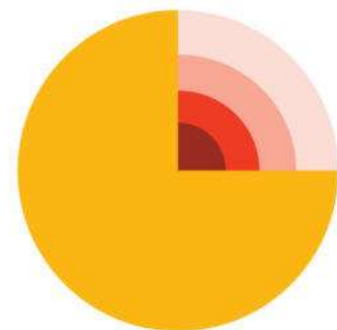


A decorative header bar featuring various geometric shapes in white outlines on a solid orange background. The shapes include circles, semi-circles, and concentric arcs, some of which are partially cut off by the edges of the frame.

Istituto Nazionale di Geofisica e Vulcanologia (INGV), Italy

Giovanni Macedonio
INGV – Osservatorio Vesuviano

Responsible: Antonio Costa
INGV - Bologna



ChEESE



Project funded by EuroHPC under the grant agreement No 101093038.



INGV origin and organization

INGV was formed in **1999** from the merging of **ING**, **OV**, and three CNR Institutes (**IIV**, **IGF** and **IRRS**).

Today, it consists of **3 Departments**, **10 Branches (Sezioni)** and several separate offices/observatories

INGV is composed (as for August 2022) by:

- 861 personnel units with permanent contracts,
- 70 personnel units with temporary contracts,
- 237 other units (research grants, collaborators and associated scientists).

Summing up to **1168 personnel units** (scientists, technicians, administratives).



The INGV mission



INGV is a Public Research Institute whose main missions are:

Multidisciplinary study of natural **geophysical, volcanological, and environmental processes**;

Observation, monitoring and modelling of geophysical processes in both the **solid and fluid components of Planet Earth**;

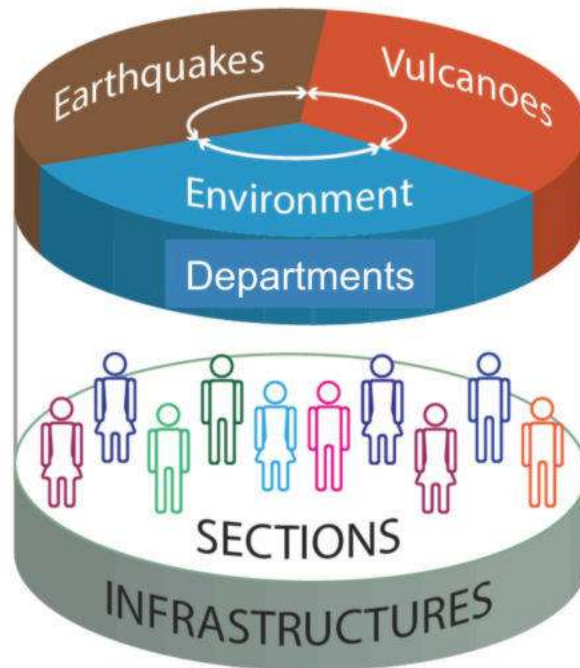
Surveillance of the seismic and volcanic activities of the entire national territory through state-of-the-art instrumental networks (INGV is part of the **National Civil Protection System** also through annual Agreements);

Development of innovative **methods to evaluate the hazard** of a variety of **natural risks (earthquakes, volcanoes, tsunamis, climate...)**, particularly focused on the Italian region;

Innovative research in Earth Sciences, for instance focused on **climate change, national security, geo-resources and sustainable development**.

Scientific Organization

Central Administration



Departments:
planning, coordination
and verification
purposes

Branches (Sezioni):
carrying out of
research and service
activities and
maintenance and
development of RI

Infrastructures (RI): e.g.
monitoring and
observation networks,
laboratories, modelling
tools, HPC, databases
and data products, web
services, etc.

