



Funded by
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Flood Risk: Risk and emergency management

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Catalonia Civil Protection: Risk and emergency management

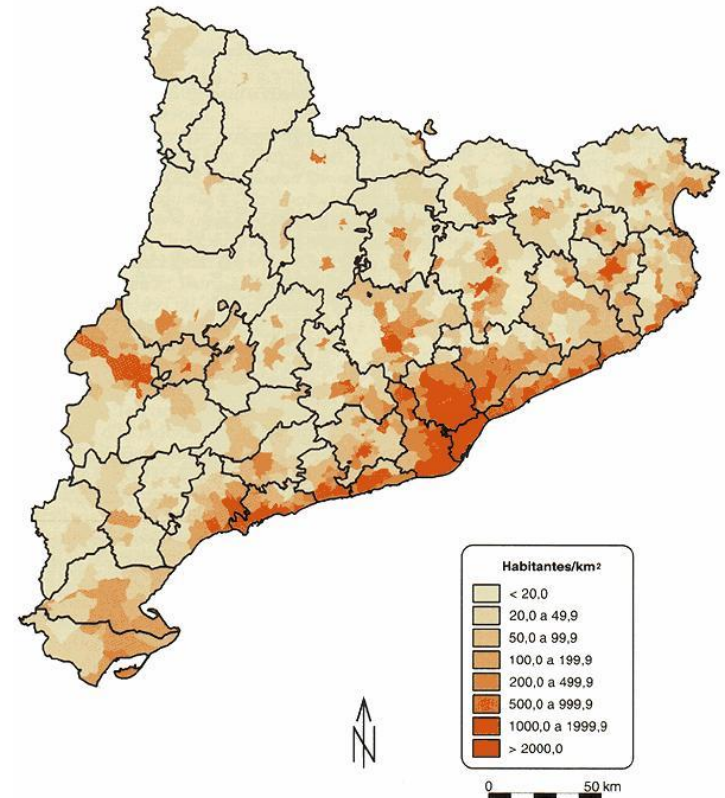
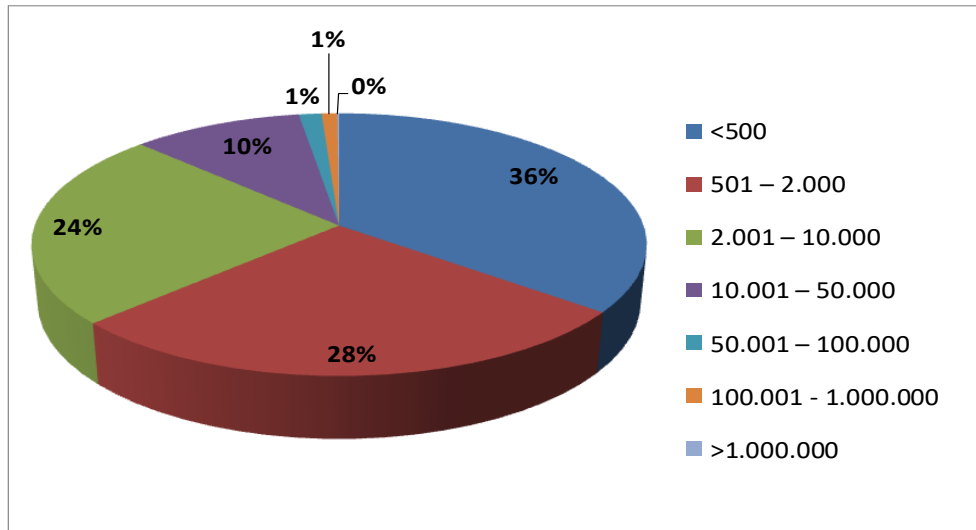
Catalonia brief numbers

- ❑ Demographic numbers
 - Inhabitants: 7,5 millions
 - Area: 32.000 km² (~Belgium)
 - Density: 234 inhab / km²

- ❑ Local administrations
 - 948 municipalities
 - 4 provinces
 - 7 territorial areas
 - 42 counties



Catalan municipalities



Inhabitants	<500	501 – 2.000	2.001 – 10.000	10.001 – 50.000	50.001 – 100.000	100.001 – 1.000.000	> 1.000.000	Total
Num of muni	337	260	230	98	13	9	1	948

Civil protection system

Organized in 3 levels according to the 3 administrations:

- ❑ Municipalities,
- ❑ Catalonia region
- ❑ Spanish central government



Civil protection authorities

According to the three administration levels:

- ❑ Mayors in their communities
- ❑ Catalan Regional Minister of Interior as the highest authority in the region.
- ❑ Spanish Government whether the emergency is nuclear, war or exceeds the Catalanian territory: “national interest” is declared.



Catalan civil protection system

□ Catalan Civil Protection Directorate:

- Depending on the catalan government
- The mission is risk management and emergency coordination.
- It includes preparedness and response (2 deputy directions)
- All major risks, except nuclear and war events (central government responsibility).

□ Catalonia has its own emergency services and also technical services:

- Police (also for natural / forest areas)
- Fire service (1 for Barcelona municipality and 1 for the rest of Catalonia)
- Emergency medical service.
- Technical services: geological, weather, water, etc.



