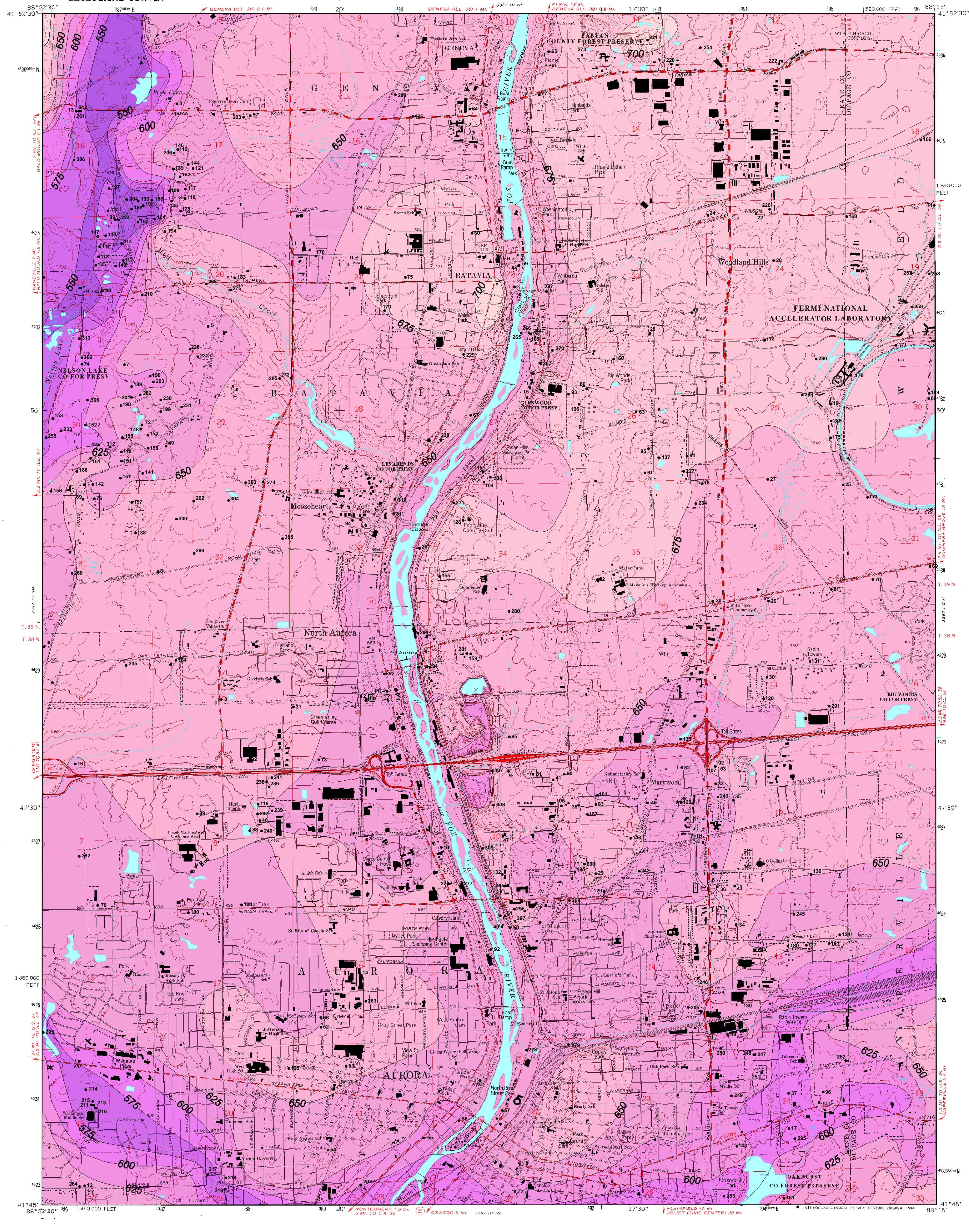


# TOPOGRAPHIC MAP OF THE BEDROCK SURFACE

Aurora North Quadrangle,  
Kane and Du Page Counties, Illinois  
B. Brandon Curry

AURORA NORTH QUADRANGLE  
ILLINOIS  
7.5-MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY



Produced by the United States Geological Survey in cooperation with State of Illinois agencies.  
Control by USGS and NOS/NOAA.  
Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1984. Revised from aerial photographs taken 1988. Field checked 1991. Map edited 1993.  
Projection and 10,000-foot grid ticks: Illinois coordinate system, based on the Illinois State Geodetic Survey, Illinois Geological Quadrangle Map, IGQ Aurora North-ET, 1:24,000.  
North American Datum of 1983 (NAD 83) is shown by dashed corner ticks.  
The values of the shift between NAD 83 and NAD 83 for 7.5-minute intersections are given in USGS Bulletin 1075.

