METEOALARM-EF

Final Report

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1. About Meteoalarm

May 2010 www.meteoalarm.eu, the official website of weather warnings by the public European weather services, did present its new Europe of regions map on the homepage. The Meteoalarm.eu website identifies the risks, covering 650 regions in the whole of Europe at a glance. The warnings for 10 weather parameters are provided by national Weather Services, ranging for time periods from 24 up to 48 hours. It will alert you to the possible occurrence of severe weather, such as heavy rain with risk of flooding, severe thunderstorms, glace-force winds, etc. In one glance you will be able to see where in Europe the weather might become dangerous.

Since Meteoalarm has been fully operational the website has generated enormous public interest. More than 1 billion hits have been recorded since its start in 2007. Meteoalarm is a unique initiative by Eumetnet, the public European weather services network within the World Meteorological Organization.

The website offers a universally understood system using symbols and colour-coded maps with the latest warnings of expected severe weather over most of Europe. Special links lead you to extra information in any language you desire. The website is plain and clear, using easily recognizable symbols. It is simple to click onto regional and local warnings. Meteoalarm is also a portal to the national warning systems: click on the logo of individual meteorological weather services to visit their websites for additional regional information. For colour blind users the coloured weather chart can be converted to black and white tints.

Meteoalarm offers the most up-to-date information on potentially dangerous weather both current and future. www.meteoalarm.eu is developed for EUMETNET, the network for European Meteorological Services. This initiative is strongly supported by WMO the World Meteorological Organization.

2. 5-day forecasts

Task ID	A	Task Title	5-day forecasts

The general objective of the EMMA Meteoalarm-EF programme was to expand the development of existing alert messages from 24 to 36 hours for up to 5 days. This enables Civil Protection to take preparatory measures on a European level in a time scale which was not achievable so far. The National Meteorological Services (NMS`s) can add or update their awareness information in a regionalized way to EMMA system.

Action A.1:

Intranet for dedicated users

The Meteoalarm system has been extended for a possible lead time of 5 days. The input structure allows testing and implementation of 5 day forecasts for dedicated user (EMMA partners). A probability scheme, which takes into consideration possible uncertainties and limits of forecasts, has been established and used during the testing phase.

Probability scheme: Uncertainties and limits of forecasts

The developed warning scheme (Table 1), takes possible uncertainties and limits of forecasts into consideration. Certain warning parameters: e.g. large scale floods are easier to forecast than small scale thunderstorms. It is therefore extremely important to include all locally available know-how into these warnings, which otherwise would be lost or be provided only at a much later stage at the onset of a weather induced catastrophe.

There are some uncertainties in forecasts; a weather forecast for tomorrow is very possible. It is even more difficult to forecast the next 5 days. Due to the large uncertainty of forecast the next several days cannot be predicted precisely, forecasts always involve uncertainty. The developed matrix (Table 1) shows how Meteoalarm cope with it. A "red" warning can only be issued, if the probability is larger than 60%. On the whole day 1 can be forecasted with a probability of about 80%, the probability of the remaining days is about 50%, and specific situation might be below 50%. For longer time range or complicated interactions between different weather parameters the certainty that can be given on the warning information is naturally lowered. This level of confidence can be expressed in terms of probability (%) of a certain event to occur in given time and region.

Ensemble forecasts give a good basis for the assessment of probabilities. To assign the correct warning levels in cases of lowered probabilities, the EMMA Meteoalarm group proposes the following scheme:

Table 1: Probability scheme

Alert level → / Level of confidence ↓	Green	Yellow	Orange	Red
0 – 5%	■	■	■	■
5 - 30%	■	■	■	
30 – 60%	■	■		■
>60%	■		■	■

Some situation might be meteorologically extreme, but they should not cause warnings if they do not cause any damage.

Any warning should comply with the following criteria: *It should warn in time for a certain event (weather parameter), giving proper timing and proper geographical spacing and displacement of the phenomenon. It should mention the potential danger, such as trees possibly falling down or areas that may be flooded. And in the best case also giving handling advisories (this might not be possible for all National Meteorological Services)* (cf. F. KROONENBERG, C., HONORE, M. STAUDINGER: Recommendation for National Warning Systems delivering warning information towards the EUMETNET System EMMA).

A straightforward 4-level colour code is used to define and connect potential impact to meteorological criteria. This gives the Civil Protection-organizations, the general public and specially targeted groups of users a clear signal on potential danger. The colours Green, Yellow, Orange and Red are used to classify levels of danger, a general advice "what to do" and typical meteorological conditions for these level. Whereas the two first elements (danger and behavioral advice) are generalized across Europe, the meteorological conditions change from one climate region to the next. Each colour has a specific meaning which can be understood by all European citizens independent from their mother language. All details can also be found on the Meteoalarm "Help" page (cf. F. KROONENBERG, C., HONORE, M. STAUDINGER: Recommendation for National Warning Systems delivering warning information towards the EUMETNET System EMMA).

The following Table 2 shows the connection between the colours and the different "what to do" (decision) criteria, which have to be considered when warnings are issued.

Table 2: Colour scheme

Colour	One word	What to do?	Damage / Impact
yellow	Be aware!	caution with exposed activities	exposed objects (avoidable)
orange	Be prepared!	keep informed in detail, follow advice of authorities	general damages (not avoidable)

## User input interface specification
General requirements and technical specifications

Recently input to EMMA System is proposed to be in a kind of XML format (newly CAP format is accepted as well) to be specified. Inputs will be generated through the post-processing of warnings or awareness information delivered at national level and/or through web interfaces on the central EMMA web server or on the national web servers.

5 day forecasts
The input architecture of the 5-day warnings is already working. Registered users can enter the password protected area of the website and there can be found all the warnings up to 5 days ahead.

Figure 1: Day 1 - 5-day forecasts
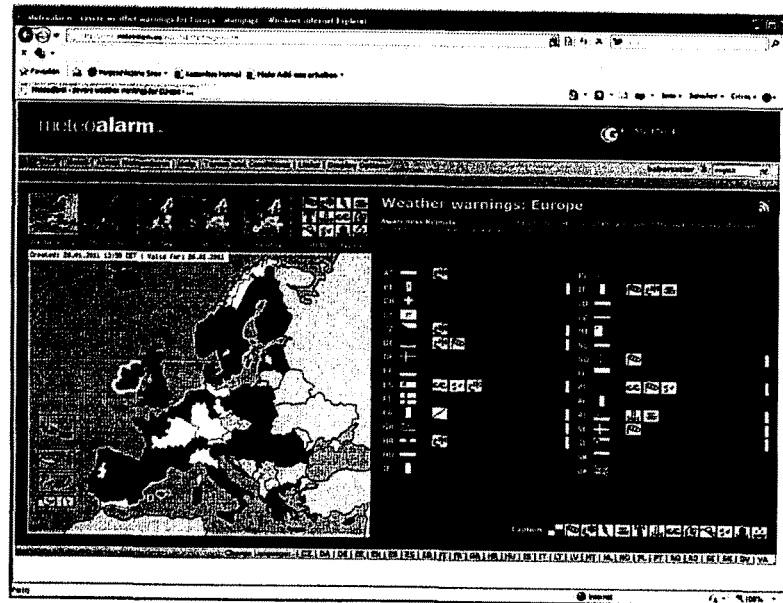
Above the Europe Map (Figure 1) five small maps are pictured. The top left is the actual day, when clicking on another day-icon the Europe Map switch to the according day. Without changing the presetting all awareness-type icons are displayed, by clicking on one icon the Europe Map can be limited to the selected one. Figure 1 depicts day 1, on the right side the highest warning for the countries for the next five days is shown with a small colour block (yellow, orange, red). In the above figure such a block is available for Belgium (BE), Germany (DE), Italy (IT) etc. For those countries that just provide awareness icon warnings up to 1 day are available but not for the following days.

