



**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.
- March 1997: A final hydrogeologic characterization report was submitted to IDOT (ISGS Open File Series 1997-3).
- June 2000: IDOT requested that ISGS monitor two newly constructed wetland compensation sites. The two sites are labeled Site 1 (most northerly) and Site 2 (most southerly).
- Springs 2001-2004: Site has been augmented with the installation of 30 soil-zone monitoring wells, 4 stage gauges, 1 RDS water-level data logger, 1 Ecotone water-level data logger, 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 2004

We estimate that the total area that satisfied wetland hydrology criteria (U.S. Army Corps of Engineers 1987) for greater than 5% of the growing season was 11.81 ac (4.78 ha) with 7.88 ac (3.19 ha) at Site 1 and 3.93 ac (1.59 ha) at Site 2. In addition, the area that satisfied wetland hydrology criteria for greater than 12.5% of the growing season in 2004 was 11.59 ac (4.69 ha), with 7.88 ac (3.19 ha) at Site 1 and 3.71 ac (1.50 ha) at Site 2. These estimates are based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in nearby Freeport, Illinois, is April 13 and the season lasts 183 days; 5% of the growing season is 9 days, and 12.5% of the growing season is 23 days.
- Total precipitation for the monitoring period of September 2003 to August 2004 was 116% of normal. Despite drier than normal conditions for the months of September and October 2003, and January, February and April 2004, the near- to above-normal precipitation in November and December 2003, and March and May through August 2004, led to wetter than typical conditions during the 2004 growing season.
- At Site 1, 2004 water levels measured in wells 2S, 3S, 10S, 11S, 12S, 28S, 29S and 30S, satisfied wetland hydrology criteria for a period greater than 12.5% of the growing season. No additional wells satisfied wetland hydrology criteria for greater than 5% of the growing season.
- At Site 1, surface-water levels measured by the RDS B data logger indicated that inundation occurred to an elevation of 240.56 m (789.24 ft) for a duration greater than 5% of the growing season, and an elevation of 240.53 m (789.15 ft) for a period that exceeded

12.5% of the growing season.

- At Site 2, 2004 water levels measured at wells, 4S, 5S, 6S, 8S, 9S, 13S, 16S, 17S, 18S, 19S, 20S, 22S, 23S, 24S, 25S, 26S and 27S satisfied wetland hydrology criteria for a period greater than 5% of the growing season. Water levels measured at all aforementioned wells (excluding wells 4S and 13S) also satisfied wetland hydrology criteria for a period greater than 12.5% of the growing season.
- At Site 2, water levels measured at stage gauge C indicated that inundation occurred to an elevation of 240.63 m (789.45 ft) for a period greater than 5% of the growing season, and remained at the same elevation for a period that exceeded 12.5% of the growing season.
- Surface-water levels measured by Infinites sonic logger A indicate that Site 2 was inundated by Richland Creek on May 22, 2004 to a peak elevation of 240.985 m (790.63 ft). Flood-water remained above the average elevation of the site for approximately one day, which is not sufficient to satisfy wetland hydrology criteria.
- Limitations of the wetland hydrology determination are as follows:
 - The area of wetland hydrology was measured planimetrically using a digitally produced ISGS topographic contour map. The acreage polygons generated from these maps were then superimposed upon the digital topographic maps used for the figures in this report.
 - Mitigation site boundaries for Sites 1 and 2 are estimated from IDOT as-built maps.

