



Tackling the challenge of delivering impact-based warnings

A specific viewpoint of the French Geological Survey (BRGM)



**Co-funded by
the European Union**

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Delivering impact-based warning: **Why?**

“Impacts” as a common language between scientists and practitioners

- Translating scientific data into operational information to support practitioners' decisions

Need to build and maintain situational awareness

- Understanding the current situation
- Anticipating potential future effects



Delivering impact-based warning: When?

Pre-event

Predict impacts in anticipation of approaching events

- Provide authorities with information they need to adjust safeguard measures

***“Early warning”
“Forecasting”***

Event

Estimating impacts immediately after an event occurs

- Provide local authorities with initial information on the scale of the situation
- Provide intervention services with information for pre-sectorization

***“Nowcasting”
“Rapid response”***

Post-event

Observe real impacts to get a consolidated view days after an event

- Provide authorities with a stabilized vision of losses, on which to base longer-term decisions (mid/long-term rehousing of affected populations, reconstruction efforts, etc.).

***“Damage
assessment”***

Delivering impact-based warning: What?

Different types of impact can be relevant to crisis management

- Physical destructions to buildings and infrastructures
- Functional disruptions/ impacts on capacities
- Impacts on populations
- Economic impacts

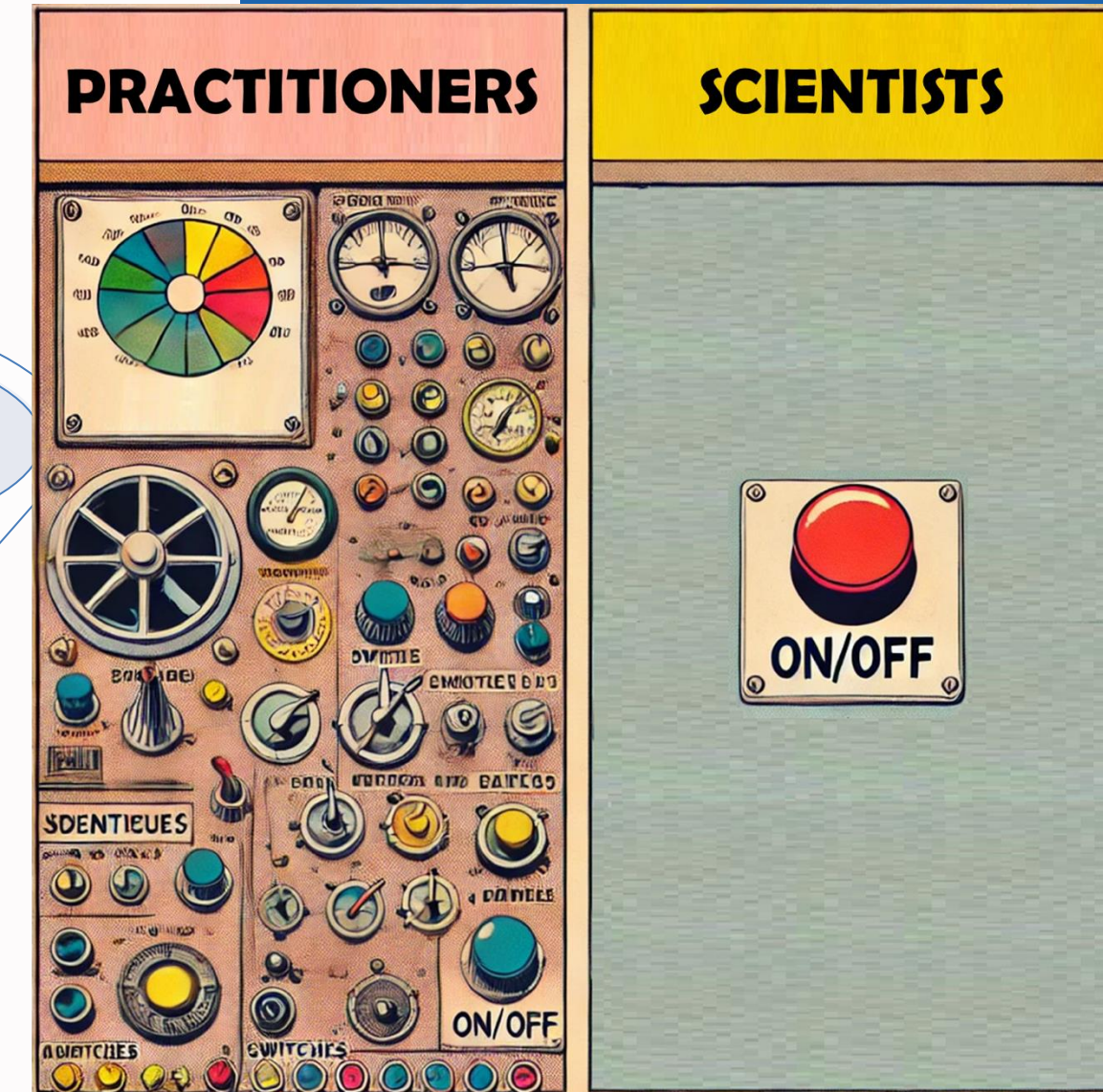
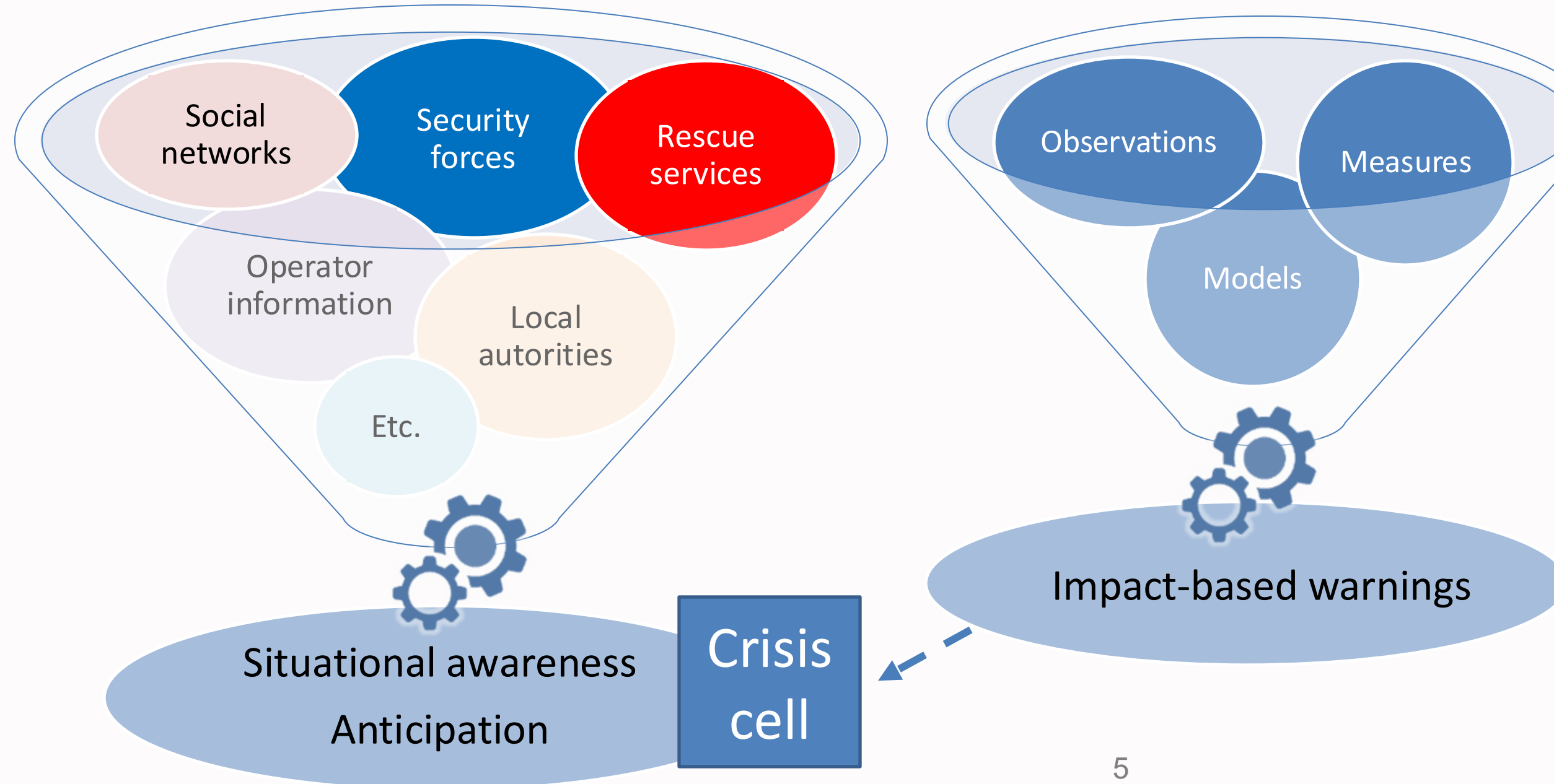
How should these alerts be formatted?

- Choice of format (reports, dashboards, maps, SMS, etc.)
- Choice of semantics to use
- Choice of how to account for uncertainty in assessments

**Understanding
practitioners'
needs is critical**

Delivering impact-based warning: In addition to...?

