

Hydrogeology of Libya

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This page has limited information. If you have more information on the hydrogeology of Libya, we will be happy to include it.



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Libya has been inhabited since ancient times and seen successive occupations, including Romans, Arabs, the Ottoman Empire, Italy and post-second world war Allied forces. Libya became independent in 1951, initially as a kingdom but following a military coup in 1969, ruled by Muammar Gaddafi until he was overthrown in a civil war in 2011. Widespread military, political and civil unrest has continued since 2011. In September 2017 the UN announced a new roadmap for political reconciliation, calling for a constitutional referendum and new general elections within a year.

The Libyan economy depends on oil, which was discovered in 1959. Other natural resources are natural gas and gypsum. There is a very large public sector, and the government is the largest employer in the country. Agriculture, which before oil discovery was the main source of revenue, today accounts for a very small proportion of GDP, and Libya imports large proportions of its food. In the early 1980s, Libya was one of the wealthiest countries in the world, but unrest in recent years, exacerbated by falling global petroleum prices, have had a significant impact on infrastructure and the economy.

Most of Libya is desert, with limited surface water resources, and it relies almost entirely on groundwater, most of which is 'fossil' water - recharged thousands of years ago when the region's climate was wetter. Most agriculture relies on groundwater for irrigation, largely from the Great Man Made River. This was a major project from the 1980s: a network of pipes transporting groundwater abstracted from the Nubian Sandstone Aquifer System, in the Saharan part of southern Libya, northwards to cities and towns on the coast where most of the population lives.

□

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Compilers

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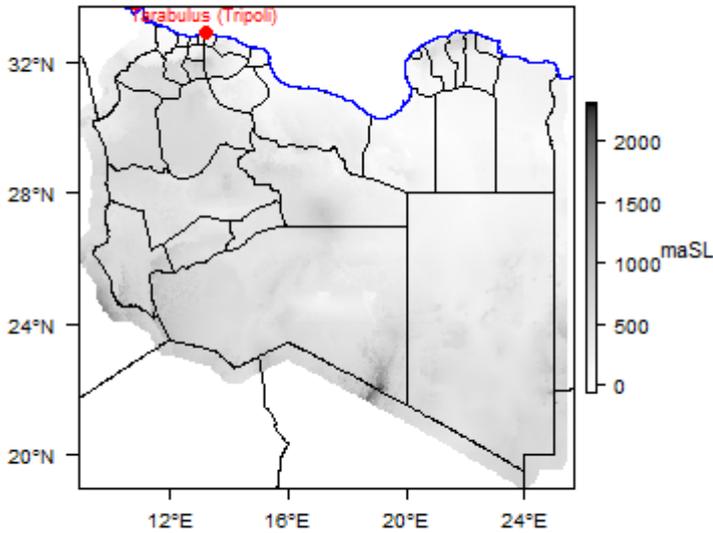
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Geographical Setting



