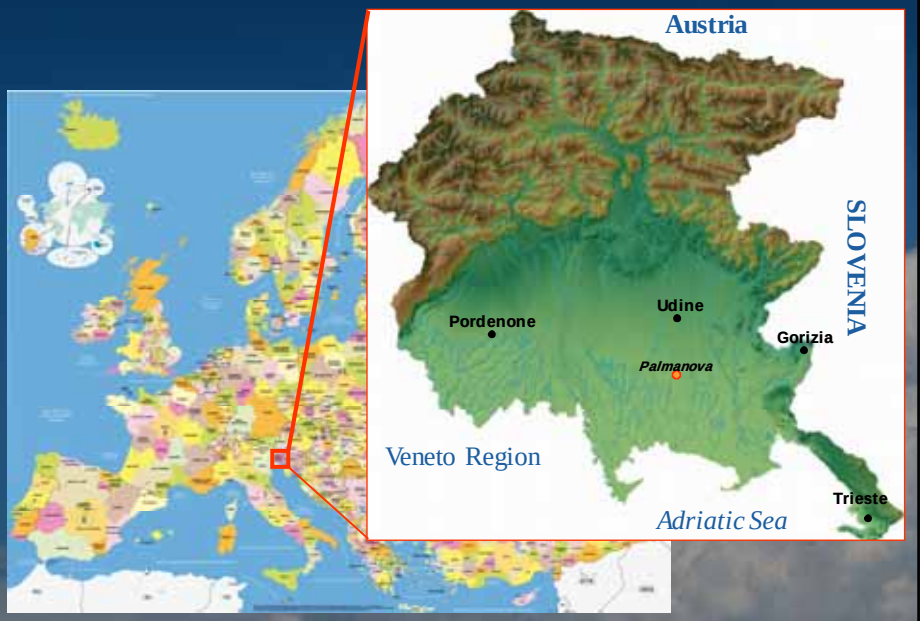
REGIONAL CIVIL PROTECTION OF FRIULI VENEZIA GIULIA

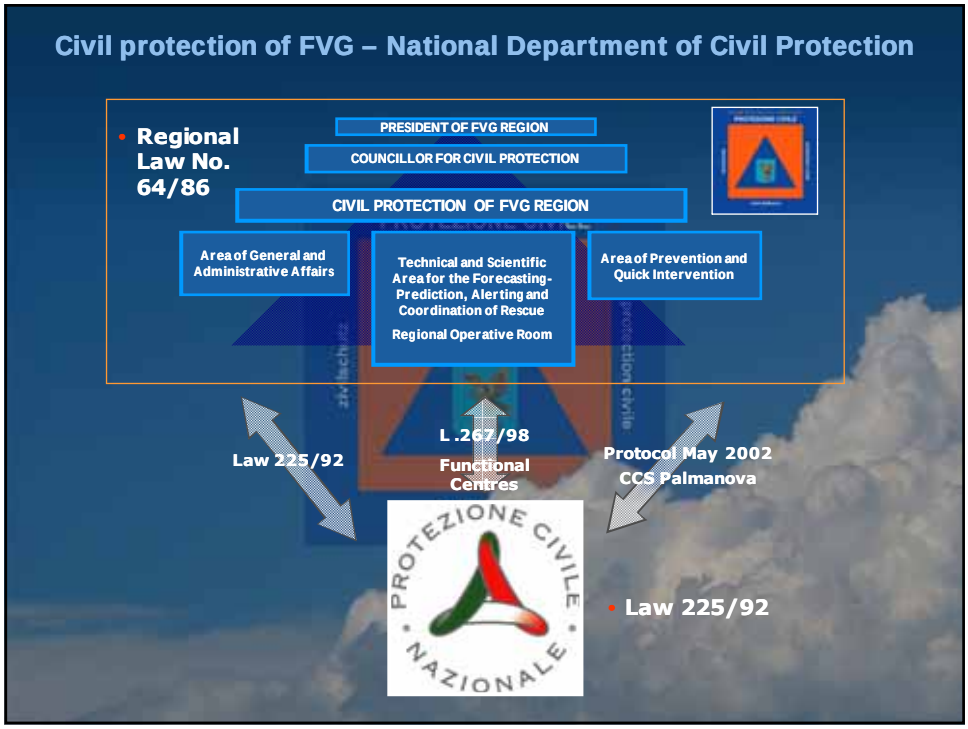
Civil protection in Friuli Venezia Giulia

Friuli Venezia Giulia Region



Organization of the Civil protection of Friuli Venezia Giulia

Civil protection of FVG – National Department of Civil Protection



Civil protection system of Friuli Venezia Giulia

PRESIDENT OF FVG REGION

COUNCILLOR FOR CIVIL PROTECTION

CIVIL PROTECTION OF FVG REGION

Area of General and Administrative Affairs

Technical and Scientific Area for Forecasting-Prediction, Alerting and Coordination of Rescue

REGIONAL OPERATIVE ROOM

Area of Prevention and Quick Intervention

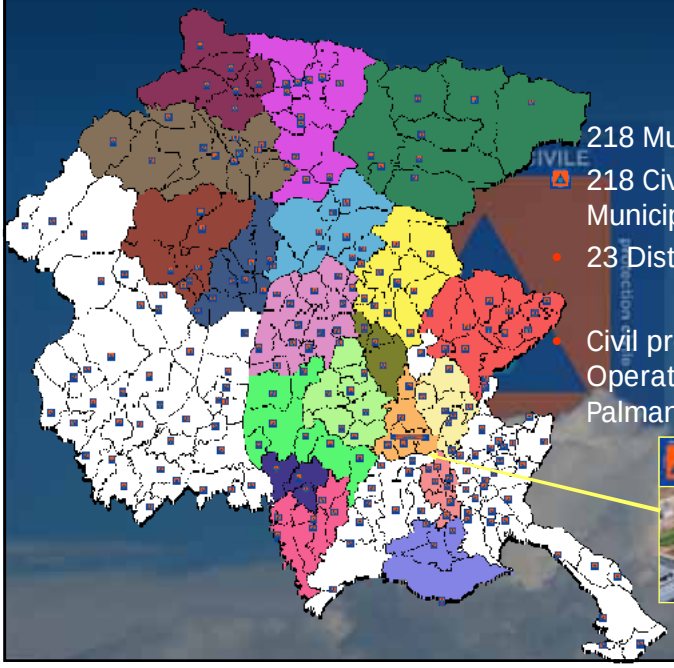
218 Municipalities

Municipality civil protection Groups

- The Major is the first Civil protection authority at local level, in FVG in every municipality he has at disposal an organised group of civil protection volunteers (men and women), trained and equipped with municipal and regional funds.
- The Major and all the volunteers know better than anybody else their own territory, and for this reason they are the main part within the Integrated Regional System of Civil Protection.
- Each Municipal Civil Protection Group has an Headquarter: a centre hub for every Civil Protection activity, both in the ordinary days and in the emergency periods .



