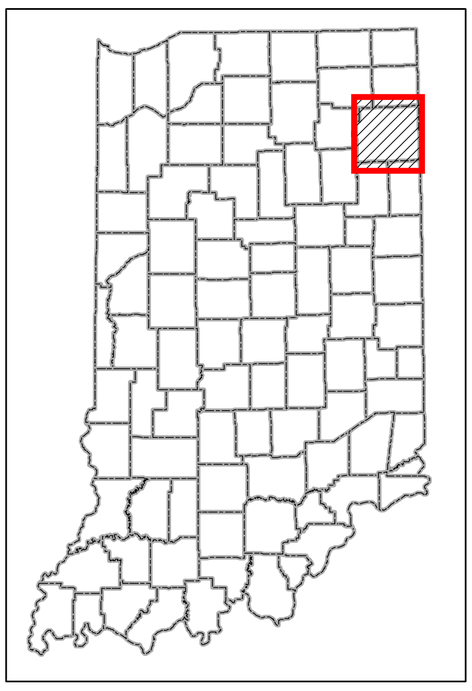
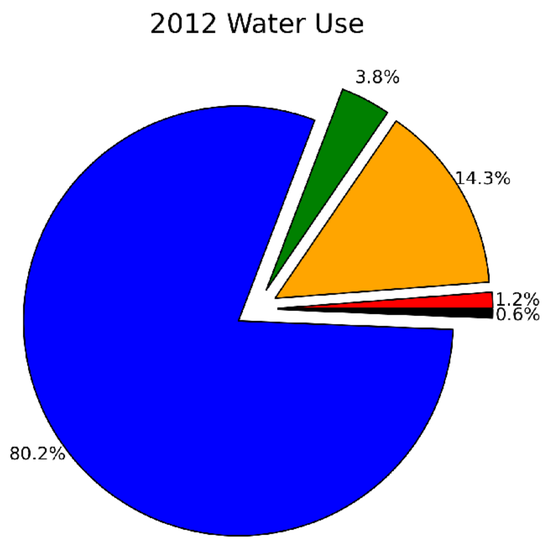
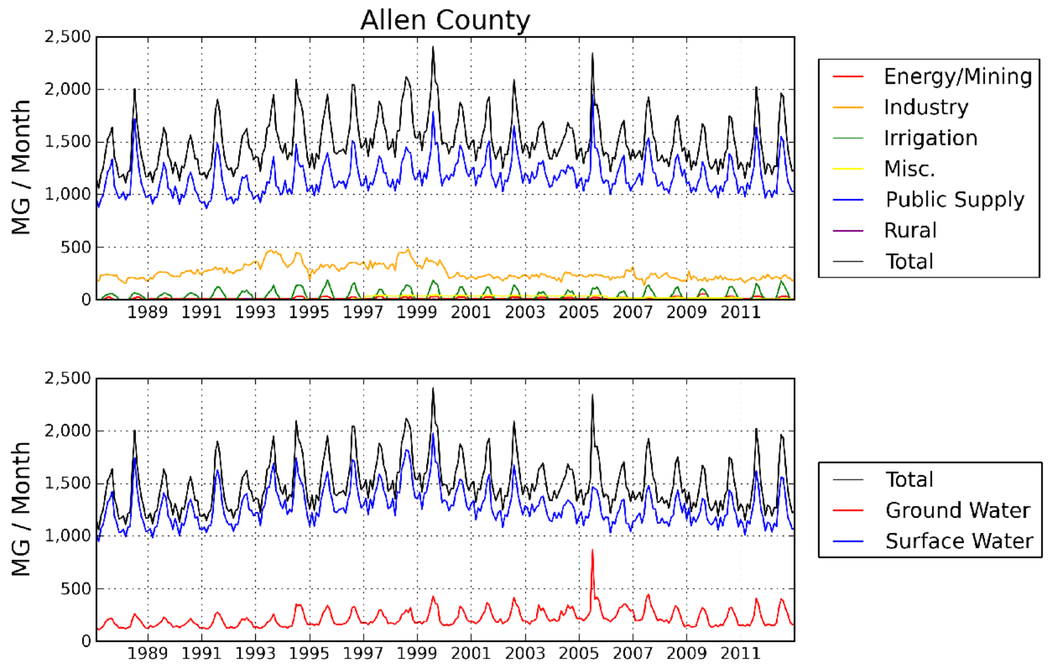
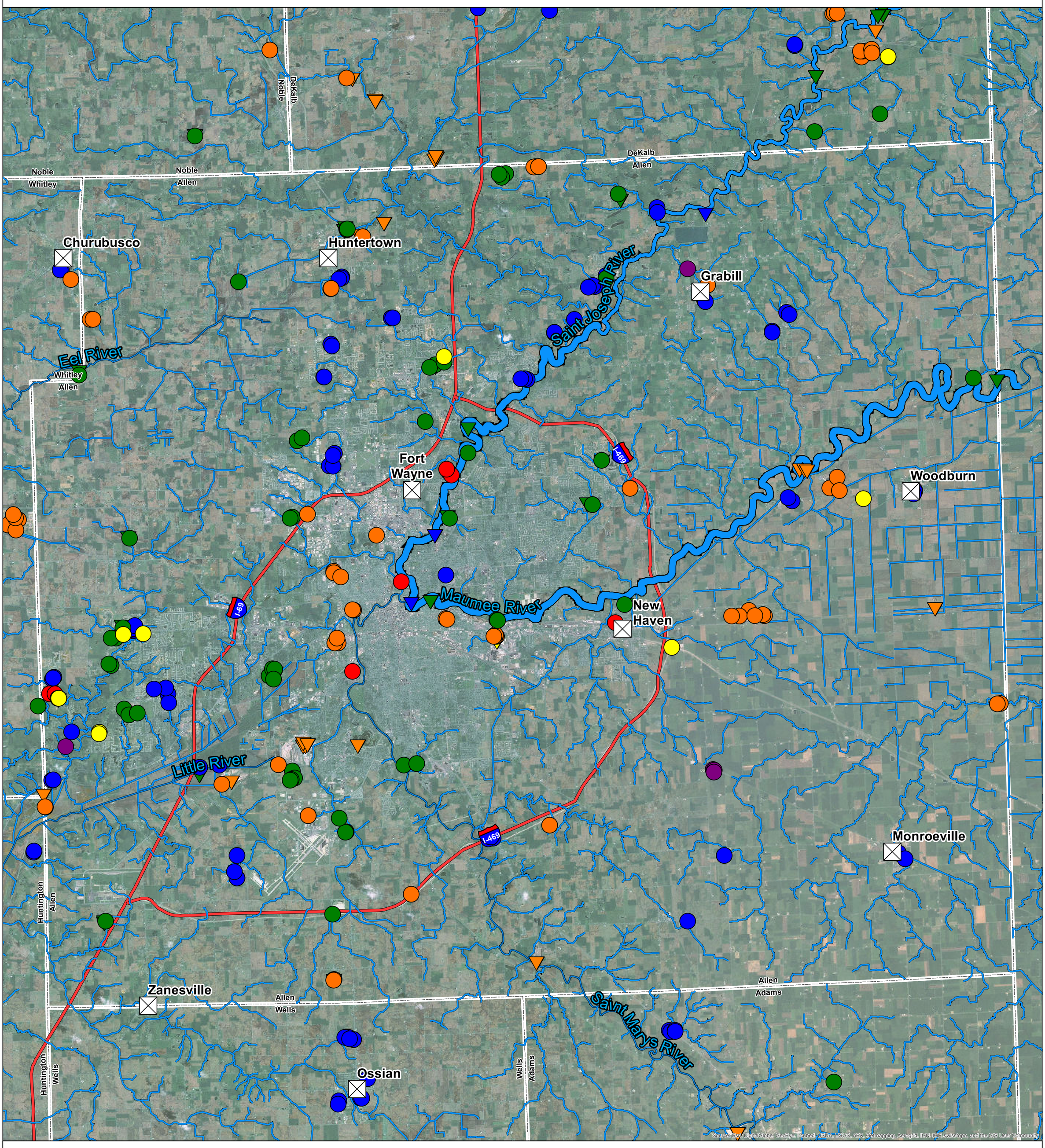




