Deutscher Wetterdienst

The Multi Hazad Early Warning System in Germany

FeWIS

A Weather Information System for Disaster Management

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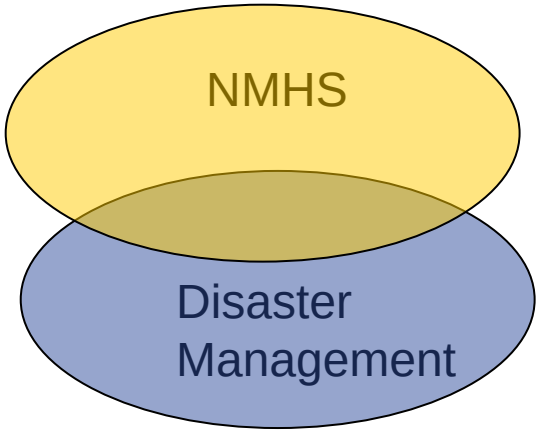
Content:

- **Early Warning Systems under the aspect of Service Delivery**
- **Disaster management: structures in Germany**
- **DWD Early Warning System**
- **FeWIS - the unique Information Platform**
- **Lessons learned**

Components of Multi Hazard Early Warning Systems:

- **Hazard forecasting**
- **Issuance of warnings**
- **Risk analysis**
- **Activation of emergency plans**



If one component fails, the whole system won‘t work. -> ***A good cooperation between NMHSs and disaster management is needed***

MHEWS under the aspect of Service Delivery

- **Availability - Does the information meet my needs?**
- **Dependability - Will the information be delivered on-time, without fail?**
- **Usability - Is the information presented understandable?**
- **Credibility - Can I have faith in this product and advice?**

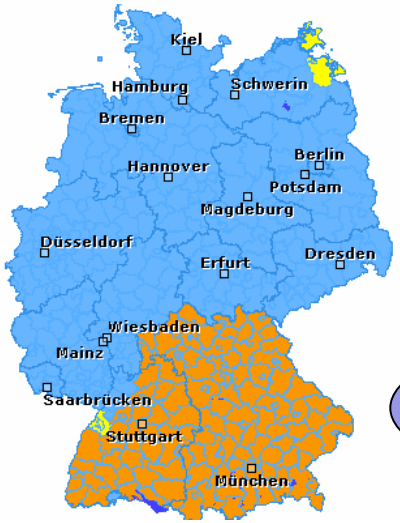
- ***This means for NMHSs and disaster management:***

Strong interaction between them is needed!

Disaster Management: structures in Germany

Disaster Management structures

In Germany, disaster management lies in the responsibility of the 16 Federal States



