

# Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites: September 1, 2017 through August 31, 2018

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*Fairmont City Wetland Mitigation Site, St. Clair County. Photo by Jessica Monson.*

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Illinois State Geological Survey

PRAIRIE RESEARCH INSTITUTE

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## **Open File Series 2018-3**

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## 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 FY18 and FY19 (grant code D6099), including current and potential wetland mitigation sites and banks. Where appropriate, this report also includes a determination of areas meeting wetland hydrology criteria listed in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and its online updates (Environmental Laboratory 1987), hereafter collectively referred to as the 1987 Manual, as well as areas meeting wetland hydrology criteria as outlined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (U.S. Army Corps of Engineers [USACE] 2010), hereafter referred to as the 2010 Midwest Region Supplement. Additional activities performed under this contract, such as water-quality monitoring, are not included in this report. Other site observations are included where appropriate.

Summaries of 15 wetland mitigation sites are included in this report. Each summary contains a location map, a site map showing field instruments and the extent of area satisfying wetland hydrology criteria, a table indicating whether well locations met wetland hydrology criteria, a table providing gauged surface-water levels that met wetland hydrology criteria, hydrographs from active wells and surface-water gauges, and graphs of local precipitation data for the period. Locations of wetland mitigation sites are shown on Figure 1, and a list of site names is presented in Table 1. Also, a summary of areas meeting wetland hydrology criteria for each site is provided in Table 2. Except where noted, all data included in this report are from September 1, 2017, through August 31, 2018, 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.



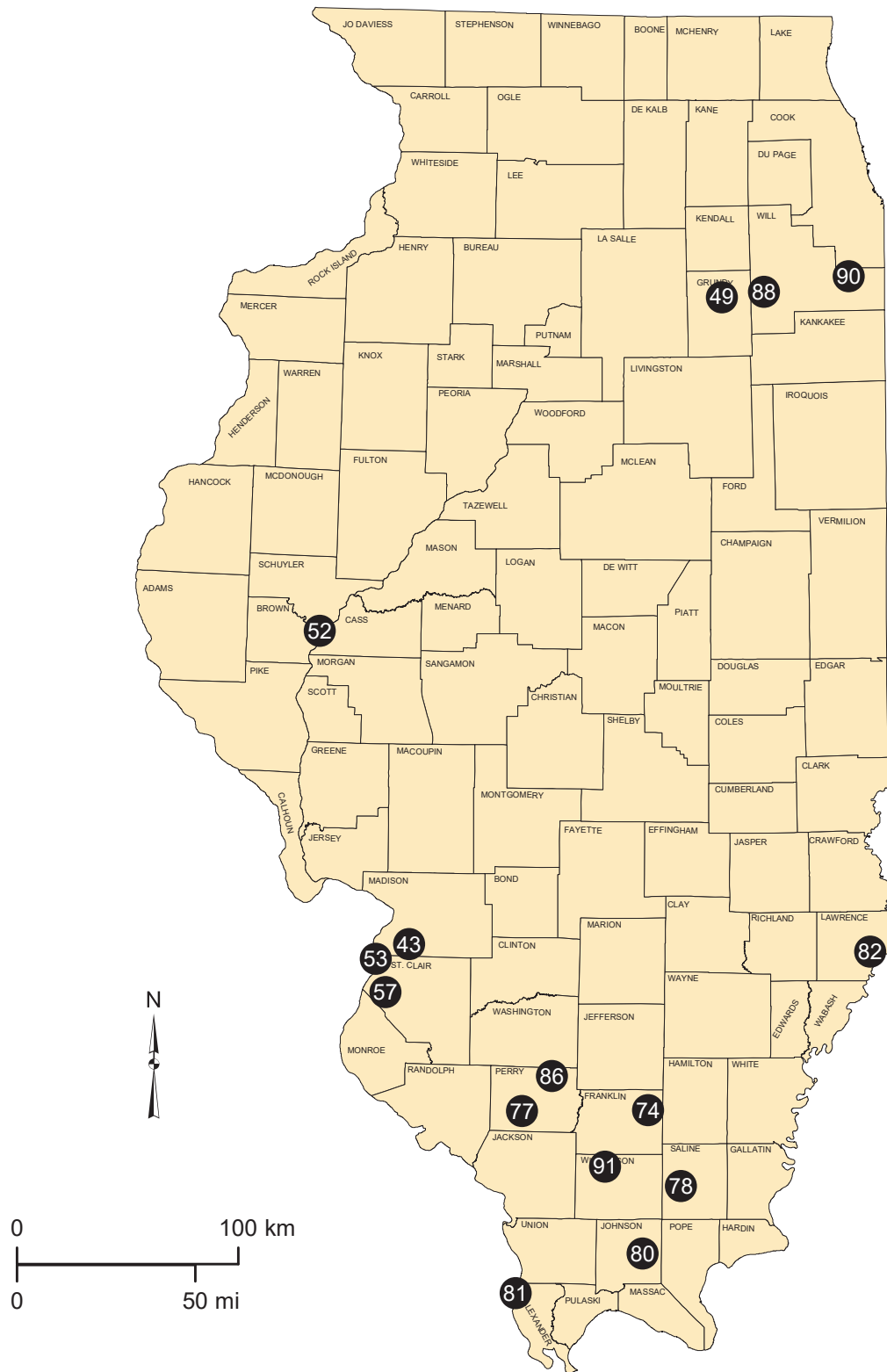


Figure 1. General locations of sites monitored by the ISGS for IDOT from September 1, 2017, through August 31, 2018. Numbers indicate ISGS project numbers listed in Table 1.

Table 1. ISGS project numbers and active IDOT wetland mitigation sites monitored by ISGS from September 1, 2017, through August 31, 2018.

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 Tierman Property	Potential Wetland Mitigation Site	N/A	FAP 14	27	St. Clair
74	Sugar Camp Creek	Wetland and Stream Mitigation Bank	N/A	N/A	9282	Franklin
77	Pyramid Site EC25	Wetland Mitigation Site	Pyatts Blacktop	FAS 864	9778	Perry
78	Harrisburg, Site 2	Wetland Mitigation Site	IL 14	FAP 857	547	Saline
80	Max Creek	Wetland Mitigation Site	IL 147	FAS 932	8717A	Johnson
81	East Cape Girardeau	Wetland Mitigation Site	IL 146	FAP 312	633A	Alexander
82	Lawrence County	Wetland Mitigation Bank	N/A	N/A	14912	Lawrence
86	Swan Road	Wetland Mitigation Site	TR 222	N/A	12315	Perry
88	Grant Creek North	Wetland Mitigation Site	I-55	FAI 55	N/A	Will
90	Thorn Creek Headwaters Preserve	Wetland Mitigation Site	I-57/Stuenkel Road	FAI 57	12558	Will
91	Herrin Road	Wetland Mitigation Site	N/A	FAS 903/FAU 9588	9891B	Williamson

Table 2. Summary of wetland hydrology area estimates for the 2018 growing season for active IDOT wetland mitigation sites monitored by the IGS from September 1, 2017, through August 31, 2018.

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	24.28	60.00	24.28	60.00
49	Morris	44.11	109.00	3.05	7.53	0.00	0.00	2.53	6.25
52	La Grange	414.40	1,024.00	485.19	1,198.93	321.37	794.13	444.25	1,097.76
53	Fairmont City	10.93	27.00	17.73	43.81	15.88	39.23	17.98	44.42
57	Former Tiernan Property	17.04	42.10	13.21	32.65	5.59	13.82	13.13	32.44
74	Sugar Camp Creek	28.00	69.20	29.26	72.31	27.55	68.07	29.26	72.31
77	Pyramid Site EC25	4.57	11.30	4.86	12.00	2.02	4.99	5.06	12.51
78	Harrisburg, Site 2	4.13	10.20	8.65	21.38	7.47	18.47	8.68	21.45
80	Max Creek	0.49	1.20	1.17	2.88	0.63	1.56	1.17	2.88
81	East Cape Girardeau	3.08	7.60	5.86	14.47	4.80	11.86	5.74	14.18
82	Lawrence County	13.62	33.65	15.30	37.81	11.80	29.17	15.30	37.81
86	Swan Road	0.30	0.73	0.33	0.82	0.30	0.75	0.41	1.01
88	Grant Creek North	5.99	14.80	24.38	60.24	21.31	52.66	20.72	51.19
90	Thorn Creek Headwaters Preserve	12.02	29.70	11.47	28.35	1.72	4.25	2.36	5.84
91	Herrin Road	3.20	7.90	1.60	3.96	1.24	3.06	1.79	4.42



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 2018). 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 2018).

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 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 (2018). 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 2018) were also used to guide delineation of wetland hydrology polygons. The locations of monitoring instruments were measured using GPS devices or a total station. Given the many potential sources of error, estimates of the amount of error are difficult to calculate and are not included.

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

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

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

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

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

At most sites, data loggers were used to monitor water levels at regular intervals ranging from daily to hourly. Various types of loggers were used and each type of instrument has different operations and default values. We have removed readings that result when the instrument sensor was dry (i.e., zero or other default values). Other spurious readings that occurred due to data-logger malfunction or natural conditions that caused inaccuracies (e.g., freezing, vegetation growth, or debris accumulation beneath the logger) were removed after interpretation by ISGS scientists. For some sites, stage data from gauges operated by the U.S. Geological Survey (USGS), USACE, or the U.S. Forest Service (USFS) were obtained from online or other sources (USGS 2018, USACE 2018, USFS 2018) 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 2018). Normal and range threshold values were based on a 30-year period, 1971-2000 or 1981-2010. Above- and below-normal thresholds were calculated using a 2-parameter gamma distribution over the 30-year period (NWCC 1995). Precipitation is classified as “above 30% threshold”, or above the normal range, when there is a 30% chance precipitation will be greater than or equal to the value shown. Precipitation is “below 30% threshold”, or below the normal range, when there is a 30% chance that precipitation will be less than or equal to the value shown. Monthly total precipitation is considered to be within the normal range when it is neither above nor below the 30% thresholds. Precipitation also may be described simply as above or below normal, where the above- and below-normal range threshold values are not shown.

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

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## REFERENCES

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

Esri, 2018, 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](http://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer).

Google Earth, 2017, Imagery from Image Landsat/Copernicus, Imagery date 3/3/2017, available online at <http://www.earth.google.com>.

Illinois State Geological Survey, 2018, 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, 2018, MRCC’s Application Tools Environment: Illinois State Water Survey, Champaign, Illinois, available online at <http://mrcc.isws.illinois.edu/CLIMATE/>.

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



- National Water and Climate Center, 2018, Climate Analysis for Wetlands by County: U.S. Department of Agriculture, Natural Resources Conservation Service, available online at [https://efotg.sc.egov.usda.gov/efotg\\_locator.aspx](https://efotg.sc.egov.usda.gov/efotg_locator.aspx) .
- U.S. Army Corps of Engineers, 2010, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0): J.S. Wakeley, R.W. Lichvar, and C.V. Noble (eds.), ERDC/ELTR-10-16, U.S. Army Engineer Research and Development Center, Vicksburg, MS, 152 p., available on line at [www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg\\_supp/erdc-el-tr-10-16.pdf](http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/erdc-el-tr-10-16.pdf).
- U.S. Army Corps of Engineers, 2018, 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://gdq.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://gdq.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://gdq.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, 1963, Johnston City quadrangle, Illinois [map]. Photoinspected 1976. 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, 1968, Herrin 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, 1990, Steger quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 1993a, Channahon quadrangle, Illinois [map]. 1:24,000. 7.5-Minute Series. Reston, Va: United States Department of the Interior.
- U.S. Geological Survey, 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, 2018, National Water Information System: Web Interface, available online at <http://waterdata.usgs.gov/nwis>.
- U.S. Forest Service, 2018, 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, 2018, Illinois Climate Network soil temperature data: Illinois State Water Survey, Champaign, Illinois, available online at <http://www.isws.illinois.edu/warm/soil/>

**ECKMANN/BISCHOFF  
WETLAND MITIGATION SITE**

**ISGS #43**

FAP 14

Sequence #27

Madison County, near Collinsville, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

The target compensation area for the Eckmann/Bischoff wetland mitigation site is 17.20 ha (42.50 ac). Using the 1987 Manual (Environmental Laboratory 1987), 24.28 ha (60.00 ac) of the total site area of 24.28 ha (60.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 24.28 ha (60.00 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 2018); 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 2018 growing season based on soil temperatures measured on site and at the nearby Fairmont City wetland mitigation site (ISGS #53).
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 105% of normal, precipitation in spring 2018 (March through May) was 124% of normal. The wettest period was February and March, when precipitation totaled 37.39 cm (14.72 in.) or 271% of normal.
- Inundation and/or saturation occurred continuously over most of the site starting on or about February 23 and persisting to August 31. A large portion of the site, including the entire former Eckmann property and the eastern portion of the former Bischoff property, is inundated year-round because of a beaver dam in Schneider Ditch. As a result, long duration inundation and saturation occurs.
- In 2018, 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 10 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 2018**

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

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

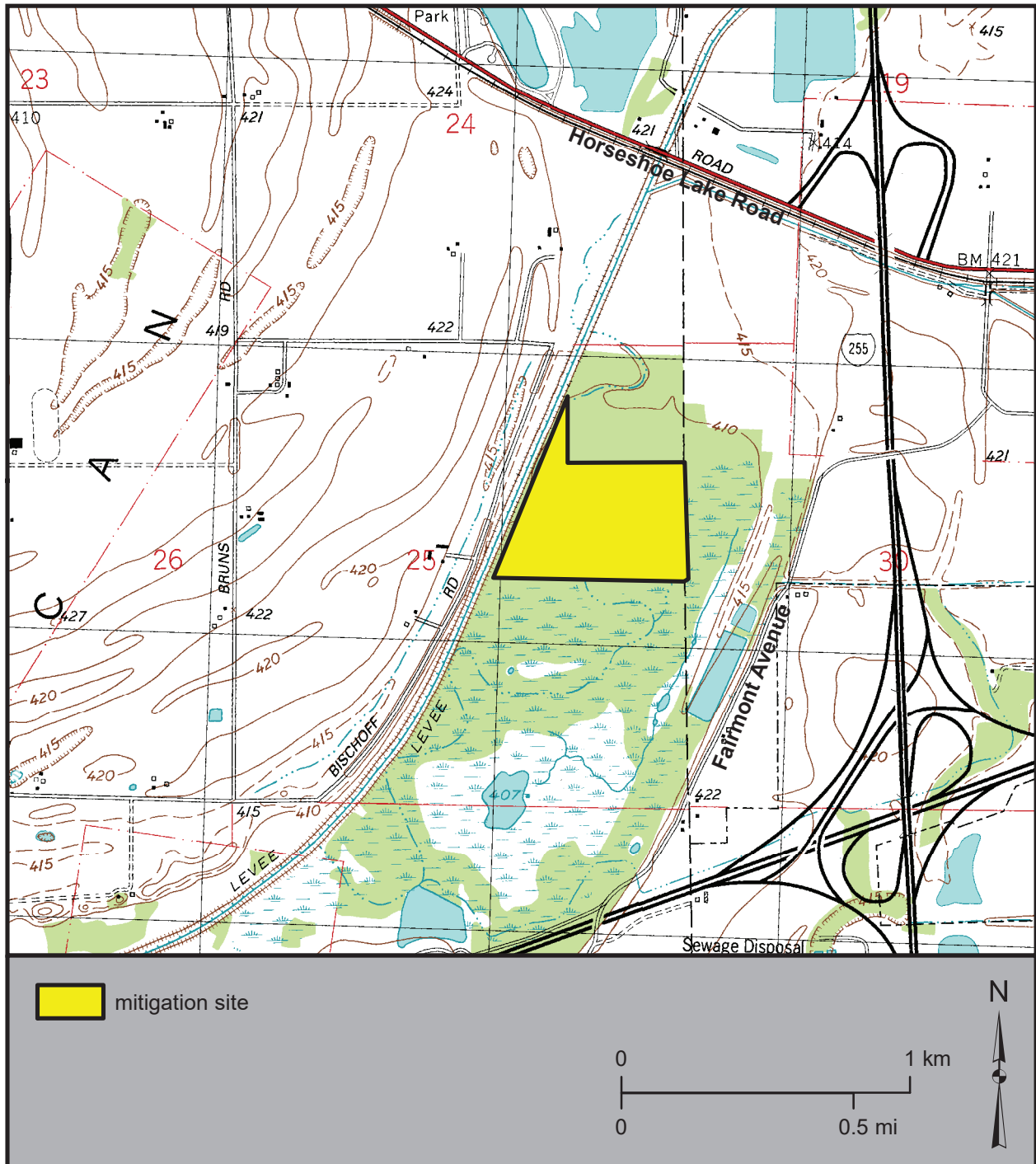
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
<b>A</b>	124.52 m (408.53 ft)	124.48 m (408.40 ft)	124.52 m (408.53 ft)
<b>B</b>	124.52 m (408.53 ft)	124.45 m (408.30 ft)	124.52 m (408.53 ft)
<b>C</b>	124.52 m (408.53 ft)	124.45 m (408.30 ft)	124.52 m (408.53 ft)
<b>D</b>	124.52 m (408.53 ft)	124.45 m (408.30 ft)	124.52 m (408.53 ft)
<b>SW1</b>	124.52 m (408.53 ft)	124.48 m (408.40 ft)	124.52 m (408.53 ft)
<b>SW2</b>	124.55 m (408.63 ft)	124.50 m (408.46 ft)	124.53 m (408.56 ft)

n/a – insufficient data to determine an elevation

# Eckmann/Bischoff Wetland Mitigation Site (FAP 14)

## General Study Area and Vicinity

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

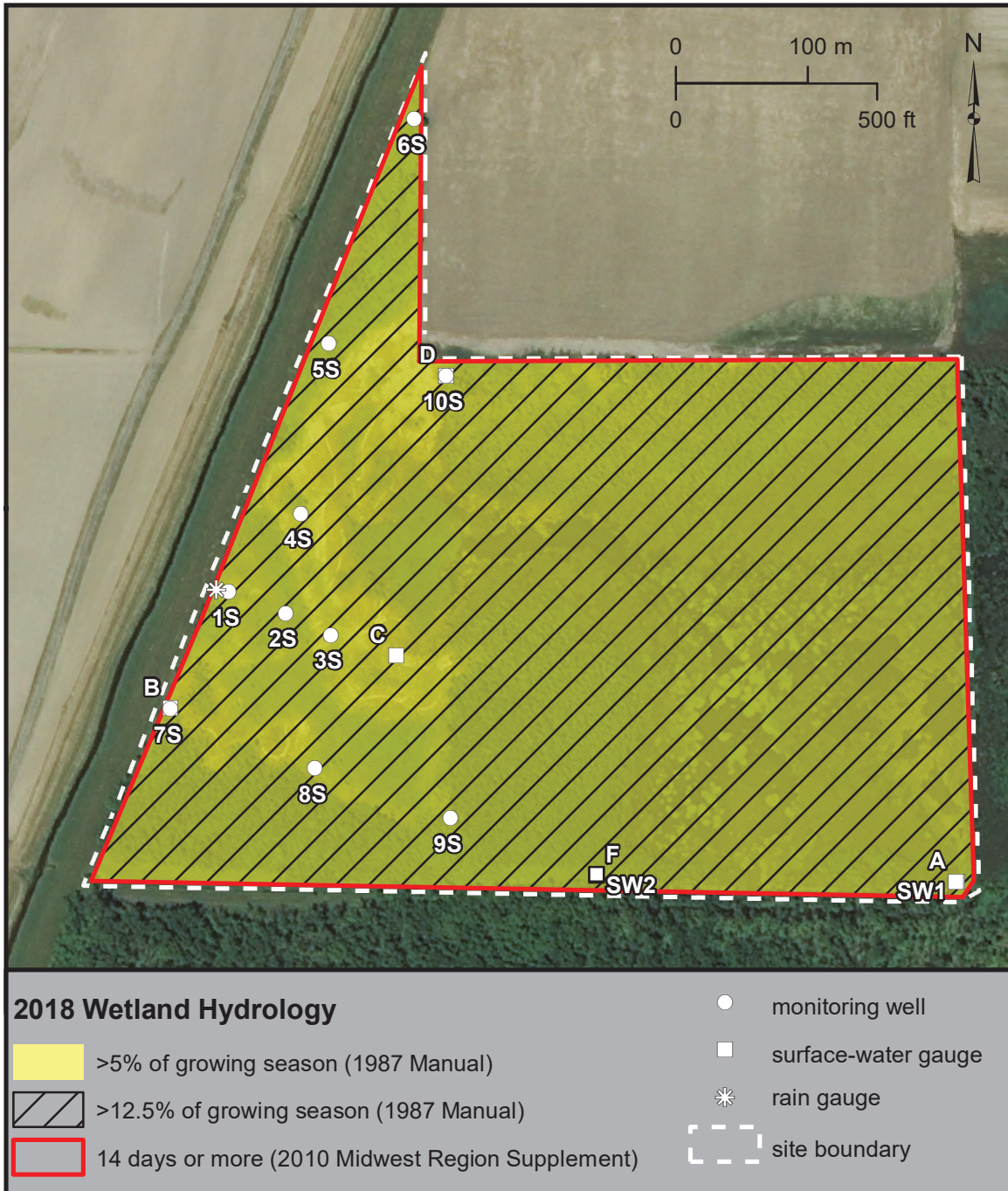




# Eckmann/Bischoff Wetland Mitigation Site (FAP 14)

## Estimated Areal Extent of 2018 Wetland Hydrology September 1, 2017 through August 31, 2018

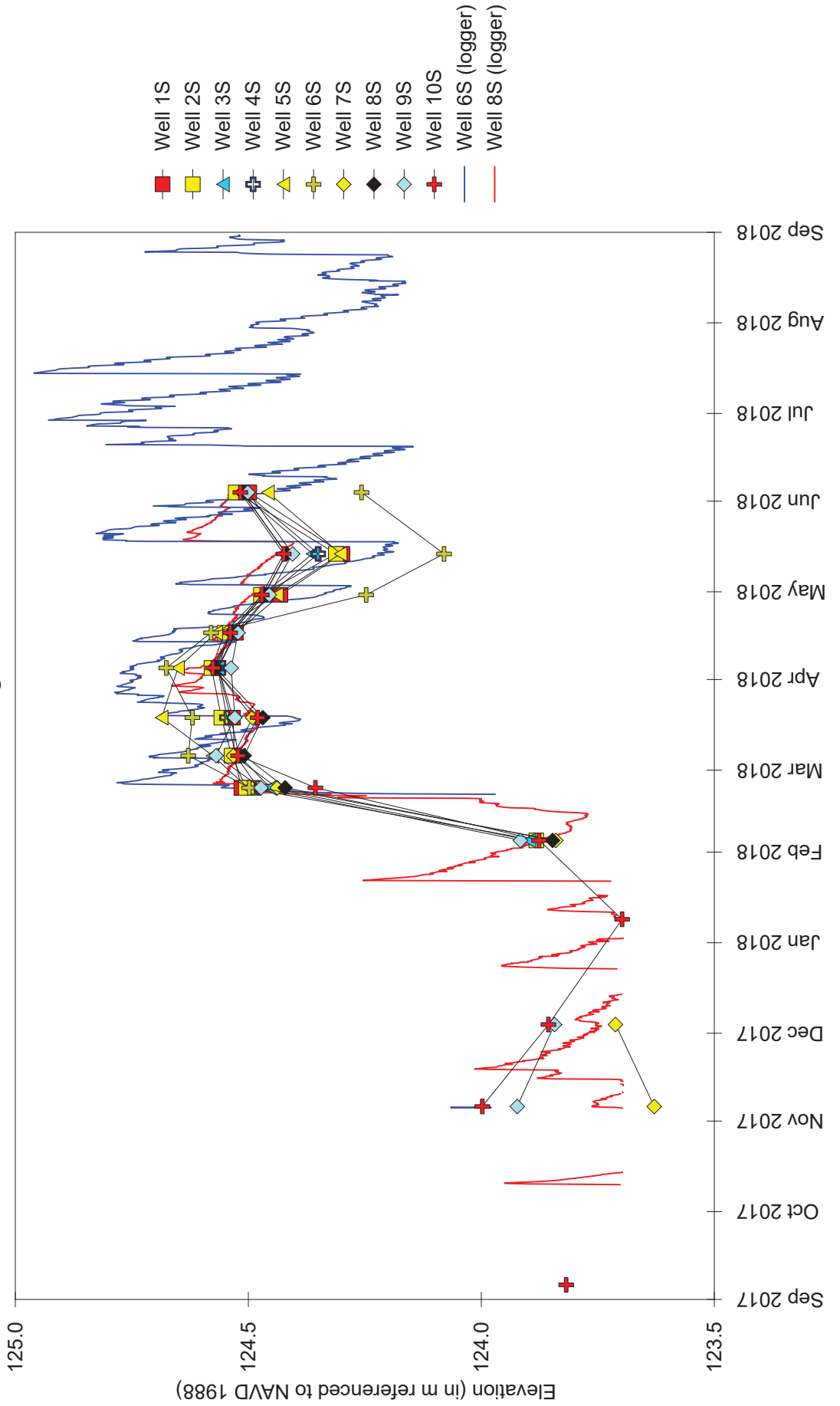
Map based on 2012 Farm Service Agency  
digital orthophotography, Madison County, Illinois (USDA-FSA 2012)



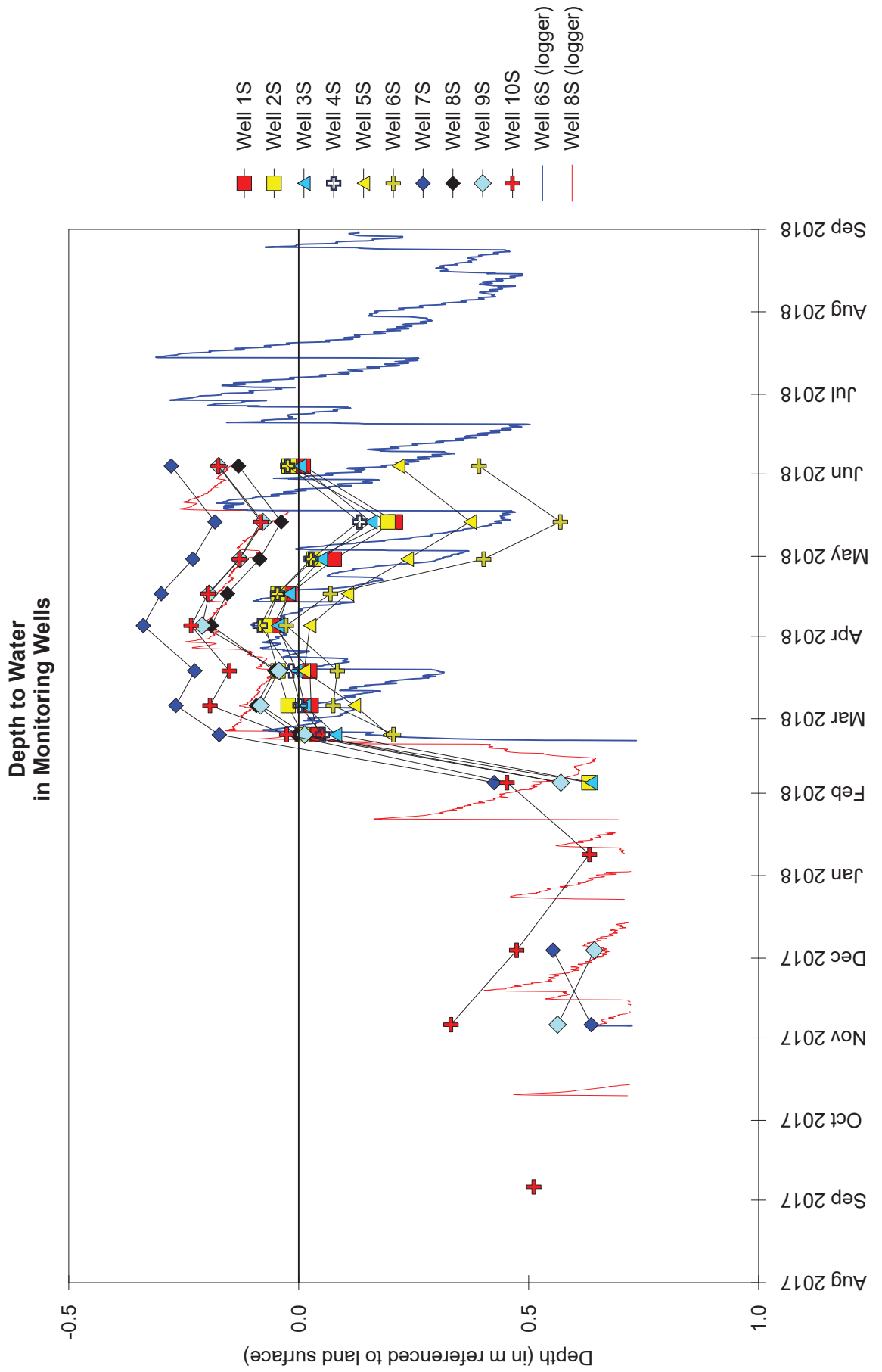


# Eckmann/Bischoff Wetland Mitigation Site September 1, 2017 through August 31, 2018

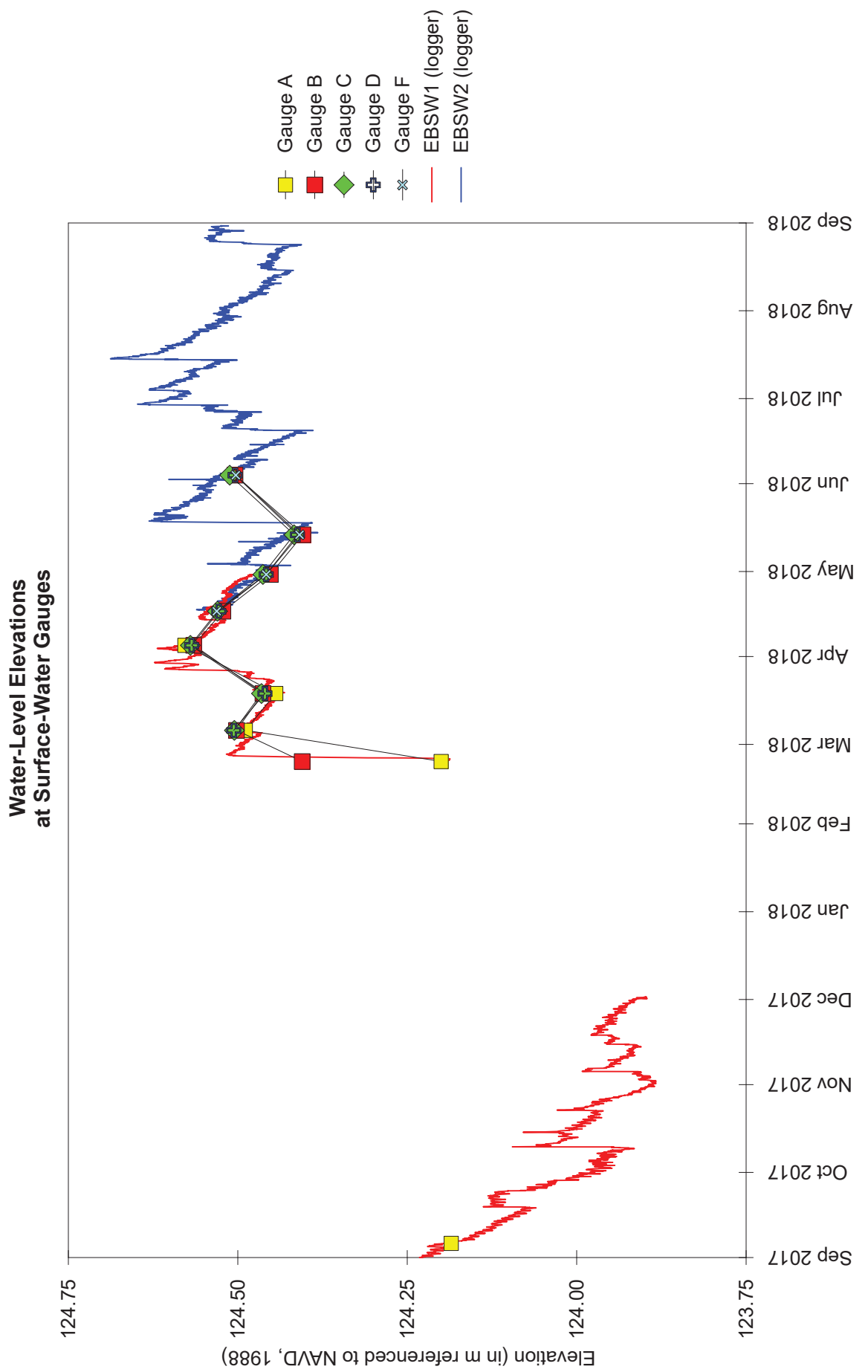
Water-Level Elevation  
in Monitoring Wells



# Eckmann/Bischoff Wetland Mitigation Site September 1, 2017 through August 31, 2018

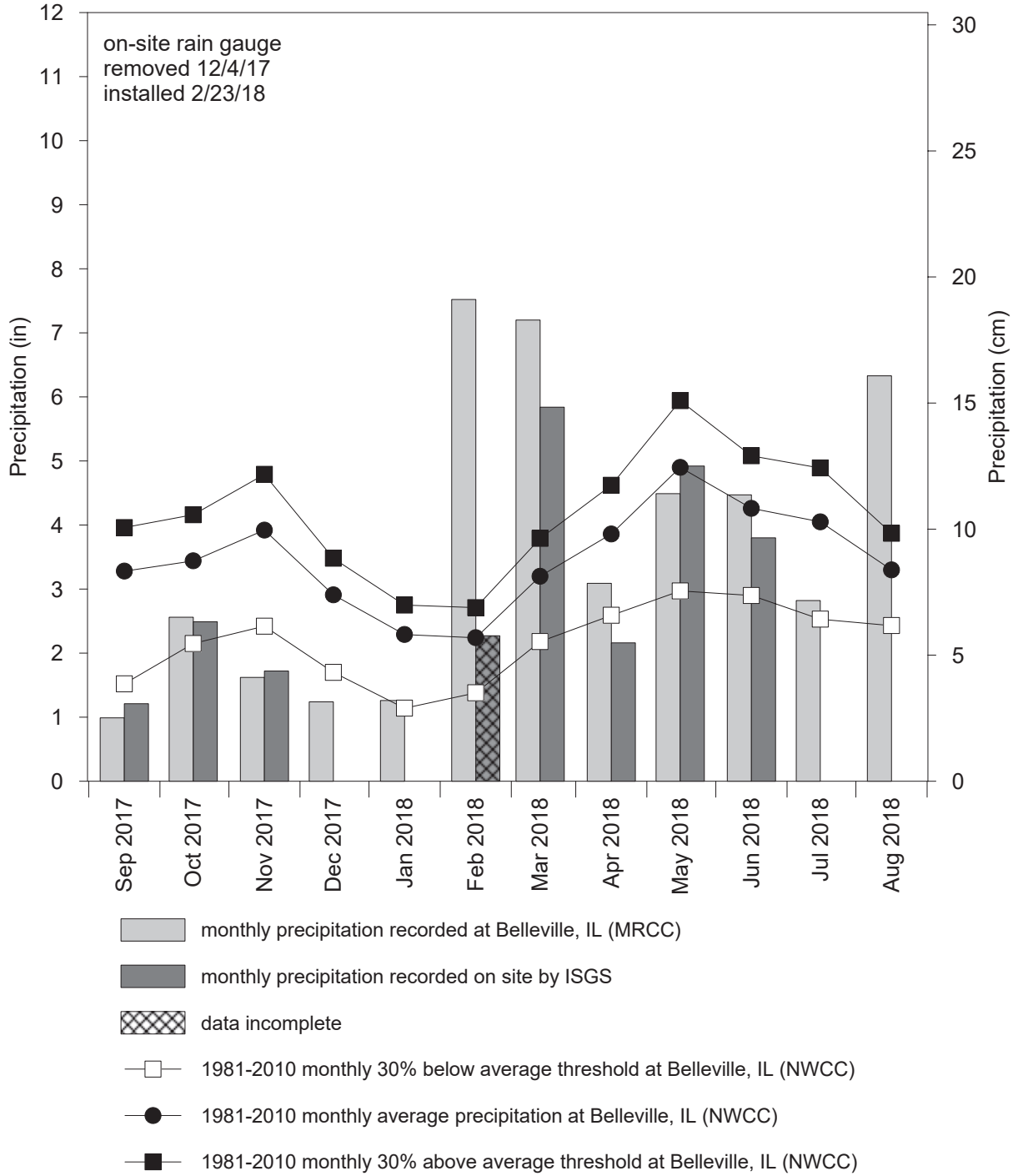


# Eckmann/Bischoff Wetland Mitigation Site September 1, 2017 through August 31, 2018



# Eckmann/Bischoff Wetland Mitigation Site September 2017 through August 2018

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



**MORRIS  
WETLAND MITIGATION BANK**

**ISGS #49**

Sequence #1306

Grundy County, near Morris, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Katharine L. Schleich

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

The target compensation area for the Morris wetland mitigation bank is 44.11 ha (109.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 3.05 ha (7.53 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 0 ha (0 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 2.53 ha (6.25 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Morris, Illinois, is April 12, and the season lasts 200 days (MRCC 2018). 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 10 was the starting date of the 2018 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Morris, Illinois (MRCC station #115825), was 97% of normal. During spring 2018 (March through May), precipitation was 83% of normal. Rainfall in June, July, and August was below average at 79% of normal.
- The Illinois River flooded portions of the site three times during the 2017-2018 monitoring period, with one flood occurring mid-October during the 2017 growing season and one flood occurring in late June of the 2018 growing season. The largest flood on the Illinois River occurred in late February through early March, prior to the start of the 2018 growing season.
- The period of maximum inundation and saturation during the 2018 growing season occurred during mid- to late April following 3.0 cm (1.18 in.) of rainfall, recorded at the Morris weather station from April 14-16.

- 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 wetland site functions.

#### WETLAND HYDROLOGY TABLE FOR 2018

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

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
<b>SW2A*</b>	148.36 m (486.75 ft)	148.36 m (486.75 ft)	148.37 m (486.78 ft)
<b>SW8</b>	n/a	n/a	n/a
<b>SW43</b>	150.29 m (493.08 ft)	n/a	150.27 m (493.01 ft)
<b>IL River**</b>	147.97 m (485.47 ft)	147.54 m (484.06 ft)	147.65 m (484.42 ft)

n/a – insufficient data to determine an elevation

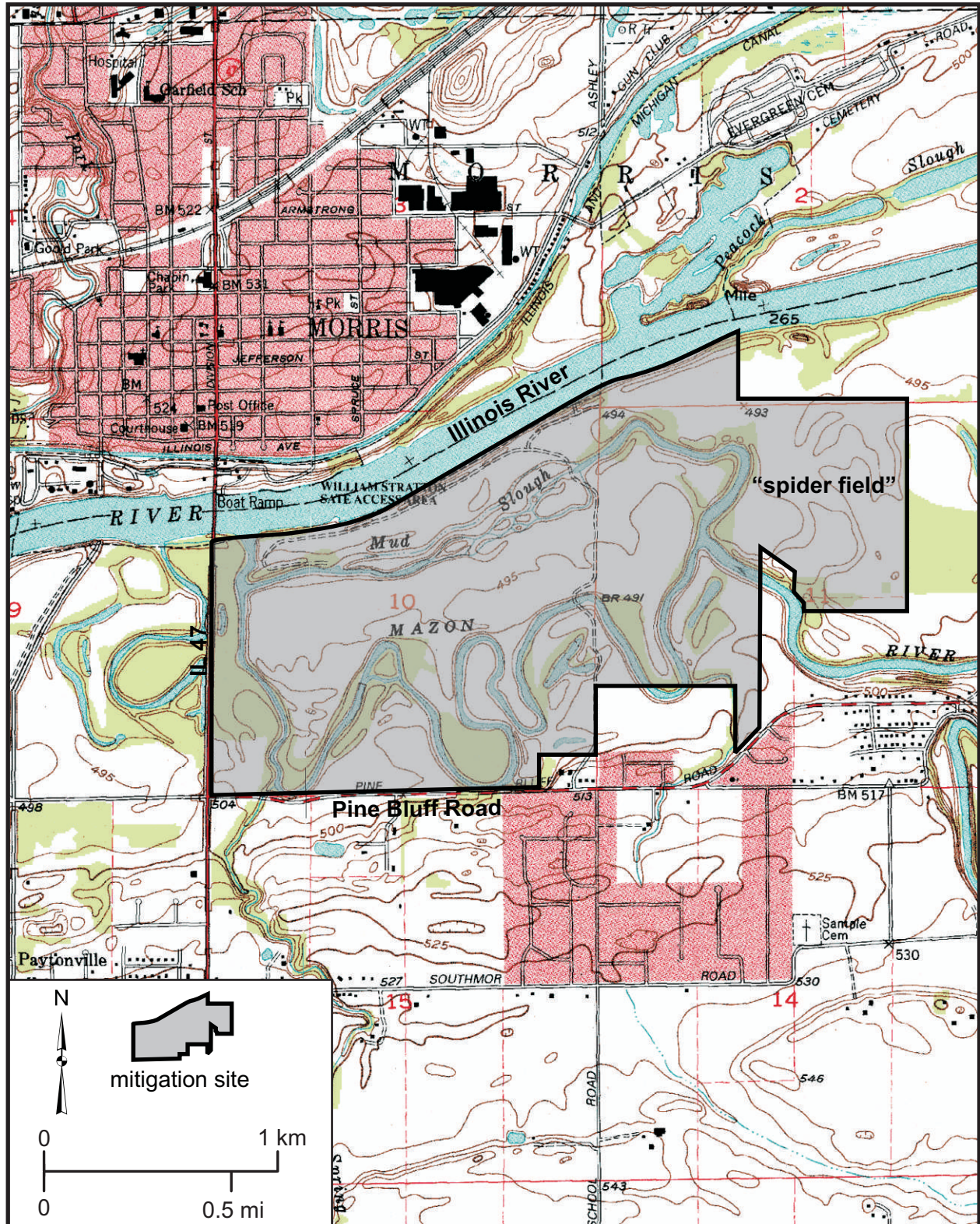
\*-Mazon River at ISGS Gauge SW2A. Elevations listed for the Mazon River reflect river stages recorded at the 5%, 12.5%, and 14-day thresholds, all of which were insufficient to cause flooding of the site.

\*\* - Illinois River at Morris (USACE 2018). Elevations listed for the Illinois River reflect river stages recorded at the 5%, 12.5%, and 14-day thresholds, all of which were insufficient to cause flooding of the site.



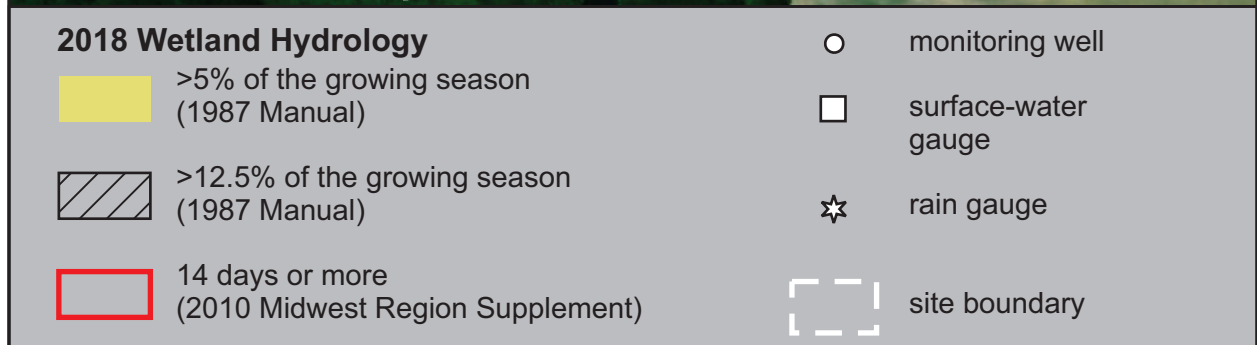
# Morris Wetland Mitigation Bank General Study Area and Vicinity

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



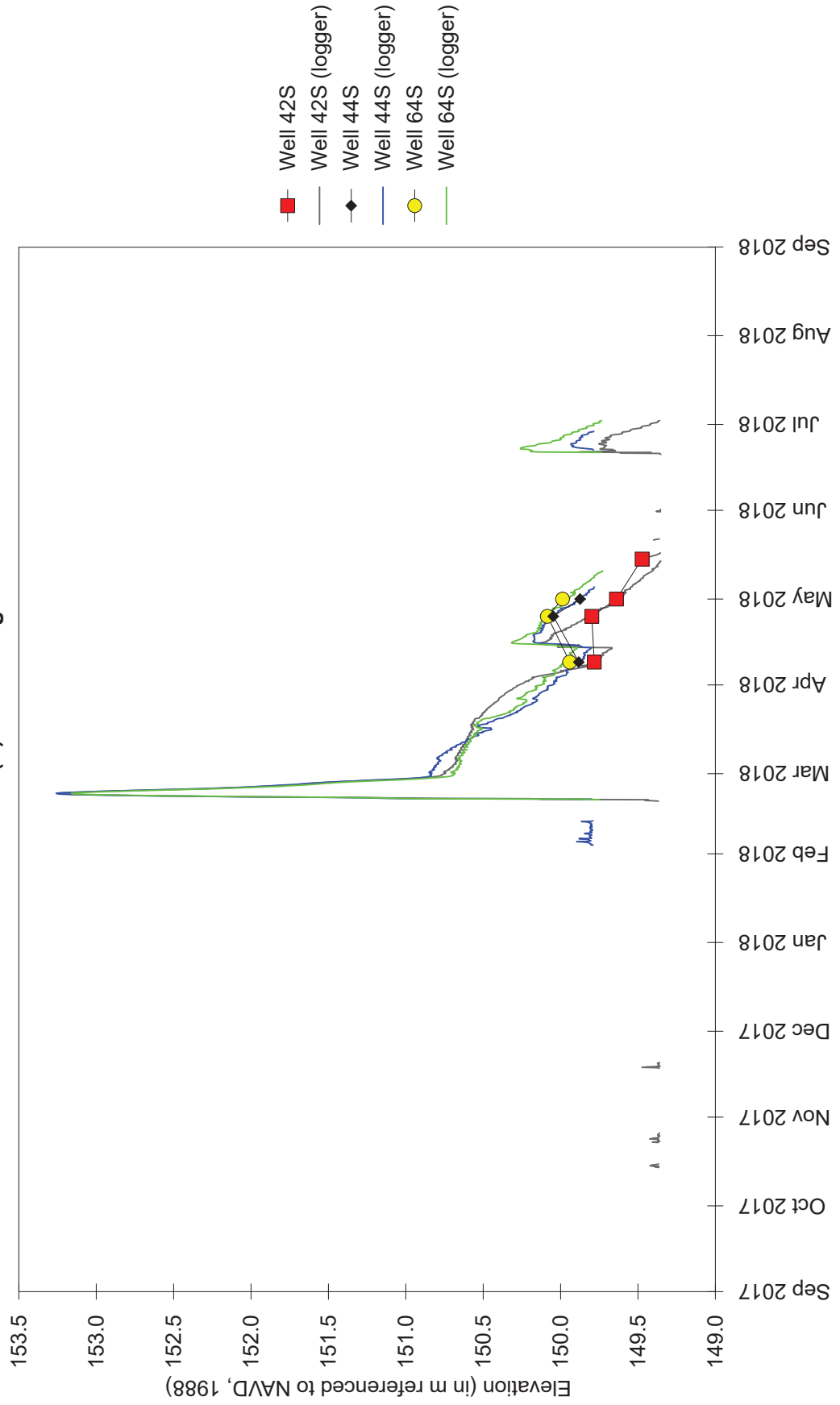


**Morris Wetland Mitigation Bank**  
**Estimated Areal Extent of 2018 Wetland Hydrology**  
**September 1, 2017 through August 31, 2018**  
 Map based on imagery available from Esri (Esri 2018)

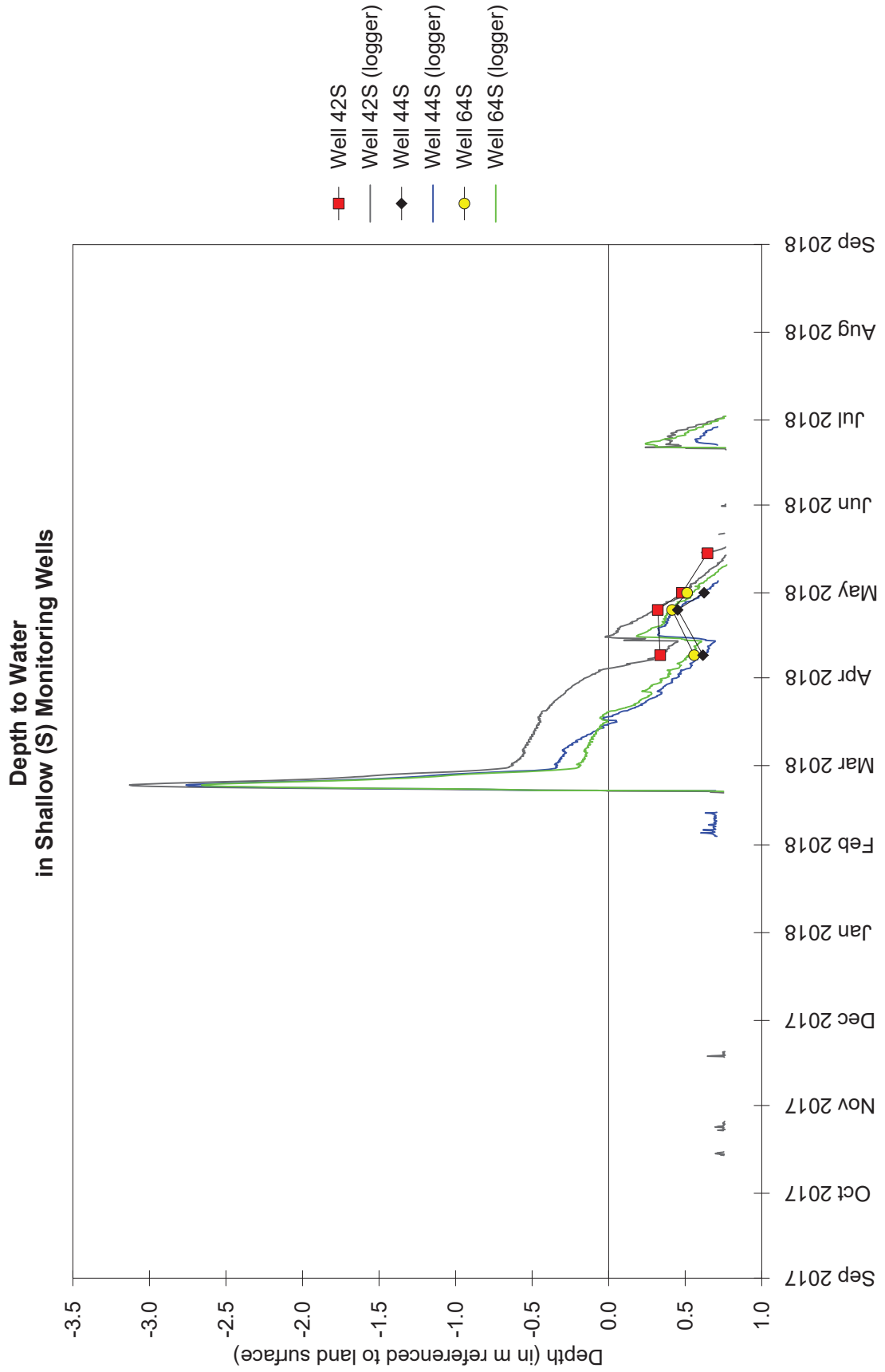


# Morris Wetland Mitigation Bank September 1, 2017 through August 31, 2018

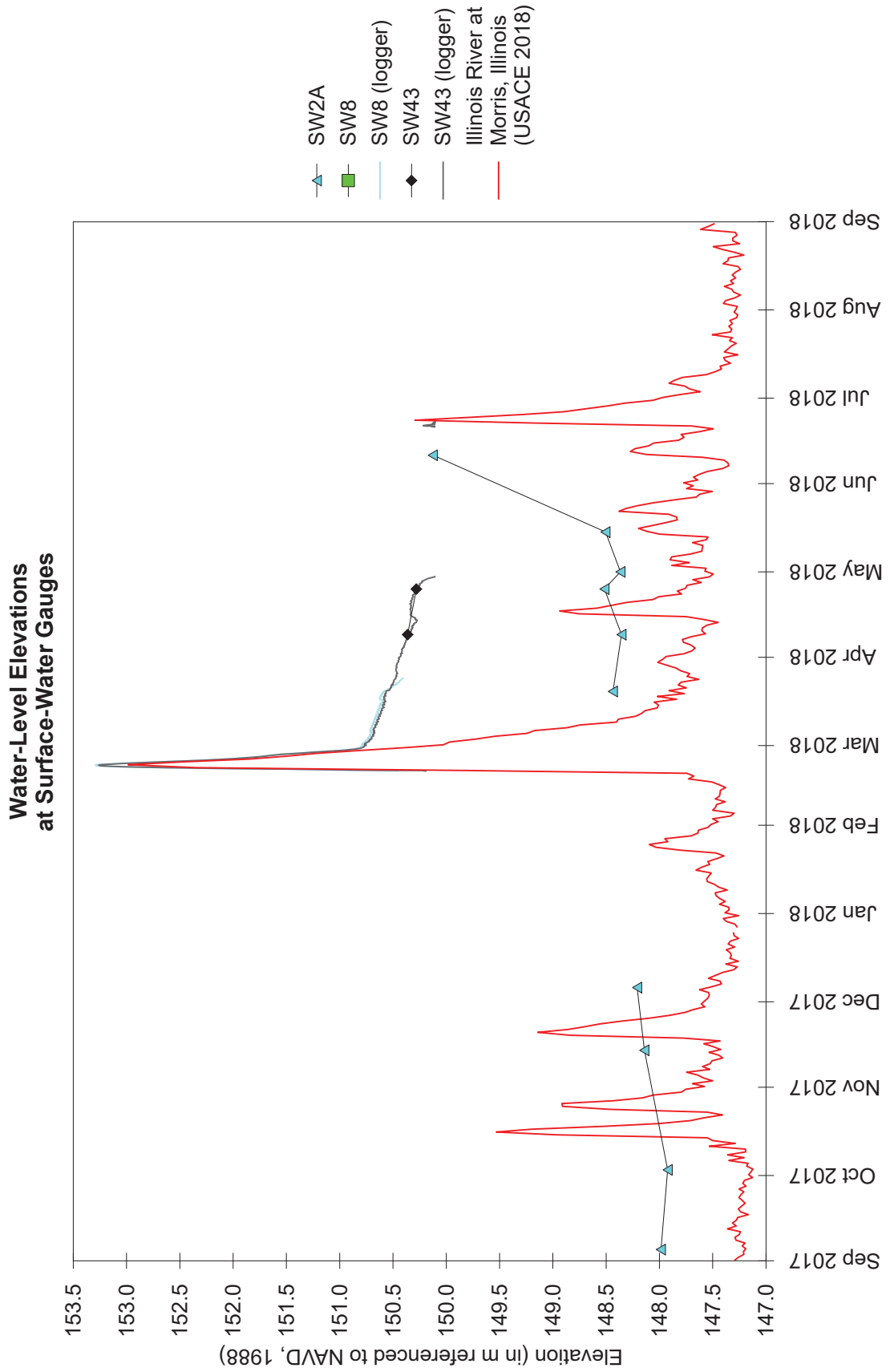
## Water-Level Elevations in Shallow (S) Monitoring Wells



## Morris Wetland Mitigation Bank September 1, 2017 through August 31, 2018

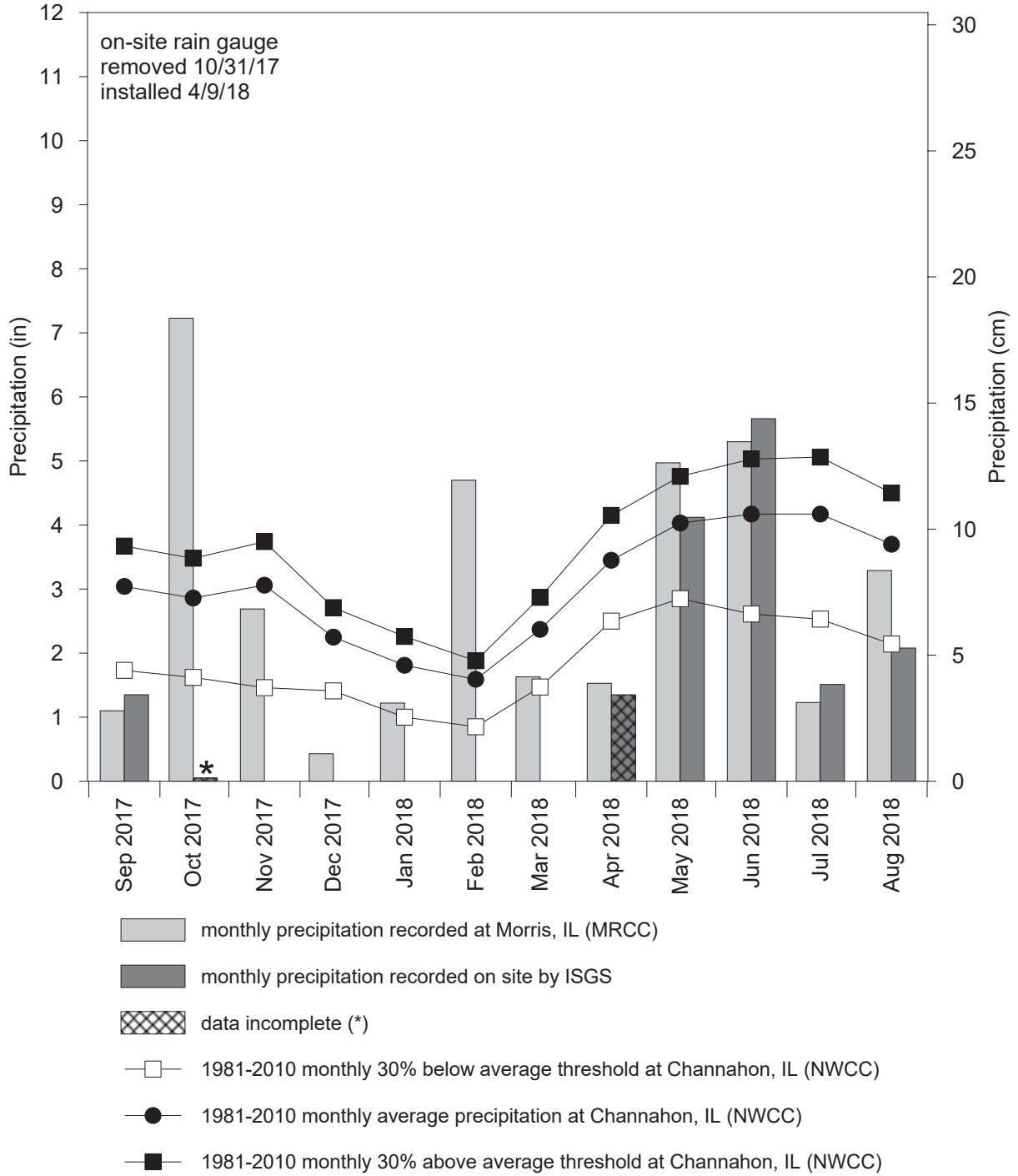


# Morris Wetland Mitigation Bank September 1, 2017 through August 31, 2018



# Morris Wetland Mitigation Bank September 2017 through August 2018

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





**LA GRANGE  
WETLAND MITIGATION BANK**

**ISGS #52**

Sequence #9579

Brown County, near La Grange, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Keith W. Carr

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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), 485.19 ha (1,198.93 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 321.37 ha (794.13 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 444.25 ha (1,097.76 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 2018); 5% of the growing season is 11 days, and 12.5% of the growing season is 27 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, April 10 was the starting date of the 2018 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Rushville, Illinois (MRCC station #117551), was 119% of normal. During spring 2018 (March through May), precipitation was 100% of normal.
- The period of maximum inundation and saturation during the 2018 growing season at the site occurred during early April due to elevated moisture from a flood that occurred a month prior to the start of the growing season.
- In 2018, water levels measured in 8 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 3 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 6 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

**PLANNED FUTURE ACTIVITIES**

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

**WETLAND HYDROLOGY TABLES FOR 2018**

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

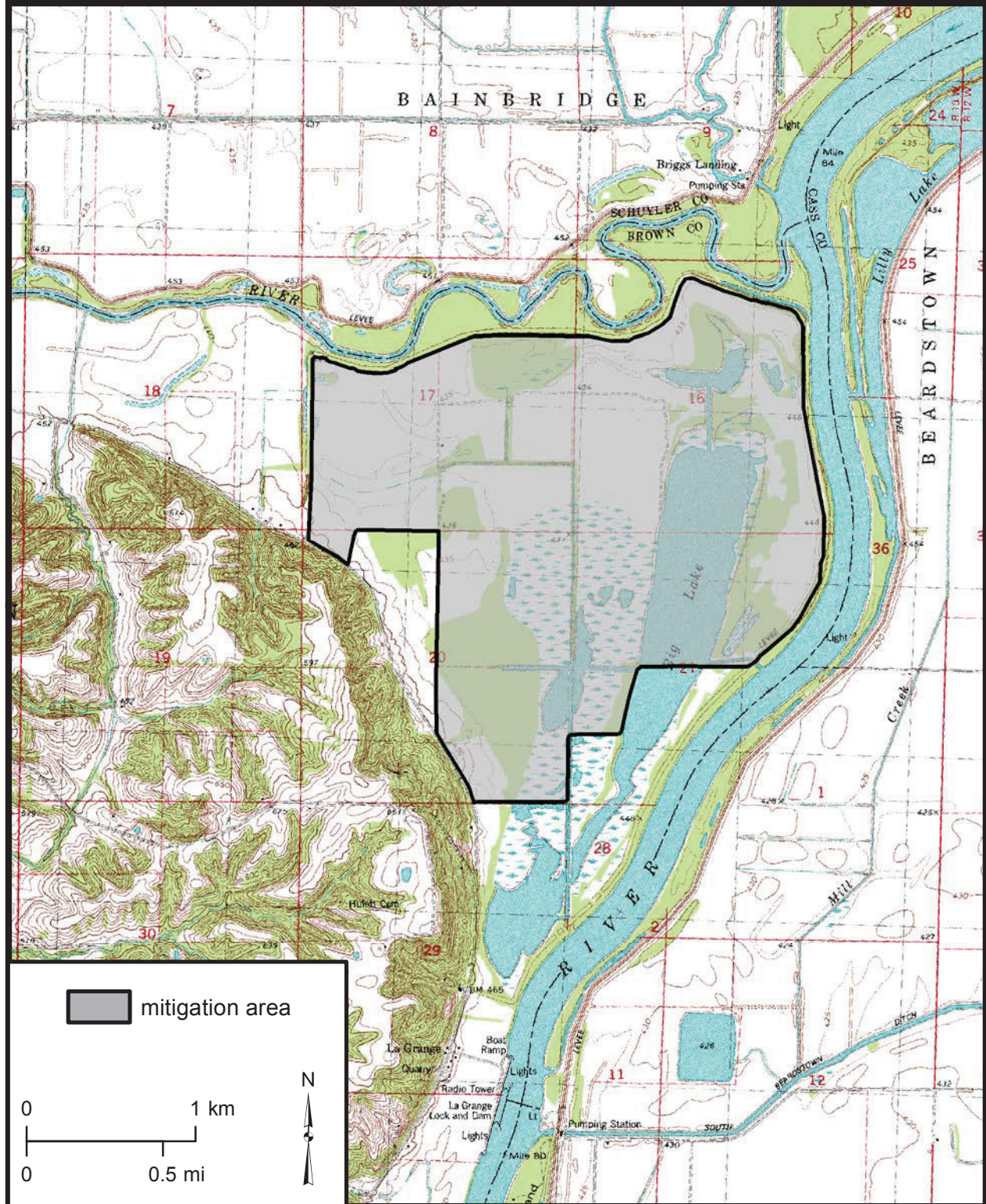
Y – met wetland hydrology criteria  
 N – did not meet wetland hydrology criteria

<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
<b>SW19</b>	131.84 m (432.55 ft)	131.75 m (432.25 ft)	131.81 m (432.45 ft)
<b>IL River*</b>	131.22 m (430.50 ft)	130.74 m (428.92 ft)	131.16 m (430.32 ft)

\* - off-site gauge, Illinois River at New La Grange Lock and Dam (USACE 2018)  
 n/a – insufficient data to determine an elevation

# La Grange Wetland Mitigation Bank General Study Area and Vicinity

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





# La Grange Wetland Mitigation Bank Management Areas

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



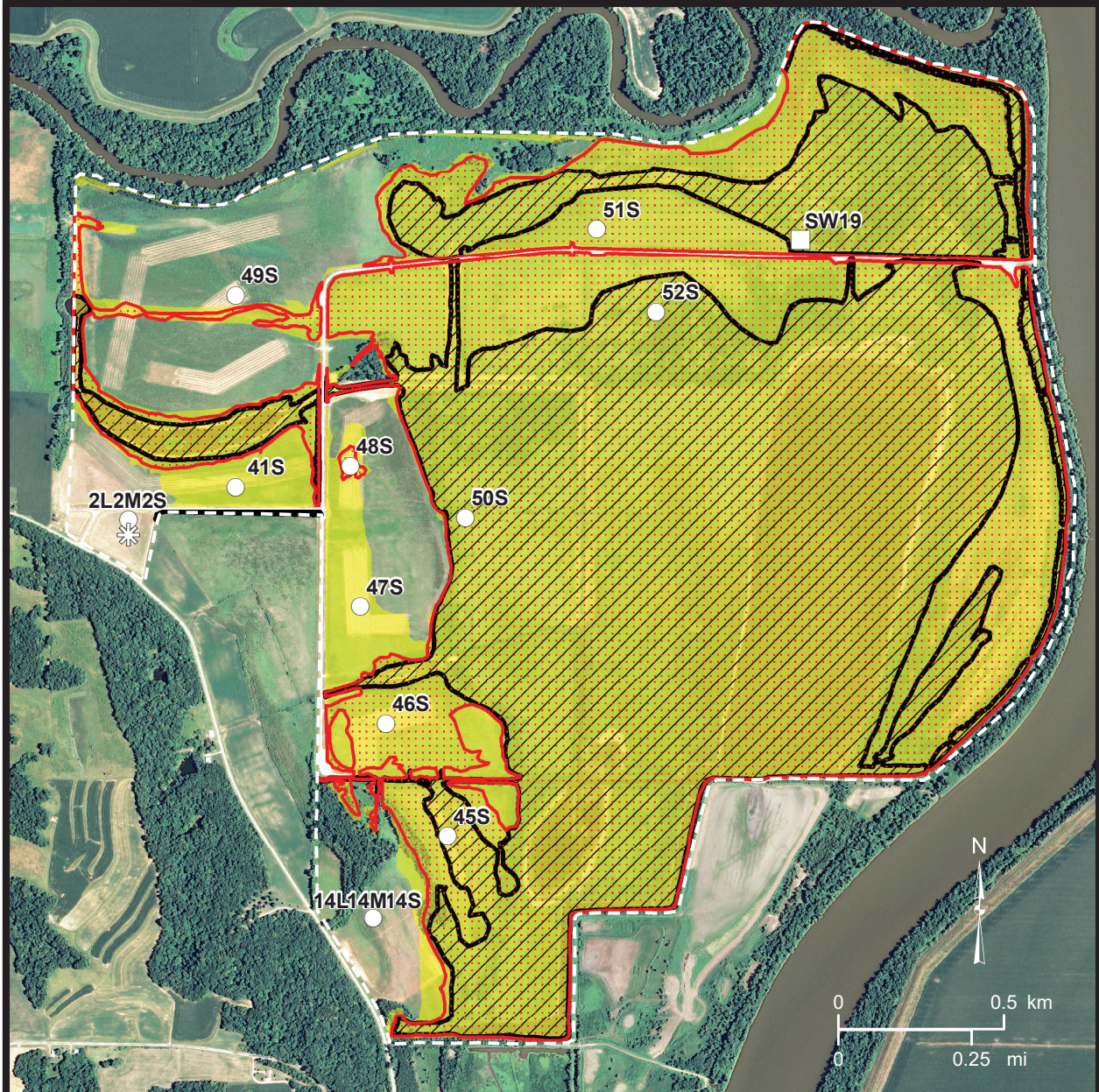


# La Grange Wetland Mitigation Bank

## Estimated Areal Extent of 2018 Wetland Hydrology

September 1, 2017 through August 31, 2018

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

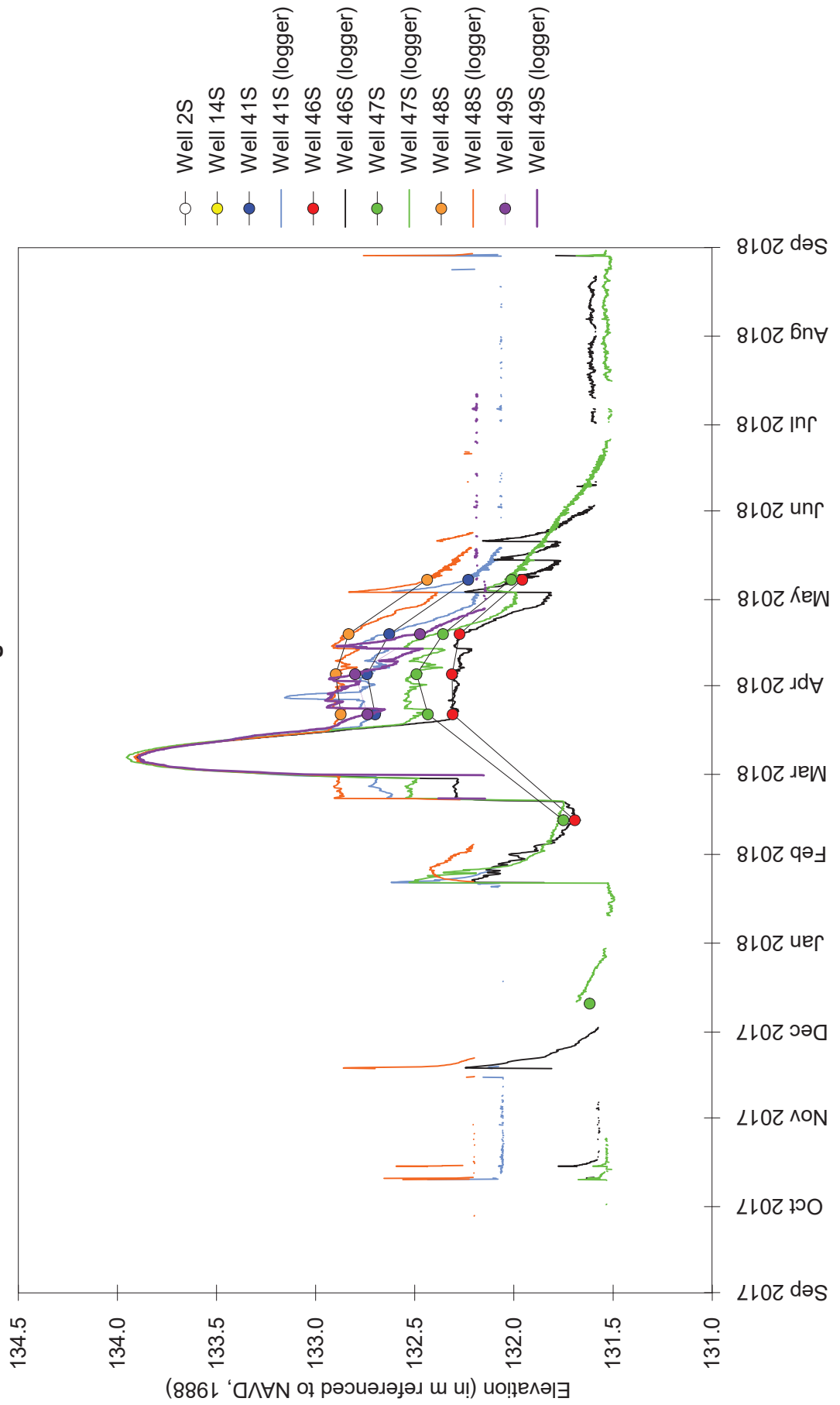


### 2018 Wetland Hydrology

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 20px; height: 10px; background-color: yellow; border: 1px solid black; margin-right: 5px;"></span> &gt;5% of growing season (1987 Manual)</li> <li><span style="display: inline-block; width: 20px; height: 10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); border: 1px solid black; margin-right: 5px;"></span> &gt;12.5% of growing season (1987 Manual)</li> <li><span style="display: inline-block; width: 20px; height: 10px; background: radial-gradient(circle, black 1px, transparent 1px); background-size: 4px 4px; border: 1px solid red; margin-right: 5px;"></span> 14 days or more (2010 Midwest Region Supplement)</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: white; border: 1px solid black; border-radius: 50%; margin-right: 5px;"></span> monitoring well</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: white; border: 1px solid black; margin-right: 5px;"></span> surface-water gauge</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: white; border: 1px solid black; text-align: center; line-height: 10px;">*</span> rain gauge</li> <li><span style="display: inline-block; width: 20px; height: 10px; border: 1px dashed black; margin-right: 5px;"></span> mitigation area</li> </ul> |
|--|--|

