Global Runoff Data Centre (GRDC)

Status Report

GEWEX - GHP Panel Meeting
10 - 13 December 2014
Pasadena, USA

by Ulrich Looser

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

Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

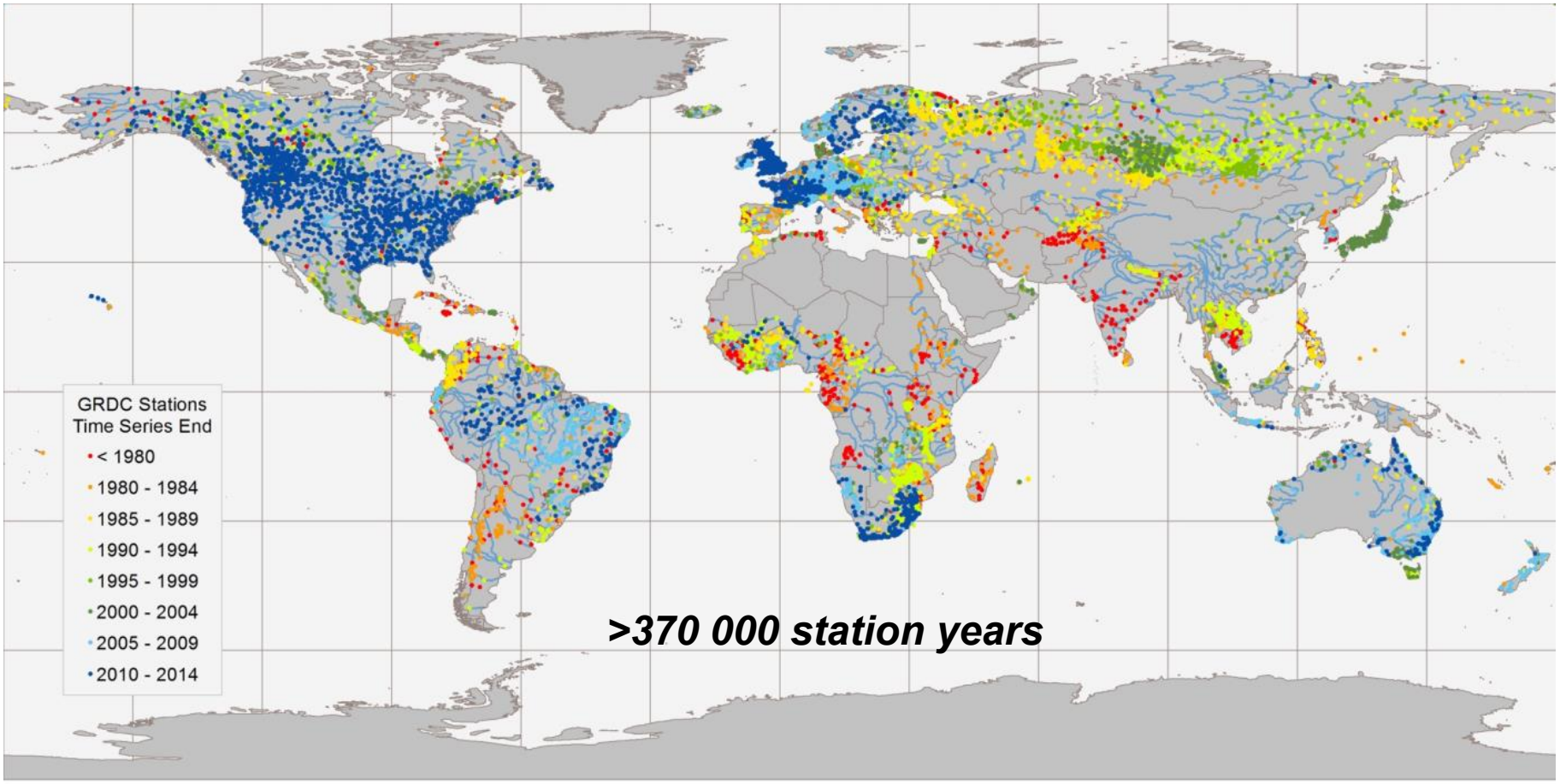
GRDC Main functions

- Acquisition and storage of global historical discharge data and associated metadata
- Dissemination of historical discharge data (370 000 station-years) and derived products from currently ~ 9000 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)
    - GEWEX (Global Energy and Water Exchanges)
    - UNESCO IHP FRIEND-Water (Flow Regime from International Experimental and Network Data)
    - GEO (Group on Earth Observations)
    - 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

Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

Status of the Global Runoff Database

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

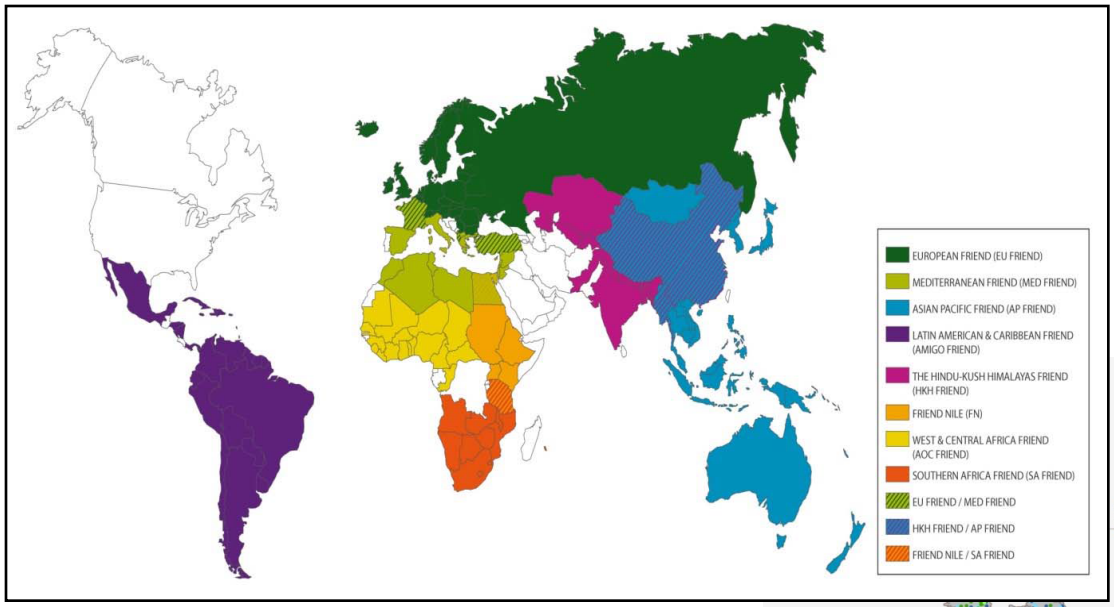


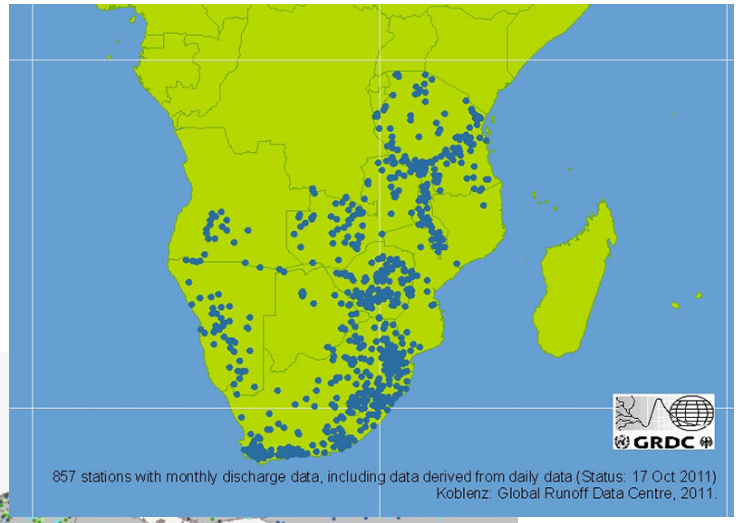
9009 GRDC stations with monthly data, incl. data derived from daily data (Status: 24 June 2014)
Koblenz: Global Runoff Data Centre, 2014.

