

June 16, 2025

News and notes

Before going on to discuss the geology and geopolitics of [Kyrgyzstan](#), 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.

Geopolitics

- American Protests:
 - [Photos: 'No Kings' Protests Across America.](#)
 - [Violent anti-Trump protesters force LAPD to take action as peaceful day turns chaotic.](#)
 - ['No Kings' protests live updates: Thousands rally across US to protest Trump as LA keeps curfew to quell chaos.](#)
 - [IRS Joins DHS in Tracking Who's Paying for LA's Violent Protests \[WATCH\].](#)
 - [Anti-ICE protests in US lead to nationwide unrest and an ideological battle - The Front Page; map of protests \[here\]\(#\).](#)
 - [Abbott Deploys National Guard To San Antonio Ahead Of Wednesday Night ICE Protest.](#)
 - [More Riots Break Out in Chicago, Other Cities Across U.S.](#)
 - [700 Marines deployed to Los Angeles amid major riots; related \[video\]\(#\).](#)
- Meanwhile in the Persian Gulf:
 - [Oil Prices Surge as Israel and Iran Target Each Other's Energy Infrastructure.](#)
 - [Trump Rejects Netanyahu's Request To Join War, As Israel Needs Large US Bunker Buster Bombs.](#)
 - [Iran threatens to close Strait of Hormuz as shipping risks being sucked into regional war.](#)
 - [Israel launches preemptive strike on Iranian nuclear sites, military targets.](#)
 - [Israel strike puts all eyes on Hormuz and \\$100 oil: Bousso.](#)
- [US-China trade truce leaves military-use rare earth issue unresolved.](#)
- [Canada Is Gathering Global Leaders in a Province That Wants Out of the Country.](#)
- Interview: [CIVIL WAR is Coming - Professor David Betz.](#)

- Northern Ireland: [How a Northern Irish town descended into 3 days of anti-immigrant violence.](#)
- Demographics is destiny, from the [United Nations Population Fund: The fertility fallacy: Five things you didn't know about global fertility rates](#); Sky News summary [here](#).

Research and News

- [Morphological and Sediment Supply Controls on Lateral Bedrock Channel Erosion.](#)
- [Precession-driven variations in phosphorus cycling facilitated Earth's oxygenation in the early Proterozoic.](#)
- [Strong link between Earth's oxygen level and geomagnetic dipole revealed since the last 540 million years.](#)
- [The role of mantle and high- \$\delta^{18}\text{O}\$ crustal components on the petrogenesis of massif-type anorthosite: Hf-O isotopic evidence from the northern Oaxacan Complex, southern Mexico.](#)
- [Decoupling between Nd-Hf isotopic evolution of Permian to Triassic granitoids and crustal thickness variation in the westernmost Mongol-Okhotsk Orogen.](#)
- [Scientists discover strong, unexpected link between Earth's magnetic field and oxygen levels.](#)
- [Solar neon dissolution into an ultramafic magma ocean.](#)
- [In situ Rb–Sr dating and REE analysis of glauconites and detrital feldspars from the Ediacaran/Cambrian strata: Centralian and Adelaide Superbasins, Australia.](#)
- [U–Pb zircon geochronology and chronostratigraphy of the Eocene–Miocene John Day Formation of central and eastern Oregon.](#)
- [Abyssal seafloor as a key driver of ocean trace-metal biogeochemical cycles](#); Phys.org summary [here](#).
- [Jadarite's unique recipe](#); Phys.org summary [here](#).
- [Age and origin of the Ngankipari Formation in the Noarlunga and Willunga embayments, southern South Australia.](#)
- [Seafloor slopes control submarine canyon distribution: A global analysis](#); Phys.org summary [here](#).
- [Variable sampling of distinct ancient mantle domains by the Iceland mantle plume over its 62 Ma eruption history.](#)
- [Russian scientists discover a new island in the Caspian Sea - the world's largest inland body of water.](#)
- Bad Science: [Journal tells author it's retracting three papers for concept that 'violates' law of thermodynamics.](#)

- Geochemistry: [Using Kgen to Generate Cross-Verified Apparent Equilibrium Constants \(\$K^*\$'s\) for Palaeoseawater Carbonate Chemistry.](#)
- [What if the Big Bang wasn't the beginning? Our research suggests it may have taken place inside a black hole.](#)

Plate Tectonics

- [Heavy potassium isotopes in carbonatites reveal oceanic crust subduction as the driver of deep carbon cycling.](#)
- [Sedimentary and Early Diagenetic Responses to the Huaiyuan Movement During the Early–Middle Ordovician Transition in the Ordos Basin, North China.](#)
- [3-D Mantle Flow and Structure of the Mediterranean From Combined P-Wave and Splitting Intensity Anisotropic Tomography.](#)
- [A two-stage mantle plume-sagduction origin of Archean continental crust revealed by water and oxygen isotopes of TTGs.](#)
- [Pre-Existing Structures Control the Orientation of Strike-Slip Faulting During the 2021 Dike Intrusion at Fagradalsfjall, Iceland.](#)
- [Unveiling tectonic activity through lithological-erosional interplay with the Tectonic Processes Index \$T_{\delta}\$.](#)

Paleontology

- [Implosion and maximum inhabitable depths throughout ontogeny in phragmocone-bearing cephalopods: the Punctuated Pfaff Model.](#)
- [Landscape-explicit phylogeography illuminates the ecographic radiation of early archosauromorph reptiles; Phys.org summary \[here\]\(#\).](#)
- [The Early Miocene muroids \(Muroidea, Rodentia\) of the Ribesalbes-Alcora Basin \(Spain\): A thriving haven during a time of migration.](#)
- [A new Mongolian tyrannosauroid and the evolution of Eutyranosauria; behind a paywall, Phys.org summary \[here\]\(#\).](#)
- [Major Shifts in Equatorial Atlantic and Pacific Calcareous Nannofossil Assemblages Across the Early Eocene Climatic Optimum \(EECO; ~53–49 Ma\).](#)
- [New insects from the Permian of Catalonia \(Spain\) predate the early diversification of Triassic clades adapted to arid environments \(Grylloblattodea, Probnidae, Dictyoptera\).](#)
- [Quantitative decoding of Ediacaran locomotory trace fossil morphologies: Evidence for the emergence of slender anterior-posterior body profiles.](#)
- [A tectonically driven 60 million-year biogeochemical redox cycle paces marine biodiversity.](#)

