

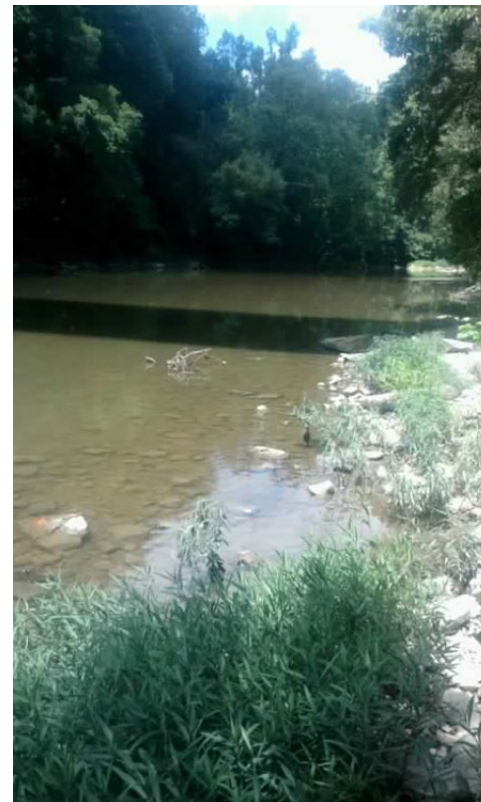


Indiana Department of Environmental Management

Protecting Hoosiers and Our Environment Since 1986



Vernon Fork Muscatatuck River Watershed TMDL Project



**Project Kickoff Meeting
October 27, 2020**



Agenda

- Watershed selection process and watershed approach
- What is a TMDL exactly?
- Watershed impairments
- Watershed characterization monitoring
- Time frame



Watershed Selection Process





The Watershed Approach

Water quality problems generally do not begin in the stream

The watershed approach incorporates:

- Examining point and nonpoint sources (NPS) of water pollution
- A problem-solving tool/decision-making model:
 - Assessment of entire HUC 10 for one year
 - Identification of stream pollutants
 - Detailed evaluation of each subwatershed
 - Encourage stakeholder involvement and implementation at the local level



Why Was Your Watershed Chosen?

- Impaired streams on the 303(d) List of Impaired Waters requiring creation of a Total Maximum Daily Load (TMDL)
- Currently no TMDL or Watershed Management Plan (WMP)
- Active interest shown at the local level in development/implementation of a WMP



What is a Total Maximum Daily Load?

- Identifies the pollutant
- Determines the current level of the pollutant
- Calculates the amount of the pollutant that a waterbody can receive and still meet water quality standards
- A report of pollutant sources, needed reductions, and actions necessary to improve water quality
- **A tool to guide watershed planning**



What Does a Total Maximum Daily Load Report Provide?

- **Information** – A description of the watershed and the water quality data on the impairment
- **Sources** – Overview of the potential sources of the pollutant
- **Loads** – The amount of the pollutant of concern that a waterbody can receive and still meet water quality standards or targets that apply to the watershed
- **Reductions** – The reduction percentage needed in pollutant loading necessary to meet the water quality standards or targets that apply to the watershed
- **Implementation** – A tool to guide watershed planning and restoration activities



Indiana's Nonpoint Source Program

The state Nonpoint Source (NPS) Program guides watershed management efforts statewide and funds local watershed groups for planning and implementation

Goals of the Indiana NPS Program Management Plan:

