

THE SECOND
100
IUGS GEOLOGICAL
HERITAGE SITES



Announced by the
International Union of Geological Sciences
during the 37th International Geological Congress
Busan, Republic of Korea / August 27th. 2024

HISTORY OF GEOSCIENCE

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
101	Arduino's lithostratigraphical sequence of the Agno Valley	Italy	The site where Giovanni Arduino established in 1758-1760 his lithostratigraphical theory in four units, the basis of modern stratigraphic chronology.
102	Cavansham Ferry and Llanstephan Quarries	United Kingdom	Location of “the first true Silurian”, as designated by its founder Sir Roderick Impey Murchison.
103	Jurassic Coast: Lyme Regis	United Kingdom	A globally unique near-continuous Mesozoic coastal succession exemplified by the classic Lower Jurassic of Lyme Regis.
104	Metamorphic Barrow Zones in Scottish Highlands	United Kingdom	The first systematic study of regional metamorphism through analysis of index minerals in metamorphosed mudstones.
105	Contact metamorphic rocks of Orijärvi	Finland	Study of these rocks led to the foundation of the metamorphic facies concept, used in nearly all metamorphic studies.
106	Durbuy Anticline	Belgium	An archetype anticline defined as early as 1807.
107	Vesuvius volcano	Italy	The birthplace of volcanology, from the description of the 79AD eruption by Pliny the Younger until the scientific studies in the 18th and 19th centuries.
108	Scheibenberg lava flow	Germany	Around 1790, the Scheibenberg became a key argument for Neptunism in the dispute about the origins of basalt from water or lava.
109	Montagne Pelée volcano	France	Montagne Pelée is the world reference volcano for the Peléan eruption-type, firstly described by Alfred Lacroix in 1902.
110	Oligocene Laccoliths and Sedimentary Rock Domes of the Henry Mountains	United States of America	The laccolithic structures identified in 1875 by G.K. Gilbert as important magmatic contributions to tectonic processes of mountain building.
111	Maruia Falls	New Zealand	Murchinson earthquake (1929) causing Maruia Falls led to the Discovery of the Inner Earth Core.
112	Mer de Glace	France	One of the most emblematic glaciers of the world, studied as early as the 18th century
113	Esmark Moraine and Otto Tank's Moraine	Norway	The sites where Jens Esmark discovered the Ice Age in 1823.
114	The Parallel Roads of Glen Roy	United Kingdom	An iconic suite of glacial lake shorelines that underpinned the development of the Glacial Theory in the 19th century.

STRATIGRAPHY AND SEDIMENTOLOGY

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
115	The Mesoproterozoic Belt-Purcell Supergroup	United States of America and Canada	The thickest sedimentary succession on earth capturing pristine Precambrian rock, spectacularly exposed by intensive glacial carving.
116	The Ordovician section of the Hällekis Quarry	Sweden	One of the most complete, spectacular and most thoroughly documented sections of Ordovician cool to temperate water limestones, globally.
117	The Ordovician glacial pavements of the Tassili n'Ajjer	Algeria and Lybia	Spectacular glacial erosion surfaces that allow a glimpse of the end-Ordovician ice streams that once crossed the entire Sahara.
118	Carboniferous evolution of The Burren and Cliffs of Moher	Ireland	One of the most complete sections with Mississippian limestones in exceptional karst landscapes and Pennsylvanian deltaics in spectacular sea cliffs.
119	Permian reef complex of the Guadalupe Mountains	United States of America	One of Earth's best exposed and most accessible ancient reef complexes.
120	Latemar Triassic carbonate platform	Italy	A fully preserved isolated carbonate platform, probably with the best exposed facies transitions and depositional geometries in the World.
121	End-Triassic Flood Basalts at the Old Wife	Canada	One of the World's greatest testimonials to the breakup of Pangea, implicated in the end-Triassic mass extinction event.
122	The Jurassic Navajo Sandstone at Coyote Buttes and The Wave	United States of America	An iconic outcrop of aeolian stratigraphy, this colorfully sculpted Navajo Sandstone landscape records the largest erg in geologic history.
123	The Oligocene-Miocene molassic and rock pinacles of Meteora	Greece	One of the most impressive molassic accumulations of the world with an iconic landscape of pinnacles and rock pillars formations.
124	Pliocene cyclostratigraphy of Scala dei Turchi	Italy	A beautiful natural cliff where Zanclean calcareous and marly limestones are controlled by Milankovitch cycles
125	Etosha Pan	Namibia	One of the largest palaeolake salt pans in the world which supported a diverse Neogene to Pleistocene fossil fauna.
126	Pliocene to Holocene records from Raciška Pecina Cave	Slovenia	A multi-proxy record of landscape and paleoenvironmental changes during the last 3.4 million years, including Pliocene-Pleistocene and Matuyama-Brunhes geomagnetic field reversals.
127	Holocene coral reef terraces of Kikaijima Island	Japan	History of coral reefs over a period of 100,000 years recorded changes in climate, sea level, and ecosystem.

