

April 27, 2026

## News and notes

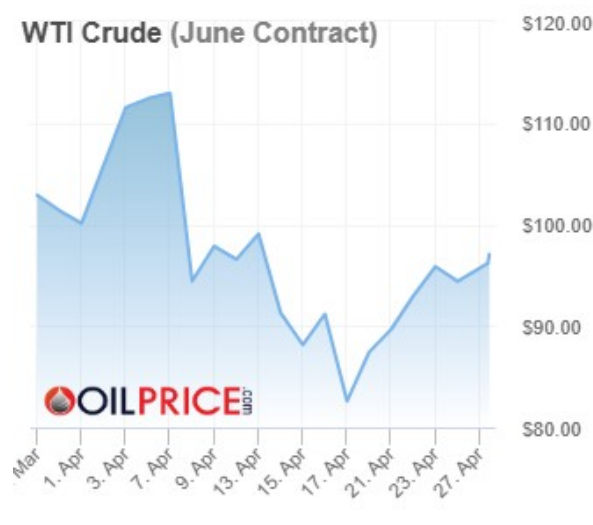
This week, before going on to discuss the geology and mineral resources of Papua New Guinea, we will first look at some news items I thought were interesting. For my news items, I try to stick to open access papers.

If you enjoy my blogs, bookmark the site and check on Mondays rather than relying on social media postings which can get lost in the shuffle.

## Comments

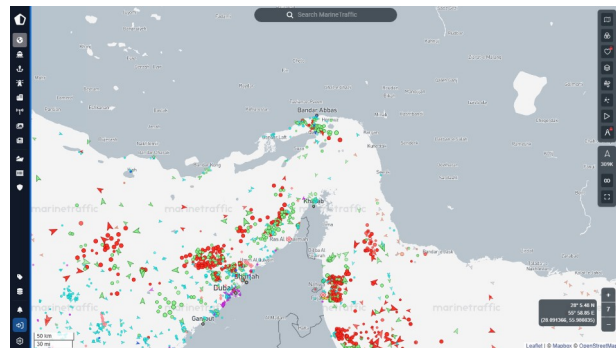
If anyone has comments on any of my postings, please leave a comment on the LinkedIn page for the posting or email me at [raymondreichelt@gmail.com](mailto:raymondreichelt@gmail.com).

## Geopolitics



Oil prices up to April 27, 2026

Credit: [Oilprice.com](https://oilprice.com)



Marine Traffic in the Strait of Hormuz

Credit: [marinetraffic.com](https://marinetraffic.com)

### Cats With Nine Lives

- [Trump faces unprecedented third assassination attempt.](#)

### Iran War

- [Ongoing coverage of the Iran War.](#)
- [Thanks to Trump: The US Now Controls the World's Major Oil Transit Chokepoints.](#)
- Pretty well all the news in [Oilprice.com](https://oilprice.com) is now on the Iran War.
- [War squeezes global mining as diesel and acid supplies tighten.](#)
- [War in Iran is causing biggest energy crisis in history, IEA says.](#)

- Opinion: [The War Will Be Won or Lost at the Strait of Hormuz.](#)

### **Other Geopolitics**

- [Militants and separatists launch coordinated attacks across Mali.](#)
- War and geophysics: [Exploiting Air-to-Ground Coupled Waves from Airstrike-Triggered Explosions in Syria.](#)
- Video: [Pakistan's Conflict with Afghanistan is Becoming a Forever War.](#)
- [Europe Turns on Turkey as the War Cycle Expands.](#)
- [The Middle Corridor Emerges As A Strategic Lifeline For Global Trade.](#)

