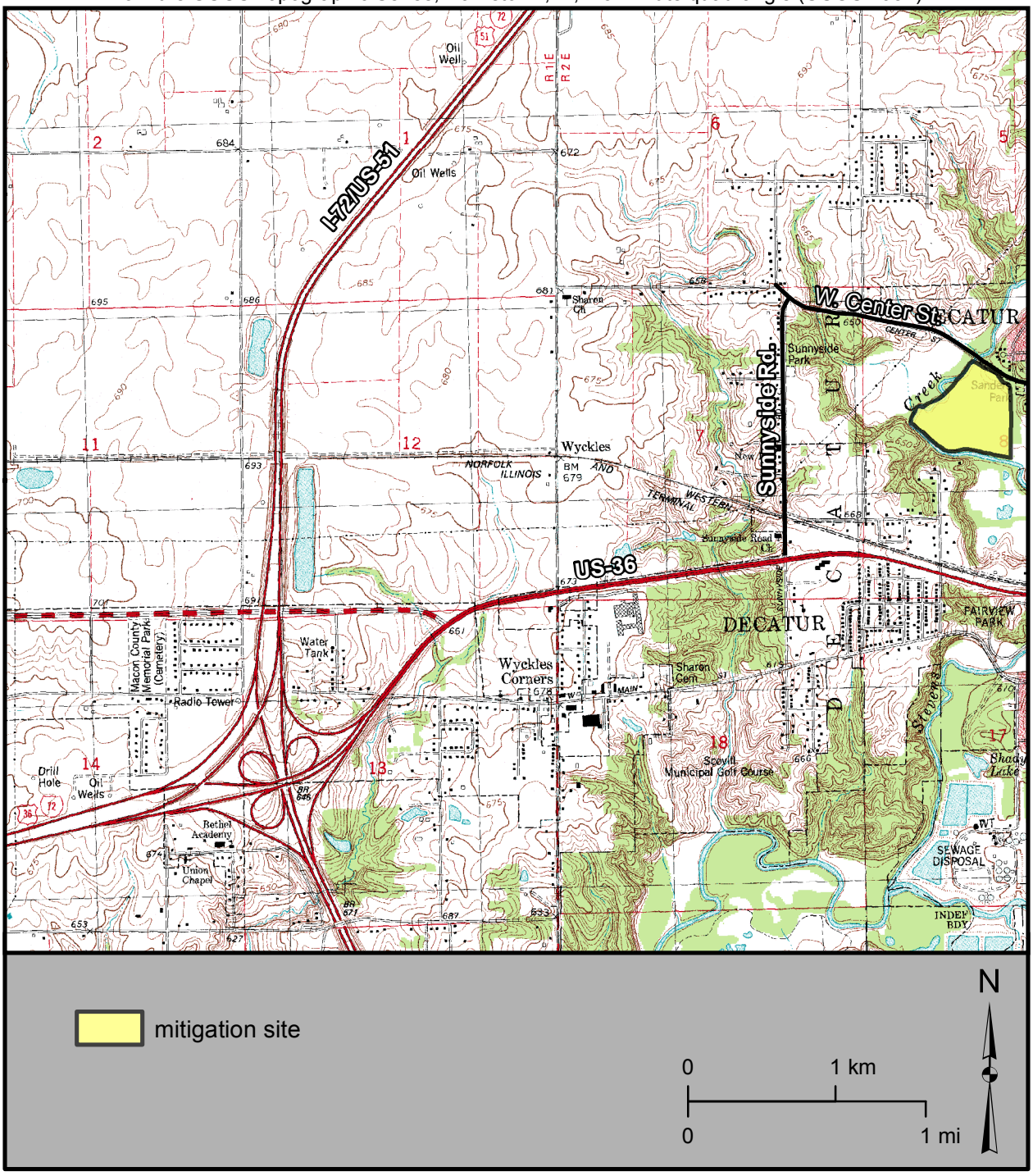
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
A	184.04 m (603.81 ft)	183.97 m (603.58 ft)	184.00 m (603.67 ft)
B	n/a	n/a	n/a
C	184.05 m (603.84 ft)	n/a	n/a

n/a – hydroperiod was not long enough 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 (USGS 1982)

