

# POTENTIOMETRIC SURFACE MAP OF THE BEDROCK AQUIFERS OF PUTNAM COUNTY, INDIANA

Putnam County, Indiana is located in west-central Indiana bounded by Montgomery, Hendricks, Morgan, Owen, Clay, and Parke counties to the north, east, southeast, south, southwest and west, respectively. The northern portion of the county is situated within the Middle Wabash River Basin, while the rest of the county lies within the White and West Fork White River Basin.

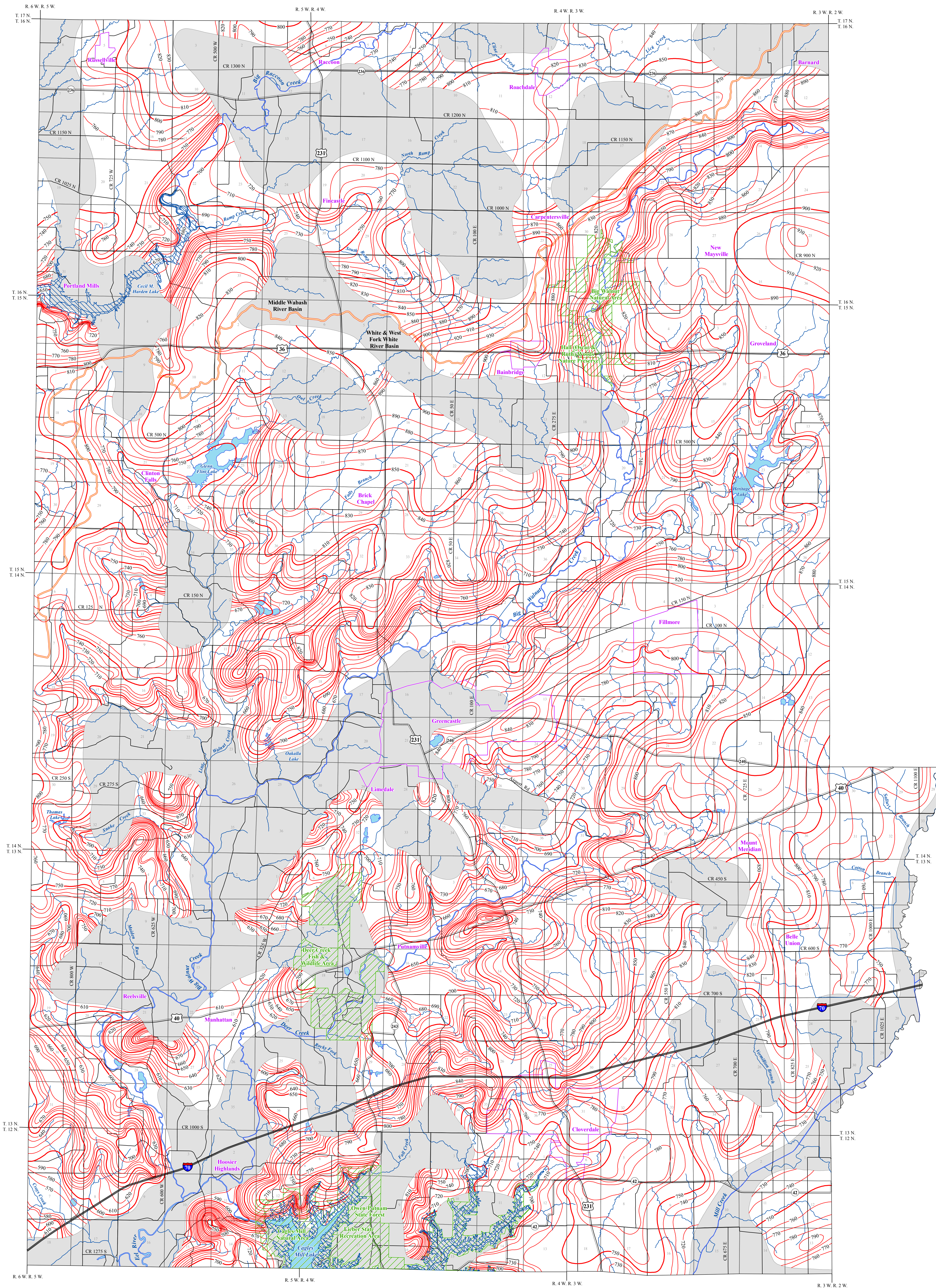
The Bedrock Potentiometric Surface Map (PSM) of Putnam County is mapped by contouring the elevation of 176 static water levels reported on well records received primarily over a 20-year period. These wells are completed in bedrock aquifers at various depths and typically under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells are completed in unconfined settings with water bearing formations not bounded by impermeable layers. The potentiometric surface is a measure of the pressure on water in a water bearing formation, or aquifer. The groundwater level in an unconfined aquifer system is at atmospheric pressure and will not rise in a well above the top of the aquifer formation. The potentiometric surface in most wells completed in bedrock within Putnam County rises above the top of the bedrock aquifer due to the confining nature of the system.

