

U-Geohaz Geohazard impact assessment for urban areas

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HR EXCELLENCE IN RESEARCH

U-Geohaz Summary

- The U-Geohaz project is focused on monitoring geohazard-associated ground deformations, a key prevention action specifically addressed to urban areas and critical infrastructures. In particular, the U-Geohaz general objective will provide a direct answer to a specific requirement detected during the SAFETY project: the necessity to shift the SAFETY products from mid-term mapping to near real time mapping of geohazard activity.
- **Policy area:** Prevention
- **Priority covered:** Projects focusing on improving urban resilience by addressing cascade effects and the resilience of urban infrastructure.
- **Total Cost:** 989,504.16 € (EU contribution = 742,128.13)
- **Number of beneficiaries:** 18 (11 countries/12 Geological surveys/3 CPAs involved)



U-Geohaz Background



European Commission,
Directorate-General
Humanitarian Aid and
Civil Protection (ECHO)

Sentinel-1 for Geohazard regional monitoring and forecasting



01/01/2016 – 01/01/2018

Developing and testing a procedure to provide Civil Protection Authorities (CPA) with the capability of periodically evaluating and assessing the potential impact of geohazards (volcanic activity, landslides and subsidence) on urban areas and infrastructures, over regional areas.



Consejería de Política Territorial,
Sostenibilidad y Seguridad
Dirección General de Seguridad
y Emergencias





