



# RECIPE

**Reinforcing civil protection capabilities into  
multi-hazard risk assessment under climate  
change**

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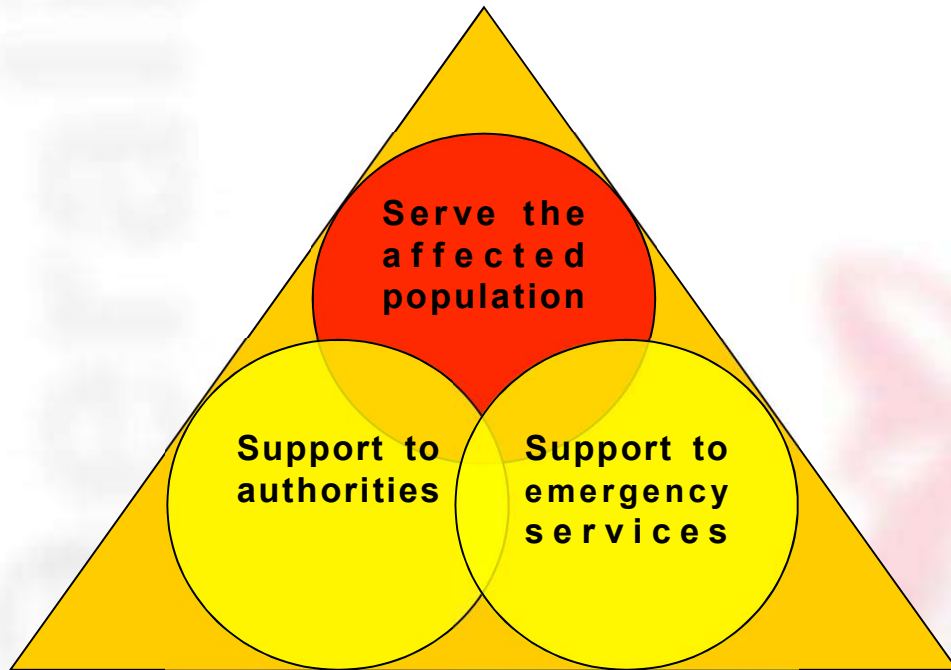
## Catalonia's Civil Protection Directorate

- The mission is to reduce the impact of emergencies on people (collective emergencies), on property and on the environment
- The civil protection in Spain is organized in three levels according to the three different administrations: state, regional or municipal (town hall). Civil protection system.
- The Catalan Civil Protection Directorate is an organism of the regional government.
- Catalonia has its own emergency services: police, fire service, medical service, geological service, weather service, etc.
- Municipal civil protection volunteer



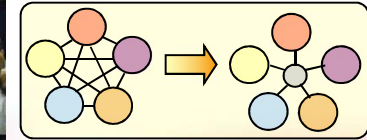
# Global Emergency management

## Goals in emergency



## Roles in emergency

### ❑ Coordination



### ❑ Information management



### ❑ Logistic services





## Global Emergency management

Two levels of coordination and management:

- Global Catalonia (strategic coordination): CECAT. In contact with all the agencies. Technical positions for the different agencies involved.
  - Global vision
  - Dealing with centers of different agencies
  - High direction and strategic decisions.
  - Less detailed information
  - Wide scope
  
- Coordination on site (Incident Command Post) and also municipal coordination centers.
  - Operatives emergency resources
  - Territorial scope
  - More operative decisions
  - More direct pressure of the affected people







## Examples of emergencies in Catalonia

Wind episode, 2009



- An extraordinary episode of strong wind occurred on January 2009.
- The wind caused 7 deaths and 12 injured in Catalonia.
- Extraordinary levels of wind speed values (up to 216km/hour)
- It was a global episode that affected all the country.
- The wind tore off trees, roofs, billboards, building walls, etc.



