IMPROVING MODELLING CULTURE: OBSTACLES AND OPPORTUNITIES

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Abstract: The series of Harmonisation conferences has been ongoing for almost two decades. Since their beginning these conferences have been an appropriate platform for disseminating information to the modelling community on common tools, procedures and guidelines, and to inspire further developments. An underlying theme is that in the modelling community we should build upon the experiences of each other. However, the situation is not optimal. Too much work is to some extent wasted.
This paper discusses obstacles towards improvements of the situation, but its emphasis is on current opportunities. It is meant also as a practical guide, which points to a number of resources that you can use in your daily work.

Key words: *atmospheric dispersion modelling, Google Scholar, atmospheric dispersion wiki, Wikipedia, web resources.*

INTRODUCTION

The series of conferences on *Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes* has been ongoing for almost two decades. Since their beginning these conferences have been an appropriate platform for disseminating information to the modelling community on common tools, procedures and guidelines, and to inspire further developments. Readers interested in a historic perspective should consult Olesen (2001); proceedings from the conferences can be found at URL 1. In the modelling community we should build upon the experiences of each other. This has been an often repeated theme throughout the series of the Harmonisation conferences, but there are obstacles on the road.

This paper discusses obstacles towards improvements of the situation, but its emphasis is on current opportunities. Which resources are available? How can we establish mechanisms which work, when it comes to pooling experiences and obtain a better utilisation of the work done in the modelling community?

THE CHALLENGE

A major challenge in our daily work with dispersion modelling is how to deal with the very large amount of information which is produced, and which is continuously growing.
There are several aspects of this challenge.

As a model user or researcher you are often in a situation where you seek information. You wish to find information relevant for your problem. The information should preferably fulfil several criteria. It should match the problem at hand as closely as possible. It should by no means be incorrect or misleading. On the contrary, ideally it should guide you, point to possible solutions to your problem and make you aware which aspects to consider in choosing a solution. It may be accompanied by tools such as software or databases.

Furthermore, you don't want to miss important information. If somebody has produced information relevant for your problem, you will be interested in finding it – unless you are already equipped with precisely the information you need. Finally, the information should be relatively easily available.

Another aspect of the information challenge is that as a model user or researcher you are regularly in a position where you can potentially be *provider of information*. You may have produced some results or gained some experience which could be added to the community's pool of information.

However, here we face what we may designate 'the funding obstacle': A customer has asked you to carry through a project and solve a problem. You are committed to produce certain deliverables within a deadline, and your focus is on satisfying the customer and on complying with his deadline. *But nobody pays you to add information to the community pool.* So you will most likely choose not to bother, but proceed directly to the next customer who is waiting for you.

As a result, often valuable experiences are not communicated further, and thus much work is to some extent wasted. Others may unnecessarily repeat part of the work you have already done, or commit the mistakes you have learnt how to avoid.

From an overall perspective this is unfortunate. We could be building up durable, well-documented and generally accessible methodologies, but we actually do it only to a limited extent.

THE 'FUNDING OBSTACLE'

Through the lifetime of the Harmonisation initiative we have been concerned about this problem. There have been many initiatives in order to produce common tools, procedures and guidelines where the Harmo conferences have had a role as focal point.

In particular, I would like to mention one small initiative, which was launched at the 10th Harmonisation conference in Crete in 2005: A wiki on atmospheric dispersion modelling (URL 2, URL 3). It addresses the community of atmospheric dispersion modellers. Its purpose is to *pool experiences gained by dispersion modellers during their work*. For instance, this wiki is well suited to communicate experiences on experimental data sets: where to find data sets, useful tools for working with them, experiences on peculiarities and pitfalls, and links to publications where they are used.

Furthermore, the wiki can serve as a platform to communicate experiences and issue warnings against pitfalls and common mistakes related to dispersion modelling. It also includes information on model evaluation tools and on dispersion models.

This wiki has not been any great success, as it has had only few contributors. The main reason is most likely the 'funding obstacle': It requires an active effort and some work to share your experiences with others on the wiki, and nobody requires you to do so. As a result it appears that the wiki will not become any primary focal point for atmospheric dispersion modellers. Nevertheless, the wiki will continue to exist, and to play a role where it has something unique to offer. This is mainly in respect to specialized content, such as exchange of experiences on experimental data sets and tools. There is no need for the wiki to duplicate information which belongs more properly elsewhere on the web.