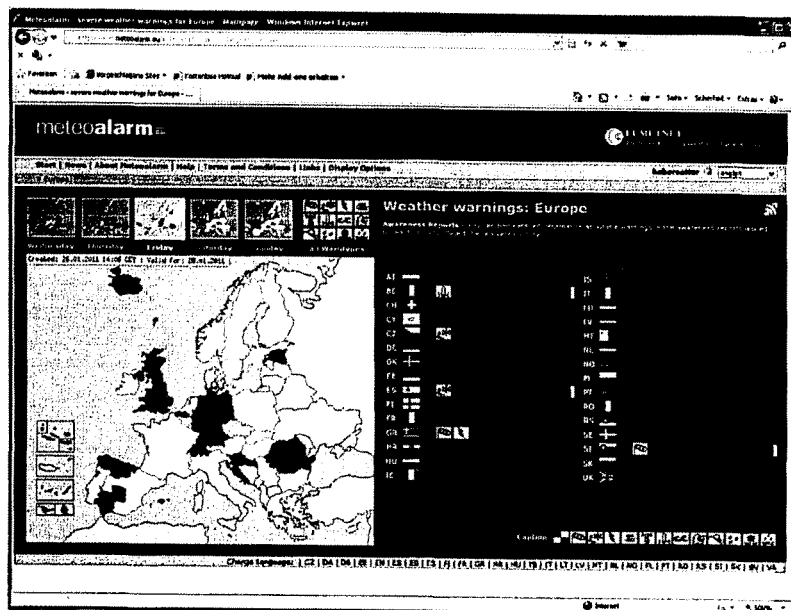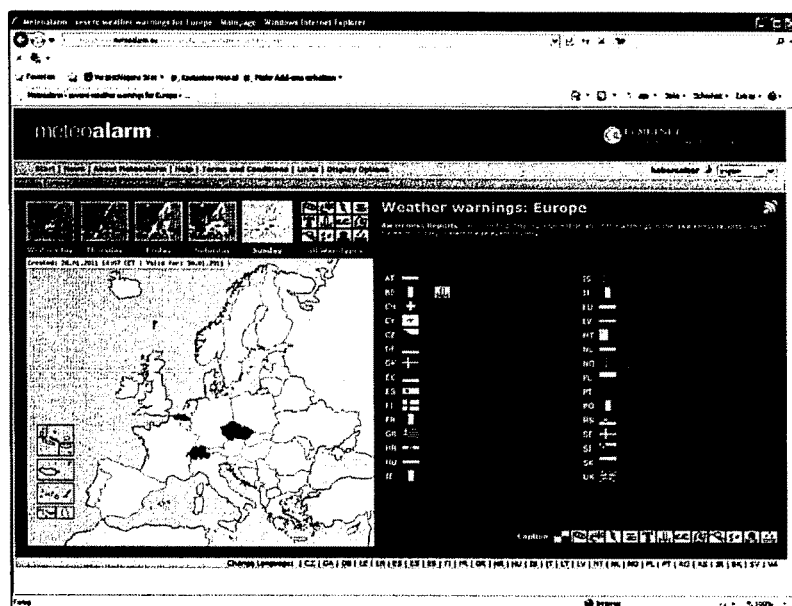**Figure 2: Day 3 - 5-days forecasts**

Fugure 2 shows day 3 in the forecast period. The white displayed countries didn't send any warning, nor a green one. Only very few countries provide warnings up to 5 days ahead in this example. The illustration below shows day 5, only three countries warned until day 5.

Figure 1: Day 5 - 5-day forecasts

To give a clear indication of the system Italy is considered exemplary. The following three small illustrations present the published warnings under the password protected area. Day 1, day 2 and day 5 are selected.

Action A.2:
Separation of public- and non public warnings for extreme weather phenomena

In the public part of the www.meteoalarm.eu website currently all warnings or alert levels are presented. Wherever you are in Europe, clear, concise information will help you plan your travel, or any activity vulnerable to severe weather. Where, for example, might severe thunder and heavy rain; what is the risk of an avalanche, might fog delay flights; and will hot, dry weather increase the risk of forest fires? The 30 EMMA partners are able to issue all together 10 different warning parameters. However it is for example not necessary for Iceland to use the parameter heat waves, some of the parameters do rarely occur. In order to avoid misuse not all of the parameters are used.

The alert messages for up to 5 days will enable Civil Protection to take preparatory measures on a European level In a time scale which was not achievable so far.

Action A.3:
Publication of 5-day alert levels in the Intranet

After the test phase was successfully completed, 5-day forecasts were launched in April 2010 in a password protected Intranet part of the website. Many EMMA Programme partners publish the alert levels with a lead time of 5-days (a few provide warnings for only 2 or 3 days) for the regions In their countries In the Intranet. Italy was selected as an example for the publication of 5-day alerts shown below. On this day Italy has issued warnings for day 1 and day 2 and it should be noted that there is only just a red warning on the second day. No warnings are issued for day 3 to 5. Parallel to the

publication process the Meteoalarm discussion forum enables the exchange of ideas between neighbouring countries. This discussion forum is only accessible to registered users in a password protected area. In cases of necessity neighbouring countries can adapt alert levels for similar events across borders.

This newly-developed extended forecast system gets us one step closer to a better planning of Community Mechanism for Civil Protection in the case of extreme events.

Figure 3: 5-day alerts from Italy
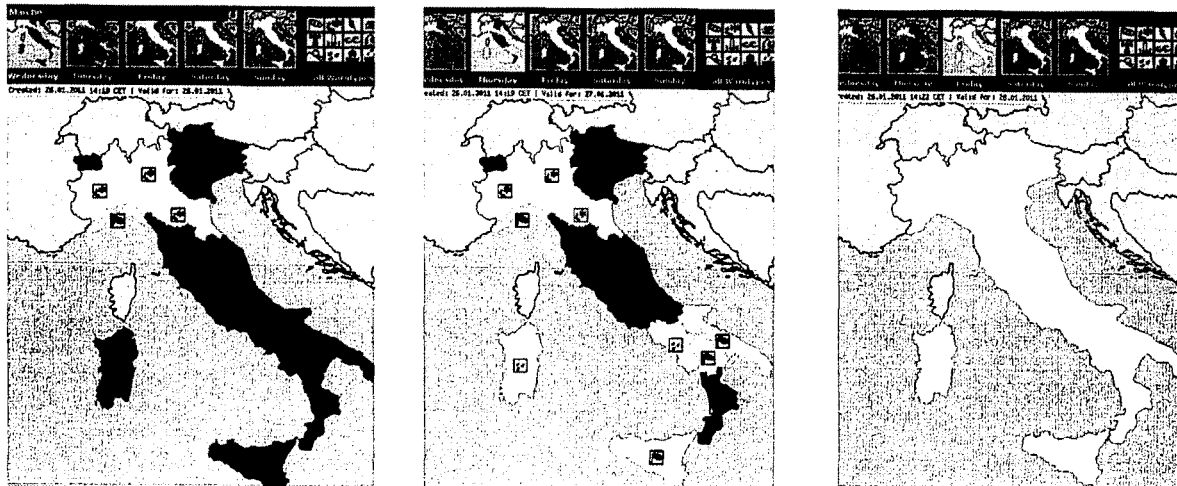
3. Additional Hazard types

Task ID	B	Task Title	Additional Hazard types

The EMMA system www.Meteoalarm.eu will provide the most relevant information needed to prepare for extreme weather, expected to occur somewhere over Europe: It publishes alert levels for 10 given features (wind, extreme high temperature, rain, extreme low temperature, snow/ice, coastal event, thunderstorms, forestfire, fog, avalanches). In one glance you will be able to see where in Europe the weather might become dangerous. The parameters correspond to the warnings of Meteorological Services. Impact and damage occur due to other factors as well (e.g. floods, avalanches, etc.). This information is provided in some countries by different sources and services. This cooperation could be improved technically and structurally.

