



Embassy of Italy

RISCHI NATURALI E TUTELA E DEI BENI CULTURALI PER L'INTERNAZIONALIZZAZIONE DEL SISTEMA ITALIA (DIPLOMAZIA SCIENTIFICA)

C. MARGOTTINI

Embassy of Italy in Egypt
Scientific and Technological Attache'
Cairo (Egypt)



United Nations
Educational, Scientific and
Cultural Organization



UNESCO Chair on the Prevention and
Sustainable Management of Geo-Hydrological Hazards,
University of Florence, Italy



UNIVERSITÀ
DEGLI STUDI
FIRENZE

INTRODUCTION

Scientific and technological attachés in the Italian Embassies



25 SCIENTIFIC ATTACHÉS

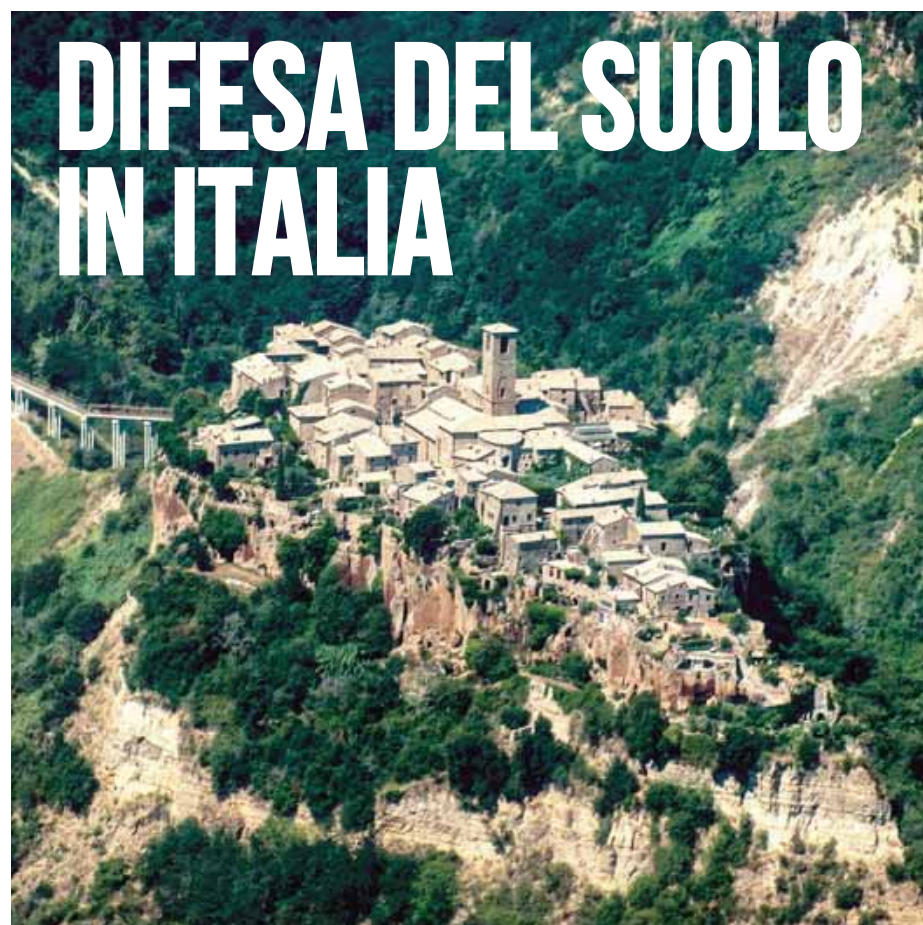
The promotion of Italian science and technology abroad: the role of science and technology experts and attachés.

The role of Scientific and Technological Attaches is to showcase and capitalise on the sectors of excellence in scientific and technological research and support the advancement of Italian companies operating in advanced technology sectors. Most of these experts and attachés, who operate in 20 countries, are from Italian research bodies and universities..

STRUTTURA DELLA PRESENTAZIONE

Coniugare la difesa del suolo con la tutela dei beni culturali

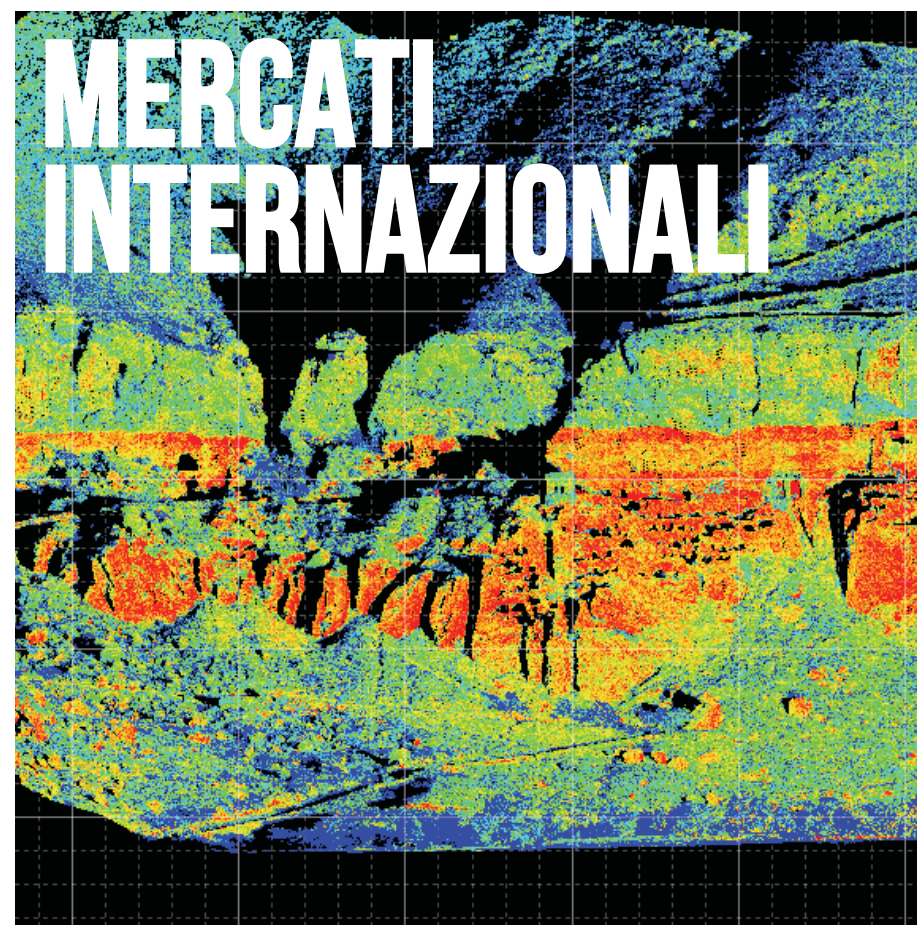
DIFESA DEL SUOLO IN ITALIA



IMPRESE INNOVATIVE



MERCATI INTERNAZIONALI



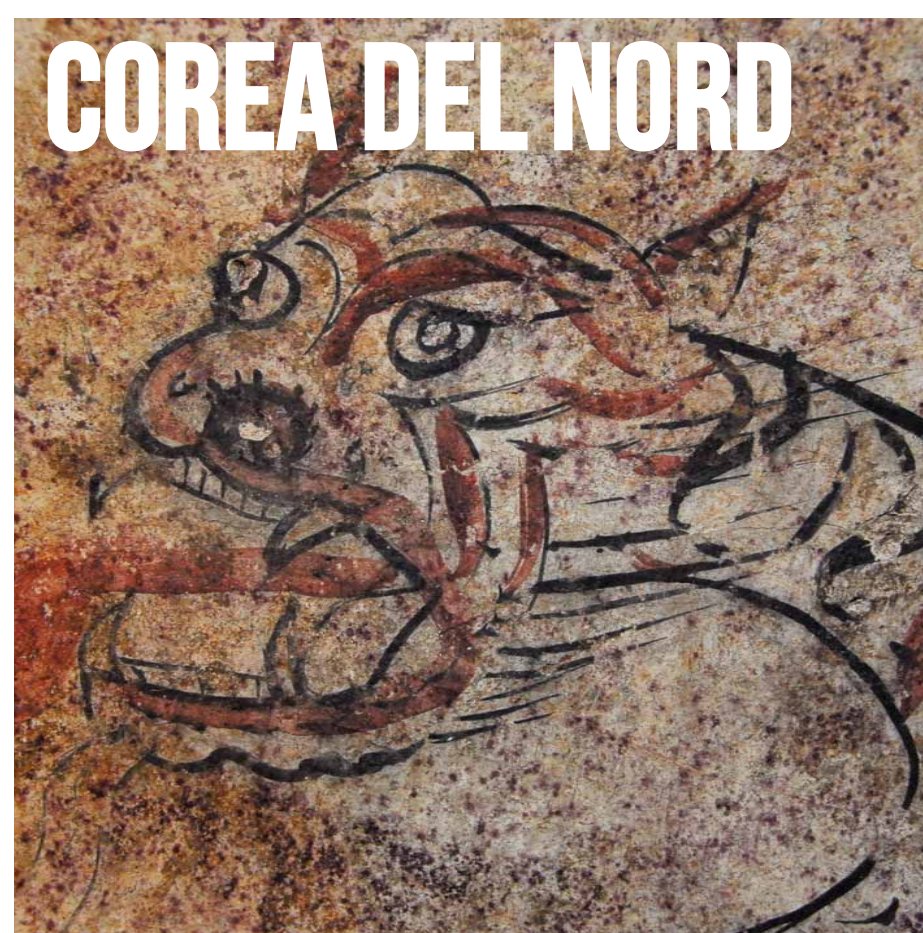
La Diplomazia Scientifica

Per corrispondere alle crescenti necessità del mondo della ricerca scientifica e delle imprese innovative, la Farnesina promuove la cooperazione internazionale in campo scientifico e tecnologico come strumento di dialogo e crescita economica. La promozione della cooperazione scientifica e tecnologica è così parte integrante della diplomazia economica, uno dei pilastri della nostra politica estera.

AFGHANISTAN



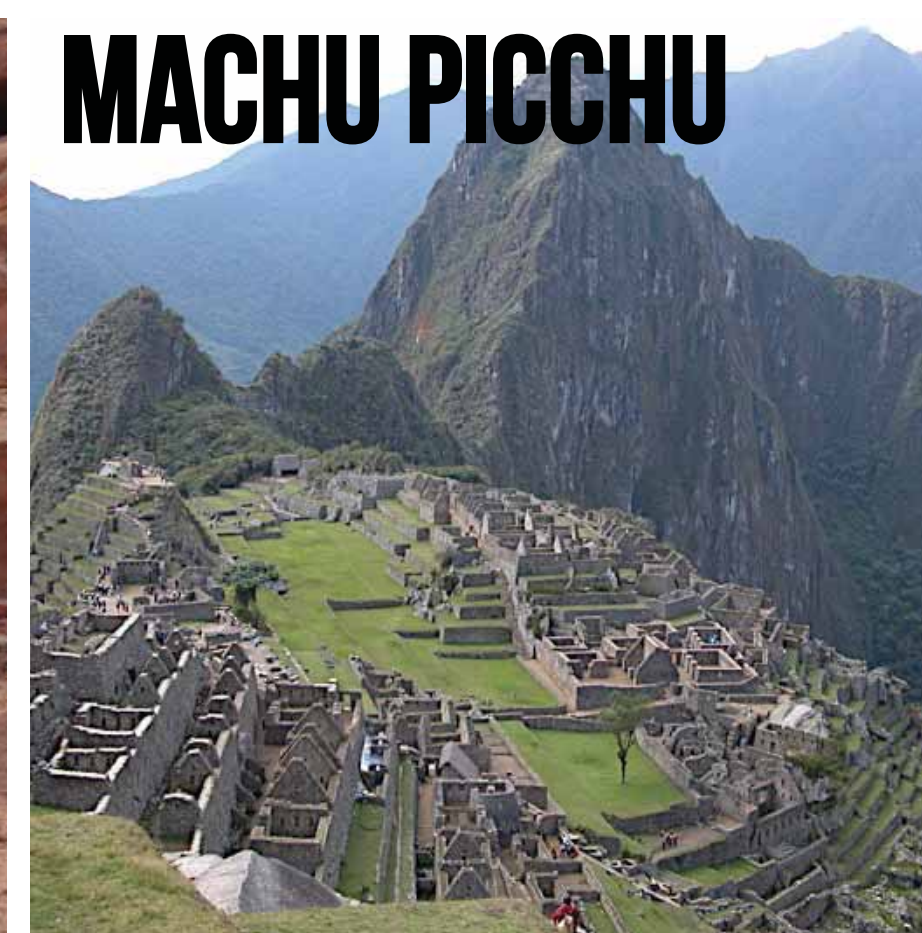
COREA DEL NORD



PETRA



MACHU PICCHU



■ ■ ■ ■ ■

SOLUZIONI INNOVATIVE

Civita di Bagnioregio



CIVITA DI BAGNOREGIO (ITALIA)

Civita di Bagnioregio, la Città che Muore, è un centro abitato medioevale arroccato sulla sommità di una rupe tufacea soggetta a fenomeni franosi e di erosione accelerata. Le frane che interessano il sistema rupe-pendio hanno determinato nei secoli un progressivo arretramento delle scarpate causando la perdita di edifici di importanza storica ed artistica.

STABILIZZAZIONE DEI CROLLI

Soluzioni innovative



7

POZZI STRUTTURALI

Mitigazione del dissesto nella parte lapidea della rupe.

I risultati delle indagini di caratterizzazione geotecnica e delle Back analysis sono stati utilizzati per proporre opere di consolidamento, a basso impatto ambientale, che agiscano effettivamente sui reali meccanismi di instabilità. In particolare viene descritto l'intervento di stabilizzazione mediante pozzi cavi tirantati eseguito sulla rupe e viene analizzato, mediante un approccio basato sulle linee di influenza, il possibile riempimento della depressione del Caven Grande ai piedi della scarpata settentrionale.

