The contribution of French insurers to the creation and management of a National Observatory for Natural Hazards (ONRN)

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Despite existing Disaster Risk Reduction (DRR) policies and measures and a medium exposure to natural hazards, France still suffers from the effects of disasters. A spate of deadly and devastating disasters in 2010 (cyclone "Xynthia" and flooding in Var, which caused 80 deaths and 4,000 million euros in cumulative economic loss) led the chairman of the French Insurers' Federation (FFA) to suggest that information on risk exposure, loss brought about and the state of prevention mechanisms should be shared more effectively among the various different interested parties. This proposal was welcomed by the parliamentary commission assigned to analyse these kinds of disasters and draw conclusions from them. The Member of Parliament who chaired the national platform for disaster prevention (DRR) and the French Association for Disaster Risk Reduction (AFPCN), as well as the incumbent Minister for Ecology and Sustainable Development persevered enough to make the proposal a reality.

After a process of debate a public private partnership agreement was signed in May 2012 and the National Observatory for Natural Hazards (ONRN) came into being, with the involvement of:

The National Observatory for Natural Hazards (ONRN) is an example of a public private partnership that brings together the state, insurers and the Caisse Centrale de Réassurance, which is founded on concerted governance that embraces territorial groups and partners on voluntary projects to pool data, experience and studies.

- the State, represented by its ministry in charge of DRR: the Ministry for Ecological and Solidarity-based Transition, and within that, the Directorate General for Risk Prevention (MTES/DGPR),
- the Caisse Centrale de Réassurance (CCR), the reinsurer for the natural disaster insurance system (CatNat), which is the beneficiary of a state guarantee, and
- the Mission Risques Naturels (MRN), which is a technical association of insurers dedicated to natural risk knowledge and reduction within the French Insurers' Federation.

This article encompasses:

- a description of the ONRN: aims, structure of governance, main services, key ongoing projects, partners and its network of territorial observatories,
- the outlook for integrating the ONRN into shared management of policies and public preventive actions, and the leading role which the insurers take on in this regard, and
- certain specific examples of the use of ONRN indicators by different groups of stakeholders.

El artículo termina con el proceso de integración del ONRN en el sistema de la plataforma nacional francesa para la prevención de las catástrofes, lo que supone una buena práctica para la puesta en marcha del Marco de Acción de Sendai para la reducción de los riesgos de catástrofe.

1. Collaborative platform among numerous stakeholders to gather and disseminate data on risks, which has come into being as a result of a public private partnership agreement

1.1. Objectives and governance of the ONRN

The National Observatory for Natural Hazards (ONRN) is an example of a public private partnership that brings together the state, insurers and the Caisse Centrale de Réassurance, which is founded on concerted governance that embraces territorial groups and partners on voluntary projects to pool data, experience and studies. The observatory addresses the following needs:

- improving and capitalising on knowledge about hazards and challenges
- building up an assessment and prospecting mechanism
- contributing to risk prevention management
- inputting economic analysis to crisis prevention and management
- contributing to improving a risk management culture

The ONRN has set itself the following as key objectives:

- pooling information and studies that derive from data produced by the various stakeholders
- having available national, reliable, homogeneous information that has been collected over time on an ongoing basis
- sharing aggregate or specifically processed data to complement public data that is already available
- providing a global approach on a municipal level to the different hazards present in the territory and expressing the latter locally
- disseminating studies and conclusions on hazards, measures in place and results obtained nationally
- promoting territorial observatories for natural hazards as well as those of other regional partners and for different topics (climate change, effects on the coastline, etc.)

The project has had political support at the highest level from the various parties which it comprises: the Minister for Ecological and Solidarity-based Transition and inter-ministerial representative for major risks (DGPR, for the French), the chairmen of the FFA and the CCR, the chairman of the Advisory Committee for the Prevention of Major Natural Hazards (COPRNM, for the French) and of the French Association for Natural Disaster Risk Reduction (AFPCN), as well as France's Association of Mayors (AMF, for the French).

Each party has designated a project manager to be a part of the project's governing bodies (**The Management Committee of the ONRN**), while coordination is ensured by the ministry (see Figure 1).

The Management Committee presents the results of its activities to the COPRNM every year.

The various **data-producing** partners (providers of public services, observatories and groups, professionals...) join in with the work conducted by the observatory when it carries out its activities.

Data and service exchanging is regulated under the partnership agreement.

At the request of the AFPCN, the **Users' Committee** encourages the collective formulation of user expectations and observations. It advises on the work performed by the observatory and contributes to its focus.

The management committee creates **working groups** to lead tasks relating to areas of focus and study topics. The committee validates the results. Three technical working groups have been formed which are headed up by each of the partners respectively to guarantee that the agreement functions smoothly in practice:

- The experimentation working group, which is to produce indicators and look into new subject-matter.
- The working group on associations, to define and manage partners on the project, as well as the relations with the users' committee.
- The communications working group, to define and coordinate actions to devise and update the ONRN website.

