

June 9, 2025



**Iris Blooming in My Garden**

## News and notes

Before going on to discuss the geology and geopolitics of [Kuwait](#), here are 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

- [Trump deploys National Guard in L.A. amid protests over immigration raids](#); Peter Turchin predicted [trouble this summer back in May](#).
- Where's the gold? [US lawmakers push for comprehensive audit of Fort Knox gold](#).
- [Ukrainian Capital Burning After Heavy Russian Cruise Missile Strikes](#).
- [U.S. Sanctions Hit Iranian Oil Smuggling Network in Asia](#).
- Finger pointing: [Iraq Says Kurdistan Is Legally Responsible for Oil Smuggling](#).
- Demographics is destiny: [Child of our times: how Japan's birthrate fell to record low](#); and not just in Japan: [Why Gen Z Is Giving Up on Sex, Love, and Each Other](#).

- [Is A New Oil Price War Between The West And OPEC About To Break Out?](#)
- [Civil War Comes to the West, Part II: Strategic Realities](#); Part I [here](#).

## Research and News

- [Reconciling Geologic and Paleotopographic Constraints on Source-to-Sink Sediment Fluxes: An Example From the Bartonian Pyrenees.](#)
- Forensic geology: [Identification of mass-independent Mo isotope anomalies in natural and industrially processed samples. Proof of concept for uranium provenance in nuclear forensics.](#)
- [Characterization of the Miocene Castellón Sandstones Formation in the Western Mediterranean as a potential geological carbon storage site.](#)
- [Crystal Fragmentation Inducing Euhedral Crystal Habits in Volcanic Rocks: Fracture Histories of Crystals from Various Tectonomagmatic Settings and Implications for Plumbing System Processes.](#)
- [Origin of Silicic Magmatism at the Katla Volcanic Complex, South Iceland.](#)
- [Discovery of a New Type of Carbohydrothermal Pegmatite at Moose Creek Valley, Ice River Alkaline Complex, British Columbia – Evidence for Extensive Ti Mobilization.](#)
- Newsletter from the New Mexico Bureau of Geology & Mineral Resources, [Lite Geology](#).
- [A model for the concomitant early formation of dolomite and fibrous clays in coastal bay systems: Evidence from the Eocene \(Paris Basin, France\).](#)
- [Lithospheric mantle evolution recorded in sulfides: An example from SW Poland peridotite and pyroxenite xenoliths.](#)
- [Milankovitch- and Millennial-Scale Sequences in the Late Piacenzian to Early Gelasian Shelf Succession of the Croton Basin, Southern Italy.](#)
- [Variations in Event-Bed Thickness-Frequency Distributions Near Volcanic Islands: Indicators of Varied Geological Processes.](#)
- [Unravelling the formation and implications of illitic grain coats for reservoir quality in the Permian tight sandstones, northern Ordos Basin, central China.](#)
- [Pinpointing regional unconformities in the Surat Basin, Australia, by statistical identification of neutron wireline log anomalies.](#)
- AI and geology: [Using machine learning to analyse coastal sediment characteristics from unmanned aerial vehicle data: A case study of the Dasha sandy beach, China.](#)
- [Models of submarine channel–levee transitions: Spatiotemporal constraints from the Tachrift system, late Tortonian, Morocco.](#)

- New Mexico: [Geologic story of ancient waterways and volcanic activity told in the rocks of the Galisteo Basin.](#)
- Hell's Canyon: [Cave records reveal recent origin of North America's deepest canyon.](#)

### Earth Shattering **Kabooms**

- Younger Dryas Event: [Evidence of a 12,800-year-old Shallow Airburst Depression in Louisiana with Large Deposits of Shocked Quartz and Melted Materials.](#)
- [Coesite discovered in Australasian microtektites.](#)

### Zircons

- [Geology constrains the diffusivity of Ti in quartz and crystallization timescales of high-silica magmas in the Searchlight Magmatic System \(NV, USA\).](#)
- [Crustal-to-mantle shifting in SiO<sub>2</sub>-rich upper crustal magmas through zircon and bulk rock compositions in the Famatinian arc, Argentina.](#)

### Plate Tectonics

- [Volcanism in the Comoros Archipelago, Madagascar, and the East African Rift: What is the link?](#)
- [Isotopic identification of paleo rift zones within the Sveconorwegian Province; implications for nickel sulphide mineralisations in the SW Fennoscandian Shield.](#)
- [Ghost plumes hidden beneath Earth's continents.](#)
- [Late Cretaceous Tectonic Evolution of the Sorgenfrei–Tornquist Zone \(STZ\): Deposition and Palaeoceanographic Implications Based on Reflection Seismic Data.](#)
- [Evolving Sediment Structure and Lithospheric Architecture Across the Indo-Burman Forearc Margin From the Joint Inversion of Surface- and Scattered-Wave Seismic Constraints.](#)
- [Non-collisional orogeny in northeast Japan driven by nearby same-dip double subduction.](#)
- [Thickening Cratonic Lithosphere by Horizontal Compression in the Presence of Surface Erosion and Sedimentation.](#)
- [Plate-Scale Strike-Slip Fault System in the Barbados Accretionary Wedge of the Lesser Antilles Subduction Zone.](#)
- [Early Cretaceous to Miocene Tectonic Evolution of the NW Cyclades Based on <sup>40</sup>Ar/<sup>39</sup>Ar Multiple Single Crystal Dating of White Mica From Andros.](#)
- [Structures and Leucogranites in the Eastern Himalayan Orogen From Reprocessed INDEPTH-I Deep Seismic Reflection Profile.](#)
- [High-resolution three-dimensional seismic imaging reveals structure and slip rate of the Hosgri fault zone offshore Point Sal, California, United States.](#)

