



IUGS GEOLOGICAL HERITAGE SITES

IGCP731

DEFINITION AND MAIN STANDARDS



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Definition and main standards

IGCP 731 / WG A



IUGS GEOLOGICAL HERITAGE SITES (Global Geosites)

DEFINITION AND MAIN STANDARDS

WORKING GROUP A / IGCP 731



INTRODUCTION AND CONTEXT OF THE WORK

This work has been done in the context of the IGCP 731 IUGS Geological Heritage Site project.

The definition of the main standards of an *IUGS Geological Heritage Site* is the first agreement needed to go forward with the next steps of the project: selection, evaluation and ratification of *IUGS Geological Heritage Sites*.

This simple document shows the result of a wide discussion that took place between September and November 2021 among 18 Geoheritage experts from 13 countries, representing IUGS, UNESCO Global Geoparks, Geological Surveys, academic institutions and international organizations like ProGEO. The proposal was analyzed and adopted by the IUGS - International Commission on Geoheritage in November 2021 in Zumaia.

This document defines as simple as possible what an *IUGS Geological Heritage Site* is, and stipulates their main characteristics. Based on this, subsequent documents will be established for the application and evaluation of potential sites as well as for the smooth running of the program.

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DEFINITION AND MAIN STANDARDS

Definition

An *IUGS Geological Heritage Site* is a key place with geological elements and/or processes of scientific international relevance, used as a reference, and/or with a substantial contribution to the development of geological sciences through history.

Main features and requirements

Typology

1. All kind of typologies related to Earth Sciences can be recognized: paleontological, geomorphological, stratigraphic, sedimentologic, petrological, tectonic, mineralogical, volcanic, meteor impacts...
2. An *IUGS Geological Heritage Site* must be a key place, preferably a specific outcrop, landform or process, with a single geological feature or a group of geological features that characterize it as one of the best examples of its kind globally. All kind of typologies related to Earth Sciences can be considered, but it should preferably stand out by one specific typology.

NOTE: Movable Geological Heritage cannot be considered in this designation. Geological elements of international reference that belong to collections ought to be recognized as IUGS Geocollections. This program is currently being developed and hopefully will be activated in 2023.

Global reference

3. An *IUGS Geological Heritage Site* must be of global significance. The geological feature does not need to have a global distribution, but the site should be one of the best examples of its kind globally.
4. An *IUGS Geological Heritage Site* must be a global scientific reference where important scientific research has been carried out. The scientific knowledge / relevance must be well demonstrated with scientific publications.
5. Iconic places for geological sciences (noteworthy waterfalls, glaciers, columnar joints, fossil localities, structures...) ought to be recognized as *IUGS Geological Heritage Sites* not only for their scientific value, but also for their educational potential.

Boundaries and size

6. An IUGS Geological Heritage Site must have well defined boundaries and must be well mapped according to the guidelines of the program.
7. There is no minimum or maximum size for an *IUGS Geological Heritage Site*. Its boundary on the map must include the area that best displays the geological feature(s) of high scientific value.
8. The proposed boundary must always be sufficiently justified. An *IUGS Geological Heritage Site* should preferably be based on the specific key sites (outcrops or landforms) that best represent the larger geological feature. Examples:
 - For a specific unit in a basin, an *IUGS Geological Heritage Site* would be a relevant stratigraphic section, such as a stratotype, but not the entire sedimentary basin encompassing that sedimentary record.
 - A good outcrop of a transcontinental fault where important research has been carried out should be considered as an *IUGS Geological Heritage Site*, but not the entire length of the fault.
 - In contrast, big scale landforms such as a great canyon or a big sand dune complex might be considered in their entirety, because only that way the entire feature may be perceived.