# La Grange Wetland Mitigation Bank September 1, 2017 through August 31, 2018

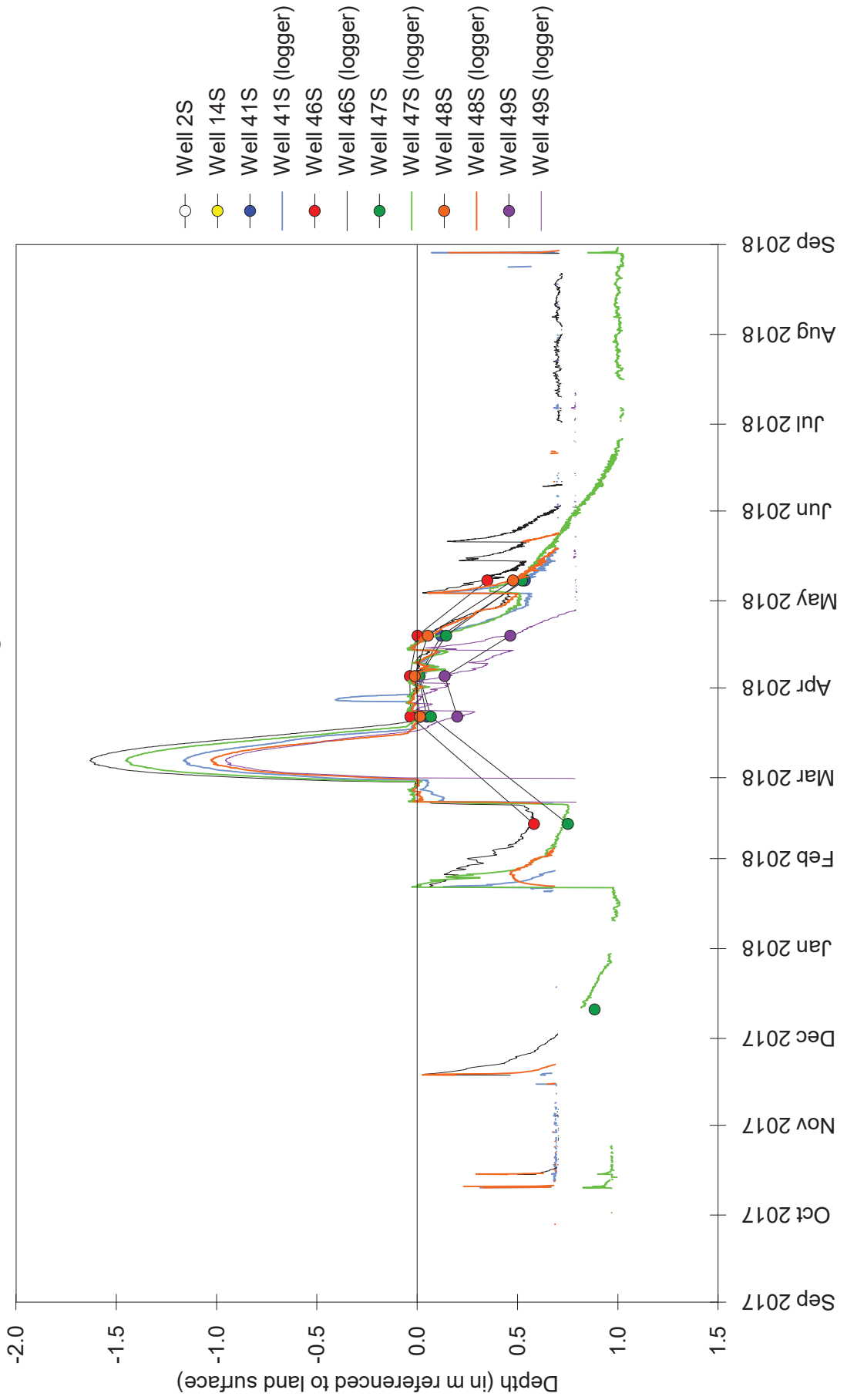
## Water-Level Elevations in Shallow Monitoring Wells





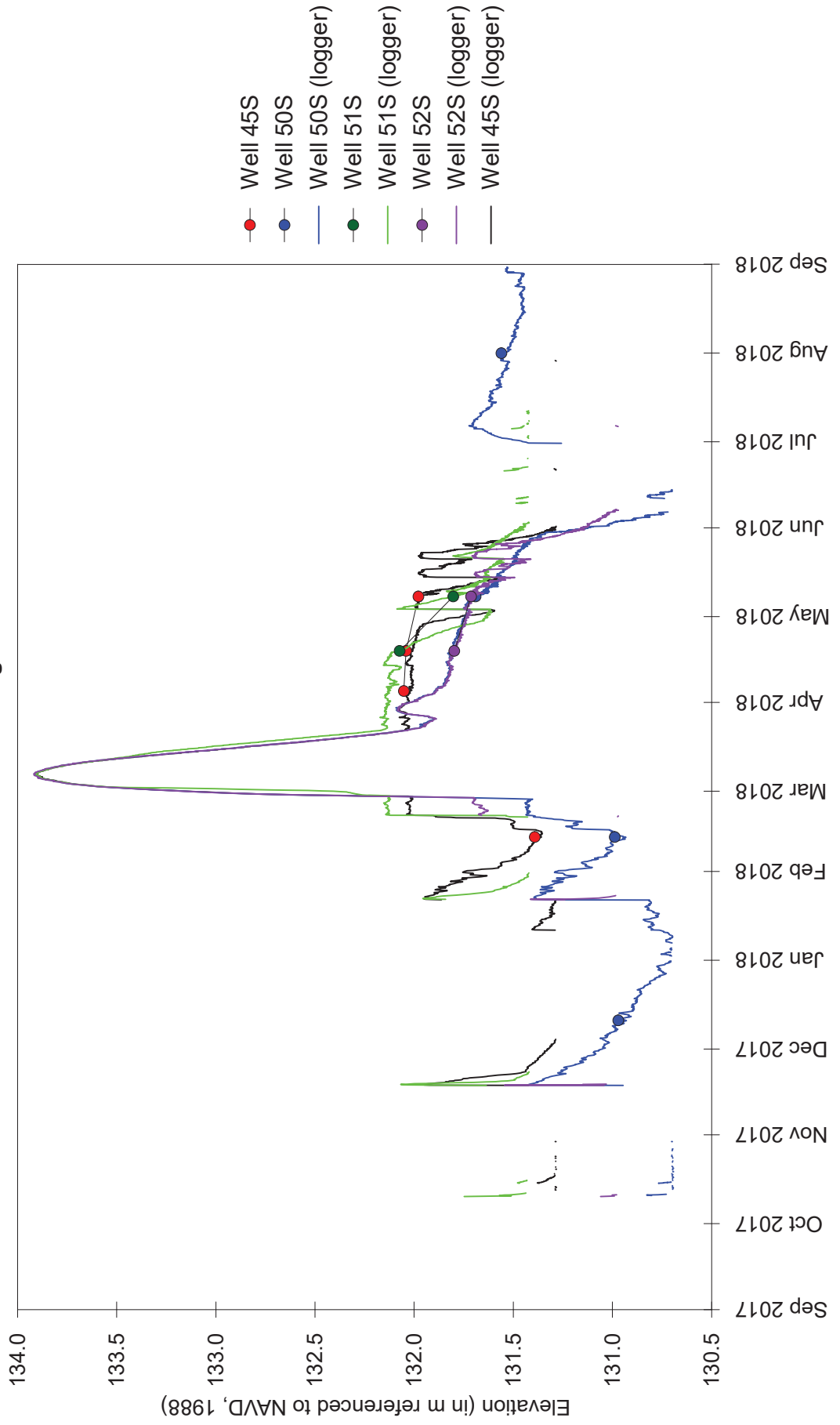
# La Grange Wetland Mitigation Bank September 1, 2017 through August 31, 2018

**Depth to Water  
in Shallow Monitoring Wells**



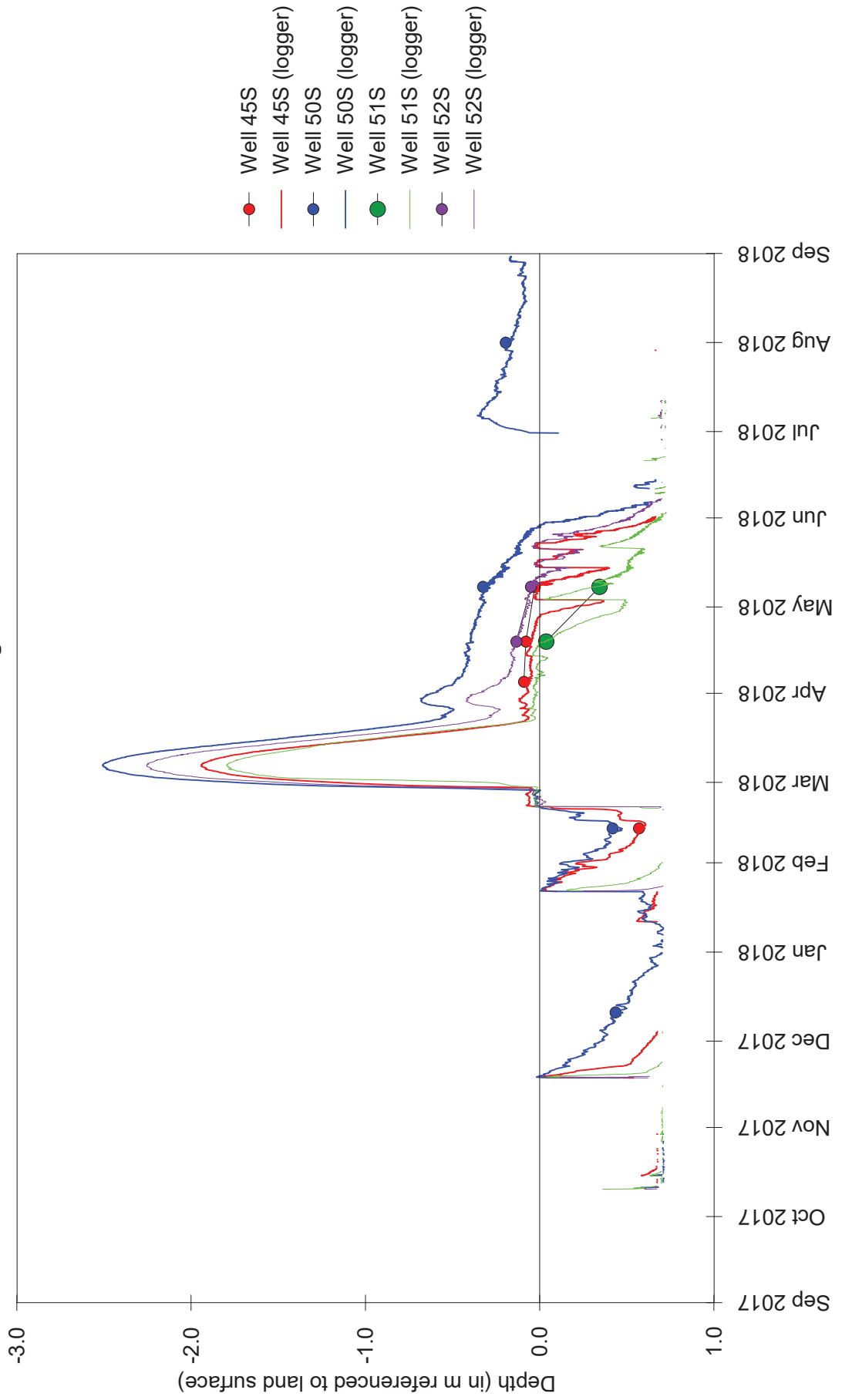
# La Grange Wetland Mitigation Bank September 1, 2017 through August 31, 2018

## Water-Level Elevations in Shallow Monitoring Wells

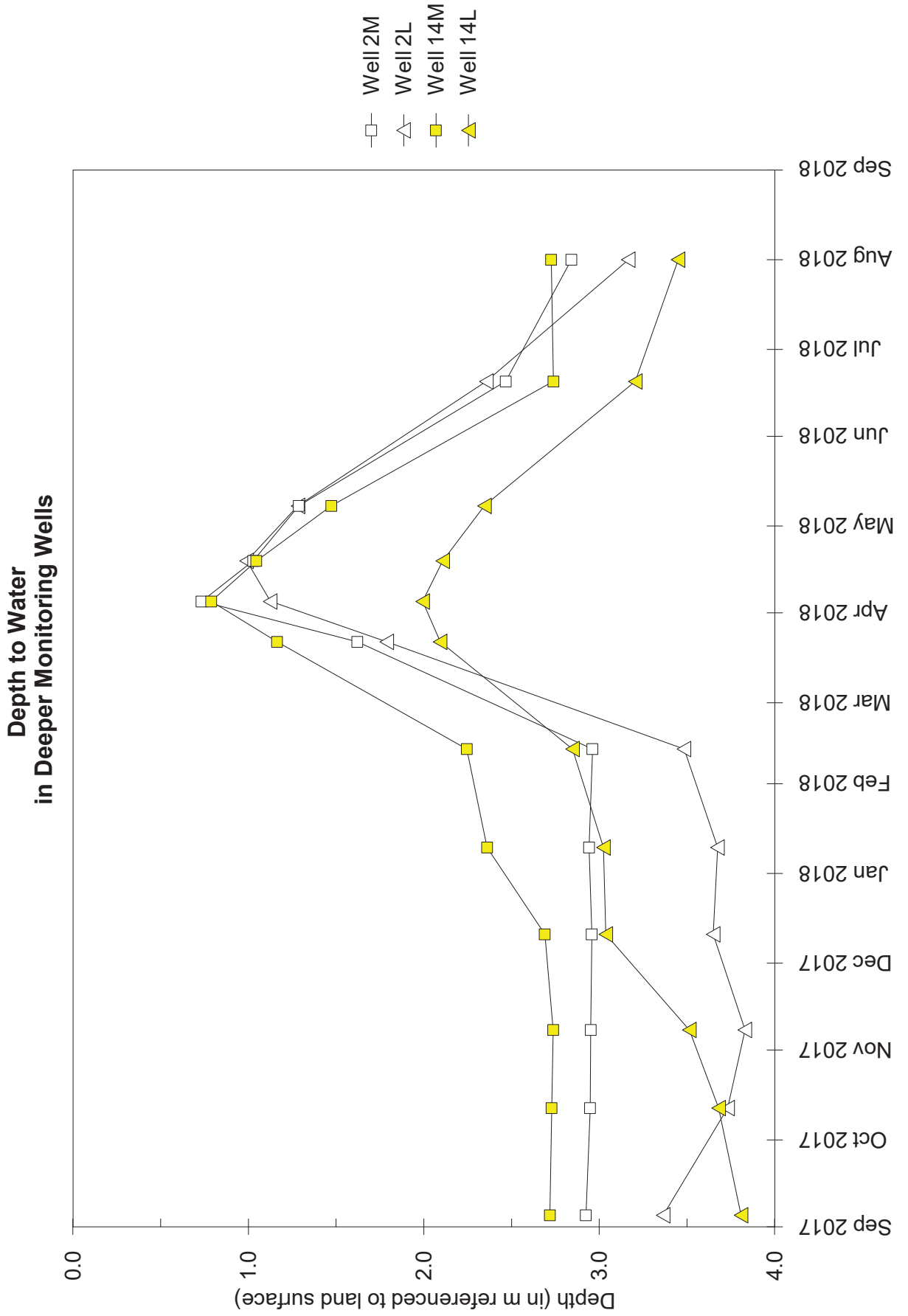


# La Grange Wetland Mitigation Bank September 1, 2017 through August 31, 2018

**Depth to Water  
in Shallow Monitoring Wells**

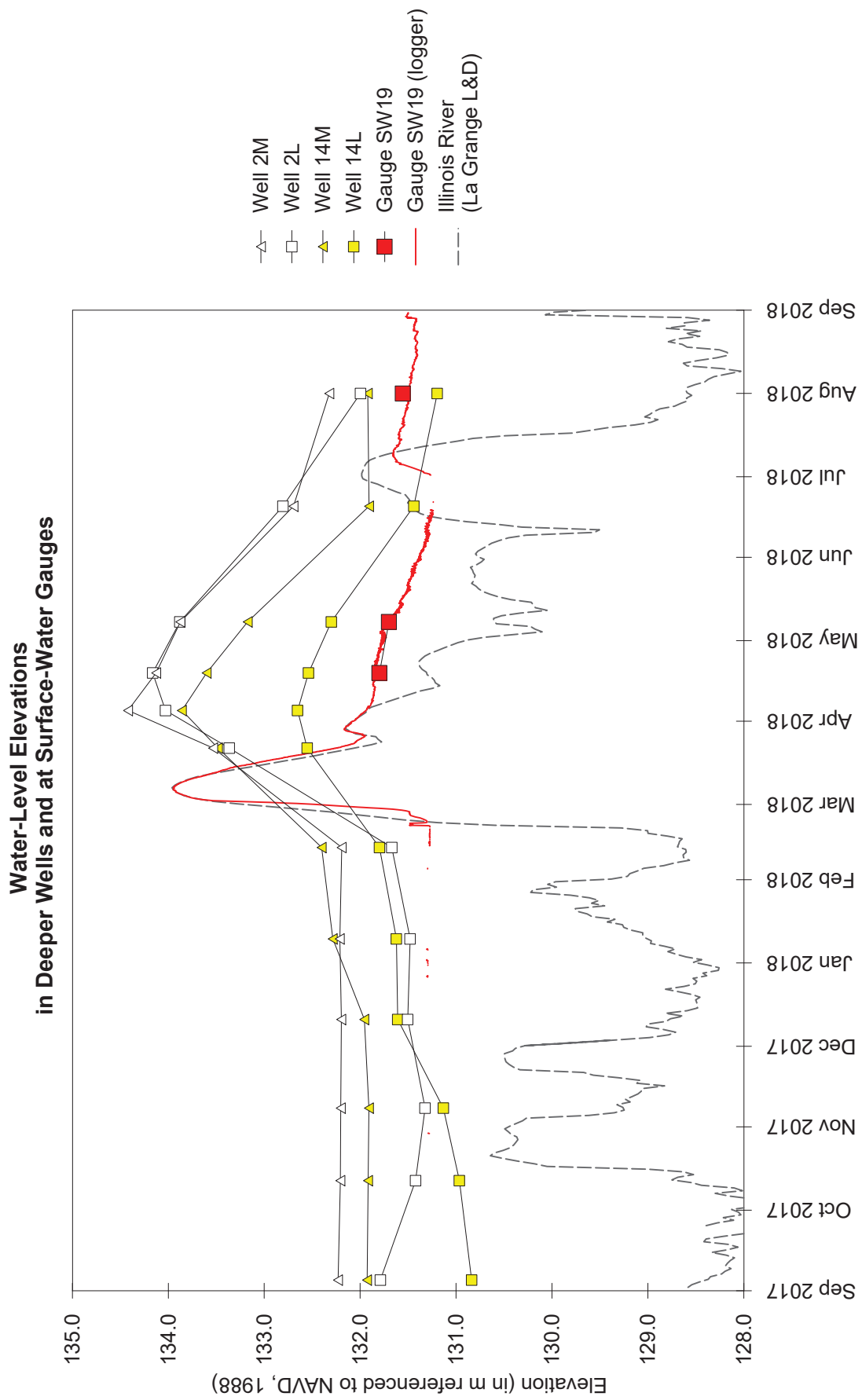


# La Grange Wetland Mitigation Bank September 1, 2017 through August 31, 2018



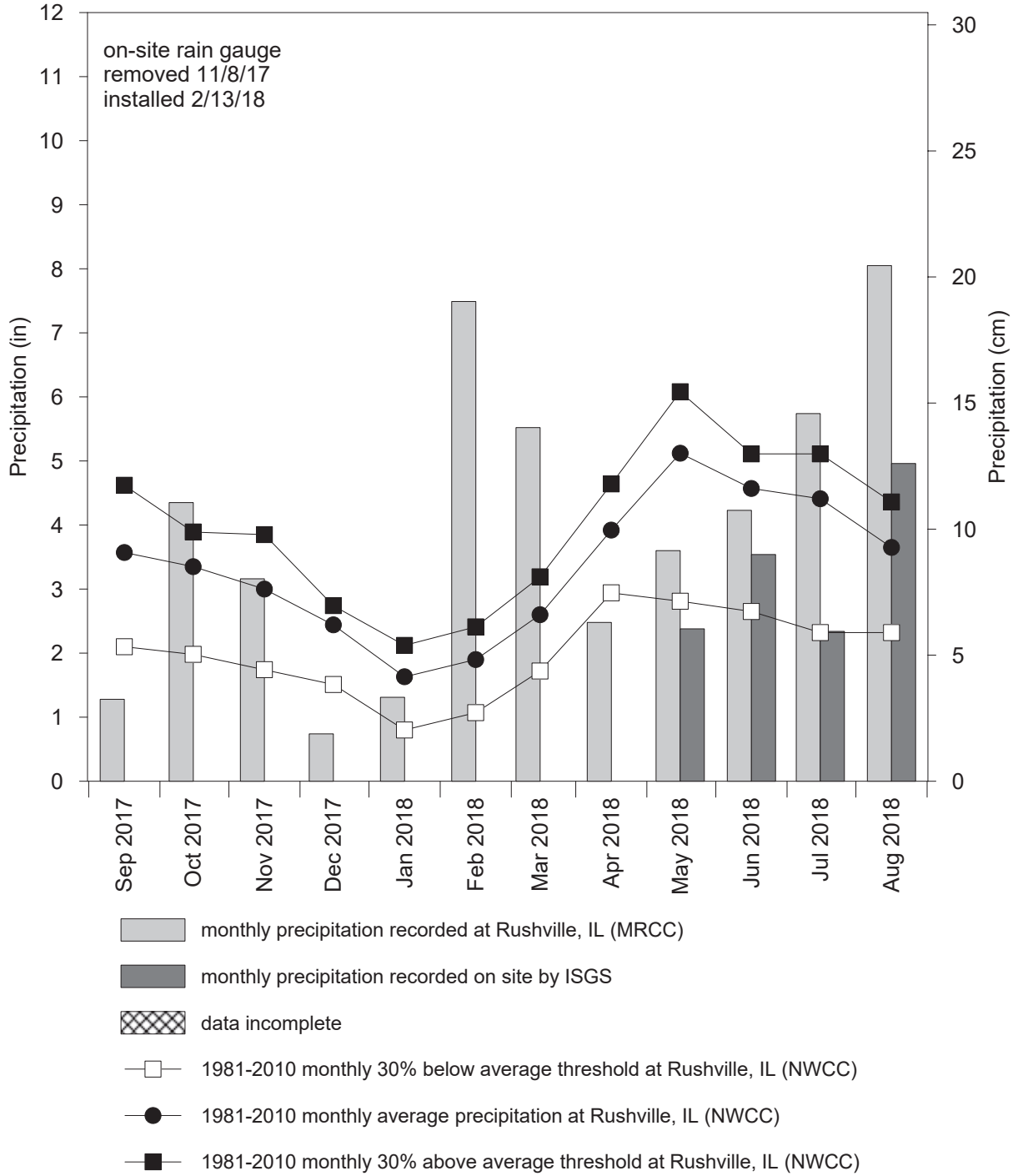


# La Grange Wetland Mitigation Bank September 1, 2017 through August 31, 2018



# La Grange Wetland Mitigation Site September 2017 through August 2018

**Total Monthly Precipitation Recorded on Site and at  
Rushville, IL (MRCC station #117551)**



**FAIRMONT CITY  
POTENTIAL WETLAND MITIGATION SITE**

**ISGS #53**

FAP 14

Sequence #27

St. Clair County, near Fairmont City, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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), 17.73 ha (43.81 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 15.88 ha (39.23 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 17.98 ha (44.42 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 2018); 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 2018 growing season based on soil temperatures measured at the site and at the Belleville SIU Research Station.
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 105% of normal, precipitation in spring 2018 (March through May) was 124% of normal. The wettest period was February and March, when precipitation totaled 37.39 cm (14.72 in.) or 271% of normal.
- The period of maximum inundation and saturation during the 2018 growing season occurred from late March to early April. As a result, the area satisfying the 14-day criteria before the median growing season starting date was larger than the area satisfying that criteria after the median growing season starting date.
- In 2018, water levels measured in 16 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 17 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 2018

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
4S	Y	Y	Y
5S	Y	Y	Y
6S	N	N	N
6VS	N	N	N
7S	Y	Y	Y
9SR	Y	Y	Y
14S	Y	Y	Y
16S	Y	Y	Y
17SR	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	N	N	Y
31S	Y	N	Y
32S	Y	N	Y

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

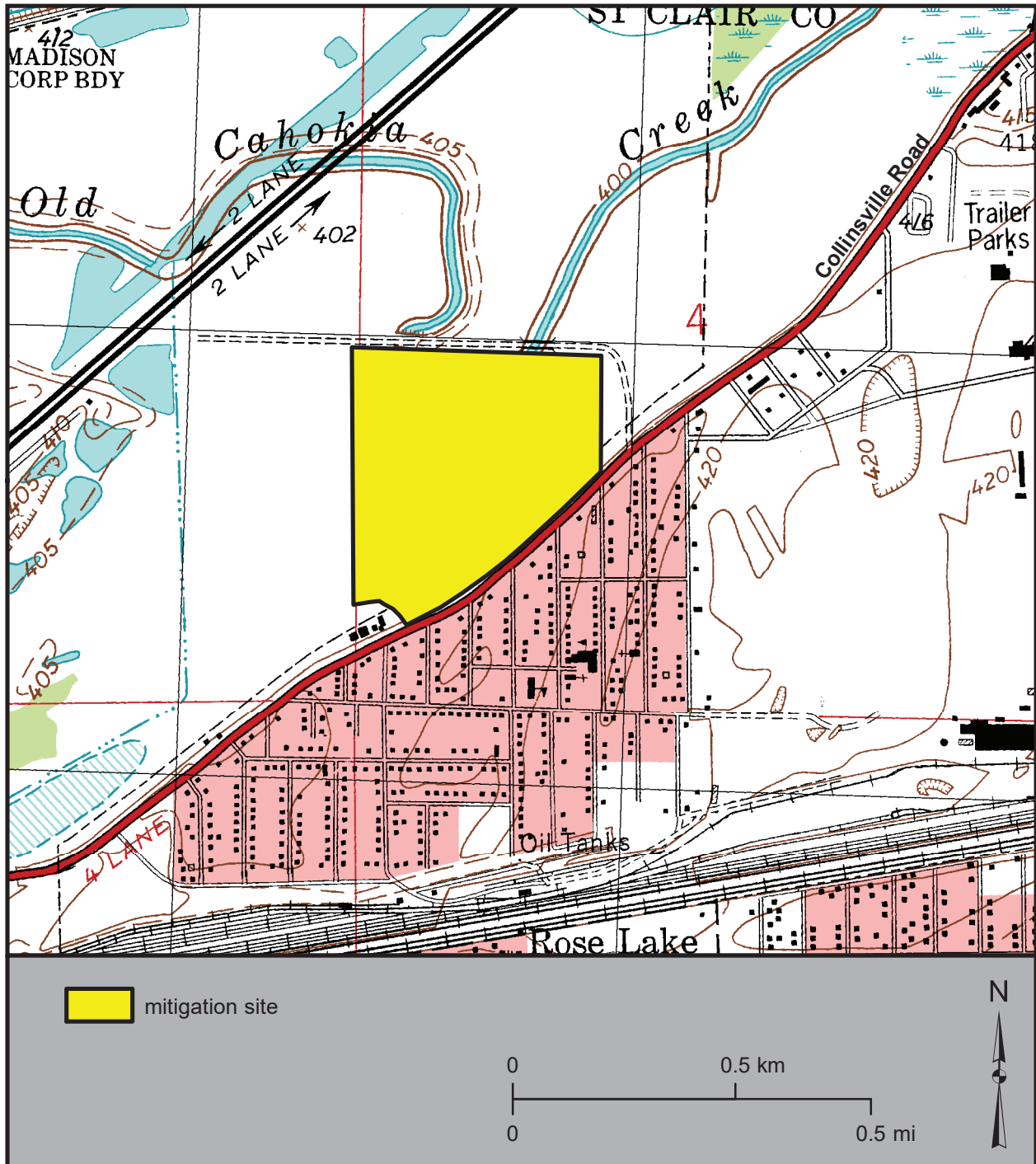
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
AR2	122.25 m (401.08 ft)	122.16 m (400.79 ft)	122.24 m (401.05 ft)
BR	122.22 m (400.98 ft)	n/a	n/a
E	122.31 m (401.28 ft)	122.25 m (401.08 ft)	122.31 m (401.28 ft)
G	122.47 m (401.80 ft)	122.42 m (401.64 ft)	122.47 m (401.80 ft)
SW Pond	122.25 m (401.08 ft)	122.16 m (400.79 ft)	122.24 m (401.05 ft)

n/a – insufficient data to determine an elevation

# Fairmont City Potential Wetland Mitigation Site (FAP 14)

## General Study Area and Vicinity

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



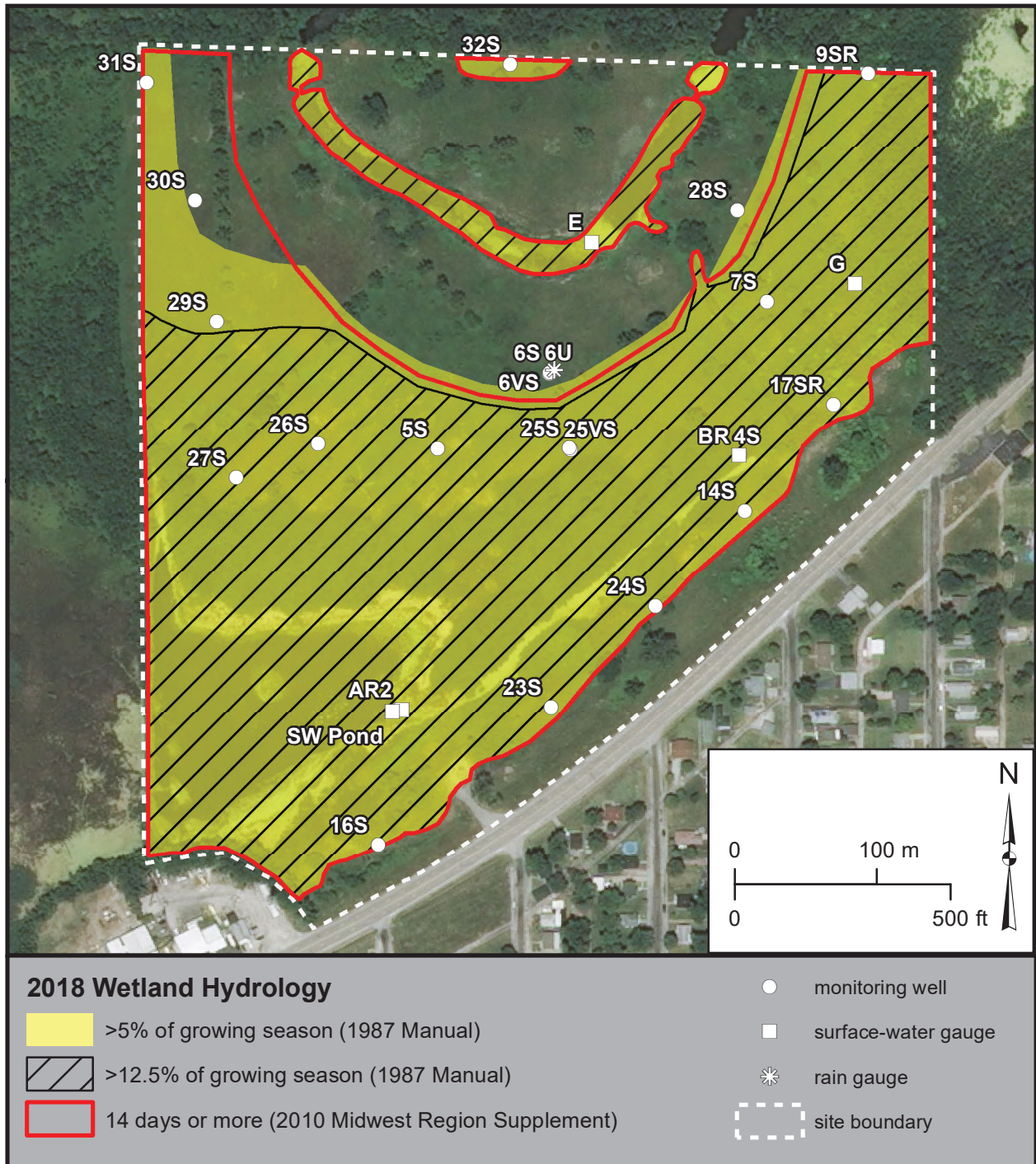


# Fairmont City Potential Wetland Mitigation Site (FAP 14)

## Estimated Areal Extent of 2018 Wetland Hydrology

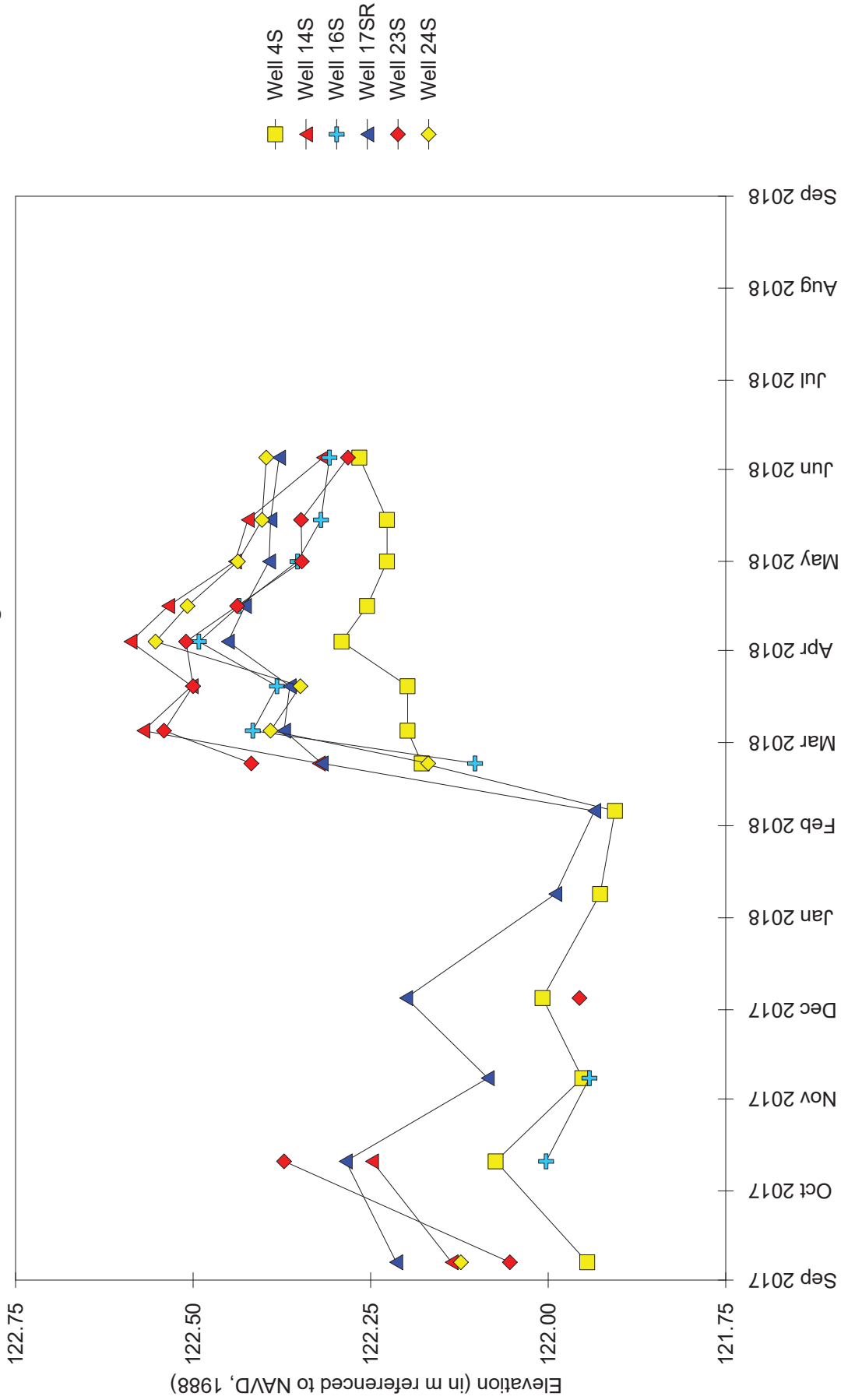
September 1, 2017 through August 31, 2018

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

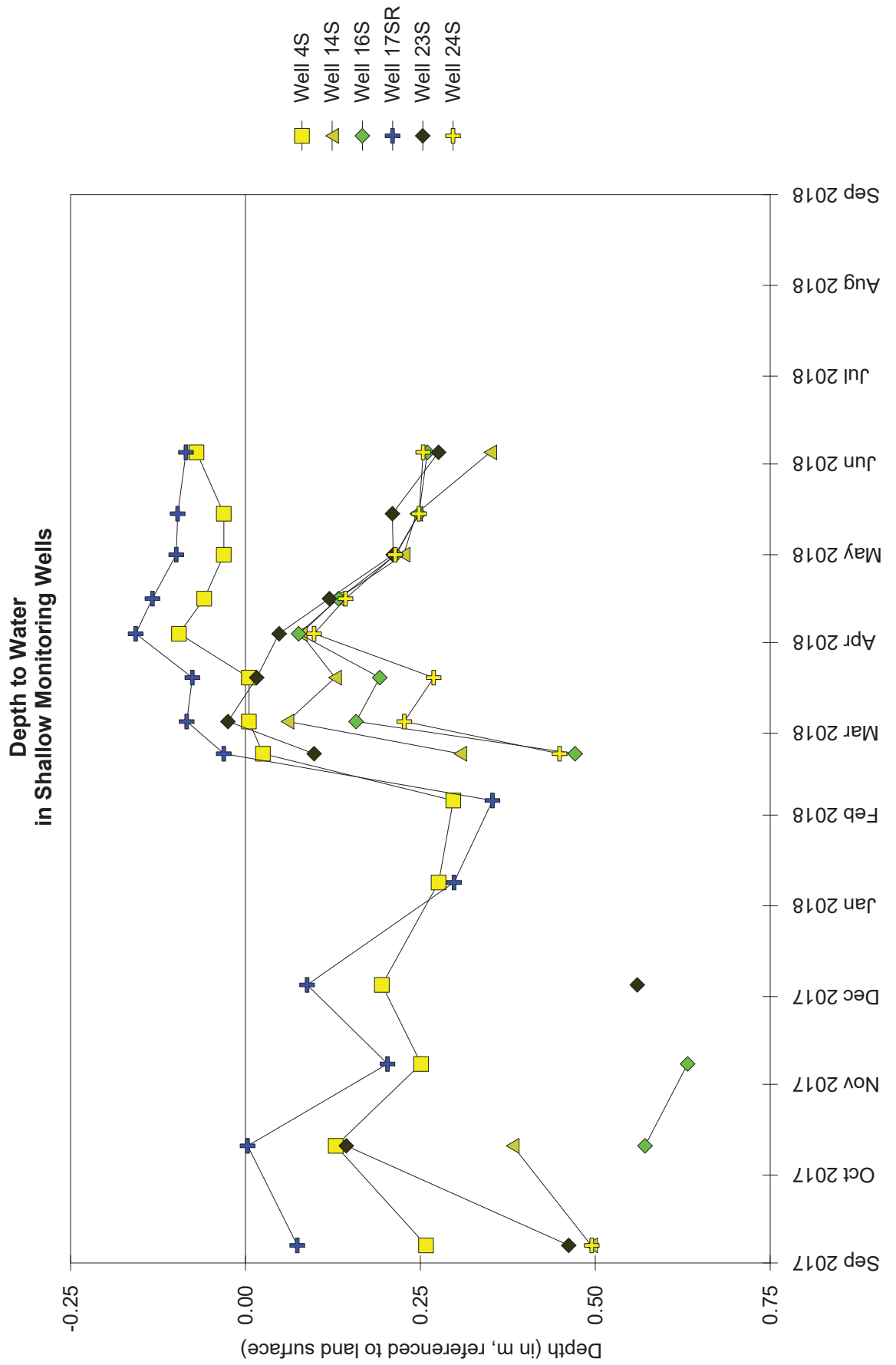


# Fairmont City Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Shallow Monitoring Wells

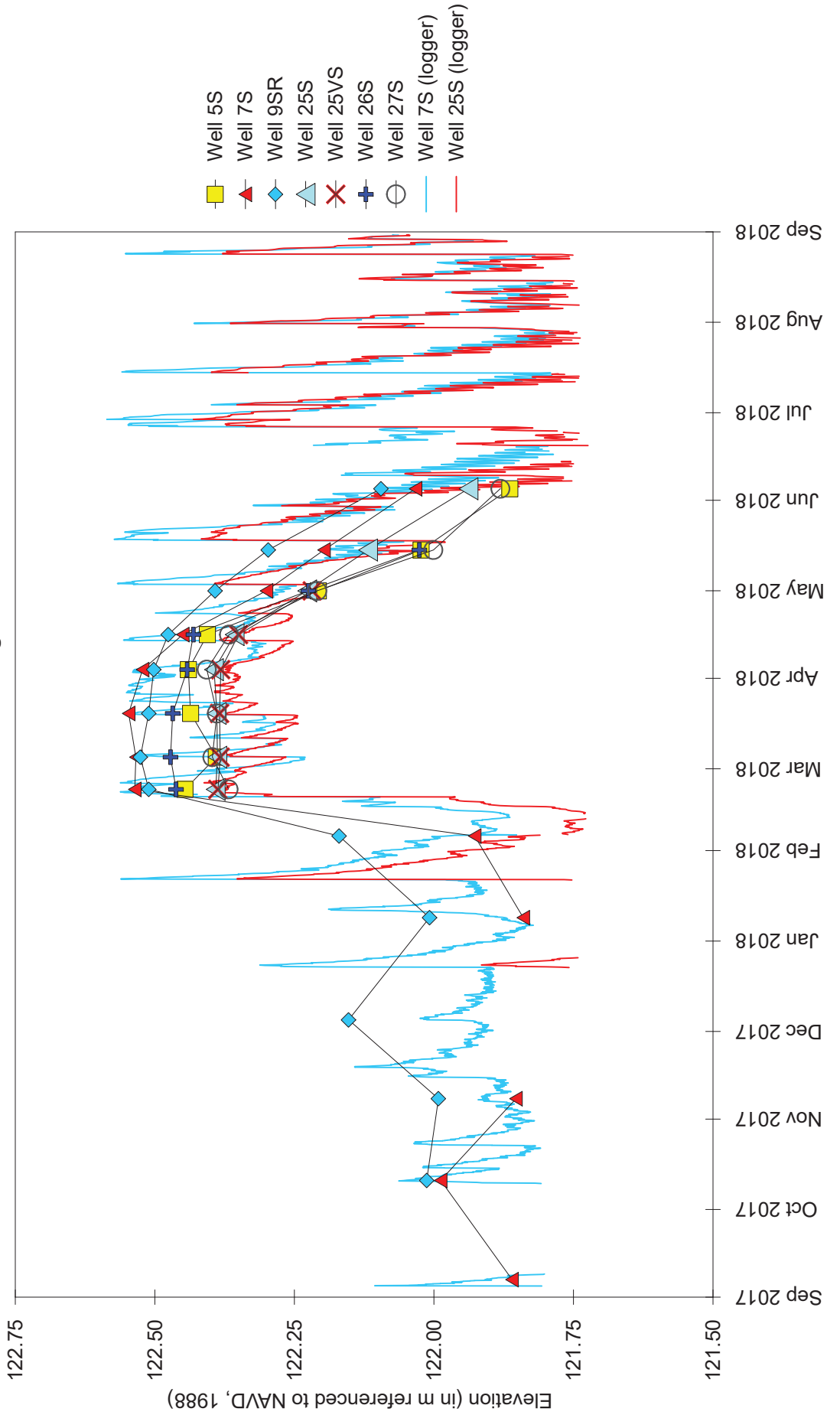


# Fairmont City Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

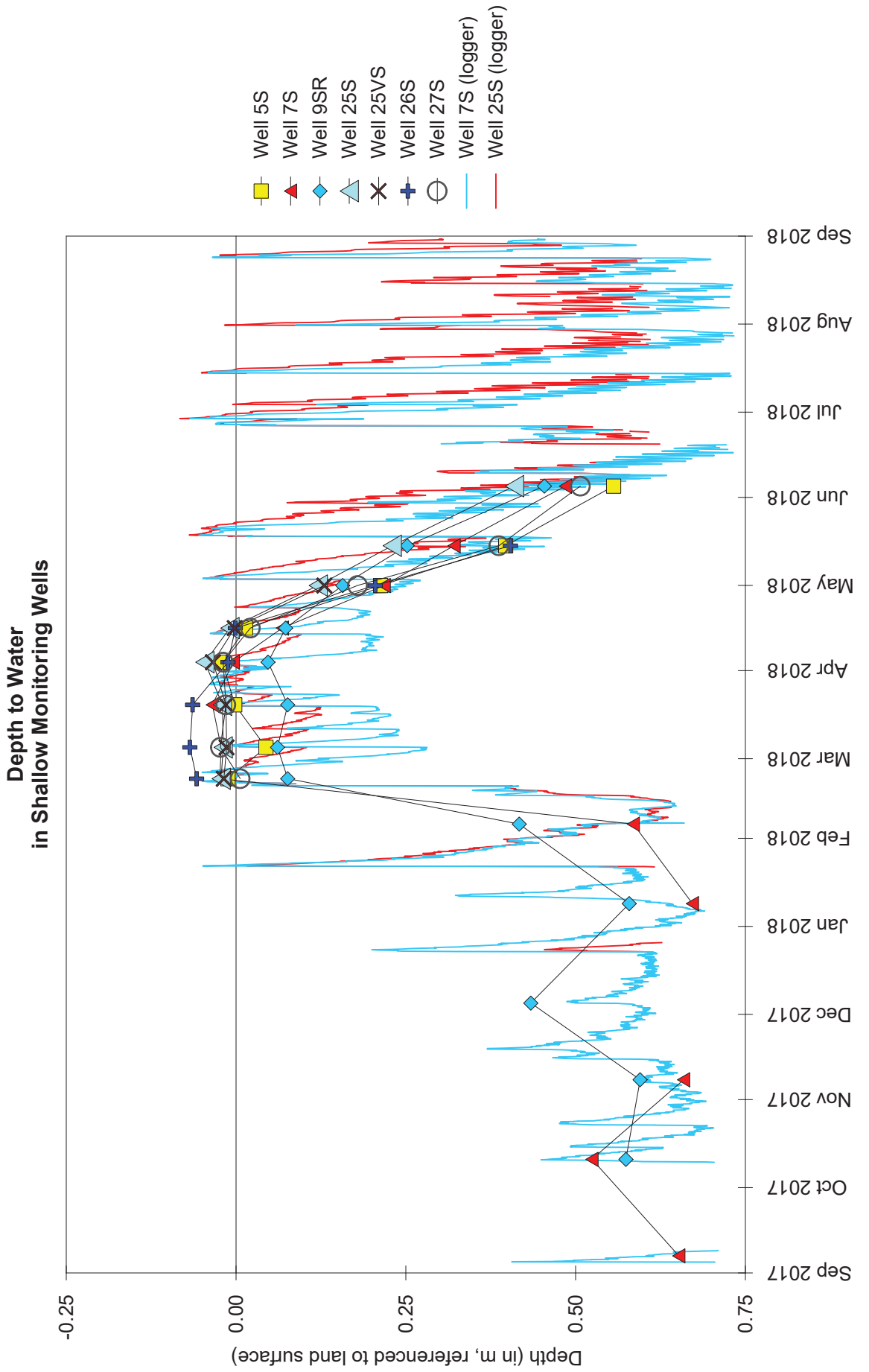


# Fairmont City Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Shallow Monitoring Wells



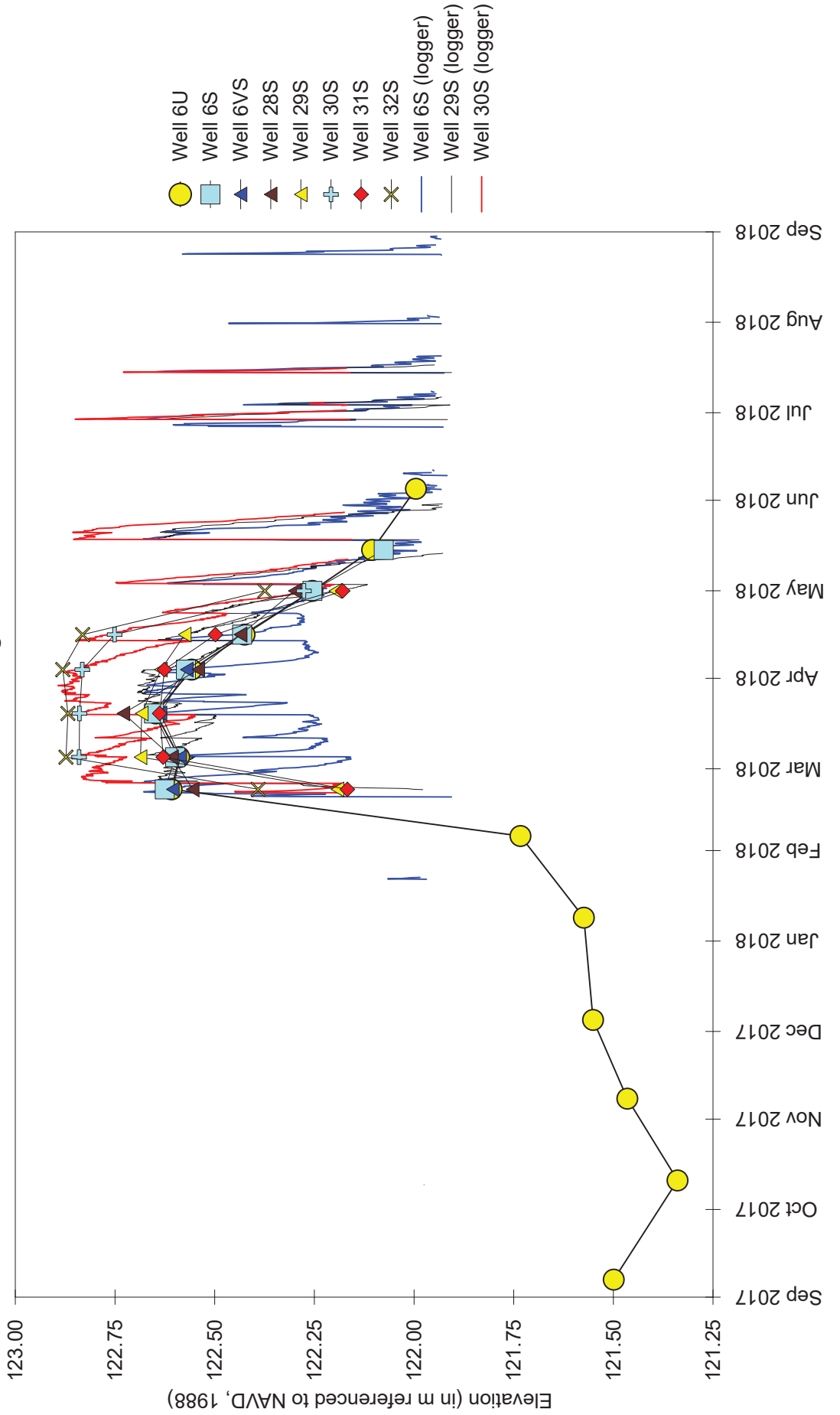
# Fairmont City Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018



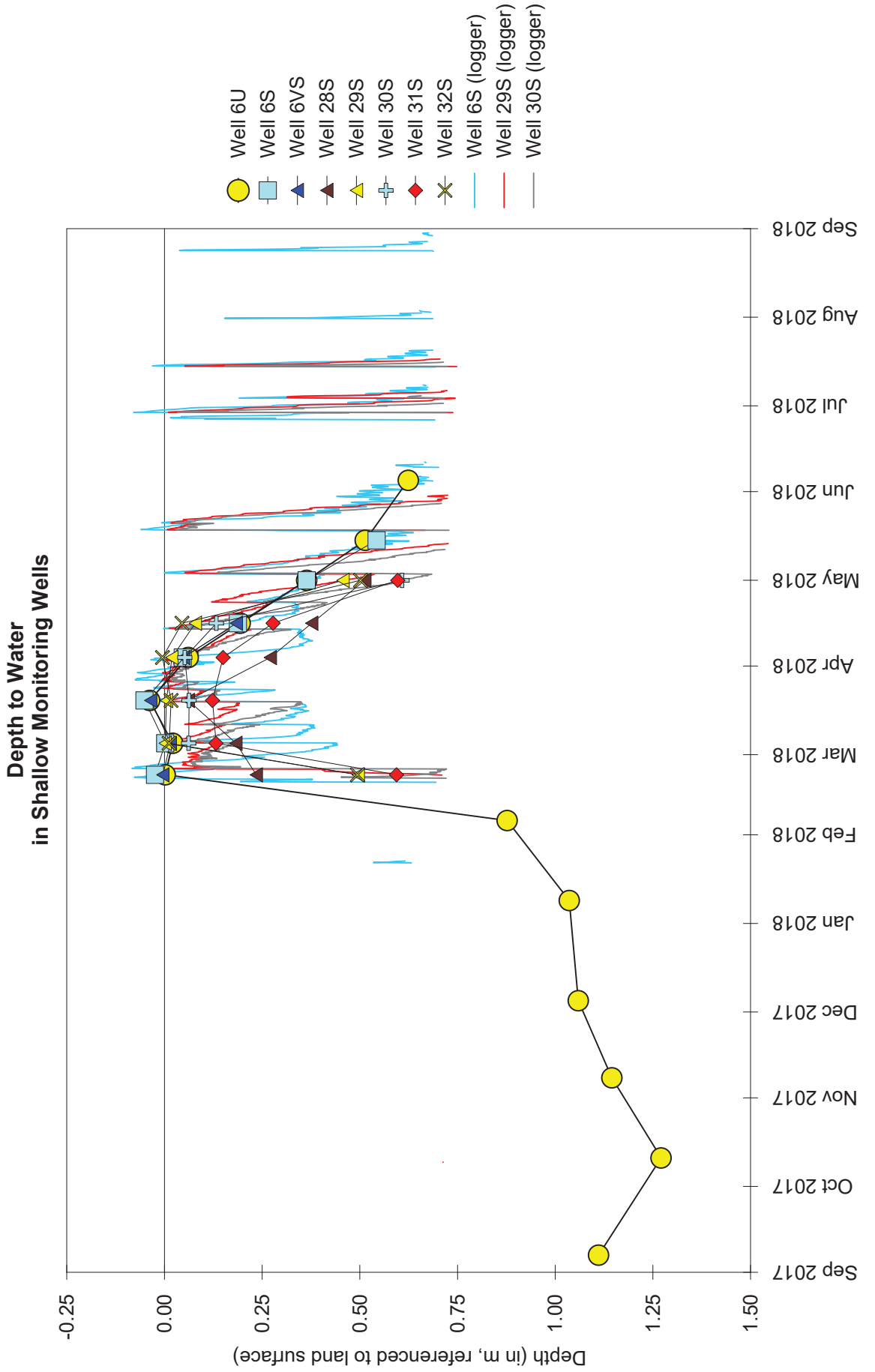


# Fairmont City Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

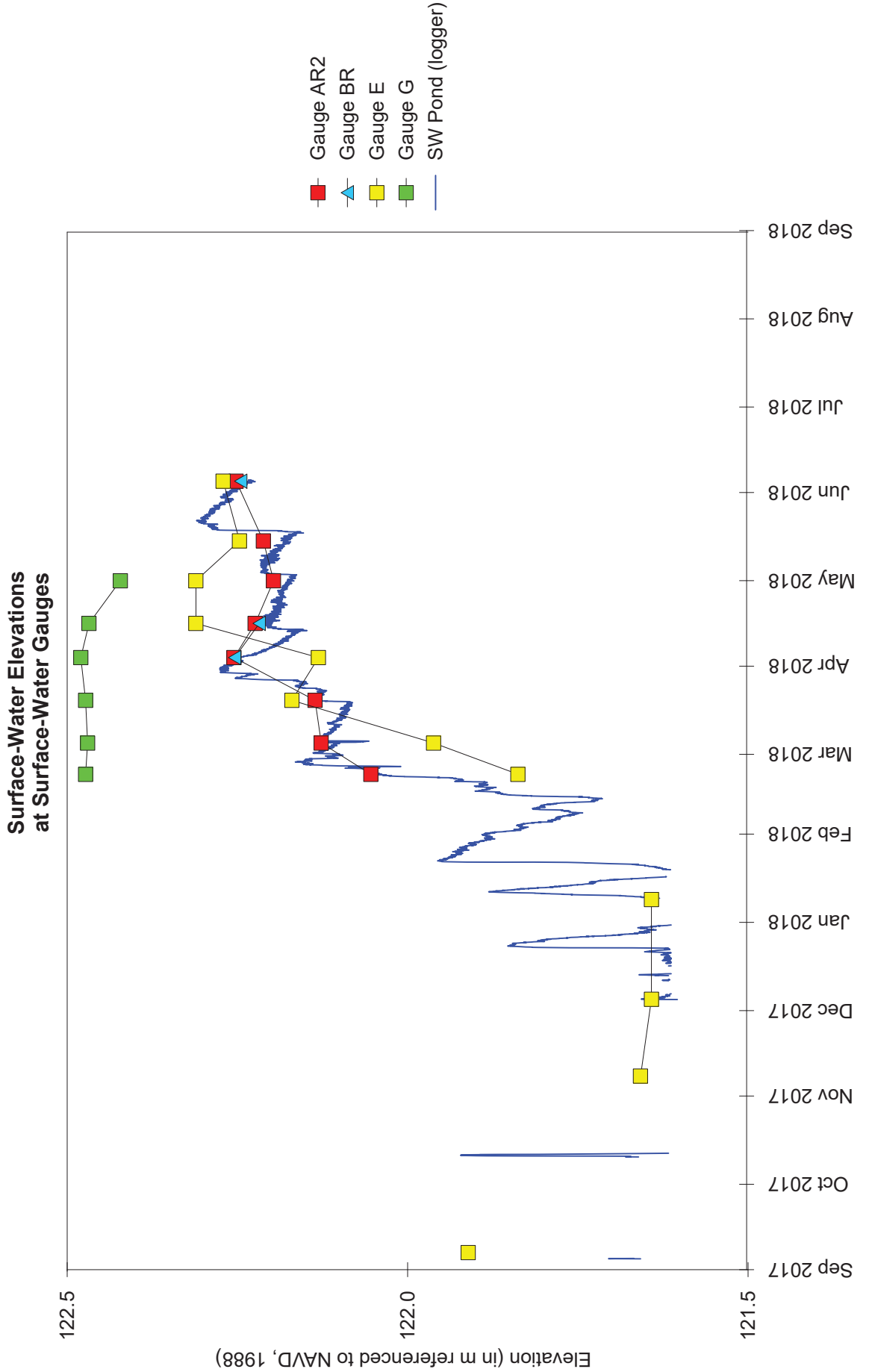
Water-Level Elevations  
in Shallow Monitoring Wells



# Fairmont City Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

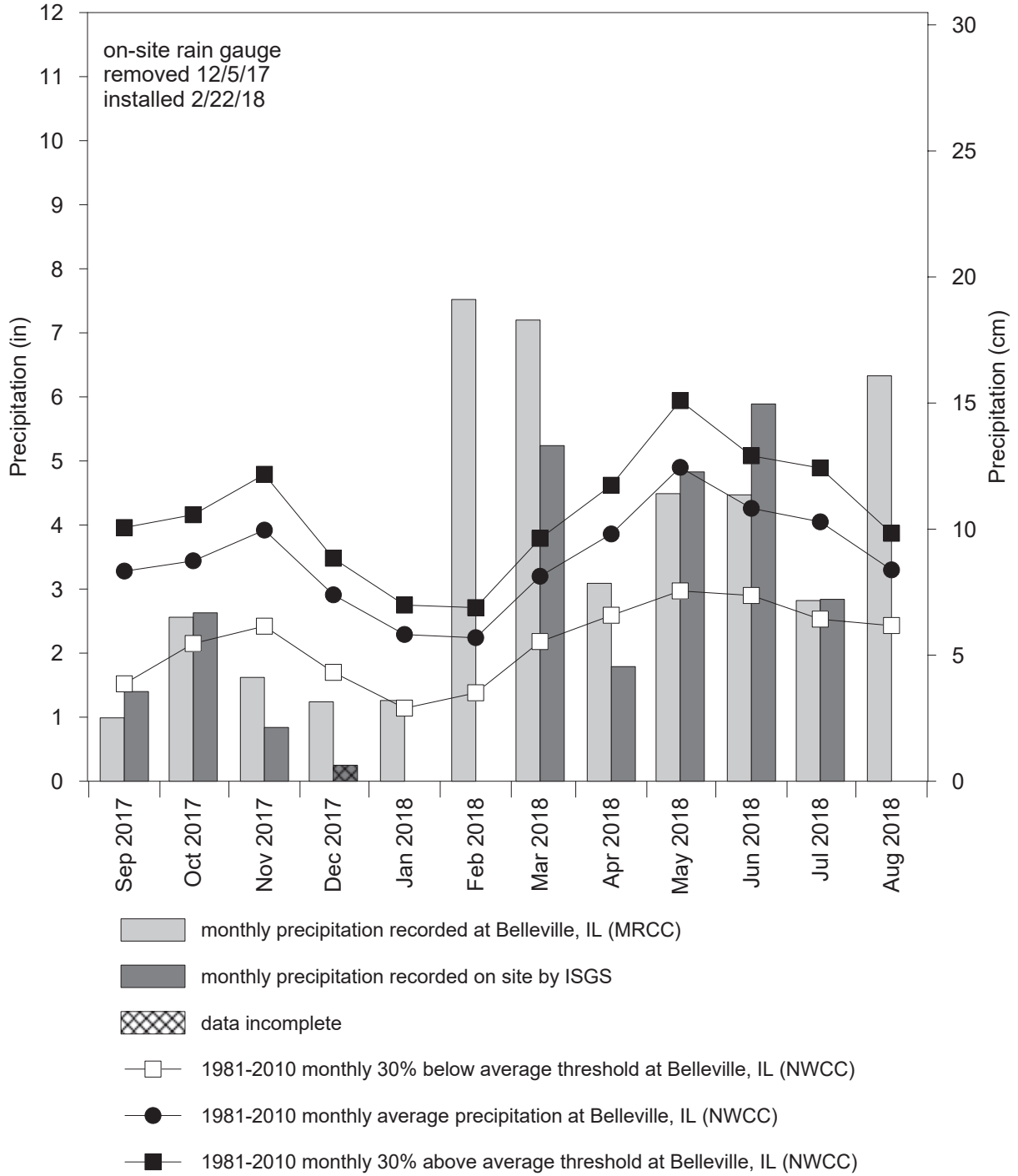


# Fairmont City Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018



# Fairmont City Potential Wetland Mitigation Site September 2017 through August 2018

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



**FORMER TIERNAN PROPERTY  
POTENTIAL WETLAND MITIGATION SITE**

**ISGS #57**

FAP 14

Sequence #27

St. Clair County, near Cahokia, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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), 13.21 ha (32.65 ac), out of a total site area of 26.43 ha (65.30 ac), satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season and 5.59 ha (13.82 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 13.13 ha (32.44 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 Belleville, Illinois, is April 4 and the season lasts 204 days (MRCC 2018); 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 2018 growing season based on soil temperatures measured on site and at the Belleville SIU Research Station.
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 105% of normal. Precipitation in spring 2018 (March through May) was 124% of normal. The wettest period was February and March, when precipitation totaled 37.39 cm (14.72 in.) or 271% of normal.
- The northern and southern portions of the site have different water sources, which usually results in different periods of maximum inundation and saturation during the growing season. In the portion of the site north of well cluster 23, the maximum occurred in March and April due to precipitation and perched groundwater. August was also wet due to above average precipitation (191% of normal), but the duration of inundation and saturation was shorter than in March and April. In the portion of the site south of well cluster 23, the maximum occurred from about May 15, 2018 to about June 16, 2018. In this portion of the site inundation typically occurs when the Mississippi River at St. Louis reaches a stage of about 6.1 m (20.0 ft), and the river was at or above that stage from May 9, 2018 to May 27, 2018. The Mississippi River was also above the threshold stage from June 26, 2018 to July 16, 2018, but the impact on the site was about the same as the earlier event.



