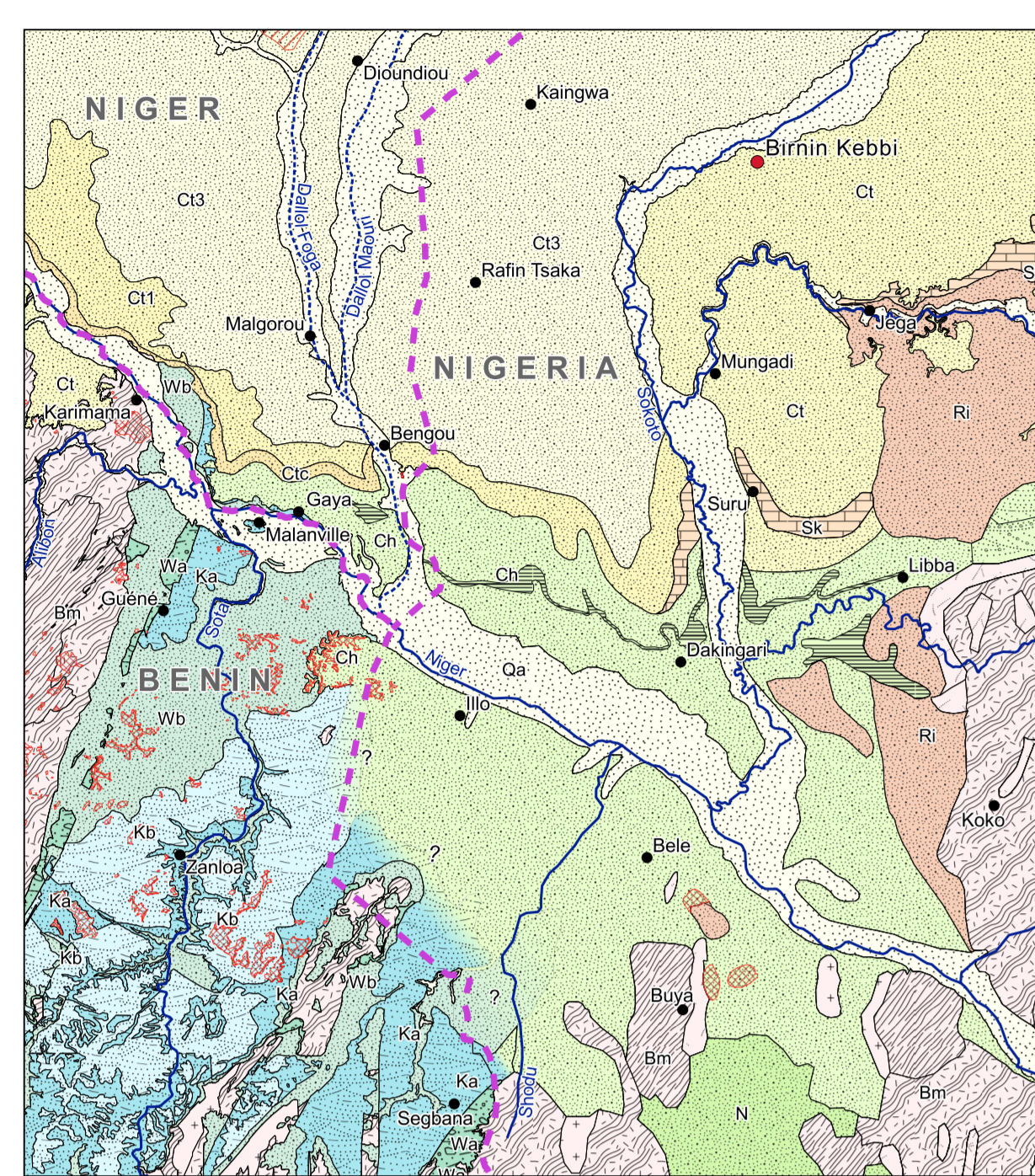