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 pumping. 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 general PSM. Groundwater flow is naturally from areas of recharge toward areas of discharge. The contours were determined based on the amount of data and the degree of change in water levels between wells. Bedrock potentiometric surface elevation contours have not been extended across portions of Putnam County because these areas are lacking in data.

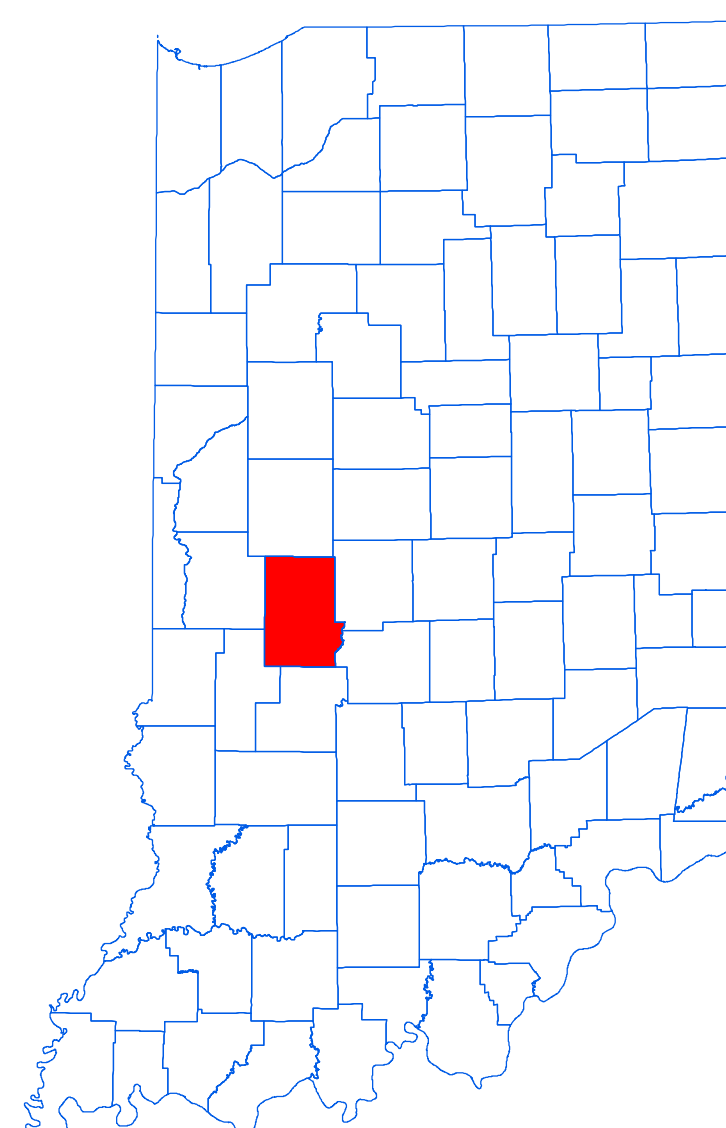
Data collected to generate the PSM were standardized and validated for accuracy. Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or determined based on water well records. The location of the majority of the water well records used to make the PSM were field verified. Elevation data were derived from a digital elevation model based on LIDAR. Quality control/assurance procedures were utilized to refine or remove data where errors were readily apparent.