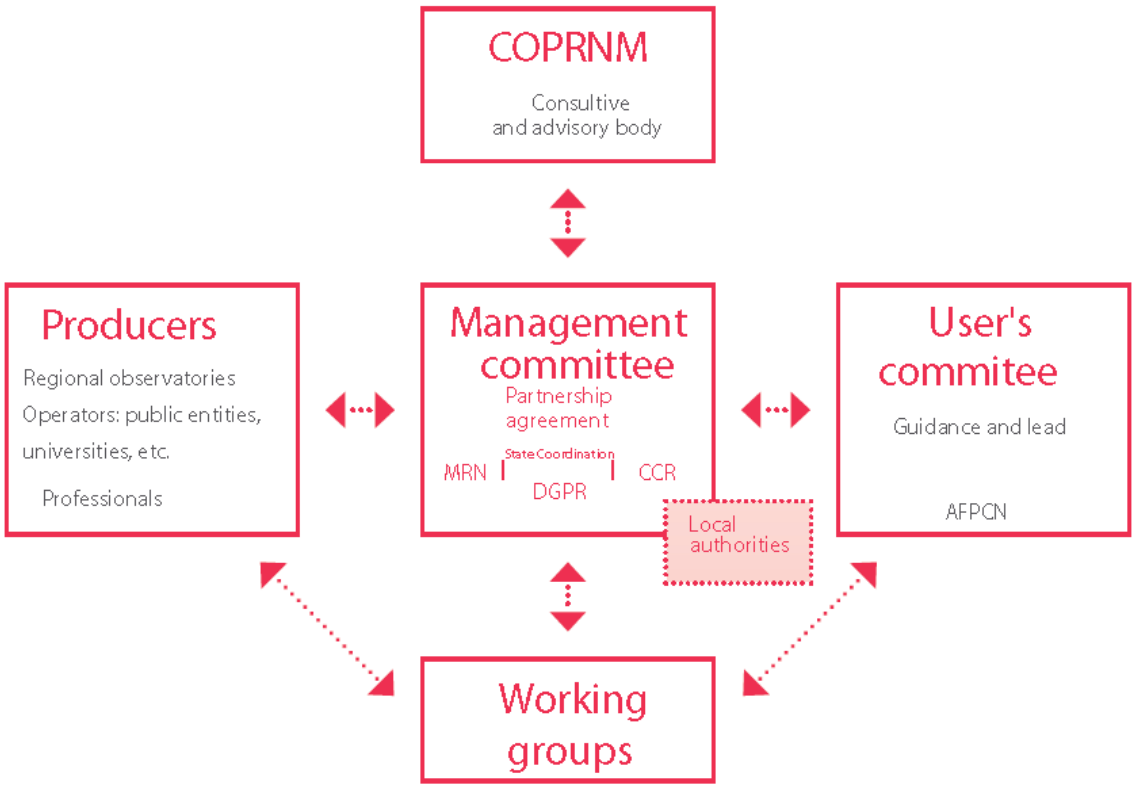

Figure 1. ONRN management model.

To synchronise itself with its own evolution, the observatory has made one or two changes to its management model on the occasion of the latest renewal of the agreement for a new three-year period. Thus the General Council for the Environment and Sustainable Development (CGEDD, for the French) at the MTES (Ministry for Ecological and Solidarity-based Transition) chairs and leads the management committee of the ONRN, the AFPCN has become a standing member in a consultative capacity, the territorial stakeholders' associations such as the European Center for Flood Risk Prevention (CEPRI) and the French association of territorial public agencies for river basins (AFEPTB, for the French) can be invited to the committee. Moreover, from now on the post of head of the ONRN mission has been created. The network of natural risk observatories widens the circle of the users' committee.

1.2. Principal utilities of the ONRN

The website at www.onrn.fr was opened to the public in March 2013. The portal shows and shares databases, public reports and information on events, partners and its projects. It therefore makes it possible to access the major useful information on the activities and decisions of prevention stakeholders in the following areas:

1. Hazards and the zones where they might appear (floods, geo-technical drought, earthquakes, landslides and storms)
2. Exposure and vulnerability to risks
3. Loss rates and feedback
4. Prevention procedures and programmes
5. Interested parties in prevention grouped into a directory with a description of the projects in the charge of public stakeholders.

The portal makes it easy to access this information according to **subject matter or territory.**

For the data provided by its partners to be exploited, the ONRN defines, produces and makes available on its portal specific datasets for **53 national indicators** in connection with the areas previously mentioned, either on a municipal or department level (for wind storms). Since the first set of indicators posted online access has been provided to data that had hitherto been reserved for the insurance industry such as on average and cumulative costs, loss frequency and loss rates. These specific ONRN indicators are freely available via a cartographic interface that allows not only data downloads but also those of metadata, in the format specified by the INSPIRE directive, as well as a standard record card which shows the definition of the indicator, elements of uncertainty, usage limitations etc.

Hay que destacar que para hacer el seguimiento de la Estrategia Nacional de Gestión del Riesgo de Inundación (aplicación en Francia de la Directiva Europea de Inundaciones) se han utilizado diez indicadores del ONRN.

