

**ANNUAL REPORT FOR ACTIVE IDOT WETLAND COMPENSATION  
AND HYDROLOGIC MONITORING SITES**

**September 1, 2001 to September 1, 2002**

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

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**Illinois State Geological Survey  
Open File Series 2002-3**

## **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 wetland compensation sites and potential wetland compensation sites being monitored under contract IDOT SW WIP FY03 ANTC. 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 (U.S. Army Corps of Engineers 1987). 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 33 sites are included in this report. Most summaries contain a location map, a site map showing monitoring wells and other field instruments, hydrographs for selected monitoring wells, and local precipitation data for the period. Sites where wetland compensation activities have been performed include a map showing the extent of areas satisfying wetland hydrology criteria. Site locations are shown on Figure 1 and a list of site names is presented in Table 1. All data included in this report are from September 1, 2001 to September 1, 2002 at IDOT's request.

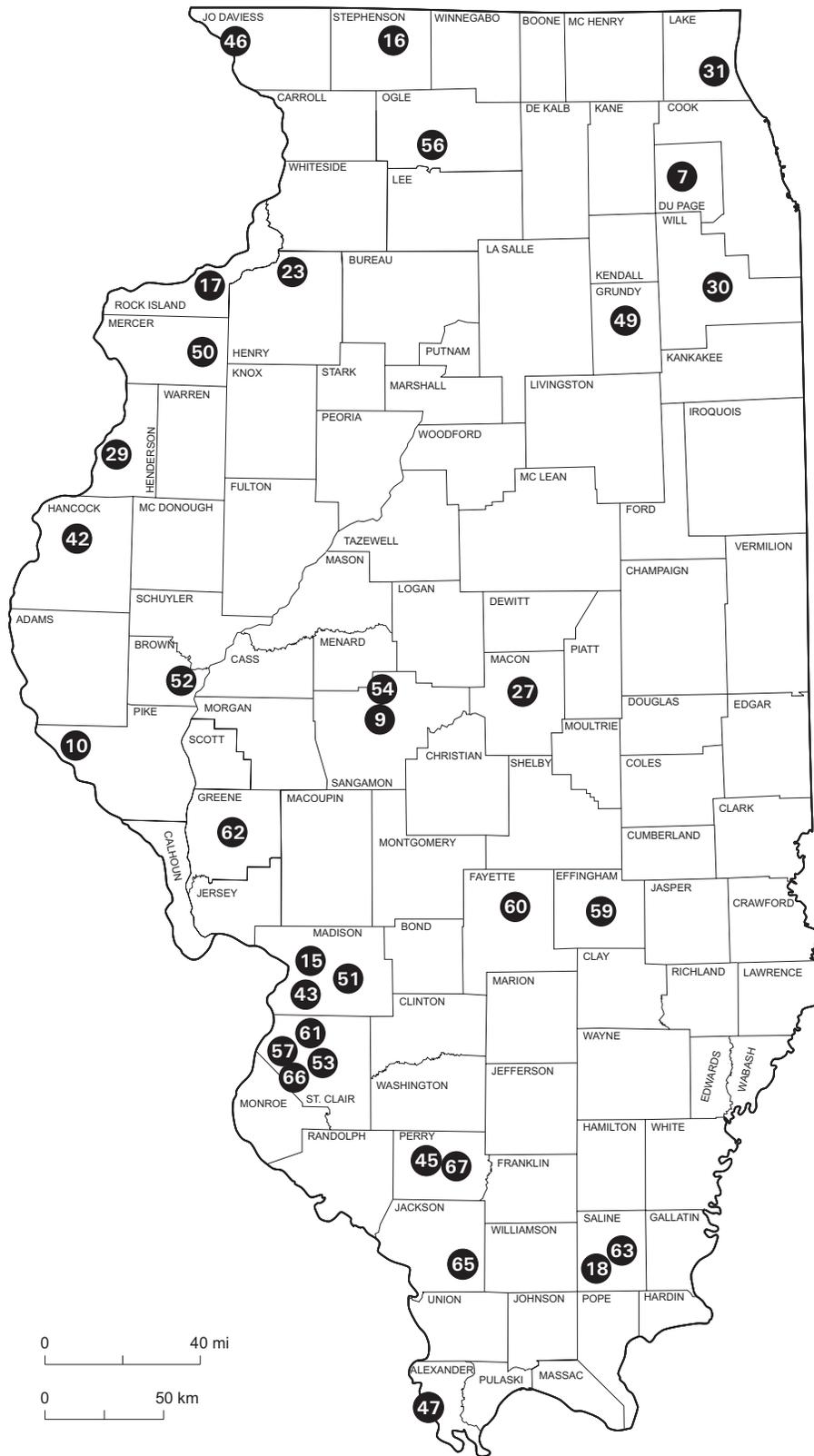
## **METHODS**

Determining the area within each wetland compensation site that satisfies the wetland hydrology criteria of the U.S. Army Corps of Engineers Wetland Delineation Manual (U.S. Army Corps of Engineers 1987) is a main focus of the work summarized in this report, and the following criteria were used. An area that conclusively satisfies wetland hydrology criteria will be inundated or saturated for no less than 12.5% of the growing season. 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. Inundation or saturation for 5% to 12.5% of the growing season may satisfy wetland hydrology criteria but is not considered conclusive. For the purposes of this report, only areas that conclusively satisfy the criteria are included in calculations and shown on maps.

The Midwestern Climate Center (MCC) provides data regarding the length and beginning date of the growing season (Midwestern Climate Center 2002). The growing season is defined as the time period between the last occurrence of 28°F air temperatures in spring to the first occurrence of 28°F air temperatures in the fall. The median beginning date and length of growing season are calculated by the MCC 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.

Wells and stage gauges where water levels satisfied wetland hydrology criteria are listed in the text for each site. Interpolation between measuring points and/or extrapolation are used to locate the boundary of the area that satisfies wetland hydrology criteria. Best professional judgement is used to refine the location of this boundary, using small-scale topographic features, vegetation, soils, and other site features. To measure the size of an area satisfying wetland hydrology criteria, the boundaries were plotted on the best available base map, then measured with a Tamaya Super Planix B digital planimeter and listed in acres (ac) and hectares (ha). If other methods were used to measure this area, they are noted in the site summaries.

The accuracy of each area measurement will vary significantly depending on the accuracy of the underlying base map, the accuracy in locating monitoring devices, and the accuracy of the planimeter at the scale of the base map. The base maps used for these determinations include as-built surveys (done both by IDOT and ISGS), construction plans, U.S. Geological Survey



**Figure 1** General locations of active water-level sites monitored by ISGS for IDOT between September 1, 2001 and September 1, 2002. Numbers indicate ISGS project numbers and are explained in Table 1.

**Active IDOT Water-Level Monitoring Sites  
September 1, 2001 to September 1, 2002**

<b>ISGS #</b>	<b>Site Name Route and FAP #</b>	<b>ISGS #</b>	<b>Site Name Route and FAP #</b>
7	Klein Creek IL 64 FAP 307	54	Springfield IL 29 FAP 658
9	Veteran's Parkway, Springfield FAP 662	56	Grand Detour IL 2 FAP 742
10	Hannibal Bridge US 36 FAP 319	57	Former Tiernan Property New River Crossing FAP 999
15	Sand Road US 267 FAP 310	59	Effingham County US 45 FAP 328
16	Orangeville IL 26 FAP 316	60	Potter Property, Fayette County District 7 Potential Wetland Bank
17	Milan Beltway, Airport Road FAU 5822	61	Site N near Caseyville New River Crossing & IL 3 FAP 999
18	Saline County IL 13 FAP 331	62	Apple Creek near Belltown US 67 FAP 310
23	Joslin IL 92 FAP 585	63	Harrisburg US 45 FAP 332
27	Decatur US 51 FAP 322	65	Carbondale US 51 FAP 322
29	Gulfport US 34 FAP 313	66	Centreville New River Crossing FAP 999
30	Spring Creek I-355 FAP 340	67	Pyatts Blacktop IL 13 & 127 FAP 42
31	North Chicago US 41/IL 137 FAP 120		
42	Hancock County near Carthage US 136 FAP 315 & 10		
43	Former Eckmann & Bischoff Properties IL 3 FAP 14		
45	Perry County Pyatts Blacktop FAS 864		
46	Galena River Bridge West Stagecoach Trail FAS 67		
47	Alexander County IL 146 FAP 312		
49	Morris, Illinois River Potential Wetland Bank		
50	Edwards River, Mercer County US 67 FAP 310		
51	Former Luehmann Property New River Crossing FAP 999		
52	Former Wessel Property, District 6 Potential Wetland Bank		
53	Fairmont City New River Crossing FAP 999		

**Table 1** ISGS project numbers and active water-level sites monitored by ISGS for IDOT between September 1, 2001 and September 1, 2002.

(USGS) 7.5-minute topographic maps, unrectified aerial photographs, and USGS digital orthophotograph quarter quadrangles (ISGS 2002). In no case is the error of the acreage calculation expected to be less than  $\pm 1.5\%$ , and it could be much greater. Given the many potential sources of error, estimates of the amount of error are difficult to calculate and are not included. However, area measurements for each site may differ in the number of significant digits, reflecting the accuracy in the base map and the methods.

Water-level data were collected monthly throughout the year, and biweekly during April and May when highest water levels are generally observed. However, this year many sites required biweekly readings through June, because high water levels continued due to heavy rain in late spring.

Given that 12.5% of the growing season ranges from about 22 days to 28 days in different parts of Illinois, three consecutive biweekly measurements are generally required to conclusively satisfy wetland hydrology criteria. If only two consecutive measurements were collected that indicated wetland hydrology criteria, interpolation of the water levels is performed to determine total number of days of inundation or saturation. In no case was one measurement be considered sufficient to indicate that a site satisfied wetland hydrology criteria. Flooding that prevented measurement of a site was considered sufficient evidence of inundation for that site visit. Manual water-level measurements were often supplemented with various automated data logging devices that measured daily or more frequently. These data loggers were used to determine the timing of hydrologic events that were not recorded in manual measurements.

Monitoring wells were given an alphanumeric designation based in part on their relative depths. Monitoring wells designated with an "S" or "VS" are the most shallow type and were specifically constructed for measuring wetland hydrology. Monitoring wells designated with a "U" (upper) are deeper than "S" wells, and may be used to determine wetland hydrology depending on the depth of the well screen. In larger sites, "U" wells used to determine wetland hydrology are graphed with "S" and "VS" wells. Other types of wells, including "M", "L", and "D", 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 they are discussed in other ISGS contract reports to IDOT.

Graphs for each site show water-level elevations at wells and surface-water instruments, and depth-to-water below land surface at each well. Depths are shown as negative when water levels are above land surface. Elevations at most sites are shown relative to the National Geodetic Vertical Datum (NGVD) of 1929; any variations to this are labeled. The water levels recorded during the year are shown in the charts accompanying each site summary. For small sites, all measurements will be shown on the same chart. For sites with more instruments, similar types of instruments are grouped on individual charts, for example all "S" wells may be on a single chart. For the largest sites, there may be several charts for a single type of instrument.

Multiple data loggers are used to monitor water levels continuously at many sites. Three main types of instruments are being used, each made by a different manufacturer. Each type of instrument has different behaviors and default values. We have removed or labeled any false readings that result when the instrument is dry (e.g. "0" or other default values) by making observations of the readings of the instrument prior to deployment. Other spurious readings that occurred due to data logger malfunction or natural conditions that cause inaccuracies (e.g. vegetation growth or debris accumulation beneath the logger) were removed after interpretation by ISGS scientists.

On-site precipitation data were collected by ISGS using several types of tipping-bucket rain gauges. Because all ISGS gauges are nonheated and must be removed in the winter, monthly precipitation data are also shown from climate observation stations maintained by the MCC (MCC 2002). The closest weather station with an adequate period of record is used at each site. Normal (or mean, or average) precipitation values, and the above and below normal-range threshold values are calculated by the National Water and Climate Center (NWCC) (NWCC 2002) and are all based on the 30-year period between 1961 and 1990. Precipitation is classified as being within the normal range when the level recorded is within a 30% probability above or below the mean based on a 2-parameter gamma distribution over the 30-year period (NWCC 1995). Precipitation is classified as above or below the normal range when the recorded level is not within the normal range as defined above. "Above 30% threshold" refers to the value at which there is a 30% chance precipitation will be greater than or equal to the value shown. "Below 30% threshold" refers to the value at which there is a 30% chance precipitation will be less than or equal to the value shown.

It is expected that accuracy will be improved in the 2003 report. Global Positioning System (GPS) location data plotted on digital orthophotograph quadrangles (DOQ) have been included in base maps where possible, but these resources are not yet available for every site. As these tools become available, they will be incorporated, leading to more accurately located site boundaries, instruments, and other important features and producing more accurate area measurements at all sites.

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

## **REFERENCES**

Illinois State Geological Survey, 2002, Illinois Natural Resources Geospatial Data Clearinghouse, Illinois Digital Orthophoto Quarter Quadrangle Data: Illinois State Geological Survey, Champaign, Illinois, available online at <http://www.isgs.uiuc.edu/nsdihome/webdocs/doqs/>.

Midwestern Climate Center, 2002, Midwestern Climate Information System: Illinois State Water Survey, Champaign, Illinois, available online at <http://www.mcc.sws.uiuc.edu>.

National Water and Climate Center, Natural Resources Conservation Service, 2002, Climate Analysis for Wetlands by County, available online at <http://www.wcc.nrcs.usda.gov/water/wetlands.html>.

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

U.S. Army Corps of Engineers, 1987, Corps of Engineers Wetlands Delineation Manual: U. S. Army Corps of Engineers Technical Report Y-87-1, Washington, D.C., 100 p.

**KLEIN CREEK  
WETLAND COMPENSATION SITE**

**ISGS #07**

FAP 307

Du Page County, near Carol Stream, Illinois

**Primary Project Manager: Kelli D. Weaver**

**Secondary Project Manager: Bonnie J. Robinson**

**SITE HISTORY**

- Spring 1993: ISGS began to measure surface- and ground-water levels at the site.
- December 1994: ISGS submitted a final hydrogeologic characterization report to IDOT (ISGS Open File Series 1994-8).
- Spring and summer 1998: Additional monitoring wells were installed to measure perched water-table elevations. Huddleston-McBride Co. searched the site for drainage tile, and submitted a map to IDOT.
- May 2000: After ISGS received permission from IDOT to discontinue water-level monitoring, data collection in the west field ended on May 23, 2000. ISGS installed an Infinities sonic data logger over Klein Creek at Kuhn Road.
- Spring 2001-2002: Proposed wetland compensation basin is excavated by contractor. April 2002, after the excavation and grading was complete, new wells were installed to monitor the areal extent of wetland hydrology.
- April 2002: IDOT ends monitoring.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Monitoring of this site was suspended in Spring 2002 by IDOT, and data collection ceased in June 2002. The total area that conclusively satisfied wetland hydrology criteria in 2002 is estimated to be 0.81 ac (0.33 ha). Data reported here are for informational purposes only.

- According to the Midwestern Climate Center, the median date that the growing season begins in Wheaton is April 28 and the season lasts 182 days; 12.5% of the growing season is 23 days.
- Precipitation during the monitoring period was 120% of normal. Precipitation was above the normal range in September and October 2001, and March through June 2002. November and December 2001 were below normal, and the remaining months were within normal range.
- In 2002, water levels measured in wells 21S, 22S, 23S, 26S, 27S, 29S, 30S, and 31S conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. The surface-water levels measured by the RDS-D logger indicated that inundation occurred to an elevation of approximately 225.28 m (739.11 ft) for a duration sufficient to satisfy wetland hydrology criteria. Surface-water levels measured by the sonic data logger indicate that the site was inundated by Klein Creek on two separate occasions during the 2002 growing season, although the duration

of inundation was approximately two days. These events provided water for ponding in the excavations, but the creek levels were not sufficient to satisfy wetland hydrology criteria without the subsequent ponding.

#### PLANNED FUTURE ACTIVITIES

- Wells remain on site pending resumption of monitoring. When wells are no longer needed, ISGS will remove them.

# Klein Creek Potential Wetland Compensation Site (FAP 307)

## General Study Area and Vicinity

from the USGS Topographic Series, West Chicago, IL 7.5-minute Quadrangle (USGS 1993)  
contour interval is 10 feet



■ general study area

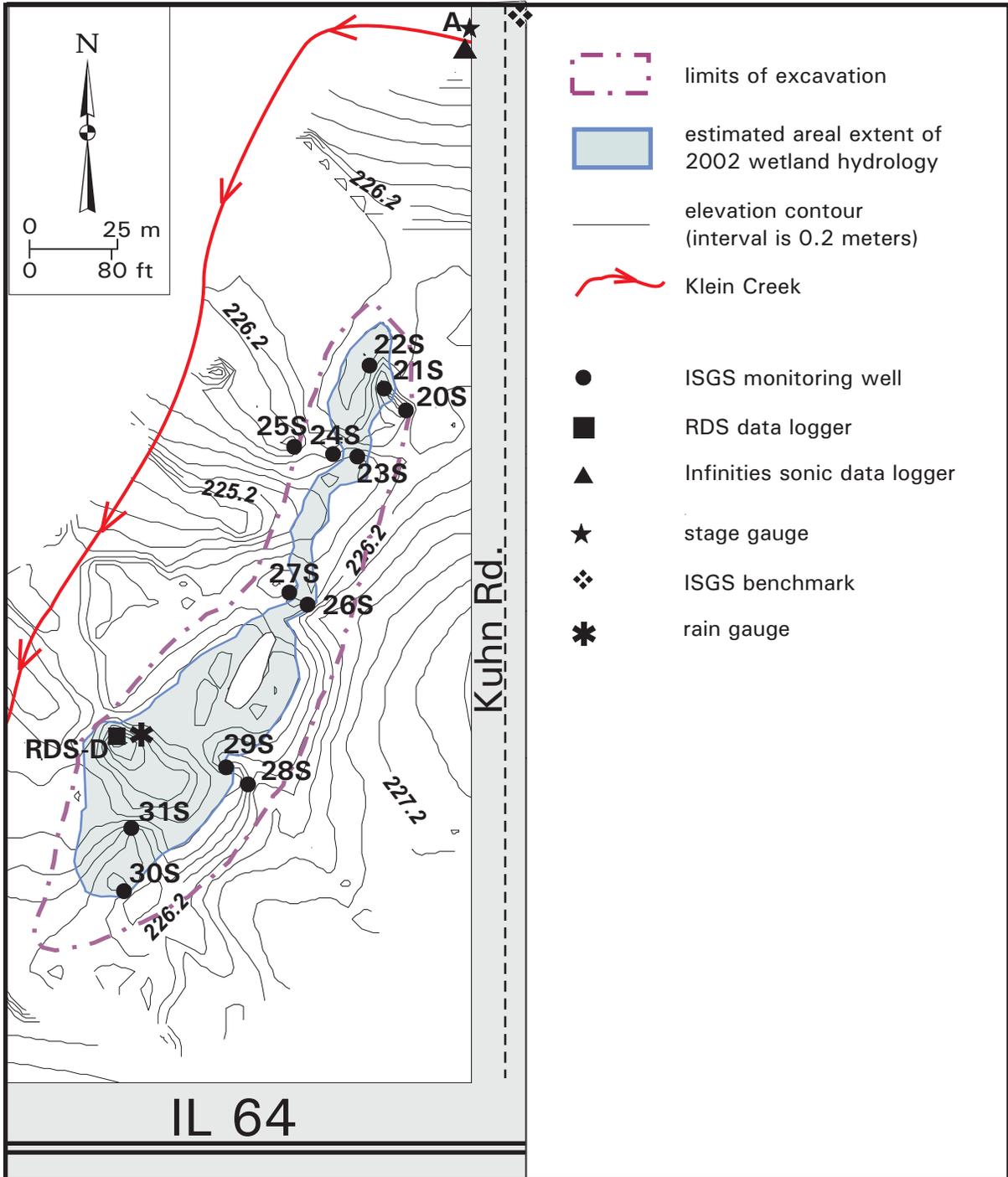
# Klein Creek Wetland Compensation Site (FAP 307)

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and June 5, 2002

map based on 2002 ISGS topographic survey referenced to NGVD, 1929

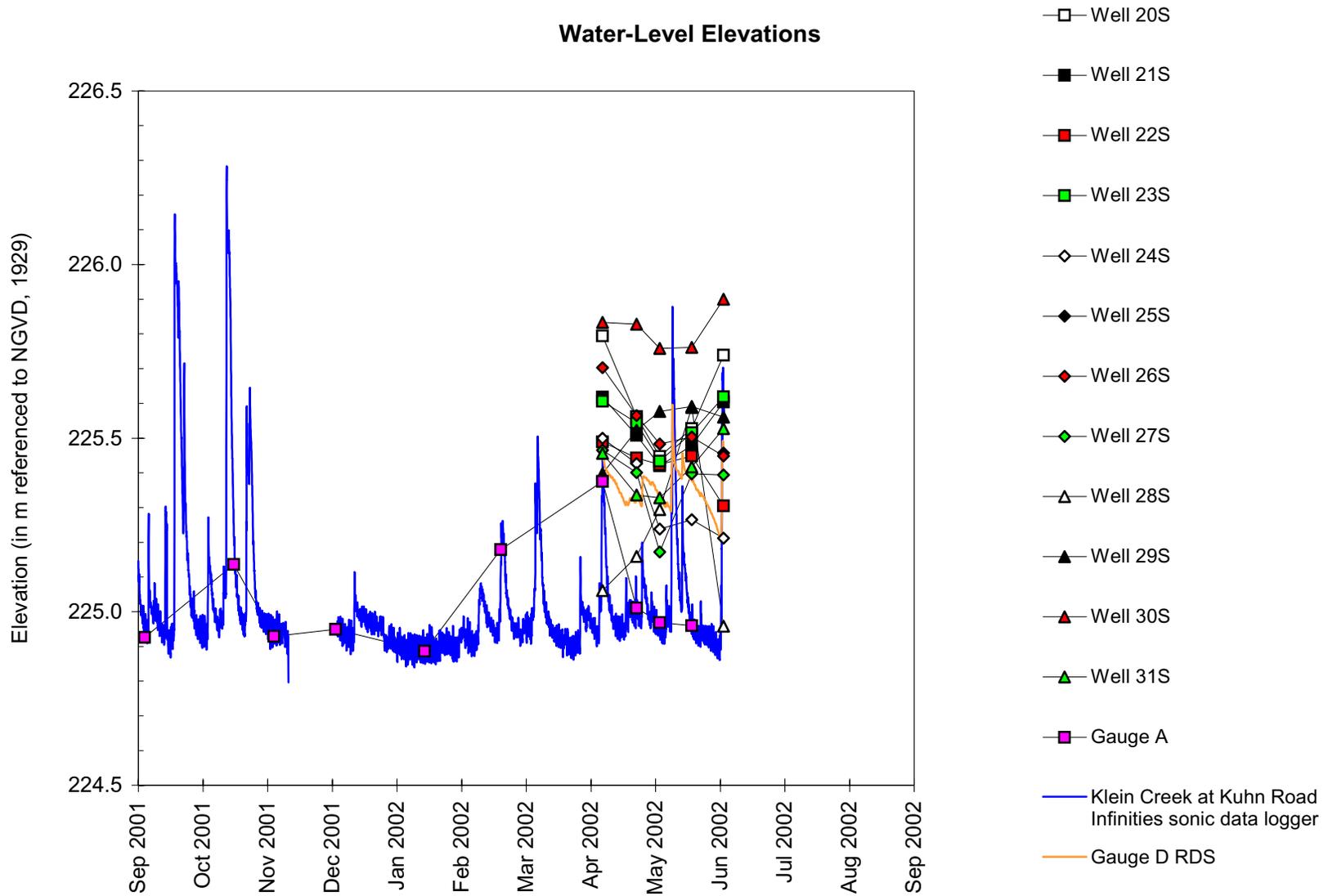
contour interval is 0.2 meters



# Klein Creek Wetland Compensation Site

## September 1, 2001 to September 1, 2002

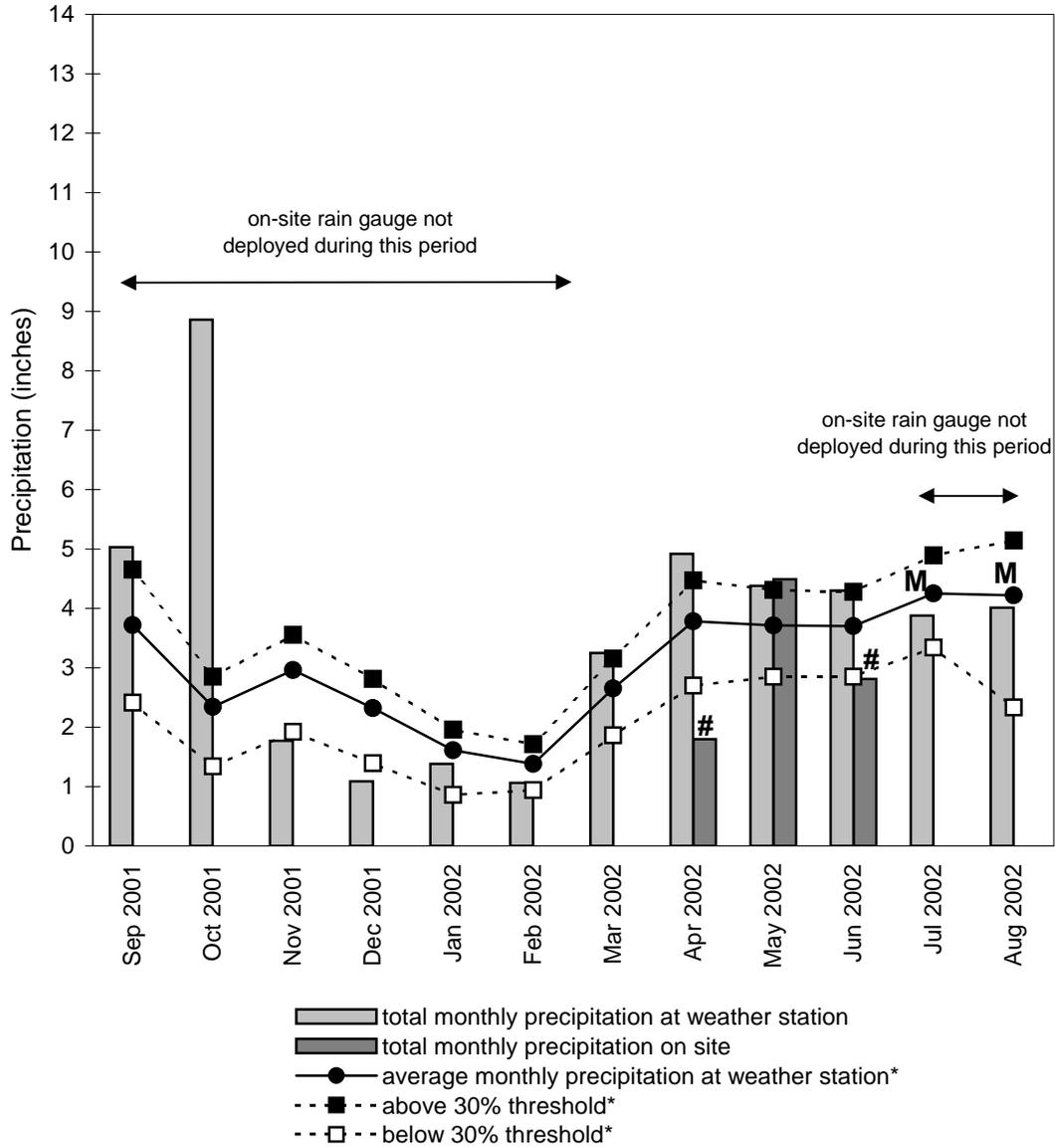
### Water-Level Elevations





## Klein Creek Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Wheaton, IL Weather Station



# on-site rain gauge not deployed for entire month  
 M missing data from weather station  
 \* see text for explanation

Graph last updated October 11, 2002

**VETERAN'S PARKWAY, SPRINGFIELD  
WETLAND COMPENSATION SITE**

**ISGS #09**

FAP 662

Sangamon County, near Springfield, Illinois

**Primary Project Manager: Geoffrey E. Pociask**

**Secondary Project Manager: Paula J. Sabatini**

**SITE HISTORY**

- Spring 1997: ISGS initiated water-level monitoring to determine the pattern of water-level fluctuation in the ponded area. Water in the ponded area was monitored throughout most of the growing season in 1997. Water-level increases were strongly associated with storm events. Upon determining the relationship between water levels in the pond and the adjacent creek, monitoring of the pond was discontinued in Fall 1997.
- July 1999: Water-level monitoring for the purpose of determining the extent of wetland hydrology was initiated at the request of IDOT. Three "S" wells were installed in the shallow exposed shelf in the northwestern corner of the excavation. A surface-water data logger was installed to monitor pond water levels.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Based on an as-built survey provided by IDOT and ground surface-elevations surveyed by ISGS, we estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 6.0 ac (2.4 ha) out of an excavation of 7.1 ac (2.8 ha). This is comparable to an area of 4.9 ac (2.0 ha) in the previous year. This year's estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Springfield is April 6 and the season lasts 209 days; 12.5% of the growing season is 26 days.
- Precipitation was below the normal range in September and December 2001 and in February and March 2002. Precipitation was within or above the normal range in October and November 2001, in January 2002, and over the period April through June 2002. Rainfall totals were excessive (183% of the 30-year average for the period) during April through June 2002. Total precipitation for the reporting period from September 2001 through July 2002 was 123% of normal (August 2002 has not been reported to date). This is compared to 91% of normal for the period from September 2000 through August 2001.
- In May 2002, water levels in the shallow ground water wells were not recorded for 2 consecutive site visits in due to inundation. However, all wells (1S, 2S and 3S) conclusively satisfied wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual because either observed or measured water levels indicated inundated or saturated conditions in excess of 26 days at these locations.
- Limitations of the wetland hydrology determination are as follows:
  - The wetland hydrology calculation was based on as-built topography (1-foot contour interval) provided by IDOT, digital orthophotography, and GPS measurements of wells, and photo-identifiable points. Photo-identifiable points were used to fit the

area of wetland hydrology traced from the as-built topographic map onto a figure based on digital orthophotography.

- The surface-water data logger (Global F) was destroyed in April of 2002 so no continuous on-site surface-water data were available for the 2002 growing season. Therefore, the elevation 157.5 m (516.7 ft) below which wetland hydrology criteria were met was estimated from the duration of inundation/saturation at well 1S and verified from water levels recorded at stage gauge E.

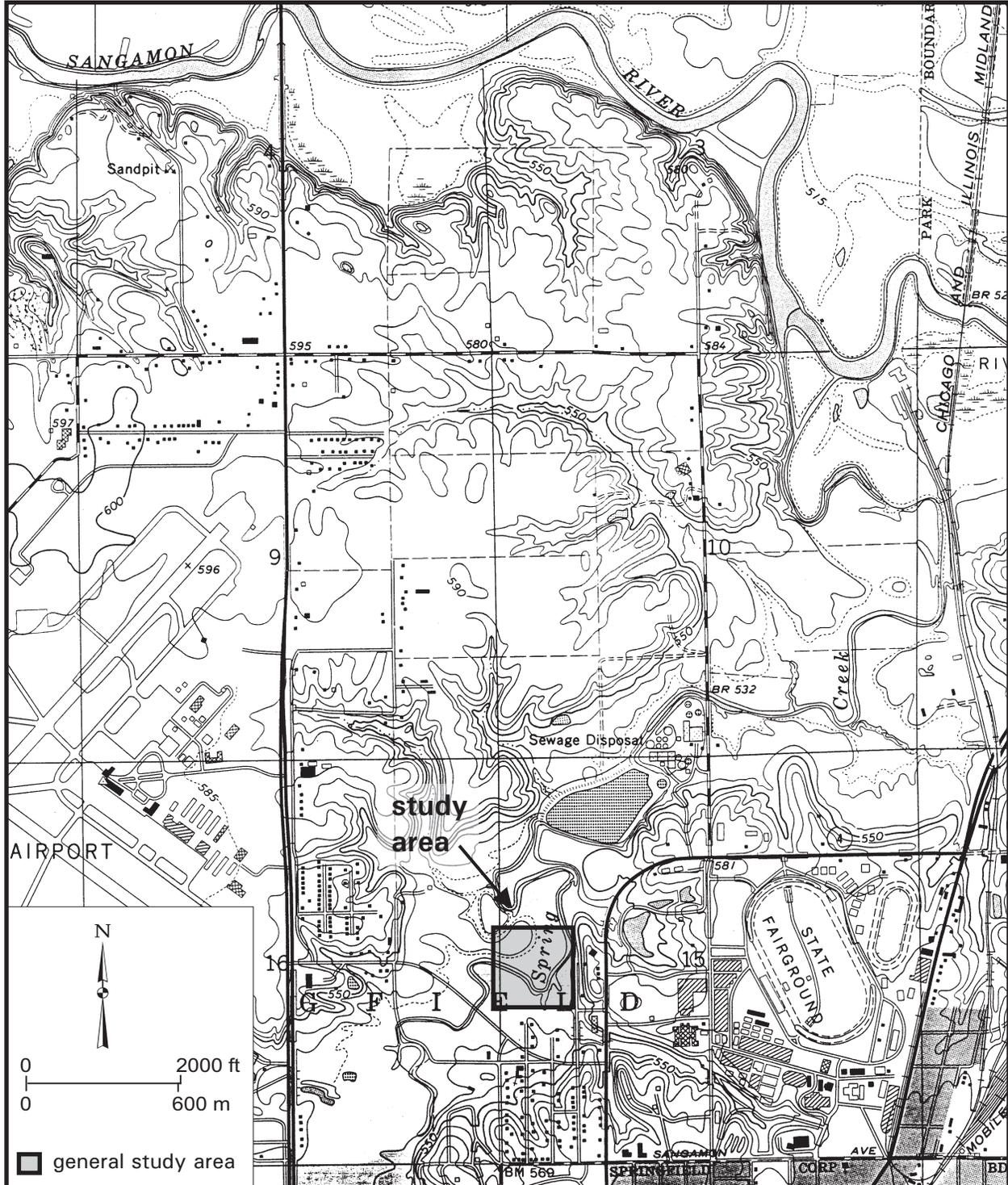
#### PLANNED FUTURE ACTIVITIES

- A replacement for the surface-water data logger F will be installed in Fall 2002. Monitoring will continue until September 2004 or until no longer required by IDOT.

# Veteran's Parkway, Springfield Wetland Compensation Site (FAP 662)

## General Study Area and Vicinity

from the USGS Topographic Series, Springfield West, IL 7.5-minute Quadrangle (USGS 1965)  
contour interval is 10 feet

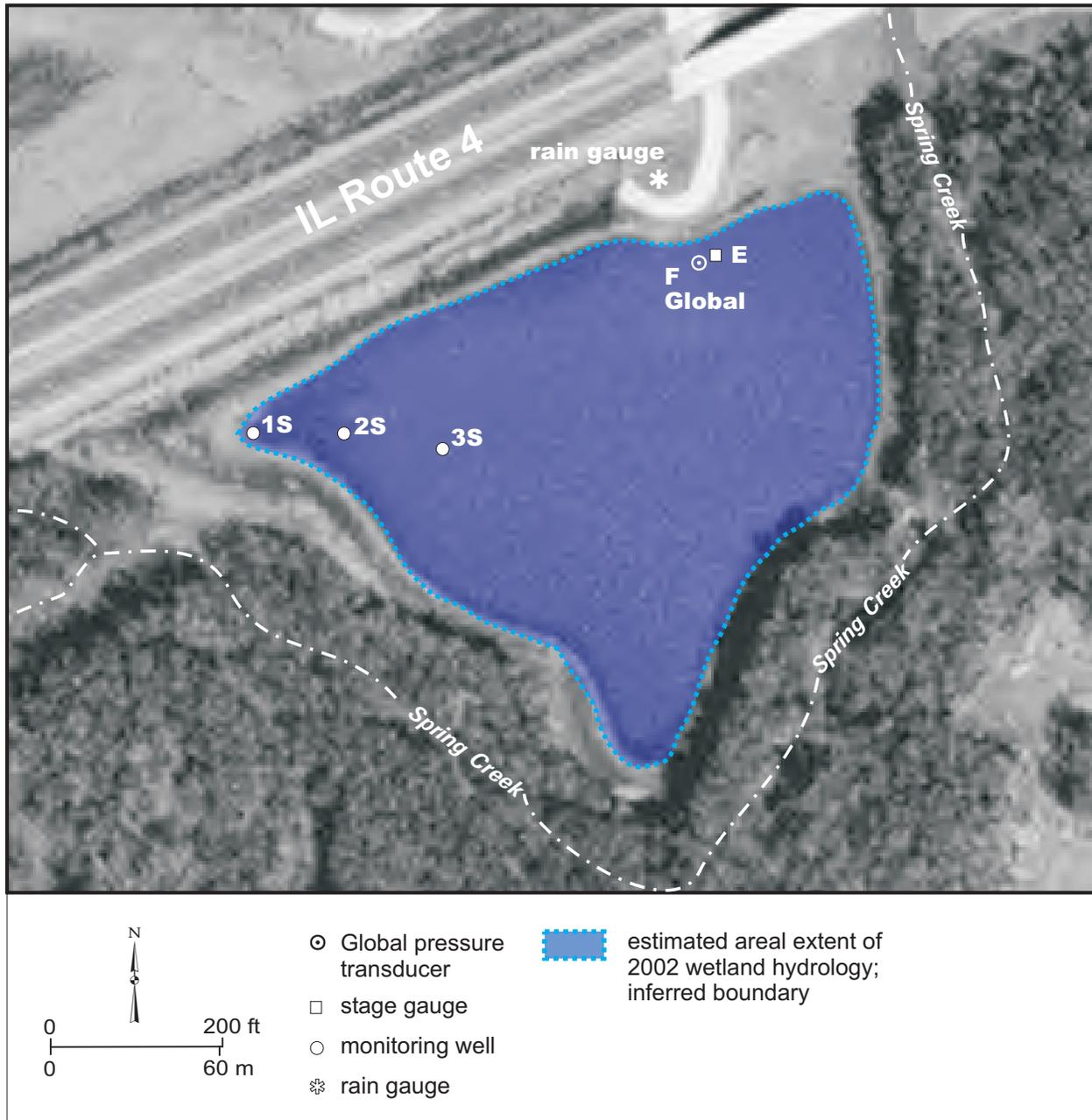


# Veteran's Parkway, Springfield Wetland Compensation Site (FAP 662)

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

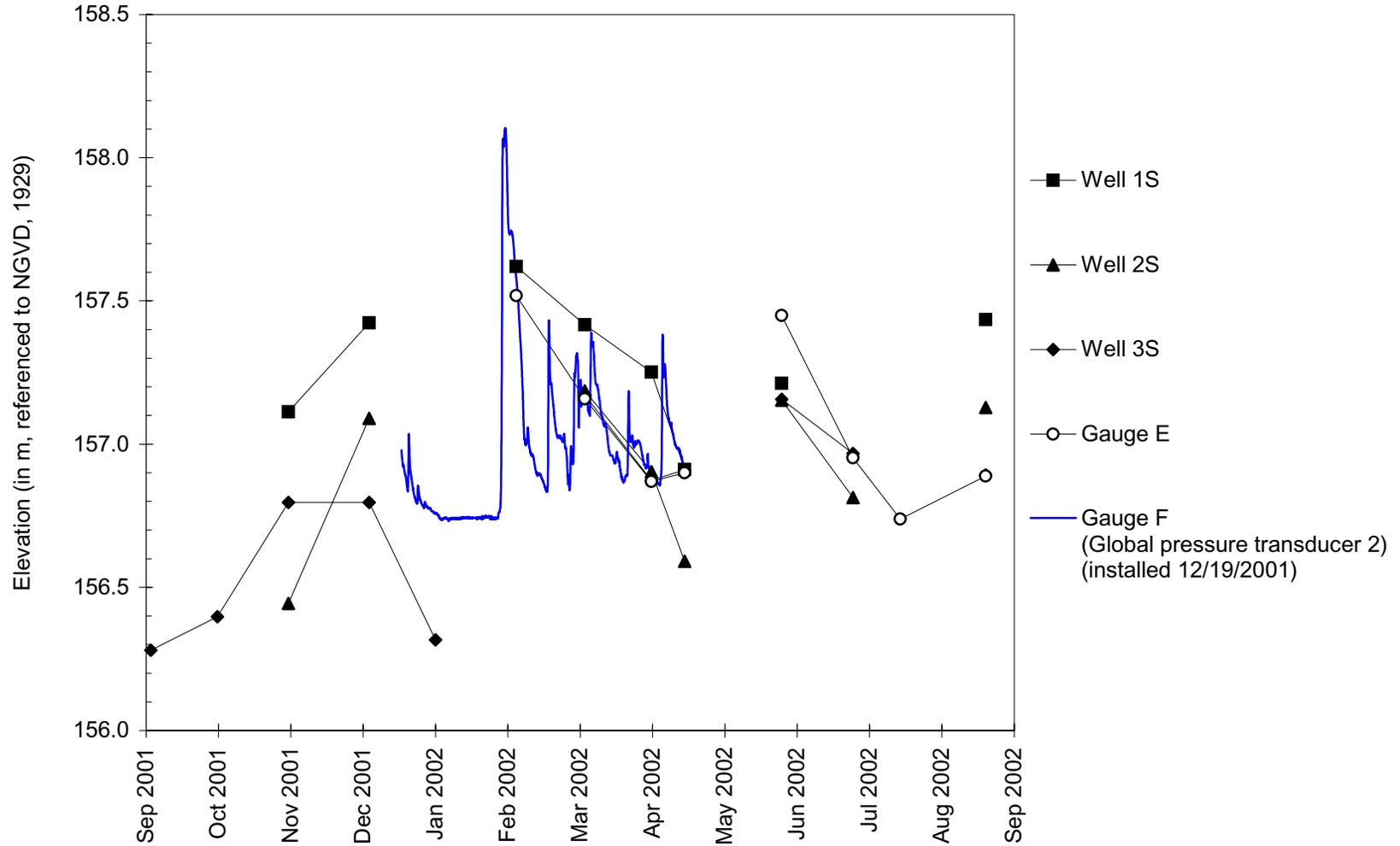
map based on USGS digital orthophotograph Springfield West, NE quarter quadrangle  
produced from 04/14/98 aerial photography (ISGS 2001)



# Veteran's Parkway, Springfield Wetland Compensation Site

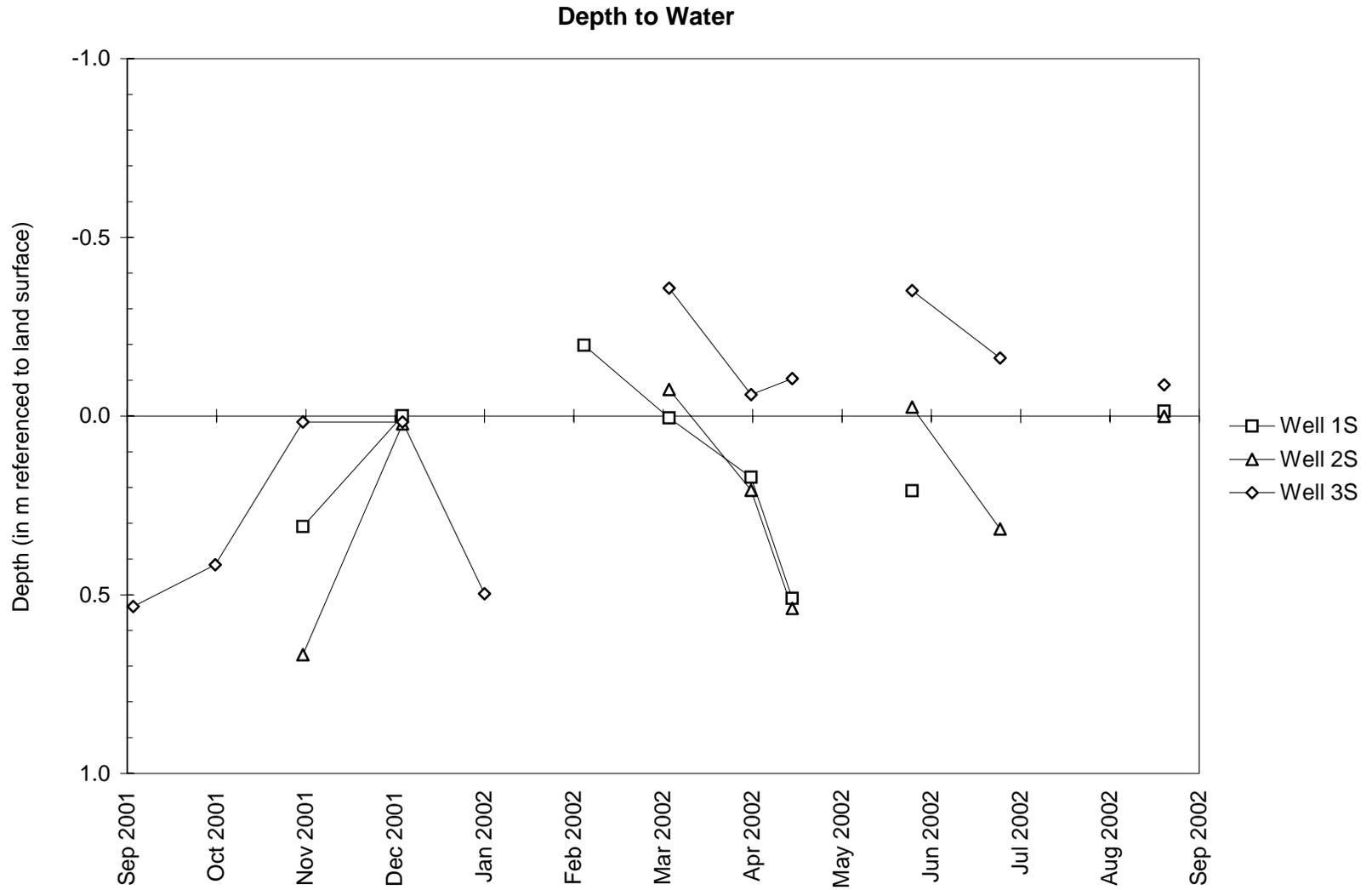
September 1, 2001 to September 1, 2002

## Water-Level Elevations



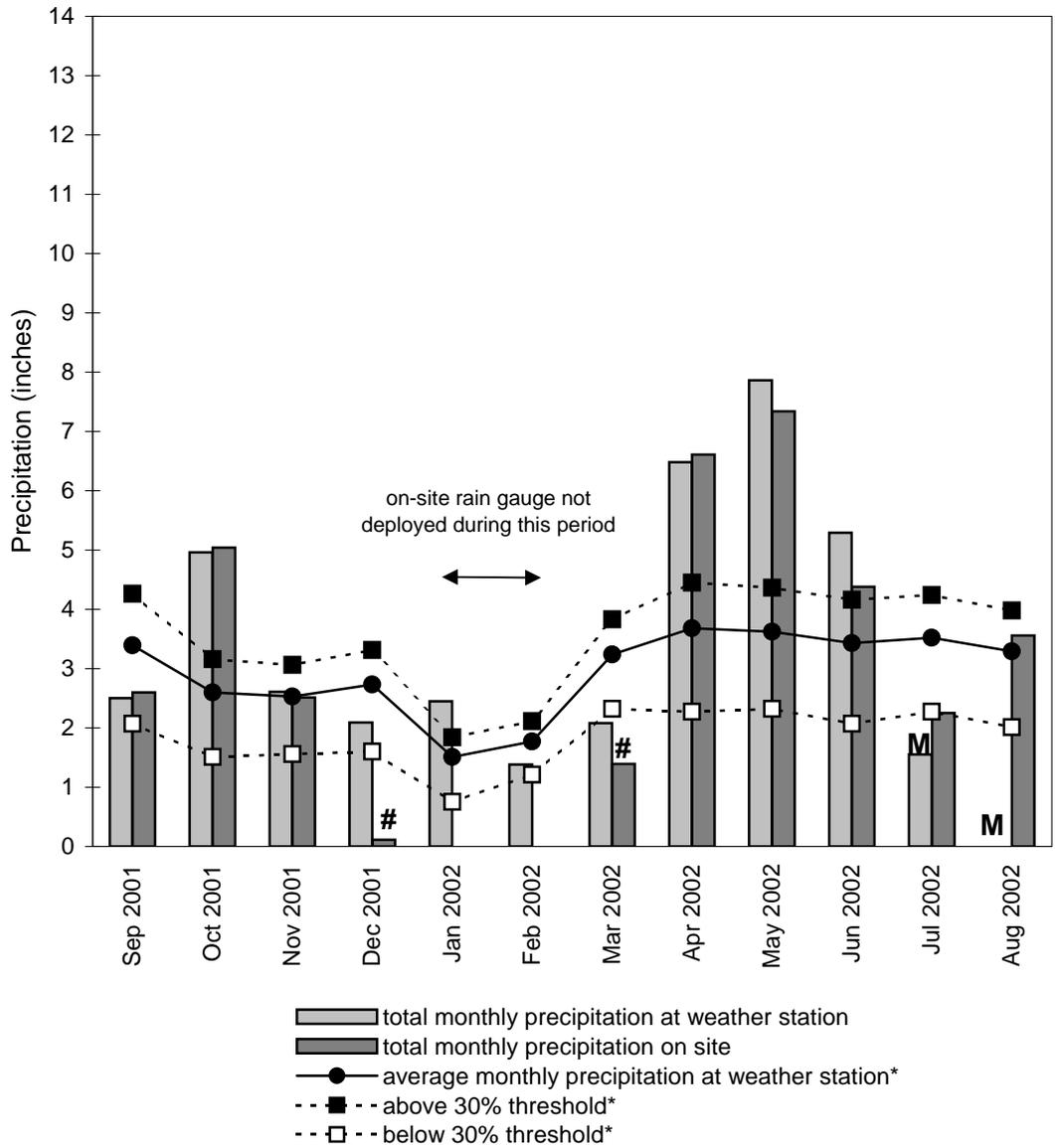
# Veteran's Parkway, Springfield Wetland Compensation Site

September 1, 2001 to September 1, 2002



## Veteran's Parkway Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Springfield, IL Capital Airport Weather Station



# on-site rain gauge not deployed for entire month

**M** missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**HANNIBAL BRIDGE  
WETLAND COMPENSATION SITE**

**ISGS #10**

FAP 319

Pike County, near East Hannibal, Illinois

**Project Manager: Blaine A. Watson**

**Secondary Project Manager: Geoffrey E. Pociask**

**SITE HISTORY**

- October 1992: ISGS installed monitoring wells and began a hydrogeologic characterization.
- June 1995: ISGS submitted a draft final hydrogeologic characterization report to IDOT.
- July 1997: IDOT completed construction of the created wetland by excavating a basin.
- March 1998: ISGS submitted the final hydrogeologic characterization report to IDOT (ISGS Open File Series 1998-2).

**WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 17.4 ac (7.0 ha) out of an excavation of 17.4 ac (7.0 ha). This is comparable to an area of 17.4 ac (7.0 ha) in the previous year. This year's estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Hannibal, Missouri, is April 7 and the season lasts 211 days; 12.5% of the growing season is 26 days.
- Overall precipitation was below the normal range in September and December 2001 and in March, June, and August 2002. Precipitation was at or above the normal range during October and November 2001 and January, April, May, and August 2002. During the period from September 2001 through August 2002, total precipitation at the Hannibal weather station was 108% of normal. This is compared to 94% of normal for the period from September 2000 through September 2001.
- In 2002, water levels measured in all "U" and "S" wells within the excavation, with the exception of well 4U, conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. This is corroborated by water levels measured at RDS 2, where a relatively static water level of approximately 139.86 m (458.85 ft) was recorded from late April until late May 2002. Water levels recorded at RDS 1 exhibited similar fluctuations, but at higher elevations than those at RDS 2.
- Based on review of the field record, it is suspected that well 4U was incorrectly read during the 5/10/02 field visit. The record at RDS #2 indicates that surface inundation occurred in the vicinity of well 4U for a period exceeding 26 days during the growing season.
- Limitations of the wetland hydrology determination are as follows:
  - The calculation does not include any area attributable to the natural, pre-existing wetland along the west-central border of the site.

- A portion of the site outside the excavated wetland's boundaries also likely met wetland hydrology during the 2001 growing season (as evidenced by readings taken at well 7S and field observations of surface inundation north of well 9U). We did not include areas outside the boundaries of the excavation.

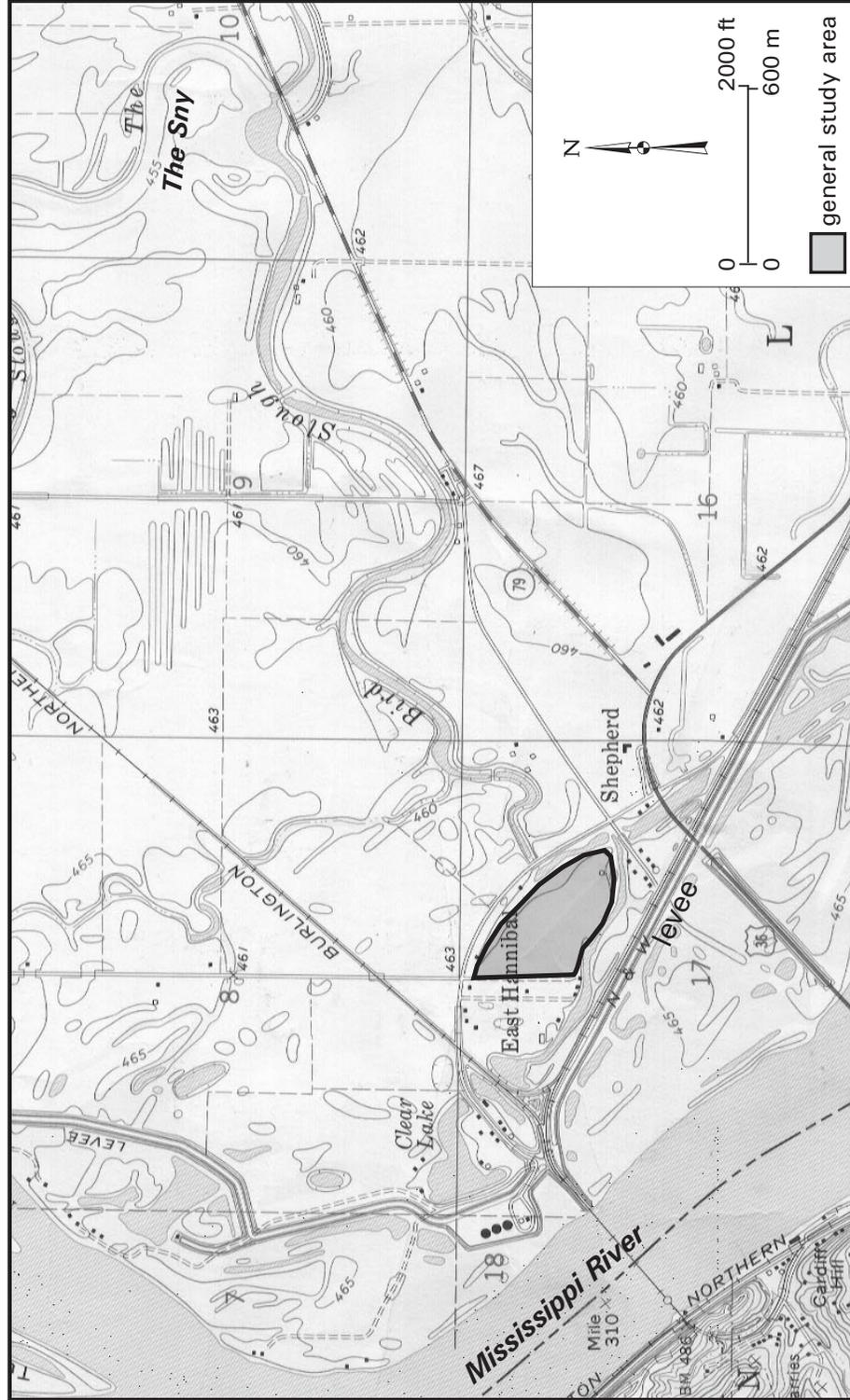
#### PLANNED FUTURE ACTIVITIES

- Due to damage incurred during mowing activities, the following wells will be removed from the monitoring protocol: 4U, 14U, 17U, and 18L. Based on the location of other nearby wells or automated instruments, the removal of these wells from the monitoring protocol should not prohibit the ISGS from making effective wetland hydrology determinations in the future.
- In order to provide concurrent hydrological monitoring data to coincide with additional vegetation monitoring being conducted by the INHS, our monitoring will continue through July 2003 or until no longer required by IDOT.

# Hannibal Bridge Wetland Compensation Site (FAP 319)

## General Study Area and Vicinity

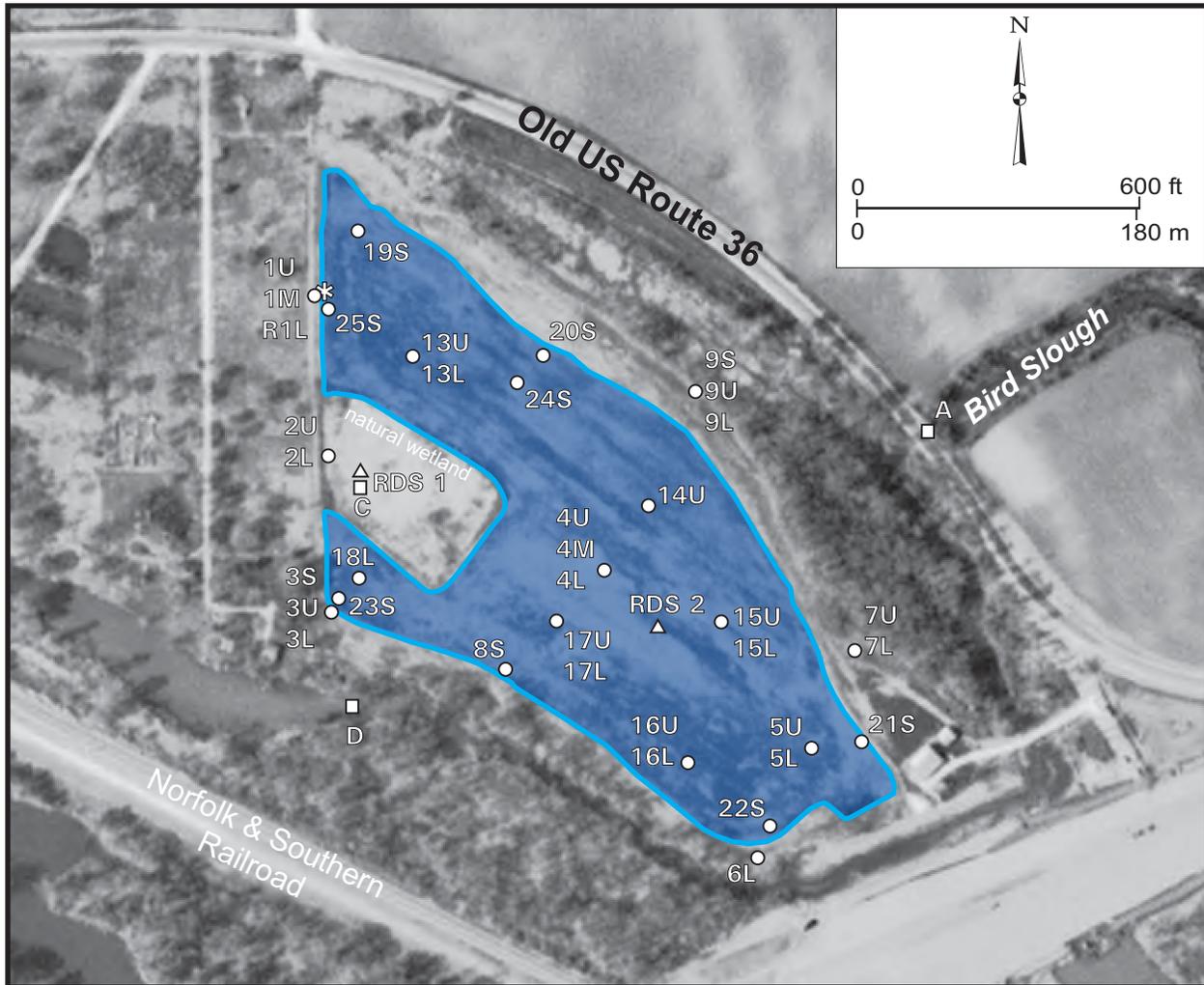
from the USGS Topographic Series, Hannibal East, IL-MO 7.5-minute Quadrangle (USGS 1971)  
contour interval is 5 feet east of the Mississippi River and 20 feet west of the Mississippi River



# Hannibal Bridge Wetland Compensation Site (FAP 319)

## Estimated Areal Extent of 2002 Wetland Hydrology

map based on USGS digital orthophotograph Hannibal East, NW quarter quadrangle  
produced from 4/12/99 aerial photography (ISGS 2002)



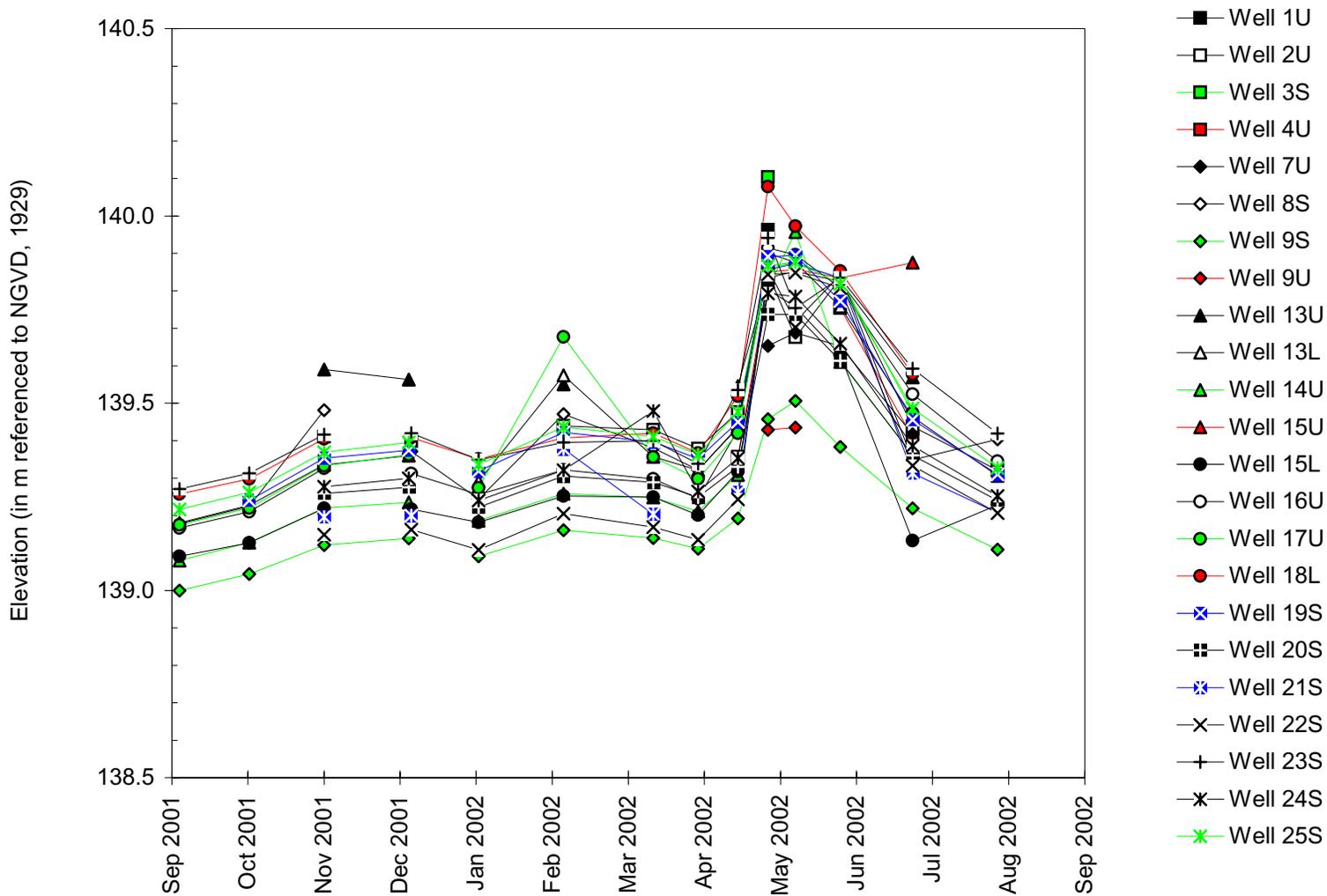
estimated areal extent of  
2001 wetland hydrology  
within excavated area

- monitoring well
- stage gauge
- △ RDS data logger
- \* rain gauge

# Hannibal Bridge Wetland Compensation Site

September 1, 2001 to September 1, 2002

## Water-Level Elevations in Wells used to Determine Areas Satisfying Wetland Hydrology Criteria

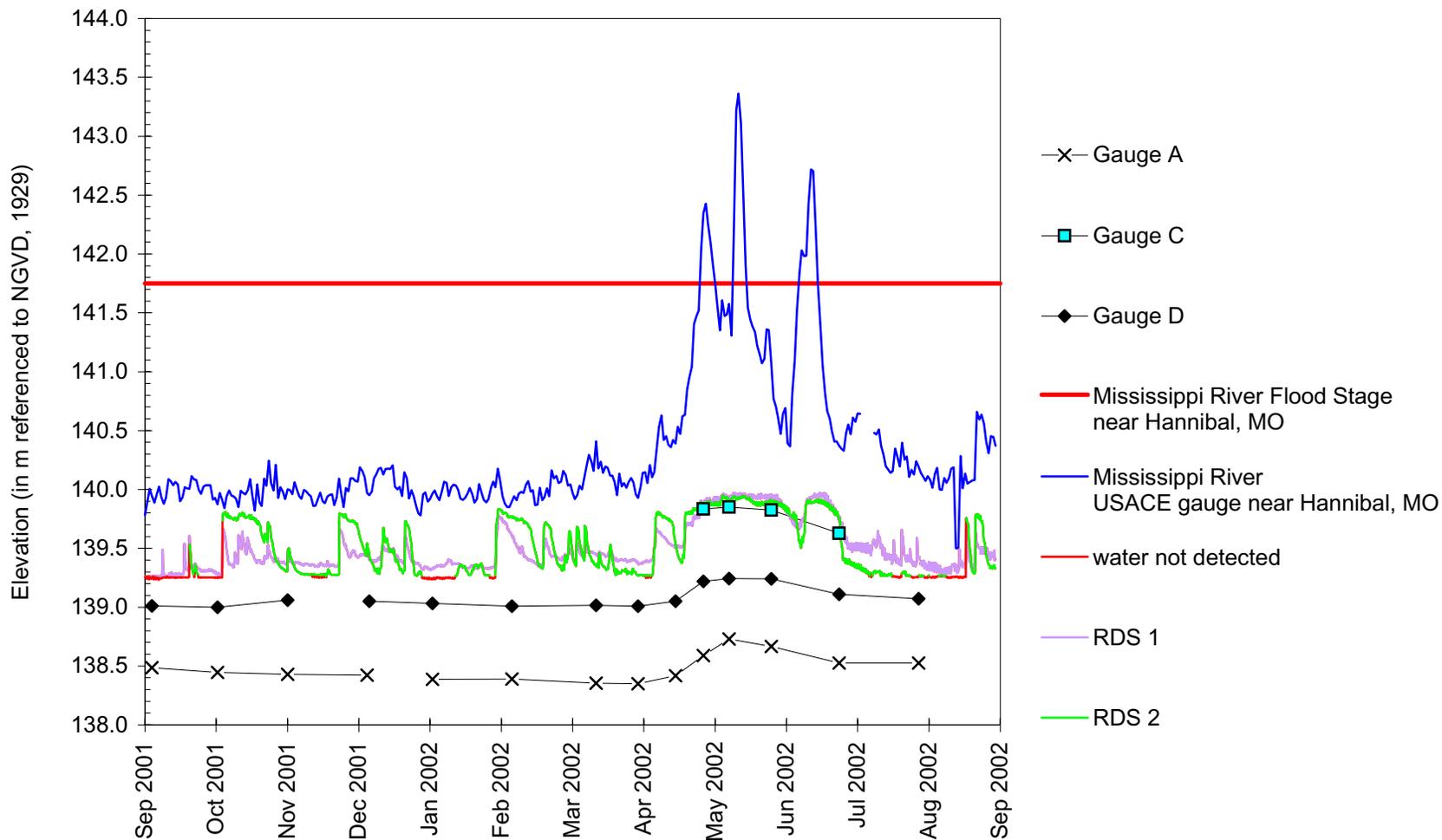




# Hannibal Bridge Wetland Compensation Site

## September 1, 2001 to September 1, 2002

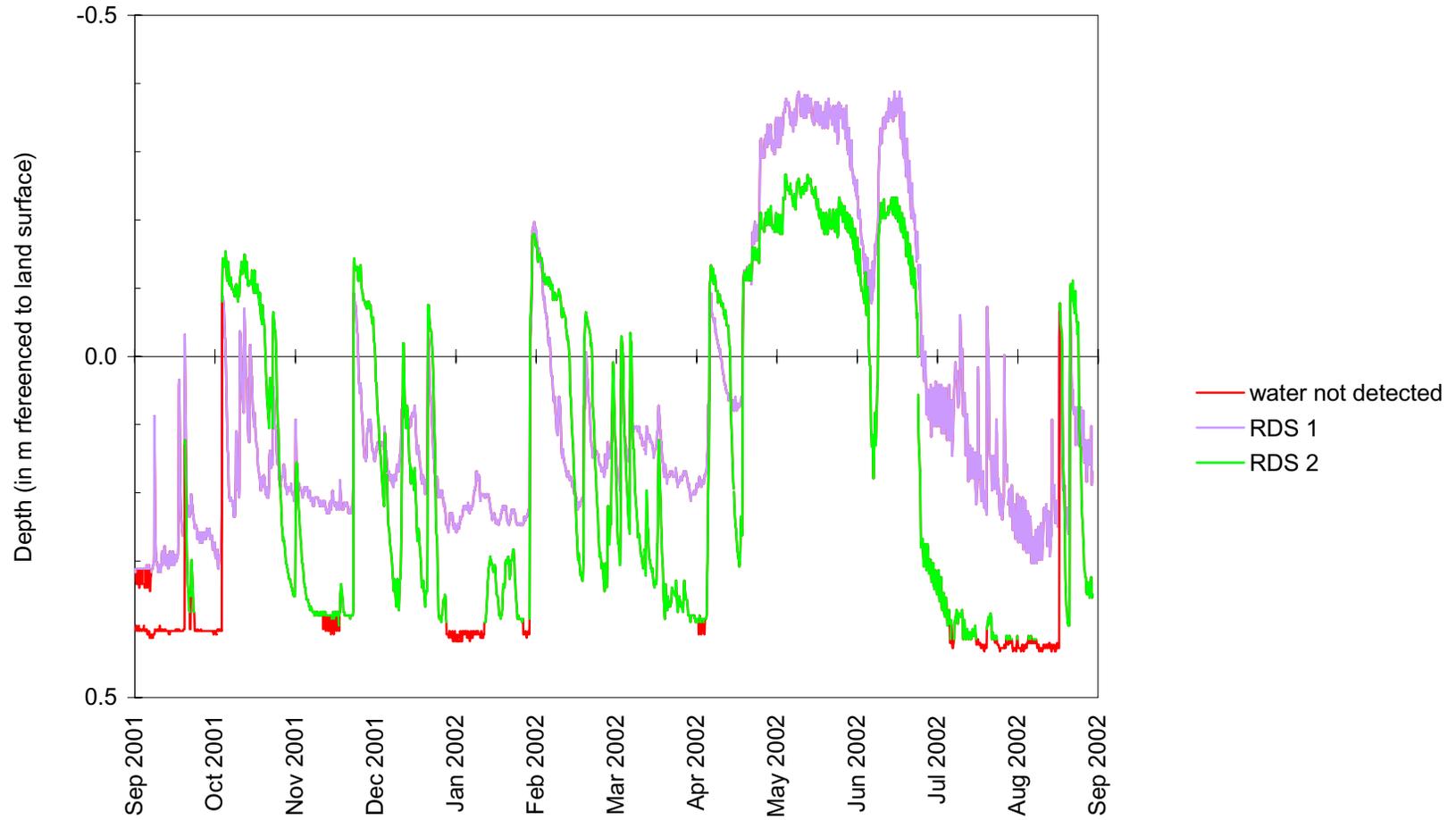
### Water-Level Elevations in RDS Data Loggers and on Stage Gauges



# Hannibal Bridge Wetland Compensation Site

September 1, 2001 to September 1, 2002

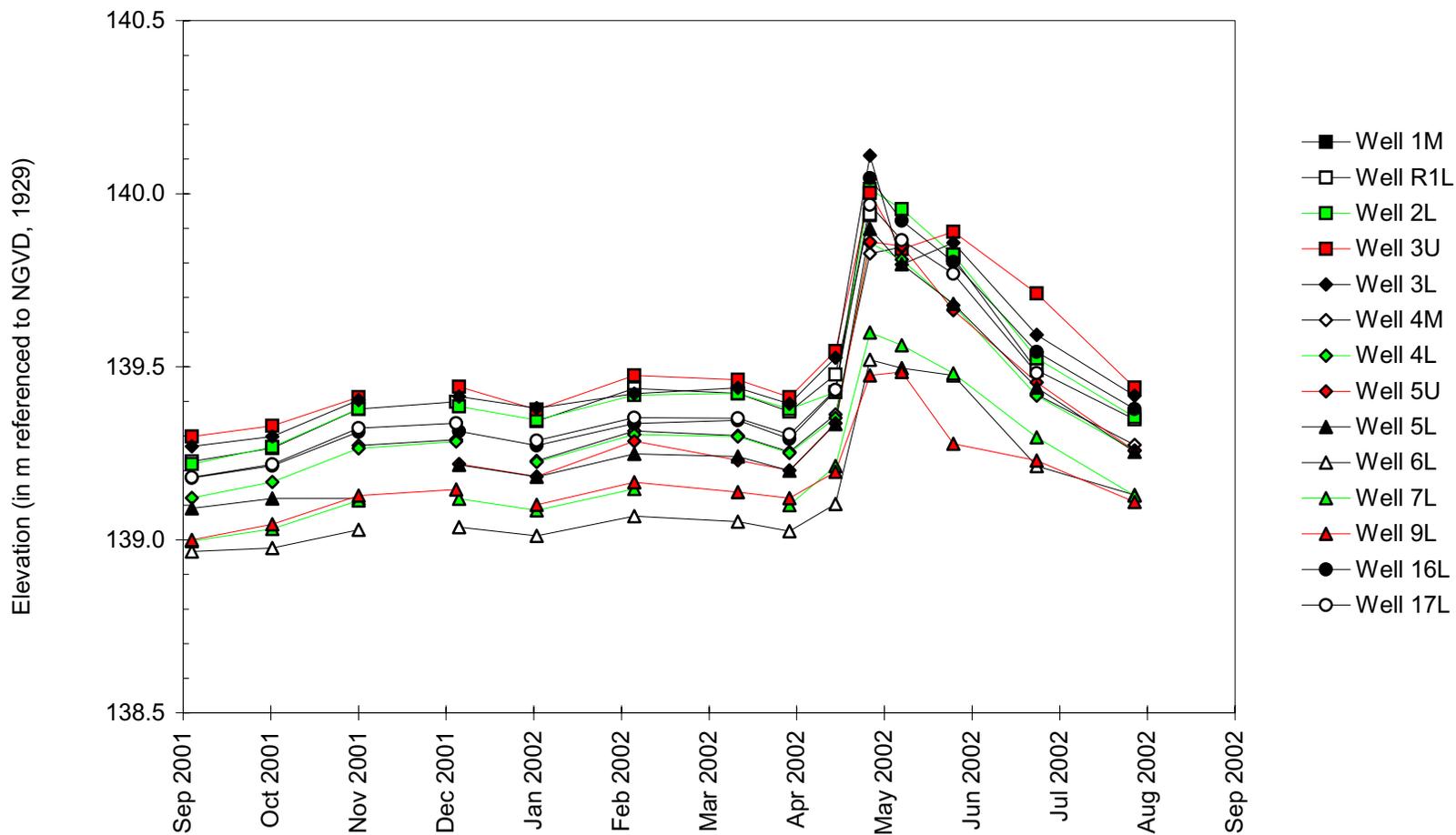
## Depth to Water in RDS Data Loggers



# Hannibal Bridge Wetland Compensation Site

September 1, 2001 to September 1, 2002

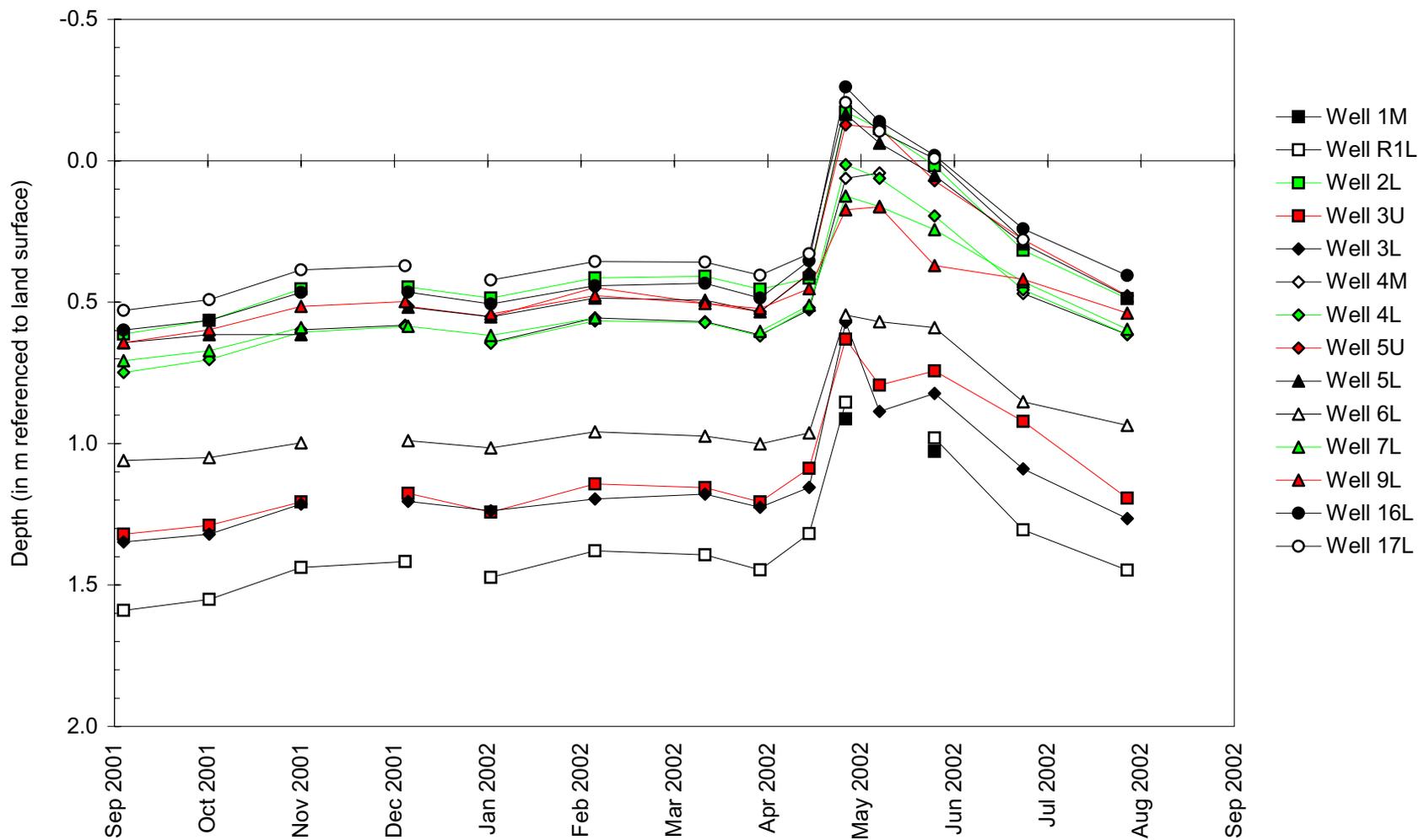
## Water-Level Elevations in Deeper Monitoring Wells



# Hannibal Bridge Wetland Compensation Site

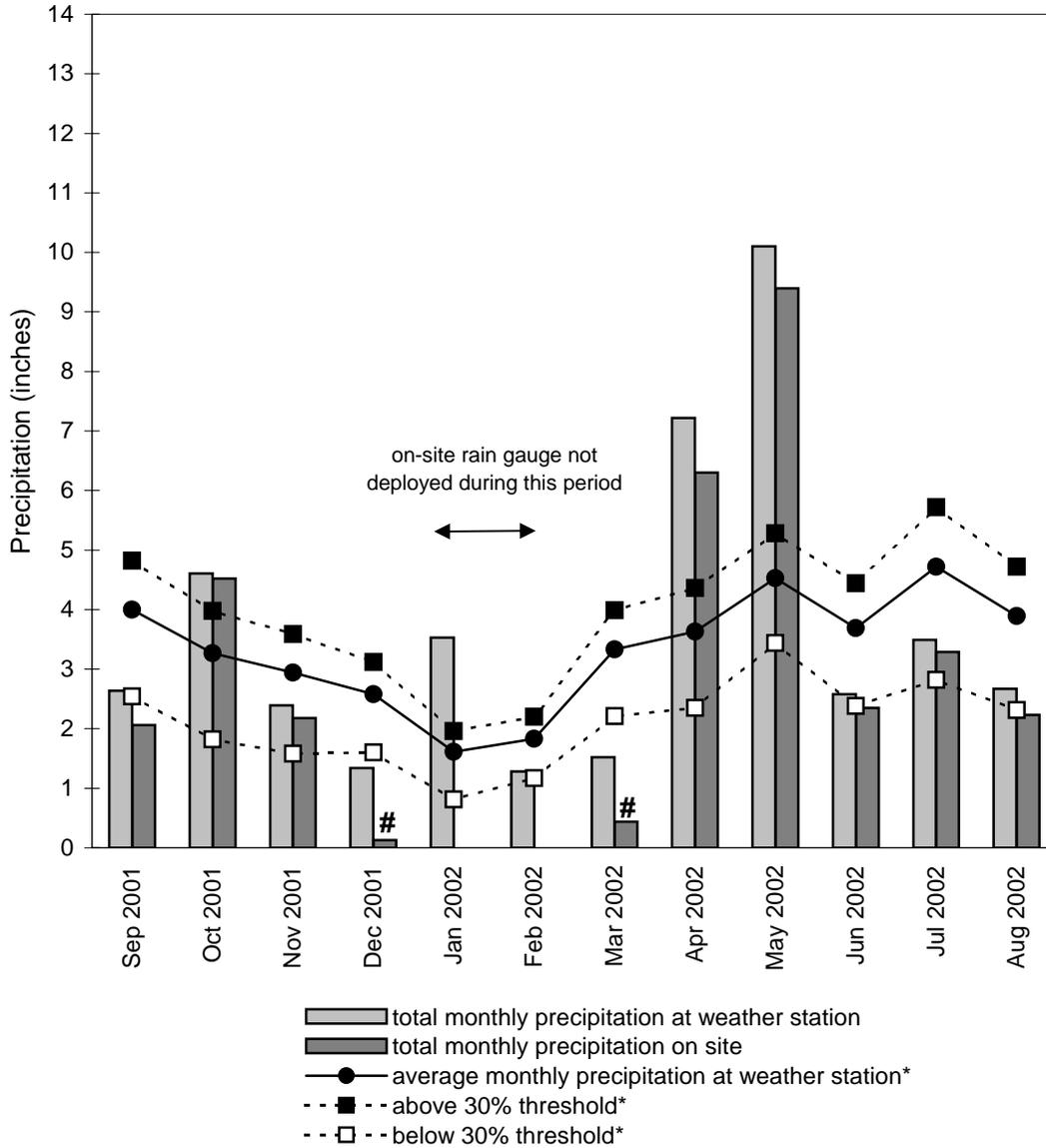
September 1, 2001 to September 1, 2002

## Depth to Water in Deeper Monitoring Wells



## Hannibal Bridge Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Hannibal Water Works Weather Station, Hannibal, MO



# on-site rain gauge not deployed for entire month  
\* see text for explanation

Graph last updated October 11, 2002

**SAND ROAD  
WETLAND COMPENSATION SITE**

**ISGS #15**

FAP 310

Madison County, near Poag, Illinois

**Primary Project Manager: Bonnie J. Robinson**

**Secondary Project Manager: Steven E. Benton**

**SITE HISTORY**

- April 1996: IDOT issued a task order to the ISGS to conduct a detailed mitigation site assessment.
- August 1996: The hydrogeologic characterization of the site was initiated with the installation of monitoring wells and staff gauges.
- July 1997: An interim hydrogeologic characterization report was submitted to IDOT.
- Fall 1998: A berm, incorporating a water control structure, was built along the south margin of the site.
- March 1999, November 1999, May 2000, December 2000, November 2001: Twenty-one soil-zone (S) monitoring wells were installed to better define the area of wetland hydrology and the transition zone along the slope of the sand terrace.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

The area that conclusively satisfied wetland hydrology criteria in 2002 is estimated to be 17.3 ac (7.0 ha). This is about 10.9 ac (4.4 ha) more than in 2001, and is probably due to above normal precipitation during the spring of 2002. This estimate is based on the following.

- According to the Midwestern Climate Center, the median length of the growing season, as measured at the Edwardsville Weather Station, is 203 days (April 5 to October 24). Therefore, 12.5% of the growing season is 25 days.
- Precipitation was at or above normal during October and December 2001 and in January, April, May and June 2002. Precipitation was below normal in September and November 2001 and in February, March, July and August 2002. Total precipitation for the period from September 2001 to August 2002 was 121% of normal.
- In 2002, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual: 2S, 2U, 3SR, 4U, 5S, 5U, 7S, 7U, 8S, 8U, 13U, 14S, 15S, 16S, 17S, 18S, 19S, 21S, 23S, 24S, 25S, 26S and 27S.
- Surface-water levels measured by the RDS data logger indicated that inundation occurred to an elevation of about 128.46 m (421.46 ft) for a duration sufficient to satisfy wetland hydrology criteria. The area defined by this elevation was within the area determined to have wetland hydrology based on ground-water levels.
- Except for the periods September 30 to October 11, 2001 and July 13 to August 31, 2002,

surface-water levels were at or above the normal elevation of 128.0 m (420 ft) as specified in the IDOT Conceptual Wetland and Illinois Chorus Frog Compensation Plan.

- Limitations of the wetland hydrology determination are as follows:
  - The wetland acreage determination contains pre-existing wetland.

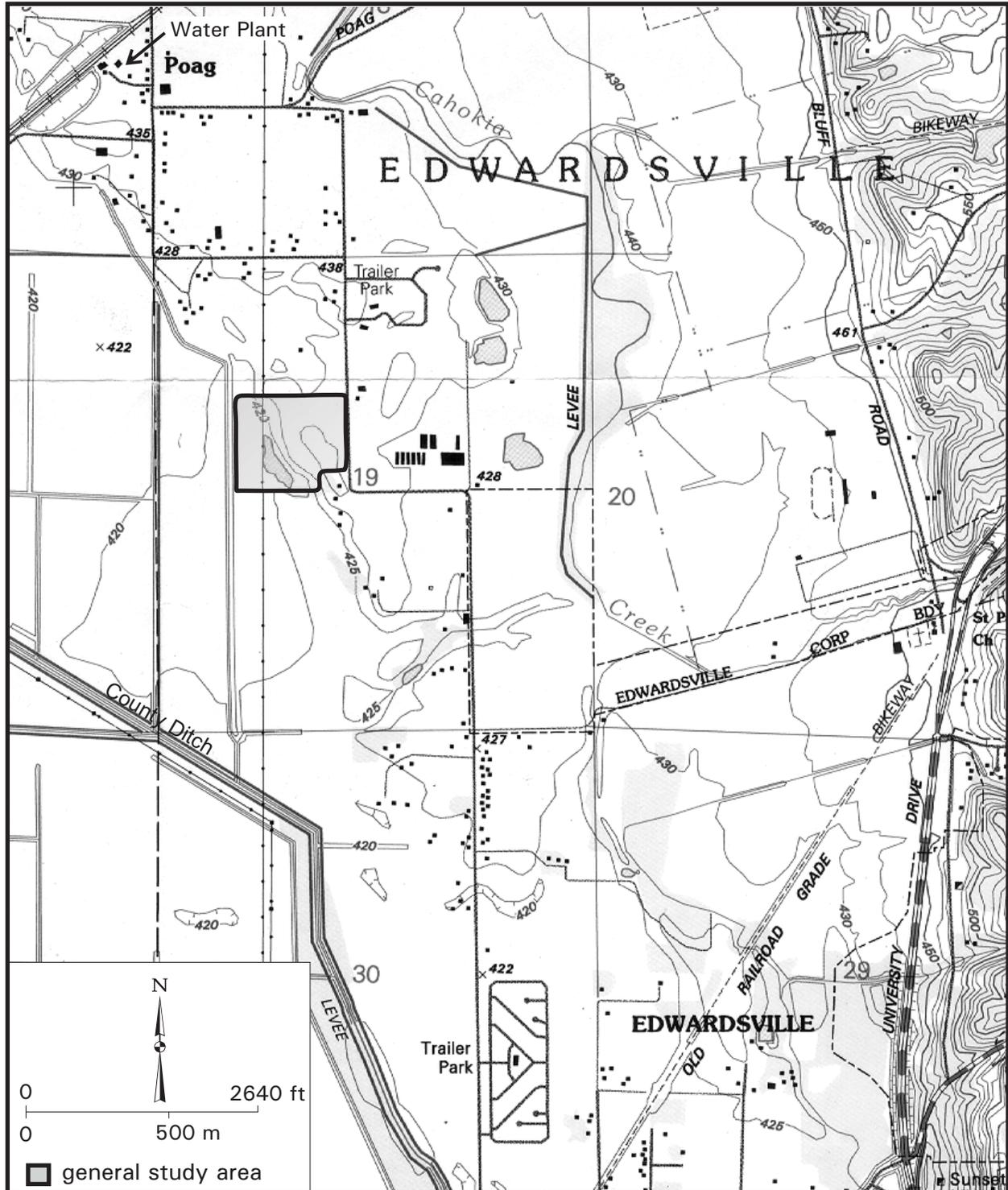
#### PLANNED FUTURE ACTIVITIES

- Monitoring will continue through the spring of 2003. This will complete the 5-year wetland hydrology monitoring phase for this project.
- Write the 5-year monitoring report.

# Sand Road Wetland Compensation Site (FAP 310)

## General Study Area and Vicinity

from the USGS Topographic Series, Wood River, IL-MO 7.5-minute Quadrangle (USGS 1994)  
contour interval is 10 feet



# Sand Road Wetland Compensation Site (FAP 310)

## Estimated Areal Extent of 2002 Wetland Hydrology

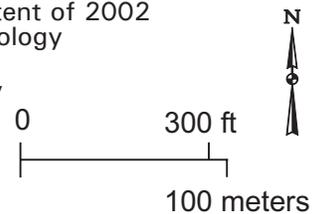
based on data collected between September 1, 2001 and September 1, 2002

map based on USGS digital orthophotograph, Wood River, SE quarter  
quadrangle produced from 4/2/1998 aerial photography (ISGS 2001)



- monitoring well
- stage gauge
- \* rain gauge
- ▲ RDS surface-water stage recorder

- estimated extent of 2002 wetland hydrology
- site boundary

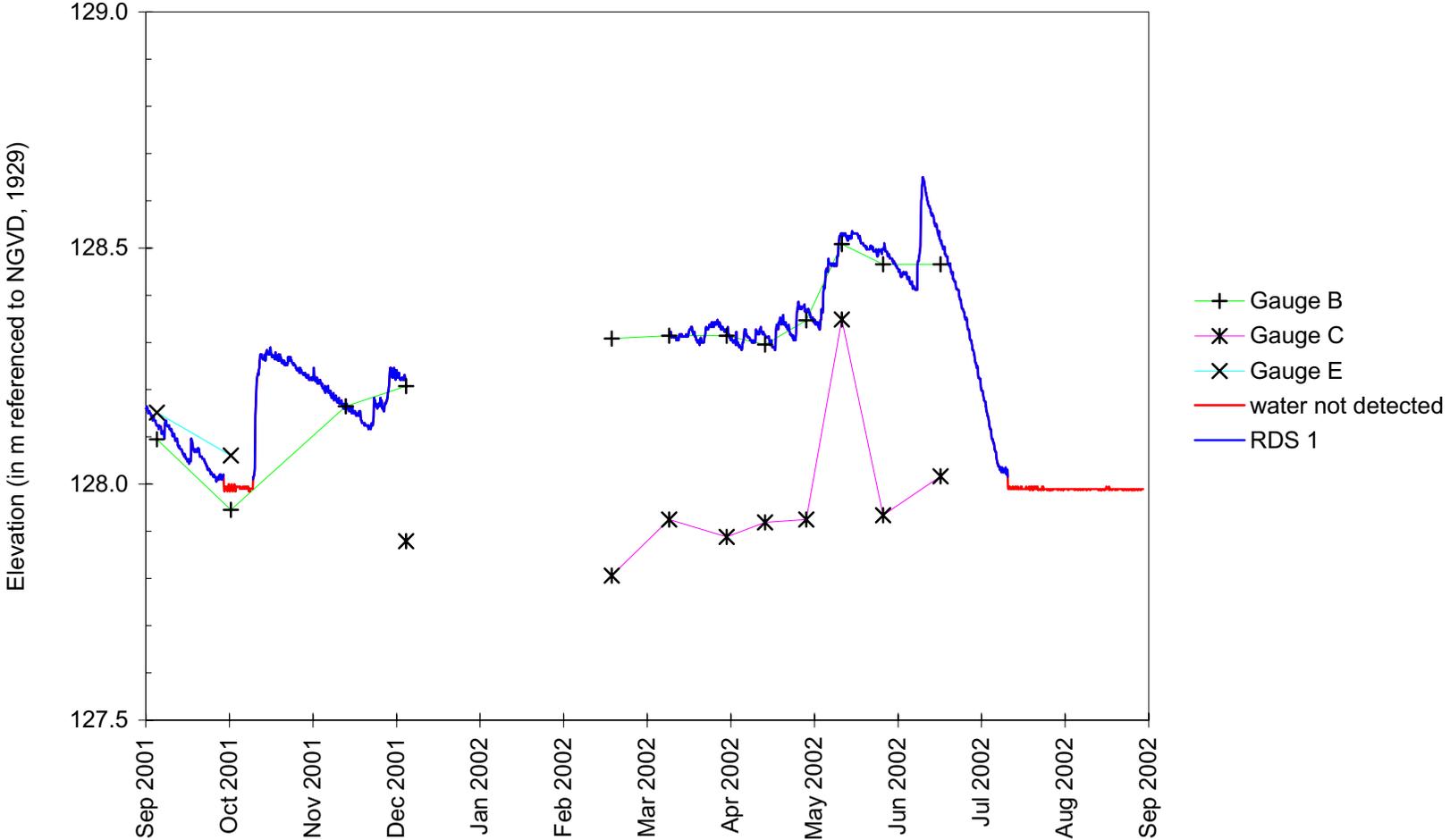






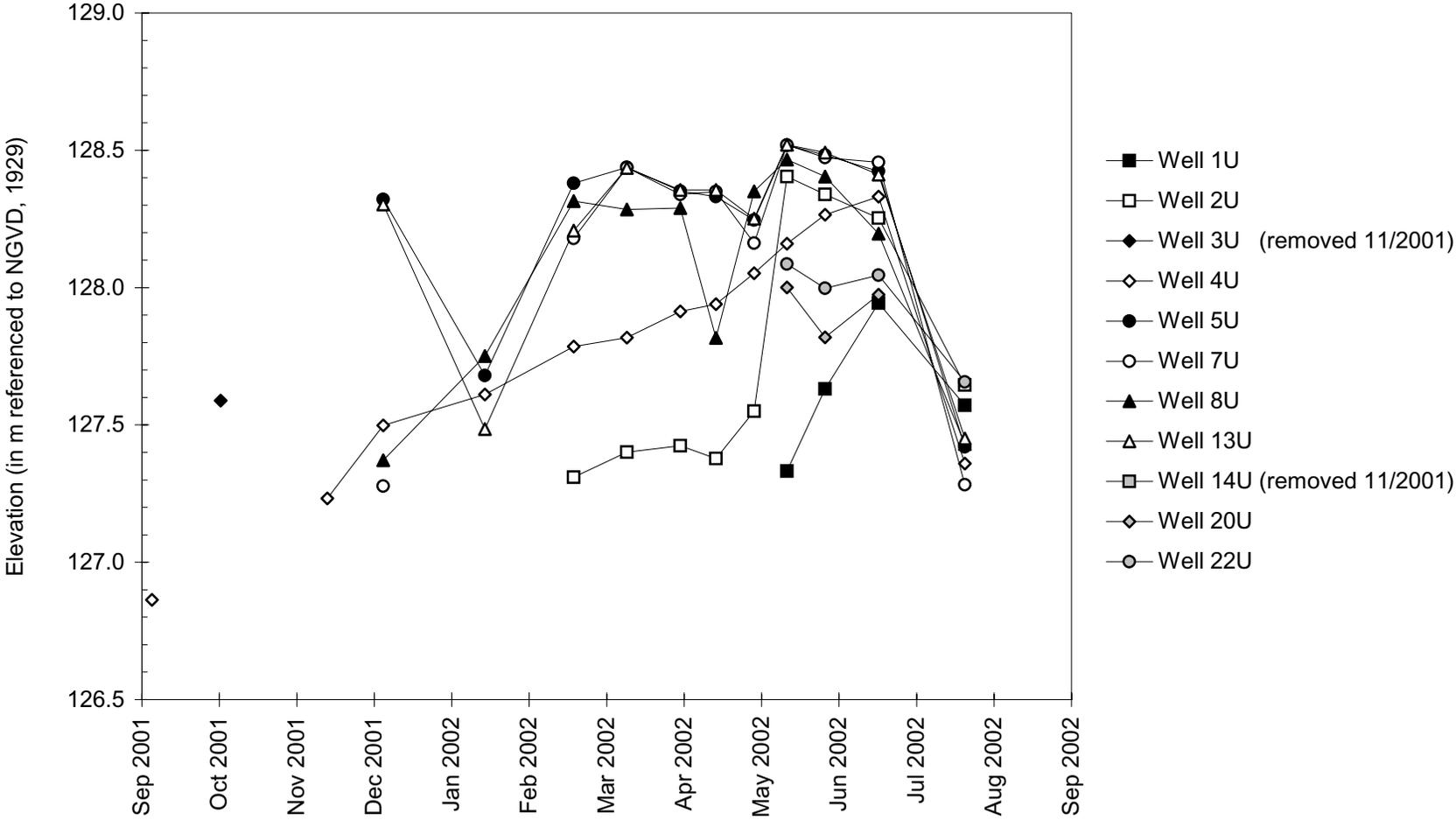
**Sand Road Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**  
**on Stage Gauges and the RDS Data Logger**



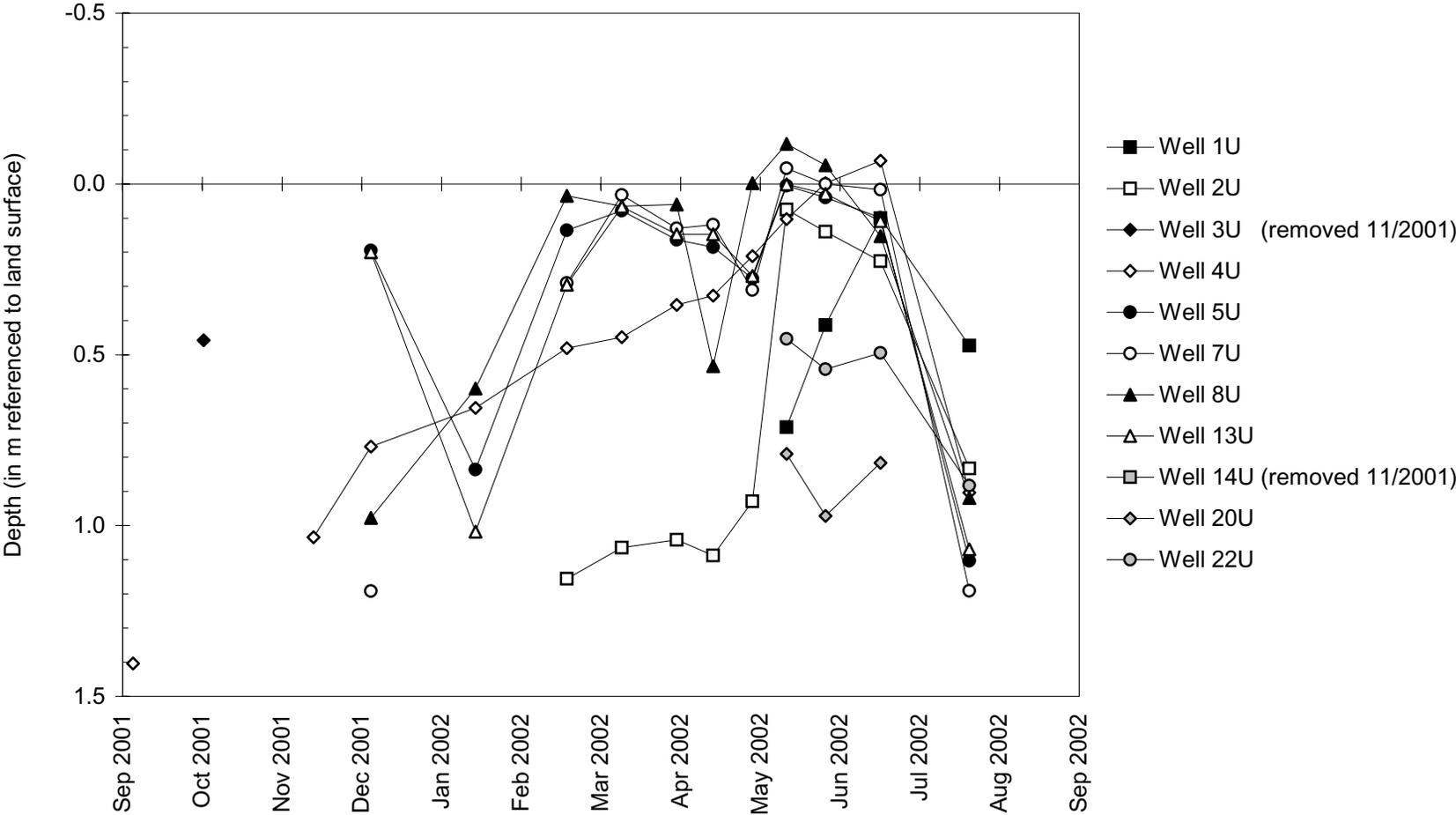
**Sand Road Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**  
**in Upper Monitoring Wells**



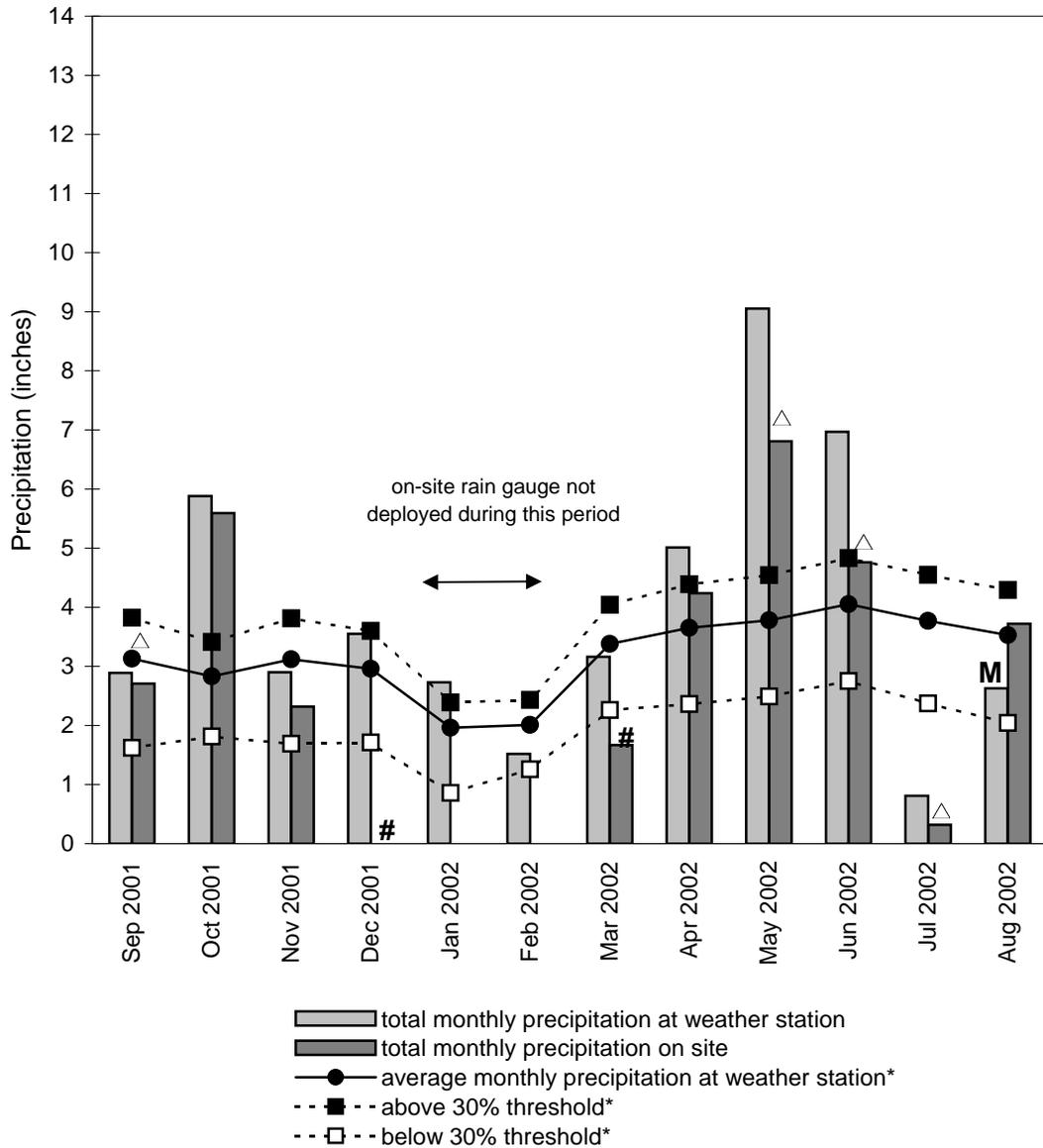
# Sand Road Wetland Compensation Site September 1, 2001 to September 1, 2002

## Depth to Water in Upper Monitoring Wells



## Sand Road Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Edwardsville, IL Weather Station



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

**M** missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**ORANGEVILLE  
WETLAND COMPENSATION SITE**

**ISGS #16**

FAP 316

Stephenson County, near Orangeville, Illinois

**Primary Project Manager: Kelli D. Weaver**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- March 1993: IDOT tasked ISGS to determine ground-water levels on the site.
- February 1994: ISGS data collection was initiated with the installation of nested monitoring wells and a staff gauge.
- December 1996: ISGS received notification from IDOT that all monitoring at the site was to cease as of January 1, 1997.
- March 1997: A final hydrogeologic characterization report was submitted to IDOT (ISGS Open File Series, 1997-3).
- June 2000: IDOT issued a task order for ISGS to monitor two newly constructed wetland compensation sites and delineate the area of wetland hydrology for each. The two sites will subsequently be known as Site 1 (most northerly) and Site 2 (most southerly).
- Spring 2001 and 2002: ISGS data collection was resumed with the installation of soil-zone monitoring wells (22), stage gauges (4), RDS water-level data loggers (2), a sonic water level logger and a rain gauge. The ISGS also produced topographic base maps of the site in 2002.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

The total area that conclusively satisfied wetland hydrology criteria in 2002 is estimated to be 12.22 ac (4.9 ha); 8.44 ac (3.41 ha) at Site 1, and 3.78 ac (1.53 ha) at Site 2. This is in contrast to the total combined area of 16.13 ac (6.5 ac), which satisfied wetland hydrology in 2001 (Site 1, 8.03 ac [3.25 ha]; Site 2, 8.1 ac [3.28 ha]). The estimates for 2002 wetland hydrology acreage are based on the following factors:

- According to the Midwestern Climate Center, the median date that the growing season begins in Freeport, Illinois is April 20 and the season lasts 182 days; 12.5% of the growing season is 23 days.
- Total precipitation for the monitoring period from September 2001 to August 2002 was 130% of normal. Precipitation was above normal for the months of September through November 2001, and February, April, and June 2002. Precipitation was below normal for the months December 2001, and January, March, and May 2002. Although weather station data are incomplete, precipitation measured on site was below normal for July and above normal for August.

- In 2001, pre-construction plans with estimated target excavation elevations were used by ISGS to determine the acreage of the planned basins (measured with a digital planimeter). New ISGS topographic base maps resulted in the reduced acreage for Site 2 in 2002. Additionally, more widespread instrumentation of the sites allowed for improved delineation of the wetland areas showing wetland hydrology on the sites.

#### SITE 1

- In 2002, water levels measured in wells 2S, 3S, 10S, 11S and 12S, and at surface-water station stage gauge B and RDS-B conclusively satisfied the wetland hydrology criteria in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. The surface-water levels measured by the RDS-B logger indicated that inundation occurred to an elevation of 240.38 m (788.65 ft) for a duration sufficient to satisfy wetland hydrology criteria.

#### SITE 2

- Water levels measured in wells 6S, 9S, 15S, 16S, 17S, 18S, 19S, 20S and 22S conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Also, water levels measured at surface-water stage gauge C conclusively satisfied the wetland hydrology criteria in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Surface-water levels measured by stage gauge A, and the RDS D data logger indicated that Site 2 was inundated by Richland Creek on two separate occasions during the spring of 2002, although the duration of inundation was 5 days or less which is not sufficient to satisfy wetland hydrology criteria.

Limitations of the wetland hydrology determination are as follows:

- Total acreage of the sites cannot be accurately determined by ISGS because no specified construction limits of the mitigation areas have been provided by IDOT. A base map showing the final construction limits is necessary for determining the full extent of wetland hydrology for both sites.

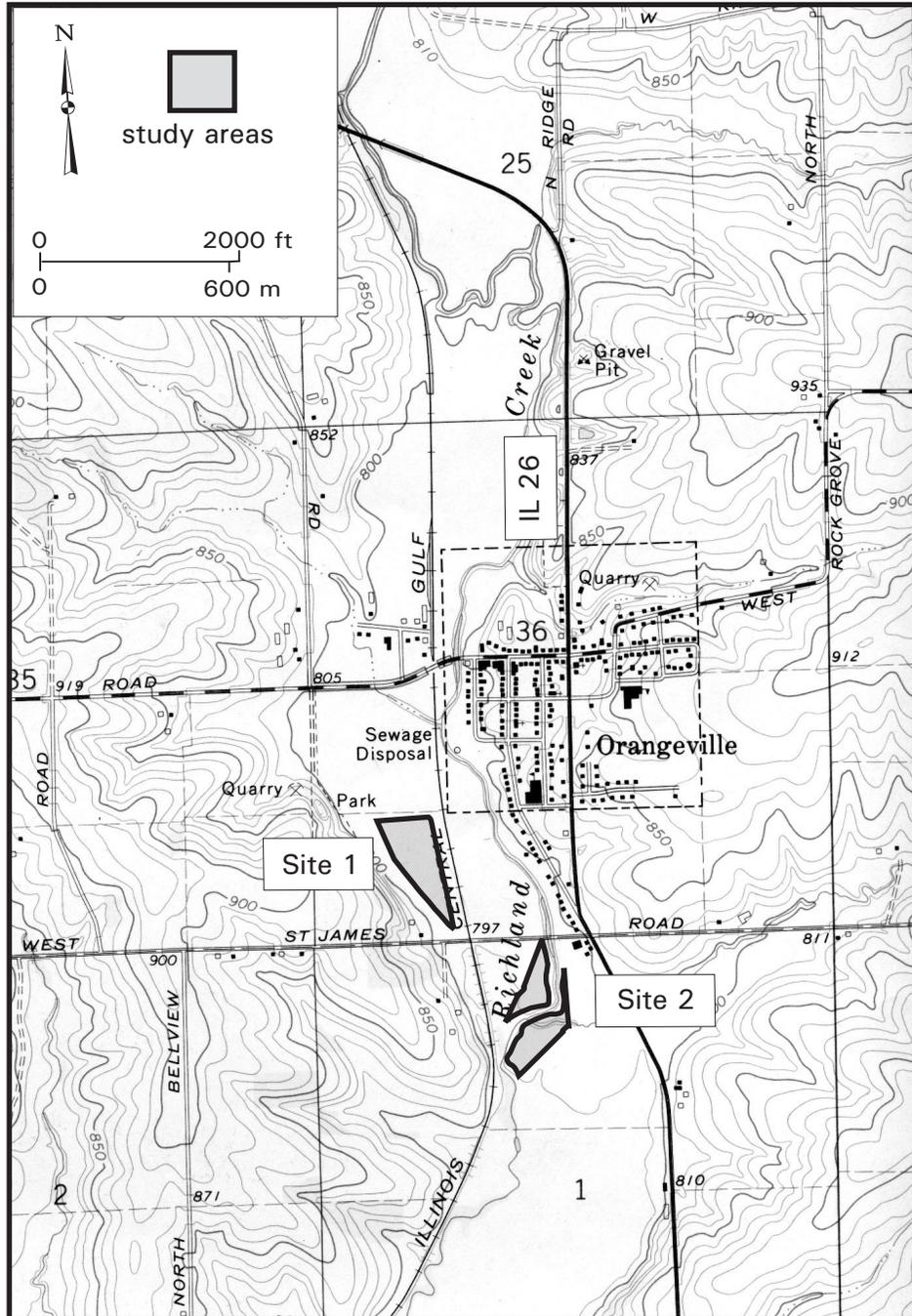
#### PLANNED FUTURE ACTIVITIES

- Additional instrumentation will be necessary to further identify wetland areas in these areas.