Average Daily Use: 48.0 MGD





Water Resources and Use in Allen County

Data Sources: U.S. Geological Survey and Indiana Department of Natural Resources

Withdrawal Location

WELL	INTAKE	
●	▼	Energy/Mining
●	▼	Industry
●	▼	Irrigation
●	▼	Misc.
●	▼	Public Supply
●	▼	Rural Use

River

7Q2 Flow (MGD)

- <10 MGD
- 10 - 50 MGD
- 50 - 100 MGD
- 100 - 500 MGD
- > 500 MGD

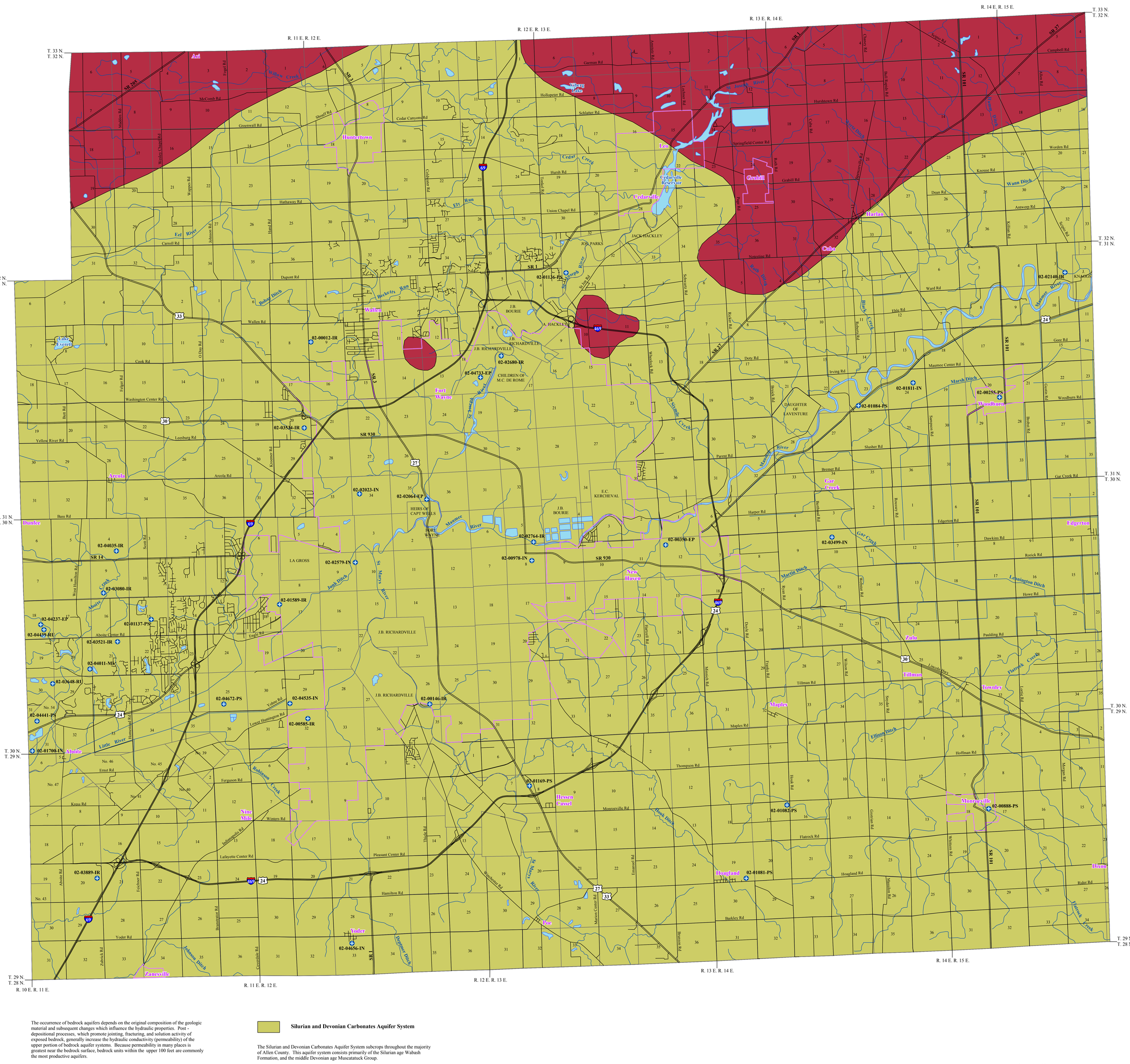
- Major Lakes
- Interstate
- County
- City

INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

NORTH

0 1 2 4 Miles

BEDROCK AQUIFER SYSTEMS OF ALLEN COUNTY, INDIANA



The occurrence of bedrock aquifers depends on the original composition of the geologic material and subsequent changes which influence the hydraulic properties. Post - depositional processes, which promote jointing, fracturing, and solution activity of exposed bedrock, generally increase the hydraulic conductivity (permeability) of the upper portion of bedrock aquifer systems. Because permeability in many places is greatest near the bedrock surface, bedrock units within the upper 100 feet are commonly the most productive aquifers.

Two bedrock aquifer systems are identified within Allen County: the Devonian and Mississippian age Coldwater, Ellsworth and Antrim Shales, and the Silurian and Devonian Carbonates. Bedrock wells represent approximately 42 percent of all wells completed in this county.

Allen County has a complex glacial history and was subjected to multiple glacial advances from the north, northeast and east resulting in glacial sediment deposits completely covering the county. The resulting unconsolidated sediments are quite variable in thickness; in the northwest corner of the county, the bedrock is covered by as much as 300 feet of glacial material, while in some areas of the southwestern part of the county, unconsolidated deposits are approximately 40 to 50 feet thick. In much of the eastern part of the county, depth to bedrock is about 30 to 50 feet below the surface.