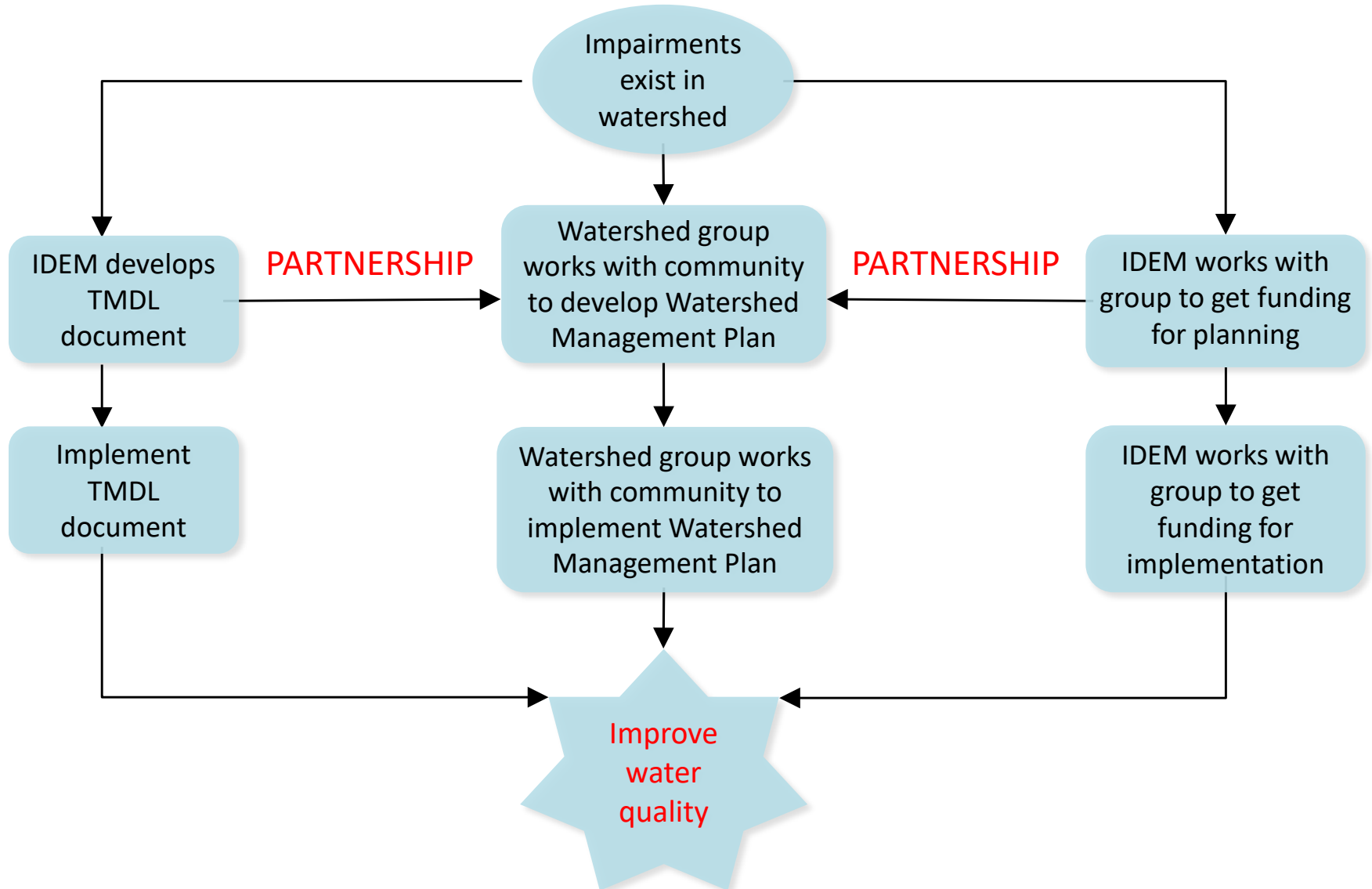
- Utilize partnerships
- Assess waters for impairments and improvements
- Develop and conduct outreach and education programs
- Improve Indiana's water quality by reducing NPS pollutants
- Protect sensitive, vulnerable, and high-quality waters

Watershed Group

A self-sustaining cooperative group that incorporates the perspectives of stakeholders to address water quality issues and improve the functioning condition of rivers and streams in a watershed

Who are stakeholders?

- Local decision-makers
- Citizens
- Agriculture/urban representatives
- Drainage board
- Health department
- Business interests
- Schools/universities
- Neighborhoods
- Outdoor groups
- Parks department
- Builders/developers





TMDL vs. Watershed Management Plan (WMP)

Similarities

TMDLs and WMPs:

- Collect water quality, physical, and social data
- Identify problems
- Identify pollution sources
- Recommend (if a TMDL) or set (if a WMP) goals and objectives

Differences

A TMDL also:

- Identifies implementation areas
- Identifies current water quality actions

A WMP also:

- Addresses public concerns
- Selects critical areas
- Measures success

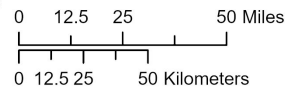


Watershed Description





Location of Vernon Fork - Muscatatuck River Watershed



	Watershed
	County Boundary

Sources:
Data: Obtained from the State of Indiana
Geographic Information Office Library

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By: Allie Gates, Office of Water Quality
Date: 7/1/2020

