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# Presidenza del Consiglio dei Ministri

*Dipartimento della Protezione Civile  
Servizio Rischio Vulcanico*



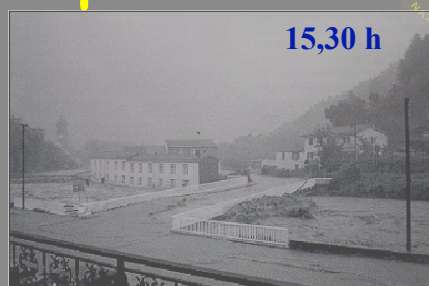
## Emergency planning at Vulcano

*Vittorio Bosi  
(for the Volcanic Risk Service)*



*ENSURE – Vulcano 11-13 Maggio 2009*

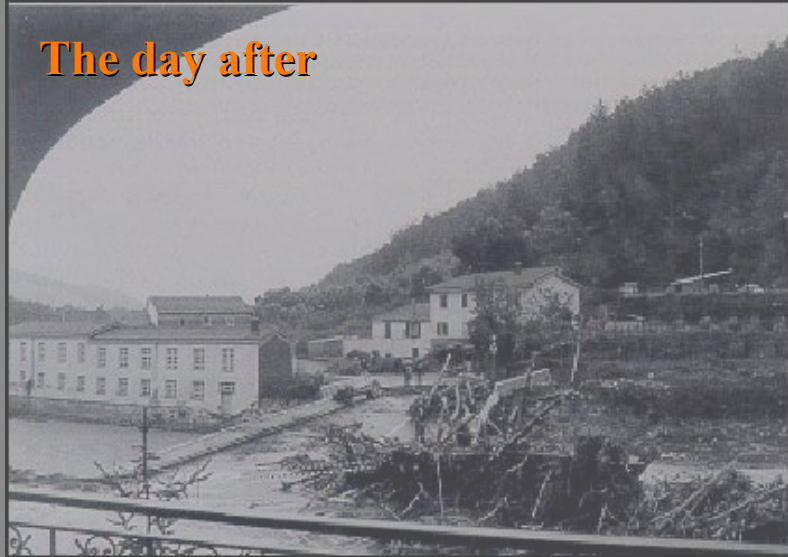
## Time step



## Time step



**The day after**



## The National Service

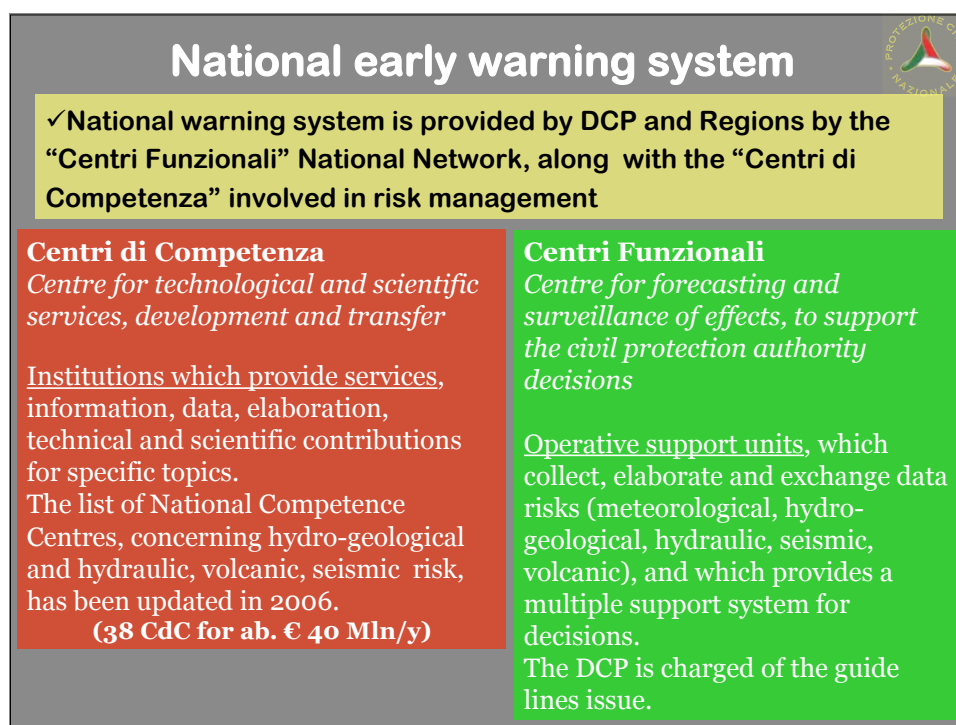
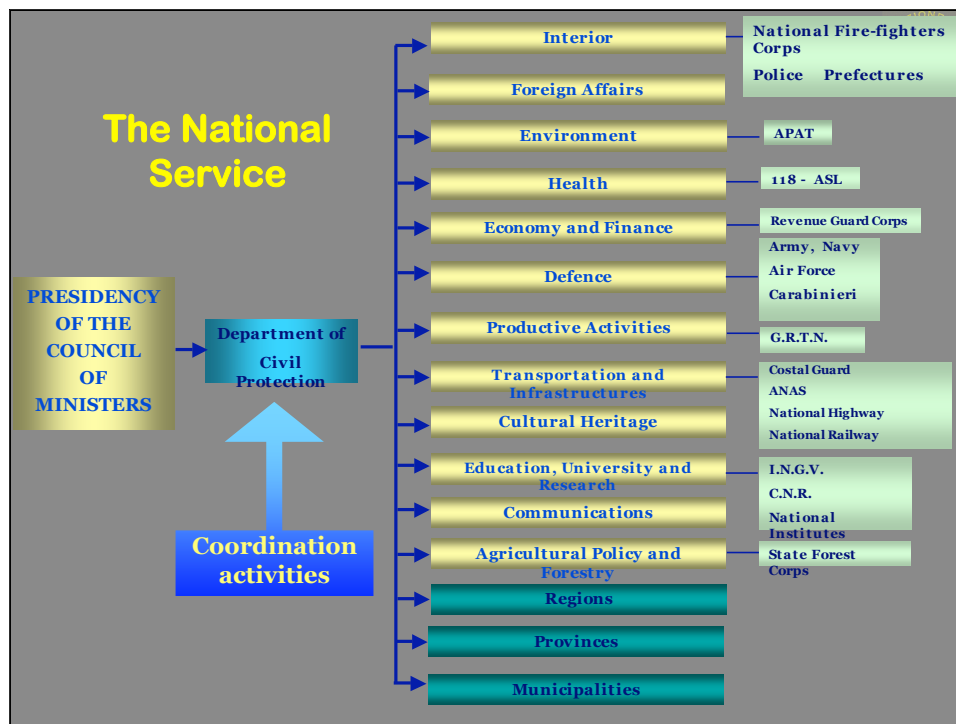


