UTILITY OF OLD POLISH CITY MAPS AND OLD LAND USE MAPS FOR MULTITEMPORAL DETAILED LAND USE SURVEY

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Abstract
In the research reported here, the authors analysed and synthesised the possibilities and limitations of use of information from old Polish land use and city maps containing detailed land use information of 1594 – 1939 period for historical land use/land cover surveys, as well as detection of long-term land use/land cover changes. Authors employed also the results of previous research on potential use of the ancient topographic maps for historical land use surveys. The results of analyses allowed to propose the concept of metadata tool for spatiotemporal analyses of detailed land use and land cover changes in Poland in 1606-1939 period. It takes into consideration the information about the coverage, temporal relevance and thematic scope of analysed maps and its relevance with CORINE Land Cover level 6, 5 and 4, Polish national topographic database (BDOT10K), functional classifications and Polish ELU monitoring proposed by IGiK.

Keywords: Detailed historical land cover / land use, Old city maps, Old land use maps, Existing Land Use Monitoring, Spatiotemporal analysis, Metadata

1. INTRODUCTION

During last years in many EU countries the growing interest in land use monitoring of the level of details corresponding to the Urban Atlas or CORINE Land Cover level 6 was observed. This kind of information is very useful for detailed spatial analyses of multifunctional urbanized and/or industrialized areas i.e. for spatial planning (Drzewiecki 2017; Klapa, Mitka 2017; Smaczyński, Medyńska-Gulij 2017) and for detection of areas of environmental problems resulting of economic activities with aid of cartographic animations (Dukaczewski 2016a). The advent of new, very high resolution satellite data, lidar and UAV multispectral data together with new possibilities of analyses allow to achieve rich, up-to-date spatial information on ELU - Existing Land Use. However, it should be emphasized that in the case of areas of complex functions and relatively fragile ecosystems the knowledge on long term processes and land use changes is also necessary. Many research have proved that old land use maps (or maps containing rich land use information) are very useful data source for evaluation of the long-term trends and help explain the reasons of recent environmental processes (i.e. employing spatiotemporal analyses, advanced cartographic animations). These maps were objects of many scientific studies and were described in many publications. The problem is that due to the dispersion and different (sometimes narrow) scope of these publications, it is very difficult to employ them directly as a reference for evaluation of old maps for multitemporal detailed land use survey. This implies the need for (ISPIRE comply) dedicated metadata, including information about the thematic scope of old maps and it’s relation with CORINE Land Cover level 6, 5 and 4 legend, thematic scope of national topographic database, land use functional classification, as well as thematic scope of ELU monitoring.

2. OBJECTIVES, APPROACH AND METHODS

The first aim of this research was to analyse and to synthesize the possibilities and limitations of use of information from old Polish land use and city maps containing detailed land use information of pre- 1939 period for historical land
use/land cover surveys, as well as detection of long-term land use/land cover changes. To achieve this goal it was necessary to carry out the archival research and to identify the useful maps. The next step was an analysis of the thematic scope of these maps and its comparison with CORINE Land Cover level 4 Smolenice legend and CORINE Land Cover level 5 and 6 nomenclature proposed by IGiK (Dukaczewski 2016b)\(^1\). The three levels of CLC legend were proposed as state, regional and local level of ELU database respectively. It was also necessary to compare the thematic scope of old maps with scope of the national topographic database (BDOT10K), as well as HILUCS (The Hierarchical INSPIRE Land Use Classification System) functional nomenclature. The similar analysis was carried out in the case of old topographic maps. The second aim of research was to propose the metadata database of analysed maps conformed with Data Specification on Land Cover Technical Guidelines (2013). This database included information on provisional identifier, map extent, name, nomenclature documentation, URL, lifespan and temporal validity, as well as CLC level 4, 5 and 6 nomenclature codes (corresponding to the thematic scope of analysed maps). Carried works allowed to propose also the concept of the metadata tool for identification of data sources useful for spatiotemporal analyses of detailed land use and land cover changes.

