

THE SYSTEM OF EDUCATIONAL GEOGRAPHICAL ATLASES IN UKRAINE

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The reorganization of geographical education has taken place in Ukraine recently, as a result of the introduction of a 12-year secondary school term. The basic courses will give students the primary overview of nature and society of the world and Ukraine, and in the senior grades deep study of Geography in the form of special courses is introduced.

The objective of our research is the analysis of Ukrainian educational atlases, the creation of the graphic model for system of geographical atlases for secondary and higher schools. The method of systemic analysis and the method of structure and graphic modeling are used for the research of school geographical atlases and for the creation of educational atlases.

The atlases published for primary school are: *Wonderworld (Dyvosvit)* and *Our Motherland. Atlas in Natural History* (3rd–4th forms, for 8-9 year-old children). For secondary school are created atlases: *Geography of one's locality* (the 5th form, for 10-11 year-olds, atlases of Ukrainian regions and Kyiv), *General Geography* (the 6th form, for 11-12 year-olds), *Geography of Continents and Oceans* (the 7th form, for 12-13 year-olds), *Physical Geography of Ukraine* (the 8th form, for 13-14 year-olds), *Social and Economic Geography of Ukraine* (the 9th form, for 14-15 years old), *Social and Economic Geography of the World* (the 10th–11th forms, for 15-17 year-olds).

Atlases for higher education make up the next level of cartographic provision in Ukraine (*The Integral Atlas of Ukraine* and *The Teacher's Atlas*).

The Integral Atlas of Ukraine is a scientific reference atlas, which consists of four sections: 1) Political and Geographical Position and Historical Development of the Ukrainian State; 2) Natural Conditions and Natural Resources; 3) Population; 4) Economy.

The Teacher's Atlas is an integral cartographic edition, which contained four parts: 1) General Geography and Cartography; 2) World; 3) Continents and oceans, regions and world countries; 4) Ukraine and reference part with the pointer of place-names and dictionary of terms.

Basic geographical courses should complement the special courses, which are elected in accordance with the profile of studies, because the system of educational geographical atlases in Ukraine will be considered atlases such as *Geography of Population*, *Geography of Religions*, *Geography of Cultures* (for humanitarian-philological profile of educational), *Recreational Geography*, *Political Geography* (for socio-humanitarian profile), *Biogeography* (for biological profile), *Geoecology*, *Geography with the Basics of Environment*, *Planetary Geography* (for natural scientific profile), *Geography of Tourism* for athletic profile).

The system of educational atlases in Ukraine helps to study geographical disciplines and the courses integrated with them, it provides cartographic materials for primary, secondary and high schools. The contents of atlases, which are included in the system, are interconsistent, they share graphical design and the general methodical apparatus. The system can expand at the expense of a series of wall educational maps, which are created according to the principles and methodological options of educational maps and atlases creation. The formation of a system of educational geographical atlases is necessary for planning of further work on new atlases such as interactive atlases on CD and atlases for the special courses, and the determination of the ways to improve the existent constituent parts of the system.

Introduction. The reorganization of geographical education has taken place in Ukraine recently, as a result of the introduction of a 12-year secondary school term. The scientists of the leading universities of Ukraine (the Kyiv Taras Shevchenko National University, the L'viv Ivan Franko National University,

the Kharkov Karazin National University, the Dnipropetrovs'k National University, the Chernivtsi Yurii Fed'kovych National University, the Ivano-Francovs'k Postgraduate Pedagogical Institute) developed the conceptions of geographical education at secondary school [1-3]. The basic theses of the offered conceptions are as follows:

1. Geography is suggested to be studied as an obligatory subject beginning with the 5th up to the 12th form, and beginning with the 5th up to the 10th form the structure of geographical education does not change: Geography of Your Locality (5th form), General Geography (6th form), Geography of Continents and Oceans (7th form), Geography of Ukraine (8th–9th forms), Social and Economic Geography of the World (10th form). Geography supplemented with the basics of Geoecology and Country Study is recommended to be taught in the 11th form, the courses in Structural Geography and Environmental Protection – in the 12th form.