The yield of a bedrock aquifer depends on its hydraulic characteristics and the nature of the overlying deposits. Shale and glacial till act as aquitards, restricting recharge to underlying bedrock aquifers. However, fracturing and/or jointing may occur in aquitards, which can increase recharge to the underlying aquifers. Hydraulic properties of the bedrock aquifers are highly variable. Most of the bedrock aquifers in the county are under confined conditions. In other words, the potentiometric surface (water level) in most wells completed in bedrock rises above the top of the water-bearing zone.

The susceptibility of bedrock aquifer systems to surface contamination is largely dependent on the type and thickness of the overlying sediments. Because the bedrock aquifer systems have complex fracturing systems, once a contaminant has been introduced into a bedrock aquifer system, it will be difficult to track and remediate.

Devonian and Mississippian -- Coldwater, Ellsworth and Antrim Shales Aquifer System

In Allen County the Coldwater, Ellsworth and Antrim Shales subcrop in the northern third of the county, and in two relatively smaller areas located in the north central portion of the county. The Coldwater, Ellsworth and Antrim Shales Aquifer System is overlain by up to 260 feet of unconsolidated deposits. These shales are commonly considered an aquitard; therefore, the system is an extremely limited ground-water resource.

Due to the availability of the overlying unconsolidated resources few wells have been completed in the Coldwater, Ellsworth and Antrim Shales Aquifer System in Allen County. Well yields range from 10 to 30 gallons per minute (gpm) and reported static water levels are 12 to 115 feet below land surface. No significant ground-water withdrawal facilities have been reported in this aquifer system.

Because the permeability of shale materials is considered low and the overlying unconsolidated deposits are thick, susceptibility to contamination introduced at or near the surface is low.

Silurian and Devonian Carbonates Aquifer System

The Silurian and Devonian Carbonates Aquifer System subcrops throughout the majority of Allen County. This aquifer system consists primarily of the Silurian age Wabash Formation, and the middle Devonian age Muscatatuck Group.

Wells completed in the Silurian and Devonian Carbonates Aquifer System are generally capable of meeting the needs of most domestic and high-capacity users in this county. Reported domestic wells utilizing this system in Allen County have depths generally ranging from about 100 feet to over 200 feet. Typical yields for domestic wells range from about 10 to 100 gpm, and static water levels from 23 to 55 feet below land surface. There are 37 registered significant ground-water withdrawal facilities (83 wells) in this system. Reported yields from the individual wells are 15 to 1500 gpm. Uses for these facilities are primarily public supply, industry, and irrigation.

In the majority of Allen County, the Silurian and Devonian Carbonates Aquifer System has a low susceptibility to surface contamination because thick clay deposits overlie the system. However, areas where overlying clays are thin or absent are at moderate to high risk to contamination.

INDIANA DEPARTMENT OF NATURAL RESOURCES

EXPLANATION

- Registered Significant Ground-Water Withdrawal Facility
- Stream
- County Road
- State Road & US Highway
- Interstate
- Municipal Boundary
- Lake & River

N W E S

1 0.5 0 1 Mile

1 0.5 0 1 Kilometer

Location Map

Map generated by Scott H. Dean
IDNR, Division of Water, Resource Assessment Section

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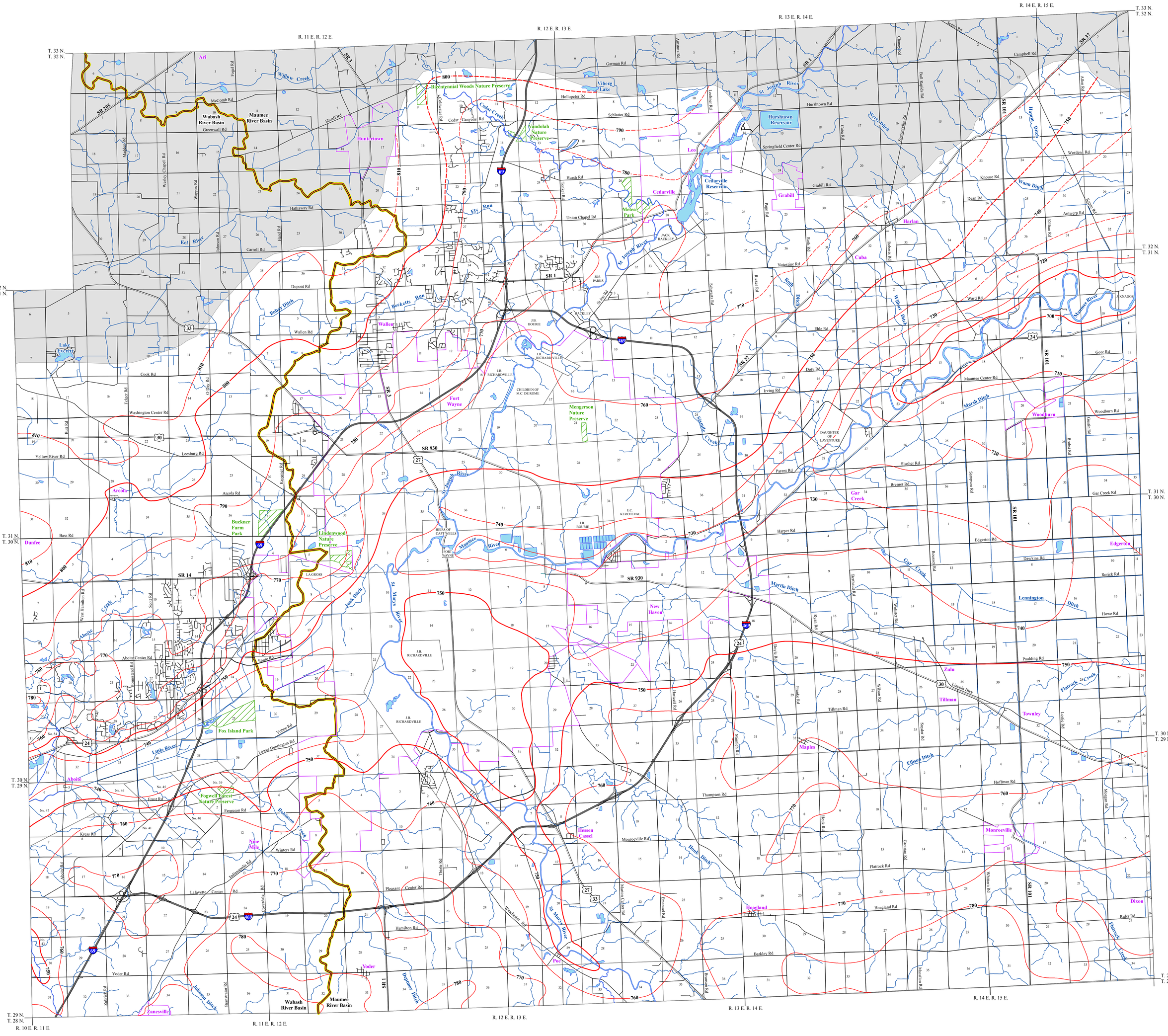
Bedrock Aquifer Systems of Allen County, Indiana

by
Robert K. Schmidt
Division of Water, Resource Assessment Section

May 2009

POTENTIOMETRIC SURFACE MAP OF THE BEDROCK AQUIFERS OF ALLEN COUNTY, INDIANA



EXPLANATION

—800— Line of equal elevation, in feet above mean sea level Potentiometric Contour interval 10 feet

