

## IUGS Geosites form for Database on Geological Sites, and proposal for Geosites form, Balkan Geological Heritage List

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The IUGS Global Geosite Working Group produced a database form (Anon., 1995) for the inventory of the geological heritage of the world. The items included in this form are cited hereafter for to be popularized and used during work also on inventories on the

regional (Europe) and subregional (Balkan Peninsula) scale.

Proposals for additional information or slight modifications of the form are discussed at the end of this review. Proposals based on Wimbledon (1995) and other published and unpublished reports are also considered.

### 1. Content of the form (Anon., 1995)

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#### IUGS GEOSITES Database on Geological Sites

Proposer name  
Proposer address  
Proposer phone  
Proposer fax

Site name  
Country  
State, Province, Region  
National sovereignty

Ownership

Latitude

Altitude

Longitude

Area of site

Geographic category (pragmatic)

I. Arctic and Sub-Arctic

IX. Antarctica

II. & III. N. & W. Europe

X. Africa

IV. E. Europe (to Ural Mountains)

XI. E. Asia

V. S. Europe

XII. Australasia

VI. N. America

XIII. Oceanic Islands

VII. Central America & Mexico

XIV. S. Asia

VIII. S. America

XV. W. Asia

Active status	Yes. Resident scientists
Staff on site	Access excellent
Museum on site	Access good
No facilities	Access poor
	Access very difficult
	Access only by permission

History and date of establishment:

Current management:

Threats to conservation:

Documentation:

### Earth Science Category

PRIMARY INTEREST

SECONDARY INTEREST

- A. Palaeobiology
- B. Geomorphic
- C. Palaeoenvironmental
- D. Igneous, metamorphic & sedimentary
- E. Stratigraphic
- F. Mineralogic
- G. Structural
- H. Economic
- I. Historic
- J. Relationships: tectonic plates
- K. Astroblemes
- L. Continental/Oceanic global scale features
- M. Submarine
- I. Major stages of Earth history
- II. Ongoing geological processes
- III. Geomorphic, physiographic feature

Comparisons to and relationships with other sites:

### IUCN Management Category

- |   |                                    |
|---|------------------------------------|
| I. Strict Nature Reserve                | VI. NAY                            |
| II. National Park                       | VII. NAY                           |
| III. National Monument/Natural Landmark | VIII. Multiple Use Management Area |
| IV. Managed Nature Reserve              | IX. Biosphere Reserve              |
| V. NAY                                  | X. World Heritage Site             |

### World Heritage Convention Integrity:

- |        |              |
|--------|--------------|
| Yes    | Partly       |
| Mostly | Not possible |

Conservation value for the geological sciences:

**2. Proposal for additional data to the content of a Balkan Geological Heritage List form (by I. Zagorchev, I. Drandaki, Tz. Tzankov)**

#### *Geotope Code Number*

*2.1. Site name and geographic position:* to be completed with data about the name origin and the position in respect to the nearest town, river, etc.

*2.2. Data about the geotope status and category (to be completed as follows):*

- Category of Geotope based on importance:
- World-wide importance
  - Regional importance (Europe)
  - Subregional importance (Balkan Peninsula)
  - National importance
  - Local/provincial importance
- Geotope interest:
- Touristic
  - Educational and/or cultural
  - Scientific only

### 2.3. Data about the biological, anthropogenic and cultural features of the geotope:

Type of vegetation, degree of exposure  
Land use  
Alterations  
Pollution

### 2.4. Relations with biotopes and/or cultural and historic monuments and reserves

#### 2.5. Geological description of the geotope

The geological description of the geotope (geosite) should expose in a most concise and clear way the reasons for inclusion (or proposal) in the corresponding Geological Heritage List (GHL). These reasons are based mainly on (i) uniqueness and representativity (importance for science); (ii) impressiveness, aesthetic value; (iii) informativity and completeness; (iv) degree of exposure; (v) possibilities for access and exhibition for (a) scientific, (b) educational purpose, and/or (c) for the general public; (vi) possibilities for conservation and preservation in its natural state. The geological description should explain the reference to the corresponding Earth Science Categories and the range of importance, and refer to the corresponding detailed studies (publications, reports). It should be illustrated with the most necessary geological maps, sections, diagrammes, field sketches and photographs. The following specific explanations should be given too (see also Zagorchev, Tzankov, 1996):

