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The role of climate services in communication between science and policy - integrating knowledge across sectors and countries

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Abstract—Changes in climatic conditions affect society in a variety of ways. The requirements related to the development and use of climate information may differ considerably between and within sectors and users' communities, and may also change over time. There may be differences between countries due to biogeographical and political differences, diversity in impact models used, adaptation strategies, legislation, etc.

Climate services play a crucial role at the interface between science with both policy and practise. They include the preparation and dissemination of climate data, products and knowledge to the public or specific users, including impact researchers.

JPI-Climate Working Group 2 aims at coordinating knowledge development to advance the quality of climate (change) services to society and within Europe. Better services require proper knowledge of users' needs, which set the scope for the relevance of climate services, and about the operational way of the providers.

Our Fast Track Activities involve an analysis of existing information on users' requirements and an analysis of climate services providers for Europe. Such information does exist to some degree but relatively little is documented and it is scattered. The result will be an overview of similarities and differences in requirements and supply of services between sectors, countries, and providers, and an overview of knowledge gaps and needs and suggestions for action.

Index Terms—Climate services, Joint Programming, user needs, science-policy interaction.

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1 Introduction

Climate change is a complex reality, affecting society at large. Understanding and responding to climate change requires coordinated and large-scale efforts in research, innovation and governance (Kraus, 2012). Joint Programming – a concept introduced by the EC and welcomed by the Council of the EU in 2008– is a possible instrument to tackle these challenges (EU-COM, 2008; Council of EU, 2008). The Joint Programming Initiative "Connecting Climate Knowledge for Europe (JPI-Climate)" is a platform, to which currently 13 member and 3 observer countries as well as 4 observer institutions have committed with the aim to align national research policies according to a jointly agreed Strategic Research Agenda (SRA) (Bley et. al. 2011). The SRA has been accepted as an initial framework for cooperation and four priority areas were identified:

1. Moving towards reliable decadal climate predictions,

2. Researching and advancing climate service development,
3. Sustainable transformations of society in the face of climate change,
4. Improving tools for decision making under climate change.

The exchange of knowledge in terms of developing and delivering climate services was identified as one of the focus areas.

The climate science community finds itself increasingly confronted with specific demands for climate-related information from different sectors. As a result, many countries are currently developing climate services capacity, producing knowledge-based information about projected regional and sectoral climate changes and impacts. However currently, each provider uses its own methods/approaches for data and information, even though all services are actually based on the same core information. Hence, we find duplication of efforts and a significant degree of inconsistency. Consistency on a larger e.g. European level would be relevant with regard to data availability, improved tools/methods and for cross-border issues. In the context of the above initiative JPI-Climate aims to improve the efficiency of the planning, development and quality of climate services in Europe as well as enhancing consistency in the methods used in order to avoid duplication of efforts.

JPI Climate Module 2 aims at researching and advancing climate services by establishing a climate service community, assessing and enhancing the quality of climate services, improving its effectiveness and efficiency from the users´ perspectives, and developing and disseminating standards good practices. Priority is seen in building up a network of climate services providers, understanding users´ requirements and improving the interface between climate research and its application. Within two Fast Track Activities (FTAs) a mapping and analysis of climate service providers and users' requirements in Europe is being carried out and intensified dialogues between climate services providers and users are supported.

The overall strategic objective of the JPI-Climate is to contribute to highly coordinated knowledge development by improving the scientific expertise on climate change risks and adaption options, but also by connecting that knowledge with decision making. Understanding the nature and scope of those providing climate services and the services being provided and understanding the users´ requirements is critical to realisation of this strategic objective.

2 Users´requirements: What do we know and what not?

Climate services include among others the dissemination of climate data, information and knowledge to the public or specific users. They involve strong partnerships among providers and stakeholders. Better

dissemination requires proper knowledge on users' requirements, which set the scope for the relevance of the data/information/knowledge. In all European countries some information is available on users' requirements, from practise or from targeted inventories. However, relatively little of this information is documented and the information is scattered. Besides this, users' requirements can be very diverse (users are very diverse) and requirements may change over time. For a good design (relevant information, logical structure to find data and information, etc.) it would be useful to take into account users' requirements from the early phases of development of climate (change) services. An understanding of users' requirements can identify where there is a need for further research, including research that specifically supports the development and delivery of climate services, both standard products that fit a broad spectrum of users and those where requirements can best be met through tailoring. FTA 2.1 looks at what is known about users' requirements at the European level.

