EXCIFF

European exchange circle on flood forecasting

Good Practice for Delivering Flood-Related Information to the General Public

Frédérique Martini & Ad De Roo (eds.)

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About EXCIFF: The European exchange circle on Flood forecasting was set up in the framework of the EU action programme on flood risk management and the EU Stakeholder group on floods, set up by the European Commission to advise on the development of the Directive on the assessment and management of floods (adopted 18.1.2006).
EXCIFF operates on a mandate by the Water Directors, and is since December 2006 an activity directly linked to Working group F on Floods in the Common implementation strategy for Directive 2000/60/EC. Members of these groups are nominated by the Water Directors and represent EU wide expertise of policy makers and practitioners from Member States as well as non-governmental organisations and international bodies.

Summary: As part of the work carried out by the Exchange Circle of Flood Forecasting (EXCIFF), an activity was initiated to bring together good practices in communicating flood-related information to the general public. A drafting group consisting of staff of several operational flood forecasting agencies in Europe collected and compiled these good practices. The team worked on this task mainly by e-mail and during 3 writing sessions, hold twice in Brussels and once in Mainz. All the EXCIFF members have been involved at the end of the validating process.
Aspects that are covered in the guide are a review of the current practices, the kinds of information in a flood warning, several broadcast technologies (internet, mobile phone, telephone, newspaper, tv, radio, public broadcasts in the street), dissemination frequency, phasing/co-ordination, synchronicity and conflicting disseminations, as well as training and education, both of the provider staff responsible for informing the general public, as well as education of the general public itself.

For more information please visit the European Commission's webpage on water policy: http://ec.europa.eu/environment/water/index.html

For more information please visit the EXCIFF website: http://exciff.jrc.it

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I. Introduction

A. Context of the work

In January 2005, the members of the Exchange Circle on Flood Forecasting (EXCIFF) identified the main subjects of interest for the exchange of experiences and information on flood forecasting.

It was identified that one of the most important issues in flood warning is the way the general public (GP) is informed about flood events. No matter how good and reliable a flood forecast technically is, without a proper communication to the general public, the primary objective of flood warning is not achieved.

Consequently, the European Water Directors asked EXCIFF to produce a guide about "how to deliver flood-related information to the general public?". The Guide at hand is the result of this work.

B. Framework

This guide focuses on several good practices for delivering flood-related information to the general public. Even if the writing group is aware that flood forecasting information has to be delivered to national, regional and local rescue services, civil protection and other organisations, it has limited its mandate in targeting its work to the information to the general public (to the end to limit the amount of work for this first stage). Consequently, this guide is addressing the way to inform the general public only, thus excluding the way the authorities responsible for safety are informed.

The Guide is aimed at national or local bodies producing and disseminating information about flood forecasting. In its current shape it is not for general public's use.

This Guide is thought to be applicable to any European country. However, the different ways countries are organised to produce and provide information to the public can impact or limit the content of this guide.

C. Definitions

The key words used in the following are defined as below.

- flood event
  - " Temporary covering by water of land not normally covered by water. This shall include floods from rivers, mountain torrents, Mediterranean ephemeral water courses, and floods from the sea in coastal areas, and may exclude floods from sewerage systems" – Reference: Proposed EU Flood Directive, 2006
- flood warning
  - "Advance notice that a flood may occur in the near future at a certain station or in a certain river basin" – Reference: UNESCO/WMO, Gloss. Hydrology, 1992
- Push and pull modes
  - Two modes of communication exist:

- (a) Pull Mode or Proactive: a reader/collector (in this case: the general public or flood affected population) polls an exporter (e.g. the flood forecasting centre) periodically in order to gather data or forecasts, usually through a request/reply mechanism (e.g. internet or WAP-services).
- (b) Push Mode or Reactive: an exporter (e.g. the flood forecasting centre) pushes out data/information to a set of readers/collectors (in this case the flood affected population) registered as listeners when a pre-defined event occurs (e.g. phone services, public broadcasts in the street).

But the two modes should be mixed. For example flood information in a pull mode will reach the flood-affected population only where this communication mode is used and accepted by the GP. When opening a new pull mode system users have to be informed and trained on it.

D. The Guide of Best Practices on Flood Prevention, Protection and Mitigation

In November 2002, after the dramatic floods that had recently occurred in Europe, the informal group of Water Directors of the European Union (EU), Norway, Switzerland and Candidate Countries agreed to take an initiative on flood prediction, prevention and mitigation. To this end, a core group led by the Netherlands and France together with the European Commission prepared a "Guide of best practices on flood prevention, protection and mitigation" eventually validated by the Water Directors in June 2003.

In particular, when addressing the question of public information, this guide presents as a good practice the early information of the public:

> *"The information [concerning flood] should be disseminated early and actively, not just on request and be accompanied by the envisaged procedures for public participation."* (Extract from the "Guide of best practices on flood prevention, protection and mitigation")

II. Review of the current practices

The first task carried out by team5C consisted of making an overview of the current practices to inform the general public. To this end, 2 questionnaires were circulated within the members of the team5C, in September-November 2005. One questionnaire was dealing with the current practices for informing the general public about flood events. The second questionnaire was focusing on the general public's expectations for the information about flood events (content and presentation).

The synthesis of these two overviews served as basic material for writing the Guide.

Synthesis of the current practices for informing the GP in Europe : see in Annex4.

Synthesis of the general public expectations: see in Annex5

III. Good practices

This guide aims to offer several good practices for informing the general public about flood situations. These examples of good practice are based on experience existing within the participating countries of the working team.

To this end, the following paragraphs will address several topics allowing describing the way the information produced for the general public should be designed.

We will then go through the different characteristics of the "product" made with the objective to inform the general public about a flood event:

- Part A will present some general characteristics of the product;
- Part B deals with the presentation of the product;
- Part C goes through the different broadcast technologies to use;
- Part D deals with the dissemination of the product;
- Part E goes through the question of the training of the staff producing the information and of the general public receiving the information;
- Part F will conclude with the question of the feedback.

Annex3 presents additional examples of national practices.

A. General characteristics

1. Language and vocabulary

Language and vocabulary used should be adapted to the addressee (in this case the general public). Some key points may help to compose the information with the appropriate words.

Language

It is better to prevent the use of several threatening words (such as catastrophe, death, chaos, ...) but obviously without hiding the truth and telling exactly what is happening.

A short description of the event should be given presenting a clear, accurate and precise account. The description has to be honest telling the exact truth about the event.

It may be necessary to pay attention to the local language (e.g. multi language countries and borders regions). In that view to produce several different bulletins for each language may be appropriate (example in Northern Italy – Trento, Bolzano).

For the same reasons, it may be appropriate for some countries, to offer the choice of different languages (foreign languages). That facilitates the understanding of the document by the maximum. But on the contrary not too many different languages should be proposed (see examples in annex)

Box 1. Use of different languages

In Italy an example of such approach is provided by Trento and Bolzano provinces

www.meteotrentino.it , http://www.provincia.bz.it/.

In the dedicated web page relevant information, including daily bulletin, is available in Italian, German and, in Bolzano web page, "Latin" languages, aiming to be understandable by local population, and English language, addressing to foreign people, since it is the largest spread language.

Similar solution is adopted by Friuli Venezia Giulia Region http://www.osmer.fvg.it/ next to Slovenia (see examples in annex as well).

When presenting the flood event it is good to compare the event with some recent events, similar or comparable. Referring to a similar past events (found out from a past events database) gives an added value to the information to the public. That

makes people remember the past event and keep it in mind. That may also highlight the similarity between the present event and this referred past event. But obviously one should pay attention to clearly distinguish observed data from forecasted data.

For that purpose one could refer to an updated database of past events, easily accessible. The Rhineland-Palatinate Flood Warning Centres provide on their website for each gauging station a table with water levels and discharges of the ten highest flood events. http://www.hochwasser.de/

Vocabulary

It is essential to give explanations about the meaning of all the specific words used. Also the meaning of the risk level (see below, par. 3-b) must be explained.

Thus one should prevent from using acronyms or technical words, unless they are defined.

The explanations of key words may be presented in a separate frame/box (if possible depending on the broadcast technology used).

One should prefer using local designations to refer to geographical areas to make the information clearly understood by the users. In the same idea referring to zoning references facilitates the comprehension for the public (This statement is appropriate only if a regional flood risk map indicating flood zones, is regularly published towards the public, so that the real time forecasts could refer to this zoning; see "annual information campaign" in paragraph 5b)

A glossary is a useful tool in this context. It helps to :

- Use the same words to describe the same event, depending on the regional circumstances/context. It is good to try to always use the same words for the same situations
- Know well the meaning of the terms used in the neighbouring areas (e.g.: design flood)

Box 2.Examples of weather glossary

In Italy: http://www.provincia.bz.it/meteo/termini2_i.htm (see also in annex)

The Interreg project TIMIS (Transnational Internet Map Information System on flooding) is developing such a glossary - http://www.timisflood.net/en/index.php.

The International commission for the protection of the Rhine has also developed a glossary.

And finally it may be very useful to feed and refer to a frequent answered questions database.

See annex1 (UK, Germany)

2. Kinds of information

The preferable elements (or kinds of information) to provide and to mix one to each other in a complementary way should be at least the following ones.

a) General information

Location/s affected by flooding

First of all some precise information about the location of the flood event and indication about the flooded area shall be delivered.

The second element of importance is the time expected to flood.

This should be followed by the critical period (duration) of the expected flood event.

This part should also include some explanations about the tendency regarding the location of the event.

Date and time of the event

Date and time of observation and forecasting must be clearly indicated.

Date and time of the next expected information must also be given.

Advice on behaviour

It could be of great interest and advantage to provide for advice on what to do after receiving the warning (refer to C-5-b education of the GP).

Other information of interest

Details about who to call and who does what (other authorities: fire service, rescue service) should be provided. The useful telephone number available in case of crisis should be easily found

And finally information on other means of information available should be delivered.

b) Warning level scales

If a warning level scale is used, one should explain clearly that it is not a stage warning level but an accurate warning level (to prevent people from waiting for the highest warning level before reacting).

A scale should be fixed, based on hydrological thresholds and meteorological thresholds.

It may be possible also to mix several solutions to increase the quick perception of the message (e.g. colours, numbers, words, format, icons: see example in annex)

0	nill
1	low
2	**medium**
3	**HIGH**

Box 3. Examples of warning level scale:

Coloured risk (or other appropriate word) levels (see example from France in Annex)

UK: Icons/level of warning in words : Annex 3b shows the UK use of icons (including descriptions) to show and represent the different levels of warnings used.

Annex 3b also shows the use of different maps available to the GP to determine the flood level of risk in their area or region.

http://www.environment-agency.gov.uk/subjects/flood/?lang=_e

Spain: Numerical risk levels are used particularly for land use management

The map scale should be adapted to the region. The maps may propose different layers so that people can select the region they want to know more about (see UK example in the box above).

One should make reference to a public and fixed scale, known by everybody, largely disseminated in advance and who to refer to in case of normal situation.

A reference to historical floods (recent events), well known by the population living in the region, including some images too, comparable to the actual flood; the actual flood being far different from the historical one or similar to the historical one, should be made.

The risk level should concern either a point associated to a section of the river where it is located, or a linear or a geographical area, depending on the characteristic of the basin. One should try to mix the three ways of presenting the risk levels if possible (possibility to down-scale the information).

Box 4. : Define a warning level scale

For defining the *warning* level scale, a good knowledge of hydraulic behaviour of the basin is needed. This also asks for a good scientific knowledge and information about land use; (examples: association of fixed thresholds with damages; reference to past events (depth, area, velocity); hydraulic models

Thresholds for the *warning* level scale should be fixed by the flood forecasters in co-operation with civil protection services who must have the information of land use from the regional authorities.

Also it could be useful to make damage evaluation of different levels of discharge (example in Germany).

c) Numerical data

Data availability

Meteorological data, such as rainfall (intensity or total amount) or any other meteorological information (temperature, wind, tide, low depression, ...) are interesting for the public. But one should pay attention to the owner of the data; it is better to get a relevant agreement to disseminate the data

If relevant, spatial water equivalent of snow, either in normal situation or in case of flood, depending on the country's habits should be delivered.

When appropriate, the links between the meteorological and the hydrological situation should be explained.

Gauging data can be water level, or discharge or both. Their dissemination depends on the data quality or the public understanding.

Usually a water level in a known site is very comprehensible for the people but a reliable discharge can be a good reference too and can show the flood magnitude in a better way than the water level can.

A way to clarify the flood risk is the comparison with past and historical events that people can keep in mind. To this purpose, a historical database should be put on line.

In some cases, depending on the country's habits, spatial water equivalent of snow (either in normal situation or in case of flood) is interesting information for the public.

Real-time data?

People ask for more information in case of flooding. Continuous information updated in real time should be provided. Some additional data in case of flood may be added. Nevertheless, real-time numerical data can be wrong ; thus they should be provided with carefulness and only if the reliability is sure to avoid mistaken alarms.

d) Time and level of the maximum peak forecasted, or critical period

When it is possible to determine the information the major flood features have to be released. Many times the level or the peak forecasted is the most wanted information.

Give an interval or approximate level and time (within the morning, the afternoon).

e) Forecast uncertainty with meteorological as well as with hydrological forecast, EPS-forecast

Two kinds of uncertainties are produced: one concerns the meteorological situation itself and its forecast (e.g. hydrological ensemble forecasting when meteorological ensemble forecasts area used as input) and one concerns the hydrological model (uncertainty of state variables of the hydrological model such as soil moisture, water equivalent of snow); make a combination of them if possible.

There are many layers of uncertainty when trying to produce an accurate flood forecast. This can consist of data, system and people. One or more of these may contribute to the uncertainty.

Box 5. example on how to communicate the uncertainty

Italy: use probability range (low/medium/high) instead of exact numbers (23%, 67%, 85%), aiming to stress it is a general indication.

Available example here:

http://www.meteotrentino.it/AspWeb/Bollettini/boll_prot_civ/protezione_civile.asp?id=8

Encourage a close two-ways communication between meteorologists and hydrologists (in particular to know how to take into account met. forecast uncertainties); experience of forecasters

Box 6. daily briefings in France

In France the National hydro-meteorological and flood forecasting centre (SCHAPI) keeps daily close contact with the National weather forecasting centre to carry out a permanent monitoring of the situation. Also a daily video-briefing takes place between the SCHAPI and the local flood forecasting centres (SPC) in order to ensure a maximum coordination for producing the flood forecast and the flood vigilance map associated (see Annex3) for all the territory.

One should communicate the uncertainty to the GP and to the security services, but always keep in mind the (mis-)interpretation that people may make of the

uncertainty. One should also pay attention to the education and preparedness of the general public to this matter (the GP should have an understanding of this concept) and that the longer the forecast the higher the uncertainty.

Box 7. Examples of uncertainties presentations

Written text of probability: In Finland, the discharge is described, for instance, as "higher than xx(1-3 different values) with xx(1-3 with different probabilities) probability

Percentage of probability : in UK, flood maps produced by the Environment Agency show likelihood of risk of flooding.

http://www.environment-agency.gov.uk/subjects/flood/?lang=_e

B. Presentation

The kind of presentation to prefer depends closely to the broadcast technology. But it is possible to mix several ways of presenting, being complementary one to each other. Nevertheless one should take into account the national/regional information culture and the flood-related experience of the general public when choosing the kind of presentation!

For some broadcasting systems (this is relevant for interactive media only) it is appropriate and efficient to propose several layers of information depending on the scale the user is interested by: from the general information to the more detailed one). The pull mode systems are particularly adapted to this approach.

Maps of flooded area, delivered to the public should be as detailed as the data owners protection permits (but the maps used for internal purposes may be downscaled)

Preferred kinds of presentation:

- written information : including small/large print or “Braille”
- graphical presentations: maps, tables, hydrograms, …
- vocal messages
- video

How to use this presentation is detailed below:

Nonetheless, the written or vocal bulletin structure is rather independent from the broadcast technology used. This structure may be as showed in the box below.

Box 8. – Basic structure for a written or vocal bulletin in full language

⇒ a header: a short title describing the event and/or its development

⇒ date and time of the bulletin's delivery and its time of validity

⇒ name of the bulletin's provider (the organisation)

⇒ core message: short and clear description of the current situation, and its forecasted development ;

⇒ data: observed and forecasted data; comparison with past and historical events; flood warning level if available; time and level of the forecasted peak

⇒ uncertainty: level of forecasting's uncertainty together with explanations

⇒ local/personal advices where appropriate; feared impacts on public life (transport, communication networks, ...) and advices to face them; refer to seasonal activities if appropriate (holidays, sport events, ...)

⇒ information about further broadcast/information technologies to ease telephone service

⇒ general permanent information: flood warning level scale if available; emergency or other useful contact points for more information; links to other information providing systems (internet addresses, telephone numbers, ...); where to find general information about flood risk in the area

⇒ date and time of the next information/forecast

C. Broadcast technologies

Comments: Many broadcast means exist and could be used to provide information to the general public. Although new technologies for information and communication have to be investigated as much as possible for that purpose, classical means have to be maintained also both to ensure that everybody can access the information, and to act as a backup in case of failure (e.g. in case of lack of energy, Internet server failures).

Also attention should be paid to system capacity to avoid system failure (especially for Internet; the capacity of this kind of service will always be limited)

Below a selection of kinds of presentation is presented. For each one is explained:

- when use this broadcast technology?
- how does the presentation look like on this broadcast technology? (content, format, principles and rules to follow, ...)

1. Internet , including newspaper on the web

When use this broadcast technology?

Internet technology is largely used for disseminating information. It is very convenient since it is continuously updateable and can provide different formats (e.g. text, maps, video, vocal messages...). Then, in a way to present a clear frame, it is possible to structure information on different levels, making them linked one to each other in a fast way, both in push and pull mode. On the contrary limitation relies on its accessibility: several times it is not accessible 7 day/week and 24h/day, since in some countries people have Internet access only at the office.

It is recommended that on the main page, information on the current situation is clearly stated (e.g. ordinary condition, warning message issued, alert message issued) using different characters formats, colours and symbols (e.g. Ligurian civil protection web site in Italy: see http://www.meteoliguria.it/cmirlhome.html).

Information on the last and following update should be clearly displayed, as already described in paragraph A – general information

The main page should be linked, if possible in a push mode, at least to three other information levels

- What to do in case of the described scenario (personal behaviour);
- How to be informed, when and how to ask for help;
- Link to regional levels. Here the GP can get detailed information on the event supposed to hit their own area, the related expected effects, how to get information and how to ask for help. The forecasted scenario is synthetically represented here and the description of its meaning, in a linked page.

Some more detailed information, linked in a pull mode, would be strongly recommended:

- Comparing the forecasted event versus previous well-known events, aiming to make it clear to the GP
- Further information
- Real time numerical data and elaboration (e.g. graphs or maps), if available and allowed by the owner dissemination policy.

Some general information should be presented as well, concerning general information on the risk, including occurrence, consequences, facing system, information points, best practises.

Concerning the facing system, organizations, responsibilities and the reliability of the forecast should be generally described.

Manage the page in a way to make it accessible even by equipped mobile phones (WAP technology is available to several mobile phone models, e.g. blackberry, Nokia, Qtek...)

1- Written information

A written bulletin should always be attached to maps, aiming to completely describe the phenomena synthetically described in the map. Refer to the general structure in Box 8 above.

The written bulletin should present few and accurate key facts (keep it simple, easily understandable? Bullet points might ease the readability)

2 - graphical presentation

The presentation may take the form of flood maps showing certain discharge values, or dynamic flood maps updated continuously with the forecast. Discharge and water level graphs with probabilities should be showed with maps to show the continuity of flood event.

Also maps showing areas covered by warnings that have been issued, or maps showing areas affected/flooded may be presented.

The risk level should be mapped too, with a legend describing the meaning and with reference to famous previous cases. (See annex)

Box 9. Examples of presentations

Coloured risk levels based on thresholds - based on observation in Spain, or in forecast in the French flood vigilance map (see annex)

Map showing the areas with warnings, which you can click on to get a text report: example in UK :

http://www.environment-agency.gov.uk/subjects/flood/?lang=_e

Tables with observations at main points/stations where measures are available daily, always the same points

Another example in Spain:

The Automatic Hydrological Information System (S.A.I.H.) sends out information every fifteen minutes on the many hydrological variables in the basin, using a network of 215 rain gauges, 130 gauging stations on rivers, 179 gauging stations on channels, 73 thermometers, 101 radio transmitters and 12 so-called concentration points. These transmit the information to the Basin Control Centre (CPC) located at the headquarters of the Ebro Hydrographic Confederation.

Its main objectives are the optimisation of water resource management, flood prevention and flood response to reduce risks and damage as much as possible, and the overall management of the resource.

Data is updated hourly on the website (http://195.55.247.237/saihebro/). This way it is possible to have access almost in real time to data on irrigation, rainfall in the Basin, the amount of water flowing in rivers and irrigation channels, and the height and volume of water stored in reservoirs

It is also possible to consult and download information corresponding to the previous 7 days, as well as historic data included in the database.

Data available on the website is of great use to those who use the reservoirs and rivers, and for carrying out monitoring in particular situations.

In the Forecasting section, information is given on developments expected over the following two days. This information is drawn up using the Decision Support System (SAD - Sistema de Ayuda a la Decisión).

It is good also to add links allowing to get data (rainfall data, gauging data, direct models outputs with expertise/explanations).

One should favour the use of simple icons related to specific levels of warning and type of warnings issued. (See examples in annex3).

3 - Vocal

Refer to general structure in Box 8 "Basic structure for a written or vocal bulletin in full language" above and examples in annex3

Vocal messages could find a good results if they are put on a fixed page on the teletext and on the radio.

One should favour the use of visual that may allow switching from text to speech. In that situation, people unable to see can easily dial the page on the TV controller or tune in on the dedicated radio channel.

Standard messages should be kept it (only some general statements to put in introduction).

That may be useful also to propose some links to the related radio channels or to some appropriate telephone messages.

4 – video

They could be put on the web site, with a the training interest with the aim to practically show events caused by the described phenomena

One could show flooding video clip/news video clip of flooded areas. This would have to be delivered via the Internet; connection with cameras in the field located in some specific/fixed areas; if possible, one should use moving cameras that could be settled in a flooded place.

Comments: These images may make the people used to having a concrete image of the level of water, related to the numerical data provided in the bulletin (that can be reached during a flood event), but pay attention to the consequences of these images on the public (panic)

5 – Personal Digital Assistant - PDA

For the time being, not enough elements about PDA can be provided for in the guide at hand. Nevertheless this new developing technology is mentioned here to be kept in mind as a broadcast technology linked to the Internet which can be more and more relevant in coming years for flood-related information delivery.

2. Mobile phone

When use this broadcast technology?

All that is written for "telephone" is also applicable for mobile phone anyway if it is used for voice communication.

In addition, the mobile phone offers the possibility of written, graphical and video information. For example automatically generated SMS-messages from the forecast centre can be provided to pre-registered users. Due to limited amount of characters the SMS can be used as a pre-warning to only inform that there is a serious situation including a brief overview how to get more information.

New technologies will allow to reach all the mobile phones situated in a certain area, similar to traffic information broadcast by car's radio. For example a pre-recorded message including the risk typology, the level, the information point and few suggestions like stay far from river-banks and go to upper floors, could be automatically sent to mobile phones detected into the danger area.

The mobile phone sometimes also allows connecting directly to WAP-services or the Internet; thus it is just a way to get access to the information described under the Internet chapter.

1- Written information

It could be used for dissemination of information from forecasting centres via the mobile operators to the public in endangered regions a contract in advance with the network providers has to be set.

It is clear that this could not be the only solution but only a very efficient additional one.

Due to limited amount of characters available in the mobile phone screen, SMS are used only to pre-warn people at first and tell where to get a additional information and a secondary warning.

It is better to prefer simple messages and key words in wording the SMS.

Refer to the general structure in Box8 "Basic structure for a written or vocal bulletin in full language" above.

Comments: SMS information about the attained values, pre-defined alert –levels, as well as forecasts from forecasting centre shall reach local bodies, responsible for defence from floods and rescue services. It should be used mainly in smaller catchments.

2 - Graphical presentation

Some new technologies can be usefully applied in flood risk management. For instance, in case of flood, problems to the viability could be transmitted on the UMTS mobile phones, suggesting an alternative solution. But in so far the people able to manage such tools are very few.

Comments: for the time being, no reliable technologies are known allowing to display graphical information on mobile phone

3 - Vocal

A pre-recorded message including the risk typology, the level, the information point and few suggestions like stay far from river banks and go to upper floors, could be automatically sent to mobile phones detected into the danger area.

See structure in Box8 and for the telephone

4 – video

The development of mobile communication technologies is quite dynamic, these technologies will offer new efficient possibilities to communicate flood information in the future. Some mobile phones now have the technology to send video or pictures. The same possibilities as with web cameras exist.

At the moment these technologies are still quite expensive. In any case it is necessary to check if a new technology is available for the general public, keeping asking whether it is useful for the general public or not.

3. Telephone

When use this broadcast technology?

The use of telephone systems falls into both categories: push and pull services. The telephone is one in the widespread technology and even if other technologies offer more extensive possibilities to provide flood information, phone services shall be used in any circumstance: In contrast to other options – for example the Internet – the phone is used by nearly all parts of the population above all also elderly persons. It is a robust and rather cheap technology, easy to use and available everywhere. Without great technical expenditure several redundant information lines can be pursued. For public access flood phone services can be hold by an operator or connected to an answering machine including direct phone access to gauging stations. A phone service permits – where necessary – also the ability to talk to a human and to communicate personal advices. As communication is the most crucial element of managing flood warning services the capability to provide such a personal voice communication represent an important advantage over other information technologies.

Comments: This broadcast technology is convenient for dissemination of information (such as hydrological and meteorological forecasts and warnings from forecasting centres) for local authorities and rescue services; in particular in case of threatening of storm, windstorm and flash floods.

In the following further recommendations for different phone services are listed:

a) Pre-warning ring by a calling center :

a very direct and personal and individual warning that may indicate:

- who send the message and when
- what area is affected
- what warning has been issued
- telephone number where to get further information

Box 10.example – a "push mode" service in UK

UK has implemented a service giving the possibility to ring people to give a pre-warning (including several automatic tries) telling to contact a service for further information (same principle than SMS); the message is no more than one minute duration

b) Structured flood messages provided by answering machines (pull mode)

- the information should always get the same and standardized format
- technical vocabulary and a ambiguous terminology should be avoided (the caller won't be able to raise a query!)
- slow replay – the caller shall be able to take notes

c) Individual telephone information service by an operator (flood warning centre)

- the person answering should have a good knowledge of the area/region affected by the flood and refer to a national and local database of frequent asked questions (see paragraph "training of the staff")
- important messages should be repeated

d) Direct phone access to gauging stations (answering machines, see Germany example)

- actual water levels, data from the recent past, tendencies and advices where to get further information are provided

Box 11. Example of a "pull mode" service in Germany

In Germany most flood relevant and important gauging stations are equipped with answering machines. They are accessible under a uniform phone number in the respective local net. The answering machines deliver actual water levels and tendencies. The risk of overloading of the system in case of crisis should be carefully studied in advance.

Finland: a wide network (30 stations) is accessible; a long time (20 years) is used

4. Newspaper – in paper

When use this broadcast technology?

Daily newspapers (only) may be used to deliver daily information towards the general public. But it closely depends on the time when the newspaper will be delivered. One has to be fully aware of this before contracting with a newspaper on daily publication of flood forecasting.

In any case, daily newspaper is more a secondary mean of information delivering, due to its too less frequent updating capacity. And it is more adapted for long duration events.

The level of information ought to be adapted to the type of newspaper (whether it is a regionally-disseminated or a nationally-disseminated newspaper). But the exact same information will be delivered to all national newspapers under contract.

Using newspaper to provide information on the flood after the event (summary, comments) makes sense.

Also, newspaper is useful to educate the public and promote flood warnings (see below, Part E "training; education") and to deliver personal behaviour advice.

When a "press service" is responsible for writing bulletins for the newspapers, one should ensure that the flood forecasters originating the forecast may validate the bulletin before publication.

Comments: Contract with daily national and/or regional newspapers to provide for daily updated information only, need to have an agreement with the newspaper to ensure that once the information/warning is provided it will be issued.

1- Written information

In a newspaper, the information will be provided mainly through a written bulletin. It ought to be written in full national language (several languages if appropriate).

With the aim to help readers to get used to the information presentation, the daily bulletins should always get the same and standardized format (see structure box8 above)

Comments: The flood forecasts have to be presented in the newspaper close to the meteorological forecasts and information about public services state of working (transport, networks, ...) if available[1]

2 - graphical presentation

The written bulletin may advantageously comes together with a graphical presentation, presented close to the written bulletin (see 1- above) and updated as frequently as it.

Several kinds of graphical presentation may be used depending on the kind of data concerned:

[1] These is the responsibility of the newspaper to ensure this consistency in the presentation; meteorological information and information about public services are delivered by other providers and gathered by the newspaper

- tables: e.g. to present data related to flood situation, observed and forecasted, and historical events
- hydrograms: same as for tables
- maps: e.g. to present levels of forecasted flood risk (with figures or colour codes) referring to a fixed scale

If appropriate, add legends enabling to understand the figures and the codes referring to the risk's levels scale.

Box 12.Newspaper - example

Finland: newspapers offer quite good information on snow melt floods; the information is updated daily

5. TV

When use this broadcast technology?

The main use of this broadcast technology is for the supply of warnings, forecasts and the education of the public about flood phenomena.

Once the flooding situation has started, the role played by TVs is to warn the public about the flood threat. During the flood it is necessary to provide the latest information and forecasts about the endangered regions, so that the event can be followed. In large catchments, the information about the situation in the upper part may activate the public in the lower parts of the catchments.

These situations happen mainly in spring (or early spring) and in autumn (depending on the regional circumstances), so it is important to establish links between the TV and the forecasters to be ready to inform.

Before and after the event the task is to educate how to behave and what is necessary to be done to reduce damages related to flood events, altogether with explanations that help to understand why and when a flood may occur.