I. General description: Earth Science Category; general geological setting (tectonic zone, unit, etc.); specific geological setting (local structure); lithostratigraphy, chronostratigraphy, lithological (petrological) features, tectonic structure

II. Specific description according to primary and secondary interest

A. Palaeobiology: macro- or microfauna and flora; presence of rich taphocoenosis, tanathocoenosis or biocoenosis; abundance of different taxa (and groups) or numerous specimens of restricted number of taxa; unique, exotic or endemic taxa

B. Geomorphic: *origin by*: 1) water erosion (streams, rivers, lakes, seas); 2) aeolic activity; 3) glacier activity; 4) karstification; 5) denudation and accumulation during young (Neogene and Quaternary) crustal movements; *products of erosion*: 1) upright impressive rocks (including "stone mushrooms", "obelisks", etc.) sculptured into hard metamorphic, igneous or sedimentary (terrigenous or carbonate) rocks; 2) rocky gorges; 3) rocky river and sea coasts; 4) rocky crowns; 5) rock bridges; 6) waterfalls; 7) rocky landforms in relatively loose sedimentary rocks (loose sandstones and conglomerates with Neogene or Quaternary age), as coulisses, obelisks, pyramids,

columns, capped columns, mushrooms, etc.; products of aeolic activity: dunes; *products of glaciation*: moraines, typical glacier valleys, "Roches moutonnées", glacier lakes; *karst products*: Karen, funnels, karst sources, caves and their formations (stalactites, stalagmites, stalactones, coulisses, draperies, etc.); *natural landscape; products of Neogene and Quaternary denudation, erosion and accumulation* as, e. g., denudation surfaces (peneplains, pediments), river terraces (denudation or accumulation) and river beds (modern and old; meanders, etc.), relict peaks, plateaus, hills, etc.; forms that originated from sea (or lake) level changes (marine terraces, palaeocoast traces, etc.).

C. Palaeoenvironmental: see above

D. Petrological features: rare rock types; relationships informative for important natural processes

E. Stratigraphic: international stratotypes (Systems, Stages, Zones and their boundaries) and national stratotypes (lithostratigraphic units); important sections for the relationships between different units

F. Mineralogic: occurrences of rare or unique minerals and/or their associations

G. Structural: unique features on the meso-structural scale (strain indicators, shearsense indicators, cleavage, schistosity, foliation, mullions, boudins, folds and their associated elements, refolded folds, thrust surfaces and thrust-related structures, strike-slip faults, normal faults and their associations); macro- to megastructures (with associated small-scale structures) with unique or rare features

H. Economic: mineral deposits (or sectors) with unique mineral associations relevant for the origin and/or structure; unique types of mineral deposits

I. Historic: geotopes/geosites with first establishment of given geological features or phenomena

J. Relationships between different geological bodies that evoke tectonic plates relationships: unique sections or geological panoramas that prove such phenomena

K. Astroblemes

L. Continental/Oceanic global scale features: more or less identical with (J)

M. Submarine

## Conclusions

Geological and geomorphic diversity in South-East Europe is still unknown to the world geological community and to the wide public.

IUGS Geosites form covers most of the important features of geosites, and would facilitate the establishment of a Balkan Geological Heritage List as a database to be

incorporated in the World database. Additional data could be useful for the evaluation of the geosites as being of national, subregional, regional or world-wide interest.

## References

Anon. (IUGS Global Geosite Working Group). 1995. *IUGS GEOSITES. Database on Geological Sites*. Database form.

NCC (Nature Conservancy Council). 1991. *Earth Science Conservation in Great Britain. A strategy*. NCC, London. 84 p.

Wimbledon, W., Benton, M., Bevins, R., Black, G., Bridgland, D., Campbell, S., Cleal, C., Cooper, R., May, V. 1995. The development of a methodology for the selection of British geological sites for conservation: part 1. - *Modern Geology*; 1; 1-51.

Zagorchev, I., Tzankov, Tz. 1996. Geological Sites of Special Scientific Importance (GSSSI): an approach to Bulgarian and Balkan geotopes. - *Geologica Balcanica*, 26, 1, 51-56.