

# Soil Productivity Factors

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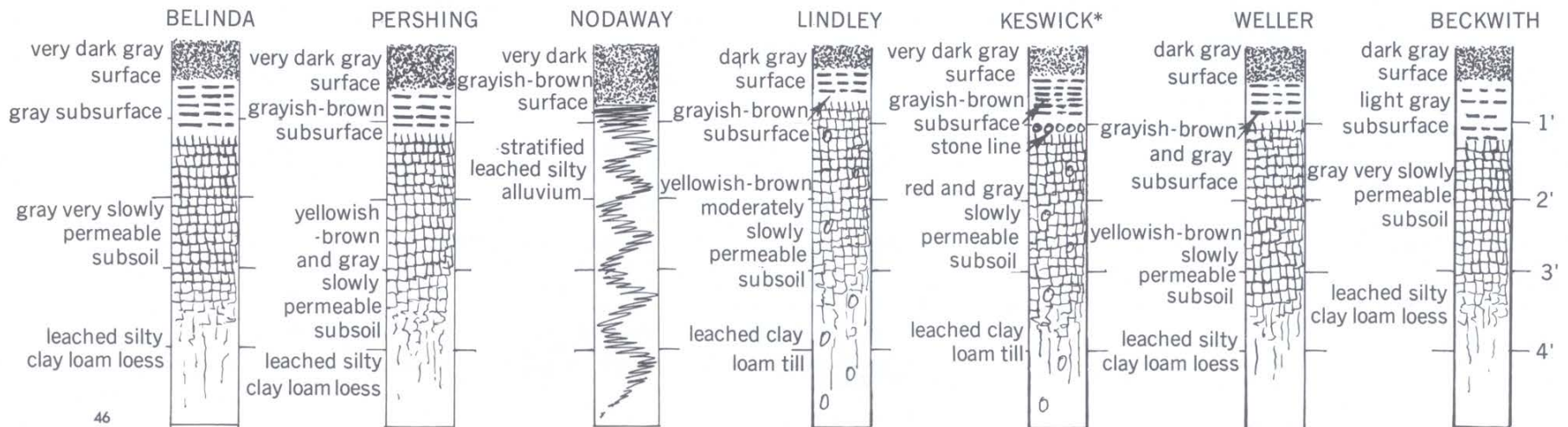
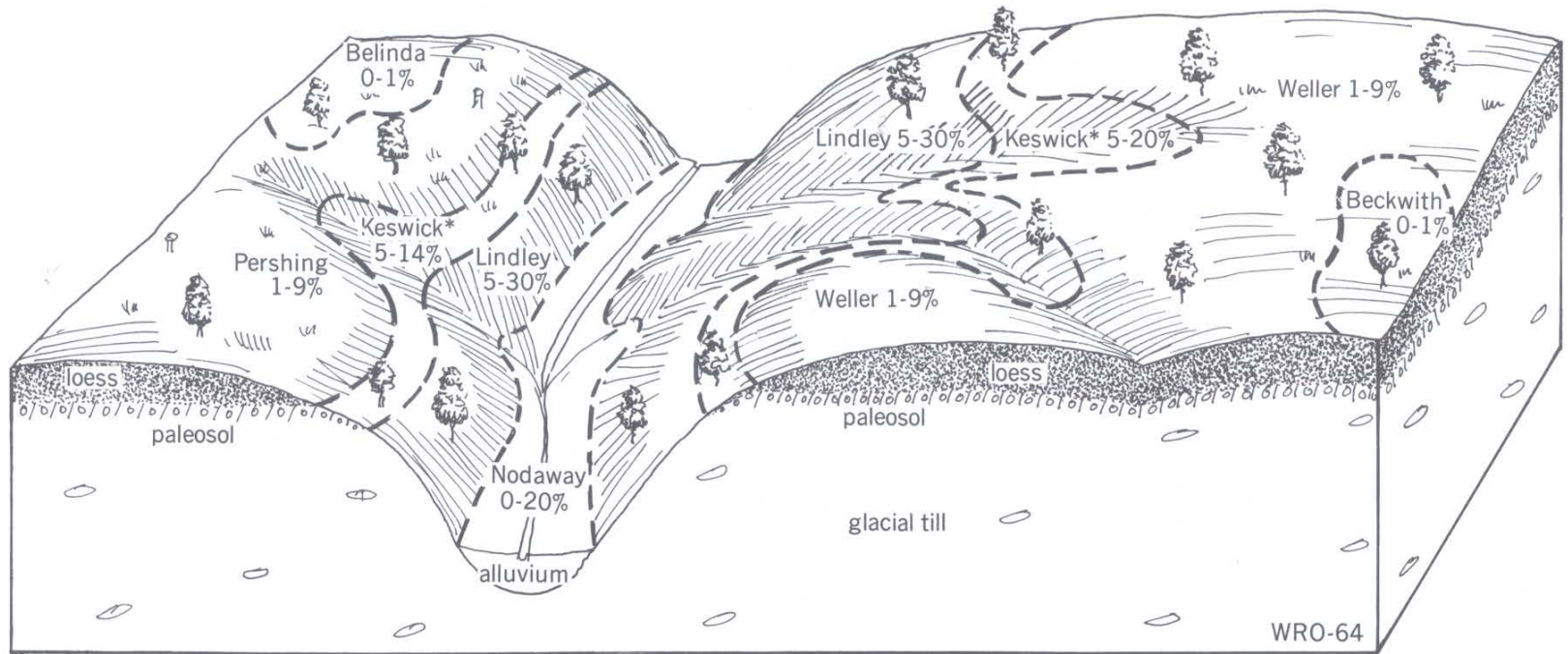
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# Soil – Not just the surface