Federal States

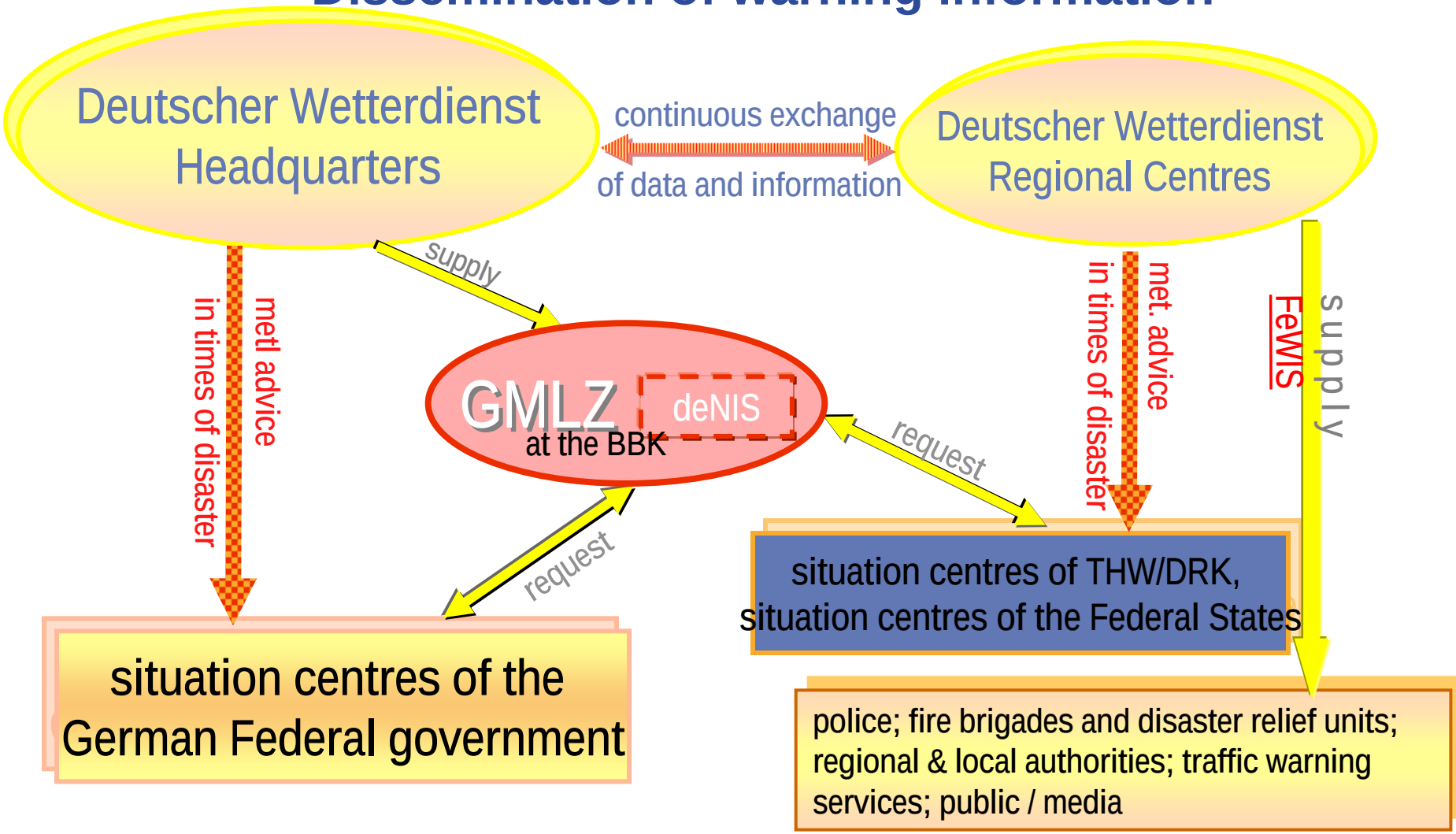
Regional Emergency Situation Centres

Joint Emergency Centre (GMLZ) of the German Federal government

approx. 210 district and 400 fire brigade control centres

- volunteer fire brigades (about 24.000)
- police, THW (Germany's central disaster relief organisation)
- other emergency and relief organisations (e.g. Red Cross (DRK))

Dissemination of warning information



DWD Early Warning System

Deutscher Wetterdienst

Bundesministerium
für Verkehr, Bau
und Stadtentwicklung

The Deutscher Wetterdienst is responsible to the Federal Ministry of Transport, Building and Urban Affairs (BMVBS)

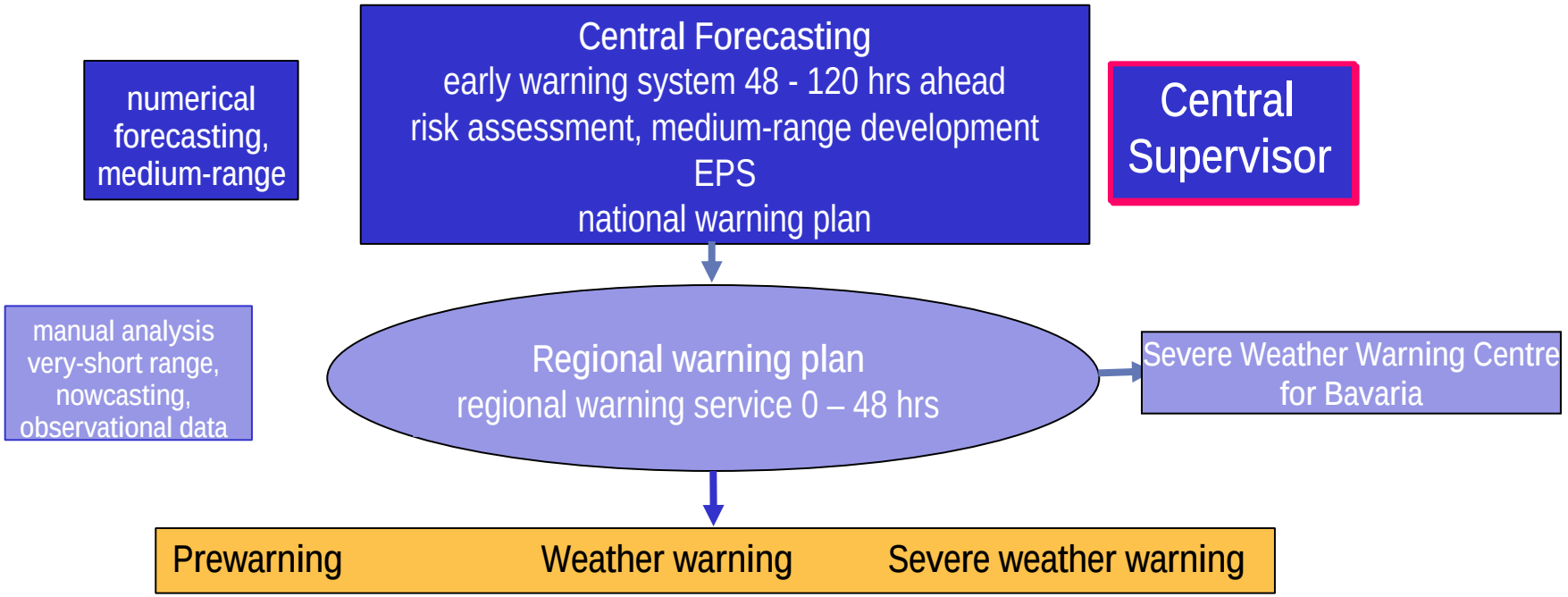
One main task is to issue and deliver warnings of severe weather events to save lives and property.

Legal Basis:

➔ Law on the DWD of 10 September 1998, last amended by the Law on the establishment of a Federal Supervisory Authority for Air Navigation Services and on the amendment and adaptation of other provisions and regulations of 29 July 2009.

DWD Warning Management

Weather monitoring and warning of dangerous weather phenomena is assured 24h/7d and thus is a personnel-intensive task.