Map Projection: UTM Zone 16 N **Map Datum:** NAD83

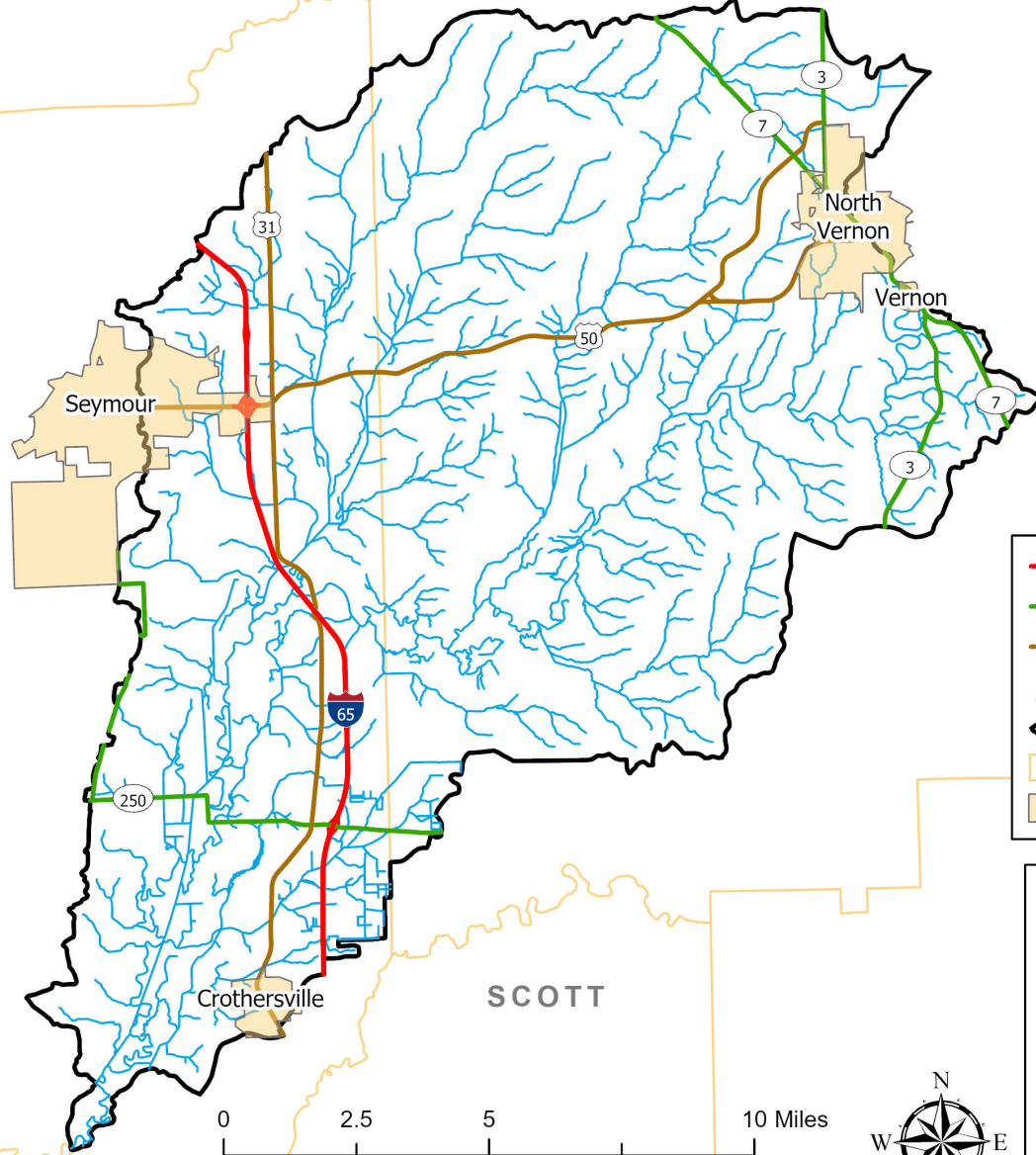
Vernon Fork Muscatatuck River Watershed



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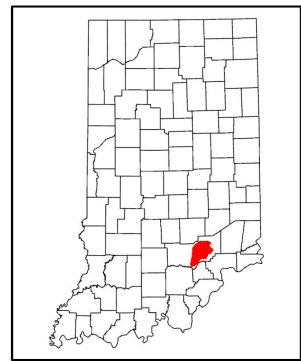
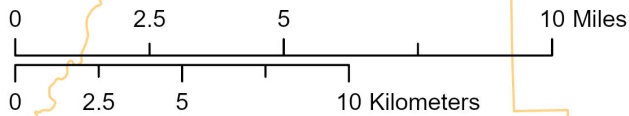


- Interstate
- State Road
- US Highway
- Stream
- Watershed
- County Boundary
- Municipality

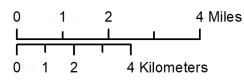
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Mapped By: Lindsay Hylton Adams, Office of Water Quality
Date: 10/5/2020

Sources:
Data: Obtained from the State of Indiana Geographic Information Office Library

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Subwatersheds of the Vernon Fork Muscatatuck River Watershed



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Mapped By: Lindsay Hylton Adams, Office of Water Quality
Date: 8/12/2020

Sources:

Non Orthophotography Data - Obtained from the State of Indiana Geographic Information Office Library

Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)

