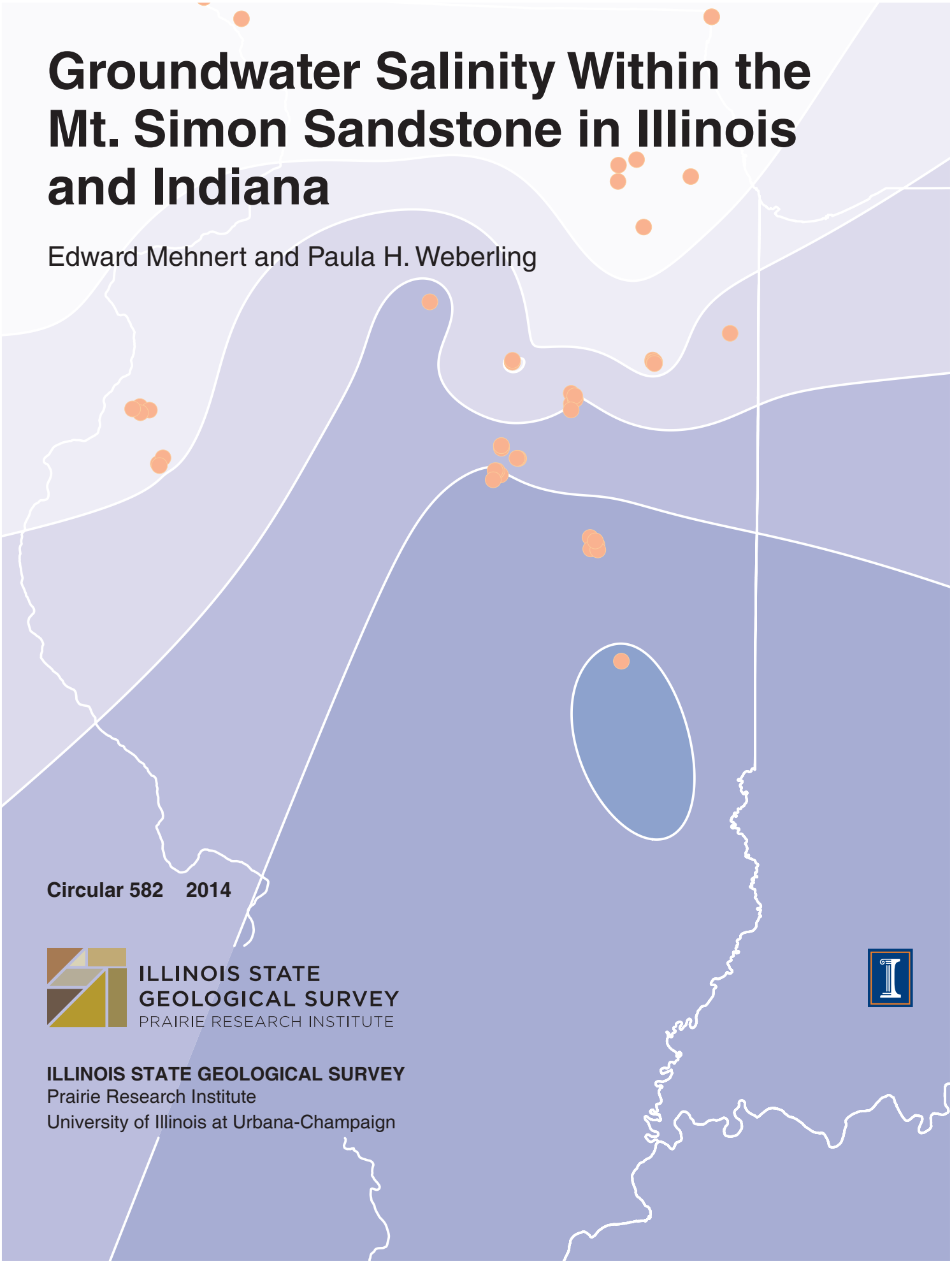
Groundwater Salinity Within the Mt. Simon Sandstone in Illinois and Indiana

Edward Mehnert and Paula H. Weberling



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Front Cover: *Contour map of the data from the Midwest Geologic Sequestration Consortium (2005) salinity map using point kriging with no search radius and a grid spacing of 250 m.*

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Abstract

In the Cambrian-age Mt. Simon Sandstone, salinity varies widely from less than 1,000 mg/L of total dissolved solids (TDS) in northern Illinois to more than 250,000 mg/L of TDS in southern Illinois. Salinity is an important characteristic of groundwater and is quantified by measuring the TDS. With recent interest in geologic carbon sequestration, new wells have been completed in the Mt. Simon and new TDS data have been collected. These new TDS data, along with other available data from Illinois and Indiana wells, were compiled and plotted to generate an updated map of salinity in the Mt. Simon Sandstone.

Background

The Mt. Simon Sandstone is the basal sandstone in the Illinois Basin and is considered a saline reservoir well suited for geologic carbon sequestration (U.S. Department of Energy 2012). For geologic carbon sequestration, salinity is an important consideration because it provides an indication of the brine density and it affects carbon dioxide solubility in brine (e.g., Pruess and Garcia 2002). Salinity data are also vital as input data for simulations that evaluate the potential effects of geologic carbon sequestration in the Mt. Simon (e.g., Zhou et al. 2010; Adams 2013; Mehnert et al. 2013). Thus, Illinois State Geological Survey (ISGS) researchers sought to improve on the available salinity maps for the Mt. Simon and develop a new map incorporating data from new wells and overlooked available data.

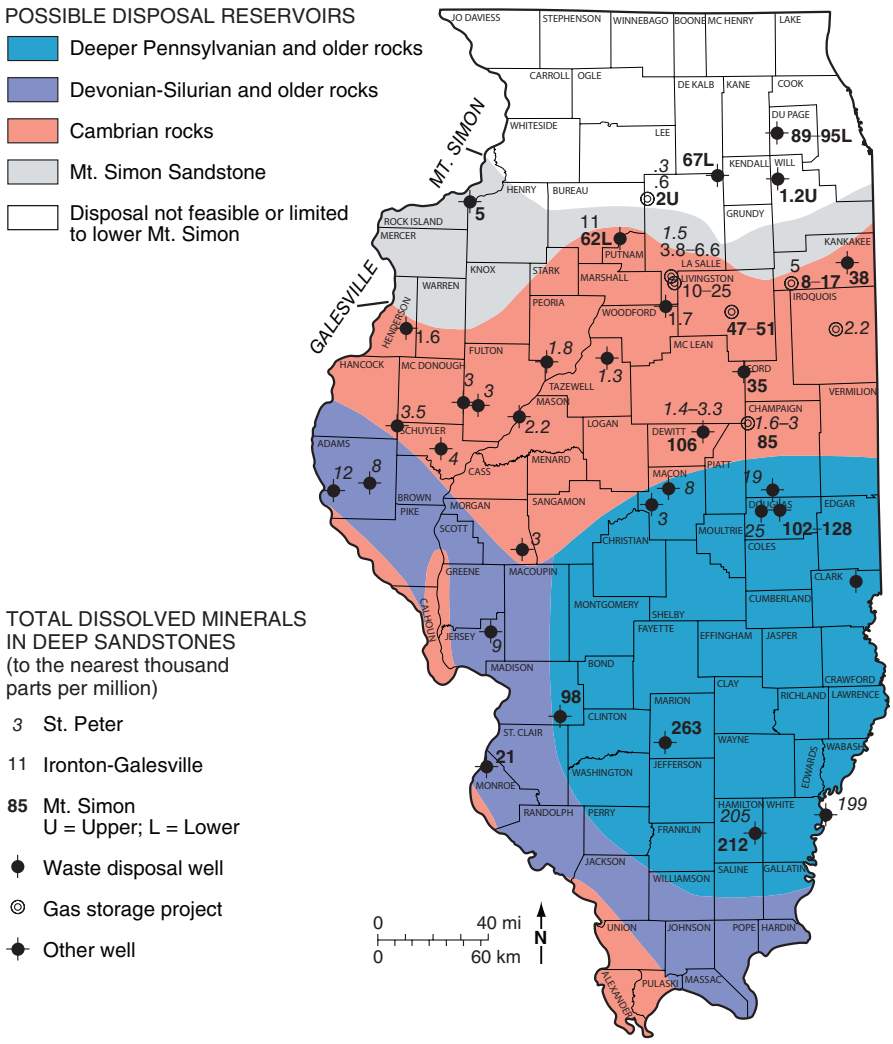

Figure 1 Map of potential waste disposal reservoirs (from Bergstrom 1968). South of the Mt. Simon and Galesville lines, these reservoirs were found to contain brine with total dissolved minerals in excess of 10,000 parts per million, which is equivalent to total dissolved solids of 10,000 mg/L.

Salinity is a measure of the saltiness of water or soil. For groundwater, salinity is typically quantified by measuring total dissolved solids (TDS). Several TDS values are significant. Total dissolved solids values for fresh groundwater are less than 1,000 mg/L, whereas TDS values for saline groundwater exceed 1,000 mg/L (Barlow 2003). For comparison, seawater typically has a TDS value of 35,000 mg/L (Stumm and Morgan 1996). The U.S. Environmental Protection Agency (USEPA) defines an underground source of drinking water as any water supply with less than 10,000 mg/L of TDS. Water supplies that exceed 10,000 mg/L of TDS are generally considered unsuitable for a drinking water source because treatment costs would be prohibitive. In this report, brine is used to define groundwater with TDS values exceeding 10,000 mg/L. Given the significance of the 10,000 mg/L TDS line for water supply purposes, this line is included in the new salinity map.

Meents et al. (1952) published brine data and produced contour maps of TDS in several oil-producing formations in the Illinois Basin. The deepest formation they studied was the Ordovician St. Peter Sandstone. Mapping water quality is also important for water supply and groundwater protection purposes. In southern Wisconsin, the Cambrian-age Mt. Simon is considered a freshwater aquifer (SEWRPC 2002). While evaluating the feasibility of industrial waste disposal, Bergstrom (1968) mapped the TDS in the Mt. Simon and the Cambrian-age Ironton-Galesville Sandstones (Figure 1). For an assessment of groundwater resources, Visocky et al. (1985) mapped TDS in the Elmhurst-Mt. Simon aquifer in northern Illinois (Figure 2). The Elmhurst Sandstone is the basal member of the Cambrian-age Eau Claire Formation, which overlies the Mt. Simon. The Elmhurst Sandstone is difficult to distinguish from the Mt. Simon,