Civil protection directorate

□ Two basic areas

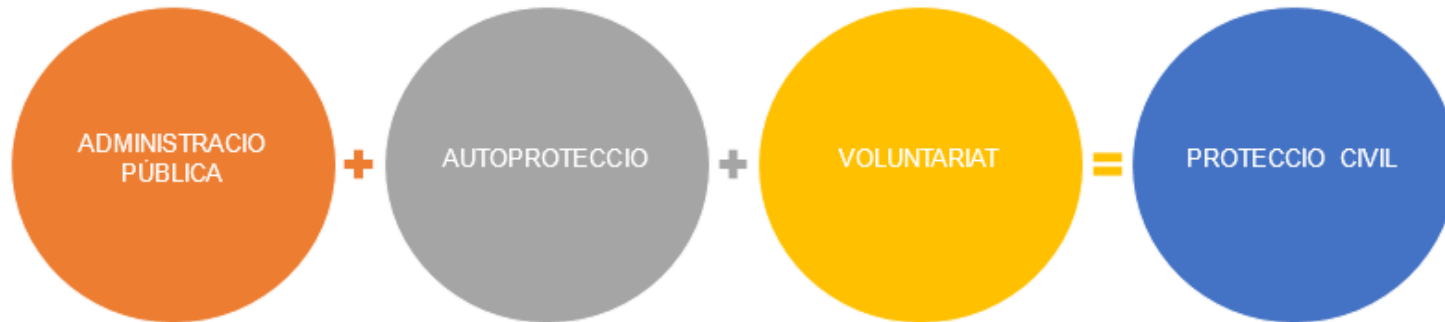
- Preparedness (deputy direction)
- Response (deputy direction)

□ Employees: 100 (aprox.)

- Staff and other technical services: ~20 employees
- Preparedness: ~30 employees
- Operational area: (~55 employees: 41 full time + 14 part time)