Mining and Energy

- [China achieves breakthrough in rubidium extraction.](#)
- [Pakistan Strikes Critical Win With Oil, Gas Wildcat Discovery.](#)
- [U.S. natural gas storage capacity increased in 2024.](#)
- Exploration tools: [Spatial interrelation matters: advancing 3D mineral prospectivity modeling with fully-connected CRFs—insights from Sanshandao Gold Belt, Eastern China.](#)
- Utah: [Fervo Energy lands \\$206M in financing to build massive geothermal power plant.](#)
- [Lower-grade Australian iron ore sparks global benchmark change.](#)
- Nova Scotia: [3 more municipalities ask province to hit the brakes on uranium exploration in N.S.](#)
- [EIA Calls Peak Shale as Drilling Activity Declines.](#)
- [Permian Oil Producers Face Higher Costs With New Saltwater Rules.](#)
- Geothermal: [Glasgow and Edinburgh sitting on 'energy bonanza' as geologists highlight Scottish 'super region'.](#)
- [US Interior publicly backs rare earth mine next to Mountain Pass.](#)

Ore and Petroleum Geology

- Petroleum exploration: [New Pattern of Uplift-Depression of the Pre-Cambrian Basement in the Sichuan Basin: Constraints From Multi-Seismic Parameter Imaging.](#)
- [The characteristics and helium generation potential of helium source rocks in the northern Ordos Basin, China.](#)
- [Characteristics of ore-forming fluids of Li-Be deposits and its application to mineral exploration in Middle Altun Region, Xinjiang.](#)
- [The origin of glimmerite and its significance to rare earth element mineralization: Insights from the Longbaoshan deposit in North China Craton.](#)
- [Enhanced solubility of gold in crude oil at high temperatures: new insights into ore genesis.](#)
- [Geochronology, geochemistry, and Hf isotopic compositions of the Jintonghu porphyry Cu-Mo deposit in the Zijinshan ore district, SE China: Insights into the controlling factors on magma fertility.](#)
- [Geochemical characteristics and their implications on mineralization of biotite from the Maodeng Mo-Bi-Sn-Cu deposit, southern Great Xing'an Range, China.](#)
- [Facies architecture, ore genesis \(Zn-Pb-Cu\) and structural evolution of the Paleoproterozoic Aijala–Metsämonttu area, SW Finland.](#)

- 06/09 Ore geology: [Zinc and cadmium isotopes in pyrite constraint on metal sources in the Guoluolongwa orogenic gold deposit, East Kunlun metallogenic belt.](#)

Pretty Shiny Rocks

- [KORITE acquisition in Alberta creates world's only mine-to-market ammolite producer;](#) ammolite is fossil [ammonite](#) shell turned into jewelry.
- [The world's second-largest diamond: a stunning 2,492-carat gem found in an unexpected location.](#)

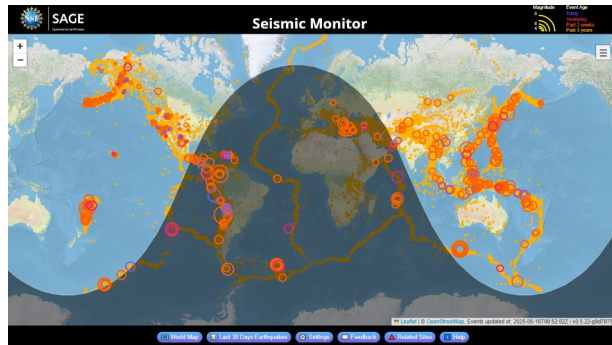
Environmental Geology and Hydrogeology

- [‘It’s scary’: Residents say their groundwater is contaminated by firefighting foam from Newfoundland airport.](#)
- [Past aquifer responses to climate recorded by fossil groundwater.](#)
- [Human perturbations to mercury in global rivers;](#) Phys.org summary [here](#).
- Salton Sea: [The situation at Calif.'s most contaminated lake is likely worse than we thought.](#)
- [How groundwater pumping is causing cities to sink at ‘worrying speed’.](#)
- [Jarosite: a golden sponge to mop up metals.](#)
- South Africa: [Coal mining fear sparks unexpected conservation boom in Mpumalanga.](#)
- France: [Hydrogeological situation as of June 1, 2025](#)

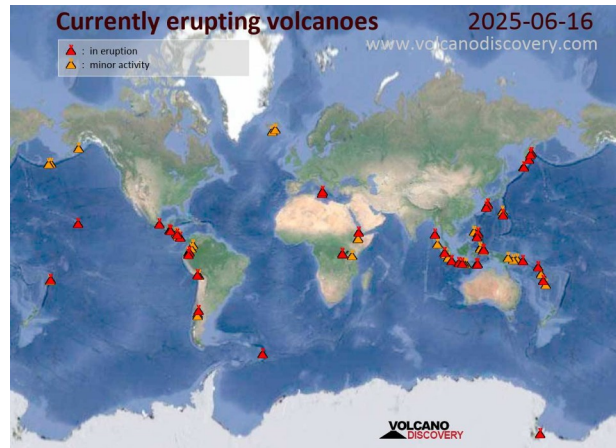
Glaciers and Climate Change

- [Potential Ice Sheet Modulation of Volcanism in West Antarctica: Constraints on the Cadence and Magnitude of Melt Delivery Into the Crust.](#)
- [Episodic reef growth in the Last Interglacial driven by competing influence of polar ice sheets to sea level rise.](#)
- [European Temperature Extremes Under Different AMOC Scenarios in the Community Earth System Model;](#) Phys.org summary [here](#).
- [Sustained decrease in inland East Antarctic surface mass balance between 2005 and 2020.](#)

Volcanoes, Earthquakes and Geohazards



[Seismic Monitor](#)



