

Hydrogeology of Eritrea

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Many ancient civilisations inhabited the area of present-day Eritrea. In the 16th century parts of the country came under Ottoman governance, including the coastal zone until the period of Italian colonisation in the late 19th century. During Italian occupation, the country saw major development of the industrial, agricultural and public service sectors. In the 1930s Italian Eritrea was merged with Italian Somaliland and Ethiopia as Italian East Africa. In 1941 Britain took over administration of Eritrea, and in 1950 the country was federated to Ethiopia. Ethiopia entirely annexed Eritrea in 1962, which was followed by 30 years of the Eritrean War for Independence, finally ending in 1991 when Ethiopian forces were defeated. The winning Eritrean People's Liberation Front has held power ever since in a one-party state. No national elections have been held in Eritrea since independence. Another border war with Ethiopia happened between 1998 and 2000, since when there has been periodic further unrest. International observers cite Eritrea as having one of the worst human rights records globally.

Eritrea's economy was severely affected by decades of war, with widespread loss of infrastructure and livestock. Recent growth in GDP is in part due to the development of mining (particularly of gold and silver) and other industry. The country has large mineral resources that are so far largely undeveloped. Most of the population are employed in subsistence agriculture, including livestock farming. However, migration from Eritrea is high, and combined with compulsory military service has reduced the agricultural workforce, affecting productivity and food security. Remittances from abroad are estimated to account for about one third of GDP.

Eritrea has limited water resources. Average annual rainfall is low and unevenly distributed both seasonally and spatially, and much rainfall occurs as high intensity events that cause flash flooding but do not sustain perennial river flows. Groundwater supplies most of the country's water supply needs.

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Compilers

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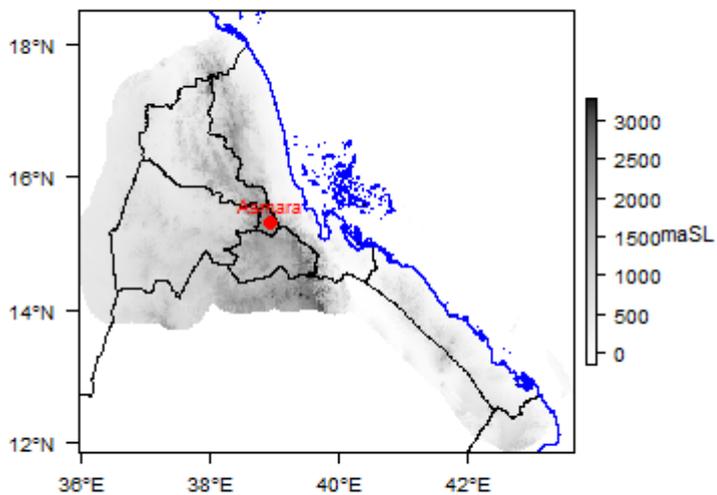
Please cite this page as: Upton, Ó Dochartaigh and Bellwood-Howard, 2018.

Bibliographic reference: Upton K, Ó Dochartaigh BÉ and Bellwood-Howard, I. 2018. Africa Groundwater Atlas: Hydrogeology of Eritrea. British Geological Survey. Accessed [date you accessed the information]. http://earthwise.bgs.ac.uk/index.php/Hydrogeology_of_Eritrea

