

**AIRPHOTO INTERPRETATION OF  
DRAINAGE FEATURES  
OF**

**WHITLEY COUNTY, INDIANA**

**APRIL, 1956**

**No. ~~18~~ 16**

**Joint  
Highway  
Research  
Project**

**PURDUE UNIVERSITY  
LAFAYETTE INDIANA**

*by*

*Merle  
Parvis*

AIRPHOTO INTERPRETATION OF DRAINAGE FEATURES OF WHITLEY COUNTY, INDIANA

TO: K. B. Woods, Director  
Joint Highway Research Project

April 19, 1956  
File: 17-5-1D-90  
C-36-51A

FROM: Harold L. Michael, Assistant Director

Attached is a report entitled "Airphoto Interpretation of Drainage Features of Whitley County, Indiana." This compilation is in connection with an airphoto study of the application of the techniques in developing surface drainage maps of Indiana on a county basis. This report was prepared by Merle Parvis, Research Engineer, Joint Highway Research Project.

Included with the report is an osalid print of a drainage map of Whitley County, Indiana. This map was prepared entirely from airphotos.

Respectfully submitted,

*Harold L. Michael*

Harold L. Michael, Assistant Director  
Joint Highway Research Project

HLM:rel

Attachment

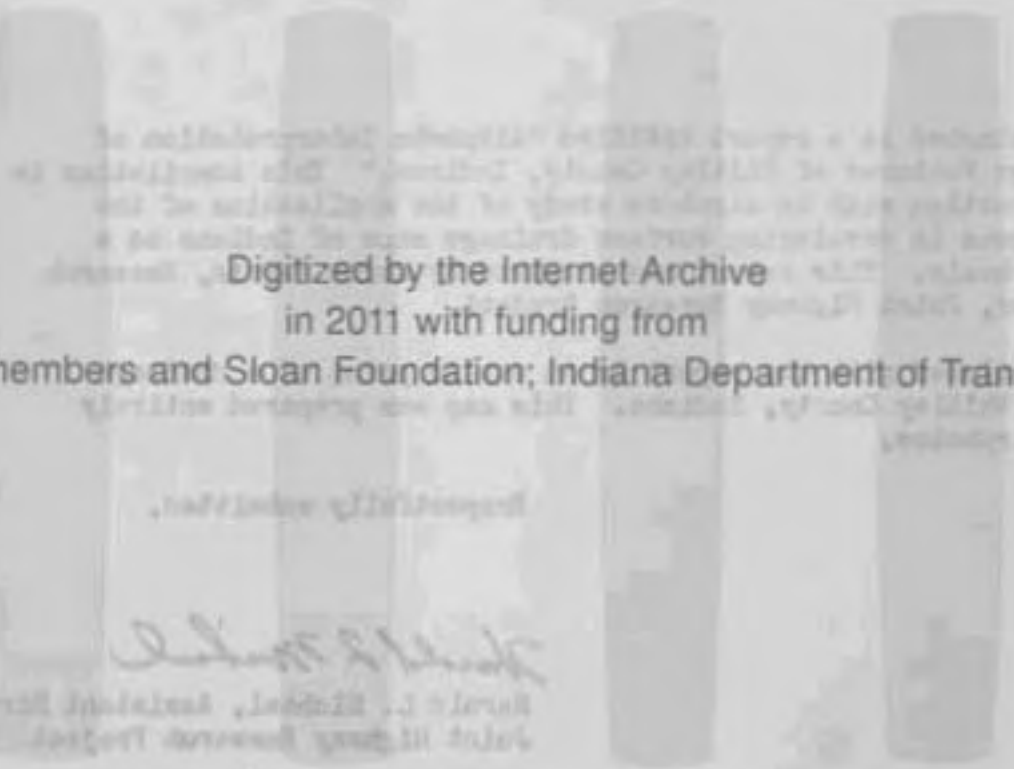
cc: J. B. Cooper	R. E. Mills
J. T. Hallett	B. H. Petty
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AIRPHOTO INTERPRETATION OF DRAINAGE FEATURES  
OF  
WHITLEY COUNTY, INDIANA

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Merle Parvis

Research Engineer

Joint Highway Research Project

C-36-51A

Purdue University  
Lafayette, Indiana

April 19, 1956

# AIRPHOTO INTERPRETATION OF DRAINAGE FEATURES

OF

WHITLEY COUNTY, INDIANA

by

Marle Parvis

## INTRODUCTION

The drainage map of Whitley County, Indiana, which accompanies this report was compiled from 9" x 9" aerial photographs having an approximate scale of 1:20,000. These airphotos were taken in the summer of 1951 in connection with the United States Department of Agriculture map program, and the prints were purchased from the Commodity Stabilization Service, Performance and Aerial Photography Division, U.S.D.A. The drainage map was made to the scale of about one inch equals one mile on a base map prepared from the 1937 "General Highway and Transportation Map, Whitley County". Slight discrepancies in the base map grid were adjusted to agree with the airphotos.

