



Hochschule  
für Technik  
Stuttgart

# Sharing cave information with explorers and public using ArcGIS Online

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# The „Blautopfhöhle“ (en. Blue pot cave)

§ The „Blautopf“ is a spring in Southern Germany, which is famous for its specific blue colour

§ Entry to the “Blautopfhöhle”

- Discovered in 1957
- 22 m under water surface

§ 1985: Discovery of the first air filled hall in the cave



Image: <http://de.wikipedia.org/wiki/Blautopf>

# The "Blautopfhöhle"

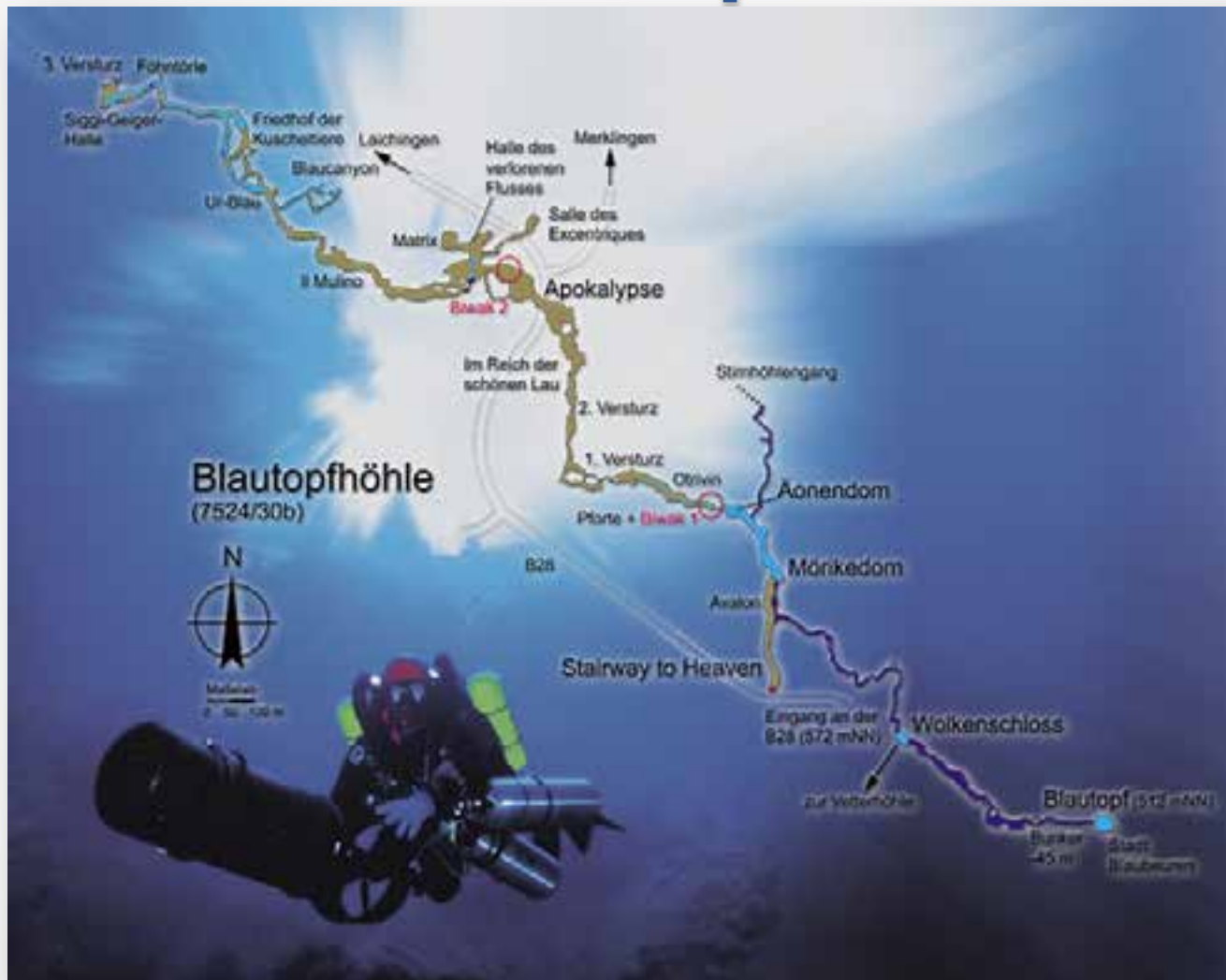


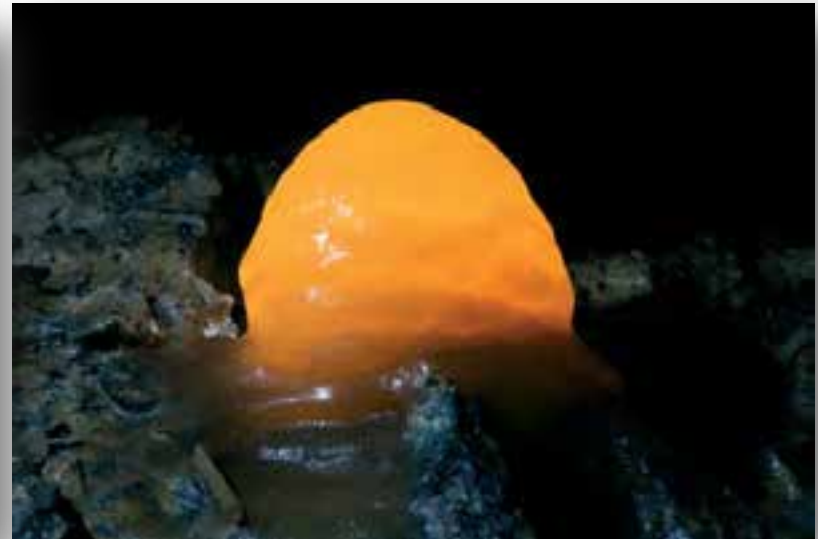
Image: <http://www.blauhoehle.com> - Höhlenrundgang

# The “Blautopfhöhle”

§ The third largest cave in Germany

- 32.860 feet (10,015 m) long

§ Rich variety of cave formations and minerals



Images: M. Schopper, „Minerale und Speläotheme im Blauhöhlensystem,“  
Mitteilungen des Verbandes der deutschen Höhlen- und Karstforscher e.V. München, Nr. 58