Organisation widespread on the regional territory



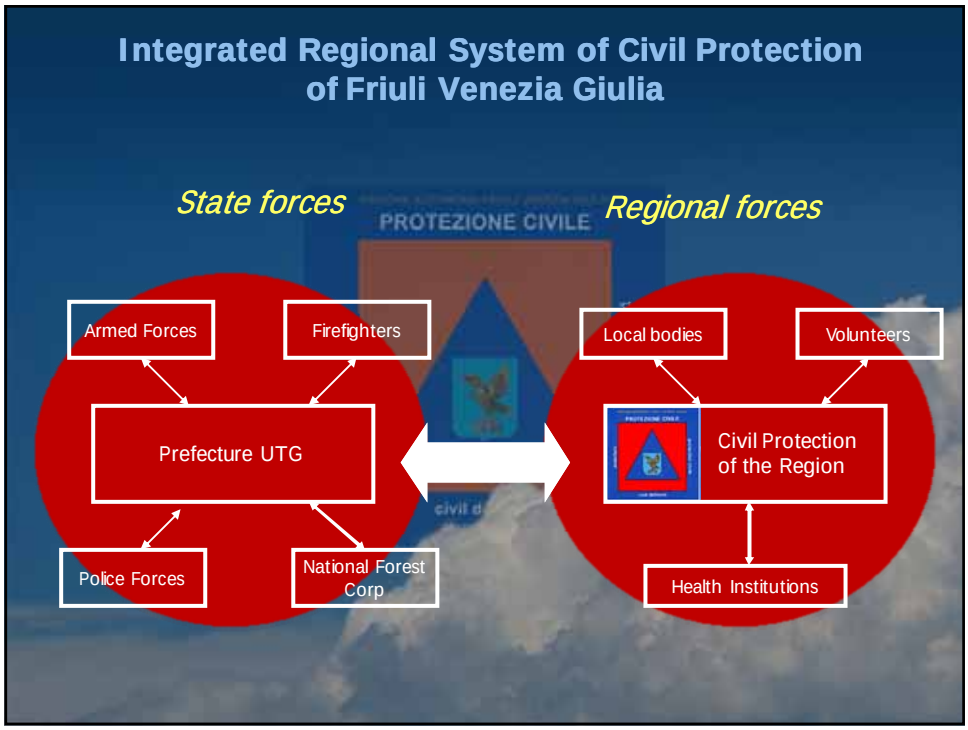
- 218 Municipalities
- 218 Civil protection Municipality Groups
- 23 Districts
- Civil protection Regional Operative Center in Palmanova: SOR/SOUP/CCS

Volunteers

- Friuli Venezia Giulia Civil Protection Volunteers in the **Municipality Groups**:
  - 218 technical and logistical teams
  - 119 fire-fighting teams
  - 1 water rescue team
    - More than 8.000 volunteers
  - Equipments
    - More than 650 operative vehicles

- Civil Protection **Associations**:
  - 80 associations
    - More than 3.600 volunteers


Volunteers


Integrated Regional System of Civil Protection
of Friuli Venezia Giulia
State forces
Regional forces
PROTEZIONE CIVILE
Armed Forces
Firefighters
Prefecture UTG
Police Forces
National Forest Corp
Local bodies
Volunteers
Civil Protection of the Region
Health Institutions

Our activities – Natural / Anthropic Risks

Hydro Geological Risks

- landslides
- floods
- debris-flow
- high-water

Fires

Earthquakes

Industrial accidents

.....

Flood events in FVG from 1991 to 2009

2009

- Municipalities damaged

24-26 November 2002 – Flood in Pordenone plain

Prata di Pordenone – loc. Prata di sopra

Pordenone

Pordenone- loc. Vallenoncello

Pasiano di Pordenone – loc. Traffe

596 mm / 72 hours

29 August 2003 – Flood in Val Canale - Canal del Ferro

Pontebba - Pietratagliata

Pietratagliata (Pontebba) – Confluence F.Fella-Rio Geloviz

293 mm / 4 hours

9 September 2005 – Downpour in lower Pordenone plain

Fiume Veneto - Azzano Decimo

173 mm / 6 hours

Ford of Vivaro to wade F.Meduna

18 November 2006 – Downpour in Malina basin

Attimis – Faedis - Povoletto

T.Malina

216 mm / 10 hours

27 May 2007 – Downpour in Latisana and Pavia di Udine

Latisana – Pavia di Udine

150 mm / 5 hours





9 agosto 2008 – Tornado
Grado – Aquileia – Lignano – Duino


Grado: Acqua alta 1 dicembre 2008

November 2008 – Floodings Friuli plain


4 September 2009 – Flood
Val Canale - Canal del Ferro - Val Dogna


Eccezionali avversità atmosferiche
9 e 10 MARZO 2010

Tromba d'aria
pianura friulana 23 LUGLIO 2010

Evento alluvionale
area isontina e provincia di Trieste
18 SETTEMBRE 2010

17-18 settembre 2010 – Area isontina e provincia di Trieste

Piena del F. Isonzo e del F.Vipacco

221 mm in 24 ore su monti
35 mm in 1ora su Carso




31 ottobre - 2 novembre 2010 – Alluvione pianura pordenonese

Piene nel bacino del F. Livenza – Sacile - Pordenone

811 mm in 72 ore
150 mm in 6 ore


Allagamenti a Pordenone


Ponte di Adamo ed Eva a Pordenone


Fiume Meduna a Villanova di Prata di PN


Allagamenti a Sacile

31 ottobre - 2 novembre 2010 – Alluvione pianura pordenonese

Piene nel bacino del F. Livenza – Sacile - Pordenone

811 mm in 72 ore
150 mm in 6 ore


Allagamenti a Pordenone

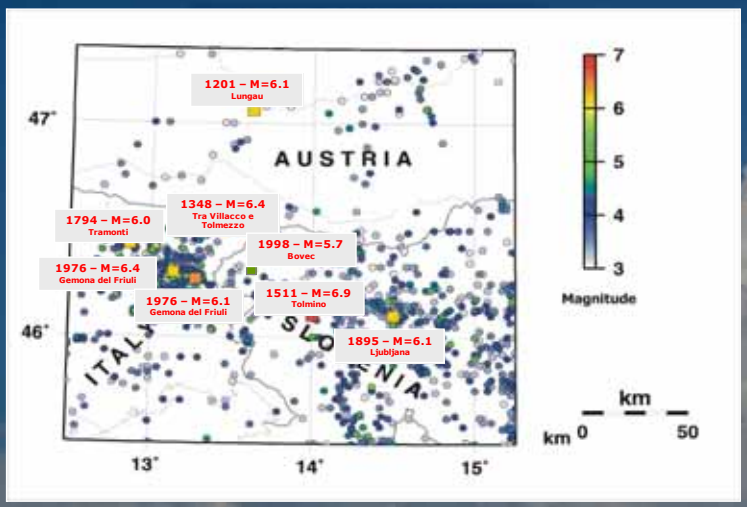

Parcheggio Marcolin a Pordenone


Fiume Noncello a Vallenoncello (PN)