# Orangeville Wetland Compensation Site (FAP 316)

## General Study Area and Vicinity

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



# OrangevilleWetland Compensation Site

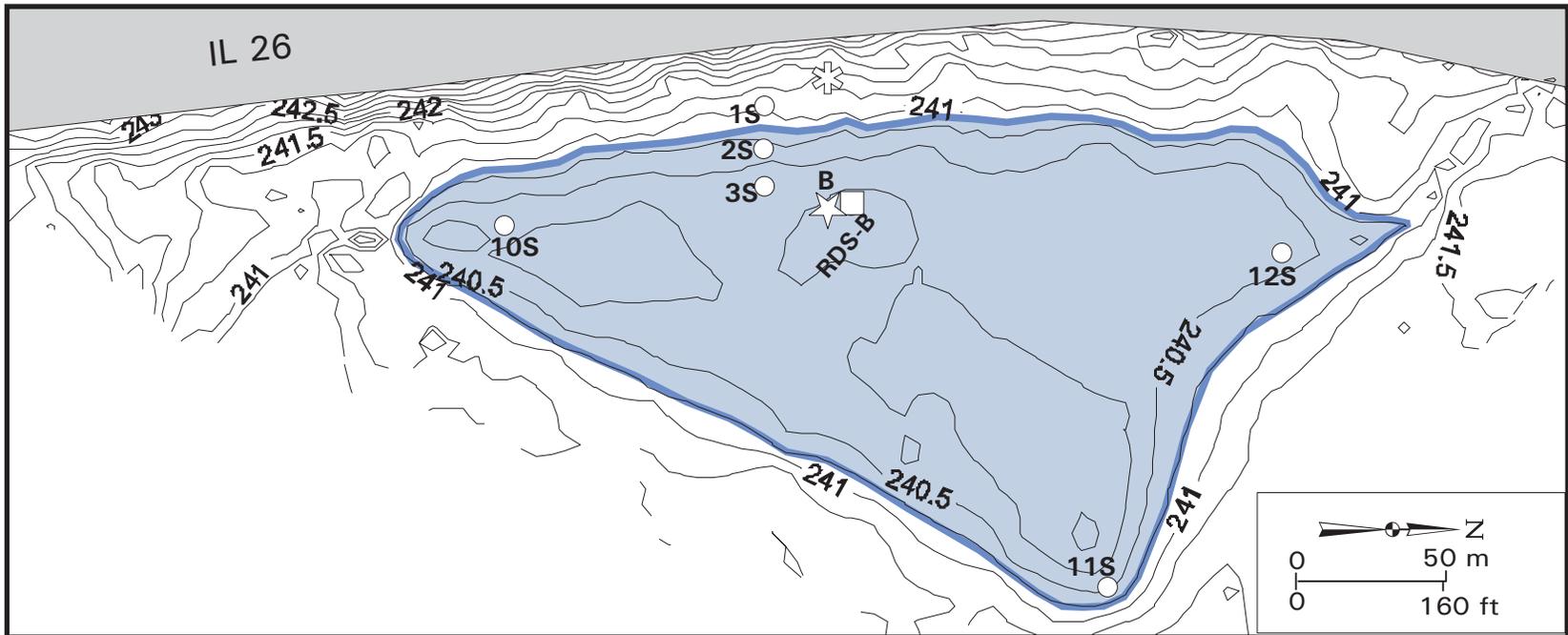
(FAP 316)

## Estimated Areal Extent of 2002 Wetland Hydrology at Site 1

based on data collected between September 1, 2001 and September 1, 2002

map based on 2002 ISGS topographic survey referenced to NGVD, 1929

contour interval is 0.25 meters



○ ISGS monitoring well

✕ Rain gauge

□ RDS level logger

☆ Stage gauge

■ estimated areal extent of 2002 wetland hydrology

— elevation contour  
(interval is 0.25 meters)

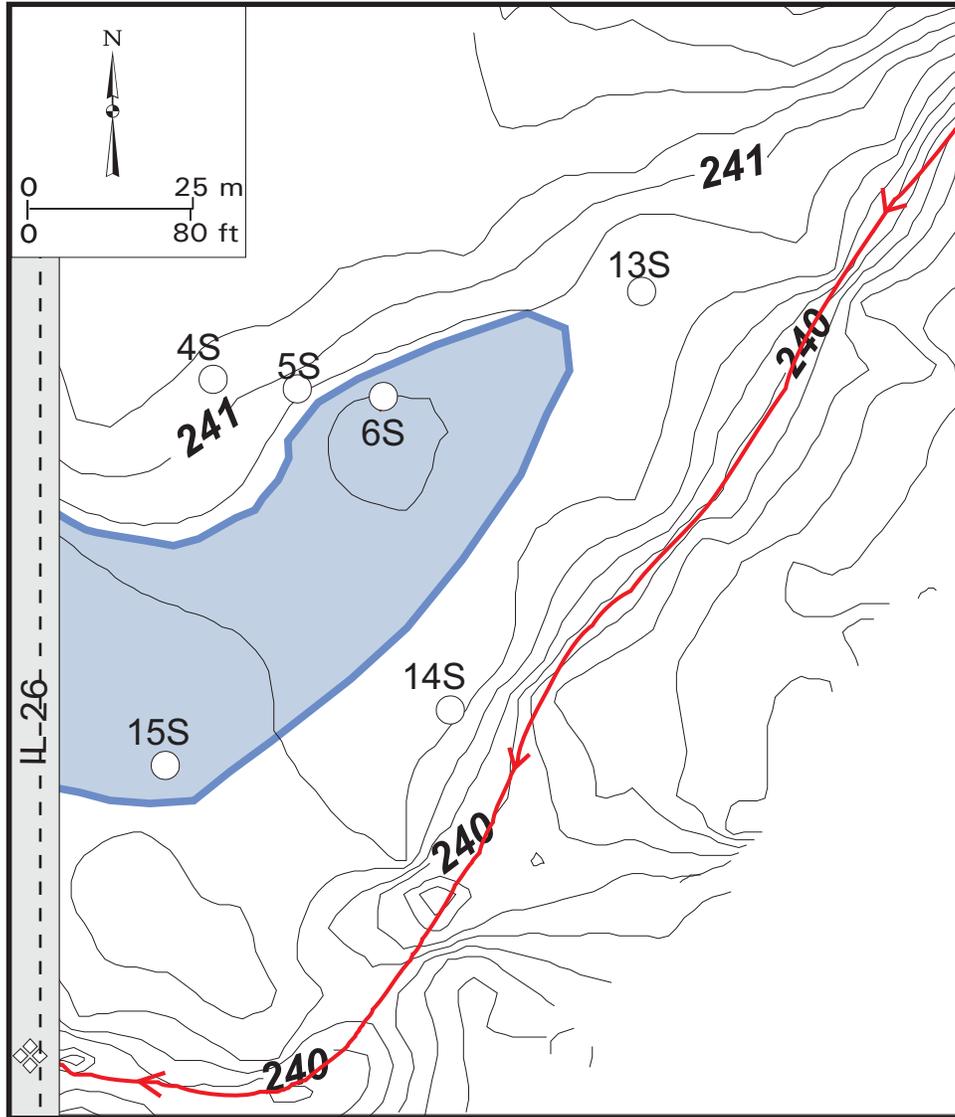
**Orangeville Wetland Compensation Site  
(FAP 316)**

**Estimated Areal Extent of 2002 Wetland Hydrology at the Eastern Half of Site 2**

based on data collected between September 1, 2001 and September 1, 2002

map based on 2002 ISGS topographic survey referenced to NGVD, 1929

contour interval is 0.2 meters



- ISGS monitoring well
- estimated areal extent of 2002 wetland hydrology
- elevation contour (interval is 0.2 meters)
- ↪ Richland Creek

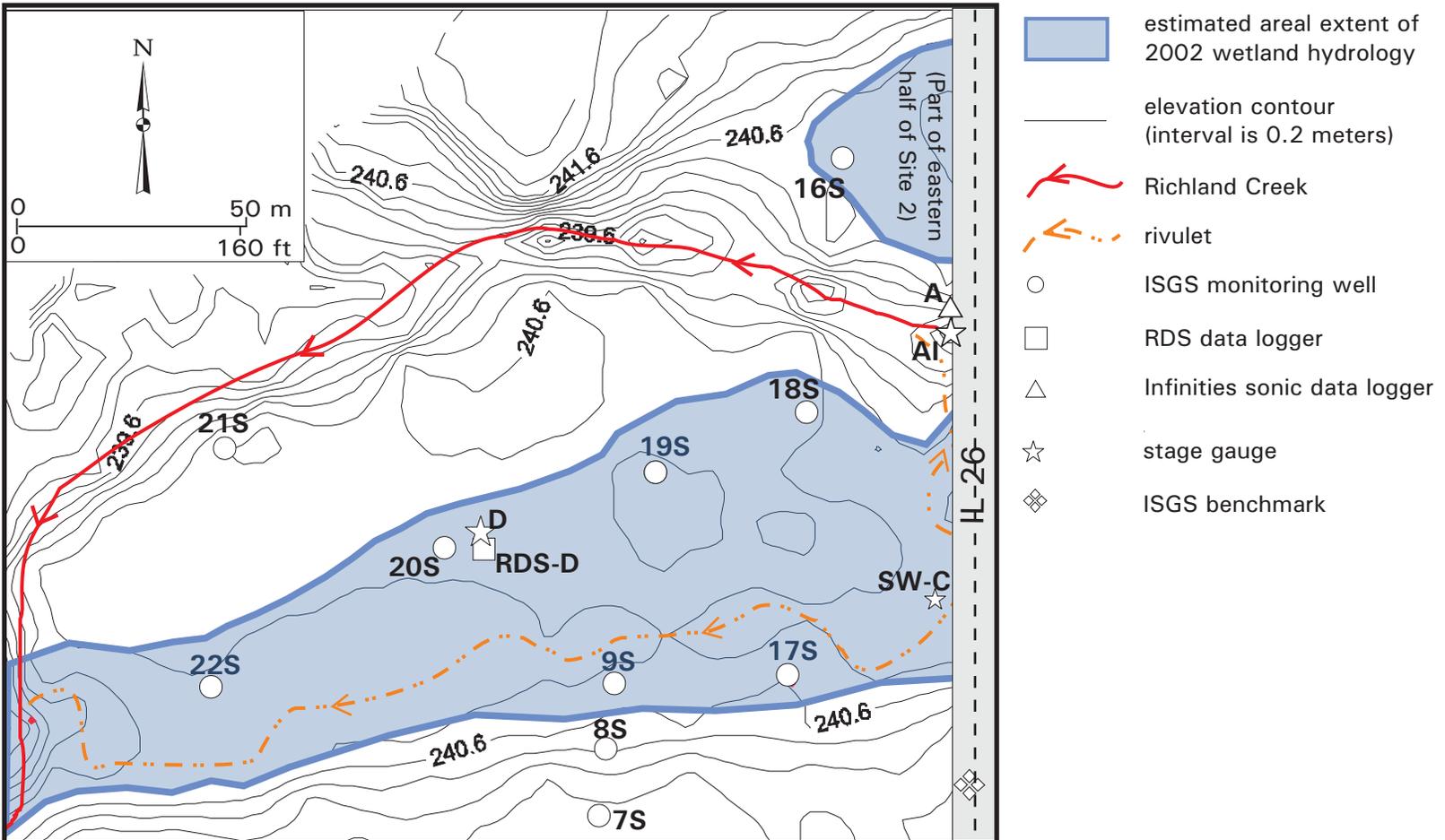
# Orangeville Wetland Compensation Site (FAP 316)

## Estimated Areal Extent of 2002 Wetland Hydrology at the Western Half of Site 2

based on data collected between September 1, 2001 and September 1, 2002

map based on 2002 ISGS topographic survey referenced to NGVD, 1929

contour interval is 0.2 meters



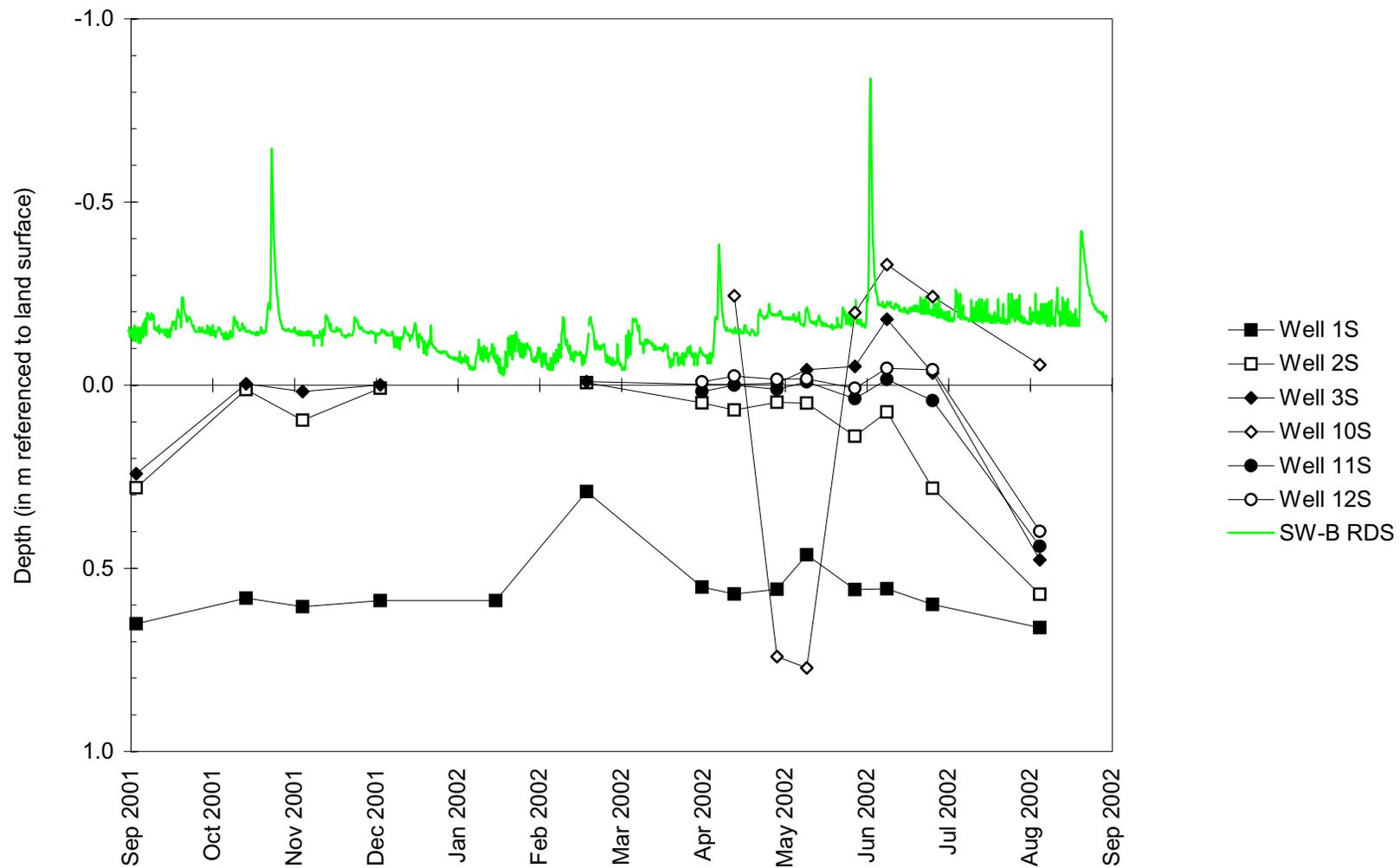
- estimated areal extent of 2002 wetland hydrology
- elevation contour (interval is 0.2 meters)
- Richland Creek
- rivulet
- ISGS monitoring well
- RDS data logger
- Infinities sonic data logger
- stage gauge
- ISGS benchmark



# Orangeville Wetland Compensation Site

September 1, 2001 to September 1, 2002

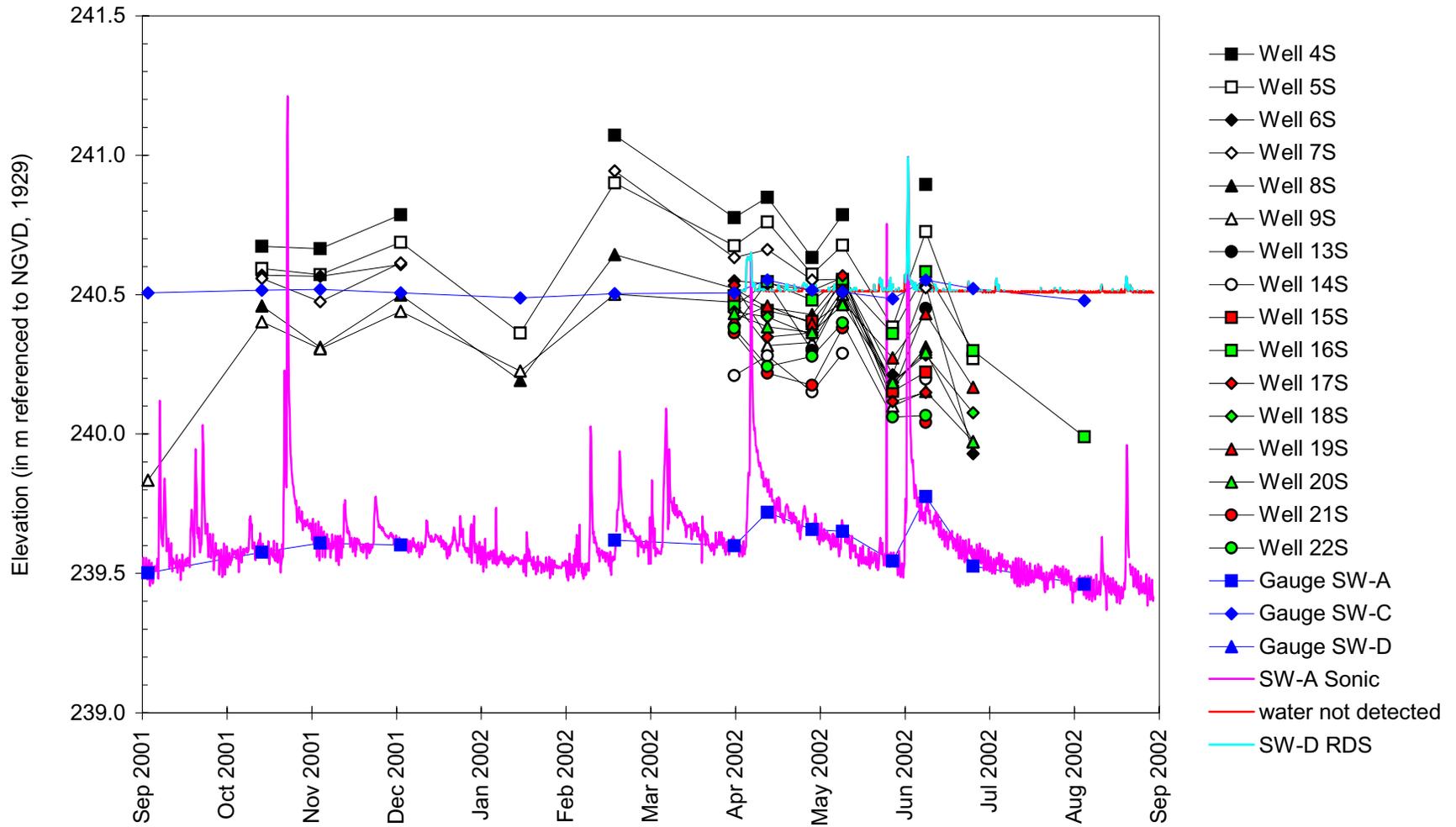
## Depth to Water in the Site 1 Compensation Area



# Orangeville Wetland Compensation Site

September 1, 2001 to September 1, 2002

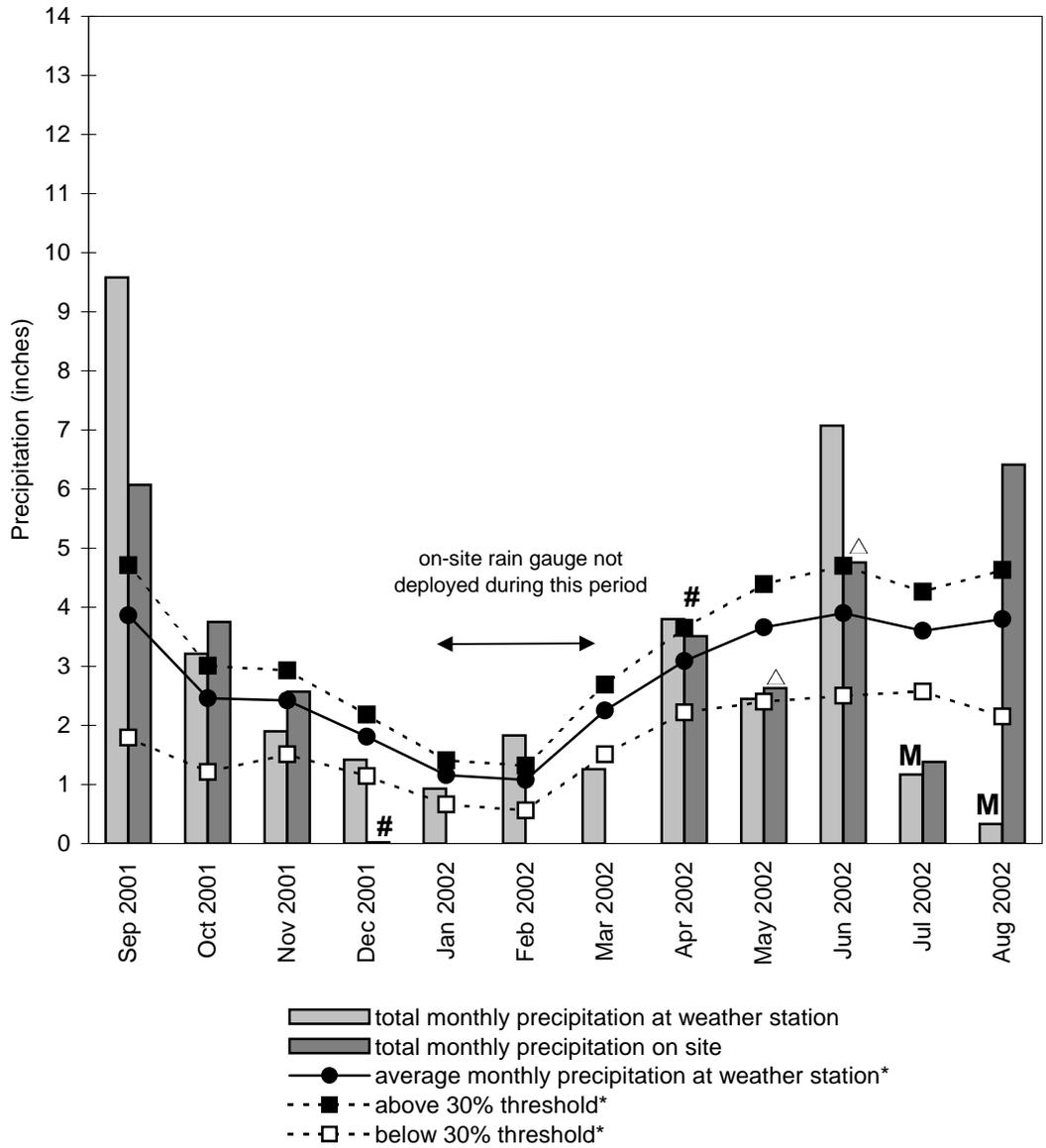
## Water-Level Elevations in the Site 2 Compensation Area





## Orangeville Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Freeport Wastewater Treatment Plant Weather Station, Freeport, IL



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

M missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**MILAN BELTWAY, AIRPORT ROAD  
WETLAND COMPENSATION SITE**

**ISGS #17**

FAU 5822

Rock Island County, near Milan, Illinois

**Primary Project Manager: Keith W. Carr**

**Secondary Project Manager: Steve E. Benton**

**SITE HISTORY**

- July 1996: ISGS submitted an Initial Site Evaluation Report to IDOT.
- February 1997: IDOT issued a task order for a hydrologic characterization of the site.
- August 1997: ISGS data collection was initiated with the installation of monitoring wells and staff gauges.
- August 2000: ISGS sent a letter to IDOT recommending approximate excavation depths required to attain wetland hydrology in the southern third of the site.
- May 2001: At IDOT's request, ISGS reviewed a mitigation plan for the site.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

The area that conclusively satisfied wetland hydrology criteria in 2002 is estimated to be 20.6 ac (8.3 ha). The entire site is roughly 28.4 ac (11.5 ha), leaving approximately 7.8 ac (3.2 ha) that did not conclusively satisfy wetland hydrology in 2002. This is in contrast to 24.0 ac (9.7 ha) which satisfied wetland hydrology criteria in 2001, a year with precipitation which was 104% of normal. This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins at the Quad City International Airport, Moline, Illinois is April 13 and the season lasts 192 days; 12.5% of the growing season is 24 days.
- Total precipitation for the monitoring period from September 2001 to August 2002 was 102% of normal. Total precipitation for the period from September 2001 to March 2002 was slightly below normal, resulting in slightly drier than typical moisture conditions entering the growing season. In the April to August 2002 period, however, precipitation was slightly above normal.
- In 2002, ground-water levels measured at wells RDS 1, 1S, 2S, 3S, 5S, 6S, 7S, and 8S, as well as surface-water levels at gauges A and B conclusively satisfied the wetland hydrology criteria in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Water levels measured at wells RDS 2 and RDS 3 may also have satisfied the wetland hydrology criteria. Water levels measured at wells 4S and 9S, as well as at gauge C did not satisfy the wetland hydrology criteria.
- During the past monitoring year, a digitally rectified DOQ became available and was thereby utilized as a base map in 2002. This allowed compatibility between the GPS locations for the instruments and the site map, yielding a more accurate determination of site acreages than in the past. This change of base map, combined with possible slight

differences in the plotting of the site boundary are together likely responsible for the slight decrease in the total mapped site acreage from 31.6 ac (12.8 ha) in 2001 to 28.4 ac (11.5 ha) in 2002.

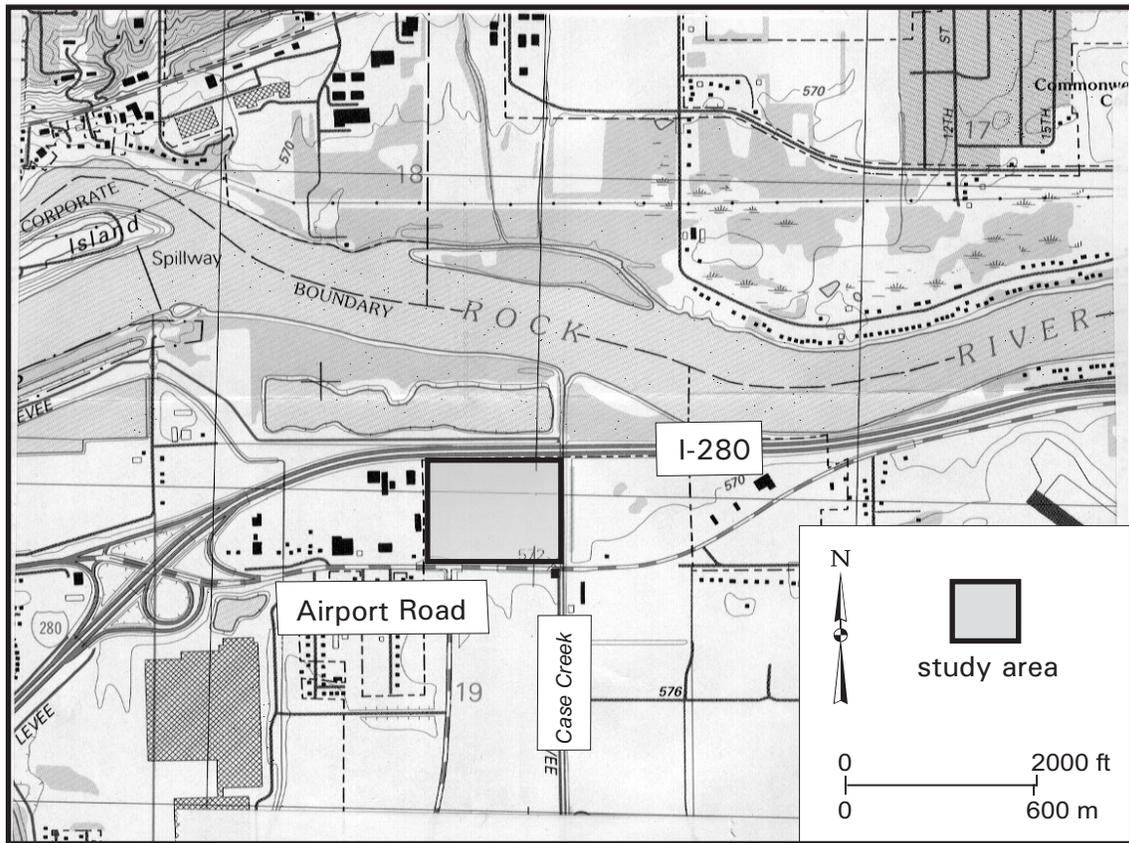
#### PLANNED FUTURE ACTIVITIES

- If previously planned IDOT excavation on the site is undertaken, several wells and data loggers will have to be removed prior to this excavation and re-deployed afterwards.

# Milan Beltway, Airport Road Wetland Compensation Site (FAU 5822)

## General Study Area and Vicinity

from the USGS Topographic Series, Milan IL-IA 7.5-minute Quadrangle (USGS 1992)  
contour interval is 10 feet



# Milan Beltway, Airport Road Wetland Compensation Site (FAU 5822)

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

map based on USGS digital orthophotograph, Milan SW quarter quadrangle  
from 03/30/2000 aerial photography (ISGS 2002)



### LEGEND

- monitoring well
- stage gauge
- △ RDS data logger
- ⊙ Global data logger



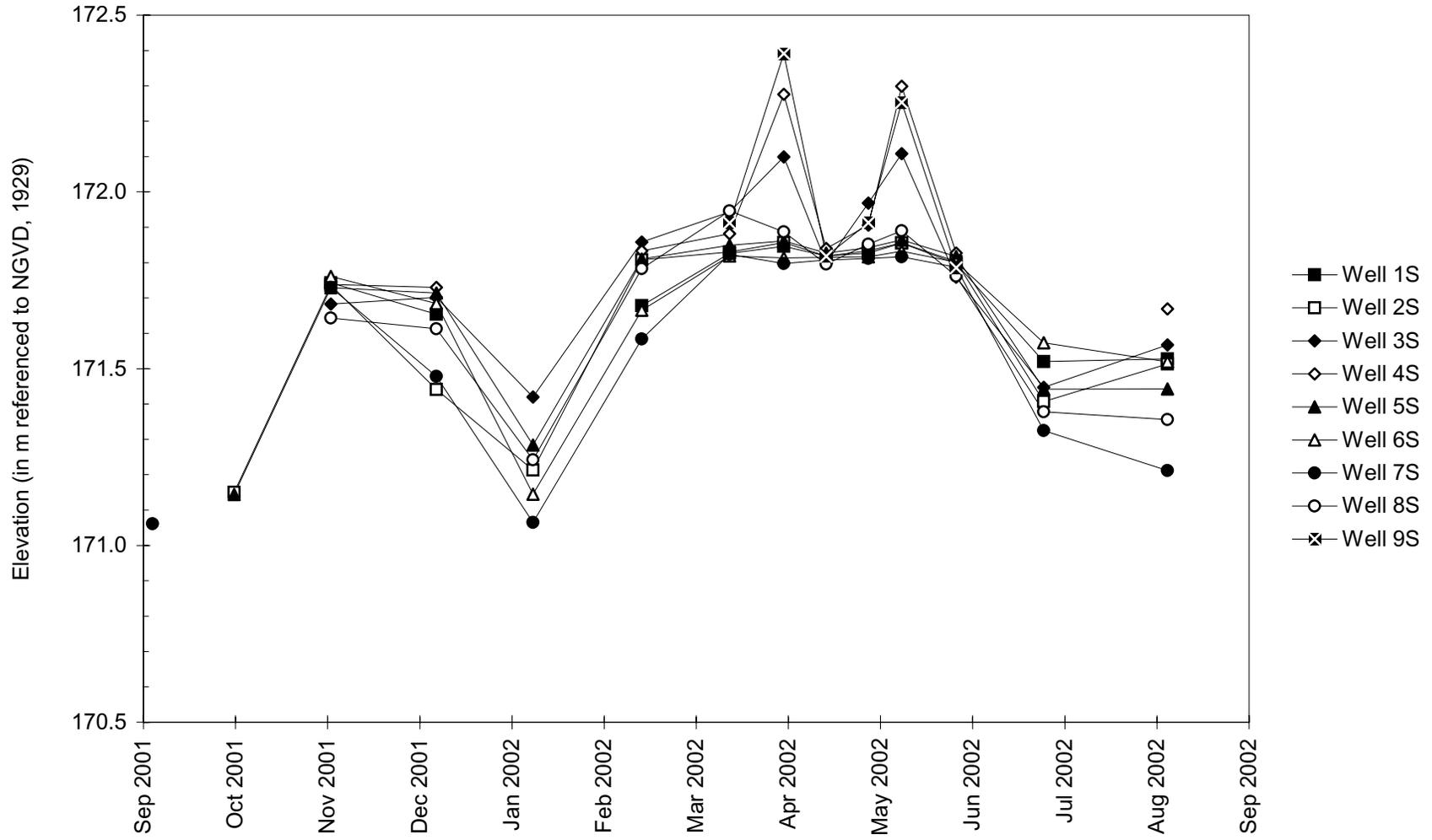
estimated areal extent of  
2002 wetland hydrology



# Milan Beltway, Airport Road Wetland Compensation Site

September 1, 2001 to September 1, 2002

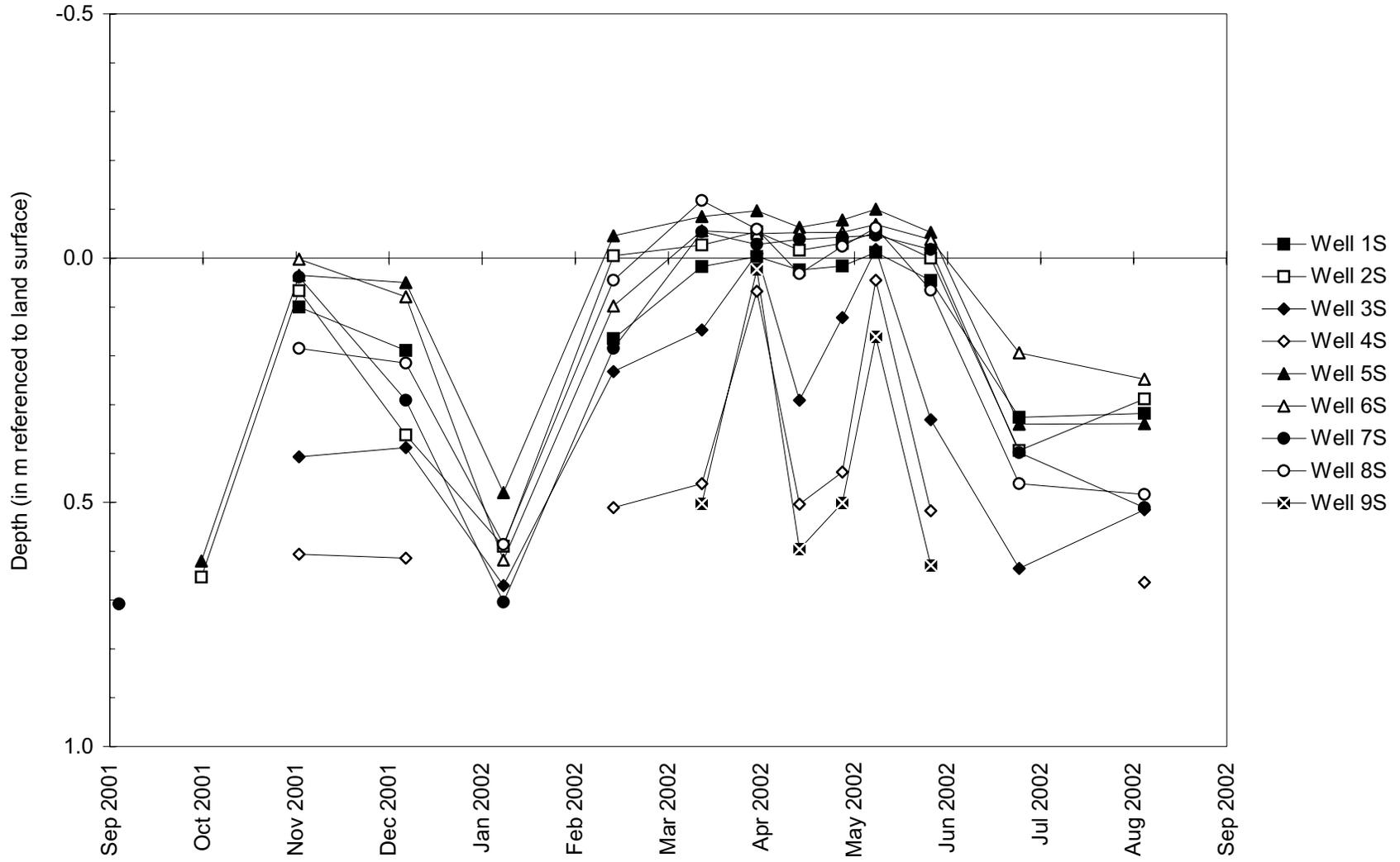
## Water-Level Elevations in Soil-Zone Monitoring Wells



# Milan Beltway, Airport Road Wetland Compensation Site

September 1, 2001 to September 1, 2002

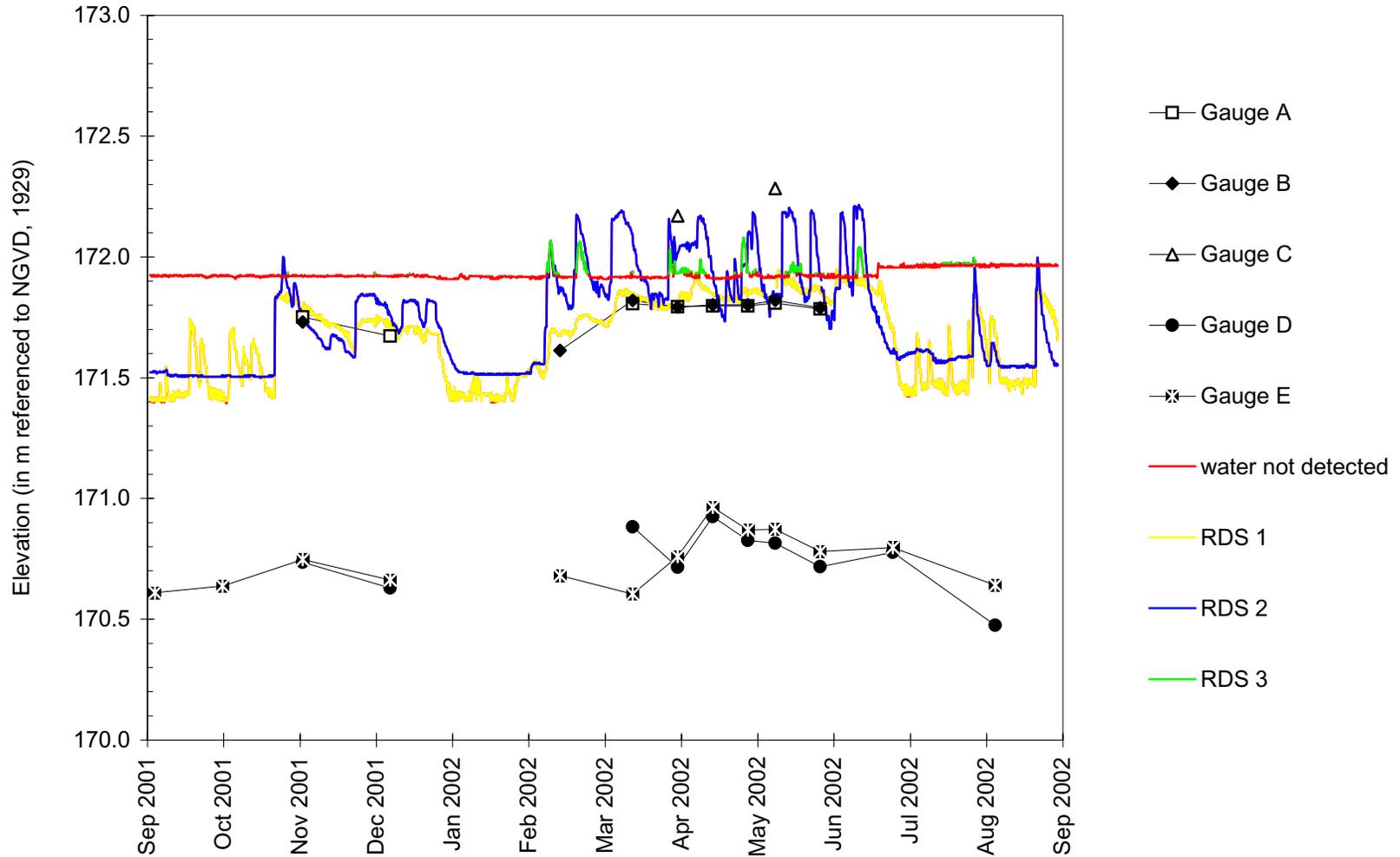
## Depths to Water in Soil-Zone Monitoring Wells



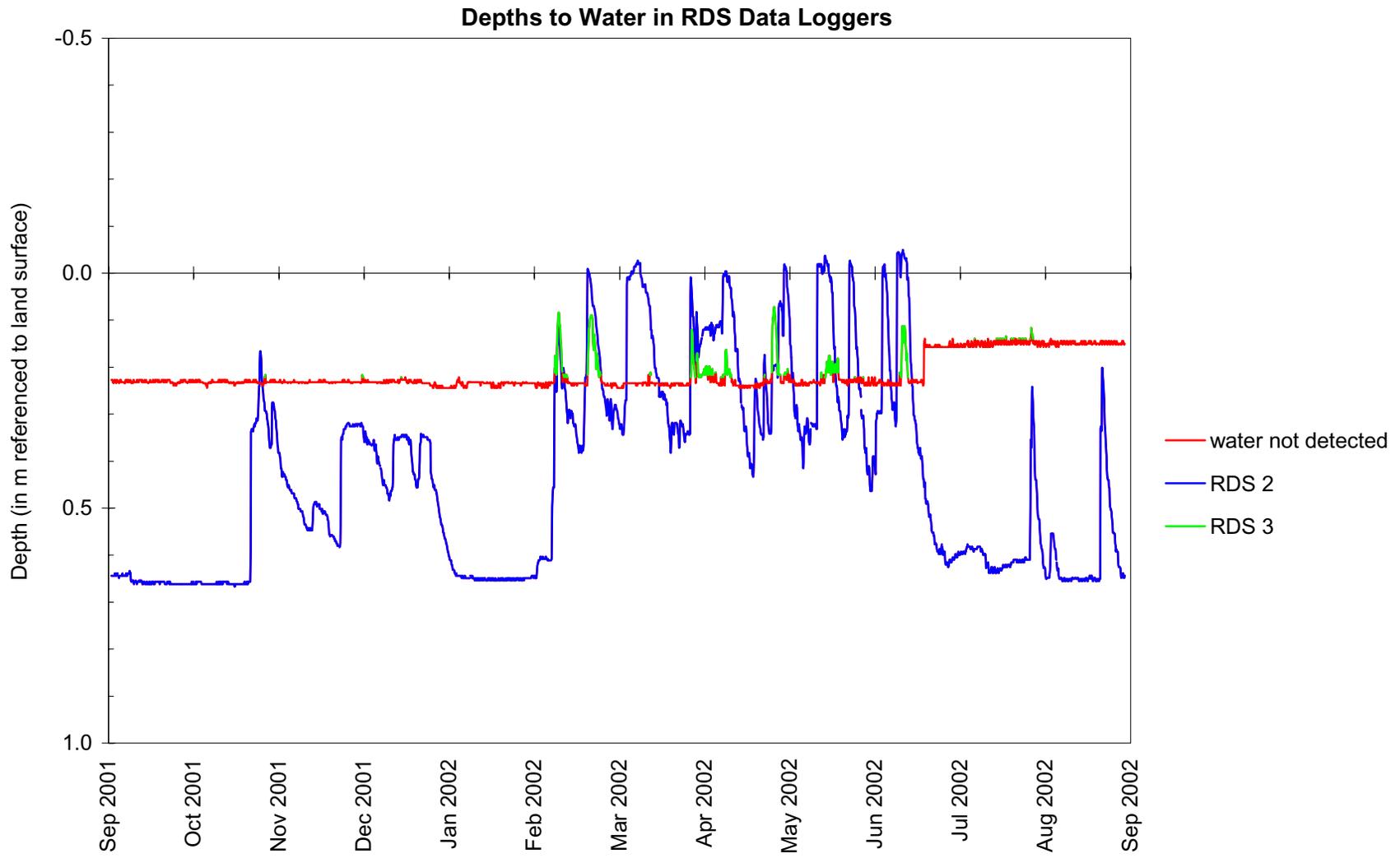
# Milan Beltway, Airport Road Wetland Compensation Site

September 1, 2001 to September 1, 2002

## Water-Level Elevations on Stage Gauges and RDS Data Loggers



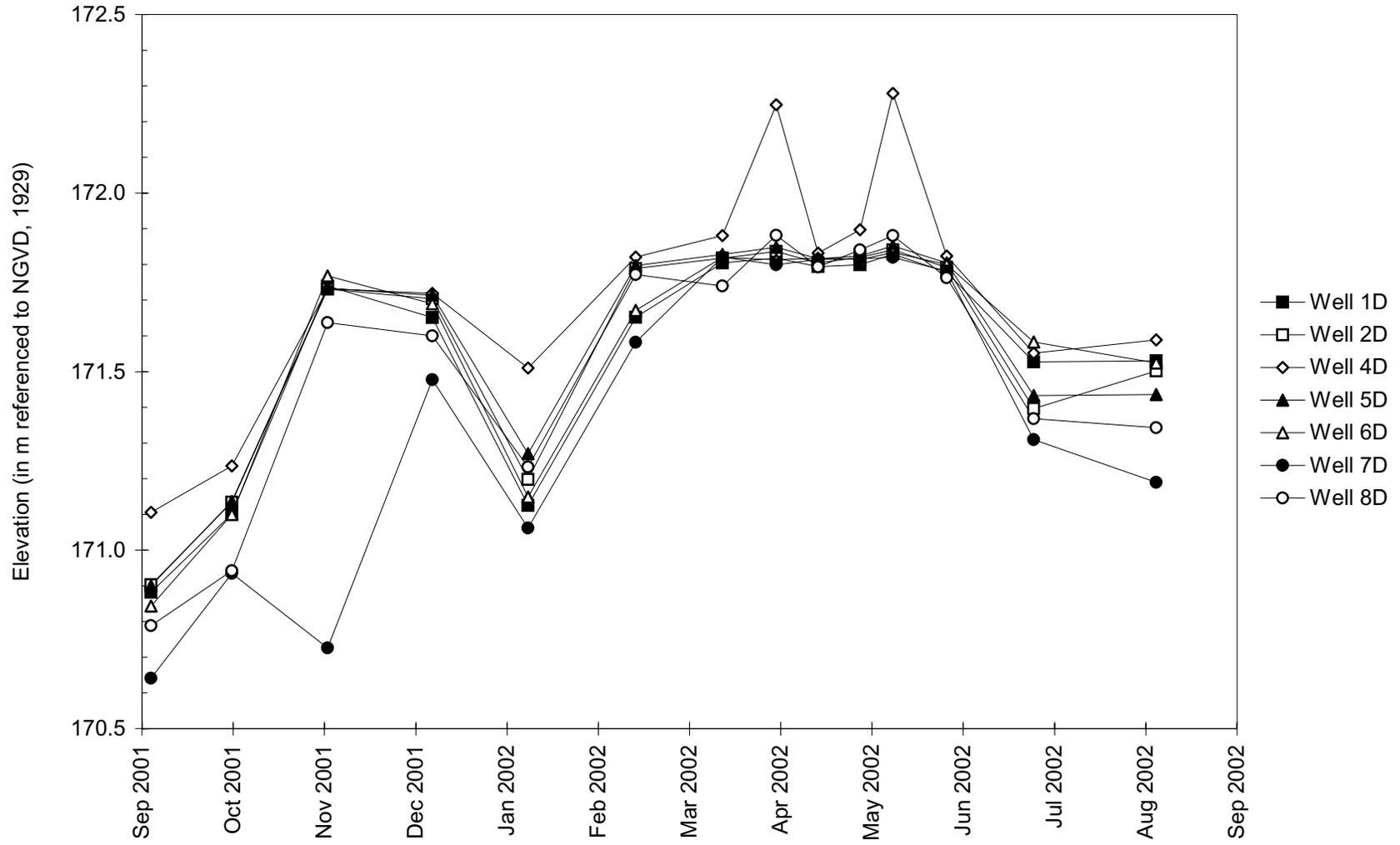
**Milan Beltway, Airport Road Wetland Compensation Site**  
September 1, 2001 to September 1, 2002



# Milan Beltway, Airport Road Wetland Compensation Site

September 1, 2001 to September 1, 2002

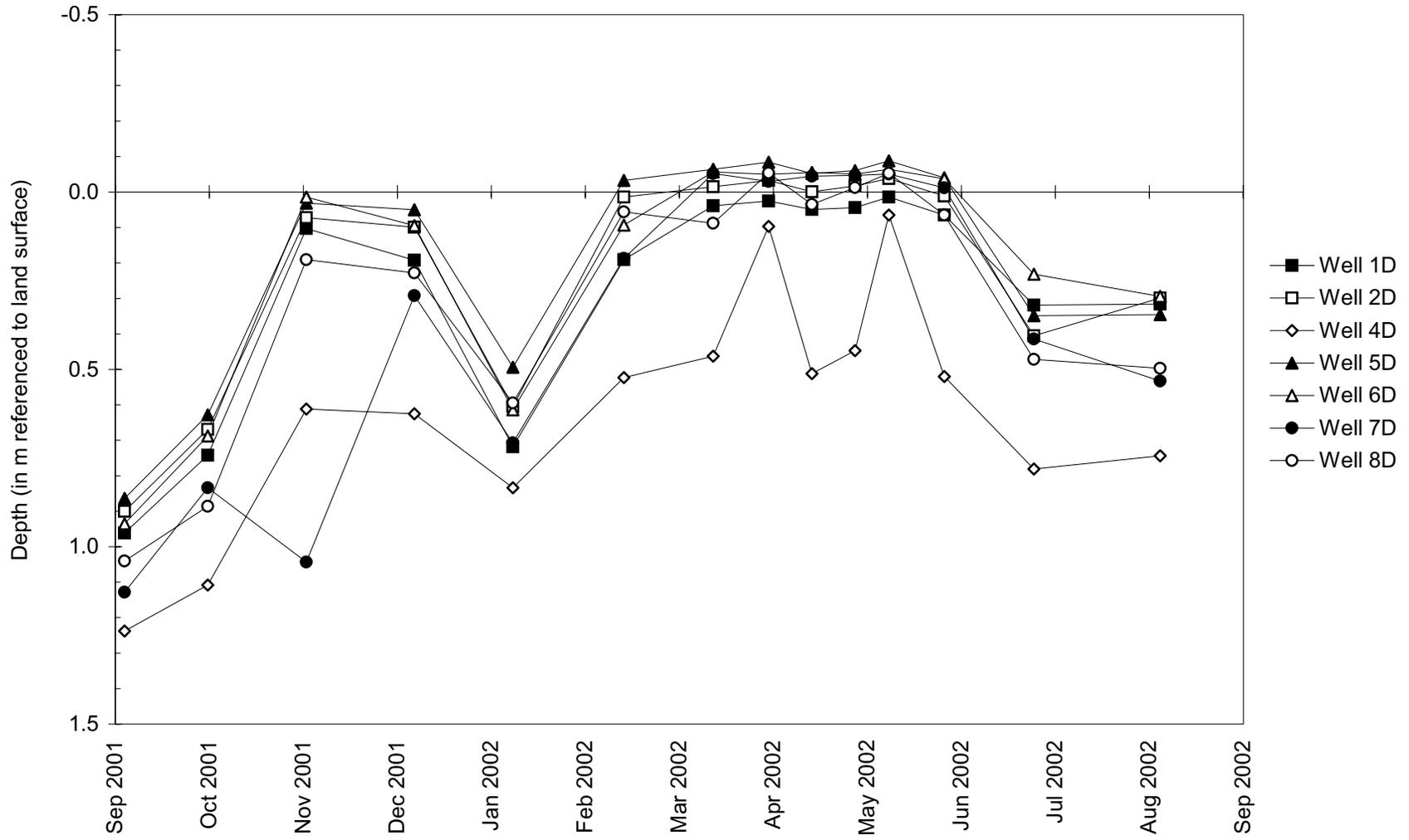
## Water-Level Elevations in Deeper Monitoring Wells



# Milan Beltway, Airport Road Wetland Compensation Site

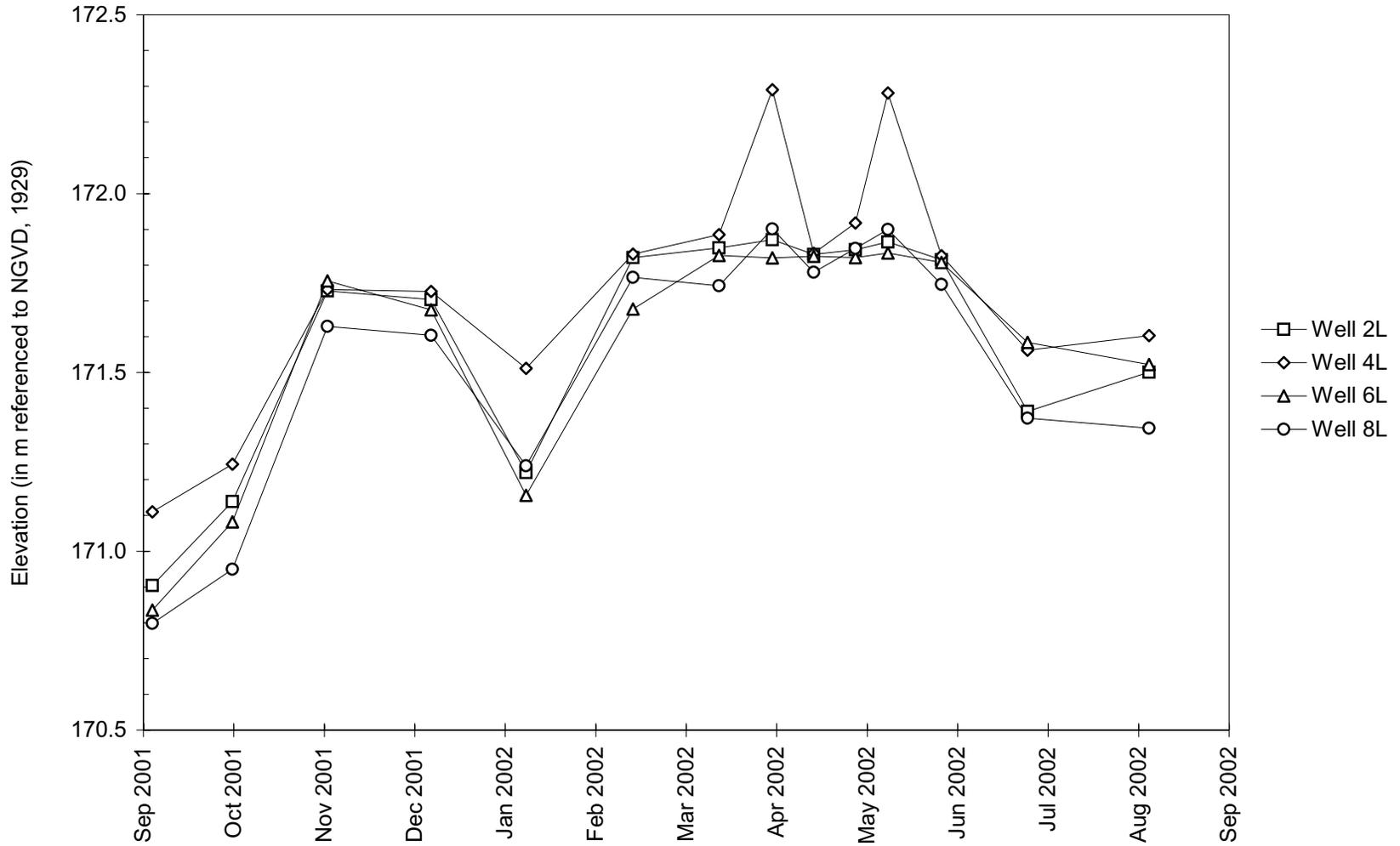
September 1, 2001 to September 1, 2002

## Depths to Water in Deeper Monitoring Wells



**Milan Beltway, Airport Road Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

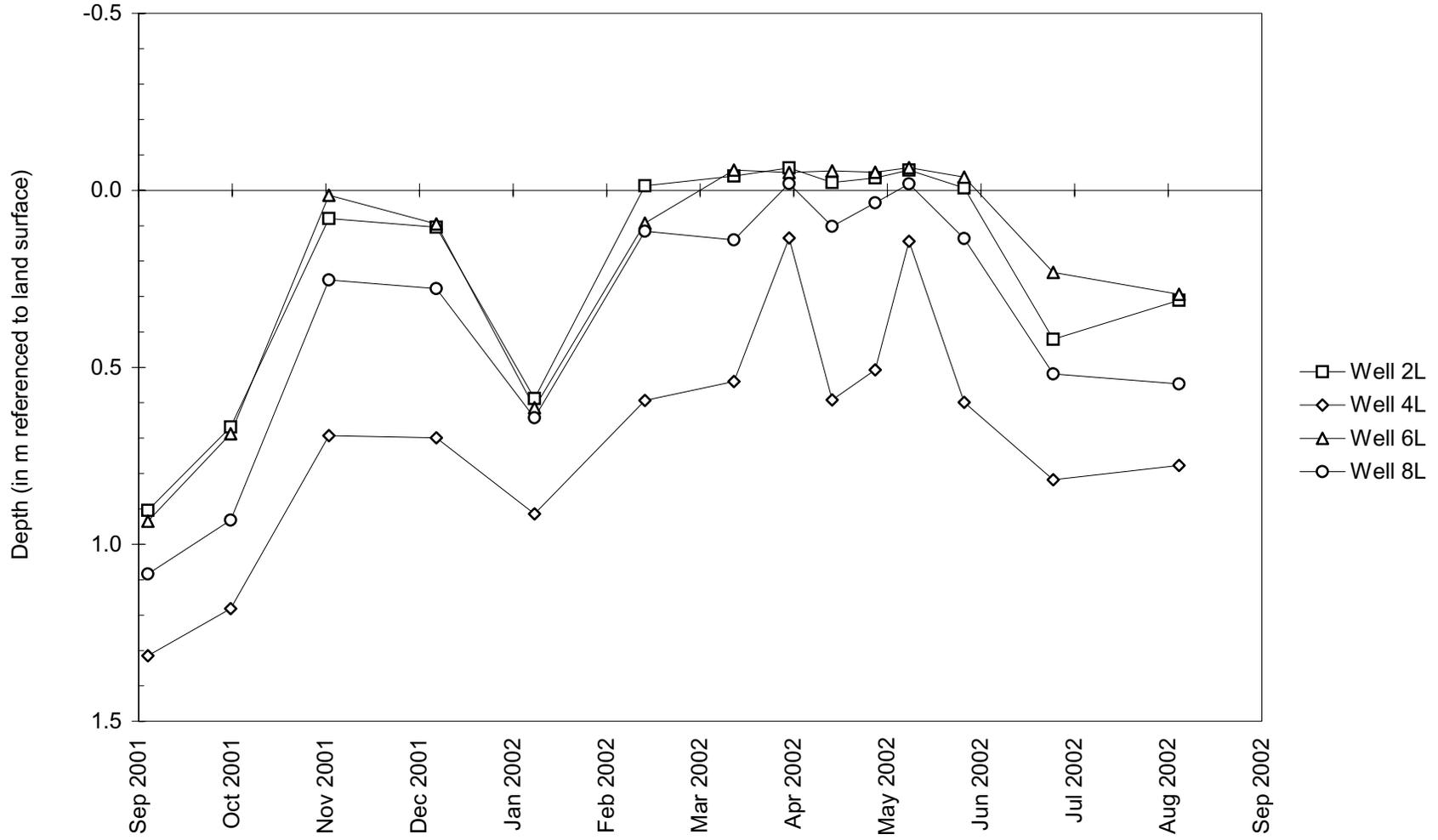
**Water-Level Elevations in Lower Monitoring Wells**



# Milan Beltway, Airport Road Wetland Compensation Site

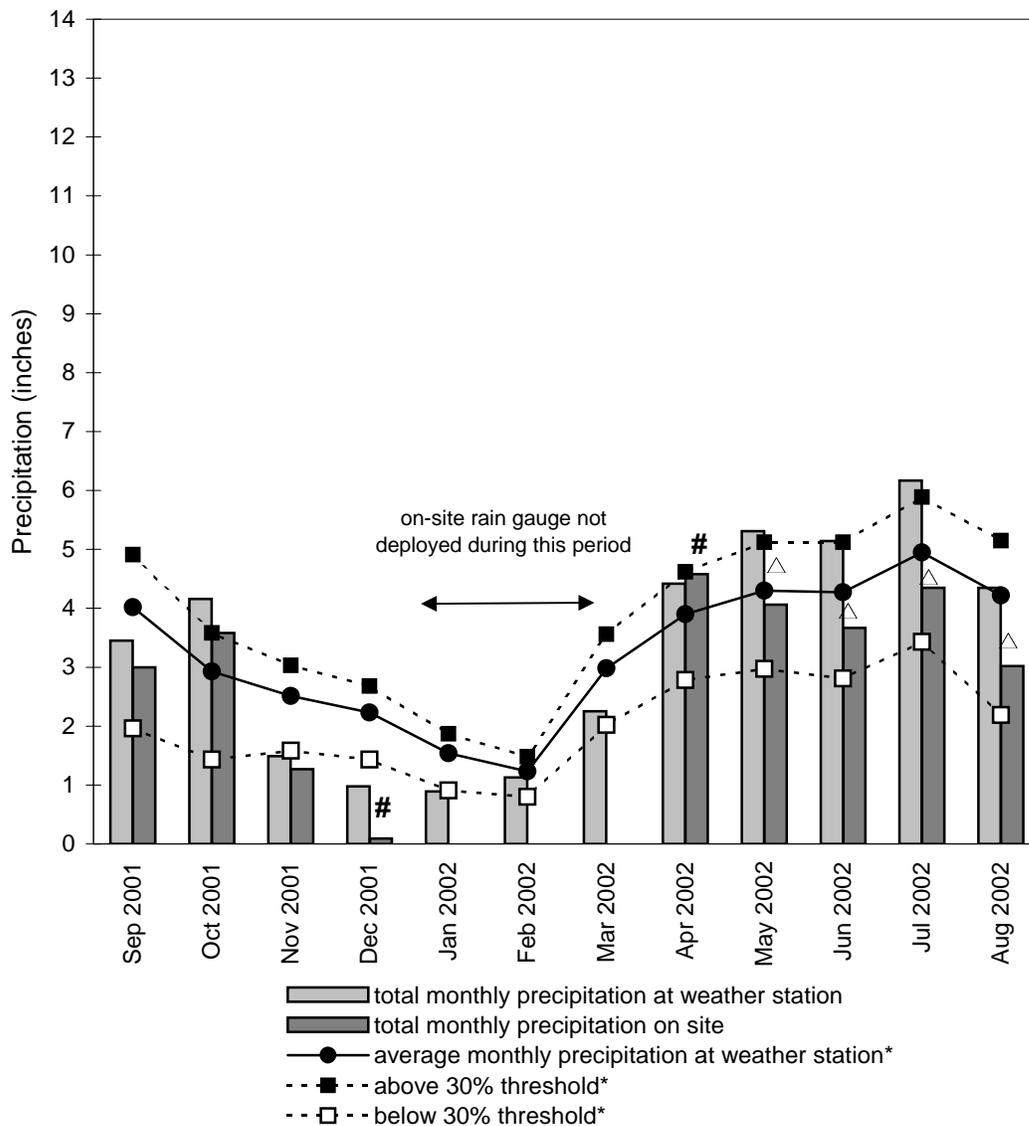
September 1, 2001 to September 1, 2002

## Depths to Water in Lower Monitoring Wells



## Milan Beltway, Airport Road Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Quad City International Airport Weather Station, Moline, IL



# on-site rain gauge not deployed for entire month  
 △ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month  
 \* see text for explanation

Graph last updated October 11, 2002

**SALINE COUNTY  
WETLAND COMPENSATION SITE**

**ISGS #18**

FAP 331

Saline County, near Harrisburg, Illinois

**Primary Project Manager: D. Bradley Ketterling**

**Secondary Project Manager: Bonnie J. Robinson**

**SITE HISTORY**

- May 1994: The ISGS began a hydrogeologic characterization of the site.
- June 1995: An interim hydrogeologic characterization report was submitted to IDOT.
- October 1996: An area of the site was excavated as part of the wetland mitigation. A berm around the new wetland was completed in August 1997.
- March 1998: A draft final characterization report was completed.
- March 1999–April 2000: Fourteen additional soil-zone monitoring wells and one staff gauge were installed. Seven additional soil-zone wells were installed in April 2001.
- September 2001: A "close-out" meeting was held on site with representatives from the U.S. Army Corps of Engineers, IDOT, IDNR, ISGS, INHS, SIUC, and USF&W. The Corps representative indicated that the site would be accepted for mitigation and that a letter indicating such would be drafted.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

In 2002, 20.0 ac (8.1 ha) of the compensation site satisfied the criteria for wetland hydrology, with approximately 2.0 ac (0.8 ha) classified as wetland by the INHS prior to site construction. Only portions of the berm in the southeast corner of the site may not have met the criteria, conservatively estimated at 0.2 ac (0.08 ha). In 2001, 16.4 ac (6.6 ha) met the criteria for wetland hydrology, 2.0 ac (0.8 ha) of which was pre-existing wetland. The figure for 2002 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season at Harrisburg, Illinois is 212 days, starting March 26 and ending October 27. Therefore, 12.5% of the growing season is 26 days.
- Above-normal rainfall in the last three months of 2001 promoted near-surface saturation throughout the winter. Heavy rainfall in March, April and May of 2002 insured the entire site would meet the criteria for wetland hydrology at the beginning of the growing season. In summary, precipitation from September 2001 through July 2002 was 121% of normal. Precipitation during the previous monitoring period was 75% of normal.
- Water levels in all S- and U-wells were observed above or within 30 cm (1 ft) of the surface for more than 12.5% of the growing season, thereby satisfying the wetland hydrology criteria outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.

## PLANNED FUTURE ACTIVITIES

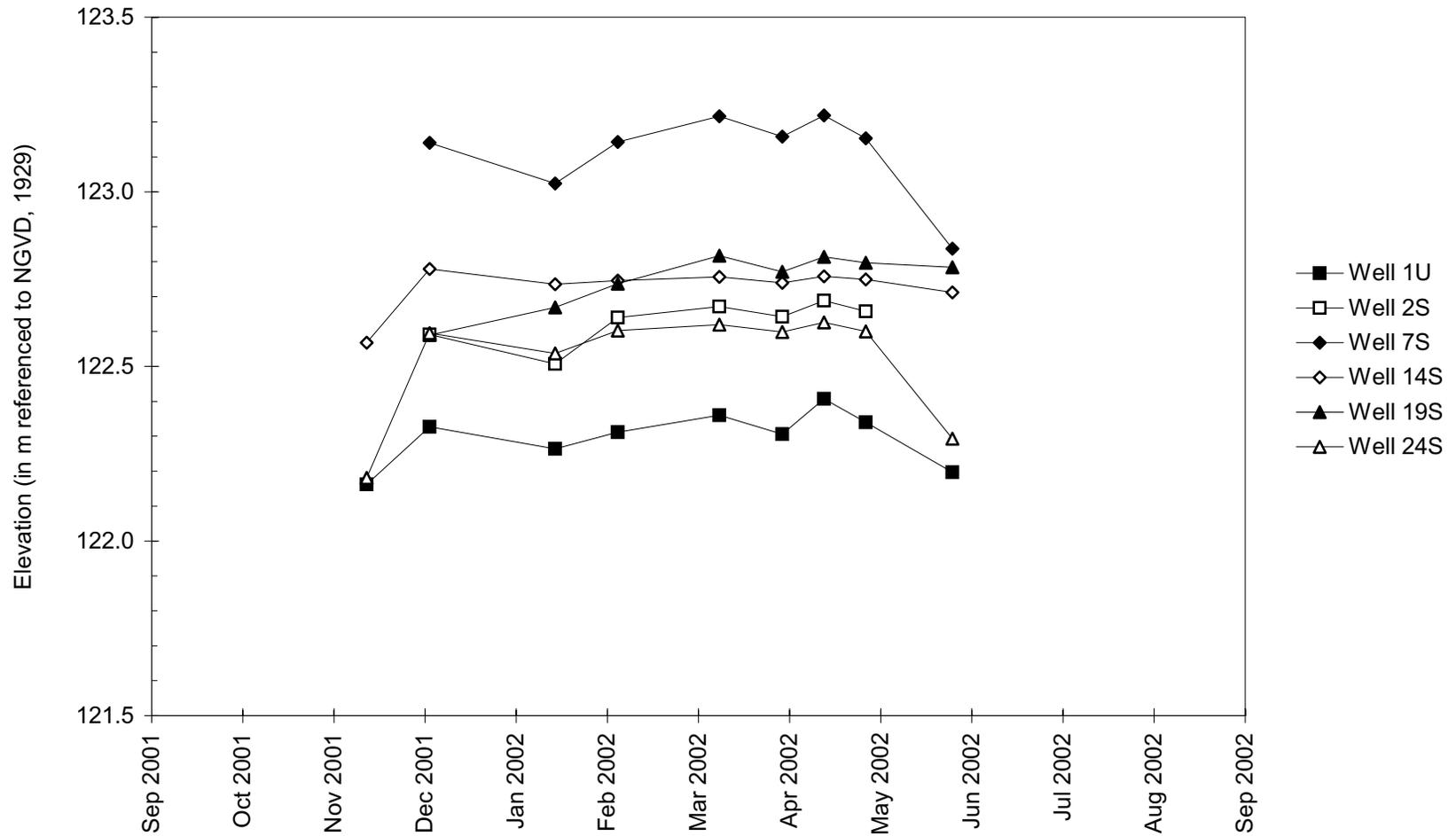
- Monitoring for wetland hydrology will continue at this site through 2002 or until no longer required by IDOT.





# Saline County Wetland Compensation Site September 1, 2001 to September 1, 2002

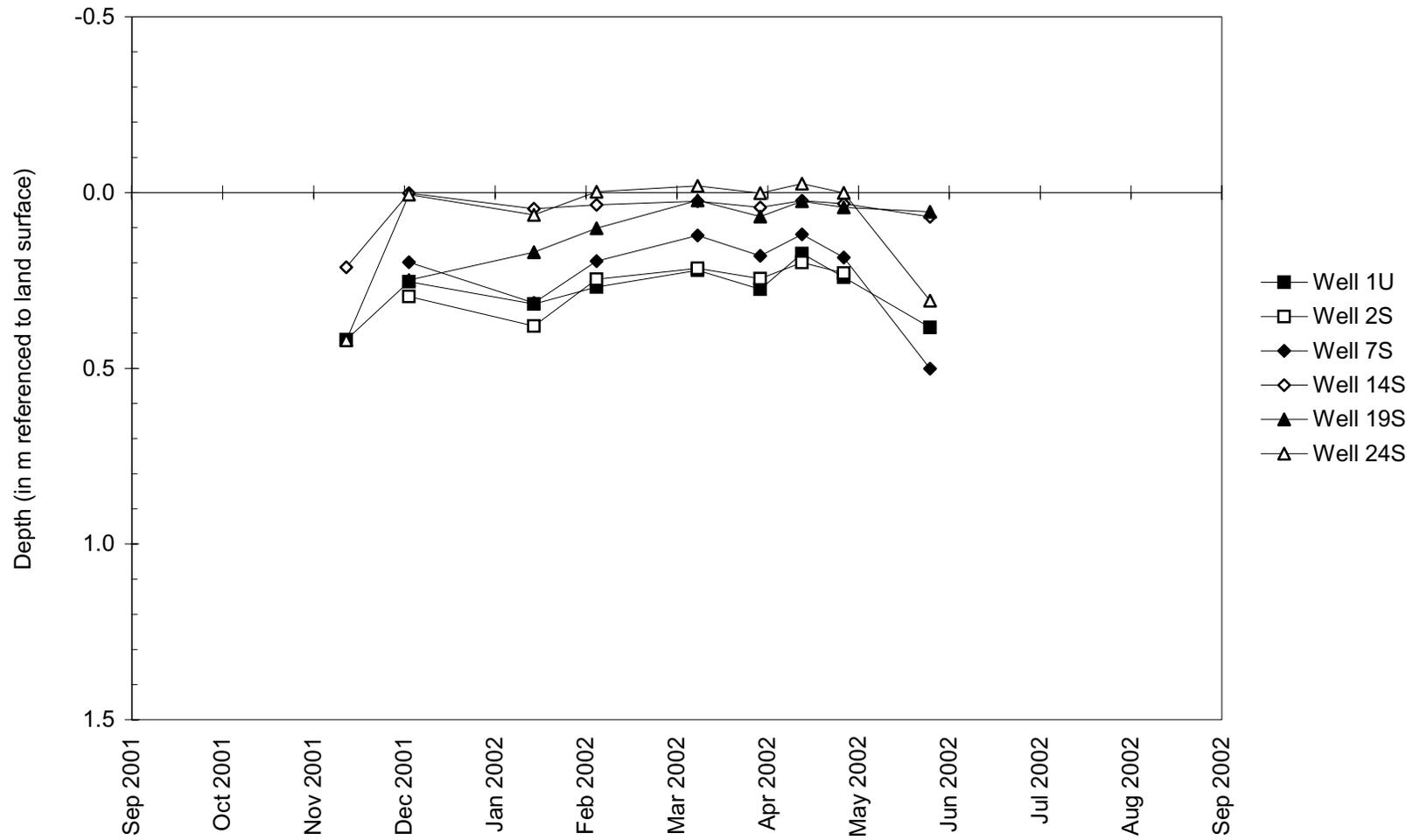
## Water-Level Elevations in Wells used to Determine Areas Satisfying Wetland Hydrology Criteria in the Eastern Portion of the Site



# Saline County Wetland Compensation Site

September 1, 2001 to September 1, 2002

## Depth to Water in Wells used to Determine Areas Satisfying Wetland Hydrology Criteria in the Eastern Portion of the Site

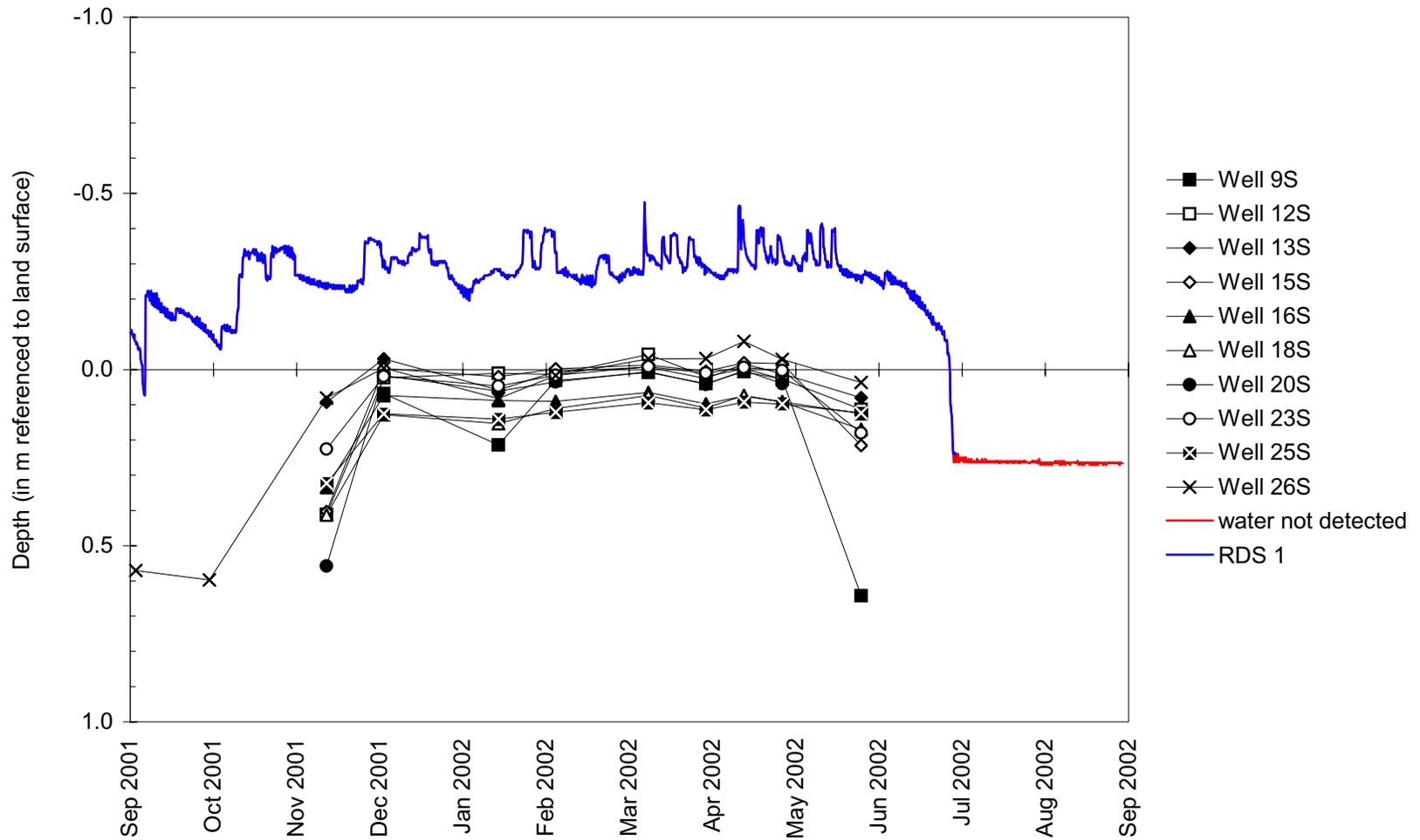




# Saline County Wetland Compensation Site

September 1, 2001 to September 1, 2002

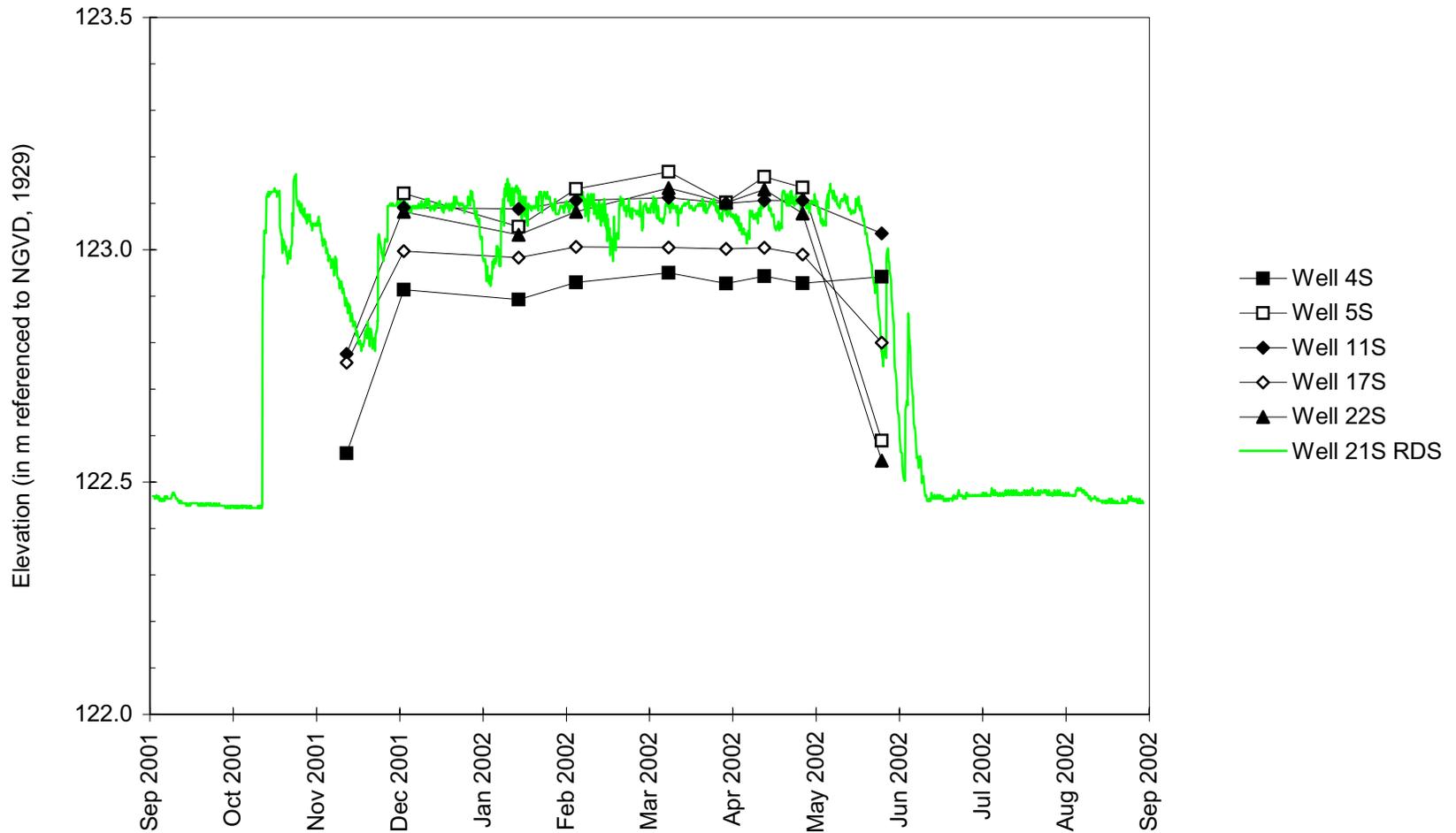
## Depth to Water in Wells used to Determine Areas Satisfying Wetland Hydrology Criteria in the Central Portion of the Site



# Saline County Wetland Compensation Site

September 1, 2001 to September 1, 2002

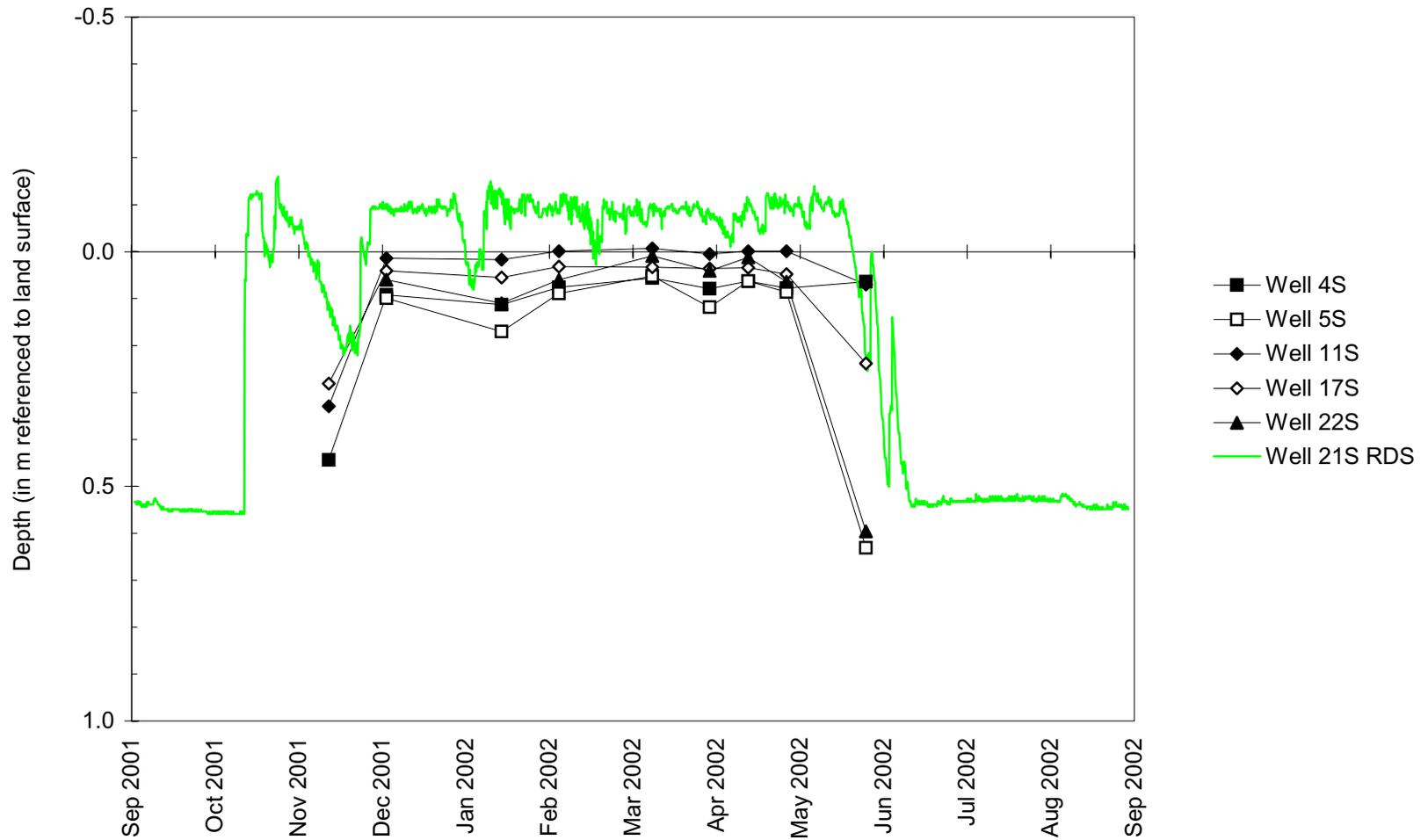
## Water-Level Elevations in Wells used to Determine Areas Satisfying Wetland Hydrology Criteria in the Western Portion of the Site



# Saline County Wetland Compensation Site

September 1, 2001 to September 1, 2002

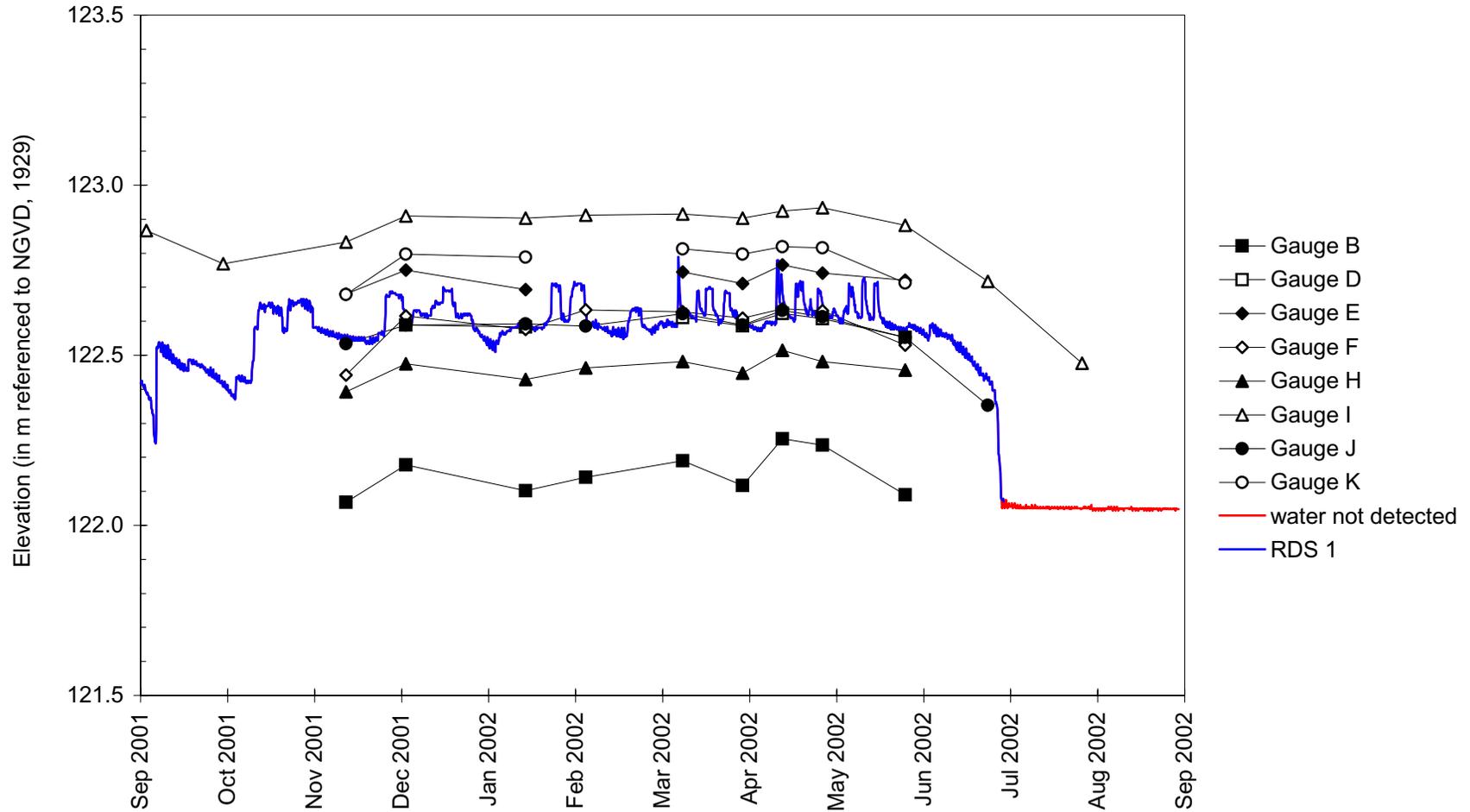
## Depth to Water in Wells used to Determine Areas Satisfying Wetland Hydrology Criteria in the Western Portion of the Site



# Saline County Wetland Compensation Site

September 1, 2001 to September 1, 2002

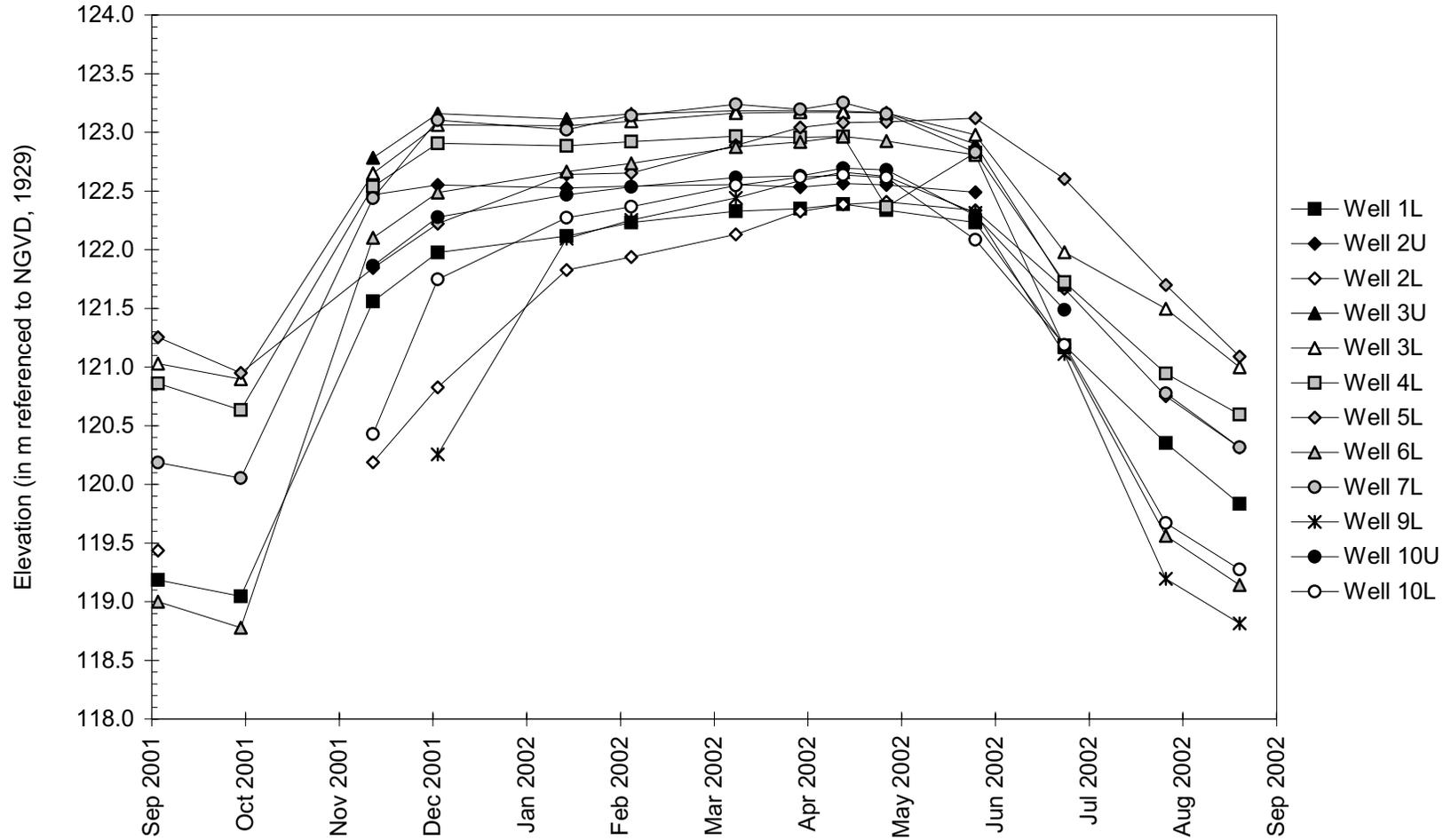
## Water-Level Elevations on Stage Gauges



# Saline County Wetland Compensation Site

## September 1, 2001 to September 1, 2002

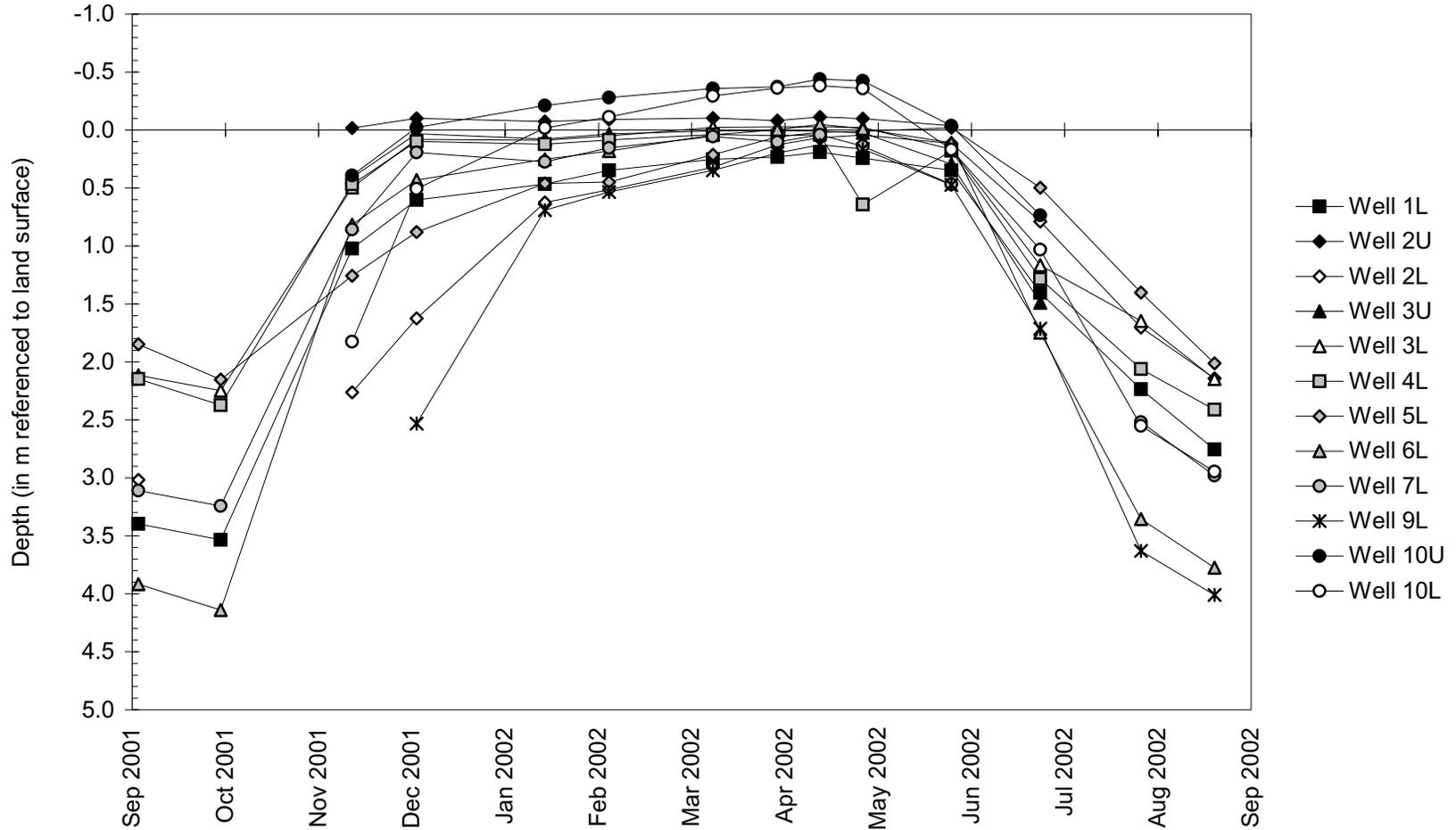
### Water-Level Elevations in Upper and Lower Monitoring Wells



# Saline County Wetland Compensation Site

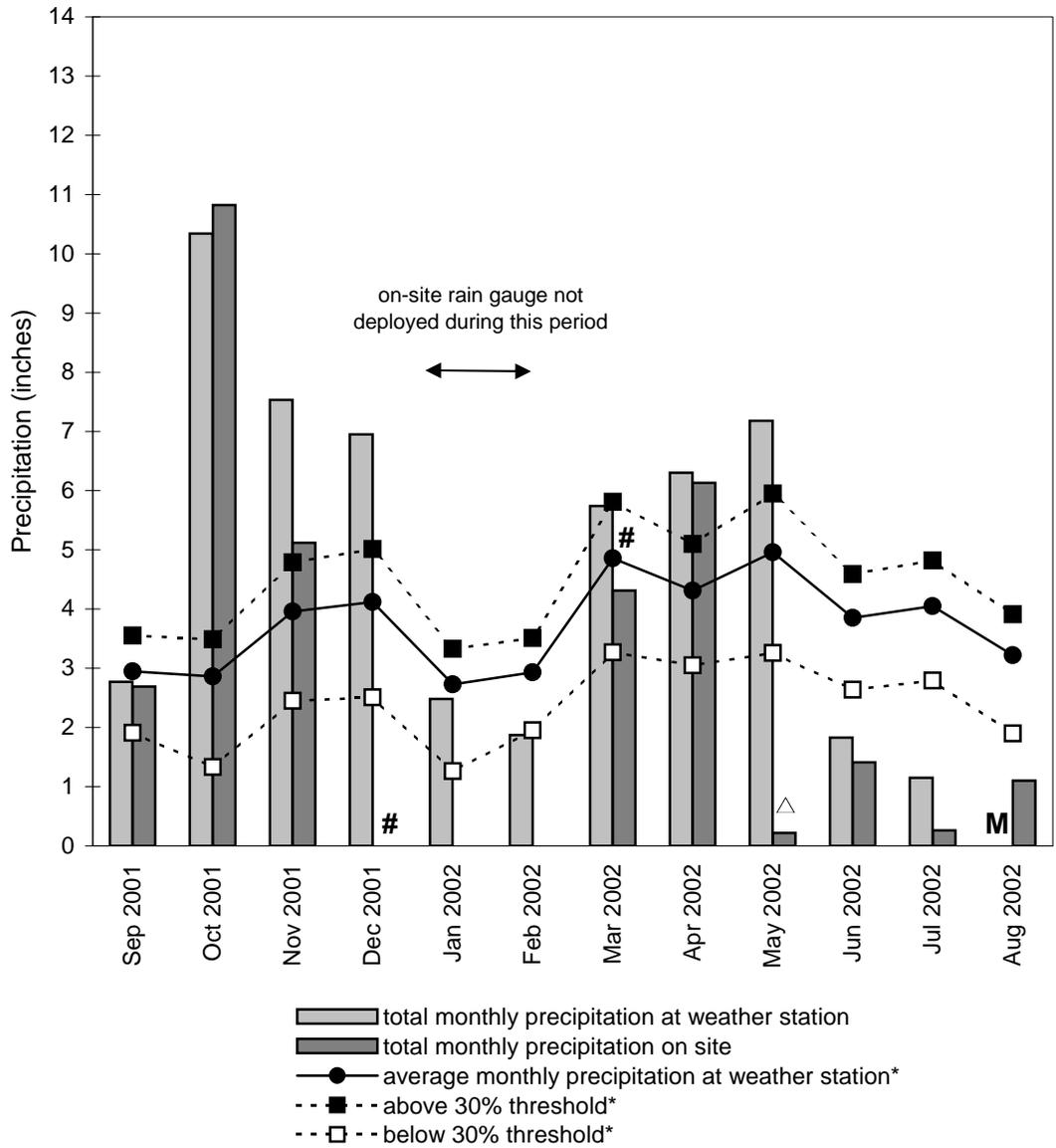
## September 1, 2001 to September 1, 2002

### Depth to Water in Upper and Lower Monitoring Wells



## Saline County Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Harrisburg, IL Weather Station



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

**M** missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

## **JOSLIN**

**ISGS #23**

### **WETLAND COMPENSATION SITE**

FAP 585

Henry County, near Joslin, Illinois

**Primary Project Manager: Kelli D. Weaver**

**Secondary Project Manager: Keith W. Carr**

### **SITE HISTORY**

- January 1995: An initial ISGS topographic survey and hydrologic analysis was sent to IDOT.
- Summer 1998: ISGS installed 18 soil-zone monitoring wells.
- April 2001: ISGS installed an RDS data logger and a stage gauge to monitor surface-water. This station monitors a backwater slough that communicates with the Rock River and that parallels the eastern site margin.

### **WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 0.00 ac (0.00 ha). The site, as defined by a boundary line drawn on an IDOT tree-planting plan, is roughly 14.2 ac (5.75 ha) in size. In 2001, 0.15 ac (0.06 ha) satisfied wetland hydrology criteria. This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Geneseo, Illinois is April 10 and the season lasts 201 days; 12.5% of the growing season is 25 days.
- Total precipitation for the monitoring period from September 2001 to August 2002 was 101% of normal. Precipitation was near normal for the months of February, and August, and above normal October 2001, and April through July 2002. Precipitation was below normal for the months of September, November and December 2001, and January, and March 2002.
- The primary source of water for this site is floodwater from the adjacent Rock River. During the 2002 monitoring period, the site experienced flooding with a duration of roughly 12 days over the average site elevation. Also, the flood peaked at 3.3 m (10.9 ft) over average site elevation.
- In 2002, water levels measured in none of the wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Surface-water levels measured by the RDS data logger on site indicate that roughly half of the site may have met wetland hydrology criteria.
- Roughly 14 days after the floodwater receded from the site, 14 of the 18 soil-zone wells were dry and the water levels in the remaining four were below the threshold elevation for wetland hydrology.

Limitations of the wetland hydrology determination are as follows:

- The map used to determine the acreage of wetland hydrology is an IDOT mitigation site plan for tree plantings on the site. The map is contoured, but the level of accuracy of the elevations and site boundary line are unknown.
- Positions of instruments determined via GPS were plotted at the same approximate scale as the base map and were overlain based on best-fit visual reference to identifiable points on the topographic map.

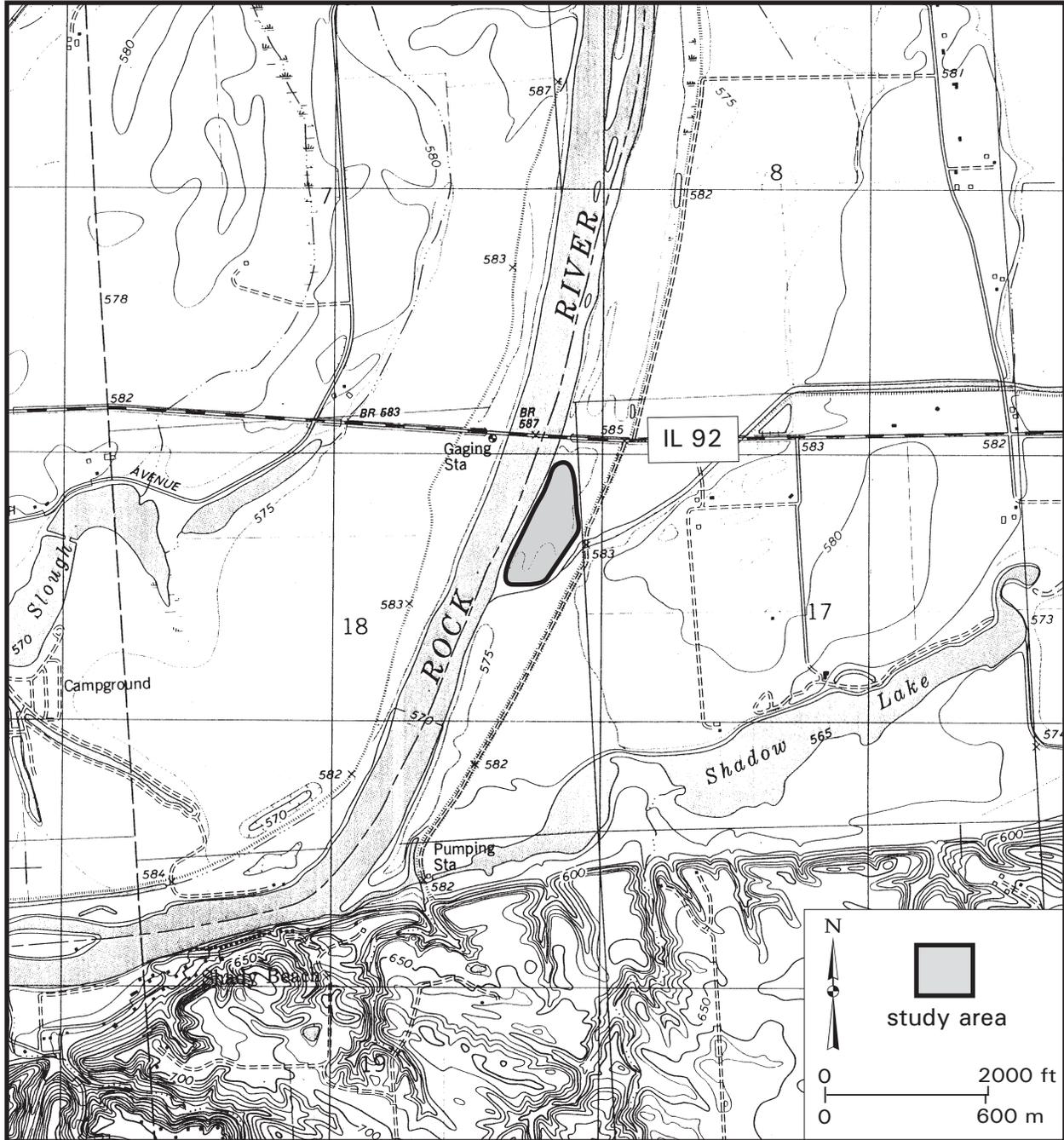
#### PLANNED FUTURE ACTIVITIES

- Monitoring is expected to continue through 2003 or until no longer required by IDOT.

# Joslin Wetland Compensation Site (FAP 585)

## General Study Area and Vicinity

from the USGS Topographic Series, Hillsdale, IL 7.5-minute Quadrangle (USGS 1982)  
contour interval is 10 feet

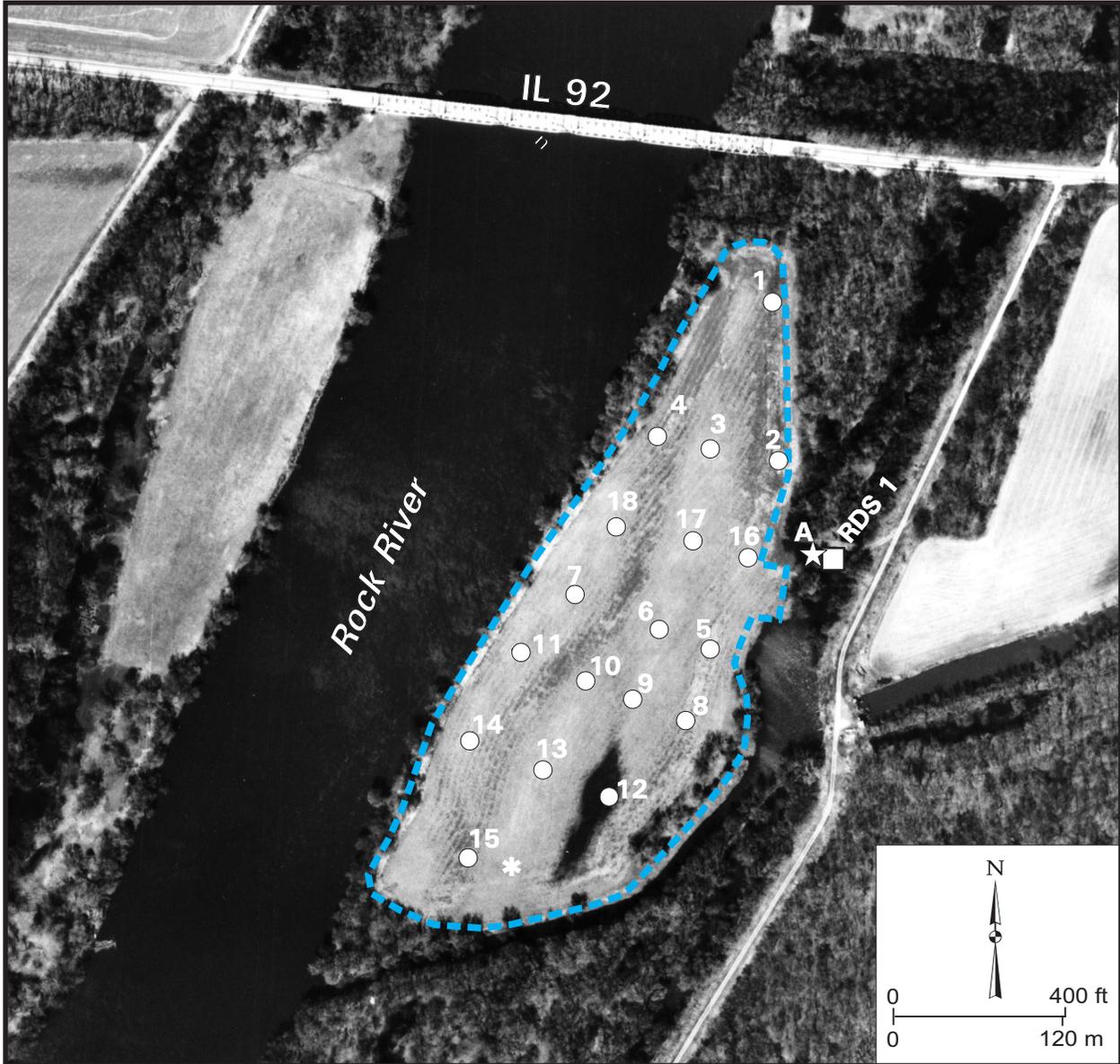


# Joslin Wetland Compensation Site (FAP 585)

## Estimated Areal Extent of 2001 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

map based on unrectified aerial photography from IDOT (April 15, 1988, MH-88 45-563)



 estimated areal extent of 2002 wetland hydrology

 estimated areal extent of site boundary

 soil-zone monitoring wells

 rain gauge

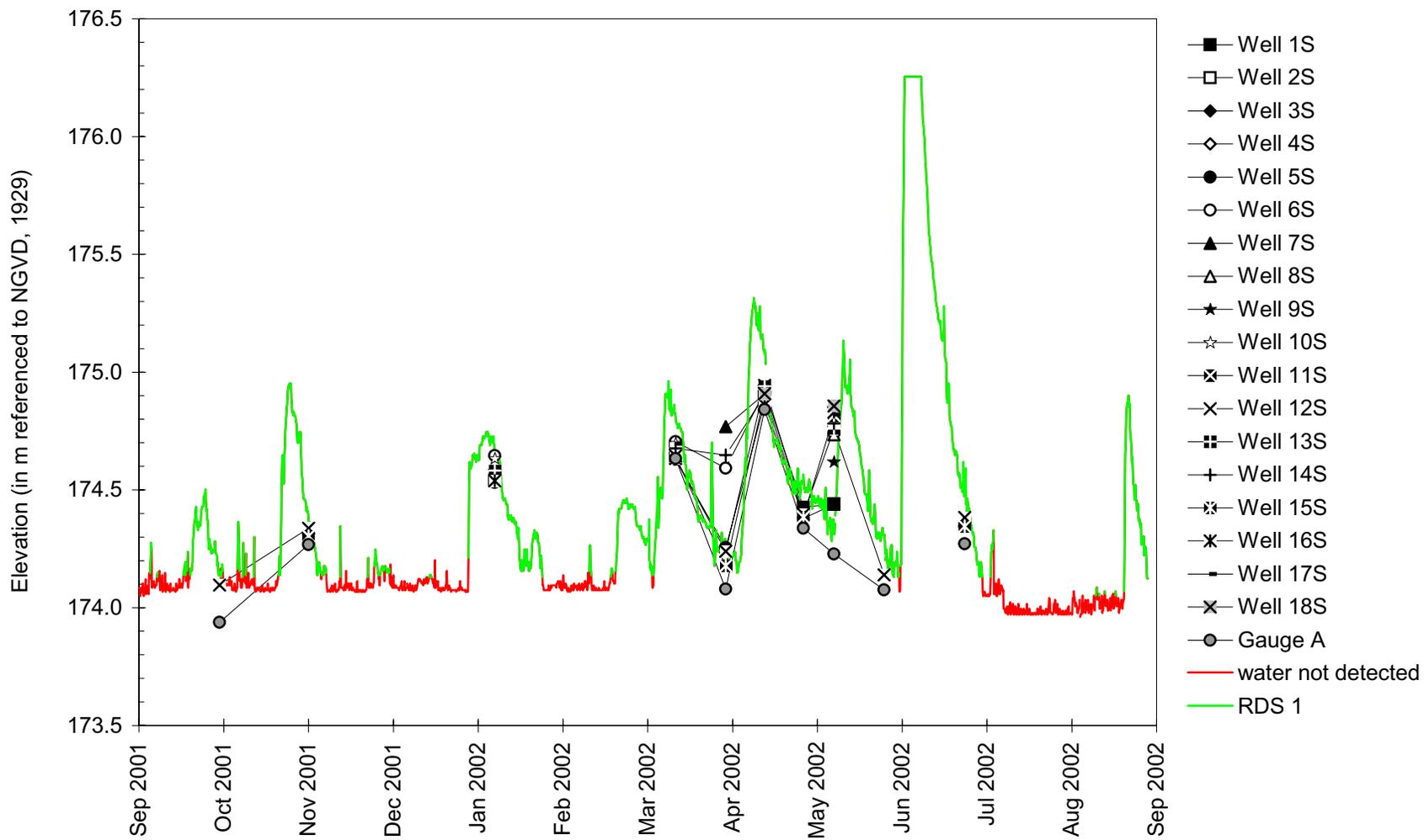
 USACE gauging station

 RDS data logger

 Stage gauge

# Joslin Wetland Compensation Site September 1, 2001 to September 1, 2002

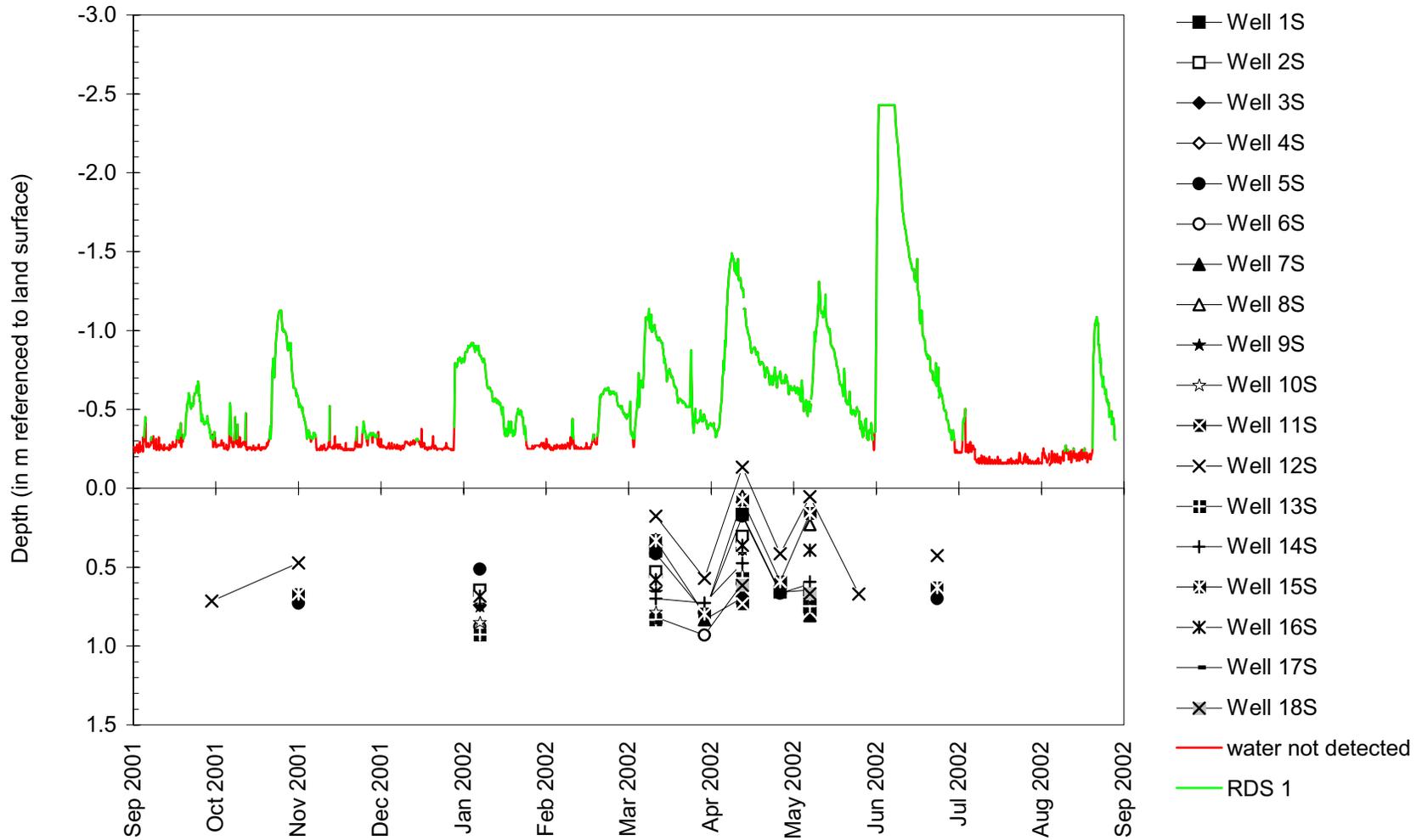
## Water-Level Elevations



# Joslin Wetland Compensation Site

## September 1, 2001 to September 1, 2002

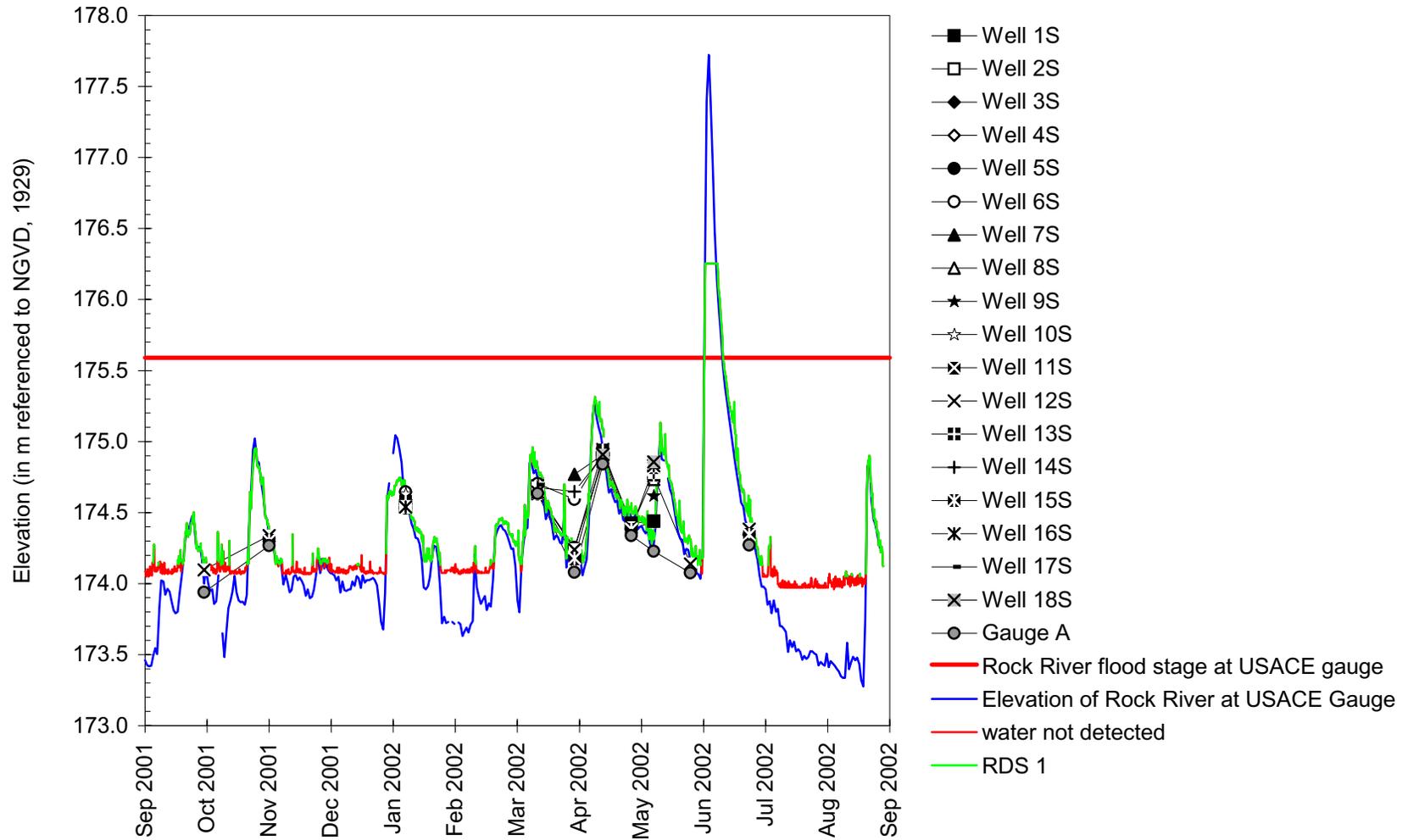
### Depth to Water



# Joslin Wetland Compensation Site

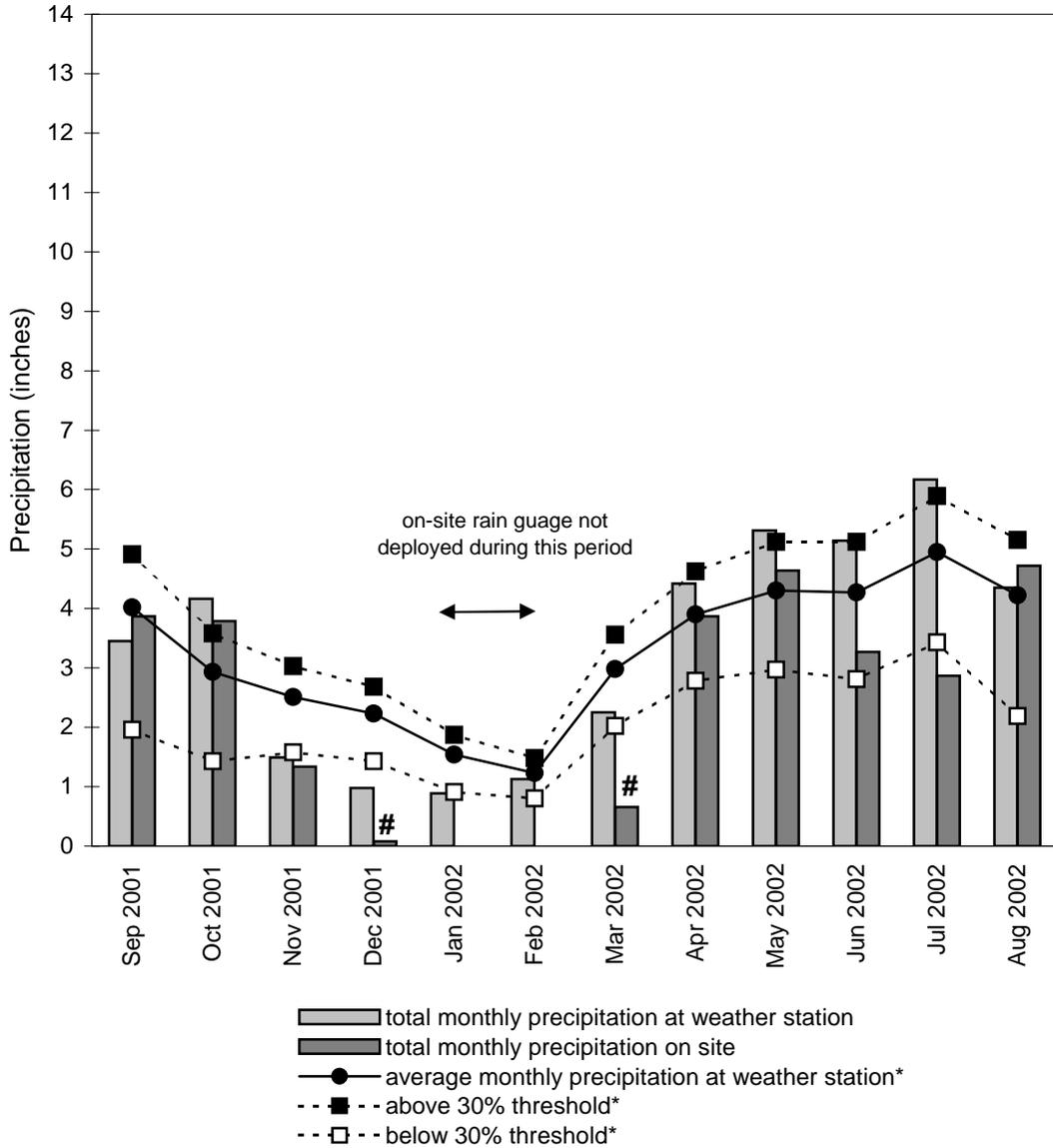
## September 1, 2001 to September 1, 2002

### Water-Level Elevations



## Joslin Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Quad City International Airport Weather Station, Moline, IL



# on-site rain gauge not deployed for entire month  
\* see text for explanation

Graph last updated October 11, 2002

**DECATUR, U.S. ROUTE 51  
WETLAND COMPENSATION SITE**

**ISGS #27**

FAP 322

Macon County, near Elwin, Illinois

**Primary Project Manager: Blaine A. Watson**

**Secondary Project Manager: Paula J. Sabatini**

**SITE HISTORY**

- May 1999: ISGS was tasked to conduct hydrologic monitoring for a Level I mitigation site assessment.
- March and May 2000: ISGS installed a surface-water monitoring station (RDS 1) and a rain gauge, then later completed several shallow soil borings to investigate the presence and condition of a shallow confined aquifer across the site.
- June 2000: ISGS conducted an on-site meeting with IDOT Central Office and the District 5 engineer to present a letter report outlining the soil-boring investigation and other potential water/construction issues identified at the site.
- June 2001: Construction of the wetland was completed.
- December 2001: ISGS installed eleven "S" wells (1S-8S and 10S-12S), two surface-water staff gauges (A and B), and one additional surface-water monitoring station (RDS 2) at the site.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 7.4 ac (3.0 ha) out of a total site area of approximately 11.6 ac (4.7 ha). By comparison, in 2001, the area of wetland hydrology was estimated to be 5.2 ac (2.1 ha). This year's estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Decatur is April 10 and the season lasts 196 days; 12.5% of the growing season is 25 days.
- Precipitation on-site or in the vicinity was within or above the normal range during most of the period from September 2001 through June 2002. Precipitation was below the normal range in July and August 2002. During the period from September 2001 to August 2002, total precipitation at the Decatur weather station was 120% of normal. This is compared to 96% of normal for the period from September 2000 to August 2001.
- In 2002, water levels measured in all "S" wells within the excavation, with the exception of well 2S, conclusively satisfied the wetland hydrology criteria (>12.5%) of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Water-level records for well 2S indicate that it may have met the wetland hydrology criteria with a period between 5% and 12.5% of the growing season.