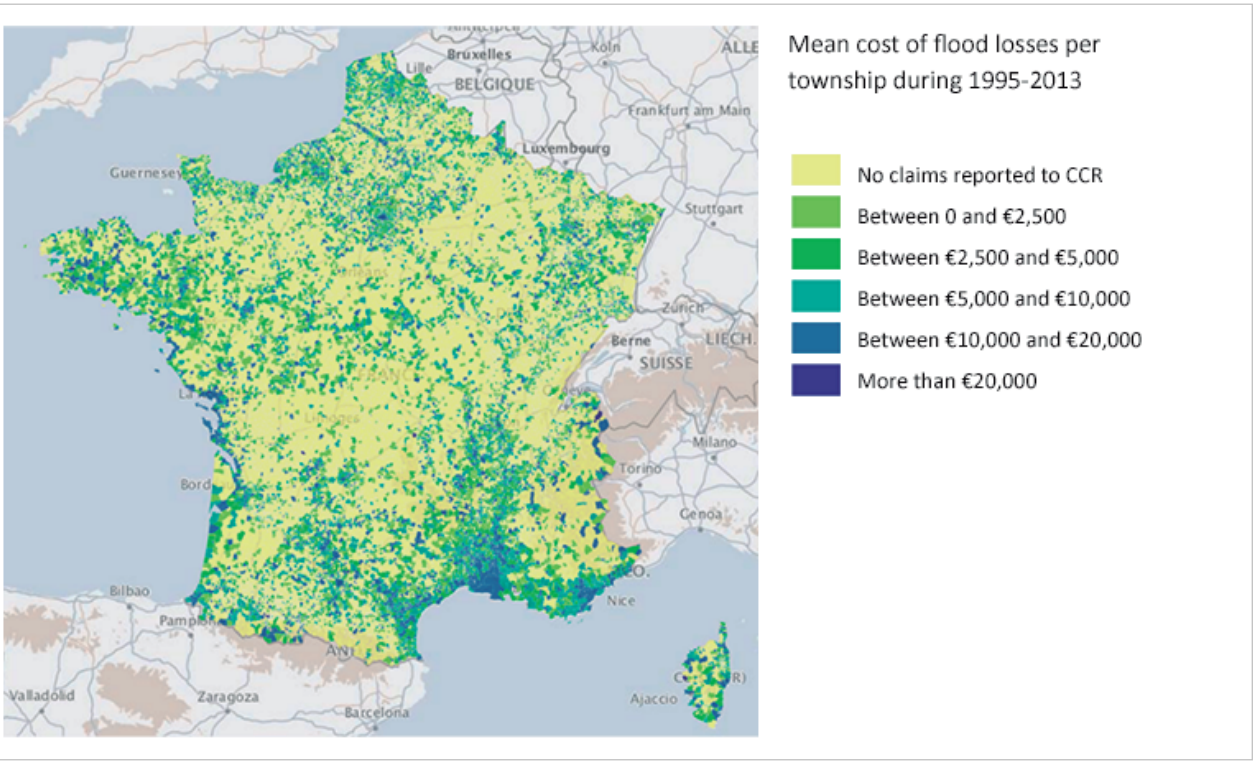

Figure 2. Example of indicator in relation to the insurance available on the ONRN portal.

1.3. ONRN publications

The ONRN has a digital publication which is associated with its work and called "Les cahiers de l'ONRN" (ONRN notebooks). The first edition is an assortment of the points of view of most of the data producers and users to offer an insight into the status of the matter of available knowledge and its grade, as well as to leave on record the

needs for contribution to the ONRN for these different stakeholders. The second edition sheds light on the state of awareness in France of the loss caused by natural phenomena. A third edition is currently being written, which will be given over to showing the importance of sharing data for a better understanding of natural risks and presenting the results of the experiments carried out with territorial partners (see what the current regional associations are below).

On top of this, in 2016 an annual informative bulletin was launched, "Newsletter de l'ONRN". Newsletter No. 1 presents a summary of the key figures taken from the indicators generated, puts forward a round-up of the observatories developed across the territory and offers certain good practices. This first edition also clarifies aspects of a special problem area, namely "the cost of natural disasters". It also features the viewpoints of a senior manager or a user of data from the observatory via the section titled "Questions to...".

Newsletter No. 2, which was published in September 2017, was focused on giving an account of the damage from the natural disasters in 2015 and national prevention policy. This exercise will be a regular feature every year so as to update results and analyse long term trends.

1.4. Other ONRN communications activities

The ONRN also engages in:

- Organising a series of three symposia on loss rate awareness in association with the ONRN's users' committee under an initiative by the French Association for Natural Disaster Risk Reduction (AFPCN).
- Taking part in national or international events, including : National conferences on natural risks in Bordeaux, 2013 and 2016, 3rd World Conference on Disaster Risk Reduction in Sendai (Japan) in 2015, a Hackathon on natural risks in 2016, an ongoing series of workshops under an OECD initiative or under the auspices of the European Commission's Joint Research Centre in connection with the creation by member states of their own indicator reporting system in the Sendai Framework for disaster risk reduction (measuring the harmful consequences of events).

1.5. Regional associations

Together with other data producers who voluntarily contribute their information, experience and studies, the ONRN paves the way for extending useful fields of knowledge for other professionals. By acting in this way it is steadily becoming a platform for mutual data enrichment with rising levels of grading and accuracy.

Since 2013 links have been forged between the ONRN and institutions acting at local level in natural risk management and prevention, such as the Paris Region Planning and Development Agency (IAU Île-de-France), the Seine-Grands Lacs Public Territorial Basin Establishment (EPTB SGL) and the Regional Observatory for Major Risks in the Provence-Alpes-Côte d'Azur region (ORRM-PACA).

1.6. Current projects

Start-up of an event database

The event database project seeks to gather information on natural disasters where damage has already occurred or might occur yet as exhaustively as possible so as to improve knowledge about natural disasters, the vulnerability of a territory, and public prevention and management policy that targets natural risks.

On a national level, this project will enable all or some of the following issues to be addressed:

- assessing loss rates by territory
- producing aggregate indicators (average cost, frequency, annual assessments...) to track exposure to natural hazards according to territory and over time
- assessing the impact of factors which worsen or limit the damage brought about by these kinds of events (hazardousness, level of urban development, prevention...)
- comparing events by their intensity and the seriousness of the impact in human, economic and property terms
- enriching feedback
- monitoring how the resilience of territories evolves
- anticipating and modelling impacts
- enhancing risk culture (communications and raising awareness).

This project will also enable a response to the following pursuant to the "EU Loss Data" (1) approach promoted by the EU's Joint Research Centre (the DG JRC):

- the first four quantitative targets under the Sendai Framework for Action as regards disaster impact reduction (monitoring of mortality indicators, persons affected, economic loss and damage to critical infrastructure) over the next 15 years (2015-2030).
- One of the four priorities defined by the Sendai Framework for Action: understanding risk (and enhancing risk culture) by promoting the collation, analysis, management and usage of key data and practical information.

In this regard, the ONRN will partner on experimental projects to gather, process and exploit data and loss rate indicators with the support of the European Commission's services.

Start-up and promotion of a network of natural risk observatories

The goal of this network among territorial initiatives on the level of regions, departments or basins of river or marine risk is to share experiences and good practices, both from a technical standpoint (a minimum of standardisation in terms of terminology, choosing IT tools or geographical information, methods and study topics) and management models.

After the initial phase in which the status of the issue was assessed, in March 2016 the ONRN launched the network of regional and local observatories in Marseille on the occasion of the 3rd round of conferences on natural risks. This is part of a shared approach that embraces the exchanging and exploitation of data, indicators and good practices.

