

August 11, 2025

## News and notes



Sunflower (*[Helianthus annuus](#)*) in my garden,  
August 5, 2025

This week, before going on to discuss the geology and mineral resources of Libya, we will first look at some news items I thought were interesting.

## Comments

If anyone has comments on any of my postings, please leave a comment on the LinkedIn page for the posting or email me at [raymondreichelt@gmail.com](mailto:raymondreichelt@gmail.com).

## Geopolitics

- That explains it: [Swedish PM Slammed After Admitting He Uses ChatGPT To Help Run Government](#).
- Video interview: [“Putin Is Acting Rationally”—Mearsheimer Challenges Western Narrative on Ukraine | APT](#).
- War and peace and common interests: [Israel Signs \\$35 Billion Gas Deal with Egypt in Historic Leviathan Expansion](#).
- [Trump's Escalating Tariff War With India Threatens Russia's Oil Economy](#).
- [Breaking China's Hold on Critical Minerals: Canada's Chances and Roadblocks](#).
- Wyoming: [\\$500,000,000 mine resurfaces after 70 years – It's the last weapon against China](#); related: [China Is Choking Supply of Critical Minerals to Western Defense Companies](#).

## Research and News

- [Desiccation of the Red Sea basin at the start of the Messinian salinity crisis was followed by major erosion and reflooding from the Indian Ocean.](#)
- [Discovery and genesis mechanism of high content diamondoids in the Gulong shale oil.](#)
- Geophysics and basalt: [Sound Velocities of Basaltic Glass at Earth's Deep-Mantle Pressures.](#)
- [Effects of subsolidus cooling on the redox state of the oceanic upper mantle.](#)
- Erosion: [Earth's silicate weathering continuum](#); Phys.org summary [here](#).
- [Age and style of intraplate basaltic volcanism at Stanley, northwest Tasmania, Australia.](#)
- [Resolving the chlorine isotope composition of Earth's depleted mantle.](#)
- [Controls on Metal Zonation in Porphyry-Skarn Systems: Evidence from the Tonglvshan Cu Polymetallic Deposit, Eastern China.](#)
- [Giant lithium-rich pegmatites in Archean cratons form by remelting refertilised roots of greenstone belts](#); Mining.com summary [here](#).
- [Magnetic and Crystallographic Fabric Analyses of Amphibolite: A Proposed Methodology Applied to a Migmatite Dome.](#)
- [Reaction-driven magmatic crystallisation at the Maoniuping carbonatite.](#)
- [Fluid-mediated uranium isotope fractionation in magmatic systems.](#)

## Bad Science

- [Exclusive: retraction-prone editors identified at megajournal PLoS ONE.](#)
- [Researchers expose organised scientific fraud network.](#)

## Planetary Geology

- [Lead isotopic evidence for an old and rapid lunar magma ocean.](#)
- [The importance of carbonatite lavas in outgassing Venus' modern-day atmosphere.](#)

## Mineralogy

- Gold: [Uncovering the mineral assemblages of six major gold deposit types - a machine learning approach to big data analytics of a global mineralogical database.](#)
- Tourmaline: [Synthesis and crystal structure of V-rich tourmaline.](#)
- [Synthesis of zircon-hafnon to determine oxygen isotope matrix effects in secondary ionization mass spectrometry.](#)

## Plate Tectonics

- Tectonic deformation: [The Significance of Weak Interfaces for the Kinematics and Rheology of the Ductile Deformation of Earth Materials](#).
- [Numerical Geodynamic Modeling of Buoyancy-Driven Tethyan-type Ophiolite Emplacement](#).
- Alpine orogeny: [Deciphering Pleistocene Fault Activity in the Eastern Alps: Dating Fault Gouges With Electron Spin Resonance and Optically Stimulated Luminescence](#).
- [Anatomy of a Curved Orogen: The Broken River Orocline in the Northeastern Tasmanides \(Australia\)](#).
- [Deformation and Sediment Provenance of the Forearc Basin in the Central Andes of Southern Peru](#).
- [Seismic Structure and the Variation of Magmatic Budget in the Southwest Sub-Basin of the South China Sea](#).
- [A large intraplate hydrogen-rich hydrothermal system driven by serpentinization in the western Pacific: Kunlun](#).
- [The Triassic Rift Event in the Northern North Sea, a New Tectonic Model for the Utsira High Area](#).
- [Protracted circum-continent subduction: A mechanism for craton destruction and a rationale for craton longevity](#).
- [Comparing Geochemical and Geodynamical Models of Plume and Ridge Mantle Source Composition](#).
- [The Evolution of the Cocos-North America-Caribbean Triple Junction From Detrital Zircon Analysis](#).