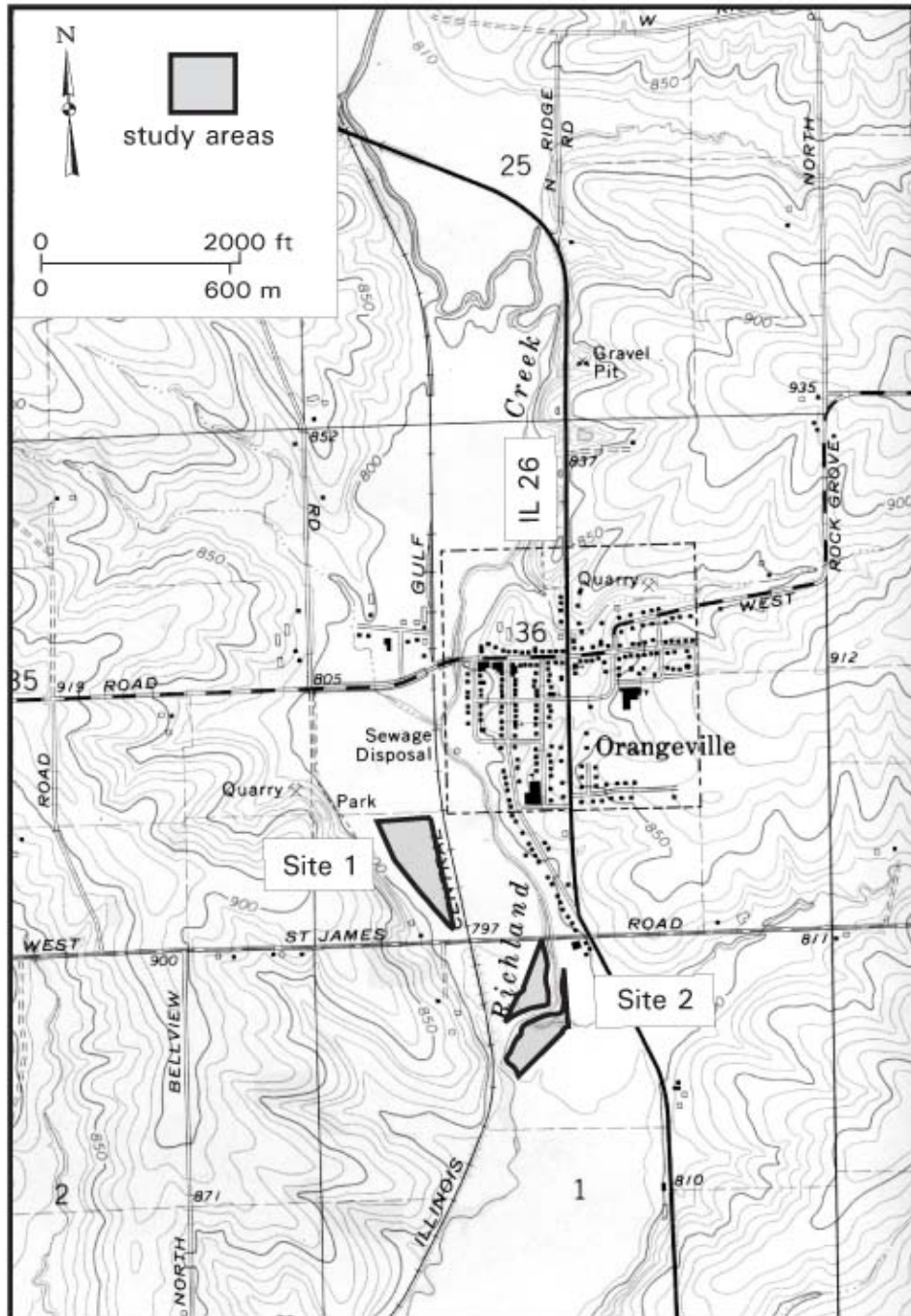
PLANNED FUTURE ACTIVITIES

- Additional soil-zone monitoring wells will be added to further delineate wetland hydrology.
- Monitoring for wetland hydrology will continue at this site through 2005 or until no longer required by IDOT.

Orangeville Wetland Compensation Site (FAP 316)