Action B.1
Cooperation with other services to formulate common warning schemes

The EMMA System www.meteoalarm.eu publishes at present precipitation warnings, but no flood warnings. It was therefore an important step to support these countries where the national Meteorological Service and Hydrological Service work separately, to cooperate. The information on the www.meteoalarm.eu website contains at present precipitation warnings, but no flood warnings. The Meteorological Service provides rain warnings and the Hydrological Service provides flood warnings. This can cause confusion in periods of floods after a precipitation event. We recommend an improved technical and structural cooperation. Further improvement and optimisation on local and regional scale is also to be expected. The corresponding Hydrological Service on a national level and the cooperated national Meteorological Service, which contains the knowledge of the different procedures involved, should start exchanging alert level and other relevant information concerning the publication of flood warnings. Sometimes there are different alert levels; these have to be transferred into the 4-level alert Meteoalarm scheme.

The quality of flood warnings especially on local and regional scales is strongly improved through the cooperation. Rain events can therefore be clearly discriminated from flood events.

The conference on flooding in Lelystad gave the opportunity of a meeting of meteorologists and hydrologists. About 30 meteorologists and 30 hydrologists from 26 European countries convened in Lelystad (The Netherlands, end of June 2010) to discuss closer cooperation within Meteoalarm.

The main objective was to ensure, within a European perspective, better harmonisation between national Meteorological and Hydrological services. During the conference a great deal of information was shared concerning, the new input parameters, relating for example, to measurement of flooding and the extension of the forecasting period to day 5 ahead. The conference in Lelystad was a great success and has opened the path to a much closer cooperation between European meteorologists and hydrologists.

The cooperation between ZAMG Salzburg (Meteorological Service) and the Hydrographischer Dienst Salzburg (Hydrological Service) works well and took place in further activities, where field oriented topics are discussed and the teamwork is extended. In this way the new warnings could be tested successfully. It can be said that the cooperation brings particularly benefits to the respective national Hydrological Service. The EMMA system is well-known and is growing steadily. The Meteoalarm website has more than 12 Mio hits per day (2010 – 1 billion hits), whereas the websites of the Hydrological Services are often still little known. The main objective of the EMMA system is to pose potential hazards and to improve the scattering effect. The further development of flood protection systems deserves special mention and the know-how of Meteorological Services can be taken into account and optimally utilized.

Action B.2
Integration of additional hazard types in the input scheme

The existing ten features (wind, extreme high temperature, rain, extreme low temperature, snow/ice, coastal event, thunderstorms, forestfire, fog, avalanches) would be complemented with two more features. Figure 4 shows the additional hazard types. New icons for rain, rain and flood, flood were created. Adding new warning types requires and adaption and restructuring the database and design of new icons (Figure 5: New Icons for rain, rain/flood, flood).

Figure 4: Existing 10 Icons

The current icon for rain has extended to "rain and flood" and "flood". This allows clear differentiations between rain and flood events. The EMMA partners can choose the symbol for the new events independently.

Figure 5: New Icons for rain, rain/flood, flood

Work is in progress to enable other services they provide information, which is not produced by the original EMMA partners, like Hydrological services for flood warnings or Avalanche Warning services for avalanches to send files to the EMMA Meteoalarm system. XML files according to the 4-level Meteoalarm alert scheme are desired. By Integration of the new Icons this system has moved on to a multi-hazard platform. The priority object is to extend the cooperation between the participating and the other (e.g. hydrological) services.

Action B.3
Restructuring of the database and website appearance

Many services expressed a high interest to be presented at the Meteoalarm website and to make use of the traffic generated thereby. If the originator of e.g. a rain and flood alert is not identical with the national Meteorological Service a new adaption of the warning types and the data-base is required. To show the originator of a warning an originator logo would be placed on the regional level of the website. The linked logo of the website (would be placed on the relevant part) is thereby indicated to the originator of the information. If detailed information is wanted or required, further particulars about the actual situation will be found through this link. Reversely this feature should be advertised as well. In addition this feature has to be promoted directly to a variety of possible partners.

4. Establishment of the CAP dissemination scheme

Task ID	C	Task Title	Establishment of the CAP dissemination scheme

On the basis that until recently no standard has been used between the providers and users of warning information the CAP (Common Alerting Protocol) format should become the future standard-format. CAP was endorsed by EU under IST (Information Society Technologies) and the WMO.

CAP is a global standard for simple, structured exchange of alerting messages associated with an event for many diverse purposes – known and unknown – among undefined parties (cf. WMO – WIS Common Alerting Protocol - Implementation Workshop; http://www.wmo.int/pages/prog/www/ISS/Meetings/WIS-CAP_Geneva2009/WIS-CAP-2009-2-1-3.pdf) CAP has been embraced for "authority-to-citizen" mass warning applications; but is only one for countless uses.

Action C.1
## Integration of the individual country data for the CAP message format

Description

CAP is a standard message format designed for All-Media, All-Hazard, and communications. This XML based format allows a straightforward dissemination of warning content across different technical platforms, languages and boarders.

CAP Alert messages contain:

- Text values for human readers, e.g. "headline", "description", "instruction", "area description", etc.
- Coded values useful for filtering, routing, and automated translation to human languages.

Filtering and Routing Criteria can be: Date/Time, Geographic Area, Status, Scope, Type, Event Categories, Urgency, Severity, and Certainty.
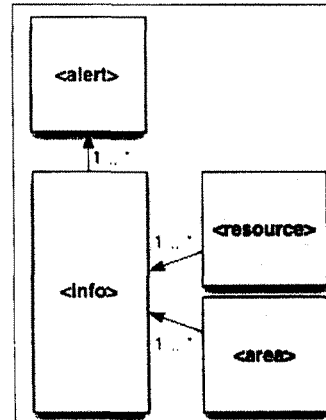
(cf. ELIOT CHRISTIAN, WMO, Joint Meeting of Meteoalarm and the WIS CAP Implementation Workshop on Identifiers).

Expected Results:
In conjunction with those activities it seems desirable to reach a consensus on CAP identifier principles and structure that includes:

- What are CAP
- Why a set of global principles and framework are useful
- The essential features of those principles and framework

CAP messages contain precise information on the identity of the warning institutions, the warning area in WGS84 format, warning duration, time of issue etc. As the Meteoalarm system is constantly growing, new partners can be integrated into the system without further difficulties, as the internal

are already available. Part of the internal www.meteoalarm.eu documentation is the procedures by the new partners. A homogenized data structure for areas, issuing bodies and other features for all of the areas (about 650) warned within Europe can be made in a common database. OASIS (Emergency management TC) which defines the CAP standard plays a highly important role, in order to integrate necessary features for Meteoalarm for the next version for the standard.

