U.S. Geological Survey and
Brunswick County, North Carolina
Cooperative Water-Resources Program

Summary of Activities for Fiscal Year 2006
(October 2005 through September 2006)

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Introduction

Since 2000, the population of Brunswick County has grown by more than 22%, nearly three times the average 7.9% growth experienced by the State of North Carolina as a whole (NC State Demographics, 2006). A growth of this magnitude places significant stress on Brunswick County's natural resources. County planners have recognized the potential consequences of land use changes associated with growth and the resulting increased demand on water resources by consolidating the many public utility providers into one organization and embarking on an aggressive utility expansion plan. In order to make informed water resource planning decisions, County officials need up-to-date water-resource information. To address concerns about the availability of ground water in the Brunswick County area, the U.S. Geological Survey (USGS) and Brunswick County initiated a cooperative water-resources program in 1998.

Cooperative Water-Resources Program

The Federal-State Cooperative Water-Resources Program is a partnership between the USGS and state or local agencies to provide information that forms the foundation for many of the Nation's water-resources management and planning activities. In addition, the collected information may function as an early warning of emerging water problems. The USGS uses nationally consistent techniques of data collection, quality assurance, and archiving. Information is stored in a common database readily available for scientific interpretation and public dissemination. The knowledge gained through the studies is published and added to the growing body of information about the hydrology of the area.

The objectives of the Brunswick County cooperative water-resources program are to (1) monitor water-level fluctuations in the surficial, Castle Hayne, Peedee, and Black Creek aquifers and (2) to relate water-level trends to changes in climatic conditions and/or ground-water withdrawals. These objectives are met by the following tasks:

- Operate and maintain 11 continuous ground-water-level monitoring wells in four aquifers.
- Update the USGS National Water Information System (NWIS) database, which includes ground-water, surface-water, and water-quality data for the area.
- Publish annual summaries of local water-resources conditions.

An overview of hydrologic conditions during the 2006 water year is presented in this document, including summaries of ground-water conditions for the Brunswick County area. Hydrographs and statistics of continuous ground-water levels collected as part of the cooperative program are presented in Appendix A.

Progress During Fiscal Year 2006

During fiscal year 2006, activities conducted for the Brunswick County Cooperative Program included:

- **Monitoring of ground-water levels**
  - The USGS has been maintaining continuous water-level recorders on 11 wells since October 2000 (figure 1). Nine of the eleven wells collect water levels hourly and transmit the data in near real time. Updated water-levels are available every 4 hours via the USGS National Water Information System web page (http://waterdata.usgs.gov/nc/nwis/current/?type=gw).
- **Maintenance of Brunswick County area hydrologic databases**
  - The USGS continued updating the National Water Information System database with ground-water level and well site information.

- **Publishing annual summaries of local water-resources conditions**
    - Summaries of local water-resources conditions are published annually. Water-level data collected in 2006 will be available April 1, 2007 in the USGS report "*Water-resources data for the United States, Water Year 2006*" U.S. Geological Survey Water-Data Report WDR-US-2006 available online at http://pubs.water.usgs.gov/wdr2006. North Carolina Water Resources Data Reports for years before 2006 can be found online at http://nc.water.usgs.gov/reports/WDR/index.html.

Ground-Water Conditions, 2006

Since 2000, ground-water levels in the Brunswick County area have been continuously monitored in 11 wells as part of the cooperative study (figure 1). Of the 11 wells, 3 monitor the surficial aquifer, 1 monitors the Castle Hayne aquifer, 1 monitors both the Castle Hayne and the Peedee aquifers, 4 monitor the Peedee aquifer, and 2 monitor the Black Creek aquifer. Hydrographs showing water year 2006 and long-term water levels for each observation well are shown in Appendix A.

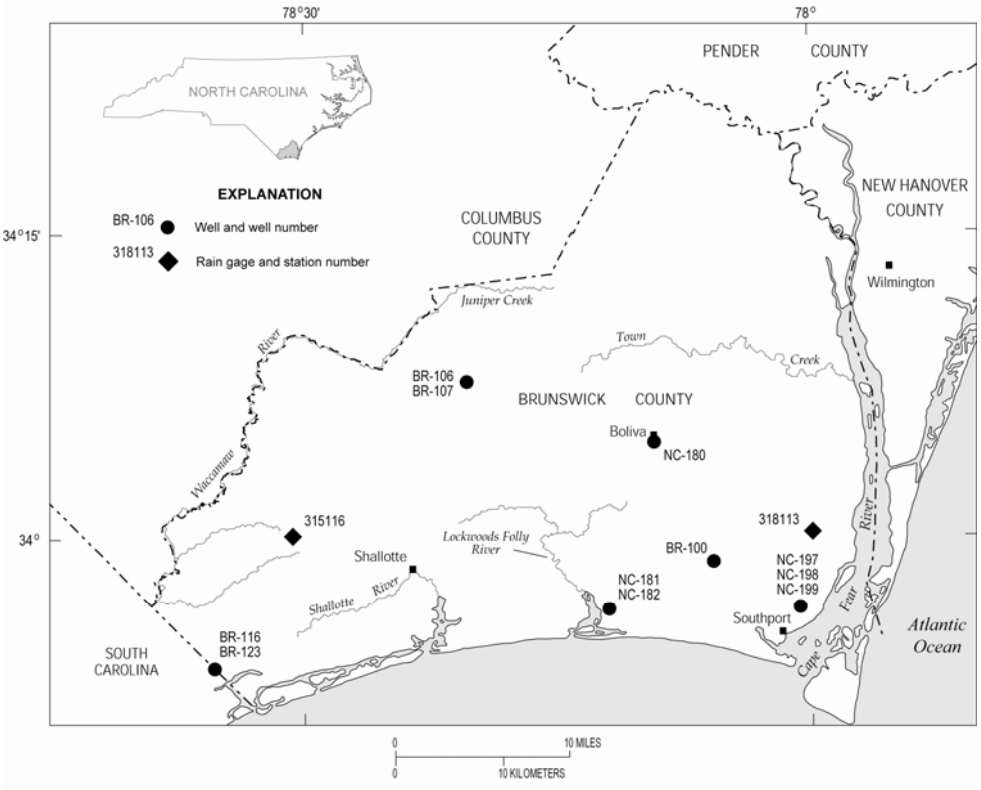


Figure 1. Location of observation wells and rain gages in Brunswick County, North Carolina.

Median water levels for water year 2006 were compared to period-of-record normal water levels to determine if water levels were above normal, normal, or below normal. The normal range of water levels is the range from the 25th to the 75th percentiles for the period of record. If the median (50th percentile) water level for water-year 2006 falls between the 25th and 75th percentiles of period-of-record water levels, then water levels in the well are considered to be normal for the water year. If the median water level for water-year 2006 was below the 25th percentile, then water levels in the well are considered below normal for the water year. If the median water level for water-year 2006 was above the 75th percentile, then water levels are considered to be above normal for the water year.

Graphically, these comparisons can be displayed by constructing box plots (Ott and Longnecker, 2001). Box plots were constructed for both water-level and precipitation data. A box plot summarizes the distribution of the data by showing the median, quartiles, 10th, and 90th percentiles (figure 2). The top, bottom, and middle line of the box correspond to the 75th percentile (3rd quartile), 25th percentile (1st quartile), and 50th percentile (median), respectively. The line caps (whiskers) extend from the 10th percentile to the 90th percentile. To aid interpretation of the water-level box plots, a shaded area corresponding to the period-of-record normal range has been included. Additionally, the results of the water-level comparisons are graphically represented on maps using colored dots: a green dot indicates the monthly mean water levels for water year 2006 were normal, a red dot indicates the monthly mean water levels for water year 2006 were below normal, and a blue dot indicates the monthly mean water levels for water year 2006 were above normal.

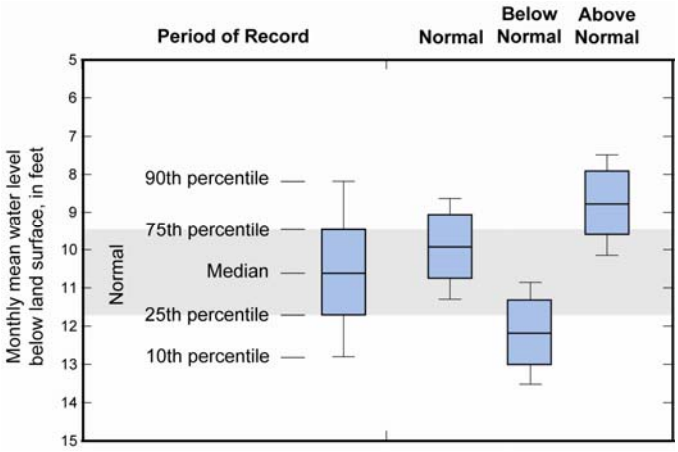


Figure 2. Box plots showing normal, below normal, and above normal water level range in comparison to the period of record.

Precipitation

The State Climate Office of North Carolina maintains two long-term climactic data stations in Brunswick County (figure 1). Both stations have significant amounts of historic precipitation data with station 318113, located in southeastern Brunswick County near Southport, in operation since January 1948 and station 315116, located in western Brunswick County near Longwood, in operation since June 1972. Rainfall data is discussed because it is a significant contributor to recharge in the surficial aquifer, and as such can be an indicator for drought conditions. Box plots of the monthly sum of daily precipitation for the period-of-record were created for both the Southport and Longwood stations (figure 3). The monthly sum of daily precipitation for water year 2006 (represented by triangles) overlay the box plot, for comparison purposes.

For water year 2006, Southport station received within normal rainfall amounts for seven months of the year (figure 3A). However, March, May, July, and September 2006 were significantly below normal (drier) months with less than 10% of the period-of-record receiving as little rainfall. In contrast, October 2005 was significantly wetter than normal due to a very active late hurricane season with less than 10% of the period-of-record receiving as much rainfall.

Similarly, the Longwood station received within normal rainfall amounts for six months of the 2006 water year (figure 3B). January, March, and May 2006 received less than normal rainfall. In December 2005 and September 2006 Longwood received above normal amounts of rainfall. As was observed at the Southport station, October 2005 was significantly wetter than normal due to a very active late hurricane season with less than 10% of the period-of-record receiving as much rainfall.

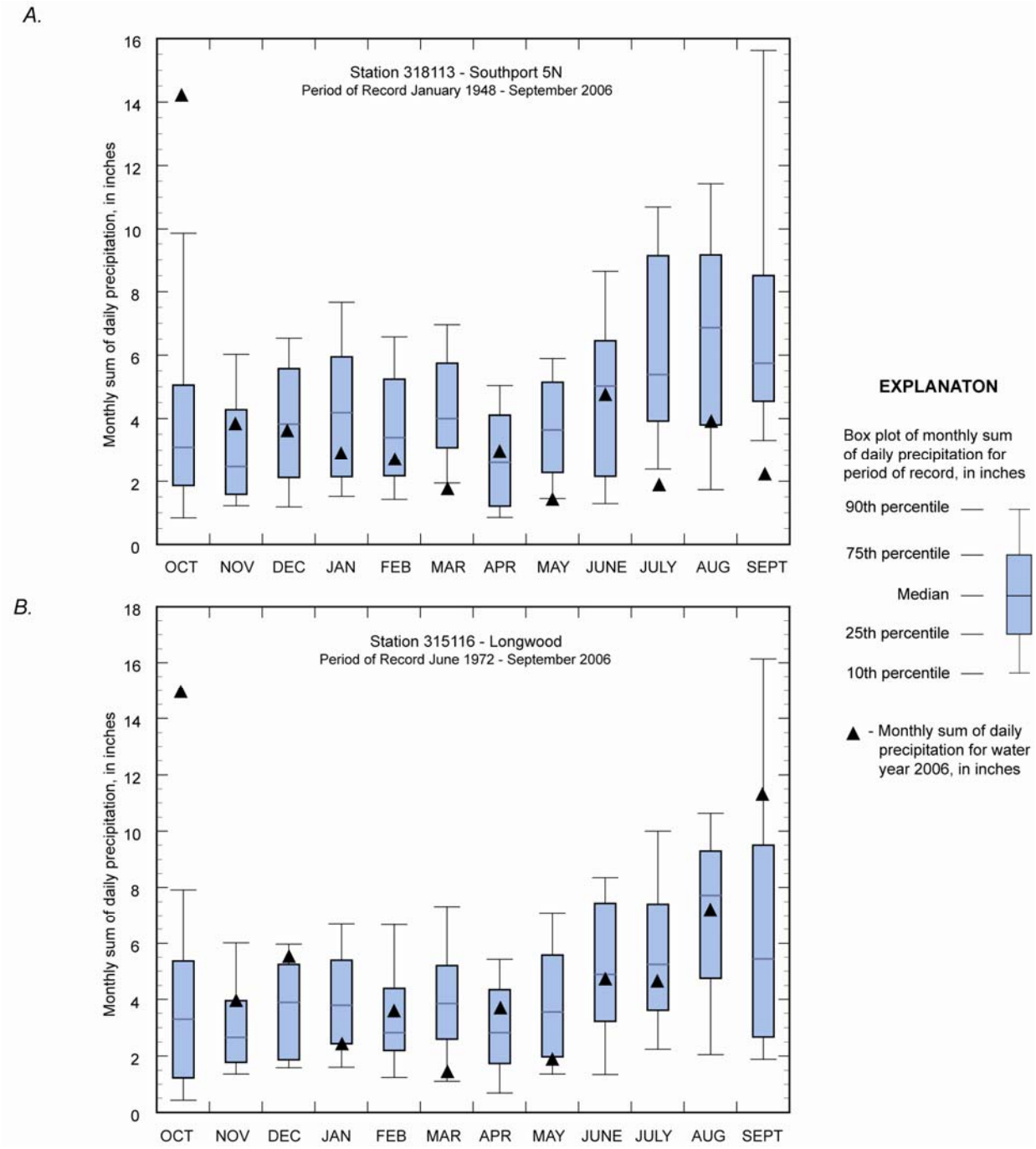
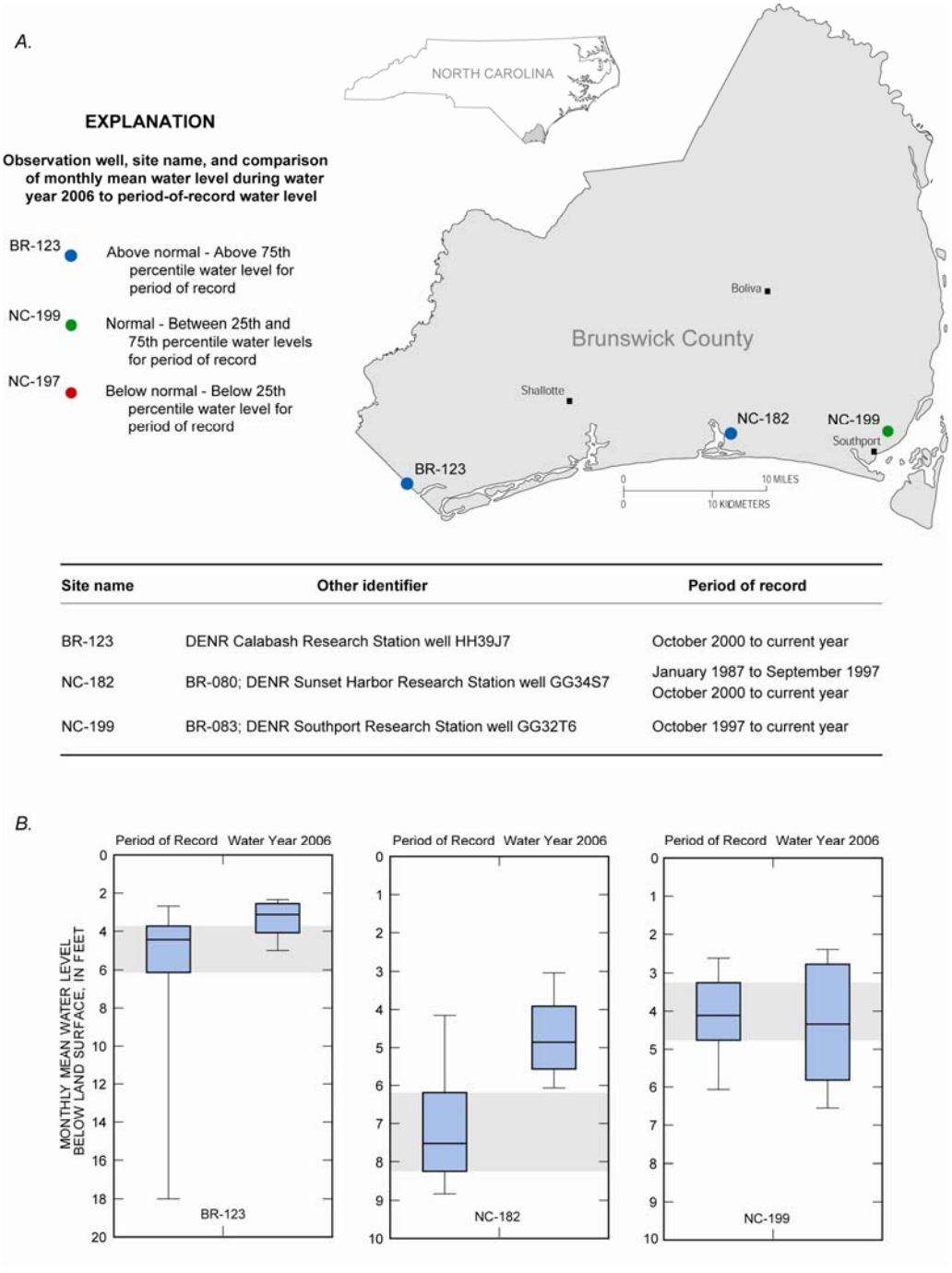


Figure 3. Box plots comparing monthly sum of daily precipitation during water year 2006 to period-of-record monthly sum of daily precipitation at North Carolina State Climate Office stations *(A)* 318113 Southport 5N and *(B)* 315116 Longwood.