The TV may serve to give a clear and comprehensive explanation of the situation, to warn when the event is going to cause damages, and to explain the predicted evolution to avoid non real expectations.

The frequency TV can present and update information is once or twice a day. This flood bulletins should be included in local as well as in national news and somehow linked to the weather forecasts, which bears relation to the cause and evolution of the flood (according to the characteristics of the basin).

Box 13. In-advance TV agreements

Example in UK: agreement for inclusion of flood-related information into the weather bulletin

Agreements with Met. Office to include icons and discuss any warnings issued during weather broadcasts exist.

Agreements with the BBC to provide information during a flood event. This is called "Connecting in Crisis"

This site http://www.bbc.co.uk/connectinginacrisis/index.shtml explains what service the BBC can offer for broadcasting public alert messages.

1- Written information

As a complementary way to convey the information, a message on the bottom of the screen can be displayed or a telephone number shown to call to get further information.

Box 14. examples of videotext

Germany: Videotext or Teletext is an information retrieval service provided by television broadcast companies. Teletext pages can be viewed on television sets with suitable decoders. They offer a range of text-based information. In Germany (e.g. Rhineland-Palatinate) this information service is already used for a long time to provide flood information, forecasts and reports (see jpg-files). While Videotext is, in most aspects, technologically inferior to the Internet, it is still very popular due to its ease of use and integration into the TV. Another benefit is that, unlike web servers, Videotext is a broadcast and thus does not slow down as the number of users increases. This is relevant during great flood events which often block access to the webpages of major flood sites.

See Annex6a and Annex6b

2 - graphical presentation

It is very useful to show a map of the situation of the river basin and the tributaries to understand the evolution of the phenomena (sequences), to make out distances between different parts of the catchment and their relative position.

With this map it is easier to inform about the time of the maximum level appearance downstream, and also the very parts of the basin that will not be affected at all.

The aim of this broadcast should be to provide general information of flood development. If available frequent flooding maps with meteorological forecasts and flood risk maps could show the affected area for the discharge expected and could be useful for comparing with precedent floods (in terms such as: similar, bigger, more extensive…)

The use of recognized icons should be taken into account if there is already a knowledge of a flood symbology widespread by civil security services for instance.

3 - Vocal

It is important to give an accurate information about the flood event. A clear and comprehensive description of the flood situation is needed. The minimum content of such information should be:

- causes: meteorological phenomena (precipitation, snow melting, temperature..), reservoir management and whatever may contribute to the flood.
- present situation: description and comparisons with previous events giving levels at fixed points (always the same and enough representative)
- future: evolution of the flood, trends, predictions (time and value of the peak approximately). Again comparisons are needed to give easily understandable information.

4 – video

The main advantage of the TV is to deliver images that may illustrate better than other explanations the flood event magnitude.

The whole explanation should be conducted by a journalist with the intervention of a technician who may contribute with a better and more accurate knowledge of the behaviour of the basin in such flooding situation.

An accurate and comprehensive explanation will prevent general public from panic and taking into account wrong speculations.

Images of the reference scales should be shown in order to identify the fixed points to which explanations (situation, evolution, ...) are referred to. If available, flood risk maps can be useful to determine the affected area due to the maximum level of the water predicted in the scales and must be included in predictions related to the water level.

There are very significant images from a moving camera located on the affected areas and a speaker explaining the situation. It is preferable that the speaker has a technical training, or when it is not possible, somebody from the staff should be appointed to answer to the media to ensure that the journalist will translate properly the information related to the flood.

Current information of a flood event should be complemented by showing recorded images or past footages of a similar past event (if exists) to allow comparison and to give a more comprehensive explanation. To this end the TV should be informed by the technician of a previous similar event.

6. Radio

When use this broadcast technology?

This technology is probably the most reliable media to reach most of the people in different locations and situations because of its characteristics.

- It is a widespread technology, easy to use and available everywhere
- Radio sets can be handled very easily and can work without external source of energy. Reporters can follow up the movement of water level in site, informing the public directly. Reporters may have more local and real time information than water authorities have.
- For daily information or shorter if needed.
- It can be listened to in any circumstances, like at home, in transport, even at work.
- It's fast reacting
- To spread new forecasts around

This broadcast may serve also in case to warn the public about the flood threat and may educate how to behave, what is necessary to be done to reduce damages related to flood events. In larger catchments the information about the situation in upper parts of catchments may activate the public in the lower parts.

During the floods the latest information can be provided at any time for the endangered regions.

With the numerous radio channels language can be fitted to local circumstances.

Comments: Pay attention to the working period of the radio (some local radios don't work 24h) get an agreement with the radio

Box15. examples of agreements with radio

Germany:

A proven technology of the Rhineland-Palatinate flood warning service to communicate flood information during flood periods:

After exceeding defined water levels flood reports and flood information (actual gauge levels for predetermined gauges and forecasts) are transmitted to the radio companies.

Reports and forecasts are broadcasted at fixed (and agreed in advance) times in the news. The actual water levels and tendencies are announced every hour after the respective newscasts. The cooperation between the flood warning service and the public service broadcasting but also the cooperation with one private radio company are regulated in arrangements. With these arrangements the radio companies agree to send flood information within their programs. For this

the flood warning centers transmit the flood information in suitable broadcasting form. The arrangement intends furthermore that no statements deviating from the official forecast should be done if the radio companies report in their broadcastings about the flood situation (single voice principle).

UK :

Arrangements are in place so that the media can disseminate a warning. This must be pre-arranged for each special circumstance, rather than relying on normal media transmission of faxed warnings, which should take place during every flood event for all warning areas.

The following measures must be taken in order to fulfil the requirements of a special broadcast warning:

- A media booklet/folder must be developed, containing;

- Maps of relevant Flood Warning Areas (covered by a broadcast warning)

- Contact details agreed between Agency and Media partner

- Scripts of warning messages that should be broadcast by Media (if appropriate and one cannot use the standard warning faxes)

- A signed copy of the National Agreement[2] (one edited copy for each Media) between the Agency and the Media Partner.

- Scripts or Faxes created for each circumstance where a special broadcast message is required.

Local radio information with reporters in the field can give good real time information of the flood. It's good to ensure the reporter has got the proper information, similar to other media technologies, especially TV.

1 - Vocal

For national radios

- Same information in all the media
- Determine precisely the flood risk areas (not too ambiguous increasing the flooding zones) with some probability information
- General behaviour advices about mobility or staying at home distinguishing before and during the event
- Try to use always the same glossary

For local radios:

- more detailed information about flood risk levels.

[2] This can be found at the back of this document as Appendix B

- more detailed information at the local level
- avoid panic warnings
- give behaviour advices.

7. Public broadcasts in the street

When use this broadcast technology?

Public board in street may be used to deliver information in case of a flood crisis, in real time.

1 - Written information

For instance, in France, during a crisis situation some information about the situation and the personal behaviour to get, are provided to the people in the street.

2 - Vocal messages

There are many different types and methods of public broadcasts used to warn the GP in the street. The primary methods are:

- megaphones on cars (Loudhailers)
- house to house, knock on doors (Flood Wardens) – should be used mainly in critical situations such as flash floods and evacuation of inhabitants. (IK)
- Sirens

Megaphones/Loudhailers

Loudhailers act as a good alert system to warn large numbers of people all at once. They are particularly effective in urban areas where the properties at risk are close together. There are many types to choose from, depending on constraints such as; features required, coverage needed etc. There are many factors to consider before establishing a loudhailer scheme. These are outlined below.

Advantages

- Able to warn large numbers of people all at once
- Messages and routes can be adapted for each flood event to give the best available information
- No public 'sign up' required
- No requirement to keep contact details of people at risk
- Can overcome problems where there are poor mobile communications reception areas
- Can be used as a contingency measure for when telephone based systems fail

Disadvantages

- Not targeted to individual properties or areas
- Takes time to establish routes
- Health & Safety implications for staff doing the warning
- Labor intensive during flood event
- May not be heard by hard of hearing

- May not be heard in homes, industrial or commercial premises where the ambient noise level is high
- Not very suitable for rural locations where at risk property is spread out
- Does not warn public who are working away or are not in the risk area

Flood Wardens/Door Knocking

Door knocking and the use of Flood Wardens should only be established as a secondary method of dissemination or used to provide community support. Flood Wardens can only be used as a primary means of direct dissemination if the scheme already exists and the public cannot be provided with an alternative warning.

Flood Wardens should be used only as a community support tool but can also be used as a contingency method of dissemination should all other systems fail. However, it is recognised that Flood Wardens offer valuable support to a community during times of flooding.

Flood Wardens should not be (if possible) the primary method for warning the GP. As a result any locations where the primary method of dissemination is a Flood Warden then this should be reviewed to see if an alternative method can be implemented.

Door knocking is heavy reliant on people to do the knocking, which may not be available during a flood event. It may also be too dangerous to send people into an affected area.

Sirens

Sirens act as a good alert system to warn large numbers of people all at once. They are particularly effective in urban areas where the properties at risk are close together. Sirens have been successfully adopted in many countries. The UK has been particularly active in establishing siren schemes due to the nature of their catchments and the need for a fast effective warning system.

There are many types to choose from depending on constraints such as; features required, coverage needs and value for money. There are many factors to consider before establishing a siren system. These are outlined below. It is difficult to outline the technical specifications as there are so many Siren systems available. Refer to the 'Useful Websites' section for recommended and tested manufacturers.

Advantages

- Able to warn large numbers of people all at once
- Quick to initiate after the initial decision to warn is made
- Very good for quick reacting catchments where signal can be activated directly by Telemetry alarm (need to ensure that Telemetry and Siren are regularly checked to avoid false alarms)
- No public 'sign up' required
- No requirement to keep contact details of people at risk
- Can overcome problems where there are poor mobile communications reception areas

Disadvantages

- No qualitative message is delivered only an alert signal

- Not targeted to individual properties or areas
- Difficult to hear in storm conditions, so possibly not ideal in coastal locations.
- May not be heard by hard of hearing
- May not be heard in homes, industrial or commercial premises where the ambient noise level is high
- May be confused with other siren type messages e.g. chemical spillage – conflict on interests in COMAH sites – Check with Local Authority before installing.
- Not very suitable for rural locations where at risk property is spread out
- Does not warn public who are working away or are not in the risk area

D. Dissemination

Comments: Once the flood-related information prepared for the general public is done it has to be disseminated in an efficient way. Some characteristics have to be specified.

Ideas about what is the good provision frequency, and how to ensure the synchronicity between various pieces of information (and how to solve the possible conflicts) are presented in the following.

1. Frequency

The information has to be updated when this is required by the changes in the flood situation. That is the case when the forecast in meteorology or hydrology or the real time information indicates a significant change in the hydrological situation or a change in the stage of the flood and the area or community affected along the river.

The frequency for the dissemination of the information to the GP depends upon the flooding situation and on the method of communication also (examples: TV and radio may be instantaneous, while newspaper may be updated only once a day) . Features such as the basin area, the river length, the population along the river or floodplain or the basin response time influence the warning frequency.

As a general rule, the information has to be updated as often as the changes oblige to. A warning must be pointed out if the stage of the flood or the affected area along the river changes significantly.

Daily updates are necessary during the flood. But depending on the basin response time the warning can be issued with less frequency. In slow response basins daily information can be enough and should be addressed to the new affected areas. In fast response basins several warnings or updates can be published in a single day.

May be delivered at a fixed period in advance to the event depending on local customers agreements (e.g. 2 hours in advance for UK)

There is a very efficient way of informing by developing a 2-step warning process (Box below). First step (to warn) uses the “push mode” and second step (to inform) uses the “pull mode”.

But we have to pay attention that the public doesn’t become complacent only waiting for the second stage of warning before they take action (through continuous public education).

Box 16. Examples of the 2-steps warning concepts

An initial warning and following depending on the situation.

One meteorological warning followed by hydrological warning.

In Mediterranean basins, one pre-warning based on the meteorological forecast of local or general high rain intensity and, when the prediction becomes real, it is followed by a hydrologic warning. (CH Jucar)

Pre-warning based on meteorological prediction saying how the water level may evolve due to the meteorological foreseen situation based on hydrological model outputs, complementing but not repeating what the meteorological forecast says (CH Ebro)

Warn people that there will be a flood, inviting them to take action (evacuate, or get further information)

Finland: A pre-warning based on precipitation from weather radar information. And a warning based on hydrological forecast or observed water level/discharge

2. Phasing/co-ordination, synchronicity / Conflicting disseminations

It is essential to ensure that various information sent to the general public (from flood forecasting centres, meteorological centres, emergency services, media) are properly phased and synchronized. To this end, some key elements should be checked.

Obviously one way to overcome this problem is that information is delivered at a local level only (for instance by local/regional service). Where appropriate, the delivery process should be decentralized as much as possible. The aim is to favour a situation where one local service is in contact with one/several reduced and fixed area/s

Where appropriate, local and national flood information has to be cross-checked before delivery. That means that, as a minimum, both authorities inform each other. And information is targeted to each significant point of one community or region that may be affected.

In case of several providers phasing in the delivery of information ought to be ensured. To this end, joint exercises or staff trainings should be organised.

Also in advance-agreements between different authorities operational and daily contacts between different stakeholders may be fruitful.

Conflicts can be avoided if one unique agreed joint (with Emergency Services) message is delivered (either by the flood forecasting centre or by the emergency service).

In any case, exchange of information before release between different authorities should be encouraged.

Box 17. Examples of practices

In France: producing one unique vigilance procedure including meteorological and hydrological concerns is under study. That tool will help the public and the emergency services to make the right link between meteorological conditions and flood events.

For the time being the two procedures refer to each other:

http://www.vigicrues.ecologie.gouv.fr/

Examples from Germany (Bavaria) works on the same principle:

http://www.hnd.bayern.de/

Or get one unique provider for all weather warning forecasts or flood forecast. In UK: the Environment Agency is the primary provider of forecasting and warning of expected flooding to the GP. The Met. Office provides the Environment Agency with meteorological information, which it then uses in its decision process as to whether a warning needs to be issued.

Finland: All water authority warnings are gathered together on a same web-page. Also cross-checked

Italy: the national authority of Civil Protection provide both weather and risk bulletins. For autonomous regions only, bulletins are collected and pasted to the national one, aiming to share the general understanding of the scenario.

In many cases, it may be appropriate to set a crisis committee gathering all stakeholders involved (local authorities, civil protection services, forecast, basin authority, met service, ...) to agree on what to deliver and what to do, how to act.

Box 18. Example of crisis committee

In Spain: According to the law a special committee is formed with representatives from the river basin district, meteorological services, forecast centres (at regional and national level) in case of a flood event in order to coordinate the action and give a unique explanation of the event to the media.

E. Training and education

Comments: To improve the efficiency of the flood-related information, both the target (the general public) and the provider (the flood forecasting services) of the information have to be trained and prepared.

For the general public, we can directly act towards people, or we can have specific actions towards media.

For the provider, the forecasters are mainly concerned but also the management team, which can be very much in demand by media in a crisis situation.

Some explanations of the exposition to the risk and the related management could be provided by spot in cartoon format, accessible trough the web page. Examples for forest fires risk and high temperature waves are available in the Italian civil protection web site :

http://www.protezionecivile.it/minisite/index.php?dir_pk=613&cms_pk=3118

1. Training of the provider staff responsible for informing the GP

The training has to cover both "routine" and "crisis" situations.

The "routine" communication includes the everyday information but also sporadic information on a specific subject connected to floods.

For this type of communication, the main thing is to learn how to popularise technical information and make it understood by everyone, with the right words and if necessary using local or regional language (for border regions for example). This can be achieved through specific preliminary and regular trainings, possibly with outside communication experts or consultants. It can also be maintained or improved through regular contacts with media or users associations, and conferences to the general public, in brief through all the situations where the forecasters have a chance to discuss with uninitiated people and adapt their presentations to the audience.

In a flood forecasting service, as part of the in-house training to routine situations, one forecaster can be designated everyday to present the hydrological situation to the whole staff (including of course uninitiated people).

For all those who have to face communication with media or general public in crisis situations (forecasters but also managers), a specific crisis communication training is very useful, to know :

- which words to preferably use and how to find the right words ;
- how to deliver a specific message, be prepared for questions that will be asked and avoid uncomfortable questions ;
- how to face media pressure or stressful interviews.

This course should also address at least:

- knowledge about the river basin
- principles of hydrology and meteorology
- principles and form of the communication

Moreover this type of training can get to draw up and maintain in-house guidelines for all managers and forecasters, to be better prepared later on to face crisis situations even if they did not follow the specific trainings.

In addition training for stress management (to face stressful interviews) is appropriate. Glossaries may also contain ideas on how to prevent stress (examples UK in Annex3).

But obviously it should be complementary to a preliminary course about communication with the GP provided to the new staff.

For flood forecasting services with numerous forecasters, or which have to face an important media pressure during crisis situations (national services for example), a team can be specialized to deal with media and general public communication. It can be an advantage to exactly know how each medium works, to be able to adapt the products to the different media, and for the specialized team to acquire a real expertise in communication to media and the general public. This can also reduce training costs, as long as not all the forecasters have to follow specific trainings.

Box 19. Training : examples of practices

In UK: National training courses have been developed and are used by the Environment Agency covering the different roles undertaken by its employees during a flood event. Examples are:

- Introduction to Flood Forecasting & Warning
- National Duty Officer Training
- Flood Warning Duty Officer Training
- Foundation Degree in Flood Defence.

Some regular internal courses for forecasters about communication may sometimes be organised with a private consultant specialized in communication (for better preparation to what the media will ask and want to hear from the forecaster). This may be the occasion to carry out interview's simulation.

In addition, external courses concerning meteorology (addressing subjects such as: meteorological training, what the meteorological office does, basic explanations on weather, models,) may complement the staff's training.

2. Education of the general public (GP)

It is important to engage with the wider community and those within it potentially at risk from flooding. Those at risk should be aware of the risk and understand its implications. Public participation in dealing with a flood is essential. However,

communicating the existence and nature of flood risk is rarely straightforward. There are many reasons why difficulty is experienced in realising awareness of risk and getting people to take action to mitigate the risk. Attitudes encountered have a wide range, including Denial, Doubt, Despair, Distrust, Denigration and Discernment.

This range of attitudes to which they belong requires a flexible approach to communication, which can adapt to the needs of individuals, groups and circumstances. As with many professions, the tendency to use jargon must be avoided and criticism accepted, but in the context of specific issues rather than generalised assertions.

The achievement of a change in attitudes and behaviours requires a patient and structured approach. In the first instance, awareness needs to be created of the reality of flood risk and what needs to change to reduce that risk. This awareness then needs to be transformed into acceptance of the risk and the need to take action to manage it. It is then necessary to secure agreement to participation in the risk measures; recognising that an individual response is essential in association with the wider institutional response. Commitment to action needs to follow and this can be encouraged by attention to maintaining awareness and preparedness through publicity campaigns and educational literature.

It follows that, for campaigns and literature to be successful in persuading and influencing behavioural change, there is a need to understand the varied nature and needs of the audience. This is not simply those who live in areas at risk from flooding, but also those who work there or may be travelling through, en route to a different destination.

Box20. examples of public education

Germany

A video film of the Cologne flood protection centre : Hochwasser - Was tun? (Flooding – What has to be done?)

This video film explains flood problems in an impressive and transferable way not only to experts but also to the general public and here before all to pupils and young persons as the population from tomorrow. See Annex7a.

The Netherlands

In the Netherlands lessons were learned from the precautionary evacuation of more than 200.000 people during the flood of 1995. If a flood actually happens the main goal is to use communication to reduce loss of life and damage as much as possible. In case of an inundation this could mean that it is necessary to announce an evacuation and to inform people what they should do to prepare themselves for this evacuation and a temporary stay somewhere else.

In the Netherlands also a booklet was published for the general public with general information on high and low flows. This leaflet answers most of the questions that are usually

raised by the general public and media during a flood event. Preparing such a leaflet on forehand saves valuable time during the flood event.

An article about the communication processes during evacuation and the cover of the high and low flow leaflet was published. See Annex8.

United Kingdom

Campaigns can take many forms but must be well thought out and repeated annually over a number of years. The Environment Agency, just after it was created in 1996 set out a 10-year awareness campaign, principally following the steps outlined above;

- Raise awareness to the risk of communities at risk from floods.

- General Public to accept that they are at risk

- Need to take action on receipt on flood forecasts.

At the end of each campaign research was undertaken to establish if the aims of the campaign where successful and to help identify the following years activities. Literature can also be used to educate and raise awareness, and can be produced in many formats.

Finland:

Pupils from local schools have taken part into the measurement of snow water equivalent. Presentations of the flood warning system together with the publishing of snow results, which were on a public www-page. The snow results were sent via email to the www-page.

Italy

Training of the general public on what to do in case of crisis available during ordinary conditions to prepare people to the event and explain them how to act in a useful way in facing the emergency. A vademecum is provided on the civil protection website (http://www.protezionecivile.it) : a page provides the general public with some general information, e.g. what to keep always available.

See Annex9a, Annex9b, Annex9c and Annex9d

A children dedicated page could be available as well:

http://www.protezionecivile.it/sitobambini/.

Some cartoons like the ones already displayed on TV describing "forest fires risk" and "Heat Health Watch Warning System" could be produced as well:

http://www.protezionecivile.it/cms/view.php?dir_pk=613&cms_pk=3118

Without the involvement of communities and individuals at risk, any interventions often prove inadequate when events occur. A local approach to early warning will

improve the participation of the local community and enable a better response to the problems they face and greatly improve any responses to their needs. During a (National) campaign, local activities need to be undertaken which complement the aims and objectives of the campaign. Local activities such as:

- Educational school visits
- Open Days. i.e. invite the communities into the work places
- Discussion forums, i.e. local meetings with communities to share information.
- Workshops to help create Flood Plans / Escape Plans
- Shows / Special Events
- Creation of Flood Warden schemes
- Local Media

Box21. example of public education

Germany : Flood partnership

The flood partnerships were started in 2003 as an important element of flood management in Baden-Württemberg. In Rhineland-Palatinate first flood partnerships will be established in 2006.

The aim is the strengthening of the awareness of floods and the transmission of experiences and know-how in the field of flood protection as well as the creation of a network of municipalities within a catchment. Target groups are the affected municipalities and associations, especially mayors, local governments and fire brigades, disaster control or urban planning.

Mayors, decision makers and members from administration shall be invited once a year to exchange experiences under guidance of a local moderator. During this exchange of experiences, speakers present especially prepared presentations under the main topic "Preventive Flood Protection", which are then discussed. To have a wide discussion base, lower administration units, disaster control and water management authorities are to be invited to every event.

Through the production of informative papers and leaflets, municipalities shall get the possibility to inform citizens about flood prevention in an complicated and appropriate way.

France

Personal behavior advices in case of crisis: http://www.vigicrues.ecologie.gouv.fr/

Italy

an example is available on the web site www.meteoliguria.it/cmirlhome.html

Box 22. example of public relation : Flood walk and flood cycle path in Cologne

Germany

„Huhwasser –wenn de Flut kütt“ (When the flood is coming)

To point out flood problems in the City of Cologne signposted a flood walk in the old town and a flood cycle path along the river Rhine. At different stops information boards explain facts and problems of floods in Cologne.

See here Annex7b and Annex7c

Box23. example of public awareness

The “Hochwassernotgemeinschaft Rhein” - a community of flood affected municipalities and private persons offered a Flood Award to sensitize the general public for flood problems. Last year the competition had as it’s motto “ the flood will come ” What to do? Your ideas are asked!. A school class from Saarburg won the first prize with their flood pictures. These pictures were published to the 10-year-anniversary of the “Hochwassernotgemeinschaft” as a poster.

See Annex10a and Annex10b

And in addition to the previous part:

- Try to prepare the media/journalist to transmit the information to the public, to tell the right thing, and to understand correctly the meaning of the forecast (e.g. annual meetings with media; agreed contracts); or keep a contact with the journalist and control the information before delivering
- Take the “opportunity” of a flood event to deliver the message and explain the phenomena to the public; maintain the memory of flood events
- Give some explanations about the meaning of the risk level and the phenomena that entails such a risk.
- Inform the public in advance about the risk/ the phenomena in some specific regions (wide annual information)
- Educate the public about the tied link that exists between meteorological and hydrological information

Note that the use of flood area maps helps the public to understand the danger for themselves (i.e. are they living in the endangered area or not)

Regular public awareness campaigns to the general public delivered at a national level and complemented and reinforced at a local level may be useful to keep the GP fully aware of all the risks that they may be faced with.

F. Feedback

Feedback and two way communication is essential between information providers and users to ensure that the information fits and to avoid misinterpretations. Beside the feedback from the users (general public) feedback from the organisations involved in the process such as flood forecasters themselves, river basin authorities, weather or civil protection services is critical. Understanding and communication as means of feedback should be an integral and ongoing part of what flood forecasters do and are indispensable to deliver useful information and to correct problems as soon as possible.

In addition to these general remarks the following key elements should be observed:

- The feedback is aimed at and has to be analysed by the organisation producing and/or delivering the information.
- The feedback should include the way of accessing the information (presentation, availability)
- Feedback on the people's behaviour during a past event, to evaluate their understanding of the information provided is useful
- To undertake local flood surgeries/meetings where the general public can discuss face to face (one to one) any issues or concerns and to provide evidence/experiences of recent events is efficient.
- Seek to have a standard feedback questionnaire that can be delivered to affected areas.
- Look for people willing to be interviewed after the event

Questionnaires may be used to find if the key performance indicators (targets) have been achieved.

These questionnaires should make a clear difference between feedback on "the forecast and its delivery", and on the impact of the event itself.

Annexes

Annex 1:	Glossaries
Annex 2:	About uncertainty and other references
Annex 3:	National experiences
Annex 4:	Synthesis of questionnaire on current practices
Annex 5:	Synthesis of questionnaire on publics' expectations
Annex 6a/b:	German examples of videotext
Annex 7a/b/c:	German examples of public education
Annex 8:	Summary of an article about risk reduction – The Netherlands
Annex 9a/b/c/d:	Italian Vademedum about people preparation.
Annex 10a/b:	German public awareness campaign
Annex 11:	Italian dictionary

Annex1 - Glossaries

The German Center of Disaster Management and Risk Reduction Technology (CEDIM) has published a German-English glossary "**terms and definitions of risk sciences**". http://cedim.gpi.uni-karlsruhe.de/english/

The International Moselle Commission expanded this glossary by a French translation. It is intended to adapt the glossary for the communication among the flood forecasting centres.

Even if this glossary is only partly suitable for the GP's information it could be a good way of approaching

Italy: see http://www.provinz.bz.it/meteo/termini2_i.htm and a dictionary here

Langage of risk – project definitions - FLOODSITE

Floodsite website http://www.floodsite.net/

Dictionary of flood protection

"Wörterbuch Hochwasserschutz; Dictionnaire de la protection contre les crues; Dizionario della protezione contre le piene.–

Roberto Loat Verlag Haupt (2003), ISBN: 3258065365

Flood risk management terminology: as understood and used by the office of public works, Ireland

INTERNATIONAL GLOSSARY OF HYDROLOGY – UNESCI&WMO

http://www.cig.ensmp.fr/~hubert/glu/aglo.htm

Annex 2 About uncertainty and other references

Communicating Uncertainties in Weather and Climate Information: A Workshop Summary:

Elbert W. Friday, Jr., Rapporteur, National Research Council

http://www.nap.edu/catalog/10597.html

This report is the product of a workshop held in Woods Hole, Massachsetts, August 7-11 2001. The workshop explored five case studies to describe the strengths and weaknesses in the communication of weather and climate information. Lessons learned from the case studies are of general application regardless of the specific situation.

Other information could be founded at the following references:

B. Merz, 2006: Hochwasserrisiken. E. Schweizerbart'sche Vertragsbuchhandlung, Stuttgart (in German)

Commission on Geosciences, Environment and Resources, 2000: Risk Analysis and Uncertainty in Flood Damage Reduction Studies.

United Nations / ISDR, 2004: Guidelines for reducing flood losses. http://www.un.org/esa/sustdev/publications/flood_guidelines.pdf

COMMISSION OF THE EUROPEAN COMMUNITIES, 2004: Flood risk management - Flood prevention, protection and mitigation. http://europa.eu/eur-lex/en/com/cnc/2004/com2004_0472en01.pdf

Merz, B; Gocht, M, 2003: Mapping for flood defence and risk management on a local scale. Hydrologie und Wasserbewirtschaftung/Hydrology and Water Resources Management-Germany [Hydrol. Wasserberwirt./Hydrol. Water Resour. Manage.]. Vol. 47, no. 5, pp. 186-194. Oct 2003.