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Geographical Setting



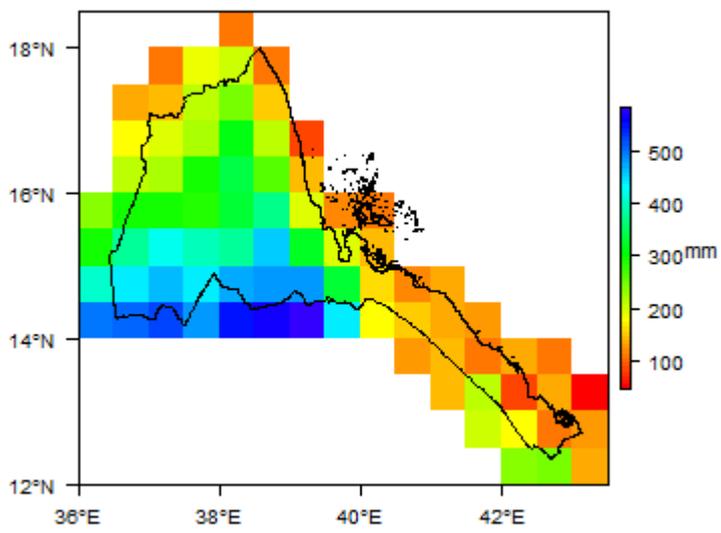
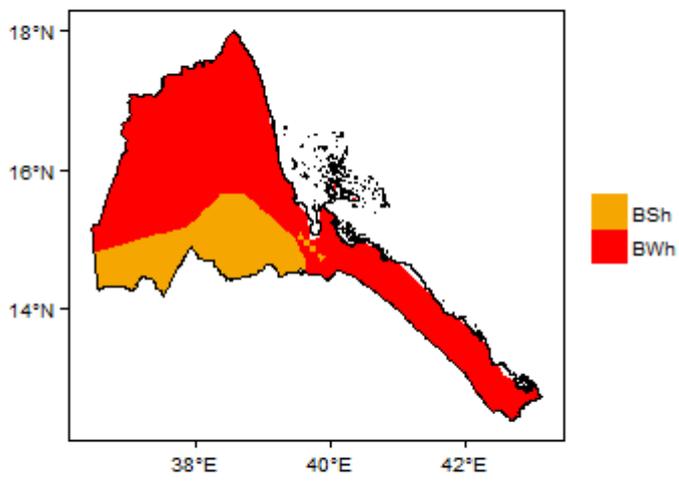
Eritrea. Map developed from USGS GTOPOPO30; GADM global administrative areas; and UN Revision of World Urbanization Prospects. For more information on the map development and datasets see the [geography resource page](#)

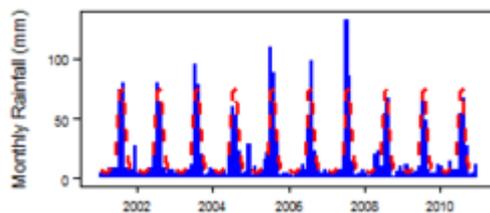
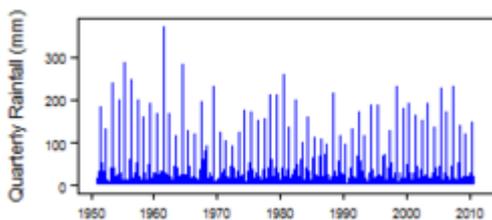
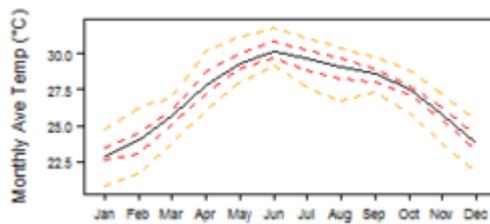
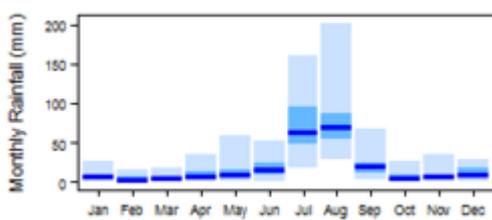
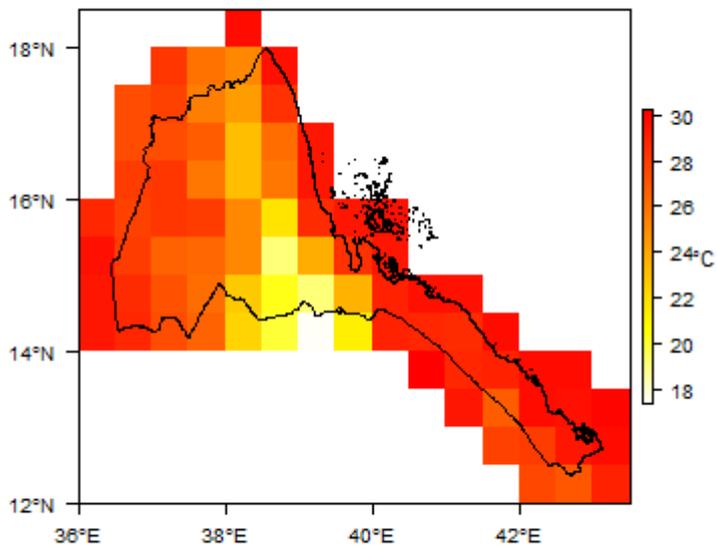
General

