

March 24, 2025

## News and notes

Before going on to discuss the geology and geopolitics of Iraq, here are some news items I thought were interesting.

### Geopolitics

- France:
  - [Macron Unveils Major Nuclear Expansion By 2035](#);
  - [Is civil war coming for France?](#)
- [Turkish police detain hundreds as unrest grows over Istanbul mayor's arrest.](#)
- [United States Challenges China's Mineral Dominance.](#)
- Enforcing sanctions: [Germany Seizes Oil Tanker Belonging to Russia's Shadow Fleet.](#)
- Preparation for war? [China to add cobalt, copper to state metal reserves.](#)
- A house divided: [The Kingdom of Judea vs. The State of Israel.](#)
- [Donald Trump is making a risky gamble to dominate the Americas.](#)

### Research and News

- [Unravelling the Nature and Origin of Jurassic to Early Cretaceous Unconformities Offshore Southwest Britain.](#)
- [Mineralogy and Petrology of Ultrapotassic Lamprophyre Dykes in the Bangbule Area, Xizang, China: Evidence for Open Magma Chamber Fractionation and Mafic Magma Recharge.](#)
- Ooh, shiny: [Photos-supported and References-based Guide on Gemstones and Semi-gemstones Focusing on their Impacts and Uses in the Ancient Egyptian Civilization.](#)
- [Insights into the chemical evolution of sub-arc magmas from the high-pressure electrical conductivity of basaltic and andesitic magmas.](#)
- [New Data from a Round, Deep Basin in the Russian Heartland: The Smerdyachee Basin as a Prospective Impact Crater.](#)
- [Paleogeography of the Southern Tarim Terrane Revealed by Neoproterozoic Mafic Dyke Swarm in Altyn.](#)
- A geologic map of the asteroid belt: [Review of asteroid, meteor, and meteorite-type links](#); Phys.org summary [here](#).
- Sedimentology: [Establishing detailed chemofacies of depositional environments in an epeiric seaway using high-resolution \(500 µm\) micro X-ray fluorescence core scanning data.](#)

## Bad Science

- Retraction Watch: [Weekend reads: Inside mass resignations; Ukraine's "stolen institutions"; federal U.S. cuts hit journal subscriptions.](#)
- Opinion: [Sometimes Papers Contain Obvious Lies.](#)

## Plate Tectonics

- [Review of Paleoproterozoic tectonics in the southern West African Craton: Insights from multi-disciplinary data integration.](#)
- Petrology and plate tectonics: [Effect of Fe<sup>2+</sup> on Akimotoite to Bridgmanite Transition: Its Implication on Subduction Dynamics.](#)
- [Rift propagation across the Tibetan Plateau as a consequence of fluid flow from south to north.](#)
- [Insights Into Subduction-Zone Fluid-Rock Interactions and Carbon Cycling From Magnesium Isotopes of Subducted Ophiolitic Mélanges in the Arabian-Nubian Shield.](#)
- [How Cratonic Roots Survive With Weak Mid-Lithosphere Discontinuities.](#)
- [The Role of Transpressional Tectonics, Volcanism, and Fluvial Processes on the Oligocene to Pliocene Evolution of Intermontane Basins of the Western Colombian Andes.](#)
- [Arc-continent collision as recorded in modern stream sand from Oecusse \(Timor Island\).](#)
- [The origin of sulfur in Canary Island magmas and its implications for Earth's deep sulfur cycle.](#)
- [Triassic Tectonic Affinity to Indochina-East Malaya Block for West Sumatra and Paleo-Tethys Implications: Constraints From Late Triassic Igneous Rocks.](#)
- [S-to-P Receiver Function Imaging of Lithospheric Discontinuities in New Zealand at the Hikurangi Subduction Zone.](#)

## Paleontology

- [Gregarious behaviour in Carboniferous cyclidan crustaceans; Phys.org summary \[here\]\(#\).](#)
- [New Permian brachiopod assemblages from Chiapas, Mexico, and their stratigraphic and paleobiogeographic significance through Kungurian-Roadian.](#)
- [Morphological trends in reticulate \*Nummulites\* across the Eocene–Oligocene transition.](#)
- 30,000-year-old vulture feather: [Fossil feathers from the Colli Albani volcanic complex \(Late Pleistocene, Central Italy\) preserved in zeolites; Gizmodo summary \[here\]\(#\).](#)
- [Building better biochronology: New fossils and <sup>40</sup>Ar/<sup>39</sup>Ar radioisotopic dates from Central Anatolia.](#)
- [The paleobiology of a new osmeriform fish species from Australia.](#)

- [Habitat openness and squamate color evolution over deep time.](#)
- [Paleontologist says NJ school lost his 380M-year-old fossils, and now they're in a landfill.](#)
- [Evolutionary trend of the broad-snouted crocodile from the Eocene, Early Miocene and recent ones from Egypt.](#)
- [The paleobiology of a new osmeriform fish species from Australia](#); summary in The Guardian [here](#).
- [Refugium amidst ruins: Unearthing the lost flora that escaped the end-Permian mass extinction](#); Ars Technica summary [here](#).
- [The world's oldest cerapodan ornithischian dinosaur from the Middle Jurassic of Morocco.](#)
- [Comparison between plant fossil assemblages and simulated biomes across the Permian-Triassic Boundary](#): Phys.org summary [here](#).