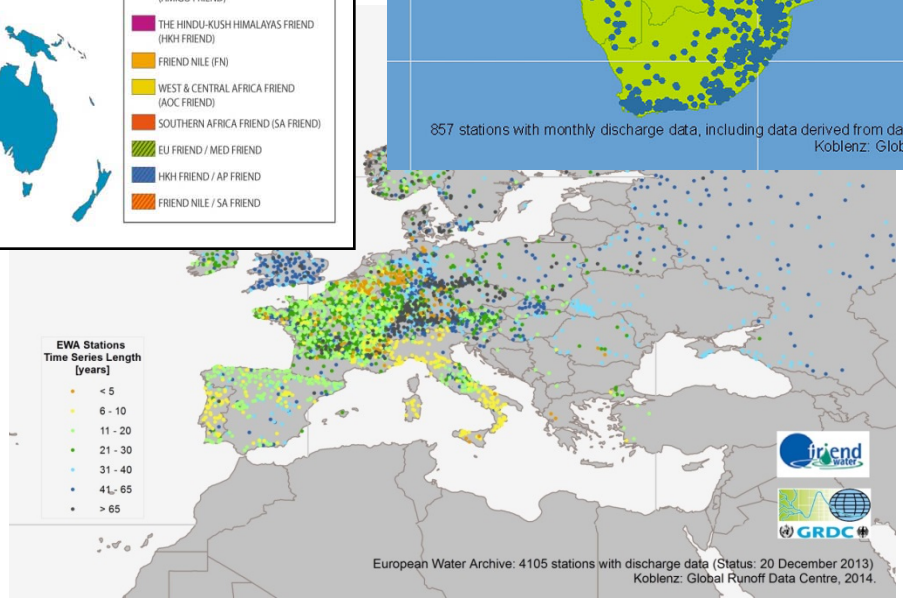
Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

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







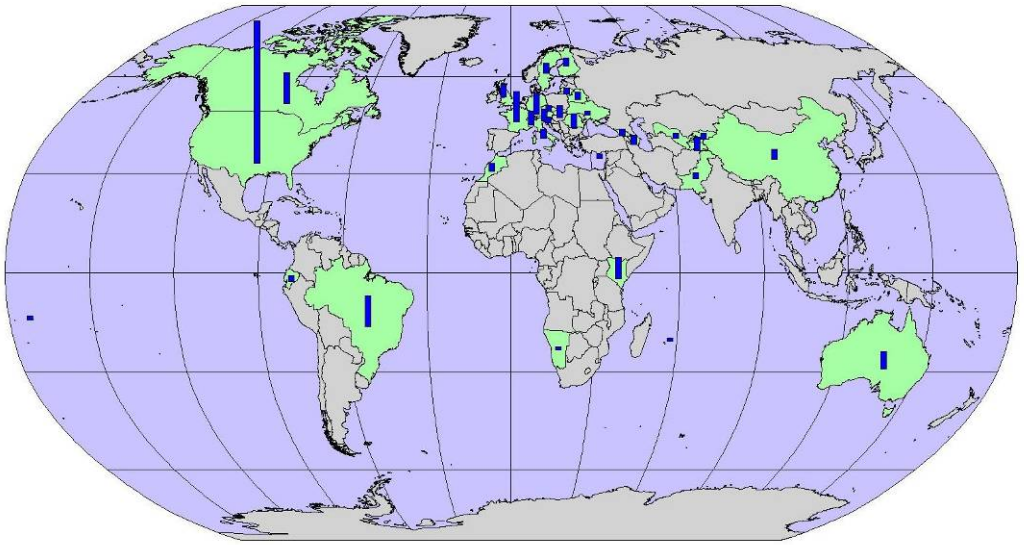
Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

Climate Sensitive Stations Dataset
under development

- Identification of stations representing climate sensitive river basins having minimal disturbance
- WMO selection criteria (http://www.wmo.int/pages/prog/hwrp/Hydroclimate/hydroclimate2.htm)
- Access under the conditions of the GRDC data policy

Project Status October 2014:

- 2,482 identified stations
- 1,175 GRDC stations confirmed
- 34 countries contributed
- daily / monthly streamflow records / station metadata

