PREDICT

An assistance service for local communities for flood management

Experience of cities of South of France
**Impacts**

- **Cost of 262 Millions €/ year in France** (source: Hydroplus – march 2004)

- 7 death, more than 1500 cities impacted, 800 Millions € insured damages in South of France in december 2003

- 24 death, 419 cities impacted, cost of 1,2 Billions € in september 2002 in South of France (source: Schapi- french governmental service, and Ministry of the ecology)

- 36 death or missing persons, 438 cities impacted, cost of 550 Millions € in 1999 in south of France (source: Schapi- french governmental service, and Ministry of the ecology)
**PREDICT’s initiative**

**Stakes**

Flooding, a main problem:

- A necessity: improve protection and information of citizens
- Facts: physical protection is necessary but inevitably limited

**The objective of PREDICT**

Supply one management tool of the floods operational matched by elements of help with the decision
Lez river at Montpellier

South of France in September 2005
The objectives of PREDICT

Propose a help for anticipation and management in case of flood crisis:

• To elaborate a municipal plan of protection, to know the stakes to better protect
• To assist during crisis, to anticipate floods and manage crisis
• To Analyse the crisis, quickly estimate damages
• Maintain risks awareness
• To elaborate a municipal plan of protection with the city, using a specific methodology with GIS

• Propose an additional information to the states services one’s during crisis, to help local communities (Real time service)
Elaboration of a municipal plan of protection:

**A specific methodology to PREDICT**

- Analyse of risk by evaluation of the flooded zone and of stakes vulnerability
- Definition of a gradual emergency plan
- Exercise of simulation, training
- Communication, public information
Experience of South of France
Context of the city of Sommières
Influence of the floods in 2002 at Sommières
Scenarios of floods for a gradual plan of intervention
<table>
<thead>
<tr>
<th>Contexte de carte</th>
<th>Champ</th>
<th>Type</th>
</tr>
</thead>
<tbody>
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<td>Oublié</td>
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<td>Rose</td>
<td>Oublié</td>
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Vauvert, a city of 10 400 inhabitants

Rhône flood risk: 3 levels of alert
Plan 1
Déclenchement de l'alerte à Sylvéral

Plan 2 et 3
Surveillance renforcée des digues : débordement certain et rupture de digue probable

Plan 3
Rupture de digue en amont des écluses de St Gilles (c.f carte P.I.G du Rhône), mise en eau du territoire communal au-delà du canal du Rhône à Sète, inondation du bas du hameau de Gallician.

Plan 2
Rupture de digue en amont des écluses de St Gilles (c.f carte P.I.G crue du Rhône), mise en eau du territoire communal limité par le canal du Rhône à Sète (Gallician non concerné)

Vigilance:
Mise en surveillance : prévenir les risques de rupture

Débordement des eaux du Rhône dans le hameau de Sylvéral

Débordement du lit meneur : mise en eau du ségnetal

With the help

Scale of risk (Rhône)
Small catch area of Crosse and Reyne
Flood Risk: 2 levels of alert
Scale of Risk

Volume Intensity Frequency
City of Vauvert

Accumulation Cumul précipité en mm

Intensity Imax(30mn) en mm/h

- Yellow line: Niveau 1
- Red line: Niveau 2
- Black line: Limite
An organization of the Plan based on operational notebooks

**Actions and missions notebook**: Classification of the interventions to be realized for each cell

**Procedures** to implement during the management of crisis. This notebook indicates the precise way to resolve the most harmful consequences: school management; key points of the hydrographic network....