Impact-based warnings are important ...
... but not self-sufficient



**Risk of
information
overload!**

Impact-based rapid response to Earthquakes

Understanding the needs of French CP practitioners

Users Committee

- **National scale:** French civil protection
- **Zonal (~regional) scale:** zonal civil protection
- **Local scale:** prefectures of Martinique & Guadeloupe, delegated prefecture of St-Martin, environmental regional directions

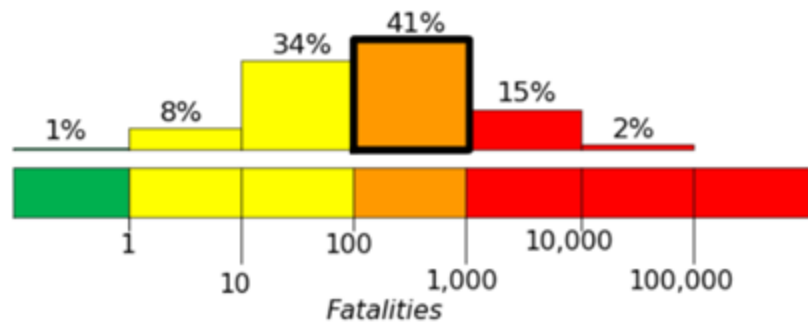
→ Identification of 2 impact indicators for decision support purposes

1. **Number of partially or totally collapsed buildings**
 - Prioritization criteria for “search & rescue” activities
2. **Number of injuries requiring hospitalization**
 - Criteria for prioritizing rescue resources

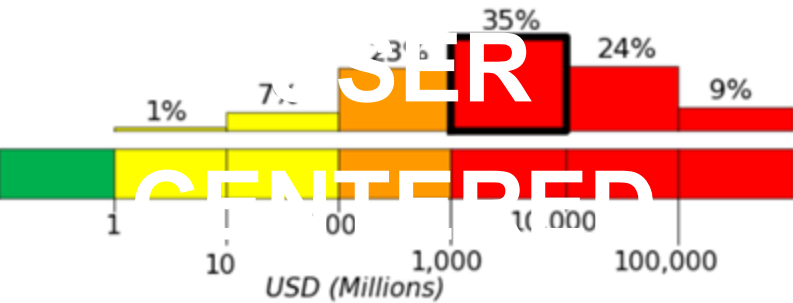
↓ Needs expressed by the user committee

Type of requirements	Expression of need
Timing	Receive a bulletin within half an hour following an earthquake
Dissemination	Send by e-mail (report attached)
Status	Restricted access to civil protection agencies
Format	Report in pdf A4 size – recto only
	Adopt a generic report format adapted to each territory (Martinique, Guadeloupe and Northern-Islands)
	Include on each of these reports a highly summarized indication of the estimated impact on the other two territories
Indicators	Estimated population exposed to levels of intensity \geq VI (text)
	Estimated number of partially or totally collapsed buildings (text + map)
	Estimated number of casualties (text + map)

Estimated Fatalities



Estimated Economic Losses



APPROACH

Impact-based rapid response to Earthquakes

Understanding the needs of French CP practitioners and of the other ones

- Deepening the characterization of users' needs

Activity		Situational awareness	Response dimensioning	Recognition prioritization	Sizing reinforcement requests	Itinerary selection and traffic plans	Assessment of induced risks	Information to supra levels (ministries, headquarters)
Sector		Rapid response						
Sub-sector		Main shock & aftershocks						
Crisis manag.	Zonal level	•		•	•		•	•
	Departmental level	•	•	•	•	•	•	•
First responders	Emergency services	•	•	•	•	•	•	•
	Security forces	•	•	•	•	•	•	•
Health		•	•		•	•		•
Transportation	Roads	•		•		•	•	
	Airport	•	•	•		•	•	•
	Port	•	•	•			•	•
Telecommunications		•		•				
Energy	Electricity	•	•	•	•		•	•
	Petrochemicals	•	•					•
Water	Drinking water	•		•				
	Sanitation	•		•				
Local authorities		•	•	•	•	•	•	

USER
CENTERED
APPROACH

Impact-based rapid response to Earthquakes

Need to think of different ways of delivering impact based warnings depending of end-users

- Local authorities (strategic level)