Allagamenti a Pordenone

Seismic risk

Largest historical earthquakes

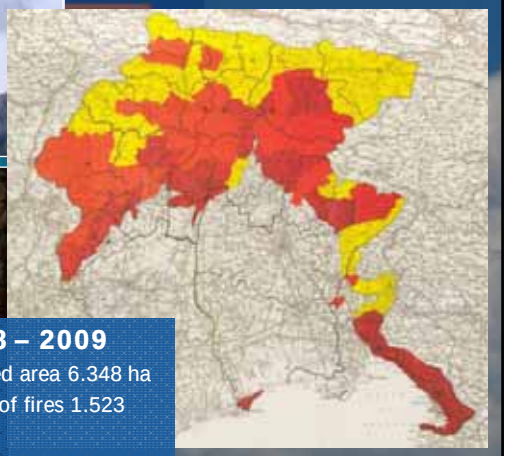


Seismic risk

06/05/1976 Ms 6.5 - 989 deaths – largest recent event

Wildland fire risk

- Map of wildland fire danger



- High danger period:
- 1 November–30 April

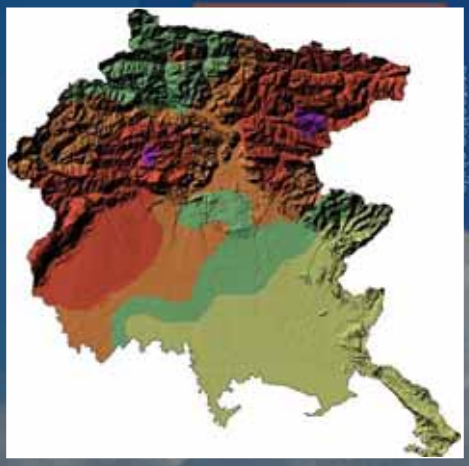
1998 – 2009

Total burned area 6.348 ha

number of fires 1.523

Anthropic risk

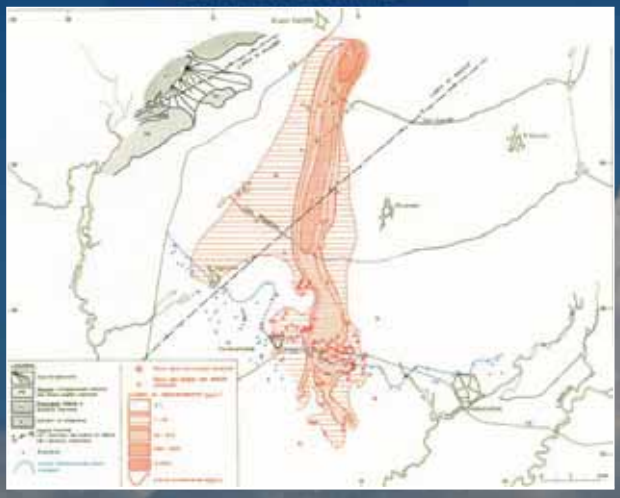
- 1986 – Radioactive contamination (Chernobyl)



- Cesio 137
  - 0-2 kBq/kg
  - 2-7 kBq/kg
  - 7-17 kBq/kg
  - 17-67 kBq/kg
  - >67 kBq/kg

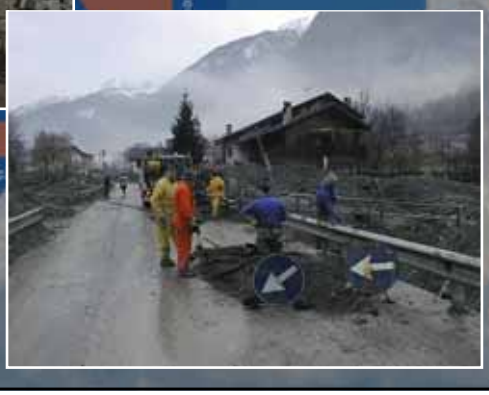
Anthropic risk

- 1987 – Groundwater pollution in drinking water supply area



Emergencis outside the region

2000 Flood - Piemonte e Val d'Aosta



2002 Molise earthquake



2004 Tsunami: Sry Lanka 19 gennaio – 11 febbraio 2005


Pakistan earthquake : 9 – 21 ottobre 2005

2009 Abruzzo earthquake

Ortophoto

2009 Abruzzo earthquake

2009 Abruzzo earthquake

Project and construction of Friuli Village

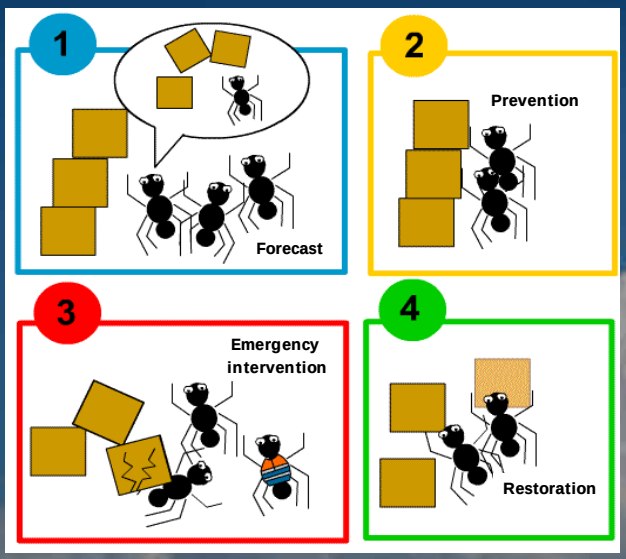
Support to "Progetto C.A.S.E." of DPC

Main objective of civil protection

PREPARE and COORDINATE all knowledge, legal and management measures and actions needed in order to **GUARANTEE SAFETY** of people, goods and environment respect to every situation that may cause damage or danger

- Forecast to provide
  - Study of natural risks and catastrophic phenomena
  - Define risk scenarios
- Know to take decisions
  - Dynamic knowledge
    - in space
    - in time

The Four main activities of civil protection



PREVENTION actions

According to civil protection Regional Law n° 64/86 the regional civil protection system have as priority PREVENTION actions, defined on 3 levels:

- **Primary level**: actions addressed to lower, under a threshold considered "acceptable", the risk of happening of catastrophic situations or events ((studies, construction of defence facilities, emergency planing, training and improvement of civil protection system, ...)
- **Secondary level**: actions for intervention at the first evidence of risk situations or catastrophic events, with the scope of limit the impact and dangerous effects (activities of surveillance and control on the territory , quick intervention works, evacuation an rescue, ...)
- **Tertiary level**: actions for activating all measures needed to restore "normal" conditions of safe living (interventions to put in safety conditions the affected territory, restoration of viability and public services, rehabilitation and/or preparation of structures and facilities for public and private use and for productive activities, ...)

