

Possible applications of hyperspectral missions in the Civil Protection activities

"Data Exploitation della missione PRISMA, precursore delle missioni iperspettrali nazionali»



PROTEZIONE CIVILE
Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

Mandate

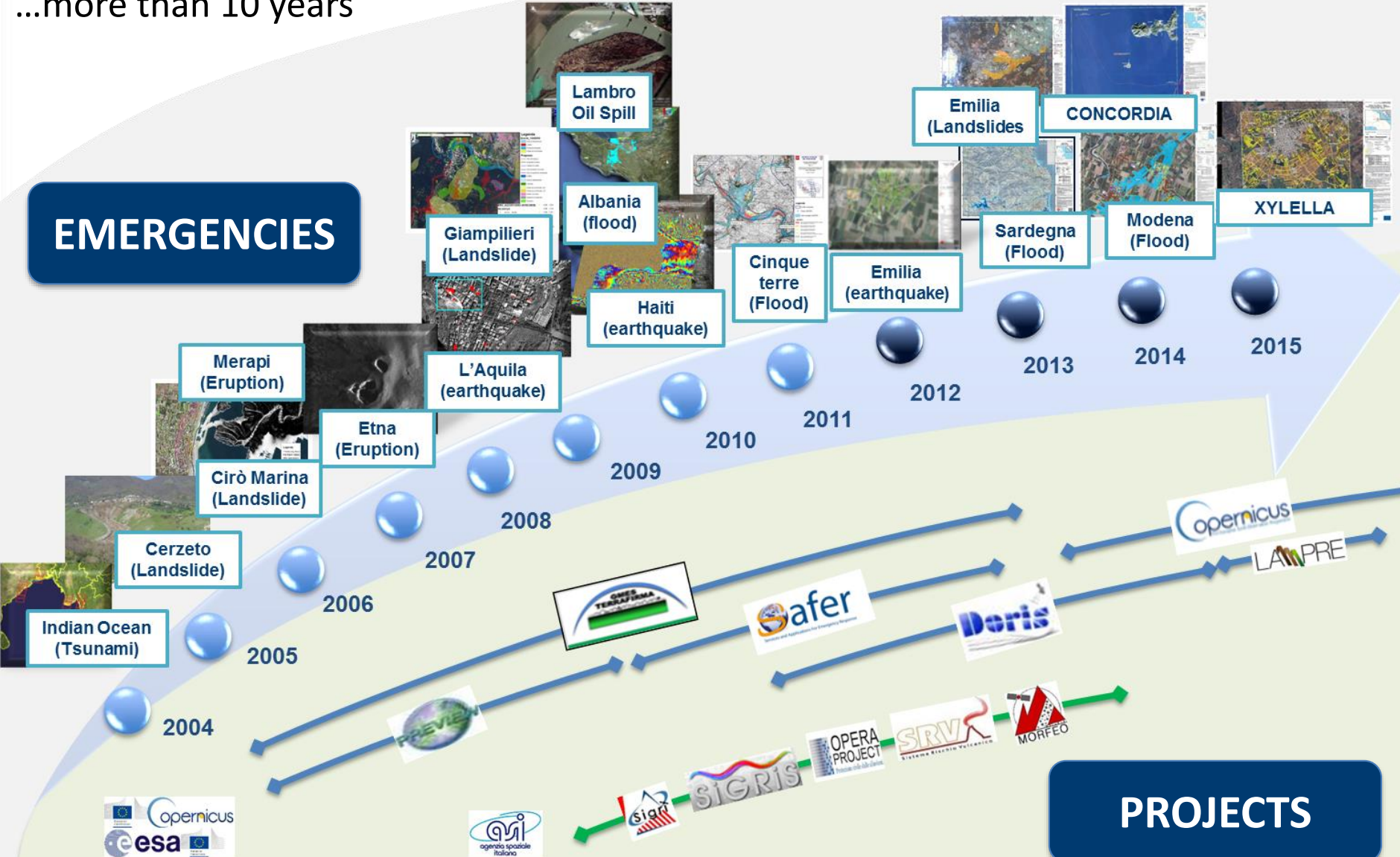
The National Civil Protection System of Italy aims at safeguarding human life and health, goods, national heritage, human settlements and the environment from all natural or man-made disasters.