Map Projection: UTM Zone 16 N **Map Datum:** NAD83



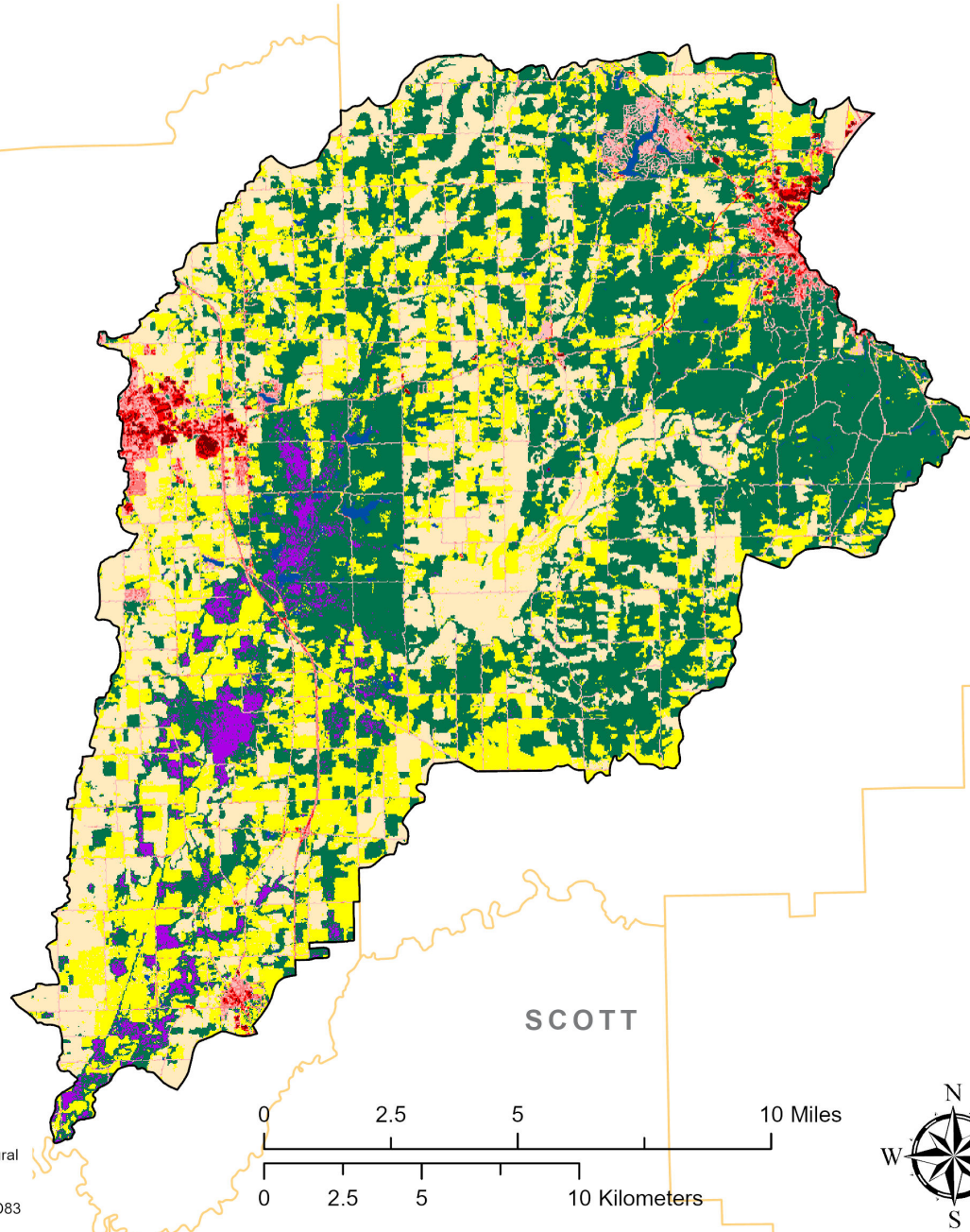
Vernon Fork - Muscatatuck River Watershed Land Use



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Watershed

County Boundary

LAND USE

- Agriculture
- Developed/High Intensity
- Developed/Low Intensity
- Developed/Med Intensity
- Developed/Open Space
- Forest
- Hay/Pasture
- Open Water
- Shrub/Scrub
- Wetlands

