

April 3, 2023

News and notes

Before going on to my short posting today, here are some news items I thought were interesting.

Research

- [New Geology articles published online ahead of print.](#)
- [GeoRoundup: the highlights of EGU Journals published during March!](#)
- Don't close the comment section: [Journals with open-discussion forums are excellent educational resources for peer review training exercises.](#)
- Coastal geology: [Recent Acceleration of Wetland Accretion and Carbon Accumulation Along the U.S. East Coast](#); Phys.org summary [here](#).
- More coastal geology: [A 5500-year record of coastal dune evolution along the shores of Lake Michigan in the North American Great Lakes: The relationship of lake-level fluctuations and climate.](#)
- Stratigraphy and sedimentology research: [Tropical conditions in southern Germany: Investigating the sedimentation of Middle Jurassic shallow marine environments in the South German Basin by cyclostratigraphy.](#)
- More stratigraphy research: [Frenchman Mountain Dolostone: A new formation of the Cambrian Tonto Group, Grand Canyon and Basin and Range, USA.](#)
- Rock mechanics research: [Experimental study on strength and failure characteristics of sandstone rock mass with complex cataclastic structure using 3D printing models.](#)
- Lacustrine geology: [Evolution of Coastal Subarctic Lakes in the Context of Climatic and Geological Changes and Human Occupation \(North-Central Labrador, Canada\).](#)
- Geology and society: [Reconstructing the geological provenance and long-distance movement of rectangular, fishtail, and croisette copper ingots in Iron Age Zambia and Zimbabwe](#); Mining.com summary [here](#).

Paleontology

- Big cats in Iowa: [A complete sabertooth cat cranium from the Midcontinent of North America and its evolutionary and ecological context](#); Eureka Alert summary [here](#).
- Wolves: [Dire wolf \(*Canis dirus*\) from the late Pleistocene of southern Canada \(Medicine Hat, Alberta\).](#)
- *T. rex* even uglier than you thought: [Theropod dinosaur facial reconstruction and the importance of soft tissues in paleobiology](#); Phys.org summary [here](#).

- Ancient African amphibians: Unique trackway on [Permian Karoo shoreline provides evidence of temnospondyl locomotory behaviour](#); Phys.org summary [here](#).
- [Australian scientists piece together toothy wombat ancestor](#).
- [The effect of geological biases on our perception of early land plant radiation](#).
- Steam locomotives and evolutionary theory: [The end of the line: competitive exclusion and the extinction of historical entities](#); Phys.org summary [here](#).
- From the British Natural History Museum: [The first known dinosaur egg? A new discovery from the Museum's collection](#); GeologyIn summary [here](#).
- La cucaracha: [Atypical 'long-tailed' cockroaches arose during Cretaceous in response to angiosperm terrestrial revolution](#).

Plate Tectonics

- Alaska: [Rapid active thrust faulting at the northern Alaska Range front](#).
- [Progressive Miocene unroofing of the Big Maria and Riverside Mountains \(southeastern California, USA\) along the southwestern margin of the Colorado River extensional corridor](#).
- China: [Late Triassic tectonic stress field of the southwestern Ordos Basin and its tectonic implications: Insights from finite-element numerical simulations](#).

Glaciers and Climate Change

- Antarctic glacier: [Migration of the Shear Margins at Thwaites Glacier: Dependence on Basal Conditions and Testability Against Field Data](#); Phys.org summary [here](#).
- Glaciofluvial geology: [Geophysical reconstruction of the late Holocene proximal proglacial landsystem at Skeiðarársandur, southeast Iceland](#).
- Ancient climates: [Simulation of the climate and ocean circulations in the Middle Miocene Climate Optimum by a coupled model FGOALS-g3](#); Phys.org summary [here](#).
- Holocene climates: [BrGDGT temperature reconstruction from interior Alaska: Assessing 14,000 years of deglacial to Holocene temperature variability and potential effects on early human settlement](#); Phys.org summary [here](#).
- Quaternary oceans: [Global reorganization of deep-sea circulation and carbon storage after the last ice age](#); Phys.org summary [here](#).
- Modern oceans: [Abyssal ocean overturning slowdown and warming driven by Antarctic meltwater](#); Phys.org summary [here](#).