EPOS
EUROPEAN PLATE OBSERVING SYSTEM

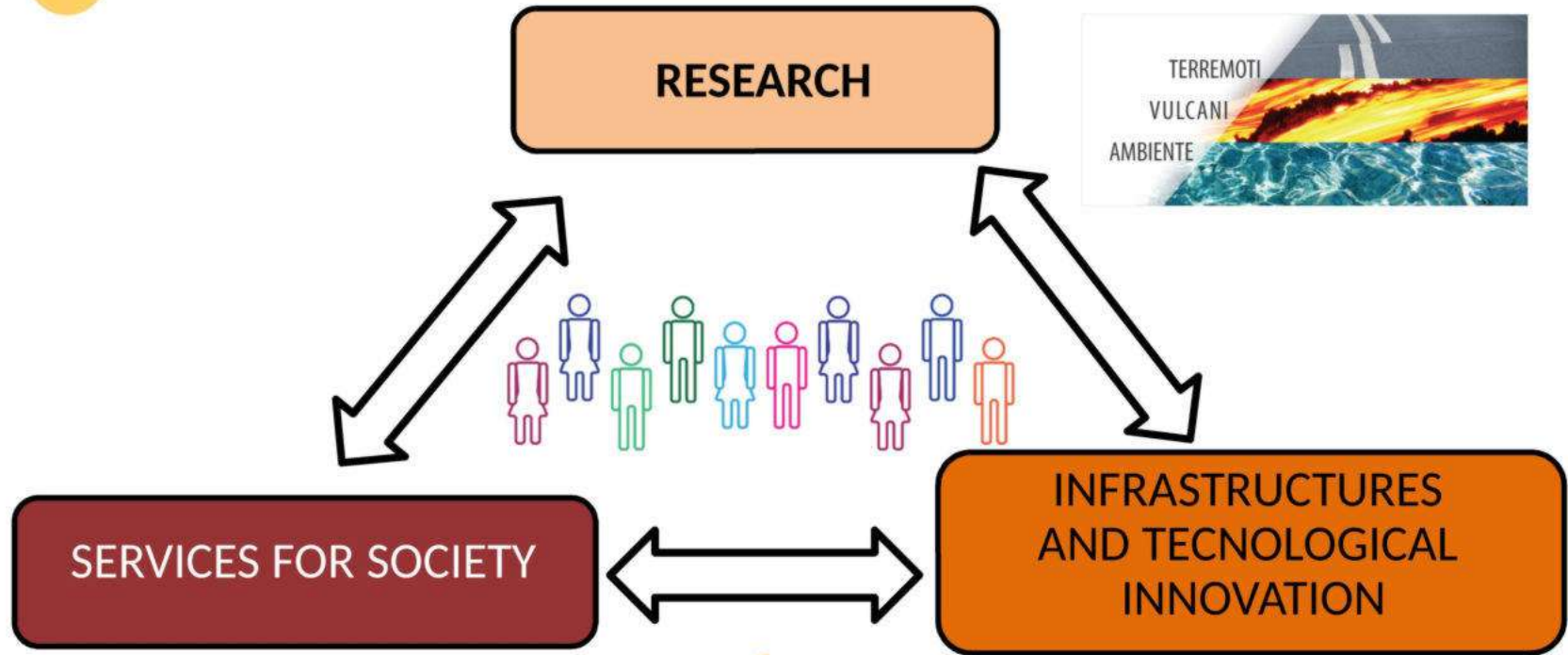
European
multidisciplinary
seafloor & water-column
observatory

emso



ChEESE

Organization of the three Departments (Earthquakes, Volcanoes, Environment)