## **Mining and Energy**

- [The Golden Age Of Nuclear Energy Is Here.](#)
- [AI Boom Favors Natural Gas Over Coal.](#)
- [The geochemistry, origins and metallurgical implications of different textural types of spodumene-quartz intergrowths \(SQUI\) from the Tanco pegmatite, Manitoba, Canada.](#)
- [The Geochemical Characteristics of Ore-Forming Fluids in the Jebel Stah Fluorite Deposit in Northeast Tunisia: Insights from LA-ICP-MS and Sr Isotope Analyses.](#)
- [Ottawa aims to backstop Temiskaming cobalt refinery project with \\$20M in funding.](#)
- Cobre Panama: [Aerial views of a controversial copper mine](#); related story [here](#).
- [U.S. Firm Backed by Gates and Bezos Seeks Congo Lithium Exploration.](#)
- [Greenland might open a vast uranium deposit to mining. Locals say it could alter their way of life.](#)
- France's geological survey: [BRGM launches update of mineral resources inventory in French Guiana.](#)
- [U.S. ethane production, consumption, and exports set new records in 2024.](#)
- [Big Oil Shrugs at \\$50 Crude.](#)
- [Iran discovers antimony reserves after 10 years of exploration.](#)
- [China flexes rare earth dominance with million-tonne discovery.](#)
- [Lithium Brines: Origin, Characteristics, and Global Distribution.](#)

- [Simandou deposit: A 'bridge to prosperity'? Guinea's junta touts opening of mining megaproject.](#)
- Battery technology: [BYD Unveils Five-Minute Charger As China Leads Solid State EV Battery Revolution.](#)
- [Conventional Geothermal's Untapped Potential: What's Holding It Back?](#)
- [Mine tailings in Sudbury, across Canada worth billions.](#)
- Molten salt reactors: [Fuel breakthrough paves way for cutting-edge nuclear reactor.](#)
- [Why OPEC+ is Supporting a Potentially Disastrous Rise in Oil Production.](#)
- [Cobalt enrichment in Paleoproterozoic African and Brazilian manganese deposits.](#)
- [Germany's First Offshore Wind Farm To Be Dismantled After Just 15 Years Of Operation.](#)

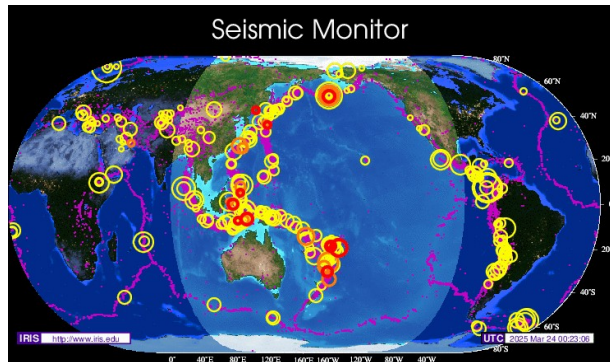
### Environmental Geology and Hydrogeology

- [NYC will eventually have to abandon part of its water supply if it keeps getting saltier.](#)
- [NASA uses advanced radar to track groundwater in California.](#)
- [Greenpeace must pay over \\$660M in case over Dakota Access protest activities, jury finds.](#)
- Geochemistry and groundwater: [Assessing the hydrothermal influence on natural waters in the Kirishima Volcanic Complex: Insights from rivers, springs and groundwater with varying residence time.](#)
- [Groundwater recharge at 800-year low in Western Australia, posing risks.](#)
- For people in Ontario: [Have a private well? Here's how you can make sure it's safe to drink, for free.](#)

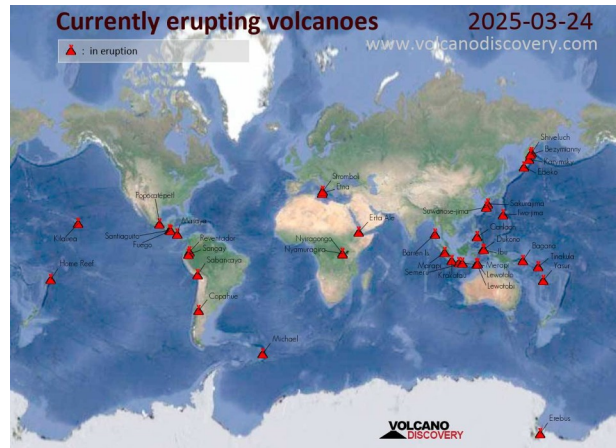
### Glaciers and Climate Change

- [World Day for Glaciers – 21 March 2025.](#)
- Andean glaciers: [Policy brief: the future of the Andean water towers](#); Phys.org summary [here](#).
- [Global sea-level rise in the early Holocene revealed from North Sea peats](#); Phys.org summary [here](#).
- Artificial photosynthesis: [Sunlight-driven simultaneous CO<sub>2</sub> reduction and water oxidation using indium-organic framework heterostructures.](#)
- [A greening Earth has reversed the trend of decreasing carbonate weathering under a warming climate.](#)
- [Deep learning the flow law of Antarctic ice shelves](#); Phys.org summary [here](#).

## Volcanoes, Earthquakes and Geohazards



[Seismic Monitor](#)



[Active Volcano Map](#)

### Volcanoes

- [Smithsonian / USGS Weekly Volcanic Activity Report](#).
- United States Geological Survey (USGS) Volcano Observatories:
  - [Volcano Watch – A collapse at Mauna Loa's summit in 1868, like Kīlauea's in 2018?](#)
  - [Yellowstone: Where there's always something new!](#)
- More on Yellowstone: [A volcano has opened up in a national park](#).

