Current methods of assessment of the Kremechutskiy reservoir basin within Cherkassy region: Research of the ecological state of Kremenchug reservoir within Cherkassy region by ERS methods

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Creation of the Dnipro cascade hydropower stations and reservoirs caused the gradual development of many complex environmental problems. In such a situation there is also Kremenchug Reservoir. Due to excessive exploitation of the reservoir area of shallow water for various reasons, but primarily due to human factors, decreased from 41.5 hectares to 30.6 hectares, of which over 10 thousand hectares of overgrown vegetation and surface were silted. Therefore, effective management decisions are necessary to control and improve the ecological condition of the Kremenchug reservoir.

We must have accurate, timely and complete information about the basic parameters of the current state of the environment components and anthropogenic factors that affect them. Most of these data can be obtained using the technologies of remote sensing (ERS) from space. These technologies offer more and more sophisticated hardware — software solutions and new approaches to the analysis of a wide range of subject — oriented problems. Analysis of these solutions and approaches, gives grounds to conclude that it is expedient to attract them to study structural relationships between socio-economic, technological, and natural resource factors that together determine the status, variability and correlation components of the natural environment in their interaction with technosphere. Using CRP allows methods and with great certainty to get objective information about the ecological state of an object and implement its Monitoring. In combination with technologies of geo-

Fig. 1. A space shot Ikonos (Cherkassy city).

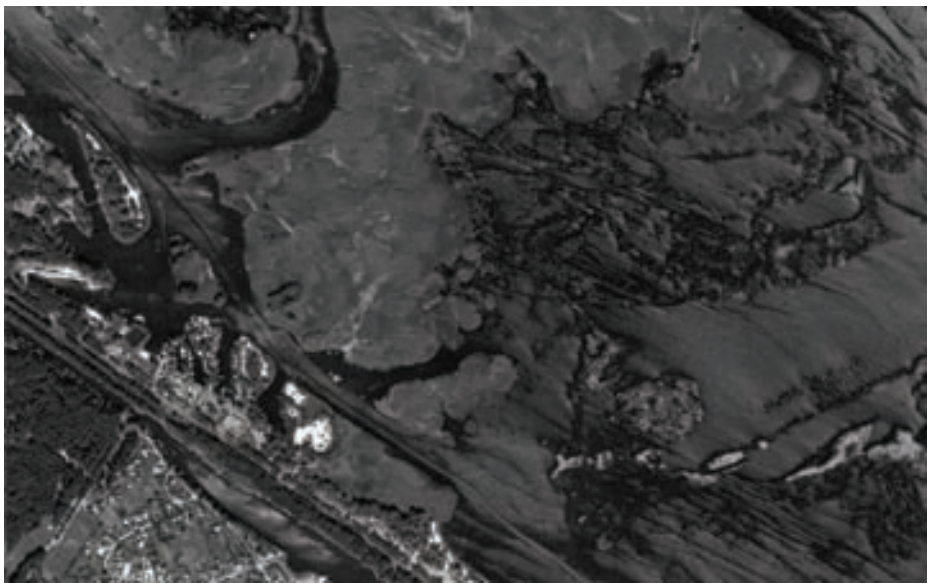

Fig. 2. Kosmos Ikonos (Kremenchug Reservoir).

