

Joint Research Centre and Civil Protection

- **The Joint Research Centre**
- **Disaster Monitoring system**
- **Public Safety communications**

Research-Based Policy Support

JRC - Robust Science for Policy Making

As a Directorate-General of the European Commission, the JRC provides customer-driven scientific and technical support to Community policy making

Supporting citizen's security, health and environmental protection, safety of food and chemicals, alternative energies, nuclear safety, econometrics, prospective technologies...



Our Structure: 7 Institutes in 5 Member States

IRMM - Geel, Belgium

Institute for Reference Materials and Measurements

ITU - Karlsruhe, Germany

Institute for Transuranium Elements

IE - Petten, The Netherlands

Institute for Energy

IPSC - Ispra, Italy

Institute for the Protection and Security of the Citizen

IES - Ispra, Italy

Institute for Environment and Sustainability

IHCP - Ispra, Italy

Institute for Health and Consumer Protection

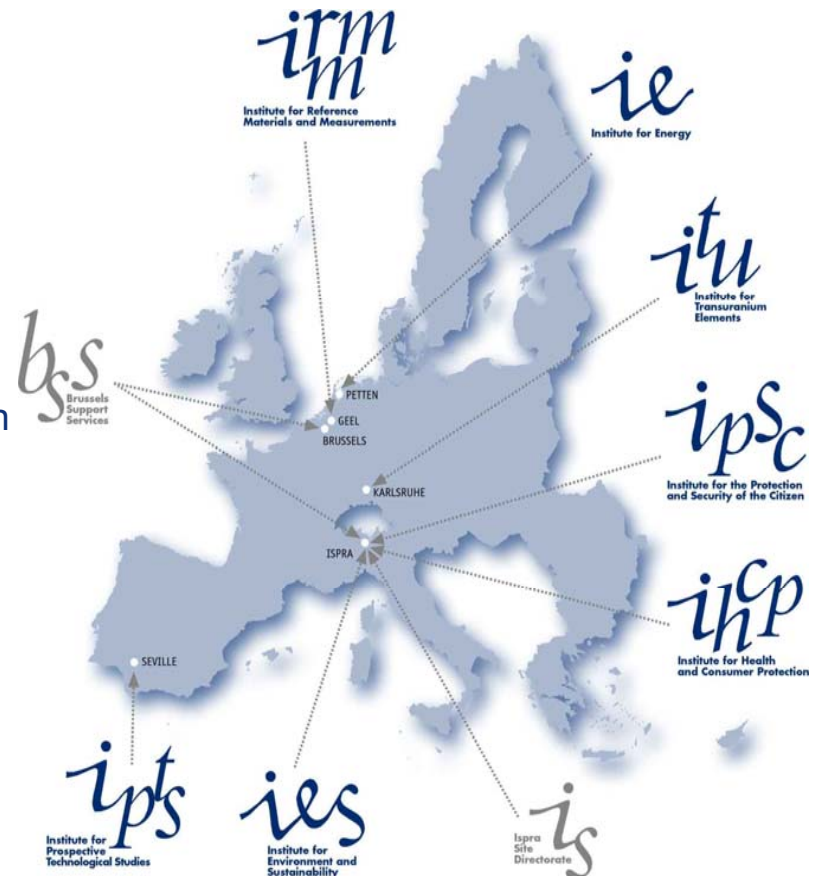
IPTS - Seville, Spain

Institute for Prospective Technological Studies

~ 2800 staff

~ 300 M€/y budget

(+ 40 M€/y competitive income)



Institute for the Protection and Security of the Citizen (IPSC) (<http://ipsc.jrc.ec.europa.eu>)

The mission of the IPSC is to provide research results and to support EU policy-makers in their effort towards global security and towards protection of European citizens from accidents, deliberate attacks, fraud and illegal actions against EU policies

IPSC's core competencies are in the field of engineering and information technologies, including satellite image processing and analysis, open source information analysis, structural mechanics, risk assessment and nuclear safeguards.