TECNOLOGIE INNOVATIVE

Orvieto

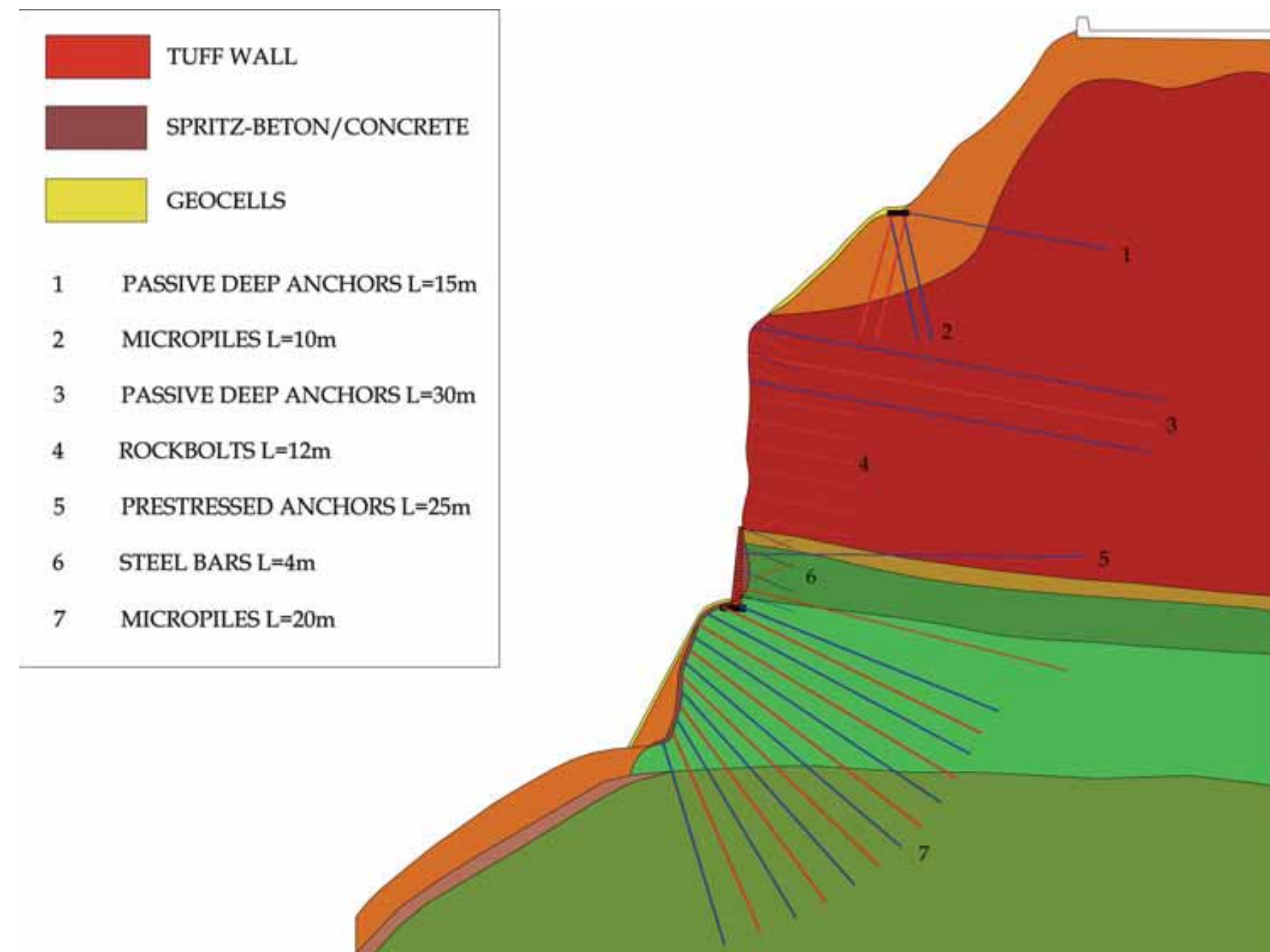


ORVIETO (ITALIA)

Orvieto sorge su una rupe di tufo (ignimbrite di Orvieto - Bagnoregio), tra i 280 (Piazza Cahen) - 325 (S. Francesco) m s.l.m., che domina la valle del fiume Paglia, affluente di destra del Tevere e che proprio sotto la città riceve da sinistra il Chiani, la Chiana Romana proveniente dalla Valdichiana. Questa enorme mesa tufacea, che si erge dai venti ai cinquanta metri dal piano della campagna, si deve al collasso di ground source (nubi e valanghe ardenti) dall'attività quaternaria dei vulcani del sistema Volsinio, il cui relitto è visibile nella caldera che ospita il lago vulcanico maggiore d'Europa, quello di Bolsena.

CONSOLIDAMENTO ROBOTIZZATO

Tecnologie innovative



1 ROBOT CLIMBER

Sperimentazione ROBOTCLIMBER per chiodature in parete (cortesia Endro Martini)

SOLUZIONI A BASSO IMPATTO AMBIENTALE



Verrisilia ed Alpi Apuane



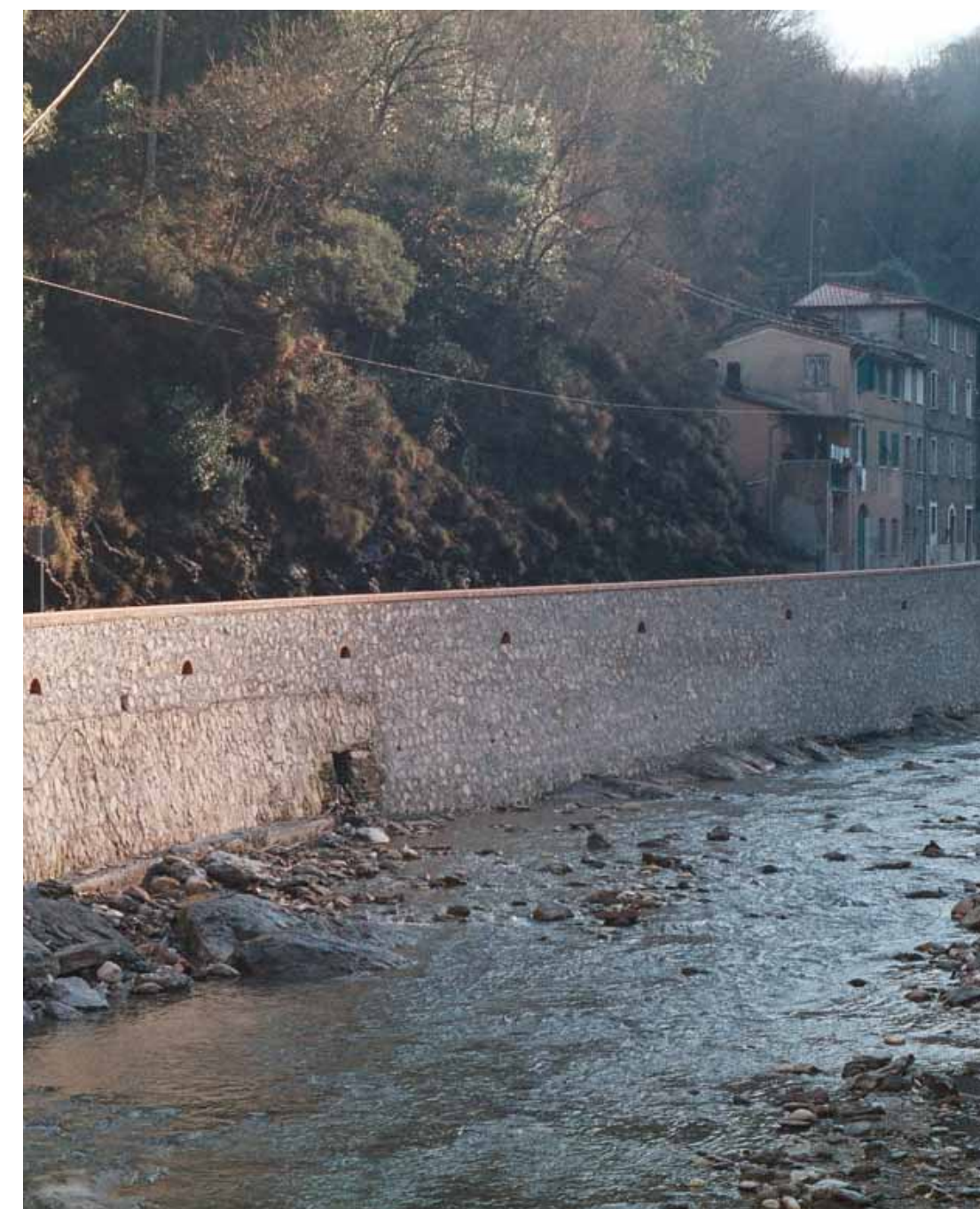
VERSILIA ED ALPI APUANE (ITALIA)

Le Alpi Apuane sono una catena montuosa situata nel nord-ovest della Toscana, facente parte del Subappennino toscano e delimitata a nord-ovest dal fiume Magra (Lunigiana), a est dal fiume Serchio (Garfagnana, Mediavalle e Piana di Lucca) e a sud-ovest dalla Versilia e dalla Riviera Apuana, interessando parte del territorio delle provincie di Lucca, Massa-Carrara e La Spezia. Il territorio corrispondente al loro bacino è storicamente conosciuto anche come Apuania.

Dal 1985 parte del territorio è compreso nel Parco naturale regionale delle Alpi Apuane, che dal 2012 è entrato nella rete dei Geoparchi tutelati dall'UNESCO.

INGEGNERIA NATURALISTICA

Soluzioni a basso impatto ambientale dopo l'alluvione del 1997

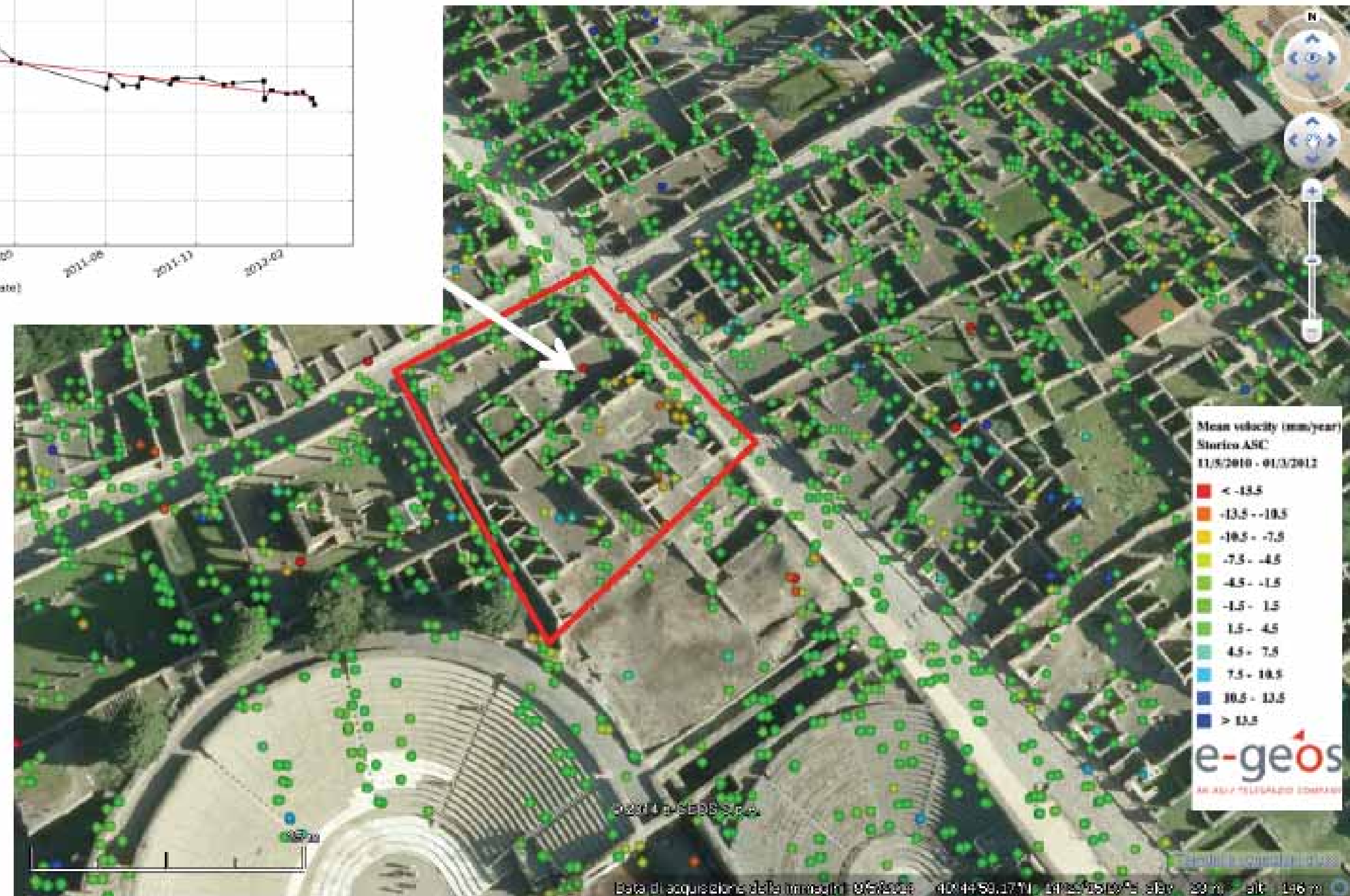


DEFINIZIONE

L'Ingegneria Naturalistica è una disciplina tecnico-scientifica che, attraverso metodologie proprie dell'ingegneria e sulla base di criteri meccanici, biologici ed ecologici, utilizza come materiale da costruzione piante vive o parti di esse in abbinamento con altri materiali, quali: pietrame, legno, terra, biostuoie, geotessili, ecc.

MONITORAGGI INNOVATIVI

CosmoSkymed x Band (2010-2012)



POMPEI TEMPLE OF ASCLEPIO



ISPRA
Istituto Superiore per la Protezione
e la Ricerca Ambientale



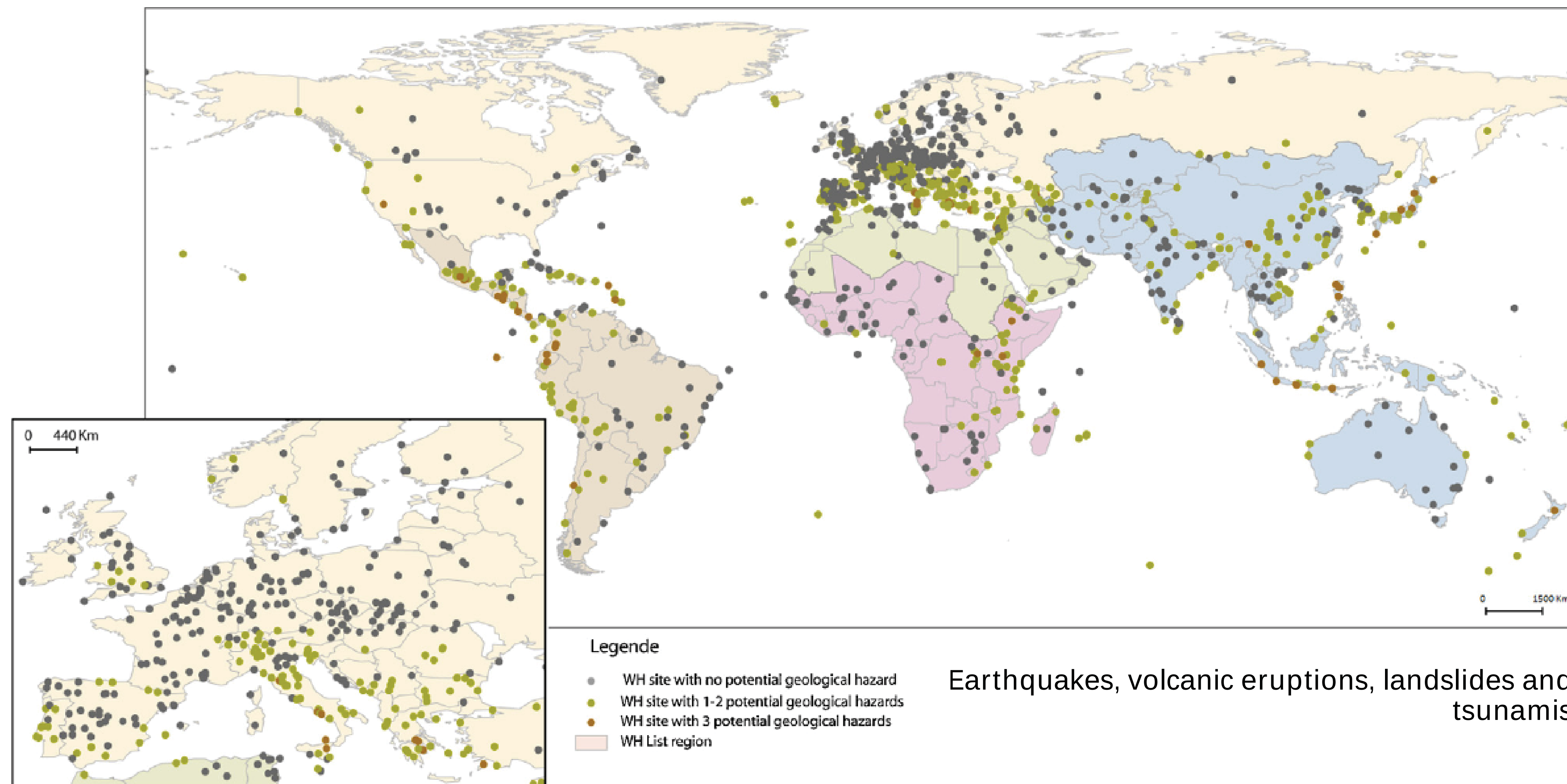
Telespazio
A Finmeccanica/Thales Company



e-geos
ANALISI E PROGETTAZIONE

UNESCO WH SITES

World heritage properties (WH) exposed to geological hazards (Pavlova et al., 2016)



MAJOR THREATS: FALL, WEATHERING, WAR, ...