With the aid of stereoscopes all discernible drainageways were marked on the odd numbered photographs with blue china-marking crayons. This drainage information was transferred from the airphotos by inserting the prints into a reflectoscope and tracing their images onto the base map.

Map symbols are identified by a legend. The names of cities, towns, lakes, and streams are added to facilitate the use of the map. An appropriate title is given the map. When available, approximate elevations of the several towns are shown in small figures enclosed in parentheses (1, p. 790); these elevations are railroad elevations presumably at the

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1. Logan, W.H., "The Sub-Surface Strata of Indiana", Publication No. 108, The Department of Conservation, Indianapolis, Indiana, 1931.

depots in the various towns and cities.

### Geography

Whitley County is roughly square in shape, being about 18 miles in both the north-south and east-west directions. Its area is approximately 336 square miles (2, p.199). The regularity of the

2. Ward, L. C., "Roads and Road Materials of the Northern Third of Indiana," 30th Annual Report, Department of Geology and Natural Resources, 1906, Indianapolis, 1907.

land section grid is broken by reserves in the central part of the county. There is a "Correction parallel" passing through Larwill.

### Climate

The climate of Whitley County is continental, marked by warm summers and moderately cold, moist winters with wide ranges of temperature. The length of the growing season is about 165 days. The mean annual precipitation is 36.99 inches at Columbia City. The rainfall is fairly well distributed throughout the year; it is lowest in February and highest in September. More than thirty inches of snow can be expected annually (3).

3. "Climate and Man", Yearbook of Agriculture, U.S.D.A., Washington, D.C., 1941.

### Physiography

All Whitley County is contained within the Steuben Morainal Lake section of the Northern Moraine and Lake physiographic region of the state (4, p.66). In respect to its physiographic situation in the

4. "Handbook of Indiana Geology", Department of Conservation, Indpls, Indiana, 1922.

United States, Whitley County lies within the Eastern Lake section of the Central Lowland province (4, p.69).

### Topography

Whitley County has an average elevation of about 855 feet above sea level. Its highest point is about 960 feet, and its lowest point is about 775 feet. Maximum local relief is about 80 feet (4, p.82)

The topography of the county is diversified. The southwestern part is fairly level. The morainal portions are rolling, consisting of many knobs and basins. The northern part is dotted with lakes and swampy tracts.

Geology

The surface and near surface geologic ages represented in the county are the Silurian, Devonian, and Quaternary periods (1, p.790). Rock outcrops are not known to exist (5, text).

5. McGrain, Preston, "Thickness of Glacial Drift in North Central Indiana", Circular No. 1, Indiana Flood Control and Water Resources Comm., Indianapolis, Indiana, January, 1950.

Bedrock. Bedrock in the southern part of the county is of Silurian age; in the northern part, it is of Devonian age (1,p.790).

Glacial Deposits. The entire county was glaciated. Leverett and Taylor stated that at Larwill the drift thickness was found to be 365 feet (6, p.163). McGrain stated that the drift thickness

6. Leverett, F., and Taylor, F.B., "The Pleistocene of Indiana and Michigan and the History of the Great Lakes," U.S.G.S. Monograph LIII, Washington, D.C., 1915.

probably exceeds 200 feet in all parts of the county except in the southeast portion (5, text). In this section the bedrock has been mapped at 100 feet or less below the surface of the ground (5, map).

The Packerton moraine covers the northwest corner of the county. It is a rolling mass of glacial material. The Mississinewa moraine extends from the southwest corner to the central part of the north county line. South of Columbia City it is from 3 to 4 miles wide. "Northeastward from Columbia City it is quite broad, attaining widths varying from 5 to 15 miles" (4, p.122). The Salamonie moraine crosses the county from the central part of its south county line to the northeast corner. The Salamonie moraine is a rather well-defined, smooth ridge

south of Eel River, thickly strewn with boulders (7, p. 515).

-3-

7. Leverett, F., "Glacial Formations and Drainage Features of the Erie and Ohio Basins," U.S.G.S. Monograph XLI, Washington, D.C., 1902)

### Soils

Most of the soils of Whitley County have been mapped as belonging to the Miami catenas.

The soils bordering Eel River from the center of the county to its western edge are of the Fox-Westland, Ostemo, and Genesee catenas.

Some Colusa soils are located in the west-central part of the county (8).

8. "General Soil Association Map," U.S.D.A., Purdue, May, 1940.

### Granular Material

Leverett and Taylor wrote concerning a strip of gravel and sand along Eel River in which the water in wells stood at about river level (6, p.171).

Ward wrote of gravel deposits 1 mile north, 4½ miles east, and 2 miles south of Columbia City (2, p.200). He further described deposits at Larwill and South Whitley as well as along practically the whole course of Eel River (2, p. 200-201).

### Marl

Marl deposits have been found in the bottoms of several of the lakes of the area including Cedar, Shriner, Round, and Blue River lakes (9, p. 140-158).

