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Compatibilization of geographical names used in the Brazilian official mapping

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Abstract:

The standardization of the geographical names used in the Brazilian official mapping presents a great challenge. In addition to the continental dimensions of the Brazilian territory, of the large volume of geographical names and the variety of the linguistic heritage received throughout our history, the official national basemaps, objects of the work in this project, were produced in different temporal contexts and scales, using different techniques and procedures. To this end, as recommended by the United Nations Group of Experts on Geographical Names (UNGEGN), this project intends to accomplish the adoption by all cartographic products, in all mapping scales, of only one name with only one spelling, for each feature/object, whenever possible, by means of a comparative analysis of the geographical names in the official cartographic bases.

Bellow, an example of the lack of standardization (Figure 1) between drainage stretches of the cartographic bases at the 1: 100,000, 1: 250,000 and 1: 1,000,000:

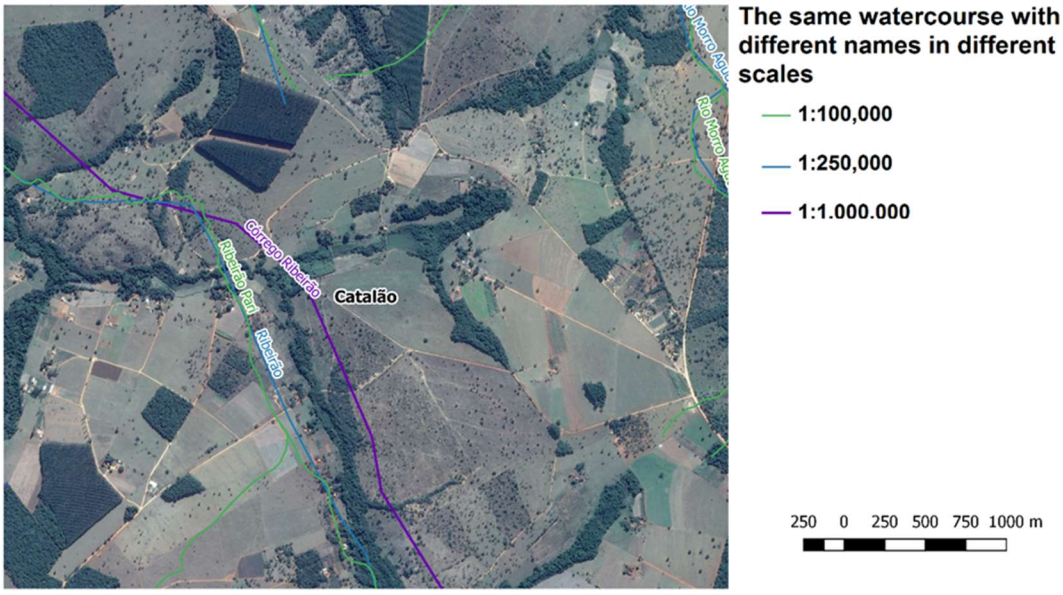

Figure 1. Example of lack of standardization.

The main objective of this harmonization is to integrate the cartographic bases with the Brazilian Database of Geographical Names so that the geographical names are updated, standardized, and harmonized between the different cartographic scales. It is desired that these databases are as convergent as possible and with known and justified divergences.

Knowing that geographical names are transversal to mapping scales and cartographic products, we developed a methodology that combines the resources of PostgreSQL/PostGIS databases and the direct interference of toponymists.

This methodology consists of two phases, where Phase 1 (Figure 2) consists of an automatic process that compares all vector cartographic bases produced by the Brazilian Institute of Geography and Statistics (IBGE) and, for each feature, updates the compatibility field, indicating in which bases the names are different, and the similarity field that receives the percentage of similarity among the names. The process also assigns a unique identifier to the names and updates this identifier both in the vector basemaps and in the Brazilian Geographical Names Database.