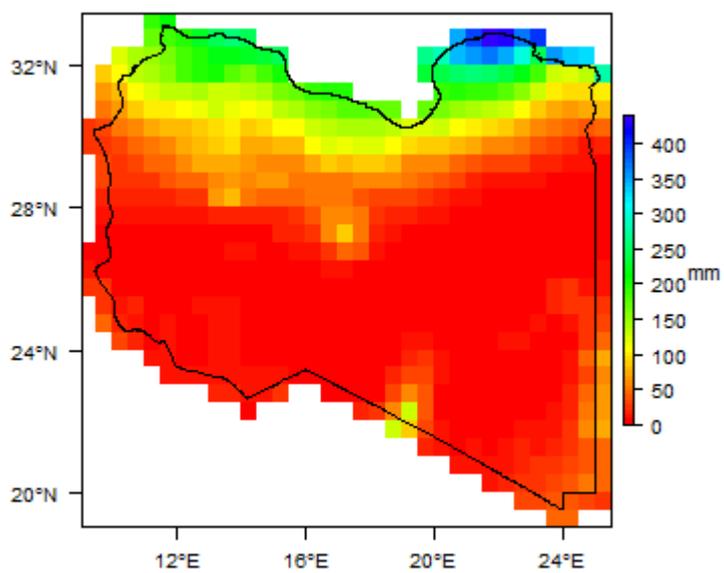
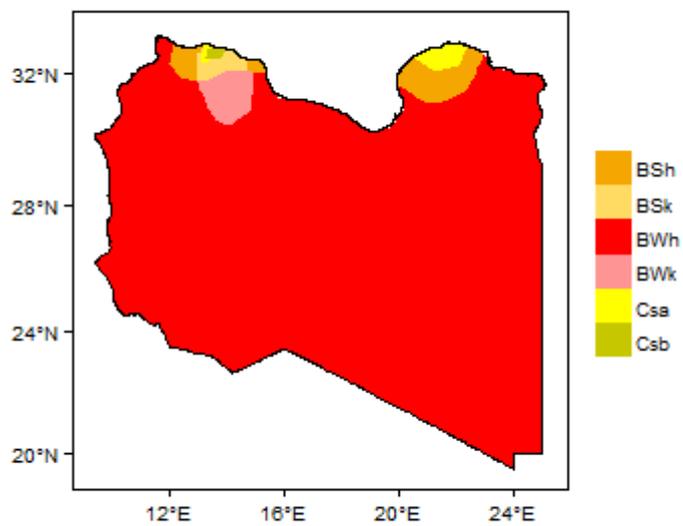
Libya. Map developed from USGS GTOPOPO30; GADM global administrative areas; and UN Revision of World Urbanization Prospects. For more information on the map development and datasets see the [geography resource page](#).

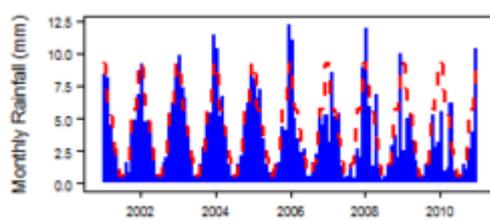
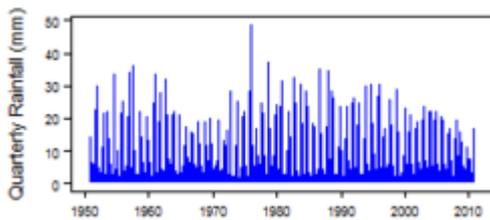
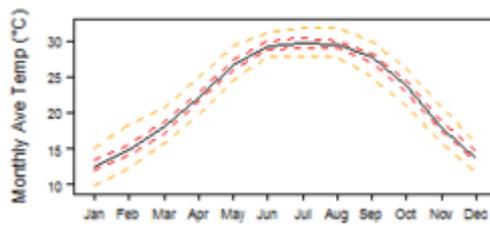
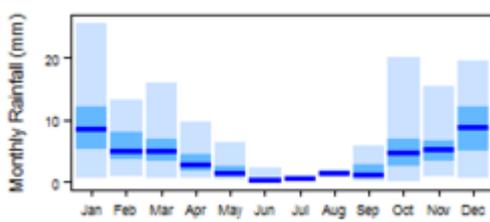
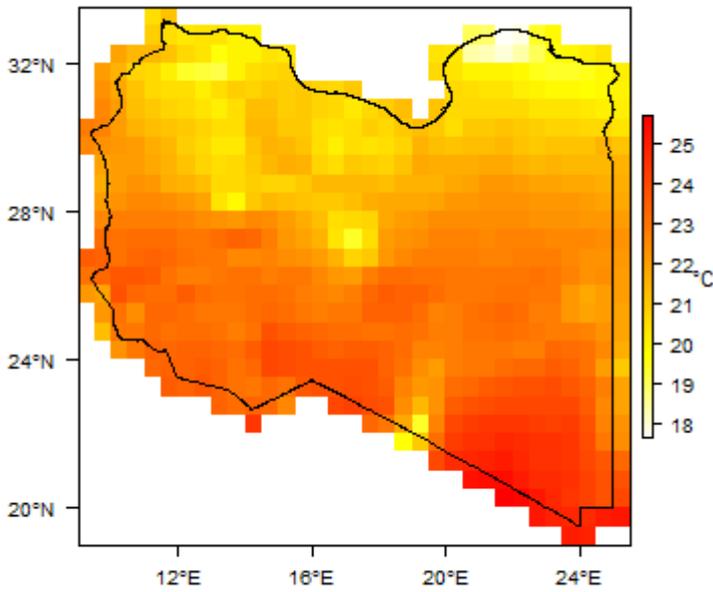
General

