



МЕЖДУНАРОДНЫЙ ЦЕНТР ДАННЫХ
ПО ГИДРОЛОГИИ ОЗЁР И ВОДОХРАНИЛИЩ
INTERNATIONAL DATA CENTRE
ON HYDROLOGY OF LAKES AND RESERVOIRS

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ANNUAL NEWSLETTER

Dear Reader!

The next, 8th release of the Annual Newsletter contains a variety of materials related to both the current activities of the International Data Center on Hydrology of Lakes and Reservoirs and the events that took place in 2017, including the Center's international collaboration. Traditionally the Newsletter provides information on the current state of the HYDROLARE database and the development of HYDROLARE IT-infrastructure.

An important event for the Center was the 6th meeting of its International Steering Committee, which was held at the State Hydrological Institute (SHI), St. Petersburg, Russia, on July 18 – 20, 2017. The current issue of the Newsletter features the highlights of the meeting.

Close attention is given to the role of remote observations in the study of hydrology of lakes. J.-F. Crétaux and T. Pavelsky's report is devoted to result of the international seminar "Lakes and Climate: The Role of Remote Sensing", organized by the National Center for Space Studies (CNES), in Toulouse, France, on June 1 – 2, 2017. The seminar was an important stage in joining efforts of the international scientific community in the wider use of remote sensing capabilities for lakes and climate studies.

The reader might also be interested in learning about the climate change indicators (ECVs) development competition for various components of the Earth system, which was announced in 2017 by the European Space Agency as a part of the Climate Change Initiative (CCI +) Program. A brief article, submitted by J.-F. Crétaux and S. Simis, examines the main goals, objectives, and possible directions for implementing this project in relation to the ECV-Lakes.

In conclusion, traditionally, on behalf of the staff of the Center, I would like to express sincere gratitude to the representatives of the countries which cooperate with HYDROLARE.

Prof. Valery Vuglinsky
Director of HYDROLARE



Lake Ilmen (Russia)

At the seminar, the attention was directed to the necessity of creation of the global network of *in-situ* observations of lakes variables for the purpose of solution of a wide range of tasks, including the following:

- calibration and validation of satellite-derived data;
- evaluation of the models;
- preparation of data for the models;
- identification and tracking of the long-term changes via multiple variables and data sets.

The seminar attendees have resolved to organize an international working group on the topic

of “Lakes and Climate: The Role of Remote Sensing” for improvement of the present representations of natural properties of lakes on the global scale and expansions of the use of satellite information for the achievement of this goal. To this end, we invite all interested colleagues to join the working group. We also hope for the support from such international organizations as UN Environment Program (UNEP), Group on Earth Observations (GEO), Food and Agriculture Organization of the United Nations (FAO), World Meteorological Organization (WMO), and space agencies, e.g. European Space Agency (ESA).

THE “CLIMATE CHANGE INITIATIVE - CCI+” PROJECT AND THE ROLE OF HYDROLARE

J.-F. Cretaux (CNES/LEGOS, France), S. Simis (Plymouth Marine Laboratory, UK)

At the end of the summer of 2017, the European Space Agency (ESA) launched a contest on development of the Essential Climate Variables (ECVs) for various components of the Earth system within the “Climate Change Initiative – CCI+” project. Among them is ECV-Lakes which had been previously proposed as a part of the indicators for the Global Climate Observing System (GCOS) project. The primary objective of the CCI+ project is determination and validation of some variables included in ECV-Lakes, which are received with the aid of satellites. The project is aimed at the long-term coordinated satellite surveillance, along with designing and development of technological units of satellite data processing in its initial stages with subsequent unification of these units into a uniform sustainable technological system.

Various indicators are included in ECV-Lakes such as a lake water level, lake surface water area, lake surface water temperature, lake ice cover and its thickness, and lake surface reflectance. For determining all the abovementioned indicators, the state-of-the-art approaches will be used including combination of diverse sensors and methodologies of calibration and validation of satellite-derived data. The main goal is the coverage of diverse landscapes of the Earth by satellite observation in which potential users are interested. It will require significant improvements of the existing methods in order to establish particular variables for the lakes, their inter-comparison, and preparation of those indicators application examples. Thus, implementation of this project will allow the scientific community to expand the use of satellite-derived data for solution of limnology tasks.