9. Blatchley, W.S., and Ashley, G.H., "The Lakes of Northern Indiana and their Associated Marl Deposits," 25th Annual Report, Department of Geology and Natural Resources, 1900, Indianapolis, 1901).



## STREAM SYSTEMS

### Drainage Basins

Whitley County lies wholly within the Wabash drainage basin of the state. The northwestern part is in the Tippecanoe subdivision, the southeastern corner is in the Little Wabash subdivision, the central part bordering Eel River is in the Eel subdivision, and a small area in the south-central part of the county is drained by minor tributaries of the Wabash River proper (4, p.271).

### Principal Streams

The principal stream in Whitley County is Eel River. It rises in the northwestern part of Allen County and flows in a southwesterly direction through the central part of Whitley County past Columbia City and South Whitley. It then enters Kosciusko County. Eel River has an average gradient of 3 feet per mile (7, p.190). Mad Creek, Stony Creek, and Sugar Creek are tributaries of Eel River on the south; they are westerly flowing streams. Blue River (or Thorn Creek) and Spring Creek are tributaries of Eel River on the north; they are southerly flowing streams.

The southeastern corner of the county is drained in a southeasterly direction by Indian Creek into Allen County where the stream joins Aboite Creek. Little Indian Creek is its tributary.

The south-central part of the county is drained by the headwater streams of Clear Creek in a southerly direction into Huntington County and thence into the Wabash River.

The southwestern corner of the county is drained in a westerly direction by Hurricane, Wheeler, and Sycamore creeks. Their waters eventually enter Eel River in Kosciusko and Wabash counties.

The northwestern corner of the county is drained by Deland Ditch in a northwesterly direction. This stream is a part of the Tippecanoe River system.

#### Lakes and Ponds

There are a number of lakes in the northern part of the county. The larger ones are Souder, Larwill, Wilson, Black, Tadpole, Troy Cedar, Goose, Loon, Cedar, Shriner, Round, and Blue River lakes. Some of them are more than a mile long.

#### Swamps

Many basins in the morainic areas contain organic soils. Swampy regions fringe several of the lakes. The conditions are most prevalent in the northern part of the county.

#### Dredged Ditches

Many of the streams have been dredged to improve natural drainage. Ditches have been constructed to drain basins and swampy tracts.

### DRAINAGE PATTERNS

Drainage patterns in the intermorainic areas are subdendritic. In the morainic areas they are quite haphazard in character. Ditches have been dredged, lending the patterns a rectilinear effect in nearly all parts of the county. Basins and lakes interrupt the continuity of the streams, especially in the northern part of the county (10).

10. Parvis, M., "Regional Drainage Patterns of Indiana", A Thesis, Purdue University, Lafayette, Indiana, 1947.

#### ACKNOWLEDGMENTS

The author wishes to acknowledge the assistance given by all those persons who have helped in the preparation of this report. Special acknowledgments are due members of the Joint Highway Research Project Advisory Board for their active interest in furthering this study; Professor H. L. Michael, Assistant Director of the Joint Highway Research Project, for his valuable suggestions and review of the report; and to the several individuals in the Airphoto Laboratory who have aided in the compilation of the map.

All airphotos used in connection with the making of the map automatically carry the following credit lines: "Photographed for Commodity Stabilization Service, Performance and Aerial Photography, U.S.D.A."



NOTE: DRAINAGE BOUNDARIES SHOWN ON THIS MAP  
 WERE DERIVED FROM AERIAL PHOTOGRAPHS  
 TAKEN IN 1951 BY THE U.S. GEOLOGICAL SURVEY

**DRAINAGE MAP  
 WHITLEY COUNTY  
 INDIANA**

PREPARED FROM  
 1951 AAA AERIAL PHOTOGRAPHS  
 BY  
 JOINT HIGHWAY RESEARCH PROJECT  
 AT  
 PURDUE UNIVERSITY  
 1956





N O B L E C O

U N I T I N G T O N C O

# DRAINAGE MAP WHITLEY COUNTY INDIANA

PREPARED FROM  
1951 A.A.A. AERIAL PHOTOGRAPHS

JOINT HIGHWAY RESEARCH PROJECT  
AT  
PURDUE UNIVERSITY  
1956



**LEGEND**

- CITIES AND INCORPORATED TOWNS
- UNINCORPORATED CITY ADDITIONS
- STATE CAPITAL
- COUNTY SEATS
- OTHER TOWNS AND VILLAGES
- U.S. AND STATE HIGHWAYS
- STATE LINE
- COUNTY LINE
- CONGRESSIONAL TOWNSHIP CORNERS
- SECTION LINES
- APPROXIMATE ELEVATIONS
- MAJOR STREAMS
- PERENNIAL STREAMS
- INTERMITTENT DRAINAGE WAYS
- CANALS AND DITCHES
- LAKES AND PONDS
- WATERLAIN BASINS
- LOW MILES
- ELEVATED AREAS
- DAMS
- WEIRS