Capital city	Tripoli
Region	Northern Africa
Border countries	Egypt, Sudan, Chad, Niger, Algeria, Tunisia
Total surface area*	2,000,000 km ² (200,000,000 ha)
Total population (2015)*	6,278,000
Rural population (2015)*	1,316,000 (21%)
Urban population (2015)*	4,962,000 (79%)
UN Human Development Index (HDI) [highest = 1] (2014)*	0.7245

* Source: [FAO Aquastat](#)

Climate





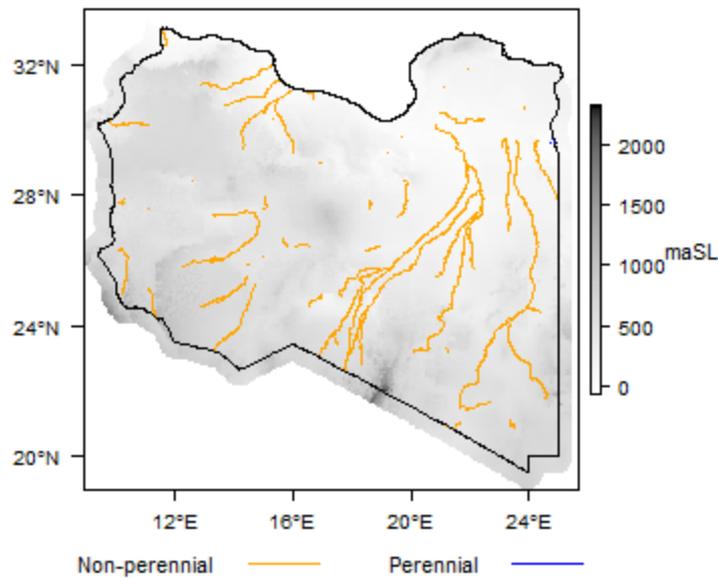
More information on average rainfall and temperature for each of the climate zones in Libya can be seen at the [Libya climate page](#).

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

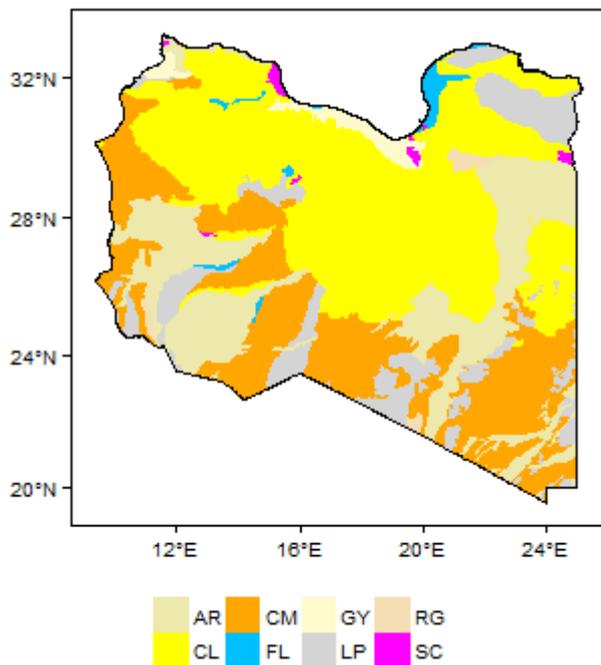
There are no permanent rivers in Libya, only ephemeral rivers or *wadis*.