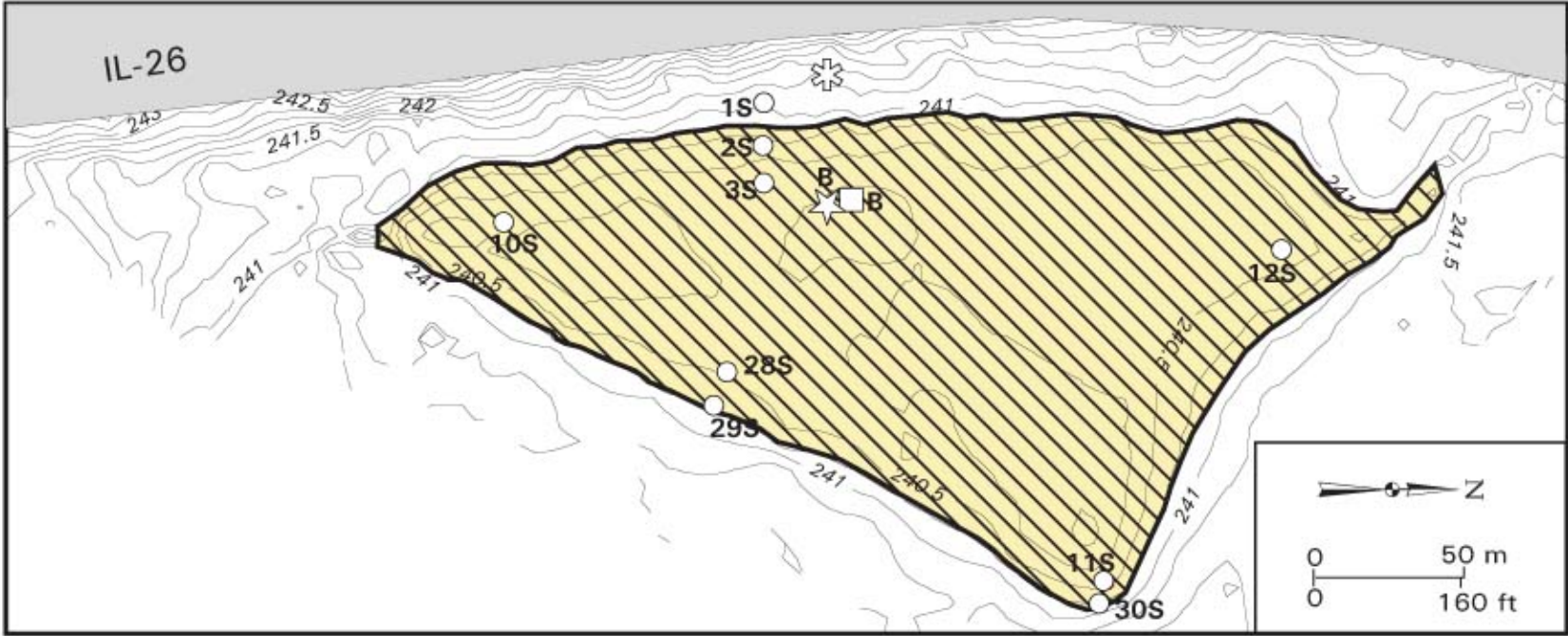
General Study Area and Vicinity

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



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Estimated Areal Extent of 2004 Wetland Hydrology at Site 1
 based on data collected between September 1, 2003 and September 1, 2004
 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

— elevation contour
(contour interval is 0.25 meters)

