

## The Calumet Region in Model-Map Contour

ALFRED H. MEYER<sup>1</sup>, Valparaiso University

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A basal prerequisite to modern community planning and other studies dealing with the interrelation of human and physical geographic factors of a region is a clear picture of what the terrain looks like.

Such a land surface perspective is made available herewith for the Calumet region of northwest Indiana and adjacent northeast Illinois in the form of a contour model-map (Fig. 1).

The original contour model is 120 inches long and 45 inches wide, representing a distance of some 46 miles in length from east to west and 17 miles from north to south. Thus the horizontal scale of the model is about two and one-half inches to the mile.

Constructed from eight topographic quadrangles based upon two different horizontal and two different vertical scales, with modifications of certain topographic details as derived from other more recent maps and field observations, this contour model affords a unified one-scale view of the head-of-Lake Michigan area.

In photographic form as presented herewith, the contour model-map may be used as a base on which to superimpose regional geographical data, both human and physical. Such use is contemplated in further studies of the Calumet.

### Structural Data

The model is constructed on a scale of 1:24,000, with a contour interval of 10 feet. It is based upon eight topographic quadrangles of the U. S. Geological Survey, a county map, a Great Lakes survey map, and local field observations. The topographic quadrangles are outlined and labeled on the index map (Fig. 2), which will help serve to identify the landsurface forms referred to in this paper and shown on the model-map.

Six of the "top" sheets—Palos Park (1925), Tinley Park (1926), Blue Island (1927), Harvey (1926), Calumet Lake (1927), and Calumet City (1926)—have a scale of 1:24,000 with a contour interval of five

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<sup>1</sup>The present study is the second of a series of chorographic investigations of the Calumet area for which the author was awarded research grants by the Indiana and Michigan academies of science.

The first study, "Toponymy in Sequent Occupance Geography, Calumet Region, Indiana-Illinois", was published in the Proceedings of the Indiana Academy of Science, Vol. 54 (1945), pp. 142-158.

Since its publication another grant has been made to our regional research program by Mr. and Mrs. Carl J. Thrun in memory of their son, Cadet Donald M. Thrun, who was a victim of an aeroplane accident in the Second World War. This supplementary contribution is thus also gratefully acknowledged.

feet. The Tolleston (1897) and Porter (1934) scales are 1:62,500, with a contour interval of 10 feet.

The varying dates of survey, indicated above in parentheses, and the map scales for the different areas (both horizontal and vertical), should be noted as significant, inasmuch as they serve as a partial index to the relative degree of accuracy of the several sections of the model unit. It should be noted especially that the Tolleston quadrangle was surveyed as far back as 1897. Not only have drainage lines and lake shoreline features been considerably modified since that time, chiefly artificially, but landsurface forms have likewise locally undergone marked transformation.

To check on the more significant changes in this area the author has resorted to the use of the following maps: Map of Lake County, Indiana, 1943, by Wm. J. Schroeter (County Surveyor and Engineer), scale 1:84,480; Map of Calumet and Indiana Harbors, 1942, scale 1:15,000, Corps of Engineers, U. S. Department of War.

The latter map has also been used in revising the outlines of lakes of the Calumet quadrangle—Calumet Lake, Wolf Lake, and Lake George.<sup>2</sup>

As indicated above, local observations also have revealed some significant changes in landforms in the Tolleston area. These are primarily related to dunal features in the northeast corner of the quadrangle and to the ancient "fossil" historic beaches of old Lake Chicago—the Glenwood beach, the Calumet beach, and the Tolleston beach. Unfortunately a ten-foot instead of a five-foot contour interval was used for surveying this flattish area. Local observation leads one firmly to believe that contour lines were drawn only in a very generalized way without regard to detailed dunal configuration. The author, therefore, has taken the liberty, in a few well examined localities, to supply miniature "dunal" outlines so as better to suggest relief reality.