**Recommended Citation**  
Curry, B.B., 2001. Topographic Map of the Bedrock Surface, Aurora North Quadrangle, Kane and Du Page Counties, Illinois: Illinois State Geological Survey, Illinois Geological Quadrangle Map, IGQ Aurora North-ET, 1:24,000.

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## Introduction

The bedrock surface in the Aurora North Quadrangle is the top of the Silurian and Ordovician dolomite and shaly dolomite that underlies glacial drift or modern sediment. Along the Fox River and near the mouths of streams tributary to the Fox River, bedrock is covered by less than 10 feet of alluvium and colluvium. In some areas, the bedrock is naturally exposed (fig. 1). Several large quarries reveal as much as 30 feet of cherty and non-cherty Silurian dolomite along the Fox River (fig. 2).

The topography of the bedrock surface of Kane County was mapped at a scale of 1:62,500 (Vaiden and Curry 1990). Regional maps of the same surface also have been published (fig. 3).

## Geologic History of the Bedrock Surface

The bedrock surface is a significant unconformity found throughout most of Illinois. Below this surface in northeastern Illinois are rocks that are more than 400,000,000 years old, and overlying the bedrock surface are sediments that are less than about 500,000 years old and in many places, less than 25,000 years old (Curry et al. 1999). Most of the rock that occurs at and just below the bedrock surface was deposited in warm, tropical oceans; most of the sediment deposited above the bedrock surface was deposited by continental glaciers.

The configuration of the bedrock surface probably has been most influenced by glacial erosion. In addition, there has been late glacial and postglacial erosion by the Fox River. Evidence for glacial erosion is most evident from the polished and striated bedrock surface observed in many quarries. Evidence also comes from the glacial diamict (till) that contains clay to boulder-sized fragments of the underlying bedrock.

The rock just below the bedrock surface may be fresh or weathered. When the rock is fresh, it is commonly found to be polished and striated. In most places, the rock is fractured, weathered, and oxidized (manifested by orange-brown stains and coatings in the upper 3 to 20 feet). Along the east side of the Fox River in south Batavia, a few bedrock cores indicated brecciated dolomite. In some areas, the fractures have been enlarged by solution of the dolomite. Soil borings from some sites in the Aurora North Quadrangle reveal organic-rich or reduced paleosols formed in silty and clayey slope deposits that were buried by glacial sediment. These weathered Quaternary sediments generally occur directly above bedrock.

## Map Use

This map of the bedrock surface topography is useful for predicting the occurrence of sand and gravel aquifers that are generally found in the deepest parts of bedrock valleys (Curry and Seaber 1990). Not only do the bedrock valleys contain aquifers of sand and gravel, but they also are places where groundwater in the bedrock recharges groundwater in the drift. Two buried bedrock valleys are present on the Aurora North Quadrangle. A segment of the St. Charles Bedrock Valley crosses the northwestern corner of the map, and part of the Aurora Bedrock Valley crosses the southern part of the map. As shown on the regional bedrock topography map (fig. 3), both bedrock valleys are important features in Kane County. The City of Aurora has developed several municipal water wells in the sediment filling the Aurora Bedrock Valley immediately west of the Aurora North Quadrangle; the City of Geneva has developed a municipal water-well field in the St. Charles Bedrock Valley just north of the Aurora North Quadrangle. The bedrock surface elevation and API number associated with the numbered data points on the map are given in Table 1. A unique API number is assigned to every water well and structural boring log on file at the Geological Records Unit at the Illinois State Geological Survey. API is an acronym for the American Petroleum Institute.