Surficial Aquifer

During water year 2006, water levels in the surficial aquifer were above normal in two of the three wells monitored (figure 4), Sunset Harbor and Calabash, reflecting recovery from the 1998-2002 drought due to increased rainfall. Water levels monitored in the Southport well were normal.



Site name	Other identifier	Period of record
BR-123	DENR Calabash Research Station well HH39J7	October 2000 to current year
NC-182	BR-080; DENR Sunset Harbor Research Station well GG34S7	January 1987 to September 1997 October 2000 to current year
NC-199	BR-083; DENR Southport Research Station well GG32T6	October 1997 to current year

Figure 4. *(A)* Observation wells completed in the surficial aquifer, Brunswick County area (colored dots indicate locations where water levels were above, below, or normal for the surficial aquifer during water year 2006) and *(B)* box plots comparing period-of-record monthly mean water levels to water year 2006 monthly mean water levels.

Castle Hayne Aquifer

Water levels in the Castle Hayne aquifer were below normal in NC-198 in the Southport area and normal at BR-100 in the well field (figure 5) during water year 2006. The Castle Hayne aquifer may be pumped in localized areas throughout Brunswick County as a source of potable water. Additionally, it should be noted that BR-100 is completed in both the Castle Hayne and Peedee aquifers, so the water levels collected in this well are composite values, and may not reflect the true water level found in either aquifer.

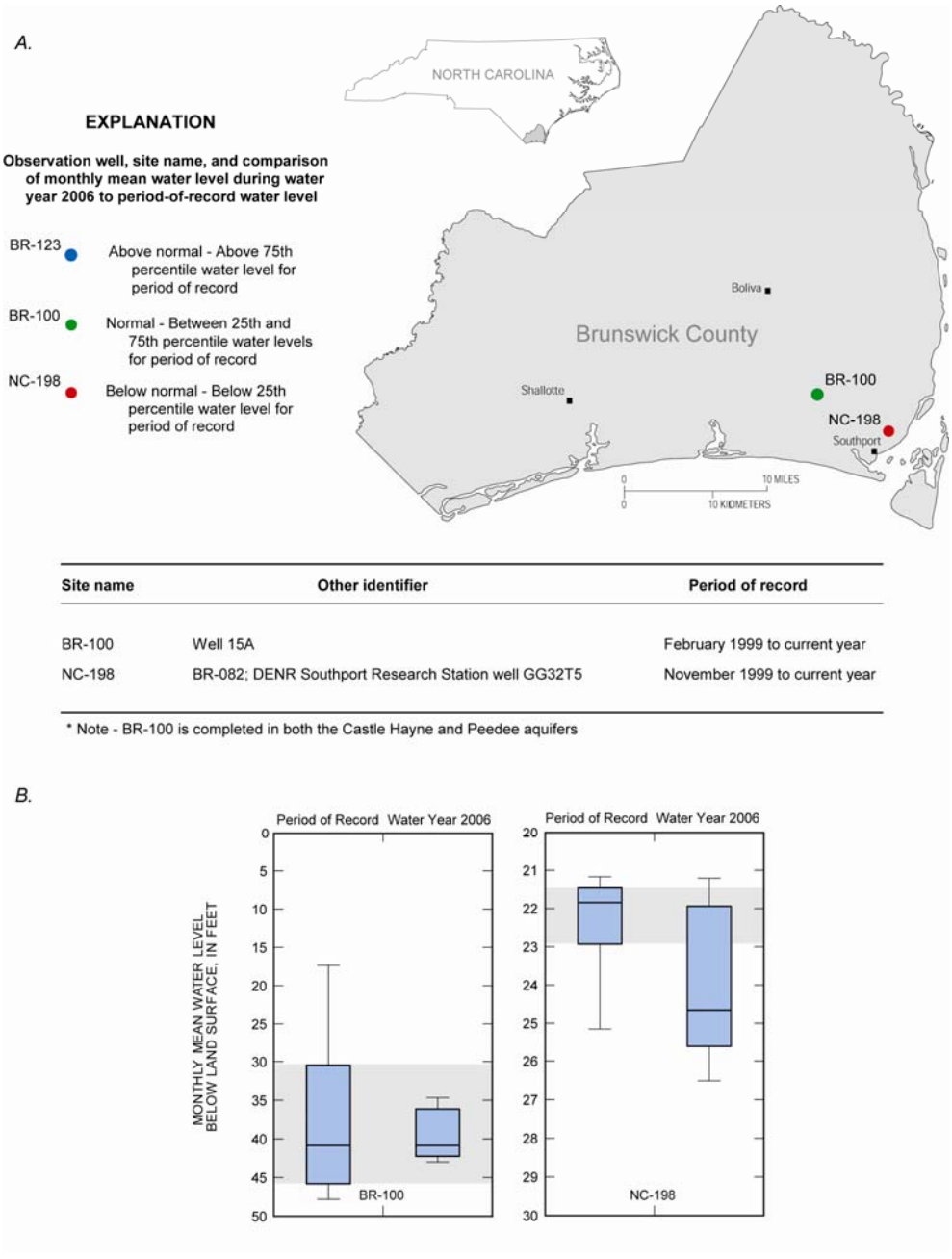
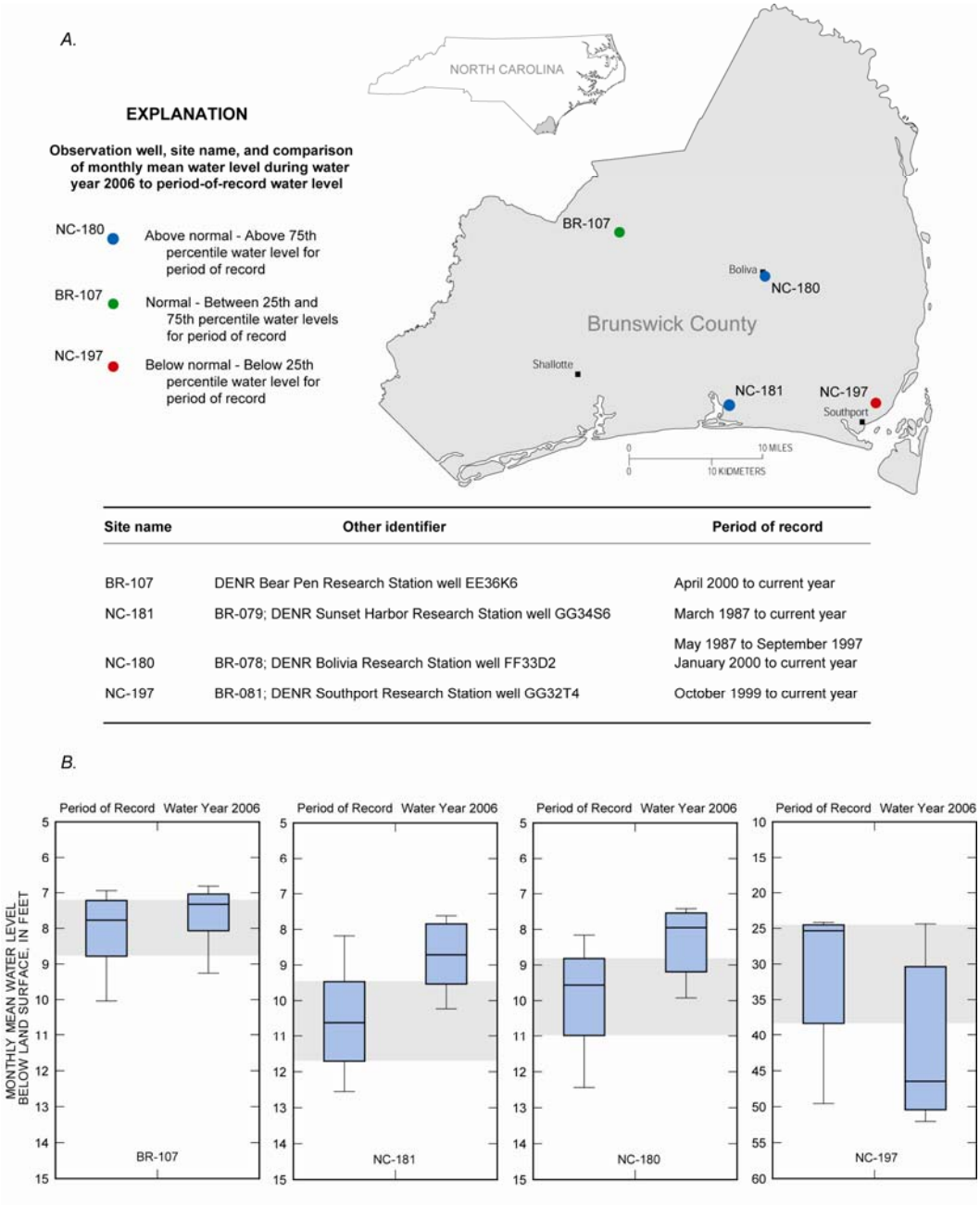


Figure 5. *(A)* Observation wells completed in the Castle Hayne aquifer, Brunswick County area (colored dots indicate locations where water levels were above, below, or normal for the surficial aquifer during water year 2006) and *(B)* box plots comparing period-of-record monthly mean water levels to water year 2006 monthly mean water levels.

Peedee Aquifer

In the Peedee aquifer during water year 2006, water levels in two of the four wells monitored were above normal, one was below normal, and one was normal (figure 6). Water levels in the Sunset Harbor (NC-181) and Bolivia (NC-180) wells were above normal. Water levels were below normal in the Southport well (NC-197). The Peedee aquifer may be pumped in localized areas throughout Brunswick County as a source of potable water.

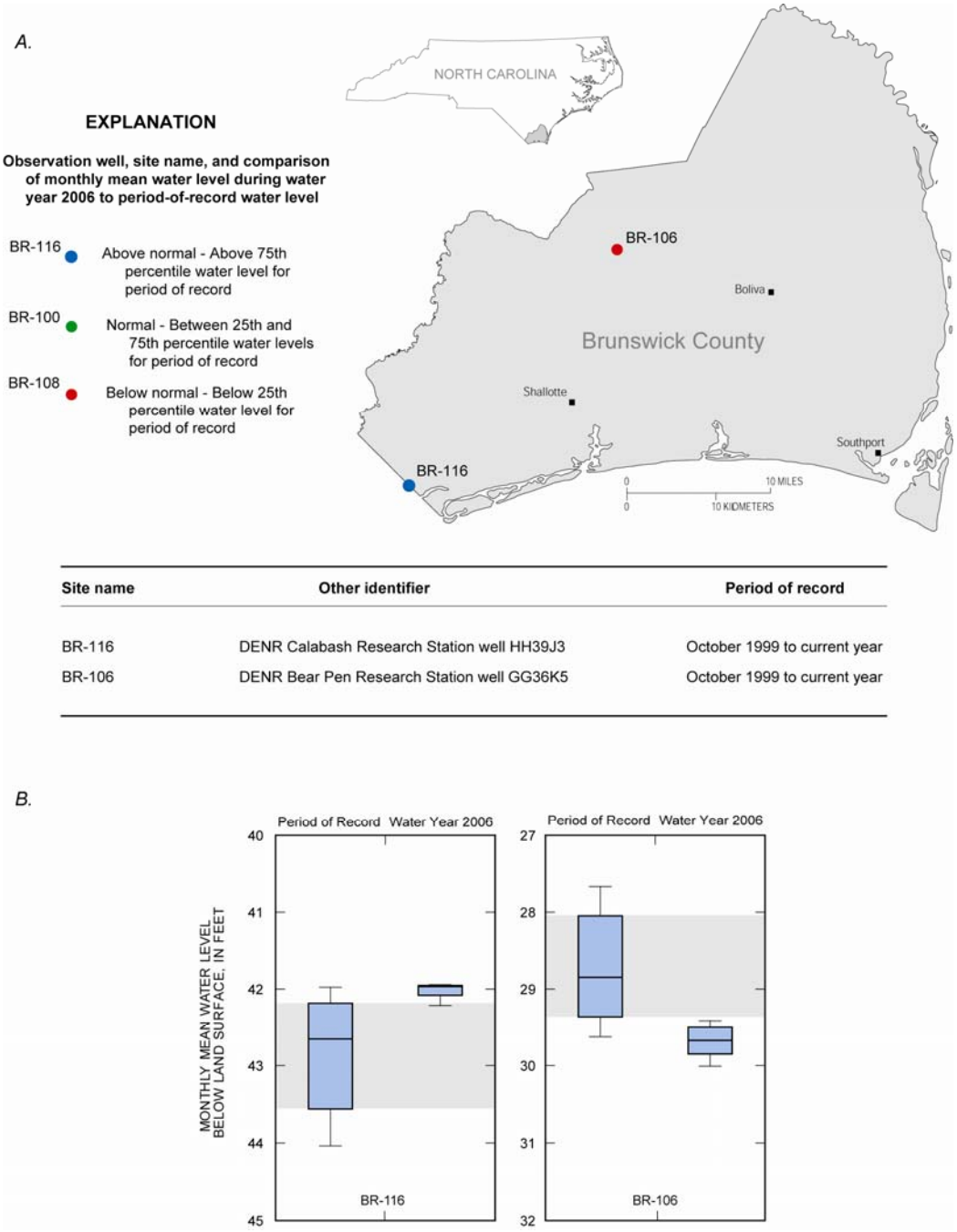


Site name	Other identifier	Period of record
BR-107	DENR Bear Pen Research Station well EE36K6	April 2000 to current year
NC-181	BR-079; DENR Sunset Harbor Research Station well GG34S6	March 1987 to current year
NC-180	BR-078; DENR Bolivia Research Station well FF33D2	May 1987 to September 1997 January 2000 to current year
NC-197	BR-081; DENR Southport Research Station well GG32T4	October 1999 to current year

Figure 6. *(A)* Observation wells completed in the Peedee aquifer, Brunswick County area (colored dots indicate locations where water levels were above, below, or normal for the surficial aquifer during water year 2006) and *(B)* box plots comparing period-of-record monthly mean water levels to water year 2006 monthly mean water levels.

Black Creek Aquifer

During water year 2006, water levels in the Black Creek aquifer were above normal at BR-116 in Calabash and below normal at BR-106 near Bear Pen (figure 7).