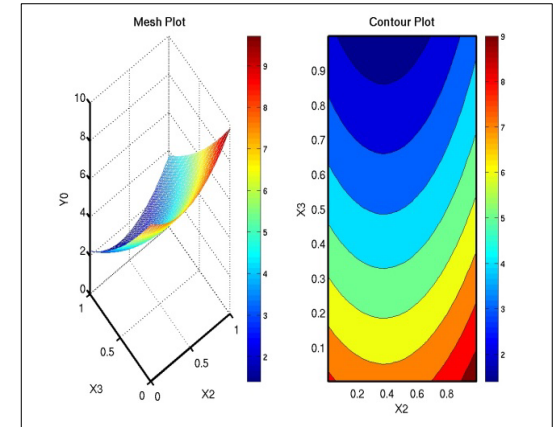
Remote sensing and data analysis



Engineering, simulation & testing



Statistical modelling



- Crisis management
- Agriculture control
- Maritime surveillance

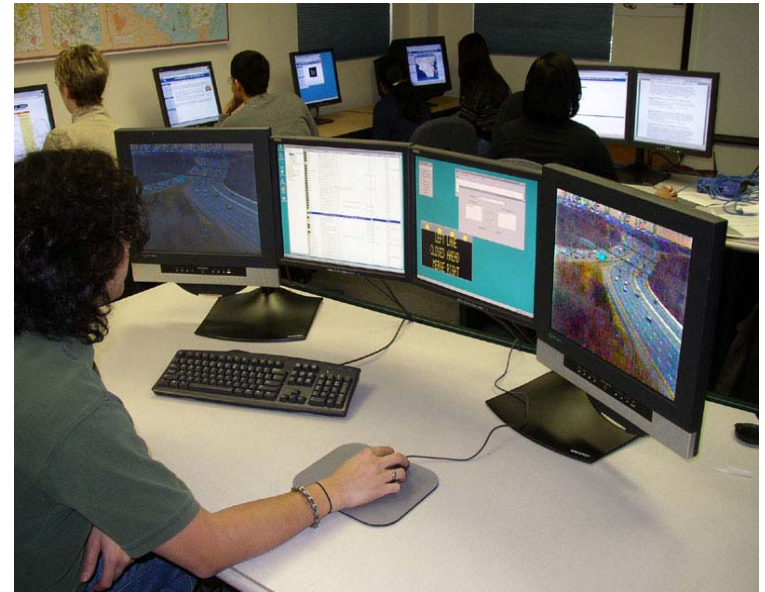
- Critical infrastructures
- Traceability
- Nuclear

- Econometrics
- Composite indicators
- Sensitivity analysis

IPSC is an applied research and development institute, aimed at analyzing, modelling and developing new **security applications**.

Our core competences are:

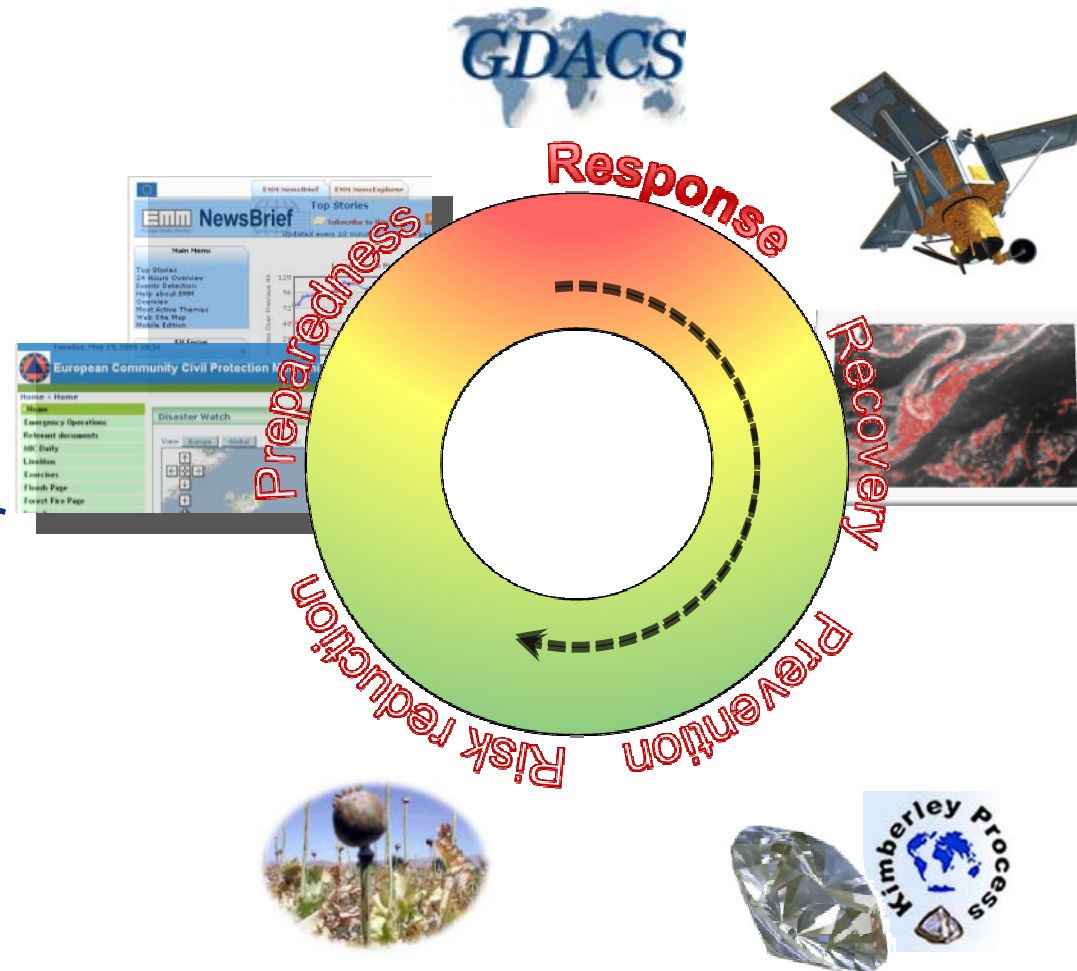
- Information and Communication Technologies
- Engineering
- Complex Systems



IPSC work is focused on **method development**, improvement and assessment, up to prototype implementation. IPSC does **not** perform any **operational** law enforcement nor control activity.

