EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

Joint Research Centre

Le Reti Europee per l'emergenza nucleare

Marc De Cort

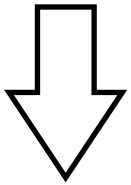
REM, IES, DG JRC, EC

ECURIE

EC - Euratom Treaty - art 35-36
- Basic Safety Standards Directive - art. 45

IAEA - Early Notification Convention (27/10/86)
- Early Assistance Convention (26/2/87)

EC - Council Decision 87/600 (14/12/87)

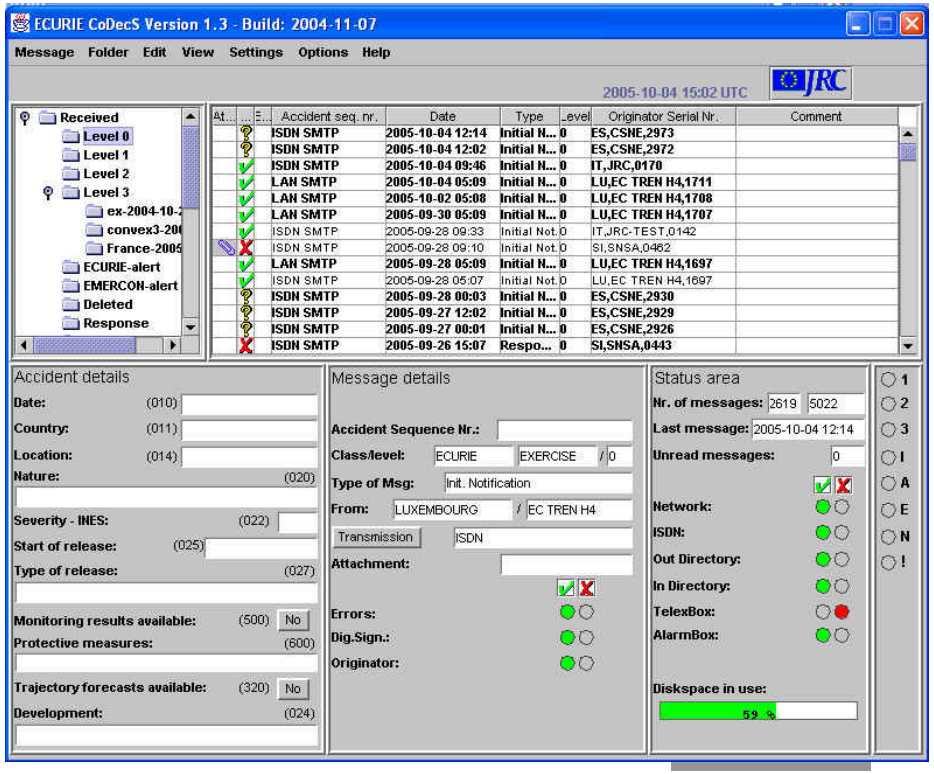


European Commission Urgent Radiological Information Exchange (ECURIE)

European Community Urgent Radiological Information Exchange (ECURIE)

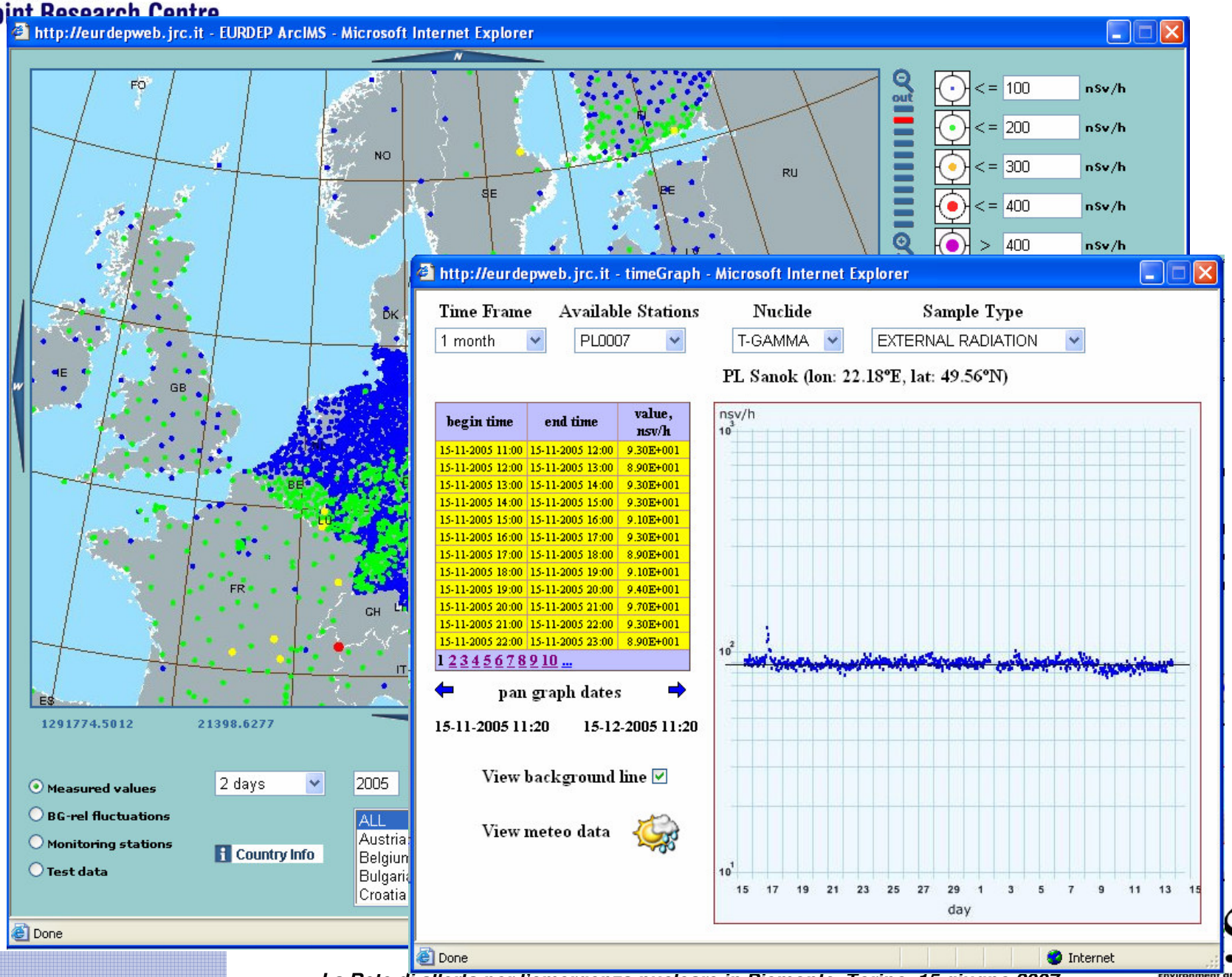
- **Early Notification system for Nuclear accidents, based on 87/600 Council Decision;**
- **24h Contact Points (EU27 + CH + NO)**
- **Transmission of Notifications, Information and Data.**
- **Notifications are created, sent and received by the CoDecS software in use at the CP's and CA's;**
- **compatibility with IAEA**
- **Developed by REM, operated by DG TREN H.4 in Luxembourg.**