# The „Blautopfhöhle“



Images: <http://www.blauhoehle.com> - Höhlenrundgang

# Cave Documentation

§ Exploration by the  
“Blautopf consortium”,  
a group of geologists



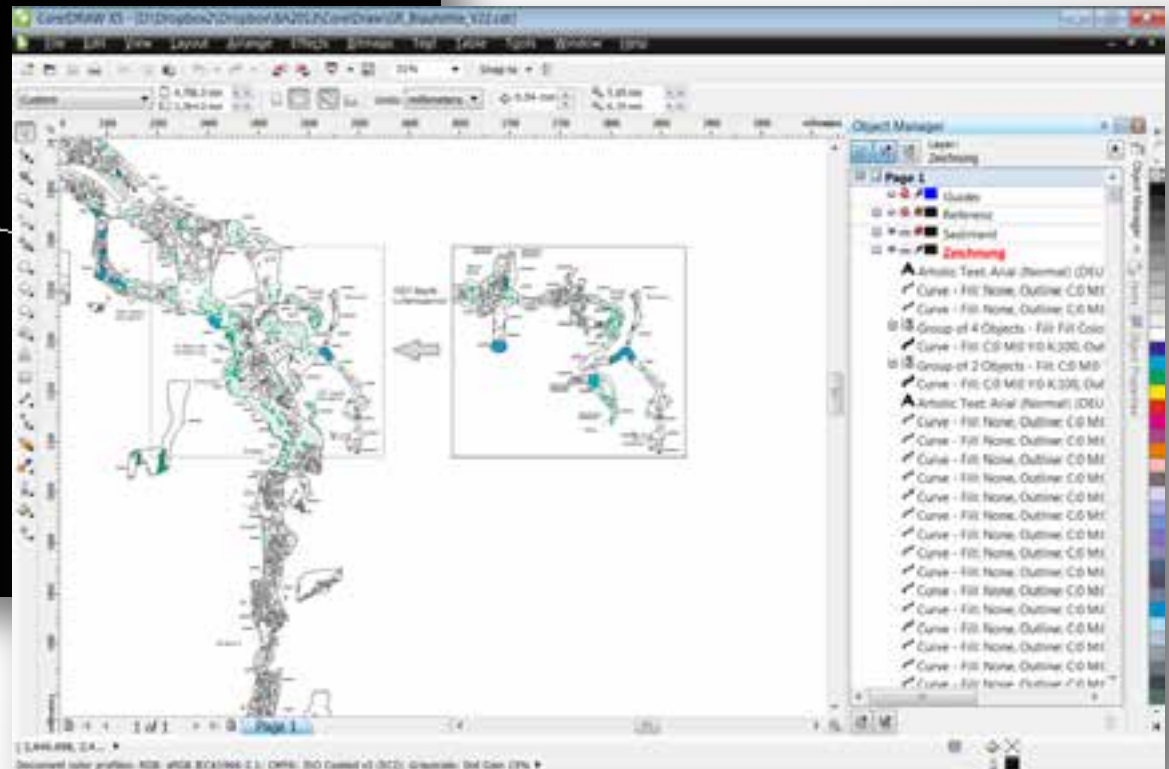
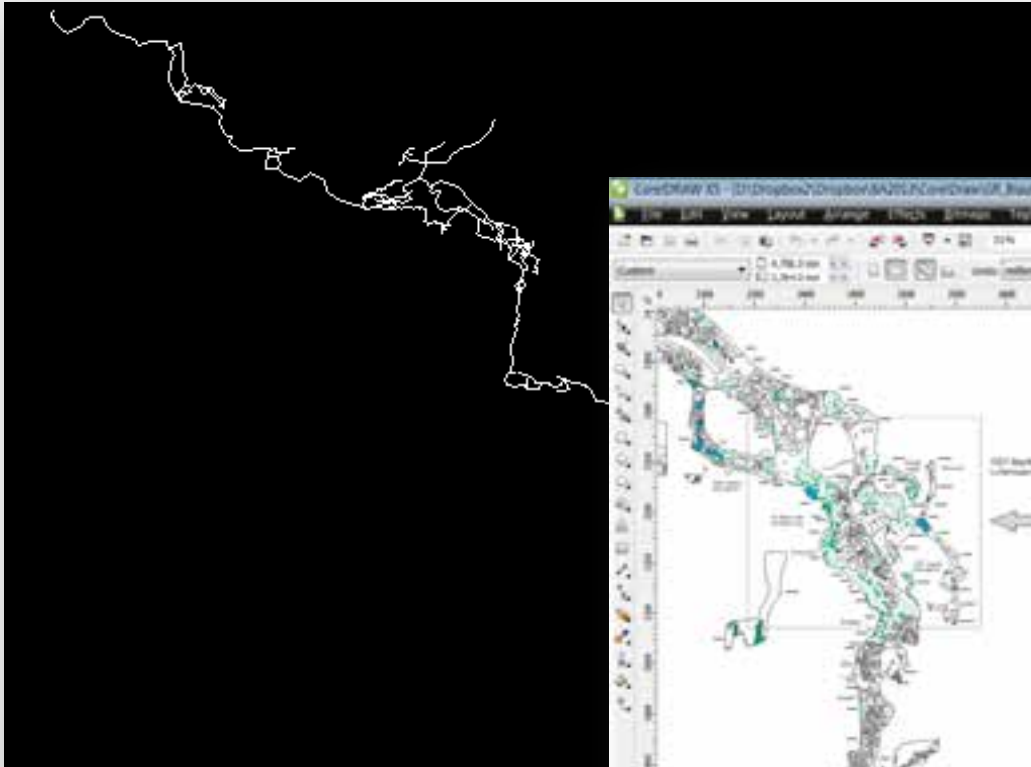
Image: <http://www.blauhoehle.com>

