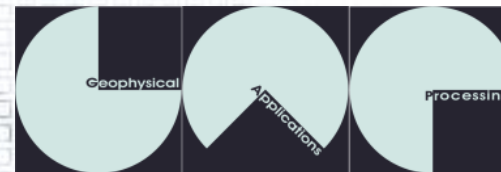


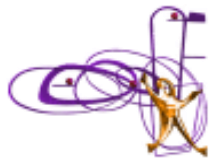
Geophysical Applications Processing GAP srl

SPIN-OFF company of *Politecnico di Bari*



New Technologies for Satellite Remote Sensed Images

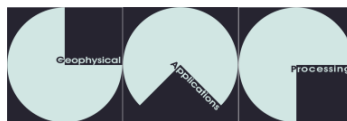
Speaker: Eng. Davide Oscar Nitti, Ph.D.



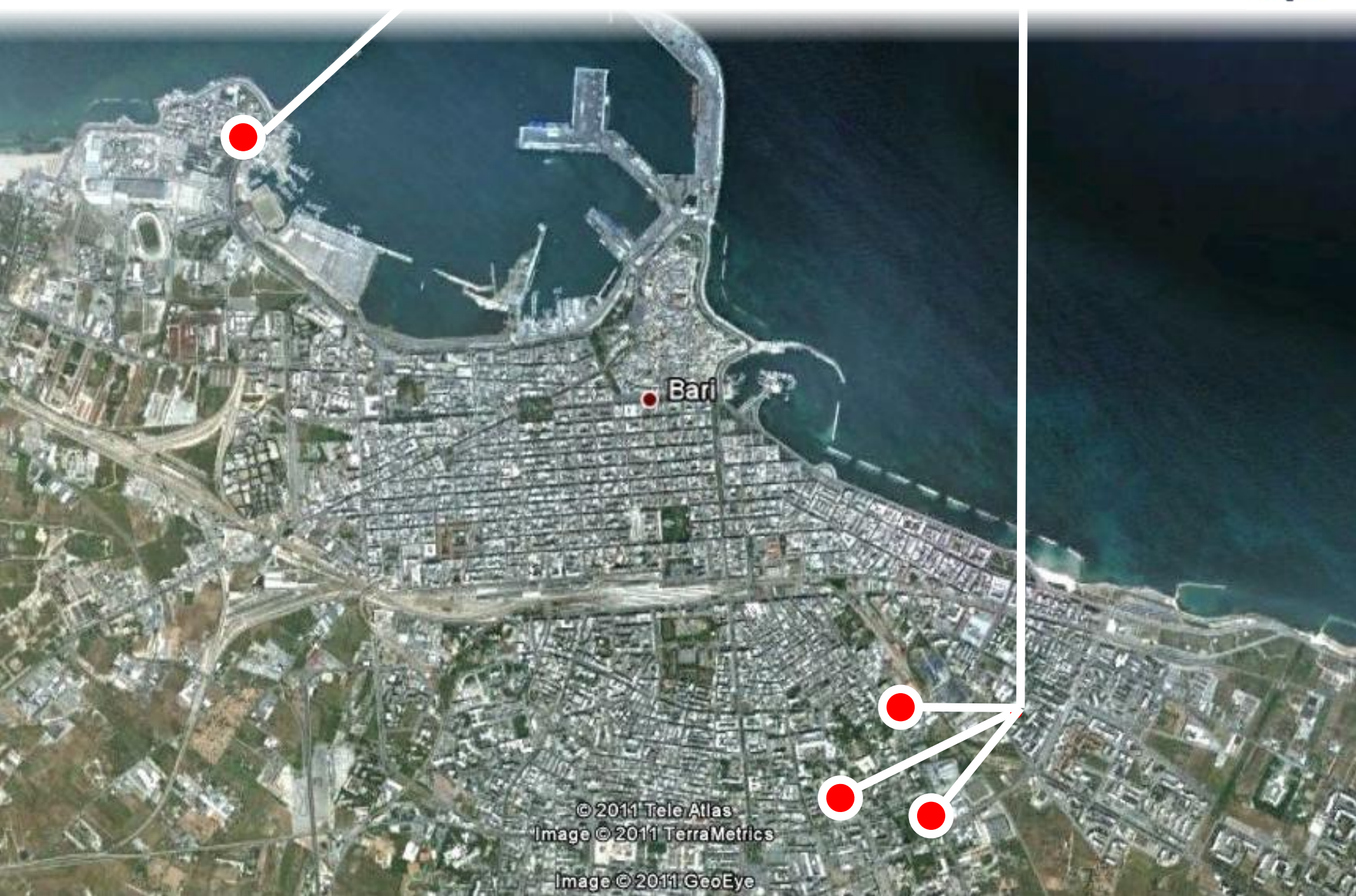
Geophysical Applications Processing - G.A.P. Srl
c/o Dipartimento Interateneo di Fisica "Michelangelo Merlin"
Via Amendola 173, 70126 Bari, ITALY

