System of Hydrological Observations on Lakes and Reservoirs in the Russian Federation

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System of hydrological observations is the main source of information on the surface water.



The main functions of the system of hydrological observations

System of hydrological observations

Surface water inventory (quantity and quality)

Water cadastre

Hydrological regime and water resources assessment Surface water quality regime assessment

Hydrological forecasts in real time scale Hydrological network is the main part of surface water inventory. Hydrological observation data are required for many branches of the national economy, scientific purposes, environmental requests and others. Therefore, the requirements for this information are diverse with time.



State Hydrological Institute - Methodical center for the hydrological network on lakes and reservoirs of Russia

Objectives

Development of common methods of observation

Development of standard methods of data collection, processing and control

Preparation of annual and longterm summaries on lakes' regime Functions

Methodical guidance of the network on lakes & reservoirs

Control of the network's functioning through inspections and analysis of data

Conducting of the State Water Cadastre, part "Lakes and Reservoirs" Development and Conducting Data Base on hydrological regime of lakes and reservoirs

Dynamics of the hydrological network on rivers, lakes and reservoirs of Russia

	Years	Lake gauges site
	1986	514
	1992	408
	1995	386
	1997	362
	1998	356
	1999	350
овродовродоводоводоводоводоводо годы	2000	351
120120120120120100100100100100100	2001	351
	2002	350
	2003	351
	2004	354
Общее количество действующих постов	2005	355
Количество речных постов	2006	355
	2007	354

Structure of Hydrological Network on Lakes and Reservoirs of Russia

Regional Hydrometeorological Centre

Hydrometeorological observatories on lakes and reservoirs

Hydrometeorological stations on lakes and reservoirs

Hydrological stations



Gauging sites

Lake level

Water surface temperature

State of water body

Ice thickness and snow depth

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Waves

Currents

Open water

Water temperature, transparency

Ice thickness and snow depth

Waves

Program of hydrological observations for gauging sites of the First category

Type of observation	Time and Period
Gauges	sites
Lake/reservoir level	Daily, at 8 a.m and 8 p.m, non-stop automatic registration
Surface water temperature	The same for ice free period
Waves (type, period, height, direction)	The same for ice free period
Ice events	Since beginning till the end of events
Ice thickness	During period of ice cover once in 5 days till 0,3 m of ice thickness, once in 10 days till max. ice thickness
Open water	(verticals and profiles):
water temperature at different depths, transparency and water color	Once in 5 days , period without ice cover





- 1. Up-to-date hydrological network on lakes and reservoirs of Russia consists of 354 gauges located on 71 reservoirs and 160 lakes
- 2. The information about hydrological regime of lakes and reservoirs consists of 3 parts: passport data of lakes and reservoirs; annual data of observations from 1989, and long-term time series from the beginning of the instrumental period till 1988-2000.
- 3. The long term time series are partly kept in the PC Data Base as well as 80% of annual information, which comes from the hydrological network.



Lake and reservoirs data processing, control and archiving are realized within the National Water Cadastre System (NWC)

The main functions of the National Water Cadastre:

collection, control of data completeness, validity and timeliness of data delivery as well as a preliminary processing of the observation data on regime and quality of water, statistical data on water use, data on registration of water bodies, observation stations and water users;

systematization and storage of the collected data and results of preliminary data processing;

standard processing and generalization of the stored data using official methods, delivery of the processed and generalized data to the users within the officially accepted standards and established dates.

The National Water Cadastre structure

Water resources, their quality and use Integrated, selected and generalized information Annual and long-term generalizations



Basic principles of the general concept of the Automated Informational System (AIS) for the NWC :

(1) The system operates in the form of individual subsystems within the responsibilities of different agencies

(2) Each type of the subsystem is characterized by hierarchic structure (three-level organizational-functional structure) and involves appropriate structures for collection and proparation of input data (level 1), local (regional, republican) centers of the NWC (level 2) and governmental center for the NWC (level 3). The total system operation is provided by the united interrelated coordinating center of the NWC at the State Hydrological Institute (level 4)
(3) Each center of the NWC provides the NWC compilation on its level for the

3) Each center of the NWC provides the NWC compliation on its level for the responsible territory. The center is responsible for the volume, reliability and timeliness of data delivery. The center provides administrative (level 2) or methodological (level 3) guidance of the structural elements of the lower level for the appropriate territory and competence.

(4) Data banks of the appropriate type, including national data bank entitled "Water Resources" and specialized data banks which are realized a standard technological formats of the AIS of the NWC.

Main conceptual statements of AIS "NWC-Lakes".

- 1. To concentrate the main part of data processing in Local Hydrometeorological Agencies (LHA)
 - To provide operational data processing
- To provide a critical analysis of data during its processing
 To transfer information from LHA to the State
 - To transfer information from LHA to the State Hydrometeorological Fund via SHI after additional control and analysis

AIS "NWC-Lakes"

(functional scheme)



Observational sites

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Information stored in the data bank:

- passport data on water bodies;
- passport data on gauges on lakes and reservoirs;
- annually replenished data on hydrometeorological observations near shore and/or at water surface;
- data of annual generalization in the form of hydrological annuals.





Output from AIS "NWC-Lakes"

- Hydrological annuals, part 2 "Lakes and reservoirs"
- Hydrometerological Observation data on lakes and reservoirs checked, corrected and compiled in a standard way to input to the State Hydrometeorological Fund.



The following information on lakes and reservoirs is presented in the hydrological annuals (part 2 "Lakes and reservoirs"): Tables:

2.1 list of gauges on lakes and reservoirs information on which is placed in an annual;

2.3 water level at gauges and mean lake level for lakes and reservoirs;

2.6 surface water temperature near shore and at the lakes surface area;

2.8 water temperature at different depths;

2.10 Ice events at gauging site;

2.11 ice thickness and snow depth on ice near shores and on ice profiles;

2.12 ice thickness and snow depth on ice profiles;

2.14 recurrence of different wind speeds and wind directions;

Territorial division of water cadastre publications (section "Surface water")



МИНИСТЕРСТВО ПРИРОДНЫХ РЕСУРСОВ И ЭКОЛОГИИ РОССИЙСКОЙ ФЕДЕРАЦИИ ФЕДЕРАЛЬНАЯ СЛУЖБА ПО ГИДРОМЕТЕОРОЛОГИИ И МОНИТОРИНГУ ОКРУЖАЮЩЕЙ СРЕДЫ ФЕДЕРАЛЬНОЕ АГЕНТСТВО ВОДНЫХ РЕСУРСОВ

> ВОДНЫЙ КАДАСТР РОССИЙСКОЙ ФЕДЕРАЦИИ

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