There are several natural desert lakes, which support unique ecosystems and provide a water supply to desert nomads and migrating animals (Abufayed et al. 2015). The main lakes are the Ubari lakes in the Ubari Sand Sea in the south, including the Gaberoun, Mandara and Mafoakes-, the protected Ouau en Namu lakes and the 23rd of July or Benghazi lake, which is more properly a lagoon. The Qattara Depression in the north-west of Libya lies under the sea level and is covered with temporary lakes, salt pans and salt marshes. Other large salt pans include Sabkhat al Hayshah close to the coast near the gulf of Sidra, and Sabkhat Shunayn and Ghuzayyil in the north-east.



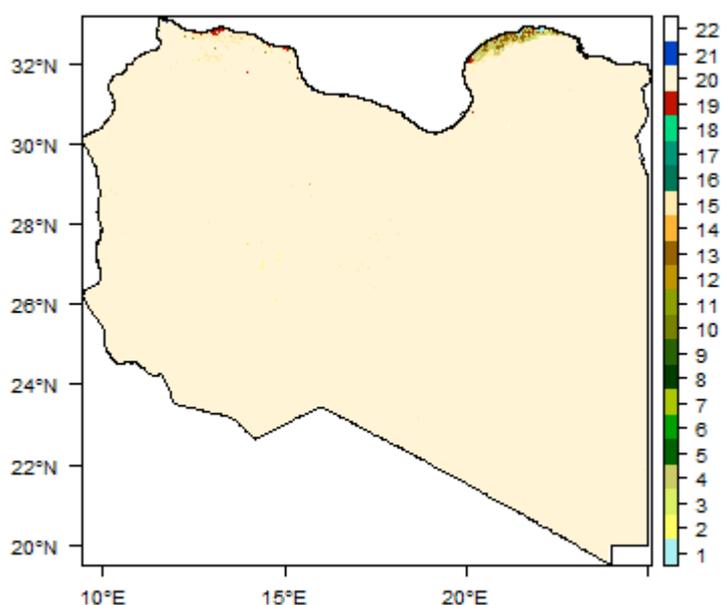
Major surface water features of Libya. Map developed from World Wildlife Fund HydroSHEDS; Digital Chart of the World drainage; and FAO Inland Water Bodies. For more information on the map development and datasets see the [surface water resource page](#).

Soil



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

Water statistics

	2000	2001	2012	2014	2015
Rural population with access to safe drinking water (%)		68.3			
Urban population with access to safe drinking water (%)		72.1			
Population affected by water related disease	No data				
Total internal renewable water resources (cubic metres/inhabitant/year)				111.5	
Total exploitable water resources (Million cubic metres/year)			635		
Freshwater withdrawal as % of total renewable water resources			822.9		
Total renewable groundwater (Million cubic metres/year)				600	
Exploitable: Regular renewable groundwater (Million cubic metres/year)			600		
Groundwater produced internally (Million cubic metres/year)				600	
Fresh groundwater withdrawal (primary and secondary) (Million cubic metres/year)			5.55		
Groundwater: entering the country (total) (Million cubic metres/year)				0	
Groundwater: leaving the country to other countries (total) (Million cubic metres/year)			700		
Industrial water withdrawal (all water sources) (Million cubic metres/year)			280		

Municipal water withdrawal (all water sources) (Million cubic metres/year)						700
Agricultural water withdrawal (all water sources) (Million cubic metres/year)						4,850
Irrigation water withdrawal (all water sources) ¹ (Million cubic metres/year)	No data					
Irrigation water requirement (all water sources) ¹ (Million cubic metres/year)	1.833					
Area of permanent crops (ha)						300,000
Cultivated land (arable and permanent crops) (ha)						2,050,000
Total area of country cultivated (%)						1.165
Area equipped for irrigation by groundwater (ha)	464,000					
Area equipped for irrigation by mixed surface water and groundwater (ha)	No data					