## Paleontology

- [A new late Permian archosauromorph reptile from Germany enhances our understanding of the early diversity of the clade](#).
- [Measuring the load-bearing capacity of Mesozoic marine reptile teeth using Finite Element Analysis](#); the paleontologists at [Weird & Dead](#) mention this paper in [Episode 305](#).
- [Louisiana fossils reveal mosasaur life before dinosaur-killing asteroid impact](#); LSU publication [here](#).
- [Acquisition of neural crest promoted thyroid evolution from chordate endostyle](#).
- [Taxonomy, morphology, and phylogeny of a nearly complete nanhsiungchelyid specimen from the Upper Cretaceous of the Nanxiong Basin, China](#).

- [Description of new \*Kimmerosaurus langhami\* \(Cryptoclididae, Plesiosauria\) material recovered from the Kimmeridge Clay Formation, Dorset, U.K.](#)
- [A new pan-chelydrid turtle, \*Tavachelydra stevensoni\* gen. et sp. nov., from the lower Paleocene \(early Danian, Puercan\) Corral Bluffs Study Area in the Denver Basin, Colorado.](#)
- [A Cretaceous mite with ultra-long setae possibly reveals the early survival strategy of Chyzeriidae.](#)
- More on mites: [When opposites attract: a syninclusion of extinct mites and a bradytelic bristly millipede in Baltic amber.](#)
- Baby dinosaurs: [Massospondylus embryos and hatchling provide new insights into early sauropodomorph ontogeny.](#)
- [An unusual early-diverging plesiosauroid from the Lower Jurassic Posidonia Shale of Holzmaden, Germany;](#) Live Science summary [here](#).
- [Carnivorous dinosaur lineages adopt different skull performances at gigantic size;](#) SciTechDaily summary [here](#).

## Mining and Energy

- Silica sand mining: [VRX Silica gains Arrowsmith mining approval.](#)
- Rare Earth Elements: [Confirmed – electric vehicles, solar panels and wind turbines depend on a single mine in China – and it is destroying its land and people](#)
- [Environmentalists Raise Alarm Over Argentina's Massive Oil Export Ambitions.](#)
- [Mexico Approves Fracking to Reverse Sagging Oil and Gas Production.](#)
- [Why the oil market is tight despite big OPEC+ output hikes.](#)
- Reservoir geology: [Multidisciplinary 3D geological-petrophysical reservoir characterization of Abu Sennan Field, Abu Gharadig Basin, Egypt.](#)
- Trade offs: [Tapirs, hummingbirds and a billion-dollar bedrock of gold: the Ecuador reserve that is now a battlefield over a new mine.](#)
- [Environmental groups launch legal campaign to stop Sask. coal plant extension.](#)
- From Nomi Prins: [The Copper Play Fueling a Global Power Shift;](#) earlier post on copper [here](#).

## Environmental Geology and Hydrogeology

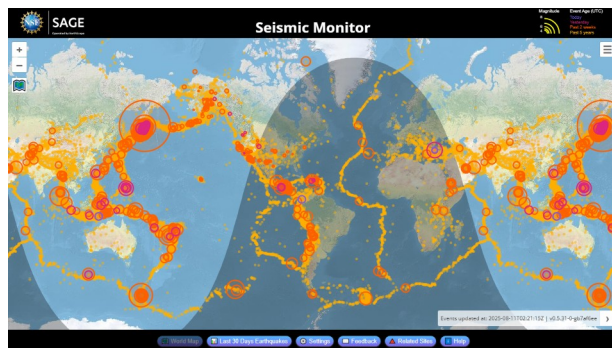
- France: [Groundwater tables as of August 1, 2025.](#)
- Whiskey's for drinking, water's for fighting: [As the Colorado River slowly dries up, states angle for influence over future water rights.](#)
- [Unprecedented large-scale aquifer recovery through human intervention.](#)

- [Groundwater is drying out, heating up, and causing sea level rise.](#)
- India: [Groundwater, not glacier melts, is what primarily keeps the Ganga flowing in summer-IIT-Roorkee study.](#)
- [Hydrogeology Journal](#) special issue: [Interplay of groundwater, geology and geological processes.](#)