Satellite data and Italian Civil Protection System

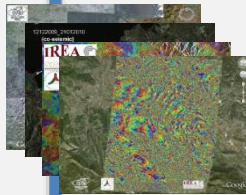
...more than 10 years

EMERGENCIES



Satellite data and Italian Civil Protection System

National resources



European & International resources



PREPAREDNESS PREVENTION

- Map of previous displacements:
- Update inventory maps

RECOVERY

- Surface deformations map
- Deflaetion rate map



Emergency

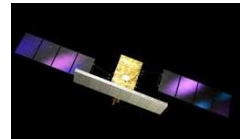
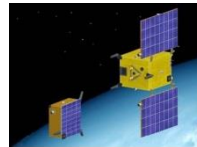
- Map of flooded areas
- Flooded area map

Especially for non-structural measures it is necessary to establish an **event SCENARIO**

Event scenario

EXPOSED

Risk scenario



Satellite data can support the collection of :

- Information about the involved areas (reference information/exposed assets...).
- extension of affected areas and severity of the phenomena;
- indicators about post-event/residual risk
- information about constituent and qualitative elements of the scenario

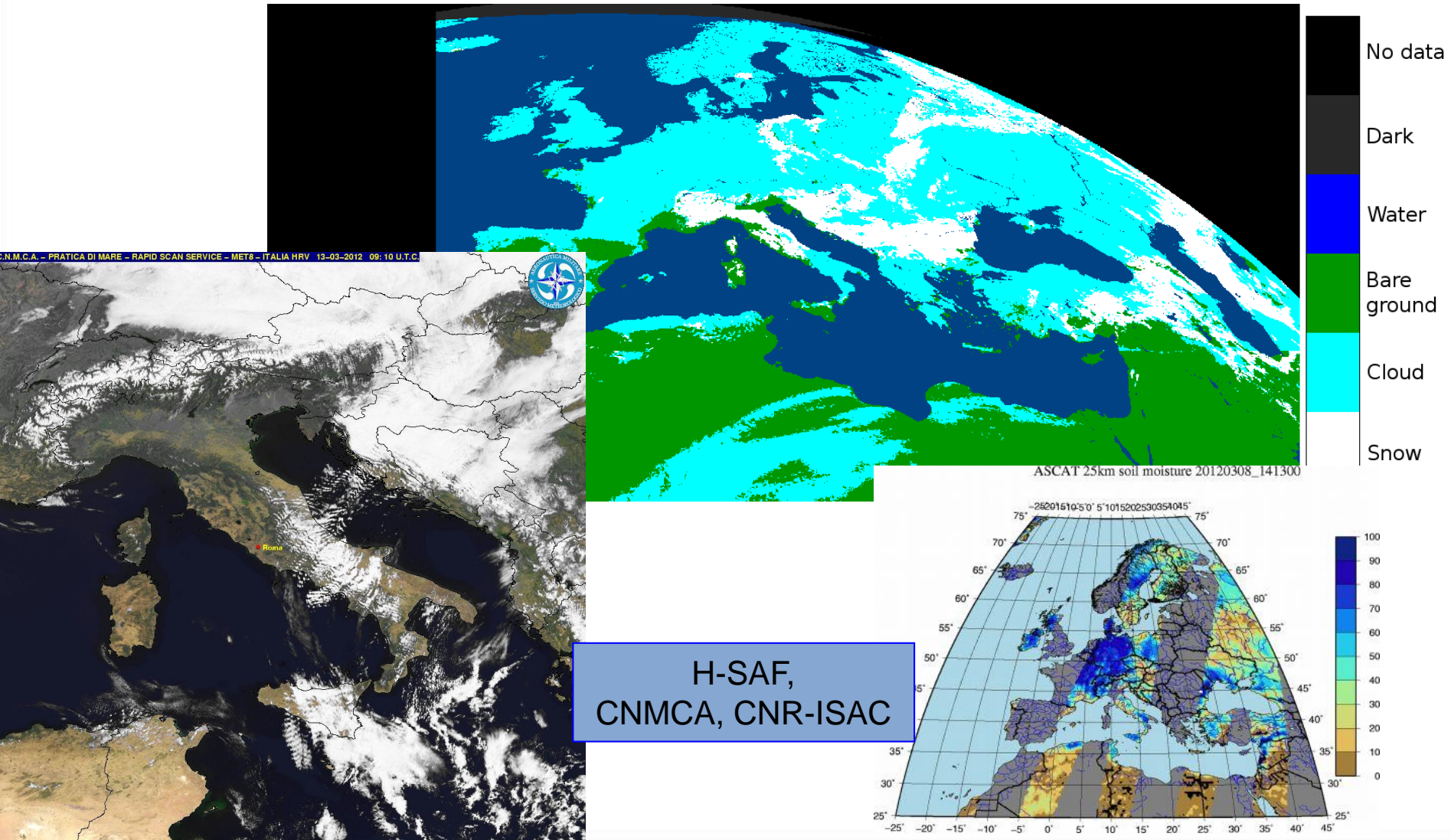
The usefulness of satellite data and the reliability of satellite products is significantly increased by **comparison and/or integration** with other types of data, **type of sensors**.....