http://rem.jrc.cec.eu.int



EUropean Radiological Data Exchange Platform (EURDEP)

- Standard data-format for radiological monitoring data
  - **Used for national and international data-exchange**
    - **EURDEP, CBSS, PDX, EGASKRO, ARGOS, RODOS, IMIS, ECURIE**
  - **EURDEP data-format is included in future IRIX data-format specifications (IAEA)**
- Network for the exchange of monitoring data
  - **Mostly Gamma-dose**
  - **Some other Sample Types and meteo-data**
  - **30 Countries, more than 4200 stations**
  - **Mostly hourly data-exchange, both in routine and emergency**
  - **All data available from 3 FTP mirror-sites: JRC-Ispra (Italy), BfS-Freiburg (Germany), DG-TREN Luxembourg.**
    - **In future also at the IAEA, Vienna (Austria)**
  - **All data visible through Web-site at JRC-Ispra**
    - **At end of 2007 also web-site at DG TREN, 2008 web-site at IAEA.**


http://eurdepweb.jrc.it - EURDEP ArcIMS - Microsoft Internet Explorer
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21398.6277
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< = 100 nSv/h
< = 200 nSv/h
< = 300 nSv/h
< = 400 nSv/h
> 400 nSv/h
Measured values
BG-rel fluctuations
Monitoring stations
Test data
2 days
2005
Country Info
ALL
Austria
Belgiun
Bulgari
Croatia
Done
http://eurdepweb.jrc.it - timeGraph - Microsoft Internet Explorer
Time Frame
1 month
Available Stations
PL0007
Nuclide
T-GAMMA
Sample Type
EXTERNAL RADIATION
PL Sanok (lon: 22.18°E, lat: 49.56°N)
begin time | end time | value, nsv/h
15-11-2005 11:00 | 15-11-2005 12:00 | 9.30E+001
15-11-2005 12:00 | 15-11-2005 13:00 | 8.90E+001
15-11-2005 13:00 | 15-11-2005 14:00 | 9.30E+001
15-11-2005 14:00 | 15-11-2005 15:00 | 9.30E+001
15-11-2005 15:00 | 15-11-2005 16:00 | 9.10E+001
15-11-2005 16:00 | 15-11-2005 17:00 | 9.30E+001
15-11-2005 17:00 | 15-11-2005 18:00 | 8.90E+001
15-11-2005 18:00 | 15-11-2005 19:00 | 9.10E+001
15-11-2005 19:00 | 15-11-2005 20:00 | 9.40E+001
15-11-2005 20:00 | 15-11-2005 21:00 | 9.70E+001
15-11-2005 21:00 | 15-11-2005 22:00 | 9.30E+001
15-11-2005 22:00 | 15-11-2005 23:00 | 8.90E+001
1 2 3 4 5 6 7 8 9 10 ...
pan graph dates
15-11-2005 11:20
15-12-2005 11:20
View background line
View meteo data
nsv/h
day
Done
Internet

Future enhancements

- More countries such as Turkey (ongoing: EWERMS, 78 stations), Cyprus (ongoing: 7 stations), Ukraine (Gamma 1-3, Prototype, Basic radiation monitoring network), Belarus (RCRCM)
- More stations (Russia: through EGASKRO obtain Rosatom, Rosenergoatom, Murmansk, Leningrad stations)
- More Sample types: all monitoring data significant during emergencies should be exchanged
- More Meteo-data from the monitoring stations

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The AIRDOS Project:

Evaluation of existing standards of dose rate; and of sampling, sample preparation and measurement for estimating radioactivity levels in air

Contract with DG TREN H-4

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- et al.