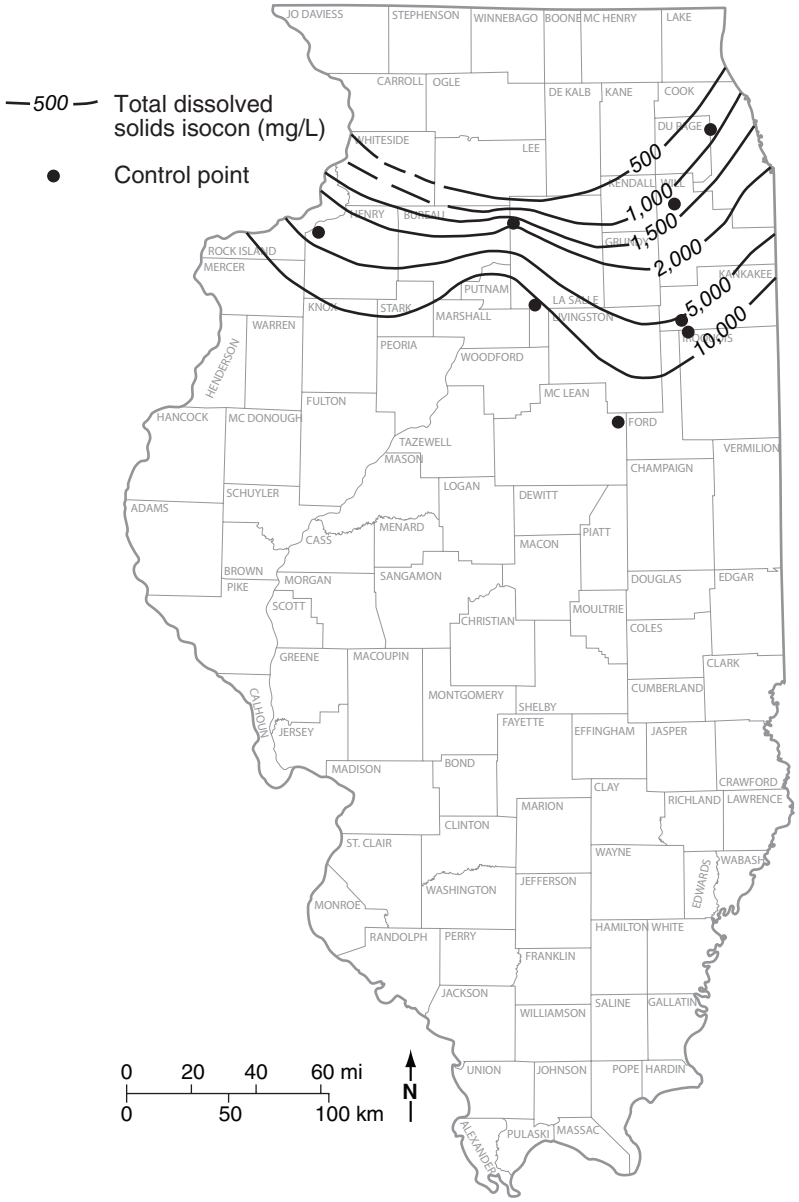

Figure 2 Salinity in the Elmhurst-Mt. Simon Sandstone in northern Illinois (from Visocky et al. 1985). This map includes total dissolved solids values up to 10,000 mg/L.

so the two units are considered a single hydrogeologic unit or aquifer. Visocky et al. (1985) noted that shale interbeds separated water higher in TDS in the deeper Mt. Simon from the lower TDS groundwater in the shallower Elmhurst-Mt. Simon. Brower et al. (1989) reviewed TDS in several formations, including the Elmhurst-Mt. Simon, and produced a statewide map showing the 10,000 mg/L TDS line in several formations (Figure 3). For northern Illinois, Morse and Leetaru (2005) published a map of the salinity in the Mt. Simon (Figure 4). The Midwest Geologic Sequestration Consortium (MGSC) published a map with an expanded geographic range showing the groundwater salinity within the Mt. Simon Sandstone in and near the Illinois Basin (Figure 5). Unlike most other maps, this map did not include a 10,000 mg/L contour.

Compilation of Salinity Data

Published salinity maps of the Mt. Simon Sandstone were developed with relatively few data points. For his statewide map of the Mt. Simon, Bergstrom (1968) plotted 14 TDS values, whereas Visocky et al. (1985) apparently developed their map of northern Illinois using fewer than 10 TDS samples. Brower et al.

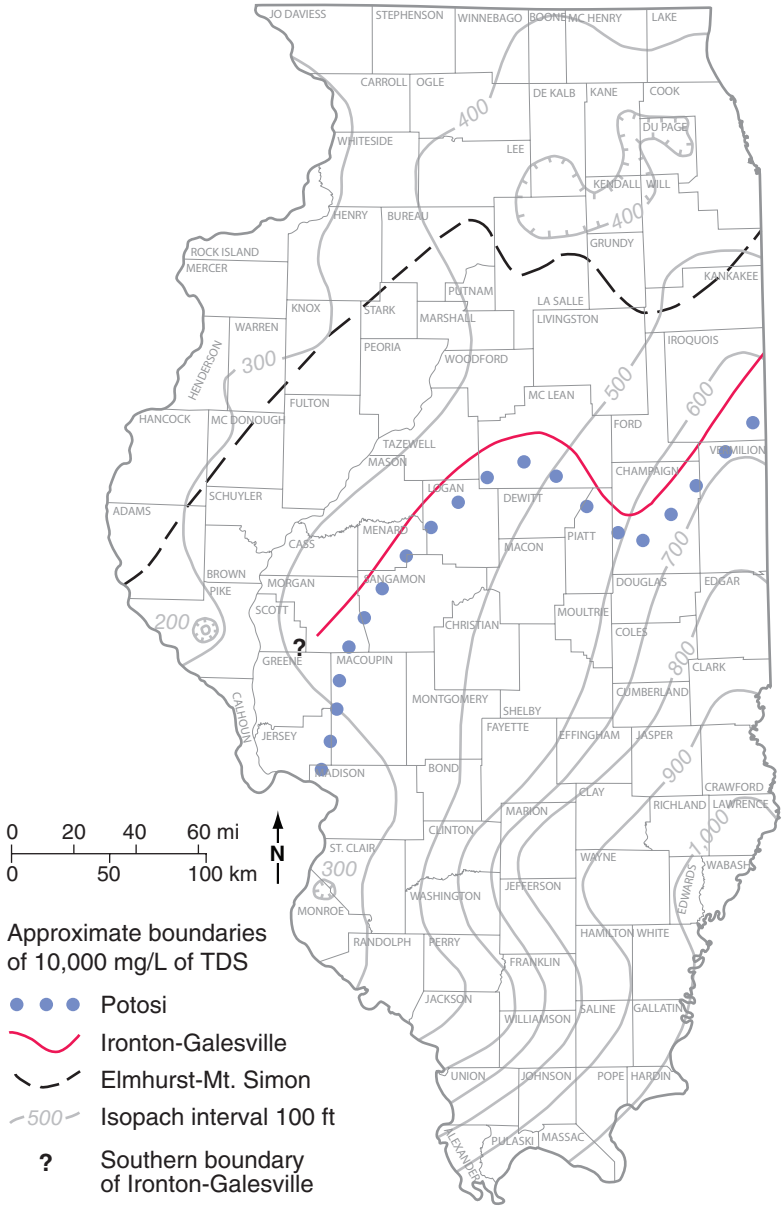

Figure 3 Map showing the 10,000 mg/L total dissolved solids (TDS) line in several formations, including the Elmhurst-Mt. Simon Sandstone (dashed line; from Brower et al. 1989). Base map shows the thickness (isopach) of the Eau Claire Formation.

(1989) did not document their TDS data. The MGSC (2005) map was developed using 57 TDS values from Illinois wells. For this study, 329 TDS values have been compiled from new and existing wells in Illinois and Indiana (Appendix Table A1). The TDS values are reported in units of milligrams per liter and are located using the Universal Transverse Mercator (UTM) coordinate system. The UTM coordinates were calculated using an ArcGIS algorithm based on well locations in the Public Land Survey System (section, township, range). Surfer version 11 (http://www.GoldenSoftware.com) was used to generate the grids and the contour maps.

Wells that penetrate the Mt. Simon, although rare in Illinois and Indiana, are drilled for structural tests, groundwater supply, natural gas storage, and liquid waste disposal. The majority of the compiled data were collected from wells in Illinois (302 values), with Indiana data accounting for the remaining 27 entries (Table 1). The Illinois data come from 31 different counties and 159 different wells, whereas the Indiana data come from 7 counties and 10 wells. Multiple data points, with different TDS values, were obtained from 45 Illinois wells and 6 Indiana wells. Most of the entries (Table 2) were compiled from water samples collected by natural gas storage companies (e.g., Nicor, Ameren,

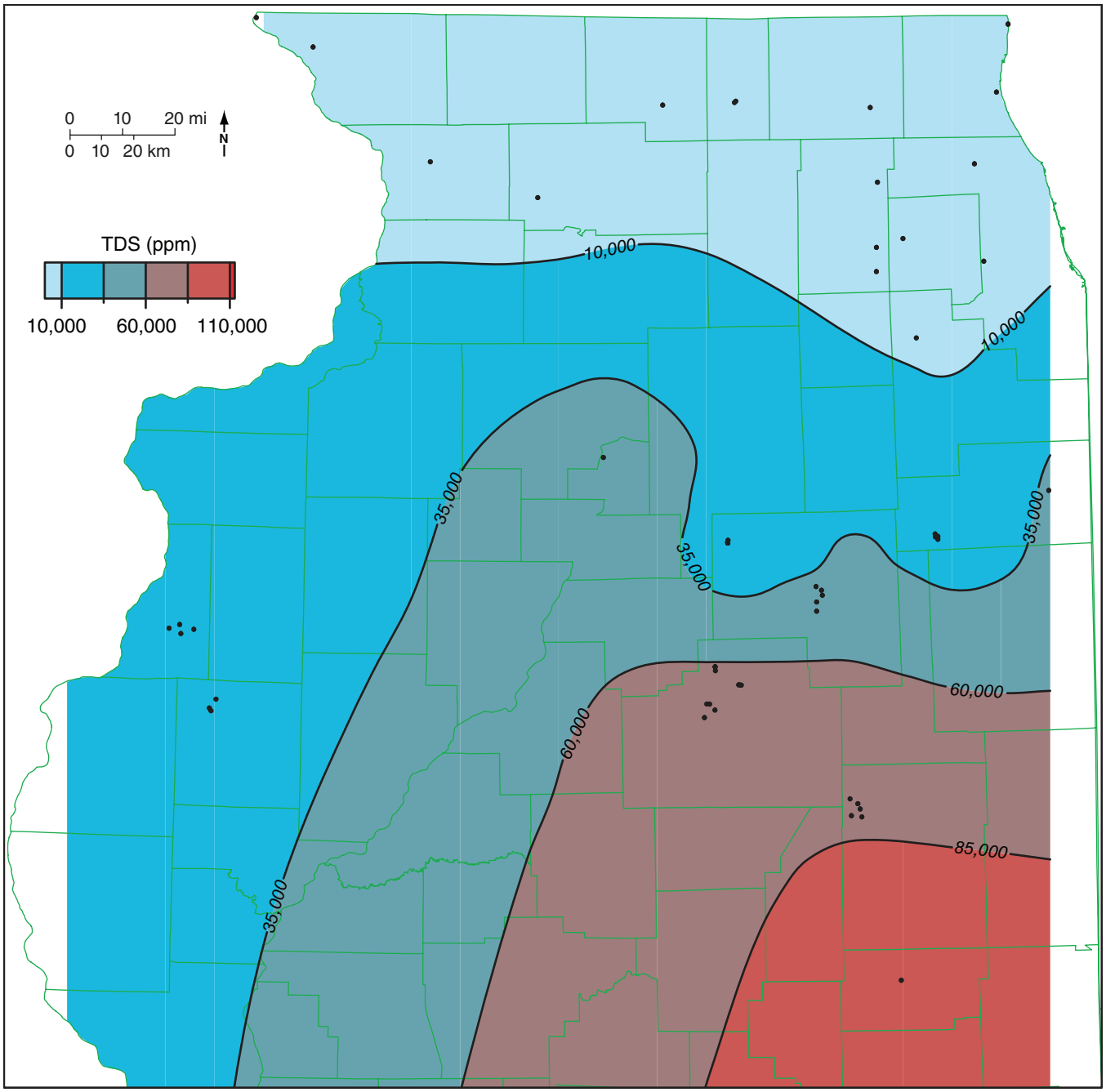

Figure 4 Salinity map for brine within the Mt. Simon Sandstone in northern Illinois (from Morse and Leetaru 2005), which includes total dissolved solids (TDS) contours marking 10,000, 35,000, 60,000, and 85,000 mg/L of TDS.

and Panhandle Eastern Pipe Line Co.) and industries using Class I injection wells (Allied Chemical and steel companies). Illinois and Indiana state institutions (ISGS, Illinois Environmental Protection Agency, Illinois State Water Survey, and Indiana Geological Survey) also accounted for a large portion of the TDS samples.

Developing a contour map is a two-step process—gridding and contouring. For the gridding process, TDS data from each well must be represented as a single data point. For our TDS data, most wells had a single TDS sample, but some wells had multiple samples. Multiple TDS data arose most commonly from samples being collected from the same well at different times, but some wells had samples collected from multiple depths. For these wells with multiple TDS values, the well was represented using the median value. The median, rather than the mean, was selected to be the representative value because extreme values have less effect on the median, especially for small samples.