Specifically, the network was later structured into working groups focussing on:

- representation of the territory,
- the monitoring and evolution of territorial approaches to flood risk management, and
- the management and productive usage of data.

(1) A project begun in 2014 and backed by the EC's Directorate General for European Civil Protection and Humanitarian Aid Operations (DG ECHO): **Current status and Best Practices for Disaster Loss Data recording in EU Member States,**
http://drr.jrc.ec.europa.eu/Portals/0/Loss/JRC%20SOTA%20Loss%20Report_11182014.pdf

2. Outlook for integration of the ONRN within coordinated management of public prevention policy and actions: the key role of the insurance industry

In implementing the Aarhus convention on access to information, public participation in the decision-making process and access to justice with respect to environmental issues, the French public initiative on the prevention of natural risks is based on the agencies in shared governance:

- On a national scale, via the Advisory Committee for the Prevention of Major Natural Hazards (COPRNM), in the work of which the insurance is represented, specifically through the MRN.
- On a territorial level, the Departmental Committees on Major Natural Risks (CDRNMs), which are under the direction of the préfet (prefect) (2) and on which representatives of the insurance policy regularly sit at the request of the MRN.

With the transposition of Directive 2007/60/EC on the assessment and management of flood risks, which was accompanied by the adoption of a national flood risk management strategy (SNGRI for the French), specific agencies were also introduced to manage flood risk prevention.

Thus, at a national level, on July 2011 the Ministry of Ecology set up the Joint Flood Commission (CMI), which has the following objectives:

- Bringing together the various stakeholders into one single body with an extensive outlook and to facilitate its long-lasting involvement.
- Making the areas of agreement on flood risk management policy visible and legible.

The commission is responsible for:

- Strategic decisions regarding the start-up of the European directive on flooding.
- Selecting projects to carry out within the framework of the plan for flash floods (which includes the dyke reinforcement programme).
- Classifying the action programmes for flood prevention.

In particular, via the MRN, the insurance industry takes part in this forum and in its efforts to start up the SNGRI's plan of action as well as in managing SCHAPI (for the French), which is the Central Hydro-meteorological Service to support Flood Prevention, via its Advisory and Scientific and Technical Support Committee (or CODOST for the French).

One of the reasons for the insurance industry's great involvement in the work of the ONRN was the potential of this project for making a contribution to discussing and taking decisions as a result of this concerted form of governance that allows the most specific and accurate information possible to be produced.

Consequently, within the ONRN's model of governance plans are afoot for "the Management Committee to present the results of its work to the COPRNM every year" and for the latter "to be able to issue an opinion and seek to avail itself of the ONRN's experience in the subject of natural risk management".

Among the ONRN's tasks a role has been identified for monitoring and reporting information to the agencies listed above, for the special purpose of:

(2) Official who equates to the Subdelegado del Gobierno (central government representative at sub-national level) in each province in Spain.

- Producing specific indicators in response to needs (in particular to oversee the start-up of the floods directive).
- Presenting elements of research on special areas, such as Programmes for Action to Prevent Flooding (PAPIs) and developing observatories specific to these territorial projects.
- Putting together an initial assessment of the events in the previous year, their consequences and the lessons learned.

The ONRN does in fact produce a certain number of national indicators on different topics (challenges, loss rates, prevention, stakeholders and their projects) which apply directly to the various different phases of the concerted management cycle for the prevention of natural risks (Figure 3).

Some of these indicators have already been used for CMI work, particularly to monitor the SNGRI. Currently efforts are underway to encourage adaptation of these indicators to both the national context and that of the various territories as well.

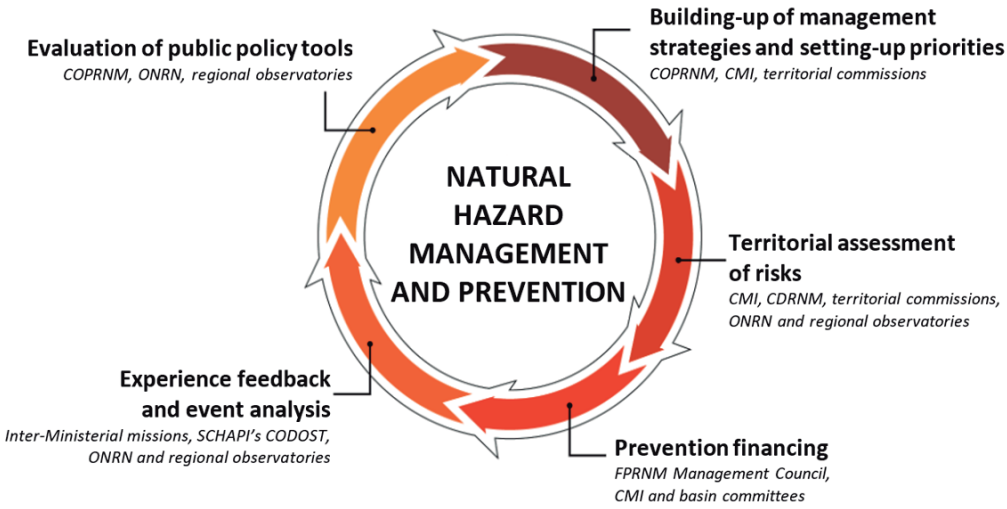

Figure 3. Integration of the ONRN into the phases of the joint governance cycle for management and prevention of natural risks vis-à-vis insurance industry representation.
Source: MRN.

3. Usage of the ONRN indicators by the various categories of territorial prevention stakeholders in decision-making over collective prevention

Given that there are increasingly more indicators with respect to preliminary evaluation of flood risk (EPRI) arising from the European Directive's own requirements in connection with flooding or the status of implementation of certain preventive measures applied (indicators and data produced by the ministry of Ecology and Sustainable Development), the **observatory also allows access to its indicators on past loss rates (insurance indicators).** As was explained in the previous section, these indicators make it possible to improve knowledge for monitoring and assessing public prevention policy on a national level.