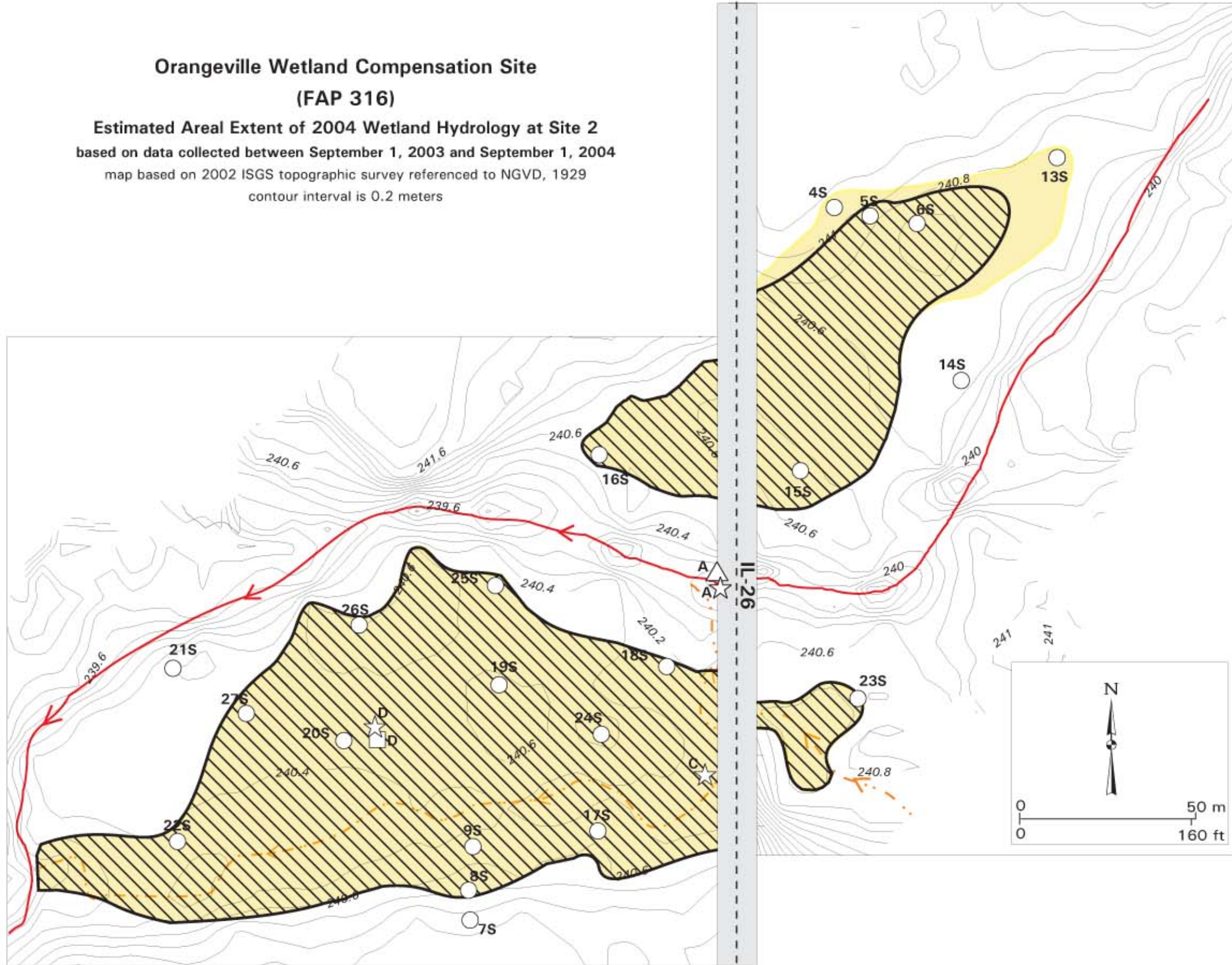
2004 Wetland Hydrology

> 12.5% of the growing season

> 5% of the growing season

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Estimated Areal Extent of 2004 Wetland Hydrology at Site 2
 based on data collected between September 1, 2003 and September 1, 2004
 map based on 2002 ISGS topographic survey referenced to NGVD, 1929
 contour interval is 0.2 meters