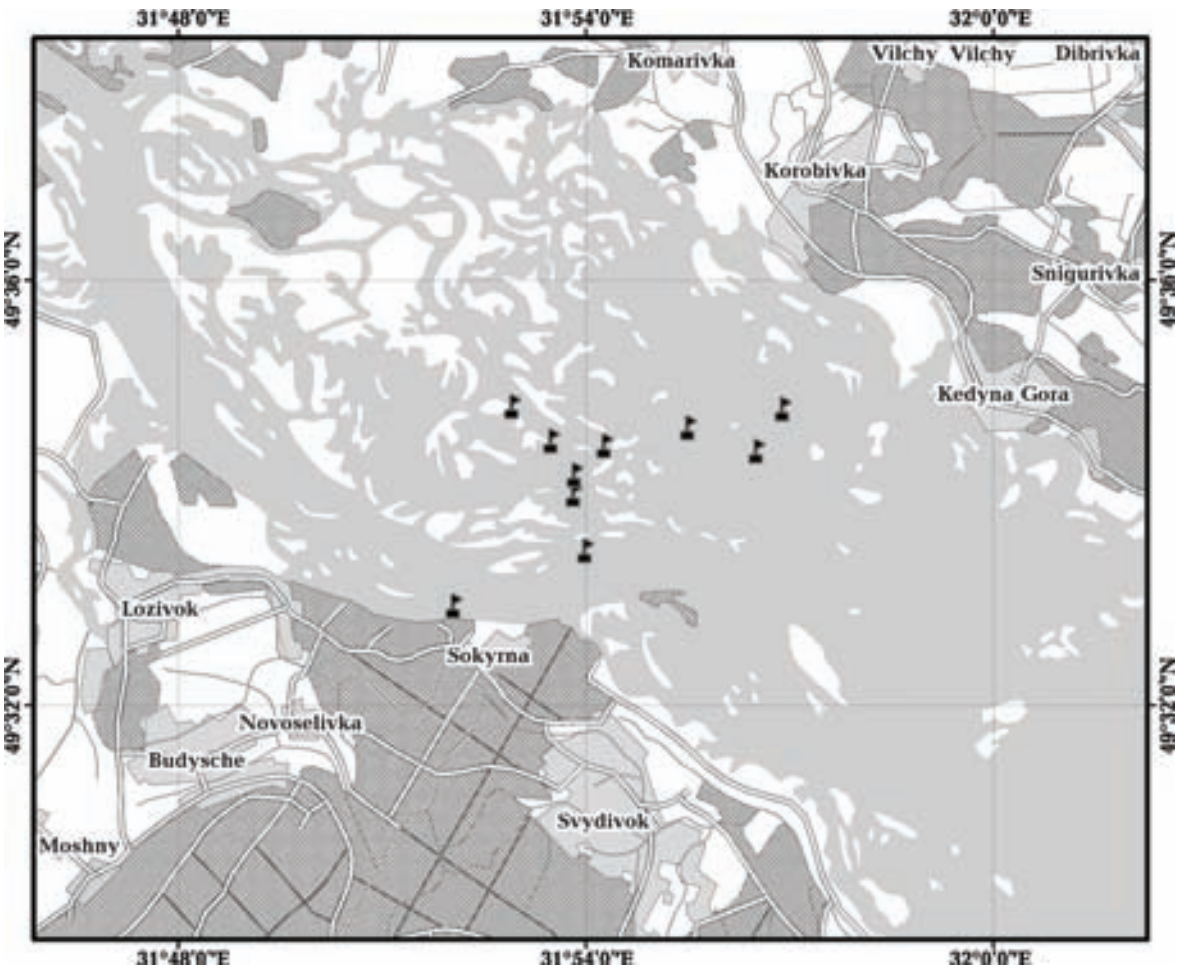

Fig. 3. Site selection stations surface water samples.

graphic information systems (GIS) remote sensing techniques allow us to quickly and comprehensively interpret environmental information content, quickly analyze and update it, combining with management decisions. That's why these methods were used in the studies of ecological state of the Kremenchug reservoir. Kremenchug water reservoir located in Cherkassy, Poltava and Kirovograd regions. It is the main regulator of Dnieper cascade.

Useful capacity of reservoir is 9 km 3, which is 50% of working volume of all Dnieper cascade reservoirs. The total length of 149 km, maximum width — 28 km, average — 15.1 km, maximum depth — 20, medium — 6 pm His area of 225 hectares. And water resources 13.5 mlrd m^3 [Regional …, 2009].

Kremenchug reservoir placed dozens of intake. In the summer in most of the waters of the Kremenchug reservoir lake set mode.

