



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

ANNUAL NEWSLETTER

№ 5
2015

Dear Reader, We are glad to invite you to read the fifth issue of the annual HYDROLARE newsletter.

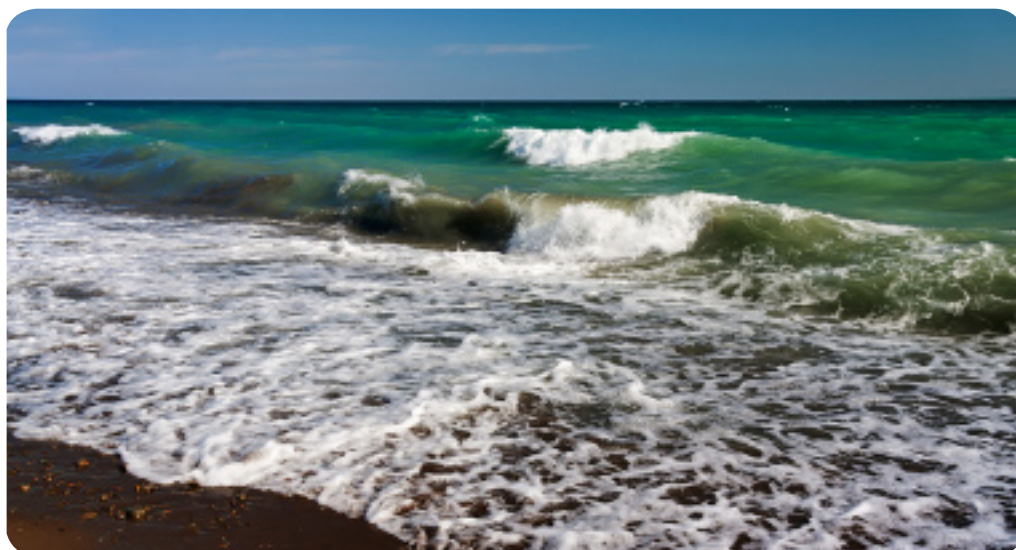
As usual, this issue presents information about the status of the HYDROLARE database and the updates made in 2014. It is very encouraging to note that in 2014 the database was enhanced with new type of data – water level time series for lakes and reservoirs obtained from satellite altimetry. These data were kindly provided by the Laboratory of Study of Geophysics and Oceanography from Space (LEGOS) at the National Centre for Space Studies (CNES, France) under bilateral cooperation. Information about recent advancements and perspectives of HYDROWEB Data Centre, a host of these data, is also presented in the newsletter (article courtesy of J-F. Crétaux).

Some readers may be interested in the article providing information about international workshop on monitoring of large lakes and reservoirs of the world held in 2014 under the umbrella of the 15th World Lake Conference (1 – 5 September 2014, Perugia, Italy).

The fifth meeting of the International Steering Committee for HYDROLARE to be held in the third quarter of 2015 at the State Hydrological Institute, St. Petersburg, Russia, will mark a very important milestone in the development of HYDROLARE.

In conclusion, as is customary, on behalf of the HYDROLARE staff, I wish to thank all the countries that have provided their data to our database. Any initiative by WMO Members towards strengthening the HYDROLARE database would be welcomed.

Prof. Valery Vuglinsky
Director of HYDROLARE



WWW.HYDROLARE.NET

Lake Balkhash

UPDATING OF THE HYDROLARE DATABASE







































E. Kuprienok, HYDROLARE, Russia
















In 2014 work has continued on collection, analysis and preparation of data from WMO Member states including coding of lakes and stations and converting of data to the adopted format. Uploaded into database were data for reservoirs of Australia (North East coast of Australia and Tasmania) for 1990 – 2012 and Mexico (endorheic regions) for 1946 – 2011. Data were also added for lakes of Slovenia (Bohinj and Bled Lakes) for the period since the start of observations until 2010. Related metadata for lakes and reservoirs of Australia, Mexico and Slovenia were added


accordingly. Armenia updated its long-term series in the HYDROLARE database by data for 2008 – 2013. Work has progressed on identification and retrieval of data from websites of Mexico, Slovenia, Sweden and the United States. Long-term series for the Great Lakes (USA) were updated by data for 2013.

As of end of 2014, 15 countries provided their data in response to the HYDROLARE request. The status of the database is provided in the table below.