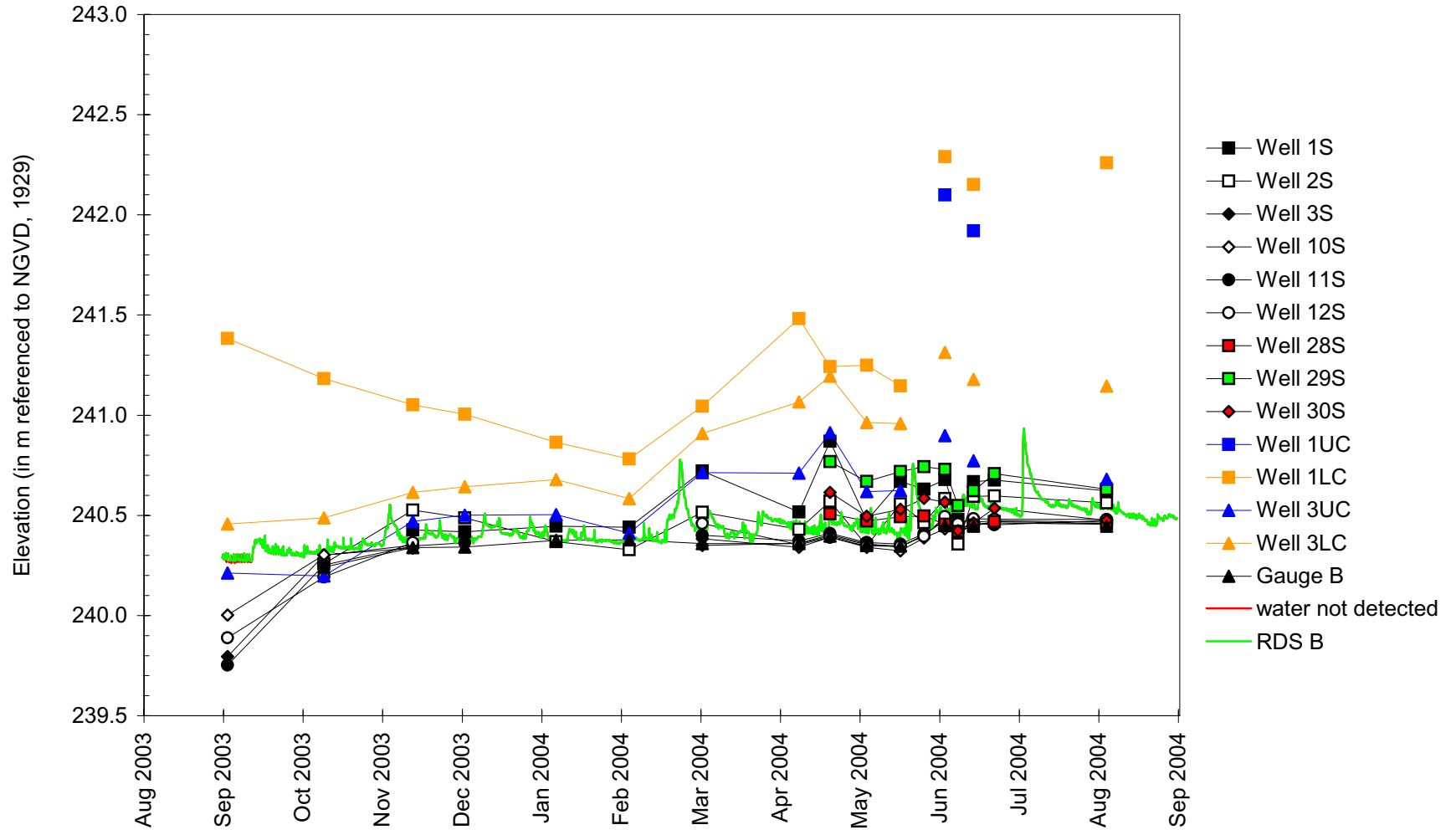


- 2004 Wetland Hydrology**
-  > 12.5% of the growing season
 -  > 5% of the growing season
 -  elevation contour (contour interval is 0.20 meters)
 -  Richland Creek
 -  diverted rivulet
 -  ISGS monitoring well
 -  RDS level logger
 -  Infinities sonic data recorder
 -  stage gauge

