

Reference Cartographic Map: from the data to the product

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Abstract

This abstract aims to summarize the procedure implemented by ITHACA S.R.L. in the last year for creating Reference Cartographic Maps. The team, thanks to its strong competences in the field of management and processing of geographic and cartographic data and its skills on GIS, Mapping and Data Analysis is able to produce maps in different size and orientation and to satisfy the specific requests of the customers, e.g. European and International organizations.

Figure 1 shows the preparatory activities carried out. An in-depth investigation of different open available and official datasets containing the main reference topographic geospatial data (e.g. boundaries, physiography, points of interest, settlements, transportation, hydrography) used for the creation of Reference Maps was the starting point [1].



Fig. 1. Setup activities for Reference Map

A preliminary analysis on the level of detail and accuracy of the data, as well as the completeness, the timeliness, the temporal coverage, the data policy and accessibility was performed. This initial setup was useful to decide the list of feature classes necessary and to choose the better data to use according to the map requested. It is important to have a bulk of data that can be used in different scales and formats of maps. For this reason a proper Geodatabase was implemented to store and to integrate all geospatial information found. The particular scheme of the GDB was realized to uniform the data belonging to different sources; it permits to save the data used and modified in the final products, so to facilitate its reuse in future requests and to maintain the same structure for any types of product [2].

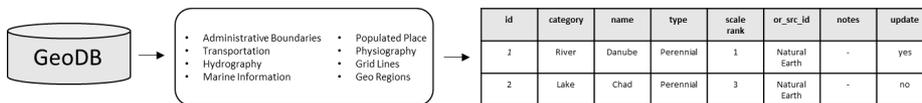


Fig. 2. The geodatabase structure

As mapping products with different characteristics both in terms of content, orientations and format can be required, ITHACA S.R.L. has also developed a set of map template

prototypes in ArcGIS Pro environment, that ensure an homogeneous look-and-feel and a company branding while allowing to manage product specific requirements [3]. The possibility to have a wide choice of templates permits to speed up the map production activity by pre-defining the locations of map elements, minimizing the amount of human interaction required to make the maps and automatically adjusting the characteristics of map elements to create a visually pleasing and easily interpretable product [4].

Regarding the Map Production (Figure 3), in a first time, the team analyses in more detail the request of the customer, in order to achieve a complete understanding of the context and the use of the product and to identify the geospatial data necessary to correctly manage the related production activities. Subsequently, the appropriate map template prototype, in terms of format and orientation, is chosen. In the map template, there are three sections that corresponds to three steps:

- The first mainframe permit to focus quickly on the Area Of Interest, to manage the extent, to set and fixed the required scale and to select the appropriate map projection.
- Once chosen the extent, the second mainframe permit to see all the features contained in the GDB and to clip the data using a clip tool created ad-hoc.
- The third mainframe includes the Table of Contents with all the layers that can be visualized in the map.

Then later, the data are uploaded in a shared GDB and linked to the TOC of the template. The data will need to be checked in terms of geometry and attributes; if they have gaps it will be necessary editing operation. Moreover, some definition query can be used to filter and simplify the data. The particular scheme of the Dataset and the use of a shared GDB speed up the editing phase, also ensuring consistency and uniqueness of the topological content and standardizing the cartographic representation of different areas of the world. This makes the final product easy to interpret even for non-expert users.



Fig. 3. Workflow for creating Reference Map

In order to produce a Reference Map of high level, the operator must verify carefully each element of the template which may have minor changes in order to better fit the type of product or rearrange to improve visualization and readability. Finally, dedicated quality check tasks, led by a team of quality experts, are foreseen. Use of quality assurance protocols, technical guidelines and checklists will ensure the products' best quality.

References

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 [2] Types of geodatabases, <https://desktop.arcgis.com/>
 [3] Layouts in ArcGIS Pro, <https://pro.arcgis.com/>
 [4] Cartographic Considerations, <https://www.icsm.gov.au/>