– –800– – Approximate line of equal elevation, in feet above mean sea level Potentiometric Contour interval 10 feet

Stream

County Road

State Road & US Highway

Interstate

Basin Boundary

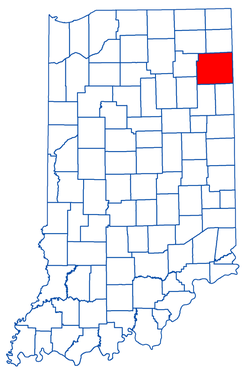
Municipal Boundary

State Managed Property

Lake & River

No Aquifer Material or Limited Data

Location Map

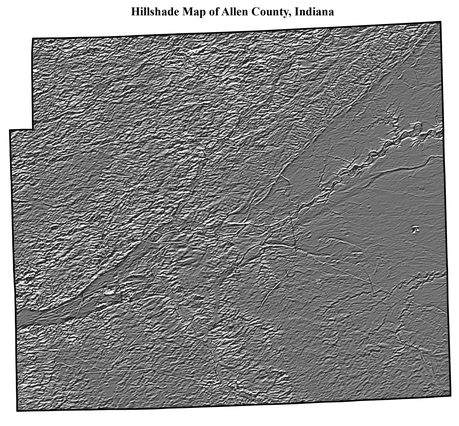


1 0.5 0 1 Mile

1 0.5 0 1 Kilometer

N
W E
S

Hillshade Map of Allen County, Indiana



Allen County, Indiana is located in the northeastern portion of the state and is bounded by the state of Ohio along its eastern border, with Dekalb, Noble, Whitley, Huntington, Wells and Adams counties adjacent to the north, west and south respectively. The eastern two-thirds of the county is situated within the Maumee River Basin, with the western third situated within the Wabash River Basin.

The Potentiometric Surface Map (PSM) of the bedrock aquifers of Allen County was mapped by contouring the elevations of over 2200 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in bedrock aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings. The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer (water table) is at atmospheric pressure and will not rise in a well above the top of the water bearing formation, in contrast to water in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement, and pumpage. Therefore, current site specific conditions may differ due to local or seasonal variations in measured static water levels. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. Groundwater flow is naturally from areas of recharge toward areas of discharge. As a general rule, but certainly not always, groundwater flow approximates the overlying topography and intersects the land surface at major streams. The contour type was determined based on the amount of data and the degree of change in water levels between wells in each mapped area. The map is shaded where the data is insufficient or the water bearing material is limited.

Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records; however, the location of the majority of the water well records used to make the PSM were address geocoded. Elevation data were either obtained from topographic maps or a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Bedrock static water levels in Allen County range from a high of 833 feet mean sea level (msl) in the northwest section of the county, to a low of 631 feet msl in the north-central portion. Groundwater flow direction within the Maumee River Basin is generally from south to north, south of the Maumee River, and northwest to southeast, north of the Maumee River. Groundwater flow direction within the Wabash River Basin is towards the River.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.

Map generated by Scott H. Dean,
IDNR, Division of Water, Resource Assessment Section

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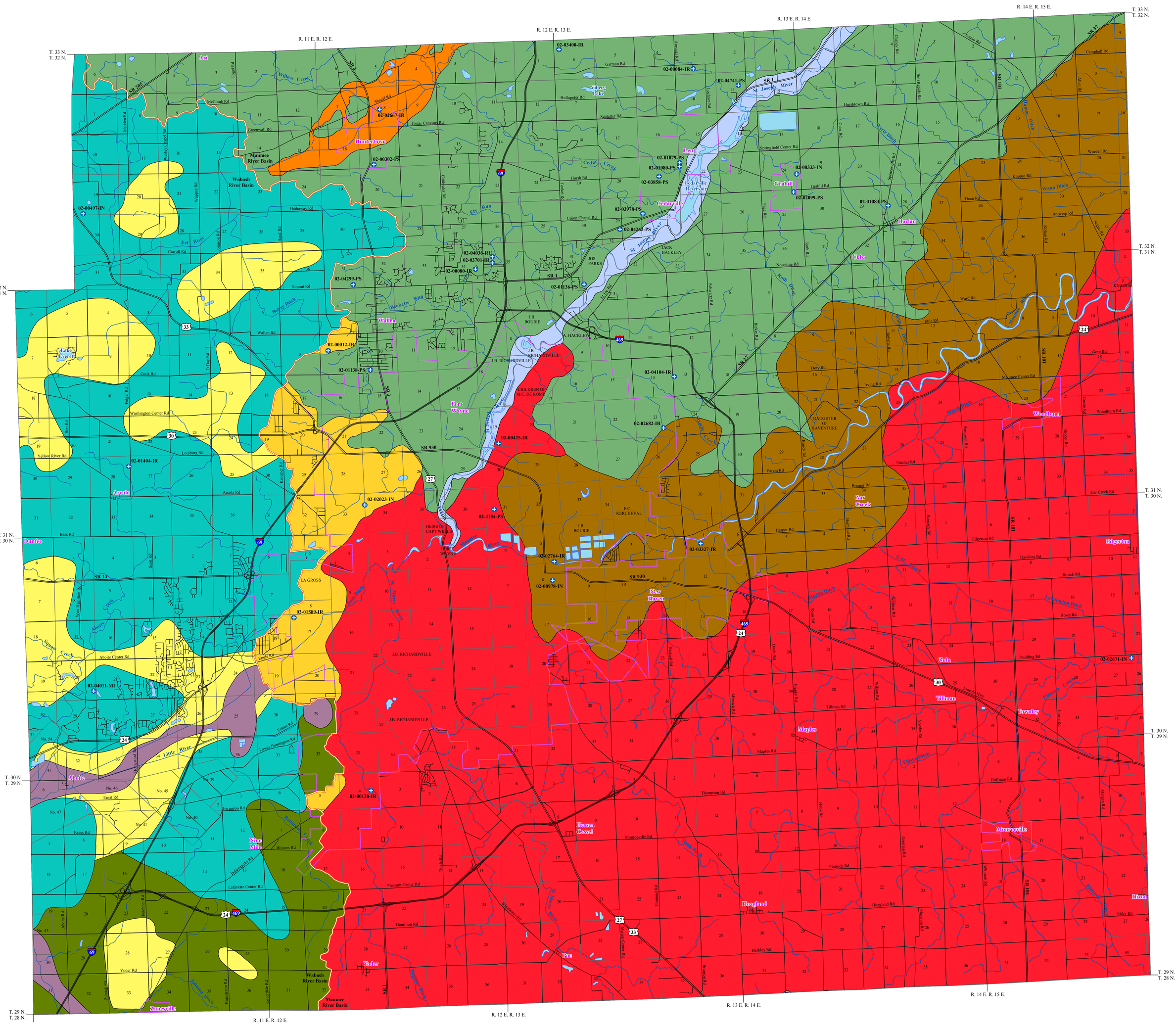
Potentiometric Surface Map of the Bedrock Aquifers of Allen County, Indiana