## Mapping Methods

This map was compiled from field observations, logs of water wells, structural test borings, and stratigraphic test borings in the Geological Records Unit of the Illinois State Geological Survey (ISGS). The bedrock surface elevation was estimated by subtracting the thickness of the glacial drift and unconsolidated material from the surface elevation. Usually, the surface elevation was estimated from the 7.5-minute USGS topographic map that has a contour interval of 10 feet. Notable records include the numerous structural borings for the Fermi National Accelerator Laboratory (Landon and Kempton 1971, Kemmis 1978, P. Kesich, personal communication 2000), bedrock cores from south-central Batavia sampled by the Illinois Environmental Protection Agency, water-well tests drilled by Layne-Western, Inc. (Gilkesson et

al. 1987, Curry and Seaber 1990), bedrock borings by the Western Sand & Gravel Company (B. Pierce, personal communication 2000), and various stratigraphic tests done by the ISGS, including a recent study of Nelson Lake, partially located in the northwestern part of the Aurora North Quadrangle (Sections 19 and 20, T. 39 N., R. 8 E.). Trends in the elevation of the bedrock surface were also estimated by seismic refraction methods. The location of the seismic lines are scattered throughout the study area (McFadden et al. 1989; Curry and Seaber 1990; Heigold 1990; Larson et al. 1991, 1992; Fitzpatrick et al. 1992). Alluvium in the Fox River and its tributaries was estimated to be less than 5 to 10 feet thick. The presence of near-surface bedrock in some places was based on the soil survey maps of Goddard (1979).

The edge of the map was matched with data from a map of the bedrock surface topography of Kane County and western Du Page County (Vaiden and Curry 1990) and other data on file at the ISGS. The three-dimensional model of the bedrock surface was created using the Vertical Mapper Version 2.0 (1998) computer program (fig. 4).

## Data Quality and Distribution

Locations of the wells and test holes used on this map were verified in the field by ISGS geologists. The quality of much of the data is excellent. Of the 400 data points used to make this map, 65 are high-quality data described by engineers and geologists (including 42 logs from Fernilab), 9 are outcrops (located by ISGS geologists), 25 are logs from Layne-Western, Inc. (for the purpose of siting municipal water wells), and 301 are logs from private water wells. The reliability of data derived from water-well logs is verified, in part, by simulating bedrock surface elevations in subdivisions where often data density is high.

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Map Number	API Number	Bedrock Surface Elevation	Mean Sea Level Datum
700-725	600-625		
675-700	575-600		
650-675	550-575		
625-650	525-550		

**Table 1** List of numbered wells on Aurora North bedrock topography map, bedrock surface elevation, and API numbers on file at the Geological Records Unit at the Illinois State Geological Survey. The user may contact the ISGS to obtain records for these wells; the user will be charged for mailing and xeroxing.