Orangeville Wetland Compensation Site

September 1, 2003 to September 1, 2004

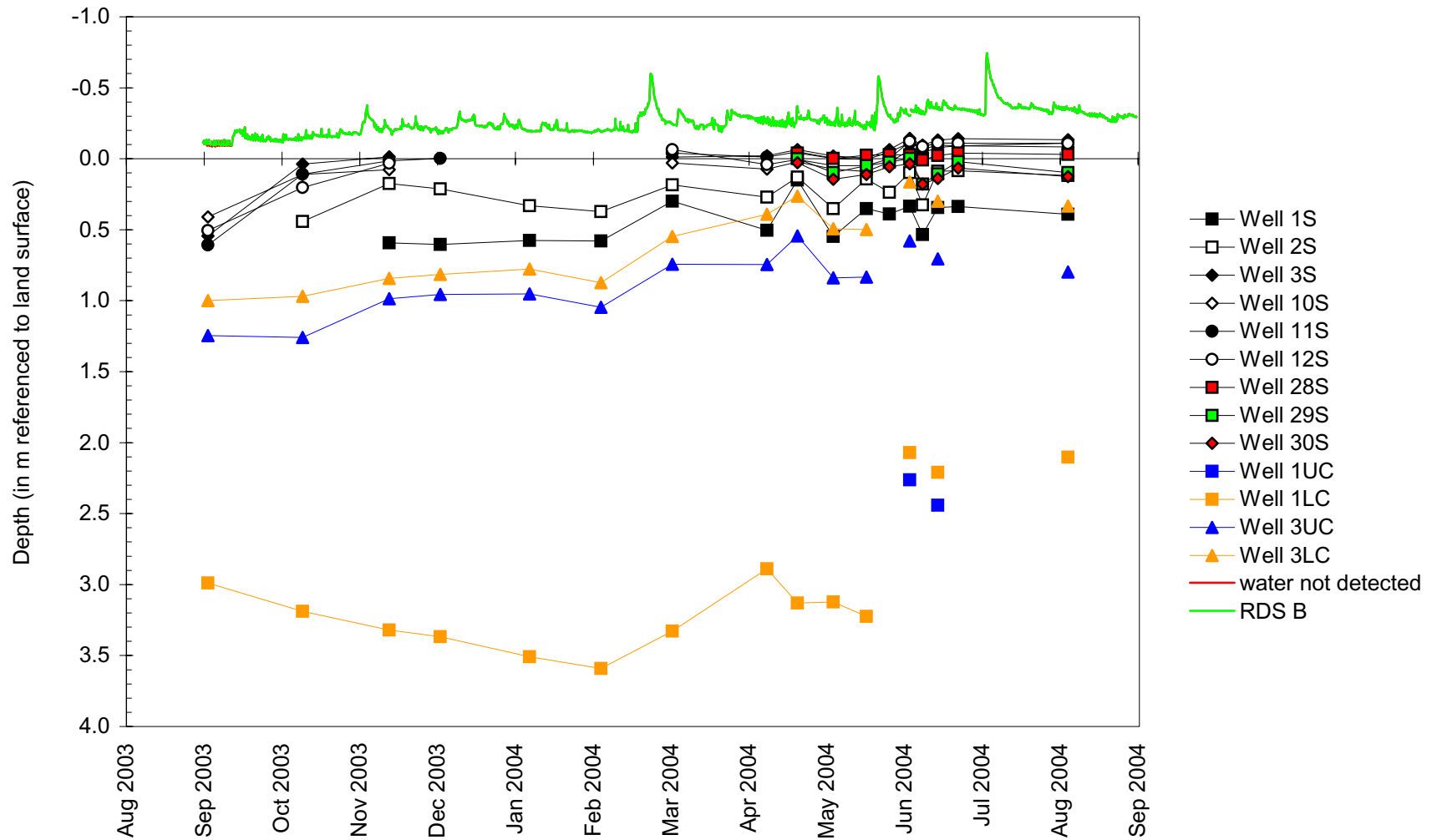
Water-Level Elevations at Site 1



Orangeville Wetland Compensation Site

September 1, 2003 to September 1, 2004

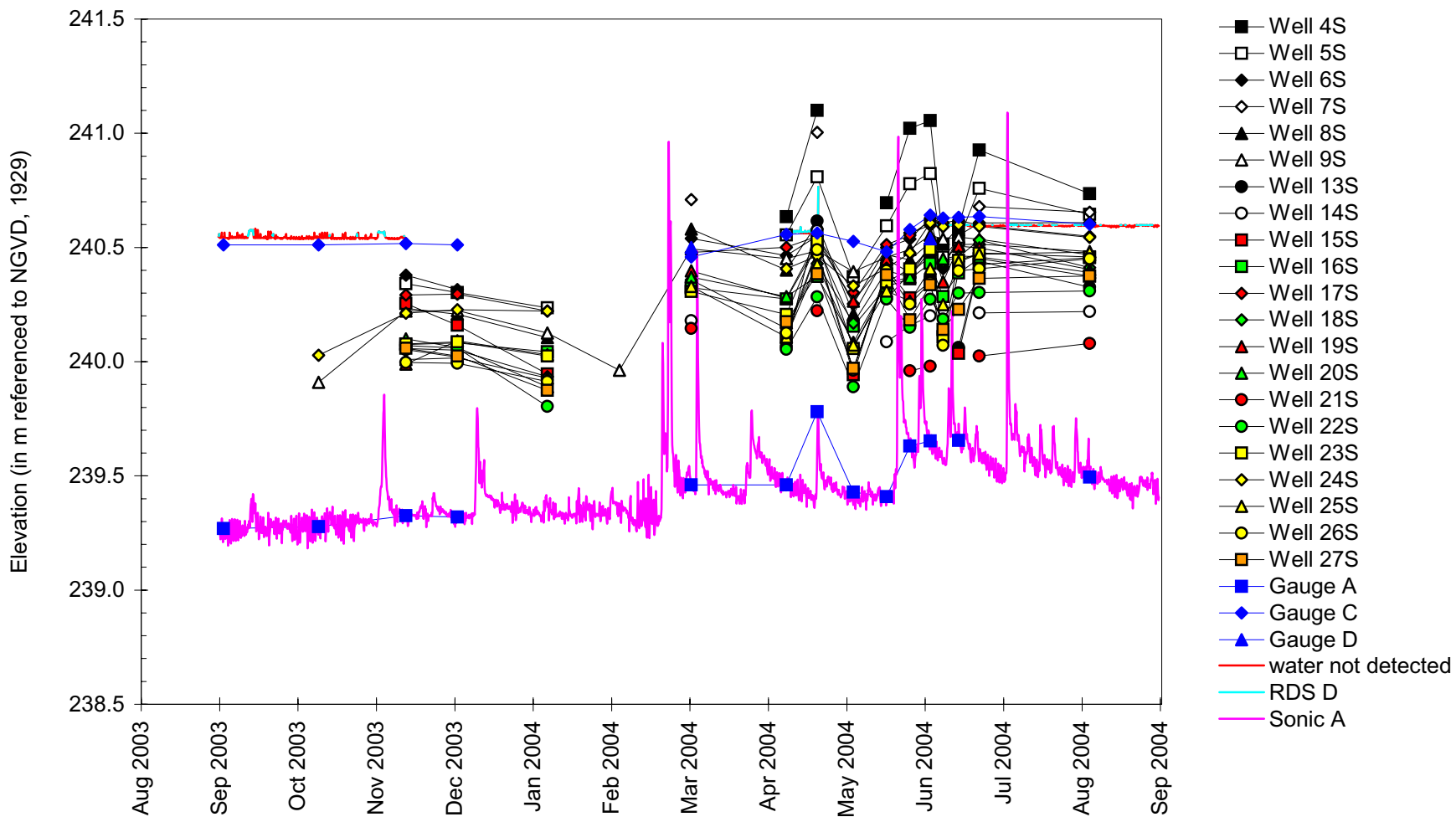