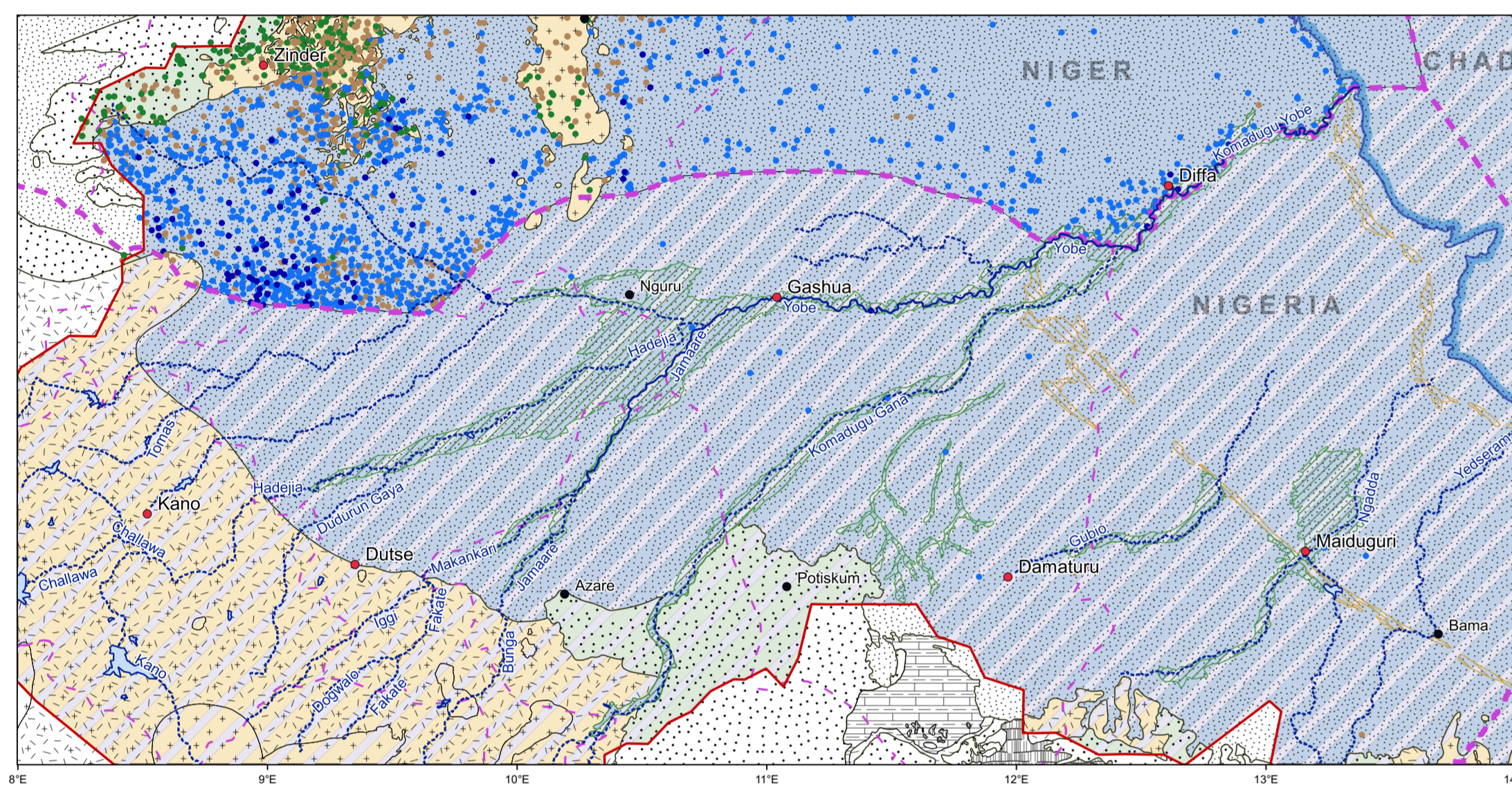