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Fig. 25. Relationship of slope, vegetation and parent material to soils of the Lindley-Keswick-Weller soil association area.



\*Tentative name



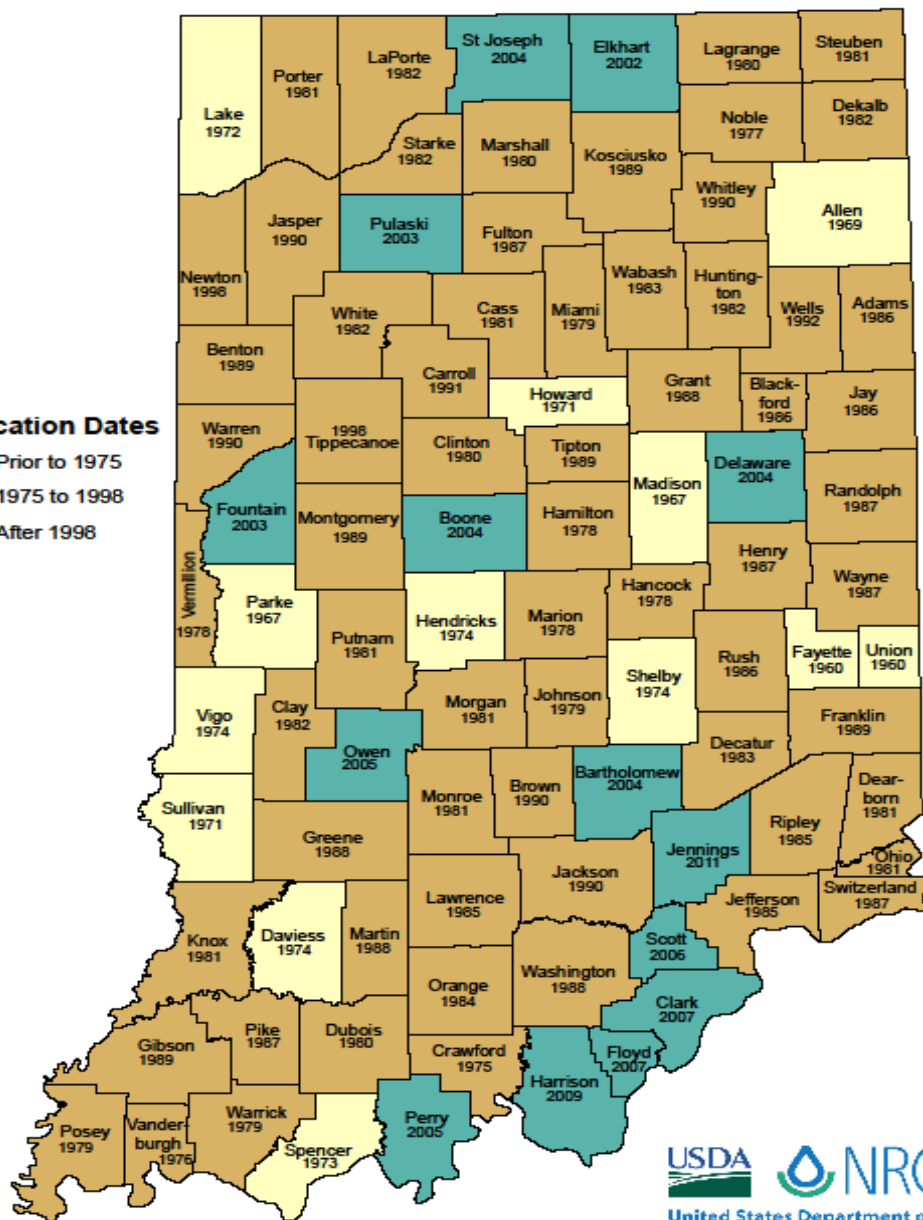
# Old way of getting soil information



## Indiana Soil Survey Publications Dates

### Publication Dates

- Prior to 1975
- 1975 to 1998
- After 1998



# December 2, 1986

## Indiana Accelerated Soil Survey Program completed

### Indiana soil survey completed

Completion of Indiana's accelerated soil survey program was commemorated last week at Purdue University's Stewart Center as a part of the 44th annual conference of Indiana Soil and Water Conservation Districts.

The observance marked the completion of soil surveys for all of Indiana's 92 counties. Indiana is the first major agricultural state to accomplish this task for every county.

On hand to participate in the celebration and to speak to the conferees were Wilson Scaling, chief of the USDA's Soil Conservation Service and Indiana Lt. Gov. John Mutz, who also serves as the state's commissioner of agriculture.

Scaling praised the state's accomplishment and reviewed the federal government's role in the soil survey program. He said that the coordinated effort at local, state and federal levels was a major factor in the program's success.

Mutz paid tribute to the efforts of soil and water conservation district supervisors in obtaining local funding for soil surveys and for promoting their use at the county level. He also noted that the 12-year program was completed for \$3 million less than the amount projected in 1974.