### Earthquakes

- [Euro-Mediterranean Seismological Centre \(EMSC\)](#).
- [Earthquakes Monitoring Live Worldwide](#).
- [Rupture dynamics and velocity structure effects on ground motion during the 2023 Türkiye earthquake doublet](#).
- [Moderate M5.1 earthquake in Mongolia](#); USGS summary [here](#).
- [First earthquakes detected in Pacific Ocean using ultra-stable optical interferometry on undersea cables](#).
- [Coseismic Deep-Seated Gravitational Slope Deformations Triggered by the 2024 Mw 7.5 Noto Peninsula Earthquake](#)

### 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).

## 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.
- 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>.

## Upcoming Events

- [Williston Basin Petroleum Conference, April 28-30, Regina Saskatchewan](#); the last day to book rooms at the [hotel hosting the venue](#) is Wednesday, April 2, 2025
- [4th Annual MPDA Reconciliation Forum & Gala, April 10, 2025, Winnipeg](#).
- European Geosciences Union: [EGU General Assembly 2025, Vienna, Austria & Online 27 April–2 May 2025](#).
- [ISMAR 2025](#) – International Symposium on Controlled Aquifer Recharge April 28 – May 2, 2025 – Stellenbosch, South Africa
- [The USGS David A. Johnston Cascades Volcano Observatory will be hosting an Open House for the public on May 10, 2025!](#)
- [Geoscience Beyond Borders, GAC-MAC-IAH-CNC 2025 Ottawa, Ontario, May 11-14, 2025](#).
- [Sedimentary Geology and the Energy Transition Conference, June 2-5, 2025 – Salt Lake City, UT USA](#).
- [Society for Sedimentary Geology conference, Mountjoy IV – August 10-13, 2025, in Montreal, Canada](#).
- [Copper to the World Conference, Tuesday 26 – Wednesday 27 August 2025](#), in Adelaide, Australia; report on 2024 conference [here](#).
- [5th International Professional Geology Conference \(IPGC\), November 5 to 7, 2025, Zaragoza, Spain](#).
- 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](#).

March 24, 2025

## Geology and the Fate of Societies – Iraq



**Figure 1a – Iraq**

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



**Figure 1b – Location of Iraq**

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

The [Republic of Iraq](#) is located in [West Asia](#). Iraq has land borders with [Kuwait](#), [Saudi Arabia](#), [Jordan](#), [Syria](#), [Turkey](#) and [Iran](#); it has one outlet to the sea on the [Persian Gulf](#).

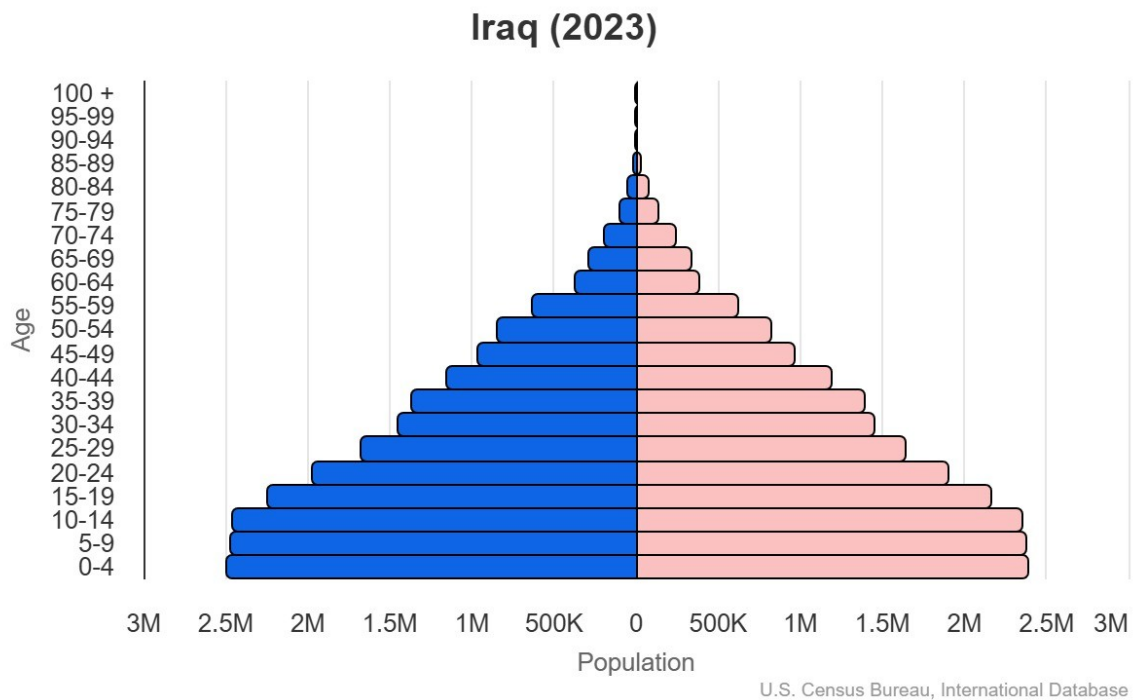
The government of Iraq is a federal [parliamentary republic](#); the President is [Abdul Latif Rashid](#) and the Prime Minister is [Mohammed Shia' Al Sudani](#). The legislature is called the [Council of Representatives](#) and consists of an upper house, the [Federation Council](#), and a lower house, the [Council of Representatives](#). The Capital and largest city in Iraq is [Baghdad](#) (pop. 8,141,000 in the metropolitan area).

According to the [Central Intelligence Agency](#)'s (CIA) [World Factbook on Iraq](#), the country has a total area of 438,317 square kilometres (km<sup>2</sup>) of which 437,367 km<sup>2</sup> is land and 950 km<sup>2</sup> is water. Also according to the World Factbook, 42,083,436 people live in Iraq, 71.6% of whom live in urban areas. Of the approximately 42 million Iraqis, 75-80% are [Arabs](#), 15% are [Kurdish](#), and 5% are other ethnicities including [Turkmen](#), [Yazidi](#), [Shabak](#), [Kaka'i](#), [Bedouin](#), [Romani](#), [Assyrian](#), [Jews](#), [Circassian](#), [Sabaeen-Mandaean](#), and [Persian](#). The official languages of Iraq is [Arabic](#) and [Kurdish](#); other languages recognized as official in Iraq include [Turkmen](#) and [Syriac](#), where where native speakers of these languages are present.

In terms of religion, most Iraqis, 95-98%, follow some form of [Islam](#) ([Shia](#) 61-64%, [Sunni](#) 29-34%). Other religions practised in Iraq include various forms of [Christianity](#) and many other faiths such as

[Mandaeism](#), [Yazidism](#), [Judaism](#), [Yarsanism](#), and [Zoroastrianism](#). In terms of education, 85.6% of the total population aged 15 and over can read and write.