by
Glenn E. Grove
Division of Water, Resource Assessment Section

June 2012

UNCONSOLIDATED AQUIFER SYSTEMS OF ALLEN COUNTY, INDIANA



Eleven unconsolidated aquifer systems have been mapped in Allen County: the Till Veneer; the Auburn/Bluffton Till; the Bluffton Till Subsystem; the Auburn/Bluffton Complex; the Hessen Cassel; the New Haven; the Aboite; the Kendallville; the Eel River-Cedar Creek; the Cedarville; and the Teays Valley and Tributary. Characteristics of the Kendallville, Aboite, Hessen Cassel, New Haven, Cedarville, Eel River-Cedar Creek, and the Teays Valley and Tributary aquifer systems were previously described and mapped as part of the published Water Resource Availability in the Maumee River Basin, Indiana, Indiana Department of Natural Resources, 1996, and are not redefined as part of the new county scale mapping.

Allen County has a complex glacial history and was subjected to multiple glacial advances from the north, northeast and east resulting in glacial sediment deposits completely covering the county. The unconsolidated sediments are quite variable in thickness; in the northwest corner of the county, the bedrock is covered by as much as 300 feet of glacial material, while in some areas of the southwestern part of the county, depth to bedrock is about 40 to 50 feet below the surface. Because of the extensive and complicated glacial geology, boundaries of the aquifer systems in this county are commonly gradational and individual aquifers may extend across aquifer system boundaries.

Regional estimates of potential contamination to aquifer systems from the surface can differ considerably by location. Variations within geologic environments can result in a wide range of susceptibility to these systems. In addition, man-made structures such as poorly constructed water wells, unplugged or improperly abandoned wells, and open excavations can provide contaminant pathways that bypass the naturally protective clays.

Till Veneer Aquifer System

The Till Veneer Aquifer System has the most limited ground-water resources of the unconsolidated aquifer systems in the county. This system is generally mapped where the depth to the bedrock surface is less than 50 feet.

Potential aquifers within this system include thin isolated sand and/or gravel layers. Where present, sand and gravel units are generally less than 5 feet thick. Therefore, very few of the reported wells penetrating this aquifer system in the county are completed in unconsolidated materials, which are bypassed in favor of the more productive underlying bedrock. The few domestic wells completed in the Till Veneer Aquifer System range from 15 to 50 feet deep, and there are no registered significant ground-water withdrawal facilities that use this system.

This system is not very susceptible to contamination from surface sources because of the low permeability of the near-surface materials. However, there are areas where bedrock is extremely shallow. These areas are moderately susceptible to contamination.

Auburn / Bluffton Till Aquifer System

The Auburn/Bluffton Till Aquifer System consists of glacial till separated by intratill sand and gravel layers. In Allen County, this system ranges in thickness from about 50 feet to more than 270 feet. Saturated aquifer materials within this system include sand and/or gravel deposits commonly 5 to 25 feet thick.

This aquifer system is capable of meeting the needs of most domestic users in Allen County. However, approximately 55 percent of wells started in this system utilize the underlying bedrock aquifer. Wells producing from the Auburn/Bluffton Till Aquifer System are typically 50 to 200 feet deep. Domestic well capacities are commonly 10 to 75 gallons per minute (gpm), and static water levels range from 9 to 90 feet below the surface. There are no registered significant ground-water withdrawal facilities using this system.

The Auburn/Bluffton Till Aquifer System typically has a low susceptibility to surface contamination because intratill sand and gravel units are commonly overlain by thick glacial till. Wells producing from shallow aquifers are moderately susceptible to contamination.

Bluffton Till Aquifer Subsystem

Areas where unconsolidated materials are generally greater than 50 feet in thickness, yet have little aquifer potential, are mapped as the Bluffton Till Aquifer Subsystem. Total thickness of unconsolidated deposits in this system is up to 125 feet in places. Potential aquifer materials include thin intratill sand and gravel deposits.

Approximately 85 percent of the wells started in the Bluffton Till Aquifer Subsystem are completed in the underlying bedrock aquifer system. However, this subsystem is capable of meeting the needs of some domestic users in the county. The few wells producing from this subsystem are completed at depths greater than 60 feet. Potential aquifer materials include intratill sand and gravel deposits that range from about 2 to 15 feet in thickness. Well yields range from 8 to 27 gpm, and reported static water levels are 28 to 47 feet below the land surface. There are no registered significant ground-water withdrawal facilities using the Bluffton Till Aquifer Subsystem.

This subsystem is generally not very susceptible to surface contamination because intratill sand and gravel units are overlain by thick till deposits. Wells producing from shallow aquifers are moderately susceptible to contamination.

Auburn / Bluffton Complex Aquifer System

This system is mapped throughout western Allen County. The Auburn/Bluffton Complex Aquifer System is characterized by unconsolidated deposits that are quite variable in materials and thickness. Aquifers within the system are highly variable in depth and lateral extent, include single or multiple intratill sands and gravels, and are typically confined by clay layers. Total thickness of unconsolidated deposits in this system is up to 265 feet in places. Wells in this system are commonly completed at depths ranging from about 70 to 135 feet, and produce from saturated aquifer materials typically 5 to 25 feet thick.

This system is capable of meeting the needs of domestic and some high-capacity users in the county. Domestic well yields are commonly 10 to 100 gpm, and static water levels range from 6 to 90 feet below the surface. There are three registered significant ground-water withdrawal facilities (4 wells) using this system. Reported capacities for individual wells range from 25 to 200 gpm. The uses for these facilities are industry, miscellaneous, and irrigation.

The Auburn/Bluffton Complex Aquifer System is not very susceptible to contamination where overlain by thick clay deposits. However, in some areas where surficial clay deposits are thin, the shallow aquifer, if present, is at moderate to high risk.

Hessen Cassel Aquifer System

The Hessen Cassel Aquifer System contains a few thin sand and gravel lenses occurring amidst thick sequences of tills and some fine-grained glaciolacustrine deposits. The sand and gravel lenses within the system are either confined within glacial till or are directly overlying bedrock. This aquifer system is characterized by an overall scarcity of productive zones. Yields for domestic wells typically range from 10 to 30 gpm. However, there are four registered significant ground-water withdrawal facilities (7 wells) which utilize locally-thick outwash deposits. Reported capacities for these wells range from 200 to 500 gpm. These facilities are used for irrigation, industry and public supply.

In general, this system has a low susceptibility to surface contamination because intratill sand and gravel units are commonly overlain by thick glacial till. Shallow wells completed in this system are moderately susceptible to contamination.