2. Basic geographical courses should complement the special courses, which are elected in accordance with the profile of studies. For socio-humanitarian type of education Geography of the World's Economy with the basics of Economy, Commercial Geography, Political Geography are suggested; for humanitarian-philological profile – Geography of Culture, Geography of Religions; for biological profile – Medical Geography, Biogeography; for physical and mathematical profile – Cartography and Geographical Information Science; for athletic profile – Geography of Tourism; for natural scientific profile – Geoecology, Geography with the basics of Environmental Protection, Planetary Geography, Geographical Prognostication.

Thus, the basic courses will give students the primary overview of nature and society of the world and Ukraine, and in the senior grades deep study of Geography in the form of special courses is introduced; these courses will conform to the profile of studies at secondary schools.

The method of systemic analysis helps to research and analyze geographical atlases for primary, secondary and high school. The methods of structure and graphic modeling are used for grouping educational atlases in a system, obtained of thematic interconnection of its elements and the demonstration of its wholeness.

The system of educational atlases allows creating logical and compact structure and content of atlases, standardizing the principles of educational cartography and showing the steps of system's development.

The following research on Ukrainian educational atlases allows us to analyze the system in detail.

The series of educational atlases, which are classified according to the age groups and geographical disciplines, is developed and issued in accordance with the renewed educational programs.

The atlas for the youngest *Let's Travel to the Wonderland!* (2000, 2003) – was published by the State Scientific and *Production Enterprise Kartographia* (Kyiv). This is an illustrated atlas for junior children, which introduces the Earth as a planet of the Solar system, the world, where the emphasis is on the wildlife, the territory of Ukraine, its natural zones, flora and fauna, traditional clothes and folk crafts, the origins of fairy-tales. The atlas was created for the children of preschool age and the students of the 1st–2nd forms of primary school (for 5-7 year-old children).

Atlas *Wonderworld (Dyvosvit)* for educational courses *Ukraine and Me* and *Natural History* at primary school has been created at the SSPE *Kartographia* (2003) for 8-9 year-old children (3rd–4th forms). A similar atlas (*Our Motherland. Atlas in Natural History for the 3rd (4th) Forms*) was published by JSC "Advanced Technologies' Institute" (ATI) (Kyiv) in 1999.

With the aim to provide the pupils with the necessary cartographic material for the study of geography of one's locality (city, Oblast', Raion) in the 5th form publishing house *Mapa* (Kyiv) created a series of 16 regional atlases *My Motherland* between 2000 and 2006 (atlases of Vinnyts'ka (2001), Dnipropetrovs'ka (2001), Donetsk'ka (2004), Zhytomyrs'ka (2003), Zaporiz'ka (2002), Ivano-Frankivs'ka (2005), L'vyvs'ka (2003), Kyivs'ka (2000, 2001, 2006), Odes'ka (2002), Poltav's'ka (2004), Ternopil's'ka (2001), Kharkivs'ka (2003), Khersons'ka (2006), Khmelnyts'ka (2002), Cherkas'ka (2002), Chernihivs'ka (2003) Oblast's of Ukraine). They are integral cartographic products with the unique structure; they contain chapters describing geographical situation of the region, its natural zones, population, economy, cultural heritage; also there are maps characterizing the peculiarities of every separate region of Ukraine, for example, recreation and tourism, environmental state, history etc.

Integral atlases of L'vyvs'ka (1999), Ternopyl's'ka (2000) and Chernivets'ka (2000) Oblast's have been worked out in the research laboratories of geographical faculties of the L'viv and Chernivtsi National Universities. These atlases have the similar structure and consist of maps of administrative and territorial system, physical surface, climate, surface water, soils, plants and animals, environmental pollution, natural reserves, population distribution, historical and ethnical territories, national composition of population, economy and infrastructure. In some of them recreation and tourism maps are added.

