CREATION OF THE ELECTRONIC VERSION
OF THE NATIONAL ATLAS OF RUSSIA

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Abstract

The National Atlas of Russia will be made in traditional polygraph as well as electronic versions. Usage of the same initial information allows to coordinate creating processes for both versions in technological way. Creating of the Atlas electronic version begins with user`s shell-supplying contact of the user and the Atlas electronic version: entering, storaging, synthesizing of graphic data and making hard copies. Edited vector layers are converted from DXF format into format of the Atlas program system that will be closed for using in other programs. In this program system each cartographic object is edited: colour, type and width of line are set, square objects are coloured according classificator. Attributive database are made in user`s shell. Space images, general photographs, pictures are scanned and transferred into raster format. For proper inflorescence (close to natural) colourcorrection takes place. Experienced specialist, who knows real image of the place, must make this work. After colourcorrection the Atlas page is installed, there are raster images, its cartographic attachment and text. Vector and raster images, texts, reference databases are loaded into user`s shell of the Atlas electronic version. Prepared files for all elements of the Atlas electronic version are recorded on compact disks and duplicated. Work for electronic and paper versions of the first volume of the National Atlas of Russia is carried out in parallel way. Electronic version plans to be ready in the end of 2002.

The National atlas of Russia, designing and creation which one began in 1995, should exist in three versions: polygraphic, electronic (simplified) and geoinformation one. The electronic (simplified) version, recorded on CD-ROM's, is allowed operatively to visualize the images of conventional version digital analogue and to perform the simplest operations with them, including deriving of hard copies on the printer (plotter). The geoinformation version is provided multifarious usage of information placed in maps. There are a developed data base and general purpose programming shell in this version. The first general geographic volume of atlas is prepared to edition now. Because the financial difficulty, which is not permitting to operate above two versions of electronic atlases simultaneously, one first volume electronic version, intermediate between the electronic (simplified) and geoinformation one, is created now.

There are a lot of national atlases over the world now. Many from them were reprinted many times and recently tendency has appeared to edit both the polygraphic and electronic versions of such cartographic

products simultaneously. USA, Japan, Switzerland, Canada already are published their national atlases both in a conventional aspect and on CD-ROM's. The operations are completed on joint edition of the polygraphic and electronic volumes of the national atlases of Hungary, Germany, Iceland, Spain, Netherlands, Poland a. o. Besides not only national, but also other atlases (complex, subject, general geographic, regional and global) are published on the CD-ROM's as the independent products and together with the polygraphic variant. Originally electronic versions of the atlases are differed from the polygraphic ones by the information carrier only. The electronic version contained a full number of paper volume maps, scanned and written in raster format, and was intended for the extension of a number of users at the expense of a decrease of the cost of a copy.

The geographic information systems are widespread since the 90th, where the cartographic information is represented not only as a simple image, but as a sensible structure of objects and data enabling to realize different inquiries, such as search and measuring, deriving of additional information and, that is not-less important, possibility to change on-the-fly and to renew constantly the separate parts of the maps without a failure of the rest of information and consequently to support monitoring and duty. The entities, designed the national atlases all over the world, began to orient themselves on these achievements of science and now some countries as USA, Netherlands, Poland and others work on creation of the national atlas geoinformation systems. In this way at the national atlas designing a ground for a whole system of national cartographic and other reference products is built up. These products are oriented both for the specialists and for a rather large number of customers of the information about nature, population and state economics. In addition to electronic version edition the sites in Internet are created, where the last information is placed about the publishing of this or that product, the additional and renewed atlas information bases, so named on-line user support is performed.

The first volume of the National atlas of Russia should be published in 2002. It would contain the next chapters: "The Federal Structure of Russia", presented the administrative division of Russian Federation and its subjects, the main chapter – "The geographic regions and seas of Russia", containing of the general geographic maps of different scales (from 1:7 500 000 up to 1:500 000) and 64 pages of photo-images from space; predominantly text chapter "The forming, study and mapping of the territory of Russia" with the illustrations, reproductions of old maps and small modern maps; the chapter "The reference geographic data", including in addition to the tabular and text reference information thirteen thematic maps of scale of 1:15 000 000. The electronic version of this product would be published after issuing of the polygraphic one.