Embassy of Italy



PETRA

Collpase of Muesra tomb in March 2009.



LALIBELA

Weathering of the roof of Biet Amanuel



BAMIYAN

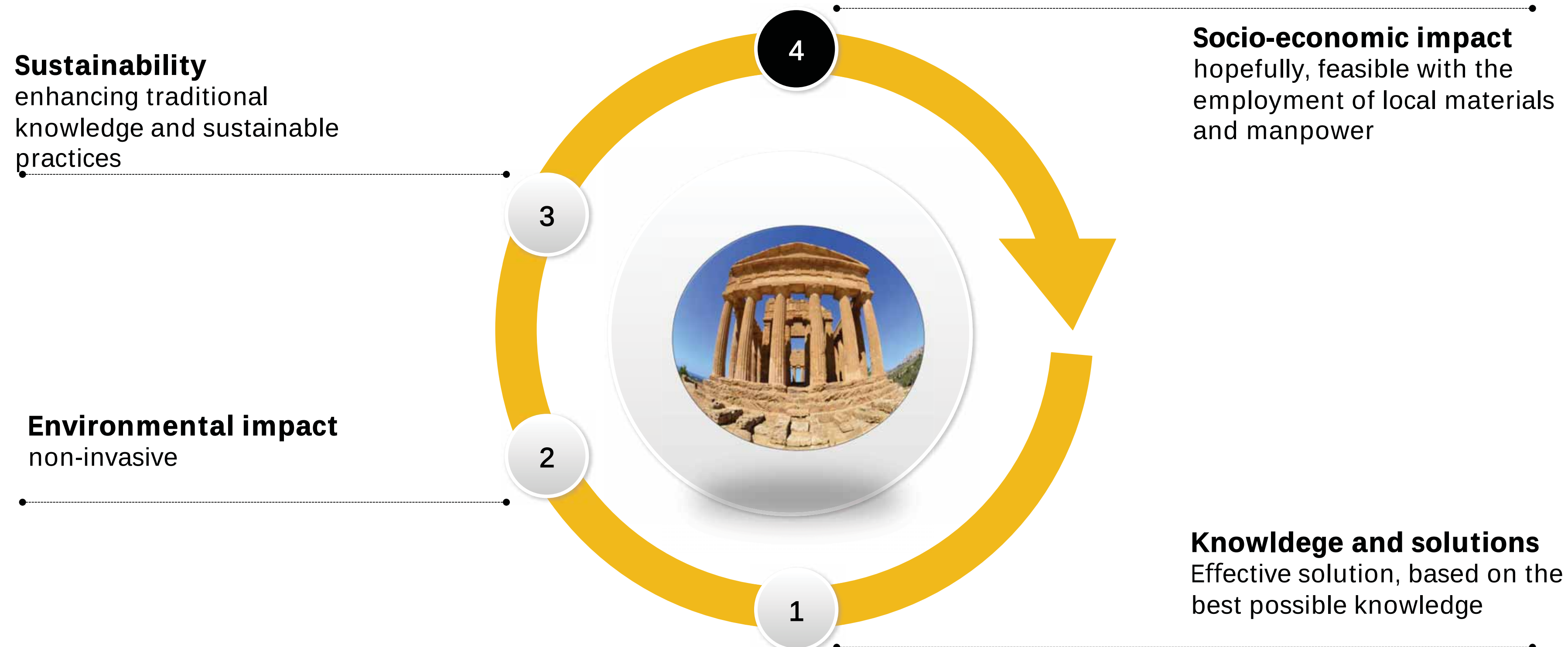
Destruction of the giant Buddha statues of Bamiyan, 14 March 2001

UNESCO AND INTERNATIONAL MISSIONS



CONSERVATION POLICIES AND MANAGEMENT

Sustainable mitigation practices



General consideration

The first requirement is obviously aimed at solving the problem; the second to emphasize the maximum preservation of the original aspect of the site, the third to make benefit of local experience, while the fourth is meant to maximize the reproducibility, both in time and space, of the adopted techniques in case of further interventions. Also to involve local community in protection and development of the site.

PETRA

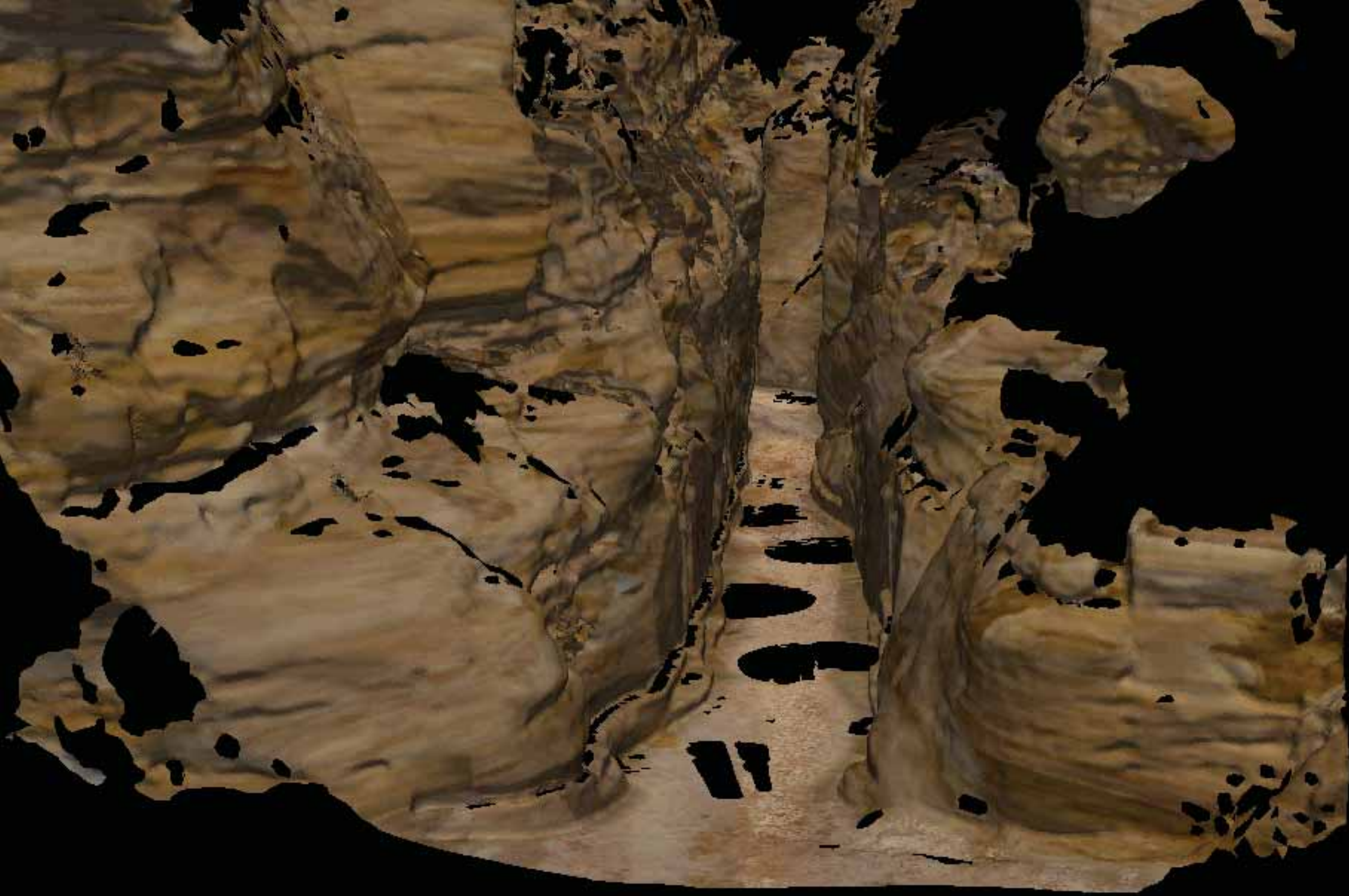
Jordan



PETRA (JORDAN)

Carved directly into red, white, pink, and sandstone cliff faces, the prehistoric Jordanian city of Petra was "lost" to the Western world for hundreds of years. Located amid rugged desert canyons and mountains in what is now the southwestern corner of the Hashemite Kingdom of Jordan, Petra was once a thriving trading center and the capital of the Nabataean empire between 400 B.C. and A.D. 106. In 1985, the Petra Archaeological Park was, and in 2007 it was named one of the new seven wonders of the world.