H. Apel, A. H. Thieken, B. Merz, and G. Blöschl, 2004: Flood risk assessment and associated uncertainty. Natural Hazards and Earth System Sciences (2004) 4: 295-308

Annex 3 – National experiences

ANNEX 3a - Italy

Some examples referring on the Italian system of civil protection are given in the following lines:

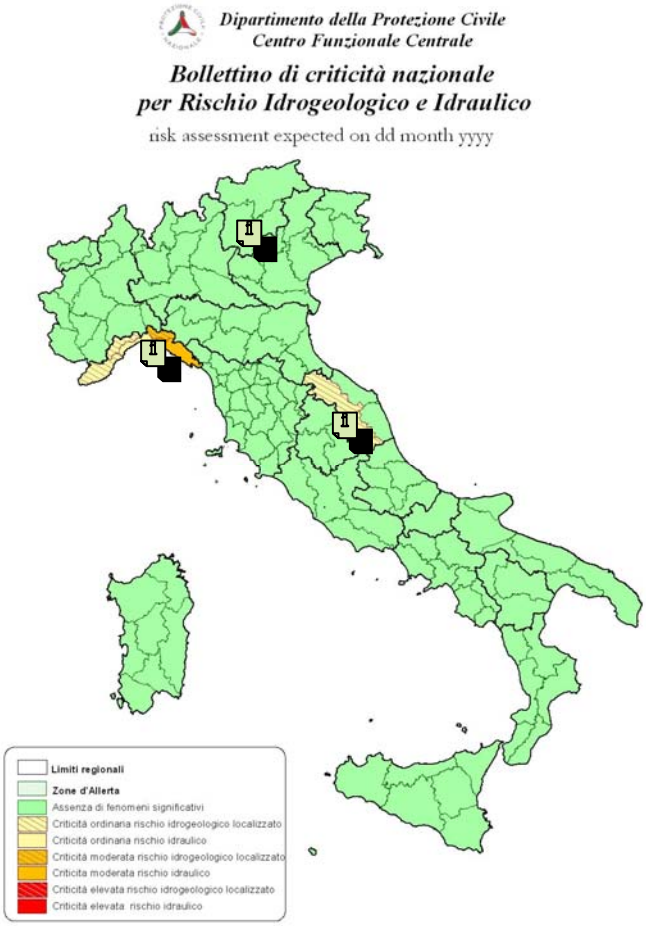
National Civil Protection Authority:

http://www.protezionecivile.it/vigilanza/index.php

A daily weather bulletin resuming the relevant, to civil protection aims, phenomena is issued. In so far, only in case of really severe conditions (e.g. large floods expected on main catchments), a special message is issued on the public web site. A restricted web site, accessible by organization involved in the civil protection activity, is daily updated as well, making available all of the useful information (daily weather bulletin, hydro-geologic risk assessment). Data by models and monitoring network are available to the civil protection network as well.

At the time being, some updates are under discussion:

the risk assessment map, and the related bulletin could be published on the public web site, including links to the specific local authority undertaking the risk management responsibility. An example is given in the following picture: the risk map links to the web page provided by regional civil protection authorities, containing further detailed information.



Liguria Region:

http://www.meteoliguria.it/protezione-civile/index.html

Trento Province:

http://www.meteotrentino.it/aspweb/index.asp

Marche Region:

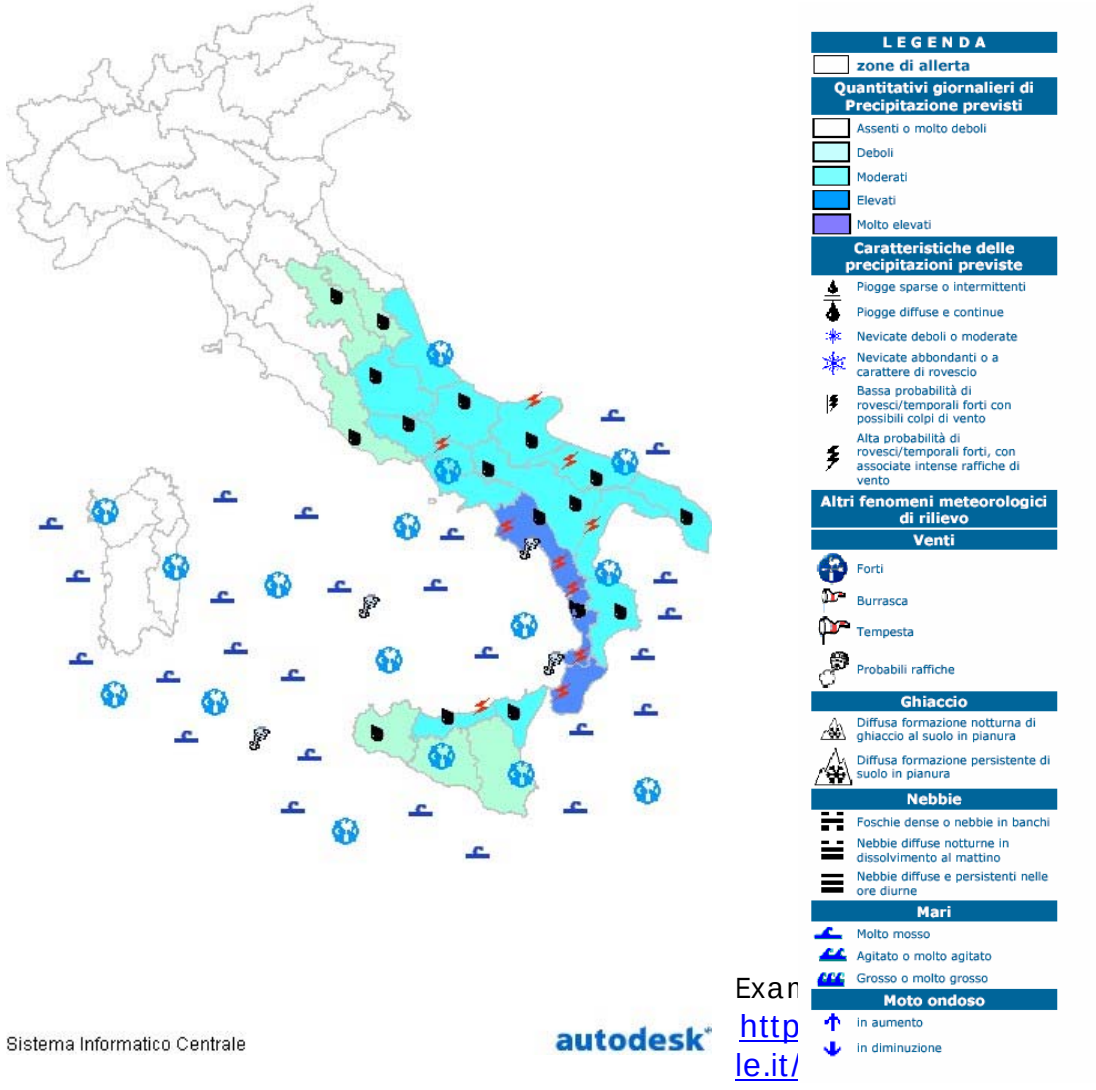
http://protezionecivile.regione.marche.it/moduli.asp?modulo=bvmig

Only few regions are already undertaking by their own such a responsibility and they are supported, in case of need, by the national authority. The larger number of the region is still managed by the national authority directly.

Internet access

An example of Internet presentation is available on the web site:

http://www.protezionecivile.it/meteo/index.php, were some maps and their meaning is represented.



Exan p – http civi le.it/

The map shows 4 risk levels (insignificant, low, moderate and high) and 2 typologies (localised hydro-geological risk – mainly due to landslides – and flood risk)

The complete description of the mentioned phenomena is available on the web site too, in a pdf document.

An example of the best practises is available too (see the web site link http://www.protezionecivile.it/). An English version is going to be implemented (see in attached the first draft)

A very good system was developed by the Liguria Region, in NW Italy. On the web site: http://www.meteoliguria.it/protezione-civile/index.html is represented a first information on the general conditions. Clicking on links on the right side, information on measurements, expected risk levels depending on the classification of each municipality and best practises to comply in case of emergency are given.

For every ground station, thresholds and a picture of the site is provided too, in order to immediately understand the risk level and the possible consequences.

the same approach can not be implemented everywhere, due to the lack of information and resources.

Another interesting approach is run by Trento province. On the web site: http://www.meteotrentino.it/aspweb/index.asp

Going into the "Protezione civile" area a description about how the system works is given. Data from the monitoring networks are provided too. Finally, information on the forecasted phenomena is given with a probabilistic output.

Some synthetic information (e.g. maps) and a link to previous web sites should be put on electronic newspaper and teletext as well. (LR)

Vocal information on Internet

Italian channels "ISORADIO" or "CAPITAL 24"

"This is the Environment Agency. A flood warning as been issued for this area. Please contact Floodline 0845 9881188 for further information".

Mobile phone

The solution was adopted in Italy in 2005 to manage the Pope funerals, giving interesting results.

Annex3b – France

Experience with Internet http://vigicrues.ecologie.gouv.fr/

According to the recent reform of the old flood notice system, initiated in 2002, the French Ministry of ecology and sustainable development has now deployed 22 flood forecasting services (FFS or SPC in French), which are coordinated by a national service called SCHAPI (« Service Central Hydrométéorologique d'Appui à la Prévision des Inondations » or « Central Flood Forecasting Service »). SCHAPI is located in Toulouse on the central site of Météo-France.

Following the concept of « vigilance » information that has existed since October 2002 for meteorological risks, contacts have been made with the civil protection services to set up a specific flood vigilance procedure. SCHAPI and the 22 FFS are jointly responsible for producing national and local vigilance maps and bulletins, as a means of informing authorities as well as the GP about flood risks. Today, all the information given to the GP on flooding is mainly based on this vigilance procedure.

The vigilance information consists of describing flood risk levels on rivers with 4 colours (green, yellow, orange and red, from low to high risk), on a national map and detailed local maps (1 per FFS). Each local map shows the flood observation stations from which, on Internet, everyone can get real time data (water level and flow when available). Each river is divided into sections, the risk level being estimated on each section. The different maps are completed with written bulletins as soon as one river section is coloured yellow.

The risk levels are estimated by potential consequences which relate to damage scale and impact on public safety :

Green : no particular watch is required. **Nothing to report**.

Yellow : risk of flood or quick level rise, generating no significant damage but people must be vigilant in case of seasonal or exposed activities. **Localized overflow, limited road cuts, isolated affected houses, disruptions in activities linked to the river.**

Orange : flood risk, generating extended overflow that is likely to have a significant impact on public safety. **Generalized overflow, traffic highly disrupted, evacuations.**

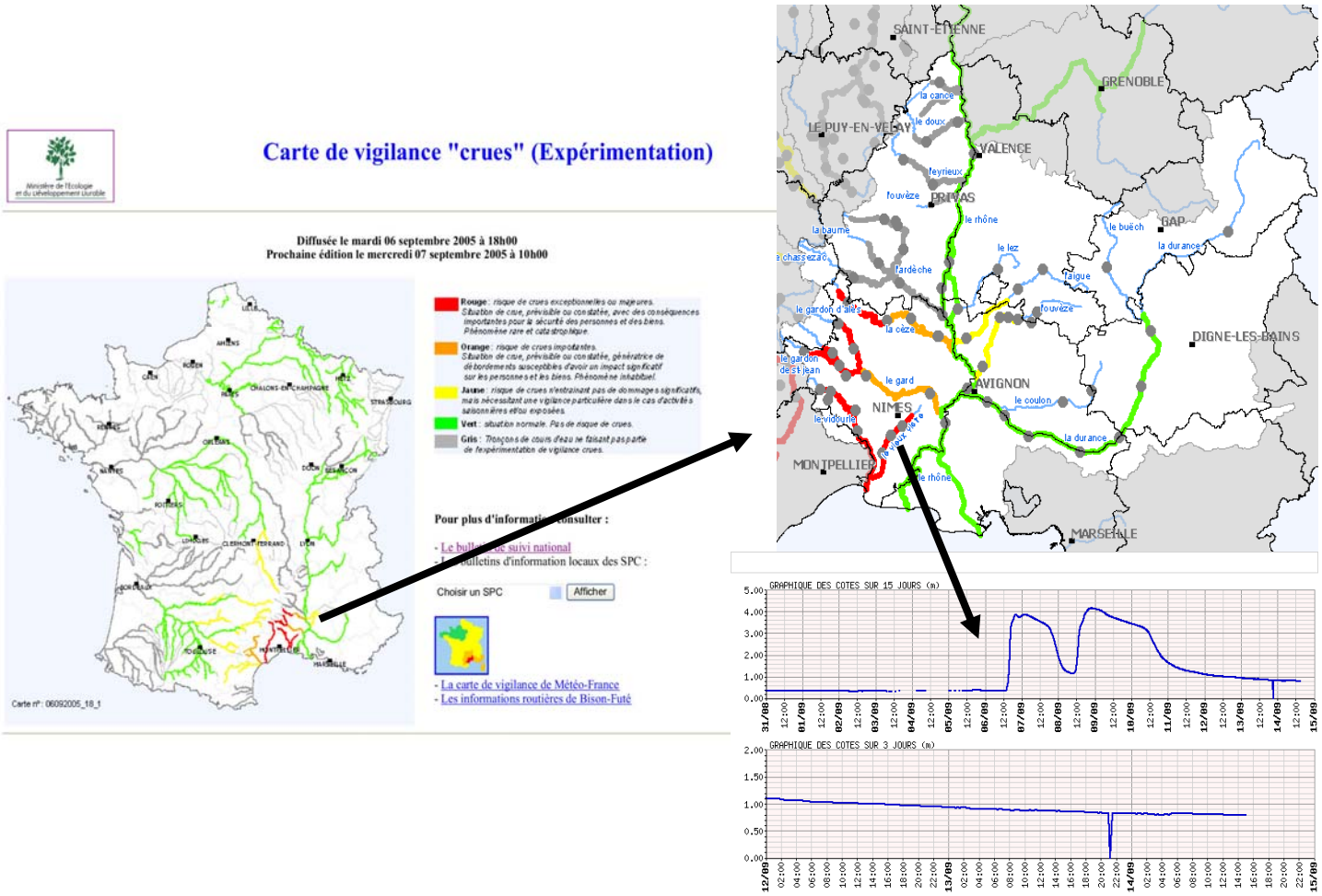
Red : Major flood risk. Direct and generalized threat on public safety**. Unusual and disastrous flood.**

The providers of vigilance information base their risk analysis on water level thresholds and historical events, but the estimation must also take into account context elements (season, recent events,...) and local vulnerability.

The vigilance information is produced twice a day and may be updated on a more regular basis if necessary. As soon as the information becomes available, it is automatically sent to the civil protection authorities (including "departments"

headquarters). It is delivered via Internet to all other users including the GP (web site : www.vigicrues.ecologie.gouv.fr).
This vigilance procedure was experienced for 10 months from September 2005. The different participating entities gradually became involved in it, before making it operational in July 2006.

The diagram below illustrates the 3 levels of information that are produced through the vigilance procedure :
- **a national map**, with a national bulletin filled in as soon as the « yellow » risk level is reached somewhere over the whole territory,
- **FFS local maps**, which show the location of water level observation stations, also with local bulletins filled in as soon as the « yellow » risk level is reached on the FFS territory,
- **water level and flow (when available) graphs**, accessible in real time on each flood observation station.
In this case, the grey colour was allocated to the river sections that were not yet involved in the experimental process.



The frameworks of the national and local bulletins, which are produced from the « yellow » risk level, have been discussed with the flood vigilance users group.

National bulletin framework :

Heading *:*

- BULLETIN NATIONAL D'INFORMATION – Origine SCHAPI
- reference of the corresponding map
- date and time of the present bulletin
- date and time of the next bulletin

Maximum vigilance state on France (higher risk level reached on the French territory)
New developments *(*new hydro-meteorological facts since the last bulletin)
Description of the situation *(*severity, frequency or reference to a past event)

List of rivers involved in « orange » or « red » risk level *(river with the numbers of concerned « départements »)*
General comment on the present national situation :

- *reference to the meteorological vigilance map*
- *meteorological context followed by the hydrological situation in progress, for each of the basins with at least yellow risk level*
- *forecast evolution : summary of meteorological forecast elements that may influence the hydrological situation and description of the expected hydrological evolution for each of the basins with at least yellow risk level*

Hydrological situation :

- *for rivers reaching at least the orange risk level, summary of the expected evolution, ordered by FFS area*

Possible consequences :

- typical sentences describing risks linked to the extent of the flooding, power cuts, disruptions made to sewerage systems, road and rail traffic (proposed by the civil protection services)

Behaviour advice :

- list of advice (proposed by the civil protection services)

Local bulletin framework :

Heading *:*

- BULLETIN D'INFORMATION – Origine : SPC XXX
- reference of the corresponding map
- number, date and time of the present local bulletin
- date and time of the next local bulletin

Maximum vigilance state (higher risk level reached on the FFS territory)

New developments *(*new hydro-meteorological facts since the last bulletin)
Description of the situation *(*severity, frequency or reference to a past event)

List of « départements » involved in « orange » or « red » risk level
Present situation and expected evolution (comments)
Hydrological situation per river section *(*summary given by a table with one line per river section which indicates the risk level)
Details for each river section :

- description of the situation (severity, frequency, reference to the past)
- table of measured and forecast values of water level on the most representative observation stations

Possible consequences :

- typical sentences describing risks linked to the extent of the flooding, power cuts, disruptions made to sewerage systems, road and rail traffic (proposed by the civil protection services)

Behaviour advice :

- list of advice (proposed by the civil protection services)

Annex3c – Spain

Experience with TV

Valencia region is located in eastern Spain, next to the Mediterranean sea and has a high risk of heavy rains that can produce some floodings. As result, there's a sensibility to these events in people and, also, in the local and regional media.

The regional TV deals with this subject in education or advices, in warnings and, of course, during the floods.

Before the fall season, the most dangerous, remembering programs are shown.

When a meteorological alert arises, or a great and extensive rainfall event is likely to come, advices and warnings are made in the news, not only in the normal weather information. Because of the quick basin response the warnings are usually at short term.

When an either ordinary or extraordinary flooding situation is produced, the past and real time information is shown during the day in the several news programs with priority.

Personal behaviour, transport network and related news are also shown.

Annex3d - UK
Existing Practices – Telephone/Mobiles

Floodline Warnings Direct - Environment Agency, UK

Floodline Warnings Direct (FWD) is the UK's first integrated multi-channel warning system, providing flood warnings and information to the public, professional partners and the media across England and Wales. It will exploit current (phone, mobiles, fax, pager) and emerging technologies (SMS texting, digital channels) to deliver flood warning messages simultaneously.

Since 1996 The Environment Agency have been issuing flood warnings via our AVM (Automated Voice Messaging) System. We have now replaced the AVM system with a new flood warning system , F WD. FWD works in the same way as the AVM issuing warning messages to the general public informing them of any imminent flooding event. The system will contact the customer by their telephone, mobile, fax or pager that the customer has registered with, to issue advanced Flood Warnings.

However, the new system can hold a greater capacity of contact numbers compared to the old AVM system. It can also be upgraded in the future, so that we could issues flood warnings via email and text message (SMS).

Registration to this new system can be done either by calling the Agency or logging into the Agency's website: www.environment-agency.co.uk to find out if you are at risk. If so, phone Floodline on 0845 988 1188 to find out if you can register for Floodline Warnings Direct, our free service that provides flood warnings direct to you by telephone, mobile, fax or pager.

Annex 4: Synthesis of the questionnaire on "Flood related information for the general public : current practices; ideas to go forward"

September 2005

Synthesis of the responses – November 2005

10 countries:	Italy, Greece, Spain, The Netherlands, Sweden, Rhineland-Palatinate - Germany, Finland, England and Wales, Czech Republic, France
Respondent:	
Date of the review:	September-November 2005

QUESTIONNAIRE

Part I – Target and provider

Q1 The general public is informed about flood/flow forecasting in my country	
✓ Yes	5
✓ No	0
✓ Partly	5
Comments: the GP is always informed about flood forecasting, and in one country on two information is provided in any flow situation not only in case of flood**.**	

Q2 Who is responsible for informing the GP, directly ? (possibly several answers)	
✓ The local authorities	5
✓ The civil security services	5

✓ The flood forecasting centre (FFC)	8
✓ The meteorological service	7

Comments: the more often, the GP is informed directly by the FFC, sometimes in relation with the local authorities, while the Meteorological services deliver met. information only - apart from those cases where FFC and Met. services are merged. For two countries, the responsible body for informing the GP depends on the size of the river: the FFC for the largest rivers under survey and the met. service for the smallest rivers, very fast-reacting rivers or urban areas.

sometimes (Neth, Sp) the information is provided by the FFC either to the civil authorities or to the media who are in charge of "pushing" the information toward the GP

Under development: TIMIS, system that will consider hydrological disposition for the smallest rivers or urban areas (Germany)

Q3 The product delivered to the GP information is:

✓ The same as to the civil authority	8
✓ Specific for the GP and delivered only to it	3

Comments : the more often the information available for the GP is not specifically designed for it; on the contrary civil authorities often receive additional information. In few cases a different product is designed only for the GP

General comments

Italy: Detailed and specific information for the civil security; Information about areas likely to flood and behaviour advices for the GP (specific web pages or written bulletins)

England: thanks to annual awareness campaigns people are informed in advance about the risk of flood in the area where they leave; they know how to react when a warning is delivered; people have pre-established personal flood plans they carry out as soon as the warning is delivered

There may be additional explaining information for the GP coming along with flood forecast (Fin)

Ideas to go forward

- delivering of detailed information to the GP on web or SMS as soon as it is proved being enough reliable (Italy); web site with forecasted water levels and background information about the forecasts (Neth)
- educate the GP to understand the FF and where to find it (CR) and how to react (Eng); national information campaigns, flood mapping on internet etc... to raise public awareness + pre-establishment of personal flood plans (Eng);
- educate the civil authorities to translate FF for the GP (CR)
- deliver flood forecasting maps (Fin), together with forecasts uncertainty expressing (Fin; Neth)

Part II – Content and presentation

Q4 What kind of information is provided to the GP ? (possibly several answers)	
✓ observed gauging or other data; which ones	7; usually, but not always: gauge, water level 2 : forecasting of these parameters
✓ Flood risk levels (figures)	4: 2 in operation; 2 under tests
✓ Flood forecasting (text)	7: 5 in operation; 2 under tests
✓ Personal behaviour advices	6: 3 in operation; 2 under tests; 1 advices give only contact points
✓ Other	4: General information about floods (Eng, CR, It, Rhi,)
Comments: in addition to water level and gauging: simulated water levels, simulated water equivalent snow, simulated discharge, simulated soil moisture, simulated ground water storage (Fin) Provision of flood forecasts figures coming along with automatically-generated texts of forecasting (Fin) And also met. info : temperature, spatial precipitation, radar, met. forecasts and warnings	
Q5 How is the information for the GP presented ? (possibly several answers)	
✓ Written bulletins	9
✓ Flood risk maps	3: 1 in operation; 2 under tests
✓ Vocal messages	5
✓ Other	5: tables, figures, hydrographs

General comments
Written bulletins is the more frequent form used to deliver flood forecasting to the GP; sometimes through the media . Vocal messages follow, sometimes delivered with the met. messages or the civil authorities warnings. Forecasted flood risks maps are in use only in one country; 2 are currently testing their implementation. Five countries deliver numerical information (often through the Internet) presented in tables, hydrographs (curves), ...
Ideas to go forward
Forecasted flood risk maps (planned in Neth, Fr) Numerical information has to come along with explaining written bulletins or flood maps (Fin) GIS interpretation of the forecast; direct connection between forecasted inundation and warning dissemination (CR) The forecasts uncertainty has to be presented with the information provided to the GP (Sp) ; Need to teach the GP to understand the uncertainty of the forecasts (CR) The emergency services have to know about the flood risk areas (Sp) Information (whatever the form it takes) may be provided jointly with met. forecasts

Part III – Broadcast technology

Q6 What broadcast technologies are used to disseminate the flood forecasting information to the GP, in a push mode ? (possibly several answers)	
✓ The TV	9
✓ The Internet	9
✓ The newspapers	9
✓ The radio	10
✓ The public broadcast in the street	4
✓ Short messages on mobile phones or pagers	6: 4 in test
✓ Other	2: teletext, sirens, direct voice messages on mobile phone
Q6bis Precise the kind of information that is provided by these means of broadcast	
Often: warning and explanations of the event, risks of flooding ; met. forecasts On website: figures, hydrological maps	

Comments : The more often, radio is used to inform the GP (still under test in one country, and used only in case of large events in one country). The Internet is widely used to provide information; every country has got a more or less comprehensive dedicated website. A very comprehensive web site exists in Finland. The TV often relays the flood information even though sometimes only in case of severe events (Rhi); the situation is the same for the newspapers. More rarely, public broadcasts are used. SMS is currently tested in 4 countries; two countries use it operationally for civil authorities information (Neth, Rhi) A service delivering direct voice messages to landlines and mobile phones is running in England and Wales

Q7 What broadcast technologies are used to disseminate the flood forecasting information to the GP, in a pull mode ? (possibly several answers)	
✓ A public phone service hold by the FFC (24h or not)	9: 2 only for the civil authorities; 2 available in open hours for the GP and 24h for the civil protection
✓ A 24h public phone service connected to an answering machine	4
✓ Other	4: teletext, WAP, Minitel system (Fr)
Q7bis Precise the kind of information that is provided by these means of broadcast	
General information, general forecasts, expert's explanations	

Comments: the most frequently used mean is the direct phone with the FFC, but sometimes available only for civil safety authorities (Fr), and not always 24h for the GP Answering machines are available in 4 countries, sometimes implemented in few places only (Fr); in England direct link with an operator may be obtained in addition.

General comments In test in England: a new system capable of delivering a message to many different media simultaneously (Fax, cell phone, SMS text, Internet, Teletext, Ceefax, etc...) TV relays the information in case of severe event

Ideas to go forward
Make use of as many different dissemination channels as possible to ensure a message is sent as widely and to as many people as possible (Eng). Explore broadcast technology to find additional routes for transferring messages quickly to those at risk (for all types of risks) (Eng)
Further development of websites; improvement of Internet broadcast

Part IV – Dissemination

Q8 The flood forecasting information for the GP is produced and disseminated :	
✓ On a regular basis; precise (daily, weekly, ...):	9
✓ Only in case of a flood event	8
Comments: The more often, regular (often daily) numerical flow-related information is provided and updated as often as necessary. And specific information is often provided in addition to the regular information in case of a flood event. In England: provision of warning service to those who have registered to the service (as a result of the annual awareness campaigns) In Italy the civil protection is provided with daily information. In Rhineland-Palatinate, the TIMIS system will provide regular (at least daily) information ; frequency of updating depends on defined warning levels (hourly for the highest level)	
Q9 In case of a flood event, how often is the information for the GP disseminated ?	
✓ Once a day	3
✓ Several times a day, precise:	5
✓ Once a week	1
✓ Several times a week, precise:	1
✓ As often as needed	9
Comments: The more often, information is updated as often as necessary. In addition there may be some regular procedures to update the information once or several times a day, in routine. Some kind of information may be updated only once or several times a week (press information) In England: a warning is used once to catch the attention of the public. After that information is updated several times a day	
Q10 When several providers disseminate flood related information to the GP during a flood event, is there any conflict?	
✓ Yes. Precise how it is fixed up:	4. Fixed up with agreements and coordination
✓ No	6

✓ Other	Conflict with information coming from unauthorised providers Some rare conflicts with met. services

Comments: Conflicts between several providers may occur when either several authorised providers are responsible for information dissemination or unauthorised providers exist.

Information provision by some unauthorized/unofficial providers may occur, what entails conflicts with official information provided by the institutional providers (It). Also the situation may be that the met. service is responsible for information on the smallest rivers while some river centres are responsible for the others (Fr). In these cases, the information sent to the GP may be confused and not clear enough.

Conflicts are often fixed up with agreements or national coordination.

Obviously, when only one authority is responsible for flood-related information dissemination no conflict can occur (Gr, Eng). Agreements between river authorities (or local centres) and national services or a clearly defined responsibility sharing help avoid any conflict (CR, Fin, Rhi, Sp)

When the responsibility is shared between two authorized authorities, pedagogic effort is needed: to make the situation clear to the GP and to ensure coherence between various information

General comments

Coordination between various stakeholders (regional centres, national centre, civil authorities, media, ...) is essential

Ideas to go forward

Clearly define the responsibility for provision (Neth) and make it clear for the GP.

Train the GP and make it used to getting several but comprehensive flood-related pieces of information.

Get a unique "counter" of information (a unique Internet portal for instance) either for the civil authorities or for the GP, preventing from any conflict between available pieces of information.

Evaluate and communicate forecasts uncertainties

Part V – Training

Q11 Is the staff responsible for producing the flood related information for the GP specifically trained for that ?	
✓ Yes. Precise the type of training	7. Scholar and professional trainings
✓ No	3
✓ Other	Training in co-operation with media

Comments: The more often, forecasters are trained first at school and get (more or less) regular professional trainings afterward. Experienced people sometimes leave the organisation too rapidly (Neth) Training is organised in co-operation with the media in Rhineland-Palatinate	
Q12 Do the forecasters refer to a specific glossary or dictionary giving flood related vocabulary when producing the information for the GP ?	
✓ Yes. Precise the content	7: 4 are in operation; 3 are under discussion
✓ No	3
Comments: few countries have a glossary available for the forecasters but the question is under discussion in some places.	
Q13 Is the GP specifically trained to understand the flood related information ?	
✓ Yes. Precise the type of training	6: either national campaigns (3) or local initiatives (3)
✓ No	4
Comments: usually there is no regular and nationally organised training of the GP. Some local initiatives exist but not often. People concerned by frequent flood events are more educated than the others. In Italy: A “vademecum for families” including advices of behaviour in case of crisis is published; a future version will include a glossary Finland provides instructions to interpret the forecasts figures in the Internet. England and Wales: Annual flood awareness campaigns aiming at raising the awareness and explaining the people the risks of flooding and what they should do when they receive a warning message are carried out	

General comments
Publication of some advices of best behaviour to get in case of crisis for the GP (It)
Hard to raise the public attention; there is a general apathy amongst the public, particularly those who have not experienced flooding (Eng)
There is some isolated initiatives to organise discussion and presentations explaining the flood problematic
Ideas to go forward
If the model is running continuously instead of only in case of flood then the training for using it is also continuous and there is less need to start again to train the staff each time a flood is expected (Neth)
Set up a national programme to organise regular and systematic presentations and discussions locally, aiming at training and informing the GP about the flood problematic (CR)
When flood forecasts are presented by hydrologists (on TV or radio) the general terminology of flood forecasts comes a bit familiar to GP (Fin).

Part VI – Feedback

Q14 Does a feedback process exist about the flood related information for the GP ?	
✓ Yes	8
✓ No	2
Comments : In many countries a survey is carried out (or the implementation is under discussion) after a flood event either towards the GP or only towards the authorities. A survey toward a sample of people flooded is carried out systematically after each event and an annual survey about the level of understanding and the awareness among the at risk population is carried out (Eng) After a severe event a questionnaire is sent towards authorities and hydropower companies in the flooded area to get opinion on the service provided by the SMHI (Sw) Internet is sometimes already used for getting feedback from the GP (Fin).	
Q15 If a feedback process exists, what does it address ? (possibly several answers)	
✓ The form of the information (presentation, broadcast, ..)	4
✓ The content of the information (accuracy of the forecasting, ...)	7: 3 under discussion
✓ Other	In addition: the awareness of flood risk and knowledge of who is responsible for risks (Eng)

Comments : When regularly implemented the feedback addresses both the form and the content of the information provided. 3 countries have the process under discussion.

