

# Database for Hydrological Time Series of Inland Waters (DAHITI)

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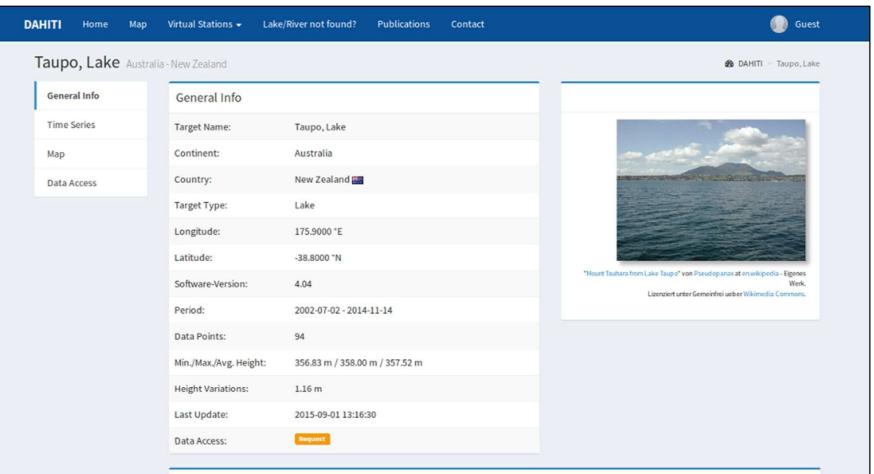
#### Introduction

The Database for Hydrological Time Series of Inland Waters (DAHITI) has been developed by the Deutsches Geodätisches Forschungsinstitut der Technischen Universität München (DGFI-TUM) since 2013. It provides water level time series of about over 300 lakes, reservoirs, rivers, and wetlands derived from multi-mission satellite altimetry which can be downloaded after a short registration process from the DAHITI website at **http://dahiti.dgfi.tum.de**.

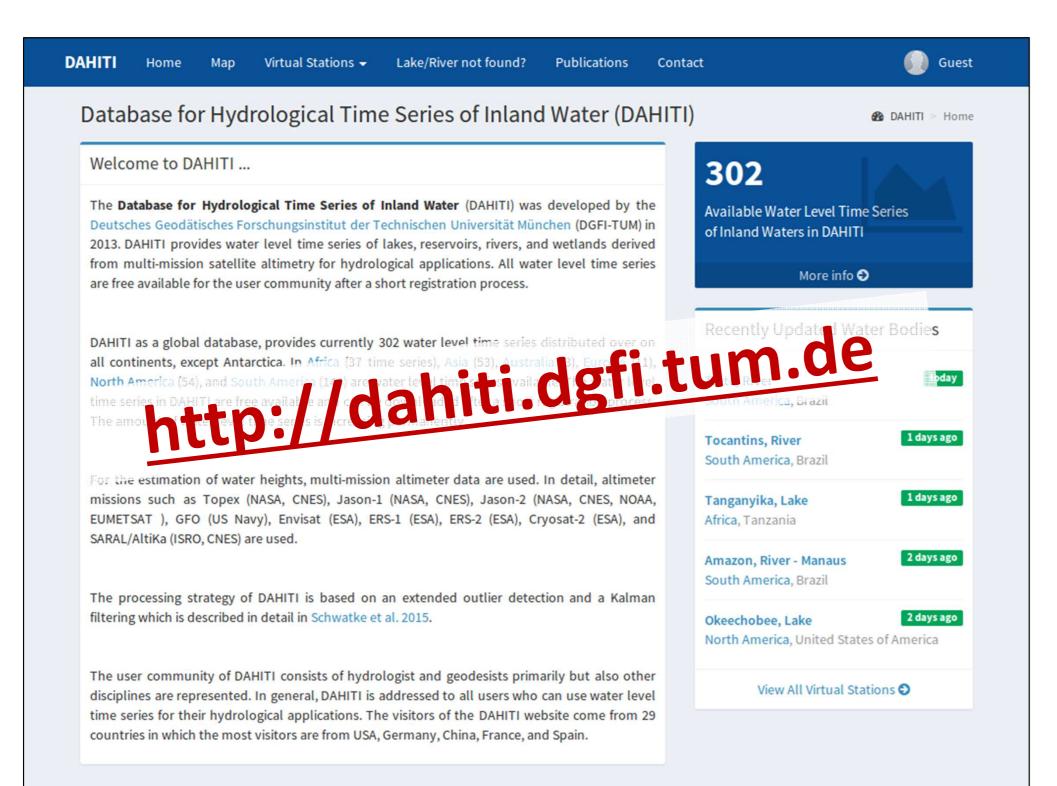
The processing strategy of DAHITI is based on an extended outlier detection and a Kalman filter approach for the estimation of water level time series of inland waters. Here, data from altimeter missions such as Topex, Jason-1, Jason-2, ERS-2, Envisat, SARAL/AltiKA, and Cryosat-2 are used. The methodology and processing strategy is described in detail in Schwatke et. al, 2015.

