



## International Data Centre on Hydrology of Lakes and Reservoirs

# HYDROLARE



- established in 2009 by Roshydromet at the State Hydrological Institute under umbrella of the World Meteorological Organization (WMO);
- together with other hydrological data centers enters the system "Global Terrestrial Network-Hydrology" (GTN-H);
- provides data on hydrology of world lakes and reservoirs.
- the Centre operates on the basis of free dissemination of information (used for non-commercial purposes) for governmental, scientific, educational, public and commercial institutions.

Director : prof. Valery Vuglinsky



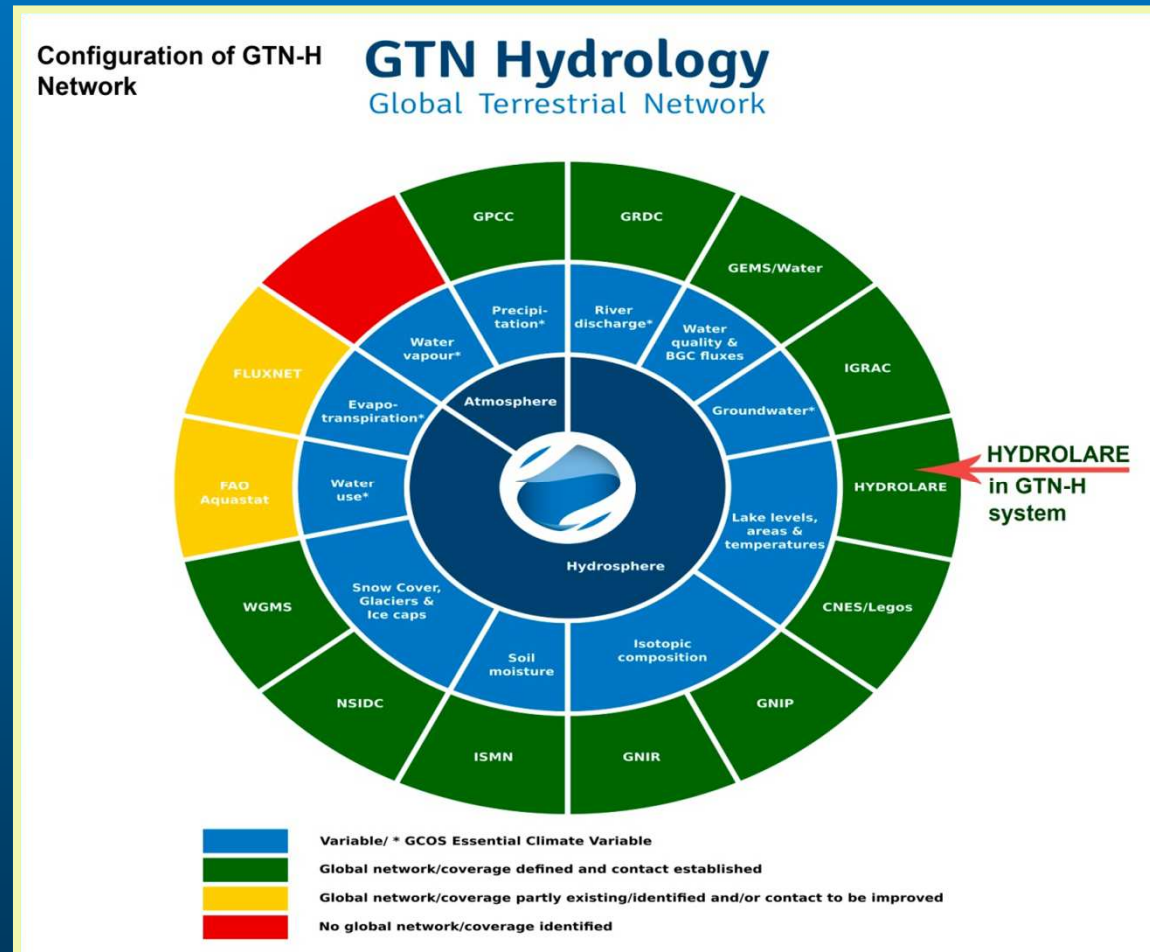
The screenshot shows the Hydrolare website interface. At the top, there is a blue header with the Hydrolare logo on the left, the text "INTERNATIONAL DATA CENTRE ON HYDROLOGY OF LAKES AND RESERVOIRS" in the center, and the WMO and Roshydromet logos on the right. Below the header is a navigation bar with links: HOME, ABOUT US, PARTNERS, NEWS, DATA, REPORTS, and CONTACT. The main content area features a paragraph stating: "HYDROLARE was established in 2009 by [ROSHYDROMET](#) at [the State Hydrological Institute](#). HYDROLARE together with other data centers enters the system "Global Terrestrial Network-Hydrology" (GTN-H). HYDROLARE provides data on hydrology of world lakes and reservoirs (today nearly 550 water bodies)." Below this text is a 2x3 grid of six photographs showing various lakes and reservoirs in different landscapes. At the bottom of the main content area, a small text block states: "HYDROLARE operates under the auspices of [WMO](#) following the recommendations made by the International Steering Committee for HYDROLARE." The footer of the website contains the copyright notice: "Copyright © International Data Centre on Hydrology of Lakes and Reservoirs".

