On the topic:
"Development of the methodological foundations of GIS technology for geographical and territorial analysis when creating adaptive - landscape system of agriculture in Kazakhstan"

Nurzhan Kerimbay
PhD, act. professor
Relevance

Agricultural Science of Kazakhstan has specific recommendations and proposals implants, which production can be a means of increasing the efficiency of the agricultural sector. However, it should be noted a considerable lag of the republic from developed countries to release products / crops from 1 hectare. With so natural - resource potential, fertile land reserves of humus which the republic is the sixth largest in the world, yields of staple food crops - wheat, more than three times lower than the world average.

Success in a number of countries associated with the conduct of the modern differentiation of cropping systems for different agro-ecological conditions and the knowledge from the obvious need to adapt agricultural technologies to different levels of intensification of production, economic structure and further to the market with a / c products.? On the basis of this motivation we needed to solve actual problem to develop scientific - methodological basis of adaptive - landscape of farming systems (ALSZ) with spatial analysis on an example Ili Alatau Almaty region.
For the first time in Kazakhstan held a territorial analysis of the classification categories of landscapes and issuing soil-geomorphological and landscape map for the creation of adaptive-landscape system of agriculture. In this case, the methodological approach to the differentiation of landscapes to taxonomic units fatsiya and urochishcha with the issuance of paper and electronic versions of maps? Of 1: 25,000 scale
Purpose of work

To hold a territorial analysis of the northern slope of the Ili Alatau, Zhambyl, Karasai and Talgar district Almaty region make up the electronic versions of maps fatsiya and urochishcha based Kaskelen experimental farm.
Tasks of the project

* To hold territorial analysis of the northern slope of the Ili Alatau, Zhambyl, Karasai and Talgar district Almaty region in key areas on the basis of Kaskelen experimental farm;

* to carry out theoretical and methodological analysis and develop detailed principles of differentiation of landscapes on the fatsiya and urochishcha develop instructional techniques and create their maps and to hold practical testing on site Kaskelen experimental farm;

* -carrying out agro-ecological assessment of dry lands on the main soil-environmental criteria in the subzone foothill light chestnut soils Ili Alatau.
### The hierarchy of natural geosystems

<table>
<thead>
<tr>
<th>Геосистемные уровни</th>
<th>Иерархические таксоны геосистем</th>
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<tbody>
<tr>
<td></td>
<td>Зональные</td>
</tr>
<tr>
<td>Планетарный</td>
<td>Ландшафтная оболочка земли</td>
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<td>Физико-географические пояса</td>
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<tr>
<td>Региональный</td>
<td>Физико-географические:</td>
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<tr>
<td></td>
<td>зоны, подзоны, провинции,</td>
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<td></td>
<td>районы, ландшафты</td>
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<td>Локальный</td>
<td>Морфологические единицы ландшафта:</td>
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<tr>
<td></td>
<td>местности, урочища, подурочица,</td>
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<td>фации</td>
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Research Methods

- design ALSZ and agricultural technologies based on electronic GIS maps;
- the selection production areas with fairly uniform soil cover and the optimal conditions of moisture, heat supply and soil fertility;
- a precision seedbed preparation, sowing precise, differentiated fertilizer and other agricultural chemicals in accordance with the microstructure of the soil and the state of the crops;
- control the special production process of plant varieties by micro periods organogenesis using self-adjusting automated tools based on electronic control systems;
- identification of crop conditions, the forecast yield and quality of products on the basis of automated remote monitoring systems, yield mapping in the process of cleaning;
Results of the study

After drawing up a landscape map followed by their further differentiation to the level of the urochishcha and fatsiya. It refers to the territorial structure of the landscape, which is characterized by a set of territorial unit, related to certain spatial relationships. Their differentiation and making large-scale maps are an integral part when designing ALSZ.