Regional groundwater resources mapping

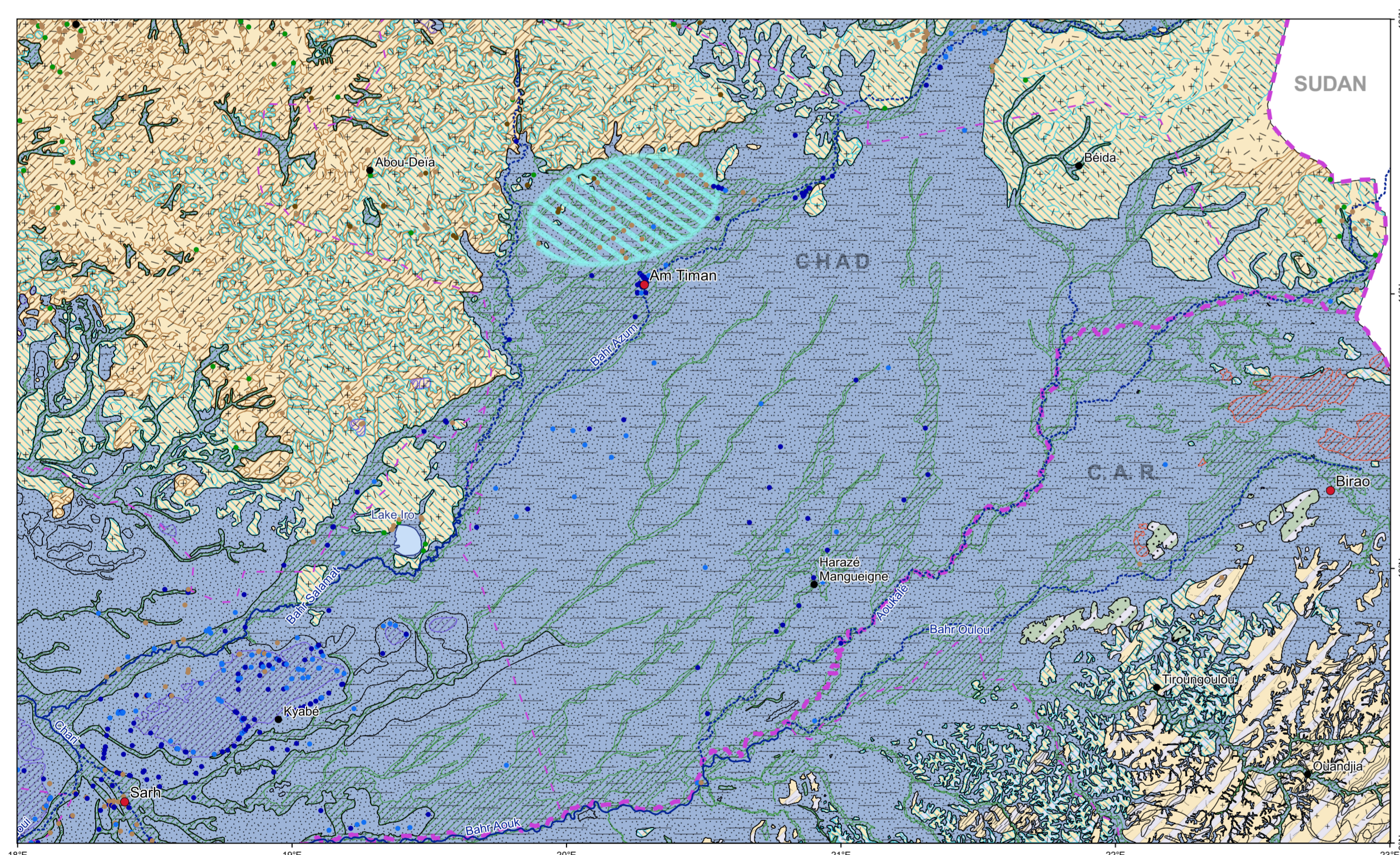
A Harmonized lithology (Benin, Niger, Nigeria) 1:1 000 000