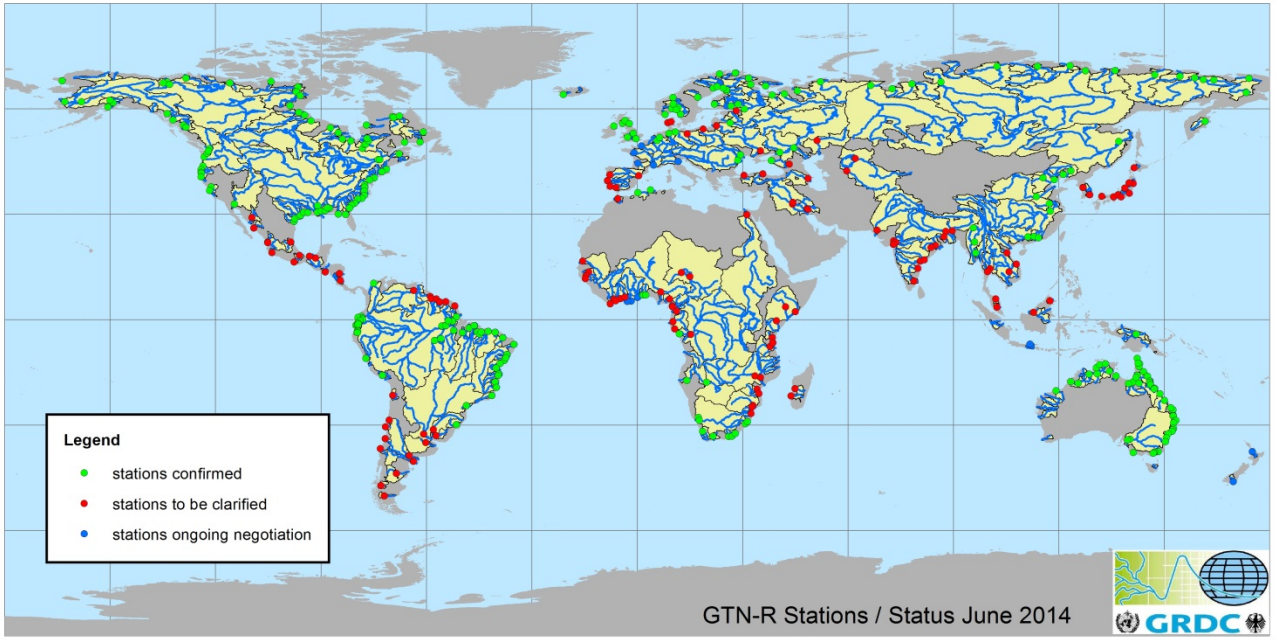


Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

Global Terrestrial Network for River Discharge (GTN-R)

- Compilation of the GCOS Baseline River Network (T6 of GCOS-IP [IP-04 T4])
- Regular provision of near real-time data to the evolving GTN-H
- Service for an automated provision of river discharge data via web services, e.g. GEOSS Common Infrastructure (GCI)

- Status October 2014:
- daily discharge data
- ~ 280 confirmed stations
- 14 national data providers
- 19 countries ongoing negotiations