Environmental Geology and Hydrogeology

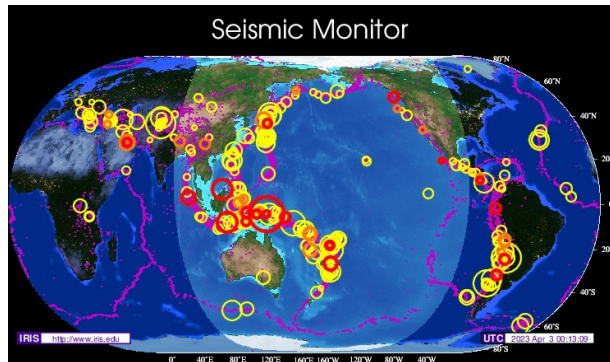
- Monitoring: [Wastewater surveillance and an automated robot: effectively tracking SARS-CoV-2 transmission in the post-epidemic era](#).

- Remediation technology: [Salinity and temperature influence removal levels of heavy metals and chloride from water by wetland plants.](#)
- Natural hydrocarbon seeps: [Widespread natural methane and oil leakage from sub-marine Arctic reservoirs.](#)
- More natural hydrocarbon seeps: [Gravity complexes as a focus of seafloor fluid seepage: the Rio Grande Cone, SE Brazil.](#)
- [Numerical Experiments for Surfactant Infiltration in the Vadose Zone to Demonstrate Concentration-Dependent Capillarity, Viscosity, and Sorption Characteristics.](#)
- [Origin and hydrochemical evolution of confined groundwater in Shanghai, China.](#)
- Confined aquifer in the Northern Valle Umbra Basin (Central Italy): [Spatiotemporal Evolution of Ground Subsidence and Extensional Basin Bedrock Organization: An Application of Multitemporal Multi-Satellite SAR Interferometry.](#)

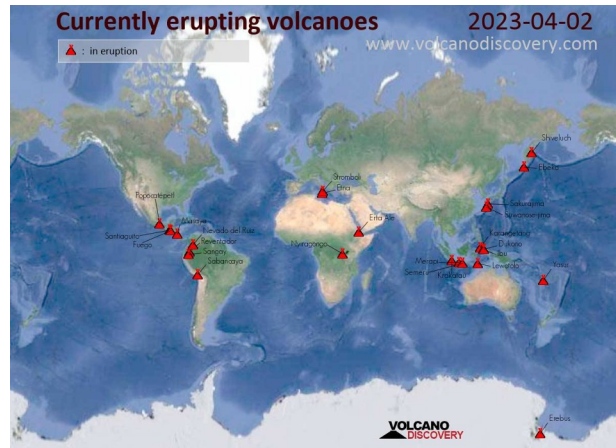
Energy and Mining

- From the United States Energy Information Administration (USEIA): [Mexico Energy Report.](#)
- Also from the USEIA: [U.S. natural gas production grew by 4% in 2022.](#)
- [For want of a pipeline: Canadian LNG should power low-carbon revolution, report says.](#)
- Exploration activity: [US oil and gas rigs fall in Q1, first quarterly drop since 2020 – Baker Hughes.](#)
- [OPEC+ makes shock million-barrel cut in new inflation risk.](#)
- [Rising Costs Are Hurting U.S. Oil And Gas Production Growth.](#)
- Aggregate mining: [Exploring the potential of late permian aggregate resources for utilization in engineering structures through geotechnical, geochemical and petrographic analyses.](#)
- Geology of ore deposits: [Water-sulfur-rich, oxidised adakite magmas are likely porphyry copper progenitors.](#)
- Australia: [Victoria's gold rush ended in the 19th century. So why are people still finding so much gold?](#)
- More on Australia: [Australia sees lithium exports matching thermal coal by 2028.](#)
- Mergers and acquisitions: [Botswana Buys 24% of Antwerp Diamond Company HB.](#)
- [Giant Chile mines are struggling just as world needs more copper.](#)
- Ontario: [First Nations leaders removed from legislature after protesting mining development.](#)
- New development: [Glencore takes cornerstone stake in North Shore nickel project.](#)

Volcanoes, Earthquakes and Geohazards



[Seismic Monitor](#)



[Currently Erupting Volcanoes](#)