Main tools for risk management and realisation of prevention actions

- *Regional Operative Room (SOR) in Palmanova*
- *Monitoring systems for real-time control of the territory*
- *Flood monitoring and emergency planning*
- *Prevention, fast intervention and restoration works*
- *Preparedness: for civil protection personnel, volunteers and population*

Regional Operative Room in Palmanova (SOR)

Civil Protection Operative Centre
the Regional Operative Room

- h24 control room
- Monitoring networks and logistic
- Coordinates the operations of civil protection
- Connected with DPC

Sala Operativa Regionale (Regional Operative Room)
Sala Operativa Unica Permanente (Unique Standing Operative Room)
Centro Coordinamento Soccorsi (Centre for the Coordination of Rescue)

- At the Operative Room of the Regional Civil Protection in Palmanova gather the Civil Protection Regional Radio Networks and the Volunteering one, and the related localizing system
- Besides, the operators have got at their disposal:
  - Data from the hydro/meteo/ pluvio sensors
  - Seismic data
  - Video monitoring
  - Landslide sensors data
  - Meteomarine buoy data
  - Meteosat
  - Civil Protection GIS
  - Fax / SMS alerting systems
  - Civil Protection Portal
  - Analogic and digital TV

SOR / SOUP / CCS

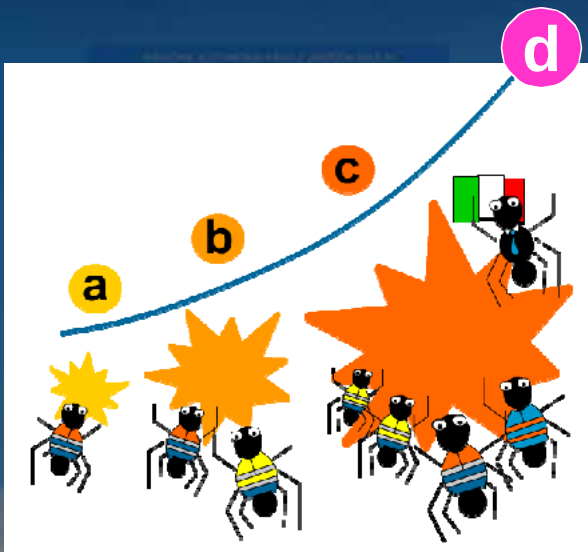
- Emergency Management Room:
  - 10 42" display
  - Digital videoprojector
  - Analogic phones, digital and VoIP ones, videotelephones
  - Laptop computers
  - Terminals of the Civil Protection Regional Radio Networks and the Volunteering one

- All the necessary informations are supplied by the Regional Operative Room

Different emegency levels ⇒ Different ways of intervention

Emergency levels

According to national Law L.225/92



Connectivity and data transmission

Civil Protection of the regions Friuli Venezia Giulia, Veneto, Trentino and National Civil Protection of Rome

Connectivity and data transmission - cross border cooperations

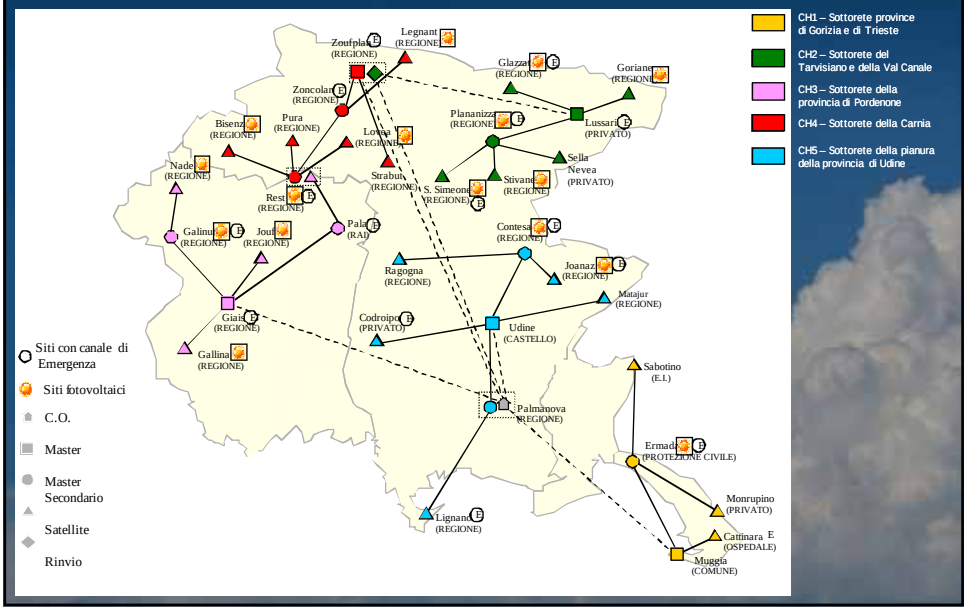
Civil Protection of Friuli Venezia Giulia, Carinthia (Austria) and Slovenia

Multimedia communications and connections

- ISDN & WIMAX links between all Municipalities Civil Protection centres and SOR for:
  - Video-conferences
  - Data exchange; field surveying and monitoring of possible dangers
  - Operative upgrades
  - Operators' training

Communications

Regional Analogic Emergency Radio Network



Our activities / Monitoring systems

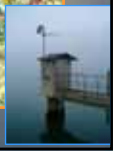
Real-time physical control of the regional territory

The data from all of the Civil Protection **Monitoring Networks** are collected in the Operative Centre in Palmanova :

- Hydro-Meteo-Marine monitoring network
- Hydro Geological monitoring network
- Meteorological Radars for nowcasting
- Satellite observations (Meteosat MSG)
- Seismic Monitoring Network

Hydro Meteo Marine monitoring network

- For real time monitoring of ground effects of meteorological events an automatic monitoring network is managed by regional civil protection composed by:
  - 191 monitoring stations
  - 111 hydrometers
  - 112 rain gages
  - 27 barometers
  - 100 air thermometers
  - 5 sea level sensors
  - 18 snow level sensors
  - 4 present weather sensors

