

Working Group "Natural Disaster Management"

Risk management, emergency response and humanitarian aid through geospatial information solutions

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A cooperative Italian/Japanese project

Objective

Improve Italian and Japanese capabilities to manage natural disaster management, emergency response and humanitarian aid through geospatial information services. Demonstration in Italy, Japan, and a third country.

Motivation

Italy and Japan share similar land and socio-economic features: small territory with large population, geology, morphology, that imply very similar geospatial information needs for managing geo-hazards.

Assets

Italy and Japan are world leaders in

- ✓ natural disaster management
- ✓ satellite EO sensors (ALOS and COSMO-SkyMed) and satellite operation
- ✓ geospatial information services.

italy-japan business group





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ALOS and COSMO COMPLEMENTARITIES

ALOS

1 satellite SAR L-Band

 ✓ Better suited for interferometric analysis of large areas with few images

 L-band, which guarantees interferometric coherence also in vegetated areas and is less sensitive to atmospheric effects

✓ Larger swath which allows for large areas monitoring

COSMO-SKYMED

4 satellites SAR X-Band

 ✓ High resolution allowing more localized observations and larger number of persistent scatterers

✓ X-band, which is more sensitive to terrain displacements

 ✓ Four satellites, which allow very high frequency of revisit time and high acquisition capacity







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Natural Disaster Management - Italian and Japanese platforms



Pilot Project "Geo-HS"

Approach

- ✓ Driven by the Users :
 - Italy and Japan Civil Protections, other Institutions (transportation, ...)

✓ Services developed and validated with the users in previous national and international projects

- ✓ Modular approach:
 - focus on sub-sets of phenomena
 - areas of interest (from small area to a whole country)
 - duration of service

Activities

- Continuous monitoring and detecting changes by Satellite data
- ✓ Integration with geospatial database service platforms
- ✓ Integration with user operational chains: COSMO to be integrated in Japanese service chain, ALOS to be integrated in Italian service chain
- ✓ Service demonstration in three sites: Japan, Italy, and a third Country







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Geo-Hazard Services: ground movement and change detection

🗸 earthquakes

volcanoes

subsidence

landslides

infrastructure stability

railways network monitoring

rapid mapping







- **Red**: SAR detected amplitude image 2009, april 14th
- Green : SAR detected amplitude image 2009, april 05th
- Blue : SAR coherence value

Change detection after L'Aquila earthquake to identify damages and to monitor rescue activities



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Vesuvius – monitoring of deformations induced by the volcanic activity



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Pescara, Italy. Monitoring urban subsidence due to natural and anthropic activities







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Geo-Hazard Services: ground movement and change detection

earthquakes

volcanoes

subsidence

🗸 landslides

infrastructure stability railways network monitoring rapid mapping







Maratea, Italy - Landslides risks analysis and inventory mapping



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Campolattaro dam (Italy): very high resolution DIFSAR analysis for stability monitoring of strategic infrastructures



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Geo-Hazard Services: ground movement and change detection

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infrastructure stability

 railways network monitoring rapid mapping



Sochi Bridge (Russia): VHR DIFSAR analysis for railways network control



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Geo-Hazard Services: ground movement and change detection

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infrastructure stability

railways network monitoring

✓ rapid mapping



Rome (Italy): flooded areas identification





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Mash-Up System: Platform for integrating & distributing geospatial information



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Example of Mash-Up System, overlaying the thematic map on the interface





Railway facility map & magnitude distribution





Provided by JRC





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UNA SOCIETÀ ASI/TELESPAZI

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EO products for L'Aquila earthquake in the geospatial platform

Options		
Map Groups	¢ # - 🚺	
 Map Groups of Abruzzo Raster di Base shared by Dimitri Dello Buono Mappa Idro-Orografica shared by Dimitri Dello Buono Strade e Centri Urbani shared by Dimitri Dello Buono Sisma Abruzzo shared by Dimitri Dello Buono plinivs - modello del danno attesa shared by Dimitri Dello Buono plinivs - modello del danno attesa shared by Dimitri Dello Buono Telespazio maps shared by Dimitri Dello Buono Telespazio - Vestizione grafo NAVTEQ per Telespazio - Edifici con crolli parziali o totali 1 Telespazio - Edifici con crolli parziali o totali 2 Telespazio - Edifici con crolli parziali o totali 3 Dati Satellitari shared by Dimitri Dello Buono Sorvoli_Aeronautica_Militare shared by Luciano G AGEA - SIAN - Maps shared by Pierpaolo Guerr fotointerpretazione sperimentale militare - Guidor Volo 6 Aprile - 25 cm shared by Dimitri Dello Buo Volo 8 Aprile - 25 cm shared by Dimitri Dello Buo ApT - Catasto shared by Dimitri Dello Buono 	uono lono tri Dello Buono erremoto Abruzzo Cavarra a nia shared by Luci: no no no	



group

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A cooperative Italian/Japanese project

"Geo-HS" – Geo-Hazard Services

A cooperative Project proposed by Italy and Japan to support risk management, emergency response and humanitarian aid through geospatial information services.

- ✓ Driven by Institutional Users
- ✓ Based on existing geospatial capabilities and integration of Japanese/Italian EO Platforms (ALOS/COSMO)
- \checkmark Distribute the data on the common and user friendly platform via internet
- \checkmark To cover specific hazards in test areas in Italy, Japan and a third country
- ✓ The project can be the stepping-stone to promote global size business opportunity for Italy and Japan
- ✓ Project can start within 2009 with a duration of 6-12 months (costs in the range 0.5 1.0 M\$)



