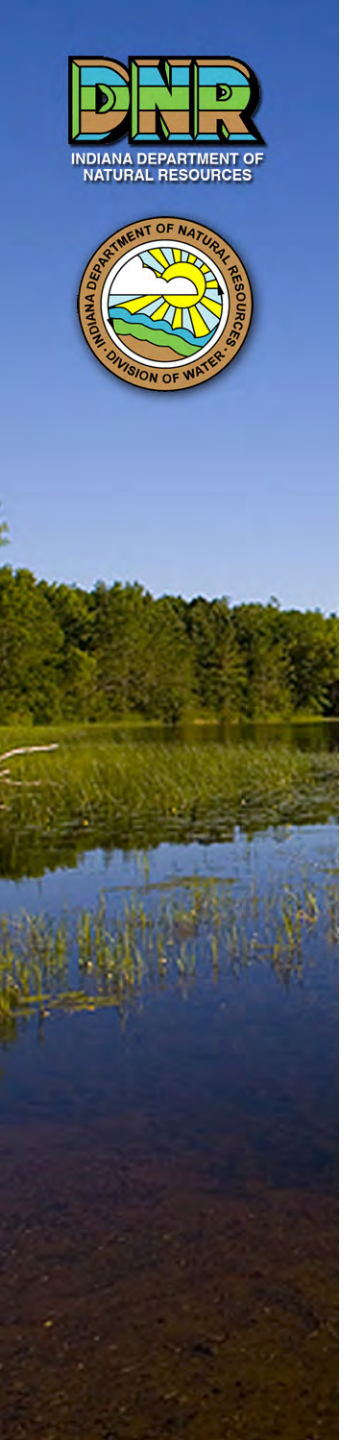
The Indiana “Best Available Floodplain Information Layer”

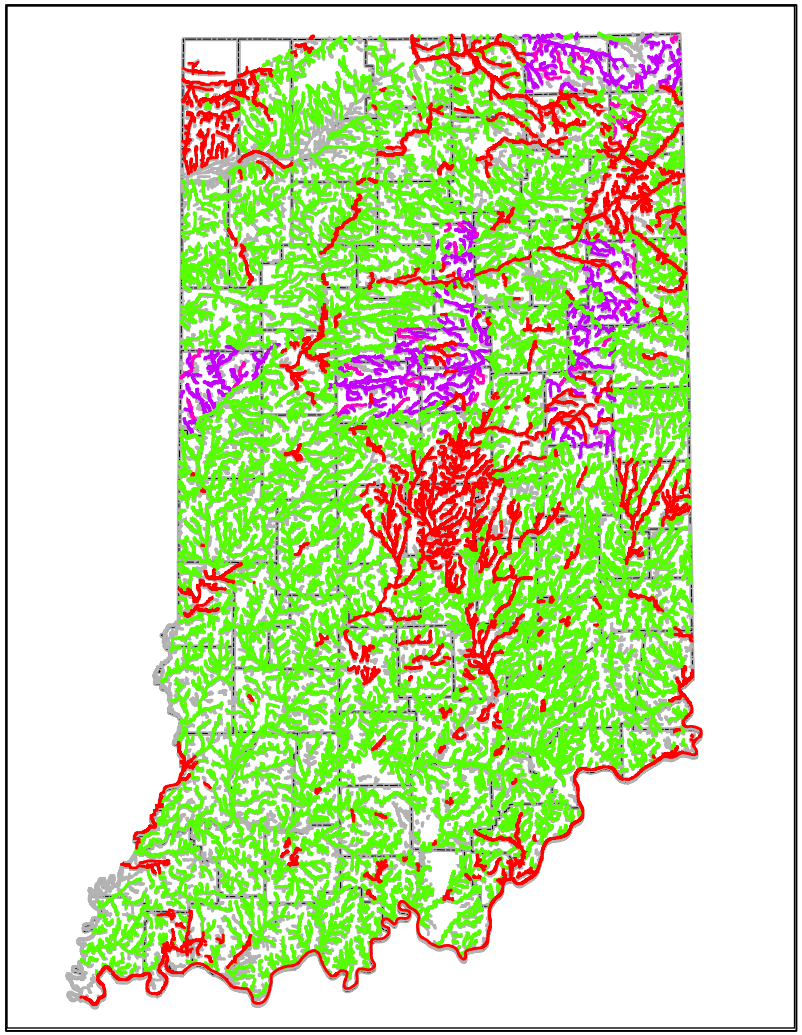
David Knipe
DNR - Division of Water



Floodplain Sources

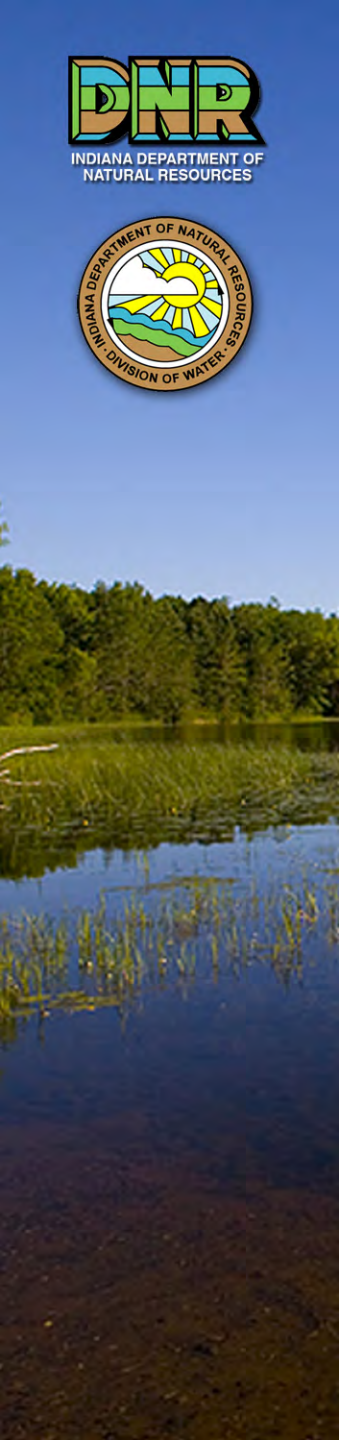
- FEMA
  - Flood Insurance Rate Maps
  - National Flood Hazard Layer
- IDNR
  - Floodplain Analysis / Regulatory Assessment letters (FARA)
  - DNR Detailed Studies
  - Submitted Detailed studies
  - Zone A project

Zone A project summary



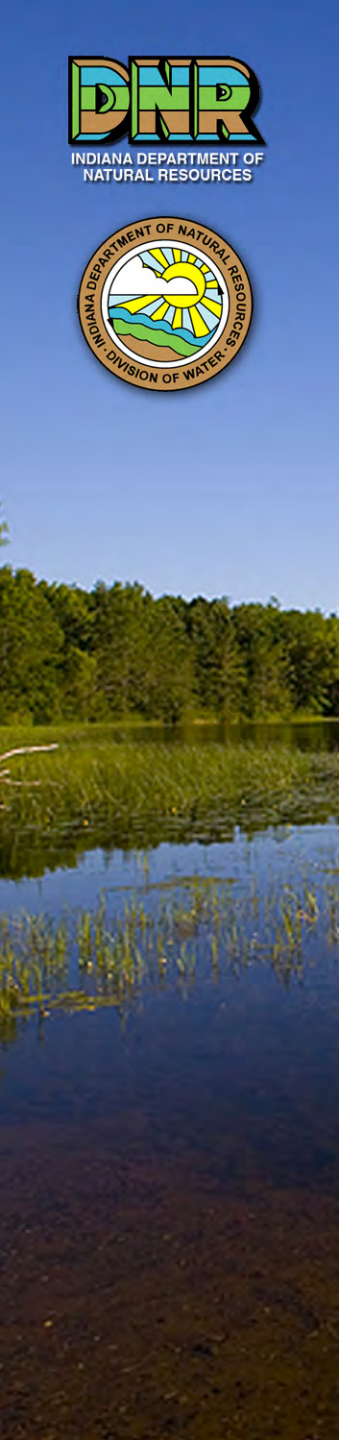
- 16,805 miles OCRA / Zone A (Green)
- 1,303 miles FEMA FY2015 CTP Grant (Purple)
- 271 miles State Funded (Pink)
- 4,388 miles existing Zone AE (Red)