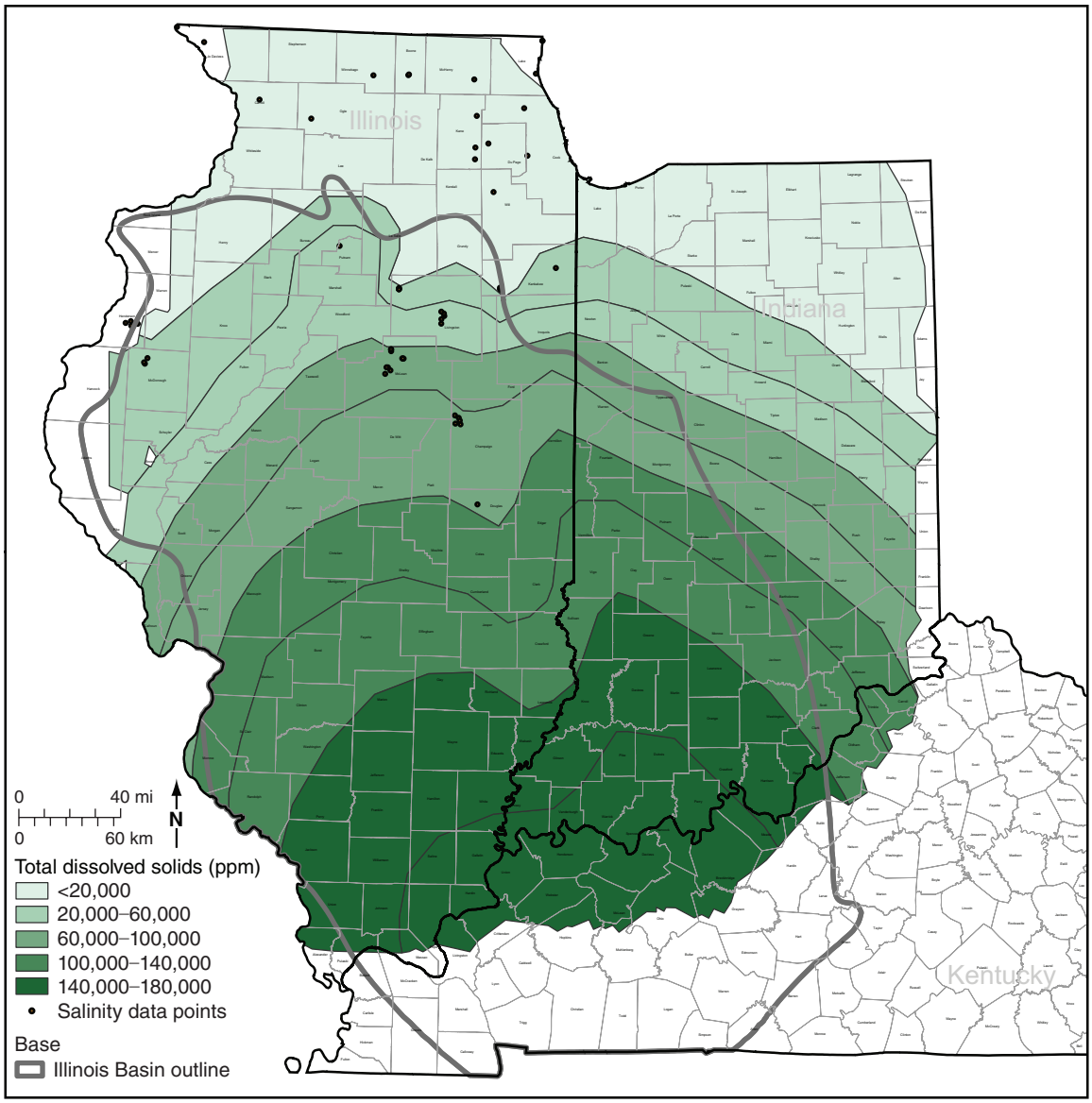

Figure 5 Midwest Geologic Sequestration Consortium (MGSC) map of total dissolved solids (TDS, mg/L) in the groundwater from the Mt. Simon Sandstone (from MGSC 2005). The locations of the 57 TDS data points are shown by black dots.

The median TDS value was computed using a spreadsheet because the Surfer algorithm for computing medians was incorrect for an even number of data points. For developing the new contour map, we had 169 TDS values.

Histograms show the distributions of all brine data (329 samples), the data used to create the final contour map (169 samples), and the MGSC (2005) map data (Figure 6). The histograms show that the data do not have a normal distribution and are better described by a log-normal or even multimodal distribution. The histograms also show a wider range of TDS values for the data used in this report than for the 2005 data, but they also display the limited amount of data in the higher TDS ranges, with limited samples between 140,000 and 180,000 mg/L. The histograms also show a tendency for lower TDS values in the 2005 data than in the data used in this report, which is also reflected in the medians. The median TDS value for the 2005 data was 18,978 mg/L, whereas the median was 34,549 mg/L for all brine data and 38,002 mg/L for the brine data used for the contour map.

The TDS samples described in this report were not collected from a single sampling event. They are samples that were collected over a long span of time. Most samples were collected when the well was drilled, but the sampling dates in our database are incomplete. The earliest sample was collected in 1911, and

Table 1 Distribution of the 329 compiled brine samples by location

State	Illinois	Indiana	Total
TDS[1] samples	302	27	329
Counties	31	7	38
Wells with multiple samples	45	6	51
Total wells	159	10	169

[1]TDS, total dissolved solids

Table 2 Sources for brine samples by contributing institution

Institution	Number
Government sources	
Illinois State Geological Survey	94
Illinois State Water Survey/Illinois State Geological Survey	33
Illinois State Water Survey	1
Illinois Environmental Protection Agency	2
Indiana Geological Survey	17
U.S. Geological Survey	1
Subtotal	148
Industrial sources	
Allied Chemical	2
Ameren/CIPS	71
FutureGen Industrial Alliance	2
Natural Gas Pipeline Co.	5
Nicor	51
Panhandle Eastern Pipe Line Co.	42
People's Gas	4
Steel companies	4
Subtotal	181
Total	329

the most recent sample was collected in 2011. The majority of samples were collected during drilling for the natural gas storage fields, which occurred in the late 1950s through the early 1970s.

Contour Map Development

In developing a contour map, many choices regarding gridding and contouring methods must be made. We wanted to develop contour maps using the same gridding and contouring options for the MGSC (2005) and the new data sets, but the details of the MGSC (2005) map were unknown. For this study, all contour maps were developed using point kriging with no search radius (i.e., all data used), a 250-m grid spacing, and the UTM16N/NAD1983 coordinate system. Figure 7a shows the TDS map using the new data, whereas Figure 7b shows the TDS map based on the MGSC (2005) data. For both data sets, the kriging method produced negative contours in the northwest portion of the grid, which are physically unrealistic. These negative contours were removed using Surfer's Grid Math function by resetting negative values to zeros. There are significant differences between the MGSC (2005) contour map (Figure 5) and our map developed with the same data (Figure 7b). The MGSC (2005) contour map shows higher maximum TDS values, and the contour lines in the eastern half of that map trend in a northwest-southeast direction. The higher TDS values in Figure 5 do not appear to be supported by the data points used in that study.

The new TDS map (Figure 8) shows the TDS contours based on 169 TDS data points displayed on a base map with state and county boundaries. This map is similar to the MGSC (2005) map (Figure 5), but some differences still remain. The trend of the contour lines in the eastern portion of the maps is still different—predominantly southwest-northeast in Figure 8 versus northwest-southeast in Figure 5. In addition, the maximum concentrations in Figure 8 are higher and are supported with data points. Both maps would benefit from more data in Indiana and southern Illinois. Unlike the previous maps, our contour map contains several bull's-eyes in northern Illinois and Indiana. These bull's-eyes reflect the variability of the TDS values observed in our larger data set. A comparison of the 10,000 mg/L TDS lines on the various TDS maps (Figure 9) shows that our line has a shape similar to the line drawn by Brower et al. (1989) but is a minimum of 10 miles farther north in central Illinois and a maximum of 50 miles north in western Illinois. The line by Morse and Leetaru (2005) is consis-

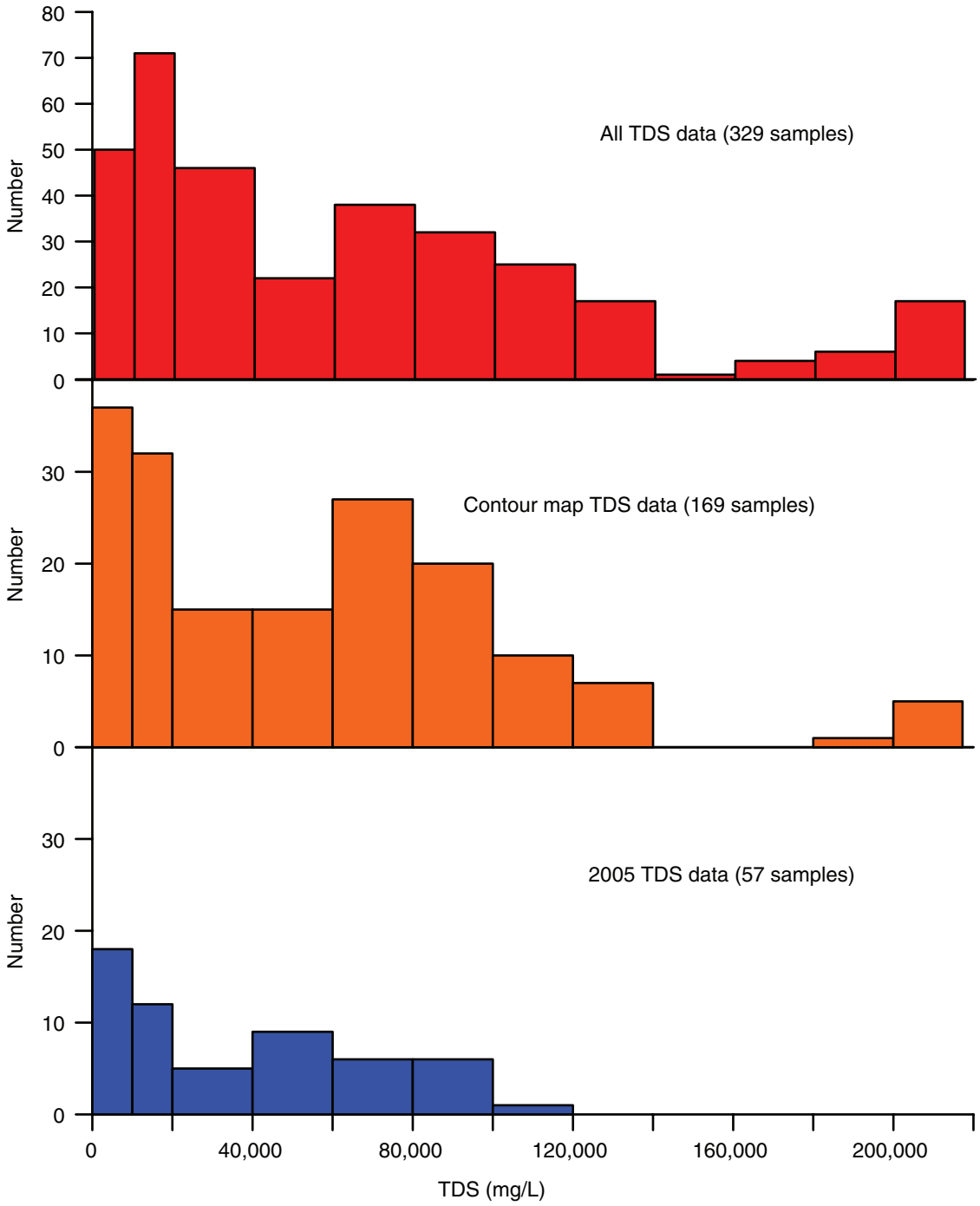

Figure 6 Histograms comparing the total dissolved solids (TDS) distributions for all 329 data points (top), for the 169 data points used for the contour map (middle), and for the original data set of the 2005 Midwest Geologic Sequestration Consortium map (bottom). Note that the *y* axis for the top plot covers twice the range of the other two plots.