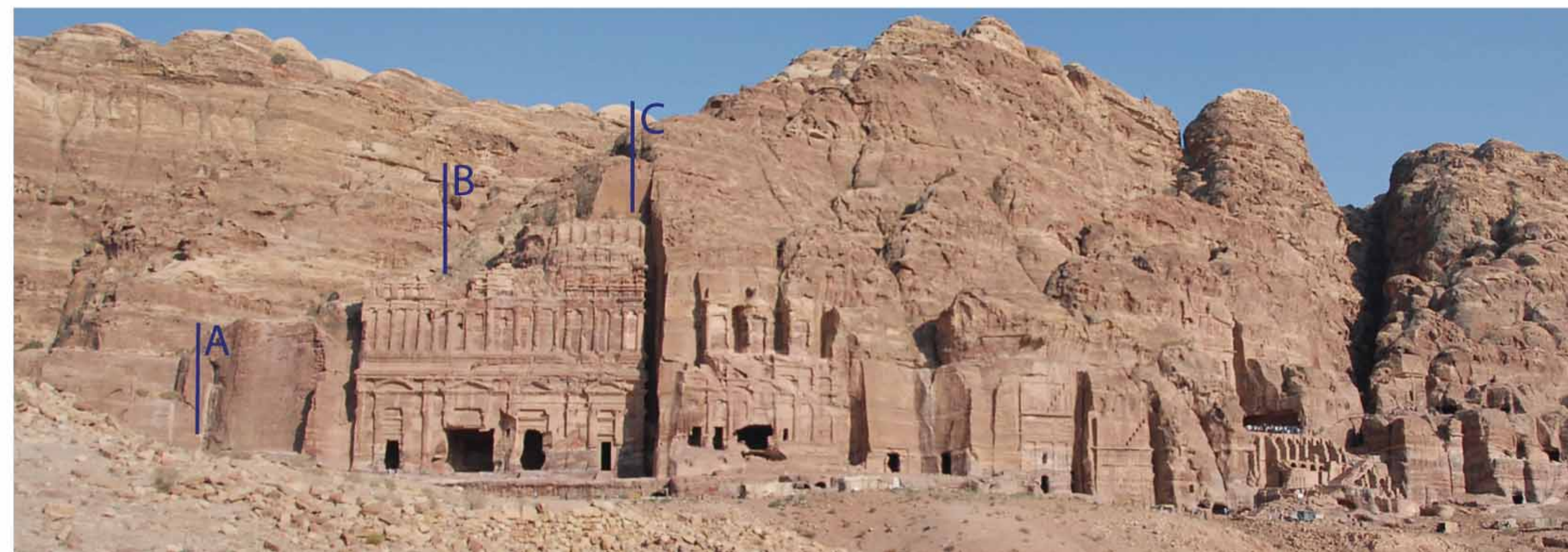
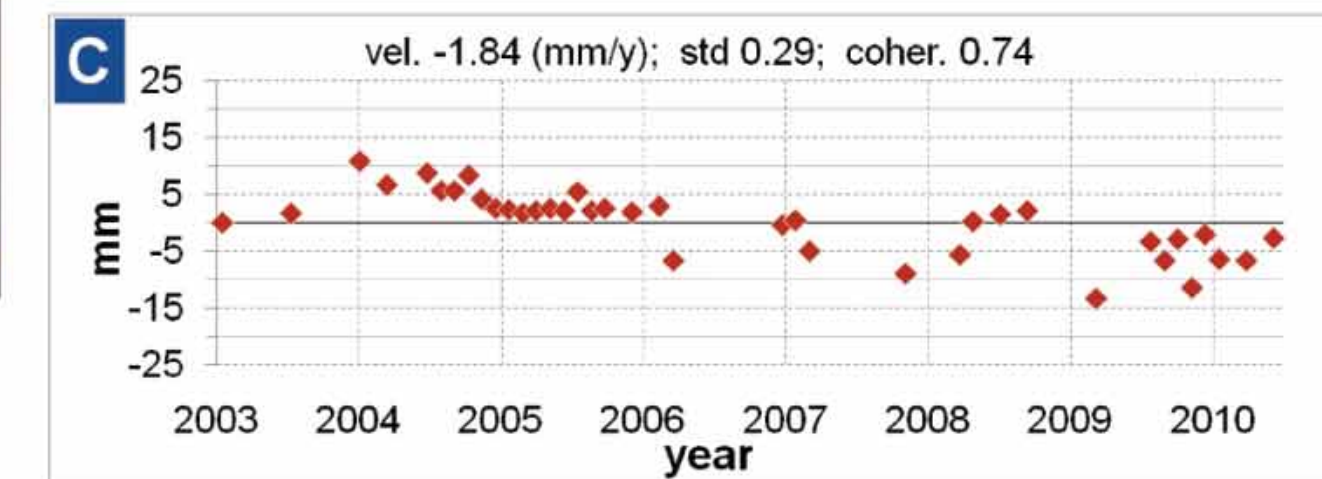
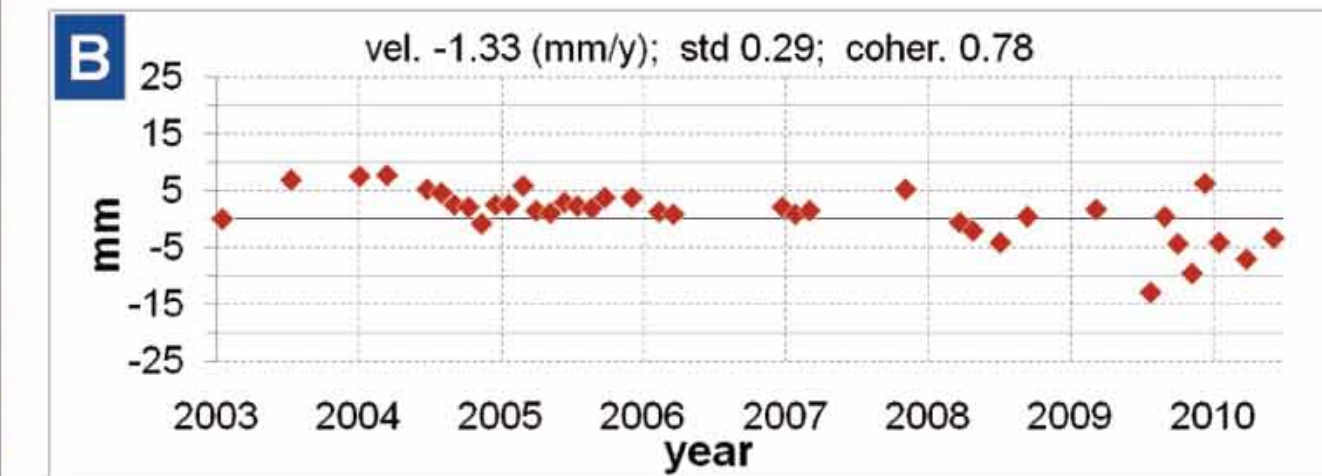
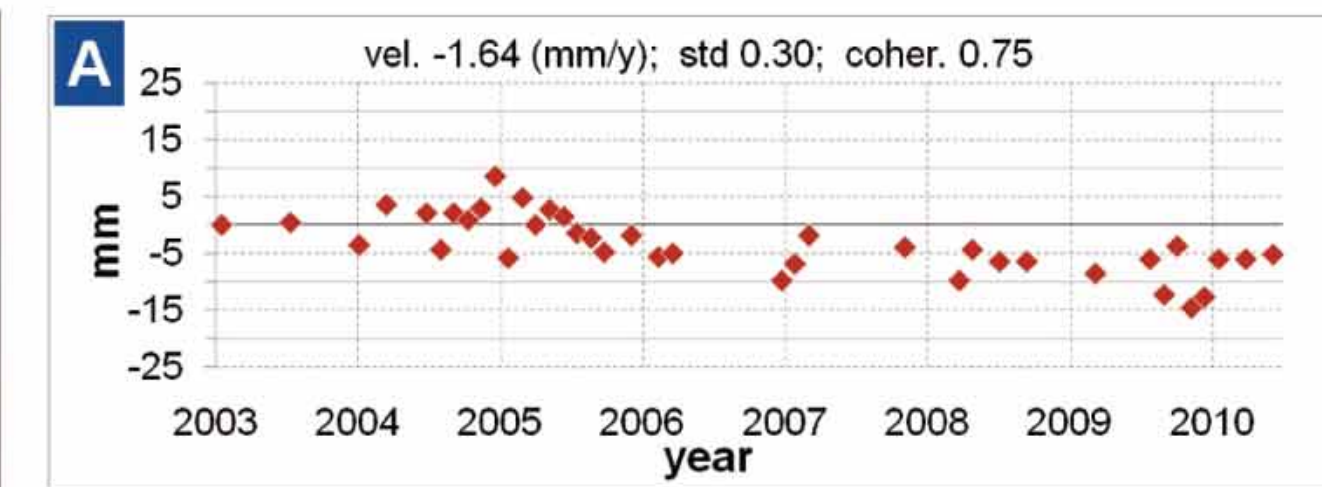
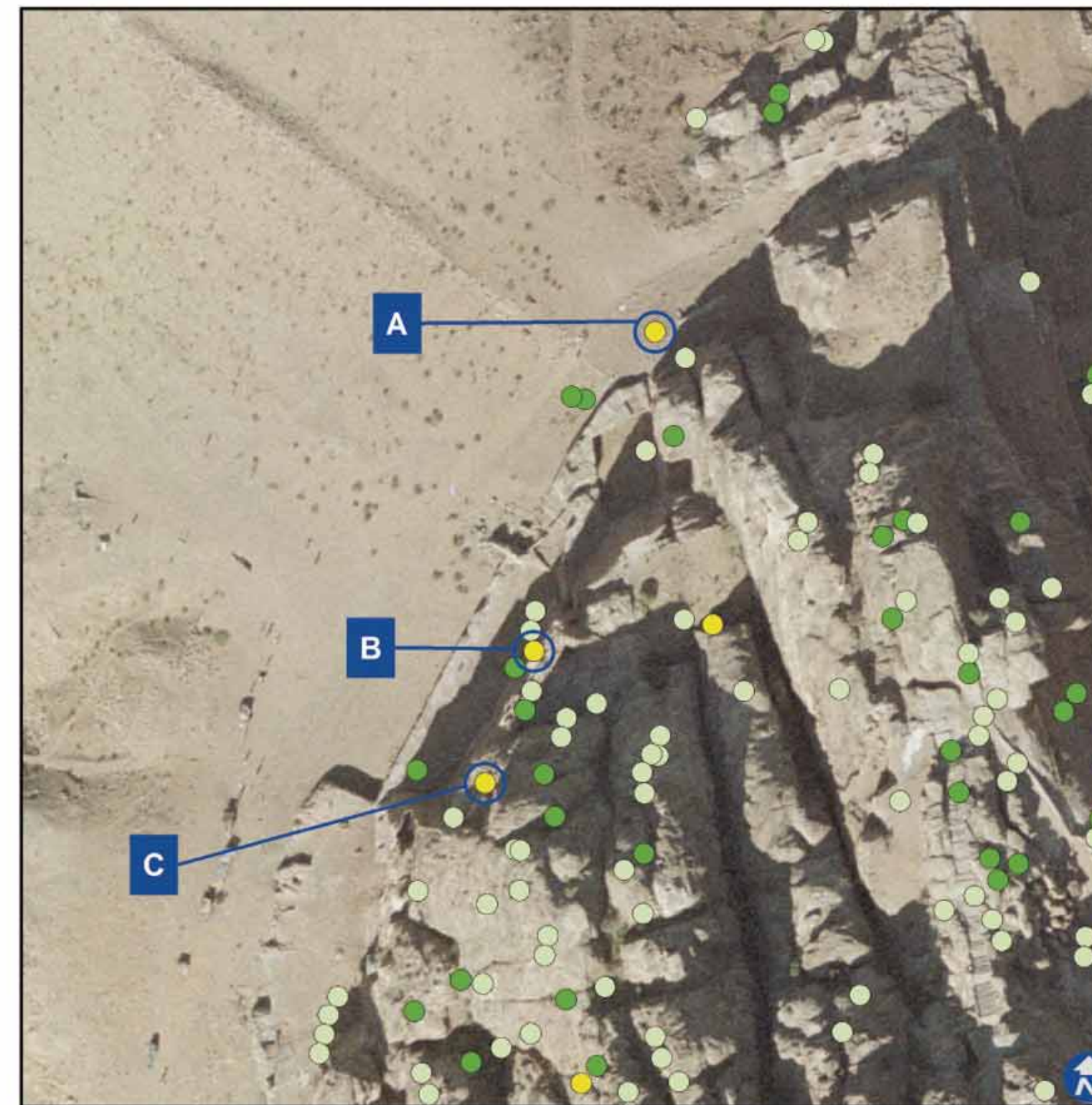
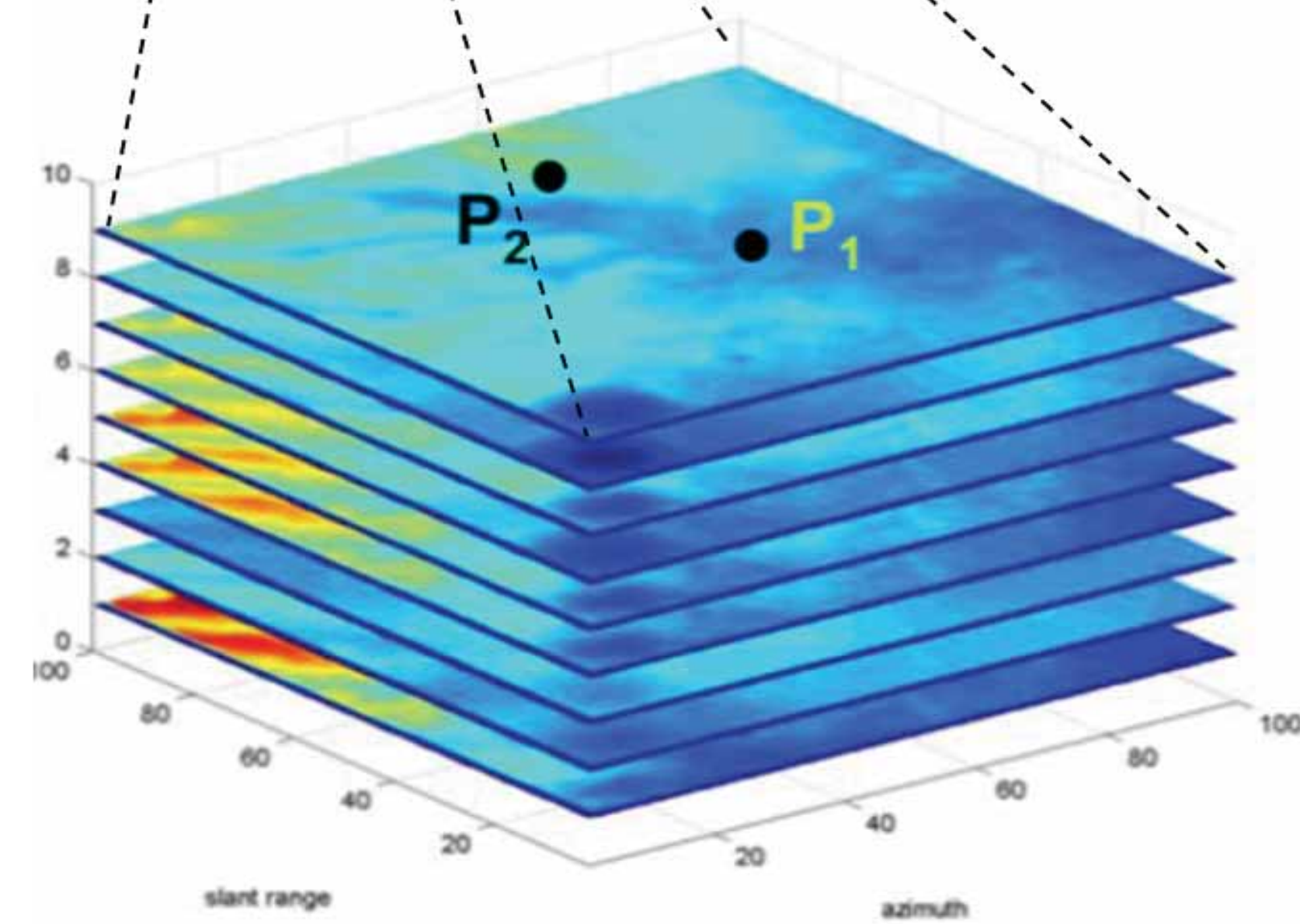
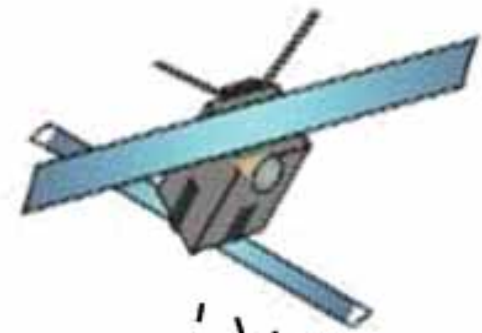