- Limitations of the wetland hydrology determination are as follows:
  - Greater-than-normal precipitation for the monitoring period, especially during the months of April and May 2002, likely resulted in an increased area of wetland hydrology during 2002, as compared to the 2001 monitoring period.
  - Well 1S is located within a small, closed depression at a ground-surface elevation above that observed near any other wells that conclusively satisfied the wetland hydrology criteria. The unusually wet spring in 2002 likely resulted in extended retention times for surface water in this depression. Typical years may not duplicate these conditions at well 1S.
  - The base photo represents site conditions before the wetland basin was excavated. As such, wet/dry indicators on the photo do not necessarily follow the current patterns that are present on the site. This is particularly true in areas to the northeast of well 8S and 10S. Subtle topographic changes in these areas result in low rises near the excavation boundary which remain exposed and do not achieve wetland hydrology, even though adjacent ditches are wet for extended periods.

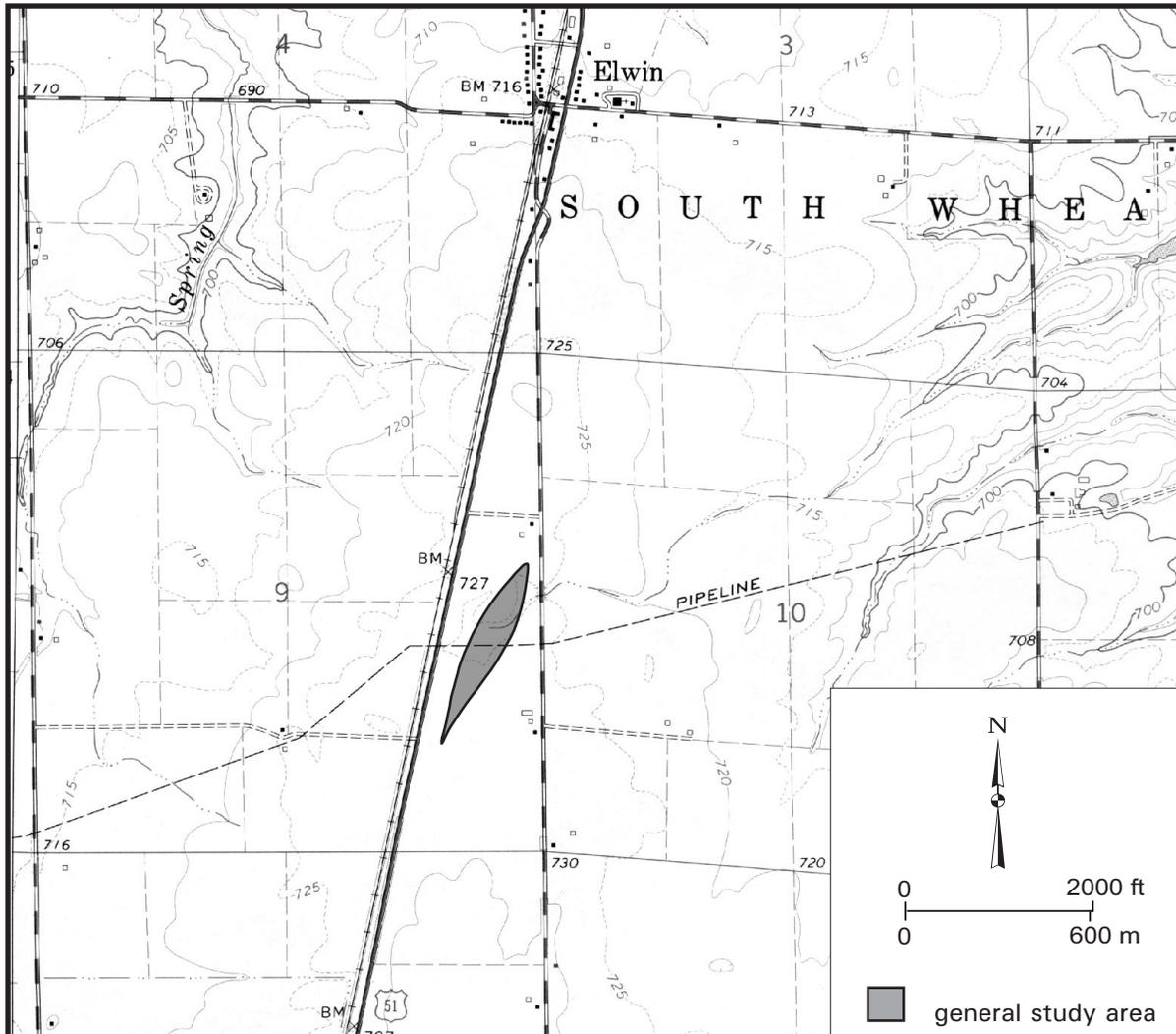
#### PLANNED FUTURE ACTIVITIES

- The current monitoring scheme will continue until July 2006, or until no longer required by IDOT.

# Decatur, U.S. Route 51 Wetland Compensation Site (FAP 322)

## General Study Area and Vicinity

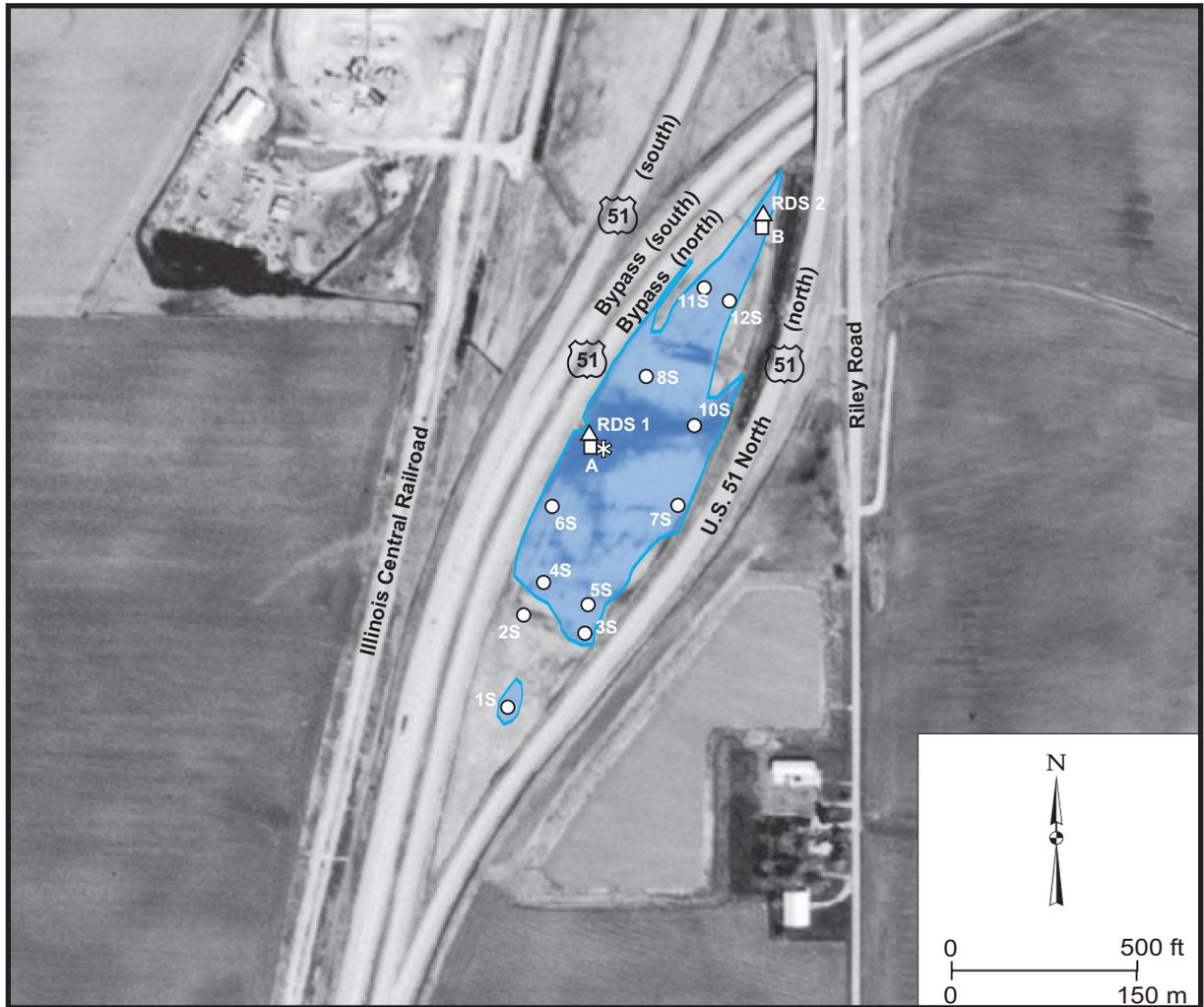
from the USGS Topographic Series, Decatur, IL 7.5-minute Quadrangle (USGS 1967; photorevised 1975)  
contour interval is 10 feet



# Decatur, U.S. Route 51 Wetland Compensation Site (FAP 322)

## Estimated Areal Extent of 2002 Wetland Hydrology

map based on USGS digital orthophotograph Decatur, SW quarter quadrangle  
produced from 4/14/98 aerial photography (ISGS 2002)



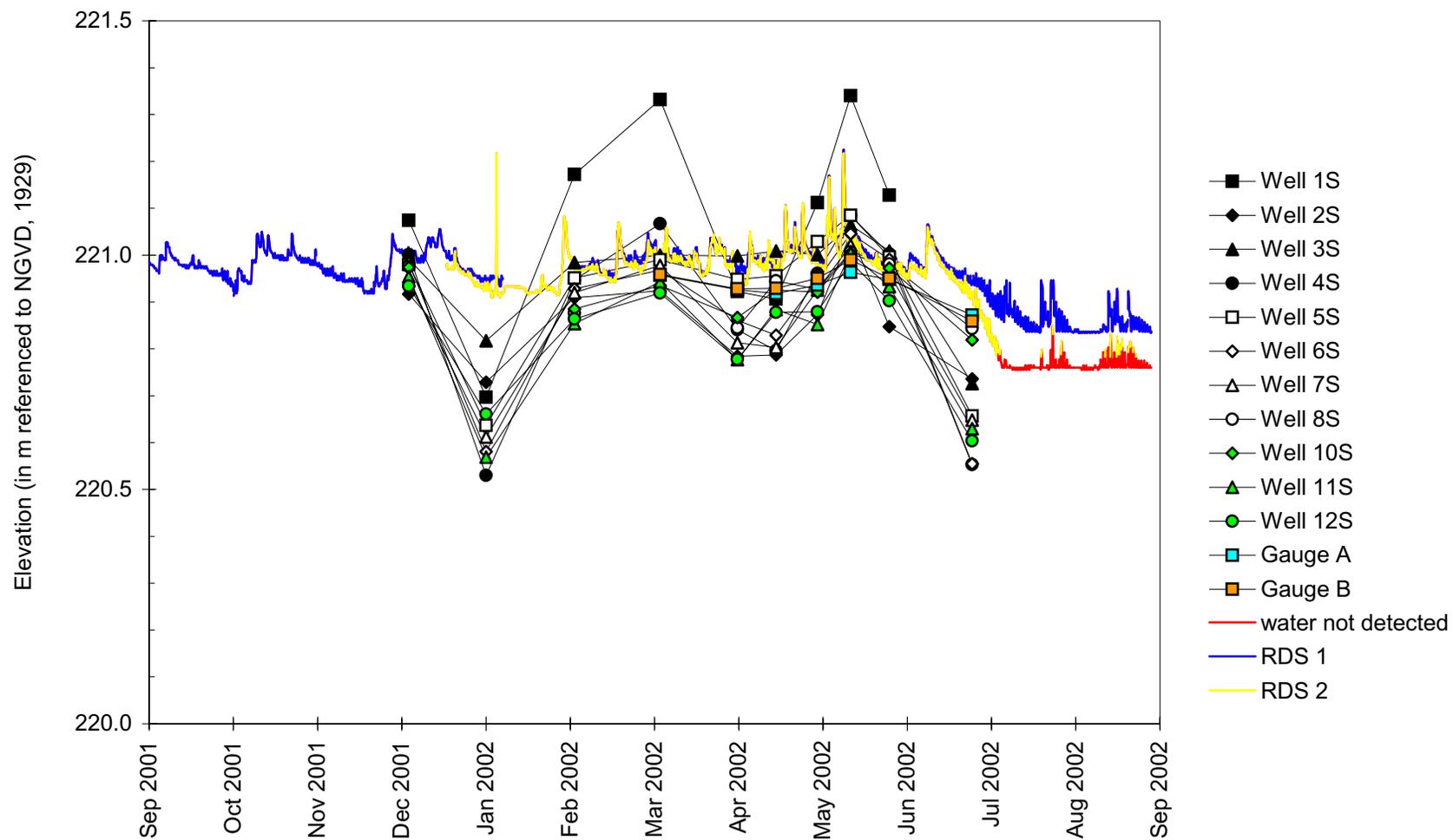
estimated areal extent of  
2002 wetland hydrology  
within excavated area

- monitoring well
- stage gauge
- △ RDS data logger
- ✱ rain gauge

# Decatur, U.S. Route 51 Wetland Compensation Site

September 1, 2001 to September 1, 2002

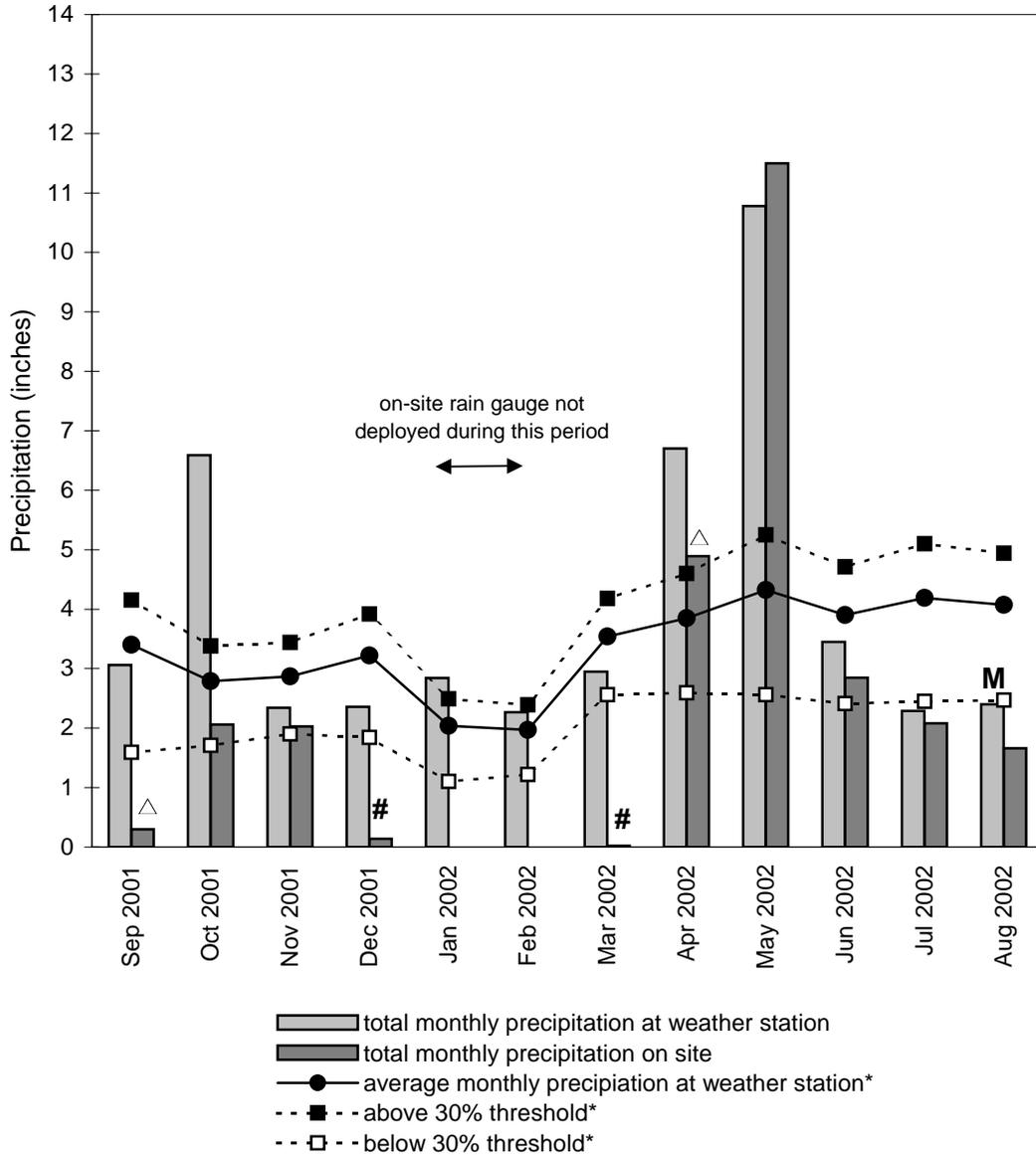
## Water-Level Elevation





## Decatur Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Decatur, IL Weather Station



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

M missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**GULFPORT  
WETLAND COMPENSATION SITE**

**ISGS #29**

FAP 313

Henderson County, near Gulfport, Illinois

**Primary Project Manager: Kelli D. Weaver**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- September 1994: ISGS submitted an Initial Site Evaluation Report to IDOT.
- Fall 1997: IDOT completed excavation of the wetland basin.
- January 1998: ISGS began surface-water elevation monitoring at the site.
- April 1999: ISGS installed soil-zone wells for ground-water elevation monitoring at the site.
- April 2001: ISGS installed four very shallow (VS) soil-zone wells at the four corners of the excavated wetland basin for the purpose of further defining the extent of wetland hydrology.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 7.8 ac (3.1 ha). The site, as defined by the area inside a line labeled "construction limits" on an IDOT site plan, is roughly 10.54 ac (4.27 ha) in size. The acreage for 2002 is in contrast to 8.4 ac (3.4 ha) that satisfied wetland hydrology criteria in 2001. This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Burlington, Iowa, is April 7 and the season lasts 206 days; 12.5% of the growing season is 26 days.
- Total precipitation for the monitoring period from September 2001 to June 2002 was 112% of normal. Precipitation was above normal for the months of September and October 2001, and April through June 2002. Precipitation was below normal for the months of November and December 2001, and January through March 2002. Although weather station data are incomplete, precipitation measured on site was above normal for July and August.
- In 2002, water levels measured in wells 3S, 5S, 6VS, 7VS, 9VS, 10VS, 11VS, and 12VS conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Wells 1S, 2S, 4S, and 8VS did not satisfy wetland hydrology criteria. In addition, surface-water levels measured by the RDS-1 data logger indicated that inundation occurred to an elevation of 157.43 m (516.50 ft) for a duration sufficient to conclusively satisfy wetland hydrology criteria.

- Limitations of the wetland hydrology determination are as follows:
  - The base map used in the calculation is an IDOT plan of the proposed wetland basin prior to construction, because no as-built topographic survey of the site has been completed.

#### PLANNED FUTURE ACTIVITIES

- Monitoring will continue through 2003 or until no longer required by IDOT.

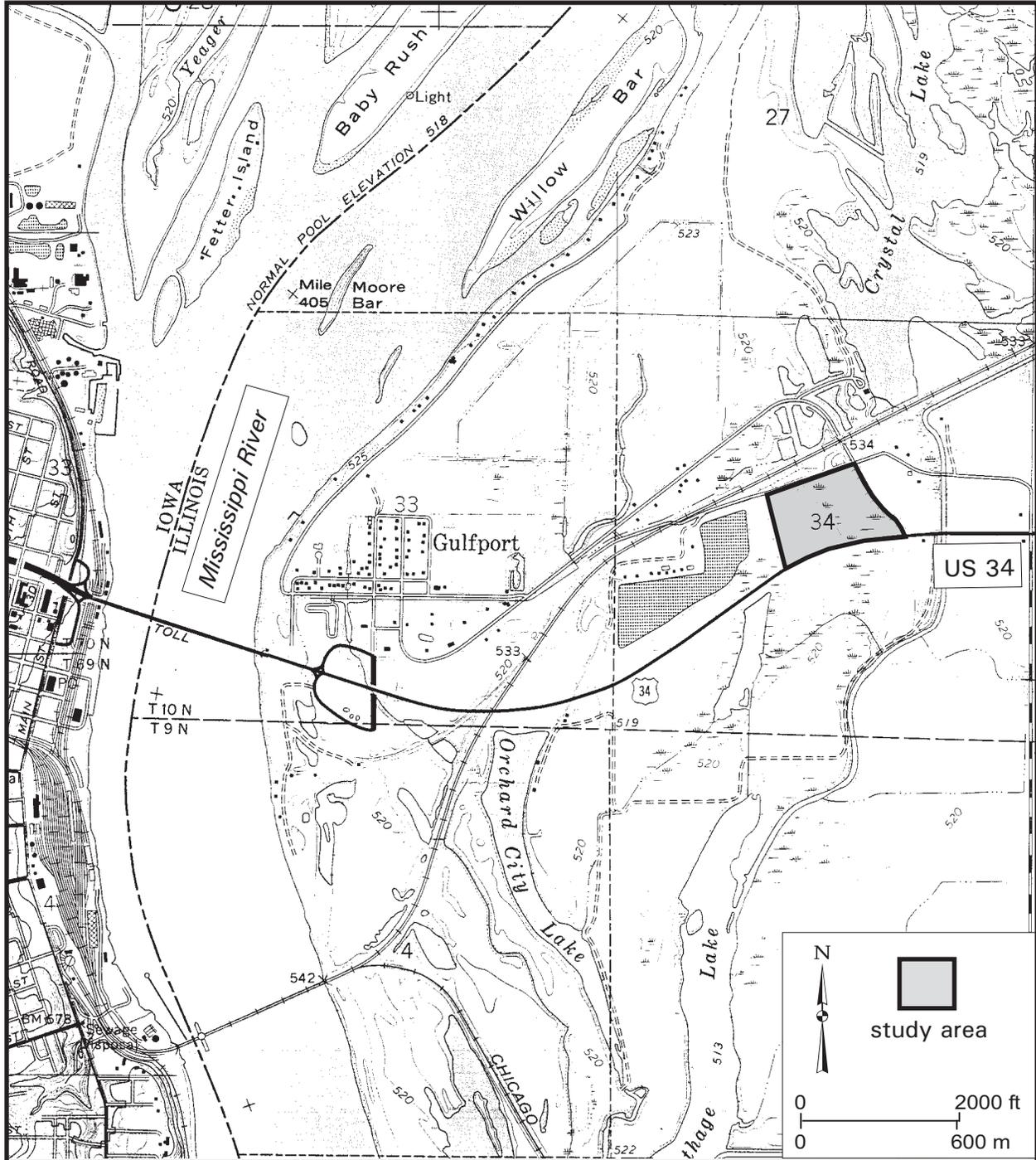
# Gulfport Wetland Compensation Site (FAP 313)

## General Study Area and Vicinity

from the USGS Topographic Series, Burlington, IA-IL 7.5-minute Quadrangle

(USGS 1964, photorevised 1976)

contour interval is 10 feet



# Gulfport Wetland Compensation Site (FAP 313)

Estimated Areal Extent of 2002 Wetland Hydrology  
based on data collected between September 1, 2001 and September 1, 2002  
map based on USGS DOQ, Burlington NW Quadrangle (1998-1999)



○ ISGS monitoring well

⊠ ISGS benchmark

\* rain gauge

□ RDS data logger



 estimated areal extent of 2002 wetland hydrology

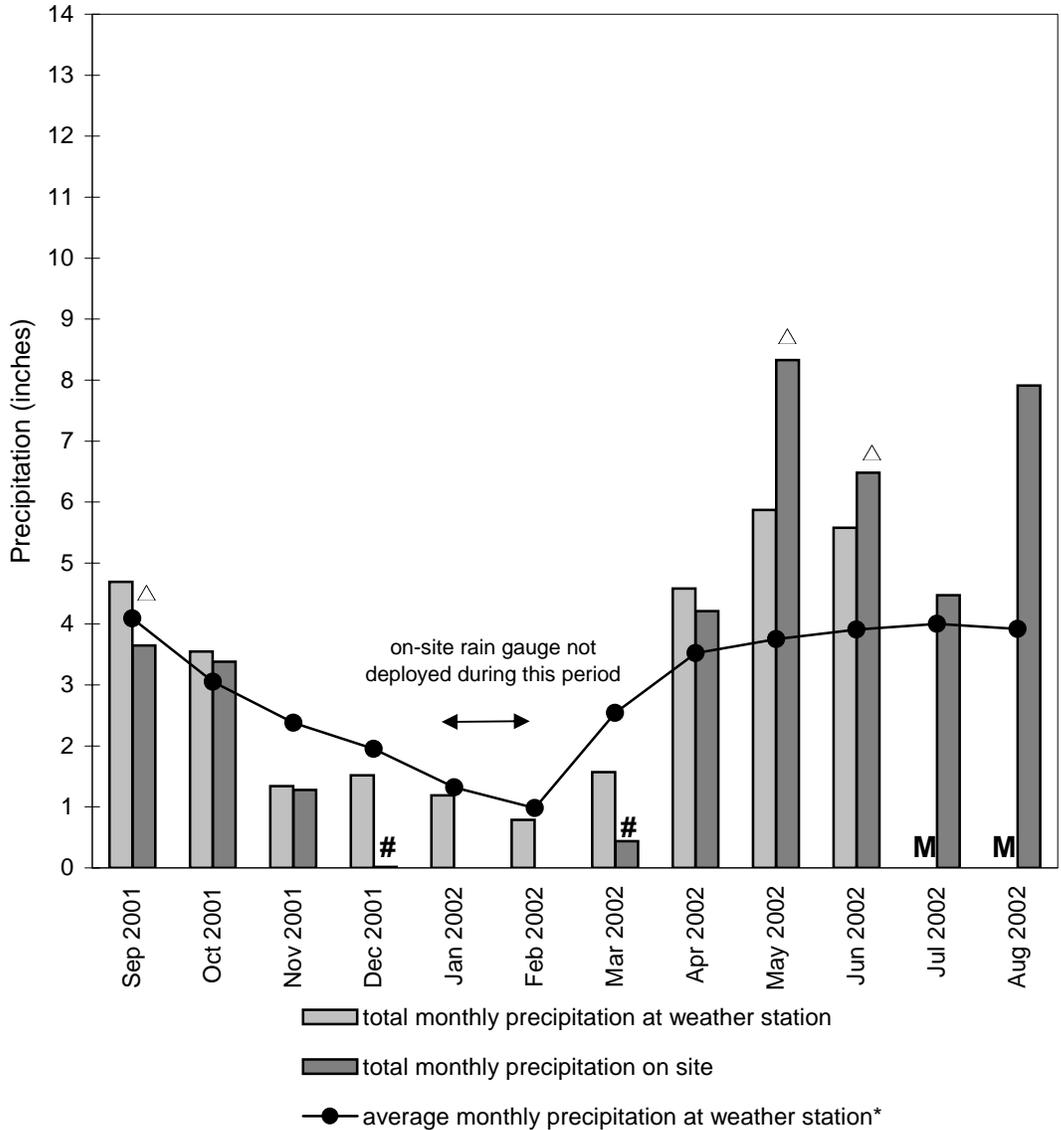
 estimated areal extent of IDOT excavation





## Gulfport Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Lock & Dam 18 Weather Station, Gladstone, IL



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

**M** missing data from weather station

\* see text for explanation

30% above and 30% below normal-range threshold values are not available for this weather station

Graph last updated October 11, 2002

**SPRING CREEK  
POTENTIAL WETLAND BANKING SITE**

**ISGS #30**

FAP 340

Will County, near New Lenox, Illinois

**Primary Project Manager: Steven E. Benton**

**Secondary Project Manager: Paula J. Sabatini**

**SITE HISTORY**

- January 1995: An access agreement to install monitoring wells in right-of-way along Gouger Road was agreed to by the New Lenox Township Highway Commission.
- October 1995: The ISGS began an investigation of surface- and ground-water levels in the valley of Spring Creek with the installation of monitoring wells and staff gauges along Gouger Road.
- January 1998: The results of the investigation were reported by letter to IDOT.
- 1998–1999: Surface-water and ground-water data were collected pending the start of a Level II Assessment.
- March 2000: IDOT requested that data collection be suspended.
- November 2000: A copy of the letter report and all data collected during the Level I Assessment were sent to Zambrana Engineering, consultants for IDOT District 1, who were conducting a feasibility study of Spring Creek.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

- No estimate of the area of wetland hydrology was made at this site because the data collected were limited to fluctuations in stream depth and elevation.
- Total precipitation recorded at the Brandon Road Dam weather station in Joliet, IL during the study period was 33.33 inches. Some data were missing for July and August 2002, therefore, the total recorded underestimated the actual total. However, the amount recorded was 93% of normal (35.97 in). Four months, September 2001 and January, February, and March 2002 were within the normal range, all other months were either above or below the normal range.
- The data logger in Spring Creek recorded several storm events, the largest occurring in October 2001 and May 2002. The first event was on October 14 and occurred during a 2.92 inch rainfall event. The second was on May 12 and occurred during a 3.20 inch rainfall event. The storm event in May 2002 was high enough to flood areas adjacent to Spring Creek. However, the storm surge lasted only a few hours.

**PLANNED FUTURE ACTIVITIES**

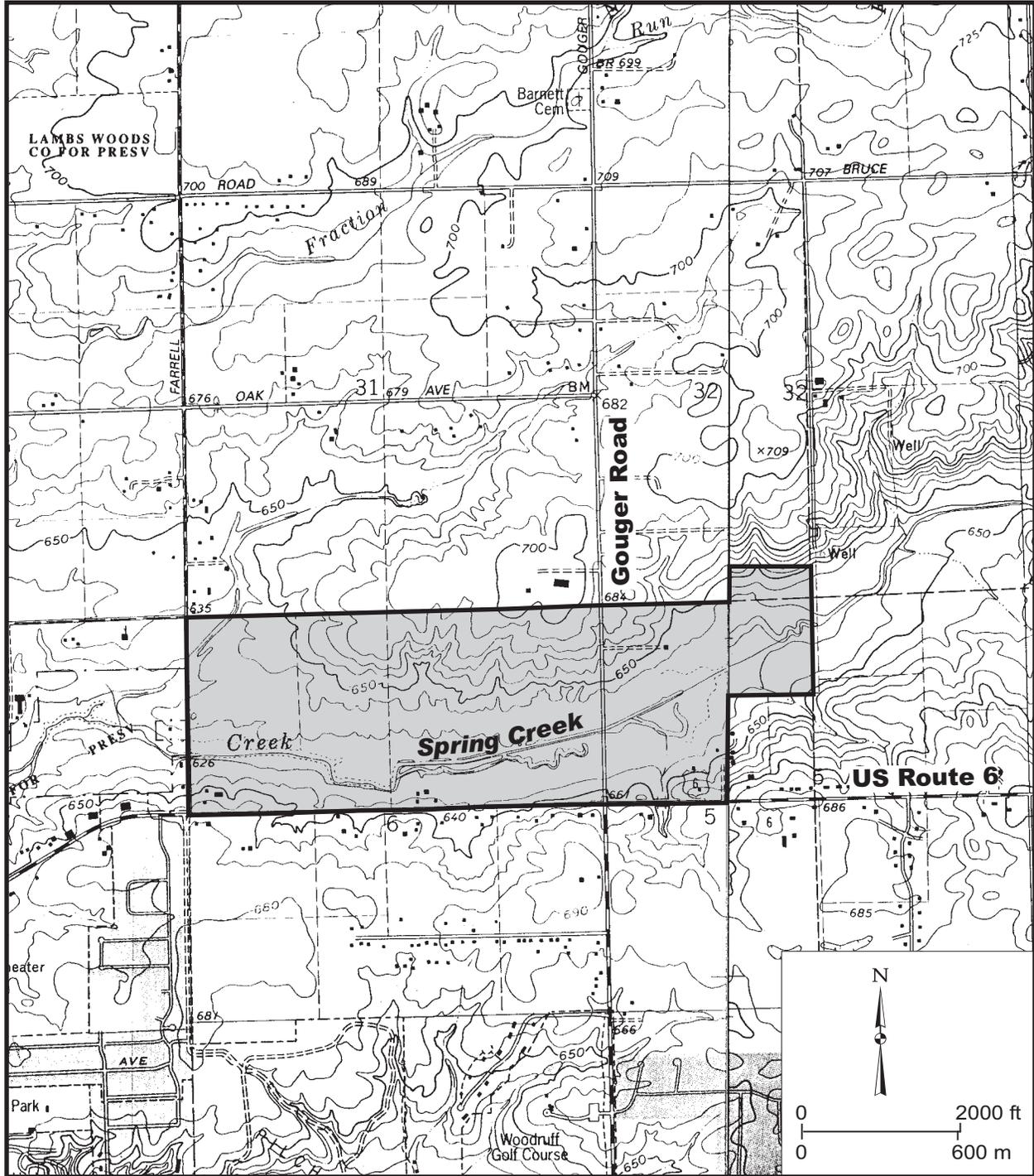
- Data are being collected to characterize stream hydrology in expectation of future mitigation activities.

# Spring Creek Potential Wetland Banking Site (FAP 340)

## General Study Area and Vicinity

from the USGS Topographic Series, Joliet, IL 7.5-minute Quadrangle (USGS 1993)

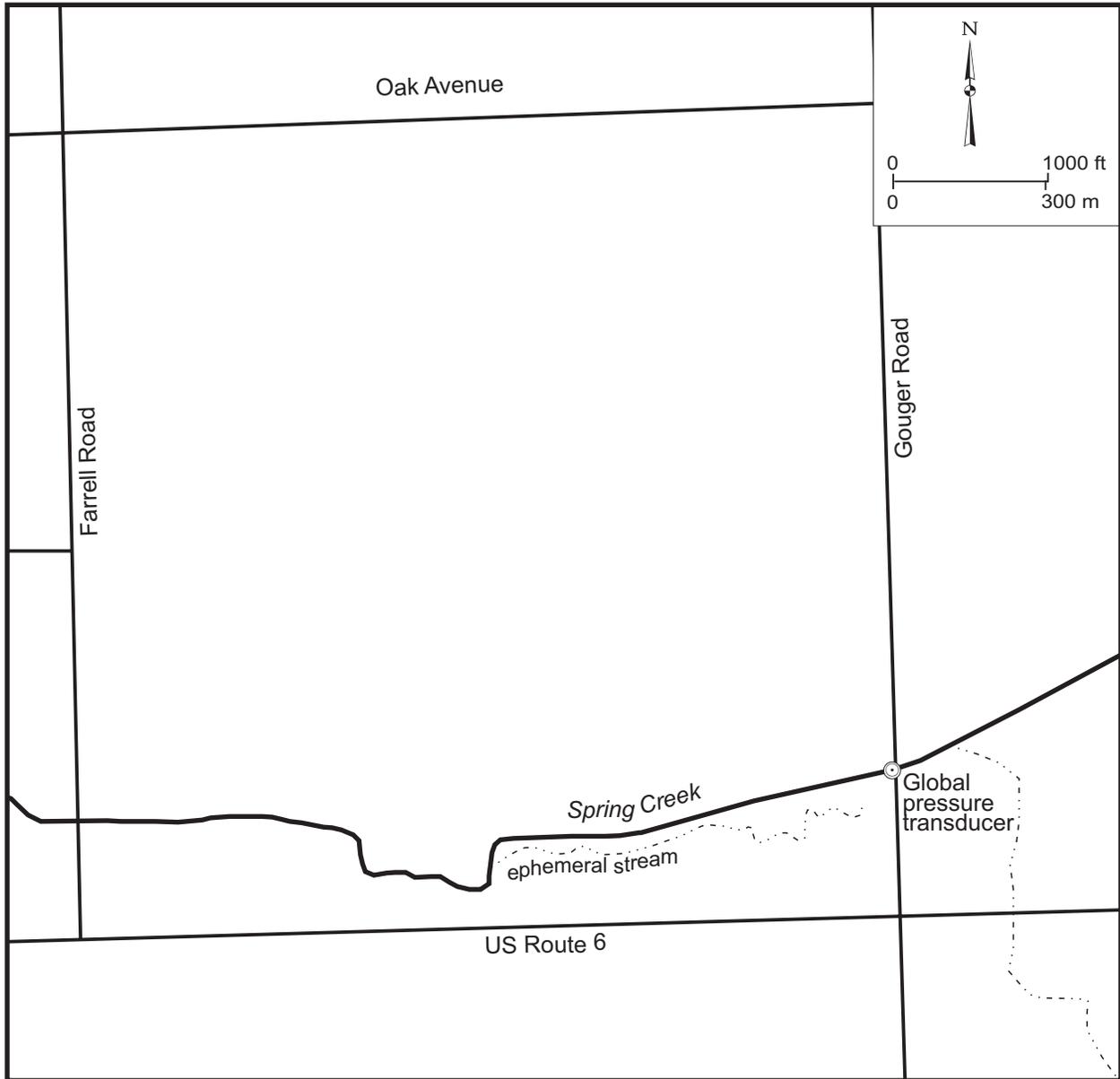
contour interval is 10 feet



■ general study area

# Spring Creek Potential Wetland Banking Site (FAP 340)

Approximate Location of the ISGS Global Pressure Transducer  
map based on Joliet, IL 7.5-minute Quadrangle (USGS 1993)

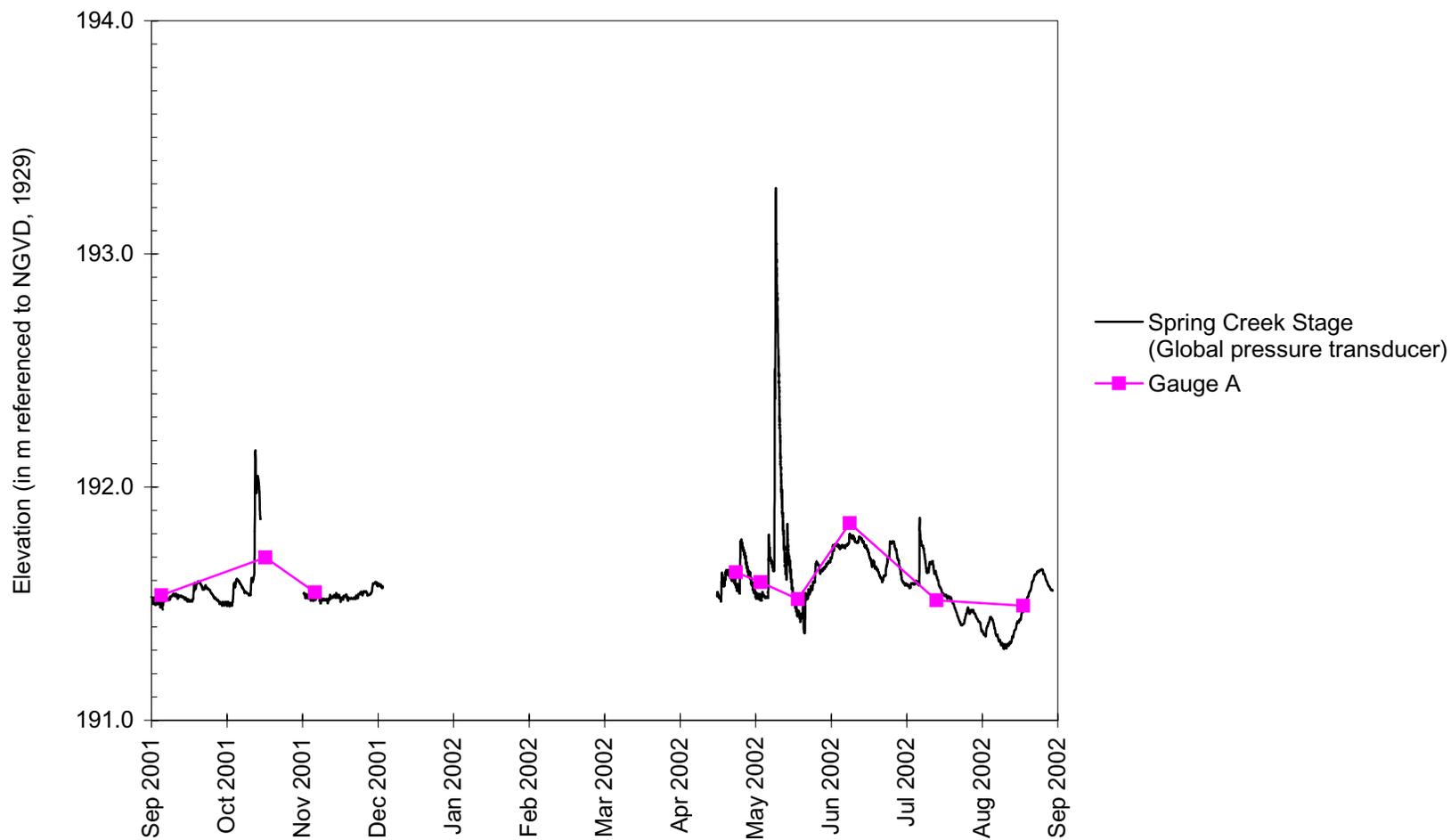


⊙ Global pressure transducer

# Spring Creek Potential Wetland Banking Site

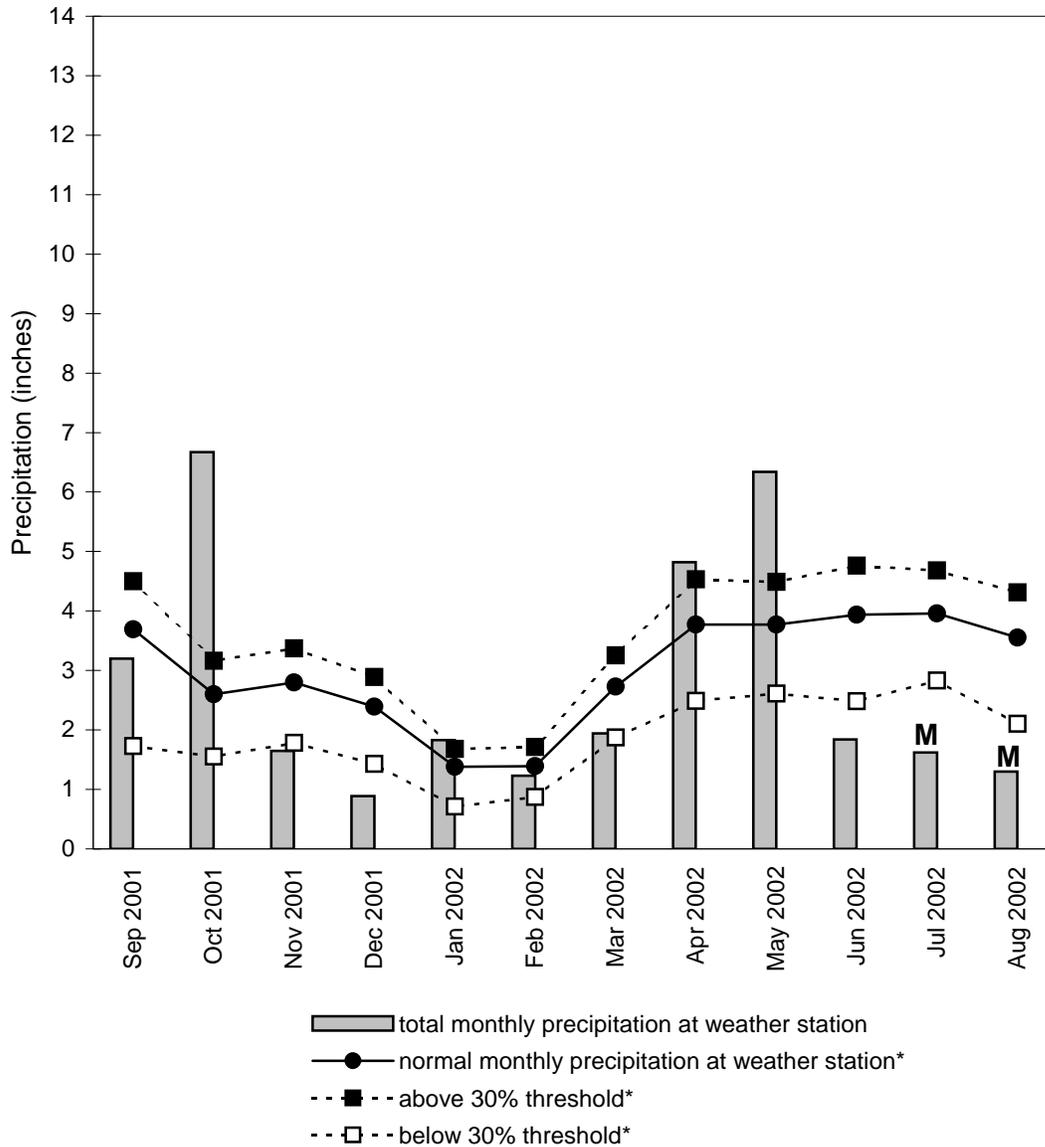
September 1, 2001 to September 1, 2002

## Water-Level Elevation



## Spring Creek Potential Wetland Banking Site September 2001 through August 2002

**Total Monthly Precipitation Recorded at the  
Brandon Road Dam Weather Station, Joliet, IL**  
(no rain gauge deployed on site)



M missing data from weather station  
\* see text for explanation

Graph last updated October 11, 2002

**NORTH CHICAGO  
POTENTIAL WETLAND BANKING SITE**

**ISGS #31**

FAP 120

Lake County, near North Chicago, Illinois

**Primary Project Manager: James J. Miner**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- Spring 1995: ISGS submitted an Initial Site Evaluation Report to IDOT.
- Summer and Fall 1998: ISGS installed monitoring wells and surface-water data loggers, and began a geochemical characterization.
- January 2000: A letter report containing initial observations and recommendations was transmitted to IDOT.
- Spring 2001: Twenty-nine additional soil-zone wells were installed throughout the site to monitor the hydrogeologic conditions in areas that were identified by Christopher B. Burke Engineering, LTD., as containing drained hydric soils.
- Spring 2002: IDOT suspended monitoring at this site.

**WETLAND HYDROLOGY CALCULATION FOR 2002 AND SUMMARY OF 2002 EVENTS**

Monitoring of this site was suspended in Spring 2002 by IDOT, and data collection ceased in June 2002. Data are reported here for informational purposes only.

- According to the Midwestern Climate Center, the median date that the growing season begins in Waukegan is April 14 and the season lasts 195 days; 12.5% of the growing season is 24 days.
- Precipitation data during the monitoring year are missing for November 2001 and June through August 2002. However, clear precipitation trends occur. Fall 2001 was well above normal, with two to three times the average precipitation in September and October. Afterward, precipitation was below normal from November 2001 through January 2002. Precipitation was within the normal range from February through May 2002.
- In 2002, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual: wells 1S, 2S, 3S, 4S, 5S, 6S, 7S, 17S, 21S, 23S, 25S, 29S, 34S, and 42S. Other wells may have but did not conclusively meet wetland hydrology criteria, including wells 32S, 33S, 37S, 39S, and 40S. Other wells also may have met wetland hydrology criteria if the monitoring had not been ended.

## ADDITIONAL INFORMATION

- No aquifers have been identified that may supply sufficient ground water to any potential wetland compensation area. Surface water and precipitation are likely the primary water sources for any wetland compensation activities. Clay-rich sediments will likely perch surface water in an efficient manner.
- The berm located on the east side of the site is being breached at several locations by surface water during spring, and erosion may eventually cut completely through the berm and drain several acres of wetlands that rely on the berm to produce flooding.

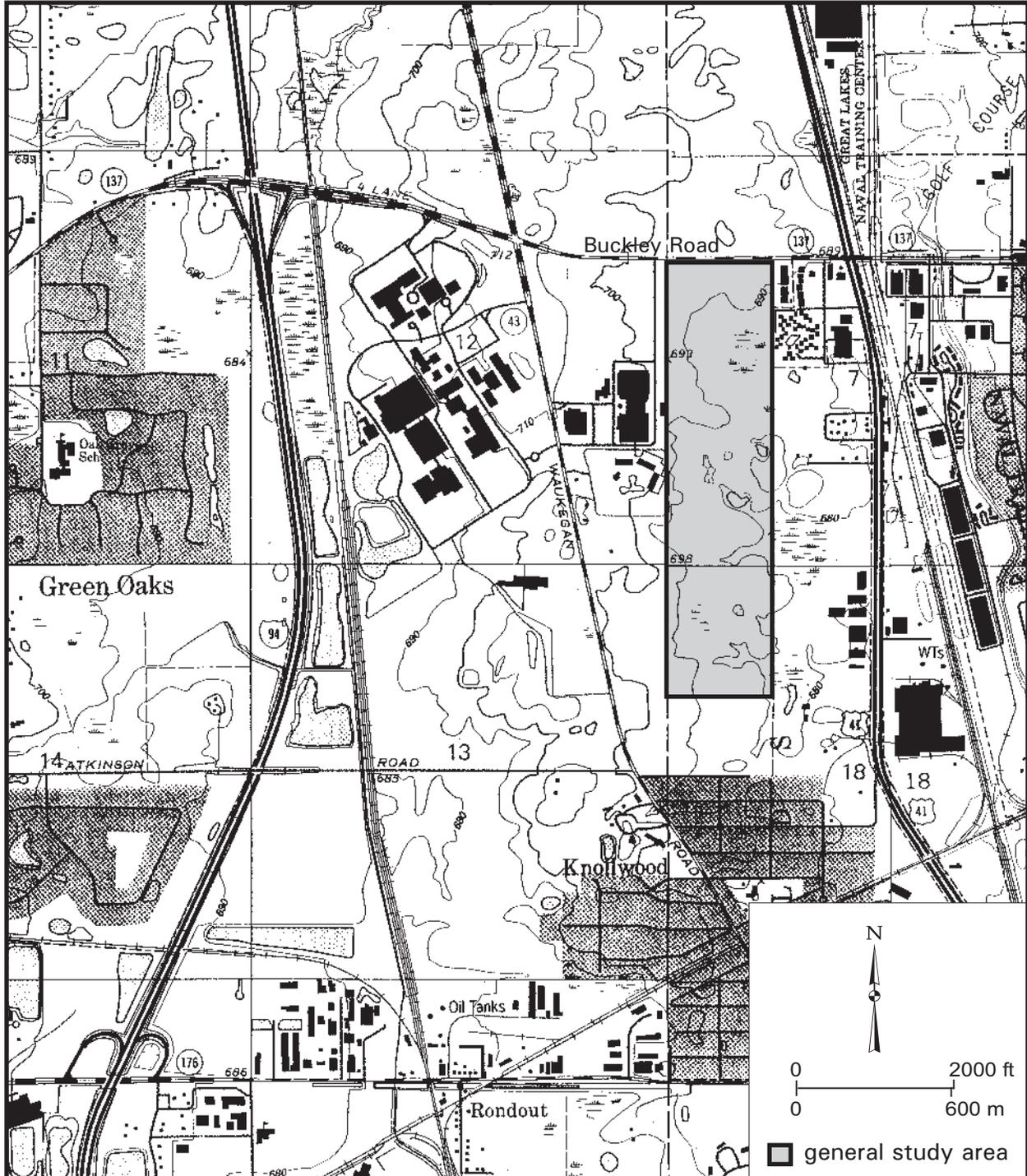
## PLANNED FUTURE ACTIVITIES

- Wells remain on site pending resumption of monitoring. When wells are no longer needed, ISGS will remove them.

# North Chicago Potential Wetland Banking Site (FAP 120)

## General Study Area and Vicinity

from the USGS Topographic Series, Libertyville, IL (W) (USGS 1993) and Waukegan, IL (E) (USGS 1993)  
7.5-minute Quadrangles  
contour interval is 10 ft

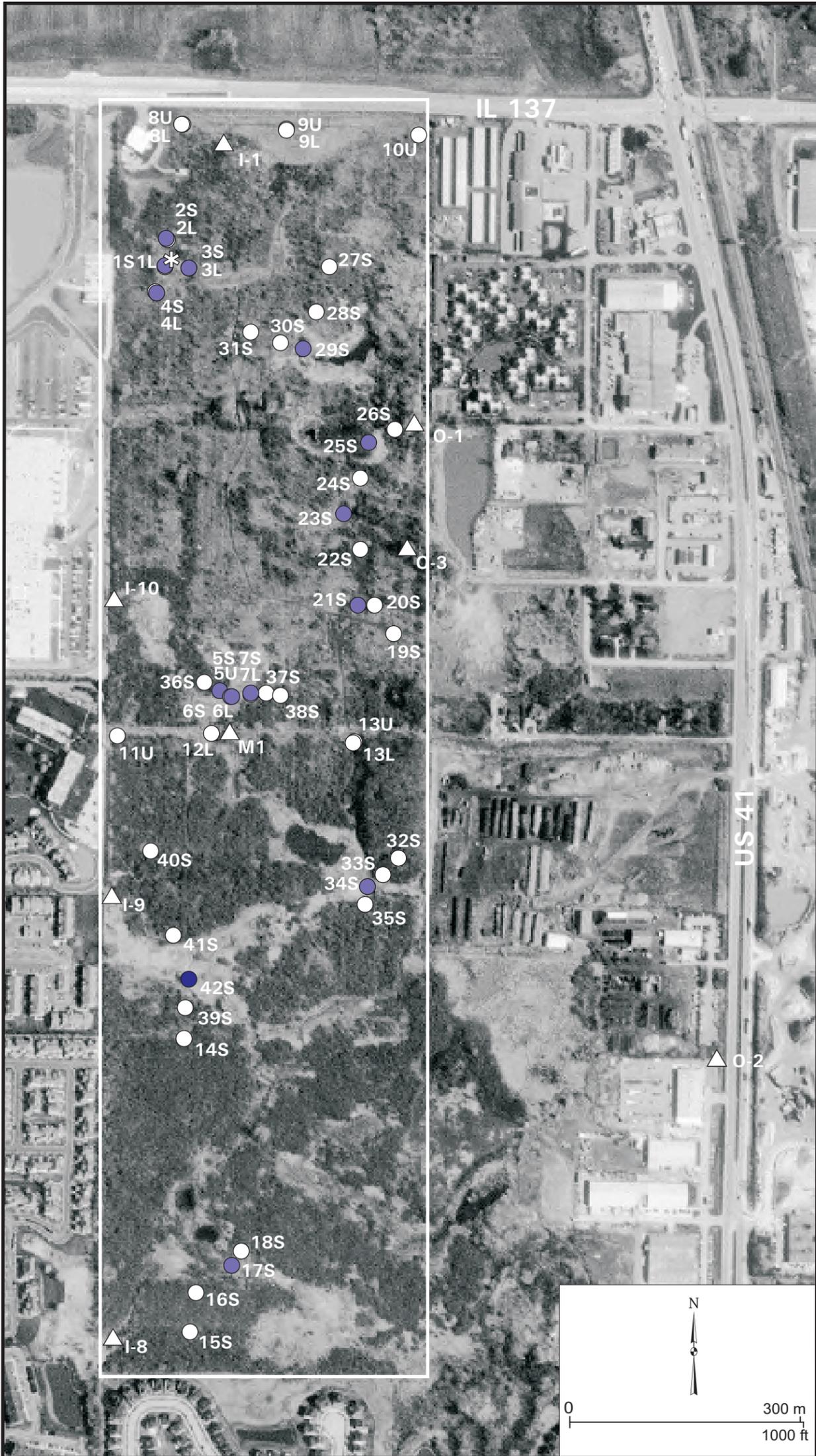


**North Chicago Potential Wetland Banking Site  
(FAP 120)**

**ISGS Monitoring Instruments and Wells Meeting Wetland Hydrology Criteria**

map based on USGS digital orthophotograph, Waukegan, NW quarter quadrangle,  
produced from 04/17/1998 aerial photography (ISGS 2001)

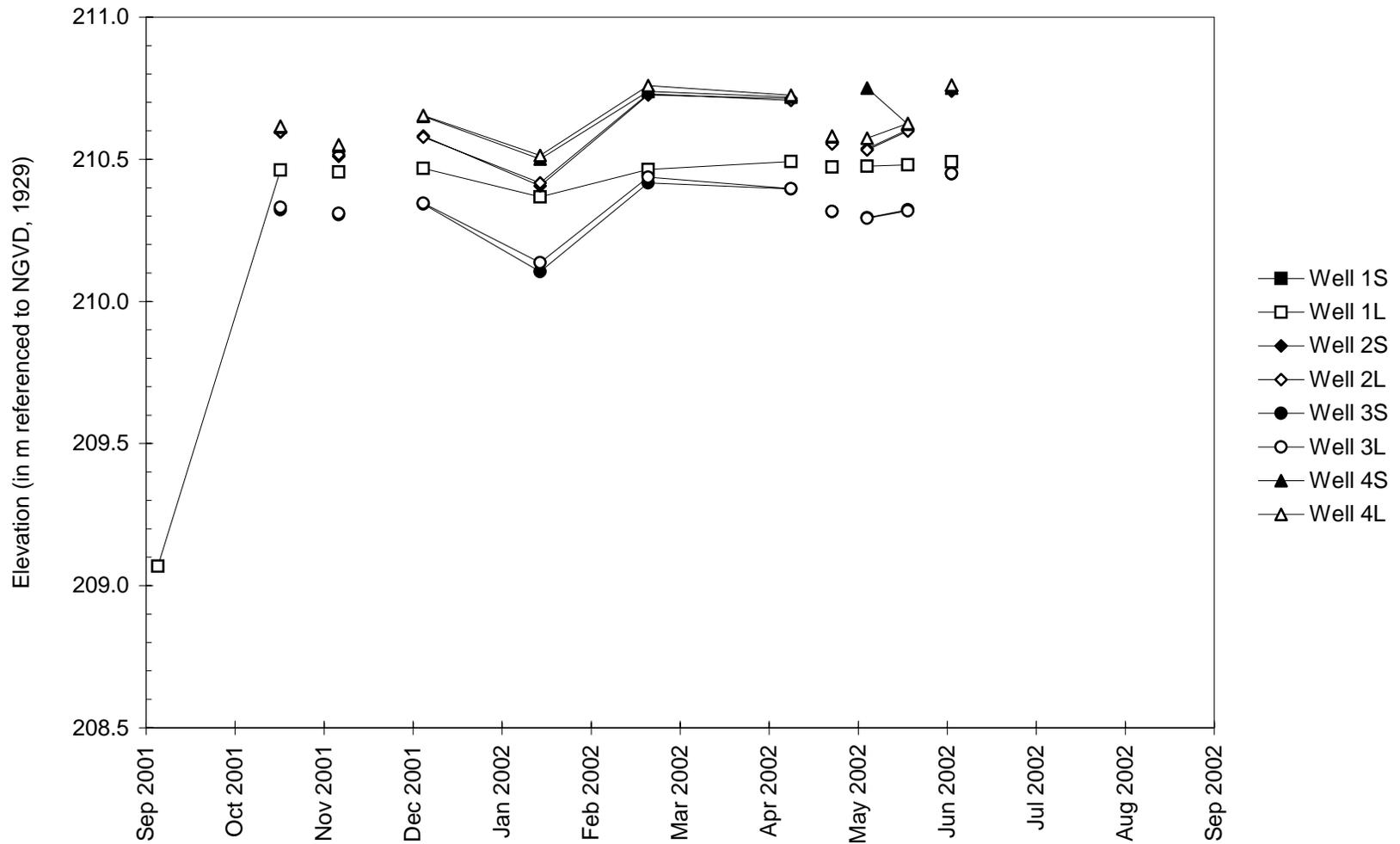
109



- monitoring wells that met wetland hydrology criteria in 2002
- other monitoring wells
- △ RDS data logger
- ✱ rain gauge
- site boundary

# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations

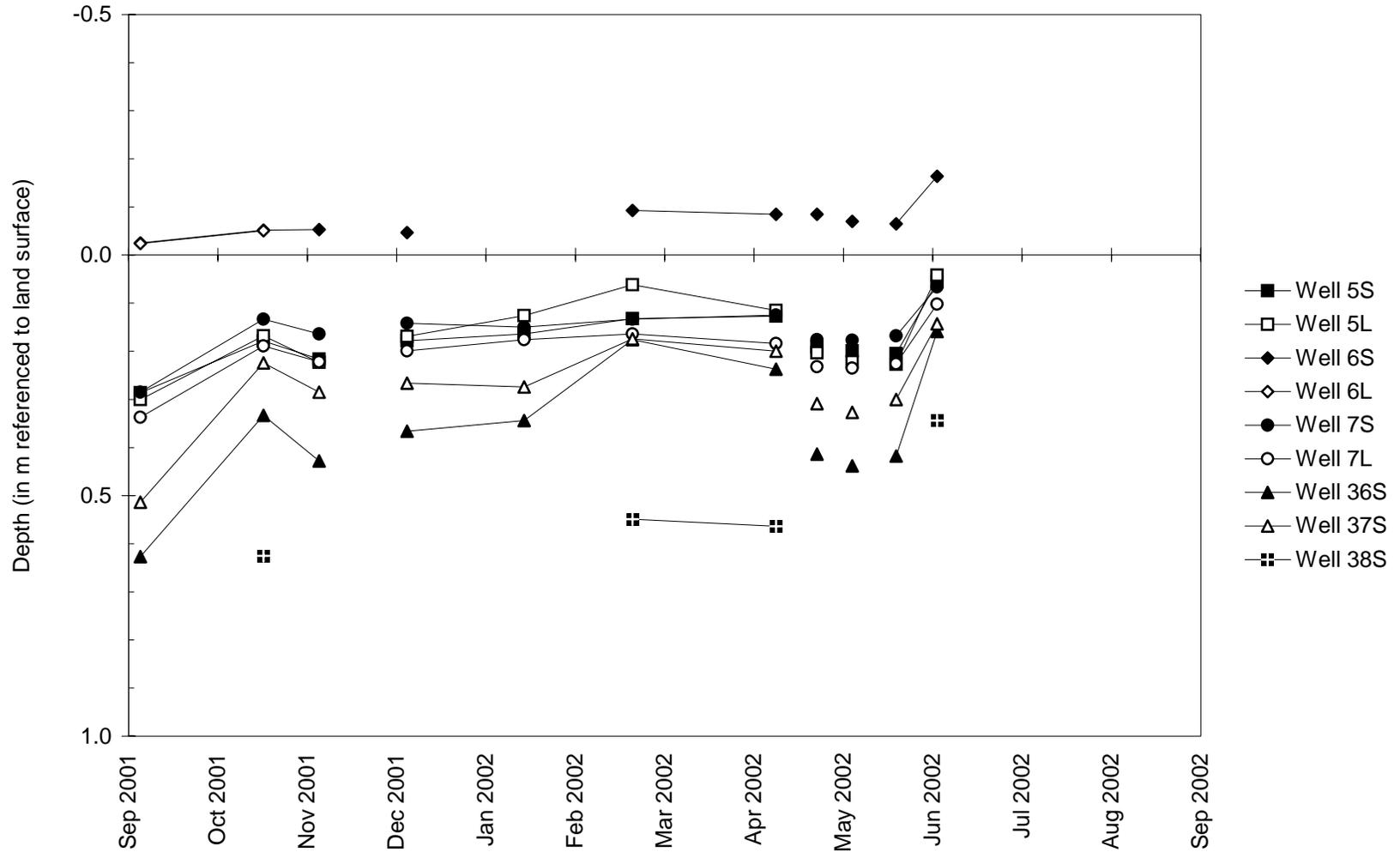






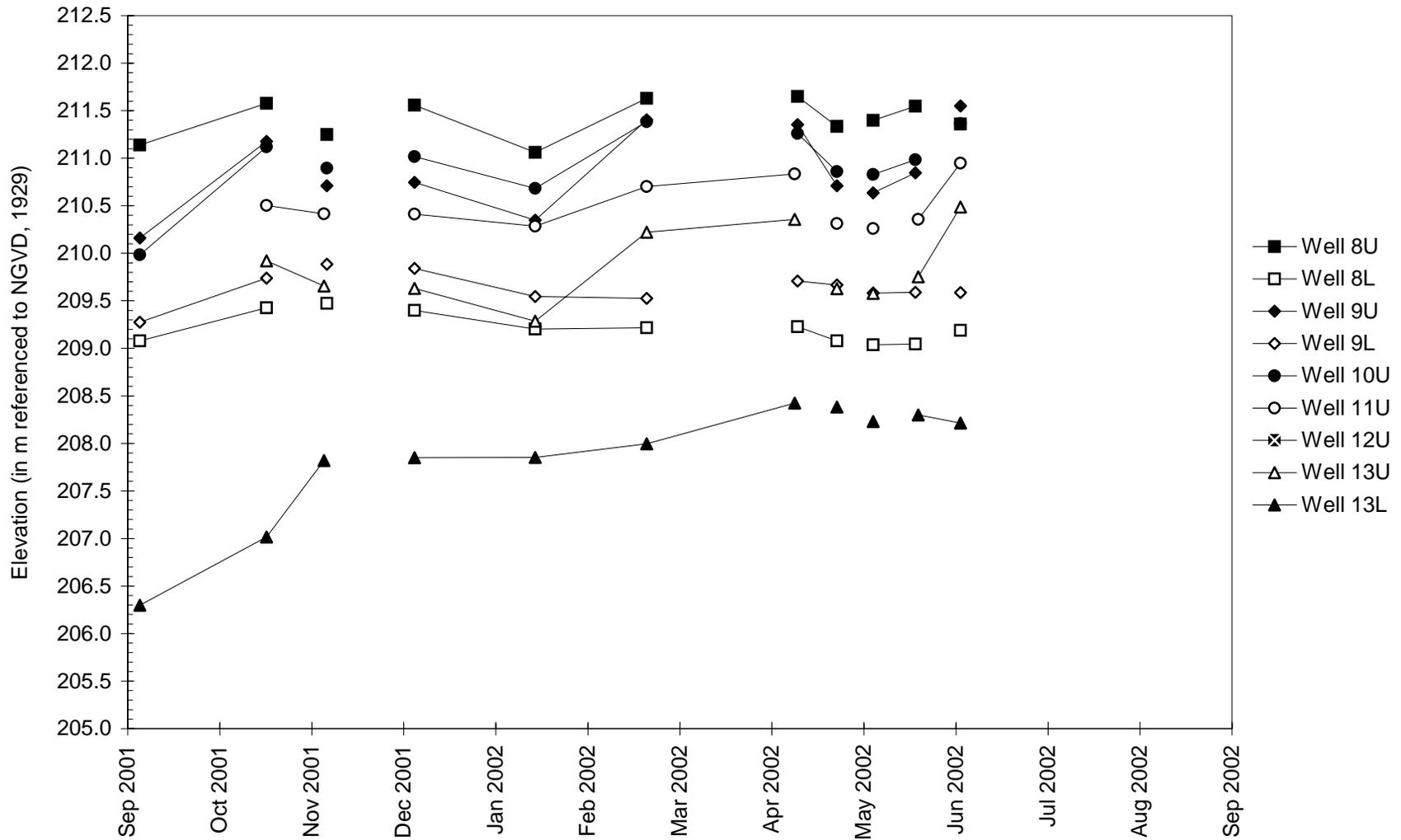
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Depth to Water



# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

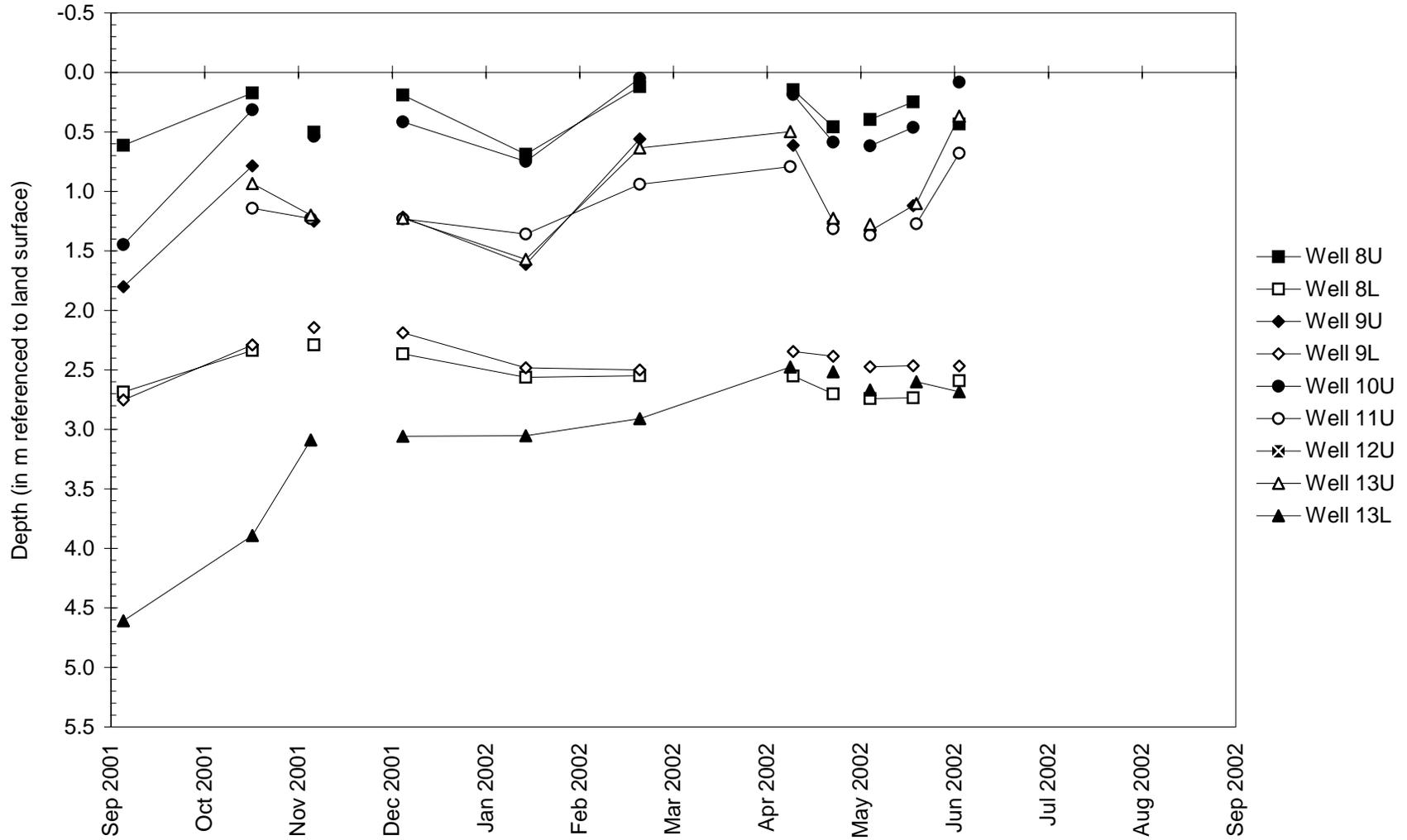
## Water-Level Elevations



# North Chicago Potential Wetland Banking Site

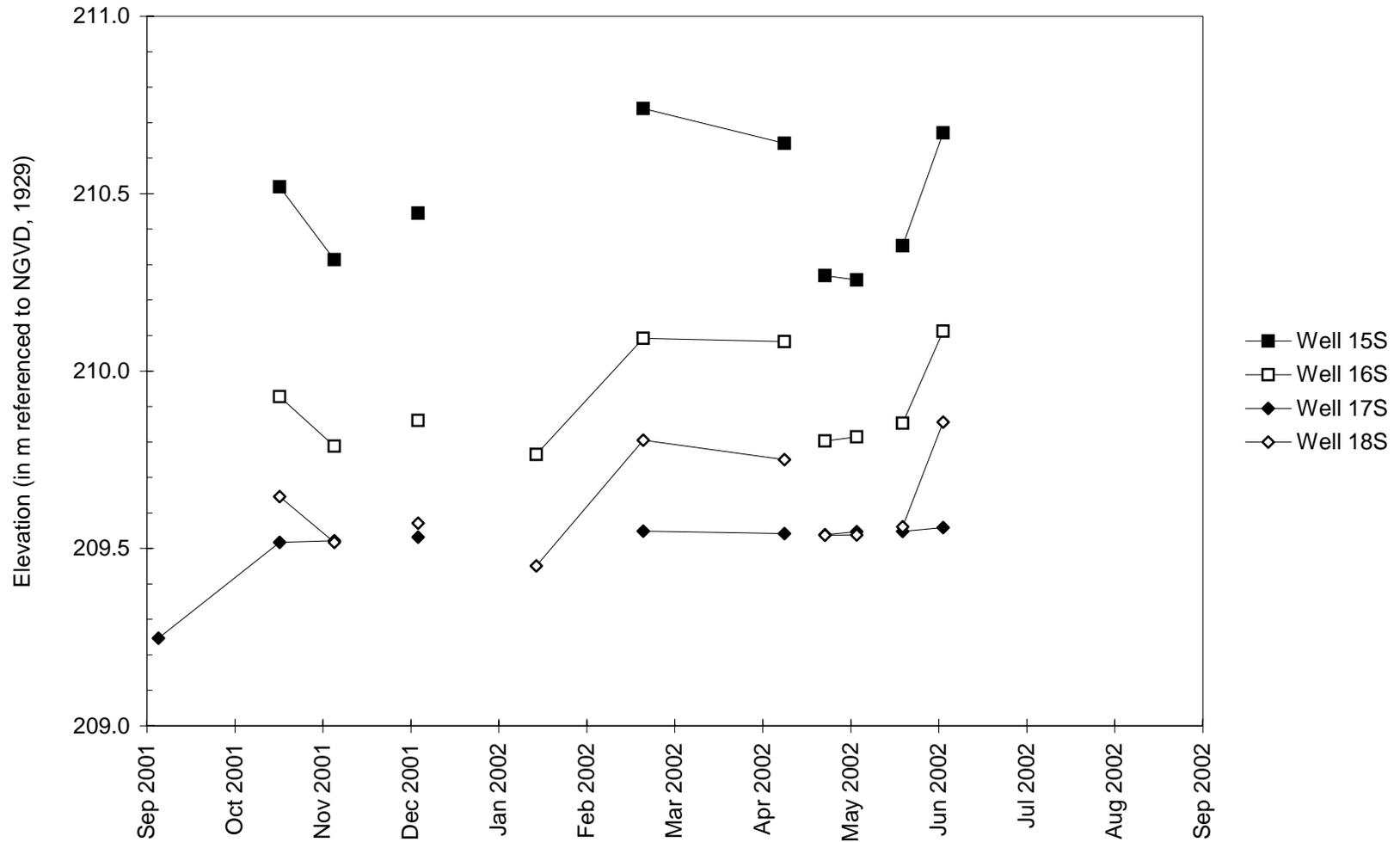
## September 1, 2001 to September 1, 2002

### Depth to Water



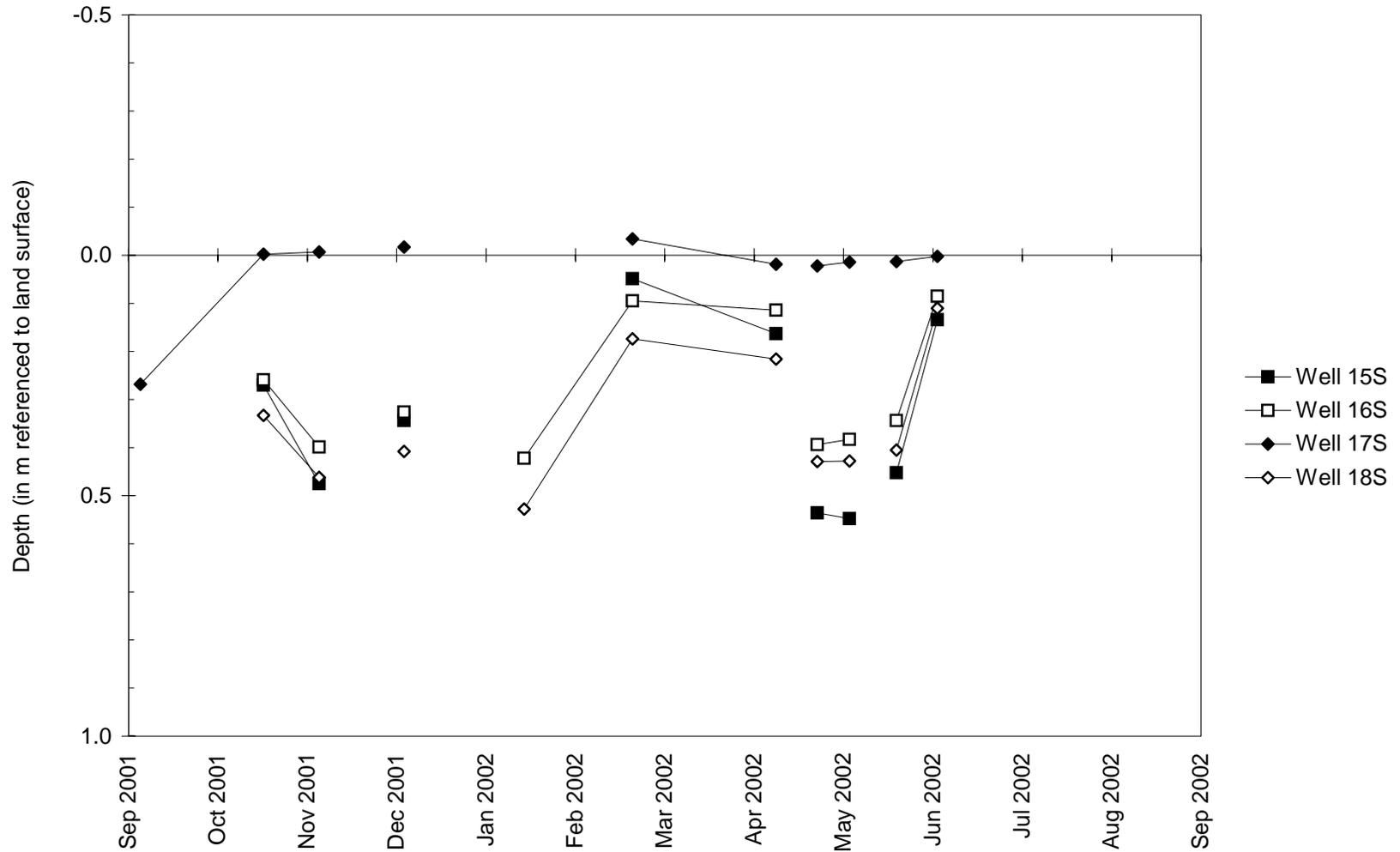
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



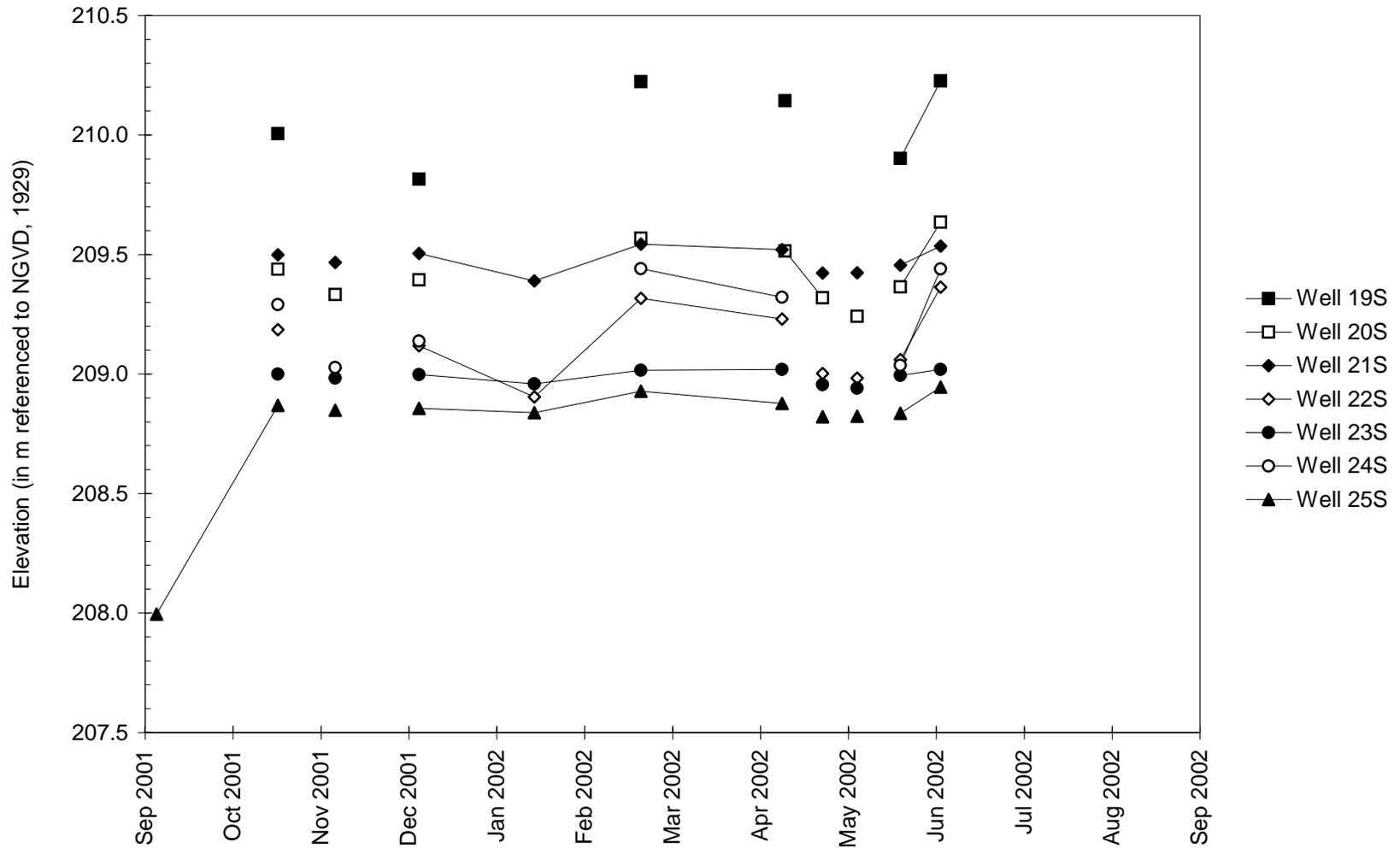
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Depth to Water



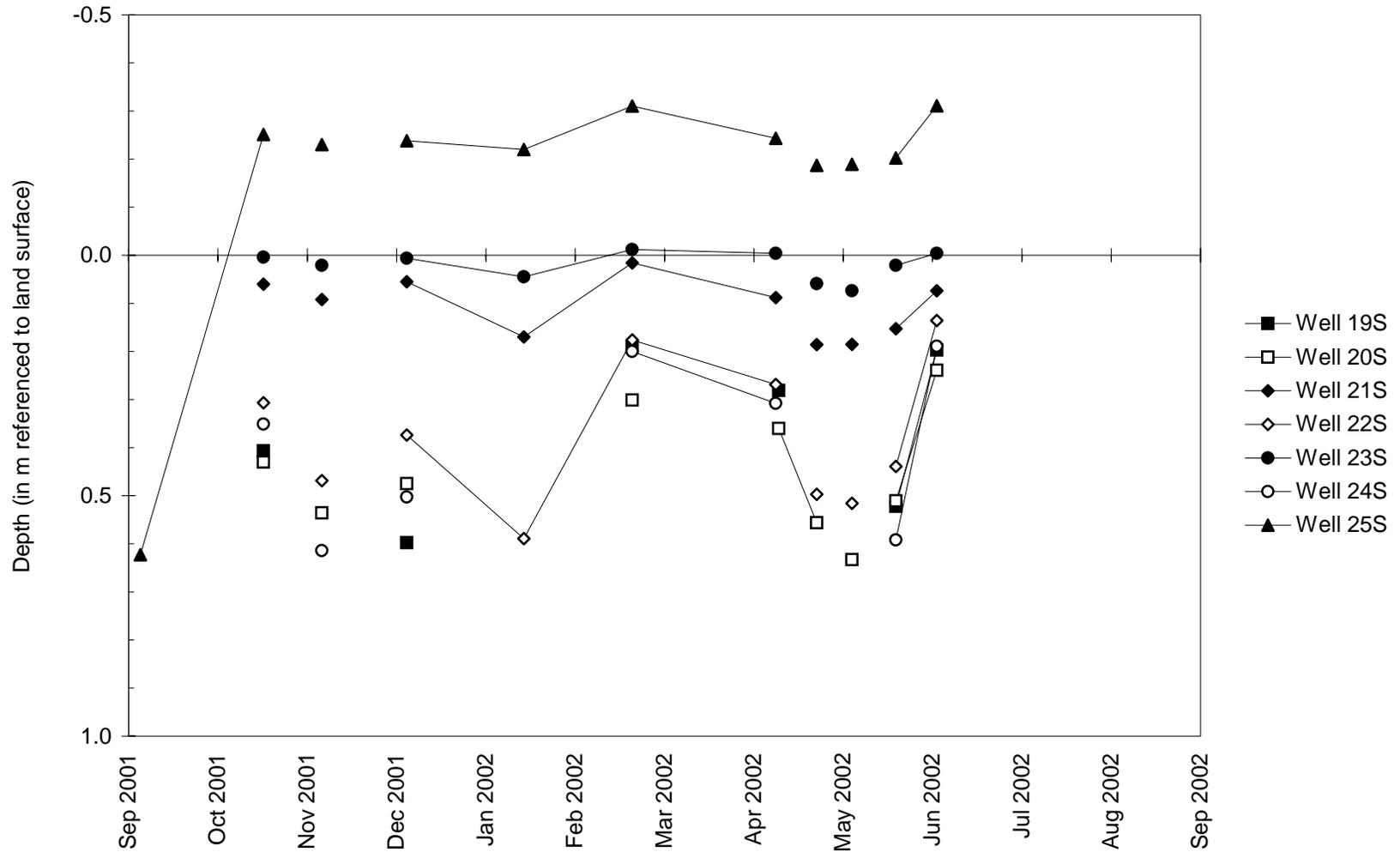
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



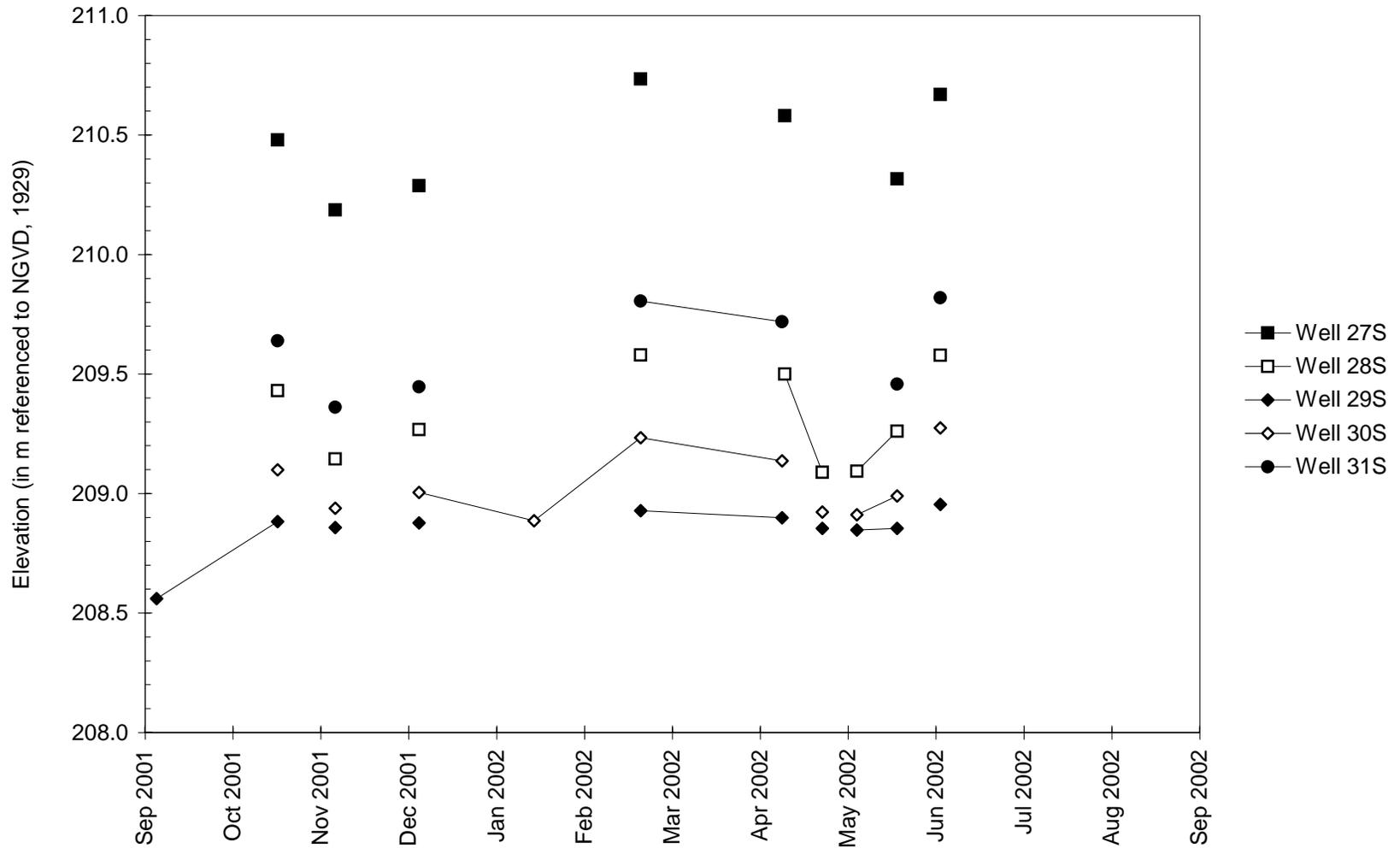
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Depth to Water



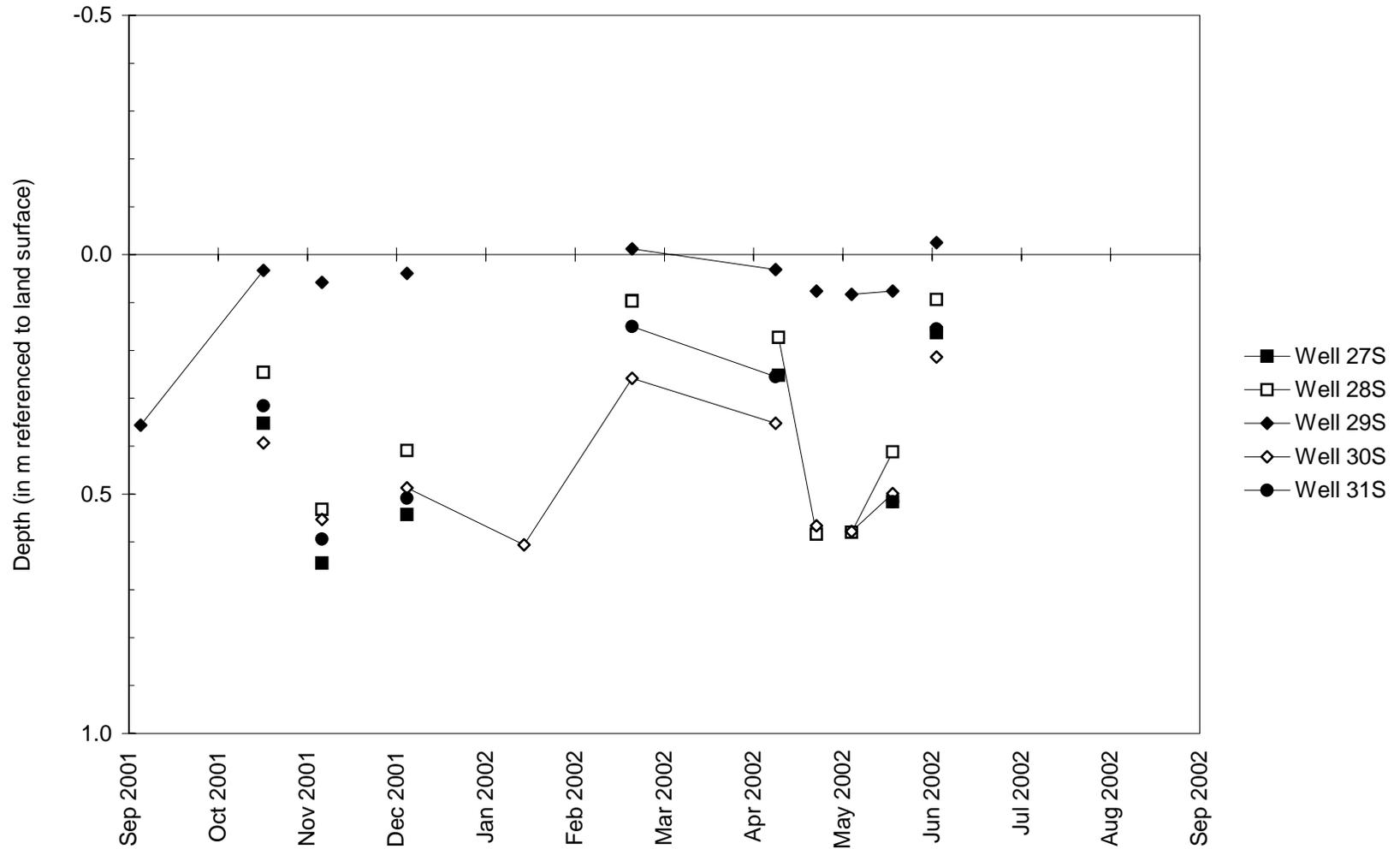
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



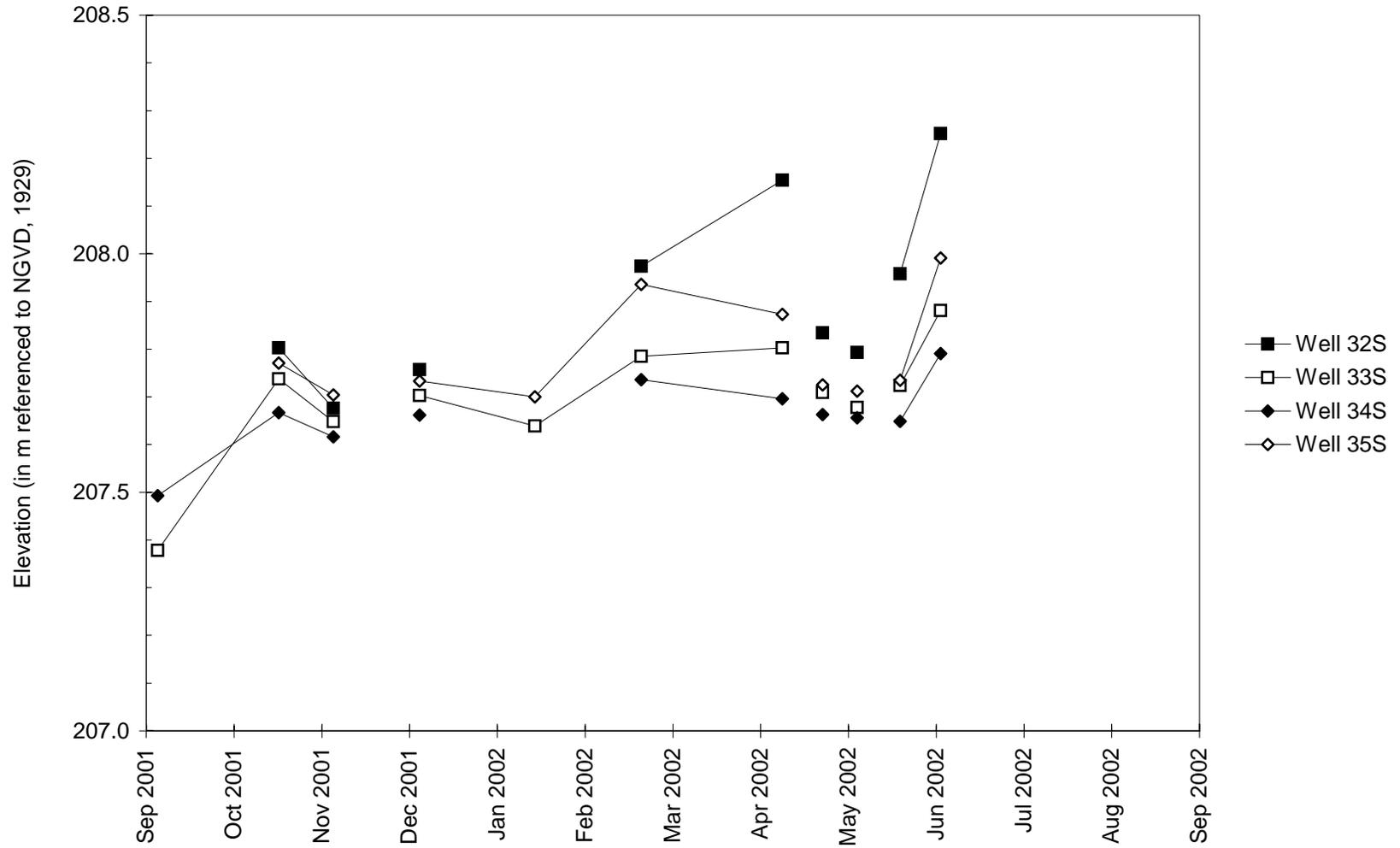
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Depth to Water



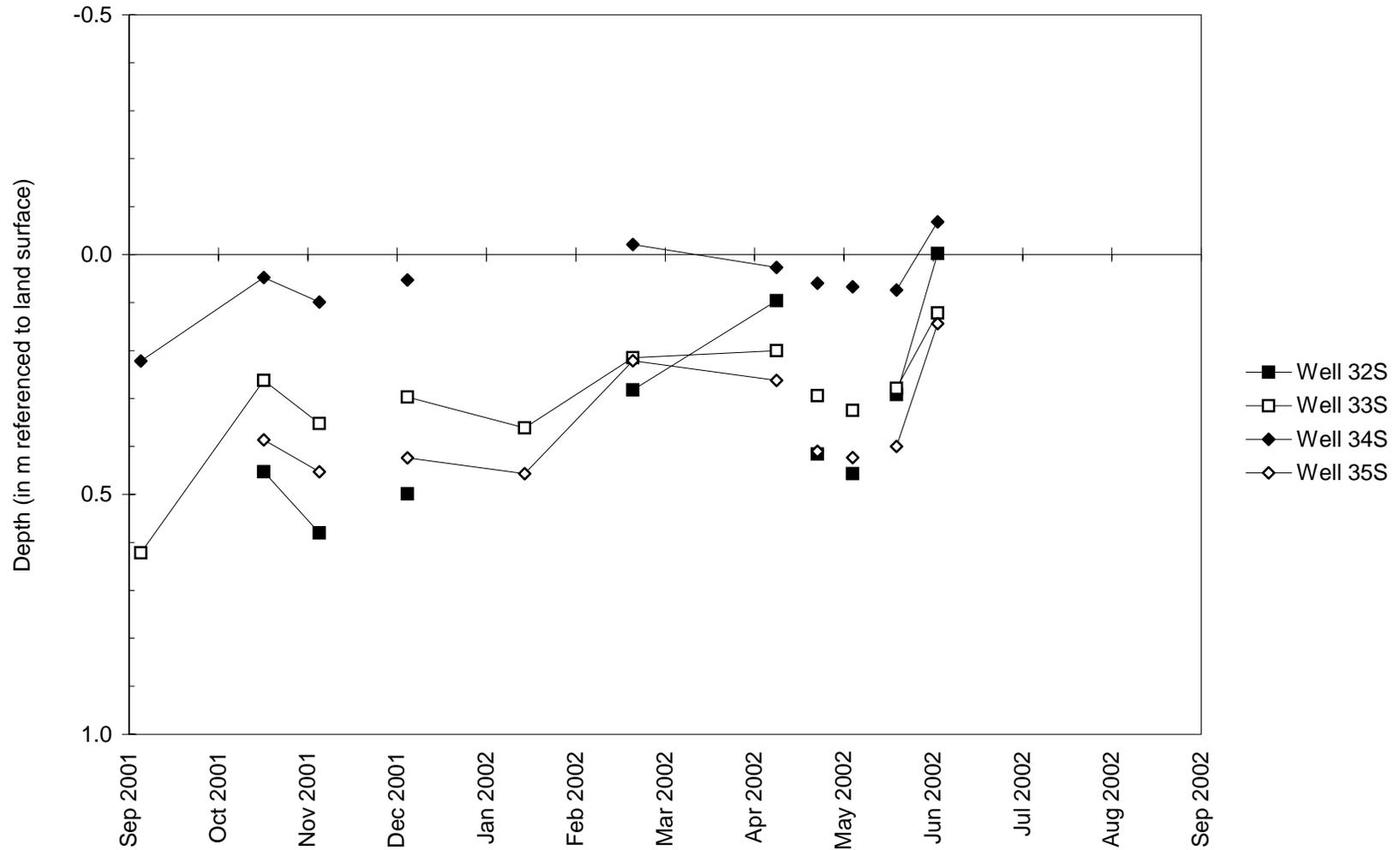
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



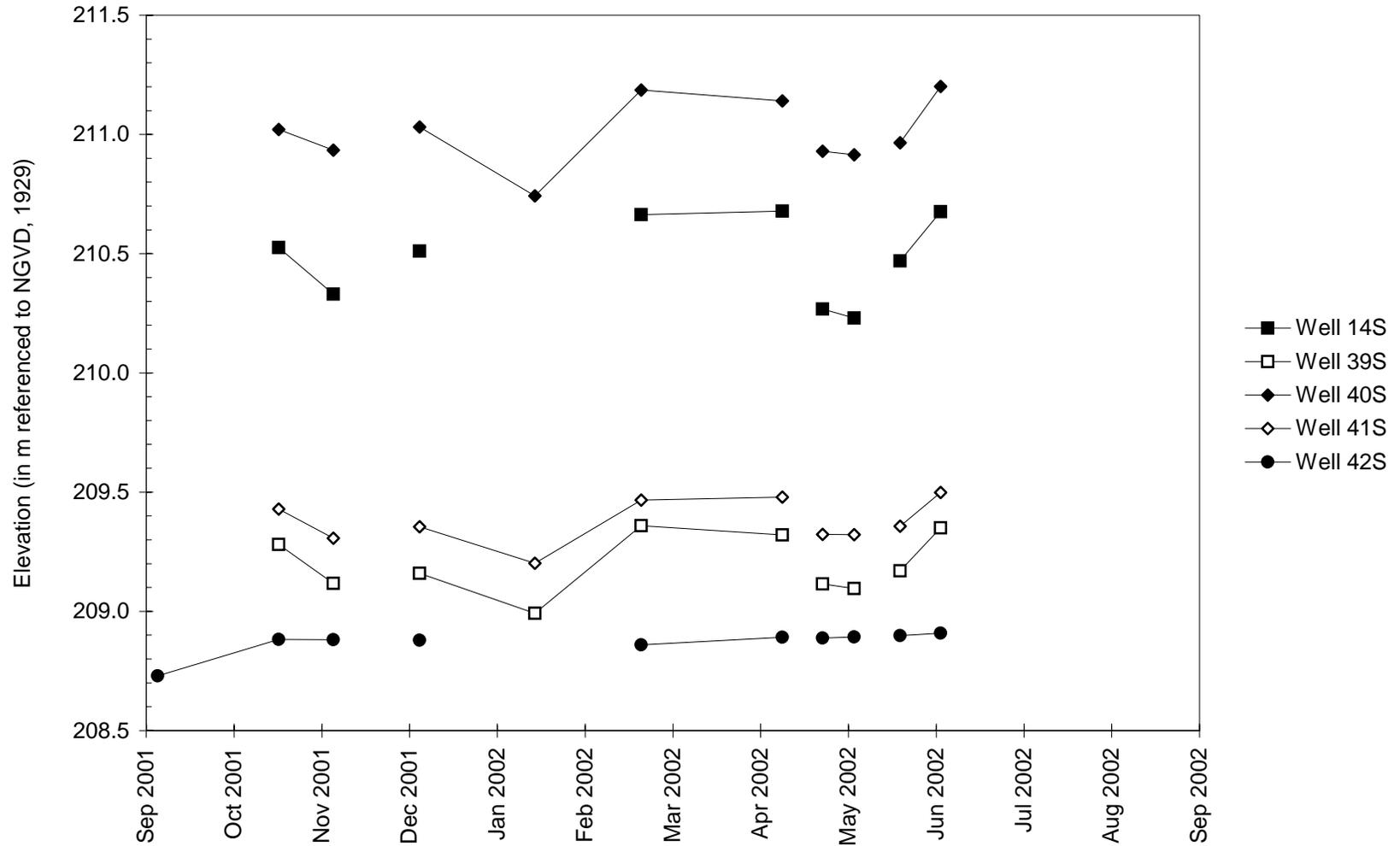
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Depth to Water



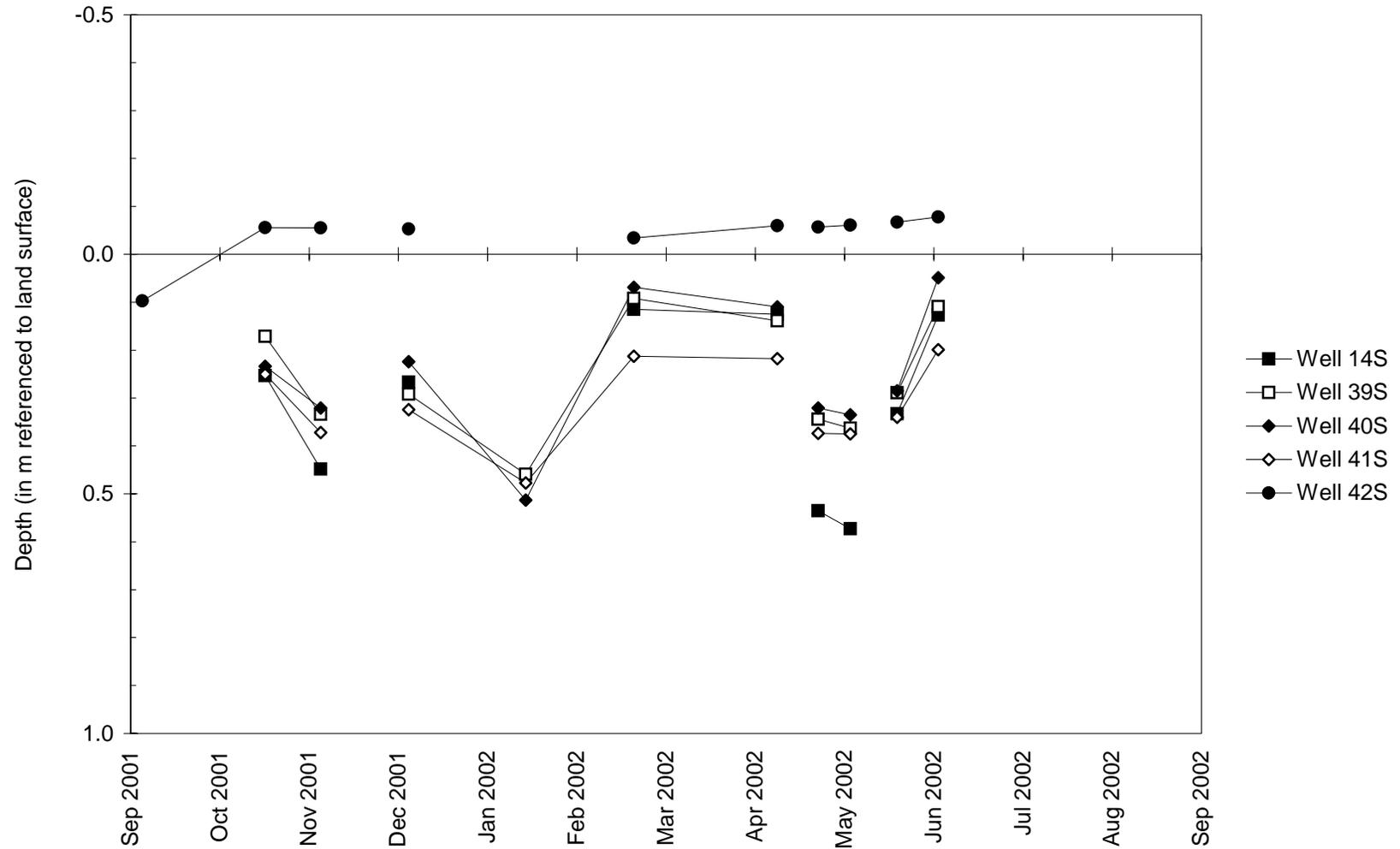
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



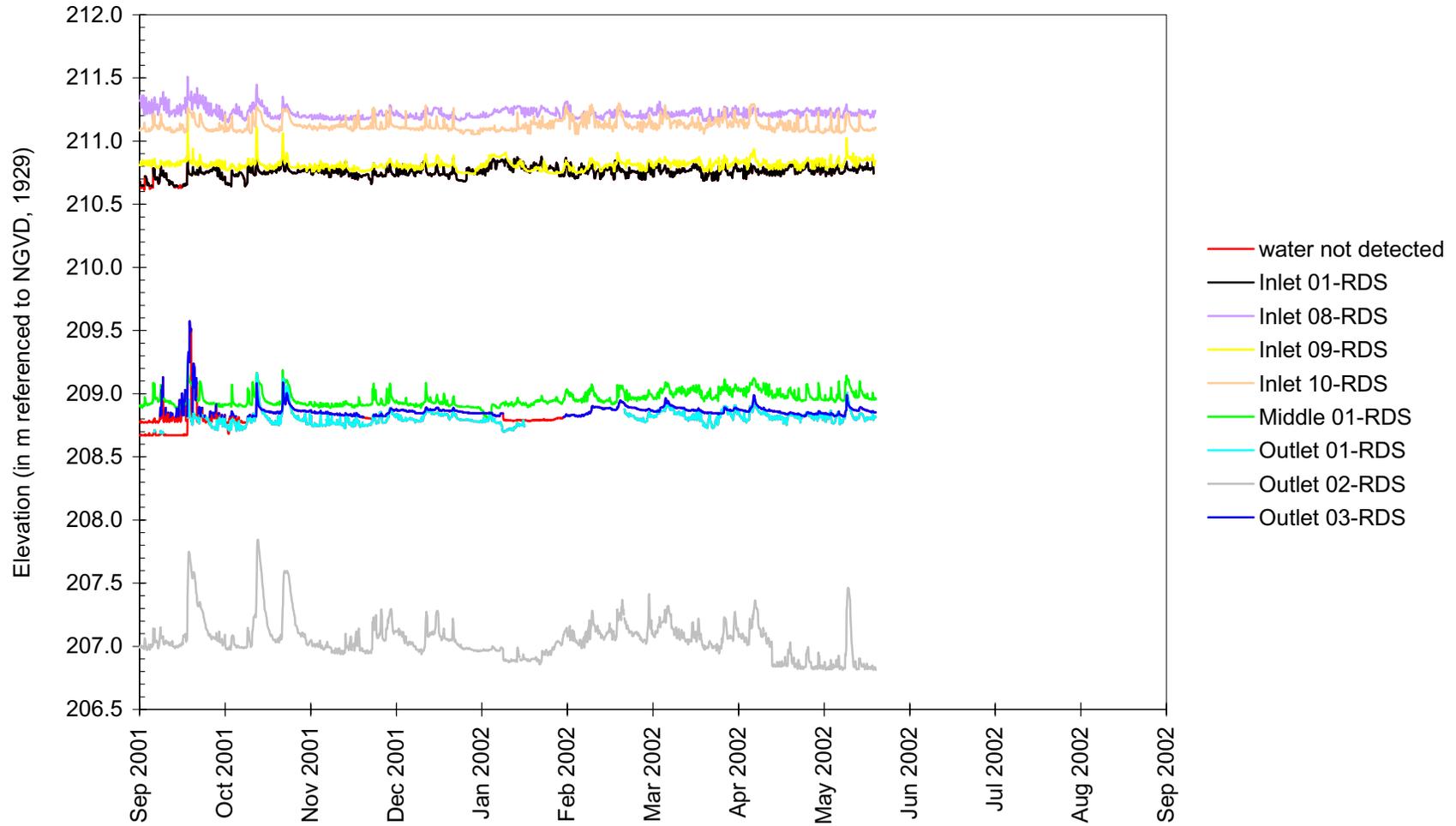
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Depth to Water



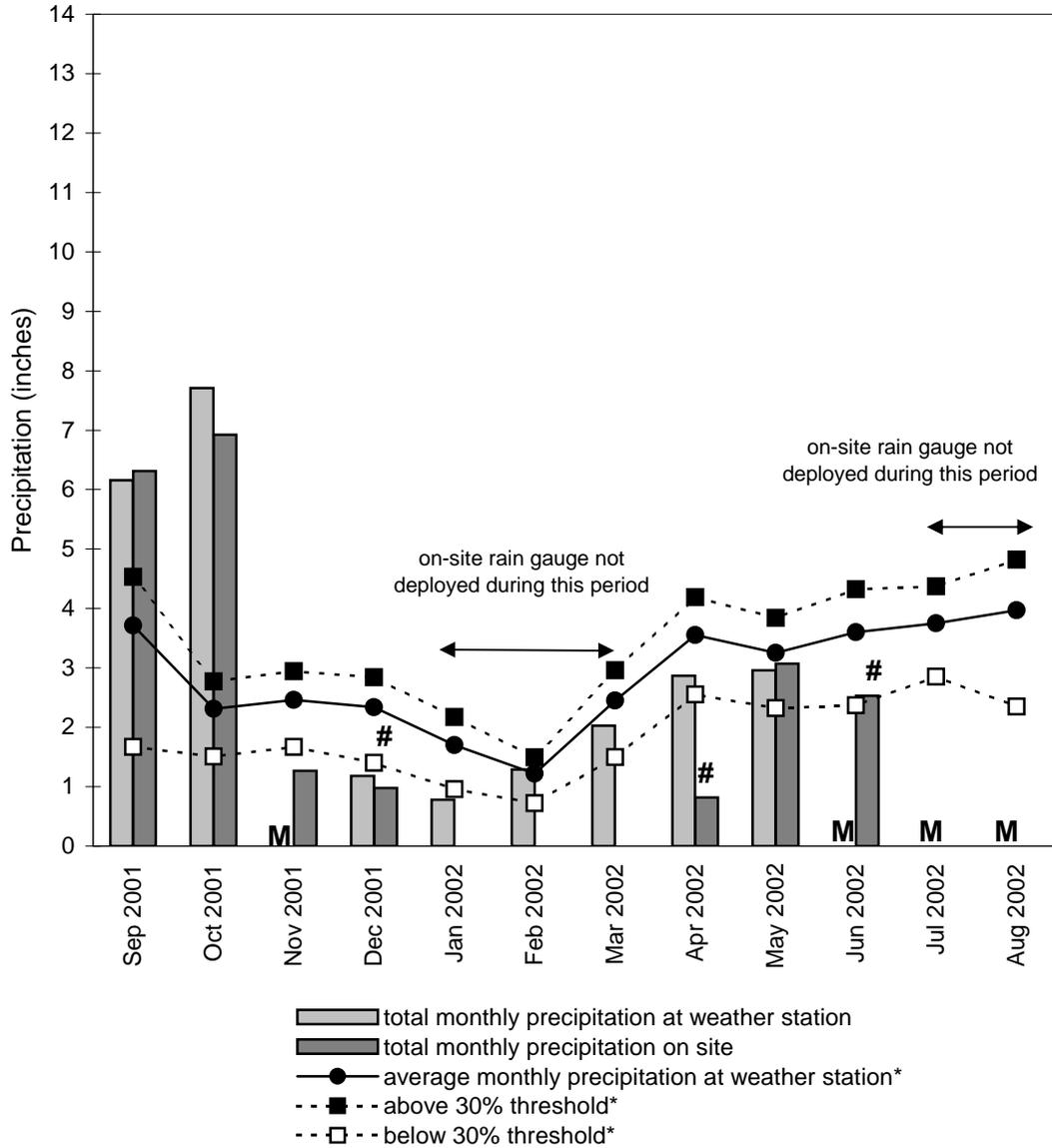
# North Chicago Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations in RDS Data Loggers



# North Chicago Potential Wetland Banking Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the Waukegan, IL Weather Station



# on-site rain gauge not deployed for entire month  
**M** missing data at weather station  
 \* see text for explanation

Graph last updated October 11, 2002

**HANCOCK COUNTY NEAR CARTHAGE  
POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #42**

FAP 315 & 10

Hancock County, near Carthage, Illinois

**Primary Project Manager: Blaine A. Watson**

**Secondary Project Manager: Katherine J. Werner**

**SITE HISTORY**

- October 1997: IDOT obtained landowner permission for the ISGS to begin work.
- February 1998: ISGS installed monitoring wells and began a hydrogeologic characterization of the site.
- September 1999: ISGS installed a surface-water data logger to record stage fluctuations of the La Moine River.
- May 2000: ISGS collected GPS data on locations of all site instruments.
- August 2000: ISGS presented a summary of hydrologic data gathered to-date and participated in general site discussion at a planning meeting with IDOT and Christopher B. Burke Engineering, Ltd. The meeting included discussion of wetland design concerns and construction ideas for the final compensation plan at the site.
- April 2002: ISGS installed wells 17S through 21S, staff gauge E, and RDS #3.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that the total area of the site that conclusively satisfied wetland hydrology criteria in 2002 is 24.8 ac (10.0 ha) out of an area of 44.3 ac (17.9 ha). By comparison, the area of wetland hydrology in 2001 was approximately 23.0 ac (9.2 ha). This year's estimate is based on the following factors:

- According to the Midwestern Climate Center, the median date that the growing season begins in La Harpe is April 11 and the season lasts 192 days; 12.5% of the growing season is 24 days.
- With the exception of March 2002, precipitation at the site or in the site vicinity was within or above the normal range. During the period from September 2001 to June 2002, total precipitation at the site was 133% of the normal amount for those months (July and August 2002 climate station data was not available and isn't included in this value). This is compared to 93% of normal for the entire period from September 2000 through August 2001.
- In 2001, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual: wells 1U, 2U, 3U, 4U, 5U, 6U, 7S, 8U, 10S, 11S, 12S, 13S, 14S, 16S, and 18S. Water levels in well 17S may have satisfied the wetland hydrology criteria, but did not do so conclusively.