- [Study of key structures associated with the indentation of the Southern Urals by the East European Craton: kinematics and age of the final impingement.](#)

## Paleontology

- [A Comparison of New and Established Foraminiferal Dissolution Proxies in Tropical Indian Ocean Deep-Sea Sediments.](#)
- [Two major ecological shifts shaped 60 million years of ungulate faunal evolution.](#)
- [Blue-stain fungus from the Jurassic provides new insights into early evolution and ecological interactions](#); SciNews summary [here](#).
- [Hips do not lie... histology of the pelvic girdle elements of \*Metoposaurus\* from the Late Triassic of Poland](#); Shakira reference [here](#).
- [A new origin of the 'modern' lungfish dentition revealed by taxonomic overlap between Devonian and Carboniferous dipnoans.](#)
- Re-burial: [An Ammonite Preserved in the Upper Pliocene Lower Tejo River Deposits of Quinta Do Conde \(Southwest Portugal\).](#)
- [Redescription of \*Pteronisculus gunnari\* \(Nielsen, 1942\) from a juvenile specimen from the Early Triassic of East Greenland, with implications for the ontogeny of early actinopterygians.](#)
- [New material of \*Dolichochoampsia minima\* \(Archosauria: Crocodylia\) from the Cretaceous–Palaeogene El Molino Formation of Bolivia sheds light on the early evolution of Gavialinae.](#)
- [Walcott Quarry, British Columbia, Canada: Spatial Thinking.](#)
- [New insights into the phylogeny and skull evolution of stegosaurian dinosaurs: An extraordinary cranium from the European Late Jurassic \(Dinosauria: Stegosauria\)](#); SciTechDaily summary [here](#).

## Mining and Energy

- Pegmatites and critical minerals: [Power Metals extends West Joe's cesium target.](#)
- [Western Range iron ore mine marks a new beginning, says Rio Tinto CEO.](#)
- [Gulf of America oil and natural gas production expected to remain stable through 2026.](#)
- [Sisson tungsten mine one of several critical mineral projects eyed by N.B. government.](#)
- [Exxon Mobil unveils two oil discoveries offshore Canada.](#)
- [Morenci Mine, The Largest Copper Mine In US, Is A Sight To Behold.](#)
- [World's first mass-producible nuclear reactor set for testing by US startup.](#)
- [Enhanced Geothermal Systems Electric-Resource Assessment for the Great Basin, Southwestern United States](#); Cowboy State Daily summary [here](#).

## Ore and Petroleum Geology

- [Pulsed Injections of Metal-Rich Magmatic Fluids: Key Drivers of Mineralization in a Back-Arc Basin Hydrothermal System.](#)
- [Paleoenvironment and source rock potential within the Jurassic-Cretaceous succession of the Nile Delta Basin, Egypt: Insights from palynology and organic geochemistry.](#)
- [Gold exploration in the Gabal Abu Karahish area, Central Eastern Desert, Egypt: an integrated geological perspective.](#)
- [Subducting seafloor anomalies promote porphyry copper formation.](#)
- [Major and Trace Element Concentrations in Chromite and Silicate Minerals of the Critical Zone of the Bushveld Complex, South Africa: Effects of Reequilibration and Crystal Fractionation on Chromite Composition.](#)
- [Quantitative reconstruction of phase states and evolution of condensate and gas in the western Kelasu Thrust Belt, Kuqa Depression, Tarim Basin.](#)
- Exploration technique: [Glacial dispersal of indicator minerals from the Brazil Lake lithium–caesium–tantalum pegmatites, SW Nova Scotia, Canada.](#)

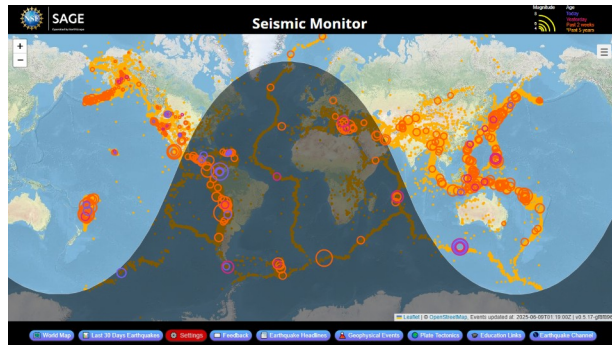
## Environmental Geology and Hydrogeology

- [Newfoundland: Hundreds of frustrated Torbay-area residents attend PFAS class-action lawsuit meeting.](#)
- [Thousands of abandoned oil wells could pose danger to Ontario landowners, including Brant County.](#)
- [Passive degassing of lithospheric volatiles recorded in shallow young groundwater;](#) Phys.org summary [here](#).
- [Landscape controls on water availability limit revegetation after artisanal gold mining in the Peruvian Amazon;](#) Phys.org summary [here](#).