Relation between sites

9. Coexisting sites. Several geosites with different typologies may be located very close to each other or even overlap, as long as both are of global significance. For example:
 - An *IUGS Geological Heritage Site* may be a canyon that includes within it another *IUGS Geological Heritage Site* such as an unconformity, as long as both are of global significance.
 - An IUGS Geological Site may be a big and significant geological structure such a fold or a diapir that includes within it another *IUGS Geological Heritage site* such as an important paleontological outcrop, as long as both are of global significance.
10. Serial sites. Only in those cases where a geological element of global significance unavoidably needs to be explained with more than one site of the same typology that respond to the same geological process, an *IUGS Geological Heritage Site* can be defined as a serial site that includes more than one single outcrop / representation. Most of these individual outcrops must fulfil the requirement of global significance. For example:
 - If there is meteorite impact crater with several good outcrops (pieces of the meteorite, suevite outcrops, impact landforms...) that have been studied together or separately, contributing to the general value and global significance of the crater, all of them could be integrated in a unique *IUGS Geological Heritage Site*.
 - If there is a special stratigraphic section that comprises several sites of global significance in a small area such as chronostratigraphic boundaries, important paleontological outcrops or paleoclimatic records of global reference, the whole section can be considered as an *IUGS Geological Heritage Site*.

Other requirements

Accessibility

11. Although accessibility is not a compulsory criterion, an *IUGS Geological Heritage Site* should preferably be accessible, especially for scientific research. Accessibility conditions must be specified in the application documents.

State of Conservation

12. An *IUGS Geological Heritage Site* must be in a good state of preservation. This does not mean that it must be in its original natural state. It may include anthropic modifications as long as they do not degrade the scientific value of the site. The outcrop itself may be due to human action (road trench, open pit, etc.). Information about the state of conservation must be specified in the application documents.

Protection

13. The declaration as an *IUGS Geological Heritage Site* can and should be used to promote its protection. If a site becomes so degraded that its geological significance is no longer evident, the IUGS-ICG could remove a designation. In those cases, information about Geoconservation measures and actions must be supplied in the application documents if needed.

NOTE: IUGS Geological Heritage Sites designation aims to give recognition to those geological sites of scientific international relevance, used as a reference, and/or with a substantial contribution to the development of geological sciences through history. This recognition may bring protection and educational activities in the future. IUGS will welcome such initiatives, but selection criteria related to those are not critical in our designation process.

APPLICATION AND EVALUATION. FIRST IDEAS.

Application and evaluation process

- An *IUGS Geological Heritage Site* proposal should be sent to the IUGS International Commission on Geoheritage following the guidelines of the program that will be created during 2022 (templates and deadlines).
- An *IUGS Geological Heritage Site* must be first approved by more than 60% of the voting members (about 20) of the IUGS Subcommittee on Sites and the IUGS-ICG, that will send it to the IUGS Executive Committee for the final approval and endorsement.
- Voting members of the IUGS Subcommittee on Sites will have a broad geographic distribution and are expected to play an active role searching for potential *IUGS Geological Heritage Sites* worldwide. In addition, the program will also be opened to receive direct applications from experts.

Application template.

Working Group A will define the application template in detail during 2022. The following information will have to be included in the template:

- 1) A clear name of the potential site (geological element of interest + location)
- 2) A short argumentation of the proposal. Why is it proposed?
- 3) Geographic location and clear boundaries of the site reflected in a shapefile and map.
- 4) A short introduction of the geological context with a regional geological map.
- 5) A full description of the geological features of the site with pictures and scientific diagrams clearly showing the main values of the site.
- 6) Scientific background and Bibliography.
- 8) Main arguments for the proposal and brief comparative analysis if necessary, specially in cases when similar sites have been already designated.
- 9) Main proponent, list of supporting researchers and support letters from the national Geological Survey or any national academic institution related to Earth Sciences.

Evaluation process.

The evaluation will be fundamentally based on qualitative arguments and the final approval will have to be supported by at least 60% of the voting members, but a simple semi-quantitative method should be also included to ensure that the potential sites fulfil all the basic criterions. Evaluation templates will be created by WG A during 2022.