One of the aims of the national network of natural risk observatories has been to encourage the usage of these nationwide indicators for territorial natural risk managers, especially those concerning loss rates, which provide a fresh perspective of a territory's situation in relation to risks.

This section offers some examples of how these loss rate indicators are used on different levels and we demonstrate the great interest of the dissemination of these indicators from the insurance industry:

- Integration in local observatories: the example of the Department of Gard's NOE observatory for flood risk management.
- Integration in a territorial analysis of flood risk by the Lys Public Territorial Basin Establishment (ETPB-Lys – SYMSAGEL).
- Comparison of national and local indicators to establish a preliminary diagnosis of vulnerability to flood risk: experiment with the regional observatory for major risks in the Provence-Alpes-Côte d'Azur region (PACA).
- Integration into territorial characterisations of natural risks of a loss rate angle by the Nouvelle-Aquitaine regional risks observatory (c.f. Results of the working group of the national network of natural risk observatories).

3.1. Integration into local observatories

Local observatories have become key in disseminating information to territorial stakeholders.

Given that data on loss rates is still relatively centralised, a lot of them have chosen to disseminate the ONRN's loss rate indicators via their platforms.

This is the case of the Department of Gard's NOE observatory for flood risk management, which uses its website to disseminate a series of indicators so the public can know the status of flood risk in Gard and measure developments in this over time. Among the thematic categories of indicators chosen and aligned with the strands of prevention policy, one refers to the **history of flooding and loss rates** which incorporates (among others) the loss rate indicators produced by the ONRN (Figure 4). The NOE observatory thus shows, for example, that 63% of the territory's municipalities (224) have an average cost per loss of over €5,000 and that for 32% (114 municipalities), this cost ranges between €10,000 and €20,000.

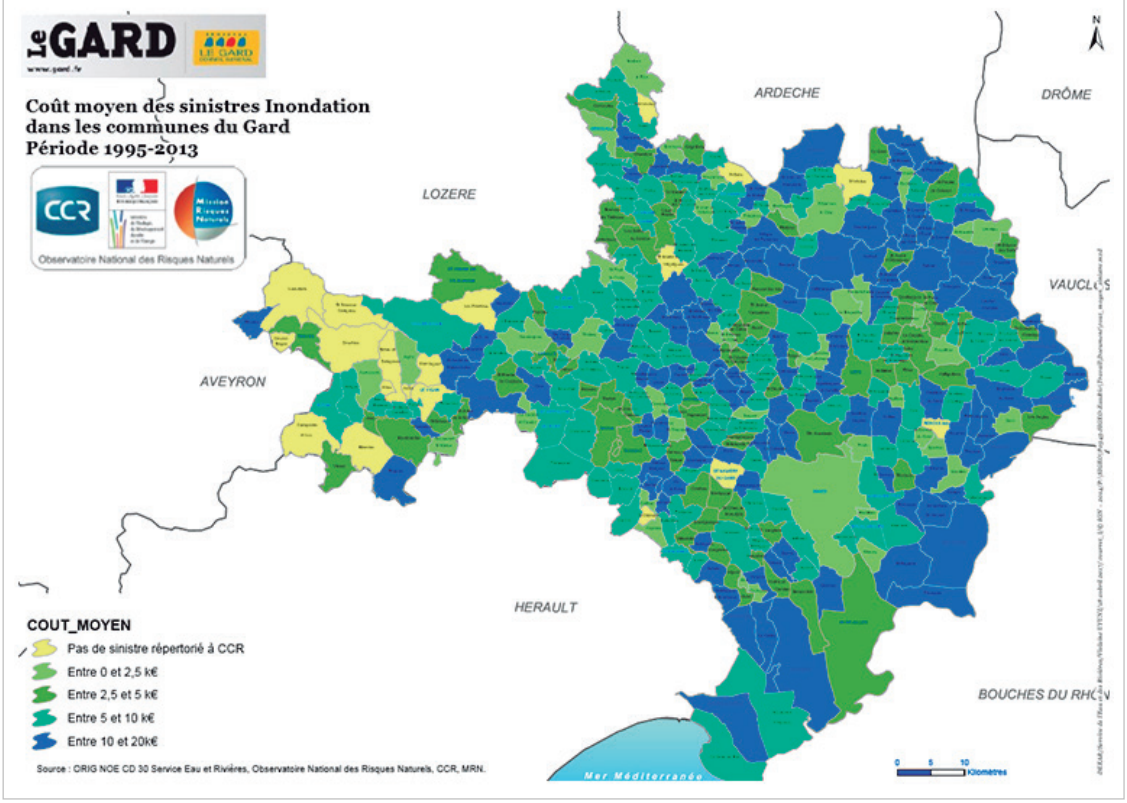

Figure 4. Map of average costs of losses per flood in the municipalities in the Department of Gard for the 1995-2013 period
Source: ORIG NOE CD 30 Waters and Rivers Service, ONRN.

3.2. Integration in a territorial analysis of flood risk on a river basin scale

Beyond dissemination of information, certain territorial stakeholders have used the ONRN's loss rate indicators to take them into account in their territorial analysis.

This is the case of the Lys Public Territorial Basin Establishment (SYMSAGEL) where the damage accumulation and frequency indicators (Figures 5 and 6) have made their contributions:

- To knowing the status of the matter of vulnerability (pending the results of the multi-criterion "AMC" analysis) for the territorial diagnosis of local flood risk management strategy (SLGRI, for the French).
- To establishing priorities among municipalities for the setting in train of prevention actions.