Site name	Other identifier	Period of record
BR-116	DENR Calabash Research Station well HH39J3	October 1999 to current year
BR-106	DENR Bear Pen Research Station well GG36K5	October 1999 to current year

Figure 7. *(A)* Observation wells completed in the Black Creek aquifer, Brunswick County area (colored dots indicate locations where water levels were above, below, or normal for the surficial aquifer during water year 2006) and *(B)* box plots comparing period-of-record monthly mean water levels to water year 2006 monthly mean water levels.

Plans for Fiscal Year 2007

During Federal fiscal year 2007 (October 1, 2006 to September 30, 2007), the USGS will continue the cooperative water-resources program for the Brunswick County area. Specific goals are:

- *Monitor ground-water levels*
    - Maintain the continuous ground-water-level monitoring program to detect changes in water levels because of pumping and climactic changes.
    - Upgrade the equipment in Well 15A to transmit water levels in near real-time.
- *Maintenance of Brunswick County area hydrologic databases*
    - Continue updating the National Water Information System database with ground-water level and well site information.
- *Publish annual summaries of local water-resources conditions*
- *Explore options for future investigations*

Options for Further Study

Future water supply and wastewater treatment/disposal are the primary issues facing Brunswick County as a by-product of population growth. The number of system users has increased, particularly in the coastal area. Brunswick County needs to understand the quantity and quality of available ground-water resources to plan future production capabilities and distribution systems. Brunswick County's last comprehensive ground-water study was completed in 2000 (Harden, et al., 2003, and Fine and Cunningham, 2001). Although a small ground-water monitoring network of 11 wells continues to provide some regional water-level information about the Surficial, Castle Hayne, Peedee, and Black Creek aquifers, there is a need to produce updated ground-water quality and availability maps for the County, particularly for the major water-supply aquifers, the Castle Hayne and Peedee.

Additionally, lateral salt-water encroachment resulting from over pumping has affected the Castle Hayne and Peedee aquifers in some areas near Brunswick County. Brunswick County is not currently pumping large amounts of ground water for potable supply; however, if rapid population growth continues, there may be a need to augment the current supply source with pumped ground water. A large increase in ground-water pumpage may result in increased saltwater encroachment and aquifer dewatering problems. There is a need to locate and monitor the existing salt-water interface in the Castle Hayne and Peedee aquifers.

References

Fine, J.M., and Cunningham, W.L, 2001, Compilation of water-resources data and hydrogeologic setting for Brunswick County, North Carolina, 1933-2000: U.S. Geological Survey Open-File Report 01-240, 141p.

Harden, S.L., Fine, J.M., and Spruill, T.B., 2003, Hydrogeology and ground-water quality of Brunswick County, North Carolina: U.S. Geological Survey Water-Resources Investigations Report 03-4051, 90p.

North Carolina State Demographics, 2006, State demographic data: accessed on December 5, 2006 at http://demog.state.nc.us/.

Ott, L. and Longnecker, M., An introduction to statistical methods and data analysis-5th ed.: Wadsworth Group, Pacific Grove California, 1152p.

Appendix A – Ground-water-level hydrographs and statistics for selected wells, water year 2006

340416078084202 Local number BR-078, DENR Bolivia Research Station well FF33d2, NC-180

Northern Atlantic Coastal Plain aquifer system
Peedee Formation

Brunswick County, NC

LOCATION.--Lat 34°04′17″, long 78°08′41″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03040207, in Bolivia at town hall on U.S. Highway 17. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 140 ft, diameter 4 in., cased to 92 ft, open hole to 140 ft.

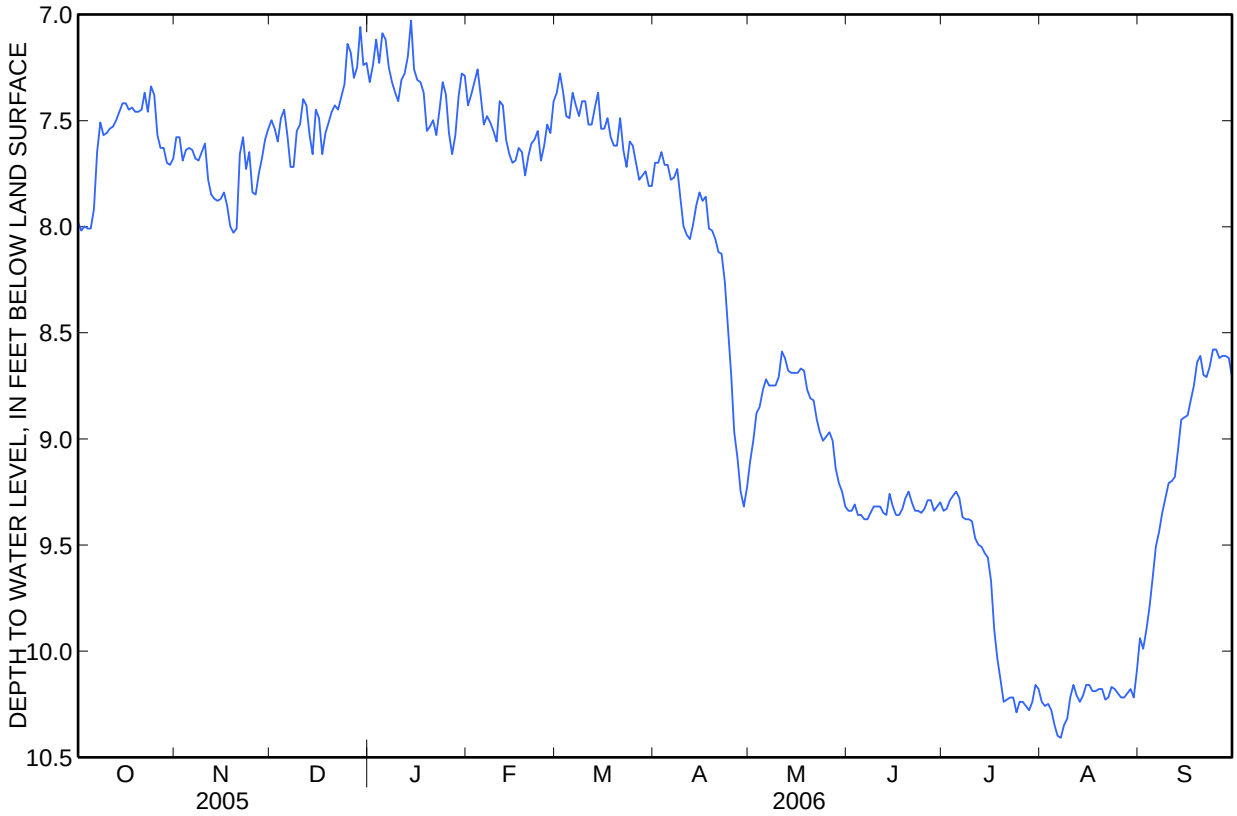
DATUM.--Land-surface datum is 40.97 ft above NGVD of 1929. Measuring point: Top of casing 0.89 ft above land-surface datum.

PERIOD OF RECORD.--April 1971 to current year. Continuous record May 1987 to September 1997, January 2000 to current year.

GAGE.--Water-level recorder collecting data at 60-minute intervals.

REMARKS.--Well is part of Brunswick County ground-water study.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft below land-surface datum, May 22, 1972; lowest water level recorded, 15.07 ft below land-surface datum, Sept. 4, 1995.



340416078084202 Local number BR-078, DENR Bolivia Research Station well FF33d2, NC-180 —Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	7.98	7.58	7.50	7.32	7.43	7.37	7.70	9.11	9.34	9.34	10.24	9.94
2	8.02	7.58	7.54	7.24	7.38	7.28	7.70	9.01	9.34	9.33	10.26	9.99
3	8.00	7.69	7.60	7.12	7.32	7.37	7.65	8.88	9.31	9.29	10.25	9.90
4	8.01	7.64	7.49	7.23	7.26	7.48	7.71	8.85	9.36	9.27	10.28	9.79
5	8.01	7.63	7.45	7.09	7.38	7.49	7.71	8.77	9.36	9.25	10.35	9.65
6	7.92	7.64	7.57	7.12	7.52	7.37	7.78	8.72	9.38	9.28	10.40	9.51
7	7.65	7.68	7.72	7.25	7.48	7.43	7.77	8.75	9.38	9.37	10.41	9.44
8	7.51	7.69	7.72	7.32	7.51	7.48	7.73	8.75	9.35	9.38	10.35	9.35
9	7.57	7.65	7.55	7.37	7.55	7.41	7.87	8.75	9.32	9.38	10.32	9.28
10	7.56	7.61	7.52	7.41	7.60	7.41	8.00	8.71	9.32	9.39	10.22	9.21
11	7.54	7.78	7.40	7.31	7.41	7.52	8.04	8.59	9.32	9.47	10.16	9.20
12	7.53	7.85	7.43	7.28	7.43	7.52	8.06	8.62	9.35	9.50	10.21	9.18
13	7.50	7.87	7.57	7.20	7.59	7.44	7.99	8.68	9.36	9.51	10.24	9.05
14	7.46	7.88	7.66	7.03	7.66	7.37	7.90	8.69	9.26	9.54	10.21	8.91
15	7.42	7.87	7.45	7.26	7.70	7.54	7.84	8.69	9.32	9.56	10.16	8.90
16	7.42	7.84	7.49	7.31	7.69	7.54	7.88	8.69	9.36	9.67	10.16	8.89
17	7.45	7.90	7.66	7.32	7.63	7.49	7.86	8.67	9.36	9.90	10.19	8.82
18	7.44	8.00	7.56	7.37	7.65	7.58	8.01	8.68	9.33	10.04	10.19	8.75
19	7.46	8.03	7.51	7.55	7.76	7.62	8.02	8.77	9.28	10.14	10.18	8.64
20	7.46	8.01	7.46	7.53	7.67	7.62	8.06	8.81	9.25	10.24	10.18	8.61
21	7.45	7.66	7.43	7.50	7.61	7.49	8.12	8.82	9.30	10.23	10.23	8.70
22	7.37	7.58	7.45	7.57	7.59	7.64	8.13	8.91	9.34	10.22	10.22	8.71
23	7.46	7.73	7.39	7.45	7.55	7.72	8.26	8.97	9.34	10.22	10.17	8.66
24	7.34	7.65	7.33	7.32	7.69	7.60	8.48	9.01	9.35	10.29	10.18	8.58
25	7.38	7.84	7.14	7.38	7.62	7.62	8.70	8.99	9.33	10.24	10.20	8.58
26	7.57	7.85	7.18	7.56	7.52	7.70	8.97	8.97	9.29	10.24	10.22	8.62
27	7.63	7.75	7.30	7.66	7.56	7.78	9.09	9.01	9.29	10.26	10.22	8.61
28	7.63	7.68	7.25	7.57	7.41	7.76	9.25	9.14	9.34	10.28	10.20	8.61
29	7.70	7.59	7.06	7.39	---	7.74	9.32	9.21	9.32	10.24	10.18	8.62
30	7.71	7.54	7.24	7.28	---	7.81	9.23	9.25	9.30	10.16	10.22	8.71
31	7.68	---	7.23	7.29	---	7.81	---	9.32	---	10.18	10.09	---
Mean	7.61	7.74	7.45	7.34	7.54	7.55	8.16	8.86	9.33	9.79	10.23	9.05
Max	8.02	8.03	7.72	7.66	7.76	7.81	9.32	9.32	9.38	10.29	10.41	9.99
Min	7.34	7.54	7.06	7.03	7.26	7.28	7.65	8.59	9.25	9.25	10.09	8.58

	Water Year 2006
Mean	8.39
High	7.03
Low	10.41

335629078115406 Local number BR-079, DENR Sunset Harbor Research Station well GG34s6, NC-181

Castle Hayne aquifer
Peedee Formation

Brunswick County, NC

LOCATION.--Lat 33°56′29″, long 78°11′56″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03040207, 1 mi north of Sunset Harbor, and 4.3 mi south of State Highway 211 on Secondary Road 1112. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 102 ft, diameter 6 in., cased to 84 ft, open hole from 84 to 102 ft.

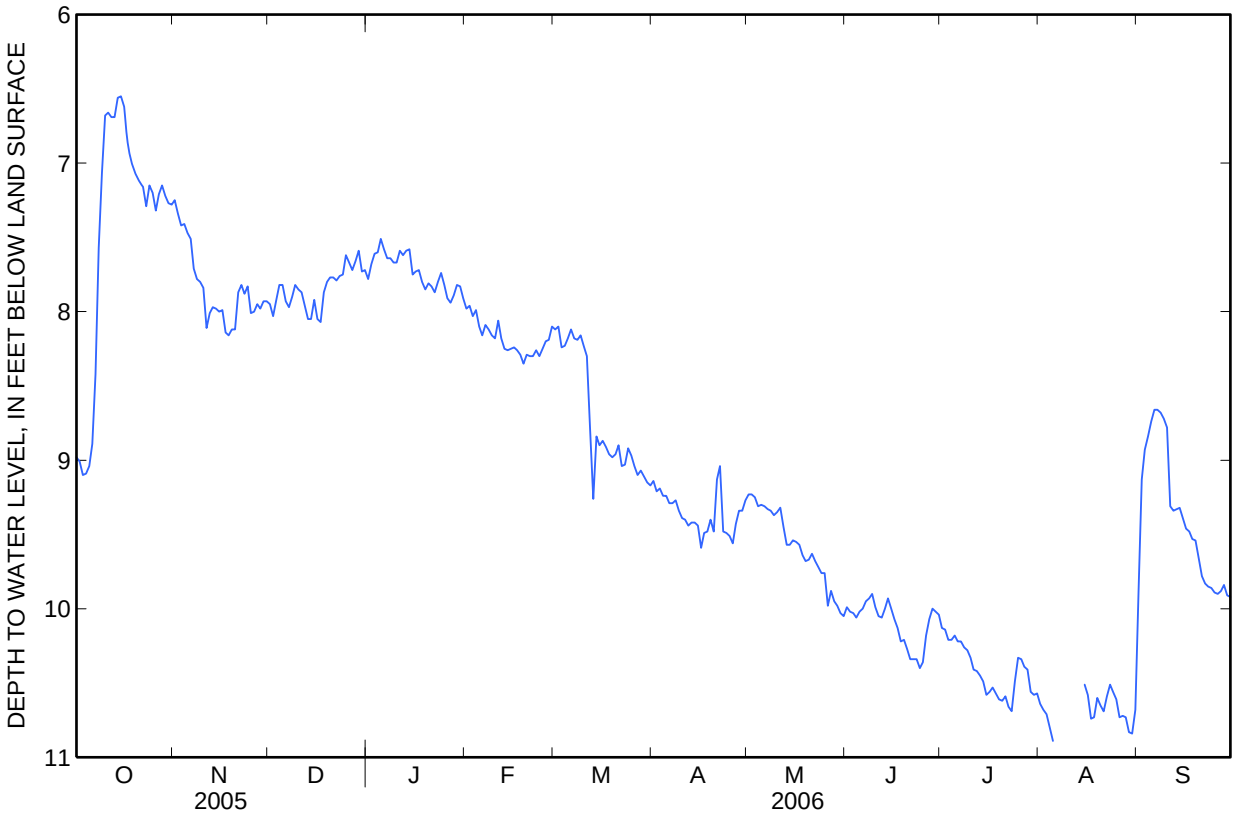
DATUM.--Land-surface datum is 28.06 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 2.02 ft above land-surface datum.

PERIOD OF RECORD.--March 1987 to current year. Records from July 1974 to March 1978 are unpublished and available in the files of the Division of Water Quality, DENR.

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of Brunswick County ground-water study. Water levels affected by localized pumping.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 4.24 ft below land-surface datum, Oct. 22, 1999; lowest water level recorded, 15.49 ft below land-surface datum, July 29, 2005.