Depth to Water at Site 1



Orangeville Wetland Compensation Site

September 1, 2003 to September 1, 2004

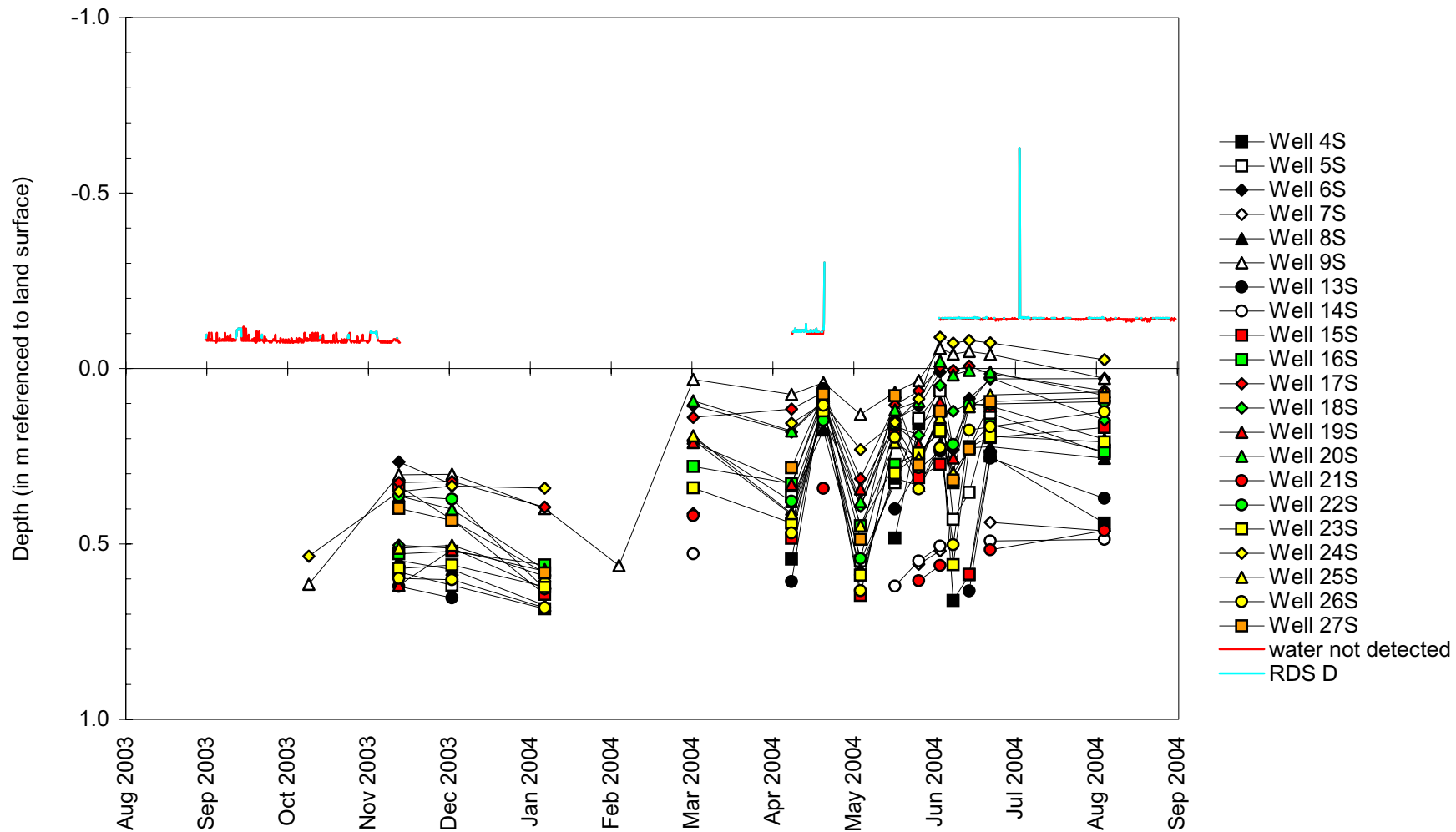
Water-Level Elevations at Site 2



Orangeville Wetland Compensation Site

