



**MID-STATES  
CORRIDOR**

# Appendix X - Geographic Information System Technical Documentation

## Mid-States Corridor Tier 1 Environmental Impact Study

Prepared for

Indiana Department of Transportation  
Mid-States Regional Development Authority

NOVEMBER 16, 2021

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# **GEOGRAPHIC INFORMATION SYSTEM TECHNICAL DOCUMENTATION**

## **1. Introduction**

This appendix describes the Geographic Information System (GIS) methodology and spatial tools used in calculating the environmental impacts of the alternatives studied as part of the Mid-States Corridor Project. Methods include overall impact calculation as well as analysis of outputs for **Chapter 3 - Environmental Resources, Impacts, & Mitigation** and **Chapter 4 - Section 4(f) Impacts**. A description of contents of the GIS data repository available for analysis is included at the end of this appendix. GIS was used throughout the Tier 1 EIS to produce maps and figures to illustrate definitions and analysis. The methodology described in this appendix is focused on the use GIS as an analysis tool; processes are described in detail only in relation to the use of GIS. Methodologies using tools other than GIS are covered within their appropriate chapters or other appendices.

## **2. Reference Definitions in GIS**

**Alternative** – Originally this was the alignment of the route through Section 2 and 3 in combination with the specific facility type. Following the screening report, an Alternative represented the combined facility types for each route plus associated local improvements. With facility types deferred until tier 2 and an alternative containing multiple facility types, impacts were calculated and reported as a minimum-maximum ranges rather than single estimate.

**Alternative Family** – Directional groupings of Section 3 alignments with B and C representing the Northwest Family, M and O the Northeast Family, and P the North Central Family

**Corridor** – A generally 2,000-foot-wide band within which a working alignment footprint is located and for a selected build alternative, the approximate boundary for development of a Tier 2 alignment.

**Facility Type** – Type of highway design which included freeway, expressway, and super 2. Freeway was later removed from consideration; coded labels in GIS were 2 (expressway) and 3 (super 2).

**Footprint** – An estimated disturbance area used for calculating impacts. The representative footprint size varied at each level of analysis, becoming more refined at each step (preliminary alternatives report, screening report, and the DEIS). These are derived from the working alignments.

**Local Improvements** – Various proposed improvements to nearby local roads that function directly with the proposed alignments to enhance the benefits of the route. These improvements are referred to by number (1-18).



**Sections** – Each alternative is separated into three sections:

- **Section 1** - From the southern terminus to the Dubois/Spencer County Line, Section 1 is common for all alternatives and no changes to existing alignment were proposed thus were not assigned a working alignment in GIS and contain no impact calculations.
- **Section 2** – Section 2 extends from the Dubois/Spencer County line near I-64 to the south bank of the East Fork White River (except for Route O which was assigned a boundary line of State Road 56. Section 2 contains the eastern and western corridor options around Jasper/Huntingburg.
- **Section 3** – Section 3 extends from the south bank of the East Fork White River to a connection at I-69 or State Road 37 depending on the alternative family.

**Study Area** – The 12-county project area.

**Study Band** – A 2-mile-wide band used to provide a target area for development of new alignments.

**Variations** – Used in GIS to denote combinations of routes and facility types for data outputs.

**Working Alignment** – The centerline and associated footprint associated with each route.

### **3. Overall GIS Methodology**

The following guidance applies to all EIS chapters and the general use of GIS spatial data and analysis.

#### **3.1 Software**

Spatial data processing was done using ESRI ArcGIS Desktop or ESRI ArcGIS Pro for impact calculations. CAD software was used to generate centerlines and working alignments for import into GIS. Excel was used to query and summarize data output.

#### **3.2 Coordinate System**

All GIS projects, shapefiles, geodatabases, CAD and other spatial, georeferenced files used the following coordinate system:

***Indiana State Plane West Zone, North American Datum (NAD) 1983 (2011), US feet.***

#### **3.3 Data Repository**

The geospatial data repository for the project is the resource data layers, LiDAR, and imagery used for analysis and mapping throughout the EIS. All data used in analyses were sourced in static data, rather than cloud services to ensure reproducibility. When data was updated with newer or corrected versions, an archive copy of the prior data was filed with the project. The archive serves to answer questions that arise about decision making and process steps throughout the project.

Resource data includes metadata which describes the source, how the data was created, definitions of codes, attributes, and labels; and notes of any changes or updates made to the data. This information enables understanding of data limitations and proper use. Metadata exists in a variety of formats, including .txt, .doc, .xls, .pdf, .xml, or .html files.



### 3.4 GIS Analyses and Mapping

Section subsets as well as end-to-end impacts were calculated for every variation, including all facility types and bypass options. Impact chapters report the range of variation end-to-end impacts by alternative. Break down by section, facility type, or bypass options are limited to presentation in associated appendices. Sums of sections may differ slightly from end-to-end calculations of the variations due to rounding differences.

Resource impact calculations for alternative ranges were rounded to whole numbers. In the case of 6-digit whole numbers, the value was rounded to the nearest hundred. Area was measured in the unit, “acres”, and distances were measured in the unit, “US feet”. Counts were summed for point data. A table footnote was added to results which were greater than zero, but rounded to zero as a whole number.

Most analyses were done by using intersection tools to calculate how much of a resource overlaid each working alignment ROW footprint. Excel was used to query and summarize subsets within the larger output results. Mapping and overlay of alternatives with study area descriptions such as natural regions aided chapter discussion on the meaning and context of the calculated impacts.

Maps and graphics were produced for the discussion of resource impacts in each chapter and associated appendices where reasonable and appropriate.

## 4. DEIS Impacts GIS Analyses

The following sub-sections describe in detail the spatial data and GIS processes used. Data layers referenced here are described and cited in the next section of this appendix.

Several interim impact calculations occurred through the development of alternatives. During the preliminary development stage, generic buffers were assigned around centerlines. Later working alignments were generated to simulate more reasonable construction footprints. Regardless of the footprint used, the processes in GIS remained consistent.

### 4.1 Land Use Impacts (Section 3.2)

The data layer used to calculate project impacts to current land use was the 2016 National Land Cover Database (NLCD) polygon layer from the U.S. Geological Survey (USGS). This national dataset was created by the USGS and partner agencies from interpretation of satellite photography at 30-meter resolution. It is most useful when analyzing large areas at small scale. The base dataset was edited within the route 2-mile bands to make it more suitable for the scale and more current. This editing was done using basic GIS editing tools and guided by 2018 NAIP photography. Editing best practices were used to ensure correct topology (avoid slivers, overlaps, etc.). The resulting edited/updated file was called “Refined 2016 National Land Cover (NLCD)”.

Refined 2016 National Land Cover was intersected with the working alignment footprints to quantify the direct impacts to land use. Analysis outputs by land use type for each variation section were summarized in the following groups: forest, agriculture, development and other areas. Land use types are described in **Volume I**.



#### 4.2 Social Impacts (Section 3.3)

Social impacts of the alignments including access, travel patterns, and cohesion were analyzed with majority qualitative methods described in *Volume I*. While quantities calculated from GIS were a limited part of the impact analyses, GIS did play a role in identifying what features had proximity and needed consideration. Point layers reviewed include religious centers, libraries, schools, medical facilities, and fire and police departments. Tiger19 census data layers for city boundaries and populated place points were used to identify nearby communities. Data layers for managed lands, recreation facilities, and trails were used to identify recreation opportunities.

GIS buffer tools were used to buffer alignment corridor layers by 2 miles to identify potentially affected communities. A one-mile buffer of corridor layers was used to identify potentially affected organizations and facilities. Social features within these buffers were analyzed using qualitative metrics and reasoning.

#### 4.3 Economic Impacts (Section 3.4)

Economic Impacts calculations involved the analyses of highway user costs and benefits, local property tax impacts, local property value impacts, construction costs, and loss of timber income. These analyses used a travel demand model and various taxation and cost rates. GIS processes captured data that was then used to calculate the local property tax impacts and the loss of timber income. Detailed steps of these calculations are presented in *Appendix EE – Economic Impacts*.

A 2019 parcel data layer and 2018 property assessment data tables were compiled from county resources by the Indiana Geographic Information Office and downloaded through Indiana Map data portal. The parcel layer and property assessment tables were joined by Parcel ID/Number. Spatial tools were used to determine the percentage of each parcel overlaying each alignment footprint and apply that percentage to the estimated total parcel value. The captured data was used to calculate the value of property acquired in each alignment footprint and the potential loss of property tax revenue.

Refined 2016 NLCD was used to identify the amount of forest directly impacted by each footprint. NCLD data does not contain adequate information to determine age, species, or quality of trees. All tree cover directly impacted by each footprint was counted to obtain a total direct impact figure for each alternative. This figure was then used to calculate an estimate of the loss of forest income.

#### 4.4 Relocation Impacts (Section 3.5)

Spatial layers for building footprints, parcels, and property assessment tables were used to identify and categorize potential relocations within 20 feet of the footprints. Aerials (2018 NAIP) were used to add structures within the footprints that were not present in the downloaded building dataset. Property tax code attributes of parcels that intersect with building impacts were evaluated and edited manually where necessary to properly reflect the type of relocation.

Buildings were queried for presence, then parcels were queried for those containing at least one impacted building. The number of relocations in an alignment was reported as the count of parcels with at least one building impact. Tier 1 information did not contain sufficient detail to differentiate between main buildings and outbuildings in most cases, thus no attempt was made to count multiple relocations within a single parcel. Relocation counts were grouped into agriculture, residential, commercial, and institution types based on the tax code of the parcel. More information on the methodology, including determining access loss and housing availability, is presented in *Volume I*.



#### 4.5 Indirect and Cumulative Impacts (Section 3.6)

Key resources evaluated for Indirect and cumulative impacts included farmland, forests, wetlands, streams, and karst features. Along with data gathered from study area research, GIS layers used to evaluate the baseline trends (**Appendix F – Baseline Trends**) of these resources included the 2001 NCLD Land Cover, Refined 2016 NCLD Land Cover, the 2019 NWI, 2019 NHD classified and unclassified streams, 2018 303(d) impaired streams, HUC 10 Watersheds, 1997 cave density, 1997 sinkhole and sinking stream basins areas, 2011 sinkhole locations, and 1997 spring locations.

The 2001 and 2016 land cover layers were used to evaluate changes over time in Indiana forests using the deciduous, evergreen, and mixed forest classes. Wetland changes over time were calculated using the 2001 and 2016 land cover layers, woody wetlands and emergent herbaceous wetland classes. The 2019 NWI was used to evaluate the current composition of wetlands by county, separated by wetland type. GIS karst layers were used to summarize karst features in study area counties.

#### 4.6 Traffic Impacts (Section 3.7)

GIS layers of the roads from INDOT were used to prepare input for the travel demand model (TDM). Results of the TDM were then used to predict traffic impacts of each alignment. Detailed description of what the TDM is, how it was used, and the analysis is in **Volume I**.

#### 4.7 Title IV/Environmental Justice Impacts (Section 3.8)

Two census data tables in the 2019 American Community Survey were used to join data into the census block group GIS layer. The tables were: “Poverty Status of Individuals in the Past 12 Months by Living Arrangement” (B17021) and “Hispanic or Latino Origin by Race” (B03002).

Calculations were performed within the GIS layer attributes to identify block groups with environmental justice populations of concern within the 12-county study area. Block groups were flagged for environmental justice concerns where the low-income population and/or minority population was greater than 50% or greater than 125% the county population of that classification. The project GIS was used to map the results of the analyses and to aid in visualization of discussion. Discussion and maps of Title IV/Environmental Justice impacts are found in **Volume I** and **Appendix W – Environmental Justice Analysis**.

#### 4.8 Air Quality Impacts (Section 3.9)

GIS tools were used to map the results of air quality concerns presented as figures in the document. GIS analysis was not used to assess impacts to air quality.

#### 4.9 Noise Impacts (Section 3.10)

The noise impact analysis was conducted using the Traffic Noise Model (TNM) 2.5 with generalized assumptions for each alignment and typical segments. The level of detail is not sufficient for a formal INDOT noise analysis, but was intended to suffice for alternative comparison at the Tier 1 level. A GIS point layer was created to provide receptors for use in TNM. Point receptors were placed at 25-foot intervals perpendicular to the roadway.

GIS buffering tools were used to create a potential sound impact area by buffering the working alignment footprint segments by the distance to 66dB(A) sound from model output. All properties



within this buffer were identified as potential impacts. Further detail on the TNM model, assumptions, and analyses limitations are presented in **Volume I** and **Appendix JJ – Noise Impacts**.