335629078115406 Local number BR-079, DENR Sunset Harbor Research Station well GG34s6, NC-181—Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	8.98	7.25	7.95	7.78	7.98	8.12	9.14	9.23	9.99	10.13	10.64	9.88
2	9.01	7.34	8.03	7.68	7.96	8.10	9.21	9.23	10.02	10.14	10.68	9.13
3	9.10	7.42	7.92	7.61	8.03	8.24	9.19	9.25	10.03	10.21	10.71	8.93
4	9.09	7.41	7.82	7.60	7.99	8.23	9.24	9.31	10.06	10.21	10.80	8.84
5	9.04	7.47	7.82	7.51	8.10	8.18	9.24	9.30	10.02	10.18	10.89	8.74
6	8.89	7.51	7.93	7.58	8.16	8.12	9.29	9.31	10.00	10.22	---	8.66
7	8.42	7.71	7.97	7.64	8.09	8.18	9.29	9.33	9.95	10.22	---	8.66
8	7.57	7.78	7.90	7.64	8.12	8.19	9.27	9.34	9.93	10.26	---	8.68
9	7.07	7.80	7.82	7.67	8.16	8.16	9.34	9.37	9.90	10.28	---	8.72
10	6.68	7.84	7.85	7.67	8.18	8.23	9.39	9.35	9.99	10.33	---	8.78
11	6.66	8.11	7.87	7.59	8.06	8.30	9.40	9.32	10.05	10.41	---	9.31
12	6.69	8.01	7.96	7.62	8.18	8.79	9.44	9.45	10.06	10.42	---	9.34
13	6.69	7.97	8.05	7.59	8.25	9.26	9.42	9.57	10.00	10.45	---	9.33
14	6.56	7.98	8.05	7.58	8.26	8.84	9.42	9.57	9.93	10.49	---	9.32
15	6.55	8.00	7.92	7.75	8.25	8.90	9.44	9.54	10.00	10.58	10.51	9.39
16	6.62	7.99	8.05	7.73	8.24	8.87	9.59	9.55	10.07	10.56	10.58	9.46
17	6.84	8.14	8.07	7.72	8.26	8.91	9.49	9.57	10.13	10.53	10.74	9.48
18	6.96	8.16	7.87	7.80	8.29	8.96	9.48	9.64	10.22	10.57	10.73	9.53
19	7.04	8.12	7.80	7.85	8.35	8.98	9.40	9.68	10.21	10.61	10.60	9.54
20	7.09	8.12	7.77	7.81	8.29	8.96	9.48	9.67	10.27	10.62	10.65	9.66
21	7.13	7.87	7.77	7.83	8.30	8.90	9.13	9.63	10.34	10.59	10.69	9.78
22	7.16	7.82	7.79	7.87	8.30	9.04	9.04	9.68	10.34	10.66	10.59	9.83
23	7.29	7.88	7.76	7.80	8.26	9.03	9.48	9.72	10.34	10.69	10.51	9.85
24	7.15	7.83	7.75	7.74	8.30	8.92	9.49	9.76	10.40	10.49	10.56	9.86
25	7.20	8.01	7.62	7.82	8.25	8.97	9.51	9.76	10.36	10.33	10.61	9.89
26	7.32	8.00	7.67	7.91	8.20	9.04	9.56	9.98	10.18	10.34	10.73	9.90
27	7.21	7.95	7.72	7.94	8.19	9.10	9.43	9.88	10.07	10.39	10.72	9.88
28	7.15	7.98	7.66	7.89	8.10	9.07	9.34	9.95	10.00	10.41	10.73	9.84
29	7.22	7.93	7.59	7.82	---	9.11	9.34	9.98	10.02	10.56	10.83	9.91
30	7.27	7.93	7.73	7.83	---	9.15	9.27	10.03	10.04	10.58	10.84	9.92
31	7.28	---	7.72	7.91	---	9.17	---	10.05	---	10.57	10.68	---
Mean	7.45	7.84	7.85	7.73	8.18	8.71	9.36	9.58	10.10	10.42	10.68	9.40
Max	9.10	8.16	8.07	7.94	8.35	9.26	9.59	10.05	10.40	10.69	10.89	9.92
Min	6.55	7.25	7.59	7.51	7.96	8.10	9.04	9.23	9.90	10.13	10.51	8.66

	Water Year 2006
Mean	8.90
High	6.55
Low	10.89

335629078115407 Local number BR-080, DENR Sunset Harbor Research Station well GG34s7, NC-182

Surficial aquifer system
Post Miocene (Quaternary + Pliocene) Rocks

Brunswick County, NC

LOCATION.--Lat 33°56′29″, long 78°11′56″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03040207, 1 mi north of Sunset Harbor, and 4.3 mi south of State Highway 211 on Secondary Road 1112. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, drilled to 15 ft, diameter 4 in., cased to 10 ft, screened interval from 10 to 15 ft.

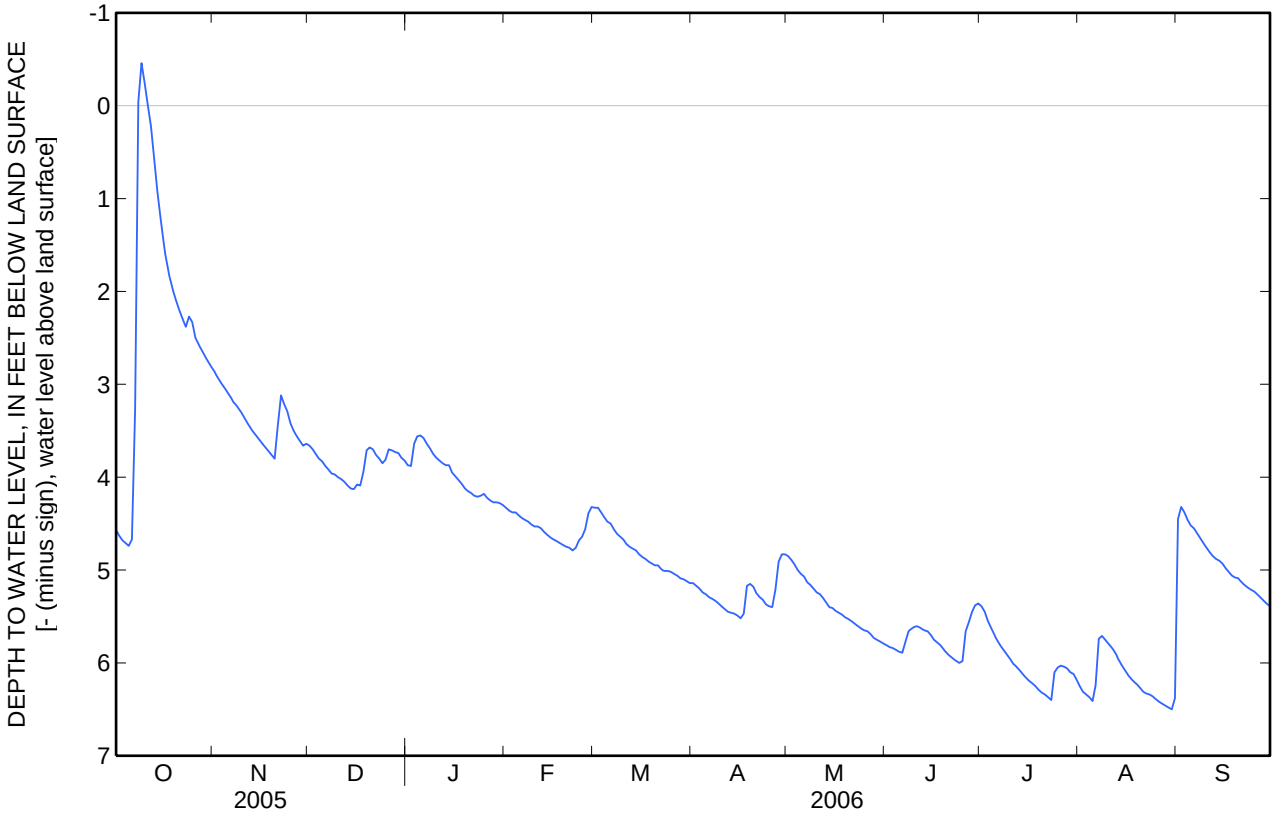
DATUM.--Land-surface datum is 28.06 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of collar on casing, 2.65 ft above land-surface datum.

PERIOD OF RECORD.--January 1987 to September 1997, October 2000 to current year.

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of Brunswick County ground-water study. Water levels may be affected by local pumping.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.63 ft above land-surface datum, Oct. 8, 2005; lowest water level recorded, 14.27 ft below land-surface datum, Oct. 31, 2003.



335629078115407 Local number BR-080, DENR Sunset Harbor Research Station well GG34s7, NC-182 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES
[- (minus sign), value is water level above land surface]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4.57	2.86	3.66	3.87	4.33	4.33	5.14	4.85	5.81	5.39	6.25	4.45
2	4.63	2.92	3.70	3.88	4.36	4.33	5.17	4.89	5.83	5.45	6.31	4.32
3	4.68	2.98	3.75	3.64	4.38	4.38	5.20	4.94	5.84	5.55	6.34	4.38
4	4.71	3.03	3.80	3.56	4.38	4.43	5.24	5.00	5.86	5.62	6.37	4.46
5	4.74	3.08	3.83	3.55	4.41	4.48	5.26	5.04	5.88	5.69	6.41	4.52
6	4.67	3.13	3.88	3.58	4.44	4.50	5.29	5.07	5.89	5.76	6.24	4.55
7	3.27	3.19	3.92	3.64	4.46	4.56	5.31	5.13	5.77	5.82	5.74	4.60
8	-0.04	3.23	3.96	3.69	4.48	4.61	5.33	5.16	5.66	5.86	5.71	4.66
9	-0.46	3.28	3.97	3.75	4.51	4.64	5.36	5.20	5.63	5.91	5.75	4.71
10	-0.24	3.33	4.00	3.79	4.53	4.67	5.39	5.24	5.61	5.96	5.79	4.76
11	-0.01	3.39	4.02	3.82	4.53	4.72	5.42	5.26	5.61	6.01	5.83	4.81
12	0.22	3.45	4.05	3.85	4.55	4.75	5.45	5.30	5.63	6.04	5.88	4.85
13	0.57	3.50	4.09	3.87	4.59	4.77	5.46	5.35	5.65	6.08	5.95	4.88
14	0.92	3.55	4.12	3.87	4.62	4.79	5.47	5.40	5.66	6.12	6.01	4.90
15	1.21	3.59	4.13	3.95	4.65	4.83	5.49	5.41	5.70	6.16	6.07	4.93
16	1.48	3.63	4.08	3.99	4.67	4.86	5.52	5.44	5.75	6.19	6.12	4.98
17	1.69	3.67	4.09	4.03	4.69	4.88	5.47	5.46	5.78	6.22	6.16	5.02
18	1.86	3.72	3.94	4.07	4.71	4.91	5.17	5.48	5.81	6.25	6.20	5.06
19	2.00	3.76	3.71	4.12	4.73	4.93	5.15	5.51	5.85	6.29	6.23	5.08
20	2.11	3.80	3.68	4.15	4.75	4.95	5.18	5.53	5.89	6.32	6.27	5.09
21	2.21	3.44	3.70	4.17	4.76	4.95	5.25	5.55	5.93	6.34	6.31	5.13
22	2.29	3.12	3.76	4.20	4.79	4.99	5.29	5.58	5.95	6.37	6.33	5.16
23	2.38	3.21	3.80	4.21	4.76	5.01	5.32	5.60	5.98	6.40	6.34	5.19
24	2.27	3.29	3.85	4.20	4.68	5.01	5.37	5.63	6.00	6.10	6.36	5.21
25	2.33	3.42	3.81	4.18	4.64	5.02	5.39	5.65	5.98	6.05	6.39	5.23
26	2.50	3.50	3.70	4.22	4.56	5.04	5.40	5.66	5.66	6.03	6.42	5.26
27	2.57	3.56	3.71	4.25	4.39	5.06	5.21	5.69	5.56	6.04	6.44	5.30
28	2.63	3.61	3.73	4.27	4.32	5.09	4.91	5.73	5.45	6.06	6.46	5.33
29	2.69	3.66	3.74	4.27	---	5.10	4.83	5.75	5.38	6.10	6.48	5.36
30	2.76	3.64	3.79	4.28	---	5.12	4.83	5.77	5.36	6.12	6.50	5.39
31	2.81	---	3.82	4.30	---	5.14	---	5.79	---	6.18	6.38	---
Mean	2.26	3.38	3.86	3.97	4.56	4.80	5.28	5.39	5.75	6.02	6.19	4.92
Max	4.74	3.80	4.13	4.30	4.79	5.14	5.52	5.79	6.00	6.40	6.50	5.39
Min	-0.46	2.86	3.66	3.55	4.32	4.33	4.83	4.85	5.36	5.39	5.71	4.32

	Water Year 2006
Mean	4.70
High	-0.46
Low	6.50

335631078003604 Local number BR-081, DENR Southport Research Station well GG32t4, NC-197

Northern Atlantic Coastal Plain aquifer system
Peedee Formation

Brunswick County, NC

LOCATION.--Lat 33°56′31″, long 78°00′35″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03030005, north of Southport, 0.45 mi northeast of Secondary Road 1526 on Secondary Road 1527. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 200 ft, diameter 6 in., cased to 93.5 ft, open hole from 93.5 to 200 ft; measured depth 199 ft, September 1997.

DATUM.--Land-surface datum is 28.08 ft above NGVD of 1929. Measuring point: Top of casing, 1.17 ft above land-surface datum.

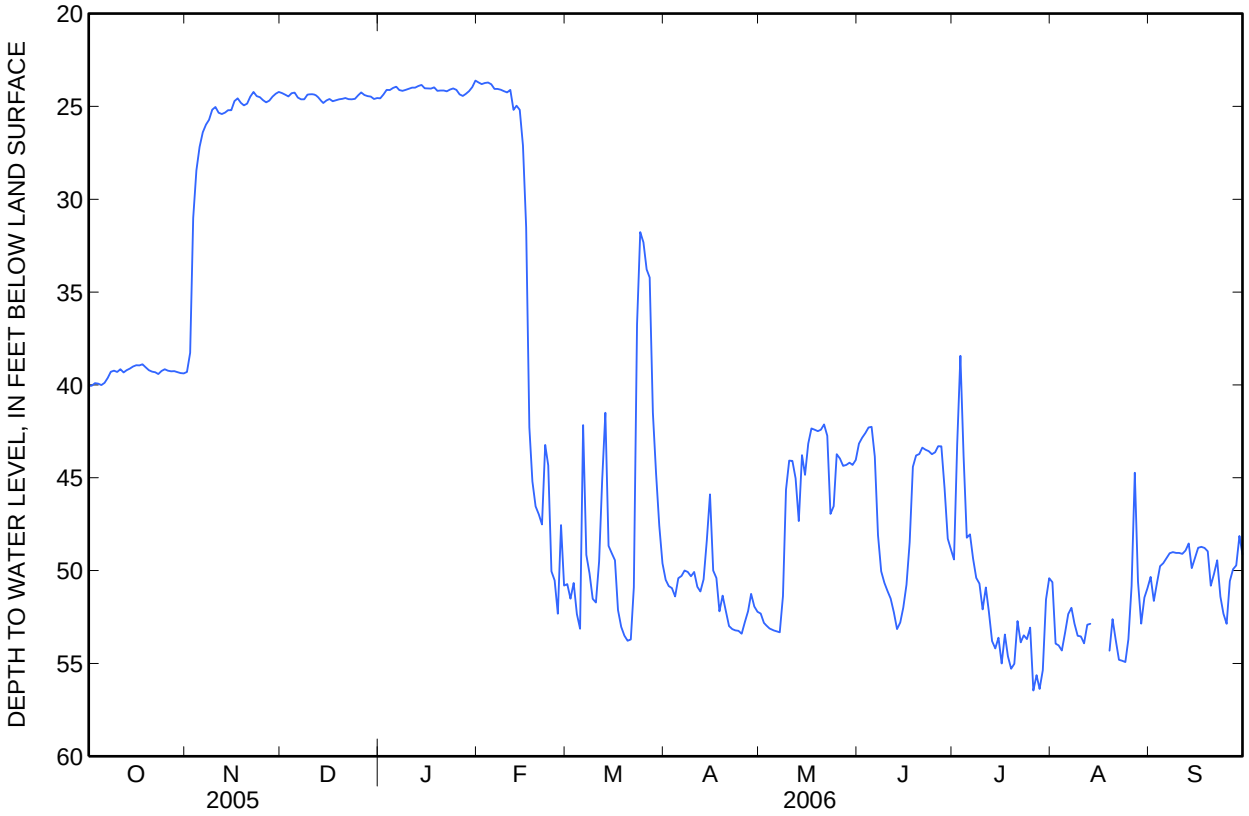
PERIOD OF RECORD.--January 1970 to current year. Continuous record began October 1999.