The objective of the HYDROLARE is:

**the establishment, development and regular update of international database on hydrological regime of lakes and reservoirs**

in order to:

- stimulate the development of the global monitoring system on lakes and reservoirs for rational use, preservation and management of their water resources;
- improve the knowledge of lateral fluxes transformation within lakes and reservoirs;
- supply data for scientific and educational purposes, modelling, development of different global and regional projects/programmes.



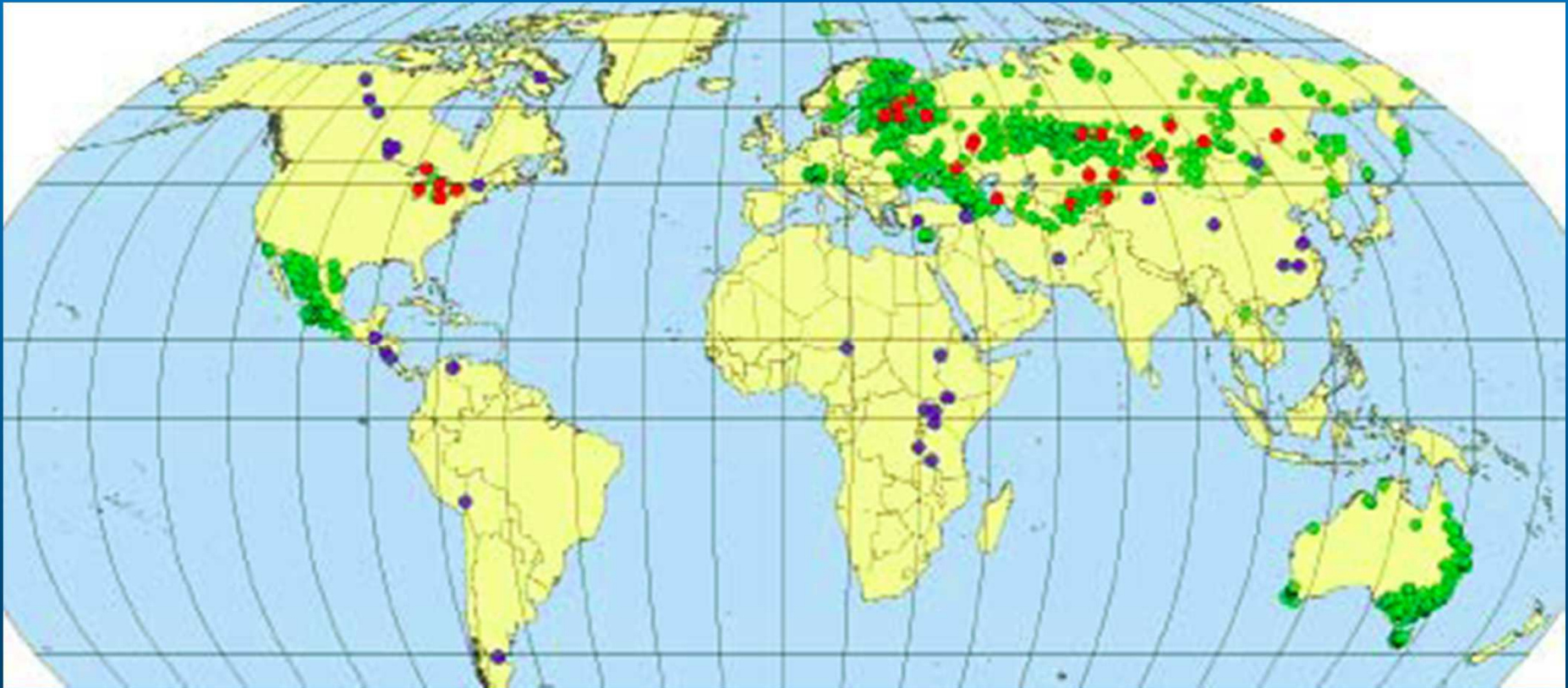
# Collection of data on hydrology of lakes and reservoirs of WMO members

