

Normalization, upgrading, and maintenance of the monitoring and alert system in Castrocucco



CITTÀ DI MARATEA



The massive landslide on November 30, 2022, caused a catastrophic breach in State Road 18 (SS18) near Castrocucco, isolating key coastal areas and threatening public safety. The site is characterized by an inherently unstable, fractured rock face where cracks are continuously exacerbated by heavy rainfall and weathering.

Given the geological complexity, the primary objective was to move beyond emergency measures toward a permanent, technologically advanced solution. **The site required a reliable, continuous system capable of detecting infinitesimal slope movements and providing automated responses to protect commuters and residents.**

Summary

Location: Castrocucco, Maratea

Conclusion: 2025

Focus: Geological and hydrogeological risk

Challenges:

- Enhance the integrated landslide monitoring system to reduce future risks
- Support the management of vehicular traffic along the SS18

CAE Solutions:

- 3 dataloggers with over 100 sensors
- 1 relocatable weather station
- 2 rainfall monitoring stations
- 1 total station
- Traffic control/inhibition devices
- 3 cameras
- 1 cloud-based control center for remote monitoring

FEATURES

In 2025, CAE, in collaboration with other companies, professionals, and the Department of Civil, Building and Environmental Engineering of the University of Naples Federico II, was commissioned to inspect the existing monitoring system, reactivate it, and carry out its maintenance.

All technologies were upgraded, and all equipment, joints, connection cables requiring it were standardized and new infrastructures were installed to promptly detect precursory signs of instability and automatically activate warning systems and traffic management procedures.

The enhancement enabled more accurate data collection, **reducing on-site interventions** thanks to advanced **remote control** and **remote maintenance functions**.

The integration of a **satellite module** was essential to ensure safer, continuous, and more reliable data transmission. In addition, a **self-sufficient solar power supply system** was introduced.

The works required the specialist expertise of CAE technicians, including rope access work at height.

Thanks to the commitment of all stakeholders, under the supervision of the Extraordinary Commissioner for the landslide emergency and the Municipal Police, and based on a site-specific management protocol, it was possible to reopen the road to vehicular traffic, **with possible temporary interruptions in case of adverse conditions**.



COMPOSITION

The landslide monitoring system in Castrocuoco currently consists of:

- **3 dataloggers** (Compact, CompactPlus and additional Plus modules) acquiring data from over **100 sensors**, including crack meters, inclinometers, accelerometers, and velocimeters;
- **1 relocatable weather station**;
- **2 rainfall monitoring stations**, used to characterize the climatic conditions triggering rockfall events at local warning points along the SS18;
- **Traffic interruption devices** at both ends of the risk-prone road section, including 2 traffic lights, 2 electromechanical barriers, and 2 acoustic warning sirens;
- **1 total station**;
- **3 cameras**: two connected to the rainfall stations and one standalone;
- **1 cloud-based control center** with CAE software for remote monitoring, data visualization, and advanced alarm management

Through these technologies, the system optimizes territorial monitoring, safeguards road infrastructure and human lives, and provides effective and precise support to hydrogeological risk managers in the Castrocuoco area.