MONITORING

Petra: permanent/persistent scatter



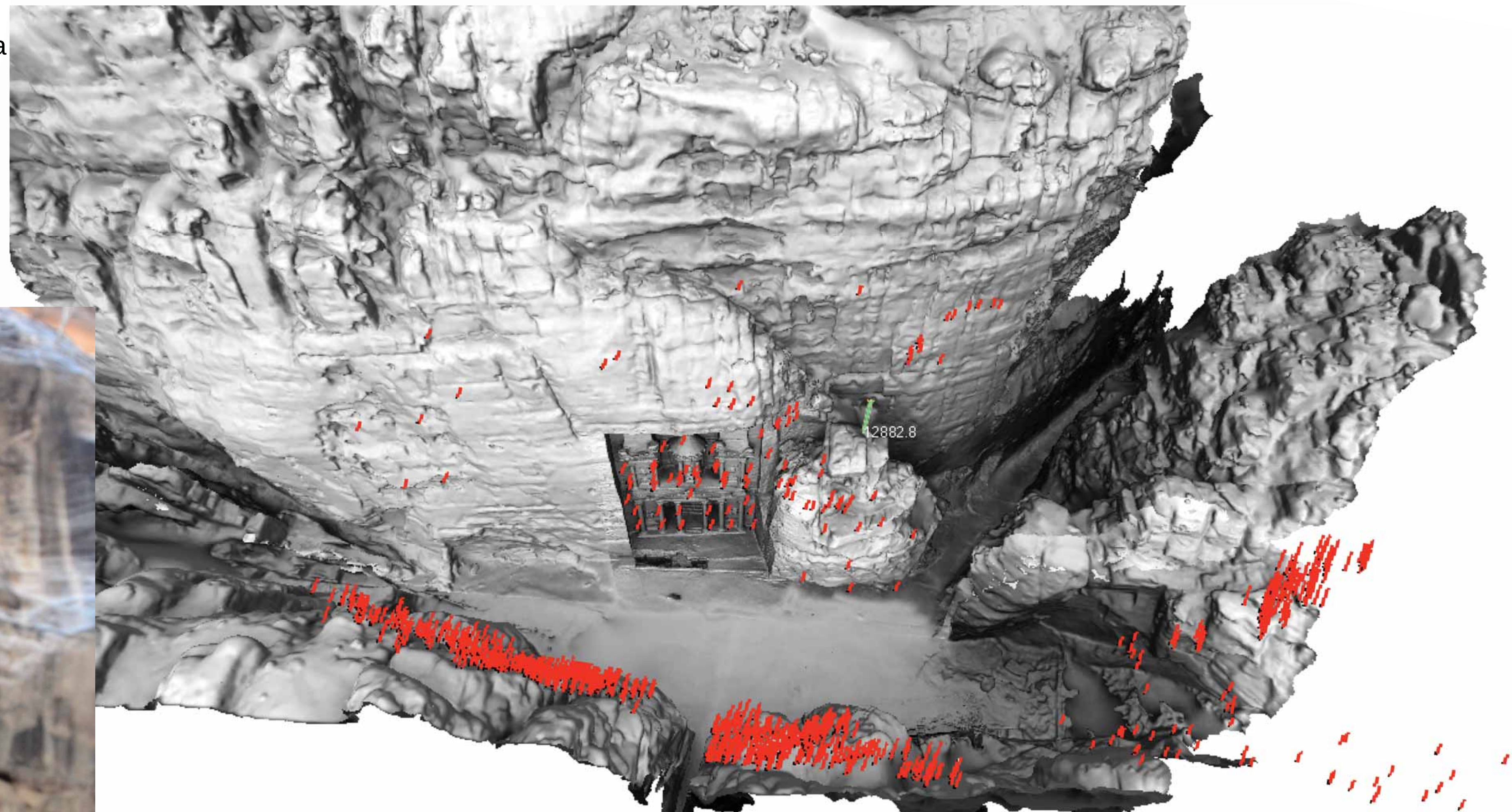
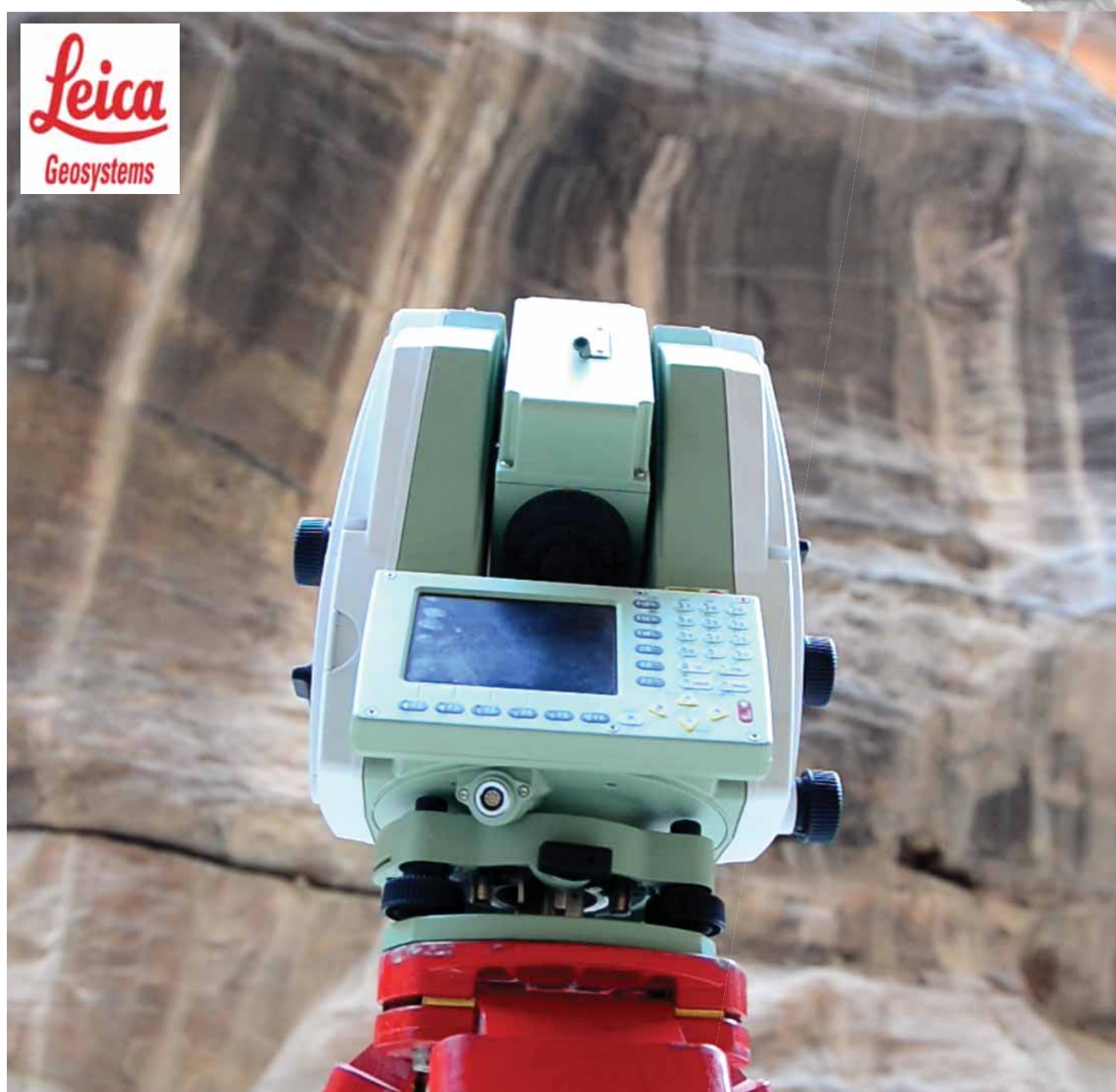
Technical analysis of SAR images that allows you to isolate and measure ground movements with millimeter accuracy on specific points that correspond to elements (PS - Permanent scatterers) very reflective on the Earth's surface .



GEODETIC MONITORING:

REFLECTOR-LESS ROBOTIC SURVEYING, LEICA TM30

More than 1600 individual points in petra siq (jordan)

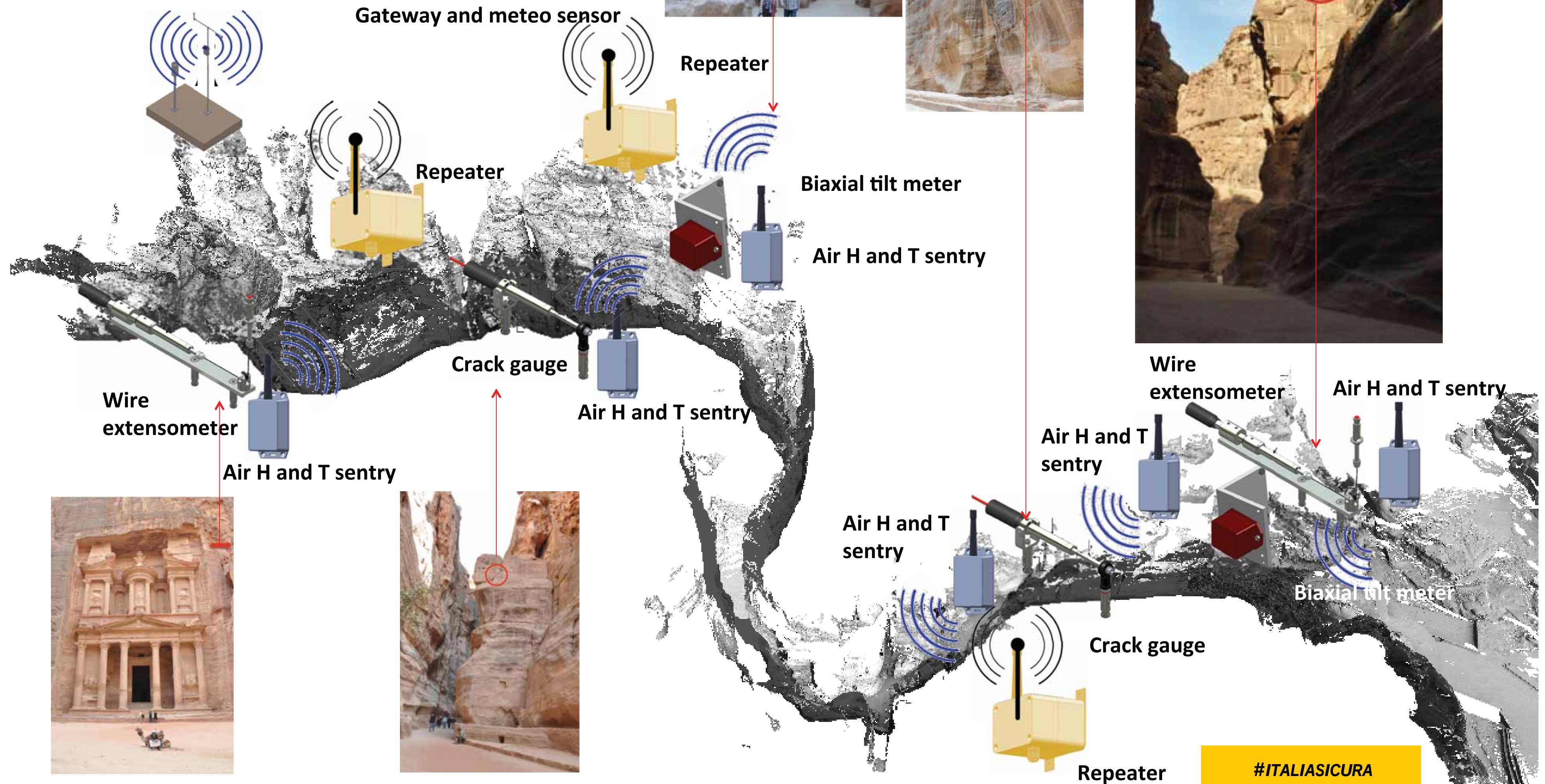
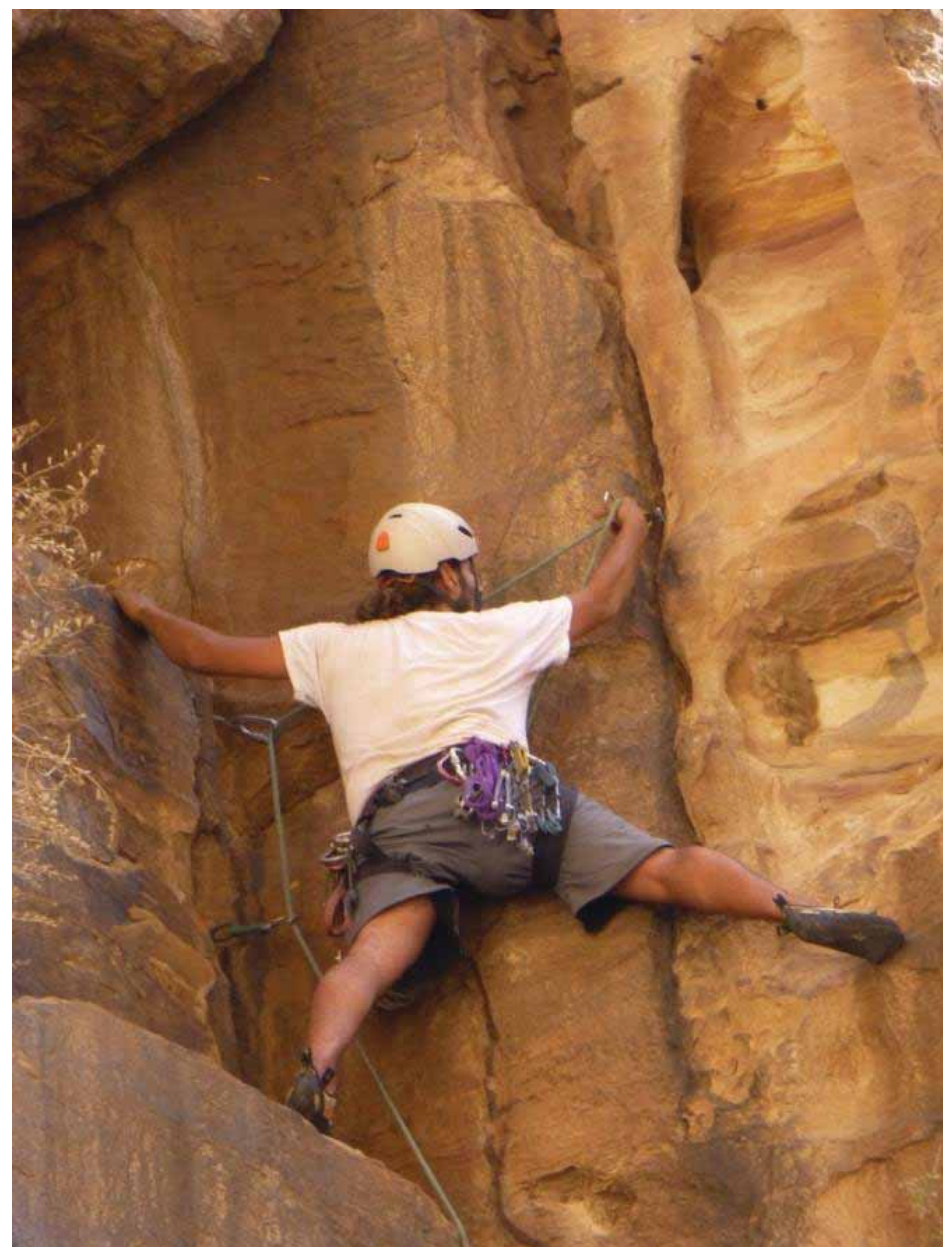


(Not impacting on the archaeological site)

MONITORING: TRADITIONAL GEOTHECNICAL INSTRUMENT IN **WI-FI NET**



Low impact installation In petra
(jordan)