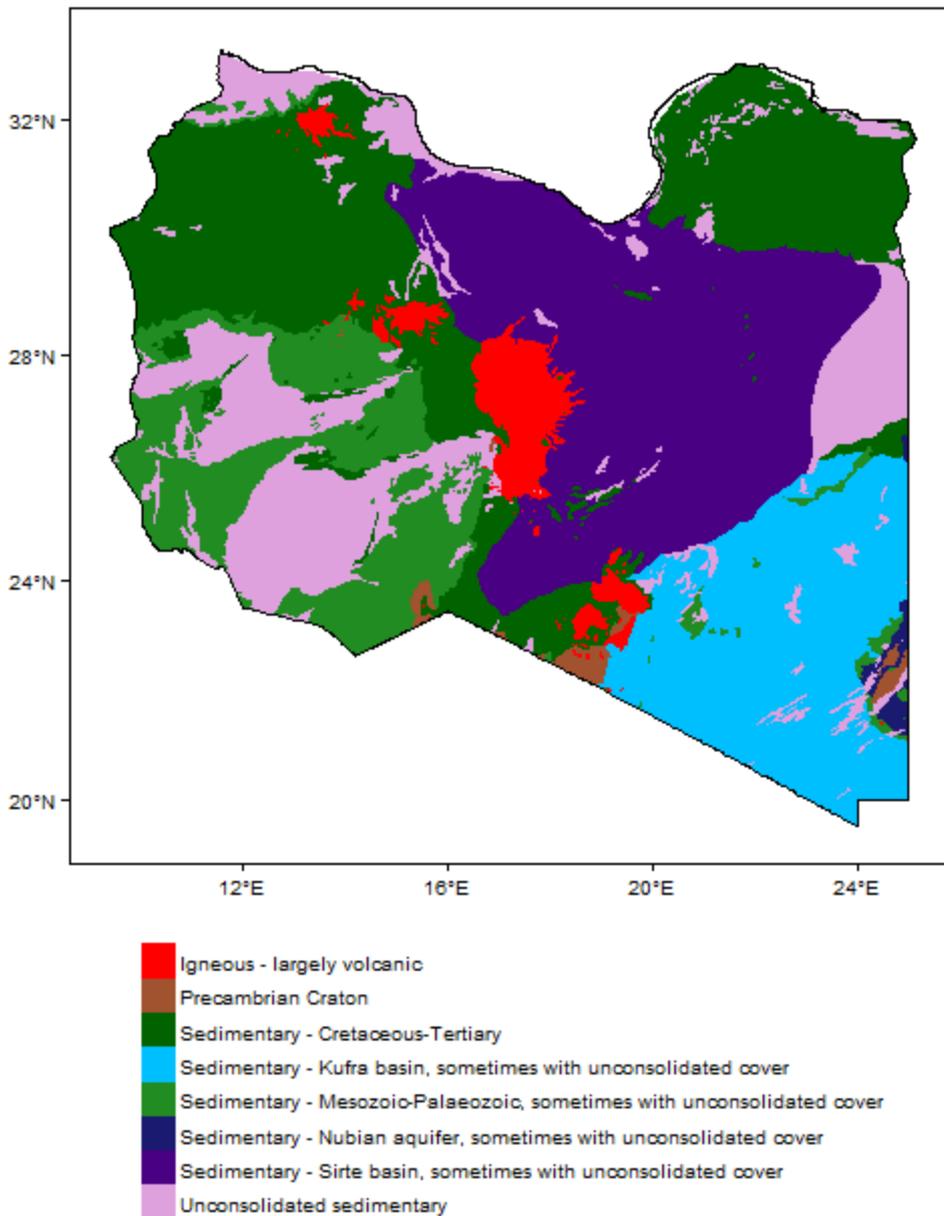
These statistics are sourced from [FAO Aquastat](#). More information on the derivation and interpretation of these statistics can be seen on the FAO Aquastat website.

