

A RELATIVE RELIEF MAP OF ILLINOIS

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A map of relative relief purports to depict quantitative differences in terrain conditions between areas. The map is constructed from an analysis of topographic maps, but the method of construction permits considerable latitude.¹

First a rectangular grid is superimposed on the area to be mapped. The size of the mesh of this grid may vary considerably. The upper limit would be established by whatever the cartographer believed to be the largest area to which the term local relief could be applied. The smallest size grid would be one on which the individual rectangles were so small that for many of the rectangles the topographic map itself would furnish no reliable information about elevation differences within the rectangle. After the grid size has been decided and the grid superimposed the maximum difference in elevation within each rectangle is determined by inspection of the topographic sheets.

When the grid has been filled with the maximum relief values, a second arbitrary decision is involved. The number and size of the relief interval classes must be determined, and this involves subjective decisions. After this is done either an isopleth map or a dasymetric map can be drawn indicating the local relief of

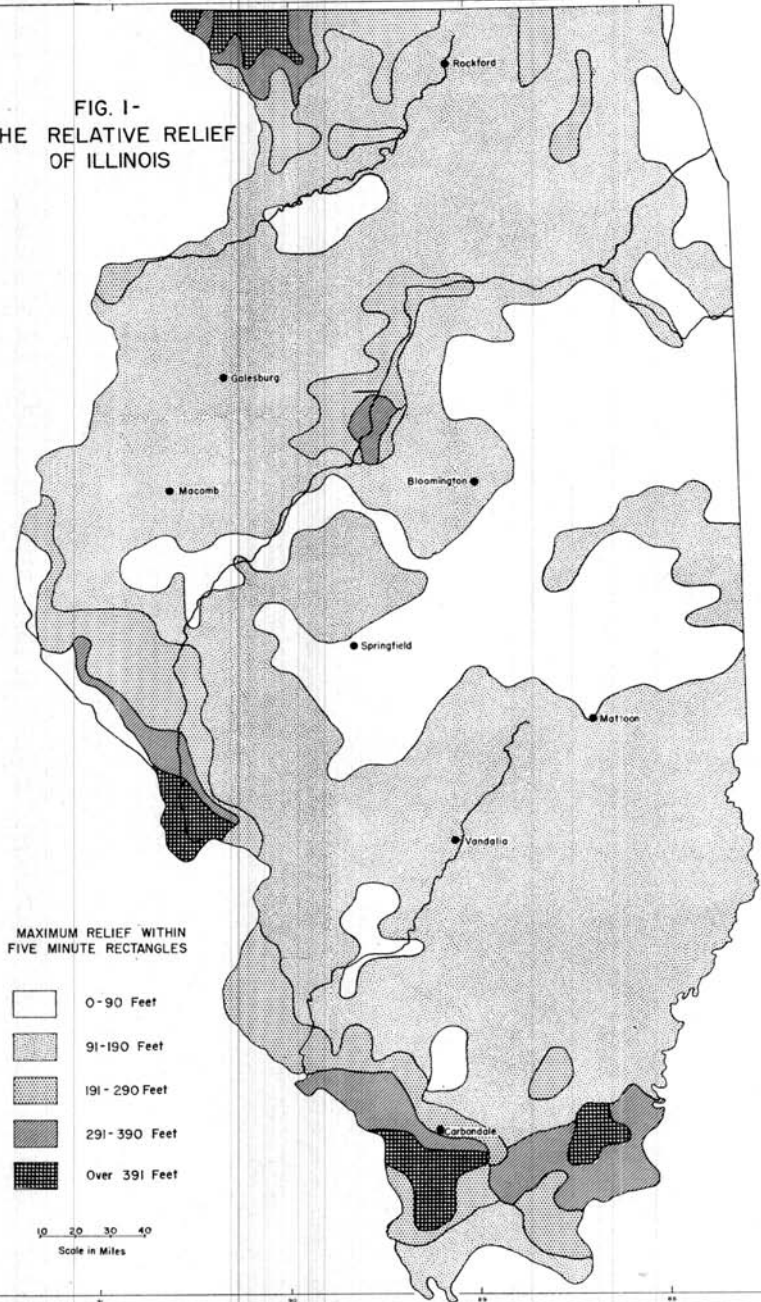
the entire area. This involves, however, a third set of arbitrary decisions; that is, the extent to which the areas will be generalized. How many contiguous isolated rectangles will be established as the lowest number which will be depicted as a separate region? What will be done with a small scattered group of rectangles surrounded by rectangles with a different class interval? All such decisions are arbitrary. Finally, there is the problem of the interpretation of value data in the drawing of boundary lines. Anyone who doubts that great variations are possible in this stage of the process is referred to the article by Mackay.²

The point emphasized here is that the objectivity of a relative relief map is much more apparent than real. If the author of a map of relative relief tells the reader in sufficient detail exactly how the map was made it would be possible (excluding the factor of error) to reproduce the map exactly from the same data using precisely the same methods. Presumably this is true of any map. In practice, however, this has never been done; and moreover, would probably not be worth doing. Put succinctly, a high degree of subjectivity is involved in making a map of relative relief. The map-

¹ G. H. Smith, *The relative relief of Ohio*: Geog. Rev. vol. 25, 1935, pp. 272-284. Also W. Calef, *Trans. Ill. Acad. Sci.*, vol. 43, 1950, pp. 110-115.

² J. Ross Mackay, *Some problems and techniques in isopleth mapping*: Econ. Geog. vol. 27, 1951, pp. 1-9.

FIG. 1-
THE RELATIVE RELIEF
OF ILLINOIS



MAXIMUM RELIEF WITHIN
FIVE MINUTE RECTANGLES

- 0-90 Feet
- ▒ 91-190 Feet
- ▓ 191-290 Feet
- 291-390 Feet
- ▣ Over 391 Feet

10 20 30 40
Scale in Miles

maker adapts the method to show what he thinks should be shown, and he modifies the method for the same purpose, almost as much as he draws his lines in conformance with the figures which his version of the method dictates. The somewhat odd appearing map of Illinois shown in figure 1 probably would be "improved" by greater generalization of the raw data. The author, however, was so acutely aware of the degree of subjectivity and generalization that had gone into the creation of this version that he refrained from any further attempt to "improve" the map by additional smoothing of lines or adjustment of areas. Keeping these characteristics of a relative relief map in mind we may survey briefly the major terrain characteristics of Illinois as revealed by the map.

The popular concept of Illinois as a vast flat plain is relatively accurate. Only along the western and southern borders of the state does the state have extensive areas of strongly rolling or hilly land. The greatest local relief is in the Ozark

outlier in southern Illinois where local relief in excess of 600 feet is not uncommon. In northwestern Illinois, in sections of the Driftless Area, there are a few places where the local relief exceeds 500 feet.

In a very rough way we might visualize the arrangement of terrain features in Illinois as consisting of three interrupted concentric bands: the Grand Prairie Area is largely an area with less than 90 feet of local relief; it is surrounded by a wide band of land with maximum local relief between 90 and 190 feet; that, in turn, is bounded by lands of still greater relief.

Glacial moraines in Illinois are not sufficiently prominent to stand out clearly from the surrounding areas, except where they have been dissected by erosion, as in the vicinity of Peoria.

Relief in Illinois is closely related to the degree of erosional dissection and the areas of higher relief everywhere lie closely adjacent to the three major streams of the region—the Mississippi, Illinois, and Ohio.