



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

## ANNUAL NEWSLETTER

№ 2  
2012

Welcome to the second issue of the HYDROLARE newsletter. In this issue we will tell you about activities of the Centre in 2011. These activities were mainly focused on further formation of the HYDROLARE database, development of computer technologies, enhancing cooperation with partner institutions and organization of the third session of the International Steering Committee for HYDROLARE.

In the section below you will find a brief summary of our activities, problems and progress in the HYDROLARE database formation process.

Third meeting of the International Steering Committee for HYDROLARE was held in July 2011 in the State Hydrological Institute (SHI), St. Petersburg, Russia. The Committee highly appreciated the progress made in the period 2009–2011 and adopted a new work plan for 2011–2012. This issue also carries information about the meeting.

In September 2011 a cooperation agreement was signed between HYDROLARE and the Laboratory of Study of Geophysics and Oceanography from Space (LEGOS) at the National Centre for Space Research (CNES, France). An agreement was reached on development of a joint project aimed at integration of in-situ and satellite data from LEGOS and HYDROLARE databases. A special article describing the HYDROLARE-LEGOS project has been kindly contributed to our newsletter by Dr Jean-François Crétaux from LEGOS/CNES.

In this issue you will also find information about another HYDROLARE partner — the Global Runoff Data Centre (GRDC) operating at the Federal Institute of Hydrology (BfG), Koblenz, Germany. We are very grateful to Dr Ulrich Looser, Head of GRDC, who has kindly provided material for the corresponding section.

The staff of the Centre expresses gratitude to all services and responsible organizations of WMO Members which have delivered their data to the international database on hydrology of lakes and reservoirs.

*Prof. Valery Vuglinsky  
Director of HYDROLARE*



WWW.HYDROLARE.RU

Lake Ladoga

## DATABASE FORMATION

Elena Kuprienok, HYDROLARE, Russia

As it was informed in the first issue, the HYDROLARE database contains annual data on water level, water temperature and ice cover thickness of lakes and reservoirs, as well as “passport data” (metadata) of lakes and hydrological stations. General description of the database is available on the HYDROLARE website. In 2011 the database was further developed. As a result, in addition to data received earlier from Kyrgyzstan, Kazakhstan, Belarus (all types of data), Tajikistan (water level), Hong-Kong (water temperature), Sweden (ice cover), and metadata from Switzerland, we received additional data from Sweden (water level) and Slovenia (water level and temperature). Two main problems became apparent in the course of the process. Firstly, in many cases data submission is delayed in spite of the pledges made earlier by the countries. Secondly, the data are delivered in a variety of formats and languages

used both in data files and the descriptions, which substantially impedes data processing. This is particularly the case when data are provided through links to official websites of responsible national services.

Besides general description of the database and policy guidelines, the HYDROLARE website provides recommended Excel forms for data submission as well as examples and notes for filling.

Taking into account the responses recently received from several countries which confirm their readiness to deliver data to the Centre (Iceland, the USA, Cyprus, etc), the questionnaire sent earlier to these countries was again made available on the website.

We are planning to put a tool for displaying information on the database content into operation as soon as the database is populated with sufficient data from outside Russia.

## RESULTS OF DATA COLLECTION

Country	Status	Country	Status
<b>EUROPE</b>			
Armenia	✉	Moldova	✉
Austria	✉	Romania	✉
Azerbaijan	✉	Serbia	✉
Belarus	✉ ✉	Slovenia	✉ ✉
Cyprus	✉	Spain	✉
Estonia*		Switzerland	✉ ✉
Finland	✉	Sweden	✉ ✉
Hungary	✉	Ukraine	✉
Iceland	✉		
<b>ASIA</b>			
Hong Kong	✉ ✉	Mongolia	✉
India	✉	Tajikistan	✉ ✉
Kazakhstan	✉ ✉	Uzbekistan*	
Kyrgyzstan	✉ ✉		

Country	Status	Country	Status
<b>AFRICA</b>			
Mali	✉	Zambia	✉
Tanzania	✉		
<b>NORTH AND CENTRAL AMERICA</b>			
Antigua and Barbuda	✉	Dominica	✉
Belize	✉	Mexico	✉
Canada	✉	USA	✉
<b>SOUTH AMERICA</b>			
Chile	✉	Colombia	✉
<b>SOUTH-WEST PACIFIC</b>			
Australia	✉		

✉ – request sent

✉ – data received

\* data until 1991 are being prepared to be sent out to countries which have provided these data for updating.