Potentiometric surface contours are developed based on the static water levels from the bedrock aquifer systems and displayed here with 10-foot and 50-foot index contours. Bedrock potentiometric surface contours in Putnam County range from a high of 939 feet mean sea level (msl) in the north and northeast, to a low of 570 feet msl in the southwest along Crox Creek. Groundwater flow direction within bedrock aquifer systems generally follows the major drainage with an overall southwesterly flow.

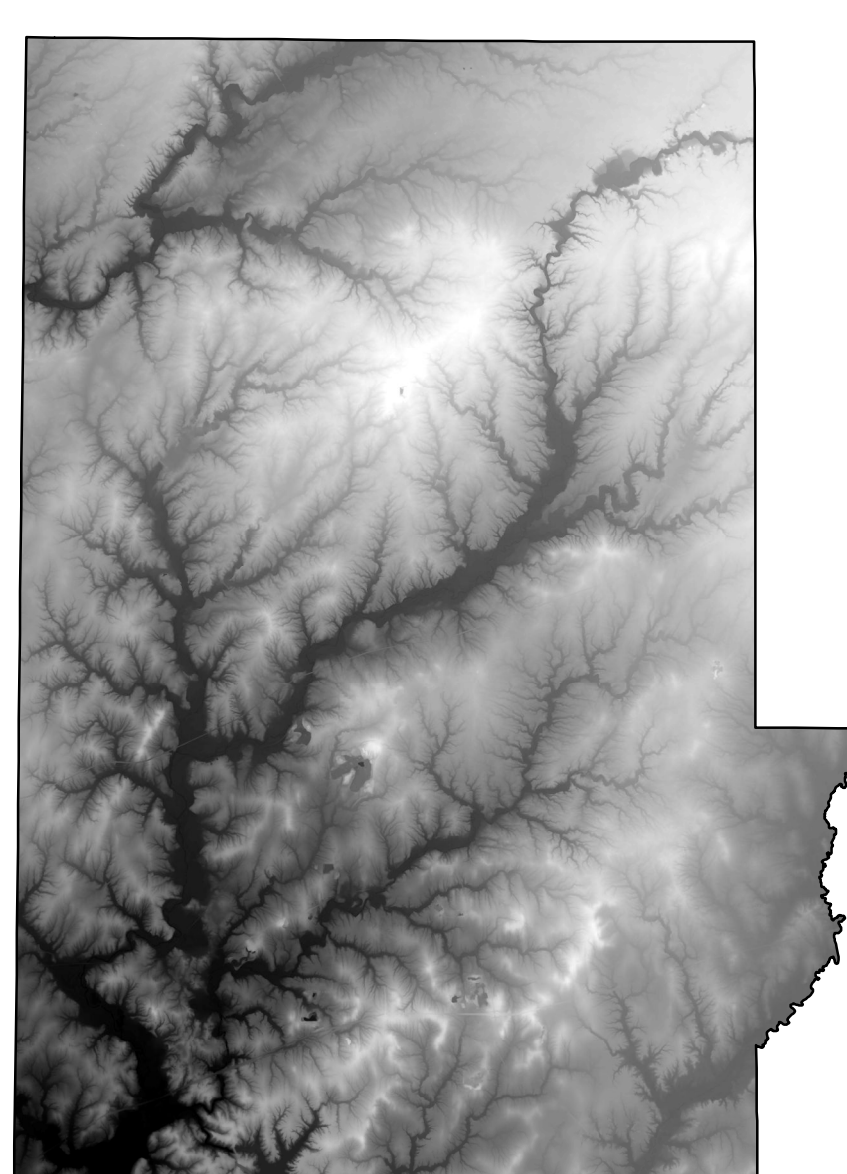
The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.



