

# **Global Runoff Data Centre (GRDC)**

## **Status Report**

GEWEX - GHP Panel Meeting  
17 - 19 November 2015  
Entebbe, Uganda

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# GRDC operational environment

Operates under the auspices of the  
World Meteorological Organisation (WMO)



on the advice of an  
International Steering Committee

with the financial support of the  
Federal Republic of Germany



within the  
Federal Institute of Hydrology

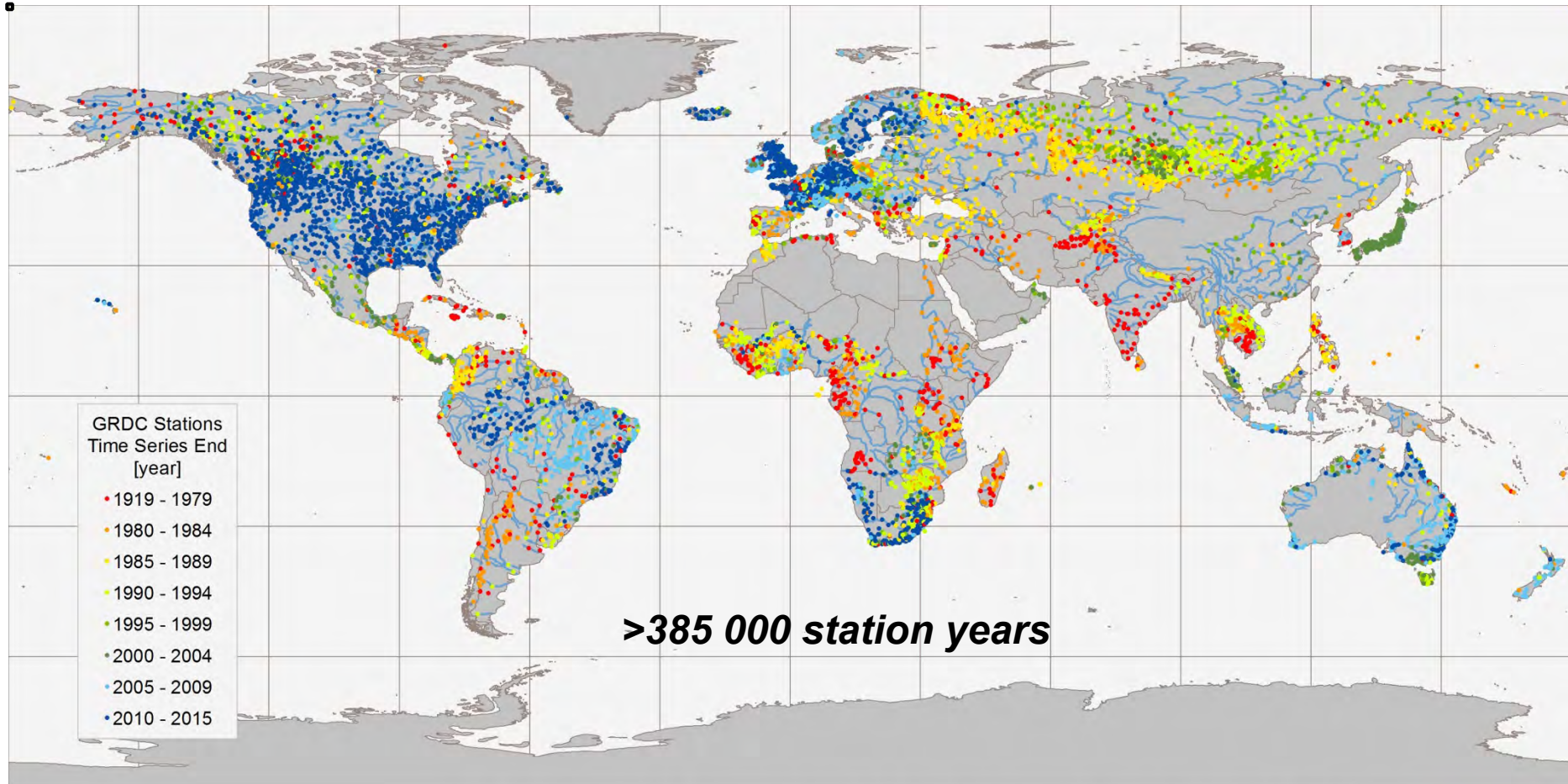


# GRDC Main functions

- Acquisition and storage of global historical discharge data and associated metadata
- Dissemination of historical discharge data (385 000 station-years) and derived products from currently ~ 9200 stations in 160 countries (“One-stop shop”)
- Support to the water and climate related programmes and projects of the United Nations and their specialised agencies
- Service to the international research community on global change and climate services
- Cooperation and participation in international projects and programmes such as:
  - GCOS (Global Climate Observing System)
  - UNESCO IHP FRIEND-Water (Flow Regime from International Experimental and Network Data)
  - GEO (Group on Earth Observations)
  - GEWEX (Global Energy and Water Exchanges)
  - OGC (Open Geospatial Consortium) Hydrology Domain Working Group
  - etc.
- The GRDC is **not** substituting the functions of the National Hydrological Services
- Ownership of the data remains with the original Data Provider

# Status of the Global Runoff Database

Global Coverage of 9213 GRDC Stations indicated by **time series end**



9213 GRDC stations with monthly data, incl. data derived from daily data (Status: 27 May 2015)  
Koblenz: Global Runoff Data Centre, 2015.