Mutz said that the soil surveys will be very useful to Indiana's agricultural industry. Through effective use of soil resources in planning, locating and constructing of new residential commercial and industrial development, these surveys can enhance economic growth statewide.

Joe Rund, a Tippecanoe County farmer; John Bonsett, director of Environmental Health for Johnson County; and James Hawley, director of the Tippecanoe County Area Plan Commission, each discussed their use of soil survey information in carrying out their jobs.

Many of the more than 100 soil

scientists who worked on the project were present, and each received a certificate signed by Mutz.

At the conclusion of the ceremony, special plaques were presented to representatives of the four major partners in the soil survey program. The plaques contained a soil probe filled with a soil core representing the final acre of soil surveyed. Recipients were Lt. Gov. Mutz, for the citizens of Indiana; Robert Eddleman, state conservationist, for the USDA Soil Conservation Service; Earl Blank, as president of the Indiana Association of Soil and Water Conservation Districts; and

Donald Frazmutter, professor of agronomy, for Purdue University.

The State Legislature first appropriated money for the Accelerated Soil Survey Program in 1974, and state-employed scientists were hired to speed the work. By 1980, 31 Department of Natural Resource soil scientists and 26 Soil Conservation Service soil scientists were working on the project. At this time, Purdue researchers also started a program to computerize the surveys.

In the past 12 years, DNR soil scientists have mapped in 49 of the state's 92 counties. During this period, about 12 million of Indiana's 22.5 million acres were surveyed.

Soil scientists classify soils on the basis of their characteristics in much the same manner as insects and plants are classified.