New Haven Aquifer System

The New Haven Aquifer System is made up of outwash plain sediments confined by varied sequences of till and glaciolacustrine deposits. The relatively continuous outwash aquifer that occurs within the system is commonly 5 to 10 feet in thickness and overlies bedrock directly in some places. Yields from domestic wells typically range from 5 to 20 gpm. There are four registered significant ground-water withdrawal facilities (5 wells) using the New Haven Aquifer System. Reported capacities for these wells range from 100 to 300 gpm. These facilities are used for irrigation and industry.

The northern part of the system is moderately susceptible to surface contamination because it is overlain by an extensive blanket of fine sand. The remainder of the system, overlain by tills, debris flow deposits, and glaciolacustrine sediment, has low susceptibility to surface contamination.

Aboite Aquifer System

The Aboite Aquifer System, consisting of sand and gravel deposits that occur at several horizons within thick, clayey till deposits, has two distinct parts that exhibit somewhat different geohydrologic characteristics. In the northern part of the system large channel deposits are sporadic, and sand and gravel bodies are separated from the underlying carbonate bedrock by till ranging from 10 to 100 feet in thickness. Coarse-grained bodies are more abundant in the southern part of the aquifer system; and many large channel deposits directly overlying bedrock valleys form well-developed hydraulic connections with the carbonate bedrock. Aquifer thickness commonly ranges from about 5 to 20 feet, and domestic wells yield from 10 to 50 gpm. There are three registered significant ground-water withdrawal facilities (3 wells) using the Aboite Aquifer System. Reported capacities for these wells range from 225 to 750 gpm. These facilities are used for irrigation and industry. The carbonate bedrock beneath the Aboite aquifer is generally preferred for high-capacity well development.

In the north, the Aboite Aquifer System, overlain by clay-rich Erie Lobe tills, is moderately susceptible to surface contamination; but in the south, where there is little if any till present and the water-bearing units are poorly confined by heterogeneous surficial sediments, the system is highly susceptible.

Kendallville Aquifer System

The Kendallville Aquifer System contains discontinuous sand and gravel outwash lenses that occur at various depths within a till and mixed drift complex. Individual sand and gravel aquifers within the system commonly range from 5 to 30 feet in thickness; but there is a general increase in outwash thickness northward where local accumulations approach 95 feet. Yields for domestic wells typically range from 5 to 100 gpm. There are 19 registered significant ground-water withdrawal facilities (37 wells) using the Kendallville Aquifer System. Reported capacities for these wells range from 20 to 1000 gpm. These facilities are used for irrigation, industry, rural use and public supply.

The susceptibility of this aquifer system to surface contamination varies from low to moderate. Susceptibility is low for much of the aquifer system overlain by clay-rich, protective Erie Lobe tills.

Eel River-Cedar Creek Aquifer System

The Eel River-Cedar Creek Aquifer System consists of surficial valley train sediments and deeper outwash plain deposits occurring beneath a major river valley. The surficial sediments consist of sand and gravel deposits which occur from the ground surface to various depths and are either underlain by tills, or coalesce with older outwash deposits. In areas where intervening layers of till are present, most wells are completed in the deeper outwash deposits. Outwash deposits in this aquifer system commonly range from 20 to 30 feet in thickness. Yields from domestic wells range from 10 to 100 gpm. The one registered significant ground-water withdrawal facility in this system reports capacities of 450 gpm for each of its two wells. This facility is used for irrigation.

The unconfined portions of the aquifer system are highly susceptible to contamination from surface sources because the surficial valley train sediments of the system are highly permeable. Susceptibility is slightly lowered for the confined outwash deposits by the presence of overlying till.

Cedarville Aquifer System

The Cedarville Aquifer System is comprised primarily of surficial valley train sediments and deeper outwash deposits in the St. Joseph River valley region. Although a thin till cap may be present locally, the valley train deposits commonly extend from the ground surface to depths of 10 to 30 feet. Most wells developed in this aquifer system penetrate the deeper outwash deposits, which commonly range from 20 to 40 feet in thickness. Yields from domestic wells typically range from 10 to 60 gpm. There are no registered significant ground-water withdrawal facilities using the Cedarville Aquifer System.

The overall susceptibility of this system to surface contamination is considered high; but the unconfined portions of the Cedarville are even more susceptible than the rest of the system because the surficial valley train sediments are highly permeable.

Teays Valley and Tributary Aquifer System

The Teays Valley and Tributary Aquifer System, an extremely small area situated in south-central Allen County at the boarder with Adams County, is the northernmost extent of a buried pre-glacial bedrock valley that runs southward through Adams County. There are no known domestic wells, or registered significant ground-water withdrawal facilities in this system in Allen county. However, typical yields of the few domestic wells located in this system in northern Adams County range from about 10 to 75 gpm, with static water levels about 25 to 60 feet below the land surface.

This system has a low susceptibility to surface contamination because outwash sediments within the bedrock valleys are generally overlain by dense tills.

EXPLANATION

- Registered Significant Ground-Water Withdrawal Facility
- Stream
- County Road
- State Road & US Highway
- Interstate
- Basin Boundary
- Municipal Boundary
- Lake & River

N W E S

1 0.5 0 1 Mile

1 0.5 0 1 Kilometer

Location Map

INDIANA DEPARTMENT OF NATURAL RESOURCES

Map generated by Scott H. Dean
IDNR, Division of Water, Resource Assessment Section

