

Ephemeral Conflation

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ABSTRACT

The great availability of geographic information, due to SDI development, the existence of data collected by volunteers, etc, makes the problems of geometric interoperability of data very conspicuous. Traditionally, conflation is being carefully carried out and evaluated by experts. Yet there are practices that involve occasional users who will look up the information in mobile devices without the intention of keeping a copy. Evaluation will be carried out with different criteria, involving the Human Visual System and perhaps even the characteristics of the physical devices as well. In this paper we coin the term Ephemeral Conflation to characterize that context and the procedures to evaluate it.

I. INTRODUCTION

A variety of circumstances have been the cause of an ever growing availability of geographic information, its easy online accessibility and its production both inside and outside the traditional institutions. People in turn are getting familiar with new services and mobile devices capable of accessing and displaying information in an office, a park, a street or a stadium. These people constitute a new kind of users for the geographic information: they are not specialists, aspire to quick answers and will make only a visual evaluation of the information. They make up a large group with quickly changing needs and are currently being considered by traditional producers. The Spatial Data Infrastructures (SDI) provide access mechanisms and ease of query which enable location and fast retrieval of geographic information of dissimilar origin, which will be jointly displayed. As the technological issues of location and data transfer begin to be solved, new challenges, now associated to the data itself, arise. When trying to jointly represent data of different lineages, geometric discrepancies may become evident. In order to lessen these discrepancies, a preprocessing of the geometry is needed as a part of a process called conflation. The term was borrowed from the area of arts and humanities

by Saalfeld (Saalfeld, 1983) for studies of geometric alignment of geospatial data of different sources; it comes from the latin *conflatio*, which means the action and effect of fusing (Cambridge Dictionaries Online, 2011). In the scientific literature the expressions *fusion* (Wald, 1999) and *harmonization* (Thornton, 1977) of data are also employed among other related terms. Formally the process of fusing two or more geospatial datasets into one is what is meant by conflation. Of the product thus obtained, new information may be extracted that none of the parts making up the set may provide separately. However, by and large the conflation of different cartographies does not generate a third one without problems or errors (Saalfeld, 1983). Such issues are still pending a satisfactory resolution, with significant research efforts at present. There is an urgent need to overcome the present difficulties, mainly motivated by the opportunity of using the large volume of heterogeneous geospatial data available on the Internet, from different origins, methodologies, scales, accuracies, etc. and from different sources (government agencies, private companies, universities, individuals, etc.) that refer to the same geographic area,

As an example of the previous statement, some references show new solutions to traditional problems of the conflation: Ruiz *et al.* recently presented a state of the art of conflation. They described the different definitions of the term conflation with its nuances by different authors; it defines each stage of the procedure, its metrics, possible applications, it reports which software exists, and finally proposes a general classification of the conflation (Ruiz *et al.*, 2011). All the literature recognizes as the first step the identification of the homologue of two map objects. This is addressed in full by Li *et al.* (2011). They focus on an optimized method for the identification of homologous objects when they are linear entities. Sledge (2011) recognizes the progress achieved since Saalfeld's seminal work, but also recognizes that the conflation problem is still a challenge. The author presents a method for geometric conflation (once identified homologous objects) in the case of the polygonal type (usually represented