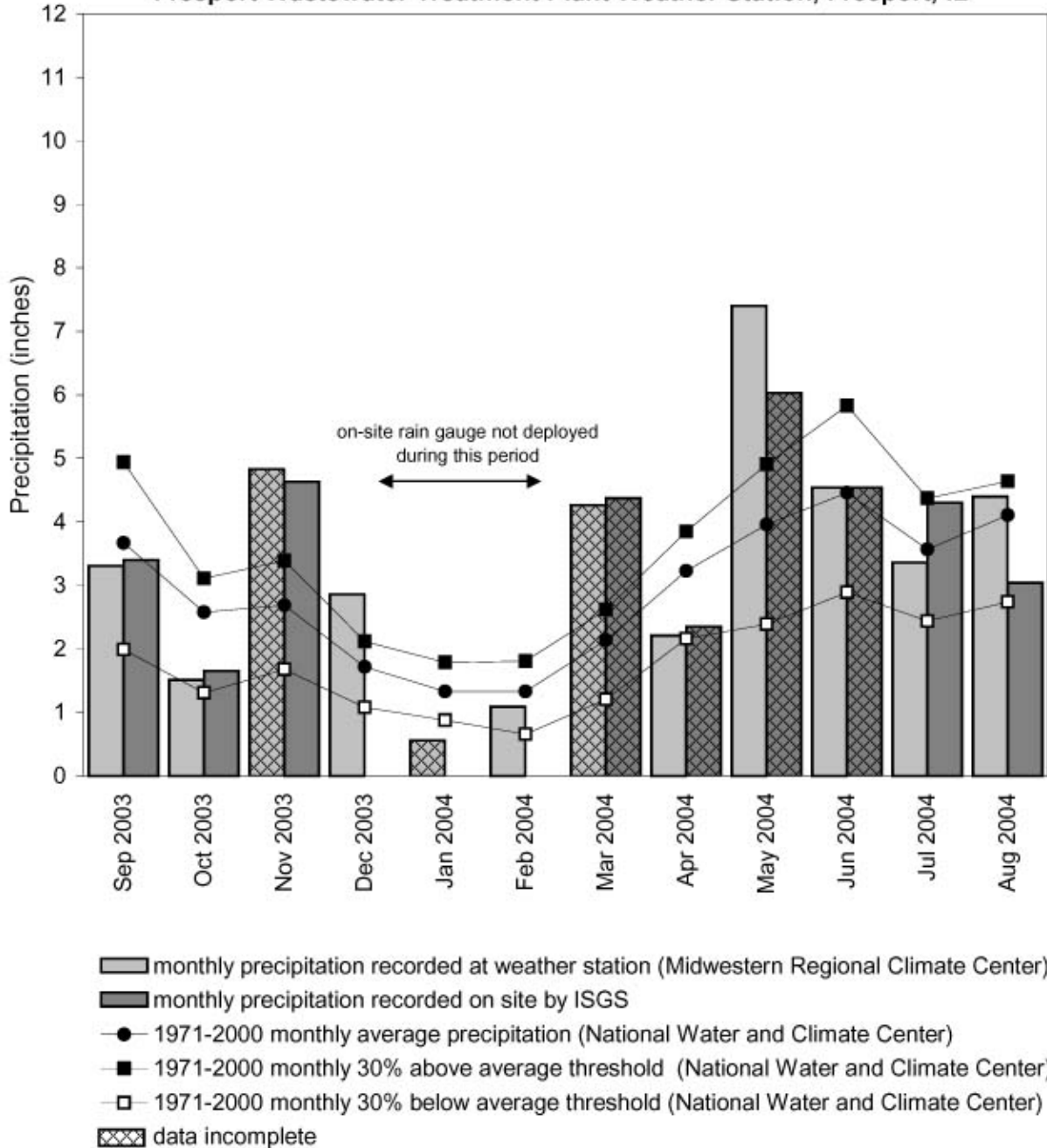
September 1, 2003 to September 1, 2004

Depth to Water at Site 2



Orangeville Wetland Compensation Site September 2003 through August 2004

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



Graph last updated October 1, 2004