Possible improvement from hyperspectral missions?

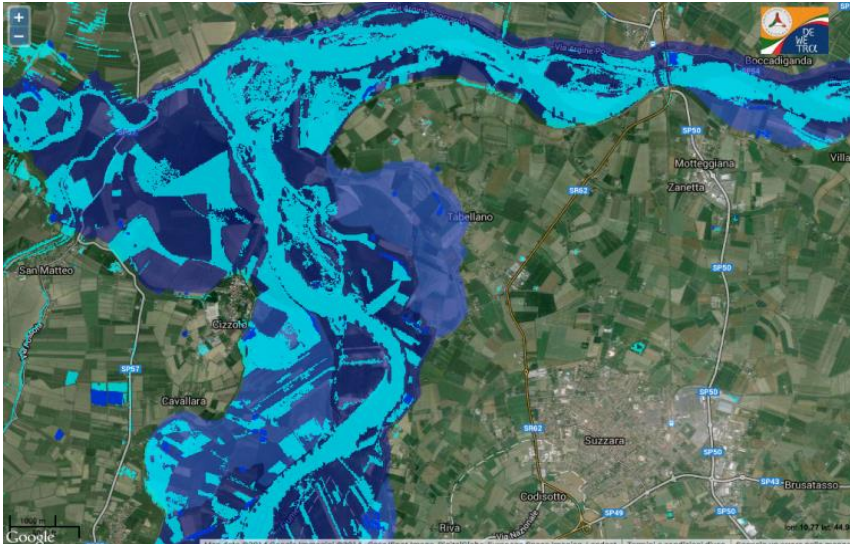
**SOIL MOISTURE
SNOW WATER EQUIVALENT
VEGETATION INDICES
SNOW ALBEDO**



Snow and Soil Moisture products derived by European Geostationary and Polar meteorological satellites



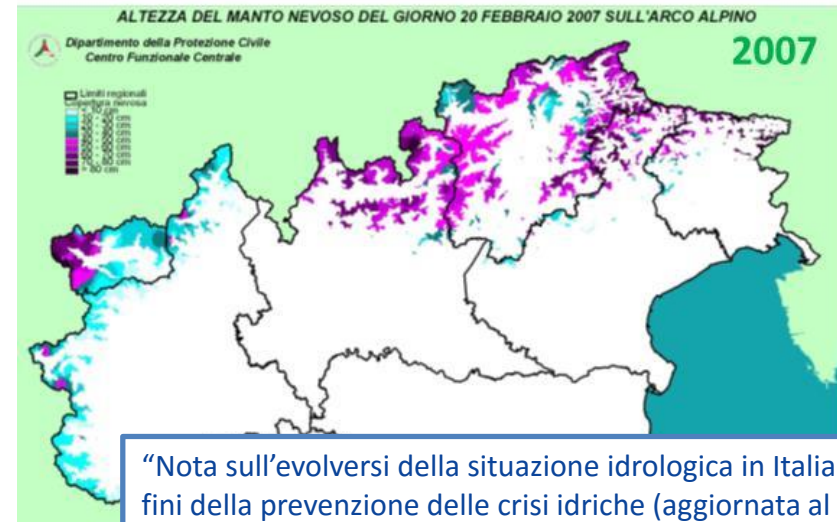
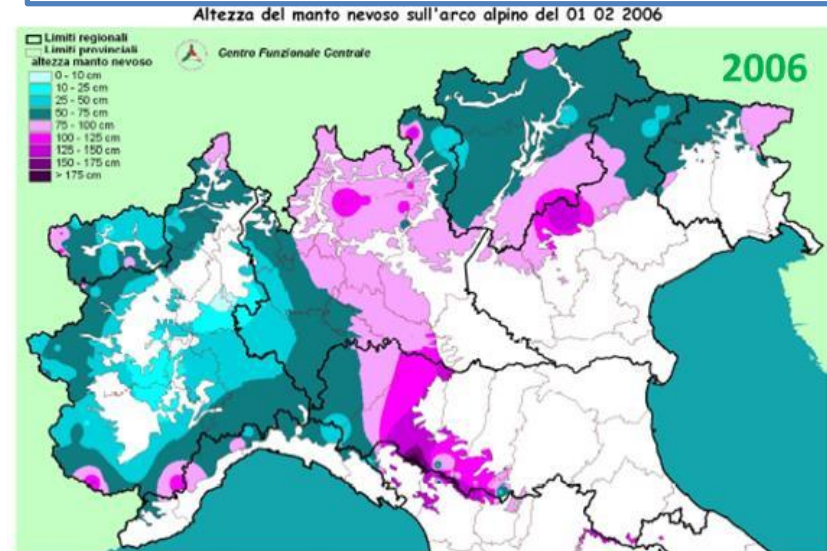
FLOODS