### **Research and News**

- [A Common Mantle Source for the Endogenous CO<sub>2</sub> Degassed at the Eifel \(Western Germany\) and the Ardennes \(Eastern Belgium\) Regions.](#)
- [Shifting the Paradigm: Redefining the Chronostratigraphy of the Triassic Rewan Group, Bowen Basin, Australia.](#)
- [Zircon U-Pb, Hf isotope and trace element geochemistry from the newly found Neoproterozoic granitoids in Wadh-Khuzdar area, Balochistan, Pakistan: constraints on magma genesis and tectonic settings.](#)
- [The geology of the Twelve Apostles in the Port Campbell Embayment in southeast Australia.](#)
- [Mid-infrared spectroscopy applied to a multi-level cave system \(Montmaurin, SW France\): An innovative method for assessing sediment provenance.](#)
- [Rb-Sr isotopic systematics across the mafic-felsic transition in the Bushveld complex: Implications for granite petrogenesis and hydrothermal processes.](#)
- [Modern microbial landscape: Aerial mapping of microbially induced sedimentary structures forming in a coastal sabkha.](#)
- [Niobobaotite, Ba<sup>4</sup>\(Ti<sub>2.5</sub>Fe<sup>2+</sup><sub>1.5</sub>\)<sub>4</sub>Nb<sub>4</sub>\(Si<sub>4</sub>O<sub>12</sub>\)O<sub>16</sub>Cl, a new mineral species from the Bayan Obo REE-Nb-Fe deposit, Inner Mongolia, China.](#)
- [UK Minerals Yearbook 2025 now available.](#)
- [Sedimentology of silica granules and haematite in the 3.47 Ga Antarctic Creek Member, Mount Ada Basalt, Western Australia.](#)
- [Controls on canyon formation along mud-rich continental margins.](#)
- Geological history: [Emergence of Continents Stabilized the Bioavailability of Boron.](#)

## Plate Tectonics

- [Seismic Stratigraphy and Tectonic Evolution of the Forearc Georgia Basin \(Upper Cretaceous–Miocene\), Canada and USA, With Implications for CO<sub>2</sub> Sequestration.](#)
- [Quaternary landscape evolution of Apennines peri-Adriatic belt: Insights into climate and tectonics from the fluvial record.](#)
- [Deciphering grain-size reduction as a driver of mid-lithosphere discontinuity formation.](#)
- [Necking of the active Turkana Rift Zone and the priming of eastern Africa for continental breakup.](#)
- [Polycyclic Metamorphism, Exhumation, and Recycling of Subduction Complex Rocks, Cedros Island, Baja California.](#)
- [Tectonic switching within a long-lived convergent margin: evidence from the geochemistry of Paleoproterozoic granitoids, Dajarra region, Mount Isa Inlier.](#)
- [Cretaceous–Neogene structural architecture, normal faulting, and sedimentary basin development in the Ruby metamorphic core complex domain, northeast Nevada, USA.](#)
- [Volcanic History of Rodrigues Island and Its Relationship With the Central Indian Ridge and the Réunion Hotspot.](#)
- [Subduction Initiation Volcanism Leading to Development of the Talkeetna Arc, Lower Shuyak Formation, Kodiak Archipelago, Alaska.](#)

## Paleontology

- [Pliocene carnivorans from Jradzor, Armenia.](#)
- [A new species of a bony spur-thighed tortoise from the Early Pliocene \(MN15\) of Jradzor site, Armenia, and the origin of the \*Testudo graeca\* \(Testudines, Testudinidae\) complex.](#)
- [Earliest octopuses were giant top predators in Cretaceous oceans; ScienceNews summary \[here\]\(#\).](#)
- [Pinnaculosum gen. nov.: a fossil form-genus for pinnacled biological soil crust.](#)
- [A Quantitative Framework for Assessing Locomotor Asymmetry in Dinosaur Trackways: Testing the Evidence for Limping and Lateral Preference.](#)
- [Evolution of sideways locomotion in crabs; Study Finds summary \[here\]\(#\).](#)
- [Polychaete annelids from the earliest Cambrian Period.](#)
- [A True Bug with a True but Unique Chela in 100 Million-Year-Old Amber; Eureka Alert summary \[here\]\(#\); the bug was named after the K Pop band, \[Stray Kids\]\(#\).](#)

- [New data on the sarcopterygian \*Koharalepis jarviki\* \(Tetrapodomorpha; Canowindridae\) from the Late Devonian of Antarctica, revealed via synchrotron and neutron tomography](#); Phys.org summary [here](#).

## Ore Deposit Geology

- [Crustal recycling and metamorphic dehydration govern the fertility of granite-associated tin systems](#).
- [Symplectitic intergrowths enriched in low-melting-point chalcophile elements and their implications for gold enrichment in the Dadiangou gold deposit, western Qinling Orogen, Central China](#).