- emergency situation centre, fire brigade, police, THW (Germany's official disaster relief organisation)
- traffic warning service
- media/public (radio/television, internet, SMS)

Definitions and lead times of warning information

	0 - 2 h	2 - 12 h	12 - 48 h	48 - 120+h
Definition Forecast	Nowcasting	Very short range	Short range	Medium range
Definition Warning DWD	Warning / Severe Weather Warning		Prewarning / Early Warning	
Definition Disaster Prevention	Warning		Early Warning	

The DWD Early Warning System consists of 3 levels

(Severe) Weather Warning
12 to 0 h ahead

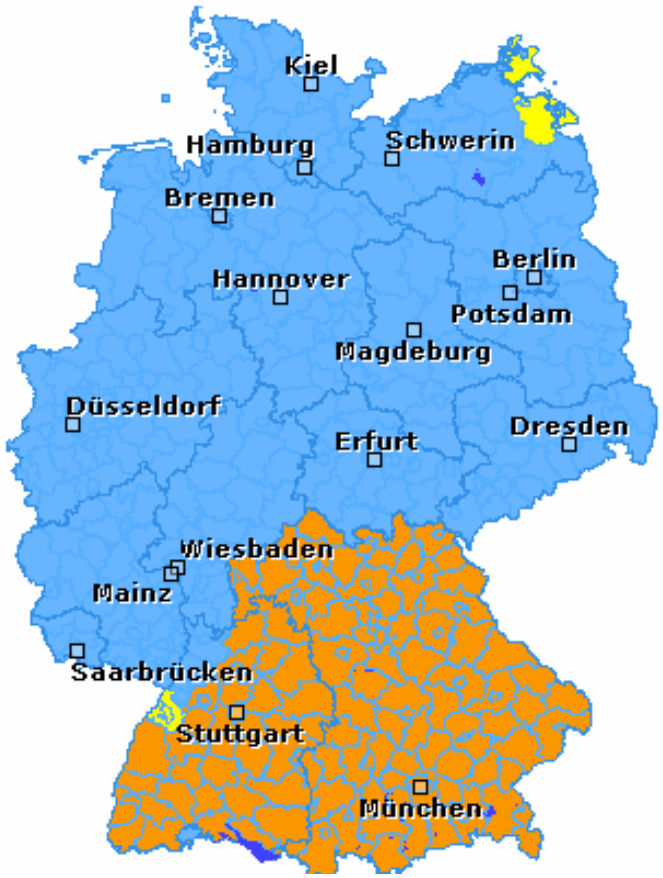
Regional hazard bulletin
24 h ahead
updated 4 times per day

Prewarning
48 to 6 h ahead
for preparation only in case of expected severe weather warning

Early Warning
Hazard Bulletin for Germany
daily updated
7 to 2 days ahead

The spatial and the timely scale of all warning information are closely connected

Weather Warnings



DWD issues 27 different types of warnings for about 450 districts in Germany and approx. 1000 height levels

All warning and additional Bulletins are well defined and regularly evaluated in cooperation with disaster management

The whole warning process is certified ISO 9001

Wetterwarnung
Warnung vor markantem Wetter
Unwetterwarnung
Extremes Unwetter

- **no serious event, but be wakeful**
- **some operations possible**
- **serious event, emergency plan is activated**
- **extreme event**

Warning criteria and thresholds

The warning criteria and thresholds are closely related to the experiences and operations of the disaster management authorities, so that they fit into the above definitions.

Due to clear information all warnings include the lead time, the valid time and the time of issuing

Meteorolog. Erscheinung	Schwellenwert	Bezeichnung
Wind	90 bis 104 km/h	Windböen
		Sturmböen
		Schwere Sturmböen
		Orkanartige Böen
		Orkanböen
		Extreme Orkanböen
		Nebel
		Starkregen
		Heftiger Starkregen
		Dauerregen
		Ergiebiger Dauerregen
Dauerregen	≥ 70 l/m² in 12 Stunden ≥ 80 l/m² in 24 Stunden ≥ 90 l/m² in 48 Stunden	Extrem ergiebiger Dauerregen
Schneefall in Lagen bis 800m	bis 5 cm in 6 Stunden bis 10 cm in 12 Stunden	Schneefall

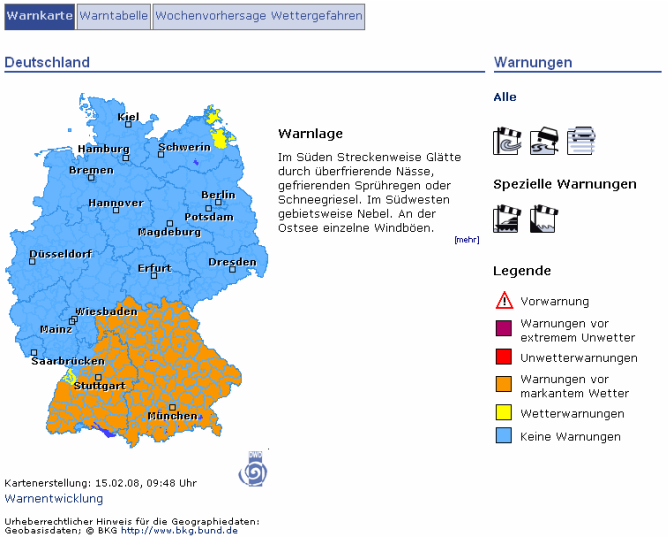
Heat Warning System sucessfully implemented

- Heat warnings operational since 19 May 2005
- Dissemination to some thousand retirement and nursing homes (in co-operation with Federal States)
- Number of people affected by heat waves has decreased

Warning information for the public

2007 DWD launched a survey on public warning:

- **The general public must be informed about a warning situation via TV/radio.**
- **They should have access to more detailed information via the internet.**
- **Warnings should be easy to understand and tell the public what to do in case of severe weather.**
- **Warnings should be issued 6 to 12 hours before the event. A lead time of some days is too long.**