- Earthquake research: [Evidencing subtle faults in deep seismic reflection profiles: Data pre-conditioning and seismic attribute analysis of the legacy CROP-04 profile.](#)
- Research on recent Turkish earthquake: [Earthquake doublet in Turkey and Syria](#); Phys.org summary [here](#).
- More on the Turkish earthquake: [Researchers use Earth observations to identify damage, impacts from earthquakes in Turkey.](#)
- More earthquake research: [A Secondary Zone of Uplift Measured After Megathrust Earthquakes: Caused by Early Downdip Afterslip?](#)
- Floods: [Extreme flooding controlled by stream network organization and flow regime](#); Phys.org summary [here](#).
- Landslide research: [Analysing the Large-Scale Debris Flow Event in July 2022 in Horlachtal, Austria Using Remote Sensing and Measurement Data.](#)

Upcoming Events

[Annual Meeting of the Geological Association of Canada, Sudbury, Ontario May 24 to 27 2023](#)

The theme of the meeting is Discovering Ancient to Modern Earth, reflecting the location of Sudbury at the intersection of the Archean Superior Province, Proterozoic Southern and Grenville Provinces, and Paleozoic-Quaternary cover sequences. The conference will include an exceptionally diverse program of Symposia, Special Sessions, General Sessions, Field trips, Workshops, and Short Courses covering the complete spectrum of geoscience disciplines. It will be delivered in hybrid format with both on-site and virtual components. Abstracts, talks, and posters can be given in English or French.

[Here is the link to the poster.](#)