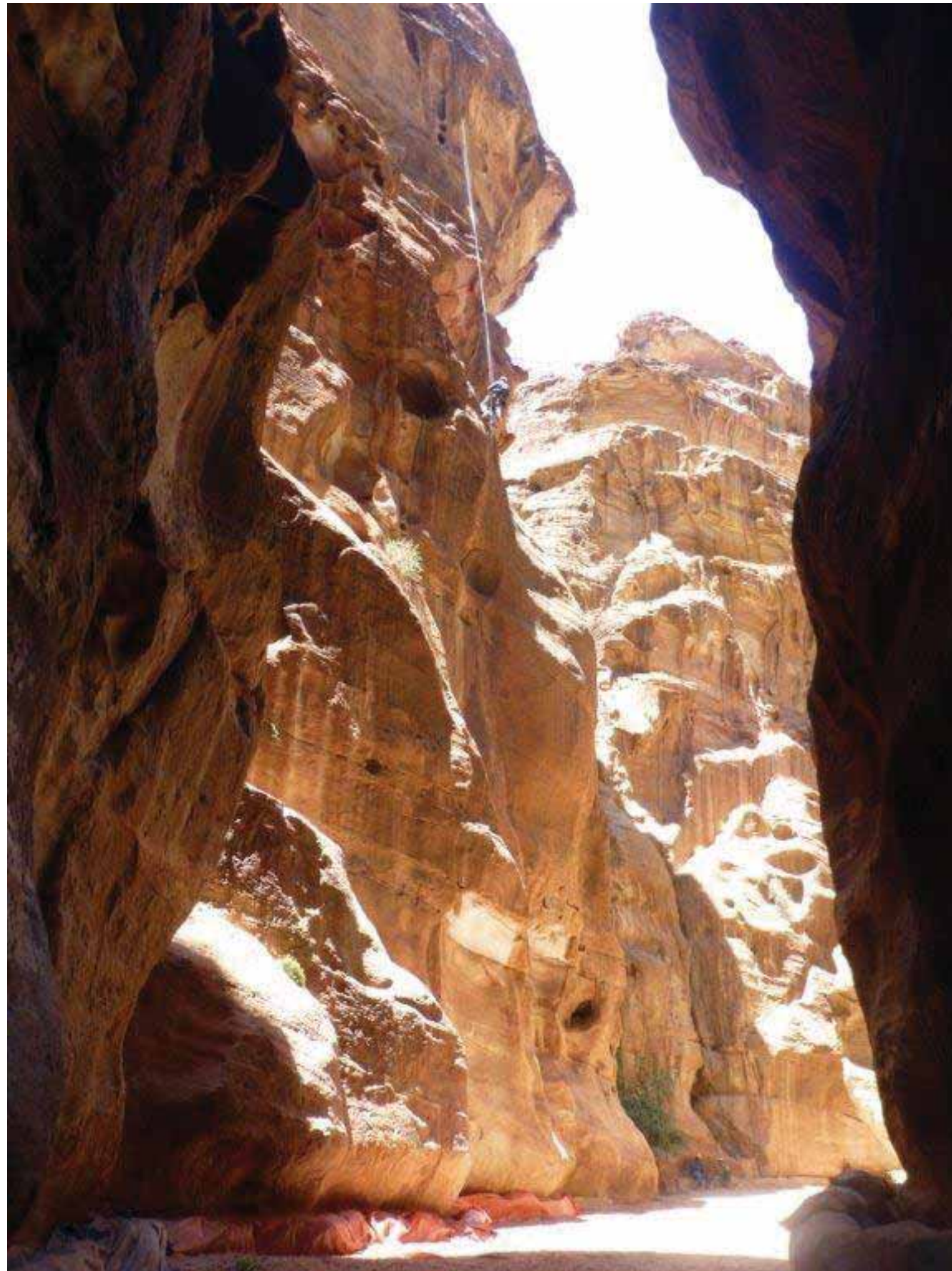
#ITALIASICURA

CONSERVATION: SCALING UNSTABLE BLOCKS IN THE SIQ



Embassy of Italy

As per 2016



(Source: facebook unesco amman)



VARDZIA

Georgia

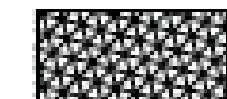
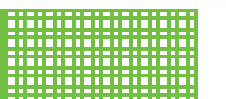
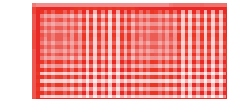


Vardzia (Georgia)

MASTER PLAN

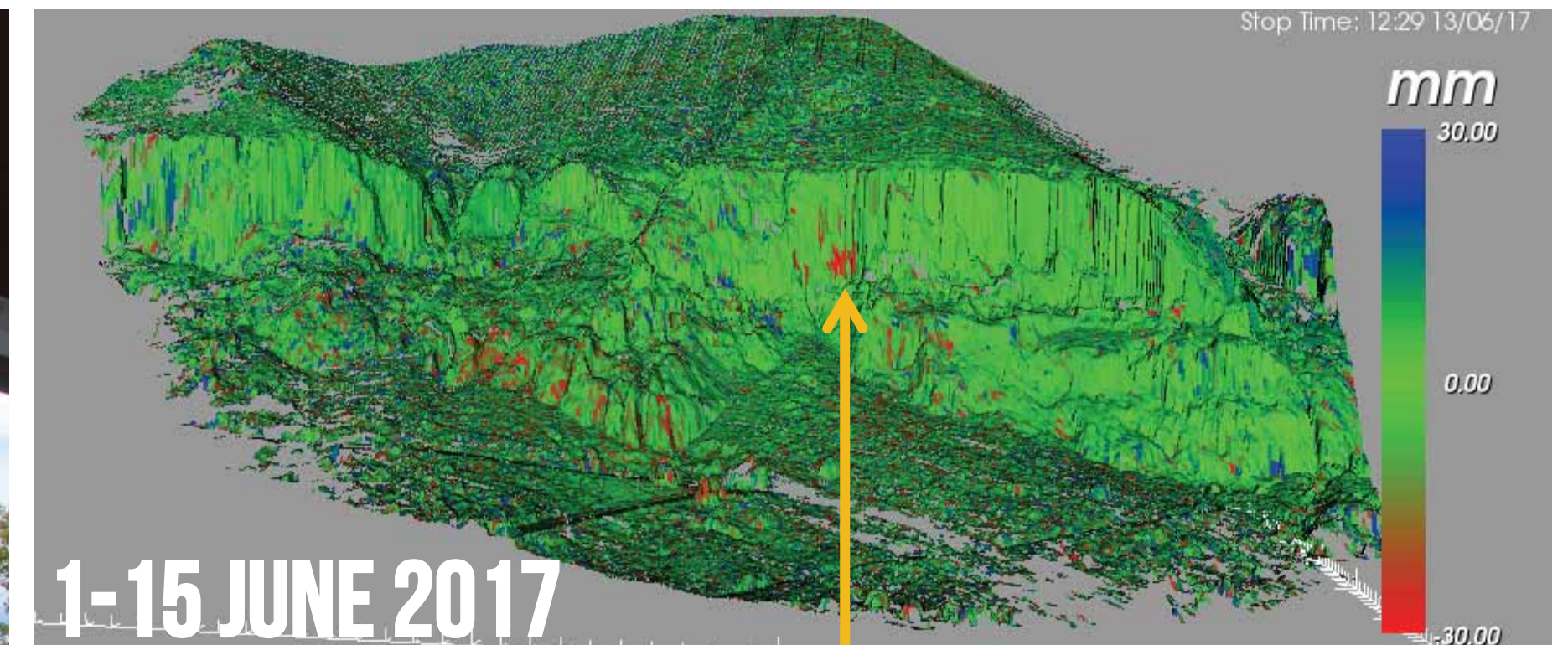
Vardzia (Georgia)



	Mitigation works through wire net, mesh and shallow bolts		Mitigation works through wire net, mesh and shallow bolts (to be verified directly on site)		Gabion walls - construction of filtering dams using local stone (trapezoidal section)		Surface water collection and drainage system
	Rock Anchors in walls by climbers through bolts and passive bars;		fixing of unstable blocks of medium / large size (buttresses, epoxy resin or bolts)		Shallow or deep rock anchors with scaffolding (bolts and passive bars)		Realization of rockfall barriers in local stone (section type - height 1.0m, width 0.4m)

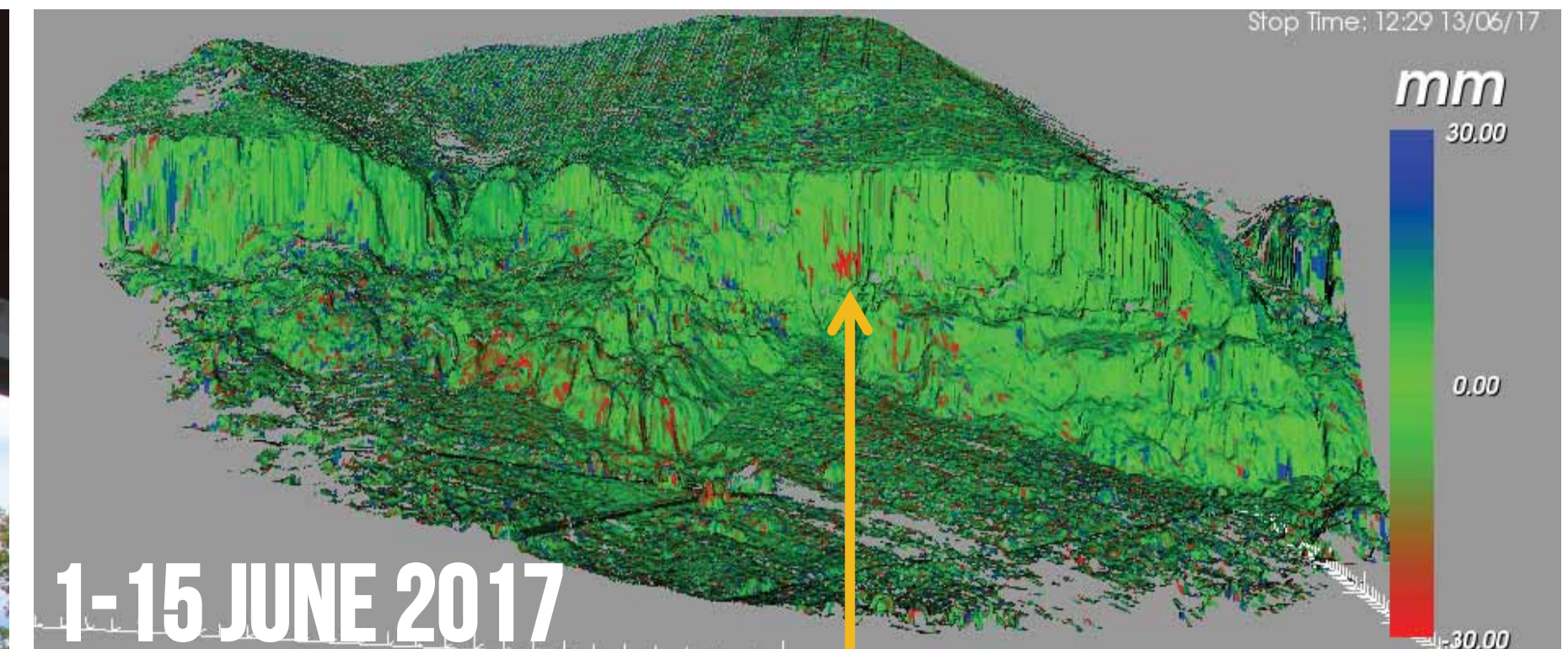
LOW IMPACT MONITORING

Vardzia (Georgia) – Deformation 1-15 June 2017



LOW IMPACT MONITORING

Vardzia (Georgia) – Deformation 1-15 June 2017



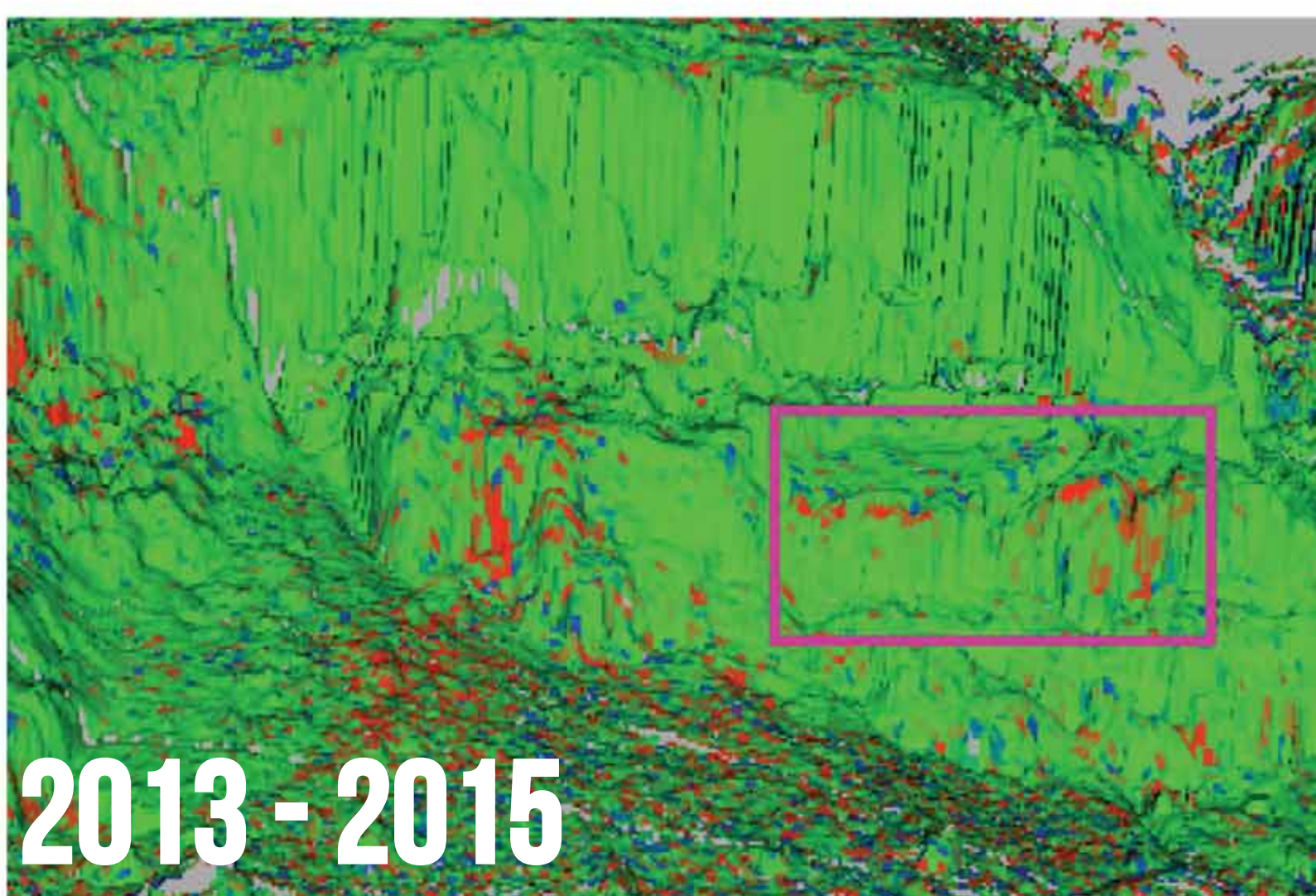
MONITORING CONSOLIDATIONS

Vardzia (Georgia)

