



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

# Prevention and sustainable management of geo- hydrological hazards

Paolo Canuti

# UNESCO Chair

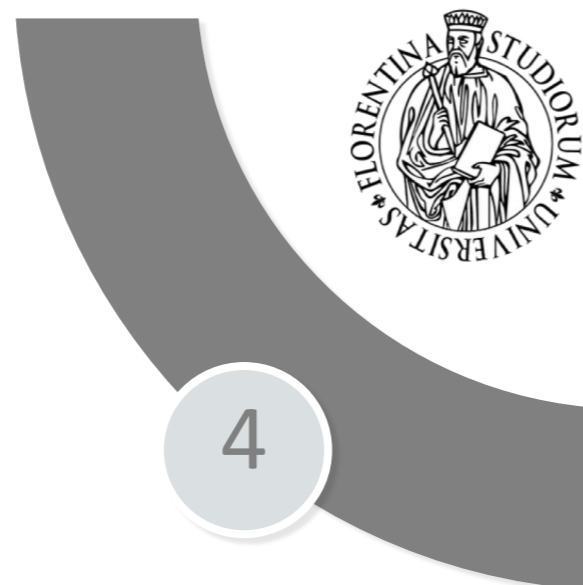
To promote the development of innovative technologies for the prevention and mitigation of Geo-hydrological hazards



To develop tools and procedures for supporting risk reduction policies and emergency management for the safety of the human life



To promote research at international level by offering scientific facilities to post-graduated Students and visiting researchers



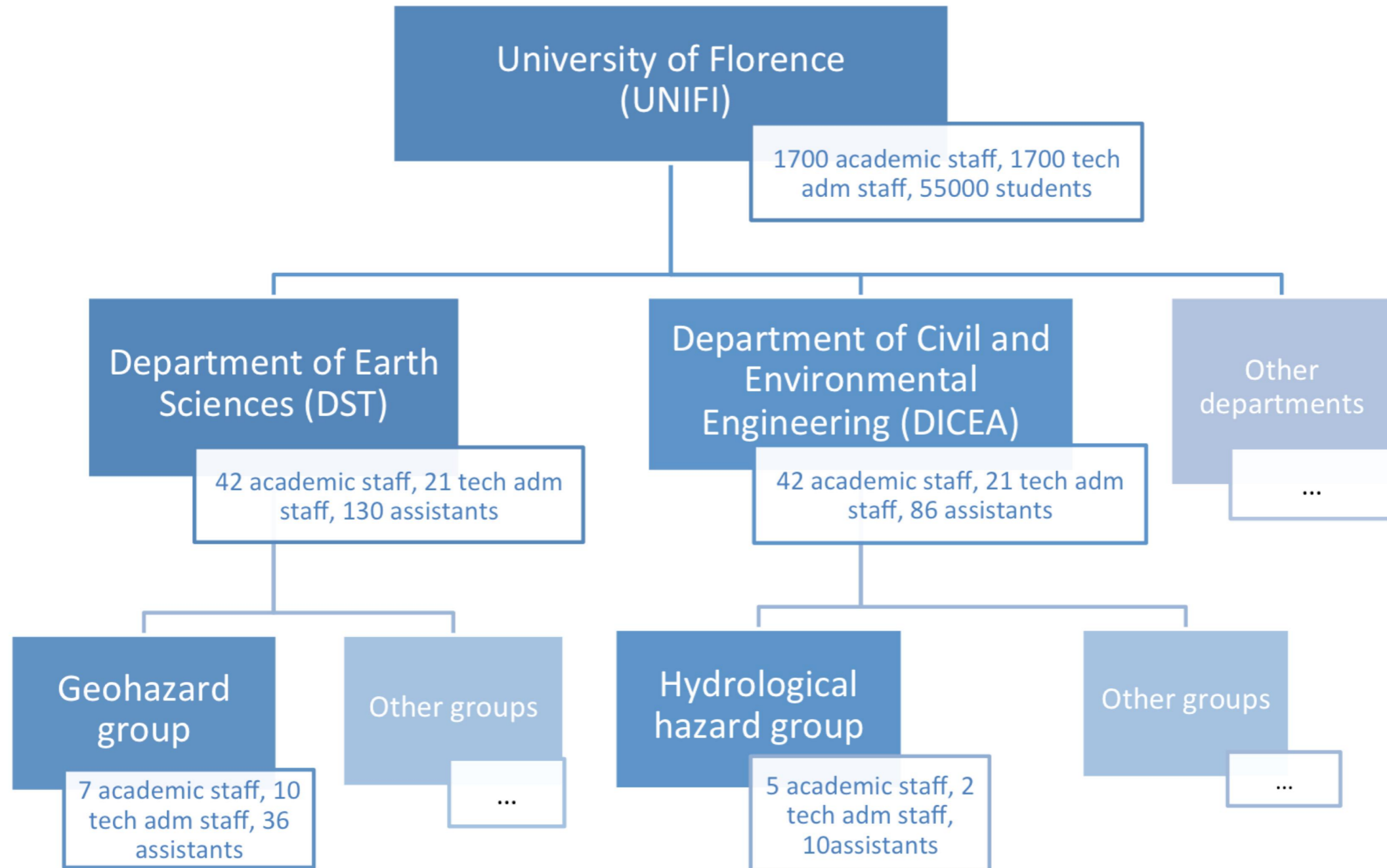
UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

To promote the protection of cultural heritage threatened by geo-hydrological hazards