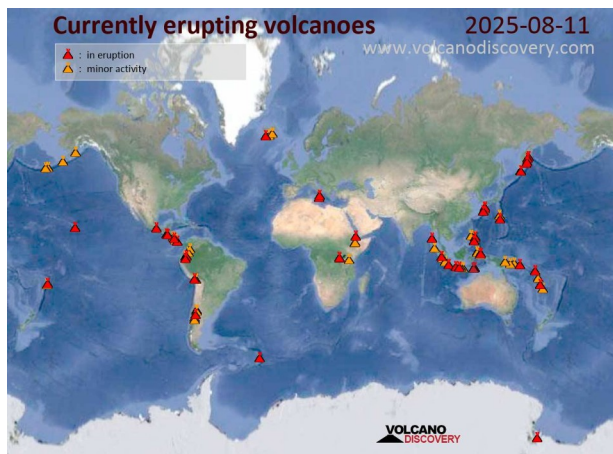
## Glaciers and Climate Change

- Younger Dryas Impact Hypothesis: [A 12,800-year-old layer with cometary dust, microspherules, and platinum anomaly recorded in multiple cores from Baffin Bay](#); Phys.org summary [here](#).
- [Drivers of global glacial erosion rates.](#)
- Report on activities of the Australian Antarctic Program: [A summer of Antarctic Geoscience.](#)
- [The state and fate of Glaciar Perito Moreno Patagonia](#); Phys.org summary [here](#).
- [Deglaciation drove seawater infiltration and slowed submarine groundwater discharge.](#)
- Neoproterozoic glaciations: [Metal-driven anaerobic oxidation of methane and the Sturtian deglaciation.](#)
- 08/05 [Increased melt from Greenland's most active glacier fuels enhanced coastal productivity](#); Phys.org summary [here](#).
- From the US DOE: [A Critical Review of Impacts of Greenhouse Gas Emissions on the U.S. Climate](#); related: [Contrarian climate assessment from U.S. government draws swift pushback.](#)

## Volcanoes, Earthquakes and Geohazards



[Seismic Monitor](#)



[Active Volcano Map](#)

### Volcanoes

- [Smithsonian / USGS Weekly Volcanic Activity Report.](#)

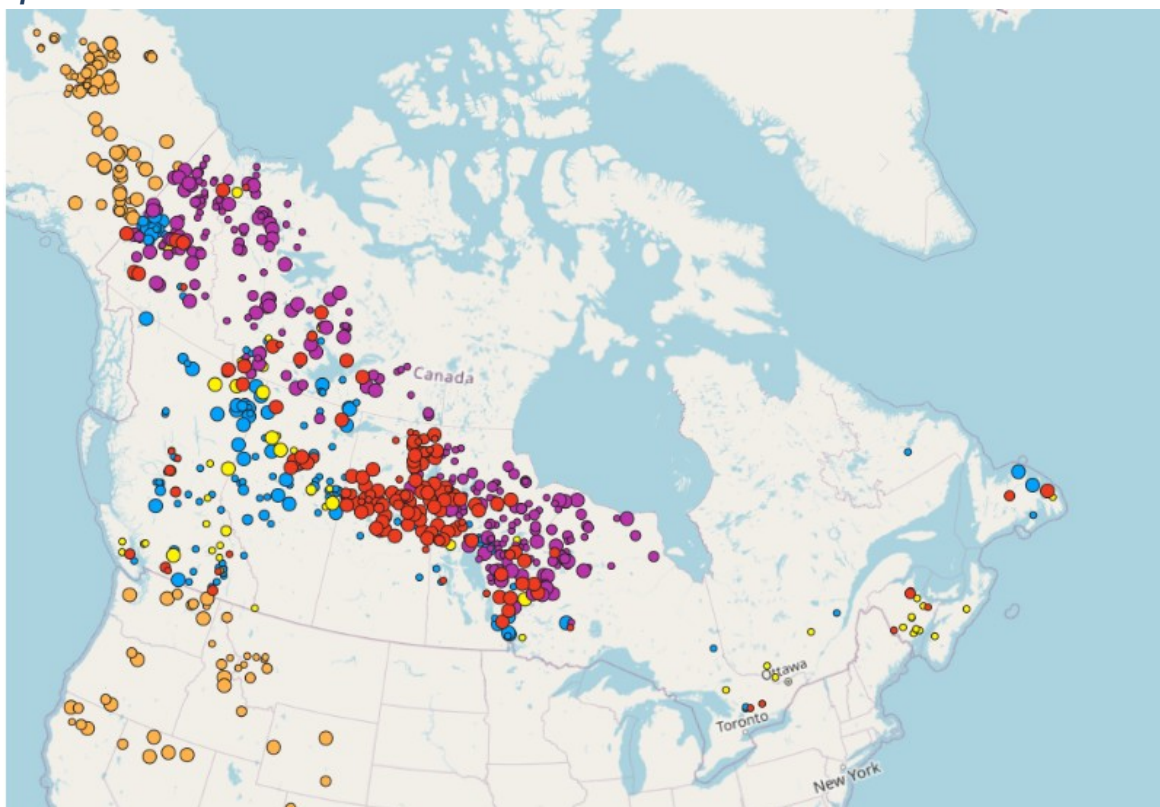
- United States Geological Survey (USGS) Volcano Observatories:
  - [Cascades Volcano Observatory Weekly Update](#).
  - Volcano Watch – [Discovery of a Massive Submarine Landslide Near the 1957 Aleutian Earthquake Epicenter](#).
  - [Hunting for Sasquatch \(events\) at Biscuit Basin in Yellowstone](#).
- [Repeating Long-Period Earthquakes at Shishaldin Volcano \(Alaska\): Insights Into the Source Mechanism and Relationship to Volcano Dynamics](#).
- Video from Shawn Willsey: [Magma Continues To Collect Beneath Iceland Volcano As Recent Eruption Ends: Geologist Analysis](#).
- [A parade of volcanoes is erupting in Russia following an 8.8 earthquake](#).