Baseline for final report: Data received by 18 January 2007

AIRDOS: summary

Aim

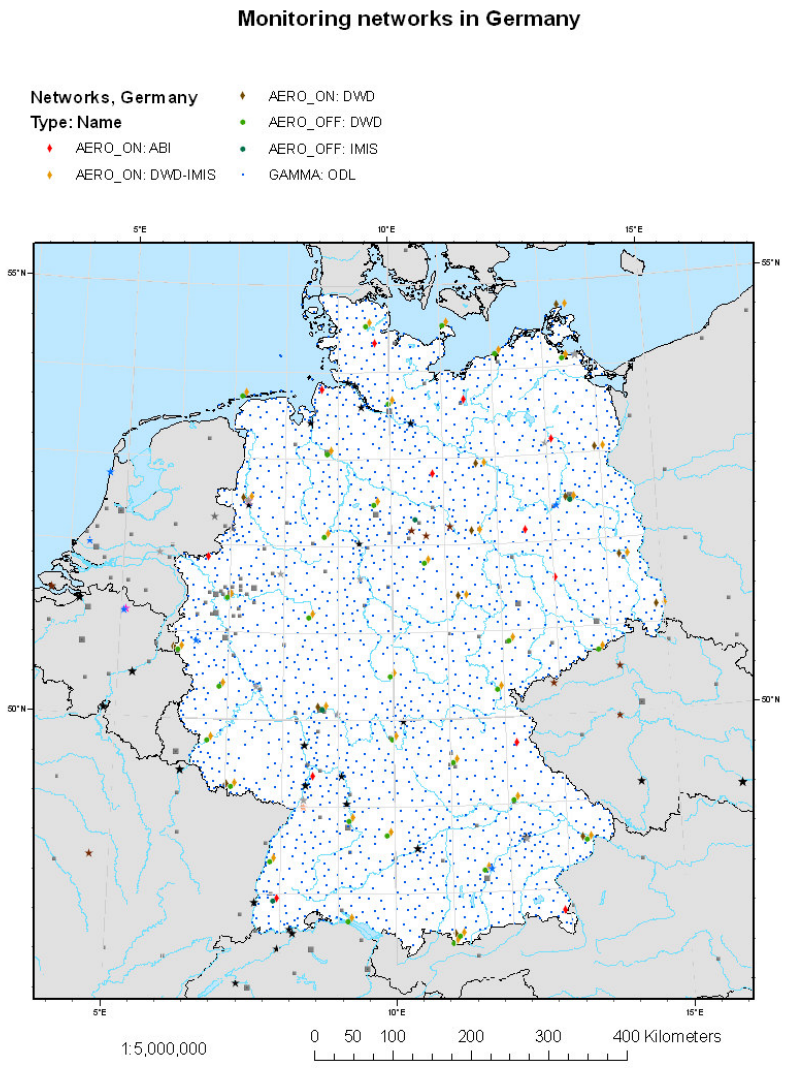
- Inventory of national networks in Europe on gamma dose rate an aerosol (on-line/off-line) measurements
- Identify the differences
- Suggest how to improve the harmonisation at European level

Current status

- Information from 32 countries evaluated
- 7 additional countries contacted
- Finalisation of report as input to Commission Recommendation

Future development

- Link the information to EURDEP
- Develop protocol to continuously update the information



AIRDOS rationale (1)

Situation:

- Monitoring environmental radioactivity requires measuring
- EC/JRC collects data, should be managed in "useable" form
- Data submitted by >30 countries (EU & non-EU)
- Nearly every country has different monitoring set-up & procedures. (for legal, political, geographical, historical etc. reasons)

Problem:

- Data from each country, even if nominally the same quantity, may represent physically different things: different temporal/spatial support and resolution, different data acquisition and aggregation logic etc. =: "factors"
- In general, information about these factors has not been available to the JRC → data difficult to interpret, QA of information generated from the data can be weak

AIRDOS rationale (2)