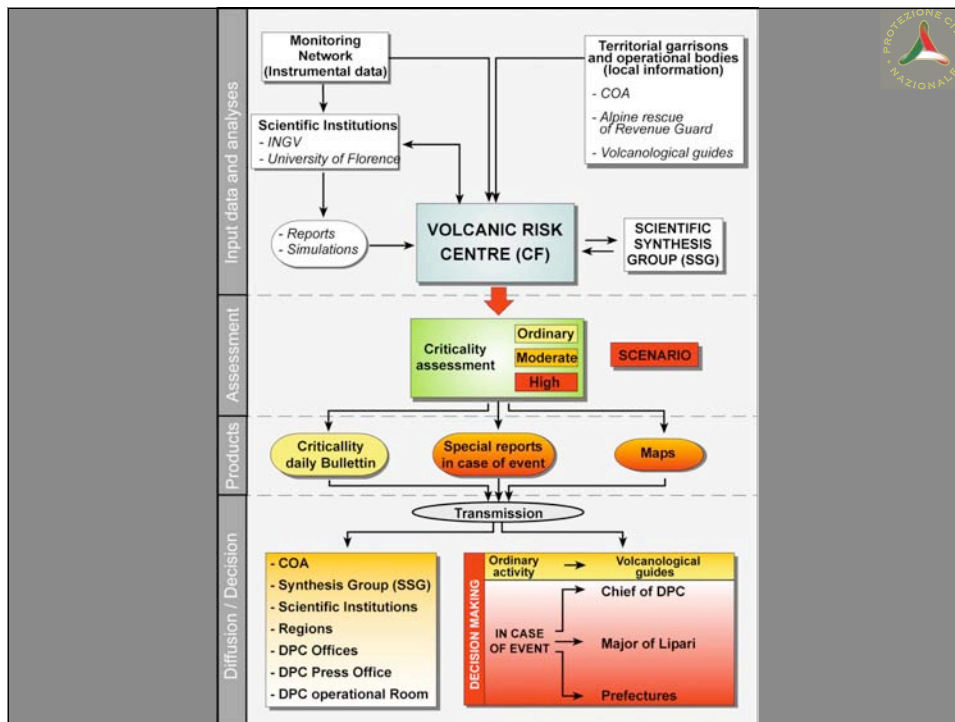
**The Italian National Service of Civil Protection was instituted by a specific law (n. 225) in 1992.**

**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)





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;
- ✓ New methodology for monitoring volcanoes



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);
- ✓Paroxysm (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

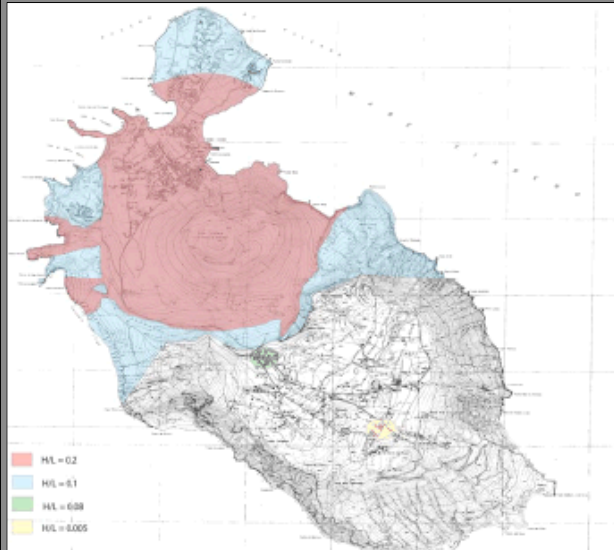
-Tsunami Scenario (landslide generated, during unrest/eruption, during “peace” time



### 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





Map of  
propagation of  
Pyroclastic  
Flows obtained  
using models.

## MONITORING (PRECURSORS)

What we can imagine?

