



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

ANNUAL NEWSLETTER

№ 3
2013

Dear Readers,

Let me introduce you to the third issue of annual newsletter of the International Data Centre on Hydrology of Lakes and Reservoirs (HYDROLARE). In this issue you will find information about our main activities in 2012.

As usual, a special section will inform you about the status of the database and the difficulties we encountered in the process of collecting and processing data from WMO Member-States.

In 2012, HYDROLARE and the Laboratory of Study of Geophysics and Oceanography from Space (LEGOS) at the National Centre for Space Studies (CNES), France, exchanged visits of their representatives. The newsletter contains information about major outcomes of these visits.

Much attention has been paid in our activities to comparison of altimetry and in-situ lake level data. This work has been carried out jointly with LEGOS. The article containing the results of the comparisons is provided courtesy of J-F. Crétau (LEGOS/CNES).

Another milestone in the development of our centre will become the fourth meeting of the International Steering Committee for HYDROLARE which is scheduled for 2–4 July 2013 at the State Hydrological Institute (St. Petersburg, Russia).

HYDROLARE Team would like to thank WMO Member-States for their support and the contribution to the development of the international lake database. We are very interested in enhancing the process of the database creation so any initiatives of WMO Member-States to provide data to our centre will be highly appreciated.

*Prof. Valery Vuglinsky
Director of HYDROLARE*



Lake Valdai

COLLECTION OF DATA FOR THE HYDROLARE DATABASE

Elena Kuprienok, HYDROLARE, Russia

As in previous years, HYDROLARE continued to collect, analyze and process data submitted by WMO Member-States, as well as to convert data sets to the suitable format. As regards former USSR countries, in addition to data obtained earlier from Kyrgyzstan, Kazakhstan, Belarus and Tajikistan, lake level data from the beginning of observations up to the year 2010 was received from the Republic of Moldova. Data on various elements of hydrological regime of lakes and reservoirs were submitted by Mexico, Australia and Cyprus. Work has progressed on retrieval of data from websites of the USA, Switzerland, Sweden and Slovenia

as well as on further identification, selection, analysis, preparation and conversion of data, including encoding of water bodies and stations. The Great Lakes water level data were uploaded into the database. Repeated data requests were sent to Poland, Canada, Finland and China. Table 1 represents status of data submission.

As it was mentioned in the previous newsletter, the process is impeded by a number of difficulties due to the variety of languages used by National services, different coordinate and elevation systems, units of measurement, encoding systems and the content and formats of the datasets submitted.

Table 1. DATA SUBMISSION STATUS

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	☒
SOUTH-WEST PACIFIC			
Australia	☒ ☒		

☒ – request sent

☒ – data received

EXCHANGE OF VISITS BY REPRESENTATIVES OF HYDROLARE AND LEGOS

Sophia Bazanova, HYDROLARE, Russia

The visit of representative of the Laboratory of Study of Geophysics and Oceanography from Space (LEGOS) J-F. Crétaux to HYDROLARE took place on 20–21 February 2012. During the meeting, participants discussed progress in implementation of the joint work plan adopted at the third meeting of the HYDROLARE Steering Committee in 2011. They noted successful start of cooperation

and agreed on further actions. In particular, an agreement was reached to jointly prepare two lists of lakes for monitoring main water and ice regime characteristics: lakes disturbed by human activities and transboundary lakes. A decision to prepare such two lists of lakes on the basis of the GCOS GTN-L list was made at the third Steering Committee meeting.

An important point of discussion was further development of a joint project on integration of HYDROLARE and Hydroweb websites. This will make information about the content of databases accessible from both websites.

On his request, the representative of LEGOS was given a set of long-term in-situ water level data for two large Russian reservoirs and five largest Russian lakes included in GTN-L list for comparison with altimetry products. Results of comparison are presented in the article by J-F. Crétaux.

The representative of HYDROLARE S. Bazanova visited LEGOS on 5–7 June 2012. The visit was aimed at exchange of experience on collection, archiving and provision of data on hydrological characteristics of lakes and reservoirs obtained by in-situ and remote sensing techniques. During the workshop S. Bazanova presented the activities of HYDROLARE focusing on its aims and tasks, status of the database, progress in collection of data from WMO Member-States, as well as data policy. Participants discussed issues of data quality control, development of measures to stimulate WMO Member-States to provide data to HYDROLARE and to increase the efficiency of data collection process.

S. Bazanova and J-F. Crétaux (courtesy of J-F. Crétaux) prepared and circulated a number of requests to countries cooperating with LEGOS and holding data on lake hydrology seeking for the possibility of obtaining such data for HYDROLARE and using of the new data in the joint HYDROLARE-LEGOS project.

Results of implementation of the HYDROLARE work plan for July 2011 — July 2013 were summarized

focusing on completion of the joint HYDROLARE/LEGOS milestones.

The perspectives of further cooperation were discussed. It was decided to continue the comparisons of altimetry and in-situ lake data.



Participants of the meeting in LEGOS/CNES

Finally parties decided to organize a visit of representatives of LEGOS to HYDROLARE in April 2013 in order to enhance the development of the on-line version of the prototype databases available from both websites. Following the agreement reached during the meeting at HYDROLARE, J-F. Crétaux provided S. Bazanova a prototype of the two lists of lakes — one of them for monitoring water and ice regime characteristics and another for transboundary lakes.