THE MISSION OF THE CHAIR IS TO PROMOTE RESEARCH AND DEVELOPMENT (R&D) FOR THE PREVENTION AND MANAGEMENT OF GEO-HYDROLOGICAL HAZARDS, IN ORDER TO SUPPORT POLICIES AND ACTIONS OF RISK REDUCTION

# Host institution - organization



# Host institution - location



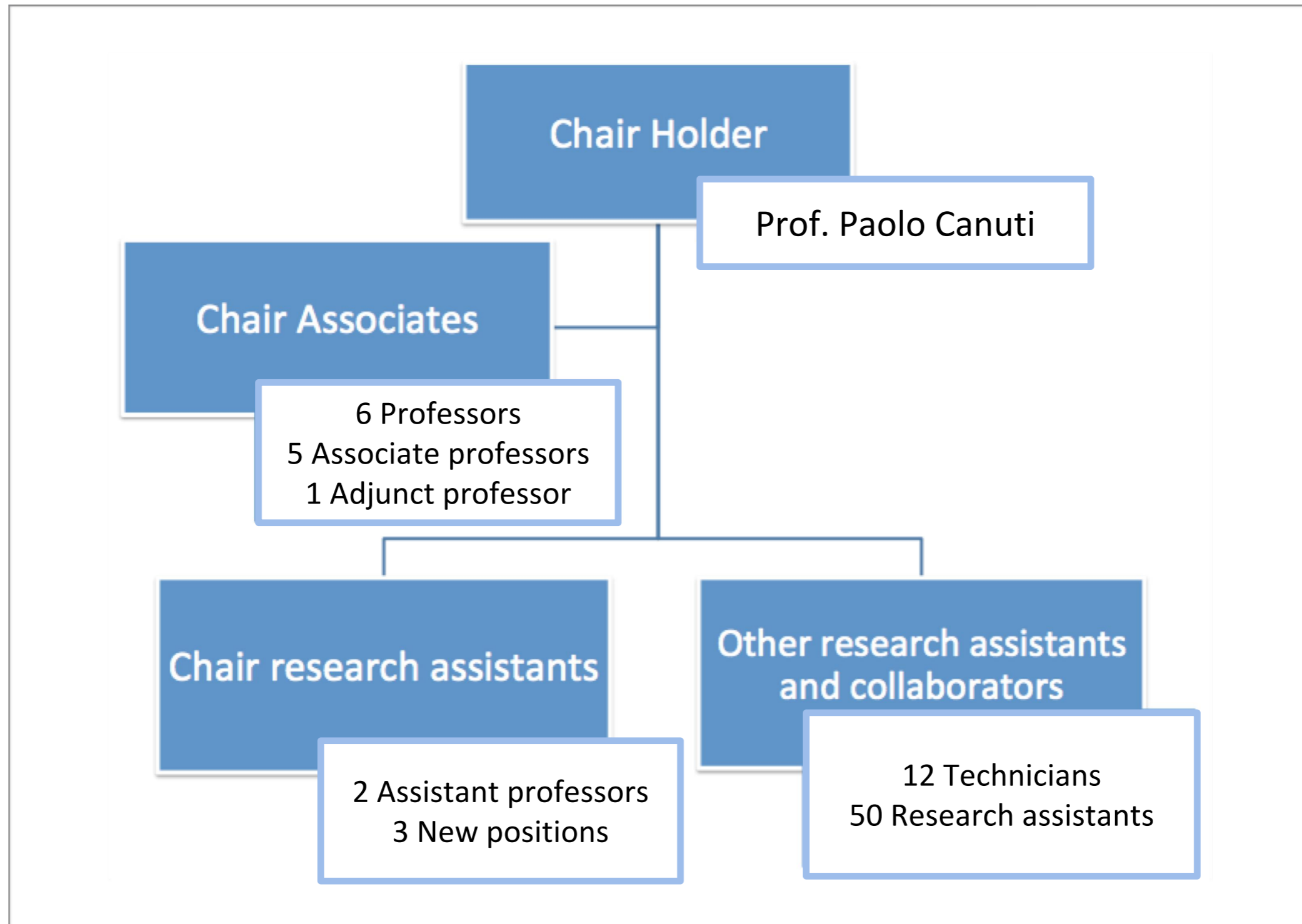
# Host institution - location



# Host institution - location



# Chair Structure



# Team

## CHAIRHOLDER



**PAOLO CANUTI**  
CHAIR HOLDER

## PROFESSORS



**NICOLA CASAGLI**  
PROFESSOR



**CARLO ALBERTO  
GARZONIO**  
PROFESSOR



**GIORGIO  
VALENTINO  
FEDERICI**  
PROFESSOR



**ENIO PARIS**  
PROFESSOR



**FABIO CASTELLI**  
PROFESSOR



**SANDRO  
MORETTI**  
PROFESSOR

## ADJUNCT PROFESSOR



**CLAUDIO  
MARGOTTINI**  
ADJUNCT PROFESSOR

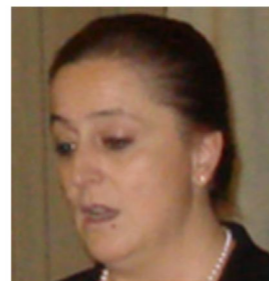
## ASSOCIATE PROFESSORS



**FILIPPO CATANI**  
ASSOCIATE PROFESSOR



**MASSIMO  
RINALDI**  
ASSOCIATE PROFESSOR



**ENRICA  
CAPORALI**  
ASSOCIATE PROFESSOR



**LUCA SOLARI**  
ASSOCIATE PROFESSOR

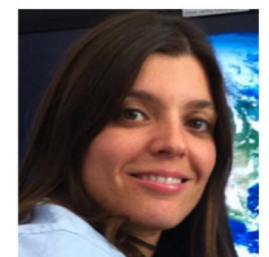


**RICCARDO FANTI**  
ASSOCIATE PROFESSOR

## ASSISTANT PROFESSORS



**GIOVANNI GIGLI**  
ASSISTANT PROFESSOR



**VERONICA  
TOFANI**  
ASSISTANT PROFESSOR



# Equipment

ULTRALIGHT AIRCRAFT



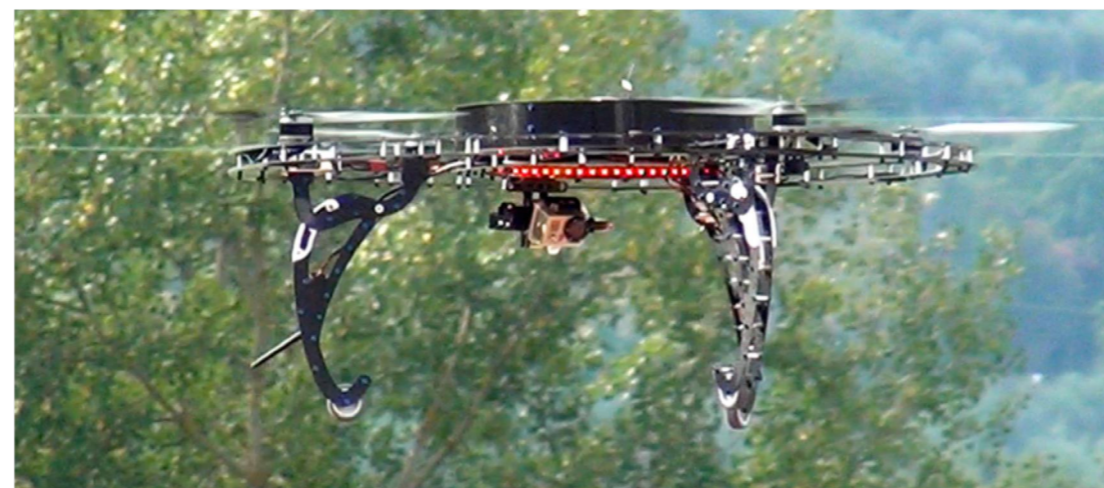
HYPERSPECTRAL FIELDSPEC



THERMAL CAMERA



ANTI POLLUTION DEVICE



DRONE MULTICOPTER



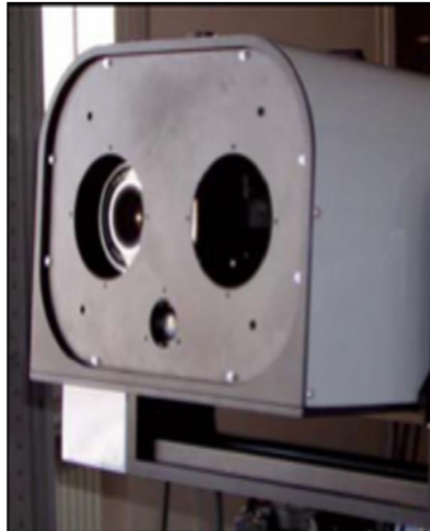