Action C.2

Organization and implementation of the export scheme for CAP messages

Users from the public as well as from the private sector are able to subscribe to the CAP messages via RSS downloads. An important step in the implementation of the user administration is the creation of a database, which allows the necessary structure of rights of dissemination for the various warning types. The following schematic illustration shows the data-process.
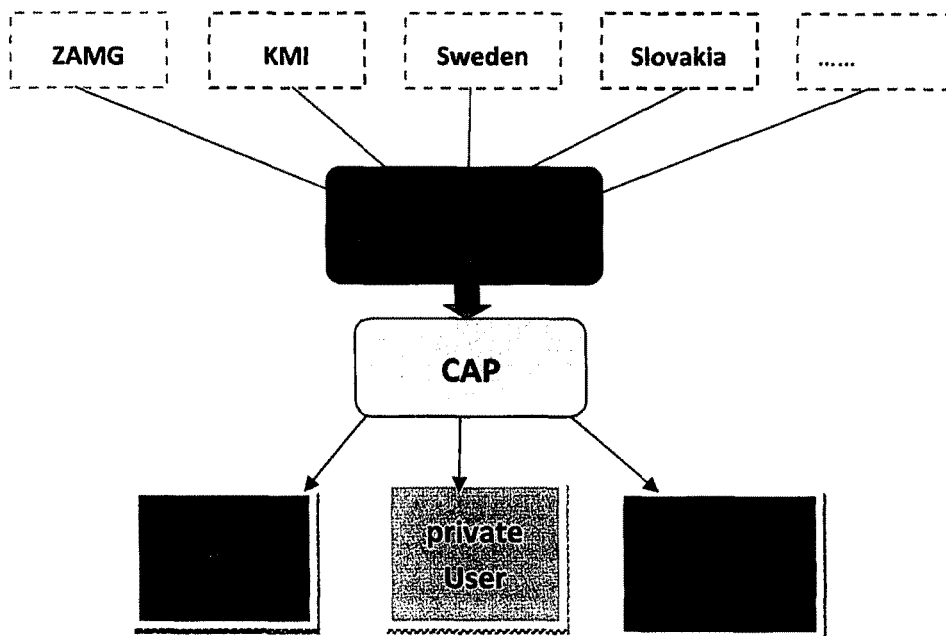
Messages in CAP format can be used for SMS messages for cell phones, RDS, palm tops, Cell Broadcast, TV production etc. and display the warnings for 650 European areas. Europe wide SMS and similar services for warnings based on the alert levels of the National Meteorological services might be very interesting for private companies.

The CAP is a simple but general format for exchanging all-hazard emergency alerts and public warnings over all kinds of network. An international working group developed this Common Alerting Protocol (CAP), which is still in development. CAP is supported by WMO and become globally known. The use of CAP files in the Meteoalarm System can be seen as a vehicle for distributing this format. The National Weather Service (www.weather.gov) was one of the first providing the CAP format. The following two figures show example of the U.S. National Weather Service. **Figure 7** shows the basics of a CAP file, such as design and structure. A Meteoalarm CAP file from Austria is also illustrated below (see Figure 8).

Figure 6: Website - National Weather Service

Figure 6: Website - National Weather Service

Figure 7: CAP-Alert from the National Weather Service (USA)

```
<cap:alert>
 - <cap:identifier>
    NOAA-NWS-ALERTS District of Columbia 2011-02-10T15:13:20-05:00
   </cap:identifier>
   <cap:sender>w-nws.webmaster@noaa.gov</cap:sender>
   <cap:sent>2011-02-10T15:13:20-05:00</cap:sent>
   <cap:status>Actual</cap:status>
   <cap:msgType>Alert</cap:msgType>
   <cap:scope>Public</cap:scope>
 - <cap:note>
    Current Watches, Warnings and Advisories for District of Columbia Issued by the National Weather Service
   </cap:note>
   <cap:references> http://www.weather.gov/alerts/dc.html </cap:references>
 - <cap:info>
    <cap:category>Met</cap:category>
    <cap:event>na</cap:event>
    <cap:urgency>Unknown</cap:urgency>
    <cap:severity>Unknown</cap:severity>
    <cap:certainty>Unknown</cap:certainty>
  - <cap:description>
     There are no active watches, warnings or advisories
    </cap:description>
   </cap:info>
```

http://www.weather.gov/alert/

Figure 8: CAP file Austria (meteoalarm.eu)

Mit dieser XML-Datei sind anscheinend keine Style-Informationen verknüpft. Nachfolgend wird die Baum-Ansicht des Dokuments angezeig

```
- <alert xsi:schemaLocation="http://niem.gov/niem/external/cap/1.1/cap.xsd">
    <identifier>2.49.0.0.40.0_2011-02-11T12:48:46+01:00</identifier>
    <sender>2.49.0.0.40.0</sender>
    <sent>2011-02-11T12:48:46+01:00</sent>
    <status>Actual</status>
    <msgType>Alert</msgType>
    <source>Meteoalarm.eu</source>
    <scope>Public</scope>
  - <incidents>
      "ZAMG-Kaernten" "ZAMG-Innsbruck" "ZAMG-Salzburg" "ZAMG Wien" "ZAMG-Wien" "ZAMG-Graz"
    </incidents>
  - <info>
      <language>de-AT</language>
      <category>Met</category>
      <event>snow-ice</event>
      <responseType>None</responseType>
      <urgency>Immediate</urgency>
      <severity>Minor</severity>
      <certainty>Likely</certainty>
    - <eventCode>
        <valueName>awt</valueName>
        <value>2</value>
      </eventCode>
    - <eventCode>
        <valueName>level</valueName>
        <value>1</value>
      </eventCode>
      <onset>2011-02-11T05:39:50+01:00</onset>
      <expires>2011-02-11T23:59:59+01:00</expires>
      <senderName>Austria, ZAMG-Kaernten</senderName>
      <headline>meteoalarm warning for avalanches</headline>
      <description>No special awarness required</description>
      <web>http://meteoalarm.eu/index2.php?country=AT</web>
    - <area>
        <areaDesc>"Kärnten" ("SÜdÖsterreich" "Österreich")</areaDesc>
      - <geocode>
          <valueName>NUTS2</valueName>
          <value>AT21</value>
        </geocode>
      </area>
```

For information only:

This video mentions the EMMA Programme and Meteoalarm.

YouTube video: Introduction to CAP (10 minute WMO video on YouTube → Eliot Christian)

http://www.youtube.com/watch?v=n0iKp60jjtY

5. Adding new alert type and areas: coastal warnings

Task ID	D	Task Title	Adding new alert type and areas: coastal warnings

At present Meteoalarm warns for conditions at the shore line, phenomena over coastal waters are not included. It is important to note that warnings presently included in Meteoalarm called 'Coastal events'. Lots of weather induced accidents e.g. boat accidents along the coast line make warnings for conditions over sea areas along the coast very necessary.

The objective is to present European-wide composite awareness information for these areas, based on already existing warnings on the national level.

Action D.1

Establishing commitments amongst member country institutions

Meteoalarm assists an established co-operative framework of presently 30 countries. 25 European states have access to coastal waters and some of them expressed interest in the participation of the development of multinational European system for coastal warnings. The following 12 countries have named contact persons for further actions: Portugal, Netherland, UK, Denmark, Spain, Norway, France, Portugal, Ireland, Finland, Sweden, and Belgium. Furthermore countries have indicated their interest and willingness to join in the near future. For further information there is a list, which is kept up to date and that contains contact details of the members (Table 3). A Contact person list from each participating institute and an actual plan for determination of the national level coastal awareness and alert information into Meteoalarm could be created.