In a typical Indiana county soil survey, there may be between 20 and 100 mapping units on the legend. The state has more than 350 different soil types which have been mapped.

A completed county soil survey is in the form of a booklet and contains a set of soil maps. The maps consist of aerial photos and overlays of soil lines and symbols. Symbols note soil types and various cultural symbols, such as roads, streams and towns.

Published soil surveys are currently available for 67 Indiana counties, and 23 counties are in the process of having their surveys published.

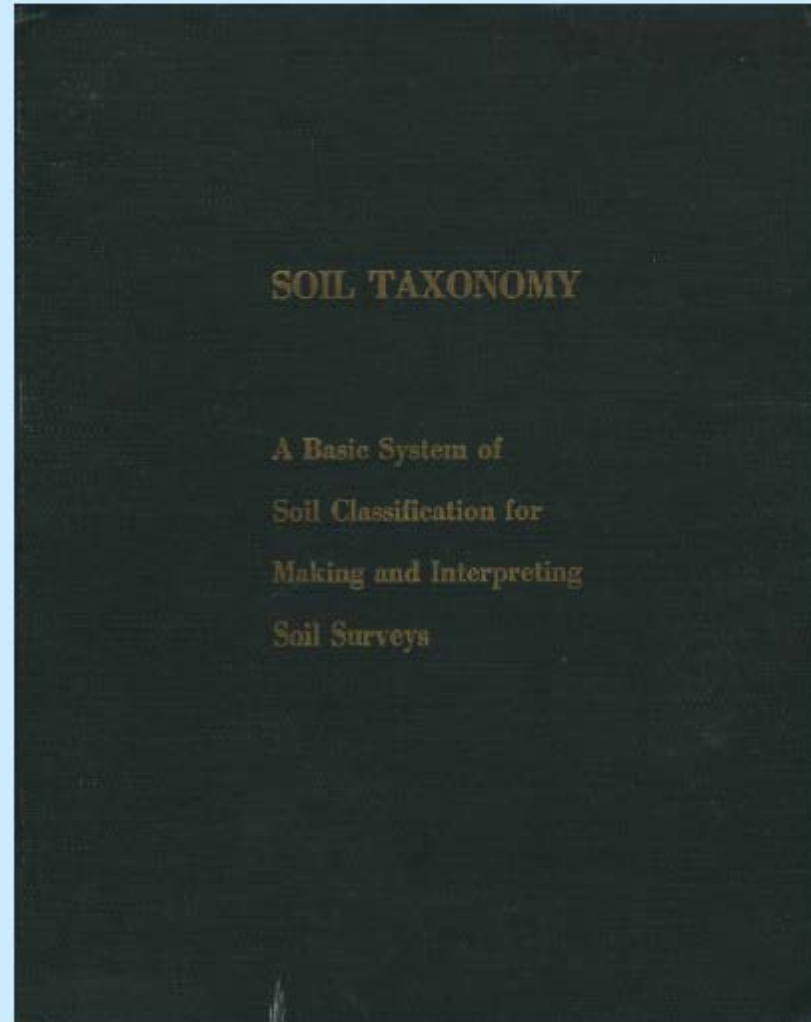
"The Lafayette Leader"  
December 11, 1986

**1975**

Soil Taxonomy  
A Basic System of Soil  
Classification for Making  
and Interpreting Soil  
Surveys