#### 4.10 Wild and Scenic Rivers Impacts (Section 3.11)

GIS data layers for streams and rivers were used to identify impacts to listed rivers. In addition to GIS layers for the 2004 National Rivers Inventory and the 1997 Indiana Outstanding Rivers, on-line water lists were reviewed to identify listed streams in the study area. These online lists include Wild and Scenic Rivers (<https://www.rivers.gov/indiana.php>), NPS National River Inventory (<https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm>), IDNR Natural, Scenic, and Recreation System (<https://www.in.gov/dnr/outdoor/5355.htm>), NRC Navigable Waterways (<http://iac.iga.in.gov/iac//20170524-IR-312170265NRA.xml.pdf>), and IDEM Special Protection Waters ([https://www.in.gov/dnr/water/files/Appdx\\_F-2.pdf](https://www.in.gov/dnr/water/files/Appdx_F-2.pdf)).

Existing GIS layers of listed rivers were analyzed for intersection with the footprints. Online lists were used to identify any other listed waters in the study area for overlap with the streams and rivers layers. Those which intersected the footprints were considered impacted.

#### 4.11 Construction Impacts (Section 3.12)

GIS data and tools were not used for this.

#### 4.12 Cultural Resources (Historic and Archaeological) Impacts (Section 3.13)

The IDNR Indiana State Historic Architectural and Archaeological Research Database (SHARRD) was the base data source for historic and archaeology data layers. SHAARD includes spatial data from the IHSSI (County Survey Program), the Indiana Cemetery and Burial Ground Registry, historic bridges, properties listed in the National Register of Historic Places, properties listed in the Indiana Register of Historic Sites and Structures, historic theaters in Indiana, and restricted locations of archaeology sites. A project data set was created by querying SHAARD sites within the Area of Potential Effect (APE) and new sites and potential eligibility information were added from Tier 1 windshield surveys and record searches.

Professional historians and archaeologists who meet the Secretary of the Interior's Standards searched the GIS layers in the restricted version of the SHAARD. GIS layers of the footprints, GIS buffer tools, and aerial photographs were used to create the APEs. After preliminary studies of existing datasets and definition of the APEs, a windshield survey was done by professional historians to add new sites and attribute all sites with determinations for potential eligibility for listing in the national register (**Appendix O – Historic Properties Analysis**). GIS spatial analysis was done to associate the parcel layer with each historic site within the APE and determine which parcels might have direct impacts from the working alignment footprints. GIS proximity analysis was used to calculate the distance from each potentially eligible site to the nearest working alignment footprint.

Determinations of potential eligibility were also done for archaeology sites within the archaeology APE using a records search (**Appendix N – Archaeological Analysis**). No field studies were conducted. Archaeology locations were kept confidential.

#### 4.13 Visual Impacts (Section 3.14)

Project GIS data layers were not used to evaluate visual impacts for the project. Evaluation methods involved online 3D visualization with Google Earth using KML files of only the working alignment footprints.



#### 4.14 Properties of Environmental Concern (Section 3.15)

Twenty-five data layers downloaded from the EPA Facility Registry Service (FRS), the INDOT Red Flag Inventory dataset (RFI), and the Indiana Map environmental layers provided by IDEM were used to identify properties of environmental concern. Additional sites were added using visual assessment of alignments and aerial imagery.

GIS intersection tools were used to identify properties within footprints. Potentially impacted properties were evaluated using the IDEM Virtual File Cabinet (VFC) and public compliance records. The subset GIS layer of property impacts was assigned a concern rating of low, medium, or high reflecting the anticipated risk of negative subsurface impacts. Detailed methods and results are discussed in ***Appendix S – Properties of Environmental Concern***.

#### 4.15 Threatened and Endangered Species (Section 3.16)

Through a data sharing agreement, USFWS provided GIS data for federally listed bats (Indiana bat, northern long-eared bat, and gray bat), mussels (fanshell mussel, sheepsnose mussel, rough pigtoe mussel, fat pocketbook mussel, and rabbitsfoot mussel), and the interior least tern within the Mid-States Corridor study area. Similarly, Indiana Natural Heritage Data Center (IDNR, Division of Nature Preserves) provided a GIS layer for listed species in Indiana. These data defined the known distribution of each species within the 12-county study area. The absence of species records in an area cannot indicate that a species may not occur there, only that an occurrence there has not been recorded.

Proximity analyses were used to determine which species are known to occur within, near, or proximal to each of the footprints. Intersect tools were used to identify records within the footprints; buffer tools identified records within 2 miles and within 1-mile of the footprints. Species data was joined with the Public Land Survey System (PLSS) Sections data and summarized to create a GIS layer of species diversity density, which contains the number of different protected species within each square-mile of the study area.

Bat habitat was assessed using buffers around bat observations to create known potential occupation limits in a polygon layer. Indiana Bat roost trees were buffered by 2.5-miles, P3/P4 hibernacula or known capture locations by 5-miles, and P1/P2 hibernacula by 10-miles. Northern long-eared bat roost trees were buffered by 1.5-miles, known capture locations by 3-miles, and hibernacula by 5-miles. Gray bat known capture locations were buffered by 10-miles. Geoprocessing measured the distance of each footprint that fell within maternity colony buffers or hibernacula buffers. The Refined NCLD Land Cover data was used to assess amounts of forest within maternity and hibernacula areas in association with the footprints.

#### 4.16 Floodplain Impacts (Section 3.17)

The IDNR data layer for 'best available floodplains' was used for impact calculations. Floodplains were attributed as two types, floodway and floodplain fringe.

Intersect tools were used to quantify the acres of floodplain of each type within footprints. Intersect was also used to calculate the length of the alignment centerline crossing floodplains of each type. Crossings were manually evaluated using the floodplain layer, aerial photography, and contours to attribute each as longitudinal or traverse impact.



#### 4.17 Wetland Impacts (Section 3.18)

National Wetland Inventory (NWI) GIS data from the USFWS was used to evaluate possible impacts to wetlands. No field investigation was performed.

GIS intersect tools were used to quantify wetlands within the footprints. Results were summarized into groups by wetland type including emergent wetlands, scrub/shrub wetlands, forested wetlands, ponds with unconsolidated bottoms, ponds with unconsolidated shores, and lakes.

#### 4.18 Stream Impacts (Section 3.19)

GIS layers from the National Hydrography Dataset (NHD) local resolution (1:2,400) were used for impact calculations. The two layers used were classified streams (streams with an assigned flow type) and unclassified streams. Classified streams layer was queried to eliminate line types for modeling connectors, underground conduits, underground pipelines, and artificial streams (with the exception of river main channels).

GIS intersect tools were used to calculate the linear feet of all classified and unclassified stream segments overlaying the footprints. The results were summarized into 5 classes: perennial streams and rivers, intermittent streams, canals/ditches, and unclassified streams. NHD waterbody polygons and linear waterbody polygons layers were used in mapping chapter graphics. Definitions of stream types are present in **Volume I** and **Appendix L – Stream Impacts**.

Streams were also evaluated for impacts to streams on the IDEM 2018 303(d) List of Impaired Waters. Only the 2018 GIS data was available from IDEM; however, each impacted unit from the 2018 dataset was manually cross-referenced with 2020 reporting data for impaired uses. The 2018 Impaired Streams layer and a GIS layer of HUC 10 Watersheds and HUC 12 Watersheds were used in the assessment. A layer of Total Maximum Daily Load (TMDL) Report Watersheds and a layer of watershed management plan (WMP) watersheds were created with subsets.

GIS intersect tools were used to calculate the linear feet of impaired streams that are within the footprints. Layer attributes were used to summarize the pollutant(s) and designated uses that were impaired, these were cross-referenced with 2020 published data (not available in GIS format). A subset of HUC 10 Watersheds was created to encompass watersheds with an approved TMDL report. A subset of HUC 12 Watersheds was created to encompass watersheds under an approved WMP report.

#### 4.19 Groundwater Impacts (Section 3.20)

Groundwater was evaluated using GIS layers for water wells points (IDNR, 2019), the karst MOU boundary, and aquifer sensitivity rating polygons (Indiana Geological Survey, 2015). The aquifer sensitivity layer was queried for polygons classified as moderate to very high (>4.3 inches/year recharge rate) to determine possible impacts.

Water wells were queried by location to identify wells falling outside the Karst MOU (1993) area and wells falling inside the Karst MOU (1993) area. Water wells located outside the karst MOU were buffered by 500 feet, while wells inside the karst MOU were buffered by 1000 feet. GIS intersect tools were used to identify and count buffers that overlaid the footprints. The working alignment centerlines were intersected with the queried aquifer sensitivity layer to summarize the linear feet of alignments crossing high recharge areas. Detailed methods for interpretation of data are found in **Appendix M – Groundwater Impacts**.



#### 4.20 Forest Impacts (Section 3.21)

Forest impacts, including total direct loss and core forest loss, were calculated from the Refined 2016 National Land Cover (NLCD) queried for forest classifications. In the NCLD, there are four forest classifications. They are deciduous forest, evergreen forest, mixed forest, and wetland forest.

The NCLD subset of the four forest classes was intersected with the footprints to summarize the acres of forest that may be directly impacted. Summaries were not separated by forest type because the scale of the data and type classifications did not provide meaningful information about forest composition at the project scale. Methods for interpretation of data output are further defined in *Volume I*.

Core forest analysis began with processing the NCLD data by merging all forest types into just one “forest category” to create forest blocks that were not falsely segmented by “type”. The new forest blocks layer was then queried by location for those that cross footprints; blocks intersecting these had edges and gaps edited and refined using 2018 aerial photography to provide a more detail edge than the original 30-meter pixels. This edited data subset was saved as “Refined Forest Blocks”.

To calculate impacts, the refined forest blocks polygons were buffered inside their boundaries by 100 meters and queried to eliminate any areas less than one acre, per the definition of a core forest. This created the “NCLD\_Core\_Forest\_Existing” base layer. The core forest layer was intersected with footprints to calculate how much core forest habitat might be impacted.

Because core forest is defined by location from the edge of a forest block, when edges are changed core forest will change. In order to calculate how much total core forest might be lost, not just from direct removal, but also from reshaping forest edges, the footprints were erased from the “refined forest blocks” layer. The remaining, reshaped forest blocks were buffered inside their boundaries by 100 meters, and queried to eliminate any areas less than one acre. This created the “NCLD\_Core\_Forest\_Remaining” layer. GIS tools were used to summarize the acres of remaining core forest for each footprint and subtract them from the corresponding summary of acres of existing core forest to arrive at the total core forest lost by the proposed variations. Detailed discussion of methods is included in *Appendix H – Forest Impacts*.

#### 4.21 Mineral Resource Impacts (Section 3.22)

Mineral impacts include coal, oil and gas, clay minerals, sand and gravel deposits, limestone, and gypsum. GIS layers from Indiana Geological Survey (IGS) including the depth, thickness, elevation, and mined out areas of the Colchester and Seelyville seams were used to explore and understand potential coal resource availability impacts. Digitized historic maps of Dubois coal reserves were also reviewed. Geoprocessing utilized layers for historic surface and underground coal mine areas and active coal mining permits (as of June 25, 2020) from the IDNR web map.

Layers used in analysis of petroleum created by IGS in 2015 included petroleum fields and petroleum well locations (from the IGS Petroleum Database Management System). Silurian reef GIS layers were examined but not used in analysis because of their generality and the complex factors needed to assess if they imply possible petroleum resource presence.

Mineral analysis included a polygon layer of the thickness of clay resources (derived by IGS from well records logs), and a polygon layer of sand and gravel resource potential (created by IGS from published research). A 2016 mineral production site point layer, a layer of 2004 industrial mineral distribution, and



abandoned quarries and pits point layers were examined for indications of mineral resource impacts but were not found to add possible impact information.

GIS analysis was used to calculate the area of historic surface and underground mines, active mine permit areas, and petroleum fields, that intersect the footprints. Petroleum wells were analyzed for points intersecting the footprints, and counts were reported in the following categories: abandoned gas storage wells, gas wells, gas storage wells, oil wells, and other petroleum test wells (including dry holes, abandoned injection wells, borings, structure tests, and abandoned oil wells). Clay resources were calculated from the area intersecting footprints and results were presented for four categories of thickness: 10-20 feet thick, 20-50 feet thick, >50 feet thick, and a total for all thicknesses. Sand and Gravel Potential was analyzed to calculate the area intersecting alignment footprints for “potential resources”, “low potential resources”, and total resource availability. Point layers for 2016 mineral producers and 2004 industrial mineral distribution was queried to count points that intersect footprints.

No layers were available that gave locations, thickness, or extraction of limestone or gypsum resources. Maps were made with layers that give a broadly general idea of the occurrence of this resource in the study area. Regional bedrock geology layers were used to map geology groups with a dominant limestone lithology. A digitized general layer of where gypsum may occur was mapped and the only gypsum mine in southern Indiana was located. This gives a broad idea of the occurrence of this resource in the study area. Analysis methodology is further discussed in **Appendix LL – Mineral Resource Impacts**.