- In 2018, water levels measured in 20 of 36 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 9 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 16 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 2018

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

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

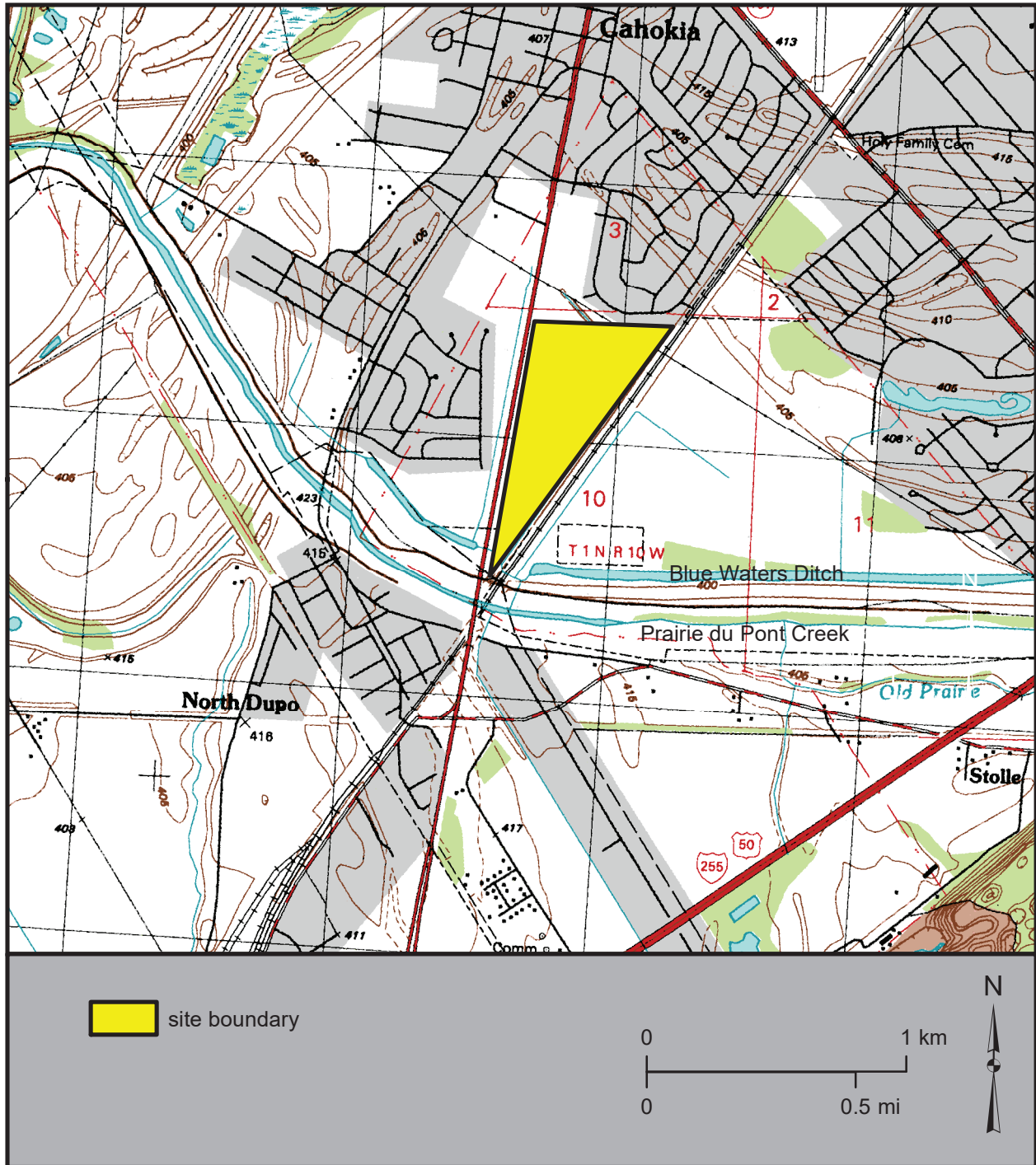
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
E	n/a	n/a	n/a
F	n/a	n/a	n/a
G	n/a	n/a	n/a
H	121.64 m (399.08 ft)	121.63 m (399.05 ft)	121.64 m (399.08 m)

n/a – insufficient data to determine an elevation

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

## General Study Area and Vicinity

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



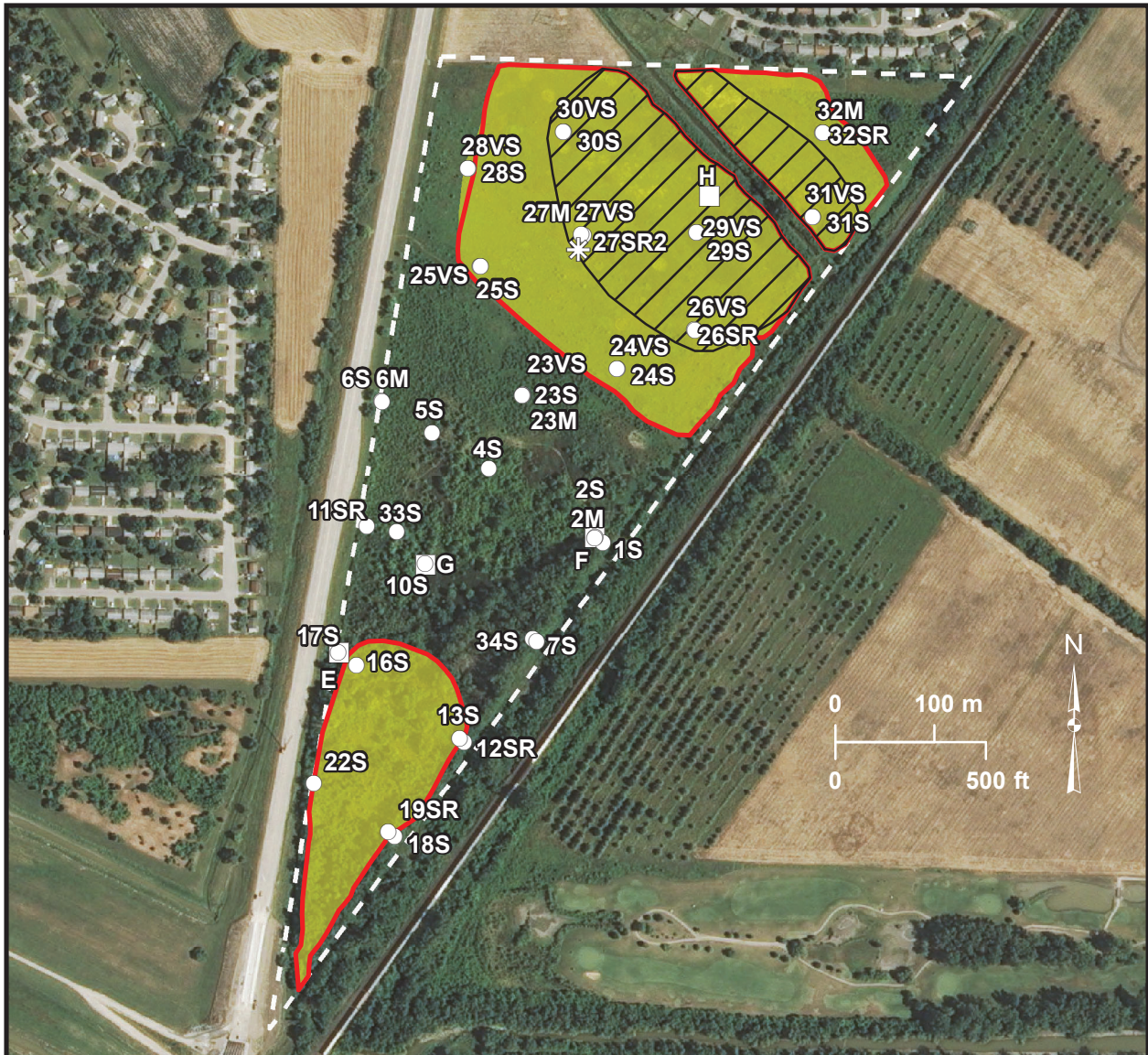


# Former Tiernan Property, Potential Wetland Mitigation Site (FAP 14)

## Estimated Areal Extent of 2018 Wetland Hydrology

September 1, 2017 through August 31, 2018

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

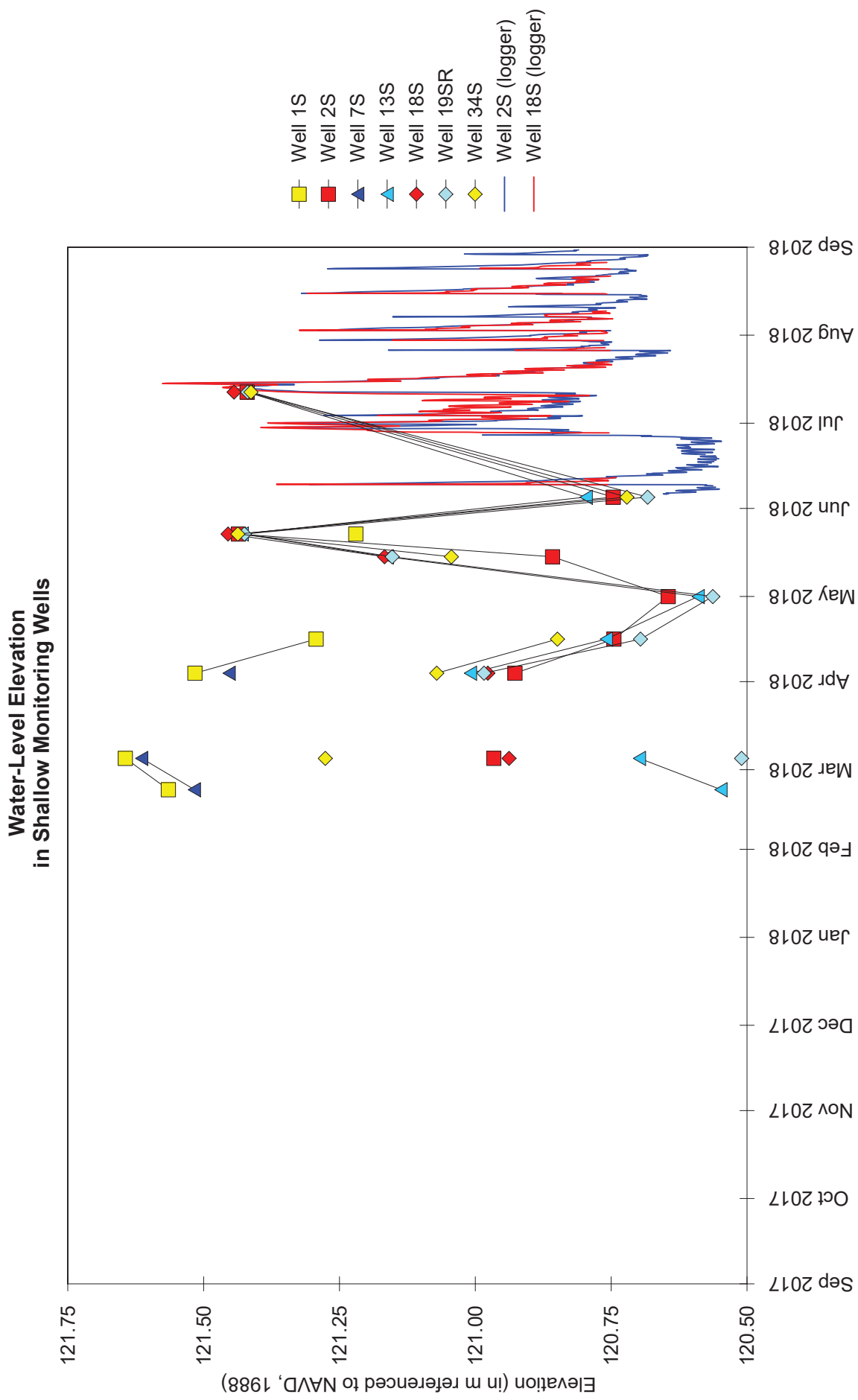


### 2018 Wetland Hydrology

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

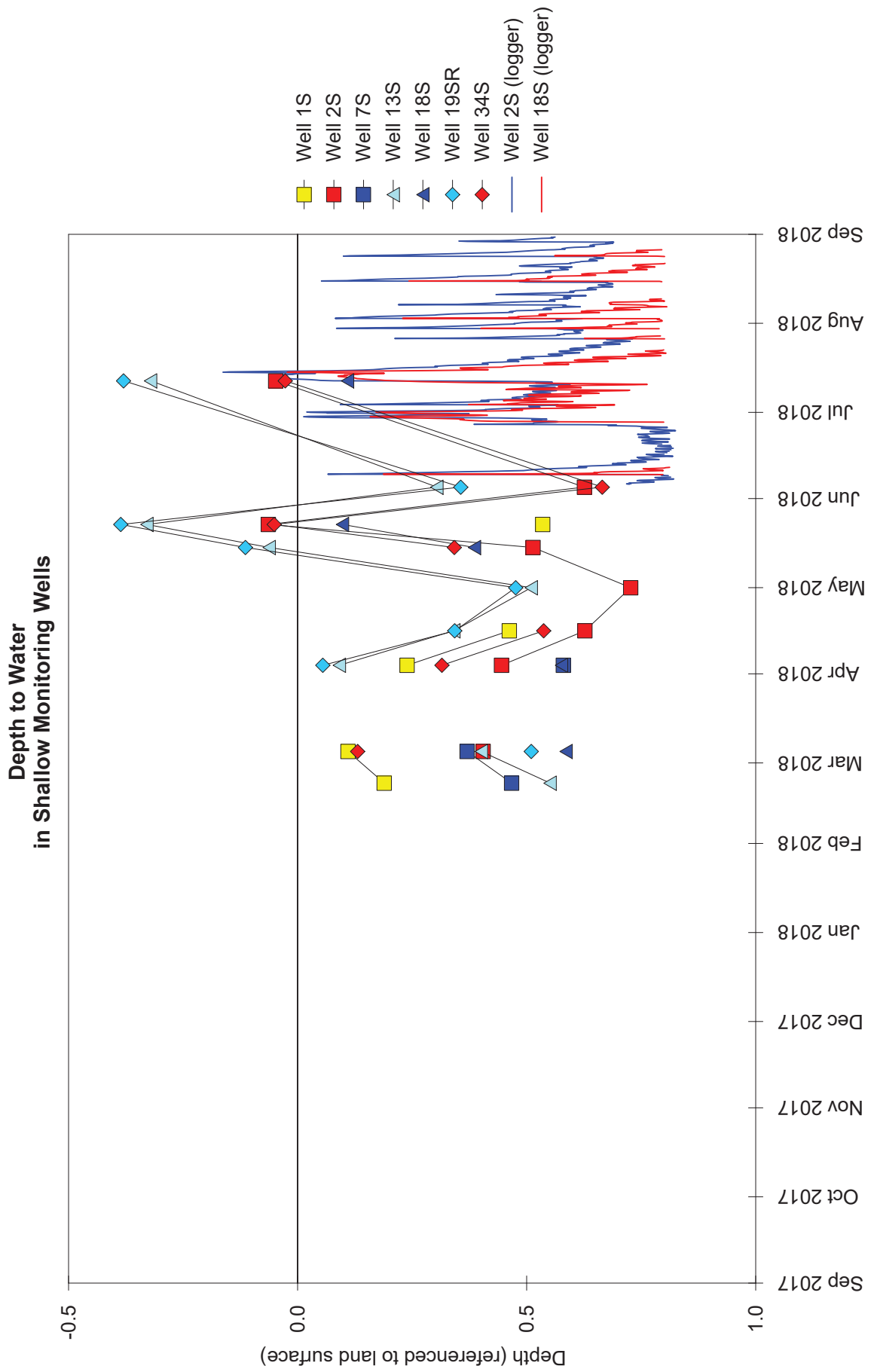
- monitoring well
- surface-water gauge
- \* rain gauge
- site boundary

# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018



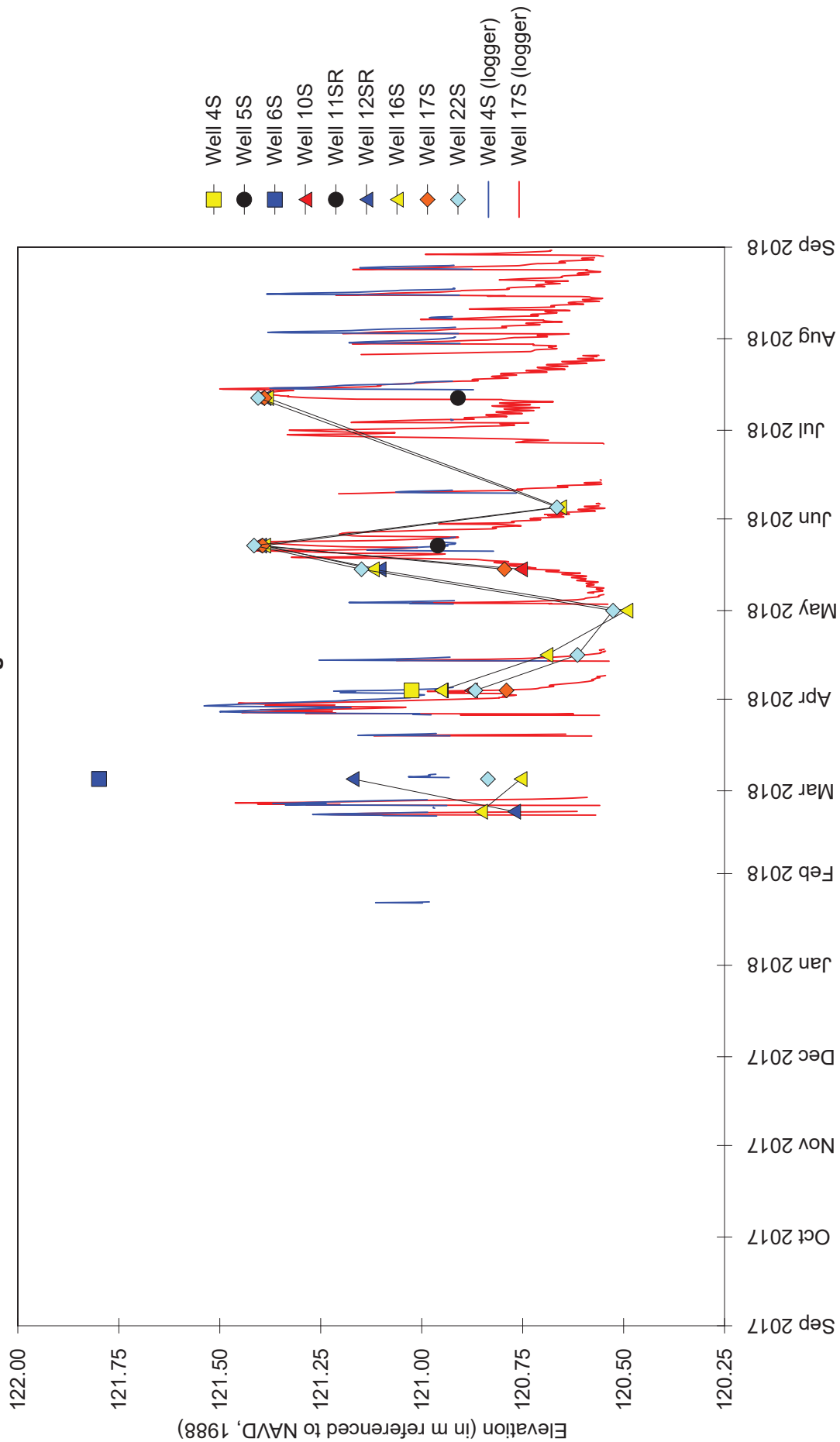


# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018



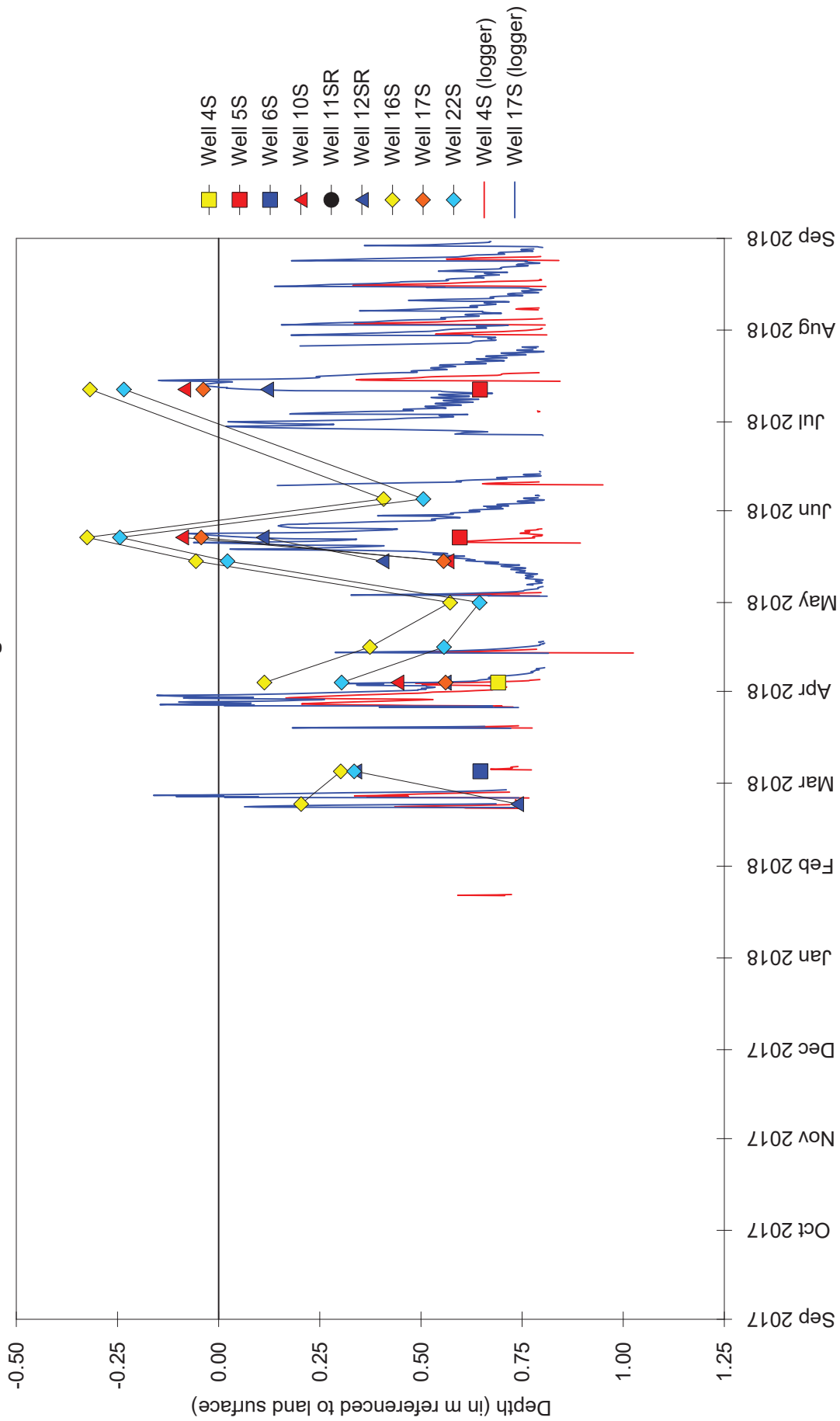
# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

Water-Level Elevation  
in Shallow Monitoring Wells



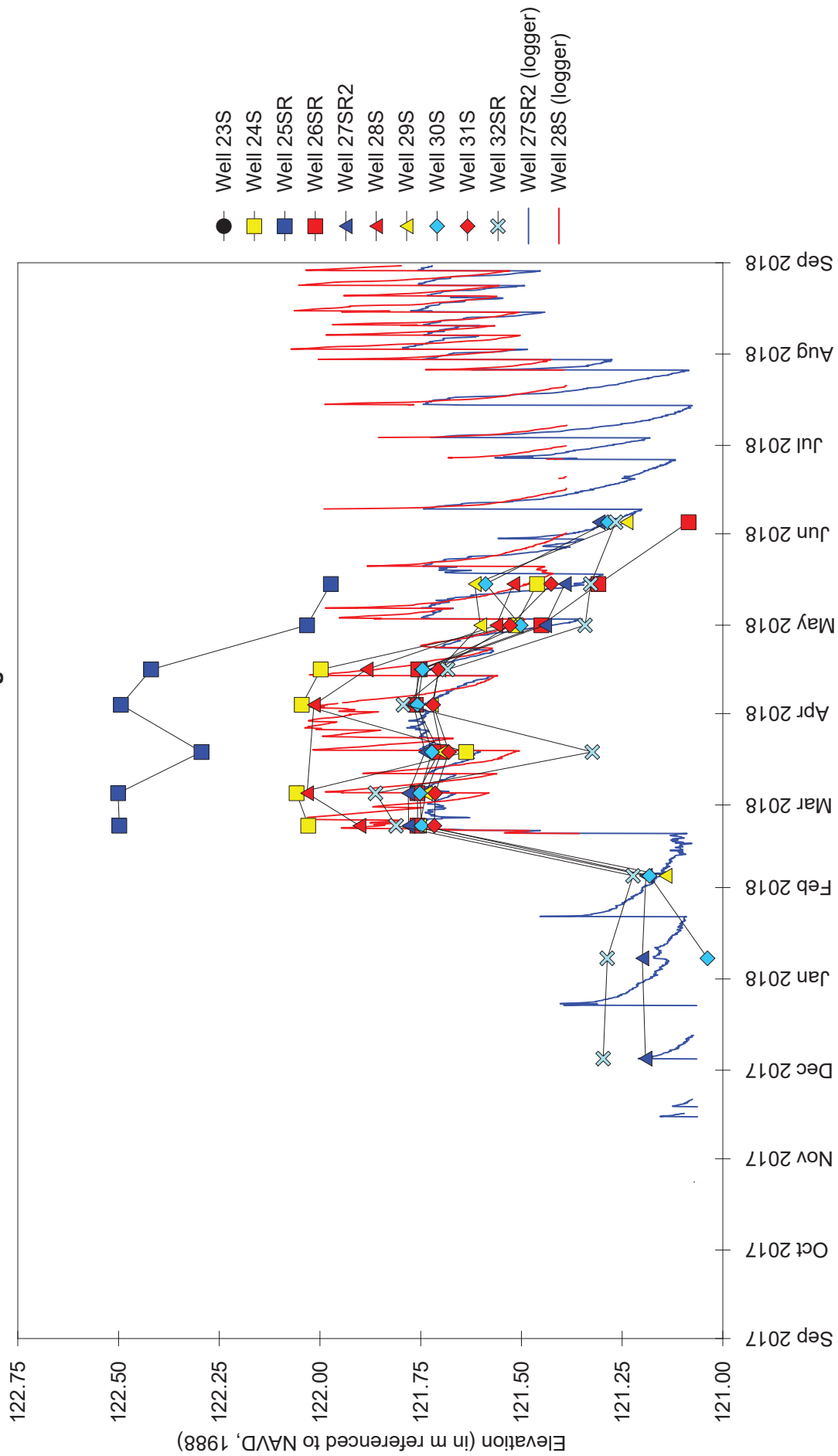
# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevation in Shallow Monitoring Wells

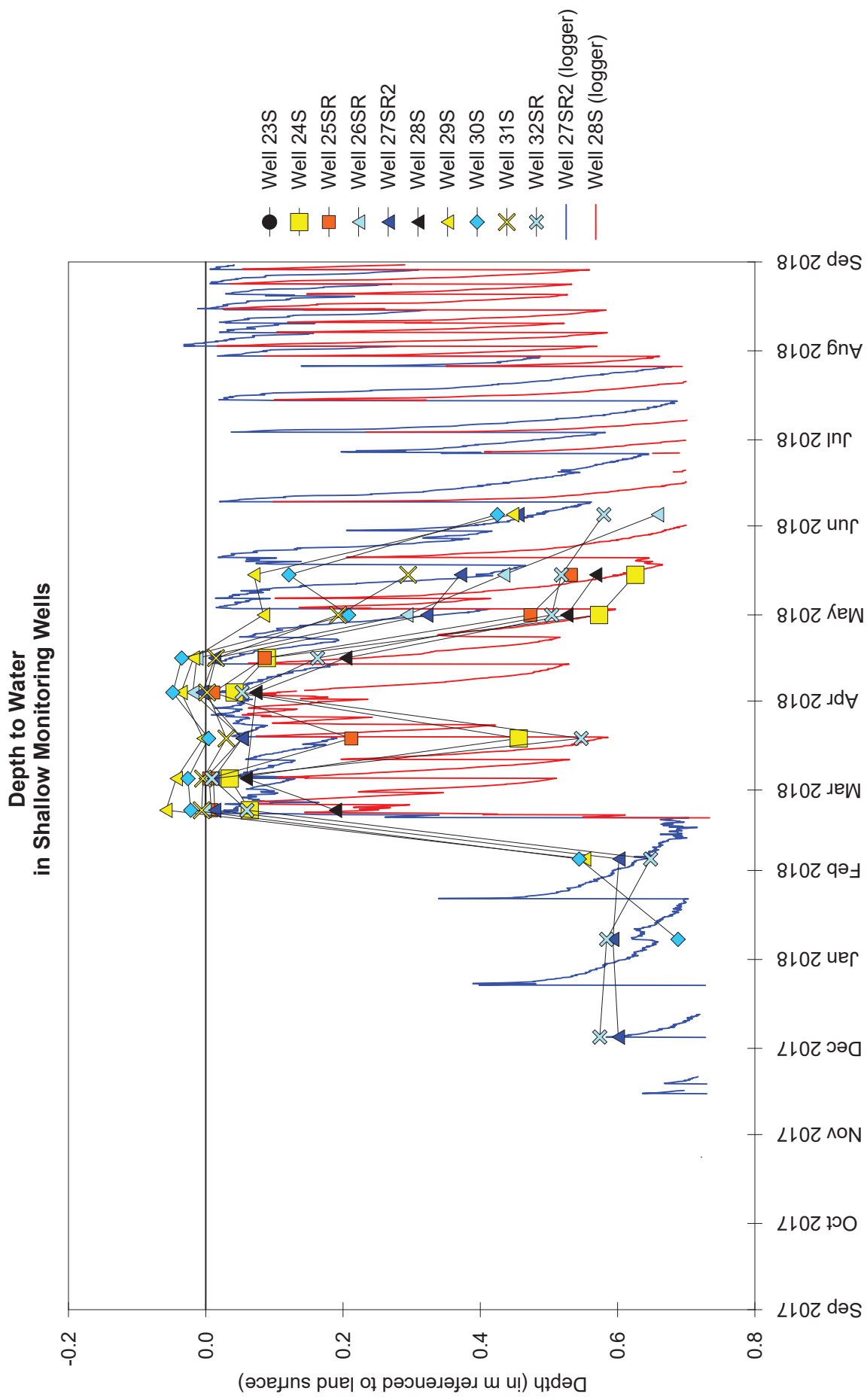


# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

Water-Level Elevation  
in Shallow Monitoring Wells



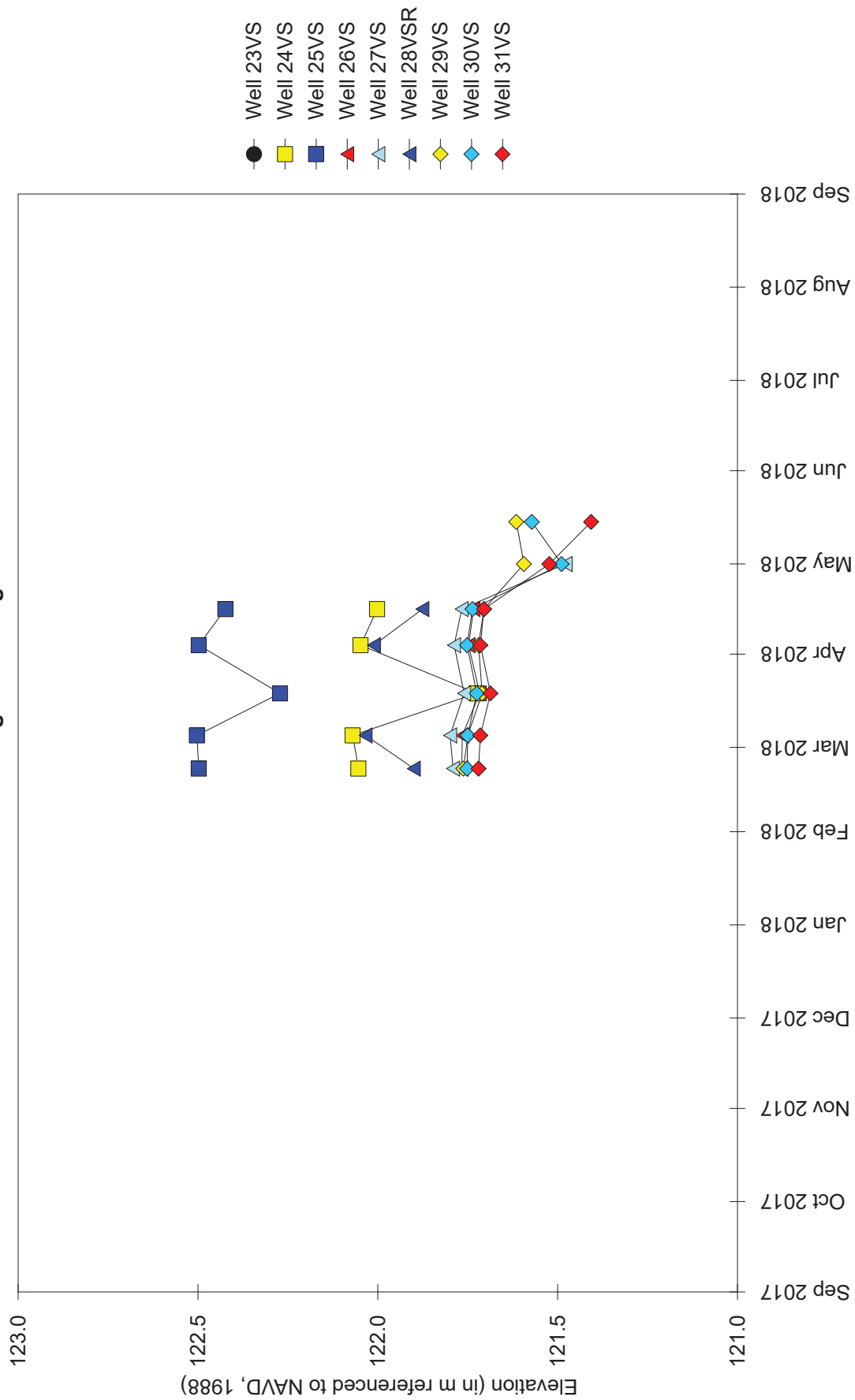
# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018



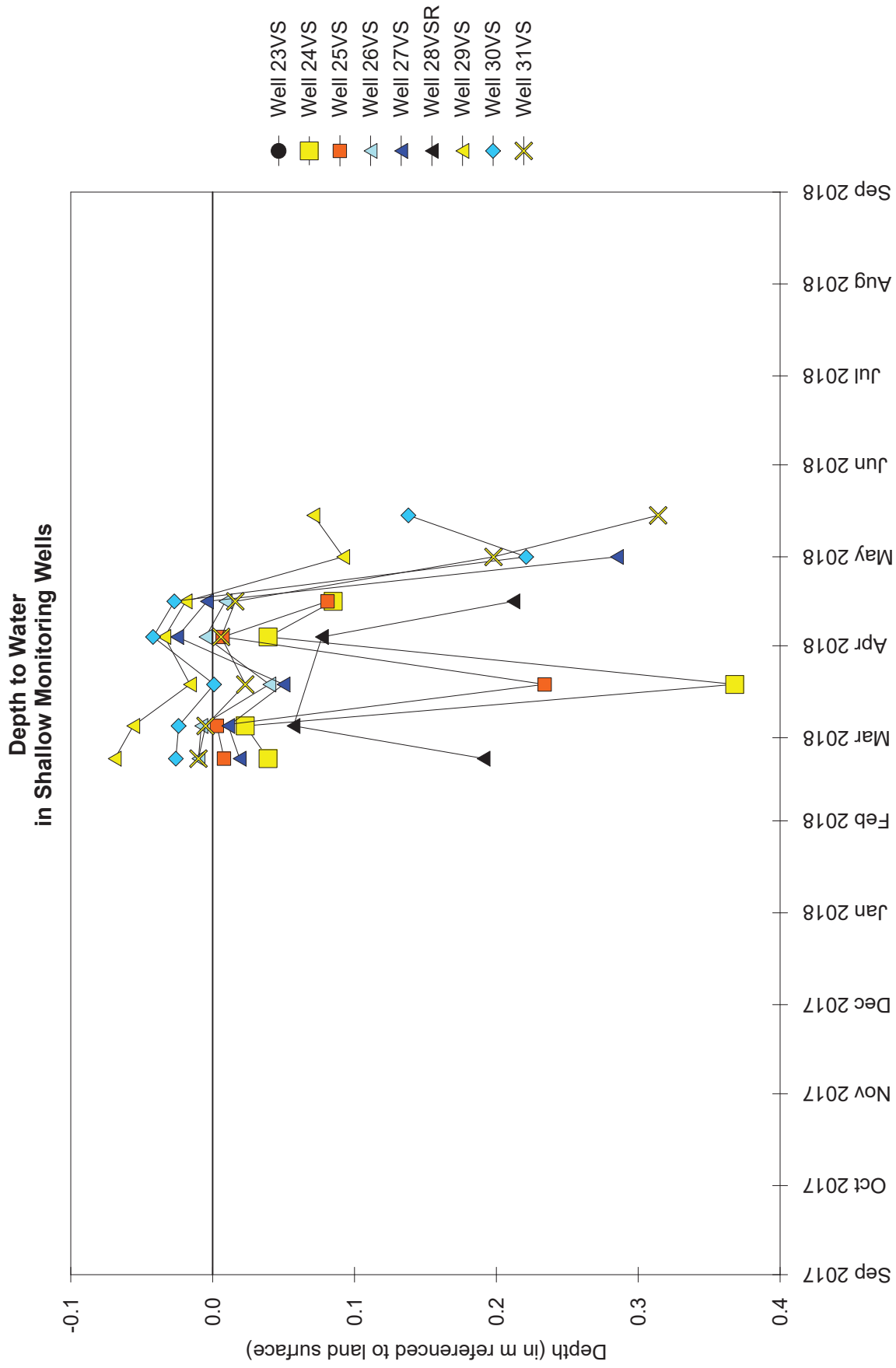


# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

Depth to Water  
in Shallowing Monitoring Wells

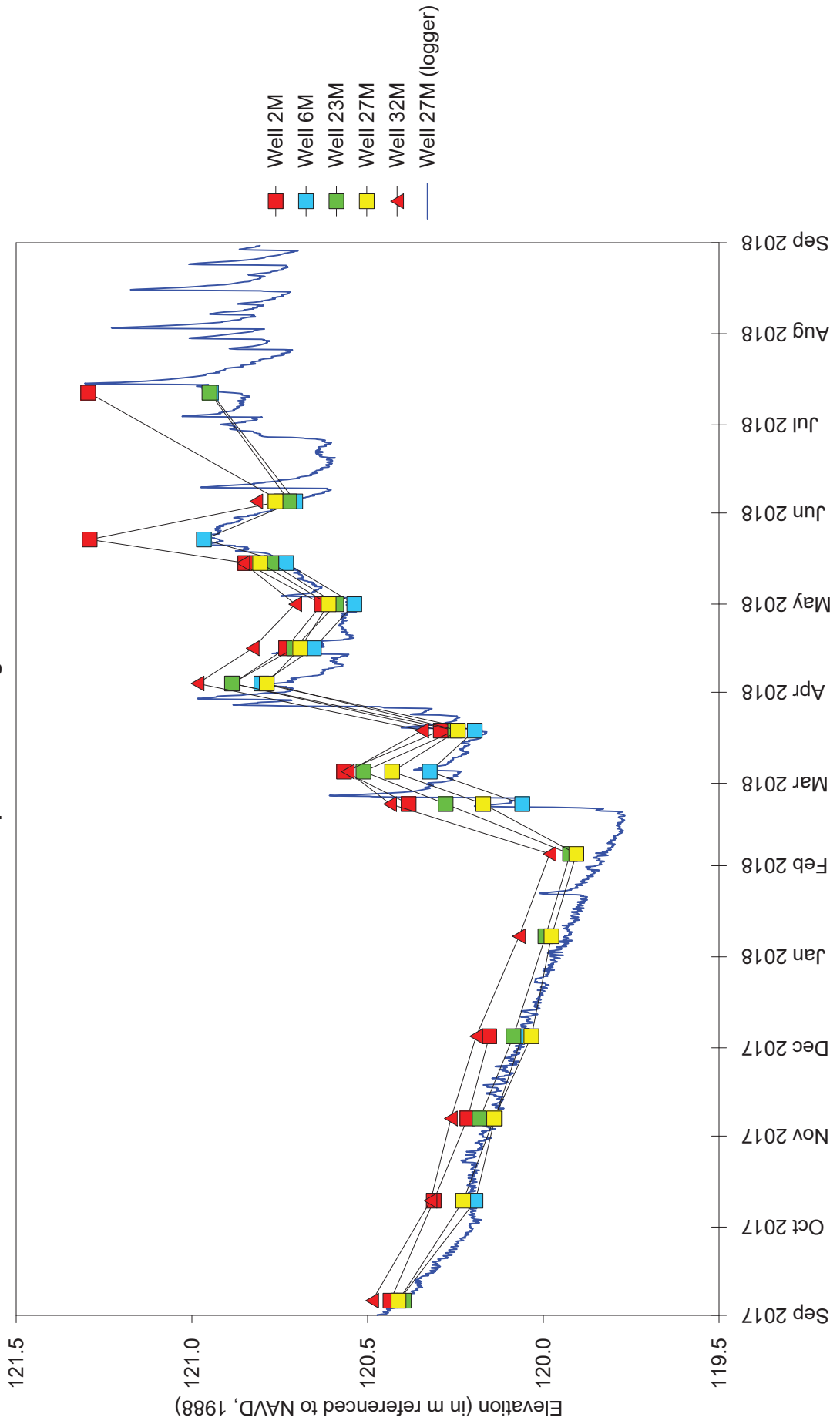


**Former Tiernan Property, Potential Wetland Mitigation Site**  
**September 1, 2017 through August 31, 2018**

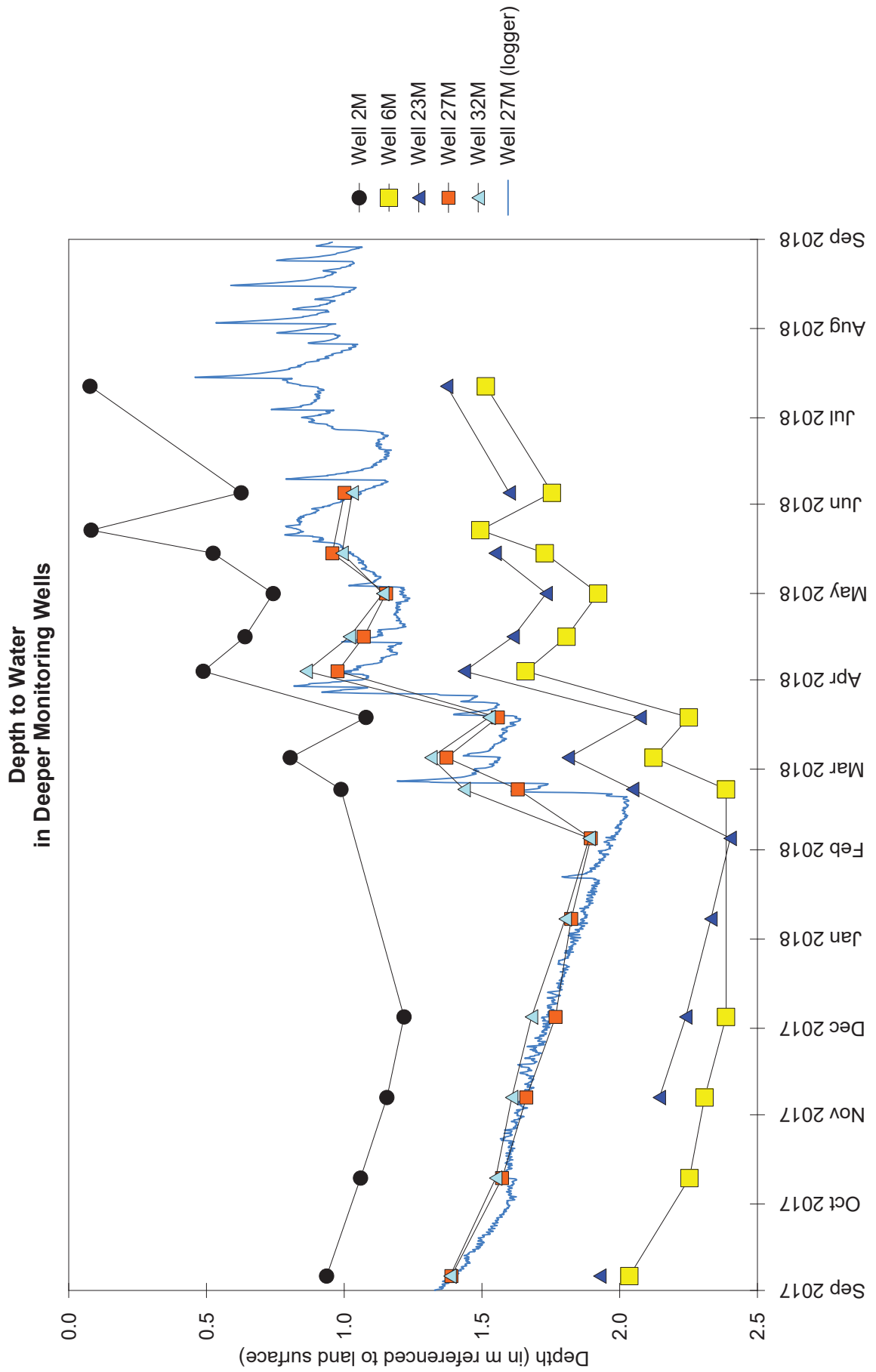


# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

Water-Level Elevations in  
Deeper Monitoring Wells

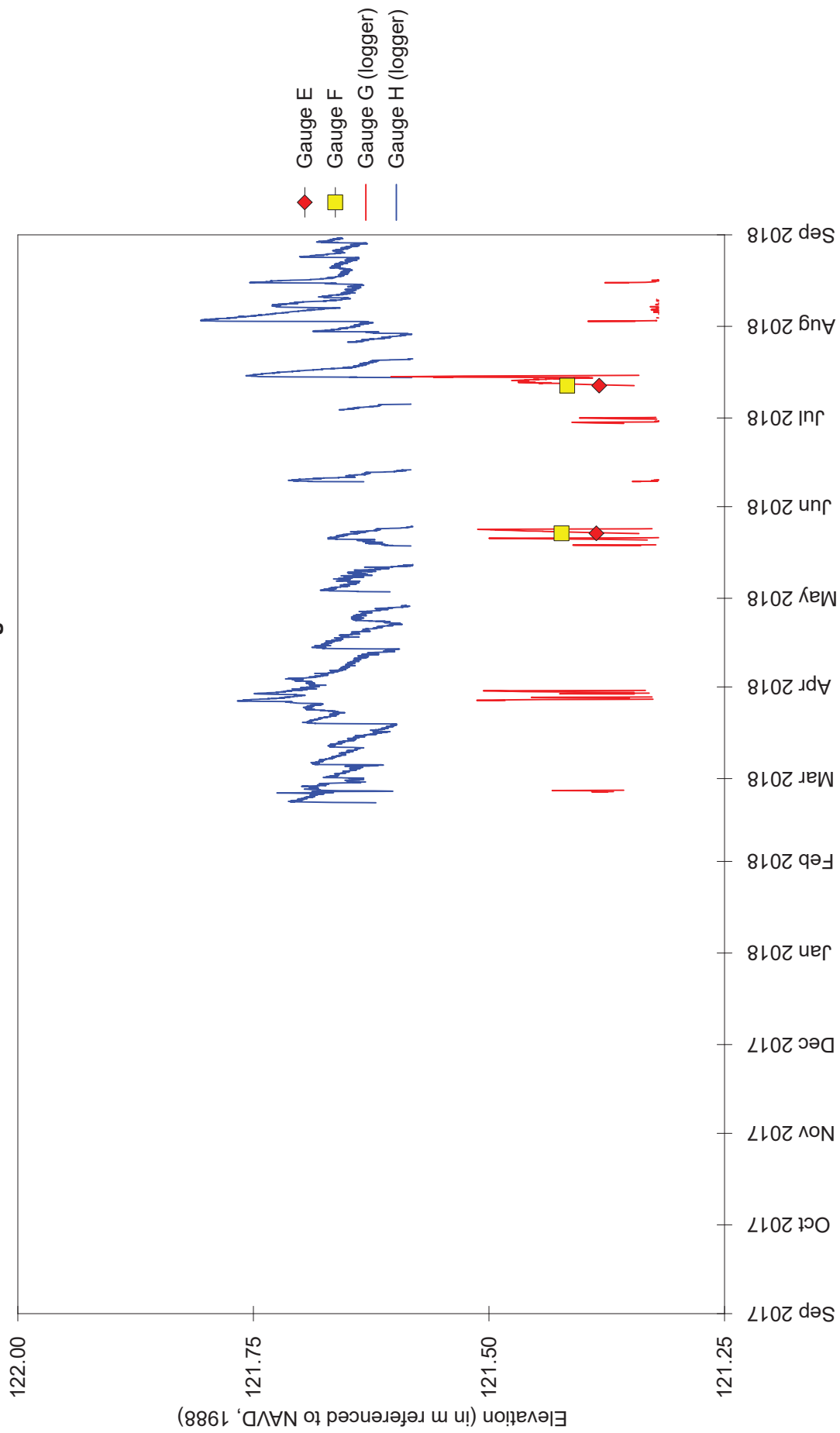


# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018



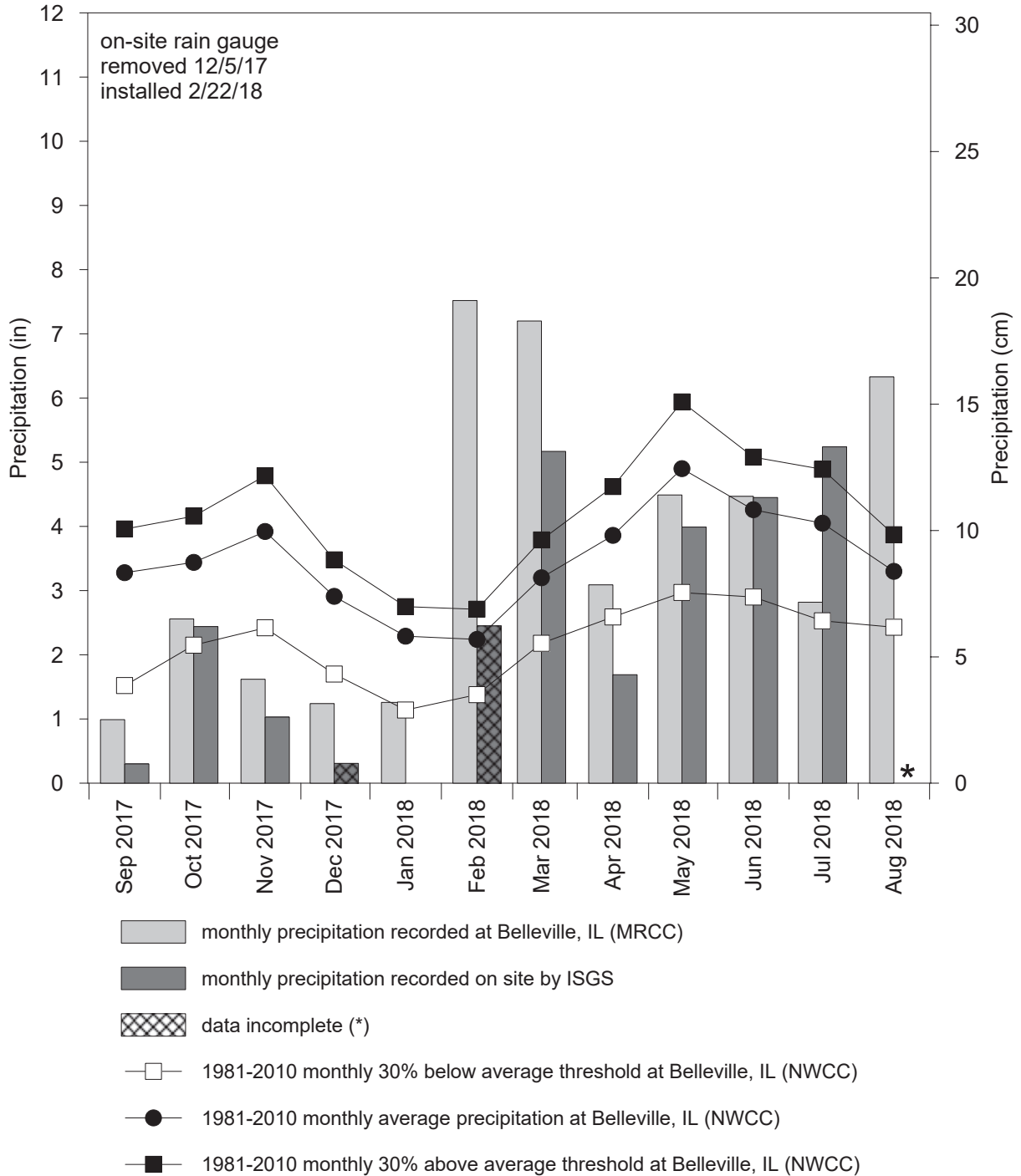
# Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevation at Surface Water Gauges



# Former Tiernan Property Potential Wetland Mitigation Site September 2017 through August 2018

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





## SUGAR CAMP CREEK

ISGS #74

### WETLAND AND STREAM MITIGATION BANK

Sequence #9282

Franklin County, Northern Township, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Audra M. Noyes

### SITE HISTORY

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

### WETLAND HYDROLOGY CALCULATION FOR 2018

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), 29.26 ha (72.31 ac) of the total bank area of 42.57 ha (105.20 ac) satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season, and 27.55 ha (68.07 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 29.26 ha (72.31 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 2018). 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 15 was the starting date of the 2018 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 109% of normal, and spring 2018 (March through May) precipitation was 120% of normal. Precipitation during February 2018 was particularly excessive with 264% of normal rainfall.
- Sugar Camp Creek flooded portions of the site 10 times during the monitoring period. None of these floods lasted long enough to satisfy wetland hydrology criteria.

- The period of maximum inundation and saturation during the 2018 growing season occurred during April and into early May in response to a combination of heavy rainfall during late March and flooding from Sugar Camp Creek. During March 23-30 a total of 10.59 cm (4.17 in.) of precipitation was recorded at the site. Also, five brief flood events covered portions of the site during late March and early April.
- In 2018, 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 24 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. Using the 2010 Midwest Region Supplement, water levels in 29 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

#### ADDITIONAL INFORMATION

- Phase 1 of the wetland mitigation bank is in year 7 and Phase 2 is in year 5 of post-construction monitoring. Therefore, we present wetland hydrology acreage separately for each phase in this section. Using the 1987 Manual (Environmental Laboratory 1987), 14.38 ha (35.54 ac) of Phase 1 and 14.88 ha (36.77 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 5% of the growing season, and 13.78 ha (34.05 ac) of Phase 1 and 13.77 ha (34.02 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement, 14.38 ha (35.54 ac) of Phase 1 and 14.88 ha (36.77 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 2018.
- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2018

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

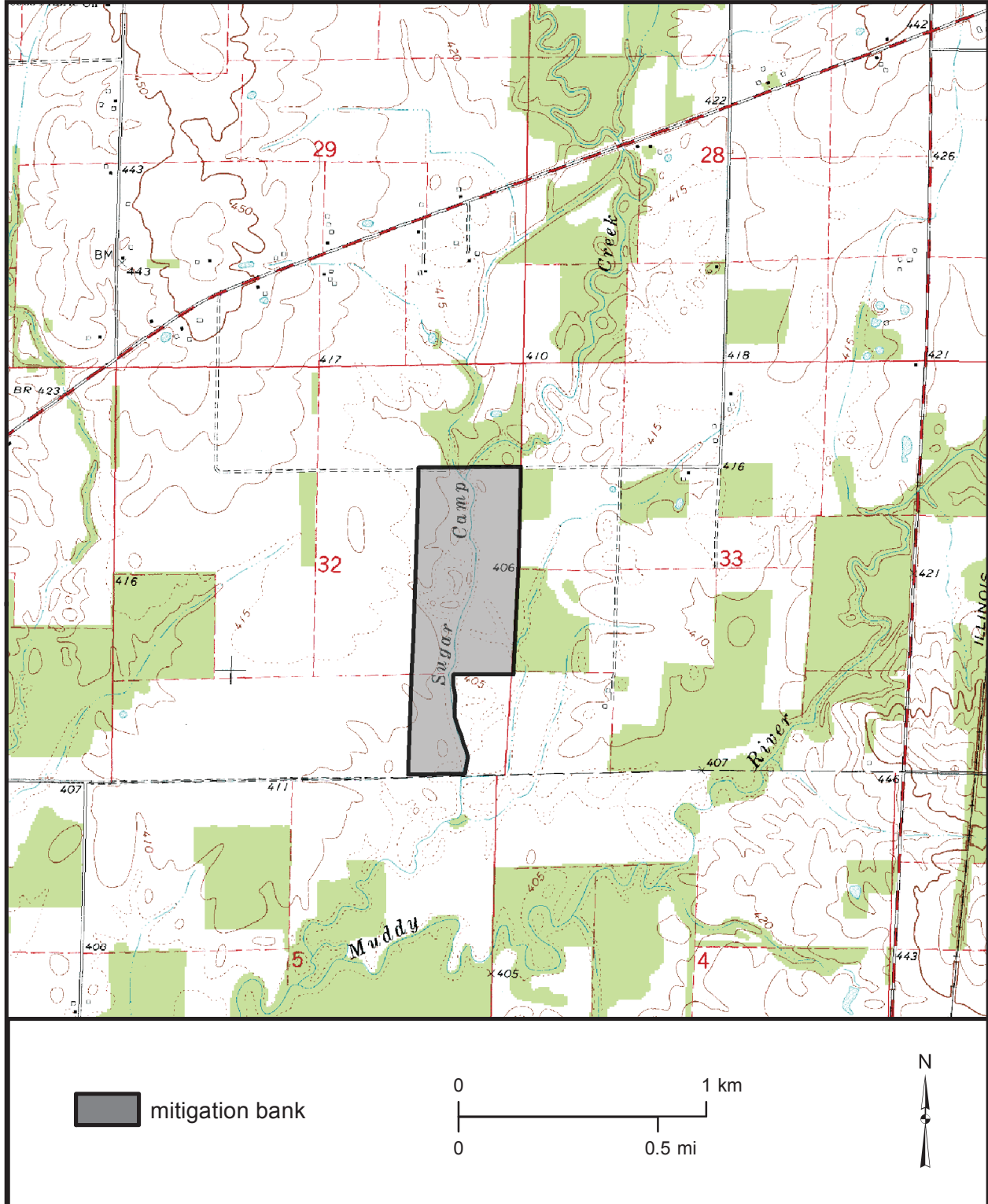
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
A	122.67 m (402.47 ft)	122.50 m (401.89 ft)	122.81 m (402.93 ft)
L	123.97 m (406.72 ft)	123.96 m (406.68 ft)	123.98 m (406.75 ft)
M	123.53 m (405.27 ft)	123.51 m (405.20 ft)	123.55 m (405.34 ft)
N	123.99 m (406.78 ft)	123.97 m (406.74 ft)	123.99 m (406.78 ft)
O	124.04 m (406.95 ft)	124.04 m (406.95 ft)	124.04 m (406.95 ft)
P	123.88 m (406.43 ft)	123.88 m (406.43 ft)	123.88 m (406.43 ft)

n/a – insufficient data to determine an elevation

# Sugar Camp Creek Wetland and Stream Mitigation Bank

## General Study Area and Vicinity

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

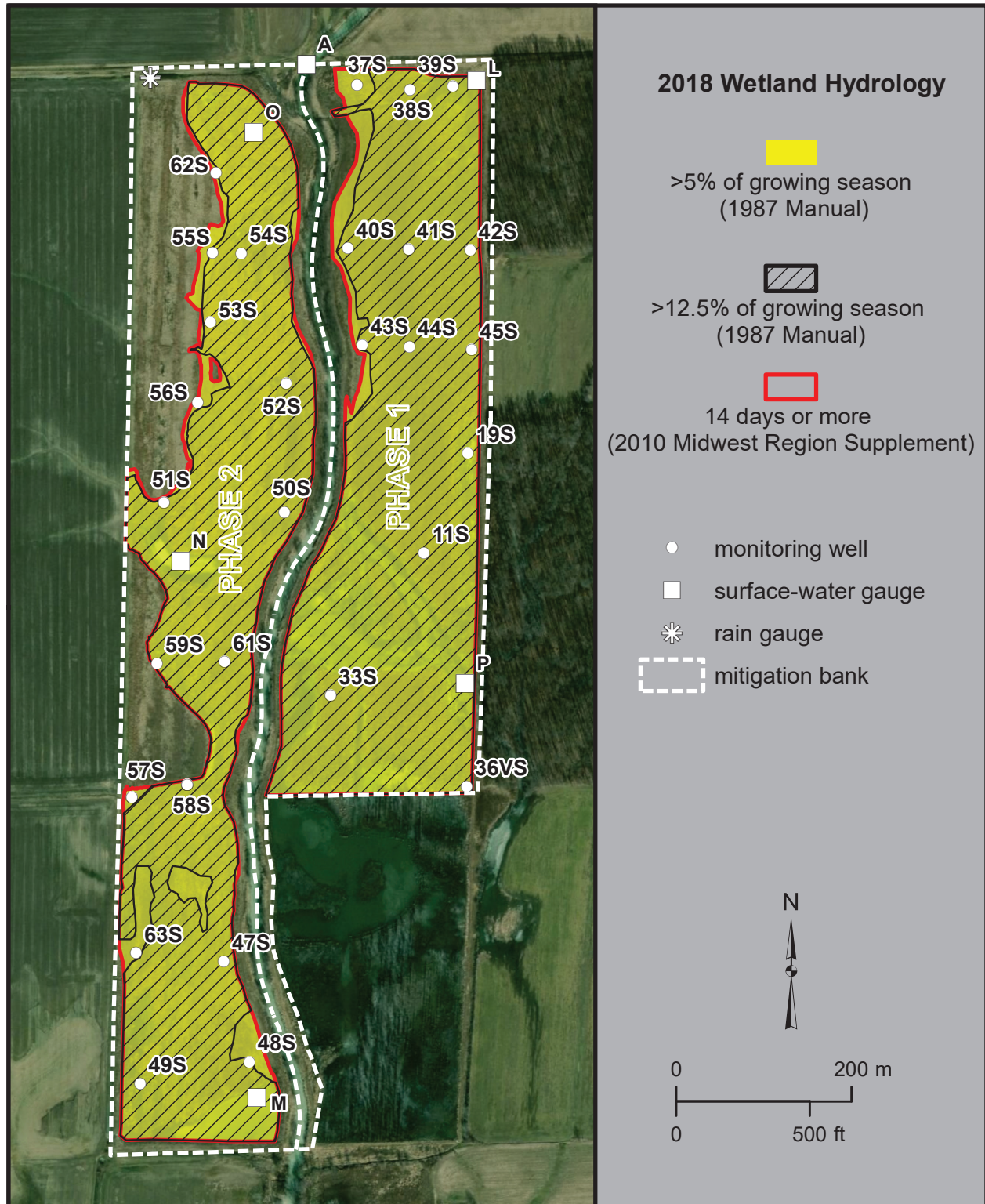


# Sugar Camp Creek Wetland and Stream Mitigation Bank

## Estimated Areal Extent of 2018 Wetland Hydrology

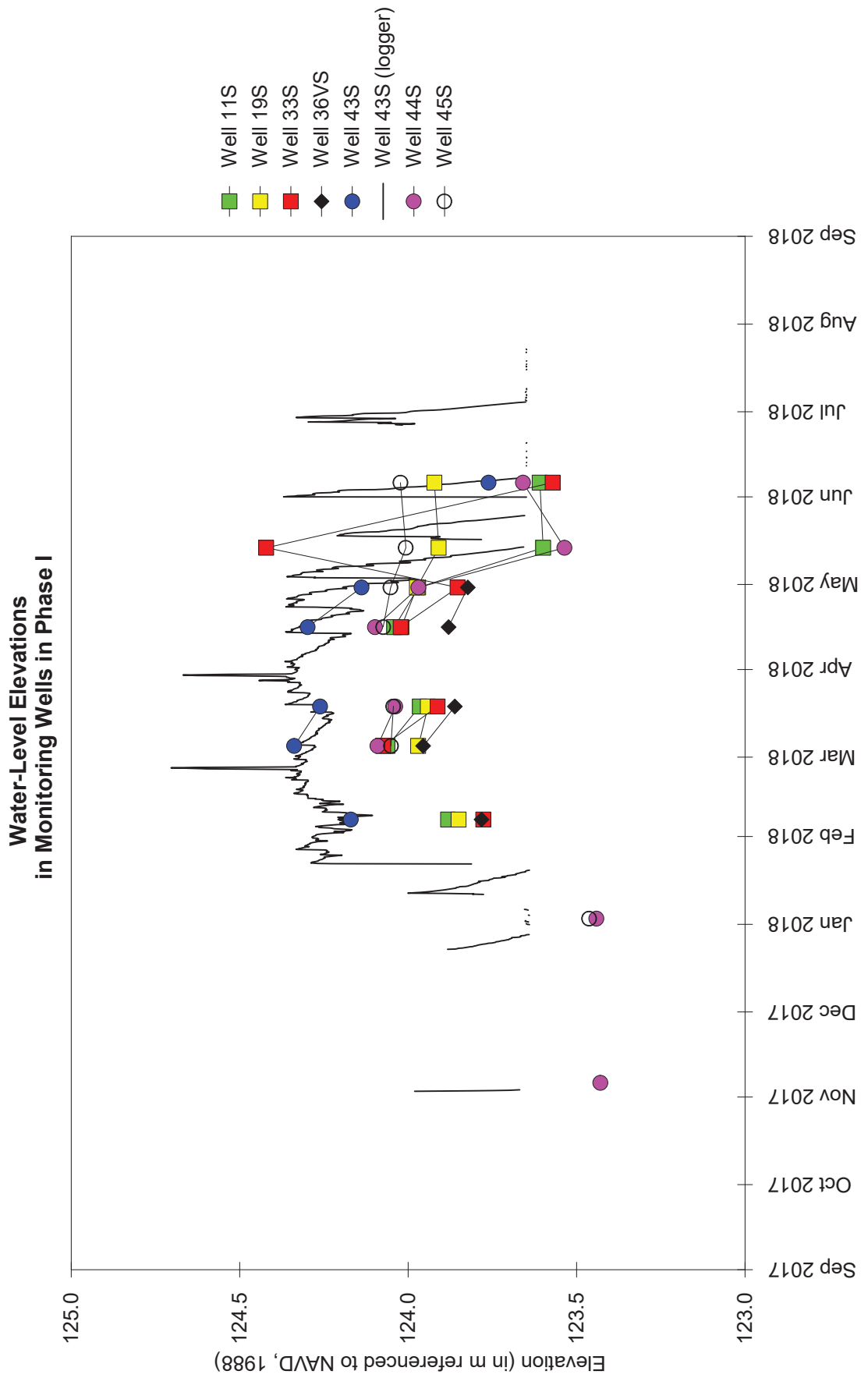
September 1, 2017 through August 31, 2018

Map based on imagery available from Esri (Esri 2018)