- 22,767 miles of stream in Indiana with model backed BFE's



Zone A process

- Streamstats (50% / 68% / 90%)
- NHD centerlines
- Semi Automated hydraulics
- Automated parameter estimation
- Channel banks from USGS FEH
- 5 “Risk MAP” profiles
- Approximate Floodways

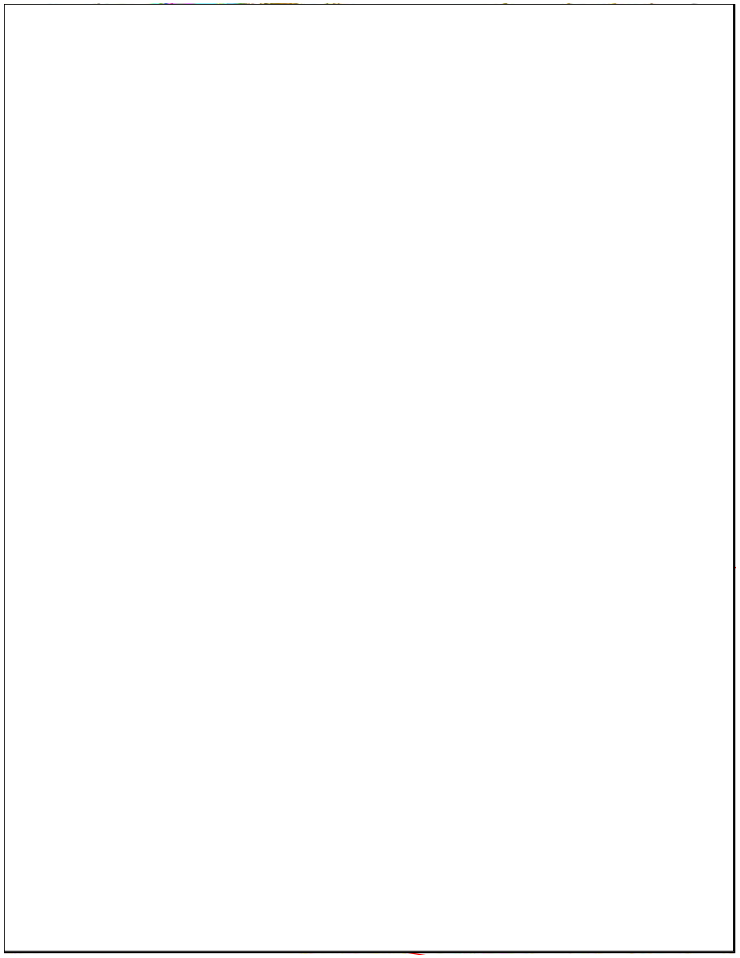


Comparison to FEMA model standards

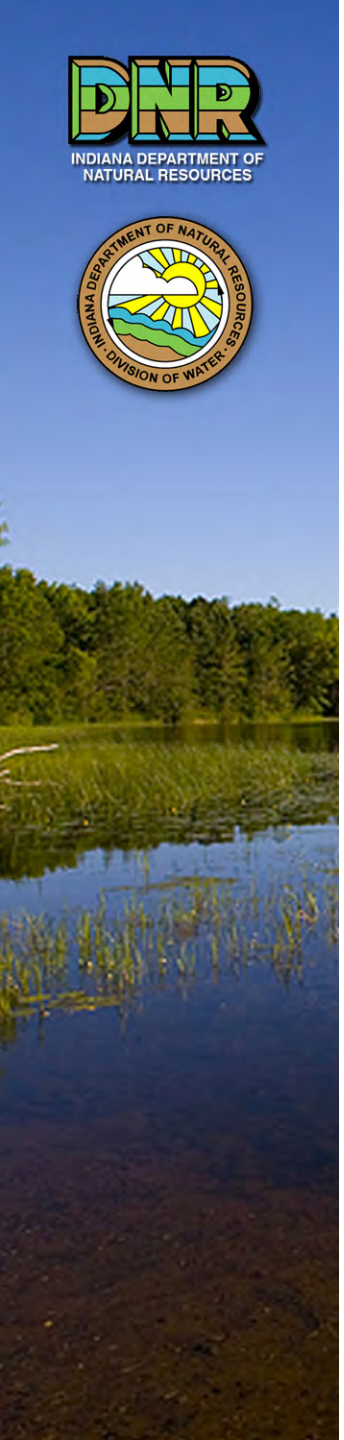
Table 1: Hydraulic Analysis Options – Base Level Engineering

Option	Cross Sections	Flow Paths (Left, Right and Channel)	Manning's "n" Values	Structures	Flood Zone
A*	Auto-placed; may be unnaturally straight with computerized placement or auto-placed by intelligent" methods.	Reach lengths are assumed equal.	Single value for each cross section.	Not included; cross sections placed as if structures don't exist or cross sections placed appropriately for structure modeling.	A
B	Auto-placed and hand adjusted or auto-placed by "intelligent" methods.	Reach lengths computed by offsetting stream centerline.	Overbanks from Land Use Land Cover (LULC) data, channel value estimated separately.	Not included; but cross sections placed appropriately for structure modeling.	A
C	Each section reviewed by engineers.	Reach lengths adjusted based on draft floodplain.	Overbanks LULC data, channel value estimated separately.	Included; structure data from national, state or other data source. Estimated based on topography and aerial photos for those not available.	A
D	Each section reviewed by engineers.	Reach lengths adjusted based on draft floodplain.	Overbanks from LULC data, channel value estimated separately and calibrated where possible.	Included; structure data from as-builts, design plans, "measured" in the field, or other community datasets with opening information.	A or AE (with or without floodway based on engineer's judgment)

Approximate Floodways



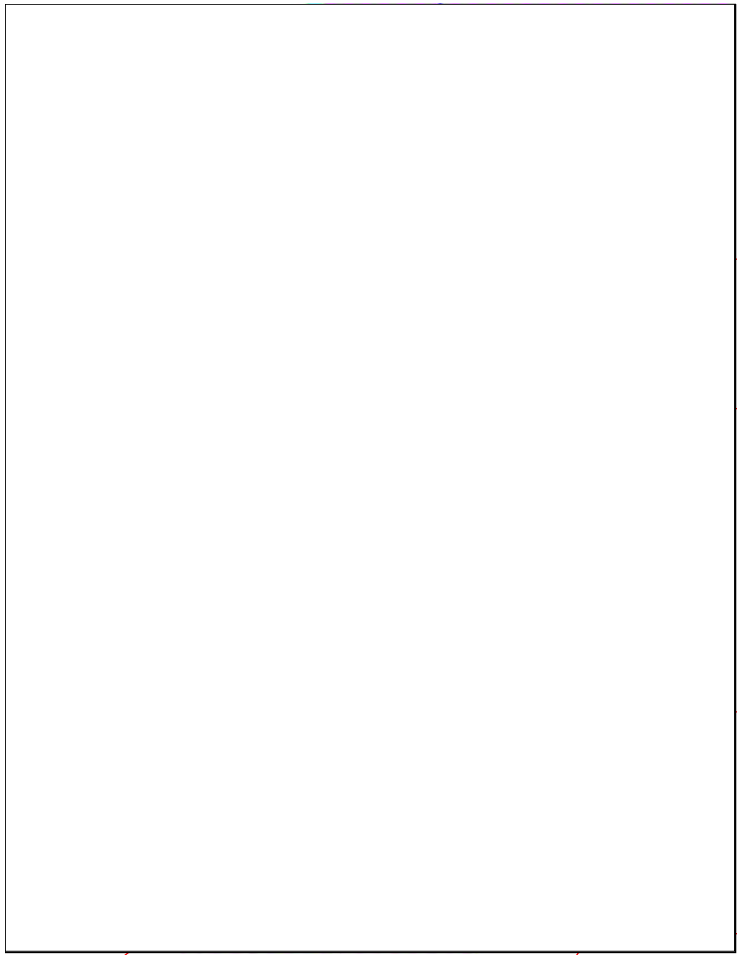
- Standard floodway modeling techniques – just used on Zone A models
- Not to FEMA standard, but acceptable for State floodway jurisdiction