#### 4.22 Karst Impacts (Section 3.23)

Karst layers developed by IGS were used to analyze possible karst areas. These included: cave entrance 1-km density, karst dye study points, karst dye study trace lines, sinkhole points, spring points, sinkhole areas, and sinking stream basin areas.

GIS intersect tools were used to identify and count point and line layer records that fall within the footprints (dye points, dye lines, springs, and sinkholes). GIS intersect tools were used to measure and summarize sinkhole areas and sinking stream basin areas that overlay the footprints. Query by location was used to identify 1-km squares that intersect the footprints. The number of cave entrances in each overlapping 1-km squares were added to calculate the number of cave entrances within 1-km of an alignment centerline.

#### 4.23 Agricultural Impacts

Agricultural impacts were calculated using the Refined 2016 National Land Cover (NLCD) queried for agriculture classifications. In the NCLD in the study area, there are two agriculture classifications: “Cropland” and “Pasture/Hay”. Impacts to agricultural soils were estimated using NRCS SSURGO soils layer attributes for prime farmland. A soils subset of prime farmland was created using “all prime farmland” classifications and not including conditional prime farmland. Any “developed” land use classes in 2016 NCLD land use data were erased from the prime farmland since those areas are permanently converted.

GIS intersect tools were used to quantify the area of agricultural land that overlaid the footprints. Results were summarized in the categories “cropland” land use and “pasture/hay” landuse, and a total of impacted agricultural land was calculated. Production income was then calculated using average prices and the calculated area (manually researched).

Intersect tools were used with the prime farmland layer to quantify the area of prime farmland soils not already converted to development that may experience direct impacts from the footprints.



#### 4.24 Ecosystem Impacts (Section 3.25)

Layers for Natural Regions, the 2016 NCLD Land Use, and 2019 NHD classified streams were used to analyze possible impacts to ecosystems.

GIS intersect tools were used to calculate the area of each natural regions and sub-region that overlaid footprints. The intersection of the alignment centerlines and natural regions layer were calculated for linear miles that cross natural regions and sub-regions. Geoprocessing and spatial queries were used to count the number of forest patches measuring 25 acres or larger that were bisected by the footprints. An analysis of stream crossings was performed by intersecting the NHD classified stream data with the footprints. “Named” streams in the dataset were counted to get the number of named streams crossed by each. The analysis was intended to provide a relative scale of potential fragmentation impacts.

#### 4.25 Permits (Section 3.26)

GIS data and tools were not used to describe potential permits needed for the project.

#### 4.26 Managed Land Impacts (Section 3.27)

Layers used to identify possible impacts to managed land included: Managed Land Areas (IDNR, March 2020), Protected Lands (USGS GAP, 2018), National Natural Landmarks (NPS, 2004), Conservation Easements (NRCS, 2020), I-69 Mitigation Properties (INDOT, 2017), The Nature Conservancy owned lands (TNC, 2020), and The Nature Conservancy Transferred lands (TNC, 2020). Each of these sources was queried for intersecting or being very near a footprint. A “Combined Managed Lands” file was made by merging the most accurate boundary source for each unique managed area in/near the footprints. A line layer of recreational trails (IDNR, 2020) was also used. Publicly available data sets from IDNR Bicentennial Nature Trust, The Nature Conservancy, Sycamore Land Trust, Central Indiana Land Trust, Indiana Karst Conservancy and Indiana Land Trusts, were searched. Properties enrolled in the IDNR CFWP were identified using property data provided by the county governments in the study area.

GIS intersect tools were used to quantify the area of each managed land that could possibly be directly impacted by the footprints. Buffers of 500 and 1000 feet were generated to analyze nearby possible indirect impacts.

#### 4.27 Energy Impacts (Section 3.28)

The Travel Demand Model (TDM) and TREDIS software (INDOT) was used to conduct the energy impact analysis. The TDM used the 2015 INDOT Roads GIS layer as one of its inputs. Detailed description of the use of the TDM and TREDIS is found in *Volume I*.

#### 4.28 Short-Term Use Vs. Long-Term Productivity (Section 3.29)

GIS data and tools were not used to describe short-term use and long-term productivity comparisons for the project.

#### 4.29 Irreversible and Irretrievable Resources Losses (Section 3.30)

GIS data and tools were not used to describe irreversible and irretrievable resources impacted by the project.



### 4.30 Section 4(f) Impacts (Chapter 4)

Section 4(f) impacts were evaluated using the combined managed lands file created from the multiple polygon layers available from agencies and conservation groups. The trails line layer (2019) and recreational facilities point layer (2009) were also evaluated. Cultural resources were evaluated using the project historic resources geodatabase created by professional historians from SHAARD data and windshield survey.

Alignments were buffered by 1,000 feet and evaluated for any intersecting managed lands, recreation areas, or trails that may meet 4(f) eligibility. Alignments were buffered by 2,000 feet and evaluated for intersecting historic structures determined potentially eligible for listing. Proximity analysis was done to identify any direct impacts. Professional archaeologists compiled existing GIS and database records and determined potential eligibility for listing of sites in the study area. A summary of their report, which contains protected sensitive information, was provided to evaluate potential 4(f) eligible sites.

## 5. Data Catalog

### 5.1 GIS Aerials

#### 5.1.1 Aerial Photographs

- **2016 NAIP Hi Resolution (60 cm) Color Aerial Photography** (PCN 2016\_NAIP\_Aerials). 2016 - 1-foot pixel resolution. Download: <http://gisdb.uits.indiana.edu/singlefile/map/m10000.html>
- **2020 NAIP County Wide (1 meter) Natural Color Aerial Photography**. 2018 -3 foot pixel resolution. Download: <https://nracs.app.box.com/v/naip/folder/129096601232>
- **2020 NAIP County Wide (1 meter) Color Infrared Aerial Photography**. 2018 -3 foot pixel resolution. Download: <https://nracs.app.box.com/v/naip/folder/129096467993>
- **Indiana Orthophotography Download Story App**  
<https://indianamap.maps.arcgis.com/apps/Cascade/index.html?appid=ee559c1083ce48b382566de8c4109d44>

### 5.2 GIS Resources

#### 5.2.1 Cultural

- **Historic Resources** – HistoricResources\_20210420.gdb: Geodatabase of point datasets that contains locations of historic properties listed in the SHAARD dataset and identified in the field from windshield survey for the Mid-states area of potential effect (APE). The geodatabase contains the following layers
  - **Historic Site Photo Points** – the locations from which report photographs were taken. Includes all sites in the APE
  - **Historic Site Locations** – locations of physical structures deemed potentially eligible for listing in field windshield review. Created from SHAARD points or aerial photography.



- **Nearest Distance to Footprint** – created with GIS Near Table tool, this point file lists the nearest alignment footprint and the distance to its boundary from each potentially eligible structure physical location.
- **Site Parcels with Nearest Distance** – Parcels associated with each historic site location. Also contains the distance to the nearest alignment boundary and a Y/N field if the parcel has a direct impact with a footprint.
- **Archaeology Resources** – Sites within the archaeology APE verified by records research and field review and determination of their eligibility for listing. Confidential data source available only to qualified historians or archaeologists. Contact Cultural Resource Analysts, Inc. (CRA) for information.
- **Archaeology APE** - APE\_Archae\_Midstates\_LG\_20210611: Polygon of the area of potential effect for historic and archaeology studies.
- **Cemetery Parcels** - Cemeteries\_Parcels\_IGIO\_Oct2019\_LG\_M12\_20200322.shp: Polygon dataset contains subset of locations of parcels associated with cemeteries (class code 690) according to land parcels data maintained by County Agencies in Indiana. This data set is the most recent compilation of county-based data from local government sources, as part of the ongoing Indiana Data Sharing Initiative (IDSI) program. Publication Date: April 11, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Land>

### 5.2.2 SHAARD

- **The Indiana State Historic Architectural and Archaeological Research Database (SHAARD)** of the Division of Historic Preservation and Archaeology (DHPA) contains information on known historic resources throughout Indiana. The data contained in SHAARD was collected from previously conducted cultural resource inventories, National and State Registers listings, research projects, and cultural resource management project reports. SHAARD includes data from the Indiana Historic Sites and Structure Inventory County Survey Program, the Indiana Cemetery and Burial Ground Registry, historic bridges, properties listed in the National Register of Historic Places, properties listed in the Indiana Register of Historic Sites and Structures, and historic theaters in Indiana. Access to archaeological site locations and information is restricted. Website: <https://secure.in.gov/apps/dnr/shaard/welcome.html>
- **Historic Structures** - Historic\_Structures\_Sites\_2019\_IDNR\_M12.shp: Historic Structures and Sites included in the Indiana Historic Sites and Structures Survey. This dataset contains point locations of sites in Indiana that have been included in the Indiana Historic Sites and Structures Inventory (IHSSI). It includes buildings, districts, sites, structures and objects that were at least 40 years old at the time of survey. It is not complete, may be inaccurate, and may be modified as new information is prepared. The absence of information in a particular location does not necessarily indicate that no such resources exist in said location. Absence of information in a particular location may be due simply to a lack of survey investigations of said location. Publication Date: April 11, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>
- **National Register Sites** -Historic\_Places\_National\_Register\_IDNR\_M12.shp: Historic Sites in Indiana that are included in the National Register of Historic Places. It includes buildings,



districts, sites, cemeteries, bridges, structures and objects. Publication Date: April 11, 2019.

Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>

- **National Register Districts**-Historic\_Districts\_National\_Register\_2019\_IDNR\_M12.shp: Historic Districts in Indiana that are included in the National Register of Historic Places (Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology, 1:5,000, Polygon Shapefile. Publication Date: April 11, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>
- **Historic Bridge Locations** -Historic\_Bridges\_2019\_IDNR\_M12.shp: This dataset contains point locations of historic bridges in Indiana. It includes buildings, districts, sites, structures and objects that are were at least 40 years old at the time of survey. It is not complete, may be inaccurate, and may be modified as new information is prepared. The absence of information in a particular location does not necessarily indicate that no such resources exist in said location. Absence of information in a particular location may be due simply to a lack of survey investigations of said location. Publication Date: April 11, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>
- **Cemetery Sites**-Cemetery\_Sites\_2019\_IDNR\_M12.shp: Dataset contains point locations of cemetery sites in Indiana, regardless of age, number of graves, or size of the cemetery Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology, 1:5,000, Polygon Shapefile. Publication Date: April 11, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>
- **Cemetery Areas**-Cemetery\_Areas\_2019\_IDNR\_M12.shp: Dataset contains polygon locations of Cemetery Site Areas in Indiana. Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology, 1:5,000, Polygon Shapefile. Publication Date: April 11, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>

### 5.2.3 Ecosystem

- **Natural Regions**- Natural\_Regions\_IDNR\_2002\_M12.shp: Digitized version of the Natural Regions map done by Michael Homoya, 1985, in Proceedings of the Indiana Academy of Science Volume 94, Plate 1. Reprinted 1990. It contains the natural regions and their subsections. Polygon dataset was compiled to provide boundaries for the natural regions in Indiana. It is intended for a variety of uses by the public recognizing that the horizontal accuracy does not support high precision applications. Publication Date: January 1, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Physiography>
- **Physiographic Regions**- Physiographic\_Regions\_IGS\_2002\_M12.shp: Polygon shapefile that shows the physiographic regions of Indiana. Detailed descriptions of these regions can be obtained from Gray, H.H., 2000, Physiographic Divisions of Indiana, Special Report 61, Indiana Geological Survey. Publication Date: April 16, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Physiography>

### 5.2.4 Environmental Concern [EPA Facility Registry Service]

- **EPA Facility Registry Service (FRS)** - Facility Interests Dataset downloadable data package consists of location and facility identification information from EPA's Facility Registry Service



(FRS) for all sites that are available in the FRS individual feature layers. FRS integrates facility data from EPA's national program systems, other federal agencies, and State and tribal master facility records and provides EPA with a centrally managed, single source of comprehensive and authoritative information on facilities. Publication Date: February 13, 2020 Download: <https://edg.epa.gov/metadata/catalog/search/resource/details.page?uuid=%7b762F413E-76B7-4E29-ACD1-E8D5161A3074%7d>