### ***Earthquakes and Tsunami***

- [Euro-Mediterranean Seismological Centre \(EMSC\)](#).
- [Earthquakes Monitoring Live Worldwide](#).
- [M6.1 earthquake shakes western Türkiye](#); EMSC summary [here](#).
- Anthropogenic earthquakes: [State of In Situ Stress and Implications for Fault Slip Potential in the Montney Play, Western Canada](#).
- [Updates on the Kamchatka earthquake](#).
- [US-French SWOT Satellite Measures Tsunami After Massive Quake](#).
- Tsunami research: [Preconditioning of sediment failure by astronomically paced weak-layer deposition](#).
- [B.C. megathrust fault confirmed, could trigger more major quakes, tsunamis](#).
- [Russian Nuclear Submarine Base Damaged By Tsunami, Satellite Images Reveal](#).
- [Earthquake Early Warning Scenarios for Alaska](#).
- Research: [Correlations of Ground-Motion Intensity Measures Observed in the Turkish Strong-Motion Database](#).
- More research: [Magnitude Distribution During Transformational Faulting: Implication for Deep-Focus Earthquakes](#).
- University of Miami: [Tsunami detectives at work](#).
- Columbia Climate School: [Leveraging Next-Generation Tsunami Early Warning Systems to Save Lives](#).



## Wildfires and Other Geohazards



**Interactive Wildfire Map – August 10, 2025**

**Credit:** ©[Canadian Wildland Fire Information System](#)

- [Canada faces second-worst wildfire season on record.](#)
- [The influence of wildfire on debris flows in a landscape of persistent disequilibrium: Columbia River Gorge, OR, USA](#); Phys.org summary [here](#).
- [Biggest French wildfire since 1949 a 'catastrophe on an unprecedented scale'.](#)

## Free Geology Books and Other Stuff

Free geology books can be downloaded from these sites:

- [OreZone Readers and Experts Telegram Channel](#); the Ore Zone channel also shows employment opportunities for geologists.
- [The Groundwater Project](#) has many groundwater geology books for free download; also they now have a [Free Online Learning Module: Pumping Test Analysis](#).
- Free Groundwater Modeling Course – [HydroGeoCenter](#).
- From Western Australia: [Carbonatite, lamprophyre and host rocks in the northern Aileron Province](#).