REVISED RECORDS.--WDR NC-04-2: 2002

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of areal-effects network. Water levels affected by localized pumping since Dec. 2002.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.28 ft below land-surface datum, Mar. 8, 1988; lowest water level recorded, 58.39 ft below land-surface datum, Jan. 28, 2005.



335631078003604 Local number BR-081, DENR Southport Research Station well GG32t4, NC-197 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	40.05	39.30	24.28	24.57	23.71	50.73	50.49	52.31	43.16	49.40	50.62	50.34
2	40.04	38.27	24.37	24.36	23.80	51.51	50.83	52.81	42.84	43.18	53.93	51.63
3	39.90	31.01	24.46	24.11	23.74	50.67	50.94	52.99	42.59	38.43	54.03	50.65
4	39.93	28.44	24.29	24.12	23.71	52.34	51.39	53.14	42.29	43.85	54.30	49.76
5	40.01	27.18	24.26	24.01	23.81	53.13	50.41	53.21	42.26	48.23	53.35	49.60
6	39.89	26.39	24.52	23.94	24.06	42.16	50.29	53.27	43.86	48.05	52.34	49.33
7	39.62	25.98	24.62	24.12	24.06	49.15	49.99	53.32	48.09	49.34	52.00	49.06
8	39.29	25.72	24.62	24.16	24.10	50.15	50.07	51.37	50.04	50.39	52.85	49.00
9	39.23	25.18	24.37	24.11	24.18	51.52	50.30	45.64	50.66	50.70	53.51	49.05
10	39.30	25.03	24.34	24.05	24.25	51.72	50.07	44.07	51.09	52.09	53.54	49.05
11	39.15	25.34	24.36	23.99	24.11	49.49	50.87	44.09	51.50	50.91	53.91	49.10
12	39.33	25.41	24.44	23.99	25.19	45.15	51.12	45.03	52.24	52.22	52.91	48.92
13	39.21	25.33	24.64	23.90	24.96	41.50	50.47	47.33	53.15	53.79	52.86	48.54
14	39.12	25.20	24.82	23.84	25.19	48.67	48.38	43.78	52.79	54.19	---	49.86
15	39.01	25.20	24.68	24.02	27.11	49.06	45.89	44.84	51.99	53.61	---	49.32
16	38.94	24.71	24.60	24.03	31.51	49.44	49.99	43.16	50.76	55.00	---	48.77
17	38.95	24.57	24.72	24.04	42.28	52.12	50.40	42.34	48.47	53.44	---	48.72
18	38.89	24.81	24.67	23.97	45.19	53.03	52.19	42.41	44.41	54.61	---	48.78
19	39.05	24.95	24.62	24.16	46.54	53.50	51.35	42.49	43.80	55.28	54.31	48.96
20	39.21	24.85	24.59	24.14	46.97	53.78	52.17	42.41	43.72	55.02	52.61	50.81
21	39.28	24.47	24.55	24.14	47.51	53.71	52.98	42.13	43.38	52.72	53.74	50.17
22	39.32	24.22	24.61	24.19	43.23	50.90	53.15	42.74	43.49	53.86	54.80	49.44
23	39.41	24.45	24.62	24.09	44.33	36.74	53.22	46.94	43.57	53.48	54.85	51.40
24	39.25	24.51	24.59	24.03	50.04	31.77	53.24	46.53	43.73	53.69	54.92	52.32
25	39.15	24.66	24.40	24.11	50.53	32.32	53.40	43.73	43.63	53.07	53.69	52.86
26	39.23	24.78	24.25	24.35	52.32	33.78	52.77	43.96	43.30	56.46	50.82	50.56
27	39.27	24.69	24.39	24.44	47.55	34.22	52.18	44.36	43.31	55.63	44.73	49.92
28	39.26	24.47	24.45	24.33	50.80	41.50	51.25	44.31	45.56	56.37	50.59	49.72
29	39.31	24.32	24.47	24.18	---	44.78	51.93	44.19	48.28	55.36	52.85	48.13
30	39.36	24.22	24.60	23.96	---	47.58	52.22	44.31	48.86	51.55	51.45	49.12
31	39.38	---	24.55	23.61	---	49.61	---	44.04	---	50.41	50.95	---
Mean	39.37	26.26	24.51	24.10	34.46	46.96	51.13	46.36	46.56	51.75	52.71	49.76
Max	40.05	39.30	24.82	24.57	52.32	53.78	53.40	53.32	53.15	56.46	54.92	52.86
Min	38.89	24.22	24.25	23.61	23.71	31.77	45.89	42.13	42.26	38.43	44.73	48.13

	Water Year 2006
Mean	41.03
High	23.61
Low	56.46

335631078003605 Local number BR-082, DENR Southport Research Station well GG32t5, NC-198

Castle Hayne aquifer
Castle Hayne Limestone

Brunswick County, NC

LOCATION.--Lat 33°56′31″, long 78°00′35″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03030005, north of Southport, 0.45 miles northeast of Secondary Road 1526 on Secondary Road 1527. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 74 ft, diameter 4 in., cased to 64 ft, screened from 64 to 74 ft; measured depth 72.0 ft, September 1997.

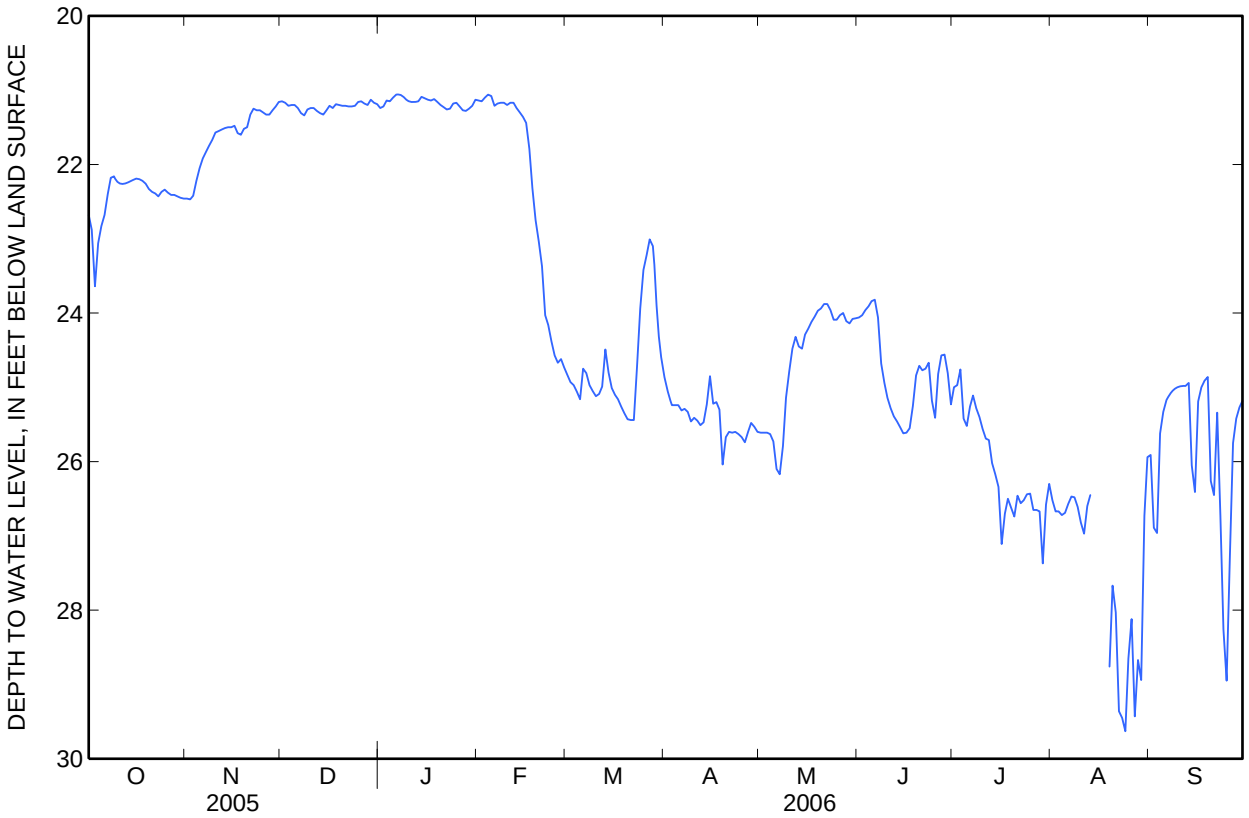
DATUM.--Land-surface datum is 28.26 ft above NGVD of 1929. Measuring point: Top of casing, 2.20 ft above land-surface datum.

PERIOD OF RECORD.--January 1970 to current year. Continuous record began November 1999.

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at site.

REMARKS.--Well is part of induced-effects network. Water levels affected by localized pumping.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 20.68 ft below land-surface datum, Nov. 11 1999; lowest water level measured, 30.64 ft below land-surface datum, Sept. 25, 2006.



335631078003605 Local number BR-082, DENR Southport Research Station well GG32t5, NC-198 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	22.68	22.46	21.15	21.24	21.14	24.83	24.94	25.61	24.06	25.00	26.52	25.91
2	22.88	22.47	21.17	21.22	21.15	24.93	25.11	25.61	24.03	24.97	26.67	26.89
3	23.64	22.42	21.21	21.14	21.10	24.97	25.24	25.61	23.96	24.76	26.67	26.96
4	23.06	22.22	21.20	21.15	21.06	25.06	25.24	25.63	23.91	25.42	26.72	25.62
5	22.83	22.05	21.20	21.10	21.08	25.16	25.24	25.73	23.84	25.52	26.69	25.33
6	22.68	21.92	21.24	21.06	21.21	24.75	25.31	26.10	23.82	25.26	26.57	25.17
7	22.40	21.83	21.31	21.06	21.18	24.81	25.29	26.17	24.06	25.11	26.47	25.10
8	22.18	21.75	21.34	21.08	21.17	24.97	25.33	25.79	24.68	25.28	26.48	25.04
9	22.16	21.67	21.26	21.12	21.17	25.05	25.46	25.14	24.94	25.40	26.61	25.01
10	22.23	21.57	21.24	21.15	21.20	25.12	25.41	24.79	25.14	25.56	26.82	24.99
11	22.26	21.55	21.24	21.16	21.17	25.09	25.45	24.48	25.28	25.69	26.97	24.98
12	22.26	21.53	21.28	21.16	21.17	24.99	25.51	24.32	25.39	25.71	26.60	24.98
13	22.25	21.51	21.31	21.15	21.24	24.49	25.47	24.45	25.46	26.02	26.45	24.94
14	22.23	21.50	21.33	21.09	21.30	24.80	25.23	24.48	25.54	26.17	---	26.05
15	22.21	21.50	21.27	21.11	21.36	25.01	24.85	24.29	25.62	26.34	---	26.41
16	22.19	21.48	21.21	21.13	21.44	25.10	25.22	24.21	25.61	27.11	---	25.19
17	22.20	21.58	21.24	21.14	21.79	25.16	25.20	24.12	25.55	26.70	---	25.00
18	22.22	21.60	21.19	21.12	22.32	25.26	25.30	24.05	25.25	26.50	---	24.91
19	22.26	21.52	21.20	21.16	22.75	25.35	26.04	23.97	24.84	26.62	28.76	24.86
20	22.33	21.50	21.21	21.20	23.04	25.43	25.67	23.94	24.71	26.74	27.67	26.26
21	22.37	21.33	21.21	21.23	23.37	25.44	25.60	23.88	24.77	26.46	28.03	26.45
22	22.39	21.25	21.22	21.26	24.03	25.44	25.61	23.88	24.75	26.56	29.36	25.34
23	22.43	21.27	21.22	21.25	24.16	24.72	25.60	23.96	24.67	26.52	29.45	26.73
24	22.37	21.27	21.21	21.18	24.38	23.94	25.63	24.09	25.18	26.44	29.63	28.26
25	22.34	21.30	21.16	21.17	24.57	23.42	25.67	24.09	25.41	26.43	28.65	28.95
26	22.38	21.33	21.15	21.22	24.67	23.22	25.74	24.03	24.82	26.65	28.12	27.30
27	22.41	21.33	21.18	21.27	24.62	23.01	25.60	24.00	24.57	26.65	29.43	25.75
28	22.41	21.27	21.20	21.28	24.73	23.10	25.48	24.11	24.56	26.67	28.67	25.42
29	22.43	21.22	21.13	21.25	---	23.80	25.53	24.14	24.81	27.37	28.94	25.27
30	22.45	21.16	21.17	21.21	---	24.35	25.60	24.08	25.23	26.58	26.73	25.18
31	22.46	---	21.19	21.13	---	24.71	---	24.07	---	26.30	25.94	---
Mean	22.44	21.61	21.22	21.17	22.27	24.69	25.42	24.61	24.82	26.08	27.52	25.81
Max	23.64	22.47	21.34	21.28	24.73	25.44	26.04	26.17	25.62	27.37	29.63	28.95
Min	22.16	21.16	21.13	21.06	21.06	23.01	24.85	23.88	23.82	24.76	25.94	24.86

	Water Year 2006
Mean	23.93
High	21.06
Low	29.63

335631078003606 Local number BR-083, DENR Southport Research Station well GG32t6, NC-199

Surficial aquifer system
Post Miocene (Quaternary + Pliocene) Rocks

Brunswick County, NC

LOCATION.--Lat 33°56′31″, long 78°00′35″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03030005, north of Southport, 0.45 mi northeast of Secondary Road 1526 on Secondary Road 1527. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 21 ft, diameter 4 in., cased to 11 ft, screened from 11 to 21 ft.

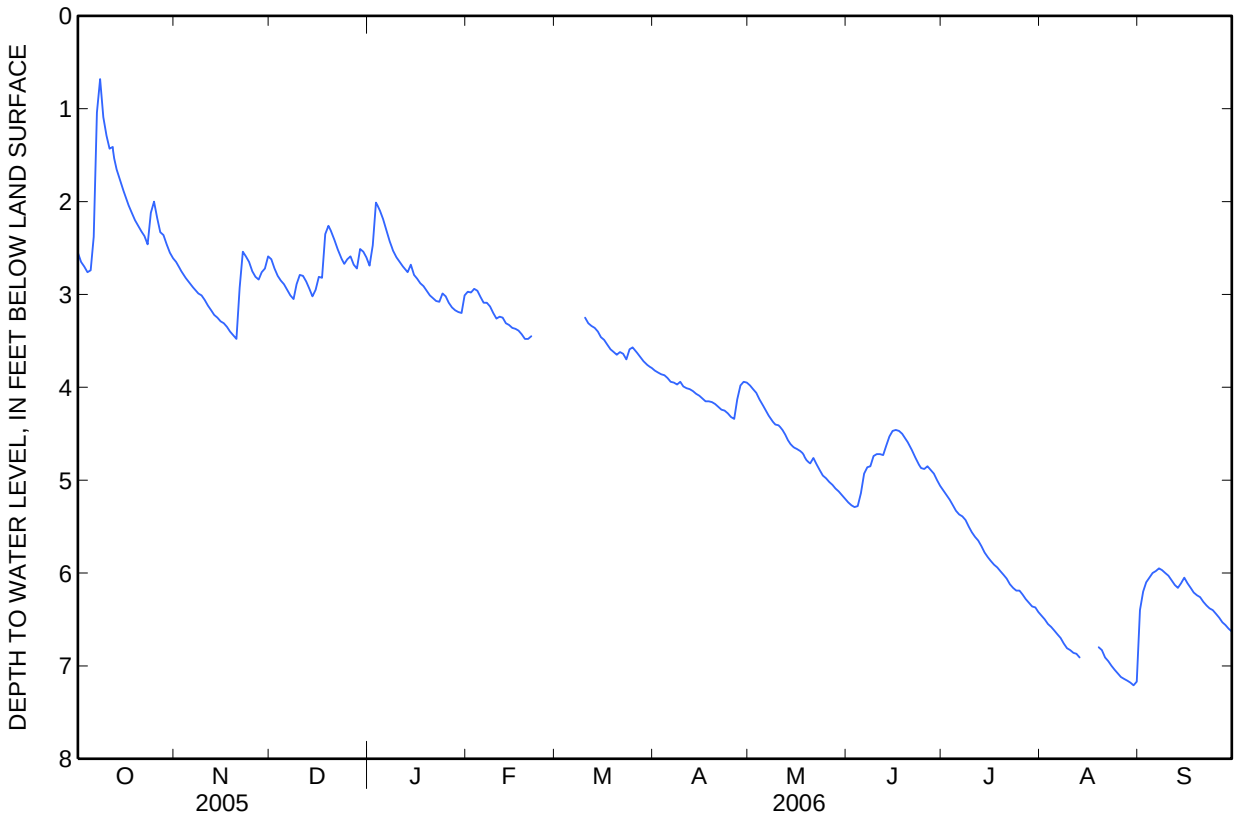
DATUM.--Land-surface datum is 28.00 ft above NGVD of 1929. Measuring point: Top of instrument shelf, 1.27 ft above land-surface datum.

