



HAL
open science

SIEREM: Information system of long-term historical data recorded in Africa.

Nathalie Rouché, Jean-François Boyer, Patrick Seyler

► **To cite this version:**

Nathalie Rouché, Jean-François Boyer, Patrick Seyler. SIEREM: Information system of long-term historical data recorded in Africa.. South America Water from Space Conference Santiago, Chile, Mar 2018, SANTIAGO, Chile. . hal-02402428

HAL Id: hal-02402428

<https://hal.umontpellier.fr/hal-02402428v1>

Submitted on 10 Dec 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NoDerivatives 4.0 International License

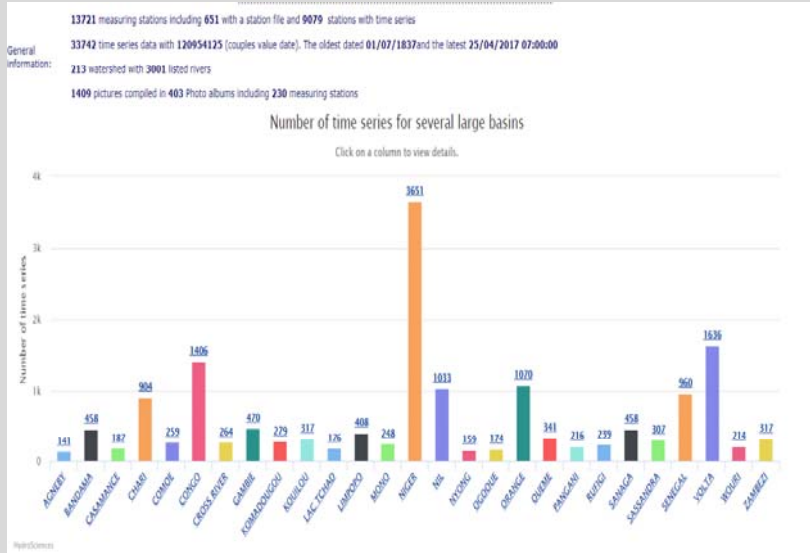
BACKGROUND AND OBJECTIVES

Data and information are often scattered, heterogeneous or incomplete ; they are rarely comparable and suited to needs.

Numerous public, semi-public and private organizations produce and manage data, but often they do not have the resources to exchange, assemble, standardize, summarize and capitalize on the data that they possess.

Over and above these difficulties, there is also the more general problem of a natural and widespread reluctance to share information, particularly when it is considered strategic because it can be used for paid services or to provide access to power.

While most countries and basins (national or transboundary) clearly need to make an effort to alleviate current data deficiencies, it is also vital that they develop links between data producers and users no matter what the theme or level of intervention (local, basin, national and international) and reinforce capacities for accessing, processing and using existing data. It is in this context and aware of these stakes that HydroSciences Montpellier Laboratory has developed an information system known as SIEREM, which contains several types of environmental variables for the whole of Africa.



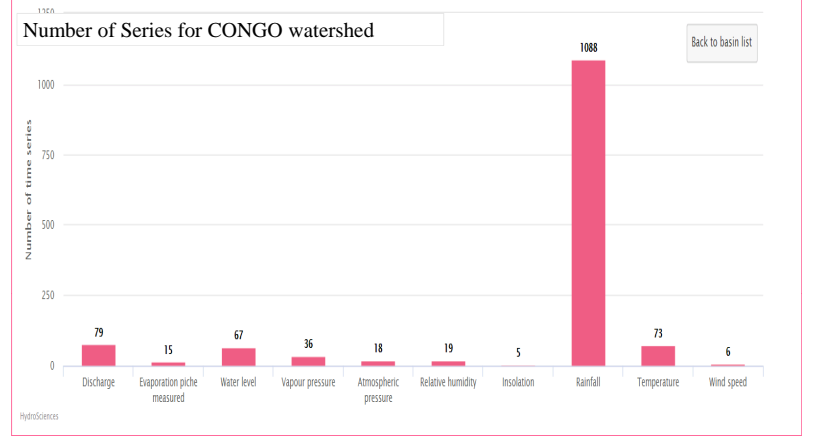
With 13,720 measurement stations and 33,740 chronological series (i.e. more than 120 million recordings) for 1837-2015, this is the largest environmental information system in Africa. The SIEREM site provides free access to all information except raw measurement data, which are the property of the national services of African countries.