§ Sketching and Surveying

- Initial point with global coordinates
- Traverse with a compass and a digital rangefinder

§ Drawing of the traverse by cave mapping software COMPASS and CorelDraw

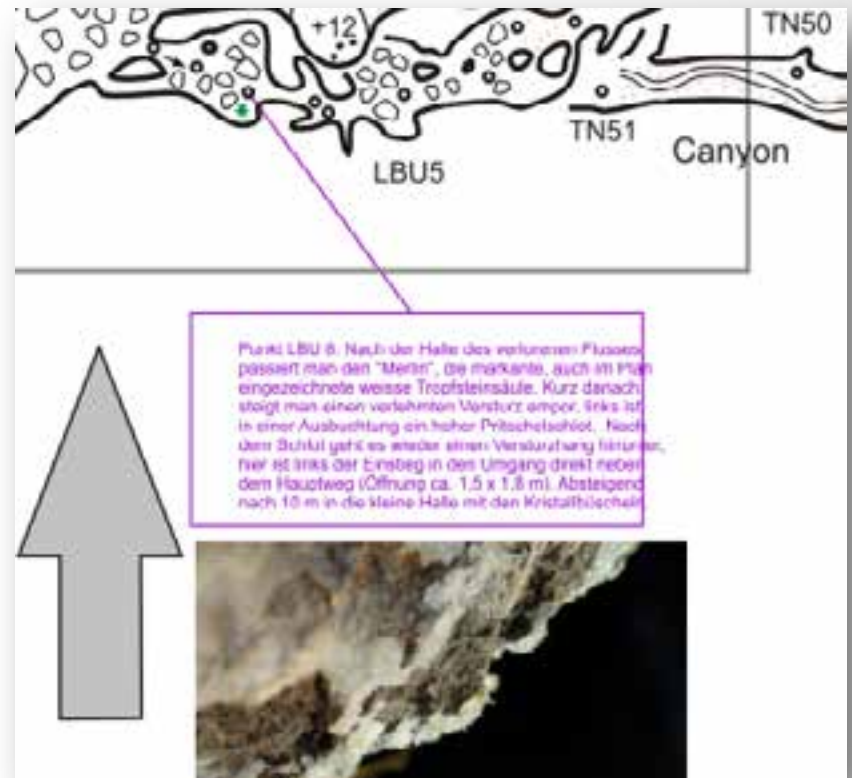
# Cave Mapping and Documentation in CorelDraw