Capital city	Asmara
Region	Eastern Africa
Border countries	Sudan, Ethiopia, Djibouti
Total surface area*	117,600 km ² (11,760,000 ha)
Total population (2015)*	5,228,000
Rural population (2015)*	3,703,000 (71%)
Urban population (2015)*	1,525,000 (29%)
UN Human Development Index (HDI) [highest = 1] (2014)*	0.3909

* Source: [FAO Aquastat](#)

Climate

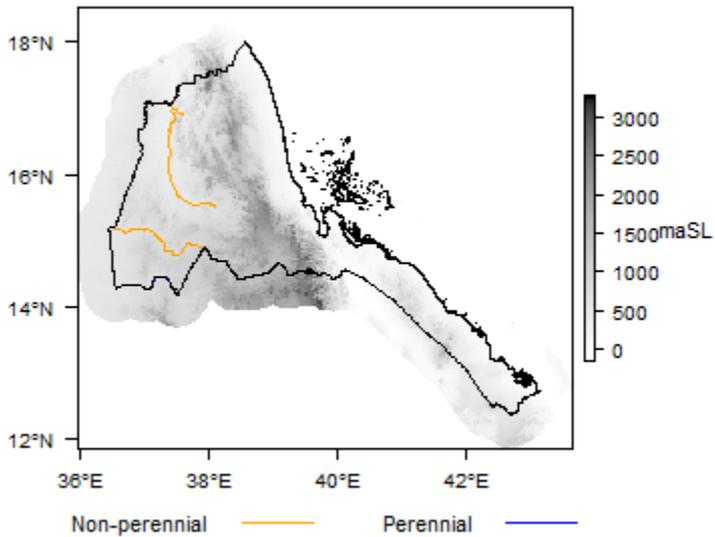




More information on average rainfall and temperature for each of the climate zones in Eritrea can be seen at the [Eritrea climate page](#).

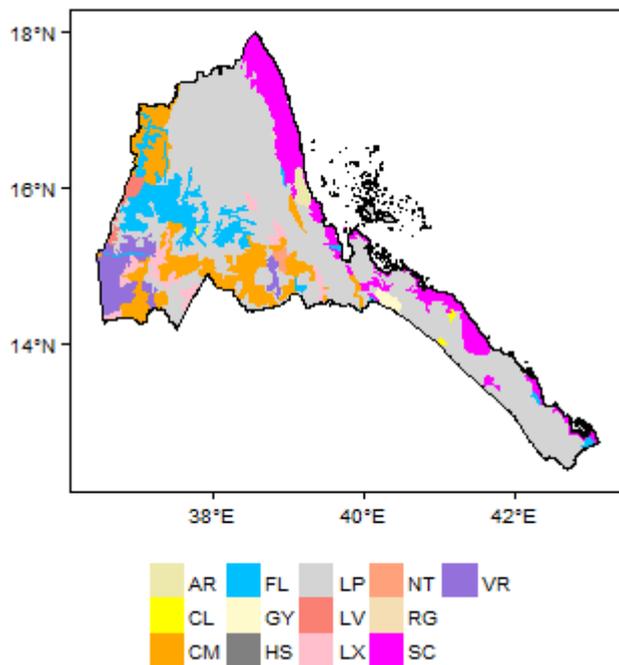
These maps and graphs were developed from the CRU TS 3.21 dataset produced by the Climatic Research Unit at the University of East Anglia, UK. For more information see the [climate resource page](#).