- Limitations of the wetland hydrology determination are as follows:
  - There is a small area of upland between wells 6U, 10S, 12S, and 13S that was excluded on the basis of topographic elevation. It is at a higher ground-surface elevation than wells 12S and 13S, both of which met wetland hydrology criteria.
  - The wetland hydrology boundary north of well 3U is also based on topographic elevation. This area has ground-surface elevations similar to that of well 15S and has been excluded from the area meeting wetland hydrology criteria.
  - Well 17S may have met the wetland hydrology criteria, but the area between it and the treeline immediately to the north is at a slightly higher ground elevation. Therefore, this area was excluded from the wetland hydrology determination.

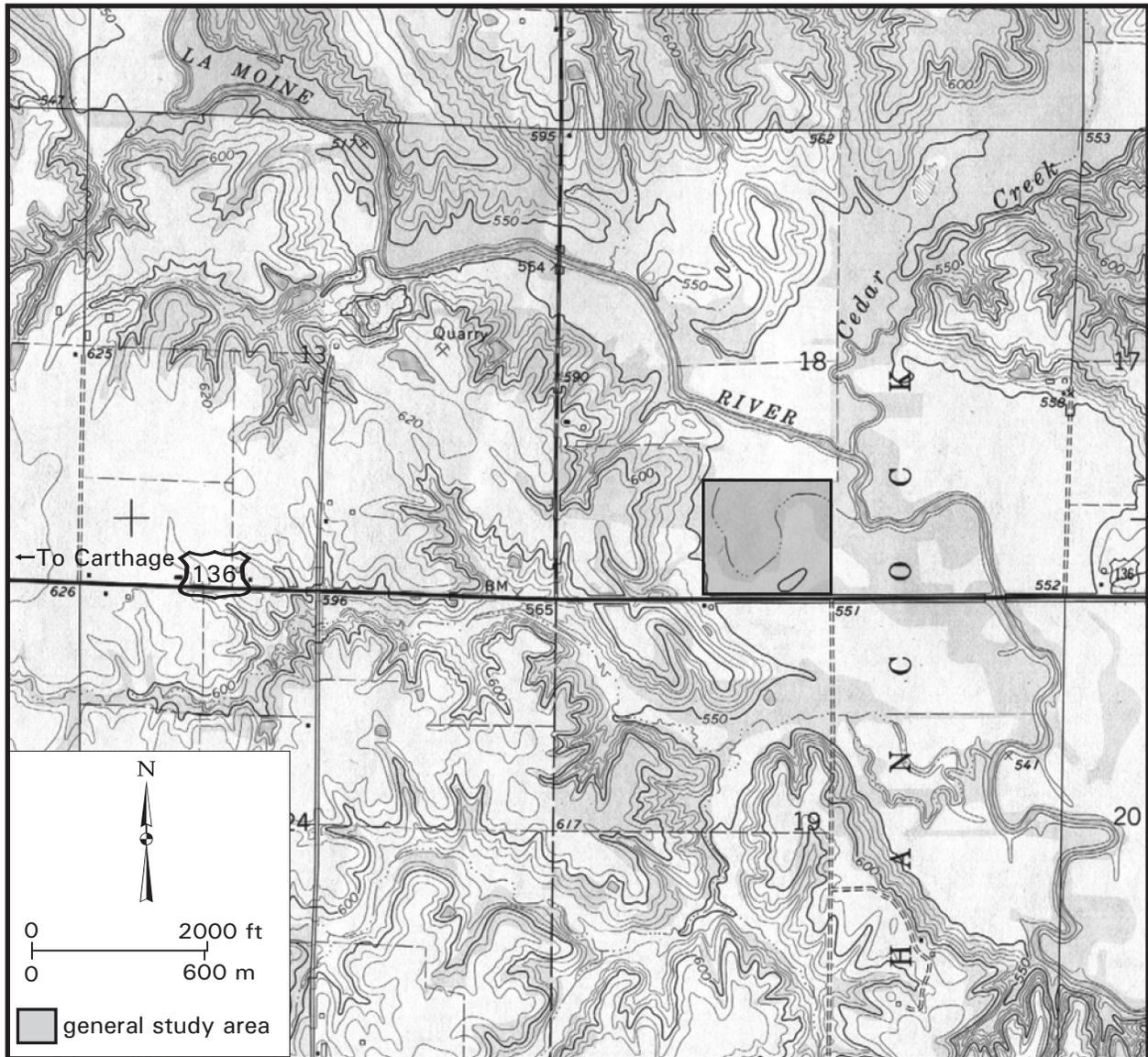
#### PLANNED FUTURE ACTIVITIES

- Monitoring of the site will continue until no longer required by IDOT.
- Installation of additional monitoring wells along wetland/non-wetland boundaries will serve to further define the extent of wetland hydrology. However, the pending site construction activities may result in changes to the distribution of wetland hydrology, so additional monitoring instrumentation will be postponed until after the site construction is complete.

**Hancock County near Carthage  
Potential Wetland Compensation Site  
(FAP 315 and FAP 10)**

**General Study Area and Vicinity**

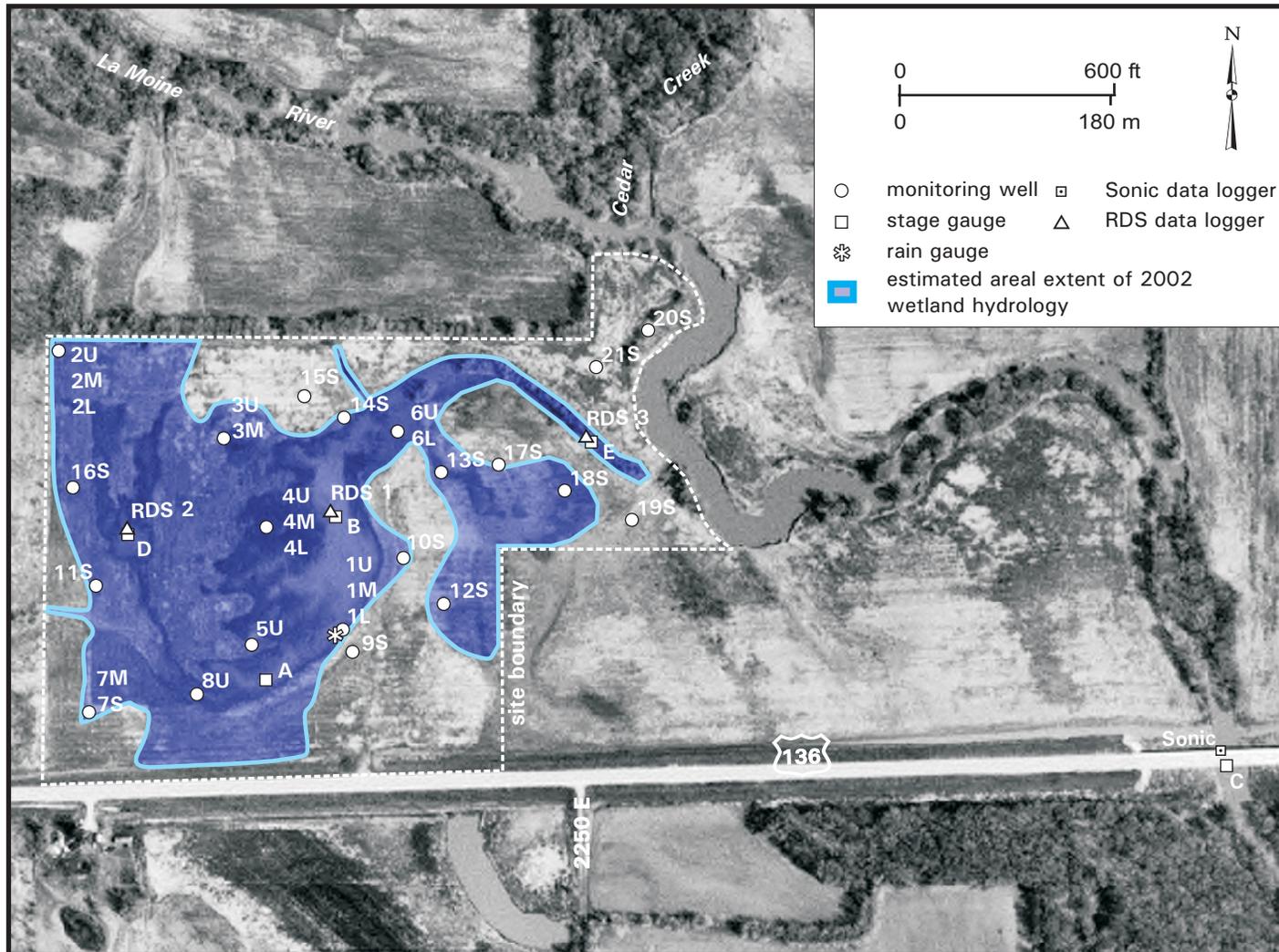
from the USGS Topographic Series, Carthage East, IL 7.5-minute Quadrangle (USGS 1974)  
contour interval is 10 feet



# Hancock County near Carthage Potential Wetland Compensation Site (FAP 315 and FAP 10)

## Estimated Areal Extent of 2002 Wetland Hydrology

map based on USGS digital orthophotograph Carthage East, SE quarter quadrangle  
produced from 4/14/98 aerial photography (ISGS 2002)

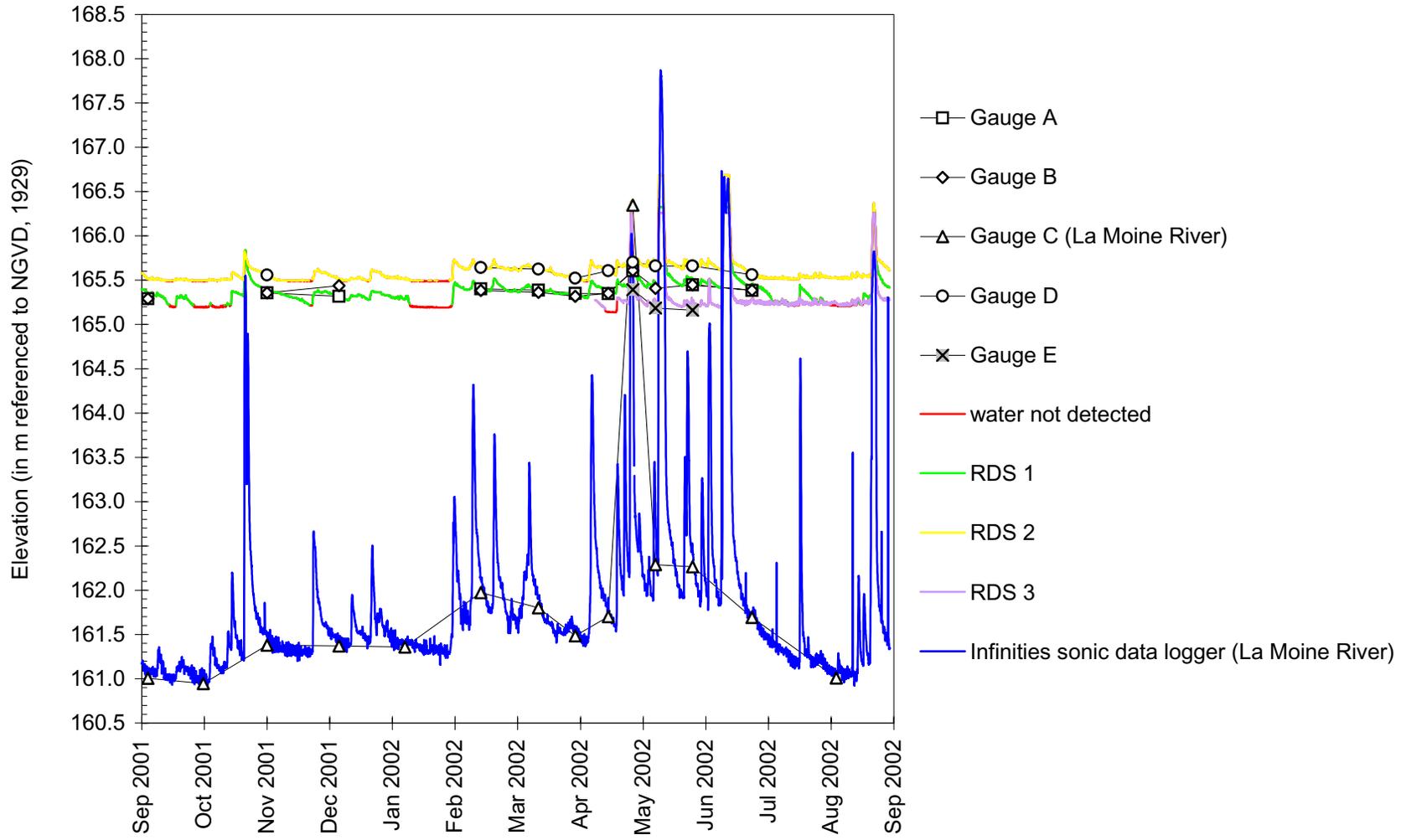




# Hancock County near Carthage Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

## Water-Level Elevations on Stage Gauges and at Data Loggers

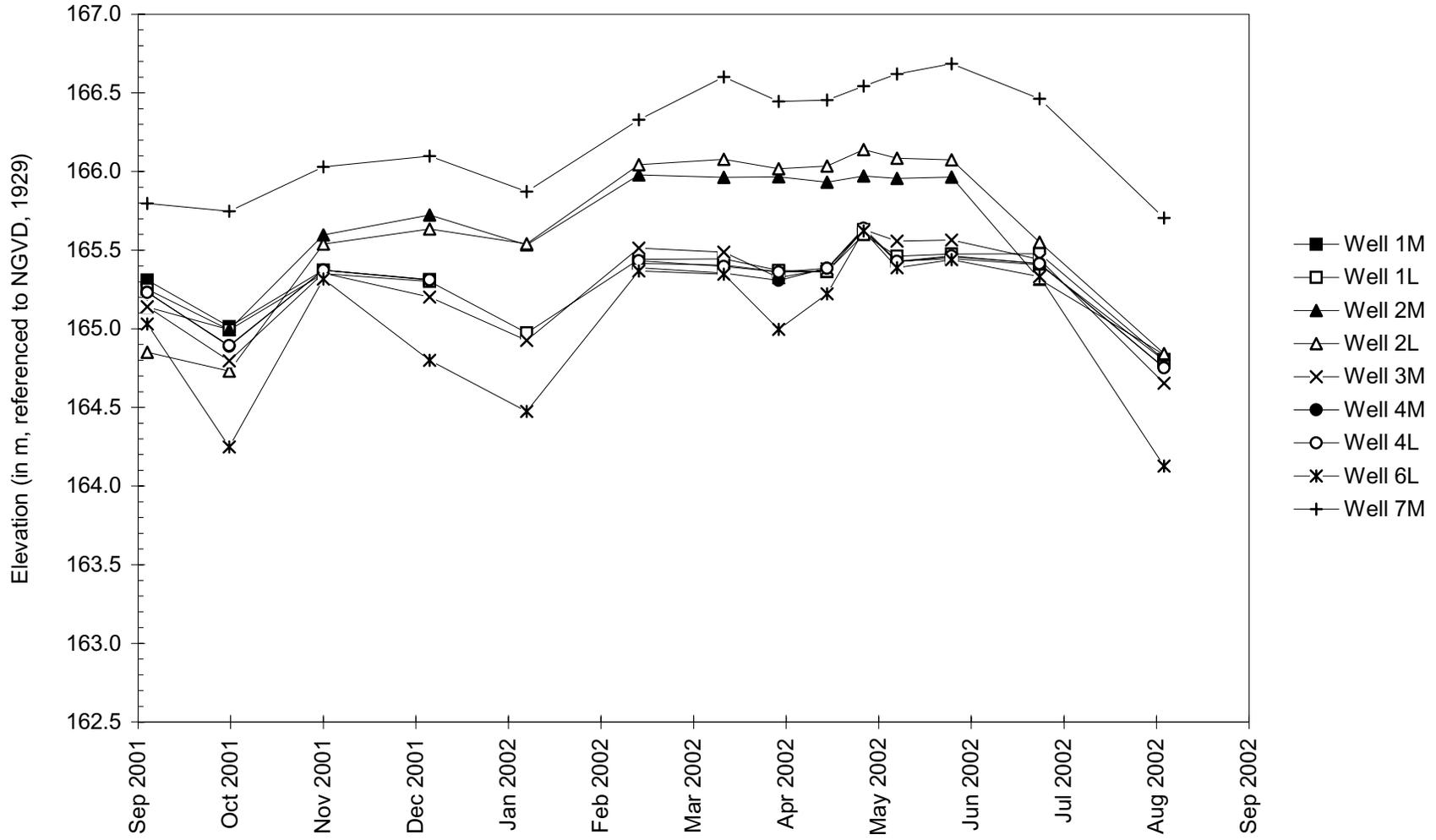




# Hancock County near Carthage Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

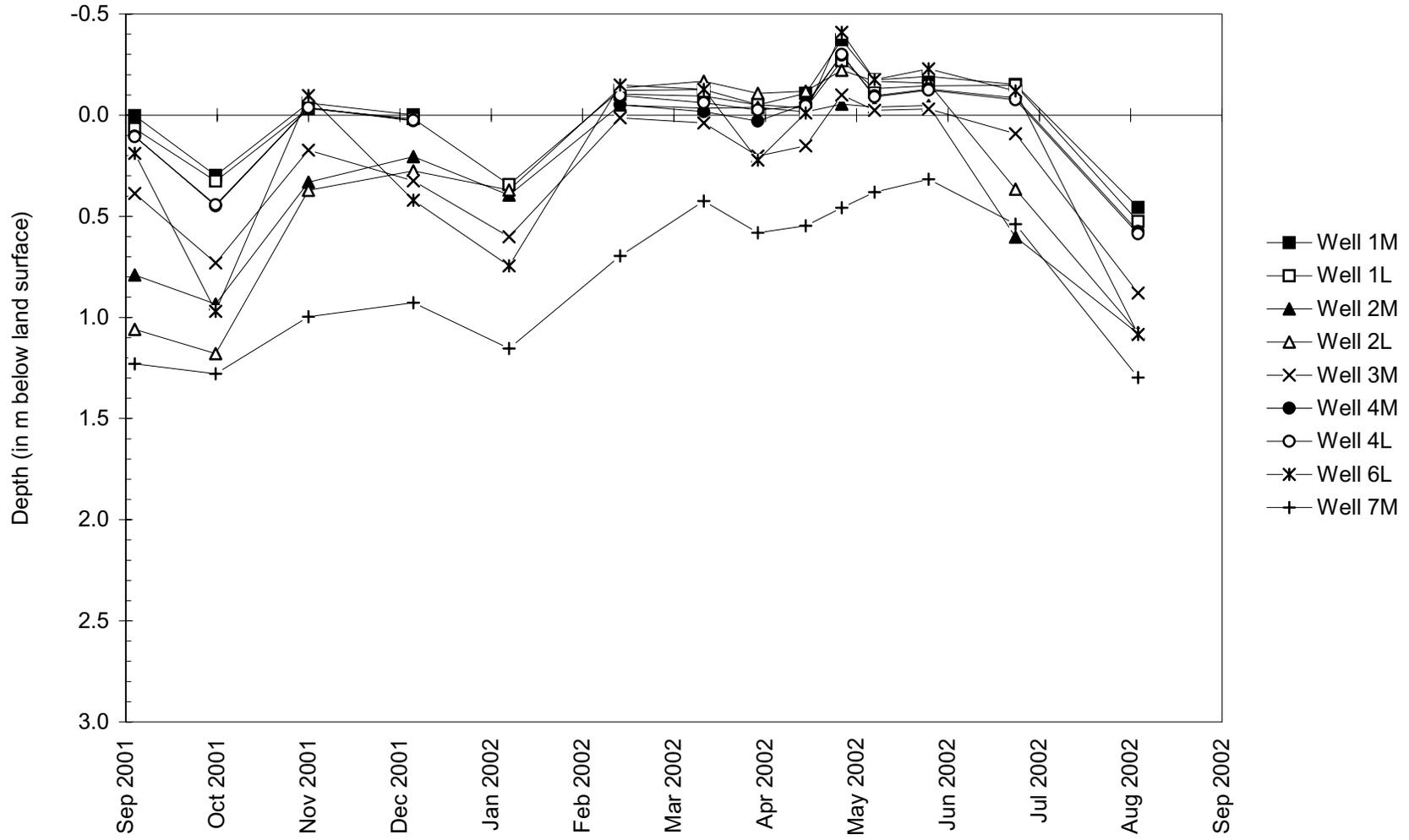
## Water-Level Elevations in Deeper Monitoring Wells



# Hancock County near Carthage Potential Wetland Compensation Site

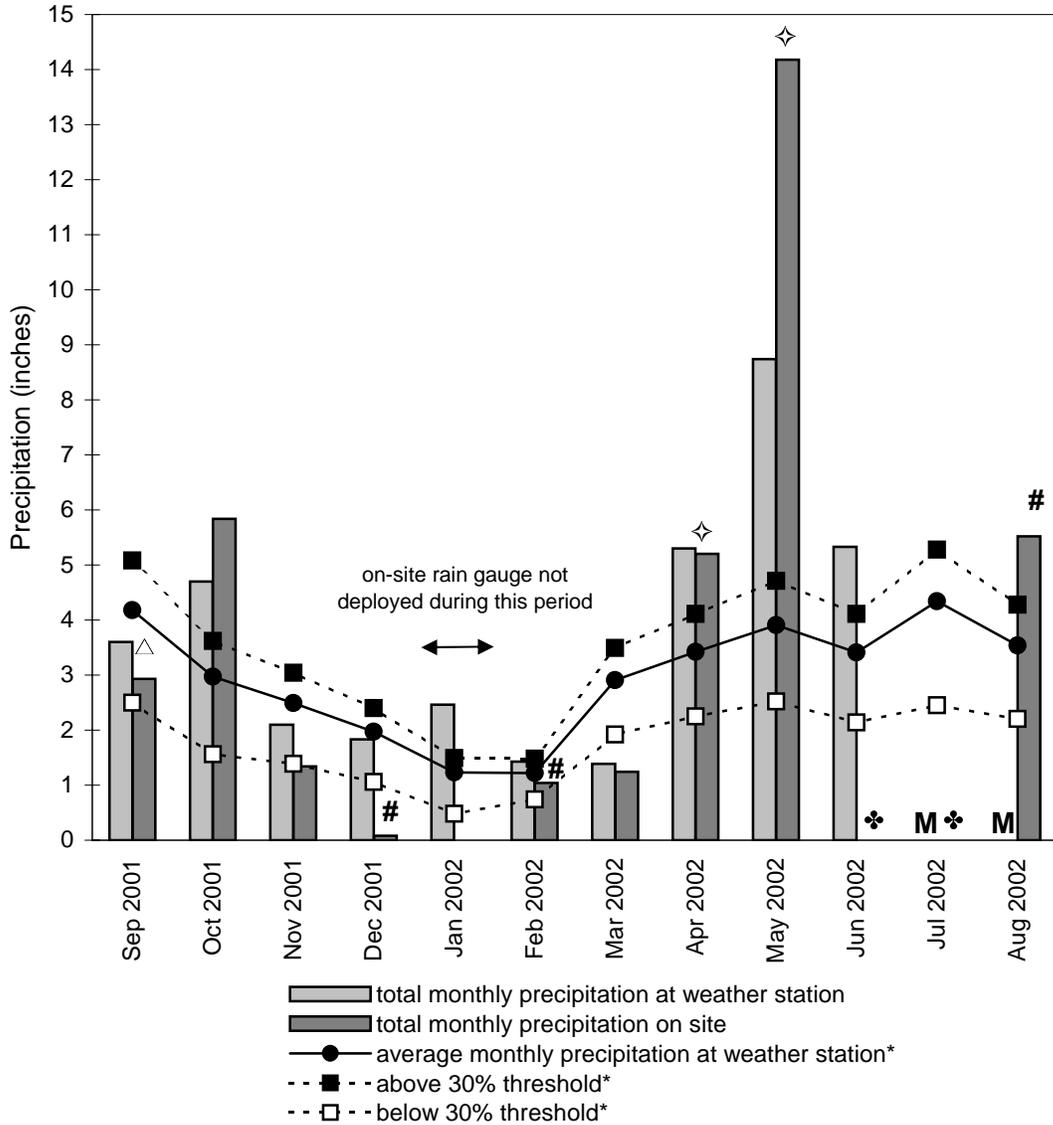
September 1, 2001 to September 1, 2002

## Depth to Water in Deeper Monitoring Wells



## Hancock County near Carthage Potential Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Bentley, IL Weather Station



- # on site rain gauge not deployed for entire month
- △ suspect data - rain collector clogged or malfunctioning; represents minimum value for month
- ◇ suspect data - on-site rain gauge malfunctioning due to flooding
- ♣ no data - on-site rain gauge damaged by flooding
- M missing data at weather station
- \* see text for explanation

Graph last updated October 11, 2002

**FORMER ECKMANN AND BISCHOFF PROPERTIES  
POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #43**

FAP 14

Madison County, near Collinsville, Illinois

**Primary Project Manager: D. Bradley Ketterling**

**Secondary Project Manager: Bonnie J. Robinson**

**SITE HISTORY**

- November 1994: The ISGS submitted an Initial Site Evaluation Report to IDOT.
- February and March 1997: A hydrogeologic characterization of the site was initiated with the installation of monitoring wells and staff gauges.
- October 1998: A draft characterization report was submitted to IDOT.
- March, April, and July 2000: Four soil-zone monitoring wells were installed in the Eckmann property and nine soil-zone monitoring wells were installed in the former Bischoff property.
- May 2001: A site meeting was held with representatives of the IDOT and the Metro East Sanitary District to discuss replacing the gravity drain in the Cahokia Canal levee with a new culvert having a flapper valve where it opens into the canal.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Using well coordinates derived via GPS and a mathematical interpolation of the shallow groundwater surface, the total area that satisfied wetland hydrology criteria in 2002 was determined to be 53.0 ac (21.4 ha). In 2001, 31.4 ac (12.7 ha) met the criteria for wetland hydrology. The figure for 2002 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season at Belleville, Illinois is 203 days, starting April 5 and ending October 24. Therefore, 12.5% of the growing season is 25 days.
- Above-normal precipitation in October and December, 2001 promoted widespread flooding on the site. High water levels persisted through the winter months and were augmented by above-normal rainfall in March, April, and May. In summary, precipitation during the monitoring period was 108% of normal. Precipitation during the previous monitoring period was 84% of normal.
- All of the former Eckmann property and 70% of the former Bischoff property conclusively met the criteria for wetland hydrology as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Only the highest areas on the eastern flank of the Cahokia Canal levee (characterized by wells 16S, 17S and 18S) did not meet the criteria.

#### ADDITIONAL INFORMATION

- A final hydrogeologic characterization report is undergoing ISGS internal review and will be submitted in the near future.

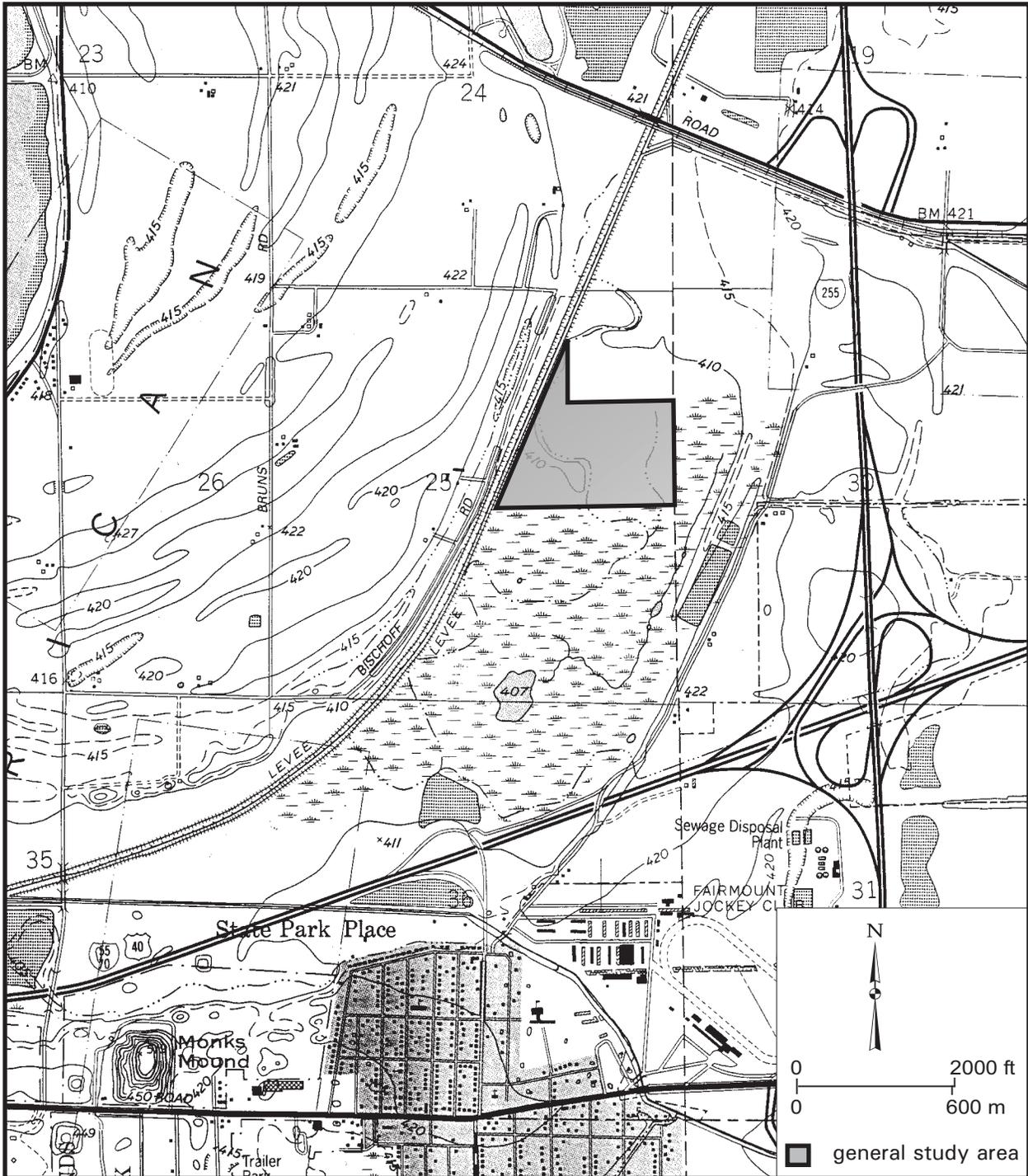
#### PLANNED FUTURE ACTIVITIES

- Monitoring for wetland hydrology will continue at this site through 2003 or until no longer required by IDOT.

**Former Eckmann and Bischoff Properties  
Potential Wetland Compensation Site  
(FAP 14)**

**Study Area and Vicinity**

from the USGS Topographic Series, Monks Mound IL 7.5-minute Quadrangle (USGS 1954, revised 1993)  
contour interval is 10 feet



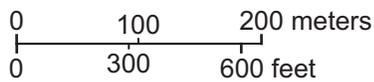
**Former Eckmann and Bischoff Properties  
Potential Wetland Compensation Site  
(FAP 14)**

**Estimated Areal Extent of 2002 Wetland Hydrology  
based on data collected between September 1, 2001 and September 1, 2002**

map based on USGS digital orthophotograph, Monk's Mound, SE quarter quadrangle  
produced from 4/2/98 aerial photography (ISGS, 2000)



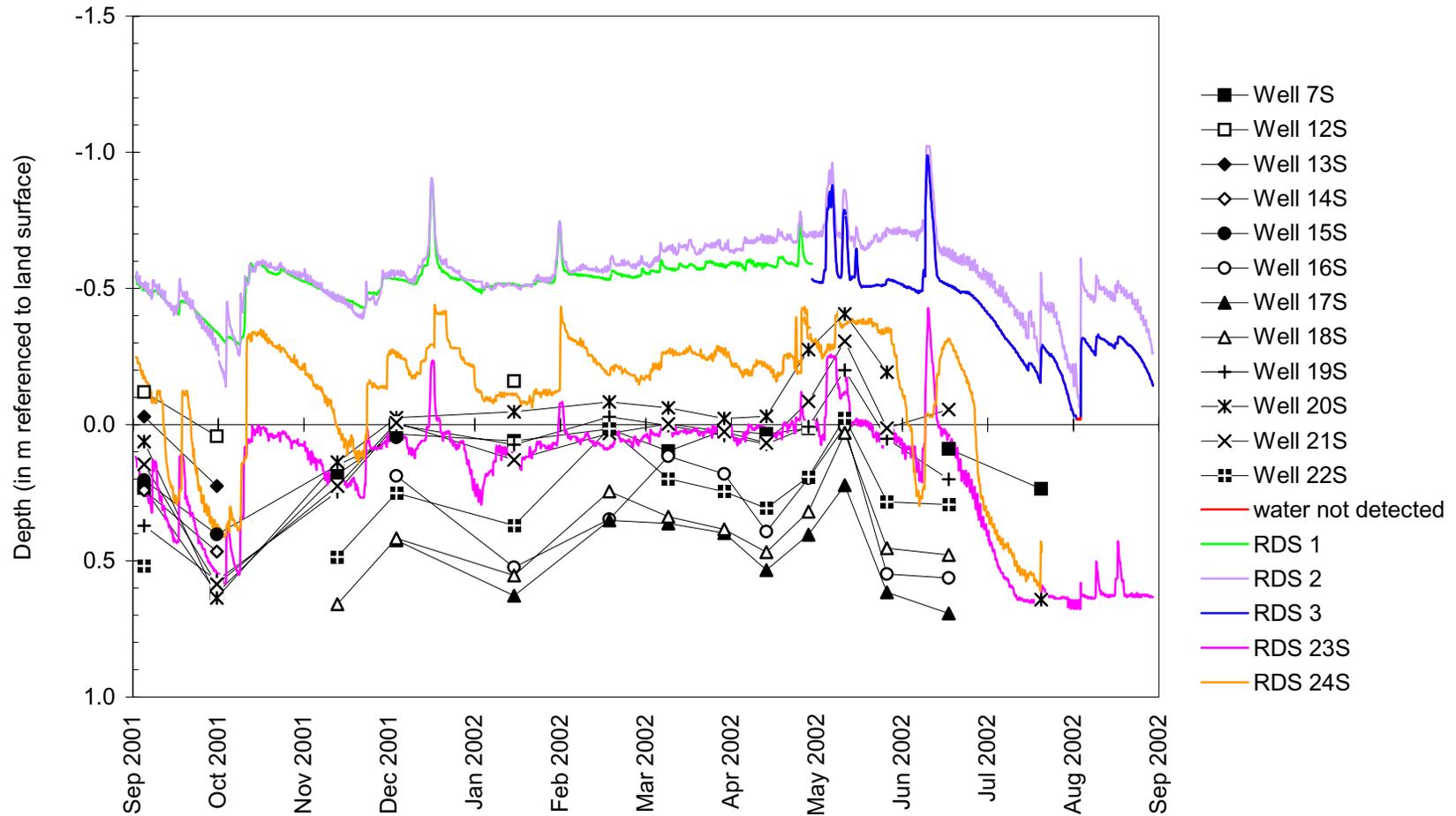
- monitoring well
- staff gauge
- ▲ RDS surface-water stage recorder
- \* rain gauge
- extent of 2002 wetland hydrology
- site boundary





# Former Eckmann and Bischoff Properties Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

## Depth to Water in Soil-Zone Monitoring Wells and Data Loggers

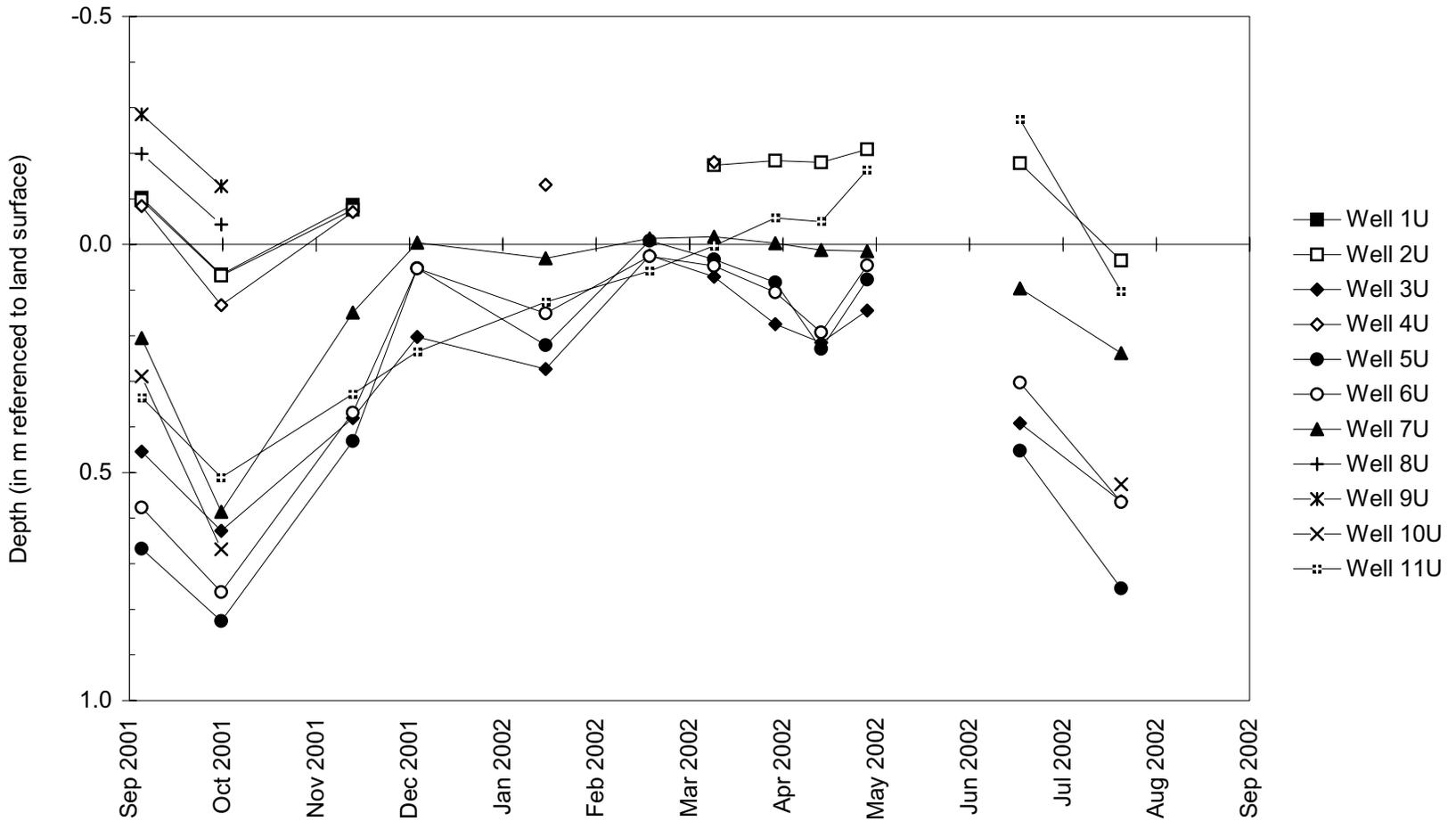






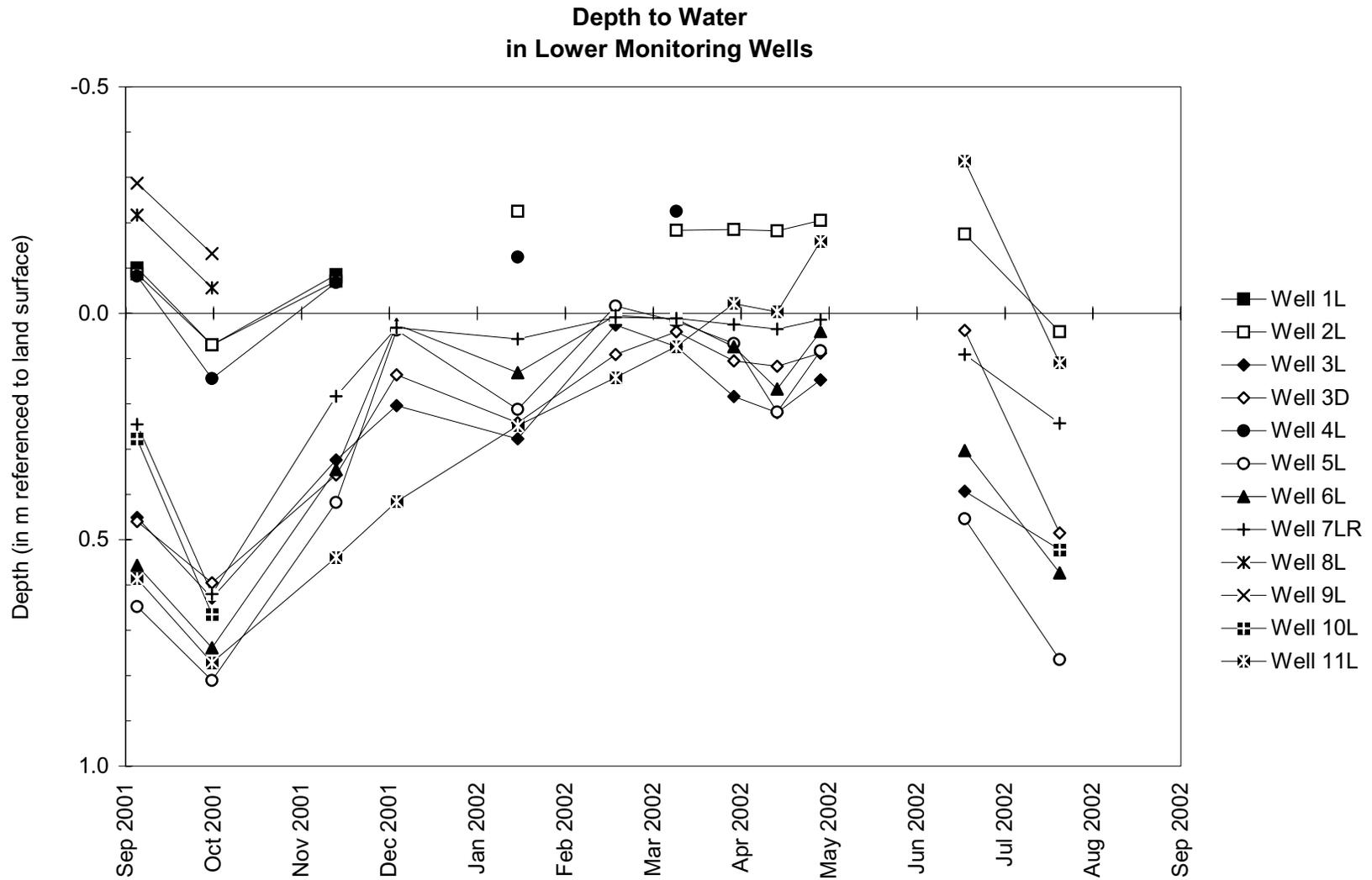
**Former Eckmann and Bischoff Properties Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Depth to Water**  
**in Upper Monitoring Wells**



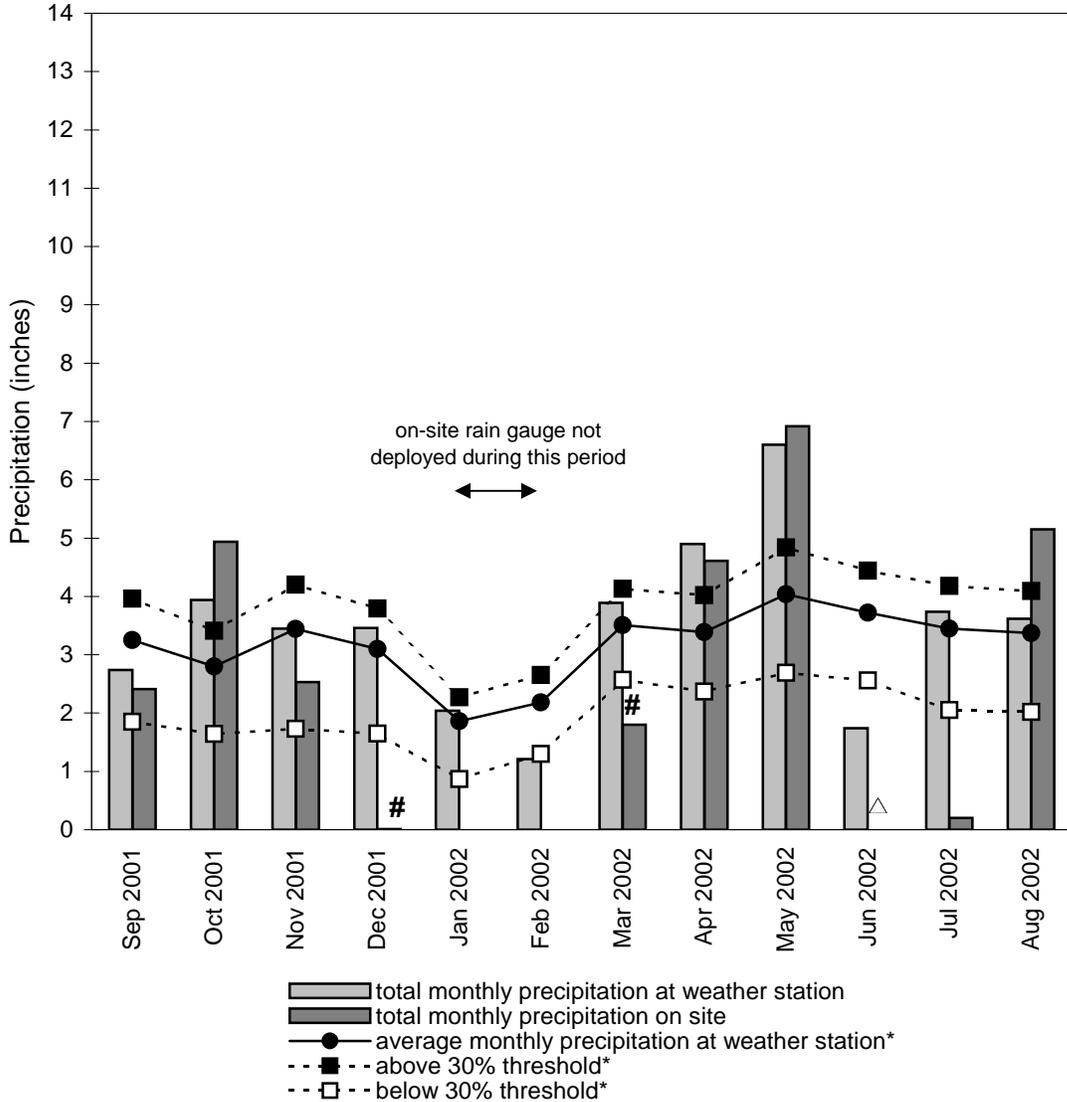


**Former Eckmann and Bischoff Properties Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**



**Former Eckmann and Bischoff Properties  
Potential Wetland Compensation Site  
September 2001 through August 2002**

**Total Monthly Precipitation Recorded On Site and at the  
Belleville, IL SIU Research Center Weather Station**



# on-site rain gauge not deployed for entire month

Δ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

\* see text for explanation

Graph last updated October 11, 2002

**PERRY COUNTY  
WETLAND COMPENSATION SITE**

**ISGS #45**

FAS 864

Perry County, near Pinckneyville, Illinois

**Primary Project Manager: Bonnie J. Robinson**

**Secondary Project Manager: D. Bradley Ketterling**

**SITE HISTORY**

- Winter 1998–1999: Monitoring wells were installed above and adjacent to the longwall mining panels prior to impending mining. Locations were chosen by the Illinois Natural History Survey (INHS) to coincide with soil test plots. Mining and subsidence occurred during 1999, so that preexisting conditions could not be documented.
- April 1999: The INHS observed that two ponds had been created by mine subsidence. One and one half panels were subsided in 1999 prior to the end of mining.
- November 2000, February 2001: Twenty-five soil-zone monitoring wells and 2 RDS water-level loggers were installed.
- February 2002: ISGS received notice from IDOT that monitoring was to be discontinued.
- May 2002: All wells and data loggers removed.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

In February 2002, IDOT asked the ISGS to discontinue monitoring the hydrology of the site. As such, no wetland hydrology calculation was carried out for 2002. Data are presented here for informational purposes only.

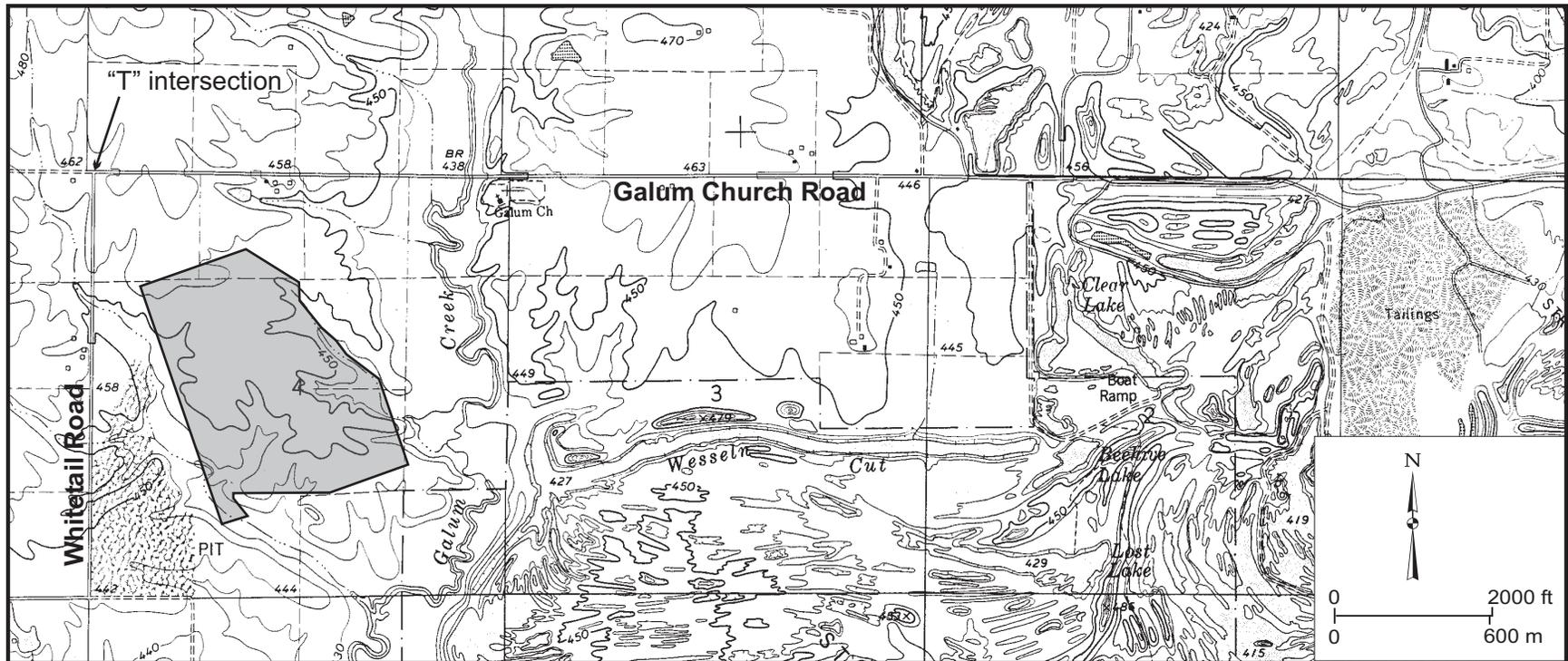
**PLANNED FUTURE ACTIVITIES**

- RDS water-level logger installations must be removed.

# Perry County Wetland Compensation Site (FAS 864)

## General Study Area and Vicinity

from the USGS Topographic Series, Pinckneyville, IL 7.5-minute Quadrangle (USGS 1981)  
contour interval is 10 feet

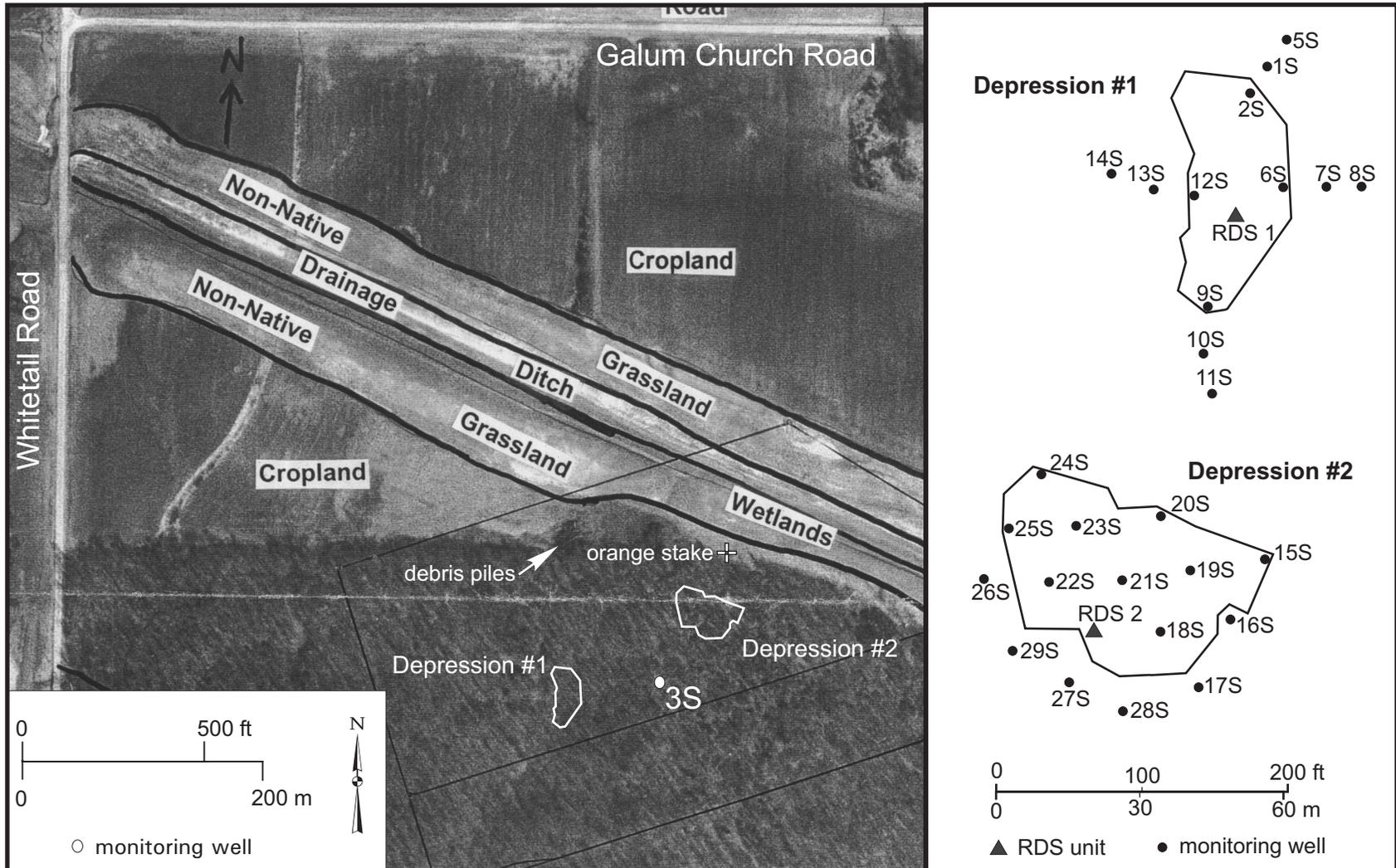


■ general study area

# Perry County Wetland Compensation Site (FAS 864)

## Approximate Locations of ISGS Monitoring Wells

map based on unrectified aerial photography from "Arch of Illinois" mining company (date and frame number unknown)

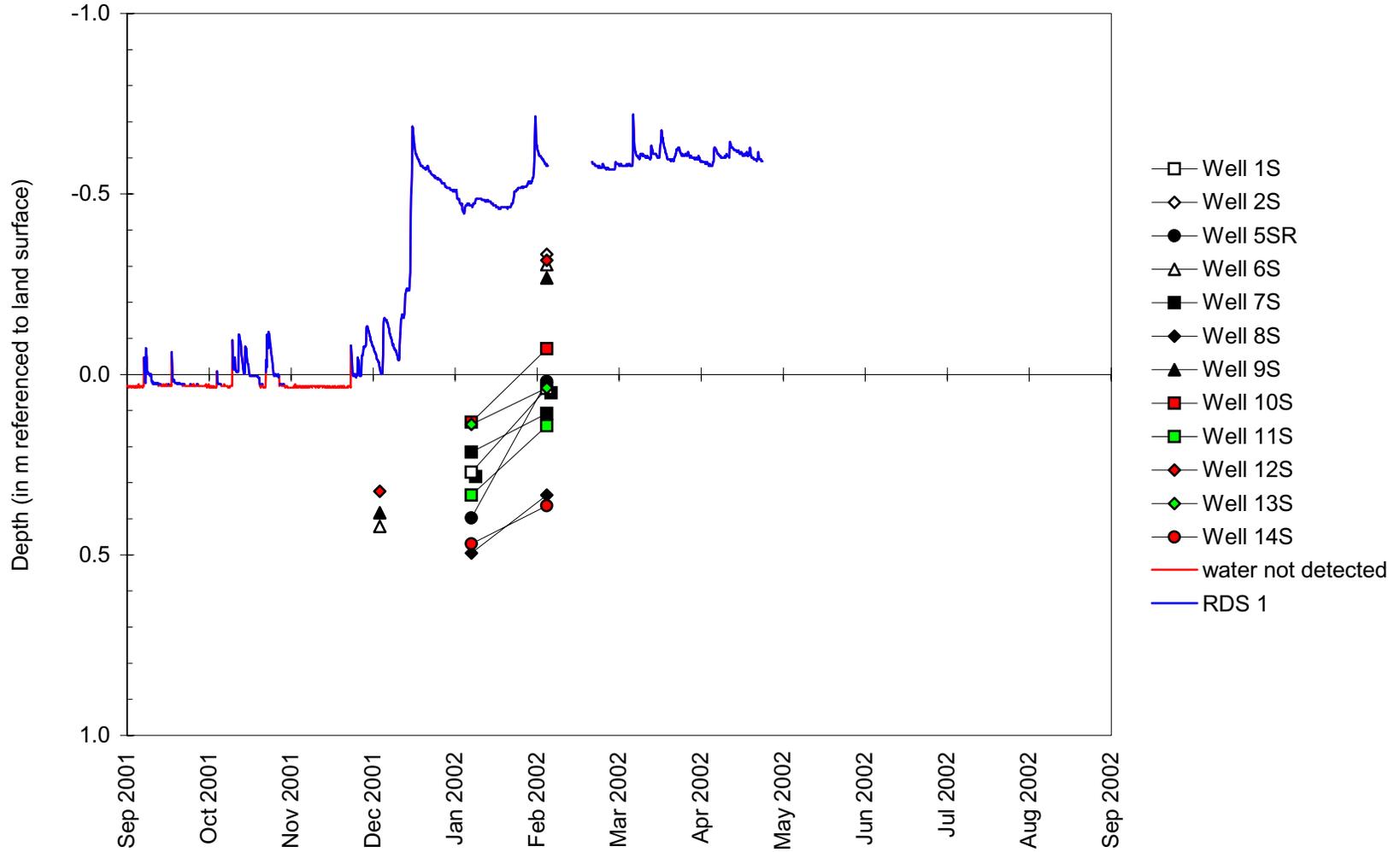




# Perry County Wetland Compensation Site

## September 1, 2001 to September 1, 2002

### Depth to Water in Wells Near Depression 1

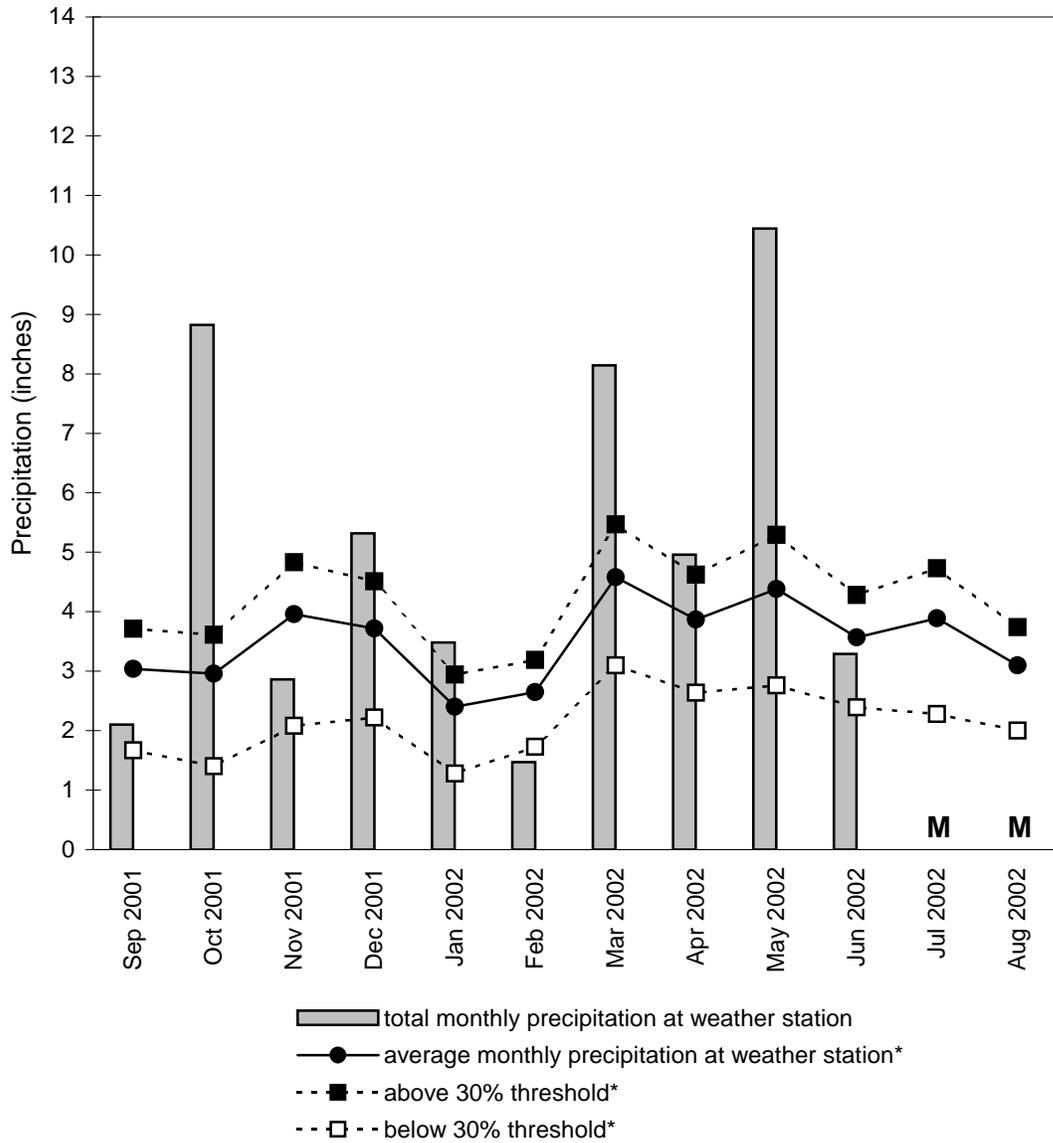






## Perry County Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation at the Du Quoin, IL Weather Station (no rain gauge deployed on site)



**M** missing data from weather station  
\* see text for explanation

Graph last updated October 11, 2002

**GALENA RIVER BRIDGE  
WETLAND COMPENSATION SITE**

**ISGS #46**

FAS Route 67

Jo Davies County, near Galena, Illinois

**Primary Project Manager: Kelli D. Weaver**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- Spring and Fall 1999: ISGS began monitoring surface- and ground- water levels at the site.
- Fall 2000: An Infinities sonic data logger was added on a telescoping mount to catch the often substantial flood peaks common to the site. A second RDS was added to the site as were two very shallow (VS) soil-zone wells and one standard soil-zone well.
- Spring 2002: Memo sent to IDOT detailing site hydrology.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 2.9 ac (1.2 ha). The site is roughly 7.4 ac (3.0 ha) in size. This is in contrast to 6.9 ac (2.8 ha) which satisfied wetland hydrology criteria in 2001. This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Dubuque, Iowa, is April 16 and the season lasts 183 days; 12.5% of the growing season is 23 days.
- Total precipitation for the monitoring period from September 2001 to June 2002 was 127% of normal. Precipitation was above normal for the months of September and October 2001, and February, April, and June 2002. Precipitation was below normal for the months November and December 2001, January, March and May 2002. Although weather station data are incomplete, precipitation measured on site was normal for July, and above normal for August.
- In 2002, water levels measured in wells 5S, 7S, 8S, and 9S, and at surface-water station Gauge A conclusively satisfied the wetland hydrology criteria as specified in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. The surface-water levels measured by the RDS 2 logger indicated that inundation occurred to an elevation of 182.9 m (600.1 ft) for a duration that may satisfy wetland hydrology.
- Well 7S is at a slightly higher elevation than the wells that achieved wetland hydrology. This may be due to the input of the spring pipe at the northeastern corner of the site.

Limitations of the wetland hydrology determination are as follows:

- During early May and late July 2002, two flood events deposited between 3 and 4 inches (7.6 and 10.2 cm) of fresh sediment into the wetland basin. The implications of this substantial rise in average ground surface elevation to the hydrology of the site are being examined.

## PLANNED FUTURE ACTIVITIES

- Monitoring will continue through Spring 2004 or until no longer required by IDOT.

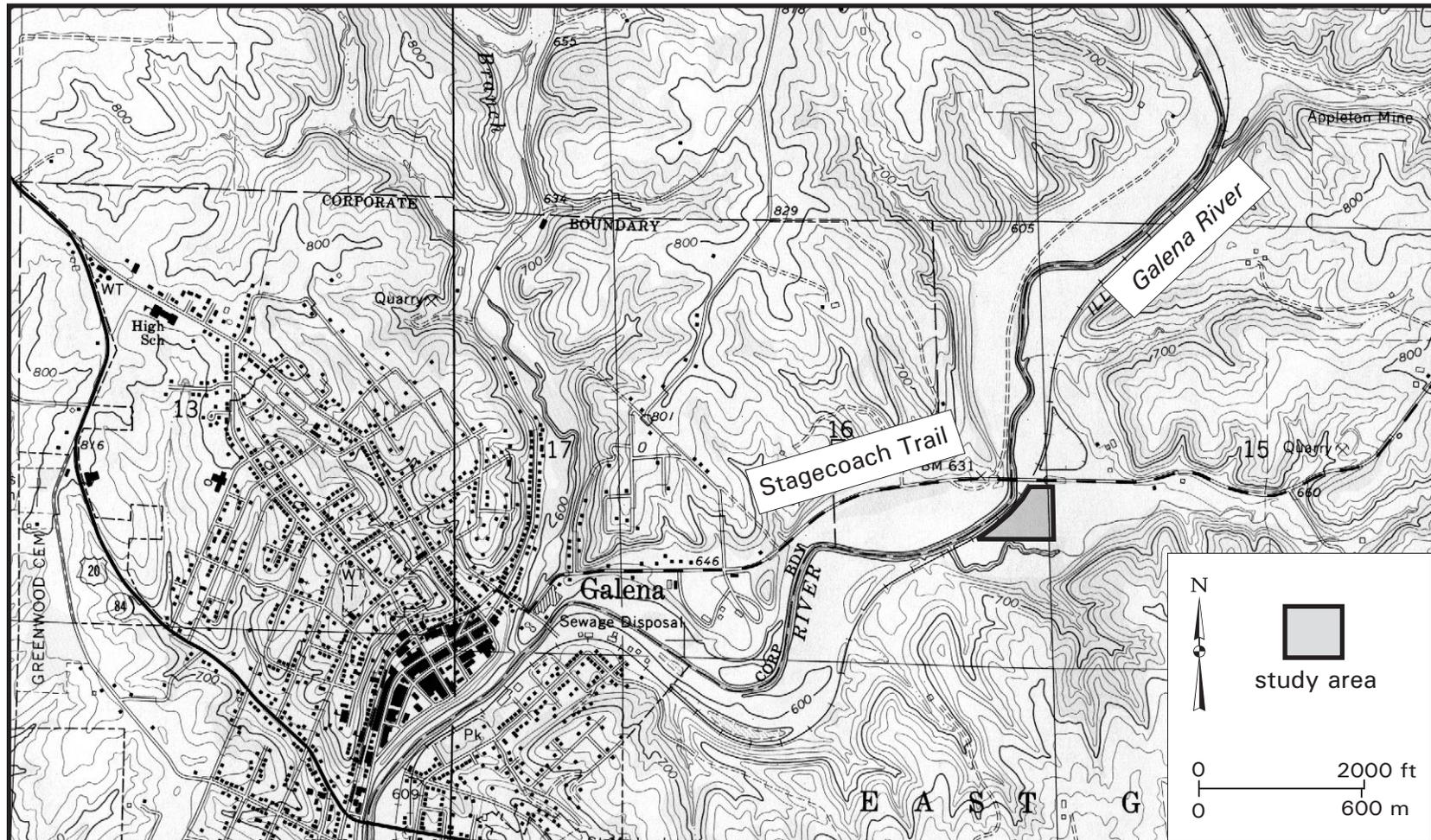
# Galena River Bridge Wetland Compensation Site

## (FAS Route 67)

### General Study Area and Vicinity

from the USGS Topographic Series, Galena, IL-Iowa 7.5 minute Quadrangle (USGS 1988)

contour interval is 10 feet



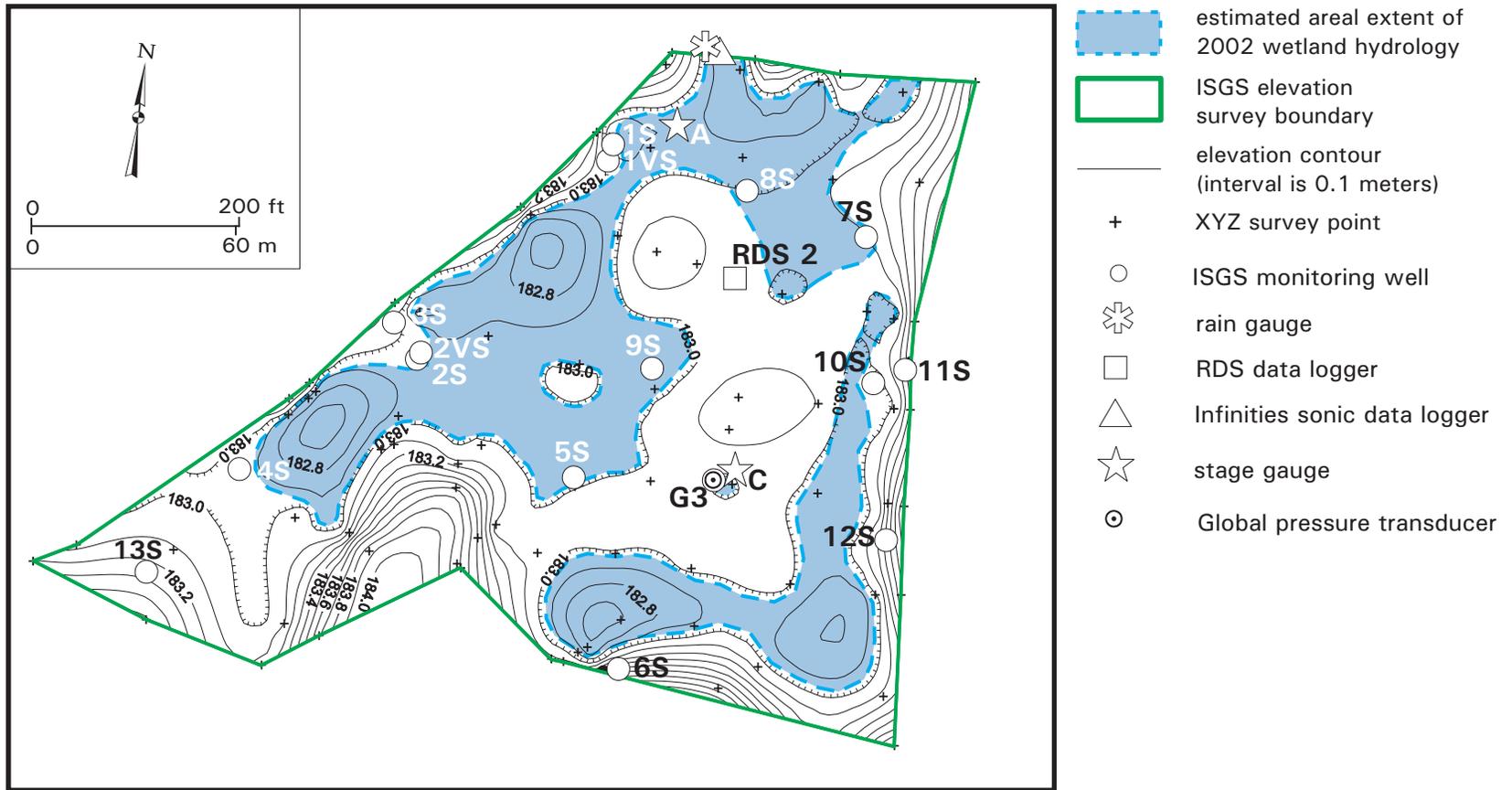
# Galena River Bridge Wetland Compensation Site (FAS Route 67)

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

map based on 1999 ISGS elevation survey referenced to NGVD, 1929

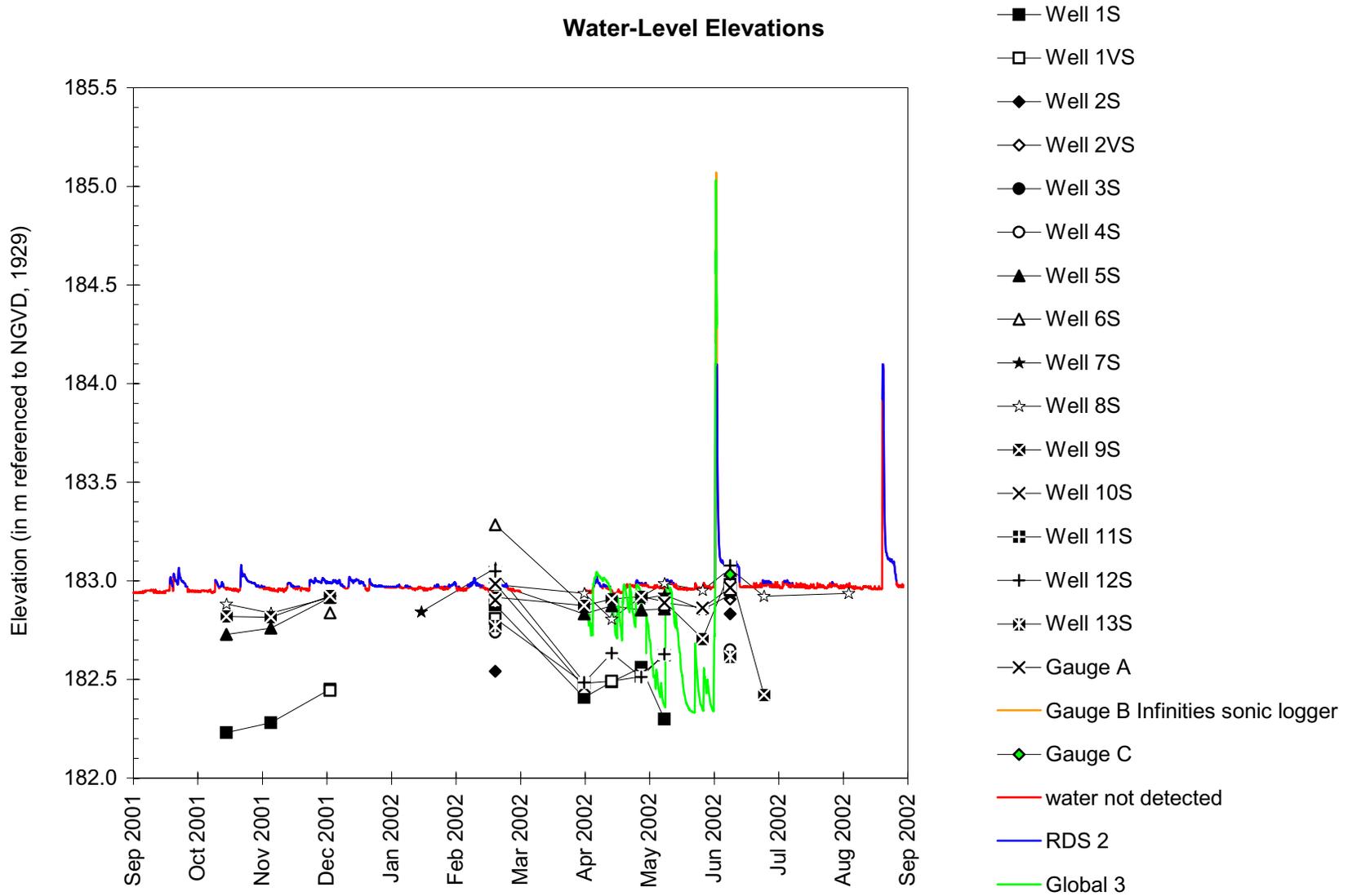
contour interval is 0.1 meters



# Galena River Bridge Wetland Compensation Site

## September 1, 2001 to September 1, 2002

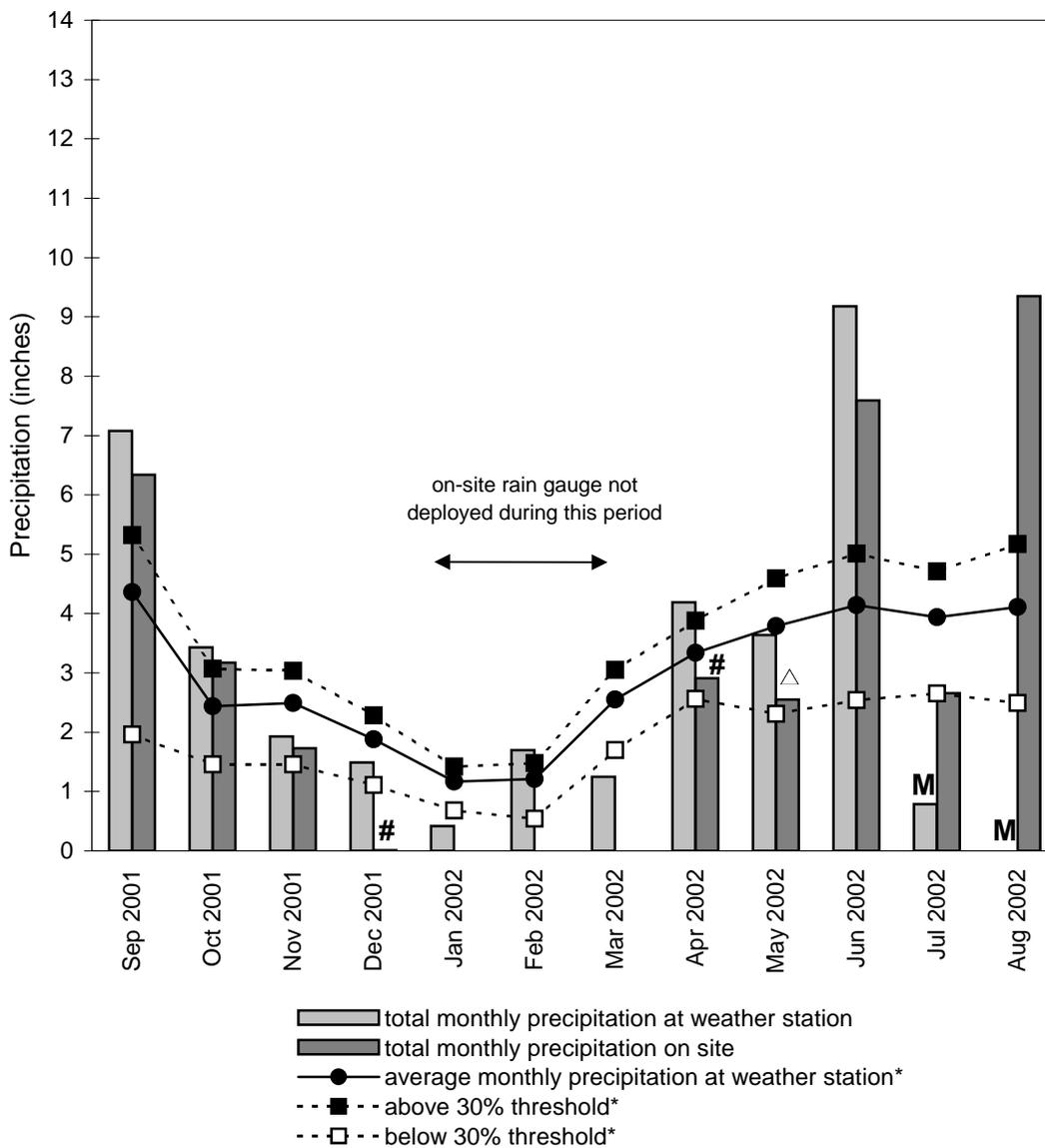
### Water-Level Elevations





## Galena River Bridge Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Galena, IL Weather Station



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning, represents minimum value for the month

M missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**ALEXANDER COUNTY, CAPE GIRARDEAU BRIDGE  
WETLAND COMPENSATION SITE**

**ISGS #47**

FAP 312

Alexander County, near East Cape Girardeau, Illinois

**Primary Project Manager: Bonnie J. Robinson**

**Secondary Project Manager: Marshall A. Lake**

**SITE HISTORY**

- March 1998: IDOT issued a task order to the ISGS to conduct a detailed mitigation site assessment.
- August 1998: The hydrogeologic characterization of the site was initiated with the installation of monitoring wells and staff gauges.
- November 1999, February 2000: Wells damaged during flooding in the summer of 1999 were removed and replaced with new monitoring wells. A pressure transducer was added to the southern excavation. A rain gauge was installed on site.
- February 2001: The pressure transducer was moved to a new location in the deepest part of the site. A second transducer was deployed adjacent to it to record surface water flooding.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Based on a topographic survey of the site, the entire site, 3.3 ac (1.3 ha), satisfied the criteria for wetland hydrology in 2002. In 2001, the entire site met the criteria for wetland hydrology as well. The determination for 2002 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season in Cape Girardeau, Missouri is 223 days, beginning March 26 and ending November 5. Therefore, 12.5% of the growing season is 28 days.
- Precipitation was at or above normal from October 2001 through January 2002, March through May and August 2002. Precipitation was below normal in September 2001, February, June and July 2002. Total precipitation for the period from September 2001 to August 2002 was 134% of normal.
- In 2002, water levels measured in the wells 2SR, 5SR, 9SR, 11SR and 13S conclusively satisfied the wetland hydrology criteria outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.
- Based on stage data from the USACE gauge at Cape Girardeau, the entire site was flooded from May 2 to June 1 (31 days), a duration sufficient to satisfy wetland hydrology criteria outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. At peak stage in the flood event, the highest parts of the site were covered by greater than 4 meters (13.1 feet) of water.

ADDITIONAL OBSERVATIONS:

- Based on measurements of well stickups, an average of 2 cm (0.8 in) of sediment were deposited on site during the spring floods.

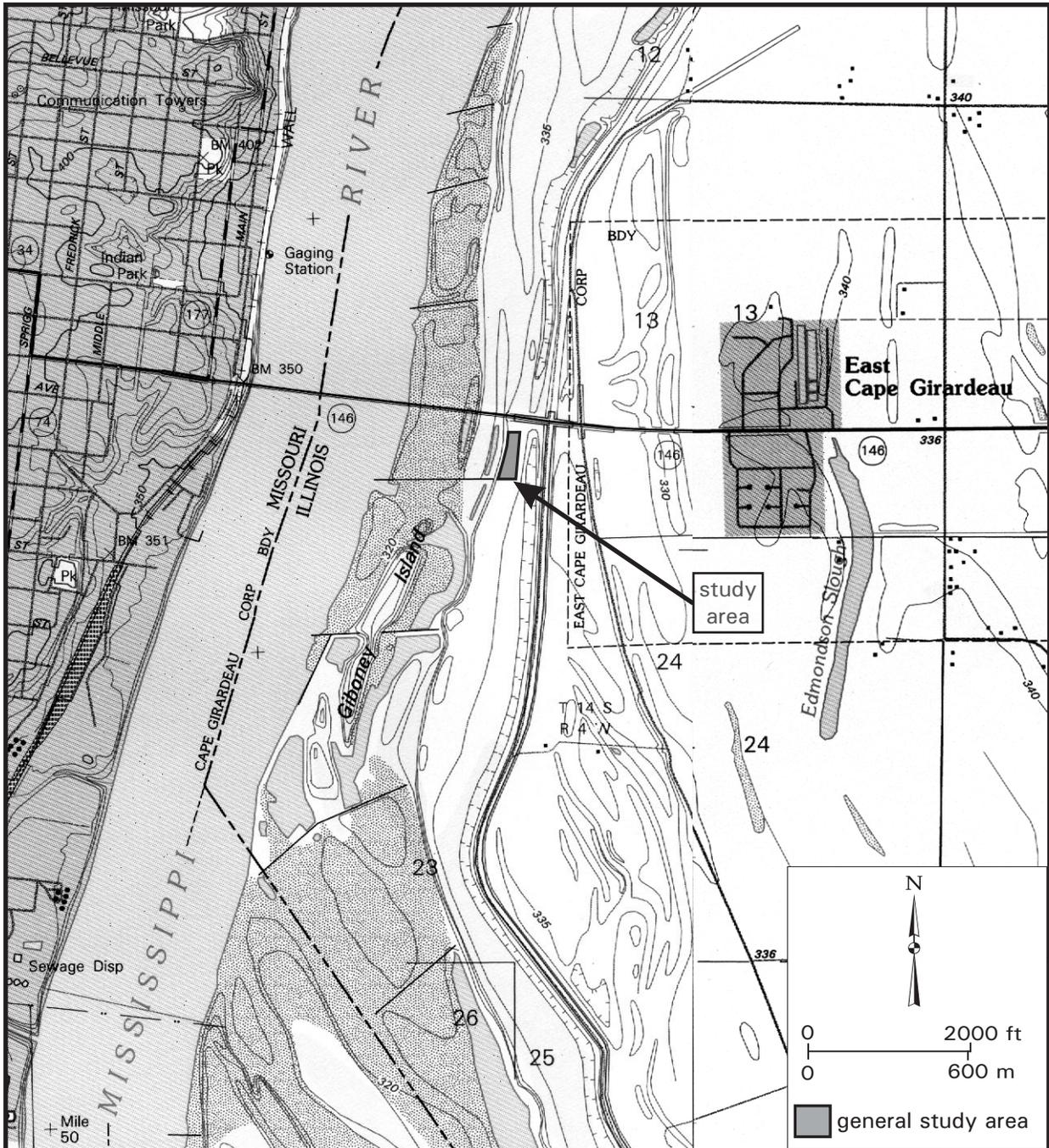
PLANNED FUTURE ACTIVITIES

- Monitoring will continue through August 2003 or until no longer required by IDOT.

# Alexander County, Cape Girardeau Bridge Wetland Compensation Site (FAP 312)

## General Study Area and Vicinity

from the USGS Topographic Series, Cape Girardeau, MO-IL and Mc Clure, IL-MO (USGS 1993)  
contour interval is 10 feet

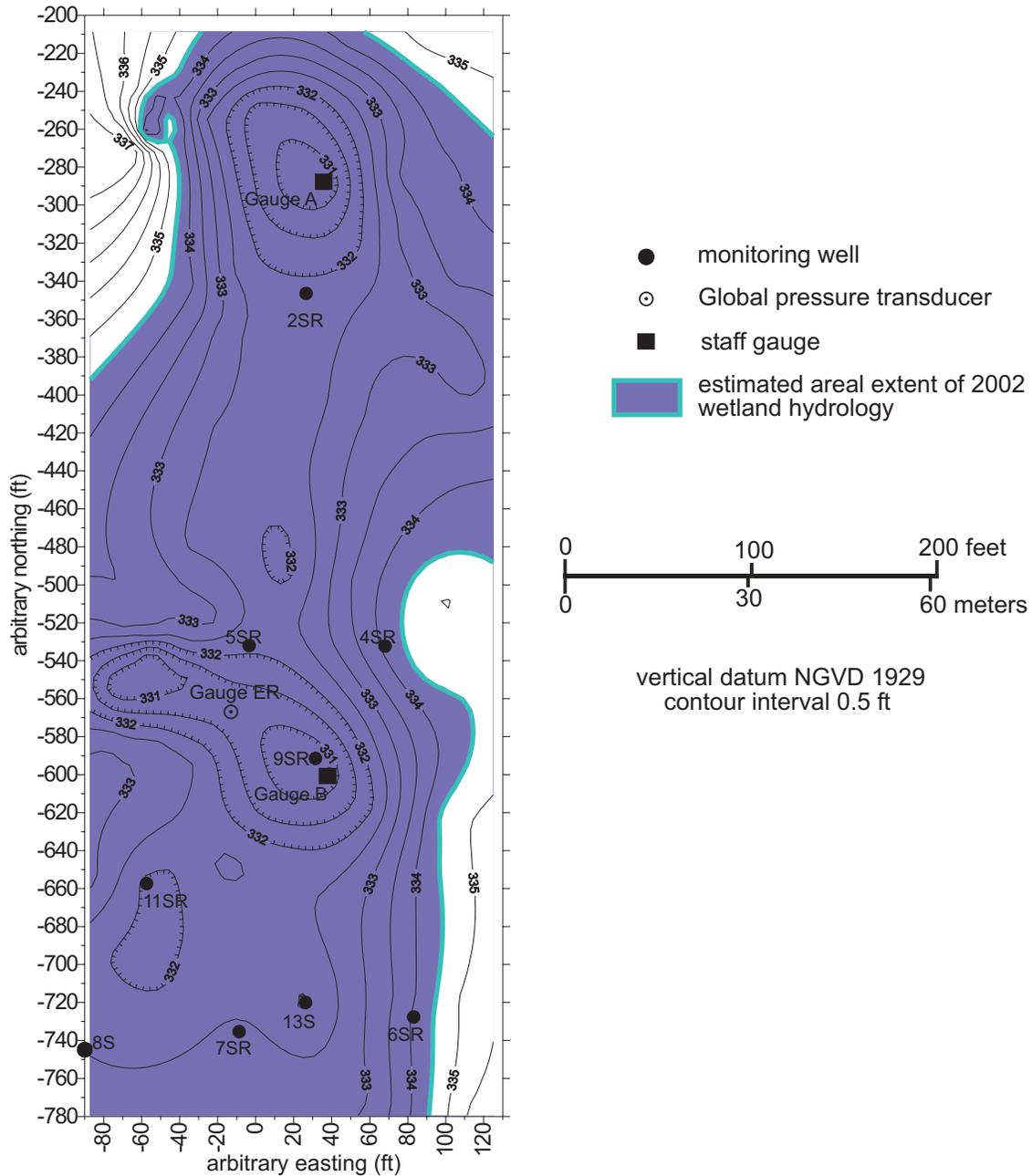


# Alexander County, Cape Girardeau Bridge Wetland Compensation Site (FAP 312)

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

contour map based on topographic survey conducted by the ISGS 08/08/00

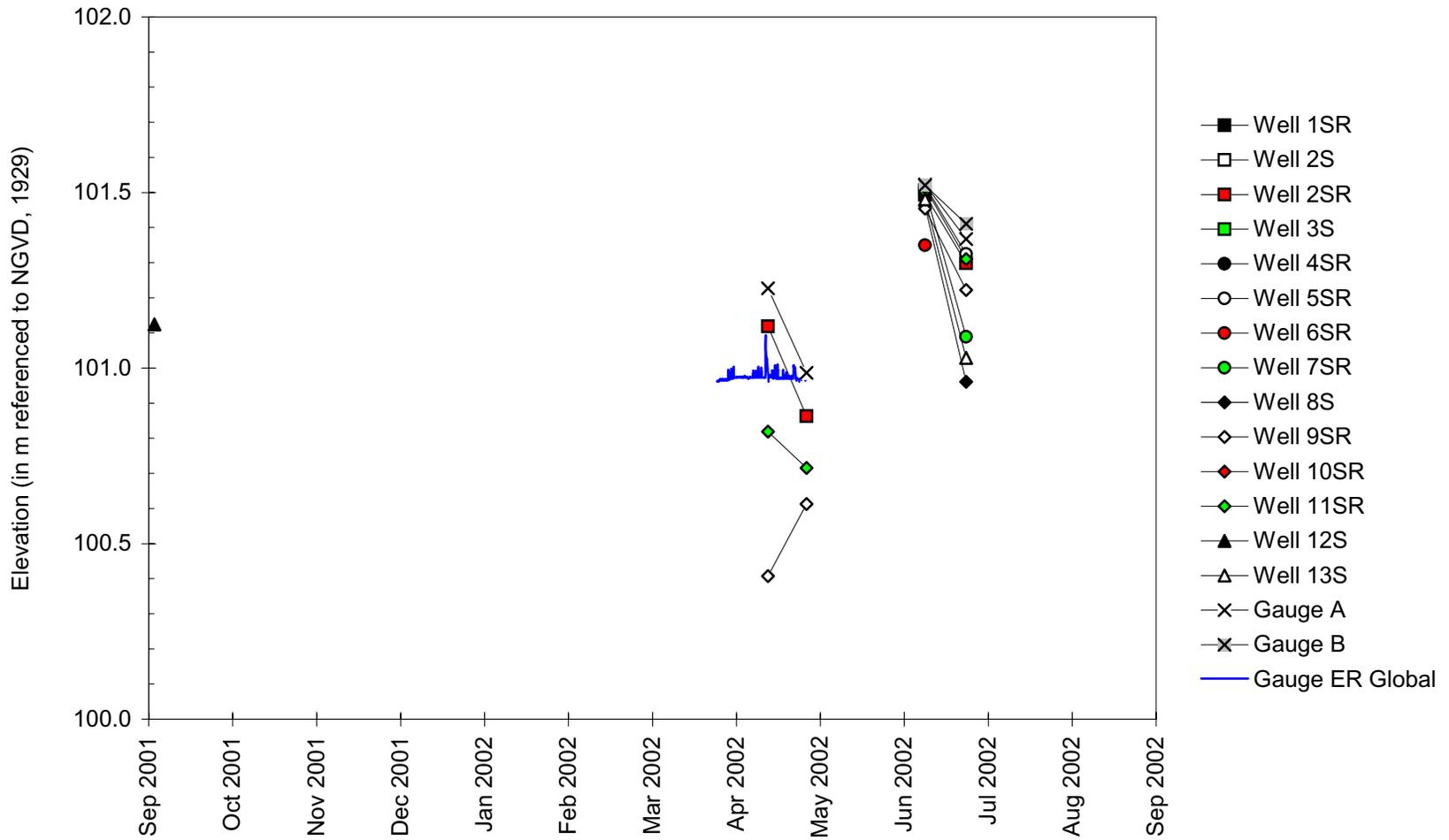


This topographic map of the Alexander County wetland compensation site was surveyed in August 2000. The contours are mapped on an arbitrary grid oriented roughly north-south. This map represents an approximation of the 2002 topography. Prolonged flooding in 2001 and 2002 deposited an average of ~ 11 cm (~4.3 in) of sediment over the site.

# Alexander County, Cape Girardeau Bridge Wetland Compensation Site

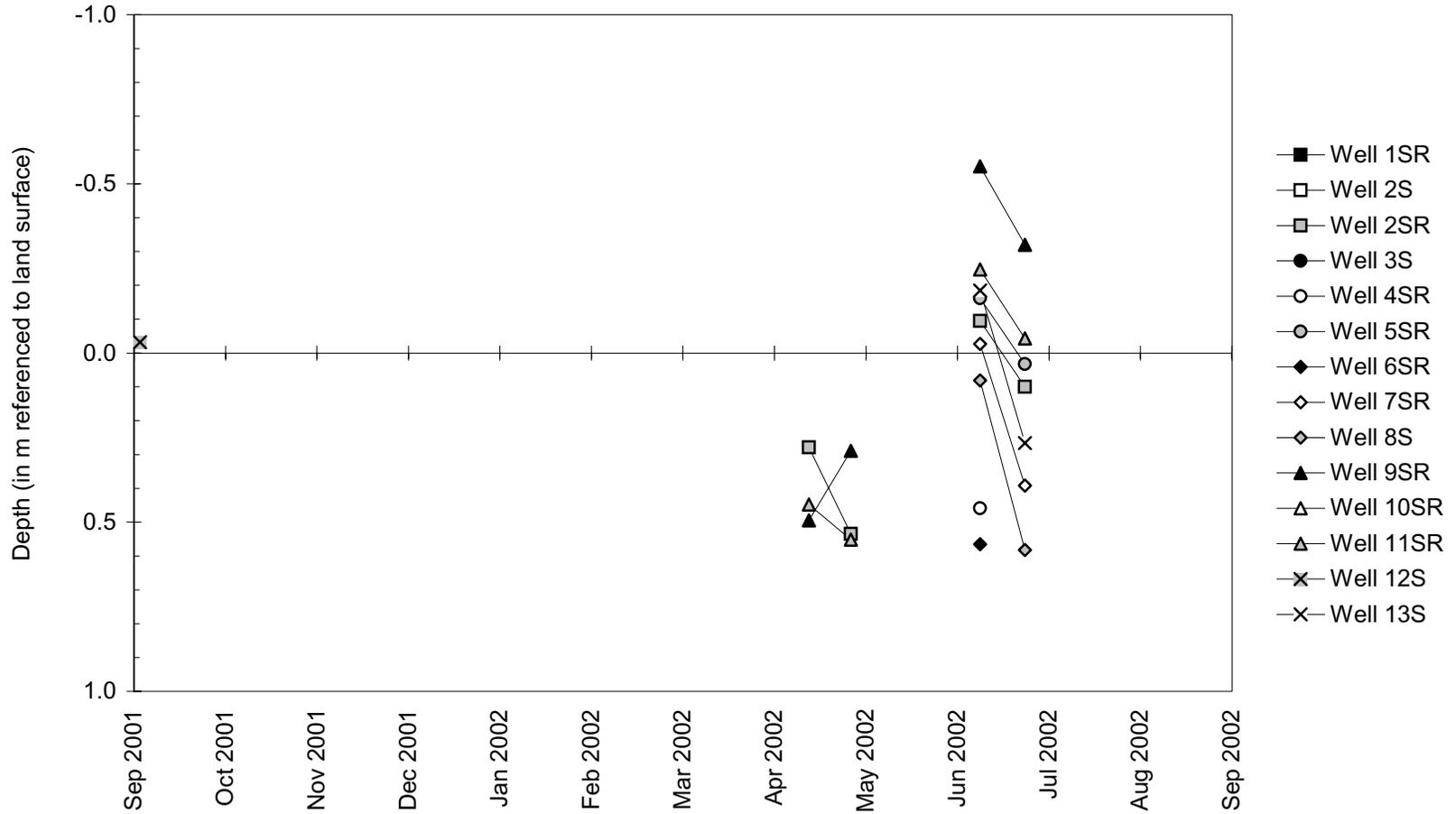
## September 1, 2001 to September 1, 2002

### Water-Level Elevations in Soil-Zone Monitoring Wells and on Stage Gauges



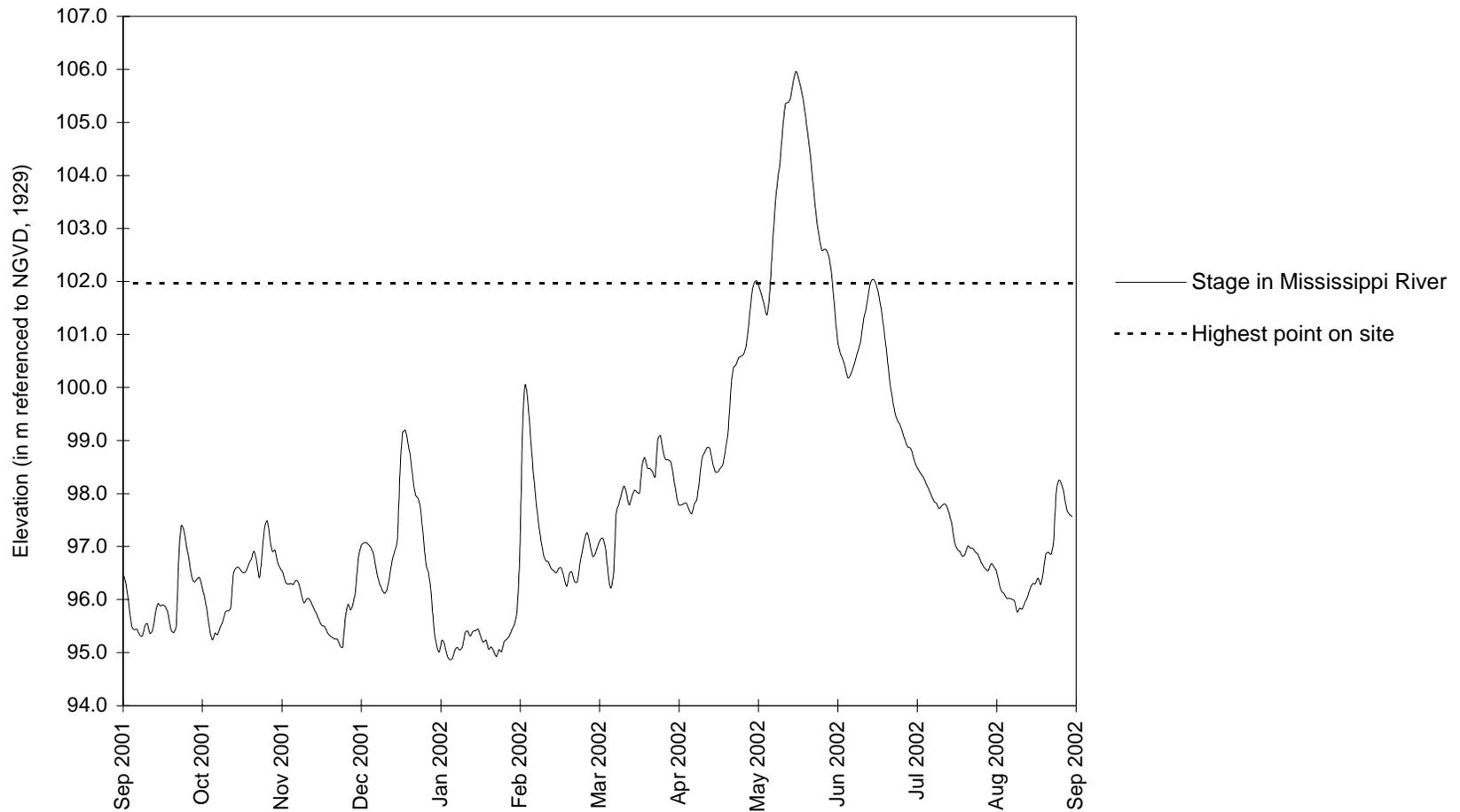
# Alexander County, Cape Girardeau Bridge Wetland Compensation Site September 1, 2001 to September 1, 2002

## Depth to Water in Soil-Zone Monitoring Wells



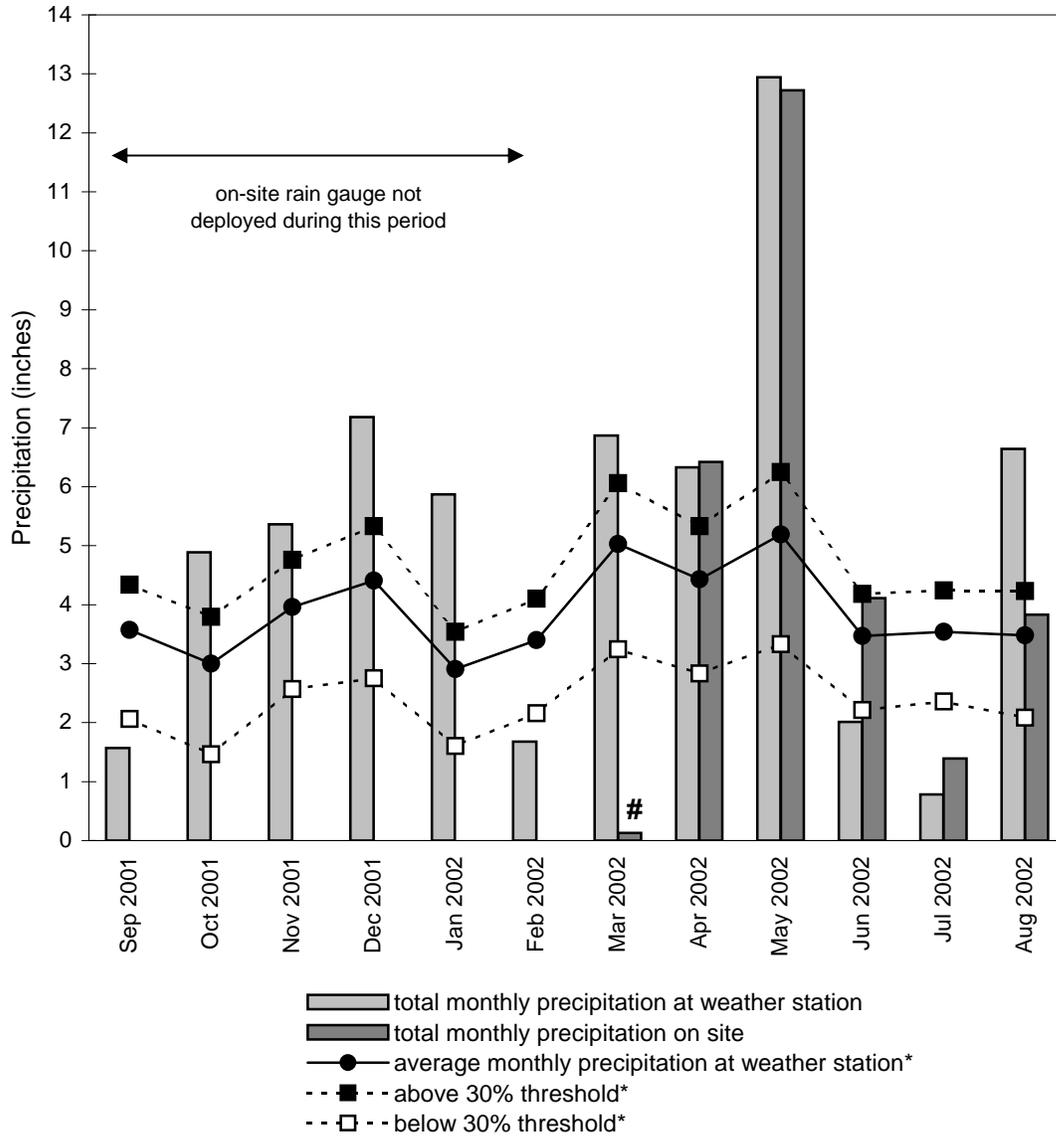
# Alexander County, Cape Girardeau Bridge Wetland Compensation Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



## Alexander County, Cape Girardeau Bridge Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Cape Girardeau, MO Regional Airport Weather Station



# on-site rain gauge not deployed for entire month  
\* see text for explanation

Graph last updated October 11, 2002

**MORRIS, ILLINOIS RIVER  
POTENTIAL WETLAND BANKING SITE**

**ISGS #49**

Grundy County, near Morris, Illinois

**Primary Project Manager: Keith W. Carr**

**Secondary Project Manager: James J. Miner**

**SITE HISTORY**

- March 1999: ISGS was tasked by IDOT to perform a Level II hydrogeologic assessment of the potential banking site.
- August 1999: ISGS began monitoring ground- and surface-water levels at the site.
- February and July 2001: Two RDS data loggers, one staff gauge, nine soil-zone monitoring wells, and six nests of soil-moisture probes were added to the instruments installed at the site.
- March 2001: Two letters were sent by ISGS to IDOT Central Office. The first was a review of a wetland mitigation plan proposed by IDOT. The second provided general information regarding site hydrological conditions.
- July and August 2002: ISGS prepared a specification for drainage tile removal at the bank site and reviewed an IDOT site work plan for Tom Brooks of IDOT Central Office.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Based on ground-water level measurements, 3 of the 40 soil-zone monitoring wells satisfied wetland hydrology criteria in 2002. In 2001, none of the 40 wells satisfied wetland hydrology criteria. Based upon these three wells, two staff gauges, and two surface water data loggers, five polygons totaling 7.1 ac (2.9 ha) conclusively satisfied wetland hydrology criteria in 2002. In 2001, only one of the polygons, with an acreage of 0.78 ac (0.31 ha), conclusively satisfied wetland hydrology criteria.

This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Morris, Illinois is April 16 and the season lasts 188 days; 12.5% of the growing season is 24 days.
- Total precipitation for the monitoring period from September 2001 to June 2002 was 105% of normal (weather station data for July and August 2002 are missing). Precipitation in October 2001 and April-May 2002 was above normal, while precipitation during the December 2001-February 2002 period was slightly below normal. Precipitation for the monitoring period in 2001 was 87% of normal.
- In 2002, water levels measured in soil-zone wells 21S, 42S, and 44S conclusively satisfied wetland hydrology criteria as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Water levels in the remaining 37 soil-zone wells did not satisfy wetland hydrology criteria. In addition, inundation occurred that conclusively satisfied wetland hydrology criteria at staff gauge SW5-F. Also, inundation occurred that may have satisfied

wetland hydrology criteria at RDS data loggers SW7-R and SW8-R, and at staff gauge SW7-F.

- A total of 2.4 ac (2.8 ha) conclusively satisfied wetland hydrology criteria in the "spider" field area (also known as the "east" field), an area slated for drainage tile removal in the fall of 2002. Also, two closed depressions (near SW5 and SW7) representing 4.7 ac (1.9 ha) in total exhibited surface-water elevations that conclusively satisfied wetland hydrology criteria. As in previous years, perennial water bodies such as the creek channels were not included in areas having met wetland hydrology criteria.
- During the 2002 growing season, site elevations less than 147.8 m (484.9 ft) were inundated by Illinois River floodwaters for a period sufficient to conclusively satisfy wetland hydrology criteria. These water levels would not overtop the bank-full elevation of the Mazon River and Mud Slough, and would therefore not back-flood a significant portion of the site.
- In 2002, one flood occurred within the growing season that had a peak stage value of 152.25 m (499.5 ft), sufficient to inundate most or all of the site. The flood duration, however, was short, as was the case in previous years. This flood inundated areas at or below 150.27 m (493 ft) for a period of only 4.8 days (this elevation encompasses the most extensive of the areas slated for wetland restoration). In addition, 18 days after the flood, all 40 soil-zone wells were either dry or exhibited water levels below the threshold elevation for wetland hydrology.

#### ADDITIONAL INFORMATION

- At the Morris site, significant areas of floodplain forest exhibiting predominantly hydrophytic vegetation seem to be present at elevations above those that are inundated for 12.5% of the growing season. It is therefore possible that on this site, areas that are inundated for less than 12.5% of the growing season may exhibit characteristics of jurisdictional wetlands. As in 2001, none of the six wells in this apparent floodplain forest satisfied wetland hydrology criteria this year, even at the level of 5% of the growing season.
- During 2001, soil-moisture probes were installed at three soil-zone well locations in the apparent floodplain forest and at three locations in the "spider" field. These data are still being examined and will not be presented at this time.

#### PLANNED FUTURE ACTIVITIES

- Monitoring will continue through 2005 or until no longer required by IDOT.