- Two volumes of Geology of Indonesia now can be accessed for [FREE/GRATIS](#). The books can be accessed from: vol 1 <https://lnkd.in/eH6Gcka4>; vol 2 <https://lnkd.in/egTYmpjk>.
- Brett Davis' book on veins in a deforming rock mass: "[The Veining Bible](#)"; also at [this site](#).
- From the Mineralogical Society of America: [Handbook of Mineralogy](#).
- [Guide Book on Surface Geological Mapping for Civil Engineering Projects](#), by Radhakrishnan Sethuramalingom.

## Upcoming Events

- [Copper to the World Conference, Tuesday 26 – Wednesday 27 August 2025](#), in Adelaide, Australia; report on 2024 conference [here](#).
- [The 52nd Congress of the International Association of Hydrogeologists, 15-19 September 2025, Melbourne Australia](#).
- [GeoManitoba 2025 78th Annual Canadian Geotechnical Society Conference & 9th Canadian Permafrost Conference, RBC Convention Centre, Winnipeg, Manitoba, September 21 – 24, 2025](#).
- [29 September – 1 October 2025, Stuttgart, Germany, Nature Conference on Advancing Perovskite-Based Photovoltaics](#).
- Australia: [12–18 October 2025, Earth Science Week](#).
- [November 3 – 4, 2025 Central Canada Mineral Exploration Convention 2025 Victoria Inn Hotel & Convention Centre, 1808 Wellington Avenue, Winnipeg, Manitoba R3H 0G3, Canada](#).
- [5th International Professional Geology Conference \(IPGC\), November 5 to 7, 2025, Zaragoza, Spain](#).
- [Saskatchewan Geological Open House, December 1 to 3, 2025, Delta Bessborough Hotel, Saskatoon](#); Registration for the 2025 Conference will be opening on August 6.
- 2025 [Society of Petroleum Engineers Distinguished Lecturer Schedule](#).
- [List of geoscience events in 2025 from the International Union of Geological Sciences](#).
- [American Geophysical Union List of Upcoming Meetings](#).
- The Geological Society: [Events & Courses](#).
- [“Geology Hour” Online](#), evenings on the 3rd Monday of the Month from the Geological Society of the Oregon Country.



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## Geology and Mineral Resources – Libya