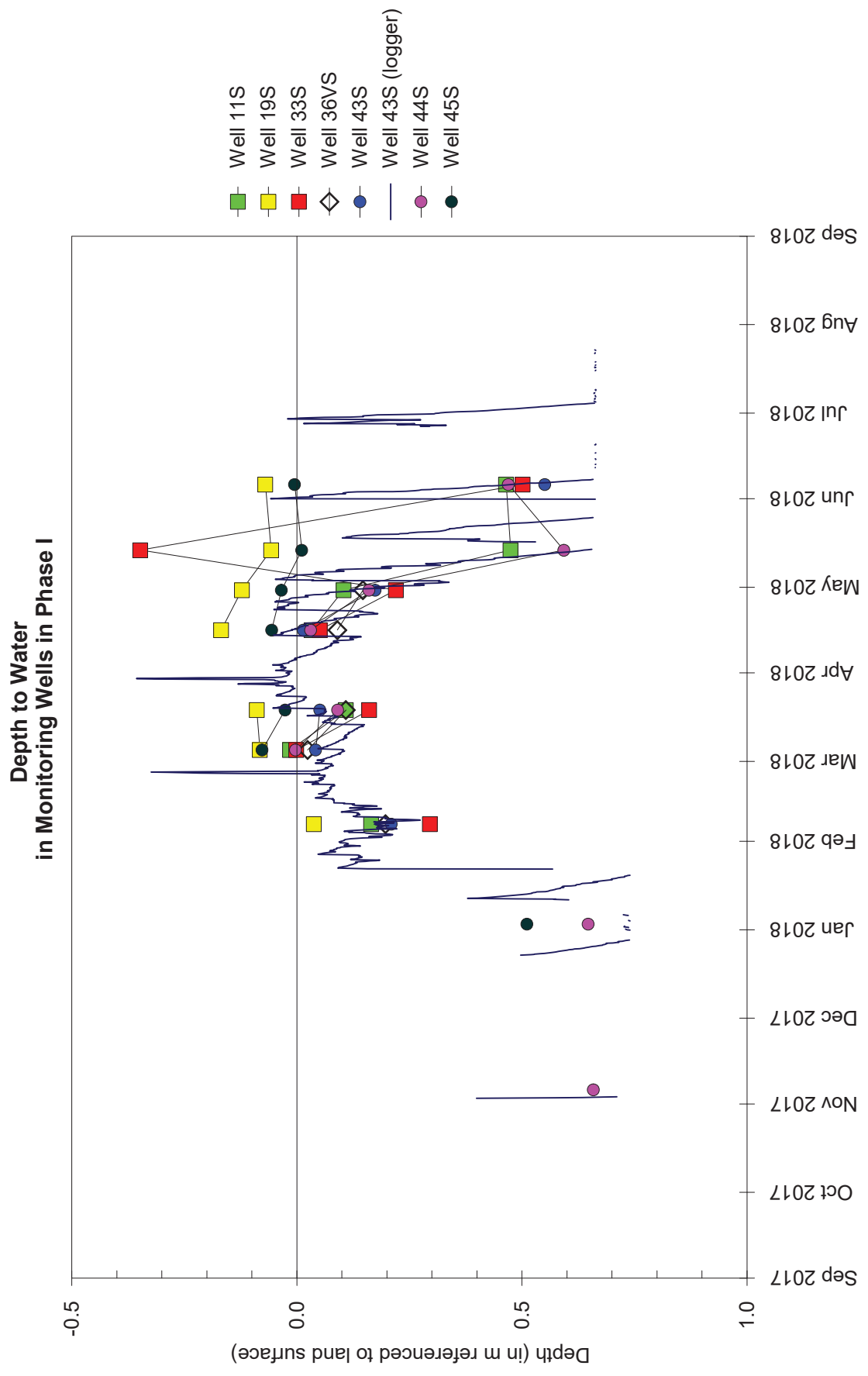


# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018

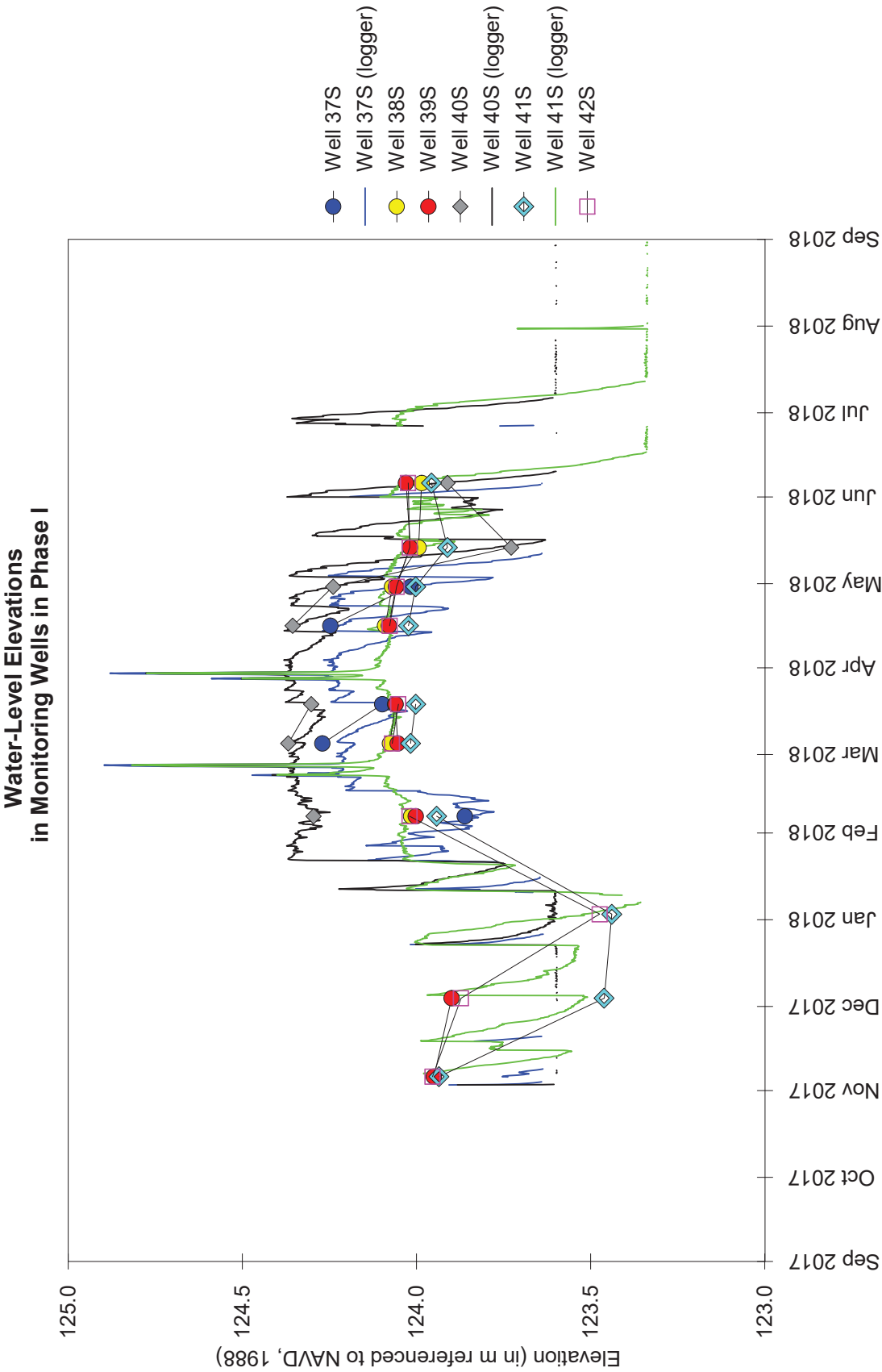




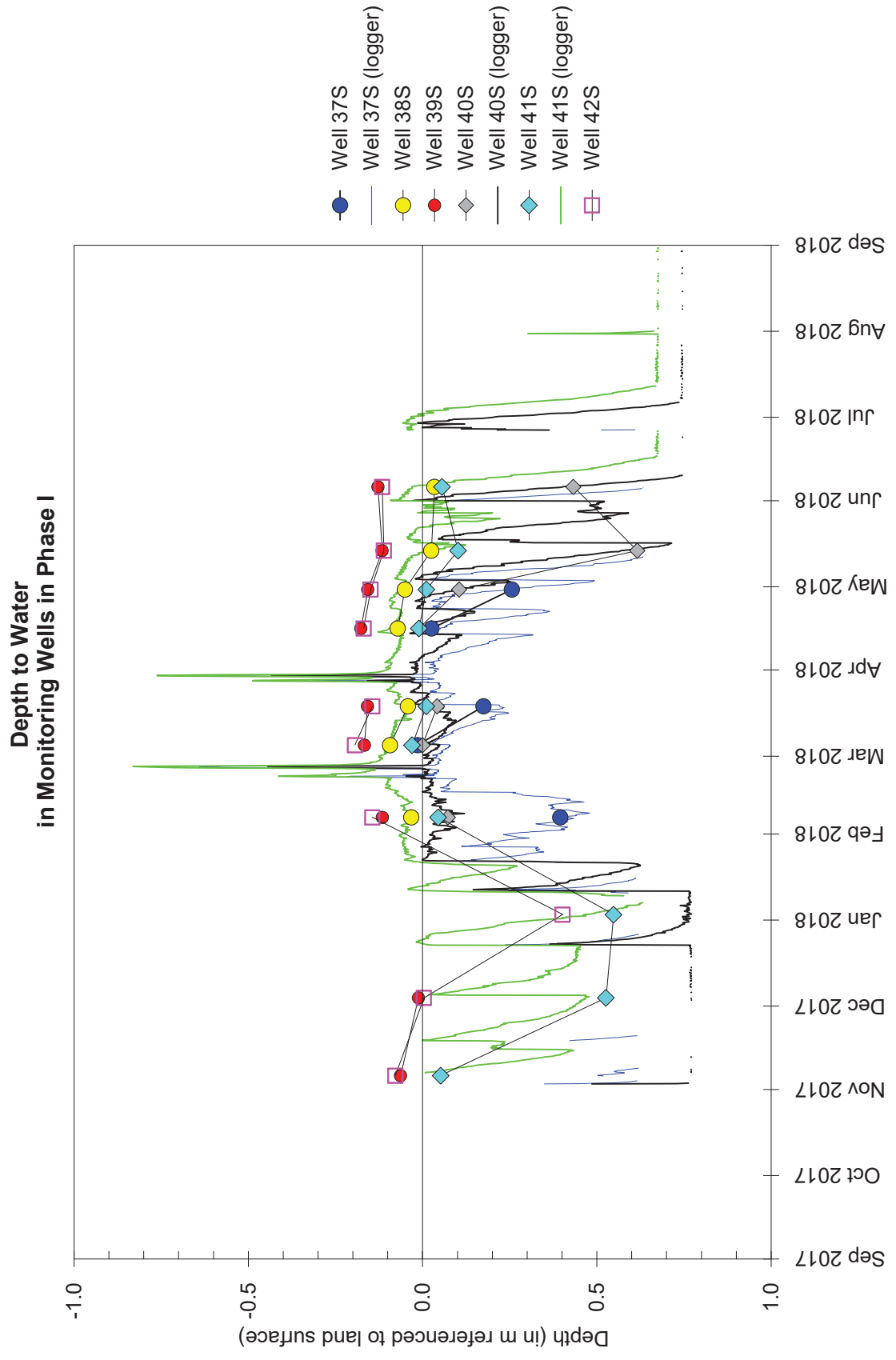
# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018



# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018

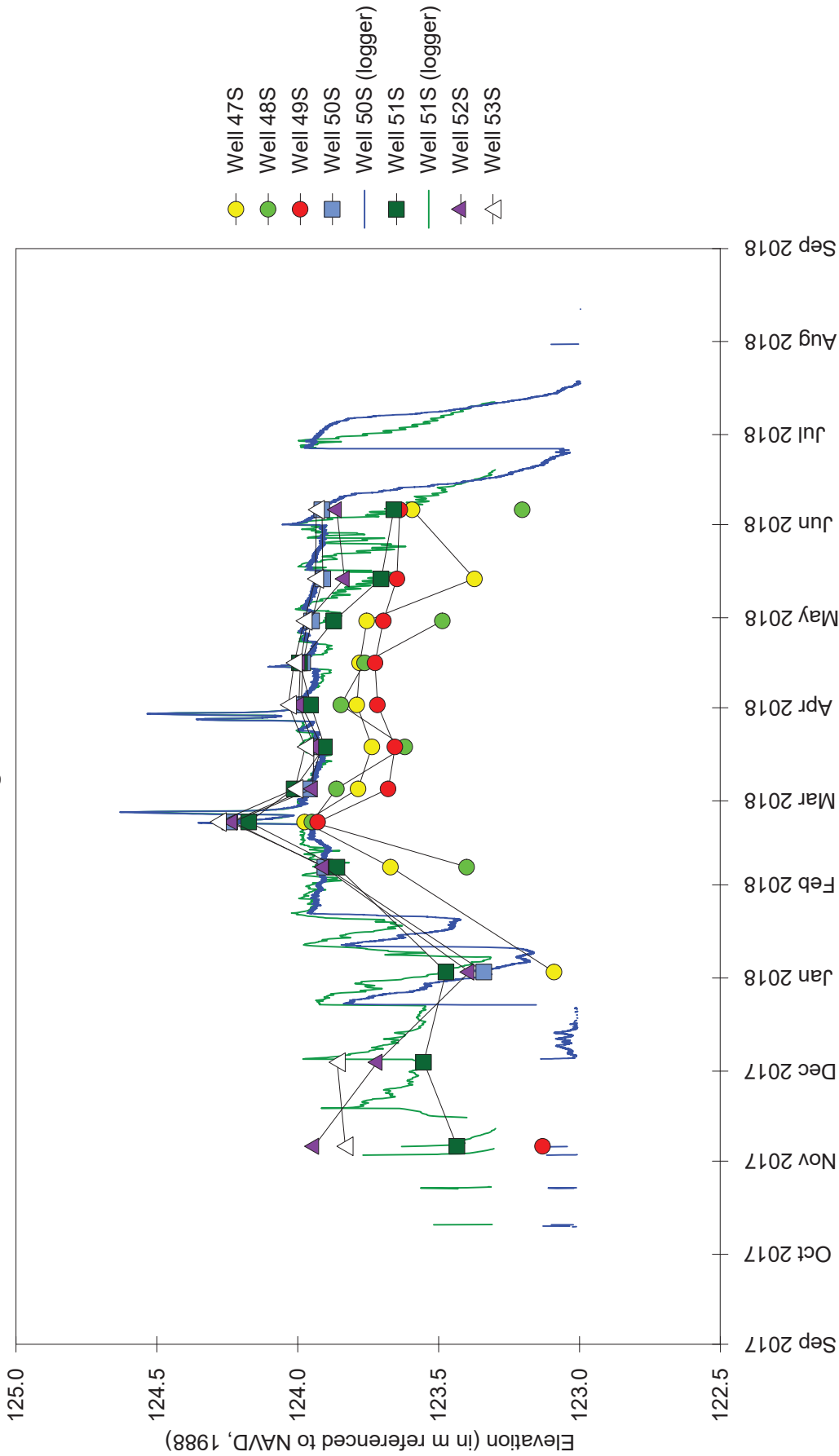


# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018

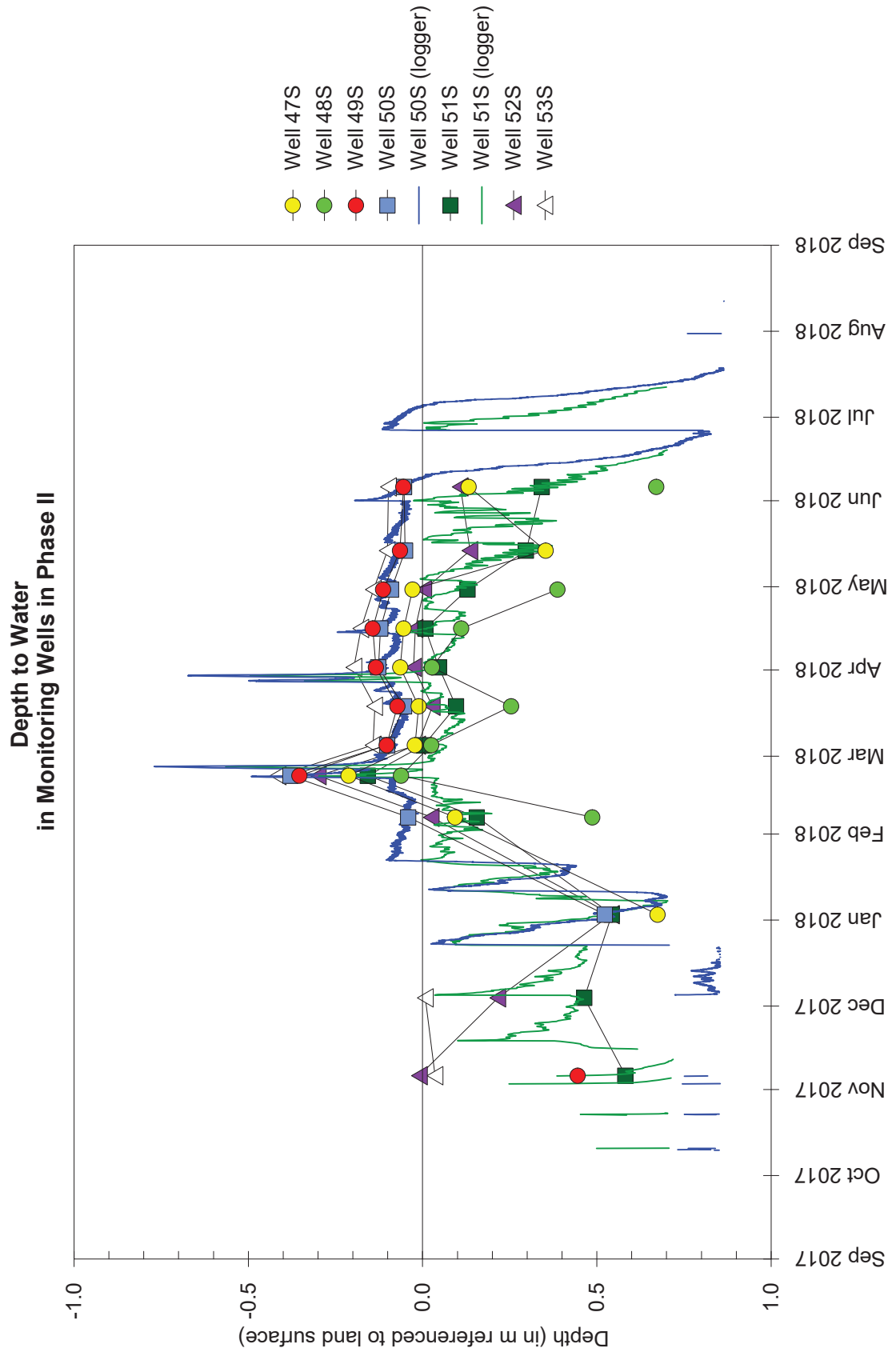


# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018

## Water-Level Elevations in Monitoring Wells in Phase II

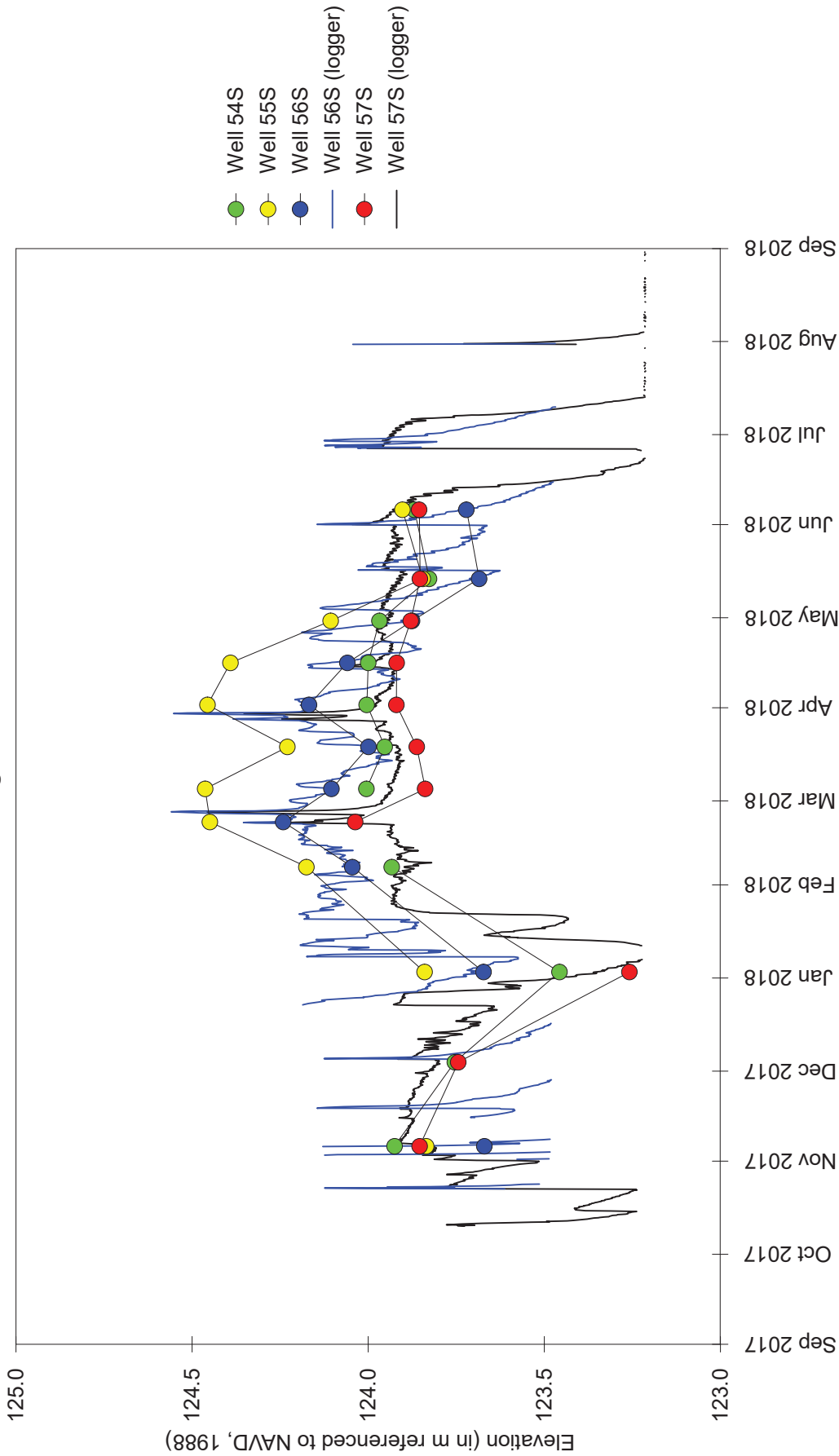


# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018



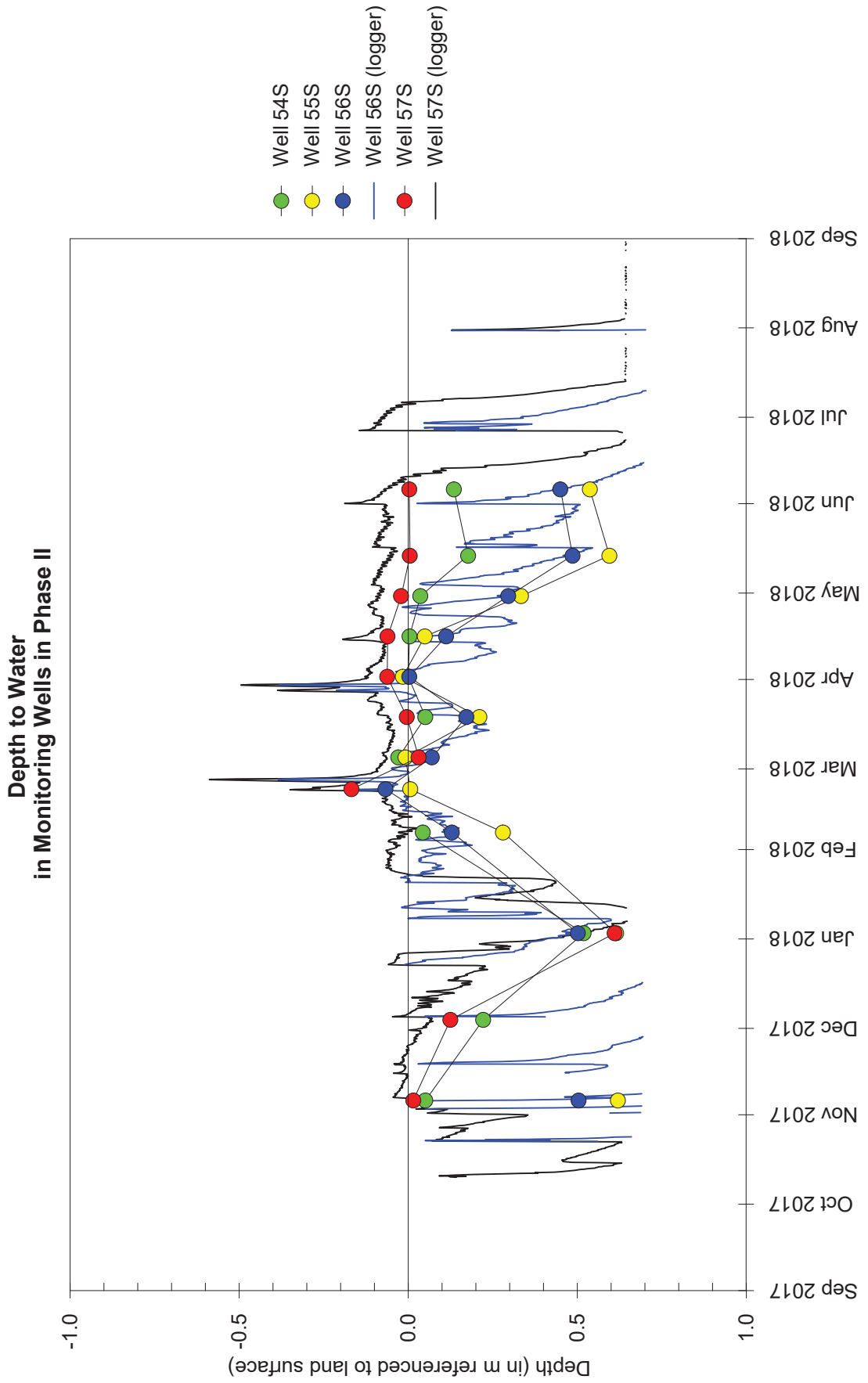
# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018

**Water-Level Elevations  
in Monitoring Wells in Phase II**

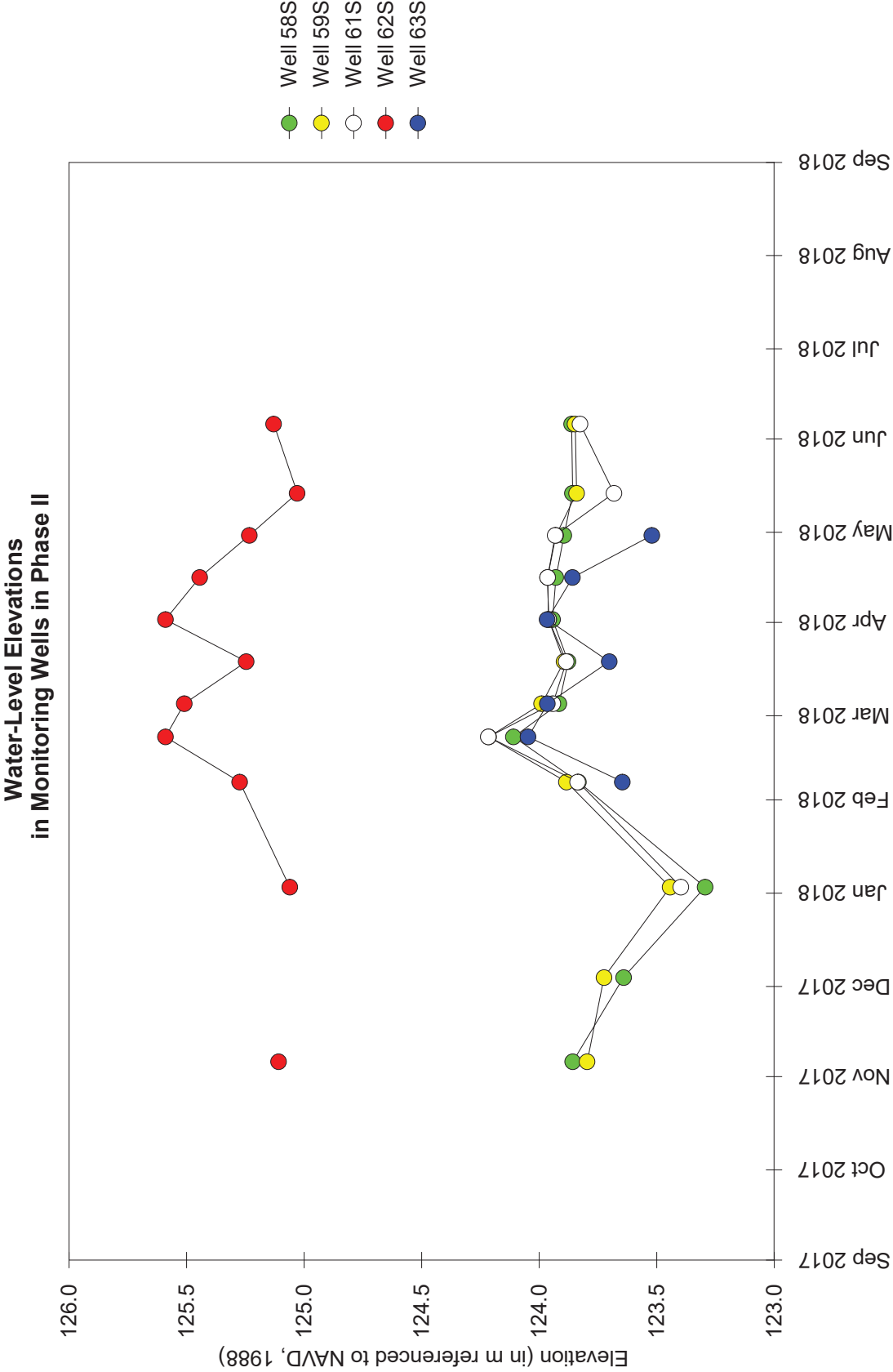




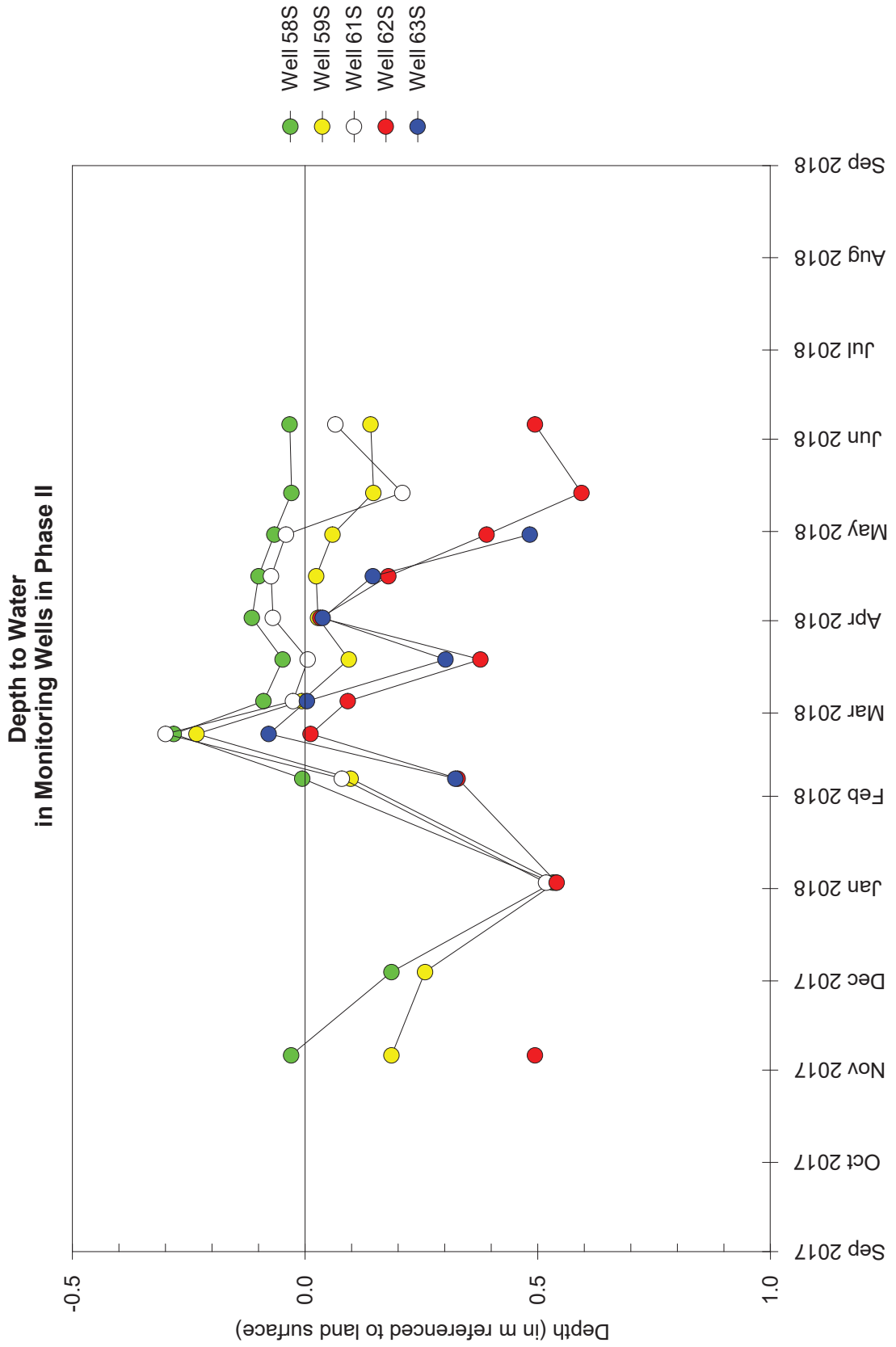
# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018



# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018

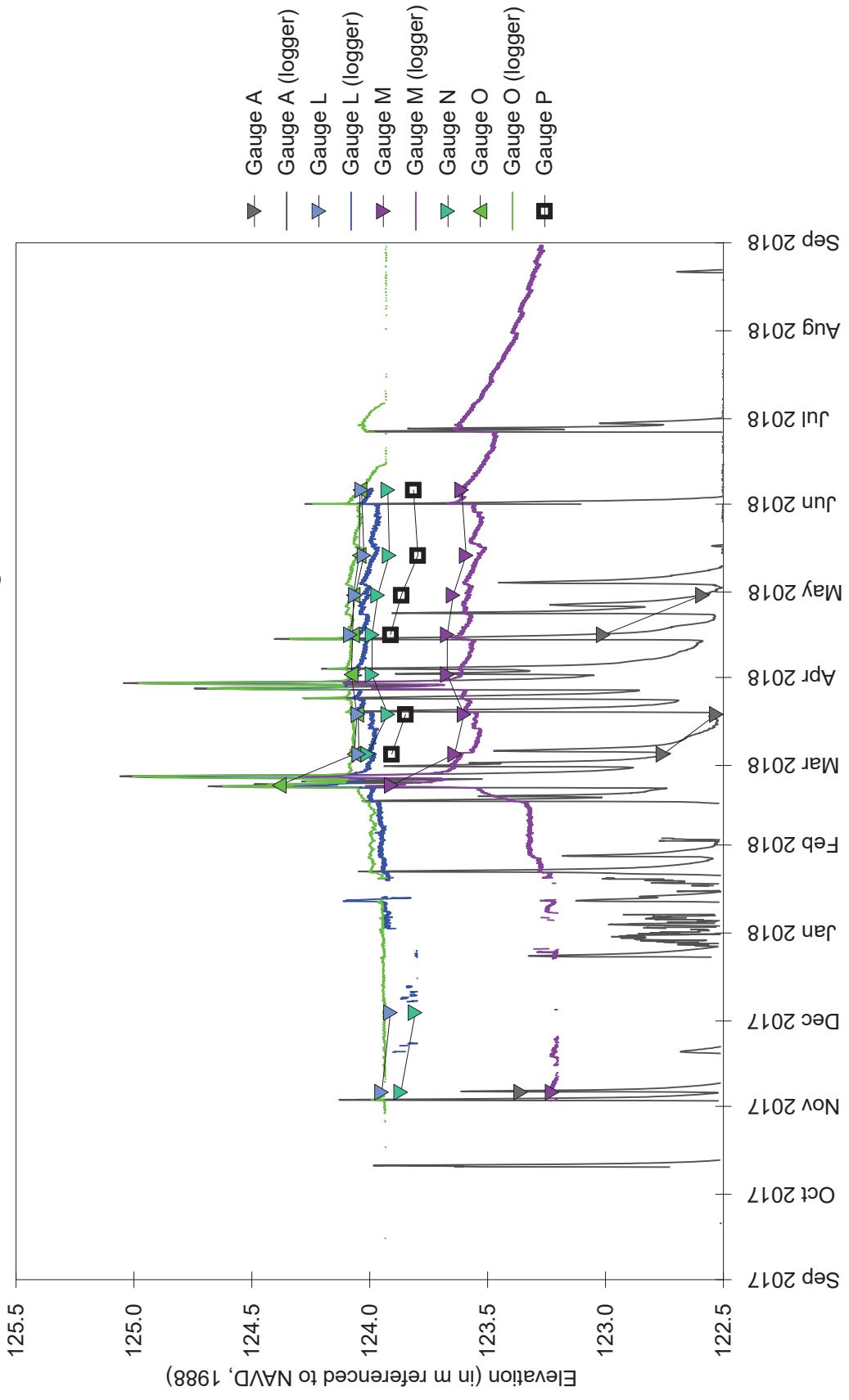


# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018



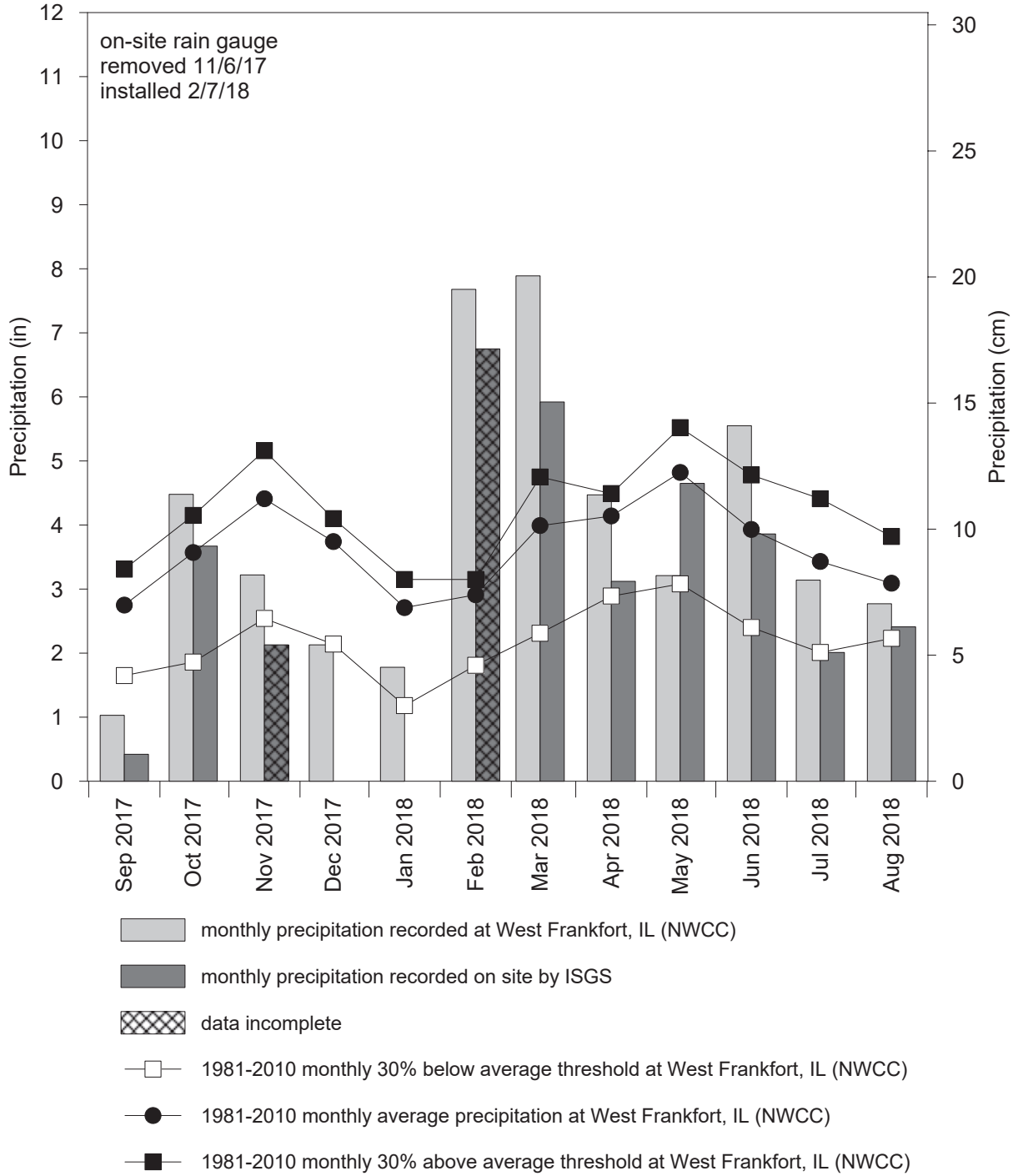
# Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2017 through August 31, 2018

Water-Level Elevations  
at Surface-Water Gauges



# Sugar Camp Creek Wetland and Stream Mitigation Bank September 2017 through August 2018

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



**PYRAMID SITE EC25  
WETLAND MITIGATION SITE**

**ISGS # 77**

Pyatts Blacktop  
FAS 864

Sequence #9778

Perry County, near Pinckneyville, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Manager: Audra M. Noyes

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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), 4.86 ha (12.00 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 2.02 ha (4.99 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 5.06 ha (12.51 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 2018). 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 19 was the starting date of the 2018 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Du Quoin, Illinois (MRCC station #112483), was 102% of normal. During spring 2018 (March through May), precipitation was 109% of normal.
- The period of maximum inundation and saturation during the 2018 growing season occurred between early March and mid-April due to frequent rainfall.
- In 2018, water levels measured in 16 of 18 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 6 of 18 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 17 of 18 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.



ADDITIONAL INFORMATION

- Four additional data loggers were added to the monitoring network in April 2018 to support the determination of areas satisfying wetland hydrology criteria.

PLANNED FUTURE ACTIVITIES

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

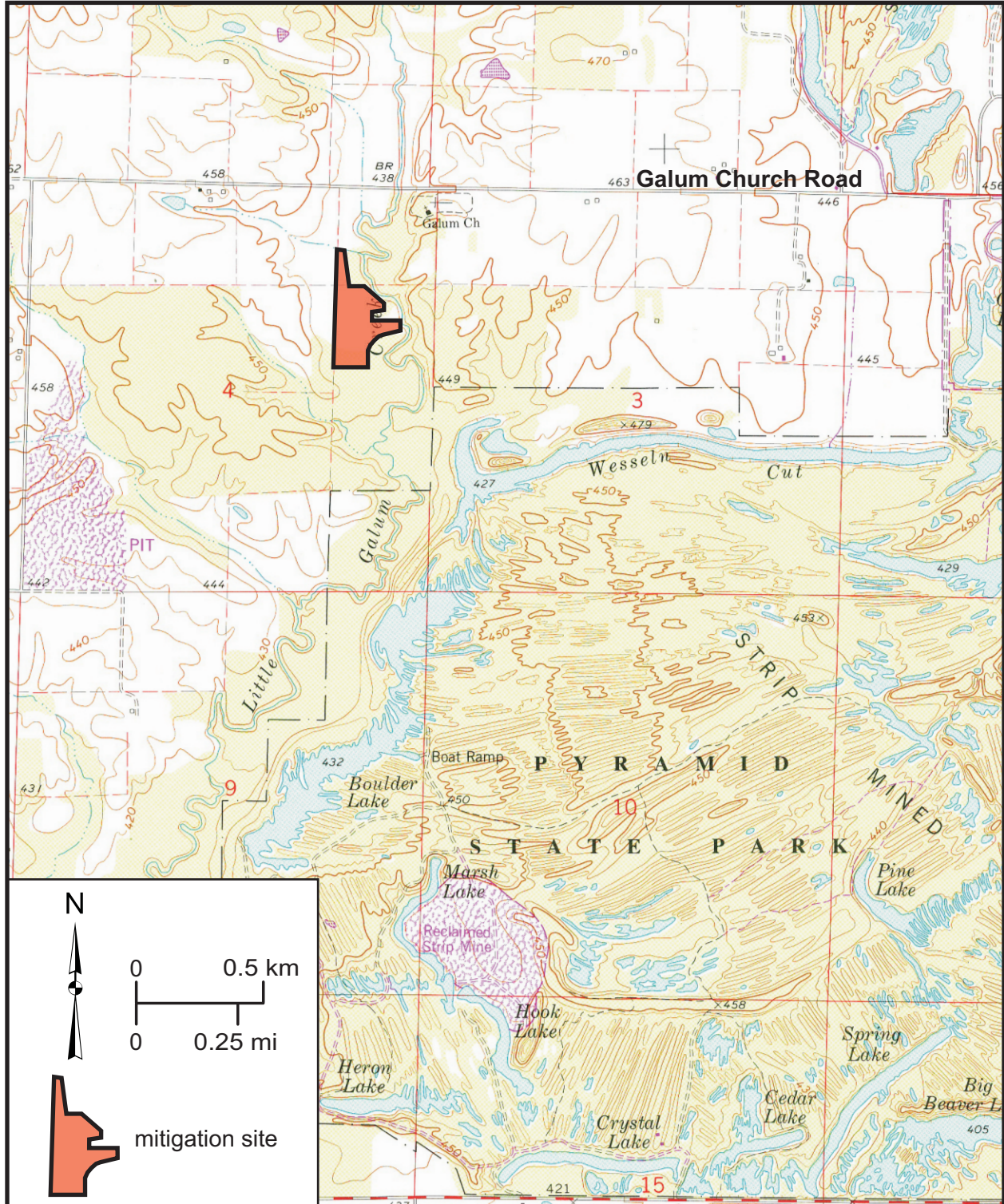
WETLAND HYDROLOGY TABLES FOR 2018

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
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	N	N	N
6S	N	N	Y
7S	Y	N	Y
7VS	Y	N	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

# 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 2018 Wetland Hydrology  
September 1, 2017 through August 31, 2018**

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



**2018 Wetland Hydrology**

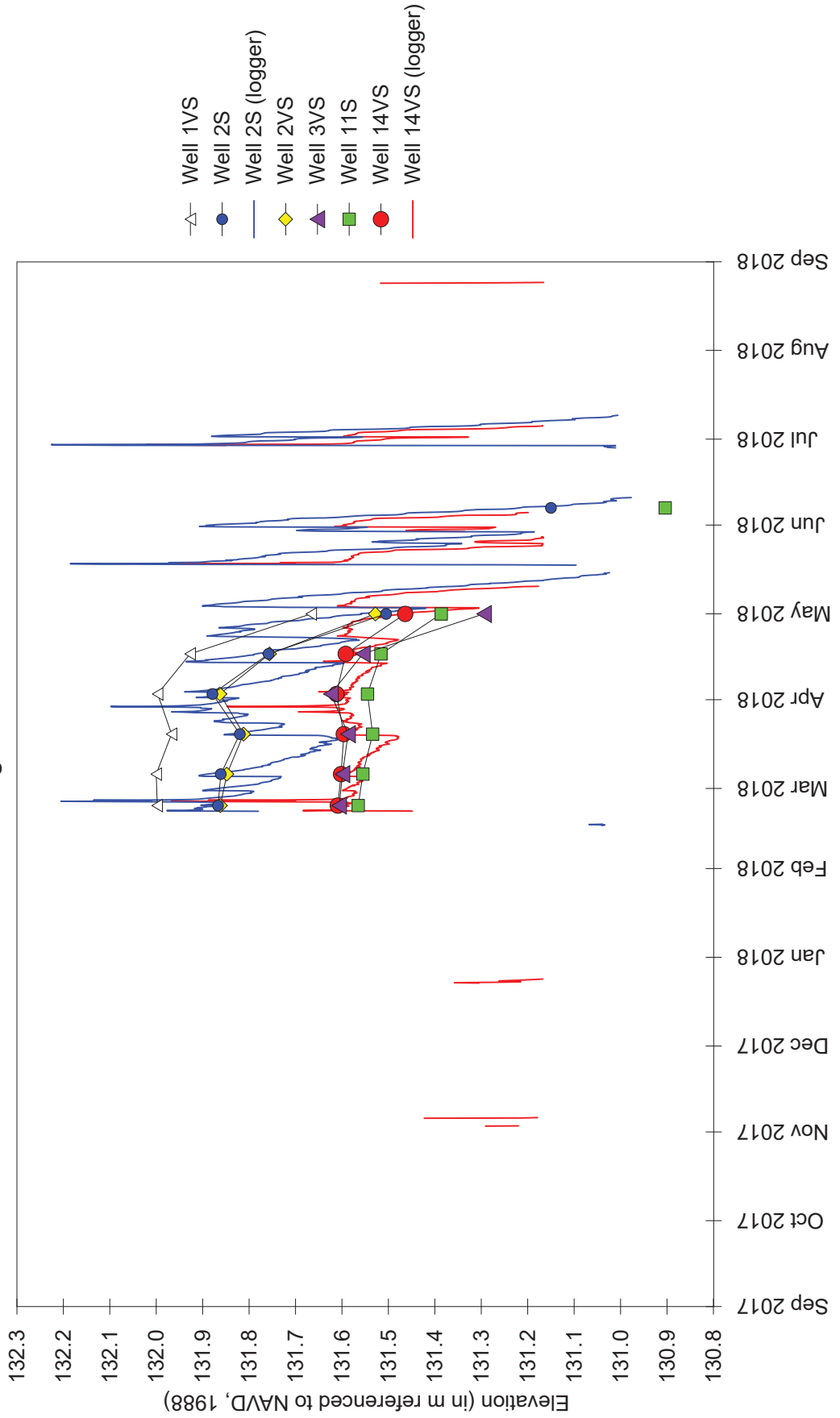
- >5% of growing season (1987 Manual)
- >12.5% of growing season (1987 Manual)
- 14 days or more (2010 Midwest Region Supplement)
- site boundary

- rain gauge
- monitoring well

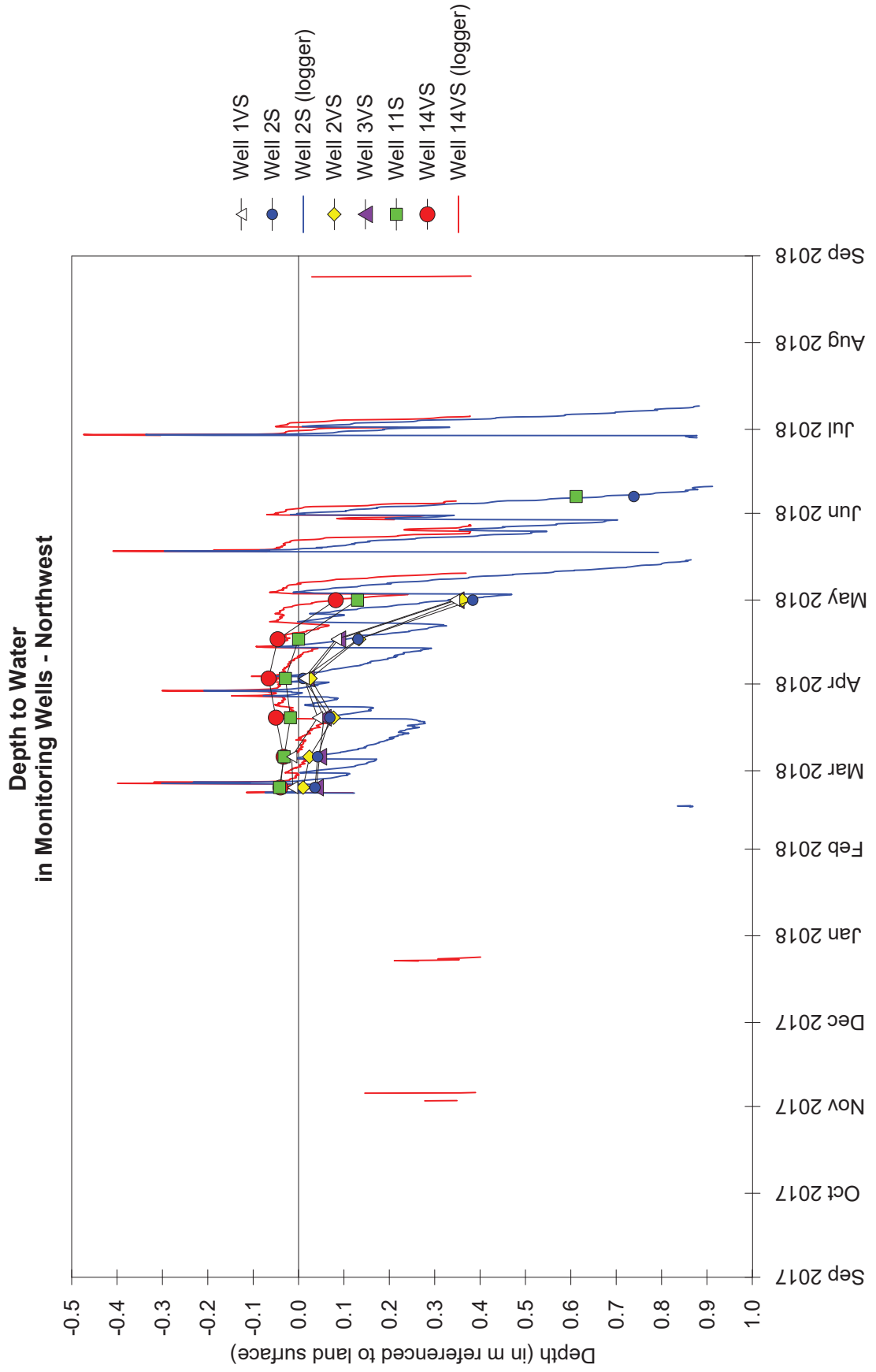


# Pyramid Site EC25 Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Monitoring Wells - Northwest

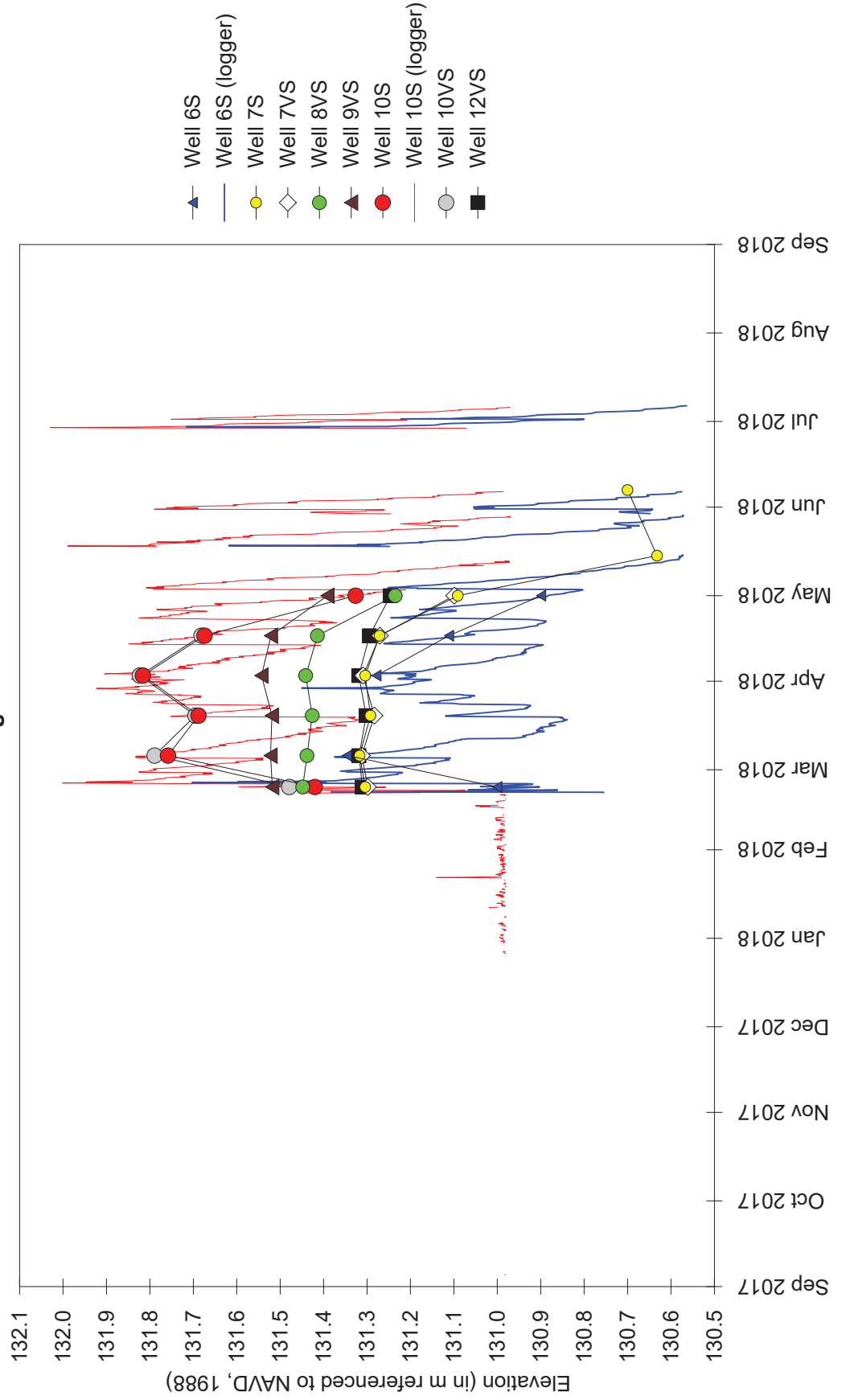


# Pyramid Site EC25 Wetland Mitigation Site September 1, 2017 through August 31, 2018



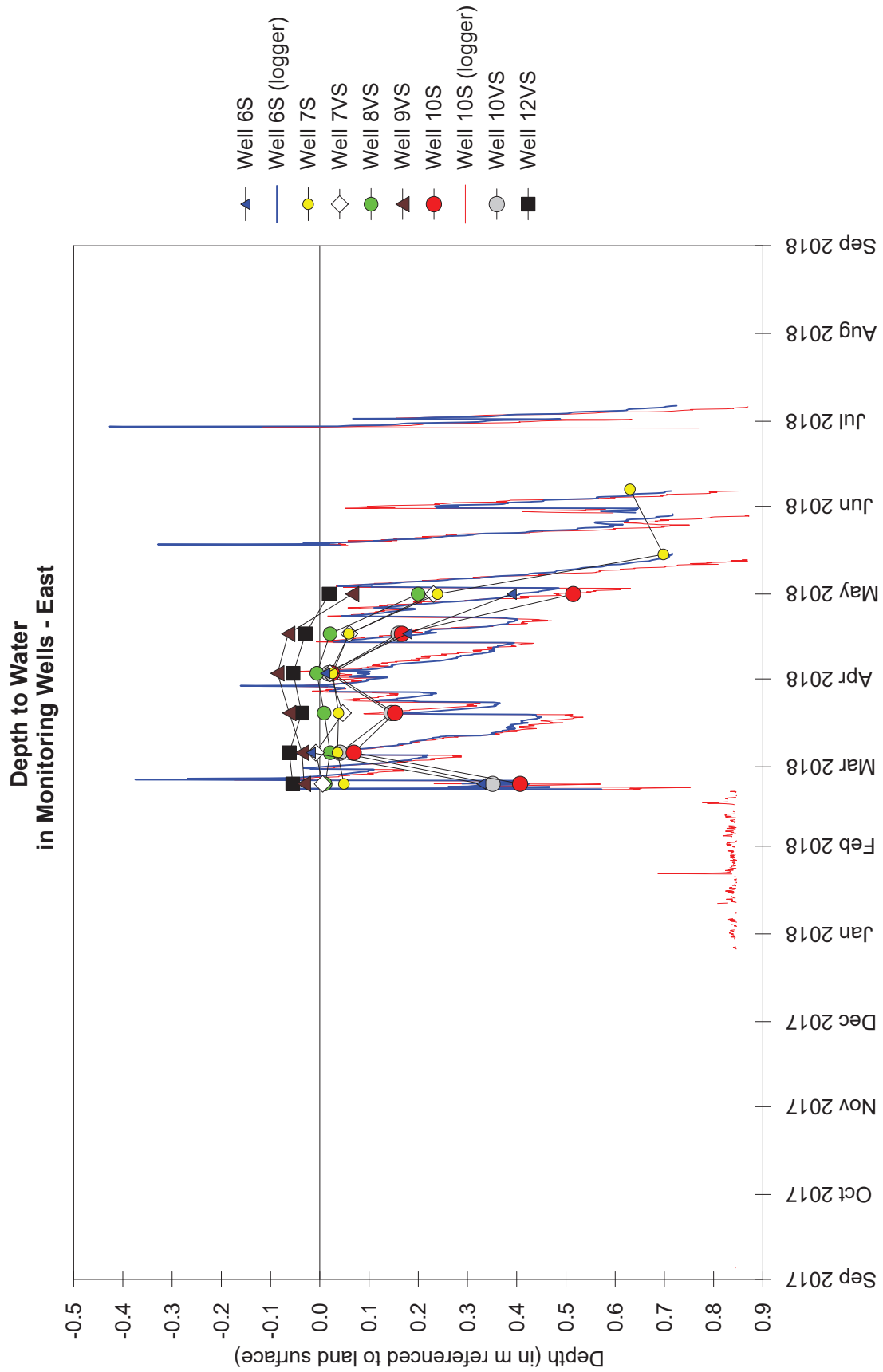
# Pyramid Site EC25 Wetland Mitigation Site September 1, 2017 through August 31, 2018

Water-Level Elevations  
in Monitoring Wells - East



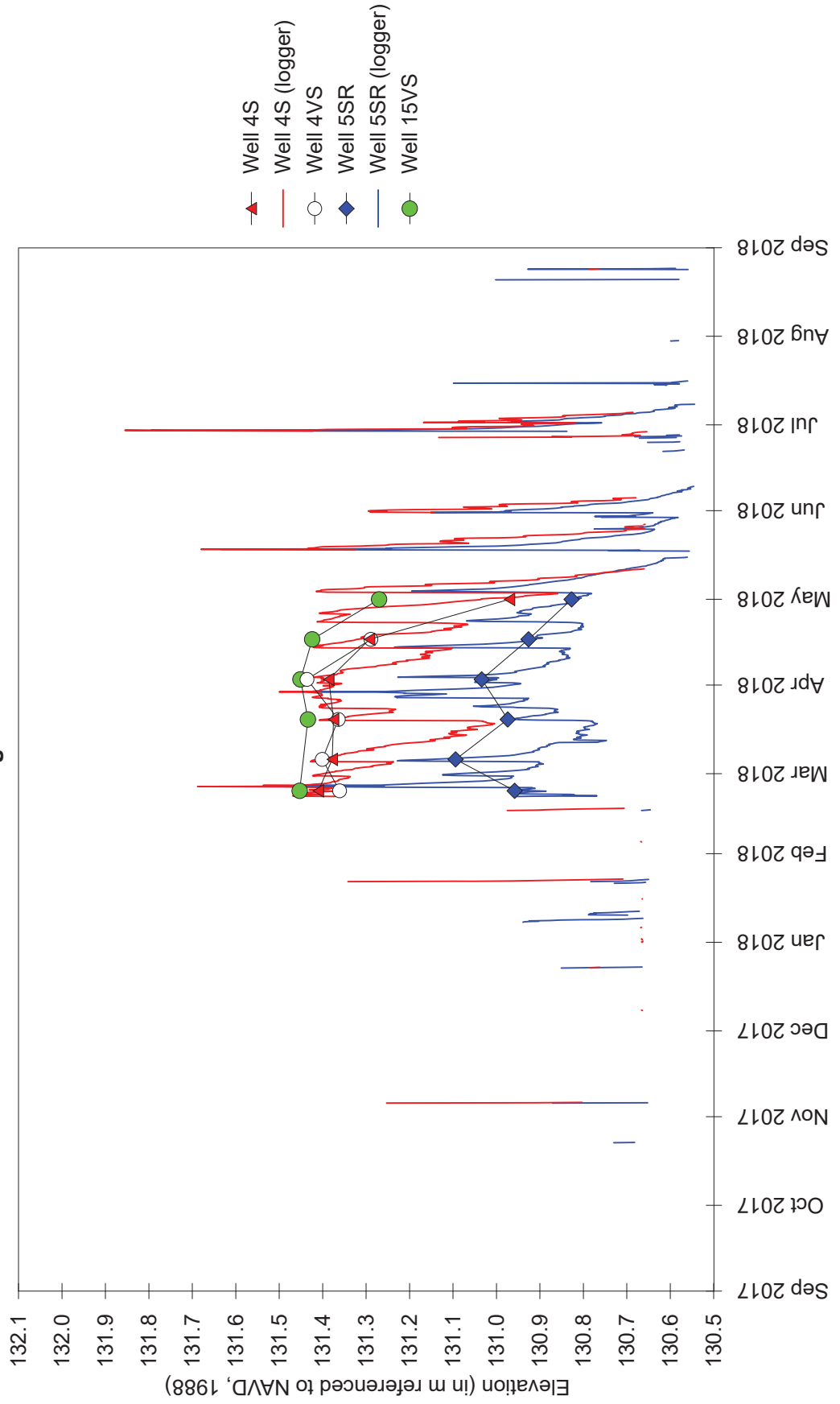


# Pyramid Site EC25 Wetland Mitigation Site September 1, 2017 through August 31, 2018

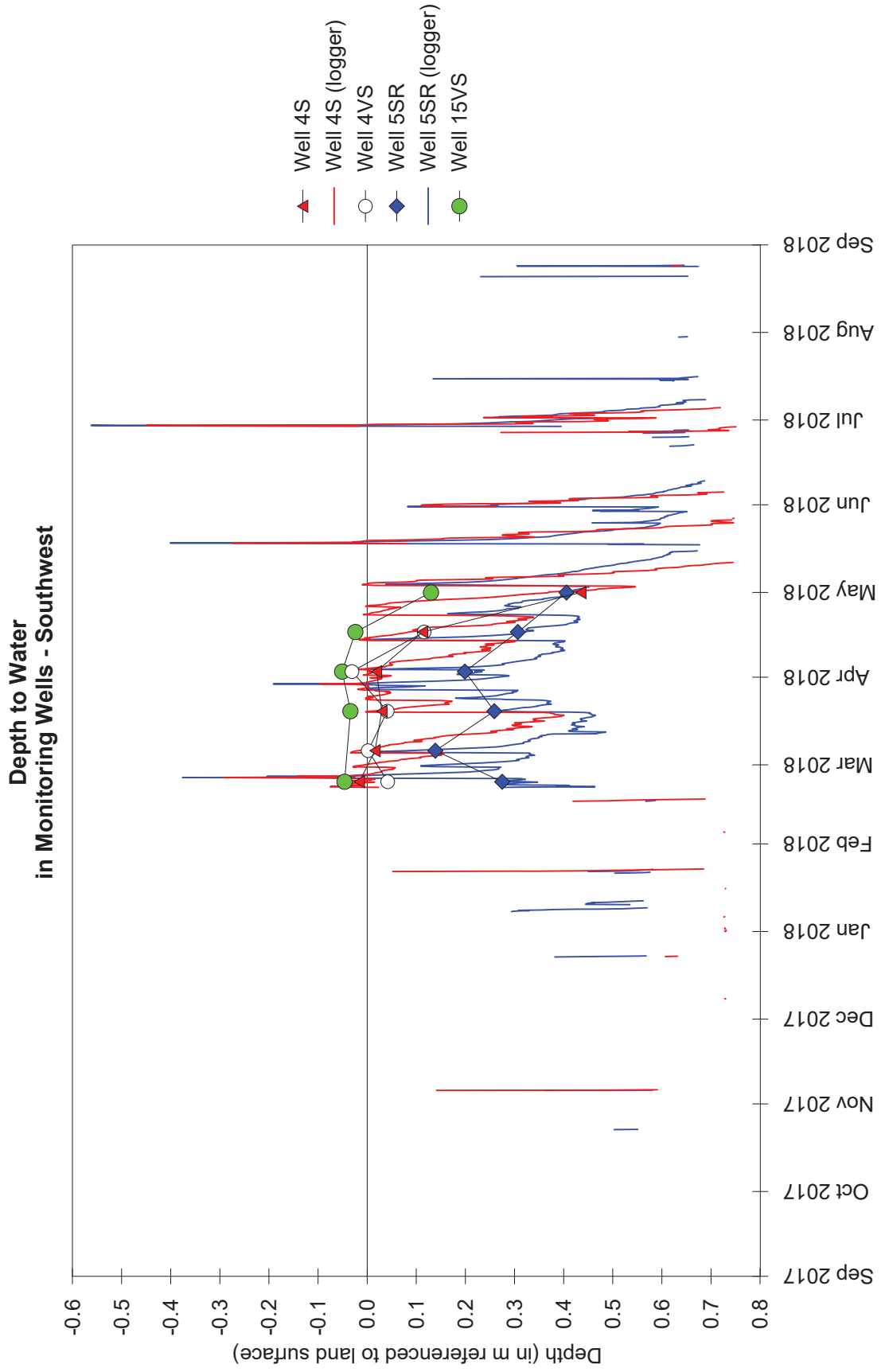


# Pyramid Site EC25 Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Monitoring Wells - Southwest

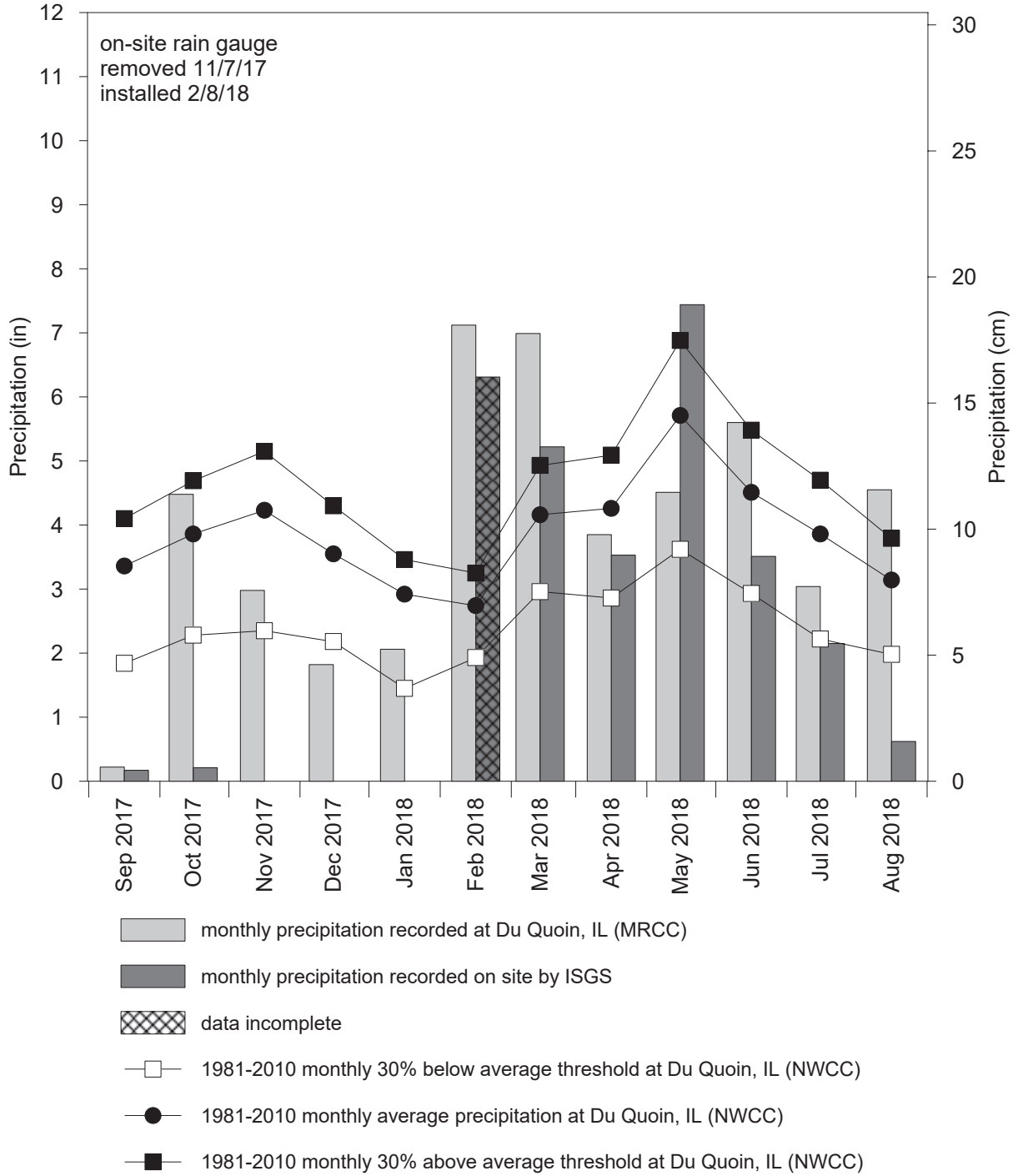


# Pyramid Site EC25 Wetland Mitigation Site September 1, 2017 through August 31, 2018



# Pyramid Site EC25 Wetland Mitigation Site September 2017 through August 2018

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



**HARRISBURG, SITE 2**  
**WETLAND MITIGATION SITE**

**ISGS #78**

IL 14

FAP 857

Sequence #547

Saline County, near Harrisburg, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Audra M. Noyes

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

The target compensation area for the Harrisburg, Site 2 wetland mitigation site is 4.13 ha (10.20 ac). Using the 1987 Manual (Environmental Laboratory 1987), 8.65 ha (21.38 ac) out of a total site area of approximately 14.16 ha (35.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season, and 7.47 ha (18.47 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 8.68 ha (21.45 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 2018). 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 14 was the starting date of the 2018 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 102% of normal, and spring 2018 (March through May) precipitation was 109% of normal.
- The period of maximum inundation and saturation during the 2018 growing season occurred during April. Rainfall amounts were near to slightly above normal during this period. Further, three brief floods occurred during April in response to heavy rainfall events although these floods only inundated areas immediately adjacent to the ditch and none lasted more than a few hours.
- In 2018, water levels measured in 22 of 22 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season and 21 of 22 wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987

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

**PLANNED FUTURE ACTIVITIES**

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

**WETLAND HYDROLOGY TABLES FOR 2018**

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
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	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
16S	Y	Y	Y
17S	Y	Y	Y
18S	Y	Y	Y
19S	Y	Y	Y
20VS	Y	Y	Y
21VS	Y	N	Y
23VS	Y	Y	Y