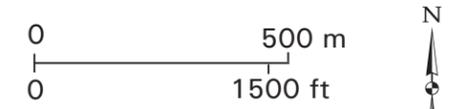


# Morris, Illinois River Potential Wetland Banking Site

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

map based on USGS digital orthophotograph, Morris NE quarter quadrangle  
from 4/5/1998 aerial photography (ISGS 2001)



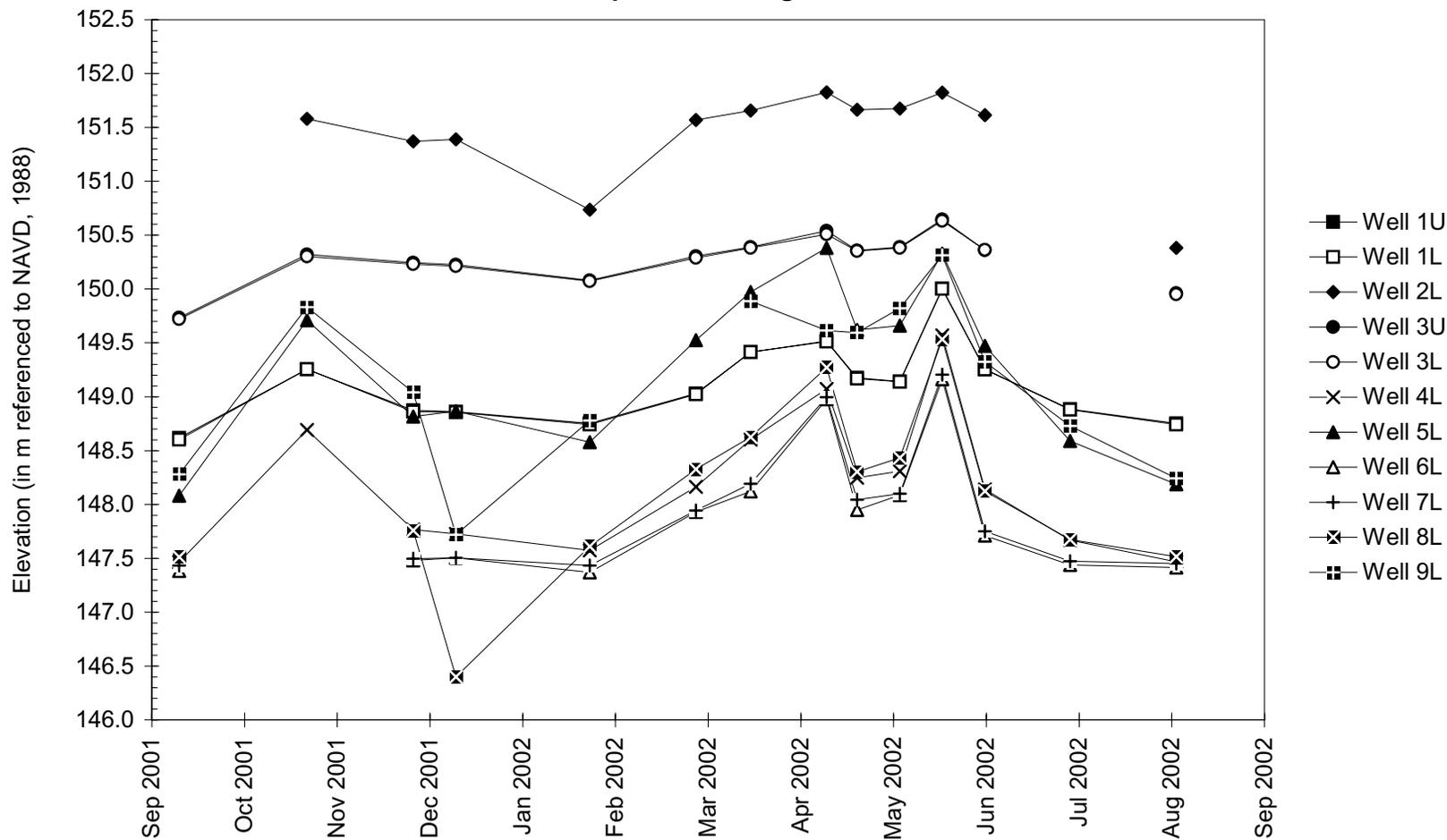
- estimated areal extent of 2002 wetland hydrology
- approximate site boundary

- soil-moisture probe
- stage gauge
- Infinities sonic data logger
- RDS data logger
- rain gauge
- ISGS monitoring well
- Global data logger

# Morris, Illinois River Potential Wetland Banking Site

## September 1, 2001 to September 1, 2002

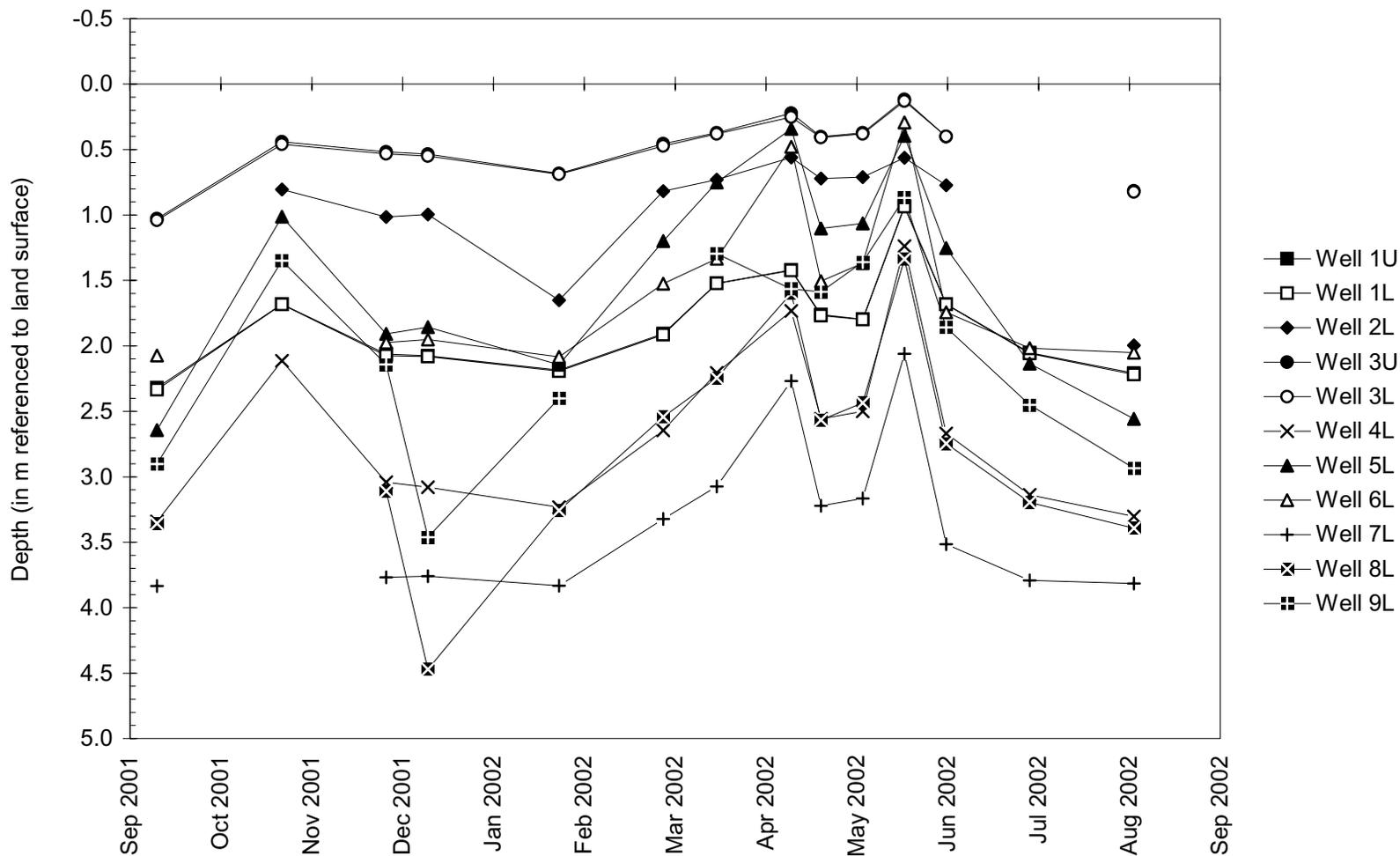
### Water-Level Elevations in Deeper Monitoring Wells



# Morris, Illinois River Potential Wetland Banking Site

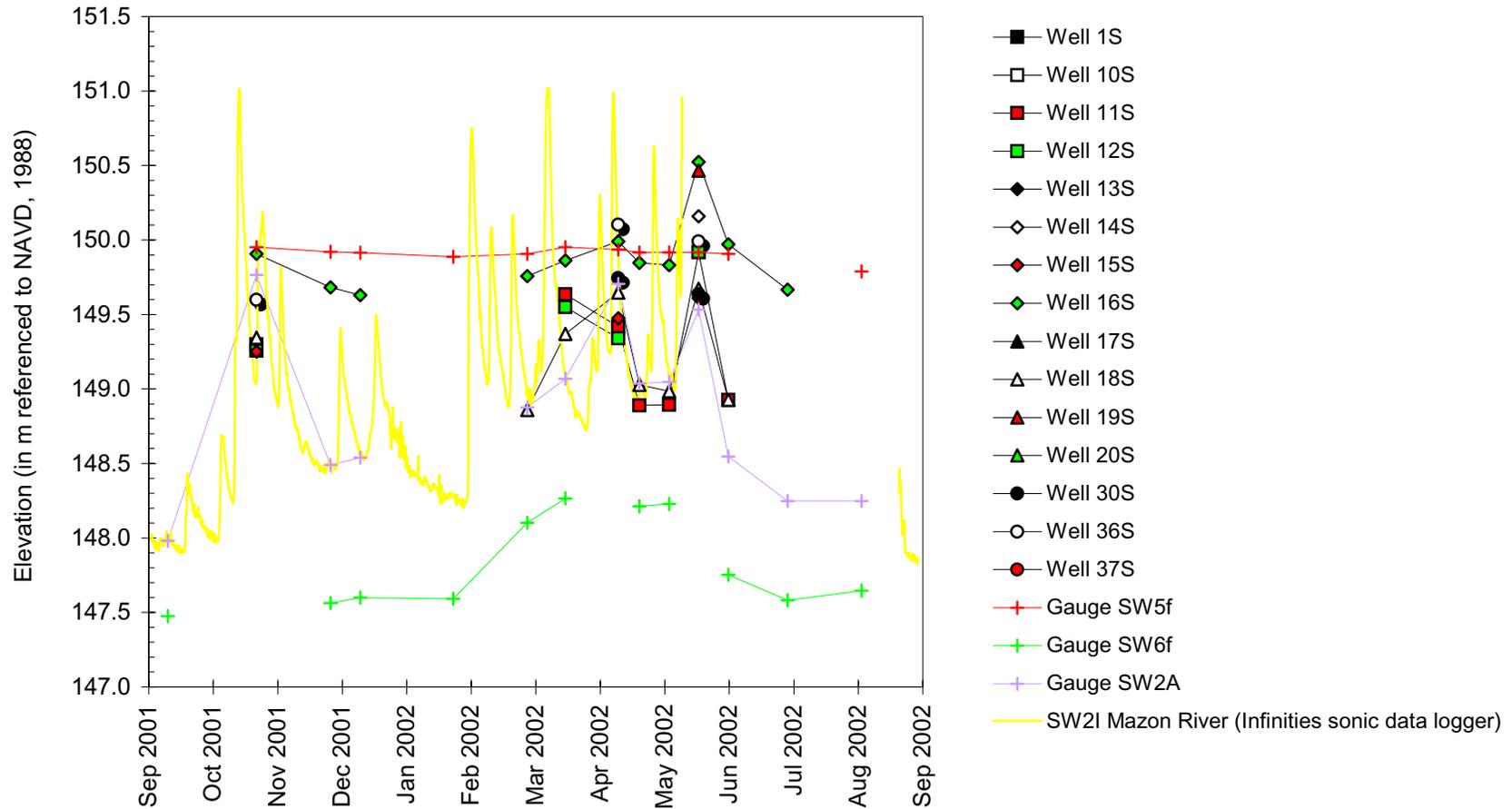
## September 1, 2001 to September 1, 2002

### Depth to Water in Deeper Monitoring Wells



# Morris, Illinois River Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations in Soil-Zone Monitoring Wells, Data Loggers, and Stage Gauges South of the Mazon River





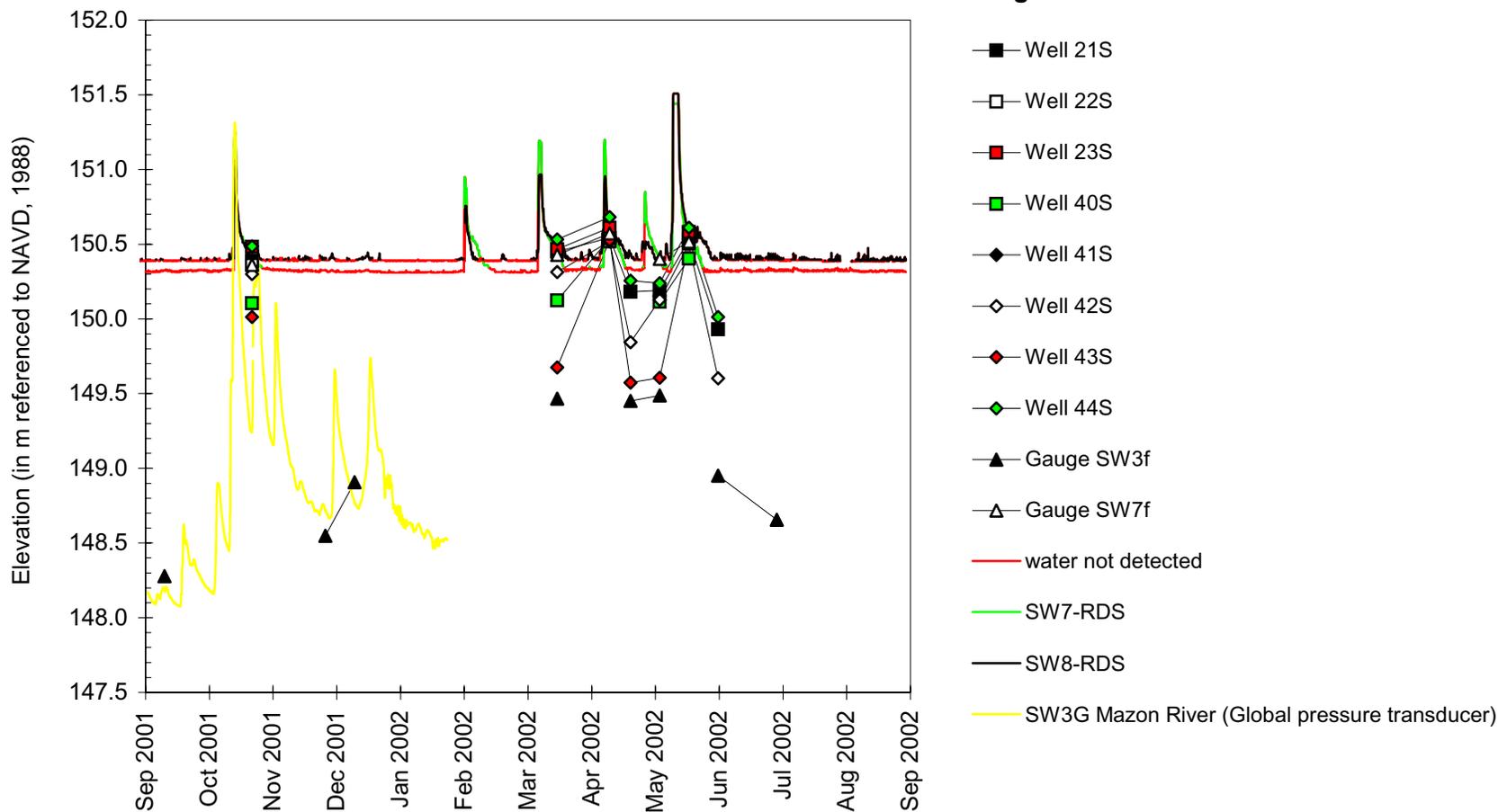




# Morris, Illinois River Potential Wetland Banking Site

## September 1, 2001 to September 1, 2002

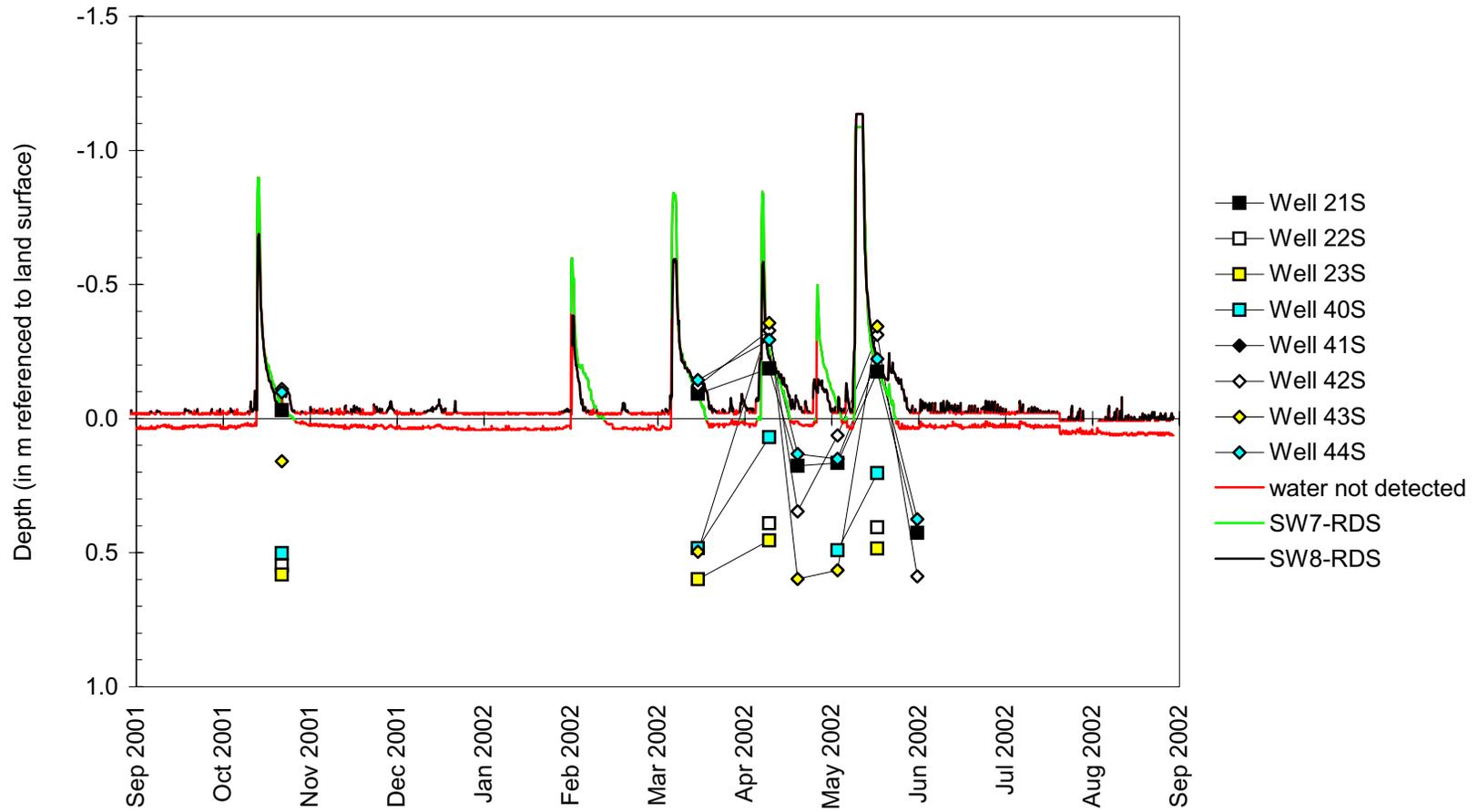
### Water-Level Elevations in Soil-Zone Monitoring Wells, Data Loggers, and Stage Gauges in the East Field and near the Natural Slough



# Morris, Illinois River Potential Wetland Banking Site

September 1, 2001 to September 1, 2002

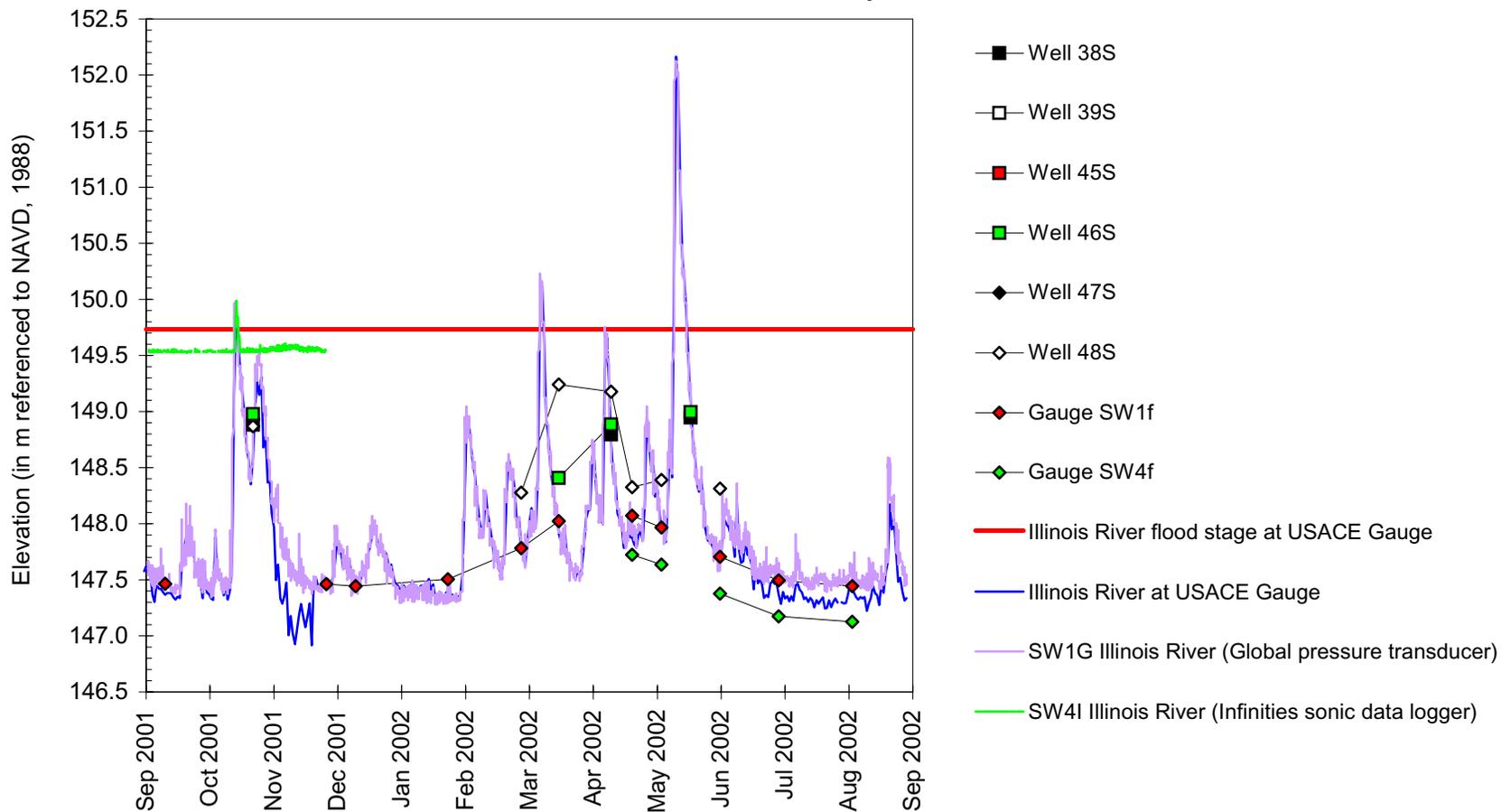
## Depth to Water in Soil-Zone Monitoring Wells and Data Loggers in the East Field and near the Natural Slough



# Morris, Illinois River Potential Wetland Banking Site

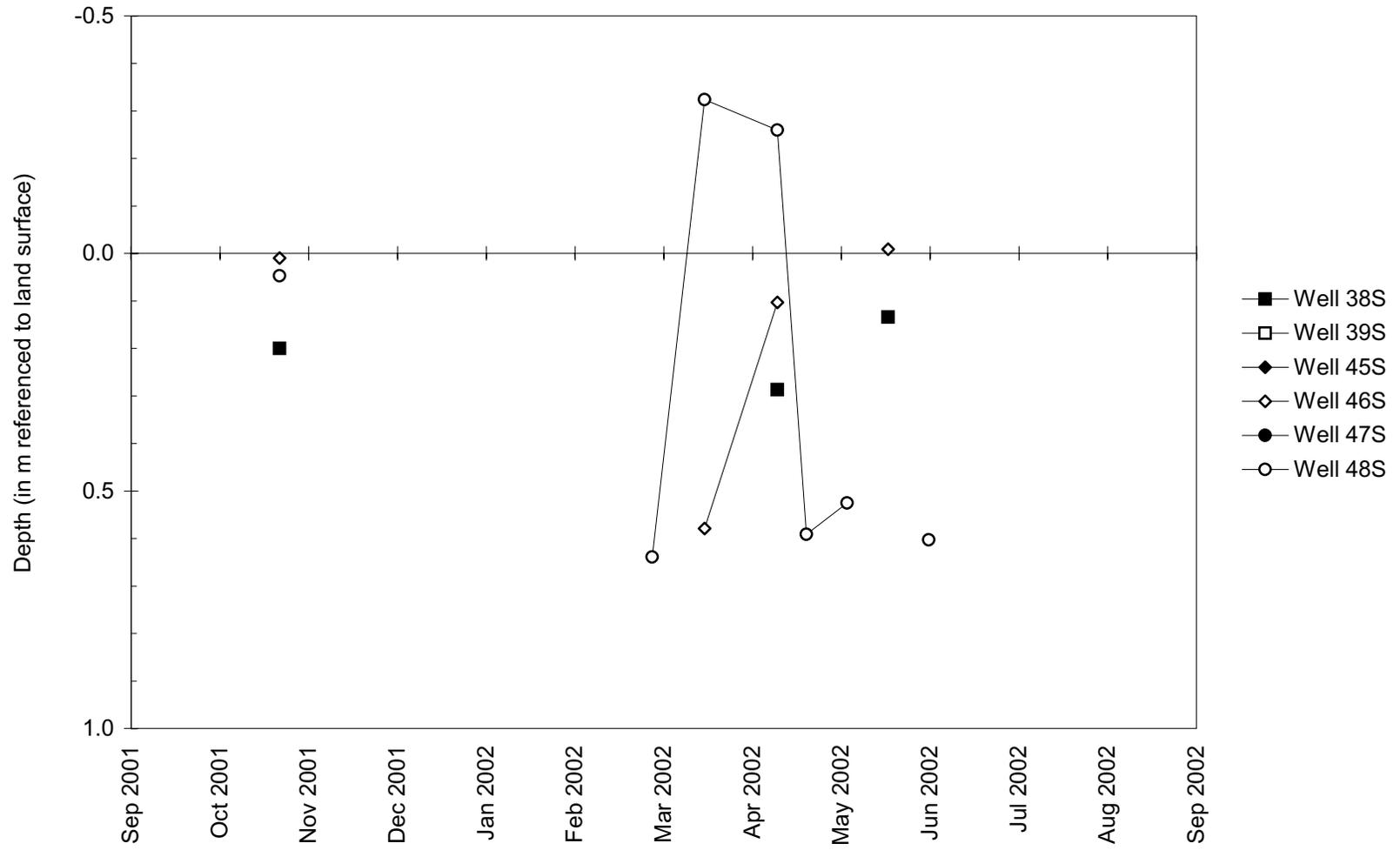
September 1, 2001 to September 1, 2002

## Water-Level Elevations in Monitoring Wells, Data Loggers, and Stage Gauges near the Illinois River Floodplain Forest



# Morris, Illinois River Potential Wetland Banking Site September 1, 2001 to September 1, 2002

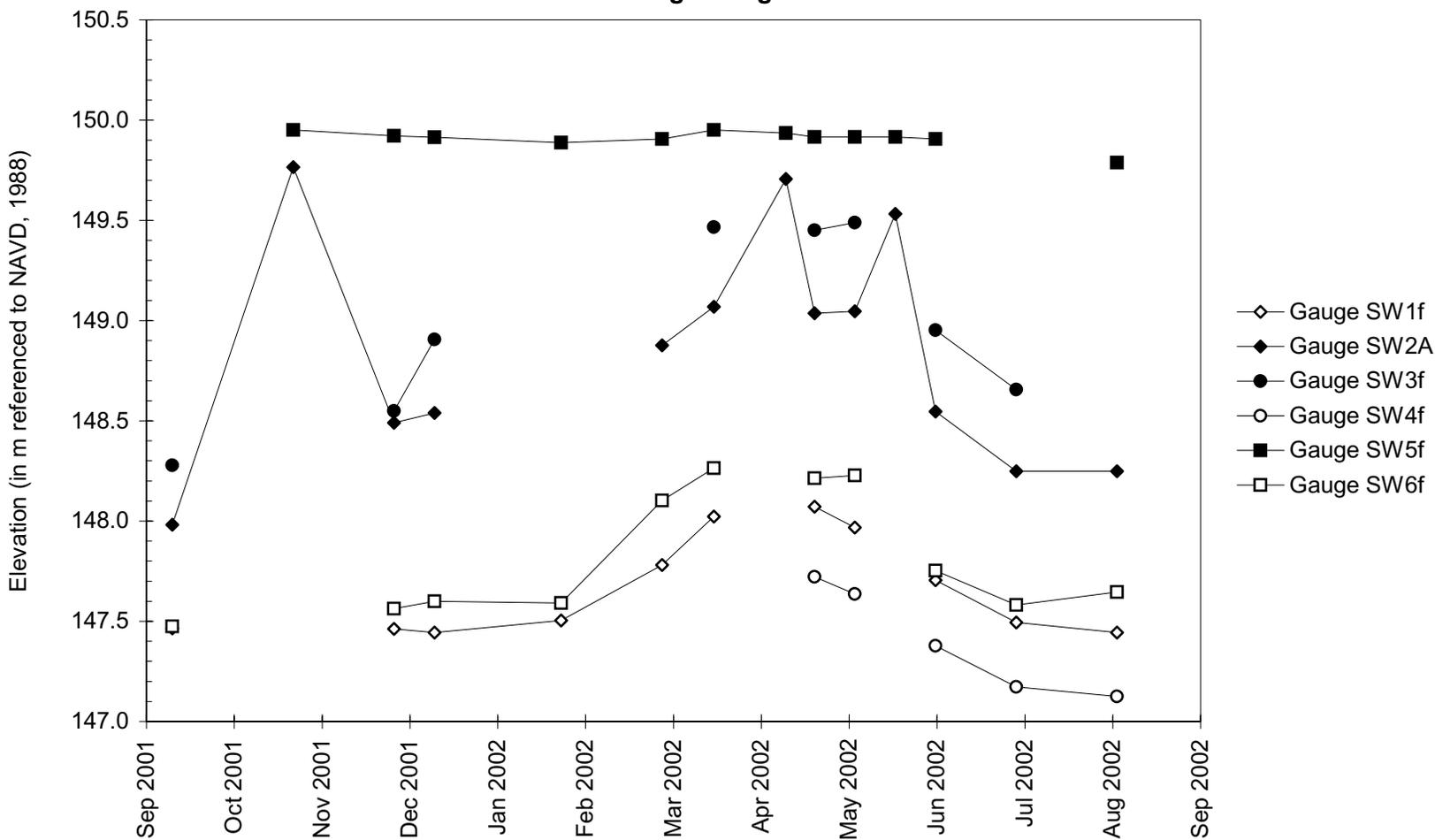
## Depth to Water in Monitoring Wells near the Illinois River Floodplain Forest



# Morris, Illinois River Potential Wetland Banking Site

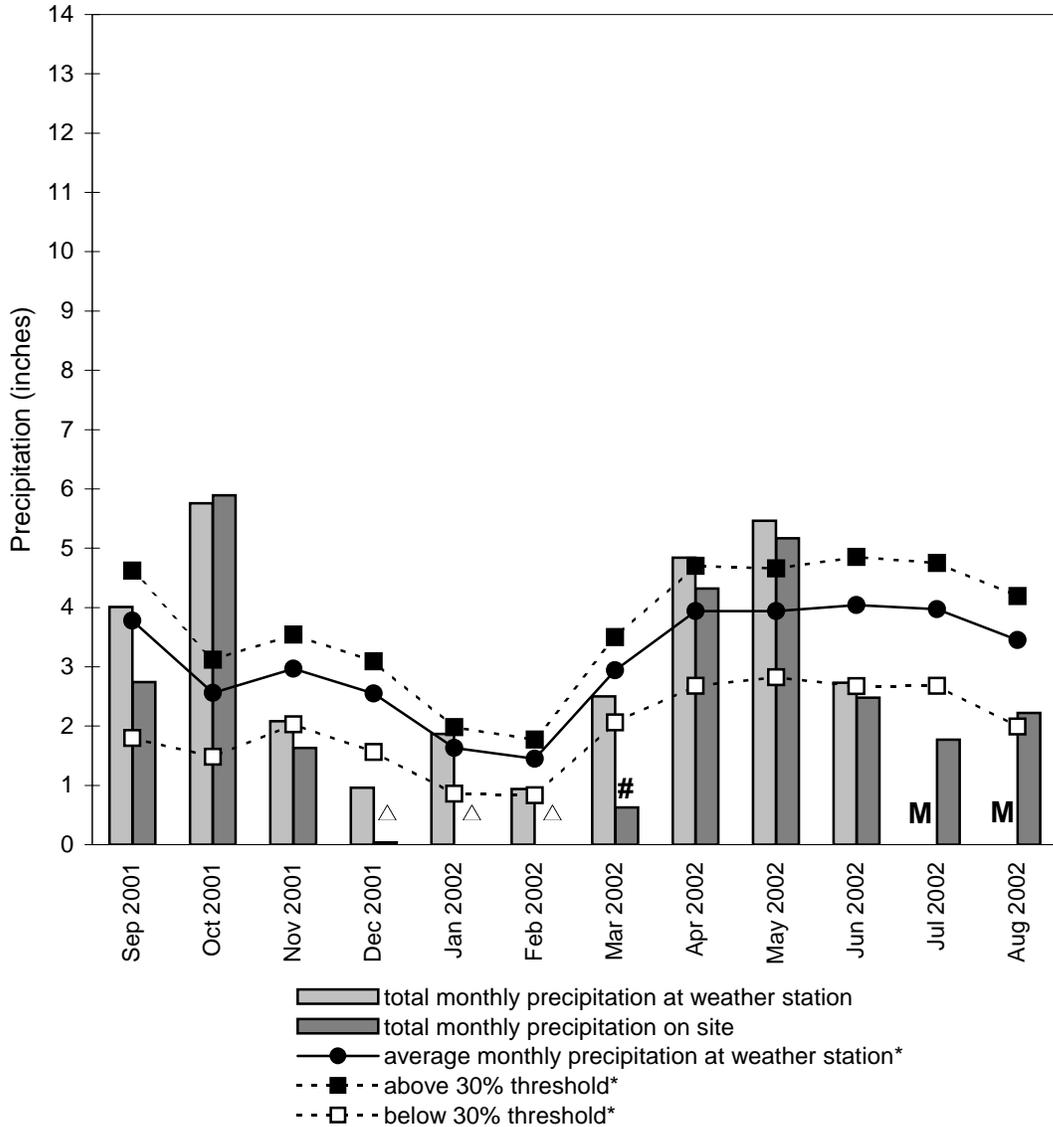
September 1, 2001 to September 1, 2002

## Water-Level Elevations on Stage Gauges



# Morris, Illinois River Potential Wetland Banking Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the Channahon, IL Weather Station



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

**M** missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**EDWARDS RIVER, MERCER COUNTY  
WETLAND COMPENSATION SITE**

**ISGS #50**

FAP 310

Mercer County, near Boden, Illinois

**Primary Project Manager: Kelli D. Weaver**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- May 1996: ISGS submitted an Initial Site Evaluation Report to IDOT.
- Spring and Fall 1999: ISGS began monitoring ground- and surface water, and a total of 12 sediment traps were also added to the site.
- Spring 2001: One RDS surface-water data logger, one stage gauge, and three very shallow (VS) soil-zone wells were added to the wetland basin.
- April 2002: Three soil-zone monitoring wells were later added along the base of the US 67 embankment to better delineate wetland hydrology along the western site margin.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that 0.39 ac (0.16 ha) of the 1.51 ac (0.61 ha) excavated basin conclusively satisfied the criteria for wetland hydrology in 2002. This is in contrast to the 1.6 ac (0.65 ha) that satisfied wetland criteria in 2001. A new base map resulted in the altered acreage for the basin in 2002 (see below). This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Aledo, Illinois is April 11 and the season lasts 194 days; 12.5% of the growing season is 24 days.
- Total precipitation for the monitoring period from September 2001 to June 2002 was 127% of normal. Precipitation was above normal for the months of September, and October 2001, February, and April through June 2002. Precipitation was below normal for the months of November and December 2001, and January and March 2002. Although weather station data are incomplete, precipitation measured on site was above normal for July and August.
- In 2002, water levels measured in wells 1S, 3S, 3VS, 5VS, 9S, and 11S conclusively satisfied wetland hydrology criteria as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Water levels in well 6S and at RDS 1 may have satisfied wetland hydrology criteria.
- The elevation and duration of surface-water inundation events were recorded in the Edwards River channel and the wetland basin, and was limited to three separate events with a maximum duration of approximately three days. Also, in all events, the hydroperiod within the excavated basin virtually mimics that of the river. As in previous years, floodwaters in 2002 only stayed in the basin hours after the river stage had dropped below the site inlet.

## ADDITIONAL INFORMATION

- A total of 12 sediment traps were reinstalled April 17, 2001. The sediment in the traps was removed April 1, 2002, and quantified in an ISGS laboratory. On average, the traps in the basin held approximately 18g of silty material. Trap 5, which is adjacent to the inlet/outlet of the site, contained 33g. Traps 8 and 9 (which are outside the excavated wetland basin and on top of the natural levee) contained the lowest totals of silty material, 8 and 7 grams, respectively. According to stage records, the sediment that was quantified in the traps represents a total period of 8.1 days that the sediment traps were inundated.
- We have determined that site is being drained too efficiently through the inlet in the northwest corner of the site. Raising the elevation of this inlet/outlet to approximately 194.0 m (636.5 ft) would cause longer-term retention of surface water in the excavated basin. This may also enhance sediment deposition due to the longer floodwater residence time.

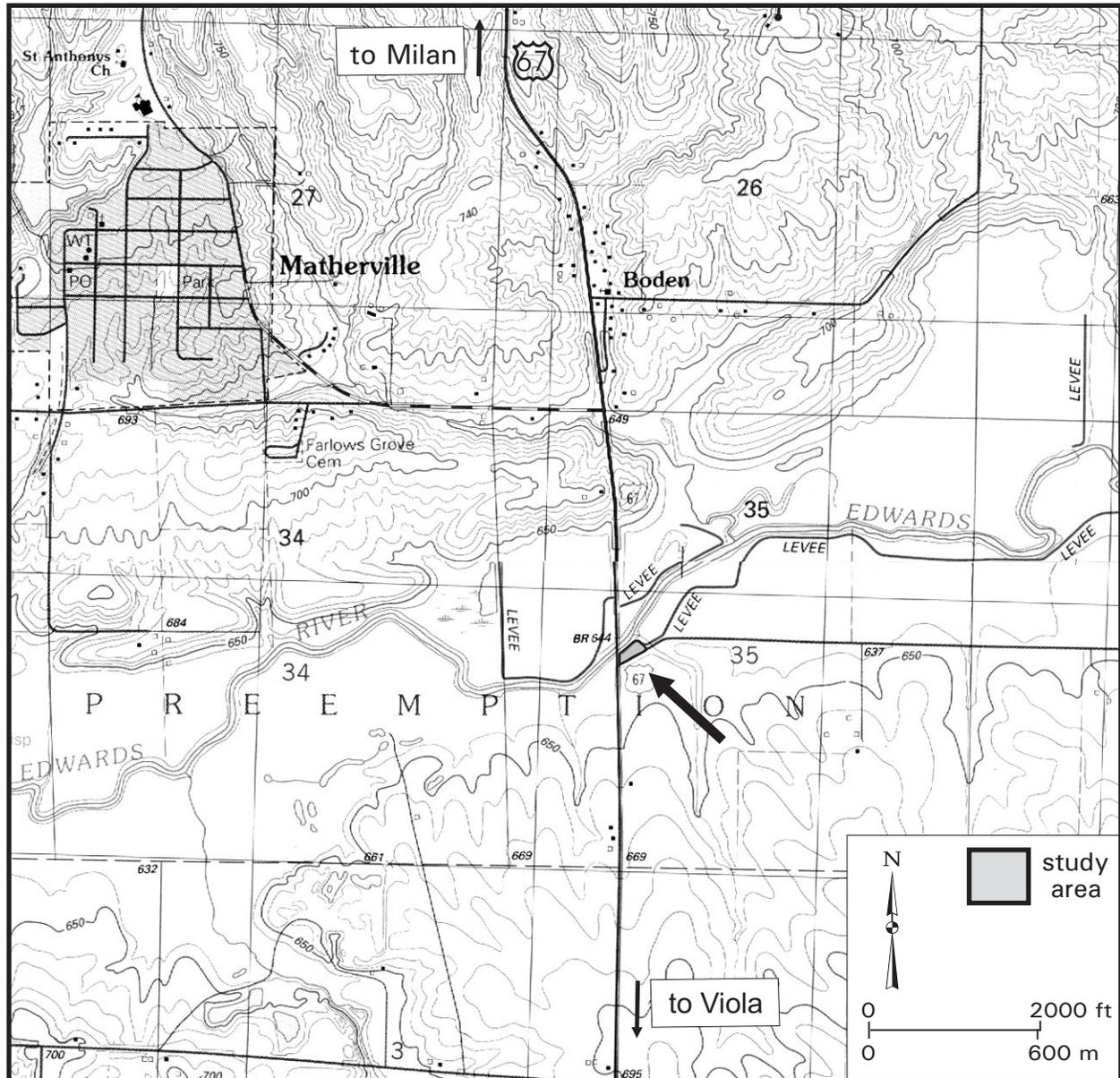
## PLANNED FUTURE ACTIVITIES

- Monitoring of hydrology and sediment deposition will continue through Spring 2004 or until no longer required by IDOT.

# Edwards River, Mercer County Wetland Compensation Site (FAP 310)

## General Study Area and Vicinity

from the USGS Topographic Series, Viola, IL (USGS 1992) and  
Matherville, IL (USGS 1991) 7.5 Minute Quadrangles  
contour interval is 10 ft



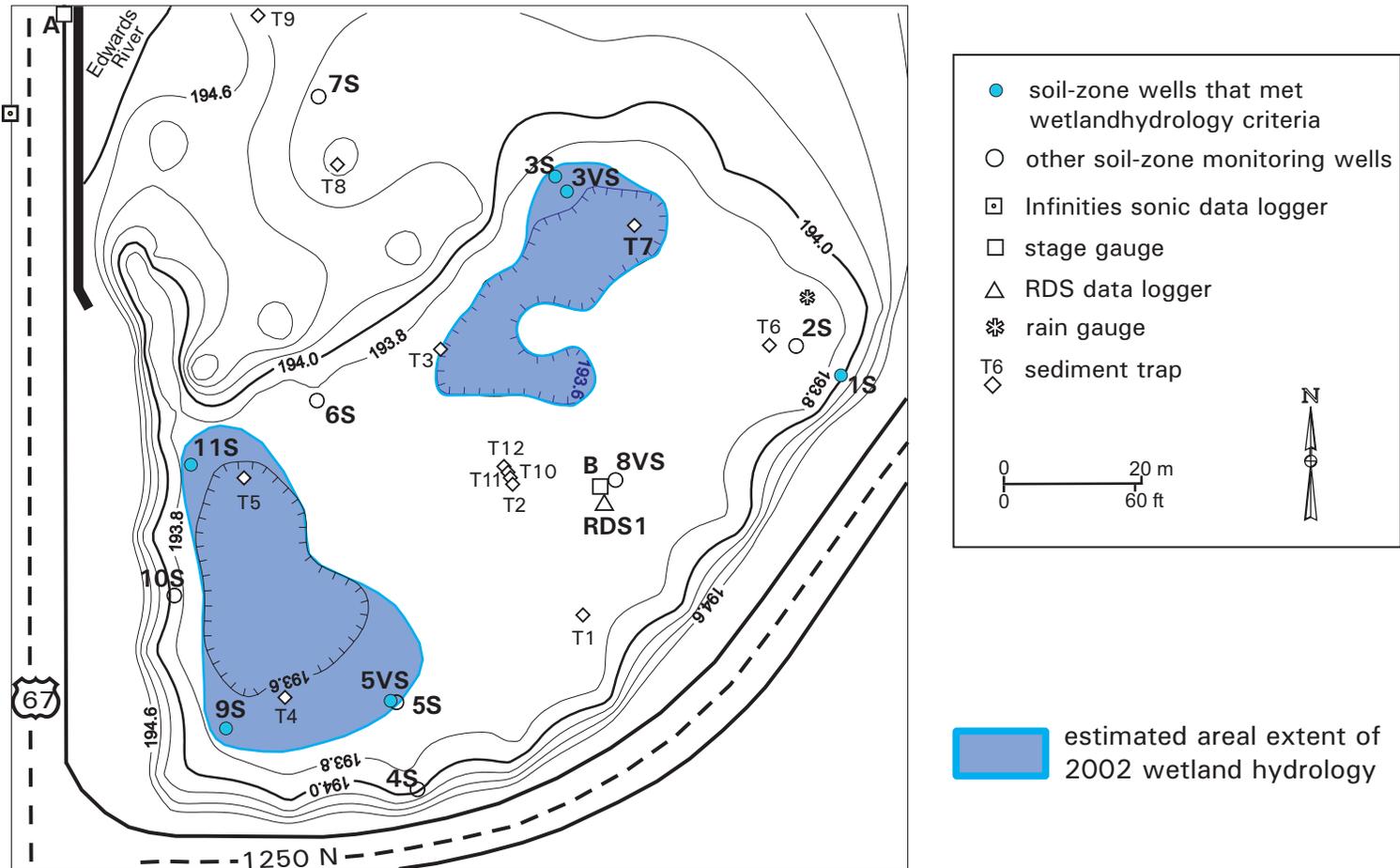
# Edwards River, Mercer County Wetland Compensation Site (FAP 310)

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

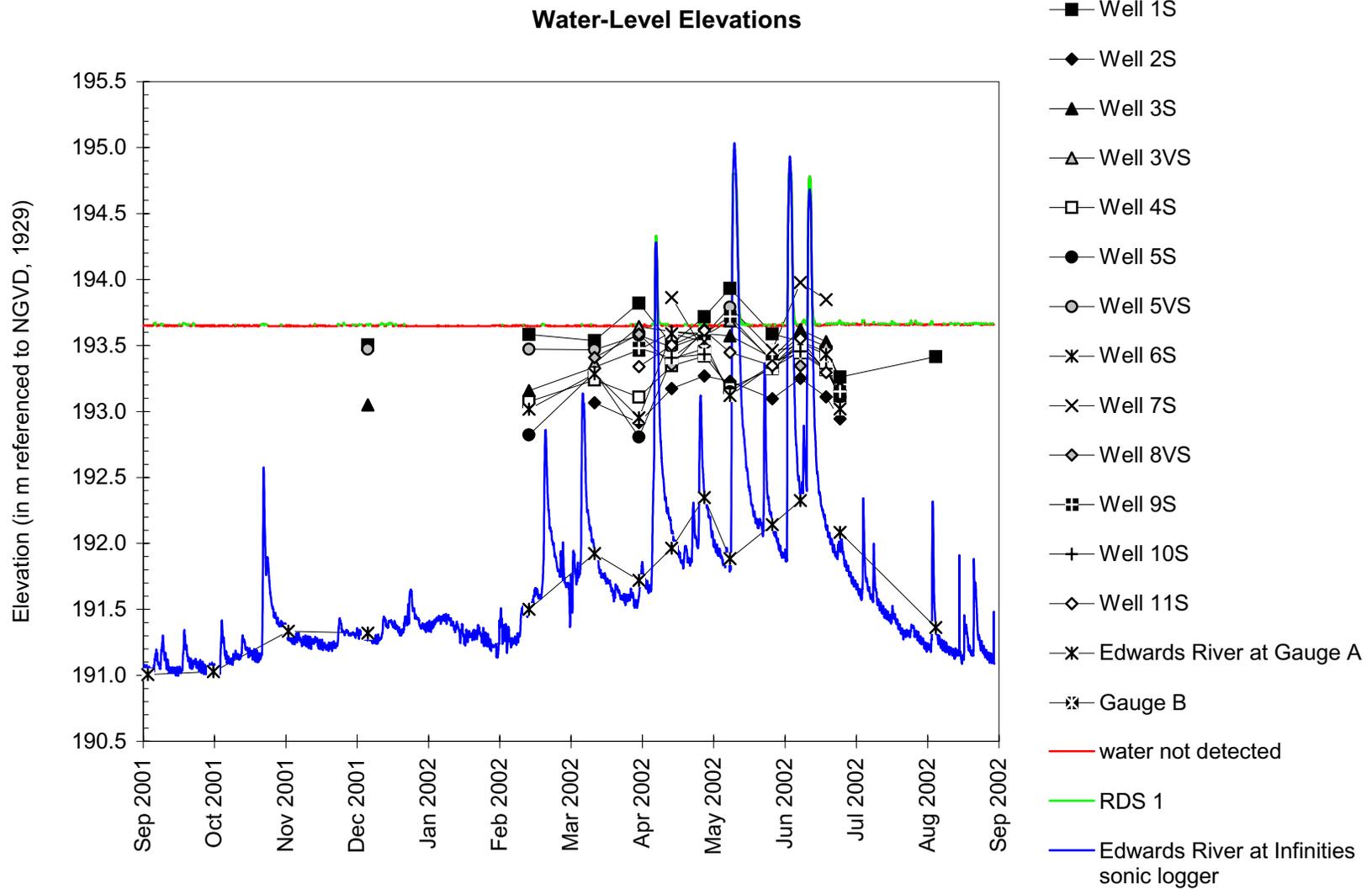
map based on 2002 ISGS elevation survey referenced to NGVD, 1929

contour interval is 0.2 meters



# Edwards River, Mercer County Wetland Compensation Site

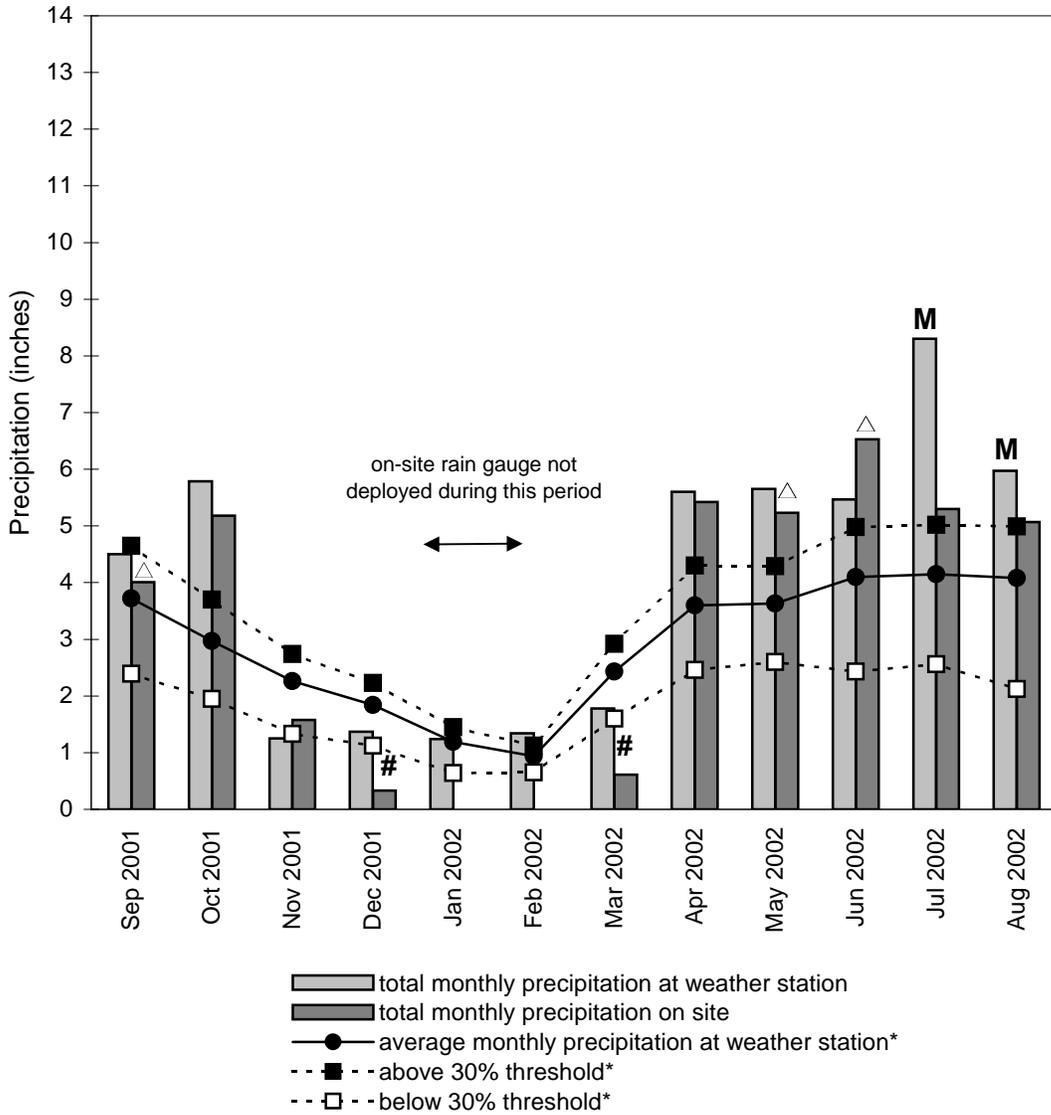
## September 1, 2001 to September 1, 2002





# Edwards River, Mercer County Wetland Compensation Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the Aledo, IL Weather Station



# on-site rain gauge not deployed for entire month  
 △ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month  
 M missing data from weather station  
 \* see text for explanation

**FORMER LUEHMANN PROPERTY, NEW RIVER CROSSING  
POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #51**

FAP 999

Madison County, near Stallings, Illinois

**Primary Project Manager: D. Bradley Ketterling**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- February 2000: The ISGS was tasked to perform a Level II hydrogeologic assessment of the site.
- March, April, and June 2000: Nine well clusters, one staff gauge, one rain gauge and three water-level loggers were installed on site.
- November 2000: A Starflow flow-velocity meter was installed in the box culvert at the southern tip of the site to measure the volume of water discharged from the site.
- February 2001: Two staff gauges were added to the ditch running along the south side of Illinois Route 162.
- April 2002: A Sonic water-level meter was added to the IL162 bridge over Cahokia Canal to record stage.
- August 2002: All wells located outside the new site boundaries were abandoned. A Starflow flow-velocity meter was installed in the east ditch NNE of well cluster nine.

**SUMMARY OF 2002 EVENTS**

Because this site is a potential compensation site, an estimate of the areas satisfying the criteria for wetland hydrology is not required for this report.

- According to the Midwestern Climate Center, the median length of the growing season at Belleville, Illinois is 203 days, starting April 5 and ending October 24. Therefore 12.5% of the growing season is 25 days.
- Precipitation during the monitoring period was 123% of normal. Above-normal precipitation fell in April, May and June, resulting in long-standing water in the farm ditches, and a delay in soybean planting. Water levels in M and L-wells reached record elevations in May.
- Water levels in wells 4S and 9S were observed above or within 30 cm (1 ft) of the surface for greater than 12.5% of the growing season, thereby satisfying the criteria for wetland hydrology outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Well cluster 4 was located near the confluence of numerous farm ditches whereas well cluster 9 is located on a topographic high. These disparate settings highlight how wetland hydrology was manifested based on local conditions such as micro topography and soil permeability.
- To evaluate Cahokia Canal as a possible source of water for wetland compensation, an electronic stage gauge was deployed in April 2002. If the levee was not defending the site,

water would begin to enter at approximately 127.3 m NGVD 29 (417.0 ft NAVD 88). Water levels in the canal exceeded this value on five occasions between April 27 and June 14.

#### ADDITIONAL INFORMATION

- Opening the site to Cahokia Canal would require the construction of various protective berms and necessitate rerouting current drainage through a new system of ditches. A letter report containing possible approaches and considerations for future wetland compensation activities is being prepared and will be submitted to IDOT in early October.
- Soil-moisture probes could not be deployed because of ongoing negotiations with the current landowner regarding site acquisition. Because the wiring for the probes must be buried about 4 inches (10 cm) below ground surface, they would have interfered with crop planting and harvesting. IDOT requested the deployment be delayed until the site was acquired to avoid crop loss/damage compensation.

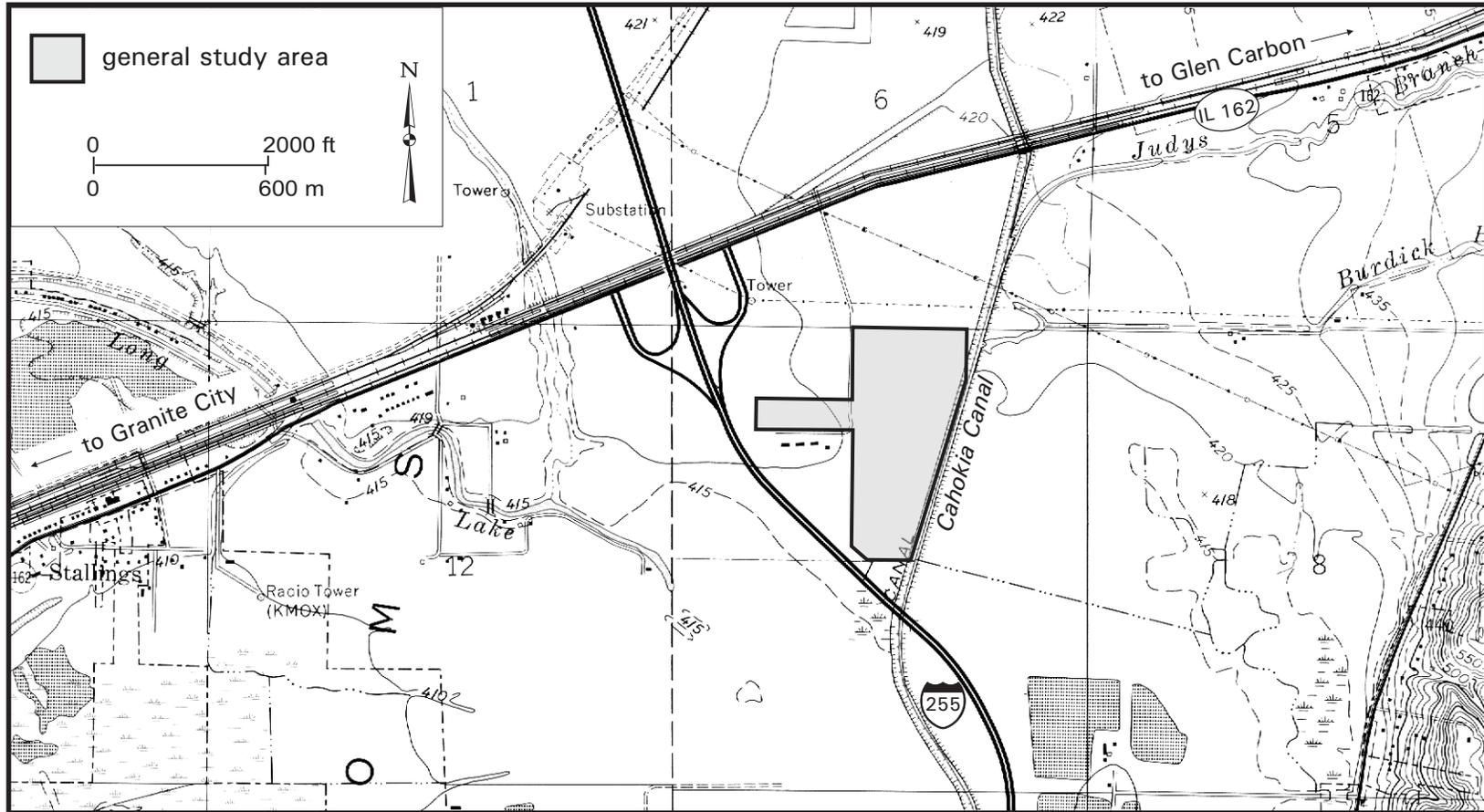
#### PLANNED FUTURE ACTIVITIES

- Soil moisture probes will be deployed as necessary and as permitted in advance of the 2003 growing season. Additional shallow wells may also be deployed within the finalized site perimeter.

# Former Luehmann Property, New River Crossing Potential Wetland Compensation Site (FAP 999)

## General Study Area and Vicinity

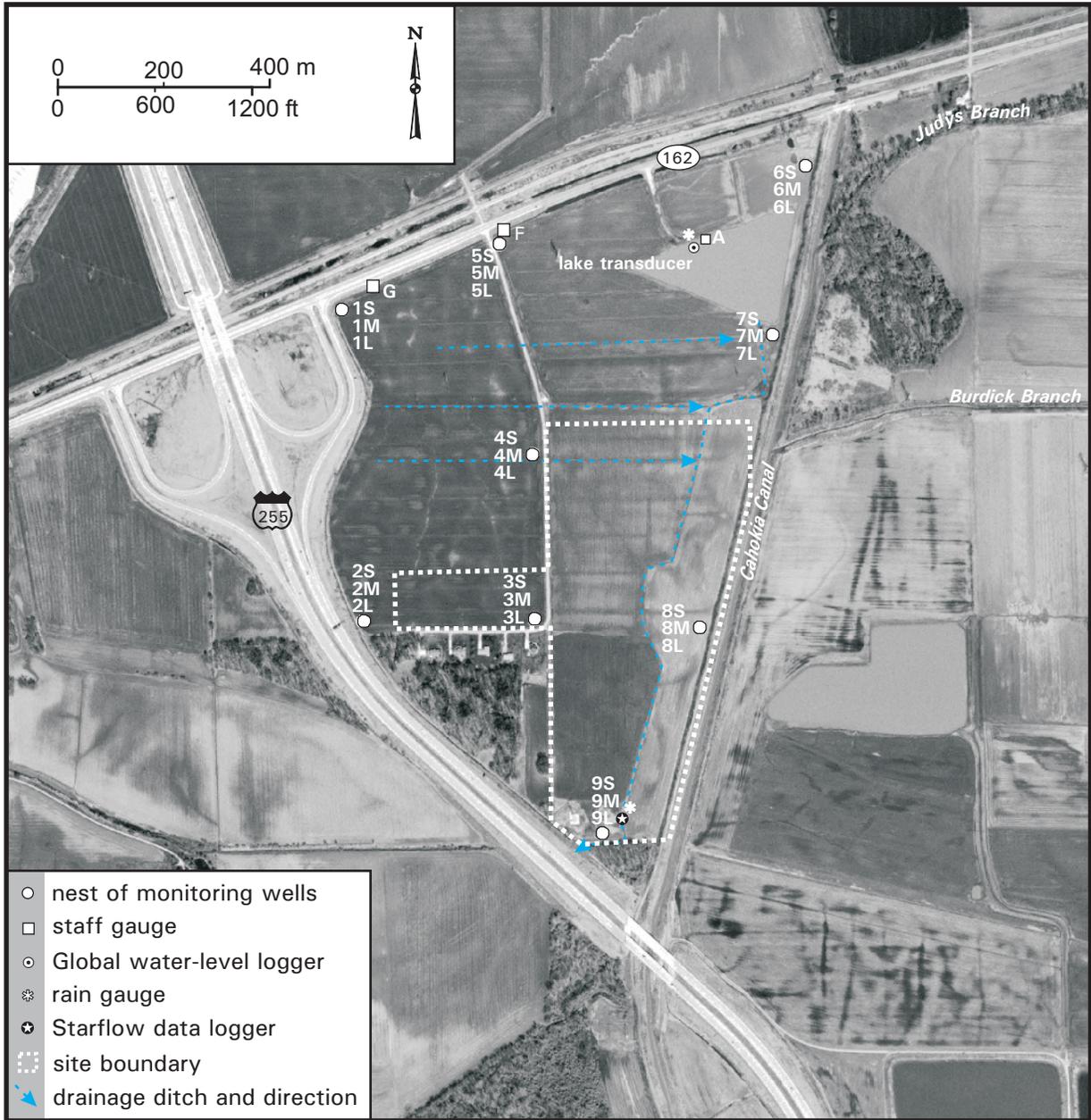
from the USGS Topographic Series, Monks Mound, IL 7.5-minute Quadrangle (USGS 1993)  
contour interval is 10 feet



# Former Luehmann Property, New River Crossing Potential Wetland Compensation Site (FAP 999)

## Locations of ISGS Monitoring Instruments

map based on USGS digital orthophotograph, Monk's Mound NE quarter quadrangle  
produced from 4/2/98 aerial photography (ISGS 2001)



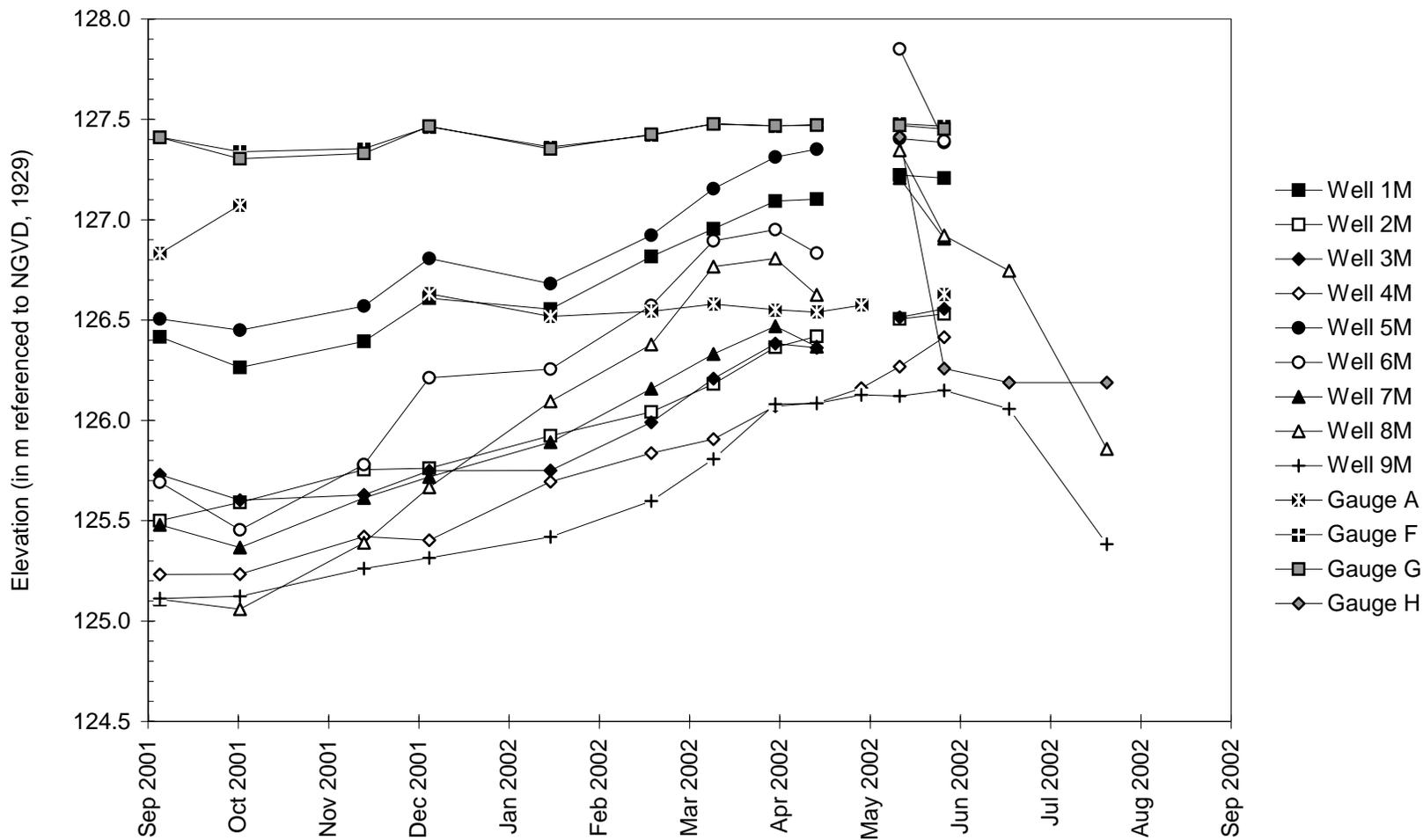




# Former Luehmann Property, New River Crossing Potential Wetland Compensation Site

## September 1, 2001 to September 1, 2002

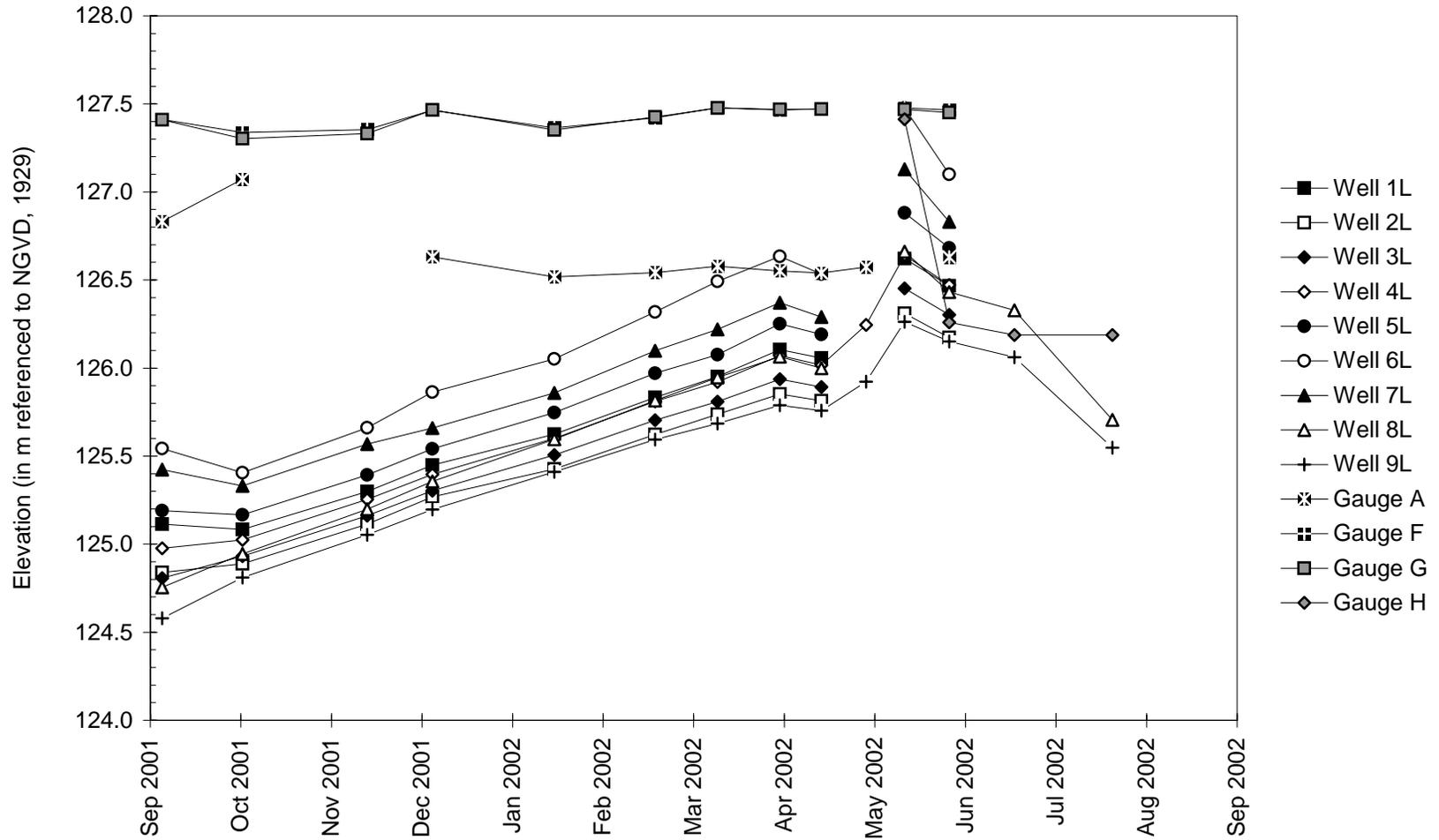
### Water-Level Elevations in Middle Monitoring Wells and on Stage Gauges





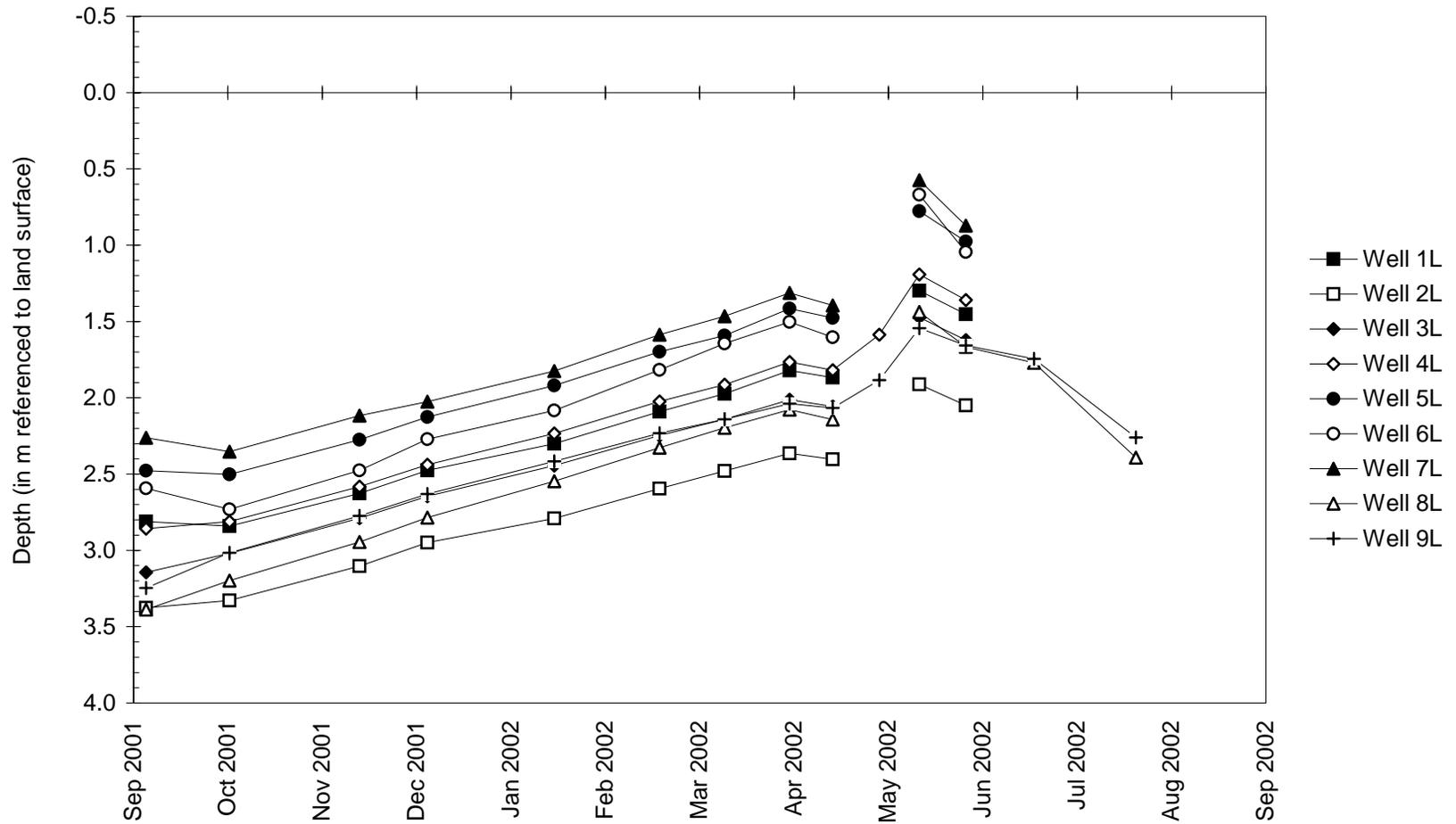
**Former Luehmann Property, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations  
in Lower Monitoring Wells and on Stage Gauges**



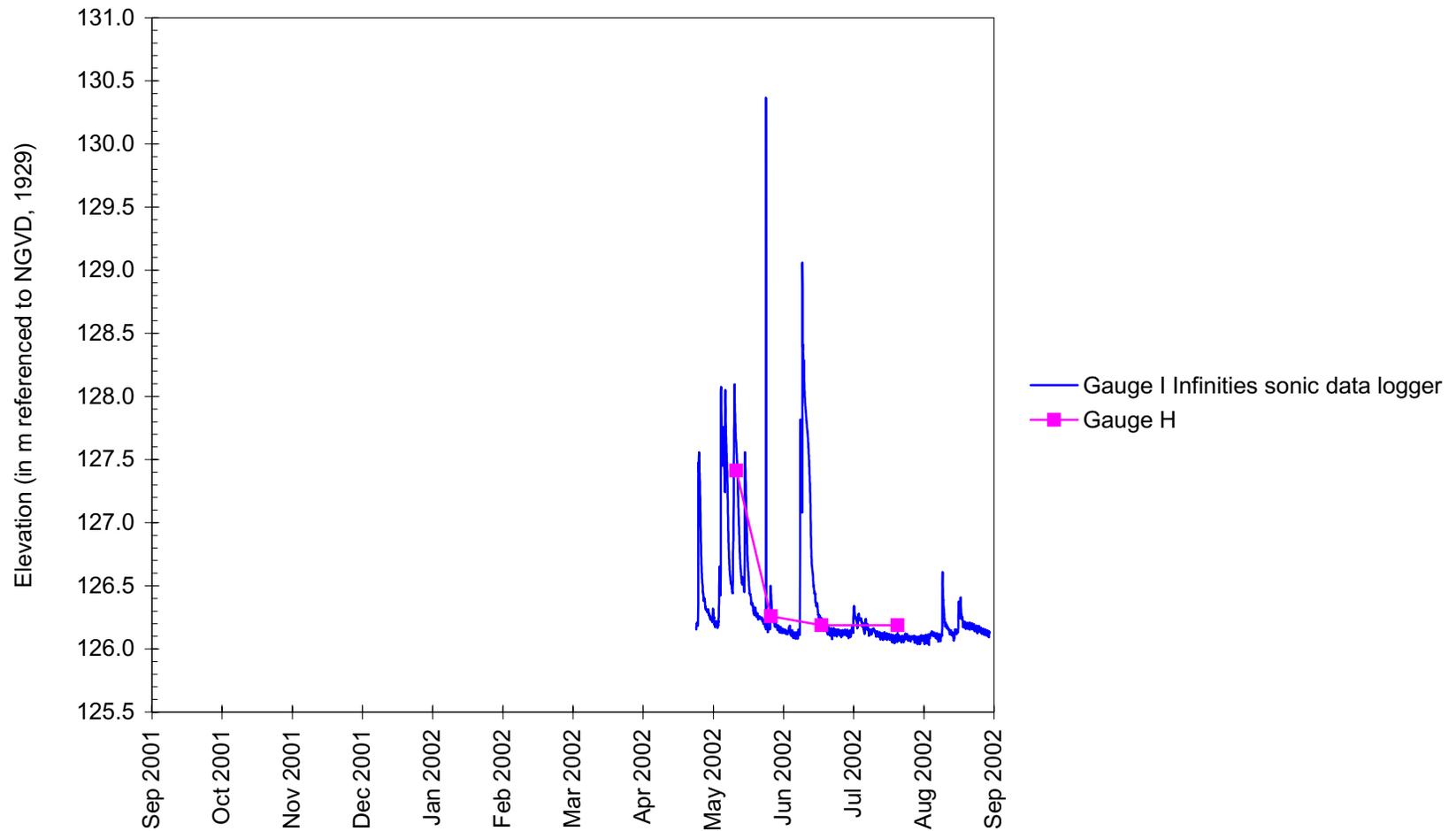
**Former Luehmann Property, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Depth to Water  
in Lower Monitoring Wells**



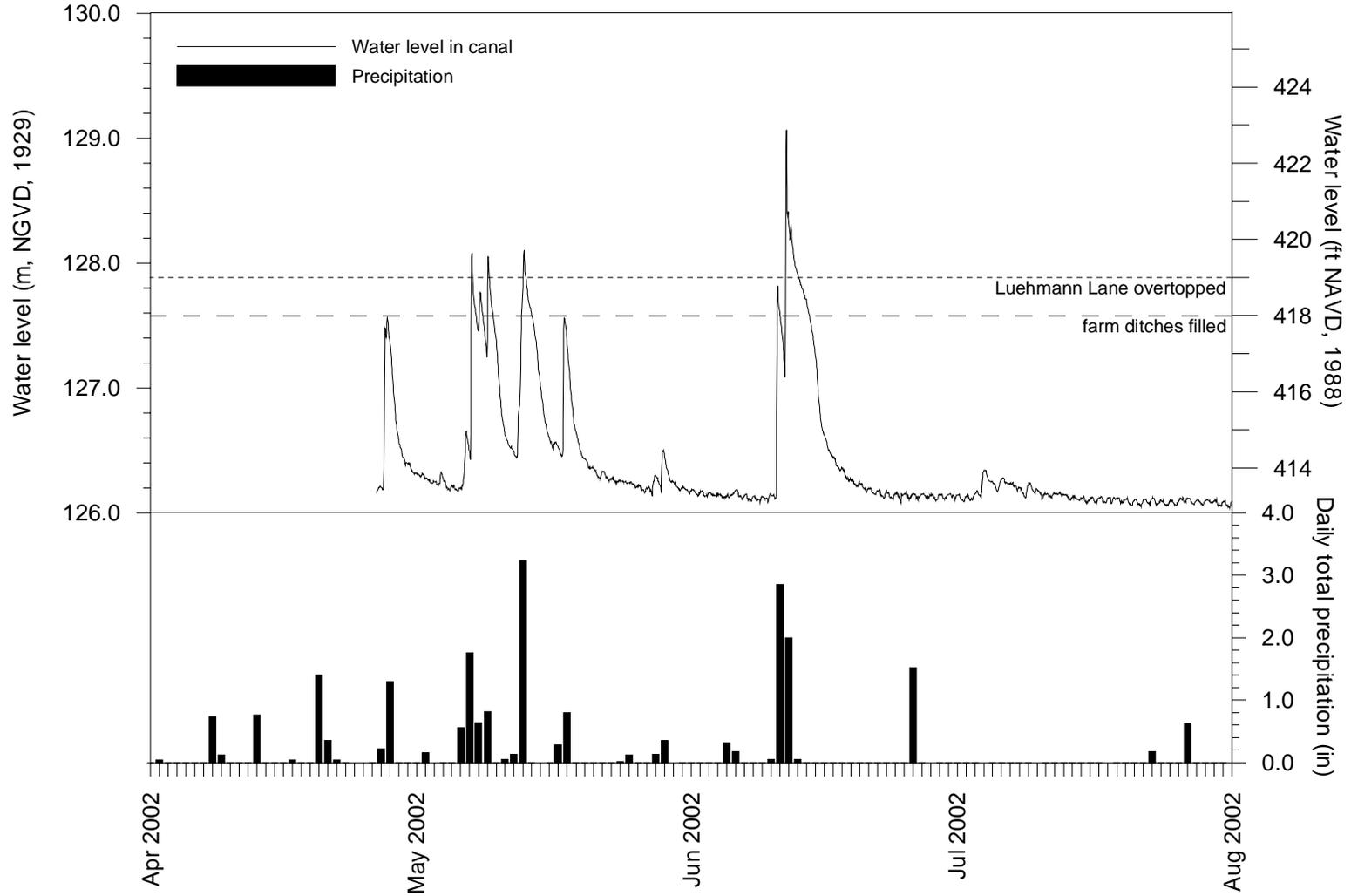
**Former Luehmann Property, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**



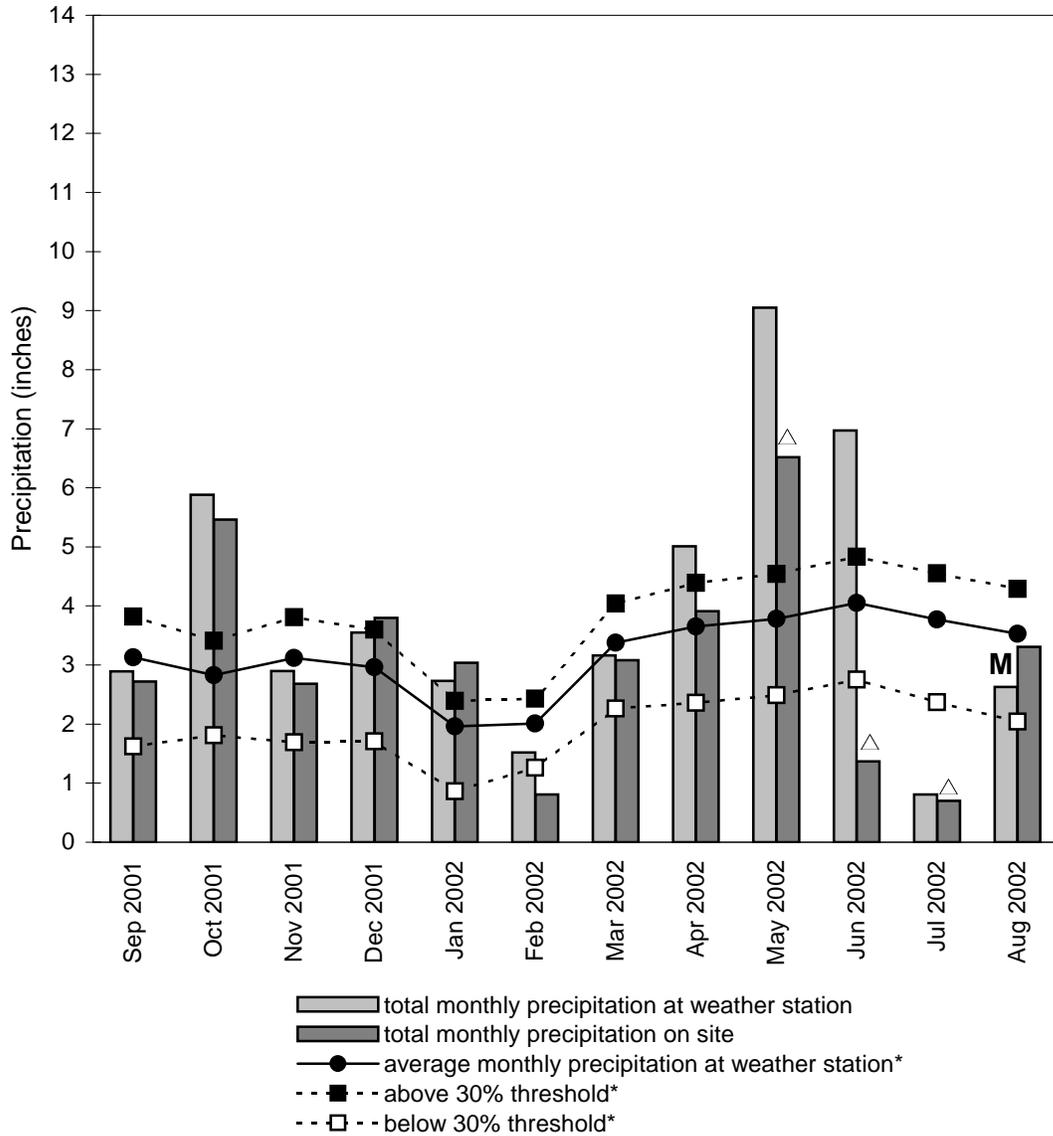
# Former Luehmann Property Potential Wetland Compensation Site April 1, 2002 to September 1, 2002

## Water level elevation in Cahokia Canal and precipitation at Edwardsville



# Former Luehmann Property, New River Crossing Wetland Compensation Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the Edwardsville, IL Weather Station



△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

**M** missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**FORMER WESSEL PROPERTY  
DISTRICT 6 POTENTIAL WETLAND BANKING SITE**

**ISGS #52**

Brown County, near Meredosia, Illinois

**Primary Project Manager: Blaine A. Watson**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- February 2000: ISGS was tasked by IDOT to conduct a Level II hydrogeologic assessment of the site.
- Spring 2000: ISGS began on-site activities with the installation of surface-water monitoring equipment and two monitoring wells in selected areas.
- Spring, Summer, and Fall 2001: ISGS installed wetland hydrology monitoring instrumentation at the site; IDOT completed a preliminary topographic survey of the site based on data acquired during the summer of 2000.
- July 2001: ISGS, INHS, and IDOT personnel met to discuss a preliminary banking plan for the site. ISGS requested discontinuation of the pumping and water-level manipulation at the site starting in October 2001. IDOT agreed to evaluate this as an option.
- February 2002: IDOT prepared an initial wetland banking prospectus.
- May 2002: Levees breached at two locations on the site; major portions of the site were inundated for approximately 45 days. Later in the month, the banking prospectus prepared by IDOT was presented to a group representing the Mitigation Bank Review Team.
- August 2002: ISGS and INHS tasked to prepare draft wetland banking instrument.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

We estimate that the total area of the site that conclusively satisfied wetland hydrology criteria in 2002 is 847.7 ac (343.1 ha), independent of the flooding event (see below). This compares to an estimate of 492.3 ac (199.2 ha) in 2001. This year's estimate is based on the following factors:

- According to the Midwestern Climate Center, the median date that the growing season begins in nearby Rushville is April 7 and the season lasts 207 days; 12.5% of the growing season is 26 days.
- During the period from September 2001 to August 2002, total precipitation at the site was 97% of normal. This is compared to 85% of normal for the period from September 2000 through August 2001. Precipitation recorded at the site and in the vicinity during September, November, and December 2001, and February and March 2002, was at the lower limit of, or below, the normal range. Precipitation either on-site or in the site vicinity was within the normal range in September 2001 and August 2002. The months of January, April, and May 2002 were above the normal range as based on either on-site data or data from the site vicinity.

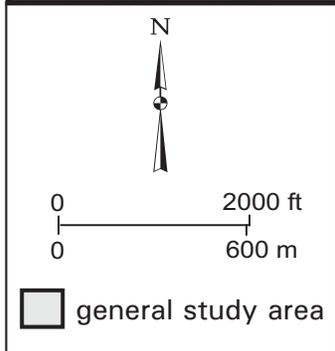
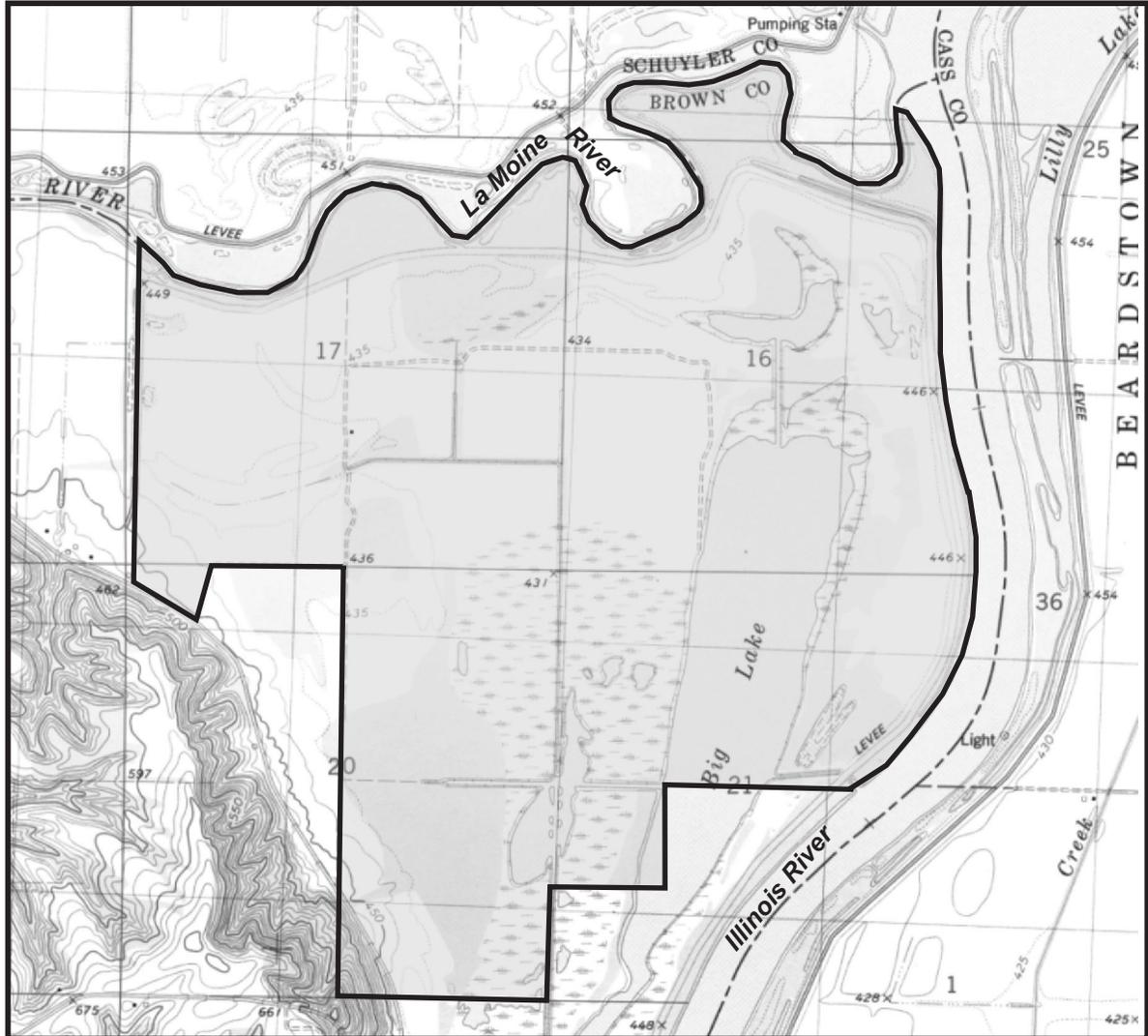
- In 2002, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual: wells 6S, 7S, 8S, 9S, 11S, 13S, 16S, 17S, 18S, 19S, 20S, 21S, and 23S. Water levels in wells 1S, 3S, 4S, 5S, 10S, 12S, 15S, and 22S may have satisfied the wetland hydrology criteria as a result of the extended period of inundation associated with the Illinois River flood event, but this cannot be confirmed due to a lack of monitoring data. Wells 24S and 25S were installed late in the growing season and no data was collected from them prior to the end of the current monitoring period.
- Limitations of the wetland hydrology determination are as follows:
  - The area of wetland hydrology estimated for 2002 (indicated by blue tint in the figure) is based solely on monitoring data collected prior to the levee breaches and flood on May 13, 2002. Monitoring data collected prior to this event indicates that this area had achieved wetland hydrology as a result of the baseline site conditions (*i.e.*, no floodwater input). Areas indicated in yellow on the attached figure represent our interpretation of additional areas that likely achieved wetland hydrology as a direct result of the flood inundation on the site.
  - Although the baseline conditions of the site were changed mid-year, we believed it was more beneficial to identify the separate areas based on the separate water sources which permitted them to achieve wetland hydrology.

#### PLANNED FUTURE ACTIVITIES

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

# Former Wessel Property, District 6 Potential Wetland Banking Site General Study Area and Vicinity

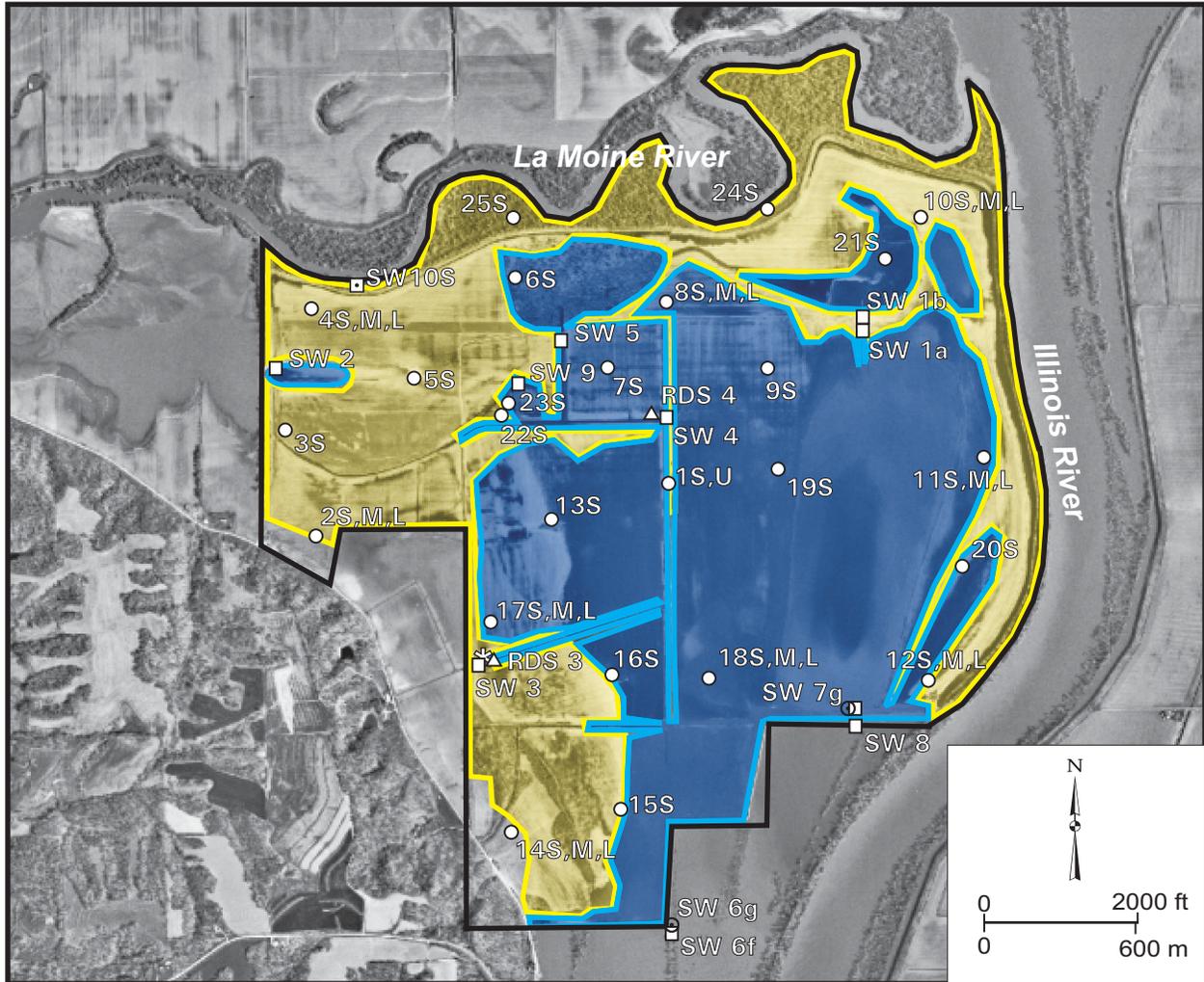
from the USGS Topographic Series, Cooperstown, IL 7.5-minute Quadrangle (USGS 1980)  
contour interval is 10 feet



# Former Wessel Property, District 6 Potential Wetland Banking Site

## Estimated Areal Extent of 2002 Wetland Hydrology

map based on USGS digital orthophotograph Cooperstown, NE quarter quadrangle  
 produced from 4/14/98 aerial photography (ISGS 2002)

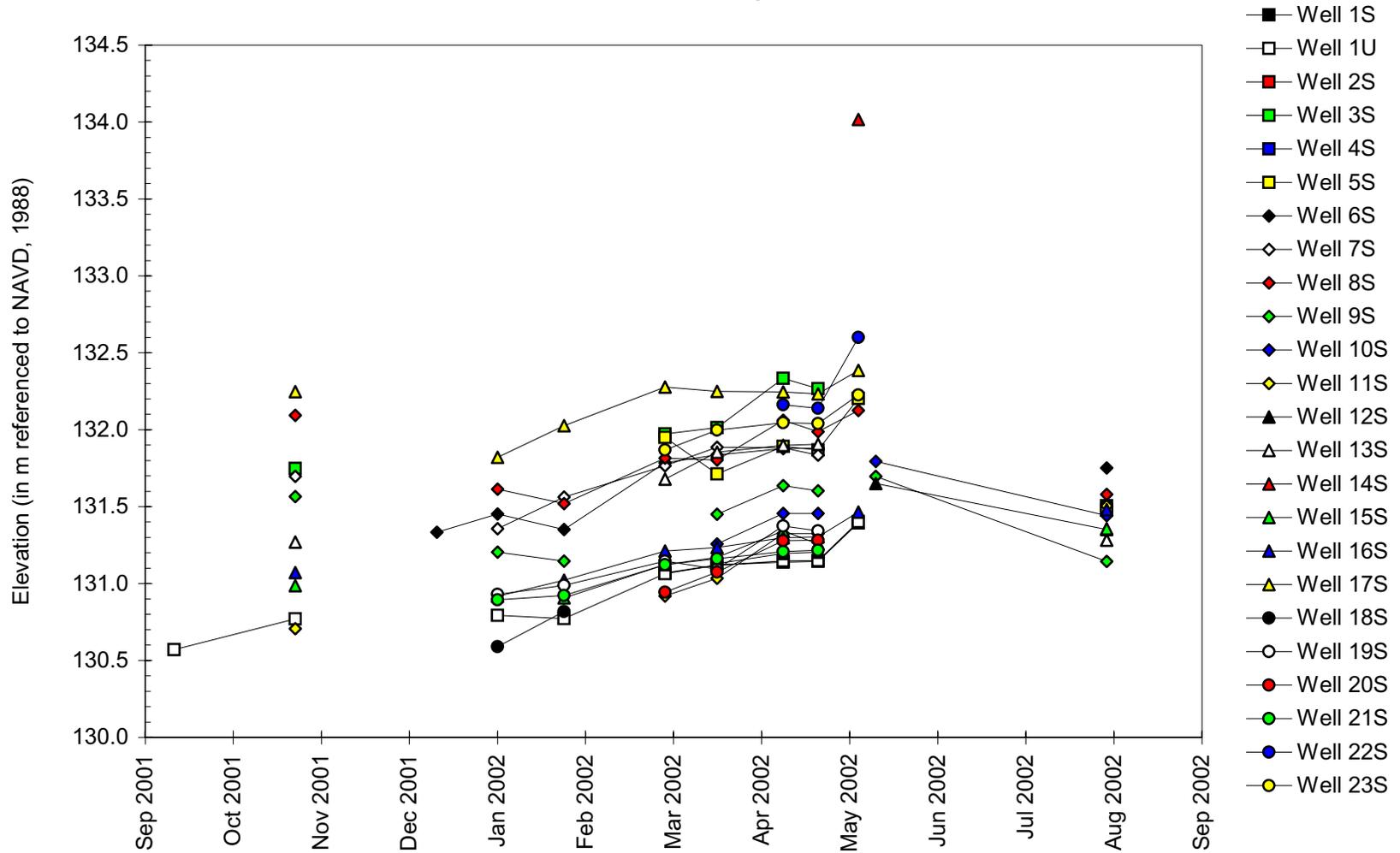


- |   |  |   |                            |
|---|--|---|----------------------------|
|  | estimated areal extent of 2002 pre-flood wetland hydrology     |  | Global pressure transducer |
|  | estimated areal extent of 2002 flood-induced wetland hydrology |  | monitoring well            |
|  | RDS data logger  |  | stage gauge                |
|  | rain gauge   |  | Sonic data logger          |

# Former Wessel Property, District 6 Potential Wetland Banking Site

September 1, 2001 to September 1, 2002

## Water-Level Elevations in Shallow Monitoring Wells

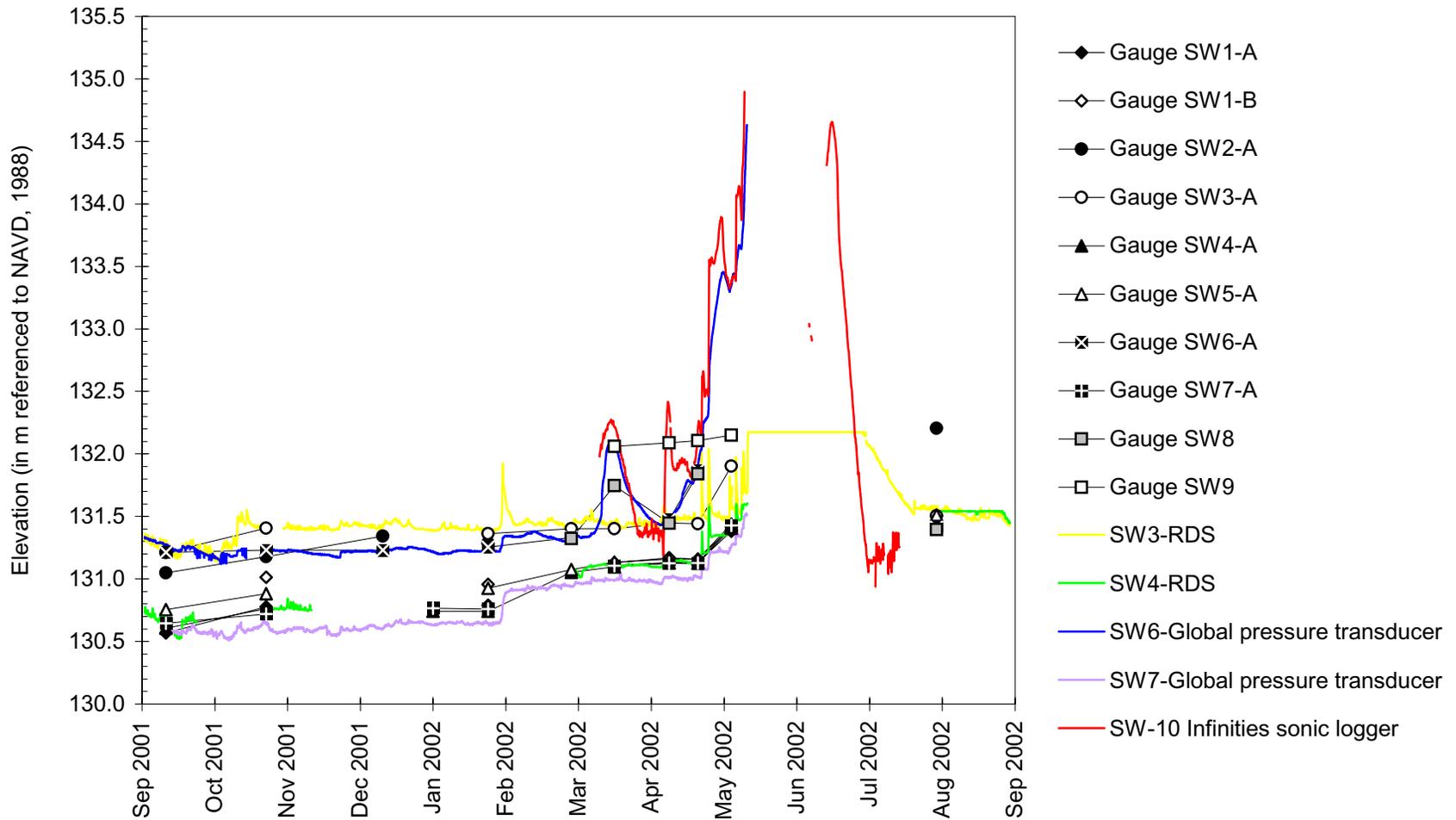




# Former Wessel Property, District 6 Potential Wetland Banking Site

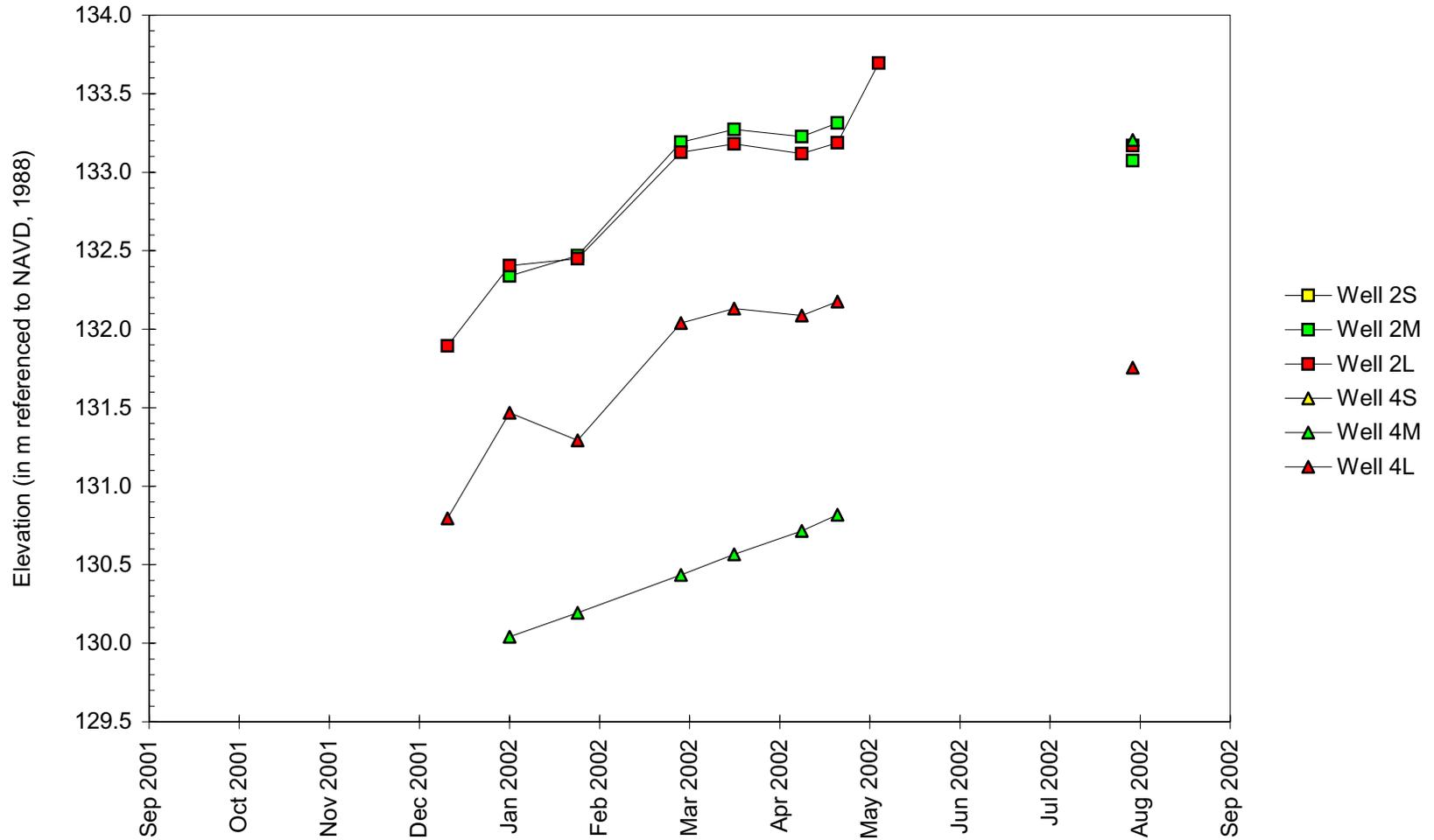
September 1, 2001 to September 1, 2002

## Water-Level Elevations on Stage Gauges and Data Loggers



# Former Wessel Property, District 6 Potential Wetland Banking Site September 1, 2001 to September 1, 2002

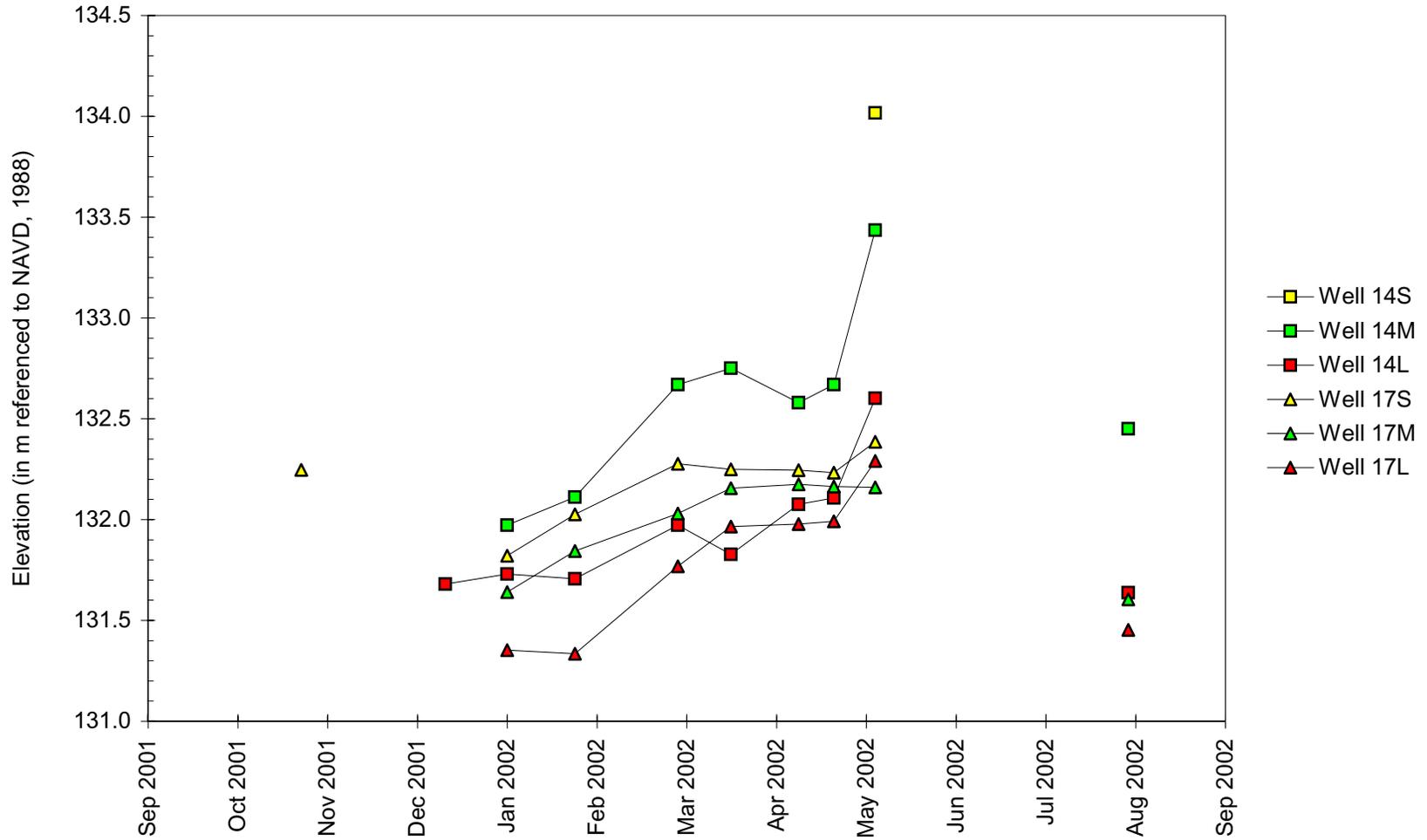
## Water-Level Elevations in Well Nests on the Upper Terrace



# Former Wessel Property, District 6 Potential Wetland Banking Site

September 1, 2001 to September 1, 2002

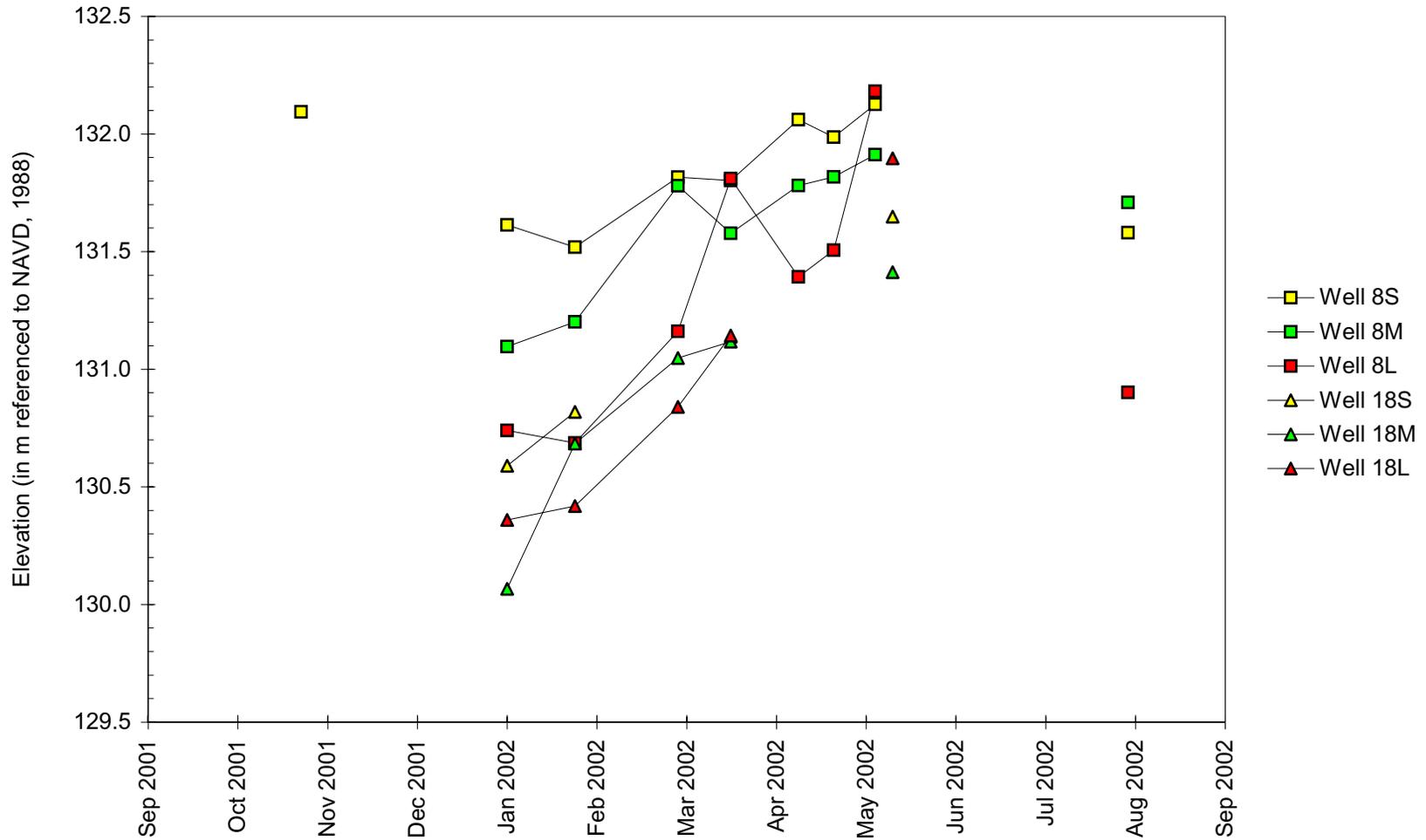
## Water-Level Elevations in Well Nests on the Upper Terrace



# Former Wessel Property, District 6 Potential Wetland Banking Site

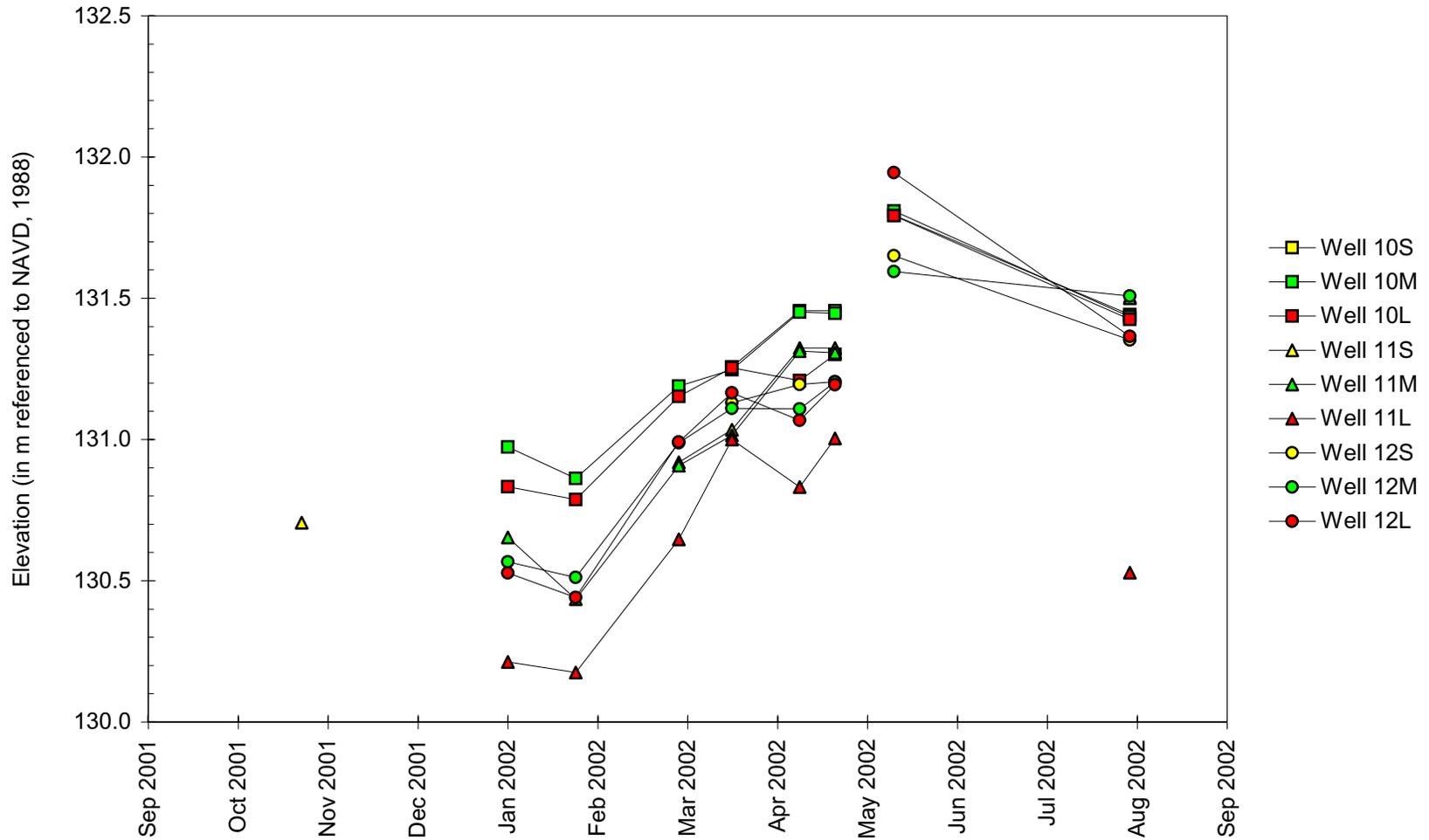
## September 1, 2001 to September 1, 2002

### Water-Level Elevations in Well Nests on the Lake Plain



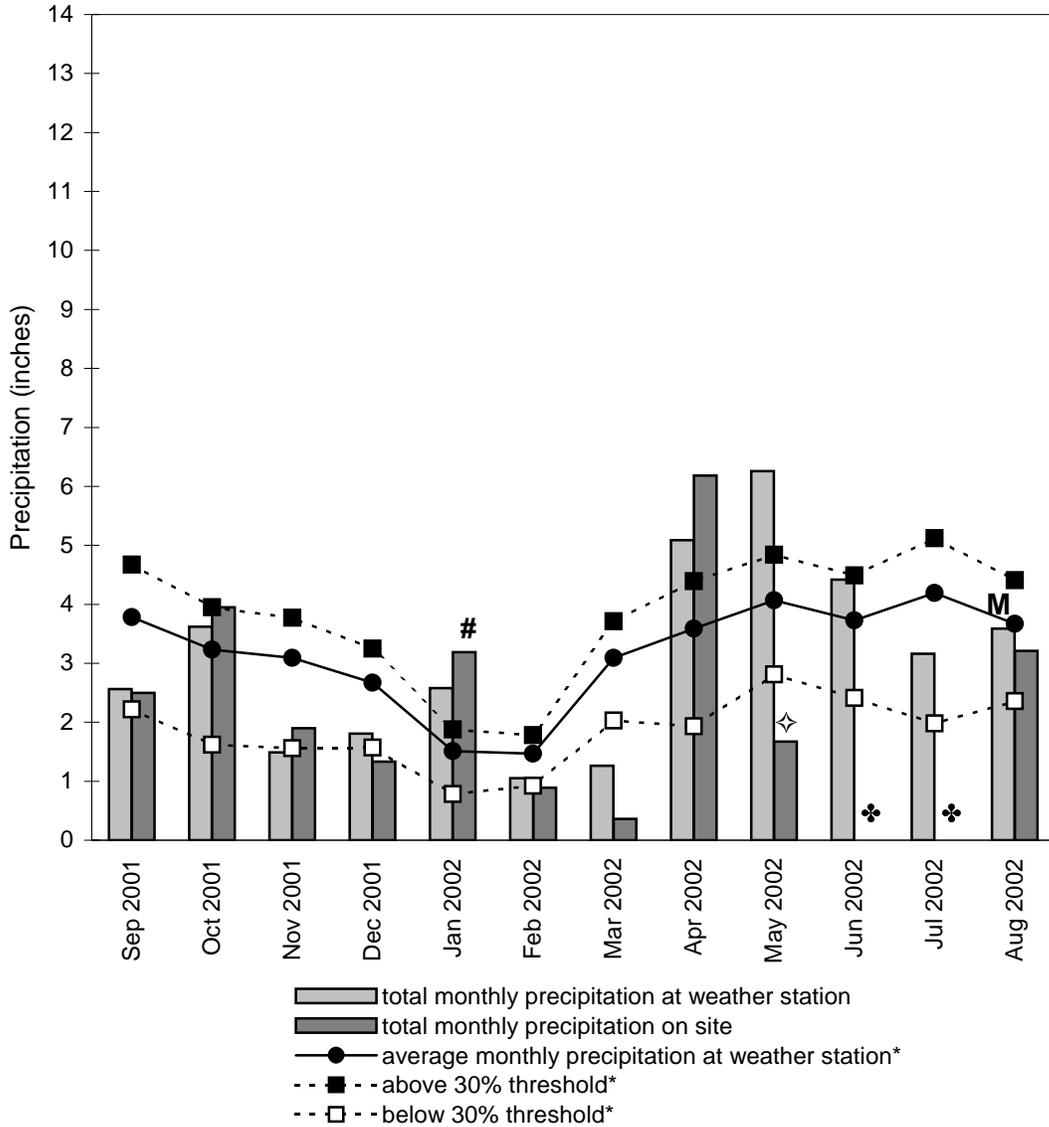
# Former Wessel Property, District 6 Potential Wetland Banking Site September 1, 2001 to September 1, 2002

## Water-Level Elevations in Well Nests Near the River



# Former Wessel Property, District 6 Potential Wetland Banking Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the Beardstown, IL Weather Station



# on-site rain gauge not deployed for entire month  
 ♦ suspect data - on-site rain gauge malfunctioning due to flooding  
 ♣ no data - on-site rain gauge damaged by flooding  
 M missing data from weather station  
 \* see text for explanation

Graph last updated October 11, 2002

**FAIRMONT CITY**  
**POTENTIAL WETLAND COMPENSATION SITE**  
FAP 999

**ISGS #53**

St. Clair County, near Fairmont City, Illinois

**Primary Project Manager: Steven E. Benton**

**Secondary Project Manager: Blaine A. Watson**

**SITE HISTORY**

- August 1999: The ISGS conducted an initial site evaluation of the proposed compensation site. The results were reported to IDOT by letter in November.
- June 2000: IDOT requested that the ISGS perform a Level II investigation of the proposed compensation site.
- September 2000: Field work commenced at the site with the installation of a ground-water and surface-water monitoring network.