## THIRD MEETING OF THE INTERNATIONAL STEERING COMMITTEE FOR HYDROLARE

Sophia Bazanova, HYDROLARE, Russia

Third meeting of the Steering Committee for HYDROLARE was held on 5–7 July 2011 in SHI, St. Petersburg, with participation of representatives of WMO, GCOS, GRDC, ILEC and LEGOS/CNES. Participants discussed realization of the work plan 2009–2011 adopted by the second Steering Committee meeting.

The following were noted among main achievements of the Centre:

- the largely re-designed website containing new important information and documents;
- database development including preparation and loading of data from Russia and former USSR countries;

- progress in integration of in-situ and satellite lake and reservoir regime data;
- first issue of the HYDROLARE newsletter.

Special attention was given at the meeting to the role of HYDROLARE in climate studies, particularly in assessing climate change impact on water regime of lakes of the world. The representative of WMO Dr W. Grabs informed participants of the recognition of the importance of global data centres, including HYDROLARE, by members of the XVI Congress of WMO held in May-June 2011 in Geneva. The representative of GCOS Dr A. Zaitsev highlighted the importance of the Centre with regard to climate variability and change and its role in the collection of climate information in the Global Framework for Climate Services (GFCS) — WMO and GCOS co-sponsored programme.

During the meeting, a number of reports were made on the activities of HYDROLARE, other international data centres and their cooperation, among which “GCOS Programme and its connection with HYDROLARE”, “Activities of LEGOS/CNES” and others. Participants discussed a wide range of issues related to the activities of the Centre.

Members of the Steering Committee highly welcomed the signing of a cooperation agreement between

LEGOS/CNES and HYDROLARE and discussed progress made in the integration of terrestrial and satellite-based observations of lake level changes.

At the end of the meeting participants adopted a new work plan for 2011–2012.



Participants of the third meeting of the International Steering Committee for HYDROLARE

Report of the third meeting of the Steering Committee is available at: [www.hydrolare.ru](http://www.hydrolare.ru).

## REMOTE SENSING TECHNIQUES FOR LAKE MEASUREMENTS AND COOPERATION OF HYDROLARE WITH THE LABORATORY OF STUDY OF GEOPHYSICS AND OCEANOGRAPHY FROM SPACE (LEGOS)

*Jean-François Crétaux, LEGOS/ CNES, France*

The LEGOS laboratory of Toulouse (France) and HYDROLARE established mutual contacts in 2009.

In September 2011 an official letter of agreement was signed between CNES (Centre National d'Etudes Spatiales), CNRS (Centre National de la Recherche Scientifique) in France and the SHI (State Hydrological Institute) in St. Petersburg to cooperate, exchange information, and share their efforts to build up HYDROLARE. The role of LEGOS will be to setup web pages on lake monitoring from satellites. Those pages are going to be accessible from both the HYDROLARE and the Hydroweb data centres. Hydroweb is a website which was initially devoted to worldwide lakes and rivers water height level inferred from satellite altimetry.

In the frame of the definition by GCOS and GTOS of a certain number of ECVs (Essential Climate Variables) on lakes (water level, area and temperature), we have at LEGOS developed a new satellite data procedure to fulfill this requirement for the water level and

area determination from a combination of radar altimetry and satellite imagery.

Radar altimetry is a technique which allows to determine water level variations every ten to 35 days depending on which satellite is used (Topex/Poseidon, Jason-1, Jason-2, Envisat, GFO, ERS2) for all lakes over passed by the satellite. The technique is very accurate for big lakes where tests have demonstrated that 2-3 cm of accuracy is achieved, less for small lakes but a generally 10 to 20 cm of accuracy is obtained for the majority of them. For more details on the techniques, results and database development, see J-F. Crétaux et al., SOLS: A Lake database to monitor in Near Real Time water level and storage variations from remote sensing data, *J. Adv. Space Res.* (2011), doi: 10.1016/j.asr.2011.01.004.