Map	API	Bedrock	Map	API	Bedrock	Map	API	Bedrock	Map	API	Bedrock
Number	Number	Surface	Number	Number	Surface	Number	Number	Surface	Number	Number	Surface
Elevation	Number	Elevation	Elevation	Number	Elevation	Elevation	Number	Elevation	Elevation	Number	Elevation
700	1208900340	686	71	12083008500	676	141	12082528900	640	211	12089277900	565
1	1208900400	674	72	12089023700	654	142	12089023700	640	212	12089023700	566
2	1208900410	662	73	12089023800	642	143	12089179900	610	213	12089179900	554
3	1208900420	650	74	12089023900	630	144	12089232900	627	214	12089232900	557
4	1208900430	638	75	12089110100	618	145	12089232900	639	215	12089232900	559
5	1208900440	626	76	12089110200	606	146	12089232900	651	216	12089232900	561
6	1208900450	614	77	12089110300	594	147	12089232900	663	217	12089232900	563
7	1208900460	602	78	12089110400	582	148	12089232900	675	218	12089232900	565
8	1208900470	590	79	12089110500	570	149	12089232900	687	219	12089232900	567
9	1208900480	578	80	12089110600	558	150	12089232900	699	220	12089232900	569
10	1208900490	566	81	12089110700	546	151	12089232900	711	221	12089232900	571
11	1208900500	554	82	12089110800	534	152	12089232900	723	222	12089232900	573
12	1208900510	542	83	12089110900	522	153	12089232900	735	223	12089232900	575
13	1208900520	530	84	12089111000	510	154	12089232900	747	224	12089232900	577
14	1208900530	518	85	12089111100	498	155	12089232900	759	225	12089232900	579
15	1208900540	506	86	12089111200	486	156	12089232900	771	226	12089232900	581
16	1208900550	494	87	12089111300	474	157	12089232900	783	227	12089232900	583
17	1208900560	482	88	12089111400	462	158	12089232900	795	228	12089232900	585
18	1208900570	470	89	12089111500	450	159	12089232900	807	229	12089232900	587
19	1208900580	458	90	12089111600	438	160	12089232900	819	230	12089232900	589
20	1208900590	446	91	12089111700	426	161	12089232900	831	231	12089232900	591
21	1208900600	434	92	12089111800	414	162	12089232900	843	232	12089232900	593
22	1208900610	422	93	12089111900	402	163	12089232900	855	233	12089232900	595
23	1208900620	410	94	12089112000	390	164	12089232900	867	234	12089232900	597
24	1208900630	398	95	12089112100	378	165	12089232900	879	235	12089232900	599
25	1208900640	386	96	12089112200	366	166	12089232900	891	236	12089232900	601
26	1208900650	374	97	12089112300	354	167	12089232900	903	237	12089232900	603
27	1208900660	362	98	12089112400	342	168	12089232900	915	238	12089232900	605
28	1208900670	350	99	12089112500	330	169	12089232900	927	239	12089232900	607
29	1208900680	338	100	12089112600	318	170	12089232900	939	240	12089232900	609
30	1208900690	326	101	12089112700	306	171	12089232900	951	241	12089232900	611
31	1208900700	314	102	12089112800	294	172	12089232900	963	242	12089232900	613
32	1208900710	302	103	12089112900	282	173	12089232900	975	243	12089232900	615
33	1208900720	290	104	12089113000	270	174	12089232900	987	244	12089232900	617
34	1208900730	278	105	12089113100	258	175	12089232900	999	245	12089232900	619
35	1208900740	266	106	12089113200	246	176	12089232900	1011	246	12089232900	621
36	1208900750	254	107	12089113300	234	177	12089232900	1023	247	12089232900	623
37	1208900760	242	108	12089113400	222	178	12089232900	1035	248	12089232900	625
38	1208900770	230	109	12089113500	210	179	12089232900	1047	249	12089232900	627
39	1208900780	218	110	12089113600	198	180	12089232900	1059	250	12089232900	629
40	1208900790	206	111	12089113700	186	181	12089232900	1071	251	12089232900	631
41	1208900800	194	112	12089113800	174	182	12089232900	1083	252	12089232900	633
42	1208900810	182	113	12089113900	162	183	12089232900	1095	253	12089232900	635
43	1208900820	170	114	12089114000	150	184	12089232900	1107	254	12089232900	637
44	1208900830	158	115	12089114100	138	185	12089232900	1119	255	12089232900	639
45	1208900840	146	116	12089114200	126	186	12089232900	1131	256	12089232900	641
46	1208900850	134	117	12089114300	114	187	12089232900	1143	257	12089232900	643
47	1208900860	122	118	12089114400	102	188	12089232900	1155	258	12089232900	645
48	1208900870	110	119	12089114500	90	189	12089232900	1167	259	12089232900	647
49	1208900880	98	120	12089114600	78	190	12089232900	1179	260	12089232900	649
50	1208900890	86	121	12089114700	66	191	12089232900	1191	261	12089232900	651
51	1208900900	74	122	12089114800	54	192	12089232900	1203	262	12089232900	653
52	1208900910	62	123	12089114900	42	193	12089232900	1215	263	12089232900	655
53	1208900920	50	124	12089115000	30	194	12089232900	1227	264	12089232900	657
54	1208900930	38	125	12089115100	18	195	12089232900	1239	265	12089232900	659
55	1208900940	26	126	12089115200	6	196	12089232900	1251	266	12089232900	661
56	1208900950	14	127	12089115300	-6	197	12089232900	1263	267	12089232900	663
57	1208900960	2	128	12089115400	-18	198	12089232900	1275	268	12089232900	665
58	1208900970	-10	129	12089115500	-30	199	12089232900	1287	269	12089232900	667
59	1208900980	-22	130	12089115600	-42	200	12089232900	1299	270	12089232900	669
60	1208900990	-34	131	12089115700	-54	201	12089232900	1311	271	12089232900	671
61	1208901000	-46	132	12089115800	-66	202	12089232900	1323	272	12089232900</	