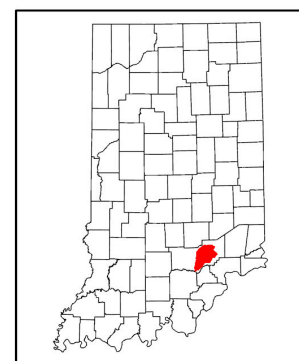
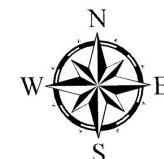
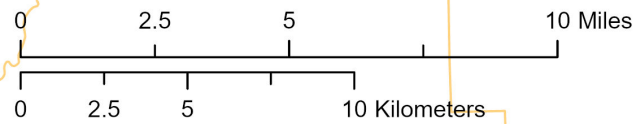
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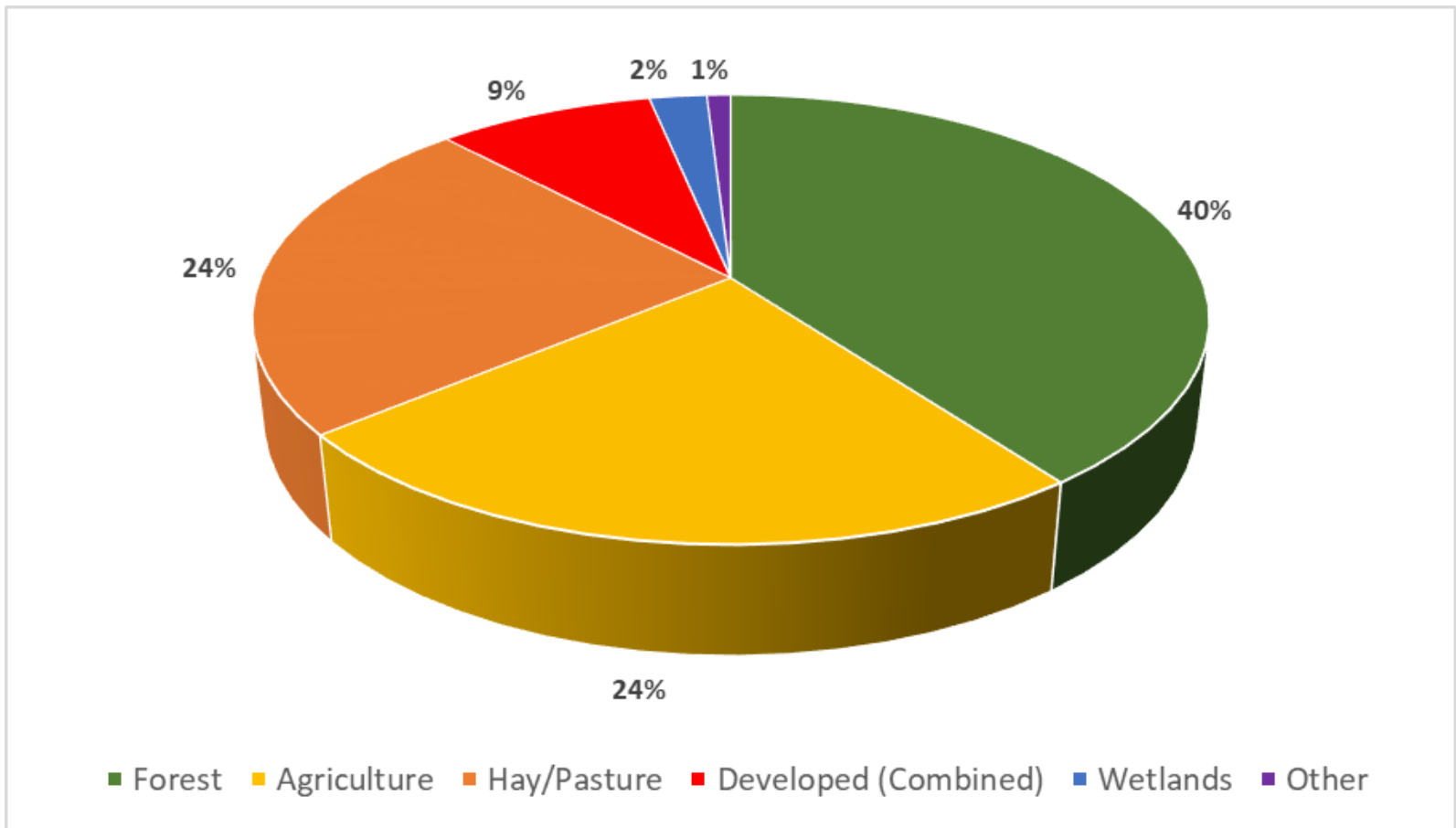
Mapped By: Allie Gates, Office of Water Quality
Date: 07/27/2020

Sources:
Data: Obtained from the State of Indiana Geographic Information Office Library and USDA National Agricultural Statistics Service