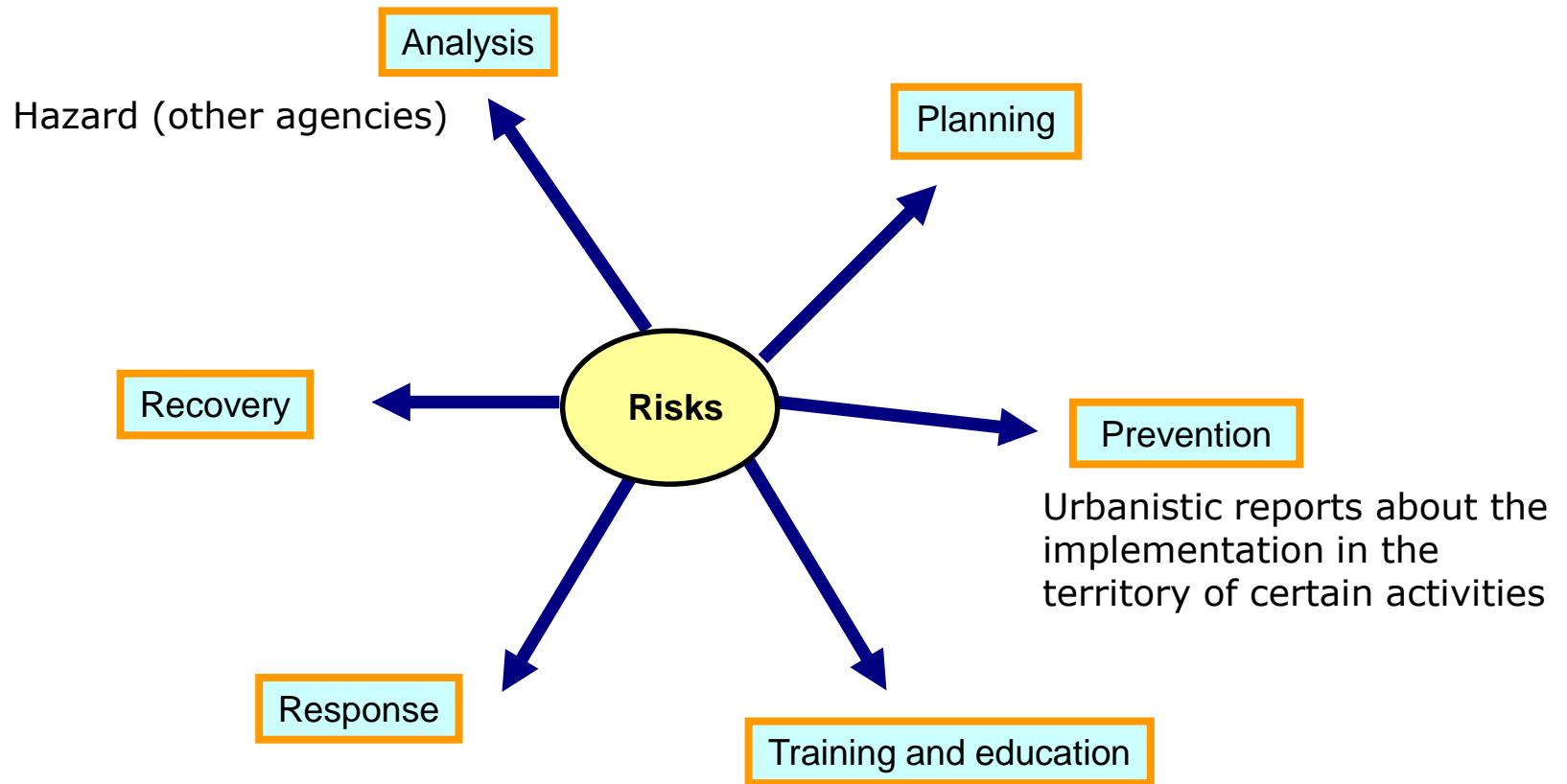
Civil protection system














System is composed by

- ❑ Public services
- ❑ Emergency services from companies and activities (self protection services): hazardous and vulnerable activities (ex: motorcycle circuit, airport, company with dangerous substances, nursing home, macroconcert...)
- ❑ Civil Protection Volunteers depending on municipalities

Risk and emergency management



Catalan emergency plans

PLA TERRITORIAL	PLANS ESPECIALS
 <p>PROCICAT</p> <p>Inclou plans d'actuació:</p> <ul style="list-style-type: none">- Contaminació Flix- Ferrocarril- Pandèmies- Sallent <p>Inclou protocols per</p> <ul style="list-style-type: none">- Estat de la mar- Vent- Subministraments bàsics- PEMONT	 INFOCAT
	 INUNCAT
	 TRANSCAT
	 SISMICAT
	 PLASEQCAT
	 NEUCAT
	 CAMCAT
	 AEROCAT
	 ALLAUCAT
	 RADCAT

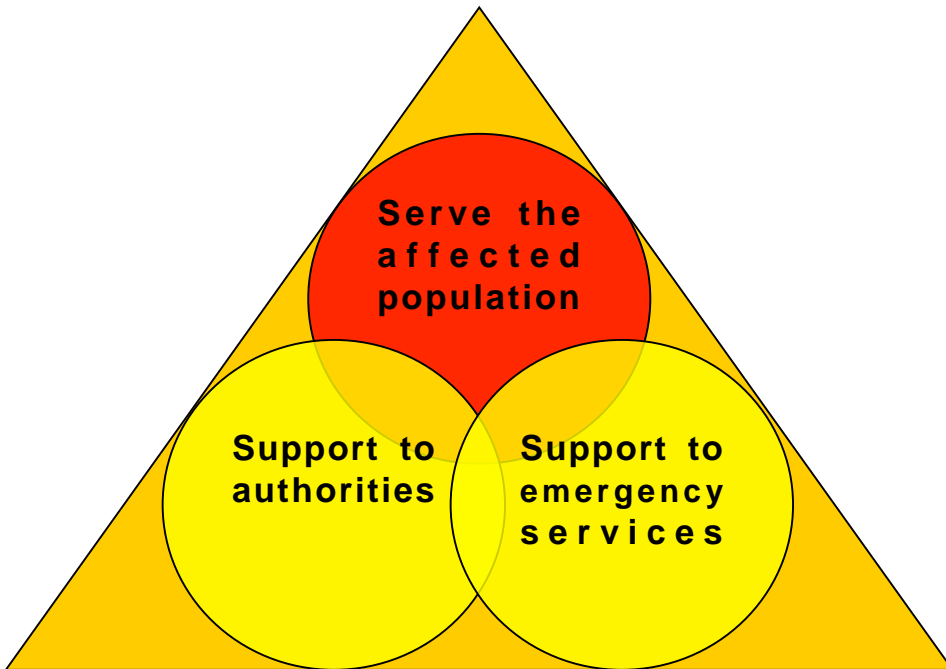
- PROCICAT (general)
- INFOCAT (forest fires)
- INUNCAT (floods)
- VENTCAT (wind)
- NEUCAT (snowfall)
- ALLAUCAT (snow avalanche)
- TRANSCAT (transport of dangerous goods)
- FERROCAT (train accidents in passenger transport)
- PLASEQCAT (accident in chemical installations)
- AEROCAT (aerial accidents)
- CAMCAT (marine pollution)
- RADCAT (accidents in radioactive facilities)

The regional plan determines municipalities obligated to prepare the municipal plan (**PAM**)

Catalogue of facilities and activities required to develop their self-protection plan (**PAU**)

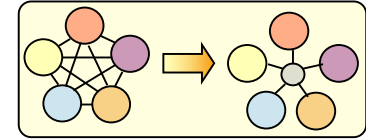
Global Emergency Management

Goals in emergency



Roles in emergency

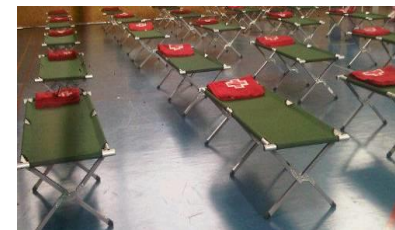
Coordination



Information management



Logistic / basic services



Global Emergency Management

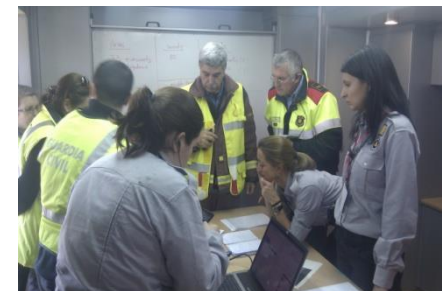
Two levels of coordination and management:

□ 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

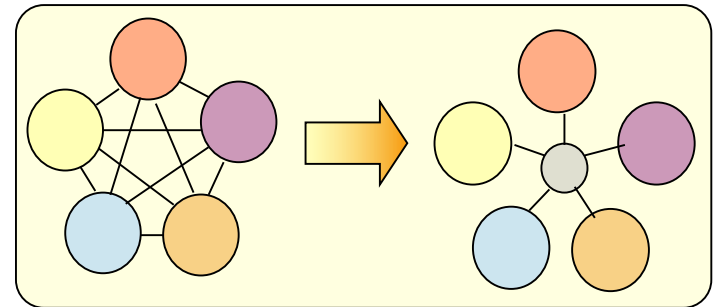
□ Coordination on site (Incident Command Post) and also municipal coordination centers.

- Operatives emergency resources
- More operative decisions
- More direct pressure



CECAT: Emergency management center of catalonia

- ❑ Operative 24 x 7: risk vigilance and deployment of the emergency management structure (plan activation).
- ❑ Communications kernel: to minimize the damages in case of emergency (positions for different agencies)
- ❑ Vigilance tools and protocols
- ❑ Crisis committee meeting
- ❑ Press and communication office
- ❑ Emergency response levels
 - Pre-alert
 - Alert
 - Emergency



INUNCAT

- Flood risk plan including dam accidents
- Risk analysis organizational structure during the emergency (functions of the different agencies and command structure)
- Implementation program (formation, information, dissemination)



INUNCAT: Risk Analysis

Other Agencies or research centers:

- Historical
- Hydrological
- Hydraulic
- Geomorphological

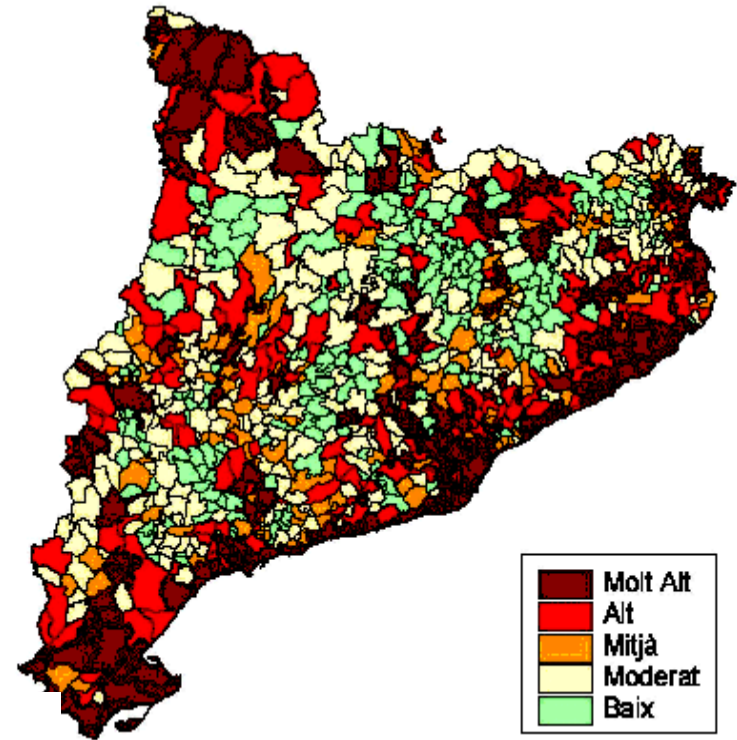


Vulnerability: Population and infrastructures



Dam scenarios
Priority action points

Static risk map:
Level of risk in municipalities



Extrem: 205 (22%)
High: 180 (19%)
Medium: 108 (11%)
Moderate: 258 (27%)
Low: 196 (21%)

Water agency zones and agencies (3)

Provide hazard maps (return periods) and operational information during the episodes