Europe					
ARMENIA			MOLDOVA		
AUSTRIA			ROMANIA		
AZERBAIJAN			SERBIA		
BELARUS			SLOVENIA		
CYPRUS			SPAIN		
ESTONIA			SWEDEN		
FINLAND			SWITZERLAND		
HUNGARY			UKRAINE		
ICELAND					
Asia					
HONG KONG			MONGOLIA		
INDIA			TAJIKISTAN		
KAZAKHSTAN			UZBEKISTAN		
KYRGYZSTAN					
Africa					
MALI			ZAMBIA		
TANZANIA					
North America, Central America and the Caribbean					
ANTIGUA AND BARBUDA			DOMINICA		
BELIZE			MEXICO		
CANADA			USA		
South America					
CHILE			COLOMBIA		
South-West Pacific					
AUSTRALIA					
– request sent		– data received			

Currently the HYDROLARE database holds water level data of 1183 world's lakes and reservoirs and 1420 stations

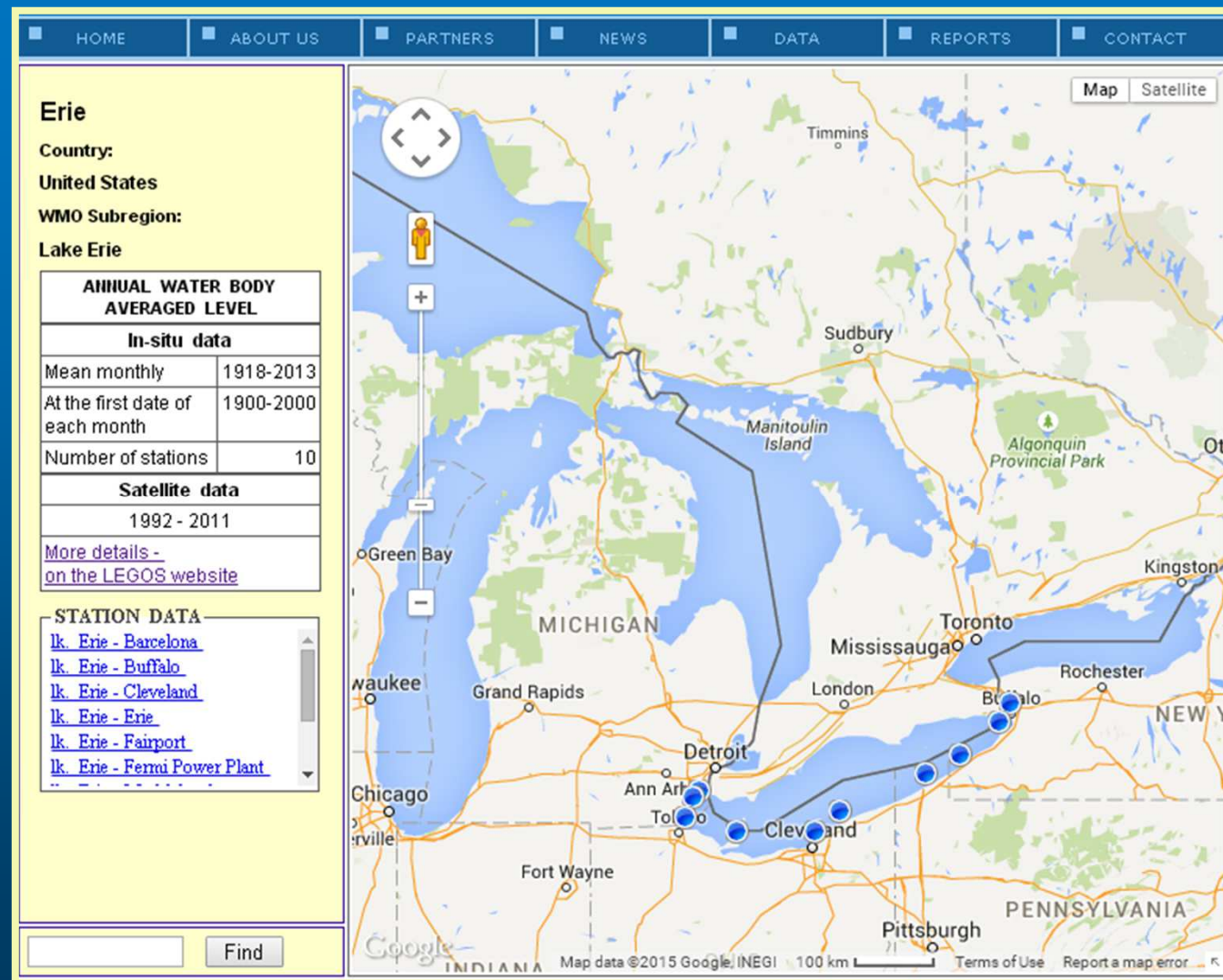


## Lake and reservoirs in the HYDROLARE data base



in-situ observations are highlighted in green, satellite observation - in blue, both type of observations – in red.

The special HYDROLARE search and explore tool helps users to search information about main database content through Google Maps .



Regularly updated information on the status of the database content is available on the web site at: [www.hydrolare.net](http://www.hydrolare.net)



Within HYDROLARE-LEGOS cooperation activities were implemented aimed at integration of in-situ and satellite data available HYDROLARE and LEGOS (Hydroweb) respectively.

