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POLISH DATABASE OF THE REPRESENTATIVE GEOSITES FOR THE EUROPEAN FRAMEWORK

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Abstract. Initiated by the International Union of Geological Sciences programme Global GEOSITES has become one of the most important projects in inanimate nature conservation in Europe. It aims to create international database of the representative geosites to preserve geological heritage of our planet. The computer database of the Polish geosites is being compiled in the Institute of Nature Conservation of the Polish Academy of Sciences in Kraków. Microsoft Access programme is used as a tool for construction of the database. All the data are stored in tables with records on single objects (geosites). Besides numerical data and text files, maps, photos, profiles etc., prepared in other applications, are being added. For print version, special tables have also been prepared.

Key words: database, geoconservation, Global GEOSITES, Poland.

Abstrakt. Zainicjowany przez Międzynarodową Unię Nauk Geologicznych program Global GEOSITES stał się jednym z najważniejszych projektów w dziedzinie ochrony przyrody nieożywionej w Europie. Ma on na celu utworzenie międzynarodowej bazy danych geostanowisk reprezentatywnych dla zachowania dziedzictwa geologicznego naszej planety. Komputerowa baza danych geostanowisk Polski jest kompletowana w Instytucie Ochrony Przyrody PAN w Krakowie. Do tego celu wykorzystano program Microsoft Access. Wszystkie dane są przedstawiane w formie tabel, których poszczególne rekordy odpowiadają pojedynczym obiektom — geostanowiskom. Oprócz danych numerycznych i tekstowych do bazy dołączono mapy, zdjęcia, profile itp., których obróbkę wykonano w innych programach. Dla drukowanej wersji przygotowano specjalne tabele.

Słowa kluczowe: baza danych, geoochrona, Global GEOSITES, Polska.

At present, computer systems supporting many disciplines of our life make easier management of various types of data. Collection, selection and processing of those data are very crucial because of the fast inflow of large amount of the information and necessity of its control. Effective use of computer science demands integration of those systems.

Particularly essential, from the nature protection point of view, is management of spatial information. The areas with high natural values demand protection and maintenance of their diversity. These activities could be more effective due to computer database in which scattered information could be gathered in one place, organised in better order, easily accessible, and continuously and quickly updated.

Progressive degradation of environment threatens with irreversible destruction of the most important geological areas and sites recording more than 4,5 billion years of the Earth history. Additionally, other natural factors such as succession of vegetation, mass movements, erosion etc. can be covered by the discussed objects. Many people have noticed these threats, therefore words such as "geoconservation" or "geodiversity" have entered into the nature protection language forever.

There are not too many sites with geological significance on the UNESCO's World Heritage List. Only the World Heritage Geological Sites, created in co-operation with IUGS and other scientific organisations, contain objects of the unique geological value (Cowie, 1990). This list contains 90 objects, and only one, Skałka Rogoźnicka (state from 1990), is from Poland, and there are no updates so far.

Programme Global GEOSITES, initiated in 1996 by the International Union of Geological Sciences and supported by UNESCO, has become one of the most important projects in the field of the inanimate nature protection on the world. It aims

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A

Geosite accession number	National site accession number
	2/III/341
Geosite name	**State, country, paris/town**
CZERWONA ŚCIANKA (RED WALL)	Poland, Małopolska province, Krakow district, Krzeszowice commune
Geographical coordinate	**Character of site**
50°10'02" N/19°37'34" E	Outcrop along the stream

B **Primary geological data**

Type of site	Primary geo(morpho)logical interest
E2 (A, C)	Visean detritical and organodetritical limestones, rich in macro- and microfauna, typical shallow-marine deposits

Framework element or context represented	Chronostratigraphy
Visean bio/lithostratigraphy	Lower Carboniferous (Dinant, Middle/Upper Visean)

Description of primary interest

The outcrop, 200 m long, is situated at the left bank of the Czernka stream valley within the eastern border of the Silesian Coal Basin. The sequence of Visean deposits dipping 130/40° SW is composed of reddish-grey limestones and marly limestones with numerous brachiopodes (a.e. *Gigantoproductus giganteus*), grey organodetritical limestones, intraformational conglomerates and dark grey bituminous limestones. The whole thickness of these deposits is about 30 m. Several microfacies characterised by microfossils (Calcisphaera, Foraminifera, Ostracoda) and remains of Echinodermata, Brachiopoda and Bryozoa were distinguished. The rich fauna of Foraminifera encloses about 50 taxa and indicates the Upper Visean age. The locality presents the standard sequence of youngest part of Lower Carboniferous Dinant limestones of Southern Poland, abounding in fossils and typical of shallow-marine environment.

Comparative assessment/justification

Upper Viseanian shallow marine deposits are typical of the Cracow Variscan Branch. Microfacies correspond with Upper Visean in Scotland and Donbass (Ukraine). The infraformational conglomerates are in similar lithostratigraphic position as breccias in the Dinant Coal Basin.

Comparative assessment/justification

Holly Cross Mts. - outcrop in Gałęzice (less important). The locality in Czernka Valley is a very important geotop for the Late Visean calcareous deposits in Central Europe.

C **Secondary supparting data**

Map sheet	Elevation	Geosite area
1:50 000	345 m a.s.l.	2 ha

Protection status, accessibility

Candidate for protection, accessible but the observation is limited by the vegetation succession.