Bari

planetek
italia



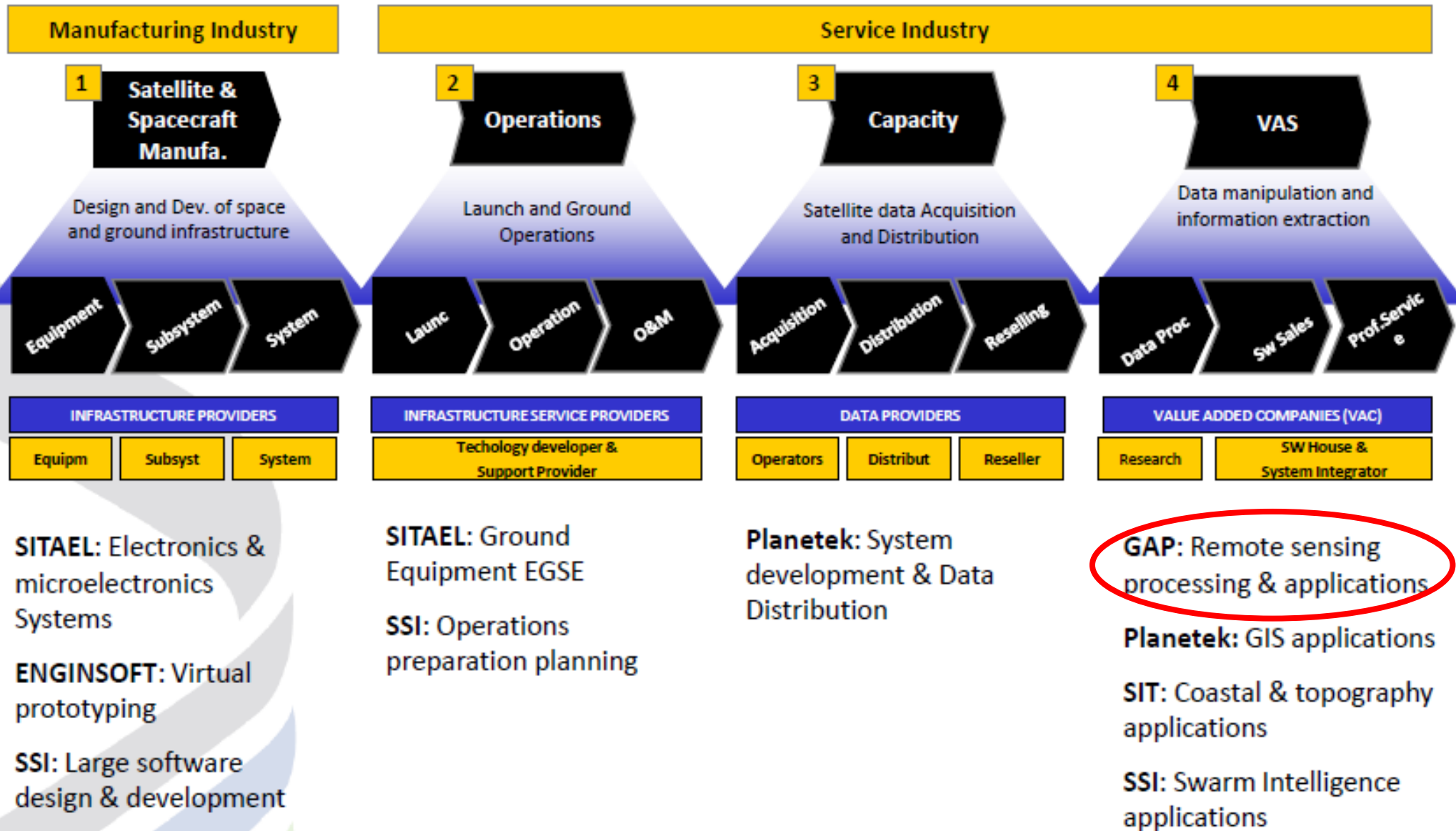
issia
sui Sistemi Intelligenti
irpi



© 2011 Tele Atlas
Image © 2011 TerraMetrics
Image © 2011 GeoEye

Apulian Space Industry

Know how

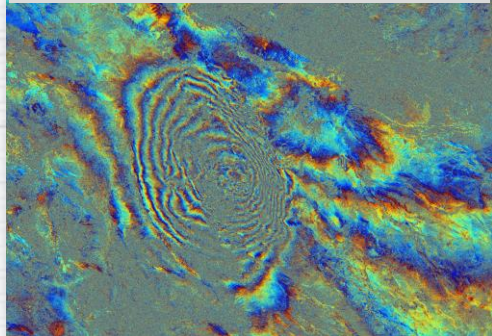




Products and Services



RADAR remote sensing



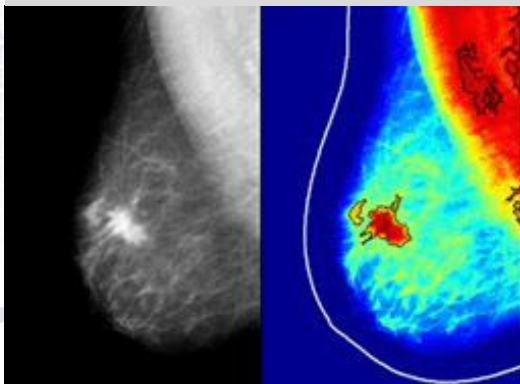
VIS/NIR remote sensing



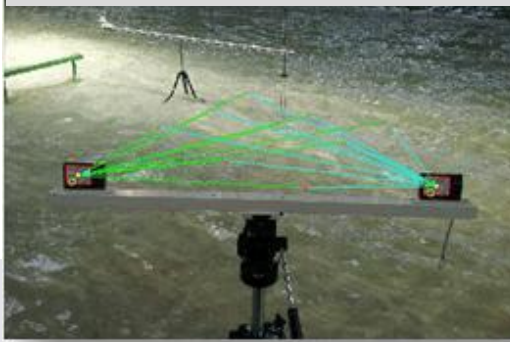
METEO forecasting



Medical Applications



Stereo Vision & 3D Tracking



APR Technologies



Remote Sensing Master

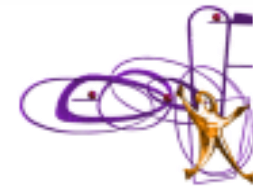


Geophysical

Applications



Agreement between Dept. of Physics - GAP srl



BC²S (Bari Computer Center for Science) Local Farm

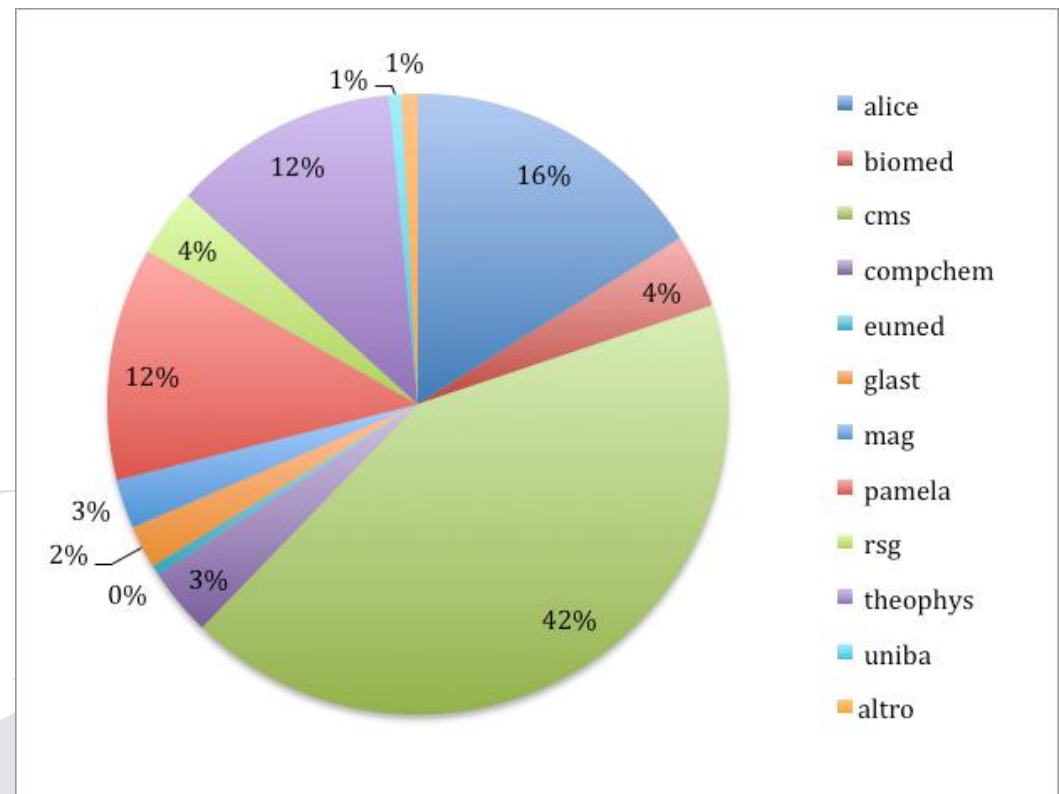
CPU: 4000 core di calcolo

Storage: 1.6PByte su un file-system distribuito e parallelo chiamato "Lustre" e 170TB in un sistema di storage distribuito e ridondato chiamato HADOOP.

Rete Locale fra i nodi: 1Gbit/s di banda passante su tutti i nodi di calcolo.

Rete geografica: 10Gbit/s verso l'esterno tramite la rete GARRX

Sistema di code usato: Torque/MAUI



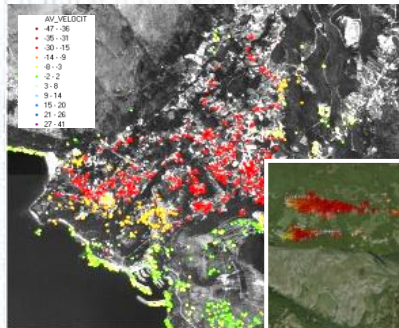


Geohazard Mapping & Monitoring



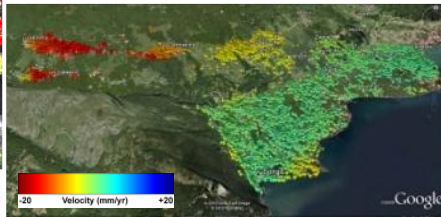
SAR - InSAR Applications & Products

Landslides



Maratea (Pz, Italy)

Garzeno (CO, Italy)



Man-made structures



Campolattaro Dam (BN)

Subsidence & uplift

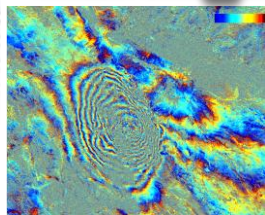


Tiber river, Rome



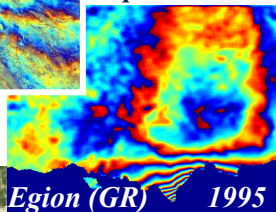
Wieliczka (Poland)

Earthquakes

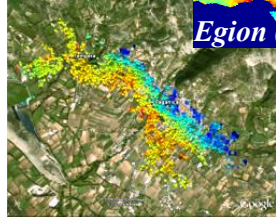


Co-seismic Displacem.

Abruzzo '09
Paganica '09



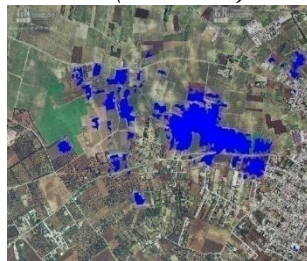
Egnon (GR) 1995



Post-seismic Disp.