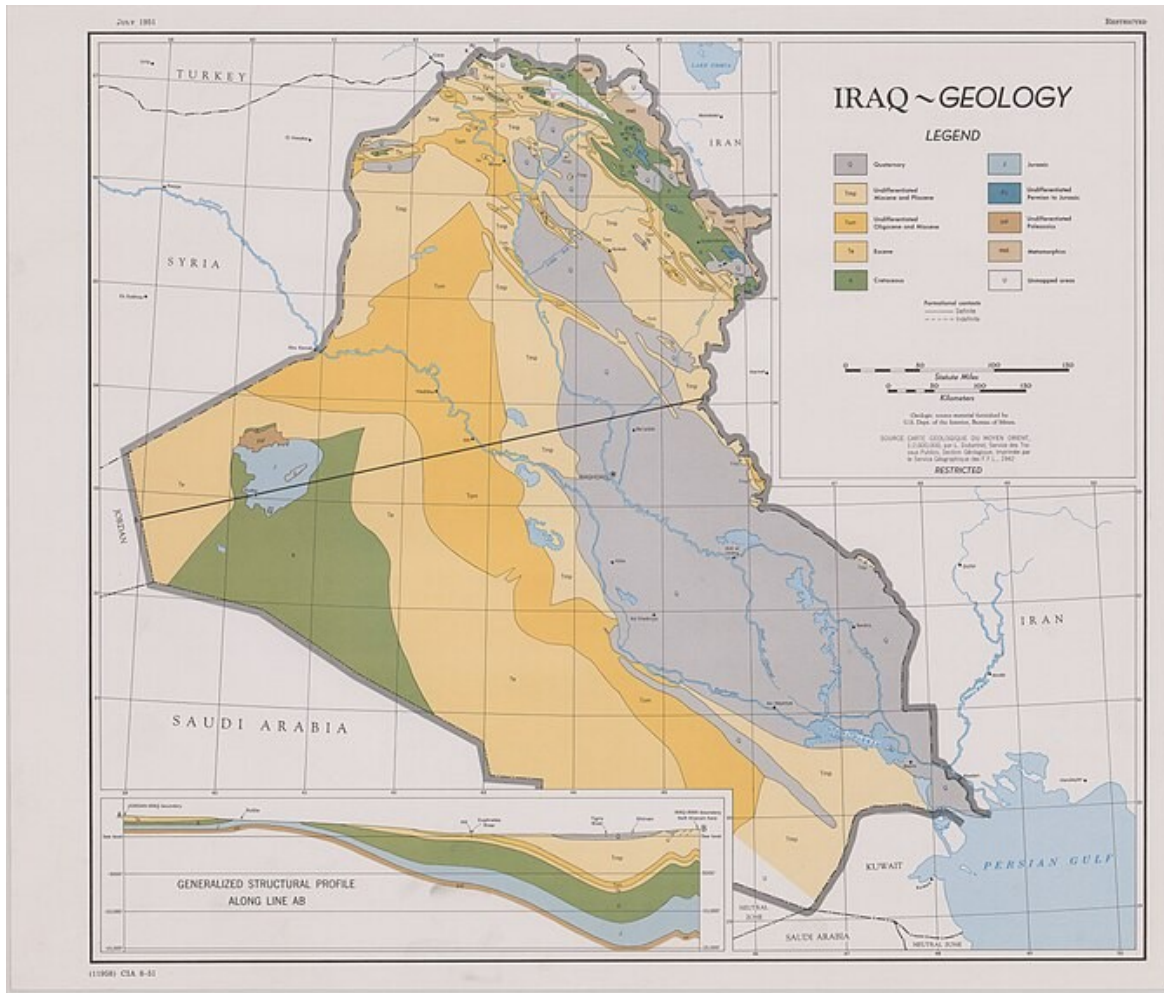
Economically, the per capita [GDP \(PPP\)](#) is \$14,756; the [Gini](#) coefficient is 29.5, indicating low inequality; and the [Human Development Index \(HDI\)](#) is medium at 0.673. The top [exports](#) of Iraq are crude petroleum (\$92.4b), refined petroleum (\$10.3b), petroleum coke (\$1.33b), gold (\$1.33b), and petroleum gas (\$494m), exporting mostly to China (\$35.5B), India (\$29.8B), United States (\$8.92B), Greece (\$5.68B), and United Arab Emirates (\$5.65B). The top [imports](#) of Iraq are refined petroleum (\$6.07b), cars (\$4.4b), broadcasting equipment (\$4.29b), jewellery (\$2.67b), and gold (\$2.19b), importing mostly from United Arab Emirates (\$22.6B), China (\$14.3B), Turkey (\$12.8B), India (\$3.47B), and United States (\$1.42B). Interestingly, in 2023, Iraq was the world's biggest importer of cast iron pipes (\$177M).



**Figure 2 – Demographic Profile of Iraq**  
**Credit: U.S. Census Bureau, International Database, public domain**

The [demographic profile](#) of Iraq shows a fairly young country, where the median age is 22.4 years and 34.6% of the population is under the age of 15. The total fertility rate is 3.17 births per woman, that's above the replacement rate of 2.1. The consequent annual population growth rate is 1.94%. The net migration rate is 0/1000, indicating that people leaving the country are matched by people coming into the country. Iraqis can expect a fairly long life, the life expectancy at birth, for both sexes is 73.5.

## Geology



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**Figure 3 – Geology of Iraq**  
**Credit: Central Intelligence Agency, public domain**

Tectonically, Iraq is found at the intersection of the [Arabian Plate](#), the [Anatolian Plate](#), and the [Iranian Plate](#). The oldest rocks outcropping in Iraq are the [Cambrian-Ordovician](#) aged [Khabour Quartzite Formation](#) found in the southwest part of Iraq. The Khabour Formation formed within a [graben](#)-constrained basin connected to the [Paleo-Tethys Ocean](#). Overlying the Khabour Formation is the [Silurian](#) aged [Akkaz Formation](#), made up of interbedded shales, sandstones, siltstones and marls.