[Active Volcano Map](#)

Volcanoes

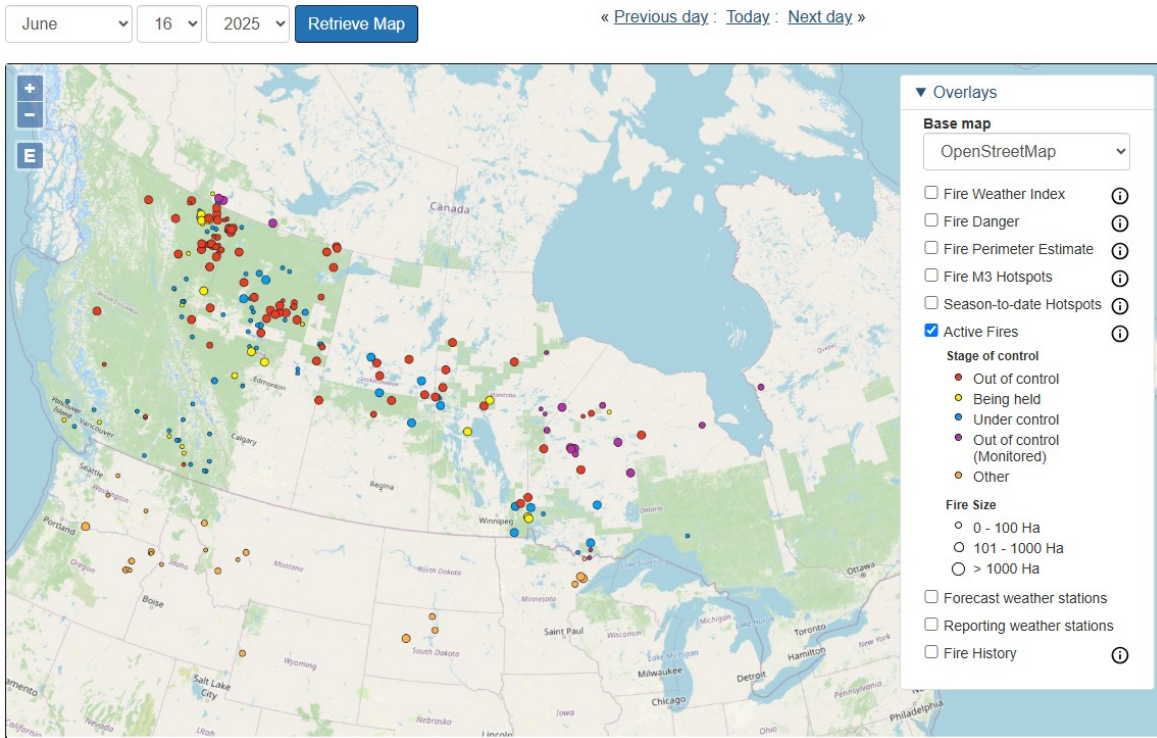
- [Smithsonian / USGS Weekly Volcanic Activity Report](#).
- United States Geological Survey (USGS) Volcano Observatories:
 - [Cascades Volcano Observatory Weekly Update](#).
 - Volcano Watch – [Six Months of Halema'uma'u Lava Fountains](#).
 - [YVO's plan for responding to future geological hazards in Yellowstone National Park](#).
- [Volcanic Radiative Power Retrieval From Moderate-to-Low-Temperature Features Using a Single TIR Band: Validation Using Volcanic Crater Lakes and Hydrothermal Systems](#).
- [Control of Gravitational Potential Energy on the Distribution of Off-Rift Volcanic Activity in the Turkana Depression, East African Rift](#).
- [Influence of cristobalite and diktytaxitic textures on the physical properties of submarine rhyolite lavas from Havre volcano \(Kermadec volcanic arc, Pacific Ocean\)](#).
- [Stealthy magma system behavior at Veniaminof Volcano, Alaska](#); Phys.org summary [here](#).

Earthquakes

- [Euro-Mediterranean Seismological Centre \(EMSC\)](#).
- [Earthquakes Monitoring Live Worldwide](#).
- [The Role of Disorder in Foreshock Activity](#).
- Triggering earthquakes: [Triggering Intensity Changes Over Time and Space as Measured by Continuous Waveforms in Southern California](#).

- [Bi-Segment Fault Rupture and Long-Lasting Intraslab Aftershock Activity During the 2017 Mw 8.2 Tehuantepec, Mexico Earthquake.](#)
- [The 2021 \$M_w\$ 5.6 Earthquake in the Guyana Shield, South America: An Intraplate Event with No Reason to Occur.](#)

Wildfires and Other Geohazards



Interactive Wildfire Map of Canada

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

- [Future climate-driven fires may boost ocean productivity in the iron-limited North Atlantic;](#) Phys.org summary [here](#).
- Floods: [Assessing Causes and Consequences of Winter Surface Water Dynamics in California's Central Valley Using Satellite Remote Sensing;](#) Phys.org summary [here](#).

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](#).

Upcoming Events

- 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 8th & 10th](#); during the Calgary Stampede.
- [August 3 – 7, Golden, Colorado, 18th Biennial meeting of the Society of Geology Applied to Mineral Deposits](#).
- [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; next one tonight, June 16th.

June 16, 2025

Geology and the Fate of Societies – Kyrgyzstan



Figure 1a – Kyrgyzstan

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



Figure 1b – Location of Kyrgyzstan

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

[Kyrgyzstan](#), officially called the [Kyrgyz Republic](#), is a landlocked country in [Central Asia](#) within the [Tian Shan](#) mountain range. Kyrgyzstan borders on: [China](#), to the southeast; [Tajikistan](#), to the south; [Uzbekistan](#), to the west; and [Kazakhstan](#), to the north. The [government of Kyrgyzstan](#) is a unitary [presidential republic](#); the President is [Sadyr Japarov](#); and the [Chairman of the Cabinet of Ministers](#) is [Adyibek Kasymaliev](#). The legislature is the [Supreme Council](#), the Speaker of which is [Nurlanbek Shakiev](#). The Capital and largest city in Kyrgyzstan is [Bishkek](#) (pop. 1,321,900).