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

<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
B	112.35 m (368.60 ft)	112.53 m (369.19 ft)	112.35 m (368.60 ft)
H	113.05 m (370.90 ft)	113.03 m (370.83 ft)	113.05 m (370.90 ft)

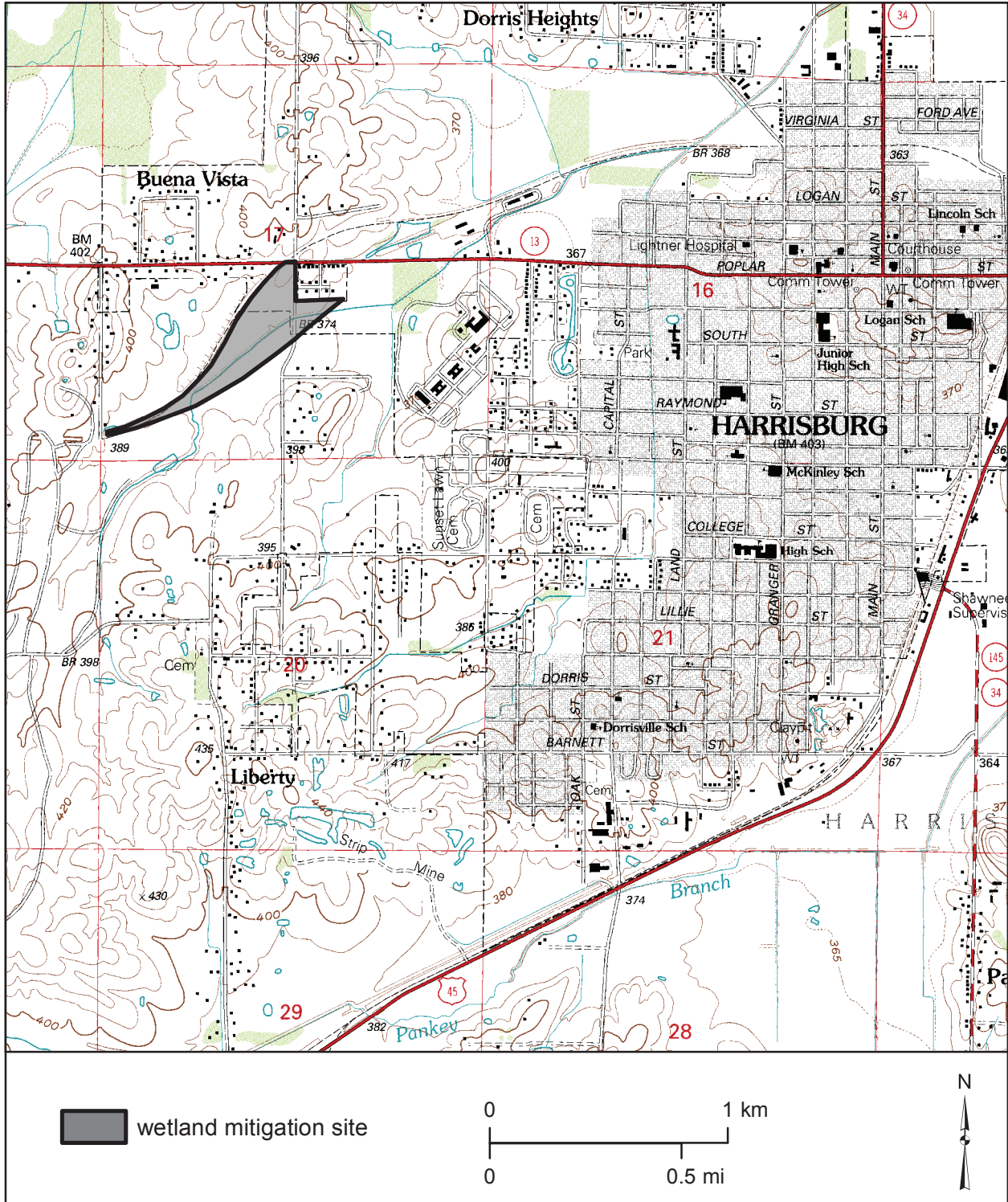
n/a – insufficient data to determine an elevation



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

## General Study Area and Vicinity

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



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

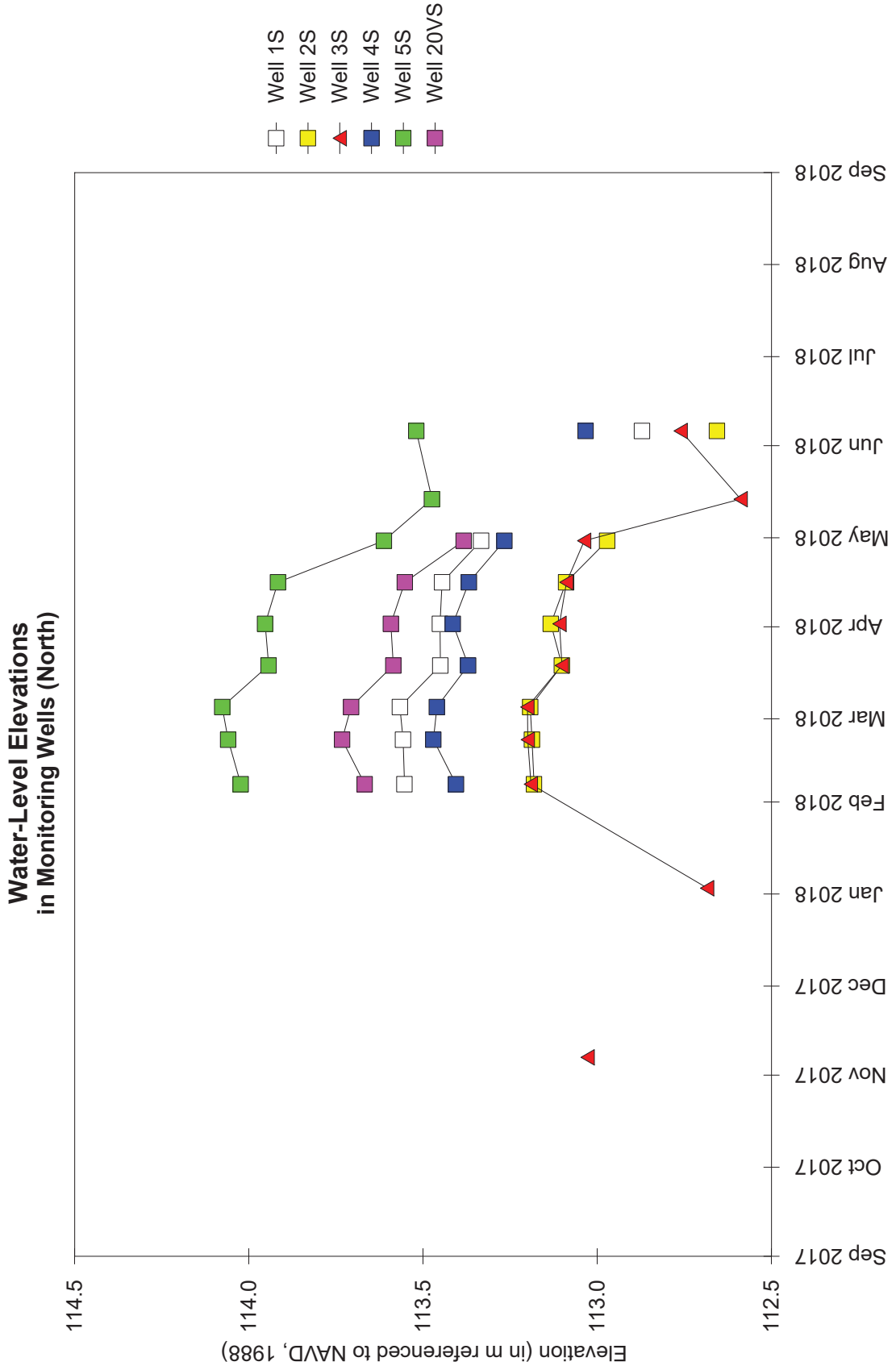
## Estimated Areal Extent of 2018 Wetland Hydrology

September 1, 2017 through August 31, 2018  
Map based on imagery available from Esri (Esri 2018)

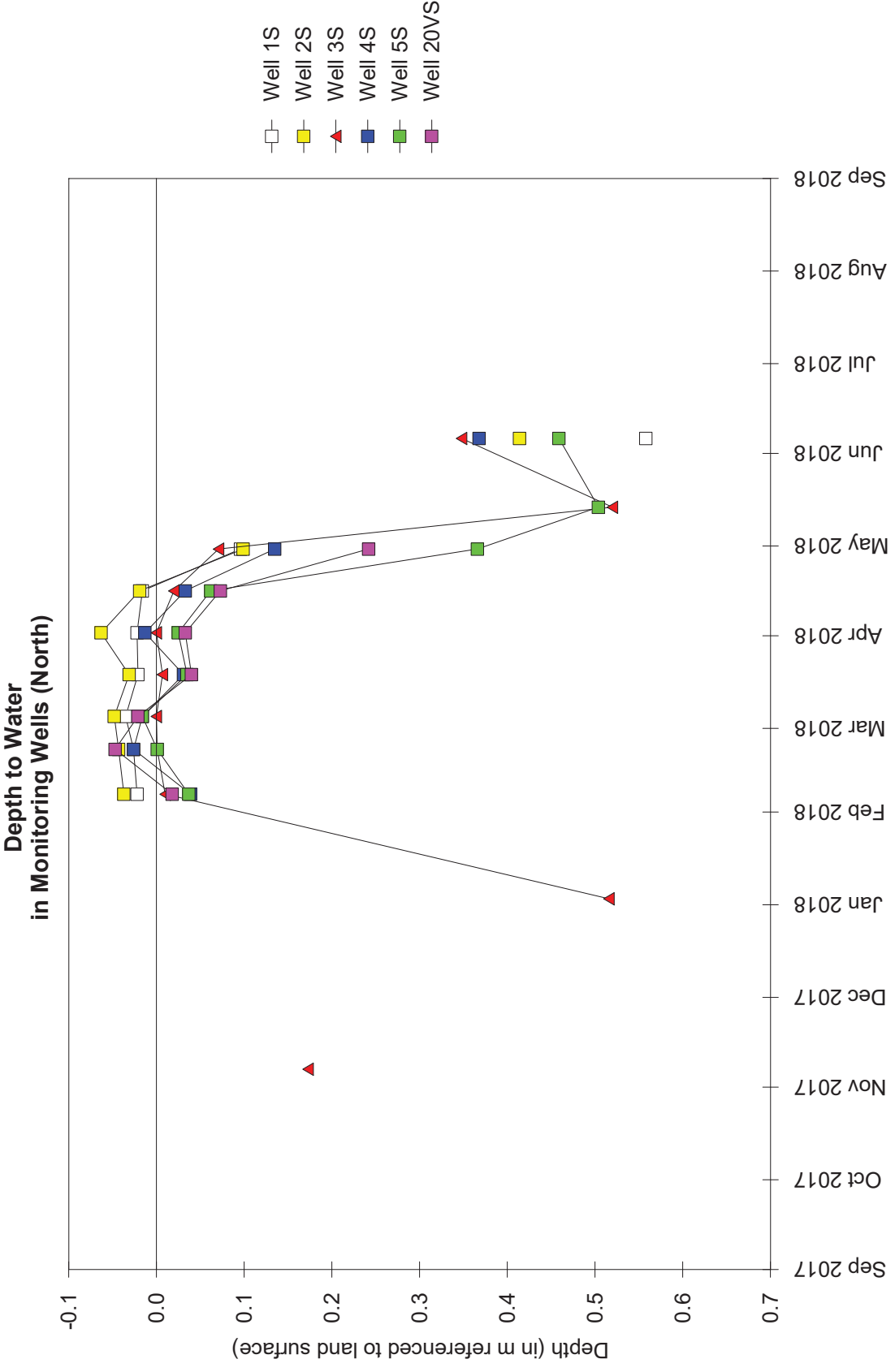




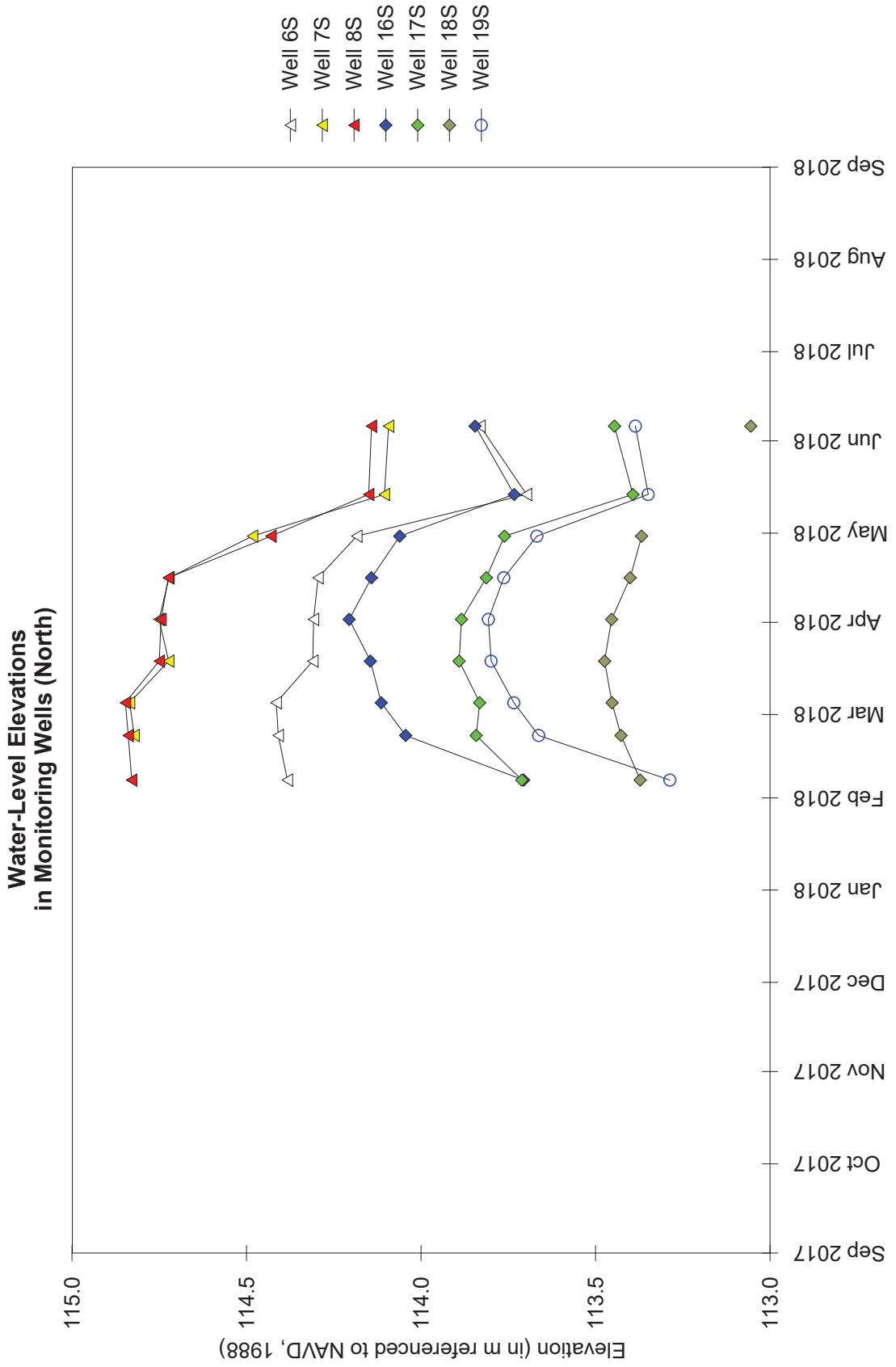
# Harrisburg, Site 2 Wetland Mitigation Site September 1, 2017 through August 31, 2018



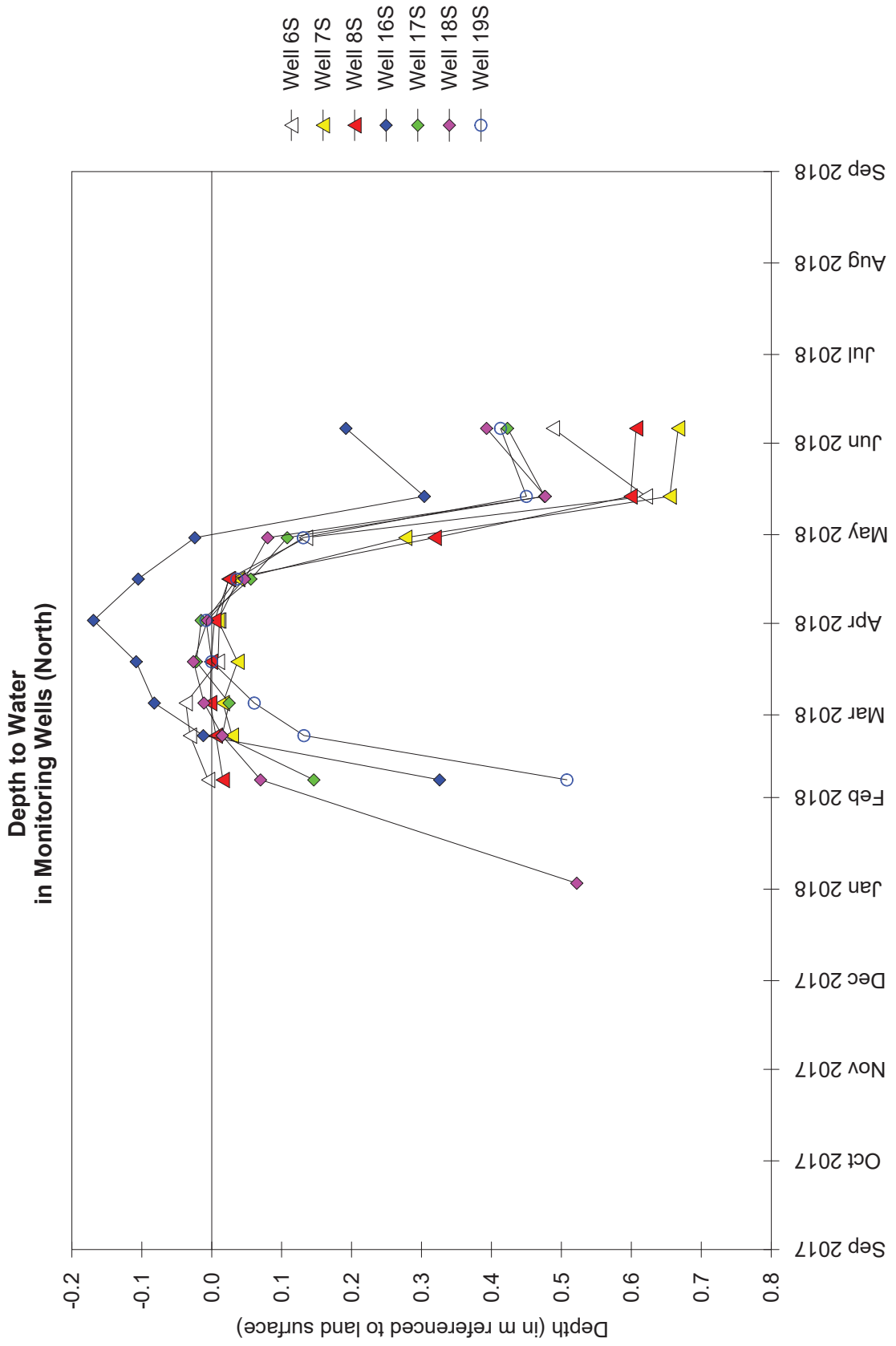
### Harrisburg, Site 2 Wetland Mitigation Site September 1, 2017 through August 31, 2018



# Harrisburg, Site 2 Wetland Mitigation Site September 1, 2017 through August 31, 2018

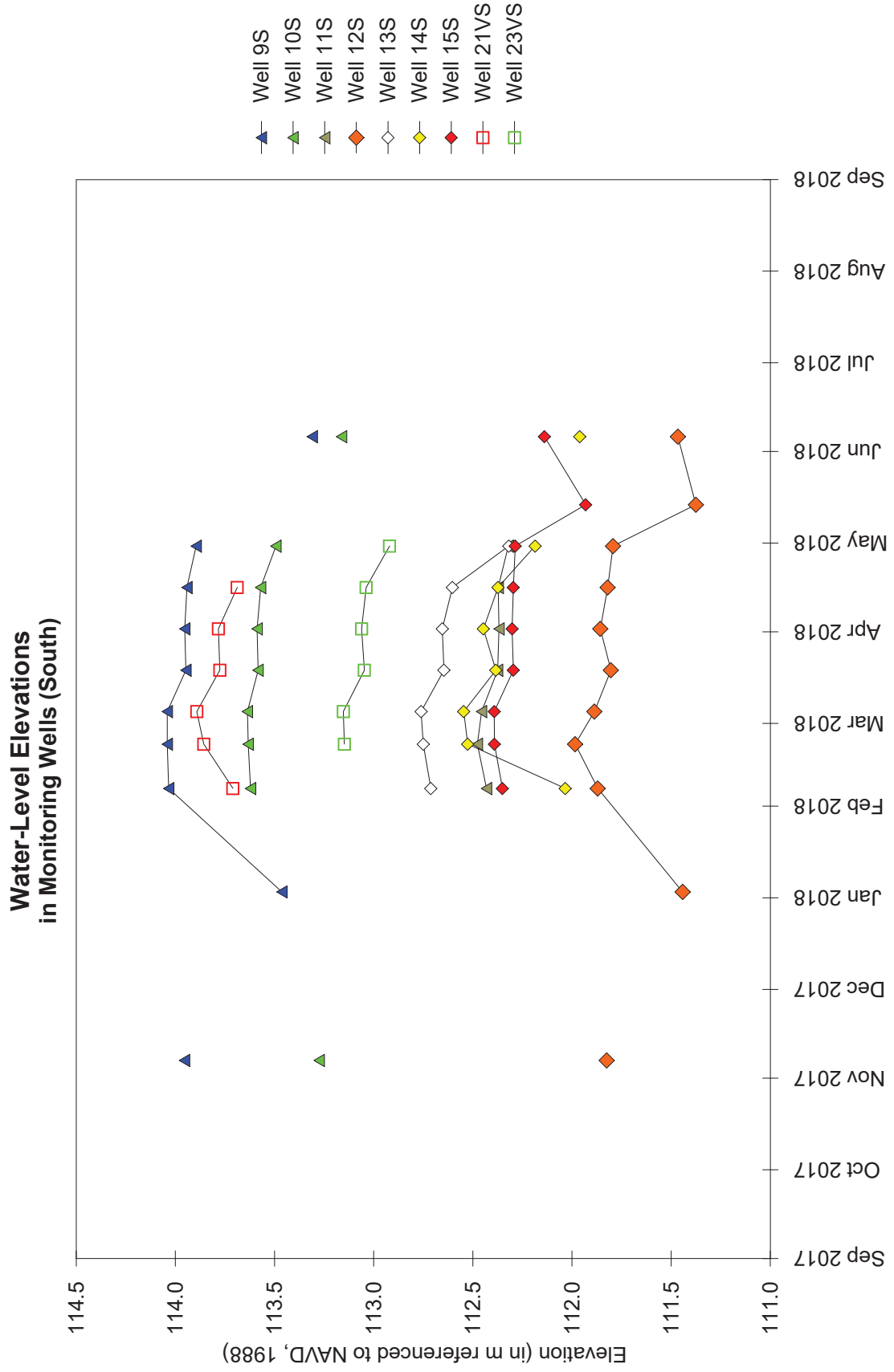


**Harrisburg, Site 2 Wetland Mitigation Site**  
**September 1, 2017 through August 31, 2018**

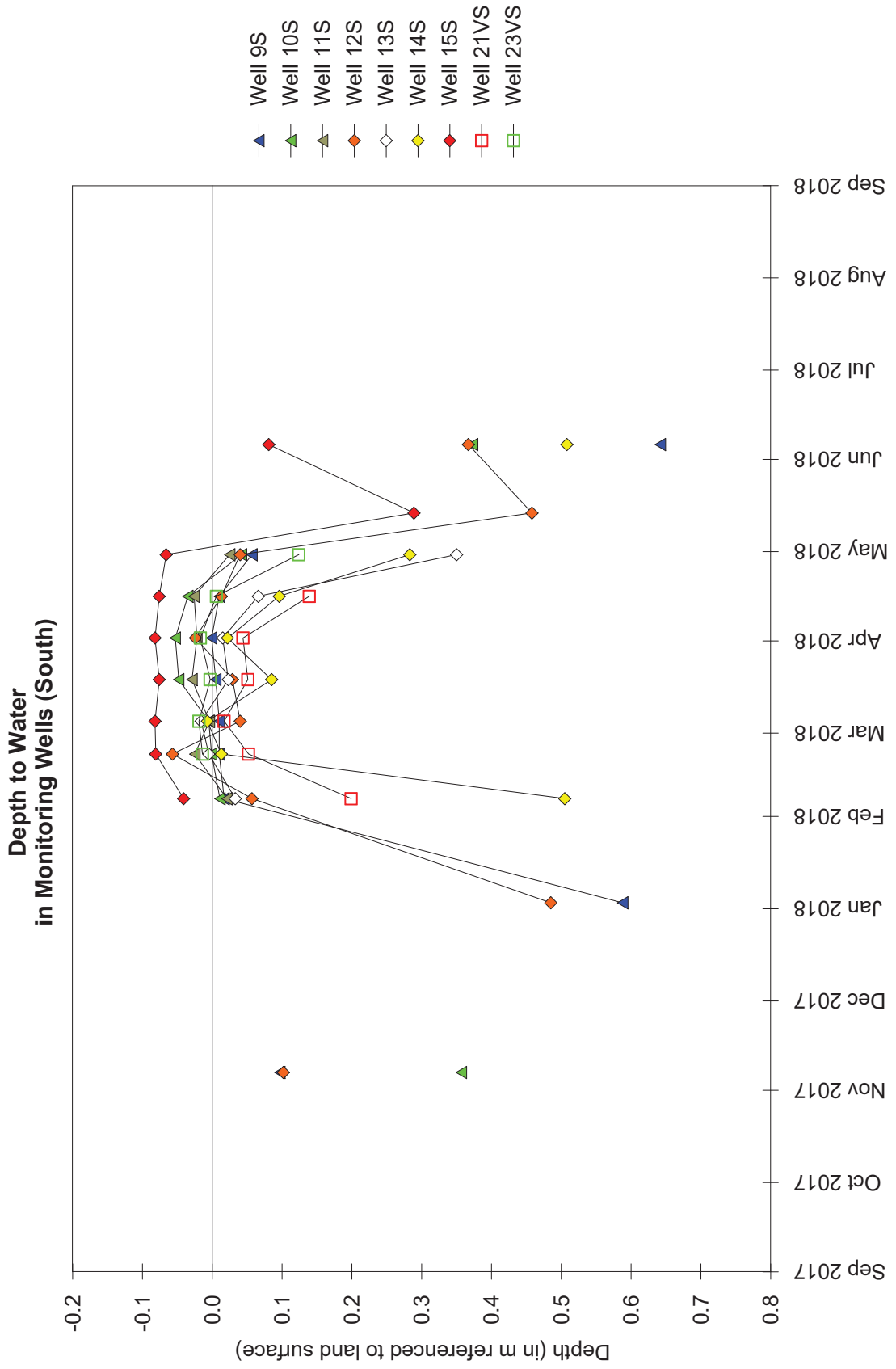




# Harrisburg, Site 2 Wetland Mitigation Site September 1, 2017 through August 31, 2018

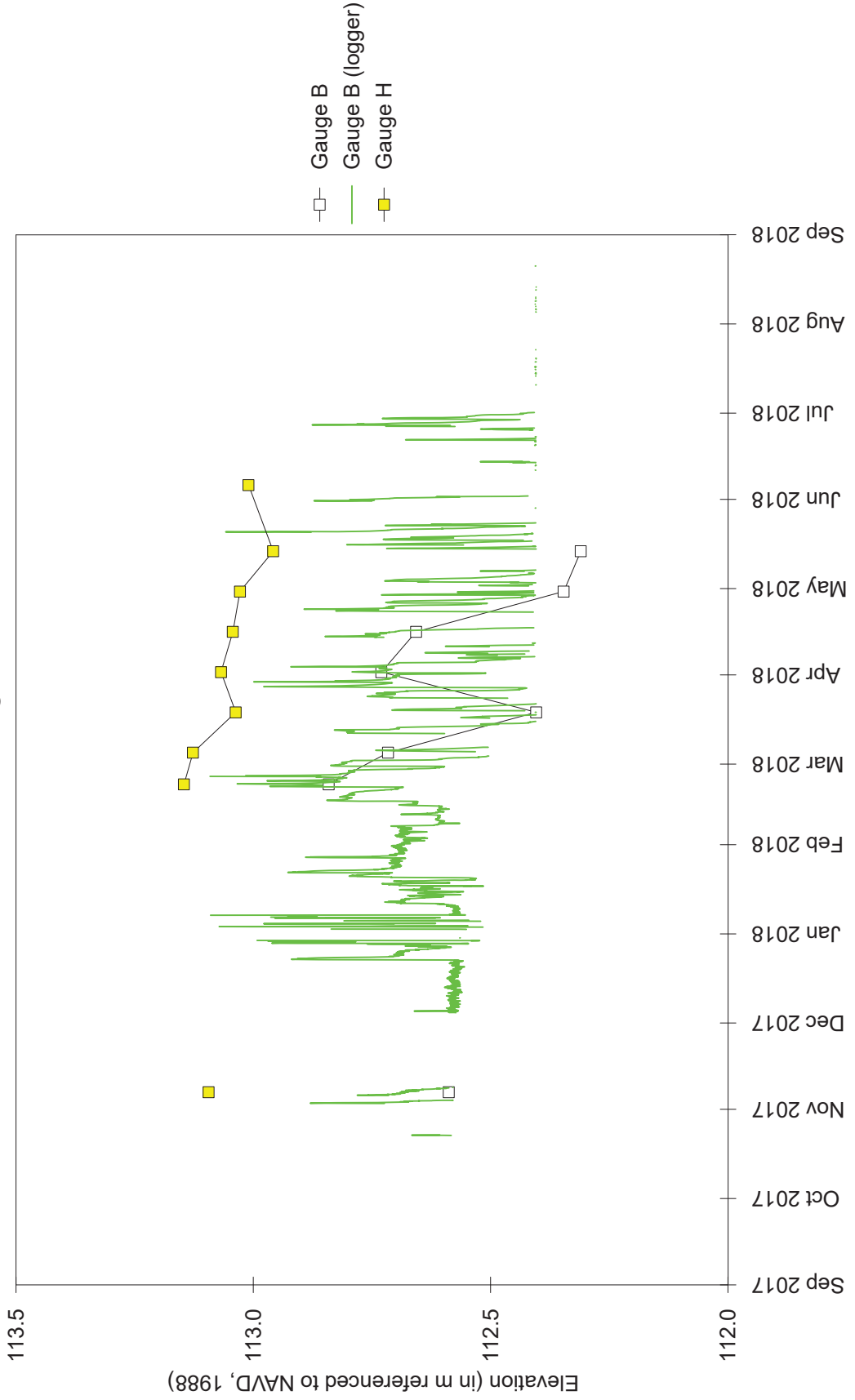


# Harrisburg, Site 2 Wetland Mitigation Site September 1, 2017 through August 31, 2018



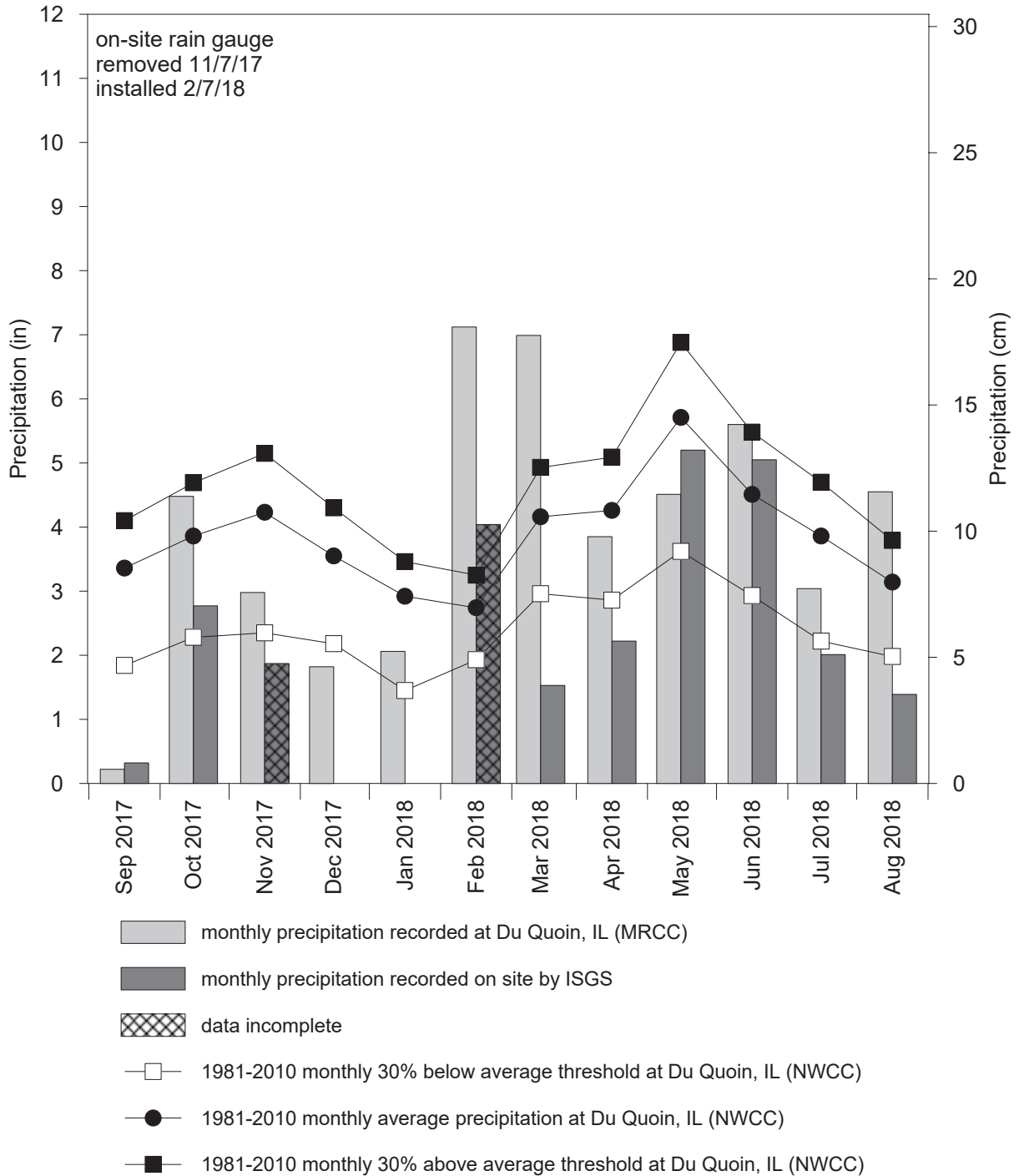
# Harrisburg, Site 2 Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations at Surface-Water Gauges



## Harrisburg Site 2 Wetland Mitigation Site September 2017 through August 2018

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



**MAX CREEK  
WETLAND MITIGATION SITE**

**ISGS #80**

IL 147

FAS 932

Sequence #8717A

Johnson County, near Simpson, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Audra M. Noyes

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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 (2.88 ac) out of a total site area of approximately 1.21 ha (3.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 0.63 ha (1.56 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 (2.88 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 Anna, Illinois, is April 2, and the season lasts 215 days (MRCC 2018). 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 14 was the starting date of the 2018 growing season based on soil temperatures measured on site and at the nearby Harrisburg, Site 3 wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at Rosiclare, Illinois (MRCC station #117487), was 124% of normal. During spring 2018 (March through May), precipitation was 100% of normal.
- Max Creek flooded the site twice during the monitoring period with no floods occurring during the growing season.
- The period of maximum inundation and saturation during the 2018 growing season occurred in early April due to a seasonal high water table.
- In 2018, water levels measured in 6 of 6 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season and 4 of 6 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 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 will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2018

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

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

<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
<b>A</b>	n/a	n/a	n/a
<b>E</b>	115.72 m (379.66 ft)	115.71 m (379.63 ft)	115.73 m (379.69 ft)

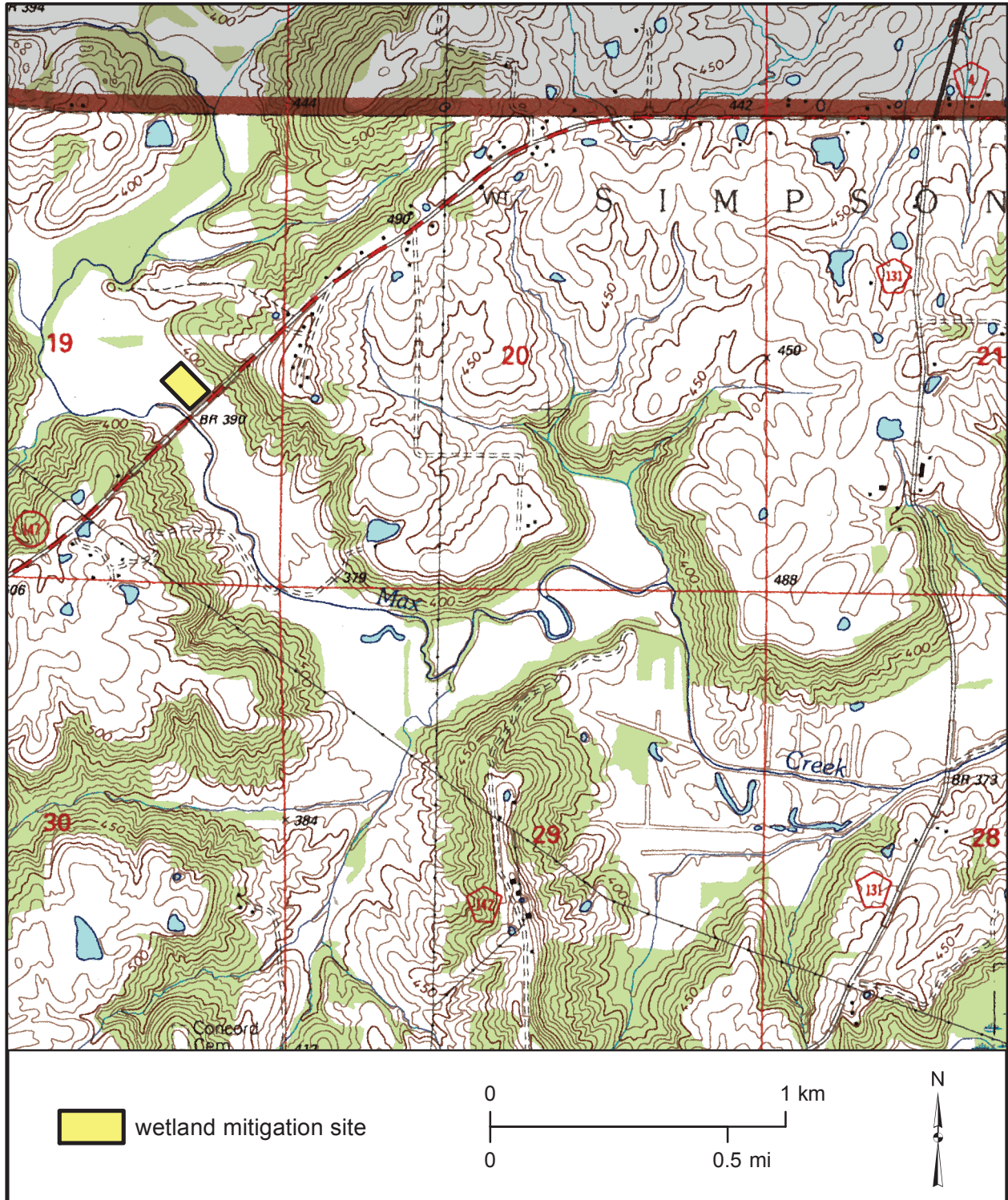
n/a – insufficient data to determine an elevation



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

## General Study Area and Vicinity

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










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

Estimated Areal Extent of 2018 Wetland Hydrology  
September 1, 2017 through August 31, 2018

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

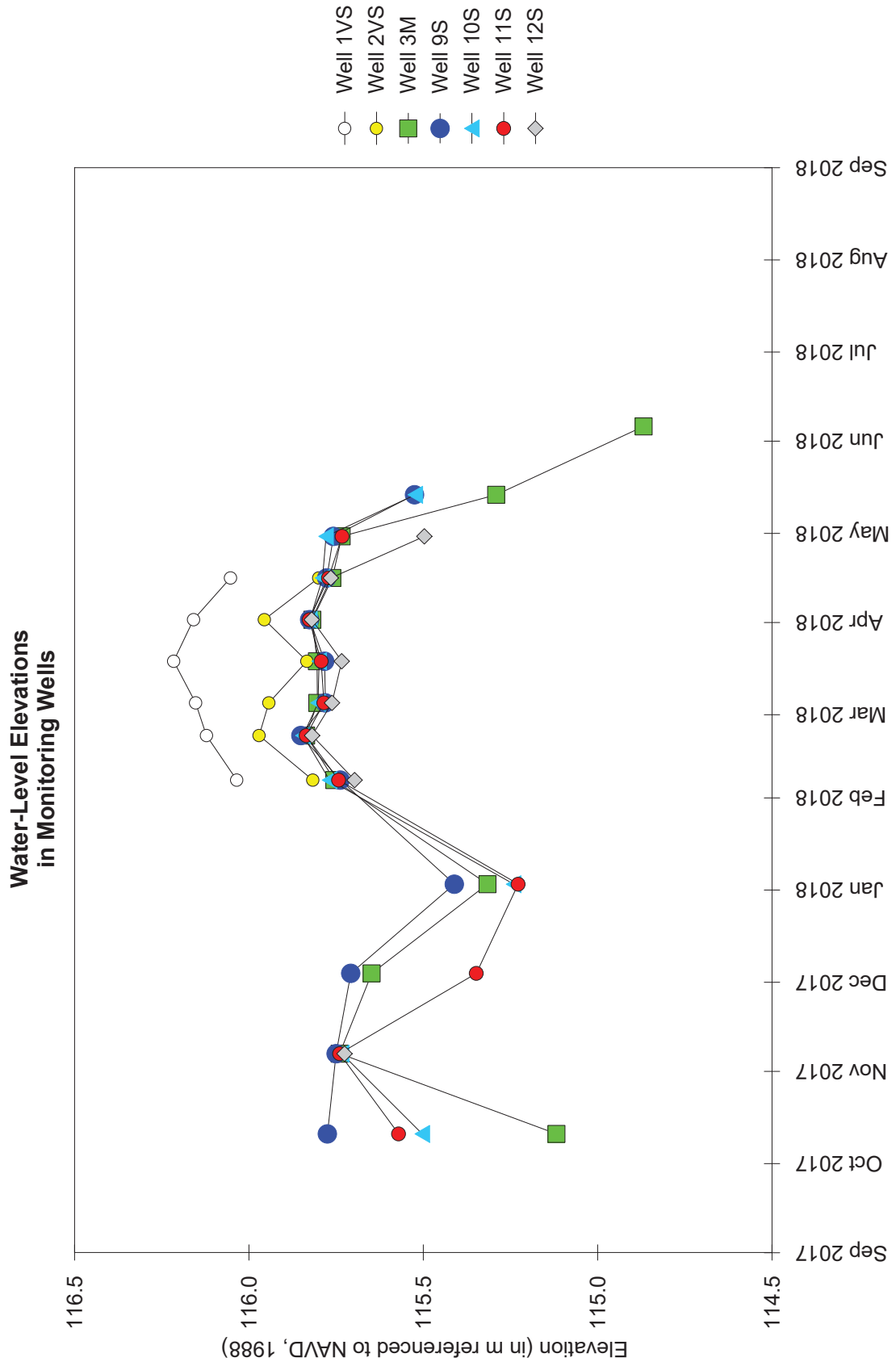


## 2018 Wetland Hydrology

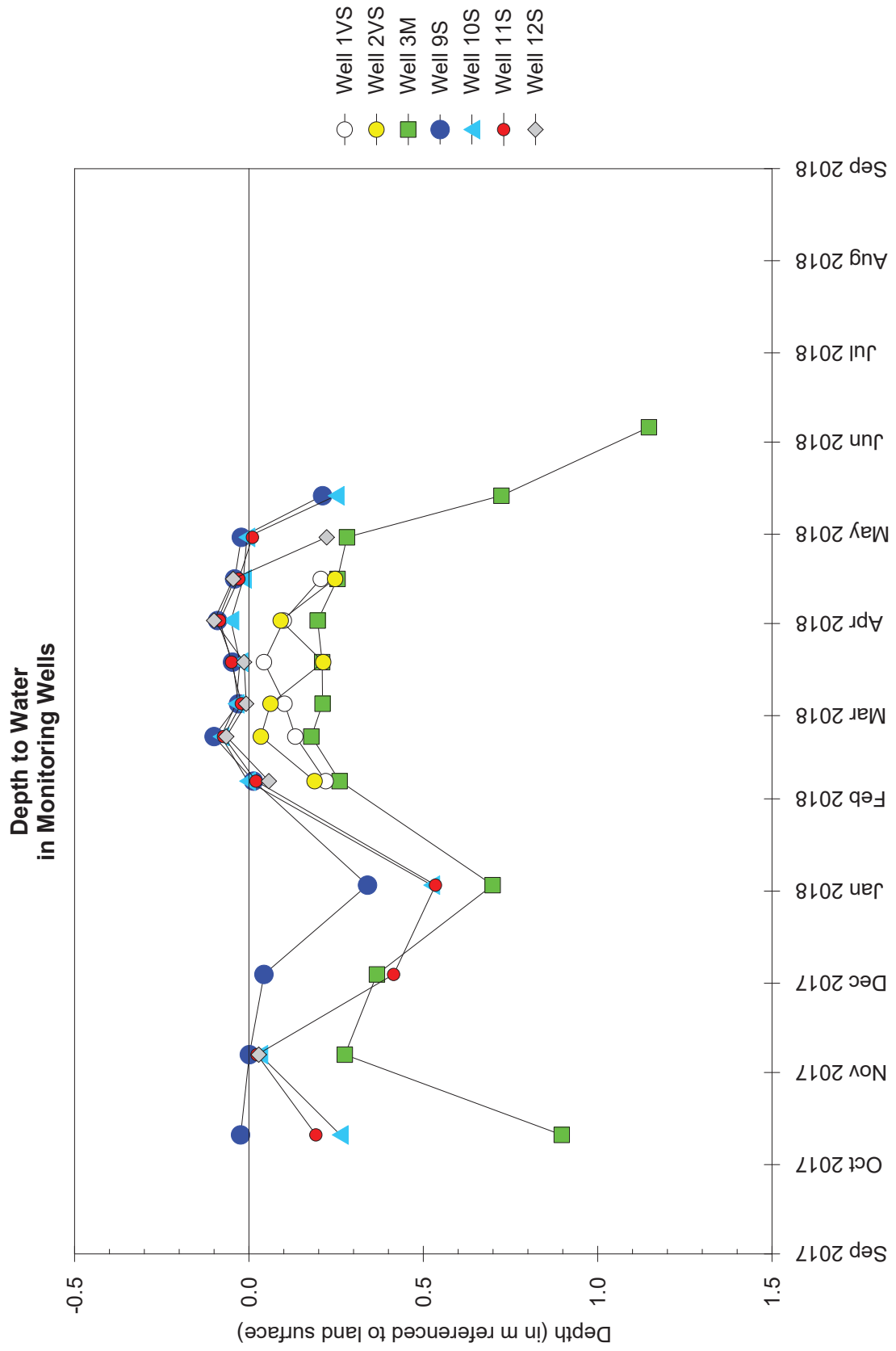
- |   |  |   |                     |
|---|--|---|---------------------|
|  | >5% of growing season (1987 Manual)              |  | monitoring well     |
|  | >12.5% of growing season (1987 Manual)           |  | surface-water gauge |
|  | 14 days or more (2010 Midwest Region Supplement) |  | rain gauge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



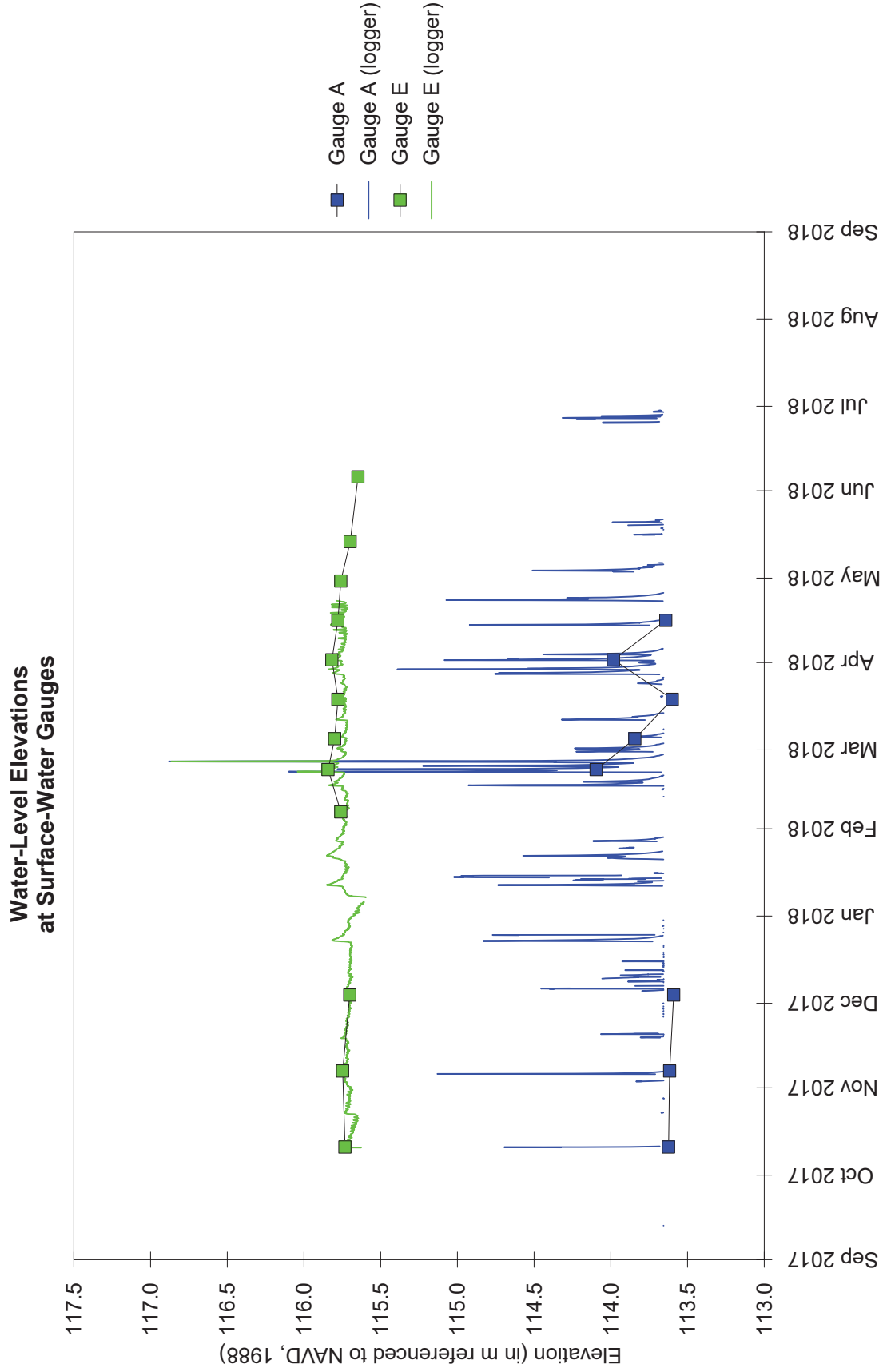
# Max Creek Wetland Mitigation Site September 1, 2017 through August 31, 2018



**Max Creek Wetland Mitigation Site**  
**September 1, 2017 through August 31, 2018**

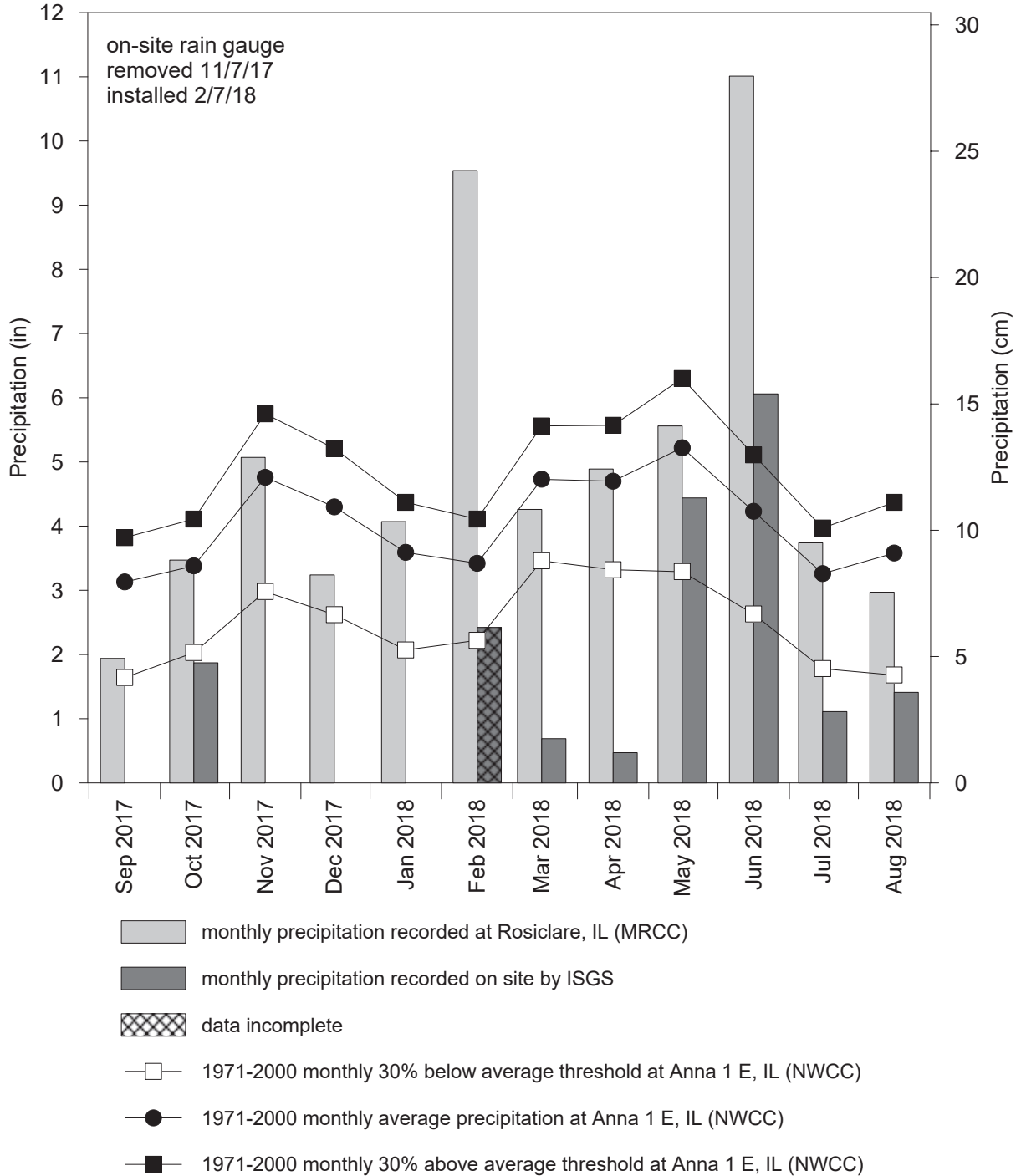


# Max Creek Wetland Mitigation Site September 1, 2017 through August 31, 2018



# Max Creek Wetland Mitigation Site September 2017 through August 2018

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





**EAST CAPE GIRARDEAU  
WETLAND MITIGATION SITE**

**ISGS #81**

IL 146

FAP 312

Sequence #633A

Alexander County, near East Cape Girardeau, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Manager: Audra M. Noyes

**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.
- August 2018: IDOT requested that monitoring of the site cease.

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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), 5.86 ha (14.47 ac) of the total site area of 6.17 ha (15.25 ac) satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season and 4.80 ha (11.86 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 (14.18 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 2018). 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 19 was the starting date of the 2018 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 103% of normal. During spring 2018 (March through May), precipitation was 108% of normal.
- Using the 1987 Manual the period of maximum inundation and saturation during the 2018 growing season began in late March and lasted through early May in response to the ponding of seasonal precipitation and runoff. However, using the 2010 Midwest Region Supplement, the period of maximum inundation and saturation began in late February and lasted through mid-March in response to flooding from on-site impounding

of precipitation and runoff, including minor flooding from the East Cape Main Ditch into the southwest basin surrounding Gauge E. (see Additional Information)

- In 2018, water levels measured in 19 of 19 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 10 of 19 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 17 of 19 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 are located along the south and southeast site perimeter, impounding precipitation or runoff onto the site in the east basin east of Gauge F and the southwest basin surrounding Gauge E. A surface-water station located at the control structure (Gauge G), monitors onsite flood events from the East Cape Main Ditch.
- Gauge G is installed above the land surface. While the gauge did not meet criteria, the area in which it is installed did, according to water levels recorded at Gauge E.

**PLANNED FUTURE ACTIVITIES**

- Monitoring will no longer continue at the site, unless requested by IDOT.

**WETLAND HYDROLOGY TABLES FOR 2018**

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
11S	Y	N	Y
11VS	Y	N	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
17S	Y	Y	Y
18S	Y	N	N
18VS	Y	N	Y
19S	Y	N	N
19VS	Y	N	Y
20S	Y	Y	Y
20VS	Y	N	Y
21S	Y	Y	Y
21VS	Y	Y	Y

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

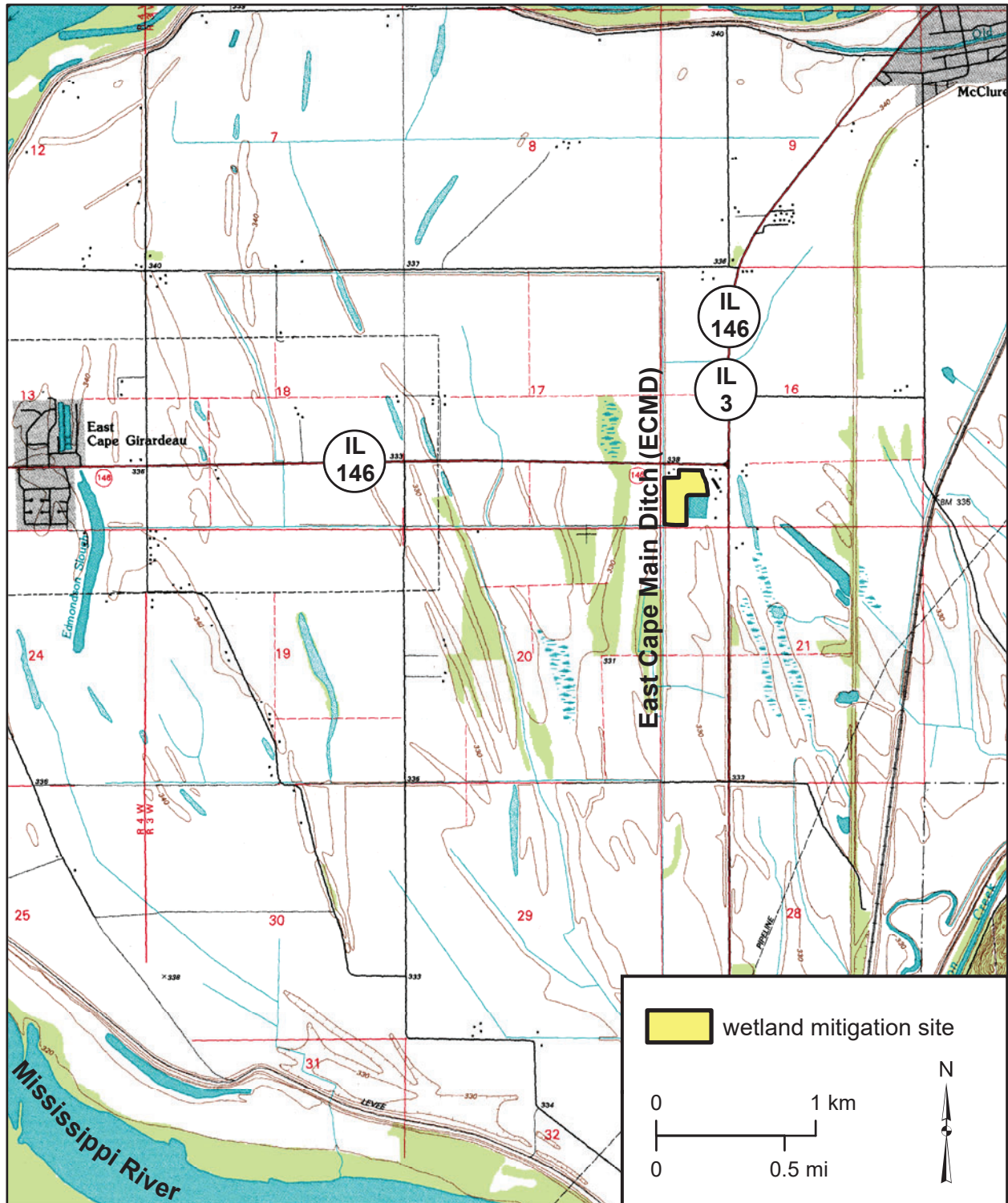
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
<b>E</b>	100.82 m (330.77 ft)	100.78 m (330.64 ft)	100.80 m (330.71 ft)
<b>F</b>	101.05 m (331.53 ft)	101.00 m (331.37 ft)	101.03 m (331.46 ft)
<b>G</b>	n/a	n/a	n/a

n/a – insufficient data to determine an elevation

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

## General Study Area and Vicinity

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












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

**Estimated Areal Extent of 2018 Wetland Hydrology  
September 1, 2017 through August 31, 2018**

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

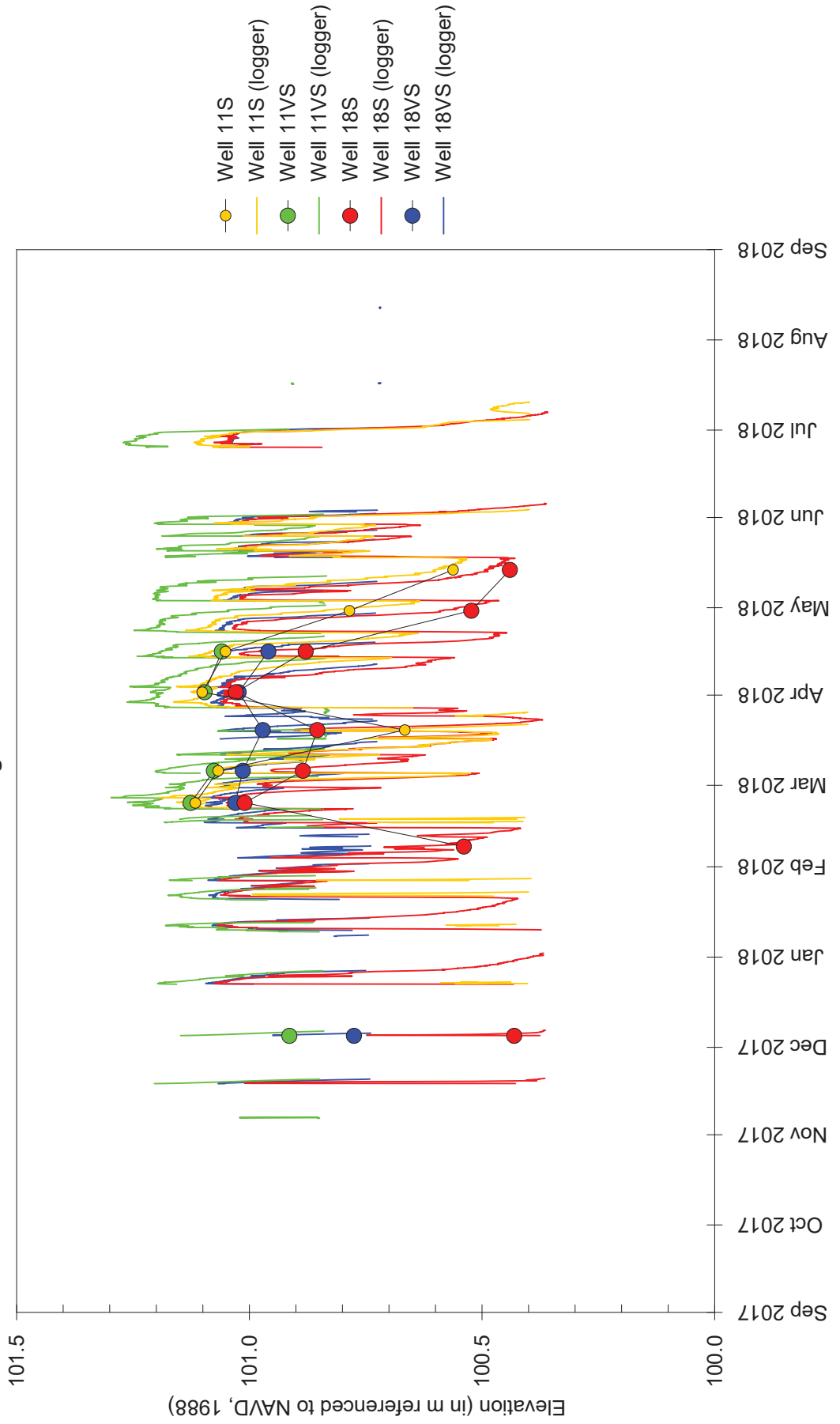


**2018 Wetland Hydrology**

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

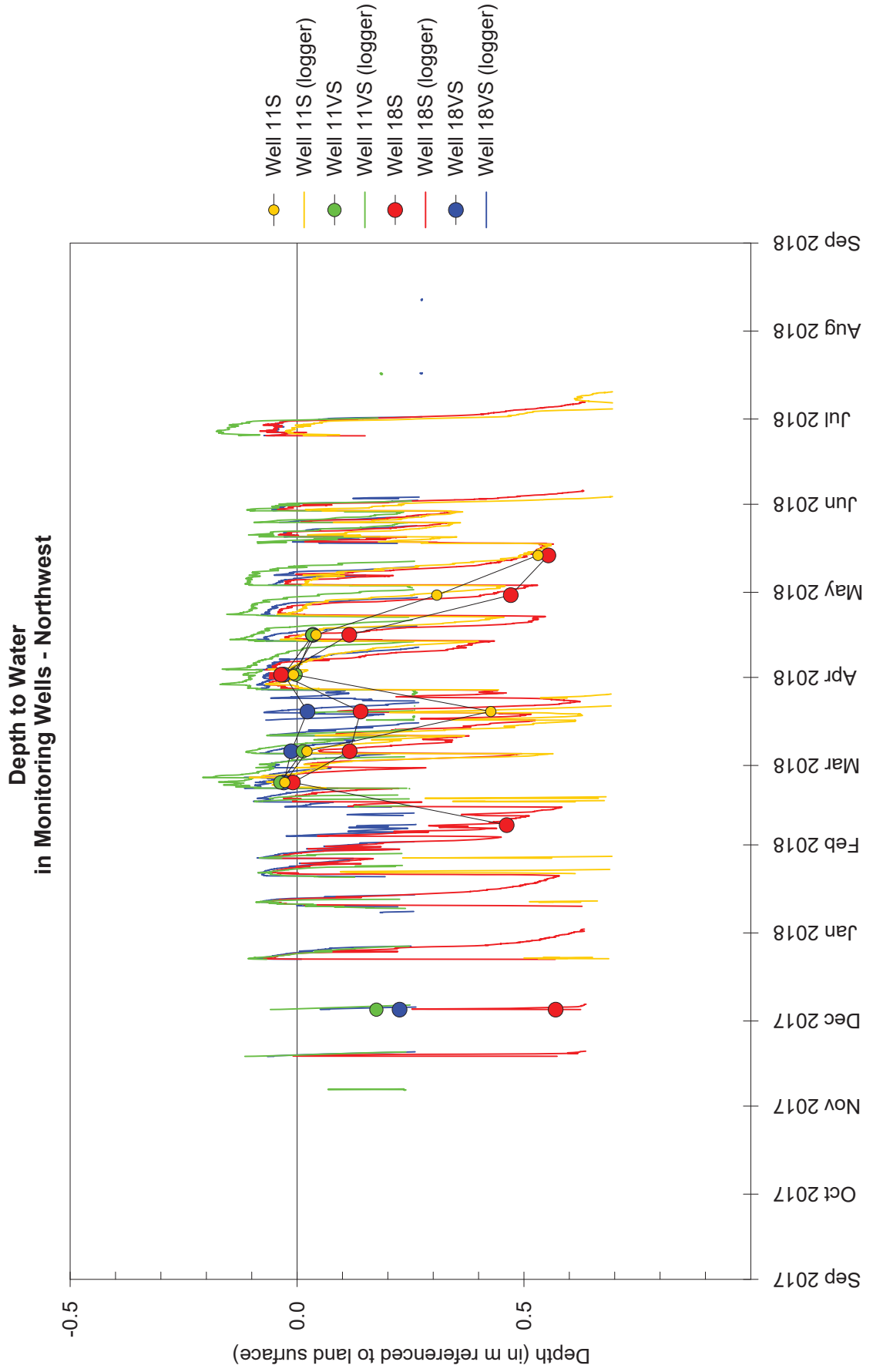
# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Monitoring Wells - Northwest