# Documentation

## § Large graphics file (CorelDRAW)

- Extension of the cave
- Findings
- Minerals
- Manually linked pictures
- Results of the analysed materials



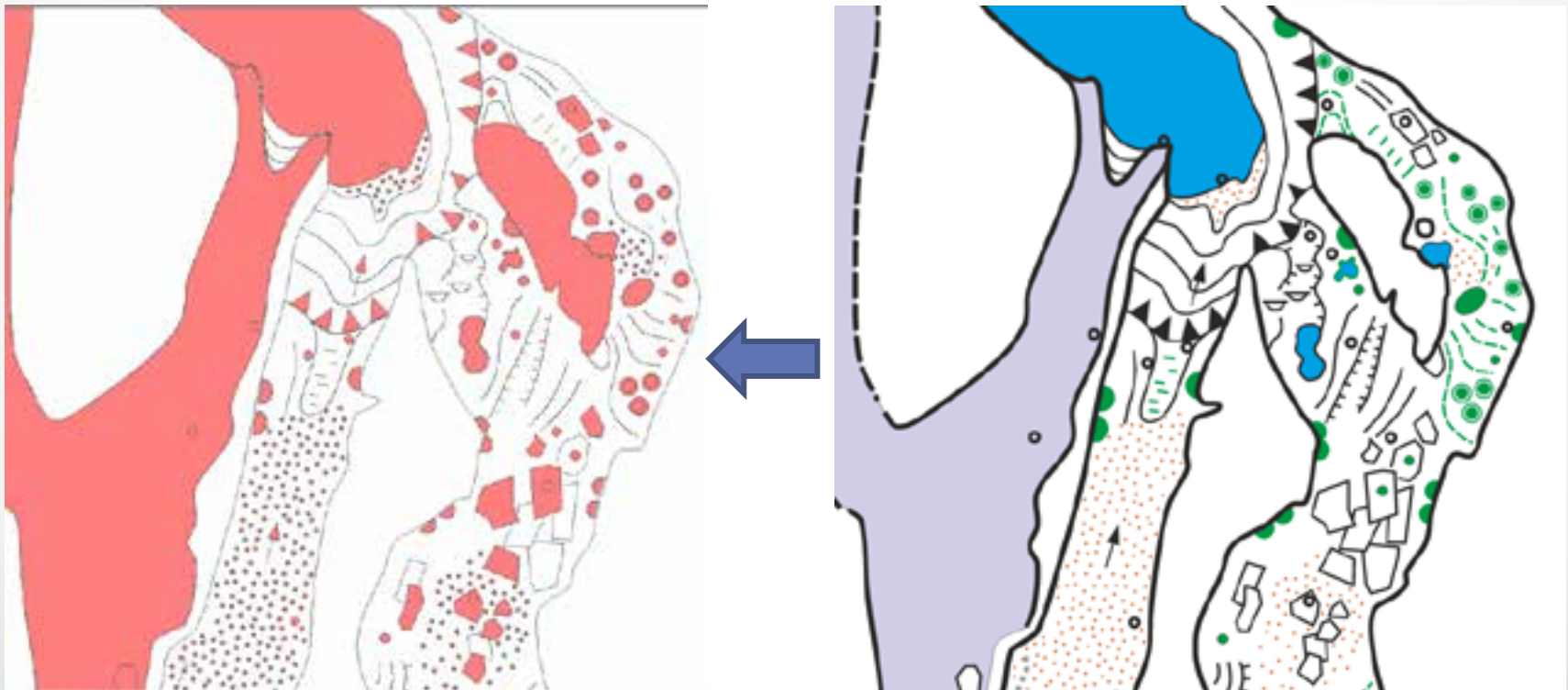


# Objectives for using ArcGIS online

- § Internet based solution
- § Cooperative work  
(independent researchers)
- § Expandable
- § Integration of diverse media
- § Easy to handle  
(without GIS-Experience)