Flooding

Salento (Nov. 2010)

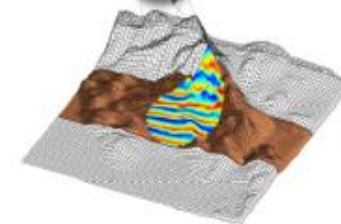


Massaciuccoli 28/12/2009

Coastal Erosion



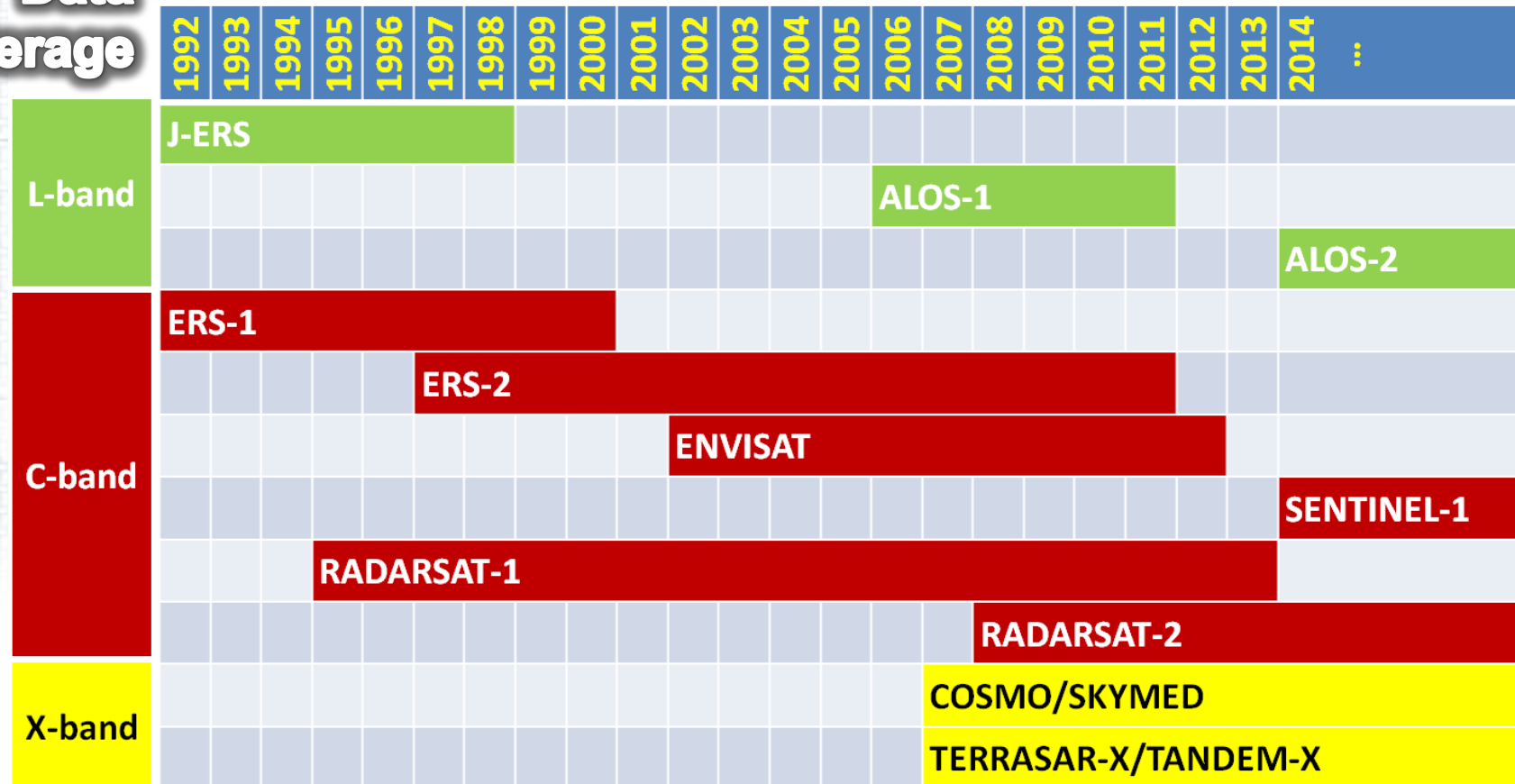
High Resolution DTM



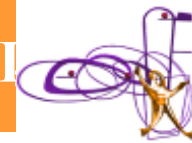


Satellite Synthetic Aperture Radar Missions

**Data
Coverage**



- ✓ Historical Analysis (exploitation of existing SAR datasets)
- ✓ Monitoring (tasking of operational satellites for new acquisitions over the AOI)



Research Projects focused on GeoHazards/Infrastructure Monitoring Through EO technologies

Project Acronym	Project Name	Funding Institution	Prime
LEWIS	<i>Landslide Early Warning Integrated System</i>	EU  FIFTH FRAMEWORK PROGRAMME	Department of Physics of Bari 
MORFEO	<i>Monitoraggio del Rischio da Frana con tecnologie EO</i>	 Progetto Pilota	 Carlo Gavazzi Space SpA
Frane Puglia		Regione Puglia PO FESR 2007-2013 	
ADF	<i>Archiving Data Fusion</i>	 II Bando PMI	
CAR-SLIDE	<i>Sistema di monitoraggio e mappatura di eventi franosi</i>	 MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITA' E DELLA RICERCA PON R&C 2007-2013	 tecnogamma a mermec group company
PANGEOS	<i>Papua New Guinea Earth Observation System</i>	 EO Support for ADB	
FAST4MAP	<i>Fast & Advanced SAR Techniques for Monitoring & Alerting Processes</i>	 IV Bando PMI	

Challenges and perspectives

Sentinel-1



C-band

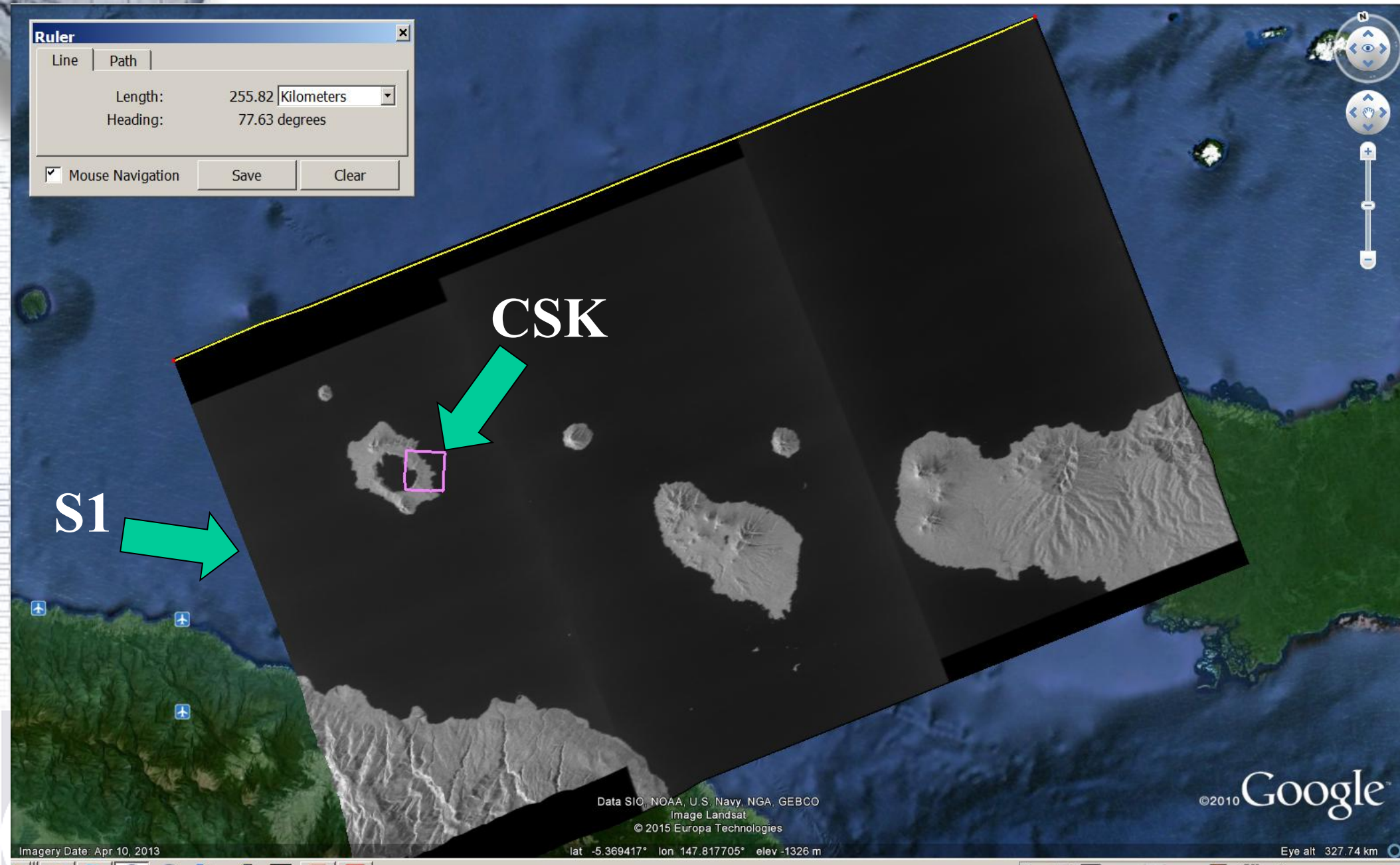
Revisit Time: up to 6 days

Launch: mid-2014

Interferometric Wide Swath (IWS)