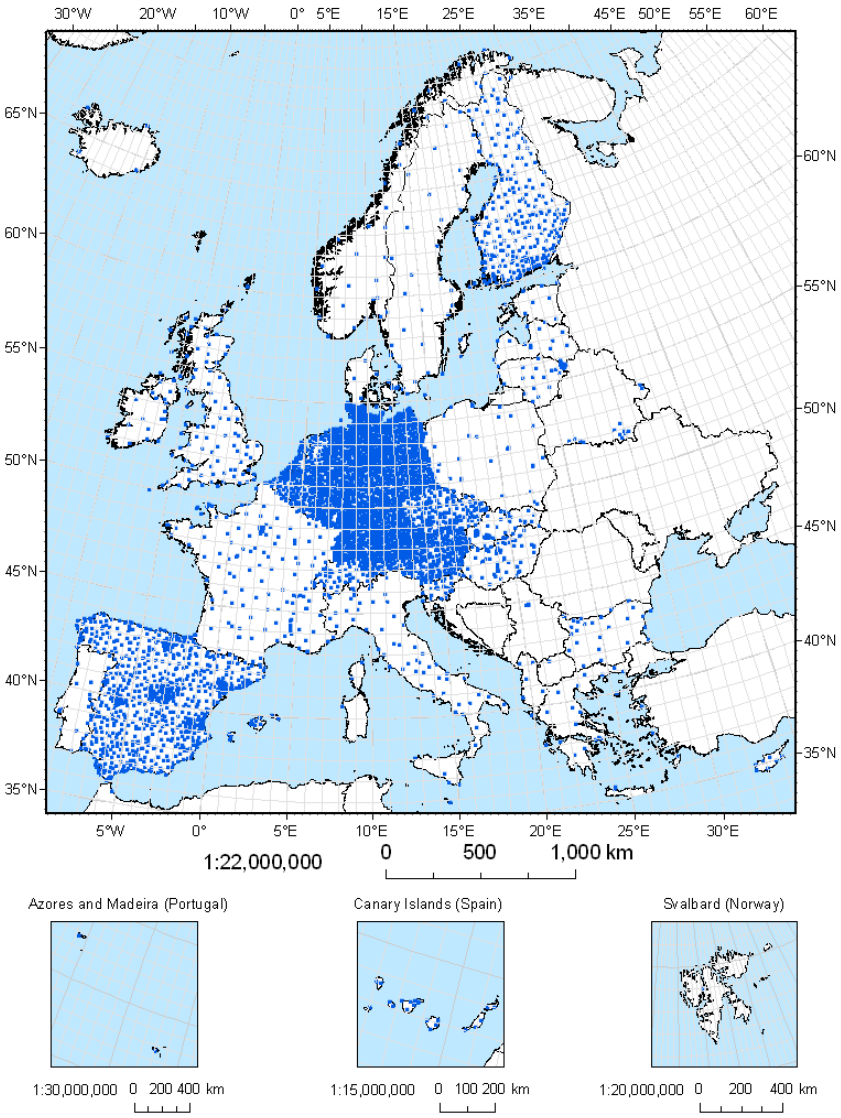
Solution strategy: →

- identify and quantify these factors;
- understand their impact on the data received by the JRC;
- conclusions;
- harmonization:
  - country level
  - JRC level

Method:

- questionnaire (+ additional discussions)
- statistics on information from questionnaire, models of: underlying physics; technical realization; data aggregation logic
- AIRDOS report, discussions
- suggestions:
  - modify system where feasible
  - develop methods for homogenizing data… ***FUTURE***

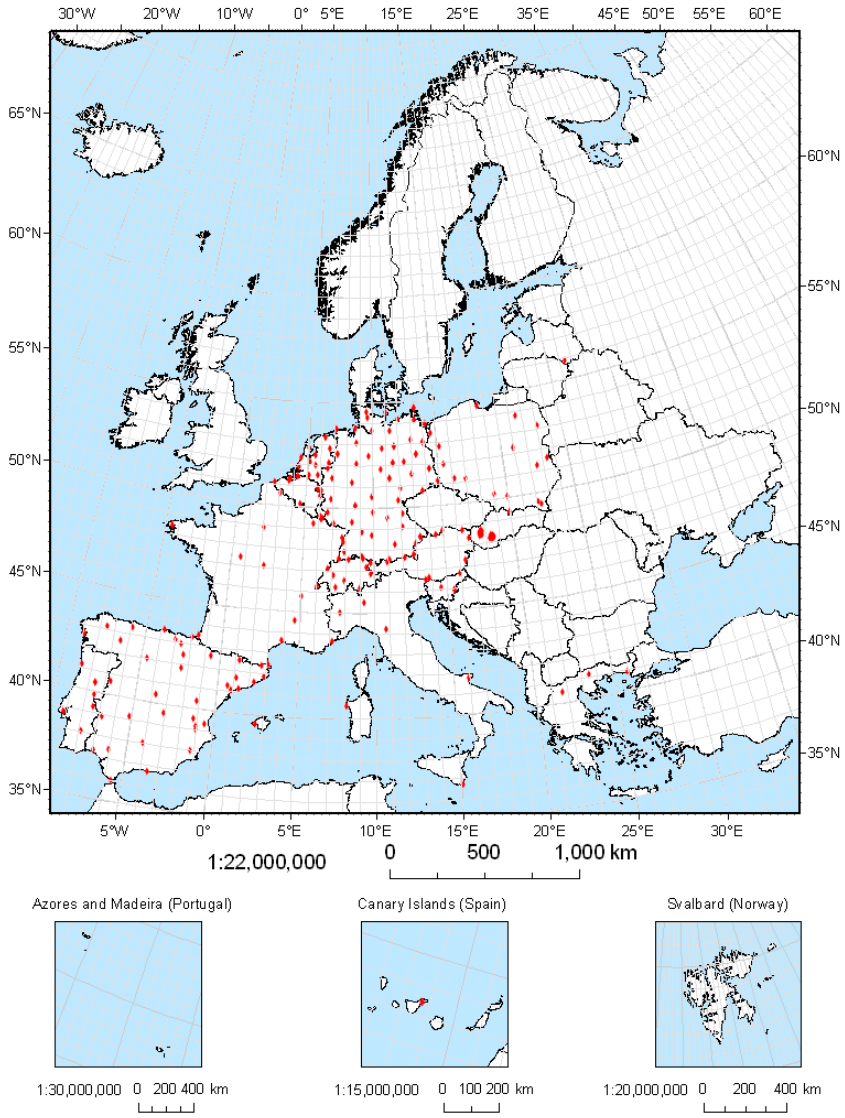
Monitoring networks in Europe: gamma stations