3. RESULTS

The archival research carried out by authors have demonstrated that the first detailed maps portraying land cover and land use appeared in Poland at XV and XVI century. In the case of 1594 – 1939 period it was possible to identify the 1950 city maps and local extent cartographic documents, which can be employed like data source on old land use. In April 2018 941 of these documents were available in digital form. The thematic scope of land use information available in the case of topographic maps published in 1732 – 1939 period was described by Dukaczewski (2001). Employing like criterion the genesis and purposes of analyzed maps it was possible to distinguish 13 groups. The first (small) group are the oldest preserved Polish maps portraying land cover and land use which were prepared for the foundation of new towns, towns expansion or new investments (like in the case of map of Cracow by G. Alabiano of 1594), as well as surveying and mapping documents of the Crown properties, resulting of agrarian and urban reform and ‘enforcement of the law policy’ like in the case of map of Ujazdów of 1606 (fig. 1) or Łomża (1619).

![Figure 1. Il sito della villa di Jasdovia (Ujazdów), ca. 1: 800, elaborated by Alessandro Albertini (1606) (2)](image)

The number of CLC classes which can be identified in the case of this group of maps varied between 8 – 24 (CLC level 4), 14 – 32 (CLC level 5) and 18 – 40 (CLC level 6). The number of HILUCS classes oscillated between 8 and 27, while in the case of Urban Atlas from 6 till 12, and from 10 till 52 in the case of BDOT10K.\(^2\).

The second group contains detailed city plans of the second half of XVI and first half of XVII century. In this period the need for detailed spatial information resulted in relatively big increase of number of city land use maps in royal map

\(^1\)Proposed CLC level 5 and 6 nomenclature is available at: http://www.igik.edu.pl/upload/File/dr-dd/2016_CORINE_5_6.pdf

\(^2\)The maximal (recent) number of land use classes is 106 in the case of CLC level 4, 189 (CLC level 5), 522 (CLC level 6), 203 (BDOT10 K), 20 (Urban Atlas). The number of functional classes of HILUCS is 64.
collections (specially in collections of kings: Zygmunt III Waza and Władysław IV). They were used as inventory documents, useful tool for urban planning, as well as main source material for topographic surveys. It was the case of 1: 7500 scale map o Warsaw of I. Hoppe (1641). Big part of these maps (1034 items mentionned in Ehrensvärd (2008)) was stolen during 1655 – 1660 war and is now available in Sweden, like plans of Tczew (1634), Grudziądz (1635), Malbork (1635) Gniew (1635), Nowe (1634), Puck (1634) by F. Getkant or anonymous maps of Brodnica (1626), Elblag (1629), Gdańsk (1629), Gniew (1626), Gorzów Wielkopolski (1631), Pułtusk (1634) and Malbork (1626). During the same war Swedish cartographer E.J. Dahlbergh has made the detailed maps of Golub, Nowe Miasto Lubawskie, Ujazd, Elblag, Gniew, Brodnica, Sandomierz, Gniezno, Nowy Dwór Mazowiecki, Gdański, Warszawa, Brześć Kujawski, Pińczów, Piotrków Trybunalski, Złotów and Malbork, published in Dahlberger and Putendorf (1655). The number of CLC classes which can be identified in the case of this group of maps varied between 14 – 36 (CLC level 4), 17 – 47 (CLC level 5) and 18 – 52 (CLC level 6). The number of HILUCS classes varied between 7 and 24, while in the case of Urban Atlas from 5 till 12, and from 14 till 68 in the case of BDOT10K.

The third group is represented by maps resulting from state policy of reconstruction and modernization of cities and towns after Polish-Swedish War and Northern War. The Polish Parliament (Sejm) has set up so-called ‘Paving Boards’, which were responsible for carrying out a detailed urban survey for urban planning and technical works. The first Paving Board was created in Warsaw in 1659. The detailed urban survey (including also land use and land cover mapping) carried out in Warsaw in 1685, 1693 and 1700, resulted in many urban maps prepared i.e. by architect and military engineer Tylman de Gameren. The number of CLC classes which can be identified in the case of this group of maps varied between 8 – 24 (CLC level 4), 9 – 30 (CLC level 5) and 14 – 38 (CLC level 6). The number of HILUCS classes varied between 8 and 20, while in the case of Urban Atlas from 7 till 12, and from 17 till 72 in the case of BDOT10K.

The fourth group is represented by maps resulting of detailed urban land use mapping, which was carried out in some private towns (i.e. works of Józef Naronowicz, Teofil Spinowski), as well as in private or church properties in cities and towns – i.e. 1: 1600 scale map of Ujazdów by Tylman de Gameren (1699), 1: 1680 and 1: 6 000 scale plans of Kraków (1667, 1670)². Due to the reduced extent of these maps the number of CLC classes which can be identify in the case of this group of maps varied between 4 – 12 (in the case of CLC level 4), 6 – 20 (CLC level 5) and 8 – 24 (CLC level 6). The number of HILUCS classes varied between 4 and 19 while in the case of Urban Atlas from 6 till 11, and from 14 till 54 in the case of BDOT10K.