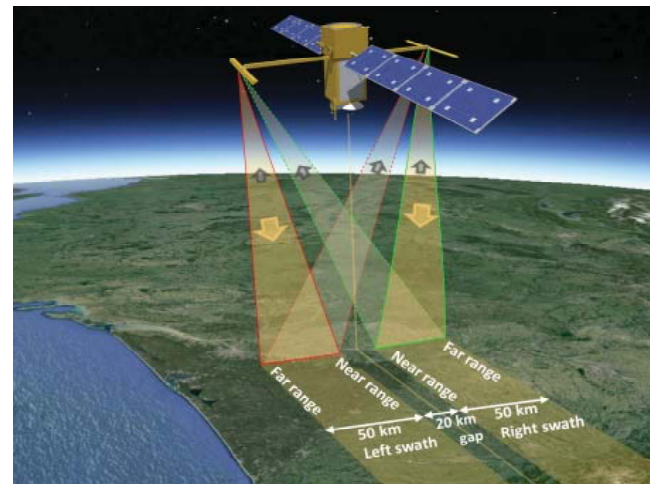


Fig. 3. The principles of operation of a large interferometer.

Another important objective of this project is validation and inter-comparison of satellite-derived data with *in-situ* data. For this task the cooperation with The International Data Centre on Hydrology of Lakes and Reservoirs (HYDROLARE) is necessary. The main aim in this case is to receive feedback from consumers on accuracy and stability of one ECV-Lakes indicators for their further improvements. Unfortunately, there are significant gaps in requirements for a series of variables for lakes, which are featured in the new realization plan of the GCOS program (GCOS-2000). In this regard, the analysis of consumers’ requirements towards indicators within ECV-Lakes at the beginning of the current project is a very important stage for further revision and specification of these requirements to reach a consensus between the scientific community studying climate and the community of specialists working on climate indicators.

SIXTH MEETING OF THE INTERNATIONAL STEERING COMMITTEE FOR HYDROLARE

Prof. V. Vuglinsky, HYDROLARE, Russia

On July 18-20, 2017, the 6th meeting of the Steering Committee of the International Data Center on Hydrology of Lakes and Reservoirs (HYDROLARE) was held at the State Hydrological Institute (SHI), St.Petersburg, Russia.

Prof. V. Vuglinsky, the Director of HYDROLARE, reported on the activities of the Center for the period of time from September 2015 to July 2017. Information on creation and maintenance of the Center's database and the development of its technological infrastructure was provided by Lyudmila Barinova and Elena Kuprienok, the Center's employees. Among the main achievements of the center, the following ones were mentioned:

- continuous lakes and reservoirs water levels data acquisition from the WMO Members;
- the launch of processing of new types information – the *in-situ* data on water temperature and ice thickness;
- ensuring the stable functioning of the Center's English-language website, including the means of informing users about the current content of the database through the cartographic interface and the search system;
- continuous collaboration with the Laboratory of Study of Geophysics and Oceanography from Space (LEGOS), at the National Center for Space Studies (CNES), France;
- preparation and publication of the 7th issue of the HYDROLARE Annual Newsletter.

The meeting participants highly praised the progress the Center had made in the period since the fifth meeting of the International Steering Committee of the Center (September 29 – October 1, 2015, St.Petersburg, Russia).

Dr. Wolfgang Grabs, the Head of the GTN-H project (Germany), made a presentation on the current status of the project and the Center's role in accomplishing its tasks. Currently, the main objectives of the project, as Dr. Grabs stated, were monitoring data preparation on terrestrial hydrological climate change indicators (ECVs) for the Global Climate Observing System (GCOS) program, as well as planning and implementation of the global data centers activities in the hydrology field.

Dr. Dominique Bérod, the Head of the Division for Basic Systems in Hydrology of the Department of Climate and Water of the WMO Secretariat, made a report on the current decisions of the WMO Executive Council, GCOS, WMO Commission for

Hydrology (CHy), and also on the role of the global hydrological data centers. He noted that currently the main activities within the "Basic Systems in Hydrology" project are as follows: receiving, collecting, processing, storing, ensuring access, as well as disseminating data.

Dr. Ulrich Looser, the Director of the Global Runoff Data Center (GRDC), Germany, presented a report on the current status of the Center and its prospective activities. He described the main functions of the Center, reported on those international projects and programs that the Center provides data for, and informed those present at the meeting of the Center's data providing policy.

Dr. Jean-François Cretaux, the representative of the LEGOS laboratory (CNES, Toulouse, France), made a report on the activities of the laboratory on monitoring lake levels from satellite altimetry. He noted that the Hydroweb database web service currently provides ECV data on changes in the water levels of 160 world lakes. In addition, satellite data are provided on the changes in the water surface extent and water volume variations for approximately 100 lakes worldwide. For 60 lakes in the Hydroweb database, satellite monitoring and processing of the received data is carried out in near-real time, and these data are publicly accessible.

The reports and presentations were followed by a general discussion of the various aspects of HYDROLARE activities. The meeting participants agreed upon the key perspectives on further development of the Center for the period of 2017–2019.

The report on the 6th HYDROLARE International Steering Committee meeting is available on the Center's official website: www.hydrolare.net



Fig. 4. Participants of the 6th HYDROLARE Scientific Steering Committee meeting.