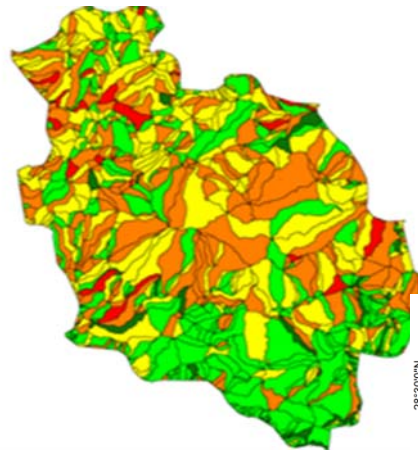
U-Geohaz Background



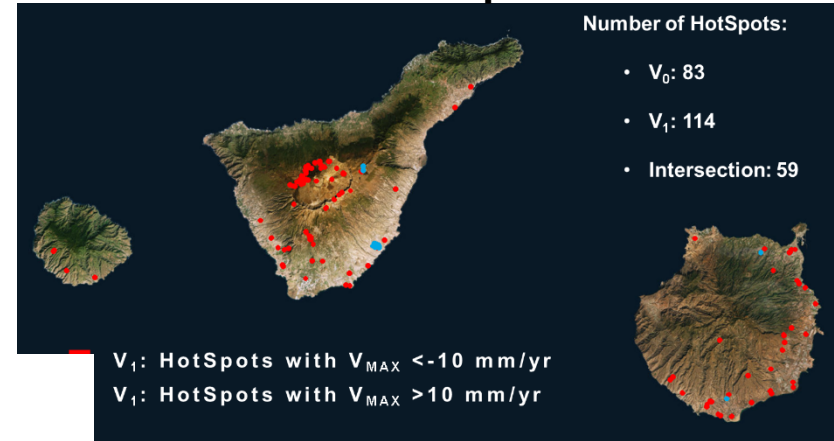
Deformation Activity Map



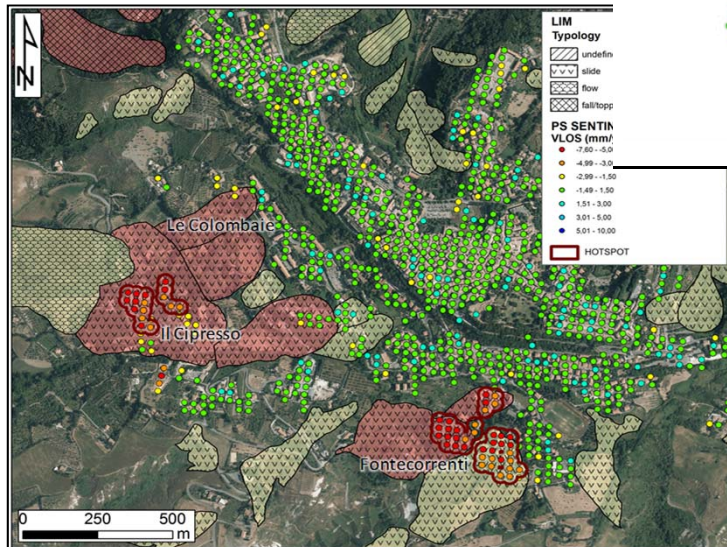
Susceptibility maps



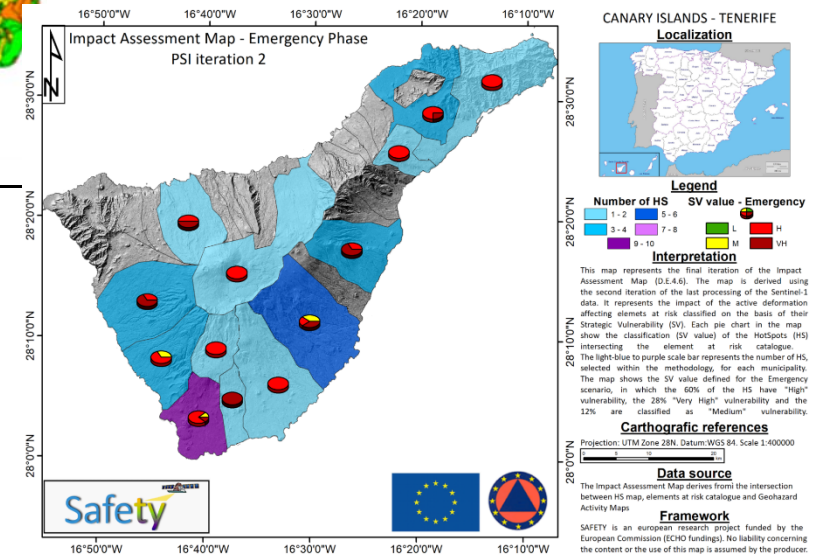
ADA maps



Geohazard Activity Map



Vulnerable Elements Activity Map

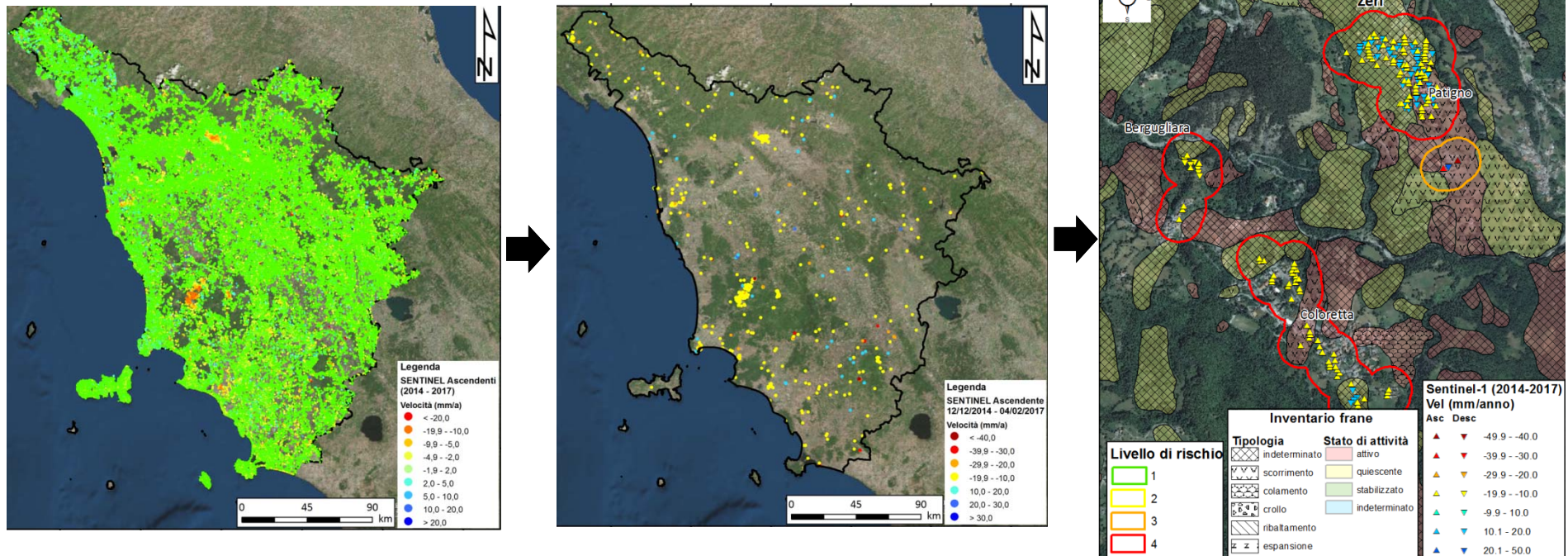


U-Geohaz Background

UNIFI project “PS continuous streaming for landslide monitoring and mapping on Tuscany Region (Italy)”

- PS mapping activity in “deferred time” with archive data
- PS monitoring activity in “near-real time” with continuous streaming

PS mapping activity: hotspot analysis and SAFETY ADA extraction



Why U-Geohaz?