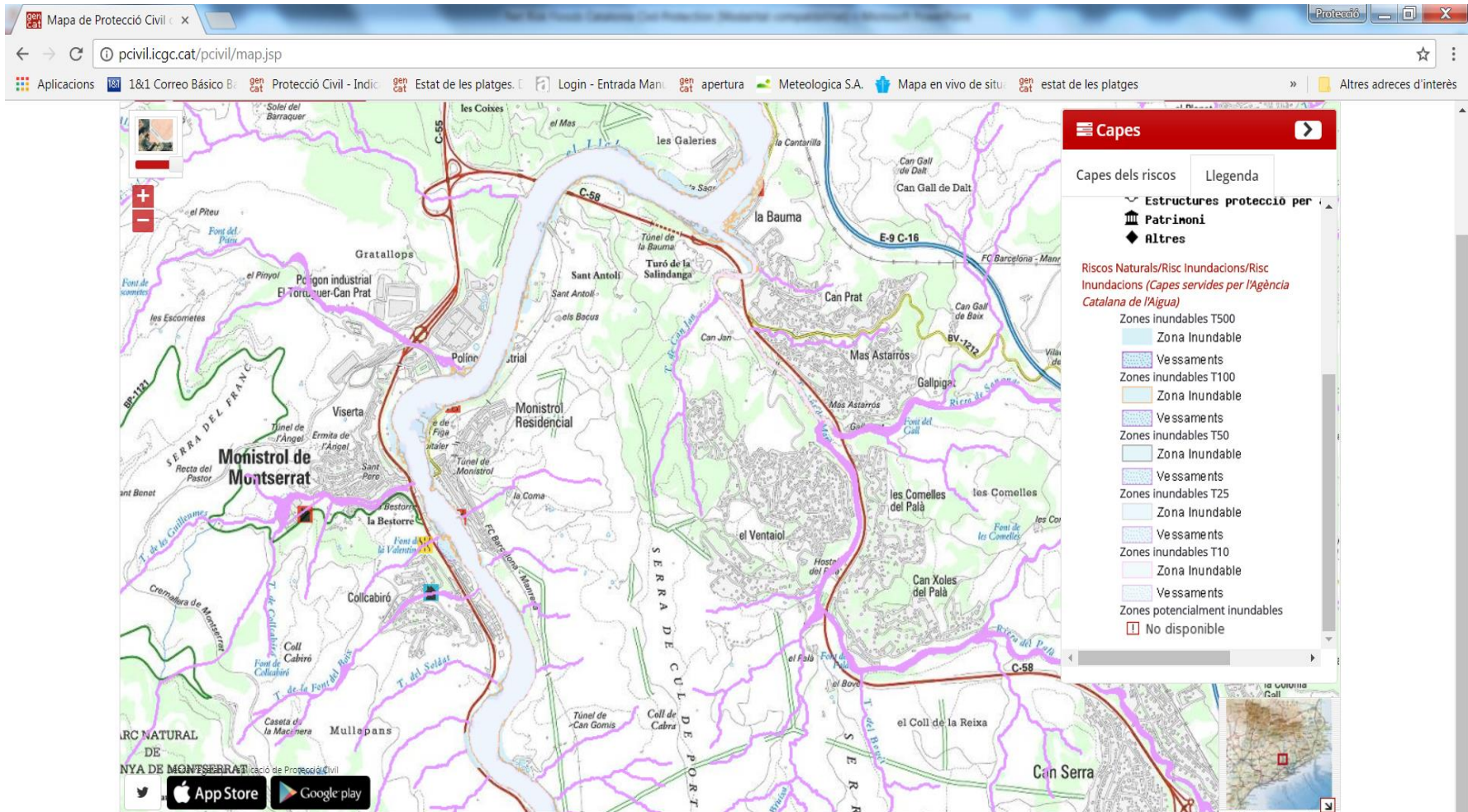


Interns Rivers that leave their waters in the Mediterranean and are in the north of the Ebre river

Intercommunitary Rivers that leave their waters in the Mediterranean but whose waters crosses more than one region

Automatic information systems

Catalonia Civil Protection: Risk and emergency management



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Civil Protection Map (it allows the superposition of different risks, website)

