



# ENSURE E-LEARNING TOOL

F00\_Emergency planning in Vulcano

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Presidenza del Consiglio dei Ministri

Dipartimento della Protezione Civile  
Servizio Rischio Vulcanico



## Emergency planning at Vulcano

Vittorio Bosi  
(for the Volcanic Risk Service)



ENSURE – Vulcano 11-13 Maggio 2009

## Time step

10,45 h



Quiliano river

15,30 h



15,40 h



15,45 h



## Time step



### The day after



## The National Service

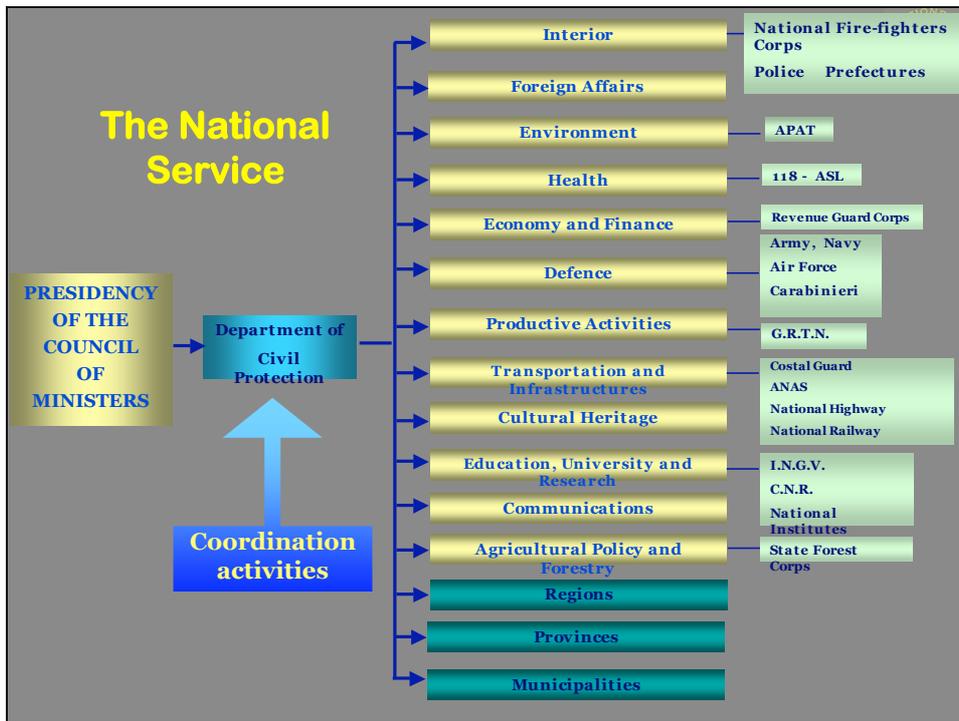


The Italian National Service of Civil Protection was instituted by a specific law (n. 225) in 1992.

Our Department is the headquarters.

### Many different Organisations:

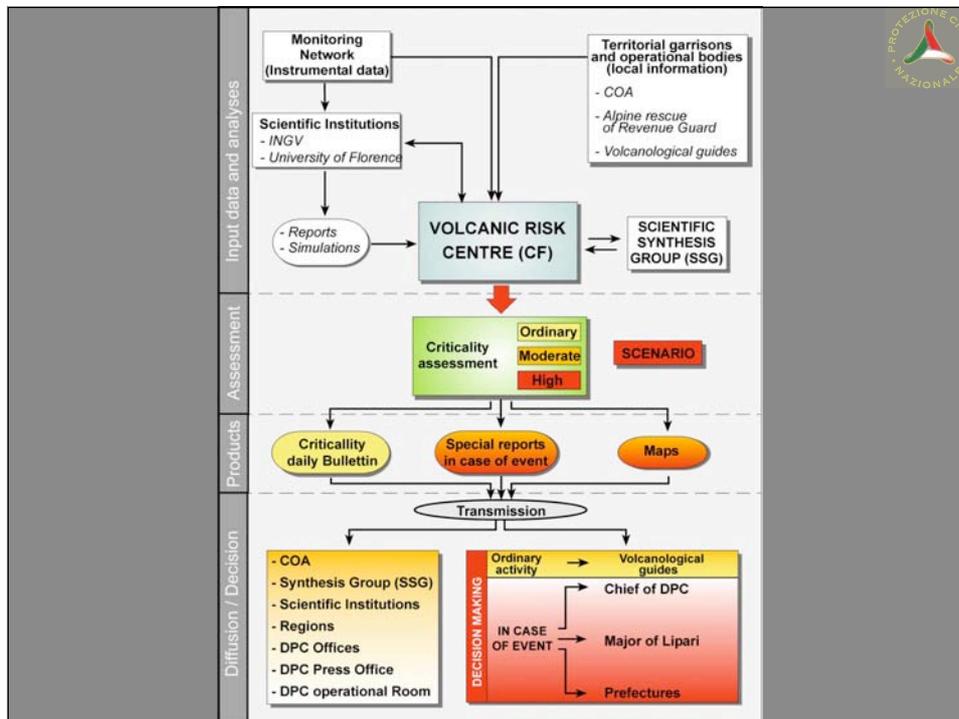
- **Public** (Government, Ministries, Regions, Provinces, Municipalities, Operational Bodies etc.)
- **Scientific/Academic** (Universities, Research Institute, etc.)
- **Private** (mainly Volunteers)