At the start of Safety:

- Sentinel-1 was not yet operational
- We have not experience with the Sentinel-1 data

At the end of Safety:

- Sentinel-1 is fully operational
- The Sentinel-1 system have widened the range of applications of SAR interferometry.

U-Geohaz aims to advance with respect to SAFETY, evolving from periodically updated maps to a near-real time mapping and monitoring of geohazard activity. More in particular:

U-Geohaz GOAL 1: to develop tools based on Sentinel-1 to support early warnings systems for landslides and volcanic activity. (WP1 and WP2)

Why U-Geohaz?

Safety included two main results in Rockslide applications:

- Tuning of existing free tools for susceptibility mapping and trajectory estimation.
- Implemented a protocol at Canary Island CP to collect key information for each event in order to improve the database in a reliable way.



U-Geohaz GOAL 2: to develop an Early warning system based on the tailoring of tools and methods and in the definition of rainfall thresholds. (WP3)





Why U-Geohaz?

An important gap detected in Safety project was related to the real capability of the CPAs to produce the products.

U-Geohaz GOAL 3: to strengthen the interaction between CPAs and Geological Surveys in Europe. with the aim of contributing to improve their cooperations. (WP4)



U-Geohaz Consortium



Consiglio Nazionale delle Ricerche



Consejería de Política Territorial,
Sostenibilidad y Seguridad
Dirección General de Seguridad
y Emergencias



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL



ICGC
Institut Cartogràfic i Geològic
de Catalunya



ISPRA
Istituto Superiore per la Protezione
e la Ricerca Ambientale



GeoZS
Geološki zavod
Slovenije



Laboratório Nacional de Energia e Geologia, I. P.



Regione Autonoma
Valle d'Aosta



Geoscience for a sustainable Earth
brgm



U-Geohaz Key Deliverables

Number	Title	Lead Beneficiary	Due Date (M)
D9	Landslides tools and methods user requirements	UNIFI	3
D10	Landslides tools and methods User assessment procedure	UNIFI	6
D11	Landslides tools and methods User assessment	UNIFI	23
D12	Description of the procedure to generate the ADA and VEAM maps	UNIFI	6
D13	Updated Active deformation areas map (ADA)	CTTC	18
D14	Software tools to produce the 6-day ADA map and User manual	CTTC	20
D15	Updated Vulnerability elements at risk map generation (VEAM) / shape file	IGME	18
D16	Landslides tools and methods Validation report	UNIFI	20
D17	Guidelines for the Integration of the Products in CPAs	UNIFI	22
D18	VEW User requirements	CNIG	3
D19	VEW User assessment procedure	CNIG	6
D20	VEW User assessment	CNIG	23
D21	Description of the VEW	CNIG	6
D22	Updated Deformation activity map	CTTC	18
D23	Software tools to produce the 6-day terrain deformation map and users manual	CTTC	20
D24	VEW validation report	IGME	18
D25	Guidelines for the Integration of VEW in CPAs	CNIG	20
D26	Rockfall tools and methods user requirements	IGME	3
D27	Rockfalls tools and methods user assessment procedure	CNR	6
D28	Rockfall tools and methods user assessment	IGME	23
D29	Rockfall Information System (RIS) design	IGME	6
D30	Rockfall Information System (RIS) design / report RIS Demonstration over Canary Island	IGME	22
D31	Map and report on rockfall source areas modelling	CNR	10
D32	Map and report on updated rockfall source areas modelling	CNR	18
D33	Maps and report on rockfall modelling and validation	CNR	22
D34	Preliminary rainfall thresholds for the Canary Island	CNR	8
D35	Rainfall thresholds for the Canary Island	CNR	18
D36	Improving the integration of geohazards into urban management and planning to increase urban resilience	IGME	6
D37	Review at European Level of recent damaging geohazard events in Urban areas and infrastructures	IGME	9
D38	Strengthening the interaction between Civil Protection Authorities and Geological Surveys for each country	IGME	12
D39	Critical Assessment of the U-Geohaz products by the Geological Surveys of Europe: proposal of pilot case studies	IGME	18