Air Quality & e-Reporting

Artur Gsella, Peter Kjeld
European Environment Agency

Air quality and citizen quality of life indicators
JRC Ispra, September 2013
Air Quality Reporting in Europe - transition time

- how has it been?
- how is it going to be?
- what are consequences and opportunities?
- … and where are we in implementing e-Reporting?
Air quality and citizen quality of life indicators

Air Quality Reporting in Europe - transition time

- how has it been?

Member States

ETC/ACM
data processing & analysis

EEA
data processing & dissemination

- how is it going to be?

Member States

ETC/ACM
data analysis

EEA
data processing & dissemination
Air Quality Reporting in Europe - transition time

- how has it been?

Council Decision 97/101/EC of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States


- how is it going to be?

Air Quality Reporting in Europe - transition time

- how has it been?
  - Exchange of Information (EoI)
  - Near Real Time (NRT)
  - AQ Questionnaire
  - AQ plans

- how is it going to be?
  - Meta on measurements (D)
  - Assessment regimes (C)
  - Aggregated data (F)
  - Primary data (E)
  - Attainment (G)
  - AQ zones (B)
  - AQ plans (H-K)
Air Quality Reporting in Europe - transition time

ETC/ACM
(UBA, Ricardo-AEA, 4sfera)

Air Quality e-Reporting Schema

JRC Ispra
Air Quality Reporting in Europe - transition time

→ Consequences and opportunities:

- **AQ e-Reporting schema** → one data model, common XML format for exchanging the air quality data!

- AQ data flows interconnected → experts and data operators in MS to collaborate...

- improved and extended data services

- ... and where are we in implementing e-Reporting?
Air Quality e-Reporting process flows at the EEA

XML validation

- E2a
- XML files
- QA
- D→E2a
- E2a
- SQL RDBMS
- reportnet
- harvesting & querying
- validated
- data services & viewers
- up-to-date

- E1a (E1b)
- XML files
- QA
- D→E1a
- E1a
- SQL RDBMS
- reportnet
- harvesting & querying
- validated
- data services & viewers
- up-to-date

- B,C,D,G
- XML files
- QA
- D→E1a
- E1a
- SQL RDBMS
- reportnet
- harvesting & querying
- validated
- data services & viewers
- up-to-date

- B,C,D,G
- E1a (E1b), F1a (F1b)
- MS annual attainment statements (versioned)

- G
- attainment
- SPATIAL DB
- Content Registry/RDF
- harvest & querying & validated
- data services & viewers
- SPATIAL DB
- Content Registry/RDF
- SDI
- data service & viewers
- attainment

European Environment Agency
Air Quality Reporting in Europe - transition time

for more information visit:
http://www.eionet.europa.eu/aqportal
Citizen science vs crowdsourcing

Crowdsourcing
NoiseWatch - http://eyeonearth.org/map/NoiseWatch

AirWatch - http://eyeonearth.org/map/AirWatch

Citizen science
Marine LitterWatch - available in Google Play

- Data flow B: air quality management zones
- Data flow C: assessment regimes for zones (sampling points within zones)
- Data flow D: sampling points, stations, measurement methods (processes), etc.
- Data flow E1a: primary validated measurements
- Data flow E1b: primary modelling results
- Data flow E2: primary up-to-date measurements
- Data flow F1a: aggregated, validated measurements
- Data flow F1b: aggregated modelling results
- Data flow F2: aggregated, up-to-date measurements
- Data flow G: attainment (aggregation within zones, approved by MS)
- Data flow H: air quality plans
- Data flow I: source apportionment
- Data flow J: scenario for the attainment year
- Data flow K: measures
Ideas on mobile sensors calibration

`citizen-centered` air quality information

(idea for an interface within data viewer or a separate interactive tool, could it be used for calibration of mobile sensors with up-to-date/NRT data?)

user specifies:

- location (lon-lat/address/map pointer?)
- and radius of interest
- short description of the location such as: urban/rural area? heavy traffic?

user gets, e.g.:

- number of AQ sampling points within the radius of interest, distance and meta of the nearest point
- AQ indicator based on the average (may be using ID interpolation)

caveats

user must be informed about the effect of generalising information with increasing radius
Ideas on mobile sensors calibration

`citizen-centered` air quality information

(idea for an interface within data viewer or a separate interactive tool, could it be used for calibration of mobile sensors with up-to-date/NRT data?)

- Interpolation with auxiliary information on area conditions (traffic/background)?
- Other auxiliary data possible? (modelling? annual statistics? fields interpolated from passive sampling?)
Ideas on testing locations

Suggested testing locations

(current NRT information tested on the number of AQ measurement stations in cities/pollutant)
Air quality and citizen quality of life indicators

Other abbreviations:

- XML – eXtensible Markup Language
- QA – Quality Assurance
- XML validation – check on fitting to the Data Model
- DB – database
- SQL – Structured Query Language
- RDBMS – relational database management system
- Content Registry – object-oriented search engine for the EIONET data
- RDF – Resource Description Framework, a way of storing data as web resources
- SDI – Spatial Data Infrastructure
- MS – EU Member State