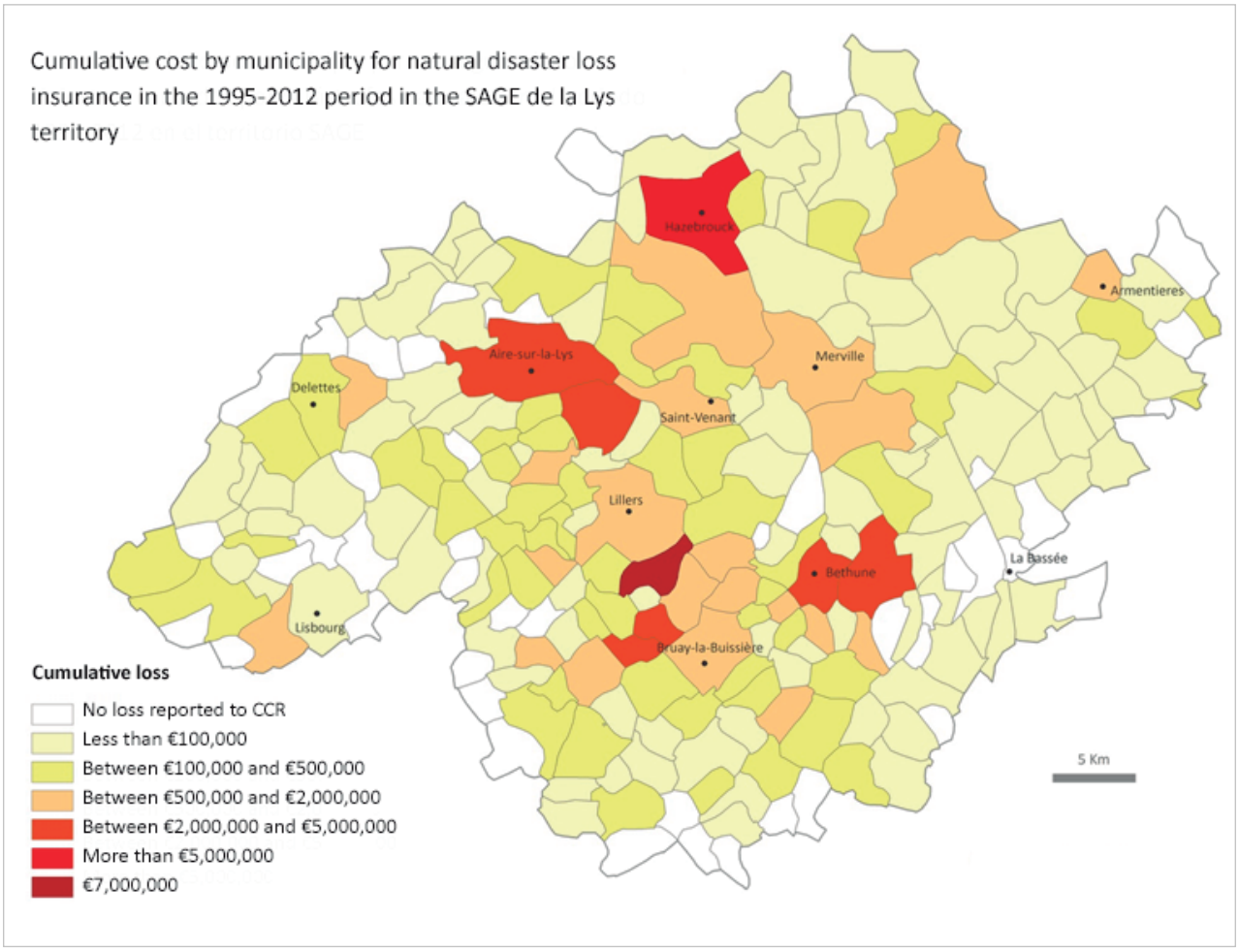

Figure 5. Cumulative cost by municipality of flood losses for the 1995-2012 period. Produced by: EPTB Lys / SYMSAGEL – Dec. 2016. Source: SYMSAGEL, GEOFLA, ONRN.

3.3. Comparison of national and local indicators for preliminary diagnosis of vulnerability to flood risk: regional level cross comparison

To delve deeper into analysis of a territory's situation as regards risks, an approach has been used which involves cross comparison of indicators within the framework of the ONRN's remarks on putting the indicators produced to good use. This approach is based on crossing the exposure, loss rate, and prevention indicators and relies on an already-made analysis for flooding on a national level which is enriched with the information obtained locally. This cross comparison between exposure, loss rate and prevention aims (with the cooperation of local stakeholders) to establish a **preliminary analysis of a territory's situation in relation to flood risk.**

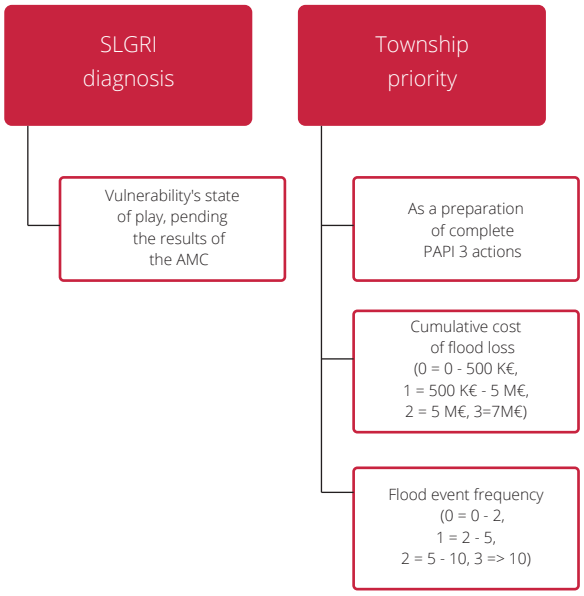

Figure 6: Diagram showing the two different uses for ONRN indicators.
Source: EPTB Lys / SYMSAGEL.