Surface water



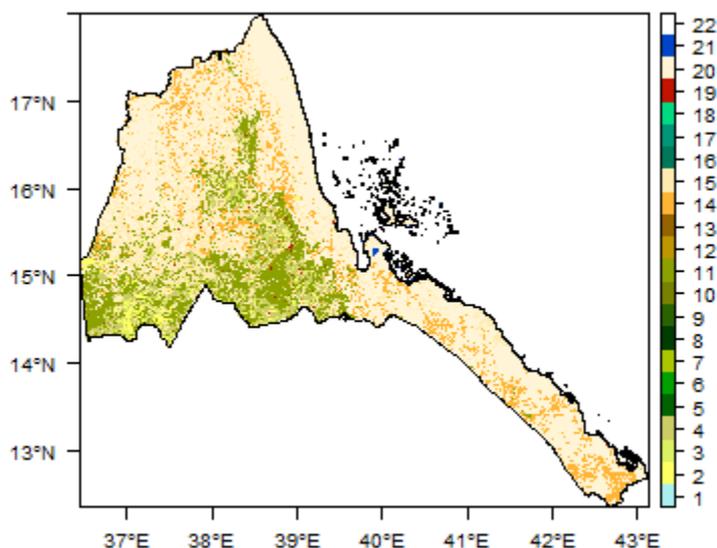
Major surface water features of Eritrea. Map developed from World Wildlife Fund HydroSHEDS; Digital Chart of the World drainage; and FAO Inland Water Bodies. For more information on the map development and datasets see the [surface water resources section](#))

Soil



Soil Map of Eritrea, from the European Commission Joint Research Centre: European Soil Portal. For more information on the map see the [soil resource page](#)

Land cover



Land Cover Map of Eritrea, from the European Space Agency GlobCover 2.3, 2009. For more information on the map see the [land cover resource page](#)

Water statistics

	1993	2004	2014	2015
Rural population with access to safe drinking water (%)				53.3
Urban population with access to safe drinking water (%)				73.2
Population affected by water related disease	No data	No data	No data	No data
Total internal renewable water resources (cubic metres/inhabitant/year)			535.6	
Total exploitable water resources (Million cubic metres/year)	No data	No data	No data	No data
Freshwater withdrawal as % of total renewable water resources		7.956		
Total renewable groundwater (Million cubic metres/year)			500	
Exploitable: Regular renewable groundwater (Million cubic metres/year)	No data	No data	No data	No data
Groundwater produced internally (Million cubic metres/year)			500	
Fresh groundwater withdrawal (primary and secondary) (Million cubic metres/year)	No data	No data	No data	No data
Groundwater: entering the country (total) (Million cubic metres/year)				
Groundwater: leaving the country to other countries (total) (Million cubic metres/year)				
Industrial water withdrawal (all water sources) (Million cubic metres/year)		1		
Municipal water withdrawal (all water sources) (Million cubic metres/year)		31		
Agricultural water withdrawal (all water sources) (Million cubic metres/year)		550		

Irrigation water withdrawal (all water sources) ¹ (Million cubic metres/year)	No data	No data	No data	No data
Irrigation water requirement (all water sources) ¹ (Million cubic metres/year)	40			
Area of permanent crops (ha)			2,000	
Cultivated land (arable and permanent crops) (ha)			692,000	
Total area of country cultivated (%)			5.884	
Area equipped for irrigation by groundwater (ha)	3,960			
Area equipped for irrigation by mixed surface water and groundwater (ha)	No data	No data	No data	No data