The atlases of Kharkivs'ka (2003), Luhansk'ka (2004) and Kyivs'ka (2008) Oblast's, and also atlas *My Kyiv* (2001, 2002, 2007) are edited and published at the SSPE *Kartographia*. The regional atlas of Kyiv was created also a publishing house JSC *ATI* (Kyiv) in 2003. The structure of these atlases is similar to regional atlases created by publishing house *Mapa*. But atlases of Kyiv have some differences in contents and cartographic methods in regards to representation of a city's territory.

The regional atlas of the Crimea (2003) developed in accordance with the conception of the National Atlas of Ukraine by the creative group of scientists of the Tavriis'kyi V. Vernads'kyi National University, the Crimean Scientific Center of Ukrainian National Academy, the Institute of Geography of the Ukrainian National Academy, and published by JSC *ATI*. This is a scientific and reference atlas, which can be used in educational process for the study of features of nature, economy, ecological situation, culture and history of the Crimean region.

The work in creation of another atlas of Ukrainian regions continues. In 2009 the atlas of Kyiv Oblast' was produced by SSPE *Kartographia* which began the series regional atlases for high school. The atlas consists of five parts (80 pages, 126 maps): history of the region, natural conditions and natural resources, population, economy, social infrastructure. The experience of creation of the National atlas of Ukraine influenced the structure and cartographic methods of this edition.

The atlases published for secondary school are: *General Geography* (the 6th form, for 11-12 year-olds), *Geography of Continents and Oceans* (the 7th form, for 12-13 year-olds), *Physical Geography of Ukraine* (the 8th form, for 13-14 year-olds), *Social and Economic Geography of Ukraine* (the 9th form, for 14-15 years old), *Social and Economic Geography of the World* (the 10th–11th forms, for 15-17 year-olds).

All educational atlases for secondary school (from the 6th to the 10th–11th forms) in Ukraine are accompanied with contour maps supplied with tasks aimed at reviewing the studied material.

In atlases for secondary school the principle of gradual complication of cartographic information is observed, together with the replacement of artistic symbols with geometrical, that is conditioned by the psychological peculiarities of cartographic images' perception by students of different age groups. The thematic structure of educational atlases for secondary school is presented in Table 1.

Table 1

Thematic structure of educational geographical atlases

Atlases	Sections	Subsections
General Geography (for the 6 th form)	The Earth in space	Universe
		Planetary system
		Starry sky
		The Moon
	Cartographic projections	Basic projections
		Projections of the Atlas' maps
	Methods of cartographic representation	Basic methods of cartographic representation
		Representation of relief on maps
	Topographical maps	Symbols on topographical maps
		Topographical maps of Ukraine
	Earth covers	Lithosphere. Structure of Earth.
		Physical map of the world and of Ukraine
		Atmosphere. Climatic map of the world
		Hydrosphere. Map of the oceans

		Biosphere. Map of natural zones
	Population	Distribution of population in the world Races. Religions
	Political map	Political map of the world
Geography of continents and oceans (for the 7 th form)	Introductory section	Physical map of the world
		Geographical discoveries
	Natural terms and resources	Geology
		Climate
		Soils
		Vegetation and animal life
		Natural areas of the world
	Political map	Political map of the world
	Population	Distribution of population
		Racial, national, linguistic, and religious composition of population
	Eurasia	Eurasia
	Africa	Africa
	North America	North America
	South America	South America
	Australia and Oceania	Australia
		Countries of Australia and Oceania
	Antarctic Continent	Antarctic Continent
	Oceans	World Ocean
		Pacific Ocean
		Atlantic Ocean
Indian Ocean		
Arctic Ocean		
Geography of Ukraine (for the 8 th -9 th forms)	Introductory	The formation of the territory of Ukraine
		Administrative and territorial division
		Physical map
	Natural conditions and resources	Geology
		Climate
		Internal waters
		Soils
		Vegetation and animal world
		The seas of Ukraine
		Landscapes
		Natural resources potential
	Population	Distribution of population
		Demography
		National, linguistic and religious composition of population
		Employment of population
	Economy	General economic situation
		Industry
		Agriculture
		Transport and communication
		Social infrastructure
		External economic links
	Ecological situation	Ecological situation