The old Tolleston map, moreover, shows several "island" configurations with as many as three or four contours (30-40 feet) where now are flat building sites of modern Gary.<sup>3</sup> Here also the contour configuration has been modified better to fit the relief perspective as it now appears to the eye.<sup>4</sup>

### The Problem of Vertical Scale

The Calumet area roughly corresponds topographically to the Chicago Lake plain at the head of Lake Michigan and the adjacent part of the Valparaiso moraine bordering it on the south. Since most of the area

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<sup>2</sup> The outlines of these lakes have changed considerably in recent years and are subject to still further changes as the result of drainage and fill-in land reclamation projects.

<sup>3</sup> Gary was not founded until nine years after the Tolleston quadrangle was surveyed, and so the name does not even appear on the map.

<sup>4</sup> Air photographs of the area were not accessible during the war. Several Calumet landscape prints examined since then do not seem sharp enough to recognize fine relief details. Moreover, old shoreline beaches and dunes are commonly covered with a scrub-oak timber which further conceals ridges and dunal outlines.



Fig. 1. Contour model-map of the land surface and hydrographic features of the Calumet Indiana-Illinois region. Contour interval 10 feet; ratio of vertical to horizontal scale 10:1. For horizontal scale and geographic identification see index map, Fig. 2.

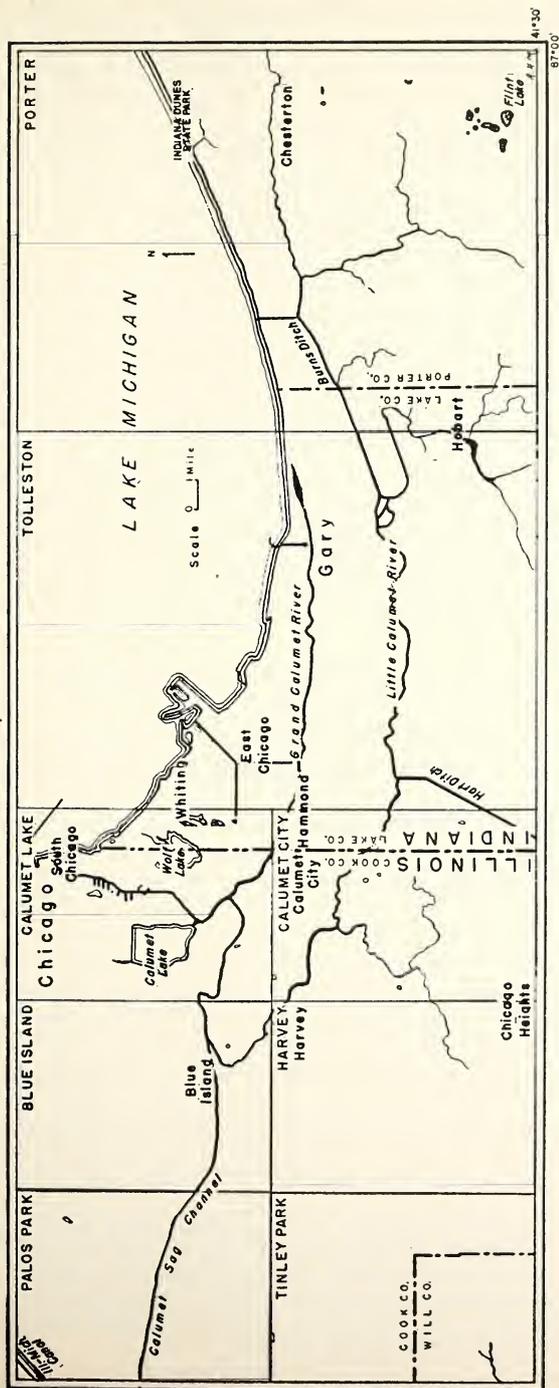


Fig. 2. Physical-political index map identifying the model-map features shown in figure 1. The eight topographic quadrangles which furnished the contour data for the model are identified by the rectangular areas labeled in each case in the upper right hand corner.

is thus low lying and very flattish, simple map contours alone do not seem as effective as "shadow-cast" contours in emphasizing such interesting features as the beach-dune ridges with which is associated geologically old Lake Chicago and with which are associated geographically the east-west arterial highways and shoestring settlements of the region.