Dissemination of severe weather warnings and information

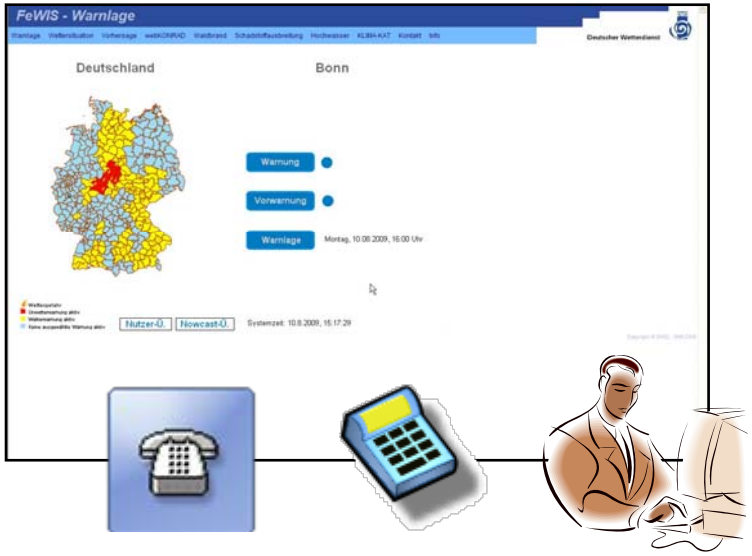
Information of general public and disaster management

www.dwd.de

Internet + Newsletter

special media bulletin, media training

www.fewis.dwd.de

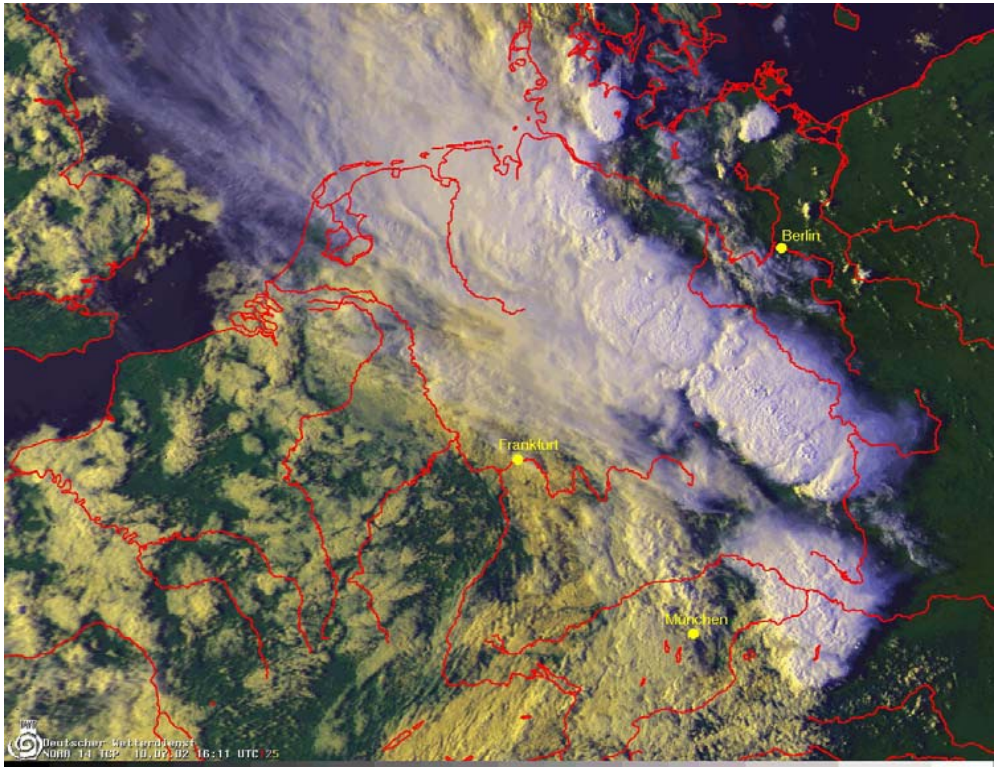


Hotline + SMS + Email + Fax

FeWIS - the unique Information Platform

July 2002 „Genesis“ of FeWIS

Quelle Fotos: Berliner Feuerwehr



Development of FeWIS

- In July 2002, Berlin was hit by a severe thunderstorm. Although the DWD had issued severe weather warnings hours before the event, fire brigades were not sufficiently prepared due to lacking trust in the forecasts and the fact that important additional information was missed.
  Two children were killed.
- Together with the Berlin fire brigade, the DWD developed a prototype of a new web based information system for disaster management (FeWIS). Operation plans were analysed to find out which information is relevant and which not.
- FeWIS contains customized warnings and graphical as well as textual information and started with great success. Up to now FeWIS has developed into the most important severe weather information tool for disaster management in Germany. It's the glue of cooperation!
- By now, FeWIS counts over 1400 customers of DRM in Germany.

„Philosophy“ of FeWIS

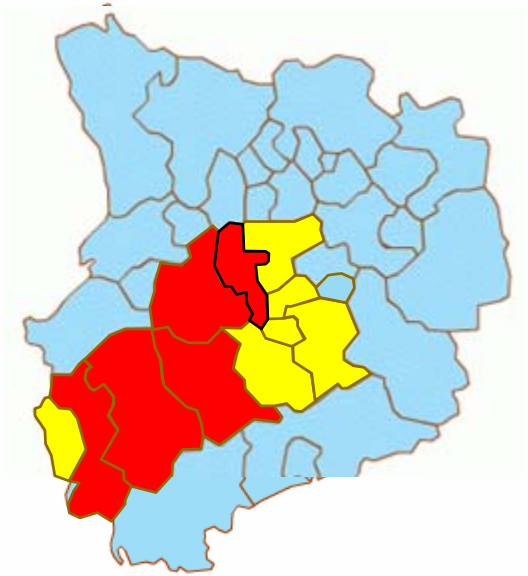
- FeWIS is an customized information platform.
- one system for different authorities – which contains all necessary advisory information from different departments
- always up-to-date thanks to online updating
- training courses
- developed in co-operation with disaster management organisations (e.g. warning thresholds)