The fifth group includes the urban maps of the first half of XVIII century, which have become popular in Poland, as a useful tool for reconstruction, evidence and to take the legal actions. This group is represented by 1: 3400 scale map of Lublin by C.V. Örken (1716), 1: 1800 – 1: 3900 scale plan of Warsaw by C.F. Werneck (1732), 1: 14 000 scale map of Warsaw by C.F. Hübner (1740), as well as anonymous 1: 7000 scale Saxonian plan of Cracow 1733/1734. The number of CLC classes which can be identified varied between 10 – 26 (in the case of CLC level 4), 12 – 32 (CLC level 5) and 16 – 42 (CLC level 6). The number of HILUCS classes varied between 10 and 32, while in the case of Urban Atlas from 10 till 12, and from 17 till 72 in the case of BDOT10K.

To the sixth group belongs the maps resulting of the works of the second ‘Paving Board’ (1740 – 1765), presided by Great Field Marshal of Crown Franciszek Bielinski, as well as was the Boni Ordinis Commissions (established in 1765). One of the results of works of the ‘Paving Board’ was publication of 1: 1100 scale Plan of Warsaw by Pierre M. Ricaud de Tirregaille of 1762 (fig. 2), as well as 1: 6900 scale Plan of Warsaw by Georges Luis Le Rouge in 1768. The goal of the Boni Ordinis Commissions was to coordinate and carry out the field works by signing the contracts with certified land surveyors. The survey of Warsaw carried out in 1770 – 1772 resulted in elaboration the 12-sheet 1: 3400 scale maps of Gdańsk (Schmidt 1780, 1792). The growing need for detailed up-to-date information has resulted in creation of a new plan of Warsaw in 1779 by Piotr Hannnequin (Planta Miasta Warszawy z Przedmiściami / Plan Ichnographique de la Ville de Varsovie...1779). In 1783 the Plan of Kraków elaborated by J. Kromer, and Plan of Lublin by Jan Nepomucen Łęcki were published, as a result of works of the local Boni Ordinis Commissions. During the second half of XVIII century in few Polish cities the urban survey and mapping was animated by local initiatives. In Gdansk, the main cartographic animator was mayor of Old City J. E. Schmidt, author of two 1: 3 400 scale maps of Gdanski (Schmidt 1780, 1792). The detailed city plans were elaborated for Toruń (1769), Zamość (1774), as well as in Kraków (1785), where their publication was commissioned by rector of Academy of Cracow Hugo Kołłątaj. In the case this group the number of CLC classes varied between 11 – 29 (CLC level 4), 14 – 32 (CLC level 5) and 16 – 38 (CLC level 6). The number of HILUCS classes varied between 14 and 39, while in the case of Urban Atlas from 11 till 15, and from 20 till 109 in the case of BDOT10K.

² probably by Mikołaj Brożek z Kurzelowa
The seventh group consists of property maps and plans in XVIII century - for example 1: 2 500 scale plan of Bolimów (1745) by Michal Nagrodzki, anonymous 1: 4900 scale plan of Łańcut (1750), plan of Łatowicze (1782) by Józef Żochowski, Nowy Dwór (1797) by Tymoteusz Nowicki, 1: 1270 scale map of Piotrków Trybunalski by Dominik Merlini (1786) and map of Włocławek (1787) by Marcin Sitz. Due to the reduced extent of these maps in the case of this group it was possible to identify 9 – 25 classes in the case of CLC level 4, 11 – 32 classes in the case of CLC level 5 and from 17 till 39 classes of CLC level 6. The number of HILUCS classes varied between 10 and 21, while in the case of Urban Atlas from 8 till 12, and from 12 till 51 in the case of BDOT10K.