LANDSLIDES



WATER CRISIS



“Nota sull’evolversi della situazione idrologica in Italia ai fini della prevenzione delle crisi idriche (aggiornata al 28 febbraio 2007)”

Possible improvement from hyperspectral missions?



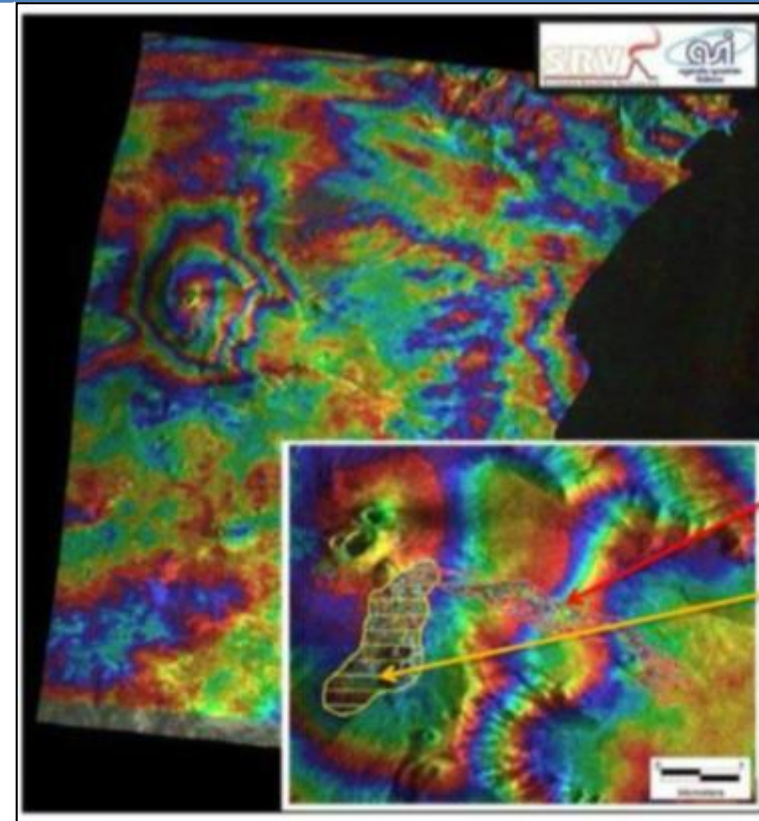
ETNA 2008



CLOUD COVER MODIS
(13/05/2008)

CKS (13/05/2008)