# ArcGIS as intermediate Platform

§ Without further processing there would only be four legend entries (4 classes)



# Restructuring - Classification

- § Class "Polyline" with 34 attributes
- § Three properties with different values
- § Classification on the basis of three properties

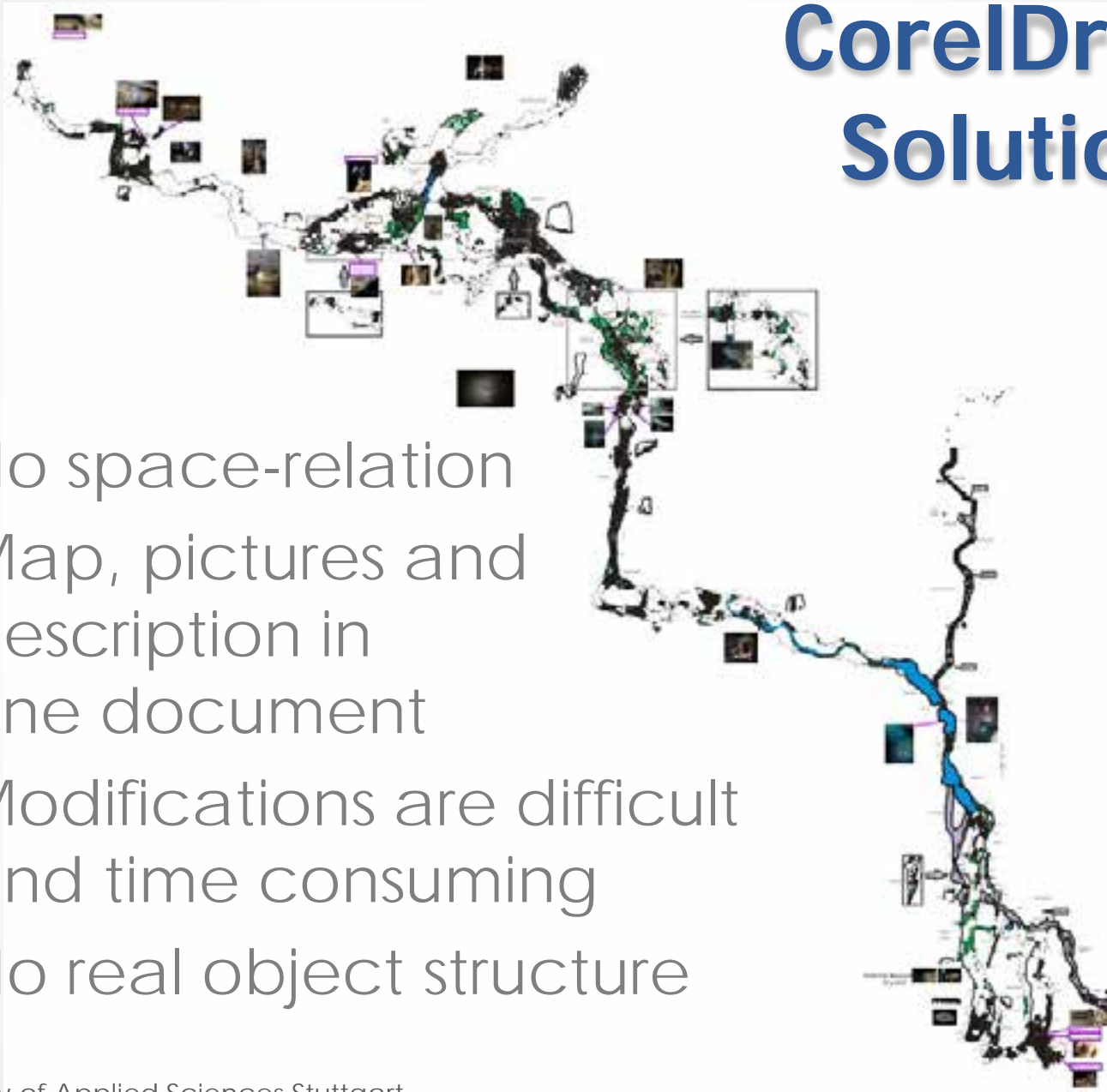
	OBJECTID *	Shape *	Entity	Layer	Color	LineWt
	1397	Polyline	Ellipse	Zeichnung	250	50
	1398	Polyline	Ellipse	Zeichnung	250	50
	1399	Polyline	Ellipse	Zeichnung	250	50
	1400	Polyline	Ellipse	Zeichnung	250	50
	1401	Polyline	Spline	Zeichnung	3	35
	1402	Polyline	Spline	Zeichnung	114	35
	1403	Polyline	Spline	Zeichnung	114	35



