CASTLE RUINS AS SITES WHERE GEODIVERSITY AND CULTURE MEET: A CASE STUDY OF JANŠTEJN (CZECHIA)

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Public Recreation and Landscape Protection – with Respect Hand in Hand?
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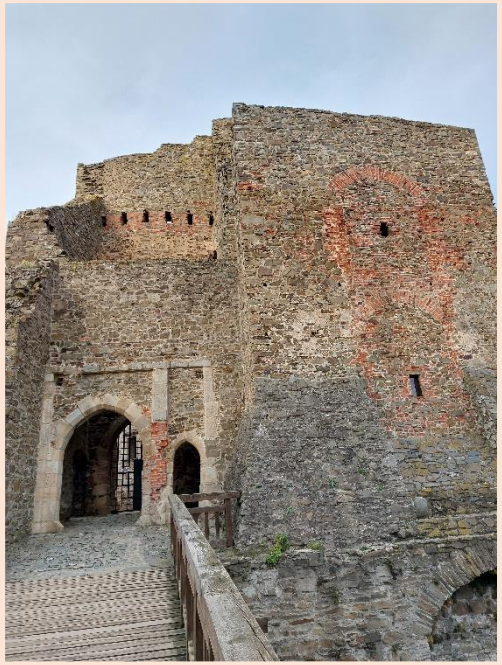
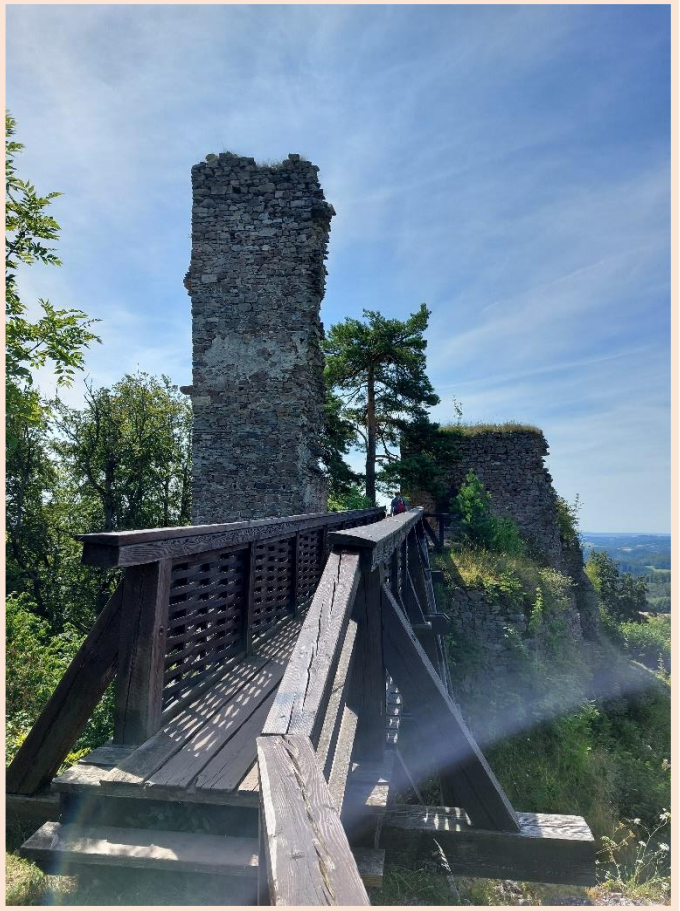
INTRODUCTION

- **Geocultural sites - locations where geological features interact with cultural elements** (e. g. historical, archaeological, or religious structures).
  - Important potential for geotourism and geoeducation
  - At the same time, they may become endangered by numerous threats (degradation, vegetation overgrowth, overtourism, inappropriate use).
- **Castle ruins = geocultural sites par excellence**
  - Interplay of geomorphological settings and architectonical aspect
  - Situated on distinctive landforms - influence the proper construction of castle or its architectonical disposition.
  - Geoheritage values (natural landforms, e.g., outcrops, tors, block accumulations)
  - Cultural heritage values (use of local stone, archaeological and historical value, mythological aspects, modification of relief by human activity resulting in anthropogenic landforms)
  - **The cultural (historical and archaeological) values of castle ruins are often emphasized, while geoheritage values are sometimes overlooked**



Clockwise from left top:

Helfštýn

Hukvaldy

Trosky

Zubštejn

Starý Jičín

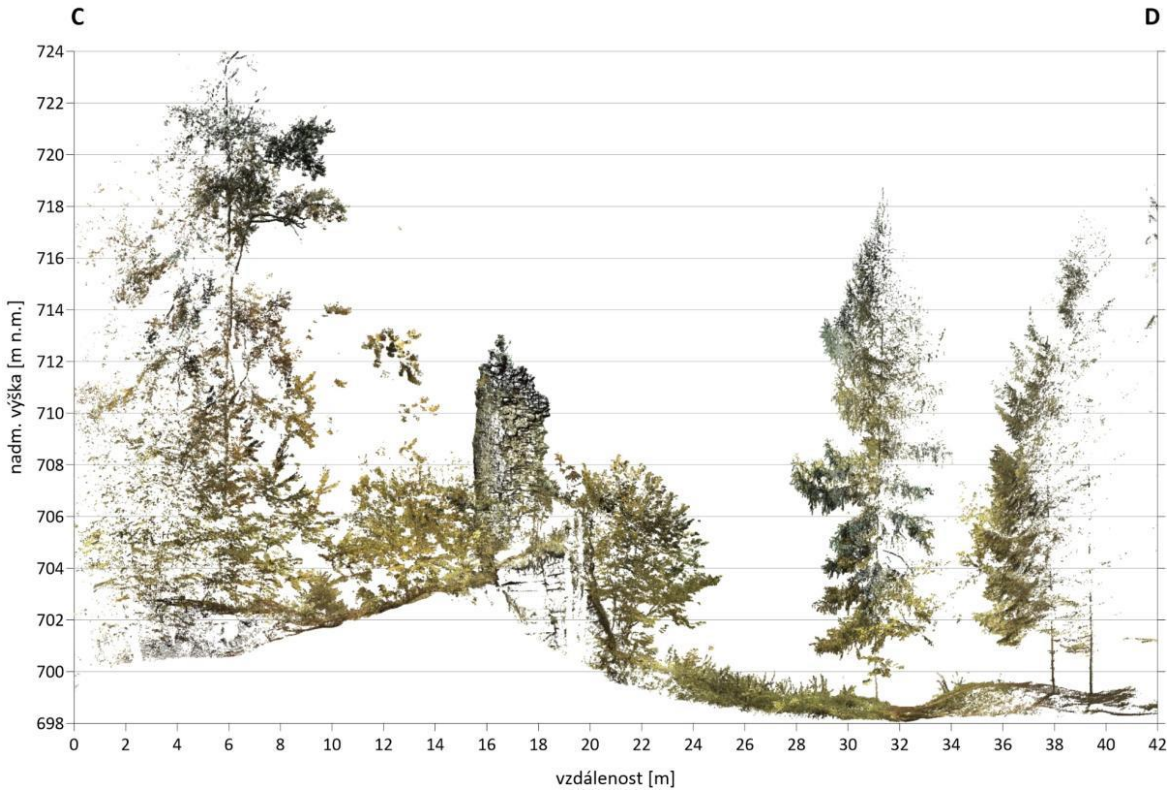
Tolštejn

Loučka



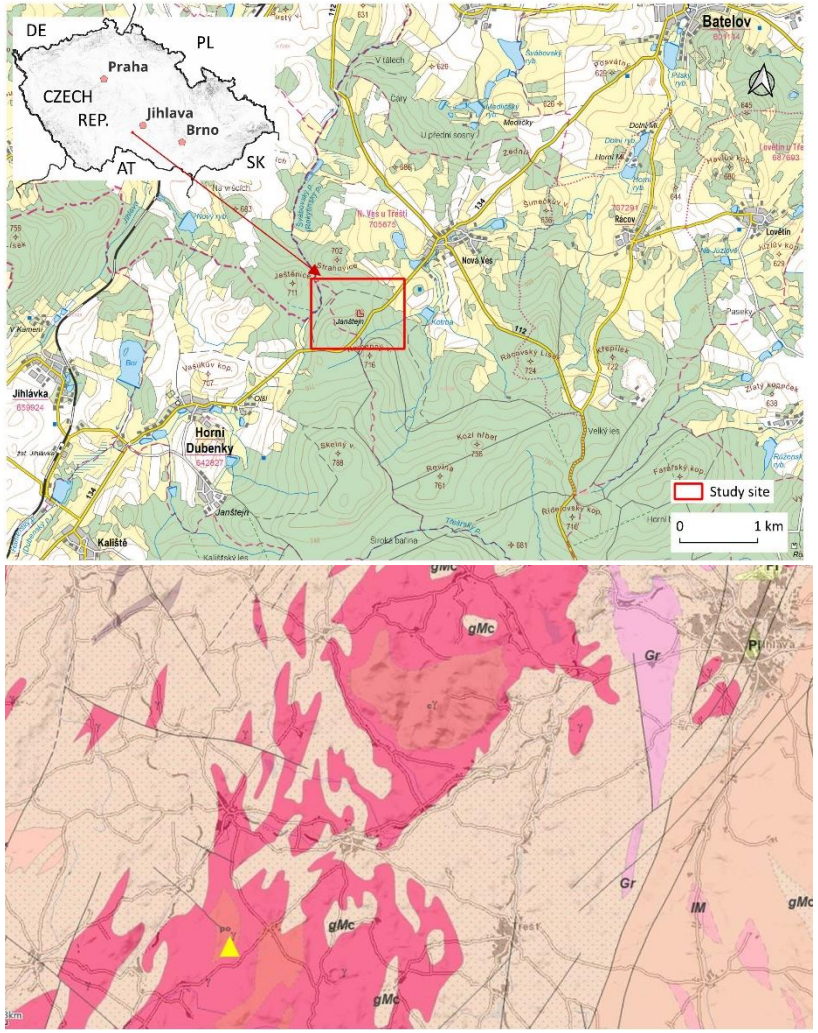
MAIN AIMS OF THE STUDY

- **Geomorphological analysis** of the study site (Janštejn Castle ruins, Vysočina Region, Czechia)
- **Identification and mapping of landforms (both of natural and anthropogenic) by using advanced visualisation methods**
- Assessment of **heritage values**
- **SWOT** analysis