ROBOTIZED UNDERWATER VEHICLE

# Equipment

RADAR INTERFEROMETER



HYPERSPECTRAL SENSOR



SEISMOMETERS



3D LASER SCANNER



ROBOTIZED TOTAL STATION



GPS SURVEY KIT



GPS



ACCELEROMETER

# Partners



United Nations  
Educational, Scientific and  
Cultural Organization



**Historic Centre of Florence**  
inscribed on the World Heritage List in 1982



A Programme of  
the ICL for ISDR

INTERNATIONAL CONSORTIUM ON LANDSLIDES  
INTERNATIONAL PROGRAMME ON LANDSLIDES



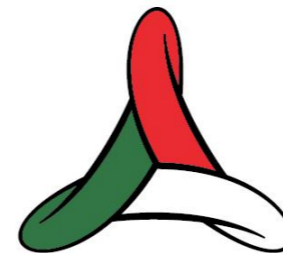
INTERNATIONAL CONSORTIUM ON GEO-  
DISASTER REDUCTION



United Nations  
Educational, Scientific and  
Cultural Organization



Federazione Italiana  
dei Club e Centri  
per l'UNESCO



**PROTEZIONE CIVILE**  
Presidenza del Consiglio dei Ministri  
Dipartimento della Protezione Civile



**ISPRA**



United Nations  
Educational, Scientific and  
Cultural Organization



Landslide and Water-related  
Disaster Risk Management



United Nations  
Educational, Scientific and  
Cultural Organization



Unesco Chair in  
Water Resources Management  
and Culture



**#ItaliaSicura**  
Presidenza del Consiglio  
dei Ministri



United Nations  
Educational, Scientific and  
Cultural Organization



UNESCO Transdisciplinary Chair in Human  
Development and Culture of Peace  
University of Florence, Italy

PREVENTION, SECURITY, BEST PRACTICES  
**Geoapp**  
ONLUS – Nonprofit Organisation