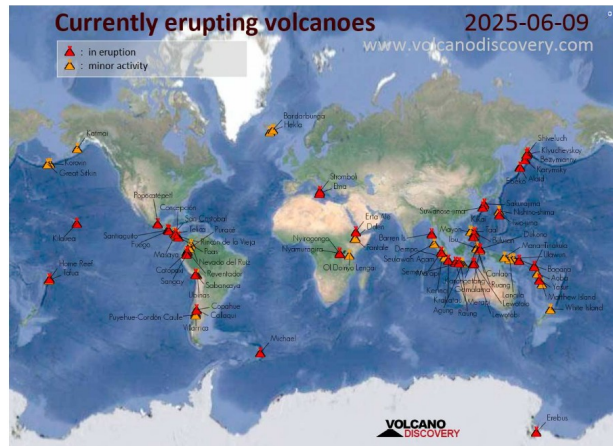
## Glaciers and Climate Change

- [Elizabeth Nickson on the climate change movement.](#)
- [Pacific Highs: A Treasure Trove of Past Warm Climate Archives;](#) Phys.org summary [here](#).
- [Advancements in Remote Sensing for Monitoring and Risk Assessment of Glacial Lake Outburst Floods.](#)
- Geoengineering: [Anthropogenic iron alters the spring phytoplankton bloom in the North Pacific transition zone.](#)

## Volcanoes, Earthquakes and Geohazards



[Seismic Monitor](#)



[Active Volcano Map](#)

### Volcanoes

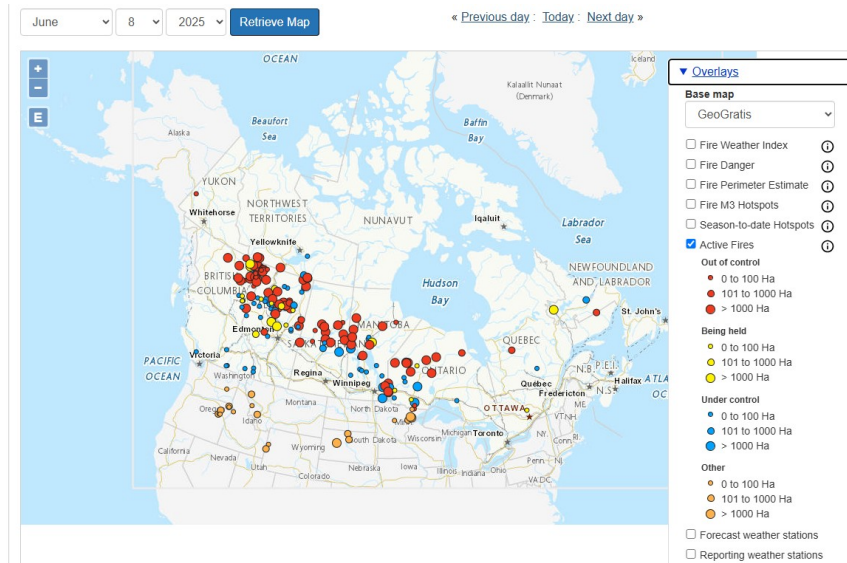
- [Smithsonian / USGS Weekly Volcanic Activity Report.](#)
- United States Geological Survey (USGS) Volcano Observatories:
  - [Cascades Volcano Observatory Weekly Update.](#)
  - Volcano Watch – [What Fans the Flames Observed at Volcanic Vents?](#)
  - [Listening for hydrothermal activity \(and more!\) in Yellowstone.](#)
- [The First Instrumentally Detected Hydrothermal Explosion in Yellowstone National Park.](#)
- Video: [Jun 6, 2025: Crazy Beautiful Eruptions from Fuego Volcano, Guatemala.](#)
- Mt. Etna Italy: Video: [Etna Eruption 2025 | The Power of Volcanoes and What Lies Beneath | Nature Documentary 4K](#); and [Tourists Flee As Mount Etna Erupts In Italy.](#)

### Earthquakes

- [Euro-Mediterranean Seismological Centre \(EMSC\).](#)
- [Earthquakes Monitoring Live Worldwide.](#)
- [M6.3 earthquake shakes Colombia](#); USGS summary [here.](#)
- [3D Reconstruction of Complex Fault Systems From Volumetric Geodynamic Shear Zones Using Medial Axis Transform.](#)
- [Ground-Motion Characteristics of Cascading Earthquakes in a Multiscale Fracture Network.](#)
- [Differential Seismic Phase Detection Probability as a Potential Discriminant of Explosions and Earthquakes.](#)

- [Characterizing Seismic Swarm Activity in the Aftershock Zone of the 2016 Amatrice-Norcia Seismic Sequence.](#)
- [Evolution of the real area of contact during laboratory earthquakes.](#)
- [Do Gravitational Quakes Exist?](#)
- [Seismogenic Structures Offshore Taiwan and Their Earthquake Potential from the Taiwan Earthquake Model \(TEM\) Project.](#)

### Wildfires and other Geohazards



**Interactive Wildfire Map of Canada**  
**Credit: Canadian Wildland Fire Information System**

- Manitoba: [Flames devour buildings in Lynn Lake; skeleton crew stays behind.](#)
- [Alberta's wildfires disrupt some 7% of Canada's oil production.](#)
- Greenland tsunami: [Observations of the seiche that shook the world](#); every 90 seconds, for nine days straight, the Earth subtly pulsed; Earth.com summary [here](#).
- Tsunami research: [Seismotectonics and Crustal Structure in the Southern Dominican Republic Offshore Margin: Implications on the Tsunami Potential.](#)

### 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; NEW BOOKS: [Using Groundwater Head Maps](#) and [Practical Groundwater Tracing with Fluorescent Dyes](#).

- 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](#).

## Upcoming Events

- [June 10, Kentucky Geological Survey 64th Annual Seminar: Geology in the Modern World](#).
- Webinar, Tuesday June 17th, 2025; *Wildlife, Landscapes, and Geology— Exploring Connections*; Register Free at <https://shorturl.at/tJJuB>; Dr. Dale Leckie speaker.
- Calgary, AB: [2025 Bootleggin’ Breakfast – July 8<sup>th</sup> & 10<sup>th</sup>](#); during the Calgary Stampede.
- [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](#).
- [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](#).
- [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](#).
- 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.