DATA SET SIEREM

1. General inventory of Environmental Information System SIEREM

The Congo river is the world's second largest river, both for its mean flow and for its catchment area 3,7 millions of km². Discharge 40,000 m³/s at Kinshasa

Source : L'hydrologie tropicale: géoscience et outil pour le développement IAHS Publ. no. 238,1996



SIEREM Système d'Informations Environnementales sur les Ressources en Eau et leur Modélisation

Watershed : Nyong

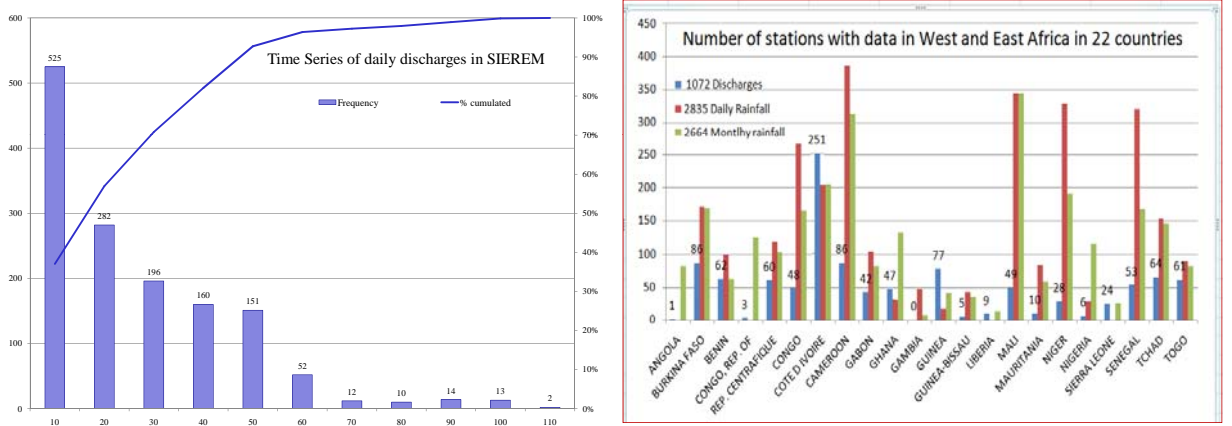
Stations with chronological series of Debit expressed in m³/s

Code	Name	Latitude	Longitude
1054001005	LOLODORF	3,2333	10,7333
1056001006	AKONOLINGA	3,7833	12,25
1056001009	AYOS	3,8833	12,5167
1056001012	DEHANE	3,5667	10,1167
1056001015	ESEKA	3,6833	10,7
1056001018	KAYA	3,8667	11,0917
1056001021	MBALMAYO	3,5167	11,5
1056001027	OLAMA	3,4333	11,2833
1056002003	FTOA	2,7667	11,4833
1056002009	NSIMALEN	3,7333	11,5333
1056099131	MBALA	3,8472	11,5164
1056099151	STATION 3 SIBAKON - PRINCIPALE BV OTOTOMO	3,6700	11,2499
1056099152	STATION 1 - SIBAKON ou SIBAKON	3,6683	11,2842
1056099153	STATION 2 - BIBONDA ou BIBONDA	3,6811	11,2906

Metadata of discharges stations Stations : 2 / 14 / 14

2. Hydrometric data recorded in Sierem database

Different Type of data can be managed : discharges, water level, rainfall, temperature, humidity