- The Joint Research Centre
- **Disaster Monitoring system**
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- JRC Unit for Global Security and Crisis Management
 - Preparedness
 - **Response**
 - Recovery
 - Prevention
 - Risk reduction
- Alert and response systems for natural disasters
 - Real time systems: **GDACS**
 - Physical and risk modelling
 - Strong practitioners community
 - Multidisciplinary scientific community



- GDACS: system for **international disaster response** community
 - Information gap in the initial response phase
 - Monitoring
 - Impact / risk analysis
 - Information integration
 - 10000 active users of 184 countries
 - Secretariat: OCHA

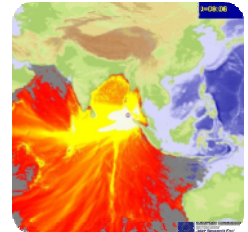


- Open access, standards
 - OGC, INSPIRE, Web2.0
 - GLIDE number

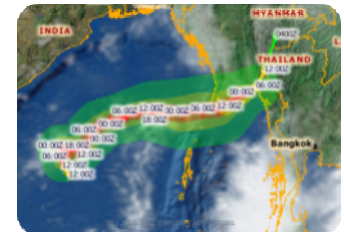


- JRC's role: alert and monitoring system

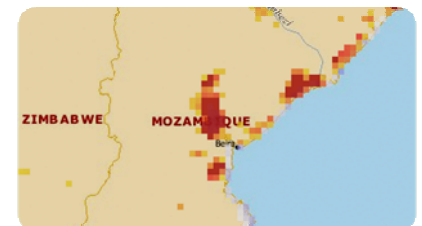
- Earthquakes and tsunamis
 - 13 scientific partners
 - Tsunami modelling
 - Impact modelling



- Tropical cyclones
 - 2 scientific partners
 - Wind modelling
 - Impact modelling



- Volcanic eruptions, Floods
 - 6 scientific partners
 - New scientific monitoring networks

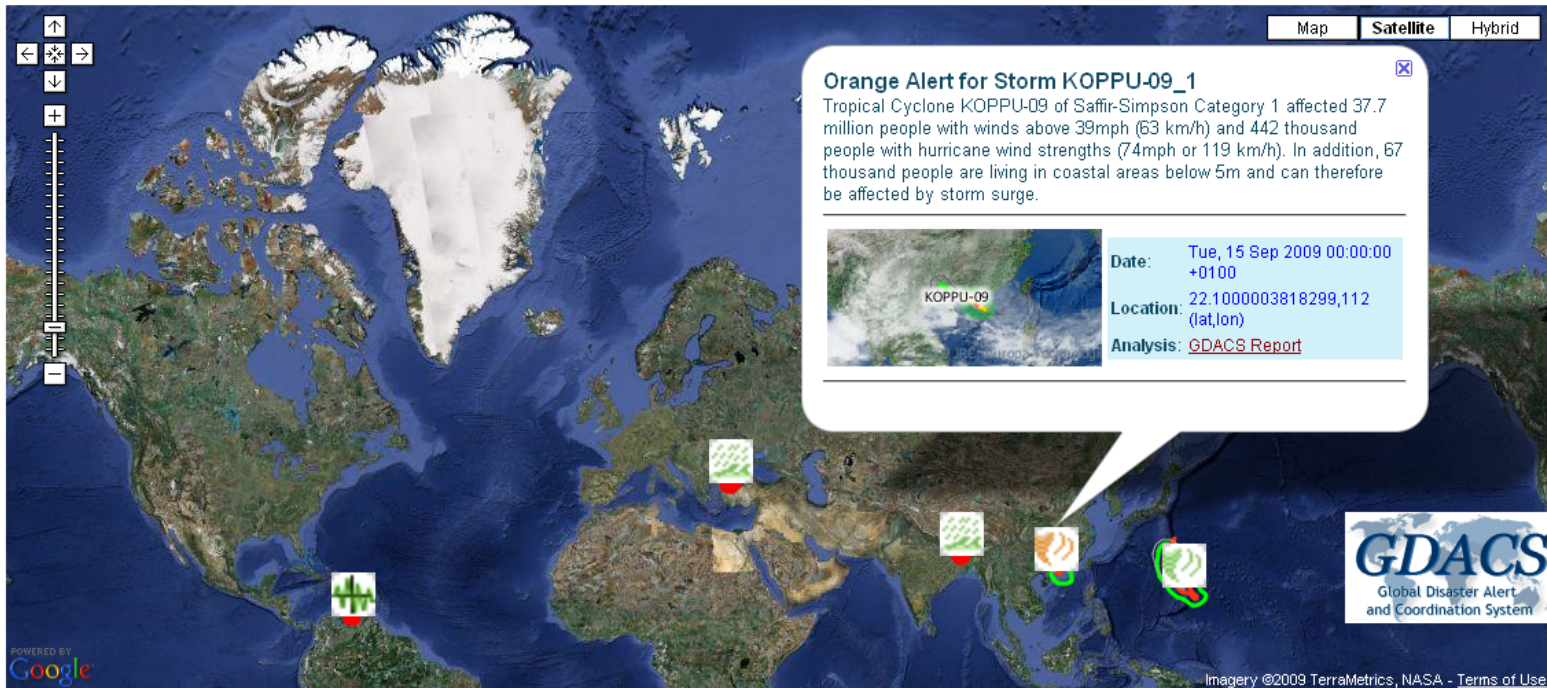




The Global Disaster Alert and Coordination System provides near real-time alerts about natural disasters around the world and tools to facilitate response coordination, including media monitoring, map catalogues and Virtual On-Site Operations Coordination Centre.