Sentinel-1 IWS vs COSMO-SkyMed Spotlight

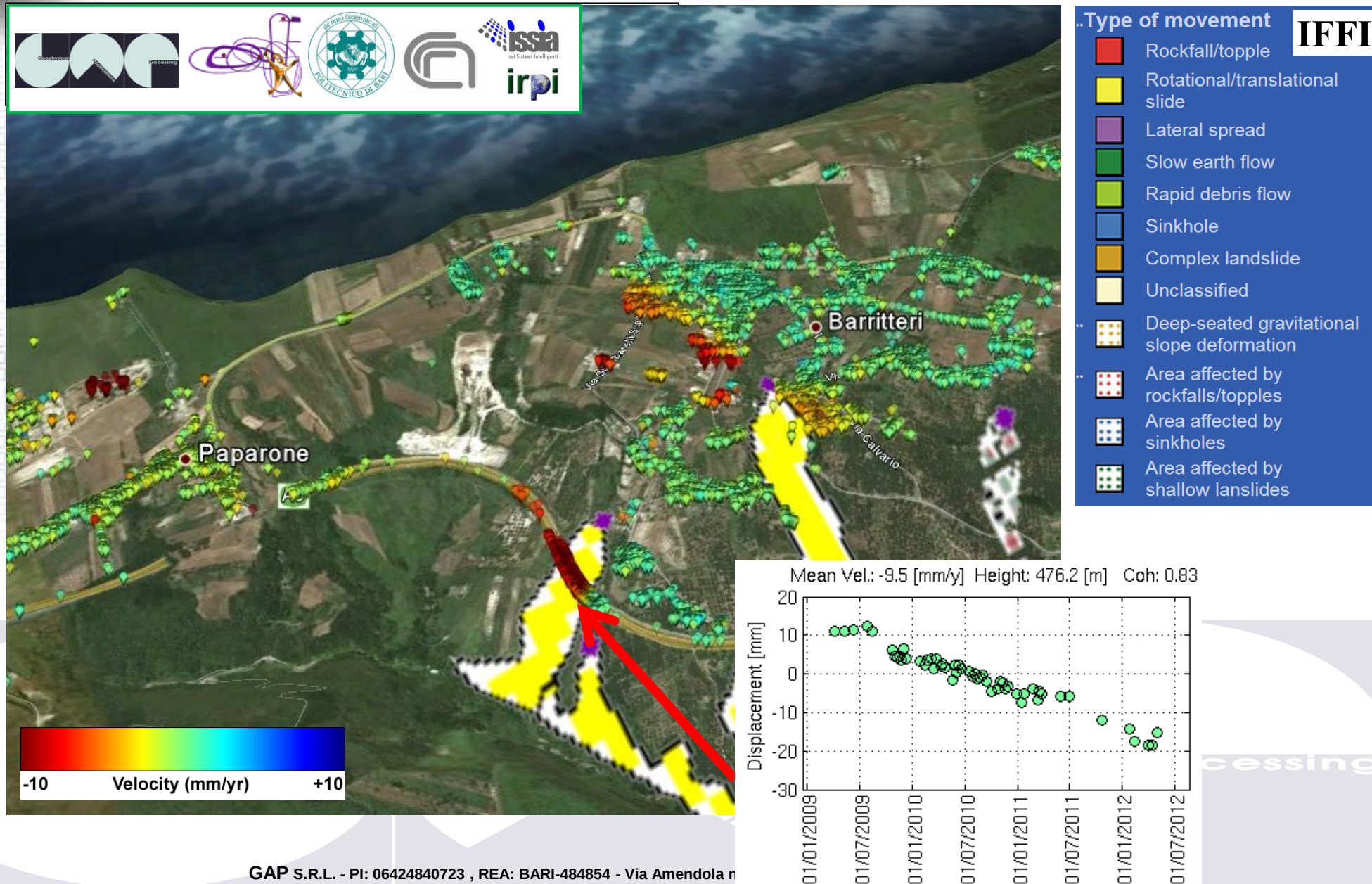




SAR satellite remote sensing

Man-made structures

Highway A3 Napoli-Reggio Calabria



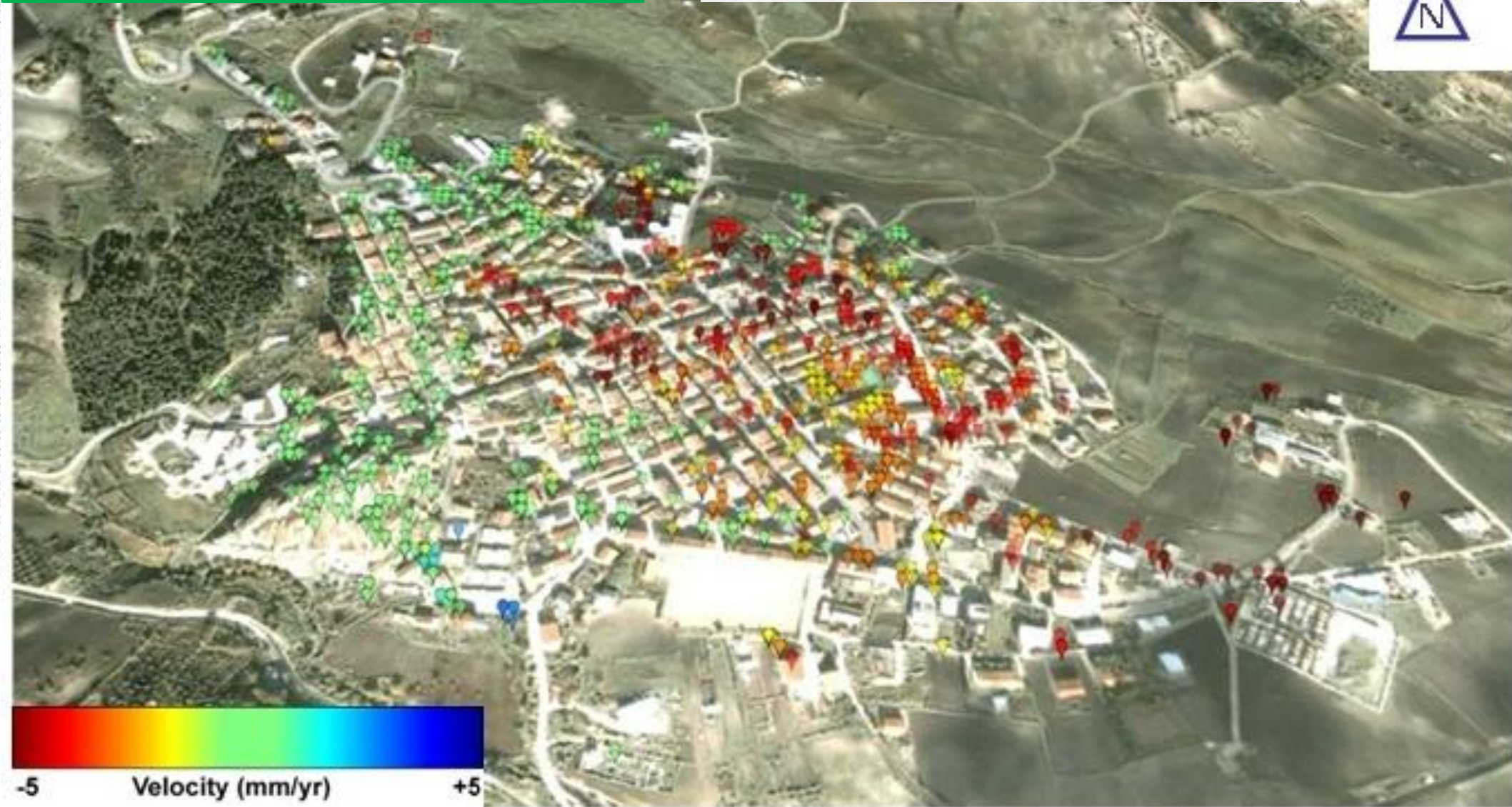


SAR satellite remote sensing

Landslide detection and monitoring