According to the [Central Intelligence Agency](#) (CIA) [World Factbook on Kyrgyzstan](#), the total area of the country is 199,951 square kilometres (km²) of which 191,801 km² is land and 8,150 km² is water. Also according to the CIA, 6,172,101 people live in Kyrgyzstan, 37.8% live in urban areas. Of those approximately 6.17 million people, 73.8% are ethnic [Kyrgyz](#); 14.8% are [Uzbeks](#); 5.1% are [Russians](#); and 1.1% are [Dungans](#). The remaining 5.2% includes [Uyghurs](#), [Tajiks](#), [Turks](#), [Kazakhs](#), [Tatars](#), [Ukrainians](#), [Koreans](#), and [Germans](#). In terms of religion, most people in Kyrgyzstan, 90%, are [Muslim](#), and most of those are [Sunni Moslems](#). Of the remaining: 7% are [Christians](#) and the remaining 3% are other including [Jews](#), [Buddhists](#), and [Baha'i](#). Interestingly, given the past dominance of [Marxist-Leninist Communism](#) when the country was the [Kirghiz Soviet Socialist Republic](#), few people identify as [atheist](#). In terms of education, the CIA World Factbook indicates that 99.6% of the people in Kyrgyzstan can read and write and that they can expect to stay in school for 14 years.

Economically, the per capita [GDP \(PPP\)](#) of Kyrgyzstan is \$7,744; the [Gini coefficient](#) is 26.4, indicating low inequality; and the [Human Development Index](#) is high at 0.701. In 2023, the top exports of Kyrgyzstan were gold (\$1.64b), coal briquettes (\$236m), precious metal ore (\$197m), refined petroleum

(\$136m), and broadcasting equipment (\$92.6m). The top destinations were Switzerland (\$1.18B), Russia (\$746M), Kazakhstan (\$559M), United Arab Emirates (\$415M), and Turkey (\$316M). Also in 2023, [the top imports of Kyrgyzstan](#) were cars (\$3.8b), refined petroleum (\$738m), light rubberized knitted fabric (\$413m), motor vehicles; parts and accessories (\$286m), and broadcasting equipment (\$257m there seems to be some re-manufacturing going on). The top origins were China (\$7.85B), Russia (\$2.18B), Kazakhstan (\$1.09B), Turkey (\$1.01B), and Uzbekistan (\$769M). In the latest year, Kyrgyzstan was the world's largest importer of metallic fabric (\$3.04M).

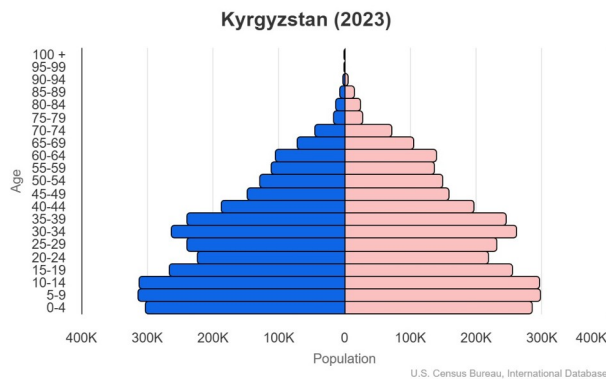


Figure 2 – Demographics of Kyrgyzstan
 Credit: U.S. Census Bureau, International Database, public domain

The demographics of Kyrgyzstan show a young to middle aged society where the median age in Kyrgyzstan is 28.3 years. 29.1% of the population are under 15 years of age; 64% are between 15 and 64; and 6.9% are over 65. Interestingly, in the middle aged group (15-64 years) females outnumber males (2,013,733 to 1,935,200). The total fertility is 2.47 births per woman (above the replacement rate of 2.1); the net migration rate is -4.8 migrant(s)/1,000 population; and the subsequent annual growth rate is 0.82%. The life expectancy at birth for both sexes is 72.9 years (68.9 for males and 77.2 for females).

Geology

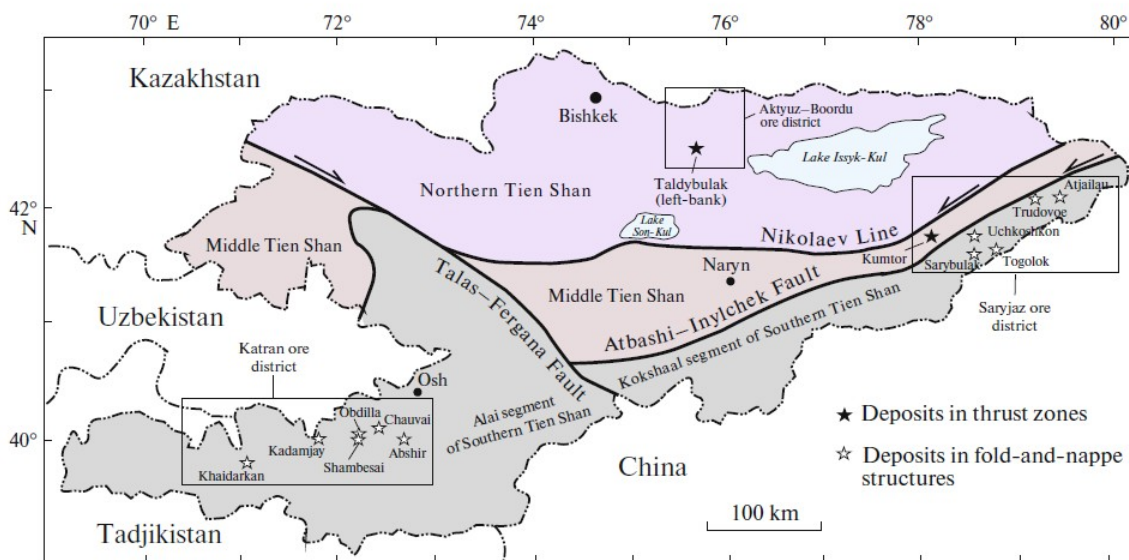


Figure 3 – Tectonic Structure of Kyrgyzstan
 Credit: Figure 1 in Trifonov, 2023

The [geology of Kyrgyzstan](#) is a fairly complex and is the result of a [long tectonic development](#) beginning during the [Proterozoic Eon](#) and continuing up to the present [Cenozoic Era](#).