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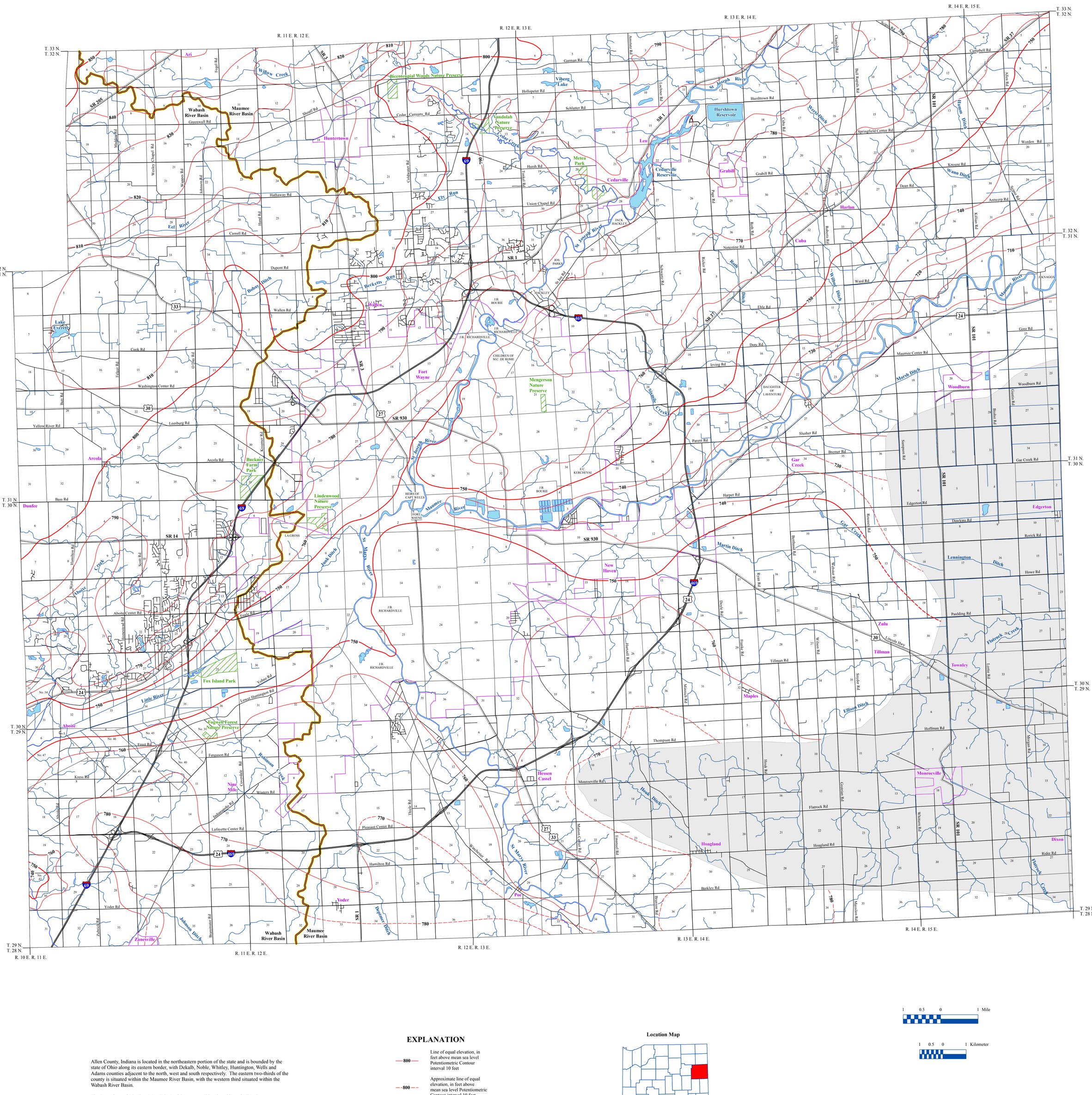
Unconsolidated Aquifer Systems of Allen County, Indiana

by
Robert K. Schmidt
Division of Water, Resource Assessment Section

May 2009

POTENTIOMETRIC SURFACE MAP OF THE UNCONSOLIDATED AQUIFERS OF ALLEN COUNTY, INDIANA



Allen County, Indiana is located in the northeastern portion of the state and is bounded by the state of Ohio along its eastern border, with Dekalb, Noble, Whitley, Huntington, Wells and Adams counties adjacent to the north, west and south respectively. The eastern two-thirds of the county is situated within the Maumee River Basin, with the western third situated within the Wabash River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Allen County was mapped by contouring the elevations of over 4200 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in unconsolidated aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings. The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer (water table) is at atmospheric pressure and will not rise in a well above the top of the water bearing formation, in contrast to water in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement, and pumpage. Therefore, current site specific conditions may differ due to local or seasonal variations in measured static water levels. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. Groundwater flow is naturally from areas of recharge toward areas of discharge. As a general rule, but certainly not always, groundwater flow approximates the overlying topography and intersects the land surface at major streams. The contour type was determined based on the amount of data and the degree of change in water levels between wells in each mapped area. The map is shaded where the data is insufficient or the water bearing material is limited.

Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records; however, the location of the majority of the water well records used to make the PSM were address geocoded. Elevation data were either obtained from topographic maps or a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Unconsolidated static water levels in Allen County range from a high of 882 feet mean sea level (msl) in the northwest section of the county, to a low of 689 feet msl in the north-central portion. Groundwater flow direction within the Maumee River Basin is generally from south to north, south of the Maumee River, and northwest to southeast, north of the Maumee River. Groundwater flow direction within the Wabash River Basin is towards the Wabash River.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.

INDIANA DEPARTMENT OF NATURAL RESOURCES

Map generated by Scott H. Dean,
IDNR, Division of Water, Resource Assessment Section

Map Use and Disclaimer Statement

We request that the following agency be acknowledged in products derived from this map: Indiana Department of Natural Resources, Division of Water.

This map was compiled by staff of the Indiana Department of Natural Resources, Division of Water using data believed to be reasonably accurate. However, a degree of error is inherent in all maps. This product is distributed "as is" without warranties of any kind, either expressed or implied. This map is intended for use only at the published scale.

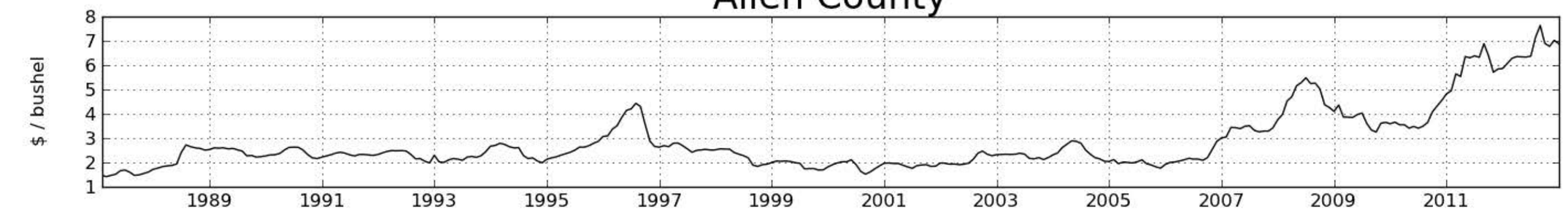
This map was created from several existing shapefiles. Township and range Lines of Indiana (line shapefile, 20020621), Land Survey Lines of Indiana (polygon shapefile, 20020621), and County Boundaries of Indiana (polygon shapefile, 20020621), were all from the Indiana Geological Survey and based on a 1:24,000 scale. Draft road shapefiles, System1 and System2 (line shapefiles, 2003), were from the Indiana Department of Transportation and based on a 1:24,000 scale. Populated Areas in Indiana 2000 (polygon shapefile, 20021000) was from the U.S. Census Bureau and based on a 1:100,000 scale. Hydrography, Streams (NHD) (line shapefile, 20081218), Rivers (NHD) (polygon shapefile, 20081218), Lakes (NHD) (polygon shapefile,20081218) was from the U.S. Geological Survey and the U.S. Environmental Protection Agency, and based on a 1:24,000 scale. Managed Lands IDNR IN (polygon shapefile, 20100920) was from the Indiana Department of Natural Resources and based on a 1:24,000 scale. The County Hillshade image was from the U.S. Geological Survey National Elevation Dataset (raster image,20100324). The Potentiometric Surface Map of the Unconsolidated Aquifers of Allen County Indiana (line shapefile, Grove, 2012) was based on a 1:24,000 scale.