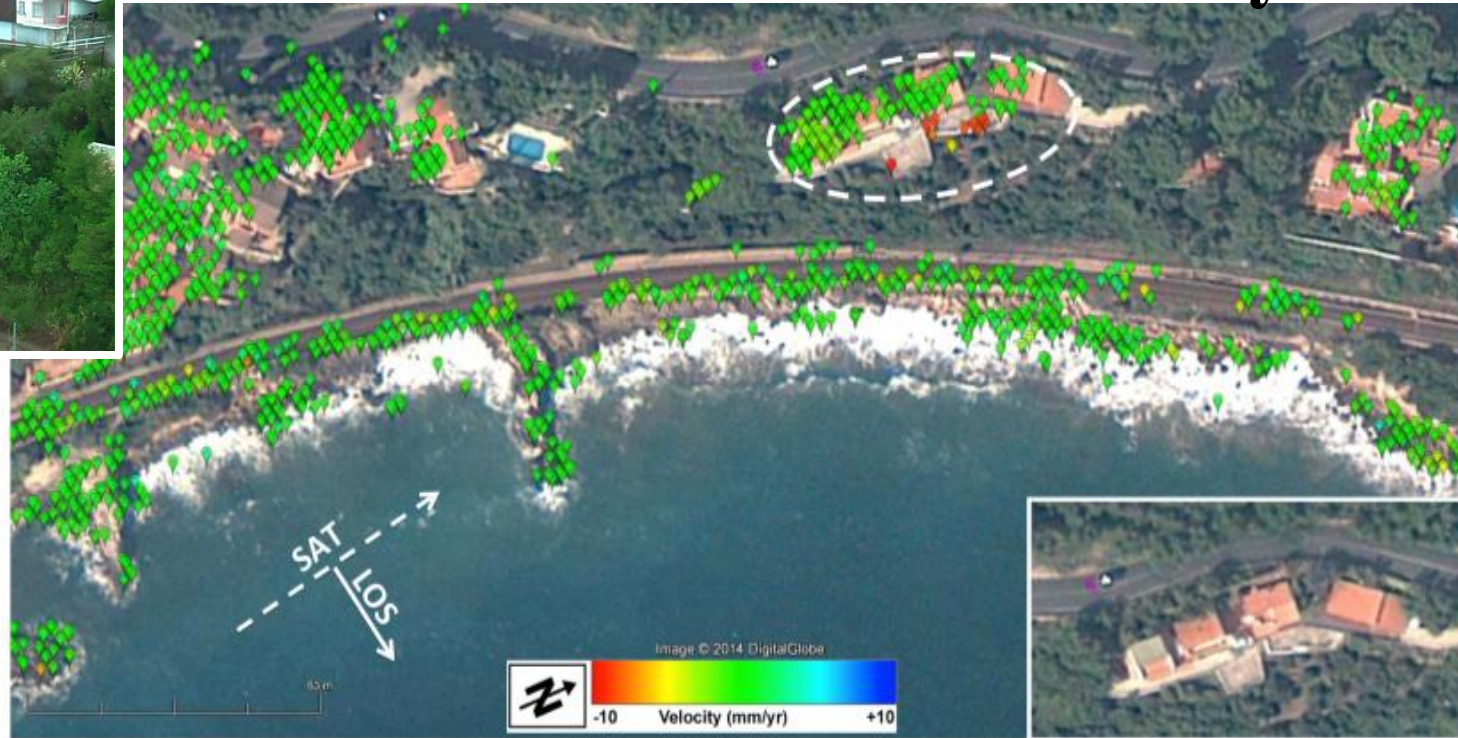
Daunia - Pietramontecorvino



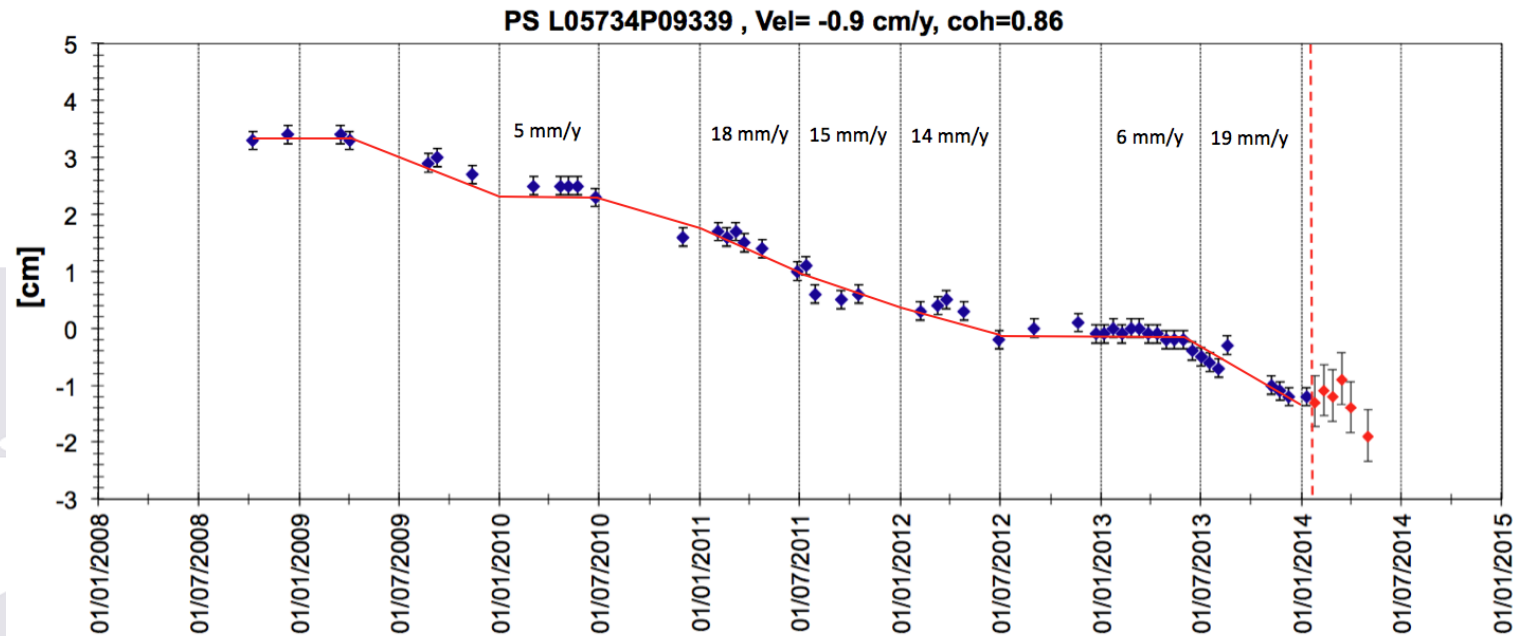
Multi-Temporal SAR Interferometric Analysis COSMO-SkyMed



(Top) Velocities of MTI targets along the railway line close to Marina di Andora from CSK data.