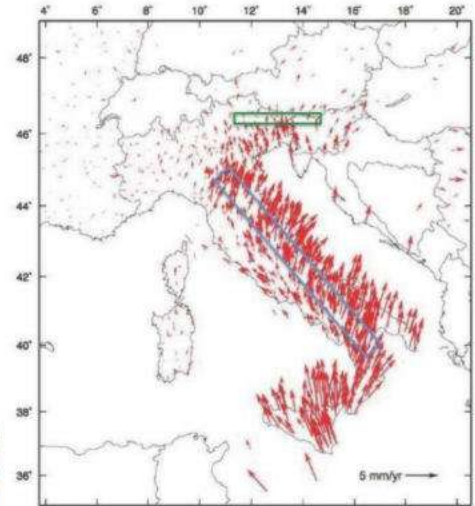
Volcanoes Department

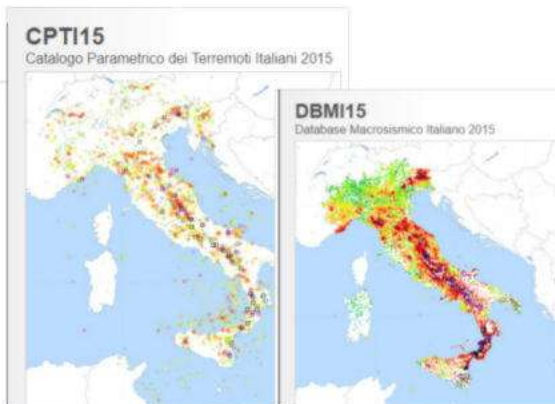
Scientific themes and Services

- **Eruptive history** and **properties of magma**;
- **Structure** and **feeding system** of volcanoes;
- Dynamics of **pre-eruptive processes**;
- Dynamics of **eruptive and post-eruptive processes**;
- **Forecasting** volcanic activity, **hazard assessment** and contributions to the **mitigation of volcanic risk**;
- Volcanoes and **geo-resources**;
- **Monitoring and surveillance** of volcanic activity (e.g. protocols, EW systems, etc.);
- Activities during **volcanic emergencies** (e.g. task-forces, crisis units, communication, etc.);
- Assessment of **volcanic hazards** (primary and secondary phenomena);
- **Alert activities** for national and international organisms (e.g. ash risk);
- **Training and dissemination** activities for civil protection authorities, operators and the general public (schools, masters, etc.)

Earthquakes Department

Research and Monitoring network





DATABASE SISMOLOGICO DEI VULCANI DELLA CAMPANIA

**INTERVALLO TEMPORALE
SELEZIONATO**
2016/12/02 13:52:38
2016/12/02 13:52:38

MENU

- ☐ SISMOLOGIA
 - ☐ Ultime eventi
 - ☐ Vesuvio
 - ☐ Campi Flegrei
 - ☐ Ischia
- ☐ Statistiche
 - ☐ Numero di eventi
 - ☐ Magnitudo
 - ☐ Rilascio energia
 - ☐ Localizzazioni
 - ☐ Profondità ipocentri
 - ☐ Classificazione eventi
 - ☐ Distribuzione areale
- ☐ Mappe delle reti sismiche
 - ☐ Vesuvio
 - ☐ Campi Flegrei
 - ☐ Ischia
 - ☐ Campi

COPYRIGHT

DISCLAIMER

ULTIMI EVENTI SISMICI AL VESUVIO



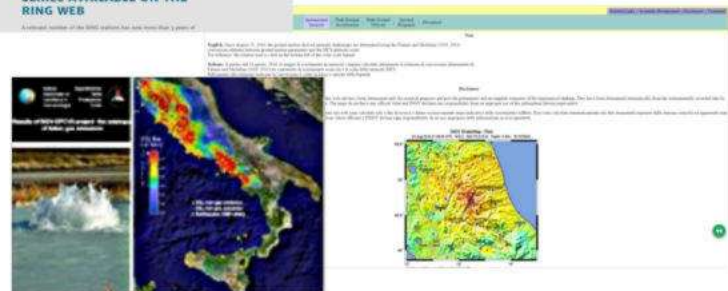
cliccare sui singoli eventi per maggiori informazioni