**Table. DATA COLLECTION STATUS
(COUNTRIES AGREED TO COLLABORATE WITH HYDROLARE)**

Country	Status	Country	Status
EUROPE			
Armenia	 	Moldova	 
Austria		Poland	
Azerbaijan		Romania	
Belarus	 	Serbia	
Cyprus	 	Slovenia	 
Estonia		Spain	
Finland	 	Sweden	 
Hungary		Switzerland	 
Iceland		Ukraine	
ASIA			
China		Kyrgyzstan	 
Hong Kong	 	Mongolia	
India		Tajikistan	 
Kazakhstan	 	Uzbekistan	

Country	Status	Country	Status
AFRICA			
Mali		Zambia	
Tanzania			
NORTH AND CENTRAL AMERICA			
Antigua and Barbuda		Dominica	
Belize		Mexico	 
Canada		USA	 
SOUTH AMERICA			
Chile		Colombia	
AUSTRALIA-OCEANIA			
Australia	 		

 – data requested

 – data submitted

NEW DATA IN THE HYDROLARE DATABASE

L. Barinova, G. Barinova, HYDROLARE, Russia

In 2014 significant progress has been made towards integration of in situ and space-based lake level data. Relevant work was undertaken as part of long-standing cooperation between HYDROLARE and the LEGOS laboratory at the French Space Agency (CNES). Water level data based on satellite altimetry together with

corresponding metadata for 47 lakes and reservoirs from 33 countries were provided by LEGOS for integration in the HYDROLARE database. The time series were analyzed and after certain upgrade of the HYDROLARE technological complex uploaded in the database with related information displayed on the HYDROLARE web site.

HYDROLARE database contains in situ data for 13 lakes and reservoirs in 8 countries out of 47 provided by LEGOS. The rest 34 lakes located in 25 countries of Asia, Africa and North and South America were linked to corresponding web pages of the HYDROWEB web site. These links supplemented on-line links for other lakes already available in HYDROLARE.

The HYDROLARE database now contains level data for lakes located in all populated continents.

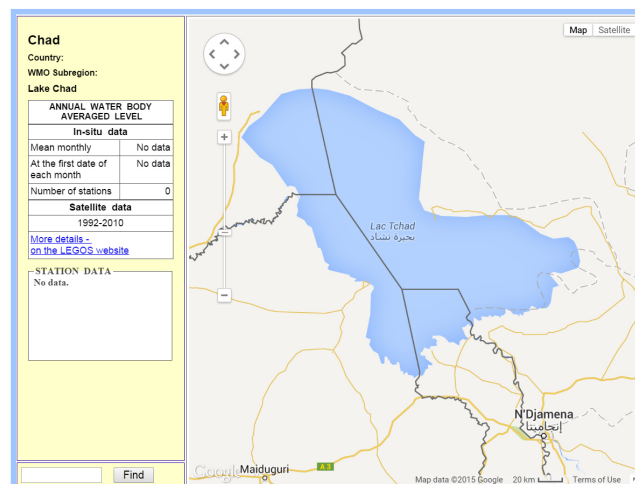


Fig. 1. The information about availability of satellite data presented on the HYDROLARE web site.

RECENT ADVANCEMENTS OF THE HYDROWEB DATA CENTRE AND PERSPECTIVES

J-F. Crétaux, LEGOS/CNES, France

Over the past 10 years the LEGOS has developed a web database (HYDROWEB: www.legos.obs-mip.fr/soa/hydrologie/hydroweb/) containing time series over water levels of 230 lakes and over more than 1400 virtual stations over rivers on a global scale. It provides offline water level time series on rivers, reservoirs and lakes based on altimetry data from several satellites (Topex/Poseidon, ERS-2, Jason-1&2, GFO, ICESAT, ENVISAT and soon, in 2015, Saral/AltiKa). In a longer perspective, the HYDROWEB database will integrate data from future missions (Jason-3, Jason-CS, Sentinel-3A/B) and finally will serve for the design of the SWOT mission.

The major developments in HYDROWEB in 2015 will be the opening of a new operational data centre with automatic acquisition and processing of satellite data for updating time series in near real time and also use of additional remote sensing data, like satellite imagery allowing the calculation of lake's surfaces. Currently HYDROWEB delivers the products with a time delay of about 2 years due to the too large amount of data to be processed rapidly. This was considered as a strong weakness of the service as it didn't allow developing new applications requiring continuous and real time release of the water level of lakes and rivers.

The opening of the new service, called HYSOPE, is planned for June 2015, and the HYDROLARE database will also receive in a short delay the products for lakes included in HYSOPE.