FeWIS services

- individual warning information
- current weather and forecasts
- WebKonRad – thunderstorm prediction system
- forest fire danger index
- HEARTS - dispersion of toxic substances
- flooding information (link)
- basic climate information for regional risk analyses

FeWIS – Warning Information Tool

Düsseldorf mit Umgebung



Unwetterwarnung aktiv
Wetterwarnung aktiv

Düsseldorf

Aktuell

Gewitter mit Starkregen

Ab 16.00 Uhr zunächst in den westlichen Stadtteile, dann auf die östlichen Stadtteile von Düsseldorf übergreifende Gewitter mit schweren Sturmböen und Starkregen, Hagel möglich.

Warnung Starkregen

Vorwarnung

Warnlage Dienstag, 1

8.05.2004, 15:49:05

special severe weather warning for urban areas

additional text information and prewarnings

area of interest and warning type can be defined individually

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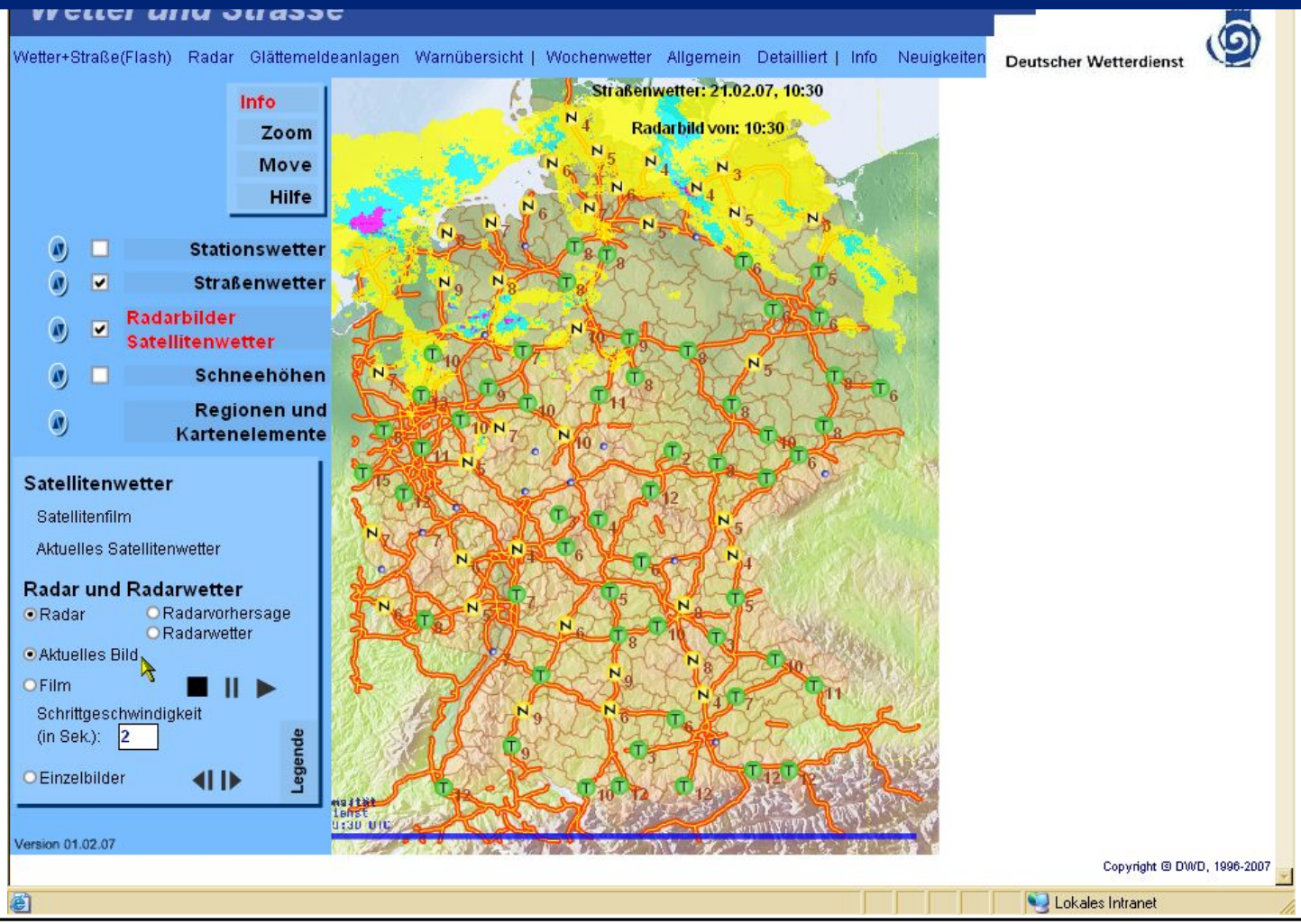
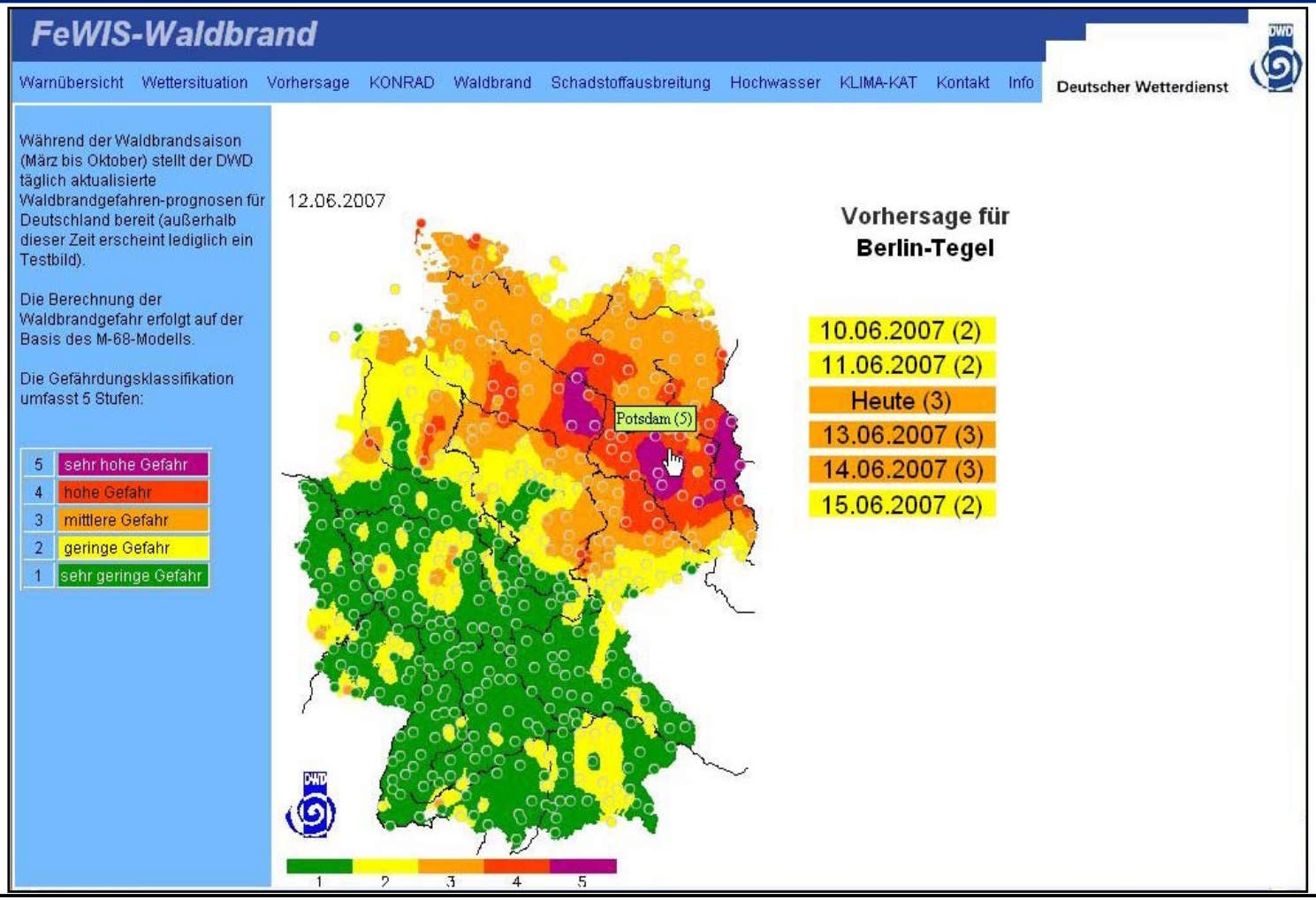
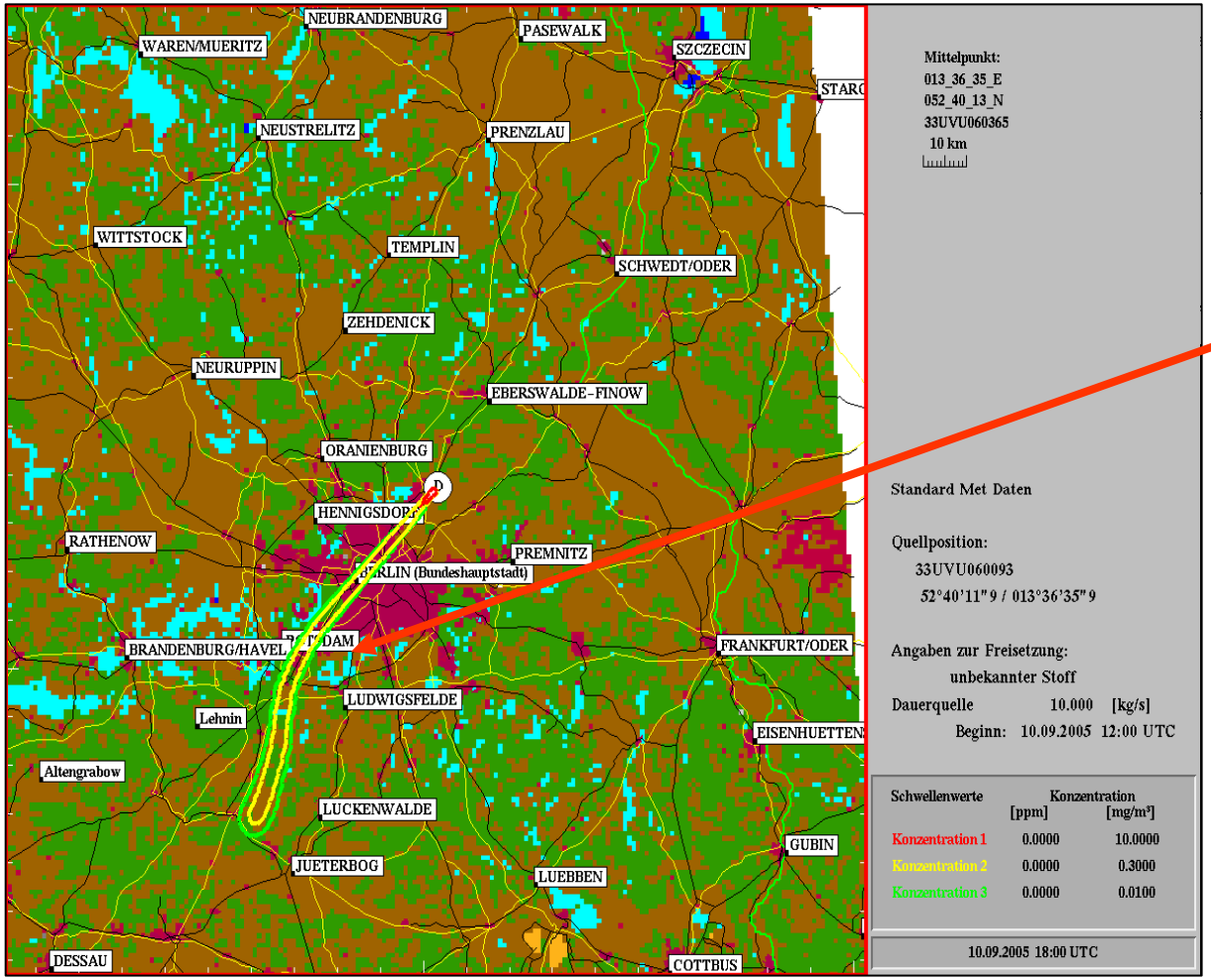
FeWIS – Current Weather