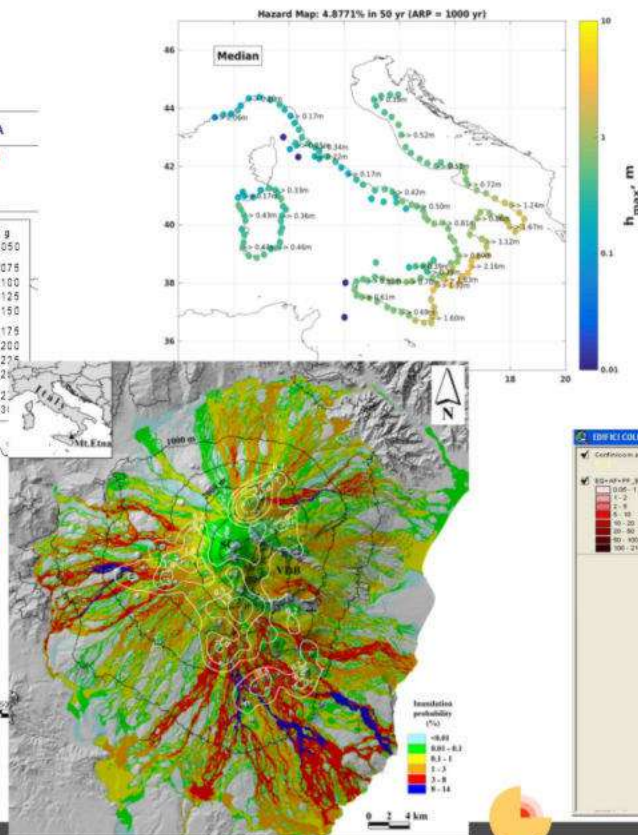
Visualizza mappa statica



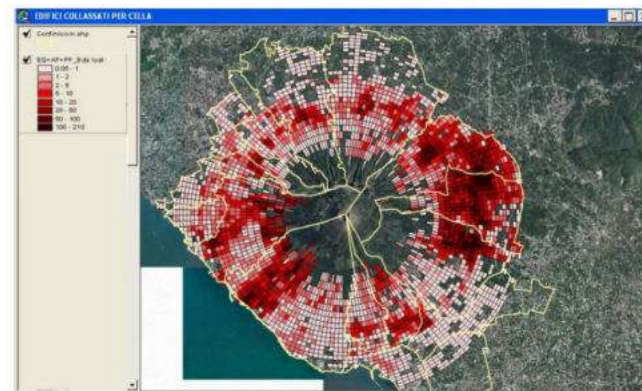
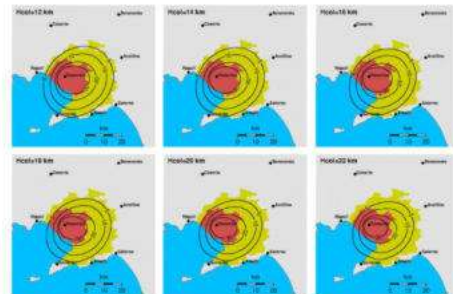
GPS DATA COSEISMIC SERIES AVAILABLE ON THE RING WEB

NEW RING CGPS TIME SERIES AVAILABLE ON THE RING WEB





Hazard and impact maps of seismic and volcanic activity and tsunamis



CAT WARNINGS - Earthquakes and tsunami alerts 2017- today



30 CAT-INGV Activations 2017-2022/March – 4 in December 2021-2022 (3 Info + 1 Advisory)

Mw 5.6 - 7.0 - Messages between 7-11 minutes



Hazard and Inundation maps for Coastal planning

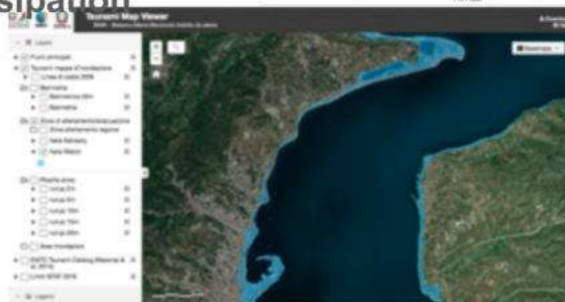
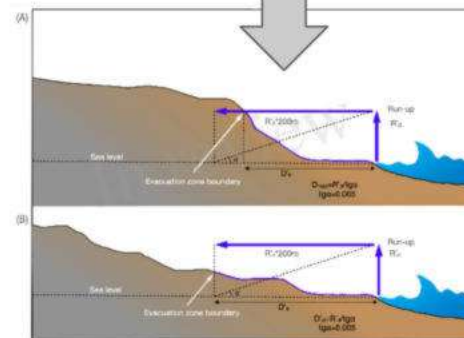
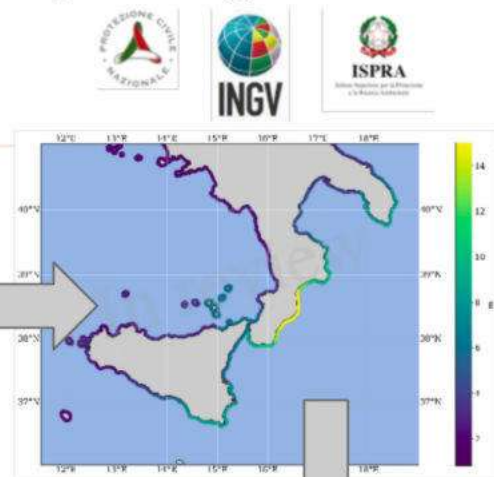
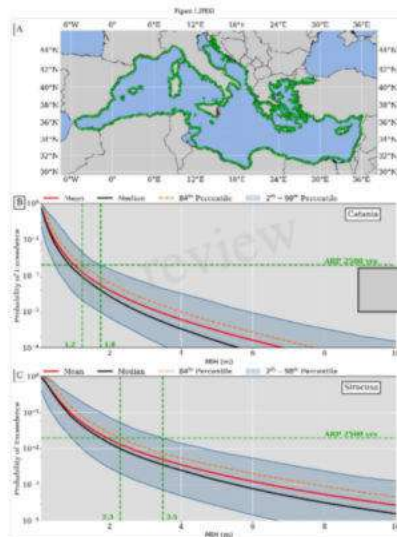
Alert Levels

