Some Problems in Flood Mapping in Illinois

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•DURING the past 2½ yr, inundation mapping in northeastern Illinois has been an interesting, informative, and reasonably successful venture. The cooperator (Northeastern Illinois Metropolitan Area Planning Commission), local governmental agencies, and the general public appear to be content with the form and context of the reports, making good use of the reports, and are favorably disposed toward the project, respectively.

The problems in this venture have been many and varied. In addition to the more common ones, such as preparation of cost estimates and procurement of adequate staff, there have been more unusual ones, such as form and context of the reports, the proper interpretation of data, and even the admissibility of the reports as evidence in legal proceedings.

In 1959, at the request of the Planning Commission, the first flood map for the Metropolitan Area was prepared. It was published as Hydrologic Atlas No. 39. The outstanding floods in this area occurring in1954 and in 1957 are shown as a blue overprint on the already available 7½ min topographic map of the Calumet City quadrangle. Three problems were particularly troublesome. First, there was the difficulty of finding, at that time, adequate field information concerning floods that had occurred as much as five years ago. This area, however, contained several gaging stations, and several profiles that had been developed shortly after the floods were available. By 1959, most of the actual flood marks were gone, however. Interviews with many local residents, yielded varying information. One variation came from those who were hoping for relief by governmental action; they had had frequent severe floods. Different stories came from those who were trying to sell their property; they never had been bothered with floods.

Another problem was the definition of what constitutes a flooded area. In this region, due to recent glaciation, stream nets are poorly developed. There are many swamps, ponds, and miscellaneous areas for which there are no drainage outlets. These areas may be flooded, but with elevations and frequencies entirely unrelated to those for flowing streams nearby. For the first map, this problem was not entirely resolved. Since then, a policy of mapping only those areas directly connected to flowing streams has been adhered to. A statement has been inserted in the accompanying text to the effect that there may be other areas that are unmapped that may be flooded by local precipitation.

The third problem was a delay in publication. More than a year passed between the completion of field work and release of the printed atlas. For work currently in progress, this delay has been shortened, but is still undesirably long. This problem is now being circumvented by use of an open-file release. As soon as a manuscript has been prepared and approved, preliminary black and white reproductions are distributed to interested local agencies, usually within a month after the completion of field work.

After the completion of HA-39, discussions with the Planning Commission resulted in a proposal to map and additional forty-three 7½ min quadrangles. The Commission first proposed that the work be completed in two years, but a compromise of five years was finally agreed on. The first year would be devoted, largely, to the establishment of a suboffice, recruitment of staff, installation of 225 crest-stage gages, and initiation of a flood-frequency study. This would leave time to complete only three or four maps, and would require about ten maps per year for the remainder of the five-year period.

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At this point, an estimate of cost for the entire project presented a problem. The estimate was needed by the Commission to make appropriate contractual arrangements with the local agencies involved. Due to limited experience, only a rough estimate could be made. It appeared that, on the average, each quadrangle would have 25 linear miles of channels to be mapped, and experience suggested $200 per mile for the cost of mapping. Twenty-five percent was added for crest-stage gages, flood-frequency studies, and contingencies. The Commission was then advised that, although any map for any fixed sum could not be guaranteed, the best estimate was an average cost of $6,250 per quadrangle. This is the basis on which all the original agreements were prepared. Since then, some minor extras have been added, and it now appears that the total cost of the project will be about $300,000.

Flood mapping has its legal aspects as shown in the following discussion. The Highland Park map was involved in a legal action almost immediately after its release to the open file. A park board undertook to acquire a portion of the floodplain, and offered to buy at the going rate for flood-plain property. This land, however, was already controlled by a real estate speculator, who claimed the property was suitable for higher uses, and demanded a correspondingly higher price. The park board resorted to a condemnation suit and attempted to introduce the flood map as evidence of fair value. The realtor opposed introduction of the map on the grounds that it was hearsay evidence—the man who made the map did not personally witness the flood. The court was about to uphold the realtor's position until the park board produced a witness who had personally observed the flood. The witness stated that he stood on this manhole cover and that the water was up to here on his legs; this elevation did, in fact, correspond to the information shown on the map. The map then was admitted as evidence, and the park board saved enough money to pay a substantial part of the whole mapping project.

This situation, of course, leaves much to be desired. Not always will an eye witness be available to testify to the validity of the maps.

The problems herein described are by no means a complete catalogue; but they are typical of the problems in flood mapping in Illinois.