In 2014 the Legos realized some new assessment of the quality of the satellite altimetry using a set of in situ data for lakes in Chile and Argentina. Using these databases 15 lakes with different sizes and locations were selected and comparisons have carried out with the instruments onboard the two missions, Envisat and Saral. Since the Saral instruments uses a new technology, expecting better accuracy than previous altimeters, the idea of this study was to check the possible improvements on lakes from this new mission. The main results of this study are illustrated in the figure 2 below.

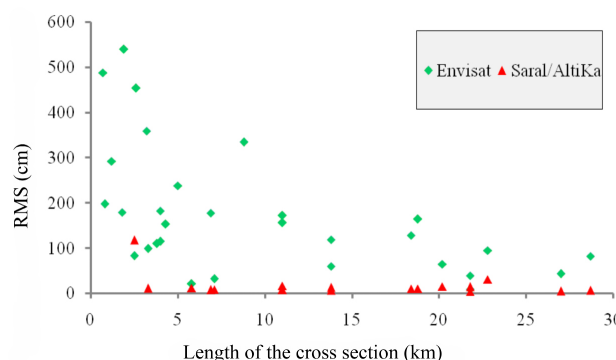


Fig. 2. RMS of the comparison Envisat/RA-2 (green) and Saral/AltiKa (red) with in situ data with respect to the length of the cross section.

For the future (beginning of 2016), the potential to monitor new lakes and reservoirs will be significantly enhanced thanks to new orbital parameter (never used in the past missions) of the European

sentinel-3 satellites and a large number of new lakes will be accessible from satellite altimetry and will be included in HYSOPE. Moreover the SAR mode on Sentinel-3 is expected to again improve the ability of altimeters to measure water heights over small or narrow water bodies such as small lakes

and reservoirs. This implies that many of such water bodies still not included in HYDROWEB with classical Low Resolution Mode mission will hopefully be monitored with high accuracy allowing them to be delivered in HYSOPE and HYDROLARE

INTERNATIONAL WORKSHOP ON MONITORING OF LARGE LAKE SAND RESERVOIRS OF THE WORLD

V. Vuglinskiy, S. Bazanova (HYDROLARE)

International workshop on monitoring of large lake sand reservoirs of the world was organized and held by HYDROLARE in the framework of 15th World Lake Conference (1 – 5 September 2014, Perugia, Italy). The conference was organized by the International Lake Environment Committee (ILEC, Japan) which is partnering HYDROLARE in assessment and study of ecological state of the world's lakes and reservoirs. Prof. N. Aladin (ZIN RAS), representative of Russia in ILEC, provided substantial support to HYDROLARE in organization of the event.

The workshop was held under the auspices and with financial support of WMO and GCOS.

The Laboratory of Study of Geophysics and Oceanography from Space (LEGOS) at the French Space Agency (CNES) participated actively in preparation for and conduct of the workshop. Representative of LEGOS J-F. Crétaux was involved in development of the programme and preparation of reports.

The workshop addressed issues related to collection, analysis, processing and delivering of the world's largest lakes and reservoirs hydrological monitoring data. These data are known to provide a basis for studies of lake regime, water balance and water exchange, maintaining the environmental balance and ensuring the most efficient use of large lakes and reservoirs by different economic sectors. Hydrological monitoring is aimed at obtaining of long-term series of data on lake levels to be used as climate change indicator.

Unfortunately, hydrological monitoring data

are not available for many large lakes of the world. Monitoring datasets available in different countries are incomplete obtained with the use of different measurement techniques leading to incompatibility of data.

Over 50 participants from different countries of the world attended the workshop. 10 presentations were made among which of the most interest were the following:

V. Vuglinskiy (State Hydrological Institute, Russia) - HYDROLARE – main tasks and first steps of the activity;

E. Kuprienok (HYDROLARE, Russia) – Database of the International data centre on hydrology of lakes and reservoirs;

A. Arsen (LEGOS, France) – HYDROWEB: a lake database from satellite;

L. Alvares de Campos Abreu (Brazil) – Combined use of satellite altimetry and imagery for modeling water volume changes of Tres Marias Reservoir, Brazil;

E. Safarov (Azerbaijan) – Investigation of Caspian Sea level variations by the modern methods.

In discussion of the above and a series of other reports by representatives of Finland, France, Russian Federation and the United Kingdom specific attention was given to issues of assessing accuracy, calibration and availability of observation data, particularly for transboundary lakes, lakes of Central Asia, Caspian Sea and large reservoirs. Issues were also discussed of exchange of satellite observation data and their calibration with the use of in situ data.

The next meeting
of the International Steering Committee for HYDROLARE
will be held in St. Petersburg at the of September 2015.