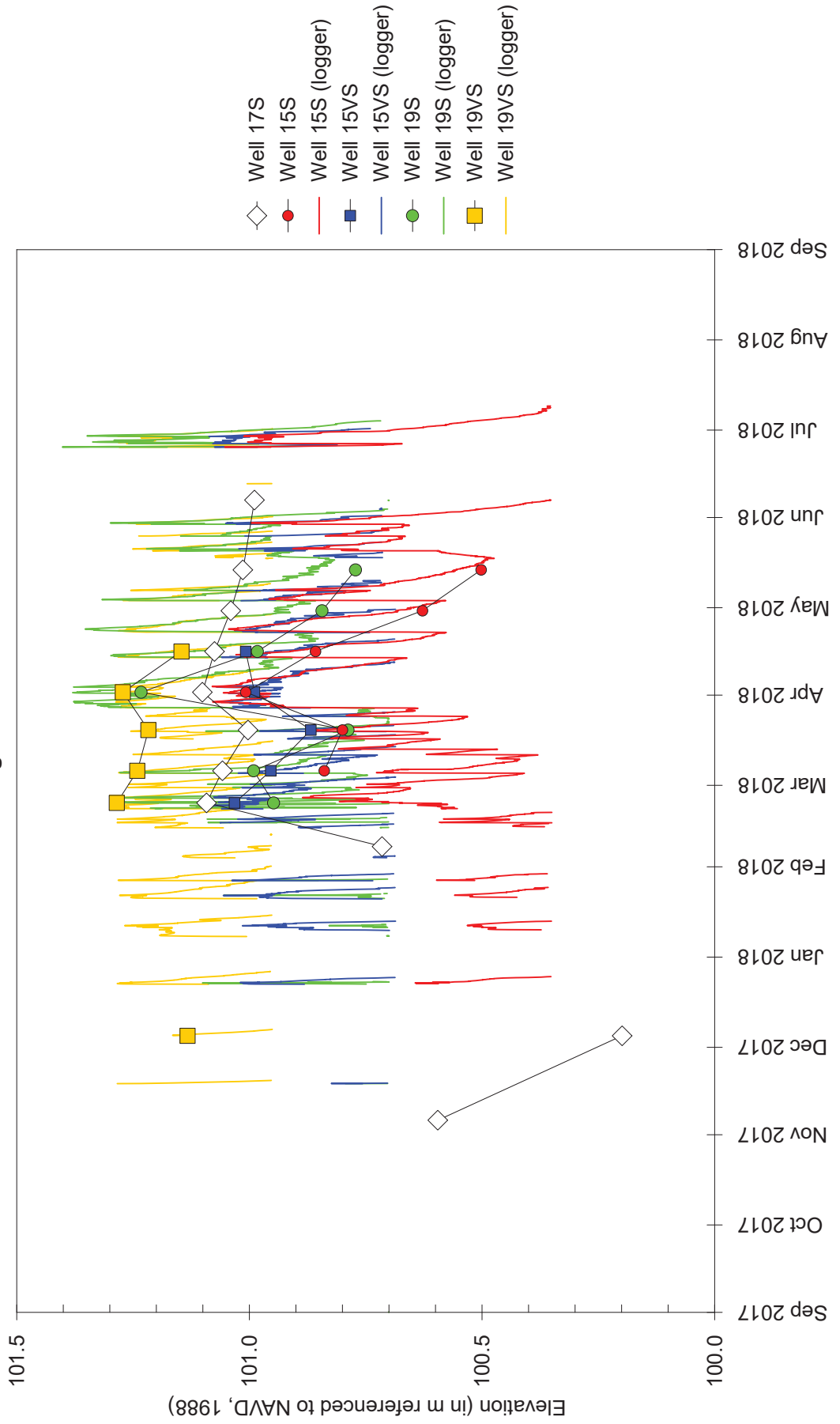


# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018

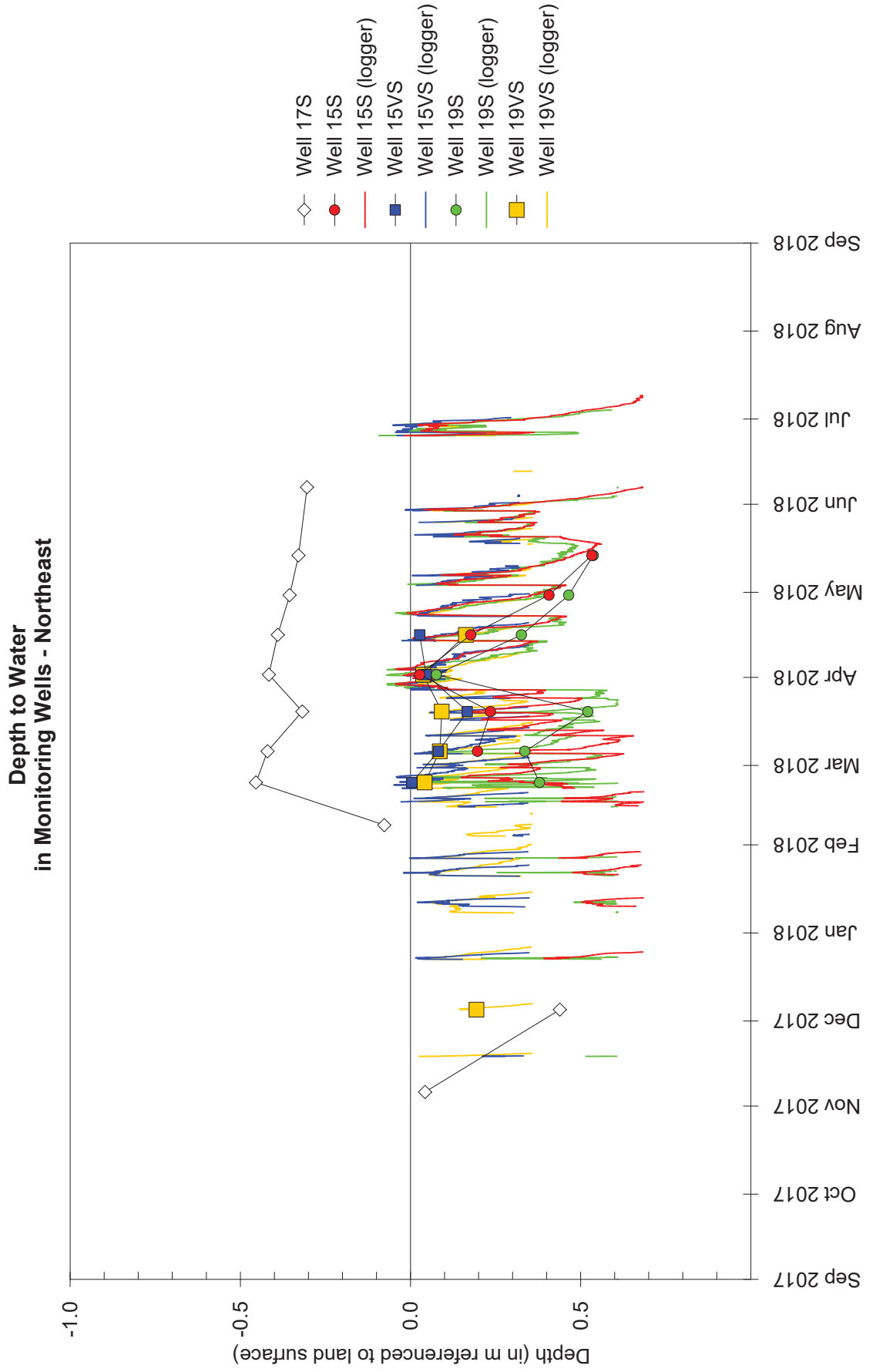


# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Monitoring Wells - Northeast

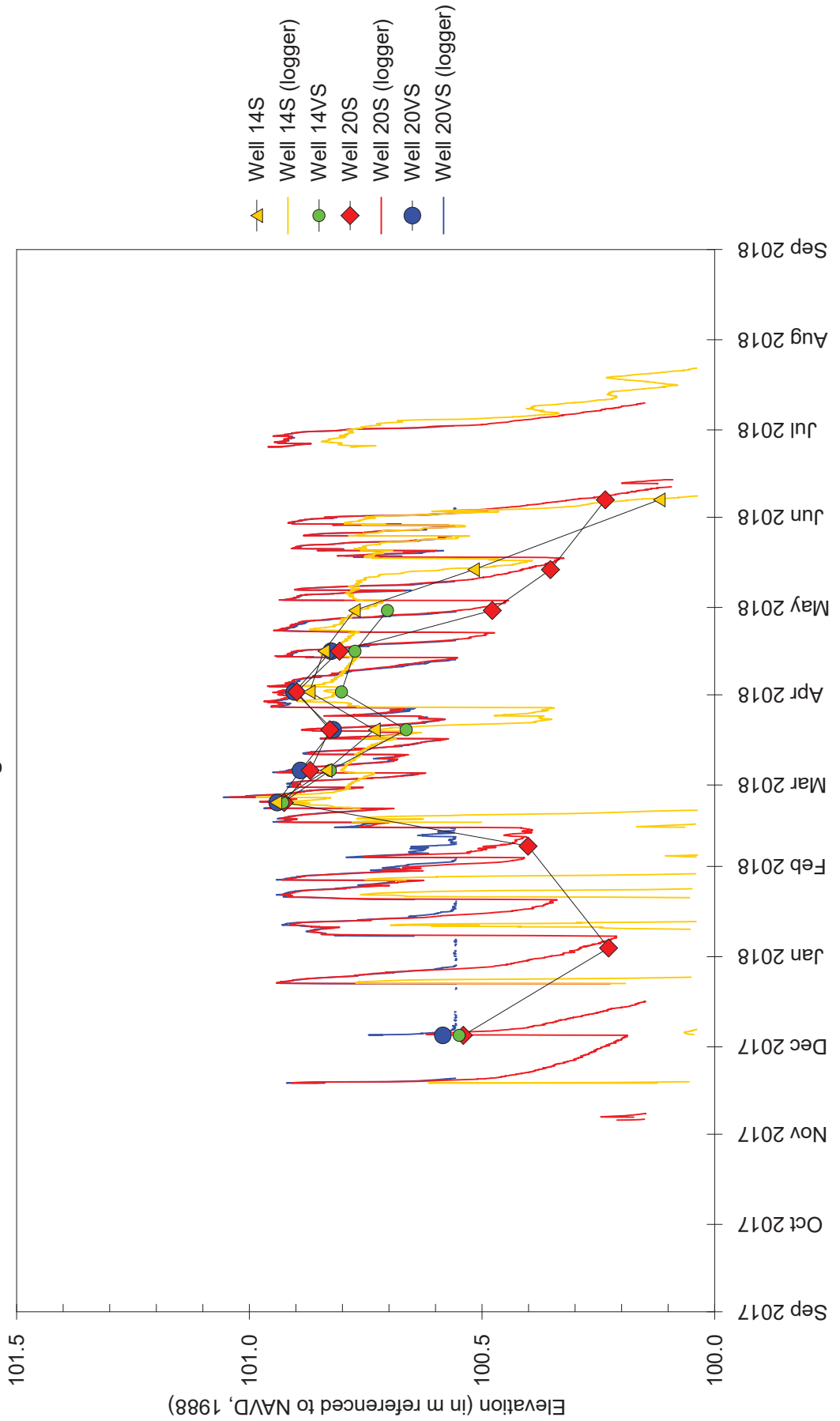


# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018

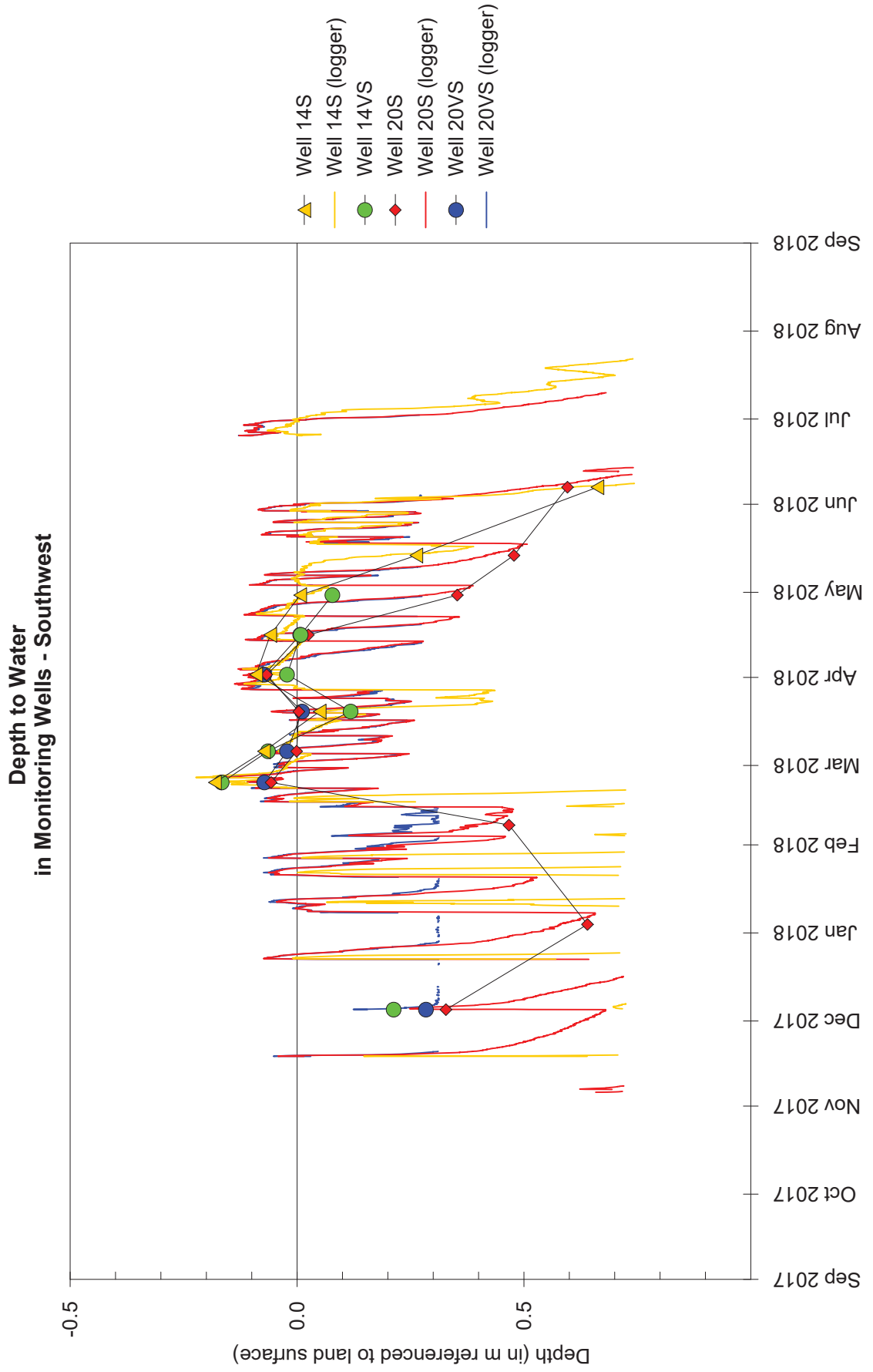


# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Monitoring Wells - Southwest

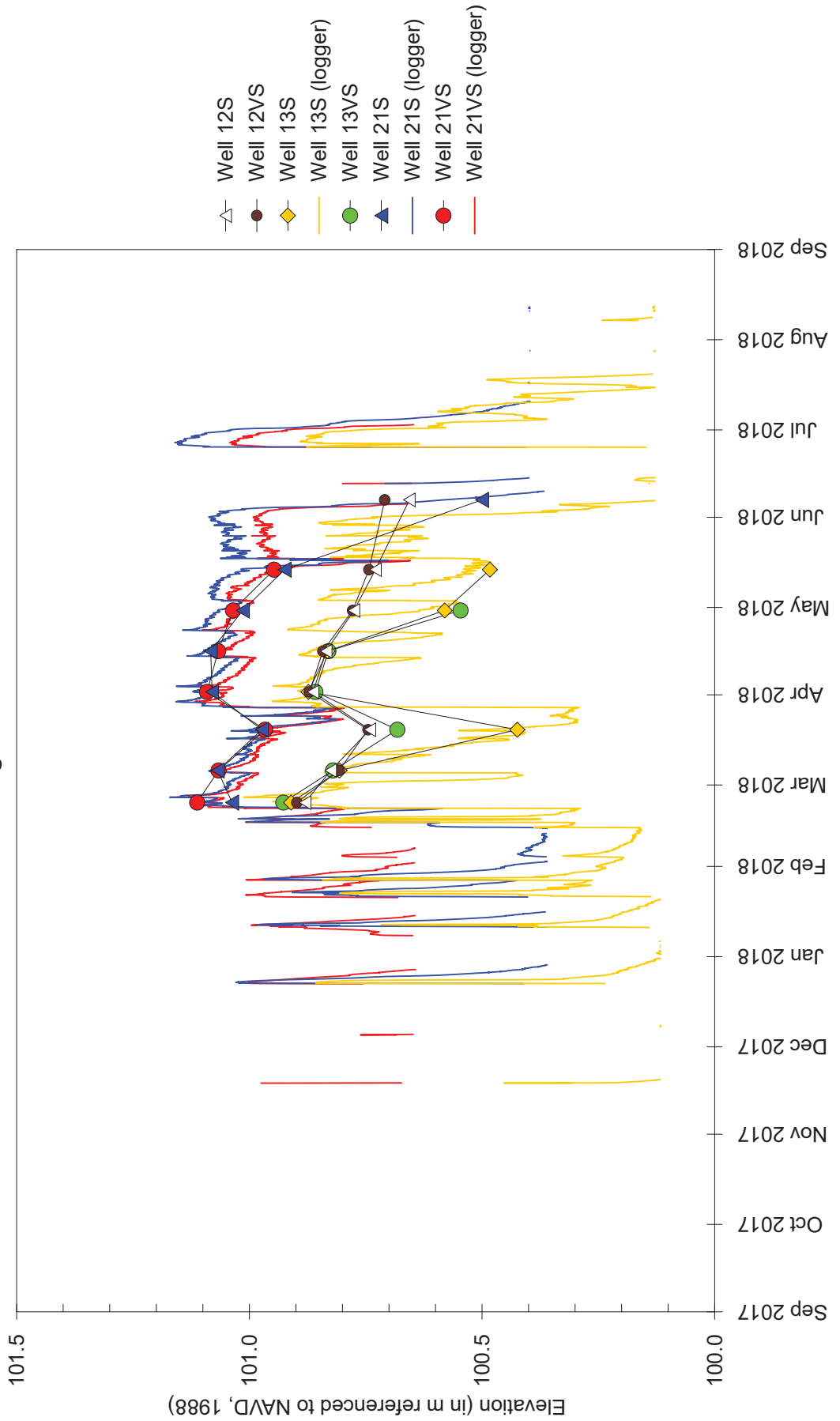


# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018



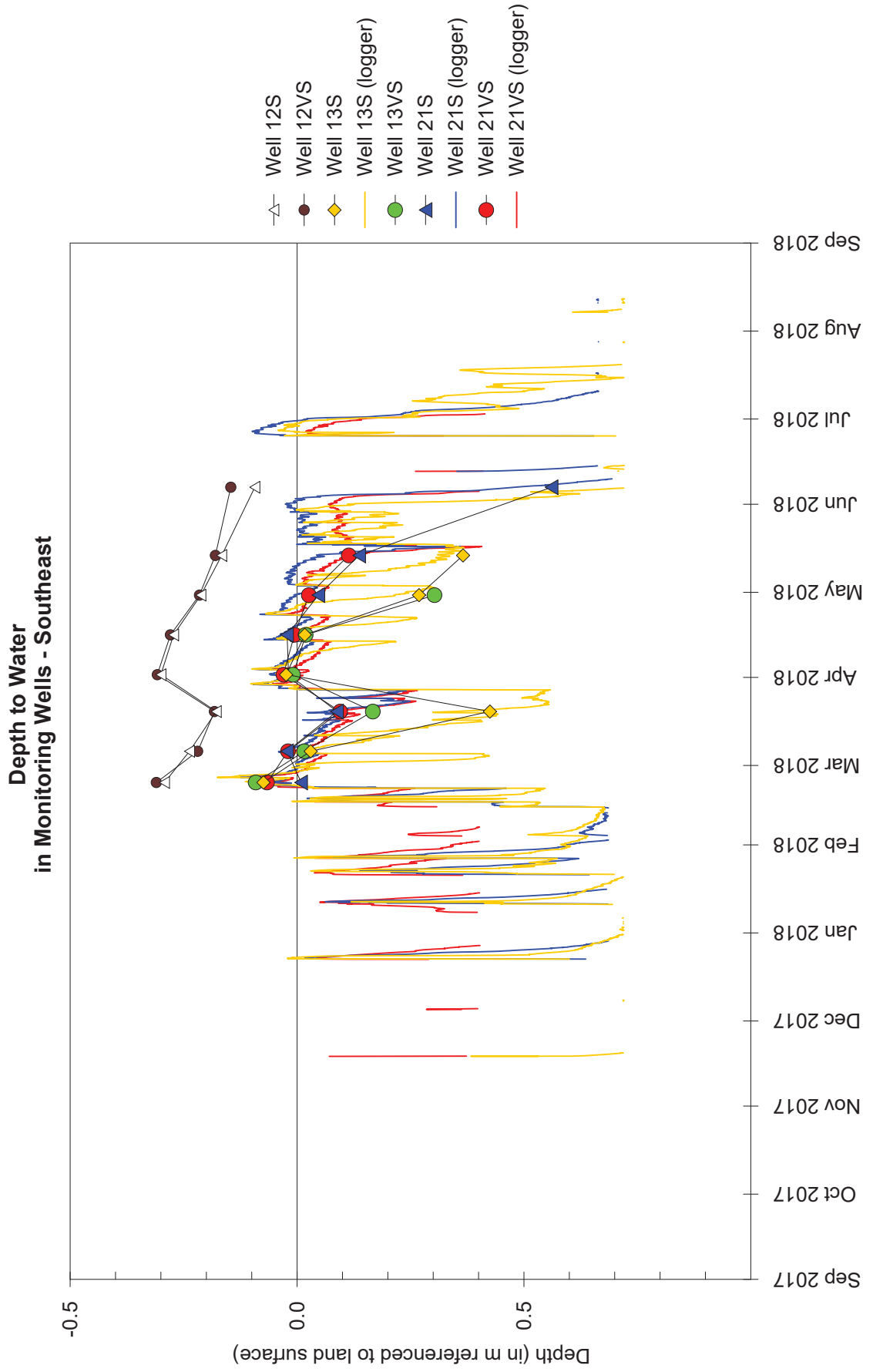
# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Monitoring Wells - Southeast



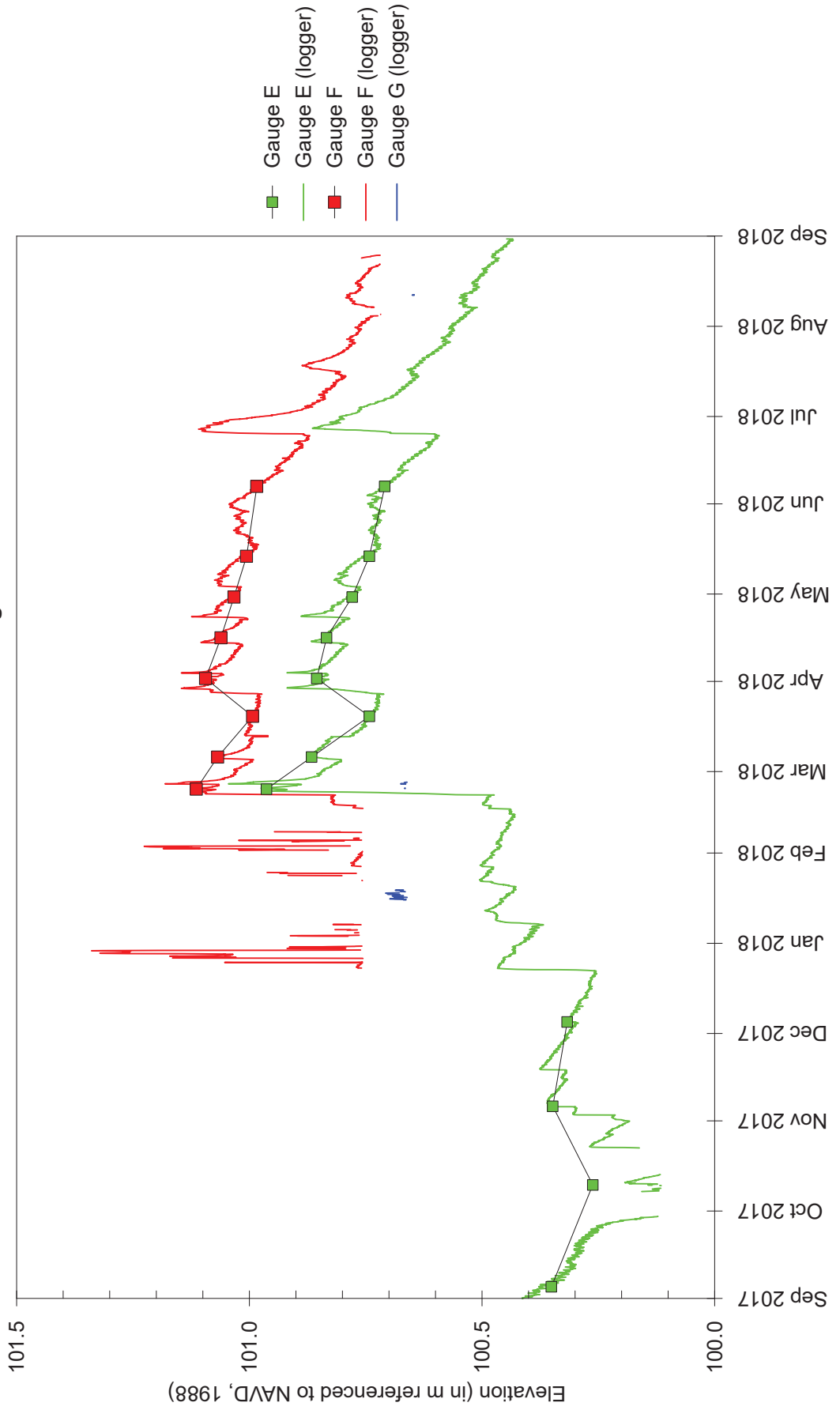


# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018



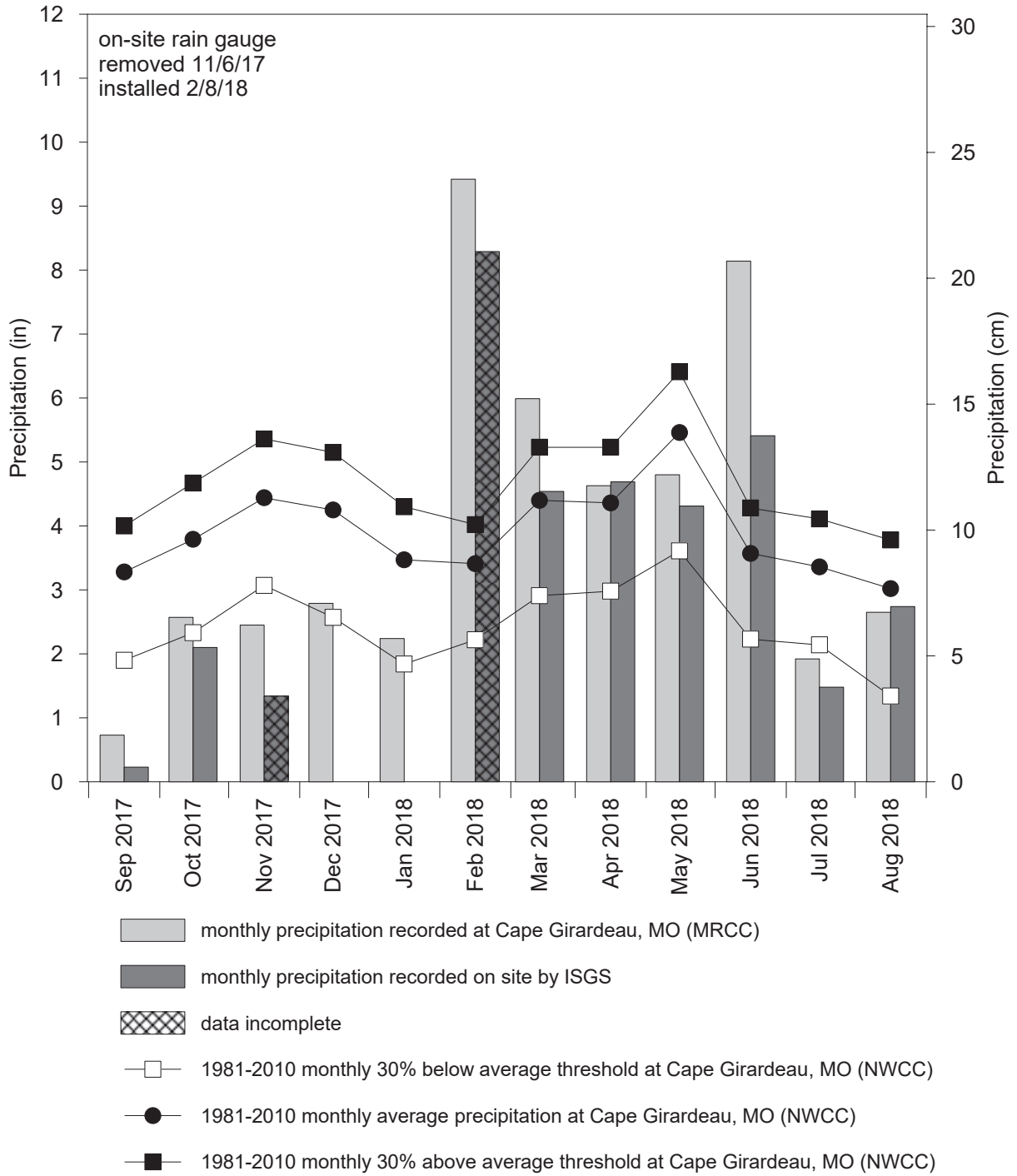
# East Cape Girardeau Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations at Surface-Water Gauges



## East Cape Girardeau Wetland Mitigation Site September 2017 through August 2018

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



**LAWRENCE COUNTY  
WETLAND MITIGATION BANK**

**ISGS #82**

Sequence #14912

Lawrence County, near Lawrenceville, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

**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 2018**

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), 15.30 ha (37.81 ac) of a total site area of 25.71 ha (63.52 ac), satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season, and 11.80 ha (29.17 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 15.30 ha (37.81 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 at Lawrenceville, Illinois is March 30, and the season lasts 221 days (MRCC 2018); 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 14 was the starting date of the 2018 growing season based on soil temperatures measured at the site.
- Total precipitation for the monitoring period, recorded at Lawrenceville International Airport (MRCC station #13809), was 86% of normal. Precipitation in spring 2018 (March through May) was 79% of normal. The wettest period was February and March with 172% of normal precipitation.
- The period of maximum inundation and saturation during the 2018 growing season occurred in March and April due to a flood event on the Embarras River starting on March 25, 2018 and ending April 14, 2018. This flood caused Beaver Pond Ditch to back-flood the site.
- In 2018, water levels measured in 18 of 23 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 11 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 18 of 23 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

**ADDITIONAL INFORMATION**

- Water was detected in the monitoring wells along the eastern boundary of the site during a site visit on April 11, 2018. On the same date, a large portion of the site east of Beaver Pond Ditch was inundated, as was the adjacent farm field east of the site. Saturation occurred at Well 19S a total of 21 days, from March 30, 2018 to April 19, 2018. Surface water and groundwater levels suggest that inundation and saturation likely occurred at Wells 21S, 23S, and 30S for at least 15 days, from March 30, 2018 to April 13, 2018.

**PLANNED FUTURE ACTIVITIES**

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

**WETLAND HYDROLOGY TABLES FOR 2018**

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
1S	Y	Y	Y
3S	Y	Y	Y
4SR	N	N	N
6S	Y	Y	Y
7S	Y	Y	Y
9S	Y	Y	Y
13S	Y	Y	Y
15S	Y	Y	Y
17S	N	N	N
19S	Y	N	Y
20SR	Y	N	Y
21S	Y	N	Y
22S	N	N	N
23S	Y	N	Y
24S	Y	Y	Y
25S	N	N	N
26S	Y	Y	Y
27SR	Y	N	Y
29S	N	N	N
30S	Y	N	Y
31S	Y	N	Y
32S	Y	Y	Y
33S	Y	Y	Y

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

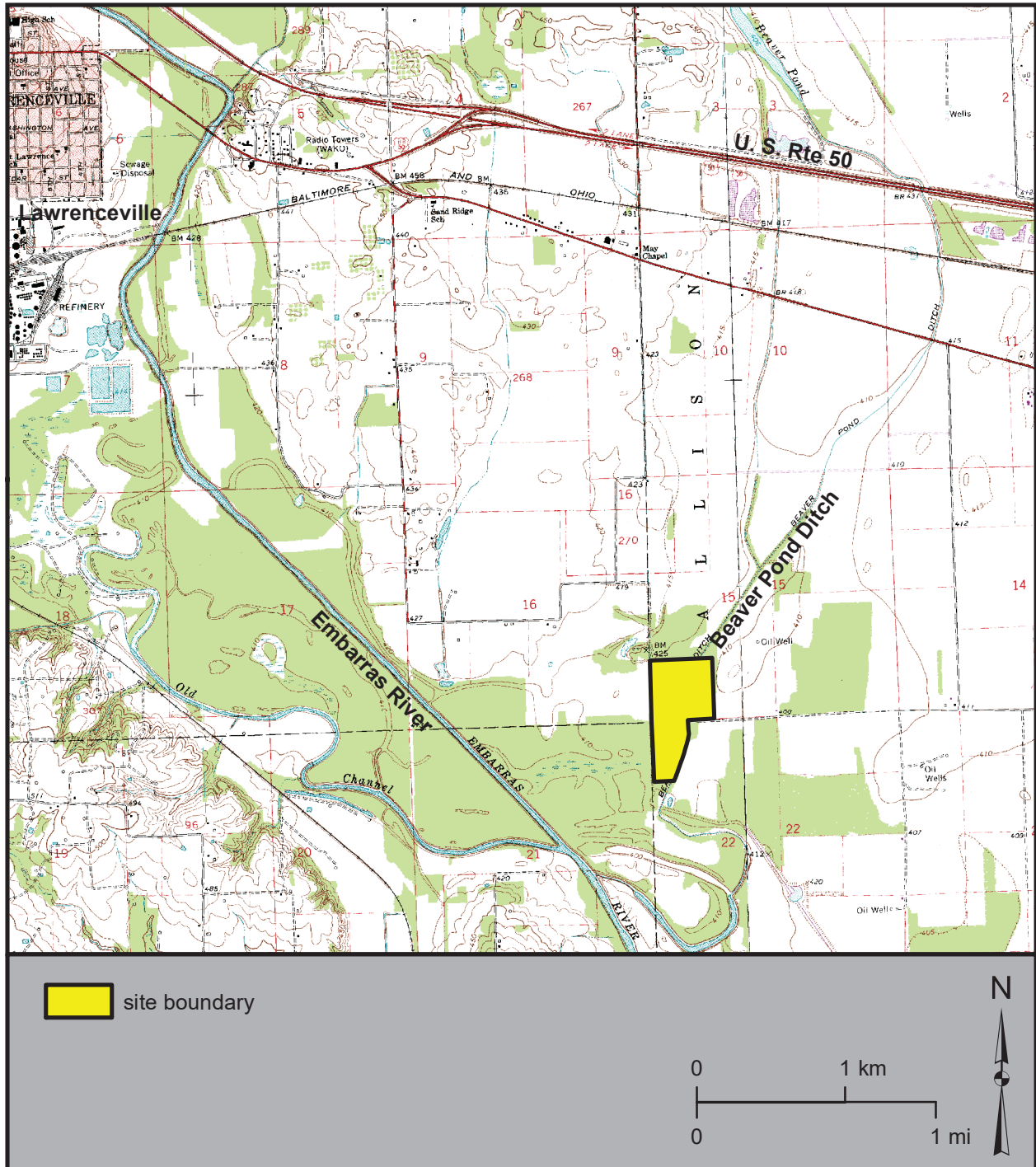
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
<b>B</b>	n/a	n/a	n/a
<b>D</b>	124.91 m (409.81 ft)	n/a	124.90 m (409.78 ft)
<b>E</b>	n/a	n/a	n/a
<b>F</b>	124.89 m (409.74 ft)	124.49 m (408.43 ft)	124.87 m (409.68 ft)
<b>G</b>	124.95 m (409.94 ft)	124.69 m (409.09 ft)	124.94 m (409.91 ft)
<b>H</b>	n/a	n/a	n/a

n/a – insufficient data to determine an elevation



# Lawrence County Wetland Mitigation Bank General Study Area and Vicinity

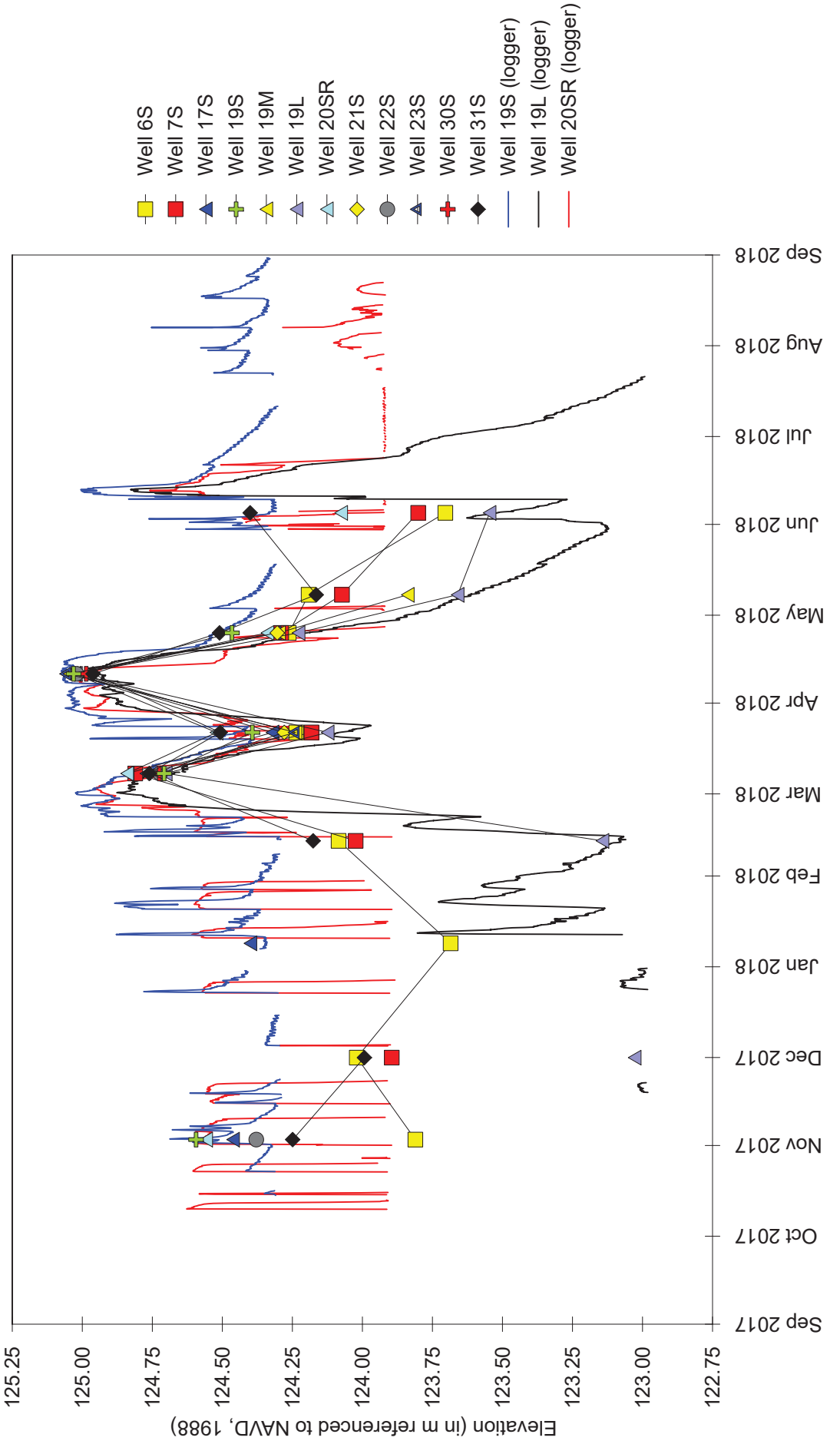
from the USGS Topographic Series, Lawrenceville, IL,  
and Vincennes, IN-IL, 7.5-minute quadrangles (USGS 1965a, 1965b)





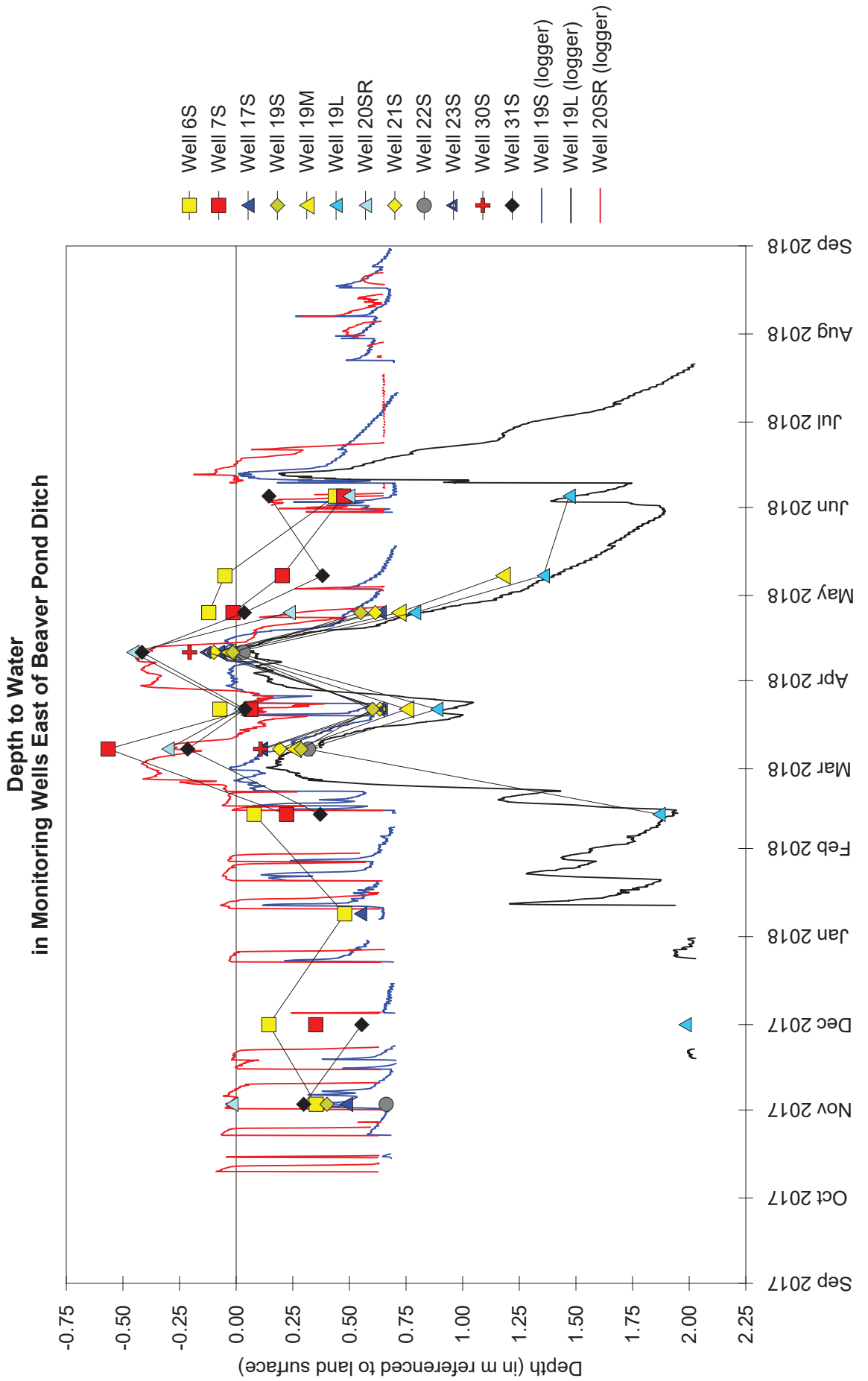
# Lawrence County Wetland Bank September 1, 2017 through August 31, 2018

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



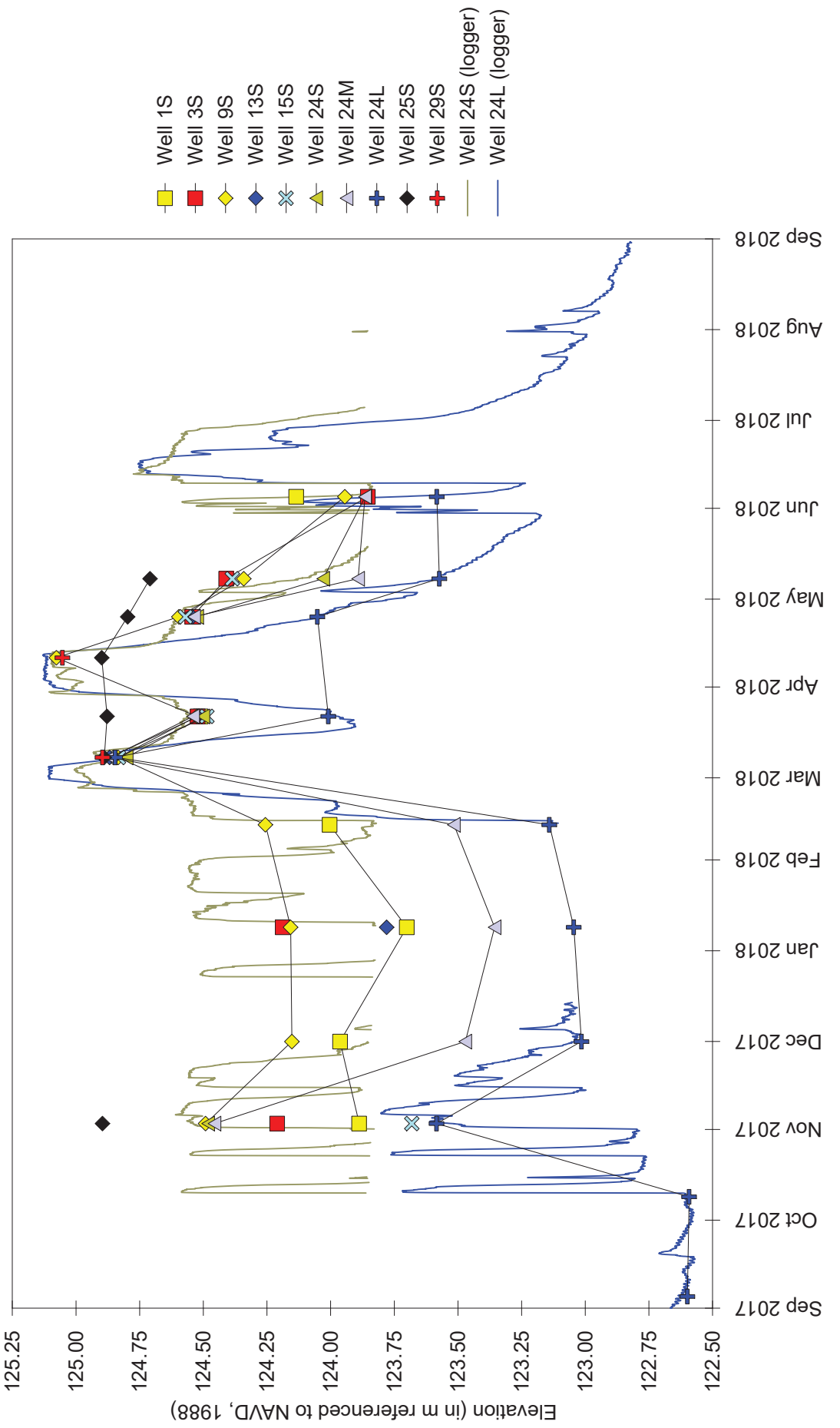


# Lawrence County Wetland Mitigation Bank September 1, 2017 through August 31, 2018



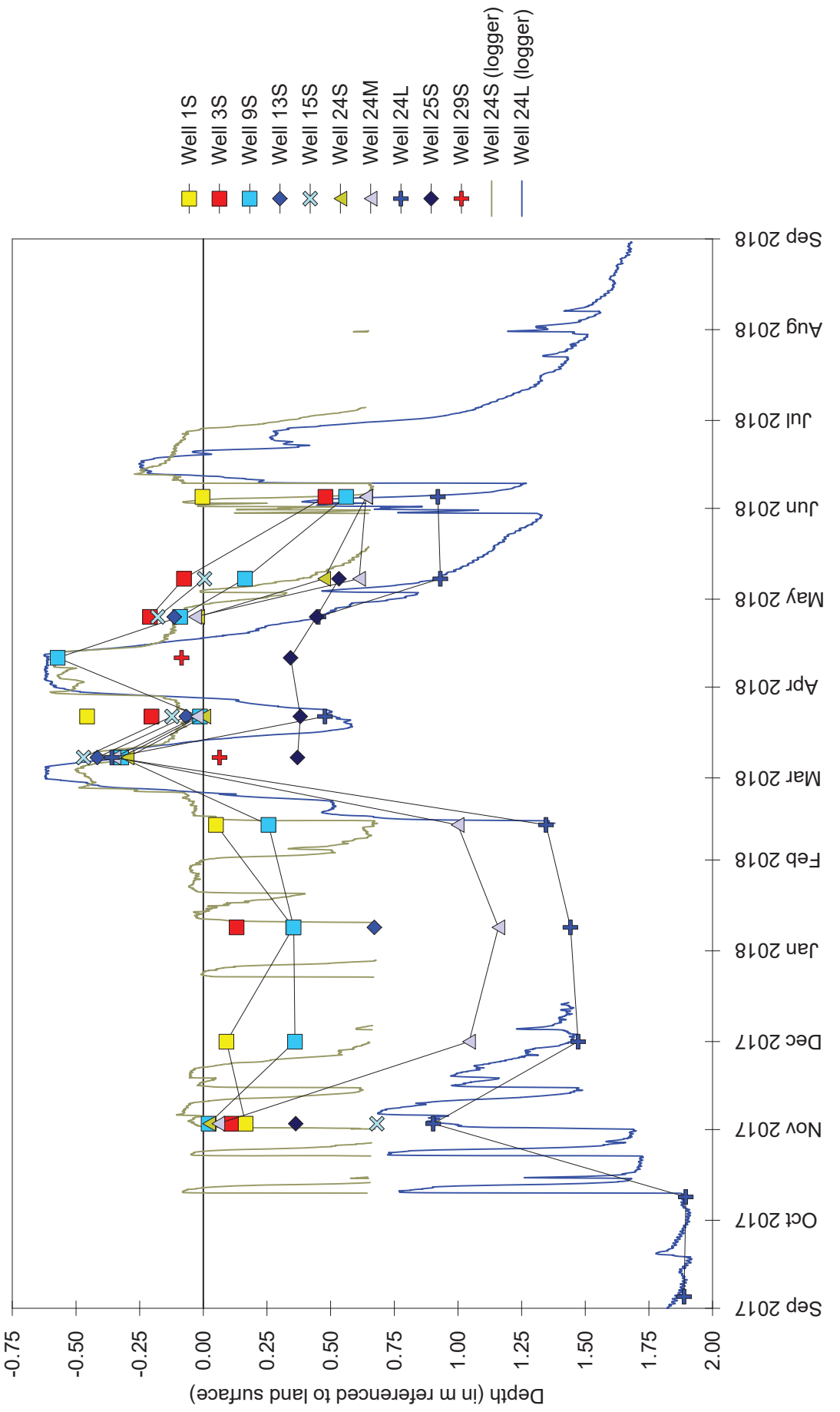
# Lawrence County Wetland Bank September 1, 2017 through August 31, 2018

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



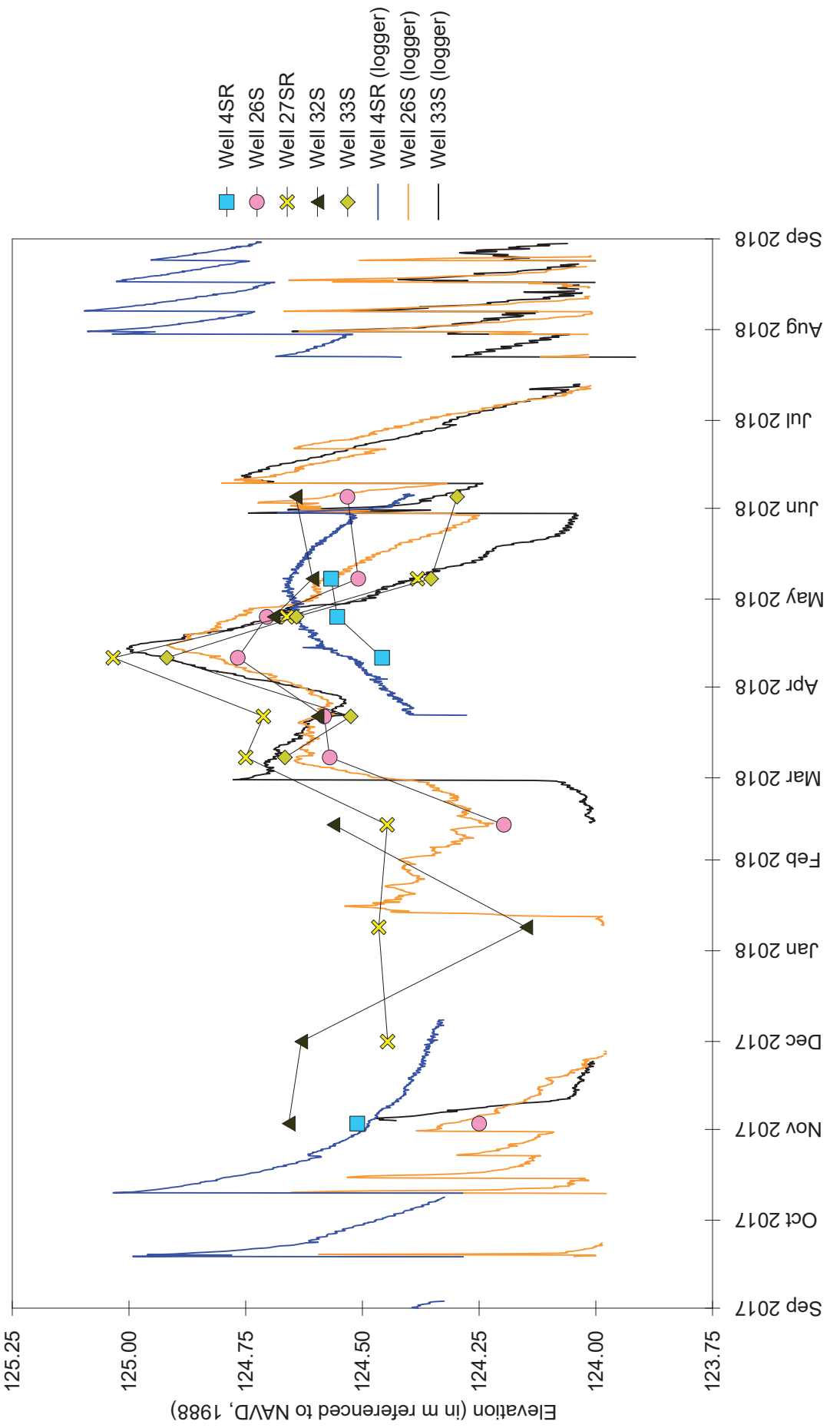
# Lawrence County Wetland Bank September 1, 2017 through August 31, 2018

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



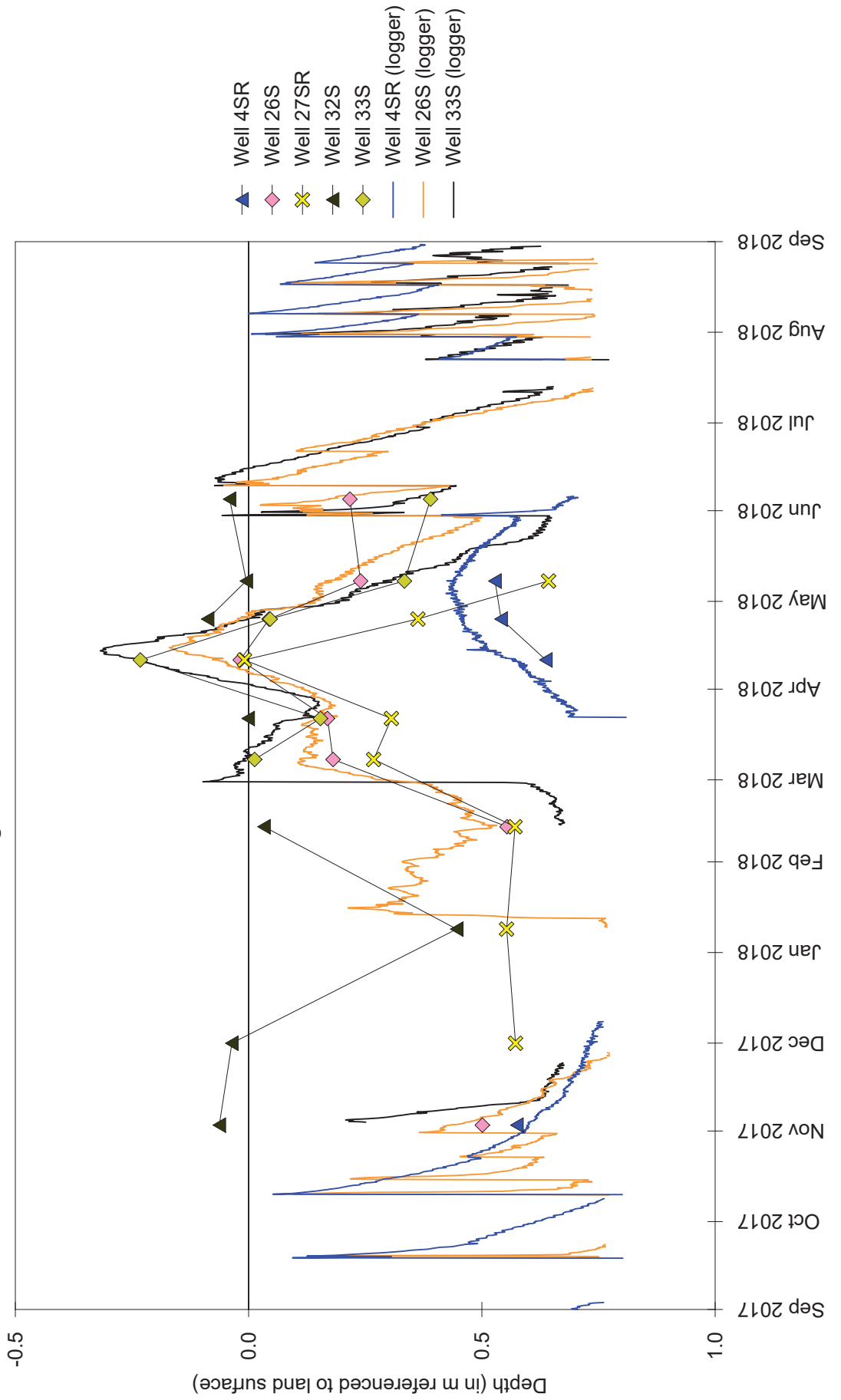


**Lawrence County Wetland Bank**  
**September 1, 2017 through August 31, 2018**  
**Water-Level Elevations**  
**in Monitoring Wells West of Beaver Pond Ditch**



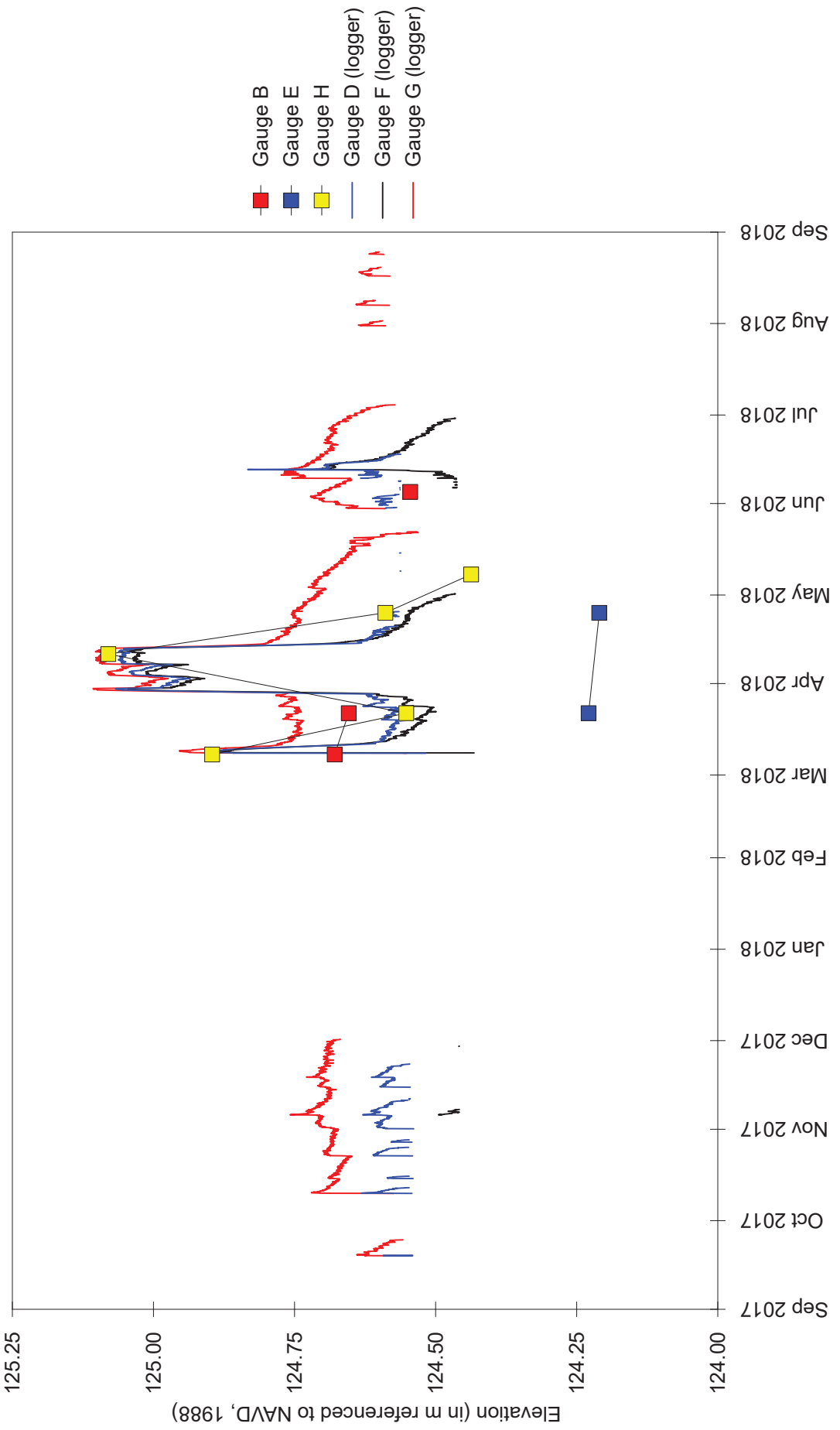
# Lawrence County Wetland Bank September 1, 2017 through August 31, 2018

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



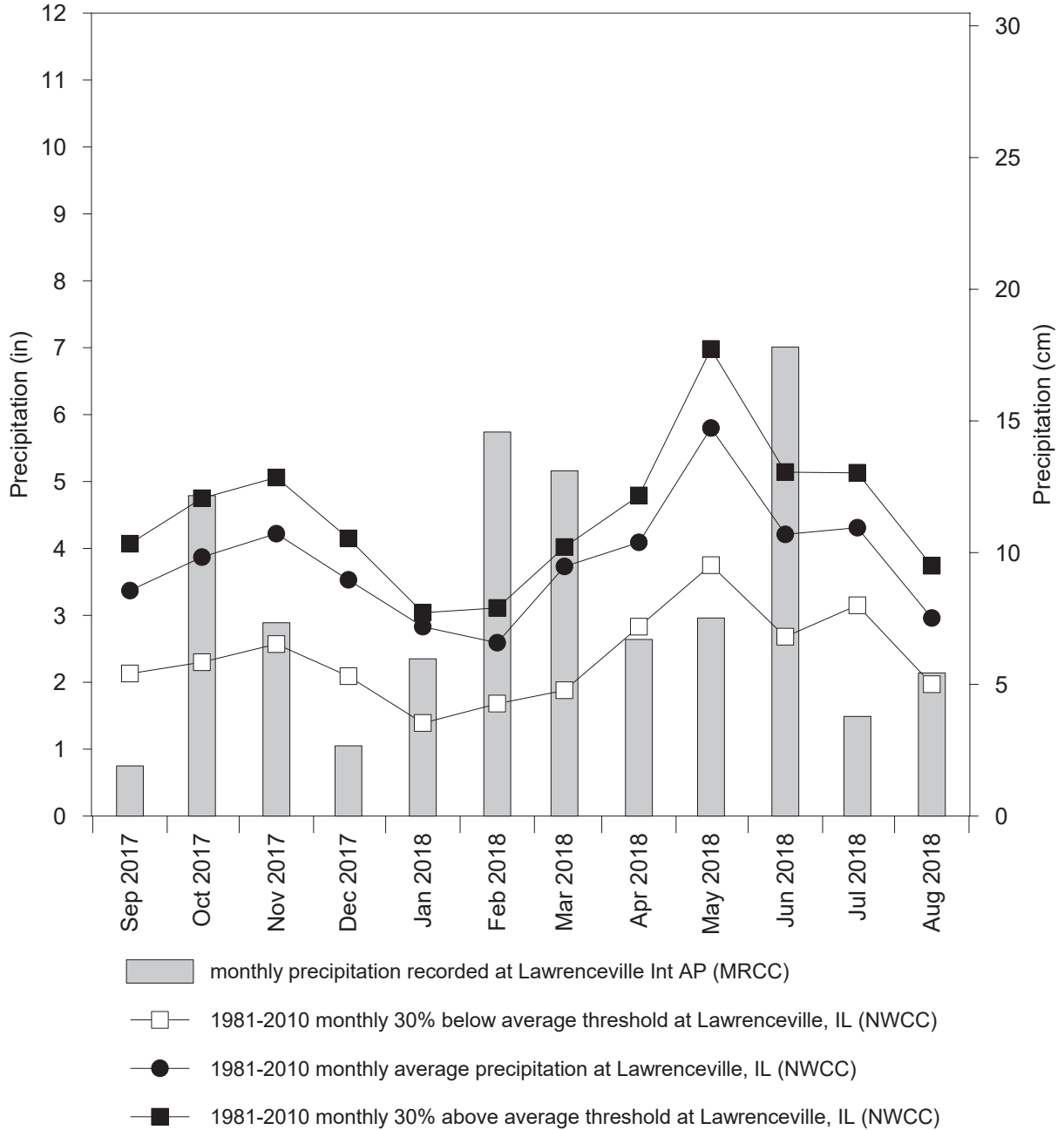
# Lawrence County Wetland Bank September 1, 2017 through August 31, 2018

## Water-Level Elevations at Surface-Water Gauges



# Lawrence County Wetland Mitigation Bank September 2017 through August 2018

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



**SWAN ROAD  
WETLAND MITIGATION SITE**

**ISGS #86**

TR 222

Sequence #12315

Perry County, near Tamaroa, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Manager: Audra M. Noyes

**SITE HISTORY**

- April 2011: ISGS was tasked to monitor wetland hydrology at the site.
- May 2011: Water-level monitoring was initiated.
- Winter 2017: Excavation took place around the site's northeast parcel just prior to the beginning of the 2017 growing season. This activity lowered surrounding land elevations, which will increase surface drainage offsite, which could also locally reduce wetland hydrology in the northeast parcel.