Zone A output

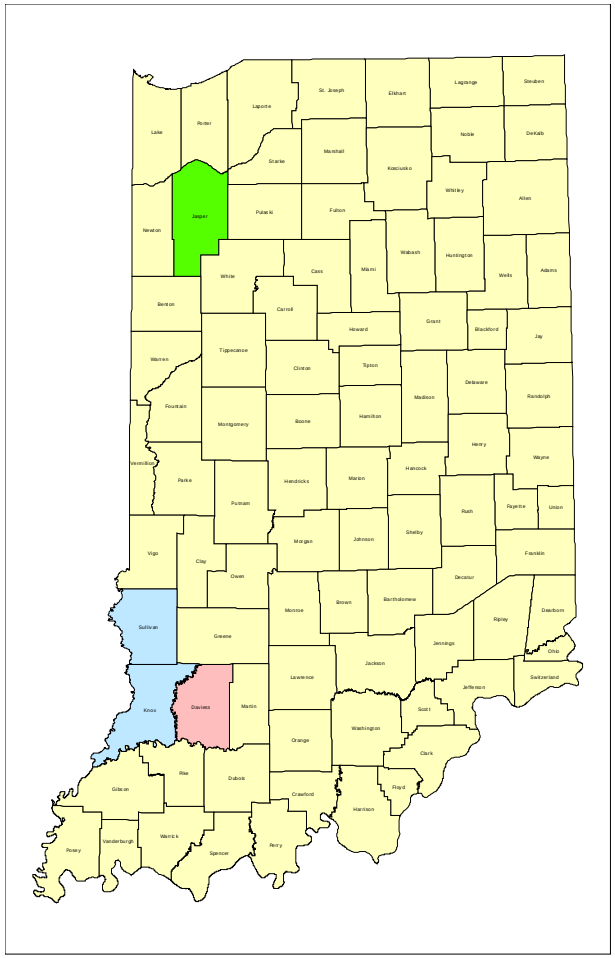
- HEC-RAS model (standardized)
- Floodplain shapes (floodplain, floodway)
- Cross sections & Stream Centerline
- Floodplain Boundary Standard checks
- Quasi-DCS format
- Depth Grids
- Flood Elevation Points

Flood Elevation Points



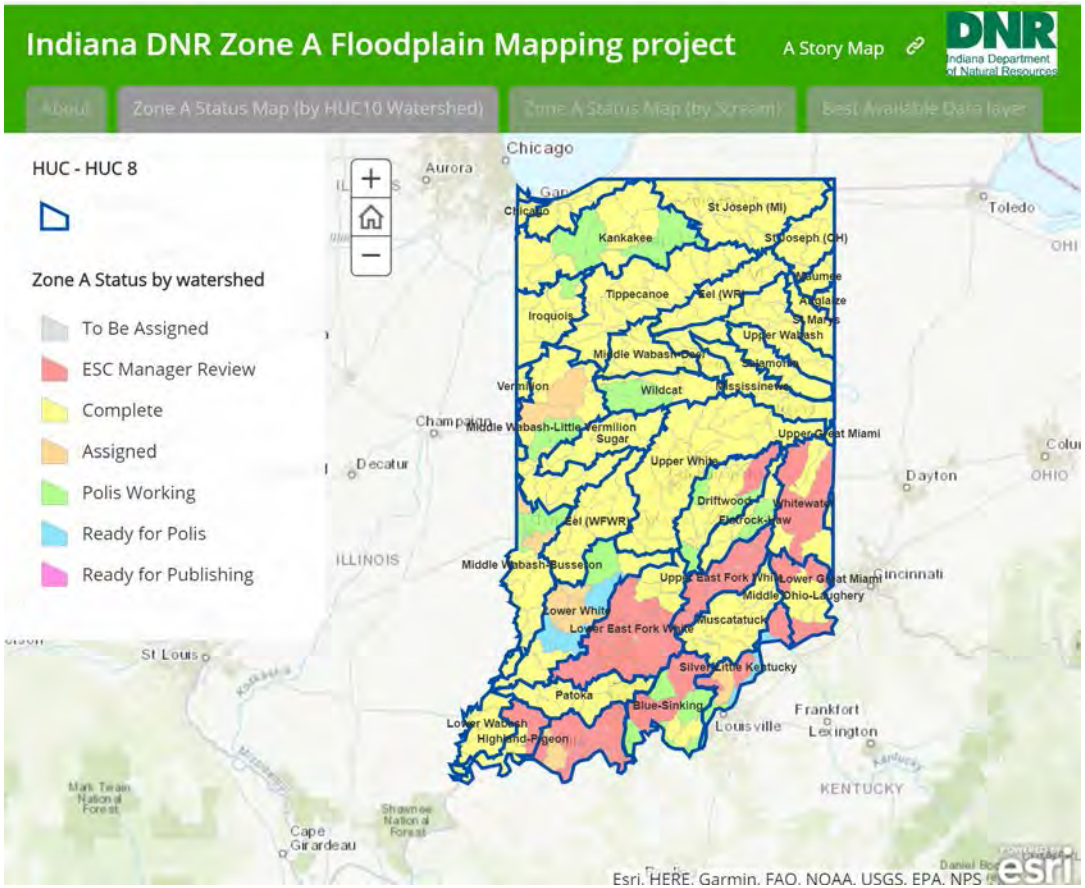
- Point every 50 feet along the stream centerline
- Provides for closest to the point BFE determinations in INFIP

