



6th Intercontinental Geoinformation Days

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Compilation of environmental protection maps by region, economic area and scale

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Keywords

Nature protection maps
Scaling order
Landscape zone
Azonal
Interzonal

Abstract

Environmental protection maps are divided into groups according to their purpose: maps describing protected natural areas and maps of environmental protection measures, and according to their content, by region, economic area and scale. When compiling regional EPM maps, the area is divided mainly by the principle of landscape zoning, and in special cases by the principle of administrative territory or basin (hydrographic network). Such maps contain various types of protection measures, the interrelationships of processes, and the regularity of change in space and time. The content elements in the specialized series of EPM of economic area include measures such as reclamation, restoration, cleaning of the area, reorientation of the enterprise to other economic spheres, regulation of the economic purpose of the territories. Large-scale EPMs describe regions with a complex landscape structure and a wide variety of nature protection objects. In the dissertation, the framework requirements for the content and legend load of all three groups of EPM maps were developed, the design methodology was improved, and the author's map copies were compiled.

1. Introduction

Geographically, the main purpose of nature protection is to create specially protected objects in order prevent the disturbance of nature as a result of economic activities. Depending on the object of environmental protection research, the direction of environmental protection mapping is determined and maps are compiled in accordance with the content of this direction [1]. The scientific basis of environmental protection maps (EPM) is formed by general landscape-territorial maps. In general, EPM is mainly divided into two main groups:

- maps describing protected natural areas;
- maps of environmental protection measures.

Compilation of environmental protection maps is very important in the development of methodological bases of environmental protection measures. It is possible to conduct a comprehensive assessment for any area based on environmental protection maps.

Compilation of environmental protection maps of the region is a very important and integral part of the whole complex of work on environmental protection. When choosing thematic content elements for EPM maps, these maps should clearly indicate which natural components

are planned to be protected and restored, the measures to be taken, and the area in which they will be placed. The content elements of EPM maps are also selected depending on the size and purpose of the area they cover. In general, in accordance with the above features, EPM maps are divided into specialized groups by region, economic region and scaling order.

2. Regional order of EPM

Small-scale regional EPMs mainly reflect the resistance of territories to anthropogenic impacts on the environment and their livelihoods, and only a general view of specially protected natural areas can be presented. At the same time, the areas of distribution of rare flora and fauna, the boundaries of reservoirs, areas of reforestation, etc., measures are described. In the legend of small-scale regional EPM, information on the characteristics of conservation measures can be presented in the form of diagrams, histograms, schemes and pictures. It is not necessary to reflect all environmental protection measures on these maps. If it is necessary to show more fully the area of protected objects, cartogram and diagram methods should be used. It is recommended to use a quality background method when creating a map of large regions.

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Cite this study

Gojamanov, M., & Garibova, I. (2023). Compilation of environmental protection maps by region, economic area and scale. *Intercontinental Geoinformation Days (IGD)*, 6, 375-378, Baku, Azerbaijan

Table 1 lists the elements that will be included in the regional EPM legend, compiled by terrain types located in different zones and belts. Table 2 shows the regional EPM legend elements for the landscapes of the azonal and interzonal regions.

Table 1. Regional EPM legends by zone and zone

In the forest-tundra landscape zone	It is a description of measures for the protection of fire-hazardous areas, vegetation and soil cover from transport, rocks from decomposition, rare species of birds and animals, spawning grounds for fish, riparian forest areas.
In forest zone	Protection of forests from fires and floods and protection of swamps, reservoirs, berry fields, rare fauna, rare and relict plants; Thermokarst and the fight against excess moisture; Reforestation measures should be described.
In the steppe landscape zone	Measures to protect soils from water and wind erosion, salinization, raw soil steppes, rare bird and animal species should be described.
In the zone of mountain landscapes	Protection of soils from erosion and rare wild animals; Prohibition of deforestation, stripping of slopes, even selective thinning of trees in the forest; Measures to prevent avalanches, floods and landslides; It is necessary to describe the regulation of animal grazing on mountain pastures, plowing of fertile lands in a scheme that stops the development of landslides, phytomelioration measures.