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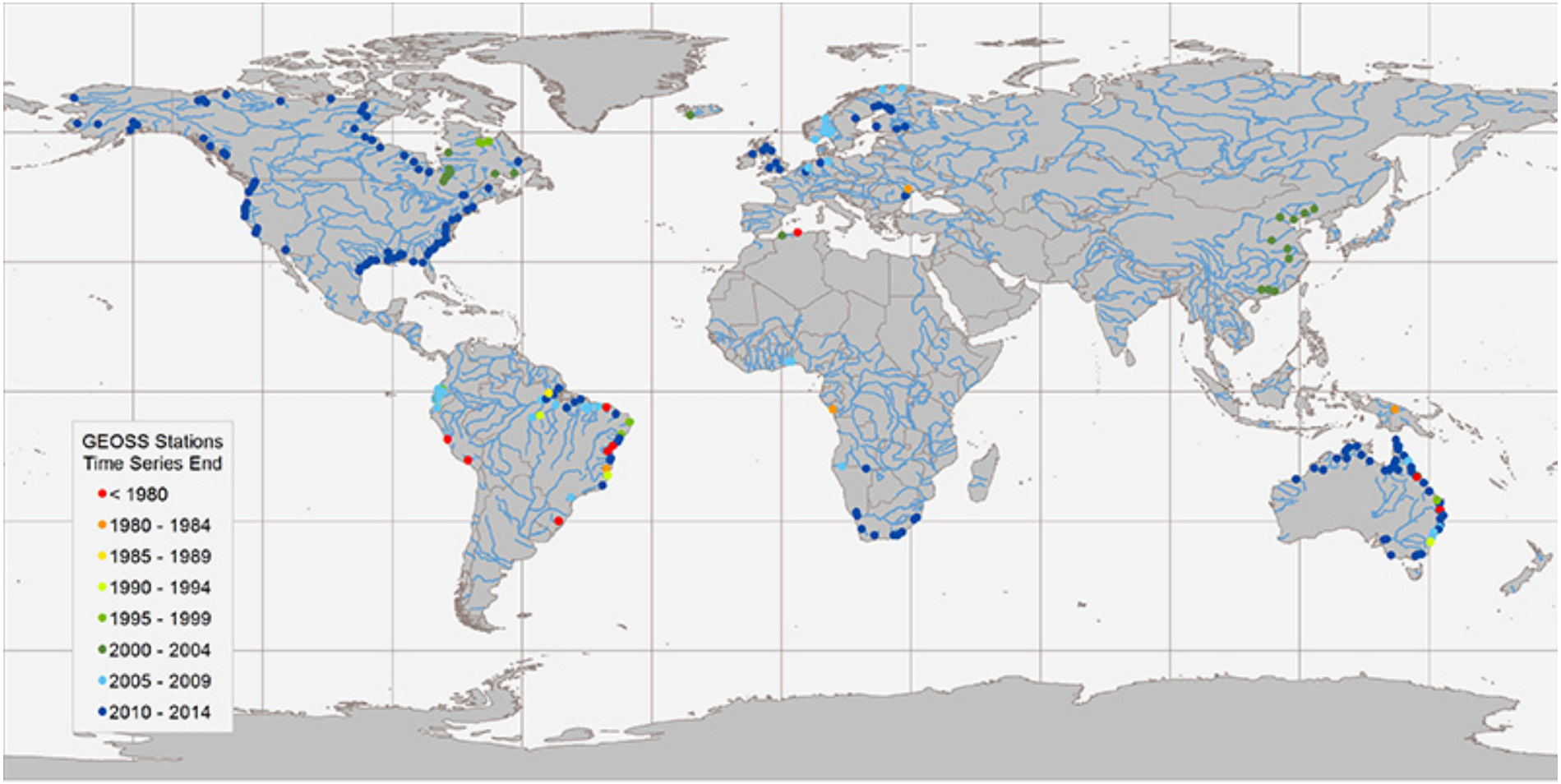
GTN-R Stations freely available through GEOSS and web services



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

Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

GRDC Data Products

The GRDC | Standard Services | Data Products | Special Datasets | Collaboration | News and Updates

You are here: GRDC > Data Products > Long-Term Mean Monthly Discharges

search item

- Freshwater Fluxes into the World Oceans
- Long-Term Mean Monthly Discharges
- Global Composite Runoff Fields

Services

- Global Runoff Database
- River Discharge Data
- GIS Layers
- BfG Homepage

Long-Term Mean Monthly Discharges and Annual Characteristics of GRDC Stations (GRDC, 2013)

Recommended citation: Global Runoff Data Centre (2013): Long-Term Mean Monthly Discharges and Annual Characteristics of GRDC Station / Global Runoff Data Centre. Koblenz, Germany: Federal Institute of Hydrology (BfG), 2013.

The *Long-Term Mean Monthly Discharges and Annual Characteristics* offer basic statistics of 3.843 stations draining basins larger than 2.500 square kilometres [km²], and being represented in the Global Runoff Database by a time series longer than ten years. On the basis of daily discharge values from years of at least ten months and months with less than ten days missing, we calculated:

- annual means
- long-term mea
least ten mont
- long-term inne
month, and th

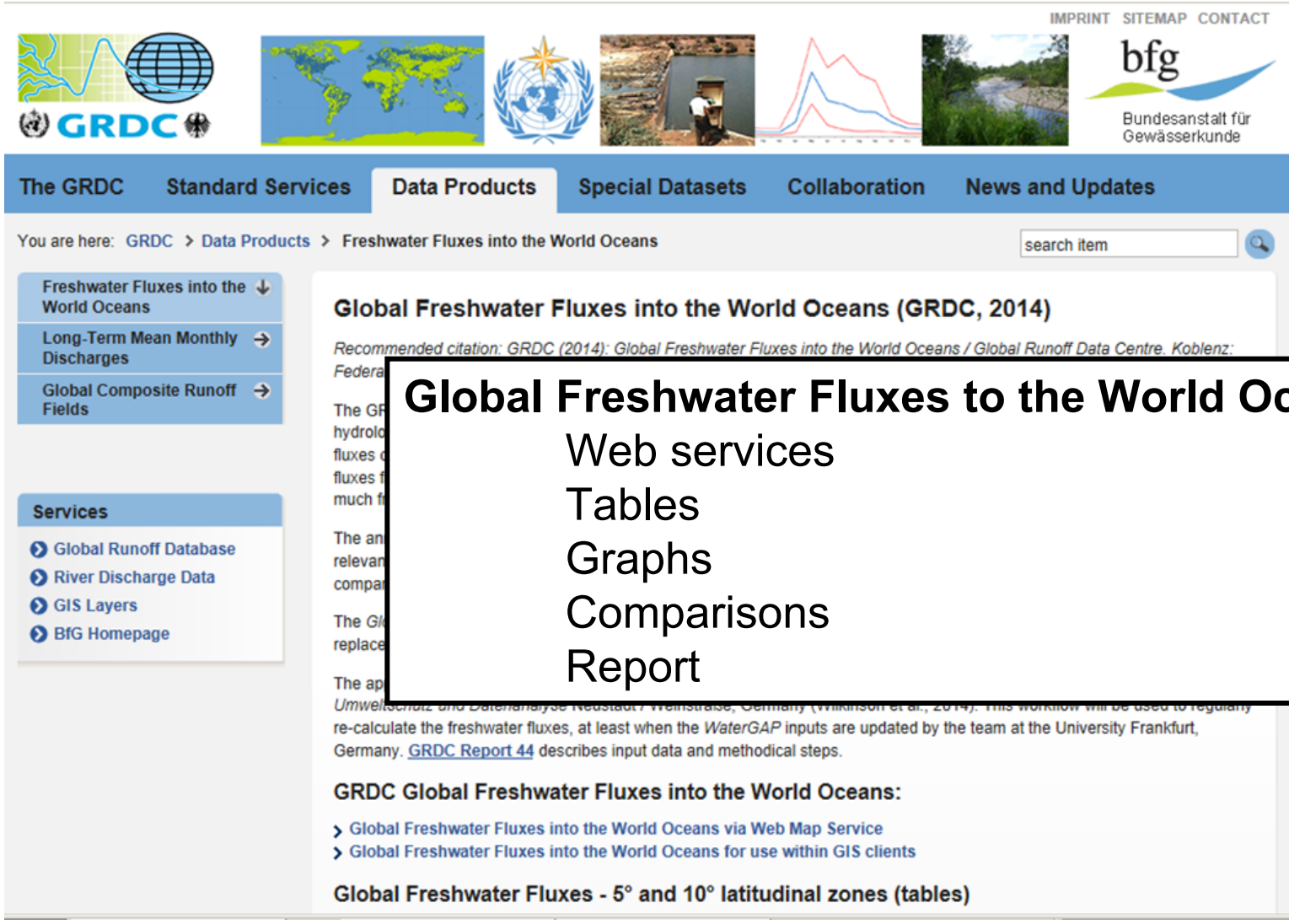
Long-Term Mean Monthly Discharges and Annual Characteristics of GRDC Stations

These monthly primary values are provided station by station as ASCII-text files (see example on the right margin), named with *pvm*-prefix and station numbers. For download, all files are grouped by WMO Regions.