June 9, 2025

## Geology and the Fate of Societies – Kuwait



**Figure 1a – Kuwait**

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

**Figure 1b – Location of Kuwait**

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

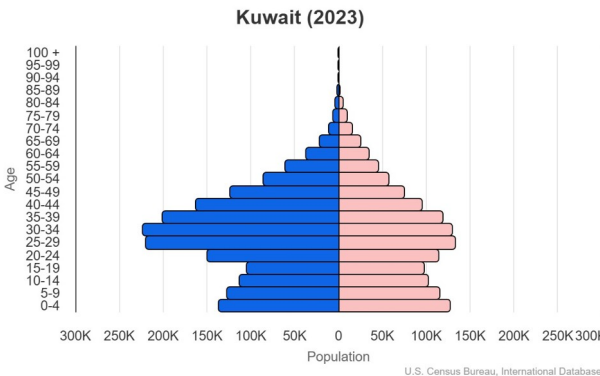
The [State of Kuwait](#) is located on the northeast corner of the [Arabian Peninsula](#) on the shores of the [Persian Gulf](#). To the south and southwest is [Saudi Arabia](#) and to the north and northwest is [Iraq](#). To the northeast, across the Persian Gulf, is [Iran](#). The government of Kuwait is a unitary [semi-constitutional monarchy](#). The Head of State is Emir [Mishal Al-Ahmad Al-Jaber Al-Sabah](#); the Crown Prince is his cousin [Sabah Al-Khalid Al-Sabah](#); and the Prime Minister is another cousin, [Ahmad Al-Abdullah Al-Sabah](#). The legislature is [The National Assembly](#), an elected body, the Emir has suspended its operation since May 10, 2024. The Capital and largest city in Kuwait is [Kuwait City](#) (pop. 120,070).

According to the [Central Intelligence Agency](#) (CIA) [World Factbook on Kuwait](#), the country has a total area of 17,818 square kilometres (km<sup>2</sup>), all of which is land. Also according to the CIA, 3,138,355 people live in Kuwait all of whom live in urban areas along the Persian Gulf. Of the approximately 3.14 million people in Kuwait: 30.4% are [Kuwaiti Citizens](#); 27.4% are other [Arabs](#) (including the [Bedoon](#)); 40.3% are [Asians](#); 1% are [Africans](#); and the other 0.9% are mostly expatriate Europeans, North Americans, South Americans, and Australians. The official language in Kuwait is [Arabic](#), although [English](#) is widely spoken.

In terms of religion, [Islam](#) is the official religion, followed by 74.6% of the population, about 60%–65% are [Sunni](#) and 35%–40% are [Shiites](#). [Christians](#) make up 18.2% and 7.2% are something other and/or

unspecified. Kuwaitis are well educated: 96.5% of the total population aged 15 and over can read and write and people can expect to stay in school for 15 years.

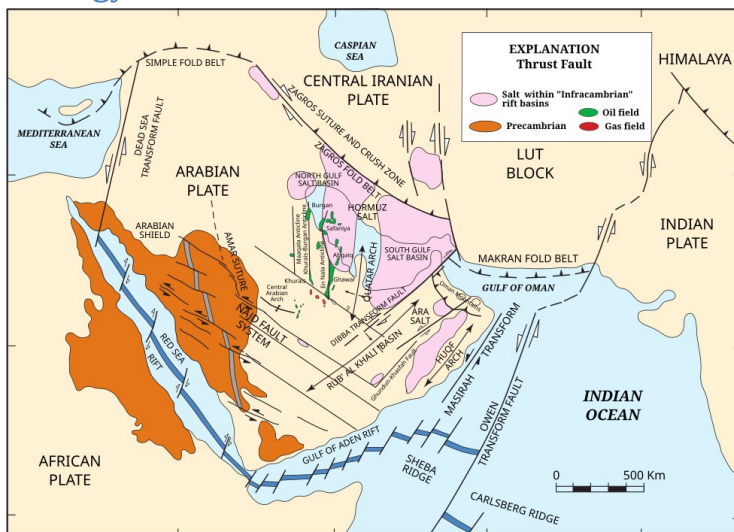
Economically, Kuwait is a well off; the per capita [GDP \(PPP\)](#) is \$49,736; and the [Human Development Index](#) is very high at 0.852. In 2023, [the top exports of Kuwait](#) were crude petroleum (\$35.7b), refined petroleum (\$23.7b), petroleum gas (\$3.27b), cyclic hydrocarbons (\$1.31b), and sulfonated, nitrated or nitrosated hydrocarbons (\$903M world's largest exporter). The top destinations were China (\$17.4B), India (\$9.51B), Japan (\$9.13B), Chinese Taipei (\$4.74B), and United Kingdom (\$3.31B). Also in 2023, the [top imports of Kuwait](#) were cars (\$4.79b), petroleum gas (\$2.43b), broadcasting equipment (\$1.46b), packaged medicaments (\$1.23b), and jewellery (\$1.18b). The top origins were China (\$7.14B), United Arab Emirates (\$3.99B), United States (\$3.74B), Saudi Arabia (\$2.25B), and Japan (\$2.24B).