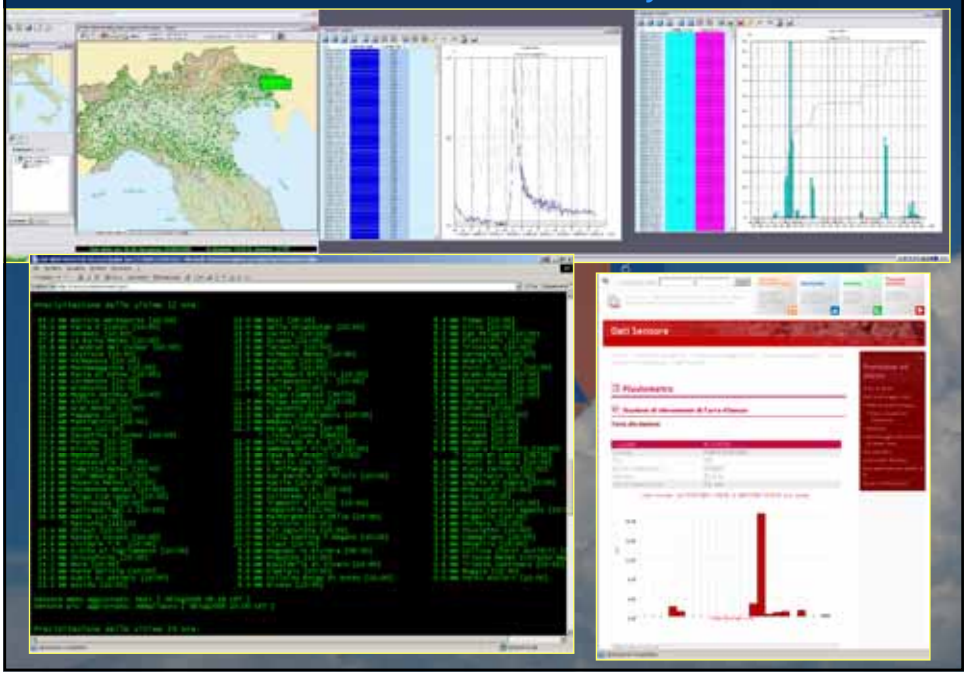


Hydro Meteo Marine Monitoring Network

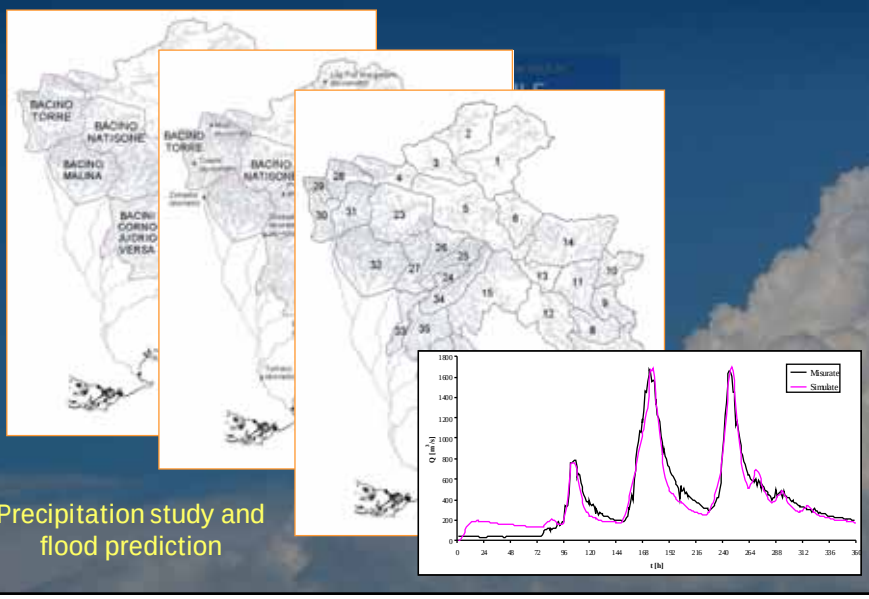
6 marine buoys (3 meteo-oceanographic + 3 for waves monitoring)

Real time monitoring system based on fixed buoys on which different oceanographic and meteorological sensors are installed. The buoys are connected in real-time to the regional hydro meteorological network managed by the regional civil protection

Data visualisation and analysis



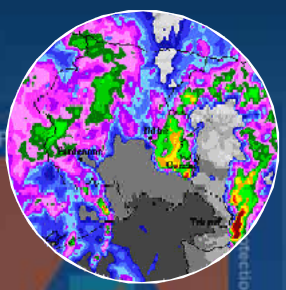
Data modelling: hydrological and hydraulic modelling of hydrographical basins



Precipitation study and flood prediction

Meteorological radar

Fossalon Radar

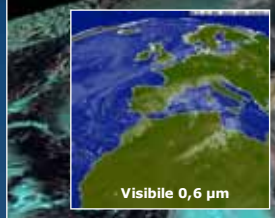


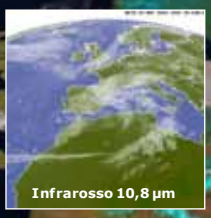
Mount Zouf Plan Radar

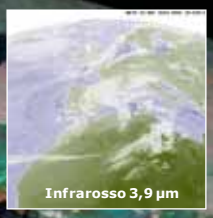
- Meteorological radar data are used for civil protection purposes in order to detect and monitor critical events and, during the phase of meteorological nowcasting, to update and /or modify meteorological alert messages
- The new meteorological radar of DPC installed on Mount **Zouf Plan** is active from autumn 2008 and grants the maximum coverage of the mountain area of FVG and also of part of Carinzia region (Austria) and Slovenia

Satellite observations

- Eumetsat – MSG Meteosat Second Generation (MET-8)



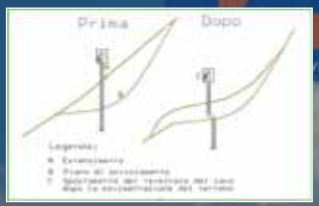




Hydro Geological Monitoring Network - e.g. Passo Pramollo landslide

4-parameters tiltmeters

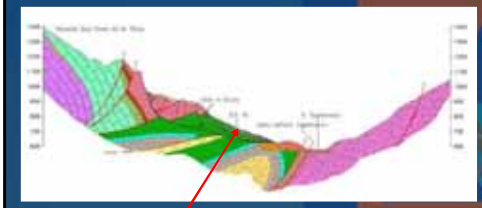
Extensimeters with cable on the surface



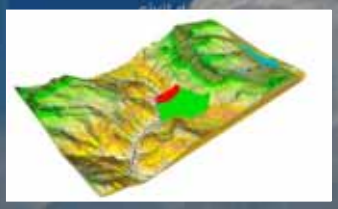
Depth extensimeters

Hydro Geological Monitoring Network - e.g. Passo della Morte landslide

- Active landslide surface : 530.000 m^2
- Active landslide volume: 2.830.000 m^3
- Quiet landslide volume: 15.000.000 m^3
- Deformation velocity: 5 cm/year

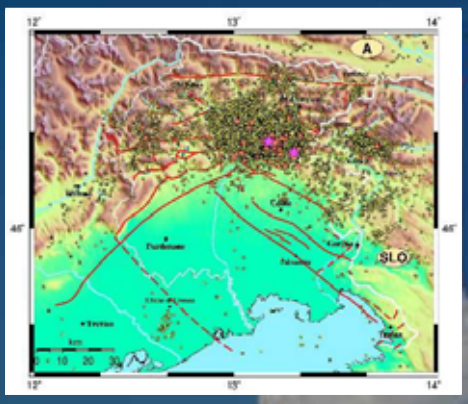


Geology of the area



Seismic monitoring network

Seismic activity



- Evolution of seismic activity

1976 - 2008

- Events recorded: 16987
- Events of magnitude > 2.5: 2257
- Events of magnitude > 4: 77

Monitoraggio sismico in Friuli Venezia Giulia

Reti di monitoraggio sismico → SOR

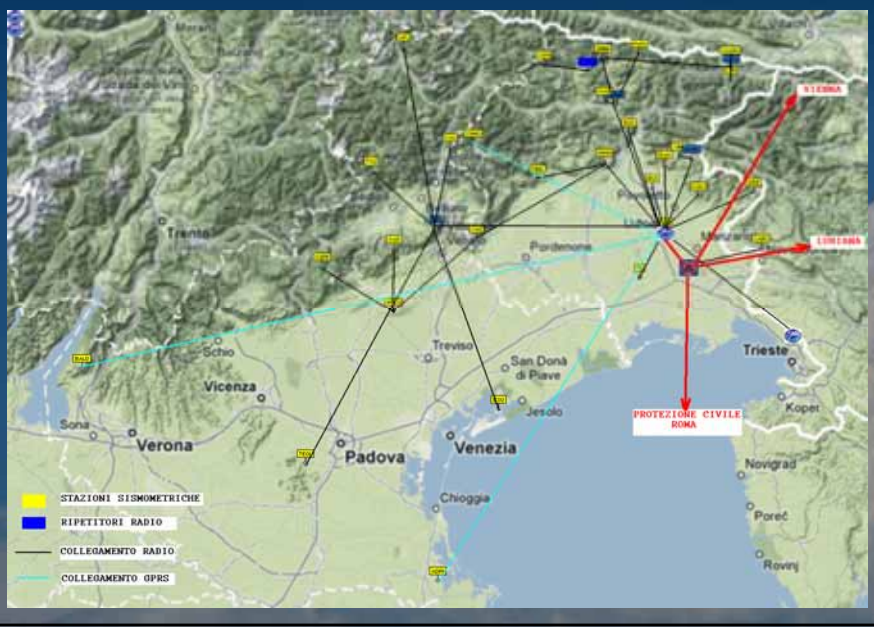
- OGS-CRS — RSFVG
  - 15 stazioni a corto periodo
  - 8 stazioni a banda larga
- DIGEO — RAF
  - 21 stazioni accelerometriche
- PCR — RSDR
  - 6 stazioni a banda larga