Survey carried out by Environment agency addresses not only the form and the content of the information provided during the event but also the awareness of flood risk and knowledge of who is responsible for risks.

General comments

As the most of information is published on the Internet probably the Internet will be also good tool for feedback; but then the GP has to be active (CR, Neth). The procedure is active in Finland.

GP wants to know the perspective and reasons of flooding. This information have to be given again and again.

Ideas to go forward

Share the few feedback information each country manages to get between all (CR)

Environment agency makes the questionnaire it uses, the feedback forms and a sample of a report that results available to others interested countries.

Annex 5: Synthesis of the questionnaire on "Flood related information for the general public : what are the GP's expectations?"

November 2005

Countries:	Synthesis : Rhineland-Palatinate, The Netherlands, England and Wales, Finland, Sweden, Spain, France
Respondents:	7
Date:	November 2005

QUESTIONNAIRE 2

Results are based on 7 questionnaires

Purpose :
In order to conceive a product for informing the general public about flood situations, it is useful to have a view of the expectation of the general public itself, in this domain.

To this end, the following questions should be answered by each action5C member, by getting the opinion of some GP's representatives.

Part I – Content and presentation

Q1 What kind of information does the GP expect to receive in order to be informed about the flood event? (possibly several answers)	
✓ Gauging or other data; which ones	Water level, rainfall, discharge data
✓ Flood risk levels (figures)	3/7
✓ Flood forecasting (text)	7/7
✓ Personal behaviour advices	Only 3 strong “yes”;
✓ Other	Reasonable behaviour during flood periods, precautionary measures, closing of streets, important telephone numbers, geographical location and time duration of floods, background information, where to go for information, impacts on infrastructures for energy or transport
Q2 What information’s presentation the GP expects ? (possibly several answers)	
✓ Written bulletins	Massive “yes”, on teletext, TV, Internet, e-mail
✓ Flood risk maps	5/7, on Internet preferably
✓ Vocal messages	4/7
✓ Other	Links to local authorities websites, bulletins and risk maps for the GP, TV announcements, public broadcast in the street in case of extreme flood events, mobile phone broadcast

General comments

- need for real time information: risk of floods? Where, when, for how long? Water levels during the next few days
- need for preventive information: local risk of flood; who to contact in case of flood; what to do before, during and after flooding; general information on flood to develop awareness
- information is expected through the media (TV, radio, newspapers) and also through a public telephone information service
- get only one single source of information (one authority that delivers the information) or one single point of contact
- get continuously updated information and more accurate information, more detailed elements
- the public is interested in the impacts of the flood on his own personal and professional life
- give a comparison between observed and forecasted data with past events or historical events
- take into account context elements (holidays, sport event, ...) in the warning information

Ideas to go forward

Use weather TV channel

Publish regional flood risk maps indicating flood zones, once a year, so that the real time forecasts could refer to this zoning; Inform people living in at-risk zones in advance

Flood maps

Warnings sent to people depending on the height of the building they live in (recorded systematically in advance)

Background information about the online monitoring network, flood forecast models and uncertainties in flood forecasting

Receive flood warnings via new technologies

Special contracts with mobile phone providers for emergency information broadcast in case of severe event

Develop risk culture through training sessions at school

Part II – Broadcast technology

Q3 What broadcast technologies would the GP prefer, in a push mode ? (possibly several answers)	
✓ The TV	7/7: the most important push mode broadcast technology (if there is still energy!); to be used for a first warning
✓ The Internet	7/7: if updated; after being alerted via TV
✓ The newspapers	3/7 Yes. Comments in addition: may be obsolete, not in real time, not for flash floods
✓ The radio	7/7. particularly local radio; to be used for a first warning ; the best one in case of lack of energy
✓ The public broadcast in the street	3/7, in case of extreme or sudden floods in particular
✓ Short messages on mobile phones or pagers	1 full "yes" only; yes but not the whole population is concerned; problem of pile-up/saturation in mobile phones buffer
✓ Other	In England and France: people prefer to be told by direct methods (telephone, door knocking)
Q4 What broadcast technologies would the GP prefer, in a pull mode ? (possibly several answers)	
✓ A 24h public phone service hold by an operator	7/7. personal advice is important and human contact also
✓ A 24h public phone service connected to an answering machine	5/7. quick and (if) updated; for ordering information booklets
✓ The Internet	7/7. Updating possibilities are appreciated
✓ Other	

General comments One single mode is not enough to touch all those who need to be alerted; combining several broadcast technologies offers greater chance of alerting the public. Direct or traditional broadcast methods should still be used Use all possible means to inform people and deliver detailed information Distribution of leaflets providing for flood information, by local authorities Mailing lists for real time information Cooperation with citizen's groups to provide the information and help in flood actions TV's advertising for flood/disaster control Specific messages for specific customers The public phone service should be properly sized to face so big amount of calls in case of flood In case of damages on public infrastructures, radio and broadcasts in the streets may turn to be the only systems still in operation
Ideas to go forward Further use of internet SMS, vocal messages Make a technologic survey to analyse the potential of new techniques Regular (once a year) and general information for people trough newspapers or local bulletins Automatic warnings with confirmation procedure; but watch out the false alarms Inform people well in advance about the information sources available in case of flood event

Annex 6 – Videotexts of a flood forecast and a flood report (example Germany, Rhine)

HOCHWASSER

Hochwassermeldezentrum Rhein

Vorhersage vom 25.08.2005, 11:00 Uhr
36-Std: Unsichere Abschätzung!

Pegel Mittelrhein	06 Std für 25. 17 Uhr	24 Std für 26. 11 Uhr	36 Std für 26. 23 Uhr
Mainz.....	455-465	460-470	470-450
Bingen.....	340-350	350-360	360-340
Kaub.....	405-415	420-430	435-415
Koblenz.....	340-350	360-370	375-355
Andernach....	400-410	425-435	425-445
Oberwinter...	345-355	370-380	370-390
Bonn.....	410-420	445-455	445-465
Köln.....	405-415	450-460	455-475

Hochwassermeldedienst ist eingestellt!

Alle Angaben ohne Gewähr >>

HOCHWASSER

Hochwassermeldezentrum Rhein

Lagebericht Rhein Nr.3 25.08.05 09 Uhr
Schlussbericht Oberrhein

Wetterlage: Der Zwischenhocheinfluss von gestern geht schon wieder zu Ende. Von Frankreich her überqueren uns heute die Ausläufer von Tief "ödipus" mit einem Regengebiet mit nur geringen Regenmengen. Ab Freitag beruhigt sich das Wettergeschehen im südlichen und südwestlichen Rheineinzugsgebiet wieder Am Wochenende sorgt ein Hochdruckgebiet für eine stabile Wetterlage.

Abflusslage: Eine erneute Verschärfung der Hochwassersituation am Oberrhein ist durch die vorhergesagten Nieder-schläge für heute nicht zu erwarten.

Alle Angaben ohne Gewähr >>

Annex 7: Flood Information for the city of Cologne (DE)

Das 1996 von der Stadt Köln entwickelte Hochwasserschutzkonzept wurde aufgrund der nachhaltigen überregionalen Konzeption mit dem Hauptbestandteil der ständigen Sensibilisierung der Bevölkerung für den vorbeugenden Hochwasserschutz als weltweites Projekt der EXPO 2000 registriert und in das IRMA-Programm der EU aufgenommen.

Das Sensibilisierungskonzept der Hochwasserschutzzentrale der Stadt Köln wendet sich nicht nur an Fachleute auf dem Gebiet des Hochwasserschutzes, sondern Zielgruppe ist die breite Bevölkerung und hier vor allen Dingen Schüler und Jugendliche als die Bevölkerung von morgen.

Mit diesem Film (gedreht von Armin Maiwald, bekannt aus seinen Beiträgen zur „Sendung mit der Maus") wird dem interessierten Zuschauer auf eindrückliche und übertragbare Weise vor Augen geführt, dass menschliche Einflüsse eine Ursache (der Häufung) von Hochwasserereignissen darstellen. Es werden aber mit der u.a. durch den Ausbau des Rheins und seiner Nebenflüsse verursachten größeren Hochwassergefährdung nicht lediglich die Situation und die möglichen Auswirkungen gezeigt, sondern mit der Einbindung möglicher zukünftiger Verbesserungsmaßnahmen zur Verzögerung des Abflussgeschehens im Einzugsgebiet werden auch Lösungsmöglichkeiten im Sinne einer Entschärfung der Situation angeboten.

Hergestellt von
Flash Filmproduktion
Eintrachtstr. 18-20
50668 Köln

Im Auftrag der
Stadtentwässerungsbetriebe Köln, AöR
Hochwasserschutzzentrale Köln
www.hochwasserinfo-koeln.de

Stadtentwässerungsbetriebe Köln, AöR | Hochwasser Schutz Zentrale Köln '99 | IRMA | Stadt Köln

Hochwasser - was tun?

Hochwasser Schutz Zentrale Köln '99

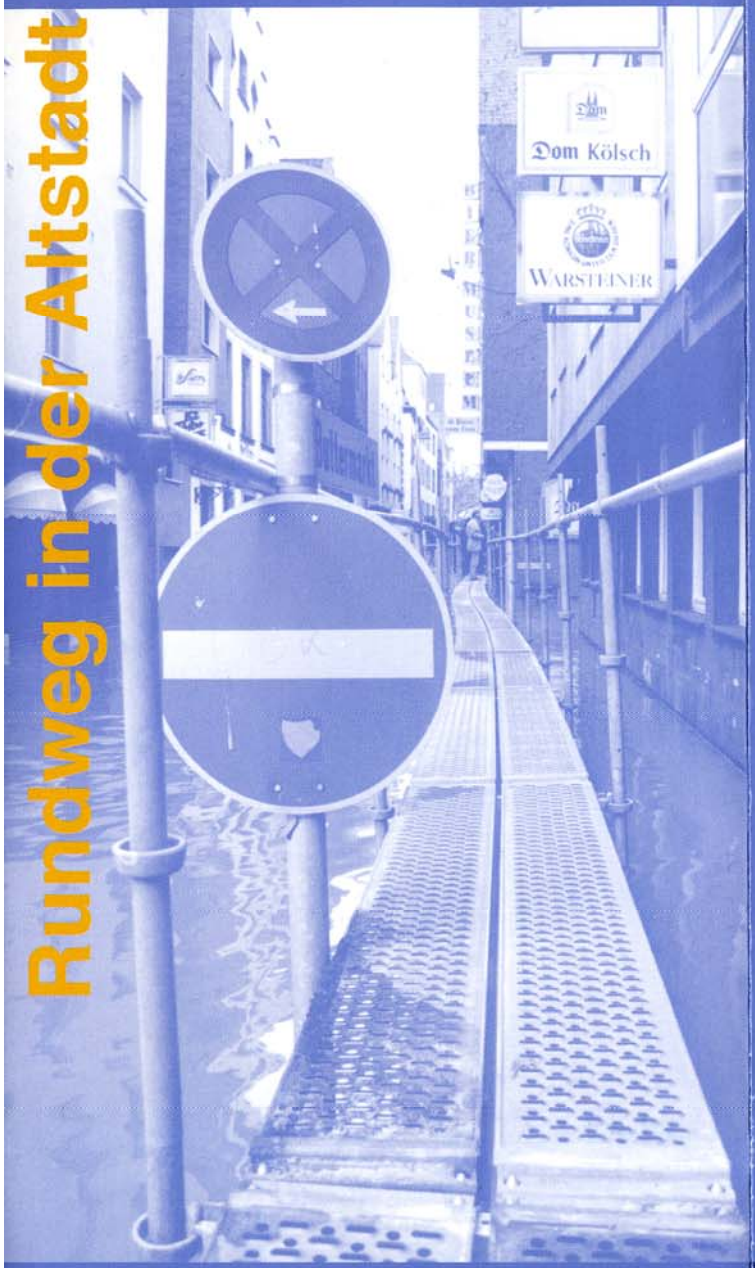
Stadtentwässerungsbetriebe Köln, AöR

Hochwasser

Was tun?

Stadtentwässerungsbetriebe Köln, AöR | Hochwasser Schutz Zentrale Köln '99

Rundweg in der Altstadt



1 Pumpwerk Rheingarten - Regenflut bei Hochwasser

2 Brigittengäßchen

Das bisher höchste Hochwasser wird aus dem Jahre 1784 überliefert. Der Rhein war mehrere Wochen zugefroren. Bei Tauwetter brach die Eisschicht auseinander und die Wassermassen stauten sich bis auf 13,55 Meter. Tausende von Tieren (Pferde, Rinder, Schafe) ertranken in den Fluten. In Köln waren hohe Sachschäden und der Verlust von über 100 Menschenleben zu beklagen.
Am Standort der Säule wird die Ausdehnung dieses Katastrophenhochwassers in das Kölner Stadtgebiet hinein verdeutlicht.

3 Fischmarkttor - Jahrhundertflut 1995

4 Pegel Köln - Rheinwasserstände

5 Hochwasserausstellung "Wollen wir ihn R(h)ein lassen"

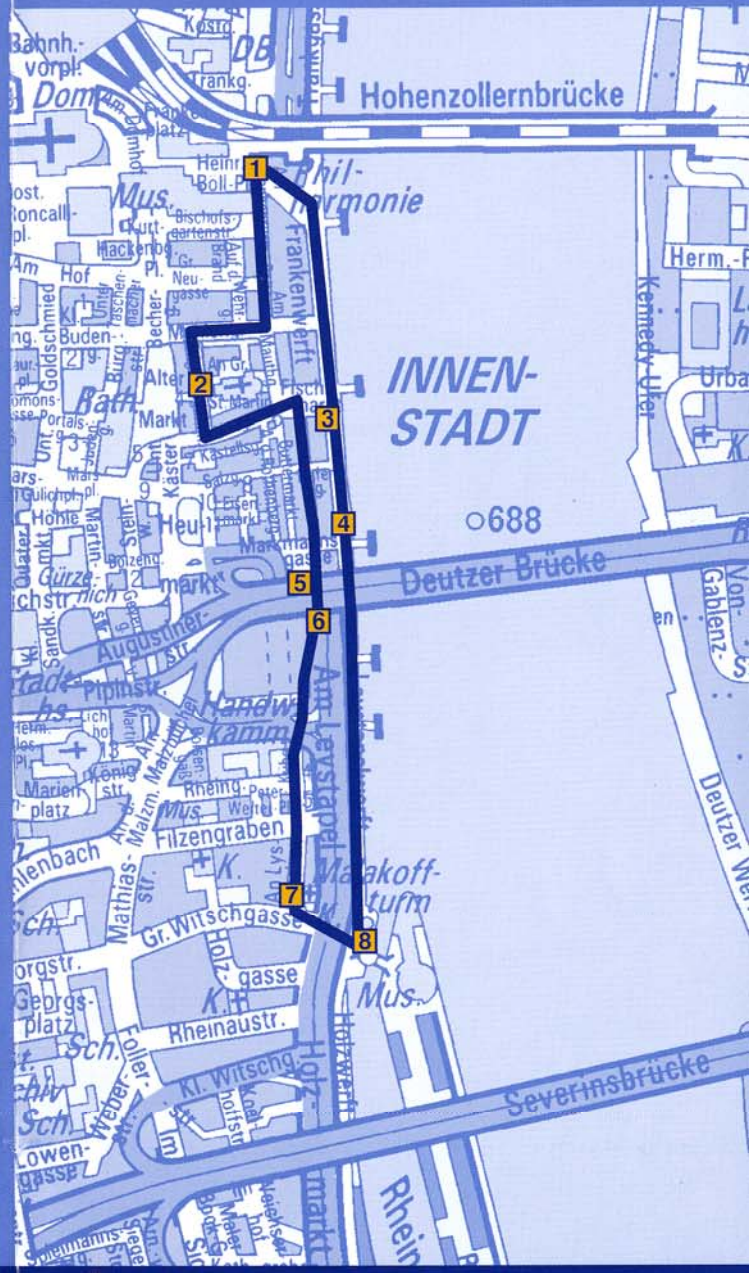
Im linksrheinischen Brückenkopf der Deutzer Brücke (Eingang an der Markmannsgasse) präsentiert die Stadt Köln noch bis zum 31. Oktober 2000 eine Hochwasserausstellung der besonderen Art. Der Besucher kann durch die dargestellte überflutete Kölner Altstadt auf Stegen vorbei an versunkenen Autos und betroffenen Häusern wandern und kann Hochwasser einmal selbst nachempfinden. Durch ein Hochwasserabflussmodell, einen Hochwasserfilm und Multimedia-Präsentationen erhält er Hintergrundinformationen über Ursachen, Folgen und Vorsorgemaßnahmen.

6 Rheinufertunnel - Verkehr im Wasser

7 Kirche Lyskirchen

Die Hochwassermarke am Eingang zu Lyskirchen verdeutlicht die enorme Höhe des durch Eis verursachten Hochwassers im Jahre 1784, das in Köln zu dem bisher höchsten Pegelstand von 13,55m K.P. führte.
In der Straße "An Lyskirchen" kann man an fast jedem Gebäude die Vorrichtungen der privaten Hochwasservorsorge erkennen. An Fenster- und Türöffnungen sind Metallschienen angebracht, in die Schutzplatten zur Wasserabwehr eingesetzt werden können.

8 Schokoladenmuseum - Privatvorsorge



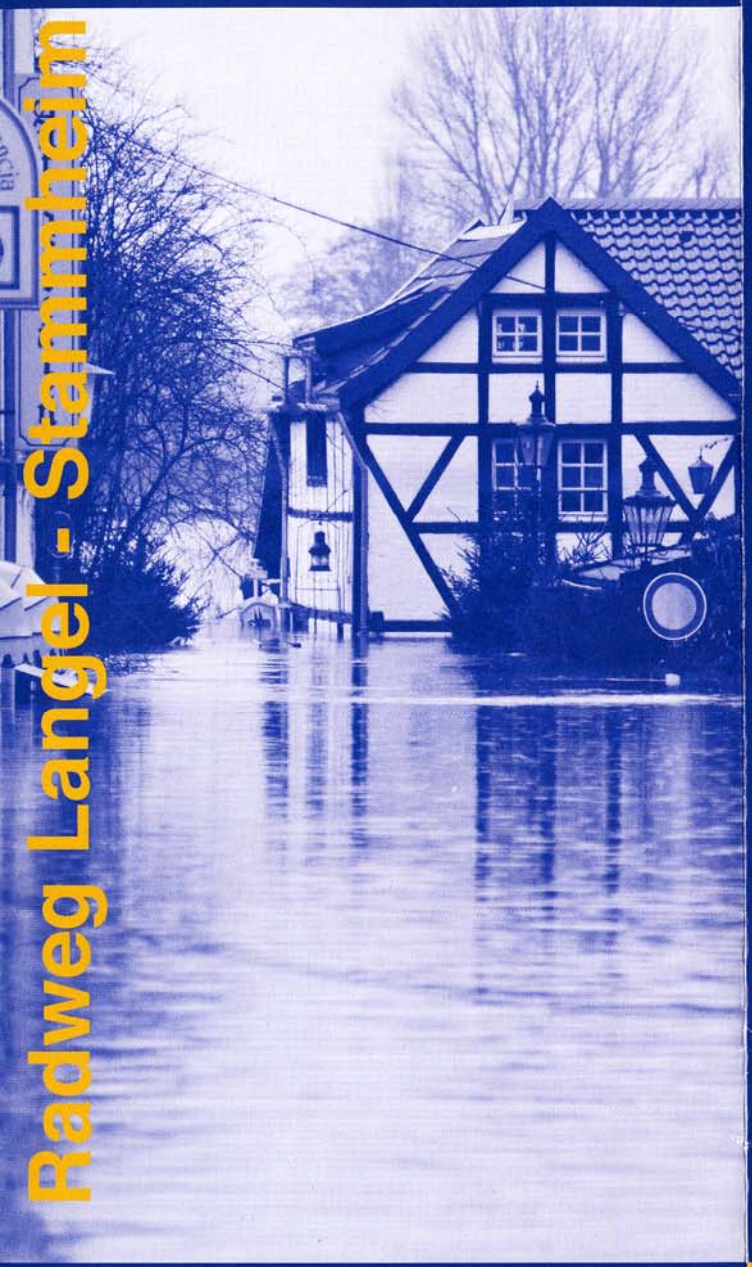
Huhwasser - wenn de Flut kütt!

INTERREG RIJN-MAAS ACTIVITEITEN
INTERREG RHIN-MEUSE ACTIVITÉS
INTERREG RHEIN-MAAS AKTIVITÄTEN

IRMA

EXPO2000 HANNOVER
Registriertes Projekt der Weltausstellung

Stadt Köln
oecolonia
die Expo2000 in Köln



Huhwasser
- wenn de Flut kütt!

Die Stadt Köln hat durch das Hochwasserschutzkonzept im Jahre 1996 eine deutliche Verbesserung des bestehenden Hochwasserschutzes beschlossen. Der vielfältige Maßnahmenkatalog befindet sich derzeit in der Umsetzung. Um den Kölner Bürgern und auch jedem anderen Interessierten die Hochwasserproblematik in Köln zu verdeutlichen, lädt die Stadt Köln zu einer Rundreise zu Fuß oder Rad "durchs Hochwasser" ein.

1 Stammheim: Flittarder-Rheinaue

In der Auenlandschaft der Flittarder Rheinaue wurde anlässlich der Expo 2000 ein Ausstellungs- und Erlebnispfad eröffnet. Großformatige Schautafeln informieren über die Wiederherstellung natürlicher Rückhalteräume zur Verhinderung von Hochwasserkatastrophen entlang des Rheins.

2 Zoo

Auch der Zoo ist hochwassergefährdet! Ab einem Wasserstand von 11,00m K.P. steht das Nashorn im Rheinwasser. Hier besteht nun die besondere Problematik: Wie evakuiert man möglichst schnell Nashörner, Elefanten, Tiger etc.? Es bestehen Transportprobleme und teilweise unüberwindliche Unterbringungsschwierigkeiten.
Am Fischottergehege informiert ein Tafel über den Zusammenhang zwischen Fischotter, Aue und Hochwasser.

3 Ebertplatz - Gefahr von unten

4 Deutzer Hafen, Feuerwehr - Hilfe im Wasser

5 Poll, DLRG - Boote satt Autos

6 Porz-Westhoven - Mit der Natur

7 Hubtor am Treppchen -Kampf gegen die Flut

8 Auenviertel, Uferstrasse - Bürgerinitiativen

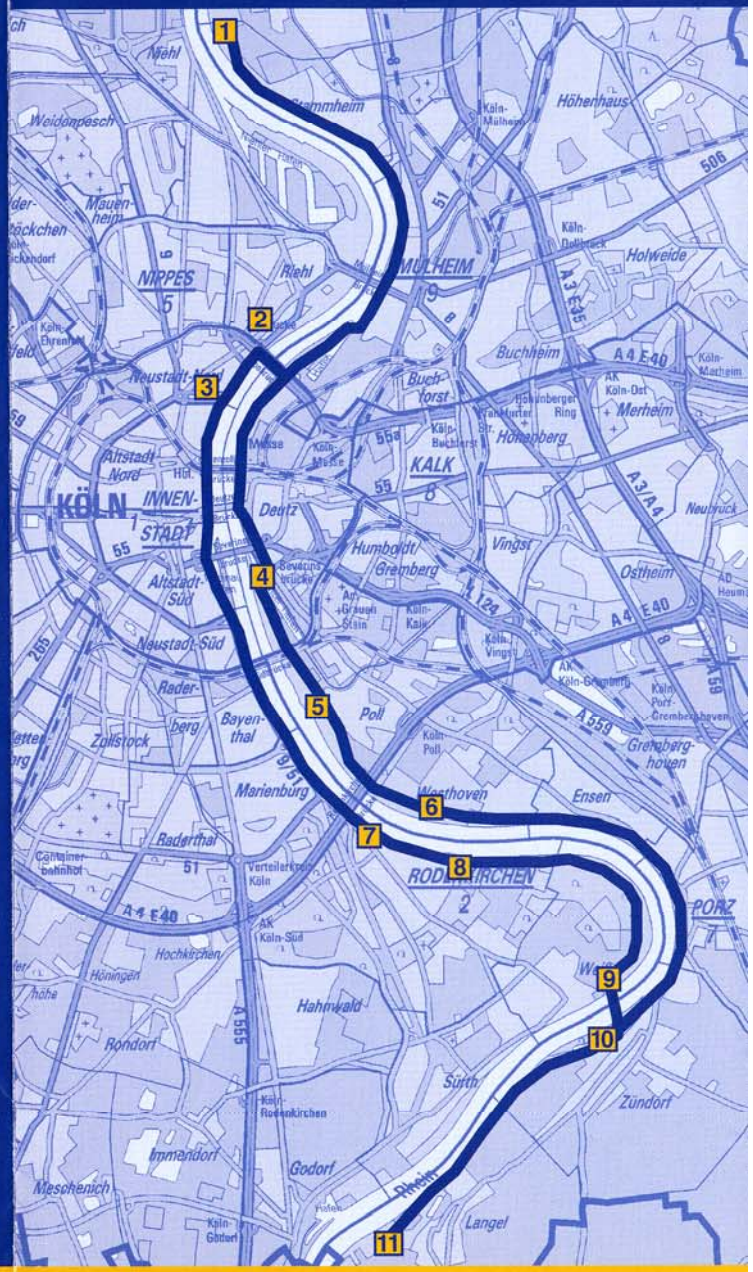
9 Weiß

Die hier eingesetzte Personenfähre nach Porz-Zündorf muss im Hochwasserfall bei einem Wasserstand von 8,30m K.P. (der Hochwassermarke II) außer Betrieb genommen werden.
Auf dem Weg zur Fähre gelangt man durch die Auenvegetation des Weißer Bogen.

10 Zündorfer Groov - Schutz gegen die Flut

11 Porz-Langel

Aufgrund der Verantwortung gegenüber den Anwohnern am Niederrhein hat die Stadt Köln durch das Hochwasserschutzkonzept die Schaffung von zwei Retentionsräumen festgelegt. In Köln Worringen und hier in Porz-Langel werden solche Überschwemmungsgebiete unter großer Bürgerbeteiligung angelegt.



Ein Radweg entlang des Rheins und ein Spaziergang durch die Kölner Altstadt greifen an markanten Standorten verschiedene Probleme und Sachverhalte zum Kölner Hochwasser auf.
Die anliegenden Karten zeigen die einzelnen Hochwasserpunkte sowie die Standorte der Informationstafeln, die anhand von Fotos und kurzen Texten informieren.

Annex 8: Summary of an article in the technical journal 'Maatschappijwetenschappen' by ir. Teun Terpstra, dr. Jan Gutteling and Asha ten Broeke – University Twenthe

The Netherlands

11/1/2006

Risk reduction of disasters

During a disaster – e.g. a flood – four different but mutual connected phases of the emergency management are distinguished:
a: Risk reduction
b: Preparation for a possible disaster
c: Reaction during a disaster
d: Recovery after the disaster

In each of these phases communication about risks is important.

In the first phase – risk reduction – communication should aim at explaining the policy for taking measures to protect people and property. Measures can be compared based on costs and effectiveness to protect against floods.

Preparation for a possible disaster
In this second phase communication should aim at informing people that are exposed to the risks of flooding. Communication should contain information on possible scenarios of floods, the severity of possible consequences and the measures that are taken by the government to prevent loss of life and damage.

Reaction during a disaster
If a flood actually happens, the third phase – reaction – begins. In this phase the main goal is to use communication to reduce loss of life and damage as much as possible. In case of an inundation this could mean that it is necessary to announce an evacuation and to inform people what they should do to prepare themselves for this evacuation and a temporary stay somewhere else. Especially in case of an evacuation it is very important to explain how and when the area should be evacuated, how the deserted area will be guarded by the police, when it is expected

for people to return to their houses and in which condition the area will be after an inundation.

During the flood of February 1995 the area in the center of the Netherlands around the river Waal was threatened by high water levels. In the region of the Province Gelderland the decision was taken by the provincial coordination center to evacuate the area. This decision was officially announced in a press conference. In this press conference it was explained which area had to be evacuated. After that the message was further explained in regional crises centers. Civilians were informed through letters, sound trucks, telephone information numbers and the media (radio, TV, cable information services, teletext). In the beginning only an advice was given to evacuate. Civilians were asked to leave the area voluntary. This gave the authorities the time to focus on special groups (nursing homes, hospitals, cattle). In the third stage people were forced to evacuate, before a certain time.

Afterwards this phasing was seen as a 'golden shot', because most of the inhabitants already left before the forced evacuation begun. In was not so difficult to convince the civilians in the area of the necessity of the evacuation. They were aware of the reality of the threat, also because they were well informed about the actual situation of the flood. Also the long preparation time for the evacuation contributed to the success. People had enough time bring their property to safety and to adapt to the idea of an evacuation. The media, especially those on a local level, played an important role in spreading the information.

It is of greatest importance to make clear what areas exactly must be evacuated. This should be clear to everybody. If in a certain area the decision to evacuate has been taken, people in the neighboring area will be worried about the safety of their area. Communication with this group is therefore very important. The government should feed the media very frequently with updates. Frequent communication with the population contributes to transparency and trust. The worst thing that can happen is "information silence", that makes civilians guess what's going on.

Recovery after the disaster

In the last phase, after an inundation, risk communication should make clear whether people can expect delayed effects (like collapsing buildings), possible other resulting disasters (damaged electricity networks, storage of dangerous substances, etc.) and how the original situation can be restored as soon as possible (clearing up the mess, rights for aid). Furthermore it is essential that people can recoup their losses (financially) and are supported in dealing emotionally with this traumatic event.