Phase 2 (Figure 2) encompasses the analyzes carried out by specialists in geographical names, supported by: a) predefined queries on compatibility information and degree of similarity, where we can select, for example, all the features that make up administrative boundaries whose names are incompatible among the basemaps, or even select all the geographical names whose degree of similarity among the bases is close to 100%, to check whether there has been a spelling error; b) QGIS plug-ins to validate names and document research in the Brazilian Geographical Names Database; and c) PL/PGSQL triggers to track names that have changed after validation. Phase 2 (Figure 2) is the most complex and time-consuming phase, because it involves the analysis by toponymists of each divergence pointed out in Phase 1, in order to decide which name is most appropriate for the feature. When it is not possible to establish a single geographical name for the geographic object with the analysis carried out in the office, the divergences are stored for future field research. Preferred names are given “validated” status and the non-preferred ones are stored as names that have already been used for that geographical feature.

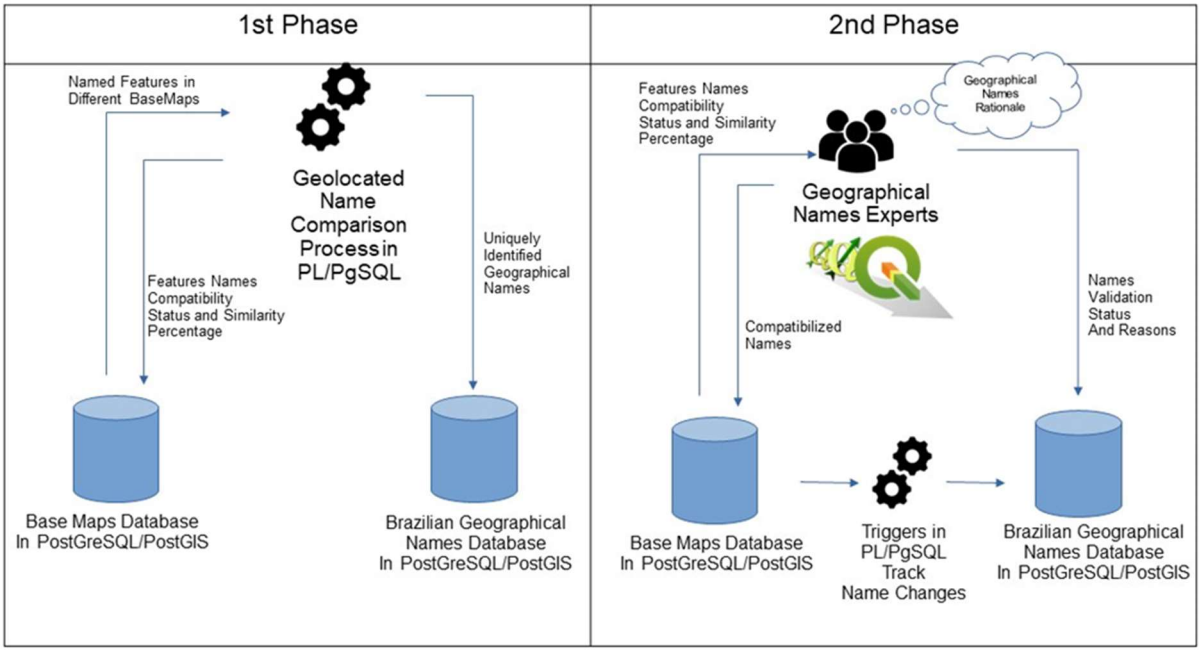

Figure 2. Illustration of the geographical name compatibility methodology.

The benefits of applying this methodology are: building a unique repository of geographical names for the products of the Coordination of Cartography of the IBGE; systematizing the treatment of geographical names; obtaining greater control over the divergences of geographical names in the different mapping scales; establishing criteria for the standardization of geographical names; encouraging joint work among the various cartographic production areas of the IBGE; and, facilitating the updating of geographical names.

The development of this methodology started in 2017. However, most of the work done was lost, because the work in the production of the basemaps was not blocked in the area under the compatibilization process, which caused the loss of the link between the production basemaps and the intermediate table used for the analysis. Subsequently, we carried out the compatibility of names of the hydrography, relief, and locality categories of two states (Espírito Santo and Sergipe), with the blocking of the work of the production of the basemaps in the areas under compatibility procedures. Currently, we have added the fields “compatibility”, “similarity”, and ‘validation”, in addition to the pre-existent field “unique identifier” of the geographical name, in the tables that make up the vector basemaps of the IBGE, with the objective of rendering the compatibility process of the geographical names of the categories of hydrography, relief and locality a continuous activity of the Geographical Names Department.

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