		Natural environment
Economic and social geography of the world (for the 10 th –11 th forms)	Introductory	Physical map of the world
		Natural resources potential of the world
	Political map	Formation of the political map
		Political system of countries
		International organizations
	Population	Distribution of population
		Demography
		Languages and ethnicity, religions
		Employment of population
	Economy	Industry
		Agriculture
		Transport and communications
		External economic links
	Global problems	Ecological problems and environmental protection
		Social and demographic problems
		Problems of war and peace
	Europe	European countries
	Asia	Asian countries
	Africa	African countries
	North America	North American countries
South America	South American countries	
Australia and Oceania	Australia and the countries of Oceania	
Ukraine in the world		

There are several atlases in General Geography for the 6th form today in Ukraine, among them *General Geography. Atlas-reader* (2003-2008), edited at the SSPE *Kartographia*. This atlas is called a reader because it contains reference information, explanatory texts, charts and pictures. The atlas consists of 17 maps (*Geographical discoveries, Starry sky, The hemispheres of the Moon, Lithosphere, Oceans, Natural zones, Climate, Western and Eastern hemispheres: physical and political, Races, Physical and administrative maps of Ukraine*).

Atlas Our Planet. Atlas for the sixth form (1998) of publishing house JSC *ATI* has similar structure, containing the complete list of necessary maps, although having somewhat fewer texts and charts. However it has a satellite image of Ukraine.

Atlas-reader General Geography (2003), published by *Stafed-2 Ltd* (Kyiv) includes explanatory charts to the themes *Solar System, Lithosphere, Atmosphere, Hydrosphere*, maps of ecological problems of the world and distribution of population, although maps *Geographical Discoveries, Political Map of the World* and illustration to the themes *Topographical Plans and Maps, Representation of Relief on a Map, Grid of the Earth* aren't in it. The texts in the atlas occupy almost 40 % of its volume.

Atlas Geography of Continents and Oceans (the SSPE *Kartographia*, 2003-2008) is constructed in accordance with the contents of study syllabus in Geography in the 7th form. Among other atlases it is distinguished by containing a new projection of the world map, construed with the help of the combination of two projections: the central part of the map is an equidistant azimuth Postel's projection, and the segments are a pseudo conical Bonn's projection. A map made in this projection takes the form of a star, and the continents, Antarctic continent excluded, are placed along meridians each on a separate segment (like the rays of a star).

Traditional maps which illustrate the course of Geography of continents and oceans are included to this atlas, as well as some new maps: *World Religions, Mineral Resources of the Waters of the World Ocean*, maps of salinity and temperature of water of the World Ocean and its environmental state.

A similar atlas is produced by JSC *ATI* (1999). It doesn't contain tectonic maps of the continents, however physical maps of the continents are supplied with satellite images, political maps of the

continents – by the charts of contours of Ukraine, which helps to compare the area of our country with the areas of other countries.

Atlases for the 6th and 7th forms are created also in Kharkiv by publishing house *Ranok* jointly with the lecturers of Geography faculty of the Kharkiv V.N. Karazin National University.

The atlases *Geography of Ukraine* for the 8th and 9th forms are created at the SSPE *Kartographia* (2003-2008) and JSC *ATI* (2000, 2008). In atlases, developed at the SSPE *Kartographia* such important subjects are viewed as zone time, the representation of the spherical surface of the Earth on a plane, topographical maps and its symbols, and maps forming of Ukrainian territory (in 1921–1954), ecological situation, seas of Ukraine (they physical, vegetable and animal world), naturally protected areas, ethnic lands, Ukrainian Diaspora, ethnic composition of population, industry and agriculture, transport, social infrastructure, external economic links of country.

Atlases in Geography of Ukraine (JSC *ATI*) contain more maps, e. g. paleo-geographical, climatic (for cold and warm periods, snow cover, frosts), spa resources and tourism, radioactive pollution of the territory, the formation of the ethnic territory, religions, history and cultural heritage of Ukraine and other maps. The contour map of Ukraine is placed in the atlas, with the certificate information on it.