NFHL / FIRM Status

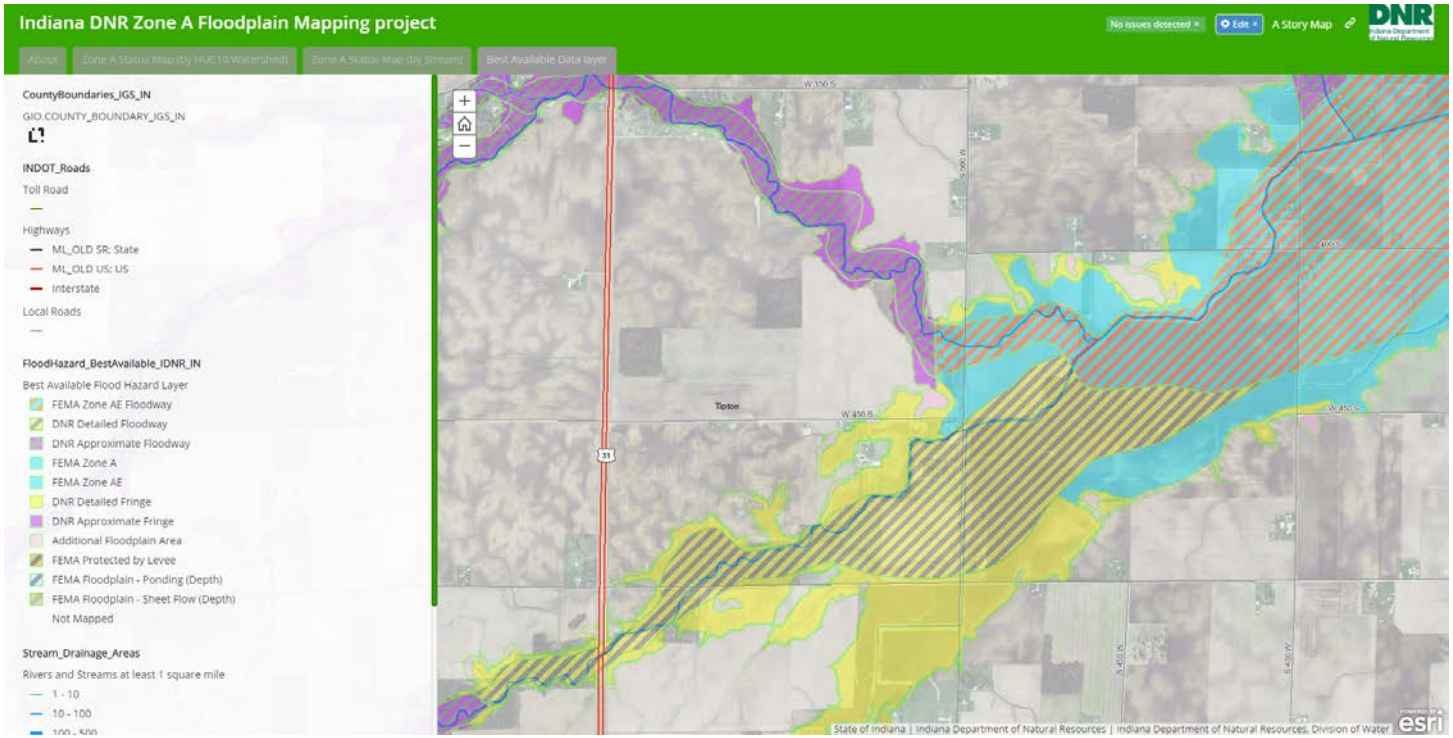


- Jasper – Post LFD
- Daviess – Revised Prelim based on LAMP
- Sullivan / Knox waiting on LAMP / FY18 Grant cycle