The main divisions of Kyrgyzstan geology are:

- The [Northern Tien Shan](#),
- The [Middle Tien Shan](#), and
- The [Southern Tien Shan](#).

The North Tien Shan, east of the [Talas-Fergana Fault](#), is made up of several [Precambrian](#) aged blocks together with Lower [Paleozoic](#) ([Cambrian](#) and [Ordovician](#)) aged [ophiolites](#) and marine sediments. These are in turn overlain by Ordovician aged sediments and volcanic rocks with [I-type granite](#) intrusions. The Northern Tien Shan region includes the southern margin of the [Kazakh–Kyrgyz Terrane](#) formed by [subduction](#) and [accretion](#) during the [Carboniferous](#) and [Early Permian](#). Further north, the Upper Paleozoic (Carboniferous and [Permian](#)) [Yili Block](#) is a [continental volcanic arc](#) that overlies Lower Paleozoic accretionary rocks.

The Middle Tien Shan, sometimes called the Sydarya, Naryn, or Ishim–Middle Tien Shan [microcontinent](#), is made up of [Neoproterozoic](#) formations that includes [tillites](#) (glacial deposits from the [Cryogenian](#)), and volcanic rocks. Between the North and Middle Tien Shan regions is the [Terskey Suture](#), also called the [Nikolaev Line](#). This dividing line is an artifact of the closure Upper Paleozoic [Terskey Ocean](#). The northern margin of the Middle Tien Shan microcontinent is the Lower Palaeozoic [Karatau-Talas Terrane](#). Various carbonate and clastic sediments were deposited during [Devonian](#) and Carboniferous times when the Middle Tien Shan was a passive continental margin.

The [South Tien Shan Suture](#) (a.k.a the Turkestan Suture) separates the Middle and South Tien Shan regions. The South Tien Shan region is a Late Paleozoic [fold and thrust belt](#) formed by the closure of the [Turkestan Ocean](#). The [suture](#), in the middle of the fold and thrust belt, contains [Lower Ordovician](#) to [Lower Carboniferous](#) aged ophiolites. The South Tien Shan region is located at the southwest margin of the [Central Asian Orogenic Belt](#).

Following the initial formation of the rocks of the Tien Shan Mountains of Kyrgyzstan, there were two more important mountain building events:

1. The Lower [Mesozoic](#) ([Triassic](#) and [Lower Jurassic](#)) [Cimmerian Orogeny](#), and
2. The [Cenozoic collision of India and Eurasia](#); the effect on the Tien Shan in Kyrgyzstan is discussed [here](#).

To repeat, the geology of Kyrgyzstan is very complicated. If you want to dig into it further, start with some of the links above such as this [one](#). The state geological service website is [here](#). You can order geological maps from the Kyrgyz geological service [here](#). If you are interested in buying detailed geologic maps of Kyrgyzstan, you can find them [here](#) (they date from Soviet times, so brush up on your Russian). Figure 4 links to an [interactive geological map of Kyrgyzstan from Macrostrat](#).

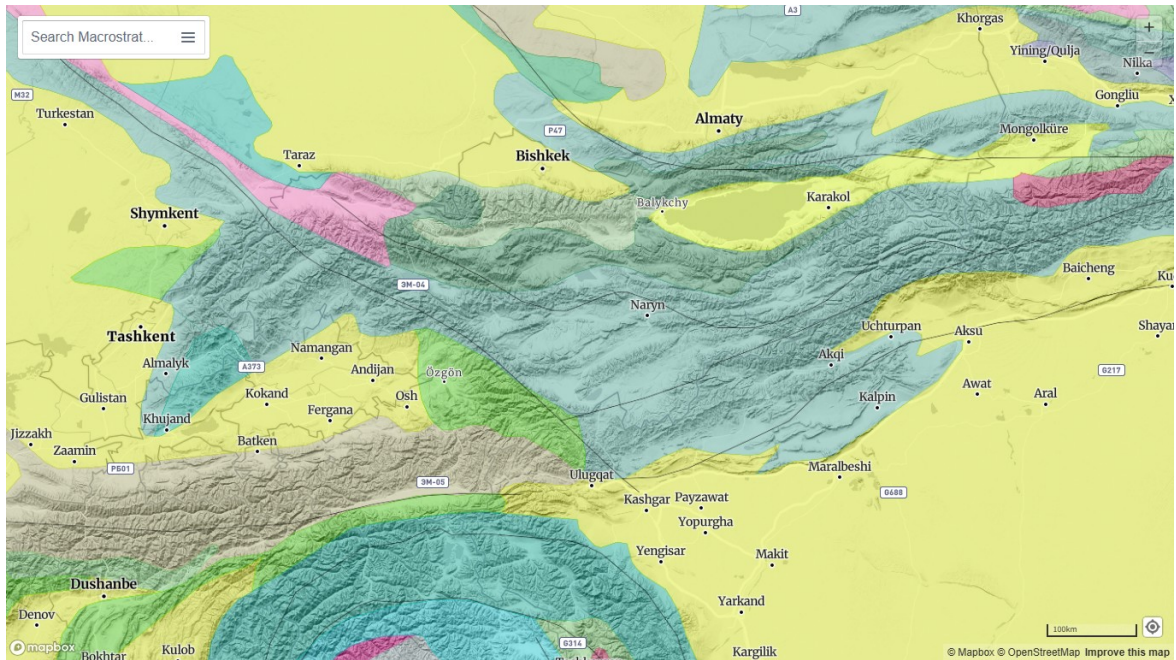


Figure 4 – Interactive Geological Map of Kyrgyzstan

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

Resources

Agriculture



Figure 5 – Irrigated Farmland near [Tamchy](#)

Credit: [Vmenkov](#), [Creative Commons Attribution-Share Alike 3.0 Unported](#), [2.5 Generic](#), [2.0 Generic](#) and [1.0 Generic](#) license