Table 3: Contact person list for coastal warnings

NMHS's contacted	Status of participation	Comments on progress	contact info	Responsible/contact person	Status of Shape Files	Awareness levels mean wind speed		Comments	high/low water level	storm surge	high waves	thunderstorms	low visibility	icing
Belgium	Waiting for confirmation	on-time, no response this year	ludo.vanderauwera@rmib.be	Ludo Van der Auwera	delivered	8 bft 17 m/s	10 Bft 25 m/s							
Denmark	Will not participate	Coastal warnings in MeteoAlarm	kjs@dmi.dk	Knud-Jacob Simonsen										
Finland	CONFIRMED	on-time, some delays possible	hannele.kaija@fmi.fi	Hannele Kaija	delivered	11 m/s 14 m/s	14 m/s 24 m/s	summer season winter season						
France	NOT THIS YEAR	join in future?	cyrille.honore@meteo.fr	Cyrille honore										
Germany	CONFIRMED	on time	sabine.krennovsky@dwd.de	Sabine Krennovsky	delivered	6 Bft 11 m/s		warning categories: basic/storm/heavy storm-hurricane				thresholds on the left applied		
Ireland	CONFIRMED	on-time	gerald.fleming@met.ie aidan.kelly@met.ie; kieran.commins@met.ie	Gerald Fleming; Aidan Kelly, Kieran Commins	delivered	8 bft 17 m/s	10 Bft 25 m/s	Mean wind speed						
Netherlands	CONFIRMED	on-time	Frank.Kroonenberg@knmi.nl kees.lemcke@knmi.nl	Frank Kroonenberg, Kees Lemcke	delivered	6 Bft 11 m/s		on-time						
Norway	CONFIRMED	on-time; waiting for more contact names	ole.nielsen@met.no	Ole Nielsen	delivered	51 km/h 14 m/s	65 km/h 24 m/s	In SE part of Norway the thresholds are 1 bf lower	yes	yes				
Portugal	NOT THIS YEAR	Planning to participate later	filipe.ferreira@meteo.pt; clara.freitas@meteo.pt	Filipe Ferreira, Clara Freitas										
Spain	Waiting for confirmation	on-time, no response this year	aalcazar@inm.es; mvf@inm.es	Angel Alcazar	delivered	7 Bft 14 m/s		see more detailed definitions in Appendix x	yes					
Sweden	CONFIRMED	on-time	Bengt.Lindstrom@smhi.se	Bengt Lindström	delivered	14 m/s	25 m/s		yes					yes
UK	NOT THIS YEAR	will probably join later (?)	Patricia.Boyle@metoffice.gov.uk	Patricia Boyle										
Estonia	CONFIRMED	on-time	taim.paljak@emhi.ee or juhan.hinnov@emhi.ee	Taimi Paljak, Juhan Hinnov	delivered	11 m/s	16 m/s							
Cyprus	CONFIRMED	slight delays expected, waiting for more info	mpapadakis@ms.moa.gov.cy; mathoospapadakis@gmail.com	Mathcos Papadakis	in progress?									
Greece	NOT CONFIRMED	no response	mavroudakis@hnms.gr; tmavrou@hnms.gr	T. Mavroudakis										
Island	CONFIRMED	waiting for more info	hrafn@vedur.is	Hrafn Gudmundsson	in progress?									
Italy	NOT CONFIRMED	no response	monucci@meteoam.it; enzo1@meteoam.it	Massimiliano Monucci										
Kroatia	CONFIRMED	some delays expected, waiting for more info	Zoran.Vakula@cirus.dhz.hr	Zoran Vakula	in progress?				PROBABLY	PROBABLY	PROBABLY	PROBABLY		
Latvia	CONFIRMED	on-time	andris.viksna@lvgmc.lv	Andris Viksna	delivered	15 m/s	25 m/s						YES 500m/100M/	
Lithuania	NOT THIS YEAR	will join later	v.rakiene@meteo.lt	Vida Rakiene										
Malta	will not participate	coastal warnings issued in MeteoAlarm	Charles.Galdies@maltairport.com	Charles Galdies										
Romania	NOT CONFIRMED	no response												
Poland	CONFIRMED	on-time, waiting for more info	edyta.wozniak@imgw.pl; rafal.szewczyk@imgw.pl	Rafal Szewczyk, Edyta Wozniak-Dudzinska	delivered				PROBABLY			YES	YES	PROBABLY
Slovenia	IN PROGRESS	waiting for more info, delays expected	ales.poredos@rzv.si	Ales Poredos	in progress									

Action D.2
Definition of the coastal zones

The approach stressed by WMO for Disaster Risk Reduction, emphasize that an early warning system should as far as possible cover all relevant risk types related to weather hazards and natural disasters. A gradual implementation of a comprehensive set of alert parameters in MeteoAlarm was therefore necessary and will strengthen its role as a true multi-hazard system. Multi–hazard warning systems have also the advantage that alerts which require attention only very rarely can be cost effectively communicated through an established service frame work.

Coastal sea warnings, typically issued due to strong wind, storm surge, high/ low water level, fog, thunderstorms etc., are targeted mainly (but not solely) to civil people that practice various outdoor activities over the sea/large lakes near the shore or immediately at the shore line. Such activities include sailing, motor boating, swimming, canoeing etc. Considering the sensitivity of these activities to adverse conditions, thresholds for specific awareness levels for coastal warnings should be set somewhat lower relative to warnings issued for open sea areas adjacent to coasts and targeted to vessels that withstand severe marine conditions. However, it should be noted that some categories of coastal warnings, such as storm surge and exceptionally low water level, can be useful for larger vessels as well.

Also worth mentioning is that awareness and alert information for coastal waters are limited to national waters only. The width of the national coastal zone is 20 nautical miles that is also taken into account at the present Meteoalarm Coastal Warnings.

Action D.3
Visualization of coastal warnings on the Meteoalarm internet site

The generated awareness and alert information are shown on www.meteoalarm.eu as coloured zones. Symbols are illustrating the type of severe event associated with the awareness colour will be added. More detailed information on warnings will be accessible by clicking on an appropriate area or label on the screen.

Action D.4
## Technical implementation

Task 1: Constructing shape files for the coastal zones

- Participating EMMA members provided names and shape files for the coastal sections. The shape files included the necessary data on polygons for visualization of the sections
- Harmonization of the shape files into a consistent set of coastal zones.

The implementation of shape files and handling of coastal awareness data required an upgrade of the software. Furthermore the sent shapfiles must be edited before they are published.

By preparing and the use of shapefiles, which store the spatial information of a country and its coastal zone, the coastal zones can be defined. Spatial analyzing and modeling methods and the provided information about the national conventions for coastal zones from each country affect the delimitation of the coastal zones. All the sent shapefiles will be collected and harmonized. A method of smoothing was applied to generalize the coast. It depends on the smoothing method, the algorithm decides whether the content can be removed or not. It may happen that Islands or a lighthouse be omitted. What is most important is that every visitor of the website is able to see/read the coastal zones and alerts easily.