- **Assessment Cleanup and Redevelopment Exchange System (ACRES) sites-**  
ACRES\_USEPA\_FRS\_2020\_M12.shp: ACRES stores information reported by EPA Brownfields grant recipients on Brownfields properties assessed or cleaned up with grant funding, as well as information on Targeted Brownfields Assessments (TBA) performed by EPA Regions.
- **Resource Conservation and Recovery Act (RCRA) active sites-**  
RCRA\_Active\_USEPA\_FRS\_2020\_M12.shp: Active hazardous waste facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo). EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984, RCRAInfo tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste.
- **Resource Conservation and Recovery Act (RCRA) inactive sites-**  
RCRA\_Inactive\_USEPA\_FRS\_2020\_M12.shp: Hazardous waste facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo). EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984, RCRAInfo tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste.
- **Resource Conservation and Recovery Act (RCRA) Large Quantity Generators (LQG)-**  
RCRA\_LQG\_USEPA\_FRS\_2020\_M12.shp: Subset of facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo) and are classified as hazardous waste large quantity generators (LQG). A LQG generates: 1,000 kg or more of hazardous waste during any calendar month; or More than 1 kg of acutely hazardous waste during any calendar month; or More than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or 1 kg or less of acutely hazardous waste during any calendar month, and accumulate more than 1 kg of acutely hazardous waste at any time; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulated more than 100 kg of that material at any time.
- **Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal (TSD) facilities -** RCRA\_TSD\_USEPA\_FRS\_2020\_M12.shp: subset of Hazardous Waste Treatment, Storage, and Disposal (TSD) facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo). A TSD Facility performs one or more of the following functions: Treatment: Any method, technique, or process, including neutralization, designed to change the physical, chemical or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from



the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store or dispose of; or amenable for recovery, amenable for storage, or reduced in volume. Storage: The holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere. Disposal: The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

- **Resource Conservation and Recovery Act (RCRA) Transporters-**  
RCRA\_Trans\_USEPA\_FRS\_2020\_M12.shp: subset of facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo) and are transporters of hazardous waste.
- **Resource Conservation and Recovery Act (RCRA) sites-** RCRA\_USEPA\_FRS\_2020\_M12.shp: Subset of hazardous waste facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo). EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984, RCRAInfo tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste.
- **Superfund Enterprise Management System (SEMS) Superfund National Priorities List (NPL) sites-** SEMS\_NPL\_USEPA\_FRS\_2020\_M12.shp: Subset of facilities that are listed on the Superfund National Priorities List (NPL). The NPL lists national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The NPL is recorded in the Superfund Enterprise Management System (SEMS), which serves as a comprehensive tracking and reporting tool, providing data on the inventory of active and archived hazardous waste sites evaluated by the Superfund program. It contains sites that are either proposed to be, or are on, the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL.
- **Toxic Release Inventory (TRI) System sites** -TRI\_USEPA\_FRS\_2020\_M12.shp: TRI is a publicly available EPA database reported annually by certain covered industry groups, as well as federal facilities. It contains information about more than 650 toxic chemicals that are being used, manufactured, treated, transported, or released into the environment, and includes information about waste management and pollution prevention activities.

#### 5.2.5 Environmental Concern [INDOT Red Flag Inventory]

- **INDOT Red Flag Inventory (RFI)** -The Environmental Services Division of INDOT has developed the Site Assessment & Management Manual which details GIS methodology for determining hazardous materials concerns for a proposed project. The purpose of this investigation is to simply identify and highlight areas of concern which appear on publicly available standard sources that are near the proposed project. The Red Flag Inventory (RFI) investigation uses GIS data from numerous data sources. Most of the data are single point files and are intended to represent a facility. The location of the symbol within the GIS data is merely for reference, many facility's encompass large parcels, and some symbols may be incorrectly located. Further guidance can be found within the Site Assessment & Management Manual. The RFI template



was last updated on January of 2018, and represents the best available information.

Publication Date: April 11, 2019. Download <https://www.in.gov/indot/2523.htm>

- OLQ\_Loc\_Data\_Program\_INDOT\_RFI\_2018\_M12.shp
  - **ATTRIBUTE:** PROGRAM; DP/ SF= Superfund; HW= RCRA Generator/TSD; RCRA= RCRA Corrective Action Sites; SC= State Cleanup Site; SP= Septage Waste Site; UT= Underground Storage Tank; VR= Voluntary Remediation Program; CC= Unknown (not define in RFI); EW= Unknown (not define in RFI); LU= Leaking Underground Storage Tank
- OLQ\_Loc\_Data\_Sub\_Program\_INDOT\_RFI\_2018\_M12.shp
  - **ATTRIBUTE:** SUB\_PROGRA; CDSL= Construction/Demolition Site; (CFSL, COFV, Closed, INNP, MSWL, NSWL, Other, SANL, SUIL, PFOP)= Solid Waste Landfill; (IWNP, MWPP)= Infectious/Medical Waste Site; LU= Leaking Underground Storage Tank; MGP= Manufactured Gas Plant; ODSL= Open Dump Waste Site; RWS1; RWS2; RWS3; RWS4; RWSX= Restricted Waste Site; TSPF= Waste Transfer Station; WTPS; WTSS= Tire Waste Site; CFV= Unknown (not define in RFI); TSD= Unknown (not define in RFI);
- Notice\_of\_Contamination\_INDOT\_RFI\_2018\_M12.shp
- Brownfield\_INDOT\_RFI\_2018\_M12.shp
- Landfill\_Boundaries\_INDOT\_RFI\_2018\_M12.shp
- Institutional\_Controls\_INDOT\_RFI\_2018\_M12.shp

### 5.2.6 Environmental Concern [Indiana Map]

- **Indiana Map Layer Gallery** – Indiana Map is the largest publicly available collection of Indiana geographic information system (GIS) map data. It is made possible by an alliance of partners from federal, state, local organizations and agencies, and universities.
  - **Environment >>Remediation**
    - **2018 Brownfield Locations**-Brownfields\_IDEM\_2018\_M12.shp: Point locations for brownfield parcels within Indiana, provided by personnel of Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include status (active, inactive), identification numbers (IDEM), site names, address information, and status comments. Publication Date: October 19, 2018. Download: <https://maps.indiana.edu/layerGallery.html?category=Remediation>
    - **State Cleanup Program Sites**-Cleanup\_Sites\_IDEM\_2018\_M12.shp: Point locations for State Cleanup Program sites within Indiana, provided by personnel of Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include site names, regulatory identification numbers (IDEM), and address information. Publication Date: October 19, 2018. Download: <https://maps.indiana.edu/layerGallery.html?category=Remediation>
    - **Institutional Controls Registry Sites**-Institutional\_Controls\_IDEM\_2019\_M12.shp: Polygons of sites in Indiana on the



Institutional Control Registry, provided by personnel of the Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes includes closure status, facility name, street address, regulatory programs (IDEM), closure type, IC type, identification numbers (IDEM), control measure notes, affected media, description of restrictions, lists of chemical contaminants, and Web links to online documentation from the IDEM "Virtual File Cabinet" (IDEMdata VFC document search - <<https://vfc.idem.in.gov/>> ).  
Publication Date: February 14, 2019. Download:

<https://maps.indiana.edu/layerGallery.html?category=Remediation>

- **Superfund Program List Sites**-Superfund\_IDEM\_2018\_M12.shp: Point locations of sites in Indiana on the IDEM Superfund Program list provided by Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include site names, regulatory identification numbers (IDEM), and address information. Publication Date: October 19, 2018. Download: <https://maps.indiana.edu/layerGallery.html?category=Remediation>
- **Voluntary Remediation Program (VRP) Sites**-VRP\_Sites\_IDEM\_2018\_M12.shp: Point locations for VRP sites provided by Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include regulatory identification numbers (IDEM), site names, address information, and data collection dates. Publication Date: October 19, 2018. Download: <https://maps.indiana.edu/layerGallery.html?category=Remediation>
- **Environment >>Storage Tanks**
  - **Underground Storage Tanks (UST)**- UST\_IDEM\_2018\_M12.shp: Point locations for regulated Underground Storage Tank (UST) systems provided by personnel of Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include regulatory identification numbers (IDEM), site names, IDEM program and sub-program designation, address information, and data collection dates. Publication Date: October 19, 2018. Download: <https://maps.indiana.edu/layerGallery.html?category=StorageTanks>
- **Environment >>Waste**
  - **Inspected Coal Combustion Waste Impoundments**- Coal\_Combustion\_Waste\_Impoundments\_IDEM\_2015\_M12.shp: Polygon shapefile that contains coal combustion waste impoundments (CCW) that have been inspected by the U.S. Environmental Protection Agency (US EPA), provided by Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributed with observations by IDEM staff and information found in US EPA contracted reports about the structural integrity and hazard potential some of the impoundment dams. Publication Date: November 13, 2015. Download: <https://maps.indiana.edu/layerGallery.html?category=Waste>
  - **Landfill (Waste Sites) Boundaries**- Landfill\_Boundaries\_IDEM\_2018\_M12.shp: Polygon shapefile of landfill boundaries within Indiana, provided by Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include facility names, permit numbers, and identification numbers



(IDEM). Publication Date: October 19, 2018. Download:

<https://maps.indiana.edu/layerGallery.html?category=Waste>

- **Waste Site Facilities for Disposal, Storage and Handling of Solid Waste and Restricted Waste**- Waste\_Disposal\_Storage\_Handle\_IDEM\_2018\_M12.shp: Point locations of waste facilities used for the disposal, storage, and handling of solid and restricted waste in Indiana, provided by Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include site names, regulatory identification numbers (IDEM), IDEM program/sub-program codes, and address information. Publication Date: October 19, 2018. Download: <https://maps.indiana.edu/layerGallery.html?category=Waste>
- **Waste Tire Program Sites**- Waste\_Tire\_Sites\_IDEM\_2018\_M12.shp: Point locations of Waste Tire Program sites within Indiana, provided Indiana Department of Environmental Management, Office of Land Quality (IDEM, OLQ). Attributes include site names, regulatory identification numbers (IDEM), and address information. Tire Sites contain tires either for processing, for storage, or transport, as well as some illegal tire dumps. October 19, 2018. Download: <https://maps.indiana.edu/layerGallery.html?category=Waste>

### 5.2.7 Environmental Justice

- **Online Census Data** - <https://data.census.gov/>
  - ACS 2019 (5-year), Table B17021; POVERTY STATUS OF INDIVIDUALS IN THE PAST 12 MONTHS BY LIVING ARRANGEMENT
  - ACS 2019 (5-year); Table B03002: HISPANIC OR LATINO ORIGIN BY RACE
- **Minority and Poverty Environmental Justice by Block Groups** - StudyAreaCensusBlockGroupsEJ\_BLN\_20210211: Census block group boundaries attributed with population data and calculations to create a Y/N flag field for block groups with EJ concerns.
- **Census Tracts 2010, TIGER 2019** – Census\_Tract2010\_TIGER19\_M12: 2010 Census Tracts, Publication Date: June 6, 2019. Download: <https://www.census.gov/cgi-bin/geo/shapefiles/index.php>
- **Census Block Groups 2010, TIGER 2019** – Census\_BlockGroups2010\_TIGER19\_M12: 2010 Census Blocks, Publication Date: June 6, 2019. Download: <https://www.census.gov/cgi-bin/geo/shapefiles/index.php>

### 5.2.8 Floodplains

- **Floodplains** - FloodHazard\_Zones\_2017\_IDNR\_MS12.shp: Best Available Floodplains (Indiana Department of Natural Resources, polygon shapefile). The Indiana DNR Division of Water has undertaken a project to create and update traditional Flood Insurance Rate Maps, which are published by FEMA, to include many more stream reaches than are currently officially published in the National Flood Hazard Layer. “Best available” flood hazard data for Indiana, includes effective mapping with additional updates based on the Zone A mapping project data, DNR



model reviews, and other floodplain data that is not FEMA approved but is considered "best available" by the Indiana Department of Natural Resources. Attributes indicate floodways. Data is current to February 2020. Download: <https://www.in.gov/dnr/water/9846.htm>

- **Base Flood Elevations:** BFE\_pnts\_2017\_IDNR\_MS12.shp: Base Flood Elevations of the Best Available Floodplains (Indiana Department of Natural Resources, point shapefile). BFEs are not used for impact calculations, but will aid designers in avoidance and minimization, and allow for better prediction of probable costs. Data is current to February 2020. Download: <https://www.in.gov/dnr/water/9846.htm>

### 5.2.9 Groundwater

- **Wells-**Wells\_2019\_IDNR\_MS12.shp: Water Well Locations in Indiana. Publication Date: June 13, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=WaterWells>
- **Aquifer Sensitivity-**AqSensitivity\_Near\_Surface\_2015\_IGS\_M12.shp: Polygon file generated from raster data layer. Relationship of groundwater recharge rates to aquifer sensitivity to contamination in shallow aquifers in Indiana using multiple regression analysis. Estimates of estimated diffuse recharge rates to the water table in glacial environments, Indiana, in inches per year. Publication Date: June 30, 2015. Download: <https://maps.indiana.edu/layerGallery.html?category=Aquifers>

