France: Preserving Prehistoric Treasures

Climatological monitoring throughout caves and at the surface level

(Photo courtesy of M. François Bourges)

Overview

The Chauvet-Pont d'Arc and Aven d'Orgnac caves are home to prehistoric treasures of rare artistic and technical beauty. The drawings and engravings that adorn them date back 360 centuries, making them among the oldest-known remains. The exceptional importance of these caves led to their inclusion on UNESCO's World Heritage List. As soon as they were discovered in 1994, preventive conservation measures were put in place to preserve the caves' natural environment and minimize potential impacts from visits and studies. Controlling microclimate parameters is essential to ensure their preservation, requiring high-precision meteorological monitoring.

The Solution

Campbell Scientific provided a complete solution to meet these complex challenges. A system of sensors was deployed in the Chauvet-Pont d'Arc and Aven d'Orgnac caves, measuring parameters such as temperature, barometric pressure, and CO_2 using a CR3000 Measurement and Control Datalogger. On the surface, a CR1000 Measurement and Control Datalogger was installed to measure outdoor parameters such as rainfall, temperature, and barometric pressure. In addition, an identical mirror station, equipped with a CR3000 and the same sensors, was installed 7 km (4.4 mi) away in Aven d'Orgnac. All data were recorded synchronously every 15 minutes at both underground sites, as well as at the surface climatological station.

The Benefits

The caves' sensor system provides the following benefits:

Case Study Summary

Application
Preserving the precious subterranean heritage of unique prehistoric grottoes

Location
Vallon-Pont-d'Arc and Aven d'Orgnac, France

Products Used
MetPRO, CELL215, AM16/32B, CR3000, CR1000

Contributors
M. François Bourges, Géologie Environnement Conseil

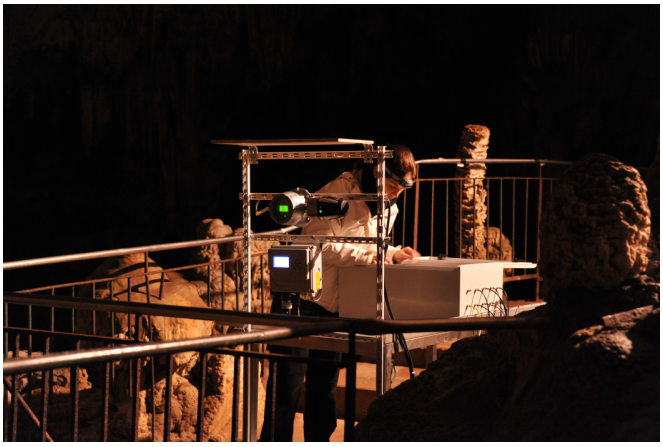
Participating Organisations
Grotte Chauvet-Pont d'Arc, Aven d'Orgnac. Drac Auvergne - Rhône-Alpes

Measured Parameters
Air and surface temperature, barometric pressure, CO_2 level, relative humidity, precipitation, wind speed and direction, solar irradiance

Related Website
Géologie Environnement Conseil

- **Preventive Conservation:** The data collected helped to maintain the caves' natural conditions while reducing environmental impacts.
- **Identification of Climatic Effects:** External climate changes were identified, enabling their impact on the caves' microclimate to be assessed.
- **Heritage Preservation:** This ongoing monitoring has contributed to the preservation of the Chauvet-Pont d'Arc and Aven d'Orgnac caves, ensuring the conservation of their exceptional heritage value.

In conclusion, the collaboration between Campbell Scientific and the managers of these caves has made it possible to protect these prehistoric sites by monitoring and maintaining ideal environmental conditions, thus helping to preserve this unique cultural heritage for future generations.



(Photo courtesy of M. François Bourges)

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