Map Projection: UTM Zone 16 N **Map Datum:** NAD83



Land Use in the Vernon Fork Muscatatuck River Watershed



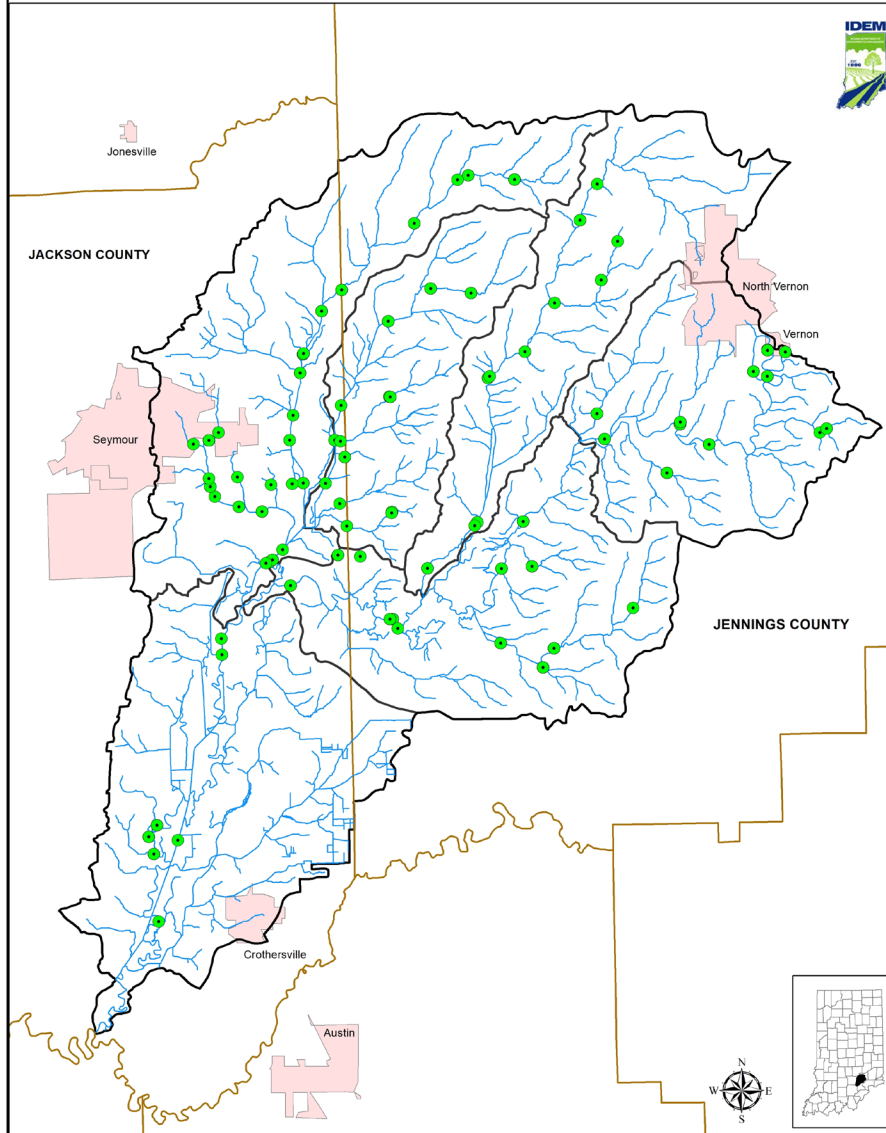
Watershed = 212 sq. miles



Watershed Impairments



Vernon Fork Muscatatuck River Watershed Historical Sampling Sites



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Mapped By: Lindsay Hylton Adams, Office of Water Quality
Date: 10/7/2020

0 1 2 4 Kilometers

0 1 2 4 Miles

- Historical Sampling Site
- Stream
- Municipality
- Watershed
- Subwatershed
- County Boundary

Sources:
Non Orthophotography Data - Obtained from the State of Indiana
 Geographic Information Office Library
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

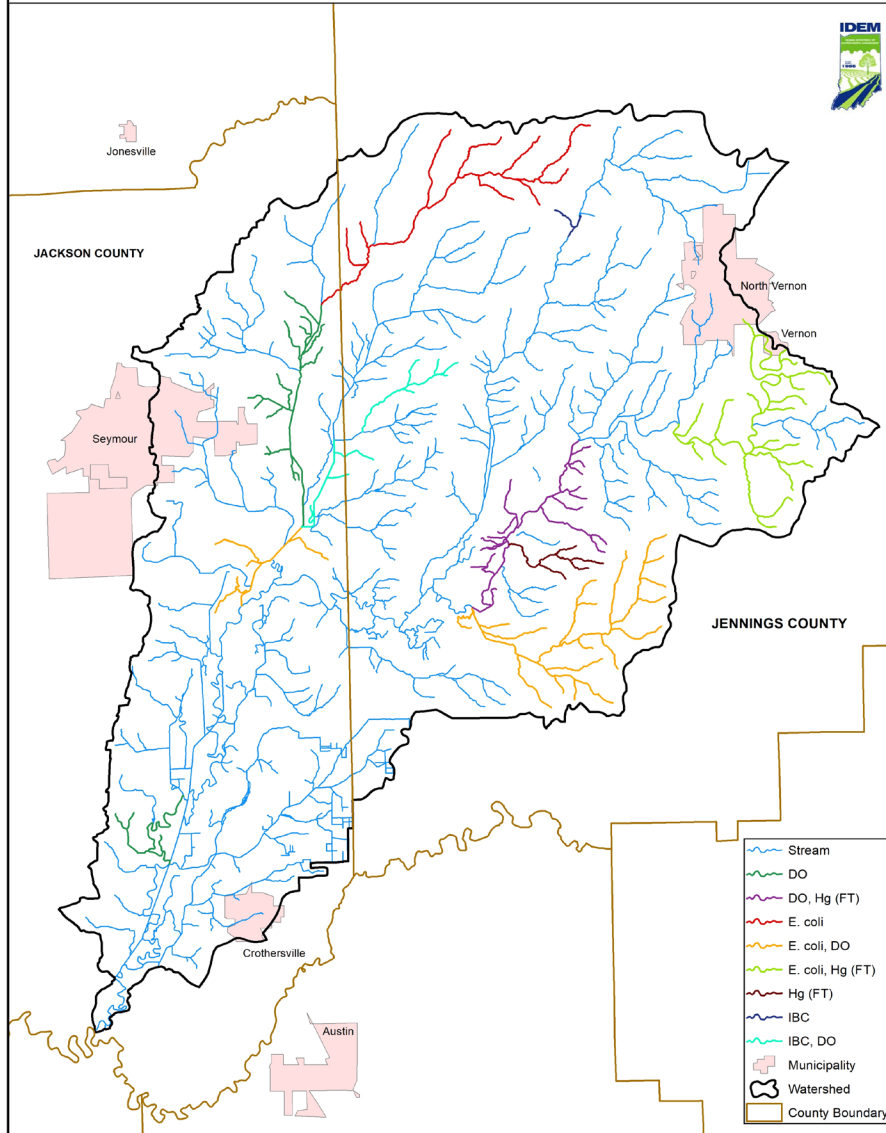


Draft 2020 303(d) Listings

Approximately **134** stream miles impaired:

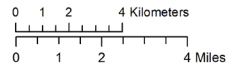
- **78.64** stream miles *E. coli*
- **10.63** stream miles Impaired Biotic Community (IBC)
- **82.33** stream miles Dissolved Oxygen (DO)
- **48.41** stream miles Mercury (Hg) for fish tissue

2020 303(d) Listed Impairments in the Vernon Fork Muscatatuck River Watershed



- Stream
- DO
- DO, Hg (FT)
- E. coli
- E. coli, DO
- E. coli, Hg (FT)
- Hg (FT)
- IBC
- IBC, DO
- Municipality
- Watershed
- County Boundary

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Mapped By: Lindsay Hylton Adams, Office of Water Quality
Date: 10/13/2020



Sources:
Non Orthophotography Data - Obtained from the State of Indiana
 Geographic Information Office Library
Map Projection: UTM Zone 16 N **Map Datum:** NAD83





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Watershed Characterization Monitoring





Monitoring Overview

- Monitoring will take place from **November 2020** through **October 2021**
- **24** sampling sites in total
- Sampling for biological communities (fish and aquatic insects) and bacteria concentrations (*E. coli*) done April through October
- **7** sites sampled year-round for water chemistry

Project Webpage: <https://www.in.gov/idem/nps/4064.htm>

Vernon Fork - Muscatatuck River Watershed Sampling Sites

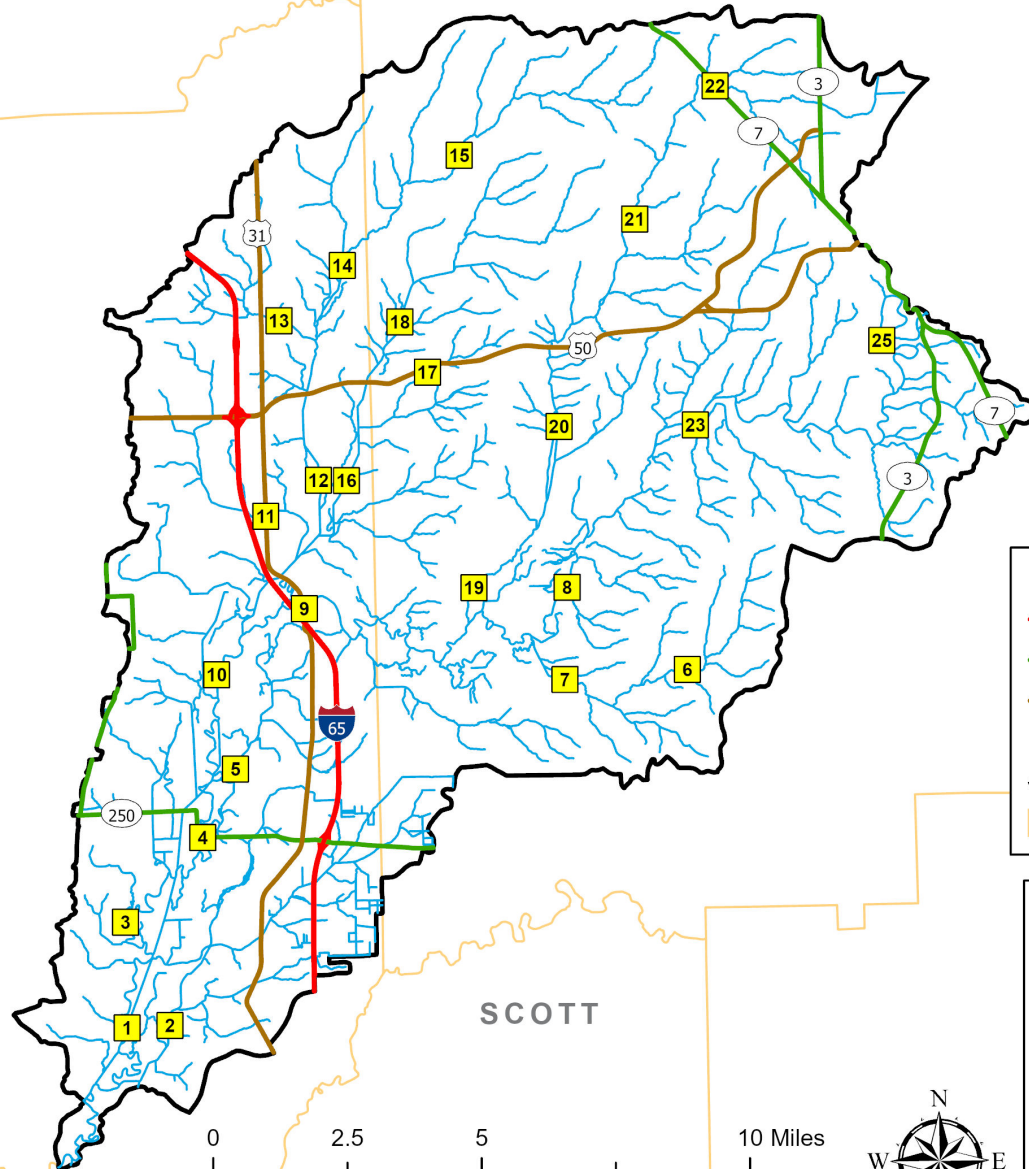


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- Sampling Sites
- Interstate
- State Road
- US Highway
- Streams
- Watershed
- County Boundary

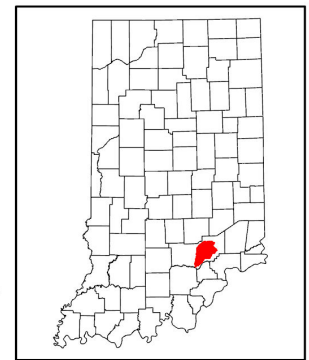
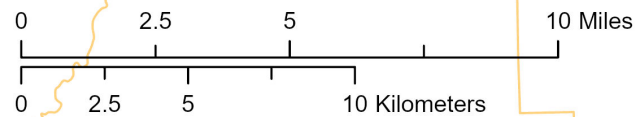
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Mapped By: Allie Gates, Office of Water Quality
Date: 09/10/2020

Sources:

Data: Obtained from the State of Indiana Geographic Information Office Library

Map Projection: UTM Zone 16 N **Map Datum:** NAD83





Water Quality Parameters (General Chemistry)

Parameter	Water Quality Standard/Target	Reference
Total Solids	No Regulatory Target	
Total Suspended Solids (TSS)	No value should exceed 30.0 mg/L in an IBC impaired segment	IDEM Target value
Total Dissolved Solids	No Regulatory Target	
Sulfate	Criteria based on hardness and chloride	Indiana Administrative Code (327 IAC 2-1-6)
Chloride	Criteria based on hardness and sulfate	Indiana Administrative Code (327 IAC 2-1-6)
Hardness	No Regulatory Target	
Alkalinity	No Regulatory Target	



