

**Approaches and experiences in institutional coordination  
in flash flood forecasting and warning in France  
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**1 Main purpose:**

This presentation describes the new flood warning system in France which will be operational this year by July 1st and the essential coordination between different mitigation agencies and specially between Meteo France and the SCHAPI which is the central hydrometeorological support agency for flood forecast. Both meteorologists and hydrologists are working in the SCHAPI.

**2 History and present :**

The previous flood warning system with its 52 heterogeneous agencies and their weaknesses or insufficiencies is presented.

After that, there is a presentation of the new flood warning system with its 22 SPC ( Service de Prévision de Crues =Flood forecast Service) under the coordination of the central agency the SCHAPI.

**3 The challenges of the new system are described :**

Better take into account the meteorological contribution in flood forecasting in order to better anticipate. Better take into account the already fallen rain and the rain about to pour or fall on a given area called "bassin versant"(river basin) with all the classical devices radars, models, "intelligent" automatic (rain gauge that can warn a central machine in the forecaster office when rain intensities are over scheduled thresholds) and so on...

**A zoom is made on the french meteorological "vigilance procedure"**

(operational since 2001) which is based on the evaluation or assessment of the danger associated with a color, a slogan and behaviour advises for the public.

The hydrological aspect is also presented with **the new flood vigilance procedure** which will be operational by July 1st 2006. This procedure presents similar aspects with the meteorological one. The main aspects of these two procedures are exposed in the appendices.

**4 Finally , the perspectives are presented :**

Particularly the main question : "toward a unique hydrometeorological vigilance procedure?". The last heavy rain episode in south of France at the end of 2005 highlighted the necessity to address this matter. In fact, the social request of emergency managers, risk mitigation agencies and communities is to have an assessment of the risk which is the combination of the hazard and the vulnerability and not only the intensity of the hazard. The risk can be different with the same level of intensity of the hazard.

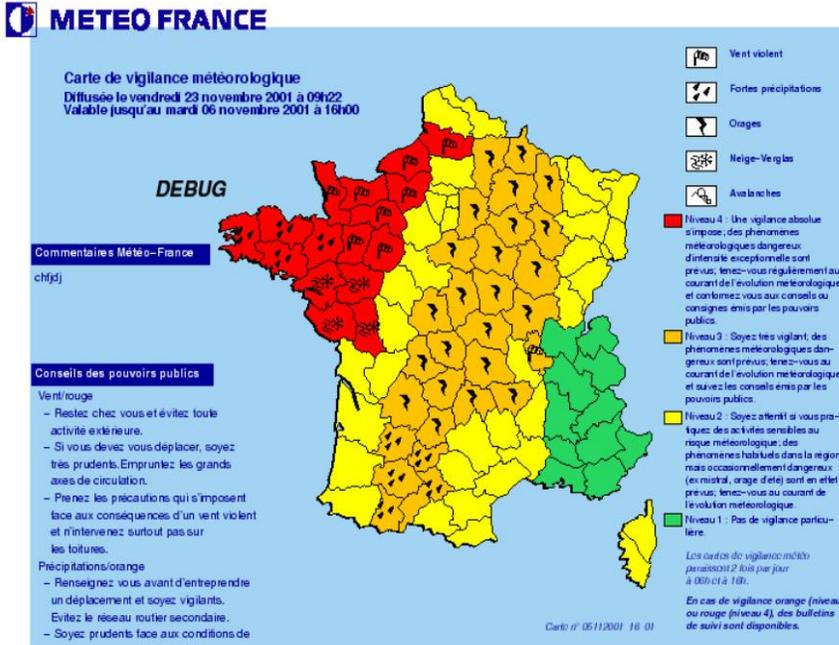
For instance, the same amount of rain with different impregnations of the soil can have different consequences in terms of flood and a lower amount of rain can have more effects if heavy rain for example have already occurred.

It was what happened in south of France at the end of 2005. The heavy rain episode which generated dramatic floodings was in fact two sub-episodes separated by a few days.

The meteorological forecast of amount of rain was pretty good in both sub-episodes but the forecast of the consequences of rain was somehow not good in the second sub-episode. The meteorological forecasters activated the "orange" vigilance level but did not activate the red level because the red thresholds was not predicted to be reached.

But because of the heavy rain a few days before, the effects was as or more important than the first part of the episode because the soil was saturated and less rain generated the same or more flood than the first sub-episode. There have been criticisms of the meteorological vigilance saying that there is a need to give not only an assesment of the amount of rain but an assesment of the global risk and then an assesment of the consequences of the amount of rain on the floods. This is a tough matter for the years to come because this requires thight operational links between meteorologists and hydrologists.

**Appendix1 : Two Colored emergency procedures in France: the meteorological vigilance procedure( since 2001) and the flood vigilance procedure( from july the 1st 2006).**



The Meteorological Vigilance  
The weather phenomena: strong winds, heavy rains, thunderstorms, snow/blackice, avalanches+ heat wave and cold wave or cold spell

four levels of danger :

The Chart is issued twice a day plus a follow up bulletin in case of orange and red vigilance level.

**Green (level 1) :**  
No special vigilance required

**Yellow (level 2) :**  
Be careful if you practise activities dependent on meteorological risks (for instance, sexual intercourse on the beaches) ; some phenomena, usual for the area but occasionally dangerous

**Orange (level 3) :**  
Be very vigilant; dangerous meteorological phenomena are forecast; keep informed about meteorological evolution and follow authorities advises

**Red (level 4) :**  
An absolute vigilance is required ; dangerous and exceptionnally intense meteorological phenomena are forecast. Keep regulary informed about the évolution of the situation and folow orders given by the authorities.

The flood vigilance procédure  
(at the present time in test , will be operational by july the 1st 2006.)