## National early warning system

✓ National warning system is provided by DCP and Regions by the “Centri Funzionali” National Network, along with the “Centri di Competenza” involved in risk management

<p><b>Centri di Competenza</b> <i>Centre for technological and scientific services, development and transfer</i></p> <p><u>Institutions which provide services</u>, information, data, elaboration, technical and scientific contributions for specific topics. The list of National Competence Centres, concerning hydro-geological and hydraulic, volcanic, seismic risk, has been updated in 2006. <b>(38 CdC for ab. € 40 Mln/y)</b></p>	<p><b>Centri Funzionali</b> <i>Centre for forecasting and surveillance of effects, to support the civil protection authority decisions</i></p> <p><u>Operative support units</u>, which collect, elaborate and exchange data risks (meteorological, hydro-geological, hydraulic, seismic, volcanic), and which provides a multiple support system for decisions. The DCP is charged of the guide lines issue.</p>
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The Department of Civil protection founded a number of scientific programs, oriented towards the civil protection aspects.

- ✓ Diffuse degassing in Italy;
- ✓ Vesuvius volcano;
- ✓ Campi Flegrei;
- ✓ Etna volcano;
- ✓ Albani Hills volcano;
- ✓ Vulcano;
- ✓ Stromboli volcano;



The Department of Civil protection is now founding scientific programs, oriented towards the civil protection aspects.

- ✓Speed (Vesuvio);
- ✓UnRest (Campi Flegrei);
- ✓Flank (Etna);
- ✓Lavas (Etna);
- ✓Paroxism (Stromboli);
- ✓Magic;
- ✓.....



## EMERGENCY PLAN FOR VOLCANO

### -SCENARIO (HAZARD)

-Vulcanian eruption (short term – higher probability) and Sub-plinian Eruption (Long term – lower probability)..

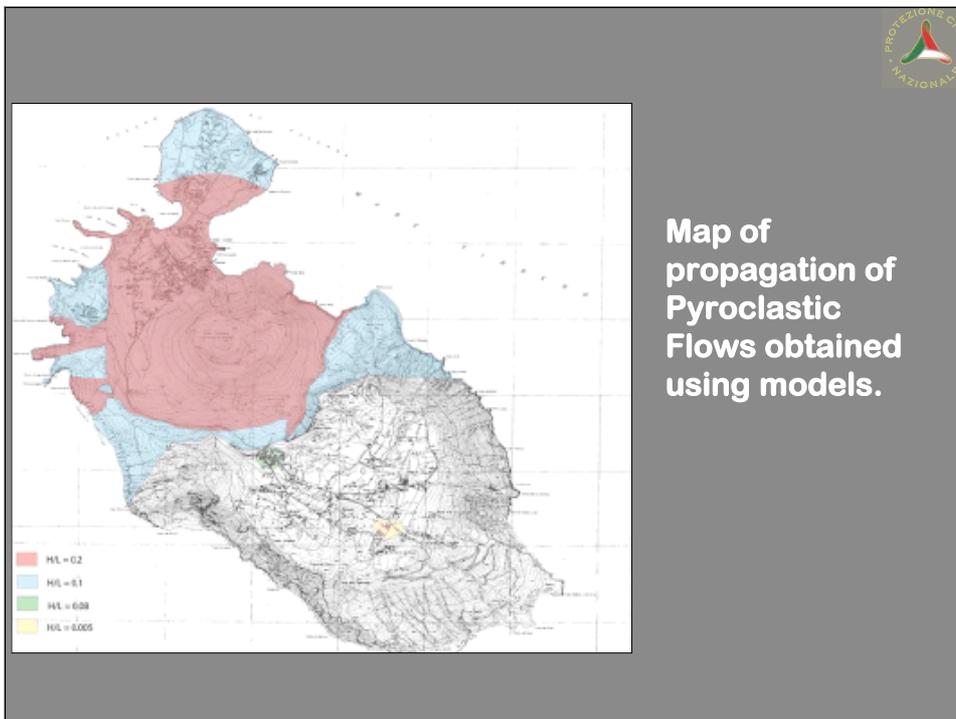
-In general: STRENGTH (sector involved and phenomena) and TIME DURATION of eruption