**SUMMARY OF 2002 EVENTS**

The area of wetland hydrology at this site in 2002 is estimated to be about 44 ac (18 ha). In 2001, the area was estimated to have been about 12 ac (5 ha). The difference is apparently due to greater amounts of precipitation in 2002.

- According to the Midwestern Climate Center, the median length of the growing season at Belleville, Illinois is 203 days, starting April 5 and ending October 24. Therefore, 12.5% of the growing season is 25 days.
- Total precipitation recorded at the Belleville, Illinois weather station during the 2002 monitoring period was 41.33 inches, which was 108% of normal. Precipitation in 8 out of 12 months was above average. Total precipitation in the spring (April, May, June) was 13.24 in, which was 119% of average. In 2001, total precipitation during the monitoring period was 36.69 in (96% of average) and spring precipitation was 9.65 in (86% of average).
- Additional ground-water monitoring wells were installed in Fall 2001. The locations of these wells were chosen in order to better define the extent of wetland hydrology in the southern portion of the site (13S, 14S, 15S, and 17S) and to determine the effect of surface-water fluctuations in Old Cahokia Creek on the water table (18S, 18U, 19S, 19U).
- In 2002, only 3 (11S, 18S, and 19S) out of 18 wells did not conclusively satisfy the criteria for wetland hydrology per the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Wells 11S and 18S had wetland hydrology for 6% of the growing season, and therefore may have satisfied the criteria, while well 19S never had ground-water levels within 30 cm of ground-surface.
- In 2001, five (1S, 2S, 3S, 4S, and 8S) out of twelve monitoring wells conclusively satisfied the criteria for wetland hydrology, one well (12S) may have satisfied the criteria, and the remaining wells did not satisfy the criteria.

- A hydrogeologic characterization report for the site was completed in August 2002 and is in review. The results of the investigation indicate that the occurrence and duration of wetland hydrology at this site depends on the amount of precipitation, ground-water discharge, and ground-surface elevation.

#### PLANNED FUTURE ACTIVITIES

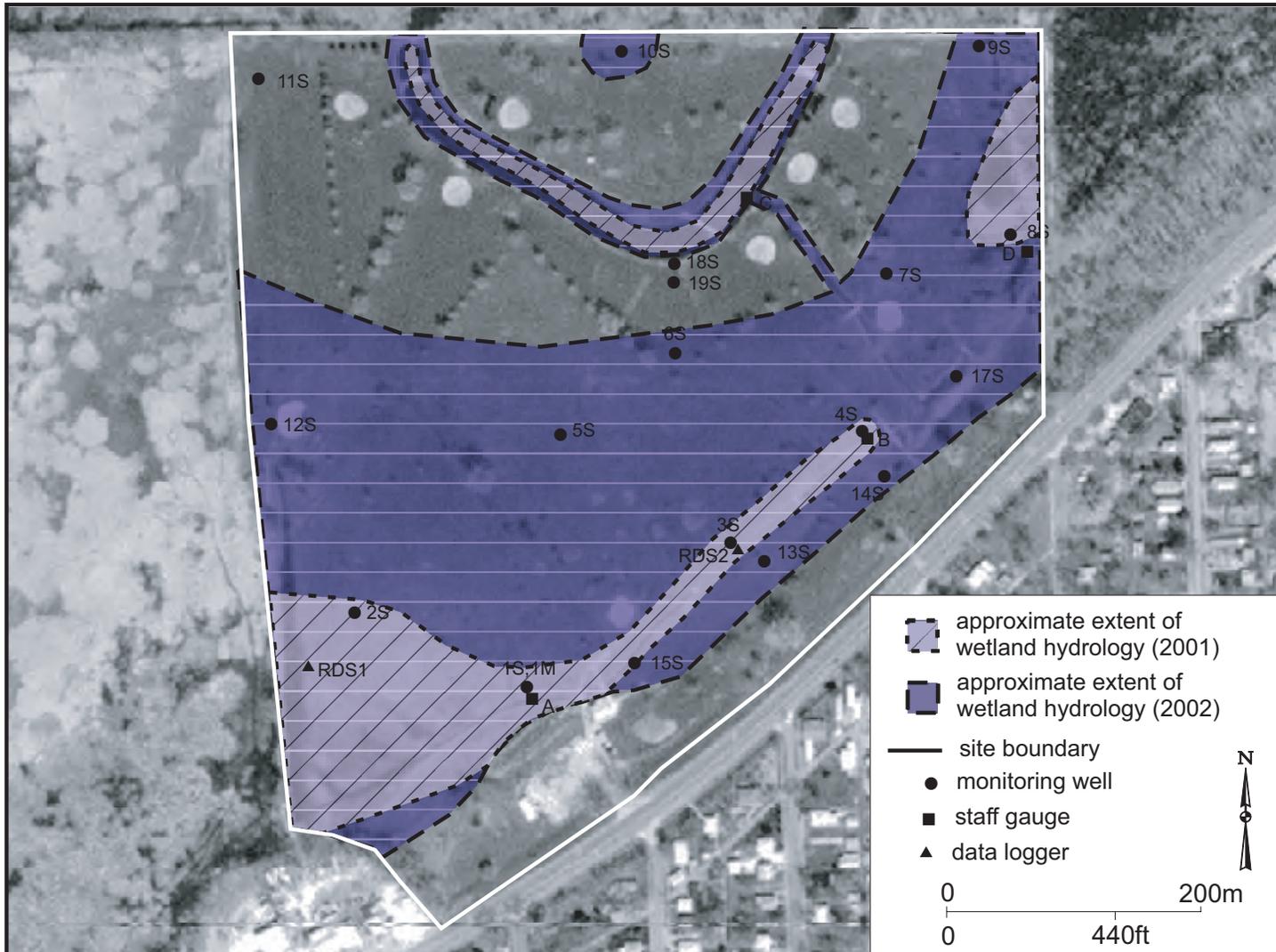
- Surface- and ground-water monitoring will continue at this site until notified otherwise by IDOT.
- Additional monitoring wells will be installed in order to better define the current area of wetland hydrology.
- It is anticipated that, if IDOT can obtain permission from the owners, the monitoring network will be expanded to include the property west of the site.



# Fairmont City Potential Wetland Compensation Site (FAP 999)

## Wetland Hydrology

map based on the USGS, Monks Mound SW, Digital Orthophoto Quadrangle (NAPP 1998/99)

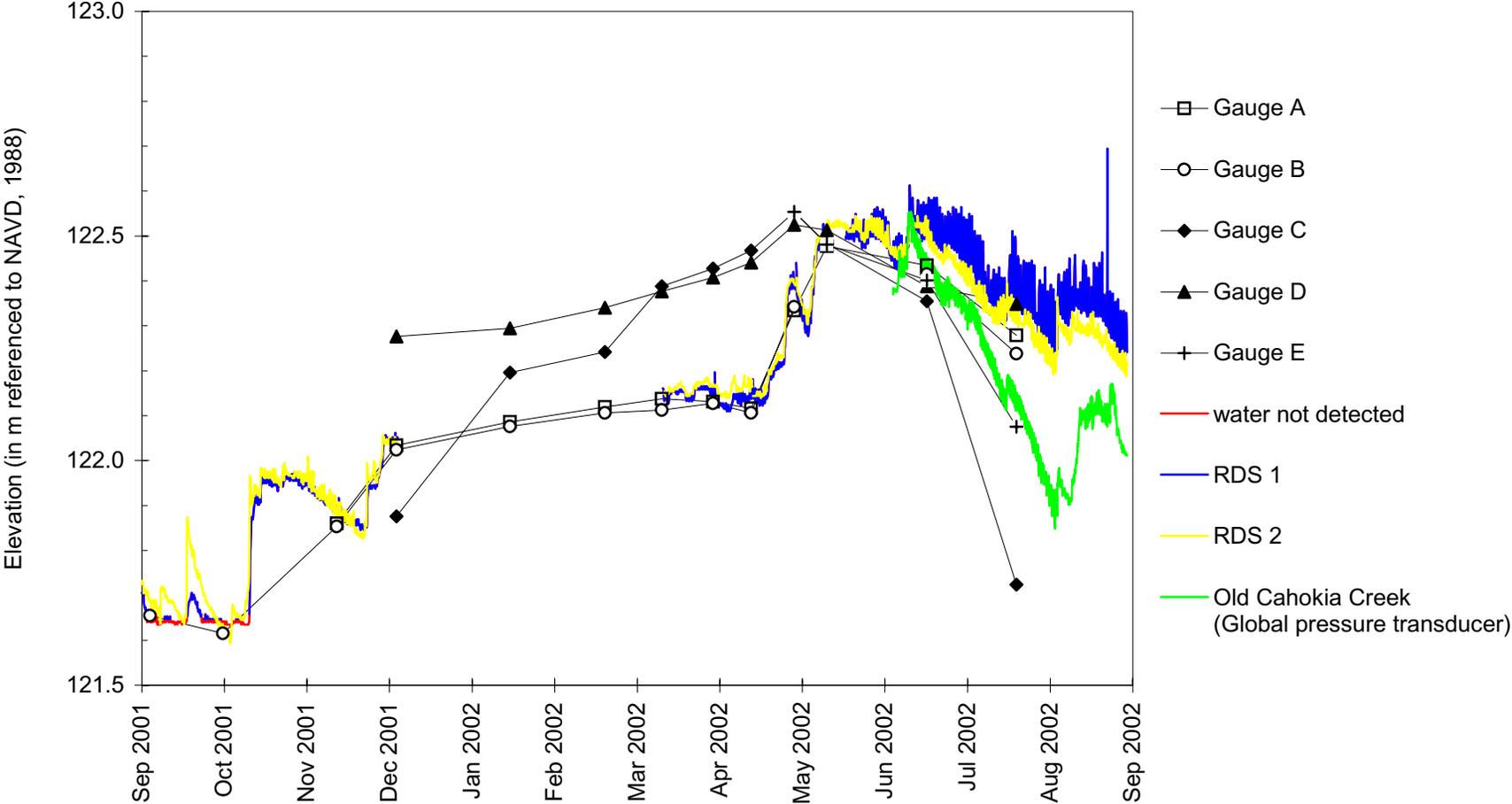






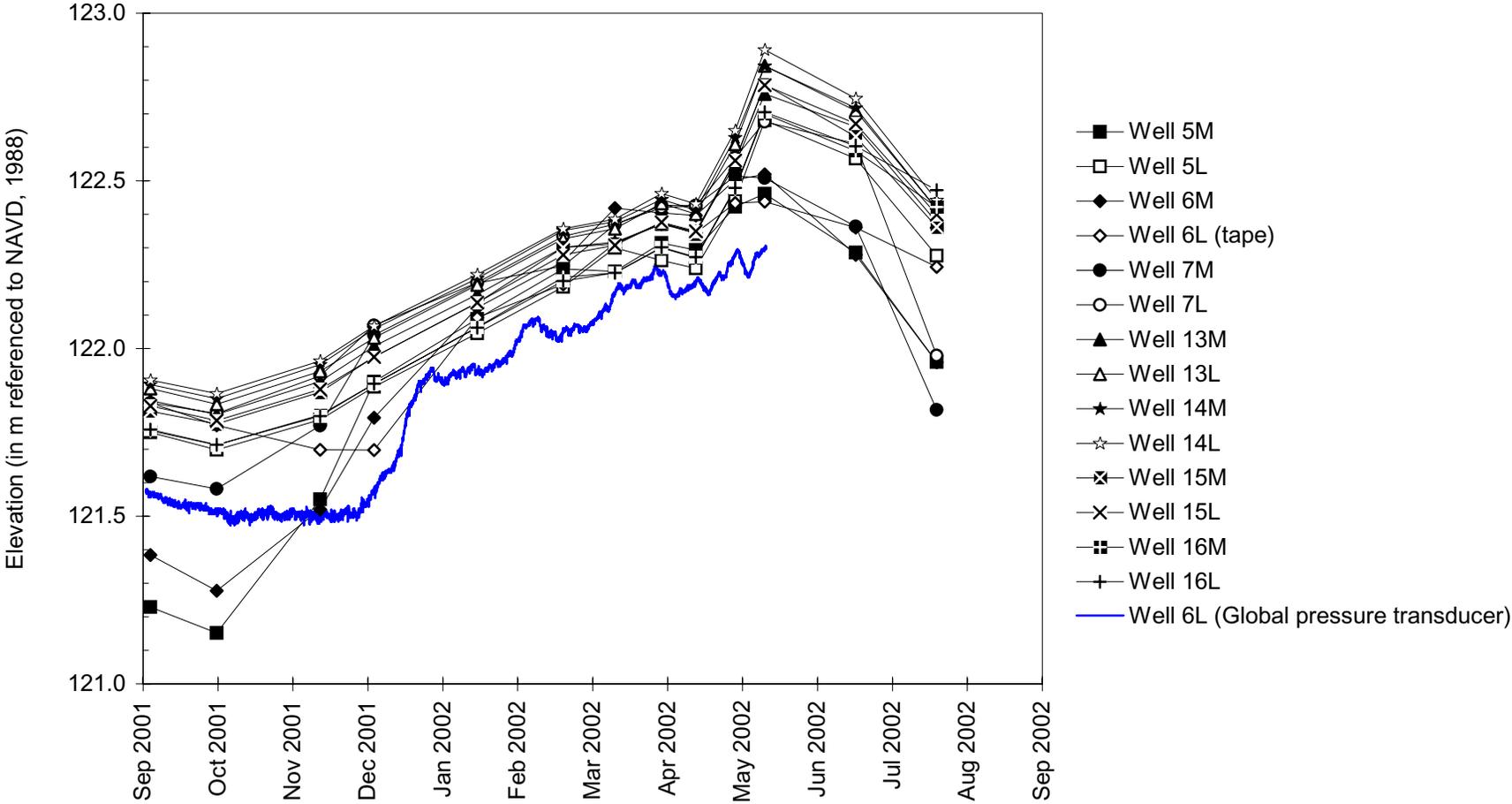
**Fairmont City, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**  
**on Stage Gauges and RDS Data Loggers**



**Fairmont City, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

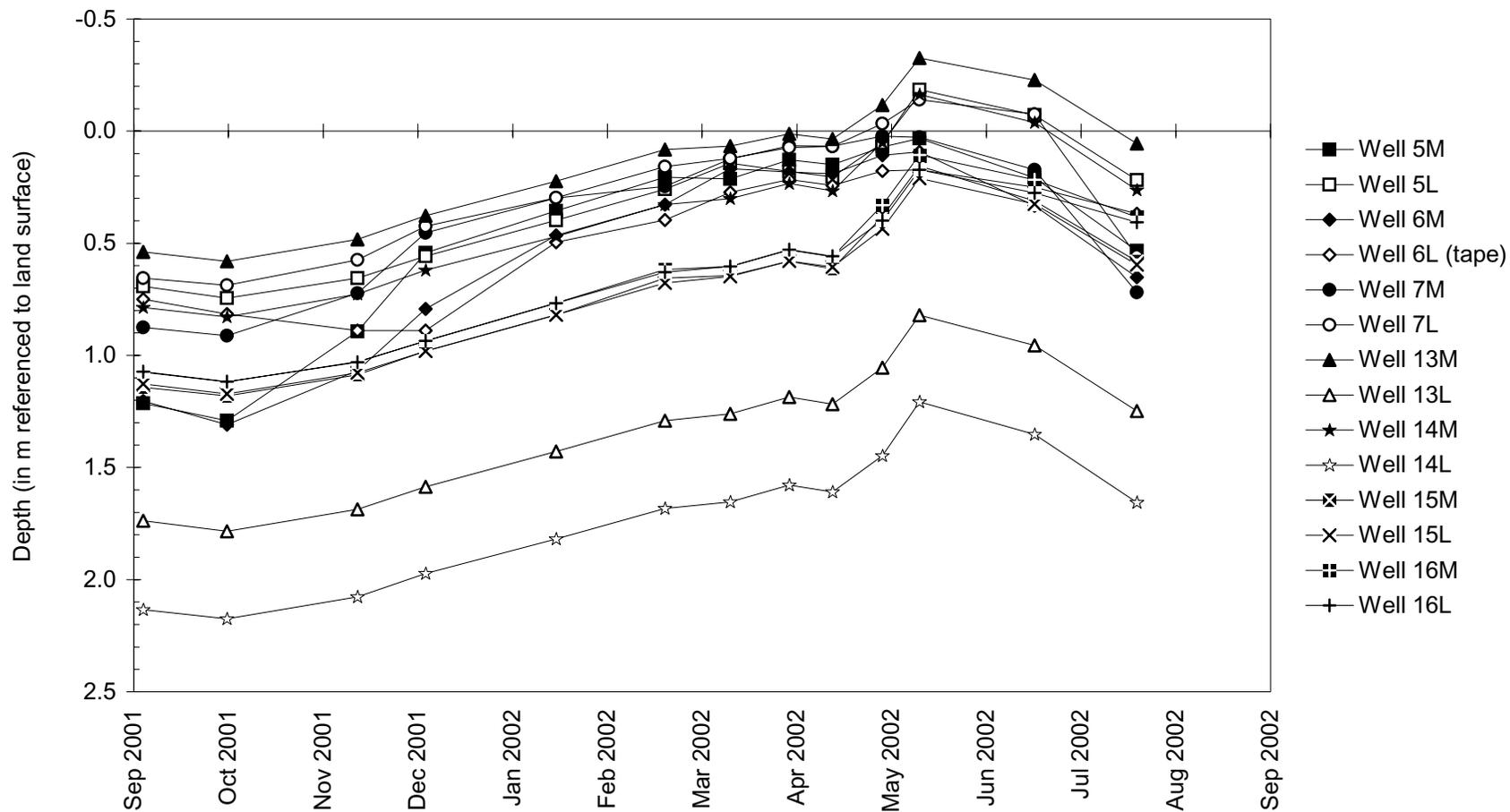
**Water-Level Elevations**  
**in Middle and Lower Wells**



# Fairmont City, New River Crossing Potential Wetland Compensation Site

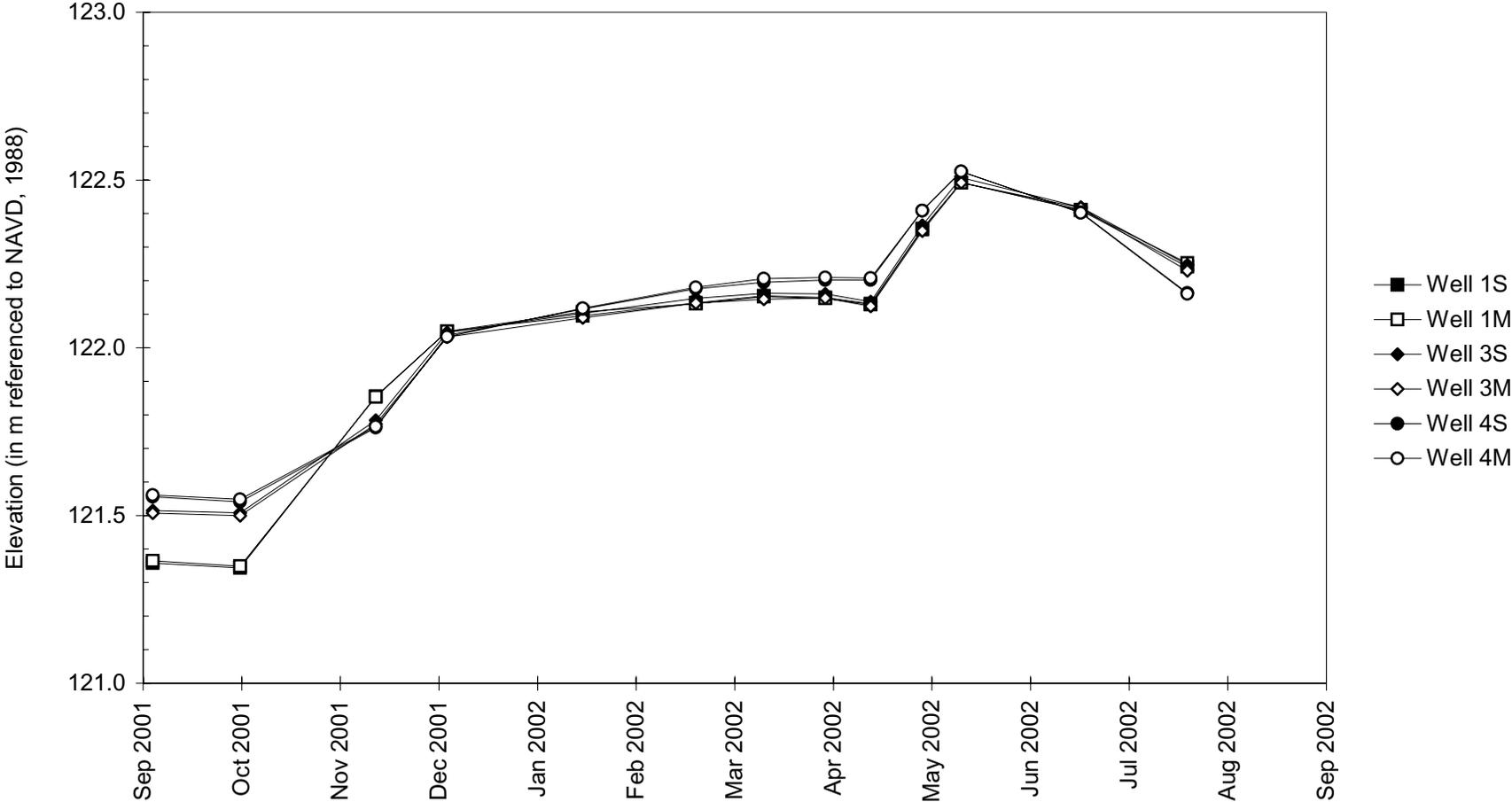
## September 1, 2001 to September 1, 2002

### Depth to Water in Middle and Lower Wells



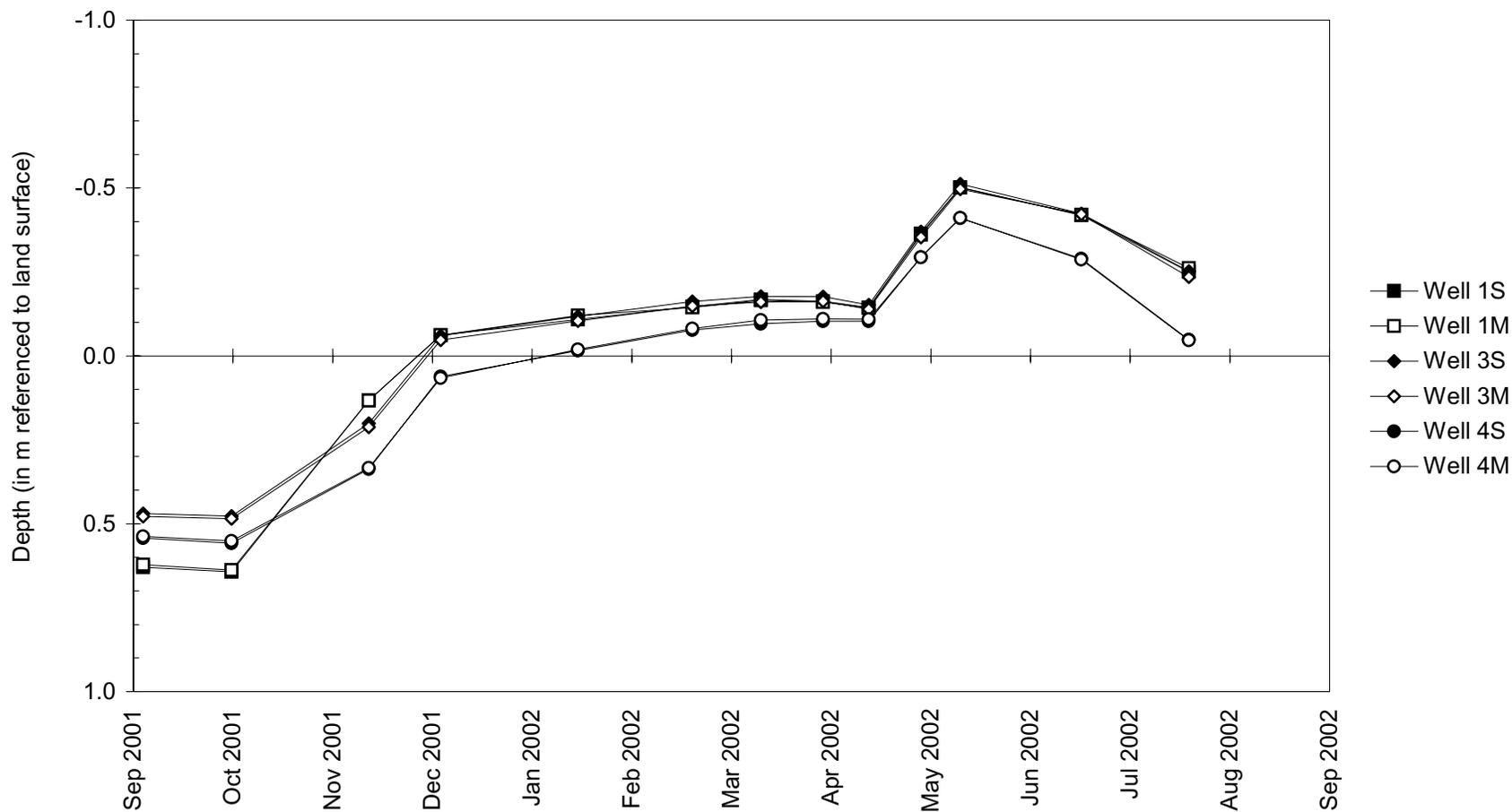
**Fairmont City, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**  
**in Soil-Zone and Middle and Wells**



Fairmont City, New River Crossing Potential Wetland Compensation Site  
September 1, 2001 to September 1, 2002

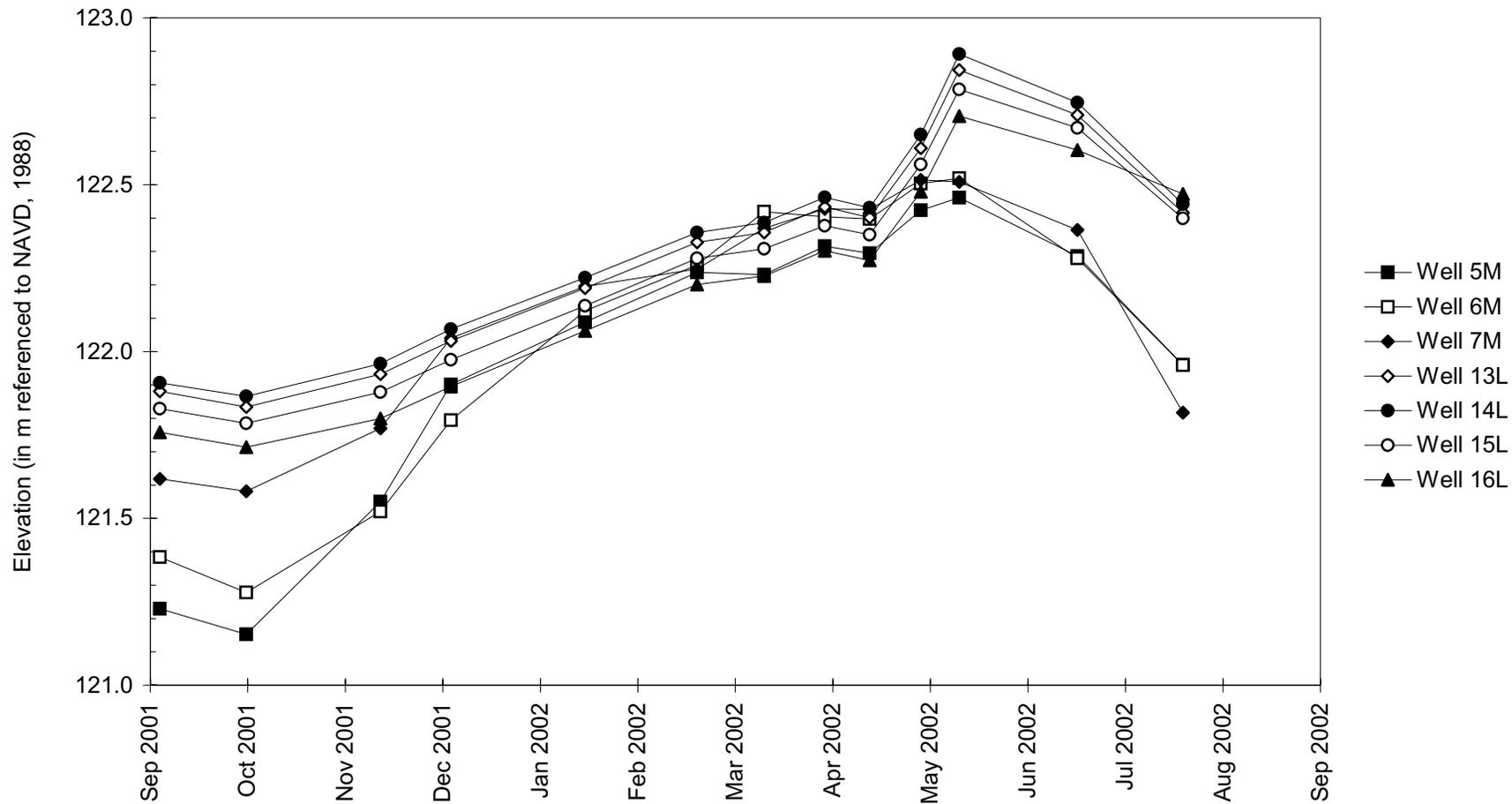
Depth to Water  
in Soil-Zone and Middle Wells



# Fairmont City, New River Crossing Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

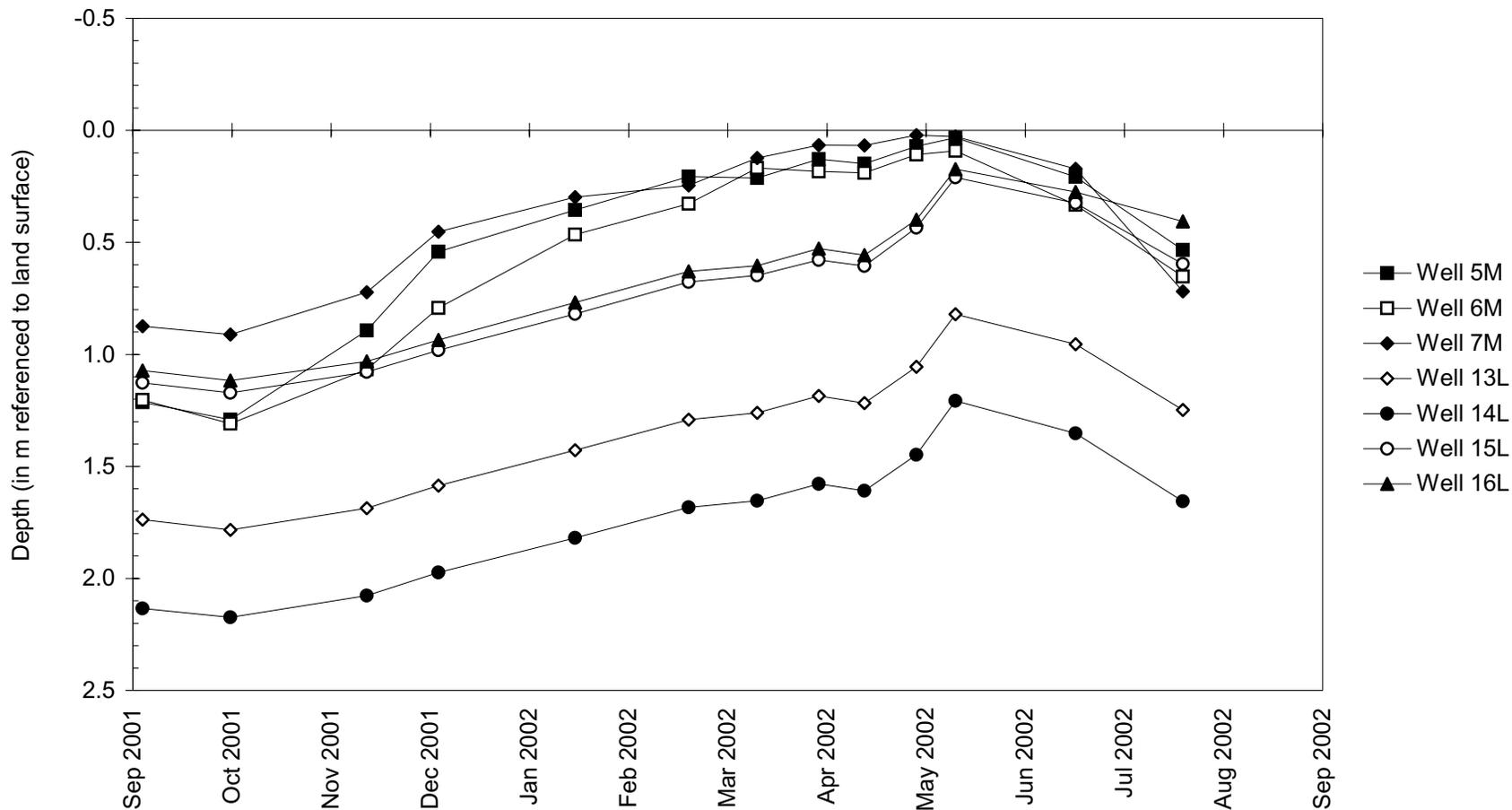
## Water-Level Elevations in Selected Wells



# Fairmont City, New River Crossing Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

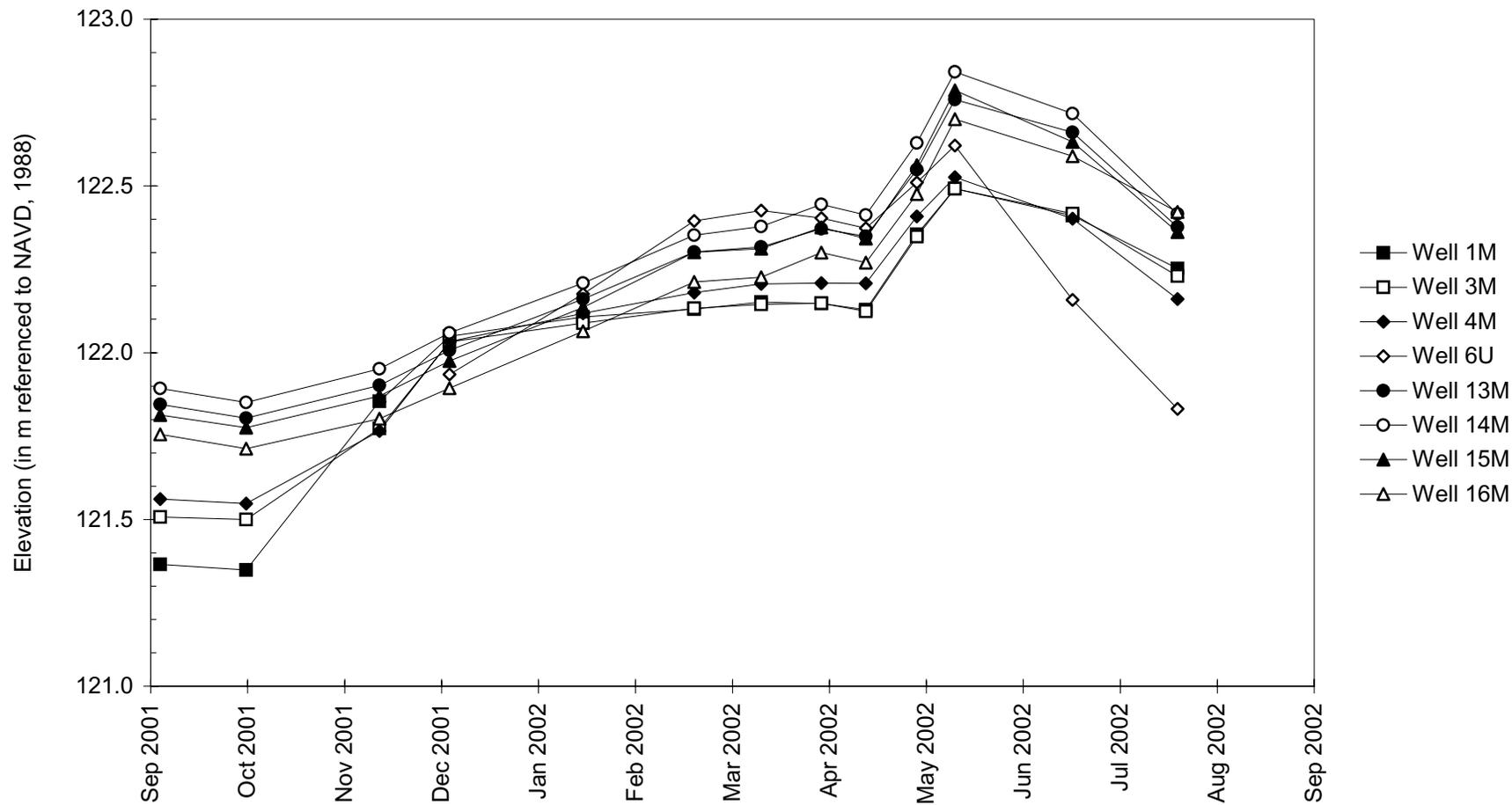
## Depth to Water in Selected Wells



# Fairmont City, New River Crossing Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

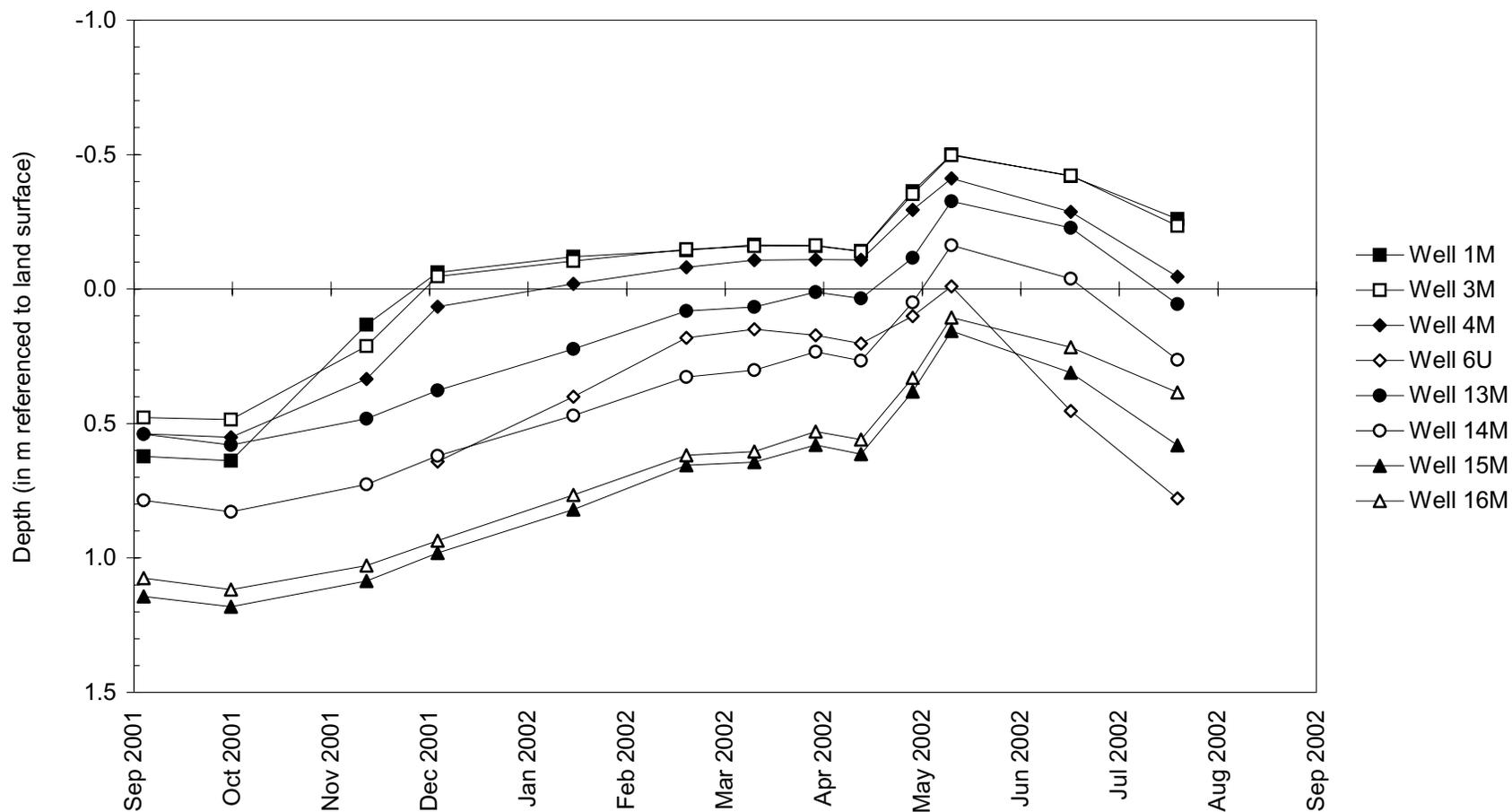
## Water-Level Elevations in Selected Wells



# Fairmont City, New River Crossing Potential Wetland Compensation Site

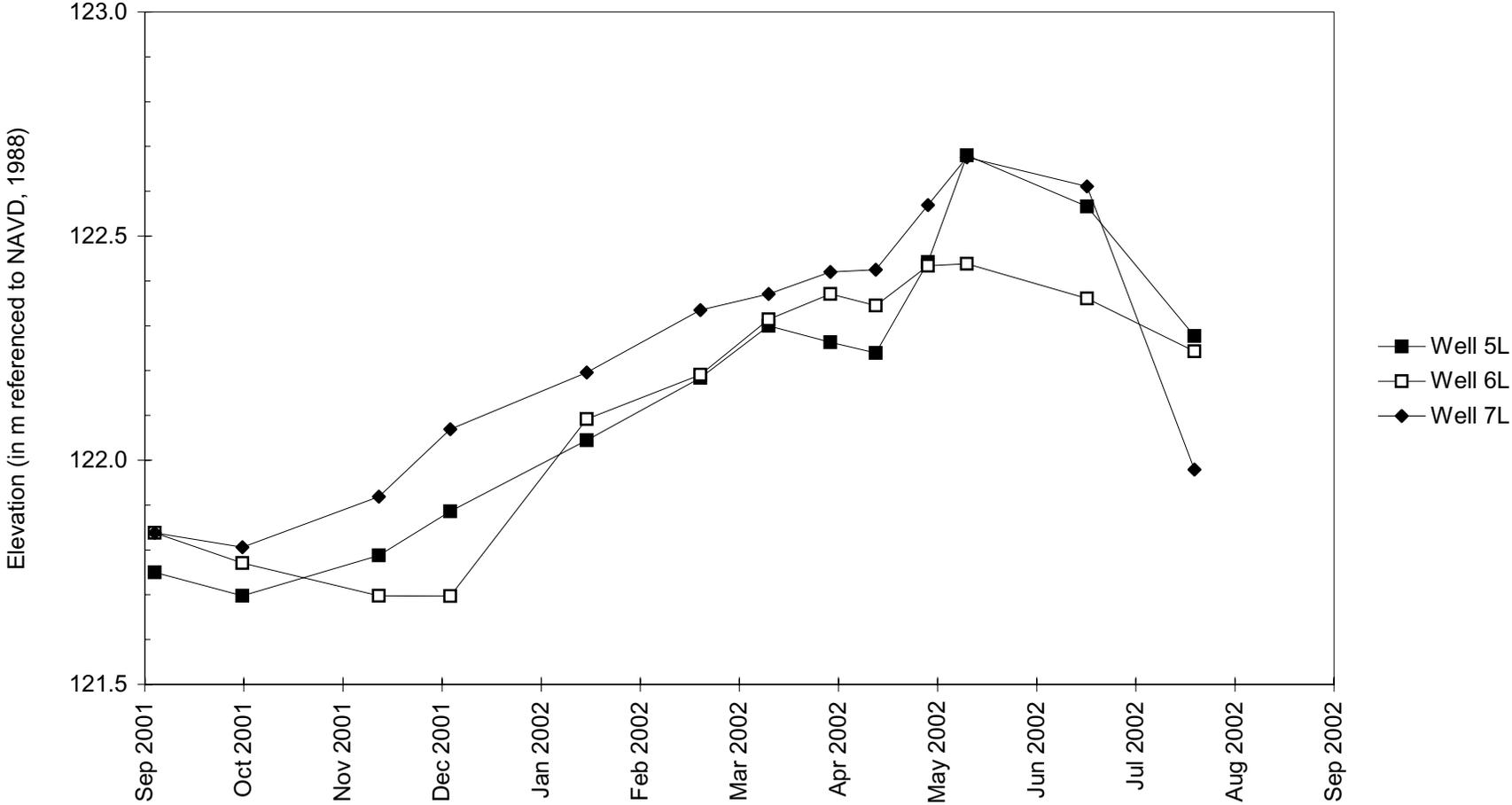
September 1, 2001 to September 1, 2002

## Depth to Water in Selected Wells



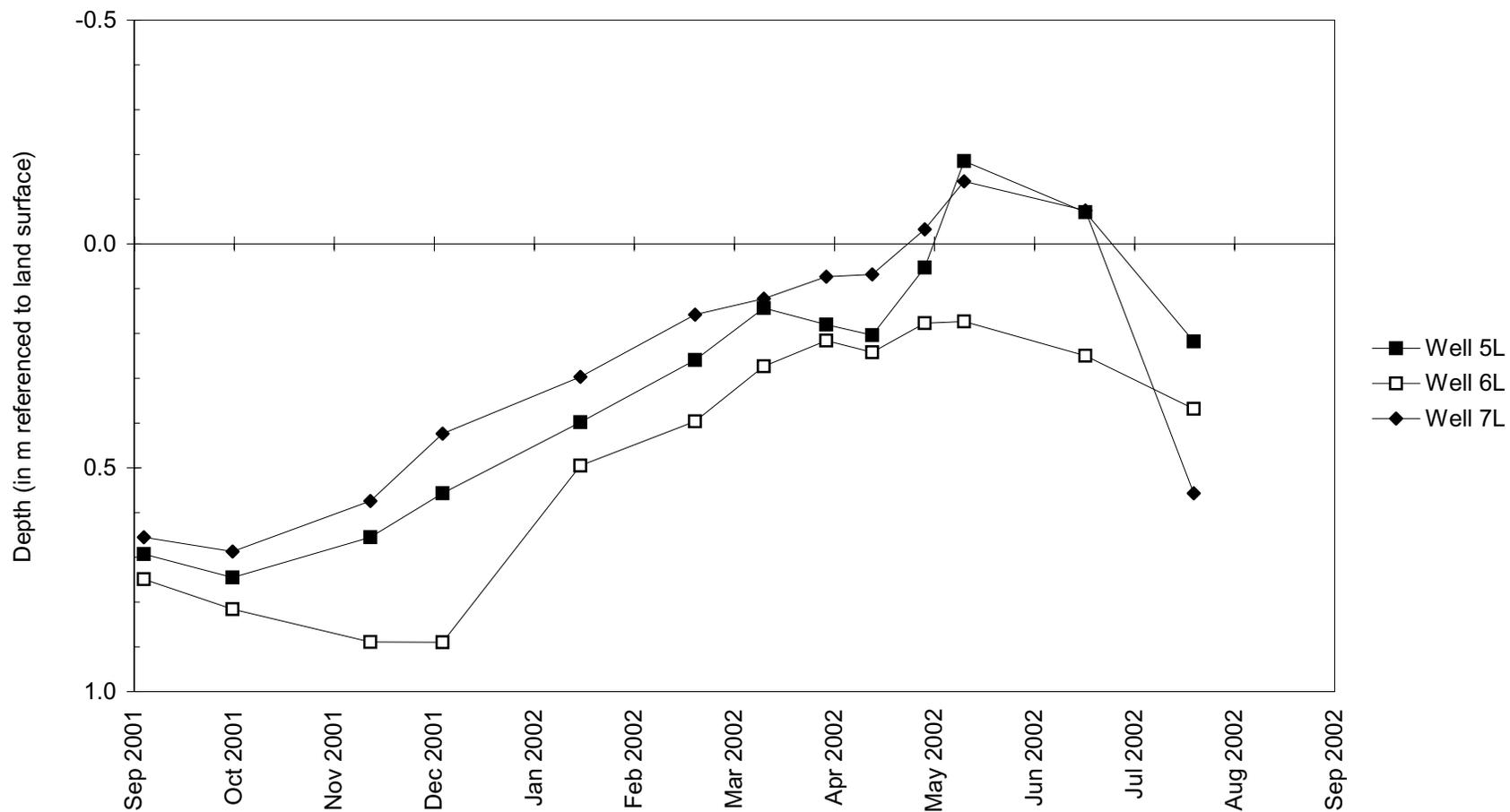
**Fairmont City, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**  
**in Selected Wells**



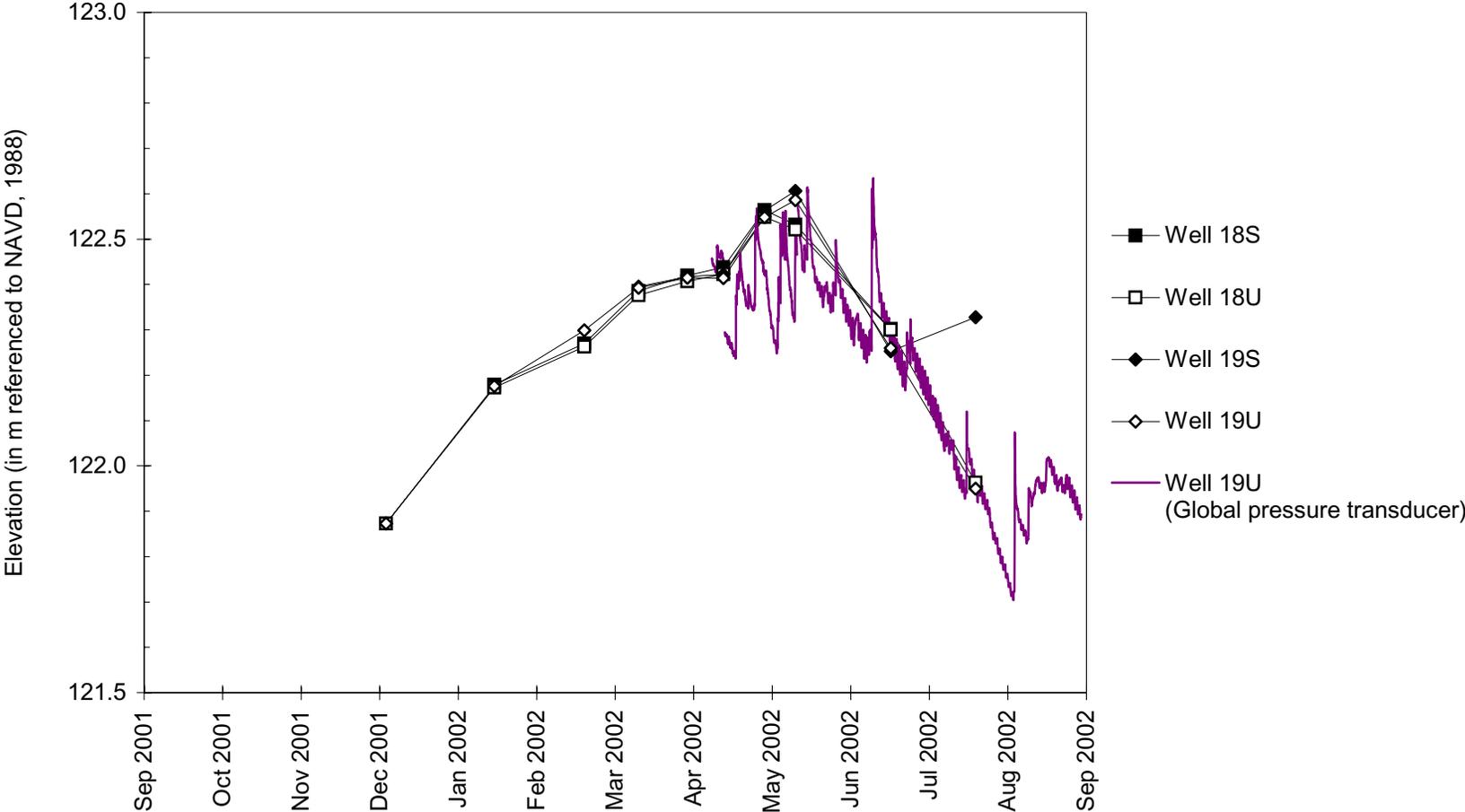
Fairmont City, New River Crossing Potential Wetland Compensation Site  
September 1, 2001 to September 1, 2002

Depth to Water  
in Selected Wells



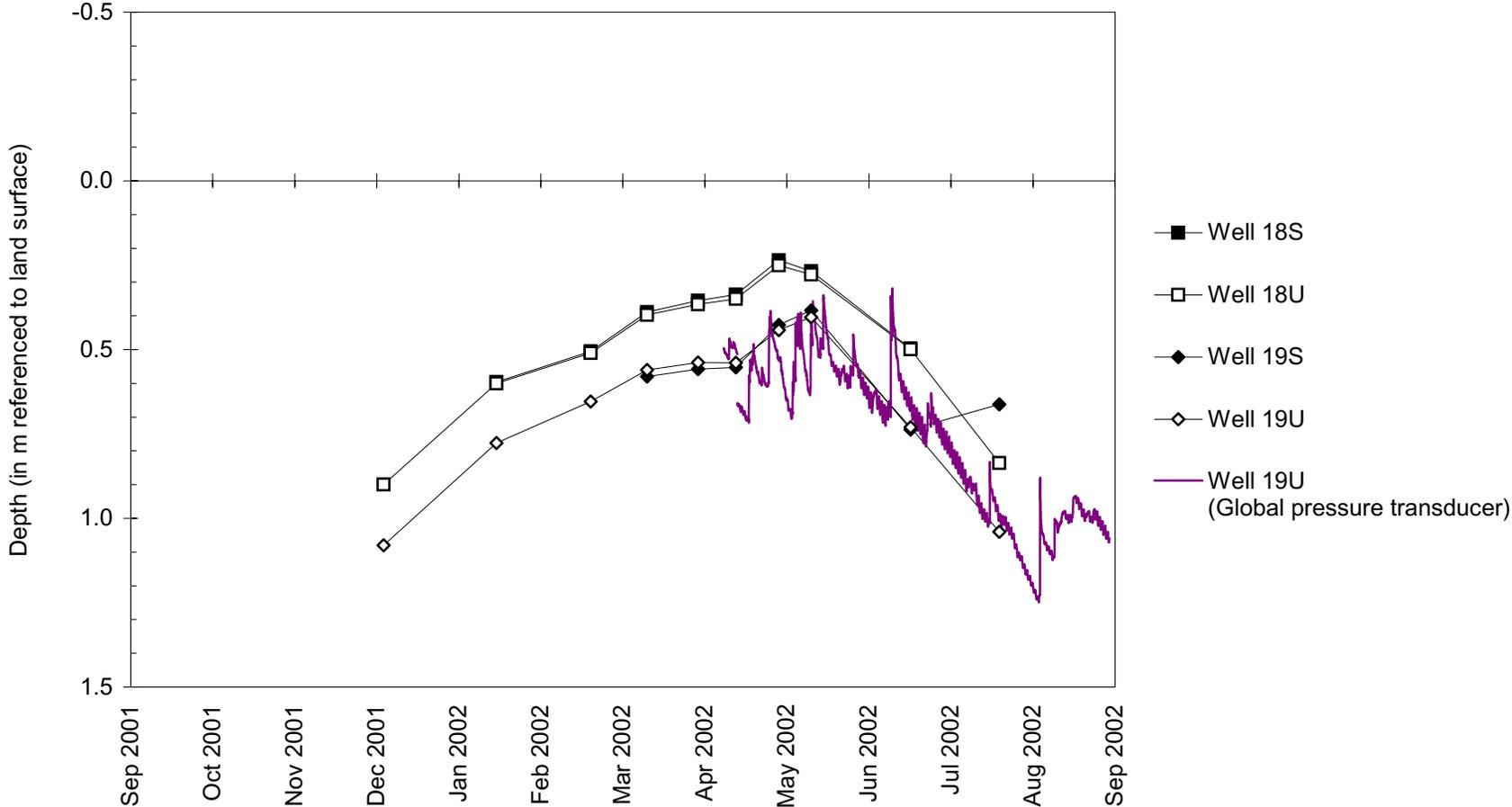
**Fairmont City, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**  
**in Selected Wells**



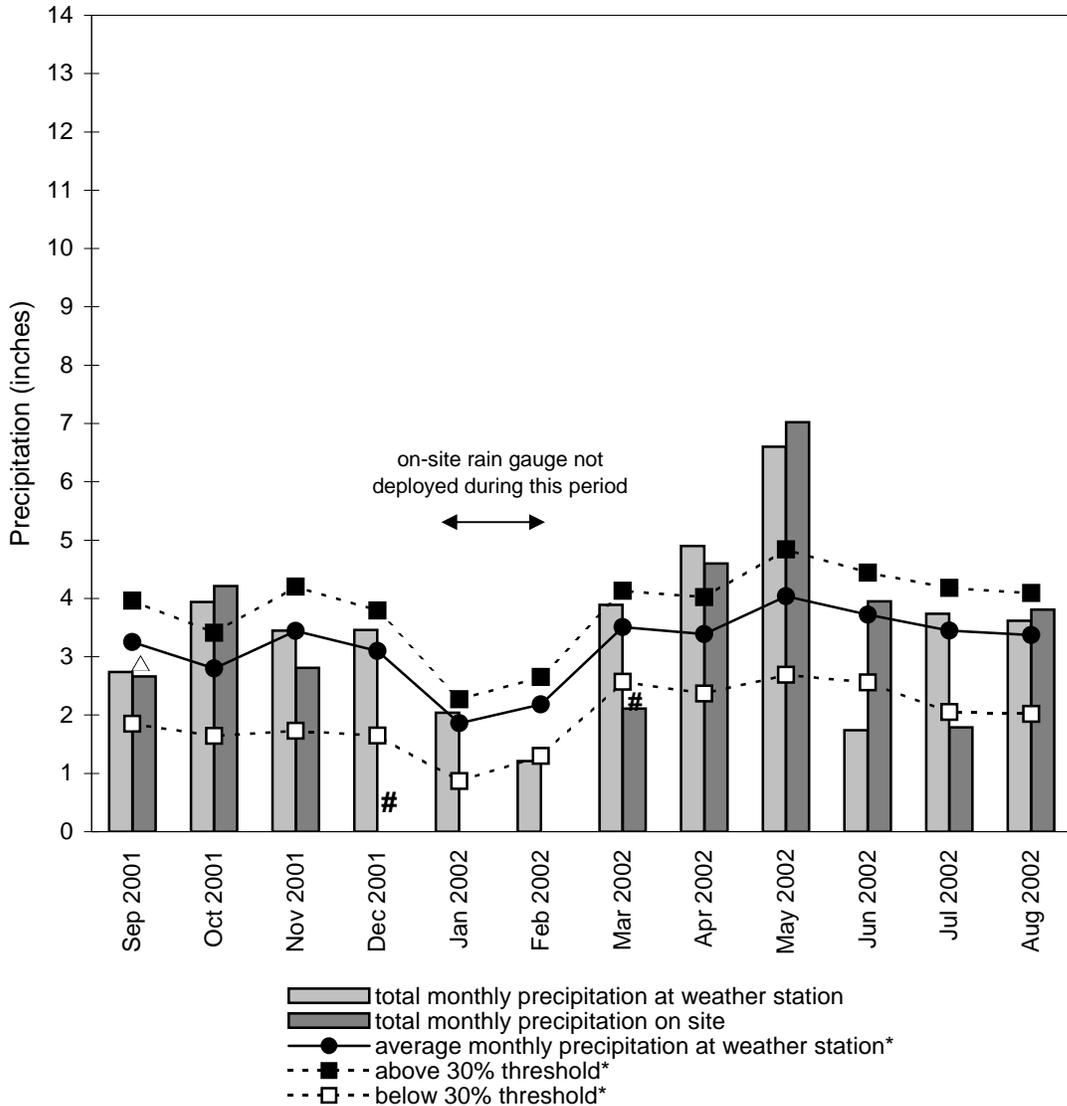
Fairmont City, New River Crossing Potential Wetland Compensation Site  
September 1, 2001 to September 1, 2002

Depth to Water  
in Selected Wells



## Fairmont City, New River Crossing Potential Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Belleville, IL SIU Research Center Weather Station



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

\* see text for explanation

Graph last updated October 11, 2002

**SPRINGFIELD, IL ROUTE 29  
WETLAND COMPENSATION SITE**

**ISGS #54**

FAP 658

Sangamon County near Springfield, Illinois

**Primary Manager: Geoffrey E. Pociask**

**Secondary Manager: Paula J. Sabatini**

**SITE HISTORY**

- September 1996: ISGS conducted an Initial Site Evaluation of the proposed compensation site and reported findings to IDOT.
- June 2000: ISGS was tasked by IDOT to monitor wetland hydrology for the north portion of the compensation site (Area B).
- September 2000: ISGS began water-level monitoring activities
- September 2001: ISGS was tasked by IDOT to monitor wetland hydrology for the south portion of the compensation site (Area A).

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Based on a topographic map and ground-surface elevations surveyed by ISGS, we estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 5.4 ac (2.2 ha) out of an excavation of 5.4 ac (2.2 ha). This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Springfield is April 6 and the season lasts 209 days; 12.5% of the growing season is 26 days.
- Precipitation was below the normal range in September and December 2001 and in February and March 2002. Precipitation was within or above the normal range in October and November 2001, in January 2002, and over the period April through June 2002. Rainfall totals were excessive (183% of the 30-year average for the period) during April through June 2002. Total precipitation for the reporting period from September 2001 through July 2002 was 123% of normal (August 2002 precipitation data has not been reported to date). This is compared to 91% of normal for the period from September 2000 through August 2001.
- In Spring 2002, surface water covered the entire mitigation area continuously for in excess of 26 days. Therefore, the entire area conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Monitoring wells were not read during a large portion of the growing season due to inundation.
- While the entire mitigation area satisfied wetland hydrology criteria, the duration of inundation and saturation may have been prolonged artificially. A hydrologic control-structure in the levee to the south of the mitigation area was closed before the onset of spring flooding and remained closed as the levee was overtopped by floods and after the floods receded. Therefore, water that would have otherwise drained towards the Sangamon

River remained ponded on the mitigation area and adjacent property bounded by the levee.

- Limitations of the wetland hydrology determination are as follows:
  - GPS coordinates of the water level instruments were determined during July 2002.
  - The wetland hydrology acreage calculation was generated by rectifying IDOT design plans to digital orthophotography. The area of wetland hydrology was then calculated based on the rectified polygons for mitigation areas 'A' and 'B'.

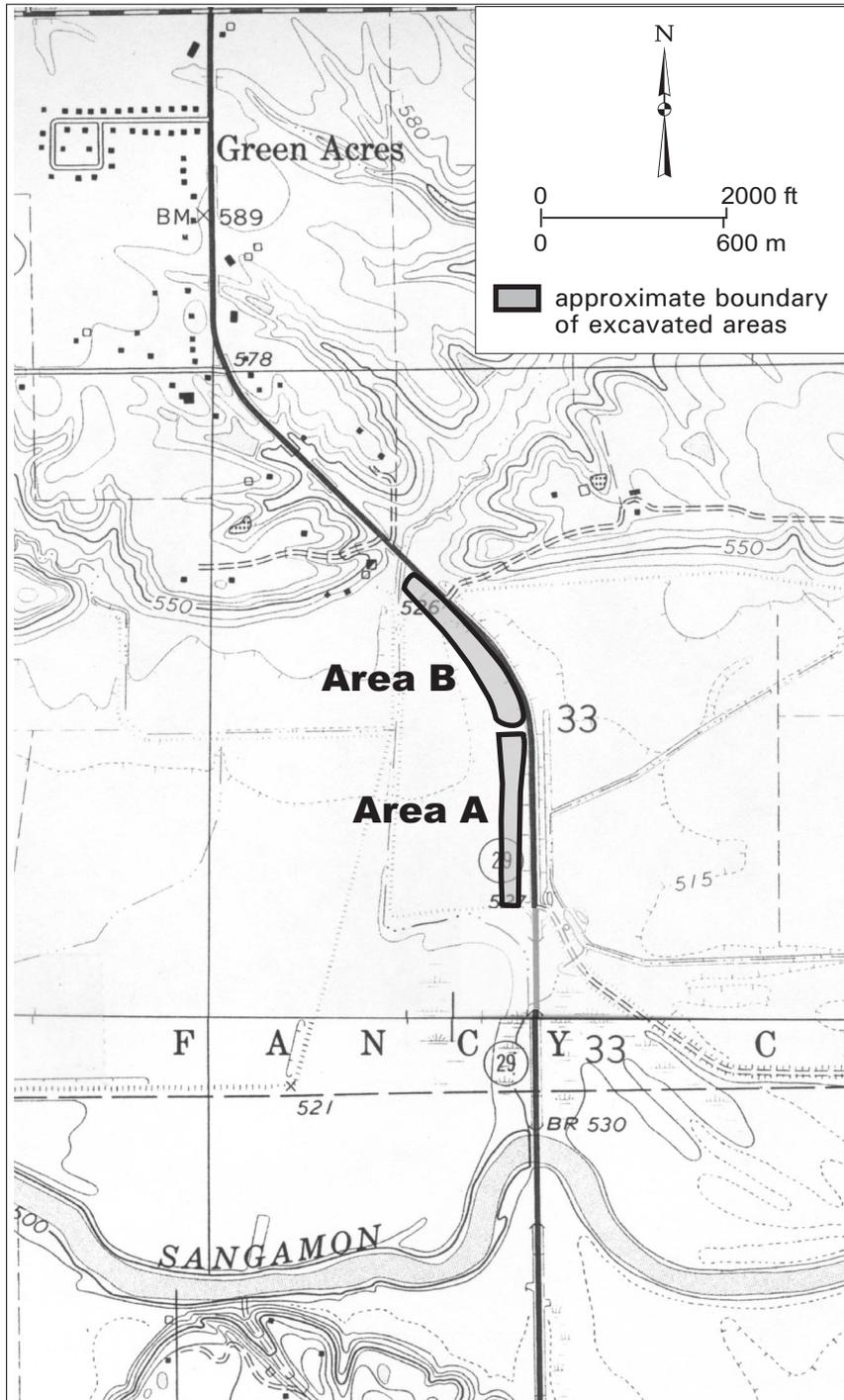
#### PLANNED FUTURE ACTIVITIES

- Monitoring will continue until September 2005 or until no longer required by IDOT.
- The two stage gauges (A and B) located on the gate valve culvert through the levee south of the site are inaccessible. These gauges are actually located on an adjacent property not owned by IDOT. The owner of the adjacent property has requested that ISGS personnel stay off his property. If the property owner will grant access, ISGS intends to remove these gauges in the future.

# Springfield, IL Route 29 Wetland Compensation Site (FAP 658)

## General Study Area and Vicinity

from the USGS Topographic Series, Athens, IL (USGS 1966; photorevised 1971 and 1976) and  
Springfield West, IL (USGS 1965; photorevised 1971 and 1976) 7.5-minute Quadrangles  
contour interval is 10 feet



# Springfield, IL Route 29 Wetland Compensation Site (FAP 658)

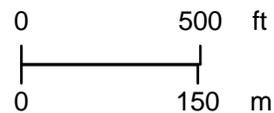
## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

map based on IDOT design plans rectified to USGS digital orthophotograph Athens SW quarter quadrangle



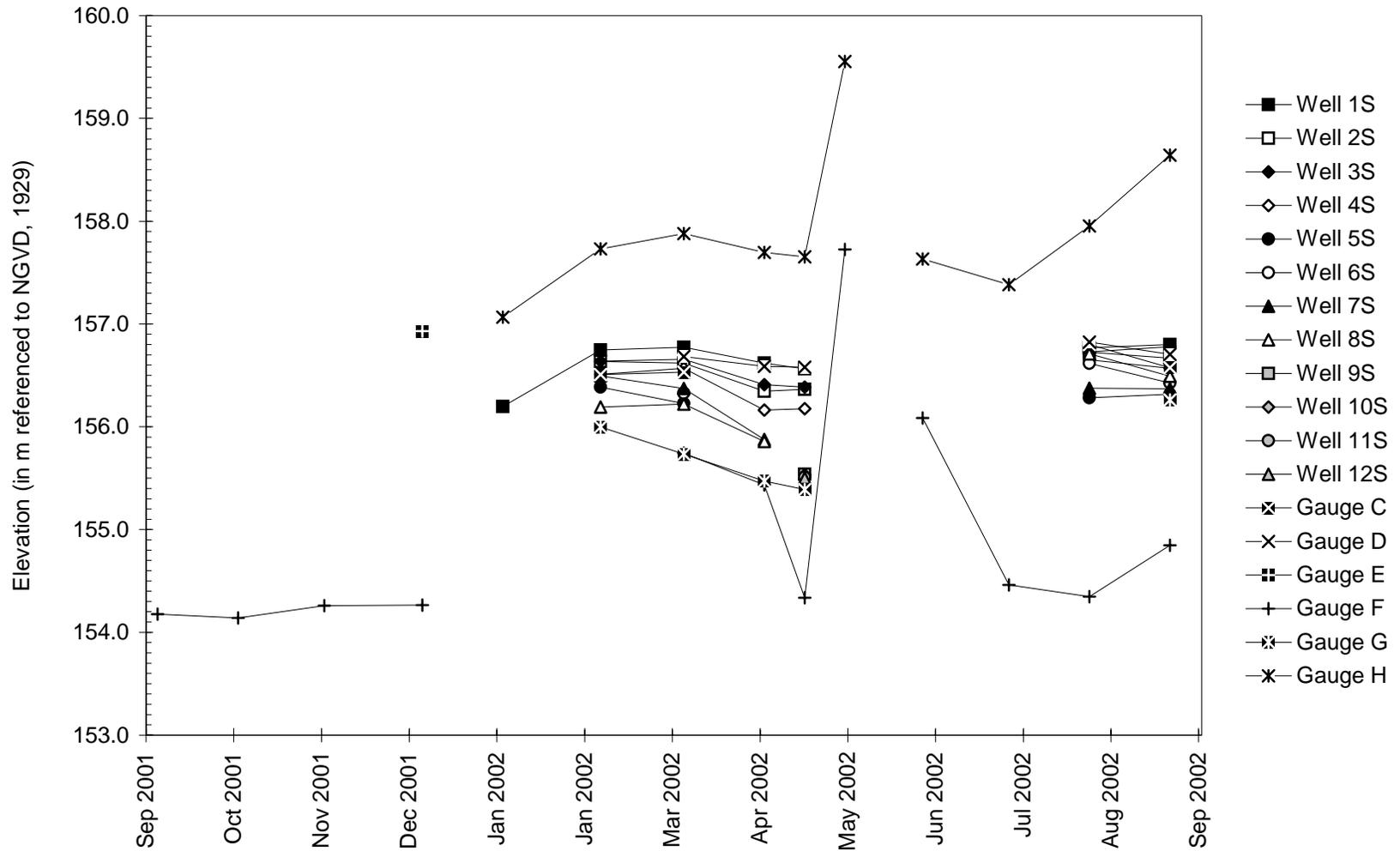
- △ RDS datalogger
- monitoring well
- stage gauge
- ✱ rain gauge
- extent of wetland hydrology (2002)



# Springfield, IL Route 29 Wetland Compensation Site

## September 1, 2001 to September 1, 2002

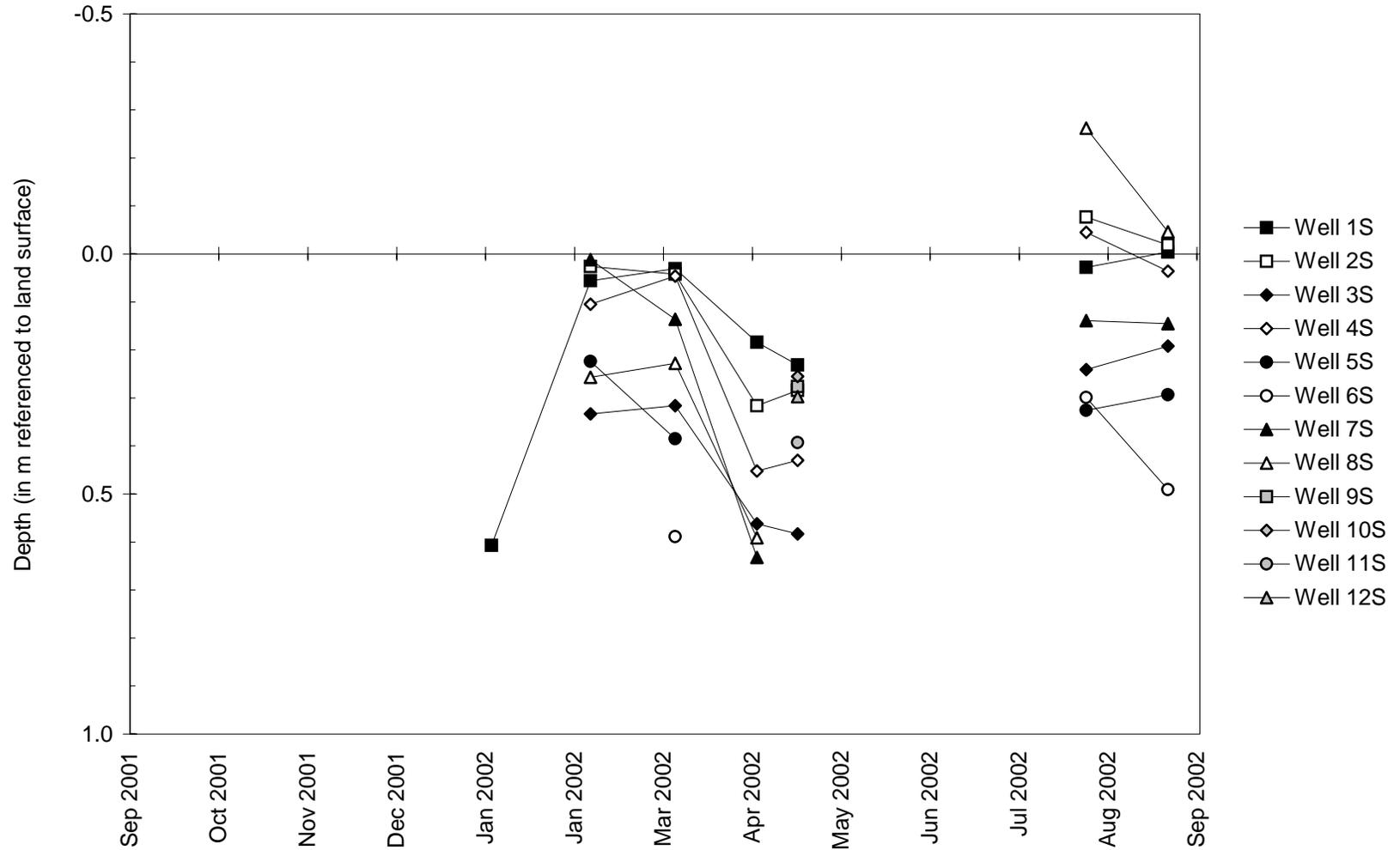
### Water-Level Elevations



# Springfield, IL Route 29 Wetland Compensation Site

September 1, 2001 to September 1, 2002

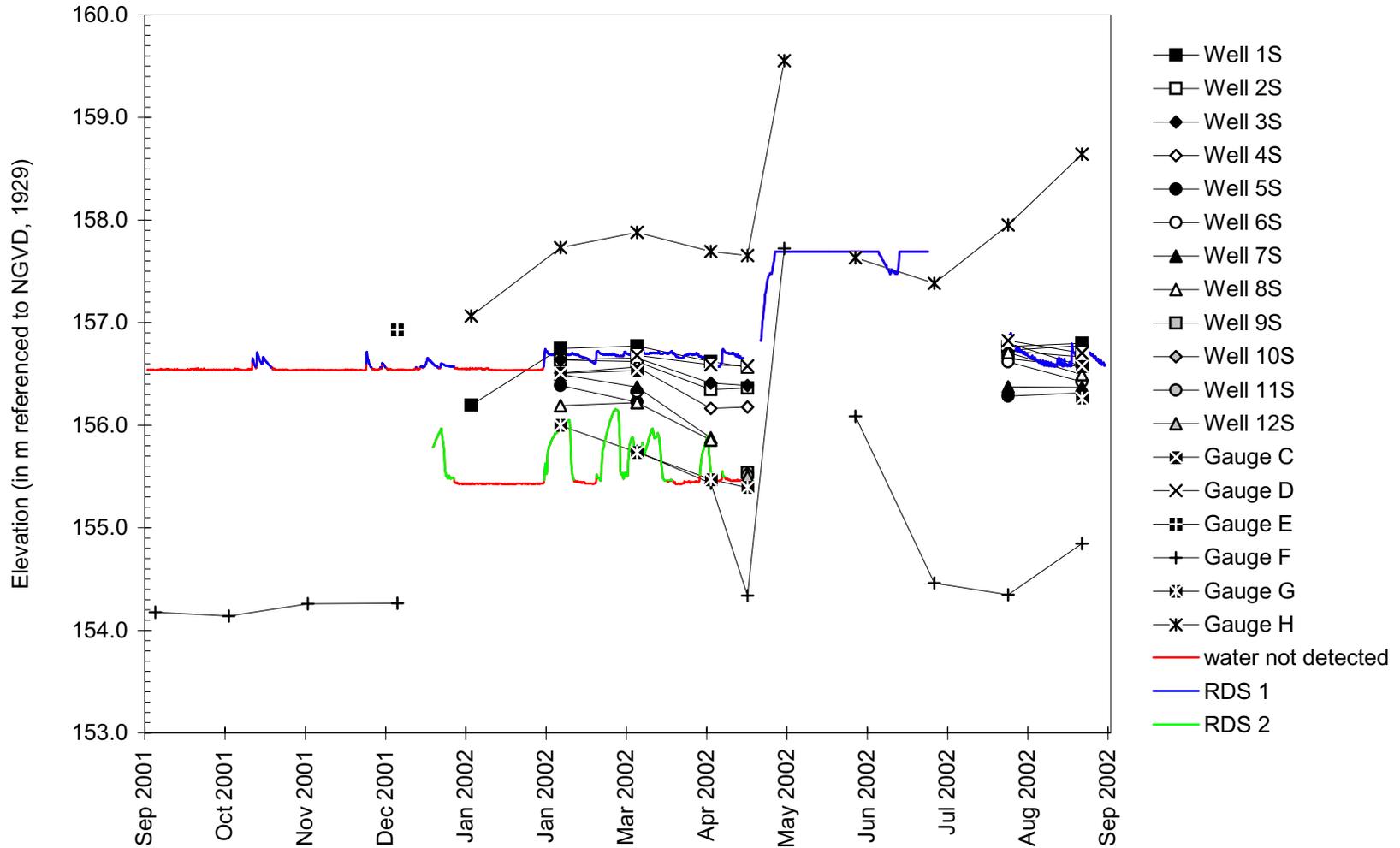
## Depth to Water



# Springfield, IL Route 29 Wetland Compensation Site

## September 1, 2001 to September 1, 2002

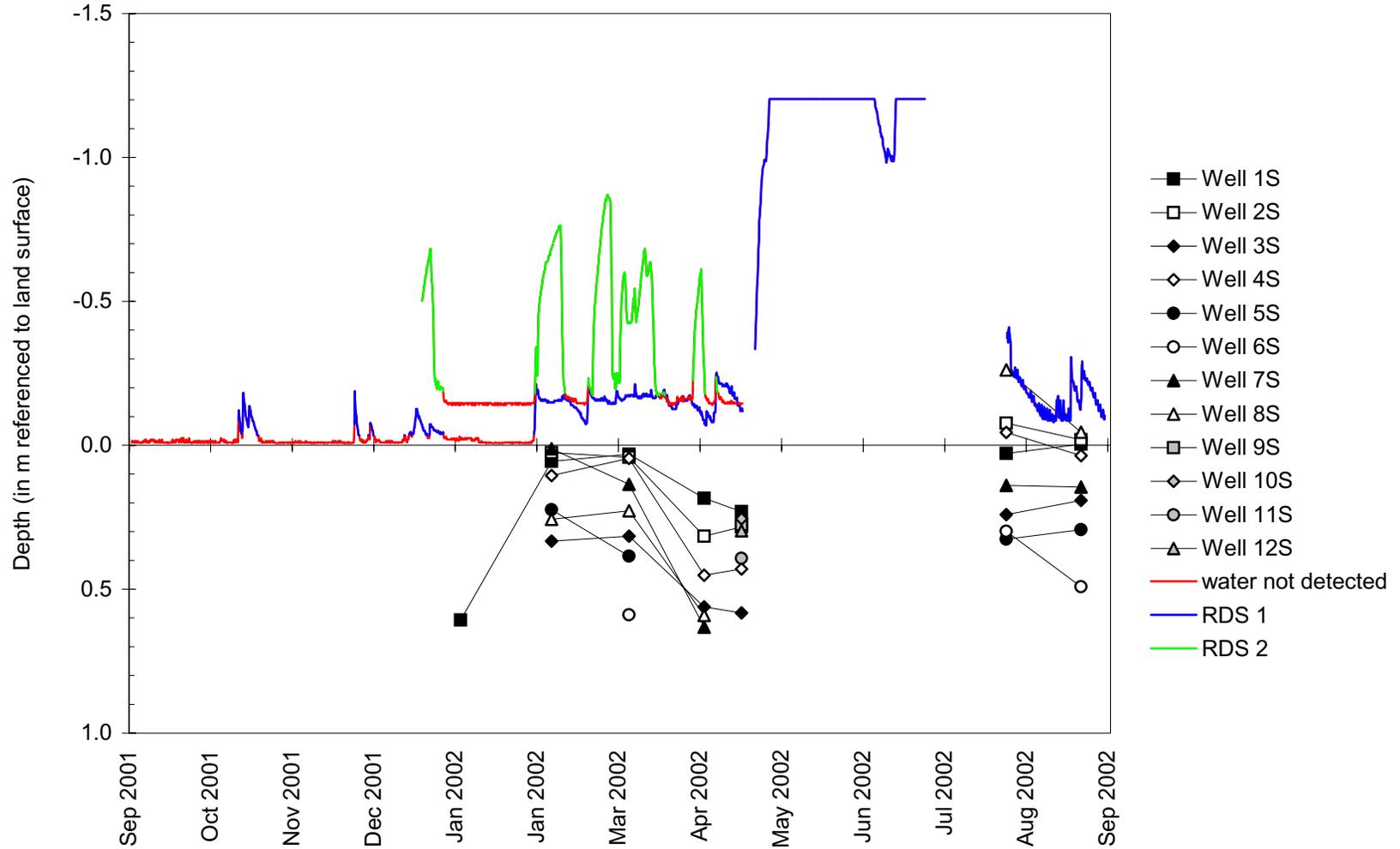
### Water-Level Elevations



# Springfield, IL Route 29 Wetland Compensation Site

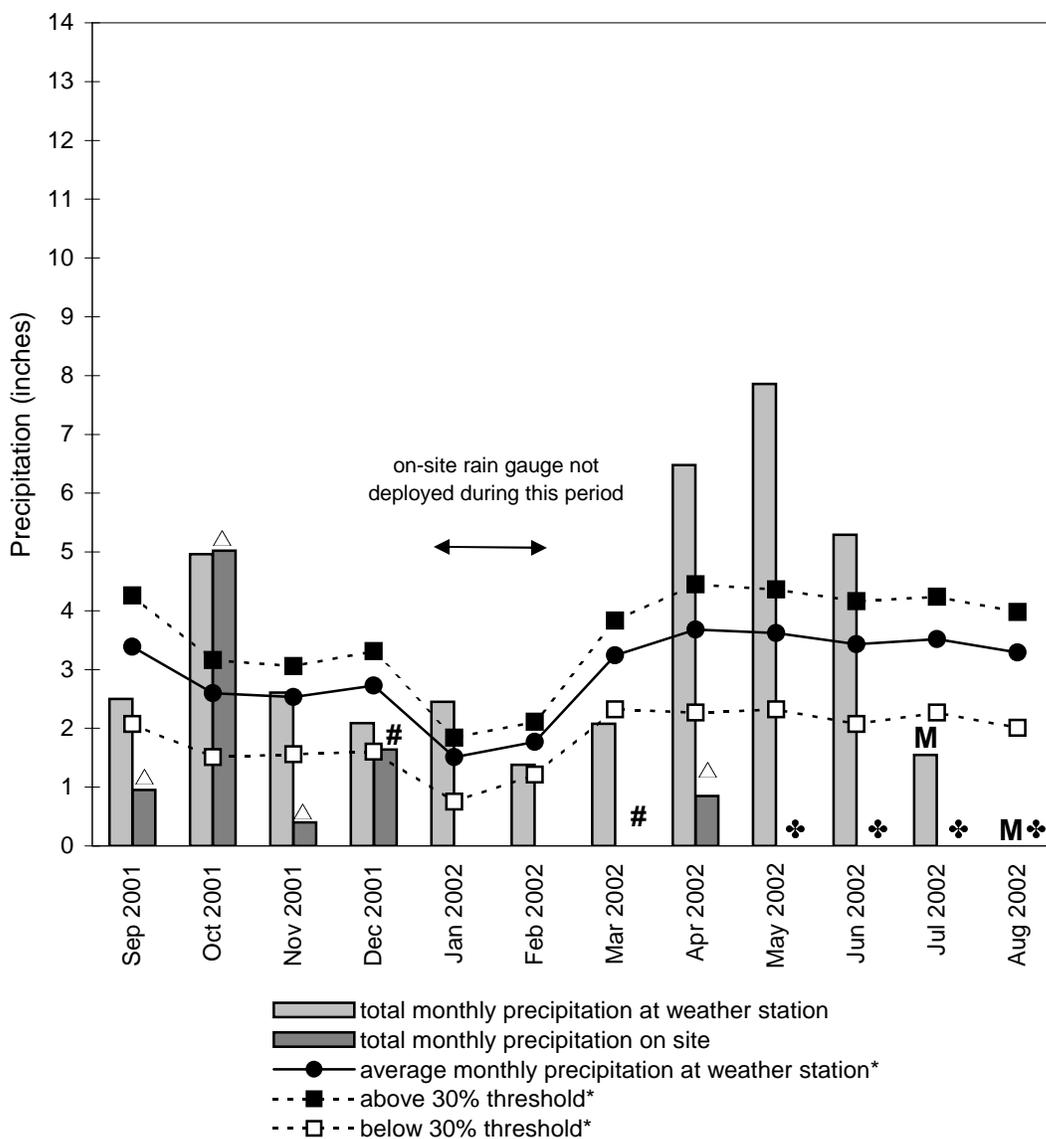
## September 1, 2001 to September 1, 2002

### Depth to Water



## Springfield, IL Route 29 Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Springfield, IL Capital Airport Weather Station



# on-site rain gauge not deployed for entire month  
 △ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month  
 ♣ no data - on-site rain gauge damaged by flooding  
 M missing data from weather station  
 \* see text for explanation

Graph last updated October 11, 2002

**GRAND DETOUR  
POTENTIAL WETLAND COMPENSATION SITE  
FAP 742**

**ISGS #56**

Ogle County, near Grand Detour, Illinois

**Primary Project Manager: Steven Benton**

**Secondary Project Manager: Kelli D. Weaver**

**SITE HISTORY**

- March 2000: The ISGS conducted an initial site evaluation of the site.
- June 2000: The ISGS was tasked to perform a Level II hydrogeologic assessment of the site.
- August–October 2000: Four S-wells, four M-wells and two staff gauges were installed on the site.
- 2001: A data logger was installed in the Rock River in order to monitor river stage. Five monitoring wells were installed in areas adjacent to the site. The purpose of these wells was to determine if wetland hydrology occurs in areas lower in elevation than the study site.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Because this site is a potential compensation site, an estimate of the areas satisfying the criteria for wetland hydrology is not needed. However, for planning purposes, jurisdictional wetland hydrology was observed at one monitoring well (6S) located in an area adjacent to the compensation site.

- According to the National Water and Climate Center, the median length of the growing season at Dixon, IL is 183 days, starting on April 19 and ending on October 19. Therefore, 12.5% of the growing season is 23 days.
- Ground-water levels in the on-site monitoring wells were deeper than 30 cm throughout the monitoring period. Therefore, wetland hydrology, per the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual, did not occur at this site.
- Total precipitation for the monitoring period as recorded at the Dixon, IL weather station was 43.11 inches or 121% of average. Precipitation during the period was above average in September and October 2001 and in February, April, May, and June 2002, and below average in November and December 2001 and in January, March, July, and August 2002.
- One flood event occurred at the site during the monitoring period (June 4 and 5). The peak river level during this event was high enough to inundate the entire site. This was the only time during the monitoring period in which inundation occurred over the entire site, and then only for about 2 days.
- The first draft of the hydrologic characterization report for this site is completed and is in review.

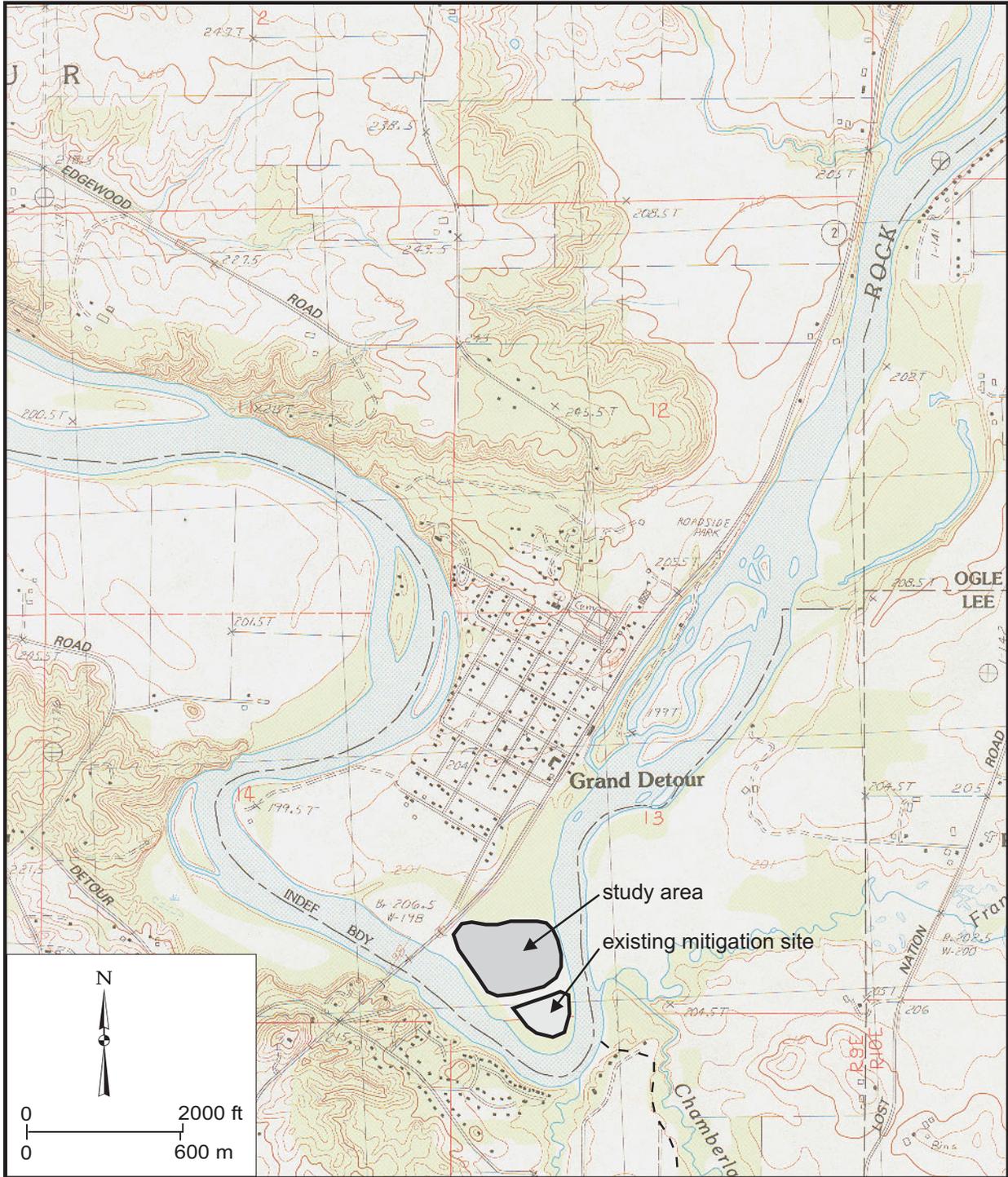
## PLANNED FUTURE ACTIVITIES

- Data collection will continue at this site until notified otherwise by IDOT.

# Grand Detour Potential Wetland Compensation Site (FAP 742)

## General Study Area and Vicinity

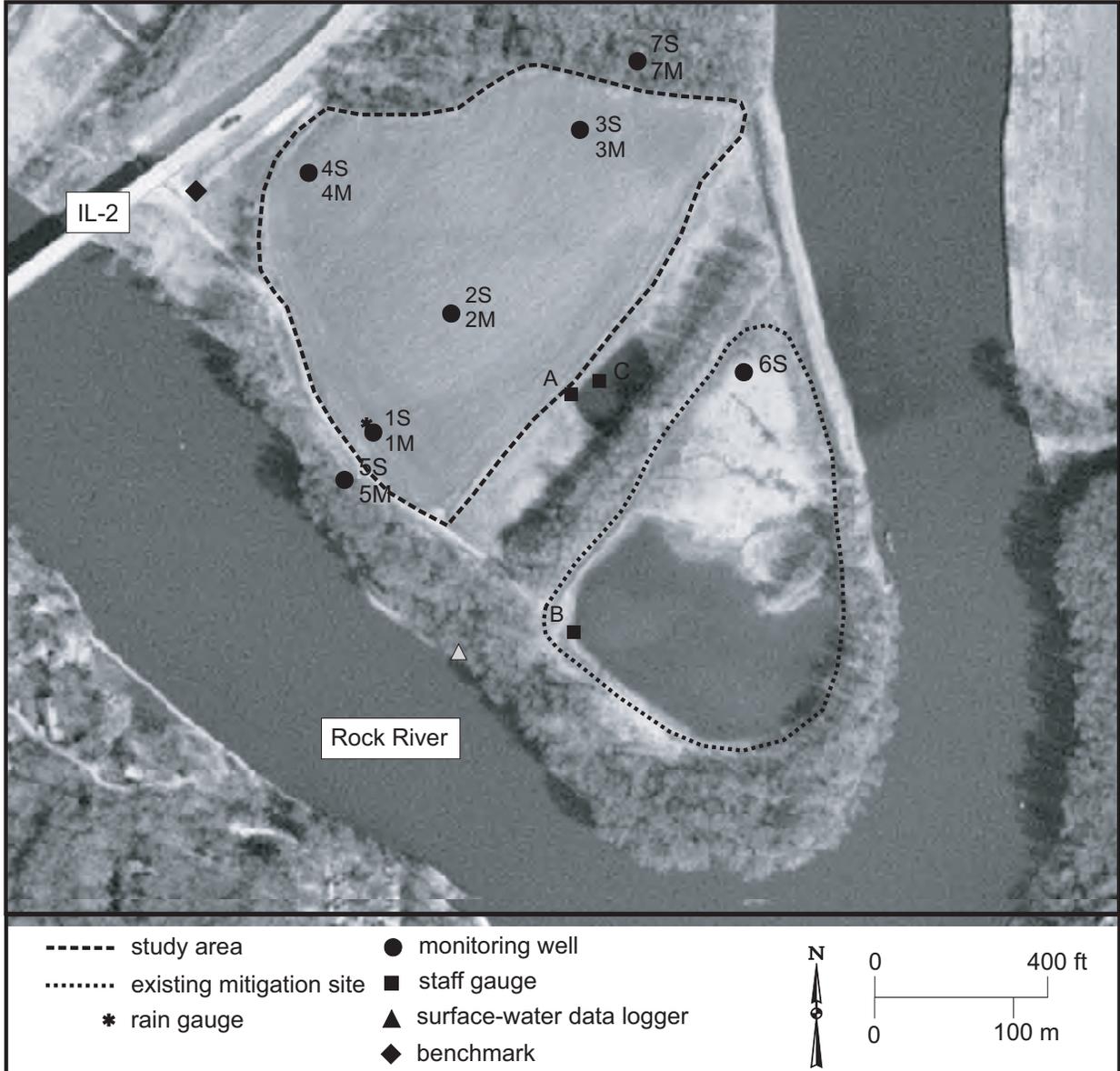
from the USGS Topographic Series, Grand Detour, IL 7.5-minute Quadrangle (USGS 1994)  
contour interval: 3 meters



# Grand Detour Potential Wetland Compensation Site (FAP 742, IL2)

## Monitoring Network

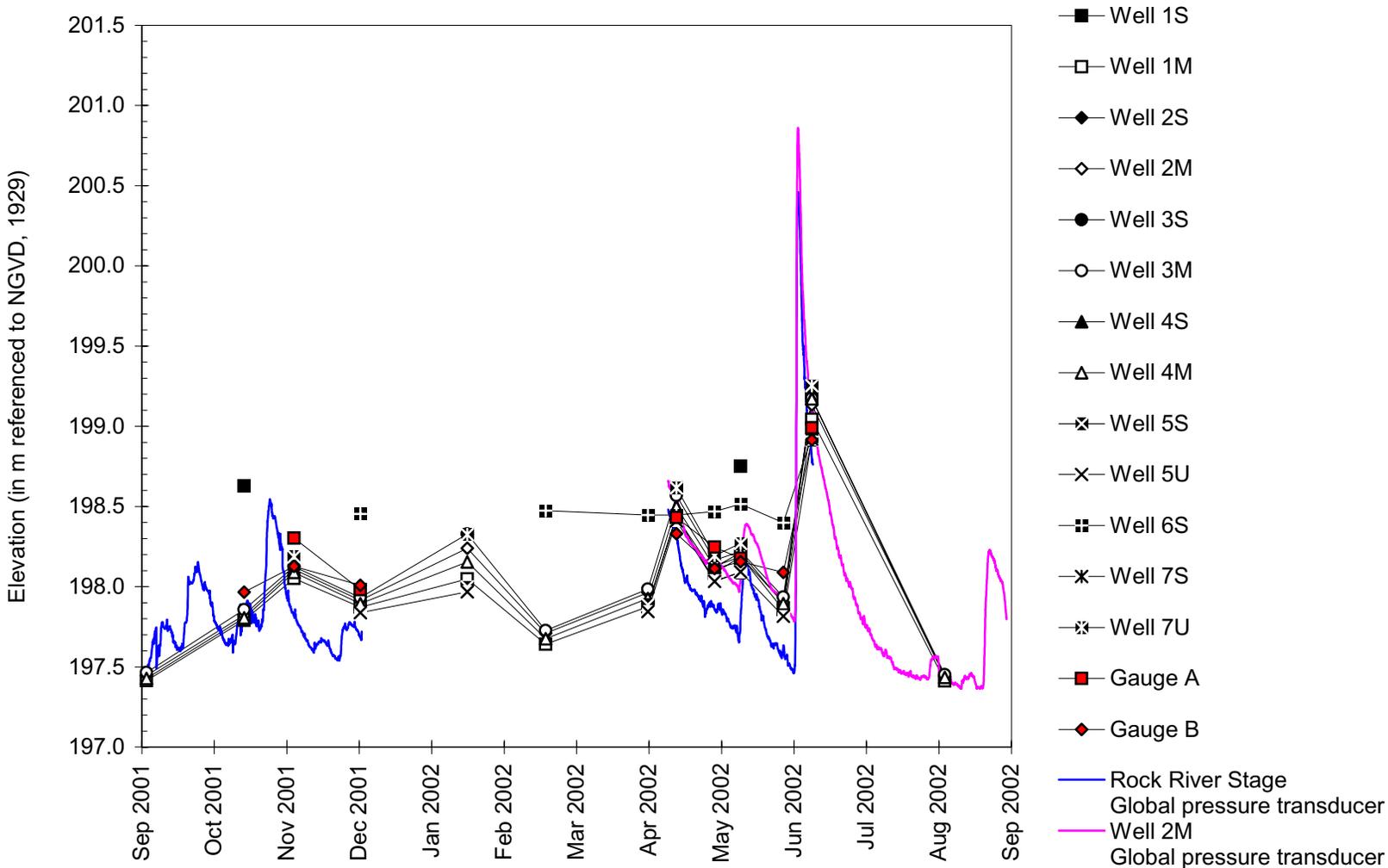
map based on the USGS, Grand Detour SE, Digital Orthophoto Quadrangle (NAPP 1998/99)  
Monitoring well, staff gauge and data logger locations from GPS survey



# Grand Detour Potential Wetland Compensation Site

## September 1, 2001 to September 1, 2002

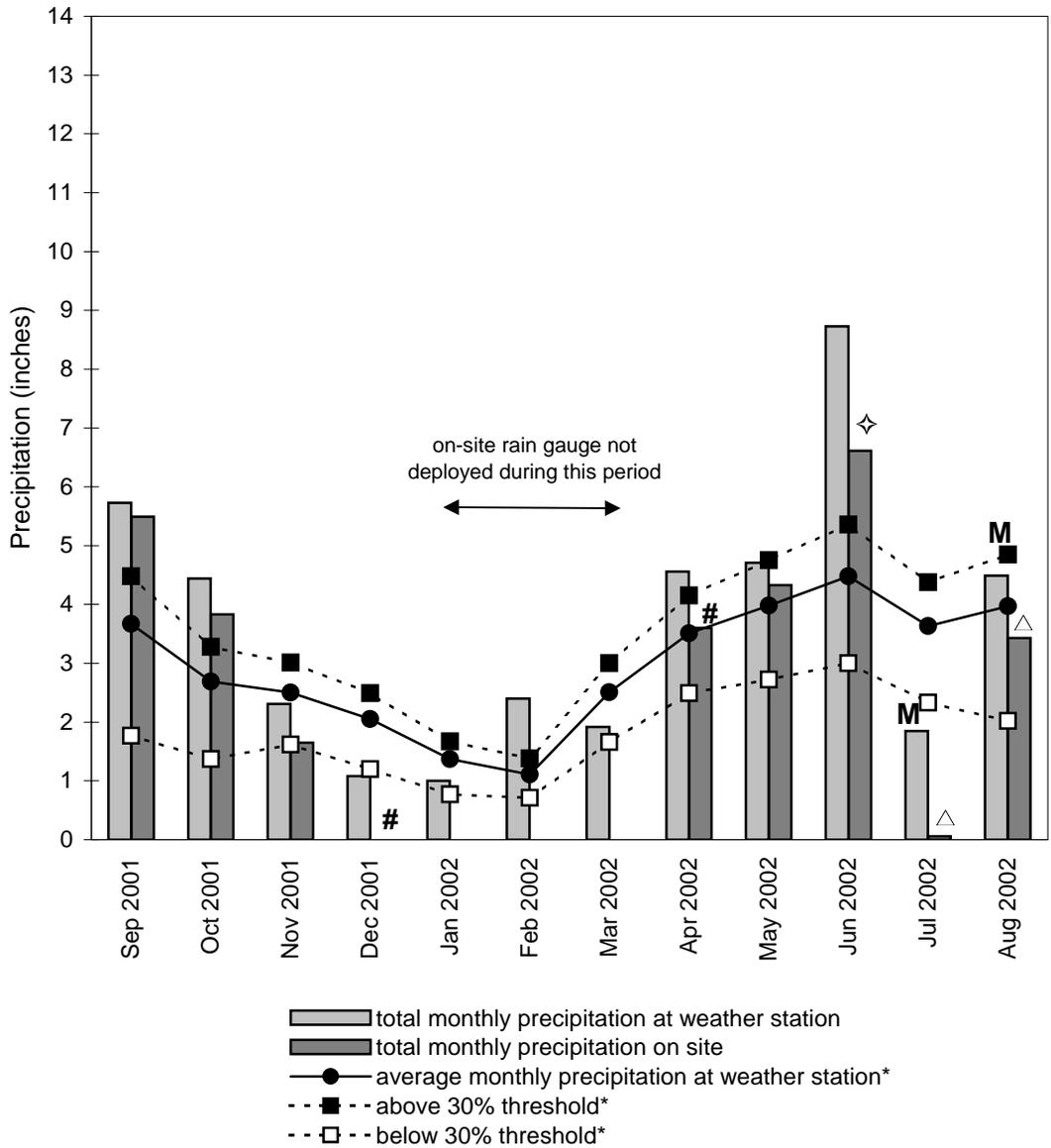
### Water-Level Elevations





# Grand Detour Potential Wetland Compensation Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the Dixon, IL Weather Station



Graph last updated October 11, 2002

**FORMER TIERNAN PROPERTY, NEW RIVER CROSSING  
POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #57**

FAP 999

St. Clair County, near Cahokia, Illinois

**Primary Project Manager: D. Bradley Ketterling**

**Secondary Project Manager: Bonnie J. Robinson**

**SITE HISTORY**

- July 2000: The ISGS was tasked to perform a Level II hydrogeologic assessment of the site.
- March - May 2001: Forty-two S- and VS-wells installed. Six benchmarks installed and surveyed. Six soil-moisture probes installed in three, two-probe clusters in the northern former farm field. Two staff gauges added to the main ditches. Water-quality sampling terminated because no quality standards were exceeded in any of the samples.
- August 2001: One deep well was added to center of former farm field to investigate deep ground-water fluctuations. Four additional deep wells installed in November, and geologic borings described for each.
- April 2002: Three dielectric soil-moisture probes added to the site, as well as a transducer in the channel draining the south wetland.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

The former Tiernan Property is a potential wetland compensation site. No calculation of the area satisfying wetland hydrology criteria is needed, but was carried out for planning purposes and because a substantial amount of wetland already exists on site.

Using well coordinates derived via GPS, a mathematical interpolation of the shallow ground-water surface, and data from soil-moisture probes, the total area that satisfied wetland hydrology criteria in 2002 was determined to be approximately 14.7 ac (5.9 ha) in the former borrow pit area and 18.5 ac (7.5 ha) in the northern former farm field. In 2001, 13.6 ac (5.5 ha) of wetland hydrology were mapped in the former borrow pit. The figure for 2002 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season at Belleville, Illinois is 203 days, starting April 5 and ending October 24. Therefore, 12.5% of the growing season is 25 days.
- Precipitation during the monitoring period was 108% of normal. Between October, 2001 and May 2002, only the month of February experienced below-normal precipitation. This produced atypical, widespread saturation in the northern fields. Above-normal local precipitation in April and May prompted high water levels in Blue Waters Ditch, flooding the southern third of the site. Even though the ditch was drained once water levels reached ~121.4 m (398.3 ft) NGVD 29, micro-topography within the former borrow pit produces areas of prolonged inundation. Ground-water discharge may also sustain near-surface saturation in the former borrow pit.
- Most of the southern half of the site (borrow pit) is a pre-existing wetland area. The

hydrology of the wetland seems to be controlled primarily by the water level in Blue Waters Ditch southeast of the site. The water levels in the ditch are controlled by a pumping station and gravity drain. After heavy rainstorms, the pumping station operates and/or the gravity drain is opened to alleviate interior flooding. This drawdown directly affects water levels on the proposed mitigation site. The extent of wetland hydrology in the former borrow pit was determined using consecutive water levels measured during the longest period of sustained high-water levels (end of May through late June).

- The extent of wetland hydrology in the northern half of the site was determined using data from soil moisture probes deployed at well clusters 26, 27, and 28. Data from Watermark probes indicate the upper 0.40 m of the soil column was saturated at all three locations from mid November 2001 through late June 2002.
- The limitations of the above methods include:
  - There is some topographic variability over the site. Field indicators were used to outline areas of wetland hydrology missed by the interpolation (*e.g.* the orientation of the wetland-hydrology boundary north of well 2S was modified to match the topography).

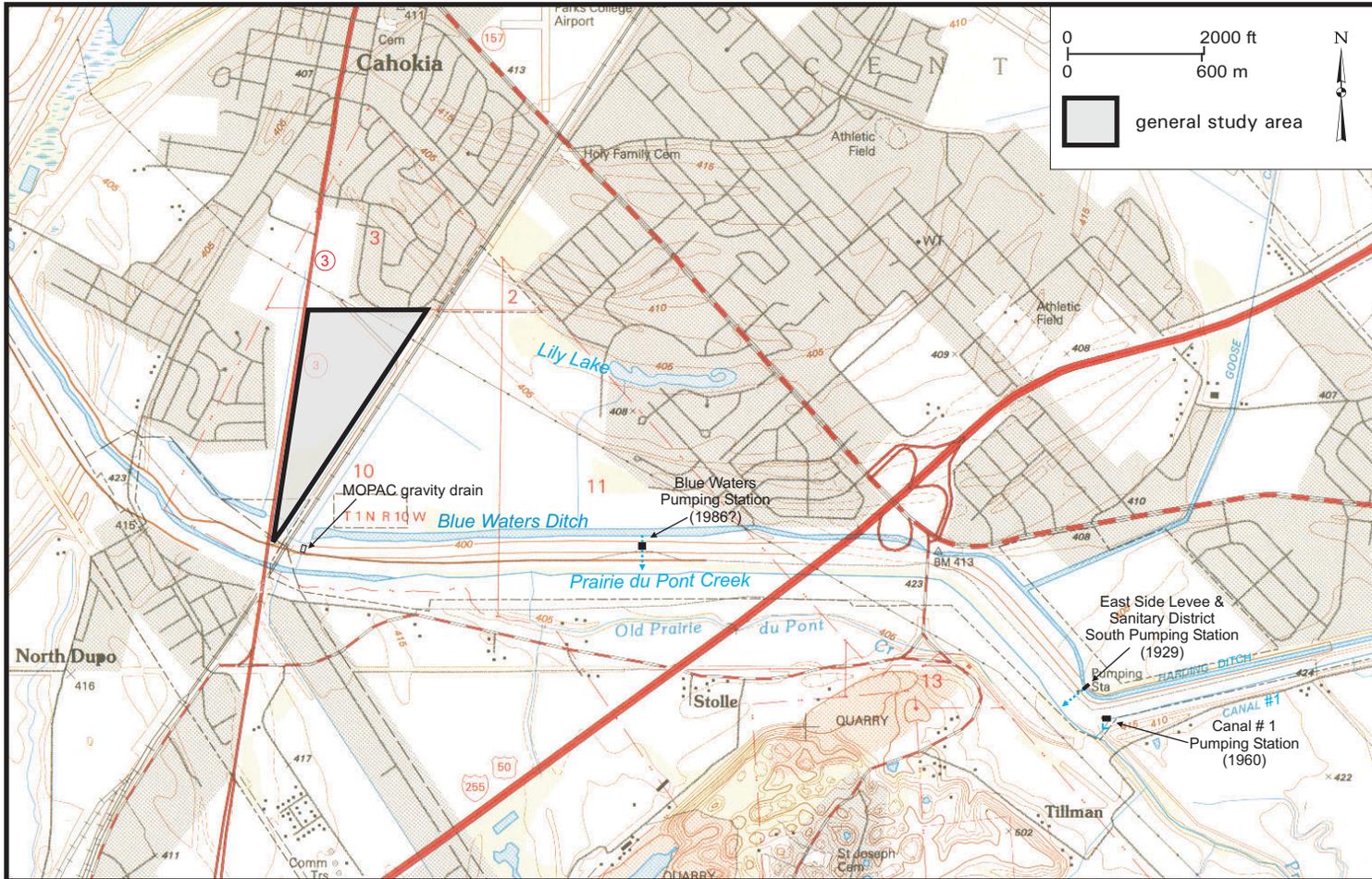
#### PLANNED FUTURE ACTIVITIES

- Officials operating the Blue Waters pumping station will be asked to provide information on the date and duration of pumping events and operation of the gravity drain at the terminus of the ditch.
- Additional transects of Decagon ECH<sub>2</sub>O soil-moisture probes may be deployed in the northern half of the site to better understand the timing and extent of near-surface saturation throughout the growing season.