ETNA 2011



CSK

→ lava flow

→ Pyroclastic depots

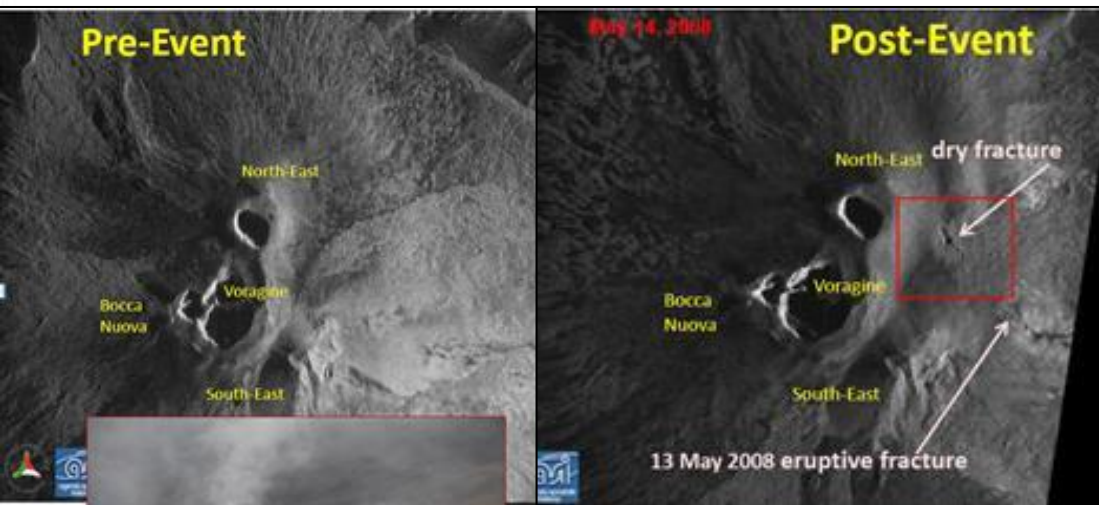


Photo taken from helicopter
some days later

Applications Volcanic Risk

ETNA 2015



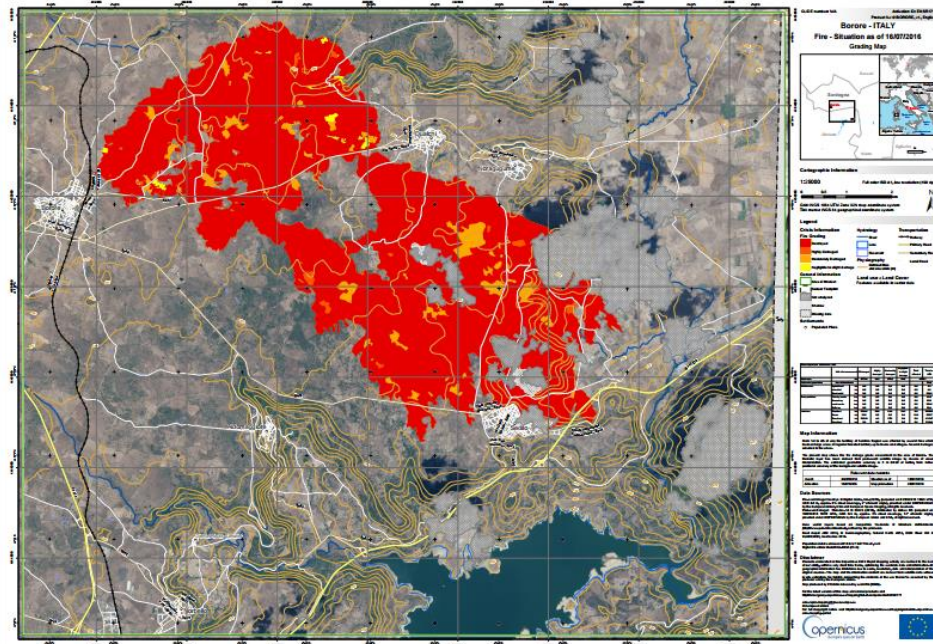
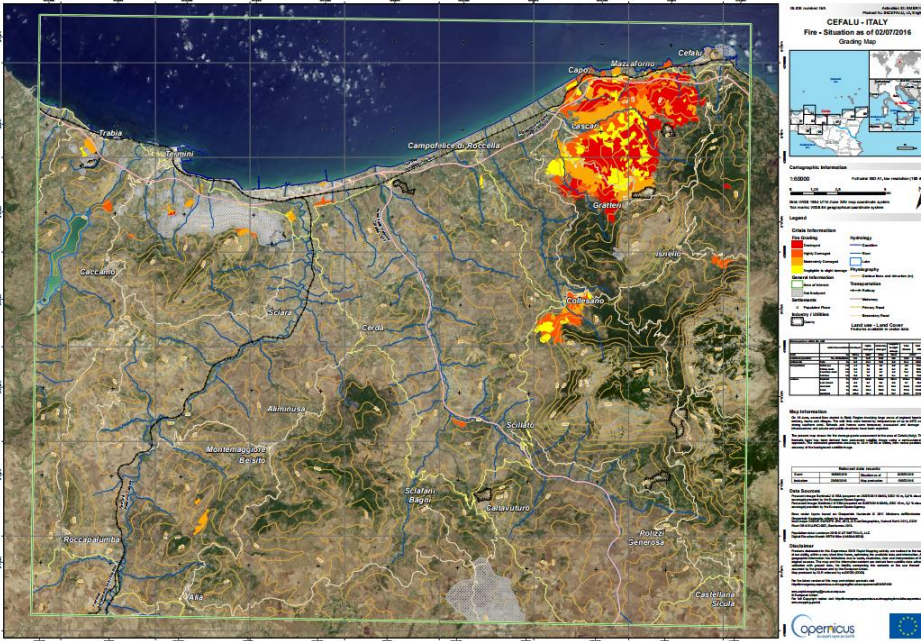
situation on the widespread
territory affected by ash fall out



- morphological variations occurred in the summit areas in terms of craters and lava flow patterns