- Further research directions



STUDY AREA: *Castle ruins of Janštejn (regional settings)*

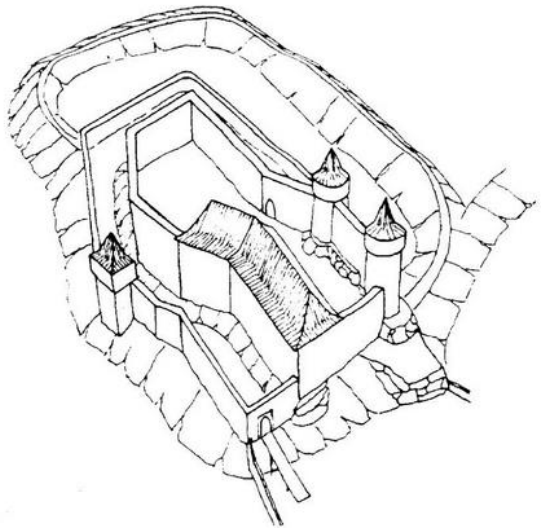
- Czechia, Vysočina Region, 21 km SW of Jihlava, 1.2 km SW of Nová Ves
- Geology: **granular biotite granite** (Mrákotín type), Moldanubian Plutonic Complex
- Northern part of the Jihlavské vrchy Highland (within Javořická vrchovina Highland and Bohemian-Moravian Highland region).
- Territory of **Vysočina National Geopark**