3. EPM of economic area

When creating an EPM of an economic area, it is important to carry out economic zoning of the country's territory in accordance with economic activity and economic concentration. In this case, environmental protection mapping and the content of the analysis to be carried out on its basis consists of studying the effects of specific field complexes (pollution, disturbance, degradation, etc.) on natural objects located in the area. The complexes are mainly divided into industrial, agricultural and recreational areas.

During the period when Azerbaijan was part of the USSR, inefficient use of natural resources and low level of nature protection work had a serious negative impact on the environment in the country. Lack of regulatory facilities in industry, excessive use of toxic chemical fertilizers in agriculture have led to pollution of our lands and atmosphere. During the years of independence, our country has made a radical turn in the field of ecological balance, protection of the environment, consistent measures have been taken to protect natural resources, including minerals, water, soil, air, forests and biodiversity.

It should also be noted that the areas with the highest environmental problems are mainly industrial and

agricultural areas. The Caspian Sea, the Absheron Peninsula, the southeastern Shirvan and Mugan plains, where the oil industry is located, are the areas with the highest environmental problems.

Table 2. The legend of the azonal and inter-zonal regional EPM

Great river valleys	The spawning grounds of rare species of plants and living creatures, valuable commercial fish, measures to protect the upper reaches of water bodies are described.
Swamps	Measures for the protection of rare plant and species species, berry fields are described.
Areas where geological rocks are collected	Measures for the detection and protection of geological objects and paleontological objects are indicated.
Areas of anthropogenic impact	Archaeological monuments (kurgans, ancient cities, places inhabited by ancient people); measures for the protection of natural objects in the places where politicians, scientists and artists live and work is described.
Afforestation areas	Given protection measures of green areas in residential areas; trees on the side of roads; forest protection strips; construction of monuments of horticultural art and resort-recreation forests.
Hydrographic objects	Rivers, lakes, seashores; creation of basin protection zones in the coastal Special Protection Areas (SPA); Detection and protection of hydrological SPAs (reserves, waterfalls, groundwater sources, etc.); Measures against the collapse of coastal areas should be reflected.
Historical-landscape and ethnographic-landscape monuments	Should be reflected measures for protection of places of historical events (geographical discoveries, battles); the lands inhabited by local peoples and arable lands.

There is a special need for nature protection measures in the man-made degraded lands of Dashkasan, Balakan and Nakhchivan AR, as well as large industrial cities Baku, Sumgayit, Ganja, Shirvan and Mingachevir, where the mining industry is developed. It is necessary to take more active measures to protect and restore the saline, eroded soils of the Kura-Araz lowland, as well as to protect and restore light forests.

In this complex of activities, environmental protection maps are very important. In these maps environmental protection areas are shown in different colors and objects in circles. In the legend of the map, the area of objects is determined by the diameter of the circles. The diagrams show the components that are considered environmentally important. We have compiled maps of the areas where some industries of Azerbaijan are located. Examples of these maps are pollution maps of the Absheron Peninsula and Dashkesan region (Figures 1 and 2) When designing EPM for industrial areas, special attention is paid to the protection of water bodies (Caspian Sea, lakes of Azerbaijan, main rivers, reservoirs, etc.), atmosphere,

groundwater, soil and plant resources. These areas can be shown as species distribution areas, special boundaries and etc. These maps should also show the areas on which reclamation works are carried out and are proposed (mining areas).

The main elements of the content are the description of such activities as reclamation, restoration, cleaning of the territory, reorientation of the enterprise to other economic regions, regulation of the economic purpose of areas in the specialized line of EPM.

For industries, it is important to indicate the following protection measures in EPM maps:

- an indication of the sites for the extraction of minerals;
- boundaries of sanitary protection zones created around industrial facilities;
- areas for collection and processing of industrial waste;
- observation points for continuous environmental monitoring;
- Proposed measures for carrying out restoration work in the territories where industrial zones are located (Gadabay, Dashkesan ore deposits).

that need to be washed, normalization of fertilization, etc. should be specified in the EPM. Water erosion is common in areas where agriculture is widespread.