Atlas *Economic and Social Geography of the World* for the 10th–11th form (the SSPE *Kartographia*, 2003–2008) contains 70 maps, traditionally has two parts: Geography of the World and Regions. The first part includes six thematic blocks: political maps (supplemented with maps *Types of the World Countries*, *Political System of the World Countries*, *History and Geography Regions*), population, natural resources, economy, external economic links, and the global problems. Regional maps of atlas are represented traditionally as integral economic; an innovation is the addition of economic zoning charts and by the tables of reference information about a country. On the general economic maps of Asia, Latin America and Africa maps *International Organizations* are inset, and the economic map of Europe is complemented with maps *European Union* and *The NATO Countries*.

Atlas *Economic and social Geography of the World* for the 10th–11th forms (JSC *ATI*, 2002) contains more maps, necessary for the study of such important themes, as the formation of the political system of the world (*World in 1914*, *World in 1961*), international geographical division (*Level of Economic Development of the World Countries*, *Level of Social Development of the World Countries*), world economy and international business (*International organizations*).

During the recent years electronic analogues of educational atlases for the 6th, 7th, 8th, 9th, 10th–11th forms are available on CDs in JSC *ATI*. Interactive CD-atlas *Geography of Continents and Oceans* (2005) is developed and published by the SSPE *Kartographia*, and supplied with test tasks, audio explanation of themes and subjects, and a dictionary of terms. The work on creation of other CD-atlases for the 6th, 8th, 9th, 10th–11th forms is continued by the SSPE *Kartographia*.

Atlases for higher education make up the next level of cartographic provision in Ukraine. The SSPE *Kartographia* published *The Integral Atlas of Ukraine* (2005) and *The Teacher's Atlas* (2008) for high school.

The Integral Atlas of Ukraine is a scientific reference atlas, which consists of four sections: 1) *Political and Geographical Position and Historical Development of the Ukrainian State* (where maps on history state formation of Ukraine from the times of the Kyivan Rus to the modern political and institutional structure are represented as well as maps characterizing the position of Ukraine among the countries of Europe); 2) *Natural Conditions and Natural Resources* (viewing the natural environment of the country and its ecological situation); 3) *Population* (maps are built on the basis of statistical materials of the 2001 census); 4) *Economy* (that includes description of industry, agricultural and forest economy, the sphere of services and external economic activity).

A large group of authors – leading researchers geographers and cartographers – worked at the atlas. The maps of *Nature* block were compiled on the basis of the maps prepared for *Ukrainian Geographical Encyclopedia* (expanded and revised by the authors according to the newest findings and changes, which took place in the last few years), and the socio-economic maps were compiled basing on up-to-date official statistical data.

The Teacher's Atlas is an integral cartographic edition. It consists of four parts: 1) General Geography and Cartography; 2) World; 3) Continents and oceans, regions and world countries; 4)

Ukraine. A reference part of atlas contains the pointer of place-names and dictionary of terms. The maps are enriched to tables, graphs, and diagrams. *The Teacher's Atlas* is universal cartographic tool, which will provide the students of geographical specialties of higher educational establishments and also teachers-geographers. This atlas connected all themes and pictured thematically links of geographical and integral with them courses (figure 1).