**CERAFRI**  
CENTRO per la Ricerca e l'Alta  
Formazione per la prevenzione  
del Rischio Idrogeologico

# International Consortium on Landslides (ICL)



A Programme of  
the ICL for ISDR

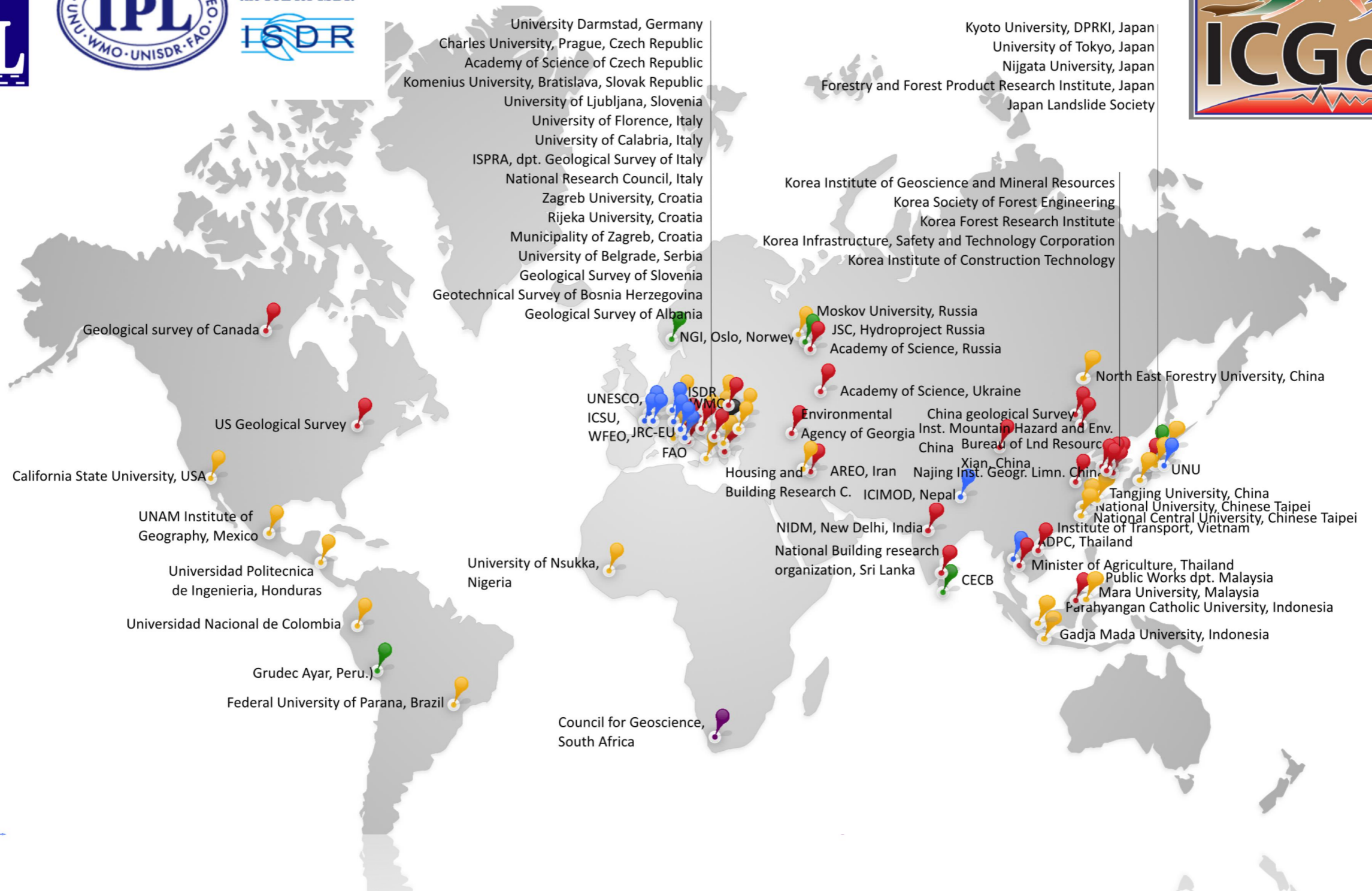


INTERNATIONAL CONSORTIUM ON LANDSLIDES  
INTERNATIONAL PROGRAMME ON LANDSLIDES

# Worldwide scientific networks



A Programme of the ICL for ISDR



# UNITWIN-UNESCO/KU/ICL Landslides Risk Mitigation for Society and Environment Cooperation Programme at Kyoto University



United Nations  
Educational, Scientific and  
Cultural Organization



Landslide and Water-related  
Disaster Risk Management



# International Consortium on Geo-disaster Reduction

THE 14TH INTERNATIONAL SYMPOSIUM ON GEO-DISASTER REDUCTION

10-13 October 2016 Chengdu, China



# Global Alliance of Disaster Research Institutes (GADRI)



**The 2<sup>nd</sup> Global Summit of Research Institutes for Disaster Risk Reduction:  
Development of a Research Road Map for the Next Decade**