The eight group of old Polish maps portraying land cover and land use is the result of intensive development of topographic mapping in the second part of XVIII century. Some topographic maps included supplementary sheets of topographic map series - i.e. Plan of Warsaw by A. Rizzi – Zannoni of 1772 (Plan de Varsovie, levé par ordre de Son Excellence Maréchal le Comte Bieliński, Grand marechal de la Couronne, par M.P. Ricaud de Tirregaille, Lieutenant Colonel et Ingénieur au Service du Roi et de la République en 1762, ca. 1 : 6750, 1762), Józef Jablonowski (1764), and Rizzi – Zannoni (1772), 1: 100 000 topographic maps of Prussia by Jan Władysław Sadowski, 1: 225 000 maps of voivodeships of Poland by Charles Perthées, as well as 1: 170 000 Map of the Starosty of Spisz by Franciszek F. Czaki included relatively rich land cover information. In the case this group the number of CLC classes varied between 9 – 21 (CLC level 4), 10 – 33 (CLC level 5) till 16 - 36 classes of CLC level 6. The number of HILUCS classes varied between 12 and 38, while in the case of Urban Atlas from 10 till 15, and from 32 till 88 in the case of BDOT10K.

The organization of urban surveys was changed by Parliament law of 1791, dissolving the Marshal Office and Paving Boards, and creating ‘Both Nations Police Commission’. According to the article VII of Economical Ordination of this Commission (Ordynacja ekonomiczna dla Komisji Policji Obojga Narodów, 1792) the urban survey was coordinated by Department of Order of Both Nations Police and carried out by certified geometers (members of Association of Architects and Geometers). This resulted in considerable stimulation of urban surveys, but the results were used by cartographers of Prussia, Austria and Russia. The partitions of Poland in 1772, 1793 and 1795 resulted in new cartographic activities of so-called ‘regulation’ maps and plans (1772 – 1806) including also information about land use. The most interested were maps of Poznań (1772), Dobrzyń nad Wisłą, Dobrzyń nad Drwęcą, Gostynin, Lipno, Rypin, Szadek, Płock and Toruń (1793), Cracow (1794), Rawa Mazowiecka (1799), Wiskitki (1802) and Pultusk (1803), as well as 1: 7 243 scale Plan of Warsaw (1796) by Gustav Johann Georg von Rauch. In the case of this group it was possible to identify from 6 – 21 classes (CLC level 4), 10 – 33 (CLC level 5) till 16 - 36 classes of CLC level 6. The number of HILUCS classes varied between 10 and 32, while in the case of Urban Atlas from 11 till 17, and from 29 till 80 in the case of BDOT10K.
Majority of city maps published during the period of Duchy of Warsaw (1807 – 1815) concerned the strategic sites like Modlin, Serock, Sandomierz and Toruń. One of the most interesting city map was *Plan of Warsaw* (1808 – 1809) by Joseph Bach (fig. 3). The thematic scope of these maps concerning land use and land cover was corresponding to 7 – 24 classes (CLC level 4), 14 – 36 (CLC level 5) till 18 - 39 classes of CLC level 6, while the number of HILUCS classes varied between 14 and 48, while in the case of Urban Atlas from 14 till 17, and from 32 till 98 in the case of BDOT10K.

![Figure 3. Plan of Warsaw by Joseph Bach (1808 – 1809)](image)

During the period of autonomous ‘Kingdom of Poland’ (1815 – 1830) 203 towns were surveyed and mapped in 1: 1 500 and 1: 5 000 scales, according to the common instructions of so called ‘City Commission of Commission of Internal Affairs and Police (KRSW)’. Unfortunately, majority of these ‘regulation plans’ was lost during 1944 Warsaw Uprising⁴. In the same period the Corps of Crown Engineers and General Quartermaster’s Department of Polish Army have prepared the 1: 126 000 scale *Topographic Map of Kingdom of Poland*, including rich information about the land cover. Surveys and mapping of Warsaw carried out by Corps of Crown Engineers and General Quartermaster’s Department resulted *i.a.* in a 1: 4 200 scale *Plan of Warsaw* (1818 – 1819) by Jan Chrzciciel Mallet (Malletski) and Józef Koriot (fig. 4). The thematic scope of these maps concerning land use and land cover was corresponding to 8 – 24 classes (CLC level 4), 10 – 38 (CLC level 5) till 12 - 42 classes of CLC level 6. The number of HILUCS classes varied between 10 and 32, while in the case of Urban Atlas from 11 till 17, and from 29 till 80 in the case of BDOT10K.