Water Quality Parameters (Nutrients)

Parameter	Water Quality Standard/Target	Reference
Ammonia Nitrogen	Criteria based on temperature and pH	Indiana Administrative Code (327 IAC 2-1-6)
Total Kjeldahl Nitrogen (TKN)	No value should exceed 0.591 mg/L	U.S. Environmental Protection Agency (U.S. EPA) recommendation
Nitrate-N+ Nitrite-N	No value should exceed 10 mg/L	IDEM target value
Total Phosphorus (TP)	No value should exceed 0.30 mg/L	IDEM target value
Total Organic Carbon (TOC)	No regulatory target	
Chemical Oxygen Demand (COD)	No regulatory target	



Water Quality Parameters (Field Parameters)

Parameter	Water Quality Standard/Target	Reference
pH	No value should be < 6.0 or > 9.0	Indiana Administrative Code (327 IAC 2-1-6)
DO	No value should be < 4.0 mg/L	Indiana Administrative Code (327 IAC 2-1-6)
% DO Saturation	No value should be > 120%	IDEM target value
Temperature	Values vary monthly	Indiana Administrative Code (327 IAC 2-1-6)
Specific Conductance	No regulatory target	
Turbidity	No regulatory target	
Weather Conditions	No regulatory target	



Using the Monitoring Results

- **Watershed reassessment**
 - Define impairments based on new data
- **Data Analysis**
 - Use precipitation and flow to calculate pollutant loadings
 - Analyze chemical, physical, and biological measures to identify stressors/sources
- **Write TMDL document**



Time Frame





Vernon Fork Muscatatuck River Watershed TMDL Schedule

- Kickoff public meeting: [October 2020](#)
- Monitoring begins: [November 2020](#)
- Monitoring ends: [October 2021](#)
- Draft TMDL public meeting: [Expected summer 2022](#)
- 30-day public comment period: [Expected summer 2022](#)
- Final TMDL report submittal to U.S. EPA: [Expected fall 2022](#)



IDEM Requests Your Help

We welcome any information on:

- Water quality data
- Possible pollution sources
- Potential stakeholders
- Studies, reports, and documents
- Projects/Best Management Practices that have improved water quality

Vernon Fork Muscatatuck River Project Information

Project Webpage: <https://www.in.gov/idem/nps/4064.htm>

- **Contains:**
 - Location of sampling sites
 - Meeting schedules
 - Project workplan
 - Interactive story map and site photos
 - Quarterly data results
 - Presentations



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<https://www.in.gov/idem/nps/4064.htm>