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The Production of a New Topographical Map Series at scale 1:25000. The case of Cyprus.

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Abstract:

The "Department of Lands and Surveys" (DLS), as the National Mapping and Cadastral Agency of Cyprus, through the Cartography Branch acts as the official Cartographic Organisation of the Republic of Cyprus, representing Cyprus in international and European organisations such as: ICA, EuroGeographics, EuroStat/GISCO etc.

The continuous effort to upgrade the cartographic products following international standards, as well as the absence of a modern updated National Topographic Series of maps (the only complete medium scale topographic map series for Cyprus was produced by the Defense Geographic Centre-DGC-of the UK Ministry of Defense, back in 1999. This is a 50k map series, including 24 sheets) led the Department in the creation of a newly structured cartographic /topographic database and additionally the production of a new topographic map series, at scale 1:25k.

It is noted that the Department's major GIS cadastral application is running for more than 25 years on esri platform. Currently, a major upgrade of the GIS sub-system (cadastre) is on development, again on esri (ArcGIS Pro platform). Since the cartography was not a part of this tender and no inhouse development team is available, as well as the lack of human and technical resources and also funding, the Department proceeded in building its cartographic database with a predefined solution under the esri platform. Thus, the Topographic Data Store Entity Catalogue (TDS EC) was selected as the database schema. The esri platform also provides a complete set of core tools to streamline the cartographic process, without any vital customization needed in the fields of topology rules, validation rules, map templates and representation styles.

Therefore, data from all single feature classes were migrated to TDS V6.0 early in 2018 using a cross reference process. Up to 1 million rows of data were transferred to the new single database through a cross - reference process as illustrated below:

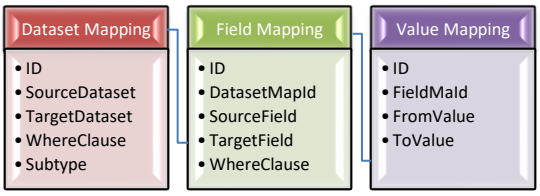

Figure 1: Tables in the cross-reference database and their relationship

Unfortunately, for some of the data only geometry was able to be transferred, thus users are still restoring compatibility in classification and attribution to the new data model. Later in 2018, during an ESRI's visit to DLS, the ArcGIS Production / Defense Mapping Lead Product Manager kindly upgraded TDS from V6.0 to TDS V7.0.

In order to proceed with a new topographic map series, a new grid was built, based on international standards. This resulted in a new separation system of 31 sheets of scale 1:50k and 89 sheets of scale 1:25k as presented in figure 1. The new sheets are uniform in size and orientation. They have encoded name (per sheet), at a national level, and a template widely accepted by various countries and cartographic organizations (e.g., Hellenic Military Geographical Service).

The cartographic workflow is basically organised in 7 major steps as presented below:

1. COMPLETION OF DATA IN TDS: users collecting and updating data per map sheet
2. DATA PREPARATION: extract AOI, Map sheet Information, add boundary
3. CREATE RAPID GRAPHIC: select product type and version using mxd template

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4. FIRST OUTPUT: map document, production pdf
5. MAP EVALUATION
6. ENHANCE CARTOGRAPHY: annotation, notes, map information (M.J.Kraak & F.J.Ormeling, 1996)
7. PUBLISH MAP

At the moment, only 3 sheets out of 89 are completed and 2 others are one step before publishing.

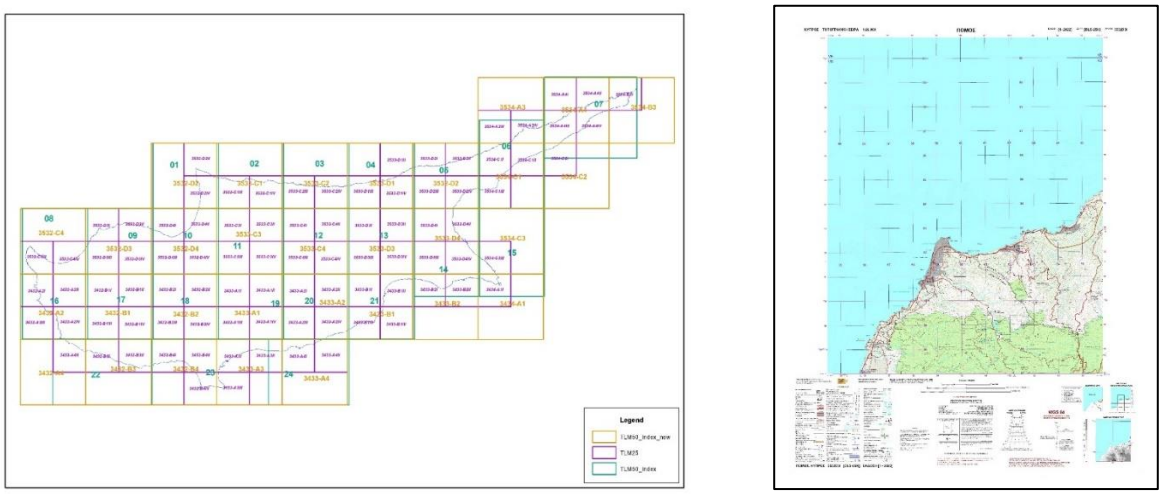

Figure 2: New grid separation at scales 1:25k and 1:50k, compared to the grid of 1:50k prepared by DGC (UK) and example of a completed map sheet, «ΠΟΜΟΣ», 3532D3I, 1:25k.

During this project the following issues have been identified:

- The time frame is not that promising. The existing map production process is not efficient (no batch processing). Significant data required for the map compilation (e.g., land cover) are still uncompleted. The team working in this project is very small (7 persons in total) and not fully dedicated due to other responsibilities.
- Significant automations that would help speed up the process of data collection and update in data themes like land cover (feature extraction & change detection) are missing. All data capture and classification processes are done in house.
- Migration to ArcGIS Pro (e.g., representation rules vs symbology, annotations).

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