First Indiana reference  
to Soil Taxonomy

Vermillion County  
**September 1978**





**LAND RESOURCE REGIONS AND MAJOR LAND RESOURCE AREAS OF THE UNITED STATES**



26 Land Resource Regions (A-Z) and 204 MLRAs

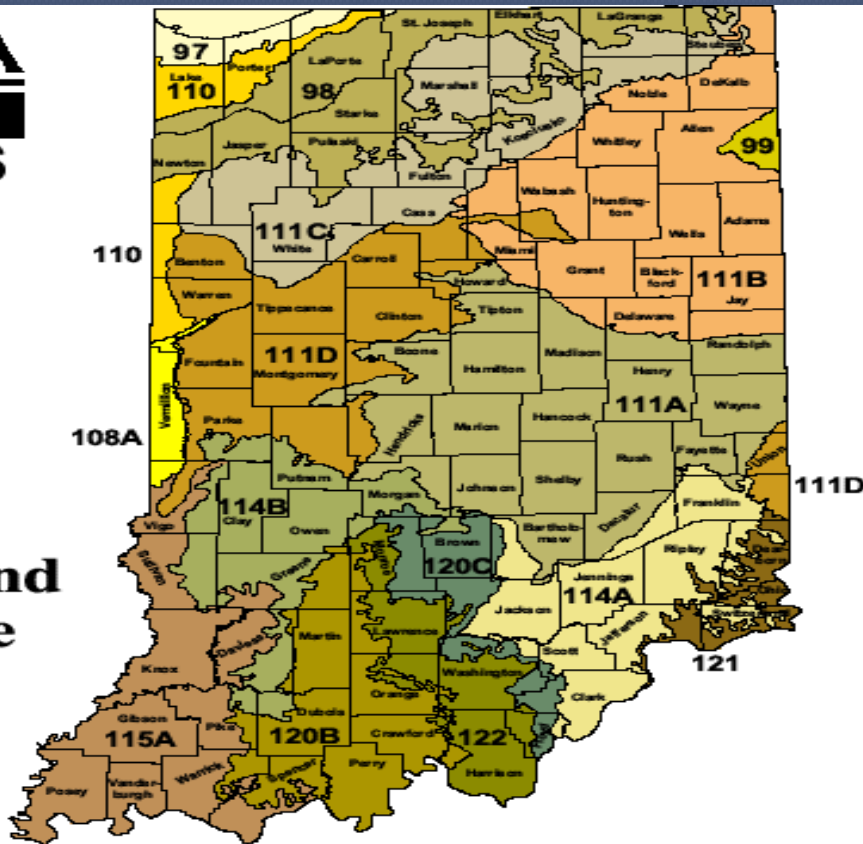
<p><b>1</b> NORTHWESTERN FOREST, FORESTRY, AND QUALITY CROP REGION</p> <ul style="list-style-type: none"> <li>1 Northern Pacific Coast Range, Everille, and Valley</li> <li>2 Willamette and Puget Sound Valleys</li> <li>3 Olympic and Cascade Mountains, Western Slope</li> <li>4 California Coastal Redwood Belt</li> <li>5 Salinas-Coos Bay Area</li> </ul>	<p><b>2</b> NORTHERN NEVADA BASIN AND RANGE</p> <ul style="list-style-type: none"> <li>26 Northern Nevada Basin and Range</li> <li>27 Southern Nevada Basin and Range</li> <li>28 Intermountain Valley</li> <li>29 Northern Intermountain Olympic Basin</li> <li>30 Southern Intermountain</li> <li>31 Colorado Plateau Basin, Mojave, and Plateau</li> <li>32 Colorado and Green River Plateaus</li> </ul>	<p><b>3</b> WESTERN GREAT PLAINS RANGE AND IRRIGATED REGION</p> <ul style="list-style-type: none"> <li>33 Northern Rolling High Plains, Northern Part</li> </ul>	<p><b>4</b> SOUTHWEST PLATEAUS AND PLAINS RANGE COTTON REGION</p> <ul style="list-style-type: none"> <li>81 Edwards Plateau</li> <li>82 Texas Central Basin</li> <li>83A Northern Rio Grande Plain</li> <li>83B Western Rio Grande Plain</li> <li>83C Central Rio Grande Plain</li> </ul>
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Land Resource Areas in 1981