(Bottom) Displacement time series for a moving target close to the landslide



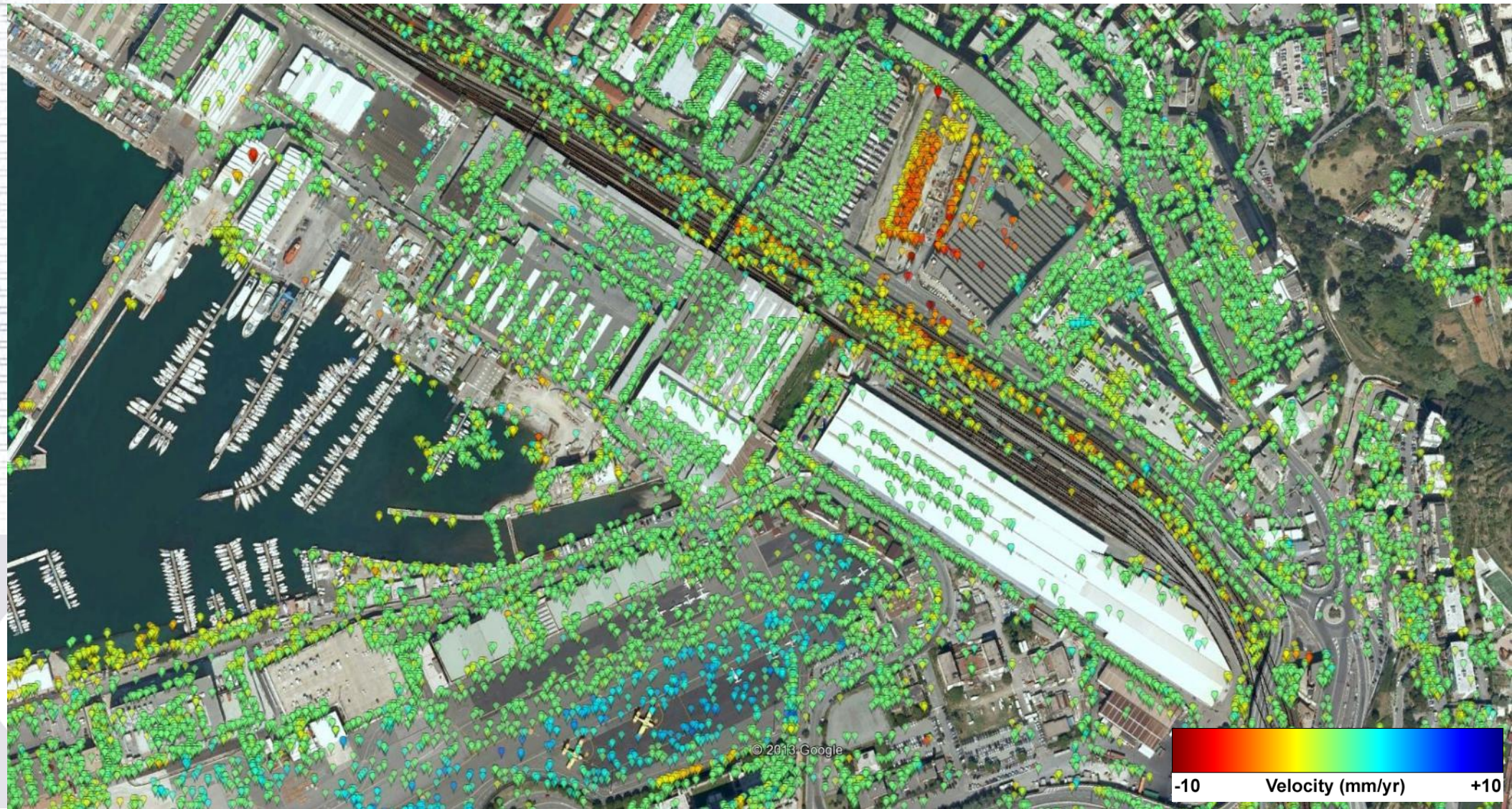


SAR satellite remote sensing

Man-made structures

Sensor: COSMO/SkyMed - Dataset: Feb '11-Nov '13

Test Site: Genoa
Sestri P. Rail Station

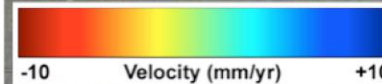




SAR satellite remote sensing

Man-made structures

Sensor: COSMO/SkyMed - Dataset: Feb '11-Nov '13

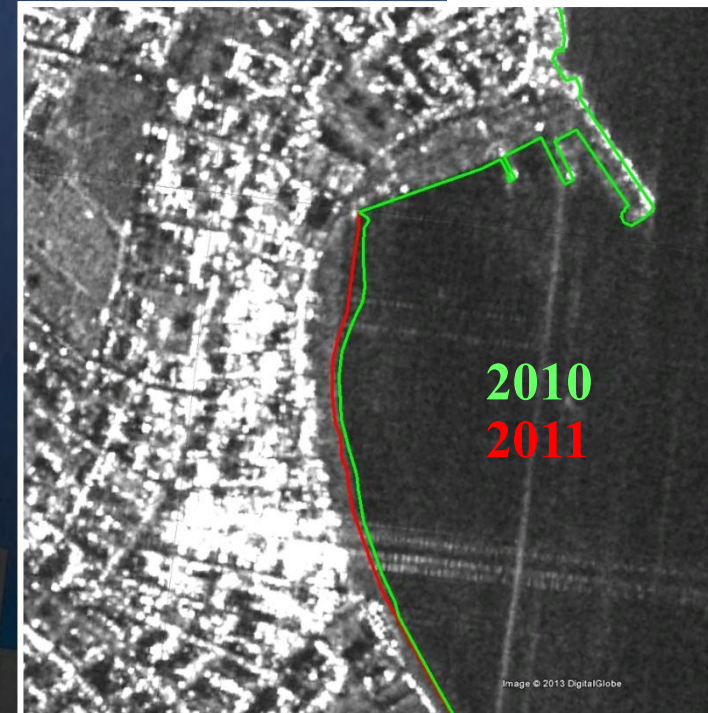


sing

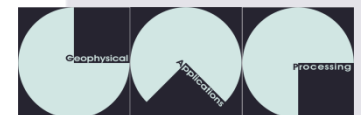


SAR satellite remote sensing

Coastal Erosion Maps

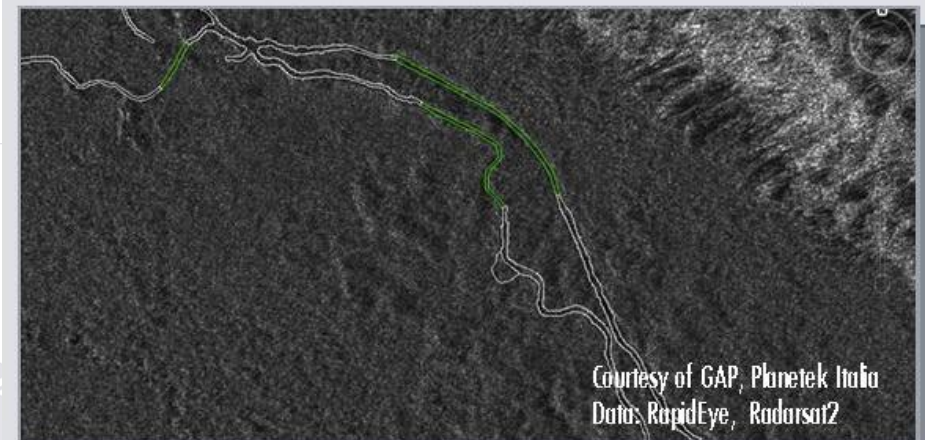
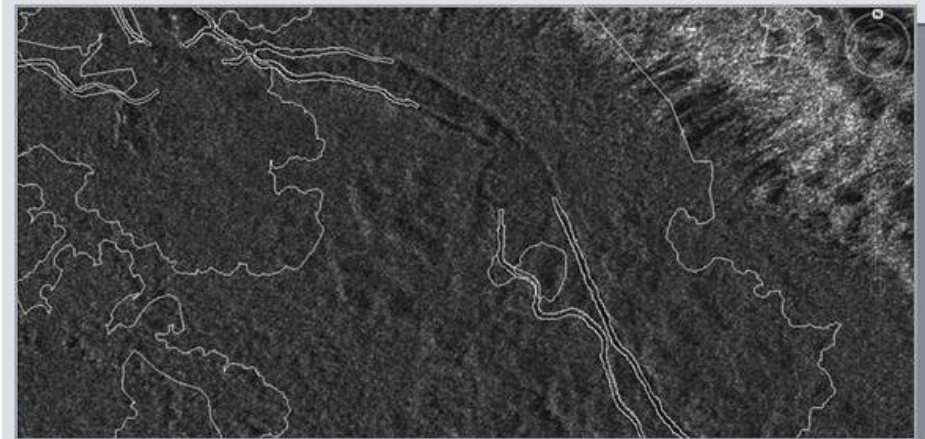
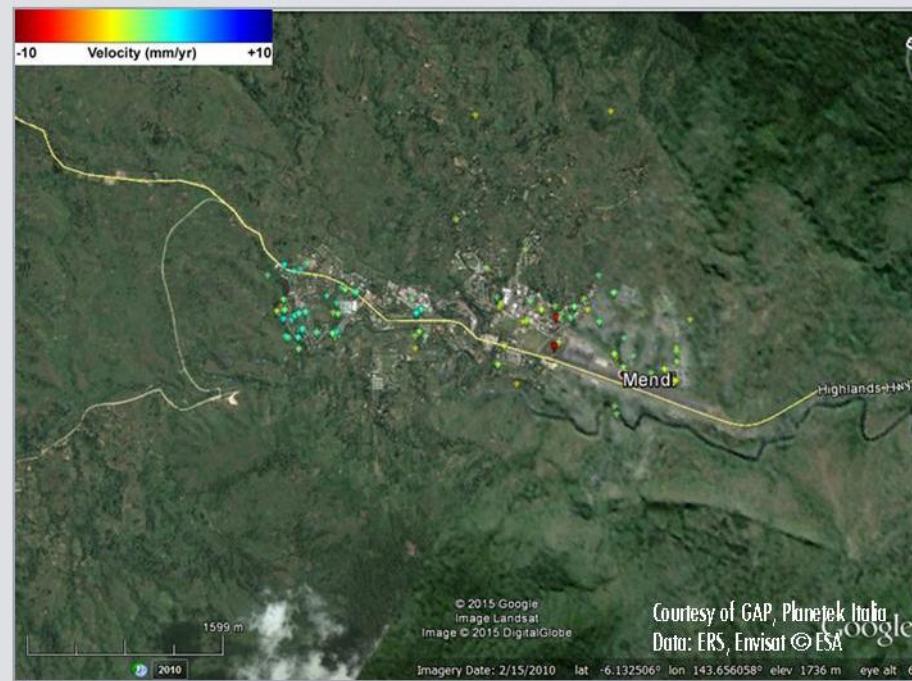