April 3, 2023

A Question for Chat GPT

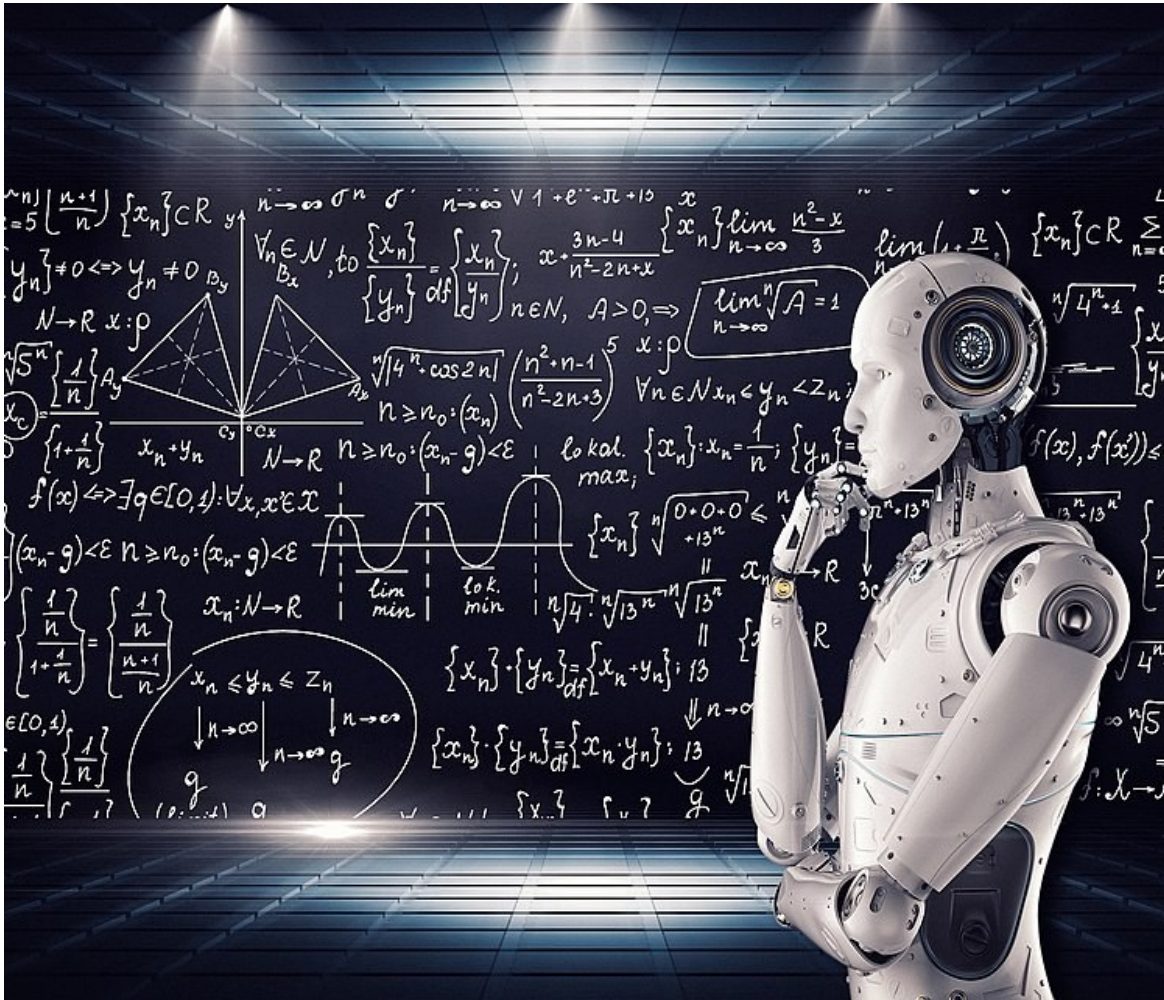


Figure 1 – Artificial Intelligence

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Just for the fun of it, I asked [Chat GPT](#), an alleged “artificial intelligence”, to: “Tell me about Glacial Lake Agassiz”. Here was its response:

Glacial Lake Agassiz was a large glacial lake that formed in North America during the last ice age, approximately 12,000 years ago. The lake covered an area of more than 170,000 square miles, making it one of the largest lakes in the world at that time.

The lake was formed as a result of the retreat of the Laurentide Ice Sheet, which covered most of Canada and the northern United States during the last ice age. As the ice sheet melted, large quantities of water were released, which collected in low-lying areas to form Glacial Lake Agassiz.

The lake was fed by several large rivers, including the Red River and the Saskatchewan River. It drained into the Atlantic Ocean via the Mackenzie River and the Arctic Ocean via the Nelson River.

Glacial Lake Agassiz had a significant impact on the geography and climate of North America. It played a key role in the formation of the Great Plains, as the sediment deposited by the lake helped to create the fertile soil that makes the region so productive today.

The lake also had a major influence on the climate of North America. As the lake formed, it released large quantities of freshwater into the North Atlantic Ocean, disrupting the ocean currents and causing the climate to cool. This cooling is thought to have played a role in the extinction of large mammals such as the woolly mammoth and the saber-toothed tiger.

Today, there is little evidence of Glacial Lake Agassiz. Most of the lake drained away around 8,000 years ago, leaving behind only a few smaller lakes and wetlands. However, its impact on the geography and climate of North America can still be felt today.

Not too bad; it's a concise description of Glacial Lake Agassiz. I could expand on it and may do so in future postings. For now, I have a few comments on the use of programs like Chat GPT and other "artificial intelligence" programs in the geosciences.

First, let's look at the term artificial intelligence. Is it applicable to a program like Chat GPT that appears to be a sophisticated compiler of information from a wide data base?

To be considered "artificial intelligence", a program, or system, has to pass the [Turing Test](#). First [proposed](#) by the mathematician, [Allan Turing](#), in 1950, the Imitation Game, as Turing named it, tests a machine's ability to mimic human intelligence. So does Chat GPT pass the Turing Test? Some would [say yes](#) and others would [say no](#). I'll let you, dear reader, decide for yourself.

In geoscience the use of artificial intelligence will probably grow. AI, as it is called, seems to be a great way to sift through lots of existing information. But can it discover new knowledge? It is possible that an AI program will find previously unrecognized connections in existing knowledge, it all depends on the programs' ability to recognize patterns. Original insights might be beyond its capabilities, however. Also, field work might be beyond its capabilities, but I can see it as a great aid in searching for existing data and papers.

I can see AI doing a lot of the drudge work, but the high-level analysis will be a human domain at least in the foreseeable future. The problem with having an AI system helping you is that the process of going through all the data, the drudge work, is how some people get their insights. We'll have to wait and see. A true AI system, a sentient being, might have its own agenda and not want to engage in human pursuits except as it benefits the AI.

As an interesting aside there are a couple of pieces of art inspired by Allan Turing and the Turing Test:

- [There is an opera](#), from 2007; and
- A movie, from 2014, called the [Imitation Game](#).

I've seen the movie, [it's available on DVD](#) and it may be available on Netflix in your region. Excerpts from the opera are on [YouTube](#).

Standard Caveat

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.