## Examples of emergencies in Catalonia

### Wind episode, 2009



- 30.000 hectares of forest had been damaged (potential combustible material for forest fires)
- Firefighters made more than 1.600 services.
- In Sant Boi city, the wind tore off a sports center roof, and 4 children died (**emergency into de emergency, incident of multiple victims**)
- Strong winds affected electricity supply in more than 150.000 homes.
- Disruptions to rail services and the rail company orders to decrease the trains speed



## Examples of emergencies in Catalonia

Wind episode, 2009



- For the first time, an emergency plan for a wind episode was activated.
- There was no historical record of a wind event like this. (The population did not remember winds of these features)**
- There wasn't a specific emergency plan for wind and was created after this episode.
- Episodes of strong winds have increased in recent years.**





## Examples of emergencies in Catalonia

### Snowfalls, 2010



- Mainly affected de north-east of Catalonia.
- 8 March, at the end of the winter
- Barcelona had not experienced heavy snowfalls since 1986. Sever traffic problems
- Electrical supply failure by the collapse of electrical towers due to the ice weight. The cuts affected 220.000 subscribers.





## Examples of emergencies in Catalonia

### Snowfalls, 2010

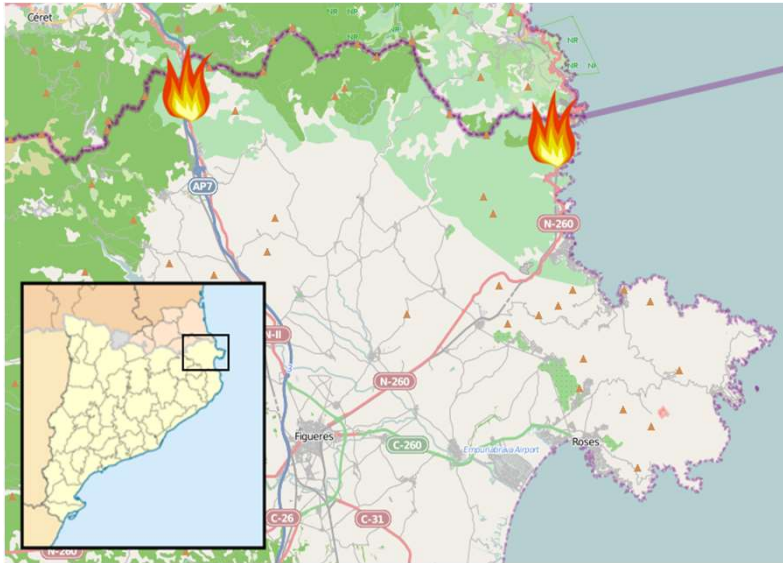


- Power cuts were very persistent (4-5 days) and in some places lasted 11 days.
- Cuts of communications: telephone and radio, and water cuts.
- Radio communications of the emergency services also failed.
- Some populations and houses were isolated by the snow.
- Checking door to door to know the people situation and in some cases, provide water, foods, blankets, etc.



## Examples of emergencies in Catalonia

### Forest fire, 2012



- On July 22, 2012 two fires in Alt Empordà lasted three days.
- Strong wind episode. Flames of more than five meters high.
- Jonquera fire affected 13.800 hectares, 19 municipalities and caused two deaths.
- Portbou fire burnt 50 hectares and killed two people trying to escape the flames



## Examples of emergencies in Catalonia

### Forest fire, 2012



- The fire threatened 19 towns reaching homes and burning some of them.
- Eight people were hospitalized, six of them with serious injuries.
- Main roads closed. Rail cuts (train line to France)
- The authorities ordered the confinement of the population
- 1.300 people were moved to emergency shelters.





## Examples of emergencies in Catalonia Forest fire, 2012



- Smoke perceived in Barcelona
- Catalan firemen worked together with firemen of France and Spanish Army to extinguish the fire.
- 3.200 subscribers without electricity and 1.700 without phone.
- Combustible material (wood) generated in episodes of wind and snow are not properly removed.



## Examples of emergencies in Catalonia

Flood, 2013



- The Vall d'Aran, highest valley of the Pyrenees. Population 7.130.
- Holds the only Catalonian river to flow into the Atlantic Ocean through France, the Garona River.
- June 2013 severe flood due of
  - Heavy rainfall over a short period of time more that 100 litres/m<sup>2</sup>
  - High temperatures: **snow melting**.