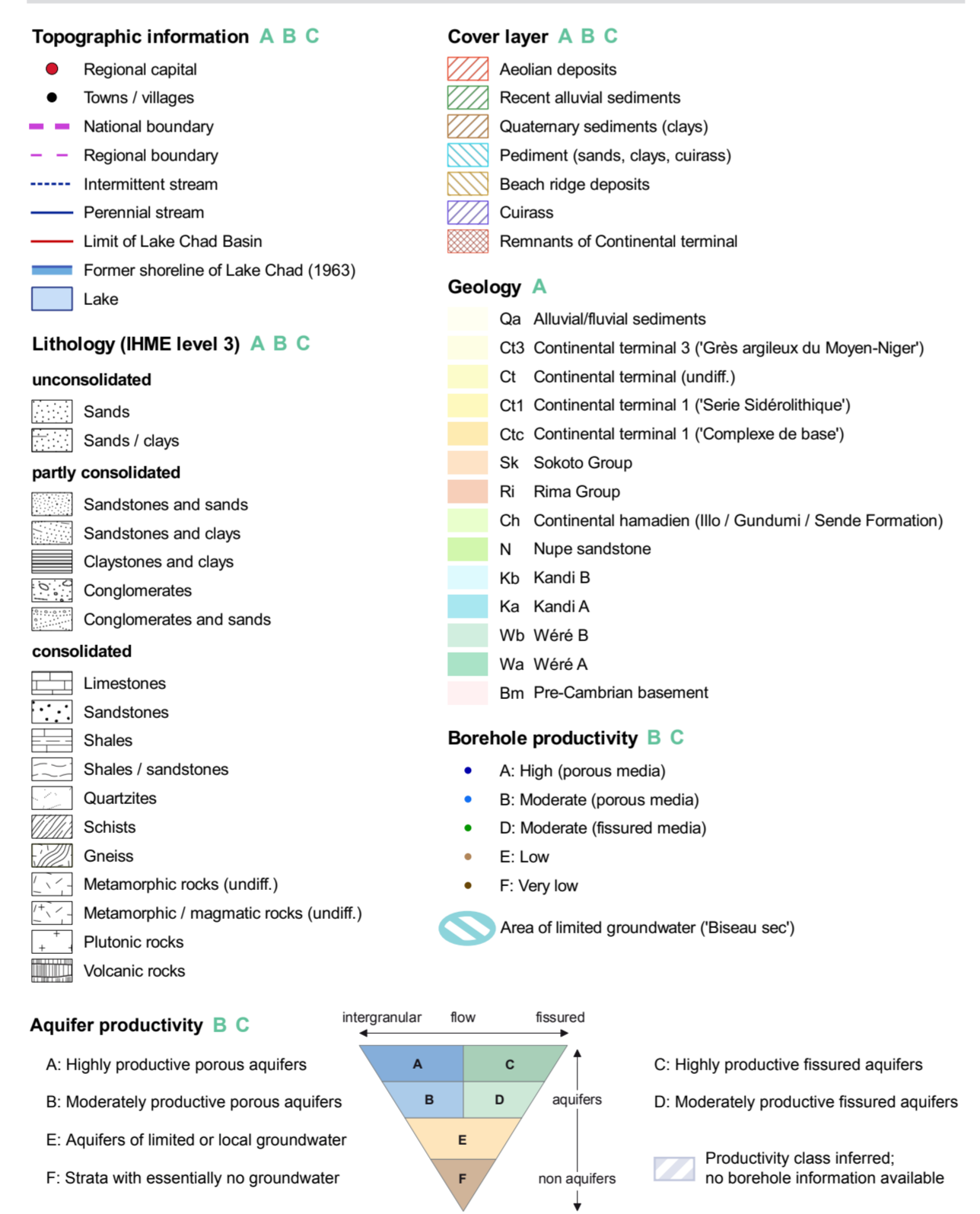
B Aquifer productivity of the transboundary Komadugu-Yobe region (Niger, Nigeria) 1:2 000 000