WMO Region	Coverage	Number of stations	Archive
1	Africa	413	Download (0,7 MB)
2	Asia	945	Download (1,7 MB)
3	South America	476	Download (1,3 MB)
4	North & Central America	1334	Download (3,3 MB)

Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

GRDC Data Products



Global Freshwater Fluxes to the World Oceans

- Web services
- Tables
- Graphs
- Comparisons
- Report

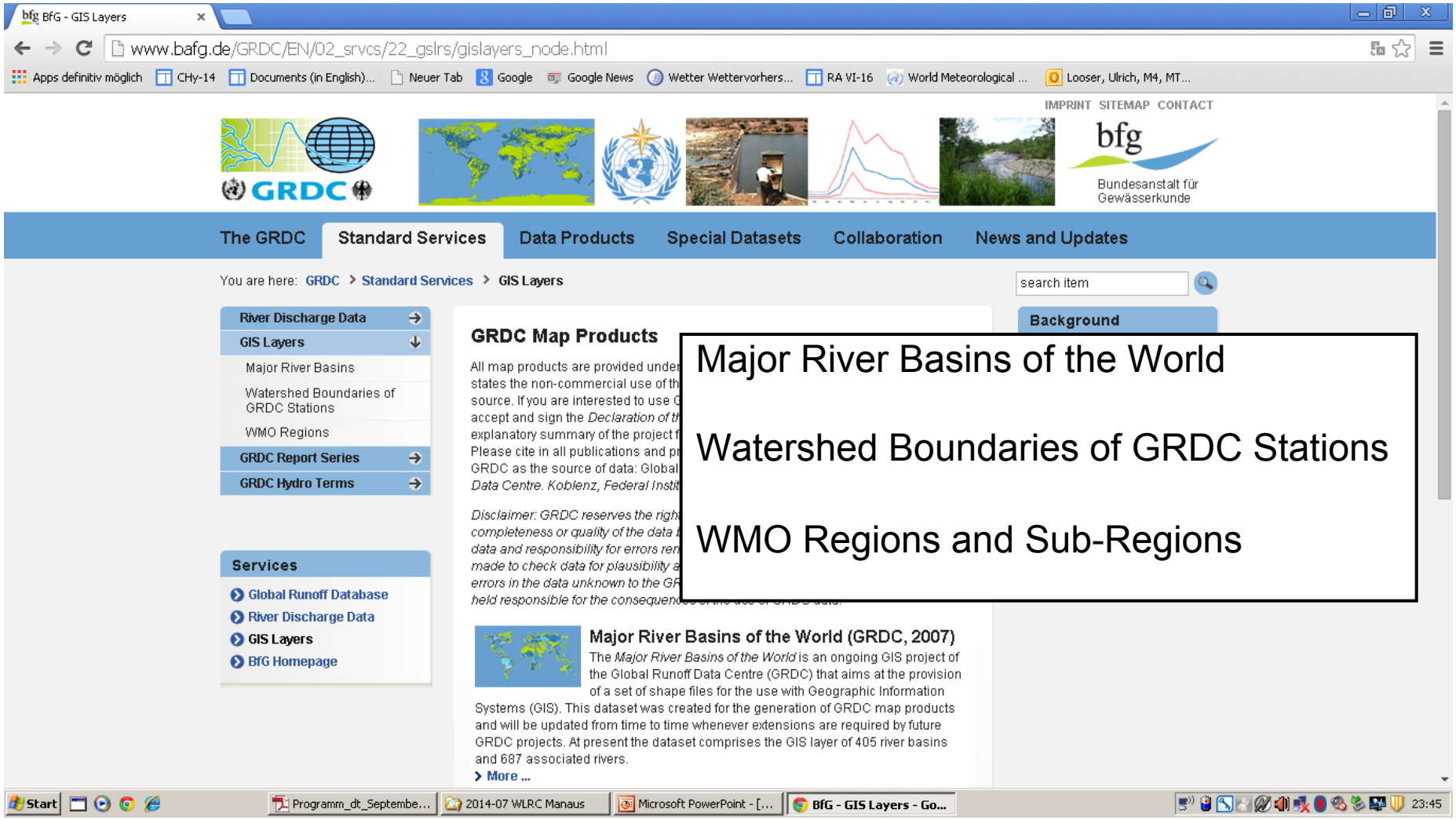
Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

