

BIOLOGICAL, ECOLOGICAL AND CLIMATIC MONITORING OF POSTOJNA PLANINA CAVE SYSTEM

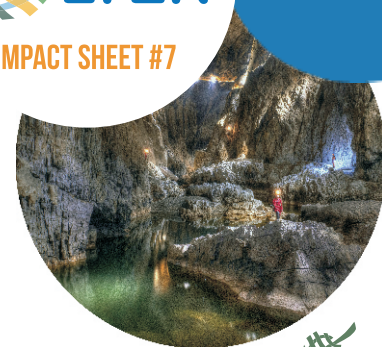
POSTOJNA PLANINA CAVE SYSTEM, SLOVENIA



IMPACT SHEET #7

Postojna Planina cave system (PPCS) is the most biologically diverse cave system in the world. Postojnska jama (Postojna cave) is a cradle of speleobiology, a locus typicus of the cave beetle *Leptodirus hochenwarti*, the first recognized cave adapted animal, and many other aquatic and terrestrial species, among which the most famous cave animal is the European salamander, human fish *Proteus anguinus*. The marine origin of some of the stygobiotic species is evident in the hydrozoan *Velkovrhia enigmatica* and the cirolanid isopod *Monolistra racovitzae racovitzae*.

Three species of the amphipod genus *Niphargus*, as well as populations of *Asellus aquaticus* were isolated in the cave at different times. PPCS consists of 24.1 and 6.6 km of passages, respectively, connected by 0.8 km of unmapped flooded corridors, and has more known species of stygobionts (obligate, permanent residents of aquatic subterranean habitats) and troglobionts (obligate, permanent residents of terrestrial subterranean habitats) than any other cave or other subterranean site in the world. PPCS is one of the best studied caves in the world, and parts of it have been heavily visited by tourists since 1818.



AIMS

- Evolution of karst through karstological modelling.
- Monitoring of subterranean biodiversity to provide current situation.
- Monitoring of water and air quality and surface bioburden related to human impact and tourist use.
- Climate change observation and its influence on the surface and subsurface habitats.
- Increase awareness for nature and life composition.

OUTCOME - IMPACT

- Supply of water and its protection.
- Assessing the impact of various plans and activities on the environment.
- Restoration of subterranean habitats and establishing criteria for the protection of subterranean diversity.
- Improved knowledge and understanding of natural cave climate conditions, possible anthropogenic impacts and remediation actions.
- Establishing of multidisciplinary group to develop an integral karstology to help site manager in cave protection and conservation.
- Developing the protection plan of karst and legislation for vulnerable karst landscapes.

RESEARCH

The research covered the following aspect:

- Cave climate observation: the objective is to characterise (micro) meteorologic and climatic patterns in Postojnska Jama. It includes setting up and maintenance of cave meteorological stations, data analysis and modelling, as well as measurement of environmental parameters, like air and water temperature, humidity, air pressure, direction and intensity of air flow and CO₂ concentration.
- Monitoring of stream water and percolation water: various biological, ecological and physico-chemical parameters are regularly measured and analysed.
- Anthropogenic impact and tourist use is monitored using air parameters and surface bioburden indicators.
- Karst hydrogeology: characterization of groundwater flow and solute transport in the karst aquifers by long-term and event-based analyses.
- Remote sensing data analyses.

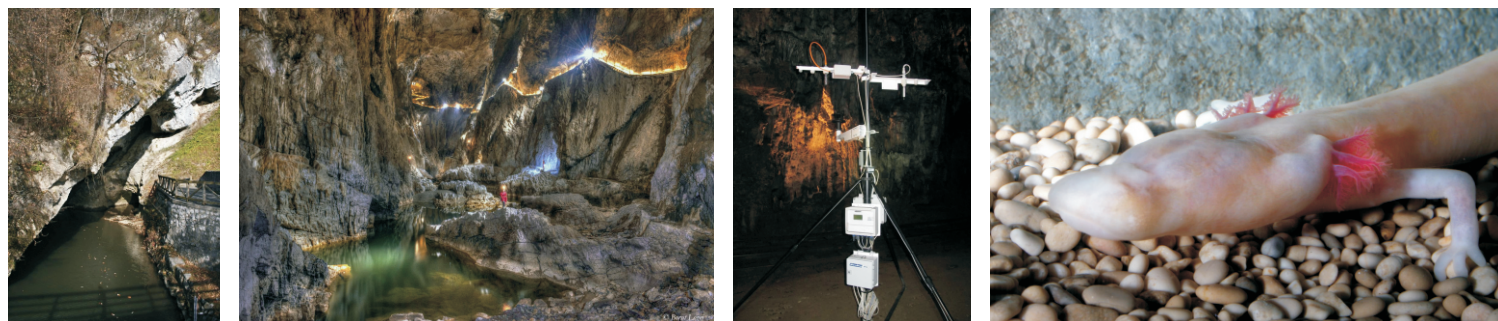
Artificial illumination experiment illustrating human impact to caves. As a result, communities of organisms called lampenflora develop in close and remote proximity to lights.



These phototrophic organisms are inappropriate from an aesthetic point of view and cause the degradation of colonized substrata.

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Pictures presents: sink of Pivka River, Reka River, Meteorological station in the Postojna cave, *Proteus anguinus* - an aquatic salamander in the family Proteidae, the only exclusively cave-dwelling chordate species found in Europe.

PRIORITY THEMES



PRIORITY ECOSYSTEM SERVICES



AREA OF RELEVANCE, ACCORDING TO SDG



SDG - UN SUSTAINABLE DEVELOPMENT GOALS

FURTHER INFORMATION

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RAVBAR, N., ŠEBELA, S. 2015. The effectiveness of protection policies and legislative framework with special regard to karst landscapes : insights from Slovenia. Environmental science & policy, 51, p.106-116.

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