Example from the Netherlands:
Rijkswaterstaat made a leaflet including basic information about the forecast of floods (hoogwater) and low flows (laagwater) in the Rhine and Meuse rivers. This leaflet answers most of the questions that are usually raised by the general public and media during a flood event. Preparing such a leaflet on forehand saves valuable time during the flood event.

Annex 9: Italian vademecum

DURING FLOOD

If you are at home

IF YOU HAVE TO LEAVE YOUR HOME TURN OFF THE GAS TAP AND DISCONNECT THE ELECTRICITY METER
→ These equipments could be damaged during calamity

DO NOT FORGET YOUR DOCUMENTS AND YOUR REGULAR MEDICINES→ They can be essential if your home becomes unreachable for a long time.

PUT ON CLOTHES AND SHOES that can protect you from water → it is important to keep your body hot and dry

If you are down the street

DO NOT CROSS BRIDGES AND GO NEAR RIVERS, TORRENTS, SLOPES ETC. FOR ANY REASON → you could be swept away by the flood

PAY CAREFUL ATTENTION TO THE ROAD SIGNS ARRANGED BY AUTHORITIES → In this way you avoid going to dangerous places

IF YOU ARE DRIVING AVOID BLOCKING STREETS → They are necessary for road service and rescue team

IF YOU CANNOT LEAVE YOUR HOME, GO UPSTAIRS AND WAIT FOR RESCUE TEAM → this will prevent you from being swept away by the flood

DO NOT GO DOWN STREETS OR SUBWAYS → water could be deeper and faster than it seems to be and water level could block your car

USE THE TELEPHONE ONLY IF YOU REALLY NEED IT→ Thus, you prevent lines to be overloaded. Remember they are important fro rescue teams.

PAY ATTENTION TO THE INSTRUCTIONS PROVIDED BY AUTHORITIES → They manage the emergency and coordinate rescue team

AFTER INUNDATION

DON NOT USE WATER UNTIL AUTHORITIES ANNOUNCE IT TO BE DRINKING AGAIN AND NOT USE FOOD EXPOSED TO INUNDATION → They could have pathogens or be contaminated.

DO NOT USE ELECTRICAL EQUIPMENTS BEFORE A TECHNICIAN CHECK → damages could cause a short-circuit

CLEAN AND DISINFECT SURFACES EXPOSED TO INUNDATION → They could have noxious substances and pathogens

SEAQUAKE OR TSUNAMI

A seaquake is a series of very long waves which are born in the sea and spread at high speed. Coming close to coasts, waves reduce speed and length, but progressively increase height until they flood the coast with devastating effects.
Seaquakes can be caused by submarine earthquakes, submarine volcanic eruptions or landslides that can develop in the sea or flow into the sea.

ATTENTION!

If you feel an earthquake and if you observe an explosive eruption in a volcanic island or a big landslide flowing into the sea or if the sea recedes suddenly without any reason

IF YOU ARE ON SHORE, GO OFF IMMEDIATELY GOING TO HIGHER ZONES → the seaquake wave can flow land for many metres above the sea level	IF YOU ARE GOING BY BOAT, GO OFF IMMEDIATELY BEARING OFF TOWARDS DEEP SEE → The coast is the zone affected by the seaquake effects. Offshore you could not notice the same waves

ROAD CONDITIONS

Users of different transport ways (road, railway, air, water, intermodal) can be exposed to danger or serious trouble situations caused by events linked to transport activities themselves (accidents, prolonged blocks and traffic congestion, etc.) and by unfavourable meteorological events (snow, fog, precipitations, etc.). In Italy, at the moment, most of goods and passengers travel on the road. Especially durind the last thirty years, car and truck traffic on the road has trebled and it it is expected to increase in the future.

Travel informed

For road users it is good to get information on weather conditions and/or road and traffic ones before starting a journey or during the journey itself. To that end, we recommend to tune to radios which broadcast news: ISORADIO within the Italian motorway net, RAI channels broadcasting the "Onda verde" news bulletin and local radios. Real-time traffic news are avalaible in most of motorway companies' web sites and in some cases it is possible to have access to webcams placed along roads; some companies have a free number.
Another important source of information are the traffic police departmental operations centre and the motorway operations centre managed by Polstrada and road companies.

IN CASE OF UNFAVOURABLE METEOROLOGICAL CONDITIONS
(snow, ice, wind, fog, precipitations, etc.)

RULES OF THE ROAD ARE FOR YOUR SEFETY → They show how to be prudent and how to use common sense for a safe driving

CHECK TO HAVE ENOUGH FUEL TO FACE UP TO POSSIBLE PROLONGED STOPOVERS → Without fuel you will make the trouble situation more dangerous

HEAVY RAIN, SNOWFALL, FOG CAN MAKE ROAD CONDITIONS WORSE OR EVEN AWFUL → Do not forget your goal is to arrive with no casualties or damages for you and other people

IF YOU ARE TRAVELLING WITH CHILDREN, OLD PEOPLE OR SICK, CARRY WHAT CAN MAKE THEIR STOPOVER DURING TAILBACK MORE COMFORTABLE → Because you have passengers with special needs

GET INFORMATION PREVIOUSLY ABOUT METEOROLOGICAL AND TRAFFIC CONDITIONS LISTENING TO THE RADIO → Road conditions change continuously

GET USUFUL NUMBERS TO HAVE INFORMATION AND/OR TO ASK FOR HELP → You could need immediate help

IF IT IS NOT STRICTLY NECESSARY, DELAY YOUR DEPARTURE UNTIL THE CRITICAL SITUATION TAKING PLACE HAS IMPROVED → It is better to run no risk

PAY ATTENTION TO THE PROPER PLACE OF CHILDREN AND MAKE SURE THEY WEAR THEIR SEAT BELT → Their safety depends on your attention

WITH HEAVY SNOWFALL DO NOT USE CAR WITHOUT SNOW CHAINS OR PNEUMATICS FOR SNOW → The risk of loosing control of your car is high

PUT ANIMALS IN THE SPACES ARRANGED FOR THEM → In case of bracking or accident their reaction is unpredictable, therefore it is very dangerous

SNOW AND AVALANCHE

Avalanches are critical events due to a sudden stability loss of the snow down a slope in which the mantle of snow involved in the breaking, slides down the mountainside.
It means a speed gravitational sliding of a mass of snow down a mountain slope.
The breaking can be natural or provoked.
In the first case, freshly fallen snow weight or rise in temperature can provoke the avalanche.
On the contrary, the provoked breaking can be: accidental, those who are going by foot or skiing down the freshly fallen snow slope, with their weight, involuntary provoke an avalanche.
Or planned, for example by ski districts to reclaim dangerous slopes with explosive devices.

IF YOU ARE AT HOME

IF YOU ARE OUTSIDE

In case of heavy snowfall and/or high avalanche risk

DO NOT GO OUT → Usually buildings are safe places, on the contrary outside there are higher risks

KEEP YOU UP TO DATE WITH WEATHER FORECAST → You can get information about weather conditions and the mantle of snow

IF YOU HAVE TO GO OUT, AVOID DANGEROUS ZONES → Near gullies, open sides and peaks the risk is higher. There are safe places known by who live in the mountains

IF YOU HAVE TO GO OUT, DO NOT DO IT WHEN THE RISK IS HIGHER → poor visibility, wind during a snowfall or rise in temperature after a snowfall can increase the avalanche risk

IF THE BUILDING WHERE YOU ARE IS AT AVALANCHE RISK, CLOSE ALL THE SHUTTERS → an avalanche can break doors and windows, keeping shutters closed you will increase the strength of the building

FIND A SAFE WAY TO REACH A SHELTER → Find a shelter, also a big rock or an old refuge. The shorter way to reach the shelter could not be the best.

TELL YOUR FAMILY OR FRIENDS WHERE YOU ARE→ If somebody knows where you are, they will not worry and will send some help if it is needed

DO NOT GO TO DANGEROUS OR LITTLE KNOWN PLACES→ To take risks in dangerous places is sensible only in extreme cases and for good reasons: if you are not sure wait for better conditions

OBSERVE SIGNS OF SKI DISTRICTS → Off-piste skiing where it is forbidden, can be very dangerous in case of avalanche

ARVA (SNOW BEEPER), AVALANCHE PROBE AND A SNOW SHOVEL → They are essential instruments that you must have to use in case of hike in zone at risk

IF YOU ARE USING CABLE FACILITIES

IF YOU CANNOT MOVE, BE CALM AND WAIT FOR HELP → You could fall down for a sudden movement

OPEN THE BAR ONLY WHEN IT IS INDICATED → Protection you find at the arrival are necessary to avoid accidents, the society's staff is ready to intervene in case of a facilities block

PULL DOWN AND BLOCK ALWAYS PROPERLY THE SAFETY BAR → It protects you from falls if you move suddenly

DO NOT MAKE RASH MOVEMENTS → They could caused a dangerous wave-like motion

TAKE CARE OF CHILDREN → They can slide down over the protection

DO NOT GET OFF BY YOURSELF → it is useless to run risks if rescue team is arriving

FOREST FIRES

A forest fire can be defined " a fire which tends to spread over wooded areas with bushes, tilled or untilled lands and pastures next to these areas."
A fire can spread if there are three elements called "the fire triangle" : combustible materials (dry grass, wood), fuel (oxigen) and heat (necessary for combustible to reach the lighting temperature.) Special weather conditions (ex. very hot and windy days in a period with poor precipitations) can facilitate the spread of fire.

A fire can be caused by:
NATURAL EVENTS: such as lightnings. They are the less frequent.
ANTHROPIC ORIGIN EVENTS: it means caused by men. They can be:
→ accidental, such as a short-circuit, overheated engines, sparks from tools etc.
→ culpable, such as some farming and pastoral activities, not responsible behaviours in tourist areas, to throw burning materials incautiously (matches, cigarettes etc.)
→ arson, when the fire is deliberately set by man for different reasons (revenge, spite, protest etc.) to cause damages.
These are the most frequent causes of forest fires.

PROTEZIONE CIVILE IN FAMIGLIA

Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

PROTEZIONE CIVILE NAZIONALE


PIANO
DI
PRO

Se sei consapevole dei possibili rischi presenti sul territorio dove vivi, se sai come e dove informarti, se sai come organizzarti per affrontare eventuali momenti di crisi, tu vivi molto più sicuro e la Protezione Civile può funzionare al meglio delle sue capacità. Sì, perché sei tu il primo attore di questo sistema: sei tu quello che deve sapere come vigilare, come avvisare, come collaborare con i soccorritori. Tu e la tua famiglia, quando si verifica una emergenza, quasi sempre in modo imprevisto ed improvviso, potete trovarvi soli di fronte a situazioni difficili e pericolose, anche soltanto per il tempo necessario ai soccorritori per raggiungervi ed aiutarvi, tempo che può essere più o meno lungo a seconda delle dimensioni dell'emergenza e delle condizioni ambientali nelle quali vi trovate. È allora essenziale sapere cosa fare e come comportarsi in quei momenti.

Questo vademecum vuole aiutare ogni componente del nucleo familiare (dal bambino al nonno) a svolgere al meglio il proprio ruolo di Protezione Civile.

Leggilo attentamente: fornisce suggerimenti e risposte, ti spiega cosa e come fare e, soprattutto, quali sono i comportamenti pericolosi e quelli corretti per te e per chi ti sta vicino.

Ricorda: la Protezione Civile siamo tutti noi.

La Protezione Civile

In Italia la Protezione Civile è un "servizio nazionale" organizzato su quattro livelli di competenza e responsabilità, immaginati per individuare tutte le soluzioni per i diversi problemi. Il primo livello è quello comunale: il Sindaco è la prima autorità di Protezione Civile nel Comune, la più vicina al cittadino, ed ha la responsabilità di vigilare e affrontare, con le risorse e gli uomini di cui dispone, i primi momenti di difficoltà o le situazioni molto localizzate. Se il Comune non può affrontare da solo l'emergenza, intervengono la Provincia e gli Uffici territoriali di Governo, cioè le Prefetture, e quindi la Regione, che attivano in favore delle aree colpite da calamità tutto il potenziale di intervento di cui dispongono. Nel caso delle situazioni più gravi e generalizzate subentra il livello nazionale: la responsabilità dell'intervento viene assunta in tal caso direttamente dal Presidente del Consiglio dei Ministri, che opera tramite il Dipartimento della Protezione Civile.

La Protezione Civile, a ciascun livello, impiega per le diverse esigenze tutte le risorse delle strutture locali e centrali: fanno parte del Servizio Nazionale tutti i corpi organizzati dello Stato, dai Vigili del Fuoco alle Forze dell'Ordine, dalle Forze Armate al Corpo Forestale, dai Vigili Urbani alla Croce Rossa, da tutta la comunità scientifica al Soccorso Alpino, dalle strutture del Servizio sanitario al personale e ai mezzi del "118". Un ruolo di particolare importanza hanno assunto le Organizzazioni di volontariato di Protezione Civile, cresciute in ogni regione del Paese sia in numero che in termini di capacità operativa e di specializzazione.

Ogni pompiere, ogni agente, ogni soldato, ogni volontario, ogni infermiere rappresenta il sistema della Protezione Civile. Questi sono i "professionisti" che 24 ore su 24 e 365 giorni dell'anno vigilano sulle condizioni della nostra vita quotidiana. Ma ricorda: sei tu, con il tuo nucleo familiare, il primo elemento organizzativo della Protezione Civile.

La Protezione Civile si sta trasformando da "macchina per il soccorso", che interviene solo dopo un evento calamitoso, a sistema di monitoraggio del territorio e dei suoi rischi, di previsione e di prevenzione.

Questa trasformazione ha coinvolto i principali organismi scientifici e tecnici che operano nel nostro Paese, ad ogni livello del sistema.

È stata creata una rete di "Centri Funzionali" che copre tutto il territorio nazionale: parte dai gestori delle reti di monitoraggio dei diversi possibili rischi ed arriva alle strutture regionali, sino a quella centrale. Questa rete permette di disporre dei dati utili per decidere possibili interventi, informare i cittadini, ridurre i tempi di intervento e soprattutto, nei limiti che la natura consente, cercare di prevenire le calamità.

Protezione Civile e nuclei familiari

La nostra struttura, per essere efficiente ed efficace negli interventi, ha bisogno principalmente di due condizioni:
- essere credibile, godere della fiducia di tutti i cittadini;
- ogni nucleo familiare deve sentirsi partecipe del sistema e non utente passivo.
Il modo più "civile", più utile per affrontare con serenità e consapevolezza i temi che riguardano la sicurezza di tutti, è trasformare il tuo nucleo familiare in un soggetto attivo della Protezione Civile.
Non è né difficile né troppo impegnativo!
Come? Costruendo insieme a tutti i componenti del tuo nucleo familiare il "Piano familiare di Protezione Civile" che prevede cinque capitoli fondamentali:

1 CONOSCERE I RISCHI

2 SAPERSI INFORMARE

3 ORGANIZZARSI IN FAMIGLIA

4 SAPER CHIEDERE AIUTO

5 EMERGENZA E DISABILITÀ

PROTEZIONE CIVILE NAZIONALE

Siamola PROTEZIONE CIVILE

INDICE

1 CONOSCERE I RISCHI

TERREMOTI

Il rischio sismico, in una determinata area, può essere misurato dal danno che ci si può aspettare, in un intervallo di tempo stabilito, a seguito dei terremoti. Può essere espresso in termini di vittime, costo economico, danno alle costruzioni. Rischio e pericolo non sono la stessa cosa: il pericolo è rappresentato dal terremoto che può colpire una certa area (la causa); il rischio è rappresentato dalle sue possibili conseguenze, cioè dal danno che ci si può attendere (l'effetto). Nella definizione del rischio, infatti, intervengono oltre la pericolosità le caratteristiche del territorio.
RISCHIO SISMICO = TERREMOTI x EDIFICI VULNERABILI x BENI ESPOSTI

Da cosa dipende il rischio sismico?

Per definire il livello di rischio di un territorio occorre conoscere la sua sismicità, cioè quanto spesso avvengono i terremoti e quanto sono forti, ma anche il modo in cui l'uomo ha costruito le sue opere, quanti e quali sono i beni esposti, quanto densamente è popolato. Infatti, a parità di frequenza e di intensità dei terremoti, il rischio è nullo laddove non esistono edifici, beni esposti, popolazione; mentre aree densamente popolate, o caratterizzate da costruzioni poco resistenti allo scuotimento di un'onda sismica, presentano un rischio elevato.

Come ci si difende dai terremoti?

I terremoti non si possono evitare. L'unica arma per la riduzione del rischio sismico è la prevenzione, che comprende: fare una completa classificazione sismica dei Comuni; costruire seguendo

precise norme tecniche antisismiche; adottare comportamenti corretti e realizzare piani di emergenza comunali necessari per organizzare un tempestivo soccorso alla popolazione colpita.

I maggiori terremoti italiani del XX secolo

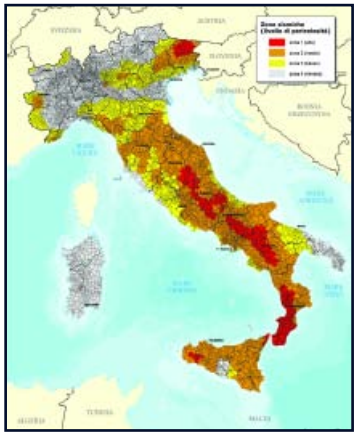
Data	Area epicentrale	Intensità	Magnitudo
8 settembre 1905	Calabria	X	7.1
28 dicembre 1908	Reggio C. – Messina	XI	7.2
7 giugno 1910	Irpinia	IX	5.9
13 gennaio 1915	Marsica	XI	7.0
29 giugno 1919	Mugello	IX	6.2
7 settembre 1920	Garfagnana	X	6.5
23 luglio 1930	Irpinia	X	6.7
21 agosto 1962	Irpinia	IX	6.2
15 gennaio 1968	Belice	X	6.2
6 maggio 1976	Friuli	IX-X	6.5
23 novembre 1980	Irpinia	IX-X	6.9
26 settembre 1997	Umbria-Marche	IX	5.8

Cosa è la classificazione sismica

Sulla base della frequenza ed intensità dei terremoti del passato, interpretati alla luce delle moderne tecniche di analisi della pericolosità, tutto il territorio italiano è stato classificato in quattro zone sismiche che prevedono l'applicazione di livelli crescenti di azioni da considerare per la progettazione delle costruzioni (massime per la Zona 1). La classificazione del territorio è iniziata nel 1909 ed è stata aggiornata numerose volte fino all'attuale, disposta nel 2003, con Ordinanza del Presidente del Consiglio dei Ministri.

Come si può conoscere la zonazione sismica del proprio Comune

L'adozione della classificazione sismica del territorio spetta per legge alle Regioni. Ciascuna Regione, partendo dall'Ordinanza del Presidente del Consiglio dei Ministri (n. 3274/03), ha elaborato propri elenchi dei Comuni con l'attribuzione puntuale ad una delle quattro zone sismiche. Si



Zona 1 → È la zona più pericolosa, dove possono verificarsi forti terremoti. Comprende 716 Comuni

Zona 2 → Nei Comuni inseriti in questa zona possono verificarsi terremoti abbastanza forti. Comprende 2.324 Comuni

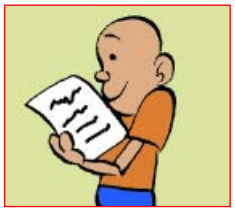
Zona 3 → I Comuni inseriti in questa zona possono essere soggetti a scuotimenti modesti. Comprende 1.634 Comuni

Zona 4 → È la meno pericolosa. Nei Comuni inseriti in questa zona le possibilità di danni sismici sono basse. Comprende 3.427 Comuni

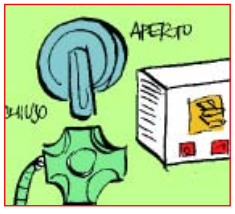
può prendere visione della classificazione sismica del Comune dove si vive, consultando il sito www.protezione civile.it. Nei Comuni classificati sismici, chiunque costruisca una nuova abitazione o intervenga su una già esistente è obbligato a rispettare la normativa antisismica, cioè criteri particolari di progettazione e realizzazione degli edifici.

COSA FARE...

prima del terremoto



INFORMATI SULLA CLASSIFICAZIONE SISMICA DEL COMUNE IN CUI RISIEDI → Devi sapere quali norme adottare per le costruzioni, a chi fare riferimento e quali misure sono previste in caso di emergenza



INFORMATI SU DOVE SI TROVANO E SU COME SI CHIUDONO I RUBINETTI DI GAS, ACQUA E GLI INTERRUTTORI DELLA LUCE → Tali impianti potrebbero subire danni durante il terremoto

EVITA DI TENERE GLI OGGETTI PESANTI SU MENSOLE E SCAFFALI PARTICOLARMENTE ALTI → Fissa al muro gli arredi più pesanti perché potrebbero caderti addosso

TIENI IN CASA UNA CASSETTA DI PRONTO SOCCORSO...→ una torcia elettrica, una radio a pile, un estintore ed assicurati che ogni componente della famiglia sappia dove sono riposti

durante il terremoto

SE SEI IN LUOGO CHIUSO CERCA RIPARO NEL VANO DI UNA PORTA...→ inserita in un muro portante (quelli più spessi) o sotto una trave perché ti può proteggere da eventuali crolli

RIPARATI SOTTO UN TAVOLO → È pericoloso stare vicino a mobili, oggetti pesanti e vetri che potrebbero caderti addosso

NON PRECIPITARTI VERSO LE SCALE E NON USARE L'ASCENSORE → Talvolta le scale sono la parte più debole dell'edificio e l'ascensore può bloccarsi e impedirti di uscire

SE SEI IN AUTO, NON SOSTARE IN PROSSIMITÀ DI PONTI, DI TERRENI FRANOSI O DI SPIAGGE → Potrebbero lesionarsi o crollare o essere investiti da onde di tsunami

prima del terremoto

A SCUOLA O SUL LUOGO DI LAVORO INFORMATI SE È STATO PREDISPOSTO UN PIANO DI EMERGENZA → Perché seguendo le istruzioni puoi collaborare alla gestione dell'emergenza

durante il terremoto

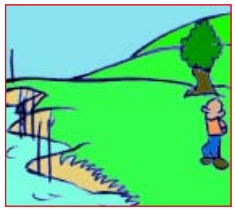
SE SEI ALL'APERTO, ALLONTANATI DA COSTRUZIONI E LINEE ELETTRICHE → Potrebbero crollare

dopo il terremoto

ASSICURATI DELLO STATO DI SALUTE DELLE PERSONE ATTORNO A TE → Così aiuti chi si trova in difficoltà ed agevoli l'opera di soccorso

STA' LONTANO DA IMPIANTI INDUSTRIALI E LINEE ELETTRICHE → È possibile che si verifichino incidenti

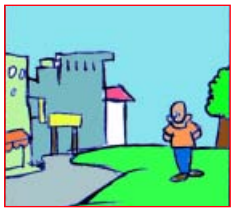
NON CERCARE DI MUOVERE PERSONE FERITE GRAVEMENTE → Potresti aggravare le loro condizioni



STA' LONTANO DAI BORDI DEI LAGHI E DALLE SPIAGGE MARINE → Si possono verificare onde di tsunami

ESCI CON PRUDENZA INDOSSANDO LE SCARPE → In strada potresti ferirti con vetri rotti e calcinacci

EVITA DI ANDARE IN GIRO A CURIOSARE... → e raggiungi le aree di attesa individuate dal piano di emergenza comunale perché bisogna evitare di avvicinarsi ai pericoli



RAGGIUNGI UNO SPAZIO APERTO, LONTANO DA EDIFICI E DA STRUTTURE PERICOLANTI → Potrebbero caderti addosso

EVITA DI USARE IL TELEFONO E L'AUTOMOBILE → È necessario lasciare le linee telefoniche e le strade libere per non intralciare i soccorsi

ERUZIONI VULCANICHE

Le eruzioni vulcaniche si verificano quando il magma (materiale solido, liquido e gassoso ad alta temperatura), proveniente dall'interno della Terra, fuoriesce in superficie.
Una prima classificazione generale distingue le eruzioni vulcaniche in effusive (colate di lava) o esplosive (con frammentazione del magma in brandelli di varie dimensioni chiamati piroclasti).
Esistono varie tipologie di eruzioni vulcaniche, ciascuna delle quali può presentare diversi fenomeni pericolosi: 1. colate di lava; 2. caduta di materiali grossolani (bombe vulcaniche e blocchi di grandi dimensioni); 3. caduta e accumulo di materiali fini (ceneri e lapilli); 4. colate piroclastiche; 5. emissioni di gas; 6. colate di fango.
Fra questi i fenomeni più pericolosi sono le colate piroclastiche e le colate di fango.
Le eruzioni vulcaniche possono avere durata variabile da poche ore a decine d'anni (il vulcano Kilauea nelle isole Hawaii è in eruzione dal 1986), possono avvenire dalla stessa bocca (es. Vesuvio) o da bocche che si aprono in punti diversi (es. Campi Flegrei, Etna) e possono emettere volumi di magma molto variabili.

A differenza di altri fenomeni naturali, quali i terremoti, le eruzioni vulcaniche sono generalmente prevedibili, grazie a particolari fenomeni precursori che possono essere rilevati da reti di monitoraggio appositamente realizzate.

COSA FARE...

se vivi o ti trovi in una zona vulcanica

INFORMATI SUL PIANO D'EMERGENZA DEL TUO COMUNE→ Per adottare i comportamenti adeguati e attuare le eventuali operazioni di evacuazione

DURANTE L'ERUZIONE RISPETTA I DIVIETI DI ACCESSO ALLE AREE INTERESSATE→ Anche se la spettacolarità delle eruzioni genera curiosità, questi luoghi sono pericolosi

ADOTTA ESCLUSIVAMENTE I COMPORTAMENTI INDICATI DALLE AUTORITÀ DI PROTEZIONE CIVILE→ Durante le fasi di crisi, è facile che si diffondano notizie errate che possono ostacolare l'intervento di soccorso

AVVICINARSI ALLE ZONE CRATERICHE È PERICOLOSO ANCHE IN ASSENZA DI ATTIVITÀ ERUTTIVA→ Fenomeni esplosivi improvvisi e/o emissione di gas sono sempre possibili

in caso di colate di lava

NON AVVICINARTI A UNA COLATA DI LAVA ATTIVA ANCHE QUANDO DEFLUISCE REGOLARMENTE → Sono molto calde, sprigionano gas, possono dare luogo a rotolamenti di massi incandescenti e repentine esplosioni

ANCHE DOPO LA FINE DELL'ERUZIONE NON CAMMINARE SULLA SUPERFICIE DI UNA COLATA LAVICA→ Le colate mantengono per anni il loro calore

in caso di caduta di "bombe vulcaniche"

INFORMATI SE LA ZONA IN CUI TI TROVI È SOGGETTA A RICADUTA DI MATERIALI GROSSOLANI→ È un fenomeno altamente distruttivo nei confronti degli edifici che pertanto non costituiscono un rifugio

PRENDI VISIONE DEL PIANO DI EMERGENZA DEL TUO COMUNE E PREPARATI AD UNA EVENTUALE EVACUAZIONE→ L'allontanamento preventivo dall'area interessata è l'unica forma di difesa possibile

in caso di caduta di ceneri vulcaniche

RIMANI IN CASA CON LE FINESTRE CHIUSE E CONTROLLA L'ACCUMULO SUL TETTO DELLA CASA → La cenere vulcanica ha un peso specifico alto e accumulandosi potrebbe causare lesioni o crolli del tetto

ALL'ESTERNO INDOSSA MASCHERINA DI PROTEZIONE E OCCHIALI ANTIPOLVERE E GUIDA CON PRUDENZA→ Le ceneri provocano disturbi all'apparato respiratorio, agli occhi e riducono l'aderenza al manto stradale

in caso di emissioni gassose

EVITA DI SOSTARE O CAMPEGGIARE IN AREE VULCANICHE O INOLTRARTI IN AMBIENTI SOTTERRANEI→ L'anidride carbonica è un gas inodore più pesante dell'aria e letale in concentrazioni elevate

NON PENSARE DI ESSERE AL SICURO SE SOSTI LONTANO DALLA ZONA DEL CRATERE→ Possono esserci emissioni di gas anche in aree più lontane

in caso di colate piroclastiche

PREPARATI AD UNA EVENTUALE EVACUAZIONE → L'unica difesa da questo tipo di colate è l'allontanamento preventivo dall'area che ne potrebbe essere investita

in caso di colate di fango

SEGUI IL PIANO DI PROTEZIONE CIVILE CHE INDICA LE AREE DI ATTESA E ALLONTANATI DALLE ZONE A RISCHIO→ Le ceneri fini possono innescare pericolose colate di fango che si riversano lungo i corsi d'acqua

FRANE

Il meccanismo di una frana si può spiegare così: il materiale che costituisce un pendio, una scarpata o una parete rocciosa è attirato verso il basso dalla forza di gravità e rimane in quella posizione finché fattori come la natura del terreno o della roccia, la forma o il profilo del pendio e la quantità d'acqua presente lo mantengono in equilibrio. Basti pensare ad un castello di sabbia: se non si mette un po' d'acqua a tenere compatti i granelli, esso non starà mai in piedi, ma se ne mettiamo troppa crolla! Così avviene lungo i pendii: hanno bisogno di una giusta quantità d'acqua per non franare. Le cause che predispongono e determinano questi processi di destabilizzazione del versante sono molteplici, complesse e spesso combinate tra loro. Oltre alla quantità d'acqua, oppure di neve caduta, anche il disboscamento e gli incendi sono causa di frane: nei pendii boscati, infatti, le radici degli alberi consolidano il terreno e assorbono l'acqua in eccesso. L'azione dell'uomo sul territorio ha provocato e potrebbe provocare ancora in futuro eventi franosi. Ad esempio, scavando ai piedi di un pendio o a mezza costa per costruire edifici o strade si può causare un cedimento del terreno. I territori alpini ed appenninici del Paese, ma anche quelli costieri, sono generalmente esposti a rischio di movimenti franosi, a causa della natura delle rocce e della pendenza, che possono conferire al versante una certa instabilità detta energia di rilievo. Inoltre le caratteristiche climatiche, la distribuzione annuale delle precipitazioni e l'intensa trasformazione dei territori operata dalle attività umane spesso senza criterio e rispetto dell'ambiente (costruzione di strade, piste da sci, nuovi insediamenti abitativi, ecc.) contribuiscono ad aumentare la vulnerabilità del territorio.