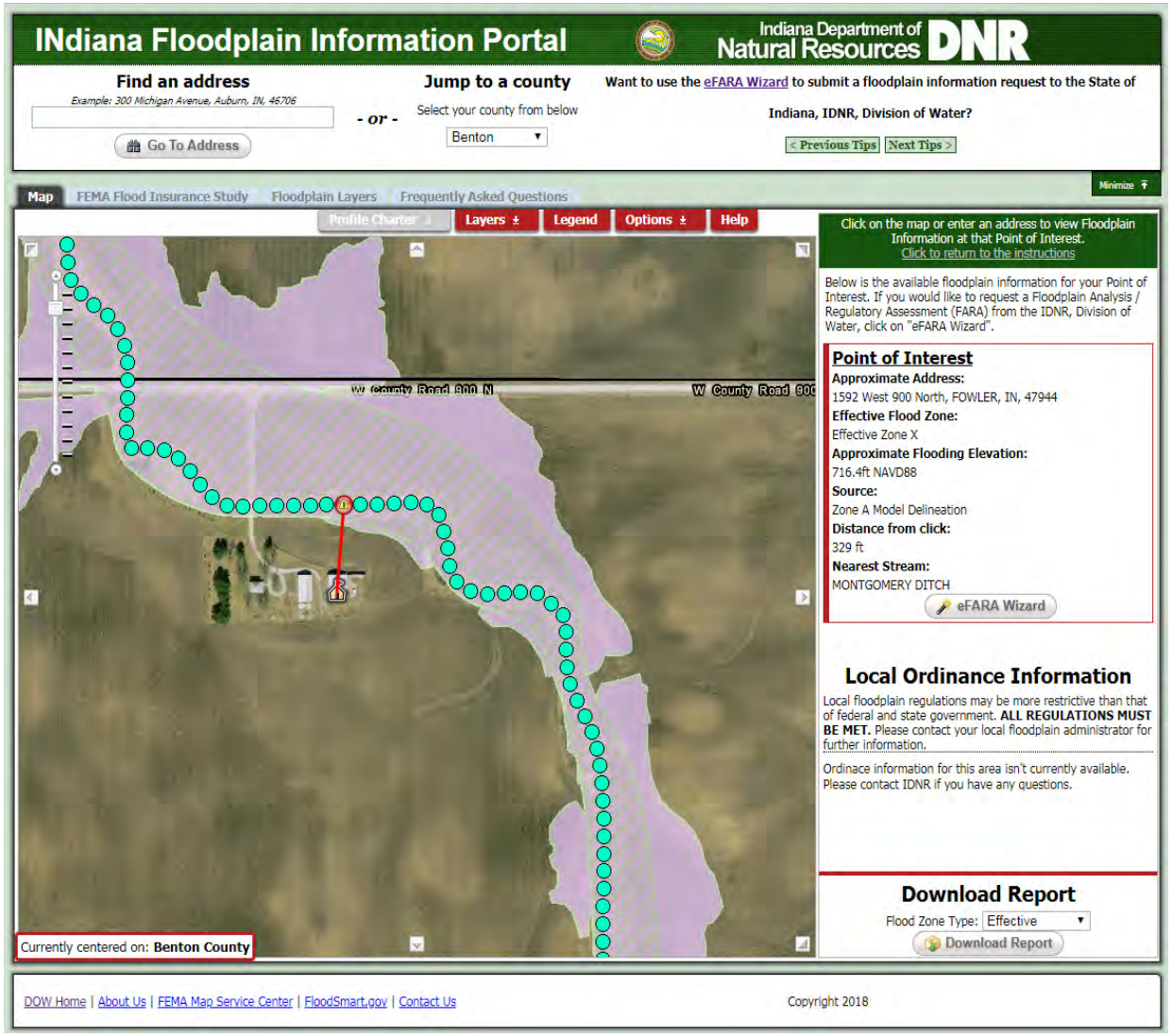
Zone A Project Status



Best Available Information Layer

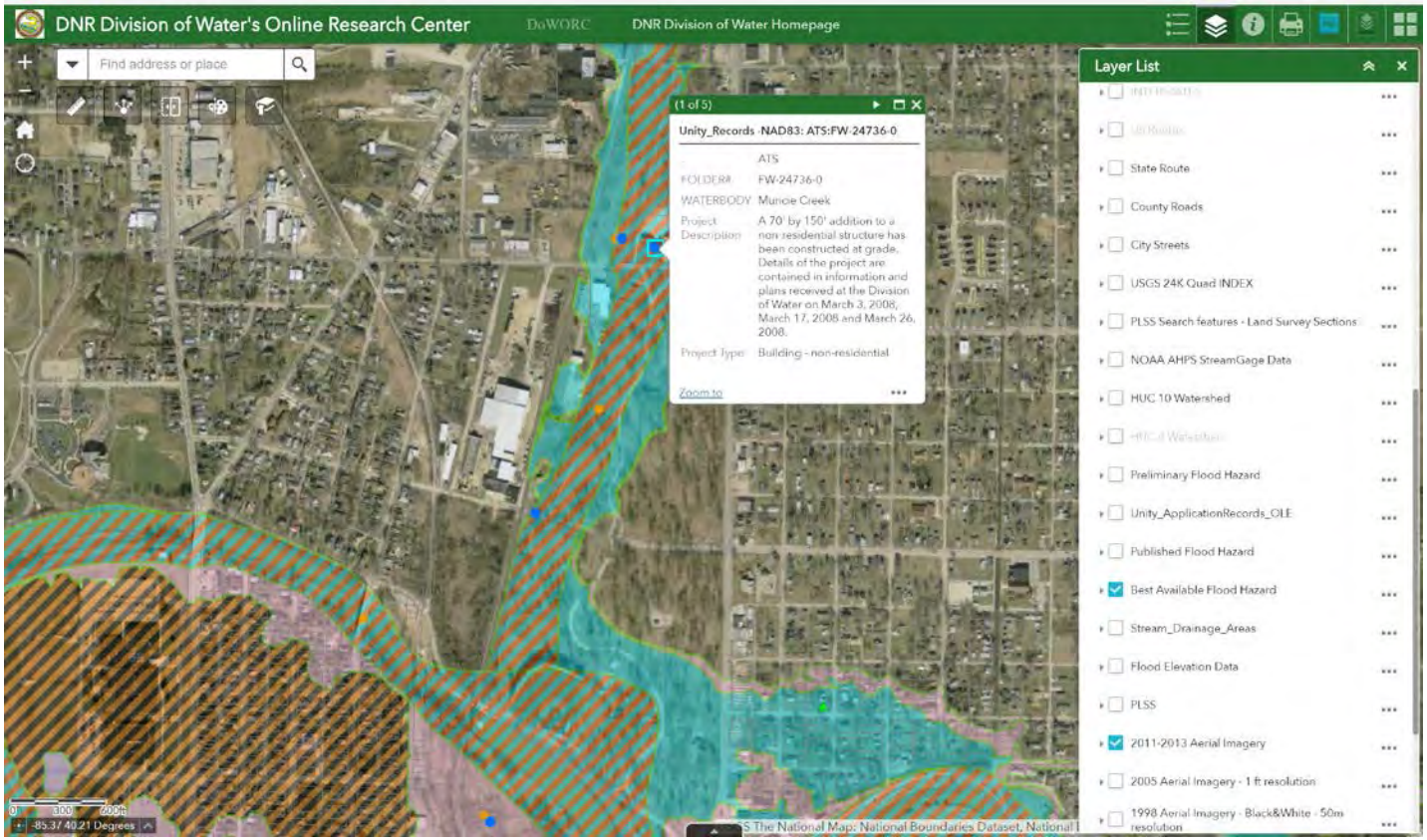


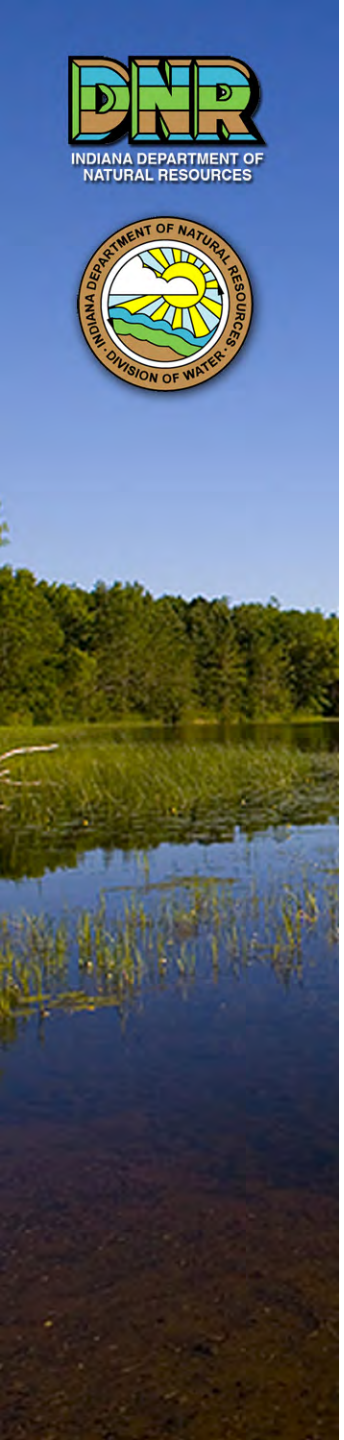
Indiana Floodplain Information Portal (INFIP)



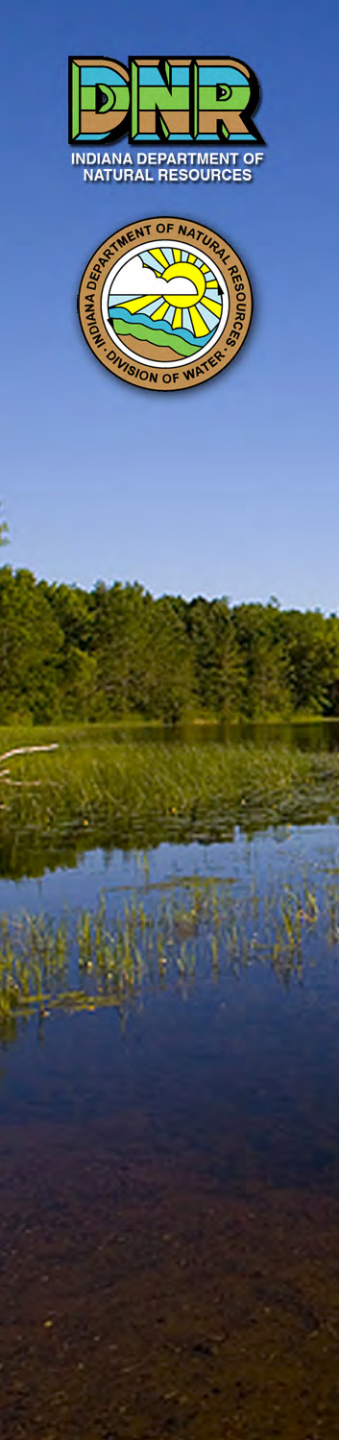
Other sources of access

- REST services
- DoWORC





Floodplain Management and the Best Available Information Layer



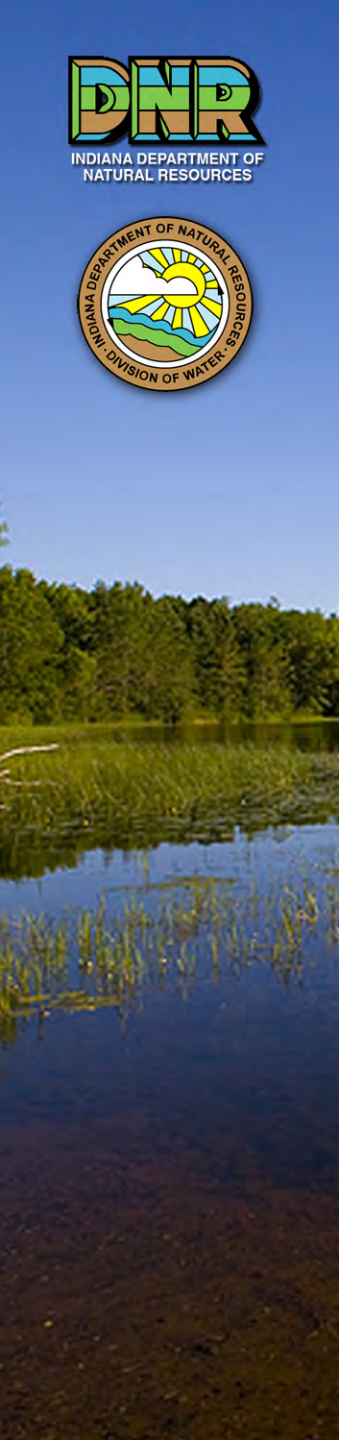
44 CFR (FEMA)

§ 60.1 (d)

The criteria set forth in this subpart are minimum standards for the adoption of flood plain management regulations by flood-prone, mudslide (i.e., mudflow)-prone and flood-related erosion-prone communities. Any community may exceed the minimum criteria under this part by adopting more comprehensive flood plain management regulations utilizing the standards such as contained in subpart C of this part. In some instances, community officials may have access to information or knowledge of conditions that require, particularly for human safety, higher standards than the minimum criteria set forth in subpart A of this part. Therefore, any flood plain management regulations adopted by a State or a community which are more restrictive than the criteria set forth in this part are encouraged and shall take precedence.