-Tsunami Scenario (landslide generated, during unrest/eruption, during “peace” time



## Phenomena generated during eruption at Vulcano

- ✓ Launch of blocks and bombs up to 5 km with estimated velocity in a range of 220 e 400 m/s
- ✓ Pyroclastic Flows
- ✓ Ash (<0.1 km<sup>3</sup> in case of Vulcanian explosions)  
(>1 km<sup>3</sup> in case of Sub-Plinian explosion)
- ✓ Atmospheric pressure wave induced by explosion which can break ....windows at distance of 5-10 km far from La Fossa Crater



## MONITORING (PRECURSORS)

What we can imagine?

- Geochemical variations
- Seismic variations (VLP seismic events, number of events and magnitude, increase of seismic tremor....)
- Deformation....

-- Is the present day monitoring network able to recognize these changes?

-- Are they able to discriminate among different scenarios? Are they able to understand the magma rising velocity and where the eruption would occur?





**VULNERABILITY** - people, buildings, social, economical, vulnerability of hosting municipalities, systemic vulnerability (communications, monitoring.....management of **FALSE ALARM**).....



**Monitoring**

**Information**

**Infrastructures**

**Tourist seasonality**

**Weather forecast**

**Priorities in case of an evacuation (areas, who evacuate, what evacuate)**



**MONITORING** – an implementation of the monitoring network is in progress

**INFORMATION**

Population, tourists and local authorities (now is insufficient)

**INFRASTRUCTURES**

Wharfs – Roads - Strategic buildings - Meeting points

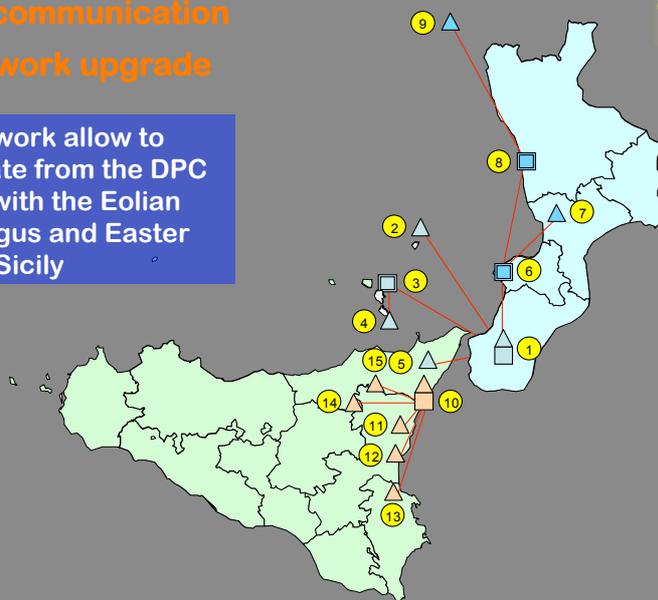
**TOURIST SEASONALITY  
WEATHER FORECAST**

**PRIORITIES**

in case of an evacuation: areas, who evacuate, what evacuate even in relation to scientists suggestions

**Telecommunication  
network upgrade**

The network allow to communicate from the DPC in Rome with the Eolian Archipelagus and Easter Sicily





**EMERGENCY PLAN is not only EVACUATION PLAN**

Meeting point (in Vulcano)

Areas that can be affected in case of Tsunami

Concept of Auto-safety

**And now.....YOU!!!**



**Thanks for your attention**