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IMPROVING THE METHOD OF MAPPING AGRICULTURE USING REMOTE SENSING DATA.

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Abstract: in this article, agricultural data is, in its essence, the most effective weapon for spatial division, analysis and Management - Geographic Information Systems (GIS). An operational source of Geographic Information Systems is Earth remote sensing (RSE) data (space shots). Long - year world experiments show that space shots from Earth's satellites provide operational control of crop condition and crop yield prediction, improved agricultural statistical data collection, and uniformity, accuracy, and objectivity of observation. Rural Foreign Studies show that agricultural research is carried out at the national, regional, local level and on separate farms.

Keywords: . GIS, Remote sensing of the Earth, map, style, Sentinel-2 MSI, Landsat-8, space shots, national, regional.

INTRODUCTION.

Working with the database in GIS and using the tools of spatial analysis, it makes it possible to analyze data on the relief of the place for agriculture, soil characteristics, the convenience of hydrological regimes.

When drawing up agricultural maps, the use of GIS and remote sensing of the Earth, on the one hand, serves to increase the volume of productivity by carrying out agrotechnical measures based on operational and detailed information about the state of the cultivated types of crops, on the other hand, is taken as the basis for creating agricultural electronic maps that embody the quantitative and qualitative characteristics of.

Using earth remote sensing data. The role of remote sensing materials and GIS technologies, which are considered modern technologies of today, in the creation of agricultural electronic maps is incomparable [1-3].

On the basis of remote sensing data, the agricultural sectors of the territory being studied make it possible to create a database in a real-time unit on hususun, dexqan-farm crop types, Fisheries, Rural crop fields and other branches of Agriculture. Remote sensing techniques can also be used with space shots and aerophotosurates to help greatly determine crop yield opportunities, parasite dispersal, increased damage, and soil conditions.

Satellite imagery and aerosurates are currently being used as primary tools for monitoring agricultural land, in addition to classifying land user types, checking crop yields and their suitability.

MAIN PART.

The grading of agricultural sectors and land users by remote sensing of the land serves as a very important reference in the running of agriculture today. Because today, accurate and reliable data on the users of agricultural land in the regions and the land they use are not reflected in any sources.

Objects in particular, geophasic data interpreting the specificity of objects at a distance can be extracted at the cost of hos spectrum returns to the plant, soil, water and other bodies themselves. It is much more convenient and cheaper to create an electronic map of agricultural networks through this very physical law.

Today, about 5,000 satellites for various purposes fly into Earth's orbit. Satellites of more than 50 Earth remote sensing agencies and states move in Earth orbit at different altitude, angle of inclination, period, and spatial capabilities. Most of them are used for commercial and military purposes [4-10].

Many satellite images can be used today. Because most of the satellites are used commercially, space shots taken through them can be obtained for a certain amount of money. Examples of such satellites include images from IKONOS, GeoEye, QuickBird, Pleiades, and other satellites. The main reason for the commercial use of these is the high spatial capability of the images and the ability to provide high resolution information regarding agriculture and mapping. Today, however, there are also free satellite images that are given a ruhsat for all use, examples of which are images from the Landsat (1-5, 7-8) and Sentinel (1-3) satellites.