### **Detail View of Inland Water**

The DAHITI website provides a detailed view for each inland body. First, general water information about the water body (e.g country, continent, type, location, etc.) and the resulting time series (e.g. period, data points, etc.) are presented. Furthermore, information regarding the used altimeter data are shown in detail. This include numbers if and an pass additional retracking was applied.



In this poster, we present the "new" DAHITI website and their functionality. In detail, information about the data holding of DAHITI and the provided data sets are shown.

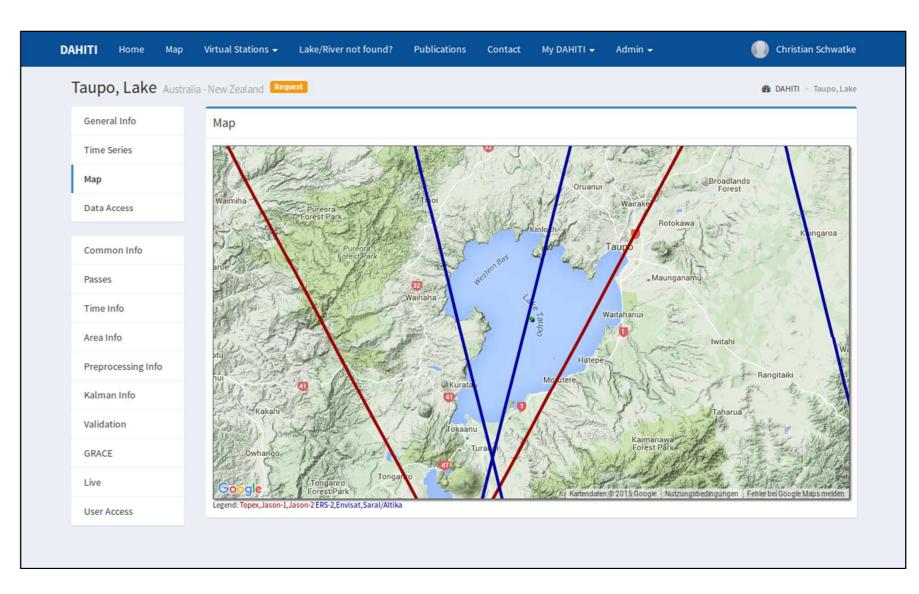


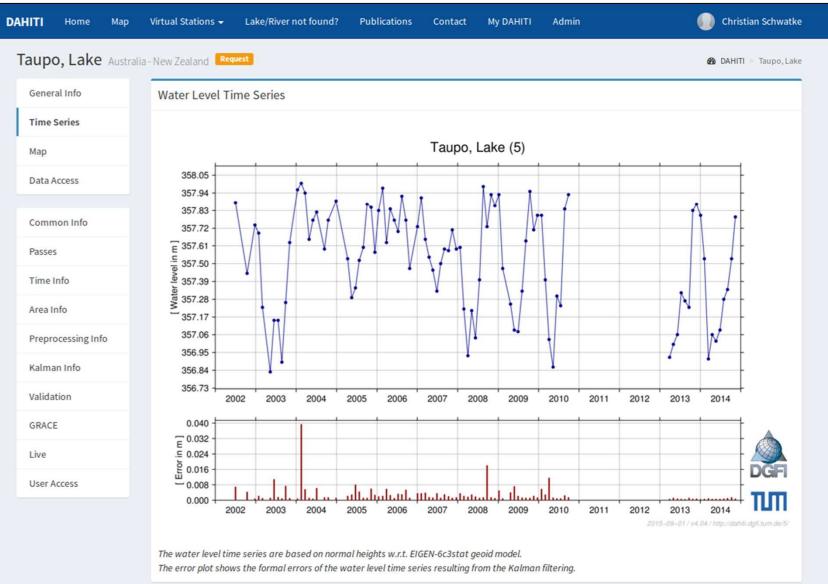
For each inland water, also a map is provided which shows the location of the water body. Moreover, altimeter tracks crossing the water body are displayed.