- 33 countries
- 67 networks
- 5295 stations

All networks shown, including those around nuclear sites

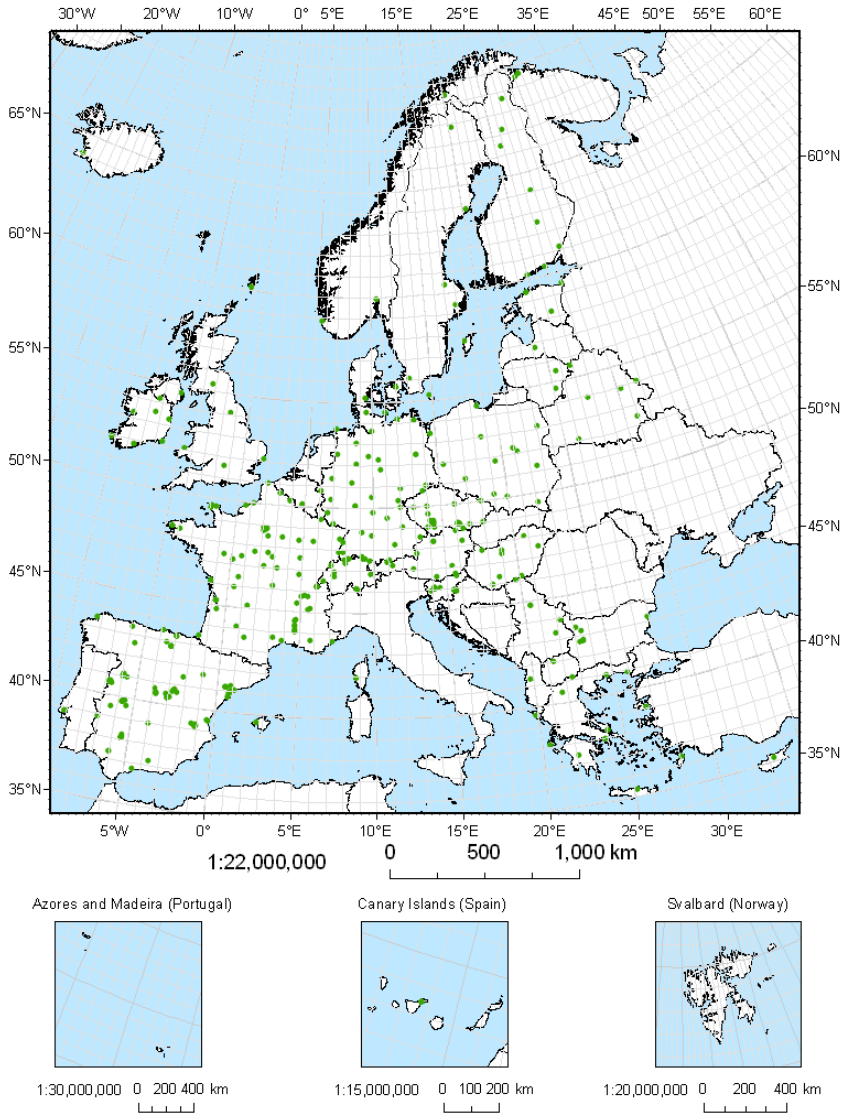
Monitoring networks in Europe: aerosol on-line stations



- 15 countries
- 22 networks
- 236 stations

All networks shown, including those around nuclear sites

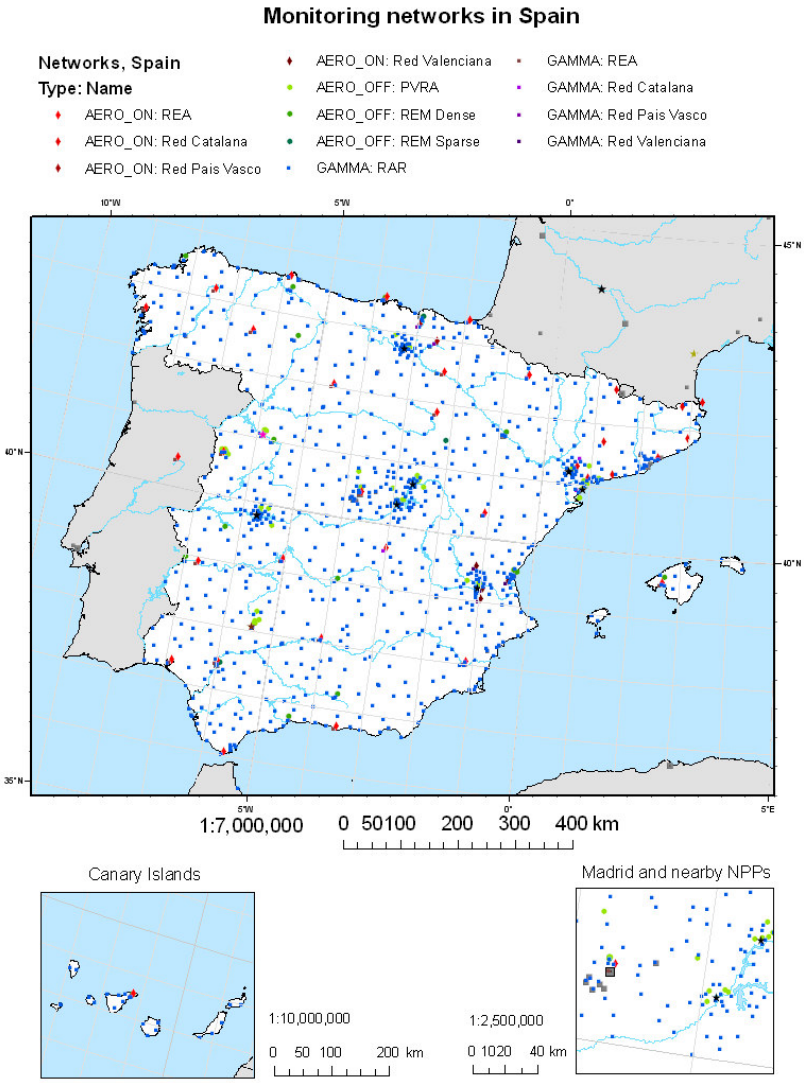
Monitoring networks in Europe: aerosol off-line stations