**WETLAND HYDROLOGY CALCULATION FOR 2018**

The target compensation area for the Swan Road wetland mitigation site is 0.30 ha (0.73 ac). Using the 1987 Manual (Environmental Laboratory 1987), 0.33 ha (0.82 ac) of the total site area of 0.43 ha (1.06 ac) satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season and 0.30 ha (0.75 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 0.41 ha (1.01 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 2018). 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 19 was the starting date of the 2018 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 102% of normal, and spring 2018 (March through May) precipitation was 109% of normal.
- The period of maximum inundation and saturation during the 2018 growing season began in mid-March and lasted through late April in response to a seasonally elevated water table and seasonal rainfall. The site was flooded 13 times during the monitoring year and 10 of these floods occurred during the growing season. None of these flood events lasted long enough to satisfy wetland hydrology criteria.
- In 2018, water levels measured in 5 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 2018**

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

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

<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
<b>A</b>	n/a	n/a	n/a
<b>B</b>	139.67 m (458.23 ft)	139.64 m (458.14 ft)	139.71 m (458.37 ft)

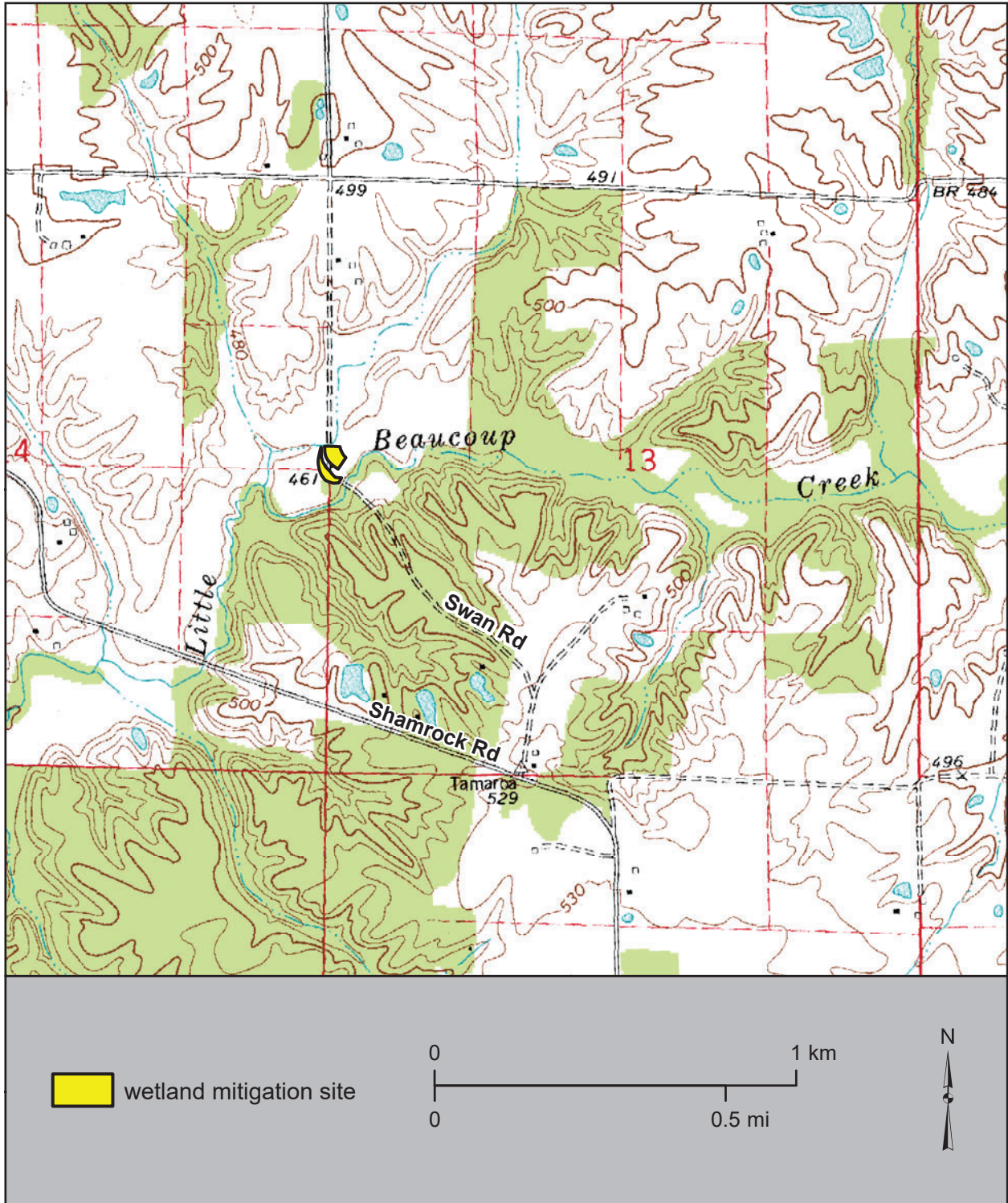
n/a – insufficient data to determine an elevation



# Swan Road Wetland Mitigation Site (TR222, Swan Road)

## General Study Area and Vicinity

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





# Swan Road Wetland Mitigation Site (TR222, Swan Road)








## Estimated Areal Extent of 2018 Wetland Hydrology

September 1, 2017 through August 31, 2018

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

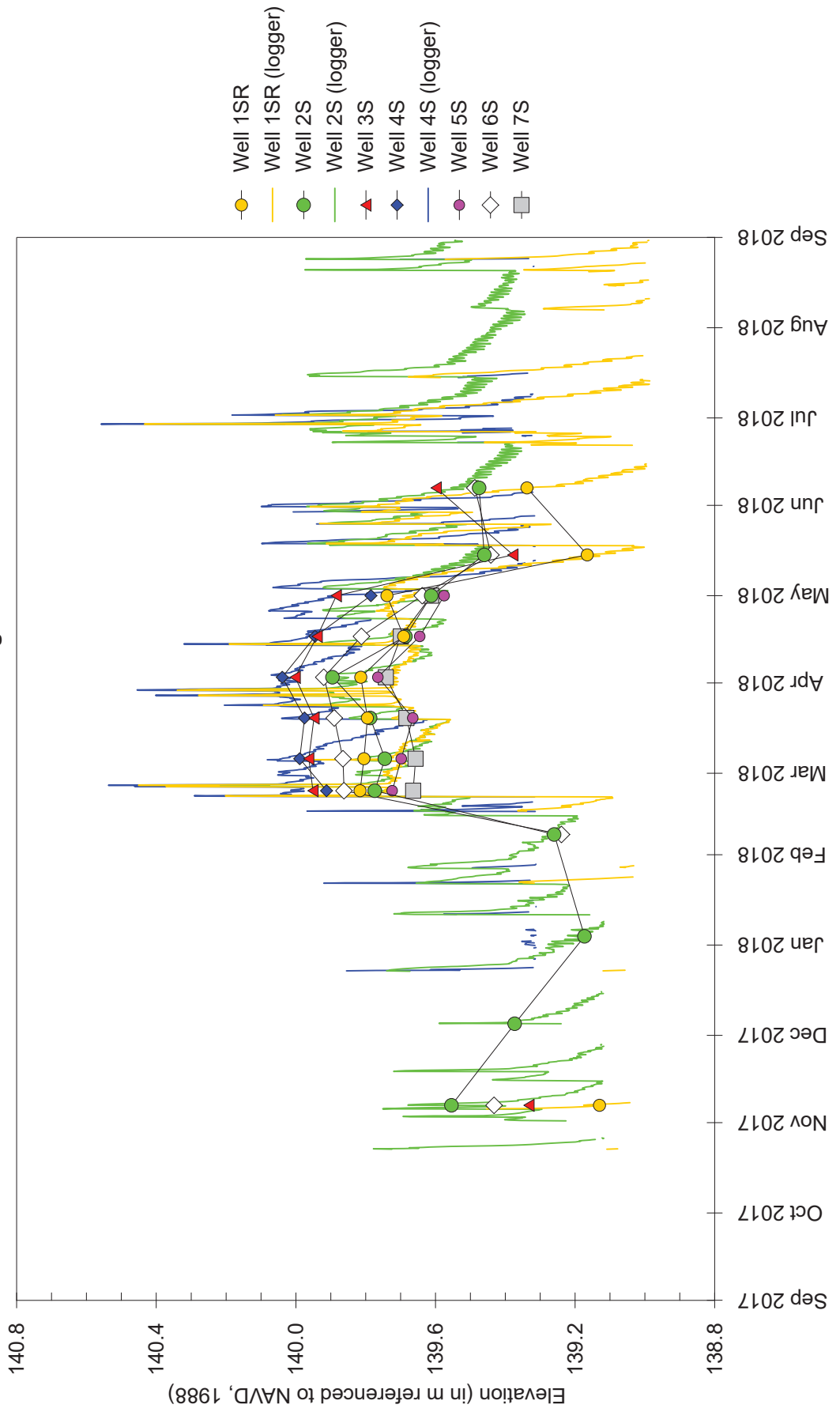


### 2018 Wetland Hydrology

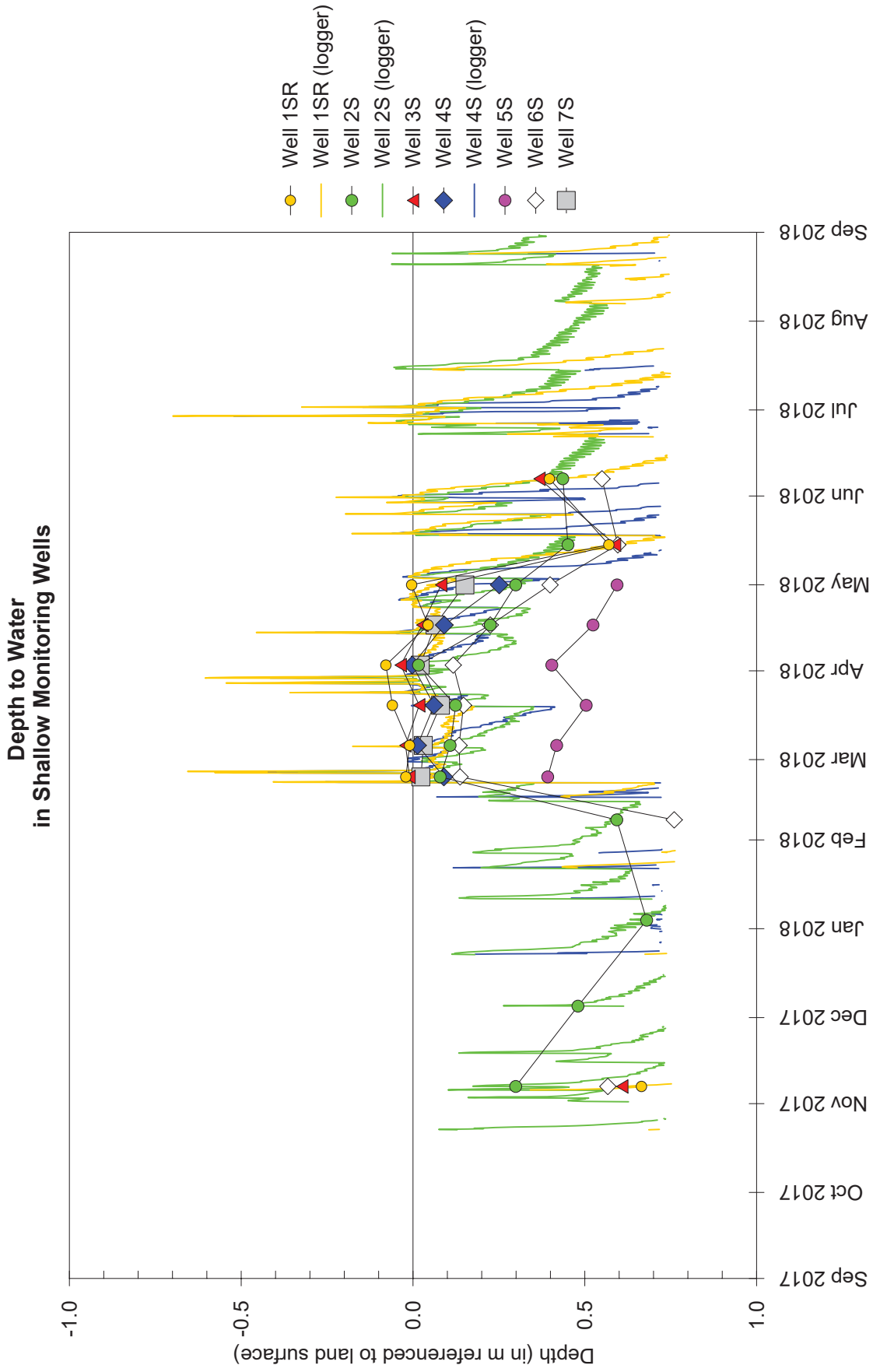
- |   |  |   |                     |
|---|--|---|---------------------|
|  | >5% of growing season (1987 Manual)              |  | monitoring well     |
|  | >12.5% of growing season (1987 Manual)           |  | surface-water gauge |
|  | 14 days or more (2010 Midwest Region Supplement) |  | rain gauge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

# Swan Road Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations in Shallow Monitoring Wells

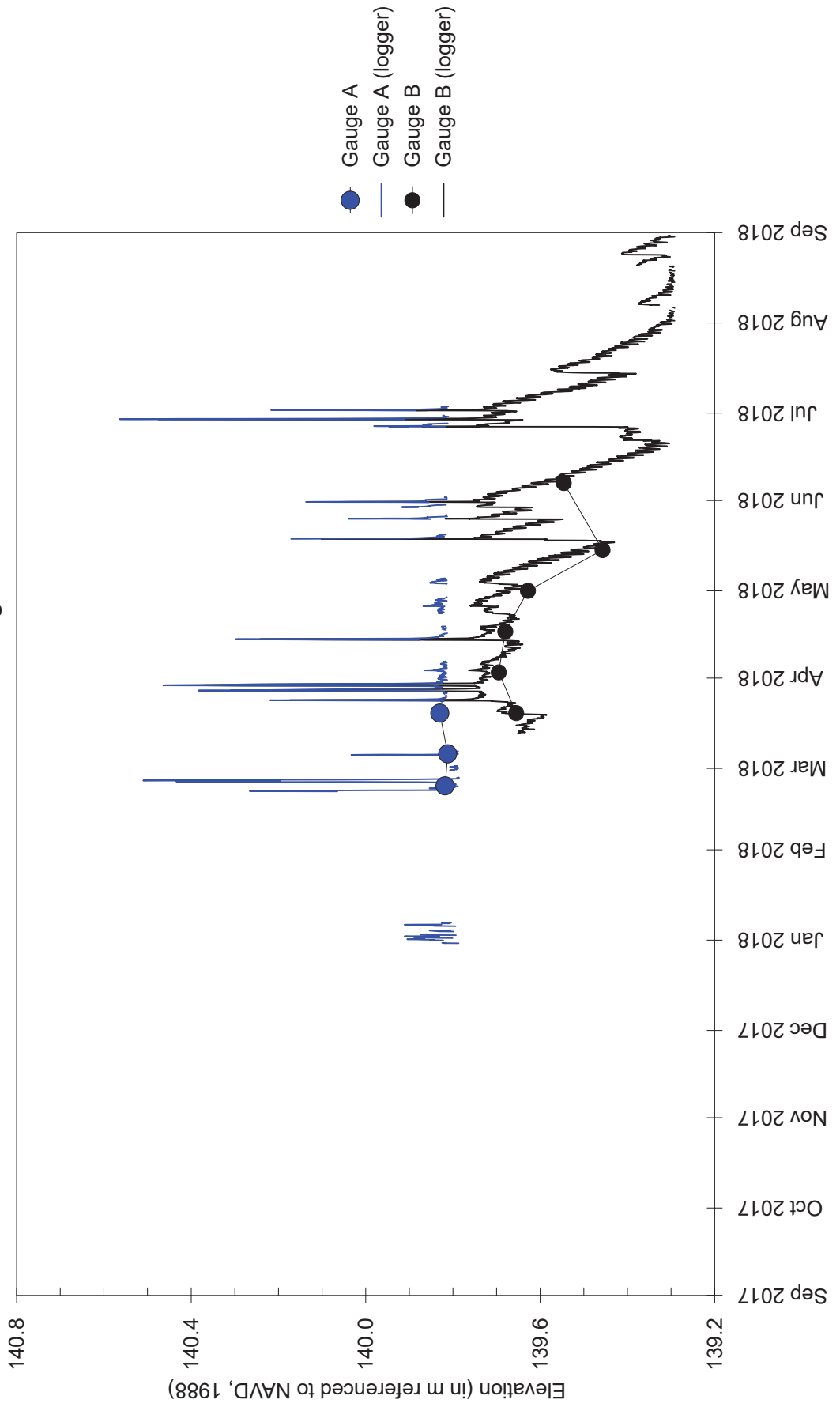


# Swan Road Wetland Mitigation Site September 1, 2017 through August 31, 2018



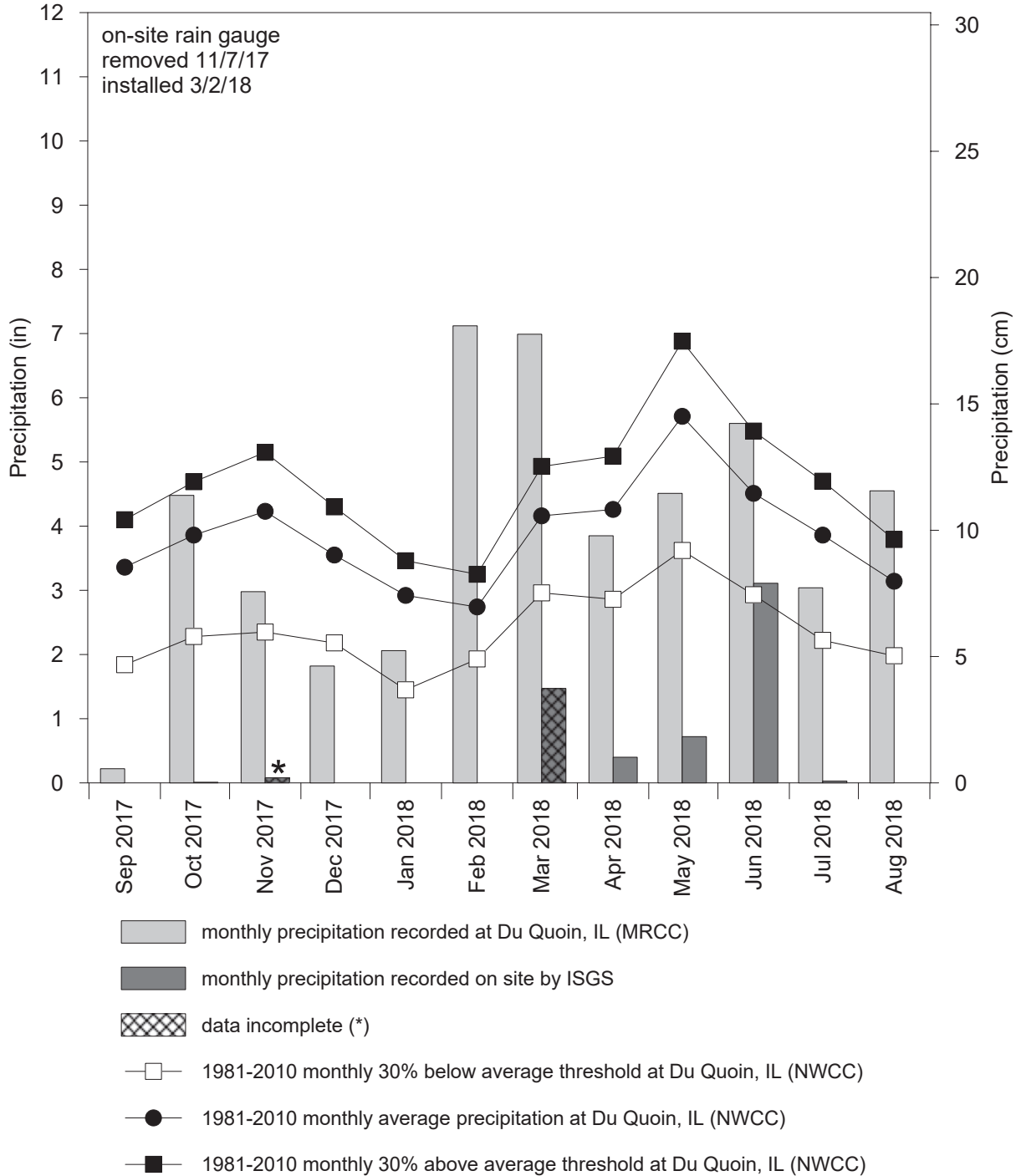
# Swan Road Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations at Surface-Water Gauges



## Swan Road Wetland Mitigation Site September 2017 through August 2018

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





**GRANT CREEK NORTH  
WETLAND MITIGATION SITE**

**ISGS #88**

I-55

FAI 55

Will County, near Wilmington, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Katharine L. Schleich

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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), 24.38 ha (60.24 ac) of the total site area of 62.73 ha (155.00 ac) satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season, and 21.31 ha (52.66 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), 20.72 ha (51.19 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 Joliet, Illinois, is April 5, and the season lasts 213 days (MRCC 2018). 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 19 was the starting date of the 2018 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Joliet, Illinois, (MRCC station #114530) was 95% of normal. During spring 2018 (March through May), precipitation was 74% of normal.
- The period of maximum inundation and saturation during the 2018 growing season occurred from early April to early May. Separately, the period of maximum inundation and saturation satisfying the 14-day wetland hydrology criteria at Gauge C occurred from mid- to late May. Both periods were primarily the result of precipitation.
- In 2018, water levels measured in 21 of 26 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 19 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 18 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

- 2018 is the last year Openlands will fund stewardship and monitoring at the site.
- Stantec's final Management and Monitoring Report is expected to be sent to the Army Corps of Engineers and U.S. Forest Service's Midewin National Tallgrass Prairie in January or February 2019.

#### PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2018

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
1S	Y	N	N
2VSR2	Y	Y	Y
3VS	Y	N	N
5VSR	Y	Y	Y
6VSR	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
19S	Y	Y	Y
20VS	Y	Y	Y
21VS	Y	Y	Y
22VSR	Y	Y	Y
23VSR2	Y	Y	Y
24VSR2	Y	Y	Y
25S	Y	Y	N
26S	Y	Y	Y
27S	N	N	N

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

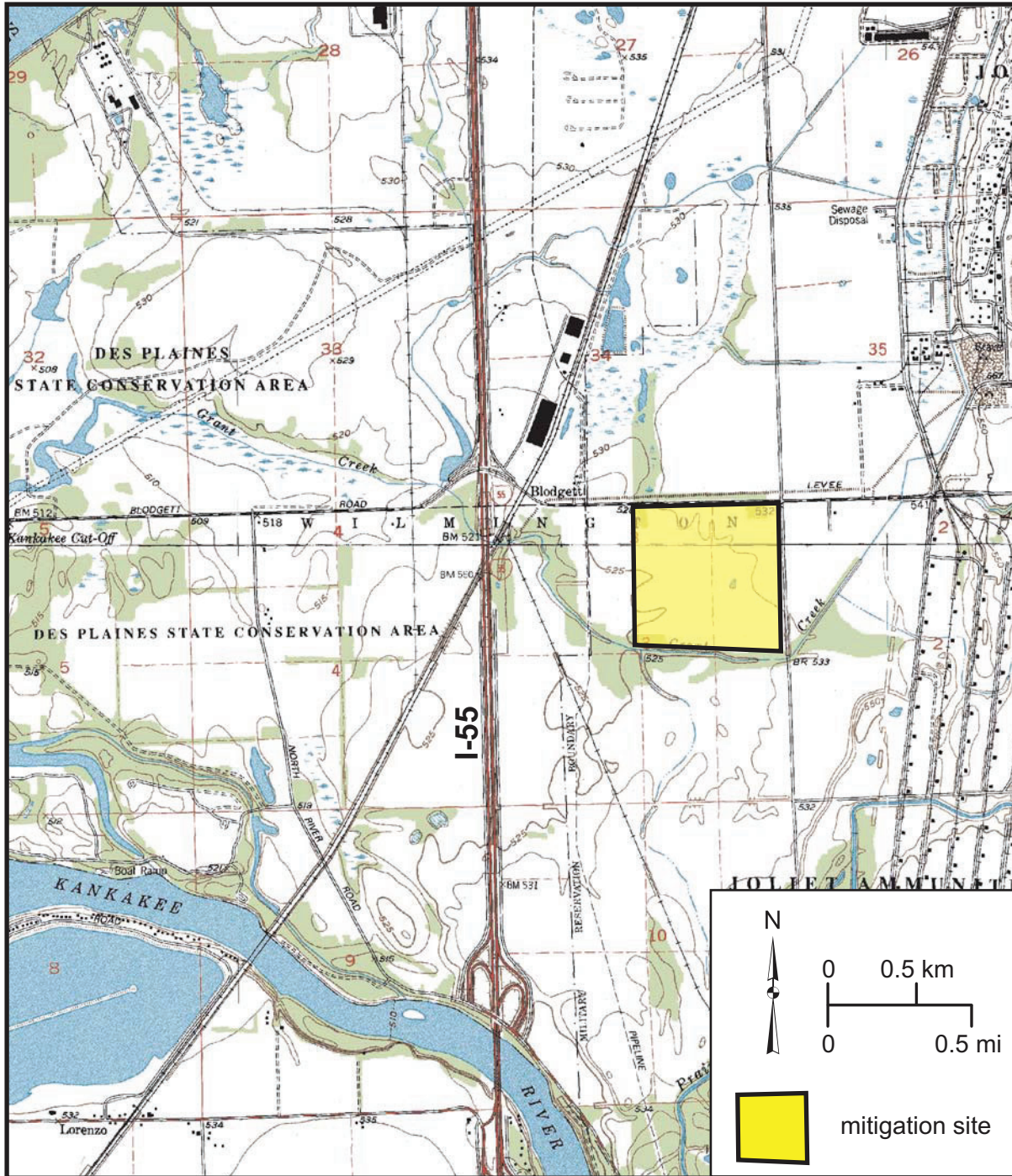
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
<b>A</b>	159.89 m (524.57 ft)	159.80 m (524.28 ft)	159.79 m (524.25 ft)
<b>B</b>	159.44 m (523.10 ft)	159.39 m (522.93 ft)	159.38 m (522.90 ft)
<b>C</b>	159.90 m (524.61 ft)	159.84 m (524.41 ft)	159.84 m (524.41 ft)

n/a – insufficient data to determine an elevation

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

## General Study Area and Vicinity

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

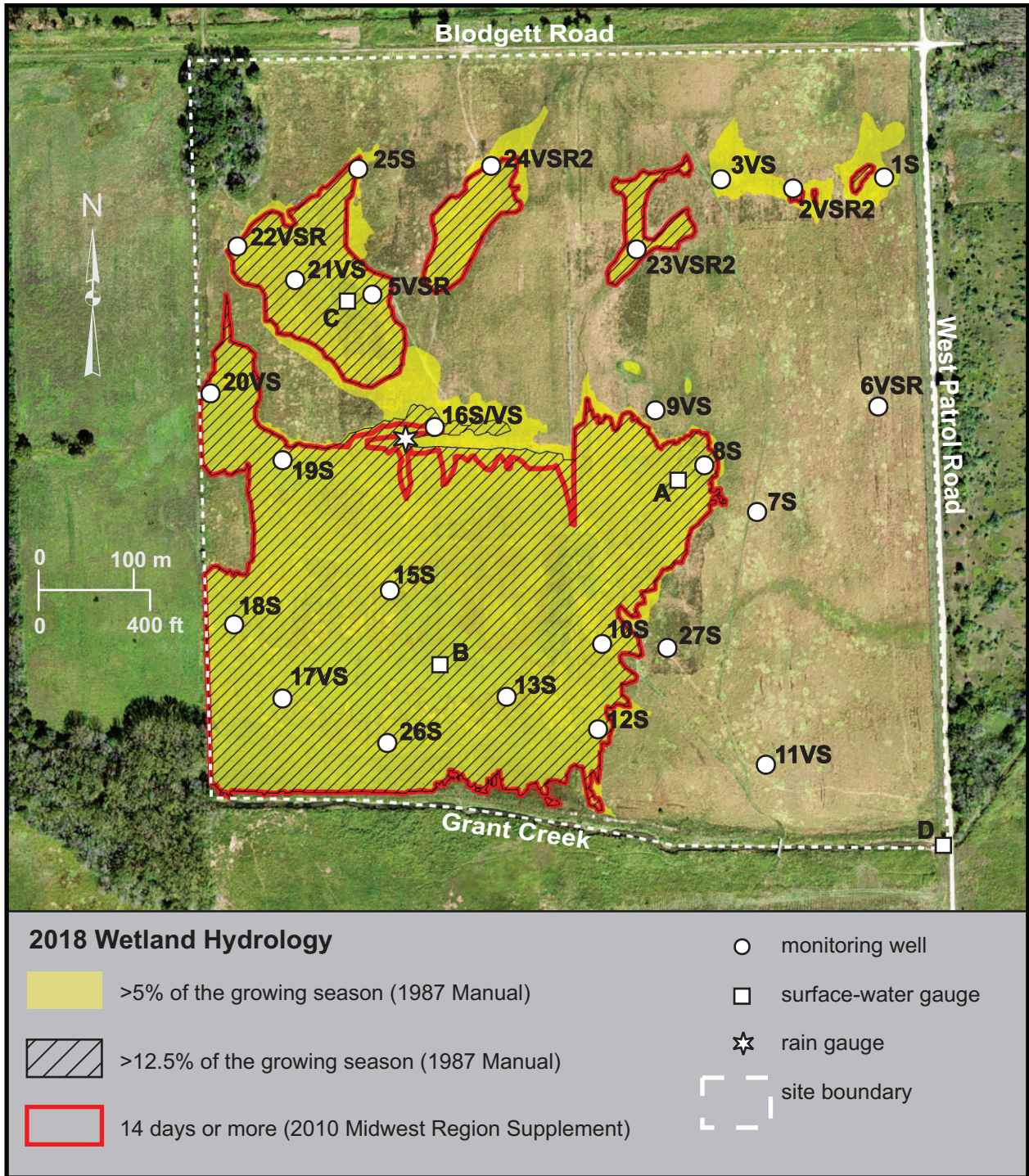




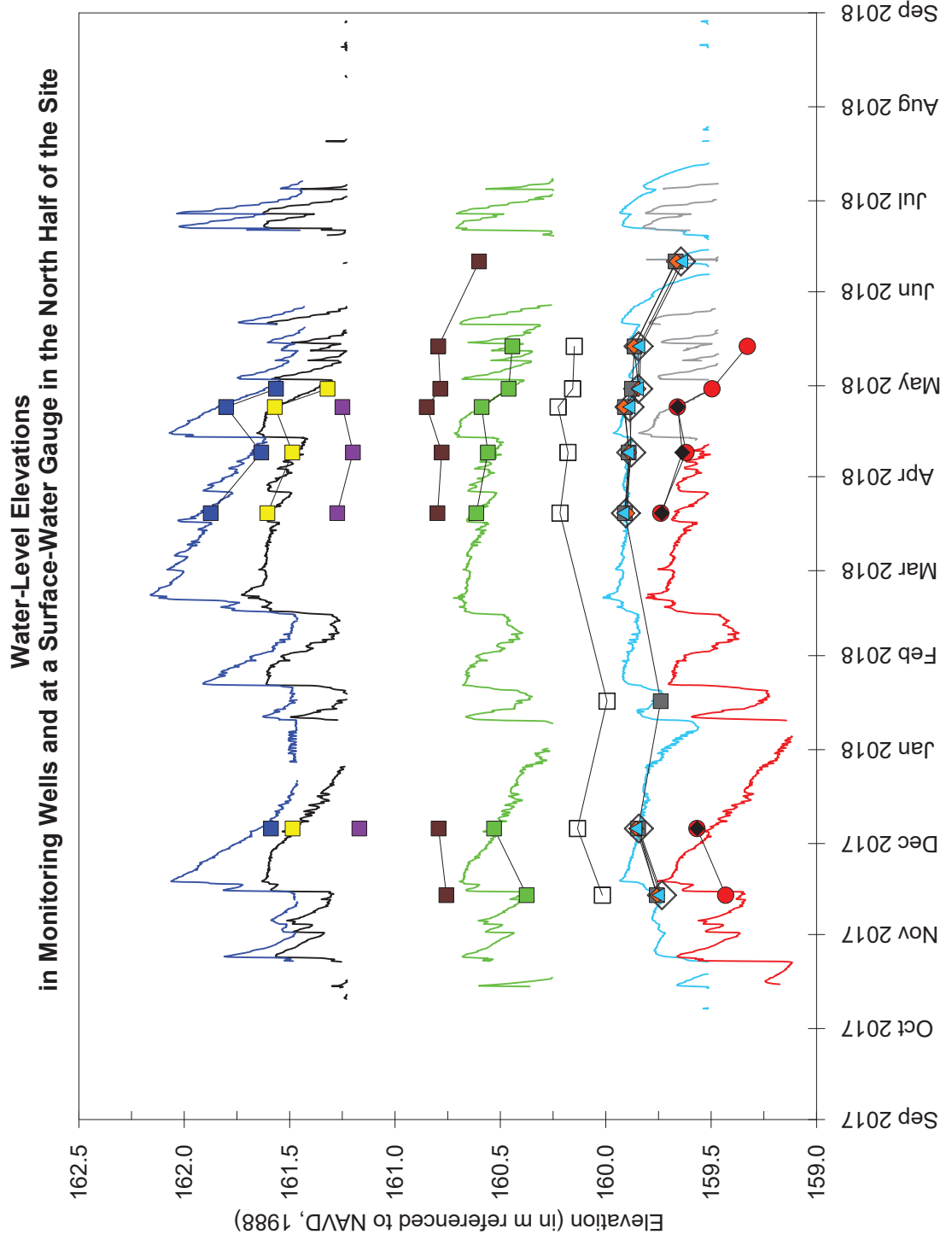
# Grant Creek North Wetland Mitigation Site (I-55, FAI 55)

**Estimated Areal Extent of 2018 Wetland Hydrology**  
September 1, 2017 through August 31, 2018

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

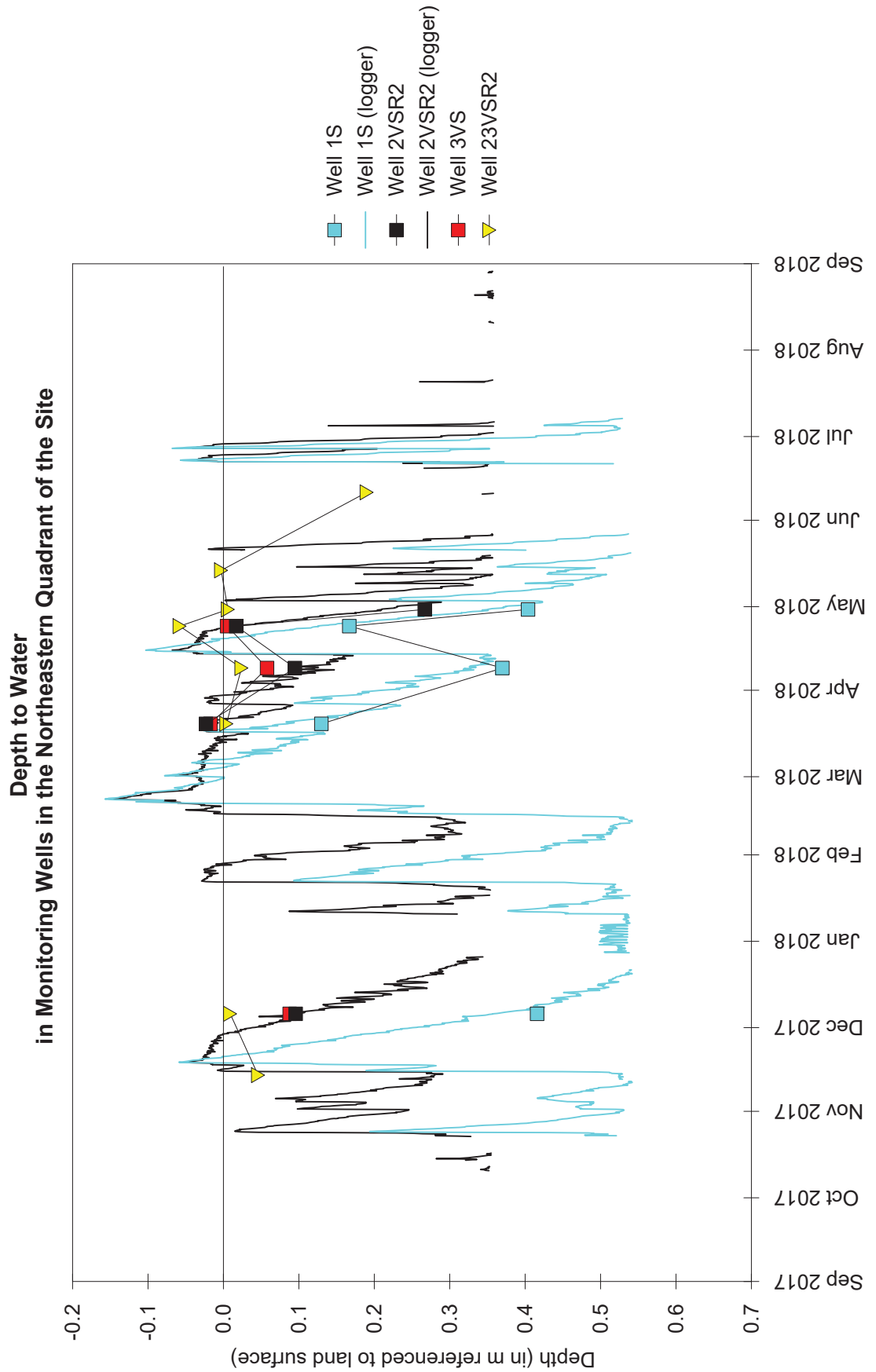


# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018

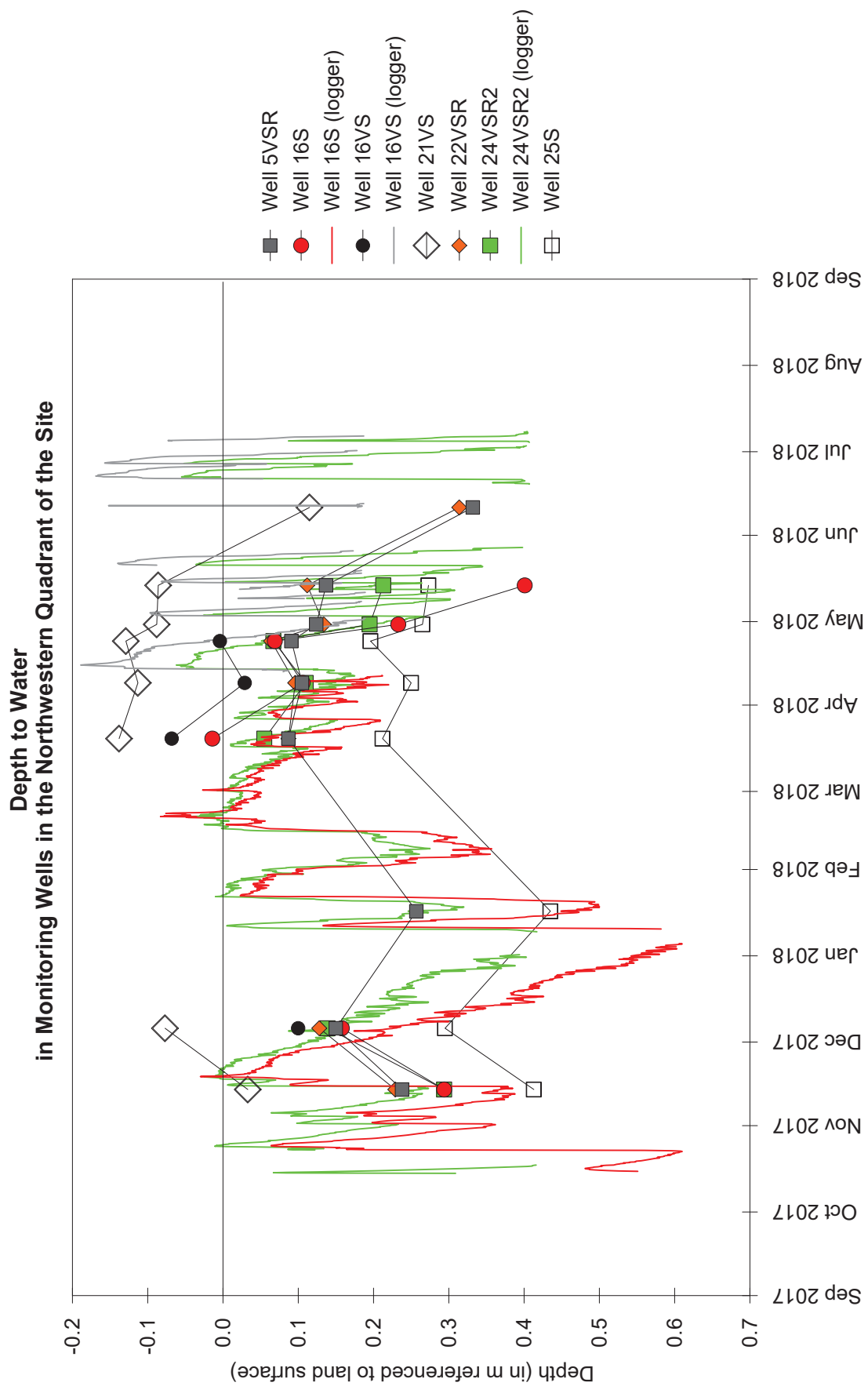




# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018

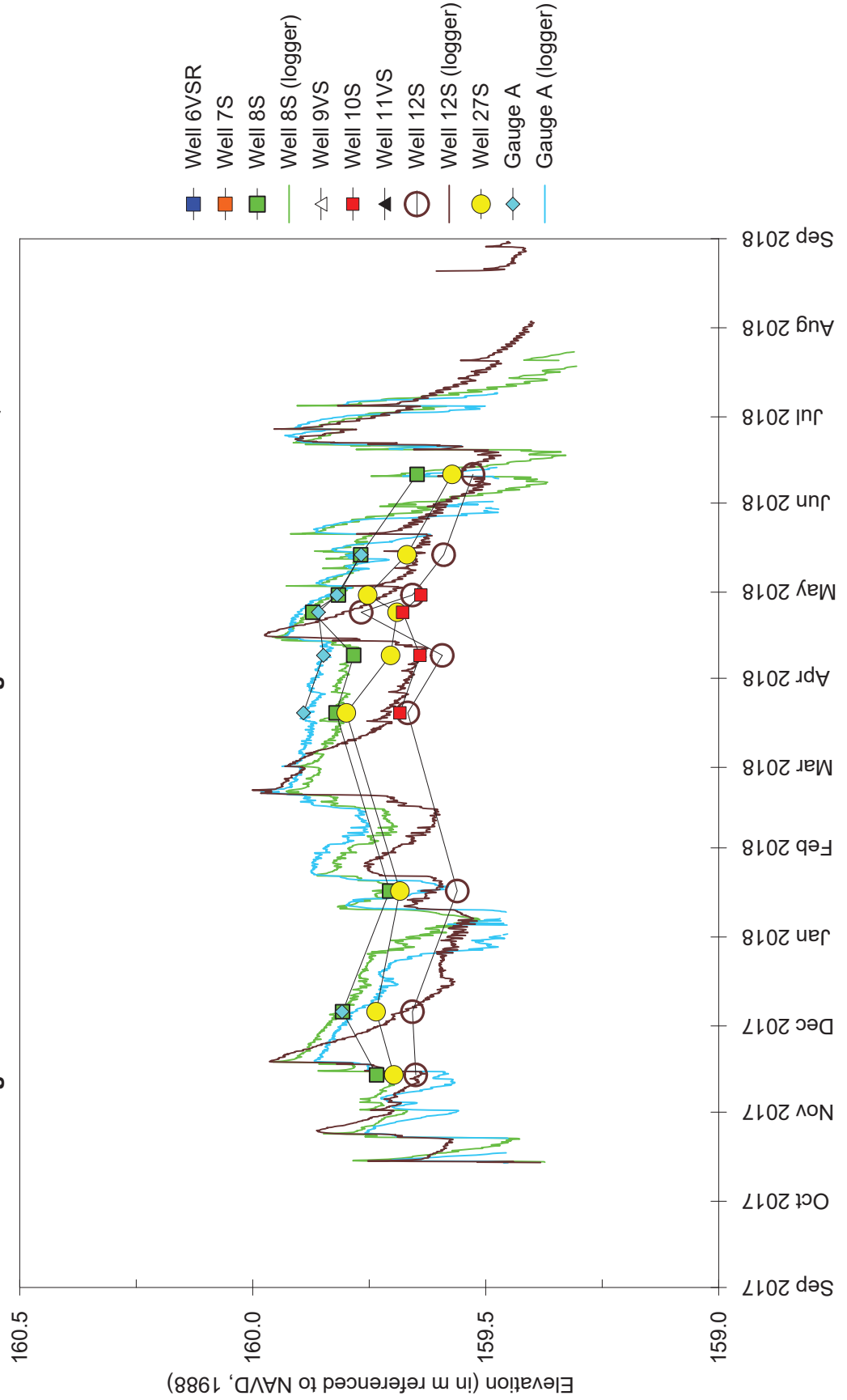


# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018

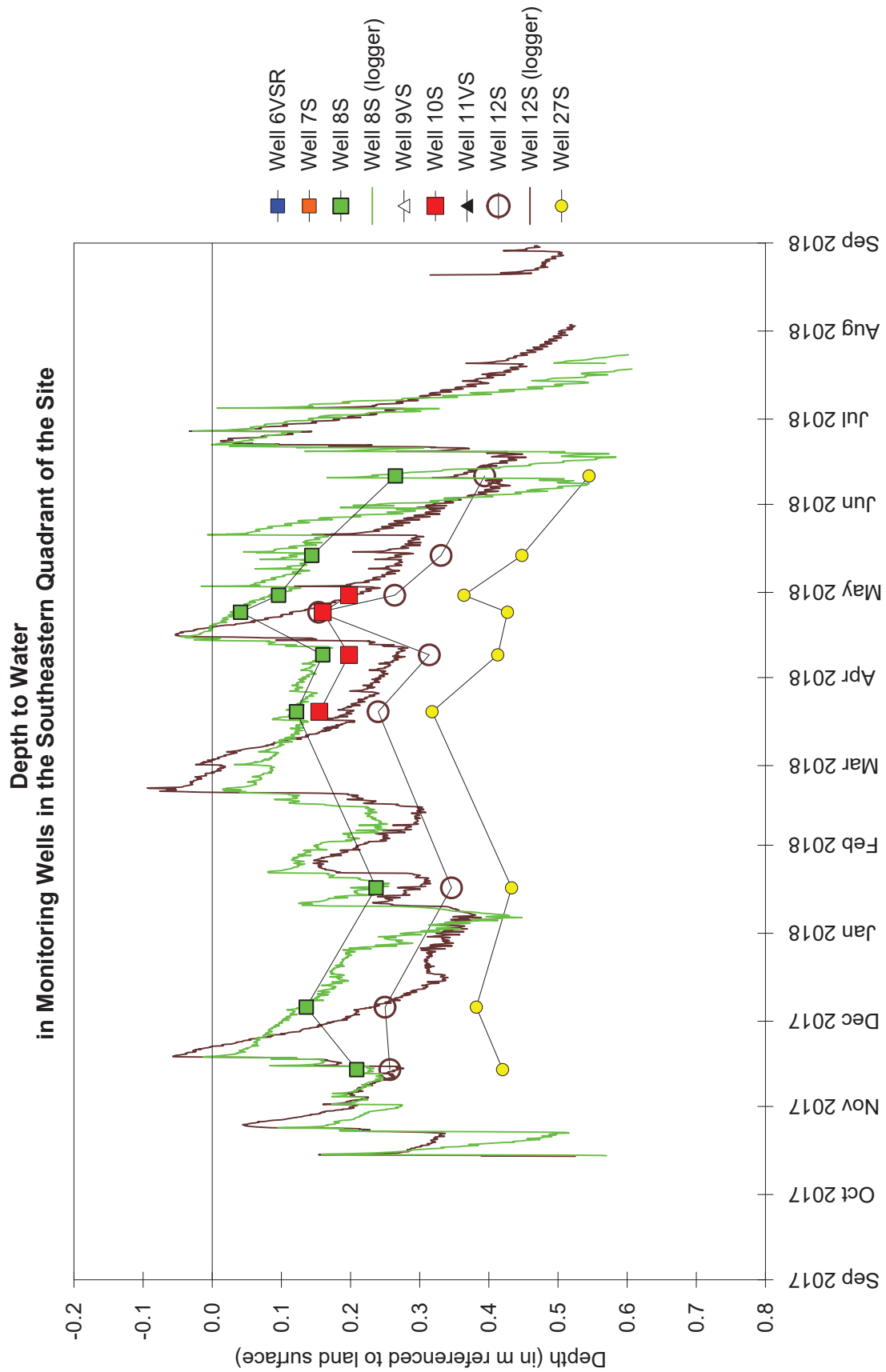


# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018

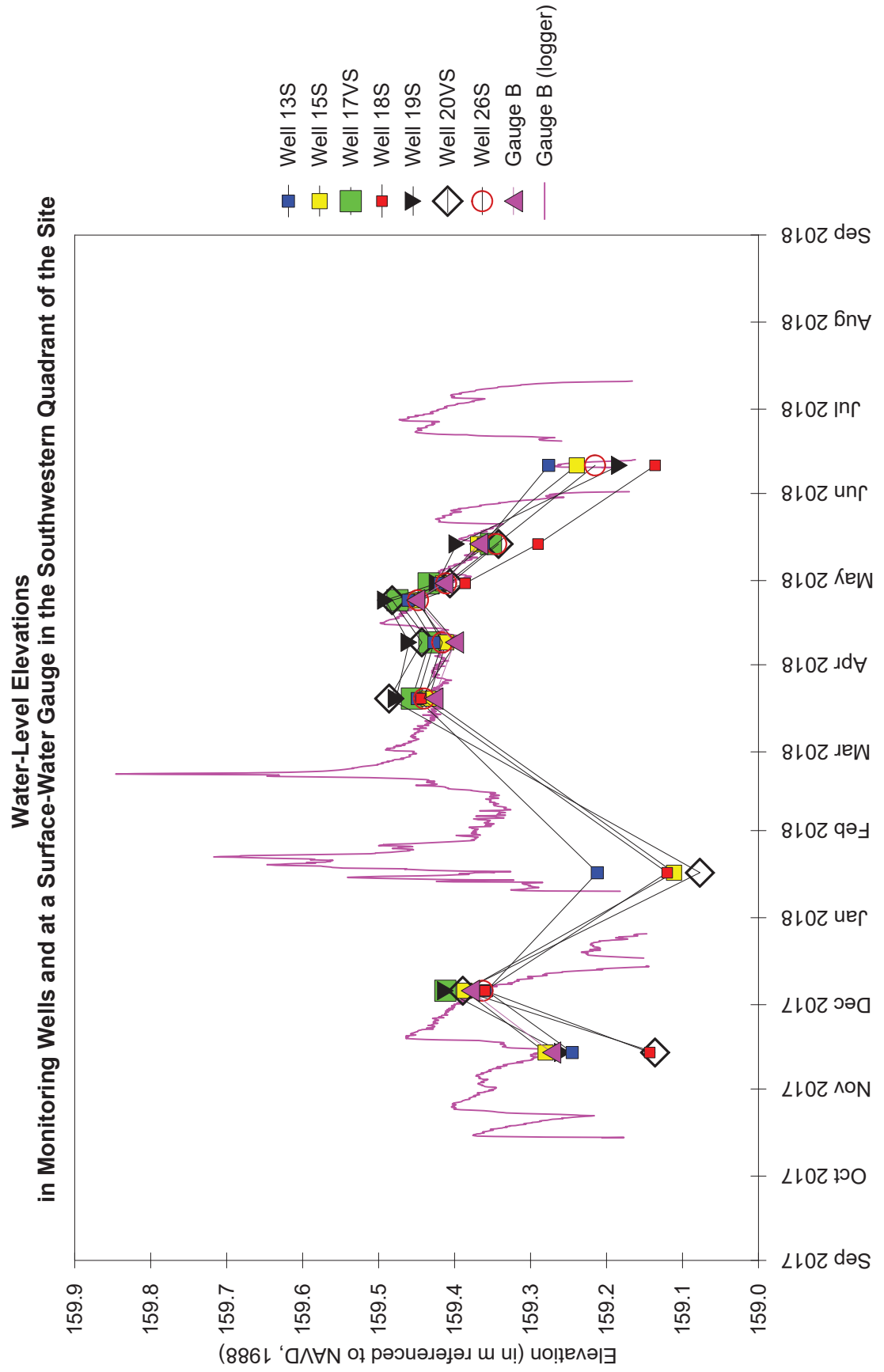
Water-Level Elevations  
in Monitoring Wells and at a Surface-Water Gauge in the Southeastern Quadrant of the Site



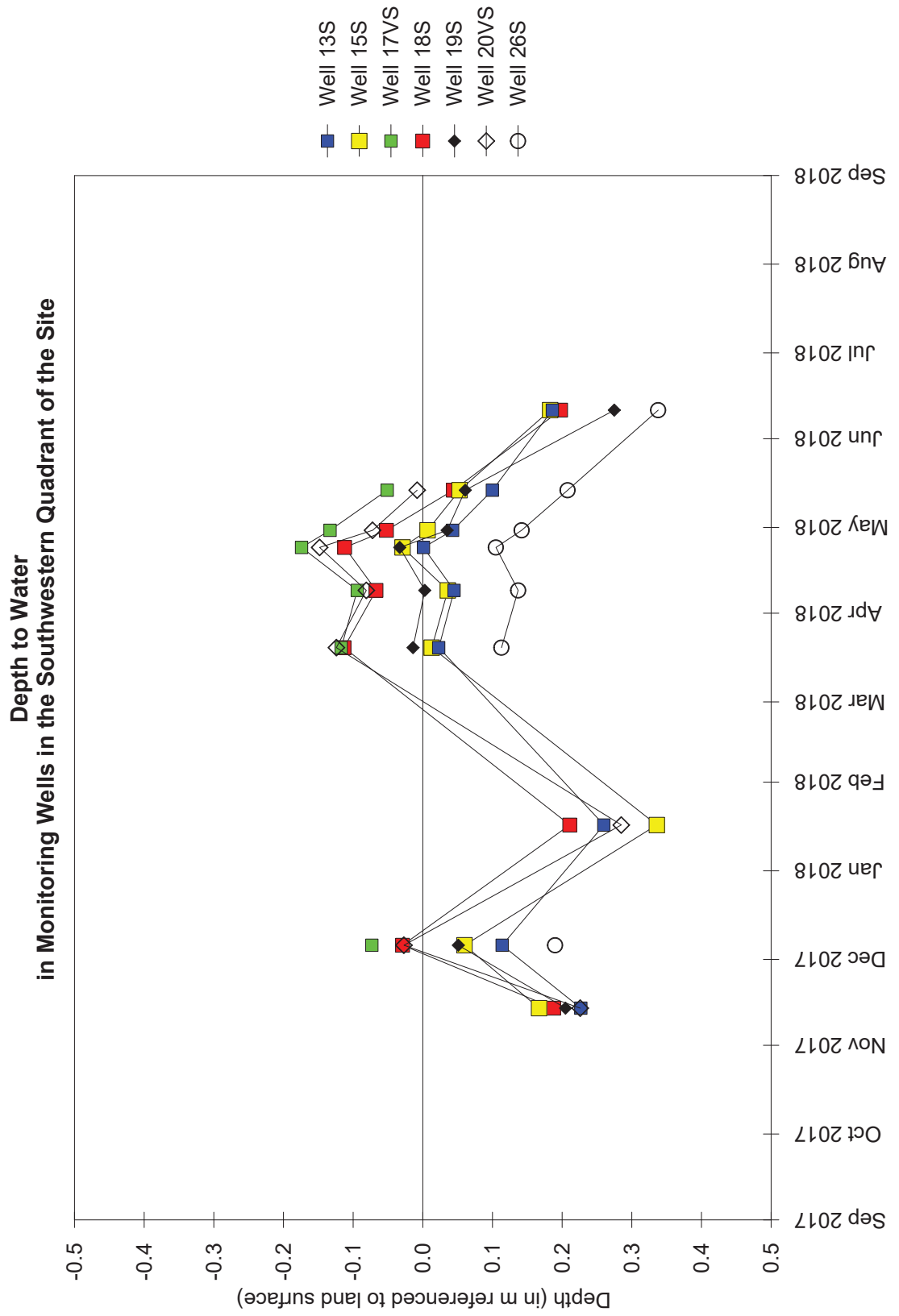
# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018



# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018



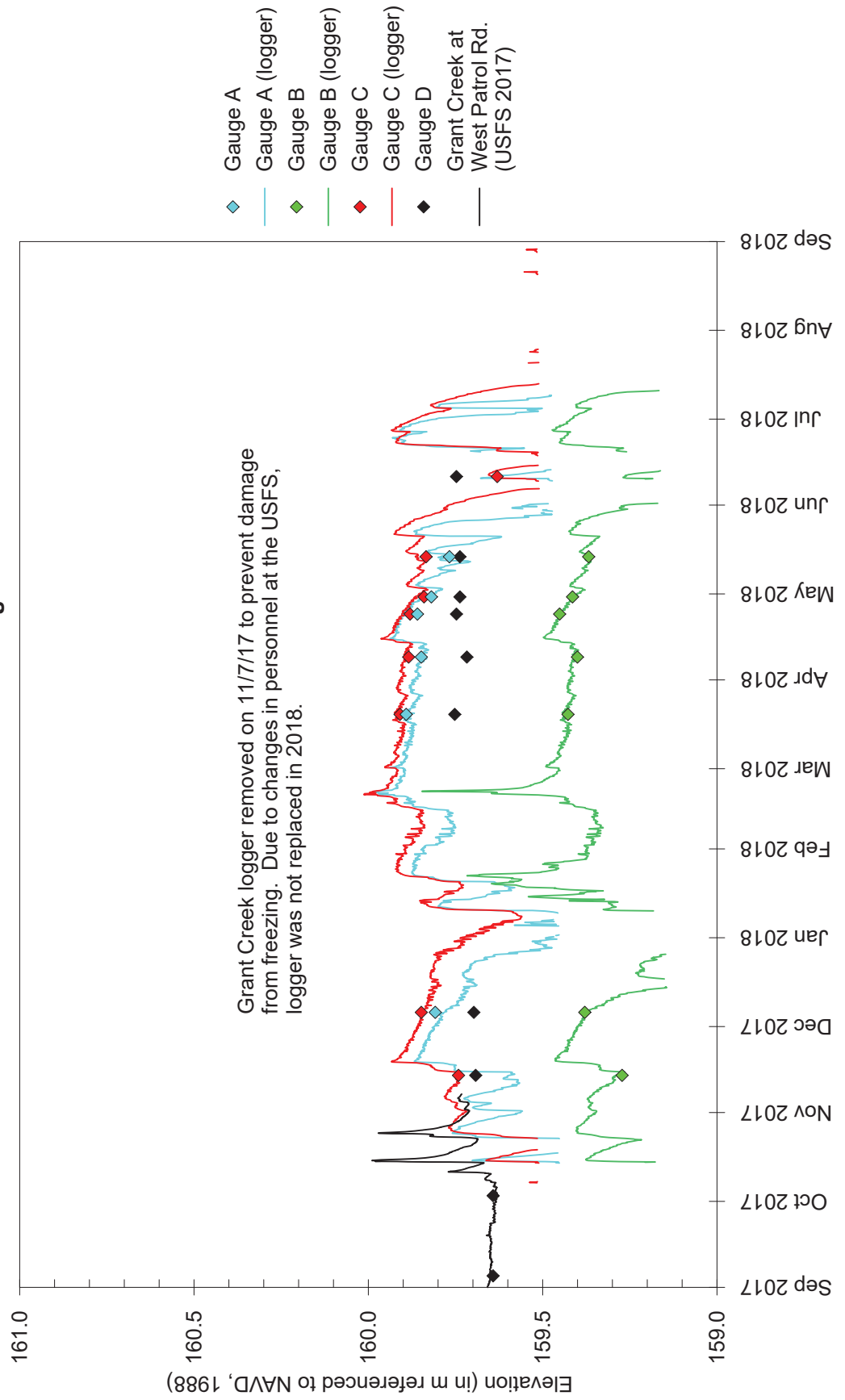
# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018





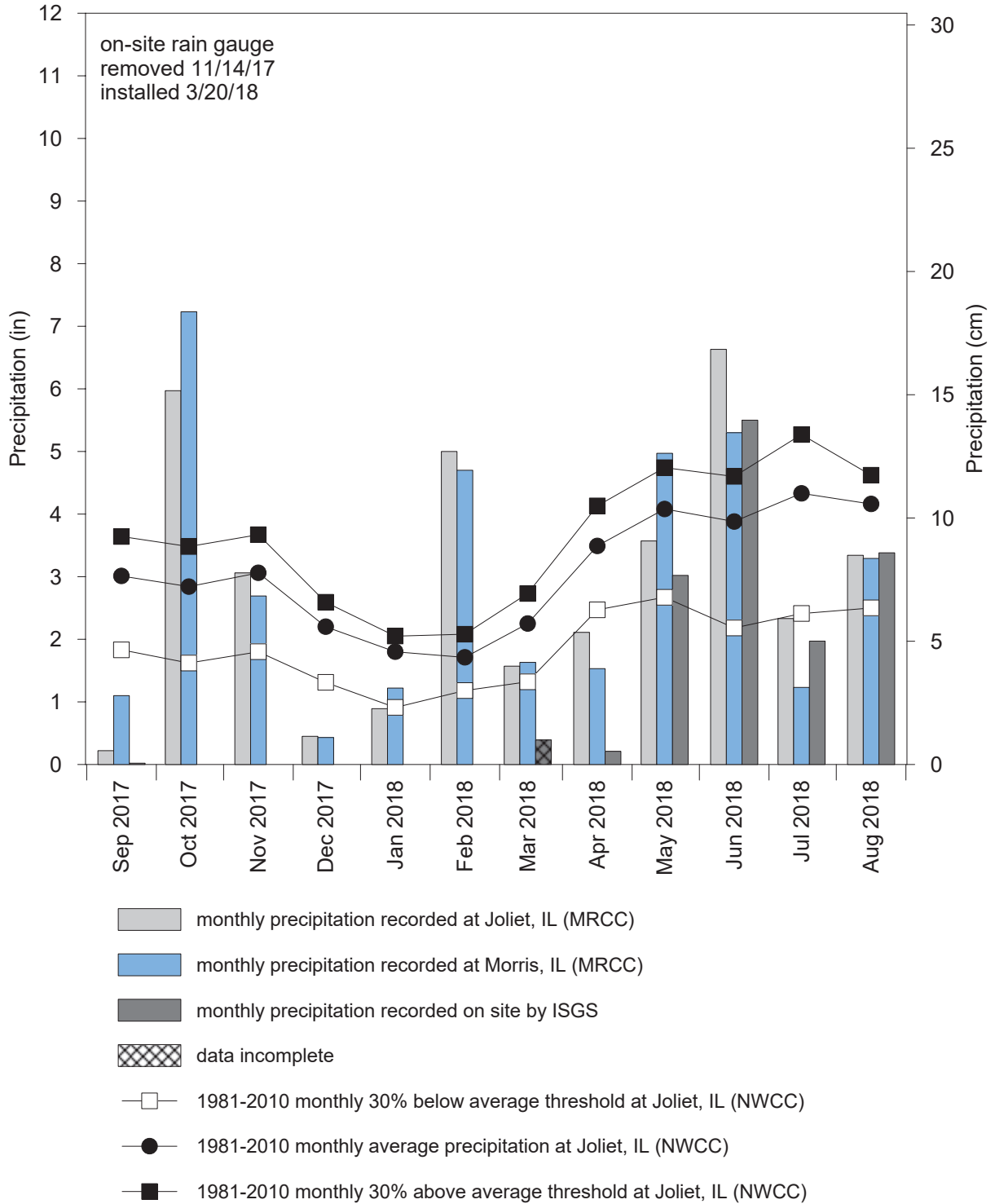
# Grant Creek North Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations at Surface-Water Gauges



## Grant Creek North Wetland Mitigation Site September 2017 through August 2018

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



**THORN CREEK HEADWATERS PRESERVE  
WETLAND MITIGATION SITE**

**ISGS #90**

I-57/Stuenkel Road

FAI 57

Sequence #12558

Will County, near University Park, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Katharine L. Schleich

**SITE HISTORY**

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

**WETLAND HYDROLOGY CALCULATION FOR 2018**

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), 11.47 ha (28.35 ac) of the total site area of 37.54 ha (92.77 ac) satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season, and 1.72 ha (4.25 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), 2.36 ha (5.84 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 2018). 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 20 was the starting date of the 2018 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Park Forest, Illinois (MRCC station #116616), was 107% of normal, and spring 2018 (March through May) precipitation was 55% of normal. Precipitation for February 2018 was particularly excessive with 308% of normal.
- The period of maximum inundation and saturation during the 2018 growing season at the site occurred during late April. Overall, precipitation during the spring was much below normal. The peak hydrology during the growing season was mainly in response to rainfall between April 14 and April 16.
- In 2018, water levels measured in 15 of 30 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 1 of 30 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010

Midwest Region Supplement, water levels in 2 of 30 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

#### ADDITIONAL INFORMATION

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

#### PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2018

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
1S	Y	Y	Y
3S	N	N	N
4S	N	N	N
5S	N	N	N
6S	N	N	N
7S	N	N	N
10S	Y	N	N
11S	N	N	N
12S	N	N	N
13S	Y	N	N
15S	Y	N	N
16S	Y	N	N
17S	Y	N	N
18S	N	N	N
19S	Y	N	N
20S	Y	N	N
21S	N	N	N
22S	Y	N	N
23S	Y	N	N
24S	Y	N	N
25S	N	N	N
26S	N	N	N
27S	N	N	N
28S	N	N	N
29S	N	N	N
30S	Y	N	N
31S	N	N	N
32S	Y	N	Y
33S	Y	N	N
34S	N	N	N
35S	Y	N	N

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

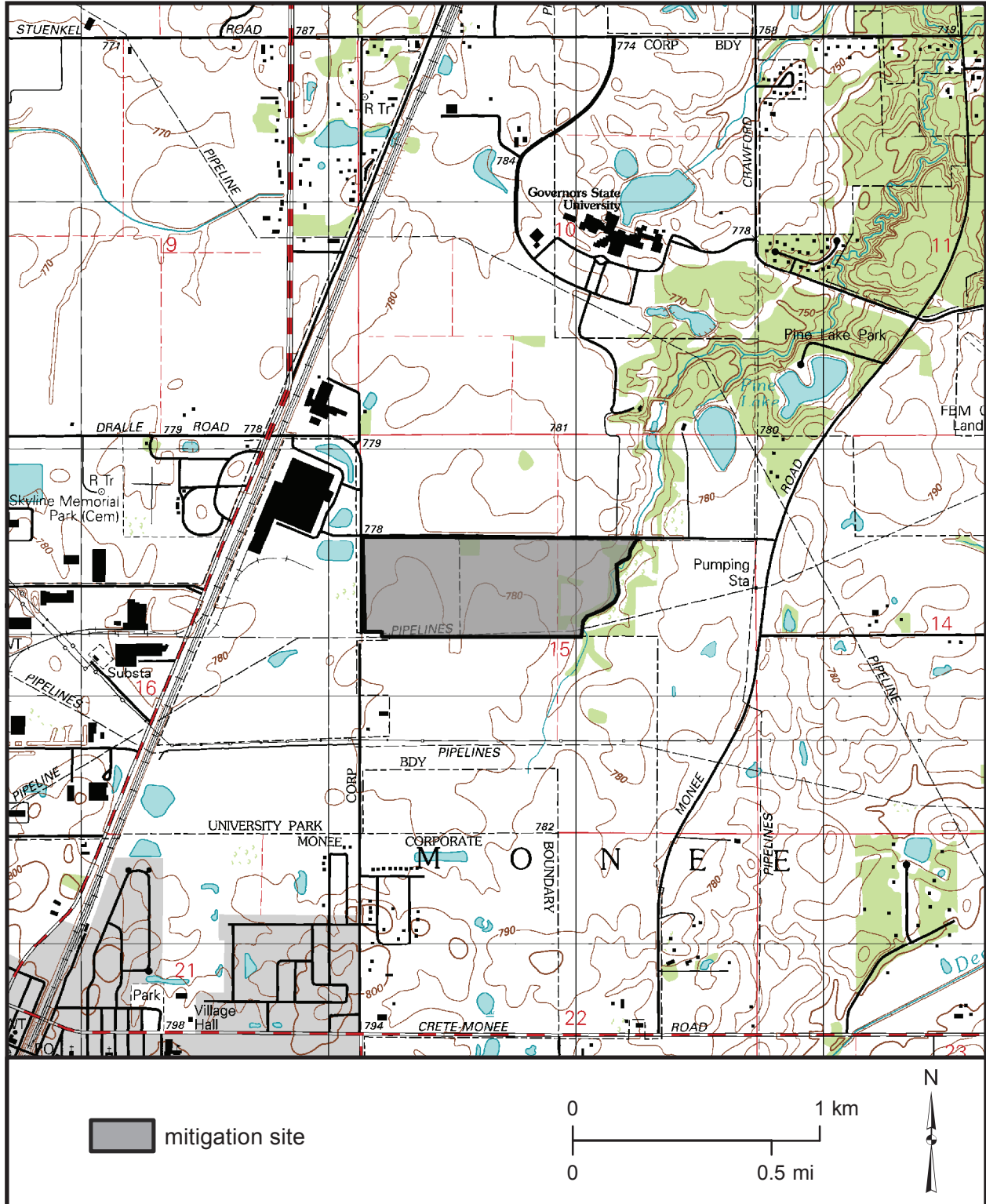
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
B	236.69 m (776.55 ft)	n/a	236.63 m (776.35 ft)
C	233.37 m (765.65 ft)	n/a	233.37 m (765.65 ft)

n/a – insufficient data to determine an elevation

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

## General Study Area and Vicinity

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



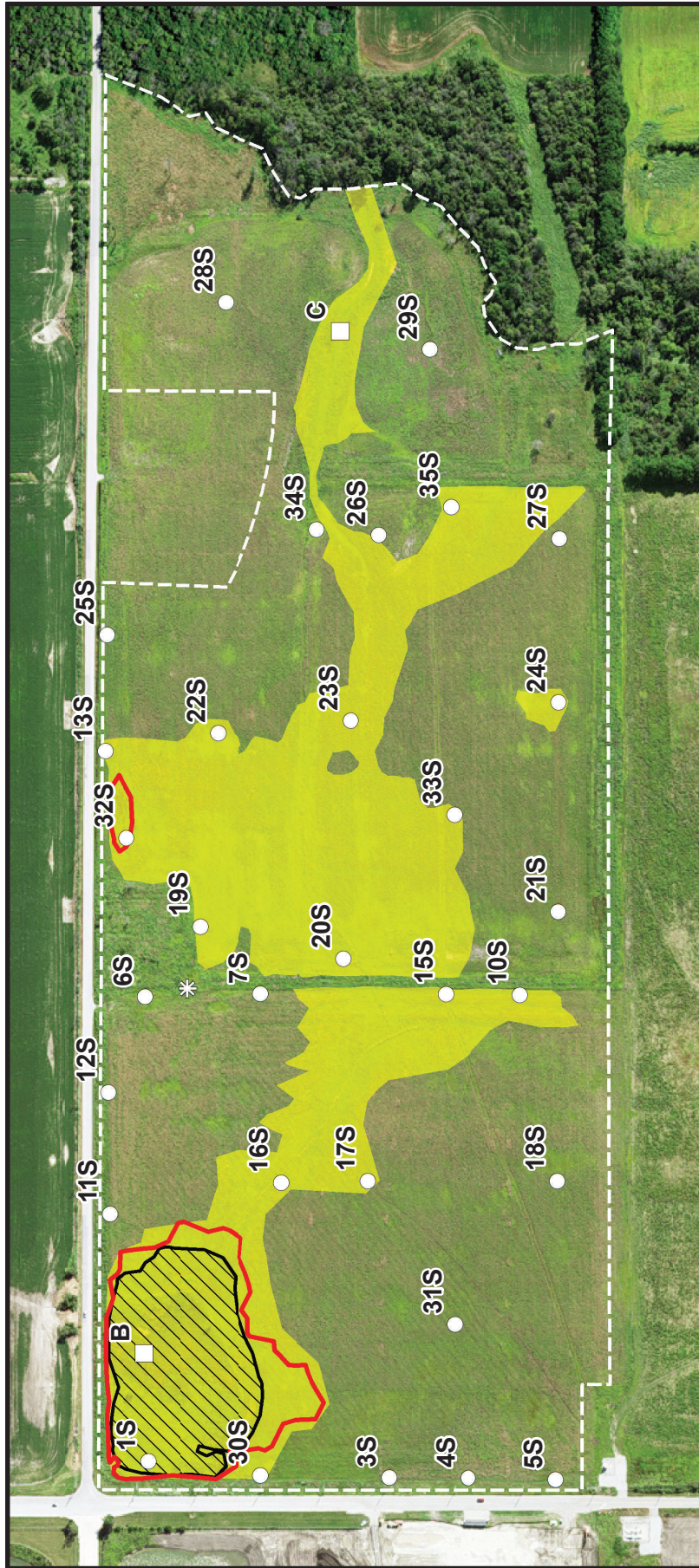


# Thorn Creek Headwaters Preserve Wetland Mitigation Site (I-57 at Stuenkel Road, FAI 57)

## Estimated Areal Extent of 2018 Wetland Hydrology

September 1, 2017 through August 31, 2018

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



### 2018 Wetland Hydrology

>5% of growing season (1987 Manual)