## Examples of emergencies in Catalonia

### Flood, 2013



- Rivers burst its banks damaging roads by cracking the pavement or **triggering landslide**. Bridges were destroyed. Closed roads
- Some villages remained isolated, and therefore the provision of food and bottled water had to be done by helicopter.
- Water supply services run out of order in many places.
- Petrol powered generators and water tank trucks from outside the valley were mobilized to supply electricity and to deliver drinking water





## Examples of emergencies in Catalonia

### Francolí Flood, 2019

- Front of heavy rain and storms from south to north
- In general exceeding 100 l/m<sup>2</sup> but in the counties of *Baix Camp*, *Conca de Barberà* and *Les Garrigues* exceed 250 liters / m<sup>2</sup>.
- Main impact in the south of Lleida and Tarragona.
- 4 victims / 3 disappeared
- Derailment of a goods train and also other impacts in rail transport





## Examples of emergencies in Catalonia

### Francolí Flood, 2019

- 40 cuts of roads
- 20.000 clients without electricity
- School transport affected
- Also floods in the Barcelona area where the Besós river multiplied its flow by 60.
- Breakage of the Old Bridge of Montblanc
- The water drags bungalows and some buildings







## Examples of emergencies in Catalonia

Gloria storm, 2020

- Simultaneity of risks (wind, snow, waves and heavy rain, causing floods)
- Long duration (five days),
- Intensity (meteorological records and volume of incidents)
- Extent (almost all of Catalonia).
- Quantities of more than 300 l/m<sup>2</sup> (and even 400!) accumulated in some areas of the NE and Southern third of Catalonia (counties of Ripollès, La Garrotxa, Alt Empordà, the Transversal mountains, the Montseny massif, as well as in Massif dels Ports).
- Snowfall, thicknesses from 50 to 100 cm of new snow have accumulated. The heaviest snowfall in the Eastern Pyrenees.
- Exceptional coastal waves: + 5m on the coast and + 13m offshore.







## Examples of emergencies in Catalonia

Gloria storm, 2020

- Special impact on the Ebro Delta, where seawater penetrated up to three kilometers inland, flooding up to 3,000 hectares of rice fields, destroying shoulder platforms and preventing the departure of fishing boats.
- Significant floods and overflows of the rivers, especially the Ter and the Llobregat
- Upstream dams with important outflows of water: Siurana and La Baells
- Confinement of about thirty municipalities (restriction on mobility and ban on spending the night on the ground floors) specially in the Ter basin.
- 4 dead in Catalonia (13 in Spain)