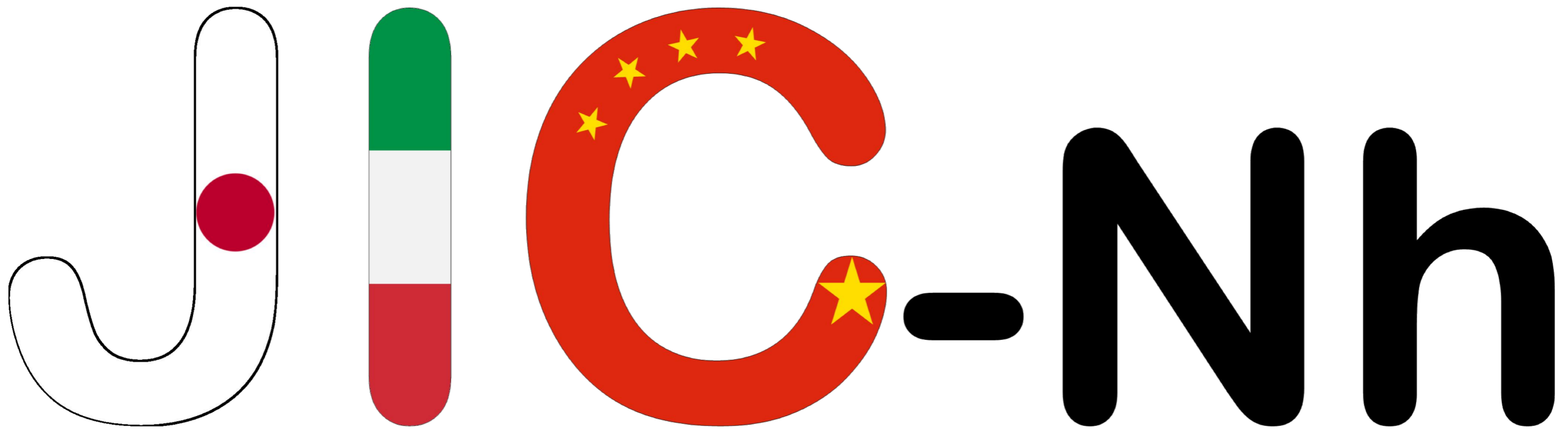
March 19-20, 2015, Disaster Prevention Research Institute, Kyoto University, Uji, Kyoto, Japan





# Joint Research Center on Natural Hazards

Japan + China + Italy



# World Centre of Excellence on Landslide Risk Reduction 2014-2020



# ISDR-ICL Sendai Partnership 2015-2025 as voluntary commitment to the World Conference on Disaster Risk Reduction for Global Promotion of Understanding and Reducing Landslide Disaster Risk



The Head of the Italian Civil Protection Franco Gabrielli with the Director of the Division of Ecological and Earth Sciences of UNESCO Qunli Han at the signing ceremony of the ISDR-ICL Sendai Partnership 2015-2025



# Bilateral agreements



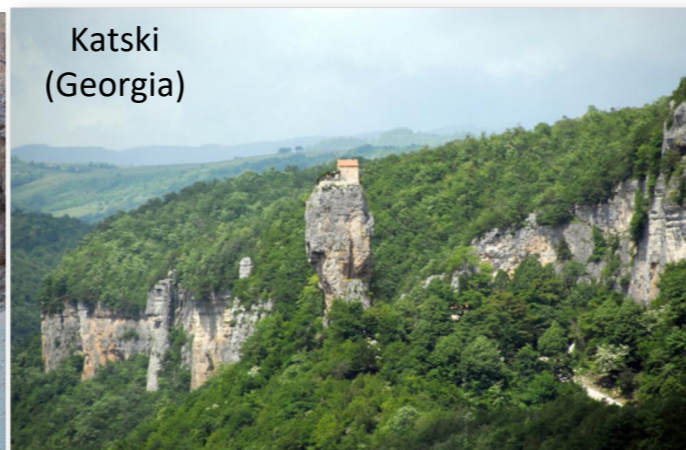
# International missions



## Legend

- Bearing capacity
- Environmental issues (EI, etc.)
- Landslides
- Hydrogeology
- Underground stability
- Geo-structural
- Archaeoseismicity

# International missions



# International MSc Geo-engineering

## GEMs

Started september 2017

SSD	Course	ECS	Year	ECS
ICAR/01	FLUVIAL HYDRAULICS	9	I	69
ICAR/02	WATERSHED HYDROLOGY	9	II	
	Hydrologic monitoring and prediction	9	II	
ICAR/06	GEOMATICS	6	II	
ICAR/07	EARTHQUAKE GEOTECHNICAL ENGINEERING	6	II	
ICAR/07	SLOPE STABILITY	6	II	
ICAR/08	STRUCTURAL MECHANICS & ENGINEERING I	6	I	
ICAR/09	STRUCTURAL MECHANICS & ENGINEERING II	6	I	
GEO/02	GEOLOGY I	6	I	
GEO/03	GEOLOGY II	6	I	
GEO-02	Field geology	6	I	
GEO/03	Structural Geology	6	I	
GEO/05	ENGINEERING GEOLOGY	9	I	
	Hydrogeology	9	I	
GEO/04	ENGINEERING GEOMORPHOLOGY	6	I	24
	Environmental Geology	6	I	
AGR/08	Watershed Management	6	II	
AGR/14	Soil Conservation	6	II	
MAT/08	COMPUTATIONAL METHODS I	6	I	
SECS-S/05	COMPUTATIONAL METHODS II	6	I	
	Free Choice	9	II	27
	Thesis	18	II	
<b>Total</b>				<b>120</b>