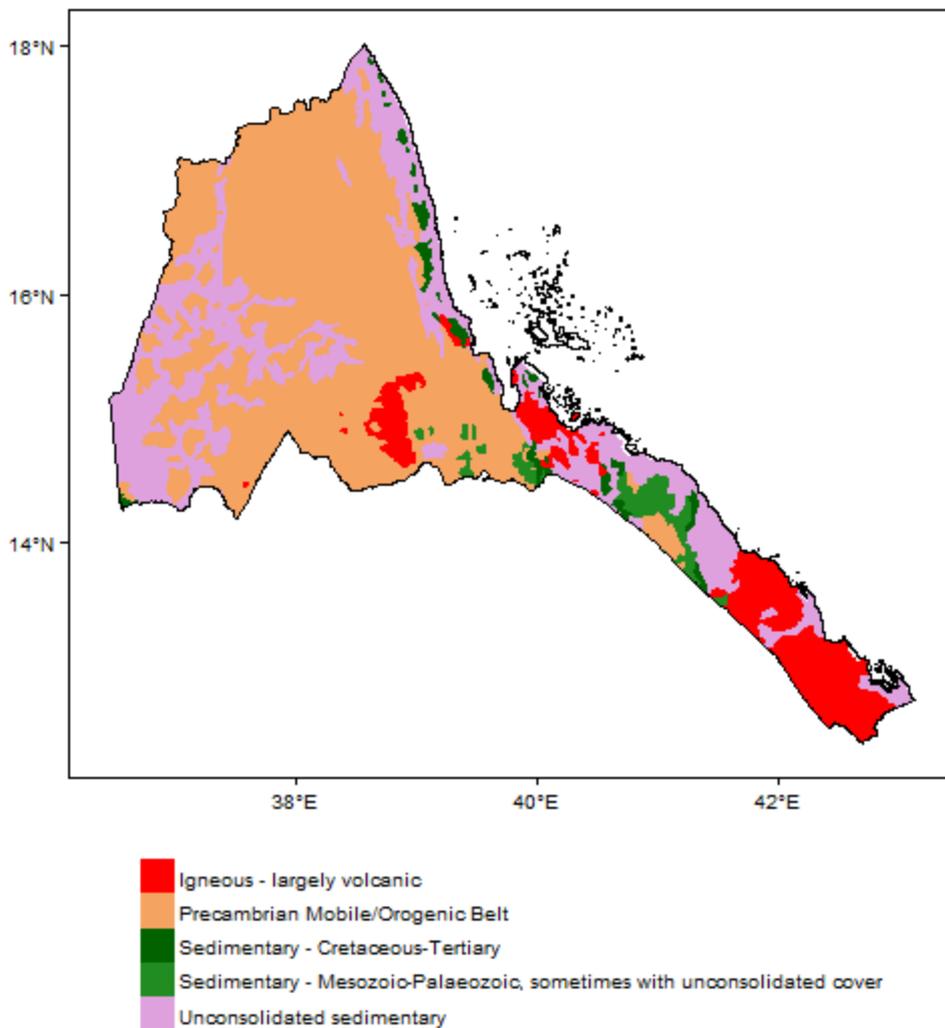
These statistics are sourced from [FAO Aquastat](#). They are the most recent available information in the Aquastat database. More information on the derivation and interpretation of these statistics can be seen on the [FAO Aquastat website](#).

Further water and related statistics can be accessed at the [Aquastat Main Database](#).

¹ More information on [irrigation water use and requirement statistics](#)