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 on this page shows a simplified version of the geology at a national scale (see the [Geology resource page](#) for more details).

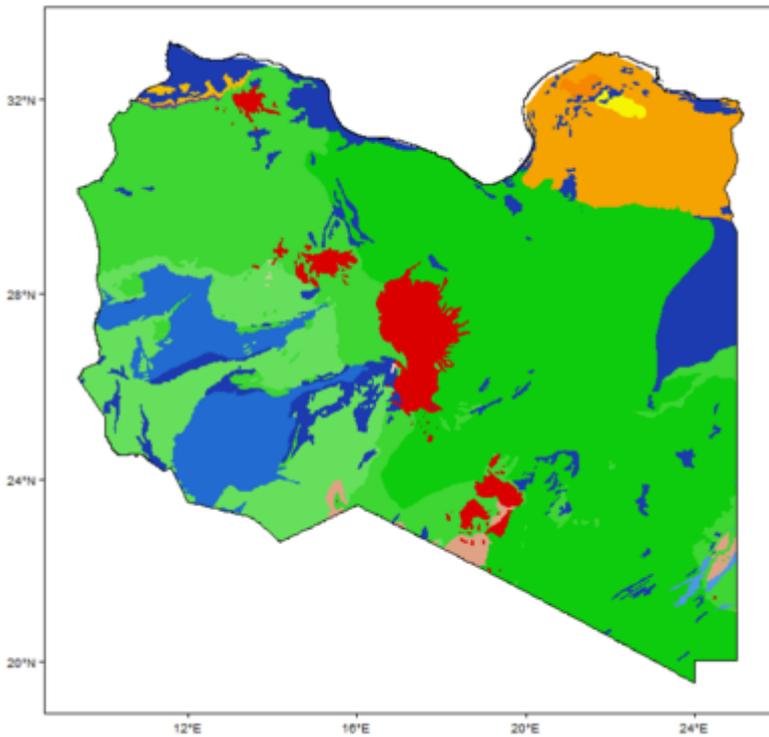


Geology of Libya at 1:5 million scale. Developed from USGS map (Persits et al. 2002). For more information on the map development and datasets see the [geology resource page](#).

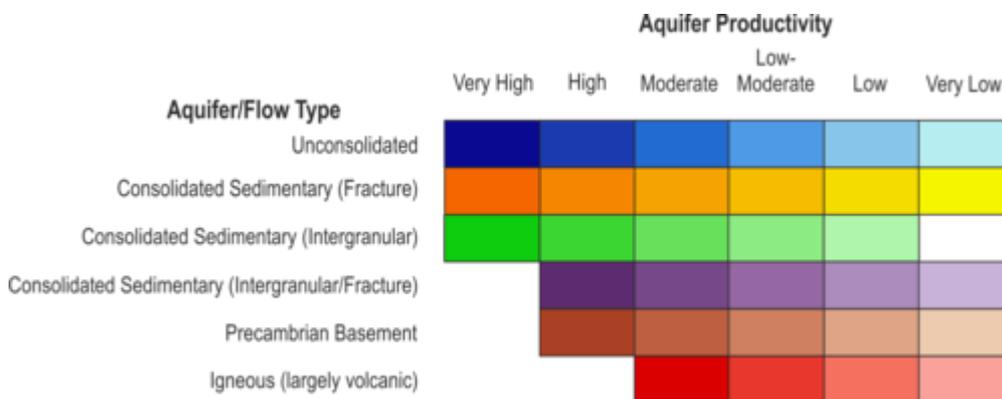
Hydrogeology

The hydrogeology map below, at 1:5 million scale, shows the type and productivity of the main aquifers at a national scale (see the [Hydrogeology map resource page](#) for more details).

More information on the hydrogeology of Libya is available in the report [United Nations \(1988\)](#) (see References section, below).



Map of hydrogeology (aquifer type and productivity) of Libya at 1:5 million 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](#).

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

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