PERIOD OF RECORD.--January 1970 to current year. Continuous record began October 1997.

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of local-effects network.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.13 ft below land-surface datum, Sept. 16, 1999; lowest water level measured, 11.36 ft below land-surface datum, Oct. 10, 1977.



335631078003606 Local number BR-083, DENR Southport Research Station well GG32t6, NC-199 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.55	2.65	2.62	2.69	2.97	---	3.82	3.98	5.24	5.11	6.46	6.40
2	2.65	2.71	2.72	2.47	2.98	---	3.84	4.02	5.27	5.16	6.50	6.20
3	2.70	2.77	2.80	2.01	2.94	---	3.86	4.06	5.29	5.21	6.55	6.10
4	2.76	2.82	2.85	2.08	2.96	---	3.87	4.13	5.28	5.27	6.58	6.05
5	2.74	2.87	2.89	2.16	3.03	---	3.90	4.19	5.14	5.33	6.62	6.00
6	2.38	2.91	2.95	2.27	3.09	---	3.94	4.25	4.93	5.37	6.66	5.98
7	1.04	2.95	3.01	2.39	3.09	---	3.95	4.31	4.86	5.39	6.70	5.95
8	0.68	2.99	3.05	2.49	3.13	---	3.97	4.36	4.85	5.43	6.76	5.97
9	1.09	3.01	2.89	2.57	3.20	---	3.94	4.40	4.74	5.50	6.81	6.00
10	1.29	3.06	2.79	2.63	3.26	3.25	3.99	4.41	4.72	5.56	6.83	6.03
11	1.43	3.12	2.80	2.67	3.24	3.31	4.01	4.45	4.72	5.61	6.86	6.08
12	1.41	3.17	2.86	2.72	3.25	3.34	4.02	4.50	4.73	5.65	6.87	6.13
13	1.62	3.22	2.94	2.76	3.31	3.36	4.04	4.57	4.63	5.71	6.91	6.16
14	1.75	3.25	3.02	2.68	3.33	3.40	4.07	4.62	4.53	5.78	---	6.11
15	1.84	3.29	2.95	2.79	3.36	3.46	4.09	4.65	4.47	5.83	---	6.05
16	1.95	3.31	2.81	2.83	3.37	3.49	4.12	4.67	4.46	5.87	---	6.11
17	2.04	3.35	2.82	2.88	3.39	3.54	4.15	4.69	4.47	5.91	---	6.16
18	2.12	3.40	2.35	2.91	3.43	3.59	4.15	4.73	4.50	5.94	---	6.21
19	2.20	3.44	2.26	2.96	3.48	3.62	4.16	4.79	4.55	5.98	6.80	6.24
20	2.26	3.48	2.33	3.01	3.48	3.65	4.18	4.82	4.61	6.02	6.83	6.26
21	2.32	2.93	2.42	3.04	3.45	3.62	4.21	4.76	4.67	6.06	6.91	6.31
22	2.37	2.54	2.52	3.07	---	3.64	4.24	4.83	4.74	6.12	6.95	6.35
23	2.46	2.59	2.60	3.08	---	3.70	4.25	4.89	4.82	6.16	7.00	6.38
24	2.12	2.65	2.67	2.99	---	3.59	4.28	4.95	4.87	6.19	7.04	6.40
25	2.00	2.75	2.62	3.02	---	3.57	4.32	4.98	4.88	6.19	7.08	6.44
26	2.18	2.81	2.59	3.09	---	3.61	4.34	5.02	4.85	6.23	7.12	6.48
27	2.33	2.84	2.68	3.14	---	3.66	4.13	5.05	4.89	6.28	7.14	6.53
28	2.36	2.76	2.72	3.17	---	3.70	3.98	5.09	4.93	6.32	7.16	6.56
29	2.46	2.72	2.51	3.19	---	3.74	3.94	5.12	5.00	6.36	7.18	6.60
30	2.55	2.59	2.54	3.20	---	3.77	3.95	5.16	5.06	6.37	7.21	6.63
31	2.61	---	2.60	3.01	---	3.79	---	5.20	---	6.42	7.17	---
Mean	2.07	2.96	2.72	2.77	3.23	3.56	4.06	4.63	4.82	5.82	6.87	6.23
Max	2.76	3.48	3.05	3.20	3.48	3.79	4.34	5.20	5.29	6.42	7.21	6.63
Min	0.68	2.54	2.26	2.01	2.94	3.25	3.82	3.98	4.46	5.11	6.46	5.95

	Water Year 2006
Mean	4.14
High	0.68
Low	7.21

335849078054301 Local number BR-100; Well 15A.

Castle Hayne aquifer
Castle Hayne Limestone

Brunswick County, NC

LOCATION.--Lat 33°58′49″, long 78°05′43″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03030005, west of Southport on State Highway 211, 1.82 mi northwest of intersection with State Highway 133. Owner: Brunswick County.

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 158.3 ft, diameter 6 in.; cased to 60 ft, open hole from 60 ft to 158.3 ft.

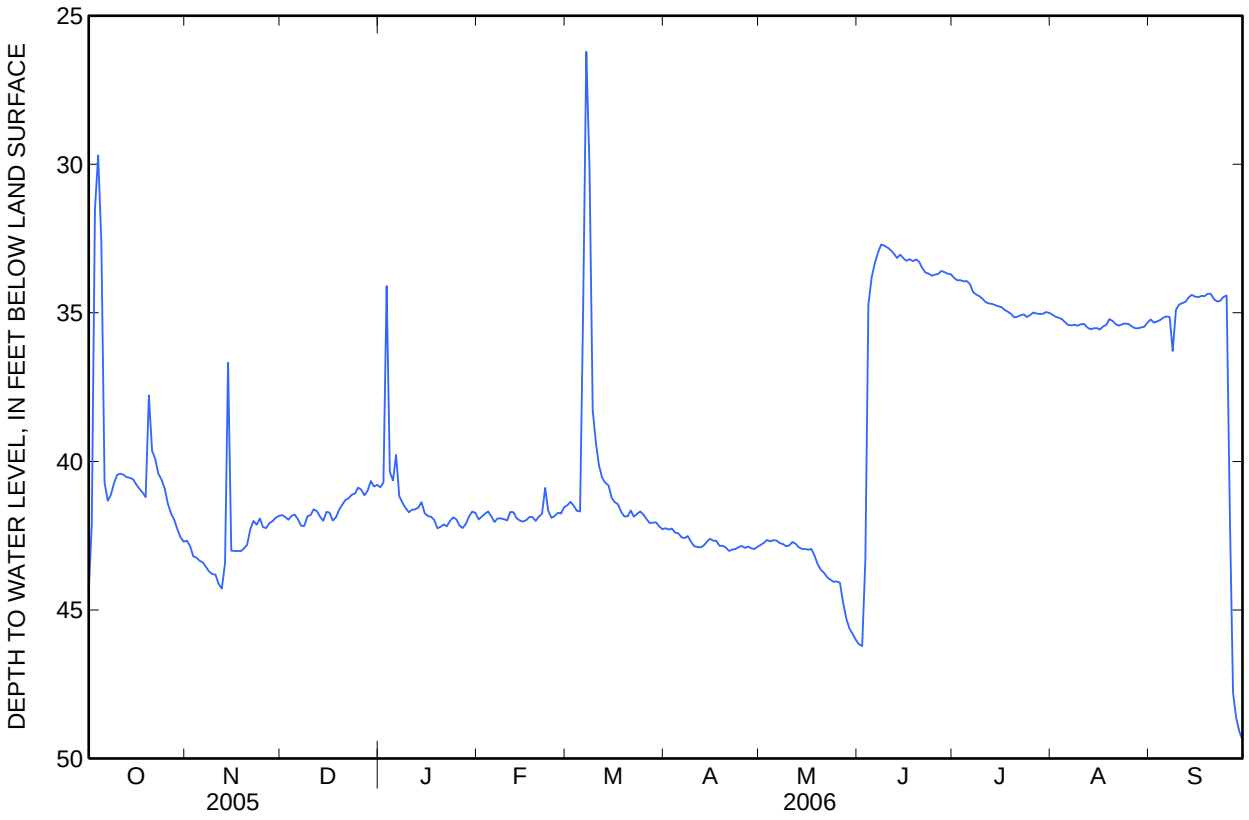
DATUM.--Land-surface datum is 56 ft above NGVD of 1929 (from topographic map). Measuring point: Top of instrument shelf, 2.42 ft above land-surface datum.

PERIOD OF RECORD.--February 1999 to current year.

GAGE.--Water-level recorder collecting data at 15-minute intervals.

REMARKS.--Water levels are affected by nearby pumping of Brunswick County Water Supply Well 15. Well is part of the Brunswick County ground-water study.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.30 ft below land-surface datum, Apr. 1, 2000; lowest water level recorded, 51.04 ft below land-surface datum, Aug. 8, 9, 2004.



335849078054301 Local number BR-100; Well 15A – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	44.36	42.67	41.80	40.87	41.95	41.48	42.25	42.81	46.15	33.82	35.06	35.22
2	42.14	42.85	41.87	40.71	41.86	41.36	42.29	42.74	46.21	33.90	35.13	35.33
3	31.51	43.19	41.96	34.10	41.76	41.49	42.26	42.64	43.33	33.90	35.16	35.29
4	29.70	43.24	41.83	40.35	41.68	41.66	42.39	42.69	34.73	33.94	35.21	35.24
5	32.62	43.34	41.79	40.64	41.85	41.68	42.42	42.65	33.82	33.93	35.31	35.16
6	40.71	43.40	41.94	39.78	42.04	34.93	42.55	42.66	33.33	34.03	35.41	35.12
7	41.32	43.55	42.16	41.17	41.92	26.21	42.58	42.75	32.97	34.30	35.42	35.14
8	41.13	43.70	42.17	41.39	41.92	30.12	42.51	42.78	32.70	34.38	35.40	36.28
9	40.73	43.79	41.85	41.57	41.94	38.28	42.70	42.85	32.74	34.44	35.43	34.90
10	40.45	43.81	41.80	41.71	41.99	39.37	42.85	42.83	32.81	34.53	35.38	34.72
11	40.41	44.12	41.61	41.63	41.70	40.13	42.88	42.71	32.88	34.64	35.37	34.67
12	40.45	44.28	41.67	41.61	41.71	40.55	42.89	42.77	33.01	34.68	35.49	34.63
13	40.53	43.42	41.86	41.55	41.91	40.72	42.83	42.89	33.15	34.70	35.55	34.48
14	40.55	36.68	42.00	41.37	41.99	40.81	42.71	42.94	33.04	34.74	35.52	34.39
15	40.60	43.00	41.70	41.74	42.02	41.23	42.60	42.95	33.16	34.78	35.51	34.45
16	40.77	43.01	41.72	41.84	41.98	41.37	42.67	42.97	33.25	34.81	35.56	34.47
17	40.92	43.01	41.99	41.86	41.87	41.44	42.67	42.95	33.19	34.90	35.46	34.43
18	41.04	43.02	41.88	41.96	41.87	41.70	42.84	43.18	33.26	34.96	35.41	34.44
19	41.20	42.93	41.63	42.25	42.00	41.85	42.84	43.46	33.20	35.04	35.21	34.36
20	37.78	42.80	41.45	42.20	41.86	41.85	42.90	43.65	33.28	35.15	35.27	34.36
21	39.64	42.28	41.30	42.12	41.76	41.65	43.01	43.75	33.49	35.13	35.38	34.54
22	39.92	42.00	41.24	42.18	40.89	41.86	42.97	43.90	33.64	35.08	35.43	34.62
23	40.41	42.13	41.12	42.00	41.66	41.76	42.95	43.98	33.68	35.05	35.38	34.59
24	40.61	41.92	41.08	41.88	41.90	41.68	42.89	44.05	33.75	35.14	35.36	34.46
25	40.91	42.21	40.88	41.95	41.84	41.79	42.84	44.04	33.71	35.07	35.37	34.42
26	41.43	42.24	40.95	42.16	41.73	41.94	42.91	44.08	33.69	34.99	35.45	41.74
27	41.75	42.08	41.14	42.24	41.75	42.07	42.86	44.75	33.59	35.02	35.51	47.79
28	41.97	42.01	40.99	42.10	41.54	42.06	42.92	45.29	33.63	35.04	35.52	48.64
29	42.28	41.89	40.66	41.85	---	42.05	42.95	45.63	33.68	35.03	35.49	49.10
30	42.56	41.84	40.84	41.69	---	42.19	42.87	45.80	33.70	34.97	35.47	49.37
31	42.70	---	40.79	41.73	---	42.28	---	46.00	---	35.00	35.33	---
Mean	40.10	42.68	41.54	41.36	41.82	40.31	42.73	43.52	34.56	34.68	35.39	36.88
Max	44.36	44.28	42.17	42.25	42.04	42.28	43.01	46.00	46.21	35.15	35.56	49.37
Min	29.70	36.68	40.66	34.10	40.89	26.21	42.25	42.64	32.70	33.82	35.06	34.36

	Water Year 2006
Mean	39.62
High	26.21
Low	49.37

340743078202002 Local number BR-106; DENR Bear Pen Research Station well EE36k5

Northern Atlantic Coastal Plain aquifer system
Black Creek Formation

Brunswick County, NC

LOCATION.--Lat 34°07′43″, long 78°20′20″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03040206, 9 mi north of Supply on Federal Road, near North Carolina Forest Service airstrip. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 654 ft, diameter 2.5 in.; cased to 644 ft, screened interval from 644 to 654 ft.