Nearly everybody has now an access to the personal computer, therefore electronic atlas will be useful for major number of the people by and large bound with teaching or scientific activity in different areas of geography and adjacent sciences.

The number of users of large cartographic products in polygraphic version, what the National atlas is, is consisted mainly from the scientists and specialists, bound with the miscellaneous aspects of study of Russia, and employers of government administration. The polygraphic version of atlas can remain inaccessible for many people, first of all for students, post-graduates and ordinary users, interested by geography and adjacent sciences and also interested in deriving the quality information about territory of Russia, because its high cost. The National atlas electronic version edition will allow to overcome this problem. Besides the electronic version would be useful in many respects when the polygraphic version is accessible. So it is not convenient to use in each case a paper volume to find the geographic object locus and the distance or area measuring in general is more comfortable to do on computer. It is more comfortable to use the electronic atlas and not a polygraphic one at the scientific studies, preparing of the monographs, textbooks, papers, where could be demanded the fragments of maps or space images.

Electronic version of the first volume of National atlas of Russia is understood as *the electronic atlas*[1]*,* including the information of the same bulk and contents as the polygraphic one. The same data are used for creation of the electronic version as for the polygraphic variant; it is permitted to achieve the information identity of both versions.

This product because of its particular significance should qualitatively stand out according to the accuracy, completeness of contents, appearance and style from a series already created in our country and abroad electronic atlases, counted for a broad customer, which are simply a number of raster scanned maps. The electronic version of the first volume of the National atlas will become the finished software product, which is not requiring from the user of any additional software except for an operating system Windows and will operate on the computer of average power. The software environment of the electronic version is allowed to the user a convenient access to whole atlas information, not requiring from him any special knowledge in programming, geographic informatics, cartography or geography.

Because the electronic version is published in the framework of the National atlas of Russia it will be have both the exterior appearance in uniform with the polygraphic version style and similar pictures of conventional signs. Because the electronic version is created after the polygraphic atlas, maps in it will be presented by separatee pages, corresponding to the pages of "paper" volume. But functions of search, measuring, level-by-level mapping and other will submit to the user more convenience than the conventional atlas itself.

The user's shell of the electronic atlas can be presented by two different variants of interface design, both the original one similar to (according to style) the polygraphic version and the standard one for the Windows programs.

The number of functions, proposed to user, should correspond the electronic atlas basic problems. The "standard" number of basic functions is formed now on the base of the existing global experience:

- the image scale change with the help of mouse or by the scale coefficient direct definition;
- the scrolling (displacement) of image with the help of scrolling lines or mouse special regime;
- the passage to any point of map with the help of geographic object search system or by the indicating on the map of a small scale with placing of required element in the centre of screen and the "highlighting";
- the short information receiving about the object from the database;
- the additional information receiving about the object with the help of references from the main data base on the text and graphical materials, given additively;
- the constant output of the cursor geographic co-ordinates;
- the absolute distance and ground area measurement with the help of mouse special regime;
- the constant output on the monitor screen of the polygraphic version page numbers, corresponded to the window current content.

The main scale of each digital map, as the content fullness, is corresponded to the scale of original (the polygraphic version map). The number of scales is proposed to the user from the minimal one, when the whole map is placed on the screen, to maximally possible increasing, when the object digital presentation discontinuity is permitted the normal visual perception of the object on the screen or in printed form.

The possibility would be proposed to user to pick out the rectangular map fragment with the help of mouse with the following increasing/decreasing of it to the representation window boundaries. The necessary scale is

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[1] The electronic atlas is a number of electronic maps and other (text, tabular, and graphic) data bases and materials, integrated by the user's environment (shell) into the uniform electronic cartographic product, recorded on the computer carrier and reproducible with the help of computer on the monitor screen or on the print output devices.

established in this case automatically. It is foreseen the exact scale determination by hand too. The object, located in the representation window centre, in this case was remained in the centre after the scale change.

During the search of any not-pointed geographic object, expressed through the area or length, and the following output of the corresponding part of map on the screen, the representation scale is determined automatically too for the optimal object inscribing in the window boundaries.