# International PhD programme

In preparation

## UNESCO Chair PhD Program Humanism and Science for Earth Sustainable Development



# Machu Picchu (Peru)



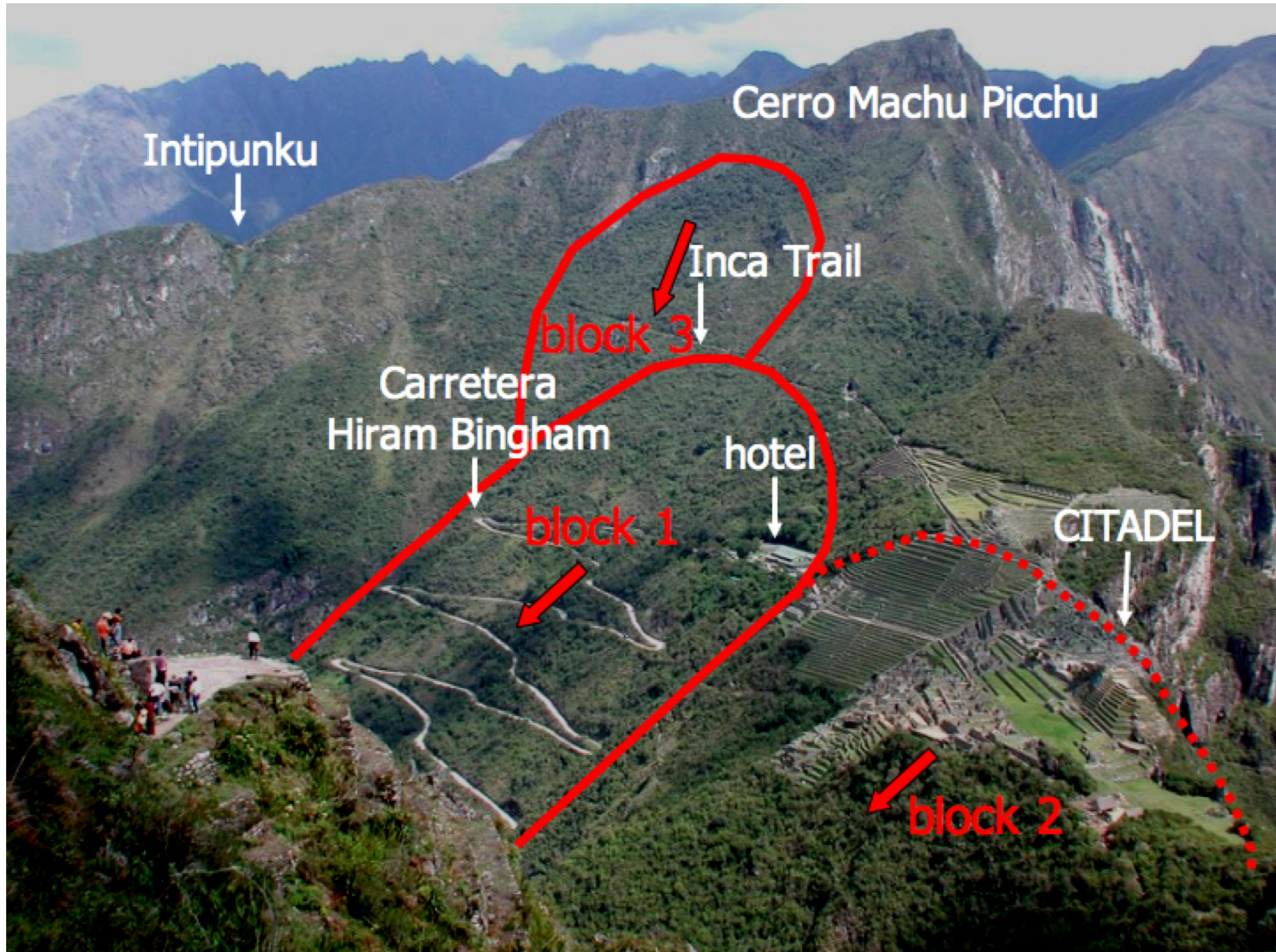
Rock slides

# Integrated monitoring

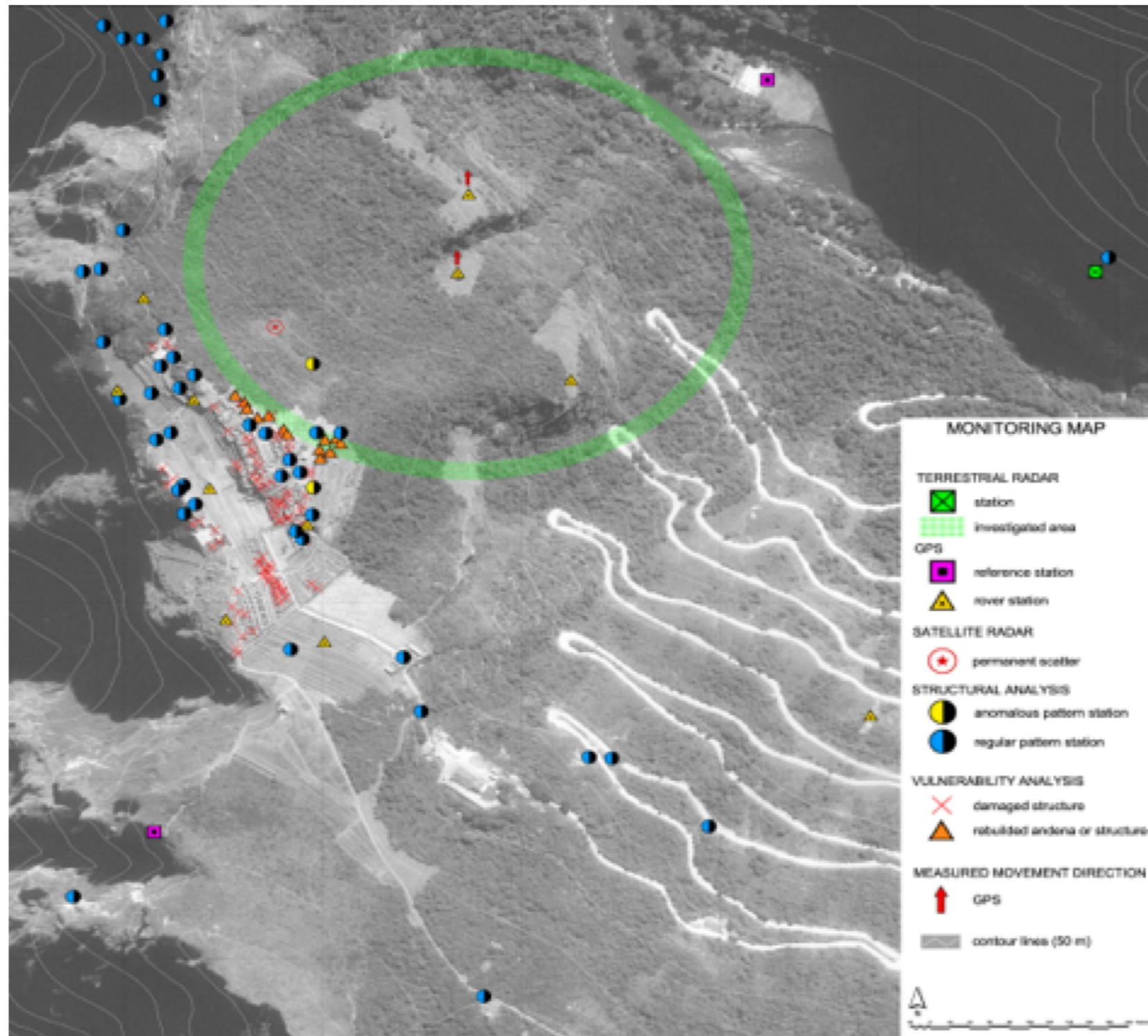


Machu Picchu (Peru)