## Mining and Energy

- [Brent crude oil spot prices surge past futures price in April](#).
- [U.S. oil producers aren't coming to the rescue despite high prices as mistrust and chaos hit outlook. The 'market is being manipulated'](#).
- [US exporters are plugging a Qatar-sized LNG supply hole – for now: Maguire](#).
- [What You Need to Know About the New Enbridge Sunrise LNG Pipeline Approval](#).
- Visual Capitalist: [These Countries Hold Most of the World's Copper](#).
- [Ghana directs Newmont, AngloGold, Zijin to shift mining ops to local firms by December](#).
- Perovskite: [Synthesis of K- and Fe-rich davemaoite](#), explanation: [perovskite and solar cells](#).
- [Germany discovers a treasure trove beneath an old gas field: 43 million tons of lithium have been found beneath the Altmark region, bringing Europe closer to the great battery revolution](#).

## Environmental Geology and Hydrogeology

- Under “whiskey’s for drinking, water’s for fighting”:
  - [Boreholes are booming in a drying South Africa – how the government plans to tighten controls](#).
  - [Golf \(dis\)courses: A political ecology analysis of water usage in an arid area](#).
- [Legacy coal mines tied to toxic selenium levels in Alberta lake, as legal pressure mounts for cleanup](#).
- [Asia’s longest free-flowing river contaminated by arsenic linked to Myanmar mines](#).

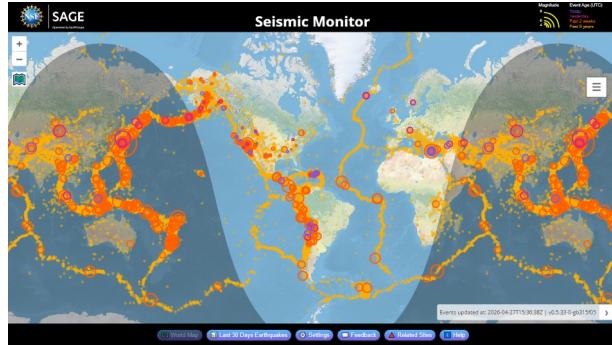
## Glaciers and Climate Change

- Lots of recent papers on glaciers in [The Cryosphere](#) from the EGU.
- [Seismic record analysis can reveal a glacier’s past](#).

## Bad Science

- [Killing of Calgary-born scientist tied to mysterious U.S. deaths, disappearances despite quick arrest.](#)

## Volcanoes, Earthquakes and Geohazards



[Seismic Monitor](#)



[Active Volcano Map](#)

## Volcanoes

- [Smithsonian / USGS Weekly Volcanic Activity Report.](#)
- United States Geological Survey (USGS) Volcano Observatories:
  - Yellowstone Caldera Chronicles: [How much water erupts from Old Faithful Geyser?](#)
  - [Cascades Volcano Observatory Weekly Update.](#)
  - Volcano Watch – [Shallow earthquakes and ground deformation at Kīlauea’s summit highlight hazards near Halema‘uma‘u.](#)
- Iceland: [Thríhnúkgígur: The only volcano on Earth where you can descend into a magma chamber.](#)
- [Fault-mediated magma propagation and triggered seismicity revealed by the 2022 São Jorge Azores unrest.](#)
- [Large Deformation, Pressure-Driven Mechanistic Modeling of the 2018 Caldera Collapse at Kīlauea Volcano, HI.](#)

## Earthquakes

- [What triggered the catastrophic 15 January 2022 Hunga eruption?](#)
- Article from Judith A Hubbard and Kyle Bradley on last week’s earthquake: [Another large subduction earthquake off the coast of northern Japan](#); USGS summary [here](#).