- 28 countries
- 39 networks
- 383 stations

All networks shown, including those around nuclear sites

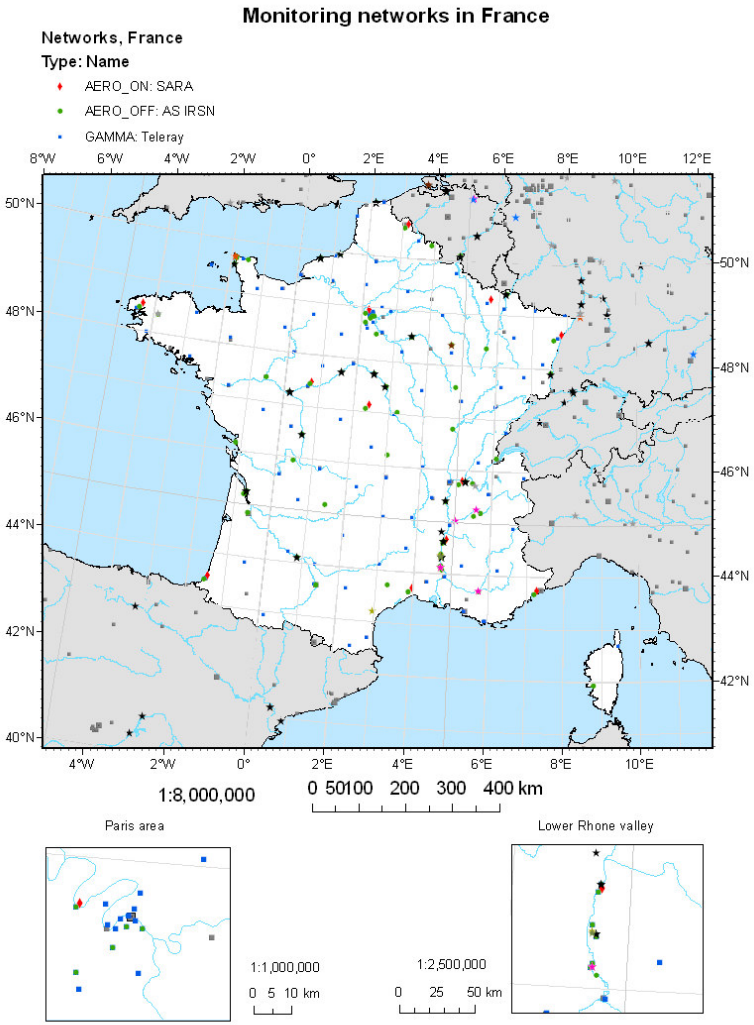
Monitoring networks in Spain



Type: Name	No. stations
• AERO_ON: REA	24
• AERO_ON: Red Catalana	10
• AERO_ON: Red País Vasco	2
• AERO_ON: Red Valenciana	4
• AERO_OFF: PVRA	64
• AERO_OFF: REM Dense	18
• AERO_OFF: REM Sparse	5
• GAMMA: RAR	881
• GAMMA: REA	24
• GAMMA: Red Catalana	3
• GAMMA: Red País Vasco	2
• GAMMA: Red Valenciana	4

RAR is a civil-defence network (not reporting to EURDEP)

Monitoring networks in France



Type: Name	No. stations
• AERO_ON: SARA	12
• AERO_OFF: AS IRSN	67
• GAMMA: Téléray	157

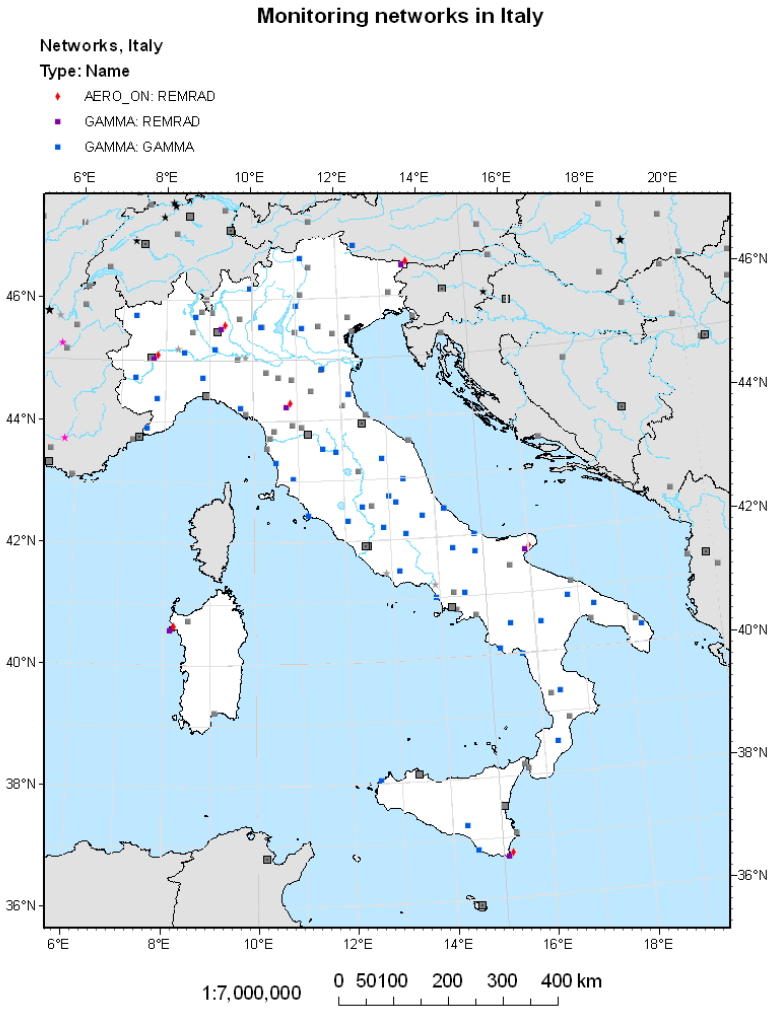
BUT

Station locations not provided for:

- **AERO_OFF: AS Site ?**
- **GAMMA: GDR Site ?**

These networks are being overhauled

Monitoring networks in Italy



Type: Name	No. stations
• AERO_ON: REMRAD	7
• GAMMA: REMRAD	7
• GAMMA: GAMMA	50

BUT

Station locations not provided for:

• AERO_OFF: RESORAD	>21

RESORAD is operated by 21 Regional Agencies

Sources of disharmony

- **Physical realm of monitoring system**

	network level	*station level*
geometry	network topology	siting, setup (systematic / random component)
transfer function: response r=T(true value)	aggregation	probe specification; aggregation

→ "measured" value (i.e. response)

- **External factors:**
  - natural: physical nature of a phenomenon, BG
  - political: legal limits, cov. factor, α, β (false acceptance / rejection risk)

→ delay times, DT, LLD → signal = information about "anomaly"

- **Data analysis:**

→ reaction to an "anomaly": alert or not ?

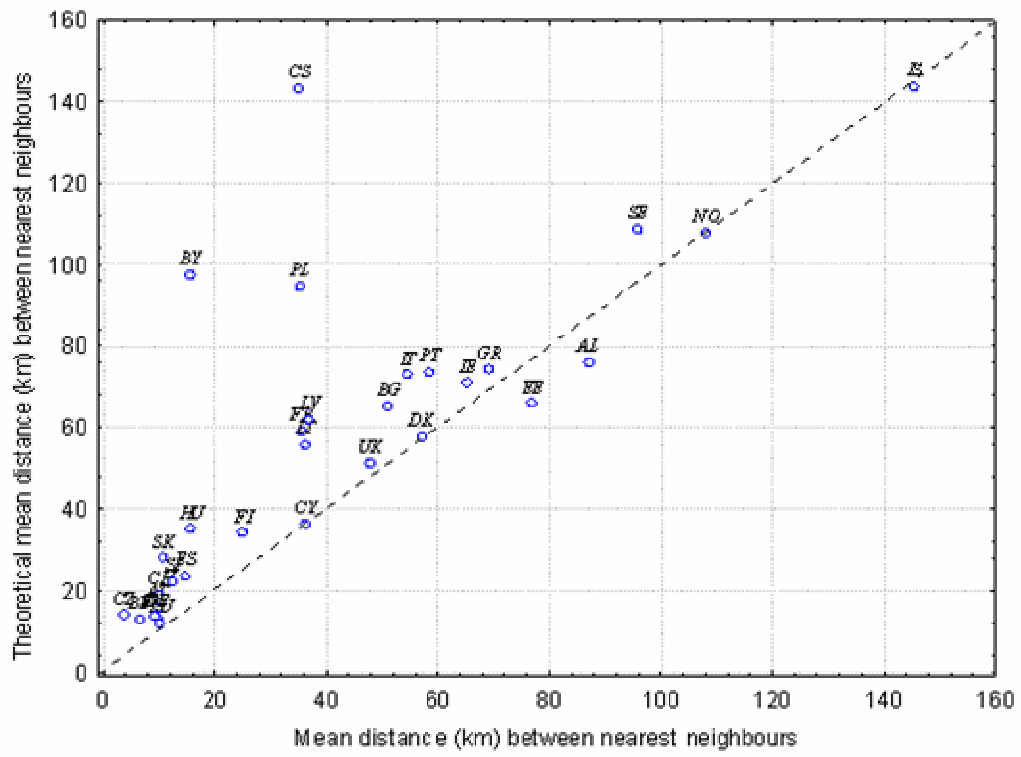
classification: "**true**" / "**spurious**" / "**harmless**" event

if "true event" → reliable alert = purpose of an emergency network

Examples (1)

Purpose of networks:
- surveillance of potential emitters
- surveillance of borders
- monitoring territory
- monitoring population centres
- etc.