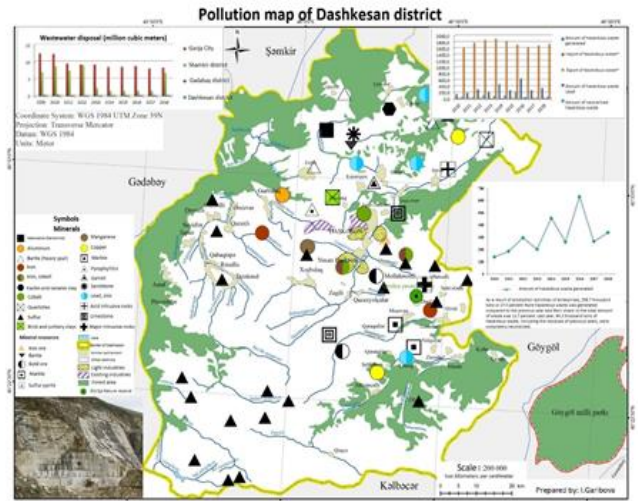


Figure 2. Pollution map of Dashkesan district

As it is more common in arable land, it is preferable to take measures against erosion in these areas. The maps should also indicate legally protected areas, natural objects, underutilized areas, and environmental agencies.

When showing the boundaries of recreation areas in the EPM, it is necessary to pay attention to specially protected natural areas, natural monuments, resort forests and beach areas. Depending on the degree of protection the zoning of national parks and depending on the tourist load the regulation of these zones should be carried out correctly. Pollution prevention measures should be specified. The content of existing recreational maps should provide information on the implementation of security rules and the state of protected objects.

4. Scale range of EPM maps

Scale EPMs are primarily designed in regions with complex landscape structures and a wide variety of nature protection areas. It is known from the cartography course that maps are usually divided into large-scale (1: 200,000 and more), medium scale (1: 200,000–1: 1,000,000) and small scale maps (less than 1: 1,000,000). Similarly, the scale range of EPM can be classified. However, the scale of these maps can be drawn not only on the scale of 1: 10000, 1: 25000, 1: 50000 and others, as in the state standard, but also on an arbitrary intermediate scale.

Generalization of EPM is sometimes associated with great difficulties. It mainly depends on the level of detail of nature protection problems. One of the reasons for the difficulty of generalization is that protection measures can be given in EPMs of different scales with completely different cartographic methods, and therefore the transition from scale to scale requires individual decisions in each case. In some cases, it is also possible to indicate the SPA and the Natural-Technical System (NTS) in scaleless characters or numbers (Table 3).