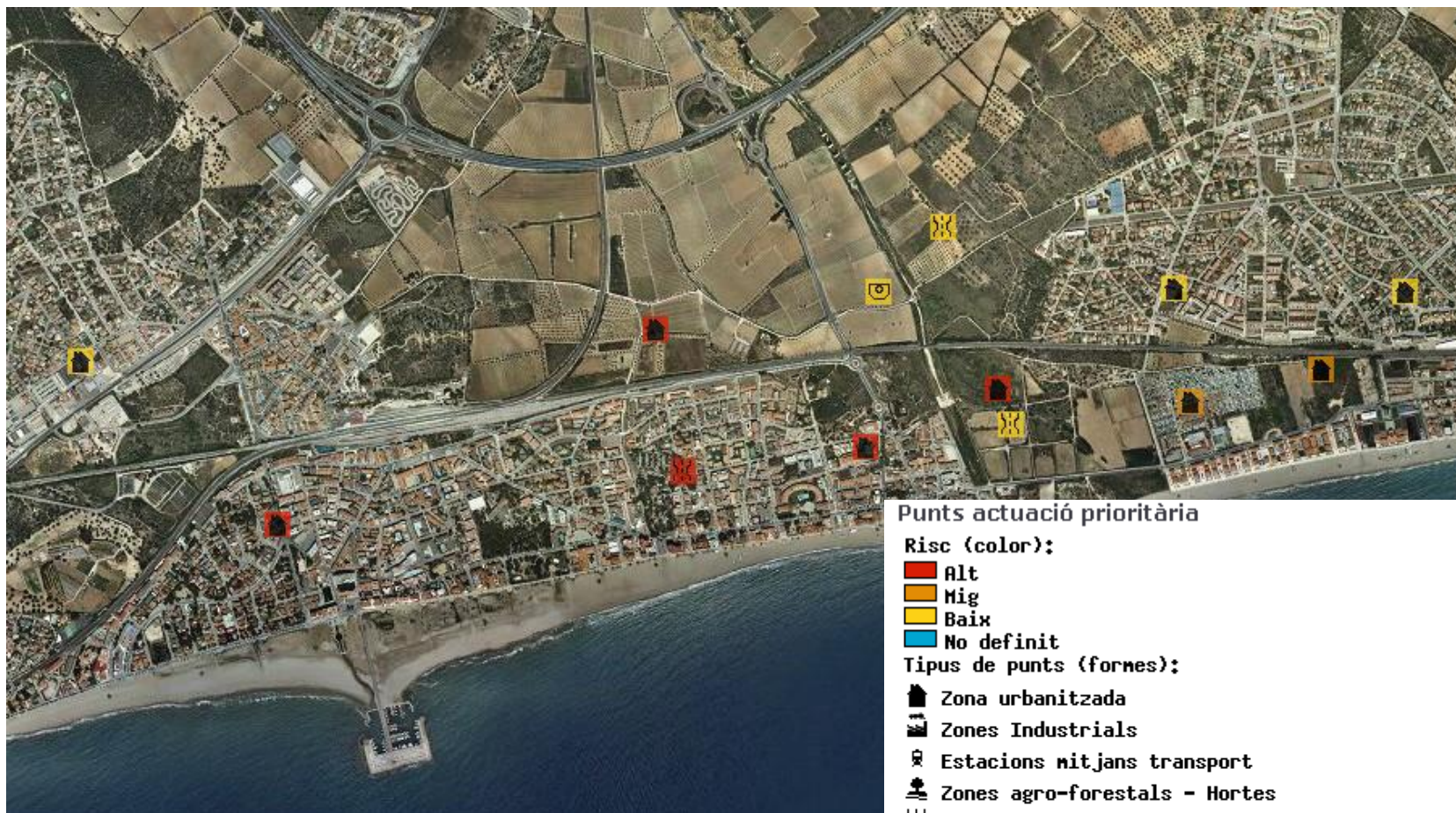
Dams

Dam management companies: information on risk scenarios and also operational information: accidents or dam operations / water discharges



Database of high risk flooding points

(priority of response: priority action points)



Priority action points

Places where heavy rains or water avenues can affect people, communication infrastructures, basic services, goods, ... Or produce some domino effect

These points, for their own intrinsic risk, they must be associated with an operation and someone in (ex: cut a road, a bridge, evacuate a building, increase drainage, etc)

The ACA agency, based on the experience of the hydraulic study and information from interviews and visits, collected a large number of these points, in order to allow municipalities to validate them and to be able to develop the operativity that must be associated to them.