Firstly, a guidance document for inventories on users' requirements was compiled. The intention is that this guidance provides an opportunity for those less experienced to learn from the experience of others and thereby providing the means to more efficiently target their collection and analysis of users' requirements.

Secondly, we started collecting documents and information on users' requirements from the following sources:

1. European projects e.g. ECLISE, CLIMRUN, IS-ENES, CIRCLE;
2. Global framework on climate services: WMO;
3. National (research) programmes on climate change and adaptation and national dialogues.

At the moment the analysis of the documents is starting. It focusses on similarities and differences in requirements between sectors and countries. The guidance document helped in getting clearer which information is needed about users and their requirements concerning climate services. Besides knowing what the users ask for, we should also have more information on the users themselves: what is the role of climate data in their decisions, what is their framing, what is their background knowledge, etc.? Based on the guidance document a checklist was made for analyzing the inventories on users' requirements. From a first quick view we see already that there is much more documented on what users ask for than on the users themselves.

The result of the analysis should be an overview of similarities and differences in requirements between sectors and countries, and an overview of knowledge gaps and suggestions for further research. A con-

cept report of the results of the analysis and required further research/activities will be discussed with representatives of European projects, in order to come to a shared proposal for a strategic research agenda.

3 Mapping climate services in Europe

The field of climate services is developing rapidly and many different types of services and service providers have evolved at the interface between climate science and decision makers. Climate service providers use climate data, either produced by themselves or purveyed to them, and transform it to tailored user needs. While some institutions have been providing climate services for quite some time, many new initiatives have been established within the last few years. The development of service portfolios within existing initiatives and institutions is very dynamic. The perception what a climate service should deliver varies substantially, depending on the specific demands that different users and sectors pose and the providers addressing them as well as differences between single countries. FTA 2.2 looks at the European landscape of climate service providers.

The FTA aims at increasing the knowledge at European level on data use, access and availability, methods' use and development, the translation of climate knowledge into climate services and transboundary differences on the interpretation of climate services. By conducting questionnaires and qualitative interviews with climate service providers' information for a first status analysis of the providers' landscape is collected at the national level. Questions of interest are who are climate service providers, what kind of services do they offer and how do they interact with the users of climate services. The survey includes detailed questions on their organisational and operational form, the contents, base data and format of offered services, the user groups of the services and the relation between provider and user, the evaluation of services and the communication and dissemination of the services. Assessing the information provided will identify common criteria for categorising the providers along e.g. their sectoral and spatial focus.

With the results of the assessment a data base about climate service providers in Europe shall be created. The data base reveals similarities and differences in the supply of services between providers, countries and sectors and potential gaps in knowledge about and in understanding of climate services. Thereof, future research questions and activities can be proposed.

The proposed methodology is tested in a case study on German national level. The experiences and les-

sons learnt in this case study are shared in a Guidance document. The document serves as support for the other JPI-Climate member states in their mapping activities. Several countries, e.g. Austria, Sweden, the Netherlands, have already kicked-off their mapping activities in exchange with the activities in Germany.

Additionally and after the data collection phase, workshops at the national level with climate service providers and their users are planned, so called national dialogues. These workshops represent the linkage between the two FTA's. The aim is to advance the dialogue between providers and users, to establish a network and to discuss quality indicators for climate services.

All countries that have conducted the mapping will share their national results. The analysis of this will reveal the differences in climate service provisioning among the countries and rise questions like what is the added value to work on European scale or how the national dialogues can be used to progress on European scale. Therewith, the efficiency, credibility and saliency of the climate services framework and the quality of provided climate services can be improved.

4 Discussion

Climate services encompass a wide range of activities and climate service means different things to different people, both from the perspective of different users and providers. A climate service is more than simply the provision of data. It also involves providing context and support that is the basis for turning data into useable and relevant information (Shafer, 2004). To create some more clarity a typology of climate services is needed.

Climate services have been developed mainly at national levels (e.g. Gawith et al., 2009; Maraun et al., 2010), without a lot of international cooperation. Although recently climate services get a lot of attention at the global level (WMO, 2011) and in European projects (e.g. Swart & Pagé, 2010), until now there has not been a comparison of available knowledge on users' requirements and climate service providers at the European level as the FTA's mentioned above are working on. We expect that beside the differences, there will also be many similarities between sectors, countries, climate service providers. This means that we can profit from more international cooperation.

5 References

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