Dissolution of Corps of Crown Engineers and General Quartermaster’s Department of Polish Army and limitations of activities of KRSW after fall of the November Uprising (1830 – 1831) resulted in limitation of publication of detailed plans and maps containing rich information on land use and land cover in Kingdom of Poland. The former territory of the Kingdom of Poland and Lithuania was surveyed and mapped in 1772 – 1918 by Prussian, Austrian and Russian cartographers, and resulted works (i.e. three Austrian, Russian and Prussian topographic surveys) can be a very useful source material for land cover changes analyses. The thematic scope of these maps was described by Dukaczewski (2001). Aside from topographic surveying and mapping in 1831 – 1918 period the main source of land use and land cover information about recent Poland were detailed regulation plans (in the case of so called ‘Kingdom of Poland’ made at the 1: 4200 scale), commercial city plans⁵ and detailed land use maps for technical infrastructure planning (*i.a.* map of Warsaw of 1878 – 1913 at 1: 250, 1: 2500 and 1: 4200 scale by William Lindley). Due to relatively reduced thematic scope of some commercial city plans the number of CLC classes possible to identification is comprised between 6 till 25 (CLC level 4), 8 and 40 (CLC level 5) and 12 - 45 (CLC level 6). The number of HILUCS classes varied between 14 and 48, while in the case of Urban Atlas from 15 till 18, and from 32 till 163 in the case of BDOT10K.

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⁴ In the case of this group it was possible to analyse the thematic scope of maps of Aleksandrów, Jadów, Konstantynów, Ozorków, Tomaszów Mazowiecki, Zduńska Wola and Zgierz

⁵ 278 identified items
1916 Eugeniusz Romer has published in his *Geographical-Statistical Atlas of Poland* a map entitled "Land Use", but this map was showing the percentage of arable lands and forest areas.

In the interwar period (1918 – 1939) the numerous attempts at drawing up land use maps were made. For the most part these were maps included within the text of articles, although sometimes they constituted separate attachments and pertained more to small regions. Land use mapping was of a fragmentary and patchy nature, being performed for different areas on differing scales and following differing methods. The first attempt of presentation of the land use trends in south – east Poland was carried out by Kubijowicz (1924), which has distinguished 7 classes (wastelands, forests, meadows and pastures, areas of prevalence of meadows over the arable lands, areas of prevalence of arable lands over the meadows and prevalence of meadows and pastures over the arable lands, areas of prevalence of arable lands over the meadows and pastures, and areas with over 70 % of arable lands). In 1927 Z. Hołub-Pacewiczowa published 1: 75 000 scale *Economical-Settlement Map of Pasturing in Tatra*, taking into the consideration 7 land use classes. In 1931 Z. Hołub-Pacewiczowa elaborated *Map of Land Use of Assets of Twardoszyn City* in 1787 based on old ‘regulation’ plan. In 1930 E. Rühle (1930) published 1: 500 000 scale *Map of Land Use of Western Polesie*, based on 1: 100 000 and 1: 200 000 topographic maps, statistical data and surveys. The legend of this map was limited to 5 land use classes. In this period were published the early land use maps of Stanisław Leszczycki (1932, 1938). The first 1: 25 000 map *The Landscape Plan of Beskid Wyspowy* was based on cadastral maps and specialized survey. The author has distinguished 6 land use classes. In the case of second work - 1: 500 000 scale *Map of Spatial Reparition of
The archival research allowed to identify 362 commercial city maps (206 of them were Polish) including information on land use, published in this period. The thematic scope of these maps concerning land use and land cover was corresponding to 8 – 24 classes (CLC level 4), 10 – 38 (CLC level 5) till 12 - 42 classes of CLC level 6. The number of HILUCS classes varied between 24 and 60, while in the case of Urban Atlas from 16 till 19, and from 14 till 176 in the case of BDOT10K.

Valuable data source on land use are also topographic maps at 1: 5000, 1: 25 000 and 1: 100 000 scale published by Polish Wojskowy Instytut Geograficzny (WIG), as well as German Reichsamt für Landesaufnahme and Zweigstelle Landesaufnahme Sachsen. The 1: 100 000 scale topographic maps of these period were employed in 1952 F. Uhorczak and his team to elaborate the 1:1 000 000 scale General land use map of Poland (Ciołkosz, Bielecka 2005).

The analysis of thematic scope of maps and its comparison with CLC level 4, 5 and 6, as well as Urban Atlas nomenclature, HILUCS classes and BDOT10K list of objects allowed to identify for each analyzed map the database codes of corresponding land use / land cover forms. These codes were employed in proposed metadata.