I see the fate of the Atmospheric Dispersion Modelling Wiki as an example of the 'funding obstacle'.

A ‘funding obstacle’ also appears in other contexts. I am referring to a wide range of activities related to the Harmonisation conferences, such as several past COST actions, the work with the Model Validation Kit, and various modelling exercises. Within these activities there has often been funding for some part of the activity – e.g. COST covers expenses for travel and meetings – but the activities have relied heavily on the voluntary contribution of members of the modelling community.

The activities certainly have produced results, but they have been limited more or less severely by the 'funding obstacle'.

The question is: Can we do more? Are there ways to overcome or bypass the 'funding obstacle'?

BYPASSING THE ’FUNDING OBSTACLE’

Obviously, the most ideal way to overcome the 'funding obstacle' is to obtain funding. Such tasks as producing datasets and software for the use of others take a lot of effort, and funding is vital for some work. But activities without direct funding have played a large role in the wide range of activities related to these conferences, and they will presumably continue to do so.

Thus, it is of interest to consider mechanisms where you can *bypass* the 'funding obstacle'.

A basic observation is that voluntary efforts are stimulated if there is some kind of reward in sight. In particular, chances for productive participation are good if the effort is closely related to work you are supposed to do anyway. So if you plan an activity involving voluntary effort, consider how it can involve some kind of reward for the participants.

As previously discussed, a ‘funding obstacle’ is also in effect when it comes to sharing your experiences. However, the web as it exists today offers a range of opportunities, which make it easy to share information and thus bypass the ‘funding obstacle’.

The idea is that it should require *only a small amount of extra effort* for you to contribute to the common pool of information. It may even be a natural part of your normal working activities. You just have to be aware of the opportunities.

There are certain rewards for an information provider. You obtain more exposure of your work, which can eventually lead to better citation ranking, and you generate a larger network of cooperating colleagues.

The remaining part of this paper is a practical guide. It points to a number of resources that you can use in your daily work

RESOURCES

This paper is meant to be useful for a reader both in the role as information provider and as information seeker. Let us take the perspective of an information seeker, because this perspective is useful to have in mind, even when you are in the role as information provider.

Google

An obvious first choice for an information seeker is to use Google (URL 4). By entering a few words you have access to vast amounts of information. Google is extremely useful, but in our discipline an ordinary Google search will often contain a lot of 'noise'. Often the search result will not fulfil the previously stipulated goal of quickly obtaining information that closely matches your problem.

Google Scholar

Here is where Google Scholar (URL 5) comes in. Many readers certainly know Google Scholar, but the service deserves some further explanation, for the benefit both of those who have tried it, and those who are yet unaware of its existence.

In many cases Google Scholar should be your first stop in searching for information, because it delivers more serious results than ordinary Google searches. It indexes 'scholarly' papers, i.e. scientific journal papers, but also theses and reports on the entire web. Commercial abstracting services (like Web of Knowledge and Scopus) also do the job of indexing journal papers, but despite the fact that Google Scholar is free, it can often provide a better coverage than the commercially available services.

Google Scholar has the advantage over other indexing services that it indexes conference publications, theses etc, and thus often delivers more recent results, and results not found by the commercial abstracting services. For journals with paid subscription Google Scholar - like the commercial services - provides immediate access to abstracts, but requires a journal subscription for access to the full text.

So Google Scholar is certainly a recommendable tool for you as an information seeker. However, supplement it by an ordinary Google Search when appropriate. Be aware that Google Scholar will not lead you to software tools or data sets, but only to papers. Furthermore, Google Scholar will sometimes miss relevant content. This is a place where you as an information provider come into the picture. Check whether your publications are included in Google Scholar, for instance by doing a site-specific search (for 'xxx site:mysite.org'). If you suspect that your publications are not properly included in Google Scholar, take action. There are guidelines for webmasters who would like their papers indexed in Google Scholar search results. So if you are employed at an institution with professionals who take care of a publishing service, ask them to consult the Google Scholar guidelines.