These areas, in most cases, coincide with the areas of the peasant-farmers. Consequently, the task of our study was to develop a methodology and allocation fatsiya urochishcha within the landscape using remote sensing identified in 2013. To do this, we needed to have satellite images and conduct a theoretical analysis of each of these taxonomic units for the purpose of practical differentiation and as a result make relevant maps. fatsiya can be combined in various territorial structures, depending on what kind of system-attitude taken in this integration. Type of relationship between the fatsiya is the basis of the territorial allocation of the landscape structure.
ОРОГРАФИЧЕСКАЯ КАРТА ЗАИЛИЙСКОГО АЛАТАУ (1979-1984 гг.)

Условные обозначения:
- высоты
- реки
- ледники
- озера
- населенные пункты

Гипсометрические ступени (м):
- низ
- 1400
- 1800
- 2200
- 2600
- 3000
- 3400
- возвыс 3800

1:200 000
КЛИМАТИЧЕСКАЯ ПОЯСНОСТЬ ЗАИЛИЙСКОГО АЛАТАУ

Условные обозначения:
- реки
- ледники
- озера
- населенные пункты

1:200 000
Космический снимок Заилийского Алатау

Условные обозначения
- границы
  - современных морен
  - древних морен
  - ледники
3D-МОДЕЛЬ ЗАИЛИЙСКОГО АЛАТАУ
3D-МОДЕЛИ ВЫСОТНОЙ КЛИМАТИЧЕСКОЙ ПОЯСНОСТИ ЗАИЛИЙСКОГО АЛАТАУ

Положение солнца - северо-восток. Так выглядит хребет в солнечное летнее утро.

Положение солнца - северо-запад. Так выглядит хребет в солнечный летний вечер.

Высота солнца над горизонтом - 30°
RESULTS

In applying the above mapping methodology and the use of other available stock of different cartographic materials, and our own field research drawn.

• Maps of surface water and irrigation systems separately for Zhambyl, Karasai and Talgar district of the northern slope Ili Alatau region on a scale of 1:100 000;

• soil and geomorphological map of the area and on the same scale;

• agro-landscape map study area at the same scale.
Appendix A.1
Map of surface water and irrigation systems
Zhambyl district of Almaty region
Appendix A.2
Map of surface water and irrigation systems
Karasay district of Almaty region
Appendix A.3
Map of surface water and irrigation systems
Talgar district of Almaty region
Appendix B.1
Geomorphological map of Ile Alatau
Appendix B.2
Soil and geomorphological map
Zhambyl district of Almaty region
Appendix B.3
Soil and geomorphological map
Karasay district of Almaty region
Appendix B.4
Soil and geomorphological map
Talgar district of Almaty region
Appendix C.1
Landscape map of
Zhambyl district of Almaty region
Appendix C.2
Landscape map of Karasay district of Almaty region
Appendix C.3
Landscape map of
Talgar district of Almaty region
CONCLUSION

Was conducted selection of satellite images for territorial analysis fatsiya and urochishcha in key areas of the Ili Alatau includes arable land, irrigation systems, lakes, reservoirs, which allowed for the primary agri-environment group lands. On the basis of these results, it was composed "Map urochishcha Kaskelen experimental farm" on a scale of 1:25 000 It has been prepared in two ways: a) leaf shape on paper that can be published typographic way; b) compiled with the help of GIS technology incorporated in the electronic version of a computer that can be used if necessary.

2 Has theoretical - methodological, methodical analyzes and developed detailed principles of differentiation of landscapes on the urochishcha and fatsiya. In this case, through the analysis and synthesis of the literature of different schools landscapes developed theoretical justification of the principles of differentiation landscapes into smaller taxonomic units in relation to the creation of ALSZ. After that developed instructional techniques of creation fatsiya and urochishcha with the definition of the optimal scale. Based on the above source material, and composed of soil and geomorphological maps using GIS technology (ENVI and ArcGIS) a provisional electronic and paper versions of “Maps of the agro-landscapes of study area of the northern slope of the Ili Alatau region" on the scale 1:100 000.
THANK YOU FOR YOUR ATTENTION!