According to the D2.8.II.2. Data Specification on Land Cover - Technical Guidelines in the case of vector data it is necessary to describe with metadata the datasets and land cover units, while in the case of raster data the description is limited to the datasets itself. Proposed record of vector datasets includes (according to the Technical Guidelines) the information on: dataset extent, preliminary identifier, name, information on nomenclature documentation, URL, responsible party, as well as information on life cycle (lifespan and validity). The authors have proposed to add the information about the geographical names (recent and historical), year of survey, year of publication, scale of survey, scale of publication, authors, ellipsoid and projection (if any), as well as related land use / land cover (and functional) codes of CLC, Urban Atlas, HILUCS and BDOT10K. In the case of land cover unit (polygon) it was also necessary to add the information on geometry, internal identifier, land cover observation, as well as voidable information on life cycle. Ac-

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According to the order of Polish Ministry of Interior of 20 October 2010 the dataset identifier should include symbol of the country (PL), code of the thematic group (ZIPIN) and ordinal number of dataset in State Metadata System.
According to the D2.8.II.2. Data Specification on Land Cover in the case of raster data it is necessary to complete the information on: dataset extent, (preliminary) identifier, name, information on nomenclature documentation, information on life cycle (lifespan and validity). The authors have proposed to add also the data on: geographical names (recent and historical), URL, responsible party, year of survey, year of publication, scale of survey, scale of publication, authors, resolution, the coordinate system, as well as related land use / land cover (or functional) codes of CLC, Urban Atlas, HILUCS and BDOT10K. According to the order of Polish Ministry of Interior of 20 October 2010 this information is supplemented in the state register of spatial datasets and services with data on: ordinal number of dataset in register, date of application, dataset identifier, name and state identification number of submitting institution, dataset name, thematic code (2.2 in the case of land use / land cover), spatial extent, legal information and available spatial data services.

Carried works allowed to propose the concept of the metadata tool for identification of data sources useful for spatio-temporal analyses of detailed land use and land cover changes. Due to the lack of harmonization of datasets of digital versions of old maps and historical maps based on old maps proposed tool can have functionality limited to query, based on metadata. The authors have proposed the query based on geographical names (recent or old), date and/or time period, spatial extent (employing geographical coordinates of area corner or central point with adjustable buffer). The results of query can be filtered with CLC, Urban Atlas, HILUCS and BDOT10K codes. The output information will include the information on name of the map, URL, responsible party, year of survey, year of publication, scale of survey, scale of publication, authors, resolution and the coordinate system.

4. CONCLUSION

The carried research has proved that number of old city map and local extent maps including the land use / land cover information of 1594 – 1939 period, concerning the recent territory of Poland is very big. It should be stressed that they are strongly dispersed, but the number of old maps available in digital form via Internet is growing rapidly, which makes access and use easier and faster. The analysis of these maps has proved that its thematic scope concerning land use and land cover is more rich (in number of CLC, Urban Atlas, HILUCS and BDOT10K classes) than it should suggest its legends. This paradox arose due to the more detailed level of recent land use classes (which are more complex and narrow in scope at the same time). The analysis and synthesis of old maps has proved that its thematic scope, corresponding to the land use / land cover classes was growing not linear way. However, it is to underline that number of classes was limited by historical factors in the case of technical infrastructure. The maximal number of possible corresponding codes was growing in the case of BDOT10K from 107 in XVII century, 112 in XVIII century, 163 in XIX century till 180 in the first half of XX century. In the case of HILUCS the maximal number of possible corresponding codes was varied from 32 in XVII century, 47 in XVIII century, 59 in XIX century till 60 in the first half of XX century. In the case of Urban Atlas the similar numbers were: 12 in XVII century, 17 in XVIII century, 18 in XIX century till 19 in the first half of XX century. This way the old city map and local extent maps can be employed (together with old detailed topographic maps) like a very rich data source for detailed land use changes monitoring. Authors have proposed the metadata database, respecting the Data Specification on Land Cover - Technical Guidelines schema, taking into the consideration the additional metadata, useful for spatiotemporal query of land use / land cover source data. Proposed metadata database as well as metadata query tool are adapted for usage of Polish CLC level 5 and 6, as well as national topographic database codes, but it should be stressed that it is possible to take also into the consideration the codes employed in other CLC 5 and 6 national nomenclature and other national topographic databases. This can allow to use the proposed conception of metadata database and metadata query tool also in other countries.
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