## Geohazards

- [A tale of two coasts: Unveiling US Gulf and Atlantic coastal cities at high flood risk.](#)

## 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 together with free online courses, listed [here](#).
- Free [Groundwater Modeling Courses](#) from the HydroGeoCenter.
- [Lectures on groundwater from the IAH, on YouTube.](#)
- From Western Australia: [Carbonatite, lamprophyre and host rocks in the northern Aileron Province.](#)
- The Geology of Indonesia: [Volume 1](#) and [Volume 2.](#)
- Brett Davis' book on veins in a deforming rock mass: "[The Veining Bible](#)"; also at [this site](#).
- From the Mineralogical Society of America: [Handbook of Mineralogy.](#)
- [Systematic geochemical classification of felsic igneous rocks of the Yilgarn Craton.](#)
- From the Arizona Geological Survey: [Geochemistry Diagram Generator v 1.0.](#)
- Online app: [Australia's full national topographic library at your fingertips.](#)

## Upcoming Events

- [May 7-8, 2026 , Core Conference 2026, Alberta Energy Regulator, Core Research Centre, 3545 Research Way NW \(University Research Park\) Calgary, Alberta.](#)
- [GAC-MAC 2026 St. John's NL, St. John's Convention Center, May 25-28, 2026.](#)
- [PEG2026: 11th International Symposium on Granitic Pegmatites; 16th–19th August 2026, in Perth, Western Australia.](#)
- [14-18 September 2026 , IAH 2026, 53rd Congress of the International Association of Hydrogeologists; Budapest Congress Center.](#)
- [September 30 - October 3, 2026 SEG 2026 Conference Salt Lake City, United States.](#)
- [Paleoamerican Odyssey 2026, October 14-17, 2026, Santa Fe Convention Center, Santa Fe, New Mexico.](#)
- [November 2-3, 2026 CCMEC 2026 Victoria Inn Hotel & Convention Centre, Winnipeg, Manitoba.](#)
- [12-20 August 2028, Geosciences for Humanity, 38th International Geological Congress, in the BMO Centre, Calgary.](#)
- [Society of Petroleum Engineers Distinguished Lecturer Schedule.](#)
- [American Geophysical Union List of Upcoming Meetings.](#)
- The Geological Society: [Events & Courses.](#)
- [Upcoming Distinguished Geoscience Australia Lectures \(DGALs\).](#)

April 27, 2026

## Geology and Mineral Resources – Papua New Guinea

### Introduction



Figure 1 – Papua New Guinea

Credit: [Mapsland](#), [Creative Commons Attribution-Share Alike 3.0 Licence](#)

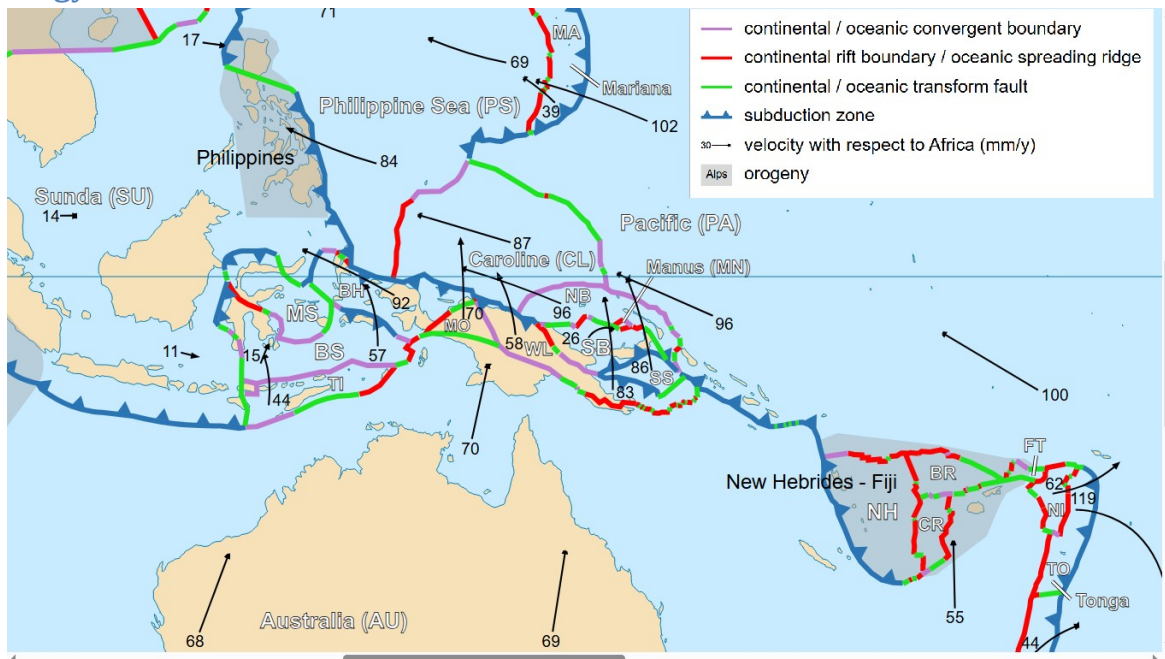
The [Independent State of Papua New Guinea](#) (PNG) is a country of 10,185,363 people ([2024 census](#)) comprising the eastern half of the island of [New Guinea](#) in [Oceania](#). PNG has an area of 462,840 square kilometres and includes a large mainland with hundreds of [Melanesian](#) offshore islands in. PNG has a [land border](#) with the [Indonesian](#) territory of [Western New Guinea](#). The country has maritime borders with [Australia](#) to the south and the [Solomon Islands](#) to the east.