14 days or more (Midwest Region Supplement 2010)

>12.5% of growing season (1987 Manual)

monitoring well

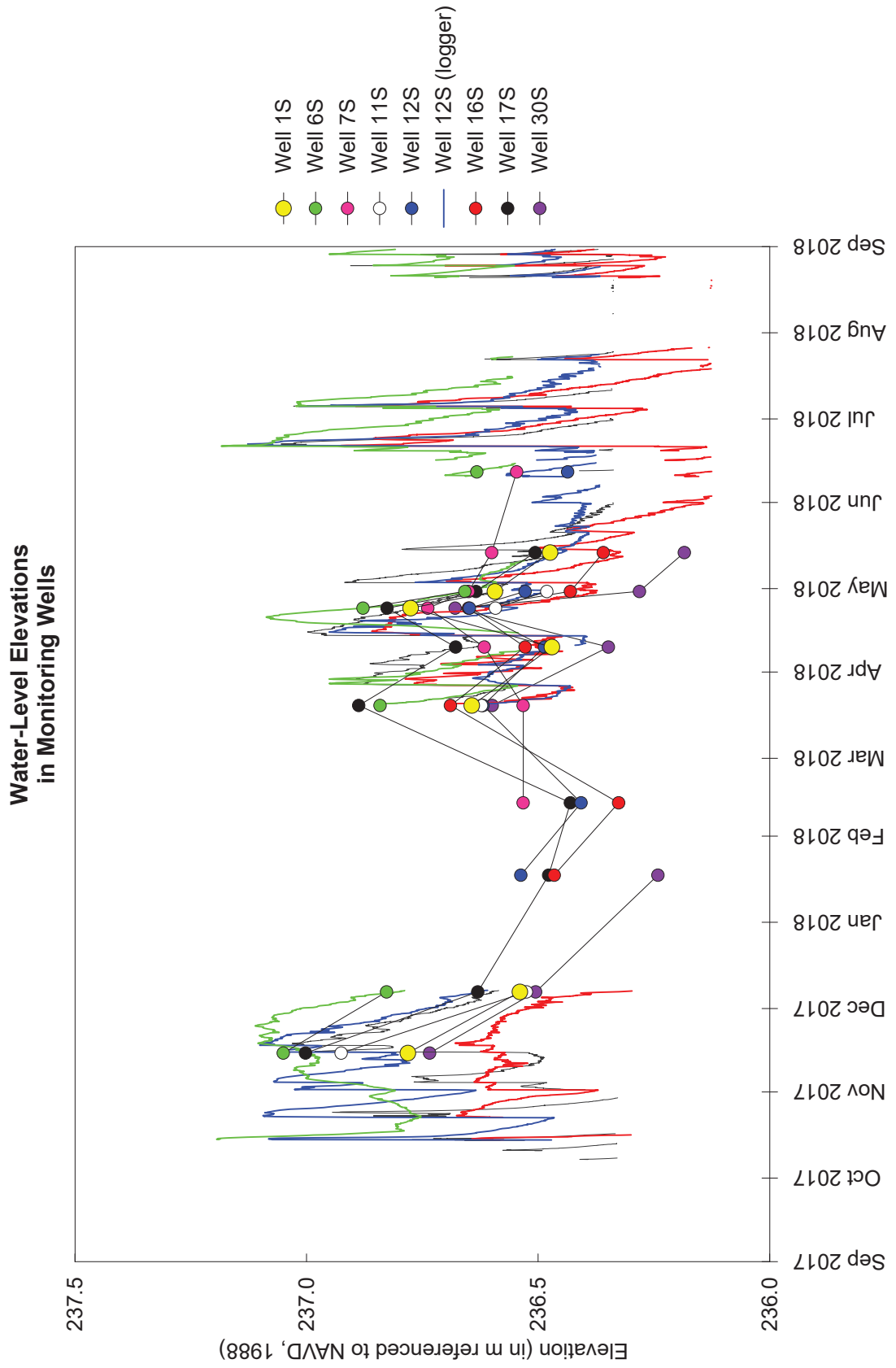
surface-water gauge

rain gauge

mitigation site

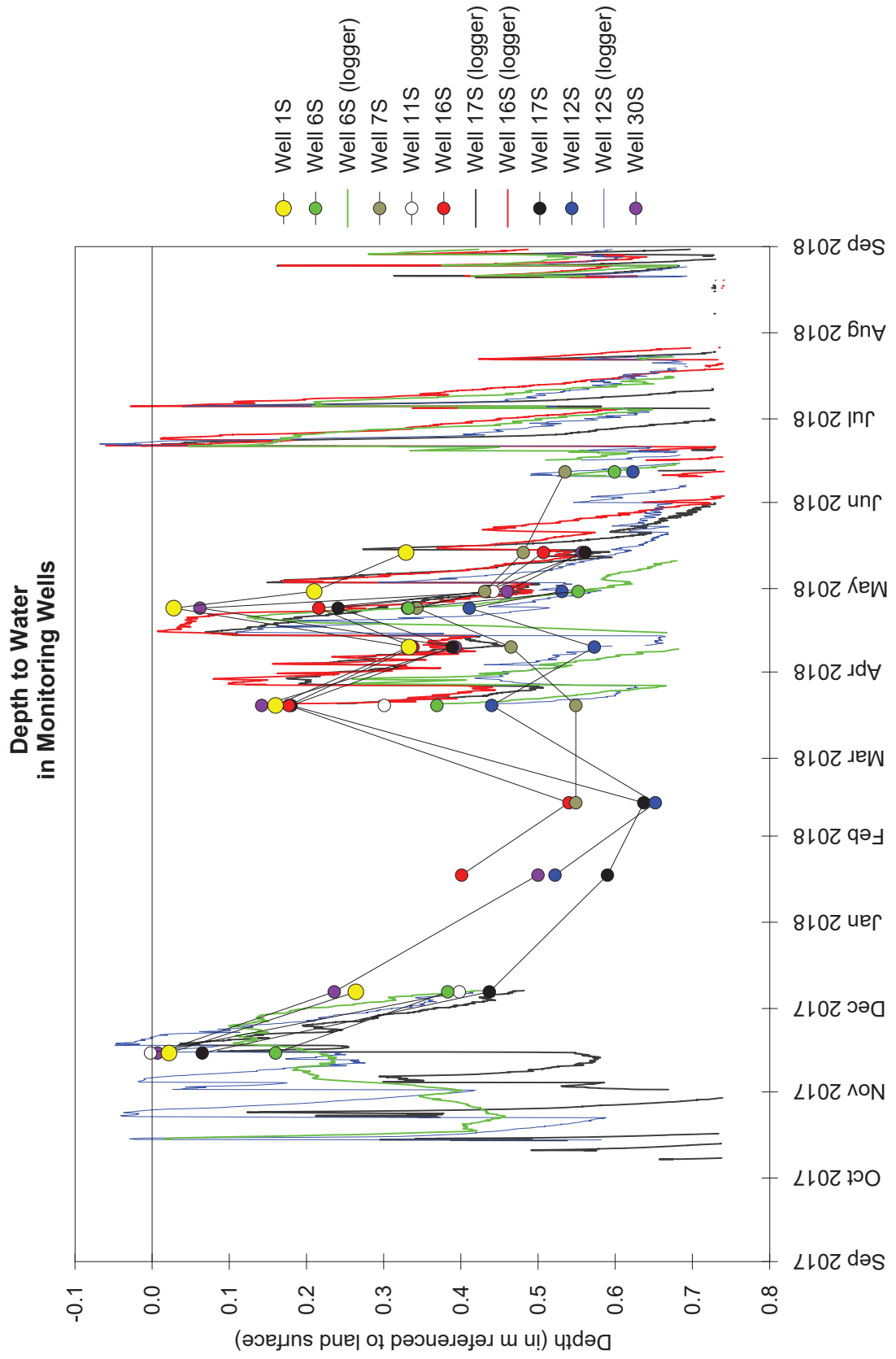


# Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2017 through August 31, 2018

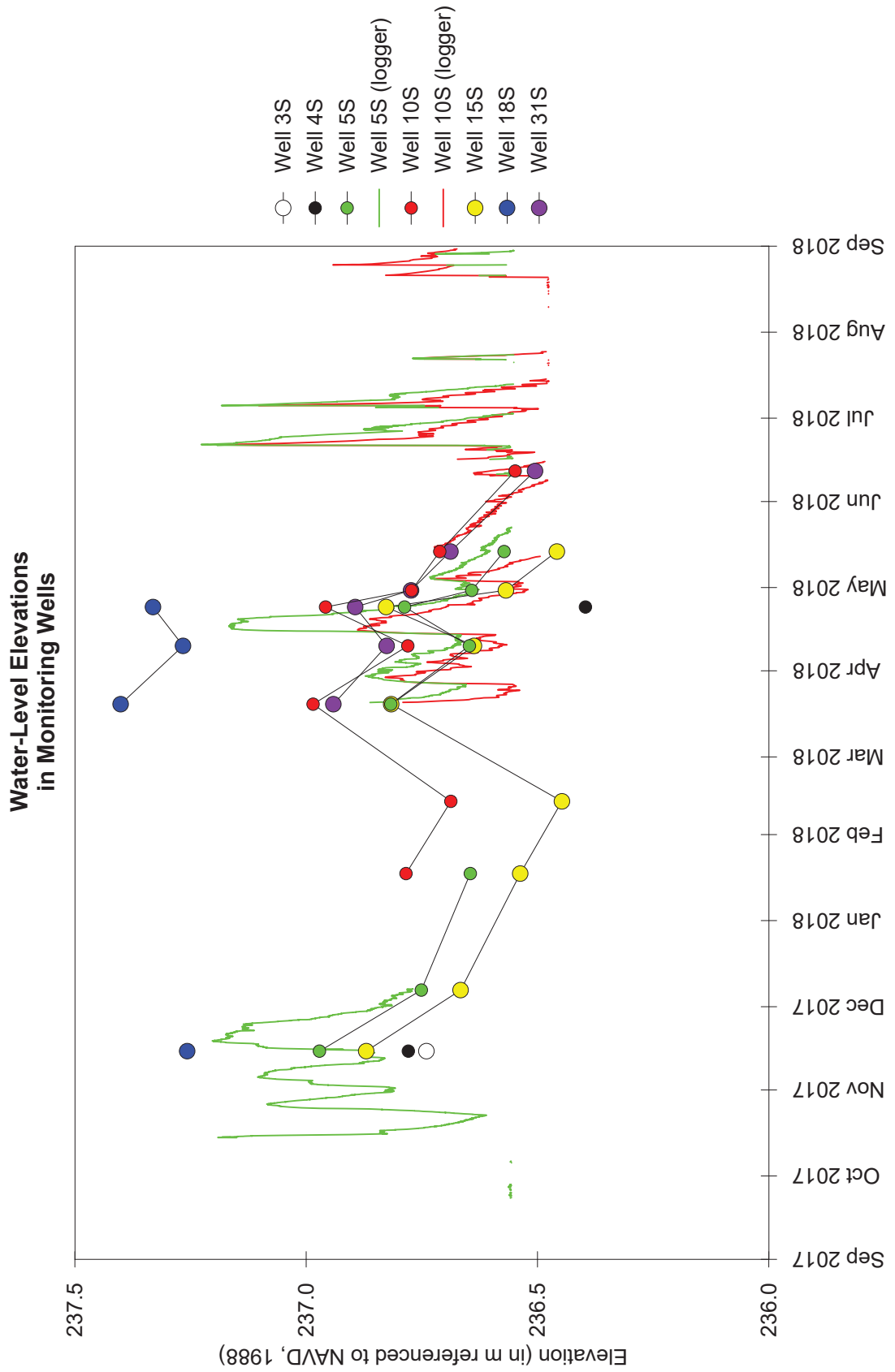


# Thorn Creek Headwaters Preserve Wetland Mitigation Site

## September 1, 2017 through August 31, 2018

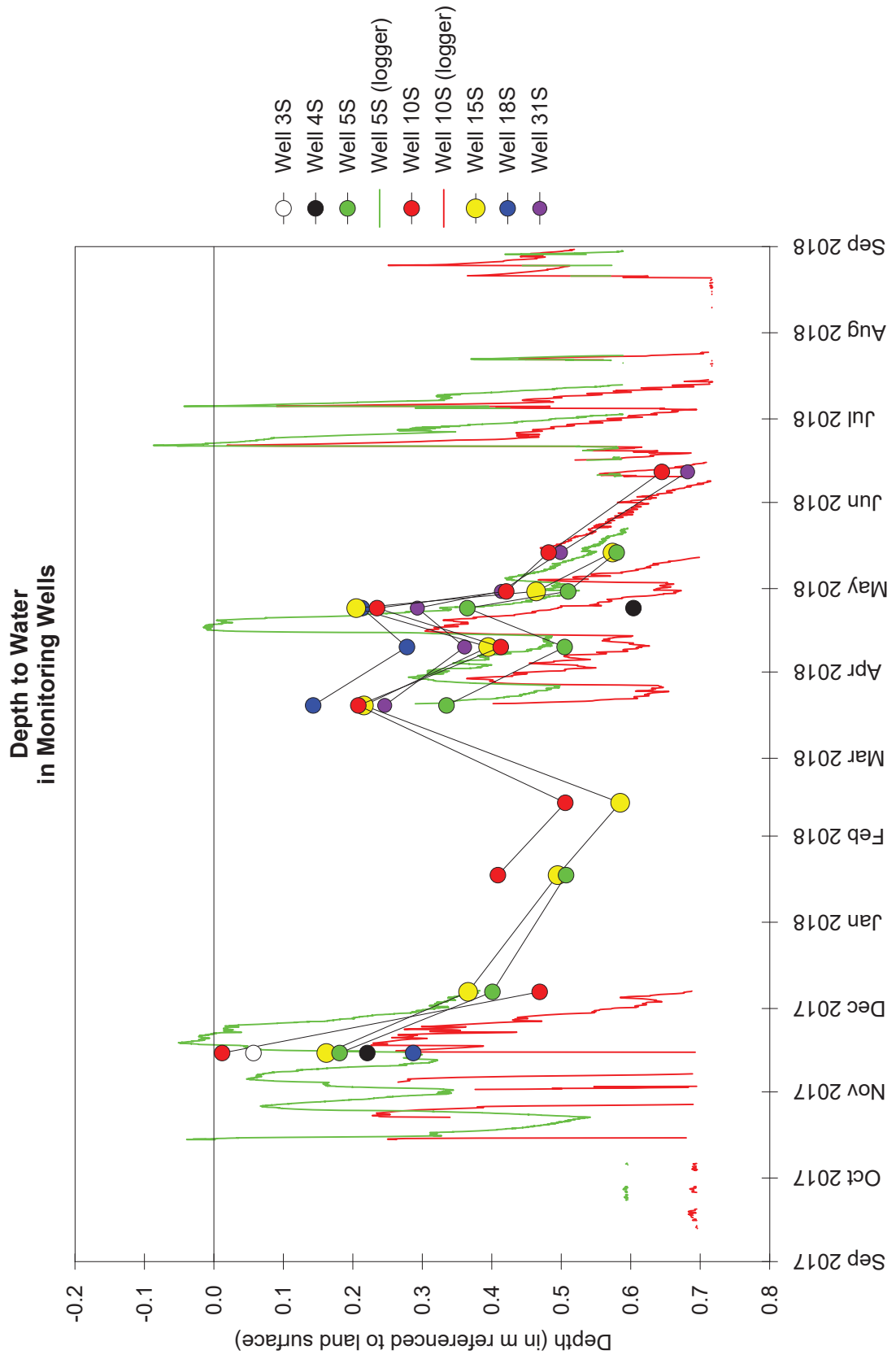


# Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2017 through August 31, 2018

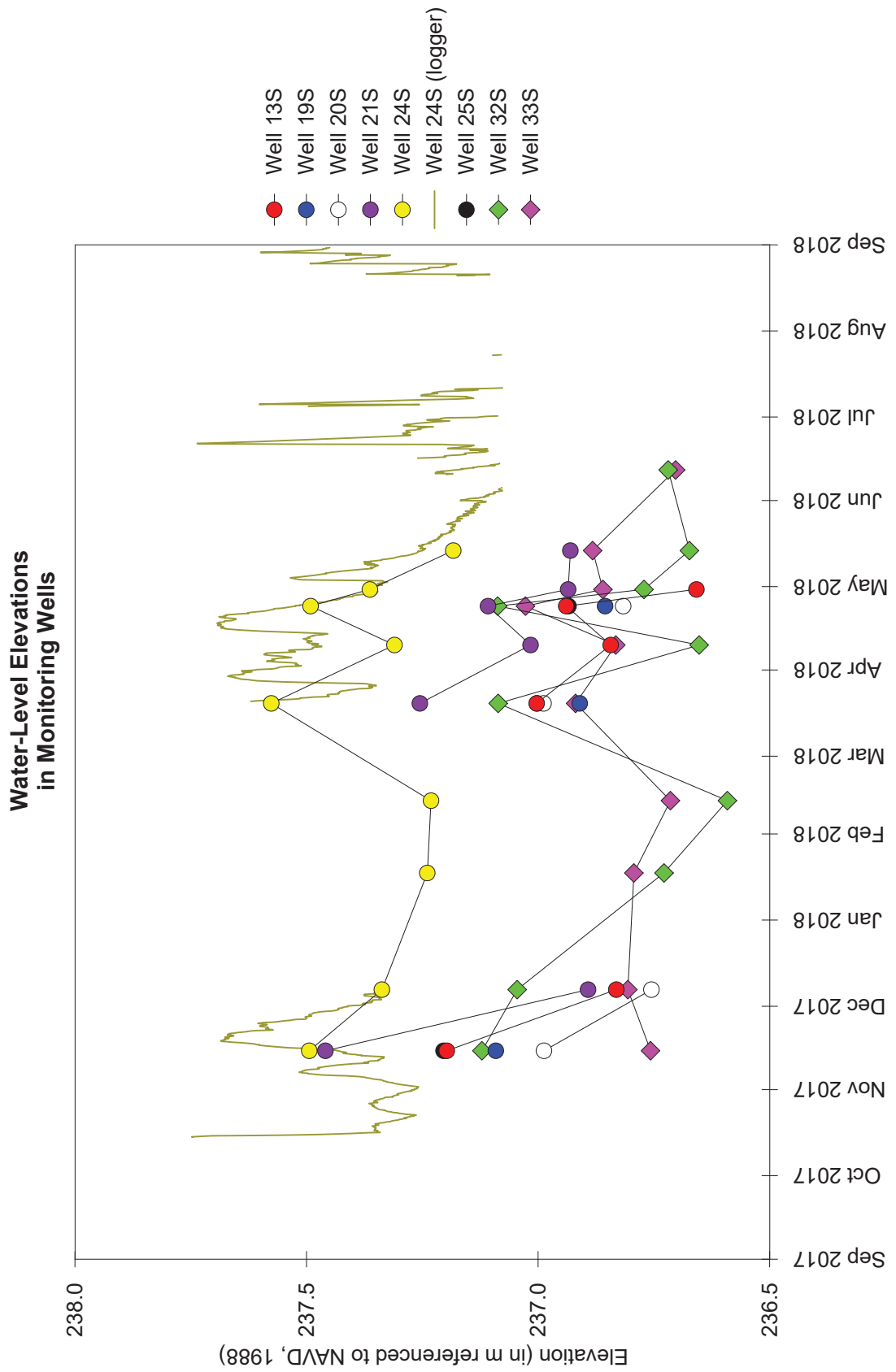




# Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2017 through August 31, 2018



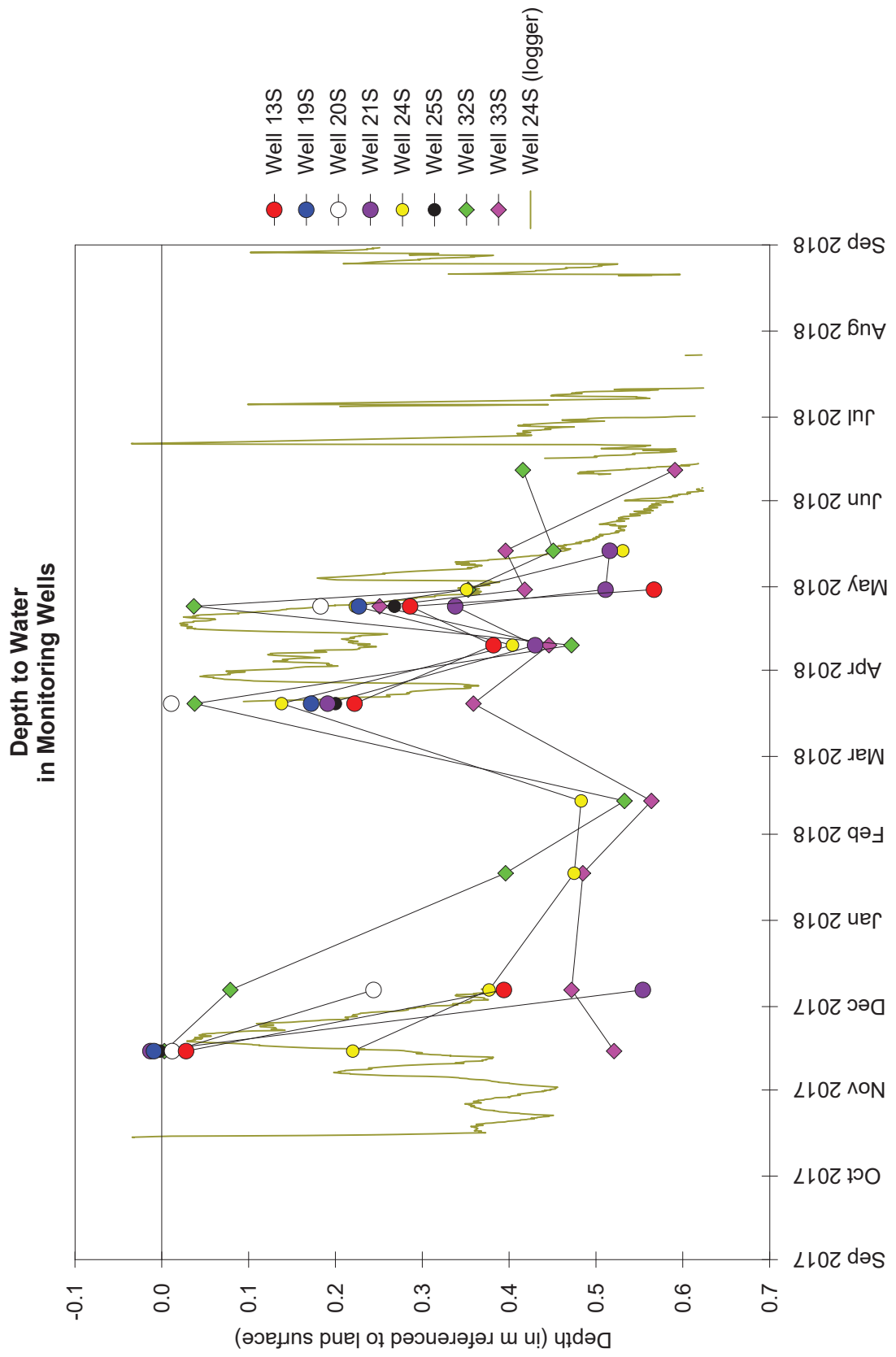
# Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2017 through August 31, 2018



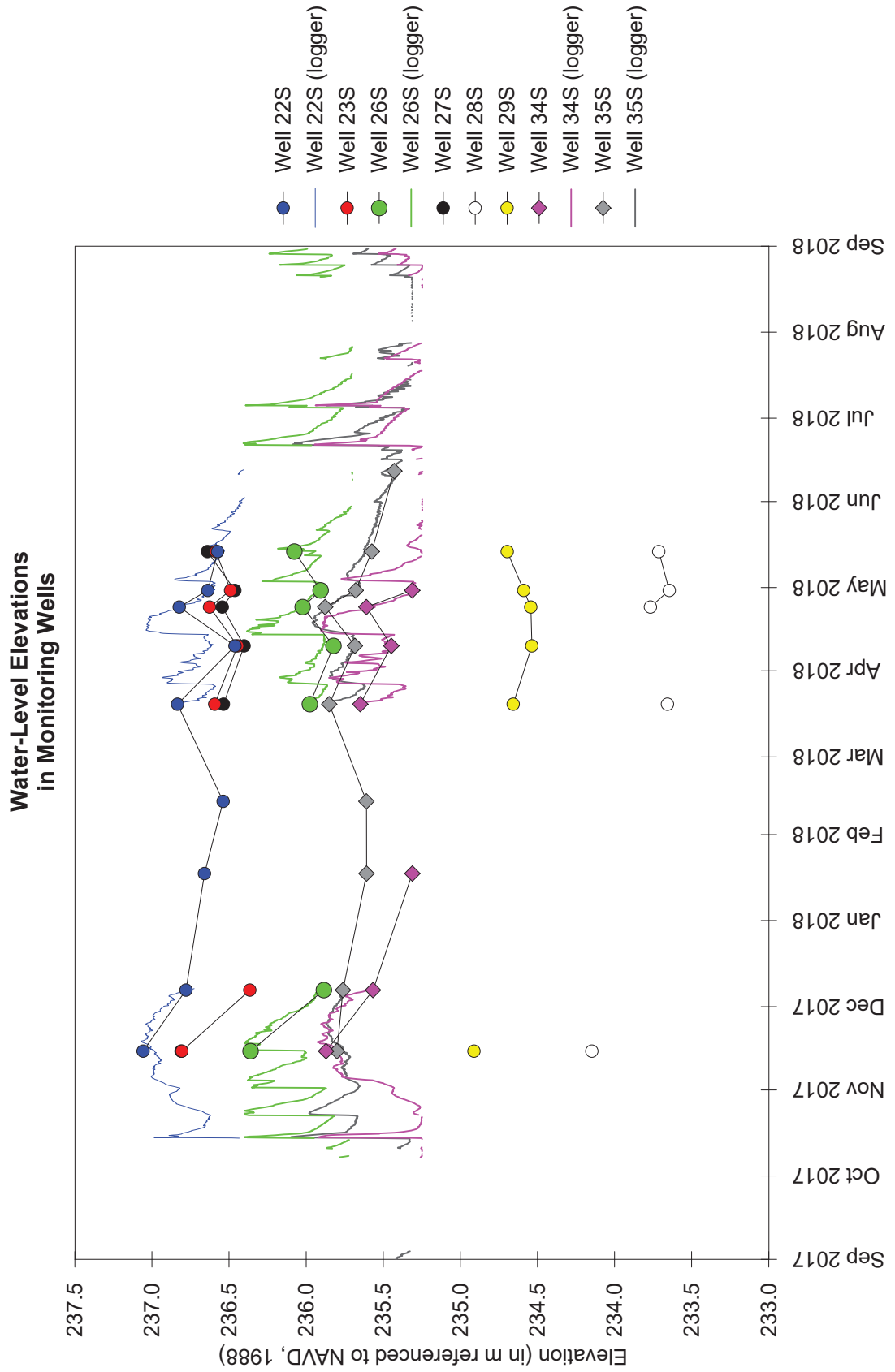


# Thorn Creek Headwaters Preserve Wetland Mitigation Site

## September 1, 2017 through August 31, 2018

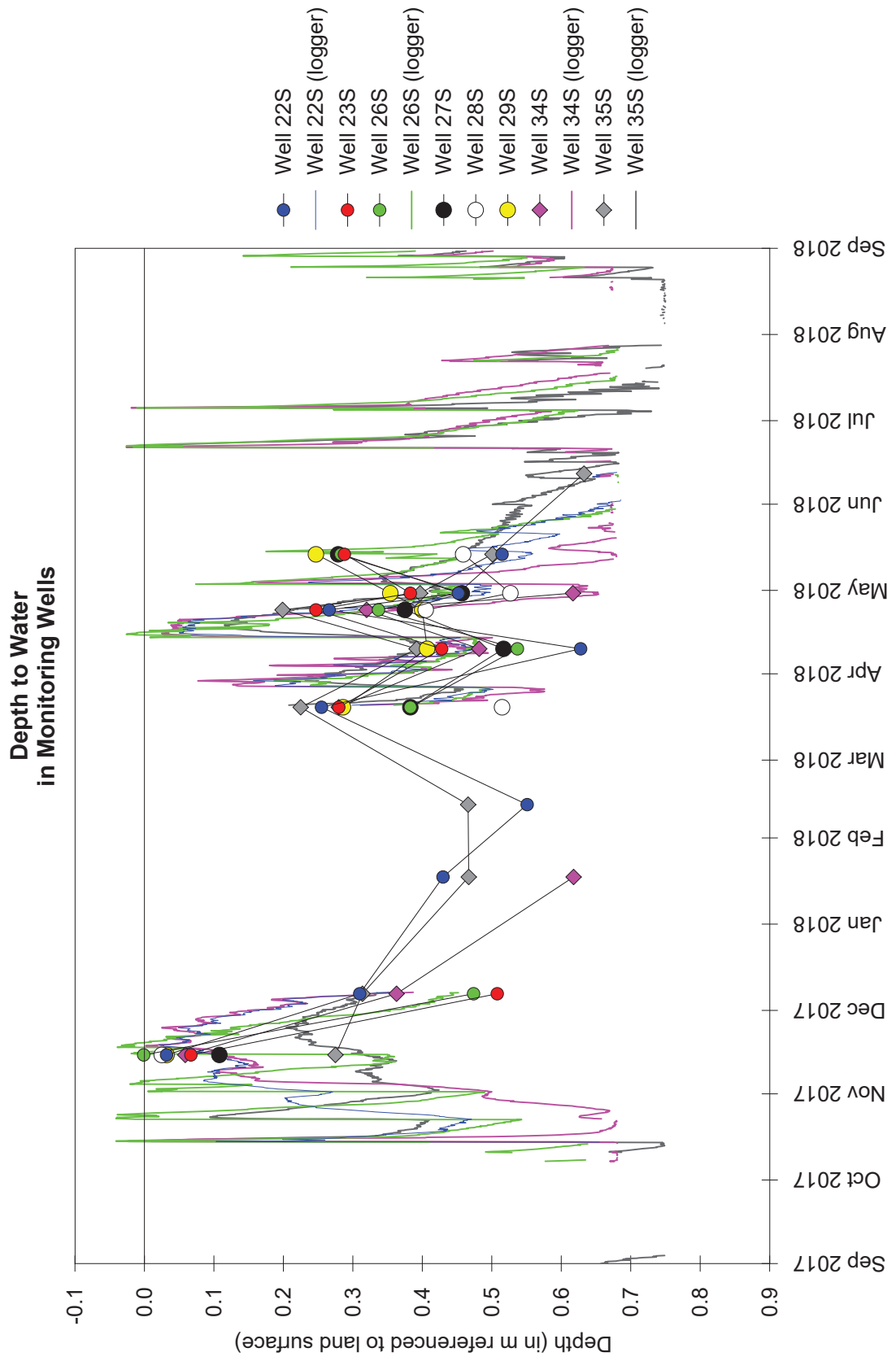


# Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2017 through August 31, 2018



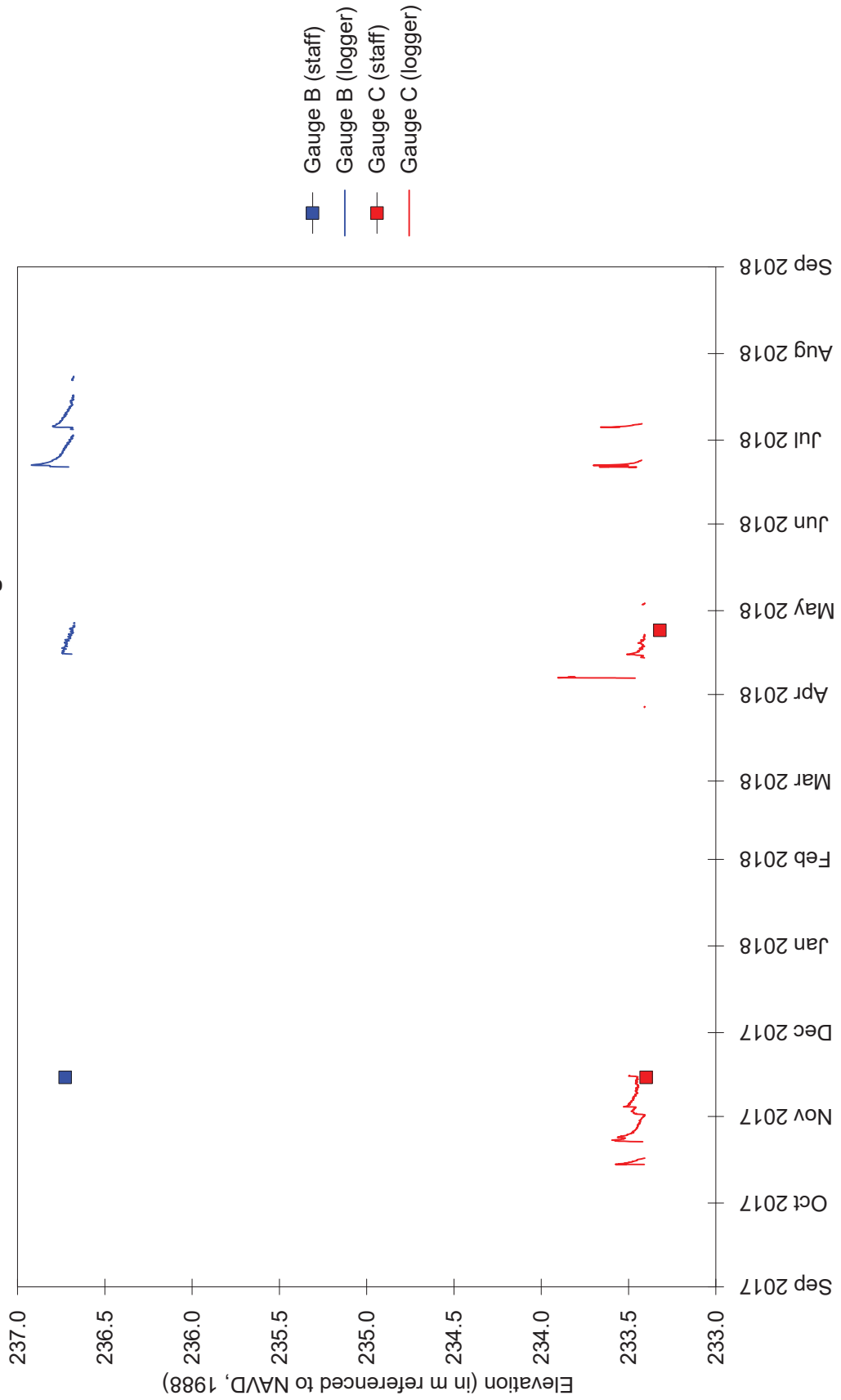
# Thorn Creek Headwaters Preserve Wetland Mitigation Site

## September 1, 2017 through August 31, 2018



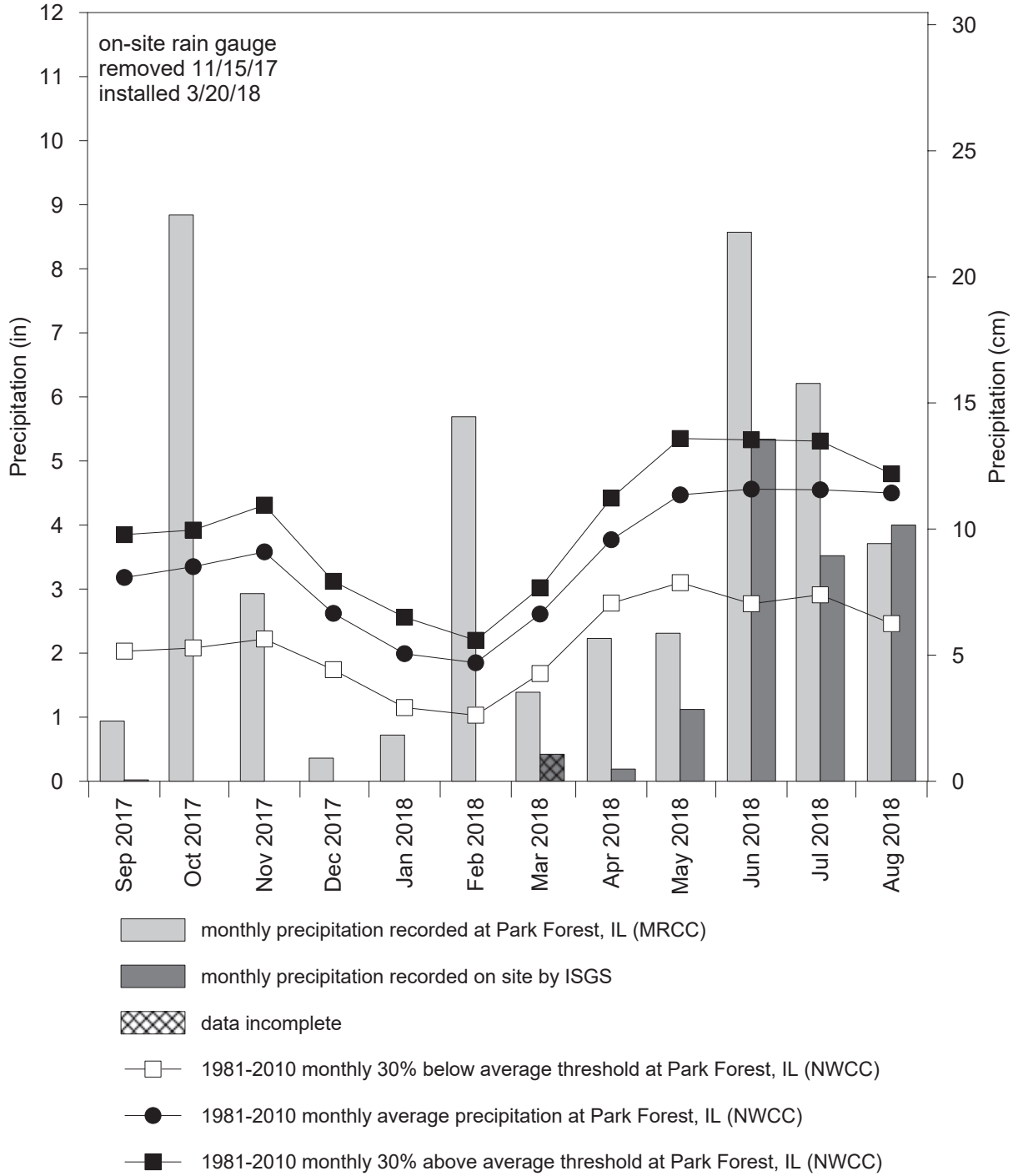
# Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2017 through August 31, 2018

Water-Level Elevations  
at Surface-Water Gauges



# Thorn Creek Headwaters Preserve Wetland Mitigation Site September 2017 through August 2018

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



**HERRIN ROAD  
WETLAND MITIGATION SITE**

**ISGS #91**

FAS 903/FAU 9588, Herrin to Johnston City Road  
Sequence #9891B  
Williamson County, near Herrin, Illinois  
Primary Project Manager: Audra M. Noyes  
Secondary Project Manager: Geoffrey E. Pociask

**SITE HISTORY**

- June 2017: ISGS was tasked by IDOT to monitor wetland hydrology.
- November 2017: The ISGS installed a monitoring network at the site.

**WETLAND HYDROLOGY CALCULATION FOR 2018**

The target compensation area for the Herrin Road wetland mitigation site is 3.20 ha (7.90 ac). Using the 1987 Manual (Environmental Laboratory 1987), 1.60 ha (3.96 ac) of the total site area of 2.52 ha (6.23 ac) satisfied wetland hydrology criteria for greater than 5% of the 2018 growing season, and 1.24 ha (3.06 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), 1.79 ha (4.42 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 Du Quoin, Illinois, is March 30, and the season lasts 217 days (MRCC 2018). 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 15 was the starting date of the 2018 growing season based on soil temperatures measured at the nearby Harrisburg, Site 3 wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at West Frankfort, Illinois (MRCC station #119148), was 109% of normal, and spring 2018 (March through May) precipitation was 120% of normal. Precipitation for February 2018 was particularly excessive with 264% of normal, however this occurred before the start of the growing season.
- The period of maximum inundation and saturation during the 2018 growing season occurred between late March and early April due to a period of frequent rainfall. Rain was recorded on 9 of 14 days and totaled 17.42 cm (6.86 in.) according to the West Frankfort weather station. Some of this precipitation occurred prior to the beginning of the growing season.
- In 2018, water levels measured in 11 of 16 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 9 of 16 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 15 of 16 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

- Input from a culvert on the northwest side of Wetland Area 1 is incising a ditch that quickly drains the area as it flows eastwards towards the unnamed creek that runs between Wetland Areas 1 and 2. A ditch south of Well 13S also drains to the unnamed creek. In addition, a beaver dam upstream of Gauge BR does not allow water levels in the creek to inundate Wetland Area 1. Removing the beaver dam may prolong and expand ponding in Wetland Areas 1 and 2 to facilitate achieving wetland restoration goals.

## PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

## WETLAND HYDROLOGY TABLES FOR 2018

<b>Well locations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
1S	N	N	N
2S	N	N	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	Y	Y	Y
10S	Y	Y	Y
11S	N	N	Y
12S	Y	Y	Y
13S	Y	N	Y
14S	Y	N	Y
15S	N	N	Y
16S	N	N	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

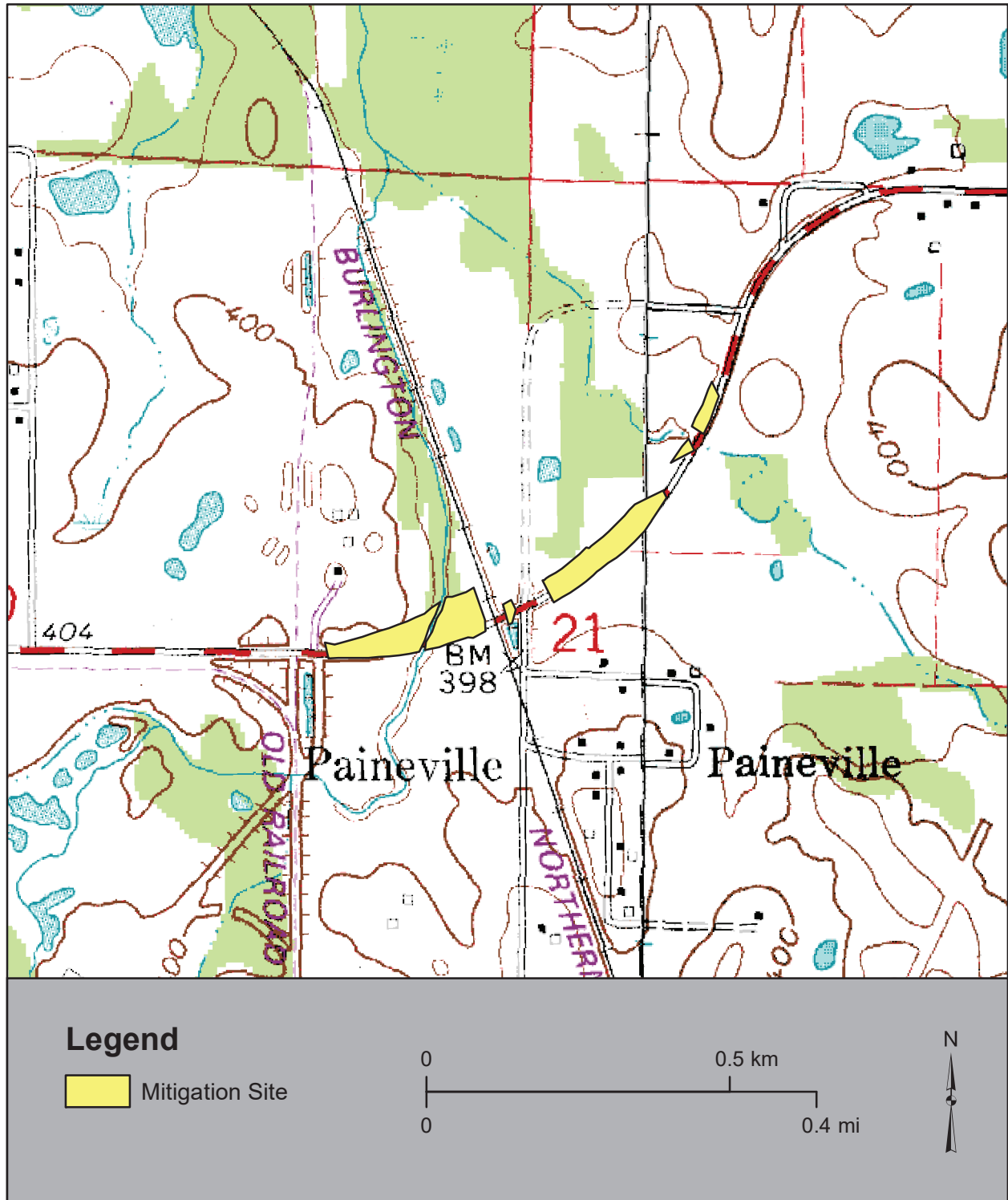
<b>Surface-water gauge elevations meeting wetland hydrology criteria</b>			
<b>ID</b>	<b>5% of growing season</b>	<b>12.5% of growing season</b>	<b>14 days during growing season</b>
A	116.79 m (383.17 ft)	116.70 m (382.87 ft)	116.78 m (383.12 ft)
B/BR	117.55 m (385.66 ft)	117.51 m (385.54 ft)	117.57 m (385.74 ft)

n/a – insufficient data to determine an elevation

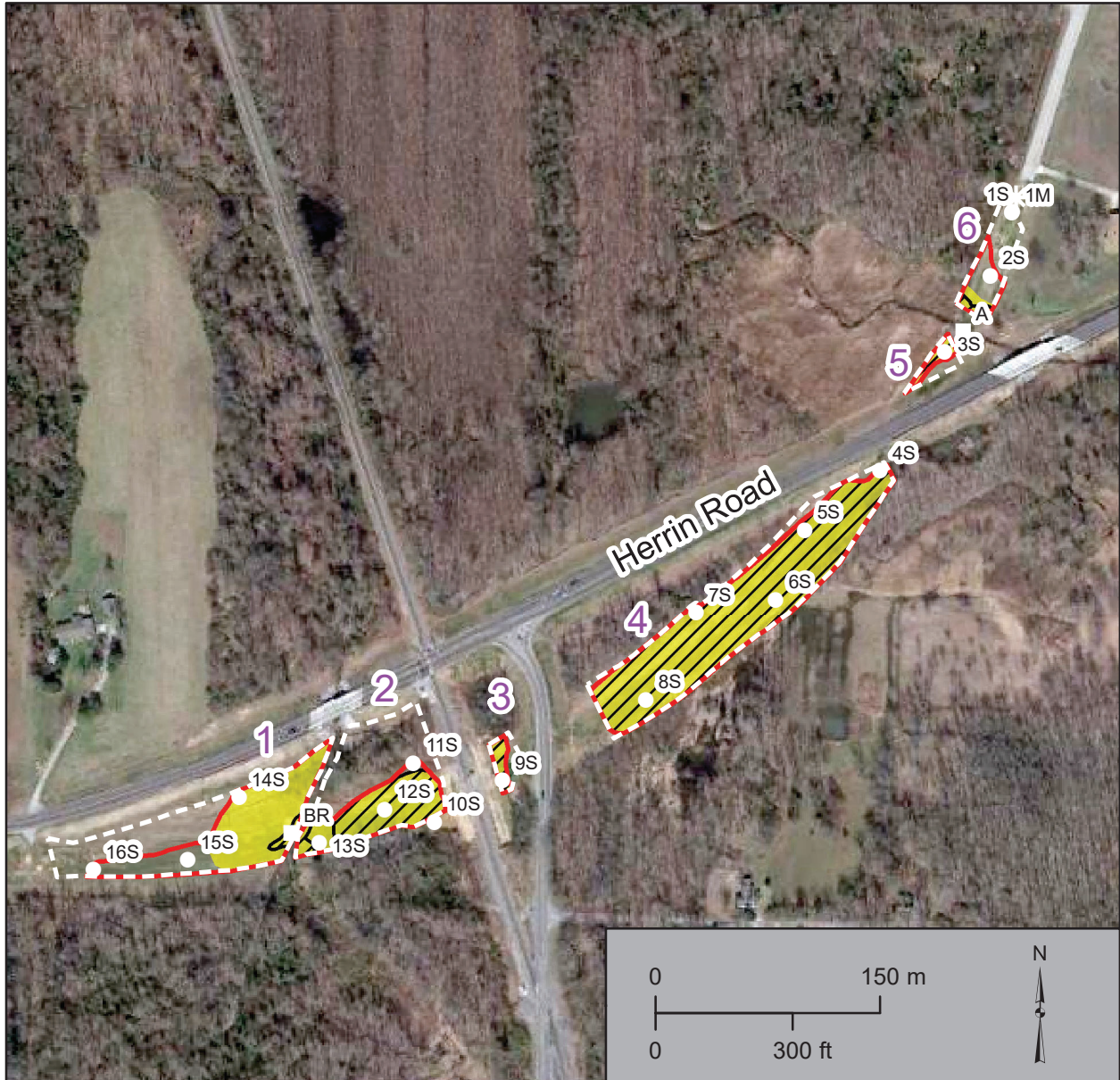
# Herrin Road Wetland Mitigation Site (FAS 903/FAU 9588)

## General Study Area and Vicinity

from the USGS Topographic Series, Herrin, IL 7.5-minute Quadrangle (USGS 1968)  
and Johnston City, IL 7.5-minute Quadrangle (USGS 1963)  
contour interval is 10 feet



**Herrin Road Wetland Mitigation Site  
(FAS 903/FAU 9588)**  
**Estimated Areal Extent of 2018 Wetland Hydrology**  
**September 1, 2017 through August 31, 2018**  
 Map based on imagery available from Google Earth (Google 2017)



**2018 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

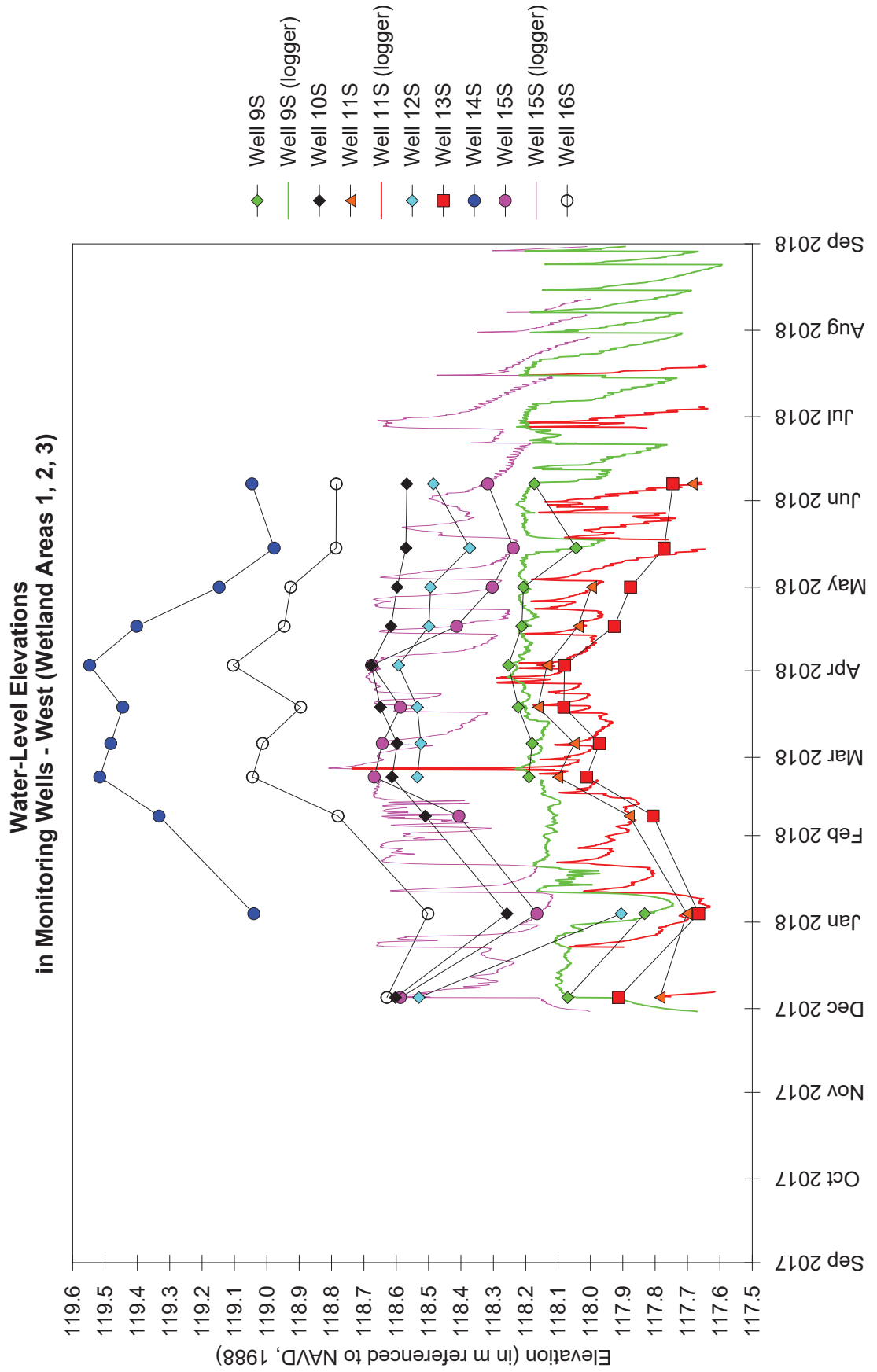
■ surface-water gauge

\* rain gauge

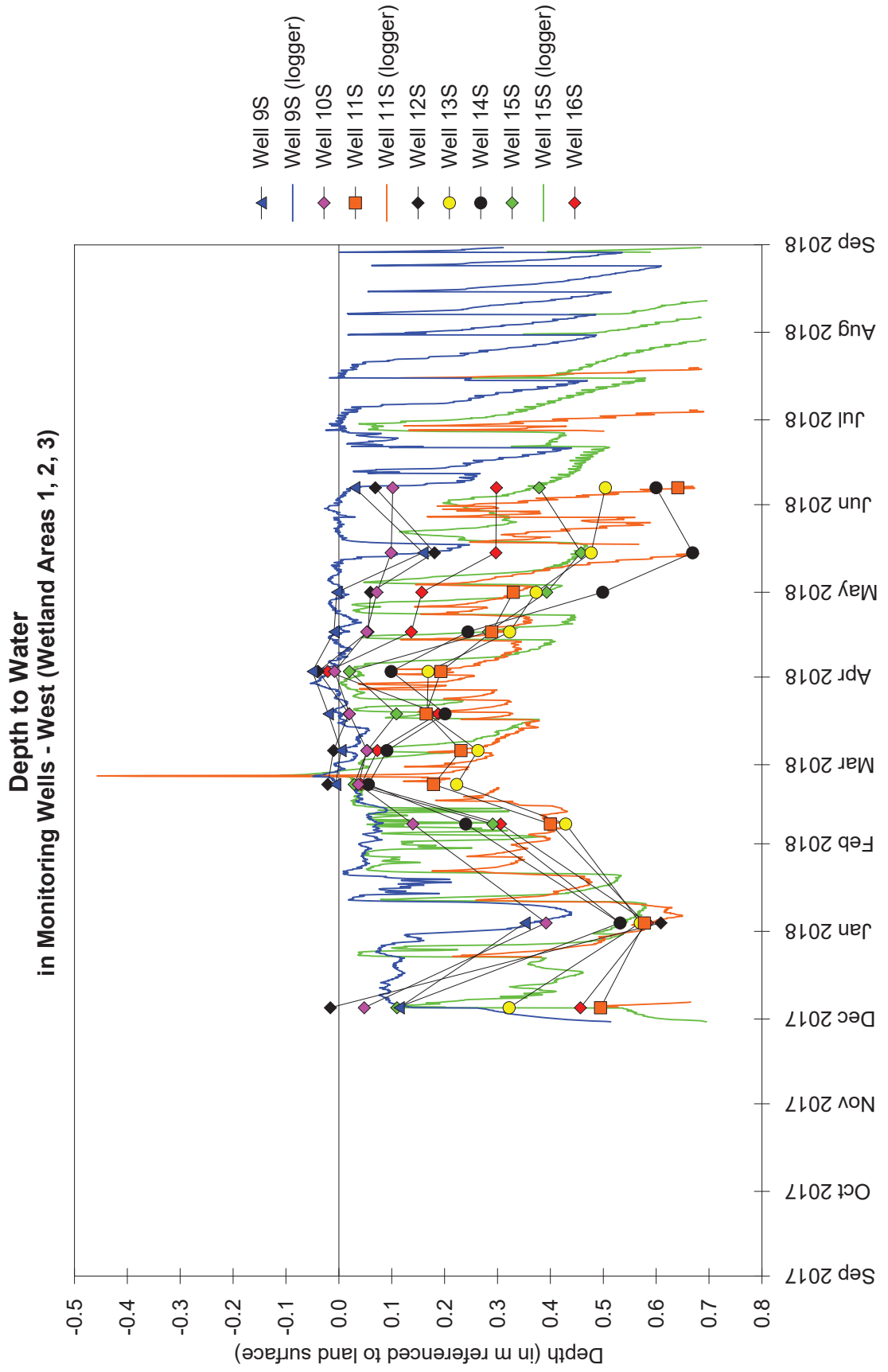
⋯ site boundary

4 Wetland Area

# Herrin Road Wetland Mitigation Site September 1, 2017 through August 31, 2018

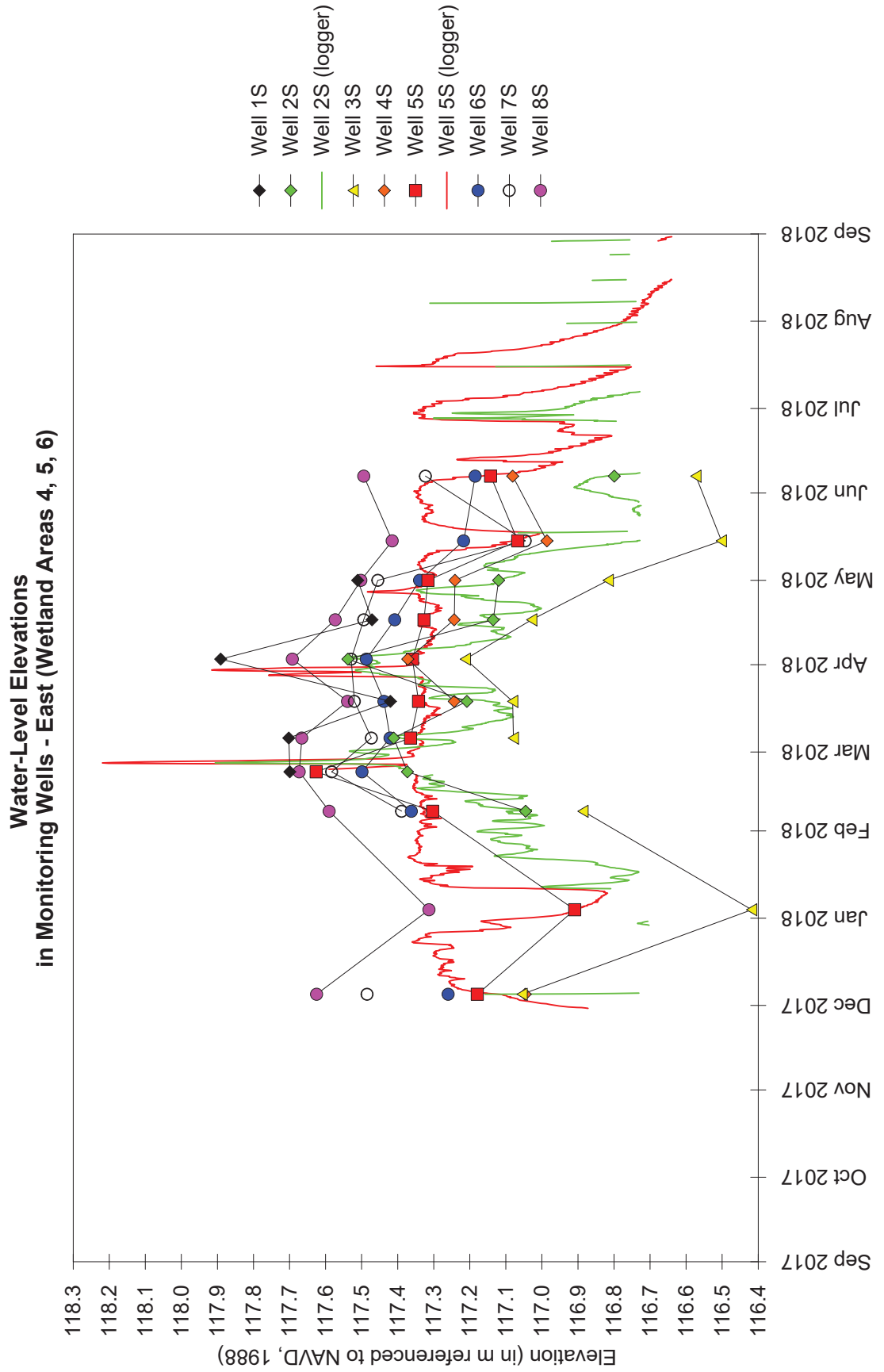


### Herrin Road Wetland Mitigation Site September 1, 2017 through August 31, 2018



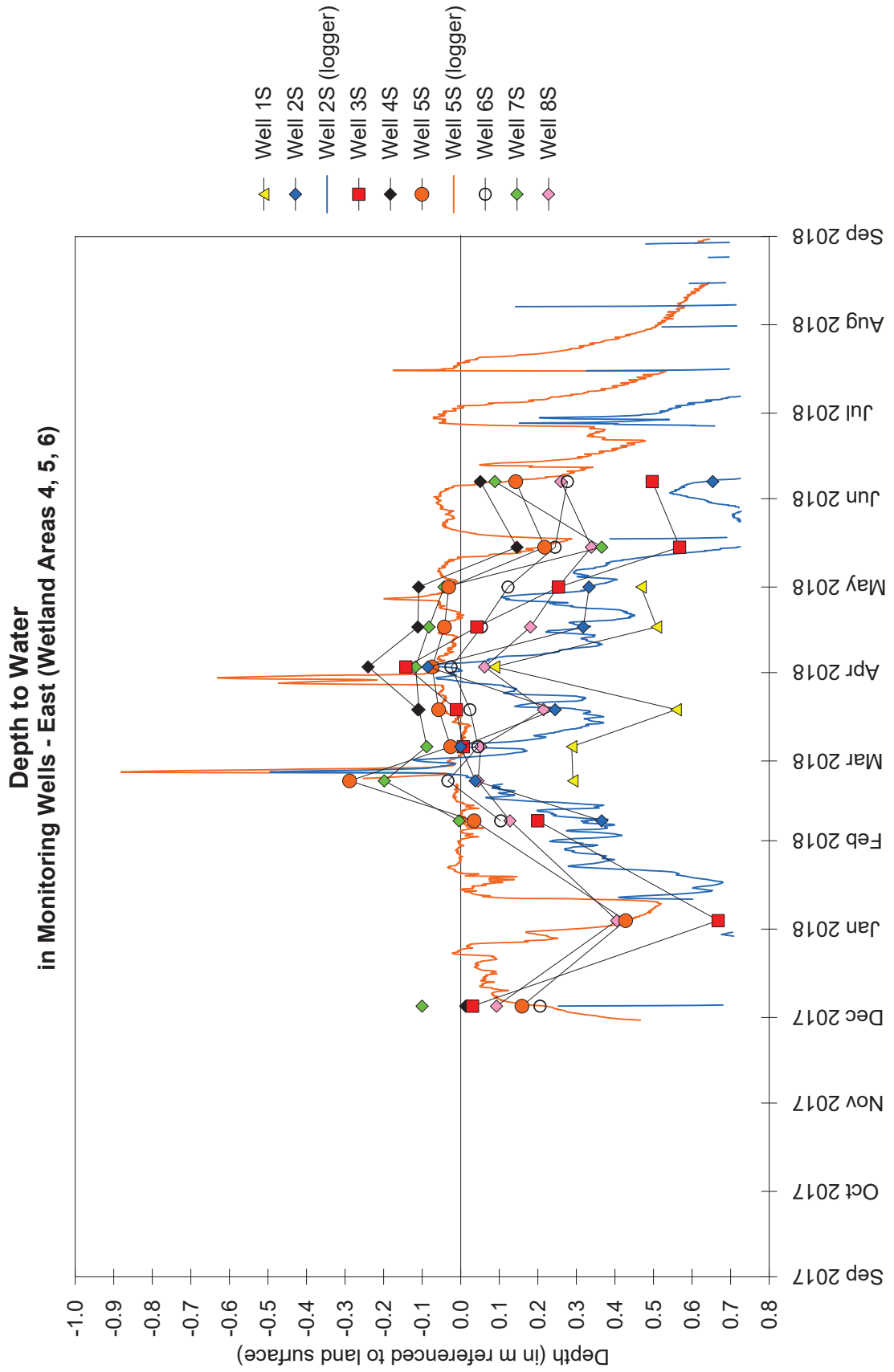


# Herrin Road Wetland Mitigation Site September 1, 2017 through August 31, 2018



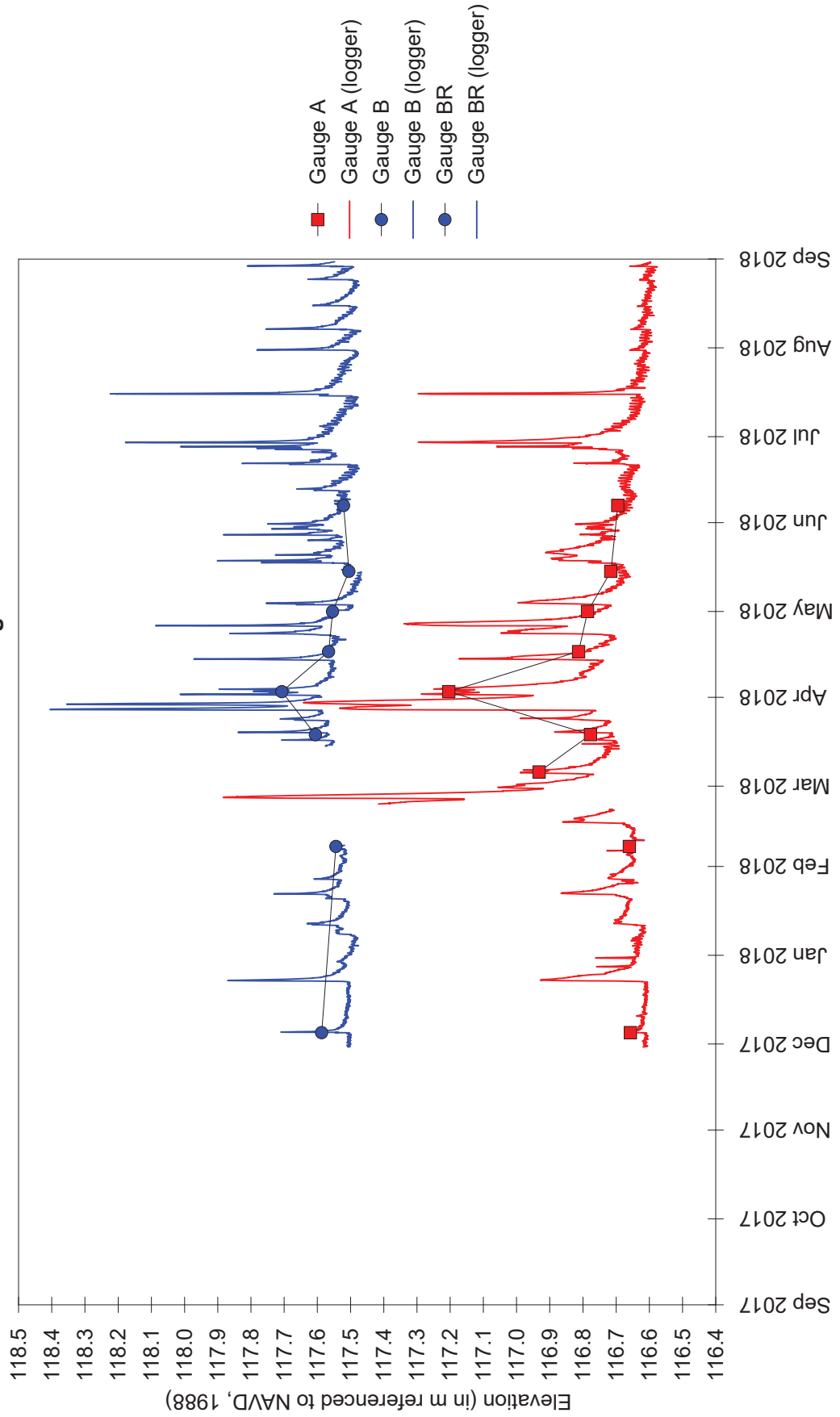


### Herrin Road Wetland Mitigation Site September 1, 2017 through August 31, 2018



# Herrin Road Wetland Mitigation Site September 1, 2017 through August 31, 2018

## Water-Level Elevations at Surface-Water Gauges



# Herrin Road Wetland Mitigation Site September 2017 through August 2018

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