Potentiometric Surface Map of the Unconsolidated Aquifers of Allen County, Indiana

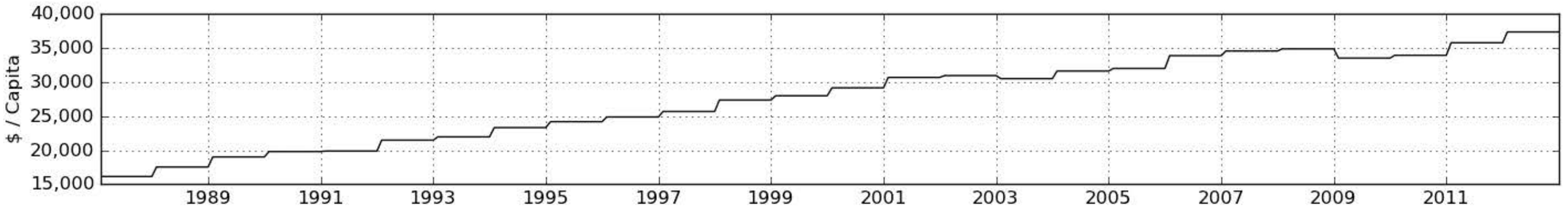
by
Glenn E. Grove
Division of Water, Resource Assessment Section

June 2012

Allen County



Corn Price



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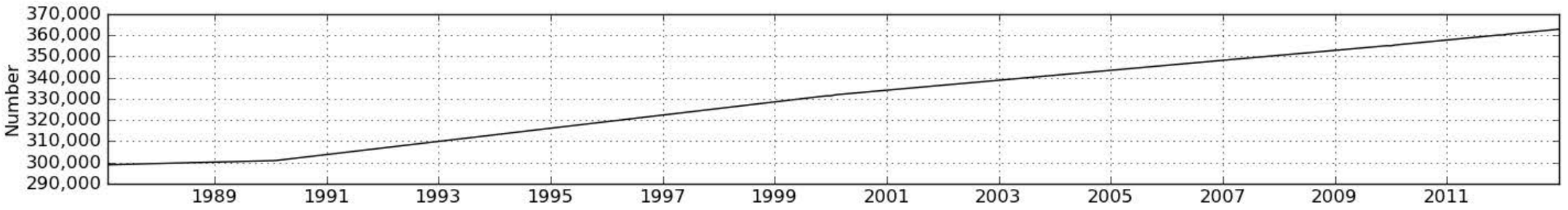
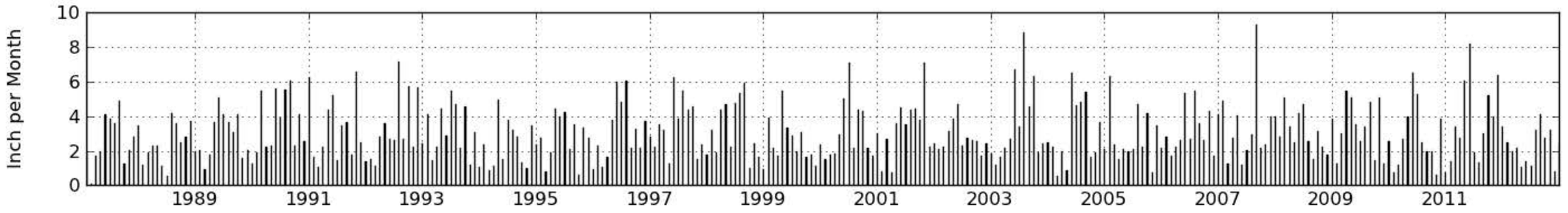
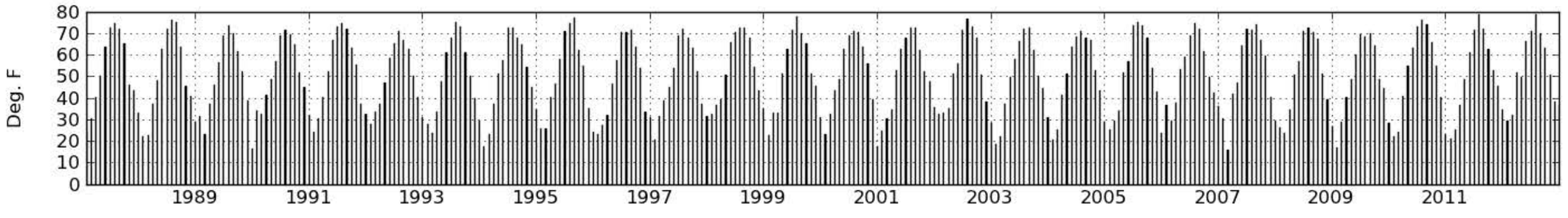


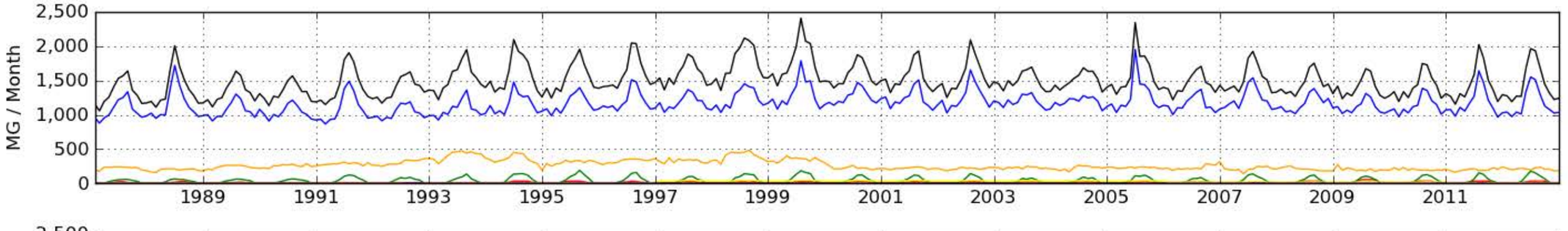
Population



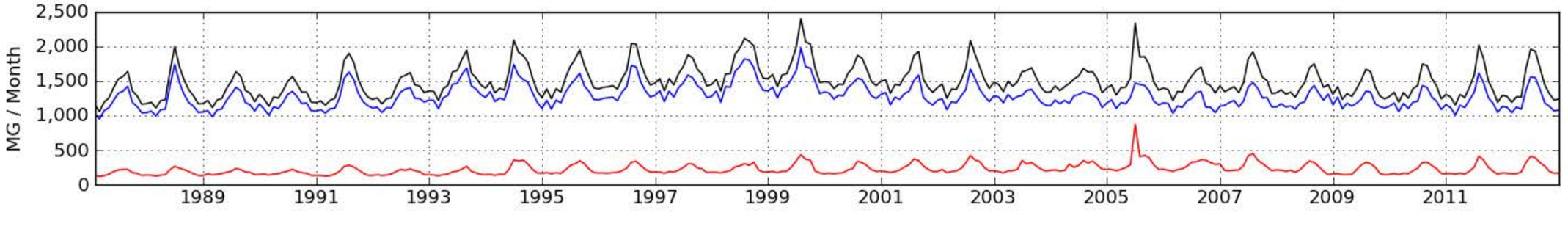
Precipitation



Temperature



Energy/Mining
Industry
Irrigation
Misc.
Public Supply
Rural
Total



Total
Ground Water
Surface Water