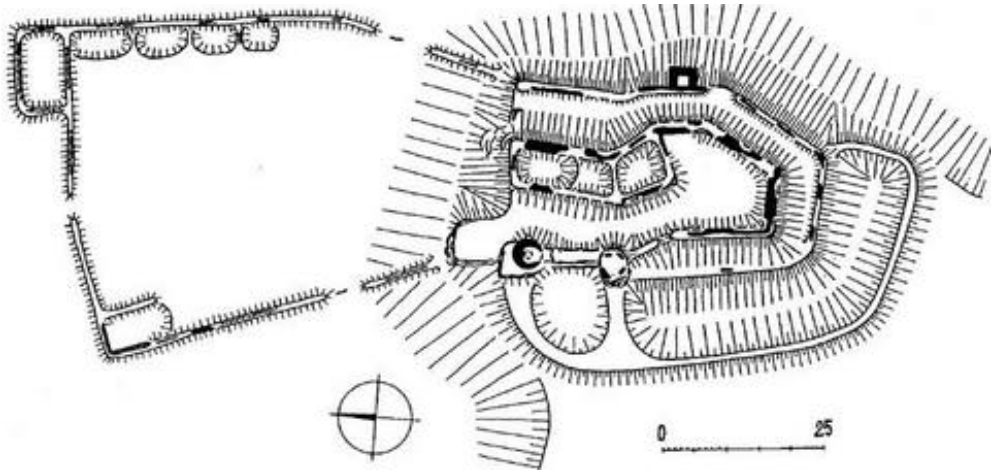


Situation map and geological scheme of the wider study area *(Data sources: Base topographic map ČR 1 : 50 000, Czech Office for Surveying, Mapping and Cadastre, Czech Geological Survey, https://mapy.geology.cz/geocr500/).*

STUDY AREA: *Castle ruins of Janštejn (historical aspects)*

- ***A Gothic castle*** dating from the early 14th century. The castle was destroyed during the Hussite Wars. Only a few remnants of the palace, including the remains of a tower and the outer bailey, have preserved. Archaeological investigations are currently being carried out.





Field sketch of the castle ruins and the outer bailey (M. Plaček (2001): Ilustrovaná encyklopedie moravských hradů, hrádků a tvrzí, Libri, Praha)

METHODS

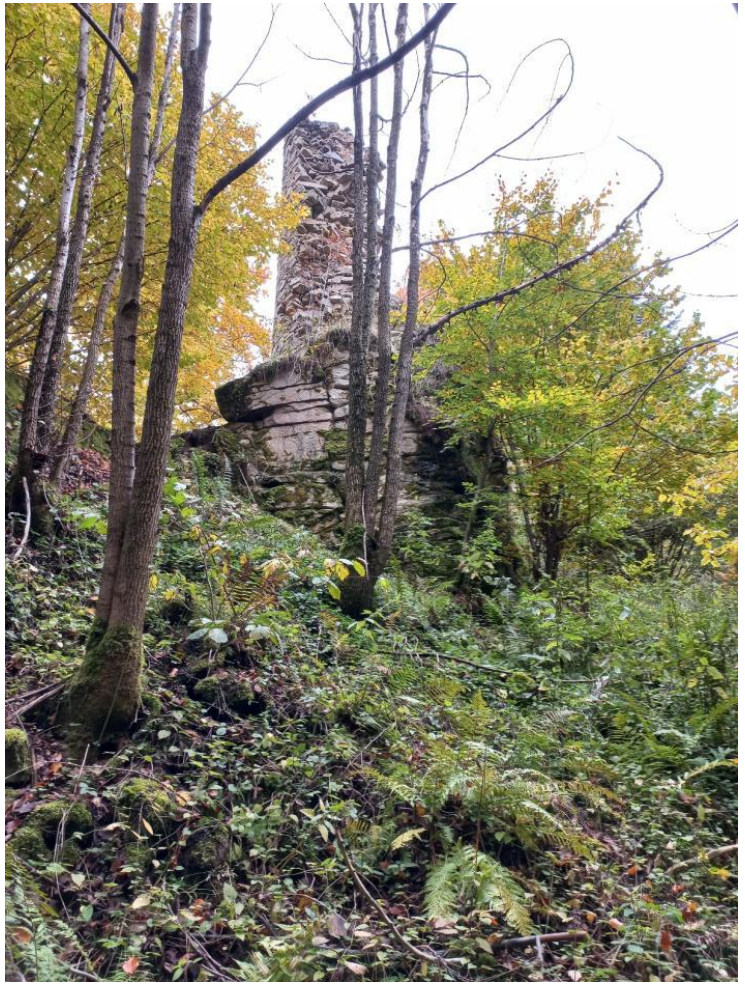
- Review of existing literature
- **Detailed geomorphological mapping and field work**
- The **visualisation** of the castle structure and its surroundings was geodetically surveyed using 3D terrestrial laser scanning (Leica ScanStation C10) connected to the Global Navigation Satellite System (GNSS) (Leica Viva NetRover GS08 receiver connected to the network of permanent GNSS stations of the Czech Republic, CZEPOS, in RTK (real-time kinematics) mode).
- All obtained data were used for the assessment of the **heritage values (using the geomorphosite concept)** and **SWOT** analysis.