Altre reti presenti in regione:

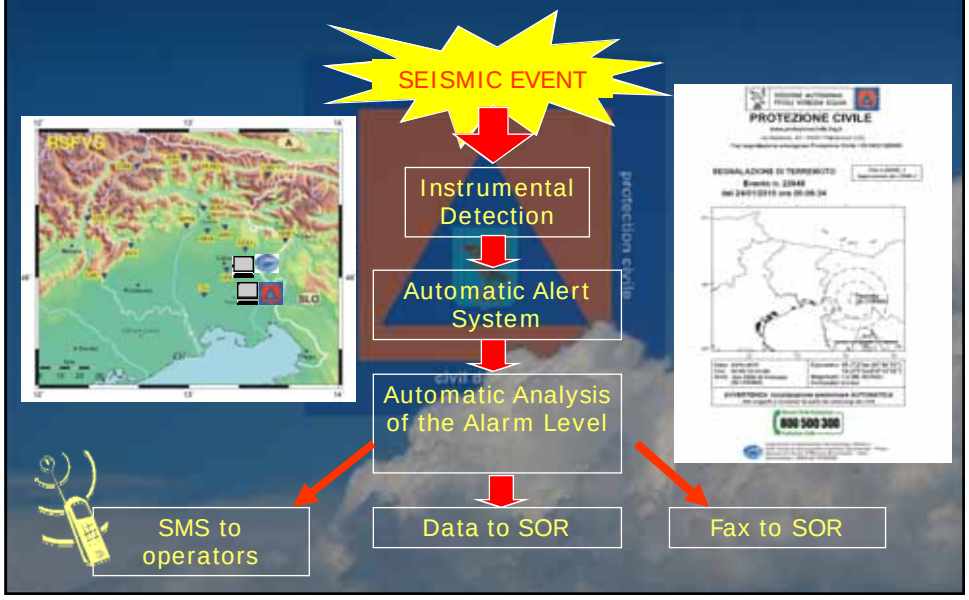
- SSN — 12 stazioni accelerometriche
- INGV — 5 stazioni velocimetriche

65

Assetto attuale della Rete sismometrica e collegamenti con Protezione Civile



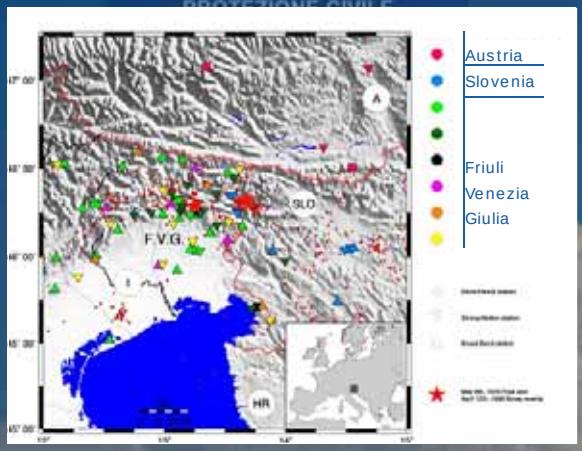
Seismic Alarm System
Information Flow



Seismic monitoring cross-borders networks integration

Interreg IIIA Italy-Austria 2000-2006 'Seismic networks without frontiers in the southeastern Alps'

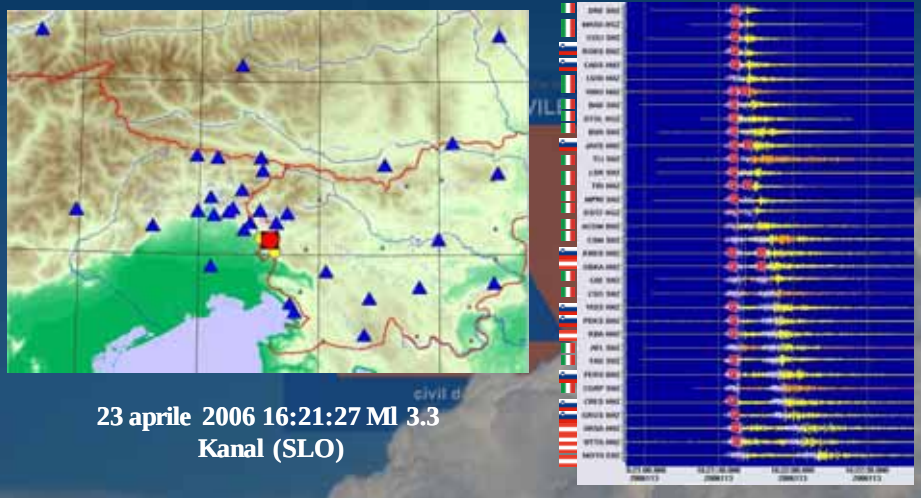
Seismic stations of Italy, Austria and Slovenia involved in the project



Interreg IIIA Italia-Austria 2000-2006

Seismological networks without frontiers in the southeastern Alps:

real-time location EXAMPLE



23 aprile 2006 16:21:27 Ml 3.3
Kanal (SLO)

broad-band data: real time; short-period and strong-motion data:near-real-time; automatic P-picking; manual S-picking

Video Monitoring Network - e.g. Passo Pramollo landslide

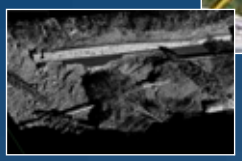
High-tech transmission system cameras

Steel-boxes to avoid air moisture

Cameras and laser-distancemeter connected in real-time to the operative center by means of radio-links, spread-spectrums and GPRS/GSM

