

Using the integrated information technology based on GIS for marine environmental data management and creation of reference books of the hydrometeorological conditions

A. Vorontsov (1), N. Mikhailov (1), Yu. Nalbandov (2), and V. Tuzhilkin (3)

(1) RIHMI-WDC, NODC of Russia
6 Korolyov St., Obninsk Kaluga Reg., 249035 Russia

(2) P.P. Shirshov Institute of Oceanology of RAS
23 Krasikova, Moscow, 117851 Russia

(3) Moscow State University, Faculty of Geography
Vorobjovy Gory, Moscow, 119899 Russia

E-mail: vorv@meteo.ru

The efficiency and validity of the World ocean investigations and decisions made in the course of exploitation of marine resources depend considerably on the level of information support for this activity. This makes it necessary to treat a full technological cycle of data management (integrated “end-to-end” information technology - IIT), from acquisition of observational data to provision of an end-user with complex information on all environmental aspects. The paper discusses the aspects of the realizing IIT and its use in the development of the specialised information systems.

The application domain of IIT is defined by the requirements imposed on the information support of marine environment investigation and exploitation. Generally these requirements may be divided into several classes of tasks such as provision of data and information by requests as hard copies or in the electronic form; obtaining climatic characteristics of marine environmental conditions in the region of investigation; monitoring of the current state of marine environment and dangerous natural phenomena; etc. The principal role of the integrated information technology consists of implementing a connected sequence of operations and procedures for acquisition, accumulation, modelling and transformation of marine environmental data in order to obtain information required for decision making and planning of environmental and other actions.

Now Russian NODC is developing such IIT (as a part of Special Federal Programme) based on modern geographical information system (GIS) to provide successful support of the marine environment data management and climatic research. Today GISs are actively used for solve different kinds of scientific and practical problems. Modern stage of using GIS in oceanography is characterized by the expansion of traditional static mapping of parameters up to the point of creating dynamic animation maps, which show the time variability of hydrometeorological fields. Modern specialists cannot do without GIS. Moreover, it is practically impossible to dispense with GIS in analyzing and displaying environmental information, when working with hydrometeorological data.

The paper analyzes the concept, architecture and development state of IIT, based on GIS. The paper examines the practical samples of the specialized integrated information systems. Technology of making environmental reference books based on GIS-technology is considered in the paper. The paper discusses the results of analysis of modern electronic reference books on the Black Sea hydrology. The fragments of a new electronic guide to the Black Sea hydrology, created on the basis of GIS-technology are shown.