**Figure 2 – Demographics of Kuwait**  
 Credit: U.S. Census Bureau, International Database, public domain

The demographics of Kuwait shows a middle aged country with many more males than females, largely due to the non-Kuwaiti guest workers (Arabs, Asians, and others). The median age is 30.3; 23% are under 15 years of age (male 376,415/female 346,190); and 73.4% are between 15 and 64 years of age (male 1,386,349/female 917,465 – this is the cohort that includes most of the non-Kuwaiti workers). Old folk, 65 years and over, make up 3.6% of the population (male 47,778/female 64,158). The total fertility rate is 2.22 births per woman (just above replacement rate of 2.1); the net migration rate is -4.2 migrant(s)/1,000 population; and the annual growth rate is 1.13%. The life expectancy for both sexes is 79.4 years (78.1 for men and 81.1 for women).

## Geology



**Figure 3 – Tectonic Framework of Kuwait,** Credit: Richard M. Pollastro  
 USGS Bulletin 2202-H, public domain

Tectonically, Kuwait sits on the [Arabian Plate](#) which is bounded to the north by the [Mesopotamian Basin](#), a [foredeep basin](#) and the [Zagros Fold Belt](#). Further away, to the west is the [Dead Sea Transform Fault](#); to the southwest is the [Red Sea Rift](#); to the south is the [Sheba Ridge](#); and to the south and east is the [Owen Fracture Zone](#) and the [Makran Subduction Zone](#).

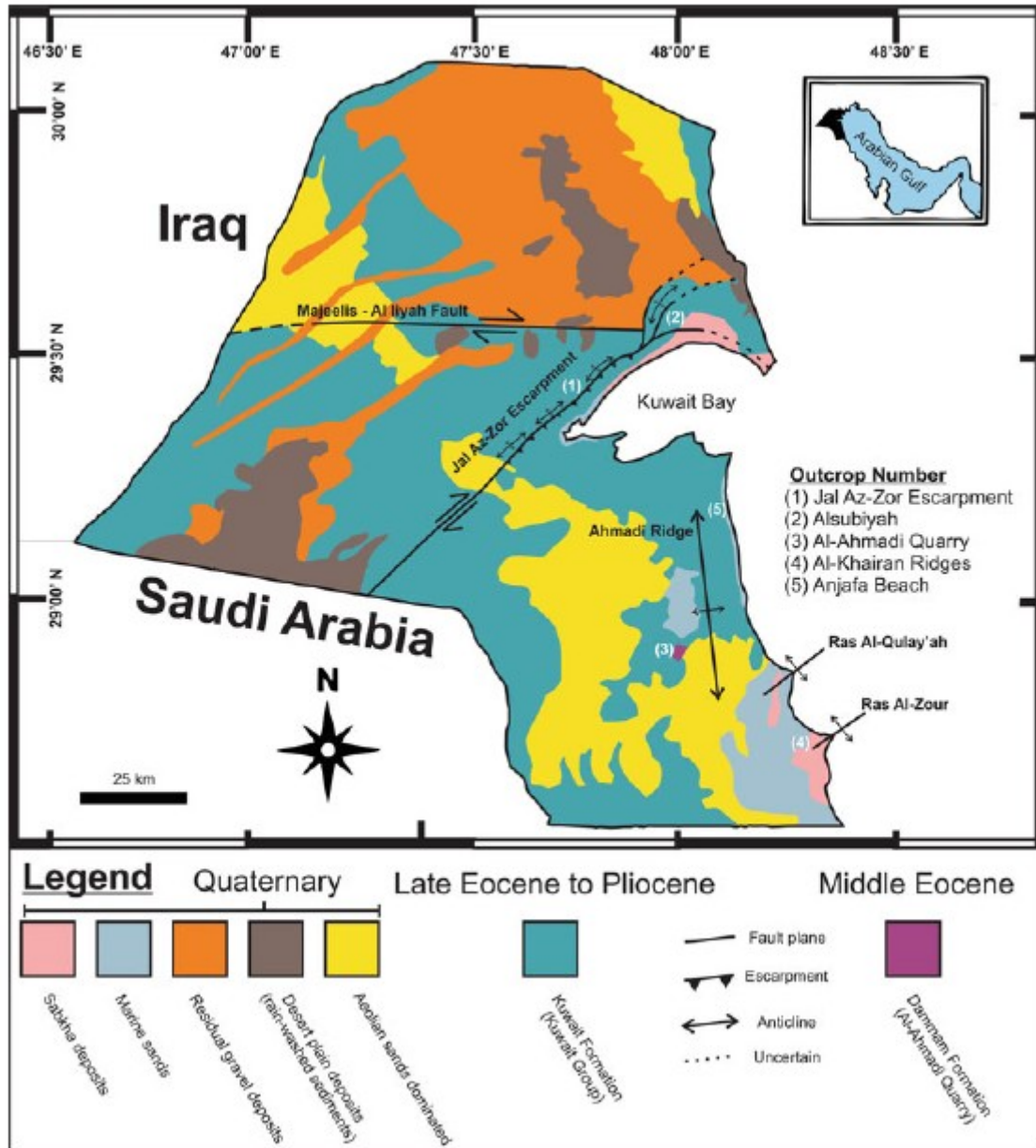


Figure 4 – Simplified Geologic Map of Kuwait

Credit: Figure 1.1 in [Alrefaei et al, 2023](#), Chapter 1 in [The Geology of Kuwait, 2023](#)  
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For a flat and generally featureless expanse of desert, the [surface geology of Kuwait](#) is fairly complex. The surface deposits range in age from [Quaternary](#) to [Eocene](#). These include: Quaternary aged [Sabkha](#) deposits, which are chemical precipitate, i.e. [evaporite](#) deposits; sort of what you might expect in a desert environment; other Quaternary deposits include [marine sands](#), [aeolian](#) (wind deposited) sands, [gravel](#).

deposits, and desert plain deposits; the Late Eocene to Pliocene aged Kuwait Formation; and the Middle Eocene aged Dammam Formation.

