RIVER DISCHARGE

by Ulrich Looser

OBSERVATIONAL IMPORTANCE

The monitoring of river discharge is ideally suited to detect and monitor changes resulting from climate change. At the same time, the freshwater discharge from rivers into the oceans plays a role in driving the climate system, as the freshwater inflow into the oceans may influence oceanic circulation patterns.

CONCEPT OF GTN-R

The project Global Terrestrial Network for River Discharge (GTN-R) was launched by the Global Runoff Data Centre (GRDC) with the aim of enabling access to near-real-time river discharge data for selected gauging stations around the world, thereby capturing the majority of the freshwater flux into oceans. GTN-R plans to draw together the already available heterogeneous information on near-real-time river discharge data from individual national hydrological services, and redistribute the data in a harmonized way. GTN-R is supported by an action item in the GCOS Implementation Plan, published in October 2004.

BENEFICIARIES

GTN-R will serve an expanding user community by supporting several activities, including: the GCOS baseline river discharge network; GTN-H; future versions of the GRDC Long-Term Mean Annual Freshwater Surface Water Fluxes into the World Oceans product; biogeochemical flux computations of the GEMS/Water Programme Office (UNEP/DEWA); the WHYMAP project, and an increasing number of activities and projects in the fields of climate and hydrological research and monitoring.

NETWORK

GRDC has proposed a priority network of river discharge reference stations. This network is now being adjusted in consultation with national hydrological services, and a total of 185 stations have been confirmed, with the status of another 265 stations not yet clarified. Only 25 percent of the national hydrological services identified for participation in GTN-R have responded, and now further efforts are needed to finalize the baseline network.

UNDERLYING SOFTWARE

At the core of GTN-R is a software that collects near-real-time discharge data from distributed servers via the Internet, harmonizes and summarizes them, and makes them available in a single, standardized format. This software is currently being developed at GRDC as part of the European Terrestrial Network for River Discharge (ETN-R). This contract work is conducted for the Joint Research Centre (JRC) of the European Commission to provide European near real-time discharge data in support of the European Flood Alert System (EFAS).
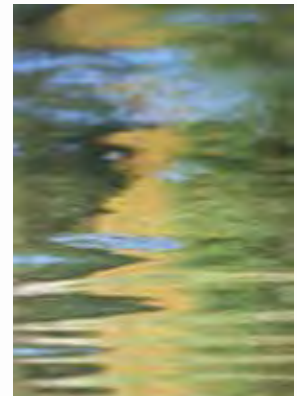
Harmonized real-time river discharge data capturing freshwater flux into oceans

COOPERATION REQUIRED

The success of GTN-R is solely dependent on the regular provision of near-real-time river discharge data from the reference stations. GRDC thus kindly requests the assistance of all organizations able to assist in providing access to available data.

FUNDS

The efficient operation of the GTN-R depends on additional resources to fully implement and manage the network. Approximately €180 000 are required annually to secure such a service at the GRDC. These funds would cover salaries for network coordination and computer programming, infrastructure and travel expenses. These funds do not cover the costs borne by the national hydrological services to operate and maintain the river discharge monitoring infrastructure.

STANDARDS

Standards for river discharge measurement are well established. Special note should be given to WMO Technical Regulations of Hydrology; ISO 1100-1 (1996); and ISO 748 (1997), dealing with the measurement of liquid flow in open channels.
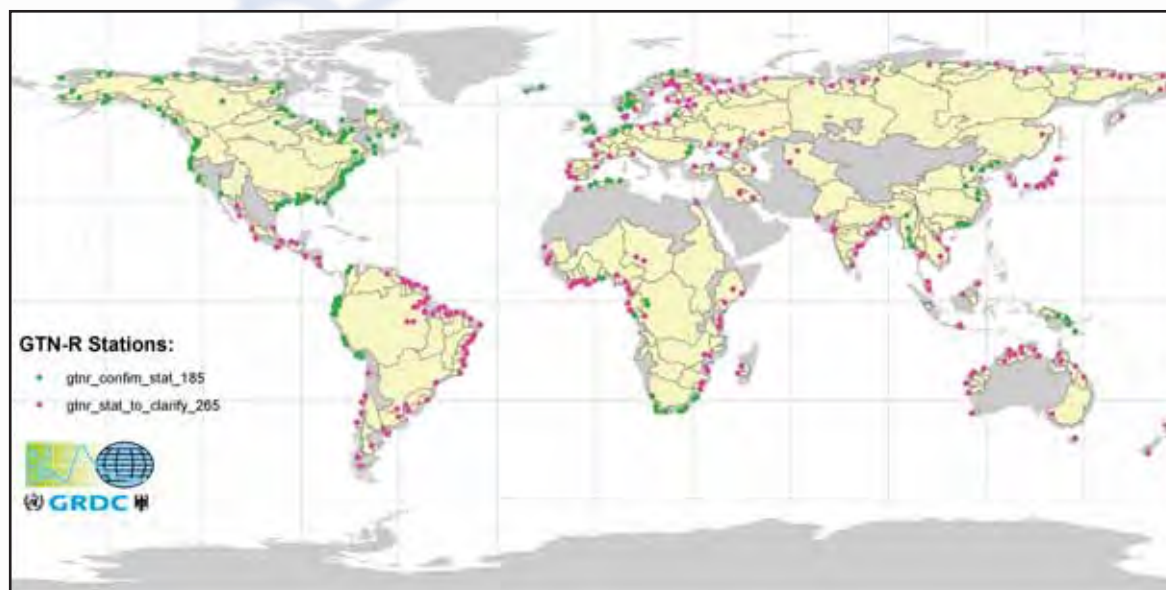

Figure to show the status of confirmation (July 2007) of the revised GTN–R network of 450 river gauges, with their respective catchment areas

RELATED LINKS:
GTN-R: http://gtn-r.bafg.de | **GRDC:** http://grdc.bafg.de | **River discharge standards report:** www.fao.org/gtos/ECV-T01.html