# Indiana Major Land Resource Areas



- 97 - Southwestem Michigan Fruit and Truck Crop Belt
- 98 - Southern Michigan and Northern Indiana Drift Plain
- 99 - Erie-Huron Lake Plain
- 108A - Illinois and Iowa Deep Loess and Drift, Eastern Part
- 110 - Northern Illinois and Indiana Heavy Till Plain
- 111A - Indiana and Ohio Till Plain, Central Part
- 111B - Indiana and Ohio Till Plain, Northeastern Part
- 111C - Indiana and Ohio Till Plain, Northwestern Part
- 111D - Indiana and Ohio Till Plain, Western Part
- 114A - Southern Illinois and Indiana Thin Loess and Till Plain, Eastern Part
- 114B - Southern Illinois and Indiana Thin Loess and Till Plain, Western Part
- 115A - Central Mississippi Valley Wooded Slopes, Eastern Part
- 120A - Kentucky and Indiana Sandstone and Shale Hills and Valleys, Southern
- 120B - Kentucky and Indiana Sandstone and Shale Hills and Valleys, Northwest
- 120C - Kentucky and Indiana Sandstone and Shale Hills and Valleys, Northeast
- 121 - Kentucky Bluegrass
- 122 - Highland Rim and Pennyroyal

# The Number of Soils Mapped in Indiana has Increased

- 533 Series Currently Correlated in Indiana
- 301 Series have their Type Locations in Indiana in 2013
- In 1990, 187 Series had Type Locations in Indiana
- In 1970, 110 Series had Type Locations in Indiana

# Digital Soil Survey Products

Web Soil Survey - Home - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>



USDA United States Department of Agriculture  
Natural Resources Conservation Service

## Web Soil Survey

Home About Soils Help Contact Us

You are here: Web Soil Survey Home

### Search


Enter Keywords

All NRCRS Sites

### Browse by Subject

- Soils Home
- National Cooperative Soil Survey (NCSS)
- Archived Soil Surveys
- Status Maps
- Official Soil Series Descriptions (OSD)
- Soil Series Extent Mapping Tool
- Soil Data Mart
- Geospatial Data Gateway
- eFOTG
- National Soil Characterization Data
- Soil Geochemistry Spatial Database
- Soil Quality

The simple yet powerful way to access and use soil data.




### Welcome to Web Soil Survey (WSS)



Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

### Three Basic Steps

1 Define.



Use the **Area of Interest** tab to define your area of interest.

### I Want To...

- Start Web Soil Survey (WSS)
- Know the requirements for running Web Soil Survey
- Know whether Web Soil Survey works in my web browser
- Know the Web Soil Survey hours of operation
- Find what areas of the U.S. have soil data

### Announcements/Events

- Web Soil Survey 2.1 has been released! View description of new features.

### I Want Help With...

- How to use Web Soil Survey
- How to use Web Soil Survey Online Help

Done

Trusted sites

Start | Inbox - Microsoft Outlook | NRCRS Soils - Microsoft In... | Web Soil Survey - Ho...

TSD | 10:19 AM



# Web Soil Survey

Area of Interest (AOI) | Soil Map | Soil Data Explorer | Shopping Cart (Free)

Search | Area of Interest Properties | Quick Navigation | Navigate By...

Address

**State and County**

View

State: Indiana

County (optional): Tippecanoe

View

Soil Survey Area

Latitude and Longitude

PLSS (Section, Township, Range)

Bureau of Land Management

Department of Defense

Forest Service

National Park Service

Hydrologic Unit

Legend

Area of Interest Interactive Map

View Extent: Contiguous U.S. | Scale: (not to scale)

Tippecanoe IN

0 3748ft

# Web Soil Survey

USDA United States Department of Agriculture  
Natural Resources Conservation Service

Web Soil Survey

Contact Us | Download Soils Data | Archived Soil Surveys | Soil Survey Status | Glossary | Preferences | Logout | Help

Area of Interest (AOI) | **Soil Map** | Soil Data Explorer | Shopping Cart (Free)

Printable Version | Add to Shopping Cart

**Search**

**Map Unit Legend**

**Tippecanoe County, Indiana (IN157)**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BgA	Beecher silt loam, 0 to 2 percent slopes	346.1	8.0%
BmA	Billett fine sandy loam, moderately wet, 0 to 2 percent slopes	1.4	0.0%
Cm	Chalmers silty clay loam	58.2	1.3%
CtA	Crosby silt loam, 0 to 2 percent slopes	0.4	0.0%
CwB2	Crosby-Miami complex, 2 to 6 percent slopes, eroded	56.1	1.3%

**Soil Map**

Scale (not to scale)

0 3748ft

# Web Soil Survey

Area of Interest (AOI)    Soil Map    **Soil Data Explorer**    Shopping Cart (Free)

View Soil Information By Use:     [Printable Version](#)    [Add to Shopping Cart](#)    ?