Processing



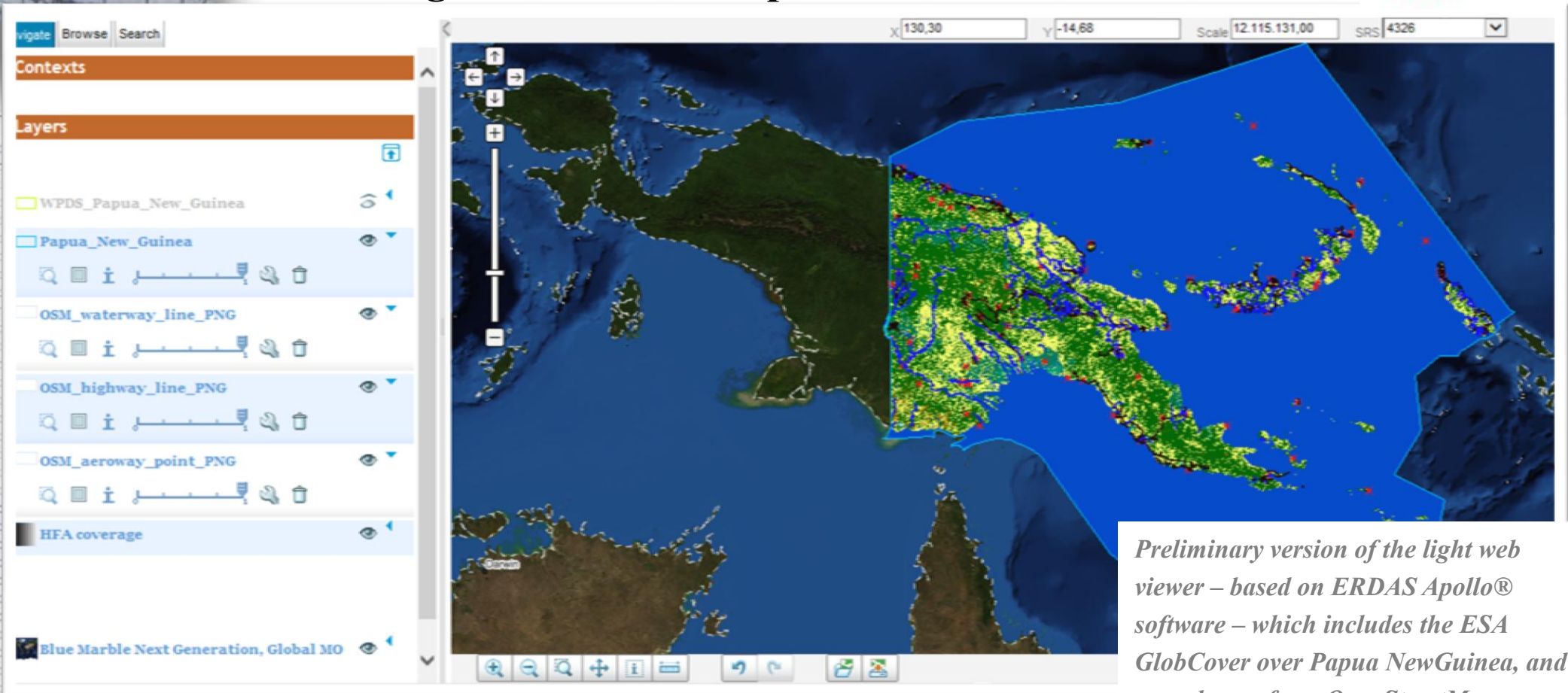
The Papua New Guinea transport infrastructure case

Integrating climate resilience into development planning: how can satellite data help?



ESA PANGEOS

The light web-based map viewer



Preliminary version of the light web viewer – based on ERDAS Apollo® software – which includes the ESA GlobCover over Papua New Guinea, and some layers from OpenStreetMap: highways (dark lines), waterways (blue lines), airports (red stars). All layers cover the whole Papua New Guinea territory.

- All basic functionalities of a geographic viewer.
- Integration of Service 1 and 2 datasets.
- Import, navigate and query external cartographic layers
- Route calculator.
- Query tool.
- Mobile app solution for the most diffused versions of smartphones and tablets equipped with GPS receiver.





Fish catch lines detection by exploiting optical remote sensed data

Algae



Swordfish

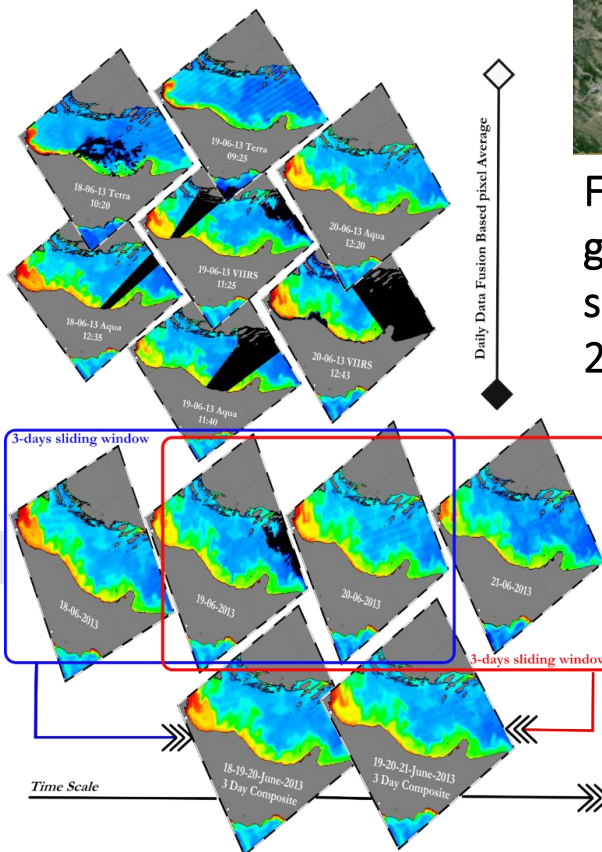


Food Chain



Krill

Phytoplankton



Fishing vessel layers with date, geographic position, total catch, and species composition from 2013 to 2014 conducted in the Adriatic Sea.