# 1558 GRDC Stations for Africa projected onto Large River Basins

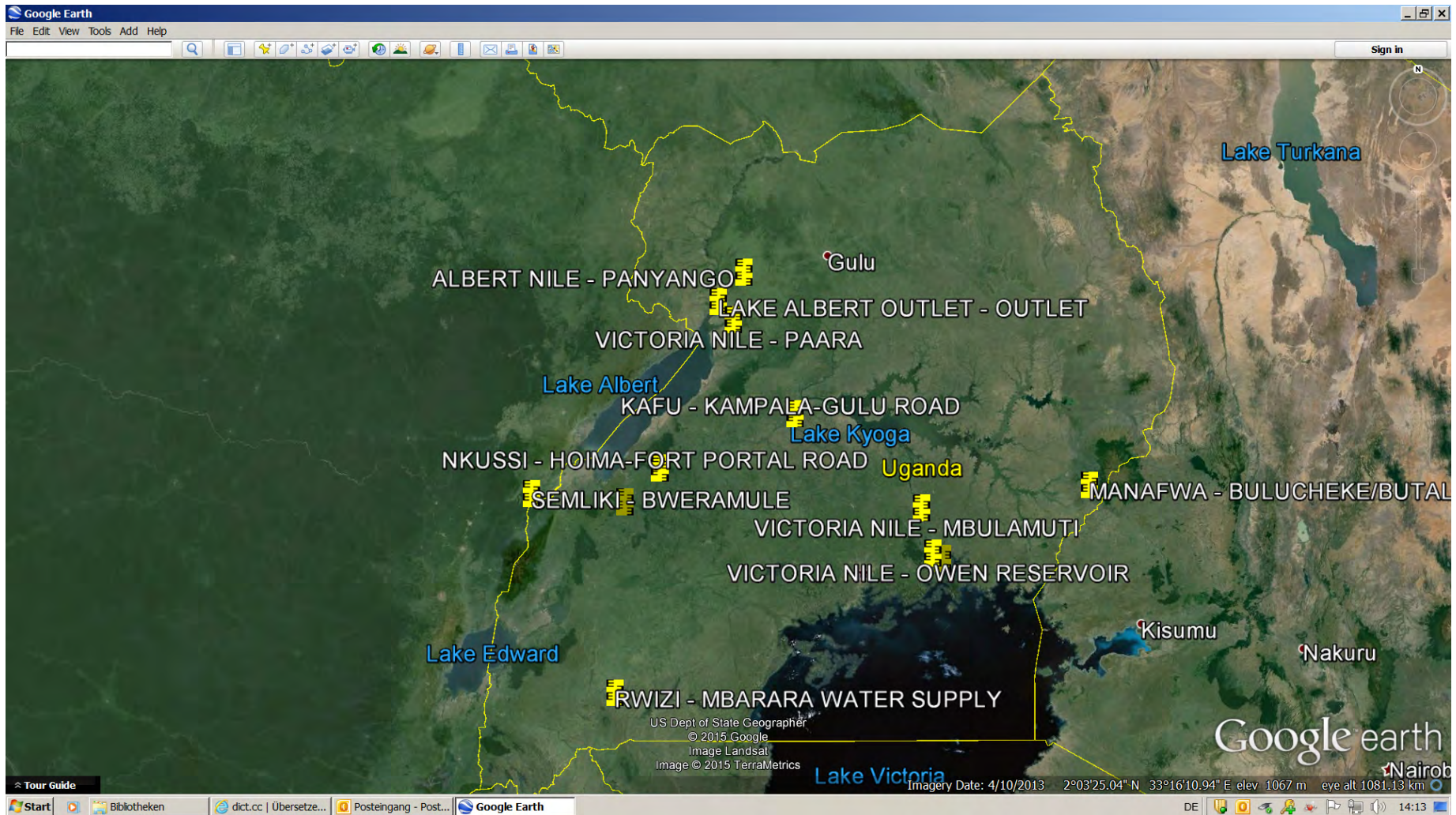


# 1558 GRDC Stations for Africa in Google Earth

Datei Bearbeiten Ansicht Tools Hinzufügen Hilfe

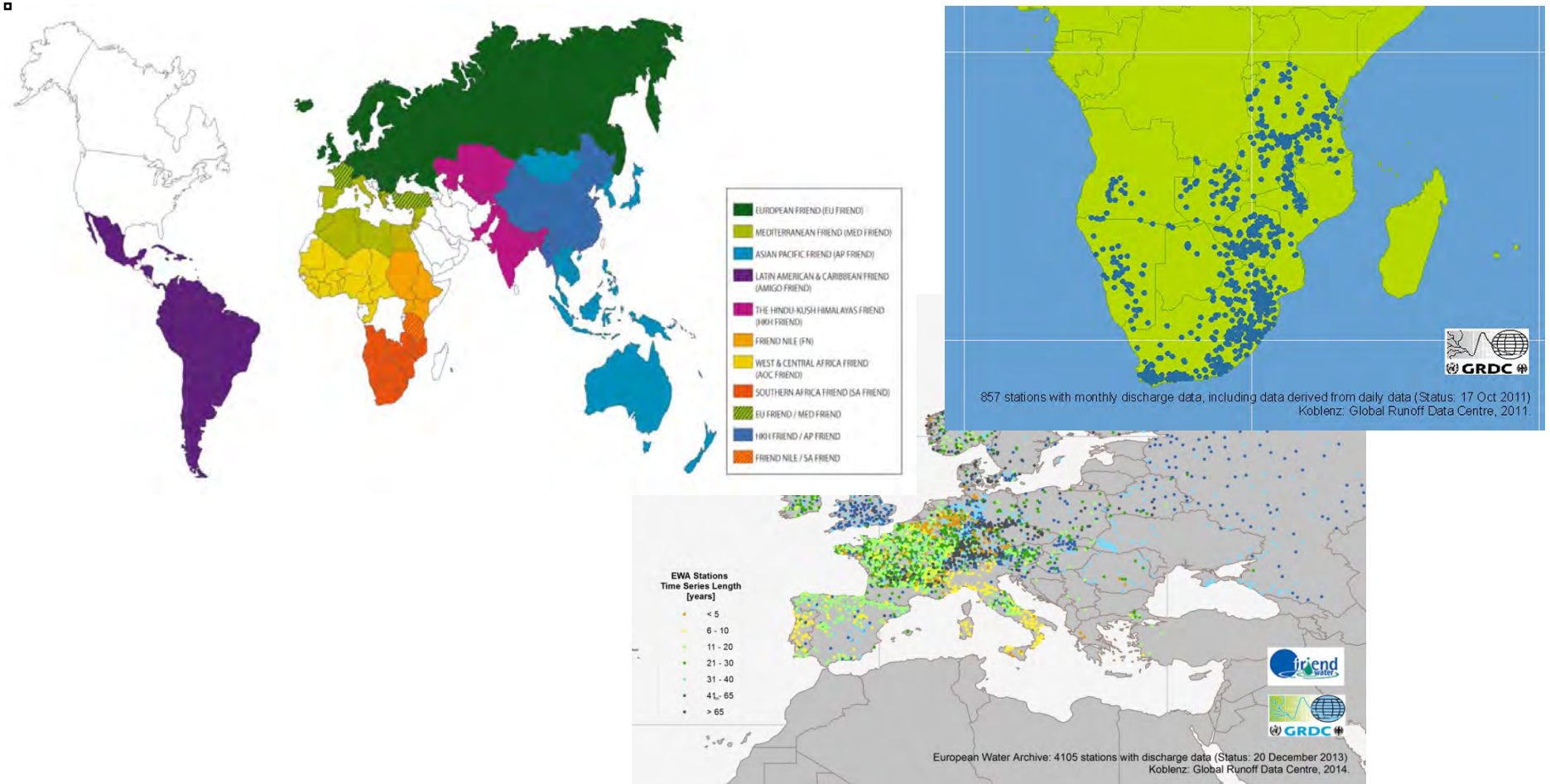


# 12 GRDC Stations for Uganda in Google Earth



# Future of UNESCO FRIEND-Water Databases

FIGCC (FRIEND-Water Intergroup Coordinating Committee) decision in Montpellier (Oct 2014) to integrate FRIEND-Water Databases into GRDC database when appropriate