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128	Shark Bay	Australia	Shark Bay World Heritage site - an area with outstanding geological, geomorphological, and biodiversity values.
129	Uyuni salt flat	Bolivia	The world's largest and highest extensive evaporitic deposit with the greatest reserves of lithium brines.
130	The Dead Sea	Israel and Jordan	The Dead Sea is an excellent site for observing geomorphological, sedimentological, lacustrine, and geochemical processes and studying tectonics and paleoclimate.
131	Mars analog of Lake Salda	Turkey	A deep alkaline lake deposits hydromagnesite microbialites that may have clues for possible ancient life on Mars.

PALEONTOLOGY

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
132	Ediacaran fauna of the Nama Group	Namibia	One of the most continuous stratigraphic and paleontological records with crucial information to understand the evolution of complex life during the Ediacaran-Cambrian time interval.
133	The Late Devonian fossil-fish Lagerstätte of Miguasha	Canada	The World's most outstanding site for Late Devonian fossil fish, including the lobe-finned fishes that are the evolutionary link to vertebrate life on land.
134	Permian vegetation of the Wuda Fossil Site	China	A coal-forming tropical rainforest preserved in exceptional detail by volcanic ash.
135	Triassic Dinosaurs and mammalian reptiles from Ischigualasto	Argentina	Continuous record that helps to understand the origin of dinosaurs and mammals.
136	Middle Jurassic dinosaur footprints from the Serras de Aire and Candeeiros	Portugal	The longest and best preserved trails with dinosaur footprints of the Middle Jurassic
137	Dashanpu Middle Jurassic Dinosaur Fossils Site	China	The most concentrated Middle Jurassic dinosaur site that demonstrates high vertebrate diversity.
138	Upper Jurassic Carnegie Quarry Dinosaur Bone Site	United States of America	Showcasing an in-situ wall of over 1500 bones representing nine Late Jurassic dinosaur species.

139	Early Cretaceous wetland of Las Hoyas	Spain	A wetland with microbial mats favoring the exceptional fossilization of animals and plants including their soft tissues
140	Cretaceous Lagerstätten of Cariri Stone	Brazil	High diversity and abundance of large reptiles, dinosaurs and pterosaurs, fish, insects, crustaceans, and plants in an hypersaline lacustrine deposits.
141	The Cretaceous Dinosaur Nesting Grounds of the Willow Creek Anticline	United States of America	The area that revealed the first evidence of colonial nesting and parental care in dinosaurs.
142	Whale Valley, Cetacea and Sirenia Eocene fossils of Wadi Al-Hita	Egypt	Hundreds of complete skeletons alongside mangrove root fossils with important evidences about the evolution of earliest whales.
143	The La Venta middle Miocene neotropical biome	Colombia	A Konzentrat-Lagerstätte that hosts one of the most diverse and exuberant biomes from an extinct neotropical rainforest.
144	The modern human fossils of the Kibish Formation	Ethiopia	Home of one of the oldest Homo sapiens fossils in the world included within a 105 m thick Middle Pleistocene to Holocene lacustrine and deltaic deposits.
145	The Human Footprints of Acahualinca	Nicaragua	A long footprint sequence with at least 16 people taking a walk in an ancient geological environment by Lake Managua.

IGNEOUS AND METAMORPHIC PETROLOGY

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
146	The larvikite plutonic rocks of the Oslo Rift	Norway	One of the few places to study the blue monzonitic plutonic rocks formed beneath a continental rift environment.
147	The Rum Igneous Complex	United Kingdom	Superb array of shallowly emplaced ultramafic to felsic igneous rocks that differentiated in an open system and concentrated precious metals.
148	Devils Tower	United States of America	An iconic and prominent igneous rock feature with the World's largest example of columnar jointing.
149	The Mohorovicic discontinuity in the Ivrea-Verbano Zone	Italy	A classical Moho outcrop in Europe showing the contact between continental mantle and lower continental crust.
150	The Cambrian Leka Ophiolite	Norway	One of the best exposed and accesible Caledonian ophiolite complex showing the remnants of the Iapetus Ocean.