Taking into account that the all the existing maps of the territory of Russia are compiled in conical projection, it is necessary to foresee the automatic turn of the represented part in such way to put the vertical axis of representation window always to the north.

The main map both the electronic version and the polygraphic one is the general geographic map of 1:2 500 000 scale. This map is fully enclosed the whole territory of the Russian Federation and the adjoining seas and partially the contiguous state territories. The user could have the possibility directly during the work with the specific page of map to call the adjoining pages by the use of buttons of fast passage to them.

The detailed maps of larger scales (from 1:500 000 to 1:2 000 000) for some regions are presented in the first volume of the National atlas. These maps would be accessible to the user with the help of special call function or, at the increasing of part of main map, into which this detailed map falls, with the help of mouse. The automatic switching to this detailed map would be performed with the conservation of the object positions on the screen.

The detailed map page and space image location would be presented on the "paper" map, subjoined to the programming product.

The subject maps and the general geographic map of 1:15 000 000 scale are created separately, as the main map, according the technologies, similar to the geoinformation system technologies.

It is provided for the following volumes of the National atlas the creation of the different subject maps in the 1:15 000 000 scale, that's why during the design and creation of the maps of this scale in the first volume it is necessary to take into account both the use of them and the technologies of their creation in the electronic version of these volumes.

The introduction chapter review maps, including time zone map could be presented both in vector and raster format, because in this case the functions of the geoinformation system are not provided.

The space photo images as the detailed maps would be called by the user by the additional inquiry.

There are many different slides in the atlas, which would be called directly at the work with the maps, to which they are belonged. The electronic version headband is designed with the use of slides from the introduction chapter too.

The old map reproductions and the historical maps would be presented in raster format and included in text, which is represented with the help of special shell function. The text and tabular information about the object would be appeared in the object property window and/or called out additively from it.

It is planned the preliminary edition of electronic variant of the first volume of the National atlas of Russia on the CD-ROM's for the potential customer familiarization with it. This promotional character version should include CD-ROM's (two, according to preliminary estimations), instruction, the address card in the pasteboard packing with the colourful polygraphic appearance.

Taking into account the electronic version simultaneous output both on the native and the world market the whole text would be translated (including the text on the packing) in English for the English version (main and show one) issue. The English language version could be issued both the separately and together with the Russian language one. The language choice in the last case is performed at the shell installation.

The uniform technology of one polygraphic and two electronic versions was developed at the National atlas of Russia, in which digital information, received once, should be used in all three versions. Unfortunately, this order of work performing was not maintained because of the absence of enough experience in creation of the cartographic products of similar complexity. The demands of the electronic version development were not taken into account at the creation of the polygraphic version of atlas and this complicates later the problem on the electronic variant creation.

The initial stage of work on the electronic version of the first volume of the National atlas of Russia and the analyse of the experience of the works on the creation of the electronic versions of the other atlases, having the polygraphic variant, showed that it is necessary initially at the design of any cartographic products with the polygraphic and electronic versions to pick up rightly the whole complex of instrumental software. The data base should be established first of all with the help of instrumental programs of the geoinformation system. All cartographic objects should be presented in vector format and linked with the attributive data. After that the vector graphics should be borrowed from the geographic information base for the following editing into the special packets for the publishing original preparation. After that the make-up of the polygraphic version is performed and the electronic version is formed on the base of specially written program – the user shell. Two products are formed on this last stage according unified design projects – the paper volume of atlas and the set of computer carriers of its electronic version.

The electronic version of the first volume of the National atlas of Russia is performed after the polygraphic one with the temporal shift in approximately 1−1,5 years.

During the work on the first volume electronic version the active scientific-research work is performed on design of the optimal technology of creation of the National atlas of Russia next volumes in three versions, including creation of the unified geographic information base for all versions and volumes of atlas. The edition of three following National Atlas of Russia volumes simultaneously in polygraphic and electronic versions should be result of this work.

Creating of the Atlas electronic version begins with user`s shell supplying contact of the user and the Atlas electronic version: entering, storaging, synthesizing of graphic data and making hard copies.

Edited vector layers are converted from DXF format into format of the Atlas program system that will be closed for using in other programs. In this program system each cartographic object is edited: colour, type and width of line are set, square objects are coloured according classificator.

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