### 5.2.10 Infrastructure

- **US Energy Information Administration (EIA) Data-** [https://www.eia.gov/maps/layer\\_info-m.php](https://www.eia.gov/maps/layer_info-m.php)
  - **Crude Oil Pipelines-**CrudeOil\_Pipelines\_EIA\_2020\_M12.shp: Major crude oil pipelines in the United States and selected crude oil pipelines in Canada. Layer includes interstate trunk lines and selected intrastate lines but excludes gathering lines. Based on publicly available data from a variety of sources with varying scales and levels of accuracy. Publication Date: 1/13/2020
  - **Electric Substations-**Electric\_Substations\_EIA\_2020\_M12.shp: Electric power substations primarily associated with electric power transmission as represented by facilities and equipment that switch, transform, or regulate electric power at voltages equal to, or greater than, 69 kilovolts. Substations with a maximum operating voltage less than 69 kilovolts may be included, depending on the availability of authoritative sources, but coverage of these features should not be considered complete. Geographic coverage includes the United States and the U.S. Territories. Publication Date: 1/13/2020
  - **Electric Transmission Lines-**Electric\_Transmission\_Lines\_EIA\_2020\_M12.shp: Includes lines operated at relatively high voltages varying from 69 kV up to 765 kV which can transmit large quantities of electricity over long distances. Underground transmission lines are included where sources were available. Geographic coverage includes the United States and the U.S. Territories. Publication Date: 1/13/2020
  - **Ethanol Plants-**Ethanol\_Plants\_EIA\_2020\_M12.shp: Operating fuel ethanol production plants in the United States. Publication Date: 1/13/2020



- **HGL Pipelines**-HGL\_Pipelines\_EIA\_2019\_M12.shp: Major hydrocarbon gas liquids (HGL) pipelines in the United States and selected HGL pipelines in Canada. Data includes interstate trunk lines and selected intrastate lines. Based on publicly available data from a variety of sources (including company websites and media reports) with varying scales and levels of accuracy. Publication Date: 10/08/2019
- **Natural Gas Pipelines**-NatGas\_Pieplines\_EIA\_2019\_M12.shp: Natural gas interstate and intrastate pipelines in the United States. Based on a variety of sources with varying scales and levels of accuracy and therefore accuracy is directly affected. Publication Date: 10/08/2019
- **Natural Gas Underground Storage**-NatGas\_Underground\_Storage\_EIA\_2019\_M12.shp: U.S. underground natural gas storage. Publication Date: 10/08/2019
- **Petroleum Product Pipelines**-Petro\_Product\_Pipelines\_EIA\_2020\_M12.shp: Major petroleum product pipelines in the United States. Layer includes interstate trunk lines and selected intrastate lines. Based on publicly available data from a variety of sources with varying scales and levels of accuracy
- **Petroleum Product Terminals**-Petro\_Product\_Terminal\_EIA\_2020\_M12.shp: All operable bulk petroleum product terminals in the United States with a total bulk shell storage capacity of 50,000 barrels or more, and/or ability to receive volumes from tanker, barge, or pipeline. Publication Date: 1/13/2020
- **Power Plants**-Power\_Plants\_EIA\_2020\_M12.shp: Operable electric generating plants in the United States by energy source. This includes all plants that are operating, on standby, or short- or long-term out of service with a combined nameplate capacity of 1 MW or more. Publication Date: 1/13/2020
- **Crude Oil Pipelines**-CrudeOil\_Pipelines\_EIA\_2020\_M12.shp: Major crude oil pipelines in the United States and selected crude oil pipelines in Canada. Layer includes interstate trunk lines and selected intrastate lines but excludes gathering lines. Based on publicly available data from a variety of sources with varying scales and levels of accuracy. Publication Date: 1/13/2020
- **Roads, INDOT** - Shows roads in Indiana, consisting of city streets, county roads, and U.S., state and interstate roads, and other roads (1:24,000). These data are from the Indiana County Log Line Inventory compiled by Road Inventory of the Indiana GIS Department of Transportation (INDOT). Position utilizes Jurisdiction, County, Road System, Route Name and Alternative Route. County Log line inventory is as of 2006-2015. Download: <https://maps.indiana.edu/layerGallery.html?category=Streets>
- **Roadways, Functional Class** - Functional\_Class\_INDOTMODEL\_IN.shp: Shows the Indiana Functional Class Line Inventory (1:24,000) compiled by Road Inventory of the Indiana GIS Department of Transportation (INDOT). Each Functional Class Line Inventory is placed as to Position, From and To Measure, and contains 7 classifications. Classifications are: Interstate, Principal Arterial-Other Freeways or Expressways, Principal Arterial-Other, Minor Arterial, Major Collector, Minor Collector, and Local Functional These classification is according to the character of service that the road is intended to provide. Class Line Inventory is dated as of 2011-2015. Download: <https://maps.indiana.edu/layerGallery.html?category=Interstates>



- **Traffic Counts** - Traffic\_Counts\_INDOTMODEL\_IN: Shows traffic counts (average annual daily traffic, factored to year 2014) for roadways in Indiana. The data set (1:24,000) was compiled by Road Inventory of the Indiana GIS Department of Transportation (INDOT). Each road segment contains the inventory event of Annual Average Daily Traffic Counts (AADT) dated for the year 2014. Download: <https://maps.indiana.edu/layerGallery.html?category=Interstates>

### 5.2.11 Karst

- **Cave Entrance Density**-Cave\_Density\_IGS\_1997\_M12.shp: Number of Mapped Cave Entrances per Square Kilometer in Silurian, Devonian, and Mississippian rocks in Southern Indiana. Locations of individual cave entrances are not shown. Publication Date: July 17, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Karst>
- **Karst Dye Trace**-Karst\_Dye\_Lines\_IGS\_1999\_M12.shp- Polyline shapefile that shows inferred subsurface connections between input and detection points of various dye-trace investigations in southern Indiana. This shapefile should be used in conjunction with an associated point shapefile, which shows input, output, and intermediate dye-trace points. Publication Date: July 17, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Karst>
- **Karst Dye Points**-Karst\_Dye\_pnts\_IGS\_1999\_M12.shp: Point shapefile that shows the locations of input and detection points that were used for selected subsurface dye-trace investigations in southern Indiana. This shapefile should be used in conjunction with an associated polyline shapefile, which shows inferred connections between dye-trace points. Publication Date: July 17, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Karst>
- **Karst MOU** - Karst\_MOU\_BLA\_IN: Line file of the boundary of the area covered by the 1993 Karst MOU in Indiana.
- **Sinkhole Areas**-Karst\_Sinkhole\_Areas\_IGS\_1997\_M12.shp: Polygon shapefile that shows sinkhole areas and sinking-stream basins associated with rocks of Silurian, Devonian, and Mississippian age in southern Indiana. Publication Date: July 17, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Karst>
- **Sinkhole points**-Sinkhole\_Inventory\_IGS\_2011\_M12.shp: Sinkhole inventory for southern Indiana and northern Kentucky. Publication Date: December 9, 2011. Download: <https://maps.indiana.edu/layerGallery.html?category=Karst>
- **Spring Points**-Karst\_Springs\_IGS\_1997\_M12.shp: Point shapefile that shows the locations of springs in and around the karst region of south-central Indiana. Publication Date: July 17, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Karst>

### 5.1.1 Land Use

- **2001 National Land Cover**- LandCover\_NLCD\_2001\_30m\_US.shp: The U.S. Geological Survey (USGS), in partnership with several federal agencies, has developed the 2001 National Land Cover Database (NLCD). The data provides spatially explicit and reliable information on the Nation's land cover and land cover change. Classifications are modified from the Anderson Land Cover Classification System. Publication Date: Download: <https://www.mrlc.gov/data?f%5B0%5D=category%3ALand%20cover&f%5B1%5D=region%3Aconus>



- **Refined 2016 National Land Cover**- Refined\_LandCover\_NLCD\_2016\_30m\_M12\_20200901.shp: Raster Database converted to polygons. The U.S. Geological Survey (USGS), in partnership with several federal agencies, has developed the 2016 National Land Cover Database (NLCD). The 2016 update provides spatially explicit and reliable information on the Nation's land cover and land cover change. Classifications are modified from the Anderson Land Cover Classification System. Publication Date: January 2019. A symbology layer following the source symbology supplements this data. Download: <https://www.mrlc.gov/data?f%5B0%5D=category%3Aland%20cover&f%5B1%5D=region%3Aconus> This layer was updated by comparison to aerial photography within the Mid-states refinement boundary, September 2020.
- **Refined Forest Blocks** – NCLD\_Refine\_Forest\_Blocks.gdb:
  - NCLD\_Forest\_Dissolv\_Refine: Subset of Refined 2016 NCLD, where all forests are one class by dissolve. Forest blocks intersecting Midstates ROWs was manually refined using 2018 aerial photography to get more accurate edges and clearings.
  - NCLD\_Forest\_Dissolv\_Refine\_Subset\_ROW: The forest blocks with refinements to edges and clearings further subset into those blocks that intersect the Midstate working alignment ROWs.
- **Existing Core Forest** - NCLD\_Core\_Forest\_Existing.shp: Refined forest blocks buffered inside the boundaries by 100 meters. Any buffer less than 1 acre queried and removed. Remaining buffers are existing core forest.
- **Remaining Core Forest** - NCLD\_Core\_Forest\_Remaining.shp: Midstate ROW footprints erased from refined forest blocks. The remaining forest block area is buffered inside the boundaries by 100 meters. Any buffer less than 1 acre queried and removed. Remaining buffers are remaining core forest.

### 5.2.12 Managed Lands

- **Recreational Facilities** - Recreational\_Facilities\_IDNR\_2009\_M12.shp: Point locations of sites that have outdoor recreation facilities. It includes facilities managed by federal, state, and local governments, as well as non-government organizations, private and commercial entities, and schools. It does not include sites that are private and not open to the public. This layer is archival and no longer maintained. Points of interest must be verified for currentness. Currentness: February 26, 2009 Download: <https://maps.indiana.edu/layerGallery.html?category=Recreation>
- **Trails** - Trails\_IDNR\_2019\_M12.shp: Polylines and attributes of public, off-road recreation and transportation trails in Indiana. It includes trails managed by federal, state, and local governments, as well as non-government organizations. It includes trails that are open, under development, planned, and potential; please check the STATUS field. Updated September 30, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Recreation>
- **Hoosier National Forest Management Area** - Hoosier\_Natl\_Forest\_Mgmt\_2020\_IN: Hoosier National Forest management areas shows the areas of focus for management activities. It does not indicate currently owned land, but is within the acquirement boundary. Publication date: March 5, 2020. Obtained by request from Hoosier National Forest.



- **Proclamation Boundary, GAP** - ProclaimBndry\_USGS\_GAP\_2018\_M12: Acquisition boundaries for federal lands that is one layer in the USGS GAP Project Protected Areas Database of the United States (PAD-US 2.0). These boundaries do not necessarily show ownership, but where federal agencies have been approved to acquire land from willing sellers. The boundaries contain both private and federally owned lands. Publication date: September 30, 2018  
Download: [https://www.usgs.gov/core-science-systems/science-analytics-and-synthesis/gap/science/pad-us-data-overview?qt-science\\_center\\_objects=4#qt-science\\_center\\_objects](https://www.usgs.gov/core-science-systems/science-analytics-and-synthesis/gap/science/pad-us-data-overview?qt-science_center_objects=4#qt-science_center_objects)
- **Combined Managed Lands** - ManagedLand\_Combined\_1222020\_StudyBands.shp: Polygon file created by Lochmueller Group which compared all the individual files below and created a single file with no duplicated properties. This combination file is only accurate to the extent of the Mid-States study bands.
  - **NRCS Easement Areas**- Conservation\_Easements\_NRCS\_2020\_MS12.shp: Polygon dataset provides an aggregate layer of conservation easements received from each state used to identify, monitor, and enhance the spatial accuracy of restoration program polygons. U.S. Department of Agriculture, Service Center Agencies should be acknowledged as the data source. Verify the appropriate use of privately owned features in this layer in publicly displayed mapping. Publication Date: January 1, 2020.  
Download: <https://gdg.sc.egov.usda.gov/GDGOrder.aspx?order=QuickState>
  - **Managed Land Areas** – ManagedLand\_Pub&Privt\_IDNR\_03312020\_M12.shp: Public and private owned managed Lands in Midstate counties, Indiana. Subset of the Indiana Natural Heritage Data Center (INHDC) managed areas dataset provided by IDNR. It includes natural and recreation areas which are owned or managed by private owners, state agencies, federal agencies, local agencies, and non-profit organizations. Verify the appropriate use of privately owned features in this layer in publicly displayed mapping. Publication Date: March 31, 2020.
  - **National Natural Landmark** - National\_Natural\_Lndmk\_NPS\_2004\_M12: is a polygon shapefile that contains all national natural landmarks in Indiana Midstates Study Area. Information regarding landmark significance, ownership, management, area, location, and concerns are included in the attribute table. Landmark boundaries were created by on-screen digitizing using digital versions of U.S. Geological Survey quadrangle maps. Boundaries were created by visual estimation from hardcopy U.S. Geological Survey quadrangle maps provided by NPS. The National Natural Landmarks Program recognizes and encourages the conservation of outstanding examples of our country's natural history. It is the only natural areas program of national scope that identifies and recognizes the best examples of biological and geological features in both public and private ownership. Verify the appropriate use of privately owned features in this layer in publicly displayed mapping. Publication date: August 4, 2004
  - **Mitigation Properties, I-69, Lochmueller Group** - MitigationProperties\_I69\_LochGrp\_20171108.shp: Polygon layer of the property boundaries of mitigation areas developed by Lochmueller Group to meet the requirements of environmental permitting for construction of I-69 from Evansville to Indianapolis. Verify the appropriate use of this layer in publicly displayed mapping. Currentness: November 8, 2017.