While the typical relief model simulates well the terrain configuration, a contourless model likewise does not bring out the subdued landforms as well as does the model where the contours show and thus add to the effect of "sharpness" to such forms. Especially is this true in a photographic reproduction of a model landscape.

But whatever means are used to give a view of the lay of the land of a region, the third dimensional model perspective does introduce a vertical scale problem in such an area like the Calumet where a mountain-like dunal terrain configuration and a relative reliefless plains area lie side by side. Without exaggeration of the vertical scale, the Chicago Lake plain features would be almost indistinguishable. It was found by experiment that a ratio for a vertical scale to horizontal scale of 10:1 was necessary to bring out these subdued but very significant landscape features. On the other hand, such exaggeration of scale does undesirably accentuate the steepness of the slopes of the lofty Lake Michigan dunes. To offset a part of this distortion the dunes area of the model was given several extra heavy applications of white paint used to finish off the model to make it "photogenic".<sup>5</sup>

#### The Physiognomy of the Calumet Area as Revealed by the Model-Map

Three striking morphological units compose the Calumet scene—the flat Chicago Lake plain, the rolling Valparaiso moraine, and the hilly Lake Michigan dunes.

The level of Lake Michigan varies as do the levels of the other great lakes, but is normally given as 581 feet above the mean tide level of the New York harbor. The Lake Michigan shoreline as outlined on topographic maps and as shown on our model-map practically coincides with the 580-foot contour. It will be noted then that from Chicago to almost as far east as Gary not a single contour is added except for a small island (Stony Island) and a few spoils dumps (see Calumet Lake quadrangle). Not until we reach the eastern end of the Tolleston region and otherwise south of the Grand Calumet River have the elevations risen sufficiently to call for an additional contour or two. And not until we reach the southern limits of the plain where it is bounded by the edge of a terminal moraine (the Valparaiso moraine) have the elevations risen sufficiently to call for six contours above the Lake Michigan contour, or an elevation of some 640 feet.

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<sup>5</sup> Though the logarithmic principle of progressively using thinner and still thinner cardboard layers for the same contour interval from the lowest to the highest elevations would result in better slope perspective, this practice did not recommend itself here, since it seemed desirable above all to maintain correct comparative elevations for the beach-dunes of modern Lake Michigan and the three beach-dune ridges of ancestral Lake Chicago.

From here on the elevations rise more rapidly as we ascend the morainic ridge—in the northwest (Palos Park) to a maximum of 745 feet; in the southwest (Tinkley Park) to a maximum of 755 feet. From here on eastward the moraine extends south off the model-map but reappears in the southeast (Porter) where the crest occurs just northeast of the Flint Lake area and attains an elevation of 850-860 feet. From here north drainage is towards the Gulf of St. Lawrence via the Calumet rivers and the Great Lakes; from the ridge southward the drainage is typically to the Gulf of Mexico via the Kankakee, Illinois, and Mississippi rivers. The watershed thus becomes a sort of "continental divide".

The terrain of the Valparaiso moraine is typical of the youthful swell and swail topography of terminal moraines, with one conspicuous exception—the east central part of the Tinley Park quadrangle where, in an area of some half dozen square miles, drainage ditches had to be constructed in the flattish area to get rid of excess moisture.

Most of the morainic country is well suited to general farming, but locally steep slopes produce gulying when cultivation is attempted.

The Lake Michigan dunes, extending eastward from Gary, commonly attain heights of a hundred feet, the maximum heights being reached in the Indiana Dunes State Park where Mt. Tom attains the elevation of 773 feet, or a height of 192 feet above the lake.

This type of terrain with its fine sandy beach at the base affords a unique attraction for the resorter, the recreationist, and the tourist alike, having countrywide appeal.

### The Calumet Plain in Retrospect and Prospect

In the early days marshes occupied much of this low-lying terrain (example, the famous Cady Marsh, the southwestern part of the Tolleston quadrangle, Hart Ditch area). These areas, often covered by several feet of water, proved a decided handicap to transportation and settlement. Even now, adequate drainage and sewerage disposal locally are concomitant problems associated with the two sluggish Calumet rivers and the low marshy areas in the Calumet Lake—Wolf Lake district.