New and ongoing disasters

Reload page every 60 seconds



This google map mashup is using the GDACS KML file: <http://www.gdacs.org/xml/gdacs.kml>



GDACS Red Earthquake Alert Chile

EUROPEAN COMMISSION JOINT RESEARCH CENTRE
Office for the Coordination of Humanitarian Affairs

Summary

On 2/27/2010 6:34:14 AM UTC (about 01:42h local time) an earthquake of magnitude 8.8 occurred in the moderately populated region of Bio-Bio in Chile. The earthquake happened 104km from Concepción. The nearest populated places are: [None]. The closest civilian airport is Quivolgo (88km).

It is likely that a tsunami was generated. The maximum tsunami wave height near the coast of **Tres Esquinas** will be **8.65m**. Please refer to the [GDACS tsunami report](#) for more details.

Potentially affected critical infrastructure:

- Nuclear plants:** [None]
- Hydrodams:** [None]
- Airports:** Los Angeles (177km), La Playa (148km), Siberia (167km), Carriel Sur International (98km), General Bernardo O Higgins (119km), Linares (134km), Panguilemo (142km), Quivolgo (88km)
- Ports:** Lebu (198km), Puerto Yana (173km), Lota (135km), Coronel (127km), San Vicente (94km), Lirquen (90km), Talca (89km), Talcahuano (88km), Torme (81km), Constitución (87km)

Based on an automated impact model, this earthquake, which occurred in a region with **low vulnerability** to natural disasters, has potentially a **high humanitarian impact**.

Whether international humanitarian aid is needed must be decided by an expert.

Event Date Univ. Time: **Sat, 2/27/2010 06:34 UTC**
 European Time of the event: Sat, 2/27/2010 07:34 CET (Brussels, Paris, Rome)
 East America Time of the event: Sat, 2/27/2010 01:34 EST (New York, Washington)
 West America Time of the event: Fri, 2/26/2010 22:34 PST (San Francisco, Los Angeles)
 East Asia Time of the event: Sat, 2/27/2010 15:34 JTI (Tokyo)

This email report was automatically created by a computer at: 3/24/2010 8:51:41 AM UTC (25 day(s)2 hours 17 minutes after the event)

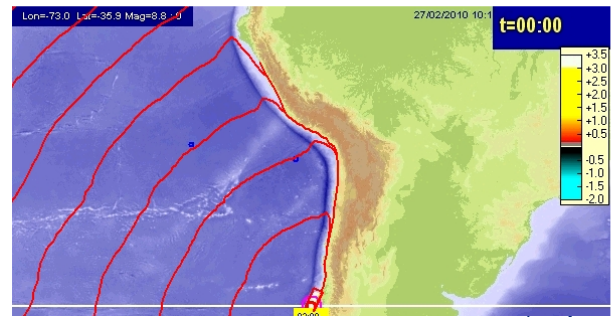
See the [GDACS website](#) for live news coverage (including OCHA Situation Reports), the [full earthquake report](#) and [tsunami report](#).

For information on emergency response, please consult the [GDACS Virtual OSOCC](#).

Tsunami Event

It is likely that a tsunami was generated. Based on precalculated scenarios, the maximum tsunami wave height near the coast of **Tres Esquinas** will be **8.65m**.

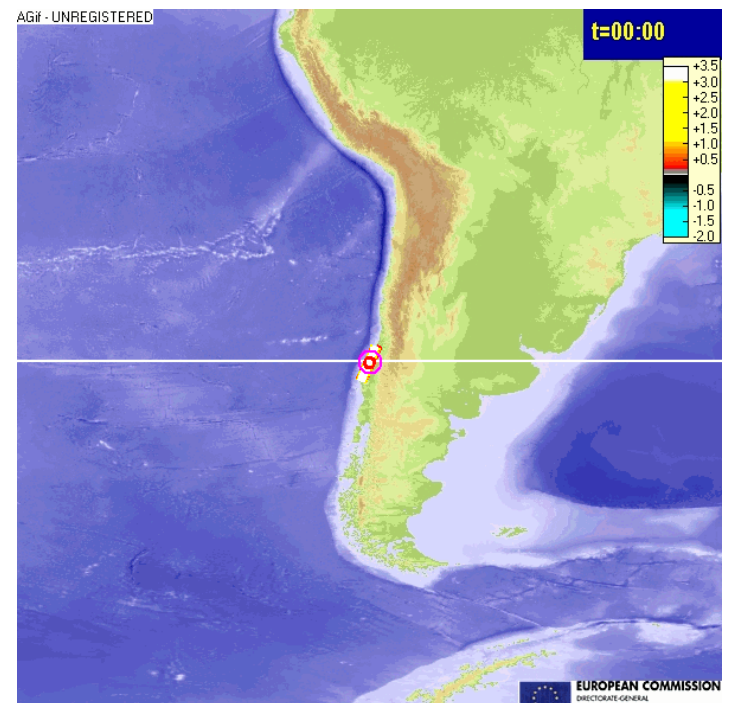
A detailed tsunami wave height calculation is ongoing and should be available 20 minutes after this report was created. Results can be slightly different than the precalculated scenario. The outcome can be checked here: [GDACS tsunami report](#).