According to the CIA World Factbook, 54% of the land area of Kyrgyzstan is agricultural land (6.7% arable land, 0.4% permanent crops, 46.9% permanent pasture). 10,041 km² of the land is irrigated, this is about 78% of the arable land. Of the remaining land, 7% is forest and 38.9% has other, or no, use. Also according to the CIA, agriculture accounts for 9.7% of the country's GDP. The top ten agricultural products of Kyrgyzstan, based on tonnage produced are milk, potatoes, maize, sugar beets, wheat, barley, tomatoes, onions, watermelons, carrots/turnips. Production statistics from the [United Nations Food and Agriculture Organization](#) (FAO) can be found [here](#). Also according to the [FAO](#), 7% of the population suffered from moderate to severe food insecurity 2021-23. Current agriculture conditions in Kyrgyzstan from the FAO can be found [here](#). The Kyrgyz people are great meat lovers, their [traditional dishes](#) revolve around beef, mutton and horse meat.

Mineral Resources



Figure 6 – Khaidarkanite Sample from the Fergana Valley

Credit: Robert M. Lavinsky, [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

According to the [USGS 2022 Minerals Yearbook](#) on Kyrgyzstan, the mineral industry in the country produces metallic minerals, industrial minerals, and fuel minerals. Metallic minerals include: antimony, copper, gold, mercury, and silver. Industrial minerals include: cement, kaolinite clay, gypsum, lime, rock salt, silica sand, sand and gravel aggregate, together with dimension stone - granite, limestone and marble. Fuel minerals include coal, natural gas, petroleum.

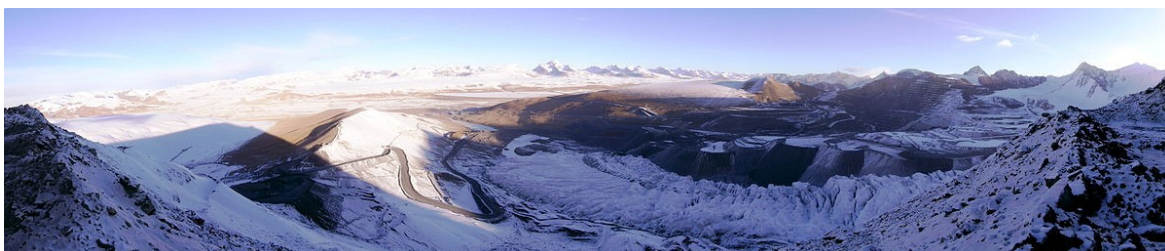


Figure 7 – Panoramic View of the Kuntor Gold Mine

Credit: Michael Karavanov, [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

Table 2 in the [2022 USGS Mineral Yearbook](#) lists the locations of the various mines in Kyrgyzstan while Table 1 in the limited [2023 data release](#) lists the most recent production statistics. For information on the general geology of ore deposits in Kyrgyzstan, check out Trifonov, B.A., 2022, *Ore Deposits of Kyrgyzstan Controlled by Thrust-Tectonics Structures*. Geol. Ore Deposits 64 (Suppl 2), S191–S204 (2022). <https://doi.org/10.1134/S1075701522100099>; Research Gate version [here](#).

Major mines in Kyrgyzstan include:

- The [Kalesay mine](#), a beryllium mine in [Issyk Kul Province](#);
- The [Bozymchak](#) copper and gold mine in [Jalal-Abad Province](#); and
- The [Kumtor](#), [Makmal](#), [Talas](#), and [Unkurtash](#) gold mines.

Uranium was formerly mined at [Mailuu-Suu](#), however it was closed soon after 1991. Uranium from Kazakhstan continues to be processed at the mill in [Kara-Balta](#).

Petroleum and natural gas deposits include [fields in the Fergana Valley](#). There are also about [70 coal deposits exploited in Kyrgyzstan](#).

Figure 8 links to an [interactive mineral occurrence map](#) of Kyrgyzstan.

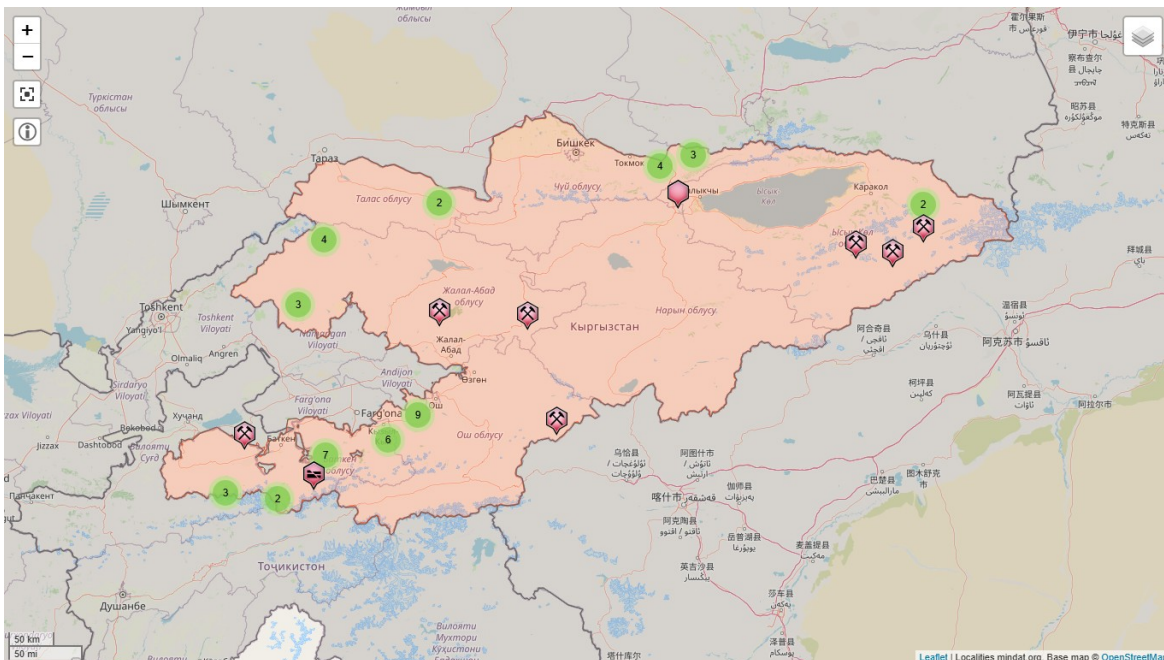
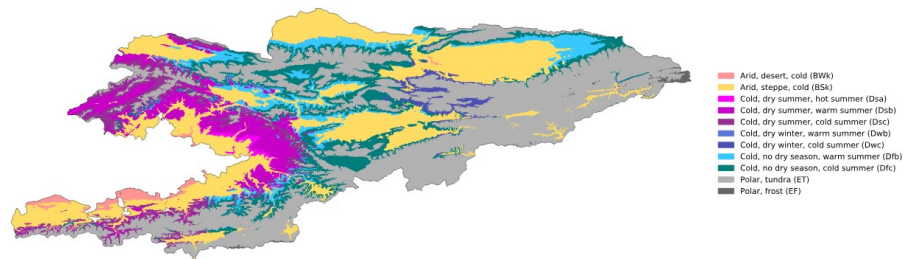