Of course, the really interesting geology of Kuwait is in the subsurface. Figure 5 shows a stratigraphic column of the subsurface geology of Kuwait.

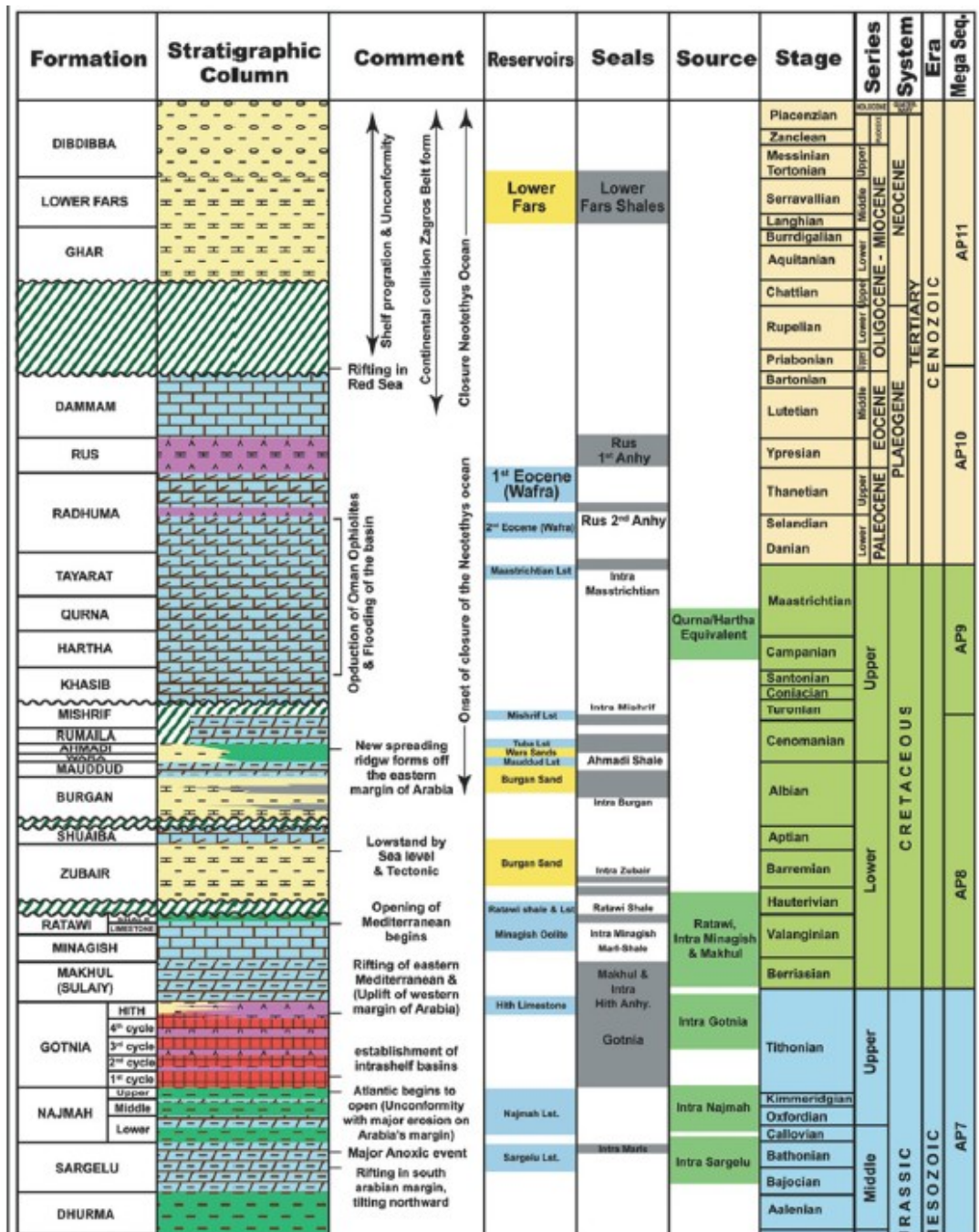


Figure 5 – Stratigraphic Column of Kuwait

Credit: Figure 6.2 in Naqi et al, 2023, Chapter 6 in The Geology of Kuwait, 2023  
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There has been a lot of work done on the geology of Kuwait. If you want to get into almost all the available details on it, read [The Geology of Kuwait, 2023, ed. Abd el-aziz Khairy Abd el-aal, Jasem Mohammed Al-Awadhi, Ali Al-Dousari, Springer Nature Link](#); it's free to download.

## Resources

### Food Production



**Figure 6 – Date Palms in Kuwait**

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

The CIA World Factbook indicates that only 8.4% of the land area of Kuwait is used for agriculture (arable land: 0.4%; permanent crops: 0.3%; permanent pasture: 7.6%). The rest, 91.2%, is desert and urban areas although a small portion, 0.4%, is considered forest (probably date palms). There are 100 km<sup>2</sup> of irrigated land. The CIA lists dates, eggs, milk, tomatoes, chicken, lamb/mutton, cucumbers/gherkins, vegetables, maize, eggplants (2023) as the top ten agricultural products based on tonnage. While Kuwait grows a variety of crops on the little agricultural land that they have – the [United Nations Food and Agriculture Organization](#) (FAO) [lists 65 different crops and livestock](#) – Kuwait [imports most of the food](#) they consume (import statistics [here](#)). The FAO indicates that 8.7% of the population suffers from severe or moderate food insecurity 2021-2023.