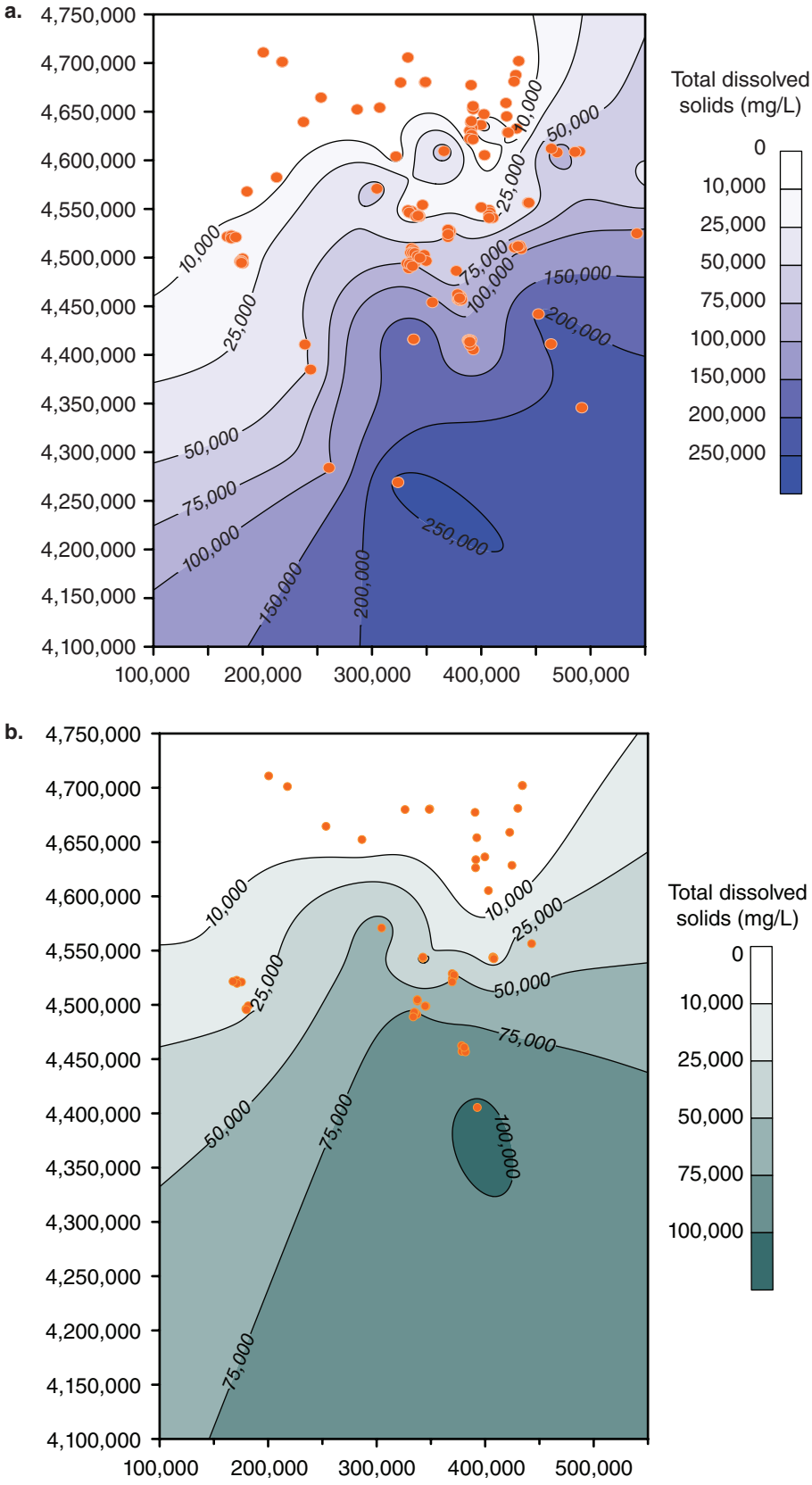

Figure 7 (a) Contour map of the updated data set using point kriging with no search radius and a grid spacing of 250 m. (b) New contour map of the data from the Midwest Geologic Sequestration Consortium (2005) salinity map using point kriging with no search radius and a grid spacing of 250 m.

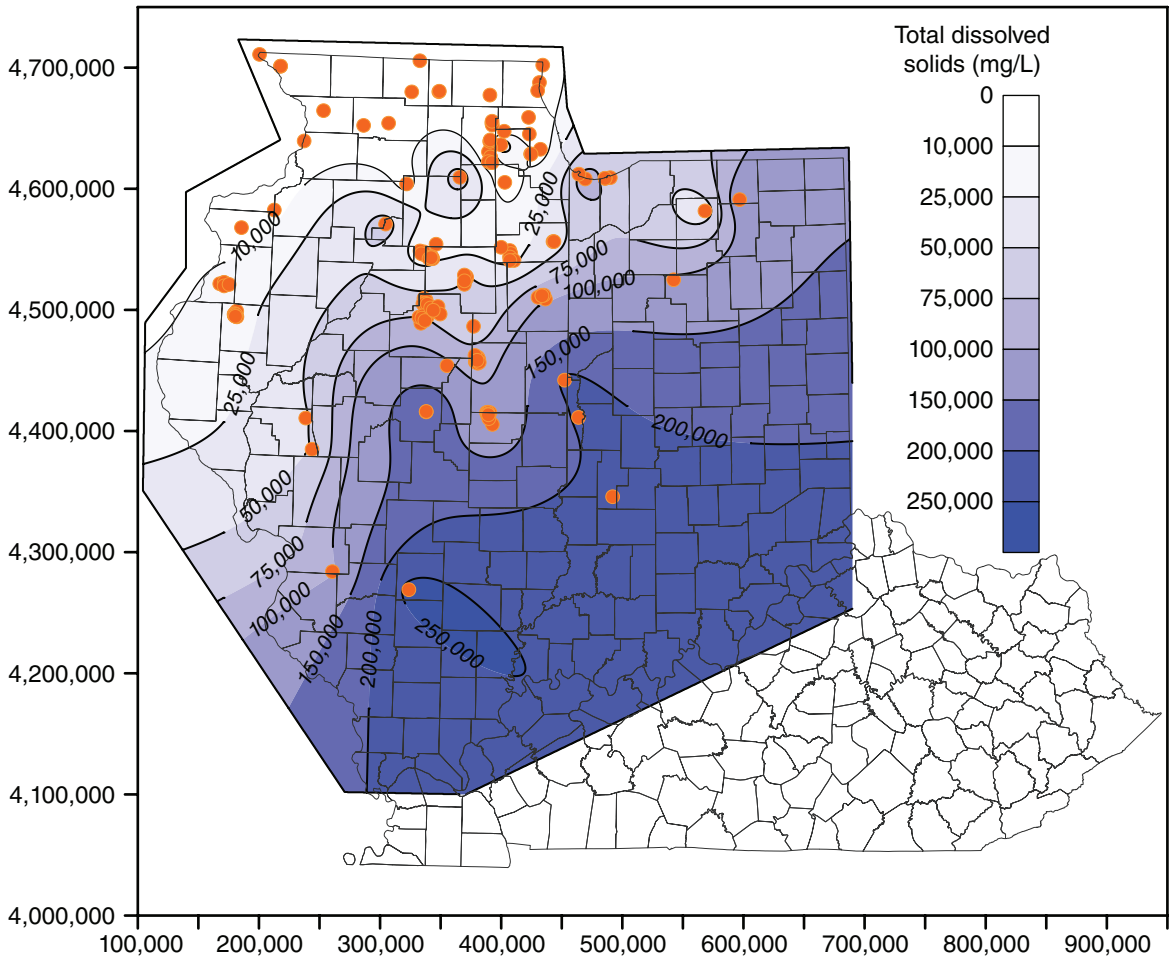

Figure 8 Filled contour map of 169 data points (orange circles) for groundwater salinity in the Mt. Simon Sandstone, where salinity is quantified by total dissolved solids. The extent of the contours has been limited by the vertical and horizontal extents of Illinois and Indiana. The vertical and horizontal ranges are 4,100,000 to 4,750,000 m and 100,000 to 690,000 m, respectively.

tently the northernmost line, whereas the line by Visocky et al. (1985) is generally the southernmost line. Three lines (Bergstrom 1968; Visocky et al. 1985; Morse and Leetaru 2005) do not trend southwest-northeast in western Illinois. In western Illinois, the Mt. Simon occurs at shallower depths, which is reflected in the groundwater salinity and is shown by Brower et al. (1989) and in Figure 8. In summary, the new TDS map has the greatest complexity, but this complexity is supported by the largest set of TDS values available to date.

As an alternative to a contour map, the TDS data can also be displayed using a bubble chart. The bubble chart does not project TDS values beyond the physical extent of each sample. Extrapolation and interpolation are part of the contour mapping process and are inherently subject to error because they estimate values for areas without samples. In addition, a bubble chart does not require selecting a single value to represent a well, as required when developing a contour map. The bubble chart was developed using all 329 TDS data points (Figure 10) and shows the variability of TDS data. The variability seems to have two primary sources—temporal and vertical variability of the TDS samples. The TDS samples in this study were collected over a 100-year time span. Thus, hydrogeologic conditions may have changed over that time, particularly in northeastern Illinois, which has experienced significant groundwater withdrawals. The vertical variability arises from the fact that samples have been collected at different depths, sometimes from the same well. Limited data indicate that TDS in the Mt. Simon increases with depth at a given location. This variability can be seen in Figure 10 by the overlapping symbols in northeastern Illinois, northwestern Indiana, and central Illinois.

In summary, a map showing the distribution of salinity within the Mt. Simon in Illinois and Indiana has been updated using a much larger data set. The distribution of TDS within the Mt. Simon is more complex than previously mapped. The map shows the data used to develop