§ 60.3

The Administrator will provide the data upon which flood plain management regulations shall be based. If the Administrator has not provided sufficient data to furnish a basis for these regulations in a particular community, the community shall obtain, review and reasonably utilize data available from other Federal, State or other sources pending receipt of data from the Administrator. However, when special flood hazard area designations and water surface elevations have been furnished by the Administrator, they shall apply. The symbols defining such special flood hazard designations are set forth in § 64.3 of this subchapter. In all cases the minimum requirements governing the adequacy of the flood plain management regulations for flood-prone areas adopted by a particular community depend on the amount of technical data formally provided to the community by the Administrator.



312 IAC 10-3-1 (DNR)

Rule 3. Flood Plain Delineations and Management

312 IAC 10-3-1 Flood plains, floodways, and fringes; local ordinances

Authority: IC 14-28-1-5; IC 14-28-3-2
Affected: IC 14-28-1; IC 14-28-3

Sec. 1. (a) A county or municipality that administers IC 14-28-3 must adopt an ordinance to implement this rule for areas within:

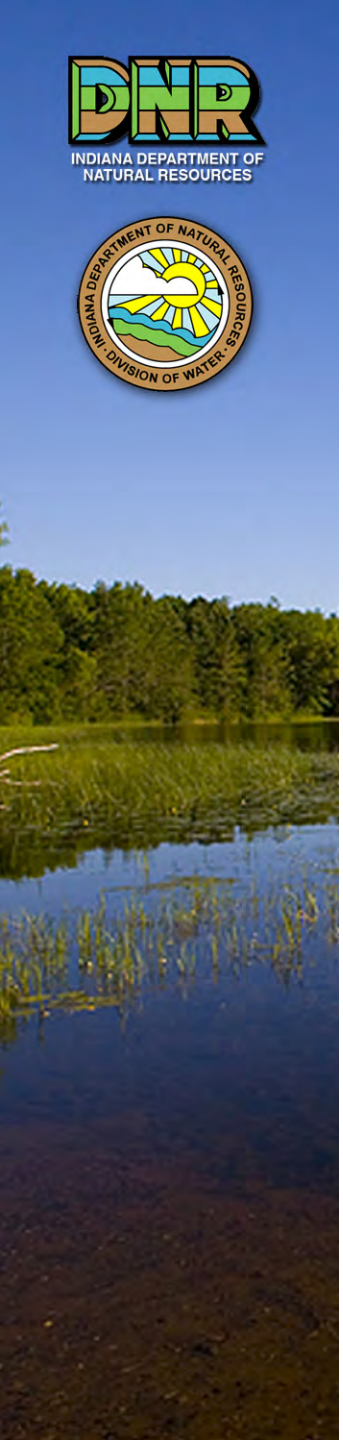
(1) the floodway and the fringe; or

(2) for an area where the floodway and the fringe are not separately identified, the flood plain.

(b) For an area where only the flood plain is identified in the ordinance, an application for a local permit must be reviewed by the department to determine if a license is required under IC 14-28-1.

(c) The department may, upon its own initiative, or, upon petition from a local unit, determine and delineate on suitable maps, the boundaries of the flood plain, floodway, or fringe within the jurisdiction of the local unit. In cases of determination and delineation by others, those determinations and delineations will be subject to review and approval by the department.

(d) A flood plain, floodway, and fringe exist for each waterway even if an area is not delineated on a map. *(Natural Resources Commission; 312 IAC 10-3-1; filed Jul 5, 2001, 9:12 a.m.: 24 IR 3389, eff Jan 1, 2002; errata filed Jan 9, 2002, 1:24 p.m.: 25 IR 1644; readopted filed Jul 21, 2008, 12:00 p.m.: 20080813-IR-312080072RFA; readopted filed Sep 22, 2014, 12:34 p.m.: 20141022-IR-312140065RFA)*



312 IAC 10-3-1 (DNR)

312 IAC 10-3-2 Designation of flood plains, floodways, and fringes by the Federal Emergency Management Agency

Authority: IC 14-28-1-5; IC 14-28-3-2
Affected: IC 14-28-1; IC 14-28-3

Sec. 2. Where a flood plain (or a floodway and fringe) is designated by the Federal Emergency Management Agency for a flood insurance study under 44 CFR 60.3, the flood plain (or floodway and fringe) also applies to this article. *(Natural Resources Commission; 312 IAC 10-3-2; filed Jul 5, 2001, 9:12 a.m.: 24 IR 3389, eff Jan 1, 2002; readopted filed Jul 21, 2008, 12:00 p.m.: 20080813-IR-312080072RFA; readopted filed Sep 22, 2014, 12:34 p.m.: 20141022-IR-312140065RFA)*

312 IAC 10-3-3 Delineation of flood plains and floodways in the absence of a Federal Emergency Management Agency designation

Authority: IC 14-28-1-5; IC 14-28-3-2
Affected: IC 14-28-1; IC 14-28-3

Sec. 3. (a) This section governs the delineation of a flood plain (or a floodway and fringe) by the department where section 2 of this rule does not apply. The delineation referenced in this section may be performed by:

(1) the department; or

(2) another person subject to review and approval by the department.

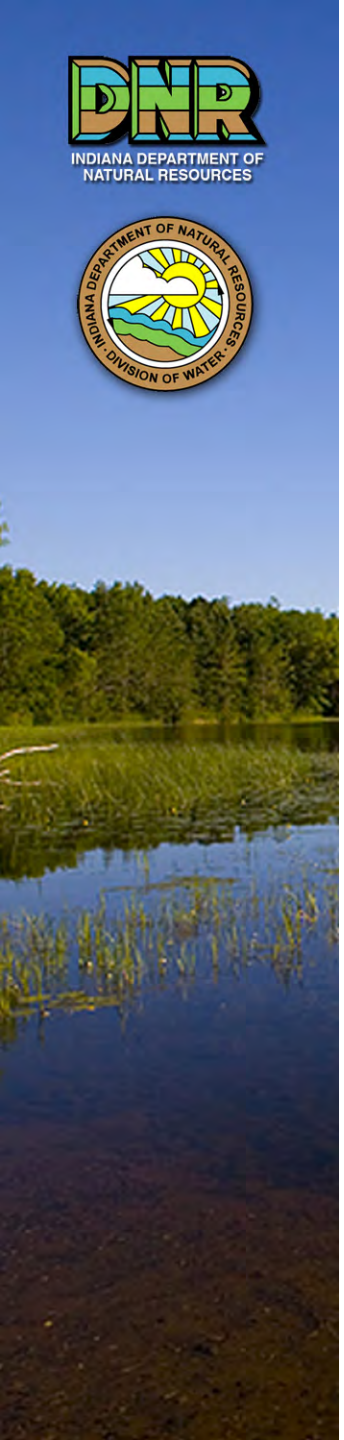
(b) The magnitude of the peak discharge of the regulatory flood of a waterway is established. Using this discharge, the regulatory flood profile is determined. The extent of a flood plain (or a floodway and fringe) is delineated using appropriate elevations from the regulatory flood profile and the best available maps.

(c) The peak discharge of the regulatory flood shall be established using standard engineering and statistical techniques acceptable to the commission.

(d) The profile for a regulatory flood is determined using standard engineering techniques acceptable to the commission. A determination shall start a sufficient distance downstream from the area of interest in order to ensure reasonable accuracy. A bridge is assumed to remain open and free of debris and ice unless local conditions indicate otherwise. Where possible, the profile for a regulatory flood is correlated with known high watermarks.

(e) The extent of a flood hazard area is delineated on the best available maps. Supplemental information from field surveys are used as needed to locate the boundaries of a flood plain.