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

Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

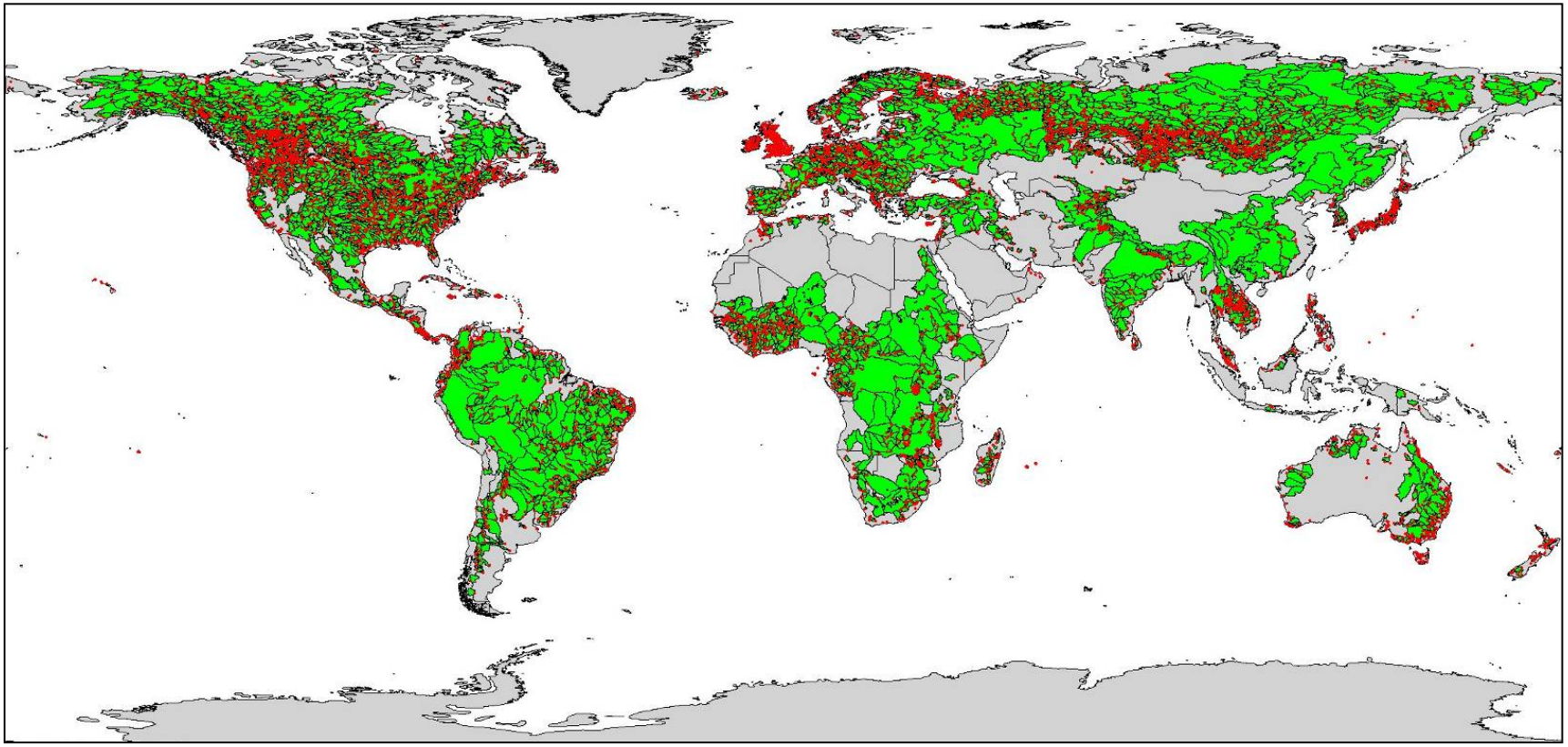
GRDC Map Products



Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

Watershed boundaries of GRDC stations

- **Watershed Boundaries of more than 7000 GRDC Stations provided as GIS Shapefiles**
- **Delineation based on *HydroSHEDS* drainage network (Lehner et al., 2008)**
- **Delineation done by Bernhard Lehner (McGill University, Canada)**
- **Methodology used is published as Report 41 in the GRDC Report Series**
- **GRDC Data Policy applies: non-commercial use and citation of GRDC as the source**



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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"

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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

Ulrich Looser, Global Runoff Data Centre (GRDC) Looser@bafg.de

…more than 25 Years GRDC

Global Runoff Data Centre (GRDC)

Ulrich Looser (Head)
Irina Dornblut
Thomas de Couet
Johannes Pauler

e-mail: grdc@bafg.de, web: http://grdc.bafg.de

Thank you for your attention!