Figure 8 – Interactive Mineral Occurrence Map of Kyrgyzstan
Credit: ©Mindat.org

Climate

Köppen-Geiger climate classification map for Kyrgyzstan (1991-2020)



Source: Beck et al. (2023): High-resolution (1 km) Köppen-Geiger maps for 1901-2019 based on constrained CMIP6 projections, Scientific Data 10:724. doi:10.1038/s41597-023-02549-6.

Figure 9 – Köppen-Geiger Climate Classification Map for Kyrgyzstan

Credit: Beck et al, 2023, Creative Commons Attribution-Share Alike 4.0 International license

Kyrgyzstan has a generally cold climate varying with altitude. Climate zones include: cold, arid, desert ([BWk](#)); cold arid steppe ([BSk](#)), [cold continental](#) ([Dsa](#), [Dsb](#), [Dsc](#), [Dwb](#), [Dwc](#), [Dfb](#), [Dfc](#)), and, in the high country, polar climates ([ET](#) and [EF](#)).

If you plan to go to Kyrgyzstan, you might want to stick to the summer months. The travel advisories ([here](#) and [here](#)) advise caution due to various kinds of crime as well as possible conflict in the borderlands with Uzbekistan and Tajikistan. The American [Center for Disease Control](#) warns against a variety of infectious diseases. If you still want to go, the [Kyrgyz government tourism site](#) lists a number of interesting attractions. Also, check out [Lonely Planet](#) and [Climates to Travel](#). One interesting thing that I came across is the [Museum of Geology](#) within the [Institute of Mining and Mining Technologies, Bishkek](#).

History and Geopolitics

History



Figure 10 – Kyrgyz Khanate ca. 840-924 AD

Credit: Postmann Michael, public domain

Like many places, Kyrgyzstan has an interesting [history](#) and if you like to go into details, check out these sites [here](#), [here](#), and [here](#). I'll give a [brief summary](#) below:

Ancient and Medieval Periods

The earliest people to live in what is now Kyrgyzstan were nomadic tribes from the [Eurasian Steppe](#) (the Steppe) such as the [Scythians](#). Beginning in the [early medieval period](#), [Turkic](#) tribes, such as the Kyrgyz people, migrated into the region from the Steppe. The Kyrgyz people appear to have originated in the [Yenisei River](#) region of [Siberia](#) and established [a rule over much of the Steppe](#) region during the 10th Century.

The Mongols

In the 13th Century, under the leadership of [Genghis Khan](#), the [Mongols](#) and their allies conquered all of the Steppe region, and much of the territory beyond,. Genghis Khan also left his genetic mark on the region, about [16 million people today](#) have a [haplotype](#) indicating descent from the Great Khan. In the 14th Century, one of Genghis Khan's descendants [Timur \(i.e. Tamerlane\)](#) established his own empire, that included modern day Kyrgyzstan. Following Tamerlane, numerous [Central Asian khanates](#) (but not the fictional [Greater Tartaria](#)) ruled the Steppe and Kyrgyzstan until the [Russians showed up in the 19th Century](#).



Figure 11 – Statue of [V. I. Lenin](#), dismantled [June 7, 2025](#)

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

The [Russian Empire](#) began encroaching on the lands around modern Kyrgyzstan beginning in 1839. By 1895, the Russians had subdued the various khanates in Central Asia and incorporated them as [Russian Turkestan](#). When the Russian Empire fell to the [Bolsheviks](#) in 1917, the new [Soviet Union](#) organized the

Kyrgyzstan territories first into the [Kara-Kyrgyz Autonomous Oblast](#) of the [Russian SFSR](#), then in 1926 into the [Kirghiz Autonomous Soviet Socialist Republic](#), and finally, in 1936 as the [Kirghiz Soviet Socialist Republic](#). Under Soviet rule, Kyrgyzstan experienced increased levels of education and economic development. They Soviets also brought in [forced collectivization](#) and [mass murders](#) of political dissidents.

The Modern Era Since 1991

With the [end of the Soviet Union in 1991](#), Kyrgyzstan declared its [independence](#) on August 31, 1991. It has not been an easy time. The first President after independence, [Askar Akayev](#), was accused of corruption and overthrown in the [Tulip Revolution of 2005](#) (if you think it was a [Colour Revolution](#), you [might be right](#)). Akayev's successor, [Kurmanbek Bakiyev](#) stayed in office until 2010 until he was also overthrown in [another uprising](#) following allegations of [corruption](#) and autocratic rule that included [extra-judicial killings](#). During the recent [Afghan War](#), the United States established an [airbase in Kyrgyzstan](#), a deal that apparently involved [generous profits for Bakiyev](#). Following his overthrow, Bakiyev was [sentenced to jail for his crimes](#).

The current President, Sadyr Japarov has also been accused of [human rights abuses and dictatorial rule](#). Sadly, I don't think that the Kyrgyz people can get a break.