During the [Devonian Period](#), the [Pirispiki Red Beds](#) and interbedded [Chalki Volcanics](#) were deposited in what is now northern Iraq during a global marine transgression called the [Kaskaskia Transgression Event](#). Also deposited during the Devonian and continuing into the [Carboniferous Period](#) was the [Ora Shale](#), thought to be a potential [source rock](#) for petroleum deposits. Also from the Carboniferous Period, the [Harur Limestone Formation](#), in the Kurdistan region, was deposited. In the Kurdistan region, the [Chia Zairi Limestone Formation](#), was deposited during the [Permian Period](#). Out in the western desert region, the [Ga'ara Formation](#) was also deposited during Permian.

During the [Mesozoic Era](#), the [Neo-Tethys Ocean](#) opened up and a basin making up much of modern Iraq, the [Mesopotamian Foredeep](#), began accumulating sedimentary sequences. In the Kurdistan region, the [Beduh Shale Formation](#) and overlying [Mirga Mir Limestone](#) were deposited during the [Lower Triassic](#). Later during the [Middle Triassic](#) the [Geli Khana Formation](#) was deposited in the Mesopotamian Foredeep. Overlying the Lower and Middle [Triassic](#) formations were the [Upper Triassic](#) [Baluti Shale](#) and [Kurrah Chine](#) formations which are overlain, in turn, by the [Middle Jurassic](#) [Sarki Formation](#).

Further south in the Mesopotamian Foredeep basin are the [Adaiyah Anhydrite](#) (Upper Triassic), [Mus Limestone](#) (Upper Triassic), the [Butmah Formation](#) ([Lower Jurassic](#)), [Alan Anhydrite](#) (Middle Jurassic) and [Sargelu Formation](#) (Middle Jurassic) were deposited in [lagoon](#) conditions. During the [Upper Jurassic](#), in the [Gotnia Basin](#), the [Najmah](#) and [Gotnia](#) formations were deposited. Out in the [Ga'ara Depression](#) of the Western desert, the [Nahr Umr](#), [Rutba](#) and [Msad](#) formations were also deposited during the [Jurassic Period](#).

During the [Cretaceous Period](#), the [Mauddud Formation](#) was deposited in the [Arabian Gulf Basin](#). In the [Foreland Folds Belt](#) of the Kurdistan region, the [Balambo Formation](#) was deposited from the [Aptian](#) to the [Cenomanian](#) stages of the Cretaceous.

Also in Kurdistan, [tectonic activity](#) during the Cretaceous opened up a [foreland basin](#) and forced up ophiolites of the [Penjwin-Shlair Complex](#), limestones of the [Qulqula Radiolarites Formation](#), and the volcanic rocks of the [Khwakurk Series](#). Also emplaced by tectonic activity during the Cretaceous was the [Karta Rash volcanic series](#) and [flysch](#) sediments of the [Kolosh](#) and [Tanjero](#) formations from the continental margin.

Numerous formations are associated with the closing of the Neo-Tethys Ocean during the [Paleogene](#); these include:

- The [Paleocene](#) and [Eocene](#) aged [the Red Bed Series](#) deposited in the subduction zone;
- The [Naopurdan Group](#), [Gimo-Qandil Group](#) and [Walash Group](#) deposited in [back-arc](#) and [forearc](#) depositional basins; and
- The [Oligocene](#) aged [Kirkuk Group](#), which hosts the [Kirkuk oil field](#),

The [Ghar Formation](#) was deposited during the Oligocene and into the [Miocene](#). Later in the Miocene, the [Jeribe](#), [Serikagni](#), [Dhiban Anhydrite](#), [Fatha](#) and [Injana](#) formations were deposited.

As a result of uplift of the [Zagros Mountains](#) during the [Alpine Orogeny](#), the [Mukdadiyah](#), [Bai Hassan](#), [Dibdibba](#) and [Zahra](#) formations were deposited. Finally, the most recent deposits in Iraq, are the [Quaternary](#) aged [alluvial deposits](#) associated with the Tigris and Euphrates rivers.

The [geology of Iraq](#) is well studied, in large part because of the oil deposits in the country. The outline above is really just a bare start, even with the links to descriptions of individual formations. For further reading, here are a couple more links to follow up on:

- Karim, K. H., 2023, [Geology of Iraq: Basic Principles Description of stratigraphy, tectonics and boundary conditions of the some Rock units in Iraq and Kurdistan during Cretaceous and Tertiary](#).
- Google books: Jassim, S. Z. & Goff, J. C., 2006, [Geology of Iraq](#).

## Resources

### Agriculture



**Figure 4 – Farm in Shaqlawa, Iraq, Credit: [Sarbast T. Hameed](#); Creative Commons Attribution-Share Alike 4.0 International, 3.0 Unported, 2.5 Generic, 2.0 Generic and 1.0 Generic license**

According to the CIA World Factbook, 21.8% of the land area in Iraq is agricultural land (11.4% arable land 1.1% permanent crops, 9.2% permanent pasture, 2022 est.). Approximately half of Iraq's arable land is irrigated, the CIA estimates 35,250 km<sup>2</sup>. Of the remainder, forest covers 1.9% of the land and 76.3% of the land is something other, mostly desert.

Agriculture makes up 2.8% of Iraq's GDP. The top ten agricultural products in 2023, based on tonnage, are wheat, dates, maize, tomatoes, rye, grapes, milk, chicken, potatoes, fruits. Statistics on agricultural production in Iraq from the [United Nations Food and Agriculture Organization](#) (FAO) can be found [here](#). The current situation in Iraq, from the FAO, can be found [here](#).