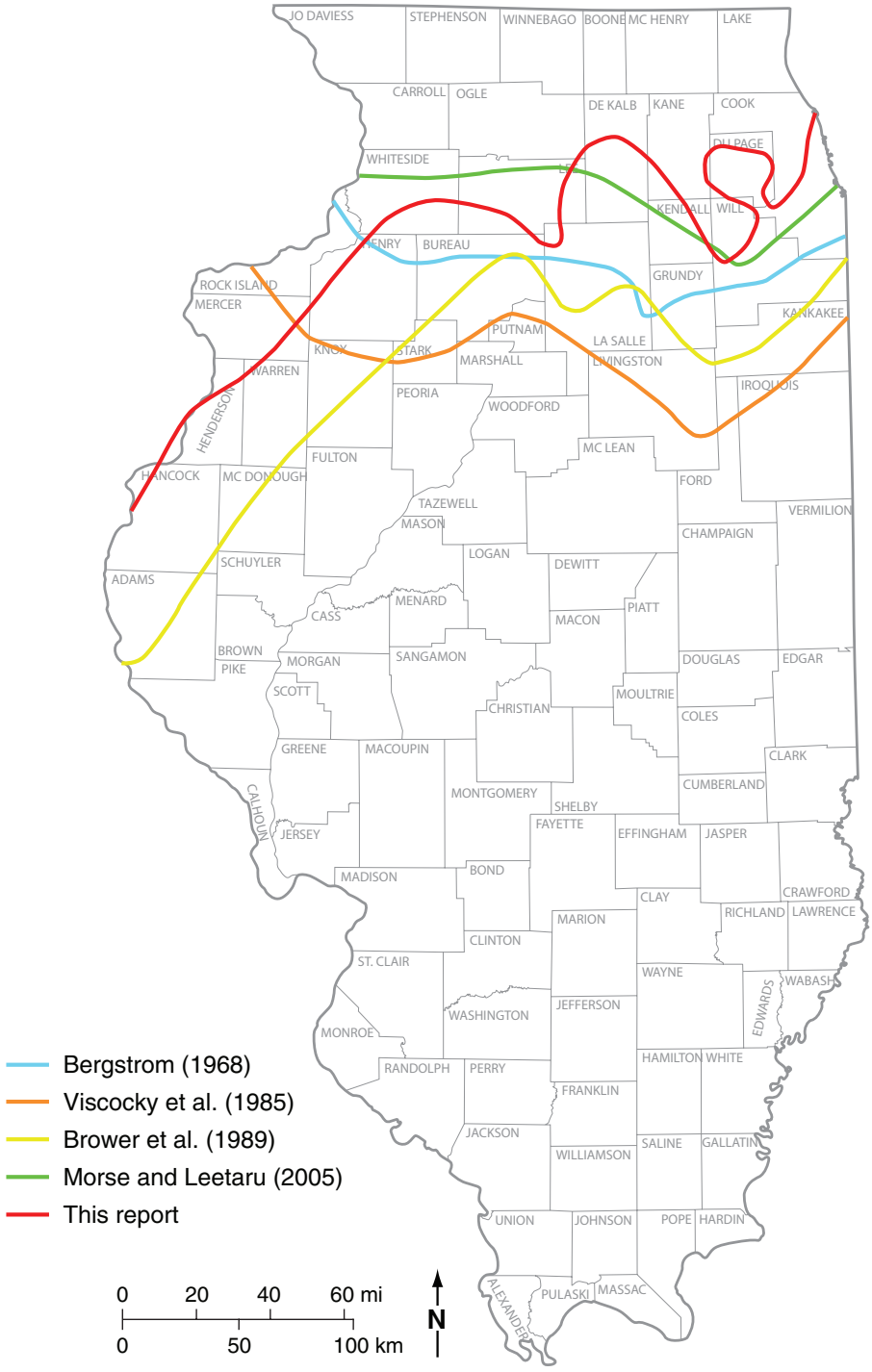

Figure 9 Location of the 10,000 mg/L total dissolved solids (TDS) lines for groundwater in the Mt. Simon Sandstone for this study and from four published maps. Indiana is excluded from this map because the 10,000 mg/L line for this study (in red) did not extend into Indiana and the other four reports did not include Indiana on their TDS maps.

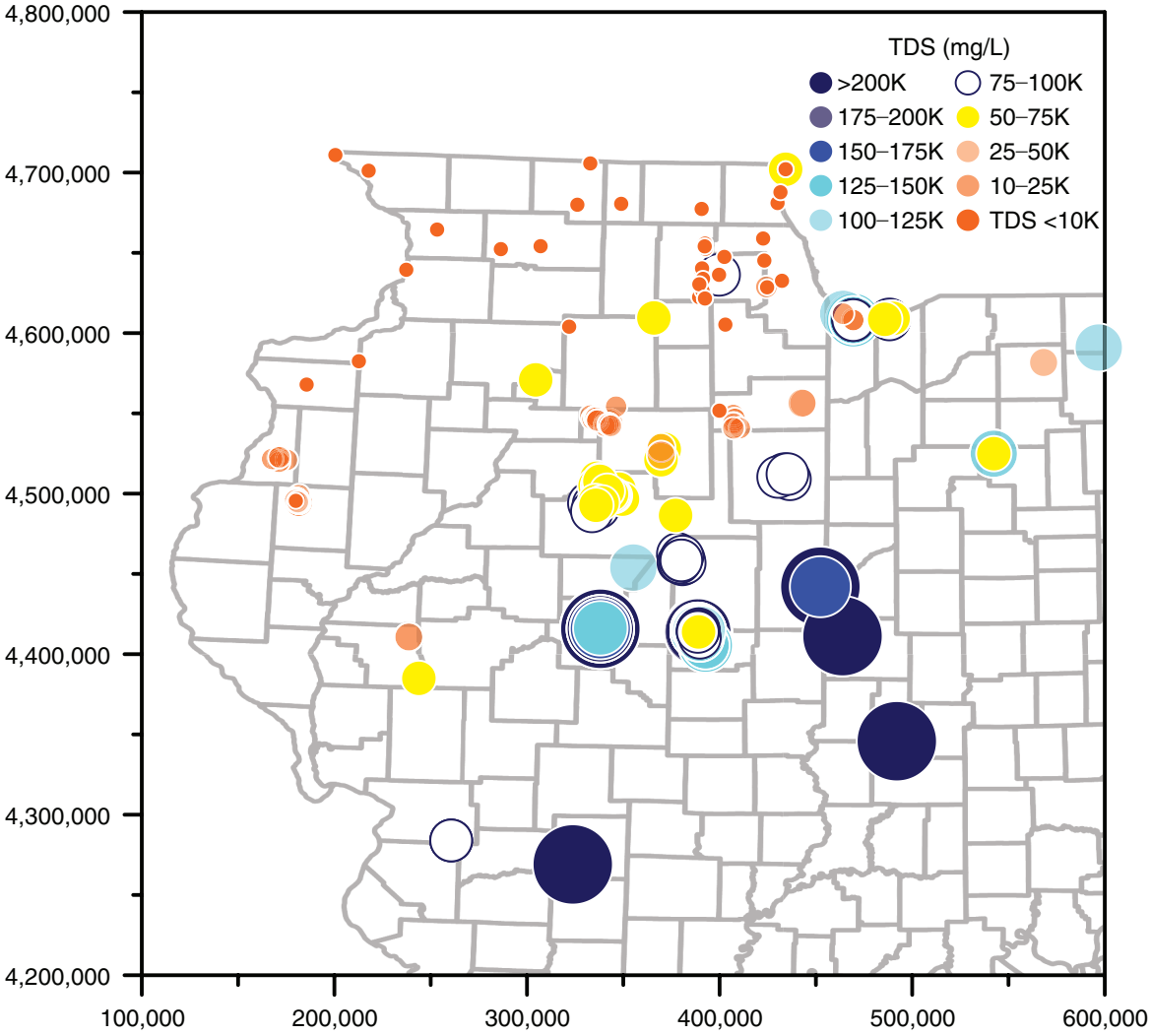

Figure 10 Bubble chart of the groundwater salinity in the Mt. Simon Sandstone based on 329 total dissolved solids (TDS) data points. Unlike the contour map, this chart demonstrates the range of TDS values at a given location. It also shows some locations with greatly varying TDS magnitudes, especially in northwestern Indiana, where values range from 10,000 to 150,000 mg/L. Note that the symbol size increases with the magnitude of TDS.

the TDS contours. The data density is highest in northern Illinois and declines toward the south and east. Hidden in the TDS data is some of its variability. Temporal and vertical variability in when and where the groundwater samples were collected are thought to be the major factors controlling this variability. Users of this TDS map should appreciate this variability.

Acknowledgments

The authors gratefully acknowledge the following people who provided assistance in the development and publishing of this report and its figures: Christopher P. Korose, ISGS, provided the GIS support necessary for mapping the TDS data. John A. Rupp, Indiana Geological Survey (Bloomington IN), provided TDS data for many wells in Indiana. Neeraj Gupta, Battelle Memorial Institute (Columbus OH), provided information regarding TDS data for wells in Illinois and Indiana. Compilation of the TDS data was assisted by Damon Garner, ISGS, and by many ISGS student employees, including Daniel Beach, Sarah Buckley, Dean Ekberg, Alex Fleshman, Lauren Frendreis, Jessica Hinton, Torrey Loper, Madeline Schuh, and Laura Tan. C. Pius Weibel, Samuel V. Panno, and Donald A. Keefer, ISGS,

reviewed this report and provided comments to improve it. This research was partially supported with funds from the USEPA, Office of Research and Development, National Center for Environmental Research, through USEPA Funding Opportunity EPA-G2008-STAR-H1 (EPA RD-83438201). Barbara Klieforth and Angela D. Page served as project officers for the USEPA.

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Appendix

Table A1 List of total dissolved solids (TDS) data used in this report[1]