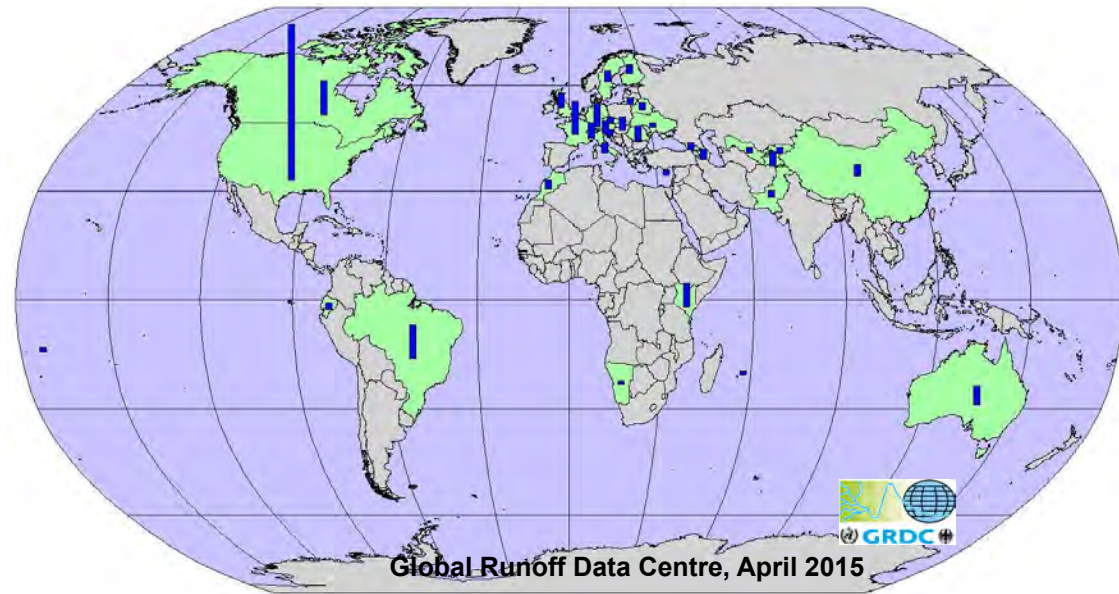


# Climate Sensitive Stations Dataset **under development**

- 2006: WMO selection criteria (<http://www.wmo.int/pages/prog/hwrrp/Hydroclimate/hydroclimate2.htm>)
- 2008 - ongoing: Collection of identified stations (by National Authorities) representing climate sensitive river basins having minimal disturbance („pristine“ basins)
- 2012: Data access under the conditions of the GRDC data policy

## Project Status April 2015:

- 2,848 identified stations
- 1198 GRDC stations confirmed
- 33 countries contributed
- daily / monthly stream flow records / station metadata



# Global Terrestrial Network for River Discharge **goes on**

Contributing the river discharge component to the GTN-H

1. Compilation of the GCOS Baseline River Network (T6 of GCOS-IP [IP-04 T4])
2. Regular provision of near real-time data to the evolving GTN-H
3. Automated collection and harmonisation of near real-time data
4. Service for automated provision of river discharge data, e.g. using SOS

2006: Tentative network of 450 stations (280 confirmed by NHS until 2015)

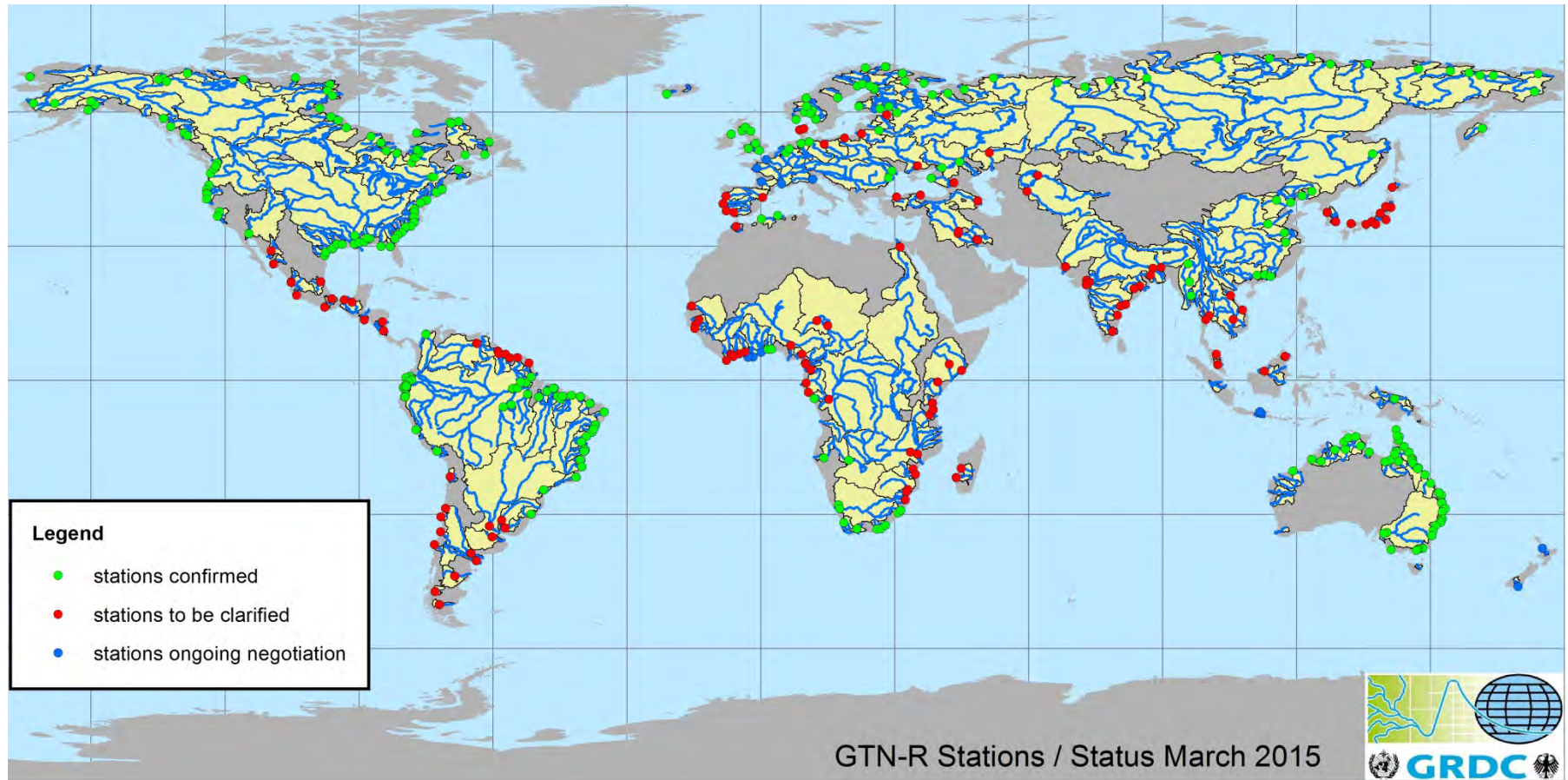
2010: Renewal of negotiations with NHS started