SICILY 2016

SARDINIA 2016



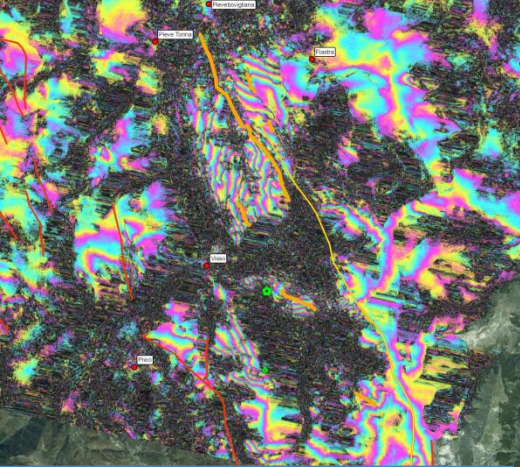
Possible improvement from hyperspectral missions?



**RUBBLE/ ASBESTOS
OIL SPILL**



EARTHQUAKE IN THE CENTRAL PART OF ITALY



Interferogramma discendente
COSMO-SkyMed 27/10/16-02/10/16.



4 Regions affected: (Lazio, Abruzzo, Marche, Umbria)

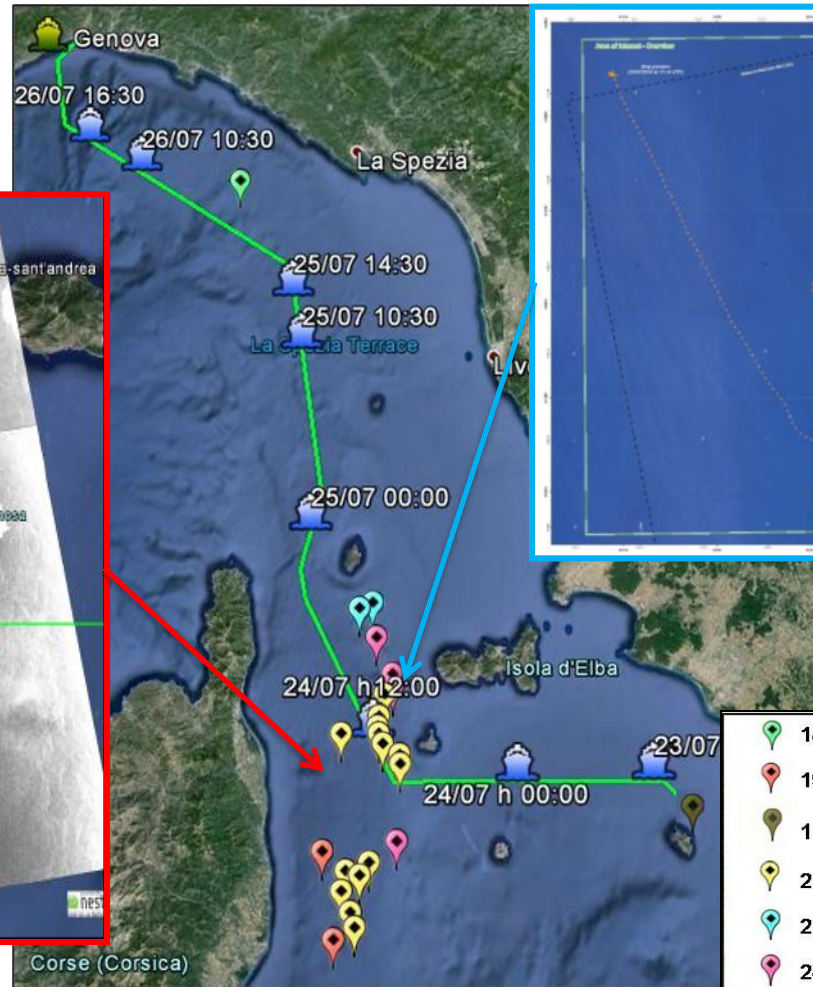


Costa Concordia

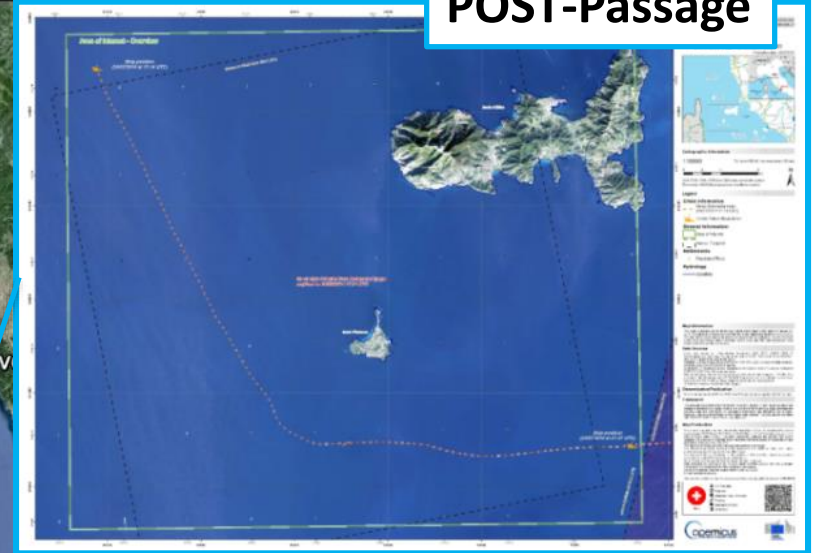
ANOMALIES RELATED TO FUEL DETECTED IN THE SEA ALONG THE ROUTE OF COSTA CONCORDIA **BEFORE** ITS PASSAGE



PRE-Passage



POST-Passage

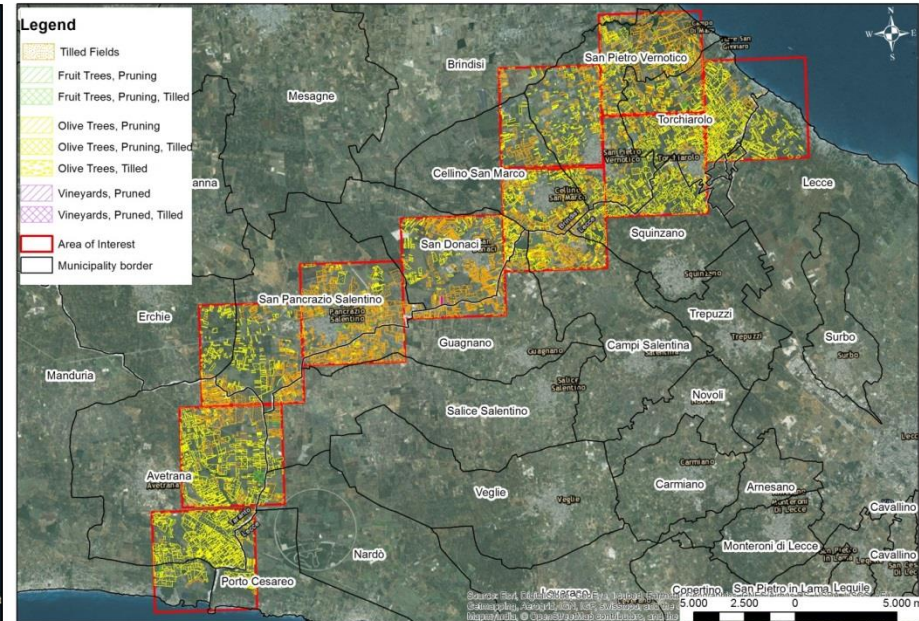
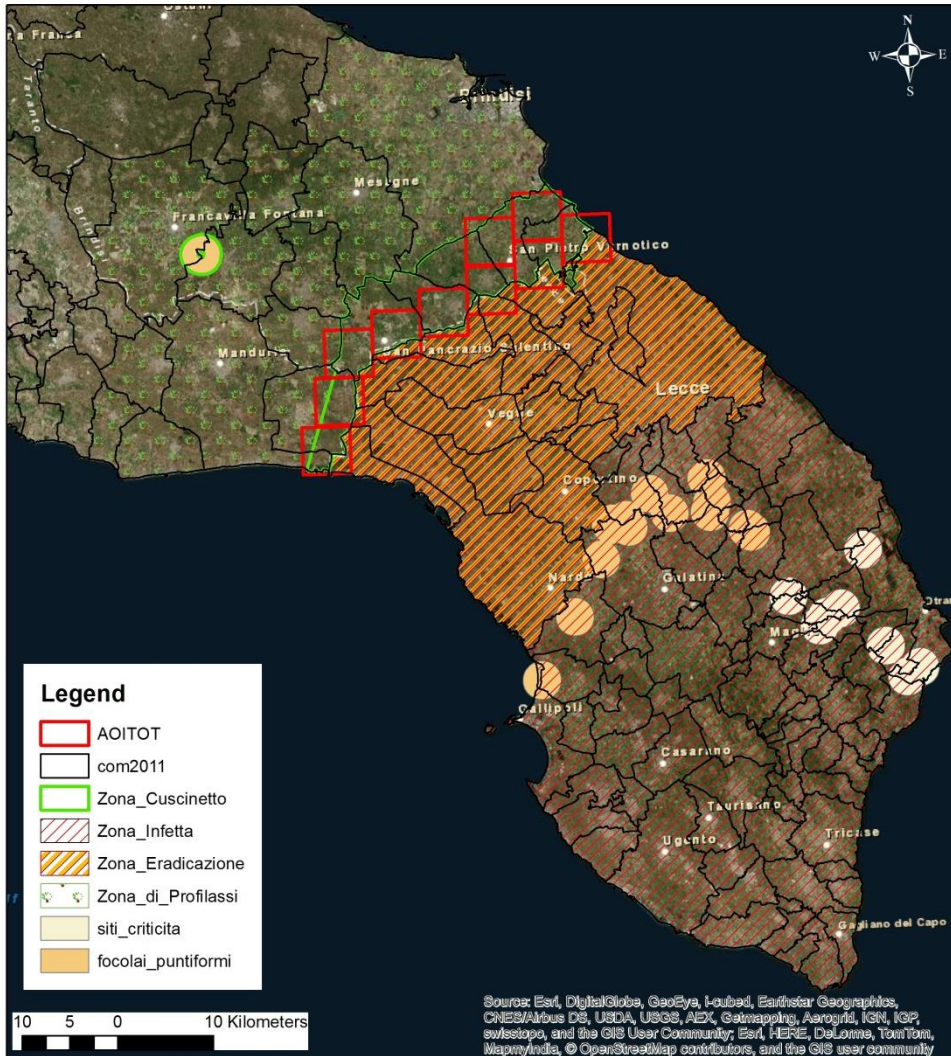