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
120070029200	Belvidere City #3	IL	Boone	25	44N	3E	348,504	4,680,127	1,800	296.87	yes
120070029200	Belvidere City #3	IL	Boone	25	44N	3E	348,504	4,680,127	1,803	738	no
120070034300	Belvidere City #2	IL	Boone	25	44N	3E	348,915	4,680,528	1,861	684	no
120150000200	Mt. Carroll #3	IL	Carroll	12	24N	4E	253,332	4,664,497	1,453	376	no
120190026700	Peoples Gas Light and Coke #1	IL	Champaign	9	21N	7E	379,864	4,460,209	3,931	82,600	yes
120190028100	Hinton Brothers #2	IL	Champaign	21	21N	7E	379,885	4,458,362	3,892	94,800	yes
120190028500	Hunt, A.G. #5	IL	Champaign	16	21N	7E	380,033	4,459,986	3,942	90,000	yes
120190075200	Hazen, F. #1	IL	Champaign	20	21N	7E	378,623	4,457,143	4,560	83,700	no
120190118500	Buckles #2	IL	Champaign	21	21N	7E	379,352	4,457,153	3,940	85,700	yes
120190133700	Leischner, W. #3	IL	Champaign	10	21N	7E	380,726	4,460,824	4,160	90,400	no
120190142500	Wilson #1-33	IL	Champaign	33	17N	8E	389,077	4,415,541	4,026	78,235	yes
120190142600	Woodworth #1-33	IL	Champaign	33	17N	8E	387,848	4,415,241	4,682	115,222	yes
120190142600	Woodworth #1-33	IL	Champaign	33	17N	8E	387,848	4,415,241	4,559	115,316	yes
120190142600	Woodworth #1-33	IL	Champaign	33	17N	8E	387,848	4,415,241	4,682	117,515	yes
120190142600	Woodworth #1-33	IL	Champaign	33	17N	8E	387,848	4,415,241	4,559	119,415	yes
120190142700	Boyer #1-34	IL	Champaign	34	17N	8E	390,661	4,415,158	4,232	106,123	yes
120190142700	Boyer #1-34	IL	Champaign	34	17N	8E	390,661	4,415,158	4,093	116,516	yes
120190142700	Boyer #1-34	IL	Champaign	34	17N	8E	390,661	4,415,158	4,559	124,588	yes
120192161700	Hazen, F. #4	IL	Champaign	27	21N	7E	380,645	4,455,953	4,055	83,300	yes
120192171400	Bidner, O. #2	IL	Champaign	15	21N	7E	381,413	4,459,146	4,265	83,600	no
120192197200	Sloan, V. #1	IL	Champaign	5	21N	7E	378,339	4,462,408	4,218	82,700	no
120192254700	Kamerer, F. #3	IL	Champaign	26	21N	7E	381,868	4,456,691	4,254	85,500	no
120192389600	Williams, J. #4	IL	Champaign	16	21N	7E	380,121	4,458,399	3,898	95,800	yes
120310037100	Western Springs #4	IL	Cook	6	38N	12E	424,313	4,628,768	1,910	15,500	yes
120310162300	Riverside City #4	IL	Cook	25	39N	12E	432,397	4,632,594	1,980	670	yes
120310242200	Western Springs City #1	IL	Cook	6	38N	12E	424,667	4,628,540	2046	932	no
120310384500	Mt. Prospect Vill. #5	IL	Cook	34	42N	11E	422,612	4,658,922	1,820	453	no
120390039100	Lamb, J. #1	IL	DeWitt	1	20N	4E	355,228	4,453,949	4,570	107,115	yes
120410079900	Shaw, Lewis #1	IL	Douglas	36	16N	8E	392,720	4,405,467	4,151	102,700	no
120410079900	Shaw, Lewis #1	IL	Douglas	36	16N	8E	392,720	4,405,467	4,046	103,000	yes
120410079900	Shaw #1	IL	Douglas	36	16N	8E	392,720	4,405,467	4,063	128,312	yes
120410105000	Bristow #1-4	IL	Douglas	4	16N	8E	389,074	4,414,691	4,135	78,090	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
120410105000	Bristow #1-4	IL	Douglas	4	16N	8E	389,074	4,414,691	4,081	92,133	yes
120410105000	Bristow #1-4	IL	Douglas	4	16N	8E	389,074	4,414,691	4,135	101,477	yes
120410105000	Bristow #1-4	IL	Douglas	4	16N	8E	389,074	4,414,691	4,038	112,656	yes
120410105000	Bristow #1-4	IL	Douglas	4	16N	8E	389,074	4,414,691	4,135	113,144	yes
120410105000	Bristow #1-4	IL	Douglas	4	16N	8E	389,074	4,414,691	3,995	113,144	yes
120410105100	DeBolt #1-4	IL	Douglas	4	16N	8E	389,077	4,414,240	4,030	77,703	yes
120410105100	DeBolt #1-4	IL	Douglas	4	16N	8E	389,077	4,414,240	4,031	123,056	yes
120410105100	DeBolt #1-4	IL	Douglas	4	16N	8E	389,077	4,414,240	4,031	182,509	yes
120410105200	DeBolt #2-4	IL	Douglas	4	16N	8E	388,699	4,413,866	4,037	87,723	yes
120410105200	DeBolt #2-4	IL	Douglas	4	16N	8E	388,699	4,413,866	4,037	99,727	yes
120410105200	DeBolt #2-4	IL	Douglas	4	16N	8E	388,699	4,413,866	4,037	119,020	yes
120410105200	DeBolt #2-4	IL	Douglas	4	16N	8E	388,699	4,413,866	4,275	129,997	yes
120410105200	DeBolt #2-4	IL	Douglas	4	16N	8E	388,699	4,413,866	4,240	138,219	yes
120410105200	DeBolt #2-4	IL	Douglas	4	16N	8E	388,699	4,413,866	4,240	139,791	yes
120410105200	DeBolt #2-4	IL	Douglas	4	16N	8E	388,699	4,413,866	4,037	186,025	yes
120410105300	DeBolt #3-4	IL	Douglas	4	16N	8E	388,998	4,414,242	3,890	103,280	yes
120410105300	DeBolt #3-4	IL	Douglas	4	16N	8E	388,998	4,414,242	3,890	131,550	yes
120410112900	Bristow #2-4	IL	Douglas	4	16N	8E	388,658	4,414,345	4,016	97,120	yes
120410113000	Bristow #3-4	IL	Douglas	4	16N	8E	388,659	4,414,769	4,026	96,703	yes
120410113000	Bristow #3-4	IL	Douglas	4	16N	8E	388,659	4,414,769	4,026	110,025	yes
120410113000	Bristow #3-4	IL	Douglas	4	16N	8E	388,659	4,414,769	4,026	118,127	yes
120410113000	Bristow #3-4	IL	Douglas	4	16N	8E	388,659	4,414,769	4,026	134,476	yes
120410113000	Bristow #3-4	IL	Douglas	4	16N	8E	388,659	4,414,769	4,026	137,105	yes
120410113000	Bristow #3-4	IL	Douglas	4	16N	8E	388,659	4,414,769	4,026	181,622	yes
120410113100	Bristow #4-4	IL	Douglas	4	16N	8E	388,654	4,415,129	4,030	125,657	yes
120410113200	Bristow #5-4	IL	Douglas	4	16N	8E	389,059	4,415,128	4,038	77,687	yes
120410113300	DeBolt #4-4	IL	Douglas	4	16N	8E	389,080	4,413,859	4,029	73,378	yes
120410113300	DeBolt #4-4	IL	Douglas	4	16N	8E	389,080	4,413,859	4,029	82,498	yes
120410113300	DeBolt #4-4	IL	Douglas	4	16N	8E	389,080	4,413,859	4,029	113,210	yes
120410113300	DeBolt #4-4	IL	Douglas	4	16N	8E	389,080	4,413,859	4,029	118,269	yes
120410113300	DeBolt #4-4	IL	Douglas	4	16N	8E	389,080	4,413,859	4,029	135,102	yes
120410113300	DeBolt #4-4	IL	Douglas	4	16N	8E	389,080	4,413,859	4,029	182,375	yes
120410113400	Bundy #3-9	IL	Douglas	9	16N	8E	389,109	4,413,049	4,057	102,297	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
120410113500	Rahn #1-9	IL	Douglas	9	16N	8E	388,690	4,413,431	4,058	103,383	yes
120410113600	Hunsaker #1-15	IL	Douglas	9	16N	8E	389,764	4,410,254	4,145	89,309	yes
120410113600	Hunsaker #1-15	IL	Douglas	15	16N	8E	389,764	4,410,254	4,034	114,570	yes
120410113600	Hunsaker #1-15	IL	Douglas	10	16N	8E	389,764	4,410,254	4,034	115,744	yes
120410114100	Bundy #2-9	IL	Douglas	9	16N	8E	389,446	4,413,416	4,067	126,060	yes
120430101300	American Potash & Chemical WD-1	IL	DuPage	9	39N	9E	399,717	4,636,320	2,130	620	no
120430101300	American Potash & Chemical WD-1	IL	DuPage	9	39N	9E	399,717	4,636,320	4,020	81,780	yes
120430194700	C.M. & St. Paul RR #1	IL	DuPage	13	40N	11E	423,227	4,645,183	2,290	430	yes
120432414900	Bartlett Village #4	IL	DuPage	11	40N	9E	402,481	4,647,469	1,985	512	yes
120530000100	ERP #1	IL	Ford	19	24N	7E	377,153	4,486,420	4,220	57,600	yes
120710031400	Oliver, L. #1	IL	Henderson	7	9N	4W	170,994	4,522,654	2,740	12,950	no
120710031700	Lillard #1	IL	Henderson	14	9N	5W	167,659	4,521,590	3,138	14,790	no
120712034900	Oliver, L. #3	IL	Henderson	7	9N	4W	171,394	4,522,639	2,054	18,180	yes
120712035100	Brook, J. #1	IL	Henderson	18	9N	4W	171,278	4,519,819	2,885	14,620	no
120712036800	Heap, Reva #1	IL	Henderson	16	9N	4W	175,368	4,521,023	2,940	14,275	no
120730036000	South, E.A. #1	IL	Henry	30	16N	1E	212,704	4,582,471	2,635	5,900	yes
120750091400	Owings #201	IL	Iroquois	18	26N	12W	436,507	4,508,945	3,746	93,586	yes
120750091600	Hummel #201	IL	Iroquois	16	26N	13W	430,413	4,510,407	3,704	96,202	yes
120750091700	Taden #209	IL	Iroquois	11	26N	13W	433,595	4,512,096	3,467	86,600	yes
120750092400	Hungess #201	IL	Iroquois	1	26N	13W	435,226	4,512,181	3,704	97,834	yes
120750092600	Taden #210	IL	Iroquois	11	26N	13W	433,633	4,511,694	3,580	92,340	yes
120850034600	Galena City Well #2	IL	Jo Daviess	24	28N	1W	217,789	4,701,153	1,491	235	no
120850034600	Galena City Well #2	IL	Jo Daviess	24	28N	1W	217,789	4,701,153	1,491	245	yes
120850034600	Galena City Well #2	IL	Jo Daviess	24	28N	1W	217,789	4,701,153	1,491	269	yes
120850034600	Galena City Well #2	IL	Jo Daviess	24	28N	1W	217,789	4,701,153	1,491	294	yes
120850034700	Galena	IL	Jo Daviess	24	28N	1W	217,896	4,701,247	981	235	yes
120850041300	East Dubuque, City Well #1	IL	Jo Daviess	20	29N	2W	200,513	4,710,927	1,502	272	no
120890060500	Batavia City #3	IL	Kane	22	38N	8E	391,389	4,633,797	2,200	459	no
120890064100	Waterwell #2	IL	Kane	33	39N	8E	389,473	4,630,416	2,300	1,248	yes
120890066300	Aurora City #5	IL	Kane	15	38N	8E	391,161	4,626,082	2,250	281.6	yes
120890066600	Aurora City #12-A	IL	Kane	15	38N	8E	391,156	4,626,272	2,251	780	no
120890068600	Aurora City	IL	Kane	27	38N	8E	391,041	4,621,613	2,185	245.2	yes
120890068800	Aurora City #7	IL	Kane	28	38N	8E	389,388	4,622,404	2,263	564.1	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
120890070100	Aurora City Park	IL	Kane	35	38N	8E	392,404	4,621,556	2,759	2,015.4	yes
120890070100	Aurora City Park	IL	Kane	35	38N	8E	392,404	4,621,556	2,759	2,992	yes
120890072100	Geneva City #3	IL	Kane	3	38N	8E	390,514	4,639,074	2,300	334	yes
120890078200	Shuler Street Well	IL	Kane	14	41N	8E	392,277	4,654,042	1,940	395	no
120890078500	Elgin State Hosp. #2	IL	Kane	23	41N	8E	392,674	4,652,549	2,000	280	yes
120890082500	St. Charles #6	IL	Kane	34	40N	8E	390,898	4,640,312	2,249	367	yes
120890089300	Elgin City Well #1	IL	Kane	11	41N	8E	392,457	4,655,749	2,000	318	yes
120910007300	Schwark 1-M	IL	Kankakee	32	30N	10E	407,156	4,543,218	2,590	17,313	no
120910007600	Bartlett 1-M	IL	Kankakee	33	30N	10E	407,982	4,543,325	2,665	17,402	no
120910009700	Knittel 1-M	IL	Kankakee	32	30N	10E	407,544	4,543,220	2,583	17,201	no
120910014700	Kilpatrick M-1	IL	Kankakee	29	30N	10E	407,136	4,544,111	2,656	16,440	no
120910015100	Knittel M-3	IL	Kankakee	32	30N	10E	407,953	4,542,443	2,665	17,707	no
120910025802	Heimberger #1	IL	Kankakee	8	30N	10E	407,115	4,549,015	2,586	16,793	yes
120910028500	Dickman #1	IL	Kankakee	20	30N	10E	407,898	4,546,536	2,720	17,863	yes
120910031800	Karcher #6	IL	Kankakee	32	30N	10E	407,154	4,543,664	2,439	18,940	yes
120910031800	Karcher #6	IL	Kankakee	32	30N	10E	407,154	4,543,664	2,442	19,055	yes
120910040000	Parish #1	IL	Kankakee	24	31N	13E	442,787	4,556,389	5,045	38,655	no
120910046801	Cook, P. #1	IL	Kankakee	3	30N	9E	399,920	4,551,688	2,204	9,362	yes
120910051400	Sands, O.M. #1	IL	Kankakee	3	29N	10E	410,549	4,540,824	2,586	19,940	yes
120910051700	Seimering, M. #1	IL	Kankakee	8	29N	10E	407,166	4,540,754	2,689	20,145	yes
	Momence	IL	Kankakee	24	31N	13E	443,534	4,556,404	2,800	38,002	yes
120970177900	American Steel & Wire Works #1	IL	Lake	33	45N	12E	431,598	4,687,751	2,200	555	yes
120970237200	Lake Bluff #3	IL	Lake	20	44N	12E	430,089	4,681,041	1,828	510	no
120973414200	IL Beach State Park #1	IL	Lake	14	46N	12E	434,290	4,702,068	1,775	1,600	no
120973414200	IL Beach State Park #1	IL	Lake	14	46N	12E	434,290	4,702,068	1,775	2,570	no
120973414200	IL Beach State Park #1	IL	Lake	14	46N	12E	434,290	4,702,068	1,932	55,800	yes
120990033100	City Well	IL	LaSalle	25	31N	3E	346,246	4,554,210	2,496	12,437.1	yes
120990082400	Matheius #1	IL	LaSalle	32	35N	1E	321,890	4,603,990	1,421	2,330	yes
120990102600	Swensen #1	IL	LaSalle	1	36N	5E	365,883	4,609,453	3,500	65,022	yes
120990102600	Swensen #1	IL	LaSalle	1	36N	5E	365,883	4,609,453	3,464	67,000	yes
120990102600	Swensen #1	IL	LaSalle	1	36N	5E	365,883	4,609,453	3,500	67,068	yes
120990102600	Swensen #1	IL	LaSalle	1	36N	5E	365,883	4,609,453	3,500	67,700	yes
120990164700	Krischel #2	IL	LaSalle	24	30N	2E	336,493	4,545,533	2,508	17,112	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
120990164700	Krischel #2	IL	LaSalle	24	30N	2E	336,493	4,545,533	2,508	17,574	yes
120990164700	Krischel #2	IL	LaSalle	24	30N	2E	336,493	4,545,533	2,508	18,448	yes
120990178100	Scheuer #1	IL	LaSalle	14	30N	2E	335,315	4,547,189	2,203	12,852	yes
120990178100	Scheuer #1	IL	LaSalle	14	30N	2E	335,315	4,547,189	2,203	13,174	yes
120990178200	Scheuer #4	IL	LaSalle	14	30N	2E	335,703	4,547,175	2,201	13,706	yes
120990179400	Scheuer #5	IL	LaSalle	14	30N	2E	335,324	4,547,516	2,519	12,886	yes
120990179400	Scheuer #5	IL	LaSalle	14	30N	2E	335,324	4,547,516	2,519	13,496	yes
120990179600	Granger #1	IL	LaSalle	14	30N	2E	336,084	4,547,924	2,342	12,768	yes
120990179600	Granger #1	IL	LaSalle	14	30N	2E	336,084	4,547,924	2,342	13,424	yes
120990179700	Healy #1	IL	LaSalle	15	30N	2E	332,936	4,548,677	2,358	10,368	yes
120990179800	Barr #1	IL	LaSalle	22	30N	2E	334,088	4,546,342	2,370	12,258	yes
120990179800	Barr #1	IL	LaSalle	22	30N	2E	334,088	4,546,342	2,370	13,026	yes
121050026600	Fordyce #1	IL	Livingston	33	30N	3E	342,429	4,543,291	2,178	17,901	no
121050027200	Fehr #1	IL	Livingston	27	30N	3E	342,592	4,543,974	2,685	25,800	no
121050027500	Smith #1	IL	Livingston	3	29N	3E	343,494	4,542,272	2,488	22,184	yes
121050027600	Fordyce #4	IL	Livingston	33	30N	3E	342,500	4,543,106	2,396	19,804	no
121050027600	Fordyce #4	IL	Livingston	33	30N	3E	342,500	4,543,106	2,396	21,400	no
121050027700	Musser #1	IL	Livingston	32	30N	3E	340,441	4,542,280	2,535	18,416	yes
121050027800	Fordyce #5	IL	Livingston	33	30N	3E	342,131	4,543,102	2,369	18,300	yes
121050073900	Fienhold #1	IL	Livingston	33	28N	6E	370,026	4,524,357	3,008	50,800	yes
121050074000	Mackinson #1	IL	Livingston	22	28N	6E	371,491	4,526,028	3,480	50,200	no
121050074100	Feinhold #2	IL	Livingston	22	28N	6E	371,262	4,527,572	3,296	51,700	no
121050074200	Dodson #1	IL	Livingston	5	27N	6E	369,571	4,521,108	3,454	53,300	no
121050078300	Clevenger #1	IL	Livingston	17	28N	6E	369,594	4,528,776	3,375	40,700	no
121050078900	Fienhold #5	IL	Livingston	33	28N	6E	369,655	4,523,978	3,271	47,100	no
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	5,772	164,500	yes
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	6,764	179,800	yes
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	6,840	182,300	yes
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	6,764	185,600	yes
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	7,045	201,500	yes
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	6,912	211,700	yes
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	6,840	219,800	yes
121152341500	ADM CCS-1	IL	Macon	5	16N	3E	338,081	4,415,813	7,045	228,100	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	5,653.8	149,728	yes
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	5,840.4	162,416	yes
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	6,416.2	200,816	yes
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	6,720.3	200,912	yes
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	6,632.3	201,944	yes
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	6,945.6	205,788	yes
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	6,983	206,472	yes
121152346000	ADM Verification Well #1	IL	Macon	32	17N	3E	338,095	4,416,131	6,837.1	206,828	yes
121190087601	Kircheis, E.F. 1-S	IL	Madison	27	3N	6W	260,640	4,283,941	4,955	87,044	yes
121190087601	Kircheis, E.F. 1-S	IL	Madison	27	3N	6W	260,640	4,283,941	4,955	95,424	yes
121190087601	Kircheis, E.F. 1-S	IL	Madison	27	3N	6W	260,640	4,283,941	5,018	98,494	yes
121210519800	Johnson, R.S. #1	IL	Marion	6	1N	2E	323,765	4,269,020	8,908	262,962	yes
121090071400	Tr. of Proctor Endowment SM-2	IL	McDonough	30	7N	3W	180,704	4,497,488	2,690	17,963.1	yes
121090071400	Tr. of Proctor Endowment SM-2	IL	McDonough	30	7N	3W	180,704	4,497,488	2,690	18,359.4	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	2,412	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	16,993.2	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	18,098.6	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	18,393	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	18,808	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	20,152	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	20,683	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,663	20,864	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,812	22,703	yes
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,764	22,710	no
121090071600	Hainline, Silas S-34	IL	McDonough	31	7N	3W	179,986	4,495,502	2,812	22,721	yes
121090071700	Tr. of Proctor Endowment SM-3	IL	McDonough	20	7N	3W	181,650	4,499,066	2,842	20,039	no
121090076500	Proctor, J.C. Endowment SM-5	IL	McDonough	31	7N	3W	179,490	4,496,354	2,636	12,385.3	yes
121090076500	Proctor, J.C. Endowment SM-5	IL	McDonough	31	7N	3W	179,490	4,496,354	2,636	18,937	yes
121090076500	Proctor, J.C. Endowment SM-5	IL	McDonough	31	7N	3W	179,490	4,496,354	2,800	18,978	no
121090076500	Proctor, J.C. Endowment SM-5	IL	McDonough	31	7N	3W	179,490	4,496,354	2,636	20,401	yes
121090076500	Proctor, J.C. Endowment SM-5	IL	McDonough	31	7N	3W	179,490	4,496,354	2,636	20,739	yes
121090076500	Proctor, J.C. Endowment SM-5	IL	McDonough	31	7N	3W	179,490	4,496,354	2,636	20,951	yes
121090076500	Proctor, J.C. Endowment SM-5	IL	McDonough	31	7N	3W	179,490	4,496,354	2,636	20,993	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
121092080100	Proctor, J.C. Endowment SM-7	IL	McDonough	31	7N	3W	179,697	4,495,968	2,660	19,022.7	yes
121092080100	Proctor, J.C. Endowment SM-7	IL	McDonough	31	7N	3W	179,697	4,495,968	2,660	19,768	yes
121092080100	Proctor, J.C. Endowment SM-7	IL	McDonough	31	7N	3W	179,697	4,495,968	2,660	20,413	yes
121092080100	Proctor, J.C. Endowment SM-7	IL	McDonough	31	7N	3W	179,697	4,495,968	2,660	23,154	yes
121092081500	Knappenberger, Burdett SM-10	IL	McDonough	5	6N	3W	180,976	4,494,802	2,691	19,148.7	yes
121092081500	Knappenberger, Burdett SM-10	IL	McDonough	5	6N	3W	180,976	4,494,802	2,691	19,177	yes
121092081500	Knappenberger, Burdett SM-10	IL	McDonough	5	6N	3W	180,976	4,494,802	2,691	20,004	yes
121092081500	Knappenberger, Burdett SM-10	IL	McDonough	5	6N	3W	180,976	4,494,802	2,691	20,271	yes
121092081500	Knappenberger, Burdett SM-10	IL	McDonough	5	6N	3W	180,976	4,494,802	2,691	20,650	yes
121092081500	Knappenberger, Burdett SM-10	IL	McDonough	5	6N	3W	180,976	4,494,802	2,691	24074	yes
121092081600	Chenoweth, Harry SM-9	IL	McDonough	31	7N	3W	180,326	4,495,394	2,685	17,903.6	yes
121092081600	Chenoweth, Harry SM-9	IL	McDonough	31	7N	3W	180,326	4,495,394	2,685	18,002	yes
121092081600	Chenoweth, Harry SM-9	IL	McDonough	31	7N	3W	180,326	4,495,394	2,685	18,396.5	yes
121092081600	Chenoweth, Harry SM-9	IL	McDonough	31	7N	3W	180,326	4,495,394	2,685	19,656	yes
121092081600	Chenoweth, Harry SM-9	IL	McDonough	31	7N	3W	180,326	4,495,394	2,685	20,966	yes
121092081600	Chenoweth, Harry SM-9	IL	McDonough	31	7N	3W	180,326	4,495,394	2,685	22,122	yes
121092081600	Chenoweth, Harry SM-9	IL	McDonough	31	7N	3W	180,326	4,495,394	2,685	22,126	yes
121092081700	Hainline, Fred SM-11	IL	McDonough	31	7N	3W	180,307	4,496,660	2,666	18,351.3	yes
121092081700	Hainline, Fred SM-11	IL	McDonough	31	7N	3W	180,307	4,496,660	2,666	18,854.1	yes
121092081700	Hainline, Fred SM-11	IL	McDonough	31	7N	3W	180,307	4,496,660	2,666	20,146	yes
121092081700	Hainline, Fred SM-11	IL	McDonough	31	7N	3W	180,307	4,496,660	2,666	20,846	yes
121092081700	Hainline, Fred SM-11	IL	McDonough	31	7N	3W	180,307	4,496,660	2,666	22,312	yes
121092086400	Chenoweth SM-12	IL	McDonough	5	6N	3W	181,390	4,494,445	2,692	18,725.7	yes
121092086400	Chenoweth SM-12	IL	McDonough	5	6N	3W	181,390	4,494,445	2,692	19,330	yes
121092086400	Chenoweth SM-12	IL	McDonough	5	6N	3W	181,390	4,494,445	2,692	19,431	yes
121092086400	Chenoweth SM-12	IL	McDonough	5	6N	3W	181,390	4,494,445	2,692	19,662	yes
121092086400	Chenoweth SM-12	IL	McDonough	5	6N	3W	181,390	4,494,445	2,692	20,373	yes
121092086400	Chenoweth SM-12	IL	McDonough	5	6N	3W	181,390	4,494,445	2,692	20,577	yes
121092086400	Chenoweth SM-12	IL	McDonough	5	6N	3W	181,390	4,494,445	2,692	34,548.9	yes
121092086500	Chenoweth SM-13	IL	McDonough	5	6N	3W	181,799	4,494,284	2,703	17,619.2	yes
121092086500	Chenoweth SM-13	IL	McDonough	5	6N	3W	181,799	4,494,284	2,703	18,223	yes
121092086500	Chenoweth SM-13	IL	McDonough	5	6N	3W	181,799	4,494,284	2,703	18,959	yes
121092086500	Chenoweth SM-13	IL	McDonough	5	6N	3W	181,799	4,494,284	2,703	19,102	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
121092086500	Chenoweth SM-13	IL	McDonough	5	6N	3W	181,799	4,494,284	2,703	19,879	yes
121092086500	Chenoweth SM-13	IL	McDonough	5	6N	3W	181,799	4,494,284	2,703	20,457	yes
121092086500	Chenoweth SM-13	IL	McDonough	5	6N	3W	181,799	4,494,284	2,703	31,375.1	yes
121092097100	SM-16	IL	McDonough	31	7N	3W	179,834	4,496,736	2,654	18,702.5	yes
121092097100	SM-16	IL	McDonough	31	7N	3W	179,834	4,496,736	2,654	20,152	yes
121092097100	SM-16	IL	McDonough	31	7N	3W	179,834	4,496,736	2,654	20,507	yes
121092097100	SM-16	IL	McDonough	31	7N	3W	179,834	4,496,736	2,654	20,516	yes
121092097100	SM-16	IL	McDonough	31	7N	3W	179,834	4,496,736	2,654	20,807	yes
121092097100	SM-16	IL	McDonough	31	7N	3W	179,834	4,496,736	2,654	20,945	yes
121092097200	SM-15	IL	McDonough	32	7N	3W	180,802	4,496,292	2,673	15,670	yes
121092097200	SM-15	IL	McDonough	32	7N	3W	180,802	4,496,292	2,673	18,210	yes
121092097200	SM-15	IL	McDonough	32	7N	3W	180,802	4,496,292	2,673	19,679	yes
121092097200	SM-15	IL	McDonough	32	7N	3W	180,802	4,496,292	2,673	20,424	yes
121092097200	SM-15	IL	McDonough	32	7N	3W	180,802	4,496,292	2,673	20,640	yes
121092097200	SM-15	IL	McDonough	32	7N	3W	180,802	4,496,292	2,673	22,096	yes
121092097200	SM-15	IL	McDonough	32	7N	3W	180,802	4,496,292	2,673	22,349	yes
121092273700	Hainline, Fred SM-17	IL	McDonough	31	7N	3W	179,742	4,495,293	2,656	19,433	yes
121092273800	Knappenberger, Burdette SM-18	IL	McDonough	5	6N	3W	180,568	4,494,691	2,682	16,677	yes
121092273800	Knappenberger, Burdette SM-18	IL	McDonough	5	6N	3W	180,568	4,494,691	2,682	16,707	yes
121092273800	Knappenberger, Burdette SM-18	IL	McDonough	5	6N	3W	180,568	4,494,691	2,682	21,245	yes
121110078200	Crystal Lake City Well	IL	McHenry	5	43N	8E	390,682	4,677,355	2,000	280	no
121130052800	Anderson, J. #1	IL	McLean	31	26N	3E	337,514	4,503,492	3,608	59,650	no
121130053300	Funk #1	IL	McLean	19	26N	3E	337,929	4,508,115	3,660	58,700	yes
121130053400	Cleary, R. #1	IL	McLean	13	26N	2E	336,257	4,509,558	3,759	57,200	yes
121130053500	Houck #1	IL	McLean	19	26N	3E	337,874	4,507,647	3,681	66,300	yes
121130053600	Furrow #1	IL	McLean	30	26N	3E	337,511	4,505,479	3,600	59,680	yes
121130053600	Furrow #1	IL	McLean	30	26N	3E	337,511	4,505,479	3,600	60,400	yes
121130055900	Anderson, O. #1	IL	McLean	6	25N	3E	337,590	4,501,816	3,716	63,250	yes
121130056100	Hitch #1	IL	McLean	35	26N	2E	335,374	4,505,054	3,612	59,100	yes
121130056200	Furrow #2	IL	McLean	31	26N	3E	337,459	4,504,694	3,564	56,800	yes
121130056200	Furrow #2	IL	McLean	31	26N	3E	337,459	4,504,694	3,564	57,600	yes
121130056200	Furrow #2	IL	McLean	31	26N	3E	337,459	4,504,694	4,071	59,750	no
121130056200	Furrow #2	IL	McLean	31	26N	3E	337,459	4,504,694	4,071	59,920	no