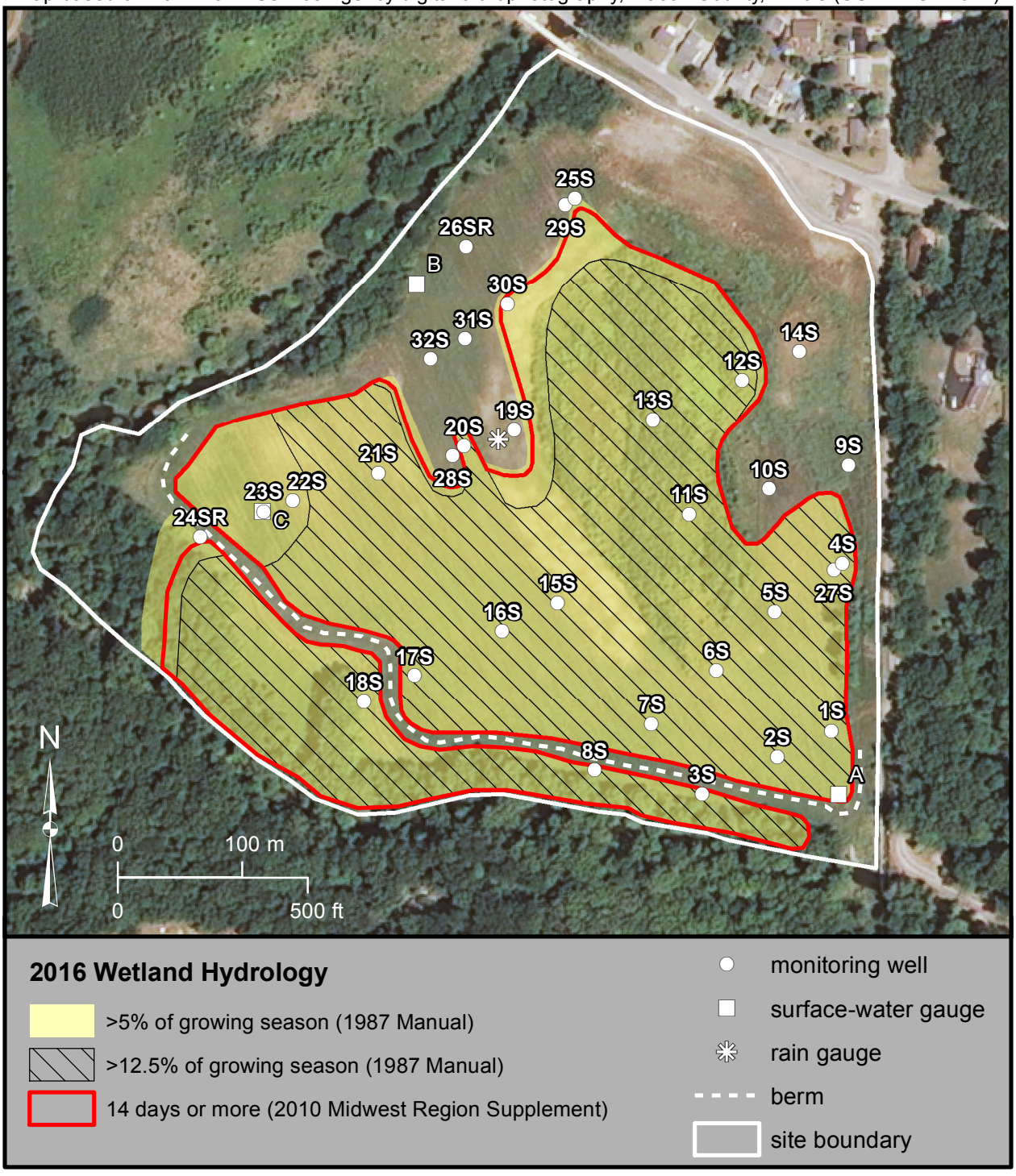


Stevens Creek Bikeway Wetland Mitigation Site

Estimated Areal Extent of 2016 Wetland Hydrology

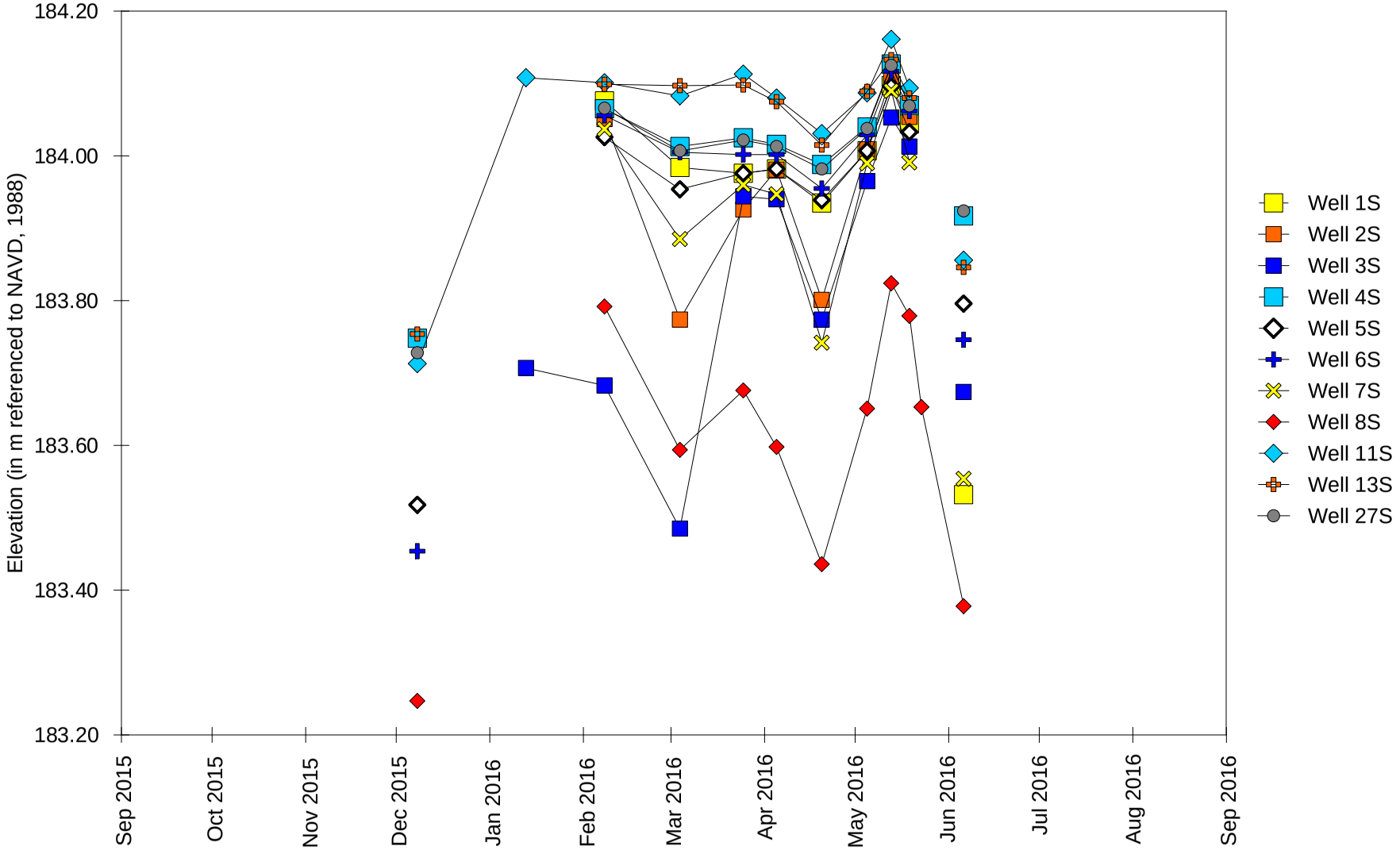
September 1, 2015 through August 31, 2016

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



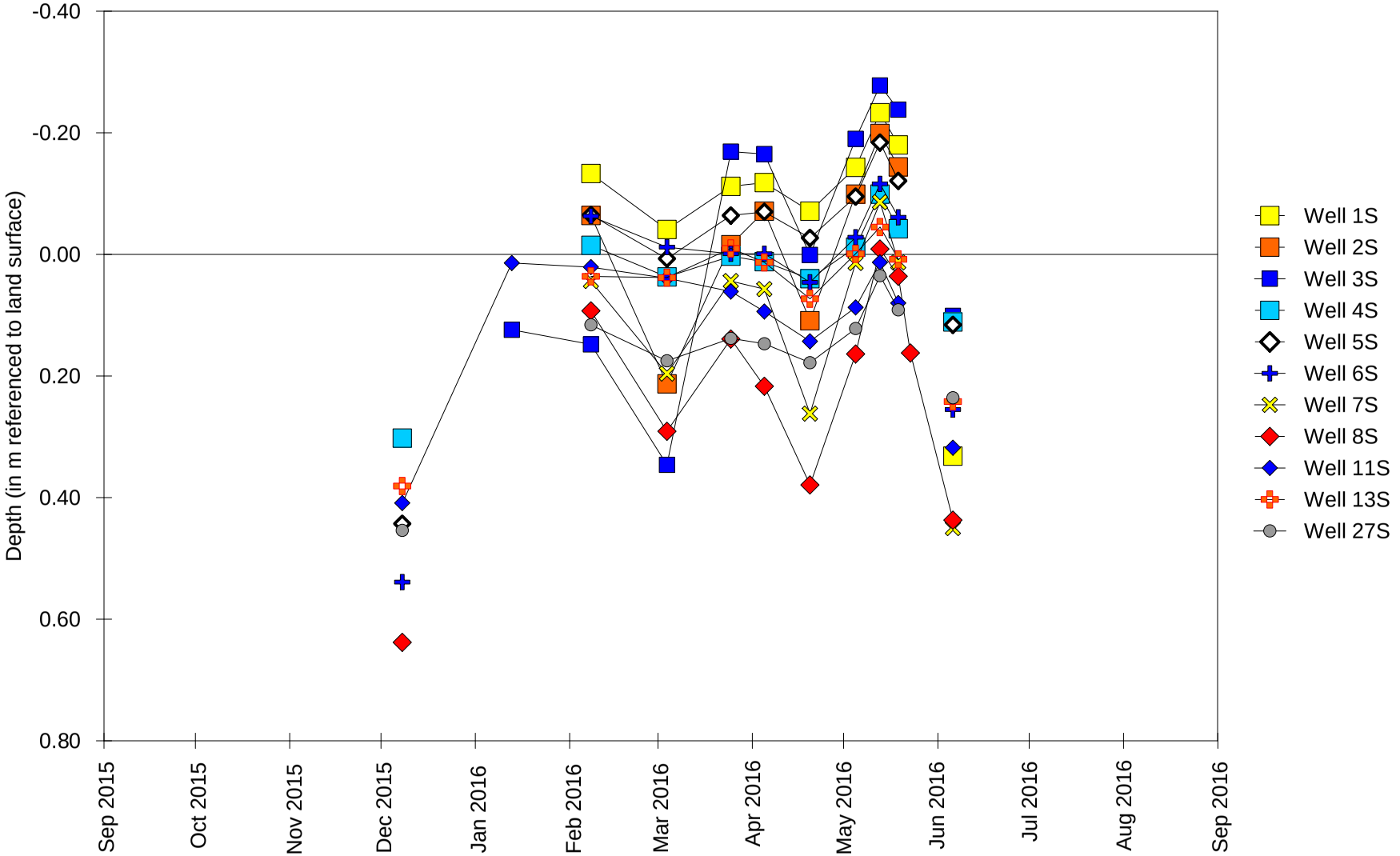
Stevens Creek Bikeway Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells



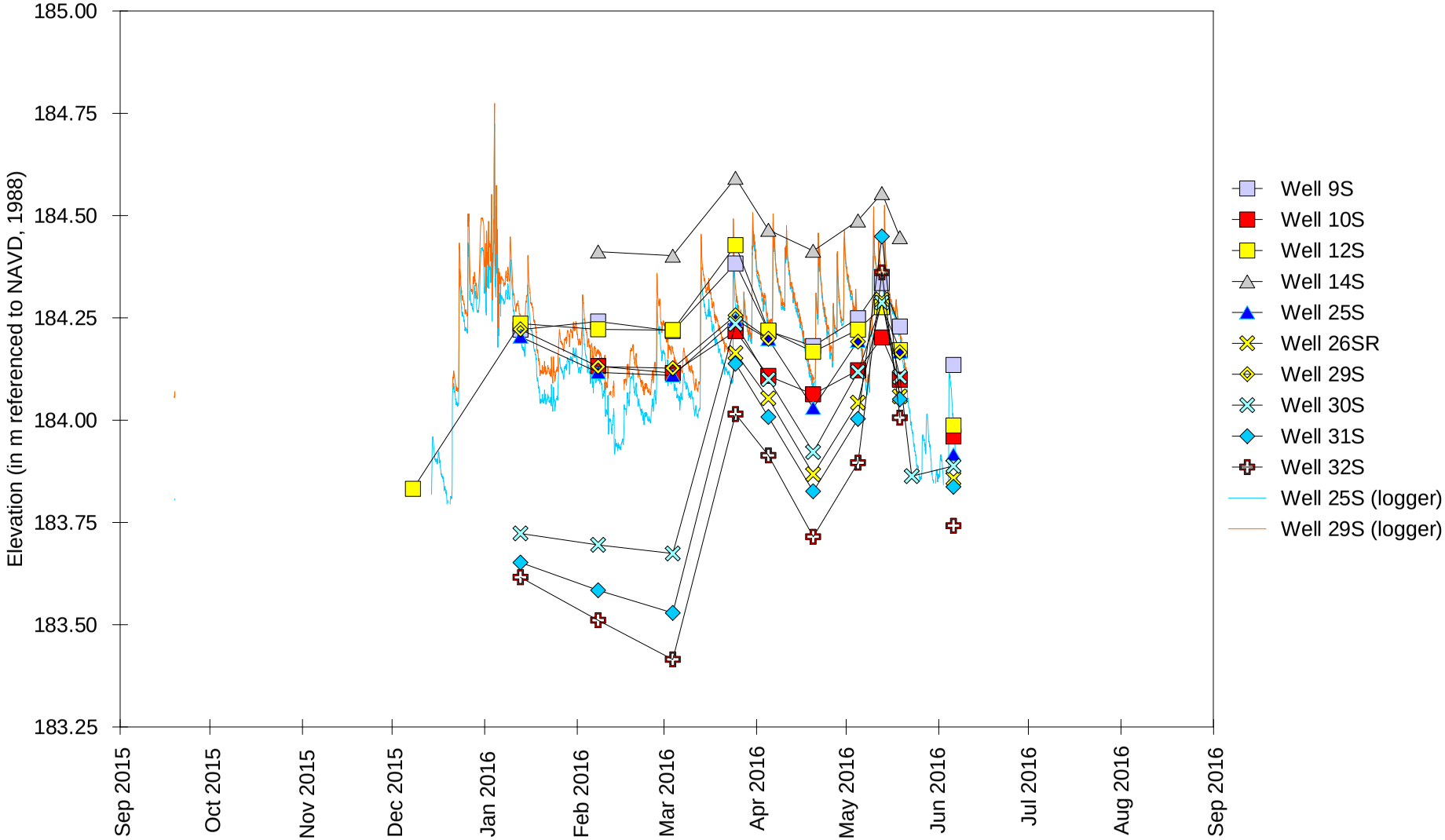
Stevens Creek Bikeway Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells



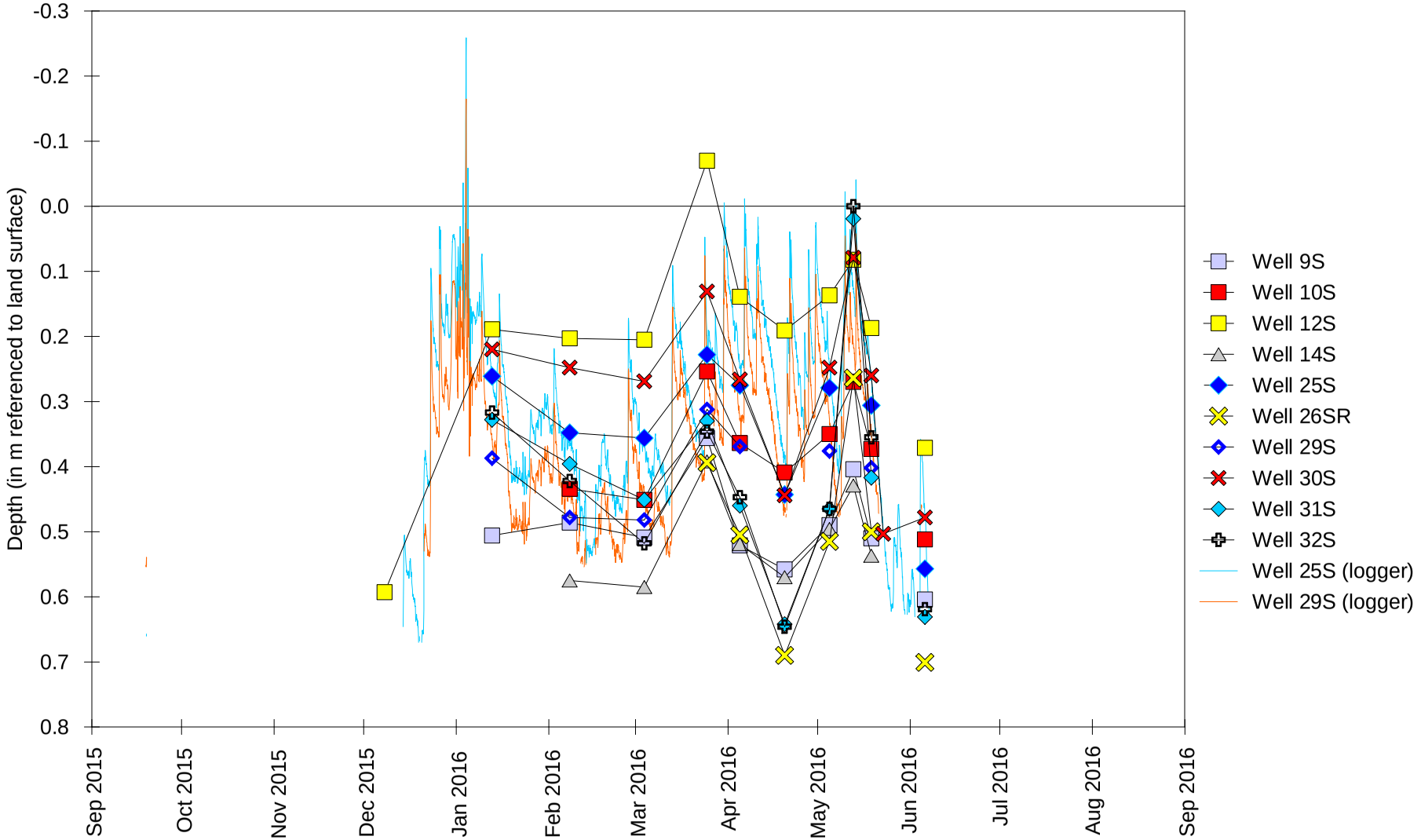
Stevens Creek Bikeway Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells



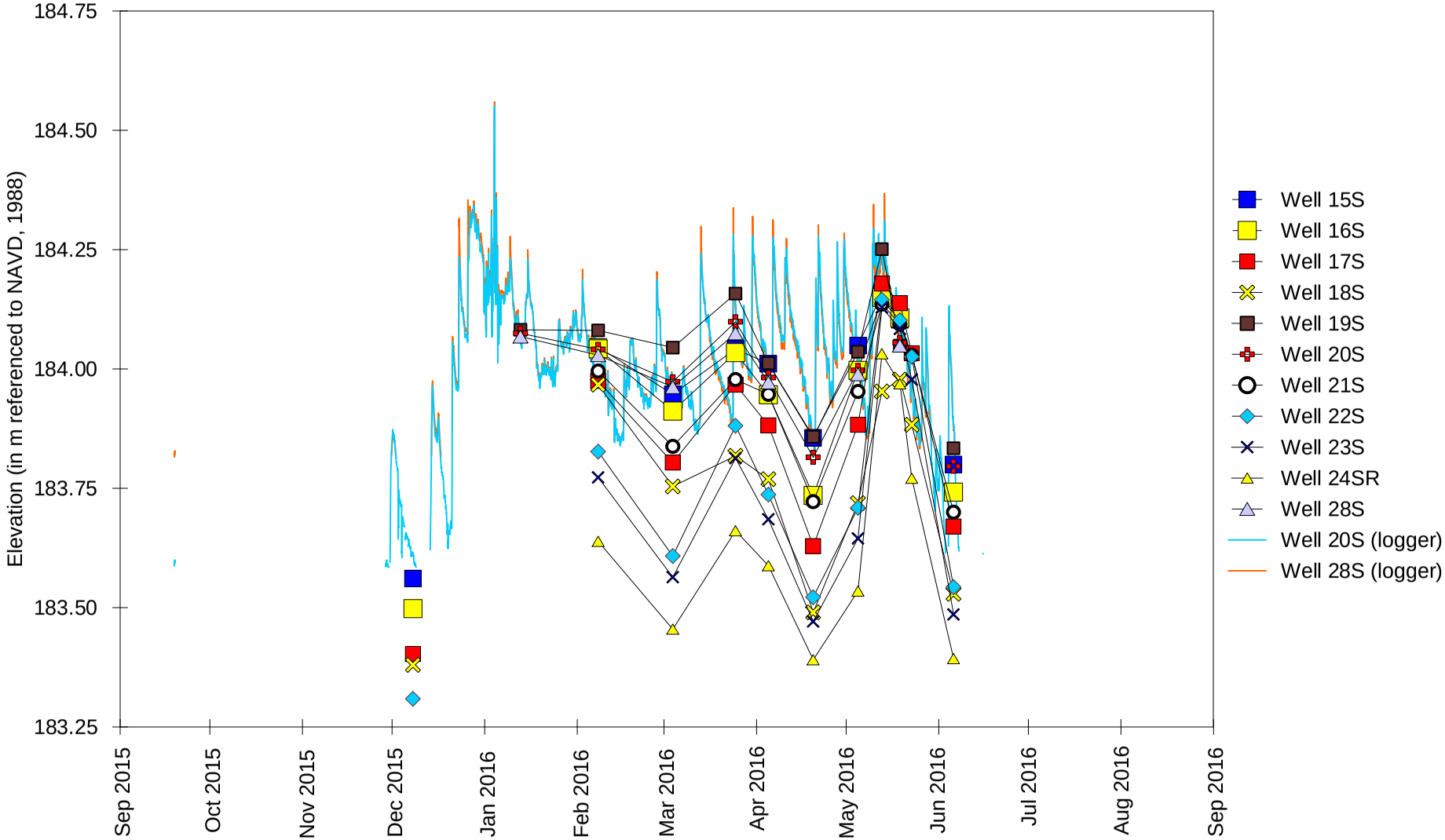
Stevens Creek Bikeway Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells



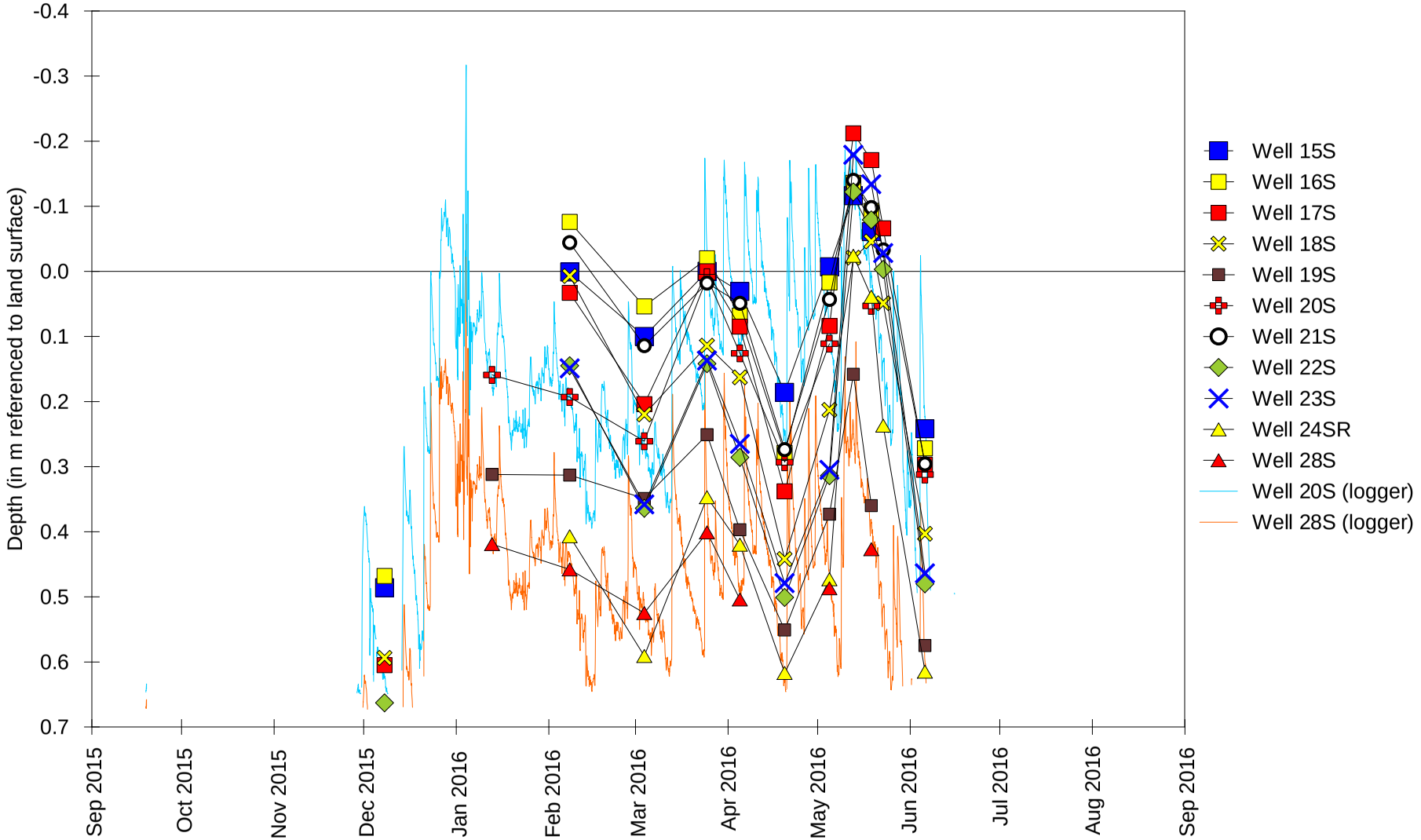
Stevens Creek Bikeway Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Shallow Monitoring Wells



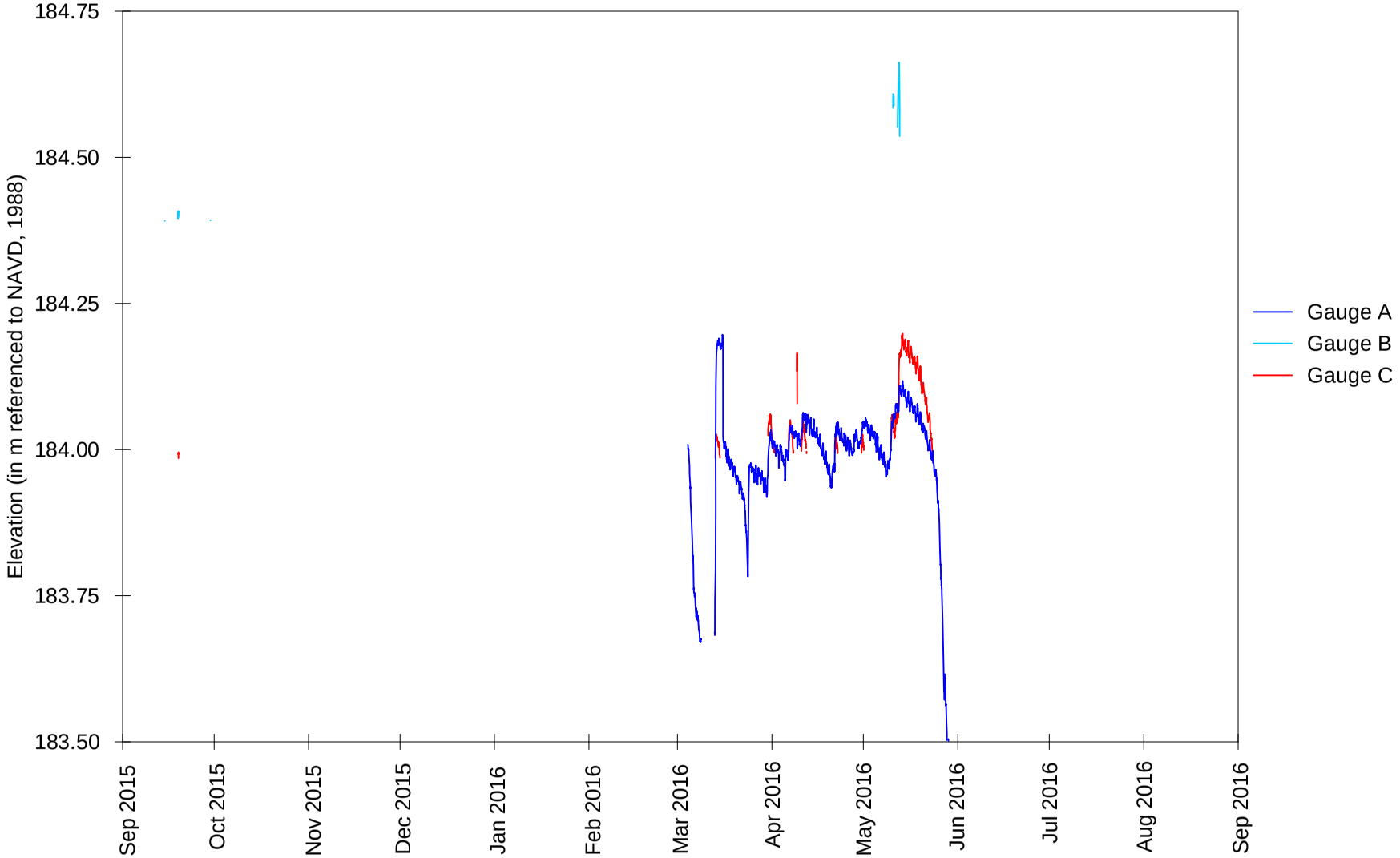
Stevens Creek Bikeway Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Depth to Water
in Shallow Monitoring Wells



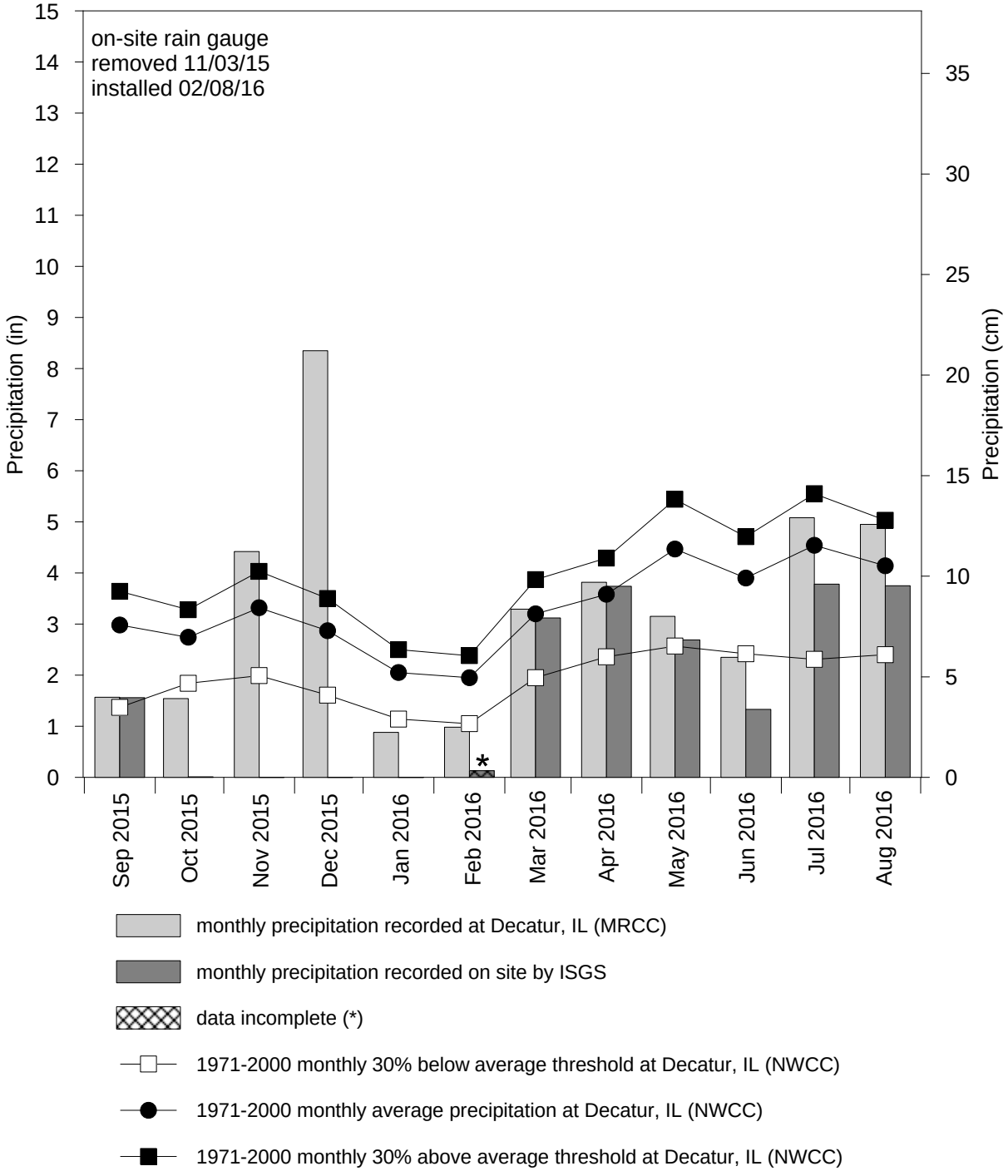
Stevens Creek Bikeway Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Steven's Creek Bikeway Wetland Mitigation Site
September 2015 through August 2016

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



THORN CREEK HEADWATERS PRESERVE **ISGS #90**
WETLAND MITIGATION SITE
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: The ISGS was tasked by IDOT to monitor wetland hydrology.
- March 2013: The ISGS installed a monitoring network at the site.
- Winter 2013-14: Drainage tile were broken and the site was broadcast seeded.
- April 2014: Additional wells were installed to monitor post-construction hydrology.