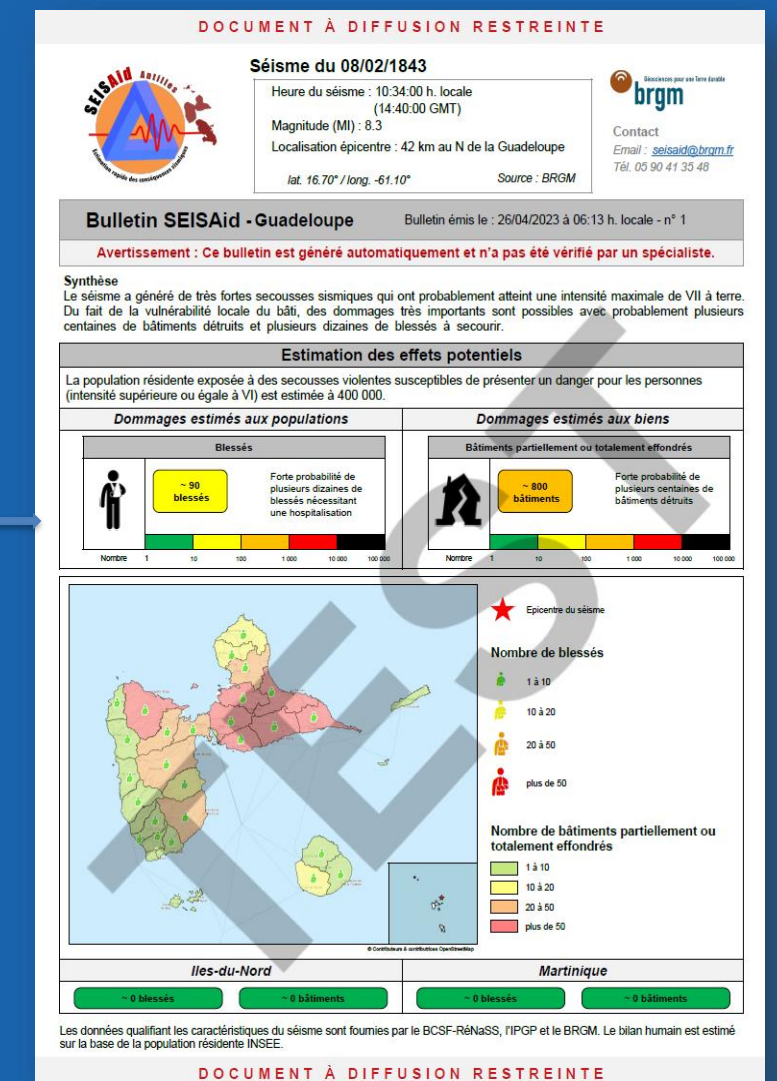
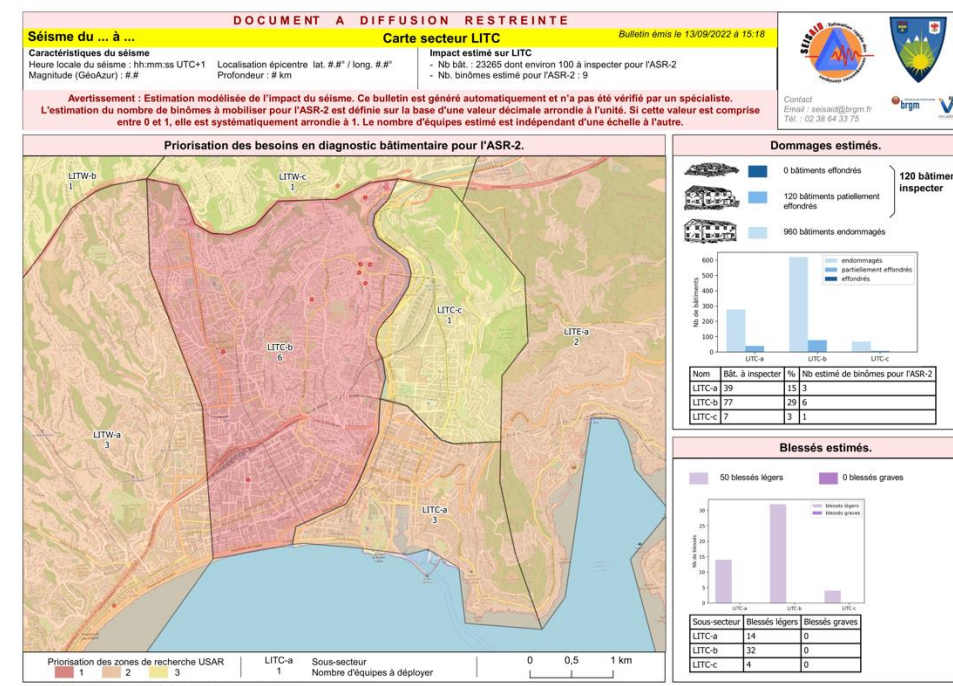
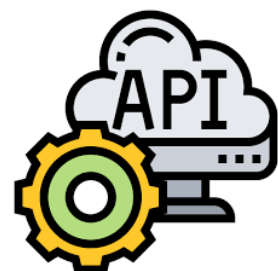
➤ Email + pdf + SMS

- USAR teams

➤ Pre-sectorization maps following INSARAG guidelines

- Rescue services

➤ Mapping webservice





Empowering
communities' response

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Let's stay in touch