# First hypothesis

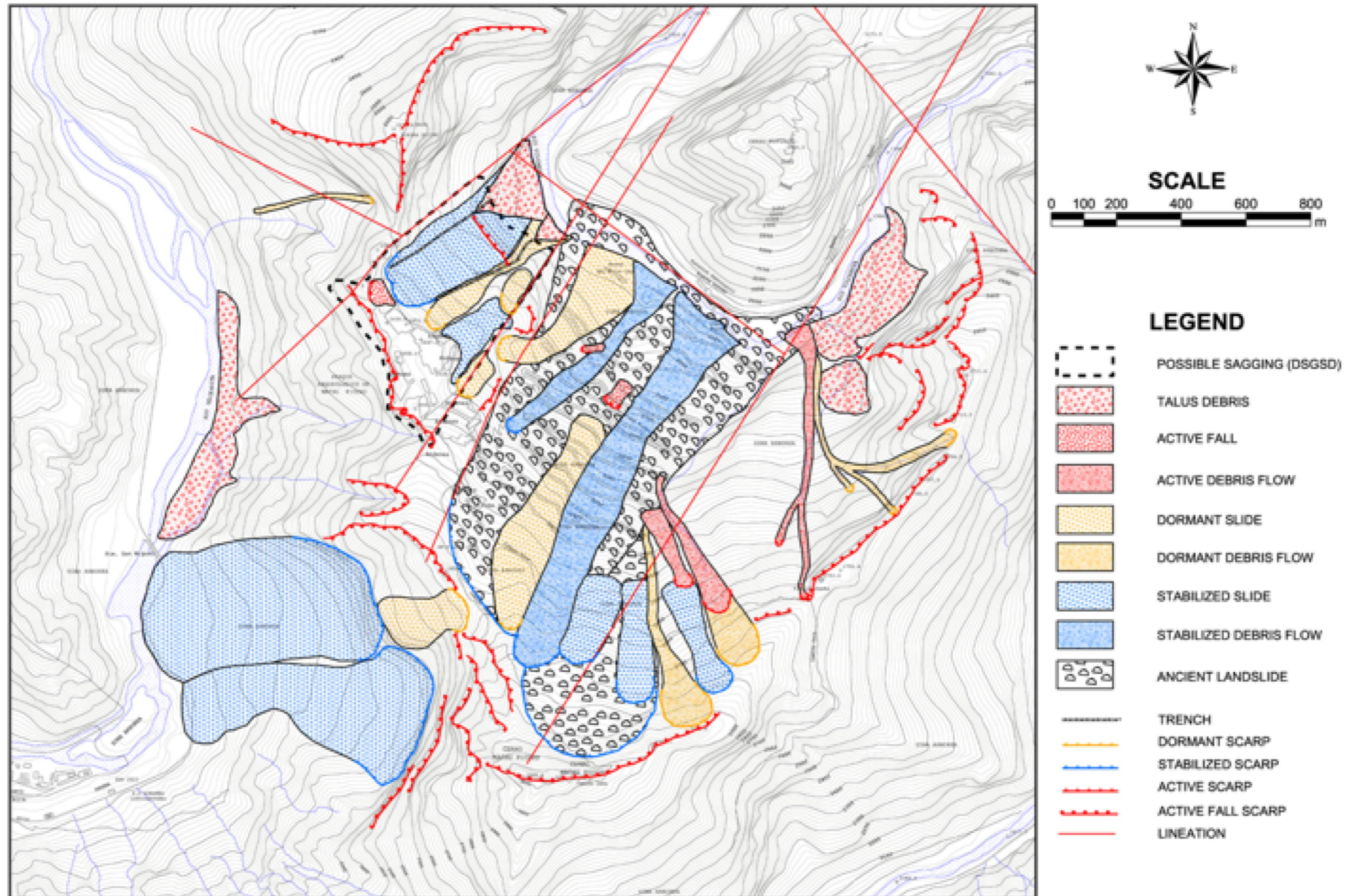


# Integrated investigations



Machu Picchu (Peru): monitoring network

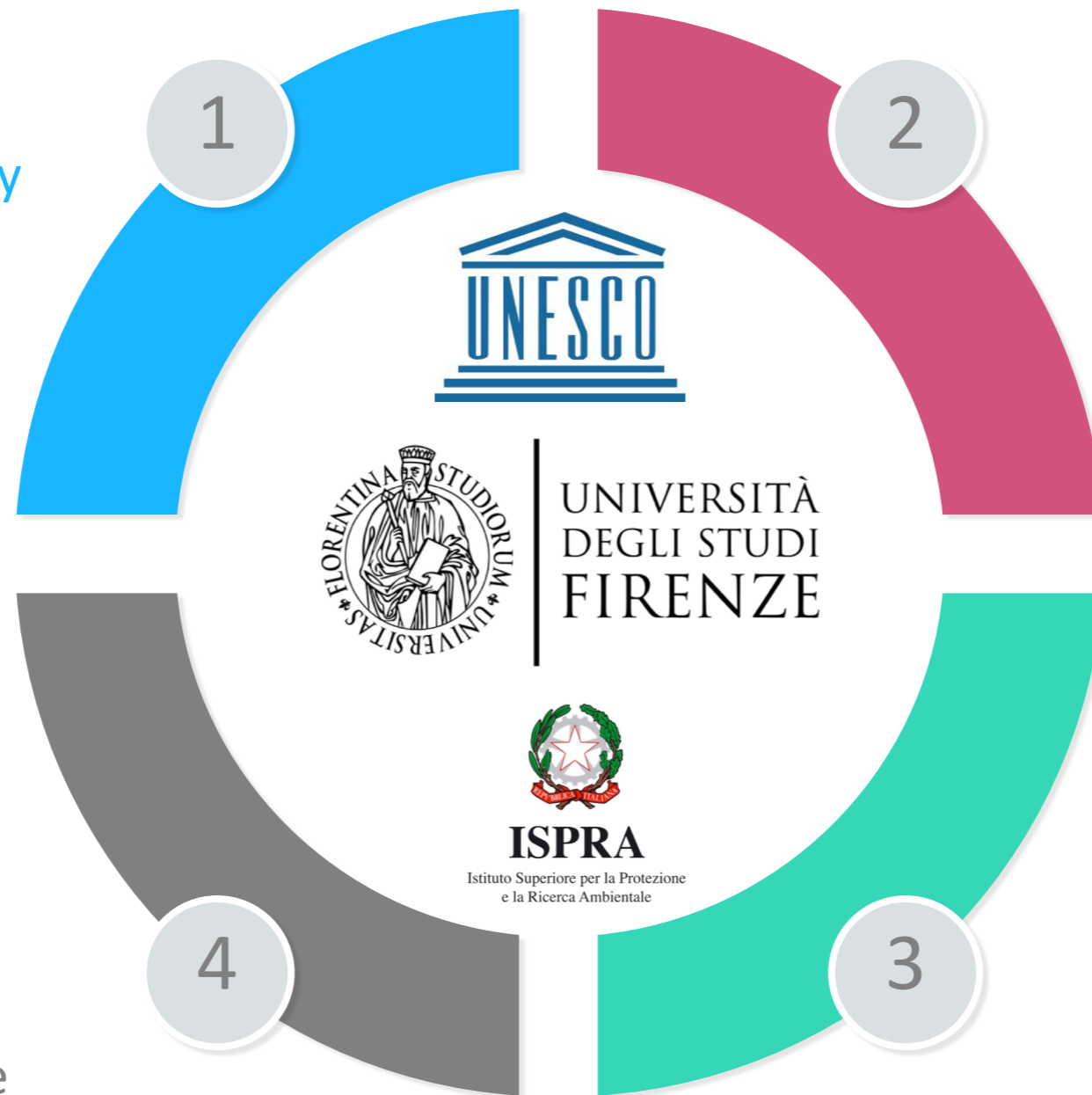
# Landslide interpretation



# Conclusions

## AWARENESS

Little awareness on geohazards and disaster risks and consequently very little preparedness. Little understanding of the consequences on CH and consequently very little resilience



## POLICIES

Scarce attention at cultural heritage within Disaster Risk Management policies and programmes, at both international and national levels

## TRADITION & SUSTAINABILITY

Traditional knowledge and sustainable practices, which ensured a protection from the effects of geohazards in the past, have been progressively abandoned

## CAPACITY BUILDING

Expertise in geo-hazards should be incorporated in CH management in order to identify risks and define appropriate strategies to reduce them

# <http://unesco-geohazards.unifi.it>

UNESCO Chair on prevention and sustainable management of geo-hydrological hazards

✉ [info@unesco-geohazards.unifi.it](mailto:info@unesco-geohazards.unifi.it) 



[MISSION](#) [TOPICS](#) [OBJECTIVES](#) [PROJECTS](#) [PARTNERS](#) [STAFF](#) [CONTACT US](#)

## UNESCO CHAIR

PREVENTION AND SUSTAINABLE MANAGEMENT OF GEO-HYDROLOGICAL HAZARDS



**Applied research for a Safer Society**





UNESCO CHAIR  
**Prevention and  
sustainable  
management of  
geo-hydrological  
hazards**

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<http://unesco-geohazards.unifi.it>