At high temperature there is intensive "blooming" of water, there is accumulation of algae and their subsequent reproduction has negative consequences for the health and biological condition of water quality, resulting in oxygen deficiency occurs in the subsurface water at night. Forming various organic and inorganic substances, including toxic.

During research expeditions ecological condition Kremenchug reservoirs, which were organized by the Institute of telecommunications and global information space of NAS of Ukraine and the State Research — Production Center "Nature" NCA in June 2009 was carried out complex measurements of environmental parameters of water masses (Fig. 1, 2). Their interpretation of satellite images of medium involved (MODIS) and super-high distinction (Ikonos) [Krasovsky, 2008; Krasovsky, Petrosov 1999].

According to preliminary data results of visual contextual interpretation of images determined the optimal location of grid stations to collect samples for hydrochemical analysis. The criterion was defined zone sign of extreme brightness area waters, according to the value resolution image. This grid included 10 stations to collect samples. Check point located to create with. Sokyrne — pp. Korobivka so that each channel was tested and cities with a dead regime. Time of testing — the middle day, averaging parameters determined for the oxygen regime. Coordinates of sampling stations of surface water registered by technical means of GPS accuracy of 15 m (Fig. 3) selected samples at different depths. Instrumentation were carried out using water devices Hanna Instrunents HI and HI 98 130 98 121 according to the following list: conductivity, temperature, pH value and redox potential (Table). Also transparency was fixed (on disk Sekky).

It is known that pH-index of activity of hydrogen ions. Size influenced by a mass development of phytoplankton (eg, blue-green algae characteristic of the Dnieper cascade reservoirs) in the summer can be increased to 9.0—10.0; the period of mass death and decomposition of algae in acid pH shift side (sharp decrease in pH) [Nikanorov, 1989].

During research expeditions in the ecological condition of the materials space shooting, synchronous with the ground measurements of indicators of ecological state of water masses, methods of correlation and regression analysis was restored spatial — temporal distribution of these indicators across the top of the Kremenchug reservoir area.

The collected data show that the top of Kremenchug reservoir no significant man-made pollution phe-

Indicators of quality of surface water

№ station	Coordinates		Time selection 21.07.09	Depth, m	Clarity, m	Conductivity	Temperature, °C	Eh, мВ	Ph	Notes
	X, latitude	*Y*, logtitude								
1	49°54.684′	31°86.902′	11:35	4.9	2.2	330	24.8	+205	8.02	
2	49°55.779′	31°90.164′	11:50	3.2	1.8	330	24.8	+205	7.59	
3	49°56.660′	31°89.883′	12:10	1.5	1.5	330	24.5	+205	7.83	
4	49°56.964′	31°89.897′	12:20	2.4	2.2	330	24.5	+214	7.83	Cal solid-watched blossom water
5	49°57.497′	31°89.329′	12:35	3.6	2.0	330	24.6	+214	7.95	
6	49°58.038′	31°88.373′	12:45	2.4	2.0	330	24.7	+213	7.99	
7	49°57.424′	31°90.632′	13:00	3.4	2.0	330	24.6	+207	8.04	
8	49°57.704′	31°92.683′	13:05	3.0	2.4	330	24.7	+216	7.87	
9	49°57.338′	31°94.367′	13:15	2.3	2.0	330	24.7	+208	8.0	Completely clarity, available higher water vegetation
10	49°58.002′	31°95.008′	13:30	2.0	2.0	320	25.0	+220	8.06	

nomena and its ecosystem is in good order. Note that the research are systematic and not selective, which can not reflect the environmental situation in general, but at the time of sampling.

On this point may be noted that there is a need for regular and thorough environmental monitoring marine and coastal areas of the lake (of course, this applies not only in the region), which should include a wide range of issues, ranging from enterprise monitoring and control of waste emissions and process waste, thermal and chemical pollution of waters to determine the intensity of self-purification, secondary contamination of biota and other issues.

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