Figure 9: Coastal Zone of Spain
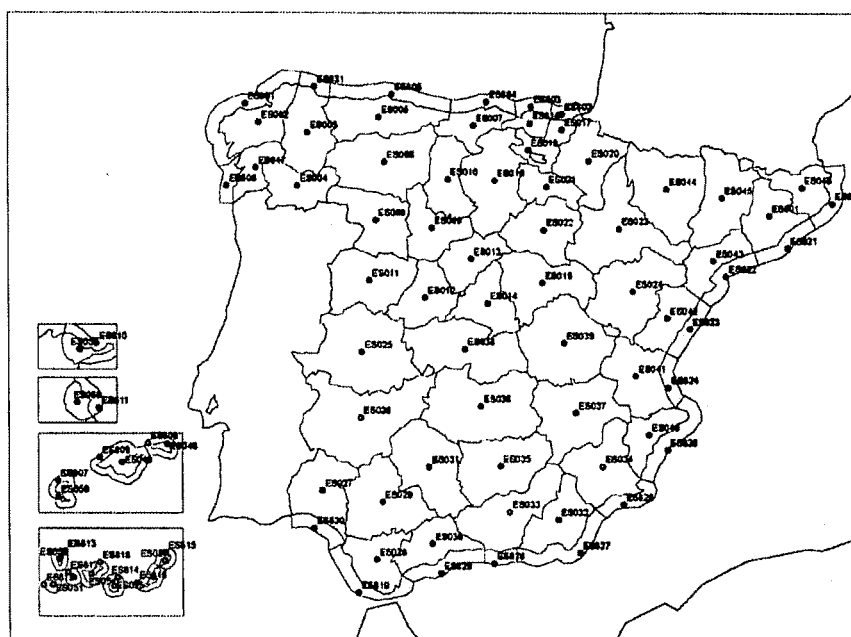
Harmonization of the use of different warning levels has constantly been seen by the users as one of the main benefits of the EMMA system. The concepts for thresholds approach each other slowly due to systemic discussions in the expert meeting, the discussion forum and exchange of opinions during and after critical situations which require a cross boarder exchange.

The EMMA system calculates permanently the use of the different alter levels per country and parameter/warning element and displays this at the EMMA Intranet. All users can see these values, compare themselves to their neighbours and eventually adjust their warning schemes if necessary and feasible

Task 2: Collect a list of warning types with thresholds of awareness levels. As a minimum, members included thresholds for wind speed warnings/awareness.

Task 3: Establishing a trial EMMA intranet web site for coastal warnings

Task 4: Test phase

Action D. 5
Test phase

After the testing phase was successfully completed, Meteoalarm was officially launched Coastal Warnings. Different user groups were asked to give feedback on the performance and contents of service. The test phase was closely monitored. Modification based on this feedback and some changes are being improved on the site.

Results and conclusion

The coastal sea areas, as defined by the NMHSs and harmonized at FMI, appear in Figure 11 together with the land areas of Meteoalarm.

The table 3summarizes the information on all contacted NMHSs as regards the contact info, status concerning the implementation of coastal sea warnings, thresholds of alert levels for wind speed, and other coastal sea warnings planned to be included.

Further tuning of the width of coastal sea zone would be desirable. On some coasts the zone could still be wider (see Ireland) in order to be clearly visible on the European scale map. The coastal sea areas should also appear at lower levels of Meteoalarm with symbols showing the type of alert involved.

Figure 11: The land areas and coastal sea zones/areas as defined by the time of the test phase of the project.
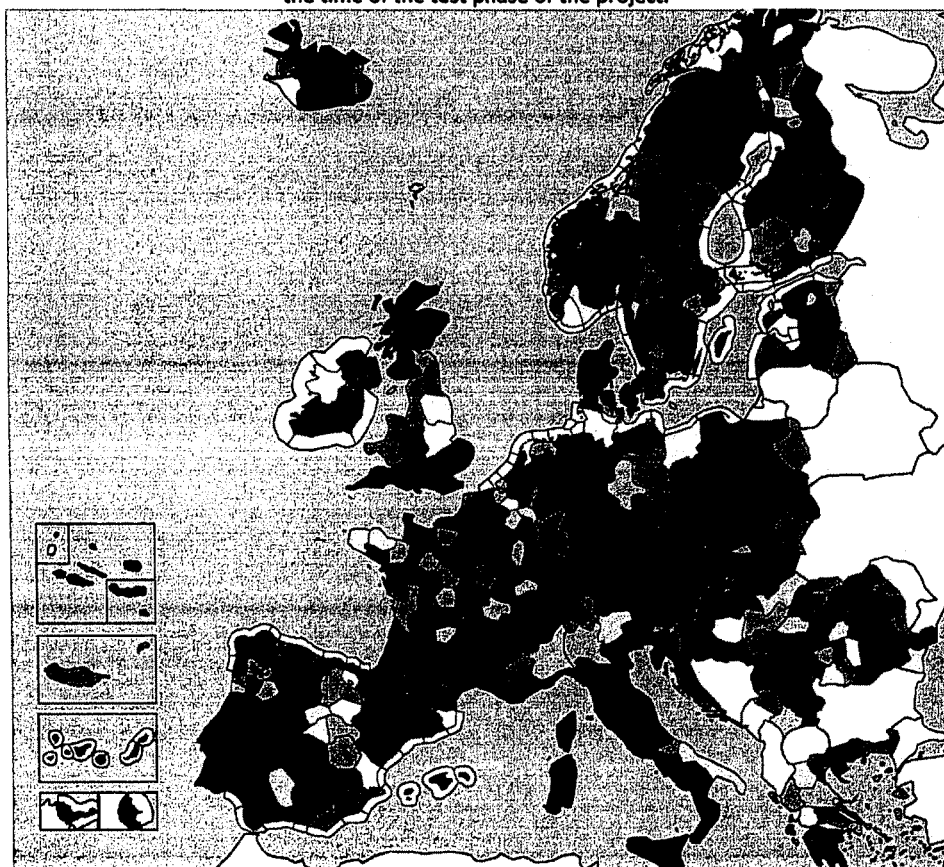
6. Communication

Task ID	E	Task Title	Communication

- Communication on the project progress towards the NMS's producing the EMMA/Meteoalarm website input
- Communication towards the targeted users of the EMMA/Meteoalarm website on the website and its extended content

The good and efficient cooperation between the Bidder and the Programme Manager (PM) on the one hand and the consistent and constructive collaboration between the Advisory Board and the Expert Members is what makes Meteoalarm successful. This is also reflected in the creative and user friendly Meteoalarm website. The structure in which the developments lead to these results was achieved by a very well defined and carefully chosen communication strategy. This communication strategy brought success in the past project periods. In order to get the same performance we intend to continue on this chosen communication strategy.

Presentations of Meteoalarm have been given two recent seminars on weather warning systems by the World Meteorological Organization (WMO) and the International Strategy for Disaster Reduction (ISDR). The Monitoring Information Centre of the European Commission (EC) attaches importance to Meteoalarm.

Action E. 1
Internal communication

Meteoalarm keep over 30 National Meteorological Services (NMS's) informed. These include notification and information on the project, its progress and actions needed on the NMS side to deliver the proper input. Keeping the internal communication within the programme up and running by assisting the general Programme Manager and by performing independent activities towards to other Meteoalarm members involved. The Communication Plan, Newsletters, Meetings and frequent eMail notices support this action.

Preparing and publishing internal Newsletters that is also a part of the internal communication. It is very important to keep all Meteoalarm members up to date.

Assisting the Programme Manager preparing Expert member meetings and introduction meetings with new Meteoalarm members needs sophisticated communication channels. The Meteoalarm Project Management Team and members are very satisfied with the internal communication and we can continue in the way that we have done so far.

Action E. 2
External communication

The external communication is progressing well. Task on the external communication include informing all potential users and National Meteorological Services (NMS's) on the website and its extended content. Differences are made between General Users and Specially targeted groups (e.g. Civil Protection) that is accurately defined by the Communication Plan. The expected result of an optimal cooperation between all parties involved during the extended features project period worked very well.