### Introduction



**Figure 1a – Libya**

**Credit:** [CIA World Factbook](#), public domain



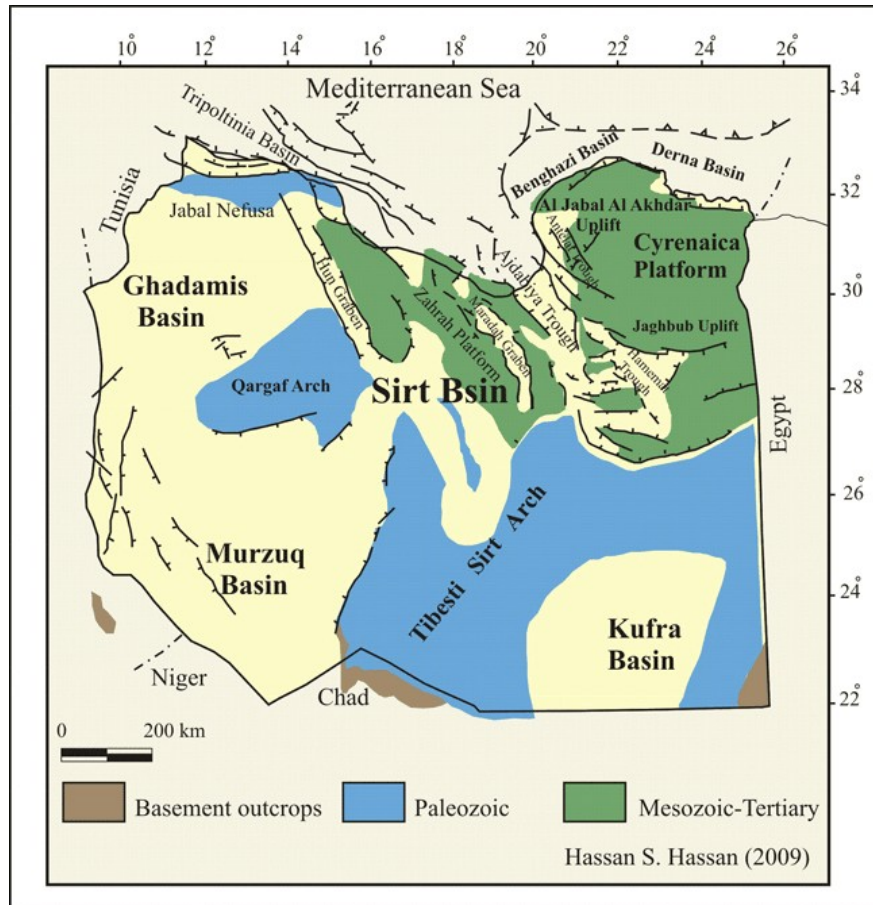
**Figure 1b – Location of Libya**

**Credit:** [CIA World Factbook](#), public domain

[Libya](#) is a country of 7,361,263 people on the [Mediterranean](#) coast of [North Africa](#). The country has an area of 1,759,540 square kilometres and borders on: [Egypt](#) to the east; [Sudan](#) to the southeast; [Chad](#) to the south; [Niger](#) to the southwest, [Algeria](#) to the west, and [Tunisia](#) to the northwest.. For more details on the country, check out the CIA World Factbook on [Libya](#) as well as the [Wikipedia article](#).

## Geology

The basement geology of Libya is part of the [Saharan Metacraton](#) of the [African Tectonic Plate](#). These basement rocks are known from deep boreholes and outcrops in the [Tibesti Mountains](#) and are apparently [Neoproterozoic](#) aged metamorphic rocks metamorphosed during the [Pan-African Orogeny](#).