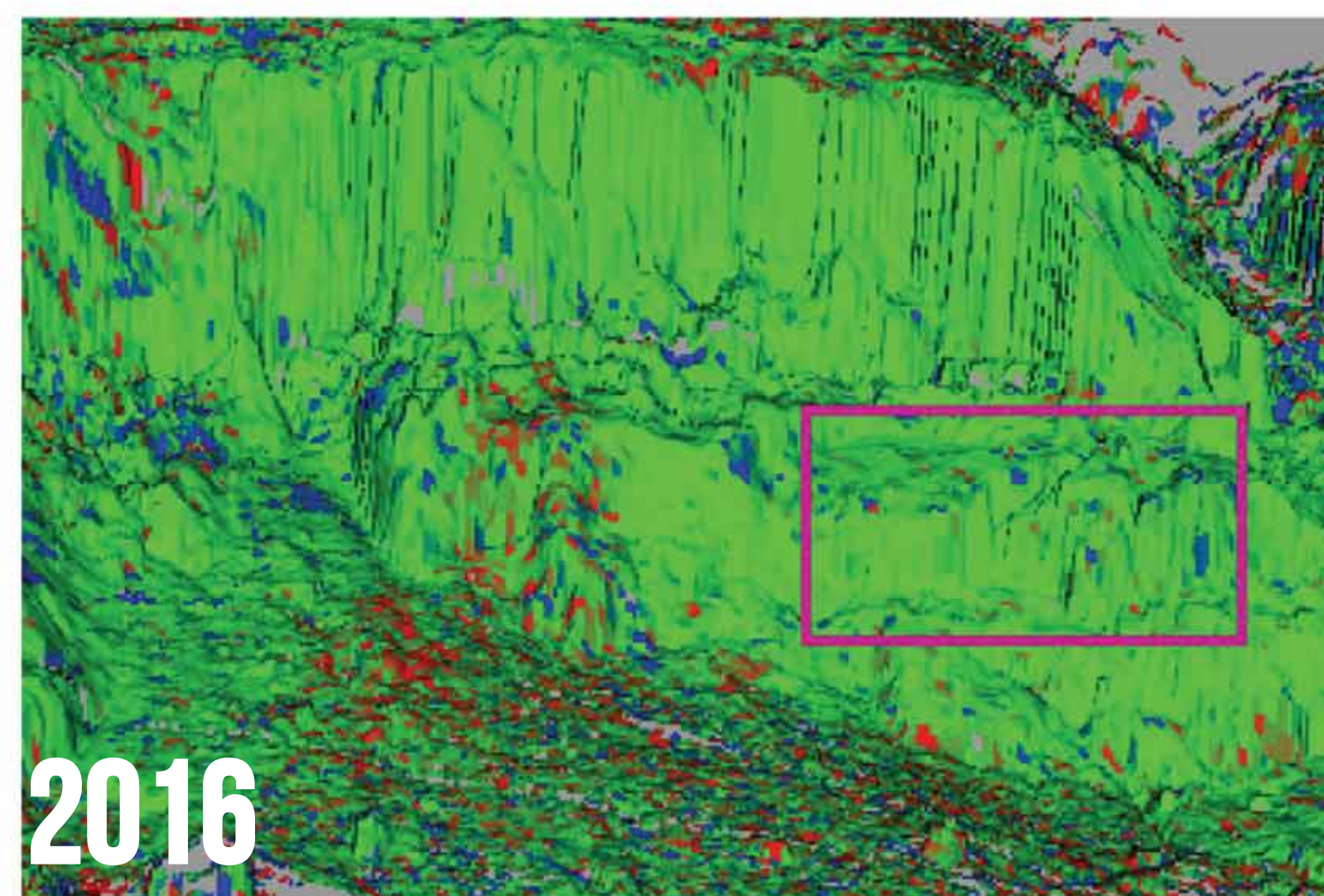


EASTERN GATE TO VARDZIA

- ◆ Eastern gate before consolidation,
- ◆ during consolidation in 2015
- ◆ 2013-15 cumulative displacement
- ◆ 2016 Jan-March displacement



2013-15 cumulative displacement



2016 Jan-March displacement



KOGURIO

North Korea



Kogurio (NORTH KOREA)

TIMELINE

Kogurio (North Korea)



Drillings

Installing piezometers

Design dewatering

Implement dewatering
of tombs

Collecting water and
following out from the
site

DEWATERING SUSANRI MURAL TOMB “



KOGURIO

North Korea



BAMIYAN

Afghanistan



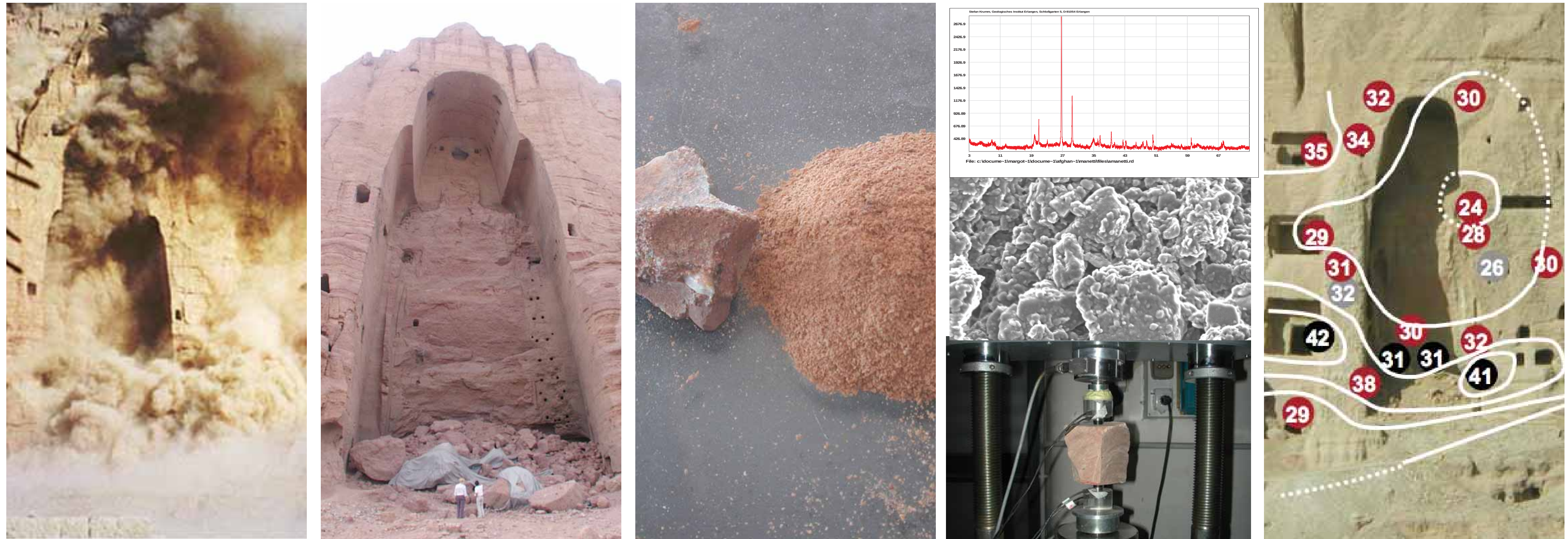
Bamiyan (AFGHANISTAN)

The Buddhist art of the Hindu Kush mountain region, of which the Bamiyan Valley is a part, represents the final flowering of Buddhism in Afghanistan. The kingdom of Bamiyan was a Buddhist state positioned at a strategic location along the trade routes that for centuries linked China and Central Asia with India and the west.

Bamiyan served as an important monastic and spiritual center, as well as a hub of intense commercial activity. The site was constructed between approximately the fifth and ninth centuries A.D. during a distinctive phase in the history of Buddhist art, a period of intense cultural and religious exchanges between east and west, and a time of great cultural change within Buddhism.

BAMIYAN

Afghanistan)

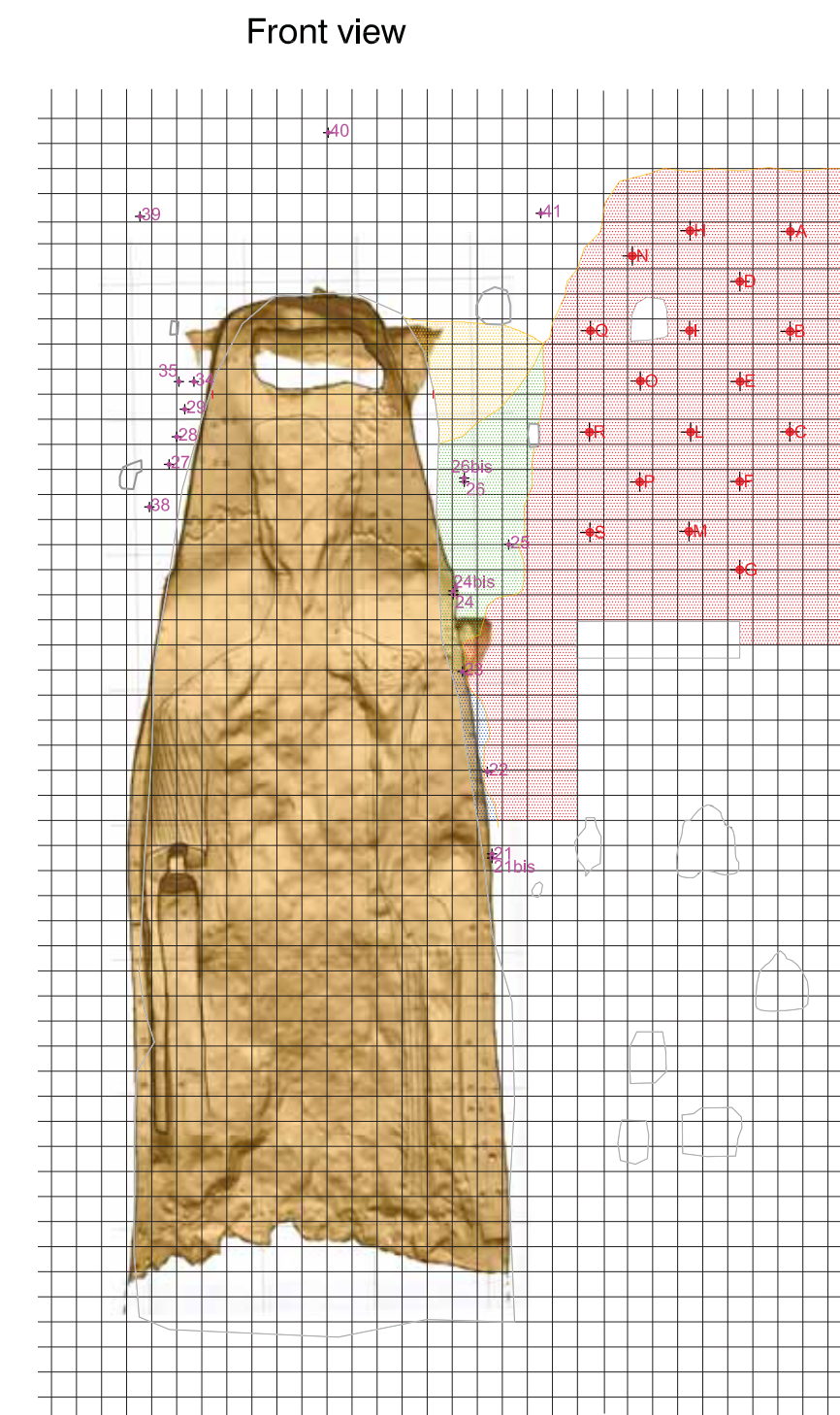


Investigation phase and consolidation project (September 2002 – June 2003)

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BAMIYAN

Afghanistan



Investigation phase and consolidation project (September 2002 – June 2003)

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soloro emium esudis essunti enihit posaped quiamit gnatur estrum.

WORK IN PROGRESS

November 2003



Consolidation activities after the explosion of March 2001.

UNESCO was immediately prompt to undertake an emergency intervention to secure the remains of such wonderful cultural heritages and, thanks to the generous Government of Japan financial support, the works started in November 2003.



BACK WALL

Local personnel



BAMYAN
PROJECT

Consolidation of the back wall of the Eastern Buddha niche, using local personnel and then enhancing sustainability and future maintenance.

UNESCO

:
:
:
:

2009

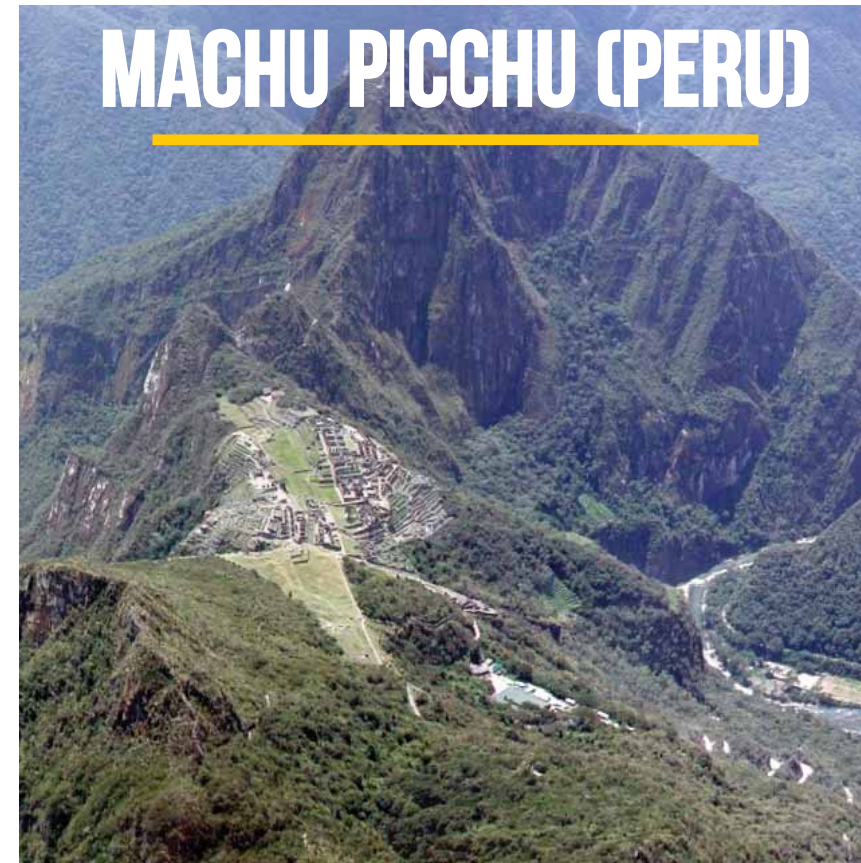
CONCLUSION

Other experiences ...