WETLAND HYDROLOGY CALCULATION FOR 2016

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), 15.42 ha (38.10 ac) of the total site area of 37.54 ha (92.77 ac) satisfied wetland hydrology criteria for greater than 5% of the 2016 growing season, and 5.20 ha (12.84 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), 11.12 ha (27.49 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 2016). 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, April 10 was the starting date of the 2016 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Park Forest, Illinois (MRCC station #116616), was 117% of normal, and Spring 2016 (March through May) precipitation was 91% of normal. Precipitation for July and August 2016 was well above average with the two-month rainfall total 185% of normal.
- Peak hydroperiod during the growing season at the site occurred due to a series of rainfall events during April 28 through May 14. Over this period, 2.55 in. of precipitation was recorded on site. The water sources at this site are mainly precipitation and storm runoff with a lesser influence from seasonal high water table due to a headwaters landscape position.
- In 2016, water levels measured in 13 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 6 of 29 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 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

- 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.

- Two tile blow outs were discovered on site, one in the west field between well 7S and 17S and one in the central portion of the east field. These presence of blowouts suggest that some segments of the tile remain active in draining portions of the site. Comparison of the 2015 and 2016 water levels in well 23S suggest that the blowout in the east field may have contributed to localized reductions in wetland hydrology area.

PLANNED FUTURE ACTIVITIES

- Additional wells will be installed during Fall 2016 or Winter 2016-17. Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2016

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
3S	N	N	N
4S	N	N	N
5S	N	N	N
6S	Y	N	N
7S	Y	N	Y
10S	Y	N	N
11S	N	N	N
12S	N	N	N
13S	N	N	N
15S	Y	Y	Y
16S	Y	N	Y
17S	N	N	N
18S	N	N	N
19S	Y	Y	Y
20S	Y	Y	Y
21S	Y	N	N
22S	Y	N	N
23S	N	N	N
24S	N	N	N

Well locations meeting wetland hydrology criteria			
ID	***5% of growing season***	***12.5% of growing season***	***14 days during growing season***
25S	Y	Y	Y
26S	N	N	N
27S	N	N	N
28S	N	N	N
29S	N	N	N
30S	Y	Y	Y
31S	N	N	N
32S	Y	Y	Y
33S	N	N	N

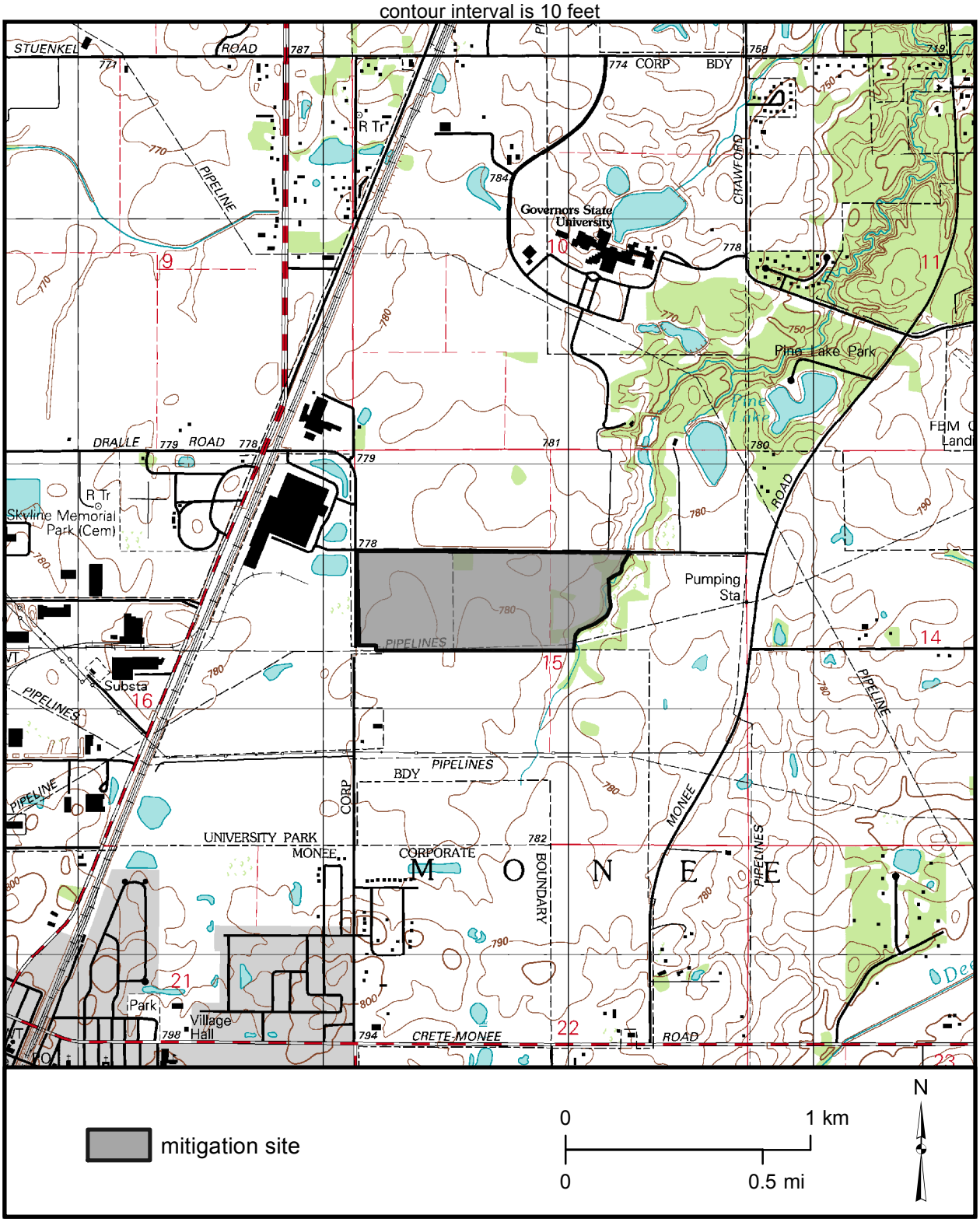
Y – met wetland hydrology criteria
N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	*5% of growing season*	*12.5% of growing season*	*14 days during growing season*
B	236.91 m (777.26 ft)	236.90 m (777.23 ft)	236.91 m (777.26 ft)
C	233.44 m (765.88 ft)	n/a	233.44 m (765.88 ft)

n/a – hydroperiod was not long enough to determine an elevation

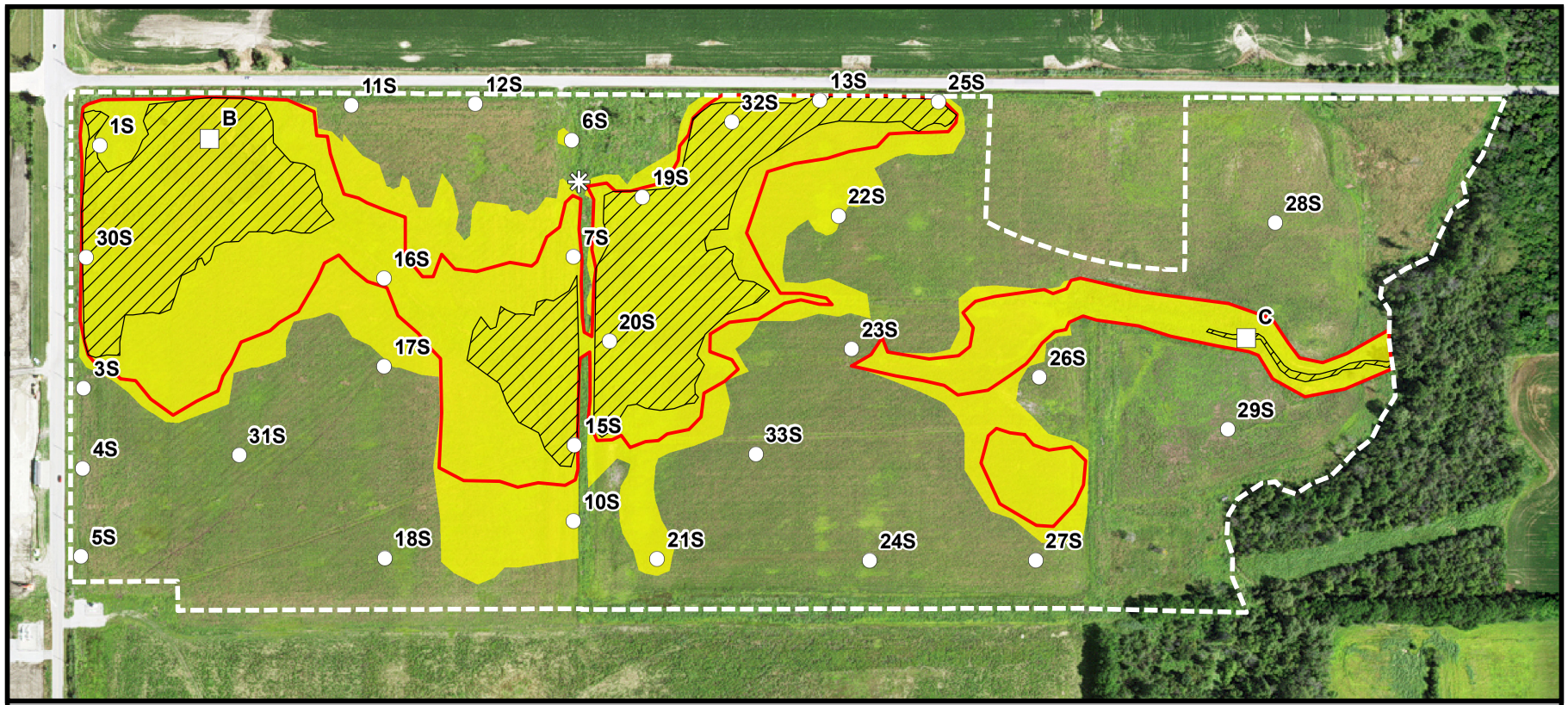
Thorn Creek Headwaters Preserve Wetland Mitigation Site
(I-57 at Stuenkel Road, FAI 57)
General Study Area and Vicinity

