

# Groundwater Data

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## Groundwater Data

On this page are links to sources of groundwater data, with a particular focus on Africa.

By groundwater data, we mean measured physical or chemical information on groundwater collected at point groundwater sources (boreholes, wells or springs).

Groundwater data includes:

- **groundwater levels**, measured in boreholes or wells: rest or static water levels; pumped water levels - one-off measurements or monitored over time
- **test pumping data**: water levels; pumping rates; aquifer properties calculated from test data
- estimated sustainable **yields** for boreholes or wells
- measured **groundwater chemistry and microbiological** parameters
- borehole **drilling logs** with geological information, water strikes and borehole construction information.

Collecting, checking, storing and managing groundwater data so that it can be used effectively is challenging. Most countries have a national borehole inventory, holding geological and groundwater data from the time of borehole drilling. Many countries also have strategic groundwater level monitoring networks and some also have a strategic groundwater quality monitoring network, with

the monitoring data stored in databases at national level. However, these databases and monitoring networks are rarely fully operational or representative of groundwater across the whole country.

[Adelana \(2009\)](#) discusses some of the issues with monitoring groundwater resources in Africa. One of the countries that has put in place a functional National Groundwater Database and developed a groundwater quality monitoring programme is [South Africa](#).

Groundwater data is different from water point data. In recent years, the availability of water point data, as part of WASH strategies, has seen huge improvements, with the development of procedures, databases & digital apps for more efficient collection, storage and availability of water point data in Africa, at project, organisation and national level, including the development of online databases. However, although most water points in Africa are groundwater sources, water point databases typically contain little groundwater data, and therefore can tell us little about the groundwater resource on which the water points rely.

Some examples of data portals or digital technologies for water point data collection and management are:

- [MWater](#);
- the Water Point Data Exchange ([WPDx](#));
- [Akvo Flow](#); [Water Point Mapper](#); and
- the Sierra Leone national [WASH Data Portal](#).

## Africa-wide or Global Groundwater Data Sources

### [Chronicles Consortium](#)

The [Chronicles Consortium](#) initiative is collating long term - multi-decadal - records of groundwater levels from around Africa.

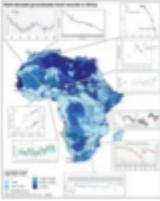
**The Chronicles Consortium**

Multi-Decadal Groundwater Levels in Africa

Project Information

Duration	Region(s)
2014 - Current	Southern Africa Eastern Africa Central Africa Western Africa Middle East and Northern Africa

The Chronicles is an international consortium of scientists from across Africa and beyond collating and analysing multi-decadal records of groundwater levels, representing long-term aquifer dynamics, in order to assess the impacts of groundwater use, climate variability and change, and land-use change on groundwater storage across Africa.



**Collation and Analysis of Multi-decadal Groundwater-levels Observations in Africa**

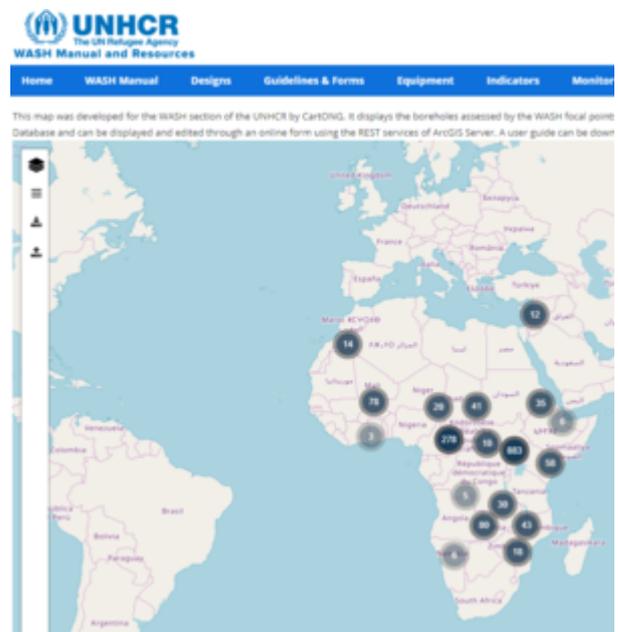
### IGRAC [Global Groundwater Information System](#)

[IGRAC](#) hosts the [Global Groundwater Information System](#) (GGIS) - an interactive, web-based portal to groundwater-related information. This includes some groundwater level monitoring data collated from a number of countries, including some in Africa, in the [Global Groundwater Monitoring Network](#) (GGMN).