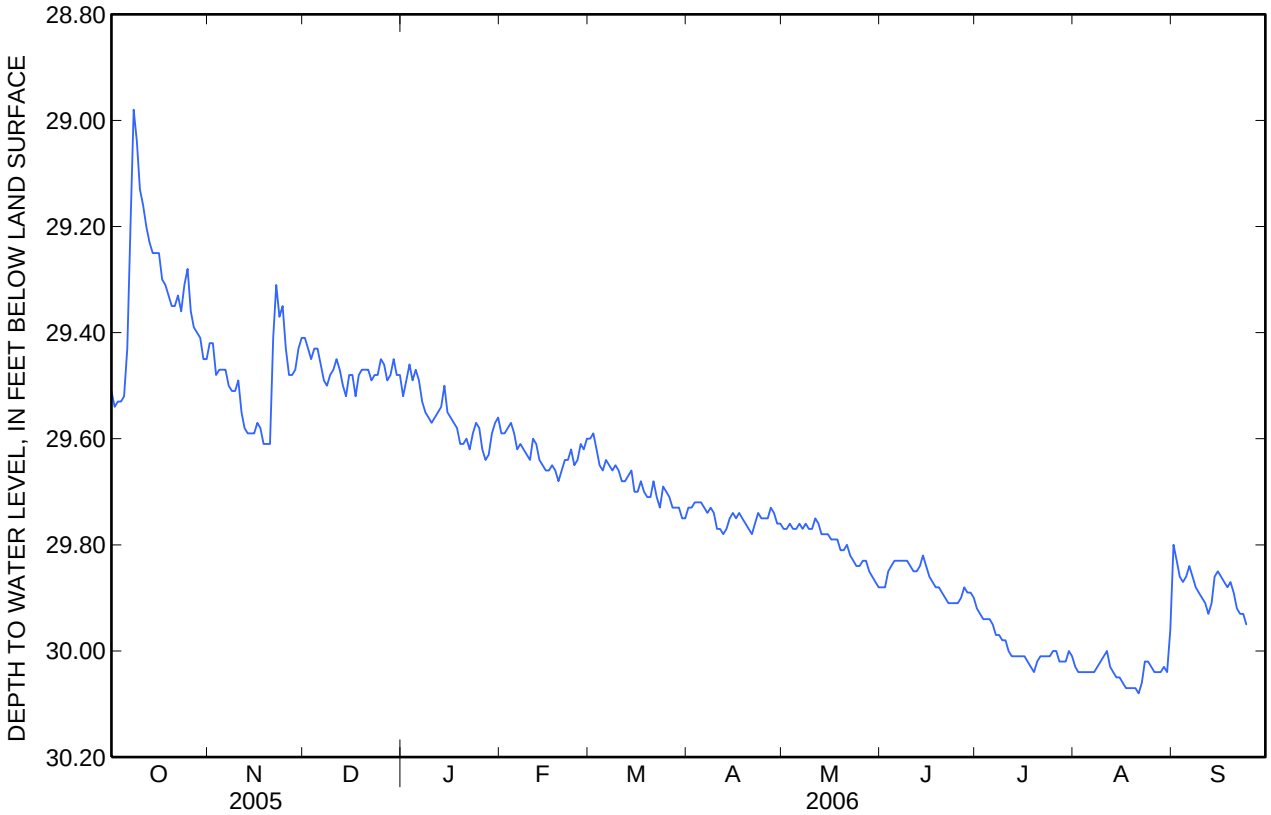
DATUM.--Land-surface datum is 61.50 ft above NGVD of 1929. Measuring point: Top of casing, 3.56 ft above land-surface datum.

PERIOD OF RECORD.--January 1974 to current year. Continuous record began October 1999.

GAGE.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of Brunswick County ground-water study.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft below land-surface datum, July 9, 1975; lowest water level recorded, 30.09 ft below land-surface datum, Aug. 21, 2006.



340743078202002 Local number BR-106; DENR Bear Pen Research Station well EE36k5 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	29.51	29.42	29.41	29.52	29.59	29.60	29.73	29.77	29.88	29.92	30.03	29.80
2	29.54	29.42	29.43	29.49	29.59	29.59	29.73	29.77	29.88	29.93	30.04	29.83
3	29.53	29.48	29.45	29.46	29.58	29.62	29.72	29.76	29.85	29.94	30.04	29.86
4	29.53	29.47	29.43	29.49	29.57	29.65	29.72	29.77	29.84	29.94	30.04	29.87
5	29.52	29.47	29.43	29.47	29.59	29.66	29.72	29.77	29.83	29.94	30.04	29.86
6	29.43	29.47	29.46	29.49	29.62	29.64	29.73	29.76	29.83	29.95	30.04	29.84
7	29.20	29.50	29.49	29.53	29.61	29.65	29.74	29.77	29.83	29.97	30.04	29.86
8	28.98	29.51	29.50	29.55	29.62	29.66	29.73	29.76	29.83	29.97	30.03	29.88
9	29.04	29.51	29.48	29.56	29.63	29.65	29.74	29.77	29.83	29.98	30.02	29.89
10	29.13	29.49	29.47	29.57	29.64	29.66	29.77	29.77	29.84	29.98	30.01	29.90
11	29.16	29.55	29.45	29.56	29.60	29.68	29.77	29.75	29.85	30.00	30.00	29.91
12	29.20	29.58	29.47	29.55	29.61	29.68	29.78	29.76	29.85	30.01	30.03	29.93
13	29.23	29.59	29.50	29.54	29.64	29.67	29.77	29.78	29.84	30.01	30.04	29.91
14	29.25	29.59	29.52	29.50	29.65	29.66	29.75	29.78	29.82	30.01	30.05	29.86
15	29.25	29.59	29.48	29.55	29.66	29.70	29.74	29.78	29.84	30.01	30.05	29.85
16	29.25	29.57	29.48	29.56	29.66	29.70	29.75	29.79	29.86	30.01	30.06	29.86
17	29.30	29.58	29.52	29.57	29.65	29.68	29.74	29.79	29.87	30.02	30.07	29.87
18	29.31	29.61	29.48	29.58	29.66	29.70	29.75	29.79	29.88	30.03	30.07	29.88
19	29.33	29.61	29.47	29.61	29.68	29.71	29.76	29.81	29.88	30.04	30.07	29.87
20	29.35	29.61	29.47	29.61	29.66	29.71	29.77	29.81	29.89	30.02	30.07	29.89
21	29.35	29.41	29.47	29.60	29.64	29.68	29.78	29.80	29.90	30.01	30.08	29.92
22	29.33	29.31	29.49	29.62	29.64	29.71	29.76	29.82	29.91	30.01	30.06	29.93
23	29.36	29.37	29.48	29.59	29.62	29.73	29.74	29.83	29.91	30.01	30.02	29.93
24	29.31	29.35	29.48	29.57	29.65	29.69	29.75	29.84	29.91	30.01	30.02	29.95
25	29.28	29.43	29.45	29.58	29.64	29.70	29.75	29.84	29.91	30.00	30.03	---
26	29.36	29.48	29.46	29.62	29.61	29.71	29.75	29.83	29.90	30.00	30.04	---
27	29.39	29.48	29.49	29.64	29.62	29.73	29.73	29.83	29.88	30.02	30.04	---
28	29.40	29.47	29.48	29.63	29.60	29.73	29.74	29.85	29.89	30.02	30.04	---
29	29.41	29.43	29.45	29.59	---	29.73	29.76	29.86	29.89	30.02	30.03	---
30	29.45	29.41	29.48	29.57	---	29.75	29.76	29.87	29.90	30.00	30.04	---
31	29.45	---	29.48	29.56	---	29.75	---	29.88	---	30.01	29.96	---
Mean	29.33	29.49	29.47	29.56	29.63	29.68	29.75	29.80	29.87	29.99	30.04	29.88
Max	29.54	29.61	29.52	29.64	29.68	29.75	29.78	29.88	29.91	30.04	30.08	29.95
Min	28.98	29.31	29.41	29.46	29.57	29.59	29.72	29.75	29.82	29.92	29.96	29.80

	Water Year 2006
Mean	29.70
High	28.98
Low	30.08

340743078202006 Local number BR-107; DENR Bear Pen Research Station well EE36k6

Northern Atlantic Coastal Plain aquifer system
Peedee Formation

Brunswick County, NC

LOCATION.--Lat 34°07′43″, long 78°20′20″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03040206, 9 mi north of Supply on Federal Road, near North Carolina Forest Service airstrip. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 110 ft, diameter 4 in.; cased to 48 ft, open interval from 48 to 110 ft.

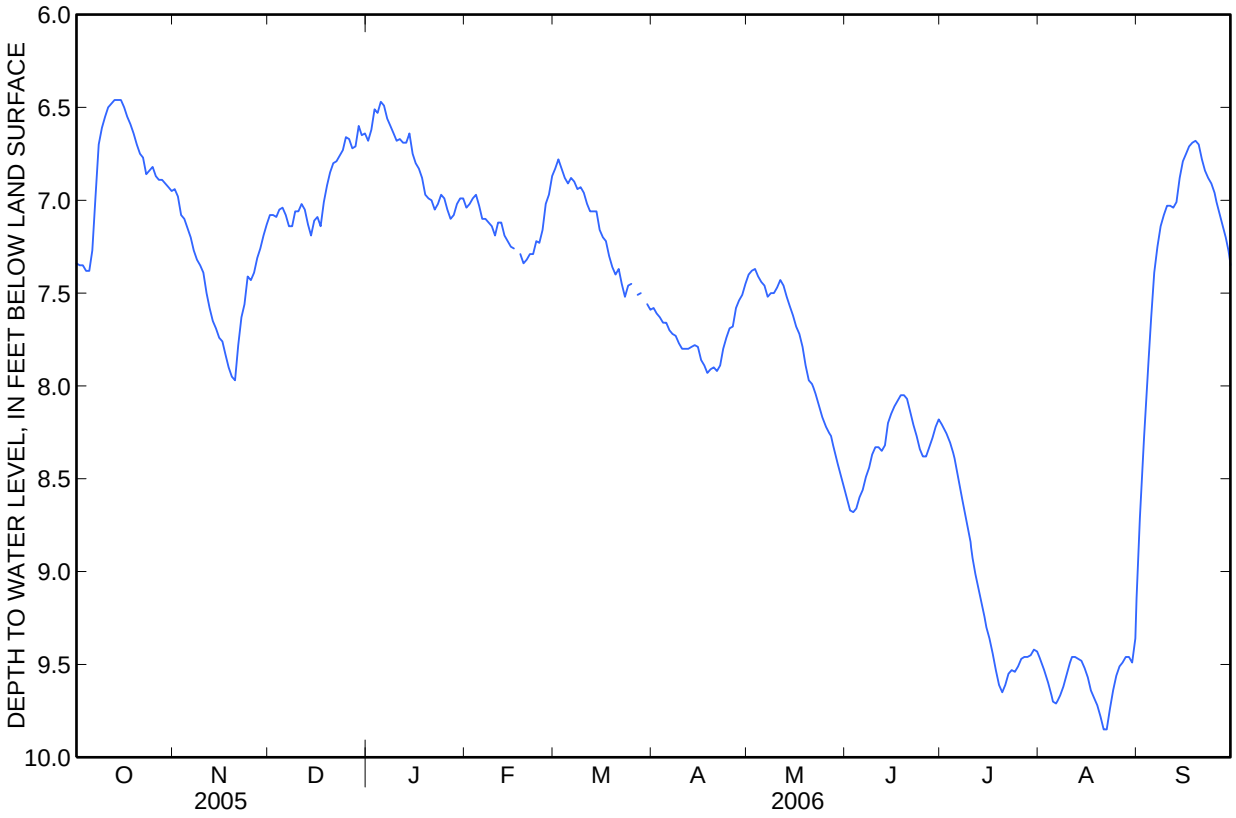
DATUM.--Land-surface datum is 61.00 ft above NGVD of 1929. Measuring point: Top of instrument shelf, 0.69 ft above land-surface datum.

PERIOD OF RECORD.--August 1999 to current year. Continuous record began April 2000.

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of Brunswick County ground-water study. Water-level data may be influenced by local pumping.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 6.37 ft below land-surface datum, Sept. 26, 2000; lowest water level recorded, 12.06 ft below land-surface datum, July 23, 2002.



340743078202006 Local number BR-107; DENR Bear Pen Research Station well EE36k6 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	7.34	6.94	7.08	6.68	7.04	6.83	7.58	7.40	8.61	8.21	9.47	8.87
2	7.35	6.98	7.08	6.62	7.02	6.78	7.61	7.38	8.67	8.24	9.52	8.53
3	7.35	7.08	7.09	6.51	6.99	6.83	7.63	7.37	8.68	8.28	9.57	8.21
4	7.38	7.10	7.05	6.53	6.97	6.88	7.66	7.41	8.66	8.33	9.63	7.91
5	7.38	7.15	7.04	6.47	7.03	6.91	7.66	7.44	8.60	8.39	9.70	7.63
6	7.27	7.20	7.08	6.49	7.10	6.88	7.70	7.46	8.56	8.48	9.71	7.39
7	6.98	7.27	7.14	6.56	7.10	6.90	7.72	7.52	8.49	8.58	9.68	7.25
8	6.70	7.32	7.14	6.60	7.12	6.94	7.73	7.50	8.44	8.66	9.63	7.14
9	6.61	7.35	7.06	6.64	7.14	6.93	7.77	7.50	8.37	8.75	9.58	7.08
10	6.55	7.39	7.06	6.68	7.19	6.96	7.80	7.47	8.33	8.84	9.51	7.03
11	6.50	7.50	7.02	6.67	7.12	7.02	7.80	7.43	8.33	8.96	9.46	7.03
12	6.48	7.58	7.05	6.69	7.12	7.06	7.80	7.46	8.35	9.05	9.46	7.04
13	6.46	7.65	7.13	6.69	7.19	7.06	7.79	7.52	8.32	9.13	9.47	7.01
14	6.46	7.69	7.19	6.64	7.22	7.06	7.78	7.57	8.20	9.21	9.48	6.88
15	6.46	7.74	7.11	6.75	7.25	7.16	7.79	7.62	8.15	9.30	9.52	6.79
16	6.50	7.76	7.09	6.80	7.26	7.20	7.86	7.68	8.11	9.36	9.57	6.75
17	6.55	7.83	7.14	6.83	---	7.22	7.89	7.72	8.08	9.44	9.64	6.71
18	6.59	7.90	7.01	6.88	7.29	7.30	7.93	7.79	8.05	9.53	9.68	6.69
19	6.64	7.95	6.92	6.97	7.34	7.36	7.91	7.89	8.05	9.61	9.72	6.68
20	6.70	7.97	6.85	6.99	7.32	7.40	7.90	7.97	8.07	9.65	9.78	6.70
21	6.75	7.78	6.80	7.00	7.29	7.37	7.92	7.99	8.14	9.61	9.85	6.78
22	6.77	7.63	6.79	7.05	7.29	7.45	7.89	8.04	8.21	9.55	9.85	6.84
23	6.86	7.56	6.76	7.02	7.22	7.52	7.80	8.09	8.27	9.53	9.74	6.88
24	6.84	7.41	6.73	6.97	7.23	7.46	7.74	8.16	8.34	9.54	9.64	6.91
25	6.82	7.43	6.66	6.99	7.16	7.45	7.69	8.20	8.38	9.51	9.56	6.96
26	6.87	7.39	6.67	7.05	7.02	---	7.68	8.24	8.38	9.47	9.51	7.04
27	6.89	7.31	6.72	7.10	6.97	7.51	7.58	8.27	8.33	9.46	9.49	7.10
28	6.89	7.26	6.71	7.08	6.87	7.50	7.54	8.35	8.28	9.46	9.46	7.16
29	6.91	7.19	6.60	7.02	---	---	7.51	8.41	8.22	9.45	9.46	7.24
30	6.93	7.13	6.65	6.99	---	7.56	7.45	8.47	8.18	9.42	9.49	7.35
31	6.95	---	6.64	6.99	---	7.59	---	8.54	---	9.43	9.36	---
Mean	6.83	7.45	6.94	6.80	7.14	7.18	7.74	7.80	8.33	9.11	9.59	7.19
Max	7.38	7.97	7.19	7.10	7.34	7.59	7.93	8.54	8.68	9.65	9.85	8.87
Min	6.46	6.94	6.60	6.47	6.87	6.78	7.45	7.37	8.05	8.21	9.36	6.68

	Water Year 2006
Mean	7.68
High	6.46
Low	9.85

335334078352102 Local number BR-116; DENR Calabash Research Station well HH39j3

Northern Atlantic Coastal Plain aquifer system
Black Creek Formation

Brunswick County, NC

LOCATION.--Lat 33°53′34″, long 78°35′21″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03040207, .75 mi west of Country Club Drive on Carolina Shores Drive. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Depth 660 ft. Upper casing diameter 6 in; top of first opening 644 ft, bottom of last opening 654 ft.