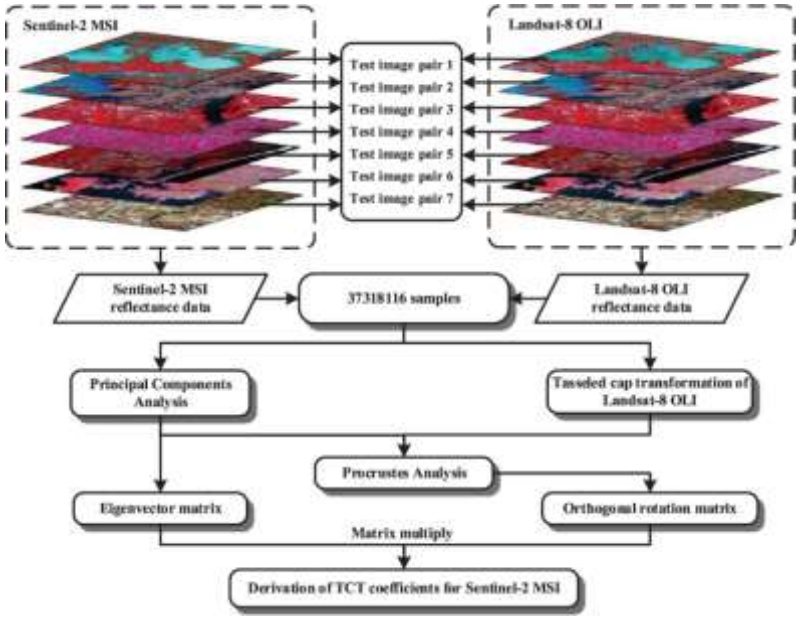

Figure 1. Images from Sentinel-2 MSI and Landsat-8 artificial satellites

In this research, optical and multispectral images from the Sentinel 2 MSI satellite were used to create an electronic map of agricultural networks of Fergana region.

The Sentinel 2 MSI multispectral images are produced by the European Space Agency's The Copernicus Sentinel-2 mission and are captured by two satellites in homogeneous dipolar, sun-synchronous orbits at an angle of 180^0 to each other. The main purpose of the satellites' flight is to continuously monitor the changes occurring in the regions between 56^0 south and 84^0 north latitudes, every 5 days in the 290 km range, 2-3 days in the cloud-free mid-latitude regions. continuously provides multi-spectral images of the diurnal cycle.

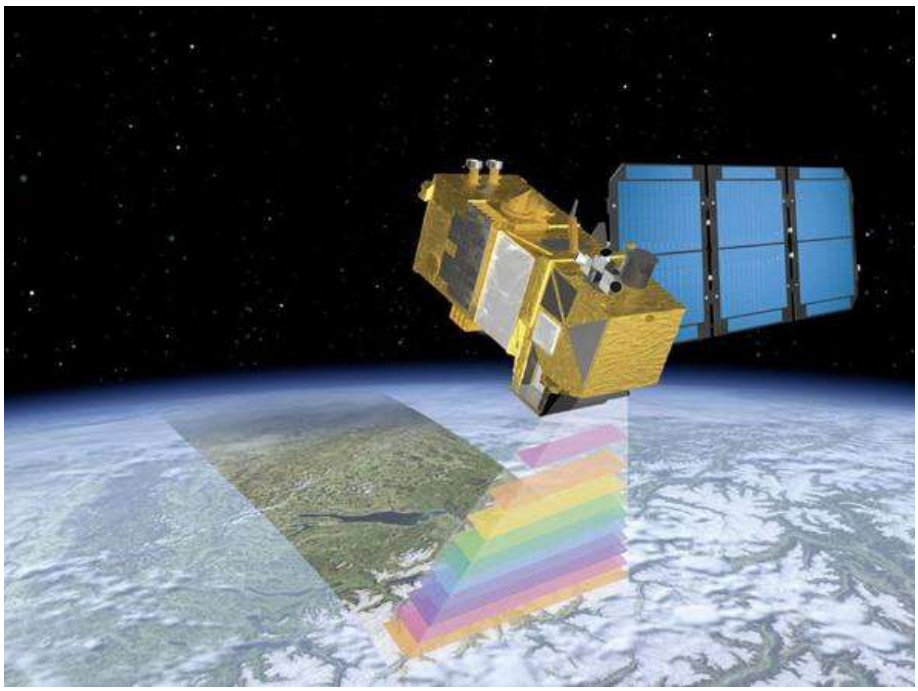

Figure 2. Sentinel 2 MSI satellite

Sentinel 2 satellites are equipped with 13 spectral optical scanners for continuous monitoring of the earth's surface, of which 4 have the ability to capture space images with a resolution of 10 meters, 6 at 20 meters, and 3 at 60 meters. (https://sentinels.copernicus.eu/web/sentinel/missions/sentinel-2).

