Local Model Evaluation Support

Objectives, the service, the service team & next steps

CERC: Christine McHugh, David Carruthers, Martin Seaton

User meeting

Oberpfaffenhofen

24 June 2010

High level objectives!

• Develop, demonstrate and evaluate local forecast model evaluation support for local authorities and city bodies

- ❑ Set standard criteria and protocols for performance evaluation
- ❑ Standardization of interfaces for local input datasets based on common practices of regional and local bodies
- ❑ Support accountability/apportionment studies to evaluate mitigation measures

But what does it mean for me?

• Develop, demonstrate and evaluate local forecast model evaluation support for local authorities and city bodies

- ❑ Set standard criteria and protocols for performance evaluation

  You are not alone and you don't have to invent your own method to know whether a forecasting service is good or bad

- ❑ Standardization of interfaces for local input datasets based on common practices of regional and local bodies

  You can compare different services easily

- ❑ Support accountability/apportionment studies to evaluate mitigation measures

  If you assess your service and it's found to be good you proceed with confidence e.g. mitigation

What will it be like?

Methodology

- **Web based**: link to main PASODOBLE website and other relevant sites (e.g. Model Documentation System, MDS)
- **Structured advice and a toolbox**
- Evaluation of model output with respect to **satellite and in situ measurements**

What will it be like?

The Toolkit will include following aspects:

- basic criteria/fitness for purpose check list e.g. is model resolution consistent with application?
- scientific assessment
- model evaluation methodologies (concentrations) e.g. HARMO, FAIRMODE
- forecast accuracy criteria (metrics) e.g. AQ index, number of episodes correctly forecast etc

How we'll go about developing the service

Local forecast model evaluation support service:

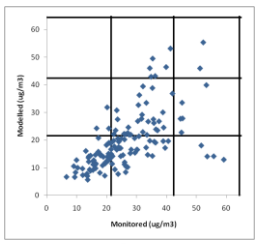
- We will not reinvent the wheel
- Maintain close links with ongoing initiatives, in particular exploit synergy with **FAIRMODE** , EEA Forum for Air Quality Modelling in Europe initiative (http://fairmode.ew.eea.europa.eu/). *FAIRMODE aims to provide guidance on the use of air quality modelling, promote best practice in air quality modelling and assessment and to provide a central reference document for the application of models, with respect to the new EC directives on air quality*
- Draw on existing body of work where relevant

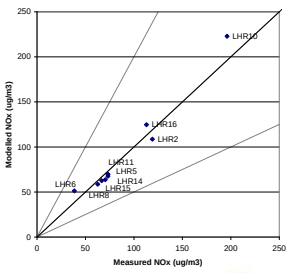
Previous work on model evaluation

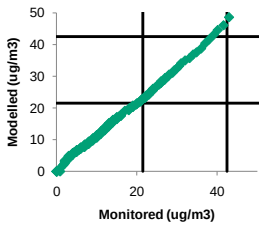
- Harmonisation Within Dispersion Modelling for Regulatory Purposes that developed a Model Validation Kit, **HARMO**
- local scale **COST 732** action; regional scale models **COST 728** and **COST ES0602**
- **ASTM** (American Society for Testing and Materials)
- **CLEAR** Cluster of European Air Quality Research, previous EU projects that have addressed local scale modelling and processes, such as, e.g. **OSCAR, SAPPHIRE, FUMAPEX** and **CAIR4HEALTH**
- UK government's assessment of air quality at **Heathrow** that used innovative, detailed analysis of monitoring and modelled data
- EEA's Model Documentation System, **MDS**
- EU-funded project on Scientific Model Evaluation of Dense Gas Dispersion, **SMEDIS**
- And much more

Existing methods…

Site	Annual average		98th percentile hourly average	
	Monitored	Modelled	Monitored	Modelled
Site 1	46	39	108	80
Site N	38	40	84	81
Average	**42**	**40**	**96**	**81**

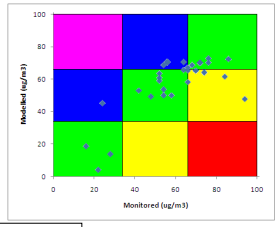


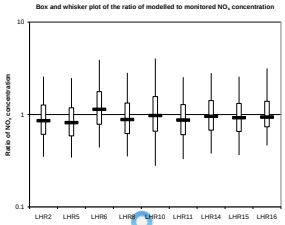


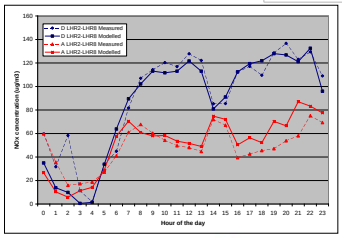


Existing methods…

- Number of monitored episodes
- Number of alerts issued
- Number of correct alerts
- Number of missed episodes
- Number of false alerts
- Alert accuracy
- Incorrect alerts issued as % of total alerts
- Episodes correctly forecast