**Figure 5 – Fishing Boat on the Euphrates River  
Credit: [Aziz1005](#), Creative Commons Attribution 4.0 International license**

Both freshwater and marine fish are harvested for local consumption. The main freshwater fish are [Barbus sp.](#) and [carp](#). Other freshwater fish caught include [shad](#), [mullet](#), and [catfish](#) are fished in the lakes, rivers, and streams. [Aquaculture](#) is mostly used to raise varieties of carp. All fish produced in Iraq is used for local consumption. Statistics on fishing in Iraq can be found [here](#).

## Mineral Resources

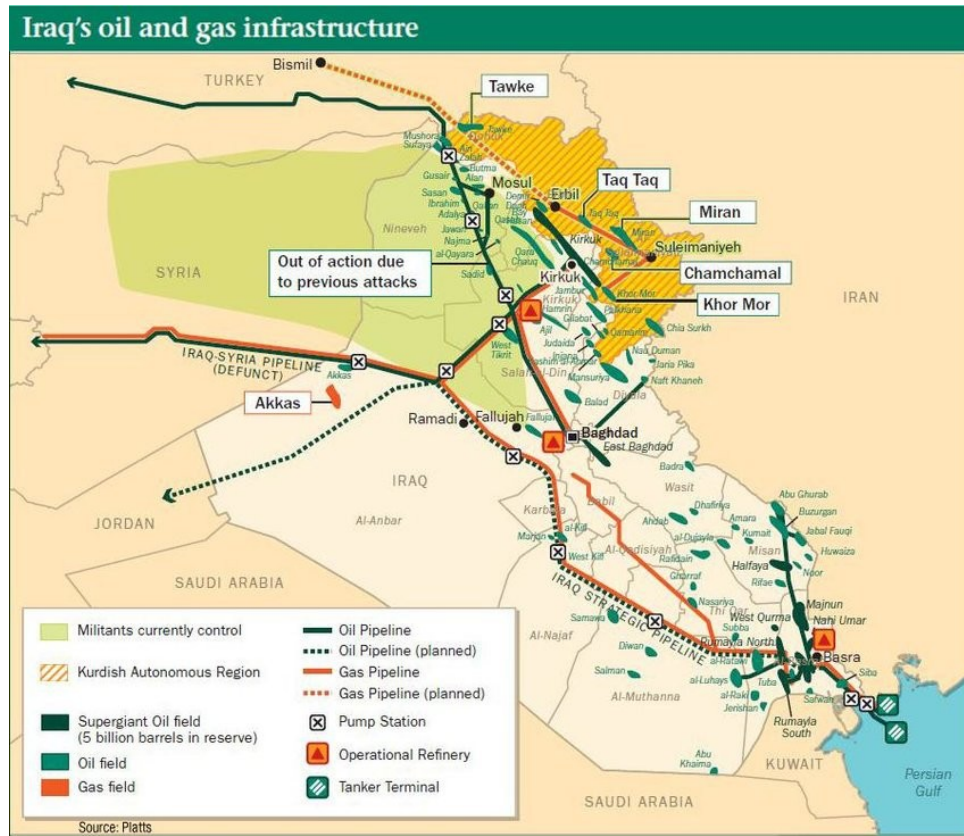
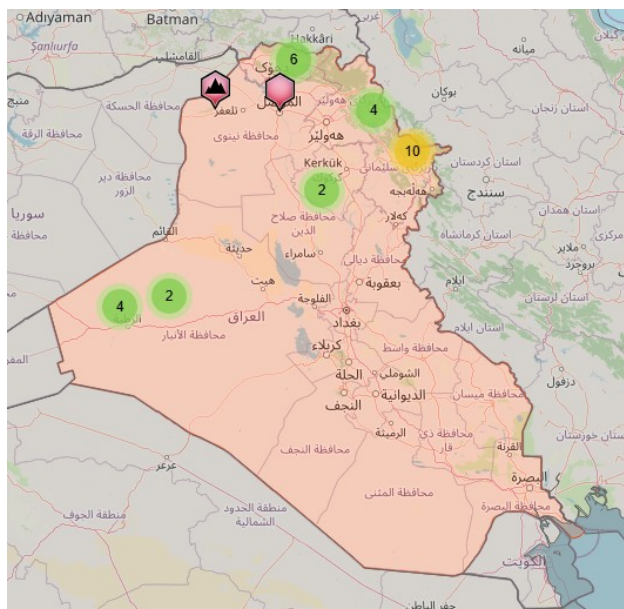


Figure 6 – Iraqi Oil and Gas Infrastructure  
 Credit: Figure 8 in [Sharif, 2015](#)

The USGS report on the [mineral industry in Iraq](#) indicates that the Iraqi mineral industry is mostly fuels, oil and natural gas, with some industrial mineral production: cement, gypsum, salt, sand and gravel, phosphate, and crushed stone.



The big mineral production in Iraq is for oil and gas. In [2022](#): 1,622,790 thousand barrels of petroleum and 9,400 million cubic metres of natural gas were produced. In addition, natural gas was used to make 90,000 tonnes of ammonia and 70,000 tonnes of urea. 74,000 tonnes of sulphur were produced as a byproduct of oil & gas production. Figure 7 links to an interactive map of mineral occurrences in Iraq.

An important mineral resource in Iraq is groundwater, the main aquifer in Iraq is called the [Arabian Aquifer System](#).

Figure 7 – Interactive Mineral Occurrence Map of Iraq  
 Credit: ©Mindat.org

## Climate

Iraq has a hot, dry climate. Most of the country has a hot desert climate ([BWh](#)). As you go into the highlands in the northeast of the country, the climate becomes hot semi-arid ([BSh](#)), then cold semi-arid ([BSk](#)) higher up the mountains, and finally a more moderate Mediterranean continental climate ([Dsb](#)) in the highest elevations.