Finally, the water level time series of an inland water and the corresponding formal errors are plotted.

> Figure 3: Websites of "General Info" (top), "Map" (middle) and *"Time Series" (bottom)*

Altimeter Data									
The data of the following altimeter missions and corresponding passes have been used for the estimation of the water level time series. An additional '*' indicates that an additional retracking of the altimeter measurements was performed.									
	Mission	Pass No.							
4	Cryosat-2 (LRM)	0030							
~\	Envisat	0430							
j.	SARAL/AltiKa	0430							
Refe	rence								
Schwatke C., Dettmering D., Bosch W., Seitz F.: DAHITI - An Innovative Approach for Estimating Water Level Time Series over Inland Waters using Multi- Mission Satellite Altimetry. Hydrology and Earth System Sciences, European Geosciences Union, 2015 (Accepted)									





## Data Holding

DAHITI as a global database, provides namely, 302 water level time series distributed over all continents, except Antarctica. Africa (37 time series), Asia (53), Australia (3), Europe (11), North America (54), and South America (144).

Figure 1:

Website "Home" of DAHITI

The water level time series in DAHITI are free available and can be downloaded after a short registration process. The number of water level time series is increasing permanently.

All targets are presented as map and list view on the DAHITI website. Thereby, a preview of the water time series can be displayed by clicking on the map.

The data access of inland water bodies is divided in to "public" which are immediately available after registration and "request" which require an additional approval.

All virtual stations can be listed globally or ordered by continent. Information such as DAHITI-Id, target name, location, software version, last update and data access are shown.

	al Stations Global				🍘 DAHITI > Virtual				
	Target Name	Longitude	Latitude	Software	Last Update	Access			
254	Aberdeen, Lake	-98.8248 °W	64.5122 °N	4.03	2015-02-17 18:15:49	Public			
5	Albert, Lake	30.921 °E	1.6807 °N	4.03	2015-03-01 21:23:56	Public			
	Amadjuak, Lake	-71.1942 °W	64.9414 °N	4.03	2015-02-16 23:41:40	Public			
	Amazon, River	-58.1414 °W	-2.9664 °S	4.03	2015-06-24 15:20:55	Request			
	Amazon, River	-65.3467 °W	-2.4931 °S	4.03	2015-02-24 22:18:25	Request			
	Amazon, River	-57.9573 °W	-2.8141 °S	4.03	2015-06-24 15:17:40	Request			
	Amazon, River - Almeirim	-52.6733 °W	-1.572 °S	4.03	2015-02-17 20:12:39	Public			
	Amazon, River - Anori	-61.6858 °W	-3.8567 °S	4.03	2015-02-17 20:20:39	Request			
	Amazon, River - Arara	-70.1201 °W	-4.0441 °S	4.04	2015-07-23 11:24:17	Request			
	Amazon, River - Gurupá 1	-52.021 °W	-1.4306 °S	4.03	2015-02-23 16:42:52	Public			
		-58.78	DAHITI	Home Map	Virtual Stations 🚽	Lake/River not found?	Publications	Contact	
55	Amazon, River - Juruti	-56.1546	Мар						🙆 DAHITI
45 64	Amazon, River - Lago Grande de Monte Alegre	-54.2773	мар						
	Amazon, River - Lago Mocambo Amazon, River - Leticia	-57.2017 -69.7946	Map Sa	tellite	A.F. W. S.	1 th	W. Contraction		÷.
		-59.9733	Map Sa			1 Ac	1.		E.
		299.8		. F. M.	BAR LAND	all .		£	
				A CONTROL	Gree Gree	enland		1 15	and the second
.44	Amazon, River - Monte Alegre Amazon, River - Monte Alegre 2	-54.0249	ANN C	Sais	Huron, Lake (33)	x	Finland	min .	His Section
	Figure 2: Website of "Virtual Stations" (left) and "Map" (right)			Canado United States Mexico	Atla	norw ted dom Details Gen France Spain Algeria Mali Nigeria	av Poland nany Ukraine taly Libya Egypt Libya Egypt Saudi Arab ger CChad ria Ethopia	Kazakhstan Afghanistan Iran Pakistan	Mongolia Unina Japan South Korea Thailand
			South Pacific Ocean		Peru Bolivia Chile Argentina	South Atlantic	Angola Namibia Botswana South Africa	lu, Lake (177)	Indonesia Papua New Guinea