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 2016 Wetland Hydrology
September 1, 2015 through August 31, 2016

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



2016 Wetland Hydrology

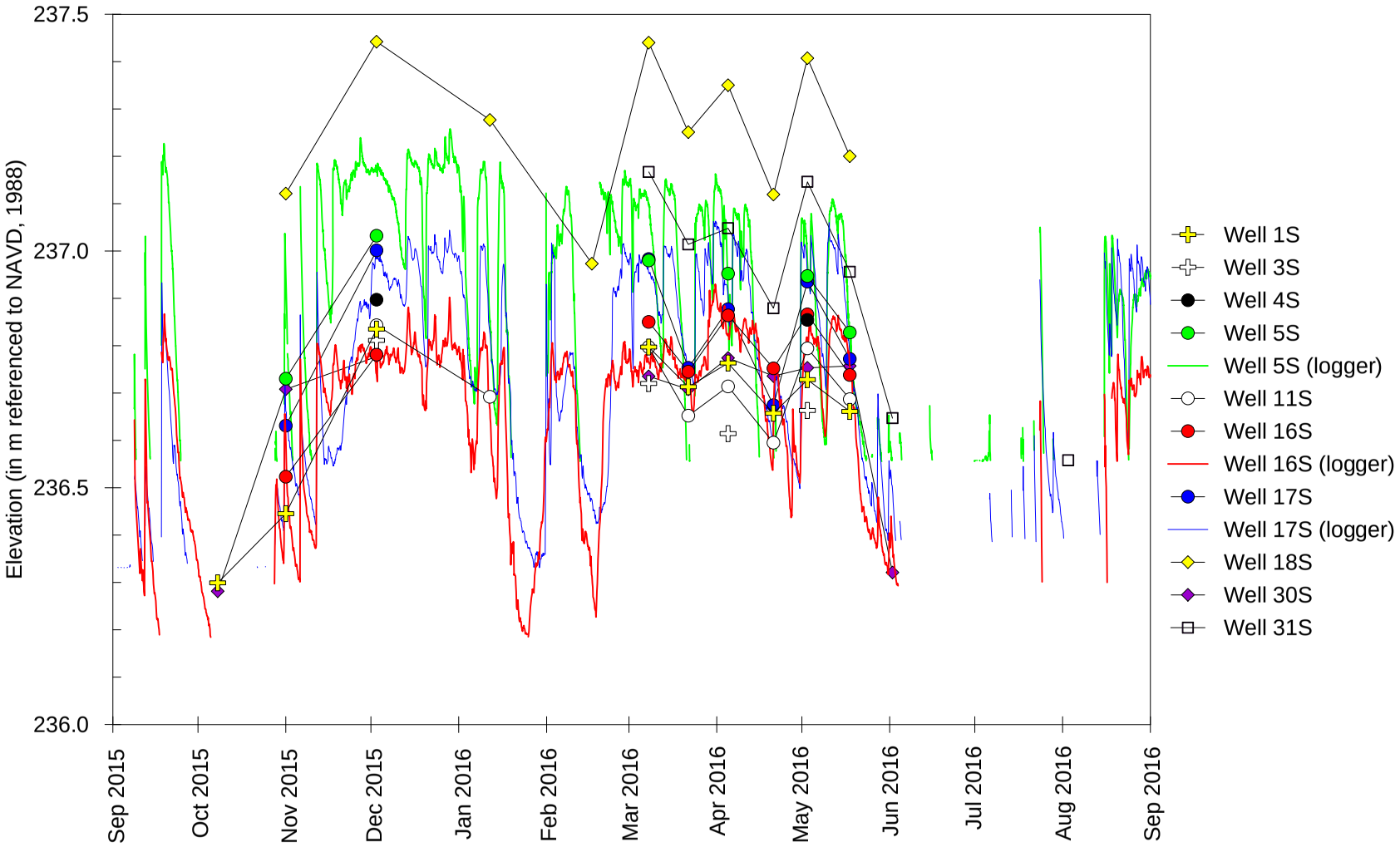
- >5% of growing season (1987 Manual)
- >12.5% of growing season (1987 Manual)
- 14 days or more (2010 Midwest Region Supplement)
- monitoring well
- surface-water gauge
- rain gauge
- mitigation site

0 100 m
0 300 ft

N

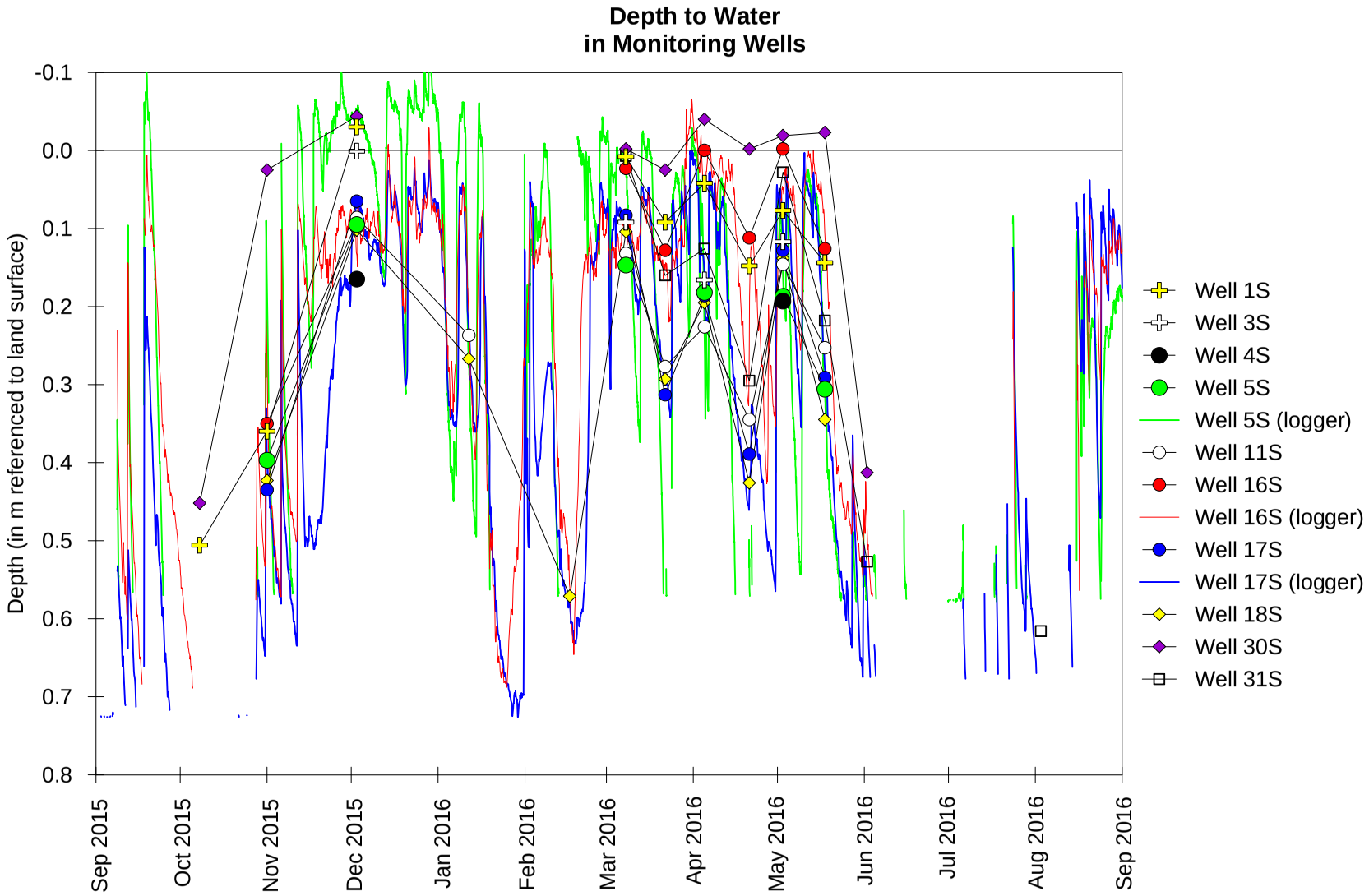
Thorn Creek Headwaters Preserve Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells



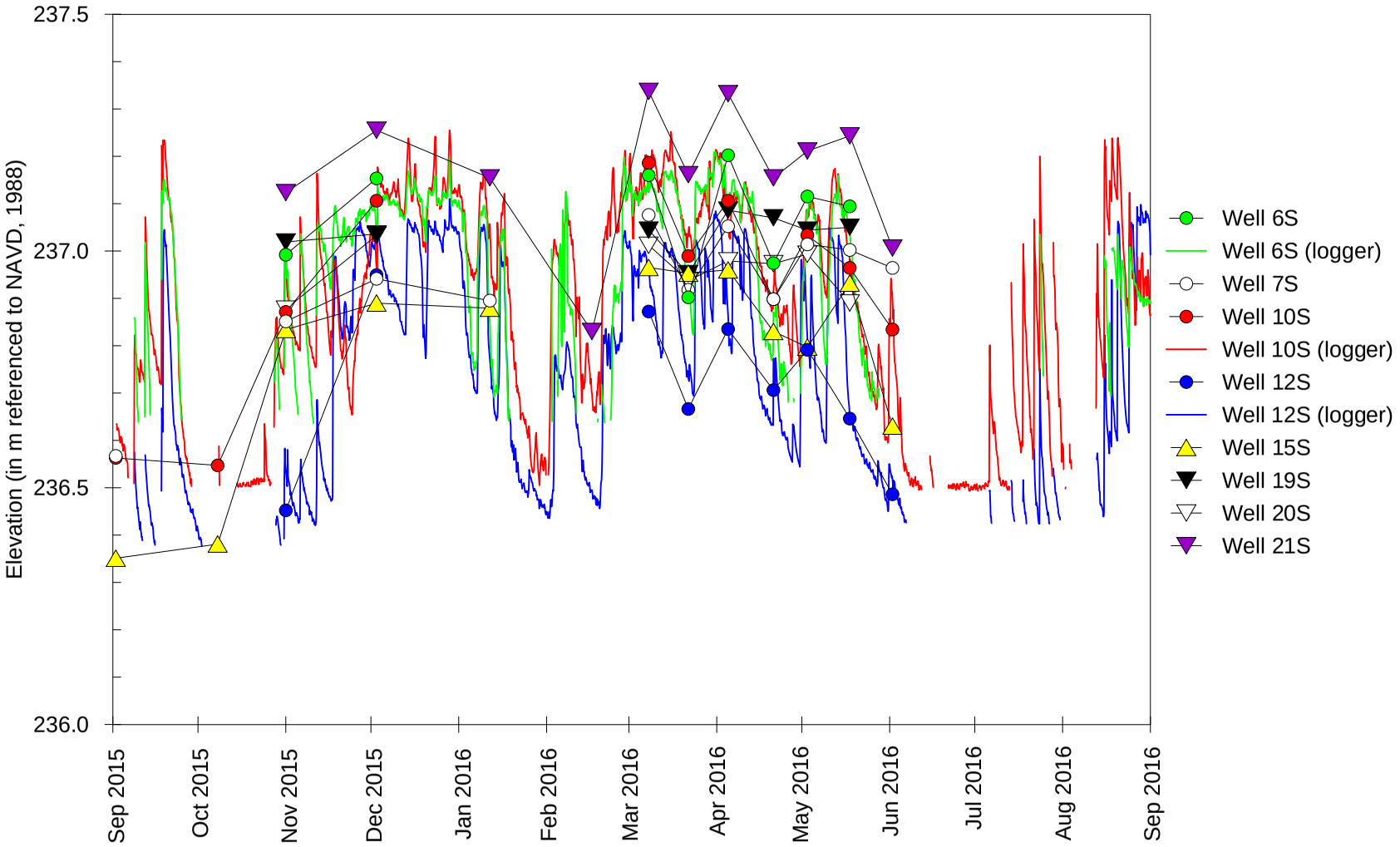
Thorn Creek Headwaters Preserve Wetland Mitigation Site

September 1, 2015 through August 31, 2016

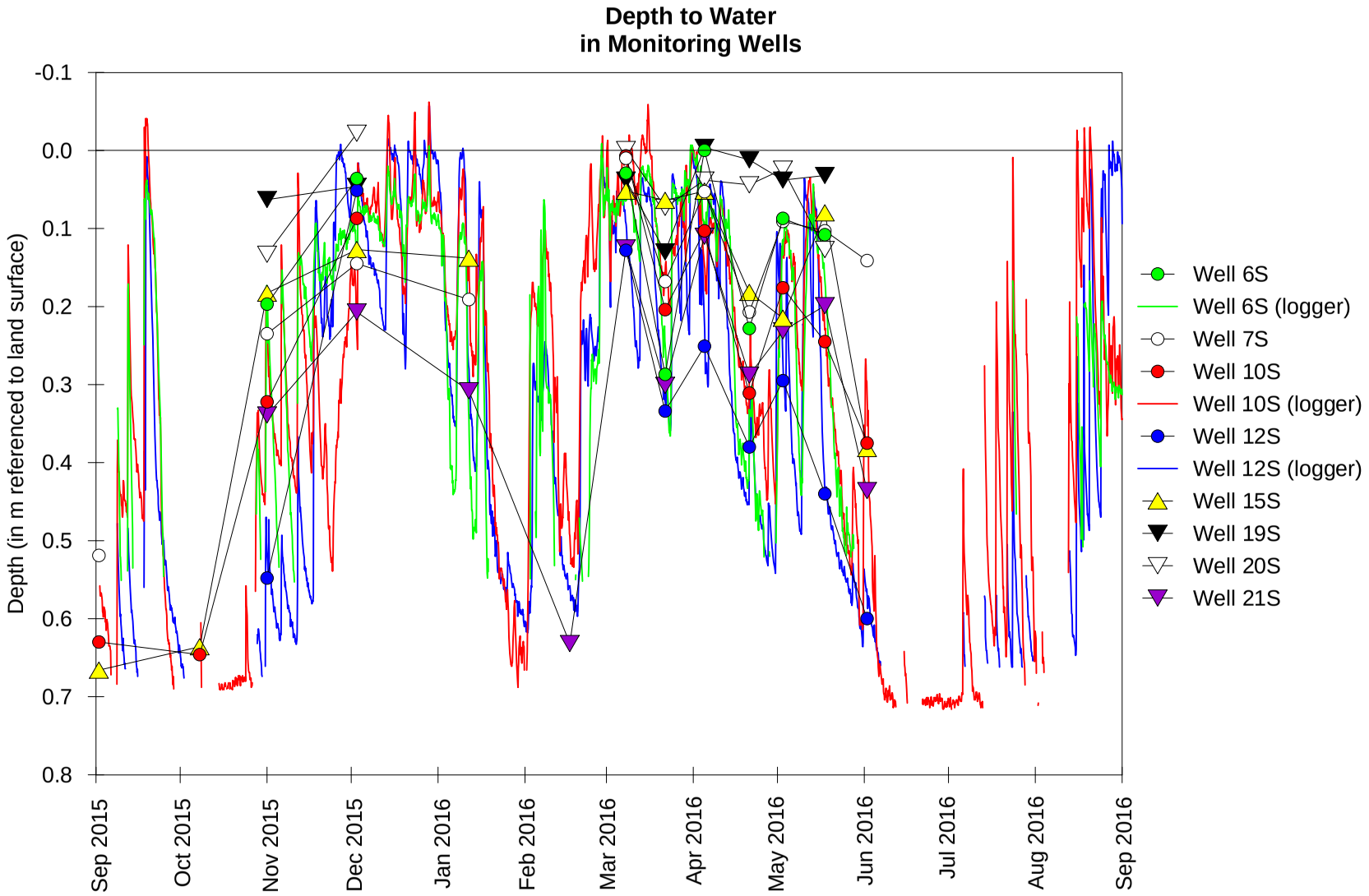


Thorn Creek Headwaters Preserve Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells

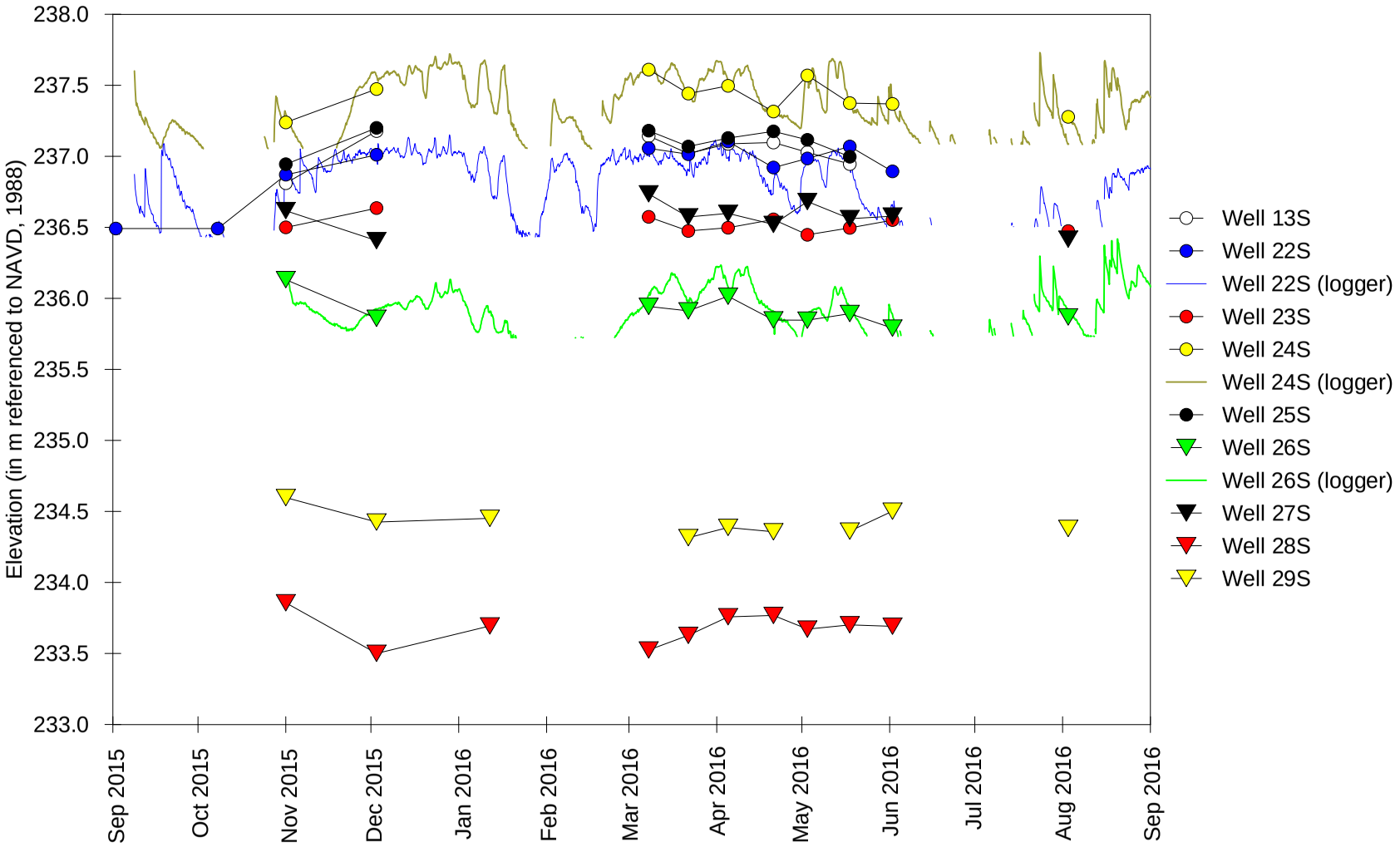


Thorn Creek Headwaters Preserve Wetland Mitigation Site
September 1, 2015 through August 31, 2016

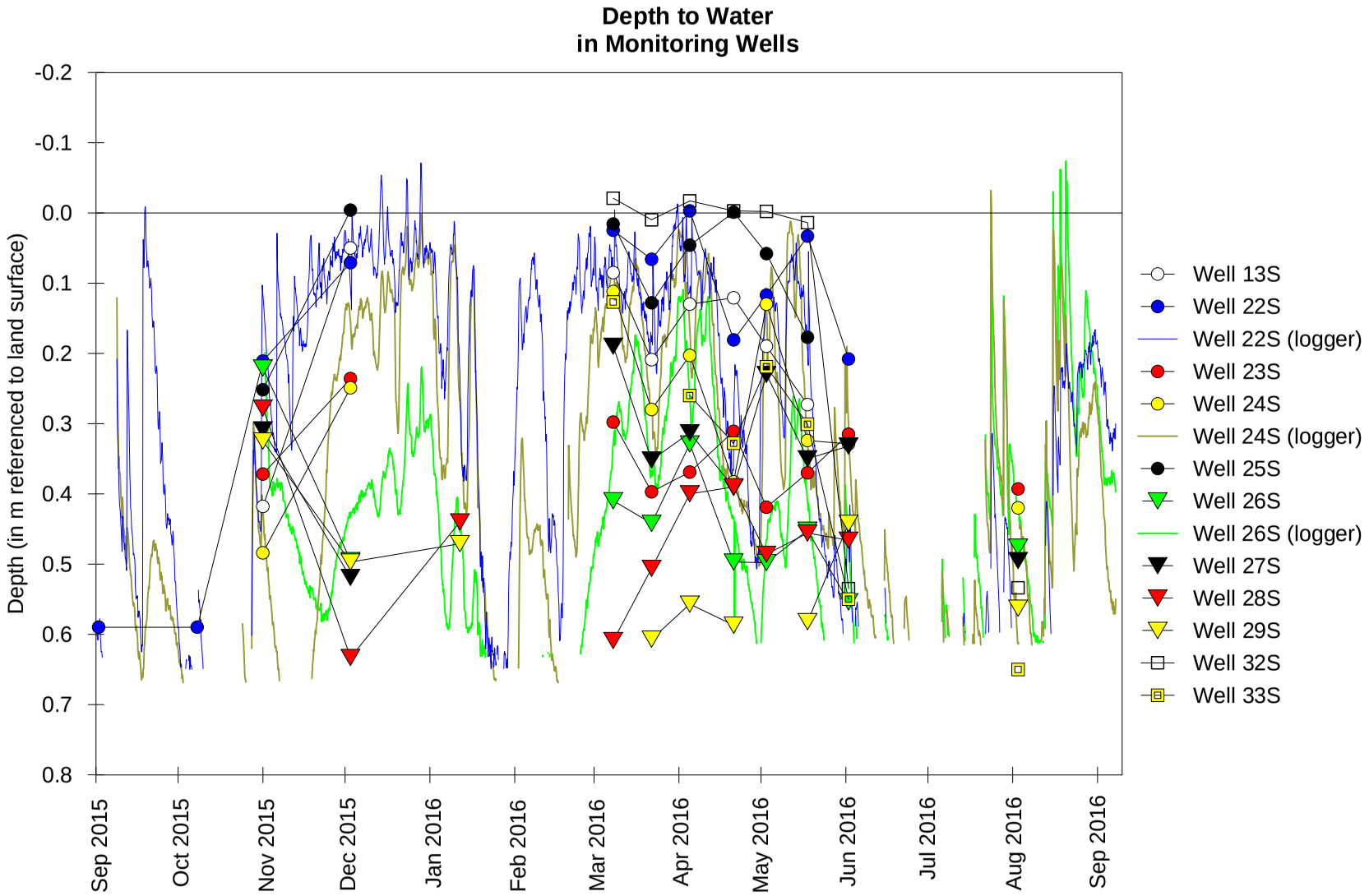


Thorn Creek Headwaters Preserve Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations in Monitoring Wells

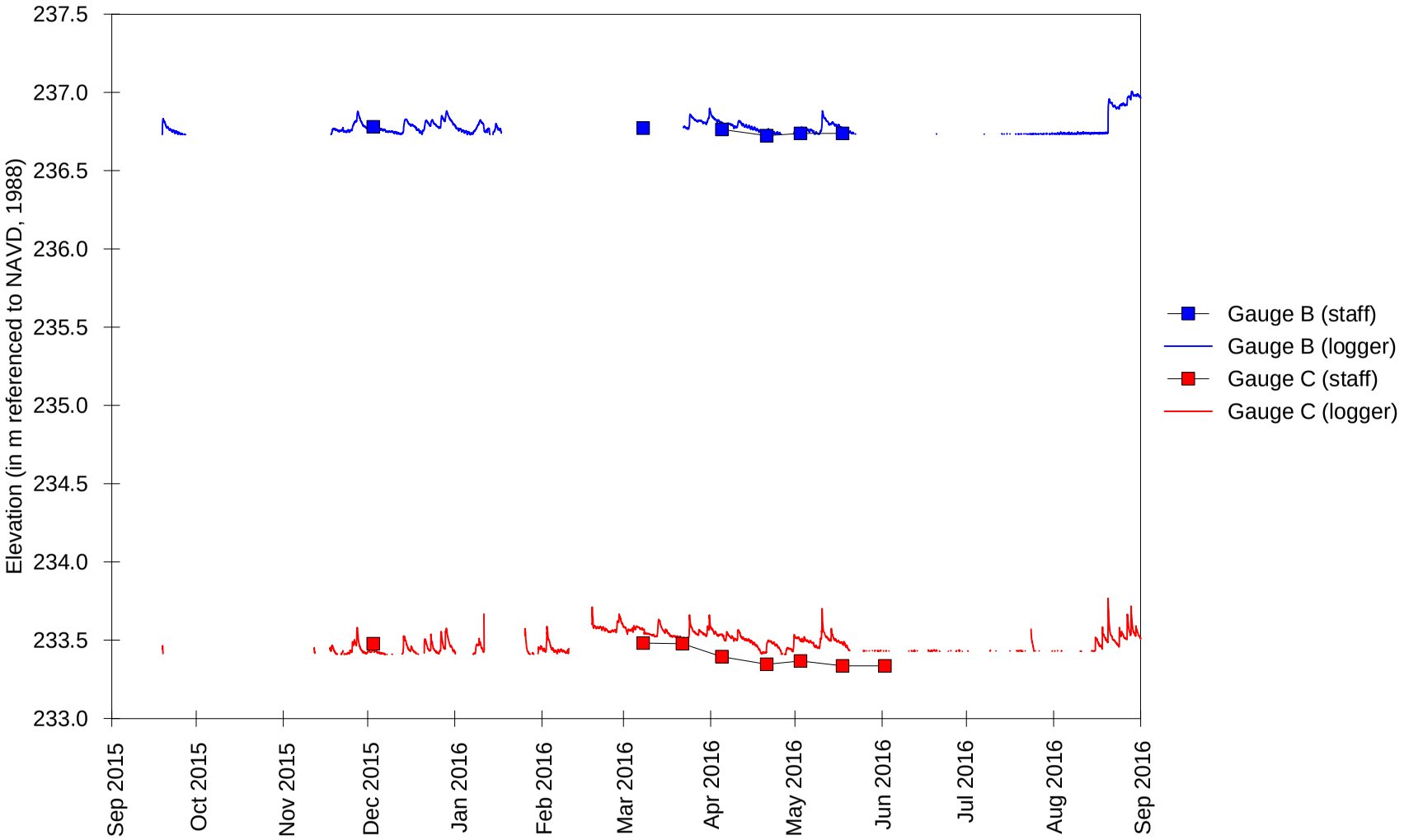


Thorn Creek Headwaters Preserve Wetland Mitigation Site
September 1, 2015 through August 31, 2016



Thorn Creek Headwaters Preserve Wetland Mitigation Site
September 1, 2015 through August 31, 2016

Water-Level Elevations at Surface-Water Gauges



Thorn Creek Wetland Mitigation Site
September 2015 through August 2016

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