(f) If there is a need to delineate flood plain and detailed engineering information is not available, a flood plain may be delineated on a temporary basis using other available information or methods acceptable to the commission. *(Natural Resources Commission; 312 IAC 10-3-3; filed Jul 5, 2001, 9:12 a.m.: 24 IR 3390, eff Jan 1, 2002; readopted filed Jul 21, 2008, 12:00 p.m.: 20080813-IR-312080072RFA; readopted filed Sep 22, 2014, 12:34 p.m.: 20141022-IR-312140065RFA)*

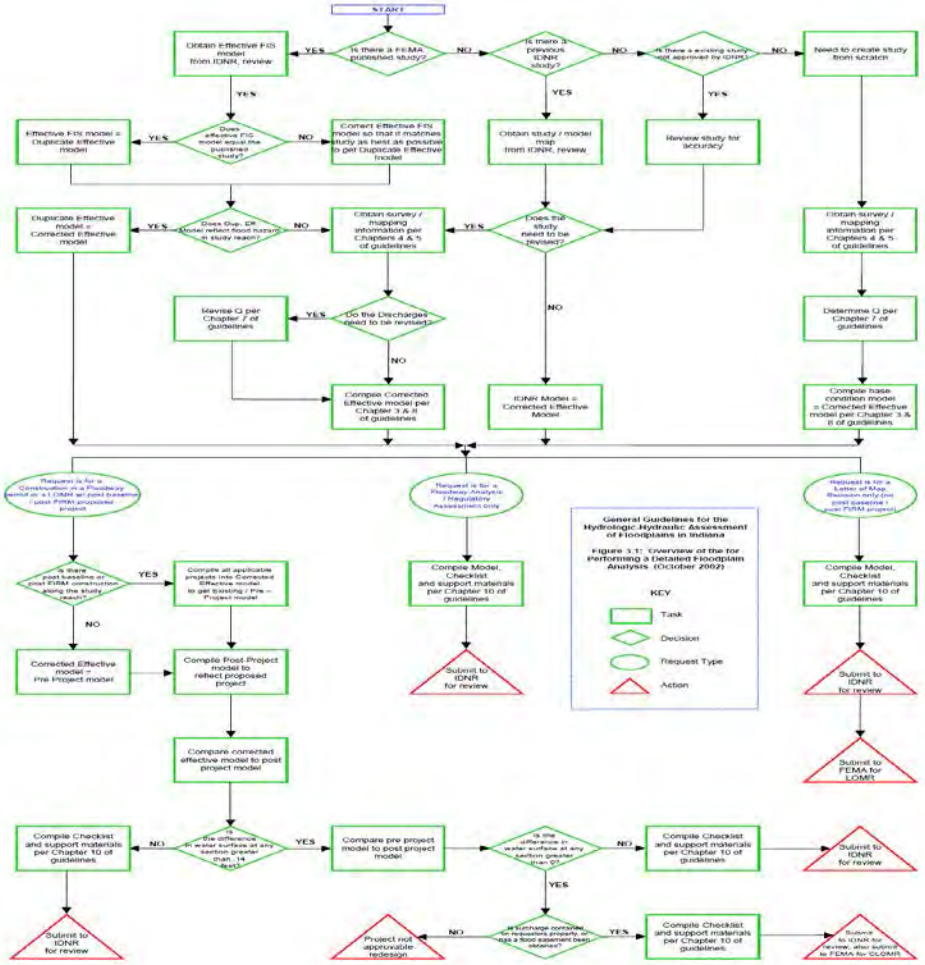


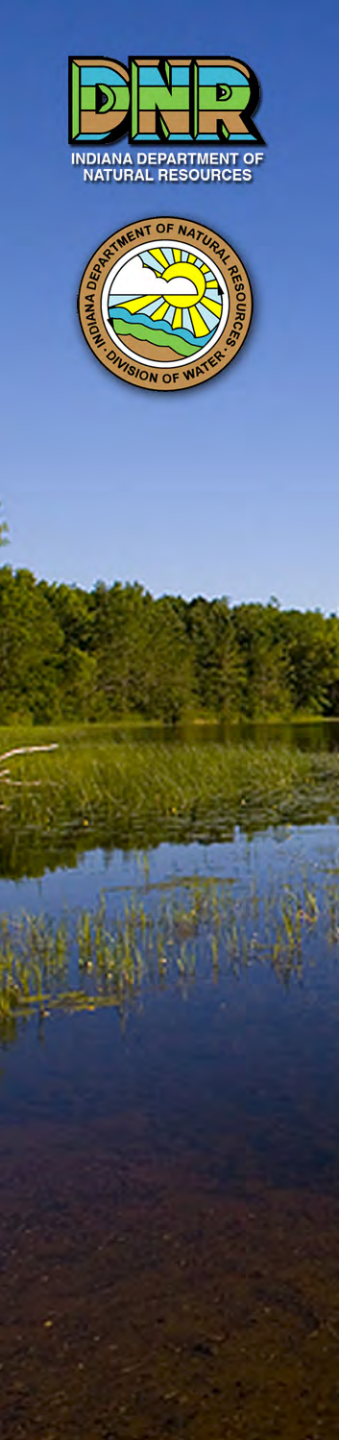
Indiana Model Floodplain Ordinance

The regulatory flood elevation, floodway, and fringe limits for each of the SFHAs within the jurisdiction of [Community name], delineated as an "A Zone" on the [Name/title of FIRM as it appears in the title block] Flood Insurance Rate Map dated [Date of FIRM] as well as any future updates, amendments, or revisions, prepared by the Federal Emergency Management Agency with the most recent date, shall be according to the best data available as provided by the Indiana Department of Natural Resources, provided the upstream drainage area from the subject site is greater than one square mile. Whenever a party disagrees with the best available data, the party needs to replace existing data with better data that meets current engineering standards. To be considered, this data must be submitted to the Indiana Department of Natural Resources for review and subsequently approved.

