

Geonucleus

geonucleus.elte.hu https://www.facebook.com/Geonucleus/

The freeware application for managing geological mapping data in GIS

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Geodatabase structures - RDB vs. xml

RDB (REALTIONAL DATABASE)

ID	Lat	Lon
001	47.5582	19.5823
002	47.682	19.4823
003	47.582	19.4823

ID	dir	dip
001	160	20
001	142	15

Many connected tables (once created, it is hard to reorganize) – good on server-side

XML DATABASE

<Point> <ID>001</ID> <coordinates>19.5823,47.5582 </coordinates> <measurements> <bedding>160/20</bedding> <bedding>142/15</bedding> </measurements> </Point> G

Tree stucture instead of tables (It can always "grow" new branches) – good on client side



GUI of Geonucleus

The data collecting app (for Windows) can be accessed freely with full functionalities for desktop users. (geonucleus.elte.hu)

Metadata area

General description area

Switchable panels for observations, measurements, photos and notes

Start

1) Select the object of measurement (e.g. fault/bedding/joint/fold axis)

2) Add the new measurement

3) Select one measurement and <u>complete</u> it



Albert G.: GEONUCLEUS

I/O file types:

- kml
- txt (AscII tabs)
- gpx (GPS exchange)

📲 Ge	onucleus 1.0: [SZM-AG090 EN.kml						
File	Edit Tools	Help	Help					
	open kml	AG090	AG090					
	save kml	Gáspár Albert, László	5 Fodor					
	import	gpx file						
	export	 text tab 	Importance					
exit		47,714255	C small • medium • high					
Longitude: Elevation (asl m)		18.4866033	Add/Update point					
		380	Total number of points: 1 Selected point: 1					

Start

File Edit 1	rools	Help			
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save kml import		Gáspár Albert, László Fo	odor		
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Longitude:		18.4866033	Add/Update point		
		Protected and a state of the st	- Total number of points: 1		

Converting the observed data into XML Start files in Geonucleus



The KML files, officially named the OpenGIS® KML Encoding Standard, are also XML documents, but specialized for the description of geospatial data.

outcrops.

geological map draped on the DTM Fürásjel : Lt-29 (Lábatlan) Magasság (tszf.): 307.92 m GEO NDX Z [m] Iml Qh_talaj 306.9 e Qp3 | 300.4 7.5 soPa2 286.9 21 7.5 d_bE2 267 21 40.9 260.9 bK1 40.9 47

ACONS

image @ 2011 Digital@isbo

(9 2011 Cace/Spot Imago classe@2011 Costro

9 2011 Euroscieckecolis Slovakia

horses 18,499281° magazado 800m

ACO34ACO3

borehole log from

@082

Pill-Pill

A@029

ACOST

GRAIL 47 720100

the borehole

database

ACO17

AC04

AC048

ACOAA

AC046

AC045

307 m

Geopal 77

ACOS

Azonosító : DSZM-AG090

Index: I_kK2 Leírók: Albert Gáspár, Fodor László Dátum: 12 okt. 2010 13:30:58 Magasság: 380 m Feltárás típusa: törmelékes és fedett feltárás Jelentőség: közepes Helyszín: A Margit-tetőről északnyugati irányba ereszkedő gerinc tetején, a Csemetekert utáni kis tisztáson.



ACOSE

ACODI ACOBS

AGOL

Litológia: Helyben lévő törmelékben nagyon durva szemcsés, rosszul osztályozott, polimikt homokkő-konglomerátum. A klasztok zömmel átkovásodott barnás- vagy zöldesszürke agyagkövek (túzkő jellegűek) és fehér túzkövek, de elszórva kerekített kvarcitkavicsok is vannak (1-2 cm-esek). A tůzkövek (agyagkövek) mérete 3-8 cm, rosszul kerekítettek, elnyújtott formájúak is vannak. Kerekített kréta hornokkő törmeléke is felbukkant, de eredete bizonytalan. Rétegsor: I_kK2

Fotók: 4881-82.jpg

Megjegyzés: Ha a kréta homokkő a törmelék része akkor a képződmény fiatalabb, mint a Köszörűkőbányai konglomerátum (eocén vagy oligocén?). Alias: 353-as folt

> data and photo of an observation point

> > Szemmagazzág: 1.48km

Start

FL1546 FL155 FL155d

FL 154

FL 156

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177	Geometry: Map Name:	Geonucleus sampl	eDSZM-AG090_GM.kml	/Lon: 4/ 42 (1.112		111.1-2	1 sa		
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szerkeszthetőség be/kikapcsolása

18,48925,47,71468

Geological documentations

Traditional geological mapping (materials: map, paper notebook, photos);



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- **Advantages**: does not depends on charged batteries, the extent of documentation is not limited.
- **Disadvantages**: there are no restrictions, so the post-process is time consuming (data mining), the localization of the sites are sometimes problematic.
- Traditional mapping with GPS (materials: map, paper notebook, photos, gpx file);
- 3. Digital geological mapping (log files on a handheld device including coordinates and photos)
 - **Advantages**: the logs are directly imported into a database, quick post-processing (e.g. coordinate transformations), the database structure is modifiable.
 - **Disadvantages**: works only with proper circumstances (battery, satellite, dust, temperature and humidity), the database structure drives the documenters to record the given type of data.