Rupture of the Petroli Bridge  
in Badalona





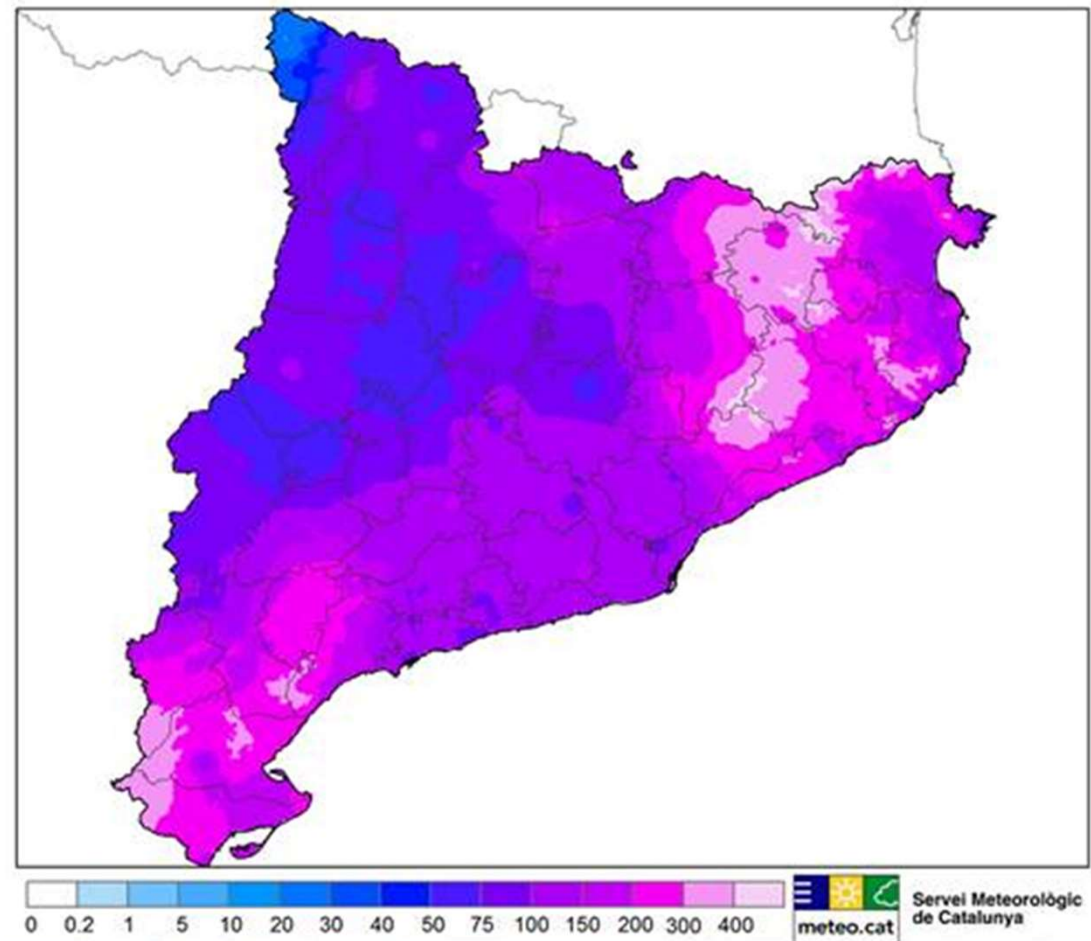
## Examples of emergencies in Catalonia

Gloria storm, 2020

- ❑ Cuts in electricity and drinking water supply (12 small villages without water)
- ❑ 70 affected roads
- ❑ 15.000 calls to 112
- ❑ Landslides



Precipitació acumulada (mm)  
Del 19 al 23 de gener del 2020 (fins a les 10h)  
S'ha obtingut a partir de 261 pluviòmetres de la XEMA i de la XOM

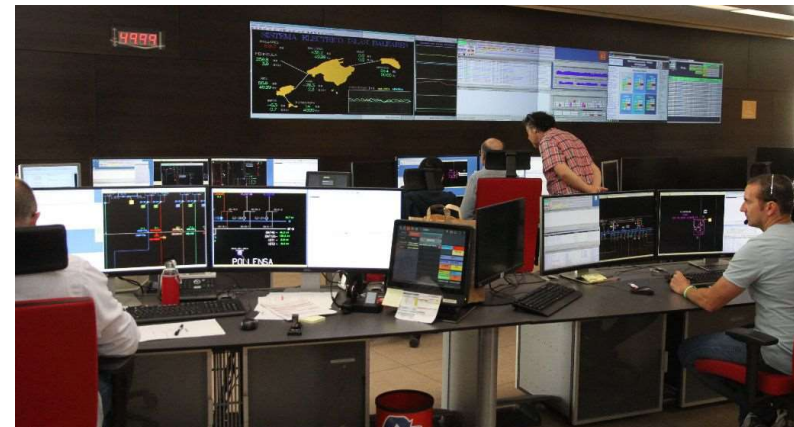




## Improving emergency management (needs)

### Civil Protection agencies

- Correlation between meteorological situation and impact on the rivers flows and on the territory causing floods (more accurate definition of factors, scenarios and models)
- Automatic alert systems for emergency managers (rivers)
- Cooperation with basic service managers (directly with companies of electricity, water, telecommunications, etc) and also with other services as Education, Health, goods transport, etc. (affected and interconnected services)
- Implementation of intermediate-level territorial coordination centres with the participation of mayors and basic service bodies in a territorial level.







## Improving emergency management (needs)

### Civil Protection agencies

- Automatic and faster incorporation of the operators of the different agencies in the CECAT centre (automatic procedures)
- Shared cartography and shared knowledge and positioning of resources
- Backup systems for cuts on power electricity or on telecommunications
- Official chat type application on mobile phones for sharing information
- Organization and sizing of resources



## Improve emergency management (needs)

### Population

- Knowledge of risk and self-protection measures by the population
- Confidence in public emergency managers
- Population alert tools (mass messaging on mobile phones in a given area)

**Moltes gràcies**  
**Many thanks**

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