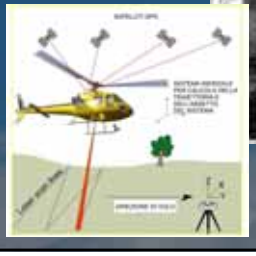
Adavanced Monitoring

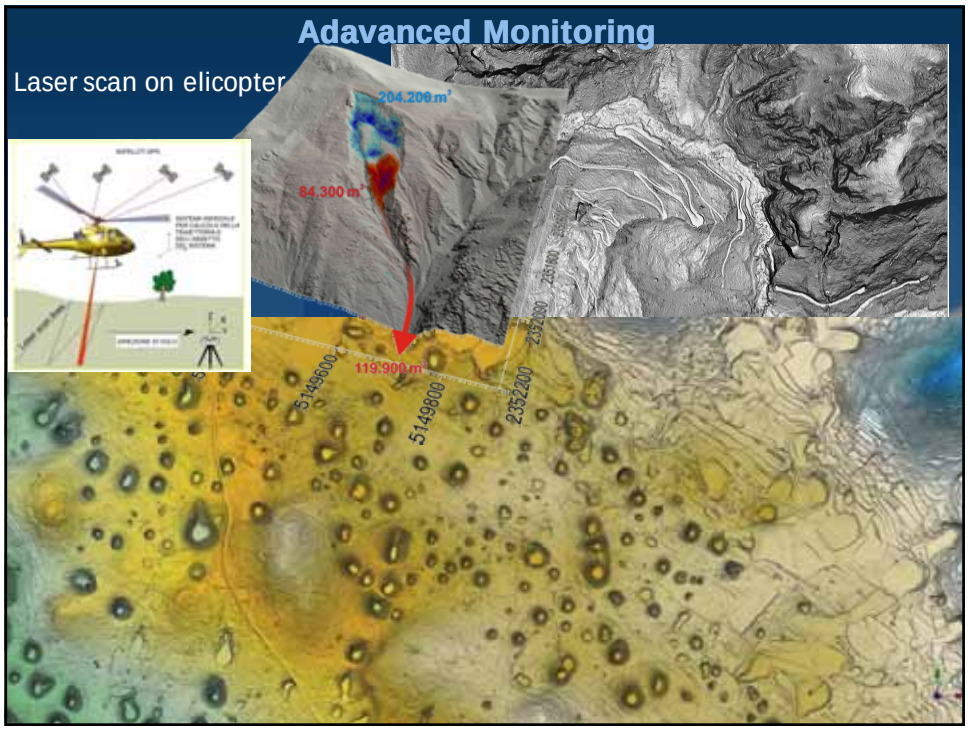
Land Laserscan

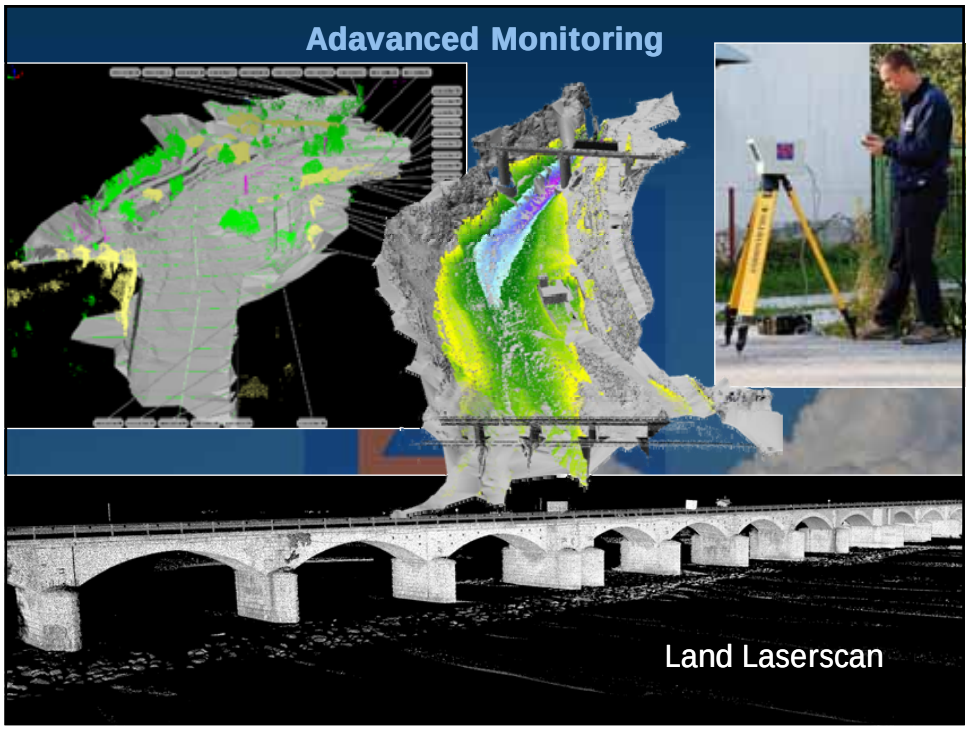


Infrared Thermocamera

Aerial Laserscan




Adavanced Monitoring
Laser scan on elicopter
204.200 m³
84.300 m³
119.900 m³
5149600
5149800
2352200


Adavanced Monitoring
Land Laserscan

Adavnced Monitoring

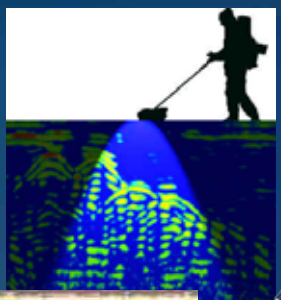
Infrared thermocamera

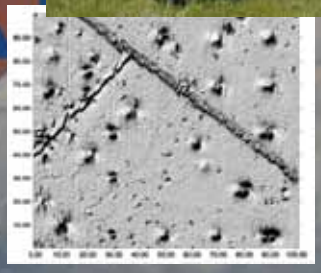
Used for:
- Prevention and monitoring against wildfires
- Search and rescue of lost people in the ground
- Search and rescue in the sea