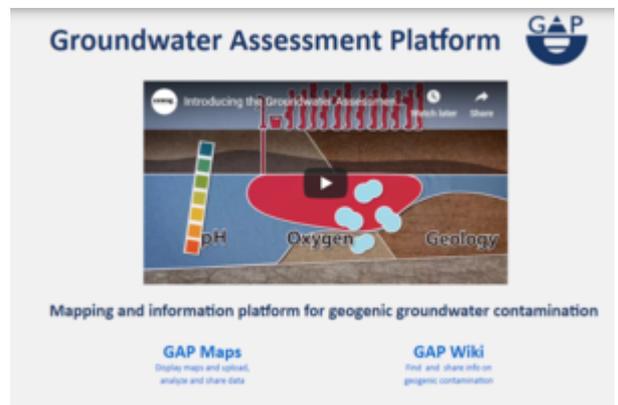
### UNHCR [Refugee Site Borehole Data](#)

The UNHCR have an online [WASH GIS portal](#), which includes groundwater data from water boreholes at UNHCR refugee sites, including borehole locations, depths, casing diameters, rest (static) water levels and estimated safe yields.



### EAWAG [Groundwater Quality information](#)

EAWAG (the Swiss Federal Institute of Aquatic Science and Technology) developed the [Groundwater Assessment Platform](#), with information on geogenic (naturally occurring in groundwater) contaminants. This database includes some measured data on groundwater arsenic and fluoride concentrations, including in Africa.



### Country-specific National Groundwater Data Sources

Most countries in Africa have some national groundwater data holdings, such as a water borehole

inventory, groundwater level or quality data. However, it is often difficult to access this data, and very few countries have so far made this data available online (this is also the case for most non-African countries).

## South Africa

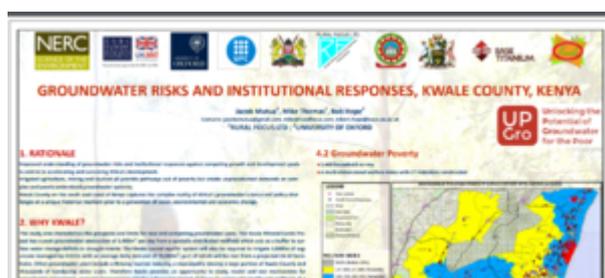
The South Africa Department of Water and Sanitation (DWS) [Data Management](#) portal includes links to the [National Groundwater Archive](#), an online database allowing users to register and explore groundwater related data collected from the [National Groundwater Level Archive](#) and the [National Groundwater Quality Monitoring Project](#).



## Project-based and Private Sector Groundwater Data Sources

Many projects and private industries carry out some form of groundwater data collection and/or monitoring. These data are often detailed, but usually focus on small areas and sometimes for short time scales (e.g. weeks to months, or in some cases a few years). These data holdings are rarely integrated with national, government-held databases. It can be difficult for people outside the project or private company to identify what data holdings exist, and if identified, to access the data.

An example of private sector groundwater data is groundwater level monitoring data for a shallow aquifer at a large mine in Kwale county, Kenya, which is collected by the mine operator Base Titanium. This data was shared by the mine operator with the [UPGro](#) research project [Gro for Good](#), illustrated by a poster by [Mutua et al \(2014\)](#).



Poster by Mutua et al (2014)

An example of project-based groundwater level monitoring comes from a WaterAid project in Burkina Faso, where WaterAid initiated community-based water resource monitoring. More information is in this [case study on community monitoring in Burkina Faso](#).



Dipping the water level in a hand dug well.  
Image credit: Djibril Barry / WaterAid (2016)

## References

Adelana SMA. 2009. [Monitoring groundwater resources in Sub-Saharan Africa: issues and challenges](#). Groundwater and Climate in Africa: Proceedings of the Kampala Conference, June 2008, IAHS Publ. 334.

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