A similar story exists for the fishery that operates out of Kuwait, where the catch only [satisfies 30% of the country's demand](#). The Kuwait fishing industry includes both a wild-caught and aquaculture. The [wild-caught fishery](#) includes silver pomfret (*Pampus argenteus* locally known as zobaidy), orange-spotted grouper (*Epinephelus coioides*), grunt (*Pomadasys kaakan*), Hilsa shad (*Tenualosa ilisha*, locally known as suboor), tigertooth croaker (*Otolithes ruber*), yellowfin seabream (*Acanthopagrus latus*) and mullet (*Liza klunzingeri*) together with shrimp including the Jinga shrimp (*Metapenaeus affinis*). Pollution has

caused a [decline](#) in many wild species in Kuwaiti waters. Fish farming is [promoted](#) by the Kuwaiti government and is [expected to grow](#) in the coming years; species raised include gilthead seabream (*Sparus aurata*) and sobaity seabream (*Sparidentex hasta*). The Kuwait fishery profile from the FAO is [here](#).



Figure 7 – Fish for Sale in [Souq Sharq](#) in Kuwait

Credit: [Yaz1998](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license

### *Mineral Resources*



Figure 8 – Mina-Al-Ahmadi Oil Refinery at Night

Credit: [Grubb \(talk\)](#), [public domain](#)

The biggest part of the [mineral industry of Kuwait](#) is oil and natural gas production. In 2022, [according to the USGS](#), Kuwait produced 13,400 million cubic meters of natural gas and 988,000 thousand 42-gallon barrels (= 157,079,447 m<sup>3</sup>) of crude oil. Associated with oil and gas production is the production of sulphur, ammonia, and urea. Other industrial minerals produced in Kuwait include sea salt and cement.

Figure 9 shows the locations of oil fields in Kuwait.



**Figure 9 – Major and Minor Oil Fields (onshore) Map of Kuwait**

**Credit:** Figure 6.1 in [Naqi et al, 2023](#), [Creative Commons Attribution-Share Alike 4.0 International license](#)

## Climate

Köppen-Geiger climate classification map for Kuwait (1980–2016)



Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1 km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

**Figure 10 – Köppen-Geiger Climate Map of Kuwait**

**Credit:** [Beck et al, 2018](#), [Creative Commons Attribution-Share Alike 4.0 International license](#)

The climate of Kuwait is uniformly hot dry desert ([BWh](#)). It is probably superfluous to show the Köppen-Geiger Climate Map above, but there it is.

If hot, deserts interest you, Kuwait may be a good place to visit. The travel advisories ([here](#) and [here](#)) warn against travel, especially near the Iraqi border, due to the threat of terrorism, unexploded ordnance, and landmines. Crime in the Jleeb Al-Shuyoukh area in Kuwait City is also a problem. If you still want to go, the Kuwait Government [tourism office](#) gives some useful information for travellers, also check out [Climates to Travel](#) and [Lonely Planet](#).

## History and Geopolitics

### *History*



**Figure 11 – Modern Copies of Ancient Trading Ships at the Maritime Museum of Kuwait**  
**Credit: [Kuwaitsoccer](#), [Creative Commons Attribution-Share Alike 3.0 Unported](#) license**

The [history of Kuwait](#) goes back to ancient times. More often than not, Kuwait has been a trading outpost for larger polities. Before the discovery of oil, trade was the most important activity in Kuwait. Below is a list of the major periods in Kuwaiti history.

During prehistoric and ancient times, the following periods and archaeological sites were important:

- Ancient [Mesopotamia](#);
- [Bahra 1](#) site;
- [H3 \(Kuwait\)](#) site;

- [Subiya](#) site;
- The [Ubaid Period](#);
- [Failaka Island](#);
- [Dilmun](#);
- [Ikaros](#);
- [Agarum](#);
- [Kazma](#);
- [Umm an Namil](#);
- [Akkaz](#); and
- [Teredon](#).

The main events from the 5th to the 18th Century AD include:

- The Province of [Maishan](#), 5<sup>th</sup> to 13<sup>th</sup> Century AD;
- The [Battle of Chains](#), 629/633 AD;
- The [Kazma](#) trading outpost, 636 AD;
- The [Portuguese trading outpost](#) in the 1500's AD;
- The [Kuwaiti invasion of Bahrain](#), 1782-1783
- The [Battle of Riqqa](#), 1783;
- [Ibn Ufaisan's Invasion](#) in 1793;

From the 19<sup>th</sup> Century to 1961, the [Sheikhdom of Kuwait](#) was in place, important events during this time include:

- The [Battle of Khakeekera](#) in 1811;
- [Sheikh Humoud's revolt](#) in 1828;
- The [Siege of Basra](#) in 1831;
- The [Siege of Al-Zubair](#) in 1833;
- The [Invasion of Muhammara](#) in 1837;
- The [Ottoman Al-Hasa Expedition](#) 1870 – 1871;
- The [Kuwaiti–Rashidi](#) war from 1900 to 1901;

- The [Battle of Jo-Laban](#) in 1903;
- The [Battle of Hadia](#) in 1910;
- [Anglo-Ottoman Convention](#) of 1913;
- The [British Mesopotamian Campaign against the Ottomans](#), 1914–1918;
- The [Kuwait–Najd War](#), 1919–1920;
- The [Battle of Jahra](#) in 1920; and the
- [Ikhwan Revolt](#), 1927–1930.