A direct access from HYDROLARE to Hydroweb web site was enabled for acquiring information on availability of satellite data for selected lakes on Hydroweb web site and vice versa

**INTERNATIONAL DATA CENTRE  
ON HYDROLOGY OF LAKES AND RESERVOIRS**

■ HOME ■ ABOUT US ■ PARTNERS ■ NEWS ■ DATA ■ REPORTS ■ CONTACT

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**HYDROWEB**  
Water level of rivers and lakes by satellite altimetry





Lake Baikal available data <-Asia <-Global Map See full list Contact

**Water level**  
Water level obtained with satellite altimetry  
altimetry processing currently is : **active** 

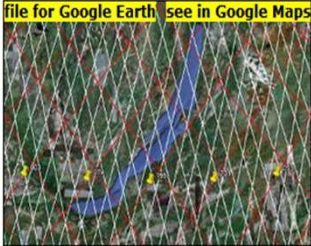
**Surface variation**  
Surface variation observed with optical and radar imagery.

**Volume variation**  
Water level and surface variations are combined to estimate the total volume variation

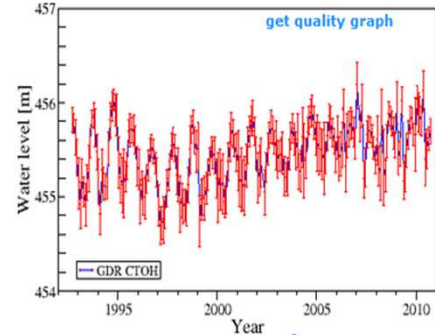
**External data**  
In Situ measurements are **available** on Hydrolare website.


Image below shows Lake Baikal in color composition.  
Legend :  Jason 1&2  Topex/Poseidon  Envisat & ERS   
GFO

[file for Google Earth](#) [see in Google Maps](#)



**Water level**  
Click-[here](#)- to download time serie's values in text format.  
Lake Baikal lat=53.40 lon=106.40



Water level reference is GRACE GGM02C 

When you use our data the appropriate citation is :  
"Surface monitoring by satellite altimetry" [pdf](#)

[Learn more](#) about satellite availability and our processing chain.