[Intro to Soils](#)    [Suitabilities and Limitations for Use](#)    **Soil Properties and Qualities**    [Ecological Site Assessment](#)    [Soil Reports](#)

**Search**    ?

**Properties and Qualities Ratings**    ?

       ?

- Soil Chemical Properties    ?
- Soil Erosion Factors    ?
- Soil Physical Properties    ?
- Soil Qualities and Features    ?
- Water Features    ?

**Soil Map**    ?

Legend    ?

Scale (not to scale)    ?

0 3836ft



# Web Soil Survey

Bookmarks

- Cover
- Preface
- Contents
- How Soil Surveys Are Made
- Soil Map
  - Soil Map
  - Legend
  - Map Unit Legend
- Map Unit Descriptions
  - Tippecanoe County, Indiana
- References

USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

## Custom Soil Resource Report for Tippecanoe County, Indiana

# Soil Survey Map

**Fc** – Fincastle: Fine-silty, mixed, superactive, mesic Aeric Epiaqualfs

**Bs** – Brookston: Fine-Loamy, mixed, superactive, mesic Typic Argiaquolls

**Kk** – Kokomo: Fine, mixed, superactive, mesic, Typic Argiaquolls

**Pa** – Patton: Fine-silty, mixed, superactive, mesic, Typic Endoaquolls

**Ca** – Carlisle muck: Euic, mesic, Typic Haplosaprist

## Limitations

- Soil Survey has hard boundaries
- Up to 2 acres of inclusions
- Interpretations are not based on management
- Created using best available technology at the time

# Where Did Name Changes Occur?

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- Most occurred in the Soil Surveys Updated after 1998 (see Publication Map)
- Counties within Hoosier National Forest were updated to make uniform legend throughout HNF
- Marshall County was also updated but w/o new publication



# Where Will Future Changes Occur?

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- Some will occur in the older Soil Surveys mapped before 1975 (see Publication Map)
- Some will occur in counties adjacent to surrounding states to make better joins between states
- Counties with Inactive Series and Variants will have updates

# Where Will Future Changes Occur? - continued

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- ◉ Some large map units will be split into phases by physiographic regions or landforms, for example Blount, Lake Michigan Lobe
- ◉ Some map units not correlated to series level, like orthents or Made land, may be changed to fill in data gaps
- ◉ Some substratum phases or taxadjuncts may become new series or map units

# Where Will Future Changes Occur? - continued

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- ◉ Future Changes in Series Names will be less than in the recent past
- ◉ Most changes will occur in the tabular data for each map unit
- ◉ Some soil lines will be adjusted with LiDAR and other new technology to make lines better fit landforms



# Soil Productivity Factors

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- In the USDA Soil Survey prior to now – Based on the Didericksen Model
- When calculated in 1979 – average yield in Indiana was 100 bu/acre
- This model adds yield for good soil properties and deducts for poor soil qualities

# Why the yield increase?

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- Better plant genetics
- Better technology
- Better management
- Since 1940 – yields have increased by over 1.5 bu/acre/year

# Soil Ranking Factor

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- Based on the natural soil – not based on management or improvements – Didericksen Model
- Uses properties such as slope, organic matter, plant available water, rooting depth, drainage, sand content, clay content, and many others.
- Each property is plus, minus or 0 yield.



# Current Status

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- Purdue is using the Didericksen Model to develop soil ranking factors – not soil productivity factors
- Ranking factors will be based on the soil's potential to produce corn without management factors included

# Summary

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- The data in Soil Survey requires updates, including the interpretations such as the better estimates of yield
- The increase in yield from USDA Soil Survey better reflects the soils potential for producers
- We are providing a soil ranking factor to provide assessments of a soils potential without management included.

# Questions?

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