It seeks to achieve the following simultaneously:

- Improve knowledge of a territory's situation in relation to flood risk by cross-referencing national indicators with municipal-level definition provided by the local stakeholders.
- Establish a preliminary diagnosis of vulnerability to flood risk and to gain an objective idea of a territory's situation in relation to the risk, especially to determine the boundary of the territory subject to the risk so as to run an analysis of the vulnerability on a sub-municipal scale (according to the national reference for vulnerability to flooding).
- Identify municipalities at risk (exposure and loss rate), particularly those where preventive measures have yet to be specified.

An experiment was conducted in 2015 in the PACA territory in conjunction with the Regional Observatory for Major Risks in the Provence-Alpes-Côte d'Azur region (ORRM PACA).

This study was carried out in the 963 municipalities of the departments in the PACA region: Bouches-du-Rhône, Var, Vaucluse, Hautes-Alpes, Alpes Maritimes and Alpes-de-Haute-Provence. It was based on indicators produced by the ONRN and others that were generated by information received from local stakeholders on the progress of other prevention procedures.

The study was particularly useful in evidencing that there is no necessary correlation between the loss rate and exposure: 12 highly exposed municipalities have not experienced loss recently and they therefore have abnormally low loss rate indicators.

As far as most of the exposed municipalities are concerned, as well as all those municipalities with high loss rates, they have an approved or prescribed Flood Risk Prevention Plan (FRPP). At any event, the study made it possible to identify certain municipalities that are highly exposed to flood risk and whose FRPP was defined over four years ago now, and which even lack a FRPP or a PAPI (Programme for Action to Prevent Flooding).

426 municipalities have drawn up their Municipal Protection Plan (PCS for the French), among which there are exposed municipalities, one of them with a high loss rate.

Notably, with respect to municipalities located among the TRIs , 22 do not even have a FRPP or a PAPI and 25 have not drawn up their PCS.

Ten municipalities do not have a Water Planning and Management Scheme (SAGE, for the French), among which there are municipalities that are highly exposed or which have high loss rates (Figure 7).

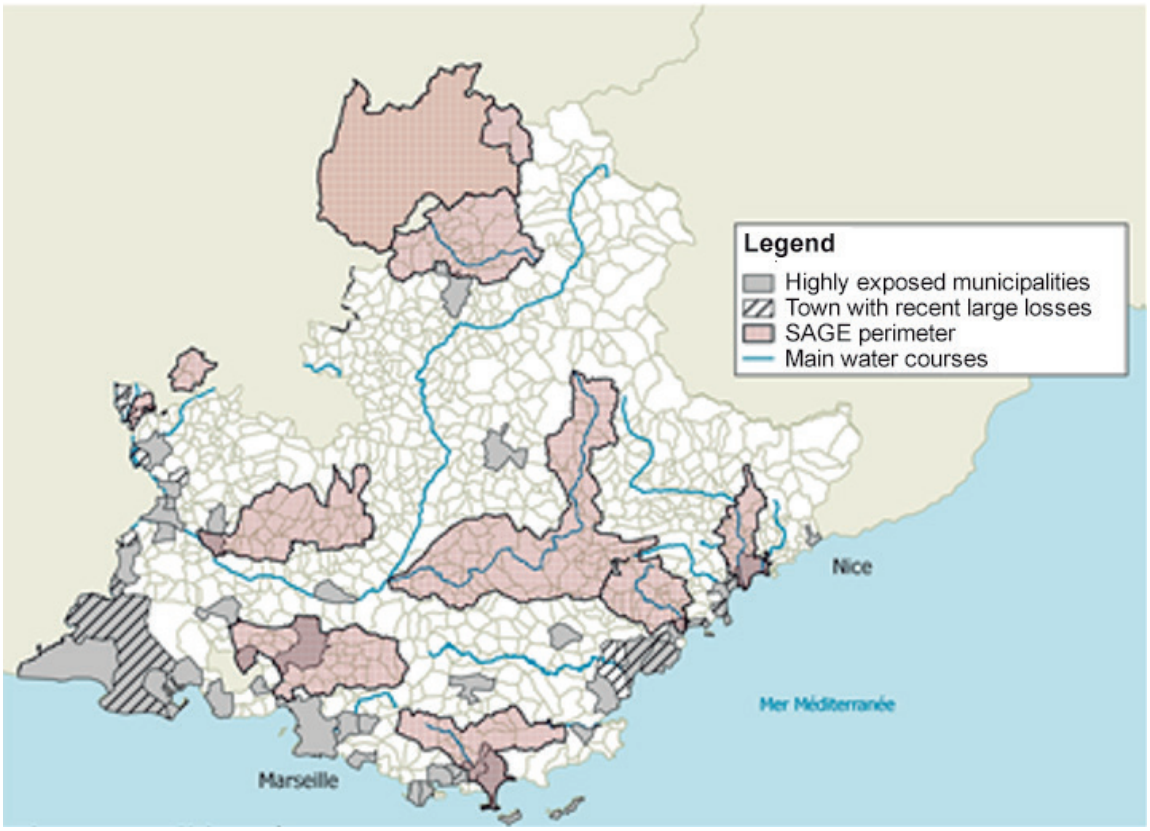

Figure 7. Illustration of cross comparison of municipal indicators.
Source: ONRN, ORRM PACA.

The experiment was aimed at verifying implementation on a territorial level of a method of analysing local vulnerability to flood risk based on a cross comparison of indicators produced by the ONRN and local information within the framework of a shared governance system. It has made it possible to evidence certain facts regarding correlations between exposure, loss and prevention on a municipal scale. A second phase, from now onwards, consists of local stakeholders using and improving this method in risk management activity. In the long run the objective is to convert this analysis into a shared tool to help decision-making, particularly in the light of the assessment of the effectiveness of prevention measures.

3.4. The integration of loss rates into the characterisation of the territory in relation to natural risks

A final example of using the ONRN's loss rate indicators concerns their integration into the territorial portals on natural risks of both regional and local observatories.