Priority action points



Situation causing floods

≡ Intense rain + steep slope

Flashfloods

≡ Less intense rain but long term

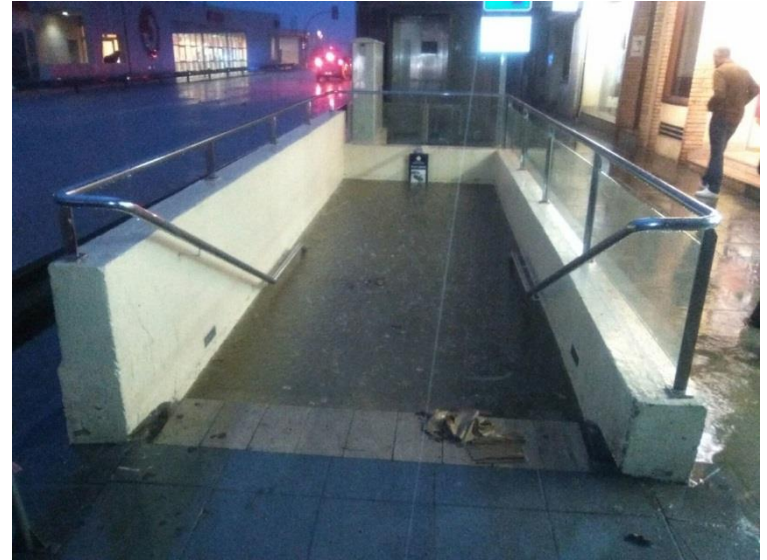
≡ Snow melting

“Slow” floods

“Slow” floods and long term events: Ebro river floods



Flashfloods: in the coast area



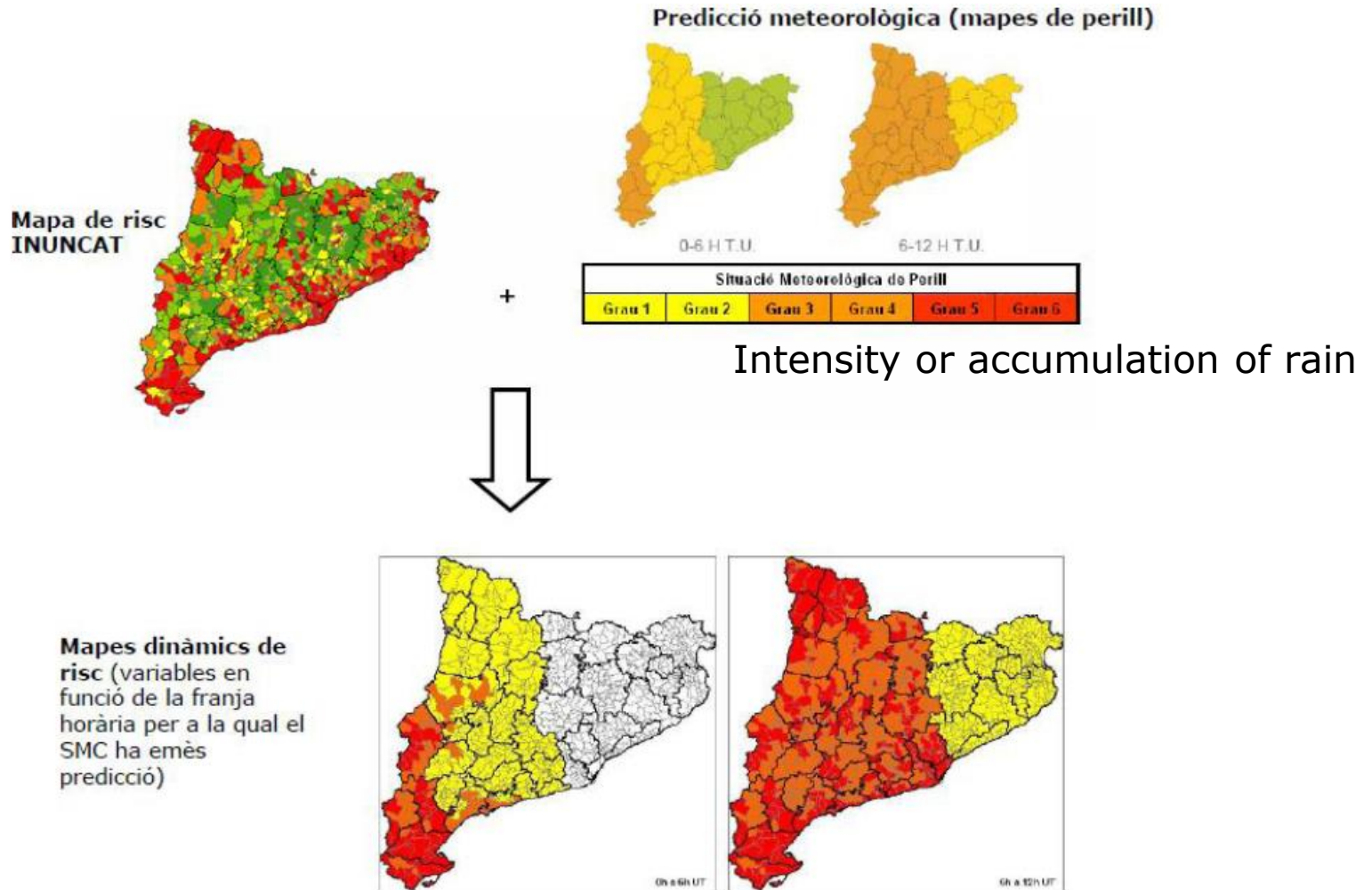
Flashfloods: in the coast area



Flash floods: mountain areas



Dynamic risk: hazard (meteorological forecast) + vulnerability

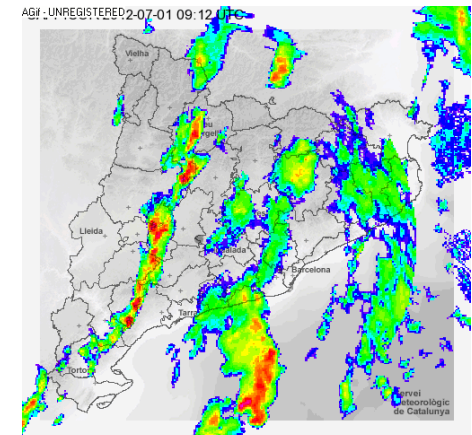
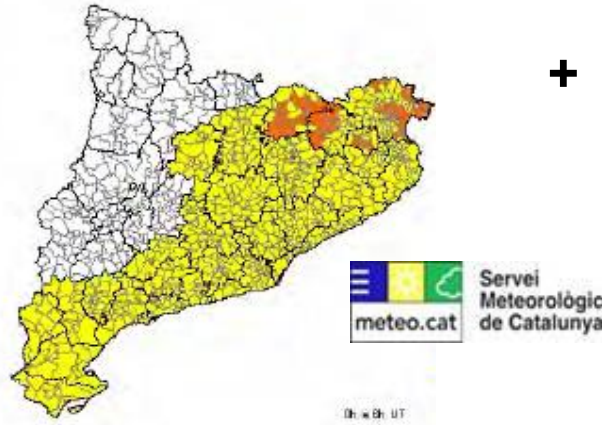