CHE COSA FARE SE SEI COINVOLTO IN UNA FRANA?

Se ti trovi all'interno di un edificio

NON PRECIPITARTI FUORI, RIMANI DOVE SEI → Rimanendo all'interno dell'edificio sei più protetto che non all'aperto

RIPARATI SOTTO UN TAVOLO, SOTTO L'ARCHITRAVE O VICINO AI MURI PORTANTI→ Possono proteggerti da eventuali crolli

ALLONTANATI DA FINESTRE, PORTE CON VETRI E ARMADI→ Cadendo potrebbero ferirti

NON UTILIZZARE GLI ASCENSORI→ Potrebbero rimanere bloccati ed impedirti di uscire

Se ti trovi in luogo aperto

ALLONTANATI DAGLI EDIFICI, DAGLI ALBERI, DAI LAMPIONI E DALLE LINEE ELETTRICHE O TELEFONICHE→ Cadendo potrebbero ferirti

NON PERCORRERE UNA STRADA DOVE È APPENA CADUTA UNA FRANA→ Si tratta di materiale instabile che potrebbe rimettersi in movimento

NON AVVENTURARTI SUL CORPO DELLA FRANA→ I materiali franati, anche se appaiono stabili, possono nascondere pericolose cavità sottostanti

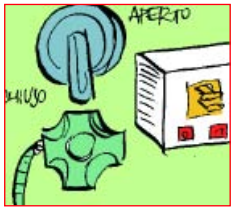
NON ENTRARE NELLE ABITAZIONI COINVOLTE PRIMA DI UN'ACCURATA VALUTAZIONE DA PARTE DEGLI ESPERTI→ Potrebbero aver subito lesioni strutturali e risultare pericolanti

ALLUVIONI

Il bacino idrografico è l'area di territorio delimitato da rilievi che assumono il nome e la funzione di "spartiacque", dividendo l'acqua piovana tra bacini diversi. La pioggia che cade all'interno di un bacino idrografico in parte sarà trattenuta dal terreno e dalla vegetazione, in parte si infiltrerà alimentando le falde sotterranee, in parte raggiungerà il corso d'acqua che scorre nel bacino. Ogni bacino idrografico ha una sua specifica capacità di regimazione idrica; se le precipitazioni sono molto intense o molto prolungate, la quantità d'acqua che raggiunge il corso d'acqua può crescere in modo significativo. Il fiume si ingrossa, fino a raggiungere il livello cosiddetto "di piena". Se, in queste condizioni, il fiume incontra un restringimento dell'alveo, a volte causato anche solo dall'occlusione delle luci di un ponte causata dall'accumulo di alberi e altri materiali trasportati dalla corrente, oppure provoca il cedimento di un argine, anche in un solo punto, o incontra alla fine della corsa una mareggiata alla foce, l'altezza dell'acqua supererà quella degli argini e le acque cominceranno a fuoriuscire, allagando il territorio circostante, le campagne ed i centri abitati. L'allagamento non è l'unico danno collegato ad una situazione alluvionale: se l'acqua erode il terreno su cui scorre, trasporterà a valle anche terra, rocce ed alberi, dando origine alle cosiddette "lave torrentizie"; lungo il percorso l'acqua può erodere le sponde e scalzare al piede interi pendii, causandone il franamento, o provocare il crollo di edifici costruiti lungo le sponde, o travolgere infrastrutture, ponti, strade ed ogni cosa non ancorata al terreno, dalle auto agli autobus, dai camion alle persone. L'alluvione può essere molto pericolosa, ma costituisce una minaccia mortale solo per quanti non la conoscono e non adottano comportamenti di grande prudenza.

DURANTE L'ALLUVIONE

Se sei in casa



SE DEVI ABBANDONARE LA CASA, CHIUDI IL RUBINETTO DEL GAS E STACCA IL CONTATORE DELLA CORRENTE ELETTRICA→ Tali impianti potrebbero danneggiarsi durante l'evento calamitoso

RICORDATI DI TENERE CON TE I DOCUMENTI PERSONALI ED I MEDICINALI ABITUALI→ Ti possono essere indispensabili se casa tua risultasse irraggiungibile per parecchio tempo

INDOSSA ABITI E CALZATURE CHE TI PROTEGGANO DALL'ACQUA→ È importante mantenere il corpo caldo e asciutto

SE NON PUOI ABBANDONARE LA CASA SALI AI PIANI SUPERIORI E ATTENDI L'ARRIVO DEI SOCCORSI→ Eviterai di essere travolto dalle acque

NON USARE IL TELEFONO SE NON PER CASI DI EFFETTIVA NECESSITÀ→ In questo modo eviti sovraccarichi delle linee telefoniche, necessarie per l'organizzazione dei soccorsi

Se sei per strada

NON AVVENTURARTI MAI, PER NESSUN MOTIVO, SU PONTI O IN PROSSIMITÀ DI FIUMI, TORRENTI, PENDII, ECC.→ L'onda di piena potrebbe investirti

SEGUI CON ATTENZIONE LA SEGNALETICA STRADALE ED OGNI ALTRA INFORMAZIONE CHE LE AUTORITÀ HANNO PREDISPOSTO→ In questo modo eviti di recarti in luoghi pericolosi

SE SEI IN MACCHINA EVITA DI INTASARE LE STRADE→ Sono necessarie per la viabilità dei mezzi di soccorso

NON PERCORRERE STRADE INONDATE E SOTTOPASSAGGI→ La profondità e la velocità dell'acqua potrebbero essere maggiori di quanto non sembra e il livello dell'acqua potrebbe bloccare il tuo automezzo

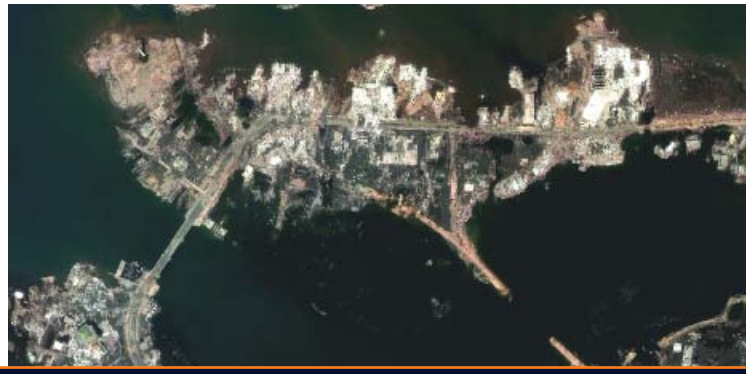
PRESTA ATTENZIONE ALLE INDICAZIONI FORNITE DALLE AUTORITÀ→ Esse gestiscono l'emergenza e coordinano i soccorsi

DOPO L'ALLUVIONE

NON UTILIZZARE L'ACQUA FINCHÉ NON VIENE DICHIARATA NUOVAMENTE POTABILE E NON CONSUMARE ALIMENTI ESPOSTI ALL'INONDAZIONE→ Potrebbero contenere agenti patogeni o essere contaminati

NON UTILIZZARE APPARECCHIATURE ELETTRICHE PRIMA DI UNA VERIFICA DA PARTE DI UN TECNICO→ Gli eventuali danni subiti potrebbero provocare un cortocircuito

PULISCI E DISINFETTA LE SUPERFICI ESPOSTE ALL'ACQUA D'INONDAZIONE→ Potrebbero presentare sostanze nocive o agenti patogeni



MAREMOTI O TSUNAMI

Un maremoto è una sequenza di onde molto lunghe che si genera nel mare e che si propaga a grande velocità. Approssimandosi alle aree costiere, le onde diminuiscono di velocità e di lunghezza, mentre aumentano progressivamente di altezza, finché si riversano sulla costa con effetti spesso devastanti.
I maremoti possono generarsi a causa di terremoti sottomarini, di eruzioni vulcaniche sottomarine o di frane che avvengono o che si riversano in mare.

ATTENTO!

Se avverti un terremoto, osservi un'eruzione esplosiva su un'isola vulcanica, noti una grossa frana che si riversa in mare, o il ritiro improvviso e non giustificato del mare dalla costa

SE SEI A RIVA ALLONTANATI IMMEDIATAMENTE DIRIGENDOTI VERSO ZONE PIÙ ELEVATE→ Più sei in alto, meno è probabile che l'onda ti possa raggiungere e travolgere

SE SEI IN BARCA ALLONTANATI IMMEDIATAMENTE VERSO IL LARGO E VERSO FONDALI PROFONDI→ Gli effetti del maremoto si verificano in area costiera, al largo le stesse onde possono non essere avvertibili

VIABILITÀ

Gli utenti delle varie modalità di trasporto (stradale, ferroviario, aereo, vie d'acqua, intermodale) possono essere esposti a pericoli o a gravi situazioni di disagio determinati sia da eventi connessi con le attività di trasporto stesse (incidenti, blocchi prolungati e congestioni del traffico, ecc.) sia da eventi meteorologici particolarmente avversi (neve, nebbia, precipitazioni intense, ecc.). Allo stato attuale, in Italia, merci e passeggeri viaggiano prevalentemente su strada. In particolare, negli ultimi trenta anni, il traffico di automobili e di autocarri su strada è più che triplicato e la tendenza per l'immediato futuro è di ulteriore crescita.

Viaggiare informati

È buona regola che gli utenti della strada provvedano a informarsi circa le condizioni atmosferiche e/o quelle della strada e del traffico sia prima di intraprendere un viaggio sia nel corso del viaggio stesso. A tal fine, è consigliabile sintonizzarsi sulle frequenze radio che trasmettono notizie e aggiornamenti: ISORADIO, sulla rete di pertinenza di Autostrade per l'Italia, sui canali RAI che trasmettono il notiziario "Onda verde", sulle radio locali. Quasi tutti i gestori autostradali rendono disponibili sui propri siti internet notizie sulle condizioni di traffico, in tempo reale, consentendo in qualche caso anche l'accesso a webcam disposte lungo il tracciato stradale; alcuni gestori hanno numeri verdi a disposizione. Altra importante fonte di informazione è rappresentata dalle Sale operative compartimentali della Polizia Stradale e dai Centri Operativi Autostradali, condotti dalla Polstrada insieme con i gestori stradali.

IN CASO DI AVVERSE CONDIZIONI METEOROLOGICHE

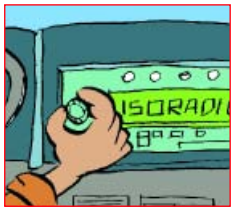
(neve, ghiaccio, vento, nebbia, precipitazioni intense, ecc.)

IL CODICE DELLA STRADA È UN INSIEME DI NORME CHE HANNO PER OBIETTIVO LA TUA SICUREZZA→ Indicano i comportamenti di prudenza e buon senso necessari per viaggiare sicuri

VERIFICA DI POTER CONTARE SU UNA QUANTITÀ DI CARBURANTE ADEGUATA A FRONTEGGIARE EVENTUALI SOSTE PROLUNGATE→ Senza carburante aumenteresti pericolosamente la situazione di disagio

CON FORTI PIOGGE, NEVICATE, NEBBIA, LA VIABILITÀ PUÒ PEGGIORARE FINO A DIVENTARE PESSIMA→ Ricordati che hai per obiettivo di arrivare alla meta senza danni per te e per gli altri

SE CON TE VIAGGIANO BAMBINI, ANZIANI O AMMALATI, PORTATI CIÒ CHE PUÒ SERVIRE PER RENDERE MENO DISAGEVOLE LO STARE IN CODA→ Perché hai a bordo passeggeri con esigenze particolari

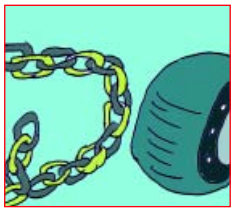


INFORMATI PREVENTIVAMENTE SULLE CONDIZIONI METEO E SULLE SITUAZIONI DI TRAFFICO ASCOLTANDO LA RADIO→ Le condizioni della viabilità cambiano continuamente

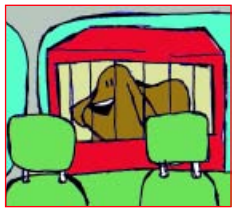
PROCURATI I NUMERI UTILI PER LA RICHIESTA DI INFORMAZIONI E/O DI SOCCORSO→ Può capitare di avere immediato bisogno di aiuto

SE NON STRETTAMENTE NECESSARIO, RIMANDA LA PARTENZA FINO AL MIGLIORAMENTO DELLE EVENTUALI SITUAZIONI CRITICHE IN ATTO→ È meglio non rischiare inutilmente

PRESTA MOLTA ATTENZIONE ALLA CORRETTA COLLOCAZIONE DEI BAMBINI E ASSICURATI CHE ABBIANO LE CINTURE DI SICUREZZA ALLACCIATE→ La loro sicurezza dipende da queste tue attenzioni



IN PRESENZA DI FORTI NEVICATE NON USARE L'AUTO SE NON HAI MONTATO LE CATENE O I PNEUMATICI DA NEVE→ Il rischio di perdere il controllo del mezzo diventa altissimo



TIENI GLI ANIMALI CHE TRASPORTI NEGLI SPAZI PREDISPOSTI→ In caso di frenata o incidente la loro reazione è imprevedibile e quindi molto pericolosa

NEVE E VALANGHE

Le valanghe sono un evento critico dovuto all'improvvisa perdita di stabilità della neve presente su di un pendio e al successivo scivolamento verso valle della porzione di manto nevoso interessata dalla frattura.
In altri termini si tratta dello scivolamento gravitativo rapido di una massa di neve su un pendio di montagna. Il distacco può essere di tipo spontaneo o provocato.
Nel primo caso fattori quali il peso della neve fresca o il rialzo termico possono determinare il verificarsi della valanga.
Il distacco provocato, invece, può essere di due tipi: accidentale, come accade a chi si trova a piedi o con gli sci su di un pendio di neve fresca e provoca involontariamente con il proprio peso una valanga; oppure programmato, come accade nei comprensori sciistici quando, con l'ausilio di esplosivi, si bonificano i pendii pericolosi.

SE SEI IN CASA

SE SEI ALL'APERTO

In caso di nevicate intense e/o di elevato pericolo di valanghe

EVITA DI USCIRE → Gli edifici sono in genere luoghi sicuri, mentre all'aperto i pericoli sono maggiori

INDIVIDUA UN PERCORSO SICURO PER RAGGIUNGERE UN RIPARO→ Trova un riparo, fosse anche un grande masso o un vecchio alpeggio. È possibile che il percorso più breve tra noi e il riparo scelto non sia il migliore

AGGIORNATI SULL'EVOLVERE DELLA SITUAZIONE ATTRAVERSO IL BOLLETTINO METEOROLOGICO→ Si possono ottenere utili informazioni circa le condizioni meteorologiche e le condizioni del manto nevoso

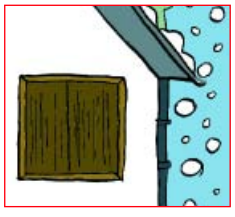
COMUNICA A FAMILIARI O AMICI IL LUOGO IN CUI TI TROVI→ Se qualcuno sa dove sei non si preoccuperà per te e, in caso di necessità, potrà inviarti i soccorsi

DOVENDO USCIRE, EVITA ZONE CONOSCIUTE COME PERICOLOSE→ Il pericolo è maggiore in prossimità di canaloni, versanti aperti e creste. Esistono zone relativamente sicure, conosciute da chi vive in montagna

EVITA DI MUOVERTI IN ZONE PERICOLOSE O POCO CONOSCIUTE→ Avventurarsi in posti pericolosi è sensato solo in casi estremi e per validi motivi; nel dubbio è meglio aspettare che le condizioni migliorino

DOVENDO USCIRE, EVITA DI FARLO QUANDO IL PERICOLO È MAGGIORE→ La scarsa visibilità, il vento durante la nevicata o un forte rialzo termico subito dopo la nevicata possono aumentare il rischio valanghe

RISPETTA LA SEGNALETICA ESPOSTA NEI COMPRENSORI SCIISTICI→ Avventurarsi in percorsi fuoripista quando questo è vietato può essere molto pericoloso nel caso si verifichi il distacco di una valanga



SE L'EDIFICIO IN CUI TI TROVI È A RISCHIO VALANGHE, CHIUDI I SERRAMENTI→ Una valanga può rompere porte e finestre; tenendo chiuse le imposte si aumenta la resistenza dell'edificio

ARVA, SONDA DA VALANGA E PALA DA NEVE→ Sono gli irrinunciabili strumenti di autosoccorso che devi utilizzare nei casi di escursione in zone a rischio

SE SEI SU UN IMPIANTO A FUNE

SE RIMANI BLOCCATO DEVI RESTARE TRANQUILLO ED ATTENDERE I SOCCORSI→ Un movimento improvviso ti potrebbe far cadere

APRI LA BARRA AL MOMENTO INDICATO→ Le protezioni esistenti all'arrivo ti consentono di evitare incidenti. Il personale addetto è addestrato ad intervenire prontamente nell'ipotesi di blocco dell'impianto

ABBASSA E BLOCCA SEMPRE CORRETTAMENTE LA BARRA DI SICUREZZA→ È la protezione attiva che ti impedisce di cadere dal sedile nell'ipotesi di movimenti bruschi

EVITA DI MUOVERTI IN MODO INCONSULTO → Il movimento potrebbe provocare ondulazioni pericolose

PROTEGGI I BAMBINI→ Essendo piccoli possono facilmente scivolare oltre le protezioni dei sedili

EVITA DI SCENDERE DALL'IMPIANTO DA SOLO IN CASO DI BLOCCO→ È inutile rischiare di farsi male, i soccorsi stanno arrivando

CRISI IDRICA

Una situazione di emergenza idrica si verifica quando la richiesta di acqua da parte dei cittadini è superiore alla disponibilità: in questo caso la domanda di acqua degli utenti non può essere soddisfatta. Le cause possono essere naturali, come ad esempio un prolungato periodo di scarse precipitazioni, o attribuibili ad attività umane, come l'inquinamento di sorgenti o pozzi, oppure accidentali, come la rottura di una tubazione. Al fine di agire in modo tempestivo al manifestarsi di una crisi idrica, la Protezione Civile, in collaborazione con tutti gli enti che ordinariamente gestiscono le risorse idriche, effettua un monitoraggio periodico della disponibilità di acqua.

Nel caso si verifichi una carenza, che non consente di soddisfare le richieste per i vari usi (civile, agricolo, industriale), la Protezione Civile interviene insieme agli Enti e alle Amministrazioni interessate, per definire ed attuare le misure necessarie a fronteggiare le situazioni critiche ed evitare ulteriori conseguenze negative, quali ad esempio possibili "black out" nel settore energetico. In particolare, quando si verifica un'emergenza idrica per uso potabile, il gestore dell'acquedotto attua un piano di emergenza che può prevedere un incremento della risorsa attraverso la distribuzione di acqua imbustata o con autobotti e contemporaneamente una riduzione dei consumi attraverso il razionamento della risorsa ed il risparmio idrico. La quantità individuale giornaliera da assicurare in caso di emergenza acuta è stimata pari a non più di 50 litri d'acqua potabile. Nella maggior parte del territorio italiano l'acqua potabile è, in condizioni normali, un bene a disposizione di tutti senza particolari vincoli al consumo. L'acqua, però, è una risorsa limitata. È bene perciò che le famiglie apprendano ad utilizzarla in modo equilibrato, evitando gli sprechi, preparandosi anche ad affrontare situazioni possibili di crisi idrica temporanee, per ridurre al minimo eventuali disagi e problemi igienico-sanitari.

COSA FARE...

per risparmiare in assoluto l'acqua

SE IL CONTATORE GIRA CON I RUBINETTI CHIUSI, SI È VERIFICATA UNA PERDITA NELL'IMPIANTO IDRICO → In tal caso contatta un tecnico specializzato

USA SEMPRE LA LAVATRICE E LA LAVASTOVIGLIE A PIENO CARICO→ Si risparmia acqua ed energia

UTILIZZA I SERBATOI A DUE PORTATE NEI SERVIZI IGIENICI→ Si risparmia fino al 60% di acqua rispetto ai serbatoi ad una portata

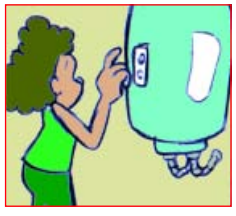
QUANDO VAI IN FERIE O TI ASSENTI PER LUNGHI PERIODI DA CASA→ Chiudi il rubinetto centrale dell'acqua

INNAFFIA LE PIANTE AL MATTINO O AL TRAMONTO→ Ridurrai la quantità d'acqua evaporata a causa del riscaldamento del Sole

per il suo uso durante una crisi idrica

SE SONO PREVISTE LIMITAZIONI D'USO, IMPIEGA L'ACQUA SOLO PER SCOPI ESSENZIALI→ Evita per esempio di innaffiare il giardino o lavare l'auto

PRIMA DELLA SOSPENSIONE DELL'EROGAZIONE, FA' UNA SCORTA MINIMA DI ACQUA PER BAGNO E CUCINA→ È essenziale per affrontare il periodo di sospensione



SPEGNI LO SCALDABAGNO ELETTRICO→ Riattivalo solo dopo che è tornata l'erogazione per evitare danni alle resistenze di riscaldamento

PRIMA DI BERE L'ACQUA, CONTROLLA L'ODORE ED IL COLORE→ Se questi aspetti non ti sembrano normali, sterilizza o fai bollire l'acqua

CHIUDI BENE I RUBINETTI QUANDO MANCA L' ACQUA→ Sia per evitare eventuali sprechi che per impedire allagamenti quando ricomincia l'erogazione

ONDATE DI CALORE

L'Organizzazione Mondiale della Sanità ha evidenziato che le variazioni del clima, in particolare quelle legate all'aumento della temperatura del pianeta, possono avere gravi effetti sulla salute di quella parte della popolazione definita a rischio a causa dell'età, di particolari e delicate condizioni di salute e delle condizioni socio-economiche, culturali ed ambientali.
Durante i periodi estivi si possono verificare condizioni meteorologiche a rischio per la salute, denominate ondate di calore, in particolare avvertibili nelle grandi aree urbane. Le ondate di calore sono caratterizzate da alte temperature, al di sopra dei valori usuali, che possono durare giorni o settimane a elevati livelli di umidità. Durante le ondate di calore è stato osservato che le popolazioni urbane non vengono colpite in maniera omogenea: della popolazione anziana sono a maggior rischio le persone con alcune malattie croniche e quelle che vivono in condizioni di isolamento sociale o sono residenti in aree di basso livello socio-economico. L'invecchiamento della popolazione ed il progressivo aumento degli anziani che vivono soli e spesso in isolamento sociale fanno aumentare il numero delle persone a rischio.

Un piano nazionale per prevenire gli effetti delle ondate di calore sulla nostra salute

A partire dall'estate 2004 il Dipartimento della Protezione Civile ha attivato nelle maggiori aree urbane il "Sistema nazionale di allarme per la prevenzione degli effetti del caldo sulla salute". Le ondate di calore e le loro conseguenze sulla salute possono, infatti, essere previste in anticipo: il potenziamento di specifiche misure di prevenzione, mirate ai gruppi più vulnerabili, può ridurre gli effetti sulla salute della popolazione.
Durante il periodo estivo, in tutte le principali città italiane, viene emesso giornalmente un bollettino con un livello di rischio graduato che prevede il verificarsi di condizioni dannose per la salute per il giorno stesso e per i due giorni successivi.
Il bollettino viene inviato ai diversi centri operativi locali che hanno il compito di coordinare gli interventi di prevenzione mirati in particolare ai sottogruppi di popolazione a maggior rischio (anziani, malati cronici), attivando le strutture e il personale dei servizi sociali e sanitari.

COSA FARE...

durante un'ondata di calore

EVITA SE POSSIBILE L'ESPOSIZIONE ALL'ARIA APERTA NELLA FASCIA ORARIA TRA LE 12 E LE 18 → Sono le ore più calde della giornata

EVITA BEVANDE ALCOLICHE, CONSUMA PASTI LEGGERI, MANGIA FRUTTA E VERDURE FRESCHE→ Alcolici e pasti pesanti aumentano la produzione di calore all'interno del tuo corpo

FA' BAGNI E DOCCE D'ACQUA FREDDA → Per ridurre la temperatura corporea

INDOSSA VESTITI LEGGERI E COMODI IN FIBRE NATURALI→ Gli abiti in fibre sintetiche impediscono la traspirazione, e quindi la dispersione di calore

PROVVEDI A SCHERMARE I VETRI DELLE FINESTRE CON STRUTTURE COME PERSIANE, VENEZIANE O ALMENO TENDE→ Per evitare il riscaldamento eccessivo dell'ambiente

ACCERTATI DELLE CONDIZIONI DI SALUTE E OFFRI AIUTO A PARENTI, VICINI ED AMICI CHE VIVONO SOLI→ Perché molte vittime delle ondate di calore sono persone sole

BEVI MOLTA ACQUA. GLI ANZIANI DEVONO BERE ANCHE IN ASSENZA DI STIMOLO DELLA SETE→ Anche se non hai sete, il tuo corpo potrebbe avere bisogno di acqua

SOGGIORNA ANCHE SOLO PER ALCUNE ORE IN LUOGHI CLIMATIZZATI → Per ridurre l'esposizione alle alte temperature

INCENDI BOSCHIVI

Un incendio boschivo può essere definito "un fuoco che tende ad espandersi su aree boscate, cespugliate oppure su terreni coltivati o incolti e pascoli limitrofi a dette aree".
Perché un incendio si possa sviluppare sono necessari i tre elementi che costituiscono il cosiddetto "triangolo del fuoco": il combustibile (erba secca, foglie, legno), il comburente (l'ossigeno) e il calore (necessario per portare il combustibile alla temperatura di accensione).
Particolari condizioni atmosferiche (es. giornate particolarmente calde e ventose in un periodo di scarse precipitazioni) possono favorire il rapido propagarsi dell'incendio.

Le cause di incendio possono essere:
NATURALI, come ad esempio i fulmini. Sono le meno frequenti in assoluto.
DI ORIGINE ANTROPICA, cioè imputabili ad attività umane.Possono essere:
→ accidentali, come ad esempio un corto circuito, surriscaldamento di motori, scintille derivate da strumenti da lavoro, ecc;
→ colpose, come alcune pratiche agricole e pastorali, comportamenti irresponsabili nelle aree turistiche, lancio incauto di materiale acceso (fiammiferi, sigarette, ecc);
→ dolose, quando il fuoco è appiccato volontariamente dall'uomo per le motivazioni più disparate (vendetta, dispetto, protesta, speculazione edilizia) al fine di provocare danni.
Sono queste purtroppo le cause più frequenti di incendio dei boschi.

COME COMPORTARSI...

per evitare un incendio boschivo

NON GETTARE MOZZICONI DI SIGARETTA O FIAMMIFERI ANCORA ACCESI → Possono incendiare l'erba secca delle scarpate lungo strade, ferrovie, ecc.

È PROIBITO E PERICOLOSO ACCENDERE IL FUOCO NEL BOSCO→ Usa solo le aree attrezzate. Non abbandonare mai il fuoco e prima di andare via accertati che sia completamente spento

SE DEVI PARCHEGGIARE L'AUTO ACCERTATI CHE LA MARMITTA NON SIA A CONTATTO CON L'ERBA SECCA→ La marmitta caldissima incendierebbe facilmente l'erba secca

NON ABBANDONARE I RIFIUTI NEI BOSCHI E NELLE DISCARICHE ABUSIVE→ Possono rappresentare un pericoloso combustibile

NON BRUCIARE, SENZA LE DOVUTE MISURE DI SICUREZZA, LE STOPPIE, LA PAGLIA E ALTRI RESIDUI AGRICOLI→ In pochi minuti potrebbe sfuggirti il controllo del fuoco

quando l'incendio è in corso

TELEFONA SUBITO AL 1515 PER DARE L'ALLARME SE AVVISTI DELLE FIAMME O ANCHE SOLO DEL FUMO→ Non pensare che altri l'abbiano già fatto. Fornisci le indicazioni necessarie per localizzare l'incendio

CERCA UNA VIA DI FUGA SICURA: UNA STRADA O UN CORSO D'ACQUA. NON SOSTARE IN LUOGHI VERSO I QUALI SOFFIA IL VENTO→ Potresti rimanere imprigionato tra le fiamme e non avere più una via di fuga

STENDITI A TERRA IN UN LUOGO DOVE NON C'È VEGETAZIONE INCENDIABILE→ Il fumo tende a salire ed in questo modo eviti di respirarlo

SE NON HAI ALTRA SCELTA, CERCA DI ATTRAVERSARE IL FUOCO DOVE È MENO INTENSO PER PASSARE DALLA PARTE GIÀ BRUCIATA→ Ti porti così in un luogo sicuro. MA RICORDA: SE NON HAI ALTRA SCELTA!!!

L'INCENDIO NON È UNO SPETTACOLO, NON SOSTARE LUNGO LE STRADE→ Intralceresti i soccorsi e le comunicazioni necessarie per gestire l'emergenza

INCENDI DOMESTICI

Come prevenire un incendio?

È necessario mettere in pratica alcuni piccoli accorgimenti che possono essere così riassunti:
→ non fumare, se lo fai non fumare a letto; → non lasciare incustodite pentole su fornelli accesi e tenere lontano il materiale combustibile; → prevedere un controllo periodico da parte di un tecnico qualificato dell'impianto di riscaldamento, della canna fumaria e della cucina; → non tenere fiammiferi e accendini alla portata di bambini; → non tenere liquidi infiammabili vicino a fonti di calore; → non impiegare apparecchi a gas o a fiamma libera (compresi i caminetti) in locali privi di aerazione adeguata.