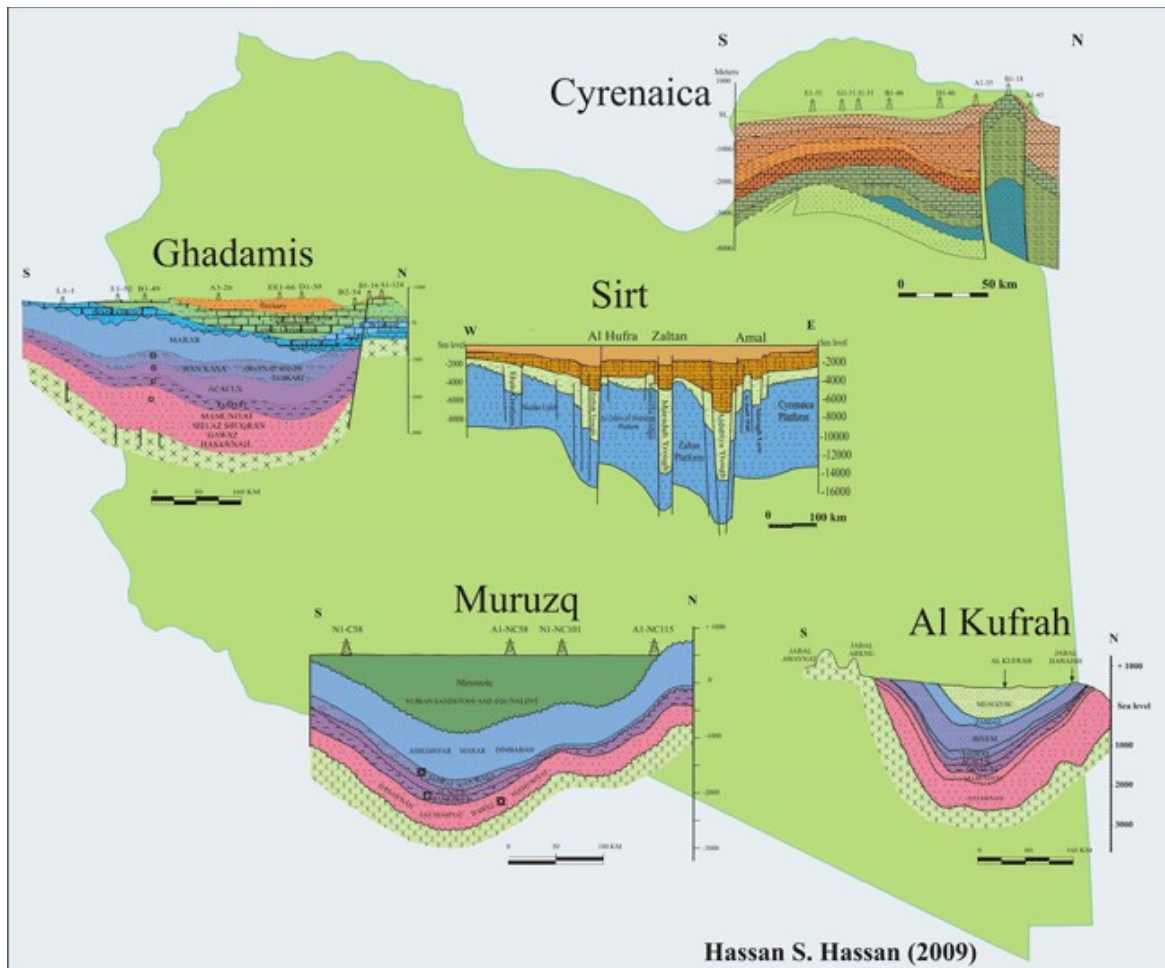


**Figure 2 – Major Tectonic Elements of Libya**

**Credit:** [©SEPM STRATA, Society for Sedimentary Geology](#)

Overlying the basement rocks are [Phanerozoic](#) aged rocks found in various basins and highlands. The highland regions are mostly made up of Neoproterozoic, [Paleozoic](#) and [Mesozoic](#) aged rocks and include:

- The [Jabal Nefusa](#) highland in northwest Libya, formations include: sandstone of the [Cambrian](#) aged Hassaouna Formation; sandstone of an unnamed [Ordovician](#) formation; Lower to Middle [Triassic](#) sandstone of the Ouledchebbi Formation; sandstone of the Middle Triassic Rashami Formation; the Middle to Late Triassic dolomitic limestone of the Azizia Formation; the shale and evaporites of the Late Triassic Bu Sheba Formation; and the Early [Jurassic](#), shale and evaporite of the Bir Ghnem Formation.
- The [Qargaf Arch](#) in west central Libya that includes Upper Ordovician aged [glaciogenic](#) rocks such as tillite, sandstones and conglomerates, associated with the [Hirnantian Glaciation](#).
- [Tibesti Sirt Arch](#) in south Libya is largely Paleozoic sedimentary rocks overlying Neoproterozoic aged metamorphic rocks such as amphibolite and granitic gneiss.



**Figure 3 – Sedimentary Basins of Libya**  
**Credit: ©SEPM STRATA, Society for Sedimentary Geology**

Between the highlands are the major sedimentary basins:

- The [Sirt Basin](#) in [central Libya](#) which consists of [Cretaceous](#) and [Paleogene](#) aged [clastic](#) and [carbonate](#) rocks overlying Paleozoic and Neoproterozoic basement rocks.
- The [Murzaq Basin](#) in [southwest Libya](#) consists of clastic sediments ranging in age from Cambrian to [Quaternary](#) overlying basement rocks.
- The [Al Kufra Basin](#) in [southeast Libya](#) consists of shallow marine to fluvial deposits ranging in age from Cambrian to [Permian](#), and overlying basement rocks.
- The [Ghadamis Basin](#) in [northwestern Libya](#) [consists of a mixture](#) of clastic and carbonate rocks, Cambrian to Paleogene in age.
- The [Cyrenaican Platform](#), also in [northwestern Libya](#), consists of a mixture of sandstones and shales with lesser amounts of limestone, dolomites, and evaporites.
- The offshore [Tripolitania Basin](#), off the northwestern shore of Libya, consists of clastic sediments with a significant bioclastic [nummulitic](#) limestone that hosts the [El Bouri oil field](#).

## Mineral Resources

The main mineral resource of Libya are oil, natural gas and related products such as ammonia and sulphur. According to the [USGS Minerals Yearbook](#), besides oil and gas, Libya also produces industrial minerals such as cement, gypsum, lime and salt – the most recent production statistics are in [Table 1 of the yearbook](#). Also, according to the most recent statistics, Libya produced 17,900 million cubic metres of natural gas and 449,000 thousand 42-gallon barrels of petroleum in 2021. Figure 4 shows the locations of the major oil and gas production facilities in Libya.