Cross links between pages of LEGOS (Hydroweb) and HYDROLARE websites

Now at the HYDROLARE database there is satellite data on lake water level for 48 lakes in 32 countries together with related metadata.

<i><b>Waterbody</b></i>	<i><b>Countries</b></i>	<i><b>Period</b></i>
<b>Europe</b>		
Il'men'	Russia	2000 - 2010
Ladoga (Ladozhskoe)	Russia	1992 - 2011
Onega (Verkhne-Svirskoe rsv)	Russia	1992 - 2011
Peipus	Russia, Estonia	1992 - 2011
<b>Asia</b>		
Balkhash	Kazakstan	1992 - 2010
Sasykkol'	Kazakstan	1992 - 2010
Issyk-Kul	Kyrgyzstan	1992 - 2011
Baikal	Russia	1992 - 2010
Chany	Russia	1992 - 2010
<b>North America</b>		
Erie	USA	1992 - 2011
Huron	USA	1992 - 2011
Michigan	USA	1992 - 2011
Ontario	USA	1992 - 2011
Superior	USA	1992 - 2011

Lakes with both satellite and in-situ data

Until 2015 the only type of data in the database was in-situ and remote sensing water levels of lakes and reservoirs.  
In 2016 HYDROLARE started updating its database with in-situ water temperature data.

The screenshot displays the HYDROLARE website interface. The header includes the HYDROLARE logo and the text 'INTERNATIONAL DATA CENTRE ON HYDROLOGY OF LAKES AND RESERVOIRS'. Navigation links for HOME, ABOUT US, PARTNERS, NEWS, DATA, REPORTS, and CONTACT are visible.

The main content area is titled 'Baikal' and includes the following information:

- Country: Russian Federation (Asia)
- WMO Subregion: Lake Baikal
- ANNUAL WATER BODY AVERAGED LEVEL
- In-situ data:
  - Mean monthly level: 1959-2008
  - At the first date of each month: 1959-2008
  - Number of stations: 22
- Satellite data:
  - 1992 - 2010
- More details - on the LEGOS website
- STATION DATA:
  - Ik. Baikal - Baikal
  - Ik. Baikal - Bahuukim
  - Ik. Baikal - Peschanaya Bukhta
  - Ik. Baikal - Maribuy
  - Ik. Baikal - Nizhneangorsk
  - Ik. Baikal - Tankhoj
  - Ik. Baikal - Rofshea

A map of Lake Baikal is shown with several stations marked. A pop-up window for 'Ik. Baikal - Tankhoj' displays the following data:

Annual data	
Mean monthly level	1940-2011
Temperature	1945-2013
Ice	No

A second window titled 'STATION INFO' for 'Ik. Baikal - Tankhoj' shows the same data:

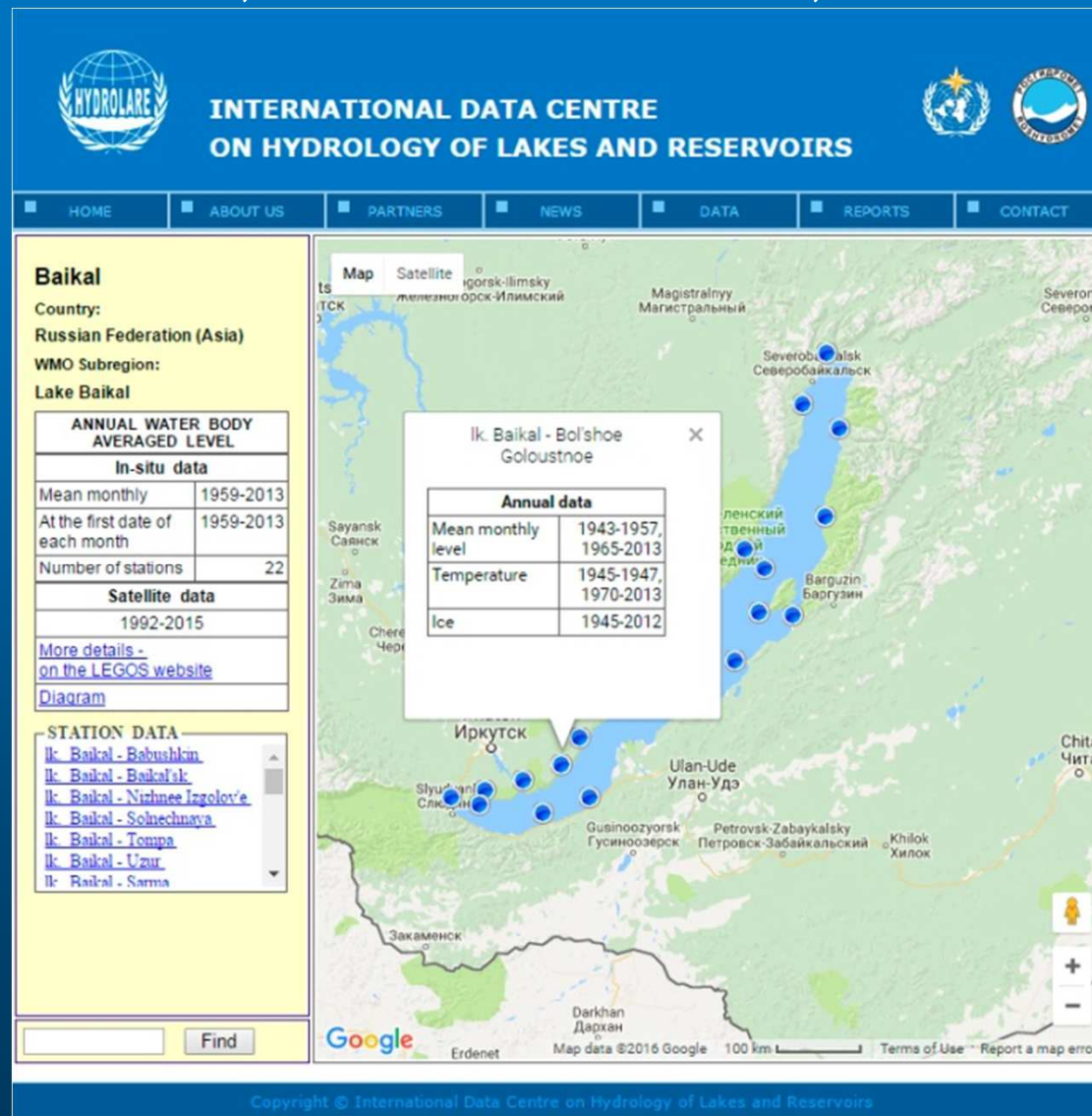
Mean monthly level	1940-2011
Temperature	1945-2013
Ice	No

The footer of the website states 'Copyright © International Data Centre on Hydrology of Lakes and Reservoirs'.

Informing users about availability of data on water temperature



In 2017, the IT-infrastructure has been further developed to include new type of information, maximum ice thickness, to the database.



Information about availability of ice thickness data in the database is displayed on the website

Now it is a possibility to display not only lake gages but also stations on rivers inflowing to and outflowing from these lakes.

For 70 lakes of Russia it has become possible to deliver inflow and outflow data from 166 GRDC stations.

For these stations, cross-links were established between HYDROLARE and GRDC websites enabling to obtain runoff data



## INTERNATIONAL DATA CENTRE ON HYDROLOGY OF LAKES AND RESERVOIRS




HOME
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### Krasnoyarskoe

Country:  
Russian Federation (Asia)

WMO Subregion:  
Yenisey (except 07-08)

ANNUAL WATER BODY AVERAGED LEVEL	
<b>In-situ data</b>	
Mean monthly	1970-2008
At the first date of each month	1970-2008
Number of stations	13
<b>Satellite data</b>	
Monthly	2002-2015

[detailed information on Hydroweb website](#)

**STATION DATA**

[rsv. Krasnoyarskoe - Abakano-Perevoz](#)

[rsv. Krasnoyarskoe - Apakshevo](#)

[rsv. Krasnoyarskoe - Enisei](#)