Iraq map of Köppen climate classification

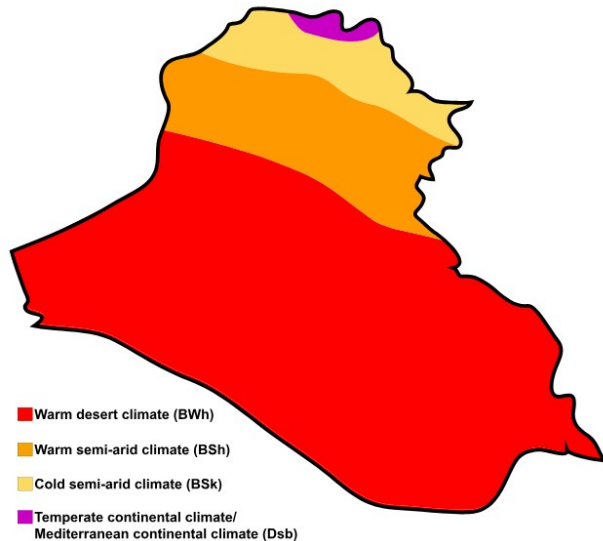


Figure 7 – Köppen Climate Classification, Iraq

Credit: [Ali Zifan](#), [Creative Commons](#)

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The travel advisories for Iraq ([here](#) and [here](#)) say “do not go there” due to terrorism, kidnapping, armed conflict, and civil unrest.

## History and Geopolitics

### *History – the Original Home of Civilization*



Figure 9 – Modern Replica of the Ishtar Gate of Babylon

Credit: [MohammadHuzam](#), [Creative Commons](#) [Attribution 4.0 International](#) license

Iraq is the home to the earliest civilizations on Earth, consequently its [history](#) goes back a long way. Rather than go through the [history of Iraq](#) in detail, let's look at a few themes that run through that history before taking a closer look at the recent history that most affects Iraq's current geopolitics.

The first theme that run through Iraqi history is the rise and fall of states and empires. Starting with the [Sumerian](#) progenitors of civilization, their successors among the [Akkadians](#), [Assyrians](#), [Babylonians](#), [Neo-Assyrians](#), [Neo-Babylonians](#), [Persians](#), [Greeks](#), [Parthians](#), [Muslim Arabs](#), [Turks](#), and [British](#) (just to name a few) we see a common story. When a civilization begins, there is great dynamism with new ideas, techniques, and organizations. The civilization flourishes as it [overcomes its challenges](#). At some point, things begin to go sour. The [creative minority](#) becomes a [dominant minority](#) that begins strip-mining the physical and social capital of their society to maintain power. Non-elite people become oppressed and disillusioned. Economic activity may drop off and birth rates fall. Eventually, the society loses the ability to control its own future and is taken over by a more vigorous foreign power. Often, the old society is dissolved into the new one, losing the old language and culture altogether. (If you like hearing good stories, Paul Cooper has excellent discussions on the [Sumerians](#) and the [Assyrians](#) in his [podcast](#).)

A second theme is environmental destruction. Much of the present Iraqi desert was [fertile farm land](#) during antiquity. Over the years, irrigation left salts in the soil, and it was/is not easy to [remediate](#) such salt poisoned land. Also, the push to get maximum productivity contributed to both soil degradation and the social collapse mentioned above. Despite their best efforts, the ancient civilizations in Iraq were often doomed by soil erosion and degradation.

Finally, throughout Iraqi history, most governments have been authoritarian. Some harshly so, as when the Assyrians bragged about the [horrors they inflicted on defeated enemies](#). There seems to be no record of self-governing republics or the like in Iraqi history until the current experiment. More often than not, a strongman will take control and impose order. This lack of cultural depth for modern democracy does not bode well for the current government of Iraq.



**Figure 10 – US 173rd Airborne Brigade Boarding Aircraft On Their Way to Iraq, March 23, 2003**

**[Credit: Tech. Sgt. Stephen Faulisi, U.S. Air Force, public domain](#)**

The [modern history of Iraq](#) began with the end of [World War 1](#) and the [occupation of Iraq by the British Empire](#). The British allowed the establishment of an officially independent [Iraqi Kingdom](#), an independence that was dependent on supplying oil to the British. During World War II, the British fought a [campaign against the Iraqi government](#) that was becoming a little too friendly to Britain's enemies. After WWII, the British got out, and left the Iraqis to their own devices.

The British did not leave the [Hashemite Monarchy](#) in Iraq with a peaceful kingdom. Political unrest leading to [riots in 1948](#), were only one of their problems. Disloyal Army officers were another. In 1958, the [monarchy was overthrown](#) by Iraqi Army officers and [the Iraqi Republic proclaimed](#). Violently ambitious people remained a problem; in 1963 the Prime Minister, [Abd al-Karim Qasim](#) was assassinated by supporters of the [Ba'ath Party](#). In July 1979, [President Ahmed Hassan al-Bakr](#) was forced to resign by [Saddam Hussein](#), who assumed the offices of both President and Chairman of the Revolutionary Command Council. Saddam then [got rid of his opponents](#) including those from within his own Ba'ath party.

Hussein kept a [tight grip on the country](#), even [killing two of his son-in-laws](#) who he suspected of disloyalty. However, his ambitions got the better of him and he took his country into a couple of disastrous wars: one with [Iran in 1980 – 1988](#) and another with the [United States over Kuwait](#) 1990-1991.

Following the 1990-1991 Gulf War, the American led coalition kept up a [campaign of sanctions](#) against Iraq, a campaign that [led to the deaths of many Iraqis](#). In 2003, another ambitious person, the [President of the United States George W. Bush](#), led an American-led coalition into an [invasion and occupation of Iraq](#). The [Americans stayed](#) in Iraq until 2011, an occupation that led to [further misery](#) for the Iraqi people.