PNG is a relatively poor country with a per capita [GDP \(PPP\)](#) of \$3,760 and a medium [Human Development Index](#) of 0.576. The country's population is largely rural and the [economy](#) is mostly [subsistence agriculture](#) with most of the [capital investment](#) concentrated in natural resources such as mining and petroleum (see below).

In 2024, the top [exports](#) of PNG were natural gas, gold, copper ore, crude petroleum, and palm oil. The top destinations were China, Japan, Australia, South Korea, and Taiwan. In 2024, the top [imports](#) of PNG were refined petroleum, rice, delivery trucks, excavation machinery, and motor vehicles including parts and accessories. The top origins were Australia, China, Singapore, Malaysia, and Japan.

For more details on the country, check out the [Wikipedia](#) and [Grokopedia](#) articles on the country.

## Geology



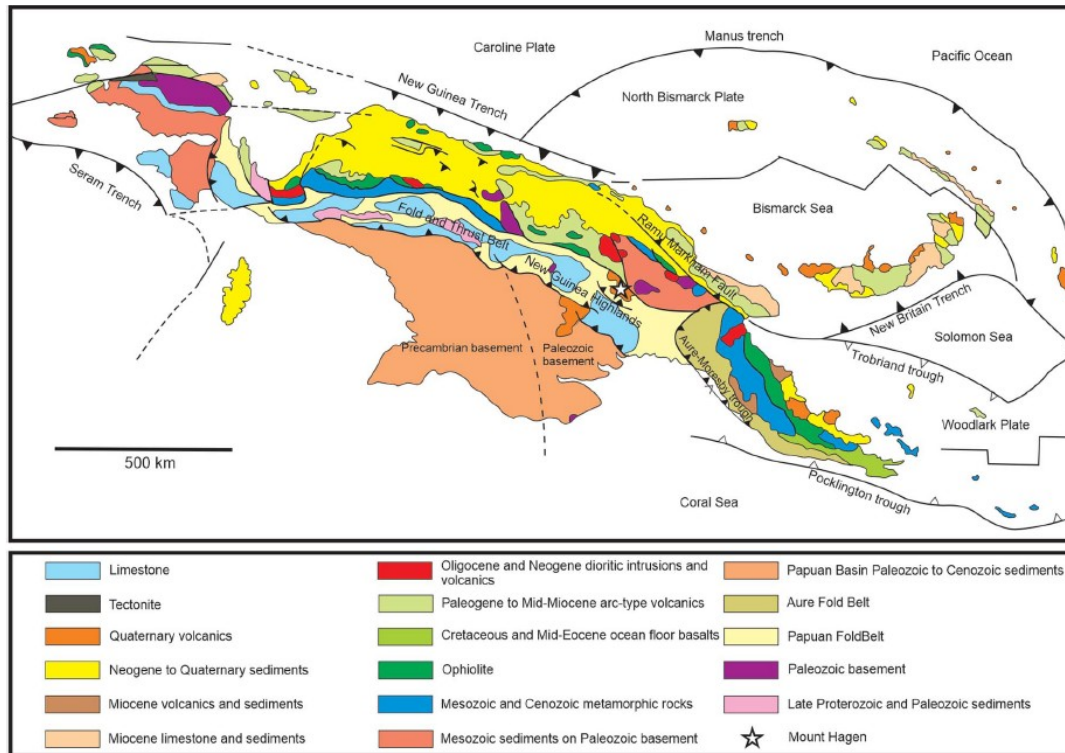
**Figure 2 – Tectonic Framework of PNG**