**Plans of Intervention Graduated**: anticipation means, impacted stakes and list of actions to implement for each plan

**Directory** of crisis: booklet containing all the useful co-ordinates during crisis

**Handrail** to use for the management of the external phone calls.
An organisation to better manage crisis

Organization chart of the municipal emergency committee

Pôle Communication
Responsable : C. Pozzo
Binôme : N. Jullien

Cellule
Poste de commandement
Directeur opérations secours:
M. Le Maire
Chef opérations secours :
correspondant S.D.I.S.
Correspondant Gendarmerie
D.G.S.: Y. Cavalier

Conditions de mobilisation :
• 24h/24, 7j/7
• En Mairie

Cellule
Transmission
Élu référent : A. Jaen
Responsable : C. Daudé
Binôme : S. Maurel

Cellule
Évaluation
Élu référent : R. Gimenez
Responsable : C. Mourard
Binôme : L. Dumas

Cellule
Action Sociale
Élu référent : O. Moritz
Responsable : D. Serrano
Binôme : C. Pazzini

Cellule
Soutien Logistique
Élu référent : J.P. Saurel
Responsable : P. Sevrin
Binôme : C. Nissard

: Cellules activées en phase de préalerte

With the help
Follow up in real time

A help in decision making

• To Assist the local community in real time to activate the municipal plan of protection
• To improve the system constantly by analyzing last and current events
Operation of the real time service on September 2005

• Traditional Context weather: cloud system arrived by the Western South and hot air coming from the Mediterranean

• Several stationary rainy events on different zones of the area during several days

• Two major events at two days of interval on the same zone of Gard (Petite Camargue, Costières, Vistrinque)
Beginning of the event on 06th sept 2005 at 6h TU

Follow-up on the infra-red satellite picture

Rainfall intensity on GIS Predict at 5h45 TU.

With the help of METEO FRANCE, BRL, and EADS ASTRIUM.
Stormy Activity and rainfall intensity on 06th sept 2005 at 10h TU

Follow up of stormy activity on Météorage on 6th sept at 9h37 TU.

Agreement of Rainfall intensity on GIS Predict at 10h00 TU with the help of Vauvert.
Rainfall intensity on GIS Predict on 8th sept. 9h45 TU
8th sept.
10h30 TU

Vauvert
8th sept.
11h45 TU
8th sept.
12h00 TU
8th sept.
12h30 TU

Vauvert
8th sept.
13h00 TU
8th sept.  
13h15 TU
8th sept.
14h00 TU
8th sept.
14h30 TU

Vauvert
8th sept.
16h30 TU
8th sept.
17h00 TU
8th sept.
17h30 TU

Vauvert

PREDICT

BRL Ingénierie
8th sept.
17h45 TU
8th sept.
18h00 TU

Vauvert
8th sept.
18h15 TU
8th sept.
18h30 TU

Vauvert
8th sept.
19h15 TU

Vauvert
8th sept.
19h30 TU

Vauvert
8th sept.
19h45 TU
8th sept.
20h00 TU
Camargue

Gard in 2005
Conclusion

• The tools and methods used enabled us to locate the phenomena precisely, to evaluate their potential gravity and to activate local safety plans with enough of anticipation (Vauvert, Aubord, Sommières, St Génies de Malgoirès…)

• The times of installation of this type of phenomenon again confirmed it is not a question of spontaneous events and they can be anticipated

• Progress will be carried out in the next years, however it is possible as of bringing a solution to the needs for the communities by developing existing technologies.
More than 30 users of the service in autumn 2005

- Agde et communauté d’agglomération d’Agde (Hérault)
- Aimargues (Gard)
- Aubord (Gard)
- Cazouls les Béziers (Hérault)
- Cessenon sur Orb (Hérault)
- Grau du Roi (Gard)
- Laudun L’ardoise (Gard)
- Lézignan Corbières (Aude)
- Lunel (Hérault)
- Lignan sur Orb (Hérault)
- Maraussan (Hérault)
- Milhaud (Gard)
- Montpellier
- Murviel les Béziers (Hérault)
- Narbonne (Aude)
- Perpignan (Pyrénées Orientales)
- Quissac (Gard)
- Saint Géniès de Malgoirès (Gard)
- Saint Gilles (Gard)
- Saint Martin de Londres (Hérault)
- Sommières (Gard)
- Thézan les Béziers (Hérault)
- Vauvert (Gard)
- Syndicat du BV de l’Orb (Hérault)
- Syndicat du BV de la Touloubre (Bouches du Rhône)
More than 30 users of the service in autumn 2005
To anticipate for better managing the risk

- A decision making help
- A simple and integrated solution
- An offer complementary to the services of the State

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