# Tiernan Property (Cahokia) Potential Wetland Compensation Site (FAP 999)

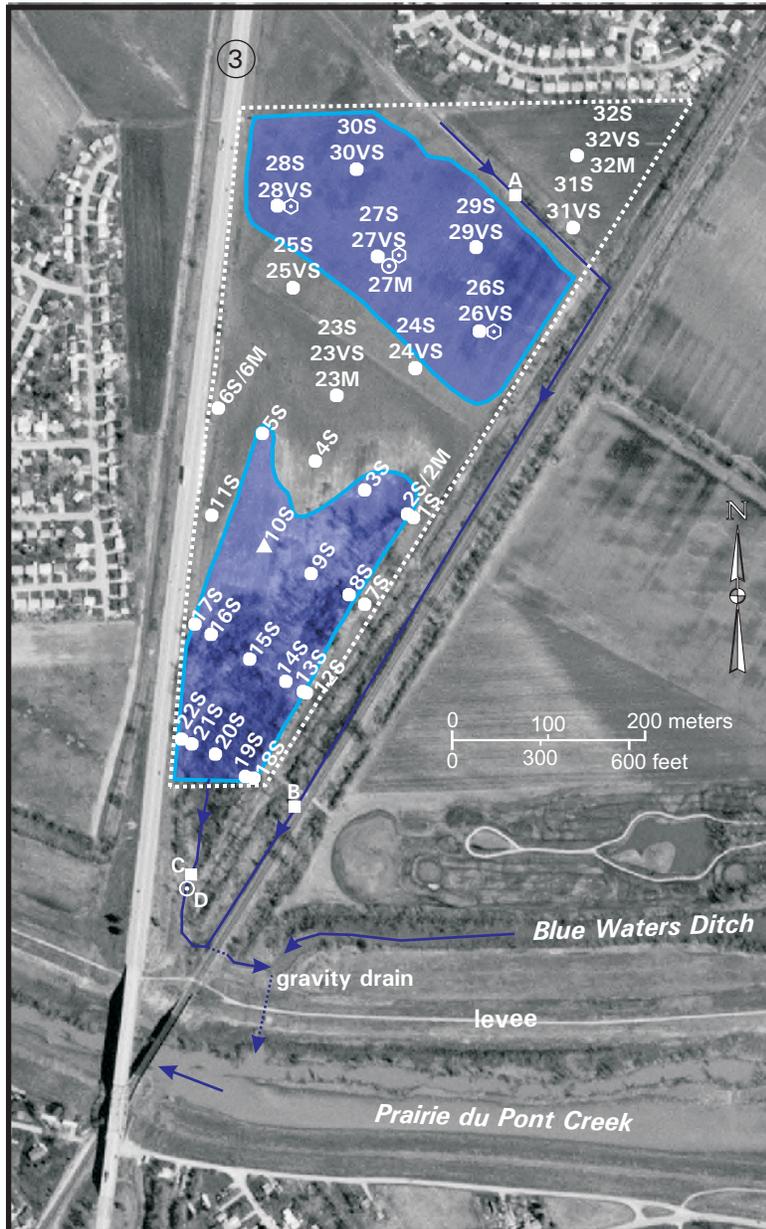
## General Study Area and Vicinity

from the USGS Topographic Series, Cahokia, IL 7.5-minute Quadrangle (USGS 1993)  
contour interval is 10 feet



# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site (FAP 999)

**Estimated Areal Extent of 2002 Wetland Hydrology**  
 based on data collected between September 1, 2001 and September 1, 2002  
 map based on USGS digital orthophotograph, Cahokia, SW quarter quadrangle  
 produced from 4/2/98 aerial photography (ISGS, 2000)

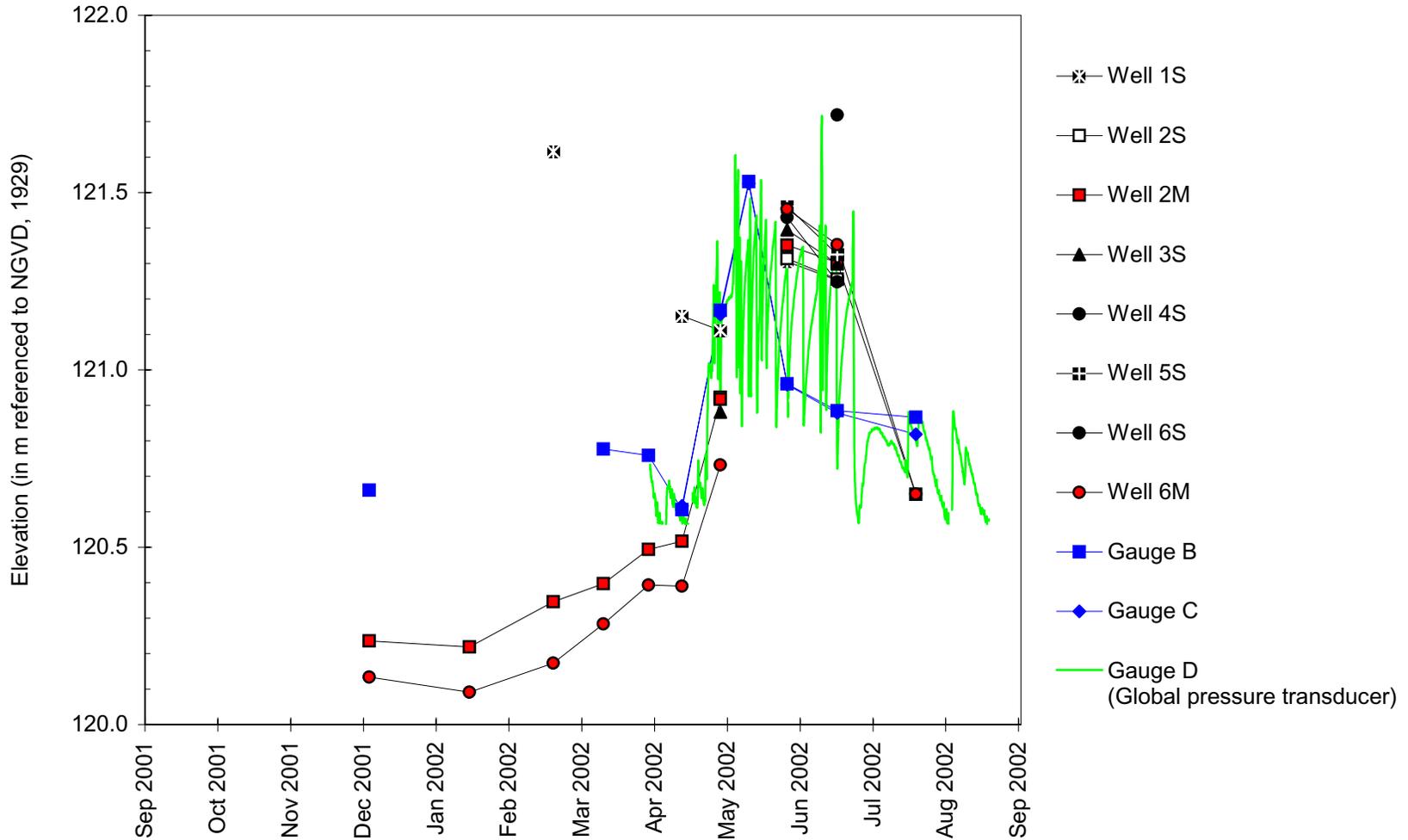


- monitoring well
- staff gauge
- ▲ RDS water-level recorder
- \* rain gauge
- ⊙ Global transducer
- ⊖ soil-moisture probe
- ⋯ site boundary
- extent of 2002 wetland hydrology
- ← flow direction

# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

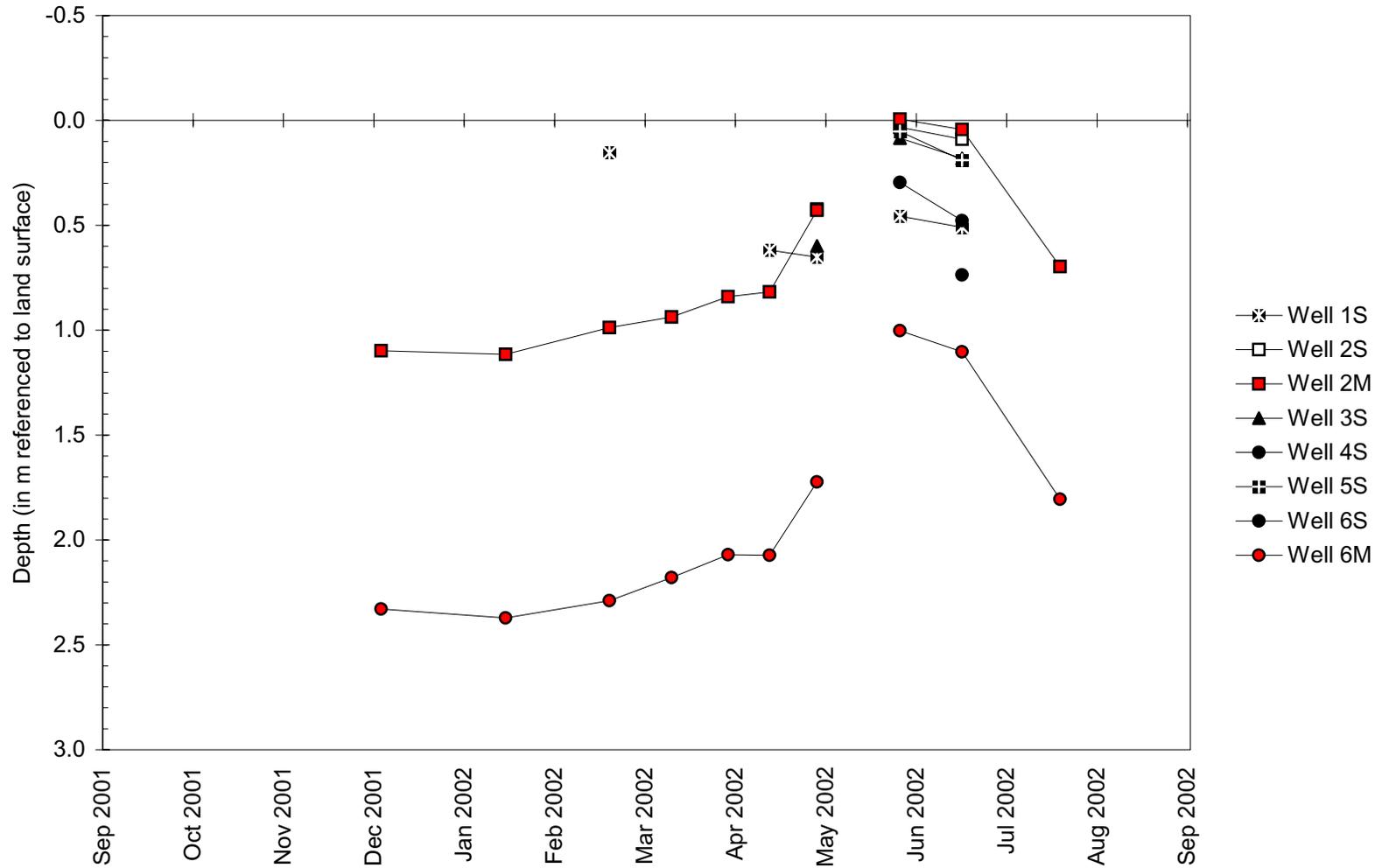
## Water-Level Elevations



# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

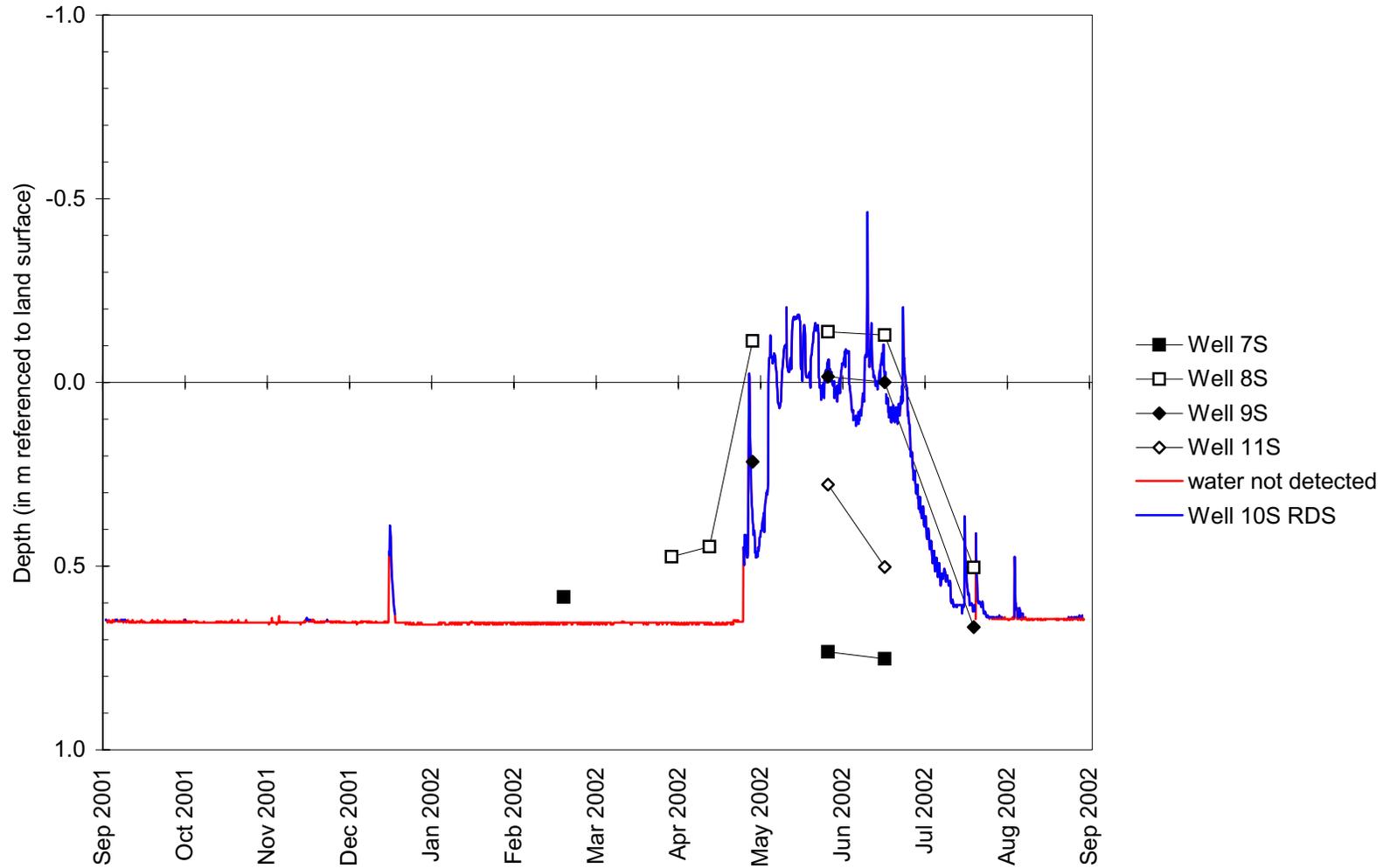
## Depth to Water





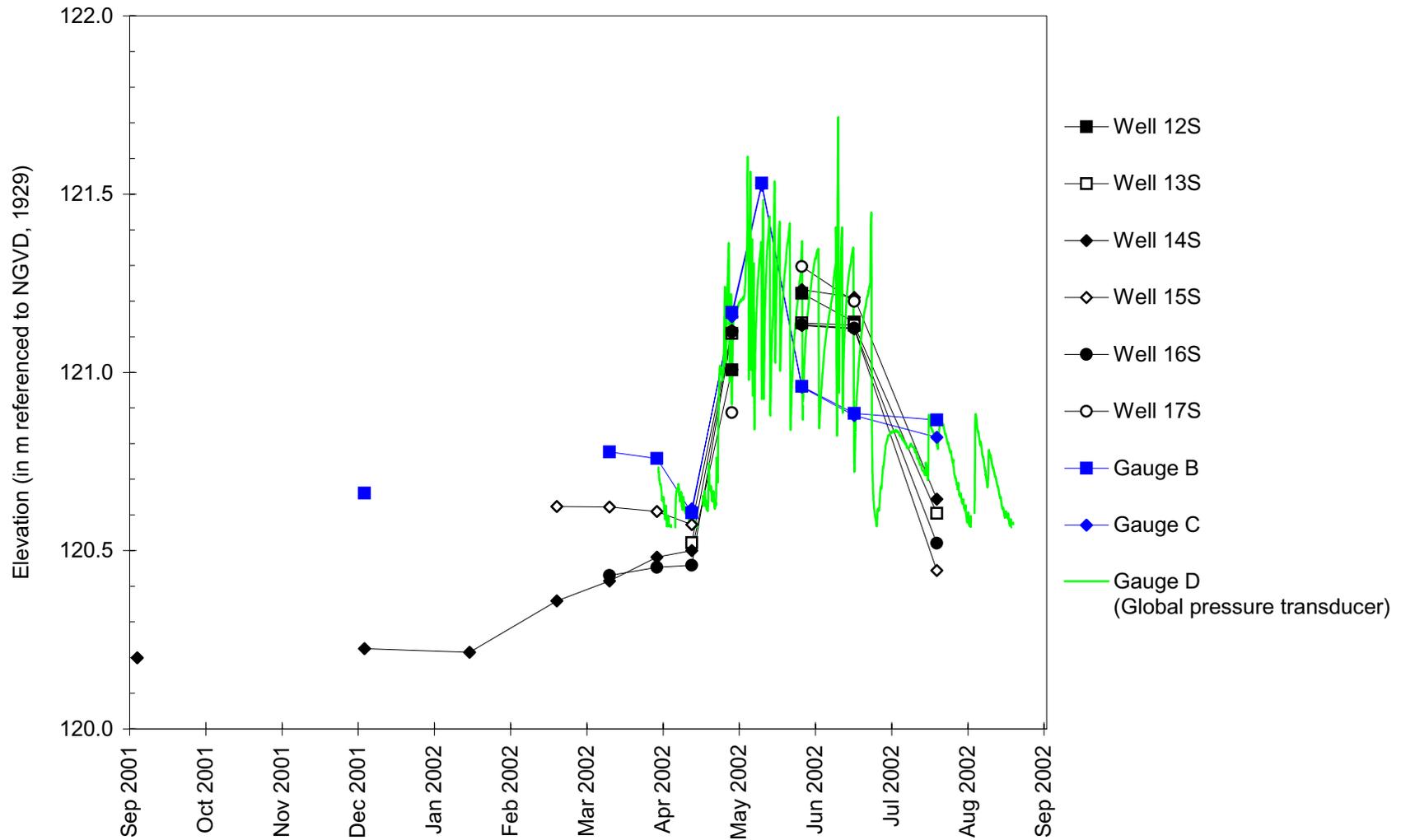
# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

## Depth to Water



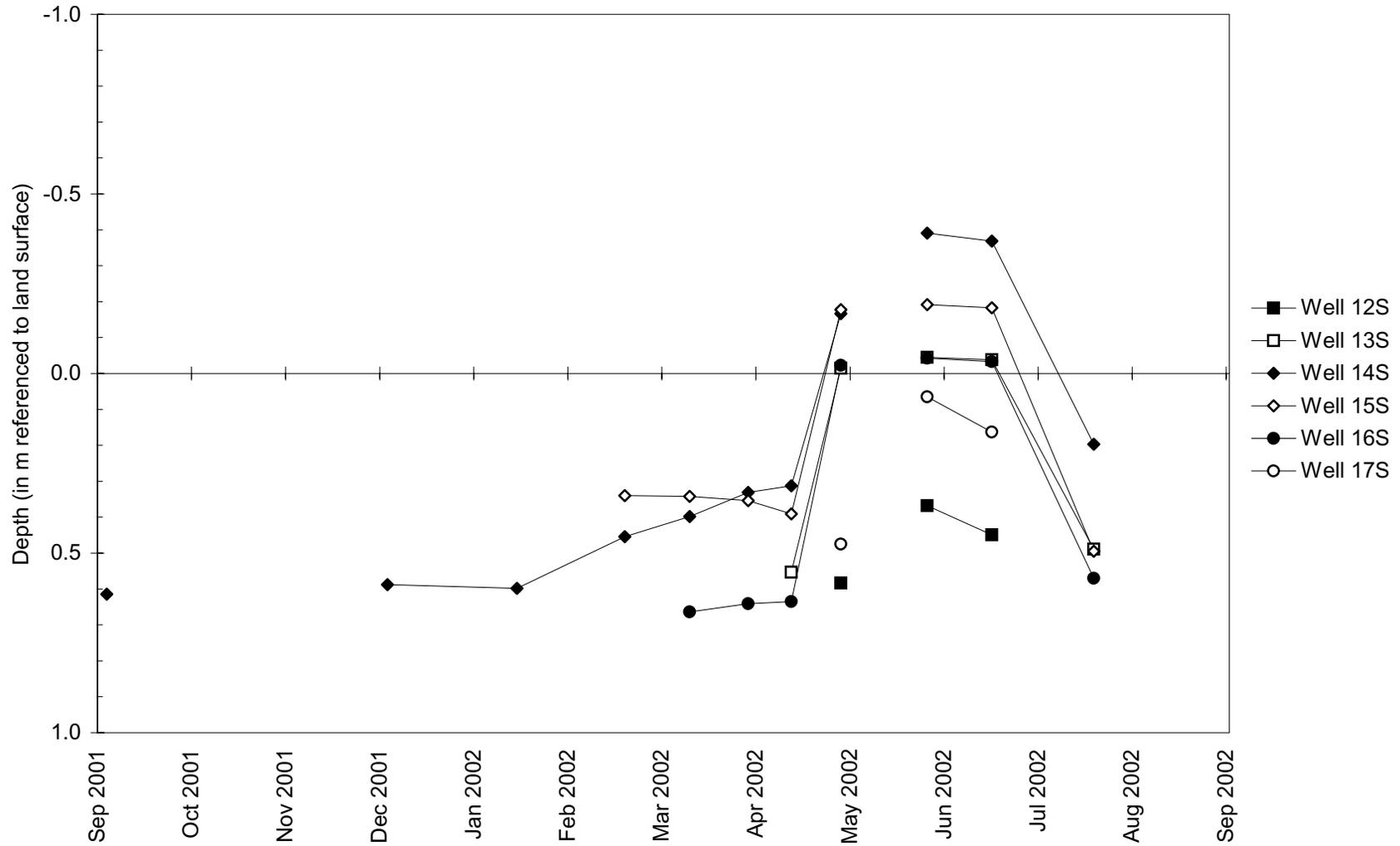
# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



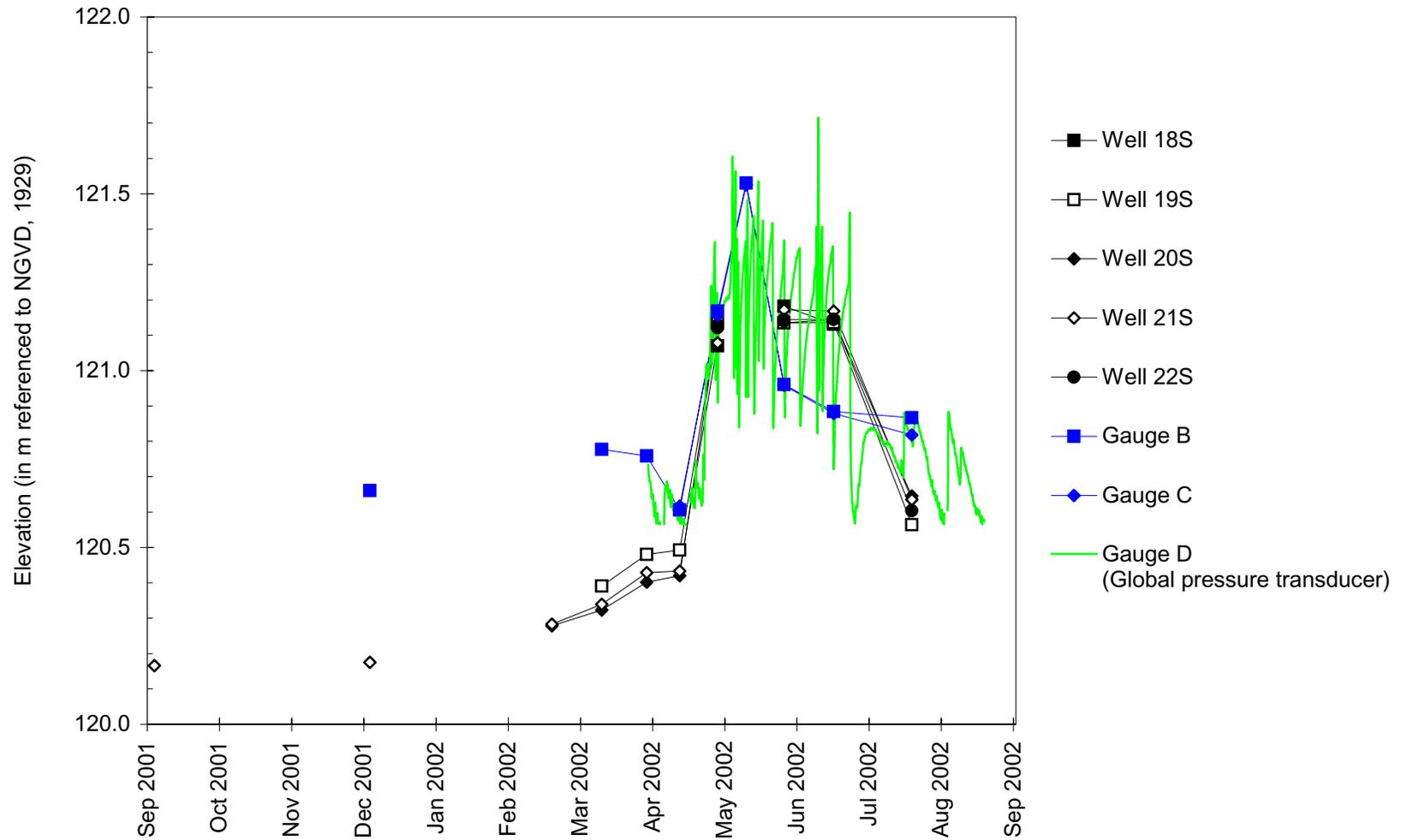
# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

## Depth to Water



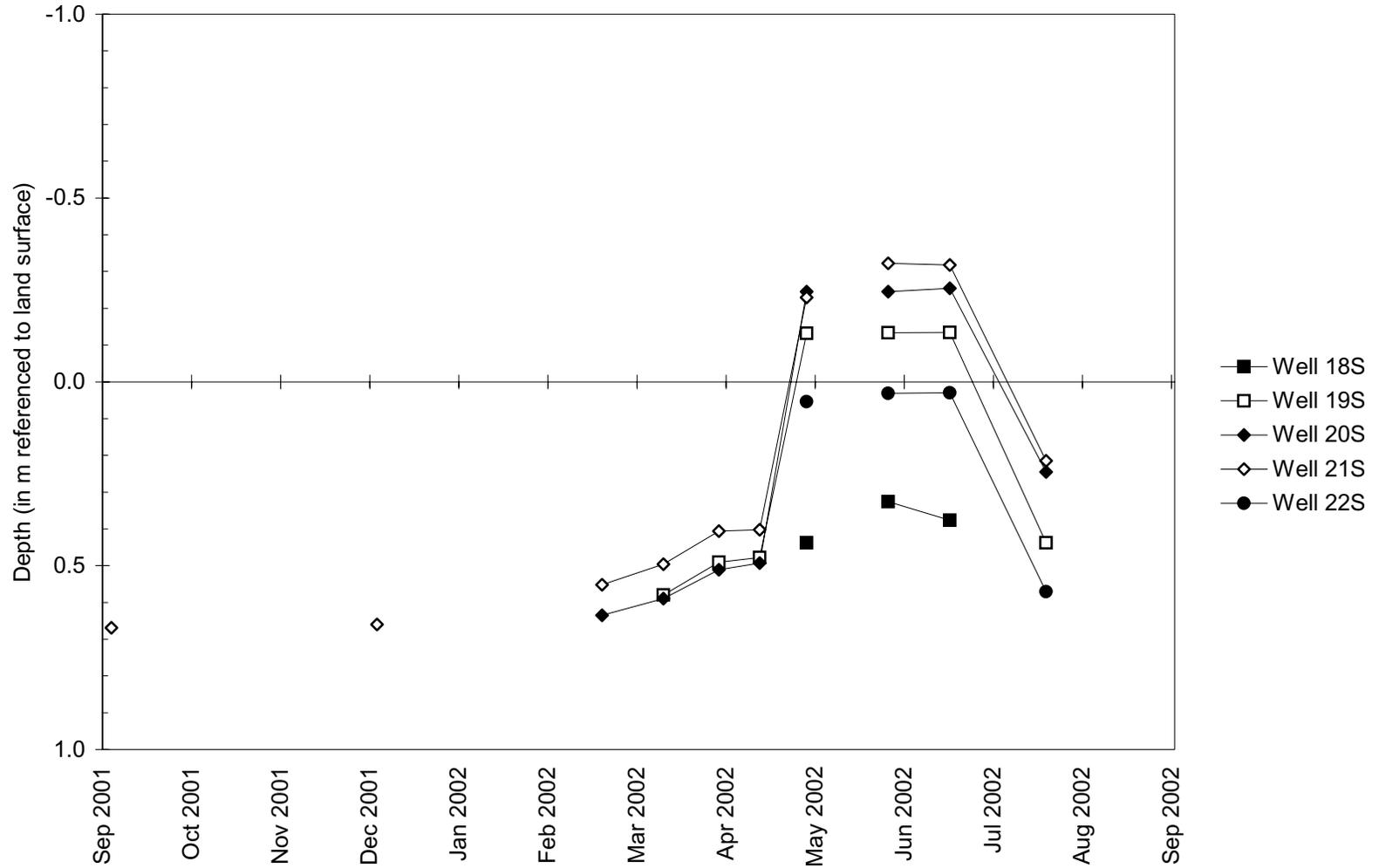
# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

## Water-Level Elevations



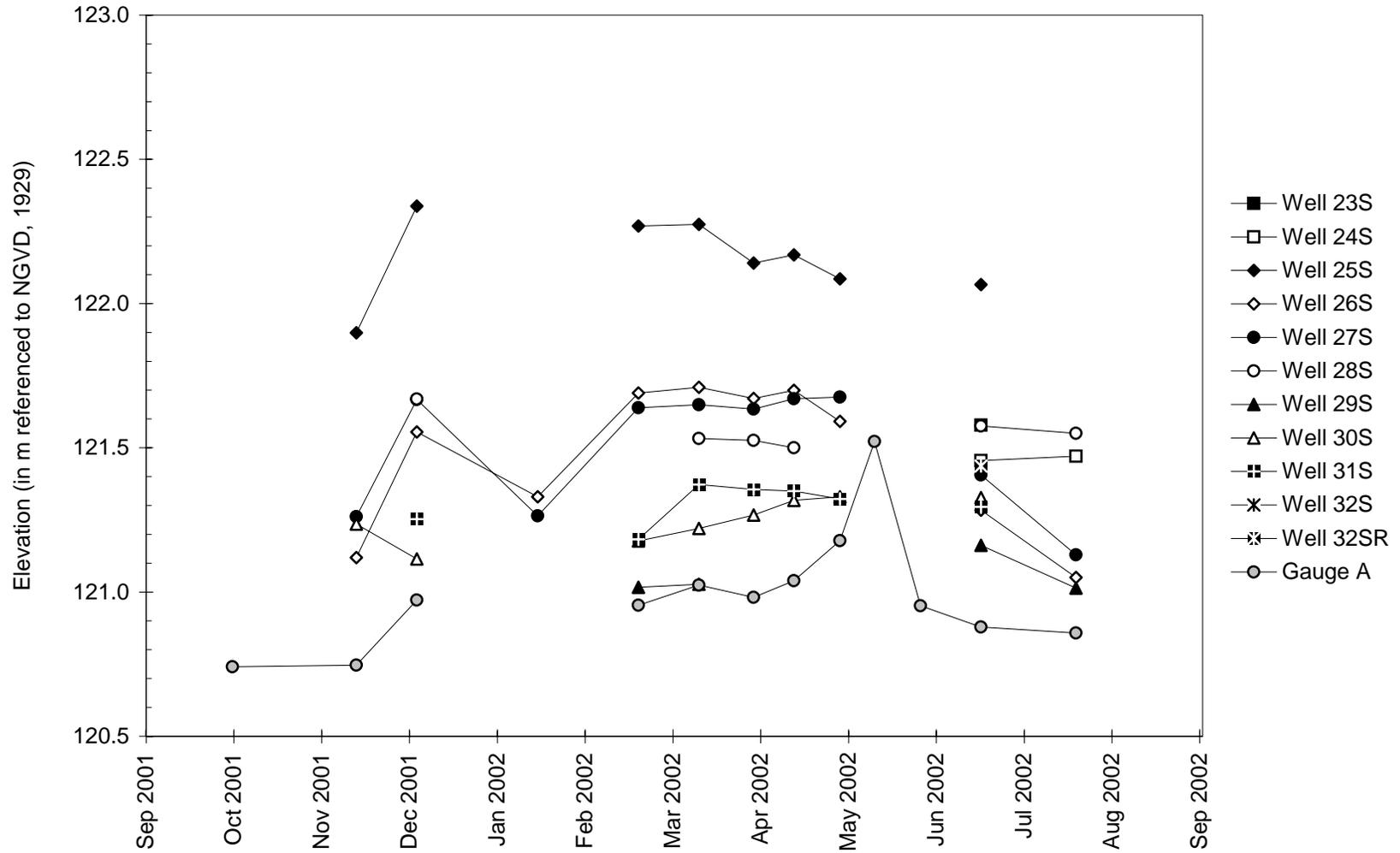
**Former Tiernan Property, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Depth to Water**



**Former Tiernan Property, New River Crossing Potential Wetland Compensation Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**



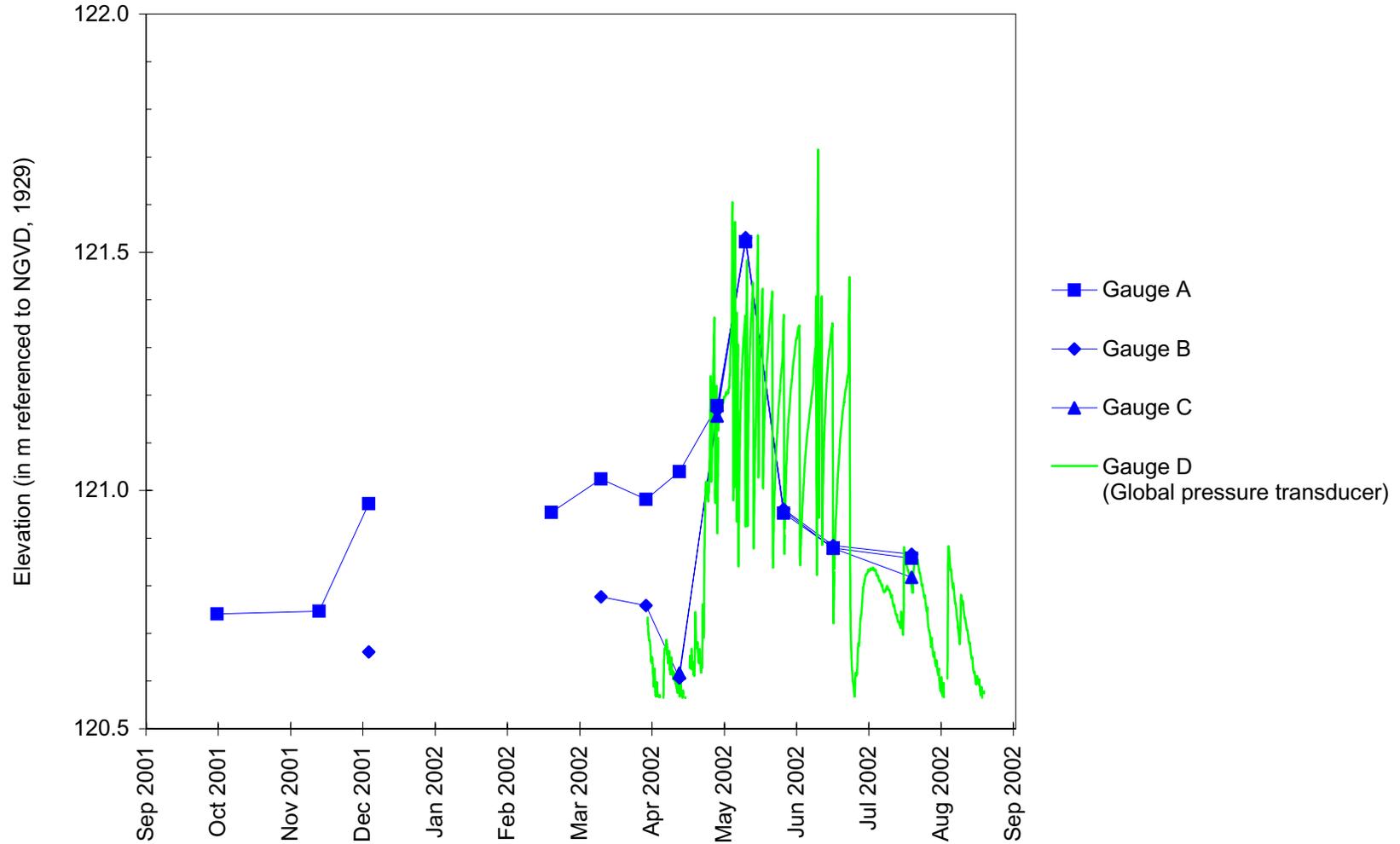






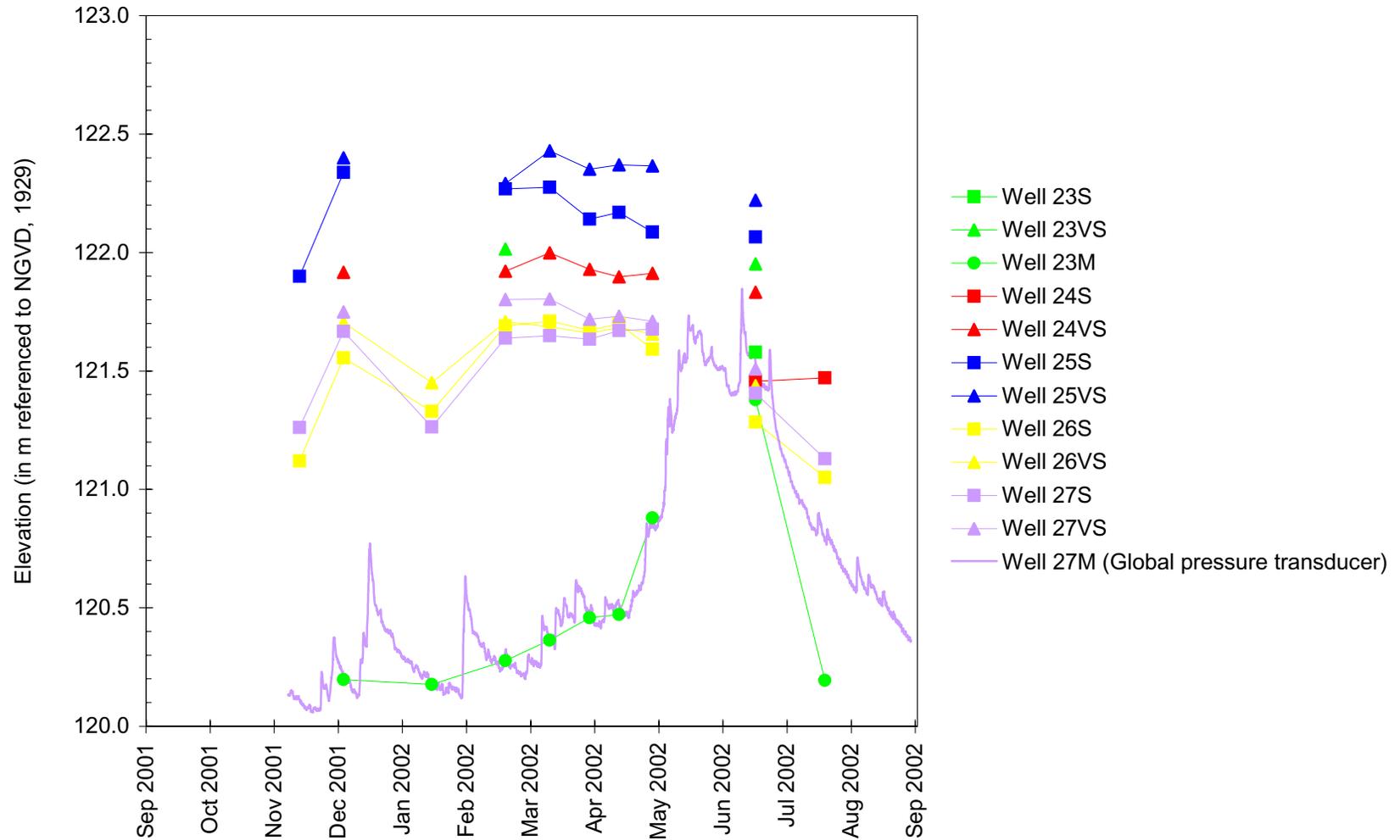
**Former Tiernan Property, New River Crossing Potential Wetland Compensation Site**  
September 1, 2001 to September 1, 2002

**Water-Level Elevations**



# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

## Water-Level Elevations

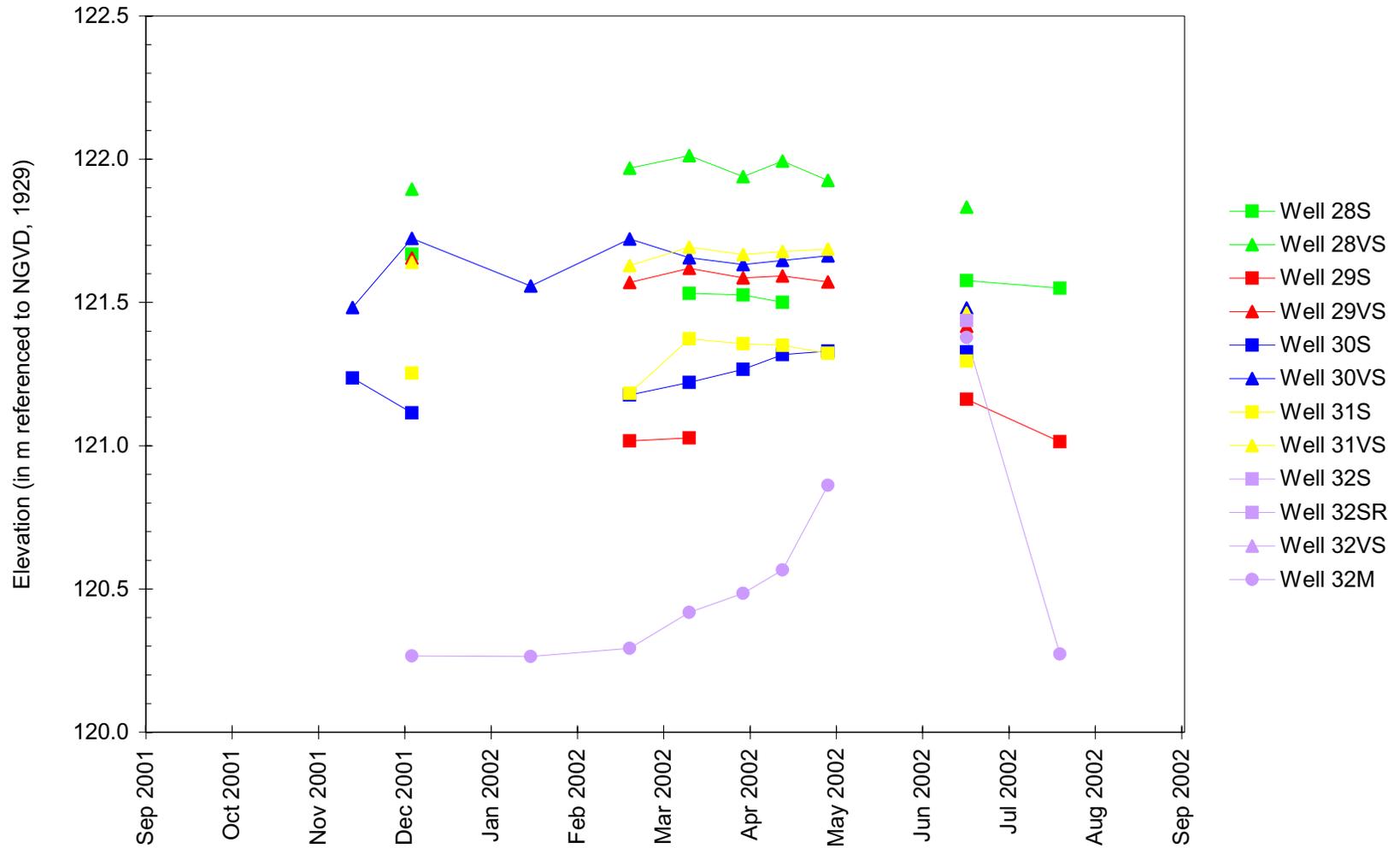




# Former Tiernan Property, New River Crossing Potential Wetland Compensation Site

## September 1, 2001 to September 1, 2002

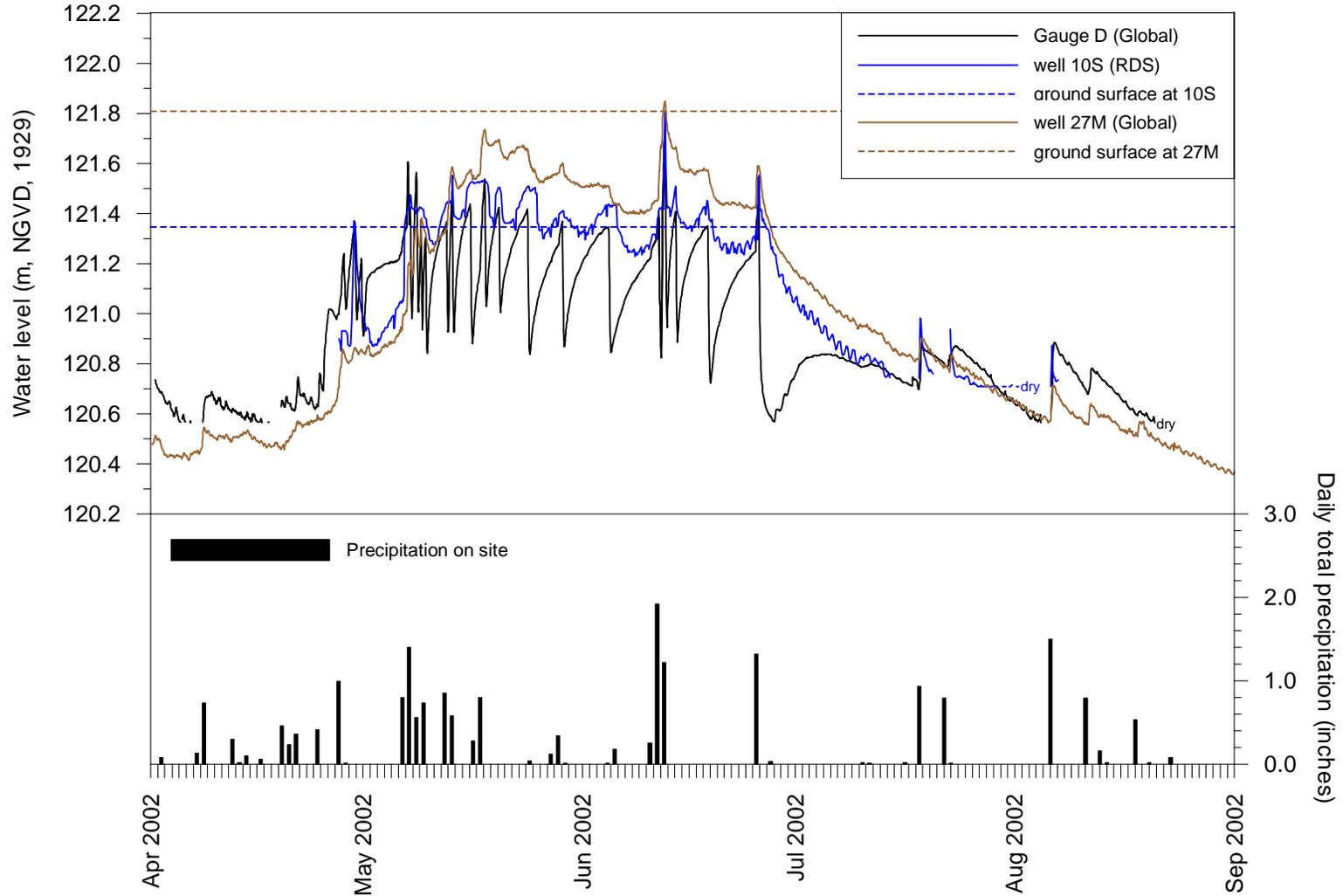
### Water-Level Elevations





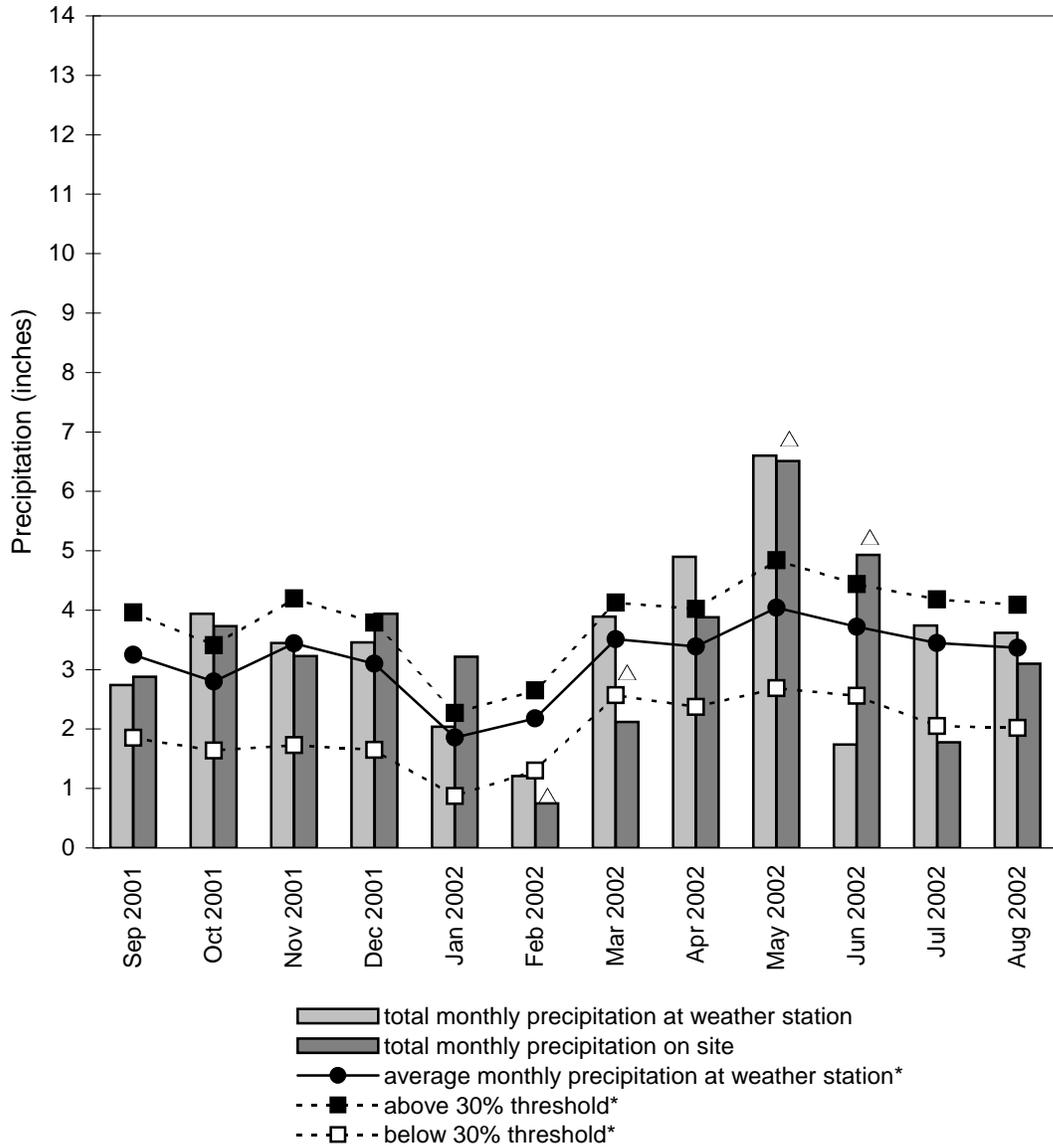
# Former Tiernan Property Potential Wetland Compensation Site April 1, 2002 to September 1, 2002

Continuous ground and surface-water monitoring and precipitation on site and at Belleville SIU



## Former Tiernan Property, New River Crossing Potential Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Belleville, IL SIU Research Center Weather Station



△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month  
\* see text for explanation

Graph last updated October 11, 2002

**EFFINGHAM COUNTY**  
**POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #59**

Effingham County, near Mason, Illinois  
FAP 328

**Primary Project Manager: Keith W. Carr**

**Secondary Project Manager: Geoffrey E. Pociask**

**SITE HISTORY**

- September 2000: ISGS was tasked by IDOT to perform an Initial Site Evaluation of the proposed wetland compensation site.
- December 2000: ISGS submitted an Initial Site Evaluation Report to IDOT.
- March 2001: ISGS began monitoring ground- and surface-water levels at the site. Equipment installed included 13 soil-zone monitoring wells, three stage gauges, one rain gauge, one Infinities sonic data logger, two Global data loggers, and an on-site benchmark.
- January 2002: A letter terminating Level II hydrogeologic assessment of the site was received from Tom Brooks of IDOT Central Office.
- May 2002: Several ISGS instruments were damaged by flooding and monitoring was ceased on 5/29/02.
- August 2002: The final remaining ISGS instruments were removed from the site.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Because the site was terminated prior to the end of the monitoring year, no wetland hydrology calculation was made for this monitoring period. The following is for informational purposes only.

- According to the Midwestern Climate Center, the median date that the growing season begins in Effingham, Illinois is April 2 and the season lasts 210 days; 12.5% of the growing season is 26 days.
- Total precipitation for the monitoring period from September 2001 to August 2002 was 119% of normal. Total precipitation for the period from January to March 2002 was above normal, resulting in somewhat wetter than average conditions entering the growing season. During April and May 2002, precipitation was above normal, but fell below normal during the June to August 2002 period.
- In 2002, water levels measured in wells 3S, 4S, 5S, 5VS, 6S, 8S, 10S, and 11S conclusively satisfied wetland hydrology criteria as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Also, surface-water inundation as determined by staff gauges and data loggers conclusively satisfied wetland hydrology criteria at SW-A, SW-B, and SW-B (Global), although these instruments are located in the small semi-permanent water bodies which also met wetland hydrology criteria in 2001.

- As in 2001, overbank flood events from the adjacent Little Wabash River were of high magnitude but short duration. From January to May 8, 2002, the seven flood events that inundated a large proportion of the site had an average duration of only 2.3 days. During a particularly high magnitude flood event between May 8 and May 13, 2002, water levels may have exceeded 2.3 m (7.5 ft) over some areas of the site, and floodwater velocities were estimated by ISGS personnel on site to be in the 2 m/sec range. We also observed significant and widespread scour damage to vegetation and large areas of erosion and re-deposition at the soil surface. One scour hole was noted that exceeded 100 m<sup>2</sup> in area and which was over 1 m deep.

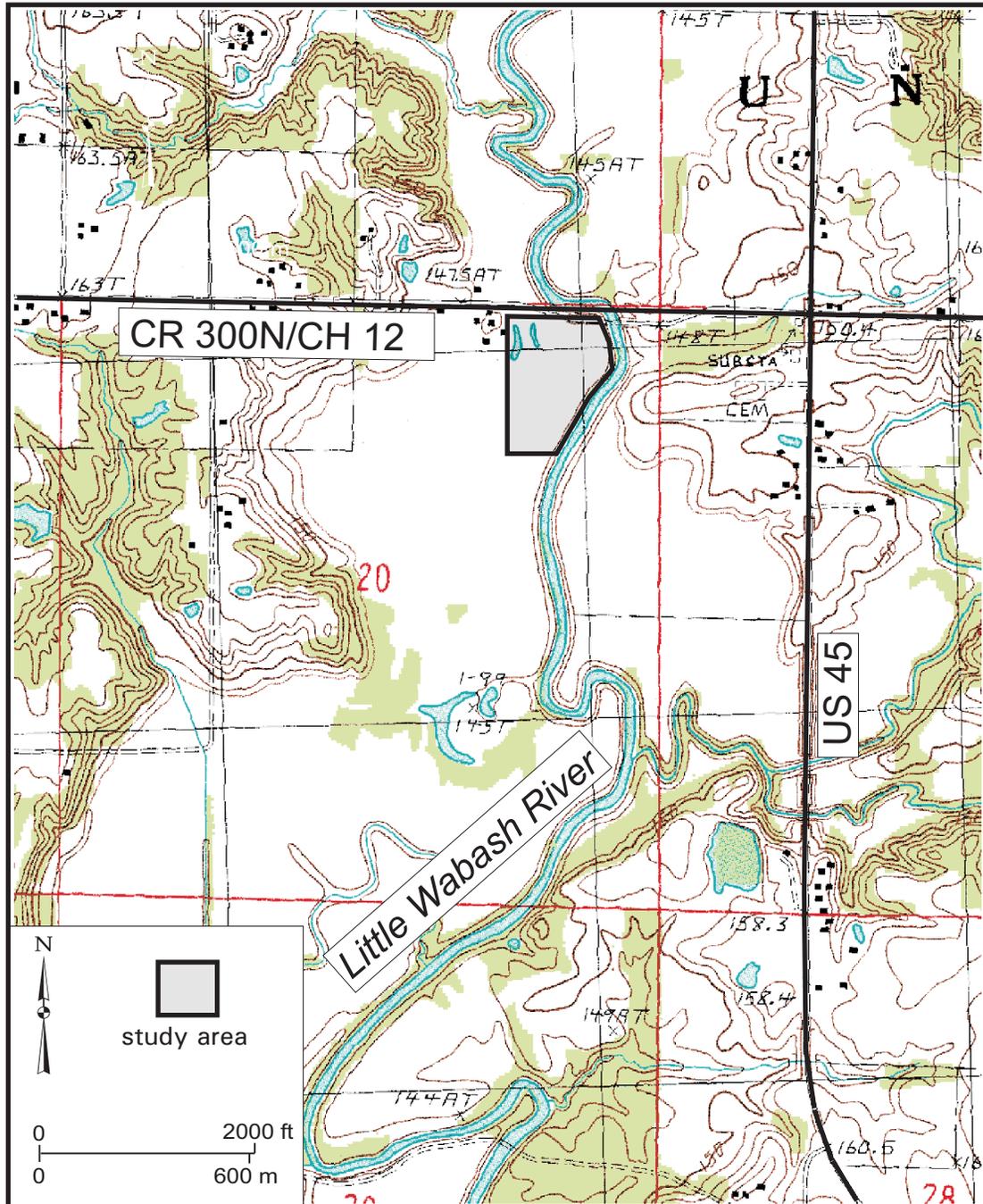
#### PLANNED FUTURE ACTIVITIES

- No future activities planned.

# Effingham County Potential Wetland Compensation Site (FAP 328)

## General Study Area and Vicinity

from the USGS Topographic Series, Hord, IL 7.5-minute Quadrangle (USGS 1985-provisional)  
contour interval is 10 feet



# Effingham County Potential Wetland Compensation Site (FAP 328)

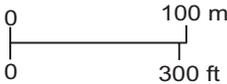
## Wells and gauges that met wetland hydrology criteria in 2002

based on data collected between September 1, 2001 and September 1, 2002

map based on USGS digital orthophotograph, Hord NE quarter quadrangle  
from 04/12/1998 aerial photography (ISGS 2001)



- soil-zone monitoring well or gauge that attained wetland hydrology in 2002
- soil-zone monitoring well or gauge that attained wetland hydrology in 2002
- other soil-zone monitoring wells
- \* rain gauge
- ⊙ Global water level logger
- ▣ Infinities sonic data logger
- stage gauge



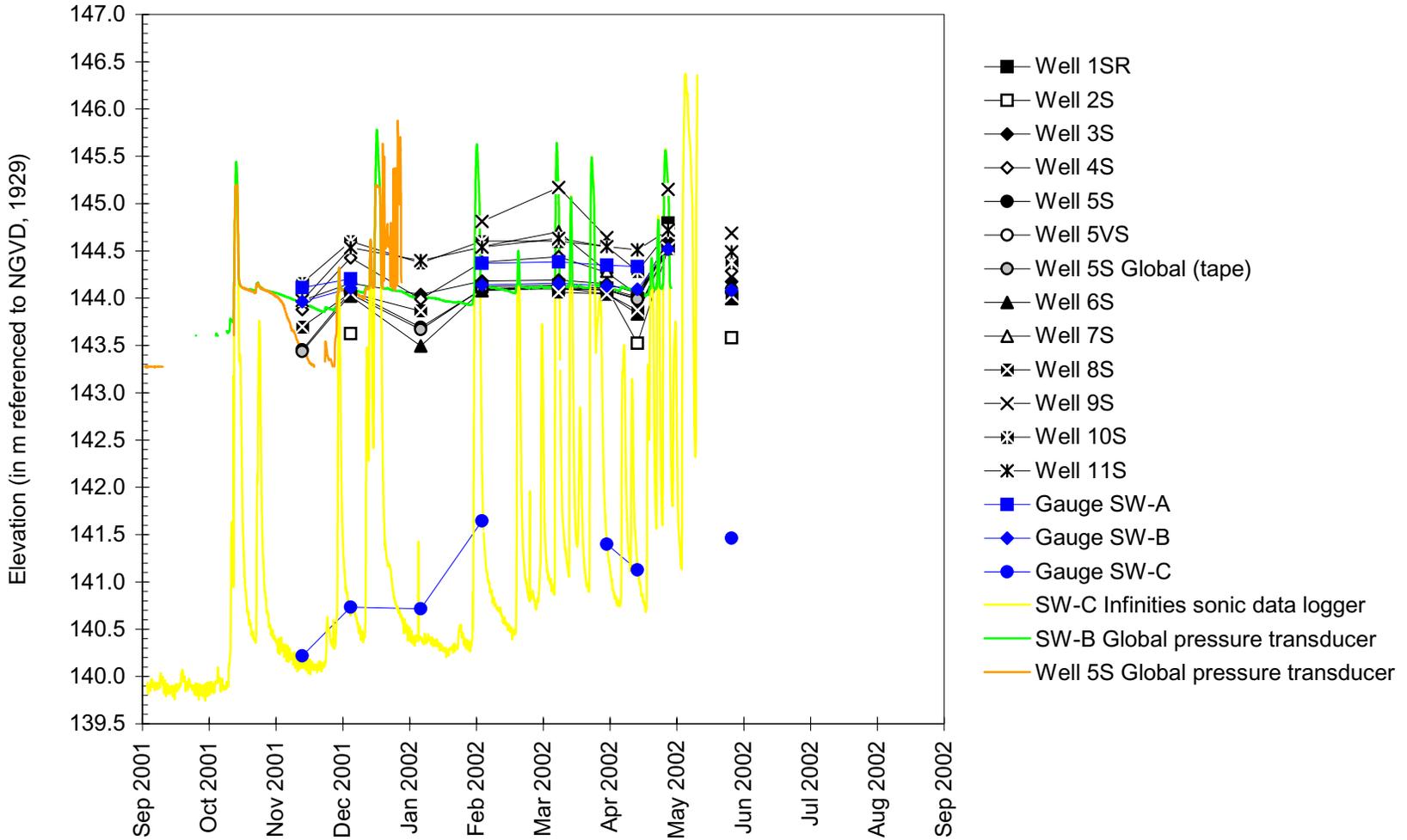
approximate site boundary



# Effingham County Potential Wetland Compensation Site

## September 1, 2001 to September 1, 2002

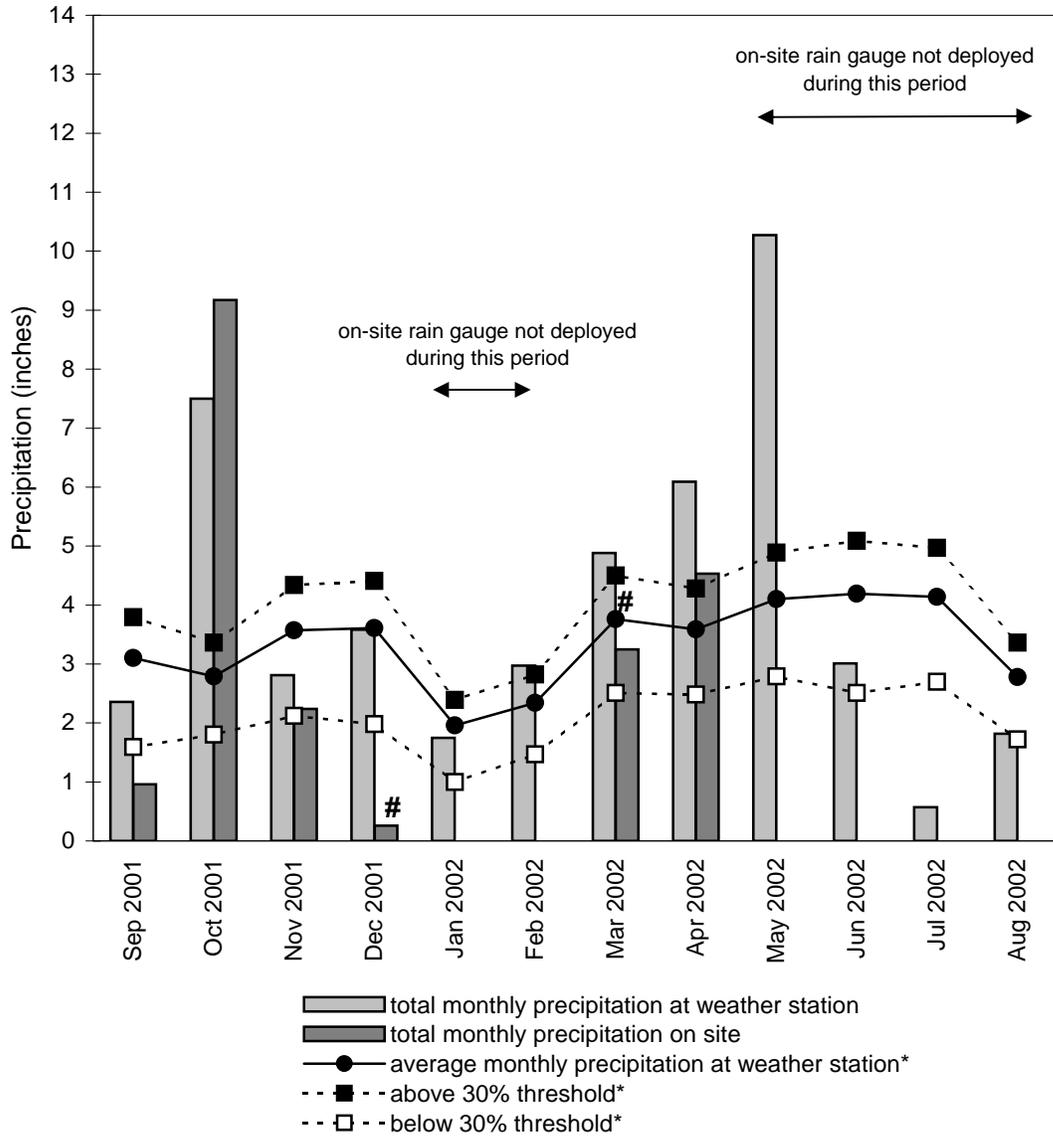
### Water-Level Elevations





# Effingham County Potential Wetland Compensation Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the Effingham, IL Weather Station



# on-site rain gauge not deployed for entire month  
\* see text for explanation

Graph last updated October 11, 2002

**POTTER PROPERTY  
DISTRICT 7 POTENTIAL WETLAND BANKING SITE**

**ISGS #60**

Fayette County, near Ramsey, Illinois

**Primary Project Manager: Blaine A. Watson**

**Secondary Project Manager: Keith W. Carr**

**SITE HISTORY**

- June 2000: ISGS was tasked by IDOT to conduct an Initial Site Evaluation of the site.
- October 2000: ISGS submitted Initial Site Evaluation report identifying the site as having high potential for wetland restoration in selected areas.
- February 2001: ISGS, INHS, IDOT District 7, and IDOT Central Office personnel met with current site owner to discuss project potential and identify information needed prior to proceeding with IDOT purchase.
- May 2001: ISGS initiated monitoring of the site.
- July 2001: A second meeting involving the participants of the February 2001 meeting was held to discuss the available data gathered at the site during Spring 2001 monitoring conducted by INHS and ISGS. Consensus was reached that IDOT can likely develop wetlands on the site, dependent upon the level of effort they wish to expend in doing so.
- May 2002: IDOT requested discontinuation of site monitoring. Site is closed.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

No wetland hydrology calculation was made for this monitoring period for the following reasons:

- Many of the site instruments were damaged by flooding and agricultural activities during the early portion (April-May) of the 2002 growing season.
- The site was discontinued and removed from the active monitoring list in May 2002.

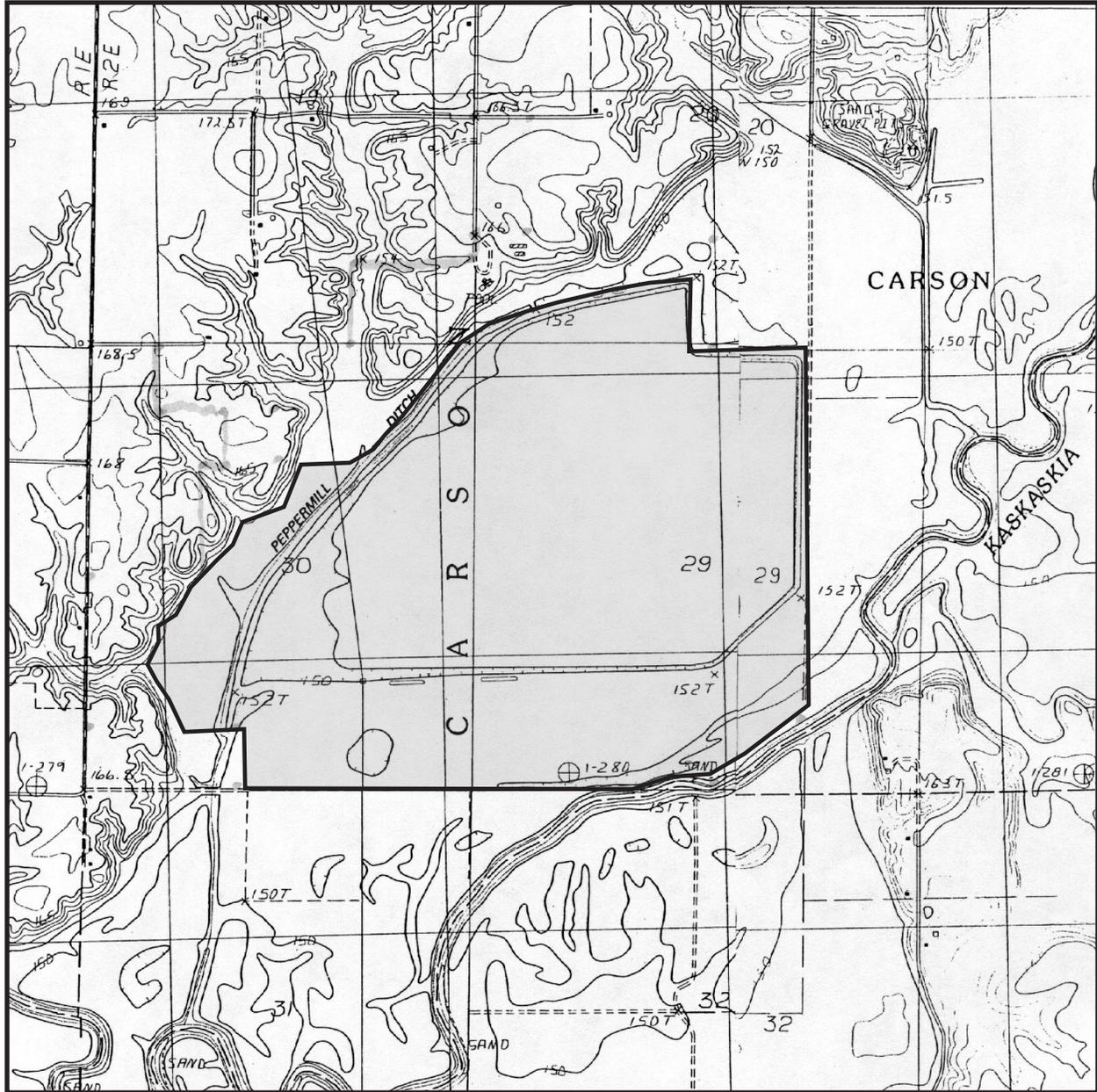
**PLANNED FUTURE ACTIVITIES**

- The site has been removed from the active monitoring list.

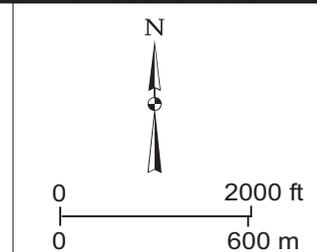
# Potter Property, District 7 Potential Wetland Banking Site

## General Study Area and Vicinity

from the USGS Topographic Series, Avena (USGS 1982) and Vera (USGS 1982), IL  
7.5-minute Quadrangles  
contour interval is 10 feet



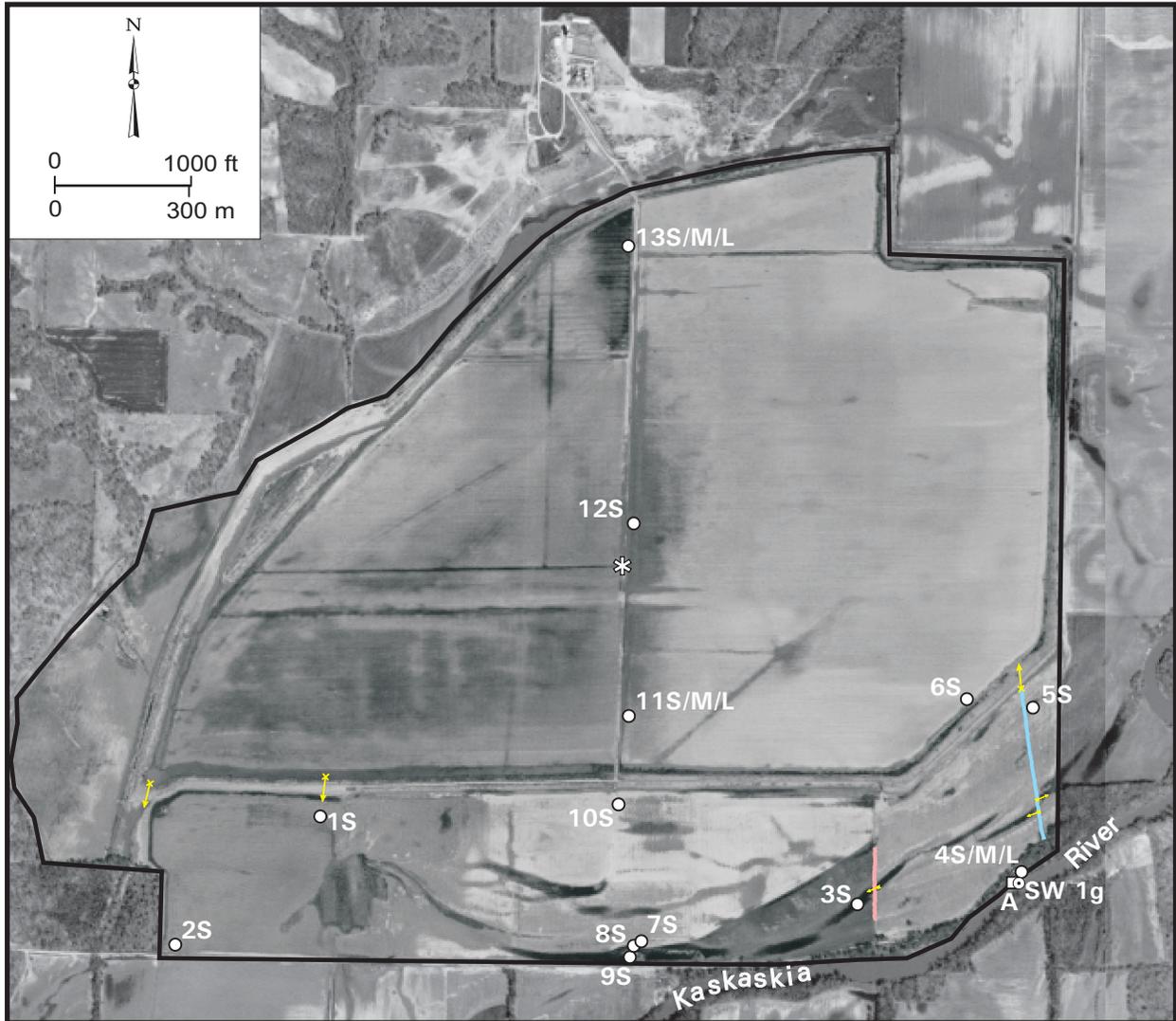
 location of proposed site



# Potter Property, District 7 Potential Wetland Banking Site

## Locations of ISGS Monitoring Equipment

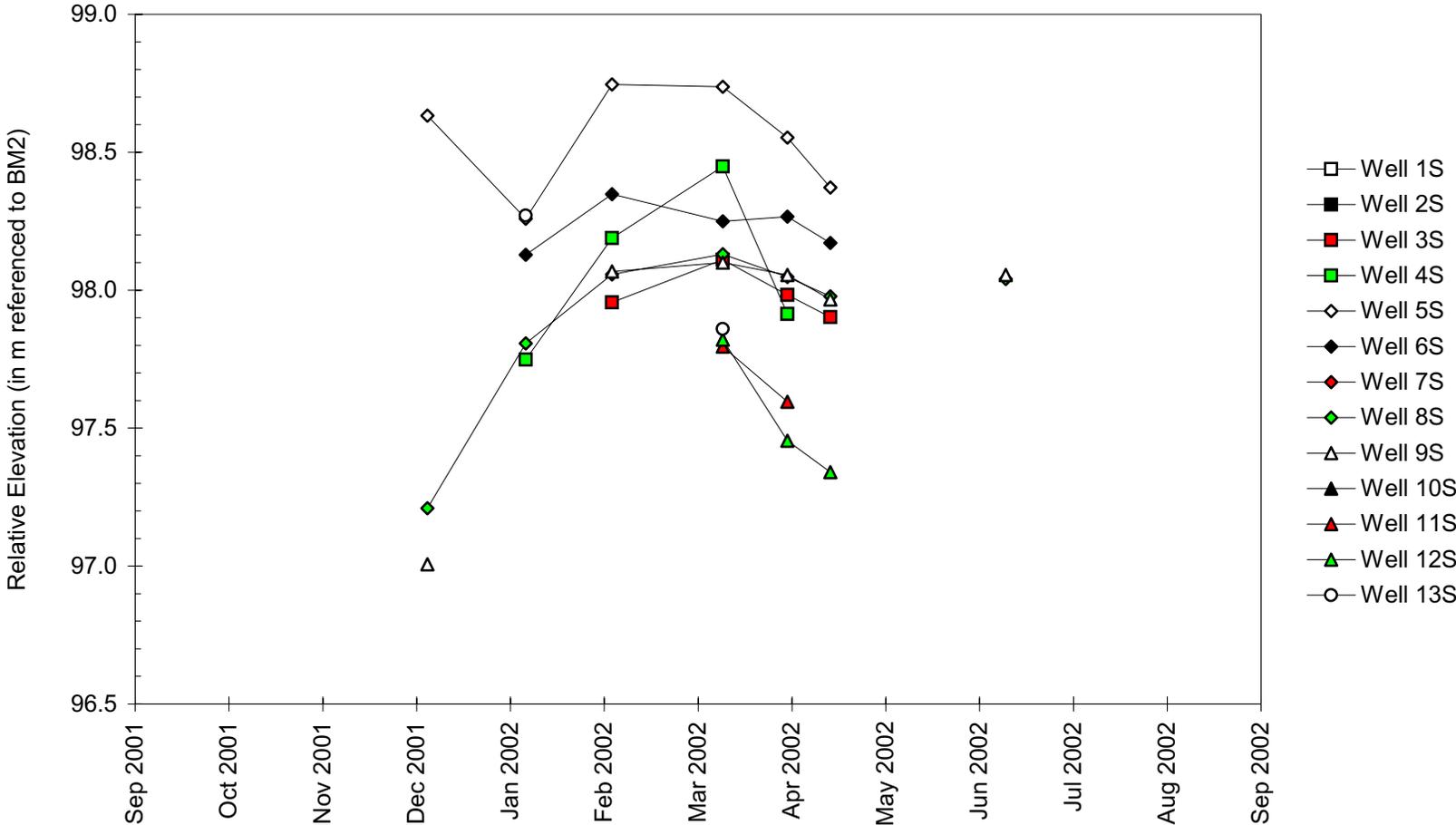
based on USGS digital orthophotograph Vera, NE and Avena, NW quarter quadrangles  
produced from 4/12/98 aerial photography (ISGS 2002)



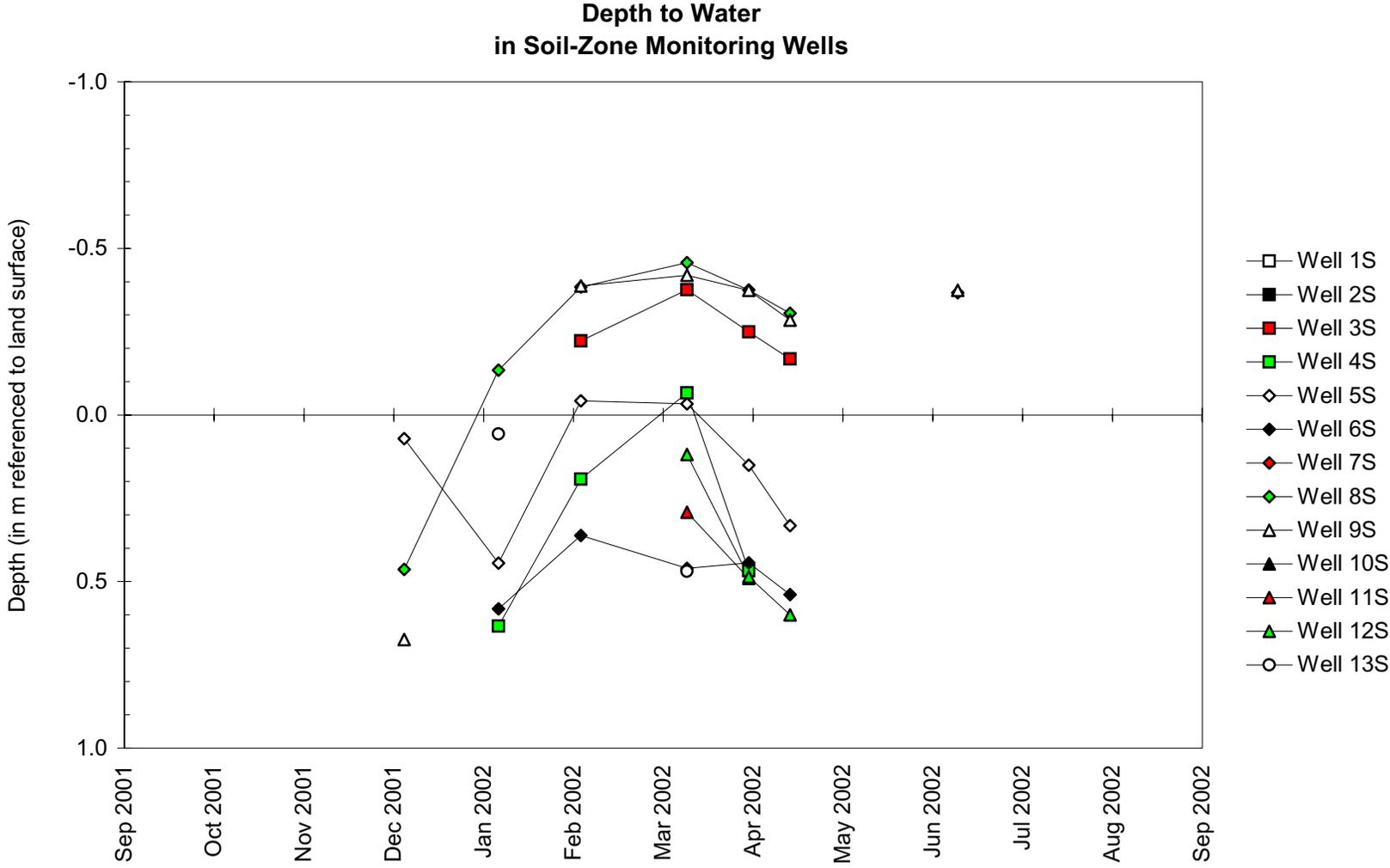
- |          |                            |            |                         |
|----------|----------------------------|------------|-------------------------|
| ✱        | rain gauge                 | ○          | monitoring well         |
| ⊙        | Global pressure transducer | □          | stage gauge             |
| — (blue) | Water supply ditch         | ↘ (yellow) | culvert with gate valve |
| — (red)  | Soil Berm                  |            |                         |

**Potter Property, Fayette County District 7 Potential Wetland Banking Site**  
**September 1, 2001 to September 1, 2002**

**Water-Level Elevations**  
**in Soil-Zone Monitoring Wells**



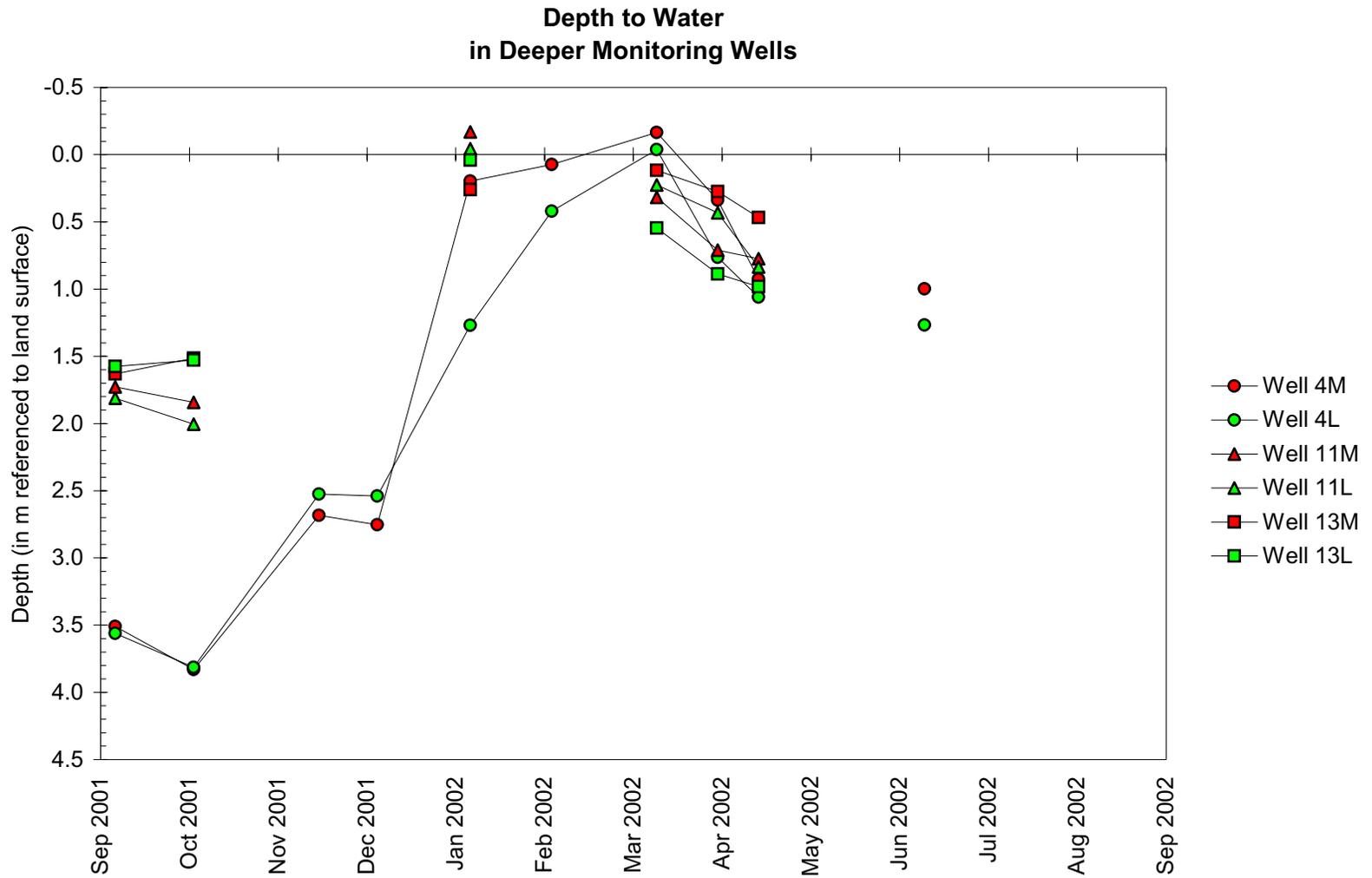
**Potter Property, Fayette County District 7 Potential Wetland Banking Site**  
**September 1, 2001 to September 1, 2002**





# Potter Property, Fayette County District 7 Potential Wetland Banking Site

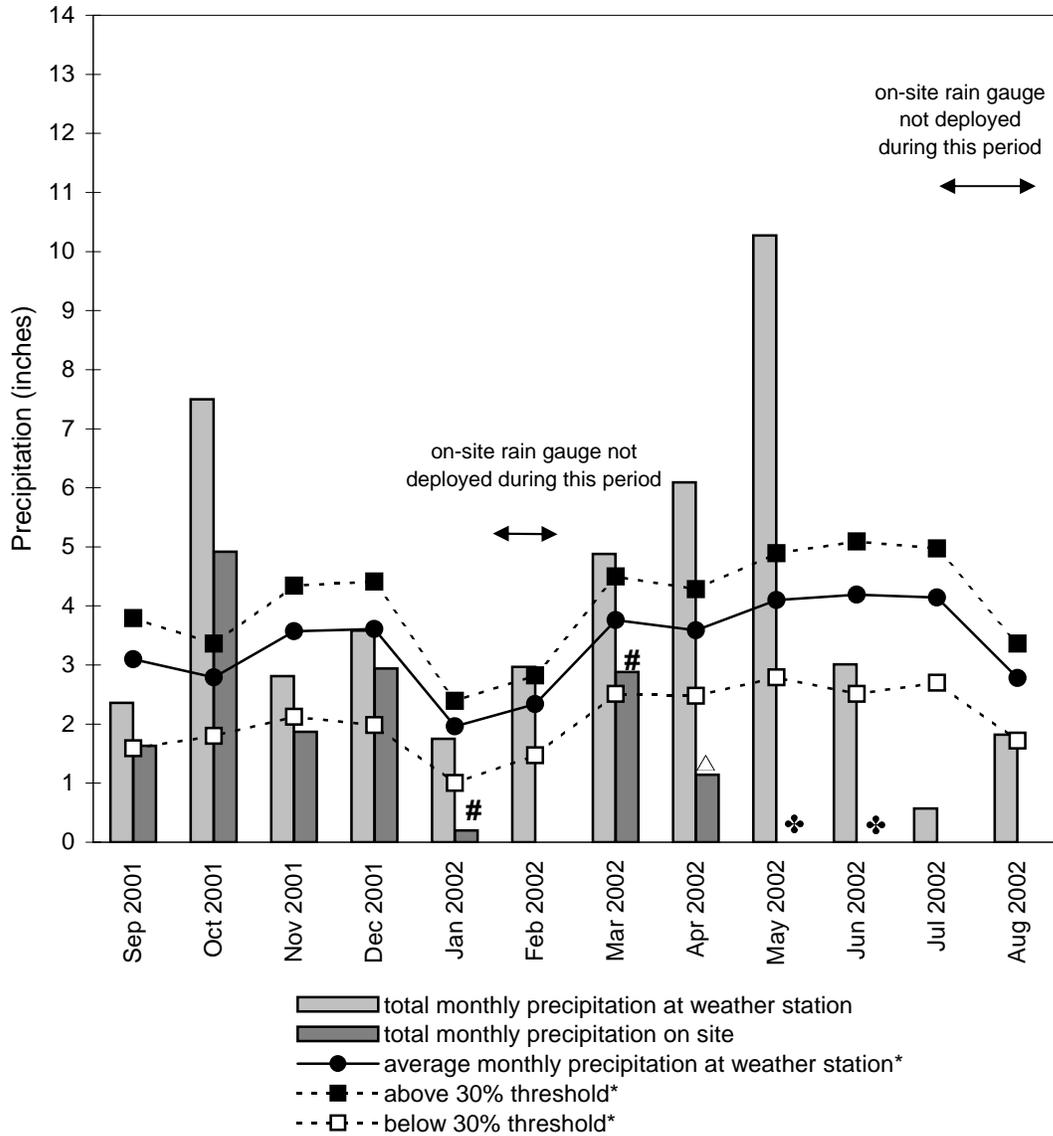
September 1, 2001 to September 1, 2002





**Potter Property, Fayette County  
District 7 Potential Wetland Banking Site  
September 2001 through August 2002**

**Total Monthly Precipitation Recorded On Site and at the  
Effingham, IL Weather Station**



# on-site rain gauge not deployed for entire month  
 △ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month  
 ❖ no data - on-site rain gauge damaged by flooding  
 \* see text for explanation

Graph last updated October 11, 2002

**SITE N NEAR CASEYVILLE, NEW RIVER CROSSING  
POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #61**

FAP 999

St. Clair County, near Caseyville, Illinois

**Primary Project Manager: Blaine A. Watson**

**Secondary Project Manager: D. Bradley Ketterling**

**SITE HISTORY**

- December 2001: ISGS was tasked to monitor wetland hydrology and calculate probable excavation volumes needed to expand wetland acreage at the site.
- March–April 2002: ISGS surveyed ground-surface elevations and installed monitoring instrumentation at the site.
- May 2002: ISGS submitted monitoring results and interpretations of the potential to expand wetland acreage at the site via excavation.
- July 2002: ISGS removed all monitoring instruments after receiving notice from IDOT to discontinue monitoring at the site.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

No wetland hydrology calculation was made for this monitoring period for the following reasons:

- The site was discontinued and removed from the active monitoring list, and the site instrumentation was removed in July 2002.

**PLANNED FUTURE ACTIVITIES**

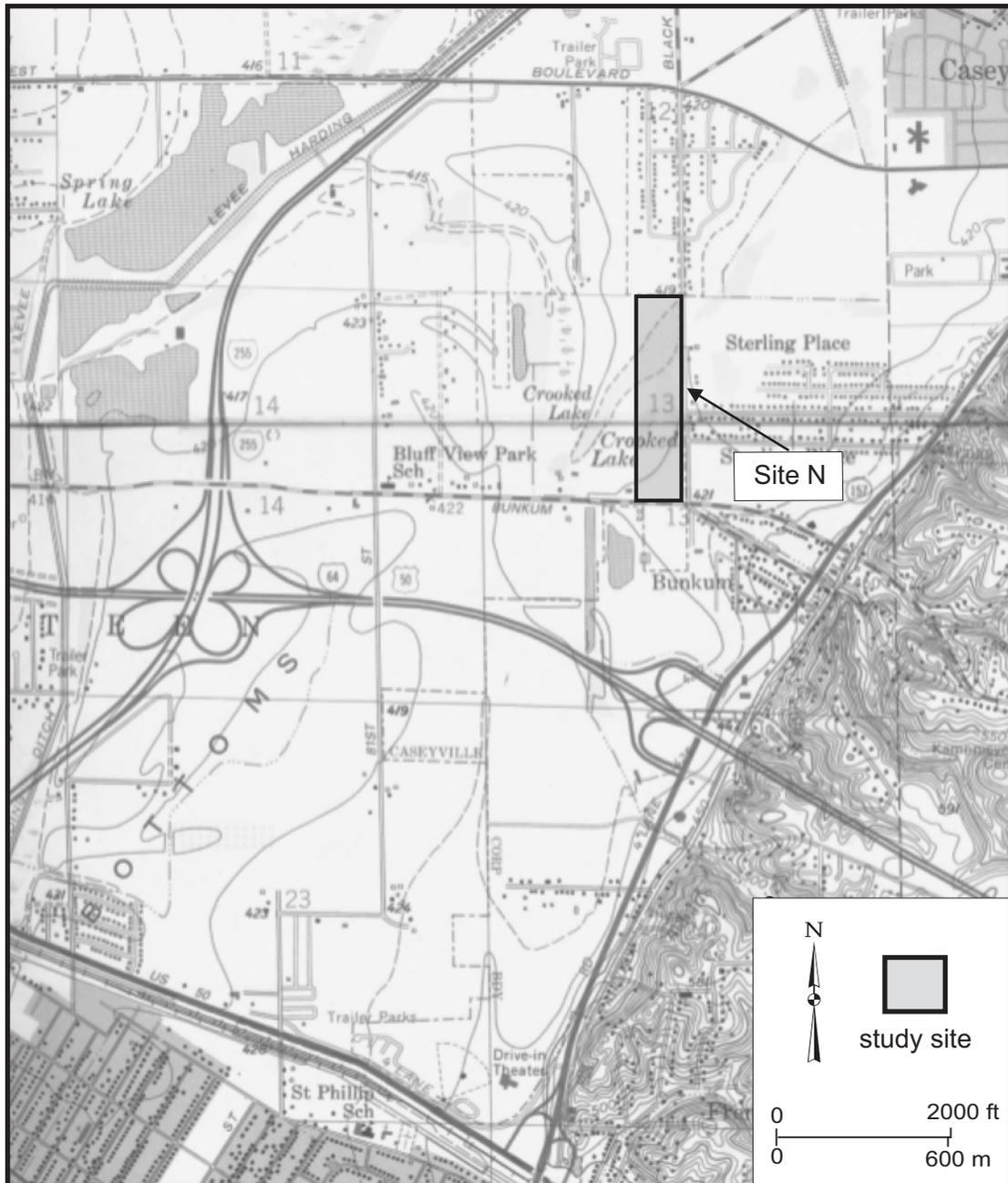
- The site has been removed from the active monitoring list.

**Site N near Caseyville, New River Crossing  
Potential Wetland Compensation Site  
(FAP 999)**

**General Study Area and Vicinity**

from the USGS Topographic Series, French Village and Monks Mound, IL Quadrangles (USGS 1993, 1998)

countour interval is 10 feet



# Site N near Caseyville, New River Crossing

## Potential Wetland Compensation Site

### Locations of ISGS Monitoring Equipment

based on USGS digital orthophotograph French Village, NE and Monks Mound, SE quarter quadrangles produced from 4/2/98 aerial photography (ISGS 2002)



site boundary



monitoring well or piezometer



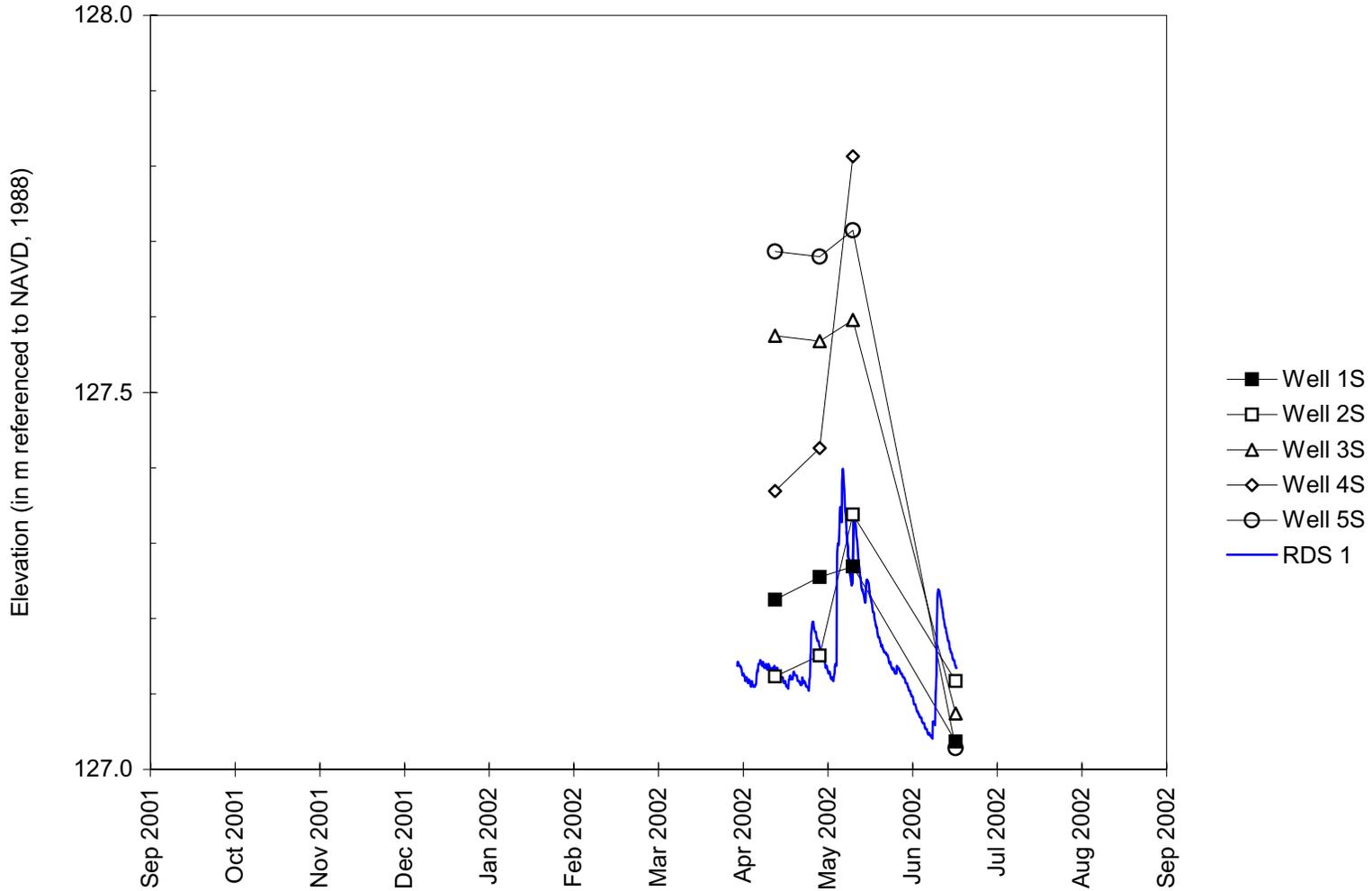
RDS data logger



stage gauge

# Site N near Caseville Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

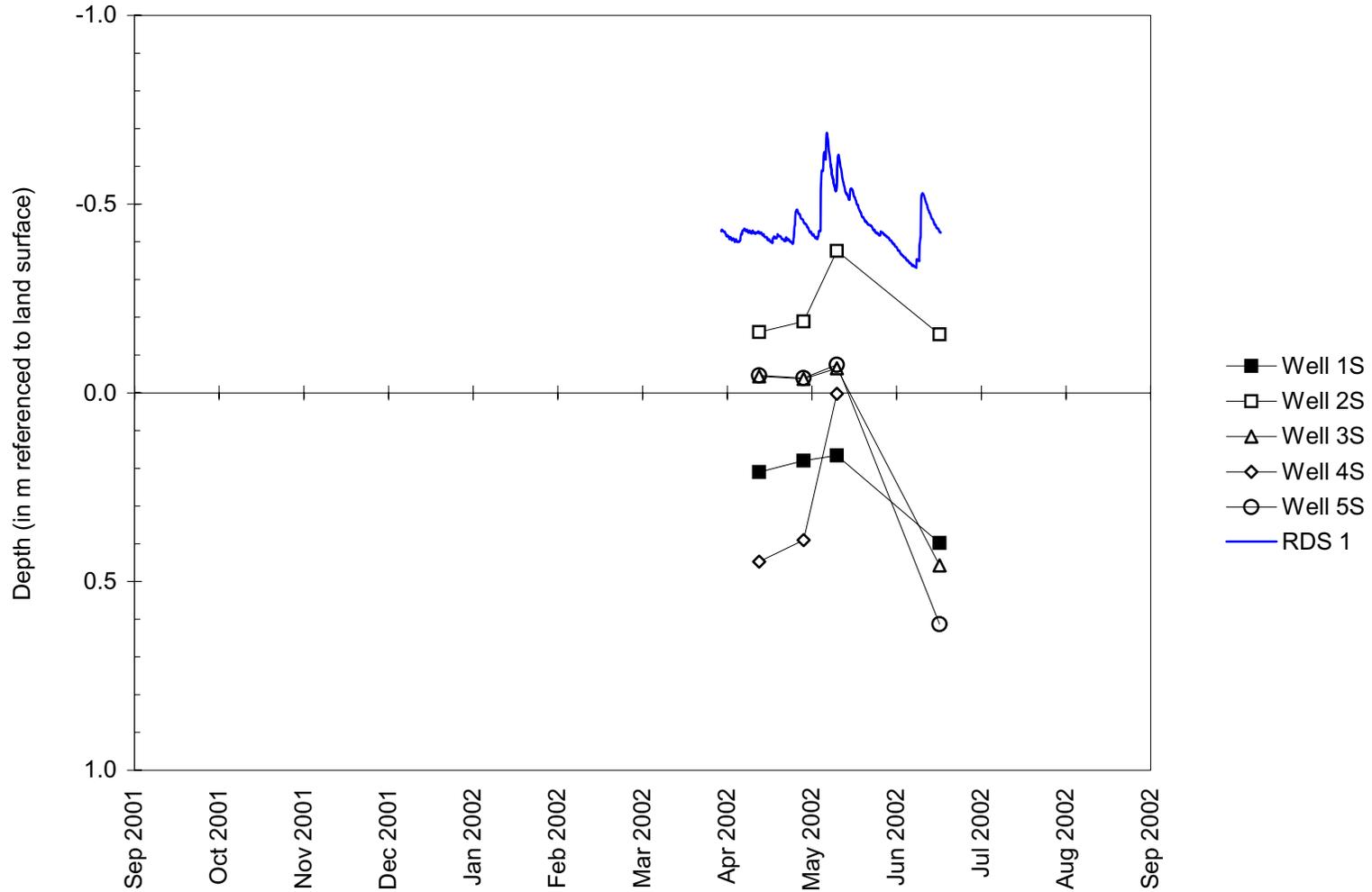
## Water-Level Elevations in Soil-Zone Monitoring Wells, on the Stage Gauge and at the RDS data logger



# Site N near Caseville Potential Wetland Compensation Site

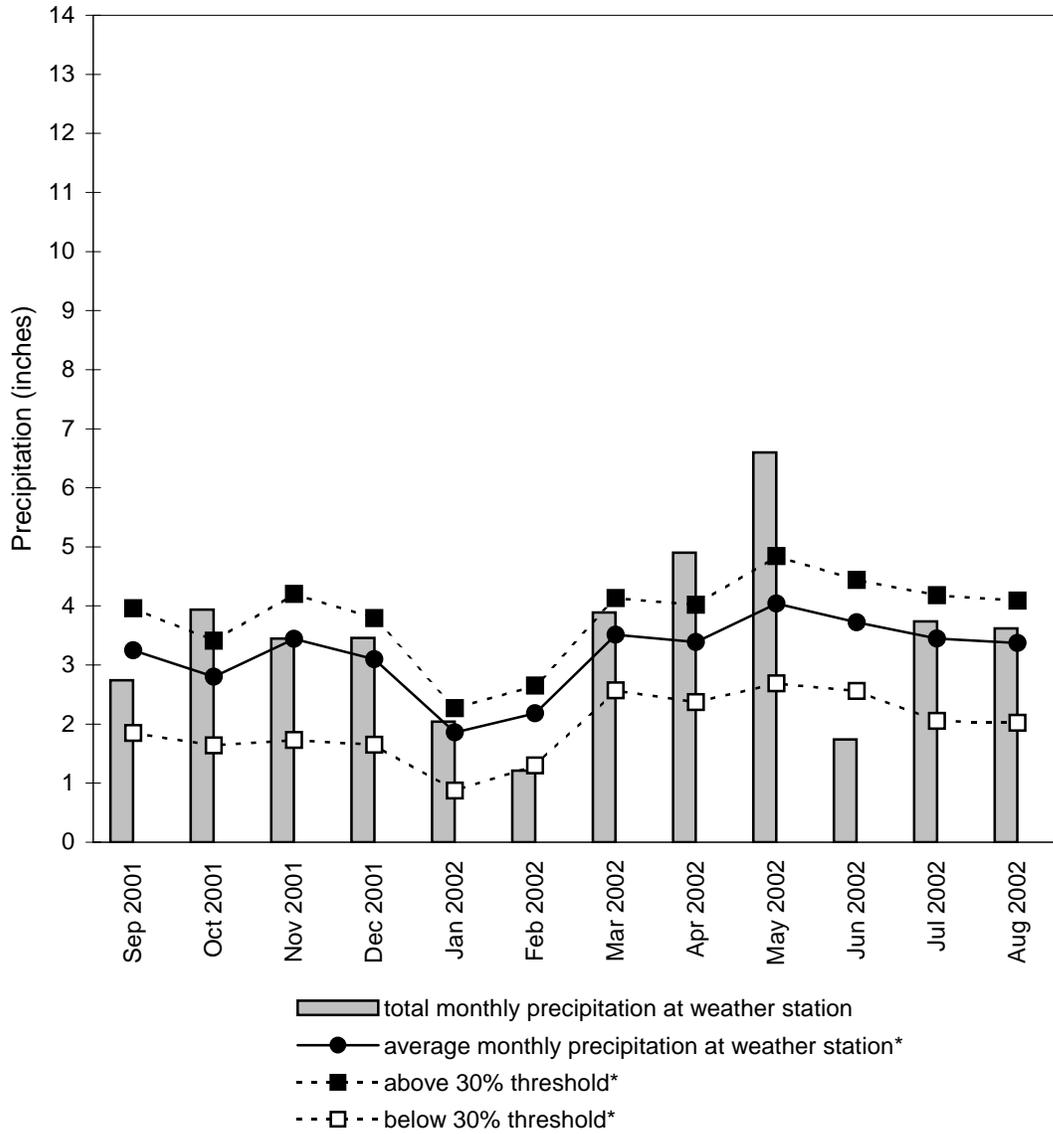
September 1, 2001 to September 1, 2002

## Depth to Water in Soil-Zone Monitoring Wells and at the RDS data logger



**Site N near Caseyville, New River Crossing  
Potential Wetland Compensation Site  
September 2001 through August 2002**

**Total Monthly Precipitation Recorded at the  
Belleville, IL SIU Research Center Weather Station  
(no rain gauge deployed on site)**



\* See text for explanation

Graph last updated October 11, 2002

**APPLE CREEK  
POTENTIAL WETLAND COMPENSATION SITE  
FAP 310**

**ISGS #62**

Greene County, near Belltown, Illinois

**Primary Project Manager: Bonnie J. Robinson**

**Secondary Project Manager: Kelli D. Weaver**

**SITE HISTORY**

- October 2001: ISGS submitted an Initial Site Evaluation report.
- December 2001: ISGS was tasked by IDOT to conduct a Level II hydrogeologic assessment of the site.
- April-June 2002: Eighteen shallow wells, two surface water-level loggers, two staff gauges and one rain gauge were installed on site.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Because this site is a potential compensation site, an estimate of the area satisfying the criteria for wetland hydrology is not required.

- According to the Midwestern Climate Center, the median length of the growing season, as measured at the White Hall climate station, is 206 days (April 9 to October 30); 12.5% of the growing season is 26 days.
- Precipitation was at or above the normal during October and November 2001 and in April, May and August 2002. Precipitation was below the normal in September and December 2001, January through March, June and July 2002. Total precipitation for the period from September 2001 to August 2002 was 107% of normal.
- In 2002, the entire site conclusively satisfied wetland hydrology criteria. Water levels measured in wells 1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S and 18S conclusively satisfied the wetland hydrology criteria in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. This includes several dates when monitoring wells were inundated and/or water levels were interpolated based on data from Gauge A (Global pressure transducer).
- Limitations of the wetland hydrology determination are as follows:
  - Abnormally high rainfall in the watershed during April and May resulted in higher than normal water levels in the creek that resulted in widespread flooding.
  - While the entire mitigation area satisfied wetland hydrology criteria, the duration of inundation may have been prolonged artificially. During the May flooding event, field observations indicated that the levee was breached and floodwaters from Apple Creek entered the site. Therefore, the levee may have prevented draining of the flood waters.
  - The surface-water data logger (RDS 1) was destroyed in May of 2002 so no

continuous surface-water data were available for the farm field for the 2002 growing season.

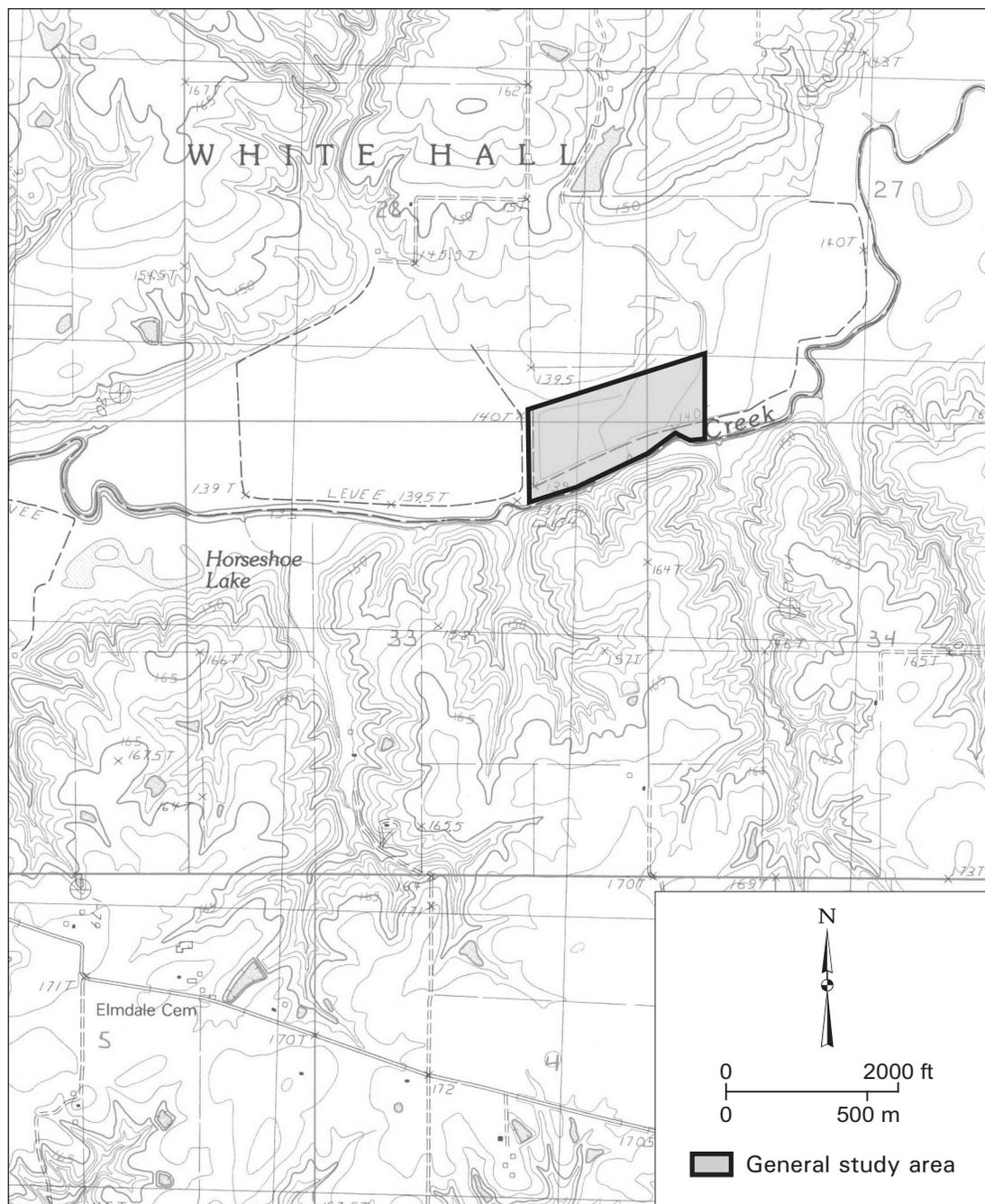
#### PLANNED FUTURE ACTIVITIES

- Deep wells will be installed to monitor ground-water levels.