- **Protected Lands, GAP** - Protect\_Land\_GAP\_PAD2\_2018\_M12: The USGS Protected Areas Database of the United States (PAD-US) is the nation's inventory of protected areas, including public land and voluntarily provided private protected areas. Most are public lands owned in fee; however, long-term easements, leases, agreements, Congressional (e.g. 'Wilderness Area'), Executive (e.g. 'National Monument'), and administrative designations (e.g. 'Area of Critical Environmental Concern') documented in agency management plans are also included. The PAD-US strives to be a complete inventory of public land and other protected areas, compiling “best available” data provided by managing agencies and organizations. Publication date: September 30, 2018 Download: [https://www.usgs.gov/core-science-systems/science-analytics-and-synthesis/gap/science/pad-us-data-overview?qt-science\\_center\\_objects=4#qt-science\\_center\\_objects](https://www.usgs.gov/core-science-systems/science-analytics-and-synthesis/gap/science/pad-us-data-overview?qt-science_center_objects=4#qt-science_center_objects)

### 5.2.13 Geology

- **Regional Bedrock Geology** - RegionalBedrock\_Geology\_IGS\_1986\_M12: Polygon shapefile that shows the bedrock geology of the state of Indiana, produced from the Indiana Geological Survey Regional Geologic Map series, (1:250,000). The mapped stratigraphic units include selected systems, groups, and formations. Additional attributes were included from derivative products of the "Compendium of Paleozoic rock-unit stratigraphy in Indiana—a revision: Indiana Geological Survey Bulletin 59 (1986)." The names of some groups, formations, and members on some of the maps have been updated to reflect the most recent nomenclature. Publication Date: May 14, 2013. Download: <https://maps.indiana.edu/layerGallery.html?category=Bedrock>
- **Quaternary Geology** -Quaternary\_Surficial\_Geology\_IGS\_2002\_M12.shp: Polygon shapefile that shows surficial geology in Indiana at a scale of 1:500,000. The mapped units include textural assemblages of quaternary sediments and bedrock lithologies. Publication Date: March 20, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Glacial>

### 5.2.14 Coal

- **National Coal Resource Data System** - Coal\_Resource\_Data\_NCRDS\_2014\_M12.shp: Point shapefile is an index to the location of coal resource data points in Indiana. This shapefile includes detailed location and stratigraphic information for each data point. Publication Date: November 15, 2017. Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Depth Ranges of the Colchester Coal Member** -Coal\_Colchester\_Depth\_NCRDS\_2014\_M12.shp: Publication Date: October 11, 2014. Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Elevation Ranges of the Colchester Coal Member** - Coal\_Colchester\_Elevation\_NCRDS\_2014\_M12.shp: Publication Date: October 11, 2014. Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Mined-Out Areas in the Colchester Coal Member** - Coal\_Colchester\_Mined\_Out\_NCRDS\_2014\_M12.shp: Publication Date: October 11, 2014. Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>



- **Thickness Ranges of the Colchester Coal Member -**  
Coal\_Colchester\_Thickness\_NCRDS\_2014\_M12.shp: Publication Date: October 11, 2014.  
Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Depth Ranges of the Seelyville Coal Member** Coal\_Seelyville\_Depth\_NCRDS\_2011\_M12.shp:  
Publication Date: August 15, 2011. Download:  
<https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Elevation Ranges of the Seelyville Coal Member -**  
Coal\_Seelyville\_Elevation\_NCRDS\_2012\_M12.shp: Publication Date: August 15, 2011.  
Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Mined-Out Areas in the Seelyville Coal Member -**  
Coal\_Seelyville\_Mined\_Out\_NCRDS\_2012\_M12.shp: Publication Date: August 15, 2011.  
Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Thickness Ranges of the Seelyville Coal Member -**  
Coal\_Seelyville\_Thickness\_NCRDS\_2011\_M12.shp: Publication Date: November 15, 2017.  
Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Surface Coal Mine Areas**-Surface\_Coal\_Mines\_IDNR\_2017\_M12.shp: Provides the locations of all documented surface coal mines that have operated in the coal region of Indiana since the mid-1880s, up to December 31, 2016. Publication Date: November 15, 2017. Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Underground Coal Mine Areas** -Underground\_Coal\_Mines\_IDNR\_2017\_M12.shp: provides the locations of all documented underground coal mines that have operated in the coal region of Indiana since the mid-1880s, up to December 31, 2016. Publication Date: November 15, 2017. Download: <https://maps.indiana.edu/layerGallery.html?category=Coal>
- **Coal Mines with Active Permits** - Coal\_Mine\_Active\_Permit\_IDNRWeb\_LG\_20200625.shp: Polygon file made from heads-up digitizing the properties observed in the Mid-States project area on the active permits website from IDNR.  
<https://indnr.maps.arcgis.com/apps/webappviewer/index.html?id=dd266f456d574b3eb070293ddf2b8d6>
- **Dubois Coal Reserves** - CoalReserve\_Over2ftThck\_Dubois\_IGSMap\_1964\_LG.shp: Polygon file digitized from a rectified hard copy image provided by Garre Connor.

#### 5.2.15 Petroleum

- **Petroleum Fields**-Petroleum\_Fields\_IGS\_M12.shp: Petroleum Reservoir Fields (Oil and Gas) in Indiana. Dataset was created by comparing digital lines from IGS Miscellaneous Map 58 (MM58) with one quarter mile buffers of productive petroleum wells. New petroleum field outlines were then manually digitized on screen using the shape information from MM58 and the buffer extents. In some cases, the IGS Petroleum Exploration Map (PEM) series was consulted to verify spatial and attribute data. Petroleum well information was queried from the Indiana Geological Survey Petroleum Well Database, which is a component of the IGS Petroleum Database Management System (PDMS). Publication Date: January 08, 2015. Download: <https://maps.indiana.edu/layerGallery.html?category=Petroleum>



- **Petroleum Well Locations** - Petroleum\_Wells\_IGS\_M12.shp: Petroleum Well Locations in Indiana. Created from data in the Indiana Geological Survey Petroleum Well Database, which is a component of the IGS Petroleum Database Management System (PDMS). The database includes records obtained from the IGS petroleum well files, which represent the most comprehensive collection of petroleum-related well records in the state. Publication Date: January 08, 2015. Download: <https://maps.indiana.edu/layerGallery.html?category=Petroleum>
- **Silurian Reef Locations** - Silurian\_Reef\_Pnts\_IGS\_2003\_M12.shp: Point shapefile that shows the locations of Silurian rock reef formations in Indiana. These data include five categories: (1) buried reef masses, (2) exposed reef, (3) exposed reef in active stone quarries, (4) reef-induced structure in overlying rocks, and (5) reef-induced structure in overlying rocks related to oil, gas, and gas storage fields. Publication Date: October 3, 2003. Download: <https://maps.indiana.edu/layerGallery.html?category=Silurian>
- **Reef Polygons**- Silurian\_Reef\_Areas\_IGS\_2003\_M12.shp: Polygon shapefile that shows the general locations of Silurian rock reef bank formations in Indiana. These data include two major reef bank areas. Publication Date: October 3, 2003. Download: <https://maps.indiana.edu/layerGallery.html?category=Silurian>

### 5.2.16 Minerals

- **Active Industrial Minerals Production Sites**- Active\_Industrial\_Minerals\_IGS\_2016\_M12.shp: Locations of Operation for Active Industrial Minerals Producers in 2016 in Indiana. a point shapefile that shows the locations of operation for industrial minerals producers that were active in 2016 in Indiana. These operations extract and (or) produce the following commodities: cement, clay and shale, crushed stone, dimension limestone, dimension sandstone, gypsum, lime, peat, slag, and sand and gravel. The data set contains location, contact information, geologic information, and other relevant information for all industrial minerals operations known to be active in Indiana on January 15, 2016. Download: <https://maps.indiana.edu/layerGallery.html?category=IndustrialMinerals>
- **Industrial Mineral Data**-Industrial\_Minerals\_Pnts\_IGS\_2004\_M12.shp: A shapefile that shows the distribution of stratigraphic data for various industrial minerals in Indiana. These data were derived from six different types of sources: cores, measured samples, mine samples, outcrops, quarries, and well logs. Data that are associated with each point can be obtained by contacting the Indiana Geological Survey and referencing the identification number stored in the field named "ID\_\_." Publication Date: February 27, 2004. Download: <https://maps.indiana.edu/layerGallery.html?category=IndustrialMinerals>
- **Abandoned Quarries** -Abandoned\_Quarries\_IGS\_2001\_M12.shp: Shapefile was derived from information from the following CD-ROM publication: Hasenmueller, W.A., and Ault, C.H., 2001, Abandoned Industrial Minerals Quarries in Indiana, 2nd Edition, Digital Version, Computer Database 2, Indiana Geological Survey. Publication Date: May 30, 2003. Download: <https://maps.indiana.edu/layerGallery.html?category=IndustrialMinerals>
- **Abandoned Sand and Gravel Pits** -Abandoned\_Sand\_Gravel\_Pits\_IGS\_2001\_M12.shp: This shapefile was derived from the following unpublished memorandum report of the Indiana Geological Survey (IGS): Hasenmueller, W. A., 2001, Preliminary database of abandoned sand and gravel pits, Coal and Industrial Minerals Section Memorandum Report 98, Indiana



Geological Survey, Bloomington, 3 p., and a CD-ROM. Publication Date: August 13, 2003.

Download: <https://maps.indiana.edu/layerGallery.html?category=IndustrialMinerals>

- **Sand and Gravel Resource Potential** -Sand\_Gravel\_Resources\_IGS\_1989\_M12.shp: Polygon shapefile that identifies sand and gravel permissive tracts in the surficial unconsolidated deposits of Indiana. Publication Date: September 02, 2003. Download: <https://maps.indiana.edu/layerGallery.html?category=IndustrialMinerals>
  - **Clay Thickness Points** -Clay\_Thickness\_Pnts\_IGS\_2002\_M12.shp: Point shapefile that shows total thickness of clay, as derived from logs of water wells in the state of Indiana. The data were obtained from the iLITH Database of the Indiana Geological Survey : Publication Date: March 20, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=Surficial>
  - **Clay Thickness Polygons** - Clay\_Thickness\_IDW\_LG\_20200626.shp: Polygon layer created by interpolation of clay thickness points with default inverse distance weighted methods.
- Possible Gypsum Resources** - Gypsum\_IGS\_Bull42A\_1966\_LG.shp: The digitized layer created from Indiana Geological Survey, Bulletin 42-A, "Gypsum Resources of Indiana," (1969) gives a general overview of the resources in Southern Indiana and where they may occur. Quantification of these gypsum deposits as mineable reserves has not been proven with drilling and testing.