Ocean Color Analysis
(chlorophyll-a, sea surface temperature, primary productivity measurements)

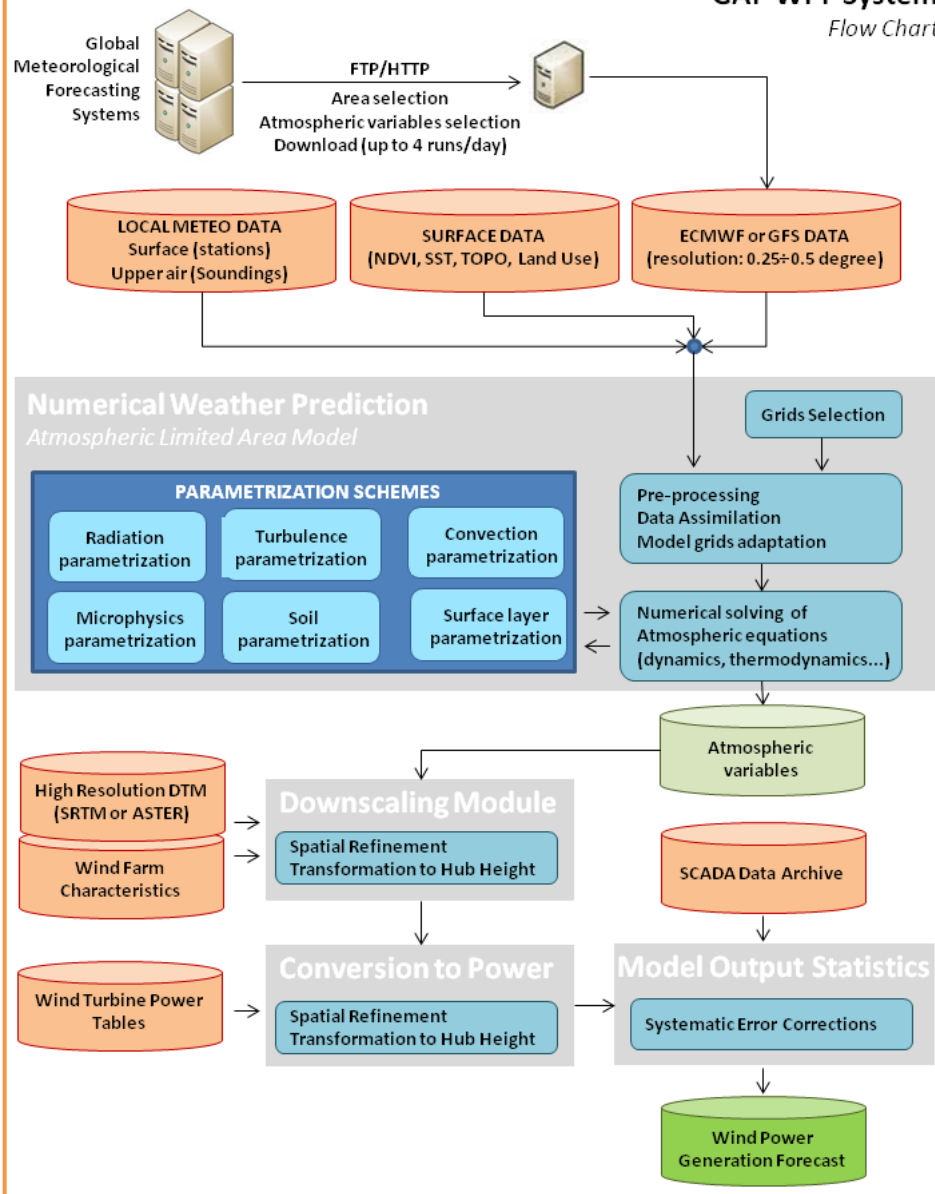
Multi-sensor, multi-resolution and multi-temporal Data fusion technique followed by sliding average window of three-days.

Meteorological Services



Wind Power Forecasting System

GAP WPF System
Flow Chart



Preciso Wind



Preciso Wind is a customized weather service offered by Planetek Italia srl for the identification and characterization of sites with potentially good wind speeds, i.e. suitable for the installation of wind farms.

GAP srl provides historical reanalysis for wind speed and all atmospheric variables concurring to the proper estimation of the wind energy (air density).

http://www.planetek.it/prodotti/tutti_i_prodotti/preciso_wind



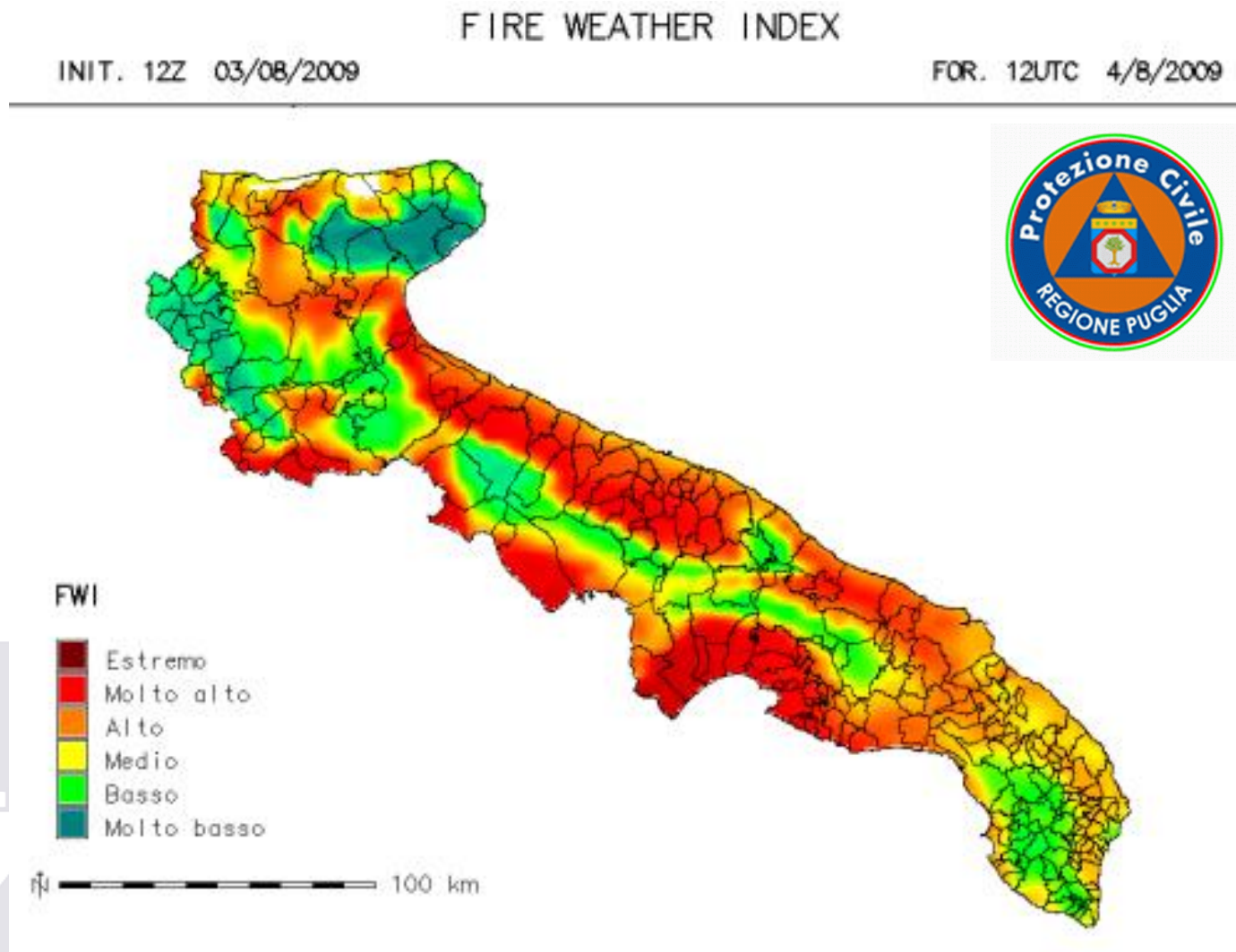
Meteorological Services



High resolution forecast services using numerical meteorological models.
Atmospheric fields forecast can be used to predict forest fire hazard related to atmospheric conditions by means of FWI (Fire Weather Index).

Forest Fires Hazard Prediction

- *Prediction of daily forest fire hazard maps on municipal scale*
- *FWI: approved by the European Commission*
- *3 maps every day*
- *Forecast: 24h → 48h → 72h*
- *Resolution: 4 km*





Info and Contacts



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Fax. +39 080544-3144 / 3224

e-mail: info@gapsrl.eu

www.gapsrl.eu



Geophysical

Thanks for your attention
Grazie per l'attenzione

Applications

Processing