**Credit: Eric Gaba, Creative Commons Attribution-Share Alike 2.5 Generic license**

Tectonically, the island of New Guinea sits on the northern edge of the Australian Plate where it forms a convergent boundary with the Pacific Plate and a host of smaller microplates including:

- The Woodlark microplate (WL), which is bounded to the north by the New Britain Trench and the South Solomon Trench, to the southeast by the active Woodlark seafloor spreading center, and to the southwest by a convergent boundary with the Australian Plate.
- The South and North Bismarck microplates: the Bismarck Sea is a back-arc basin with respect to the New Britain arc and is divided into the North Bismarck (NBS) and South Bismarck (SBS) microplates.
- The Manus microplate (MN) squeezed between the South and North Bismarck microplates
- The Caroline microplate in north-central New Guinea and extending under the Pacific Ocean.
- The Solomon Sea microplate (SS), between the Woodlark plate, the South Bismarck Plate and the Pacific Plate.
- The Maoke microplate (MO), to the west of the Woodlark plate; west of the Maoke plate is the Bird's Head microplate (BH).

It's all very complex and reflects a complex tectonic history. A very good paper that describes the tectonic framework of New Guinea is: "Suzanne L. Baldwin, Paul G. Fitzgerald, Laura E. Webb. 2012. *Tectonics of the New Guinea Region*. Annual Review Earth and Planetary Sciences. 40:495-520. <https://doi.org/10.1146/annurev-earth-040809-152540>", which you can also download from [here](#).



**Figure 3 – Geology of New Guinea**  
 Credit: Figure 1 in [Misztela et al, 2022](#)

Figure 3, above, summarizes the geology of New Guinea

- The oldest rocks on the island are [Paleozoic](#) and [Proterozoic](#) basement [complexes](#) and [sediments](#).
- Next in age are the Paleozoic aged deposits in the [Papuan Fold Belt](#) that were folded during the [Mesozoic Era](#).
- The Papuan Basin is made up sediments ranging in age from Paleozoic to [Cenozoic](#) in age.
- The [Cretaceous](#) and younger deposits of the [Aure Fold Belt](#) were deformed from the [Miocene](#) to the present.
- In places, the Paleozoic basement is overlain by [Mesozoic aged sediments](#).
- Tectonic activity has deformed some of the [Mesozoic and Cenozoic into metamorphic rocks](#).
- [Ophiolites](#) are found in the [Papuan Ultramafic Belt](#).
- Volcanic rocks – [ocean floor basalts](#), [volcanic arc deposits](#), and [diorite intrusions](#) – range in age from Cretaceous to [Neogene](#).
- Various [Miocene aged sediments](#), especially [limestone](#).

This only scratches the surface of the geological complexity of New Guinea. A good place to start further reading is: Davies H.L., 2012, *The geology of New Guinea - the cordilleran margin of the Australian continent*, Episodes 2012;35:87-102, <https://doi.org/10.18814/epiugs/2012/v35i1/008>.

## Paleontology

With its complex geology, you might expect there to be some fossils in PNG. A few have been found, many are so-called [megafauna from the Quaternary](#). Here are some examples:

### *Protemnodon tumbuna*

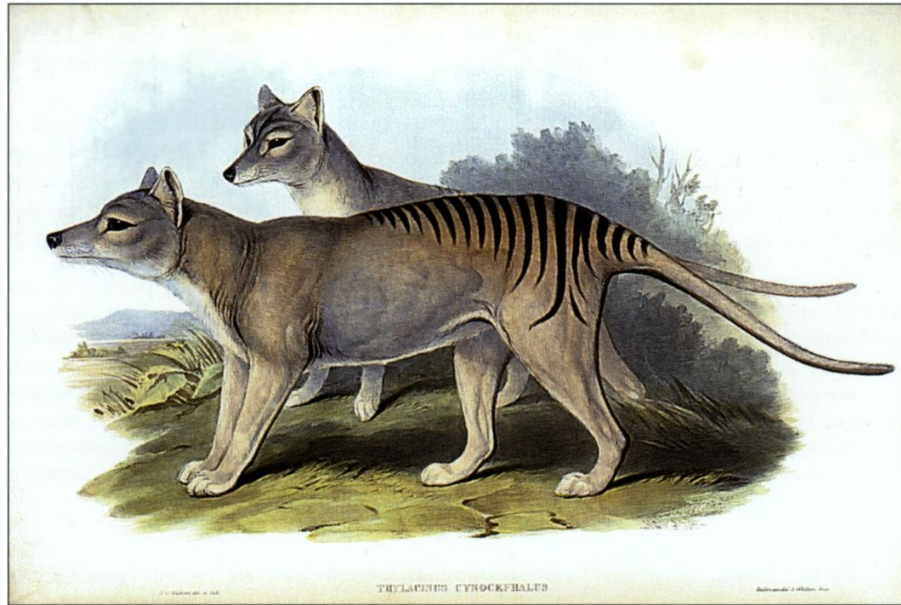


Figure 4 - *Protemnodon tumbuna* reconstruction

Credit: [Apokryltaros](#) at [English Wikipedia](#),  
[Creative Commons Attribution 3.0 Unported](#) license

A giant [kangaroo](#), *Protemnodon tumbuna* was one of many species of the genus, [Protemnodon](#) that lived during the [Quaternary Period](#) in Australia and New Guinea. [T. F. Flannery, M. J. Mountain, and K. P. Aplin](#) published their discovery of *Protemnodon tumbuna* in 1983, from fossils found in the [Nombe rock shelter](#) in PNG. A new species of *Protemnodon* from New Guinea was [described in 2022](#).

### *Thylacinus cynocephalus*



**Figure 5 - *Thylacinus cynocephalus* reconstruction**  
**Credit: [Henry Constantine Richter \(1821–1902\)](#), public domain**

The thylacine (*Thylacinus cynocephalus*), also called the [Tasmanian tiger](#) or [Tasmanian wolf](#), lived throughout Australia and New Guinea during the Pleistocene and persisted in Australia until the [last specimen died in a zoo in Tasmania](#). A predator, examples of fossil thylacines were found in the [Nombe rock shelter in 1990](#). Some people [claim](#) that it still exists in PNG.

### *Hulitherium tomasetti*



*Hulitherium tomasetti* was a large [zygomaturine](#) marsupial that lived in New Guinea during the Pleistocene. First found by a Roman Catholic priest, Fr. Berard Tomasetti, the fossils of *H. tomasetti* were first [described scientifically in 1986 by T. F. Flannery and M. Plane](#) from fossils found in swamp sediments in [Pureni, Southern Highlands Province](#). *H. tomasetti* was the largest mammal yet known from the Quaternary of New Guinea.

**Figure 4 - *Hulitherium tomasetti* Restoration**  
**Credit: [Peter Schouten](#)**  
**[Creative Commons Attribution 4.0 International](#) license**

## Mineral Resources



**Figure 7 – Gold, Mount Kare, Porgera, Auagum Range, Western Highlands, Papua New Guinea**  
**Credit: Daderot, [Creative Commons CC0 1.0 Universal Public Domain Dedication](#)**

According to the latest [USGS Minerals Yearbook for Papua New Guinea](#), the mineral industry of PNG includes the production of metallic minerals, industrial minerals, and fuel minerals. The latest statistics on production from the USGS are [here](#).

### ***Industrial and Metallic Minerals***

- The only industrial mineral production in PNG is a [cement plant](#) in Lae, Morobe Province.
- Chromium, cobalt, and nickel are mined at the [Ramu Mine in Madang Province](#), Ramu Nickel & Cobalt Management (MCC) Co., Ltd. website [here](#) (in Chinese).
- Copper, gold and silver are mined at the [Kainantu Mine](#) in the Eastern Highlands and at the [Ok Tedi open pit mine](#) in the Western Province.
- Gold and copper are mined at the [Sinivit](#) open pit mine in East New Britain Province.
- Gold and silver are mined at the [Hidden Valley open pit mine](#) in Morobe Province; and at the [Porgera open pit mine](#) in Enga Province.
- Gold alone is mined at the [Tolukuma Hill](#) open pit mine in Central Province; at the [Lihir](#) open pit in Niolam Island, New Ireland Province; and at the [Simberi Island](#) open pit mine in New Ireland Province.