2014: Negotiations part of GEOWOW project to make data available to GEOSS

# Global Terrestrial Network for River Discharge (GTN-R) Network Status as of 1 March 2015

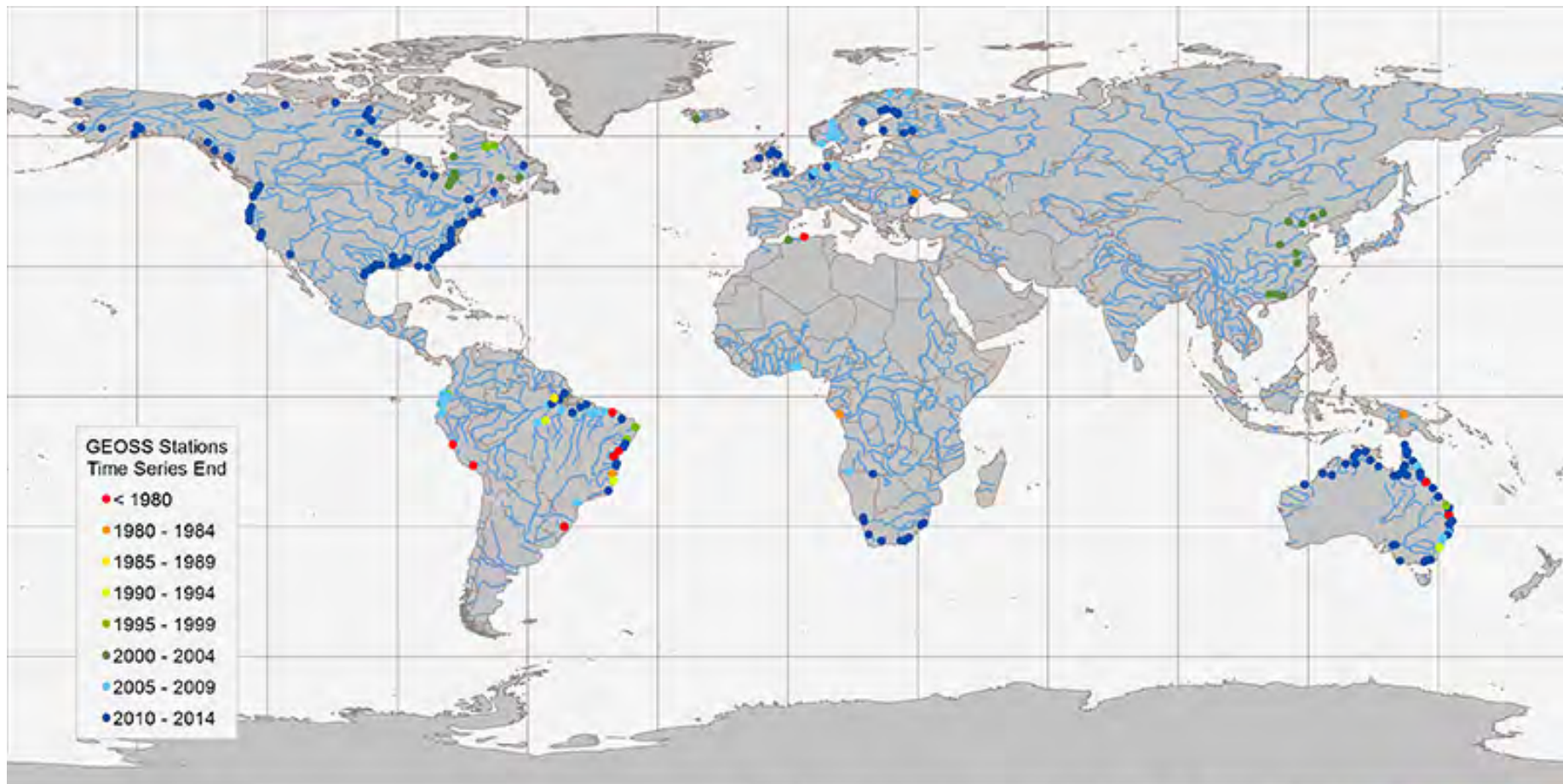
280 Stations confirmed

160 Stations to be clarified



# Global Terrestrial Network for River Discharge (GTN-R)

## Data access according to GEO data