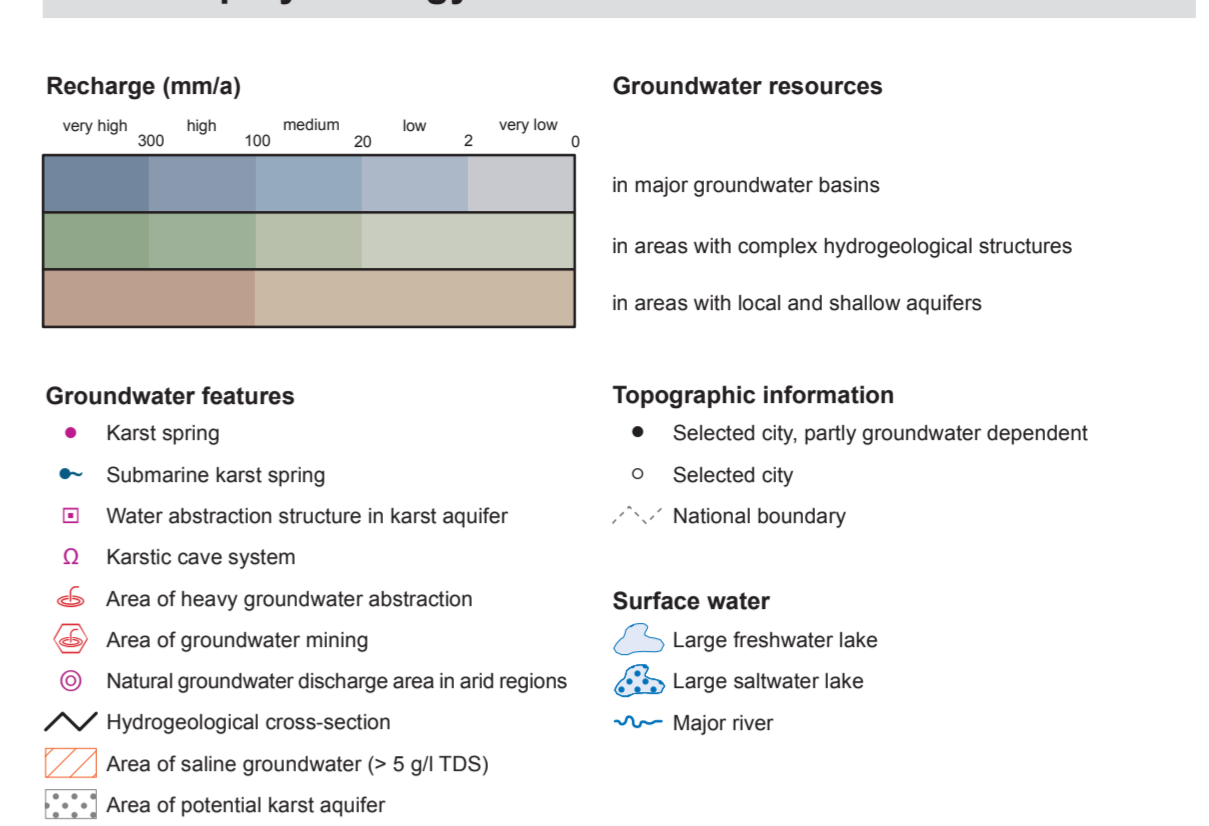
C Aquifer productivity of the transboundary region of Salamat (Chad) and Vakaga (Central African Republic) 1:1 500 000