# Apple Creek near Belltown Potential Wetland Compensation Site (US 67, FAP 310)

## General Study Area and Vicinity

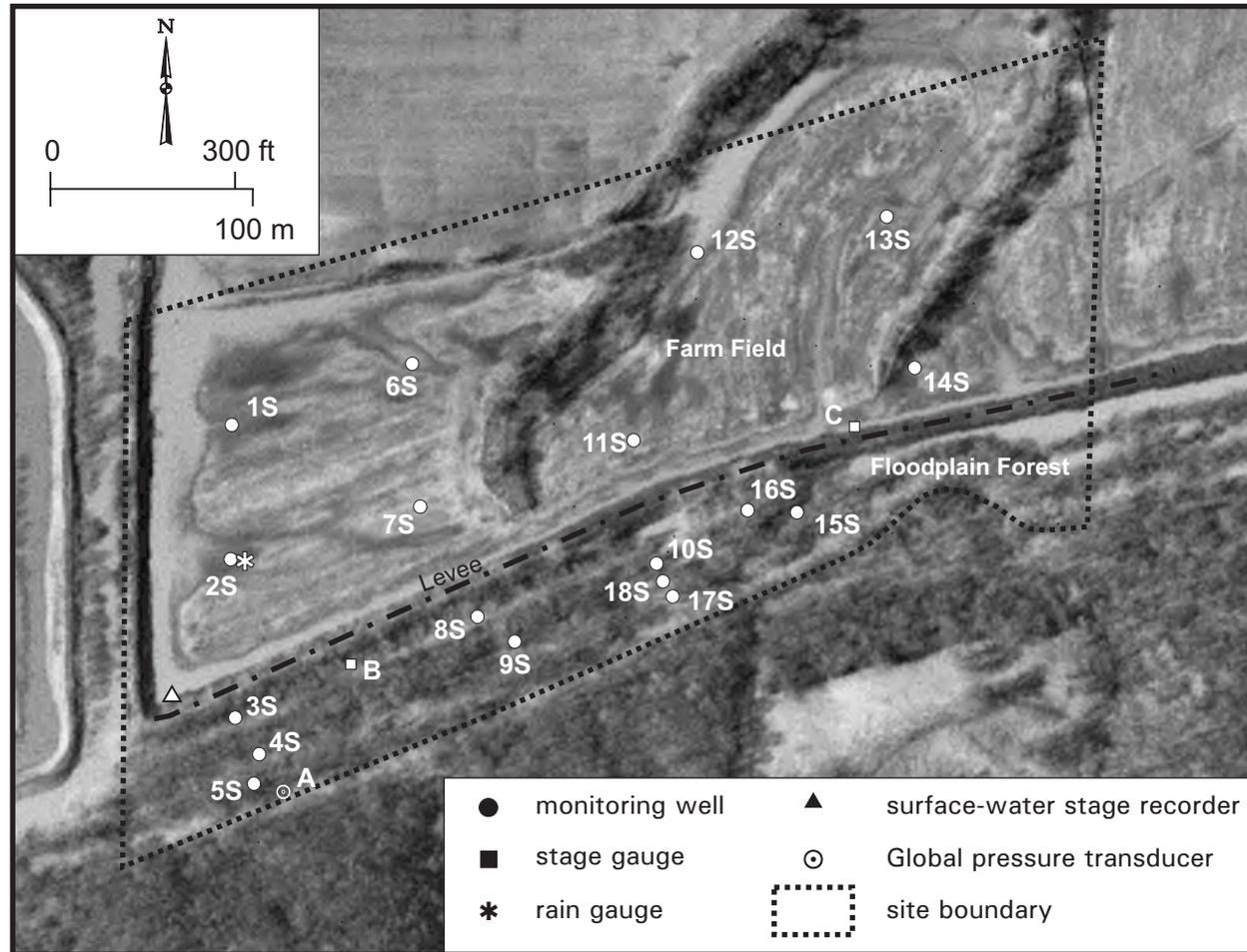
from the USGS Topographic Series, Carrollton, IL 7.5-minute Quadrangle (USGS 1983)  
contour interval is 10 feet



# Apple Creek near Belltown Potential Wetland Compensation Site (US 67, FAP 310)

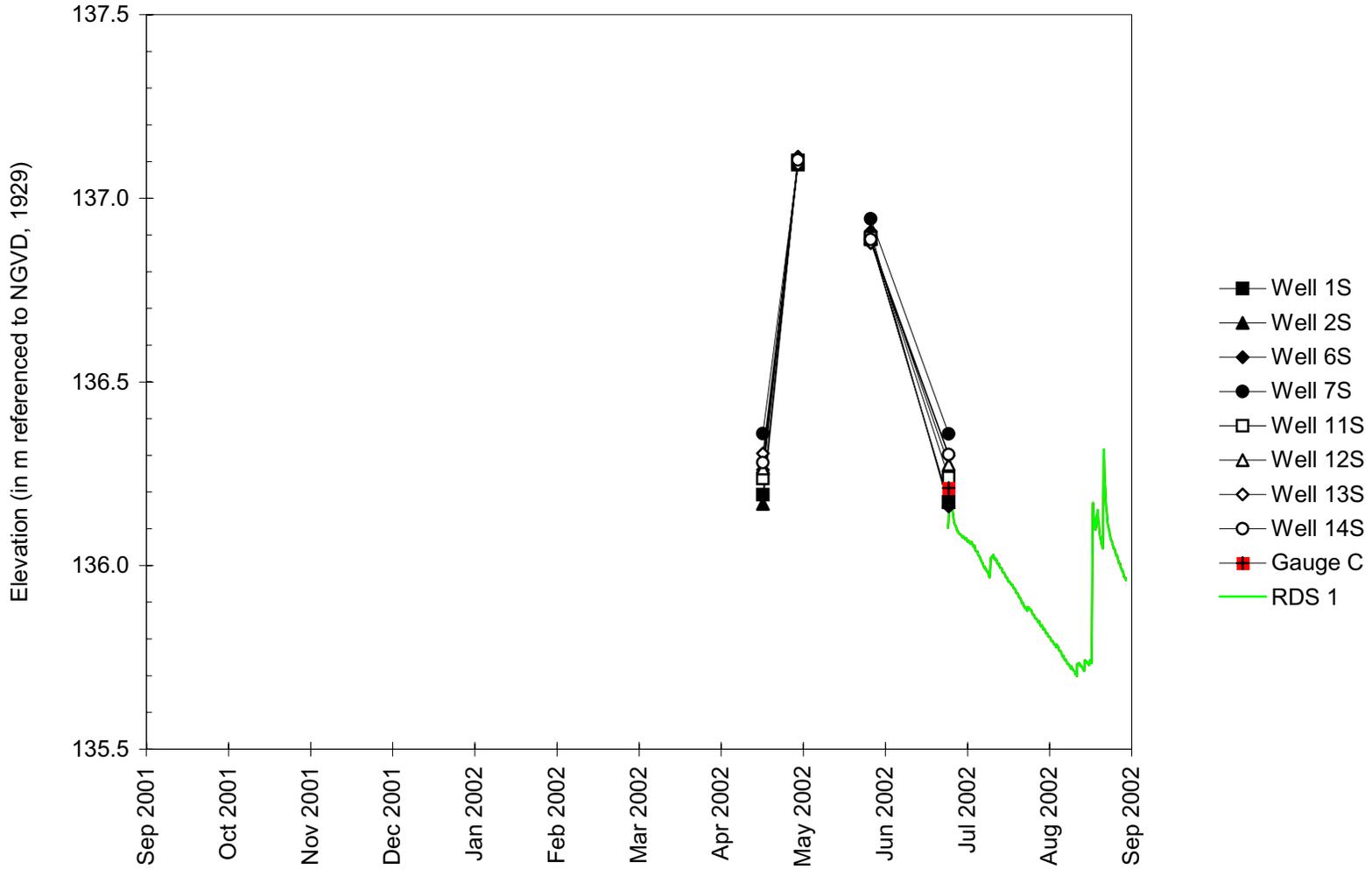
## Locations of ISGS Monitoring Instruments

map based on USGS digital orthophotograph, Carrollton, NE quarter quadrangle  
quadrangle produced from 4/5/1998 aerial photography (ISGS 2001)



# Apple Creek Potential Wetland Compensation Site September 1, 2001 to September 1, 2002

## Water-Level Elevations in Selected Monitoring Wells in the Farm Field

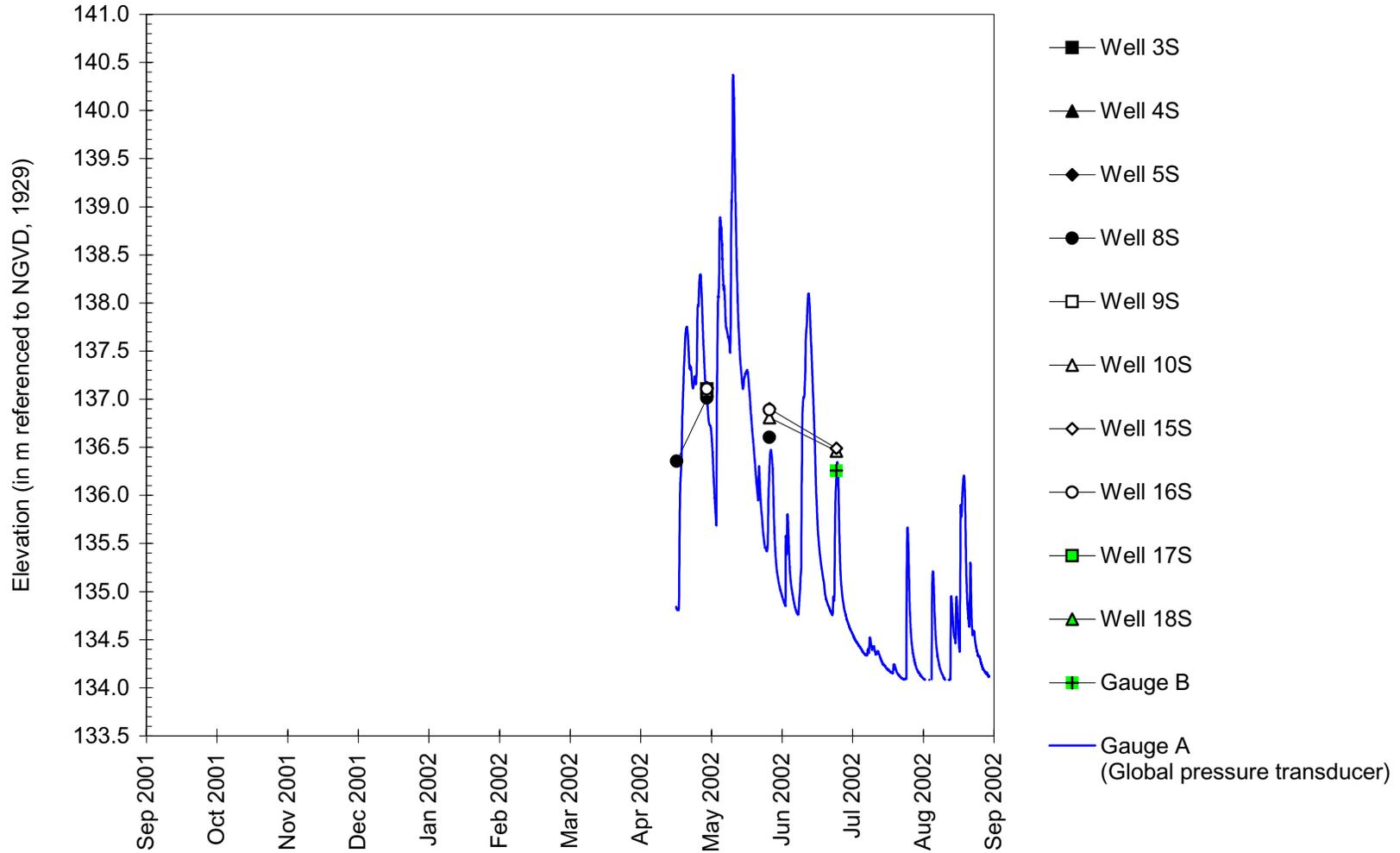




# Apple Creek Potential Wetland Compensation Site

September 1, 2001 to September 1, 2002

## Water-Level Elevations in Selected Monitoring Wells in the Floodplain Forest

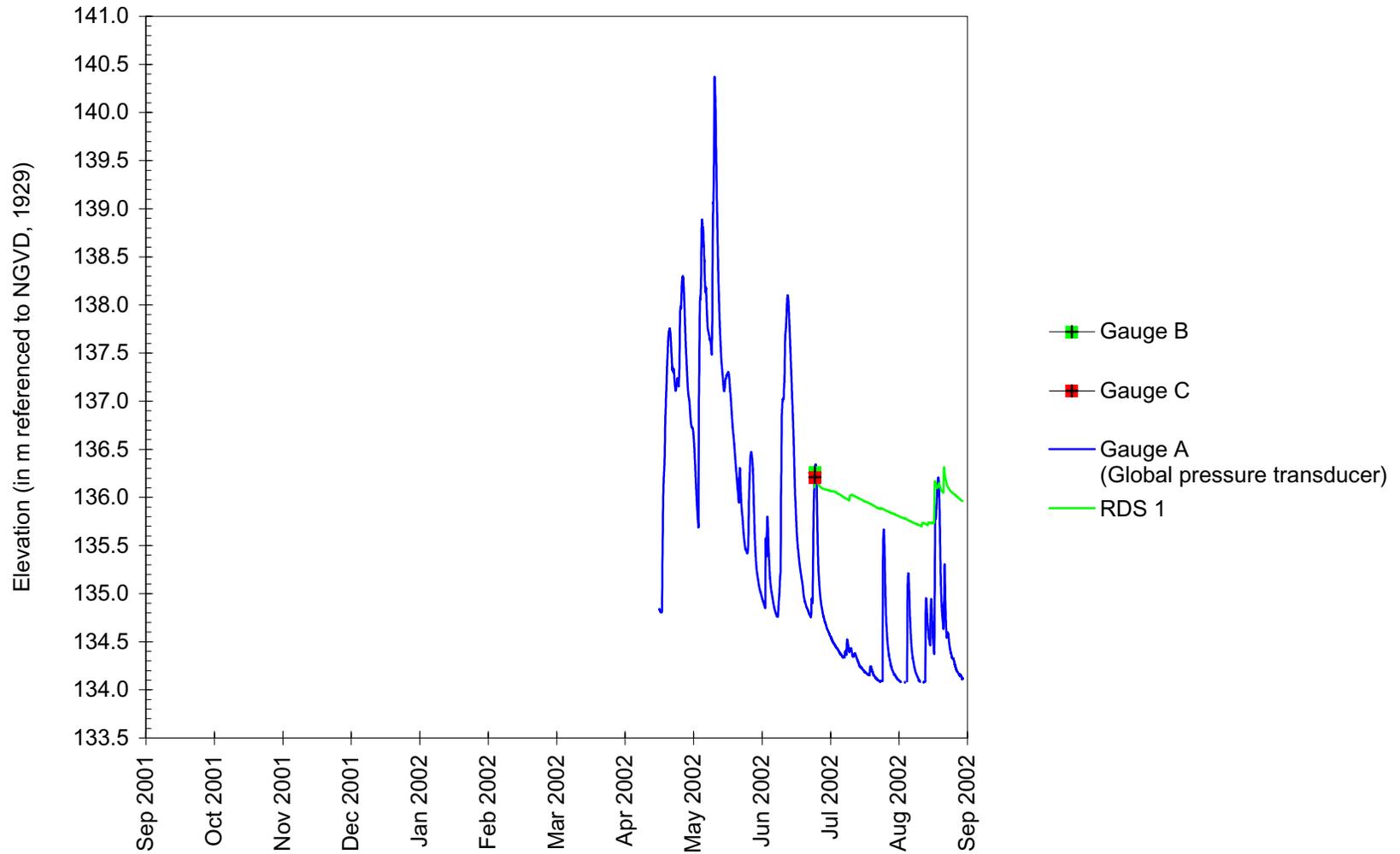




# Apple Creek Potential Wetland Compensation Site

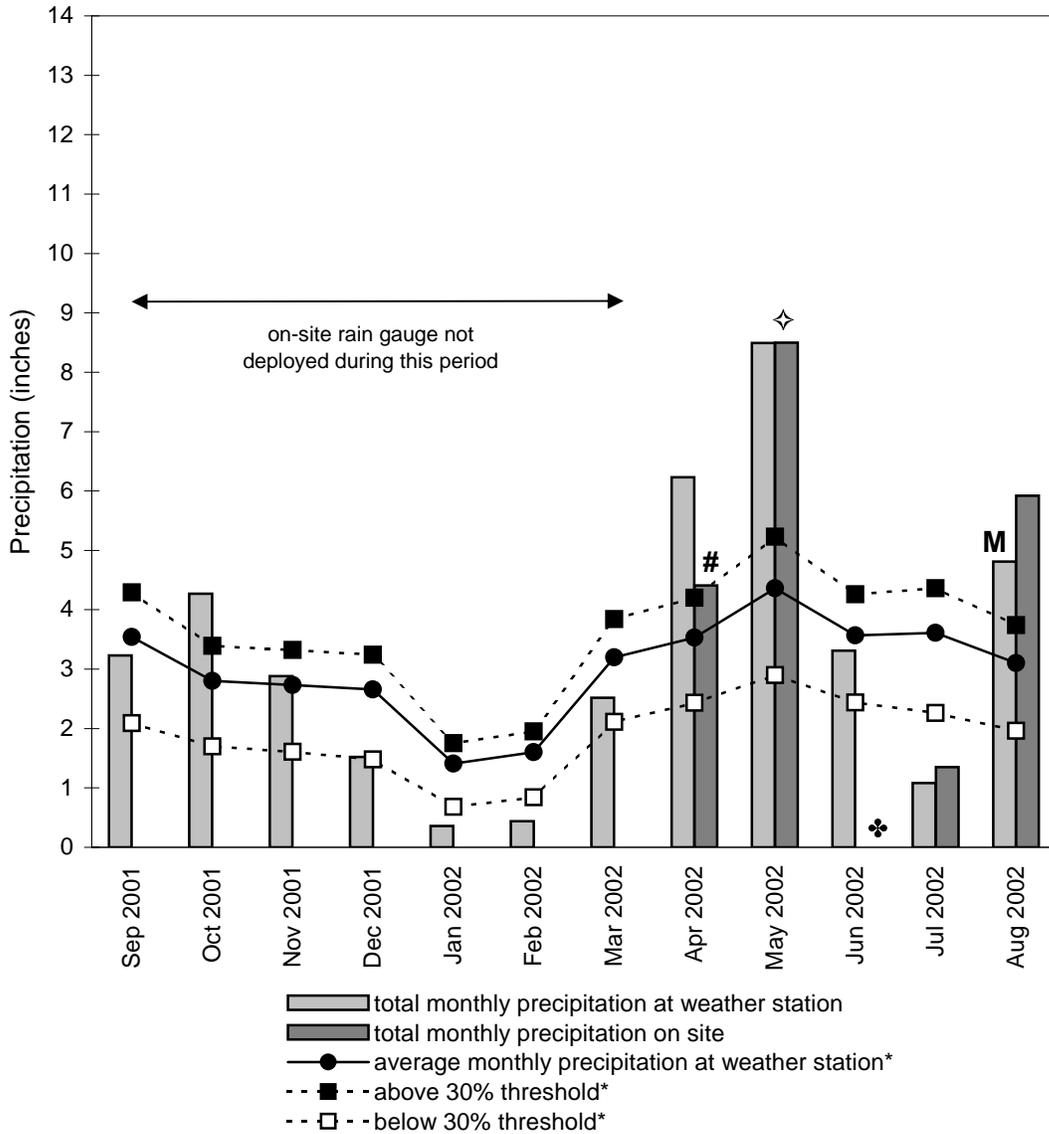
September 1, 2001 to September 1, 2002

## Water-Level Elevations on the Stage Gauges and at the Data Loggers



# Apple Creek Potential Wetland Compensation Site September 2001 through August 2002

## Total Monthly Precipitation Recorded On Site and at the White Hall, IL Weather Station



- # on-site rain gauge not deployed for entire month
- ◇ suspect data - on-site rain gauge malfunctioning due to flooding
- ♣ no data - on-site rain gauge damaged by flooding
- M missing data from weather station
- \* see text for explanation

Graph last updated October 11, 2002

**HARRISBURG  
POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #63**

FAP 332

Saline County, near Harrisburg, Illinois

**Primary Project Manager: Geoffrey E. Pociask**

**Secondary Project Manager: Marshall A. Lake**

**SITE HISTORY**

- January 2000: ISGS was tasked by IDOT to conduct an Initial Site Evaluation of the site.
- April 2000: ISGS submitted Initial Site Evaluation report identifying the site as having low-moderate potential for wetland restoration.
- December 2001: ISGS was tasked by IDOT to conduct a Level II hydrogeologic assessment of the site.
- March 2002: ISGS initiated monitoring of the site. Additional wells will be required for full coverage of the site.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

Because this site is a potential compensation site, an estimate of the areas satisfying the criteria for wetland hydrology is not required for this report, although it is included for design purposes. Based on a topographic map and ground-surface elevations surveyed by ISGS, we estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2002 is 8.3 ac (3.3 ha) out of an excavation of 20.0 ac (8.1 ha). This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Harrisburg is March 26 and the season lasts 212 days; 12.5% of the growing season is 27 days.
- Precipitation was below the normal range in September 2001, during January through February, and June through August 2002. Precipitation was within or above the normal range from October through December 2001, and from March through May 2002. Total precipitation for the reporting period from September 2001 through July 2002 (August 2002 precipitation data has not been reported to date) was 130% of normal. This is compared to 81% of normal for the period from September 2000 through August 2001.
- In 2002, monitoring wells 1S, 2S, 3S and 5S conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.
- The RDS data logger, located at the confluence of the drainage ditches at the east end of the site, indicated that surface-water inundation occurred below 111.10 m (364.50 ft) for a duration sufficient to conclusively satisfy wetland hydrology criteria.
- Limitations of the wetland hydrology determination are as follows:
  - The calculation was generated using GIS. A topographic map was produced using

survey data collected in May 2002. The topographic map was rectified to digital orthophotography and wetland hydrology polygons were produced using topography, GPS locations of instruments and observed features on site.

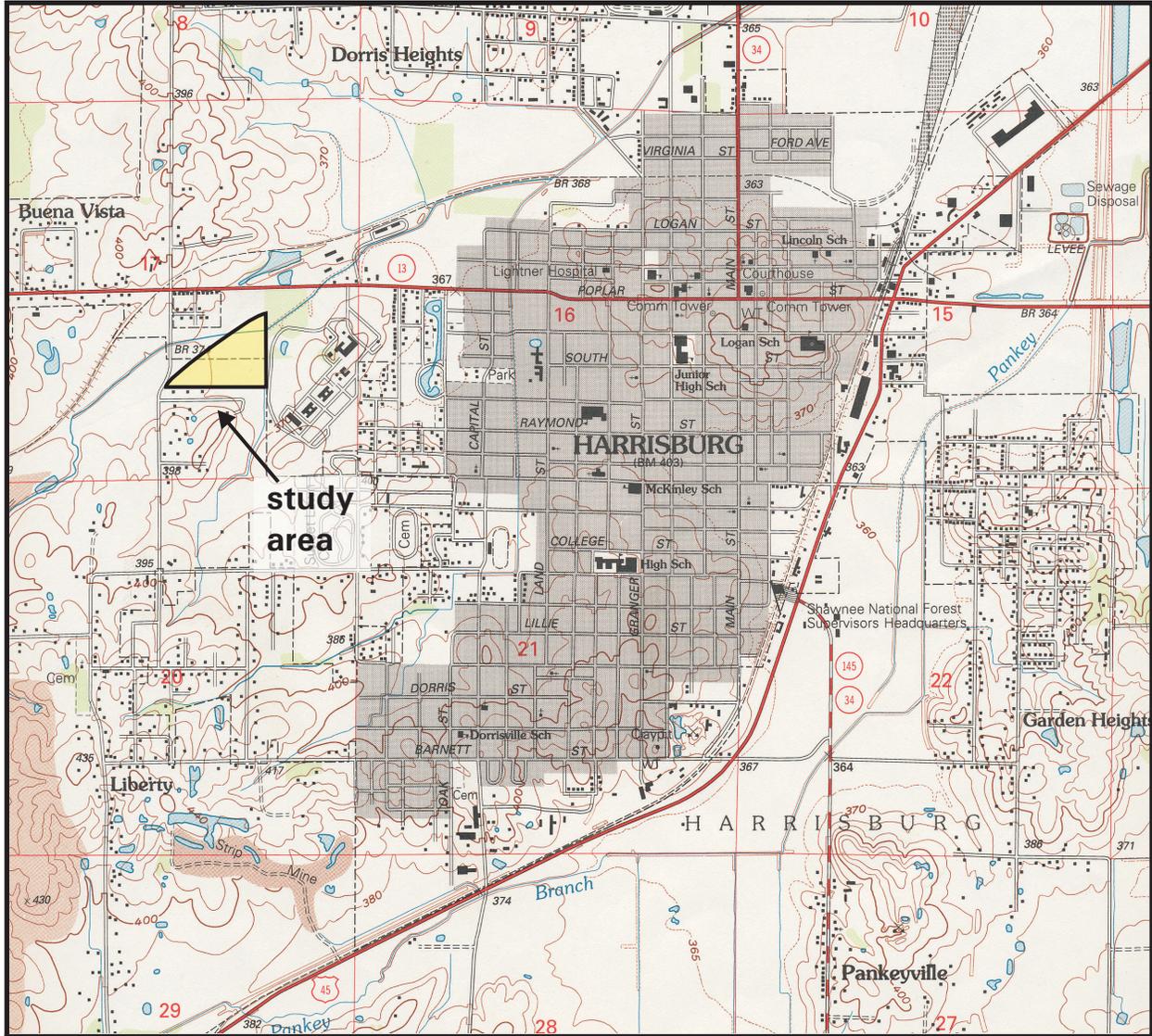
#### PLANNED FUTURE ACTIVITIES

- Additional monitoring wells will be installed to monitor ground-water levels and gradients. Monitoring will continue until no longer required by IDOT.

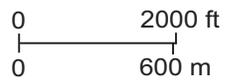
# Harrisburg Potential Wetland Compensation Site (FAP 332)

## General Study Area and Vicinity

from the USGS Topographic Series, Harrisburg, IL 7.5-minute Quadrangle (USGS 1996)  
contour interval is 5 feet



 general study area

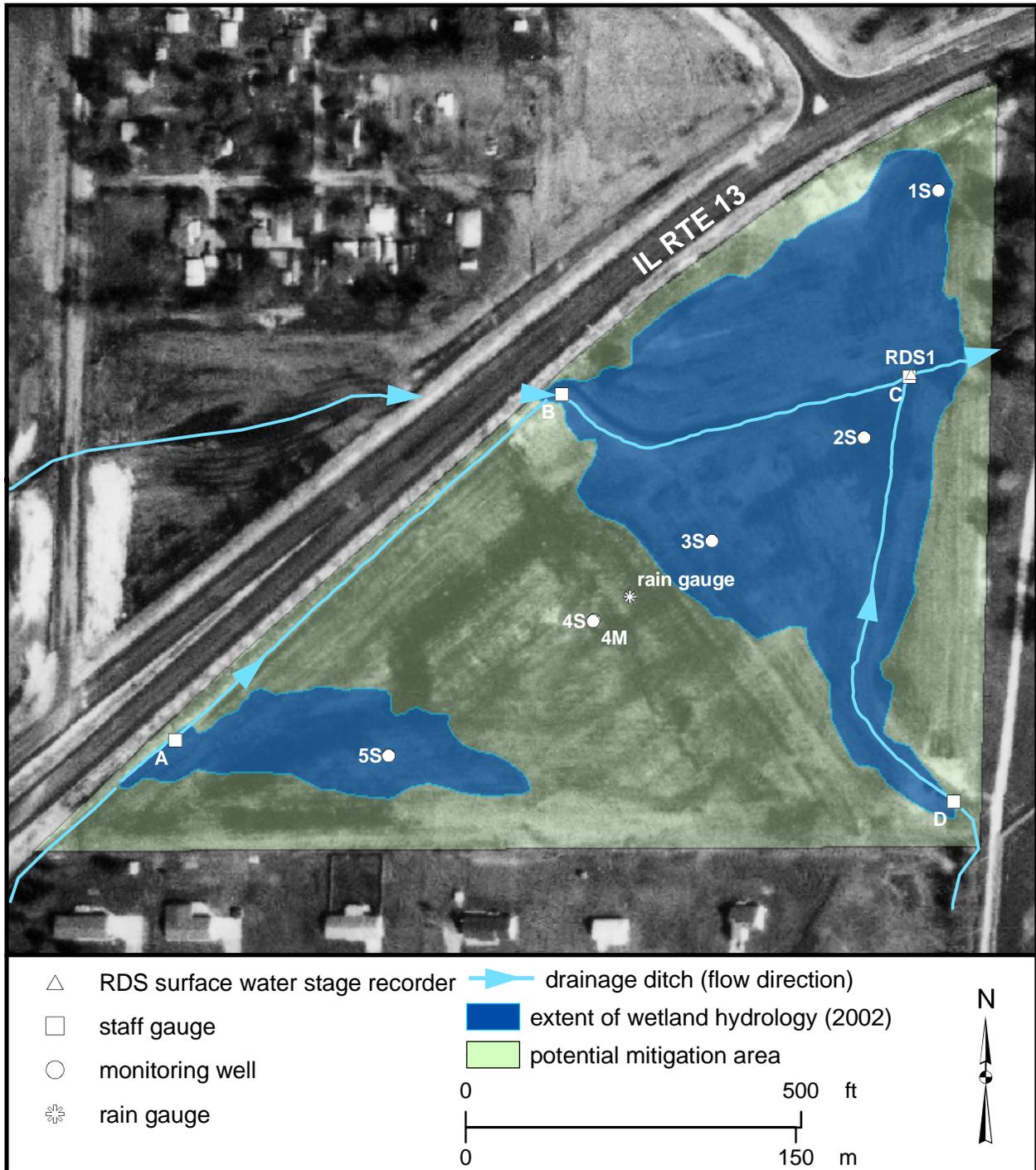


# Harrisburg Potential Wetland Compensation Site (FAP 332)

## Estimated Areal Extent of 2002 Wetland Hydrology

based on data collected between September 1, 2001 and September 1, 2002

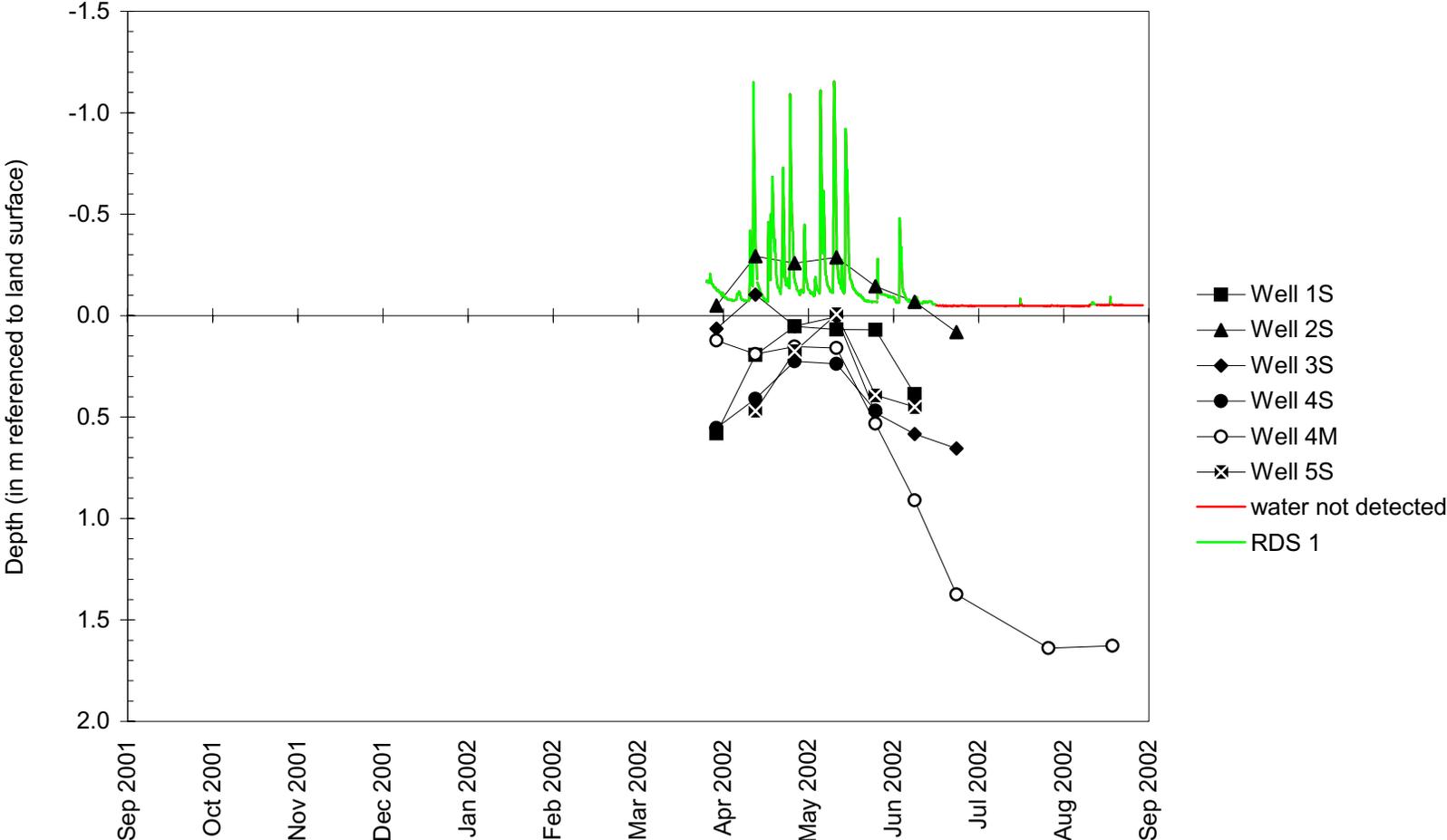
base map generated from IDOT aerial photography rectified to USGS digital orthophotograph  
Harrisburg, NW quarter quadrangle (ISGS 2002)





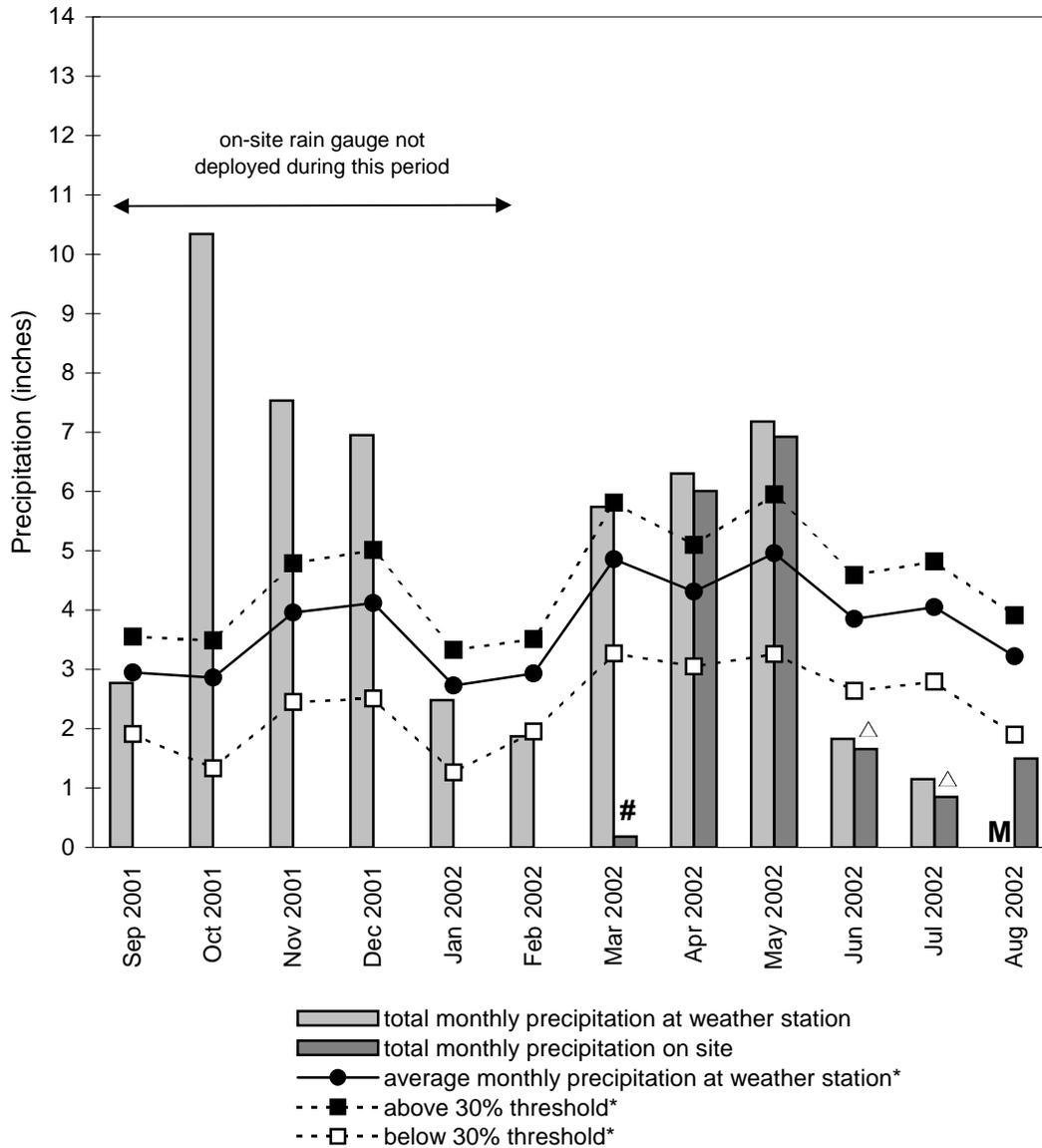
**Harrisburg Potential Wetland Compensation Site**  
September 1, 2001 to September 1, 2002

**Depth to Water**  
in Monitoring Wells and at the RDS data logger



## Harrisburg Potential Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Harrisburg, IL Weather Station



# on-site rain gauge not deployed for entire month  
 △ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month  
 M missing data from weather station  
 \* see text for explanation

Graph last updated October 11, 2002

**CARBONDALE  
WETLAND COMPENSATION SITE**

**ISGS #65**

FAP 322

Jackson County, near Carbondale, Illinois

**Primary Project Manager: Geoffrey E. Pociask**

**Secondary Project Manager: Marshall A. Lake**

**SITE HISTORY**

- March 2002: ISGS was tasked by IDOT to monitor wetland hydrology for this compensation site.
- April 2002: ISGS initiated water-level monitoring activities.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

- No wetland hydrology calculation was made for this monitoring period for the following reasons:
  - The monitoring network was installed approximately one month after the start of the growing season therefore no data were available for the early portion (March-April) of the 2002 growing season.
  - During the period between late April and September 2002, only one on-site well (5S) conclusively satisfied wetland hydrology criteria as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. This well is situated in a localized depression representative of less than 1 ac (0.4 ha) of the site.
- Precipitation was below the normal range in September and November 2001 and in February, and over the period June through August 2002. Precipitation was within or above the normal range in October and December 2001, in January 2002, and over the period March through May 2002. Rainfall totals during March through May 2002 were 170% of the 30-year average. Total precipitation for the reporting period from September 2001 through August 2002 was 119% of normal. This is compared to 95% of normal for the period from September 2001 through August 2002.
- ISGS personnel observed several areas of erosion and deposition on a preliminary site visit in late March 2002. Maps and photographs indicating areas of erosion and deposition were forwarded to IDOT.

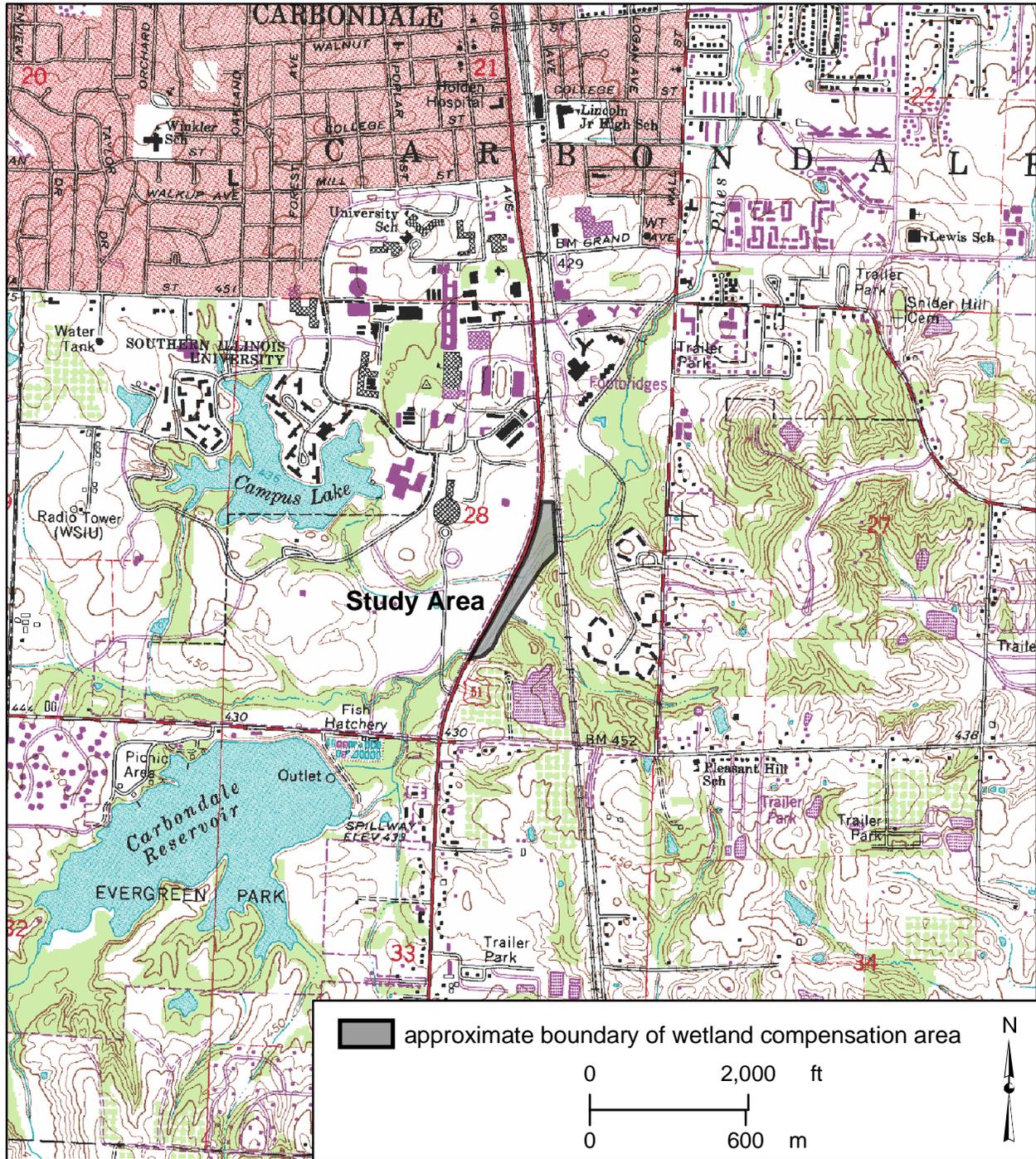
**PLANNED FUTURE ACTIVITIES**

- Additional monitoring instruments will be installed in the created wetland areas in Fall 2002. Water-level monitoring activities will continue until no longer required by IDOT.

# Carbondale Wetland Compensation Site (FAP 322)

## General Study Area and Vicinity

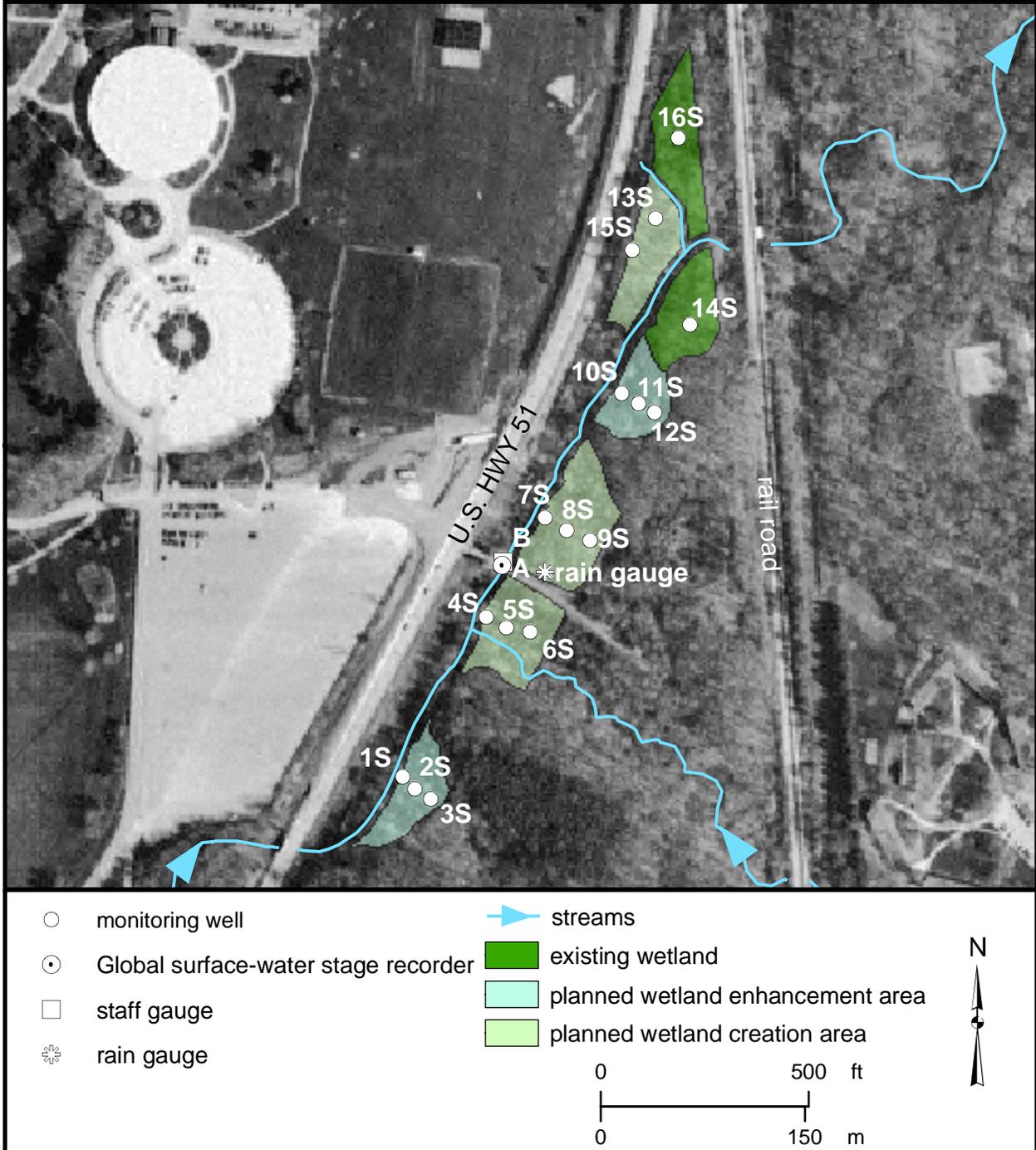
from the USGS Topographic Series, Carbondale, IL 7.5-minute Quadrangle (USGS 1966; photorevised 1990)  
contour interval is 10 feet



# Carbondale Wetland Compensation Site (FAP 322)

## Approximate Locations of ISGS Monitoring Equipment and Mitigation Areas

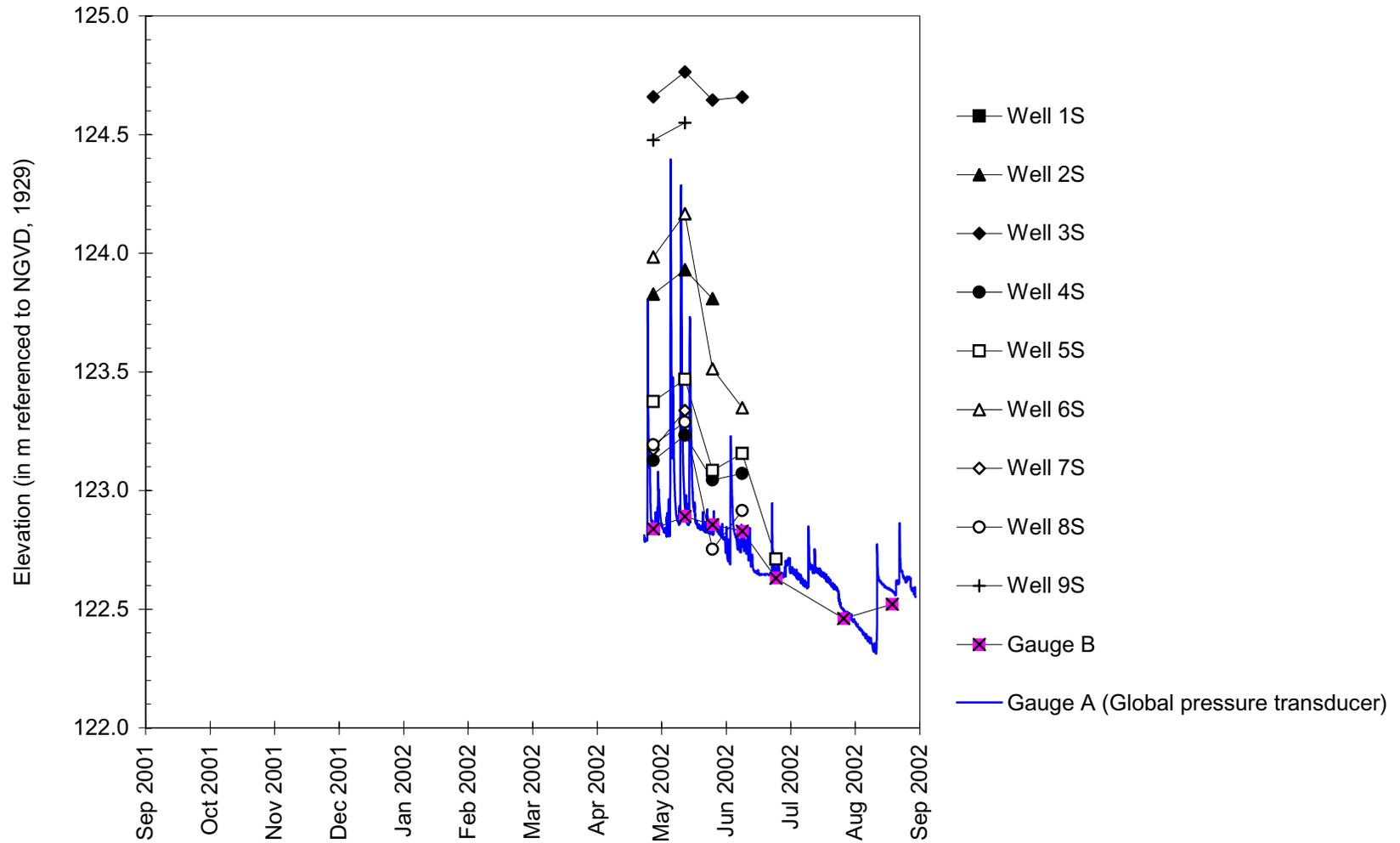
map based on IDOT mitigation design plan rectified to USGS digital orthophotograph  
Carbondale NW quarter quadrangle (ISGS 2002)



# Carbondale Wetland Compensation Site

September 1, 2001 to September 1, 2002

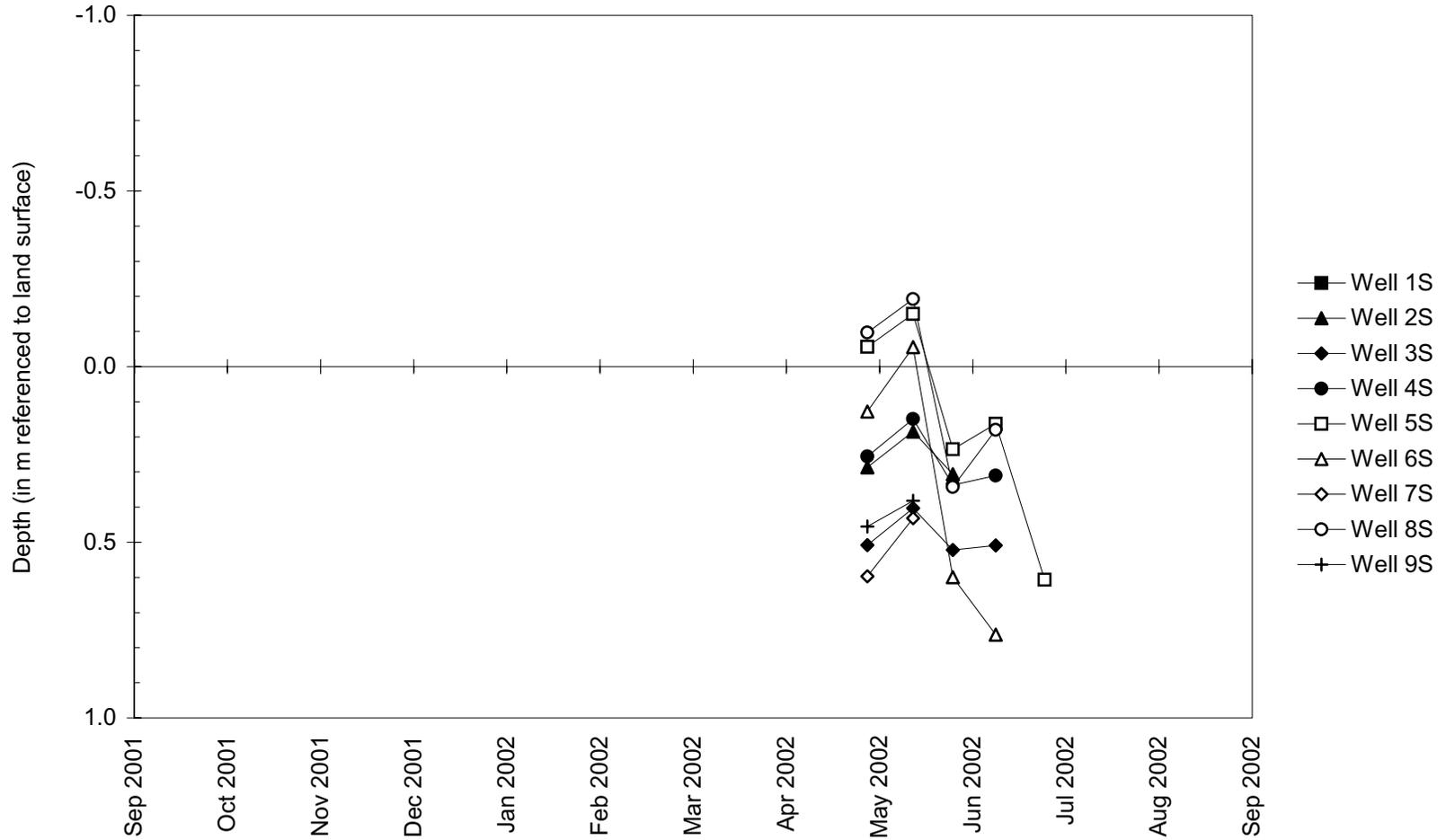
## Water-Level Elevations in Selected Monitoring Wells, on the Stage Gauge, and at the Global data logger



# Carbondale Wetland Compensation Site

September 1, 2001 to September 1, 2002

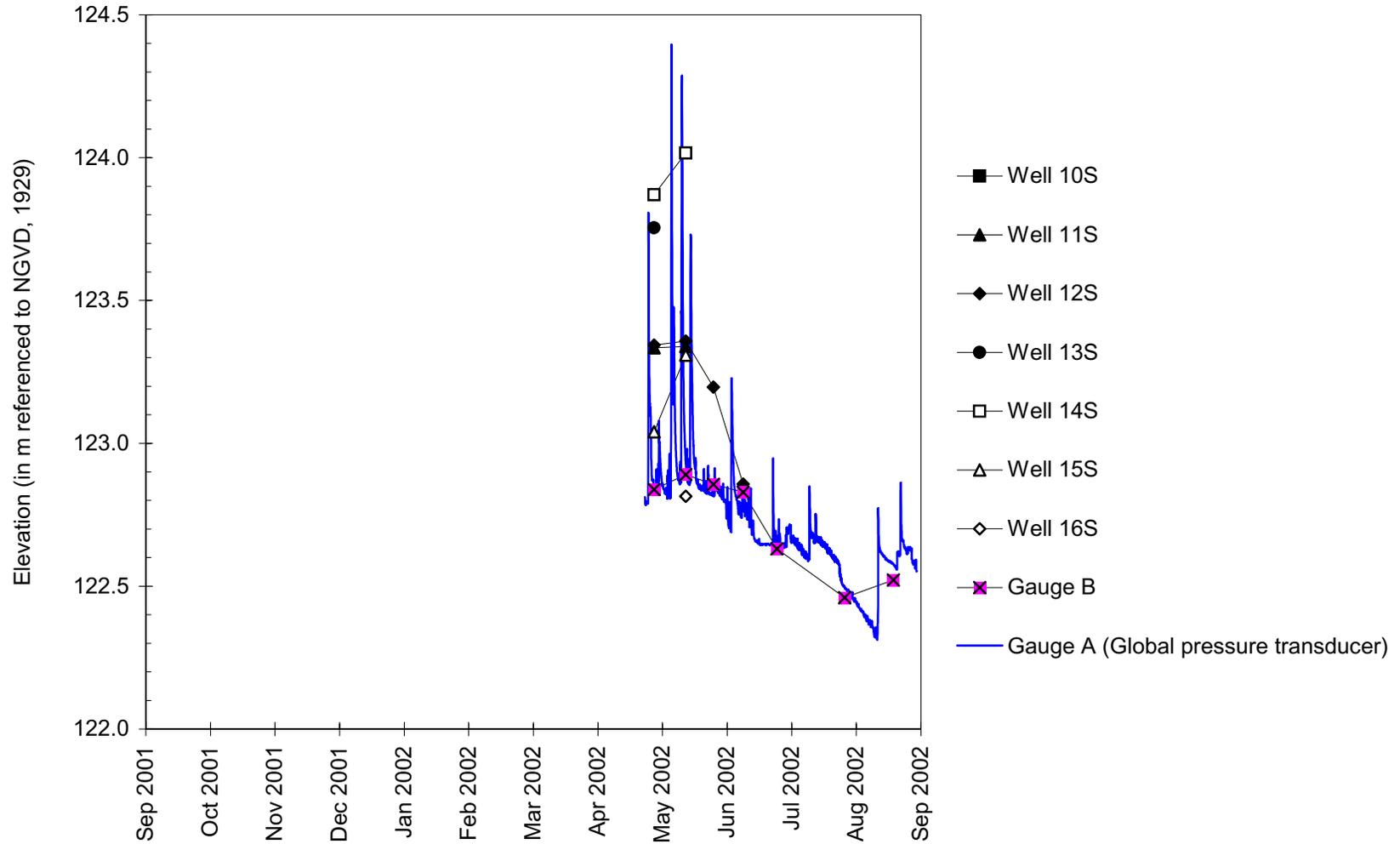
## Depth to Water in Selected Monitoring Wells



# Carbondale Wetland Compensation Site

September 1, 2001 to September 1, 2002

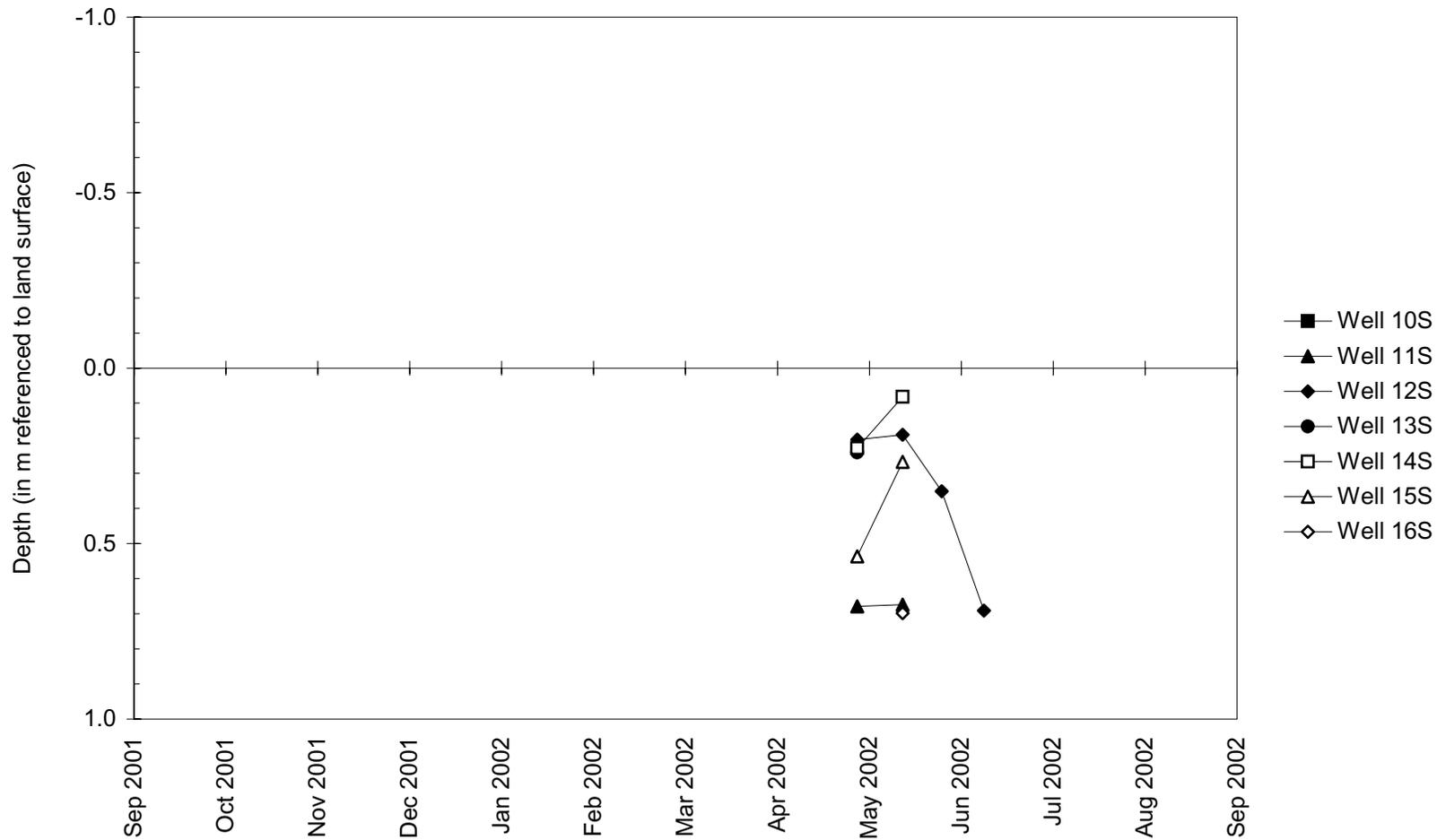
## Water-Level Elevations in Selected Monitoring Wells, on the Stage Gauge, and at the Global data logger



# Carbondale Wetland Compensation Site

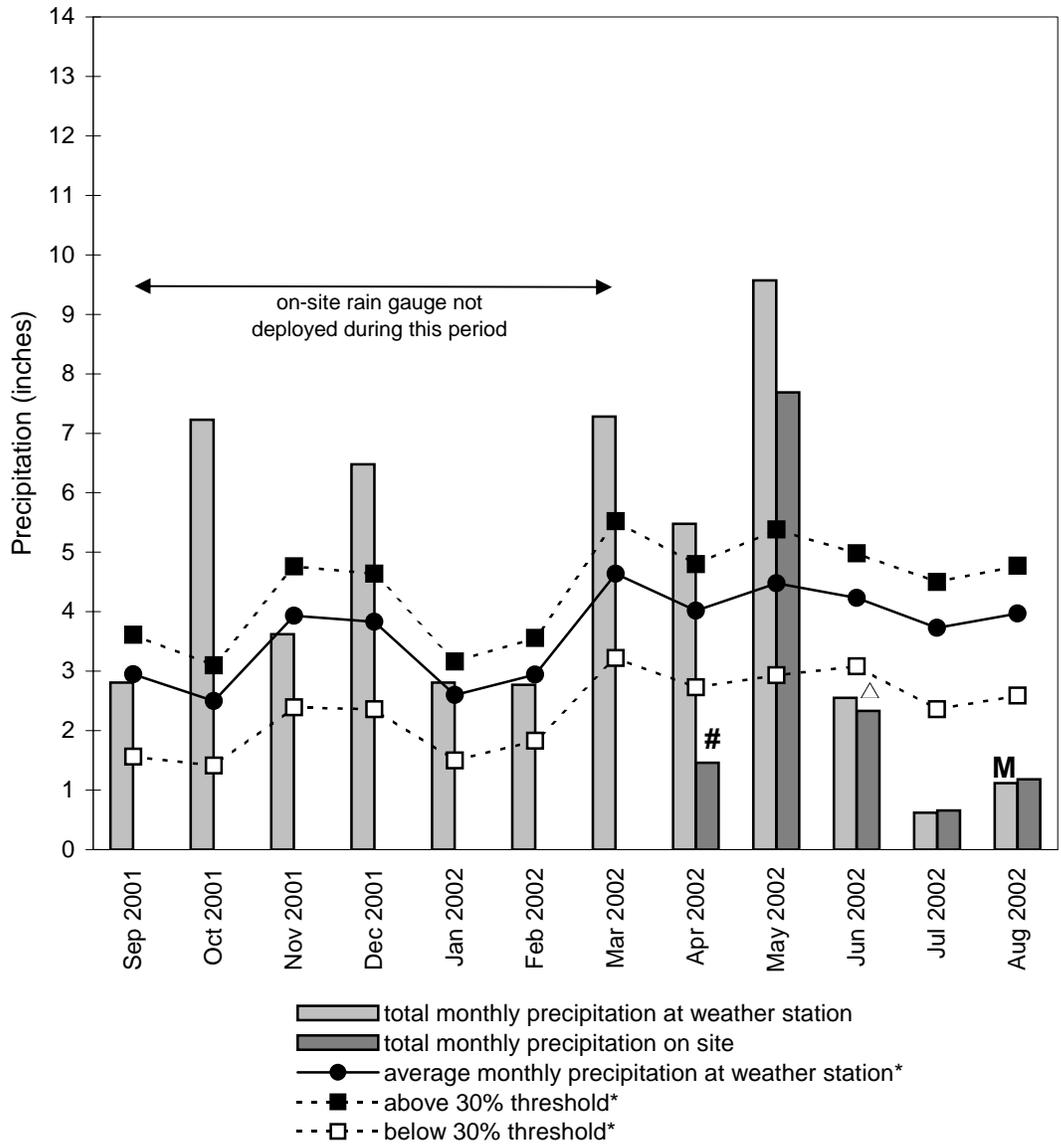
September 1, 2001 to September 1, 2002

## Depth to Water in Selected Monitoring Wells



## Carbondale Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Carbondale Sewage Plant Weather Station, Carbondale, IL



# on-site rain gauge not deployed for entire month

△ suspect data - rain collector clogged or malfunctioning; represents minimum value for the month

**M** missing data from weather station

\* see text for explanation

Graph last updated October 11, 2002

**CENTREVILLE, NEW RIVER CROSSING  
POTENTIAL WETLAND COMPENSATION SITE**

**ISGS #66**

FAP 999

St. Clair County, near Centreville, Illinois

**Primary Project Manager: Steven E. Benton**

**Secondary Project Manager: Katherine J. Werner**

**SITE HISTORY**

- An Initial Site Evaluation was performed in December 2001.
- A level 2 hydrogeologic assessment was requested by IDOT on March 13, 2002.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

No calculation of wetland hydrology for this site was made in 2002 because the site was not instrumented until midsummer. The following data are presented for informational purposes only.

- A monitoring network consisting of 16 monitoring wells, a staff gauge, and an electronic data logger were installed in June and July 2002 and an elevational survey was performed in July 2002.
- Total precipitation during the monitoring period, as recorded at the SIU Belleville, IL weather station, was 41.33 inches (108% of average). Precipitation was below the normal range in February and June 2002, above the normal range in October 2001 and April and May 2002, and within the normal range in all other months.
- Ground-water has been detected in the U-wells along the drainage ditch in the southwestern portion of the site. Surface inundation was observed in the forested area along Westerheide Drive in June 2002 and a large area of surface inundation was observed there in December 2001.

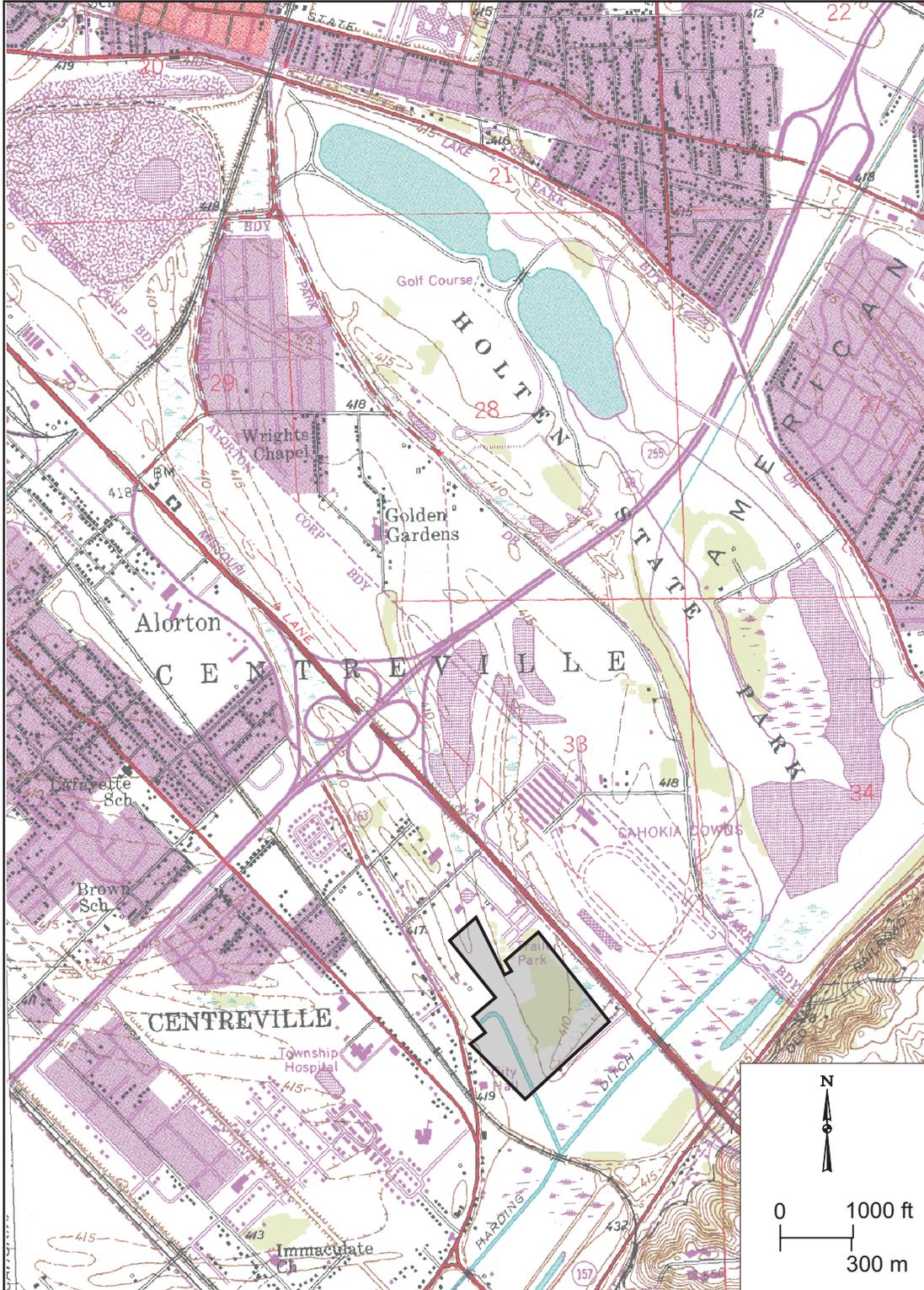
**PLANNED FUTURE ACTIVITIES**

- A global positioning survey will be performed in December 2002.
- Additional monitoring wells and staff gauges will be added as needed.

# Centreville Potential Wetland Compensation Site (New River Crossing, FAP 999)

## Site Location

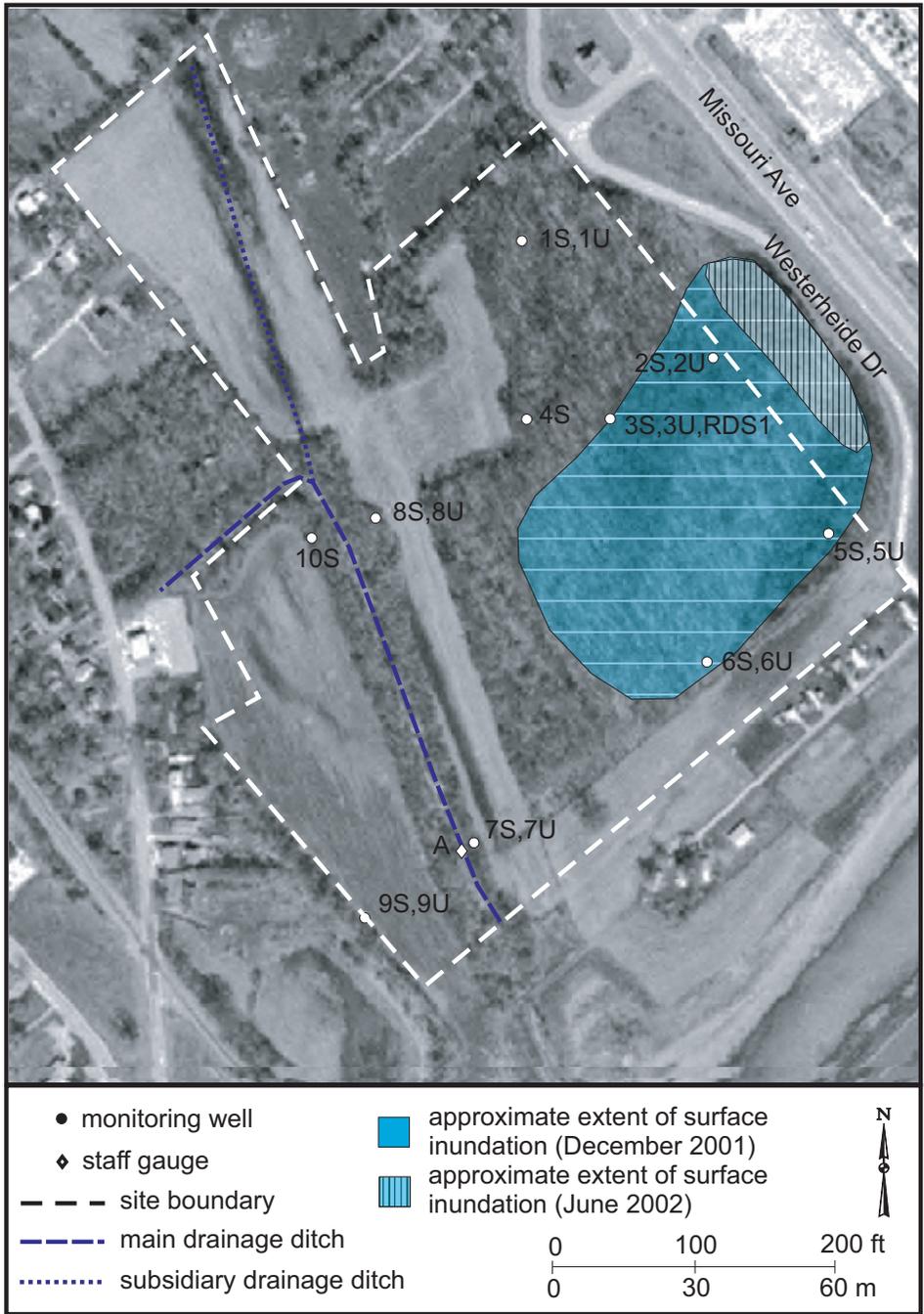
base map from the French Village 7.5-minute Quadrangle (USGS 1998)



# Centreville Potential Wetland Compensation Site (New River Crossing, FAP 999)

## Monitoring Network

aerial photography from the French Village, NW Digital Orthophoto Quadrangle



**Centreville Potential Wetland Compensation Site  
Data Collected to Date**

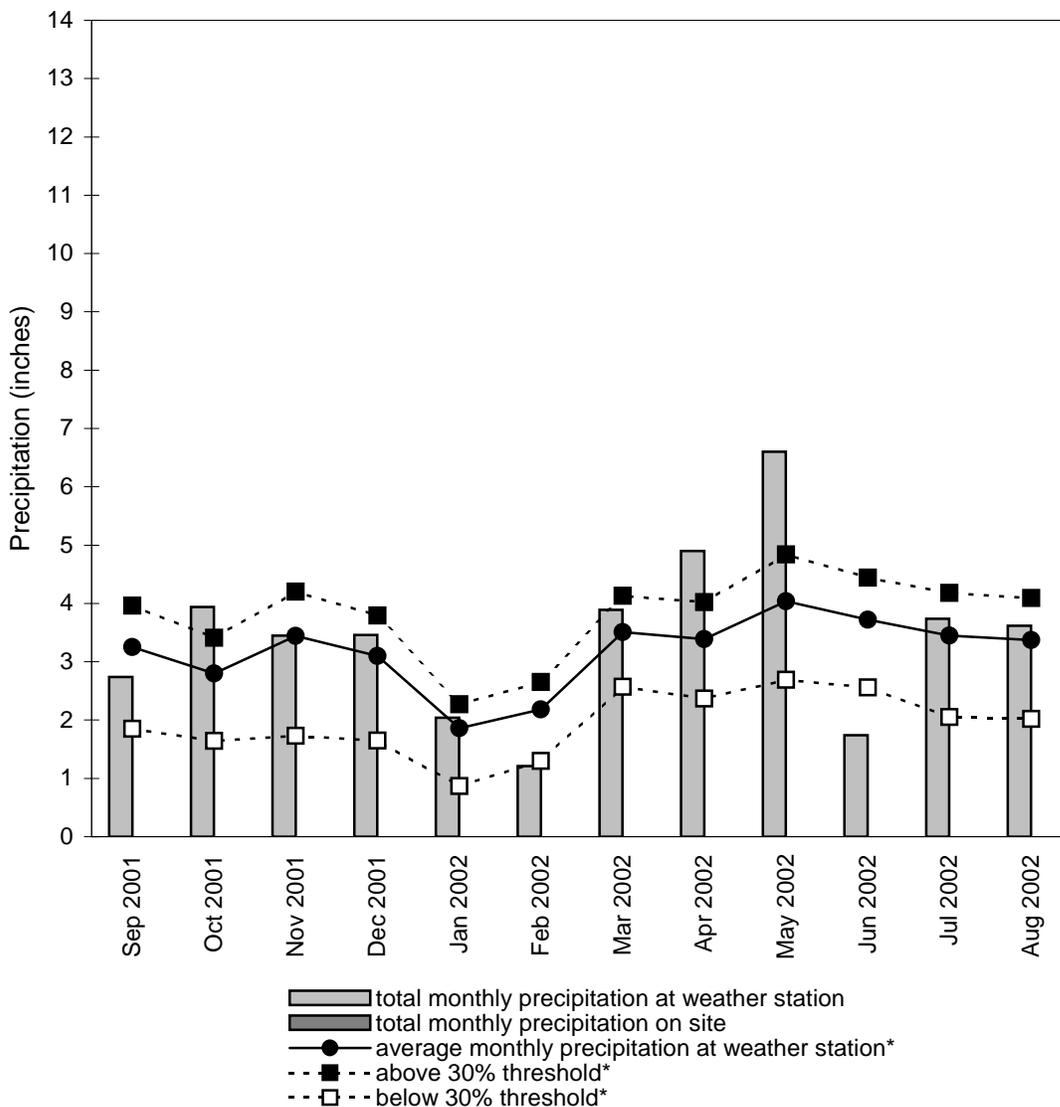
<b><i>Water-Level Elevations (in m referenced to NAVD, 1988)</i></b>		
Date	07/17/02	09/04/02
Well 1S	dry	dry
Well 1U	dry	dry
Well 2S	dry	dry
Well 2U	dry	dry
Well 3S	dry	dry
Well 3U	dry	dry
Well 4S	dry	dry
Well 5S	dry	dry
Well 5U	122.88	dry
Well 6S	dry	dry
Well 6U	dry	dry
Well 7S	dry	dry
Well 7U	122.57	121.99
Well 8S	dry	dry
Well 8U	122.84	122.34
Well 9S	dry	dry
Well 9U	122.69	122.12
Well 10S	dry	dry
Gauge A	122.67	dry

<b><i>Depth to Water (in m referenced to land surface)</i></b>		
Date	07/17/02	09/04/02
Well 1S	dry	dry
Well 1U	dry	dry
Well 2S	dry	dry
Well 2U	dry	dry
Well 3S	dry	dry
Well 3U	dry	dry
Well 4S	dry	dry
Well 5S	dry	dry
Well 5U	1.598	dry
Well 6S	dry	dry
Well 6U	dry	dry
Well 7S	dry	dry
Well 7U	1.336	1.919
Well 8S	dry	dry
Well 8U	0.896	1.405
Well 9S	dry	dry
Well 9U	1.398	1.961
Well 10S	dry	dry

- indicates water above land surface  
S indicates soil-zone monitoring well  
U indicates upper monitoring well

**Centreville, New River Crossing  
Potential Wetland Compensation Site  
September 2001 through August 2002**

**Total Monthly Precipitation Recorded at the  
Belleville, IL SIU Research Center Weather Station  
(no rain gauge deployed on site)**



\* see text for explanation

Graph last updated October 11, 2002

**PYATTS BLACKTOP  
WETLAND COMPENSATION SITE**

**ISGS #67**

FAP 42

Perry County, near Pyatts, Illinois

**Primary Project Manager: Geoffrey E. Pociask**

**Secondary Project Manager: Marshall A. Lake**

**SITE HISTORY**

- April 2002: ISGS was tasked by IDOT to monitor wetland hydrology for this compensation site.
- May 2002: ISGS initiated water-level monitoring activities.

**WETLAND HYDROLOGY CALCULATION FOR 2002**

No wetland hydrology calculation was made for this monitoring period because the monitoring network was installed approximately one month after the start of the growing season. It is likely that a significant portion of the compensation site would have met wetland hydrology criteria if monitoring was initiated prior to the start of the growing season. The following data are presented for informational purposes only.

- During the period between early May and September 2002, only two on-site wells (3S and 4S) conclusively satisfied wetland hydrology criteria as outlined in the 1987 U.S. Army Engineers Wetland Delineation Manual. However a conclusive wetland acreage could not be calculated.
- Precipitation was below the normal range in September and November 2001 and in February 2002, and over the period June through August 2002. Precipitation was within or above the normal range in October and December 2001, in January 2002, and over the period March through May 2002. According to the local weather station, rainfall totals during the period March through May 2002 were 183% of the 30-year average. Total precipitation for the reporting period from September 2001 through June 2002 was 145% of normal. This is compared to 85% of normal for the period from September 2000 through August 2001

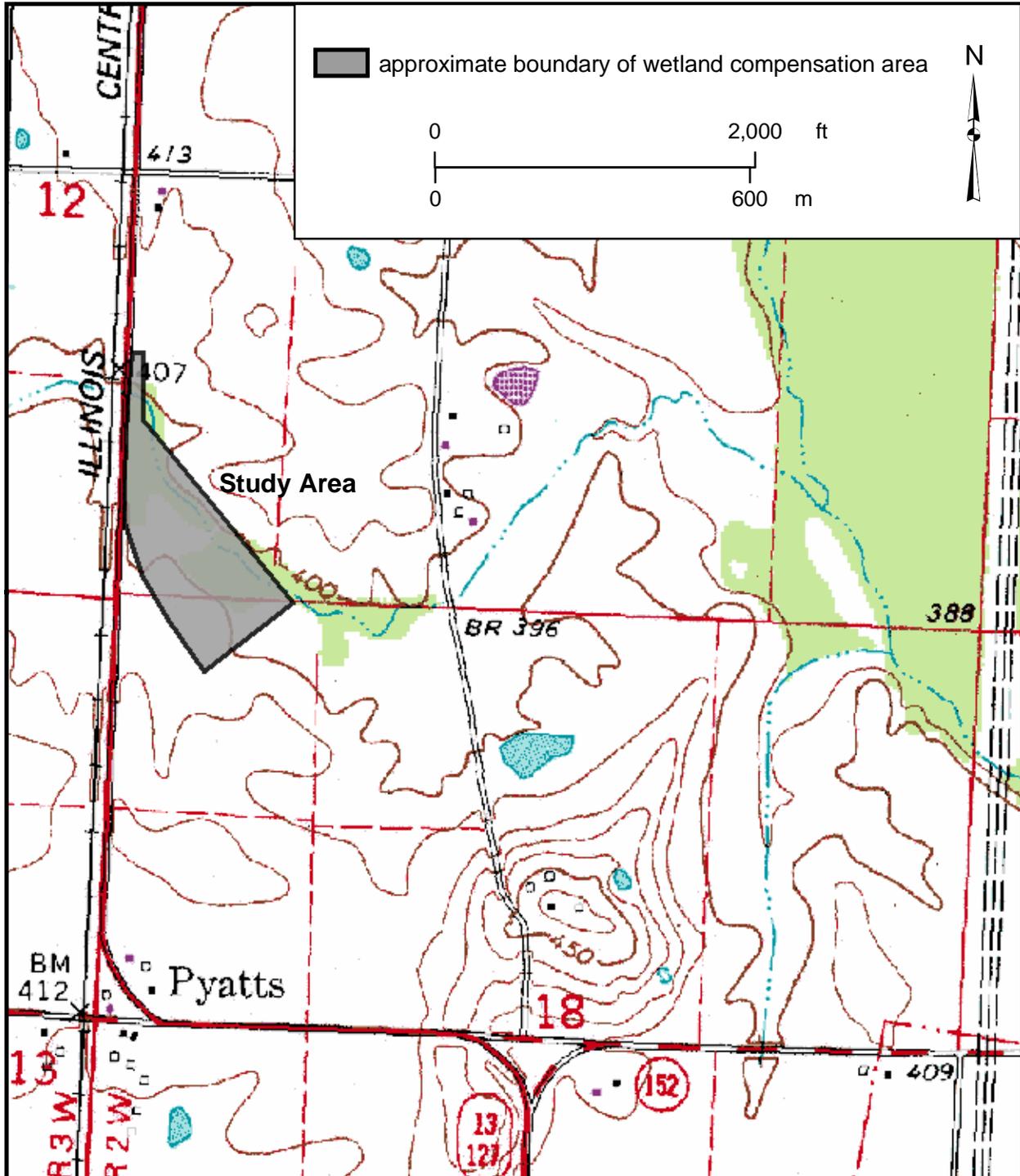
**PLANNED FUTURE ACTIVITIES**

- The current water-level monitoring scheme will continue until no longer required by IDOT.

# Pyatts Blacktop Wetland Compensation Site (FAP 42)

## General Study Area and Vicinity

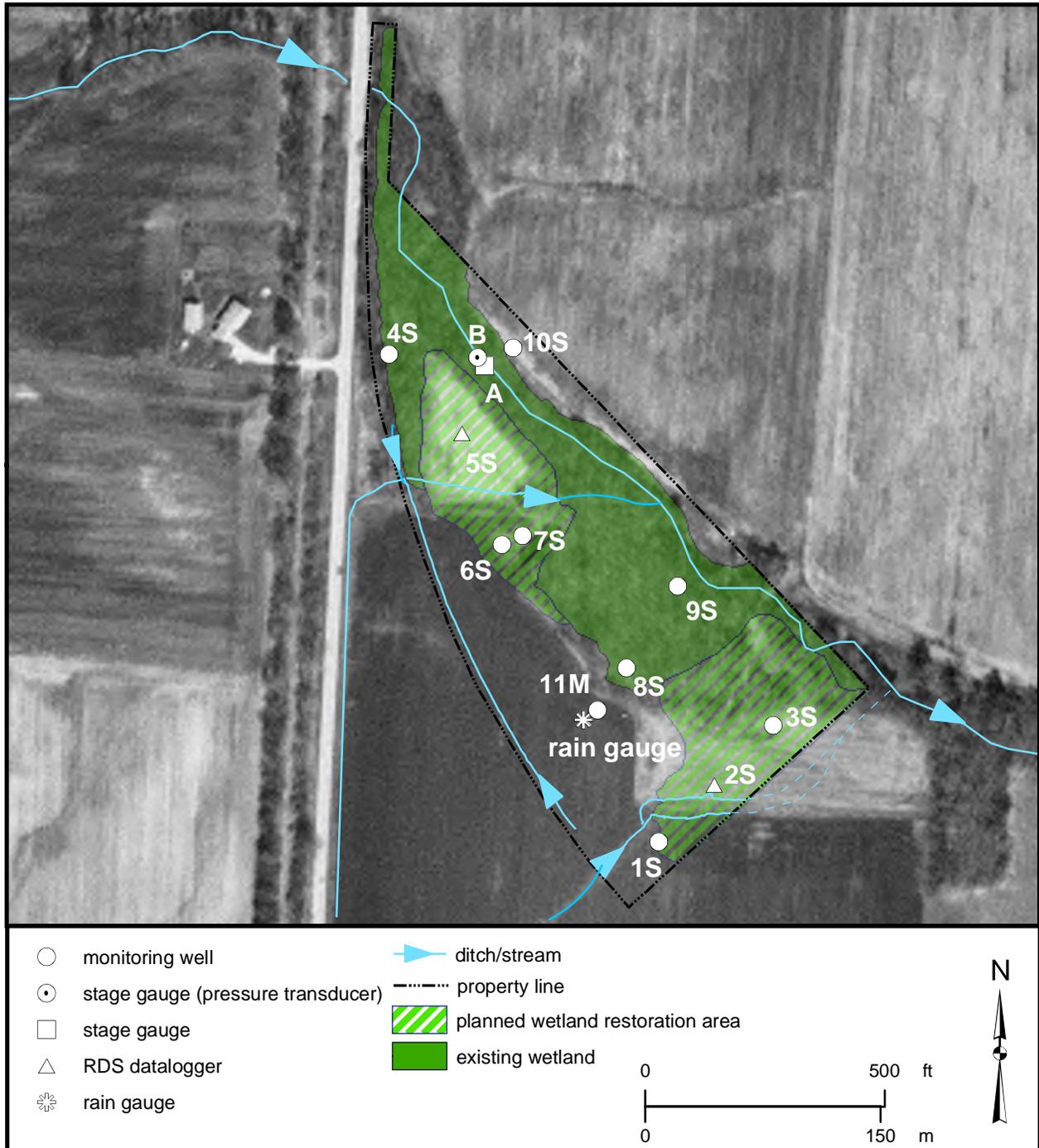
from the USGS Topographic Series, Pyatts, IL (USGS 1974; photorevised 1982) 7.5-minute Quadrangle  
contour interval is 10 feet



# Pyatts Blacktop Wetland Compensation Site (FAP 42)

## Approximate Locations of ISGS Monitoring Equipment

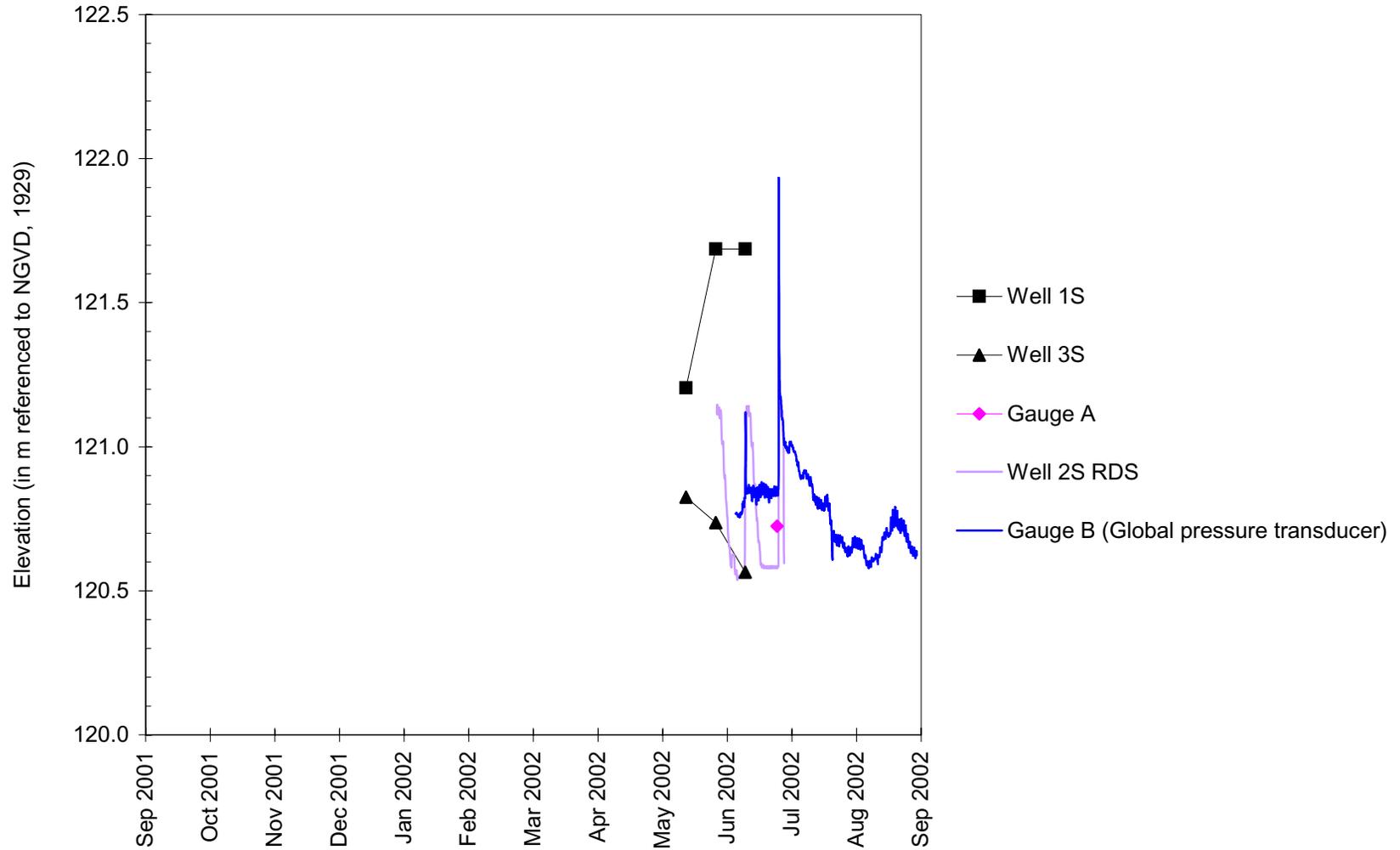
map produced by rectifying IDOT design plans to USGS digital orthophotograph  
Pinckneyville, SE quarter quadrangle (ISGS 2002)



# Pyatt's Blacktop Wetland Compensation Site

September 1, 2001 to September 1, 2002

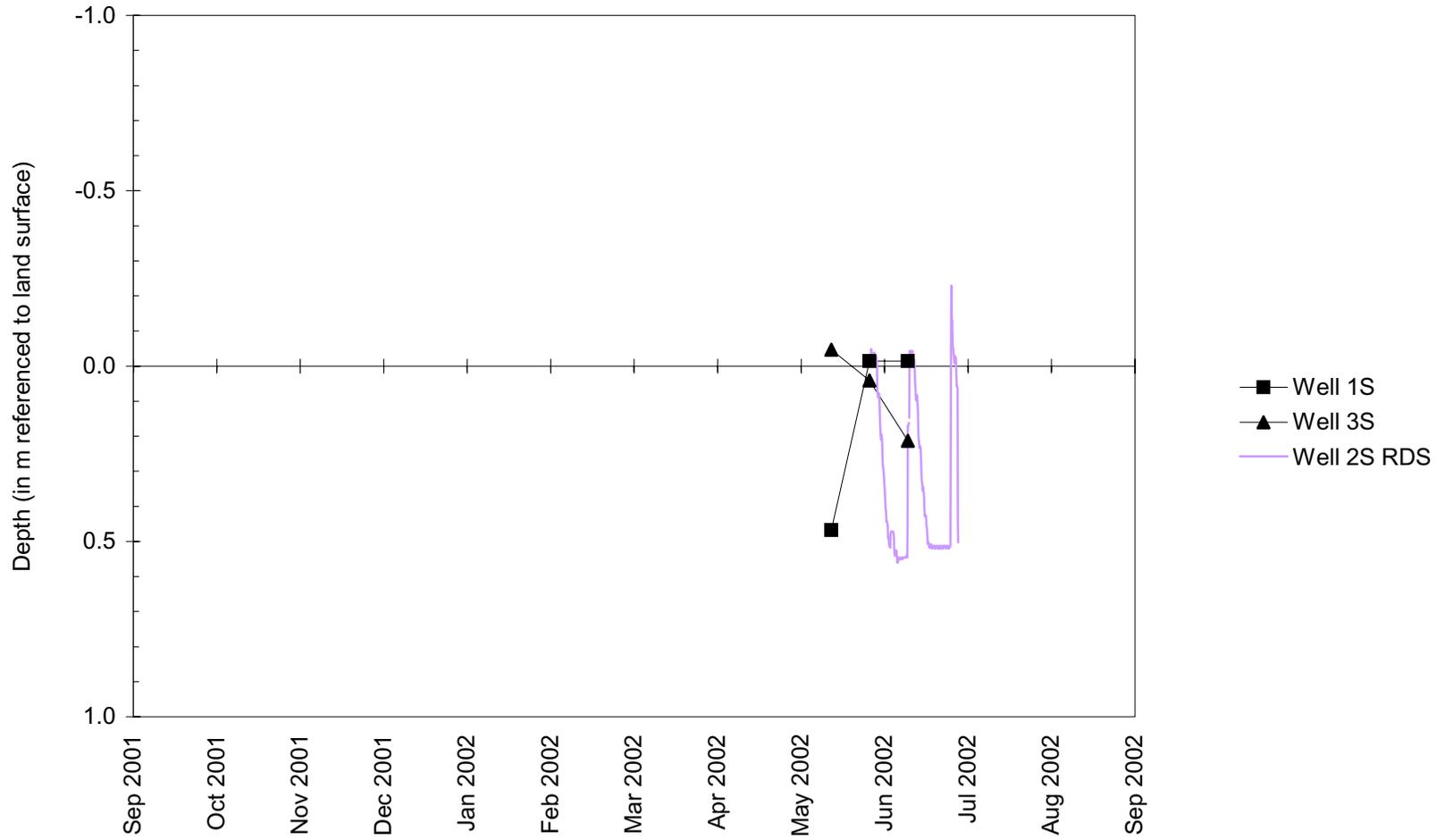
## Water-Level Elevations in Selected Monitoring Wells, on the Stage Gauge, and at the Global data logger



# Pyatts Blacktop Wetland Compensation Site

September 1, 2001 to September 1, 2002

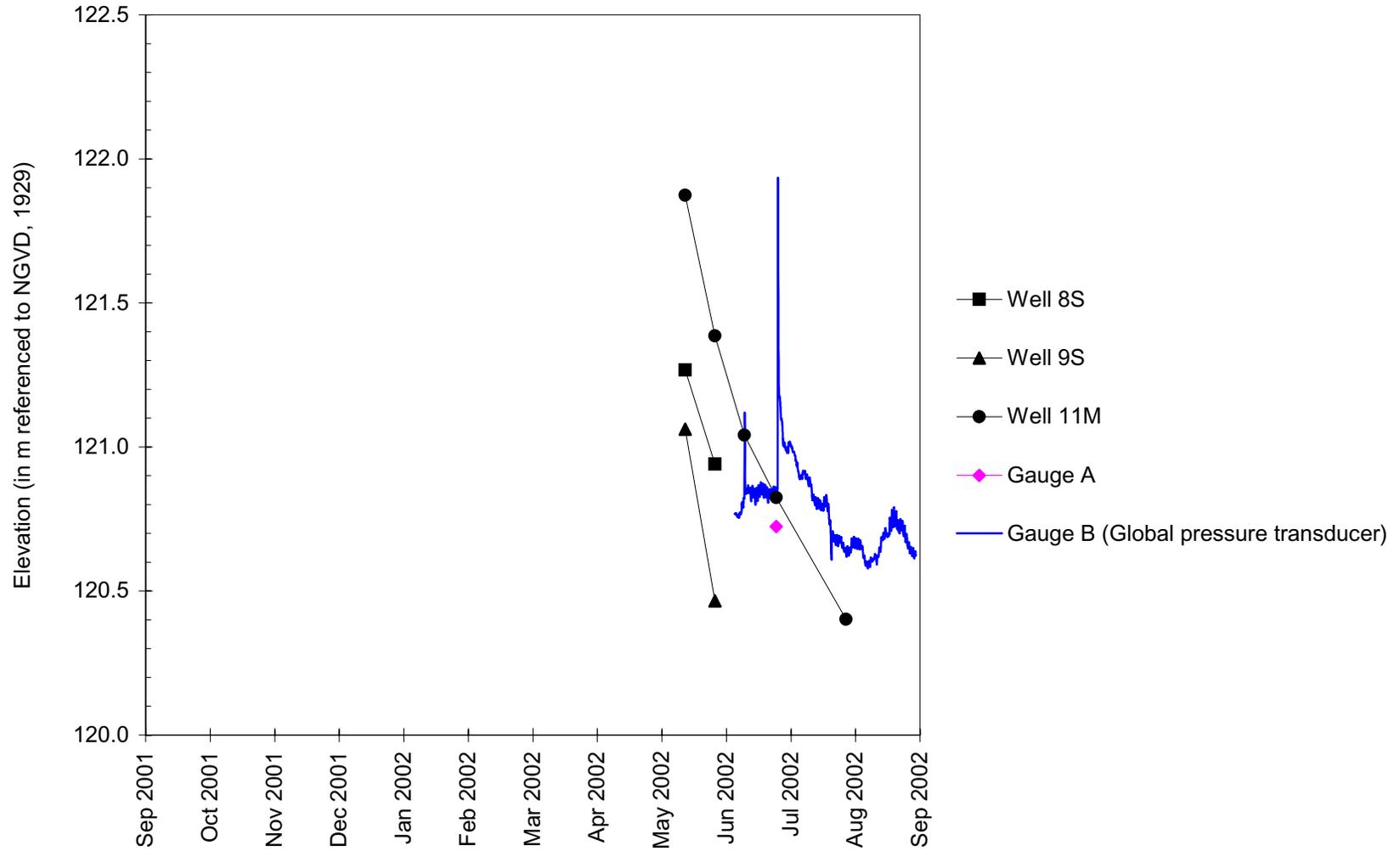
## Depth to Water in Selected Monitoring Wells



# Pyatt's Blacktop Wetland Compensation Site

September 1, 2001 to September 1, 2002

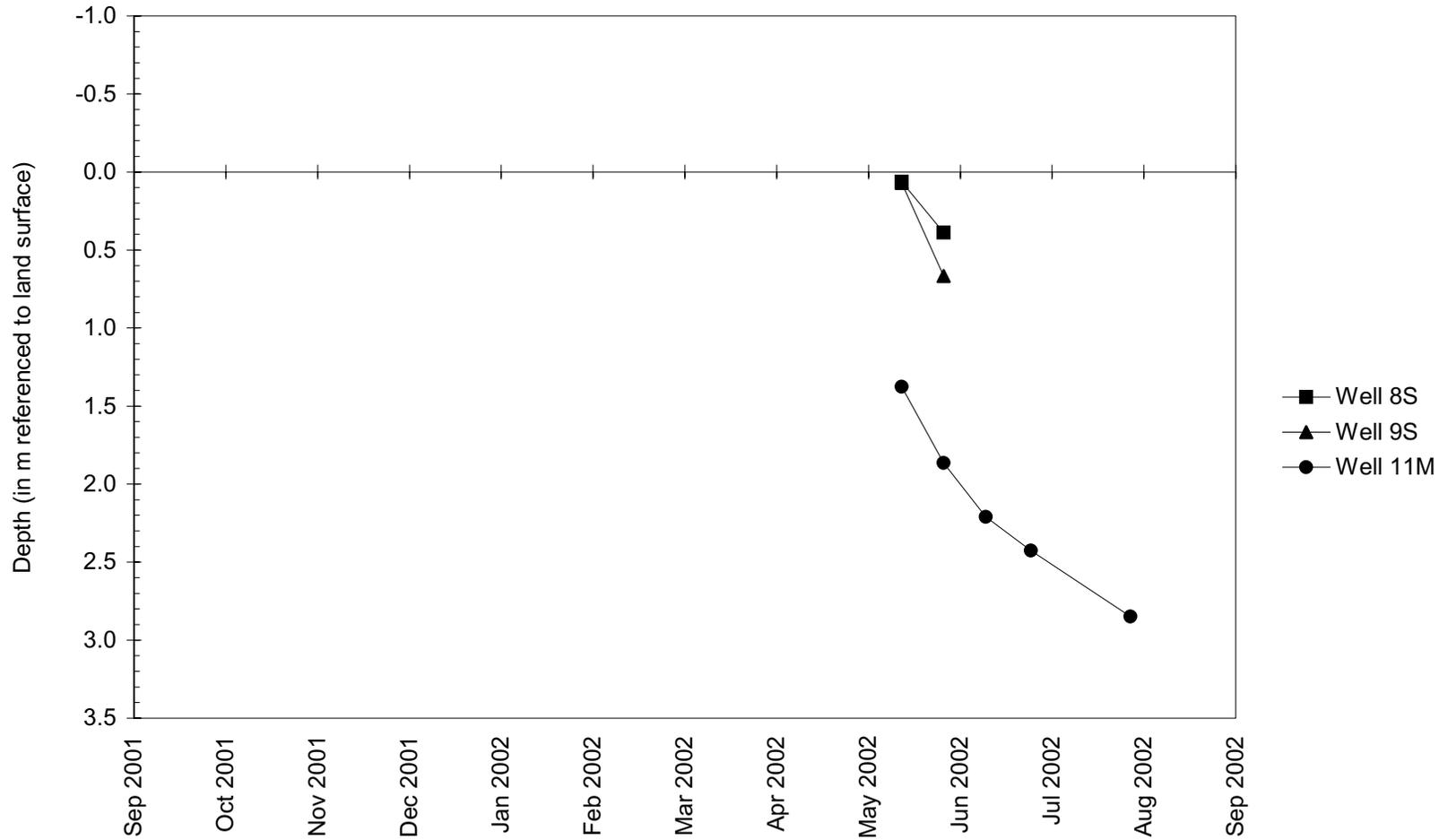
## Water-Level Elevations in Selected Monitoring Wells, on the Stage Gauge, and at the Global data logger



# Pyatts Blacktop Wetland Compensation Site

September 1, 2001 to September 1, 2002

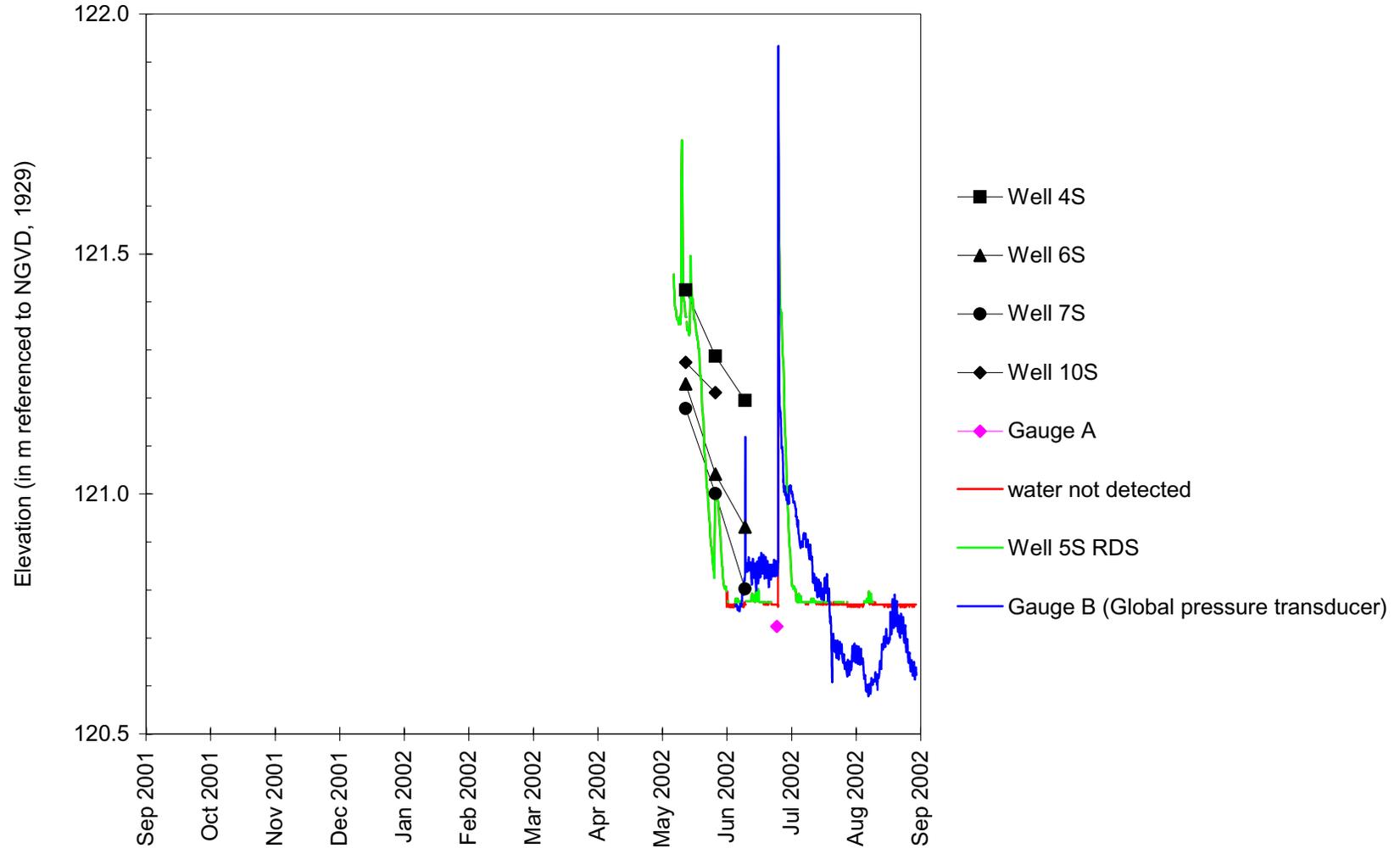
## Depth to Water in Selected Monitoring Wells



# Pyatt's Blacktop Wetland Compensation Site

September 1, 2001 to September 1, 2002

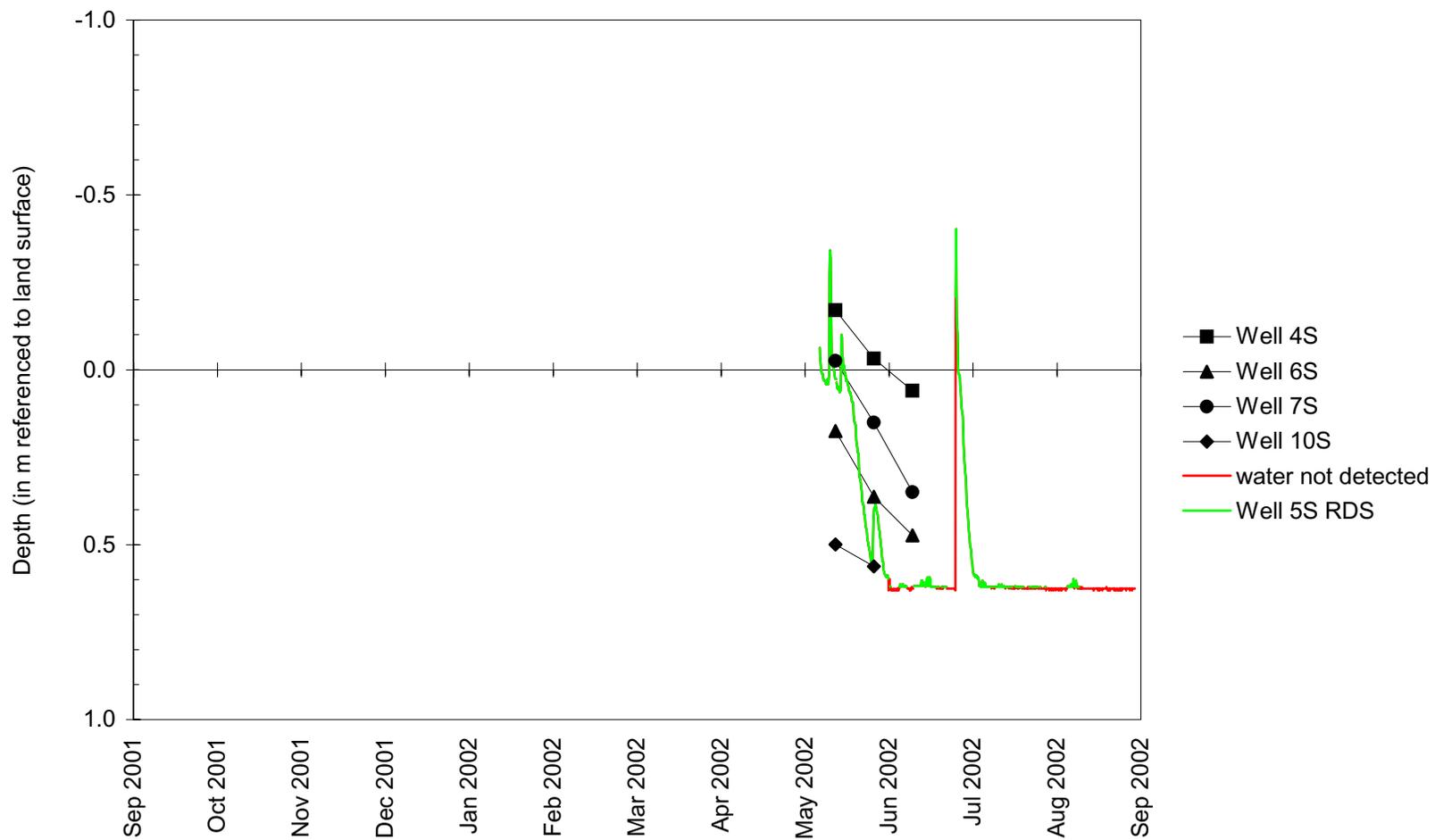
## Water-Level Elevations in Selected Monitoring Wells, on the Stage Gauge, and at the Global data logger



# Pyatts Blacktop Wetland Compensation Site

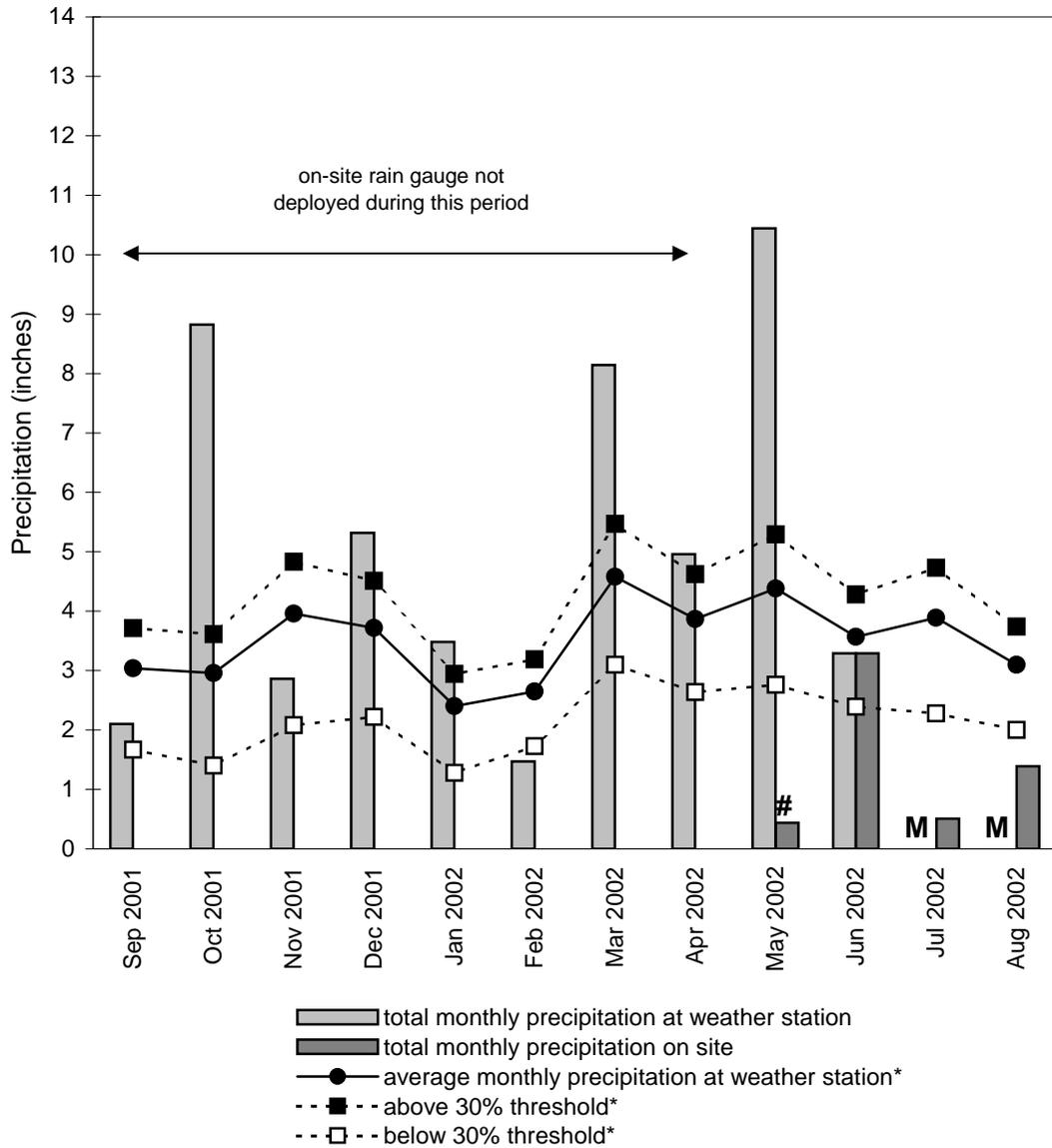
September 1, 2001 to September 1, 2002

## Depth to Water in Selected Monitoring Wells



## Pyatts Blacktop Wetland Compensation Site September 2001 through August 2002

### Total Monthly Precipitation Recorded On Site and at the Du Quoin, IL Weather Station



# on-site rain gauge not deployed for entire month  
**M** missing data from weather station  
 \* see text for explanation

Graph last updated October 11, 2002