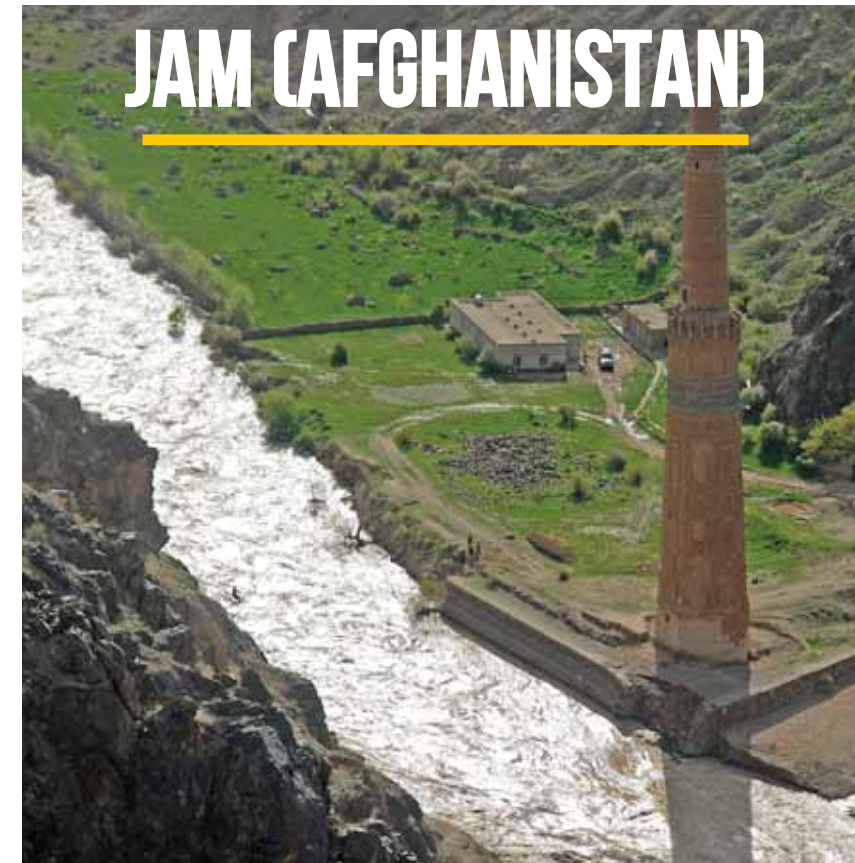
HERAT (AFGHANISTAN)



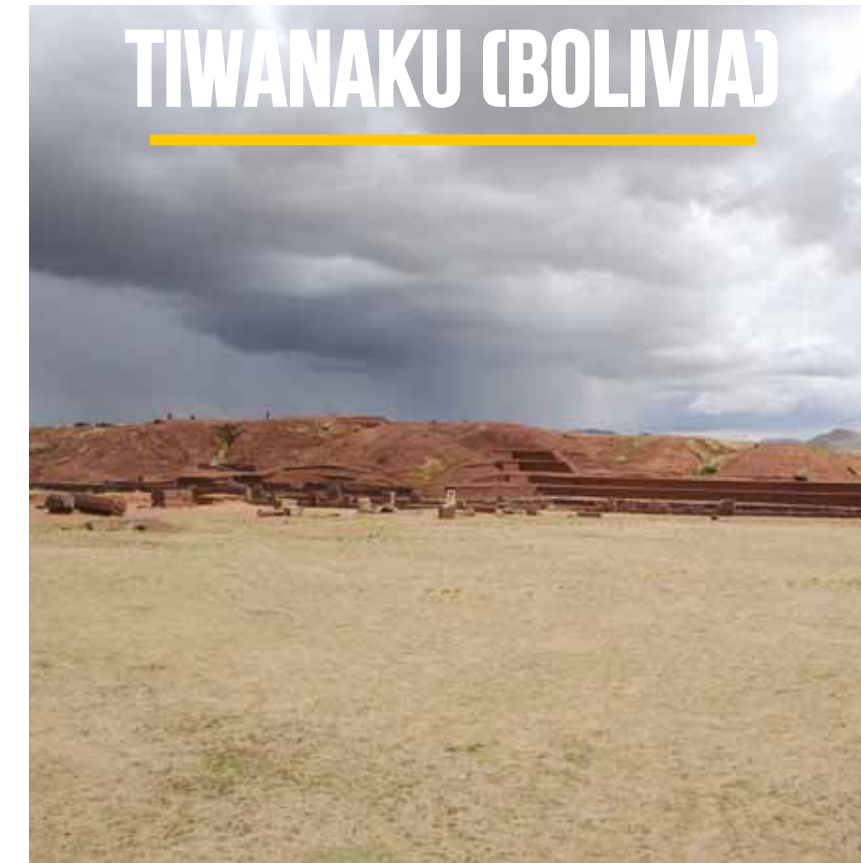
MACHU PICCHU (PERU)



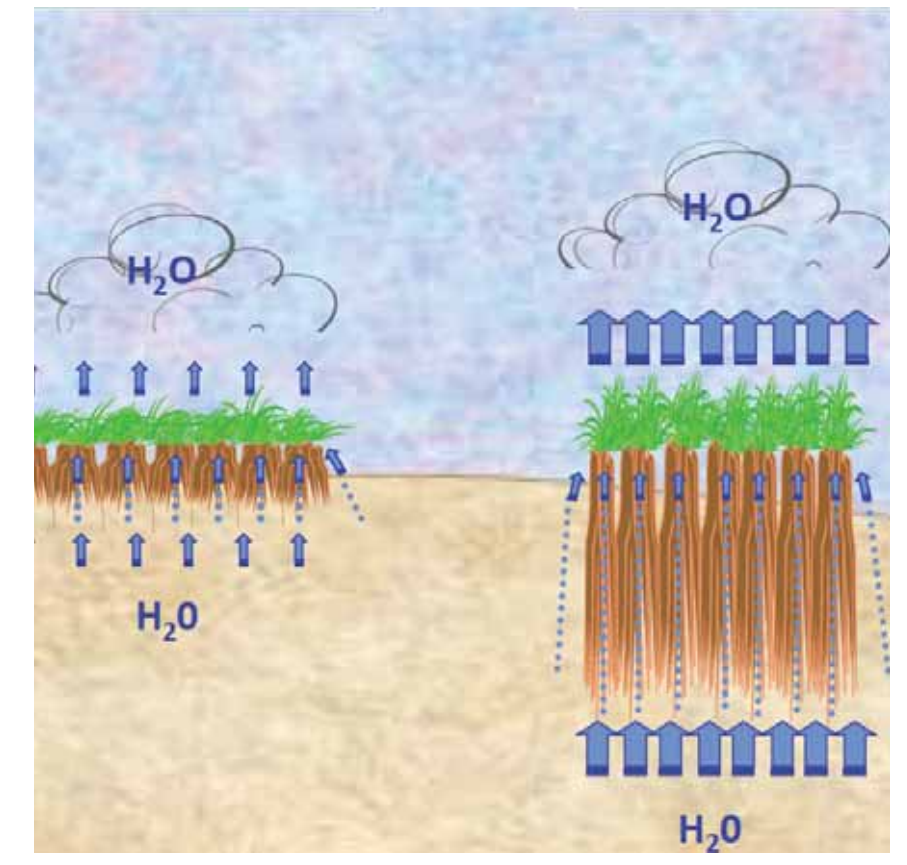
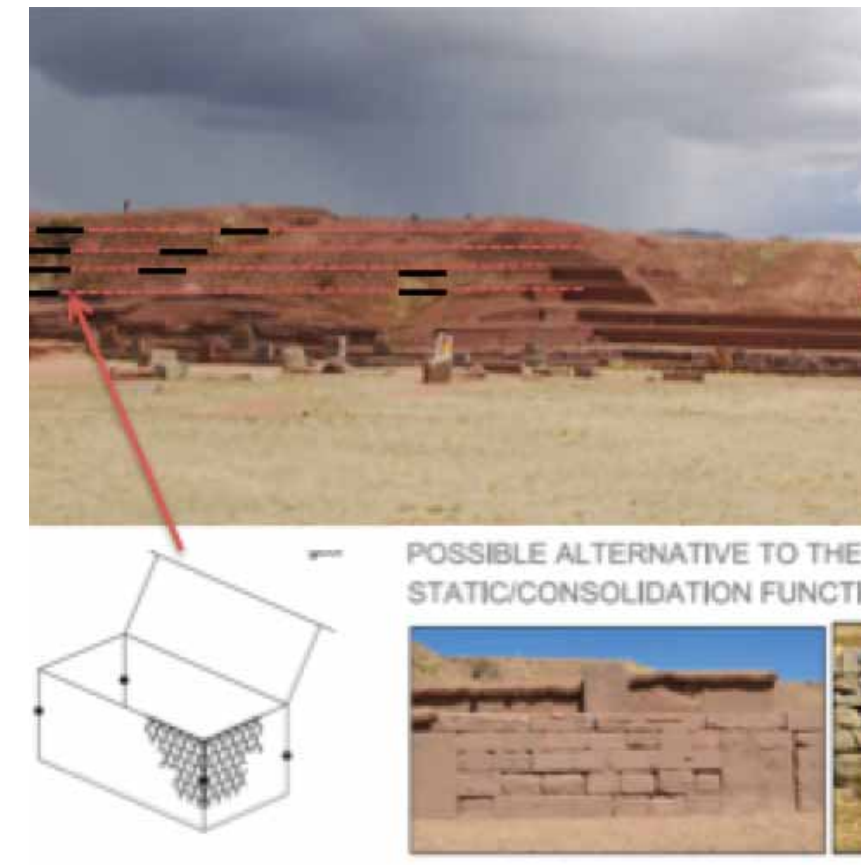
JAM (AFGHANISTAN)



TIWANAKU (BOLIVIA)

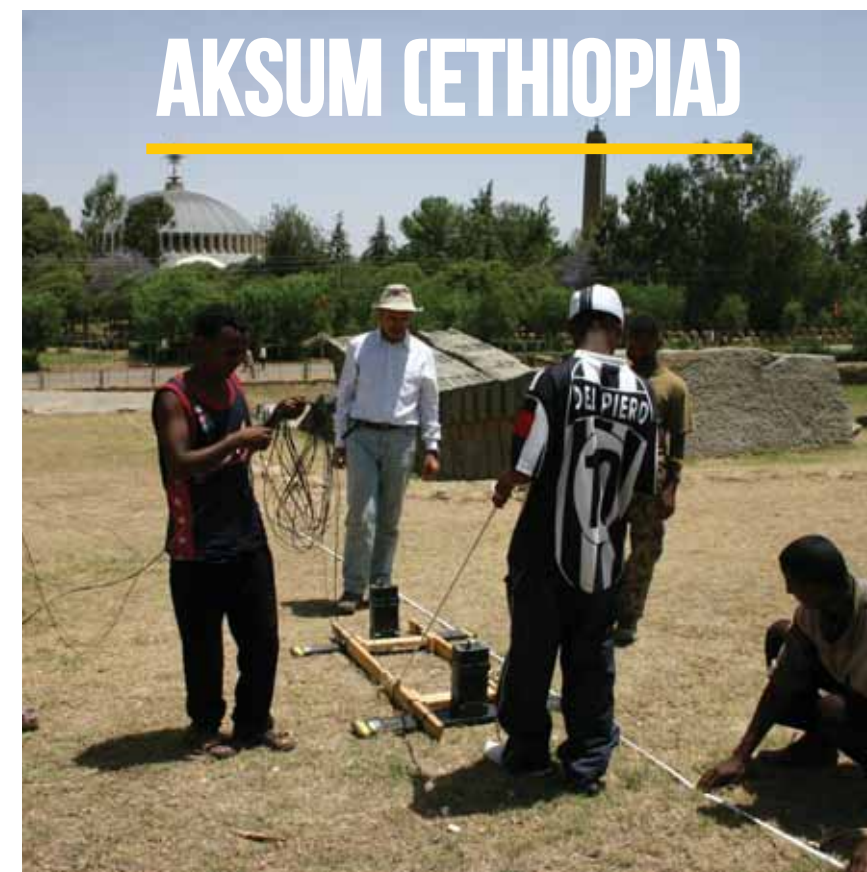
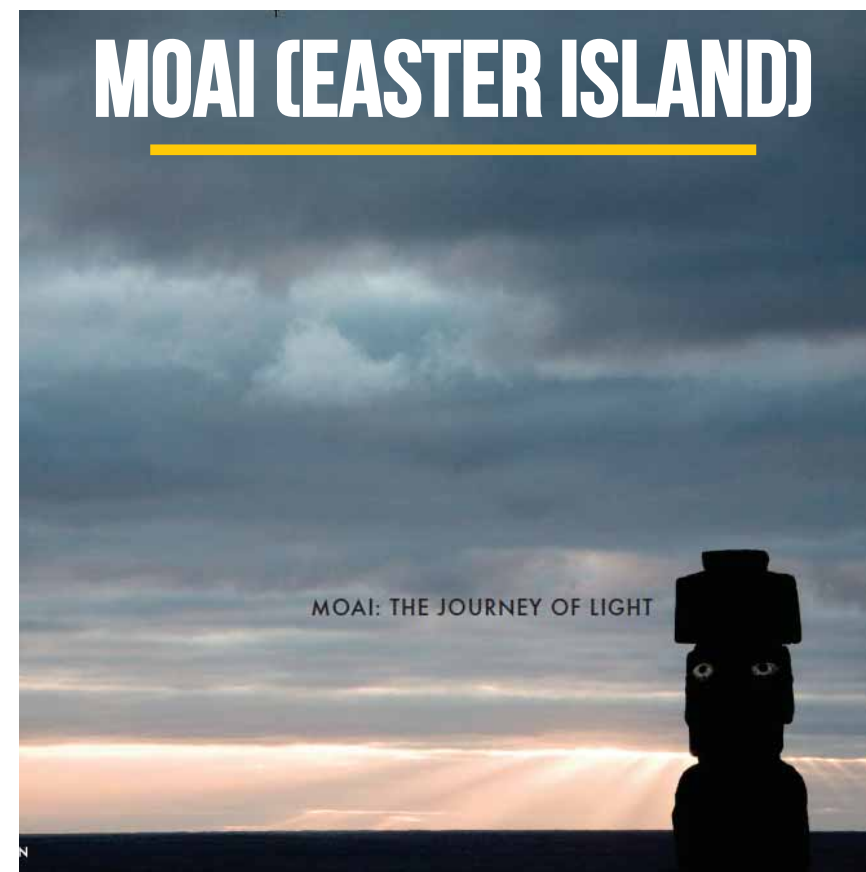


HAWARA (EGYPT)



CONCLUSION

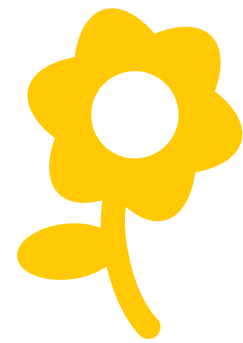
The driver of science and technology for advanced technology sectors



Science and technology,
are a powerful driver for
advancement of Italian
companies operating in
advanced technology
sectors.

CONCLUSION

Our mandate: to promote the Italian excellence in Science and Technologies



PHOTOGRAPHY

Italy is a Country prone to natural disasters but also rich of cultural heritages.



BRANDING

Italy has developed a long tradition of protecting cultural heritages from natural hazards.

Innovation and sustainability are the key points for such tradition, enhancing traditional knowledge and sustainable practices.



DESIGN

Promoting and exporting world wide the high level knowledge and science, in these topics, is the mandate of Minister of Foreign Affairs.

Also capacity building of local experts, linked permanently to the Italian system
(Scientific diplomacy)



OPERATING

European Commission projects;
MAECI Bilateral projects;
scholarships;
Embassies and Scientific Attachés are the main actors in promoting Italian excellence in science and technology and supporting the advancement of Italian companies operating in advanced technology sector.



LATTANZI S.r.l.

Prof. Alberto Lodigiani

Studio Andrea Bruno



Studio Giorgio Croci



SAPIENZA
UNIVERSITÀ DI ROMA



United Nations
Educational, Scientific and
Cultural Organization



UNIVERSITÀ
DEGLI STUDI
FIRENZE

UNESCO Chair on the Prevention and
Sustainable Management of Geo-Hydrological Hazards,
University of Florence, Italy



LOUIS VUITTON



ISPRA

Superiore per la Protezione
la Ricerca Ambientale



BETA Studio

Landslide and Cultural & Natural Heritage Network



Minteos



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