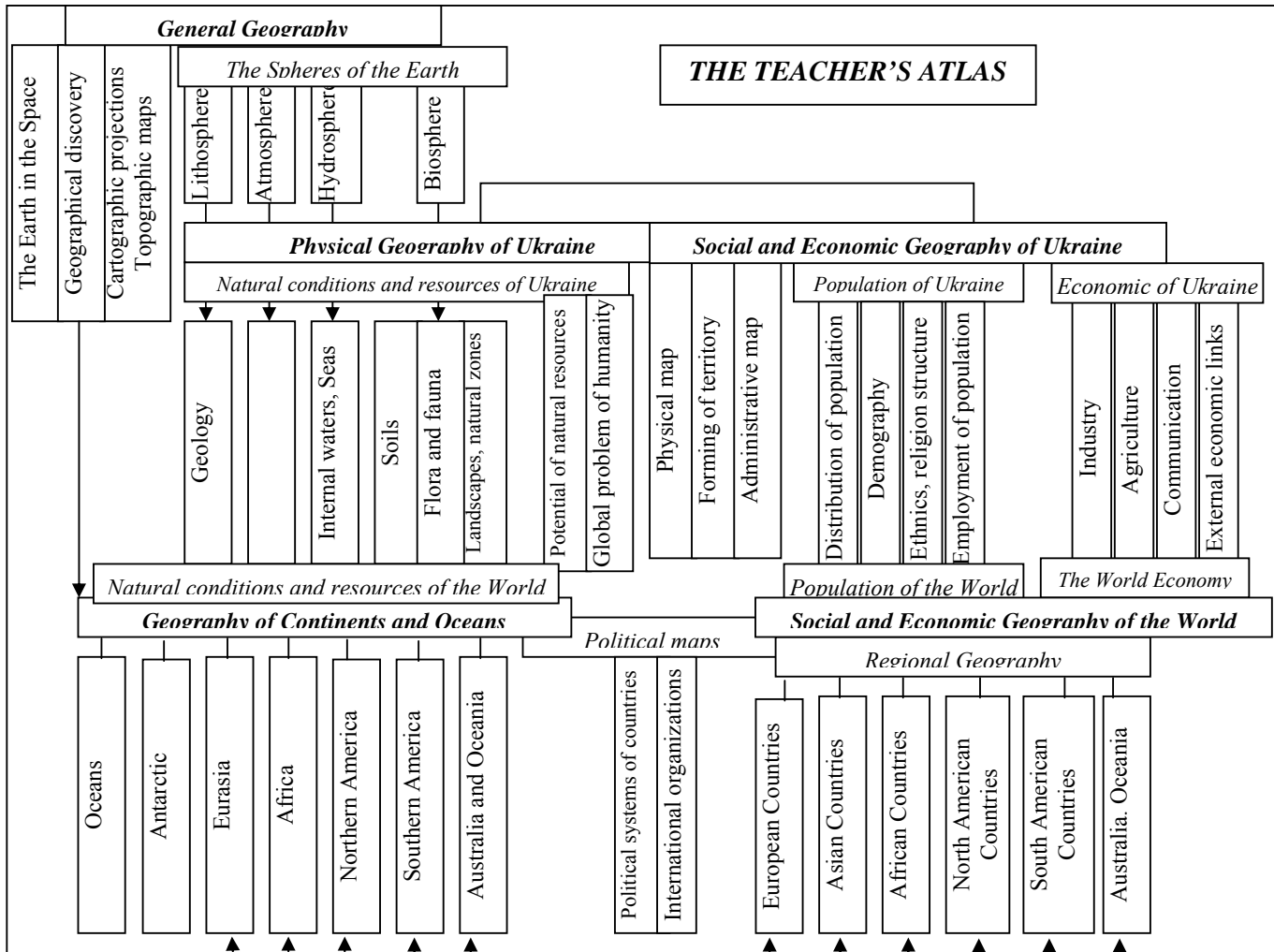


Figure1. Thematic interconnection of educational geographical atlases

Thus, the system of educational geographical atlases in Ukraine will be considered completed on condition of edition in future of interactive atlases the 6th, 7th, 8th, 9th, 10th–11th forms and atlases for the special courses *Geography of Population*, *Geography of Religions*, *Geography of Cultures*, *Geography of Tourism*, *Recreational Geography*, *Political Geography*, *Planetary Geography*, *Biogeography*, *Geoecology*, *Geography with the Basics of Environment* and others.

Conclusions. The system of educational atlases in Ukraine helps to study geographical disciplines and the courses integrated with them, it provides cartographic materials for primary, secondary and high schools. The contents of atlases, which are included in the system, are interconsistent, they share graphical design and the general methodical apparatus. The system can expand at the expense of a series of wall educational maps and interactive maps, which are created according to the principles and methodological options of educational maps and atlases creation. The formation of a system of educational geographical atlases is necessary for planning of further work on new atlases and maps, and the determination of the ways to improve the existent constituent parts of the system.

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