sharing principles



245 GRDC stations provided for the GEOSS (Status: 4 Dec 2014)  
Koblenz: Global Runoff Data Centre, 2014.



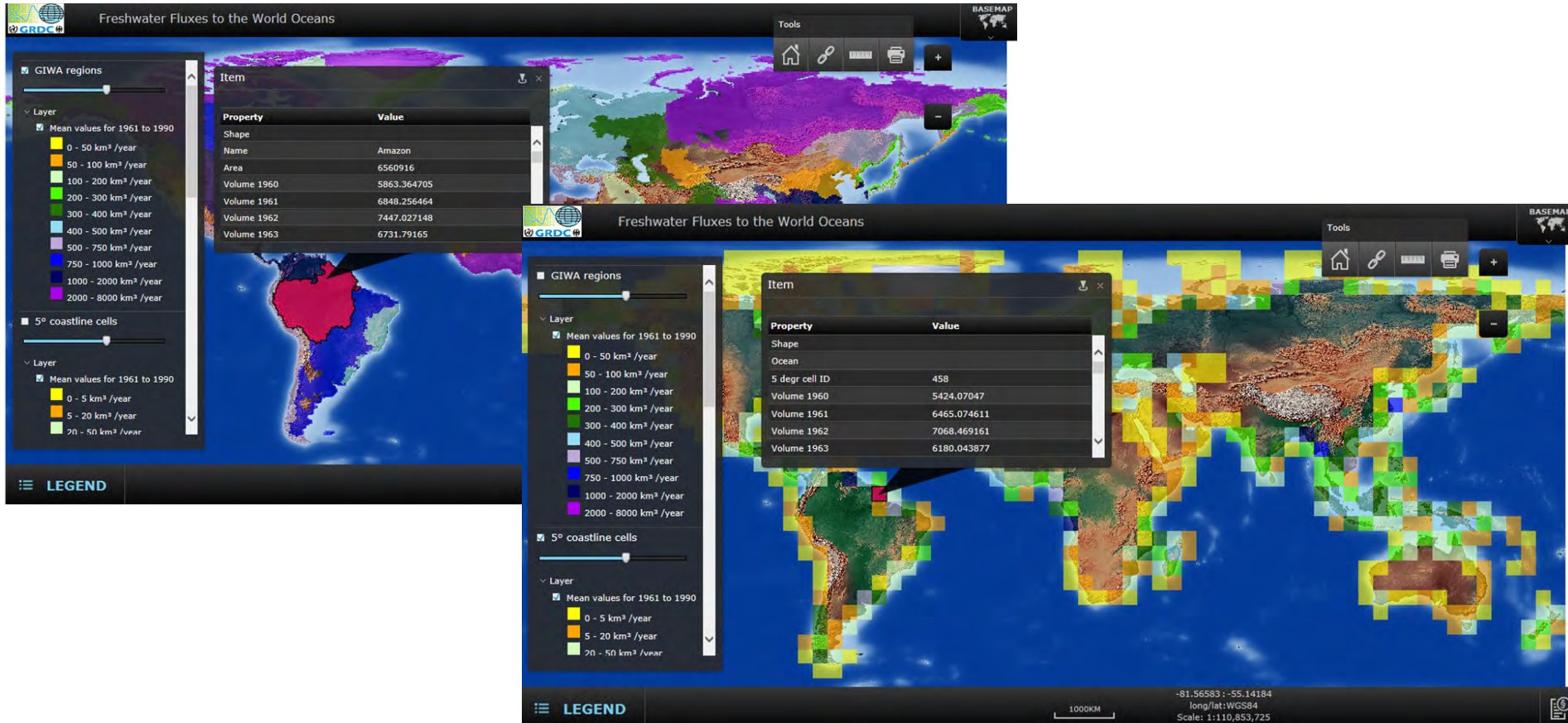
# Global Freshwater Fluxes to the World Oceans

50 years data (1960 – 2009) for 0.5° grid cell resolution based on WaterGAP results

GIWA regions (UNEP - Global International Waters Assessment)