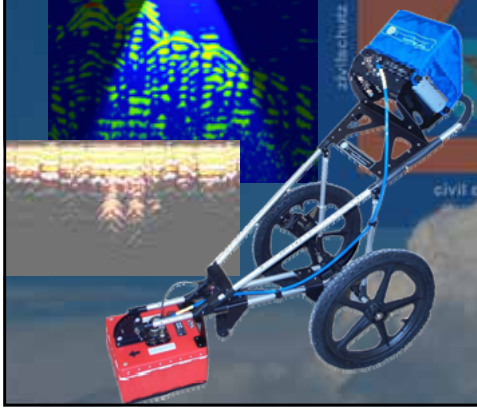
Adavanced Monitoring

Georadar

Cesio Magnetometer







Flood monitoring and emergency planning

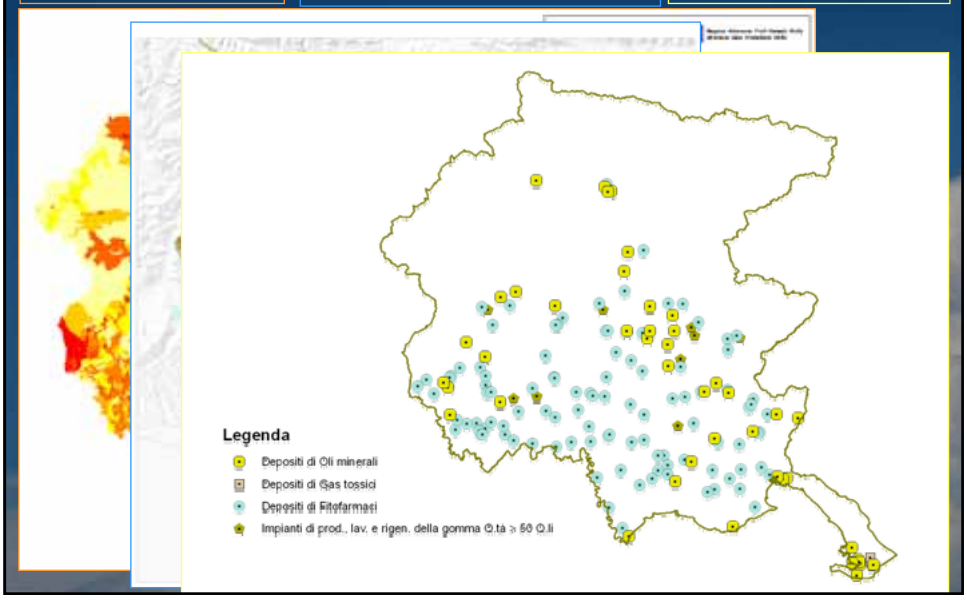
REGIONAL EMERGENCY PLAN
IDENTIFICATION OF RISKS ON LARGE SCALE

REGIONAL PLAN FOR HIGH-WATER SERVICE

Sharing of Databases to create a unique GIS FOR SOIL DEFENSE

REGIONAL EMERGENCY PLAN
IDENTIFICATION OF RISKS ON LARGE SCALE

SEISMIC RISK | ***HYDROGEOLOGICAL RISK*** | ***ANTHROPIC RISK***

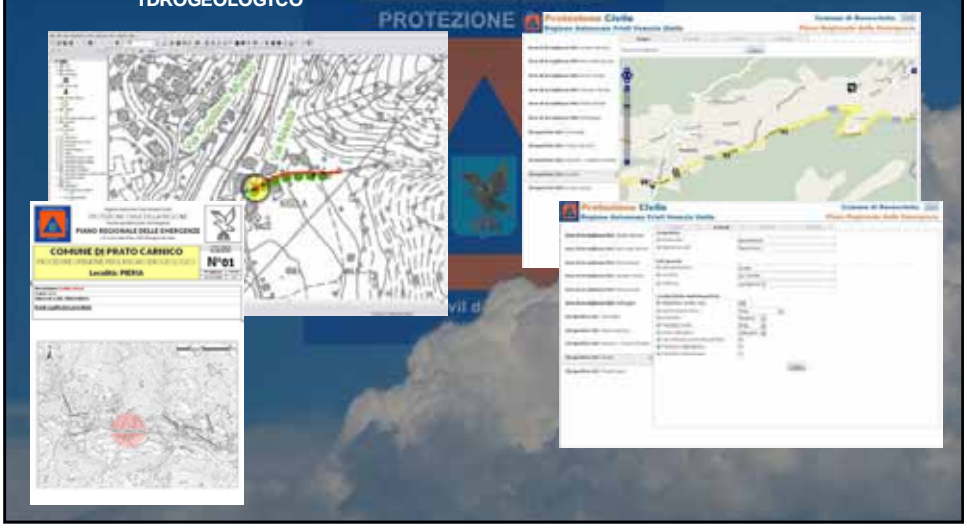


PIANO REGIONALE DELLE EMERGENZE

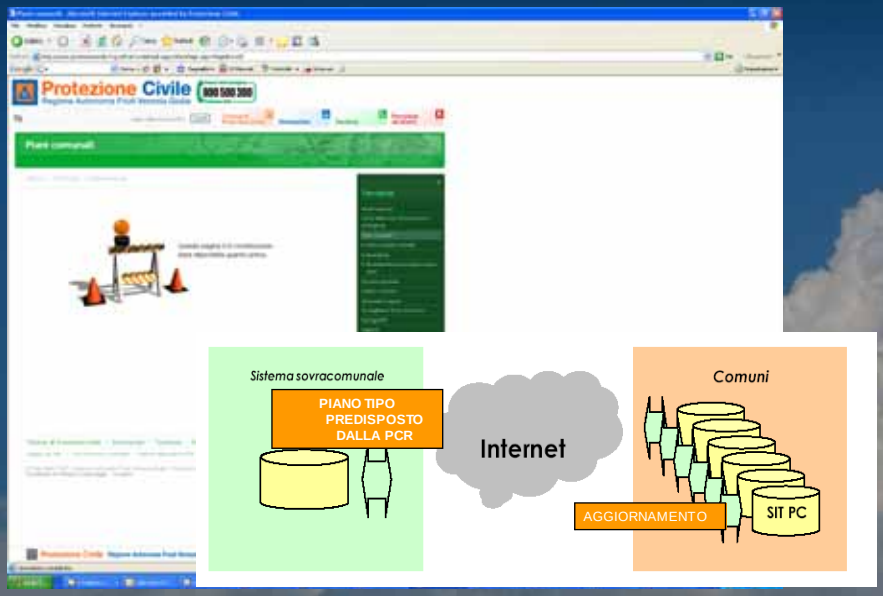
LE ATTIVITA' IN CORSO

REALIZZAZIONE DELLE PROCEDURE OPERATIVE PER IL RISCHIO IDROGEOLOGICO

INDIVIDUAZIONE AREE COMUNALI DI EMERGENZA



I PIANI COMUNALI DI EMERGENZA NEL SISTEMA REGIONALE INTEGRATO DI PROTEZIONE CIVILE



Prevention, quick intervention and restoration works


3 febbraio 2003
Maintenance of water courses
Meduna river – Visinale di Sopra (Pasiano di Pordenone)
Cut of vegetation inside the bed of the river
14 aprile 2003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Flood 2002 – Pordenone embankment's break

Steel screen

Flood 2003 - Ugovizza

Gravel and material removal
from the bed of the creek

Flood 2003 - Pietratagliata

River side defenses and new bridge

Temporary rock cliff defense

Bailey bridge

Esempi di interventi di ripristino a seguito dell'alluvione avvenuta in Val Canale il 29 agosto 2003

Zona colpita nella Frazione di Ugovizza - Comune di Malborghetto-Valbruna

Stessa zona dopo gli interventi di ripristino


Esempi di interventi di ripristino a seguito dell'alluvione avvenuta in Val Canale il 29 agosto 2003
Zona colpita
sulla strada per Passo Pramollo
Stessa zona
dopo gli interventi
di ripristino


Esempi di interventi di ripristino a seguito dell'alluvione avvenuta in Val Canale il 29 agosto 2003
Stessa zona
dopo gli interventi
di ripristino
Zona colpita
nella Frazione di Pietratagliata -
Comune di Pontebba

Esempi di interventi di ripristino a seguito dell'alluvione avvenuta in Val Canale il 29 agosto 2003

Zona colpita
nella Frazione di Pietratagliata -
Comune di Pontebba

Stessa zona
dopo gli interventi
di ripristino

Landslide settlements – Lunze (Tolmezzo)

Works for maintenance of forest tracks on Karst area

- Exercise and works to improve techniques, apply equipments, make a good maintenance of territory

Cleaning of bed of Torre creek

Exercise: building a tent camp

Meetings and exercises at school with civil protection personnel, volunteers and students

Web Portal of Friuli Venezia Giulia Civil Protection

www.protezionecivile.fvg.it