RESULTS

- 1) **A detailed geomorphological mapping and analysis**
- 2) **Identification and assessment of heritage values**
- 3) **SWOT analysis** (identification of threats and opportunities as a starting point for the further research and activities oriented towards the sustainable geotourist and geoeducational use)

GEOMORPHOLOGICAL SETTINGS

- Diversity of landforms that have been formed by a range of geomorphological agents and processes (polygenetical relief)
- The following morphogenetic landforms may be identified
  - 1) **Structural-denudational**
  - 2) **Cryogenic**
  - 3) **Gravitational**
  - 4) **Anthropogenic**

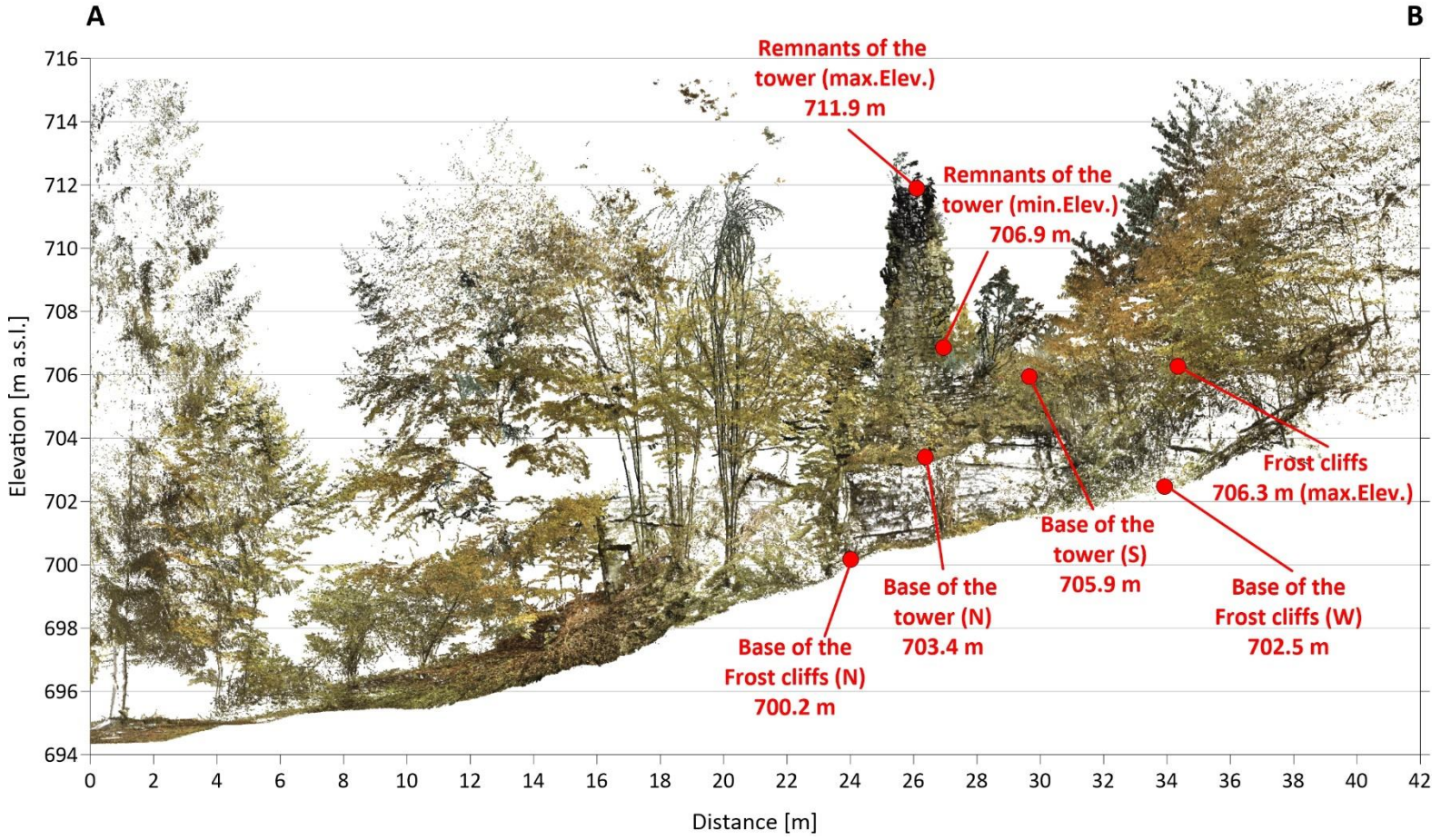


STRUCTURAL-DENUDATIONAL LANDFORMS

- Structurally-denudational rock wall (a remnant of a more extensive formation, constituting a rocky elevation that arose after the removal of tropical weathering deposits from the basal weathering surface)
- **Boulder (blocky) accumulations** (remnants of a weathering mantle)