Dynamic risk maps for three daily periods

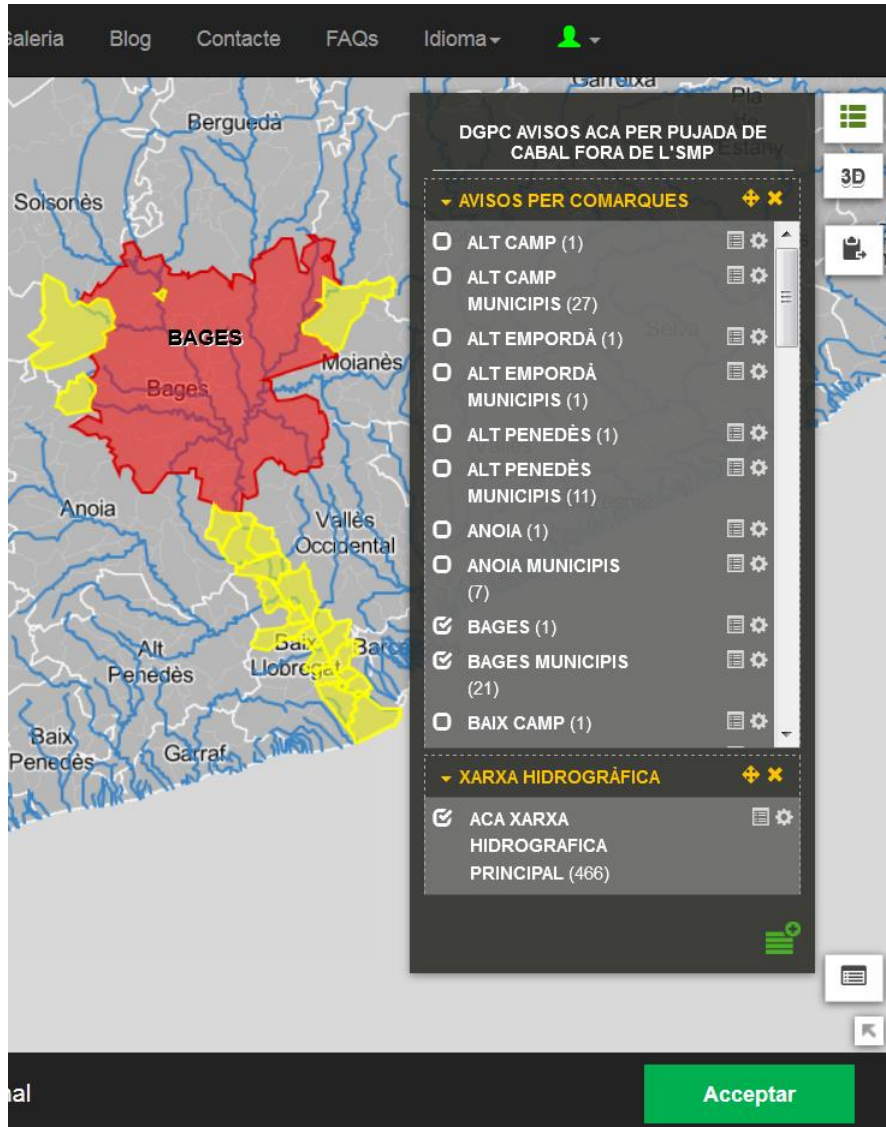
Monitoring rain and floods



Riu	Municipi	Tendència	Explicació
Fluvià	Olot	↓	Decreixent, dins de la normalitat
Ter	Sant Joan de les Abadesses	↓	Decreixent, Alerta
Ter	Ripoll	↓	Decreixent, Perill
Ter	Girona	→	Estable, dins de la normalitat
Ter	Torroella de Montgrí	↓	Decreixent, Alerta
Siurana	Cornudella de Montsant	→	Estable, Cabal normal
Congost (Besòs)	La Garriga	↓	Decreixent, dins de la normalitat
Besòs	Santa Coloma de Gramenet	↓	Decreixent, dins de la normalitat
Anoia (Llobregat)	Martorell	↓	Decreixent, dins de la normalitat
Llobregat	Sant Joan Despi	→	Estable, Perill
Llobregat	Castellbell i el Vilar	↓	Decreixent, dins dels llindars denormalitat
Llobregat	Guardiola de Berguedà	↓	Decreixent, dins dels llindars denormalitat
Cardener (Llobregat)	Súria	↓	Decreixent, dins dels llindars denormalitat
Tordera	Sant Celoni	→	Estable dins dels llindars de normalitat
Tordera	Fogars de Tordera	→	Estable dins dels llindars de normalitat
Francofí	Montblanc	↓	Decreixent, dins dels llindars denormalitat
Foix	Castellet i la Gornal	↓	Decreixent, Alerta
Muga	Castelló d'Empúries	↓	Decreixent, Alerta



Catalonia Civil Protection: Risk and emergency management



When the water or meteorological agencies alert of a river flood or a very intense rain in an area, we have a cartographic program to determine what are the associated downstream municipalities that can suffer floods (it allows to determine the necessary warnings to local authorities and agencies)



Tools of warning

Economic massive warnings and information broadcasting

- App alert push
 - Free application downloaded from the internet
 - on mobiles phones or tablets
 - information about de geographic area you have selected
 - information about the area where you are (GPS)
 - warning messages and emergency information
 - need for LAN data

- Massive SMS and calls
(almost 3.000 callings / 5 minutes)



Thank you

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