151	Late Cretaceous Samail Ophiolite	Oman	The largest, best preserved/exposed oceanic lithosphere on land. A world reference for obduction and igneous processes related studies.
152	Lower Pillow Lavas of Troodos Ophiolite	Cyprus	The transportation conduits through which the magma reached the ancient Neotethys ocean-floor forming the pillow lavas 92 million years ago.
153	The ultrahigh-pressure unit of the Dora-Maira Massif	Italy	The first place where ultrahigh-pressure (UHP) metamorphic rocks were described on Earth and recognised as forming a coherent unit.

VOLCANOLOGY

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
154	Deccan Traps	India	The best-studied section and tourist hotspot in the Deccan Traps (India), one of the world's great continental flood basalt provinces.
155	Muriwai megapillow lava flows	New Zealand	World's largest, most complex and spectacular megapillow lava flow with internal feeding tubes with giant fans of cooling columns.
156	The Pleistocene Al Wahbah dry maar crater	Saudi Arabia	The world largest, young dry maar volcano, half sectioning older scoria cones.
157	El Laco iron lavas	Chile	Unique magnetite lavas due to their preservation quality, surface structures and other features of iron eruptions.
158	Ngorongoro Crater	Tanzania	The world's largest unflooded and unbroken caldera.
159	Ruapehu Volcano	New Zealand	Te Matua o Te Mana. An iconic subduction related stratovolcano.
160	Parícutin Volcano	Mexico	The first volcano whose eruption and entire activity was observed and documented in real time (1943-1945)
161	Heisei Shinzan Lava Dome	Japan	Scientifically best-documented dome growth during the Hensei eruption (1990-1995) at Unzen Volcano.
162	The Active Hunga Volcano	Tonga	This volcano shocked our world with one of the most extraordinary geological events ever observed.
163	Rotorua's geothermal fields (Ahi-Tupua)	New Zealand	Outstanding colourful sinters, geysers, boiling mud pools and siliceous lily-pad stromatolites.

TECTONICS

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
164	The Mid-Atlantic ridge on Reykjanes	Iceland	Active rift zone onshore with faulting, fissure eruptions, hyaloclastite ridges and a geothermal area.
165	The evolution of the Andes in Colca Canyon	Peru	1800 millions years of Earth´s history including six geological periods of active continental margins located in one of the deepest canyons on Earth.
166	Salt domes and glaciers of the Zagros Fold and Thrust Belt	Iran	The most spectacular manifestation of salt tectonics in one of the youngest collisional zones in the world.
167	The Patos Shear Zone	Brazil	Impressive example of an exhumed mid-crustal strike-slip intracontinental shear zone.
168	Esla Unit thrust system	Spain	An exceptional natural laboratory for the study of the evolution of foreland fold and thrust belts in the Cantabrian Zone.
169	Glarus Thrust	Switzerland	An exceptional and dramatic display of mountain building through continental collision with phenomenal outcrops in an alpine mountain landscape.
170	Monte Perdido massif tectonic structure	Spain	A key site for understanding the relations between sedimentation and deformation in mountain building processes.
171	Brittle structures of the Somerset Coast	United Kingdom	Spectacular and most studied exposures of brittle structures related to basin development and inversion.
172	Surface faulting of a seismic sequence in Mt. Vettore	Italy	The most recent, documented and preserved surface faulting related to the 2016 earthquakes in Central Appennines.
173	Alpine superposed buckle folds in Aliaga	Spain	Probably, the largest and most original example of superposed buckle folding reported in the world.
174	Marine terraces of San Juan de Marcona	Peru	Exceptional site showcasing the influence of the Nazca-Ridge on the continuous uplift of the western edge of the Central Andes.

MINERALOGY

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
175	The Sar-e-Sang Lapis Lazuli Deposit	Afghanistan	One of the most classical localities of Lapis Lazuli on Earth, that occupies a scientific key position between geoscience and archaeology.
176	The Kalahari Manganese Field	South Africa	The Kalahari Manganese Field, South Africa, is the worlds largest land-based resource of manganese hosting rare, unique and world-renowned minerals.
177	The Broken Hill Pb-Zn-Ag deposit	Australia	A 'mineralogical rainforest', having yielded 340 mineral species, 26 of which are types.
178	Mineral site of Mont Saint-Hilaire	Canada	With 445 mineral species, it is the preeminent, single-site mineral locality in the world.
179	The Muzo emerald deposit	Colombia	Unique for its hydrothermal-sedimentary genesis this site is known since Precolombian times and yielded the finest gem emeralds on Earth.