# Results

# CorelDraw Solution

- § No space-relation
- § Map, pictures and description in one document
- § Modifications are difficult and time consuming
- § No real object structure





# Situation in ArcGIS Online

- § Published as raster and feature services
- § Interactive GIS
- § Modification is possible for all authorized researchers

# Situation in CorelDraw

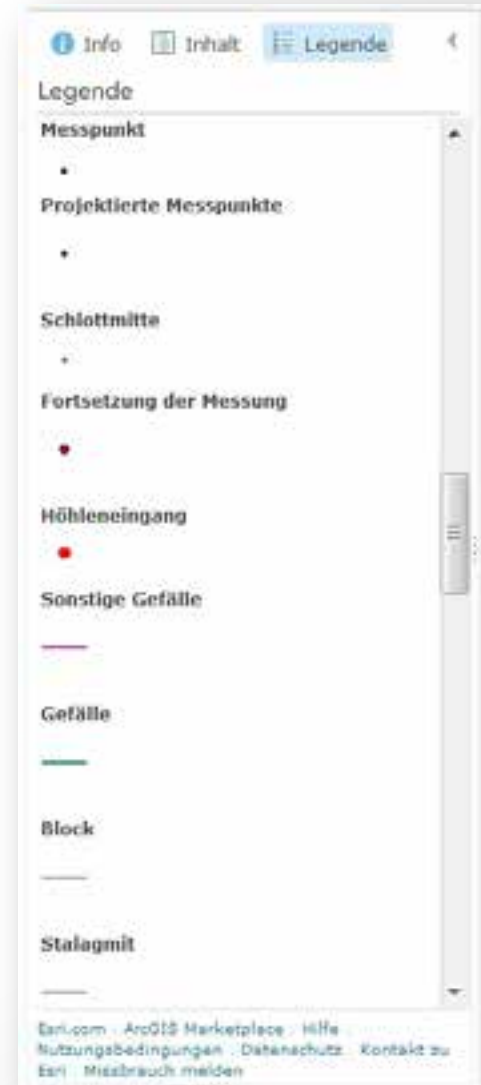
- § Different symbols for the same kind of objects
- § No legend





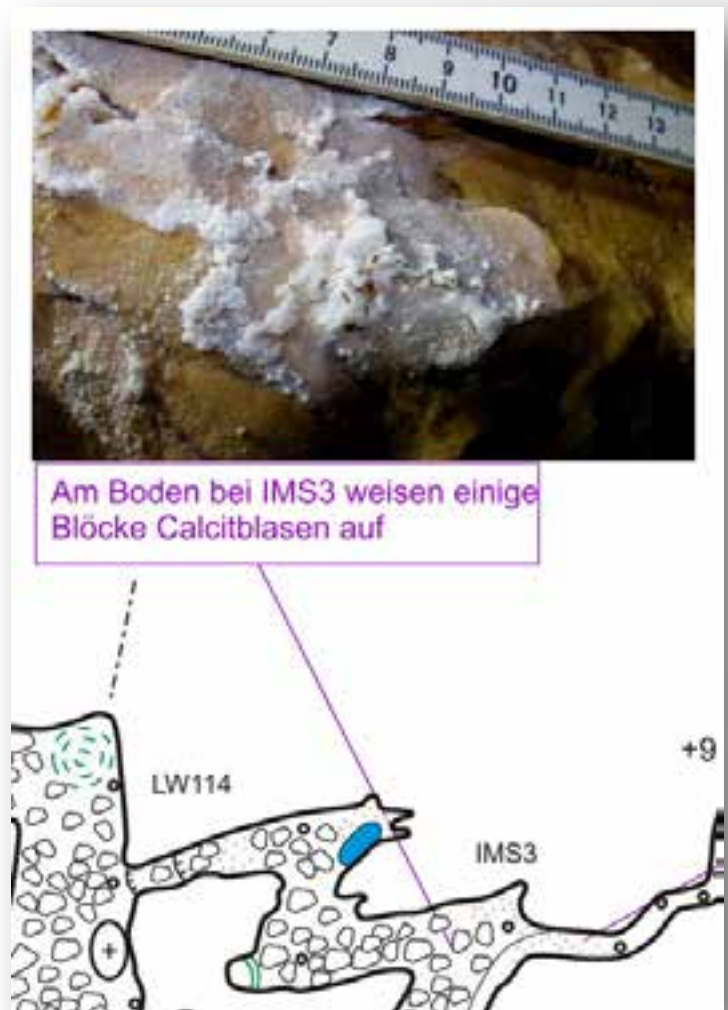
# Situation in ArcGIS Online

- § Common Geodatabase
- § Object structure
- § Variable legend with cave symbols
  - The official UIS List