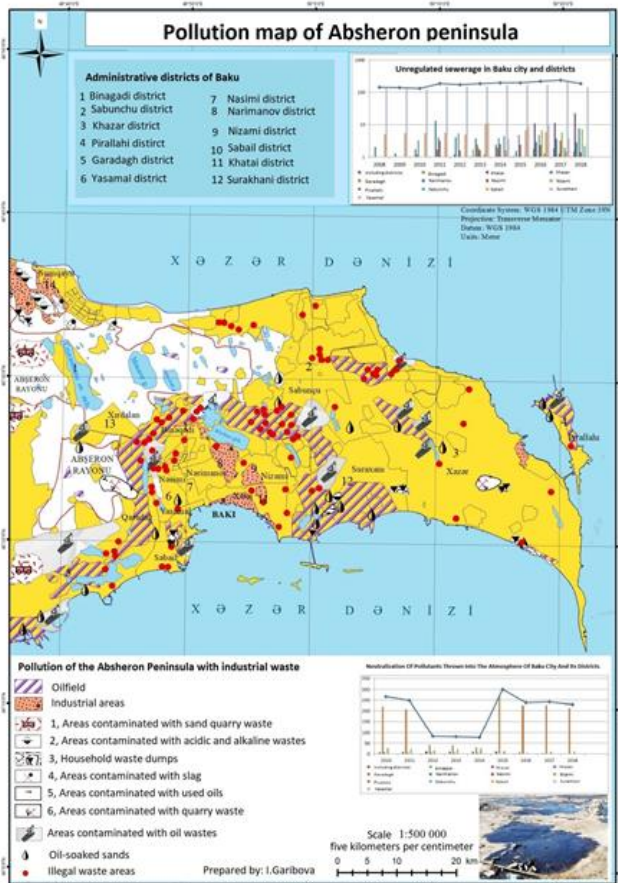


Figure 1. Pollution map of Absheron peninsula

When describing the development of agricultural lands in the EPM, the scheme of regular distribution of grazing and pastures (mainly in the foothills), the areas where reclamation measures are carried out and proposed (many areas of the Kur-Araz lowland) should be reflected. It is known that some areas of the Absheron Peninsula and the Kura-Araz lowland have been exposed to salinization. Washing of these territories and the areas

Table 3. Content elements of scale range EPM

Map scale and mapping area	Degree of description of SPA and NTS			
	Large area NTS	Small area NTS	Reserve, national parks	Dotted SPA historical, cultural, natural monuments
Summary and small scales: 1: 1 000 000 - 1:10 000 000 (maps of large countries and administrative-territorial divisions)	In full	With certain restrictions	With certain restrictions	-
Average scales: 1: 200 000-1: 1 000 000 (maps of small countries and administrative-territorial divisions)	With certain restrictions	In full	In full	With certain restrictions
Large scales: 1: 10000-1: 200000 (map of districts, SPAs and landscape complexes)	-	With certain restrictions	In full	In full
Very large scales: 1: 2,000 -1: 10,000 (SPA plans)	-	-	With certain restrictions	In full

The results of the landscape planning should also be used in the compilation of the EPM. Landscape planning aims to maintain soil health and protect its physical and biological environment and is a system that serves to preserve the characteristics of the landscape. Landscape planning is the process of collecting and studying information about the current state of the environment in an area, its importance for the country's economy, its attractiveness and vulnerability. It then examines the impact of current and future projects in the area on these components and identifies parameters that are important for the sustainable development of the area. An action plan is also being developed to ensure the vital functions of the natural environment, maps are published with recommendations for the use and management of the landscape. In recent years, extensive research in the field of landscape planning has been carried out in Azerbaijan under the leadership of academician Ramiz Mammadov.

5. Conclusion

Based on the analysis and study of the features of the maps, the following conclusions were drawn:

1. When compiling regional EPM maps, the area is divided mainly by the principle of landscape zoning, and in special cases by the principle of administrative territory or basin (hydrographic network). Such maps contain various types of protection measures, the interrelationships of processes, and the regularity of change in space and time.
2. The content elements in the specialized series of EPM of economic area include measures such as

reclamation, restoration, cleaning of the area, reorientation of the enterprise to other economic spheres, regulation of the economic purpose of the territories. Large-scale EPMs describe regions with a complex landscape structure and a wide variety of nature protection objects. The framework requirements for the content and legend load of all three groups of EPM maps were developed, the design methodology was improved and the author's map copies were compiled.

3. Maps of the regional EPM series mainly reflect the stability and vital activity of areas to man-made environmental impacts and can only give the appearance of specially protected natural areas. Cartogram and diagram methods can be used in the preparation of regional EPMs, in large regions the quality background method can be used, and in the legend information on environmental protection measures can be given in the form of diagrams, histograms, schemes and pictures.
4. When creating a series of EPM for the field of economy, the content of environmental mapping and analysis based on it is directed to the study of the impact of specific field complexes (pollution, disturbance, degradation, etc.) on natural objects located on the territory.
5. When compiling a large-scale EPM, the map should reflect suggestions for agricultural land, mineral deposits, forestry, the boundaries of recreational zones and the state of these territories, protected areas, rational use of natural resources.

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