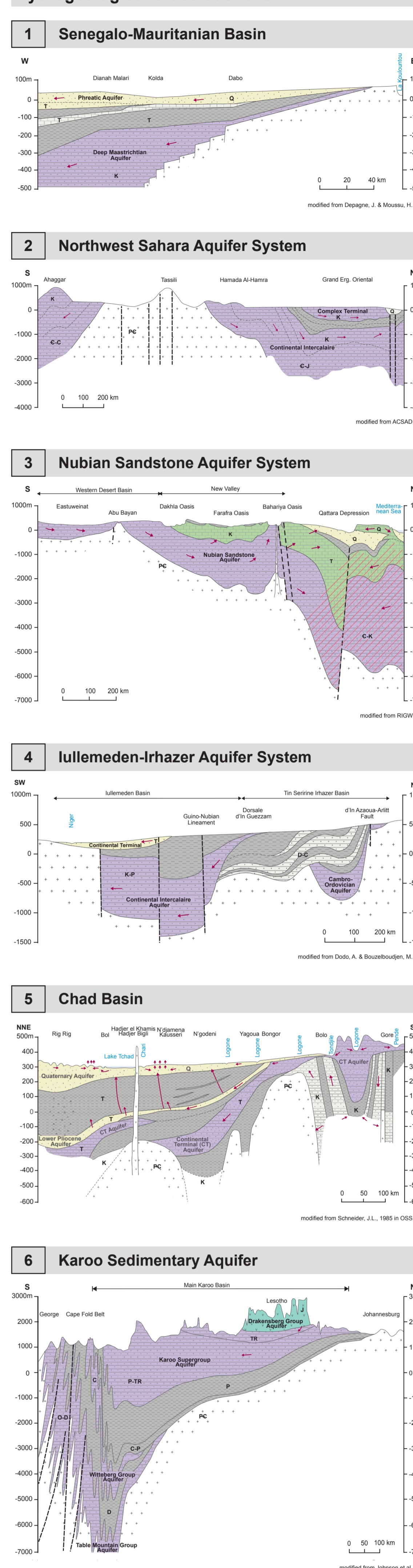
Regional maps symbology



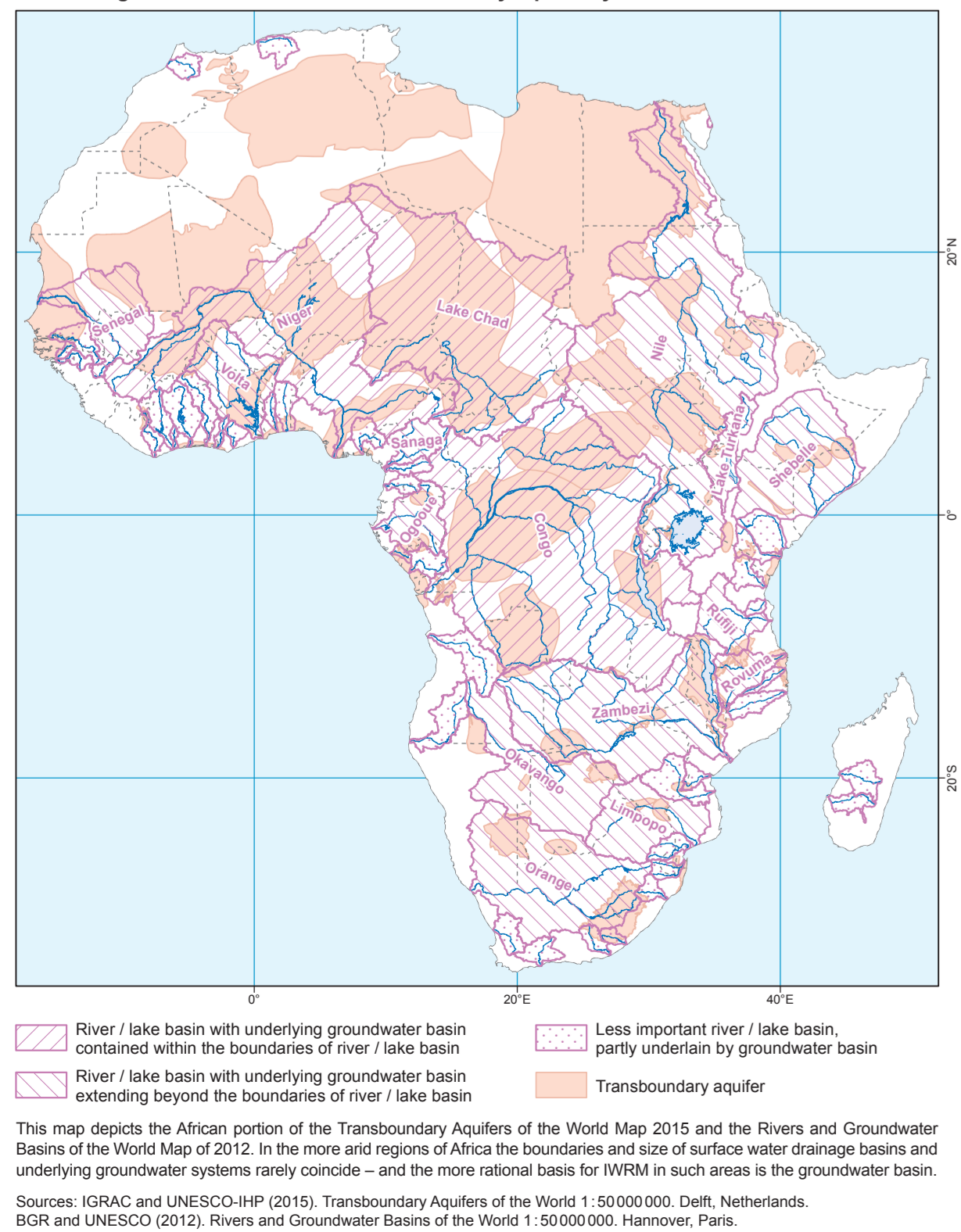
Main map symbology



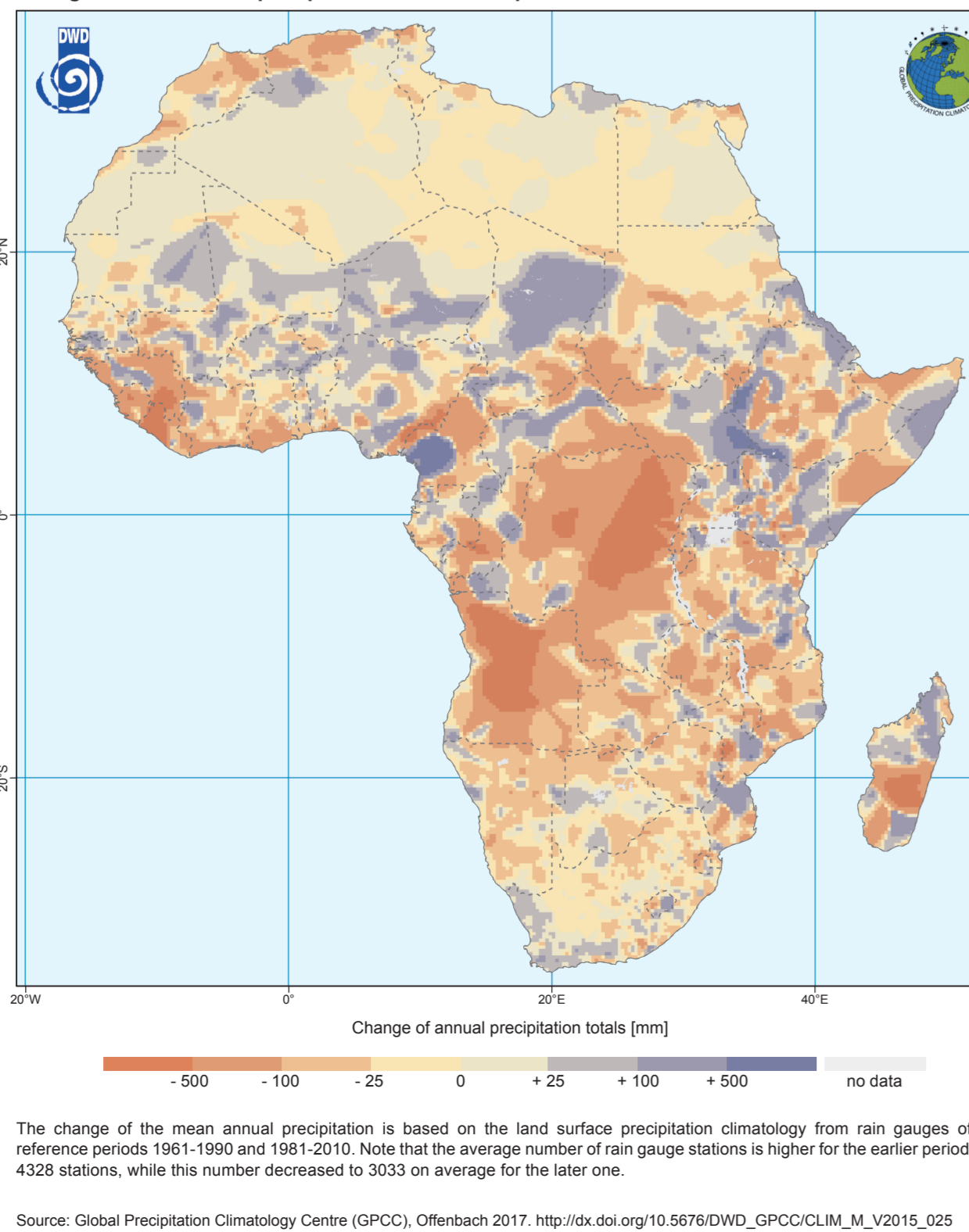
Hydrogeological cross-sections



River and groundwater basins and transboundary aquifer systems



Change of mean annual precipitation between the periods 1961-1990 and 1981-2010



WHYMAP and its current status of groundwater resources mapping in Africa

The World-wide Hydrogeological Mapping and Assessment Programme (WHYMAP) is a joint programme consisting of a consortium composed by the UNESCO, the Commission for the Geological Map of the World (CGMW), the International Association of Hydrogeologists (IAH), the International Atomic Energy Agency (IAEA), the International Groundwater Resources Assessment Centre (IGRAC), and the German Federal Institute for Geosciences and Natural Resources (BGR). Its principal aim is to contribute to the world-wide efforts to better understand, manage and protect aquifer resources, and to transfer the groundwater-related information to groundwater experts as well as to non-experts and politicians.

Governance and management of transboundary aquifers in Africa