# Findings, pictures and attributes in CorelDraw

- § Description, results of analysis and photos partially overlap the map
- § Not clearly arranged

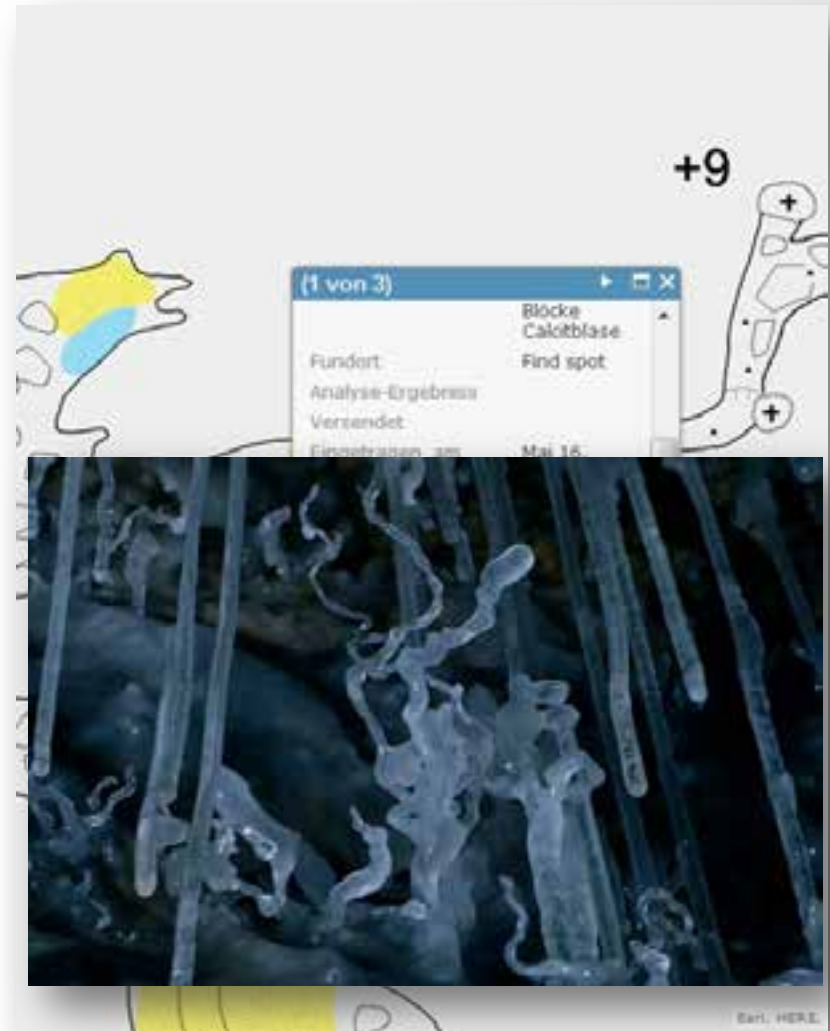


# Findings, pictures and attributes in ArcGIS Online



# Findings, pictures and attributes in ArcGIS Online

- § Self-explanatory mask for object-creation and symbols
- § Upload of pictures possible directly or as URL