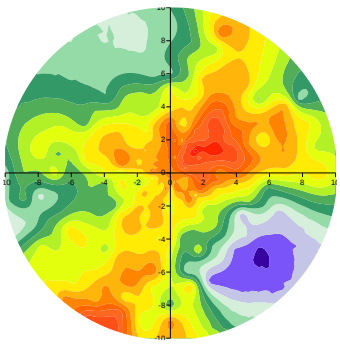


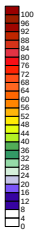


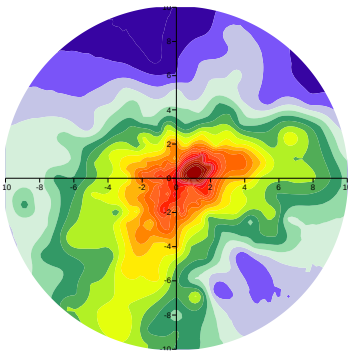


Myair Pasodoble

Existing methods…







Monitored

Modelled

Myair Pasodoble

How will Myair be different?

Remember that evaluation of forecasting services requires **additional considerations** to evaluation of models used for regulatory purposes

& we aim for something **more useful than vague advice!**

The DS-LOCAL team and roles

- **CERC**, Cambridge Environmental Research Consultants
- **FMI**, Finnish Meteorological Institute
- **AUTH**, Aristotle University of Thessalonika
- **VITO**, Vlaamse instelling voor technologisch onderzoek N.V.(Flemish Institute of Environmental Research)

- Work package leader: **CERC**
- Experience relevant to developing the methodology: **CERC, FMI, AUTH**
- Forecast data for testing the service: **CERC, AUTH, VITO**

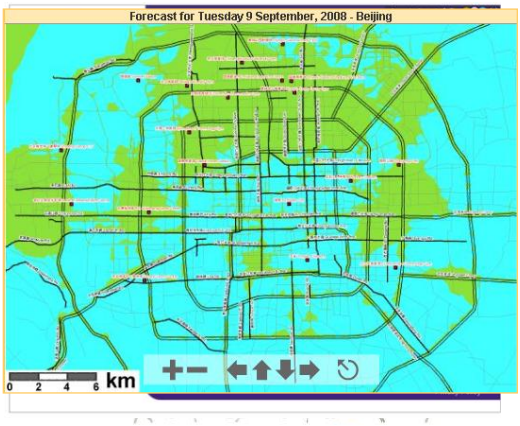
Summary of DS-LOCAL work package

- 51 months of effort in total

- TASK_1: Co-ordination
- TASK_2: User interaction
- TASK_3: Review of state of the art
- TASK_4: Development of toolkit and methodology
- TASK_5: Demonstration of toolkit and methodology
- TASK_6: Service evaluation and assessment

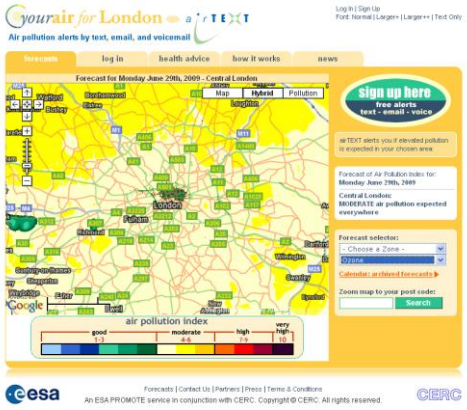
Forecasting and alerting services

- Wakefield (UK), HealthPACT
- Vienna, working with UBA (Austrian Environment Agency) and City of Vienna. Forecasts run by UBA
- Liverpool (UK)
- Beijing



Forecasting: London *air*TEXT

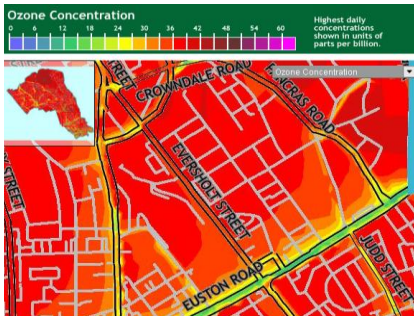
- London *air*TEXT system
- Over 6,000 subscribers
- www.airtext.info
- In DS-PUBLIC, develop the service e.g. pollen, UV & work with partners to deliver info at sports and leisure venues e.g. 2010 Olympics



Myair Pasodoble

GMES · EUROPEAN COMMISSION

Forecasting: local (street) scale



Myair Pasodoble

GMES · EUROPEAN COMMISSION

Next steps

- User requirements
- State of the art review
- Draw up a plan for the methodology and start to make it
- Test it by May 2011