Other values

Literature

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Source of data, collections

Illustrations

Profile 1

Proposer(s)

S.W. Alexandrowicz – Polish Academy of Art and Sciences, Kraków; Z. Alexandrowicz - Inst. of Nature Conservation Pol. Ac. Sci., Kraków (2002).

Fig. 2. Example of geosite format — Czerwona Ścianka; version to print

A – Primary identifying data, **B** – Primary geological data, **C** – Secondary supporting data

Table 1

Types of geosites in Polish database (supplemented by Z. Alexandrowicz in accordance with the proposal of Wimbledon *et al.* (1999) – Mem. Descr. Carta Geol. d'Italia 54: 45–60; app. 2.

Symbol	Branch	Explanation of geosite type
A	Palaeobiology	fossil fauna and flora, ichnofauna, evolution of live
B	Geomorphology	landformes, morpho-processes, landscape
C	Palaeoenvironment	deposits, indicators of palaeoclimate and sedimentary environment
D	Petrography	igneous rocks and its body-forms, metamorphic rocks, sedimentary rocks, textures, structures, genesis
E1	Quaternary stratigraphy	sequences and age of sediments, biostratigraphy, geochronology, climatostratigraphy
E2	Stratigraphy of Phanerozoic	stratotypes, lithostratigraphical sequences, facial differentiation, index fossils
E3	Stratigraphy of Proterozoic	differentiation of rocks, radiochronology, early traces of life
F	Mineralogy	minerals and its associations, genesis, forms of occurrence
G	Tectonics	folds, faults, overthrusts, tectogenesis, evidence of neotectonical, glacitectonical deformations
H	Geology of mineral deposits	forms occurrence, genesis, mining monuments
I	History of geology	sites and monuments important for Earth sciences development
K	Cosmogeology	meteorites, chondrites, meteor craters
L	Geotectonic	rocks and structures documenting plate tectonics
M	Marine geology	recent marine sediments, submarine processes, phenomena and forms

III — Silesia–Cracow Upland.
IV — Małopolska Upland.
V — Lubelskie Upland and Polesie Plain.
VI — Sudetes Mts. and Sudetes Foreland.
VII — Carpathian Mts. and Carpathian Foredeep.

This division has reflection in national site accession number, e.g. 7/III/341 is a serial number of the site/symbol of subprovince according to Kondracki (2000). Taking geographical co-ordinates into consideration, it will be possible touse it in the Global Information System.

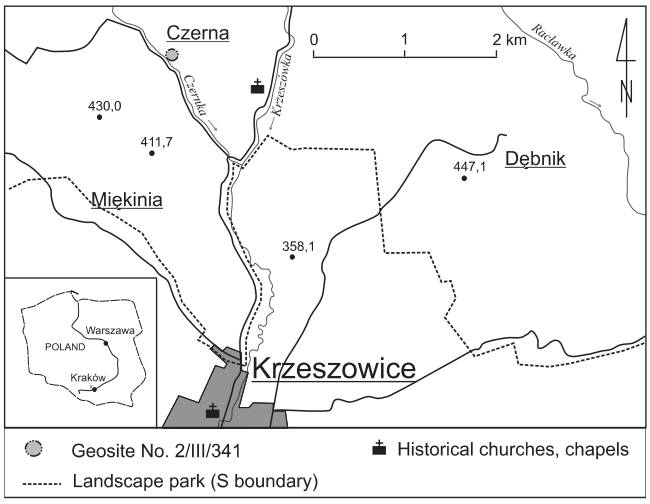

Fig. 3. Schematic map — localisation of geosite No. 2/III/341

2. **Primary geological data** assigning a site according to specific geological features (Figs. 1, 2B) with special regard to type of site (Table 1). This characteristics will have great meaning in selection of the most important geosites in Europe.
3. **Secondary supporting data** includes maps, pictures, profiles, diagrams etc. (Figs. 1, 2C).

To better manage large quantity of data, it is necessary to use relational database management system, so that gathered information on objects could be fully used. To this end, Microsoft Access programme was applied. It made possible to define, manage, control and make our data available. Microsoft Access is widely accessible as part of Microsoft Office. Structure of Polish Geosites Database illustrates Figure 1. All data are stored in tables which contain records, equivalents of single objects (geosites). Every object has been attributed certain quantity of information, which could be processed and replenished at any moment. Due to the use of queries — interactive questions — one can select the information from one or more tables without searching the whole database. That is why searching is going to be easy and comfortable. Additionally, there is possibility of using SQL — Structured Query Language — which permits defining the collection in order to find the information. In the project, the following criteria of choice have been used: geosite name, type of site and region in which it appears. There will also be possible to locate all sites on general map of Poland. These criteria may be replaced by other.

Besides numerical data and text files, maps, photos etc., made in other applications, can be added. For this purpose Corel Draw, a very useful programme for making pictures in the cold vector graphics format, have been used. Therefore, schematic maps (Fig. 3) with locations of geosites against the background of main roads, towns, rivers, mountains and most important relics of cultural heritage: historical churches and chapels, have been attached. Additionally, photos and profiles prepared with the use of Corel Photo-Paint programme, were taken into consideration. Special tables (Fig. 2A–C) were prepared for print version.

The database of the national geological heritage geosites will be an initial material for selection of the most representative geosites in Europe. This database will in future be available on the Institute of Nature Conservation PAS website and on the ProGEO website. The geographical co-ordinates might be used in the Global Information System (GIS).

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