## Petroleum and Natural Gas

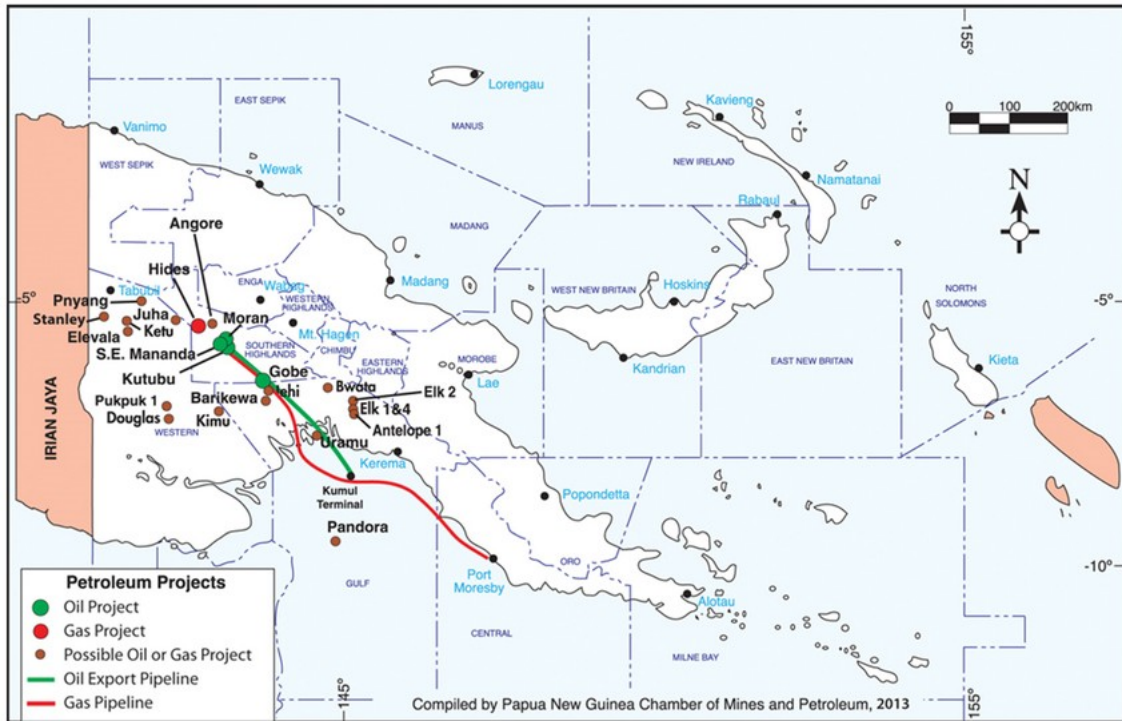


Figure 8 - Map of Oil And Gas Projects and Pipelines in Papua New Guinea

Credit: Figure 9 in [Mosusu et al, 2023](#), [CC BY 4.0](#)

PNG is [developing](#) its oil and gas resources, and there is great [potential for more development](#). Major fields include the [Agogo Field](#), [Gobe Field](#), [Kutubu Field](#), and the [Moran Field](#). PNG is also developing a [liquid natural gas export facility](#) near Port Moresby, National Capital Region.

## Summary



Figure 9 – Fishing in Vunapope, East New Britain, PNG

Credit: [Tarotastic](#), [Creative Commons Attribution 2.0 Generic license](#)

PNG has a great potential for further [mineral](#) and [oil / gas development](#). Some people hope that it will significantly increase the standard of living for the people of PNG, [especially oil and gas development](#). Others [question](#) if such development is desirable. However, for geoscientists, there are lots of potential opportunity.

Politically, PNG [has had its problems](#), perhaps not surprising for a country with [839 indigenous languages](#) and at least that many ethnic groups. The [Australian government](#) advises travellers to PNG to exercise a high degree of caution due to high levels of crime, tribal violence and civil unrest.

Pay your money and take your chances.

## **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.