RESULTS OF COMPARISON OF ALTIMETRY AND IN-SITU LAKE LEVEL DATA (case study of Russian lakes)

Jean-François Crétaux, LEGOS/CNES, France

Comparison of in-situ and altimetry level data for two large Russian reservoirs (Bratskoye and Kuybyshevskoye) and five large lakes (Khanka, Ilmen, Ladoga, Onega and Baikal) was done in 2012 in the framework of cooperation between HYDROLARE and LEGOS. The comparison was done by LEGOS using data provided by HYDROLARE.

Comparison for the two reservoirs (Bratskoye and Kuybyshevskoye) showed the worse correspondence of in-situ and altimetry data (residual mean square about 40 cm), which can be attributed to the fact that their length is incommensurably larger than their width. At the same time correlation coefficients

are quite good (due to high amplitude of water level variations well captured by altimetry).

Comparison of long-term data for five lakes demonstrated residual mean square (RMS) ranging between 8 and 41 cm with correlation coefficients of about 0,94 to 0,98 except for the lake Khanka (0,60).

Table 2 contains summary of accuracy of altimetry comparing to in-situ lake level data. Results given in the table show that for long term or inter-annual variability, although accuracy is not very high, in case with no in situ data, altimetry can be an acceptable alternative.

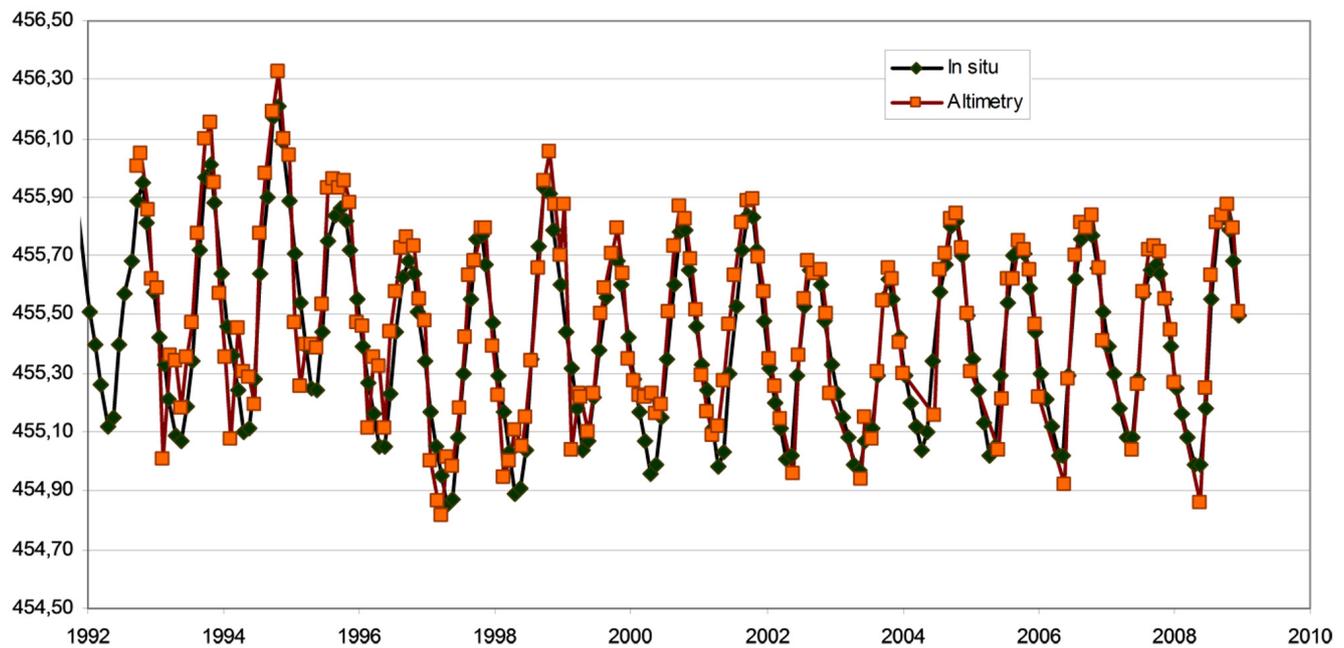
Table 2. SUMMARY OF ACCURACY OF ALTIMETRY COMPARING TO IN-SITU LAKE LEVEL DATA

Lake/Reservoir	Residual mean square, cm	Correlation coefficient	Maximum of errors, cm
Khanka	13	0,60	32
Ilmen	33	0,96	103
Ladoga	8	0,98	40
Onega (<i>rest of year</i>)	4	0,99	15
Onega (<i>winter</i>)	15	0,88	81
Baikal	11	0,94	43
Bratskoye	41	0,98	215
Kuybyshevskoye	37	0,97	160

It was also observed that for lakes covered by ice in winter, the altimetry data are less accurate during this period, as given by the example of the lake Onega for which the RMS using data in winter is about 15 cm, while it is as small as 4 cm for the rest of the year.

The above results have also been confirmed by other studies (Ricko et al., 2012 and Cretaux et al., 2011).

The figure below represents historical variations of the Baikal lake level for 1992–2009 by both in-situ and altimetry observations.



Historical variations of the Baikal level by in-situ and altimetry data