GDACS system (times relative to event)

- 23 min** Detection of earthquake, but inaccurate
- 43min** Detection of strong EQ through NEIC
- 53min** GDACS Red tsunami Alert
- 53min** GDACS report published on-line
- 53min** **SMS, Email, Fax alert sent to 11000 users**

all automatic



GDACS system (times relative to event)

collaboration of first responders

12 Jan 21:53

18 min GDACS/JRC red alert

1h GDACS Virtual OSOCC topic created

1h30 UNDAC Alert Message



<4h Media “no reports of casualties”

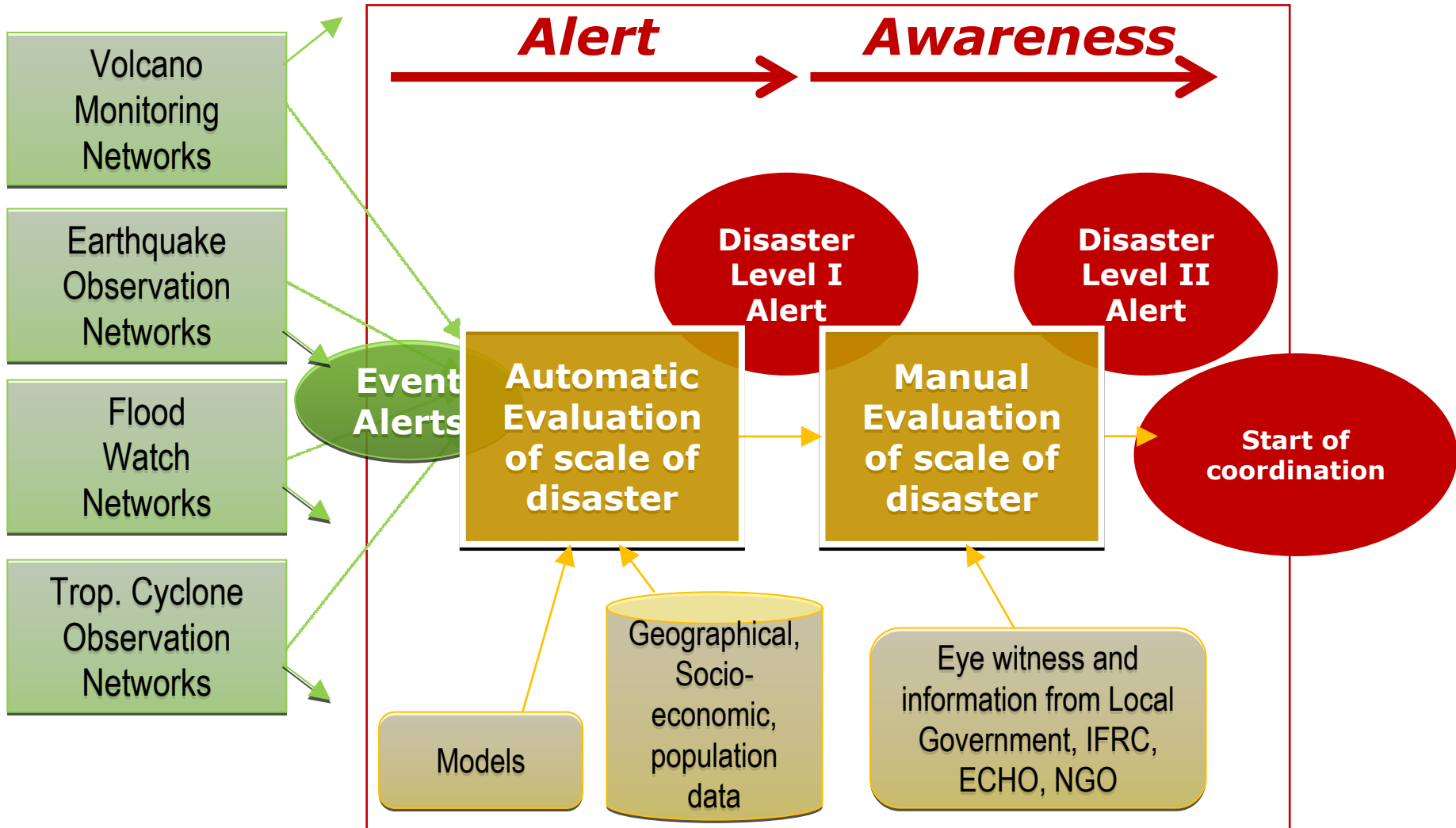
4h Media reports “many deaths feared”

18h Media reports “hundreds / thousands death”