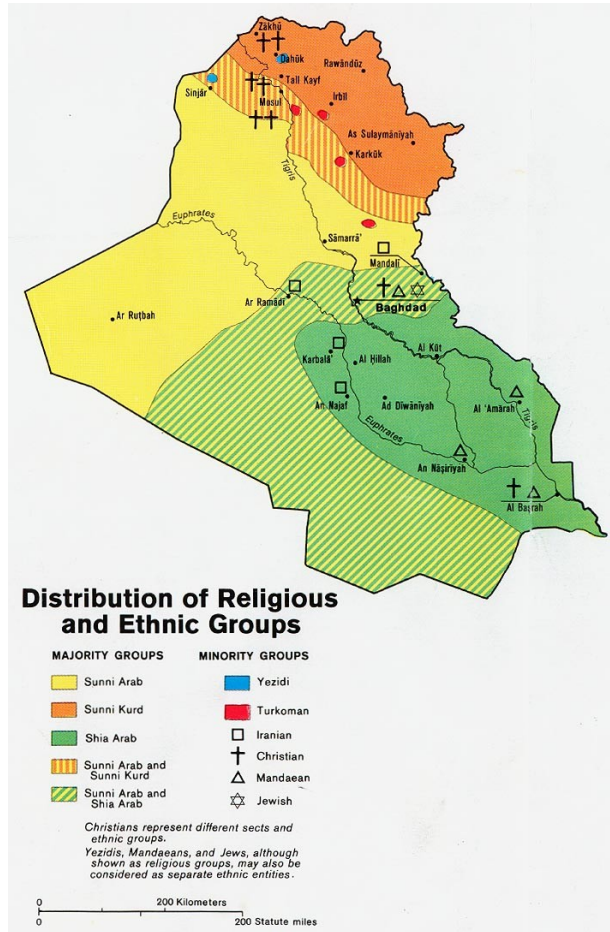
Since the [departure of the Americans](#), Iraq has had to deal with numerous internal problems, including the rise and fall of the [fanatical organization, Isis](#).

### ***Geopolitics***

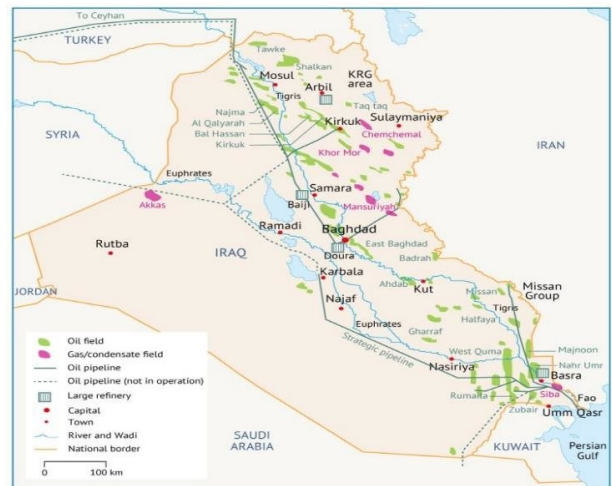
It can't be easy for President Abdul Latif Rashid or his Prime Minister, Mohammed Shia' Al Sudani. The [internal problems of Iraq](#) are daunting:

- [Kurds in the northwest](#) who have practically seceded from the Iraqi state;
- Various [Shiite](#) Arabs, all [wanting more power](#) for their people;
- [Sunni Arabs](#) wanting to keep some of their advantages;
- Everyone who has a grievance against someone who killed a member of their family – [honour requires retribution](#); and
- [Rebuilding the infrastructure of Iraq](#), shattered during three decades of war, blockade, and occupation (what do you think that they are doing with the \$177M worth of iron pipe Iraq imported in 2023?)

And then there is the oil.



**Figure 11 – Map of Religious and Ethnic Groups in Iraq**  
**Credit: Central Intelligence Agency, public domain**



**Figure 12 – Map of Oil Fields in Iraq**  
**Credit: Figure 1 in Hasan & Razali, 2019 Creative Commons Attribution 4.0 International license**

For Iraq, oil production and the subsequent revenues have been both a blessing and a curse. The vast wealth that the oil make possible ought to make Iraq a hugely prosperous country. Unfortunately, that same wealth is a magnet for ambitious people to seize control of it for their own benefit. This dynamic of wealth and ambition underlies much of the political machinations of Iraq in the 20<sup>th</sup> and 21<sup>st</sup> Centuries. Keep this in mind, I am sure that the leaders of Iraq are doing so.

As if the internal problems are not enough, Iraq has neighbours with varying degrees of friendliness and animosity. To the west, [Syria is still in a civil war](#), some of those troubles [spill over into Iraq](#). The fanatical armed gang, Isis, [is still active in both Syria and Iraq](#). Another situation to keep an eye on.

To the northwest is Turkey, which may wish to re-establish the regional dominance that they exercised under the [Ottoman Caliphate](#). Iraq is a tempting target for any Turkish expansion – remember that oil in Kurdistan? Add to that, the [Turkish dams on the Tigris and Euphrates rivers](#) that restrict the flow of water downstream into Iraq. Remember that “whiskey’s for drinking, water’s for fighting”.

To the east is Iran, a country with its own issues and one that maintains [close relations with the Shiites](#) in Iraq, however strained those relations may be. They too may have ambitions towards Iraq. They haven't forgotten the 1980's war nor the [treatment of Shiites under Saddam Hussein](#). The Shiite land in southern Iraq also has oil.

Finally, to the south are Saudi Arabia and Kuwait. For their part, I doubt that the [Kuwaitis](#) have forgotten about the Iraqi invasion of their country in 1990. Nor have the Saudis forgotten the connections between the Iraqi Shiite Arabs and the [Shiites in the Saudi Kingdom](#). Also, look at the locations of oil fields in southern Iraq, where the Iraqi Shiites live.

That kind of wraps up this quick look at Iraq. I wish the Iraqi people well, they deserve better than what they have received from their leaders and from outside forces. Their best hope is a responsible government that invests in improving the lives of ordinary Iraqi citizens. Surely there is enough oil wealth to satisfy both the needs of the people and the desires of the ambitious.

## **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.