### 5.2.17 Property

- **2019 Parcels**- Parcels\_IGIO\_Oct2019\_MS12.shp: Land Parcels Maintained by County Agencies in Indiana. This data set is the most recent compilation of county-based data from local government sources, as part of the ongoing Indiana Data Sharing Initiative (IDSI) program. The attributes have been expanded to now include parcel ID, acquisition dates from each county, property classification codes, property classification descriptions, street address information, and tax district ID numbers. A symbology layer and table of land use codes supplements this data. Publication Date: October 17, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Land>
- **2018 Building Footprints in Indiana**- Building\_Footprints\_Microsoft\_2018\_MS12.shp: Computer generated polygon feature class showing building footprints. It was produced from data originally created by Microsoft in June 2018 (20180628) for all 50 U.S. states. Attribute fields showing building footprint perimeter length and area were added (software computed by Esri) by IGWS personnel after the conversion and reprojection to an Esri polygon feature class. Publication Date: February 2, 2019. Download: <https://maps.indiana.edu/layerGallery.html?category=Buildings>
- **2018 Real Property Data Tables, DLGF** - REAL\_PROPERTY\_2018\_DLGF\_IN.GDB is an Esri file geodatabase that provides Real Property tax assessment information for Indiana for the "2018-pay-2019" tax year, in a GIS-ready format. It was provided to the Indiana Geological and Water Survey by IGIO staff on December 4, 2019. The data were compiled by IGIO staff as part of the Indiana Data Sharing Initiative (IDSI), which provides the most accurate framework data (including address points, street centerlines, land parcels, and governmental boundaries) for the citizens of Indiana. An associated Microsoft Excel spreadsheet named "REAL\_PROPERTY\_2018\_DATA\_DICTIONARY" is the data dictionary for the seven file geodatabase tables. It provides the relationships and primary key fields between the nine file



geodatabase tables, definitions for the attribute fields within the tables, and code-list definitions for any coded values contained within. Published date: December 4, 2019 Download:

<https://maps.indiana.edu/layerGallery.html?category=Land>

### 5.2.18 Reference

- **Indiana County Boundaries** - County\_Boundaries\_IGS\_1998\_IN: This shapefile was created as a framework layer defining the county boundaries of Indiana in polygon format. The information is intended for geographic display or analysis at a scale of 1:24,000 or smaller. Publication Date: June 21, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=PLSS>
- **Mid-State Study Area County Boundaries** - County\_Boundaries\_IGS\_1998\_M12: This shapefile was created as a framework layer defining the county boundaries of Indiana Midstate Study Area counties in polygon format. The information is intended for geographic display or analysis at a scale of 1:24,000 or smaller. Publication Date: June 21, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=PLSS>
- **Place Boundaries, TIGER 2019** – Polygon shapefile of legally incorporated places and census CDP concentrations. An incorporated place usually is a city, town, village, or borough, but can have other legal descriptions. CDPs are delineated for the decennial census as the statistical counterparts of incorporated places. CDPs are delineated to provide data for settled concentrations of population that are identifiable by name, but are not legally incorporated under the laws of the state in which they are located. Publication Date: June 6, 2019. Download: <https://www.census.gov/cgi-bin/geo/shapefiles/index.php>
- **Populated Places, USGS GNIS, 2020** -- Populated\_Place\_USGS\_GNIS\_2020\_M12: U.S. Populated Places File lists information about all communities throughout the United States that are described in the database. The Geographic Names Information System contains information about physical and cultural geographic features of all types in the United States, associated areas, and Antarctica, current and historical, but not including roads and highways. The database holds the federally recognized name of each feature and defines the feature location by state, county, USGS topographic map, and geographic coordinates. Update date: March, 2020 Download: <https://www.usgs.gov/core-science-systems/ngp/board-on-geographic-names/download-gnis-data>
- **Townships and Ranges** - Townshp\_Rng\_Poly\_IGS\_2016\_M12: Township and Range grid in Indiana Mid-States study area. These data were originally published by the Indiana Geological Survey on June 21, 2002. Update: April 7, 2016. Download: <https://maps.indiana.edu/layerGallery.html?category=PLSS>
- **Sections** - Sections\_Poly\_IGS\_2016\_M12: Section grid in Indiana Mid-States study area. These data were originally published by the Indiana Geological Survey on June 21, 2002. Update: April 7, 2016. Publication Date: June 21, 2002. Download: <https://maps.indiana.edu/layerGallery.html?category=PLSS>

### 5.2.19 Social

- **Features** - Features\_USGS\_GNIS\_2020\_24K\_M12.shp: Physical and Social features with a location and federally recognized name in the Geographic Names Information System. These



features commonly appear on USGS quadrangles. They may duplicate features from other sources. Download: <https://www.usgs.gov/core-science-systems/ngp/board-on-geographic-names/download-gnis-data>

- Social Features: Airports, Bridges, Buildings (Fire Stations, Police Stations, Hospitals, Government Offices, Cemeteries, Places of Worship (church), Hospitals, Locale (Stadiums, Recreation Facilities, Sports Clubs, Campgrounds), Parks, Populated Areas, Post Offices, Schools, Tower)
- **Religious Centers** - Religious\_Centers\_USGS\_BLA\_2007\_24K\_M12.shp: Point file compiled by personnel of Bernardin, Lochmueller & Associates (BLA) from the United States Geological Survey (USGS) Geographic Names Information System (GNIS), USGS topographic map review, and locating addresses found on various religious listing web sites. To find out more about the USGS, GNIS visit <http://geonames.usgs.gov/domestic/index.html>. Web sites used to obtain address listings for additional listings include - Dharma Web <<http://www.dharmaweb.org/index.php/Indiana>>, Jewish Finder <[http://www.ujc.org/ir\\_LL\\_category.html?state=in](http://www.ujc.org/ir_LL_category.html?state=in)>, and The Church of Jesus Christ Latter-day Saints <<http://www.mormon.org/worshipwithus/1,20864,,00.html>>. Additional sites were added from field review in the study of Interstate 69, Indiana. No additional features in the project corridors were found when compared to USGS GNIS 2020 and Homeland Infrastructure Foundation-Level Data 2020. Published date: August 23, 2007 Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>

### 5.2.20 Education

- **Libraries** - Libraries\_ISL\_2020\_M12.shp: Point shapefile showing the locations of public and public branch libraries. Street addresses for each library were originally provided by personnel of the Indiana State Library. Attributes include the library name, branch name, address, city, telephone numbers, and Website URLs for each location. Published date: January 21, 2020 Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>
- **Museums** - Museums\_IGS\_2007\_M12.shp: Point shapefile showing the locations of museums. Using street addresses obtained from Web pages, a shapefile was created using the "Geocoding" tool in ESRI ArcMap 9.2 and street information licensed from Tele Atlas, Dynamap 2000, v. 17.0. Published date: May 31, 2007 Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>
- **School Districts** - School\_Districts\_USCB\_2003\_M12\_20200301.shp: School Districts (USCB, polygon file) For Census 2000, the U.S. Census Bureau tabulated data for three types of school districts: elementary, secondary, and unified. Published date: December 22, 2003 Download: <https://maps.indiana.edu/layerGallery.html?category=Schools>
- **Schools** - Schools\_MHMP\_2011\_M12\_20200301.shp: Point shapefile that shows school facilities with the exception of some universities. This data set was derived by The Polis Center as part of several "DMA2000 Multi Hazard Mitigation Planning" (MHMP) projects, from data of the "Hazards U.S. Multi-Hazards" (Hazard-MH MR1, v 1.1) program (data from 2003) developed by the Federal Emergency Management Agency (FEMA). Source: POLIS Center, Lochmueller Group Internal Files. Published date: January 6, 2011, Currentness: 2008 Download: <https://maps.indiana.edu/layerGallery.html?category=CriticalFacilities>



- **Schools, Child Care** - Schools\_ChildCare\_HIFLD\_2018\_M12.shp: This feature class/shapefile contains locations of center based child day care locations (including those located at schools and religious institutes) and does not include group, home, and family based child day cares. All the data was acquired from respective states departments or their open source websites and only contains data provided by these sources. The TYPE attribute categorizes every child day care into Center Based, School Based, Head Start, or Religious Facility solely based on the type of facility where the child day care center is geographically located. Publication date: June 23, 2019 Download: <https://hifld-geoplatform.opendata.arcgis.com/datasets/child-care-centers>
- **Schools, Colleges** - Schools\_Higher\_Education\_ICHE\_2007\_M12.shp: Point shapefile showing the locations of colleges and universities (including 2- and 4-year public institutions and independent institutions) listed on a directory obtained from the Indiana Commission for Higher Education (<http://www.che.state.in.us/schools/interactivelist.shtml>). Publication date: June 4, 2007 Download: <https://maps.indiana.edu/layerGallery.html?category=Schools>
- **Schools, Private** – Schools\_Private\_HIFLD\_2016\_M12.shp: Point dataset composed of private elementary and secondary education facilities as defined by the Private School Survey (PSS, <https://nces.ed.gov/surveys/pss/>), National Center for Education Statistics (NCES, <https://nces.ed.gov>), US Department of Education for the 2015-2016 school year. This includes all prekindergarten through 12th grade schools as tracked by the PSS. Data Currentness: 2016 Download: <https://hifld-geoplatform.opendata.arcgis.com/datasets/private-schools>
- **Schools, Public** - Schools\_Public\_HIFLD\_2016\_M12.shp: Point feature dataset composed of all Public elementary and secondary education facilities as defined by the Common Core of Data (CCD, <https://nces.ed.gov/ccd/>), National Center for Education Statistics (NCES, <https://nces.ed.gov>), US Department of Education for the 2015-2016 school year. This includes all Kindergarten through 12th grade schools as tracked by the Common Core of Data. Included in this dataset are military schools referenced in the city field with an APO or FPO address. Data Currentness: 2016 Download: <https://hifld-geoplatform.opendata.arcgis.com/datasets/public-schools>

### 5.2.21 Medical

- **Hospitals, Clinics** - Hospitals\_Clinics\_ISDH\_2007\_M12.shp: Point shapefile showing the locations of hospitals included in a "Hospital Directory" that appears on a Web page of the Indiana State Department of Health (ISDH) (<http://www.indiana.gov/isdh/regsvcs/acc/hospital/wdirhos.htm>), as well as the locations of rural health clinics included in a "Rural Health Care Clinic Directory" that appears on the ISDH Web site (<http://www.in.gov/isdh/regsvcs/acc/rhcdir/wdirrhc.htm>). Publication date: May 2007 Download:
- **Hospitals**- Hospitals\_HSIP\_IDHS\_2009\_M12.shp: Point dataset including General Medical and Surgical Hospitals, Psychiatric and Substance Abuse Hospitals, and Specialty Hospitals (e.g., Children's Hospitals, Cancer Hospitals, Maternity Hospitals, Rehabilitation Hospitals, etc.). Other types of hospitals are included if they were represented in datasets sent by the state. Therefore, not all of the specialty hospitals in Indiana are represented in this dataset. Hospitals operated by the Veterans Administration (VA) are included, even if the state they are located in does not license VA Hospitals. Nursing homes and Urgent Care facilities are excluded because they are included in a separate dataset. Locations that are administrative offices only are excluded from



the dataset. Published date: June 29, 2009 Download:

<https://maps.indiana.edu/layerGallery.html?category=CriticalFacilities>

- **Medical Care Facilities** – Medical\_Care\_Facilities\_MHMP\_2011\_M12.shp: Most complete and spatially accurate health facilities file. Point shapefile that shows medical care facilities derived by The Polis Center as part of several "DMA2000 Multi-Hazard Mitigation Planning" (MHMP) projects, from data of the "Hazards U.S. Multi-Hazards" (Hazes-MH MR1, v 1.1) program (data from 2003) developed by the Federal Emergency Management Agency (FEMA). Local jurisdiction planning teams provided updated medical care facility location and attribute information to the Polis Center at IUPUI. The Polis Center used available aerial photography to place or adjust the locations of the facilities on top of the building rooftops. Currentness date: 2008 Download: <https://maps.indiana.edu/layerGallery.html?category=CriticalFacilities>
- **Naloxone Providers** - Naloxone\_Providers\_ISDH\_2018\_M12.shp: Point shapefile that was produced from data that were harvested on February 26, 2018 from the "Overdose Prevention Therapy-Indiana Registry" website of the Indiana State Department of Health (ISDH). These data should not be considered completely current, as entities could potentially be added or removed from the registry since the last date of publication. Further, entities that temporarily run out of naloxone stock are temporarily removed from the live optIN Registry website, and are reinstated when the ISDH is notified that the entity has been resupplied with dosages. For the most current information about naloxone entities, and other related online resources, please visit the ISDH optIN Registry website (<https://optin.in.gov/>). "Naloxone Entities" may include pharmacies, pharmacists or other non-pharmacy organizations, non-profit entities or individuals that are in a position to assist an individual who, there is reason to believe, is at risk of experiencing an opioid-related overdose. Publication date: February 26, 2018 Download: <https://maps.indiana.edu/layerGallery.html?category=Facilities>
- **Urgent Care** - Urgent\_Care\_HIFLD\_2009\_M12.shp: Point dataset of the delivery of ambulatory medical care outside of a hospital emergency department on a walk-in basis without a scheduled appointment. The Urgent Care dataset consists of any location that is capable of providing emergency medical care and must provide emergency medical treatment beyond what can normally be provided by an EMS unit, must be able to perform surgery, or must be able to provide recuperative care beyond what is normally provided by a doctor's office. In times of emergency, the facility must be able to accept patients from the general population or patients from a significant subset of the general population (e.g., children). The newest facilities may not be included. Entities that are excluded from this dataset are administrative offices, physician offices, workman compensation facilities, free standing emergency rooms, and hospitals. Urgent Care facilities that are operated by and co-located with a hospital are also excluded because the locations are included in the hospital dataset. ID# 10194253 is a "mobile" urgent care center that provides urgent care to private residences. This entity is plotted at its administrative building. Records with "-DOD" appended to the end of the [NAME] value are located on a military base, as defined by the Defense Installation Spatial Data Infrastructure (DISDI) military installations and military range boundaries. Publication date: July 17, 2009 Download: <https://hifld-geoplatform.opendata.arcgis.com/datasets/urgent-care-facilities>