## **Data Access**

The main product of DAHITI are water level time series which can be downloaded as ASCII files. Here, the user has the possibility between selected the to following types of data.

- Normal heights (w.r.t. EIGEN-6C3stat)
- Ellipsoidal heights (w.r.t WGS84)
- Variations around the mean value

In near future, there will be also an API to a the data holding of DAHITI directly within o

# **User Community**

	DAHITI	Home	Мар	Virtual Stations 🗸	Lake/River not found?	Publications	Contact	My DAHITI	Christian Schwatke		
	Taup	po, Lake	e Austral	ia - New Zealand					🍘 DAHITI > Taupo, Lake		
	Gen	eral Info		Data Access							
	Time Series Map			Please select the	type of time series you are i	nterested in to do	wnload.				
				• Water level time series with normal heights (w.r.t EIGEN-6c3stat geoid model)							
/	Data	a Access		○ Water level time series with ellipsoidal heights (w.r.t WGS84 ellipsoid)							
				Don't forg If you are u Schwatke C., D	using products from [ Dettmering D., Bosch W., Seitz	DAHITI in your work plea		roach for Estimating Water Lev	vel Time Series over Inland Waters		
Figure 4: W		-	-			<pre># Longit # Latitu # Softwa # Downlo # # columr # columr # columr #</pre>	tude ude are bad 1 1 2				
and downloaded water level time series							<pre># 2002-07-02 357.877 0.007 2002-10-15 357.438 0.004 2002-12-24 357.739 0.001 2003-01-28 357.690 0.002 2003-03-04 357.233 0.001 2003-05-13 356.835 0.001 2003-06-17 357.152 0.011 2003-06-17 357.151 0.002 2003-08-26 356.891 0.001 2003-09-30 357.256 0.007 2003-11-04 357.631 0.001 2004-01-13 357.960 0.001 2004-02-17 357.997 0.040 2004-03-23 357.942 0.006</pre>				
be also an API to access TI directly within own scripts.											

In general, DAHITI addresses to all users who are interested in using water level time series for their hydrological applications. The visitors of the DAHITI website come from 65 countries in which the most visitors are from USA, China, Germany, France, and Brasil. The user community of DAHITI consists of hydrologist and geodesists primarily but also other disciplines are represented.

#### References

Förste, C., Bruinsma, S., Flechtner, F., Marty, J., Lemoine, J., Dahle, C., Abrikosov, O., Neu10 mayer, H., Biancale, R., Barthelmes, F., and Balmino, G.: A preliminary update of the Direct Approach GOCE Processing and a new release of EIGEN-6C, 3–7 December 2012, G31B-0923, 2012. 4820, 4843

Schwatke C., Dettmering D., Bosch W., Seitz F.: DAHITI - An Innovative Approach for Estimating Water Level Time Series over Inland Waters using Multi-Mission Satellite Altimetry. Hydrology and Earth System Sciences, European Geosciences Union, 2015 (Accepted)

#### Acknowledgement

Products of DAHITI are based on altimetry missions operated by CNES/NASA (TOPEX, Jason-1), ESA (ERS-1/2, Envisat, Cryosat-2), USNavy/NOAA (GFO), CNES/NASA/Eumetsat/NOAA (Jason-2), and ISRO/CNES (SARAL/AltiKA). The original data sets are disseminated by AVISO, ESA, NOAA, and PODAAC.

Ocean Surface Topography Science Team Meeting, Reston, Virginia, USA, 20-23 October 2015