Elements of a mapping project (data acquisition)

ATTENTION! In practice these methods compete each-other!

Start

- Spectrometry (radar, laser, hyperspectral, sonar, etc.)
- Morphometry (analysis of landforms)
- Cartometry (analysis of maps)
- Field observation (mapping)
 - Sampling (collecting materials from the field)

Aim of these methods is to qualify the observed formations.

Start

Qualifications by mapping

Database of observations



Modified kml for Global Mapper

<Placemark> <name>AG098</name> <visibility>l</visibility> <styleUrl>#mafi_10e_style</styleUrl> <Point> <extrude>l</extrude> <altitudeMode>relativeToGround</altitudeMode> <coordinates>18.4769833,47.720155,50</coordinates> </Point> <POINT ID>AG098</POINT ID> <FORMATIONS>1K1-2: dT3:</FORMATIONS> <OBSERVERS>Albert Gáspár, Lantos Zoltán</OBSERVERS> <DATE>2011.06.28. 10:58:00</DATE> <ELEV>238</ELEV> <TYPE>in situ</TYPE> <IMPORTANCE>medium</IMPORTANCE> <LOCATION>In the valley of Stonecreek.</LOCATION> <LITHOLOGY>Light brown, coarse-grain sandstone.</LITHOLOGY> <STRATIGRAPHY>IK1-2/dT3</STRATIGRAPHY> <MEASURES>155/25 (BP 1K1-2) U size:1; </MEASURES> <FOSSILS>Foraminifera (lK1-2) U size:nagy; </FOSSILS> <PHOTOS>P6285494_w500.jpg; </PHOTOS> <NOTE>unfortunately the bottom of the creek was littered with plant debris.</NOTE> <ALIAS-329 Császár G., DSZM-AG035</ALIAS> <PHOTO_URL>G:\ELTE\TerepiGIS\fotok\20110628-DSZM-AG098-103\ belyeqkepek\P6285494 w500.jpg; </PHOTO URL> </Placemark>

Database structure

ID	Lat	Lon	measures
AG012	18.497305	47.7238	08/30 rtg;
AG013	18.496	47.72425	66/15 rtg (p]3)
AG014	18.495194	47.72438	148/20 rtg; 146/55;
AG015	18.494527	47.72444	176/45 rtg (b_fK1)
AG023	18.481083	47.73202	110/20 rtg (lösz)
AG025	18.484055	47.73275	8/10 rtg; 22/18 (xl)
AG029	18.4706383	47.72396	320/14 rtg; 350/20

txt of the "measures" table

- The database is exported into xml (on the left), or AscII tab (on the right) file structure.
- Both can be imported into any GIS application.
- The coordinates should be defined in WGS84 Global coordinate system.

of the Geonucleus data processing App

Geonucleus aims to assist the preparation of a geodatabase from traditional geological mapping.
It supports basic types of geodata (KML, AscII, GPX)
Provides a comprehensive interface for detailed documentation

Start

Documentation, download and information:

<u>geonucleus.elte.hu</u> <u>https://www.facebook.com/Geonucleus/</u>

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Geonucleus

For converting field observations into GIS

Geological mapping techniques

Database structures

Geonucleus User Interface

Click on an element for details!

References

Start

References

ALBERT G. 2014: Inventorizing tectonic elements in geological maps and 3D models – Problems, Concepts, Solutions – in: Beqiraj A, Ionescu C, Christofides G, Uta A, Beqiraj Goga E, Marku S (eds.) Proceedings XX Congress of the Carpathian-Balkan Geological Association. Tirana: p. 459.

ALBERT G., CSILLAG G., FODOR L., ZENTAI L. 2012: Visualisation of Geological Observations on Web 2.0 Based Maps – in: Zentai, L. and Reyes-Nunez, J (eds.): Maps for the Future - Children, Education and Internet, Series: Lecture Notes in Geoinformation and Cartography, Tentative volume 5 – Springer; pp. 165–178.