→ resulting network design/ topology

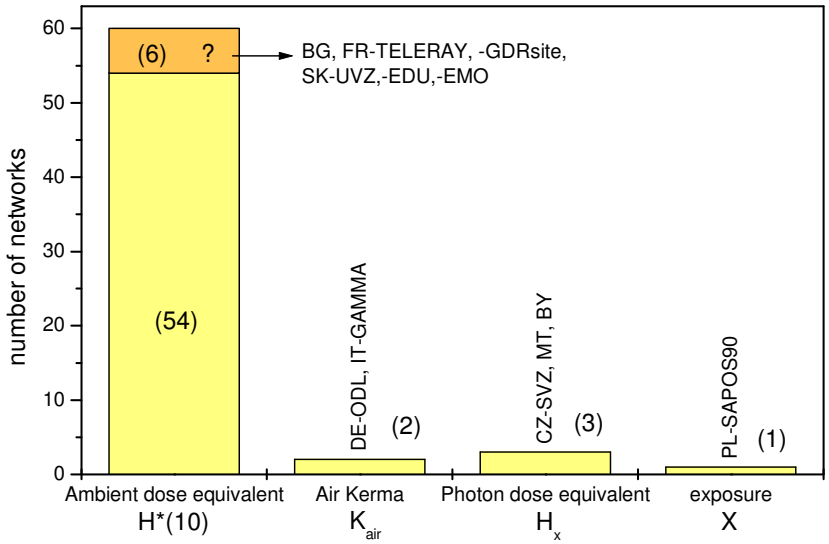


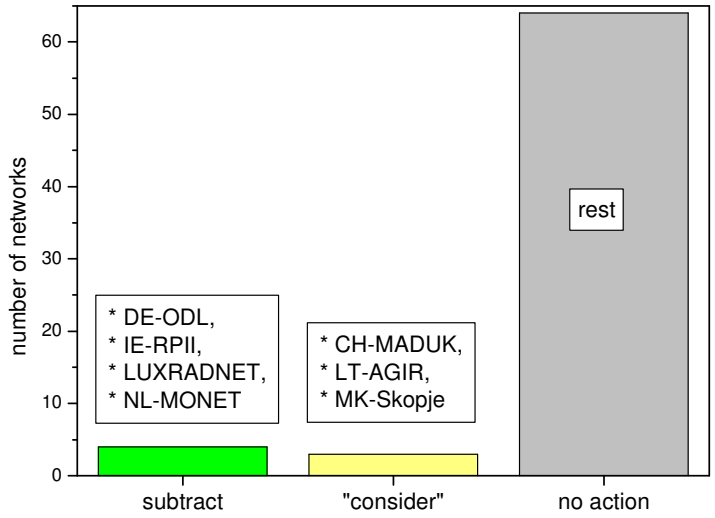
Examples (2)

Which quantity is reported?

example: gamma dose rate

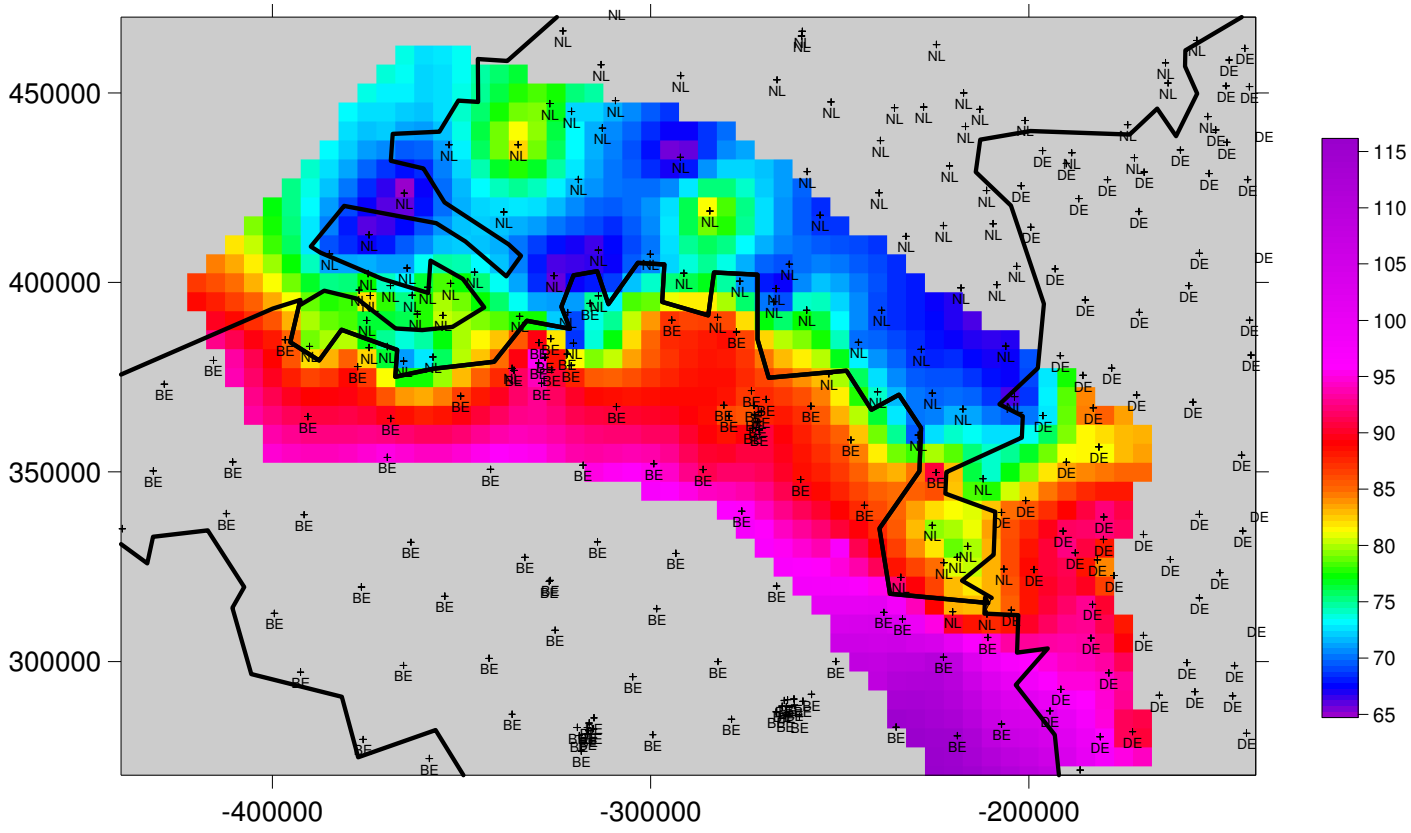
Internal detector BG
(gamma dose rate)





Examples (3)

- An example of inconsistency:
  gamma dose-rate NL/BE border



A tentative quantification of harmonization need