➤ Geochemical variations

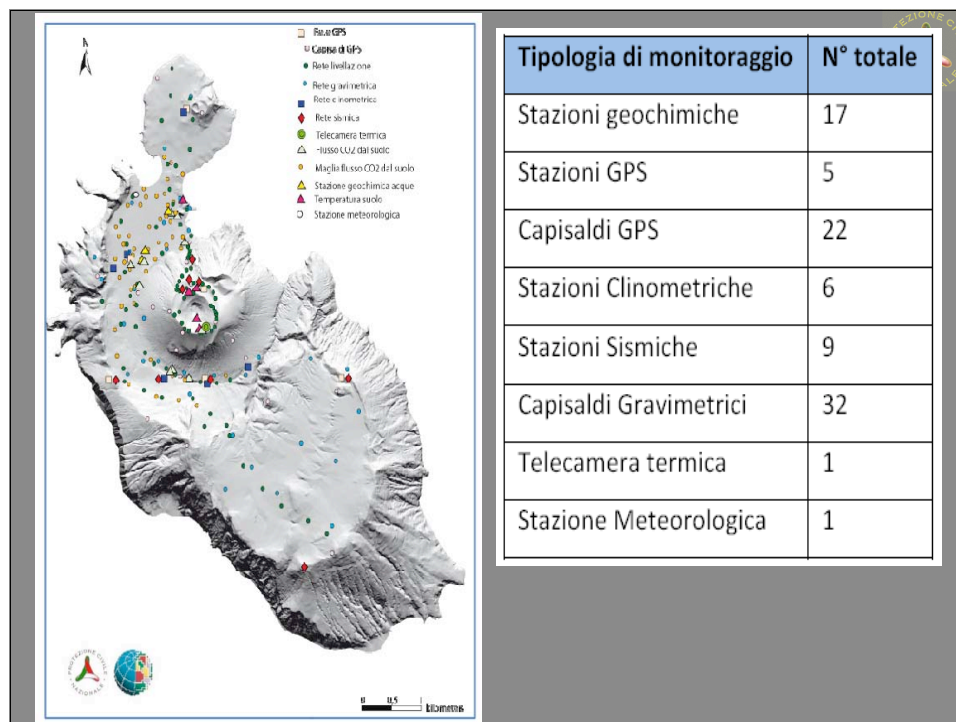
➤ Seismic variations (VLP seismic events, number of events and magnitude, increase of seismic tremor....)

➤ 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

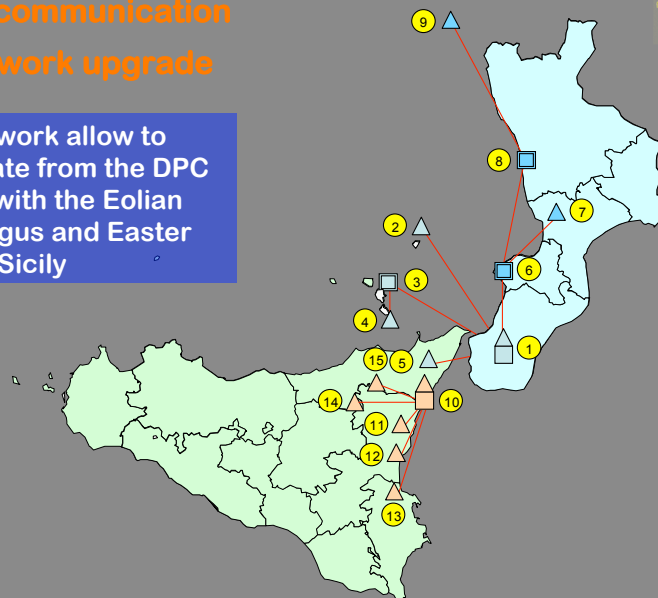
**TOURIST SEASONALITY**  
**WEATHER FORECAST**

**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



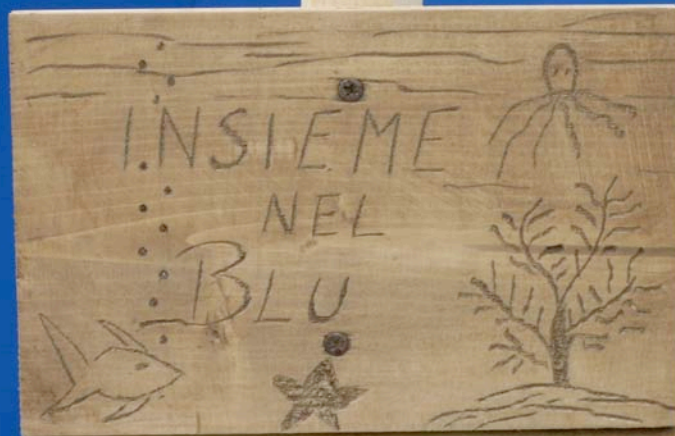
## **EMERGENCY PLAN is not only EVACUATION PLAN**

**Meeting point (in Vulcano)**

**Areas that can be affected in case of Tsunami**

**Concept of Auto-safety**

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



**Thanks for your attention**