Come intervenire in caso d'incendio?

Per affrontare un principio d'incendio è sufficiente mettere in pratica alcuni semplici consigli:
→ se prende fuoco una pentola, per spegnerla basterà appoggiarci sopra un coperchio, in modo da soffocare le fiamme; → se i vestiti indossati prendono fuoco non si deve correre (l'aria alimenta il fuoco!), bisogna cercare di spogliarsi o cercare di soffocare le fiamme rotolandosi per terra o coprendosi con una coperta; → se prende fuoco un apparecchio elettrico o una parte dell'impianto elettrico prima di tentare di spegnerlo bisogna staccare la corrente.

Ricorda di non utilizzare l'acqua per spegnere un incendio di origine elettrica: potresti prendere una forte scossa! L' acqua non si deve usare nemmeno per spegnere incendi che interessano petrolio o benzina, perché tali sostanze galleggiano sull'acqua e possono diffondere l'incendio in altri luoghi.

COME COMPORTARSI DURANTE UN INCENDIO DOMESTICO

SE POSSIBILE CERCA DI USCIRE O PORTATI IN UN LUOGO SICURO → In questo modo eviterai di respirare fumo e di rimanere coinvolto nell'incendio

SE AVVERTI UN MALESSERE, CONTATTA IMMEDIATAMENTE IL 118→ Puoi esserti intossicato respirando i fumi o altre sostanze presenti nell'ambiente

SE IL FUMO È NELLA STANZA, FILTRA L' ARIA ATTRAVERSO UN PANNO, MEGLIO SE BAGNATO, E SDRAIATI SUL PAVIMENTO → A livello del pavimento l'aria è più respirabile

PRENDITI CURA DELLE PERSONE NON AUTOSUFFICIENTI E, SE PUOI, AIUTALE A METTERSI AL SICURO → Potrebbero non rendersi conto del pericolo

SE IL FUOCO È FUORI DALLA PORTA CERCA DI SIGILLARE, CON STRACCI POSSIBILMENTE BAGNATI, OGNI FESSURA → Eviti di far entrare il fumo e permetti alla porta di contenere l'incendio

ACCEDI AI LOCALI INTERESSATI DALL'INCENDIO SOLAMENTE DOPO CHE QUESTI SONO STATI RAFFREDDATI E VENTILATI→ È indispensabile un'abbondante ventilazione per almeno alcune ore

SE ABITI IN UN CONDOMINIO RICORDA CHE IN CASO D'INCENDIO NON DEVI MAI USARE L'ASCENSORE → L'ascensore potrebbe rimanere bloccato ed intrappolarti al suo interno

PRIMA DI RIENTRARE NELL'APPARTAMENTO CONSULTATI CON I VIGILI DEL FUOCO→ Potrebbero esserci ancora situazioni di potenziale pericolo

IN LUOGHI AFFOLLATI DIRIGITI VERSO LE USCITE DI SICUREZZA PIÙ VICINE, SENZA SPINGERE O GRIDARE → Le uscite sono realizzate per l'evacuazione rapida di tutte le persone!

I PRODOTTI ALIMENTARI CHE SONO VENUTI IN CONTATTO CON CALORE O FUMO DA INCENDIO NON SONO PIÙ DA RITENERSI COMMESTIBILI→ Potrebbero essere stati alterati e contaminati

BLACK OUT

Che cos'è ?

Il black out è una interruzione della fornitura di energia elettrica.
Può essere locale, se riguarda una porzione ristretta del territorio, oppure esteso, se interessa uno o più Comuni o aree anche molto più vaste, fino ad assumere portata regionale o addirittura nazionale, come si verificò il 23 settembre 2003.
Può essere provocato da interruzioni o sovraccarichi improvvisi della rete elettrica, dovuti a guasti alle centrali o alle linee.

Importante

Se avete un familiare che necessita di apparecchi elettromedicali salvavita, mantenete sempre in evidenza il numero telefonico del servizio sanitario d'urgenza.

COME COMPORTARSI DURANTE UN BLACK OUT

TIENI SEMPRE IN EFFICIENZA UNA TORCIA ELETTRICA ED UNA RADIO A PILE → La torcia elettrica permette di muoversi mentre la radio serve a ottenere informazioni e aggiornamenti sull'emergenza in corso

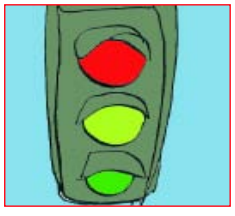
EVITA DI UTILIZZARE GLI ASCENSORI→ C'è il pericolo di rimanere bloccati all'interno

FA' ATTENZIONE ALL'USO DI CANDELE E ALTRE FONTI DI ILLUMINAZIONE COME LAMPADE A GAS, A PETROLIO, ECC. → La fiamma libera a contatto con materiali infiammabili può dare origine ad un incendio

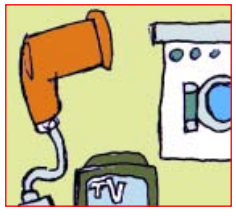
SE RIMANI BLOCCATO, EVITA DI USCIRE A TUTTI I COSTI DALL'ASCENSORE→ Le cabine degli ascensori non sono a tenuta stagna, e quindi non manca l'aria

EVITA DI APRIRE INUTILMENTE CONGELATORI E FRIGORIFERI → Gli alimenti contenuti possono alterarsi e divenire pericolosi per la salute

EVITA DI USARE IL TELEFONO SE NON PER EMERGENZA→ È bene evitare di sovraccaricare le linee telefoniche quando sono utili ai soccorsi



SE SEI PER STRADA, PRESTA ATTENZIONE AGLI INCROCI SEMAFORICI → In caso di semaforo spento alcuni automobilisti effettuano manovre scorrette o impreviste



AL RITORNO DELLA CORRENTE, NON RIATTIVARE TUTTI ASSIEME GLI APPARECCHI ELETTRICI DI CASA→ Per non sovraccaricare la linea elettrica

RISCHIO INDUSTRIALE

Per rischio industriale si intende la possibilità che in seguito ad un incidente presso un insediamento industriale si sviluppi un incendio, un'esplosione o una nube tossica, coinvolgente una o più sostanze pericolose, i cui effetti possano arrecare danni alla popolazione o all'ambiente.
Tali effetti sono mitigati dall'attuazione di adeguati piani di emergenza, sia interni (redatti dall'industria per fronteggiare immediatamente l'evento incidentale) che esterni (redatti dall'Autorità per fronteggiare i possibili effetti sul territorio circostante); questi ultimi prevedono adeguate misure di autoprotezione e comportamenti da fare adottare alla popolazione.

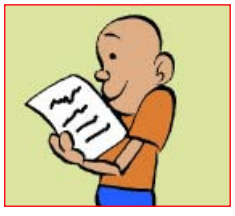
Indicazioni

Se abiti in una zona con stabilimenti industriali, informati dal Sindaco del tuo Comune se sono inseriti nell'elenco degli impianti a rischio, per i quali è previsto un piano di emergenza in caso di incidente. Puoi anche ottenere l'informazione consultando il sito internet del Ministero dell'Ambiente. L'elenco degli stabilimenti industriali a rischio di incidente rilevante lo trovi all'indirizzo:
www.minambiente.it/Sito/settori_azione/iar/stabilimenti/stabilimenti_italia.asp
Per i casi di incendio e/o esplosione si rimanda alle raccomandazioni fornite nei rispettivi capitoli.

Evacuazione

Quando il rischio di contaminazione è elevato le Autorità responsabili dell'emergenza possono ordinare l'evacuazione secondo il piano di emergenza esterno prestabilito, che fornisce altresì indicazioni circa le modalità di allontanamento e i luoghi di raccolta.

IN CASO DI INCIDENTE INDUSTRIALE

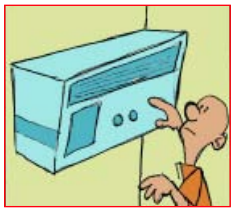


SEGUI LE INDICAZIONI CONTENUTE NELLE SCHEDE DI INFORMAZIONE ALLA POPOLAZIONE DISTRIBUITE DAL SINDACO → Per conoscere le misure di sicurezza da adottare e le norme di comportamento

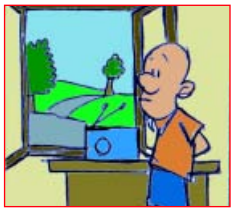
TIENITI INFORMATO CON LA RADIO E LA TV → Per ascoltare le indicazioni fornite dagli organi competenti sulle misure da adottare e sulla situazione in atto fino al cessato allarme

IN CASO DI EMISSIONE DI SOSTANZE TOSSICHE DALLO STABILIMENTO → Rifugiati in un luogo chiuso

ATTENZIONE ALLE INFORMAZIONI DATE DALLE AUTORITÀ ATTRAVERSO IMPIANTI MEGAFONICI, ALTRI MEZZI ED EVENTUALI SEGNALI → Possono fornire utili indicazioni sulle misure da adottare e sulla situazione



PER RIDURRE L'ESPOSIZIONE ALLE SOSTANZE TOSSICHE → Chiudi porte e finestre occludendo gli spiragli con tessuti bagnati, spegni condizionatori ed aeratori evitando l'interscambio di aria con l'esterno



AL CESSATO ALLARME AERA GLI AMBIENTI E RIMANI SINTONIZZATO SULLE RADIO LOCALI → Per effettuare idoneo cambio d'aria e seguire l'evoluzione del post-emergenza

EPIDEMIA/PANDEMIA INFLUENZALE

Influenza

L'influenza è una malattia respiratoria acuta dovuta all'infezione da virus influenzali, che si manifesta prevalentemente nel periodo invernale. Costituisce un rilevante problema di sanità pubblica a causa della sua ubiquità e contagiosità, per l'esistenza di serbatoi animali e per le possibili complicanze.
Il virus responsabile dell'influenza penetra nell'organismo attraverso l'apparato respiratorio ed è altamente contagioso. Si verificano nel nostro Paese epidemie di influenza che causano, mediamente, 5 milioni di malati.
Una peculiarità dei virus influenzali è la marcata tendenza a variare in modo tale da poter aggirare la barriera protettiva costituita dalle difese immunitarie presenti nella popolazione. Questo comporta che le difese messe a punto contro il virus dell'influenza che circola nel corso di una determinata stagione possono non essere più efficaci per il virus che circola nel corso dell'anno successivo. Per questo motivo la composizione del vaccino contro l'influenza deve essere aggiornata tutti gli anni e la sorveglianza del sistema sanitario è fondamentale per preparare il vaccino adatto alla stagione successiva.

Pandemia

Per pandemia di influenza si intende la diffusione di un nuovo virus influenzale tra la popolazione di tutto il mondo. Trattandosi di un virus nuovo esso può diffondersi rapidamente, poiché nessuno ha ancora sviluppato specifiche difese immunitarie. Le pandemie si sviluppano ad intervalli di tempo imprevedibili. Nel secolo scorso pandemie si sono verificate nel 1918 (Spagnola), nel 1957 (Asiatica) e nel 1968 (Hong Kong). In caso di pandemia, le Autorità sanitarie informano puntualmente la popolazione tramite radio, televisione e giornali, indicando le misure da adottare per difendere la salute dei cittadini.

Vaccinarsi, soprattutto per i soggetti a rischio, è il modo migliore di prevenire e combattere l'influenza per 2 motivi:

1) perché si riducono notevolmente le probabilità di contrarre la malattia;
2) perché in caso di sviluppo di sintomi influenzali questi sono meno gravi e viene ridotto il rischio di complicanze.

COME COMPORTARSI IN CASO DI EPIDEMIA/PANDEMIA

CONSULTA IL TUO MEDICO DI BASE O IL DIPARTIMENTO DI PREVENZIONE DELLA TUA ASL→ Per avere informazioni attendibili e aggiornate sulla vaccinazione e sulla malattia

SEGUI SCRUPOLOSAMENTE LE INDICAZIONI DELLE AUTORITÀ SANITARIE→ Perché in caso di pandemia potrebbero essere necessarie misure speciali per la tua sicurezza

INFORMATI SE RIENTRI NELLE CATEGORIE A RISCHIO PER LE QUALI È CONSIGLIATA LA VACCINAZIONE→ Alcuni soggetti sono più vulnerabili di altri al virus

SE PRESENTI I SINTOMI RIVOLGITI SUBITO AL MEDICO→ Una pronta diagnosi aiuta la tua guarigione e riduce il rischio di contagio per gli altri

RICORRI ALLA VACCINAZIONE SOLO DOPO AVERE CONSULTATO IL TUO MEDICO O LA TUA ASL→ La vaccinazione protegge dal virus, ma per alcuni soggetti può essere sconsigliata

PRATICA UNA CORRETTA IGIENE PERSONALE E DEGLI AMBIENTI DOMESTICI E DI VITA→ Per ridurre il rischio di contagio

CONSULTA I SITI WEB E SEGUI I COMUNICATI UFFICIALI DELLE ISTITUZIONI → Per essere aggiornato correttamente sulla situazione

SE HAI UNA PERSONA MALATA IN CASA, EVITA LA CONDIVISIONE DI OGGETTI PERSONALI→ Per evitare il contagio

Annex 10: Flood award

Hochwasser ist in unseren Breiten eine natürliche Erscheinung. Häufigkeit und Höhe haben jedoch in den letzten Jahrzehnten zugenommen. Immer mehr Menschen leben in den Überschwemmungsbereichen von Flüssen und sind deshalb auch immer öfter von Hochwasser betroffen. Umso wichtiger ist die eigene Vorsorge.

Die Hochwassernotgemeinschaft Rhein e. V. lobt nun zum dritten Mal einen Hochwasserpreis aus, erstmals richtet er sich aber ausschließlich an Kinder, Jugendliche und junge Erwachsene.

MACH MIT!

Macht mit!

Zeigt uns, wie man gerade in hochwasserfreien Zeiten auf die Gefahren hinweisen kann und welche Maßnahmen ihr ergreifen würdet, um Hochwasserschäden zu verringern.

HOCHWASSER
NOTGEMEINSCHAFT
RHEIN e.V.

Hochwassernotgemeinschaft Rhein e. V.
Deutschhausplatz 1 · 55116 Mainz
Tel.: 06131/2398184 · Fax: 06131/2398139
E-Mail: ueifler@gstbrp.de

Weitere Informationen:
www.hochwassernotgemeinschaft-rhein.de

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Hochwasser-Preis 2005

Das nächste Hochwasser kommt bestimmt

Was tun? Eure Ideen sind gefragt!

Ein Wettbewerb für
Kinder, Jugendliche und junge Erwachsene

Zu gewinnen: Ein Multimediapaket
und viele attraktive Sachpreise!

HOCHWASSER
NOTGEMEINSCHAFT
RHEIN e.V.

PREISE

Mitmachen lohnt sich!

Auf euch warten Preise in Höhe von insgesamt 10.000 Euro! Gewinnen könnt ihr ein Multimediapaket (PC, Digitalkamera, Drucker etc.), eine Informationsfahrt auf dem Rhein mit einem Mess- und Untersuchungsschiff, einen Informationstag bei einem wissenschaftlichen Institut, das sich mit Hochwasserschutz befasst, eine Kanufahrt, Bücher, Sachpreise, Experimentierkästen zum Thema Wasser und Spiele.

TEILNEHMER

Wer ist dabei?

- Schüler aller Schulstufen
- Mitglieder von Jugendgruppen, z. B. des DRK, der freiwilligen Feuerwehr oder von Umweltschutzverbänden

Teilnehmen können Kinder, Jugendliche und junge Erwachsene als Gruppe oder auch als Einzelpersonen.

WELCHE BEITRÄGE WERDEN ERWARTET?

Was wird erwartet?

Das nächste Hochwasser kommt bestimmt! Umso wichtiger ist es, in hochwasserfreien Zeiten alles dafür zu tun, dass die nächste Hochwasserwelle nicht allzu viel Schaden anrichtet.

Euer Beitrag zum Wettbewerb:
- Wie kann vorbeugender Hochwasserschutz im Kleinen aussehen?
- Was bedeutet z. B. die Renaturierung eines Baches für den Hochwasserschutz?
- Welche Ideen habt ihr für Information und Öffentlichkeitsarbeit zum Thema Hochwasser?
- Wie kann der Einzelne Verantwortung übernehmen und in Eigeninitiative vorbeugenden Hochwasserschutz betreiben?
- Wie sieht aktive Hilfe für die Betroffenen im Hochwasserfall aus?
- Was können wir tun, damit gerade in hochwasserfreien Zeiten oder Zeiträumen mit extremen Niedrigwasserständen wie z. B. 2003 der Hochwasserschutz nicht in Vergessenheit gerät?

Auf eure Einfälle kommt es an!
Lasst der Fantasie freien Lauf.
Umfangreiche Informationen zum Thema findet ihr unter dem Stichwort „Hochwasser“ z. B. im Internet.

Schickt uns z. B. eure Bilder, Filme, Fotos und Dokumentationen. Geeignet als Beiträge sind auch Presseartikel, Reportagen, Plakate, Videos, Hefte, Bücher, Comics, Internetauftritte, Theaterstücke oder Aktionen in betroffenen Gemeinden und Städten.

Wir sind gespannt, was von euch kommt!

PREISVERLEIHUNG EINSENDESCHLUSS JURY

Jury

Über die Vergabe des Hochwasserpreises entscheidet unter Ausschluss der Öffentlichkeit eine Jury, bestehend aus dem Vorsitzenden der Hochwassernotgemeinschaft Rhein e. V. und je einem Vertreter der Internationalen Kommission zum Schutz des Rheins (IKSR), des Deutschen Komitees für Katastrophenvorsorge e. V. (DKKV) und verschiedener Medien.

Die Bewertung der Beiträge erfolgt in Alterskategorien, die den Schulenstufen und älter entsprechen.
Der Rechtsweg ist ausgeschlossen.
Der eingereichte Beitrag ist nicht auf das Mitgliedergebiet der Hochwassernotgemeinschaft Rhein e. V. beschränkt.

Einsendeschluss für die Beiträge ist der 01.07.2005. Die Preisverleihung findet bei der Mitgliederversammlung der Hochwassernotgemeinschaft Rhein im Herbst 2005 statt.

Auf eine Preisverleihung kann verzichtet werden, wenn keine geeigneten Beiträge vorliegen. Alle Rechte an den Beiträgen gehen mit der Einsendung automatisch an die Hochwassernotgemeinschaft Rhein e. V. zur nicht kommerziellen Nutzung über.

Annex 11: Italian Dictionary of risk

id	parole chiave	definizione
1	AFS: Annual Flood Series	Annual Flood Series, i.e. data series of annual maximum discharge recorded at a gaude river site (usually expressed in m3/s).
2	Base Flood	Base Flood shall mean the flood having a one percent chance of being equalled or exceeded in magnitude in any given year. (sometimes known as the 100-Year Flood).
3	Base Flood Elevation	Base Flood Elevation means the height (above sea-level) that flood waters will reach at a given location in the event of the Base (e.g., 100-year) flooding event.
4	Bedrock	Bedrock is a general term for the rock (e.g., basalt) that underlies the soil or other unconsolidated, surface material.
5	Bench Mark	Bench Mark means a permanent marker or monument of known elevation and horizontal location used for surveying.
6	Catchment	A term used to designate the area drained by a river and its tributaries, this including that contributing to subsurface flow.
7	Clast	Clast is an individual particle or fragment of a sediment or rock produced by the mechanical weathering of a larger rock mass.
8	Clastic Dike	Clastic Dike is a feature that cuts across bedding structures and is composed of the sedimentary material it transects. Believed to be the result of fracturing and sediment movement due to earthquake shaking during or soon after cataclysmic flooding.
9	Clay	Clay means extremely small sedimentary particles that are less than 0.004 mm in diameter.
10	Coarse-Grained	Coarse-Grained pertains to sedimentary material composed of relatively large particles of sand and/or gravel.
11	Conveyance	Conveyance is a measure of the water carrying capacity of a stream reach.
12	Coulee	Coulee is long, dry, steep-walled, trench-like gorge or valley representing an abandoned river channel.
13	Cumulative probability Distribution Function (CDF)	Cumulative probability Distribution Function (CDF) gives the probability that a random variable X (e.g., maximum annual flow) tales values smaller than or equal to a specified value x, FX(x) = Pr[X x]. The corresponding exceedence probability is Pr[X>x] = 1 - FX(x). The associated probability density function (pdf) is given by fX(x) = dFX(x)/dx.
14	Eolian	Eolian means pertaining to the wind. Includes deposits of loess and dune sand.
15	Cross Section	Cross Section means surveyed ground points along a line that shows the geometry of the floodplain and channel.
16	Cubic Meter Per Second (m3/s)	A unit expressing rate of discharge, typically used in measuring streamflow. One cubic meter per second is equal to the discharge in a stream of a cross section one meter wide and one meter deep, flowing with an average velocity of one meter per second.
17	Dam	A structure of earth, rock, concrete, or other materials designed to retain water, creating a pond, lake, or reservoir.

18	Depth-Duration-Frequency (DDF) Curve	Nondecreasing function H = H(t;T) providing the rainfall depth as a function of time (duration, t) showing the variability of cumulative precipitation wih the temporalo aggregation of the process, for a specified frequency or return period T. Scaling DDF. The power law hT = a1 wT t holds for H(t;T), with hT denoting the quantile* of H having a return period T, a1 the expected value* of maximum annula precipitation depth for a unit duration, a1 = E[H(1)], a scale exponent and wT is a function of return period depending on the probabilistic law used to fit the data. the associated rainfall rate is pT = a1 wT t -1.
19	Design Flow	The extream flood event selected and used for the design of structural measures such as dykes, spillways, and floodways. The term is also used in the delineation on topographic maps of flood hazard areas adjacent to rivers, lakes, and the sea. Most often, however, the extreme flood event selected is determined statistically from hydrometric and hydrological records collected in the vicinity of the site under consideration. The selection of the extreme event is based upon the perceived risk to life and property. Flooding events with higher recurrence intervals generally have higher volumes of water. For example, a 1 in 100-year flood, generally used for flood hazard mapping, would have a smaller volume than a 1 in 1000-year flood used, e.g., in the design of a spillway. A 1 in 100-year flood means the flood that has one chance in one hundred of being equalled or exceeded in any given year.
20	Discharge	In the simplest form, discharge means outflow of water. The use of this term is not restricted as to course or location and it can be used to describe the flow of water from a pipe or from a drainage basin. Other words related to it are runoff, streamflow, and yield. Maximum discharge is the maximum value (peak) of instantaneous discharge of a flood hydrograph*. Annual Maximum Discharge is the maximum value of instantaneous discharge in a year, see, also annual flood series*.
21	Diversion	The transfer of water from a stream, lake, aquifer, or other source of water by a canal, pipe, well, or other conduit to another watercourse or to the land, as in the case of an irrigation system.
22	Drainway	Drainway shall mean a depression two feet or more below the land which serves to give direction to a current of water less than nine months of the year, and which has a bed and well-defined banks. (See Watercourse.)
23	Dyke	An artificial embankment constructed to prevent flooding.
24	Encroachment	Encroachment is any man-made obstruction in the floodplain, which displaces the natural passage of floodwaters.
25	Expected Value, E[X]	Expected Value, E[X] is the mean or mahematical expectation of random variable X (e.g., maximum annual flow, sometimes referred to as index flood).
26	Expansion Bar	Expansion Bar is a type of flood bar that forms where flood channels suddenly widen or expand in size. Channel expansion causes the current to decrease, which in turn causes sediment to settle out of suspension, forming a bar.
27	Flood Bar	Flood Bar is an accumulation of sediment, most often composed of sand and/or gravel, that occurs along flood routes where the currents move slower for various reasons. Different types of flood bars include eddy bars, expansion bars, shoulder bars, and pendant bars.
28	Fore-Set Bedding	Fore-Set Bedding is a primary sedimentary structure in flood gravels where a pronounced dip occurs in bedding planes in the direction of sediment transport.

29	Flood	The temporary inundation of normally dry land areas resulting from the overflowing of the natural or artificial confines of a river or other body of water. Flood means a general and temporary condition of partial or complete inundation of normally dry land areas from: (1) The overflow of inland or tidal waters. (2) The unusual and rapid accumulation of runoff of surface water from any source.
30	Flood Boundary And Floodway Map	Flood Boundary And Floodway Map is a floodplain management map that shows, based on detailed and approximate analyses, the boundaries of the T-year floodplains and the T-year floodway.
31	Flood Fringe	Flood Fringe means that portion of the T-year floodplain outside the floodway in which total encroachment is permissible.
32	Flood Hazard Boundary Map	Flood Hazard Boundary Map is the map that identifies approximate areas of T-year flood hazard in a community.
33	Flood Insurance Rate Map	Flood Insurance Rate Map is the insurance and floodplain management map that identifies areas of T-year flood hazard in a community. In some areas, the map also shows base flood elevations and T-year floodplain boundaries and occasionally, regulatory floodway boundaries.
34	Flood Assessment Study	Flood Assessment Study is an engineering study to identify flood hazard areas, flood insurance risk zones, and other flood data in a community.
35	Floodplain	Floodplain means any land area susceptible to inundation by floodwaters from any source. Any normally dry land area that is susceptible to being inundated by water from any natural source. This area is usually lowland adjacent to a stream or lake.
36	Floodplain Management	Floodplain Management is the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to, emergency preparedness plans, flood control work, and floodplain management regulations.
37	Floodproofing	Floodproofing means any combination of structural and non-structural additions, changes or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.
38	Floodway	Floodway means the channel of a river or watercourse and the adjacent land areas that must be reserved in order to discharge the T-year flood without cumulatively increasing the water surface elevation more than a specified flow depth. The channel of a river or stream and those parts of the adjacent floodplain adjoining the channel which are required to carry and discharge the T-year flood.
39	Flood Damage	The economic loss caused by floods, including damage by inundation, erosion, and/or sediment deposition. Damages also include emergency costs and business or financial losses. Evaluation may be based on the cost of replacing, repairing, or rehabilitating; or the comparative change in market or sales value; or on the change in the income or production caused by flooding.
40	Flood Forecasting	Prediction of stage, discharge, time of occurrence and duration of a flood, especially of peak discharge at a specified point on a stream, resulting from precipitation and/or snowmelt.
41	Flood Fringe	The land on which water is stored as dead water during flooding, and which does not contribute to the downstream passage of flow.
42	Flood Peak	The highest magnitude of the stage of discharge attained by a flood. Also called peak stage or peak discharge.
43	Flow	The rate of water discharged from a source; expressed in volume with respect to time, e.g., m3/s.

44	Freshet	As snow and ice melt in the spring, or in the early summer in mountainous regions, lage quantities of water are released, causing rivers and streams to attain their annual peak flow. These peak flows, which often result in flooding, are called freshet.
45	Gaging Station	Gaging Station is a particular site on a stream, river, canal, lake or reservoir where systematic observations of gage height or discharge are collected.
46	Generalised Extreme Value distribution (GEV)	Generalised Extreme Value distribution (GEV) is the most popular probability distribution funtion used to predict extreme storm precipitation and river flow. It comprises the Gumbel e Frechet laws as particular cases.
47	Gravel	Gravel is large sedimentary particles that are greater than 2 mm in diameter. Gravel clasts include, in increasing size, granules, pebbles, cobbles, and boulders.
48	Hanging Valley	Hanging Valley is a tributary valley whose floor is notably higher than the valley it joins. Characteristic of flood coulees, where flat valley floors suddenly drop off abruptly at one or both ends where they join adjacent coulees.
49	Hydraulic Constriction	Hydraulic Constriction is where a large volume of water is confined to a narrow opening. If more water enters the opening than can drain through, then the constriction will cause water to back up, creating a type of hydraulic dam.
50	Hydraulics	Hydraulics is a branch of engineering dealing primarily with the flow of water and the application of fluid mechanics principles.
51	Hydrograph	Hydrograph: graphic showing the temporal evolution of instantaneous river flow. Direct Flow Hydrograph is the reduced hydrograph not including the growndwater contribution to flow, sometimes referred to as baseflow.
52	Hydrology	Hydrology is a science dealing with the properties, distribution and circulation of water on the surface, below the ground and in the atmosphere.
53	Hyetograph	Hyetograph: graphic showing the temporal evolution of precipitation rate. Net hyetograph: portion of precipitation originating surface runoff.
54	Igneous	Igneous is rock that solidified from molten or partly molten material (i.e., magma). One of the three principal rock types, along with sedimentary* and metamorphic*.
55	Instantaneous Unit Hydrograph (IUH)	Linear system response describing the transformation of a temporal input function (e.g., net hyetograph*) into the output function (e.g., direct hydrograph*). It is also the holdin time pdf* of net precipitation within the river basin.
56	Jokulhlaup	Destructive flood that occurs as the result of the rapid draining of a lake impounded by a glacier. Also known as a glacier-outburst flood.
57	Lag Time	First order moment of the Instantaneous Unit Hydrograph* form the origin, i.e. teemporal length between the center of mass of the direct hydrograph* and that of the net hyetograph*.
58	Lake	Any inland body of standing water, usually fresh water, larger than a pool or pond; a body of water filling a depression in the earth's surface.
59	Mesa	Mesa is an isolated, nearly level land mass standing distinctly above the surrounding country, bounded by abrupt steep-sided slopes on all sides and capped by layers of more-resistant rock.
60	Metamorphic	Metamorphic is any rock derived from pre-existing rocks by mineralogical, chemical, and/or structural changes. One of the three principal rock types, along with sedimentary and igneous.