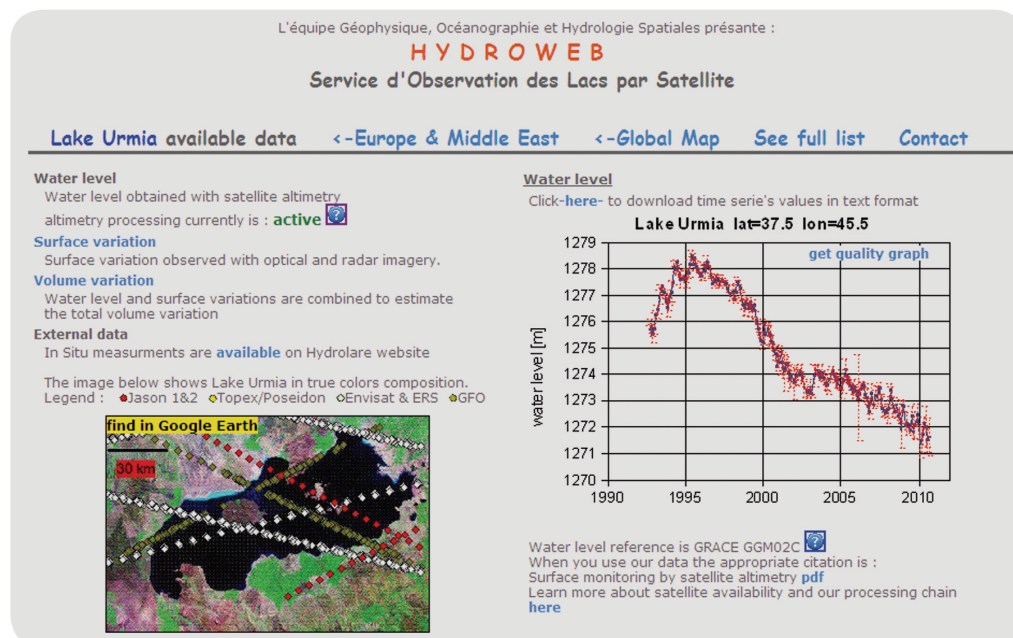
In 2011 the LEGOS reinforced its efforts in preparing the adaptation of Hydroweb to HYDROLARE database. It has consisted in automatization of the satellite data processing (for altimetry), a relooking of the individual lake pages, and updating of the new pages



for now a pre list of 30 lakes and reservoirs among the 162 already included in Hydroweb.

A direct link to HYDROLARE website has already been created on each lake's page, and will be active in agreement with SHI.

The plan for the year 2012 is to increase the number of lakes that will be directly linked to HYDROLARE website, and to start the active linkage between HYDROLARE and Hydroweb.



Fragment of Hydroweb web-page providing data of satellite-based lake monitoring

## GLOBAL RUNOFF DATA CENTRE (GRDC) — THE PARTNER CENTRE FOR HYDROLARE

Ulrich Looser, GRDC, Germany

The Global Runoff Data Centre (GRDC) established in 1988 at the Federal Institute of Hydrology (BfG) in Koblenz, Germany, is a contribution of the Federal Republic of Germany to the World Climate Programme Water (WCP-Water) WMO.

Central tasks of the GRDC are:

- world-wide acquisition, storage and dissemination of historical and near-real-time river discharge data in support of the predominantly water and climate related programmes and projects of the United Nations, their specialized agencies and the scientific research community;
- operation and further development of the GRDC database; improvement of integration with external databases;
- contribution to the development of international standards for hydrological data transfer, metadata and data structures;
- preparation and maintenance of applied global data products and discharge-related geo-information,

partly in collaboration with specialized external institutions;

- operation and maintenance of a comprehensive GRDC website and publication of the GRDC Report Series.

In November 2011 the GRDC database holds world-wide discharge data for 8,068 stations in 157 countries featuring around 320,000 station-years of monthly and daily values with an average time-series length of 40 years. A map representing location of stations in GRDC is available at the GRDC website.

This wealth of river discharge data and additional GRDC generated information is willingly accepted by the research community. A noticeable trend over the last years is the increasing need for global datasets for the operation and calibration of global climate change models, often to support mitigation and adaptation strategies.

For a comprehensive view on the data, products and activities of the GRDC please visit the GRDC website at: <http://grdc.bafg.de>.