5°Cells along the coast lines

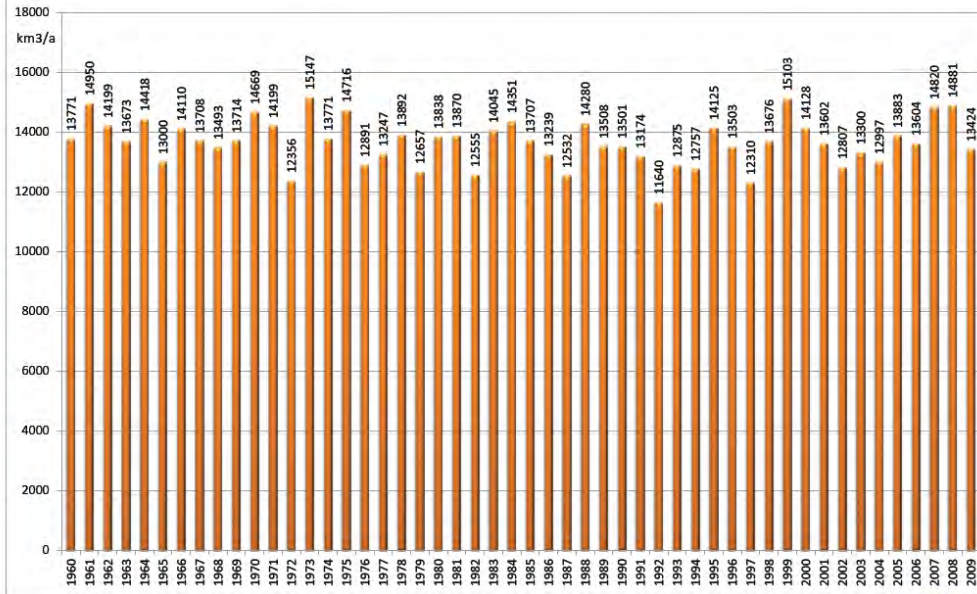
5° and 10° Latitude bands



# Global Freshwater Fluxes

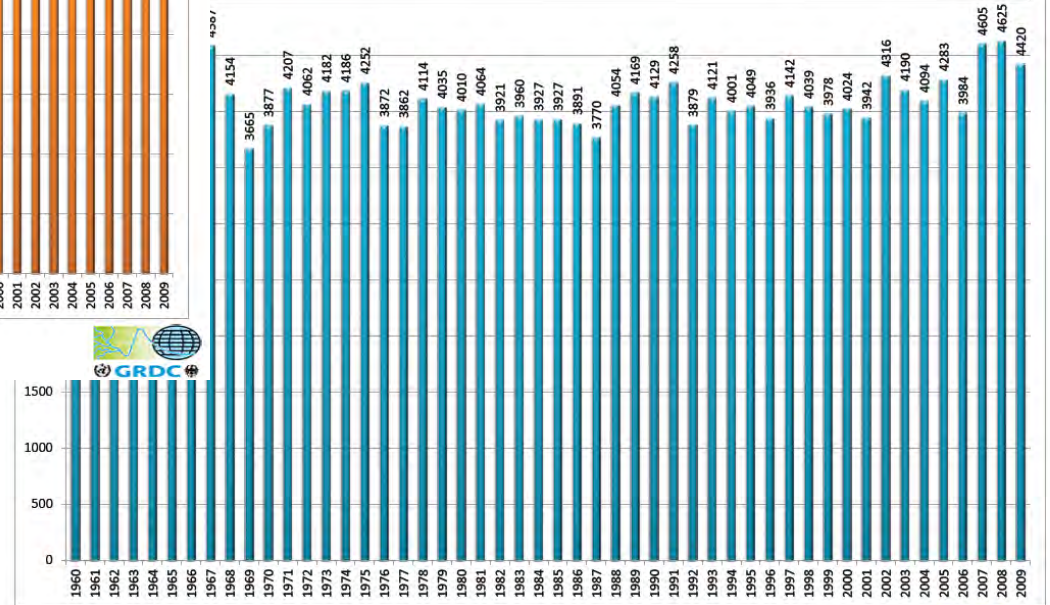
Tabular and graphical for further assessment and analysis

Annual Freshwater Fluxes from ASIA



Koblentz: Global Runoff Data Centre, 2014

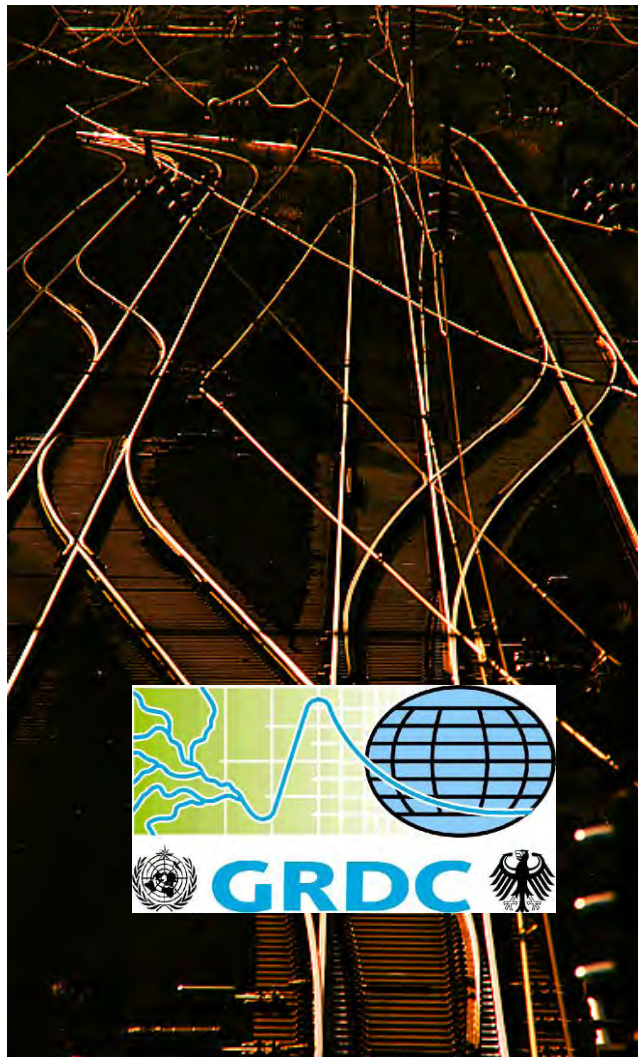
Annual Freshwater Fluxes into the NORTH POLAR ocean