Advisory: run-up up to 1 m

Watch: run-up exceeding 1m

DirPC SiAM; DPC, 2018

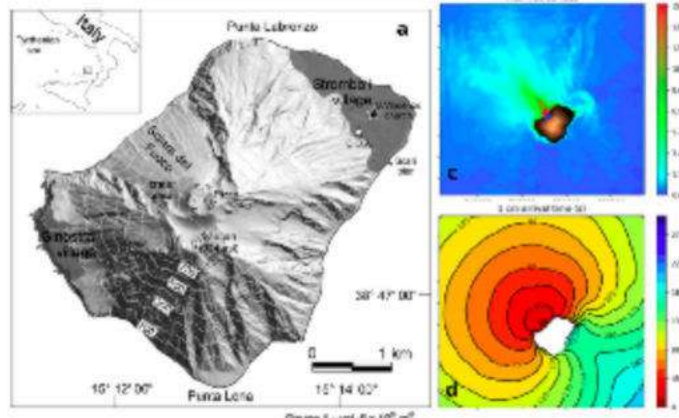
- Regional Hazard (NEAMTHM18)
- 2500 yr ARP + 84th percentile
- Safety factors
- Coastal dissipation



CAT-INGV will be in charge in 2 years of the system developed by LGS @ University of Florence



LGS
Laboratorio Geofisica Sperimentale



CENTRO ALLERTA TSUNAMI
ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA



ChEESE

INGV activities in ChEESE-2P

- ❖ Leads WP6 and 2 tasks (T6.1, T6.3)
 - T6.1: Setup of Simulation Cases and trials
 - T6.3: Exascale capacity simulation cases
- ❖ Participates to 18 tasks (T1.1 to T1.5, T2.1 to T2.4, T4.1 to T4.3, T6.2, T6.4, T7.1 to T7.4), PD2, PD4, PD5
 - T1.1 to T1.5: Administration
 - T2.1: Code audits
 - T2.2: Increasing the performance portability of flagship codes for different accelerators
 - T2.3: Optimisation for Exascale
 - T2.4: Continuous Performance Efficiency Monitoring
 - T4.1: Workflow implementation and optimization , NGI, CNRS, IPGP, IRB). This task will implement
 - T4.2: Lightweight performance analysis and optimization services for simulation ecosystem components
 - T4.3: Development, deployment and quality assessment tools
 - T6.2: Exascale capability simulation cases and Scientific Grand Challenges
 - T6.4: EuroHPC urgent computing service enabling
 - T7.1: Dissemination and communication
 - T7.2: Liaison activities
 - T7.3: Training activities
 - T7.4: Community building and roadmap activities
- ❖ Leads OpenPDAC flagship code, PD3 and PD6, SC2.1, SC3.1, SC5.1, SC6.1, SC6.2, UC service enabling



INGV activities in ChEESE-2P

Other active projects in synergy with ChEESE-2P:



- DT-GEO

- GEO-INQUIRE

- EFlows4HPC

- EUPEX





THANK YOU!



giovanni.macedonio@ingv.it
antonio.costa@ingv.it



[@Cheese_CoE](https://twitter.com/Cheese_CoE)



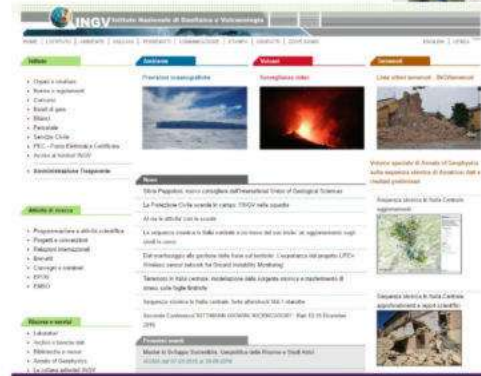
The National Civil Protection System

- The **Dipartimento della Protezione Civile** (DPC, Presidenza del Consiglio dei Ministri) is the coordination body of the Italian National Civil Protection System (established in 1982 after the big Irpinia earthquake).
- Its tasks are: **Mitigation, Alert, Response and Recovery**

The System involves **many different organizations** such as:

- **Public bodies** (Government, Ministries, Regions, Provinces, Municipalities, Operational Bodies, etc. as *decision makers*);
 - **Scientific and academic institutions** (Universities, Research Institutes (INGV), etc.);
 - **Civil society** (Volunteers, private companies)
- A key role is played by the “**Commissione Grandi Rischi**” which is the link between DPC and the scientific community (advisory role).





giochi anti-terremoto



EDURISK