The Grand Calumet River and the Little Calumet River form a sort of hairpin course, the latter flowing westward and the former originally flowing eastward emptying into Lake Michigan at the eastern extremity of the Tolleston quadrangle. Modern canalization of an earlier poorly defined drainage line of the Grand Calumet towards South Chicago and another westward along the "Sag", as well as the construction of the Indiana Harbor Canal at East Chicago, have modified the flow of the current. So low is the gradient of the Grand Calumet, however, that an east or west wind may well determine which way the stream flows.

A somewhat discriminating look at the model-map watershed between the Grand Calumet and Little Calumet rivers reveals the existence of a fine textured terrain configuration of some two contours above the level of Lake Michigan. This is called the Tolleston beach, the innermost one of the set of beaches of old Lake Chicago, the postulated ancestral lake of present Lake Michigan.

About a mile south of the Little Calumet and running parallel with it is another such ridge, the Calumet beach, noted on the model-map as generally a two-contour ridge some twenty feet higher than the Tolleston (620).

Still farther south, bordering the moraine, there occurs a third ridge, the Glenwood beach, rising from one to two contours above the Calumet beach, or an elevation of about 55 or 60 feet above the present Lake Michigan level. Since this beach-dune ridge in most places flanks the moraine, it is not readily distinguishable everywhere on even a five-foot contour interval map. In the southern part of the Calumet City quadrangle, however, this formation is distinctly discernible, particularly where it is extended across a former lake embayment in the form of a compound recurved spit (see the southeast part of the quadrangle).

It was these beach-dune ridges which made possible east-west travel across the Calumet marshes in the early days and which to this day, because of their elevation and sandy base, favor modern highway construction and traffic along their courses.

The only other conspicuous relief features which break the monotony of the lake plain are several elevated so-called "islands" which protrude above the early Lake Chicago waters, as, for example, Blue Island (Blue Island) and Stony Island (Calumet Lake).

If planeness of terrain combined with proximity to navigable waterways and with a strategic lake position for railway convergence upon a city is an asset favoring the growth of a metropolitan community, then the Chicago locale represents a unique topographic situation.

Entering the north limits of our model-map area at Eightieth Street, Chicago has already extended itself far south in the Blue Island and Calumet Lake quadrangle areas. In fact, the whole suburban area, including the cities of South Chicago on the north, Blue Island and Harvey on the southwest, Calumet City and Hammond on the south, and Whiting, East Chicago, and Gary to the east, now constitutes practically one large con-urbanized community with corporate boundaries in most cases even now hardly distinguishable geographically.

It is not, therefore, fantastic to envision metropolitan Chicago sometime sprawled out over practically the whole Calumet lake plain area. And by the possible future development of the Calumet harbors, rivers, lakes, and canals into a unified deep waterway system connecting the Gulf of St. Lawrence with the Gulf of Mexico, the Chicago-Calumet lake plain may yet become the site of the entrepot not only of the Western Hemisphere but of the entire world.

It will be obvious, therefore, that the presently promoted regional, county, and city planning programs in the Calumet region should take cognizance of these geographic facts. Not only will the satellite suburbs previously mentioned want to be alert to this situation, but even the "Calumet plain" communities still farther east, such as Hobart and Chesterton (see map), and the "Calumet moraine" communities farther south, such as Chicago Heights, Crown Point, and Valparaiso (the latter two cities just a few miles off the map to the south) want to observe

the relationship of the planning problem of their own communities to those of the Calumet region as a whole.

It is the hope, then, that the model-map photographed on a sufficiently large enough scale to bring out relief details, will prove helpful as a base map in planning such community projects.

#### Acknowledgments

In the construction of the Calumet model the writer has had the assistance of a number of his geography students—Dorothy Asch, Waldemir Beckman, Edna Bierlein, Loraine Bruening, Mildred Giesecking, Phyllis Graebner, Lois Hennig, and Lois Ihde. To all these students the writer is gratefully indebted for their painstaking care and skill in tracing, cutting out, and assembling the contour sections, basic to this type of landform study.