16 Jan First satellite based damage map



The screenshot shows a web browser displaying the UNOSAT website. The address bar shows the URL: http://unosat.web.cern.ch/unosat/asp/prod_free.asp?id=52. The page features the logos for UNOSAT, UNITAR, and OCHA. Below the logos, there is a section titled "MAPS" with a search bar containing "Haiti" and a "Show" button. A specific map is highlighted with a pink header: "EQ-2010-000009-HTI". The map title is "Intensity of Building Damages in Delmas Commune, Haiti". The product details include: Product ID: 1436 - 3 Mar, 2010 - English; GLIDE: EQ-2010-000009-HTI. The description states: "This map presents an interpolated building damage intensity surface as assessed from both satellite and aerial survey imagery covering Delmas Commune, Haiti. Damaged buildings were classified according to visually-assessed damage levels according to the EMS-98 classification system. This work is done at the request of UNDP, and in support of the UN-led efforts in the aftermath of the Haiti earthquake. Swisstopo and the Remote Sensing Laboratories (RSL) at the University of Zurich provided extensive pre-crisis building data in direct technical support of this UN damage analysis. Initial reference data were received from collaborative centers (European Commission JRC with the support of the Stability Instrument; Serti/Space Charter) and other supporting entities (ITHACA, DLR, OSM). This analysis will be validated in the field during PDNA and recovery activities. Map scale for A3: 1:24,000; Projection: UTM Zone 18 North - NAD-83." The source information includes: Source(s): Satellite Data : WorldView-2; Imagery Dates : 19 Dec.2009 / 7-15 Jan. 2010; Resolution : 50cm; Copyright : DigitalGlobe; Aerial Photos : NOAA / Google; Imagery Date : 18 Jan / 21 Jan 2010; Copyright : NOAA / Google; Source : USGS / ERDAS APOLLO WMS; Building Data : Swisstopo/RSL-Zurich/UNOSAT; Landcover Data : CNIGS, Infoterra, OSM, OCHA; Road & Urban Data : Open Street Map; Place Names : OCHA, Google Map Maker; Other Data : MINUSTAH, USGS, NGA.



- The Joint Research Centre
- Disaster Monitoring system
- **Public Safety communications**

- Interoperability barriers among the wireless equipment and systems of the various public safety organizations.
- Public Safety responders need high communication bandwidth to transmit images and video.
- Public safety organizations must operate in uncertain conditions and difficult environments both at physical and spectrum perspective (interferences)
- Public safety operations are usually unplanned and communications facilities are not guaranteed.
- Public Safety users may not have the terminals related to the wireless networks existing in the emergency area.
- Evolving Technologies and standards may cause the existing wireless equipment to become obsolete. Equipment lifecycle can be a problem.

WINTSEC

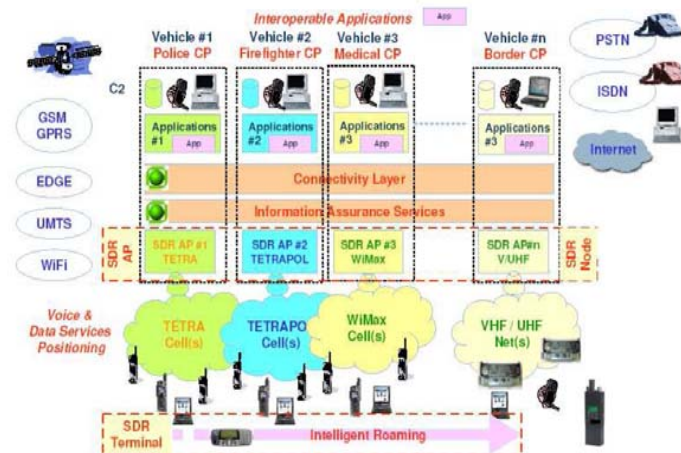
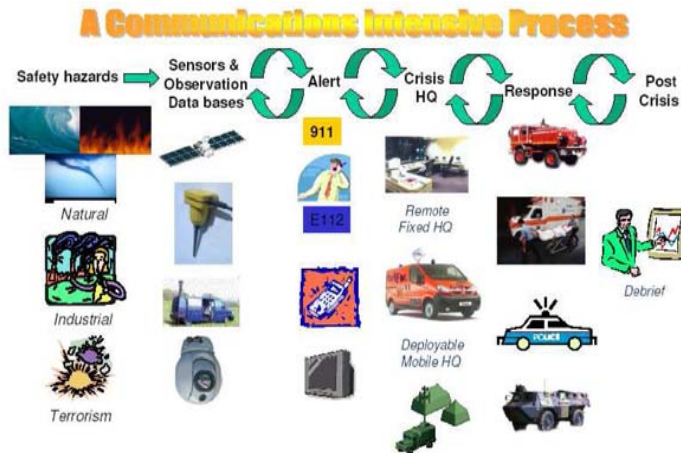
(Wireless INTeroperability for SECurity)

Crisis management for homeland security is a **communication intensive** process with involvement of **many Public Safety agencies** and actors, generally relying on their own procedures and communication systems.

Therefore, Public Safety agencies face communication **interoperability challenges** for day-to-day operations and pre-planned responses, as well as responses to unplanned major incidents.

With the support of End-Users from 6 EU nations, WINTSEC explores a mix of complementary **solutions to overcome the barriers** for wireless interoperability across different agencies, taking into account the constraints of the security services and the legacy base.

In WINTSEC, the **IPSC** is the **leader** of the **Certification Environment** study, in Reference Implementations, Platform and Waveform Certification, Waveform Repositories and Certification Centre Networks.