### 5.2.22 Responders

- **Emergency Medical Services** - EMS\_Stations\_HSIP\_IDHS\_2009\_M12.shp: Point dataset consisting of any location where emergency medical services (EMS) personnel are stationed or



based out of, or where equipment that such personnel use in carrying out their jobs is stored for ready use. Ambulance services are included even if they only provide transportation services, but not if they are located at, and operated by, a hospital. If an independent ambulance service or EMS provider happens to be collocated with a hospital, it will be included in this dataset. The dataset includes both private and governmental entities. Publication date: June 29, 2009

Download: <https://maps.indiana.edu/layerGallery.html?category=CriticalFacilities>

- **Fire Stations** - Fire\_Stations\_HSIP\_IDHS\_2009\_M12.shp: Point shapefile that contains locations of fire station, as developed for the Homeland Security Infrastructure Program (HSIP). The data were provided by personnel of Indiana Department of Homeland Security (IDHS) on June 29, 2009. Download: <https://maps.indiana.edu/layerGallery.html?category=CriticalFacilities>
- **Fire Stations** - Fire\_Stations\_MHMP\_2011\_M12\_20200302.shp: Point shapefile that shows fire station facilities derived by The Polis Center as part of several "DMA2000 Multi-Hazard Mitigation Planning" (MHMP) projects, from data of the "Hazards U.S. Multi-Hazards" (Hazus-MH MR1, v 1.1) program (data from 2003) developed by the Federal Emergency Management Agency (FEMA). Currentness date: 2008 Download: <https://maps.indiana.edu/layerGallery.html?category=CriticalFacilities>
- **Police Stations:** Police\_Stations\_MHMP\_2011\_M12.shp: point shapefile that shows police station facilities derived by The Polis Center as part of several "DMA2000 Multi-Hazard Mitigation Planning" (MHMP) projects, from data of the "Hazards U.S. Multi-Hazards" (Hazus-MH MR1, v 1.1) program (data from 2003) developed by the Federal Emergency Management Agency (FEMA). Currentness date: 2008 Download: <https://maps.indiana.edu/layerGallery.html?category=CriticalFacilities>
- **Police Stations, Local** - Local\_Law\_Enforcement\_HIFLD\_2009\_M12.shp: Point locations and tabular information pertaining to a wide range of law enforcement entities. Law Enforcement agencies "are publicly funded and employ at least one full-time or part-time sworn officer with general arrest powers". This is the definition used by the US Department of Justice - Bureau of Justice Statistics (DOJ-BJS) for their Census of State and Local Law Enforcement Agencies (CSLLEA). Federal level law enforcement agencies are excluded from this effort. Data fusion techniques are utilized to synchronize overlapping yet disparate source data. The primary sources for this effort are the DOJ-BJS CSLLEA from 2008 and the previously mentioned 2009 feature class from Homeland Security Infrastructure Foundation-Level Data (HIFLD). Currentness date: 2009 Download: <https://hifld-geoplatform.opendata.arcgis.com/datasets/local-law-enforcement-locations>

### 5.2.23 Soils

- **Soils-SSURGO\_Soils\_USDA\_- SSURGO\_Soils\_USDA\_2017\_MS12.shp:** Soil Survey Geographic Database (SSURGO) dataset is a compilation of soils information collected over the last century by the Natural Resources Conservation Service (NRCS). Map-units delineate the extent of different soils. Data for each map-unit contains descriptions of the soil's components, productivity, unique properties, and suitability interpretations. Each soil type has a unique combination of physical, chemical, nutrient and moisture properties. Symbology Layer files have been made to show hydric soils and prime farmland. Publication Date: November 2, 2017. Download: <https://www.arcgis.com/apps/View/index.html?appid=cdc49bd63ea54dd2977f3f2853e07fff>



- **Prime Farmland** - PrimeFarm\_DevelopClass\_Erased\_M12\_20210312.shp: Subset of SSURGO Soils data where the field "farmlandcl" = "All areas are prime farmland". Areas of the subset that overlaid any "developed" land use class in the Refined 2016 NCLD land use were erased from the dataset. This removes from the subset soils that are permanently converted to developed use no longer available for agriculture.

#### 5.2.24 Streams and Rivers

- **2019 Classified Streams** - Hydrography\_LocalRes\_Flowline\_Classified\_NHD\_M12.shp: Perennial and intermittent streams, rivers, canals, ditches, drainages, artificial paths, connectors, underground streams, and pipelines. The data is a Local-Resolution National Hydrography Dataset (1:2,400), created by the United States Geological Survey (USGS) and the United States Environmental Protection Agency (EPA). This data was last updated on April 26, 2019. A pdf of Fcode definitions and a symbology layer file supplements with this file. A definition of classifications may be found in the metadata abstract. Source Download: <https://maps.indiana.edu/layerGallery.html?category=WaterBodies>
- **2019 Refined Classified Streams Query** - Hydrography\_LocalRes\_Flowline\_Classified\_Query\_NHD\_M12\_20200317: The classified streams source file selected streams, rivers, and canals/ditches. Removed connectors, underground conduits, underground pipelines, and artificial streams that overlay the waterbodies NHD file. Small model artificial paths perpendicular to the river mainlines, within the Rivers polygon NHD file were removed within the Mid-states refinement boundary. A pdf of Fcode definitions and a symbology layer file supplements with this file. A definition of classifications may be found in the metadata abstract.
- **2019 Unclassified Streams** - Hydrography\_LocalRes\_Flowline\_UnClassified\_NHD\_M12: Unclassified flowlines are drainageways that may or may not have water present outside of a rain even, and may or may not exhibit channelization associated with streams. The data is a Local-Resolution National Hydrography Dataset (1:2,400), created by the United States Geological Survey (USGS) and the United States Environmental Protection Agency (EPA). All new flowlines resulting from the Indiana NHD local resolution upgrade project that could not be categorized (artificial path, canal/ditch, coastline, connector, pipeline, stream/river perennial, stream/river intermittent, or underground conduit) were given an FTYPE of Stream/River and an FCODE of Stream/River (46000) and generically classified as "drainageway". This data was last updated on April 26, 2019. Source Download: <https://maps.indiana.edu/layerGallery.html?category=WaterBodies>
- **2019 Lakes and Reservoirs** - Hydrography\_LocalRes\_WaterbodyDiscrete\_NHD\_M12: Shows lakes, ponds, reservoirs, swamps and marshes. This layer is derived from the local-resolution (1:2,400) National Hydrography Dataset (NHD), and provides currently available data as of April 26, 2019. A layer symbology file and Fcode definitions file supplement this data. Source Download: <https://maps.indiana.edu/layerGallery.html?category=WaterBodies>
- **2019 Rivers** – Hydrography\_LocalRes\_WaterbodyLinear\_NHD\_M12: Shows rivers, inundation areas, canals, ditches, submerged streams and other linear waterbody areas. This layer is derived from the local-resolution (1:2,400) National Hydrography Dataset (NHD), and provides currently available data as of April 26, 2019. A layer symbology file and Fcode definitions file



supplement this data. Source Download:

<https://maps.indiana.edu/layerGallery.html?category=WaterBodies>

- **2004 National Rivers Inventory, NPS** – Rivers\_NRI\_NPS\_2007\_M12: Line shapefile of river reaches on the Nationwide Rivers Inventory (NRI) listed by the U.S. National Park Service (NPS). In order to be listed on the NRI, a river must be free-flowing and possess one or more Outstandingly Remarkable Values (ORVs). In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. Publication date: May 21, 2007 Download: <https://maps.indiana.edu/layerGallery.html?category=WaterBodies>
- **1997 Outstanding Rivers, NRC** - Rivers\_Outstanding\_NRC\_2004\_M12: Line shapefile of river and stream segments on the NRC's Outstanding Rivers list for Indiana. The listing was published in the Indiana Register on March 1 of that year as Information Bulletin #4 in Volume 16, Number 6, page 1677 through 1680 (sometimes cited as 16 IR 1677). Its purpose is to help identify the rivers and streams which have particular environmental or aesthetic interest. Publication date: August 1, 2004 Download: <https://maps.indiana.edu/layerGallery.html?category=WaterBodies>
- **2018 Impaired Streams, 303(d), IDEM** - Impaired\_Waters\_303d\_2018\_IDEM\_M12: Includes the rivers, streams, and tributaries that do not meet water quality standards for 1 or more monitored indicators, and are listed as not supporting one or more uses, i.e., recreation, fish consumption, aquatic life, and drinking water supply. The 303(d) List of Impaired Waters are submitted by IDEM to the U.S. EPA. Impairment definitions are included in the attribute definitions within the metadata. Source Download: <https://maps.indiana.edu/layerGallery.html?category=WaterQuality>
- **2018 Impaired Lakes, 303(d), IDEM** - Impaired\_Waters\_303d\_2018\_IDEM\_M12: Includes the lakes that do not meet water quality standards for 1 or more monitored indicators, and are listed as not supporting one or more uses, i.e., recreation, fish consumption, aquatic life, and drinking water supply. The 303(d) List of Impaired Waters are submitted by IDEM to the U.S. EPA. Impairment definitions are included in the attribute definitions within the metadata. Source Download: <https://maps.indiana.edu/layerGallery.html?category=WaterQuality>
- **2020 Impaired Waters, 3030(d), IDEM** – Listing in an Excel spreadsheet. Not geospatial data. Source Download: <https://www.in.gov/idem/nps/2647.htm>
- **2009 Watershed Boundary Dataset, 10-Digit HUCs** - This data set, part of the Watershed Boundary Data set (WBD), is a complete digital hydrologic unit boundary layer to the Watershed (10-digit) 5th level for the NRCS business areas in and around the state of Indiana. Source Download: [https://maps.indiana.edu/previewMaps/Hydrology/Watersheds\\_HUC10\\_2009.html](https://maps.indiana.edu/previewMaps/Hydrology/Watersheds_HUC10_2009.html)
- **2009 Watershed Boundary Dataset, 12-Digit HUCs** - This data set, part of the Watershed Boundary Data set (WBD), is a complete digital hydrologic unit boundary layer to the Subwatershed (12-digit) 6th level in and around the state of Indiana. Source Download: [https://maps.indiana.edu/previewMaps/Hydrology/Watersheds\\_HUC12\\_2009.html](https://maps.indiana.edu/previewMaps/Hydrology/Watersheds_HUC12_2009.html)
- **2021 TMDL Watersheds – 10 Digit HUCs** – A subset of the study-wide 10-digit HUCs that contains only those watersheds that have a Total Maximum Daily Load report accepted by the EPA.



- **2021 WMP Watersheds** – 12-Digit HUCs – A subset of the study-wide 12-digit HUCs that contains only those watersheds that have a Watershed Management Plan administered by a local agency or group.

#### 5.2.25 Threatened and Endangered Species

- **TES Bat Observations - Threatened and Endangered Species (USFWS)** – Confidential records of observed locations provided through a data sharing agreement. Point layer representing a capture, roost tree, or hibernacula. Data Currentness: 2018; Obtained: January 29, 2020.
- **TES Mussel Observations - Threatened and Endangered Species (USFWS)** – Confidential records of observed locations provided through a data sharing agreement. Polygon layer of 1-mile wide linear buffers along stream reaches where TES mussels were observed. Data Currentness: 2018; Obtained: January 29, 2020.
- **Federal and State Listed Species, Indiana Natural Heritage Data (IDNR, Division of Nature Preserves)** – Confidential records of species or natural community observations in two layer types: a point layer and in a polygon layer consisting of circular or linear buffers up to 1-mile in diameter. Layers contains federal and state listed species (endangered, threatened, special concern, rare, and watch list) and rare/sensitive natural communities. Historic records are included of all recorded observations, even species that are now extinct or extinct in Indiana. Provided through a data sharing agreement. Data Currentness: September 30, 2021

#### 5.2.26 Wetlands

- **Wetlands-NWI\_Wetlands\_2019\_USFWS\_M12.shp**: Polygon of wetlands represents the extent, approximate location and type of wetlands and deep-water habitats in the United States and its Territories. The US Fish and Wildlife Service (FWS) is the principal US Federal agency tasked with providing information to the public on the status and trends of our Nation's wetlands. The US FWS National Wetlands Inventory (NWI) is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of US wetlands. These data delineate the areal extent of wetlands and surface waters as defined by Cowardin et al. (1979). Publication Date: October 1, 2019. Download: <https://www.fws.gov/wetlands/Data/Data-Download.html>