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
121130056300	Furrow #3	IL	McLean	31	26N	3E	337,101	4,505,040	3,538	61,100	yes
121130056400	Punke #1	IL	McLean	32	26N	3E	339,053	4,504,666	3,726	60,400	yes
121130061200	Schlosser #1	IL	McLean	32	25N	3E	338,976	4,494,313	3,956	74,450	yes
121130061600	Carden #1	IL	McLean	15	24N	2E	333,700	4,488,957	4,278	81,650	no
121130062600	Stephens #1	IL	McLean	34	25N	2E	332,157	4,494,044	3,880	75,700	yes
121130065600	Grimes #1	IL	McLean	1	24N	2E	335,420	4,493,122	4,234	77,450	no
121130070100	Fortner #1	IL	McLean	36	25N	2E	335,490	4,495,159	3,946	74,175	yes
121130071500	Grimes #2	IL	McLean	1	24N	2E	335,822	4,492,754	3,794	74,650	yes
121130071700	Bates #2	IL	McLean	2	24N	2E	334,557	4,493,181	4,135	77,450	no
121130071900	Hoopes #1	IL	McLean	7	24N	3E	337,033	4,491,219	4,275	76,200	no
121130073800	Berenz #1	IL	McLean	4	25N	3E	341,739	4,501,578	3,796	68,480	yes
121130074100	Cooke #1	IL	McLean	14	25N	3E	345,455	4,498,764	3,726	65,460	no
121130074200	Pyne #1	IL	McLean	14	25N	3E	344,643	4,498,874	3,752	65,220	yes
121130074200	Pyne #1	IL	McLean	14	25N	3E	344,643	4,498,874	4,002	67,790	no
121130074300	Cooke #3	IL	McLean	14	25N	3E	345,051	4,498,796	4,231	66,000	no
121130074600	Gilmore #1	IL	McLean	6	25N	4E	347,804	4,502,783	3,857	63,650	yes
121130074700	Smith #1	IL	McLean	20	25N	4E	349,575	4,496,567	3,857	64,480	yes
121132116600	Moore #1	IL	McLean	22	25N	3E	343,888	4,499,660	3,908	68,460	yes
121310008400	Aledo City #1	IL	Mercer	17	14N	3W	185,579	4,567,929	3,113	1,673	yes
121370034601	Whitlock #7-15	IL	Morgan	15	13N	8W	243,853	4,384,943	4,100	51,461	yes
121372213200	FutureGen Alliance #1	IL	Morgan	25	16N	9W	238,645	4,410,693	4,048	47,100	yes
121372213200	FutureGen Alliance #1	IL	Morgan	25	16N	9W	238,645	4,410,693	4,048	47,700	yes
121410068400	Polo City Well #1	IL	Ogle	9	23N	8E	286,433	4,652,309	2,100	337	no
121410075900	Oregon City #2	IL	Ogle	3	23N	10E	307,055	4,654,144	1,200	320	yes
121550010400	Jones & Laughlin Steel WD-1	IL	Putnam	3	32N	2W	304,520	4,570,859	4,500	60,000	no
121550010400	Jones & Laughlin Steel WD-1	IL	Putnam	3	32N	2W	304,520	4,570,859	3,109	61,600	yes
121550010400	Jones & Laughlin Steel WD-1	IL	Putnam	3	32N	2W	304,520	4,570,859	3,086	61,628	yes
121830184800	Allied Chemical Corp. #1	IL	Vermilion	12	19N	11W	452,323	4,442,014	5,144	172,000	yes
121830184800	Allied Chemical Corp. #1	IL	Vermilion	12	19N	11W	452,323	4,442,014	4,864	207,800	yes
121830184800	Allied Chemical Corp #1	IL	Vermilion	12	19N	11W	452,323	4,442,014	6,000	220,000	yes
121950010300	Fulton City Well #3	IL	Whiteside	28	22N	3E	237,328	4,639,465	1,943	333	yes
121970127400	Herren, E.L. #1	IL	Will	23	36N	9E	402,996	4,605,289	1,958	1,210	no
122010030400	City of Rockford #4	IL	Winnebago	34	44N	1E	326,149	4,679,967	1,219	624	no