Kuwait has been an independent state since 1961, important events up to 1990 include:

- [Operation Vantage](#) in 1961;
- The [Abdul Karim Qasim Crisis](#), 1961-1963;
- The [Arab-Israeli War of 1967](#);
- The [Samita border dispute](#) of 1973;
- The [October War](#) 1973;
- The [terrorism attack on the Japanese Embassy in Kuwait](#) in 1974;
- Iranian sponsored [Terrorist bombings](#) in Kuwait in 1983;
- [Aircraft hijackings](#) 1983 – 1988; and
- [The attempted assassination of Emir Jaber in 1985](#).



**Figure 12 – Disabled Iraqi Tank in Kuwait with Burning Oil Facilities in the Background, 1991**  
 Credit: [JO1 Gawlowicz, USN, public domain](#)

In 1990, [Iraq invaded Kuwait](#), this precipitated the 1990-91 [Gulf War](#). When the [coalition forces](#) (mostly [American](#)) drove the Iraqis out of Kuwait, the [Iraqis torched Kuwait's oil fields](#). Also, among the foreign workers in Kuwait prior to the invasion, were many Palestinians. Never missing an opportunity to defeat their own cause, the Palestinians supported the Iraqi invaders. After the Iraqis were driven out, [Kuwait expelled the Palestinians](#). Kuwait also provided a staging area for the [2003-2011 Iraqi War](#).

The most recent serious trouble in Kuwait was the bombing of a [Shiite mosque in 2015](#) by self-proclaimed [Islamic State of Iraq and the Levant \(ISIS\)](#). Also, in 2024, the Emir of Kuwait [suspended the operations of the National Assembly](#), due to political deadlock, and some fear that the democratic institutions of Kuwait are [now at risk](#).

### *Geopolitics*



Figure 13 – Kuwait City Skyline

**Credit: [Zairon](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license**

Internally, Kuwait has the problems of a stratified society with two main divisions: full Kuwaiti citizens and the non-citizen residents. Kuwaiti citizens enjoy [generous social benefits](#) and access to well paid government jobs, some of which allow for [generous access to graft](#). Non citizens, such as foreign workers, have fewer benefits and their situation varies widely. Western technical experts do well, labourers from poor countries, not so well. Among the most poorly treated are the [Bedoon](#) who have lived in Kuwait as stateless people for a long time. As well, Kuwaiti officials have been accused of [human rights violations](#) in their efforts to maintain order or just beat up on the lower classes.

The issue of corruption in Kuwait is a contentious one. On one hand, there are [long standing cultural practice of Wasta](#) involving bribes and kickbacks that grease the wheels of commerce. On the other hand,

there are strict legal prohibitions against corrupt practices; some of these prohibitions are [attributed to Mohammed himself](#). The rulers of Kuwait have been [prosecuting corrupt officials](#), as in this example [here](#), so the problem is not entirely ignored.

There are plenty of opportunities for trouble with Kuwait's internal situation. Managing the expectations of Kuwaiti citizens and the grievances of non-citizens who reside in Kuwait is always going to be a problem for the country's rulers.

Between Kuwait's neighbours, [Saudi Arabia](#) is probably the one that Kuwait has the best relationship with. [Shared interests and culture](#) lie behind this friendly relationship. The only caution in this is if there is significant [regime change](#) in the Saudi kingdom.

As for Iraq, although [Saddam Hussein is dead and buried](#), the Kuwaitis and Iraq have a [complicated relationship](#) due to the historical events of the 1990-91 Gulf War. Kuwait also has to keep an eye on the [instability in Iraq](#), lest it overflow into their own country.

The [Iranians are probably the biggest worry](#). Iran is a regional power and has interests in the affairs of their neighbours, such as Kuwait. One of Iran's interests is the wellbeing of their [Shiite coreligionists](#) in places like [Kuwait and the other Gulf States](#). In advancing their interests, the Iranians have a [history of using unconventional warfare](#), a.k.a terrorism, when it suits them. Kuwait has to keep a close eye on Iranian behaviour, such as using Kuwait as a staging ground for [guerrilla warfare](#). To complicate things some more, Iran and Saudi Arabia are in competition for status and power in their region, and [Kuwait is in the middle](#). Finally, there is always the possibility that Iran will use discontent among non-citizens in Kuwait to their own advantage.

Further afield, as a major oil producer, Kuwait has a lot of people depending on delivery of Kuwaiti oil. These include [China](#) and [India](#), two powers with their own troubles and disputes. It is not beyond the realm of imagination to see a future Great Power Conflict involving the interdiction of Kuwaiti oil on its way to its normal peacetime customers.

The final big player in the game is the [United States](#). The USA has a [large military presence in Kuwait – the oil must flow](#) – and any future Great Power conflict is likely to involve strikes on American facilities in places like Kuwait.

I have guarded optimism for Kuwait. Their long standing tradition of being traders and brokers between the various states of their region has generally served them well. However, that tradition has been severely tested by events such as the Gulf War. Having thrown their lot in with the Americans, who liberated them from Iraq, they are now targets for America's adversaries, such as Iran. A very long term issue is what will happen when the oil runs out. [Depletion of reservoirs](#) is a geological fact, and an unpleasant political reality when the revenues diminish. For now they are doing fine, but diminishing oil revenues could spark instability, especially among the less favoured, i.e. non-citizens, part of the population. It's worth keeping an eye on.

## **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.