Location Map

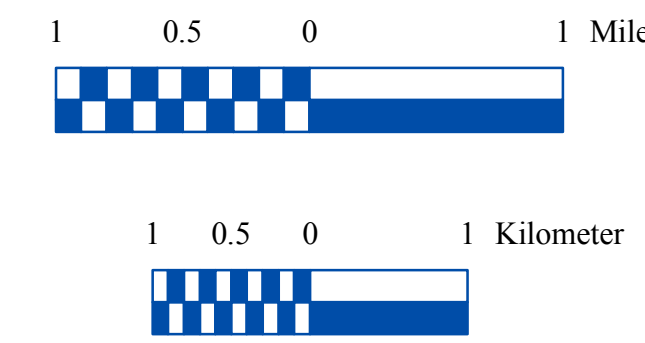
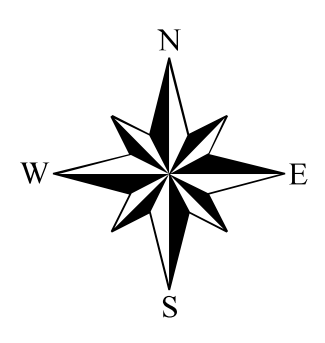
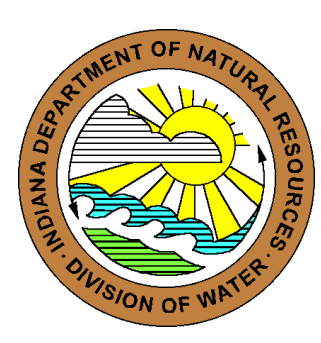


Digital Elevation Model of Putnam County, Indiana



### EXPLANATION

- Line of equal elevation, in feet above mean sea level
- Stream
- Basin Boundary
- County Road
- State Road
- US Highway
- Interstate
- Municipal Boundary
- State Managed Property
- Inundated Land
- Lake & River
- No Aquifer Material or Limited Data



**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 is 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) are from the Indiana Geological Survey and based on a 1:24,000 scale. Roads (TIGER and INDOT) (line shapefile, 2005) is from the Indiana Department of Transportation and based on a 1:100,000 scale. System 1 (line shapefile, 2003) is from the Indiana Department of Transportation and based on a 1:24,000 scale. Incorporated Boundaries in Indiana (polygon shapefile, 20060501) is from the Graphics and Engineering Section, Indiana Department of Transportation. Hydrography: Streams (NHID) (line shapefile, 20081218), Rivers (NHID) (polygon shapefile, 20081218), and Lakes (NHID) (polygon shapefile, 20081218) are from the U.S. Geological Survey and based on a 1:24,000 scale. Basin boundaries are modified from Watershed Boundary Dataset (polygon shapefile, 2008) developed by the Natural Resource Conservation Service and based on a 1:24,000 scale. Managed Lands (DNR) (polygon shapefile, 20100920) is from the Indiana Department of Natural Resources and based on a 1:24,000 scale. Digital Elevation Model image is derived from the Indiana Ortho LIDAR Statewide Collection Program (2013). Putnam County Bedrock No Aquifer Material or Limited Data (polygon shapefile, Kormek, 2015, revised 2016, Grove) and Potentiometric Surface Contours of the Bedrock Aquifers of Putnam County, Indiana (line shapefile, Kormek, 2015, revised 2016, Grove) are based on a 1:24,000 scale.

**Potentiometric Surface Map of the Bedrock Aquifers of Putnam County, Indiana**

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