Geology

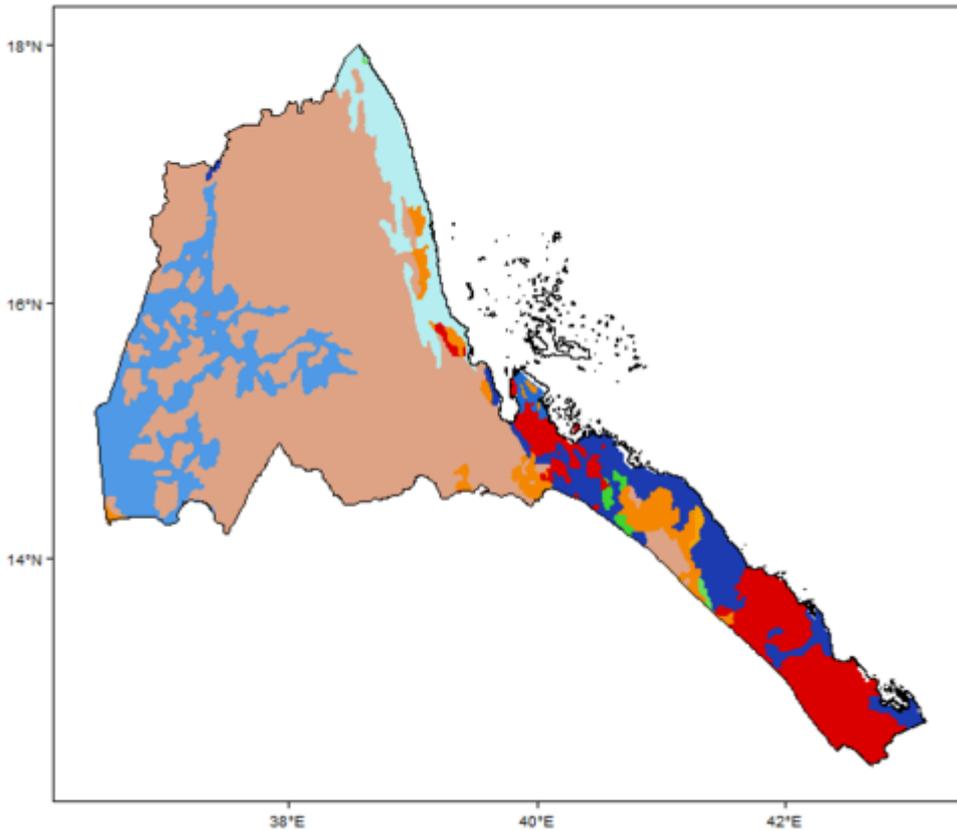
The geology map shows a simplified version of the geology at a national scale.



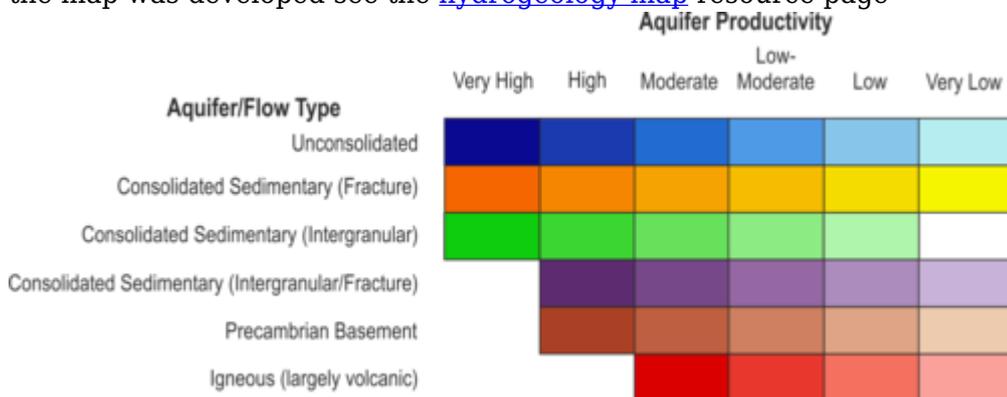
Geology of Eritrea at 1:5million scale. Developed from USGS map (Persits et al. 2002). For more information on the map development and datasets see the [geology resource page](#)

Hydrogeology

The hydrogeology map below shows a simplified version of the type and productivity of the main aquifers at a national scale (see the [hydrogeology Map](#) resource page for more details).



Hydrogeology of Eritrea at 1:5million scale. For more information on how the map was developed see the [hydrogeology map](#) resource page



Transboundary aquifers

For further information about transboundary aquifers, please see the [Transboundary aquifers resources page](#).

References

References with more information on the geology and hydrogeology of Eritrea can be accessed through the [Africa Groundwater Literature Archive](#).

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