Koblentz: Global Runoff Data Centre, 2014

# GRDC Web Services Future Facilitator between Data Provider and Data User

## Data providers National Hydrological Services



## Data users Portals, Scientific Programmes, Research Community



# Registration of GRDC Services in the GEOSS Portal



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[GEOSS Registry Publication Portal](#)

## Search GEOSS Resource

Free Text Search:



**Advanced Search** (Define more query conditions: Resource Category, Societal Benefit Areas, GEO affiliation)



(Leaving all search fields blank will return a list of all registered Resources)

### 8 Matched Resource ( ✓ indicates Approved)

First Page	Previous Page	Next Page	Last Page	
1.	Global Terrestrial Network for River Discharge (GetCapabilities for Sensor Observation Service)	<a href="#">Details</a>	✓	
2.	Global Terrestrial Network for River Discharge (dataset in WaterML 2.0)	<a href="#">Details</a>	✓	
3.	Global Freshwater Fluxes into the World Ocean for use within GIS clients	<a href="#">Details</a>	✓	
4.	Long-Term Mean Monthly Discharges and Annual Characteristics of GRDC Stations	<a href="#">Details</a>	✓	
5.	Global Runoff Data Centre	<a href="#">Details</a>	✓	
6.	Global Freshwater Fluxes into the World Oceans	<a href="#">Details</a>	✓	
7.	World-wide Hydrogeological Mapping and Assessment Programme	<a href="#">Details</a>	✓	
8.	Global Runoff Data Centre (GRDC) Streamflow Stations	<a href="#">Details</a>	✓	

(This public search page is provided as a convenience to allow users to browse and search the GEOSS Component and Service Registry. The information found here is intended to assist software developers and data integrators in identifying registered GEO resources at a high level. The information stored in this Registry is used by the GEOSS Clearinghouse to develop a more comprehensive list of GEO Resources. The GEOSS Web Portal candidates are required to support search into detailed Clearinghouse and Registry resources.)  
Please note that only approved Components will be listed here.

Last updated: Wed Sep 23 2015



## Contributions to GEWEX Science Questions

- The GRDC contributes to the GSQ 2, 3 & 4
- The GRDC is recognised since 1995 by GEWEX as an affiliated Global Organisation
- The GRDC provides river discharge data to GEWEX activities
- The GRDC aims to provide quality assured discharge data to the research community
- The GRDC offers to include GHP discharge data and products after project termination

## Interactions with other GEWEX Panels or parts of WCRP and others:

- **CLiC** - Maintaining the Arctic Runoff Database (ARDB) as a subset of the GRDC database in support of CLiC, ACSYS and the evolving ArcticHYCOS
- **UNESCO IHP FRIEND-Water** – Integrating river discharge databases in to GRDC with country permission (SA FRIEND completed, European FRIEND busy, more to follow)
- **Global Climate Observing System (GCOS)** – Maintaining and expanding the Global Terrestrial Network for River Discharge (GTN-R) as a baseline network in support of GCOS, UNFCCC, GTN-Hydrology and Group on Earth Observations (GEO)
- **WMO Commission for Hydrology (CHy)** – Maintaining and expanding the river discharge data for WMO defined "Climate Sensitive Stations"

# Plans for next 1 – 3 years

## Standardisation

- Standardisation of hydrologic data exchange formats and hydrologic feature models within the hydrological community in support of the WMO CHy and National Hydrological Services (results from WMO/OGC Hydrology Domain Working Group activities)

## Updating GRDC Operations

- Investigate and implement new operational system to support GRDC functionality
- Implementation of WMO/OGC HDWG developed standards
- Implement and improve web services for data provisioning

## Data acquisition

- Historical discharge data updates for under-represented regions
- Institutionalisation of data provision
- Near real-time data for GTN-R
- Integration of FRIEND-Water databases

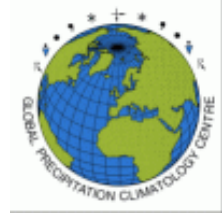
# Partner Data Centres

Precipitation: GPCC

[gpcc.dwd.de](http://gpcc.dwd.de)

**Global Precipitation Climatology Centre**

Offenbach, Germany



Water Quality: GEMS/Water GEMStat

<http://www.gemstat.org>

**Global Environment Monitoring System of UNEP DEWA**

Koblenz, Germany



Groundwater: IGRAC

<http://www.igrac.net>

**International Groundwater Resources Assessment Centre**

Delft, The Netherlands



Lakes and Reservoirs: HYDROLARE

[www.hydrolare.ru](http://www.hydrolare.ru)

**International Centre on the Hydrology of Lakes and Reservoirs**

St. Petersburg, Russia



# ...more than 26 Years GRDC

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Thank you for your attention!