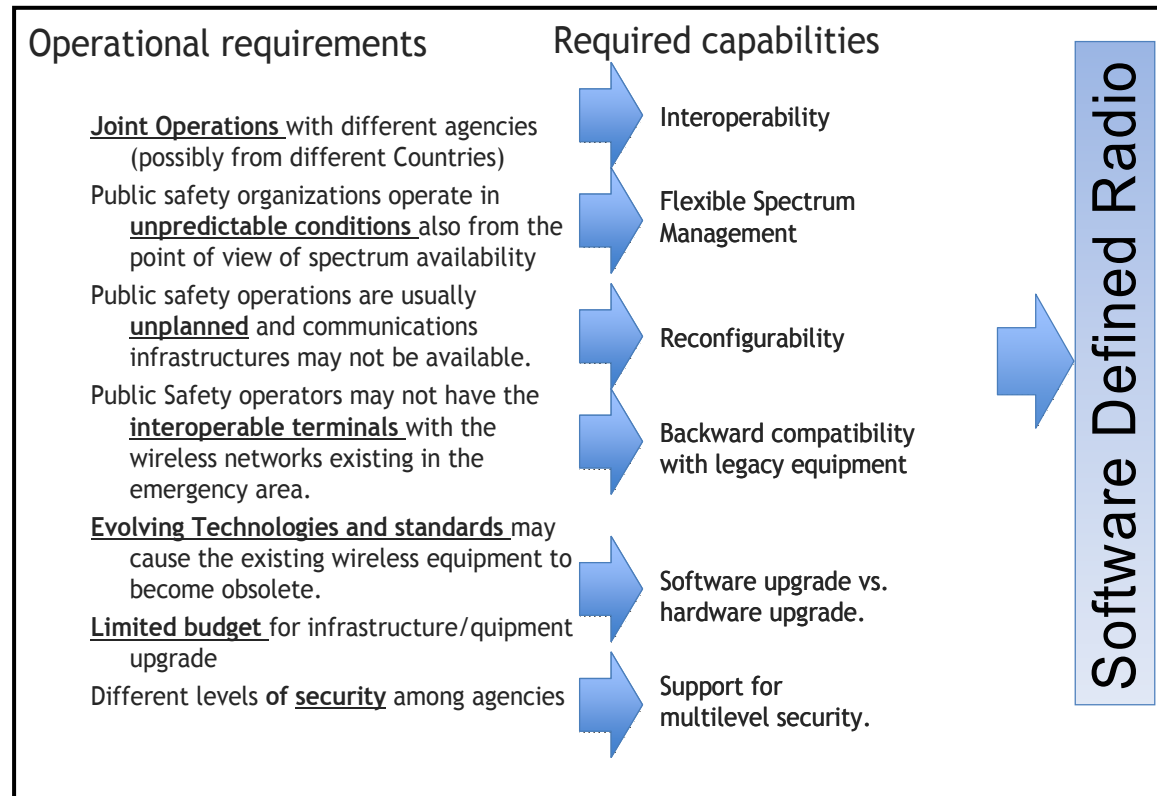


EULER (EUropean Software defined radio for wireLEss in joint security operAtions).

EULER collaborative research project gathers main European actors to demonstrate how the benefits of Software Defined Radio can be leveraged in order to enhance interoperability and fast deployment in case of crisis needed to be jointly resolved.

THALES France is the Project Coordinator

In EULER, IPSC is the leader of the User Requirements work package





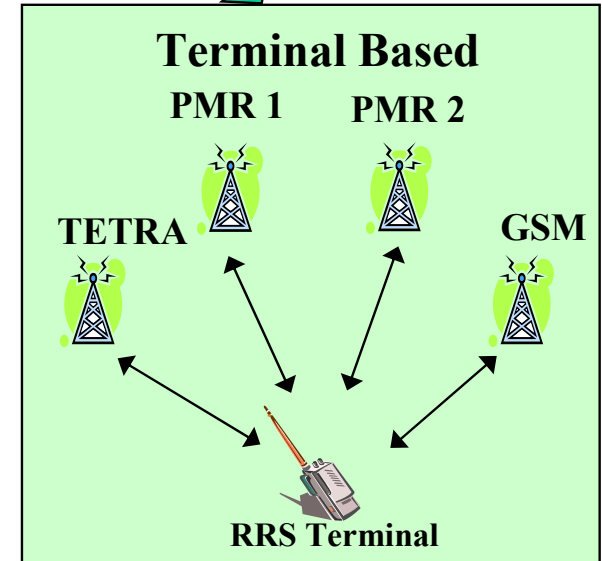
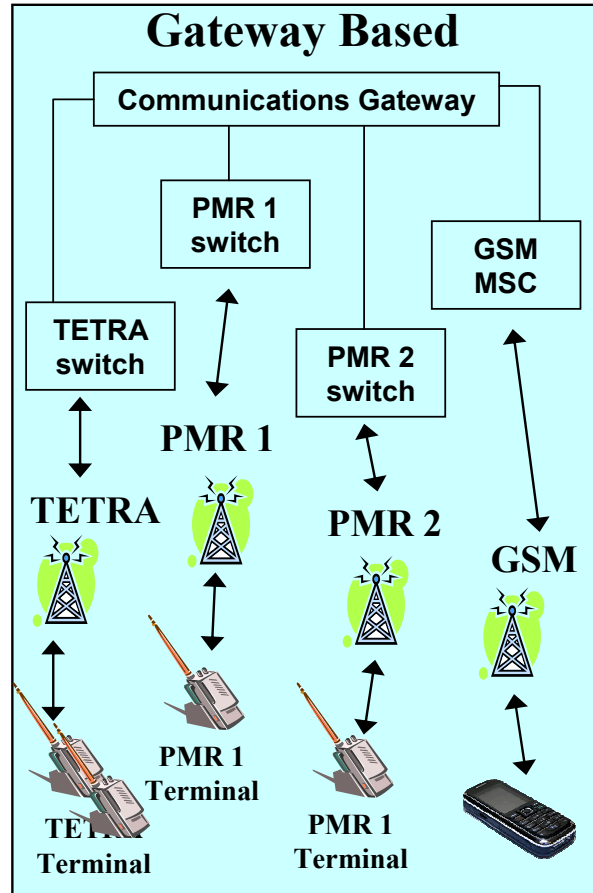
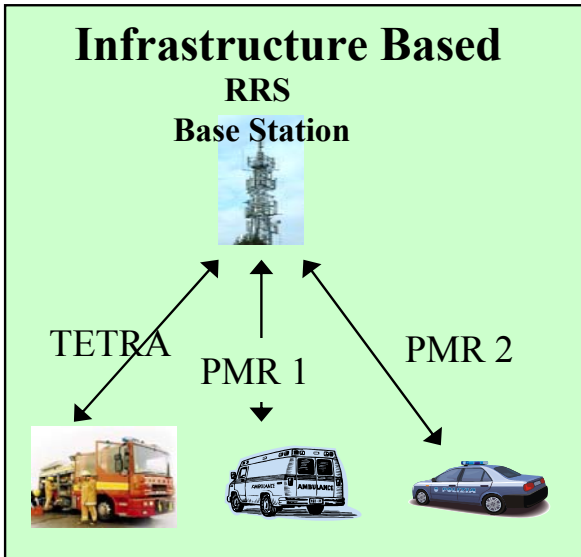
TC RRS shall have responsibility:

- of standardization activities related to Reconfigurable Radio Systems encompassing system solutions related to Software Defined Radio (SDR) and Cognitive Radio (CR);
- to collect and define the related Reconfigurable Radio Systems requirements from relevant stakeholders;
- to identify gaps, where existing ETSI standards do not fulfil the requirements, and suggest further standardization activities to fill those gaps;
- to deliver its findings in the form of ETSI deliverables as appropriate;
- to provide ETSI with a major centre of expertise in the area of Reconfigurable Radio Systems.

Four working groups: WG4 focused on public safety.
Interoperability and broadband connectivity are still the main challenges

Reconfigurable Radio Systems and Public Safety

Gateway Approach



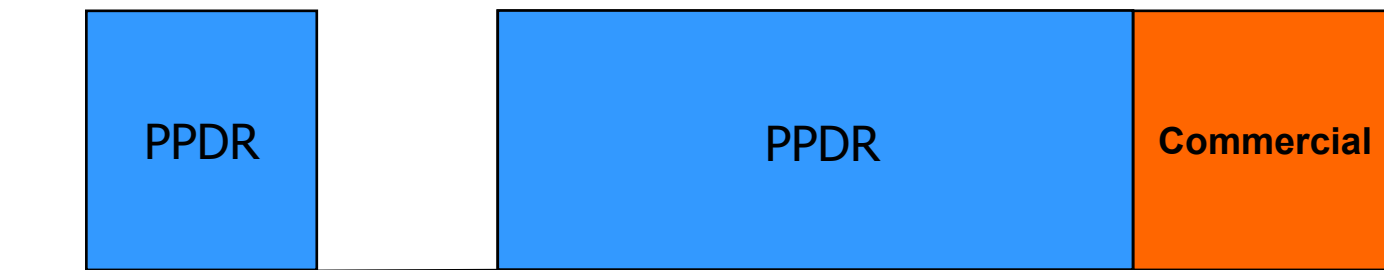
Spectrum usage patterns in commercial networks and PPDR can be quite different:

- Commercial networks have predictable spectrum usage patterns based on users habits (work, night/day).
Average revenue per unit (ARPU) is the main requirement.
Resilience and QoS are important, but mainly in relation to ARPU.
- Public Safety networks may need additional spectrum in consequence of unpredictable events (natural disasters) or predictable events (major event).
Resilience, Security and QoS are critical requirements.

A concept explored in ETSI TC RRS and TETRA is to increase spectrum utilization by spectrum sharing.

Public Safety would be the primary owner of the spectrum bands, but it would allow commercial users to use them or a portion of them during routine operations.

At the occurrence of a major event or natural disaster, Public Safety organizations would pre-emptively gain back the spectrum bands by notifying the secondary users (networks and terminals)



Public safety will be the “licensee” who will be in “control” of the sharing procedure

The majority of the member states in Europe have, during the last 10 years, deployed public safety (PS) wireless networks based on TETRA and TETRAPOL digital technology.

In comparison to commercial networks, which are fully interoperable, there are still interoperability barriers between TETRA and TETRAPOL networks.

In the Council Recommendation on improving radio communication between operational units in cross-border areas (Doc. 10141/09 ENFOPOL 143 TELECOM 116 COMIX 421) of the 4-5 June 2009, the European Council therefore the need for interoperability between PS digital radio systems.

Border Security operations and the resolution of cross-national emergency crisis can be seriously affected by lack of interoperability.

WORKSHOP

“Interoperable communications for Safety and Security”

Organized by DG ENTR and JRC, supported by EUROPOL

**JRC, Ispra (Va), Italy
June 28 & 29, 2010**

Workshop objective:

The objective of the workshop is to identify the research activities and enablers, which can improve the interoperability and capabilities of public safety organizations in Europe.

Many thanks for
your attention

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