61	Model	A simulation, by descriptive, statistical, or other means, of a process or project that is difficult or impossible to observe directly.
62	Natural flow	The flow of a stream as it would be if unaltered by upstream diversion, storage, import, export, or change in upstream consumptive use caused by development.
63	Overbank	Overbank: Left And Right is the floodplain which lies to the left and right, respectively, of the watercourse as one looks downstream.
64	Partial Duration Series, PDS	I.E. data series of maximum discharge (peak) recorded at a gaude river site (usually expressed in m3/s) exceeding a specified threshold; also referred to as Peak Over a Threshold (POT) data series.
65	Pedogenic	Pedogenic means relating to the processes that produce soil.
66	Pendant Bar	Pendant Bar is a type of flood bar that forms immediately downstream of an obstruction in the flow of the flood current.
67	Point Bar	Point Bar is an arcuate (curved or bow-shaped) ridge of sand* and gravel* developed on the inside of a growing meander (loop) in the course of a stream.
68	Pond	A small natural body of standing fresh water filling a surface depression, usually smaller than a lake.
69	Quantile	Statistical term denoting the value of a random variable X with a specified frequency of non-execeedence or return period, u : FX( ) = u, i.e. Pr[X>x] = 1 - u.
70	Random Variable (X)	Random Variable (X) is a measurable quantity that cannot be predicted using a deterministic approach (e.g. maximum river flow and daily precipitation); i.e., measurable function having domain given by all possible values x that can be taken by X and codomain given by the subset [0, 1] of real numbers.
71	Regulatory Flood Elevation	Regulatory Flood Elevation means the Base Flood Elevation plus one foot of freeboard which is required to meet the Minimum Standards for Floodplain Management.
72	Replacement Cost	Replacement Cost means the cost to replace property with the same kind of material and construction without deduction for depreciation.
73	Reservoir	A pond, lake, or basin (natural or artificial) that stores, regulates, or controls water.
74	Residual Risk	Probability that in a river site the design flow of a structural flood mitigation project is exceeded at least once in a specified time horizon.
75	Return Period (T) of a hydrologic variable	Return Period (T) of a hydrologic variable (e.g., maximum river flow or hourly rainfall rate) is the inverse of the exceedence probability of a specified value of this variable in a given time interval, e.g. one year; T also equals the avearge time interval between two subsequent exceedences of this value.
76	Reverse Fault	Reverse Fault is a fault, usually with a dip of >45 degrees, where the hanging wall has moved up relative to the footwall of the fault.
77	Reverse Grading	Reverse Grading refers to sedimentary* beds that show an increase in particle size upward within the bed, as opposed to normal grading which shows a decrease upward. Most flood rhythmites display normal grading.
78	River	A natural stream of water of substantial volume.
79	River basin	A term used to designate the area drained by a river and its tributaries.
80	Roughness Coefficient (Manning's)	Roughness Coefficient (Manning's) is a measure of ground surface roughness used in flow equations.

81	Runoff	The amount of precipitation appearing in surface streams, rivers, and lakes; defined as the depth to which a drainage area would be covered if all of the runoff for a given period of time were uniformly distributed over it.
82	Sand	Sand is sedimentary* particles that are between 0.06 to 2.0 mm in diameter.
83	Scale Invariance	Statistical property of a random variable X paramtrized by t (temporal or spatial scale) so that Pr[X(t) x] = Pr[nX(t) x] for any value x of X, with >0 denoting a scale factor and n the scale exponent. Annula maximum flows displays scale invariance with catchment* area in homogeneos regions for a given range of spatial scales (e.g. from 10 to 1000 km2). Also the extremes of station precipitation displays scale invariance with storm duration for a given range of temporal scales (e.g. from 1 to 100 hours).
84	Sedimentary	Sedimentary is composed of sediment. One of the three principal rock types, along with igneous and metamorphic.
85	Silt	Silt are small, sedimentary* particles between 0.06 to 0.004 mm in diameter.
86	Slackwater	Slackwater refers to areas with slower moving flood waters associated with cataclysmic flooding (i.e., backflooded valleys and valley margins) where fine-grained sediment (mostly sand* and silt*) was deposited.
87	Seiche	A periodic oscillation, or standing wave, in an enclosed water body the physical dimensions of which determine how frequently the water level changes.
88	Sheet Flood Hazard	Sheet Flood Hazard is a type of flood hazard with flooding depths of 0.1 to 1 m that occurs in areas of sloping land.
89	Soft-Sediment Deformation	Soft-Sediment Deformation is deformation that occurs during or soon after sediment deposition while sediment is still partially or fully saturated with water. Examples of soft-sediment deformation include flame structures, load structures, and clastic dikes*.
90	Soil Horizon	Soil Horizon is a distinct interface (surface or thin layer) in a stratigraphic sequence.
91	Special Flood Hazard Area	Special Flood Hazard Area is the darkly shaded area on the Flood Hazard Boundary Map or Flood Insurance Rate Map which identifies an area that has a specific percent chance of being flooded in any given year (e.g. 100-year floodplain).
92	Specific Flood Discharge	Discharge per unit cachtment* area of the river site (usually in m3s-1Km-2).
93	Start Of Construction	Start Of Construction shall mean the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days of the permit date. "Start of construction" includes substantial improvements. The actual start means the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings. the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds nor occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not the alterat
94	Stage	Stage is the elevation of surface water above a reference datum, that datum usually being near the stream bed.

95	Stream	Any body of running water moving under gravity flow through clearly defined natural channels to progressively lower levels.
96	Streamflow	The discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream. The term "streamflow" is more general than the term "runoff", as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.
97	Surface Water	All water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, etc.); also refers to springs, wells, or other collectors which are directly influenced by surface water.
98	Surcharge	Surcharge means an increase in flood elevation due to destruction of the floodplain that reduces its conveyance capacity.
99	Suspension	Suspension means the removal of a participating community from the National, Regional or Basin Flood Mitigation Program because the community has not enacted and/or enforced the proper floodplain management regulations required for participation in the Program.
100	Swamp	A type of wetland that is dominated by woody vegetation and does not accumulate appreciable peat deposits. Swamps may be fresh or salt water and tidal or non-tidal.
101	Tributary	A stream that contributes its water to another stream or body of water.
102	Talus	Talus is broken rock accumulated at the base or against the lower part of a steep slope or cliff.
103	Tectonic	Tectonic means that pertains to forces within the earth's crust that give rise to earthquakes, folds, faults, and joints observed at or near the surface.
104	Tephra	Tephra refers to airfall deposit from a volcanic eruption. Usually consists of distinctive, light-colored, well-sorted, gritty particles of ash.
105	Tsunami	A large seismically generated or landslide generated sea wave which is capable of considerable destruction in certain coastal areas, especially where sub-marine earthquakes occur.
106	T-Year Discharge	T-Year Discharge is the volume rate of streamflow (usually expressed in m3/s) having a T-year frequency of recurrence (e.g. 100 years). This discharge magnitude is based on statistical analysis of stream flow records and analysis of rainfall and runoff characteristics in a particular watershed.
107	T-Year Flood	T-Year Flood (e.g. 100-Year Flood) is the flood having a 1/T (e.g. one) percent chance of being equalled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every T (e.g. 100) years.
108	T-Year Floodplain	T-Year Floodplain The area adjoining a river, stream, or water- course covered by water in the event of a T-year flood.
109	T-Year Frequency	T-Year Frequency (e.g., 100-Year Flood) means a recurrence interval averaging T (e.g., 100) years. It can also be stated as having a 1/T (e.g., one) percent probability of occuring in any given year.
110	Urban Runoff	Storm water from city streets and adjacent domestic or commercial properties that may carry pollutants of various kinds into the sewer systems and/or receiving waters.
111	Venturi Effect	Venturi Effect is the principle that fluid moving through a smaller area will move at a higher velocity than the same amount of water moving through a larger area; e.g., floodwater moving through a narrow opening is moving much faster, with significantly more erosive power, than the water above or below the gap.

112	Water Management	The study, planning, monitoring and application of quantitative and qualitative control and development techniques for long-term, multiple use of the diverse forms of water resources.
113	Watercourse	Watercourse shall mean any depression two feet or more below the surrounding land which serves to give direction to a current of water at least nine months of the year and which has a bed and well-defined banks. (See Drainway)
114	Watershed (synonym Drainage Basin)	It is that area of land which may contribute flow from runoff to a particular watercourse.
115	Water Surface Profile (synonym Flood Elevation Profile)	Water Surface Profile means a graph showing the relationship of water surface elevation to location, the latter generally expressed as a distance upstream from some reference point.
116	Wetlands	Wetlands are transitional areas between open water and dry land. The water may not be on the surface at all times making it hard to recognize. Wetlands are generally extremely valuable and productive ecosystems.

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1	Accuracy	Closeness to reality.
2	Adaptive capacity	Is the ability to plan, prepare for, facilitate, and implement adaptation options. Factors that determine a community adaptive capacity include its economic wealth, its technology and infrastructure, the information, knowledge and skills that it possesses, the nature of its institutions, its commitment to equity, and its social capital.
3	Aims	The objectives of groups 'individuals'organisations involved with a project. The aims are taken to include ethical and aesthetic considerations.
4	Attenuation (flood peak)	Lowering a flood peak (and lengthening its base).
5	Basin (river) (see catchment area)	The area from which water runs off to a given river.
6	Catchment area	The area from which water runs off to a river.
7	Bias	The disposition to distort the significance of the various pieces of information that have to be used.
8	Characterisation	The process of expressing the observed/predicted behaviour of a system and it's components for optimal use in decision making.
9	Cognition	The conscious or unconscious process of deriving meaning from sensory data. So 'perceived risk' might be more correctly termed 'cognated' risk.
10	Conditional probability	The likelihood of some event given the prior occurrence of some other event.
11	Confidence interval	A measure of the degree of (un)certainty of an estimate. Usually presented as a percentage. For example, a confidence level of 95% applied to an upper and lower bound of an estimate indicates there is a 95% chance the estimate lies between the specified bounds. Confidence limits can be calculated for some forms of uncertainty (see knowledge uncertainty), or estimated by an expert (see judgement).
12	Consequence	An impact such as economic, social or environmental damage/improvement that may result from a flood. May be expressed quantitatively (e.g. monetary value), by category (e.g. High, Medium, Low) or descriptively.
13	Coping capacity	The means by which people or organisations use available resources and abilities to face adverse consequences that could lead to a disaster.
14	Correlation	Between two random variables, the correlation is a measure of the extent to which a change in one tends to correspond to a change in the other. One measure of linear dependence is the correlation coefficient p. If variables are independent random variables then p = 0. Values of +1 and -1 correspond to full positive and negative dependence respectively. Note: the existence of some correlation need not imply that the link is one of cause and effect.
15	Critical element	A system element, the failure of which will lead to the failure of the system.
16	Damage potential	A description of the value of social, economic and ecological impacts (harm) that would be caused in the event of a flood.
17	Decision uncertainty	The rational inability to choose between alternative options.
18	Defence system	Two or more defences acting to achieve common goals (e.g. maintaining flood protection to a floodplain area/ community).

19	Design objective	The objective (put forward by a stakeholder), describing the desired performance of an intervention, once implemented.
20	Design discharge	See Design standard and Design flood.
21	Design standard	A performance indicator that is specific to the engineering of a particular defence to meet a particular objective under a given loading condition. Note: the design standard will vary with load, for example there may be different performance requirements under different loading conditions.
22	Dependence	The extent to which one variable depends on another variable. Dependence affects the likelihood of two or more thresholds being exceeded simultaneously. When it is not known whether dependence exists between two variables or parameters, guidance on the importance of any assumption can be provided by assessing the fully dependent and independent cases (see also correlation).
23	Deterministic process/method	A method or process that adopts precise, single-values for all variables and input values, giving a single value output.
24	Discharge (stream, river)	As measured by volume per unit of time.
25	Efficiency	In everyday language, the ratio of outputs to inputs; in economics, optimality.
26	Element	A component part of a system.
27	Element life	The period of time over which a certain element will provide sufficient strength to the structure with or without maintenance.
28	Emergency management	The ensemble of the activities covering emergency planning, emergency control and post-event assessment.
29	Epistemology	A theory of what we can know and why or how we can know it.
30	Ergonomics	The study of human performance as a function of the difficulty of the task and environmental conditions.
31	Error	Mistaken calculations or measurements with quantifiable and predictable differences.
32	Evacuation scheme	Plan for the combination of actions needed for evacuation (warning, communication, transport etc.).
33	Event (in context)	In FLOODsite, these are the conditions which may lead to flooding. An event is, for example, the occurrence in Source terms of one or more variables such as a particular wave height threshold being exceeded at the same time a specific sea level, or in Receptor terms a particular flood depth. When defining an event it can be important to define the spatial extent and the associated duration. Appendix 1 expands upon this definition.
34	Exposure	Quantification of the receptors that may be influenced by a hazard (flood), for example, number of people and their demographics, number and type of properties etc.
35	Expectation	Expectation, or .expected value. of a variable, refers to the mean value the variable takes. For example, in a 100 year period, a 1 in 100 year event is expected to be equalled or exceeded once. This can be defined mathematically (Appendix 1).
36	Expected annual frequency	Expected number of occurrences per year (reciprocal of the return period of a given event).
37	Expected value	Asee Expectation.
38	Extrapolation	The inference of unknown data from known data, for instance future data from past data, by analysing trends and making assumptions.

39	Failure	Inability to achieve a defined performance threshold (response given loading). "Catastrophic" failure describes the situation where the consequences are immediate and severe, whereas "prognostic" failure describes the situation where the consequences only grow to a significant level when additional loading has been applied and/or time has elapsed.
40	Failure mode	Description of one of any number of ways in which a defence or system may fail to meet a particular performance indicator.
41	Flood	A temporary covering of land by water outside its normal confines.
42	Flood control (measure)	A structural intervention to limit flooding and so an example of a risk management measure.
43	Flood damage	Damage to receptors (buildings, infrastructure, goods), production and intangibles (life, cultural and ecological assets) caused by a flood.
44	Flood forecasting system	A system designed to forecast flood levels before they occur:
45	Flood hazard map	Map with the predicted or documented extent of flooding, with or without an indication of the flood probability.
46	Flood level	Water level during a flood. Flood management measures /Actions that are taken to reduce either the probability of flooding or the consequences of flooding or some combination of the two.
47	Flood peak	Highest water level recorded in the river during a flood.
48	Floodplain	Part of alluvial plain that would be naturally flooded in the absence of engineered interventions.
49	Flood prevention	Actions to prevent the occurrence of an extreme discharge peak.
50	Flood protection (measure)	To protect a certain area from inundation (using dikes etc).
51	Flood risk zoning	Delineation of areas with different possibilities and limitations for investments, based on flood hazard maps.
52	Flood risk management	Continuous and holistic societal analysis, assessment and mitigation of flood risk.
53	Flood warning system (FWS)	A system designed to warn members of the public of the potential of imminent flooding. Typically linked to a flood forecasting system.
54	Flooding System (in context)	In the broadest terms, a system may be described as the social and physical domain within which risks arise and are managed. An understanding of the way a system behaves and, in particular, the mechanisms by which it may fail, is an essential aspect of understanding risk. This is true for an organisational system like flood warning, as well as for a more physical system, such as a series of flood defences protecting a flood plain.
55	Fragility	The propensity of a particular defence or system to fail under a given load condition. Typically expressed as a fragility function curve relating load to probability of failure. Combined with descriptors of decay/deterioration, fragility functions enable future performance to be described.
56	Functional design	The design of an intervention with a clear understanding of the performance required of the intervention.
57	Governance	The processes of decision making and implementation.
58	Harm	Disadvantageous consequences /economic, social or environmental. (See Consequence).
59	Hazard	A physical event, phenomenon or human activity with the potential to result in harm. A hazard does not necessarily lead to harm.
60	Hazard mapping	The process of establishing the spatial extents of hazardous phenomena.
61	Hierarchy	A process where information cascades from a greater spatial or temporal scale to lesser scale and vice versa.

62	Human reliability	Probability that a person correctly performs a specified task.
63	Ignorance	Lack of knowledge
64	Institutional uncertainty	Inadequate collaboration and/or trust among institutions, potentially due to poor communication, lack of understanding, overall bureaucratic culture, conflicting sub-cultures, traditions and missions.
65	Integrated risk management	An approach to risk management that embraces all sources, pathways and receptors of risk and considers combinations of structural and non-structural solutions.
66	Integrated Water Resource Management	IWRM is a process which promotes the co-ordinated management and development of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.
67	Intervention	A planned activity designed to effect an improvement in an existing natural or engineered system (including social, organisation/defence systems).
68	Inundation	Flooding of land with water. (NB: In certain European languages this can refer to deliberate flooding, to reduce the consequences of flooding on nearby areas, for example. The general definition is preferred here.)
69	Joint probability	The probability of specific values of one or more variables occurring simultaneously. For example, extreme water levels in estuaries may occur at times of high river flow, times of high sea level or times when both river flow and sea level are above average levels. When assessing the likelihood of occurrence of high estuarine water levels it is therefore necessary to consider the joint probability of high river flows and high sea levels.
70	Judgement	Decisions taken arising from the critical assessment of the relevant knowledge.
71	Knowledge	Spectrum of known relevant information.
72	Knowledge uncertainty	Uncertainty due to lack of knowledge of all the causes and effects in a physical or social system. For example, a numerical model of wave transformation may not include an accurate mathematical description of all the relevant physical processes. Wave breaking aspects may be parameterised to compensate for the lack of knowledge regarding the physics. The model is thus subject to a form of knowledge uncertainty. Various forms of knowledge uncertainty exist, including: Process model uncertainty -All models are an abstraction of reality and can never be considered true. They are thus subject to process model uncertainty. Measured data versus modelled data comparisons give an insight into the extent of model uncertainty but do not produce a complete picture. Statistical inference uncertainty -Formal quantification of the uncertainty of estimating the population from a sample. The uncertainty is related to the extent of data and variability of the data that make up the sample. Statistical model uncertainty -Uncertainty associated with the fitting of a statistical model. The statistical model is usually assumed to
73	Legal uncertainty	The possibility of future liability for actions or inaction. The absence of undisputed legal norms strongly affects the relevant actors. decisions.
74	Likelihood	A general concept relating to the chance of an event occurring. Likelihood is generally expressed as a probability or a frequency.
75	Limit state	The boundary between safety and failure.
76	Load	Refers to environmental factors such as high river flows, water levels and wave heights, to which the flooding and erosion system is subjected.
77	Mitigation	See Flood management measures

78	Natural variability	Uncertainties that stem from the assumed inherent randomness and basic unpredictability in the natural world and are characterised by the variability in known or observable populations.
79	Parameters	The parameters in a model are the .constants., chosen to represent the chosen context and scenario. In general the following types of parameters can be recognised: Language of risk: Project defitions Contract No:GOCE-CT-2004-505420 FLOODsite_Language_of_Risk_v4_0_P1 23 09 March 2005 Exact parameters - which are universal constants, such as the mathematical constant: Pi (3.14259...). Fixed parameters - which are well determined by experiment and may be considered exact, such as the acceleration of gravity, g (approximately 9.81 m/s). A-priori chosen parameters - which are parameters that may be difficult to identify by calibration and so are assigned certain values. However, the values of such parameters are associated with uncertainty that must be estimated on the basis of a-priori experience, for example detailed experimental or field measurements Calibration parameters - which must be established to represent particular circumstances. They must be determined by calibration of model results for historical data on both input and outcome. The parameters are generally chosen to minimise the difference between model outcomes and measured data on the same outcomes. It is unlikely that the set of parameters required to achieve a "satisfactory" calibration is unique.
80	Pathway	Route that a hazard takes to reach Receptors. A pathway must exist for a Hazard to be realised.
81	Performance	The degree to which a process or activity succeeds when evaluated against some stated aim or objective.
82	Performance indicator	The well-articulated and measurable objectives of a particular project or policy. These may be detailed engineering performance indicators, such as acceptable wave overtopping rates, rock stability, or conveyance capacity or more generic indicators such as public satisfaction.
83	Post-flood mitigation	Measures and instruments after flood events to remedy flood damages and to avoid further damages.
84	Precautionary Principle	Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
85	Precision	Degree of exactness regardless of accuracy.
86	Pre-flood mitigation	Measures and instruments in advance to a flood event to provide prevention (reducing flood hazards and flood risks by e.g. planning) and preparedness (enhancing organisational coping capacities).
87	Preparedness	The ability to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.
88	Preparedness Strategy	Within the context of flood risk management a preparedness strategy aims at ensuring effective responses to the impact of hazards, including timely and effective early warnings and the evacuation of people and property from threatened locations.

89	Probability	A measure of our strength of belief that an event will occur. For events that occur repeatedly the probability of an event is estimated from the relative frequency of occurrence of that event, out of all possible events. In all cases the event in question has to be precisely defined, so, for example, for events that occur through time reference has to be made to the time period, for example, annual exceedance probability. Probability can be expressed as a fraction, % or decimal. For example the probability of obtaining a six with a shake of four dice is 1/6, 16.7% or 0.167.
90	Probabilistic method	Method in which the variability of input values and the sensitivity of the results are taken into account to give results in the form of a range of probabilities for different outcomes.
91	Probability density function (distribution)	Function which describes the probability of different values across the whole range of a variable (for example flood damage, extreme loads, particular storm conditions etc).
92	Probabilistic reliability methods	These methods attempt to define the proximity of a structure to fail through assessment of a response function. They are categorised as Level III, II or I, based on the degree of complexity and the simplifying assumptions made (Level III being the most complex).
93	Process model uncertainty	See Knowledge uncertainty.
94	Project Appraisal	The comparison of the identified courses of action in terms of their performance against some desired ends.
95	Progressive failure	Failure where, once a threshold is exceeded, significant (residual) resistance remains enabling the defence to maintain restricted performance. The immediate consequences of failure are not necessarily dramatic but further, progressive, failures may result eventually leading to a complete loss of function.
96	Proportionate methods	Provide a level of assessment and analysis appropriate to the importance of the decision being made.
97	Proprietary uncertainty	Indicates contested rights to know, to warn or to secrete. In both risk assessment and management, there are often considerations about the rights of different people to know, to warn or to conceal
98	Random events	Events which have no discernible pattern.
99	Receptor	Receptor refers to the entity that may be harmed (a person, property, habitat etc.). For example, in the event of heavy rainfall (the source) flood water may propagate across the flood plain (the pathway) and inundate housing (the receptor) that may suffer material damage (the harm or consequence). The vulnerability of a receptor can be modified by increasing its resilience to flooding.
100	Record (in context)	Not distinguished from event (see Event)
101	Recovery time	The time taken for an element or system to return to its prior state after a perturbation or applied stress.
102	Reliability index	A probabilistic measure of the structural reliability with regard to any limit state.
103	Residual life	The residual life of a defence is the time to when the defence is no longer able to achieve minimum acceptable values of defined performance indicators (see below) in terms of its serviceability function or structural strength.
104	Residual risk	The risk that remains after risk management and mitigation measures have been implemented. May include, for example, damage predicted to continue to occur during flood events of greater severity that the 100 to 1 annual probability event.
105	Resilience	The ability of a system/community/society/defence to react to and recover from the damaging effect of realised hazards.
106	Resistance	The ability of a system to remain unchanged by external events.

107	Response (in context)	The reaction of a defence or system to environmental loading or changed policy.
108	Response function	Equation linking the reaction of a defence or system to the environmental loading conditions (e.g. overtopping formula) or changed policy.
109	Return period	The expected (mean) time (usually in years) between the exceedence of a particular extreme threshold. Return period is traditionally used to express the frequency of occurrence of an event, although it is often misunderstood as being a probability of occurrence.
110	Risk	Risk is a function of probability, exposure and vulnerability. Often, in practice, exposure is incorporated in the assessment of consequences, therefore risk can be considered as having two components . the probability that an event will occur and the impact (or consequence) associated with that event. See Section 4.3 above. Risk = Probability multiplied by consequence
111	Risk analysis	A methodology to objectively determine risk by analysing and combining probabilities and consequences.
112	Risk assessment	Comprises understanding, evaluating and interpreting the perceptions of risk and societal tolerances of risk to inform decisions and actions in the flood risk management process.
113	Risk communication (in context)	Any intentional exchange of information on environmental and/or health risks between interested parties.
114	Risk management	The complete process of risk analysis, risk assessment, options appraisal and implementation of risk management measures.
115	Risk management measure	An action that is taken to reduce either the probability of flooding or the consequences of flooding or some combination of the two.
116	Risk mapping	The process of establishing the spatial extent of risk (combining information on probability and consequences). Risk mapping requires combining maps of hazards and vulnerabilities. The results of these analyses are usually presented in the form of maps that show the magnitude and nature of the risk.
117	Risk mitigation	See Risk reduction.
118	Risk perception	Risk perception is the view of risk held by a person or group and reflects cultural and personal values, as well as experience.
119	RRisk reduction	The reduction of the likelihood of harm, by either reduction in the probability of a flood occurring or a reduction in the exposure or vulnerability of the receptors.
120	Risk profile	The change in performance, and significance of the resulting consequences, under a range of loading conditions. In particular the sensitivity to extreme loads and degree of uncertainty about future performance.
121	Risk register	An auditable record of the project risks, their consequences and significance, and proposed mitigation and management measures.
122	Risk significance (in context)	The separate consideration of the magnitude of consequences and the frequency of occurrence.
123	Robustness	Capability to cope with external stress. A decision is robust if the choice between the alternatives is unaffected by a wide range of possible future states of nature. Robust statistics are those whose validity does not depend on close approximation to a particular distribution function and/or the level of measurement achieved.
124	Scale	Difference in spatial extent or over time or in magnitude; critical determinant of vulnerability, resilience etc.

125	Scenario	A plausible description of a situation, based on a coherent and internally consistent set of assumptions. Scenarios are neither predictions nor forecasts. The results of scenarios (unlike forecasts) depend on the boundary conditions of the scenario.
126	Sensitivity	Refers to either: the resilience of a particular receptor to a given hazard. For example, frequent sea water flooding may have considerably greater impact on a fresh water habitat, than a brackish lagoon; or: the change in a result or conclusion arising from a specific perturbation in input values or assumptions.
127	Sensitivity Analysis	The identification at the beginning of the appraisal of those parameters which critically affect the choice between the identified alternative courses of action.
128	Social learning	Processes through which the stakeholders learn from each other and, as a result, how to better manage the system in question.
129	Social resilience	The capacity of a community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organising itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures.
130	Spatial planning	Public policy and actions intended to influence the distribution of activities in space and the linkages between them. It will operate at EU, national and local levels and embraces land use planning and regional policy.
131	Standard of service	The measured performance of a defined performance indicator.
132	Severity	The degree of harm caused by a given flood event.
133	Source	The origin of a hazard (for example, heavy rainfall, strong winds, surge etc).
134	Stakeholders	Parties/persons with a direct interest (stake) in an issue -also Stakeowners.
135	Stakeholder Engagement	Process through which the stakeholders have power to influence the outcome of the decision. Critically, the extent and nature of the power given to the stakeholders varies between different forms of stakeholder engagement.
136	Statistic	A measurement of a variable of interest which is subject to random variation.
137	Strategy (flood risk management)	A strategy is a combination of long-term goals, aims, specific targets, technical measures, policy instruments, and process which are continuously aligned with the societal context.
138	Strategic spatial planning	Process for developing plans explicitly containing strategic intentions referring to spatial development. Strategic plans typically exist at different spatial levels (local, regional etc).
139	Statistical inference uncertainty	See Knowledge uncertainty
140	Statistical model uncertainty	See Knowledge uncertainty.
141	Sustainable Development	Is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

142	Sustainable flood risk management	Involves: -ensuring quality of life by reducing flood damages but being prepared for floods -mitigating the impact of risk management measures on ecological systems at a variety of spatial and temporal scales -the wise use of resources in providing, maintaining and operating infrastructure and risk management measures -maintaining appropriate economic activity (agricultural, industrial, commercial, residential) on the flood plain
143	Sustainable flood risk management strategy	An approach which -aims to be effective in the long term, and -can be combined 'integrated' with other international, national and regional activities (transport, environment, conservation etc.) (See IRMA-SPONGE Glossary Appendix 2)
144	Susceptibility	The propensity of a particular receptor to experience harm.
145	System	An assembly of elements, and the interconnections between them, constituting a whole and generally characterised by its behaviour. Applied also for social and human systems.
146	System state	The condition of a system at a point in time.
147	Tolerability	Refers to willingness to live with a risk to secure certain benefits and in the confidence that it is being properly controlled. To tolerate a risk means that we do not regard it as negligible, or something we might ignore, but rather as something we need to keep under review, and reduce still further if and as we can. Tolerability does not mean acceptability.
148	Ultimate limit state	Limiting condition beyond which a structure or element no longer fulfils any measurable function in reducing flooding.
149	Uncertainty	A general concept that reflects our lack of sureness about someone or something, ranging from just short of complete sureness to an almost complete lack of conviction about an outcome.
150	Validation	Is the process of comparing model output with observations of the 'real world'.
151	Variability	The change over time of the value or state of some parameter or system or element where this change may be systemic, cyclical or exhibit no apparent pattern.
152	Variable	A quantity which can be measured, predicted or forecast which is relevant to describing the state of the flooding system e.g. water level, discharge, velocity, wave height, distance, or time. A prediction or forecast of a variable will often rely on a simulation model which incorporates a set of parameters.
153	Voluntariness	The degree to which an individual understands and knowingly accepts the risk to which they are exposed in return for experiencing a perceived benefit. For an individual may preferentially choose to live in the flood plain to experience its beauty and tranquillity.
154	Vulnerability	Characteristic of a system that describes its potential to be harmed. This can be considered as a combination of susceptibility and value.

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Abstract

As part of the work carried out by the Exchange Circle of Flood Forecasting (EXCIFF), an activity was initiated to bring together good practices in communicating flood-related information to the general public. A drafting group consisting of staff of several operational flood forecasting agencies in Europe collected and compiled these good practices. The team worked on this task mainly by e-mail and during 3 writing sessions, hold twice in Brussels and once in Mainz. All the EXCIFF members have been involved at the end of the validating process.

Aspects that are covered in the guide are a review of the current practices, the kinds of information in a flood warning, several broadcast technologies (internet, mobile phone, telephone, newspaper, tv, radio, public broadcasts in the street), dissemination frequency, phasing/co-ordination, synchronicity and conflicting disseminations, as well as training and education, both of the provider staff responsible for informing the general public, as well as education of the general public itself.

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