Geopolitics



Figure 12 – Bread for Sale in the Bazaar in Osh
Credit: Ben Paarmann, [Creative Commons Attribution 2.0 Generic](#) license

Kyrgyzstan's main internal problem is establishing a rule of law that works for everyone and is respected by everyone. Both history and culture work against this. For most of its history, the Kyrgyz have been ruled by autocratic rulers, be they the Khans, the Russian Tsar or the Soviet Commissars. Post Soviet rulers have often resorted to autocratic methods, some worse than others. The corruption that accompanies autocratic rule is almost a given; [Transparency International ranks Kyrgyzstan](#) at 146/180 in terms of corruption. Not the absolute worst but fairly low on the list. People lead by example, a corrupt ruler will be matched by abundant criminality in the population. They have quite a challenge to fix this.

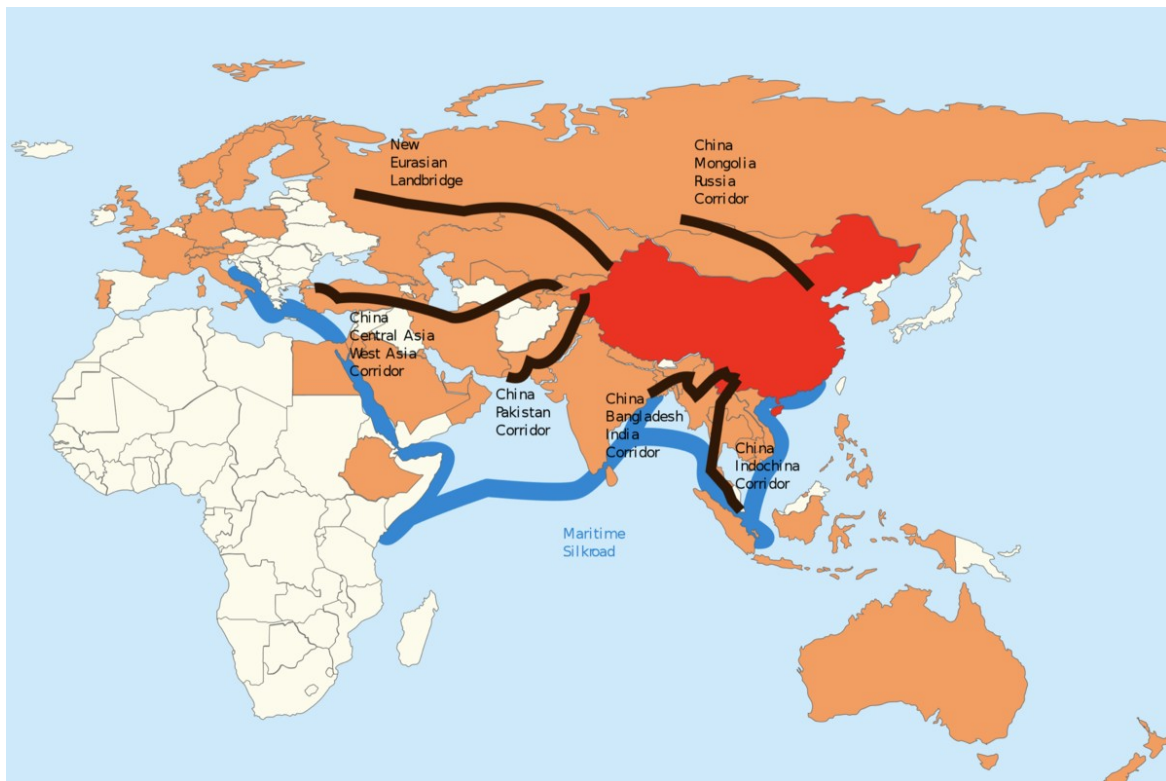


Figure 13 – China's Belt and Road Initiative

Credit: Mathildem16, [Creative Commons Attribution-Share Alike 4.0 International license](#)

As if their internal challenges are not enough, Kyrgyzstan has mixed relations with their neighbours. China and Kyrgyzstan have a [strong commercial relationship](#), perhaps too strong with a strong hint a [predatory practises on the part of China](#). For people who are officially Communist, the Chinese have shown themselves to be astute capitalists. The Chinese also appear to be establishing themselves as the Asian hegemon through the [Belt and Road Initiative](#). Kyrgyzstan needs to be astute to avoid losing their hard won independence.

The [relationship between Kyrgyzstan and Kazakhstan](#) is also peaceful, and primarily commercial. As noted above, uranium ore from Kazakhstan is processed in Kyrgyzstan. In 2024 the two states signed a [commercial treaty](#).

[Kyrgyzstan and Uzbekistan](#) have peaceful, commercial relations. In March this year, the Kyrgyz, Tajik, and Uzbek presidents held a [trilateral summit to discuss their differences](#). Among the items was the brief [border war in 2021](#) between Kyrgyzstan and Tajikistan, a dispute that ended in a [negotiated settlement](#). It remains to be seen if the deal holds and Kyrgyzstan can maintain a peaceful relationship with [Tajikistan](#).

Further afield there is [Russia](#) and the [United States](#). Since the end of the Afghan War, the United States relationship with Kyrgyzstan has [become more distant](#). Perhaps it's just as well.

On the other hand, Russian influence in their [former territory has increased](#). Russia has a natural interest in nearby Kyrgyzstan and a recent agreement has increased the opportunities for [commercial and security collaboration](#). The Kyrgyz may also be seeking a counterbalance to their engagement with China while Russia is seeking influence in Central Asia.

I don't know what to make of Kyrgyzstan's future. I think that they will work out their internal issues, it may involve further bloodshed at some point. Internationally, they are stuck between two major Eurasian powers, one of which, Russia, is a former colonial master, and the other, China, has the potential to make itself a colonial master. Both China and Russia [have similar goals in Central Asia](#). It is hard to see how Kyrgyzstan will fare, perhaps they will succeed in successfully balancing off the Great Powers in their neighbourhood. I can only wish the best for the people of Kyrgyzstan.

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.