INDIANA DEPARTMENT OF NATURAL RESOURCES

Current / Historic process for floodplain determinations

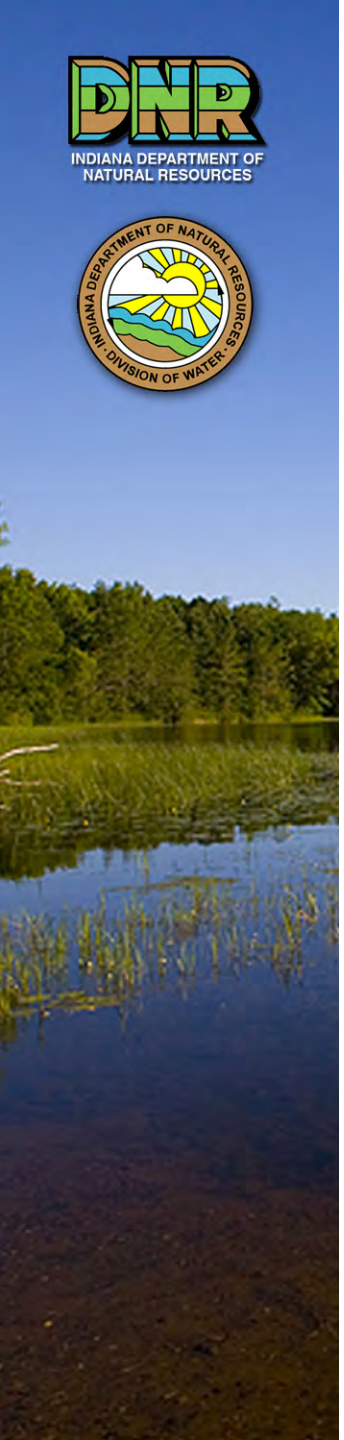




Use of Indiana Best Available Information Layer

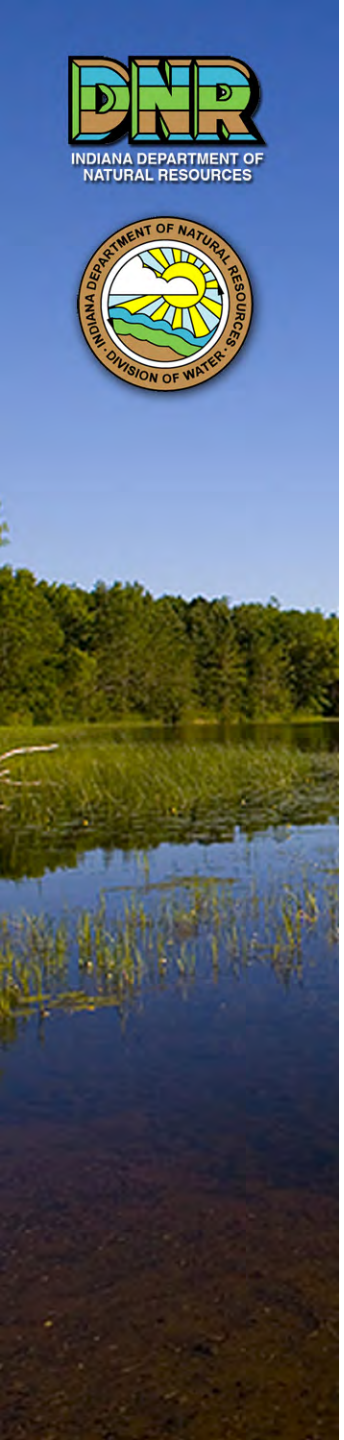
Two different layers:

- NFHL: use for federal Flood Insurance determinations, including Letters of Map Change
- Best Available layer: use for construction, permitting, general planning and analysis



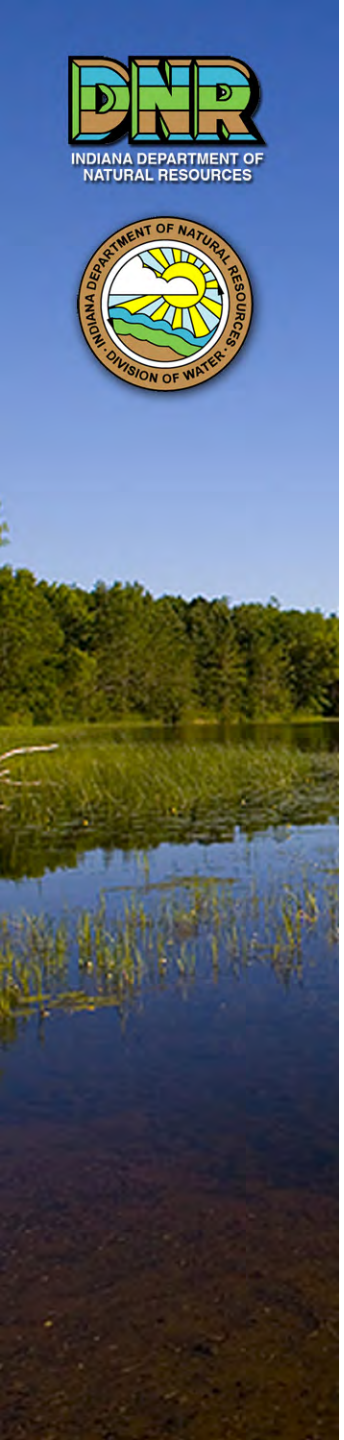
More on the Indiana Best Available Information Layer

- Zone AE information is from NFHL / FIRM – cannot be modified without a Letter of Map Revision
- Zone A / information from DNR sources. Can be revised with approval of DNR (typically requires a new study submitted to DNR for approval)



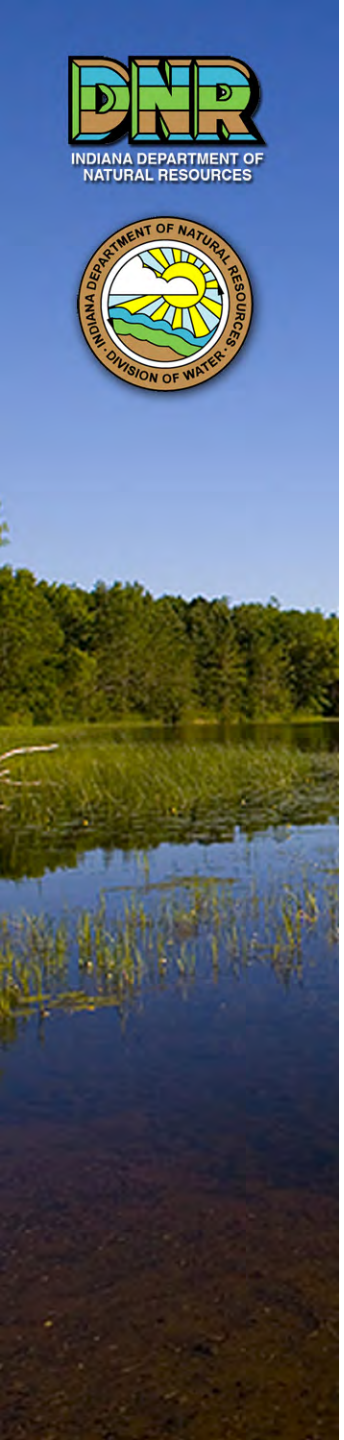
What if a floodplain is not studied?

- Most major floodplain / streams / rivers are covered by a model backed Base Flood Elevation
- Some minor tribs have not yet been studied
- DNR will use the established tools / process to determine BFE / floodway upon request. Then incorporate into Best Available layer



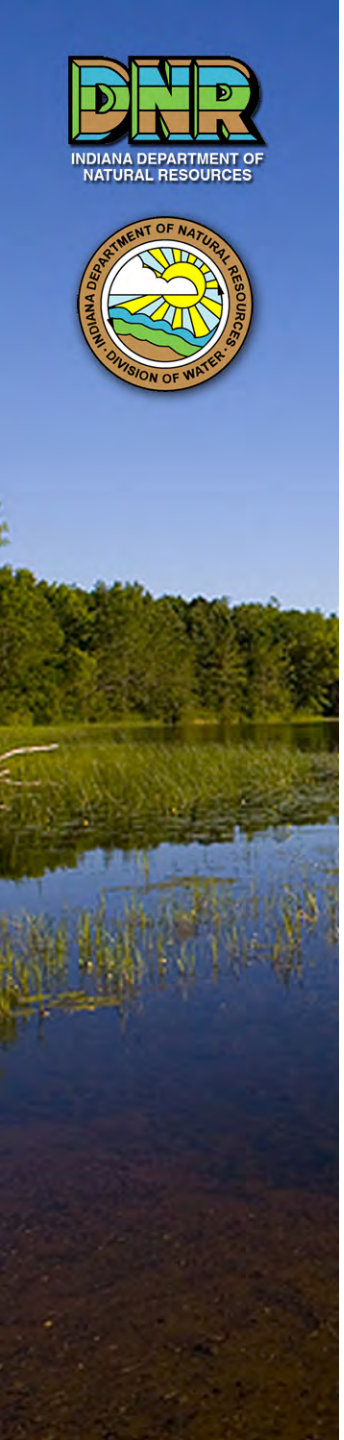
What if I don't agree with a study / floodplain?

- If a FEMA Zone AE / Floodway, will have to go through the FEMA Letter of Map Change process
- If DNR source, there will need to be a study completed to update / revise the current study. Need to submit for DNR approval
- Meet with DNR staff ahead of time



Do I still need a FARA?

- If you are using the information for a LOMA – yes
- If you are using the data for construction or permitting – not necessarily
- If there are any questions about interpretations – can always apply and have DNR staff make a determination



Can I use this for Construction in A Floodway permit jurisdiction?

- Yes. The mapped floodways for all data sources define the jurisdiction of the DNR with respect to the Indiana Flood Control Act and associated statutes and rules
- Models are available from the Indiana Hydrologic and Hydraulic modeling library

INDIANA DEPARTMENT OF NATURAL RESOURCES

When will this information be included on the FIRM's?