- 18/07 h 04:55
- 19/07 h 05:14
- 19/07 h 04:25
- 21/07 h 05:01
- 21/07 h 17:11
- 24/07 h 05:07

GEOLOGY
LAND USE/COVER
CLIMATOLOGICAL TIME SERIES
WATER INDICES
OTHER.....



Puglia 2015 – Xylella Emergency Mapping of agronomic practices


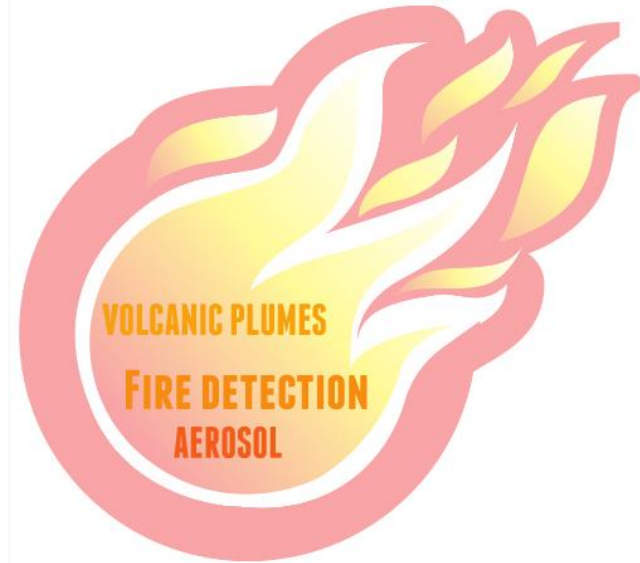


CAMPI - Field	ha
CAMPI ARATI - Tilled Fields	3.831,18
ULIVETI ARATI - Olive Trees, Tilled	3.263,01
ULIVETI POTATI - Olive Trees, Pruning	652,96
ULIVETI POTATI E ARATI - Olive Trees, Pruning, Tilled	698,73
FRUTTETI POTATI - Fruit Trees, Pruning	15,71
FRUTTETI POTATI E ARATI - Fruit Trees, Pruning, Tilled	104,58
VIGNETI POTATI - Vineyards, Pruned	0,84
VIGNETI POTATI E ARATI - Vineyards, Pruned, Tilled	3,47
Total	8.570,49

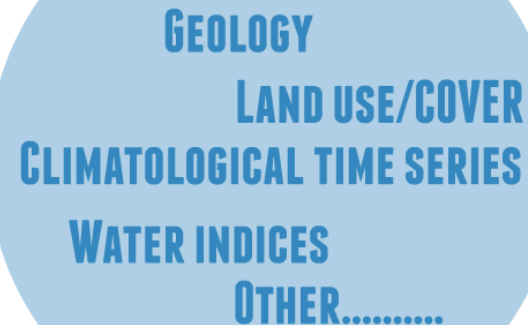
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