CRYOGENIC LANDFORMS

- frost cliffs, cryoplanation terrace, cryoplanation plateau, debris accumulations



GRAVITATIONAL FORMS

- Weathered and lose rock faces, niches, resulting in the formation of debris
- Loosening of rocks and rock falls, topples
- Rock niches formed by joints

ANTHROPOGENIC LANDFORMS

- Historical settlement features and military defensive structures (embankments, moats or ramparts)
- Modifications of natural outcrops and block accumulations during the construction of the castle.

Moats or ramparts

Moats or ramparts

Fortification wall

Excavations - archaeological research

Remnants of historical settlement

Ramparts in outer bailey

Unofficial tourist trails

Unofficial tourist trails

HERITAGE VALUES ASSESSMENT

- **Representativeness**: the main landforms - typical features resulting from the long-term geomorphological evolution (granitic landscapes, cryogenic processes)
- **Integrity**: The rock wall modified by cryogenic and anthropogenic processes, its state of preservation is more or less average. The cryogenic landforms can be considered well-preserved.
- **Interpretative value**: The site shows the typical phenomena of granitic landforms, although the visibility is limited and the landforms are remodelled, so the interpretative value is average. Cryogenic and anthropogenic landforms are considered typical examples, pedagogical and interpretative value is very high.
- **Paleogeographical importance**: The geomorphological processes and phenomena reflect the long-term geomorphological evolution of the wider - the paleogeographic importance is high,
- **Aesthetic value**: The site appears to be somewhat hidden and does not stand out prominently in the landscape. However, the spatial structure is interesting, with rock outcrops alternating with remnants of old masonry, complemented by anthropogenic landforms. Aesthetically, the site can be considered “picturesque,” but it is not particularly unique,
- **Cultural value**: The castle ruins - status of Cultural Monument with archaeological and historical importance. The cultural value quite high, not only thanks to the presence of ruins, but also thanks to the presence of anthropogenic landforms, or the use of local rock material as building stone.

SWOT ANALYSIS

Strenghts	Weaknesses
➢ The geo-phenomena (especially cryogenic landforms) are representative, clearly visible, and easily recognizable ➢ The site is of high cultural (archaeological and historical) significance ➢ A close relationship between geoscientific and cultural values	➢ The site is not a unique or exceptional (within the broader region) ➢ There is a lack of information on the biota and its relationship to geodiversity features ➢ Due to the reshaping of the relief by cryogenic processes, older landforms (typical of granite landscapes) are less easily recognizable
Opportunities	**Threats**
➢ Leveraging the close connections between geoscientific and cultural values for multi- and transdisciplinary education (Earth sciences, history…) ➢ The development of sustainable forms of tourism (especially geotourism) ➢ More detailed geomorphological and archaeological research can contribute to further increasing the overall value of the site	➢ Active processes at the site (slope instability, deterioration of the castle walls) may pose a risk both in terms of the site's overall degradation and in terms of its potential future use for geotourism and education ➢ Risks at the site associated with a potential increase in visitor numbers need to addressed regarding the tourism infrastructure and safety

CONCLUSION

- The Janštejn castle - typical example of **geocultural site** where geodiversity and culture are closely interconnected and they influence each other.
- Very often, the cultural value is emphasized, geodiversity (geology and geomorphology) is rather overlooked → detailed geomorpholoigcal analysis and mapping
- **Main results:** identification, analysis, and mapping of **geomorphological settings**, **classification of the landforms**
- Geomorphosite assessment approaches enabled the identification, documentation, and evaluation of the **heritage values**.
- Based on the **SWOT analysis**, the preliminary analysis of **threats** and **opportunities** was done → This will serve for a further rational use and management of the site (may be used also by local stakeholders, e.g., municipalities, schools, or Vysočina National Geopark)
- **Further research**: analysis and assessment of the site's potential for education and sustainable forms of tourism, a more detailed evaluation of threats and risks.

THANK YOU FOR THE ATTENTION!

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