

A PROMISING SOLUTION FOR CREATING AGRICULTURAL MAPS BASED ON GAT PROGRAMS AND REMOTE SENSING DATA CREATION TECHNOLOGIES

Usmonjon Adhamovich Berdikulov

Teacher of the Geomatics Engineering Department
of Samarkand State University of Architecture and Construction.

Email: berdikulov.usmonjon.1990@mail.ru

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Abstract. *The article analyzes scientific and practical research based on earth remote sensing materials in a cartographic study of agriculture in Uzbekistan, covering agriculture, infrastructure facilities and agricultural networks, depending on natural and socio-economic conditions and the problem of improving the method of creating an electronic map. In addition, the importance of creating an electronic map of agriculture and creating interactive and web-based agricultural maps based on the capabilities of computer programming and an agricultural geodatabase was noted.*

Keywords: *GAT, Agriculture, Remote Sensing, Digital Map, GlobalMapper, Surfer, ArcGIS, Digital Software.*

ПЕРСПЕКТИВНОЕ РЕШЕНИЕ ДЛЯ СОЗДАНИЯ СЕЛЬСКОХОЗЯЙСТВЕННЫХ КАРТ НА ОСНОВЕ ПРОГРАММ GAT И ТЕХНОЛОГИЙ СОЗДАНИЯ ДАННЫХ ДЗЗ

Аннотация. *В статье проведен анализ научных и практических исследований на основе материалов дистанционного зондирования земли при картографическом исследовании сельского хозяйства Узбекистана, охватывающем сельское хозяйство объектов инфраструктуры и сетей сельского хозяйства в зависимости от природных и социально-экономических условий и проблемы совершенствования способа создания электронной карты. Кроме того, была отмечена важность создания электронной карты сельского хозяйства и создания интерактивных и веб-сельскохозяйственных карт на основе возможностей компьютерного программирования и базы агрогеоданных.*

Ключевые слова: *GAT, сельское хозяйство, дистанционное зондирование земли, цифровая карта, GlobalMapper, Surfer, ArcGIS, цифровая программа.*

I. INTRODUCTION

In recent years, the work of updating or creating agricultural maps in the Republic of Uzbekistan is carried out using remote sensing of the earth and digital aerial photography.

In the study and analysis of the agricultural sector, cartographic support and the creation and visualization of electronic, interactive and web maps based on modern GAT (geo-information systems and technologies) are of great importance. In this regard, including in the study of agricultural, natural and socio-economic problems related to the development of the economy in the developed countries of the world, to provide reliable information about the territory with the help of agricultural electronic cards Particular attention is paid to the urgent tasks of modern cartography [5]. As a result of the research carried out by the regions of agriculture, which is one of the main branches of agriculture, there was a need to reflect the technical and material services in the contents of the cards. Applying modern technologies in agricultural mapping, by digitizing

it, describing the qualitative and quantitative indicators of events and their distribution in the regions, assessing the interconnectedness of agricultural objects, applying an automated system to the mapping process there was a chance. GAT has continuously evolved with its automated systems for capturing, collecting, analyzing, evaluating and mapping large volumes of data. [4].

II. OBJECTIVE OF THE RESEARCH

The research materials are scientific and practical studies on land monitoring issues using modern technologies and methods. Research methods are summarization, systematization and analysis of scientific and practical literature on research issues [2].

Creating a database of agricultural sectors in countries such as Russia, USA, Holland, India and Australia using modern GAT, theoretical and practical issues of determining agricultural arable land based on remote sensing of the Earth (EMZ) data are widely discussed. is used [5].

There are not many scientific works devoted to the use of modern technologies in the cartographic evaluation of agriculture and its sectors of our republic, including the creation of agricultural maps using geoinformation systems. Some scientific research is being done to map agricultural sectors or geographically study the natural factors affecting them. [5].

Geographic information systems (GIS) are the most effective tool for spatial distribution, analysis and management of agricultural data. Remote sensing of the Earth (EMZ) data (spatial images, images from unmanned aerial vehicles and laser scanning materials) serve as an operational source of geographic information systems. [3].

On the basis of remote sensing data, it is possible to create a real-time database on agricultural sectors of the researched area, in particular, agricultural crops, fisheries, agricultural fields and other sectors of agriculture. . Also, remote sensing techniques, using space imagery and aerial photography, are of great help in determining crop yield potential, parasite distribution, damage incidence, and soil conditions[1].

III. RESEARCH METHODOLOGY

In order to determine the main types of soils in the ground monitoring test areas, the spectral processing method using hyperspectral (KA Terra (Modis)) space images is used, and a thematic map of the soils in the test areas is created[4,5].

The multi-spectral photo plans of the received space photo were created using the command "Composite Bands" - "Spectral composition" in the tool panel of the ArcGIS program. the cultural landscape types of the region were distinguished using the landscape typological map (Fig. 1). As a result, it made it possible to distinguish the specific features of the objects in the territory of the region, in particular, the flora, soil and water objects[5].

