

Summary discussion

During the discussion session the participants were split up into four groups, each tackling their own question. Afterwards, each group presented their findings and other participants could add ideas. The main points raised during the discussion are summarized per question.

1.) Is it necessary to validate a WRF-Chem modelling framework for each new research plan and case study? Is there a more efficient way to deal with validation?

- Yes, validation is necessary when changing the location, season and/or model version; the difficulty is that it is hard to make a general validation while there are many model options.
- Validation can be made more efficient by putting all data together and in a similar format and/or on the same grid. Then there is no need to contact all data providers separately. Also, a shared set of scripts in the community for validation could be useful.
- Validation can also be done by model intercomparison; for example, a continuous ensemble model forecast can be used to compare your own simulations to. For air-quality models have been compared (acmip?). There didn't seem to be a pressing need to initiate a new one.

2.) What are the regional air quality research challenges of the future and what kind of model development, tools and expertise is needed to address them?

Main challenges are:

- better representation of subgrid scale processes and exposure assessment
- using satellite data for model evaluation and data assimilation (especially important for regions where not so much ground-based data is available)
- scenario modelling (e.g. what are the consequences of a change in energy mix/the climate?) -> Does an emission reduction imply that boundary conditions become more important? Or will we mainly use global models in the future with a zoom on the region of interest?
- understanding the model code -> WRF-Chem is too much a "black box", which discourages model development

Requirements to deal with these challenges are:

- coupling of WRF-Chem to tools for exposure assessment
- regridding tools for satellite data
- tools for scenario modelling
- better organisation of WRF-Chem developments, including explaining comments in the code
- Andreas Hilboll: an tutorial, as was made for the PANDA project, on how to use satellite <-> model comparison can be helpful for this community as well
- WRF is very well updated and tested for the dynamics component, the WRF-Chem part stays behind in this. Would be good as WRF-Chem would also be more active regulated, could be helpful if we indicate as a large user group that this is disarable.

3.) Would a European infrastructure be desirable to keep up with changes in the model code and recent developments in methodology? Would you care to share your work with a wider community?

- Harmonisation of input and boundary conditions, land use maps, emission input, etc. in Europe would be efficient
- Preferred settings (such as urban parameters) could be shared
- A European mailing list could support the community in finding help and offering assistance, having regular meetings offline (like this workshop) would give some problems with travelling (costs) for the participants
- It could be useful to share pre-/post-processing tools and the willingness is there
 - Although people use different languages for pre-/post-processing, tools in a different language can still provide a useful example
- Trust is a keyword: sharing requires some form of quality control and traceability, for example by adding comments about the status of the code
- Some people are willing to have a Skype conference if help is needed
- We do NOT want a European version of WRF-Chem

4.) If a European infrastructure would be set-up to share ideas and tools, what should it look like? What kind of platform could be used? Who would manage the platform?

- A Wiki exists (Manchester), but the amount of information is still limited; people that are interested to get access can contact Douglas Lowe; who is willing to set-up an European-wide Wiki, based on this Manchester one.
- A repository can be useful to share tools and documentation; Andreas Hillboll suggested to set up such repository from the German community; tools can be linked to the Wiki.
- A collection of personal failures on the wiki site can help to prevent making 'common' mistakes
- Sharing set-ups/namelists can help to streamline validation
- Adding WRF user profiles makes it easier to identify who to contact for questions
- Challenge: how to make sure that information is updated regularly?
- The Dutch community (Sander Houweling, Iris Dekker) showed willingness to set up a European mailing list. Otherwise, Andreas Hilboll is willing to set-up an European WRF-Chem mailinglist, but this will take some time then
- There was interest in a follow on meeting of the European WRF community in the future, although some participants have limited possibilities to travel. Options would be to organize meetings at a lower frequency, with the possibility to join remotely. Another possibility is to organize it as a side event prior or posterior to a conference as EGU.