Information Brochure

To address a wider audience with a print product and to give the public and professional users an overview about the new features of the EMMA Programme, the following brochure was created and edited. The leaflet explains the new icons for flood and the combination rain and/or flood and gives a short overview on the present features, the meaning of the warning levels and the participating National Meteorological Services.

meteoalarm
alerting europe for extreme weather

What dangers do you face?

Torrential rain, floods, spring tides, storm surges and coastal erosion, gales, severe thunderstorms, heatwaves, forest and heath fires, fog, extreme cold and blizzards, freezing rain and severe frost, avalanches . . . . .

Are you planning to travel, for a business trip or holiday? Perhaps camping, climbing or enjoying the beach? Would you like up-to-date information on potentially hazardous weather today and tomorrow?
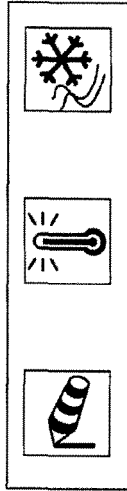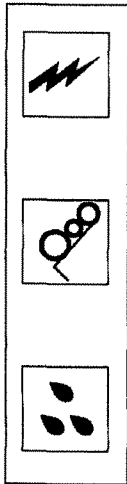
The Meteoalarm.eu website identifies the risks, covering 650 regions in the whole of Europe at a glance.

The website is plain and clear, using easily recognizable symbols. It is simple to click onto regional and local warnings, and the websites of the various European national weather services.

Tourists, travellers, truck drivers, businessmen, the emergency services, aid and relief organizations the media - everyone can be warned without any language barriers.

www.meteoalarm.eu

Photo: J. Bouwknecht

Four colours

Green	Is your area coloured green? Then there's nothing to worry about.
Yellow	Yellow means potential danger. The weather is unlikely to be really abnormal but care is called for in activities that are dependent on the weather. Keep a check on the weather forecasts and warnings and run no unnecessary risks.
Orange	Orange means danger. There is a forecast of severe weather that is very likely to cause damage or accidents. Be careful and keep abreast of the latest warnings and developments in the weather. Keep in mind the risks, which may be unavoidable. Take heed of all advice given by the authorities.
Red	Red means extreme danger from exceptionally severe weather. Major damage and accidents are likely, in many cases with threat to life and limb over a wide area. Pay constant attention to bulletins on developments and to warnings, and obey the instructions and advice given by the authorities under all circumstances. Keep in mind that exceptional measures may be taken.

Photo: P. de Vries

Photo: A. Eektimmerman

meteoalarm
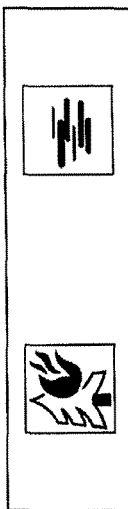
International and reliable

The website has no language barriers because standardized symbols are used. It makes no difference whether you come from the north or south of Europe . . . Everyone, millions of travellers, can understand Europe's "dangerous weather" charts.

The warnings and danger levels imminent in about 650 different regions covering 30 countries are visible at a glance. Special links lead you to extra information in any language you desire. For colour-blind users the coloured weather chart can be converted to black and white tints.

The warnings are also available via RSS feeds, an alternative method to access Meteoalarm on other internet sites.

Meteoalarm is a system integrating the official weather warnings of each participating country's national weather service, in cooperation with hydrologists. It is based on the most up-to-date information from the worldwide meteorological network, and on computer model analysis of the weather expected.

Photo: WMO

Cooperating weather services

Zentralanstalt für Meteorologie und Geodynamik (ZAMG)
L'Institut Royale Météorologique (RMI)
MeteoSwiss
Meteorological Service of Cyprus
Czech Hydrological and Meteorological Institute (CHMI)
Deutscher Wetterdienst (DWD)
Danmarks Meteorologiske Institut (DMI)
Estonian Meteorological and Hydrological Institute (EMHI)
Agencia Estetal de Meteorologia (AEMET)
Finnish Meteorological Institute (FMI)
Météo France
Hellenic National Meteorological Service
Meteorological and Hydrological Service (Croatia)
Hungarian Meteorological Service (OMSZ)
Met Eireann
Icelandic Met Office
Servizio Meteorologico Aeronautica Militare
Luxembourg Meteorological Service
Meteorological Service of Latvia (LVGMC)
Malta Airport Metoffice
Koninklijk Nederlands Meteorologisch Instituut (KNMI)
Norwegian Meteorological Institute (met.no)
Polish Institute of Meteorology and Water Management (IMGW)
Instituto de Meteorologia IP Portugal
Meteo Romania
Republic Hydrometeorological Service of Serbia (RHMS)
Swedish Meteorological and Hydrogical Institute (SMHI)
National Meteorological Service of Slovenia (meteo.si)
Slovenský Hydrometeorologický Ústav (SHMU)
UK Met Office

Colophon

Text by Harry Geurts, KNMI / Translation: Donald Hatch
Concept by Studio KNMI / Published by KNMI, The Netherlands

www.meteoalarm.eu is developed by ZAMG for Eumetnet, the Network of European Meteorological Services. This initiative is also supported by WMO, the World Meteorological Organisation and the European Commission.
Copyright: KNMI, De Bilt, The Netherlands, 2011
Source: Michael Staudinger, ZAMG, Austria

www.meteoalarm.eu

Up-to-date warnings of dangerous and extreme weather across Europe available via the internet.

Weather warnings: Europe

A cooperative initiative by more than 30 European countries' national weather services

Web-Statistics

The website www.meteoalarm.eu was very well accepted by the public. The numbers of hits increased continuously with the higher attention the public, the media and professional users. The number of hits increased by 36% in comparison to 2009. The following figures (Figure 10, Figure 11 Figure 12) show the statistics of the www.meteoalarm.eu website for 2010 for hits, unique visitors and numbers of visits and transferred bytes.
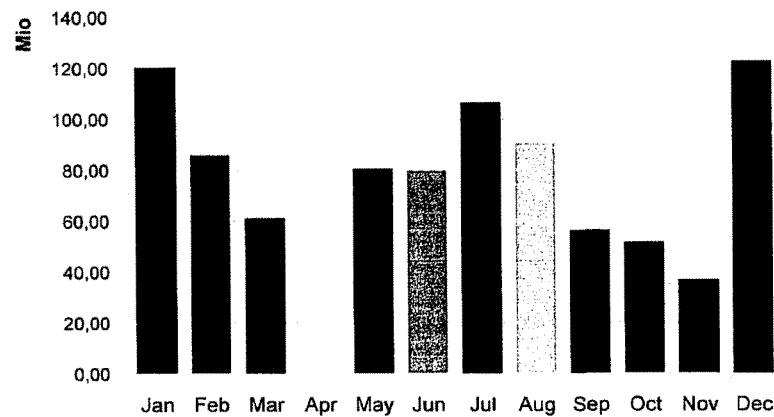
Figure 10: Monthly history 2010 – hits