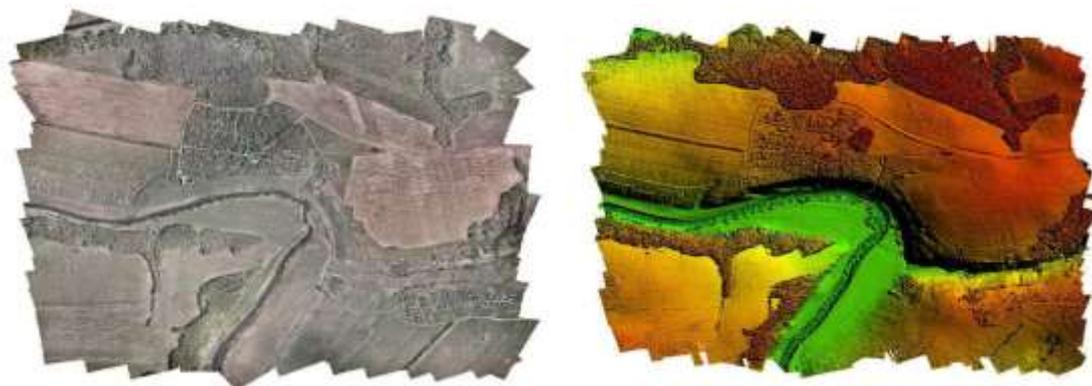


Fig. 1 - Thematic map of the soils of land parcels according to data from the Terra spacecraft

It is necessary to develop a method of identifying and mapping agricultural fields, while studying the YeMZ system, space images, their processing and analysis methods used for agricultural purposes[6].

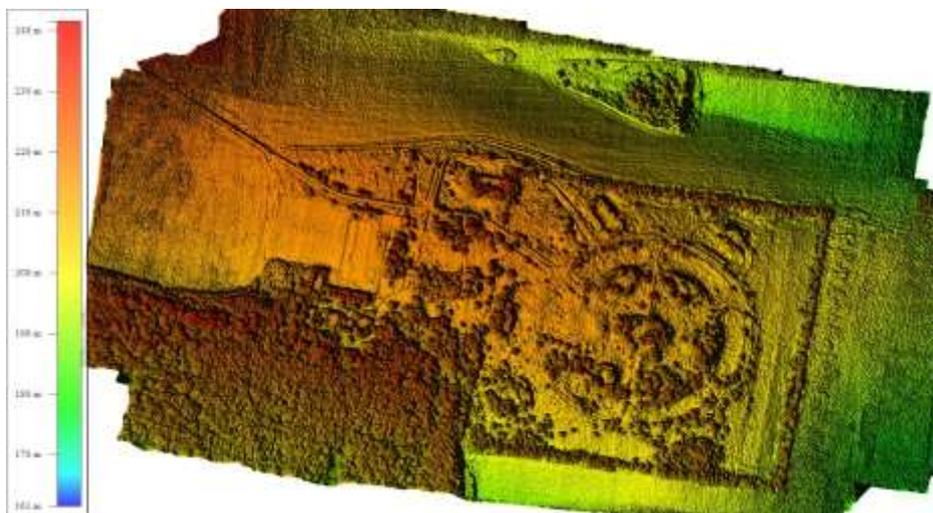


Fig. 2 - Digital elevation model

Based on the analysis of cartographic sources used in the preparation of agricultural maps, the technology of making maps was developed. This technology includes 9 steps, including the complete process of creating electronic agricultural cards[4,5,7].

IV. RESEARCH RESULTS

By creating an agro-geodatabase based on the "technological system for creating an electronic agricultural map" developed within the framework of the research, the following tasks were defined in the creation of an electronic agricultural map of the region [4,5]:

- conducting field research with modern geodetic instruments;
- creation of agro-geodatabase and thematic layers;
- integration of field work into the geodatabase;
- identification and classification of thematic layers;
- download orthophotoplans and geospatial linking;
- vectorization of orthophotoplanes and selection of conditional symbols;
- filling in attributive tables of thematic layers;
- conversion of the agrogeodatabase as a basis for creating an interactive map and web map of agriculture.

Based on the results of the research, electronic, interactive and web maps of agriculture were created based on improved methods. In order to evaluate the possibilities of creating, using, importing and exporting data, searching for objects, and other possibilities of these cards, cards created based on traditional methods and innovative approaches were compared[3].

V. CONCLUSION

The methods and technologies developed for the creation of electronic, interactive and web cards of agriculture will be the basis for the creation of thematic cards for other regions of our Republic.

The electronic map of agriculture, created on the basis of improved methods and technologies, serves as the basis for the creation of analytical maps that visualize the quality and quantity indicators of small or separate branches of agriculture that require special study.

Interactive and web agricultural maps of our republic created on the basis of agro-geodata base developed on the basis of field research, geodetic surveying, information obtained by the state organization in the field, statistics and other additional, auxiliary sources. The importance of web maps is very important in assessing and predicting the economic indicators of industry sectors, as well as in making investments in the region by foreign investors.

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