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
122010030400	City of Rockford #4	IL	Winnebago	34	44N	1E	326,149	4,679,967	1,219	646	yes
122010030400	City of Rockford #4	IL	Winnebago	34	44N	1E	326,149	4,679,967	1,219	658	yes
122010030400	City of Rockford #4	IL	Winnebago	34	44N	1E	326,149	4,679,967	1,219	665	yes
122010030400	City of Rockford #4	IL	Winnebago	34	44N	1E	326,149	4,679,967	1,219	695	yes
122010030400	City of Rockford #4	IL	Winnebago	34	44N	1E	326,149	4,679,967	1,219	706	yes
122010039200	Wisc. Power & Light #3	IL	Winnebago	5	46N	2E	332,856	4,705,698	1,200	311	yes
	Northern Indiana Public Service S-106	IN	Cass	14	28N	1W	542,384	4,524,892	2,770	68,800	yes
	Northern Indiana Public Service S-106	IN	Cass	14	28N	1W	542,384	4,524,892	2,802	104,400	yes
	Northern Indiana Public Service S-106	IN	Cass	14	28N	1W	542,384	4,524,892	3,991	124,200	yes
117407	Pensinger #1	IN	Clay	32	10N	6W	492,019	4,345,770	6,670	208,340	yes
135895	Hoskin Mfg. WD-1	IN	Elkhart	21	35N	6E	596,863	4,591,024	3,418	123,600	yes
142097	US Steel WD-1 (Sample C-65-3)	IN	Lake	29	37N	8W	469,400	4,608,110	2,469	13,100	yes
142097	US Steel WD-1 (Sample H-191)	IN	Lake	29	37N	8W	469,400	4,608,110	2,442	13,200	yes
142097	US Steel WD-1 (Sample H-188)	IN	Lake	29	37N	8W	469,400	4,608,110	2,384	91,900	yes
142097	US Steel WD-1 (Sample H-187)	IN	Lake	29	37N	8W	469,400	4,608,110	2,384	92,500	yes
142097	US Steel WD-1 (Sample H-192)	IN	Lake	29	37N	8W	469,400	4,608,110	3,289	97,800	yes
142097	US Steel WD-1 (Sample C-65-4)	IN	Lake	29	37N	8W	469,400	4,608,110	3,316	101,300	yes
142097	US Steel WD-1 (Sample H-186)	IN	Lake	29	37N	8W	469,400	4,608,110	3,766	124,000	yes
142097	US Steel WD-1 (Sample C-65-5)	IN	Lake	29	37N	8W	469,400	4,608,110	3,793	128,200	yes
142098	Inland Steel Co. WD-1 (Sample H-195)	IN	Lake	14	37N	9W	464,140	4,612,070	2,582	20,100	yes
142098	Inland Steel Co. WD-1 (Sample H-196)	IN	Lake	14	37N	9W	464,140	4,612,070	3,870	123,000	yes
143816	Northern Indiana Public Service LW-88/ Ames #1	IN	Marshall	21	34N	3E	568,227	4,581,707	2,982	34,000	yes
144456	Bethlehem Steel WPL-1	IN	Porter	28	37N	6W	490,065	4,609,174	3,210	68,100	yes
144456	Bethlehem Steel WD-1 (Sample C-64-1	IN	Porter	28	37N	6W	490,065	4,609,174	2,222	68,300	yes
144456	Bethlehem Steel WD-1	IN	Porter	28	37N	6W	490,065	4,609,174	2,210	71,370	yes
144456	Bethlehem Steel WPL-1	IN	Porter	28	37N	6W	490,065	4,609,174	3,210	71,600	yes
144458	Bethlehem Steel WD-2C (Sample C-68-1)	IN	Porter	29	37N	6W	488,140	4,608,510	4,250	98,000	yes
144461	Midwest Steel WD-1 (Sample C-64-13)	IN	Porter	25	37N	7W	485,744	4,608,600	2,160	57,800	yes
144461	Midwest Steel WPL-1	IN	Porter	25	37N	7W	485,744	4,608,600	3,500	74,255	yes
159092	Midwest/U.S. Steel WPL #2	IN	Porter	25	37N	7W	485,779	4,608,660	2,485	69,400	yes

Well ID	Name	State	County	SEC	TWP	RNG	UTM16 NAD83 X (m)	UTM16 NAD83 Y (m)	Depth (ft)	TDS (mg/L)	New data?
125110	Newport Chemical Plant WD-1 (Sample C-60-24)	IN	Vermillion	9	16N	9W	463,827	4,411,220	5,450	202,100	yes
125110	Newport Chemical Plant WD-1	IN	Vermillion	9	16N	9W	463,827	4,411,220	5,450	204,400	yes
125110	Newport Chemical Plant WD-1	IN	Vermillion	9	16N	9W	463,827	4,411,220	5,450	234,700	yes

[1]All 329 samples were collected from wells completed in the Mt. Simon Sandstone. The list is organized alphabetically by state and county and then numerically by well ID. The last column indicates whether the TDS value was new data compiled for this study. SEC = section; TWP = township; RNG = range; UTM = Universal Transverse Mercator; NAD = North American Datum.