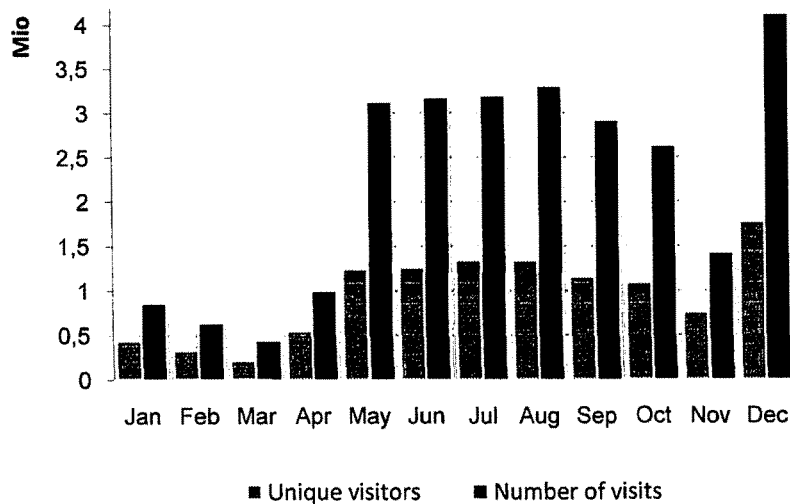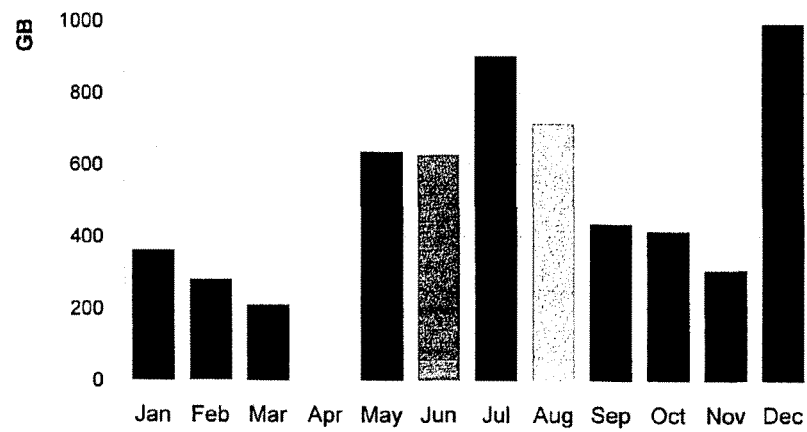Figure 11: Monthly history 2010 - visitors

■ Unique visitors   ■ Number of visits

Figure 12: Monthly history 2010 - transferred bytes

These figures demonstrate how well the system fits to the needs of its users and with how little financial effort a high audience can be reached if the provided information is well structured and technically adaptable via e.g. RSS feeds.

7. Project Management

Task ID	F	Task Title	Project Management

A well structured Project Management ensured that the objectives are well met, the project time schedule is visible to all partners and subcontractors ensured. A very tight reporting schedule guaranteed this visibility also towards the Commission and its involved bodies, especially the MIC, who is a direct user of the project results.

In case of upcoming problems concerning the organizational or technical realization of the project the Project Management develops viable solutions together with the other project participants.

Action F.1
Implementation of the Project Coordination: Project, Advisory Board, PM

The following chart below shows the Meteoalarm Project structure. The key tasks within this Project Coordination are to ensure the flow of information and to continue decision making at a high level.

It is the duty of the Advisory Board to advice the Programme Management. It was the plan that the Advisory Board working group would include approximately 7 person of Civil Protection, representative Users and the MIC. This Board was supposed to meet twice a year at different locations Europe-wide. Control and Monitoring of the Project Plan and direct implementation of user and project needs were to be discussed in these regular meetings. Furthermore necessary updates of the Project Plan in case of organizational or technical problems are building the center of attention. As the establishment of a formal Advisory Board was very complicated due to time constraints of Advisory Board members, the cooperation with the Advisory Board occurred in a more informal manner. A direct feedback from representatives of civil Protection bodies in Austria, Finland the Netherlands and the MC was obtained during the Project timeline.

METEOALARM-EF   Project structure – Information flow
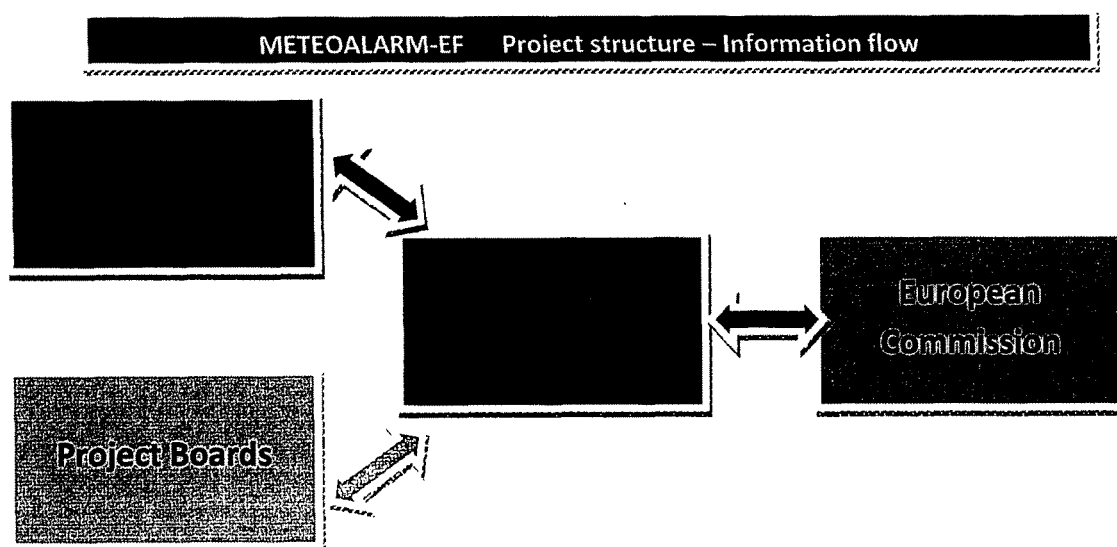
Action F.2
Monitoring of project results and feedback to different actors

The task of the Programme Manager is to monitor the project results in a clear and understandable way. The performance indicators based on the (i) Status of technical achievements, (ii) Number of participating countries in various actions and (iii) Usage of the information on the website.

An overview of the project results with clear indicators during the whole duration of the project is published to the Project and Advisory Board, when the project is finished. A further task that the different actors were introduced to was the structure of debriefing. The purpose is to think about the working method and to reflect on it.

Action F.3
Regular reporting

Regular reporting on the status of the current project status is useful and extraordinarily important. Regular and detailed reports give all partners the necessary oversight on the project development.

In addition to this Final report an intermediate report have been published during the course of the project.

Action F.4
Organization and realization of user meetings

The organization and realization of user meetings is the work of the Project Management. The user meetings during the project period were held with the partners from EMMA group, Civil Protection and representatives from the MIC. The focus of these meetings was to define common interests, review on the project results and discussion on the implementation of the project results. The output and the result of user meeting aims, clear formulation of detailed user requirements and direct implementation of the necessary features. By the user meeting e.g. in Budapest, Geneva and Lelystad further steps have been taken in this direction.

The process of performing a good Project Management requires a lot of work. Due to the delay of the initial timetable the Project Management got shortened. The total project execution has been carried out within 12 instead of 16 months. The project coordination was mostly performed per email, telephone calls, conference calls and direct contacts.

8. Resumee

Meteoalarm can record an increased interest by the media, the public and professional institutions. The website attracted 36% more users than in 2009, more than 1000 websites link to Meteoalarm or have placed "deep links" which show permanently the map of the distribution of alert levels.

3 more new partners joined the EMMA Programme in 2010, one more went online during the year, after he had joined the Programme the year before.

The widening of the partner area is a clear sign of the straightforward approach of the Meteoalarm alert level system and its capacity to be employed by other NHMS after the necessary internal restructuring and definition of the information channels with public and professional users. All new partners reported increased media attention to their own products after the internationally announced launch of their active participation.

Michael Staudinger 28.3.2011