GEOMORPHOLOGY AND ACTIVE GEOLOGICAL PROCESSES

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
180	Granite landforms of Dartmoor	United Kingdom	Emblematic granite landforms and the global reference site for studies of granite weathering and Pleistocene cold-climate landforms
181	Inverted landscape of a Plio-Pleistocene phreatomagmatic monogenetic volcanic field in the Bakony-Balaton Upland.	Hungary	One of the best examples on Earth of a completely inverted relief of a high vent-density phreatomagmatic monogenetic volcanic field.
182	Great Salt Lake	United States of America	The largest saltwater lake in the western hemisphere controlled by basin tectonics and isostasy and recording Pleistocene climate change.
183	Mackenzie Delta	Canada	Complex coastal landforms of diverse origin: glacial, permafrost, fluvial, and pseudokarst in the north-west Canadian Arctic.
184	Getbol Tidal Flats	South Korea	The most complex tidal flat landforms formed by dynamic past and ongoing sedimentological processes during the Holocene.

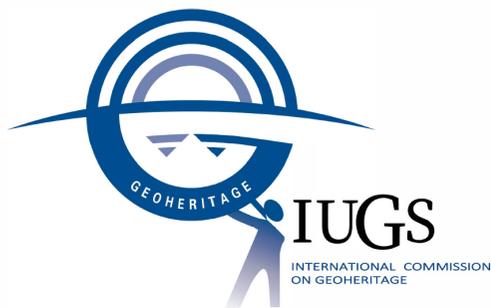
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185	Fontaine de Vaucluse	France	The locus typicus ascending spring with globally longest history of recorded discharge.
186	Wakulla spring	United States of America	The largest individual spring and the longest submerged spring cave system in the United States.
187	Vrelo Bune Spring	Bosnia and Herzegovina	Deep siphonal spring and pilgrimage site with enormous maximal discharge.
188	Mammoth Cave	United States of America	The Mammoth Cave System is the longest known cave in the world and is still being explored.
189	The White Limestone Karst of Cockpit Country	Jamaica	One of the most outstanding areas of limestone Cockpit karst in the World, located in the caribbean.
190	Guilin Karst	China	A global reference to show the geological and geomorphological effects of continental karst development.
191	Ha Long Bay-Cat Ba Archipelago	Vietnam	The most extensive and best known example of marine-invaded tower karst in the world.
192	Tepuis and quartzite karst of Gran Sabana	Venezuela	The World's Finest Quartzite Karst in an spectacular table mountains landscape with the highest waterfall on Earth
193	Fjords and towering sea cliffs of Fiordland	New Zealand	Globally significant examples of spectacular fjords, deeply carved by glaciers through gneissic rocks uplifted high along a convergent plate boundary.
194	Fjords and glaciers in Hornsund and Van Mijenfjorden, Svalbard	Norway	A showcase of glaciers and landforms of polar environments.
195	Vatnajökull	Iceland	Unique landscape forged by the constant conflict between fire and ice in the rift zone at the divergent plate tectonics.
196	Yosemite Valley	United States of America	Archetypal glacial landforms inset into spectacular mountainous granite topography

IMPACT STRUCTURES AND EXTRATERRESTRIAL ROCKS

Nº	NAME OF THE SITE	COUNTRY	HEADLINE
197	Vredefort Dome	South Africa	Eroded remnant of Earth's largest impact structure, exposing varied impact-related deformation and melt rocks, and a deeply exhumed crustal profile.
198	Ries Crater	Germany	One of the best preserved craters worldwide displaying many impact features, which can be studied in an easily accessible region.
199	Lake Bosumtwi Impact Crater	Ghana	Bosumtwi is the youngest well preserved complex impact structure known on Earth and the source of the Ivory Coast tektites
200	The Barringer Meteorite Crater	United States of America	The Barringer Meteorite Crater aka "Meteor Crater" is one of the best-preserved and -exposed meteorite impact craters on Earth.

THE SECOND 100 IUGS GEOLOGICAL HERITAGE SITES

The list of the Second 100 IUGS Geological Heritage Sites was unanimously approved by the **Selection Committee**, formed by representatives from all the international organizations listed below. The list was ratified by the **IUGS Executive Committee** on 23 February 2024.



TecTask



TGIR

IUGS Task Group on Igneous rocks