Preparing images for processing

Reconstruction of agricultural production based on remote sensing of the earth begins with the production of image processing.

however, remote sensing data from satellite or aircraft-mounted imaging sensors will have errors and damage. Preparation for recycling includes systematic and qualified support [11-17]. Atmospheric control of remote and process images (scattering and stopping in the atmosphere affect the measurement values of the object); construction geometry of the sun; earth erosion; changes in satellite phase;

The influence of the earth, at the level, errors in the error of the sensor (irregularity in the response of the detector, changes in the vibration of the mirror); the project is affected by loss of image capture line and other errors. But it is not necessary to restore all this, the material is corrected before it reaches the user.

The most important technologies for preparing data for processing when obtaining information from remote sensing data are radiometric, geometric and atmospheric safeties.

Radiometric speed. Includes image processing to determine remote and radiometric imaging accuracy. The main purpose of using radiometric imaging is to reduce the effects of software errors and create inconsistencies. Because these errors can limit human processing, interpretation and analysis of images.

Development of a method for improving agricultural networks through remote sensing of the earth

Based on remote sensing data, the above programs are used to measure agricultural production. There are different breeding algorithms for agro-ecological diseases in regions and agricultural sectors. All classification algorithms are of two main types: supervised classification algorithm, based on field research and verification data, human factor participation in the classification process; type of unsupervised classification, image pixel data is divided into reliable automatic clustering algorithms. Later, the control of scientific research proved that classification algorithms show better results.

Supervised classification algorithms, private maximum similarity algorithm (MLA), random forest algorithm (Random Forest), support vector method (SVM), artificial neutral networks (ANN) algorithms to determine specific classification [18-23].

The Random Forest algorithm is notable for its high accuracy and fast data analysis by computer. This systematizes the data for data classification (classification) based on the shared forest algorithm. Based on field experiments, the data tools algorithm identifies by querying a large amount of data in each system. In others, spectral data are classified into class systems and individual objects using the voting method.

Maximum similarity algorithm (MLA) is one of the most widely used derived classification algorithms. The algorithm is based on knowing and assuming that each spectral index is normally distributed across the classes according to the statistics of the field experiment data. By optimizing the closest location of experimental samples and charging the maximum distances of the boundaries between them with the SVM algorithm, the measured samples are divided into mutual content and related classes.

An Artificial Neural Networks (ANN) algorithm is an algorithm that can provide suitable solutions for detection of sensor data that are usually nonlinearly dependent, complex, inaccurate, and imperfect or error-prone. Image classification with the help of neural networks is carried out by determining the characteristics of the textures and then applying a regression algorithm.

Agricultural mapping requires the selection of a classification algorithm that ensures the reliability and accuracy of data extracted from remote sensing data. Scientific research and experiments have shown that increasing the accuracy of classification results requires not only choosing the perfect algorithm, but also having high-level knowledge and skills in the field of research.

In the mapping of agricultural sectors, in particular, in the classification of crop types, it is necessary to be familiar with the existing crop types in the area, their dependence on natural and climatic conditions, and their development trends.

The collection, processing, registration and use of the data of Remote sensing of the Earth is part of a larger system of agricultural research.

The Remote sensing of the Earth system increases the possibilities of researching the characteristics of agriculture through proper organization, including the collection, selection, processing and transmission of data from Earth satellites, sensors, and space imagery [24-28].

CONCLUSION

A method of identifying and mapping agricultural fields was developed by researching the Remote sensing of the Earth system used for agricultural purposes, space images, their processing and analysis methods. Using this method, it is possible to classify the types of agricultural crops, assess their condition, determine plant diseases, soil characteristics, and general monitoring of agricultural activities, as well as make a thematic map.

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