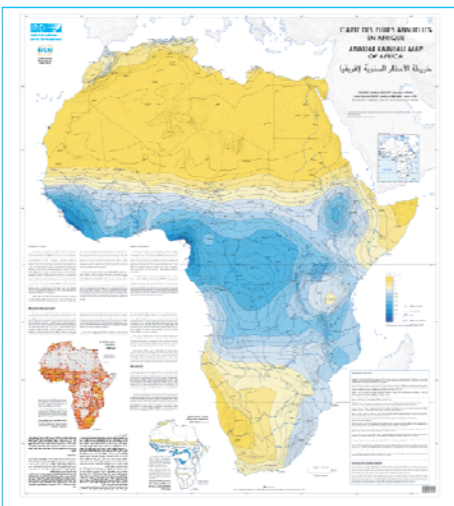


3. Catchment basins – Photos – Book Map Library

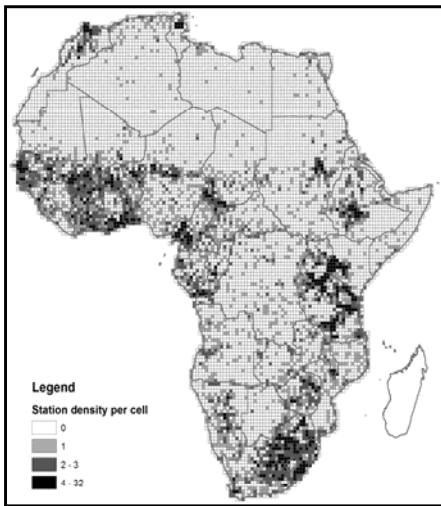
Hydro-climatic data is combined with spatial data : 201 contours of catchment basins and 2,962 rivers. SIEREM has also been enriched with data recovered from historical hydrological archives. More than 1,342 photos have been brought together in 391 geo-referenced albums. <http://www.hydrosciences.fr/sierem/produits/index.asp?frame=datasig>

RESULTS

Annual rainfall map of Africa



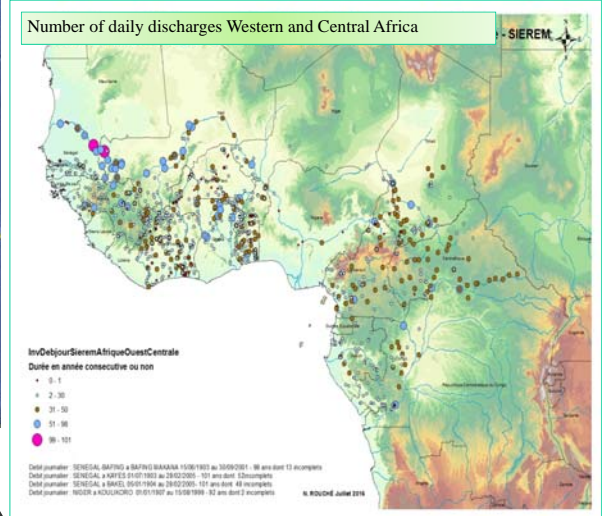
Map of the density stations of the SIEREM data base



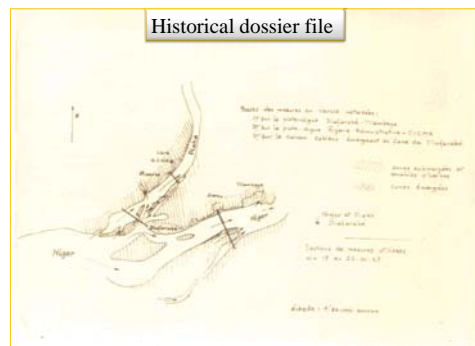
SIEREM produces kml files that place the station on Google Earth. The data become more accessible, time series plotted and metadata can be seen on the context of the landscape.



Duration in years of daily discharges in Western and Central Africa



GIS layers of Nyong watershed, hydrometric stations Cameroon



Mali : Bani at Douna Lat. 13.21, long. -5.90 G. MAHÉ 02/2001



Gabon : Ogooue at Ayem Lat. -0.1037, long 11.4151 JP. BRICQUET 01/2017



RÉFÉRENCES

-BOYER JF, DIEULIN C, ROUCHÉ N, et al. / SIEREM an environmental information system for water resources. 5th World FRIEND Conference, La Havana - Cuba, Nov. 2006 in Climate Variability and Change - Hydrological Impacts. IAHS Publ. 308, p.19-25, 2006.
 -LOUVET S, PATUREL JE, MAHÉ G, ROUCHÉ N, KOITE M / Comparison of the spatiotemporal variability of rainfall from four different interpolation methods on the result of GR2M hydrological modeling - case of Bani River in Mali, West Africa. Theoretical and Applied Climatology, 2016, 123 (1-2), p. 303-319.
 -MAHÉ G, ROUCHÉ N, DIEULIN C, BOYER JF, IBRAHIM B, CRÈS A, SERVAT E, et al. / Carte annuelle en Afrique = Annual rainfall map of Africa. Montpellier (FRA) : IRD, 2012.
 -SIDIBE, M, DIEPOIS, B, ROUCHÉ, N, et al. Trend and variability in western and central Africa streamflow, and their relation to climate variability between 1950 and 2010. Geophysical Research Abstracts . Vol. 19, EGU2017-8302, 2017. EGU General Assembly 2017