The chart will be issued twice a day with follow up bulletins .

Four levels of danger:

**Green ( level1) :** normal situation. No risk of flood .

**Yelow ( level 2) :** risk of flood with no significant damages but that require vigilance in case of exposed or seasonal activities.

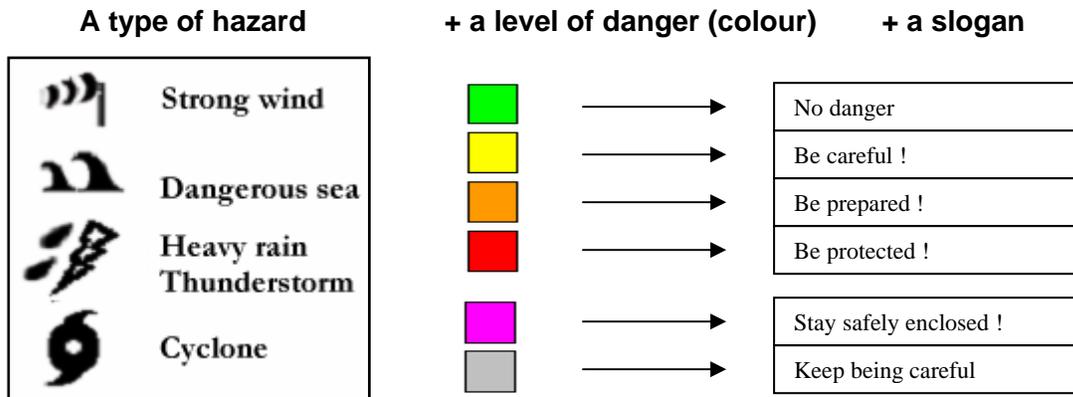
**Orange level ( level3) :** important risk of flood. Observed or forecast flood that could have significant impact for safety of people and properties. Inhabitual phenomenon.

**Red level ( level4) :** major and exceptional risk of flood . observed or forecast flood that could have major or catastrophic impacts for safety of people and properties. Uncommon and catastrophic phenomenon.

**APPENDIX 2 : another example of vigilance procédure in the French West indies (FWI) adapted because of the cyclonic hazard :**

The aim ...Only one procedure all year long for all the FWI , including 4 sorts of meteorological hazards and 4 levels of danger ( + 2 for cyclones ) showed with colours

- 1- Only one clear, overall and easy to memorize information towards everybody ( gouvernement, emergency managers, medias, general public ...)



- 2- Main goal : to give a clear message of what should be and should not be done to avoid wrong comportemental attitudes . For each hazard and each colour, appropriate individual and collective measures are given to the public. These collective measures ( closing of schools, stopping industrial or of airport activities ...) are choosen in real time among a predefined list by emergency managers depending on the expertise of this special threat ....because each case is a different case ...)

The mainspring ...MétéoFrance choose the colour ( level of danger ) taking into account the hazard itself and the possible impact ( probability x vulnerability ) . A sensible decision weight is left to the forecaster in order to stick the best we can to the reality

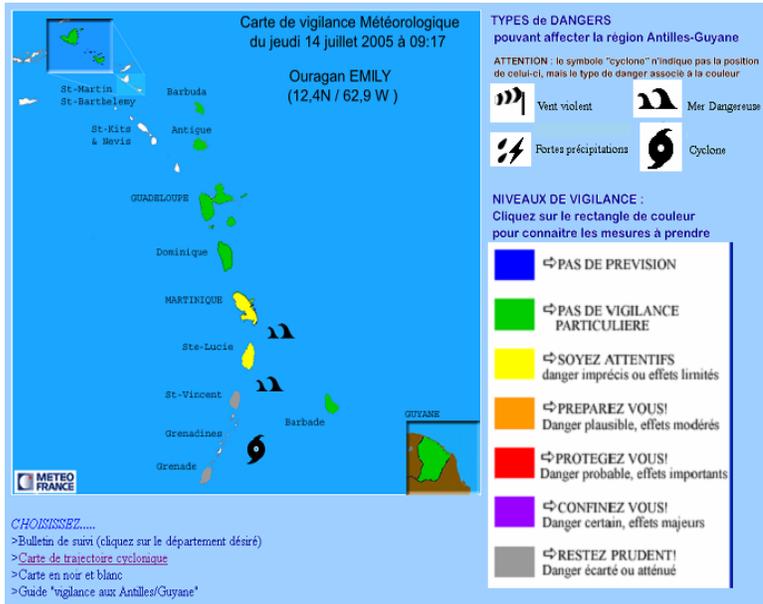
For any hazard ...

	<b>Impact</b>	Light imprecise	or Moderate	Deep	Very deep (major)
<b>Probability</b>					
low		1	1	1	2
Forte moderate to high		1	1	2	3
Very high		1	2	3	3
Certain ...(imminent)		1	2	3	4

For cyclone ...

TIMING IMPACT	+ 48h	42h 48h	36h 42h	30h 36h	24h 30h	18h 24h	12h 18h	06h 12h	00h 06h
Light or Imprecise									
Moderate									
Deep									
Very deep Major									

## The products ...the vigilance « chart »



\* Issued all year long, at least twice per day and more if necessary ( every 6 hours for cyclones in yellow, orange or grey but every 3 hours when one of the FWI is in red or purple )

\* Only for the FWI , except for cyclone . Other Islands will be coloured according to the official track and intensity forecast

\* Free access from the front page on our website ( [www.meteo.gp](http://www.meteo.gp) )

### 2- Special « follow-up » bulletins

- Give more details about the hazard, the forecast, the danger , the impact, the probability , etc. These bulletins are issued as soon as one of the island is not in "green"
- Issued with the same frequency than the chart
- Free access from the « vigilance page » on website