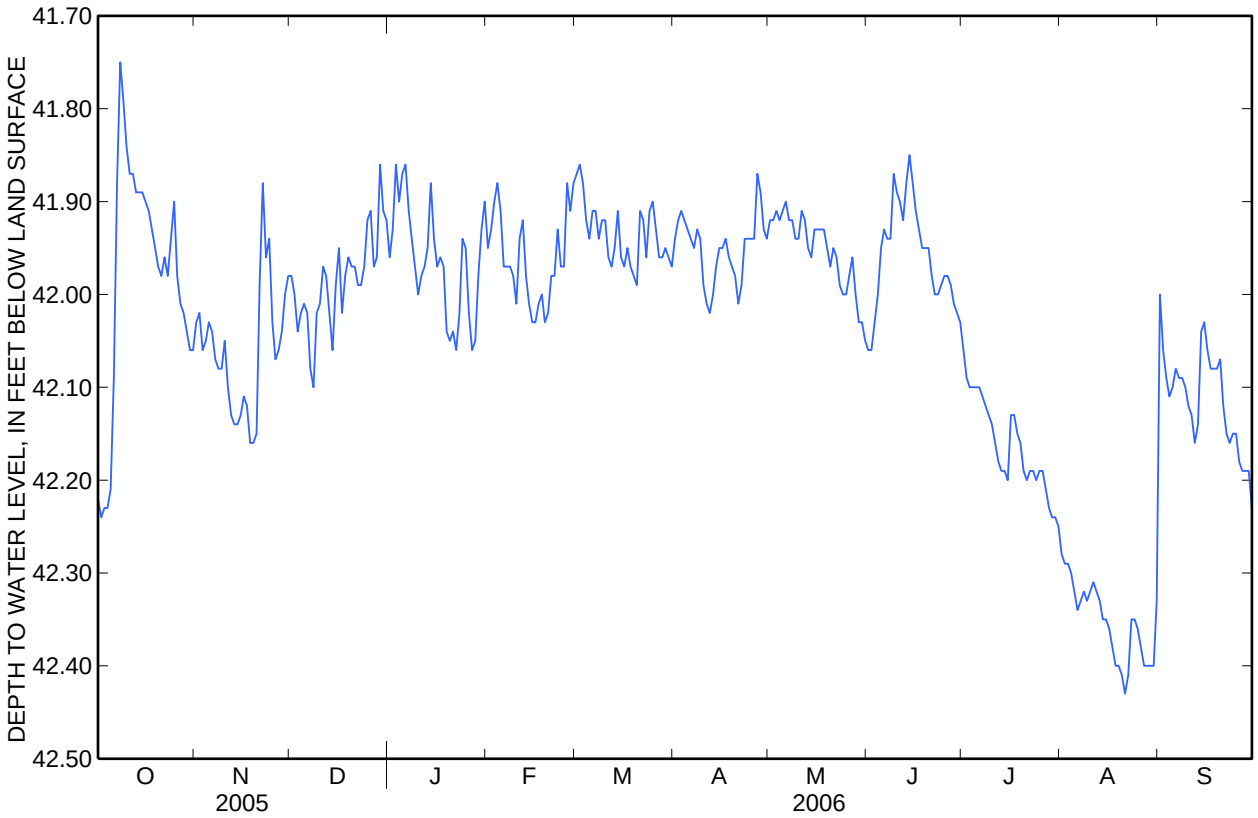
DATUM.--Land-surface datum is 47.59 ft above NGVD of 1929. Measuring point: Top of casing, 2.79 ft above land-surface datum.

PERIOD OF RECORD.--May 1973 to current year. Continuous record began October 1999.

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of Brunswick County ground-water study.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.79 ft below land-surface datum, May 7, 1973; lowest water level measured, 53.00 ft below land-surface datum, Nov. 11, 1991.



335334078352102 Local number BR-116; DENR Calabash Research Station well HH39j3 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	42.22	42.03	41.98	41.96	41.95	41.87	41.94	41.92	42.06	42.06	42.28	42.00
2	42.24	42.02	42.00	41.93	41.93	41.86	41.92	41.92	42.06	42.09	42.29	42.06
3	42.23	42.06	42.04	41.86	41.90	41.88	41.91	41.91	42.03	42.10	42.29	42.09
4	42.23	42.05	42.02	41.90	41.88	41.92	41.92	41.92	42.00	42.10	42.30	42.11
5	42.21	42.03	42.01	41.87	41.91	41.94	41.93	41.91	41.95	42.10	42.32	42.10
6	42.09	42.04	42.02	41.86	41.97	41.91	41.94	41.90	41.93	42.10	42.34	42.08
7	41.88	42.07	42.08	41.91	41.97	41.91	41.95	41.92	41.94	42.11	42.33	42.09
8	41.75	42.08	42.10	41.94	41.97	41.94	41.93	41.92	41.94	42.12	42.32	42.09
9	41.79	42.08	42.02	41.97	41.98	41.92	41.94	41.94	41.87	42.13	42.33	42.10
10	41.84	42.05	42.01	42.00	42.01	41.92	41.99	41.94	41.89	42.14	42.32	42.12
11	41.87	42.10	41.97	41.98	41.94	41.96	42.01	41.91	41.90	42.16	42.31	42.13
12	41.87	42.13	41.98	41.97	41.92	41.97	42.02	41.92	41.92	42.18	42.32	42.16
13	41.89	42.14	42.02	41.95	41.98	41.95	42.00	41.95	41.88	42.19	42.33	42.14
14	41.89	42.14	42.06	41.88	42.01	41.91	41.97	41.96	41.85	42.19	42.35	42.04
15	41.89	42.13	41.99	41.94	42.03	41.96	41.95	41.93	41.88	42.20	42.35	42.03
16	41.90	42.11	41.95	41.97	42.03	41.97	41.95	41.93	41.91	42.13	42.36	42.06
17	41.91	42.12	42.02	41.96	42.01	41.95	41.94	41.93	41.93	42.13	42.38	42.08
18	41.93	42.16	41.98	41.97	42.00	41.97	41.96	41.93	41.95	42.15	42.40	42.08
19	41.95	42.16	41.96	42.04	42.03	41.98	41.97	41.95	41.95	42.16	42.40	42.08
20	41.97	42.15	41.97	42.05	42.02	41.99	41.98	41.97	41.95	42.19	42.41	42.07
21	41.98	41.99	41.97	42.04	41.98	41.91	42.01	41.95	41.98	42.20	42.43	42.12
22	41.96	41.88	41.99	42.06	41.98	41.92	41.99	41.96	42.00	42.19	42.41	42.15
23	41.98	41.96	41.99	42.02	41.93	41.96	41.94	41.99	42.00	42.19	42.35	42.16
24	41.94	41.94	41.97	41.94	41.97	41.91	41.94	42.00	41.99	42.20	42.35	42.15
25	41.90	42.03	41.92	41.95	41.97	41.90	41.94	42.00	41.98	42.19	42.36	42.15
26	41.98	42.07	41.91	42.02	41.88	41.93	41.94	41.98	41.98	42.19	42.38	42.18
27	42.01	42.06	41.97	42.06	41.91	41.96	41.87	41.96	41.99	42.21	42.40	42.19
28	42.02	42.04	41.96	42.05	41.88	41.96	41.89	42.00	42.01	42.23	42.40	42.19
29	42.04	42.00	41.86	41.98	---	41.95	41.93	42.03	42.02	42.24	42.40	42.19
30	42.06	41.98	41.91	41.93	---	41.96	41.94	42.03	42.03	42.24	42.40	42.23
31	42.06	---	41.92	41.90	---	41.97	---	42.05	---	42.25	42.33	---
Mean	41.98	42.06	41.99	41.96	41.96	41.94	41.95	41.95	41.96	42.16	42.35	42.11
Max	42.24	42.16	42.10	42.06	42.03	41.99	42.02	42.05	42.06	42.25	42.43	42.23
Min	41.75	41.88	41.86	41.86	41.88	41.86	41.87	41.90	41.85	42.06	42.28	42.00

	Water Year 2006
Mean	42.03
High	41.75
Low	42.43

335334078352106 Local number BR-123; DENR Calabash Research Station well HH39j7

Surficial aquifer system
Post Miocene (Quaternary + Pliocene) Rocks

Brunswick County, NC

LOCATION.--Lat 33°53′34″, long 78°35′21″ referenced to North American Datum of 1983, Brunswick County, NC, Hydrologic Unit 03040207, .75 miles west of Country Club Drive on Carolina Shores Drive. Owner: DENR (North Carolina Department of Environment and Natural Resources).

GROUND-WATER RECORDS

WELL CHARACTERISTICS.--Drilled observation well, depth 56 ft, diameter 4 in., cased to 46 ft, screened interval from 46 to 56 ft.

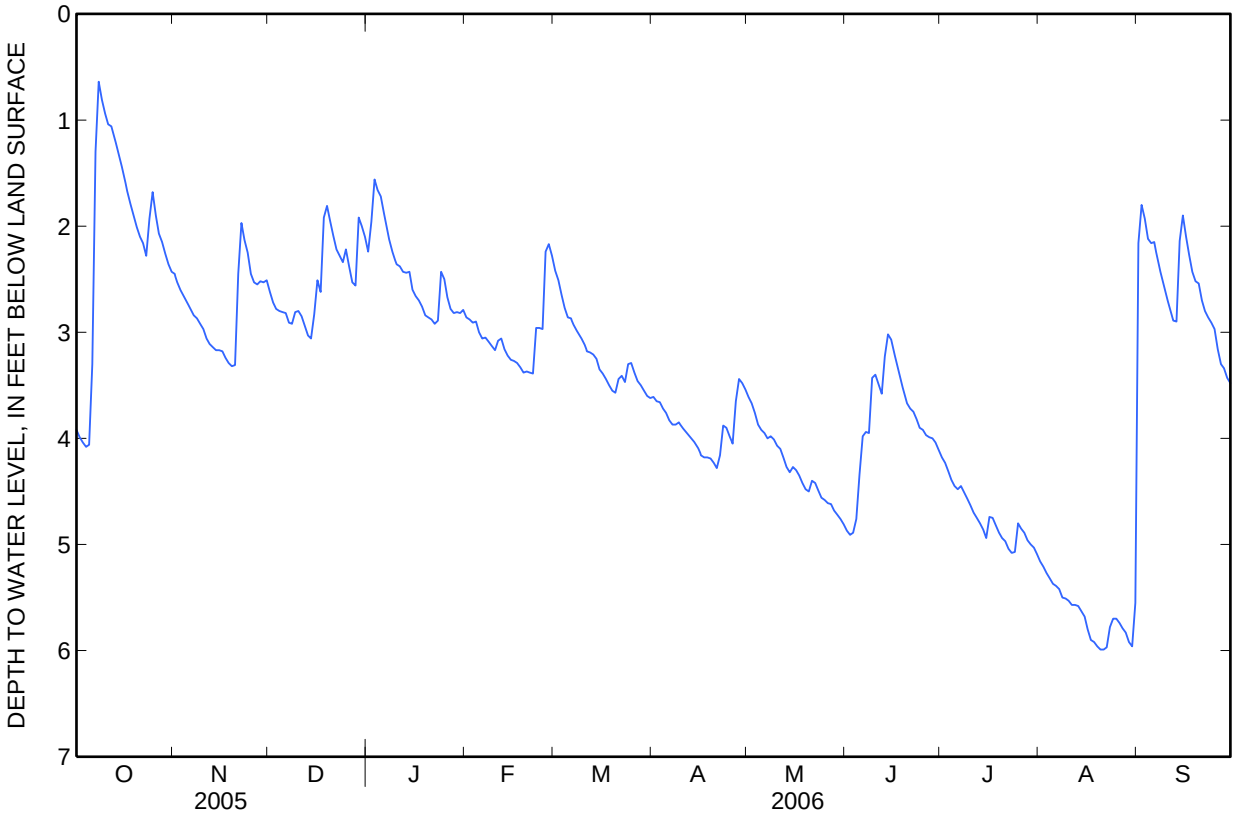
DATUM.--Land-surface datum is 47.28 ft above NGVD of 1929. Measuring point: Top of casing, 1.97 ft above land-surface datum.

PERIOD OF RECORD.--April 1999 to current year. Continuous record began October 2000.

GAGE.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

REMARKS.--Well is part of Brunswick County ground-water study. Water levels may be affected by local pumping.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.49 ft below land-surface datum, Oct. 8, 2005; lowest water level recorded, 23.12 ft below land-surface datum, May 11, 2001.



335334078352106 Local number BR-123; DENR Calabash Research Station well HH39j7 – Continued

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	3.92	2.45	2.62	2.24	2.86	2.42	3.61	3.61	4.87	4.18	5.16	2.16
2	3.99	2.54	2.72	1.96	2.88	2.51	3.65	3.67	4.91	4.23	5.21	1.80
3	4.04	2.62	2.78	1.56	2.91	2.65	3.66	3.76	4.89	4.31	5.27	1.93
4	4.08	2.67	2.80	1.66	2.90	2.77	3.72	3.87	4.76	4.39	5.32	2.12
5	4.06	2.73	2.81	1.72	3.00	2.86	3.76	3.92	4.34	4.45	5.37	2.16
6	3.30	2.78	2.82	1.88	3.06	2.87	3.83	3.95	3.98	4.48	5.39	2.15
7	1.30	2.84	2.91	2.04	3.05	2.94	3.87	4.00	3.94	4.45	5.42	2.30
8	0.64	2.87	2.92	2.17	3.09	3.00	3.87	3.98	3.95	4.51	5.50	2.44
9	0.81	2.92	2.81	2.28	3.13	3.04	3.85	4.01	3.43	4.57	5.51	2.57
10	0.94	2.97	2.80	2.36	3.17	3.10	3.89	4.07	3.40	4.63	5.53	2.67
11	1.04	3.06	2.85	2.38	3.08	3.18	3.93	4.10	3.49	4.70	5.57	2.79
12	1.06	3.11	2.94	2.43	3.06	3.19	3.97	4.18	3.58	4.75	5.57	2.89
13	1.17	3.14	3.03	2.44	3.16	3.21	4.00	4.27	3.23	4.80	5.58	2.90
14	1.29	3.17	3.06	2.43	3.22	3.25	4.04	4.32	3.02	4.86	e5.63	2.14
15	1.40	3.17	2.83	2.60	3.26	3.35	4.09	4.27	3.07	4.94	5.68	1.90
16	1.54	3.18	2.51	2.66	3.27	3.39	4.16	4.30	3.20	4.74	5.80	2.10
17	1.67	3.24	2.62	2.70	3.29	e3.44	4.18	4.35	3.33	4.75	5.90	2.27
18	1.79	3.29	1.92	2.76	3.33	3.50	4.18	4.42	3.45	4.82	5.92	2.43
19	1.90	3.32	1.81	2.84	3.38	3.55	4.19	4.48	3.56	4.89	5.96	2.52
20	2.01	3.31	1.95	2.86	3.37	3.57	4.23	4.50	3.67	4.94	5.99	2.54
21	2.10	2.45	2.09	2.88	3.38	3.44	4.28	4.40	3.72	4.97	5.99	2.70
22	2.16	1.97	2.22	2.92	3.39	3.41	4.16	4.42	3.75	5.04	5.97	2.80
23	2.28	2.13	2.28	2.89	2.96	3.47	3.88	4.49	3.82	5.08	5.78	2.86
24	1.93	2.25	2.34	2.43	2.96	3.30	3.90	4.56	3.90	5.07	5.70	2.91
25	1.68	2.45	2.22	2.50	e2.97	3.29	3.98	4.58	3.92	4.80	5.70	2.97
26	1.90	2.53	2.38	2.67	2.24	3.38	4.05	4.61	3.97	4.85	5.74	3.16
27	2.07	2.55	2.53	2.78	2.17	3.46	3.65	4.62	3.99	4.89	5.79	3.30
28	2.15	2.52	2.56	2.82	2.28	3.50	3.44	4.68	4.00	4.96	5.83	3.34
29	2.26	2.53	1.92	2.81	---	3.55	3.48	4.72	4.04	5.00	5.92	3.43
30	2.36	2.51	2.00	2.82	---	3.60	3.54	4.76	4.11	5.03	5.96	3.48
31	2.43	---	2.10	2.79	---	3.62	---	4.81	---	5.09	5.55	---
Mean	2.11	2.78	2.52	2.46	3.03	3.22	3.90	4.28	3.84	4.75	5.65	2.59
Max	4.08	3.32	3.06	2.92	3.39	3.62	4.28	4.81	4.91	5.09	5.99	3.48
Min	0.64	1.97	1.81	1.56	2.17	2.42	3.44	3.61	3.02	4.18	5.16	1.80

	Water Year 2006
Mean	3.43
High	0.64
Low	5.99