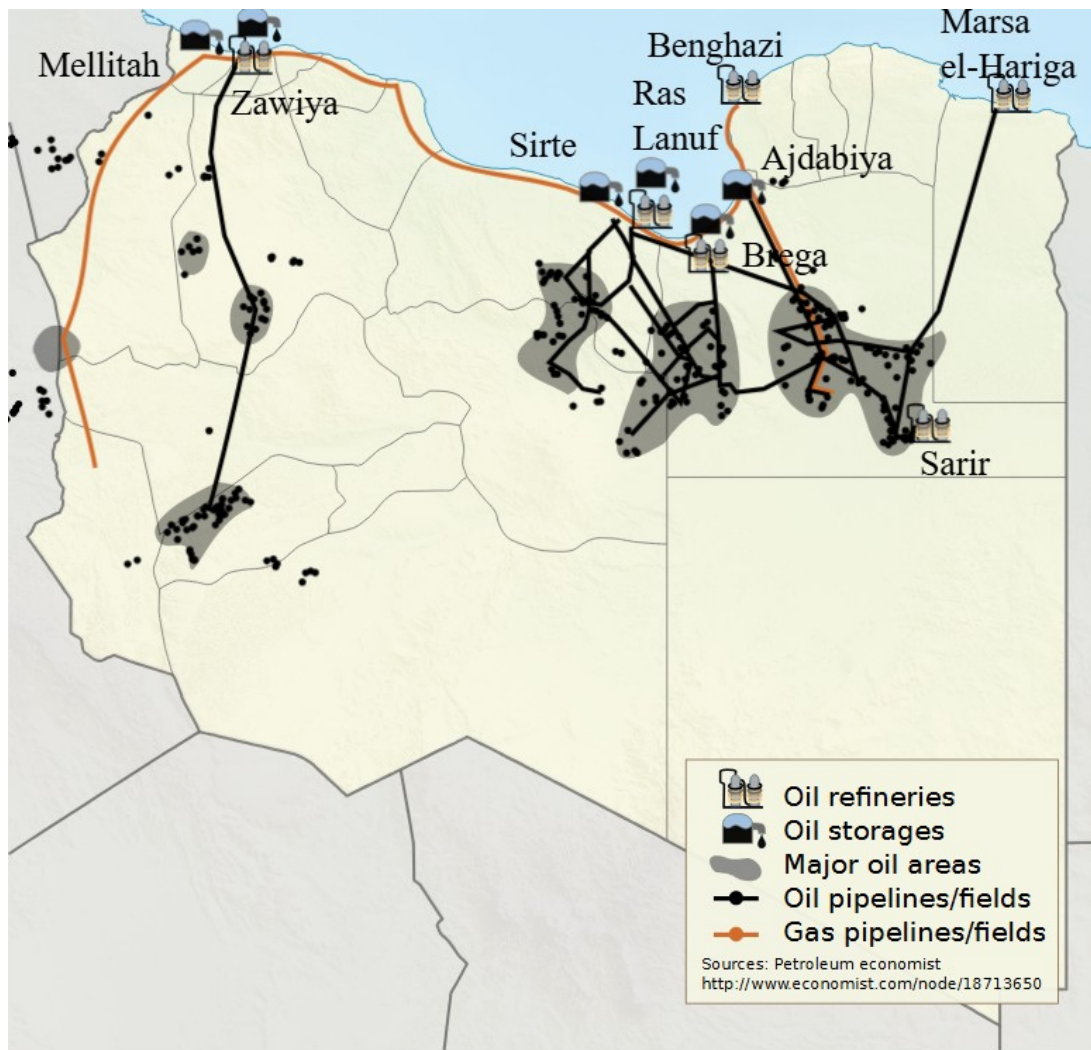


Figure 4 – Libyan Oil Fields and Pipelines

**Credit:** NordNordWest, Yug, [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

Besides oil and gas, the other critical mineral resource in Libya are water resources. Although some water is produced by [desalination](#), much of Libya depends on groundwater. According to the article by the [British Geological Survey in the Africa Groundwater Atlas](#) Libya produces 600 Million cubic metres/year, much of it transported to the population centres by the [Great Man-Made River](#).





## Summary



**Figure 7 – El Saharara oil field, Libya**

**Credit:** Javier Blas, [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

That winds up this short look at Libya. Really, all Libya has going for it is oil and little else. There are still many opportunities for further development of the petroleum resources, especially offshore.

## Standard Caveat

### [J. Robert Oppenheimer on freedom and scientific inquiry](#)

The purpose of my weblog postings is to spark people's curiosity in geology. Don't entirely believe me until you've done your own research and checked the evidence. If I have sparked your curiosity in the subject of this posting, follow up with some of the links provided here. If you want to, go out into the field and examine some rocks on your own with the help of a good field guide. Follow the evidence and make up your own mind.

In science, the only authority is the evidence.