At the time when territorial natural risk observatories were starting up, the **Nouvelle Aquitaine Regional Risk Observatory** (ORRNA) suggested organising a working group to define indicators that would be suited to making characterisations of natural risks in a territory that address various needs:

(3) Territory with Major Flood Risk

1. Shared diagnosis of the territory.
2. Recognising public prevention policy.
3. Offering guidance for regional and local policies.
4. Cultivating a risk culture (preserving the memory of events).

These characterisations of a territory essentially target the technical experts in territorial groups and the decentralised state services. They are intended to enlighten by providing an overview of the territory with reference points and concise information. Those involved in the working group have agreed on what the five themes to approach should be in characterising any given territory:

1. overview of the territory
2. exposure of the territory to natural hazards
3. loss rates
4. challenges which have presented themselves
5. prevention policy.

Loss rates described by a portion of the ONRN's indicators therefore emerge as one of the key elements in characterising the situation of territories in relation to natural risks.

The ORRNA is currently engaged in putting territorial characterisation of this kind into practice and its experience will facilitate replication of this in other territories.

Conclusion

The ONRN is a living laboratory which works on the principle of a public private partnership nationally (top down) and territorially (bottom up), and it represents a platform for collating and pooling information required for managing risks, whether this be for improving knowledge, enhancing management, making better decisions in investing in prevention or "building back better". It was possible to demonstrate this on the occasion of the 3rd World Conference on Disaster Risk Reduction (Sendai, May 2015). Building Back Better (BBB), the last of the four priority goals within the Sendai Framework for Action, calls for the specific support of direct insurers and their adjusters, particularly on the basis of loss data that they can contribute. At a recent conference on this matter there was an exchange of good practices, which included those of the Consorcio de Compensación de Seguros (FFA, Paris, 8 September 2017).

Having emanated from a political commitment at the highest level among all those concerned, including the insurance industry, the ONRN is an integral part of the living and interactive system in the "French national disaster prevention platform" (Figure 8), towards better assessment and decision-making in our individual and collective actions aimed at managing and preventing natural disaster risks.

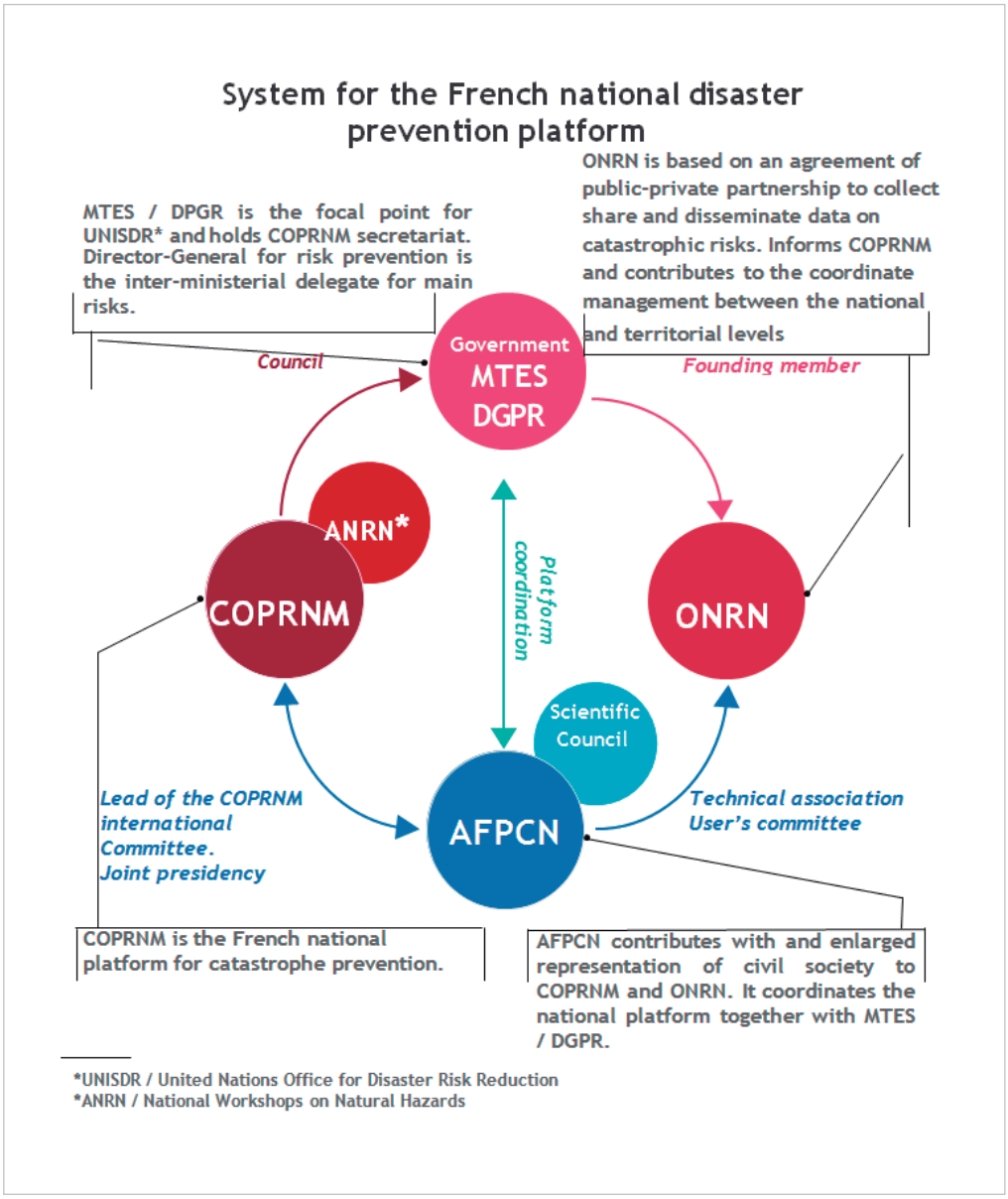

Figure 8. The system for the French national disaster prevention platform.
Source: AFPCN.