# 3D Documentation

## § Mobile Laser Scanner

ZEB1 - Hand-Held  
Mobile Mapping

§ Used for important  
parts of the cave

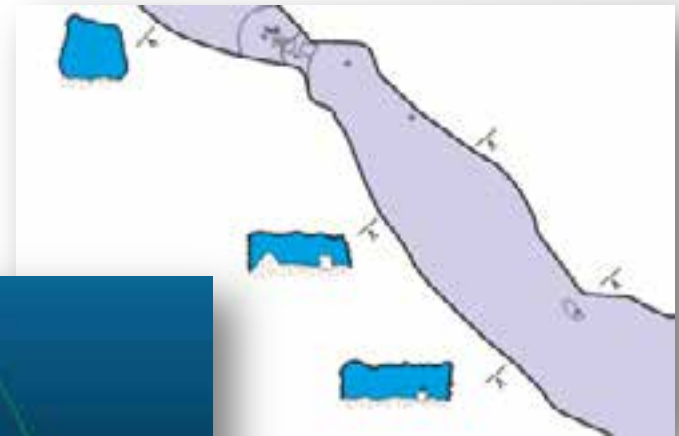
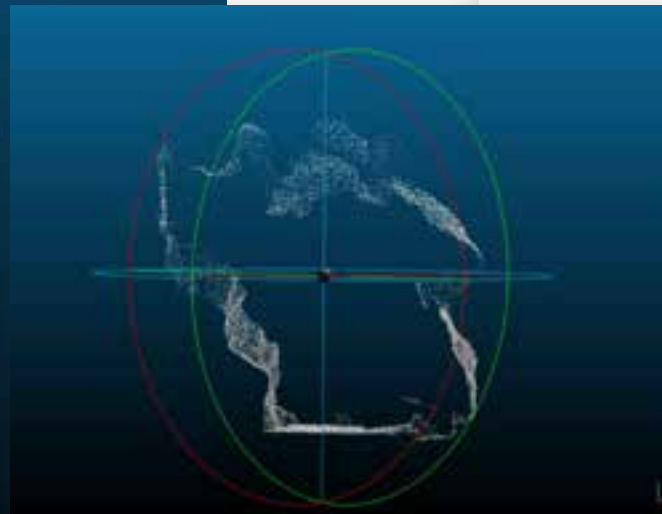
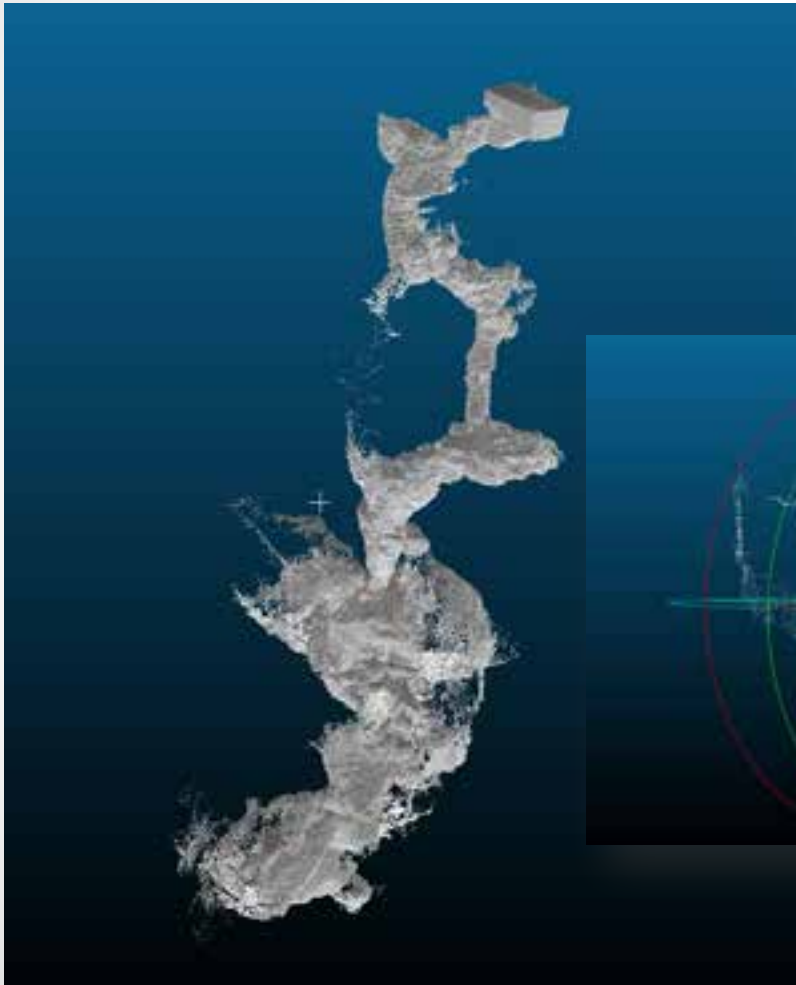


Image: <http://www.3dlasermapping.com/products/handheld-mapping>

# ZEB1 - Application



# Creation of cross sections



# Map-Presentation as Map Tour

**The Blue pot cave (dt. das Blauhöhlensystem)**  
The third largest cave in Germany with 32.860 feet (10.015 m)

Zum Generator-Modus wechseln

The history of the cave

Blautopf

1 Entry

2 View

3 Mineral

4 Beautiful

5 Cross section



**Thank you for your  
attention**