Wikipedia
Another obvious resource for some purposes is Wikipedia (URL 6). Wikipedia contains encyclopaedic articles, so it may not provide the specialized information you need, but it is a good reference to have in mind when you seek information. And, importantly: If you have information on a model or another topic that should be easy for the public to find, consider submitting an entry to Wikipedia. It is not difficult. Wikipedia has an entry on 'Atmospheric dispersion modeling' which may be a good place to start.

Wiki on Atmospheric Dispersion Modelling
A more specialised resource is the Atmospheric Dispersion Modelling Wiki (URL 2), which addresses the community of atmospheric dispersion modelers. Its purpose is to *pool experiences gained by dispersion modellers during their work*.

Warnings against pitfalls and common mistakes are of high interest. A central part of the wiki is a section, where it communicates experiences on experimental data sets. The intention is that it should guide you to where data sets and tools can be found. However, the wiki requires continuous contributions from the modelling community if it shall fulfil its mission properly.

The wiki allows anyone to edit and create web pages.

YouTube
YouTube (URL 7) is a media which can also serve the community of modellers. Obvious possibilities are educational videos, providing examples of plume behaviour, stack downwash and other phenomena. Contributors should make sure to tag uploaded files it with relevant labels (e.g., 'atmospheric', 'educational').

Atmospheric Dispersion mailing list
Yet another resource is mailing lists. There is a mailing list entitled Atmospheric Dispersion in the frame of Google Groups (URL 8). This is an e-mail list where people working in the field of atmospheric dispersion can post announcements and exchange experiences. Since the beginning of 2011 the list has replaced a similar list, AtmosphericDispersion, which was hosted by the Dutch Surfnet organisation until it stopped that service by the end of 2010.

LinkedIn
Social networks such as the professional network LinkedIn (URL 9) carry some potential for communication. Despite the 'funding obstacle', there is lively professional activity in some groupings. LinkedIn has a group 'Air Quality Dispersion Modeling' (URL 10) which is currently tuned mainly towards US topics, but which might become more international if the users wish so.

The Harmonisation initiative
The web site www.harmo.org has a section entitled 'Related activities and tools' (URL 11). Here you can find the present paper, follow-up information related to it, and all of the links mentioned.

Scientific journals
The traditional way of publishing scientific research – *peer reviewed journals* – remains a solid corner stone in scientific work. The information in scientific journals is more accessible than ever, because of the advent of search engines like Google Scholar. Open access journals provide an interesting alternative to traditional journals with subscription fees.

General considerations
You should be generous in providing links in reference lists when referring to non-journal publications. This will not only help your colleagues, but also the search engines, which are doing an impressive job of analysing the information on the web and putting it to use. Thus, Google Scholar displays the very the useful links "Cited by" and "Related papers", and these rely on information from reference lists.

CONCLUSION

The objective of this paper is to encourage you to do something active to share your experiences with others. With a small additional effort you can increase visibility of your work on the web. Furthermore, the paper suggests useful resources for information retrieval - and, conversely, you should consider these resources as places where you might add information.

REFERENCES

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All URL's below were visited August 31, 2011.

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URL 2: http://atmosphericdispersion.wikia.com/ Wiki on Atmospheric Dispersion Modelling
URL 3: http://www.harmo.org/conferences/Crete/Wiki_Introduction.asp Wiki on Atmospheric Dispersion Modelling: What and Why?
URL 4: http://www.google.com Google search engine
URL 5: http://scholar.google.com Google Scholar search engine
URL 6: http://en.wikipedia.org Wikipedia, the free encyclopedia
URL 7: http://youtube.com YouTube, video repository.
URL 8: http://groups.google.com/group/atmospheric-dispersion/about?hl=en E-mail discussion list on Atmospheric Dispersion.
URL 9: http://www.linkedin.com/ LinkedIn. 'World's largest professional network'
URL 10: http://www.linkedin.com/groups/Air-Quality-Dispersion-Modeling-3722325 LinkedIn, group 'Air Quality Dispersion Modeling'
URL 11: http://www.harmo.org/harmoni/LinksTo.asp Harmonisation initiative. Related activities and tools.