[rsv. Krasnoyarskoe - Khmel'niki](#)

**RivSTATIONS DATA**

[detailed information on GRDC website](#)

[Derbina - Derbino](#)

[Oya - Yemakovskoye](#)

[Sisim - Sisim](#)

[Syda - Otrok](#)

[Tuba - Bugurtak](#)

[Yenisey - Krasnoyarskaya GES](#)

[Yenisey - Nikitino](#)

Map
Satellite



RIVER STATION INFO

Yenisey - Nikitino

Region	Asia
Water body name	rsv. Krasnoyarskoe
GRDC code	2909158

Map data ©2017 Google 50 km Terms of Use Report a map error

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# The special issues of the annual newsletters in Russian and English are prepared each year providing information about HYDROLARE activities



## 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 15<sup>th</sup> 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*



Lake Balkhash



WWW.HYDROLARE.NET



## Terrestrial ECV product requirements

ECV	Products	Frequency	Resolution	Required measurement uncertainty	Stability (per decade unless otherwise specified)	Standards/References
Lakes	Lake water level	Daily	100 m	3 cm for large lakes, 10 cm for the remainder	1 cm/decade	WMO (2006, 2008(a))
	Water extent	Daily	20 m	10 % (relative) 5% (for 70 largest lakes)	5%/decade	
	Lake surface-water temperature	Weekly	300 m	1 K	0.1 K/decade	
	Lake-ice thickness	Monthly	100m	1–2 cm		
	Lake-ice cover	Daily	300 m	10 %	1 % /decade	
	Lake colour (Lake water-leaving reflectance)	Weekly	300 m	30 %	1 %/decade	



## Implementation

Implementing this plan will:

- a) Ensure that the climate system continues to be monitored;
- b) Improve global, regional and local long-term climate forecasts by: Filling gaps in network coverage, Refining ECV Requirements, Observing additional parameters identified by the scientific community, Improving techniques, and addressing the Global Cycles more holistically;
- c) Support adaptation;
- d) Improve the provision of useful information to users;
- e) Improve the communication of the state of the climate. Observations for Adaptation, Mitigation and Climate

#### Action T8: Lakes and Reservoirs: Compare Satellite and in situ observations

**Action** Assess accuracy of satellite water level measurements by a comparative analysis of in situ and satellite observations for selected lakes and reservoirs.

**Benefit** Improved accuracy.

**Timeframe** 2017 -2020

**Who** Legos/CNES, HYDROLARE.

**Performance Indicator** Improving accuracy of satellite water level measurements.

**Annual Cost** 10-100k US\$

#### Action T9: Submit historical and current monthly lake level data

**Action** Continue submitting to HYDROLARE historical and current monthly lake level data for the GTN-L lakes and other lakes weekly /monthly water temperature and ice thickness data for the GTN-L.

**Benefit** Maintain data record.

**Timeframe** Continuous.

**Who** L National Hydrological Services through WMO CHy and other institutions and agencies providing and holding data.

**Performance Indicator** Completeness of database.

**Annual Cost** 100k-1.M US\$ (40% in non-Annex-1 Parties)



#### Action T10: Establish sustained production and improvement for the Lake ECV Products

**Action** Establish satellite based ECV data records for Lake Surface Water Temperature, Lake Ice Coverage, and Lake Water Leaving Reflectance (Lake Colour) Implement and sustain routine production of these new satellite based products; Sustain efforts on improving algorithms, processing chains and uncertainty assessments for these new ECV Products, including systematic in situ data sharing and collection in support of ECV validation; Develop additional products derived from Lake Water leaving Reflectance for turbidity, chlorophyll, and coloured dissolved organic matter.

**Benefit** Add additional Lake ECV products for extended data records. Providing a more comprehensive assessment of climate variability and change in Lake systems.

**Timeframe** Continuous.

**Who** Space Agencies and CEOS. Copernicus Global Land Service, GloboLakes and ESA CCI+

**Performance Indicator** Completeness of database.

**Annual Cost** 1-10M US\$ (40% in non-Annex-1 Parties)



For more information about  
HYDROLARE Data Base, Partners, News  
visit :

**[www.hydrolare.net](http://www.hydrolare.net)**