FeWIS – Forest Fire Danger Index



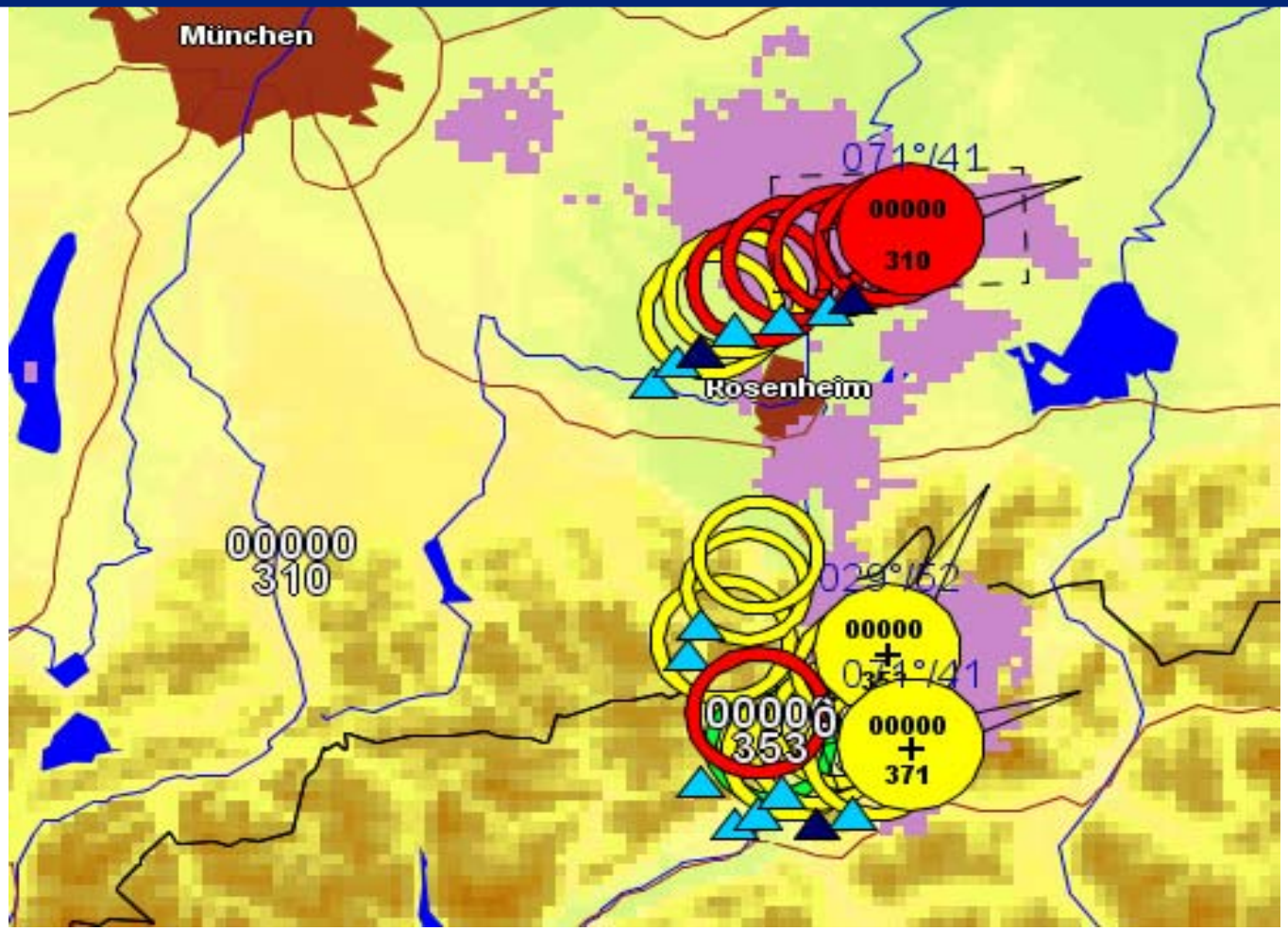
FeWIS – Toxic Dispersion Modelling



HEARTS

In case of incidents or explosions with toxic substances disaster management authorities can request individual dispersion information.