World-wide, management of transboundary aquifers remains challenging as groundwater has been traditionally considered a national matter. Monitoring of the Sustainable Development Goal (SDG) indicator on transboundary waters under an operational arrangement (UNESCO & UNEP, 2018) including the large groundwater resources of the Nubian Sandstone Aquifer System (NSAS), the North-Western Sahara Aquifer System (NWSAS), and the Sahelian Transboundary Aquifer System (STAS). A memorandum of understanding was signed in 2014 for the establishment of a consultation mechanism for the Iullemeden, 'Touareg', Trans-Saharan Aquifer System (TTAS) but has not entered into force yet.

Lithological harmonisation draws on available geological information and uses expert knowledge to unify differing lithological descriptions

The lithology of the uppermost aquifer can be derived from the harmonised lithological maps and allows a first differentiation of aquifer types, which is the basis for a productivity classification according to the SLHYM. This categorisation scheme separates on the one hand aquifers of fractured and intragranular flow. On the other, it differentiates between classes of high, moderate and limited productivity, and of no groundwater resources. To add a quantitative component to the individual productivity classes, a classification methodology proposed by Kobayashi (1993) was adopted relating qualitative productivity classes to absolute values of transmissivity, specific capacity and yield. Available field measurements were used to first categorise the productivity of each borehole and then to assign a mean productivity class to each lithological unit (map B). Map C applies a slightly modified approach after Ntiba & Baume (2007) and Kobayashi (1993).

WHYMAP - a continuous effort

This map represents the current status of WHYMAP's groundwater mapping efforts in Africa. While the WHYMAP programme is a continuous effort to contribute to the continuous improvement of the WHYMAP products, including the present version of this map. Contact information for the submission of any notes and drafts related to this map is available at www.whymap.org.

Groundwater Resources of Africa

Special edition for the 7th Africa Water Week in Libreville (Gabon), Oct 29 - Nov 2 2018, extracted from the World-wide Hydrogeological Mapping and Assessment Programme (WHYMAP). Includes logos of IGRAC, BGR, Igrac, and other organizations.