FeWIS – WebKonRad



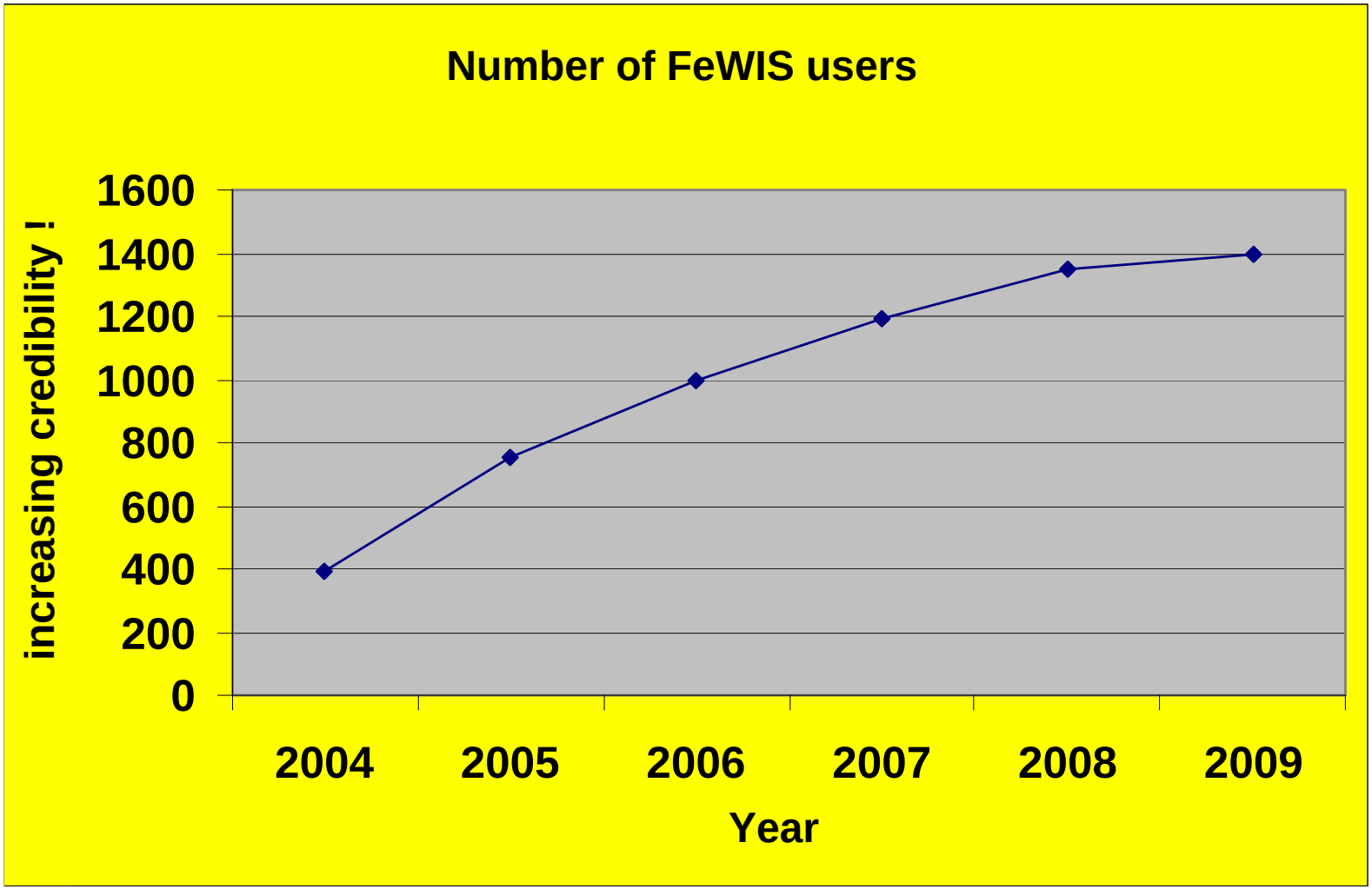
since May 2009

Example
25.08.2009 18:25 UTC
Bavaria

Severe thunderstorm radar tracking and forecasting up to 60 min. ahead

DWD arranges regularly meetings with different disaster management authorities

- central and regional user conferences
- feedback meetings after extreme events (e.g. „Kyrill“)
- training workshops at fire brigade control centres
- gives lessons at the Institut for fire brigades in Münster


Number of FeWIS users
increasing credibility !
1600
1400
1200
1000
800
600
400
200
0
2004
2005
2006
2007
2008
2009
Year

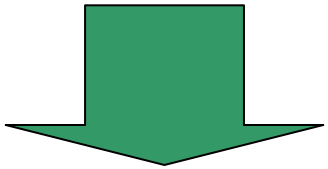
Lessons learned I:

- **NMHSs should meet the needs of the media. They play an important role for public preparedness**
- **A good Early Warning System should follow the 4 rules of service delivery (availability, dependability, usability, credibility)**
- **Improve collaboration with disaster management by:**
  - **arranging workshops on regional and national level**
  - **defining focal points for disaster management**
- **When developing a dissemination system, do it in cooperation with disaster management – keep the information as simple as possible**

Lessons learned II:

- **A high level national platform (top-down) is important but you need also to meet with basic disaster management offices to see how they work and what they need (bottom-up)!**
- **Together with disaster risk management analyse which warning criteria/thresholds are relevant for operation**
- **Quality management is an powerful tool to improve your services**
- **The best early warning information is useless if nobody reads it or trusts in it**

The overall message



Cooperation, partnership and communication in all ranks between NMHS and disaster management is the key for a successful development of EWS

Thank you !

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